

**TECHNICAL MANUAL
MAINTENANCE INSTRUCTIONS
DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
M1083 SERIES, 5-TON, 6 X 6,
MEDIUM TACTICAL VEHICLES (MTV)**

VOLUME NO. 1 OF 4

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HEADQUARTERS, DEPARTMENTS OF THE ARMY AND THE AIR FORCE

15 SEPTEMBER 1998

CHANGE
NO. 1

HEADQUARTERS
DEPARTMENTS OF THE ARMY
AND THE AIR FORCE

Washington, D.C., 31 July 2001

TECHNICAL MANUAL
MAINTENANCE INSTRUCTIONS
DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
M1083 SERIES, 5-TON, 6x6,
MEDIUM TACTICAL VEHICLE
(MTV)

VOLUME NO. 1 OF 4

TM 9-2320-366-34-1, 15 September 1998, is changed as follows:

1. Remove old pages and insert new pages as indicated below.
2. New or changed material is indicated by a vertical bar in the out margin of the page.
3. Added or revised illustrations are indicated by a vertical bar adjacent to the illustration.

Remove Pages	Insert Pages	Remove Pages	Insert Pages
e thru kk/(ll Blank)	e thru al	2-1017 and 2-1018	2-1017 and 2-1018
none	A thru H	2-1029 and 2-1030	2-1029 and 2-1030
i thru xi/(xii Blank)	i thru xii	2-1067 thru 2-1071/(2-1072 Blank)	2-1067 thru 2-1072
none	xiii/(xiv Blank)	none	2-1072.1 thru 2-1072.15/ (2-1072.16 Blank)
2-1 and 2-2	2-1 and 2-2	2-1073 and 2-1074	2-1073 and 2-1074
2-7 thru 2-16	2-7 thru 2-16	A-1 and A-2	A-1 and A-2
none	(2-66.1 Blank)/2-66.2 thru 2-66.9/(2-66.10 Blank)	C-1 thru C-8	C-1 thru C-8
none	2-66.11 thru 2-66.17/(2-66.18 Blank)	none	C-9/(C-10 Blank)
2-67 and 2-68	2-67 and 2-68	D-1 and D-2	D-1 and D-2
2-71 and 2-72	2-71 and 2-72	none	D-4.1/(D-4.2 Blank)
2-73/(2-74 Blank)	2-73 and 2-74	D-5 and D-6	D-5 and D-6
none	2-74.1/(2-74.2 Blank)	D-25 thru D-28	D-25 thru D-28
2-75 thru 2-202	2-75 thru 2-202	D-31 and D-32	D-31 and D-32
none	2-202.1 and 2-202.2	D-39 thru D-48	D-39 thru D-48
2-203 thru 2-418	2-203 thru 2-418	none	D-81 thru D-86
none	2-418.1 and 2-418.2	F-1 thru F-15/(F-16 Blank)	F-1 thru F-16
2-419 thru 2-590	2-419 thru 2-590	none	F-17/(F-18 Blank)
none	2-590.1 thru 2-590.4	G-1/(G-2 Blank)	G-1/(G-2 Blank)
2-591 thru 2-838	2-591 thru 2-838	none	H-1 thru H-4
none	2-838.1 and 2-838.2	INDEX-1 thru INDEX-25/ (INDEX-26 Blank)	INDEX-1 thru INDEX-26
2-839 thru 2-959/(2-960 Blank)	2-839 thru 2-960	none	INDEX-27 thru INDEX-30
none	2-960.1 thru 2-960.3/(2-960.4 Blank)	DA Form 2028-2 Sample	DA Form 2028 Sample
2-961 and 2-962	2-961 and 2-962	DA Form 2028-2	DA Form 2028
2-965 and 2-966	2-965 and 2-966	DA Form 2028-2	DA Form 2028
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2-981 and 2-982	2-981 and 2-982	DA Form 2028-2	DA Form 2028
2-987 and 2-988	2-987 and 2-988	FO-1 FP-1/(FP-2 Blank)	FO-1 FP-1/(FP-2 Blank)
2-1005 and 2-1006	2-1005 and 2-1006	thru FP-21/(FP-22 Blank)	thru FP-21/(FP-22 Blank)
none	2-1006.1 thru 2-1006.4	FO-1 FP-25/(FP-26 Blank)	FO-1 FP-25/(FP-26 Blank)
2-1007 and 2-1008	2-1007 and 2-1008	FO-1 FP-29/(FP-30 Blank)	FO-1 FP-29/(FP-30 Blank)
none	2-1008.1 and 2-1008.2	thru FP-67/(FP-68 Blank)	thru FP-67/(FP-68 Blank)
2-1009 thru 2-1012	2-1009 thru 2-1012		

Place this change sheet in the front of the publication for reference purposes.

Remove Pages

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thru FP-79/(FP-80 Blank)
BackCover

Insert Pages

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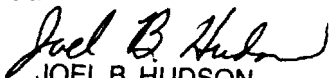
Insert Pages

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By Order of the Secretary of the Army:

ERIC K. SHINSEKI
General, United States Army
Chief of Staff

Official:


JOEL B. HUDSON
Administrative Assistant to the
Secretary of the Army
0110114

DISTRIBUTION: To be distributed in accordance with the Initial Distribution Number (IDN) 380942, requirements for TM 9-2320-366-34-1.

WARNING SUMMARY**WARNING****EXHAUST GASES CAN KILL**

1. **DO NOT** operate your vehicle engine in an enclosed area.
2. **DO NOT** idle vehicle engine with cab windows enclosed.
3. **DO NOT** drive vehicles with inspection plates or covers removed.
4. **BE ALERT** at all times for exhaust odors.
5. **BE ALERT** for exhaust poisoning symptoms, they are:

Headache

Dizziness

Sleepiness

Loss of Muscular Control

6. **IF YOU SEE** another person with exhaust poisoning symptoms:

Remove person from area.

Expose to open air.

Keep person warm.

Do not permit person to move.

Administer cardiopulmonary resuscitation, if necessary.*

* For cardiopulmonary resuscitation, refer to FM 21-11.

WARNING

Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock. Batteries can explode from a spark. Battery acid is harmful to skin and eyes. Always wear eye protection and rubber gloves when working with batteries. Failure to comply may result in injury to personnel.

WARNING

Battery acid (electrolyte) is extremely harmful. Always wear safety goggles and rubber gloves, and do not smoke when performing maintenance on batteries. Injury will result if acid contacts skin or eyes. Wear rubber apron to prevent clothing being damaged. Failure to comply may result in injury to personnel.

WARNING (CONT)

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in injury to personnel.

WARNING

- Dry cleaning solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in well ventilated area; avoid contact with skin, eyes, and clothes, and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flashpoint for Type I dry cleaning solvent is 100 ° F (38 ° C) and for Type II is 130 ° F (50 ° C). Failure to comply may result in serious injury or death to personnel.
- If personnel become dizzy while using dry cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

WARNING

Diesel fuel is flammable. If fuel is spilled, clean it up immediately. Failure to comply may result in serious injury or death to personnel.

WARNING

Use care when moving oxygen/acetylene bottles. Oxygen/acetylene bottles can act as projectiles if punctured and discharge explosive gases. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING

Diesel fuel is flammable. Do not fill fuel tank with engine running, while smoking, or when near an open flame. Never overfill the tank or spill fuel. If fuel is spilled, clean it up immediately. Failure to comply may result in serious injury or death to personnel.

WARNING

Adhesive Sealant MIL-S-46163 can damage your eyes. Wear safety goggles/glasses when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

WARNING

Use care when removing springs. Springs are under tension and can act as projectiles when being removed. Failure to comply can cause injury to personnel.

WARNING

After Nuclear, Biological, or Chemical (NBC) exposure of vehicle, all air filters shall be handled with extreme caution. Unprotected personnel may experience serious injury or death if residual toxic agents or radioactive material are present. If vehicle is exposed to chemical or biological agents, servicing personnel shall wear protective mask, hood, protective overgarments, and chemical protective gloves and boots in accordance with FM-3-4. All contaminated air filters shall be placed in double-lined plastic bags and moved swiftly to a segregation area away from the worksite. The same procedure applies for radioactive dust contamination. The Company NBC team should measure radiation prior to filter removal to determine extent of safety procedures required per the NBC Annex to the unit Standard Operating Procedures (SOP). The segregation area in which the contaminated air filters are temporarily stored shall be marked with appropriate NBC placards. Final disposal of contaminated air filters shall be in accordance with local SOP. Decontamination operation shall be in accordance with FM-3-5 and local SOP. Failure to comply may result in serious injury or death to personnel.

WARNING

Use care when installing springs. Springs are under tension and can act as projectiles when removed. Failure to comply may result in injury to personnel.

WARNING

Ensure exhaust system is cool before performing maintenance. Failure to comply may result in injury to personnel.

WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

WARNING

Do not operate MTV vehicle with muffler removed. Toxic exhaust fumes may enter cab, resulting in serious injury or death to personnel.

WARNING

Do not work on fuel system when engine is hot; fuel can be ignited by a hot engine.

WARNING

Post signs that read "NO SMOKING WITHIN 50 FEET" when working with open fuel, fuel lines or fuel tanks. Failure to comply may result in injury to personnel or damage to equipment.

WARNING (CONT)

WARNING

Exhaust pipe, transmission oil lines, and transmission scavenge pump hose may be hot to the touch. Extreme care should be taken when checking exhaust pipe, transmission oil lines, and transmission scavenge pump hose for leaks. Failure to comply may result in injury to personnel.

WARNING

Compressed air used for cleaning purposes will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc). Failure to comply may result in injury to personnel.

WARNING

Wheel drum weighs approximately 90 lbs (41 kgs). Use the aid of an assistant to help remove wheel drum. Failure to comply may result in injury to personnel.

WARNING

Wheel drum weighs approximately 90 lbs (41 kgs). Use the aid of an assistant to help install wheel drum. Failure to comply may result in injury to personnel.

WARNING

Brake shoes may be covered with dust. Breathing this dust may be harmful to your health. Do not use compressed air to clean brake shoes. Wear a filter mask approved for use against brake dust. Failure to comply may result in injury to personnel.

WARNING

Cage spring brake before air chamber is removed or severe injury to personnel will occur.

WARNING

Ensure air chamber is caged prior to installation. Failure to comply may result in injury to personnel.

WARNING

Ensure that tire is totally deflated before removing self-locking nuts. Failure to comply may result in serious injury or death to personnel.

WARNING

Spring brakes must be caged before attempting replacement of a rear axle wheel stud. Failure to comply may result in severe injury to personnel.

WARNING

Wear protective goggles to protect against possible injury from release of high pressure air. Failure to comply may result in injury to personnel.

WARNING

Prolonged contact with lubricating oil (MIL-L-2104) may cause a skin rash. Skin and clothing that come in contact with lubricating oil should be thoroughly washed immediately. Saturated clothing should be removed immediately. Areas in which lubricating oil is used should be well ventilated to keep fumes to a minimum. Failure to comply may result in injury to personnel.

WARNING

Hydraulic fluid (MIL-H-5606) is TOXIC. Wear protective goggles and gloves; use only in well ventilated area; avoid contact with skin, eyes, and clothes. Skin and clothing that come in contact with hydraulic oil should be washed immediately. Saturated clothing should be removed immediately. Failure to comply may result in injury to personnel.

WARNING

Wire rope can become frayed or contain broken wires. Wear heavy leather-palmed gloves when handling wire rope. Frayed or broken wires can injure hands. Failure to comply may result in injury to personnel.

WARNING

Never let moving wire rope slide through hands, even when wearing gloves. A broken wire could cut through gloves and cut hands.

WARNING

Wear appropriate eye protection when drilling out rivets. Failure to comply may result in injury to personnel.

WARNING

Wear leather gloves at all times when handling winch cable. Do not allow cable to slide through hands even with gloves on. Broken wires may cause injury.

WARNING SUMMARY (CONT)

WARNING

Use extreme caution when working around moving cable. Failure to do so may result in serious injury to personnel.

WARNING

Caution must be exercised while cab is raised. Ensure that locking mechanism is functioning properly before proceeding. Failure to comply may result in death or serious injury to personnel and damage to equipment.

WARNING

Hydraulic components are hot when hydraulic oil reaches operating temperature. Use caution when handling hydraulic components. Wear gloves or use rags to hold metal objects. Failure to comply may result in injury to personnel.

WARNING

Do not remove radiator cap when the engine is hot; steam and hot coolant can escape and burn skin. Failure to comply may result in injury to personnel.

WARNING

Use extreme care when opening cab door with cab raised. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Ensure engine is cool before performing troubleshooting. Failure to comply may result in severe burns.

WARNING

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

WARNING

Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.

WARNING

Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.

WARNING

Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

WARNING

Ensure all pressure is released from engine container. Failure to comply may result in injury to personnel.

WARNING

Engine container cover weighs approximately 130 lbs (59 kgs). Attach a suitable lifting device prior to unpacking. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Engine assembly weighs approximately 1500 lbs (681 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING

Engine assembly weighs approximately 1500 lbs (681 kgs). Attach a suitable lifting device prior to packing. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING

Storage container cover weighs approximately 130 lbs (59 kg). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Wear appropriate eye protection when drilling holes. Failure to comply may result in injury to personnel.

WARNING SUMMARY (CONT)

WARNING

Alternator weighs approximately 50 lbs (23 kgs). The aid of an assistant is required to remove alternator. Failure to comply may result in injury to personnel.

WARNING

Alternator weighs approximately 50 lbs (23 kgs). The aid of an assistant is required to install alternator. Failure to comply may result in injury to personnel.

WARNING

Cylinder head weighs approximately 150 lbs (68 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Cylinder head weighs approximately 150 lbs (68 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Adhesive causes immediate bonding on contact with eyes, skin, or clothing and also gives off harmful vapors. Wear protective goggles and use in well-ventilated area. If adhesive get in eyes, try to keep eyes open, flush eyes with water for 15 minutes, and get immediate medical attention. Failure to comply may result in injury to personnel.

WARNING

Flywheel housing weighs approximately 75 lbs (34 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Flywheel housing weighs approximately 75 lbs (34 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Use care when removing springs. Springs are under tension and can act as projectiles when removed. Failure to comply may result in injury to personnel.

WARNING

Use care when removing retaining rings. Retaining rings are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

WARNING

Use care when installing retaining rings. Retaining rings are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

WARNING

Engine compartment and components may be hot to the touch. Extreme care should be taken when adjusting idle speed. Failure to comply may result in injury to personnel.

WARNING

Engine compartment includes a partially covered fan blade. Extreme care should be taken when working in the engine compartment. Failure to comply may result in injury to personnel.

WARNING

Use care when removing retaining clips. Retaining clips are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

WARNING

Use care when installing retaining clips. Retaining clips are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

WARNING

Clutch housing is assembled under tension. Use caution during disassembly. Failure to comply may result in injury to personnel.

WARNING

Loosen C-clamps slowly and evenly to release tension. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Tighten C-clamps slowly and evenly to apply tension. Failure to comply may result in injury to personnel or damage to equipment.

WARNING SUMMARY (CONT)

WARNING

Ensure engine is cool before performing maintenance. Failure to comply may result in injury to personnel.

WARNING

Torque converter module weighs approximately 65 lbs (30 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel.

WARNING

Torque converter module weighs approximately 65 lbs (30 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Transmission weighs approximately 1300 lbs (590 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Transmission weighs approximately 1300 lbs (590 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Diesel fuel is flammable. Keep diesel fuel away from open fire and keep a fire extinguisher within easy reach when working with diesel fuel. Do not smoke when working with diesel fuel. If fuel is spilled, clean it up immediately. Failure to comply may result in serious injury or death to personnel.

WARNING

Use care when removing valve body parts retained by retaining pins. Valve body parts are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

WARNING

Use care when installing valve body parts retained by retaining pins. Valve body parts are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

WARNING

Control valve module weighs approximately 65 lbs (30 kgs). Position a floor jack under control module prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Control valve module weighs approximately 65 lbs (30 kgs). Position a floor jack under control module prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Front axle assembly weighs approximately 1580 lbs (717 kgs). Front axle assembly must be supported on a transmission/differential lift during removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Front axle assembly weighs approximately 1580 lbs (717 kgs). Front axle assembly must be supported on a transmission/ differential lift during installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Steering gear assembly weighs approximately 130 lbs (59 kgs). Support steering gear assembly on jack before dismounting from chassis. Failure to comply can cause injury to personnel or damage to equipment.

WARNING

Steering gear assembly weighs approximately 130 lbs (59 kgs). Support steering gear assembly on jack during installation. Failure to comply may cause injury to personnel or damage to equipment.

WARNING

Front differential carrier weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Front differential carrier weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING SUMMARY (CONT)

WARNING

Steering knuckle weighs approximately 150 lbs (68 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Steering knuckle weighs approximately 150 lbs (68 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Intermediate axle assembly weighs approximately 1580 lbs (717 kgs) and must be supported during removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Intermediate axle assembly weighs approximately 1580 lbs (717 kgs) and must be supported during installation. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING

Intermediate differential carrier weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Intermediate differential carrier weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Rear axle assembly weighs approximately 1580 lbs (717 kgs). Rear axle assembly must be supported on a transmission/differential lift during removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Rear axle assembly weighs approximately must 1580 lbs (717 kgs). Rear axle assembly must be supported on a transmission/differential lift during installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Rear axle differential carrier weighs approximately 400 lbs (182 kgs). Rear axle differential carrier must be supported on transmission/differential lift during removal. Failure to comply may cause serious injury to personnel or damage to equipment.

WARNING

Parachute suspension assembly weighs approximately 250 lbs (113 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in damage to equipment or injury to personnel.

WARNING

Parachute suspension assembly weighs approximately 250 lbs (113 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in damage to equipment or injury to personnel.

WARNING

Frame plate weighs approximately 90 lbs (41 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in damage to equipment or injury to personnel.

WARNING

Frame plate weighs approximately 90 lbs (41 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in damage to equipment or injury to personnel.

WARNING

Lifting beam weighs approximately 75 lbs (34 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Front lifting bracket assembly weighs approximately 300 lbs (136 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING SUMMARY (CONT)

WARNING

Front lifting bracket assembly weighs approximately 300 lbs (136 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Lifting beam weighs approximately 75 lbs (34 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Frame rail weighs approximately 250 lbs (113 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Frame rail weighs approximately 250 lbs (113 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Frame rail weighs approximately 320 lbs (145 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Frame rail weighs approximately 320 lbs (145 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Frame rail weighs approximately 280 lbs (127 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Frame rail weighs approximately 280 lbs (127 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Frame rail weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Frame rail weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Frame rail weighs approximately 300 lbs (136 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Frame rail weighs approximately 300 lbs (136 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Subframe rail weighs approximately 200 lbs (91 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Subframe rail weighs approximately 200 lbs (91 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Subframe weighs approximately 630 lbs (286 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Subframe weighs approximately 630 lbs (286 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING SUMMARY (CONT)

WARNING

Subframe rail weighs approximately 280 lbs (127 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Subframe rail weighs approximately 280 lbs (127 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Subframe rail weighs approximately 240 lbs (109 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Subframe rail weighs approximately 240 lbs (109 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Front crossmember weighs approximately 200 lbs (91 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Front crossmember weighs approximately 200 lbs (91 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Intermediate crossmember weighs approximately 75 lbs (34 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Intermediate crossmember weighs approximately 75 lbs (34 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Fifth wheel assembly weighs approximately 930 lbs (422 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Fifth wheel assembly weighs approximately 930 lbs (422 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Fifth wheel top plate weighs approximately 210 lbs (141 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Fifth wheel top plate weighs approximately 210 lbs (141 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Do not attempt to repair or disassemble leaf springs. Leaf springs are under extreme tension. Failure to comply may result in serious injury or death to personnel.

WARNING

Wear appropriate eye protection when drilling out rivets. Failure to comply may result in injury to personnel.

WARNING

Wear protective goggles to protect against possible injury from release of high pressure air. Failure to comply may result in injury to personnel.

WARNING SUMMARY (CONT)

WARNING

Brace cab prior to removal of cotter pin from cab tilt cylinder mounting bolt. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING

Standard cab weighs approximately 1400 lbs (636 kgs). M1093/M1094 cab weighs approximately 1700 lbs (772 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Cab may swing forward slightly when screws are removed. An assistant is required to steady cab. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Standard cab weighs approximately 1400 lbs (636 kgs). M1093/M1094 cab weighs approximately 1700 lbs (772 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

After cab is lowered on cab support tool, return cab tilt selector knob to the RAISE position for added safety. Failure to comply may result in injury to personnel.

WARNING

Brace cab with cab support tool before installing locking arm, spacer, washer, and cotter pin on tilt cylinder mounting bolt. Failure to comply may result in serious injury or death to personnel.

WARNING

Cab must be braced on cab support tool prior to removal of cotter pin from cab tilt cylinder mounting bolt. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Goggles and gloves must be worn when working with glass. Failure to comply may result in injury to personnel.

WARNING

Cargo bed weighs approximately 2660 lbs (1208 kgs). Attach a suitable lifting device to four corner tiedown points prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Cargo bed weighs approximately 2660 lbs (1208 kgs). Attach a suitable lifting device to four corner tiedown points prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Cargo bed weighs approximately 3520 lbs (1598 kgs). Attach a suitable lifting device to four corner tiedown points prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Cargo bed weighs approximately 3520 lbs (1598 kgs). Attach a suitable lifting device to four corner tiedown points prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Dump body weighs approximately 3,030 lbs (1,377 kg). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Dump body weighs approximately 3,030 lbs (1,377 kg). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Cab protector weighs approximately 185 lbs (84 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Cab protector weighs approximately 185 lbs (84 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING SUMMARY (CONT)

WARNING

Support structure weighs approximately 600 lbs (272 kgs). Attach suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Support structure weighs approximately 600 lbs (272 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Material Handling Crane (MHC) weighs approximately 3030 lbs (1375 kgs). Attach suitable lifting device prior to removal. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING

Personnel must stand clear during lifting operations. Failure to comply may result in serious injury or death to personnel.

WARNING

A guide rope must be attached to aid in controlling Material Handling Crane (MHC) during removal. Failure to comply may result in serious injury or death to personnel.

WARNING

Material Handling Crane (MHC) assembly weighs approximately 3030 lbs (1375 kgs). Attach suitable lifting device prior to installation. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING

A guide rope must be attached to aid in controlling Material Handling Crane (MHC) during installation. Failure to comply may result in serious injury or death to personnel.

WARNING

Boom assembly weighs approximately 800 lbs (363 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Drive pivot shaft far enough to release tension link cylinder. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Drive pivot shaft far enough to release mast. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Boom assembly weighs approximately 800 lbs (363 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Boom fly section weighs approximately 120 lbs (55 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

A guide rope must be attached to aid in controlling boom fly section during removal. Failure to comply may result in injury to personnel.

WARNING

Boom fly section weighs approximately 120 lbs (55 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

A guide rope must be attached to aid in controlling boom fly section during installation. Failure to comply may result in injury to personnel.

WARNING

Boom mid section and telescopic cylinder combined weigh approximately 320 lbs (145 kgs). Attach suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING SUMMARY (CONT)

WARNING

A guide rope must be attached to aid in controlling boom mid section and telescopic cylinder during removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Telescopic cylinder weighs approximately 150 lbs (68 kg). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Telescopic cylinder weighs approximately 150 lbs (68 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Boom mid section and telescopic cylinder combined weigh approximately 320 lbs (145 kgs). Attach suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

A guide rope must be attached to aid in controlling boom mid section and telescopic cylinder during installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Boom base section weighs approximately 370 lbs (169 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel and damage to equipment.

WARNING

Boom base section weighs approximately 370 lbs (169 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Lift cylinder assembly weighs approximately 100 lbs (45 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Lift cylinder assembly weighs approximately 100 lbs (45 kg). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Erection cylinder weighs approximately 50 lbs (23 Kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel.

WARNING

Erection cylinder weighs approximately 50 lbs (23 Kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel.

WARNING

RH lift cylinder assembly weighs approximately 100 lbs (45 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Mast weighs approximately 120 lbs (54 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Mast weighs approximately 120 lbs (54 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

RH Lift cylinder assembly weighs approximately 100 lbs (45 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING SUMMARY (CONT)

WARNING

Turntable weighs approximately 130 lbs (59 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Turntable bearing weighs approximately 150 lbs (68 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Turntable bearing weighs approximately 150 lbs (68 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Turntable weighs approximately 130 lbs (59 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Do not remove swivel nut on back side of tension load cell. Failure to comply may result in injury to personnel and damage to equipment.

WARNING

Cylinder housing is under tension. Use care when removing cylinder housing from end cover. Failure to comply may result in injury to personnel.

WARNING

Hoist assembly weighs approximately 210 lbs (95 kgs). Attach suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Hoist assembly weighs approximately 210 lbs (95 kgs). Attach suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Swing drive assembly weighs approximately 70 lbs (32 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Swing drive assembly weighs approximately 70 lbs (32 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Jack cylinder weighs approximately 170 lbs (77 kgs). Attach suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Jack cylinder weighs approximately 170 lbs (77 kgs). Attach suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

When loads are applied to boom cable all personnel must move to a safe distance. Failure to comply may result in injury to personnel.

WARNING

Personnel shall wear proper eye protection. Failure to comply may result in injury to personnel.

WARNING

Material Handling Crane (MHC) weighs approximately 4575 lbs (2077 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Material Handling Crane (MHC) weighs approximately 4575 lbs (2077 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING SUMMARY (CONT)

WARNING

Boom assembly weighs approximately 1330 lbs (604 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Boom assembly weighs approximately 1330 lbs (604 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Remove pivot shaft far enough to release RH tension link cylinder. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Lift cylinders must be supported to remove pivot shafts. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Lift cylinders must be supported to install pivot shaft. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Boom fly section weighs approximately 210 lbs (95 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Boom fly section weighs approximately 210 lbs (95 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Boom mid section and telescopic cylinder combined weigh approximately 510 lbs (231 kgs). Attach suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Attach a guide rope to boom mid section and telescopic cylinder prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Boom mid section and telescopic cylinder combined weigh approximately 510 lbs (231 kgs). Attach suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Attach a guide rope to boom mid section and telescopic cylinder prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Telescopic cylinder weighs approximately 240 lbs (109 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel.

WARNING

Telescopic cylinder weighs approximately 240 lbs (109 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel.

WARNING

Boom base section weighs approximately 540 lbs (245 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING

Boom base section weighs approximately 540 lbs (245 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING

Lift cylinder weighs approximately 180 lbs (82 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING SUMMARY (CONT)

WARNING

Lift cylinder weighs approximately 180 lbs (82 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Remove pivot shaft enough to release tension link cylinder and erection cylinder. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Erection cylinder weighs approximately 70 lbs (32 kgs). Attach suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Erection cylinder weighs approximately 70 lbs (32 kgs). Attach suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Swing drive assembly weighs approximately 70 lbs (32 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Swing drive assembly weighs approximately 70 lbs (32 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Outrigger beam weighs approximately 175 lbs (80 kgs). Attach suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Outrigger beam weighs approximately 175 lbs (80 kgs). Attach suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Crane control panel weighs approximately 150 lbs (68 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Crane control panel weighs approximately 150 lbs (68 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

30K winch assembly weighs approximately 1450 lbs (658 kgs). Attach suitable lifting device prior to removal. Failure to comply may result in injury to personnel.

WARNING

A guide rope must be attached to 30K winch frame to aid in controlling winch assembly during removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Ensure banding strap around 30K winch is secured tightly and will not slip off. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Winch weighs approximately 550 lbs (250 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Drum weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to disassembly. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Ensure banding strap around 30K winch is removed carefully. Failure to comply may result in injury to personnel.

WARNING SUMMARY (CONT)

WARNING

Drum weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to assembly. Failure to comply may result in injury to personnel and/or damage to equipment.

WARNING

Winch weighs approximately 550 lbs (250 kgs). Attach suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

30K winch assembly weighs approximately 1450 lbs (658 kgs). Use suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

A guide rope must be attached to 30K winch frame to aid in controlling 30K winch assembly during installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Use care when installing balance ring springs because ring springs are under tension and can act as projectiles when released. Failure to comply may result in injury to personnel.

WARNING

Underlift and stiffleg assembly weighs approximately 4000 lbs (1816 kgs). Attach suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Crossbar weighs approximately 350 lbs (158 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Underlift and stiffleg assembly weighs approximately 4000 lbs (1816 kgs). Attach suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Crossbar weighs approximately 350 lbs (158 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Telescopic lift cylinder weighs approximately 225 lbs (102 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Telescopic lift cylinder weighs approximately 225 lbs (102 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING

Upper arm weighs approximately 190 lbs (86 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Remove retaining pin far enough to release telescopic cylinders. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Prior to removing retaining pin and retaining pin covers, ensure upper arm assembly is properly balanced. Failure to comply may result in injury to personnel.

WARNING

Upper arm weighs approximately 190 lbs (86 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Prior to installing retaining pin and retaining pins covers, ensure upper arm is properly balanced. Failure to comply may result in injury to personnel.

WARNING SUMMARY (CONT)

WARNING

Drive retaining pin out far enough to release telescopic cylinder. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Boom frame weighs approximately 320 lbs (145 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Boom frame weighs approximately 320 lbs (145 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Spooler weldment weighs approximately 130 lbs (59 Kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Spooler weldment weighs approximately 130 lbs (59 Kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Stiffleg weighs approximately 300 lbs (136 Kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Stiffleg weighs approximately 300 lbs (136 Kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Tow bar weighs approximately 150 lbs (68 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Tow bar weighs approximately 150 lbs (68 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Pressure hose to monoblock valve operates at high pressure and flow. Ensure pressure and return lines are connected to the correct ports. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING

15K Self-Recovery Winch (SRW) weighs approximately 300 lbs (136 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

15K Self-Recovery Winch (SRW) weighs approximately 300 lbs (136 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Three stage hydraulic pump weighs approximately 70 lbs (32 Kgs). Attach suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Three stage hydraulic pump weighs approximately 70 lbs (32 Kgs). Attach suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Use care when removing screws. Pump is under spring tension. Failure to comply may result in injury to personnel.

WARNING

Use care when installing screws. Pump is under spring tension. Failure to comply may result in injury to personnel.

WARNING SUMMARY (CONT)

WARNING

Use care in placement of pressure gage and STE/ICE-R instruments used to perform these adjustments. Hydraulic system pressures are 3000 PSI (20685 kPa). Hoses will move or jump under this pressure. Secure test instruments, as required. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Cap, fitting, and four way relief may be very hot, use gloves while removing. Failure to comply may result in injury to personnel.

WARNING

Use care while performing adjustments. Stay clear of dump body while operating. Failure to comply may result in injury to personnel.

WARNING

Hoist cylinder weighs approximately 430 lbs (195 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Hoist cylinder weighs approximately 430 lbs (195 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Machine gun ring assembly weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Machine gun ring assembly weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

High pressure steam can blow particles or chemicals into eyes, can cause severe burns, and creates hazardous noise levels. Wear appropriate eye, skin, and hearing protection when using high pressure steam. Failure to comply may result in serious injury to personnel.

WARNING

Some chemical agents (detergents, solvents, alkalis, etc.) may irritate skin or be harmful to the eyes, nose, and throat. Some must be used only with adequate ventilation. When working with potentially harmful chemical substances, read and heed all warnings on the product labels and follow prescribed safety precautions. When working with any potentially harmful substance; including live steam, hot water, and compressed air; wear appropriate safety equipment and use extreme care. Failure to comply may result in injury to personnel.

WARNING

Follow these general precautions whenever using these methods of crack detection to prevent personnel injury. Never shine the black light directly into the eyes. Do not smoke or eat while using inspection chemicals. Avoid getting chemicals on clothing. Avoid inhaling spray mist, airborne powder dust and solvent vapors. Provide adequate ventilation. Store chemicals away from open flames and sources of heat. Failure to comply may result in injury to personnel.

WARNING

Crankshaft weighs approximately 130 lbs (59 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Crankshaft weighs approximately 130 lbs (59 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Use extreme care when handling heated gear. Failure to comply may result in injury to personnel.

WARNING

Use extreme care when handling heated camshaft gear. Failure to comply may result in injury to personnel.

WARNING SUMMARY (CONT)

WARNING

Torque converter housing weighs approximately 65 lbs (30 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Torque converter housing weighs approximately 65 lbs (30 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

C3/C4 clutch spring assemblies are under pressure. Loosen bolts evenly during disassembly. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Transfer case weighs approximately 500 lbs (227 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Transfer case weighs approximately 500 lbs (227 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Transfer case cover weighs approximately 75 lbs (34 kgs). The aid of an assistant is required to safely lift it. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Front axle differential carrier weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to moving. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Intermediate differential weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to moving. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Rear differential carrier weighs approximately 350 lbs (159 kgs). Attach a suitable lifting device prior to moving. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Lift cylinder weighs approximately 180 lbs (82 kgs). The aid of an assistant is required to safely move it. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Telescopic lift cylinder weighs approximately 180 lbs (89 kgs). Attach a suitable lifting device prior to repair. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Both cylinder rods together weigh approximately 65 lbs (88 kgs). Do not remove both cylinder rods together. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

There may be excess hydraulic pressure in stiffleg cylinder. Loosen plugs slowly before removing. Failure to comply may result in serious injury to personnel.

WARNING

Cover is under pressure. Loosen bolts equally when removing cover. Failure to comply may result in injury to personnel.

WARNING

Lift cylinder weighs approximately 100 lbs (45 kgs). The aid of an assistant is required to safely move it. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Erection cylinder weighs approximately 70 lbs (32 kgs). The aid of an assistant is required to safely move it. Failure to comply may result in injury to personnel or damage to equipment.

WARNING SUMMARY (CONT)

WARNING

Boom telescopic cylinder weighs approximately 150 lbs (68 kgs). Attach a suitable lifting prior to repair. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Boom telescopic cylinder weighs approximately 230 lbs (104 kgs). Attach a suitable lifting prior to repair. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Jack cylinder weighs approximately 110 lbs (50 kgs). Attach a suitable lifting prior to repair. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Dump body lift cylinder weighs approximately 200 lbs (91 kg). Attach a suitable lifting device prior to lifting. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Cylinder rod weighs approximately 110 lbs (50 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Cylinder rod weighs approximately 110 lbs (50 kgs). Attach a suitable lifting device prior to lifting. Failure to comply may result in injury to personnel or damage to equipment.

LIST OF EFFECTIVE PAGES

Insert latest changed pages. Destroy superseded pages.

NOTE: New or changed material is indicated by a vertical bar in the outer margin of the page.

Dates of issue for original and changed pages are:

Original..... 0..... 15 September 1998
 Change..... 1..... 31 July 2001

THE TOTAL NUMBER OF PAGES IN THIS PUBLICATION IS 4860, CONSISTING OF THE FOLLOWING:

Page No.	*Change No.	Page No.	*Change No.	Page No.	*Change No.
Cover.....	1	2-964 Blank.....	0	2-1111 thru 2-1119.....	0
Blank.....	0	2-965.....	1	2-1120 Blank.....	0
a thru e.....	0	2-966 thru 2-973.....	0	A-1 thru A-4.....	0
f thru al.....	1	2-974 Blank.....	0	B-1 thru B-6.....	0
A thru H Added.....	1	2-975.....	1	C-1 thru C-8.....	1
i.....	1	2-976 thru 2-979.....	0	C-9 Added.....	1
ii and iii.....	0	2-980 Blank.....	0	C-10 Blank Added.....	1
iv thru xii.....	1	2-981.....	1	D-1.....	1
xiii Added.....	1	2-982 thru 2-985.....	0	D-2 thru D-4.....	0
xiv Blank Added.....	1	2-986 Blank.....	0	D-4.1 Added.....	1
1-1 thru 1-45.....	0	2-987.....	1	D-4.2 Blank Added.....	1
1-46 Blank.....	0	2-988 thru 2-1000.....	0	D-5 and D-6.....	1
2-1.....	1	2-1001 Blank.....	0	D-7 thru D-24.....	0
2-2 thru 2-7.....	0	2-1002 thru 2-1005.....	0	D-25 thru D-28.....	1
2-8 thru 2-15.....	1	2-1006.....	1	D-29 thru D-31.....	0
2-16 thru 2-65.....	0	2-1006.1 thru 2-1006.4		D-32.....	1
2-66 Blank.....	0	Added.....	1	D-33 thru D-38.....	0
2-66.1 Blank Added.....	1	2-1007 and 2-1008.....	1	D-39.....	1
2-66.2 thru 2-66.9 Added.....	1	2-1008.1 and 2-1008.2		D-40 and D-41.....	0
2-66.10 Blank Added.....	1	Added.....	1	D-42 thru D-47.....	1
2-66.11 thru 2-66.17 Added.....	1	2-1009 thru 2-1011.....	1	D-48 thru D-80.....	0
2-66.18 Blank Added.....	1	2-1012 thru 2-1015.....	0	D-81 thru D-86 Added.....	1
2-67.....	1	2-1016 Blank.....	0	E-1 thru E-8.....	0
2-68 thru 2-71.....	0	2-1017.....	1	F-1 thru F-16.....	1
2-72 thru 2-74.....	1	2-1018 thru 2-1027.....	0	F-17 Added.....	1
2-74.1 Added.....	1	2-1028 Blank.....	0	F-18 Blank Added.....	1
2-74.2 Blank Added.....	1	2-1029.....	1	G-1.....	1
2-75 thru 2-202.....	1	2-1030 thru 2-1052.....	0	G-2 Blank.....	0
2-202.1 and 2-202.2 Added.....	1	2-1053 Blank.....	0	H-1 thru H-4 Added.....	1
2-203 thru 2-418.....	1	2-1054 thru 2-1058.....	0	INDEX-1 thru INDEX-26.....	1
2-418.1 and 2-418.2 Added.....	1	2-1059 Blank.....	0	INDEX-27 thru INDEX-30	
2-419 thru 2-590.....	1	2-1060 thru 2-1065.....	0	Added.....	1
2-590.1 thru 2-590.4 Added.....	1	2-1066 Blank.....	0	Glossary-1.....	0
2-591 thru 838.....	1	2-1067 thru 2-1072.....	1	Glossary-2 Blank.....	0
2-838.1 and 2-838.2 Added.....	1	2-1072.1 thru 2-1072.15		FO-1 FP-1.....	1
2-839 thru 2-960.....	1	Added.....	1	FO-1 FP-2 Blank.....	0
2-960.1 thru 2-960.3 Added.....	1	2-1072.16 Blank Added.....	1	FO-1 FP-3.....	1
2-960.4 Blank Added.....	1	2-1073.....	1	FO-1 FP-4 Blank.....	0
2-961.....	1	2-1074 thru 2-1109.....	0	FO-1 FP-5.....	1
2-962 and 2-963.....	0	2-1110 Blank.....	0		

* Zero in this column indicates an original page.

LIST OF EFFECTIVE PAGES

Insert latest changed pages. Destroy superseded pages.

Page No.	*Change No.	Page No.	*Change No.	Page No.	*Change No.
FO-1 FP-6 Blank.....	0	FO-1 FP-56 Blank.....	0	FO-4 FP-2 Blank.....	0
FO-1 FP-7	1	FO-1 FP-57	1	FO-4 FP-3	0
FO-1 FP-8 Blank.....	0	FO-1 FP-58 Blank.....	0	FO-4 FP-4 Blank.....	0
FO-1 FP-9	1	FO-1 FP-59	1	FO-5 FP-1	0
FO-1 FP-10 Blank.....	0	FO-1 FP-60 Blank.....	0	FO-5 FP-2 Blank.....	0
FO-1 FP-11.....	1	FO-1 FP-61	1	FO-5 FP-3	0
FO-1 FP-12 Blank.....	0	FO-1 FP-62 Blank.....	0	FO-5 FP-4 Blank.....	0
FO-1 FP-13.....	1	FO-1 FP-63	1	FO-5 FP-5	0
FO-1 FP-14 Blank.....	0	FO-1 FP-64 Blank.....	0	FO-5 FP-6 Blank.....	0
FO-1 FP-15.....	1	FO-1 FP-65	1	VOLUME 2	
FO-1 FP-16 Blank.....	0	FO-1 FP-66 Blank.....	0	Cover	1
FO-1 FP-17.....	1	FO-1 FP-67	1	Blank.....	0
FO-1 FP-18 Blank.....	0	FO-1 FP-68 Blank.....	0	a thru e.....	0
FO-1 FP-19.....	1	FO-1 FP-69	0	f thru al	1
FO-1 FP-20 Blank.....	0	FO-1 FP-70 Blank.....	0	A thru C Added	1
FO-1 FP-21.....	1	FO-1 FP-71	0	D Blank Added.....	1
FO-1 FP-22 Blank.....	0	FO-1 FP-72 Blank.....	0	i	1
FO-1 FP-23.....	0	FO-1 FP-73	0	ii	0
FO-1 FP-24 Blank.....	0	FO-1 FP-74 Blank.....	0	iii thru vi.....	1
FO-1 FP-25.....	1	FO-1 FP-75	1	vii Added	1
FO-1 FP-26 Blank.....	0	FO-1 FP-76 Blank.....	0	viii Blank Added.....	1
FO-1 FP-27.....	0	FO-1 FP-77	1	3-1 thru 3-14.....	0
FO-1 FP-28 Blank.....	0	FO-1 FP-78 Blank.....	0	3-15 thru 3-19.....	1
FO-1 FP-29.....	1	FO-1 FP-79	1	3-20 thru 3-22.....	0
FO-1 FP-30 Blank.....	0	FO-1 FP-80 Blank.....	0	3-23.....	1
FO-1 FP-31.....	1	FO-2 FP-1	0	3-24 and 3-25	0
FO-1 FP-32 Blank.....	0	FO-2 FP-2 Blank.....	0	3-26.....	1
FO-1 FP-33.....	1	FO-2 FP-3	0	3-26.1 and 3-26.2 Added	1
FO-1 FP-34 Blank.....	0	FO-2 FP-4 Blank.....	0	3-27 thru 3-30.....	1
FO-1 FP-35.....	1	FO-2 FP-5	0	3-31.....	0
FO-1 FP-36 Blank.....	0	FO-2 FP-6 Blank.....	0	3-32 thru 3-39.....	1
FO-1 FP-37.....	1	FO-2 FP-7	0	3-40.....	0
FO-1 FP-38 Blank.....	0	FO-2 FP-8 Blank.....	0	3-41 and 3-42	1
FO-1 FP-39.....	1	FO-3 FP-1	0	3-42.1 Added.....	1
FO-1 FP-40 Blank.....	0	FO-3 FP-2 Blank.....	0	3-42.2 Blank Added	1
FO-1 FP-41.....	1	FO-3 FP-3	0	3-43 and 3-44	1
FO-1 FP-42 Blank.....	0	FO-3 FP-4 Blank.....	0	3-44.1 Added.....	1
FO-1 FP-43.....	1	FO-3 FP-5	0	3-44.2 Blank Added	1
FO-1 FP-44 Blank.....	0	FO-3 FP-6 Blank.....	0	3-45 thru 3-48.....	1
FO-1 FP-45.....	1	FO-3 FP-7	0	3-49 thru 3-51	0
FO-1 FP-46 Blank.....	0	FO-3 FP-8 Blank.....	0	3-52 thru 3-54.....	1
FO-1 FP-47.....	1	FO-3 FP-9	0	3-54.1 Added.....	1
FO-1 FP-48 Blank.....	0	FO-3 FP-10 Blank.....	0	3-54.2 Blank Added	1
FO-1 FP-49.....	1	FO-3 FP-11	0	3-55 and 3-56	1
FO-1 FP-50 Blank.....	0	FO-3 FP-12 Blank.....	0	3-57.....	0
FO-1 FP-51.....	1	FO-3 FP-13	0	3-58.....	1
FO-1 FP-52 Blank.....	0	FO-3 FP-14 Blank.....	0	3-59 thru 3-80.....	0
FO-1 FP-53.....	1	FO-3 FP-15	0	3-81 thru 3-83.....	1
FO-1 FP-54 Blank.....	0	FO-3 FP-16 Blank.....	0	3-84 thru 3-86.....	0
FO-1 FP-55.....	1	FO-4 FP-1	0	3-87 and 3-88	1

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LIST OF EFFECTIVE PAGES (CONT)

Insert latest changed pages. Destroy superseded pages.

Page No.	*Change No.	Page No.	*Change No.	Page No.	*Change No.
3-88.1 Added.....	1	8-10.1 Added.....	1	10-43 thru 10-47.....	1
3-88.2 Blank Added.....	1	8-10.2 Blank Added.....	1	10-48 thru 10-54.....	0
3-89 thru 3-135.....	0	8-11 thru 8-17 Added.....	1	10-54.1 and 10-54.2 Added.....	1
3-136 Blank.....	0	8-18 Blank Added.....	1	10-55 thru 10-58.....	1
4-1 thru 4-46.....	0	9-1.....	0	10-58.1 Added.....	1
5-1.....	1	9-2.....	1	10-58.2 Blank Added.....	1
5-2.....	0	9-3.....	0	10-59 and 10-60.....	1
5-3 thru 5-8.....	1	9-4 and 9-5.....	1	10-60.1 and 10-60.2 Added.....	1
5-9 Added.....	1	9-6.....	0	10-61.....	1
5-10 Blank Added.....	1	9-7 and 9-8.....	1	10-62 Blank.....	0
6-1.....	1	9-8.1 Added.....	1	11-1.....	0
6-2 thru 6-26.....	0	9-8.2 Blank Added.....	1	11-2.....	1
6-27 and 6-28.....	1	9-9 and 9-10.....	1	11-3 thru 11-7.....	0
6-29.....	0	9-11 thru 9-14.....	0	11-8 and 11-9.....	1
6-30.....	1	9-15 and 9-16.....	1	11-10 Blank.....	0
6-31 and 6-32.....	0	9-16.1 and 9-16.2 Added.....	1	12-1.....	1
6-33 thru 6-36.....	1	9-17 thru 9-20.....	1	12-2 thru 12-14.....	0
6-36.1 thru 6-36.15 Added.....	1	9-20.1 Added.....	1	12-15.....	1
6-36.16 Blank Added.....	1	9-20.2 Blank Added.....	1	12-16 Blank.....	1
6-37.....	1	9-21.....	1	12-17 and 12-18 Deleted.....	1
6-38 thru 6-44.....	0	9-22 thru 9-30.....	0	13-1 and 13-2.....	1
7-1 thru 7-3.....	1	10-1.....	0	13-3 thru 13-31.....	0
7-4 thru 7-16.....	0	10-2 and 10-3.....	1	13-32.....	1
7-16.1 Added.....	1	10-4 thru 10-7.....	0	13-33 and 13-34.....	0
7-16.2 Blank Added.....	1	10-8 thru 10-10.....	1	13-35.....	1
7-17 and 7-18.....	1	10-10.1 Added.....	1	13-36 and 13-37.....	0
7-19 and 7-20.....	0	10-10.2 Blank Added.....	1	13-38.....	1
7-21.....	1	10-11.....	1	13-39 thru 13-41.....	0
7-22 thru 7-24.....	0	10-12.....	0	13-42.....	1
7-25 and 7-26.....	1	10-13 and 10-14.....	1	13-43 thru 13-45.....	0
7-26.1 thru 7-26.19 Added.....	1	10-15 thru 10-17.....	0	13-46.....	1
7-26.20 Blank Added.....	1	10-18.....	1	13-47 thru 13-70.....	0
7-27 thru 7-46.....	1	10-19.....	0	13-71.....	1
7-47.....	0	10-20.....	1	13-72.....	0
7-48.....	1	10-20.1 and 10-20.2 Added.....	1	13-73.....	1
7-49 thru 7-53.....	0	10-21 and 10-22.....	1	13-74 thru 13-170.....	0
7-54.....	1	10-22.1 and 10-22.2 Added.....	1	13-171.....	1
7-55 thru 7-68.....	0	10-23 and 10-24.....	1	13-172.....	0
7-69.....	1	10-24.1 Added.....	1	13-173 thru 13-176.....	1
7-70 thru 7-72.....	0	10-24.2 Blank Added.....	1	13-176.1 Added.....	1
7-73 and 7-74.....	1	10-25 thru 10-27.....	1	13-176.2 Blank Added.....	1
7-75 thru 7-82.....	0	10-28 and 10-29.....	0	13-177 thru 13-180.....	1
7-83.....	1	10-30 thru 10-32.....	1	13-181 thru 13-191.....	0
7-84 thru 7-89.....	0	10-32.1 Added.....	1	13-192.....	1
7-90 thru 7-93.....	1	10-32.2 Blank Added.....	1	13-193 thru 13-205.....	0
7-94 thru 7-100.....	0	10-33 and 10-34.....	1	13-206 and 13-207.....	1
7-101 thru 7-134 Added.....	1	10-34.1 Added.....	1	13-208.....	0
8-1 thru 8-3.....	1	10-34.2 Blank Added.....	1	13-209.....	1
8-4.....	0	10-35 thru 10-37.....	1	13-210 thru 13-220.....	0
8-5 thru 8-10.....	1	10-38 thru 10-42.....	0	13-221 thru 13-223.....	1

* Zero in this column indicates an original page.

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Insert latest changed pages. Destroy superseded pages.

Page No.	*Change No.	Page No.	*Change No.	Page No.	*Change No.
13-224 thru 13-236	0	D-7 thru D-24	0	FO-1 FP-30 Blank	0
13-237 thru 13-239	1	D-25 thru D-28	1	FO-1 FP-31	1
13-240 thru 13-250	0	D-29 thru D-31	0	FO-1 FP-32 Blank	0
13-251 thru 13-253	1	D-32	1	FO-1 FP-33	1
13-254 thru 13-268	0	D-33 thru D-38	0	FO-1 FP-34 Blank	0
13-269 thru 13-271	1	D-39	1	FO-1 FP-35	1
13-272 thru 13-284	0	D-40 and D-41	0	FO-1 FP-36 Blank	0
13-285 thru 13-287	1	D-42 thru D-47	1	FO-1 FP-37	1
13-288 thru 13-300	0	D-48 thru D-80	0	FO-1 FP-38 Blank	0
13-301 thru 13-304	1	D-81 thru D-86 Added	1	FO-1 FP-39	1
13-305 thru 13-314	0	E-1 thru E-8	0	FO-1 FP-40 Blank	0
13-315 thru 13-317	1	F-1 thru F-16	1	FO-1 FP-41	1
13-318 thru 13-328	0	F-17 Added	1	FO-1 FP-42 Blank	0
13-329 thru 13-331	1	F-18 Blank Added	1	FO-1 FP-43	1
13-332 thru 13-394	0	G-1	1	FO-1 FP-44 Blank	0
13-395 thru 13-400	1	G-2 Blank	0	FO-1 FP-45	1
13-401 thru 13-405	0	H-1 thru H-4 Added	1	FO-1 FP-46 Blank	0
13-406	1	INDEX-1 thru INDEX-7	1	FO-1 FP-47	1
13-407 thru 13-410	0	INDEX-8 Blank	1	FO-1 FP-48 Blank	0
13-411	1	Glossary-1	0	FO-1 FP-49	1
13-412 thru 13-414	0	Glossary-2 Blank	0	FO-1 FP-50 Blank	0
13-415 and 13-416	1	FO-1 FP-1	1	FO-1 FP-51	1
13-417 thru 13-423 Added	1	FO-1 FP-2 Blank	0	FO-1 FP-52 Blank	0
13-424 Blank Added	1	FO-1 FP-3	1	FO-1 FP-53	1
14-1	0	FO-1 FP-4 Blank	0	FO-1 FP-54 Blank	0
14-2 thru 14-10	1	FO-1 FP-5	1	FO-1 FP-55	1
14-11	0	FO-1 FP-6 Blank	0	FO-1 FP-56 Blank	0
14-12 thru 14-16	1	FO-1 FP-7	1	FO-1 FP-57	1
14-16.1 Added	1	FO-1 FP-8 Blank	0	FO-1 FP-58 Blank	0
14-16.2 Blank Added	1	FO-1 FP-9	1	FO-1 FP-59	1
14-17 thru 14-21	0	FO-1 FP-10 Blank	0	FO-1 FP-60 Blank	0
14-22	1	FO-1 FP-11	1	FO-1 FP-61	1
14-23 thru 14-27	0	FO-1 FP-12 Blank	0	FO-1 FP-62 Blank	0
14-28	1	FO-1 FP-13	1	FO-1 FP-63	1
14-29 thru 14-33	0	FO-1 FP-14 Blank	0	FO-1 FP-64 Blank	0
14-34	1	FO-1 FP-15	1	FO-1 FP-65	1
14-35 thru 14-48	0	FO-1 FP-16 Blank	0	FO-1 FP-66 Blank	0
14-49 and 14-50	1	FO-1 FP-17	1	FO-1 FP-67	1
14-51 Added	1	FO-1 FP-18 Blank	0	FO-1 FP-68 Blank	0
14-52 Blank Added	1	FO-1 FP-19	1	FO-1 FP-69	0
A-1 thru A-4	0	FO-1 FP-20 Blank	0	FO-1 FP-70 Blank	0
B-1 thru B-6	0	FO-1 FP-21	1	FO-1 FP-71	0
C-1 thru C-8	1	FO-1 FP-22 Blank	0	FO-1 FP-72 Blank	0
C-9 Added	1	FO-1 FP-23	0	FO-1 FP-73	0
C-10 Blank Added	1	FO-1 FP-24 Blank	0	FO-1 FP-74 Blank	0
D-1	1	FO-1 FP-25	1	FO-1 FP-75	1
D-2 thru D-4	0	FO-1 FP-26 Blank	0	FO-1 FP-76 Blank	0
D-4.1 Added	1	FO-1 FP-27	0	FO-1 FP-77	1
D-4.2 Blank Added	1	FO-1 FP-28 Blank	0	FO-1 FP-78 Blank	0
D-5 and D-6	1	FO-1 FP-29	1	FO-1 FP-79	1

* Zero in this column indicates an original page.

LIST OF EFFECTIVE PAGES (CONT)

Insert latest changed pages. Destroy superseded pages.

Page No.	*Change No.	Page No.	*Change No.	Page No.	*Change No.
FO-1 FP-80 Blank	0	15-21	0	15-120.6 Blank Added	1
FO-2 FP-1	0	15-22 and 15-23	1	15-121 and 15-122	1
FO-2 FP-2 Blank	0	15-24 thru 15-26	0	15-123 and 15-124	0
FO-2 FP-3	0	15-27 and 15-28	1	15-125 thru 15-128	1
FO-2 FP-4 Blank	0	15-29	0	15-128.1 and 15-128.2 Added	1
FO-2 FP-5	0	15-30	1	15-129	0
FO-2 FP-6 Blank	0	15-30.1 Added	1	15-130 thru 15-137	1
FO-2 FP-7	0	15-30.2 Blank Added	1	15-138 thru 15-156	0
FO-2 FP-8 Blank	0	15-31 thru 15-33	0	16-1	0
FO-3 FP-1	0	15-34 and 15-35	1	16-2	1
FO-3 FP-2 Blank	0	15-36	0	16-3 thru 16-132	0
FO-3 FP-3	0	15-37 thru 15-44	1	16-133	1
FO-3 FP-4 Blank	0	15-45	0	16-134 thru 16-170	0
FO-3 FP-5	0	15-46 thru 15-48	1	16-171	1
FO-3 FP-6 Blank	0	15-48.1 Added	1	16-172	0
FO-3 FP-7	0	15-48.2 Blank Added	1	16-173	1
FO-3 FP-8 Blank	0	15-49	1	16-174 thru 16-344	0
FO-3 FP-9	0	15-50 thru 15-53	0	16-345 thru 16-352	1
FO-3 FP-10 Blank	0	15-54	1	16-353 thru 16-373	0
FO-3 FP-11	0	15-54.1 Added	1	16-374 and 16-375	1
FO-3 FP-12 Blank	0	15-54.2 Blank Added	1	16-376 thru 16-388	0
FO-3 FP-13	0	15-55 thru 15-59	1	16-389 and 16-390	1
FO-3 FP-14 Blank	0	15-60	0	16-390.1 thru 16-390.3 Added	1
FO-3 FP-15	0	15-61	1	16-390.4 Blank Added	1
FO-3 FP-16 Blank	0	15-62 thru 15-65	0	16-391 thru 16-394	1
FO-4 FP-1	0	15-66	1	16-395 thru 16-400 Deleted	1
FO-4 FP-2 Blank	0	15-67 thru 15-70	0	16-401 thru 16-434	0
FO-4 FP-3	0	15-71	1	16-435 and 16-436	1
FO-4 FP-4 Blank	0	15-72	0	16-437 thru 16-486	0
FO-5 FP-1	0	15-72.1 and 15-72.2 Added	1	16-487 and 16-488	1
FO-5 FP-2 Blank	0	15-73	1	16-488.1 Added	1
FO-5 FP-3	0	15-74 and 15-75	0	16-488.2 Blank Added	1
FO-5 FP-4 Blank	0	15-76	1	16-489	1
FO-5 FP-5	0	15-76.1 Added	1	16-490 thru 16-496	0
FO-5 FP-6 Blank	0	15-76.2 Blank Added	1	16-497	1
VOLUME 3		15-77	0	16-498 thru 16-500	0
Cover	1	15-78	1	16-500.1 and 16-500.2 Added	1
Blank	0	15-79 thru 15-82	0	16-501 and 16-502	1
a thru e	0	15-82.1 Added	1	16-502.1 thru 16-502.12	
f thru al	1	15-82.2 Blank Added	1	Added	1
A thru C Added	1	15-83	1	16-503 thru 16-516	1
D Blank Added	1	15-84 thru 15-86	0	16-516.1 thru 16-516.13	
i thru iv	1	15-87	1	Added	1
v and vi Added	1	15-88 thru 15-97	0	16-516.14 Blank Added	1
15-1	0	15-98 thru 15-100	1	16-517 thru 16-520	1
15-2 thru 15-5	1	15-101	0	16-521 thru 16-535	0
15-6 thru 15-11	0	15-102 thru 15-107	1	16-536 thru 16-538	1
15-12 thru 15-14	1	15-108 thru 15-118	0	16-539 thru 16-567	0
15-15	0	15-119 and 15-120	1	16-568	1
15-16 thru 15-20	1	15-120.1 thru 15-120.5 Added	1	16-569	0

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Page No.	*Change No.	Page No.	*Change No.	Page No.	*Change No.
16-570	1	D-48 thru D-80	0	FO-1 FP-37	1
16-570.1 and 16-570.2		D-81 thru D-86 Added	1	FO-1 FP-38 Blank	0
Added	1	E-1 thru E-8	0	FO-1 FP-39	1
16-571 thru 16-573	1	F-1 thru F-16	1	FO-1 FP-40 Blank	0
16-574	0	F-17 Added	1	FO-1 FP-41	1
16-574.1 Added	1	F-18 Blank Added	1	FO-1 FP-42 Blank	0
16-574.2 Blank Added	1	G-1	1	FO-1 FP-43	1
16-575 and 16-576	1	G-2 Blank	0	FO-1 FP-44 Blank	0
16-577 and 16-578	0	H-1 thru H-4 Added	1	FO-1 FP-45	1
16-578.1 and 16-578.2		INDEX-1 thru INDEX-4	1	FO-1 FP-46 Blank	0
Added	1	INDEX-5 Added	1	FO-1 FP-47	1
16-579	1	INDEX-6 Blank Added	1	FO-1 FP-48 Blank	0
16-580 and 16-581	0	Glossary-1	0	FO-1 FP-49	1
16-582	1	Glossary-2 Blank	0	FO-1 FP-50 Blank	0
16-582.1 and 16-582.2		FO-1 FP-1	1	FO-1 FP-51	1
Added	1	FO-1 FP-2 Blank	0	FO-1 FP-52 Blank	0
16-583 and 16-584	1	FO-1 FP-3	1	FO-1 FP-53	1
16-584.1 Added	1	FO-1 FP-4 Blank	0	FO-1 FP-54 Blank	0
16-584.2 Blank Added	1	FO-1 FP-5	1	FO-1 FP-55	1
16-585 and 16-586	1	FO-1 FP-6 Blank	0	FO-1 FP-56 Blank	0
16-587 thru 16-589 Added	1	FO-1 FP-7	1	FO-1 FP-57	1
16-590 Blank Added	1	FO-1 FP-8 Blank	0	FO-1 FP-58 Blank	0
17-1 thru 17-7	1	FO-1 FP-9	1	FO-1 FP-59	1
17-8 Blank	1	FO-1 FP-10 Blank	0	FO-1 FP-60 Blank	0
17-9 and 17-10 Deleted	1	FO-1 FP-11	1	FO-1 FP-61	1
17-11 Blank	1	FO-1 FP-12 Blank	0	FO-1 FP-62 Blank	0
17-12 thru 17-14	1	FO-1 FP-13	1	FO-1 FP-63	1
17-14.1 thru 17-14.12 Added	1	FO-1 FP-14 Blank	0	FO-1 FP-64 Blank	0
17-15 thru 17-25	1	FO-1 FP-15	1	FO-1 FP-65	1
17-26 thru 17-30	0	FO-1 FP-16 Blank	0	FO-1 FP-66 Blank	0
17-31	1	FO-1 FP-17	1	FO-1 FP-67	1
17-32 Blank	0	FO-1 FP-18 Blank	0	FO-1 FP-68 Blank	0
A-1 thru A-4	0	FO-1 FP-19	1	FO-1 FP-69	0
B-1 thru B-6	0	FO-1 FP-20 Blank	0	FO-1 FP-70 Blank	0
C-1 thru C-8	1	FO-1 FP-21	1	FO-1 FP-71	0
C-9 Added	1	FO-1 FP-22 Blank	0	FO-1 FP-72 Blank	0
C-10 Blank Added	1	FO-1 FP-23	0	FO-1 FP-73	0
D-1	1	FO-1 FP-24 Blank	0	FO-1 FP-74 Blank	0
D-2 thru D-4	0	FO-1 FP-25	1	FO-1 FP-75	1
D-4.1 Added	1	FO-1 FP-26 Blank	0	FO-1 FP-76 Blank	0
D-4.2 Blank Added	1	FO-1 FP-27	0	FO-1 FP-77	1
D-5 and D-6	1	FO-1 FP-28 Blank	0	FO-1 FP-78 Blank	0
D-7 thru D-24	0	FO-1 FP-29	1	FO-1 FP-79	1
D-25 thru D-28	1	FO-1 FP-30 Blank	0	FO-1 FP-80 Blank	0
D-29 thru D-31	0	FO-1 FP-31	1	FO-2 FP-1	0
D-32	1	FO-1 FP-32 Blank	0	FO-2 FP-2 Blank	0
D-33 thru D-38	0	FO-1 FP-33	1	FO-2 FP-3	0
D-39	1	FO-1 FP-34 Blank	0	FO-2 FP-4 Blank	0
D-40 and D-41	0	FO-1 FP-35	1	FO-2 FP-5	0
D-42 thru D-47	1	FO-1 FP-36 Blank	0	FO-2 FP-6 Blank	0

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Page No.	*Change No.	Page No.	*Change No.	Page No.	*Change No.
FO-2 FP-7	0	20-1 and 20-2	1	26-62 thru 26-66	0
FO-2 FP-8 Blank	0	20-3 and 20-4	0	26-67	1
FO-3 FP-1	0	20-5	1	26-68 thru 26-72	0
FO-3 FP-2 Blank	0	20-6 thru 20-10	0	26-73	1
FO-3 FP-3	0	20-11	1	26-74 thru 26-82	0
FO-3 FP-4 Blank	0	20-12 thru 20-39	0	27-1 thru 27-9	0
FO-3 FP-5	0	20-40	1	27-10 Blank	0
FO-3 FP-6 Blank	0	20-41 thru 20-49	0	A-1 thru A-4	0
FO-3 FP-7	0	20-50	1	B-1 thru B-6	0
FO-3 FP-8 Blank	0	20-51 thru 20-57	0	C-1 thru C-8	1
FO-3 FP-9	0	20-58	1	C-9 Added	1
FO-3 FP-10 Blank	0	20-59 and 20-60	0	C-10 Blank Added	1
FO-3 FP-11	0	21-1 thru 21-9	0	D-1	1
FO-3 FP-12 Blank	0	21-10 and 21-11	1	D-2 thru D-4	0
FO-3 FP-13	0	21-12 thru 21-39	0	D-4.1 Added	1
FO-3 FP-14 Blank	0	21-40	1	D-4.2 Blank Added	1
FO-3 FP-15	0	21-41 thru 21-77	0	D-5 and D-6	1
FO-3 FP-16 Blank	0	21-78 Blank	0	D-7 thru D-24	0
FO-4 FP-1	0	22-1	0	D-25 thru D-28	1
FO-4 FP-2 Blank	0	22-2 thru 22-9	1	D-29 thru D-31	0
FO-4 FP-3	0	22-10 thru 22-22	0	D-32	1
FO-4 FP-4 Blank	0	23-1	0	D-33 thru D-38	0
FO-5 FP-1	0	23-2 and 23-3	1	D-39	1
FO-5 FP-2 Blank	0	23-4 thru 23-6	0	D-40 and D-41	0
FO-5 FP-3	0	23-7	1	D-42 thru D-47	1
FO-5 FP-4 Blank	0	23-8 thru 23-12	0	D-48 thru D-80	0
FO-5 FP-5	0	23-13 thru 23-15	1	D-81 thru D-86 Added	1
FO-5 FP-6 Blank	0	23-16	0	E-1 thru E-8	0
VOLUME 4		23-17 thru 23-19	1	F-1 thru F-16	1
Cover	1	23-20 Blank	0	F-17 Added	1
Blank	0	24-1	0	F-18 Blank Added	1
a thru e	0	24-2 thru 24-4	1	G-1	1
f thru al	1	24-5 and 24-6	0	G-2 Blank	0
A and B Added	1	24-7	1	H-1 thru H-4 Added	1
i	1	24-8	0	INDEX-1 thru INDEX-4	1
ii thru vi	1	24-9	1	INDEX-5 Added	1
vii Added	1	24-10	0	INDEX-6 Blank Added	1
viii Blank Added	1	24-11	1	Glossary-1	0
18-1 thru 18-77	1	24-12 thru 24-17	0	Glossary-2 Blank	0
18-78 Blank	1	24-18 thru 24-24	1	FO-1 FP-1	1
18-79 thru 18-131 Deleted	1	24-25 thru 24-27	0	FO-1 FP-2 Blank	0
18-132 Blank Deleted	1	24-28	1	FO-1 FP-3	1
19-1 and 19-2	1	24-29 thru 24-33	0	FO-1 FP-4 Blank	0
19-3	0	24-34 thru 24-36	1	FO-1 FP-5	1
19-4 thru 19-6	1	24-37	0	FO-1 FP-6 Blank	0
19-7	0	24-38 thru 24-40	1	FO-1 FP-7	1
19-8 thru 19-15	1	25-1 thru 25-33	0	FO-1 FP-8 Blank	0
19-16	0	25-34 Blank	0	FO-1 FP-9	1
19-17	1	26-1 thru 26-60	0	FO-1 FP-10 Blank	0
19-18 Blank	0	26-61	1	FO-1 FP-11	1

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FO-1 FP-14 Blank	0	FO-1 FP-64 Blank	0	FO-5 FP-6 Blank	0
FO-1 FP-15	1	FO-1 FP-65	1		
FO-1 FP-16 Blank	0	FO-1 FP-66 Blank	0		
FO-1 FP-17	1	FO-1 FP-67	1		
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FO-1 FP-23	0	FO-1 FP-73	0		
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FO-1 FP-25	1	FO-1 FP-75	1		
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FO-1 FP-35	1	FO-2 FP-5	0		
FO-1 FP-36 Blank	0	FO-2 FP-6 Blank	0		
FO-1 FP-37	1	FO-2 FP-7	0		
FO-1 FP-38 Blank	0	FO-2 FP-8 Blank	0		
FO-1 FP-39	1	FO-3 FP-1	0		
FO-1 FP-40 Blank	0	FO-3 FP-2 Blank	0		
FO-1 FP-41	1	FO-3 FP-3	0		
FO-1 FP-42 Blank	0	FO-3 FP-4 Blank	0		
FO-1 FP-43	1	FO-3 FP-5	0		
FO-1 FP-44 Blank	0	FO-3 FP-6 Blank	0		
FO-1 FP-45	1	FO-3 FP-7	0		
FO-1 FP-46 Blank	0	FO-3 FP-8 Blank	0		
FO-1 FP-47	1	FO-3 FP-9	0		
FO-1 FP-48 Blank	0	FO-3 FP-10 Blank	0		
FO-1 FP-49	1	FO-3 FP-11	0		
FO-1 FP-50 Blank	0	FO-3 FP-12 Blank	0		
FO-1 FP-51	1	FO-3 FP-13	0		
FO-1 FP-52 Blank	0	FO-3 FP-14 Blank	0		
FO-1 FP-53	1	FO-3 FP-15	0		
FO-1 FP-54 Blank	0	FO-3 FP-16 Blank	0		
FO-1 FP-55	1	FO-4 FP-1	0		
FO-1 FP-56 Blank	0	FO-4 FP-2 Blank	0		
FO-1 FP-57	1	FO-4 FP-3	0		
FO-1 FP-58 Blank	0	FO-4 FP-4 Blank	0		
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TECHNICAL MANUAL
NO. 9-2320-366-34-1

TECHNICAL ORDER
NO. 36A12-1C-1092-1

Washington, D.C., 15 September 1998

Direct Support and General Support Maintenance Manual
**M1083 SERIES, 5-TON, 6 x 6,
MEDIUM TACTICAL VEHICLES (MTV)**
VOLUME NO. 1 OF 4

MODEL	NSN	EIC
TRK, CAR., MTV, M1083 W/WN W/O WN	2320-01-360-1895 2320-01-354-3386	BT3 BR2
TRK, CAR., MTV, W/MATL HDLG EQPT (MHE), M1084	2320-01-354-3387	BR3
TRK, CAR., MTV, LWB, M1085 W/WN W/O WN	2320-01-360-1897 2320-01-354-4530	BT5 BR7
TRK, CAR., MTV, LWB, W/MATL HDLG EQPT (MHE), M1086	2320-01-354-4531	BR8
TRK, TRACTOR, MTV, M1088 W/WN W/O WN	2320-01-360-1892 2320-01-355-4332	BTY BTJ
TRK, WKR, MTV, M1089	2320-01-354-4528	BR4
TRK, DUMP, MTV, M1090 W/WN W/O WN	2320-01-360-1893 2320-01-354-4529	BTZ BR5
TRK, CHAS, MTV, M1092	2320-01-354-3382	BRZ
TRK, CAR., MTV, AIR DROP, M1093 W/WN W/O WN	2320-01-360-1896 2320-01-355-3063	BT4 BR9
TRK, DUMP, MTV, AIR DROP, M1094 W/WN W/O WN	2320-01-360-1984 2320-01-355-3062	BT2 BTK
TRK, CHAS, MTV, LWB, M1096	2320-01-354-4527	BR6

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HOW TO USE THIS MANUAL

OVERVIEW

This Technical Manual (TM) is provided to help you maintain the MTV at the Direct Support (DS) and General Support (GS) Maintenance levels. This volume, Volume 1, contains Troubleshooting information which will assist you in Maintaining your MTV. Volumes 2 and 3 contain DS Maintenance procedures. Volume 4 contains the remainder of the DS Maintenance procedures and the GS Maintenance procedures. Volume 1 contains the following major sections in order of appearance:

- **WARNING SUMMARY.** Provides a summary of the most important warnings that apply throughout the manual. Read all **WARNINGS** and **CAUTIONS** before performing any troubleshooting or maintenance procedure.
- **TABLE OF CONTENTS.** Lists, for both volumes, the chapters, sections, appendixes, and indexes with page numbers in order of appearance.
- **CHAPTER 1, INTRODUCTION.** Describes the MTV and provides equipment data.
- **CHAPTER 2, VEHICLE MAINTENANCE.** This chapter contains information for finding tools; special tools; test, measurement, and diagnostic equipment (TMDE); and repair parts. It also contains the troubleshooting tables.
- **APPENDIX A, REFERENCES.** Lists publications used with the MTV and reference publications which contain information regarding the equipment

- **APPENDIX B, TOOLS AND SPECIAL TOOLS LIST.** Lists equipment used in the performance of maintenance.
- **APPENDIX C, EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST.** Lists expendable and durable items used in the performance of maintenance.
- **APPENDIX D, ILLUSTRATED LIST OF MANUFACTURED ITEMS.** Illustrates and describes items that must be fabricated from bulk materials for repair of the MTV.
- **APPENDIX E, TORQUE LIMITS.** Lists the standard torque values for specific attaching hardware.
- **APPENDIX F, MANDATORY REPLACEMENT PARTS.**
- **APPENDIX G, ADDITIONAL AUTHORIZATION LIST (AAL).** Lists additional items you are authorized for support of the MTV.
- **APPENDIX H, TRANSMISSION/TRANSMISSION CONTROLS ADAPTABILITY CHART.** Lists actions required to mate different transmission configurations with WTEC II or WTEC III controls.
- **SUBJECT INDEX.** Lists important subjects contained in Volume 1, Volume 2, Volume 3, and Volume 4 in alphabetical order and gives the paragraph number where they are located.

Volume 2 contains the following major sections in order of appearance:

- **WARNING SUMMARY.** Provides a summary of the most important warnings that apply throughout the manual. Read all **WARNINGS** and **CAUTIONS** before performing any maintenance procedure.
- **TABLE OF CONTENTS.** Lists the chapters, sections, appendixes, and indexes with page numbers in order of appearance.
- **MAINTENANCE PROCEDURES.** DS Maintenance procedures to assist you in supporting the MTV. Chapters 3 through 14 are Direct Support Maintenance procedures. Become familiar with the entire maintenance procedure before beginning any maintenance task.

DIRECT SUPPORT MAINTENANCE

- **CHAPTER 3, ENGINE MAINTENANCE**
- **CHAPTER 4, FUEL SYSTEM MAINTENANCE**
- **CHAPTER 5, COOLING SYSTEM MAINTENANCE**
- **CHAPTER 6, ELECTRICAL SYSTEM MAINTENANCE**
- **CHAPTER 7, TRANSMISSION MAINTENANCE**
- **CHAPTER 8, POWER TRANSFER AND FINAL DRIVE ASSEMBLY MAINTENANCE**
- **CHAPTER 9, FRONT AXLE MAINTENANCE**
- **CHAPTER 10, INTERMEDIATE AND REAR AXLE MAINTENANCE**
- **CHAPTER 11, BRAKE SYSTEM MAINTENANCE**

OVERVIEW (CONT)

DIRECT SUPPORT MAINTENANCE (CONT)

- **CHAPTER 12, STEERING SYSTEM MAINTENANCE**
- **CHAPTER 13, FRAME MAINTENANCE**
- **CHAPTER 14, SUSPENSION MAINTENANCE**
- **APPENDIX A, REFERENCES.** Lists publications used with the MTV and reference publications which contain information regarding the equipment.
- **APPENDIX B, TOOLS AND SPECIAL TOOLS LIST.** Lists equipment used in the performance of maintenance.
- **APPENDIX C, EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST.** Lists expendable and durable items used in the performance of maintenance.
- **APPENDIX D, ILLUSTRATED LIST OF MANUFACTURED ITEMS.** Illustrates and describes items that must be fabricated from bulk materials for repair of the MTV.
- **APPENDIX E, TORQUE LIMITS.** Lists the standard torque values for specific attaching hardware.
- **APPENDIX F, MANDATORY REPLACEMENT PARTS.**
- **APPENDIX G, ADDITIONAL AUTHORIZATION LIST (AAL).** Lists additional items you are authorized for support of the MTV.
- **APPENDIX H, TRANSMISSION/TRANSMISSION CONTROLS ADAPTABILITY CHART.** Lists actions required to mate different transmission configurations with WTEC II or WTEC III controls.
- **SUBJECT INDEX.** Lists important subjects contained in Volume 2 in alphabetical order and gives the paragraph number where they are located.

Volume 3 contains the following major sections in order of appearance:

- **WARNING SUMMARY.** Provides a summary of the most important warnings that apply throughout the manual. Read all **WARNINGS** and **CAUTIONS** before performing any maintenance procedure.
- **TABLE OF CONTENTS.** Lists the chapters, sections, appendixes, and indexes with page numbers in order of appearance.
- **MAINTENANCE PROCEDURES.** DS Maintenance procedures to assist you in supporting the MTV. Chapters 15 through 17 are Direct Support Maintenance procedures. Become familiar with the entire maintenance procedure before beginning any maintenance task.

DIRECT SUPPORT MAINTENANCE

- **CHAPTER 15, BODY AND CAB MAINTENANCE**
- **CHAPTER 16, MATERIAL HANDLING CRANES (MHC), 30K WINCHES, UNDERLIFT, AND 15K SELF-RECOVERY WINCH (SRW) MAINTENANCE**

- **CHAPTER 17, HYDRAULIC SYSTEM MAINTENANCE**
- **APPENDIX A, REFERENCES.** Lists publications used with the MTV and reference publications which contain information regarding the equipment
- **APPENDIX B, TOOLS AND SPECIAL TOOLS LIST.** Lists equipment used in the performance of maintenance.
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- **APPENDIX F, MANDATORY REPLACEMENT PARTS.**
- **APPENDIX G, ADDITIONAL AUTHORIZATION LIST (AAL).** Lists additional items you are authorized for support of the MTV.
- **APPENDIX H, TRANSMISSION/TRANSMISSION CONTROLS ADAPTABILITY CHART.** Lists actions required to mate different transmission configurations with WTEC II or WTEC III controls.
- **SUBJECT INDEX.** Lists important subjects contained in Volume 3 in alphabetical order and gives the paragraph number where they are located.

Volume 4 contains the following major sections in order of appearance:

- **WARNING SUMMARY.** Provides a summary of the most important warnings that apply throughout the manual. Read all **WARNINGS** and **CAUTIONS** before performing any maintenance procedure.
 - **TABLE OF CONTENTS.** Lists the chapters, sections, appendixes, and indexes with page numbers in order of appearance.
 - **MAINTENANCE PROCEDURES.** DS and GS Maintenance procedures to assist you in supporting the MTV. Chapters 18 and 19 are Direct Support Maintenance procedures. General Support Maintenance procedures are contained in chapters 20 through 27. Become familiar with the entire maintenance procedure before beginning any maintenance task.
 - **CHAPTER 18, SPECIAL PURPOSE KIT MAINTENANCE**
 - **CHAPTER 19, ARMAMENT/SIGHTING AND FIRE CONTROL MATERIEL MAINTENANCE**
- GENERAL SUPPORT MAINTENANCE**
- **CHAPTER 20, ENGINE MAINTENANCE**
 - **CHAPTER 21, TRANSMISSION MAINTENANCE**
 - **CHAPTER 22, POWER TRANSFER AND FINAL DRIVE ASSEMBLY MAINTENANCE**
 - **CHAPTER 23, FRONT AXLE MAINTENANCE**

OVERVIEW (CONT)

- **CHAPTER 24, INTERMEDIATE AND REAR AXLE MAINTENANCE**
- **CHAPTER 25, FRAME, TOWING ATTACHMENT, AND DRAWBARS MAINTENANCE**
- **CHAPTER 26, MATERIAL HANDLING CRANES (MHC) AND UNDERLIFT MAINTENANCE**
- **CHAPTER 27, HYDRAULIC MAINTENANCE**
- **APPENDIX A, REFERENCES.** Lists publications used with the MTV and reference publications which contain information regarding the equipment
- **APPENDIX B, TOOLS AND SPECIAL TOOLS LIST.** Lists equipment used in the performance of maintenance.
- **APPENDIX C, EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST.** Lists expendable and durable items used in the performance of maintenance.
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- **APPENDIX H, TRANSMISSION/TRANSMISSION CONTROLS ADAPTABILITY CHART.** Lists actions required to mate different transmission configurations with WTEC II or WTEC III controls.
- **SUBJECT INDEX.** Lists important subjects contained in Volume 4 in alphabetical order and gives the paragraph number where they are located.

FINDING INFORMATION

There are several ways to find the information you need in this manual. They are as follows:

- **FRONT COVER INDEX.** The front cover index contains a list of the most important topics contained in each volume. It features a black box at the right edge of the cover which corresponds with a black box on the page containing the topic. The topics listed on the front cover are highlighted in the table of contents with a box.
- **TABLE OF CONTENTS.** Lists chapters, sections, appendixes, and indexes with page numbers in order of appearance.
- **CHAPTER INDEXES.** List paragraphs contained in the individual chapters with paragraph and page numbers in order of appearance.
- **SYMPTOM INDEX.** Lists malfunctions contained in the troubleshooting table with page numbers in order of appearance.

- **SUBJECT INDEX.** Lists all maintenance procedures contained in Volume 1 and Volume 2 in alphabetical order and gives the paragraph number where they are located.

TROUBLESHOOTING

Troubleshooting is contained in Chapter 2 of Volume 1. When a malfunction occurs, look at the symptom index for the vehicle troubleshooting table in Chapter 2. Find the malfunction in the index. Turn to the page number listed for the malfunction in the troubleshooting table. Perform the steps required to correct the malfunction. If you can't find the malfunction, or the malfunction is not corrected, notify your supervisor.

FOLLOW THESE GUIDELINES WHEN USING THIS MANUAL:

- Become familiar with the entire maintenance procedure before beginning a maintenance task.
- Read all **WARNINGS** and **CAUTIONS** before performing any procedures.

CHAPTER 1 INTRODUCTION

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Section I. GENERAL INFORMATION

1-1. SCOPE

This chapter provides general information, equipment description, and principles of operation for the M1083 series Medium Tactical Vehicle (MTV). The MTV will herein be referred to as the vehicle.

a. Type of Manual: Direct Support and General Support Maintenance Instructions, TM 9-2320-366-34-1.

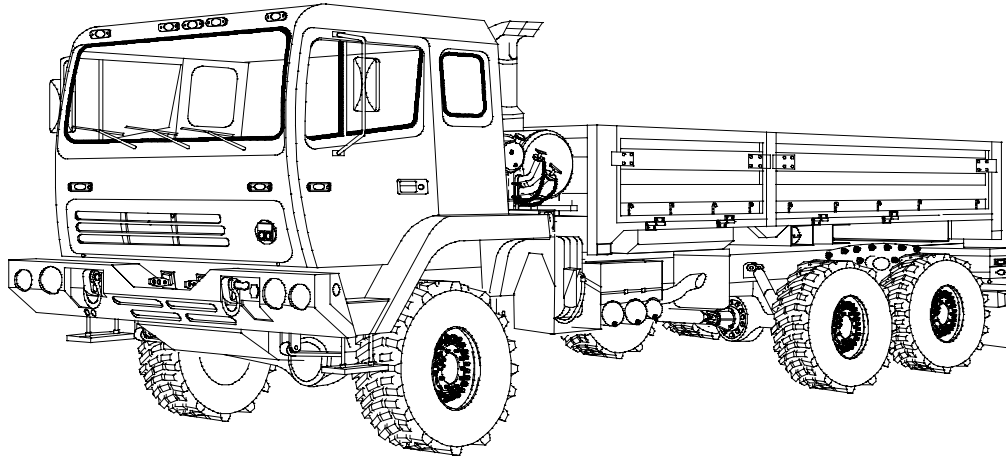
b. Model Numbers and Equipment Names. The vehicle model numbers and names are listed below:

- M1083 Truck, Cargo: 5-Ton, 6x6, Dropside (Figure 1-1).
- M1084 Truck, Cargo: 5-Ton, 6x6, Dropside, W/MHC (Figure 1-2).
- M1085 Truck, Cargo: 5-Ton, 6x6, Dropside, LWB (Figure 1-3).
- M1086 Truck, Cargo: 5-Ton, 6x6, Dropside, LWB, W/MHC (Figure 1-4).
- M1088 Truck, Tractor: 5-Ton, 6x6 (Figure 1-5).
- M1089 Truck, Wrecker: 5-Ton, 6x6 (Figure 1-6).
- M1090 Truck, Dump: 5-Ton, 6x6 (Figure 1-7).
- M1092 Truck, Chassis: 5-Ton, 6x6 (Figure 1-8).
- M1093 Truck, Cargo: 5-Ton, 6x6, Dropside, Air Drop (Figure 1-9).
- M1094 Truck, Dump: 5-Ton, 6x6, Air Drop (Figure 1-10).
- M1096 Truck, Chassis: 5-Ton, 6x6, LWB (Figure 1-11).

1-1. SCOPE (CONT)

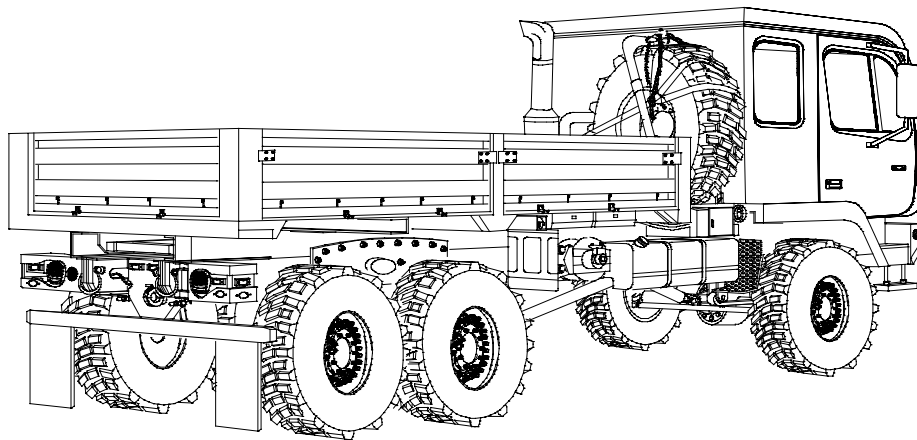
c. Purpose of Equipment. The MTV series is a family of 6x6 wheeled vehicles. The purpose of these vehicles is as follows:

- (1) M1083 - Cargo hauling vehicle; can be outfitted for troop transport when equipped with a troopseat kit.
- (2) M1084 - Cargo hauling vehicle; equipped with a Material Handling Crane (MHC).
- (3) M1085 - Long Wheelbase (LWB) cargo hauling vehicle; can be outfitted for troop transport when equipped with a troopseat kit.
- (4) M1086 - Long Wheelbase (LWB) cargo hauling vehicle; equipped with a Material Handling Crane (MHC).
- (5) M1088 - Tractor with fifth wheel; used to pull various types of fifth wheel trailers.
- (6) M1089 - Wrecker with two winches, an underlift assembly, and a Material Handling Crane (MHC); used for recovering disabled vehicles.
- (7) M1090 - Dump truck; can be outfitted for troop transport when equipped with a troopseat kit.
- (8) M1092 - Standard wheelbase vehicle chassis; this chassis will accept a standard cargo bed or may be modified for special missions.
- (9) M1093 - Cargo hauling vehicle; can be airdropped and outfitted for troop transport when equipped with a troopseat kit.
- (10) M1094 - Dump truck; can be airdropped and outfitted for troop transport when equipped with a troopseat kit.
- (11) M1096 - Long Wheelbase (LWB) vehicle chassis; this chassis will accept a long cargo bed or may be modified for special missions.



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LEFT FRONT VIEW

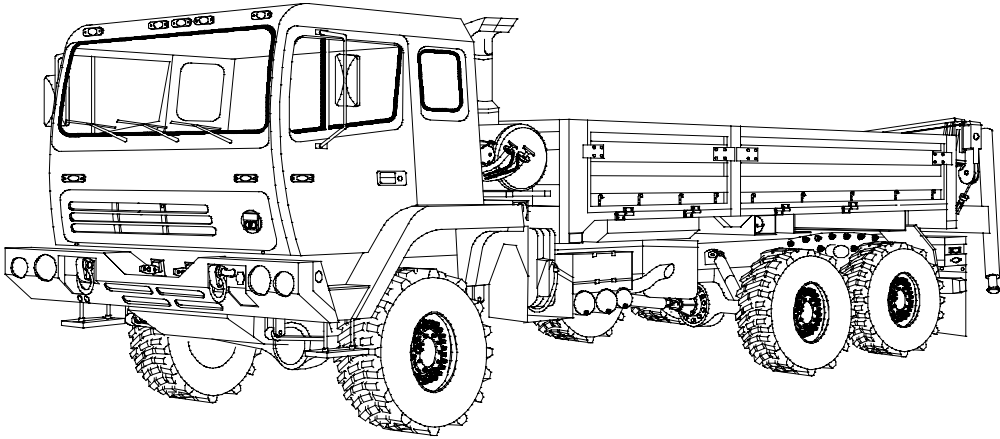


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RIGHT REAR VIEW

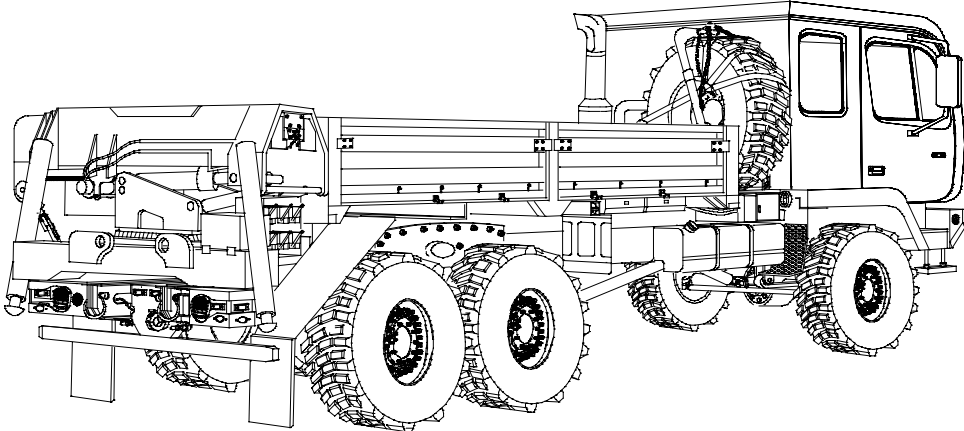
Figure 1-1. M1083 Truck, Cargo: 5-Ton, 6x6, Dropside

1-1. SCOPE (CONT)



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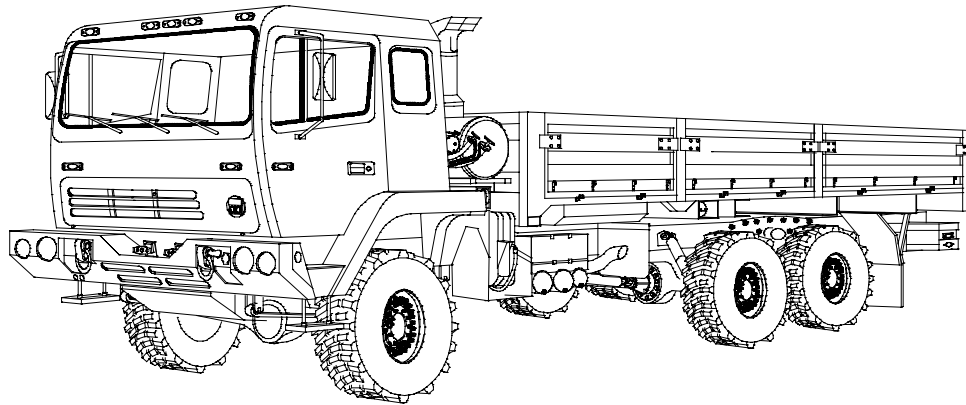
LEFT FRONT VIEW



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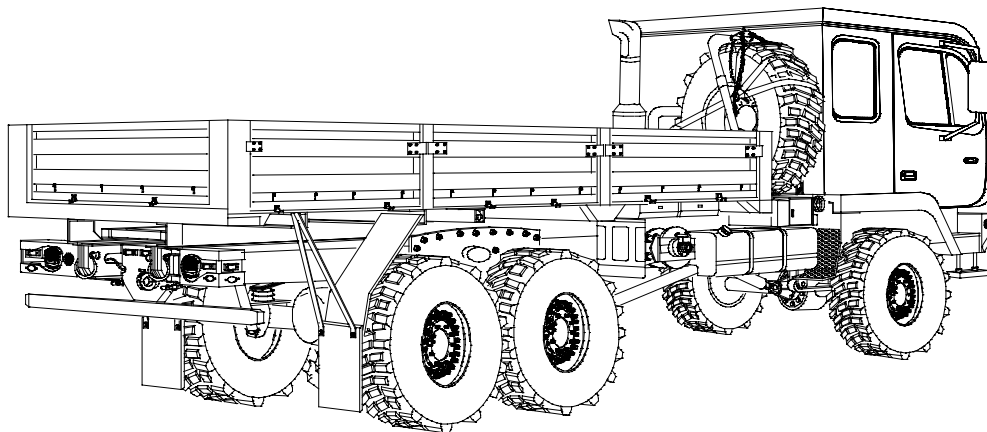
RIGHT REAR VIEW

Figure 1-2. M1084 Truck, Cargo: 5-Ton, 6x6, Dropside, W/MHC



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LEFT FRONT VIEW

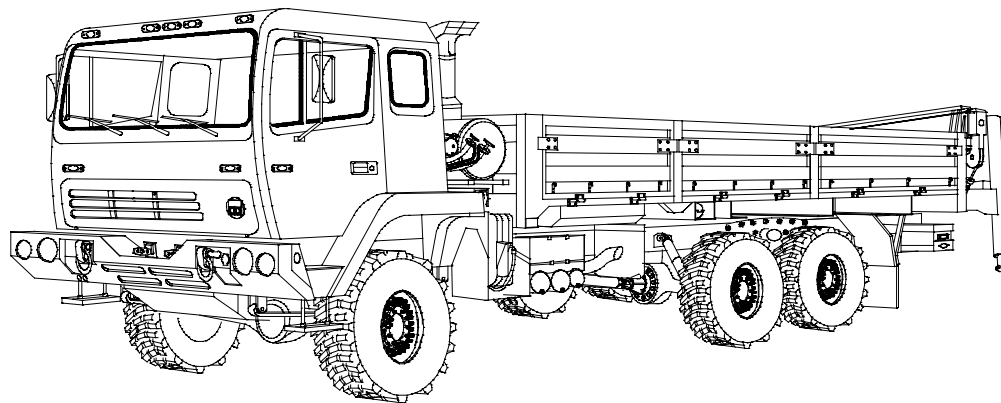


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RIGHT REAR VIEW

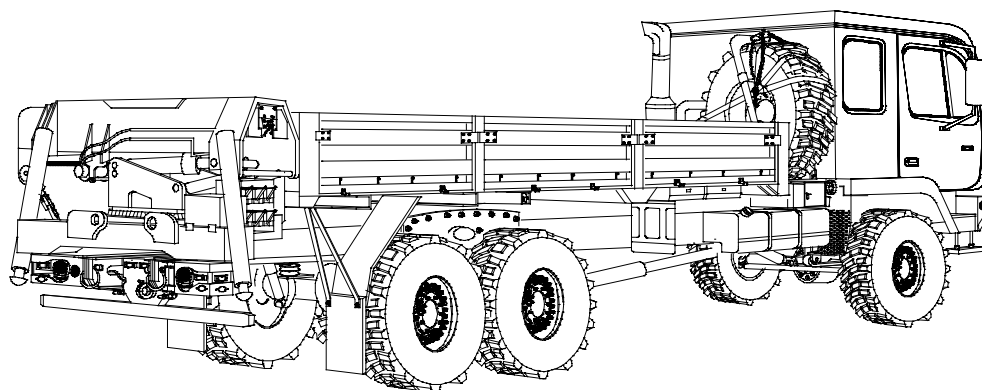
Figure 1-3. M1085 Truck, Cargo: 5-Ton, 6x6, Dropside, LWB

1-1. SCOPE (CONT)



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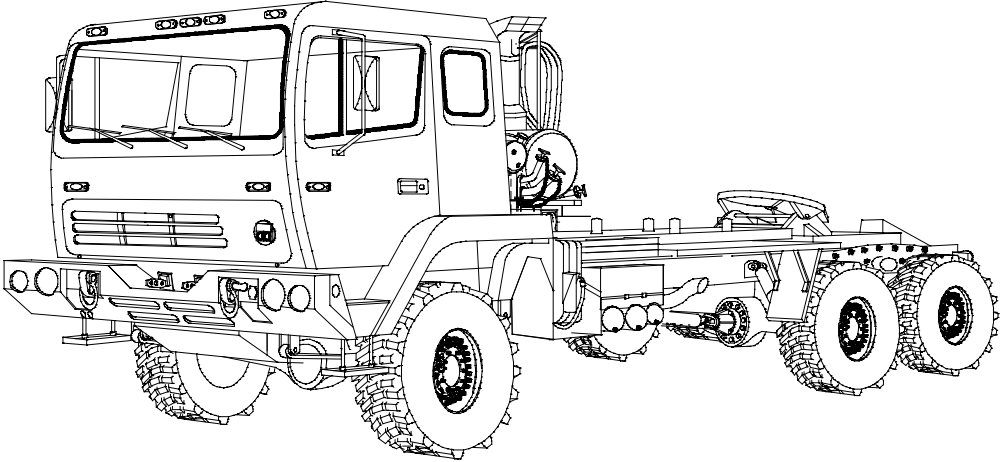
LEFT FRONT VIEW



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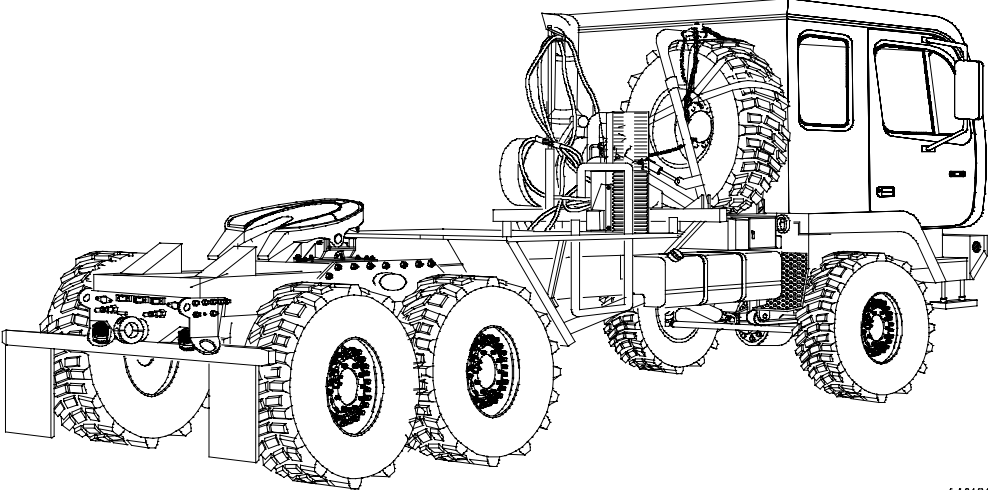
RIGHT REAR VIEW

Figure 1-4. M1086 Truck, Cargo: 5-Ton, 6x6, Dropside, LWB, W/MHC



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LEFT FRONT VIEW

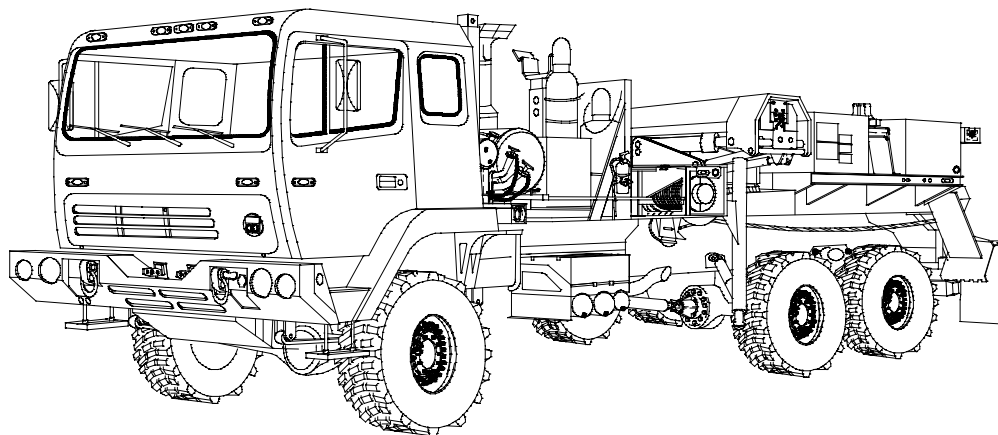


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RIGHT REAR VIEW

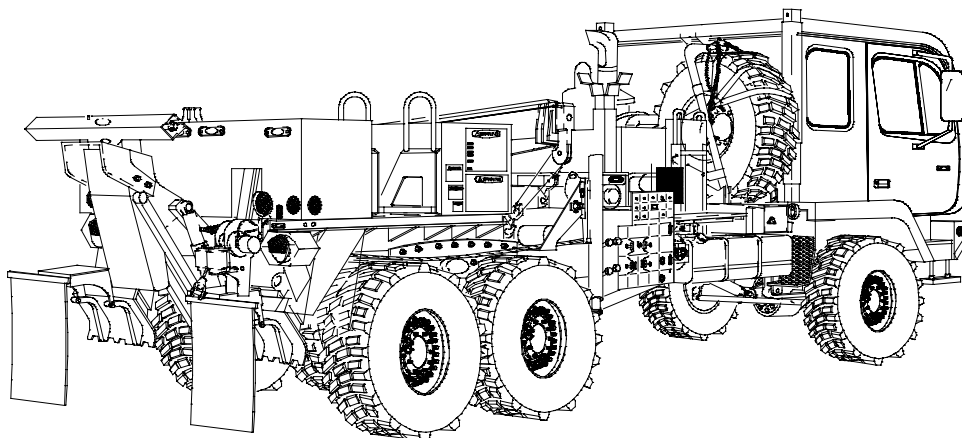
Figure 1-5. M1088 Truck, Tractor: 5-Ton, 6x6

1-1. SCOPE (CONT)



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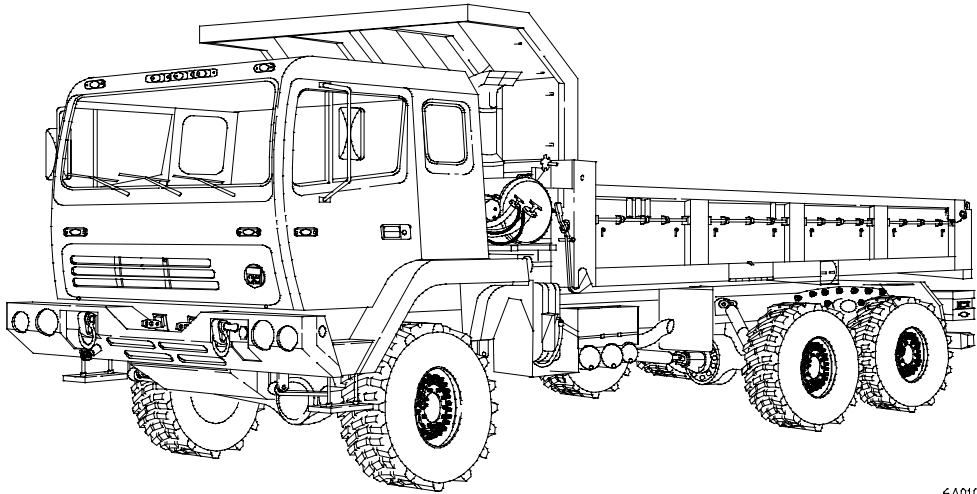
LEFT FRONT VIEW



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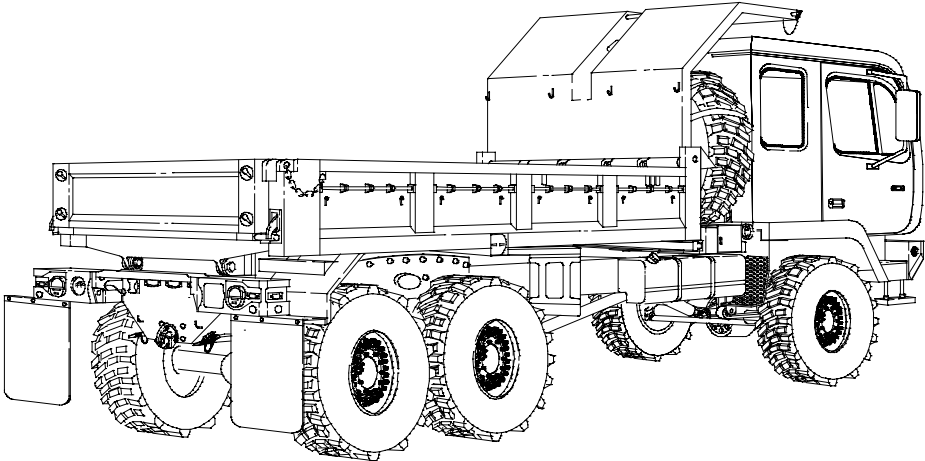
RIGHT REAR VIEW

Figure 1-6. M1089 Truck, Wrecker: 5-Ton, 6x6



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LEFT FRONT VIEW

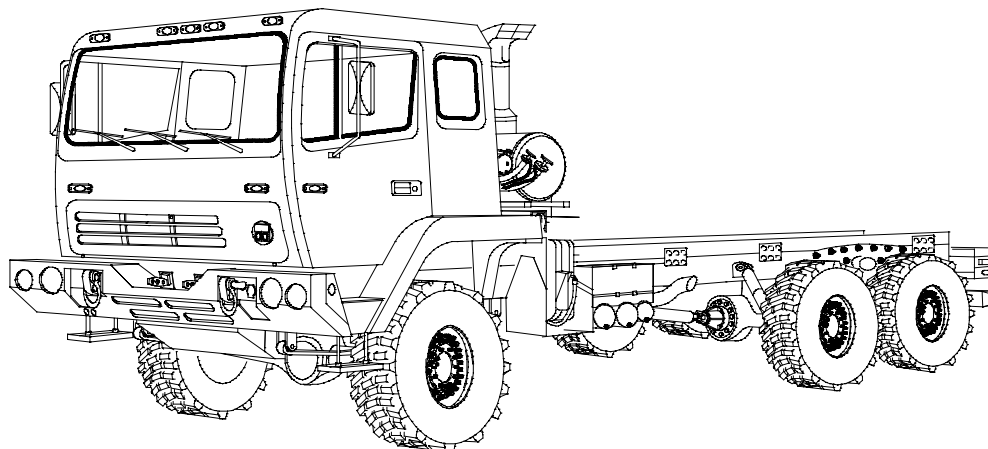


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RIGHT REAR VIEW

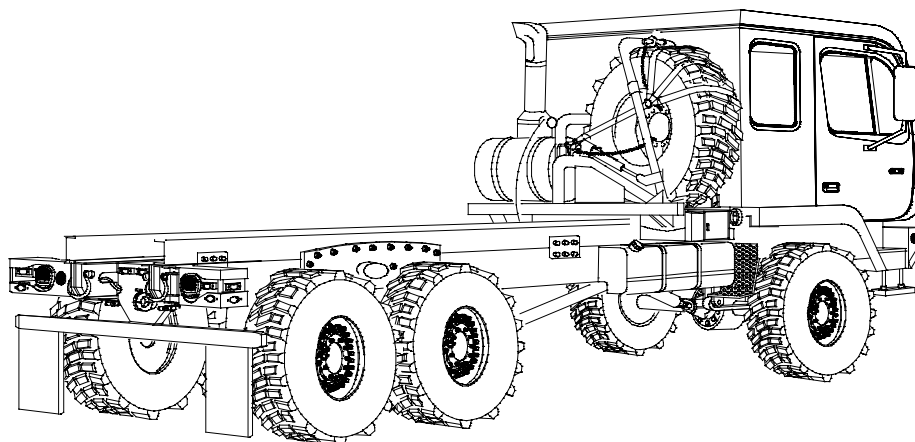
Figure 1-7. M1090 Truck, Dump: 5-Ton, 6x6

1-1. SCOPE (CONT)



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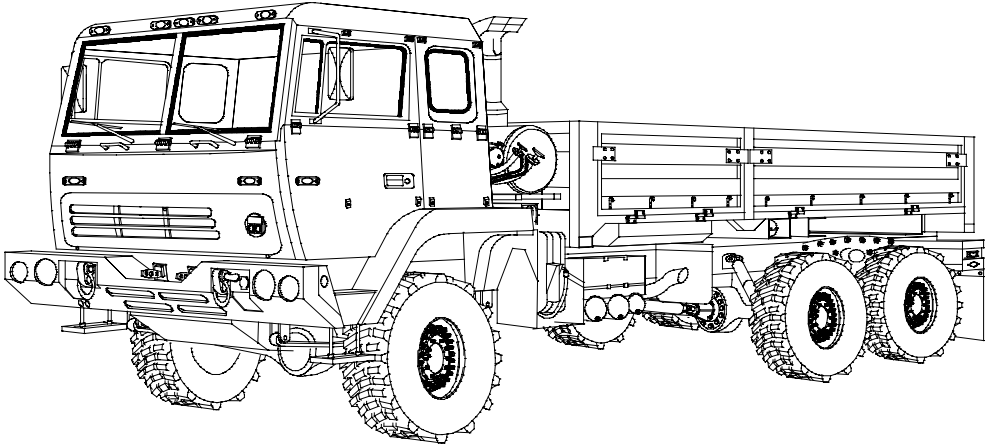
LEFT FRONT VIEW



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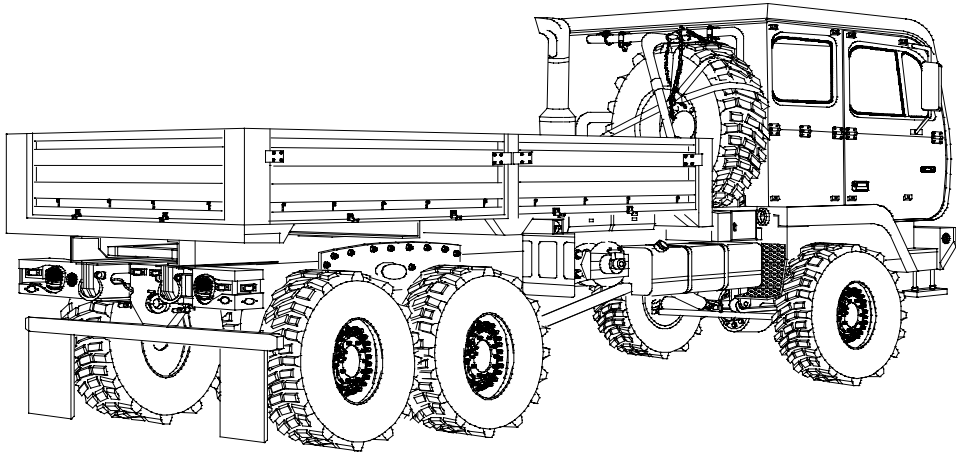
RIGHT REAR VIEW

Figure 1-8. M1092 Truck, Chassis: 5-Ton, 6x6



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LEFT FRONT VIEW

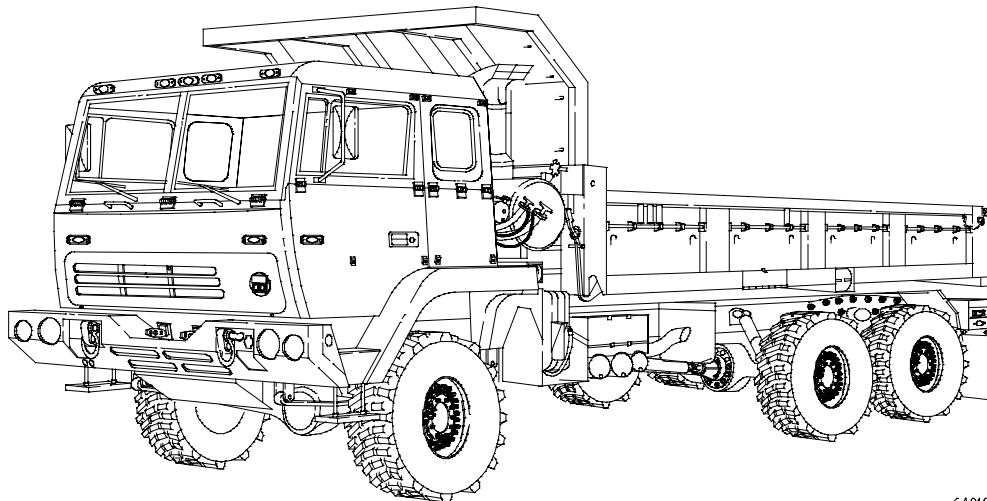


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RIGHT REAR VIEW

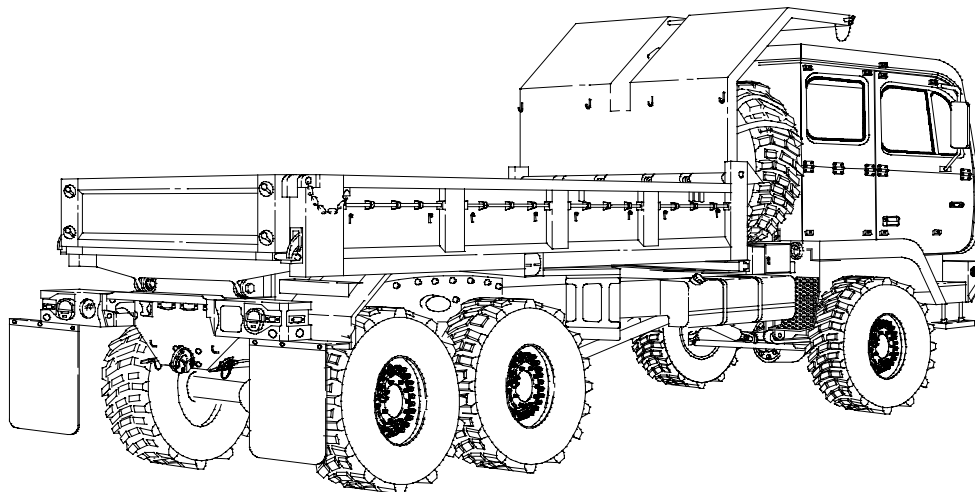
Figure 1-9. M1093 Truck, Cargo: 5-Ton, 6x6, Dropside, Air Drop

1-1. SCOPE (CONT)



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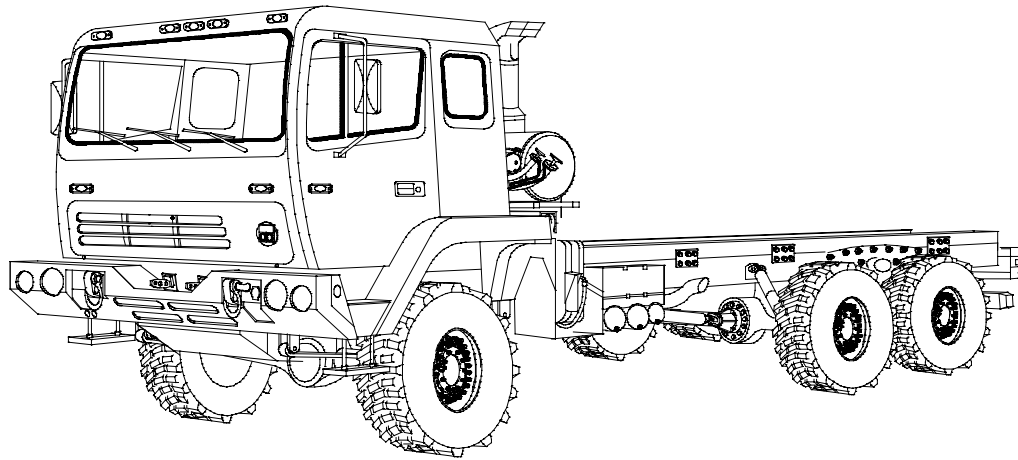
LEFT FRONT VIEW



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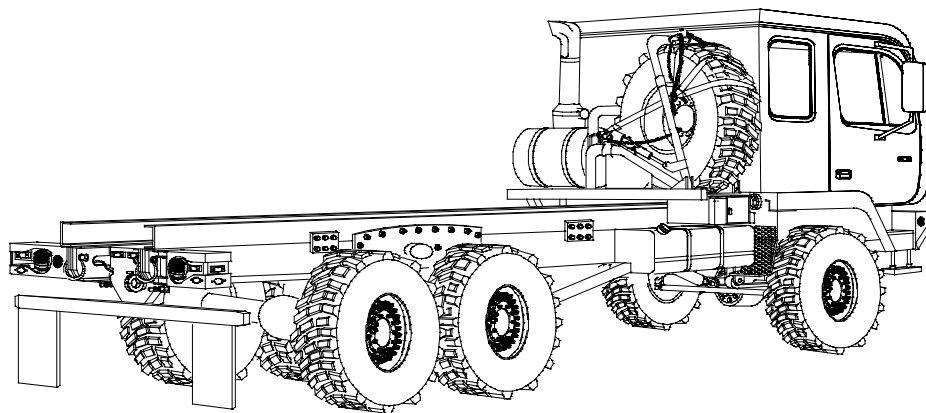
RIGHT REAR VIEW

Figure 1-10. M1094 Truck, Dump: 5-Ton, 6x6, Air Drop



6A01C211

LEFT FRONT VIEW



6A01C221

RIGHT REAR VIEW

Figure 1-11. M1096 Truck, Chassis: 5-Ton, 6x6, LWB

1-2. MAINTENANCE FORMS, RECORDS, AND REPORTS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by (as applicable) DA Pam 738-750. The Army Maintenance Management Systems (TAMMS); DA Pam 738-751, Functional Users Manual for the Army Maintenance Management Systems; or AR 700-138. Army Logistics Readiness and Sustainability.

1-3. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

Command decision, according to the tactical situation, will determine when the destruction plan of the M1083 vehicles will be accomplished. A destruction plan will be prepared by the using organization unless one has been prepared by a higher authority. For general destruction procedures for this equipment, refer to TM 750-224-6, Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use (U.S. Army Tank-automotive and Armaments Command).

1-4. OFFICIAL NOMENCLATURE, NAMES AND DESIGNATIONS

Table 1-1 lists the nomenclature cross-reference used in this manual.

Table 1-1. Nomenclature Cross-Reference

<u>Common Name</u>	<u>Official Nomenclature</u>
Cold Start System	Ether Quick-Start System
Engine Coolant	Antifreeze, Ethylene, Glycol, Inhibited
Gladhand	Quick-Disconnect Coupling
Vehicle	Medium Tactical Vehicle (MTV)

1-5. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your Medium Tactical Vehicle (MTV) needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Put it on an SF 368 (Quality Deficiency Report). Mail it to us at: Commander, U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-TR-E/FMTV/312, Warren, MI 48397-5000. We'll send you a reply.

1-6. WARRANTY INFORMATION

Refer to M1083 Series Warranty Program Technical Bulletin, TB 9-2300-366-15, for complete warranty information covering the vehicle. Warranty starts on the date found in block 23, DA Form 2408-9, in the logbook. Report all defects in material or workmanship to your supervisor, who will take appropriate action.

Section II. EQUIPMENT DESCRIPTION AND DATA

1-7. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

Refer to TM 9-2320-366-10-1 for equipment characteristics, capabilities, and features.

1-8. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

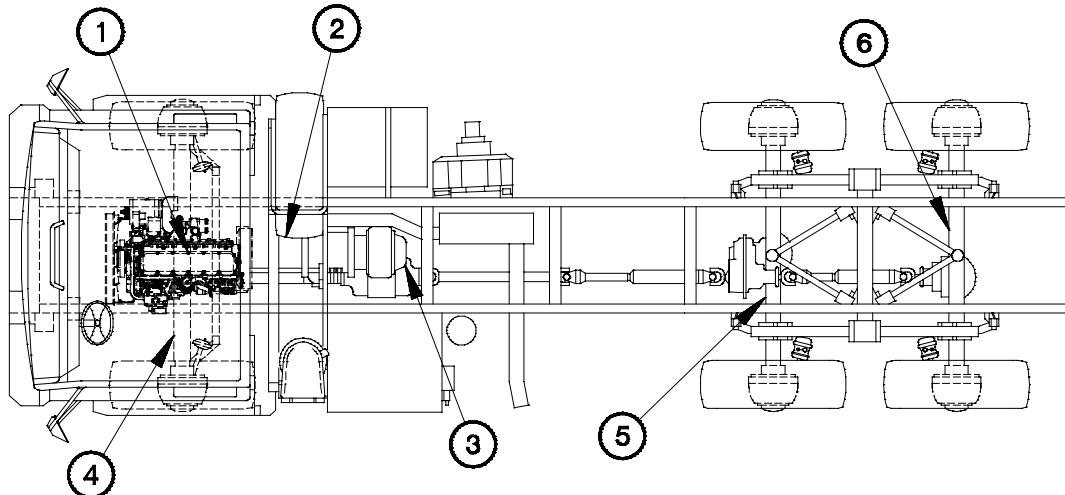
Refer to TM 9-2320-366-10-1 for location and description of major components.

1-9. DIFFERENCES BETWEEN MODELS

Refer to TM 9-2320-366-10-1 for differences between models.

Section III. PRINCIPLES OF OPERATION

1-10. POWERTRAIN

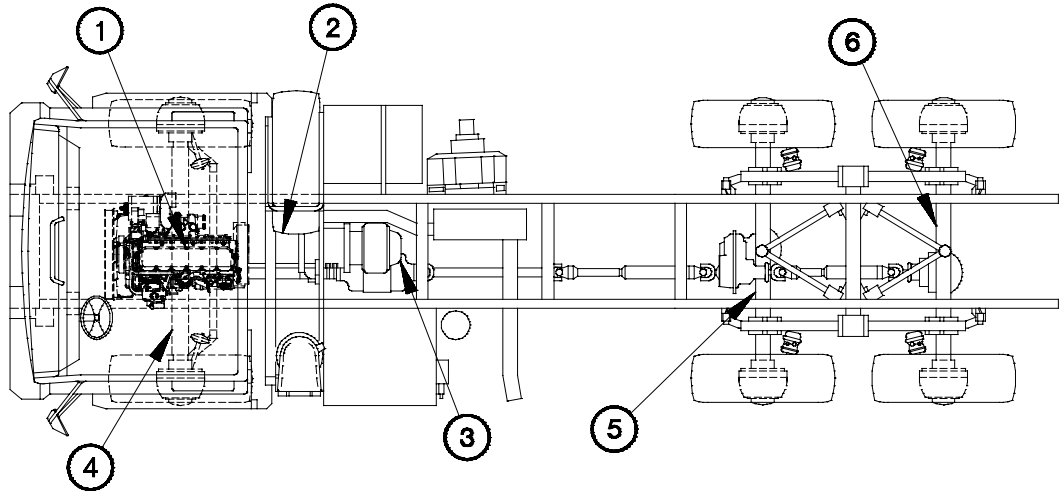


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Figure 1-12. Powertrain

Power for the vehicle is provided by a diesel engine (1, Figure 1-12) which is coupled directly to an automatic transmission (2). Power from the automatic transmission is transferred to the transfer case (3) and on to the front steering and rear drive axles (4, 5, and 6) through a series of drive shafts and universal joints. The vehicle drive train is enhanced by the use of an electronically controlled seven-speed transmission. The primary components of the Allison MD3070PT transmission consist of either a WTEC II Transmission Electronic Control Unit (ECU) Pushbutton Shift Selector (WTEC II TEPSS) or a WTEC III Transmission Pushbutton Shift Selector (WTEC III TPSS) coupled with a WTEC III transmission ECU; a control module located directly beneath the transmission main housing; a Throttle Position Sensor (TPS) which detects the percentage of throttle being used; engine, turbine, and output speed sensors which, in combination with each other, send information to the ECU to provide the smoothest possible shifting and allow the ECU to monitor overall transmission performance.

1-10. POWERTRAIN (CONT)



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Figure 1-12. Powertrain (Cont)

- a. Engine.** The vehicle is equipped with a Caterpillar diesel engine, model 3116 ATAAC (Air-to-Air After Cooler) (1, Figure 1-12), rated at 290 HP.
- b. Transmission.** The vehicle is equipped with an Allison automatic transmission, model MD3070PT (2, Figure 1-12). It is a fully automatic electronically controlled seven-speed close-ratio transmission.

(1) The WTEC II TEPSS contains microprocessor based electronics, and is located in the instrument panel to the driver's left. The WTEC III TPSS is located in the instrument panel to the driver's left, while the WTEC III transmission ECU is located behind the kick panel. The ECU receives information, in the form of electrical signals from the various sensors, processes that information, then sends the appropriate signals to the solenoids which control transmission function. The ECU incorporates a diagnostic program which enables it to identify numerous actual and/or potential transmission problems. The WTEC II TEPSS and WTEC III TPSS are capable of displaying diagnostic codes in the Light Emitting Diode (LED) display on the pushbutton shift selector. These diagnostic codes are stored in the ECU for later retrieval. The pushbutton shift selector is used for selecting transmission range. The transmission defaults to Neutral (N) whenever electrical power is removed from the vehicle. The Drive (D) gear selection is used for normal driving conditions. The transmission will engage 2nd gear when D is selected and the vehicle is stopped. As the accelerator is depressed and speed increases, the transmission will automatically upshift through 3rd, 4th, 5th, 6th, and 7th gears. Low gear (1st gear), is available only by manual selection. Selecting a specific gear; for example, 3rd; will prevent the transmission upshifting past the selected gear. This is useful if road or load conditions require lower gear range operation. When road conditions improve or load is reduced, the shift selector can be returned to the normal (D) driving position. When electrical power is applied to the WTEC II TEPSS and a fault is detected in the transmission controls, the WTEC II TEPSS will emit an eight second series of beeps. When electrical power is applied to the WTEC III TPSS and a fault is detected in the transmission controls, "--" will appear in the WTEC III TPSS LED display. In either case, the transmission will not engage a range (forward or reverse) when D or Reverse (R) range is selected on the pushbutton shift selector. TM 9-2320-366-10-1 provides full operating instructions for the transmission.

(2) The transmission may include a Power Take-Off (PTO). The PTO powers a hydraulic pump which supplies hydraulic pressure for hydraulically operated components.

c. **Transfer Case.** The transfer case (3, Figure 1-12) provides the transmission (2) with the seventh gear (low gear, or 1st gear) and delivers power from the transmission to the front and rear driveshafts. In normal driving conditions, the transfer case splits the output torque of the transmission, providing 70 percent of the torque to the rear output drive yoke and 30 percent to the front output drive yoke. In low gear the output torque of the transmission is split evenly, with 50 percent going to the front output yoke and 50 percent going to the rear.

d. **Suspension.** The suspension system is designed to maintain tire/ground contact in all types of terrain. The vehicle is equipped with 395/85R20 tires. The tires have a tread pattern designed to maximize traction on all types of terrain.

e. **Axles.** Front, Intermediate and Rear axles (4, 5, and 6, Figure 1-12) feature wheel end planetary drives designed to allow the vehicle to carry heavy loads. When the vehicle is operated in MODE, all axles become driving axles. When the vehicle is operated in MODE, 7th gear is unavailable.

1-11. ENGINE AIR INTAKE SYSTEM

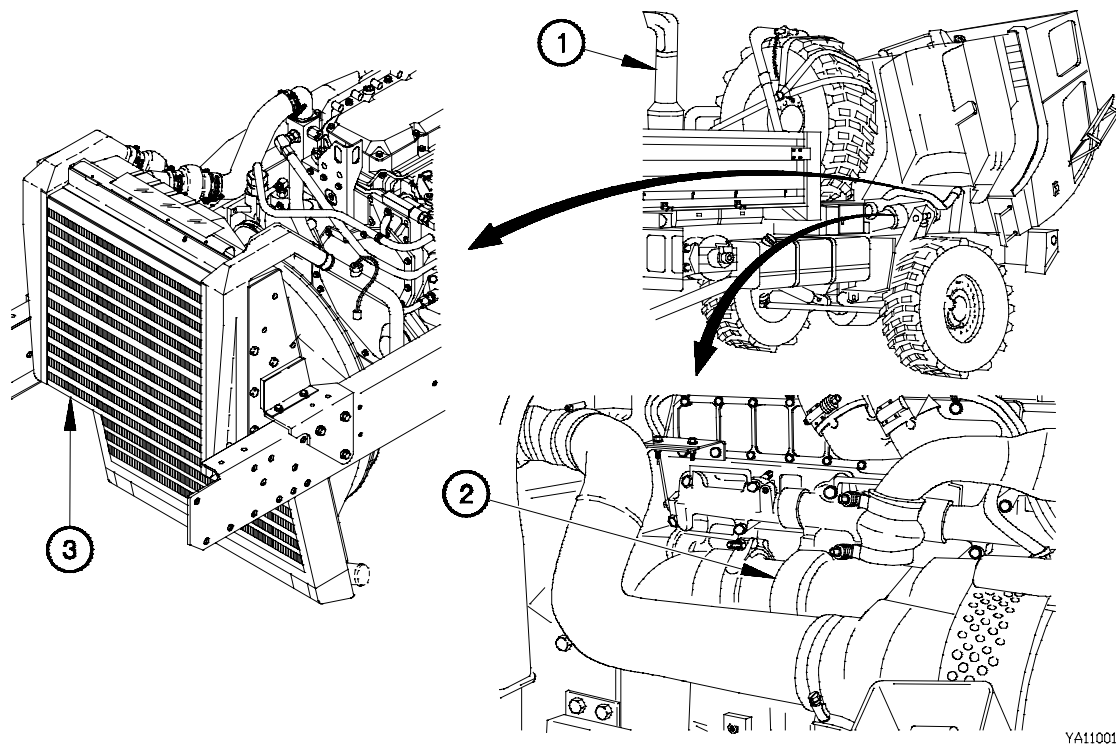


Figure 1-13. Engine Air Intake System

The engine air intake system consists of a dry-type air cleaner (1, Figure 1-13), turbocharger (2), and a charge air cooler (3). The turbocharger increases engine horsepower by delivering a higher volume of air to the engine. Engine exhaust gases flow through the turbocharger, causing a turbine wheel to spin. As the turbine wheel spins, a compressor wheel on the opposite end of the turbine wheel shaft spins and draws fresh air through the air cleaner. The compressor wheel compresses the air and delivers it to the charge air cooler. The air flows through the charge air cooler which cools the air before it is delivered to the engine cylinders. The charge air cooler allows a denser charge of air to be delivered to the engine, which also aids in increasing engine horsepower.

1-12. FUEL SYSTEM

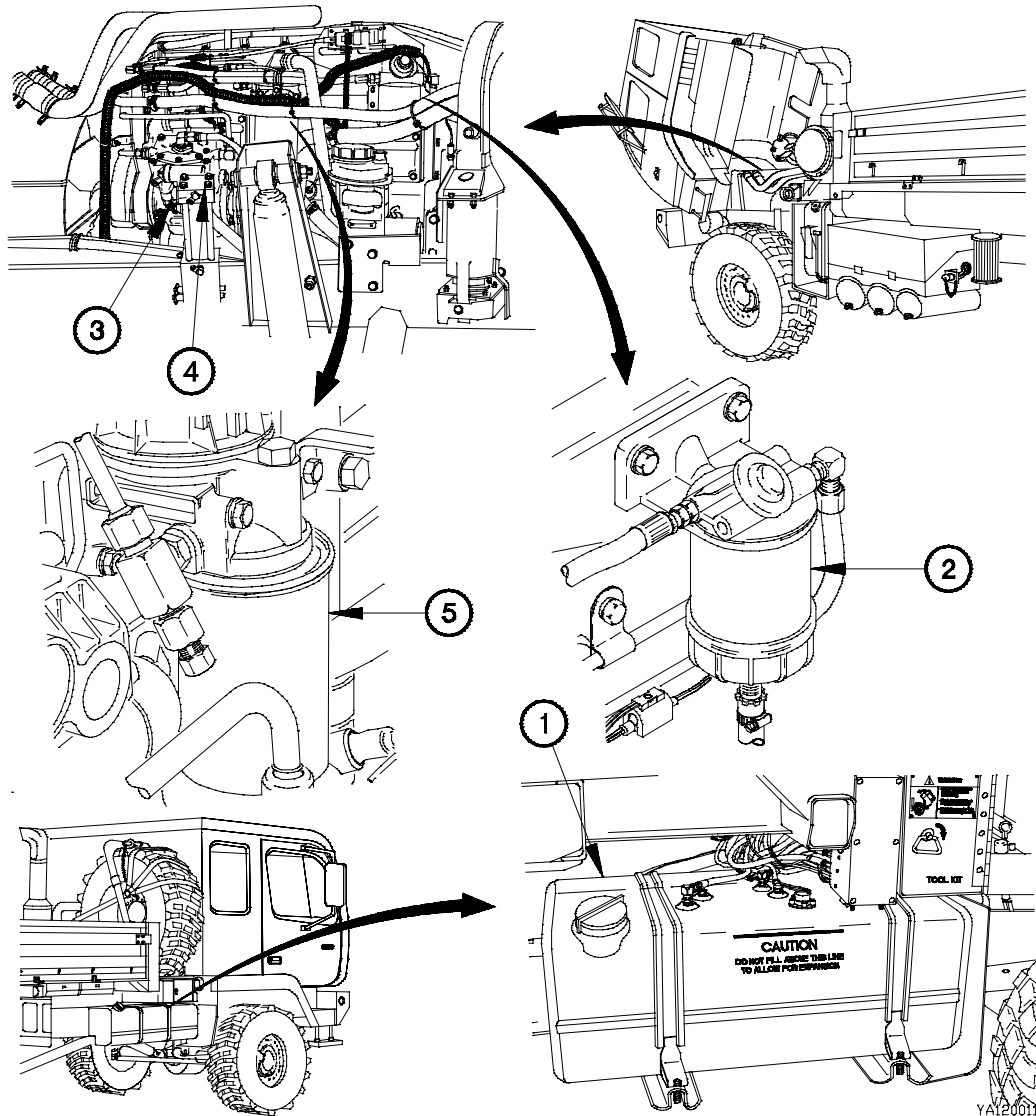
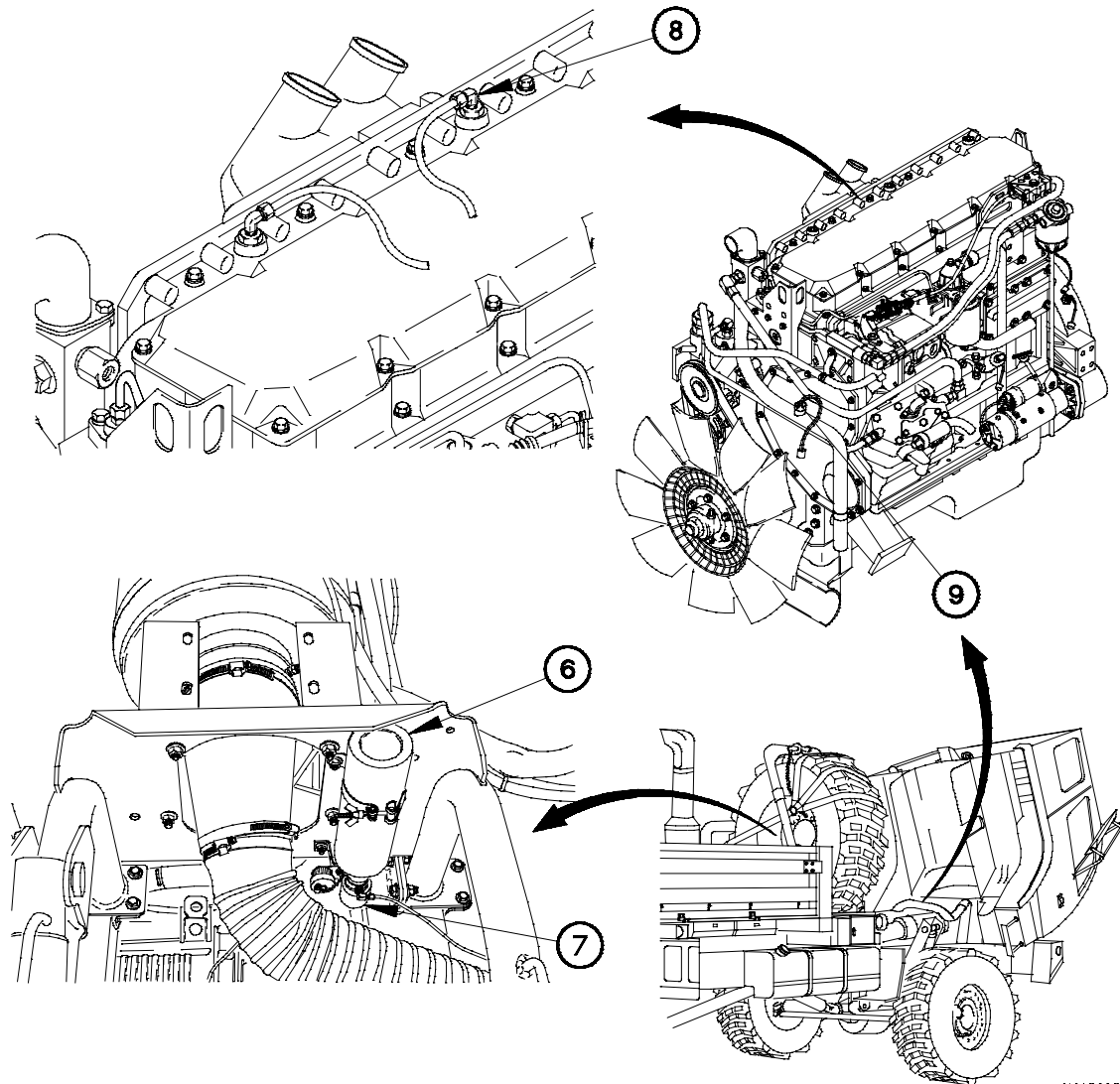


Figure 1-14. Fuel System

The primary components of the fuel system are the fuel tank (1, Figure 1-14), fuel priming pump and fuel/water separator (2), fuel shutoff solenoid (3), fuel governor (4), and secondary fuel filter (5). The mechanical fuel pump acts as an engine priming feature. The fuel/water separator removes water and large solid particles from the fuel before it is passed to the fuel governor. The fuel shutoff solenoid, when energized, frees the fuel governor output shaft to move to the FUEL ON position. When electrical power is removed from the fuel shutoff solenoid, the fuel governor output shaft is locked in the FUEL OFF position. The fuel governor contains a mechanical link to the fuel control linkage and fuel transfer pump. The fuel governor responds to input from the accelerator pedal and causes the fuel control rack to rotate, resulting in an increase or decrease in engine speed. The fuel governor adjusts the amount of fuel delivered to the engine as engine speed changes. The secondary fuel filter removes finer particles from the fuel before it reaches the cylinder head. A fuel pressure regulator redirects excess fuel, through a fuel return hose, back to the fuel tank.



YA120021

Figure 1-14. Fuel System (Cont)

Additionally, the vehicle is equipped with an ether quick start system designed for starting the engine when ambient temperatures are below 32°F (0°C). The ether quick start system is composed of an ether cylinder (6), ether valve (7), two ether nozzles (8), and an ether sensor switch (9). The ether sensor switch detects the temperature of the engine coolant and disables the ether valve above 32°F (0°C). The ether valve delivers a controlled charge of ether to the ether nozzles.

1-13. COOLING SYSTEM

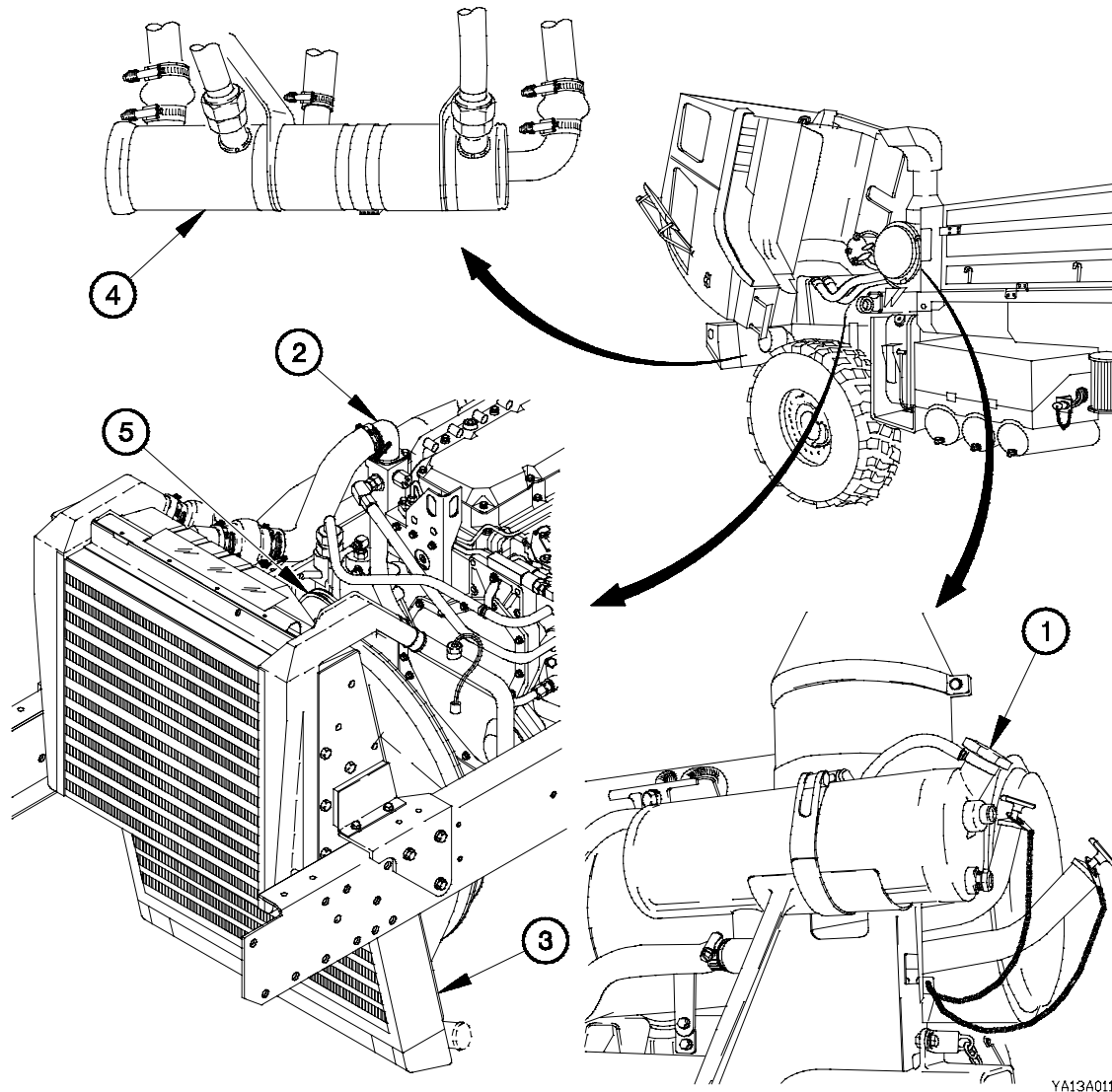
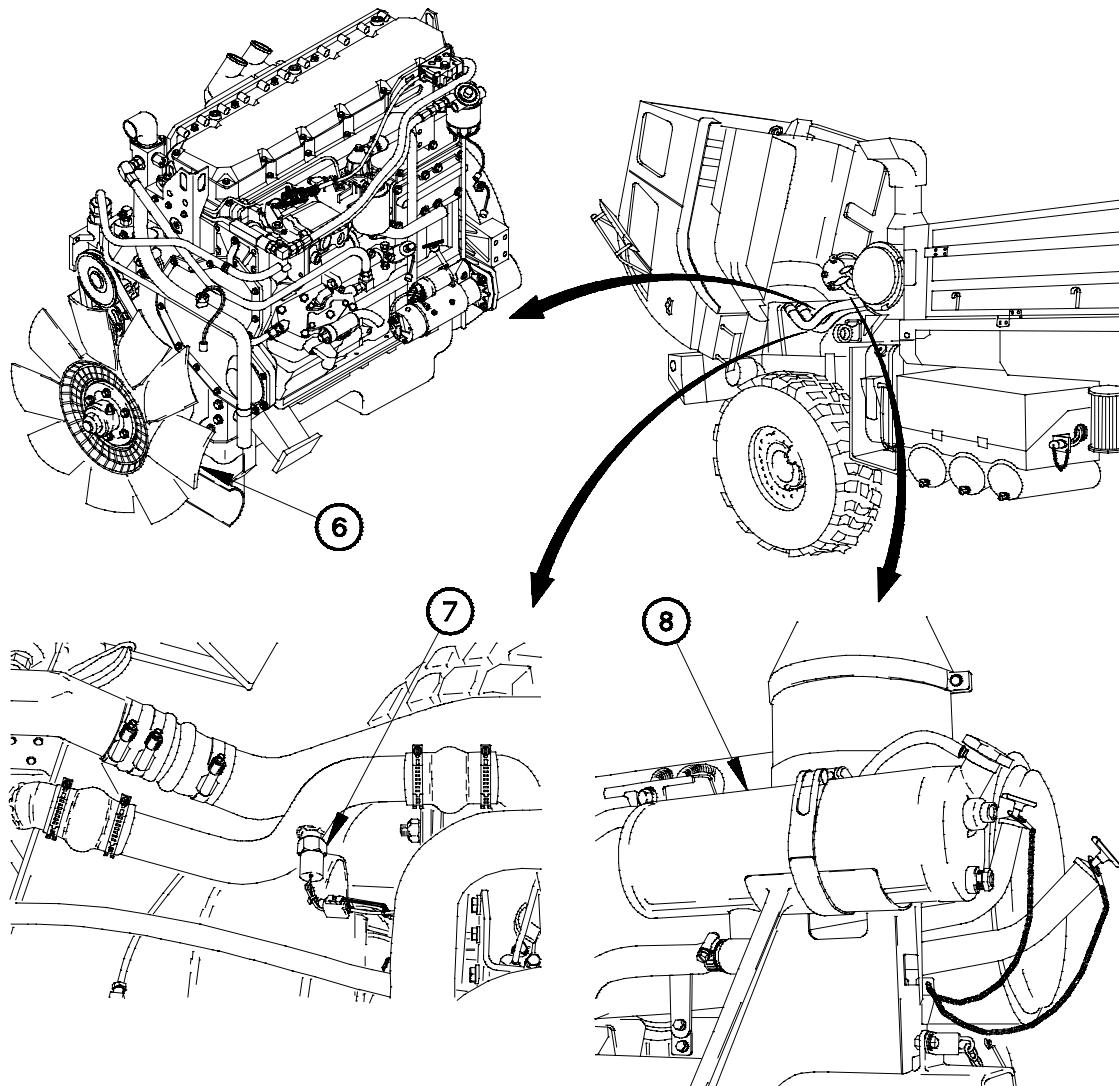


Figure 1-15. Cooling System

a. Cooling System. The pressurized cooling system protects the engine, transmission, and air compressor by providing a means of dissipating heat generated during operation of the vehicle. The radiator pressure cap (1, Figure 1-15), in combination with the ethylene glycol-based antifreeze, effectively raises the boiling point of the coolant to well above 212° F (100° C). The thermostat (2), located in a housing on the right side of the engine, helps the engine to warm up quickly by remaining closed until the coolant temperature reaches approximately 180° F (82° C). When the coolant reaches 199° F (93° C), the thermostat is fully open and coolant is circulated through the water jackets in the engine to maintain the correct operating temperature for the engine. Coolant is drawn from the radiator (3), through the transmission oil cooler (4), and circulated throughout the cooling system by the water pump (5). The water pump, located on the front of the engine toward the right side, is driven by two V-belts from the crankshaft pulley.

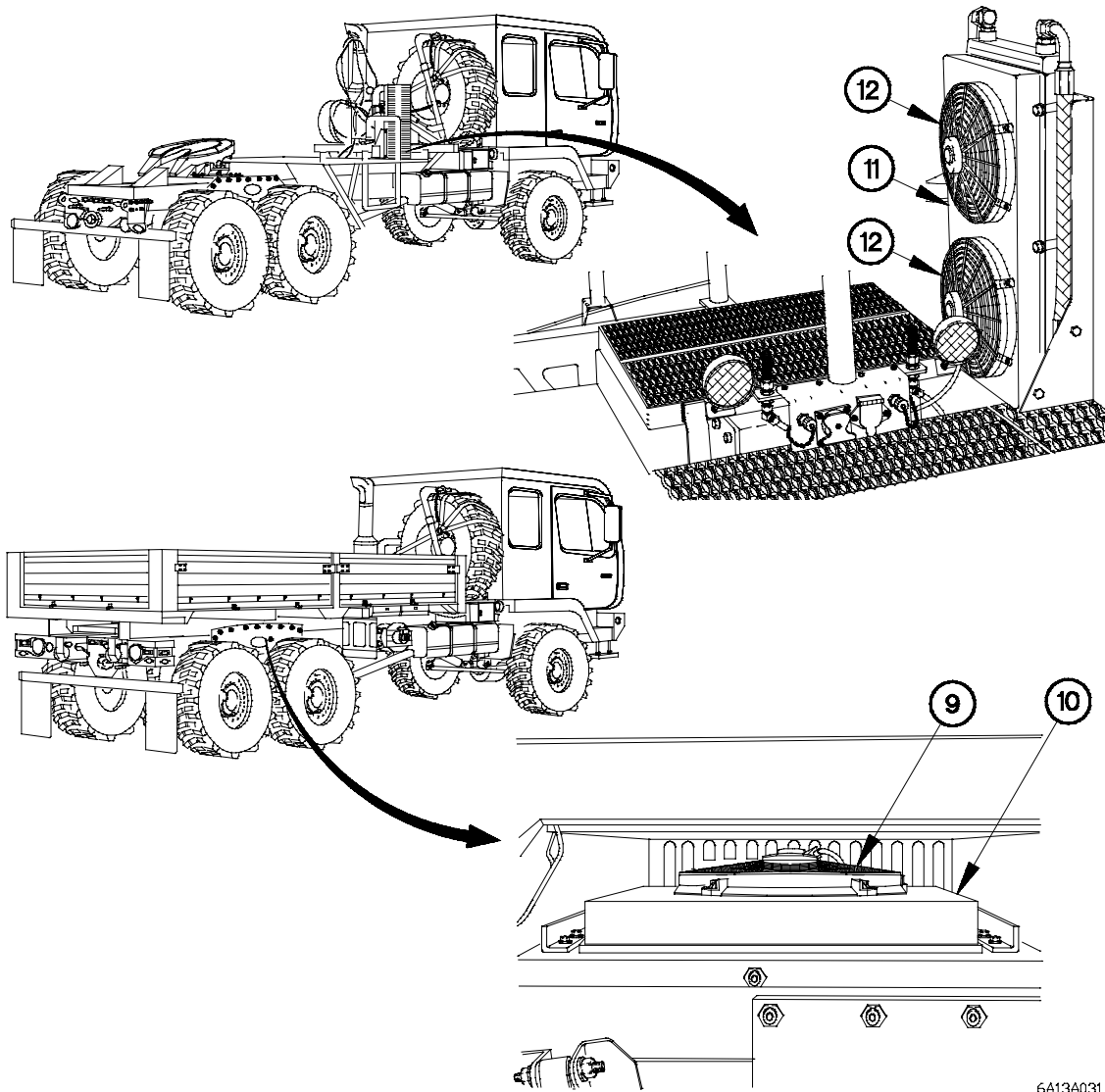


YA13A021

Figure 1-15. Cooling System (Cont)

An engine fan (6) with pneumatic clutch is activated by the water temperature switch (7). When the water temperature switch detects a high temperature condition, air pressure is removed from the fan clutch and the engine fan is engaged. Excess heat is drawn from the radiator by the flow of air created by the engine fan over the radiator cooling fins. A radiator overflow tank (8) is provided to allow for expansion of the coolant. The radiator overflow tank also serves as the point where new coolant is introduced into the cooling system.

1-13. COOLING SYSTEM (CONT)

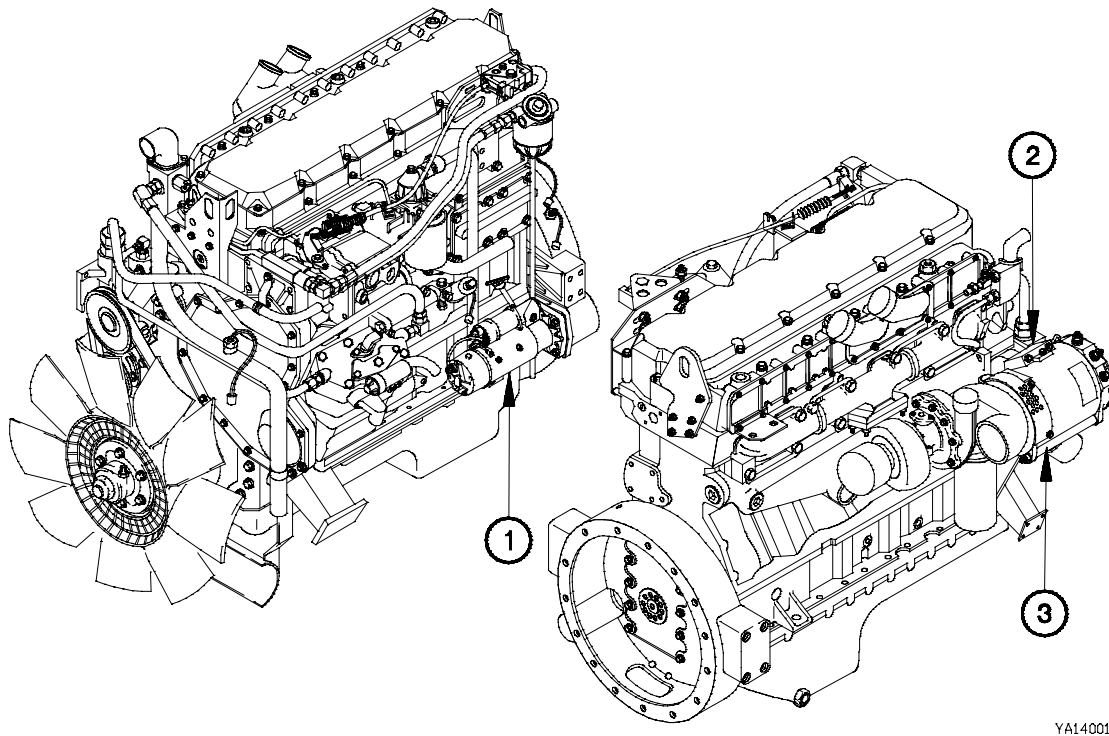


6A13A031

Figure 1-15. Cooling System (Cont)

Cooling capacity for the transmission is increased through the use of a transmission auxiliary oil cooler (9). All MTV vehicles, except M1088 and M1089, are supplied with a transmission auxiliary oil cooler equipped with a single electric fan (10) to draw air over the oil cooler core. The M1088 and M1089 vehicles are supplied with a larger transmission auxiliary oil cooler (11) equipped with dual electric fans (12) to provide even more air flow across the oil cooler core.

1-14. ELECTRICAL SYSTEM



YA140011

Figure 1-16. Electrical System

In the Electrical System, a heavy duty starting motor (1, Figure 1-16) is mounted on the engine flywheel housing and provides the cranking power necessary for starting the engine. The voltage regulator (2) maintains both a 14- and 28-volts level for proper battery charging. The alternator (3) provides sufficient amperage to operate all electrical components and charge the batteries during engine idling. Vehicle exterior lights are mounted in protective locations or are protected to prevent damage. Protection is provided for lights during cross country travel. Polycarbonate lenses are provided for all lights except the sealed beam headlights. The electrical system supplies all of the electrical power needed to operate the vehicle and trailer. The complete Electrical System is made up of the following subsystems:

- Power Storage and Generating
- Engine Starting and Stopping
- Service Lighting
- Blackout Lighting
- Accessory Lighting
- Instruments
- Indicator Lights and Alarm
- Material Handling Crane (MHC)
- Troubleshooting Aid
- M1089 Underlift

a. Power Storage and Generating. Power storage for the vehicle consists of four 12-volt batteries. The four batteries are divided into two sets. Two batteries in each set are wired in parallel to produce higher amperage. The two sets are then wired in series to produce 24 volts Direct Current (DC). While the batteries can power all of the systems for a limited time, their primary purpose is to supply power to the engine starting system. Once the engine is running, the generating system provides electrical power for all of the systems. The engine driven alternator generates Alternating Current (AC) which is passed through a set of rectifiers that change it into DC current. This DC current is used to charge the batteries and is distributed to the electrical sub-systems of the vehicle. The voltage regulator adjusts alternator output to fit the needs of the electrical system.

1-14. ELECTRICAL SYSTEM (CONT)

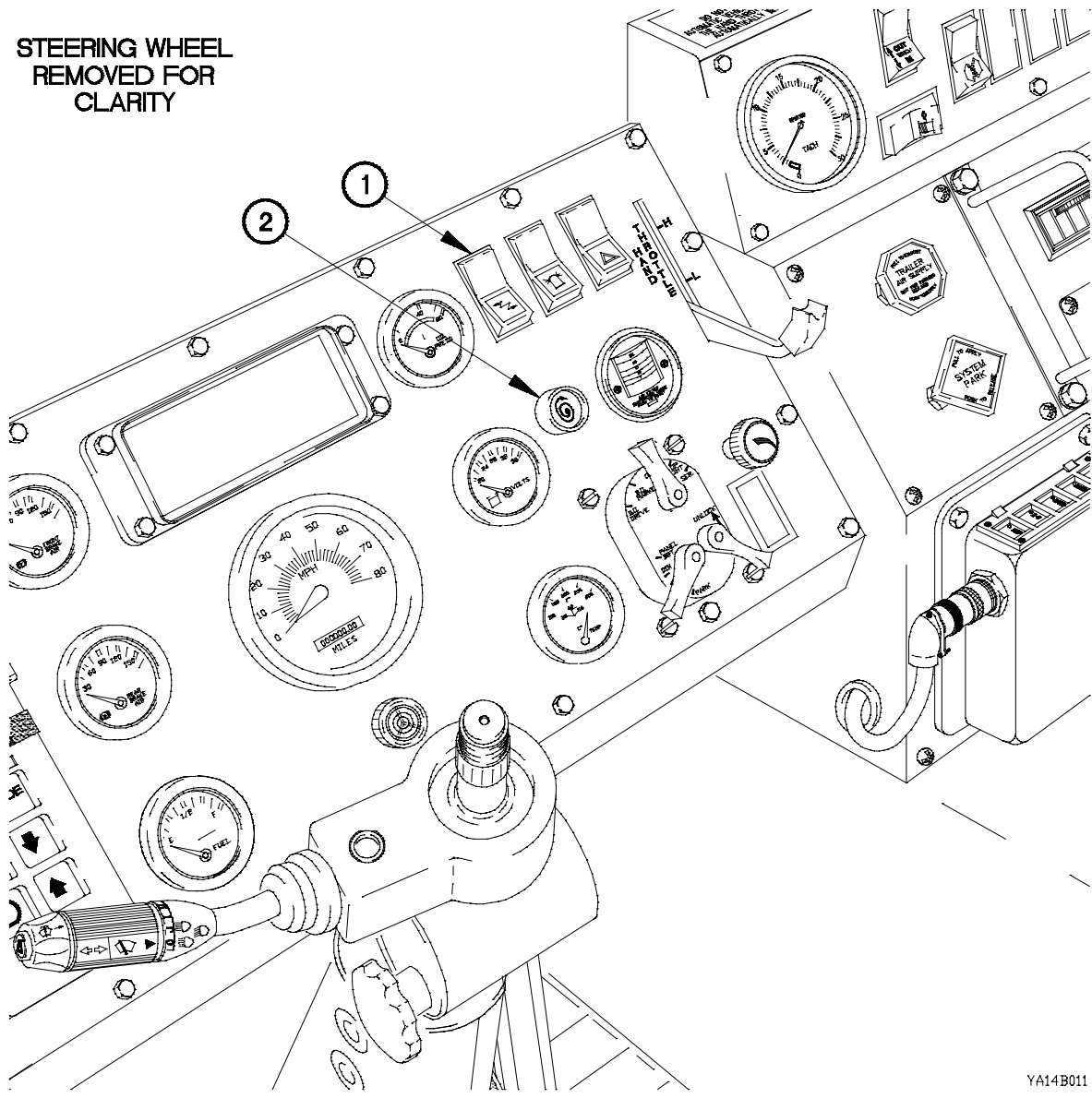
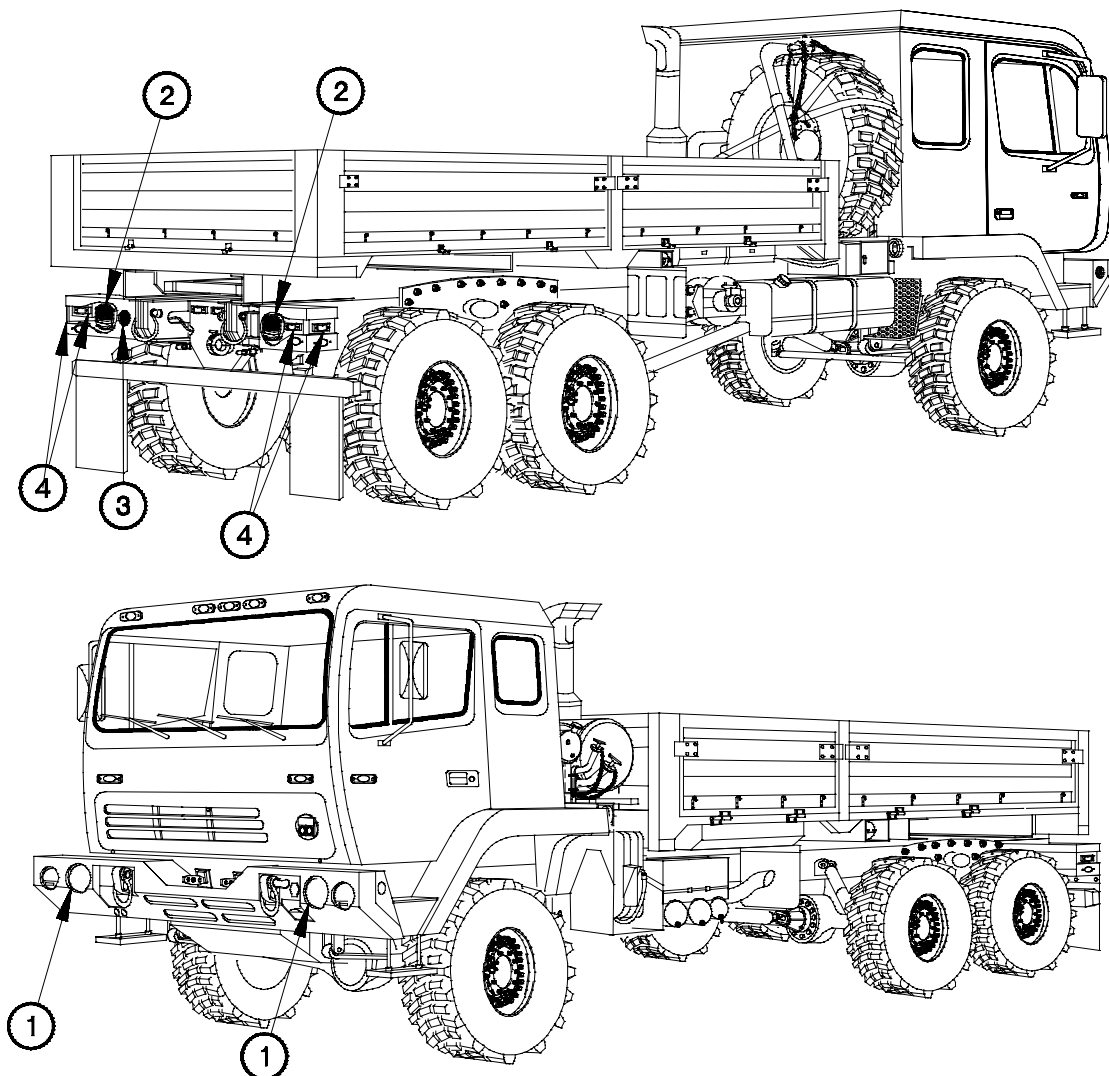


Figure 1-17. Engine Starting System

b. Engine Starting and Stopping. The Engine Starting System uses the stored electrical energy of the batteries to the turn the starting motor. When the master power switch (1, Figure 1-17) is positioned to on and the starter pushbutton switch (2) is depressed, electrical power passes through the starter pushbutton to the auxiliary starter solenoid. The auxiliary starter solenoid draws electrical power directly from the batteries and sends it to the starting motor solenoid. When the starting motor solenoid is energized, electrical power from the batteries is supplied to the starting motor and the engine begins cranking. Positioning the master power switch to off stops the engine.

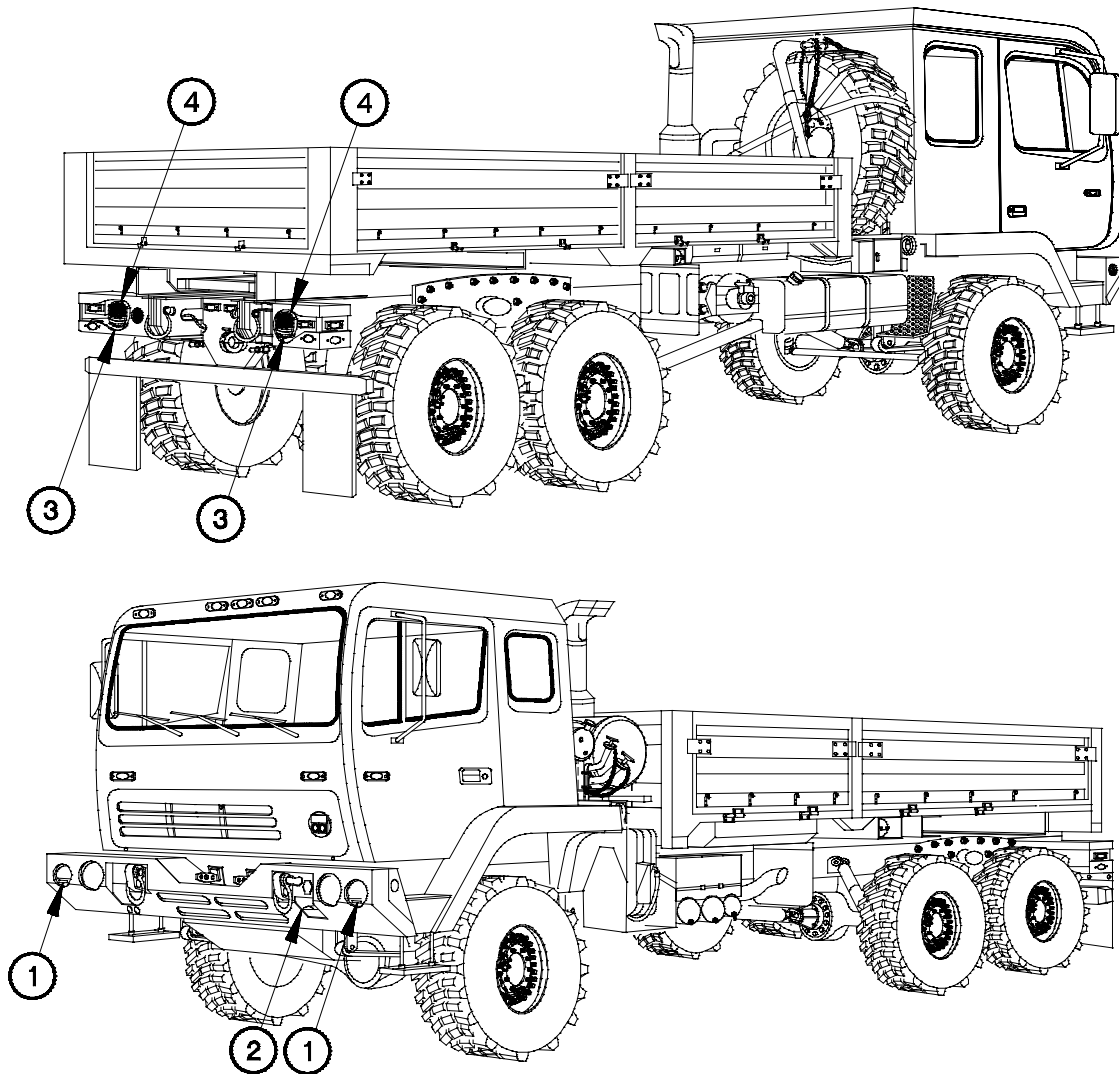


6A14C011

Figure 1-18. Service Lighting System

c. Service Lighting. The Service Lighting System includes the headlights (1, Figure 1-18), taillights (2), backup light (3), and clearance and marker lights (4). They are energized by positioning the main light switch to the appropriate position (TM 9-2320-366-10-1).

1-14. ELECTRICAL SYSTEM (CONT)



6A14D011

Figure 1-19. Blackout Lighting System

d. Blackout Lighting. The Blackout Lighting System includes the front blackout marker lights (1, Figure 1-19), blackout drive light (2), rear blackout marker lights (3), and blackout stop lights (4). These lights are energized by positioning the main light switch to the appropriate position (TM 9-2320-366-10-1).

e. Accessory Lighting. The accessory lights are the warning light and worklights. These circuits are energized by positioning the appropriate switch (TM 9-2320-366-10-1) to on. The worklights are then controlled by a separate switch on the worklight.

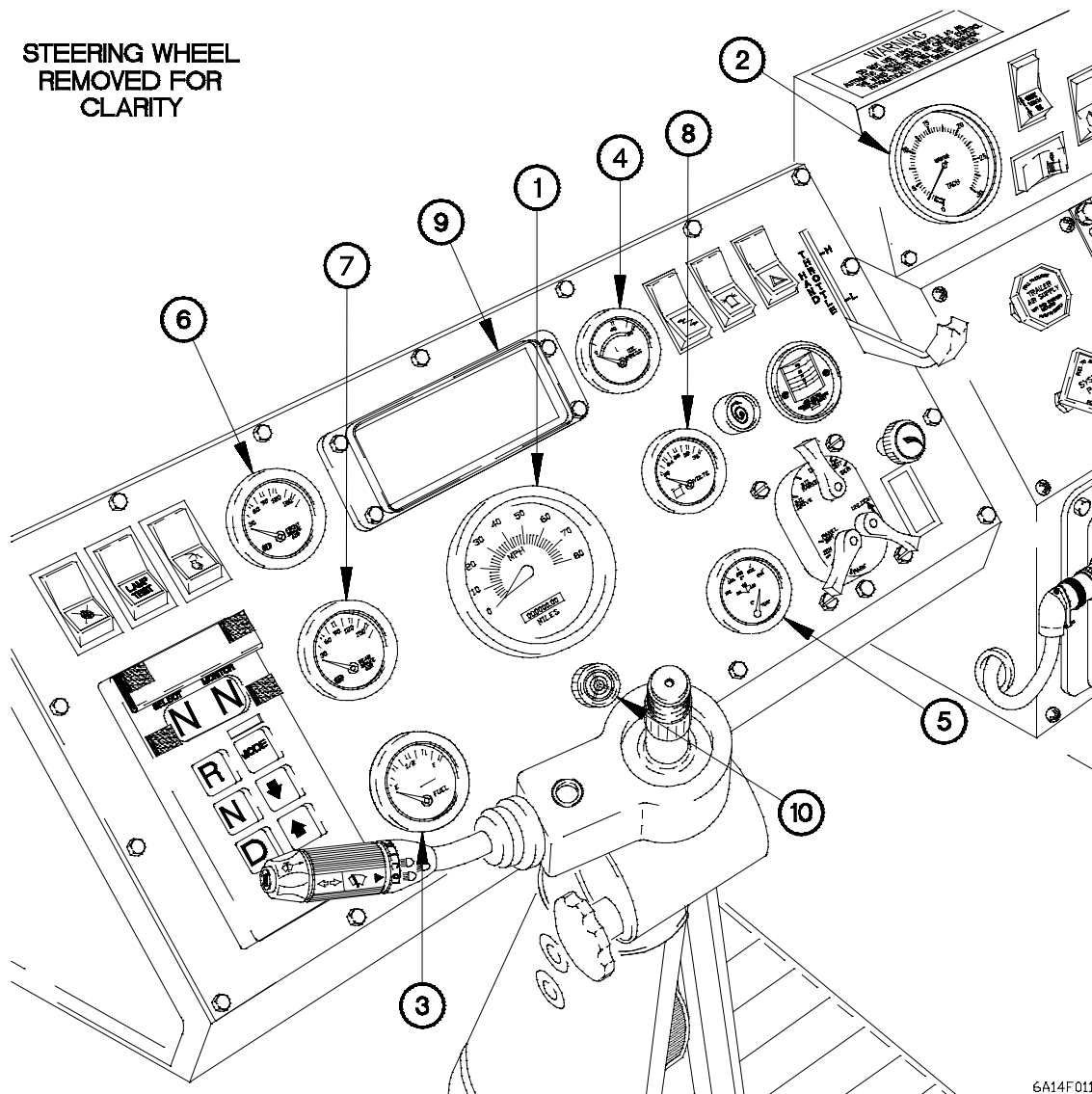


Figure 1-20. Instrument Panel

f. Instruments. The Instrument Panel includes all gages that provide the operator with information about vehicle condition and operating status. The speedometer (1, Figure 1-20) receives electrical input from the WTEC II Vehicle Interface Module (VIM) on vehicles equipped with WTEC II transmission controls. The speedometer receives electrical input from the WTEC III transmission ECU on vehicles equipped with WTEC III transmission controls. The WTEC II VIM and the WTEC III transmission ECU are both located behind the kick panel. Tachometer (2) input is provided by the engine speed sensor located on the engine flywheel housing. The fuel gage (3), oil pressure gage (4), water temperature gage (5), FRONT BRAKE AIR pressure gage (6), REAR BRAKE AIR pressure gage (7), and VOLTS gage (8) receive electrical signals from sending units. The sending units respond to changes in fluid level, pressure, temperature, and DC correct and send this information to the gages.

g. Indicator Lights and Alarms. The lighted indicator display (9) and audible alarm (10), located on the instrument panel assembly, are activated by switches located in various systems. These include, but are not limited to; master stop, low engine oil pressure, low air pressure, high water temperature, fan off, and high transmission oil temperature. When any of these switches are activated, they energize the proper indicator and/or alarm, alerting the operator of a potential problem or condition which needs to be monitored.

1-14. ELECTRICAL SYSTEM (CONT)

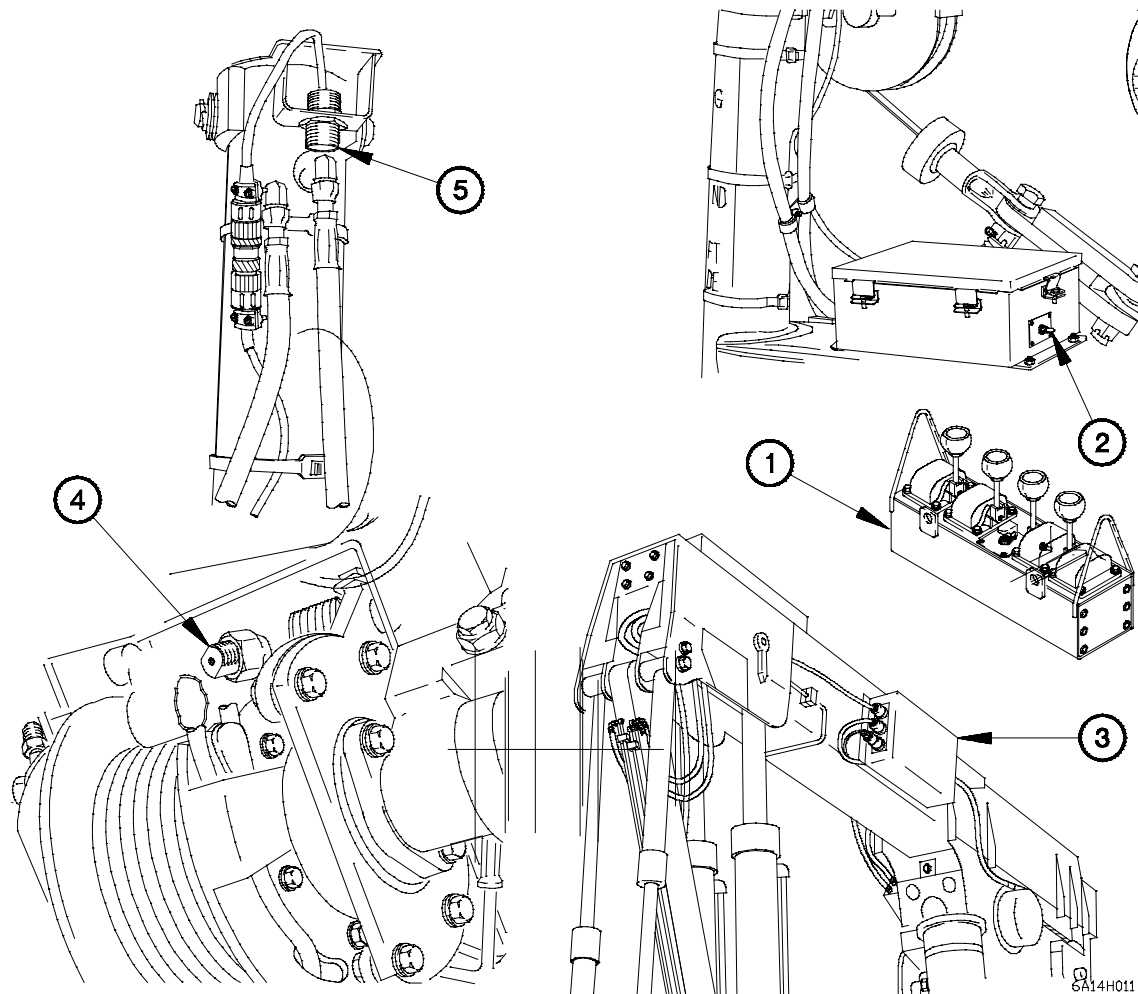
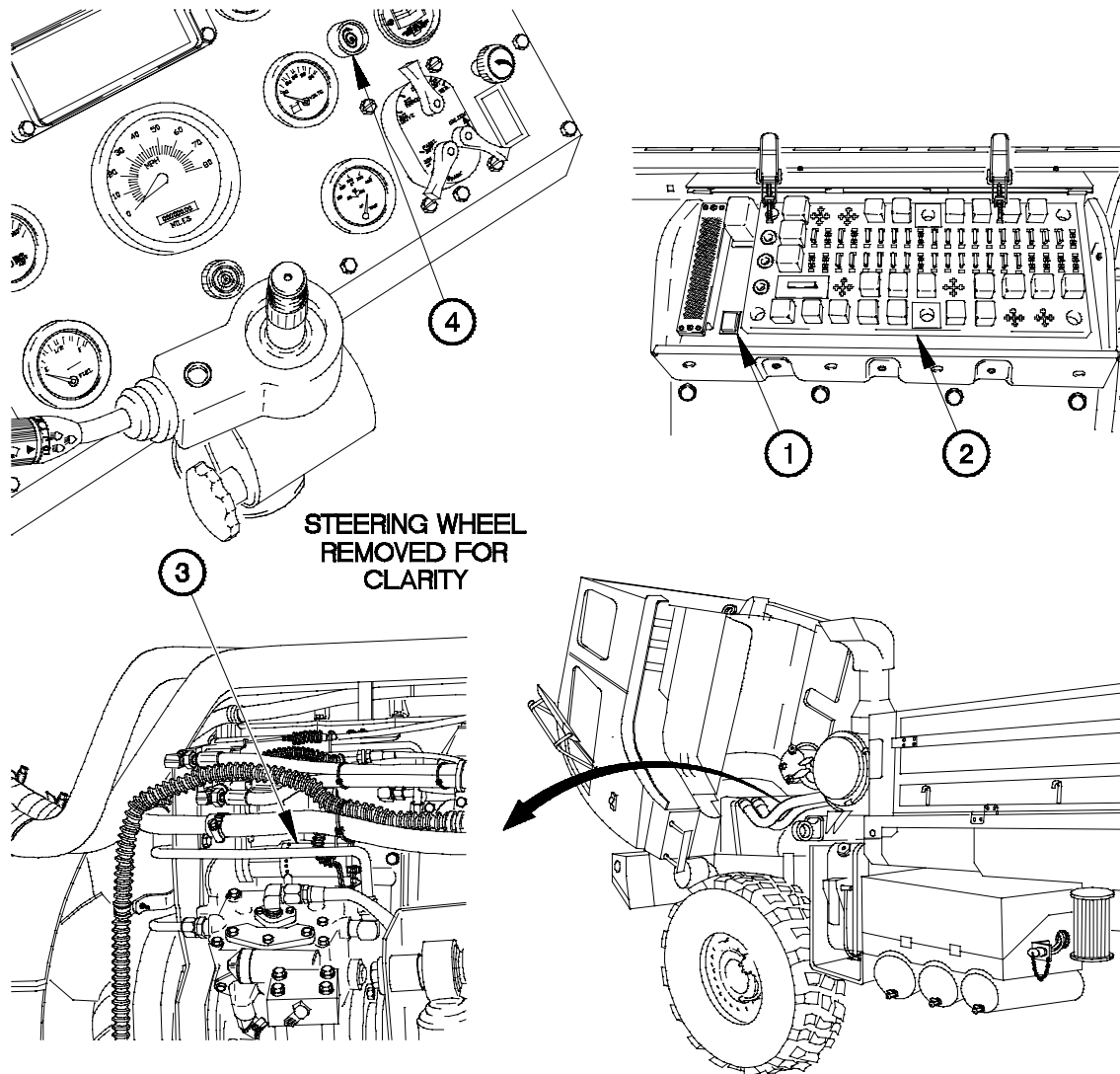


Figure 1-21. Material Handling Crane (MHC) System

h. Material Handling Crane (MHC). The primary electrical components of the MHC System are the REMOTE CONTROL UNIT (1, Figure 1-21), junction box (2), overload shutdown box (3), tension load cell (4), left and right side jack cylinder proximity sensors (5) and several function and lockout solenoids. When the operator selects an MHC function using the REMOTE CONTROL UNIT, electrical current is sent through the junction box and to the appropriate solenoid. When energized from the REMOTE CONTROL UNIT, the function solenoid controls hydraulic pressure to the function selected by the operator. When the function solenoid is de-energized, hydraulic pressure is removed and the function stops. The overload shutdown system controls the lockout solenoids. The lockout solenoids prevent operation of certain MHC functions when an overload condition is sensed. Overload conditions are sensed, in combination, by the tension load cell and a microprocessor inside the overload shutdown box which monitors boom angle and extension. When an overload condition is sensed, the boom up/boom down, hoist up, telescope out functions are locked out. The hoist down and telescope in functions will still operate and allow the operator to safely lower the load to the ground. When the power switch on the remote control box is used as an emergency shutdown, all MHC functions are locked out. The left and right side jack cylinder proximity sensors prevent operation of the MHC until both jack cylinder outrigger pads are lowered fully to the ground.



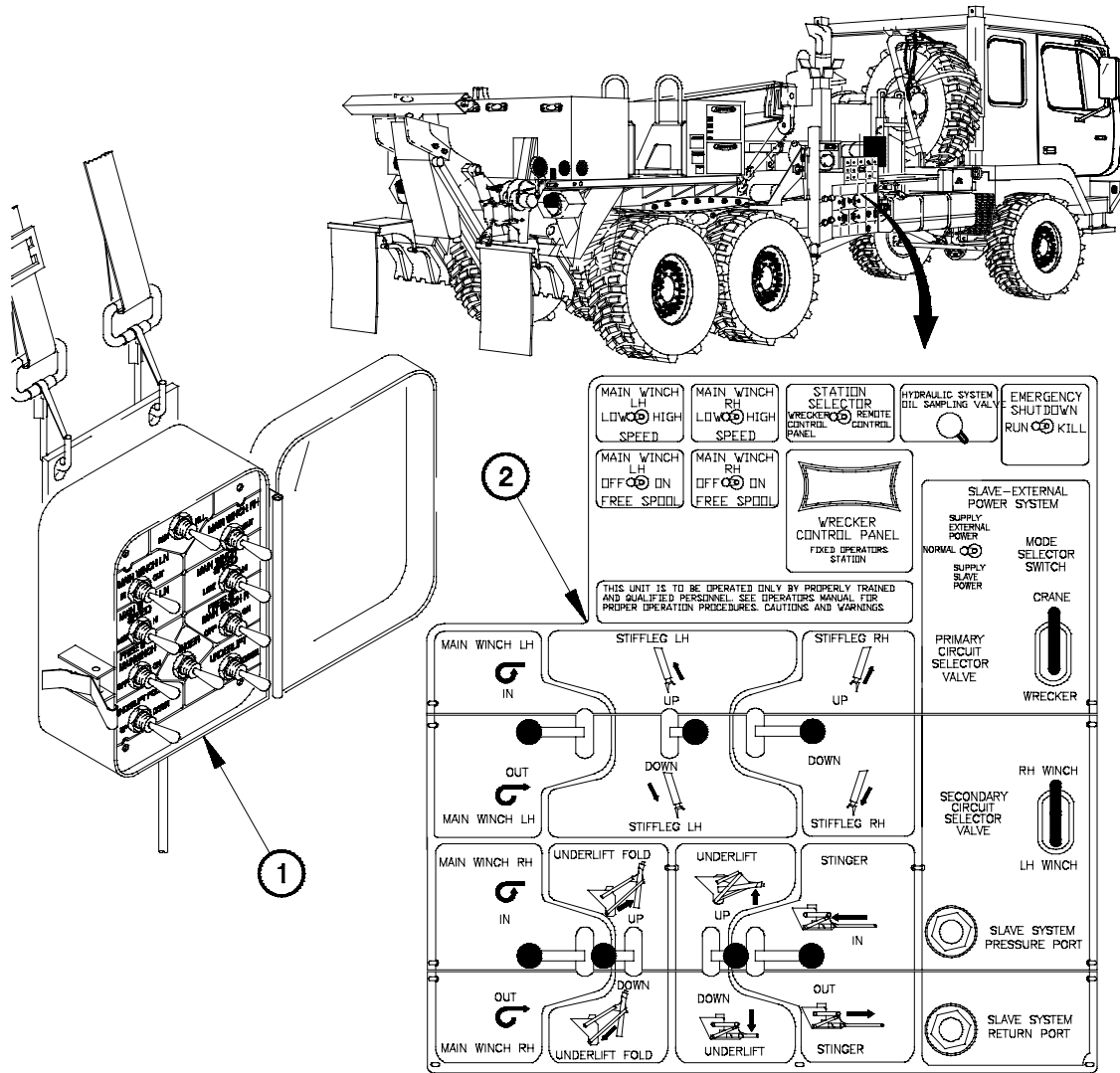
STEERING WHEEL
REMOVED FOR
CLARITY

YA141011

Figure 1-22. Troubleshooting Aid

i. **Troubleshooting Aid.** A start inhibit switch (1, Figure 1-22), located on the Power Distribution Panel (PDP) (2), is provided as a troubleshooting aid for the Unit and DS Maintenance levels and as a maintenance tool at the GS Maintenance level to stop fuel flow at the fuel shutoff solenoid (3). By pressing the start inhibit switch first, the starter pushbutton (4) can be pressed and the engine cranked without allowing the engine to be started. The start inhibit switch is reset when the master power switch is positioned to off and then to on again.

1-14. ELECTRICAL SYSTEM (CONT)

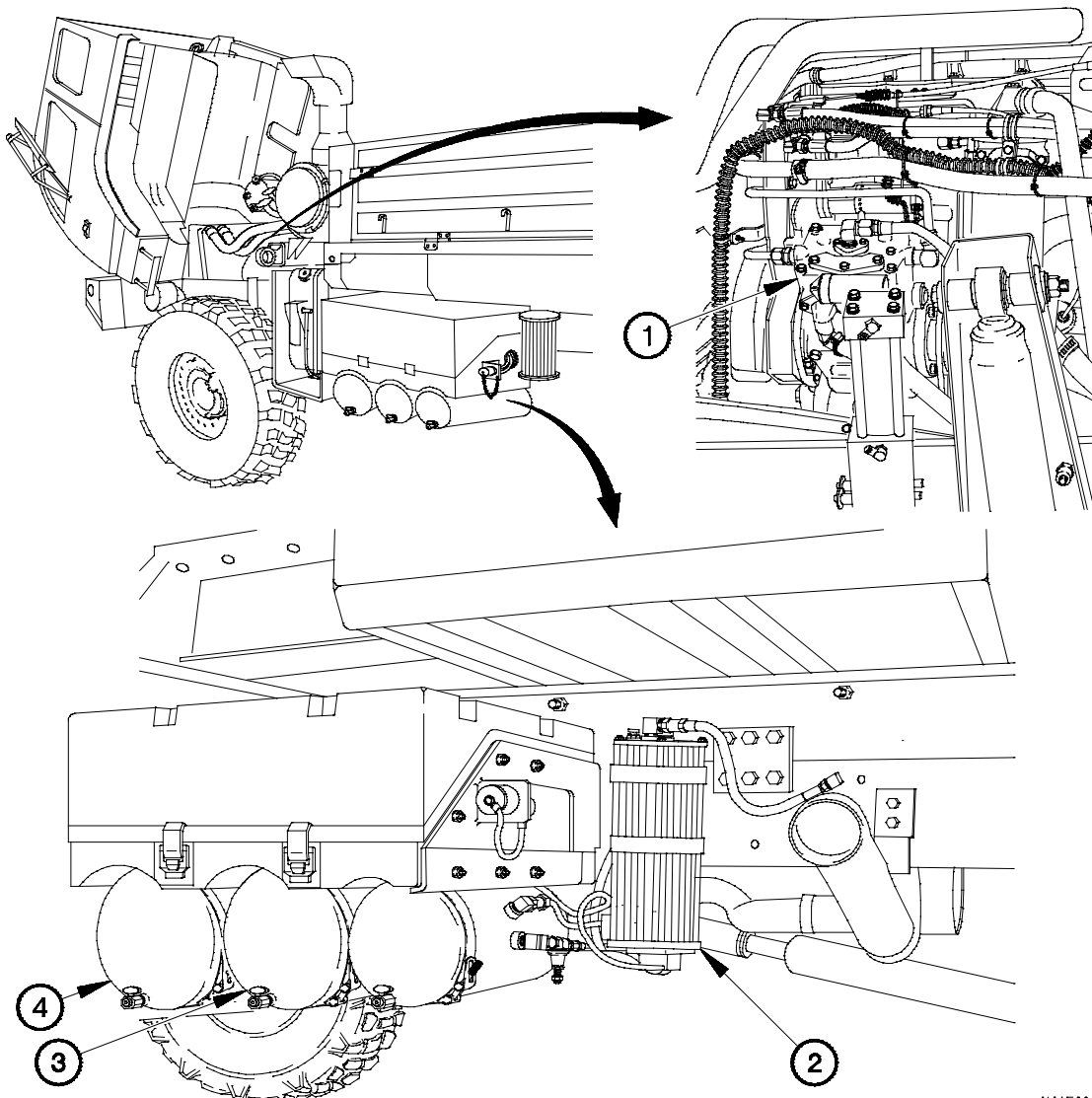


6A14J011

Figure 1-23. M1089 Underlift System.

j. M1089 Underlift. The electrical portion of the M1089 Underlift consists of a REMOTE CONTROL UNIT (1, Figure 1-23) and solenoids attached to the function valves in the WRECKER CONTROL PANEL (2). When the operator selects an underlift function from the REMOTE CONTROL UNIT, electrical current is sent to the solenoid which controls the selected function. The solenoid is energized and hydraulic pressure is supplied to the selected component(s). When the solenoid is de-energized, hydraulic pressure is removed and the selected function stops.

1-15. BRAKE SYSTEM

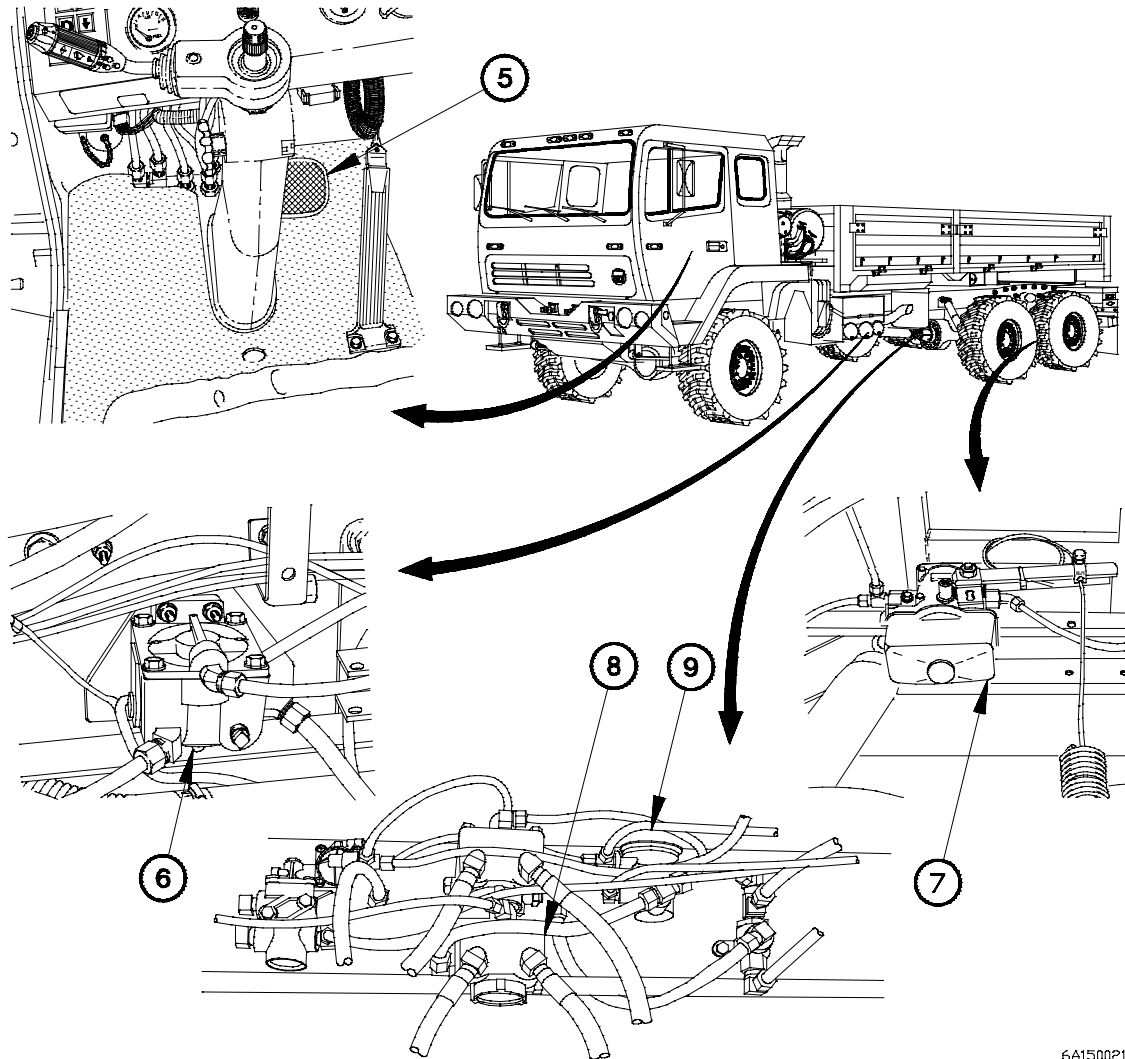


YA150011

Figure 1-24. Brake System

The vehicle is equipped with an brake system which complies with the Federal Motor Vehicle Safety Standard (FMVSS) 121. The brake system is made up of a number of components including an air compressor, air dryer, primary and secondary air tanks, and several valves which control the application and release of the brakes. The air compressor (1, Figure 1-24) supplies approximately 120 psi (827 kPa) to the air dryer (2). The air dryer contains a heating element and a desiccant cartridge to remove moisture from the air before it is delivered to the primary air tank (3) and secondary air tank (4).

1-15. BRAKE SYSTEM (CONT)

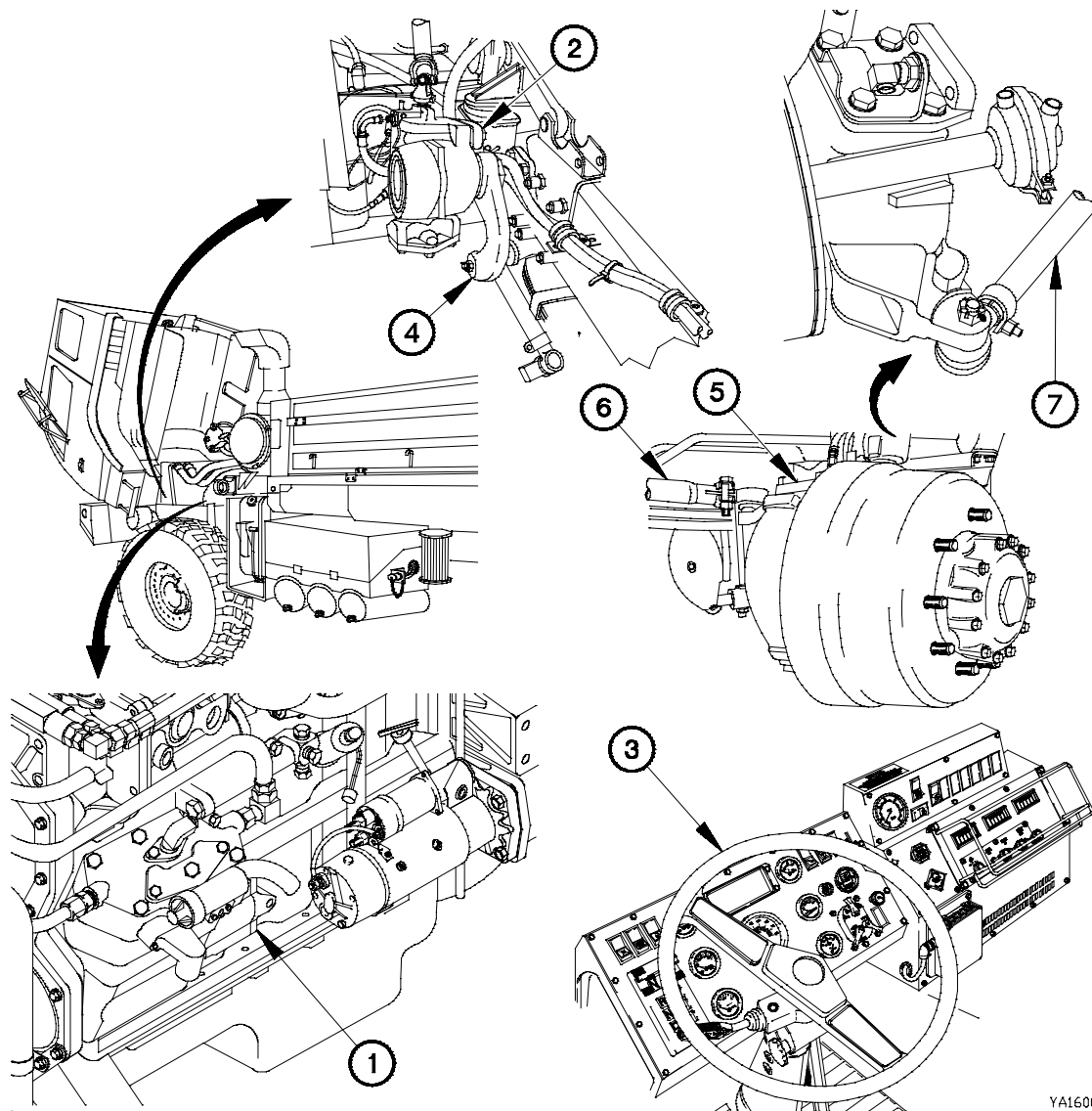


6A150021

Figure 1-24. Brake System (Cont)

The foot control valve is operated by the brake pedal (5) and receives pressurized air from both the primary and secondary air tanks. The foot control valve is a dual activation design, with one set of ports supplying air to the front brakes from the secondary air tank and another set of ports supplying air to the rear brakes from the primary air tank. The plumbing between the primary and secondary air tanks is designed to allow controlled braking in the event of a failure in either the primary (rear brakes) or secondary (front brakes) brake circuit. A booster valve (6) is incorporated into the primary brake circuit to provide a more rapid braking response. Air from the booster valve is supplied to the load sensing valve (7) which, in turn, controls air delivery to the relay valve (8). The load sensing valve is mounted on a crossmember and connected, by a spring and cable, to the load averaging channel. This arrangement of the load sensing valve and load averaging channel provides a mechanical anti-lock feature to the rear brakes by sending less air to the rear brakes when the vehicle is not heavily loaded. The relay valve is used to provide the operator with quicker brake response. An inversion valve (9) redirects air from the secondary brake circuit to the primary brake circuit in case of loss of pressure in the primary brake circuit. This feature allows control of the spring brakes and prevents early rear brake lock-up.

1-16. STEERING SYSTEM

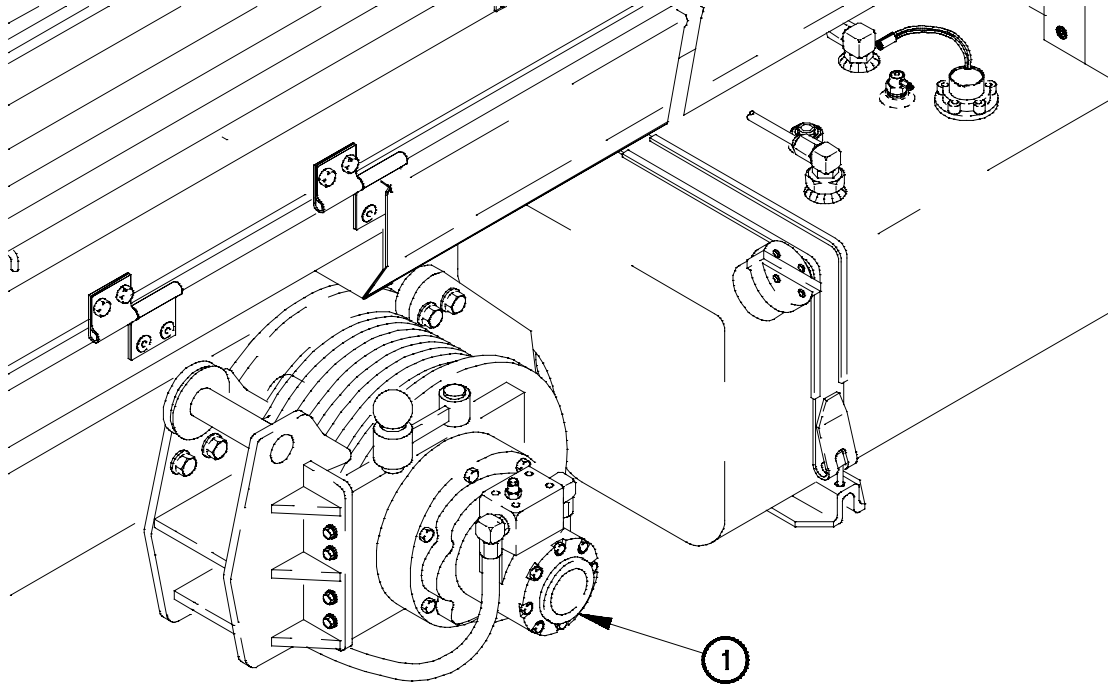


YA160011

Figure 1-25. Steering System

The vehicle is equipped with hydraulically-assisted power steering. The power steering pump (1, Figure 1-25) is driven by a shaft at the rear of the air compressor. The steering gear box (2) is a recirculating ball design. The steering wheel (3) is linked to the steering gear box by a shaft and two universal joints. The power steering pump supplies constant hydraulic pressure to the steering gear box. The steering pitman arm (4) is attached to the left steering knuckle (5) by the drag link (6). The left and right steering knuckles are connected to each other by the tie-rod (7). Turning the steering wheel to the right causes the steering pitman arm to move toward the front of the vehicle and the front wheels to turn right. Turning the steering wheel to the left causes the steering pitman arm to move toward the rear of the vehicle and the front wheels to turn left. The tie-rod allows for front wheel toe-in adjustment.

1-17. 15K SELF-RECOVERY WINCH (SRW)

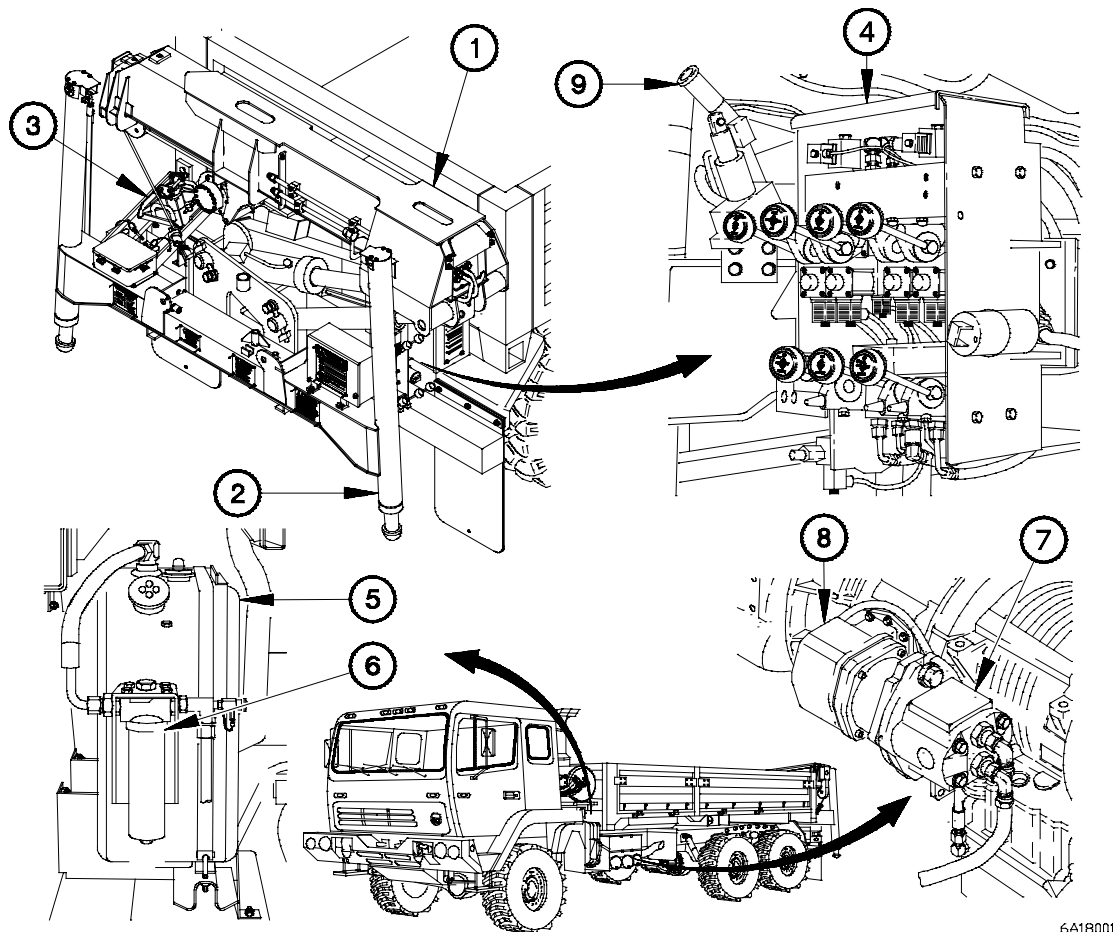


YA170011

Figure 1-26. 15K Self-Recovery Winch (SRW)

When specified, any vehicle except models M1084 and M1086 may be equipped with a 15K Self-Recovery Winch (SRW) (1, Figure 1-26) mounted on the right hand frame rail. The 15K SRW is rated for 15,500 lbs (68,944 N) pull when the winch drum has one full layer of cable. One full layer of cable is the minimum amount of cable that may be left on the drum when using the 15K SRW. Pulling capacity is reduced with each layer of cable that is added to the winch drum. Pulling capacity with seven full layers of cable on the winch drum is 9,090 lbs (40,432 N). For recovery operations, the cable may be routed to the front on all vehicles so equipped. The cable may be routed to the rear of the vehicle on models M1083, M1085, M1090, M1093, and M1094. The 15K SRW is equipped with a fail-safe brake which is spring applied and hydraulically released. The fail-safe brake is automatically applied when hydraulic pressure falls below 270 psi (1,862 kPa). The fail-safe brake will hold the load until hydraulic pressure is restored. The winch control valve functions as a throttling valve when cable is being payed out. The winch control valve controls the flow of fluid to the winch motor. When cable is being pulled in, the winch control valve acts as a free flow check valve. The winch control valve is preset at the factory and is not to be adjusted under any circumstances.

1-18. M1084/M1086 MATERIAL HANDLING CRANE (MHC)



6A180011

Figure 1-27. M1084/M1086 Material Handling Crane (MHC)

Vehicle models M1084 and M1086 are equipped with a Material Handling Crane (MHC) (1, Figure 1-27) mounted on the frame at the rear of the vehicle. The M1084/M1086 MHC has a lifting capacity of 5,000 lbs (2,270 kgs). The MHC contains an overload shutdown system which monitors boom angle, boom extension, and load weight. If the overload shutdown system senses an overload condition, certain MHC functions become locked out. The vehicle is stabilized during MHC operation by jack cylinders (2). Proximity sensors are attached to the jack cylinders to prevent operation of the MHC unless the jack cylinders are extended to the ground. Outrigger pads (3) are provided and are attached to the bottom of the jack cylinders by quick release pins. All MHC functions are hydraulically controlled by levers at the control station (4). All exposed hydraulic cylinder rods are hard chrome plated to resist corrosion and wear.

a. MHC Hydraulic System. The hydraulic reservoir (5) provides for 21 gal (79 L) of fluid. A fluid filter (6) is mounted on the hydraulic reservoir. The filter removes contaminants from the oil and is easily replaced. Hydraulic pressure for the MHC is supplied by a hydraulic pump (7) attached to the rear of the Power Take-Off (PTO) (8). The hydraulic cylinders contain cartridge-type holding valves which lock the cylinder in case of sudden hydraulic pressure loss. A hand operated back-up hydraulic pump (9) allows the operator to lower any load to the ground and stow the MHC if the hydraulic pump fails.

1-18. M1084/M1086 MATERIAL HANDLING CRANE (MHC) (CONT)

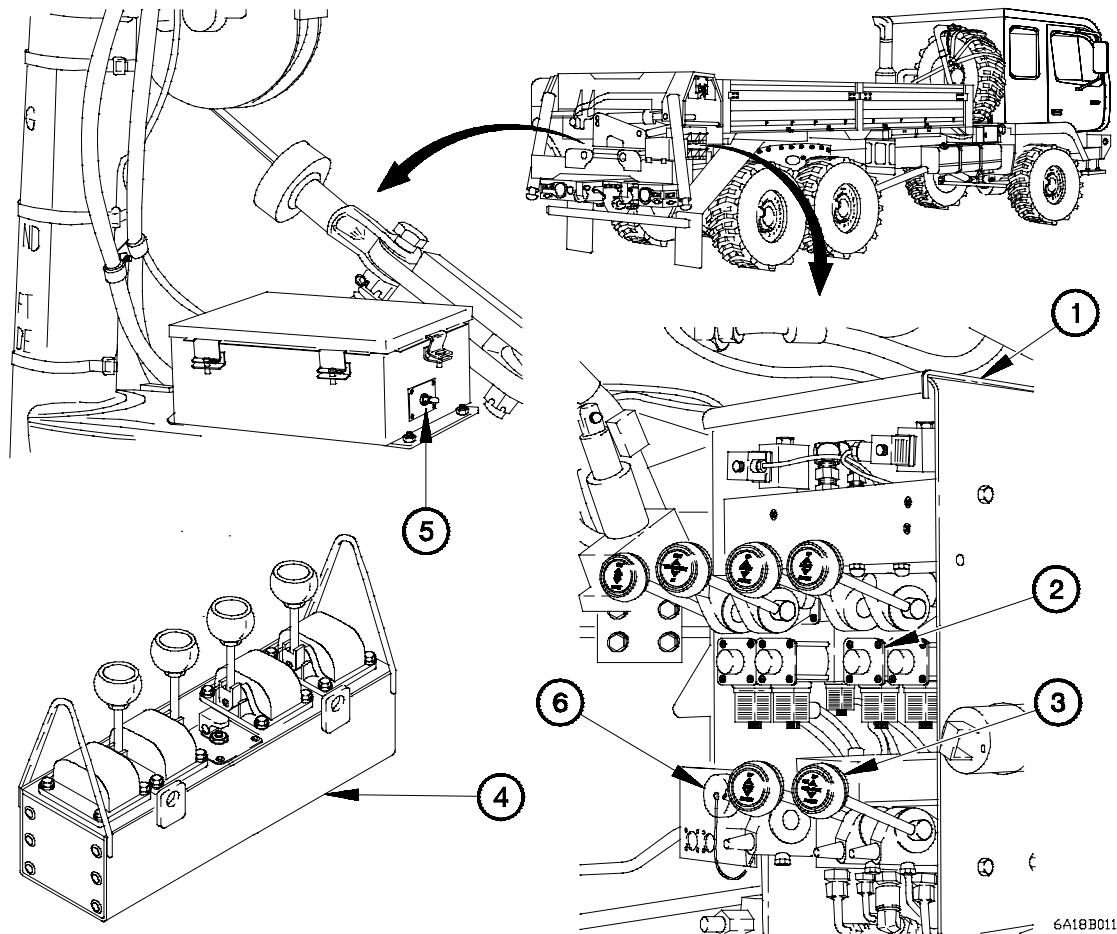


Figure 1-28. Material Handling Crane (MHC) Control Station and REMOTE CONTROL UNIT

b. MHC Control Station. All MHC functions can be controlled by the operator from the control station (1, Figure 1-28). A lever controlled valve (2) is provided for each control function. All control valves are spring-loaded and will return to the center, or neutral, position when they are released. The control valves are proportionately variable. A small movement from the neutral position results in a small change in the function which that valve controls. A larger movement from the neutral position results in a faster change. The function of each control lever is identified on the end of the control knob (3).

c. MHC REMOTE CONTROL. The MHC REMOTE CONTROL UNIT (4) permits operation of the MHC from either side of the vehicle. This feature allows the operator to keep the load in sight at all times. A remote control switch (5) activates power to the remote control connector (6). The REMOTE CONTROL UNIT is attached to the MHC by an electrical cable. When the REMOTE CONTROL UNIT is active, solenoids on the control valves respond to input from the REMOTE CONTROL UNIT. The levers on the REMOTE CONTROL UNIT are proportionately variable. A small change in lever position results in a small change in the function controlled by that lever. A larger change in lever position results in a faster change in function. The levers on the REMOTE CONTROL UNIT are also spring-loaded and will return to the neutral position when released. The REMOTE CONTROL UNIT can be used to operate HOIST up/down, BOOM up/down, TELESCOPE in/out, and SWING clockwise/counterclockwise.

1-19. M1089 MATERIAL HANDLING CRANE (MHC), 30K WINCHES, AND UNDERLIFT

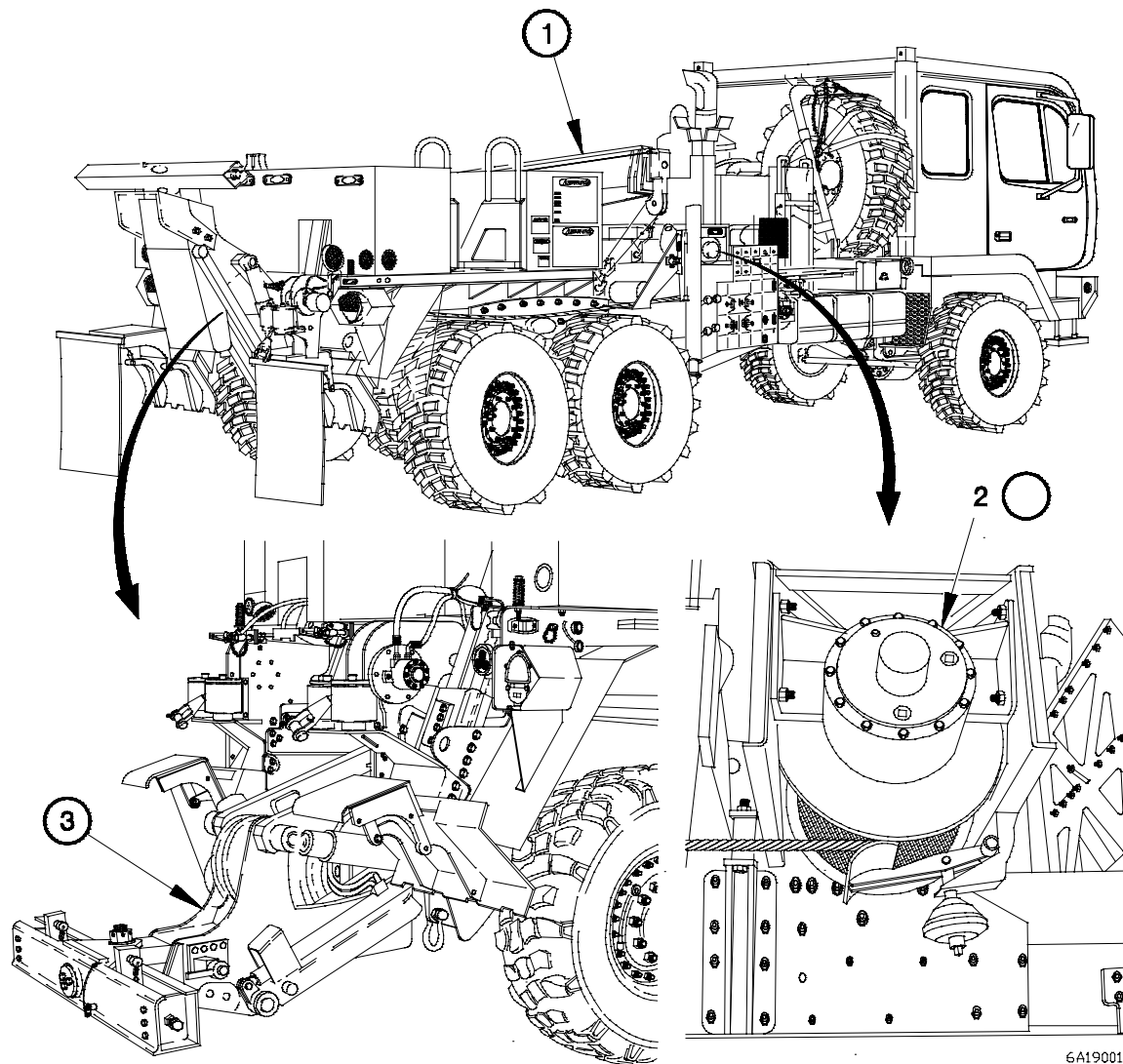
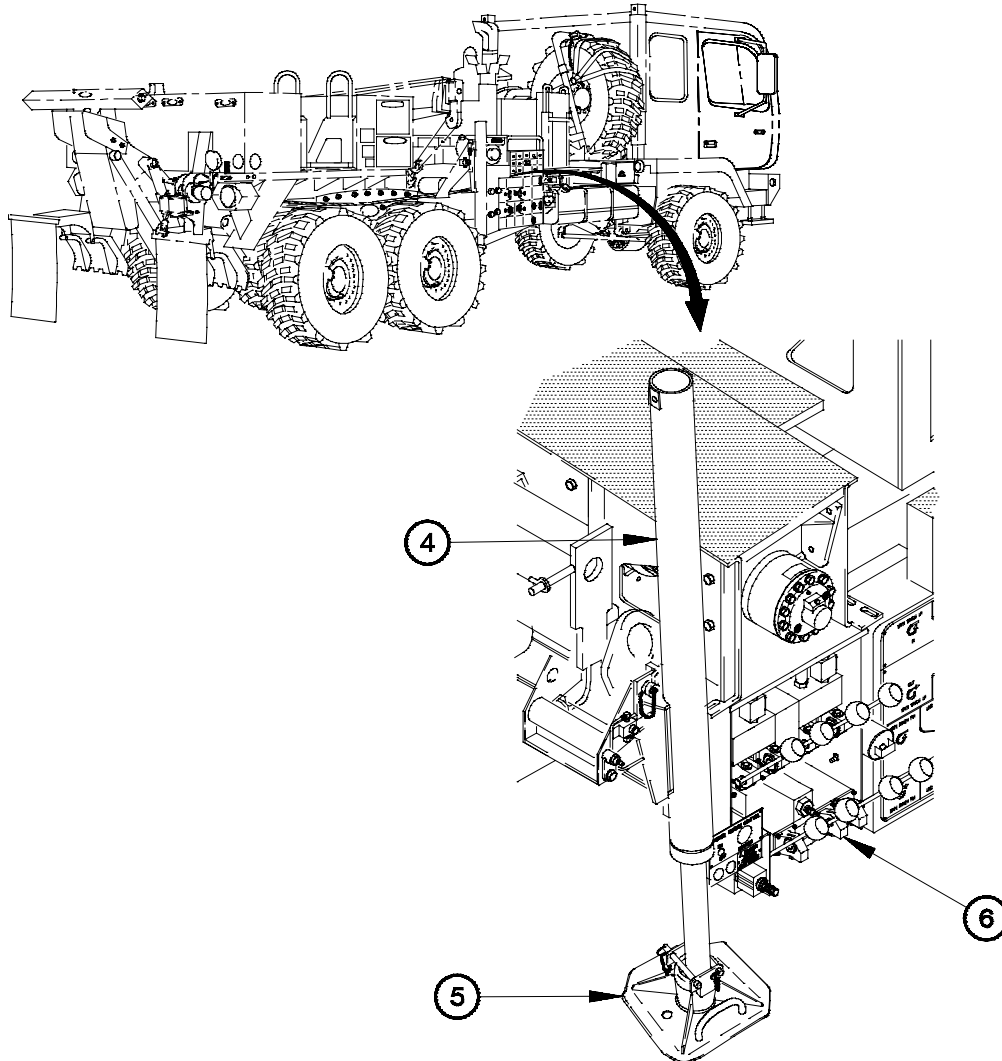


Figure 1-29. M1089 Material Handling Crane (MHC), 30K Winches, and Underlift

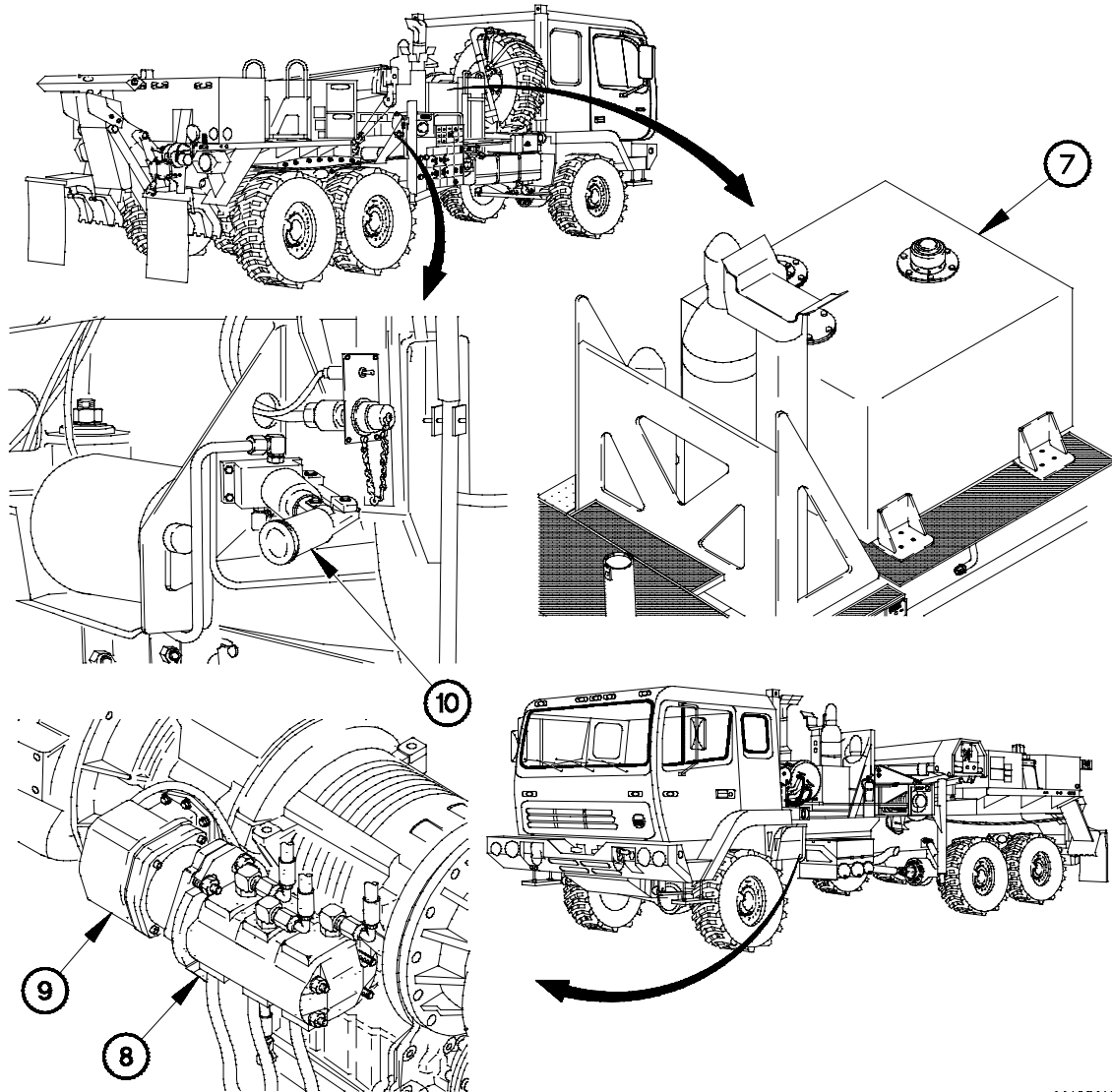
Vehicle model M1089 is equipped with a Material Handling Crane (MHC) (1, Figure 1-29) mounted on the frame near the middle of the vehicle; left and right 30K winches (2), located ahead of the MHC; and an underlift (3), attached to the rear of the vehicle.

1-19. M1089 MATERIAL HANDLING CRANE (MHC), 30K WINCHES, AND UNDERLIFT (CONT)



6419A011

a. Material Handling Crane (MHC). The M1089 MHC has a lifting capacity of 11,000 lbs (4,994 kgs). The MHC contains an overload shutdown system which monitors boom angle, boom extension, and load weight. If the overload shutdown system senses an overload condition, certain MHC functions become locked out. The vehicle is stabilized during MHC operation by jack cylinders (4) attached to outrigger beams. Outrigger pads (5) are provided and are attached to the bottom of the jack cylinders by quick release pins. All MHC functions are hydraulically controlled by levers at the control station (6). All exposed hydraulic cylinder rods are hard chrome plated to resist corrosion and wear.



6A19B011

b. Hydraulic System. All of the hydraulics on the M1089 are driven by a common power source and supply system. The M1089 is provided with a hydraulic tank (7) which has a capacity of 74 gal (280 L) of fluid. The hydraulic tank contains an internal fluid filter. The filter removes contaminants from the oil and is easily replaced. Hydraulic pressure for the MHC is supplied by a three stage hydraulic pump (8) attached to the rear of the Power Take-Off (PTO) (9). The hydraulic cylinders contain cartridge-type holding valves which lock the cylinder in case of sudden hydraulic pressure loss. A hand operated back-up hydraulic pump (10) allows the operator to lower any load to the ground and stow the MHC if the hydraulic pump fails.

1-19. M1089 MATERIAL HANDLING CRANE (MHC), 30K WINCHES, AND UNDERLIFT (CONT)

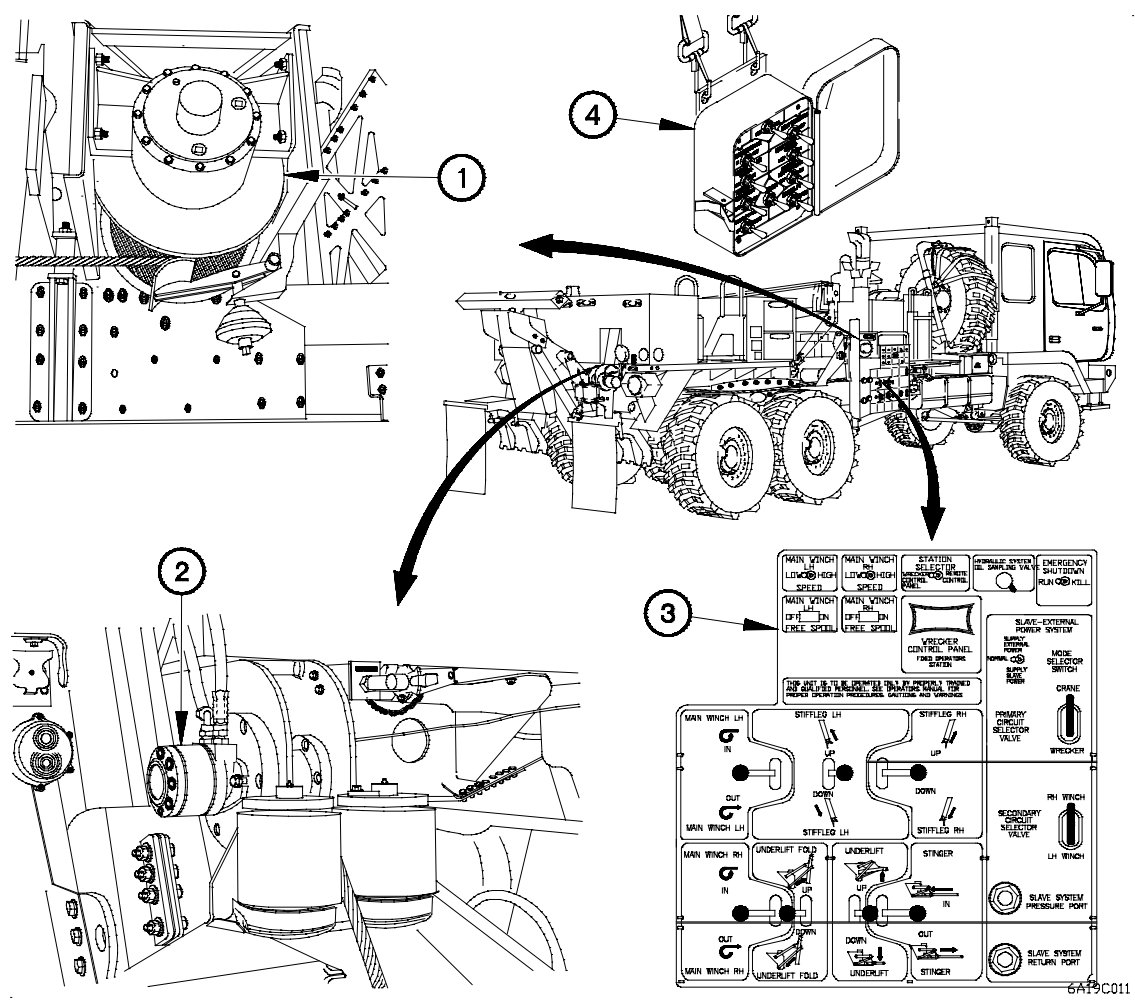


Figure 1-30. M1089 30K Winches

c. M1089 30K Winches. The left and right 30K winches (1, Figure 1-30) are designed to be used for recovering stranded vehicles from the rear of the M1089. The 30K winches are rated for a 30,000 lbs (13,620 kgs) pull with a full drum of cable. Pulling capacity is reduced with each layer of cable that is taken off the winch drum. Pulling capacity with only one full layer of cable on the winch drum is 15,830 lbs (7,187 kgs). One full layer of cable is the minimum amount of cable that may be left on the drum when using the winch. The winch is equipped with a fail-safe brake which is spring applied and hydraulically released. The fail-safe brake is automatically applied when hydraulic pressure falls below 270 psi (1,862 kPa). The fail-safe brake will hold the load until hydraulic pressure is restored. The winch control valve functions as a throttling valve when cable is being payed out. The winch control valve controls the flow of fluid to the winch motor. When cable is being reeled in, the winch control valve acts as a free flow check valve. The winch control valve is preset at the factory and is not to be adjusted under any circumstances. The 30K winches are equipped with pay-in/reeled out spoolers (2) to keep tension on the cable when cable is payed-in/reeled out. The 30K winches can be controlled from either the M1089 control panel (3) or from the REMOTE CONTROL (4).

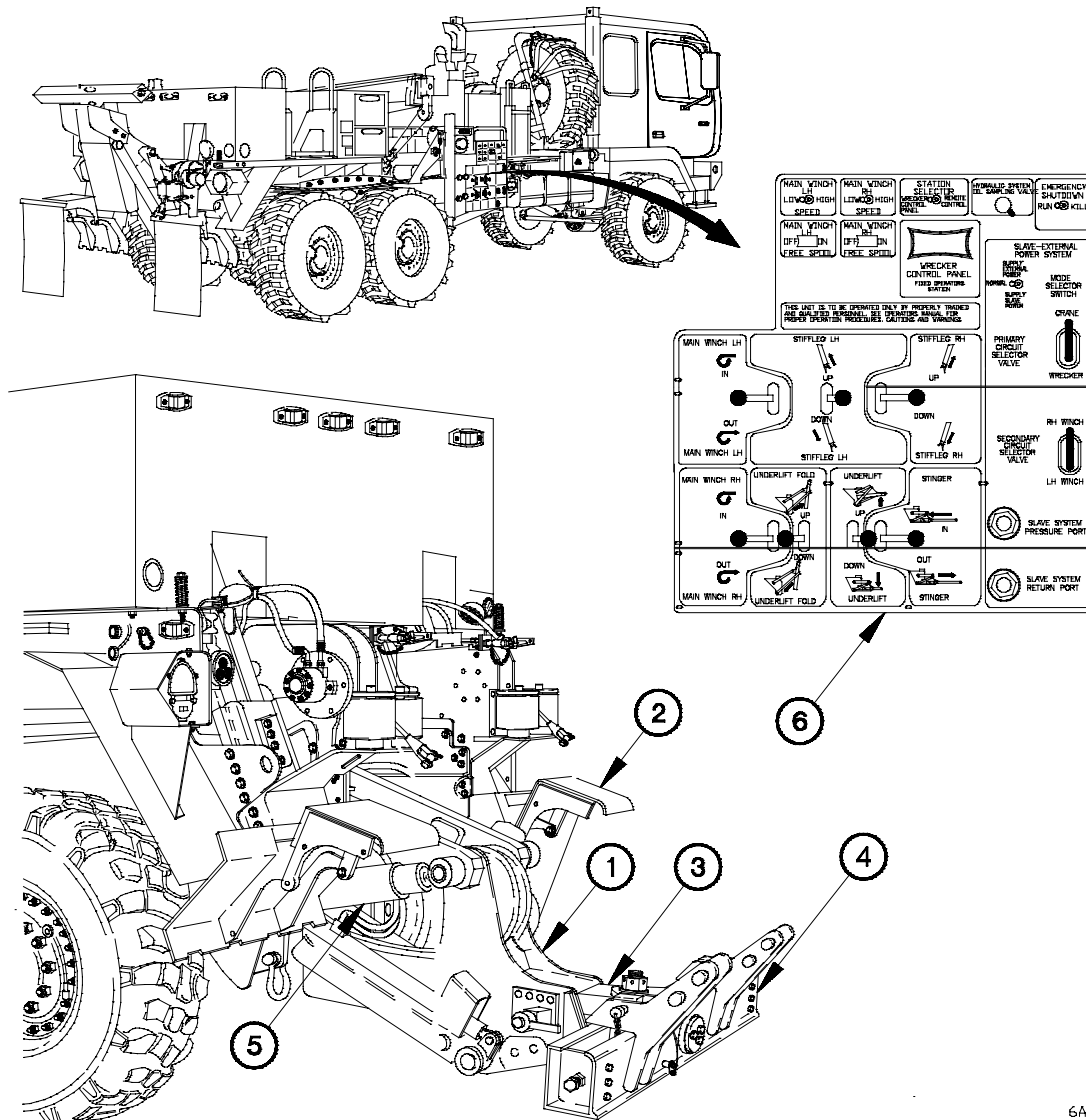
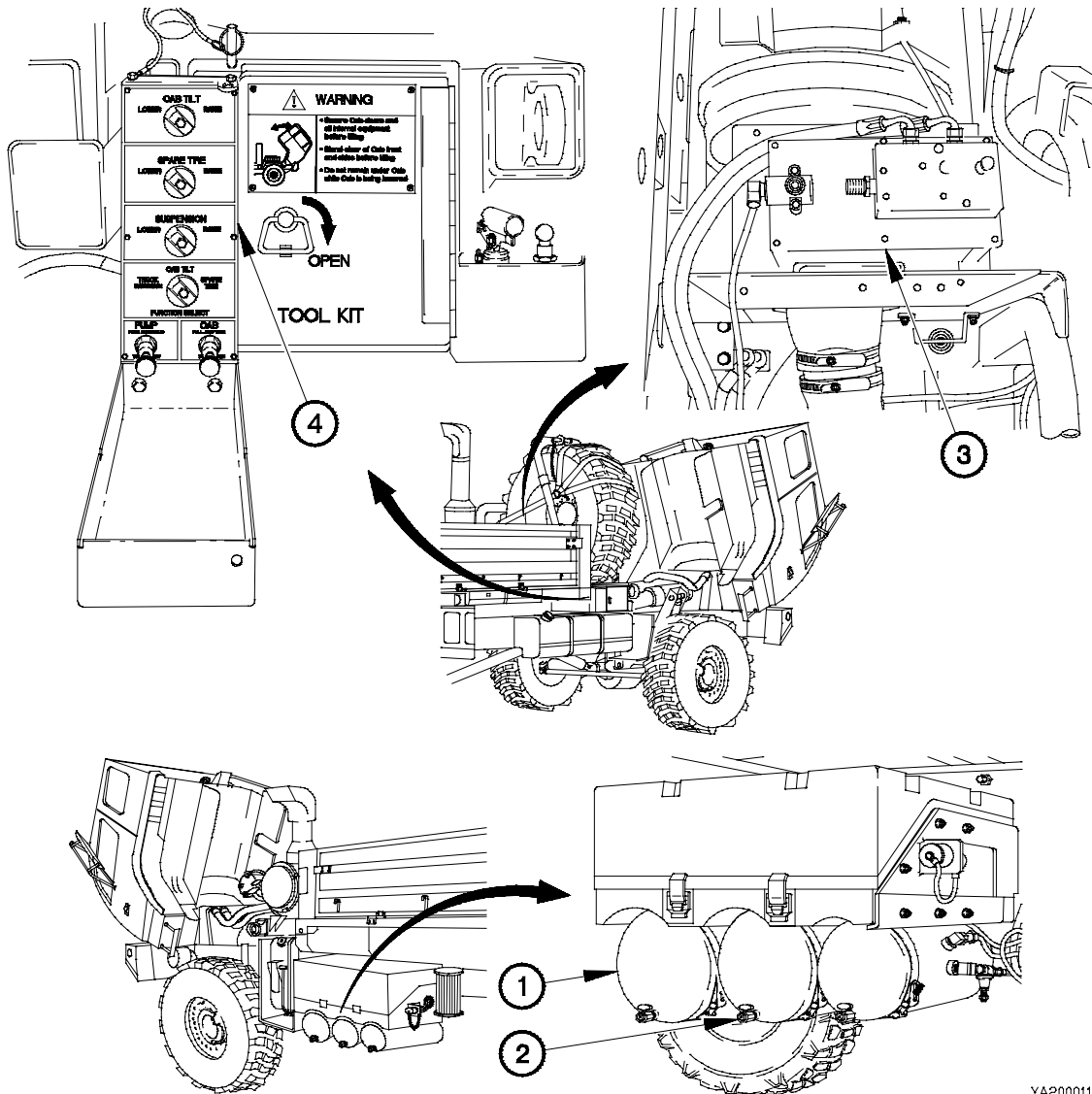


Figure 1-31. M1089 Underlift

d. M1089 Underlift. Vehicle model M1089 is equipped with a hydraulic underlift (1, Figure 1-31) component. The underlift is used for towing a disabled vehicle. Stifflegs (2) are used to keep the M1089 vehicle stable during recovery operations. The stinger (3) can be extended to position the crossbar (4) beneath the vehicle being recovered. The crossbar is equipped with adapters which make it suitable for towing a wide range of vehicles. Two underlift cylinders (5) control the height of the crossbar to allow the operator to tow a disabled vehicle with the front wheels off the ground. All underlift functions are hydraulically controlled from the WRECKER CONTROL PANEL (6).

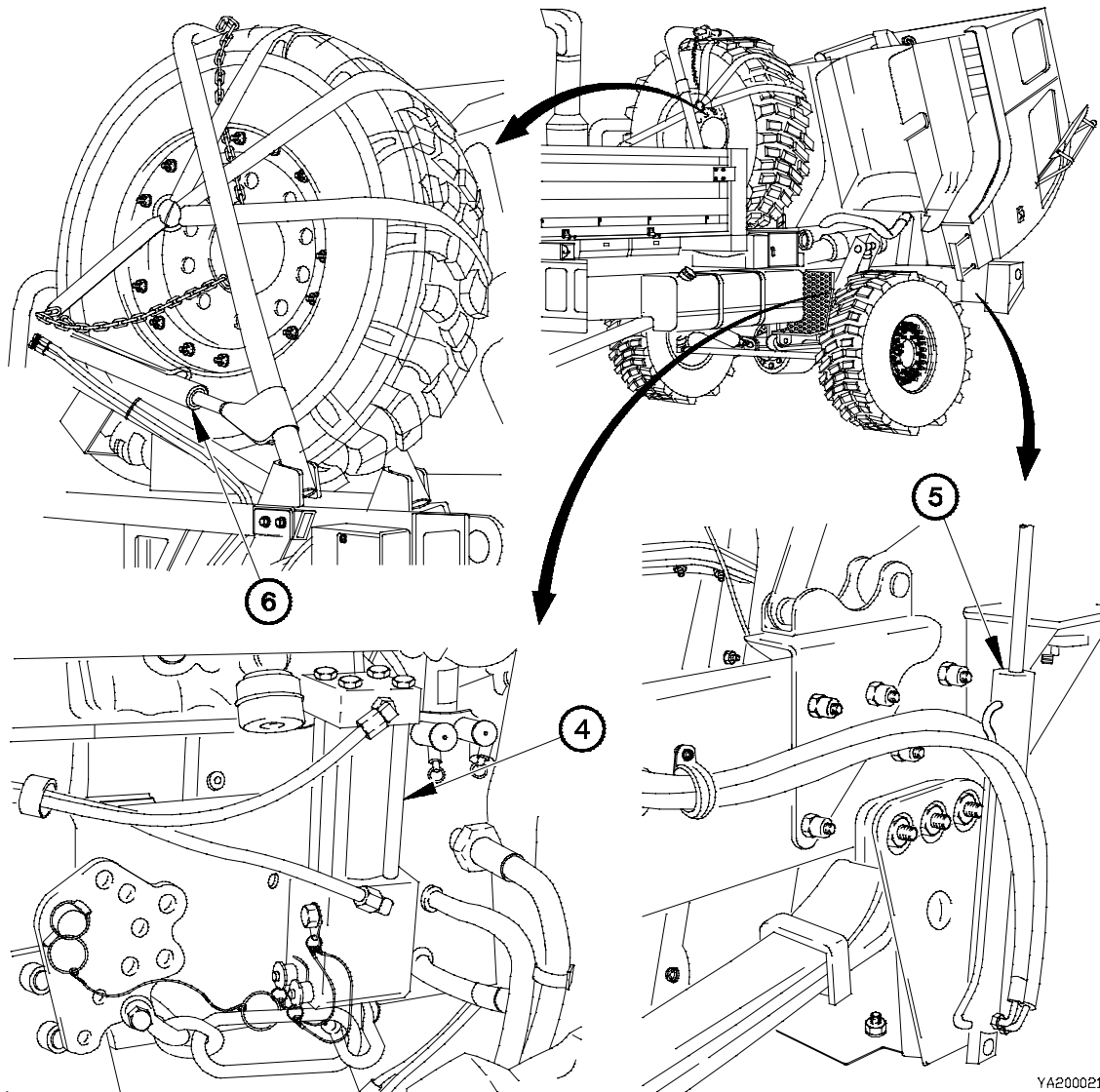
1-20. AIR TRANSPORTABILITY HYDRAULIC SYSTEM



YA200011

Figure 1-32. Air Transportability Hydraulic System

The entire series of M1083 vehicles is equipped with a hydraulic system which allows the vehicle to be prepared for internal air transport in a short time by a minimum number of personnel. Air from the secondary and primary air tanks (1 and 2, Figure 1-32) powers the air/hydraulic power unit (3). The air/hydraulic power unit supplies hydraulic power to the rest of the system. The system is controlled by valves in the hydraulic manifold (4).

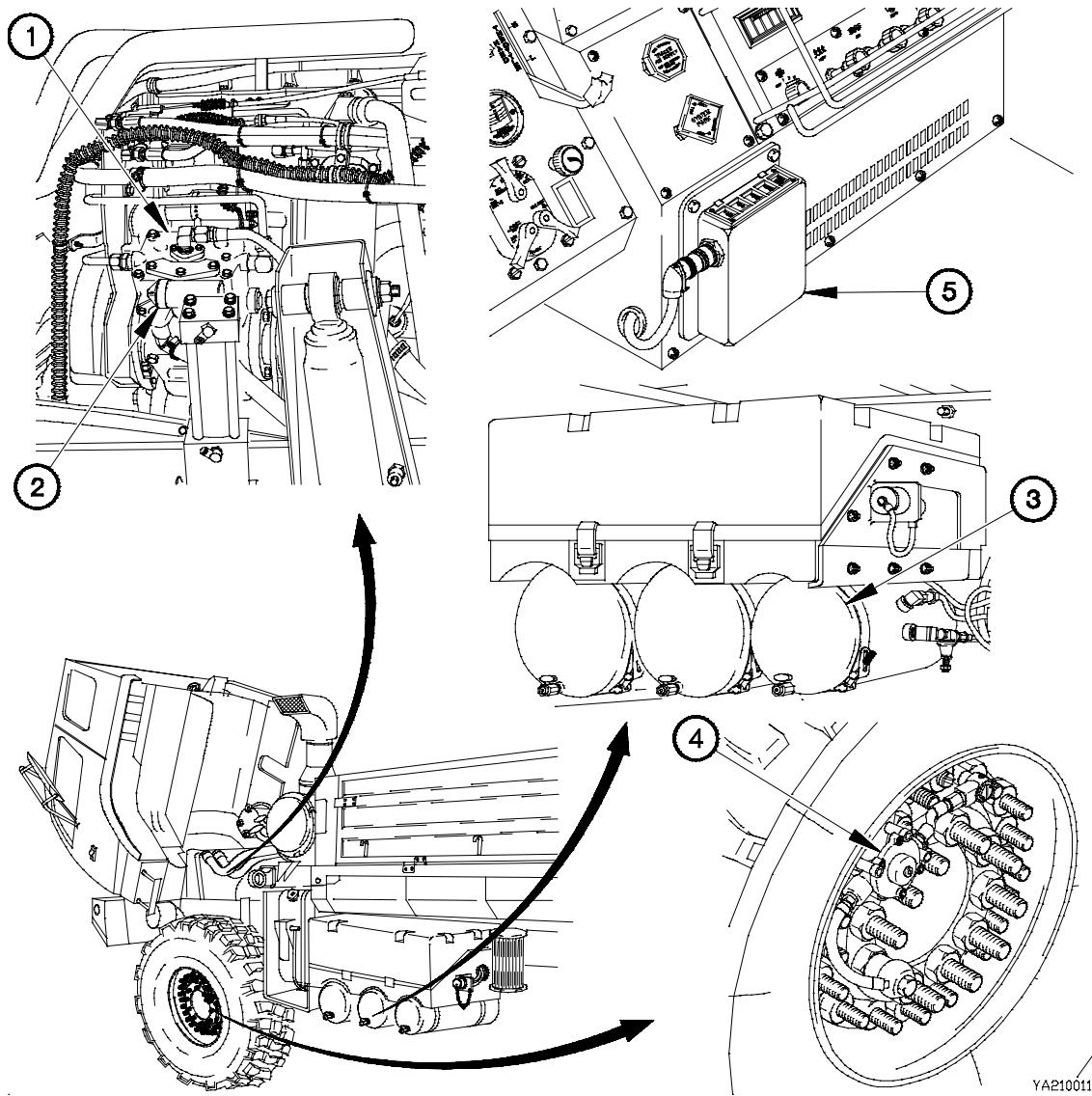


YA200021

Figure 1-32. Air Transportability Hydraulic System (Cont)

Two suspension cylinders (4), mounted, on the frame are used to compress the suspension so that the vehicle can be loaded into an aircraft. Valves on the hydraulic manifold control pressure to the cab tilt cylinder (5); to raise and lower the cab, and the spare tire retainer cylinder (6); to lower and raise the spare tire.

1-21. AIR SYSTEM



YA210011

Figure 1-33. Air System

The air system provides clean, dry air for use in the brake system and the Central Tire Inflation System (CTIS). The air system is pressurized by an engine driven air compressor (1, Figure 1-33) with a nominal output pressure of 125 psi (862 kPa). The system pressure is controlled by an unloading type pressure governor (2) which maintains the output pressure between 105 psi (724 kPa) and 125 psi (862 kPa). Air is supplied to the air brake portion of the air system from the primary and secondary air tanks. Air for the CTIS comes from the wet tank (3) and is supplied to the axles by the CTIS manifold valve (4). Air pressure in the tires is controlled by the CTIS Electronic Control Unit (ECU) (5). The CTIS ECU provides for four tire pressure settings.

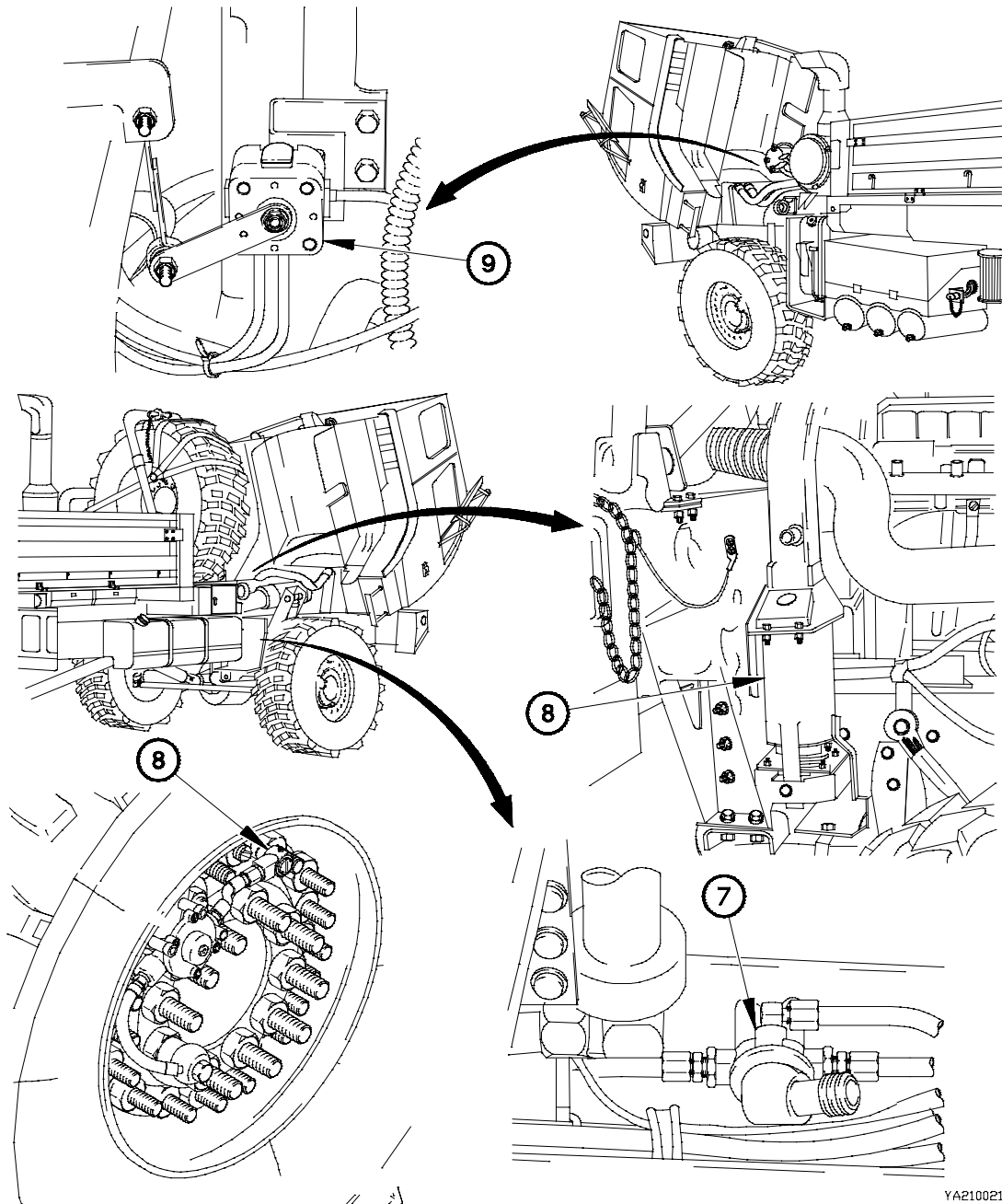


Figure 1-33. Air System (Cont)

Kneeling valves (6) on the front tires allow the front of the vehicle to be lowered for internal air transport. Quick release valves (7) are provided for each axle to exhaust air from the CTIS when the operator selects a mode which requires a lower pressure setting. Air pressure is also used to keep the cab level through the use of air springs (8), mounted below the rear cab support, and a cab leveling valve (9). The air system has enough reserve capacity to keep the vehicle operational in the event of a partial system failure.

CHAPTER 2 VEHICLE MAINTENANCE

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Section I. REPAIR PARTS, TOOLS, SPECIAL TOOLS, TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE), AND SUPPORT EQUIPMENT

2-1. COMMON TOOLS AND EQUIPMENT

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE), CTA 50-970, or CTA 8-100 as applicable to your unit.

2-2. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

For a listing of special tools, TMDE, and support equipment, refer to the Maintenance Allocation Chart (MAC), (TM 9-2320-366-20) and to the Repair Parts and Special Tools List (RPSTL), TM 9-2320-366-24P.

2-3. REPAIR PARTS

Mandatory replacement parts are listed in Appendix F. Repair parts are listed and illustrated in the RPSTL, TM 9-2320-366-24P, covering Unit, Direct Support and General Support repair parts and special tools for the vehicle.

Section II. SERVICE UPON RECEIPT

2-4. UNPACKING AND DEPROCESSING

a. Unpacking. Upon receipt of a new vehicle, the receiving organization must see if it has been properly prepared for service and is in good condition. Inspect all assemblies, subassemblies, and accessories to be sure they are in proper working order (TM 9-2320-366-10). Secure, clean, and correctly adjust and/or lubricate as needed (TM 9-2320-366-20). Check all tools and equipment to be sure every item is accounted for (TM 9-2320-366-10-HR) in good condition, clean and properly mounted or stowed (TM 9-2320-366-10).

b. Deprocessing. Read "Processing and Deprocessing Record of Shipping, Storage and Issue of Vehicles and Spare Engines" tag, (DD Form 1397) and follow all precautions checked. This tag should be attached to the steering wheel or manual throttle control lever.

2-5. HAND RECEIPT MANUAL AND INVENTORY OF EQUIPMENT

When a new vehicle is first received by the using organization, it is necessary to inventory the vehicle equipment. For detailed procedures, refer to Hand Receipt Manual, TM 9-2320-366-10-HR.

2-6. SERVICE BEFORE OPERATION

a. General.

- (1) Refer to TM 9-2320-366-10-1 for operating instructions for the vehicle.
- (2) Upon receipt of a new, used, or reconditioned vehicle, the receiving organization must see if it has been properly prepared for service and is in good condition (TM 9-2320-366-10). Inspect all assemblies, subassemblies, and accessories to be sure they are in proper working order. Secure, clean, correctly adjust, and/or lubricate (TM 9-2320-366-10 and TM 9-2320-366-20) as needed. Check all tools and equipment to be sure every item is there (TM 9-2320-366-10-HR), in good condition, clean and properly mounted or stowed (TM 9-2320-366-10).
- (3) Follow general procedures for all services and inspections given in TM 9-2320-366-10-1.

b. Inspection and Servicing Equipment.

NOTE

If vehicle has been driven to the using organization, most or all of the following work should have been done.

(1) When vehicle is received, inspect items for damage during shipment and unloading operations. Check for any loose or missing nuts, bolts, screws, access plates, drain plugs, draincocks, oil plugs, assemblies, subassemblies that may be easily lost or broken in transit. Check Basic Issue Items (BII) against checklist to ensure all items are accounted for (TM 9-2320-366-10-HR). Carefully list all discrepancies.

WARNING

- **Dry Cleaning Solvent P-D-680 is TOXIC and flammable. Wear protective goggles and gloves; use only in well-ventilated area; avoid contact with skin, eyes, and clothes, and do not breathe vapors. Keep away from open flame. Never smoke when using solvent; the flashpoint for Type I Dry Cleaning Solvent is 100°F (38°C) and for Type II is 130°F (50°C). Failure to comply may result in serious injury or death to personnel.**
- **If personnel become dizzy while using Dry Cleaning Solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.**

(2) Clean all exterior surfaces coated with rust-preventive compound with Dry Cleaning Solvent (Item 83, Appendix C).

(3) Perform the Semiannual Preventive Maintenance Checks and Services (PMCS), Table 2-1, TM 9-2320-366-20-1.

(4) Lubricate all points shown in TM 9-2320-366-20 (Appendix H) regardless of interval. Schedule services in accordance with DA Pam 738-750.

(5) Initial Service Intervals:

a. Initial 500 miles (805 km) of operation:

- (1) Perform Front and Rear Axle oil change.
- (2) Perform Front Axle Wheel end Planetary Hub oil change.

b. Initial 1,000 miles (1,609 km) of operation:

Tighten self-locking nuts on leaf spring U-bolt to 390-510 lb-ft (529-692 N·m), in 50 lb-ft (68 N·m) increments, in a crisscross pattern.

c. Initial 5,000 miles (8,045 km) of operation:

- (1) Perform Engine oil and filter change.
- (2) Perform Transmission oil and filter change.

(6) Activate battery if vehicle is delivered with dry-charged battery (TM 9-6140-200-14).

WARNING

Do not remove radiator cap when the engine is hot; steam and hot coolant can escape and burn skin. Failure to comply may result in injury to personnel.

(7) Check radiator coolant. Check if solution is adequate for expected climatic conditions. Refer to TB 750-651 for preparation of antifreeze solutions. Put tag near filler cap with type of antifreeze and degree of protection written on tag.

2-6. SERVICE BEFORE OPERATION (CONT)

c. Special Service Instructions.

- (1) Vehicle Body and Sheet Metal Inspection (TM 9-2320-366-10-1).
 - (a) Inspect body and sheet metal for evidence of damage during shipment.
 - (b) Check doors, latches, and hinges on compartments for proper operation.
 - (c) Check mounting hardware and tighten as necessary.
- (2) Vehicle Cab Inspection (TM 9-2320-366-10-1).
 - (a) Inspect cab for evidence of damage during shipment.
 - (b) Inspect windshields and window glass for cracks or other damage.
 - (c) Check door latches, hinges, and windows for proper operation.
 - (d) Check seats and seatbelts mounting hardware to ensure they are securely installed and tighten as necessary.
 - (e) Check operator's seat adjustments to ensure they are functioning properly.
- (3) Engine Inspection (TM 9-2320-366-10-1).
 - (a) Check for obstructions to cooling air flow to radiator.
 - (b) Remove any seals, plugs, or tape used to seal air inlets and ports on the engine during shipping.
 - (c) Check crankcase oil level with dipstick.
 - (d) Examine air cleaner element for dirty or restricted condition.
 - (e) Inspect engine and cooling hose connections for evidence of leakage.
- (4) Transmission Inspection (TM 9-2320-366-10-1).
 - (a) Check fluid level with dipstick.
 - (b) Check external tubes and hoses for evidence of leakage.
- (5) Transfer Case Inspection (TM 9-2320-366-10-1).
 - (a) Check level of lubricant at fill plug.
 - (b) Inspect lubrication pump and external hoses for evidence of leakage.
 - (c) Operate driveline control and observe drive power to front axle.
 - (d) Inspect bolts on driveline U-joints.

(6) Electrical System Inspection (TM 9-2320-366-10-1).

- (a) Inspect battery cable connections and clean and tighten as necessary.
- (b) Check all lights for burned out lamps, loose connections, and dirty or broken lenses.
- (c) Ensure alternator is charging properly.
- (d) Ensure all electrical equipment functions.

(7) Air System Inspection (TM 9-2320-366-10-1).

- (a) Drain any water from reservoirs.
- (b) Inspect all accessible air hose and tubing connections for leakage.

(8) Steering System Inspection (TM 9-2320-366-10-1).

- (a) Check steering hydraulic reservoir for proper fluid level.
- (b) Examine steering linkage and steering gear for damage incurred during shipment.
- (c) Examine steering hoses and connections for evidence of leakage.
- (d) Check steering system for proper operation during road test.

(9) Chassis and Front, Intermediate, and Rear Axle Inspection (TM 9-2320-366-10-1).

- (a) Check all lubricant levels.
- (b) Check axle housing pressure vents to ensure freedom from foreign matter.

(10) Tire Inspection.

- (a) Check tire pressure (TM 9-2320-366-10-1).
- (b) Inspect tires for serious cuts, bubbles, cracks, bruises, dry-rot, foreign objects, or exposure of internal cords. Remove foreign objects lodged between treads (TM 9-2320-366-10-1).
- (c) Check all wheel mounting nuts for proper torque (TM 9-2320-366-20-3).

(11) Fuel System Inspection (TM 9-2320-366-10-1).

- (a) Check fuel level and replenish, if necessary.
- (b) Inspect fuel lines, connections, and filters for evidence of leakage.

(12) Arctic Kit. If vehicle is equipped with an arctic kit, and is going to operate in non-arctic climates, remove arctic alternator belts and replace with standard belts (TM 9-2320-366-20-4).

Section III. TROUBLESHOOTING

2-7. INTRODUCTION TO LOGIC TREE TROUBLESHOOTING

This section contains step-by-step procedures for identifying, locating, isolating, and repairing equipment malfunctions.

This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

2-8. TROUBLESHOOTING INSTRUCTIONS

a. Page Layout. Troubleshooting procedures are divided into logic tree pages and test pages.

- (1) A logic tree page is always a left-hand page, facing the test page on the right. The logic tree page provides the sequence of steps required to isolate a fault to a failed component. All critical information for decision making is on the left-hand page. Each logic tree page contains the following information:
 - (a) **INITIAL SETUP** - This box is located only on the first logic tree page of a fault. INITIAL SETUP lists tools, materials, references, personnel, and equipment needed to troubleshoot the fault.
 - (b) **KNOWN INFO** - This box is located in the top left-hand column. KNOWN INFO lists conditions and information that will eliminate specific components as the cause of the fault.
 - (c) **POSSIBLE PROBLEMS** - This box is located directly below KNOWN INFO. All of the system components that could cause a fault are listed in the POSSIBLE PROBLEMS box. The first component listed in the POSSIBLE PROBLEMS box is the one that will be tested at that step in the logic sequence. When one of the components is tested and found to be operational, it is entered at the bottom of the KNOWN INFO box as OK.
 - (d) **QUESTION** - Each question, located in the middle column, refers to the first possible problem listed in POSSIBLE PROBLEMS. If the answer to the question is YES, proceed to the next step. If the answer is NO, follow the NO arrow to obtain directions for correcting the problem. If the step contains a WARNING or CAUTION message, a small shadow box is printed above the question. Text for WARNINGS or CAUTIONS is on the following right-hand page.
 - (e) **TEST OPTIONS** - This box is located in the top right-hand column. TEST OPTIONS lists tests available for testing parts suspected of failing.
 - (f) **REASON FOR QUESTION** - This box is located directly below TEST OPTIONS. It explains the purpose for the question in the middle column.
- (2) A test page is always a right-hand page, facing the logic tree page on the left. The test provides detailed instructions for testing the first component listed in the POSSIBLE PROBLEMS box. This test will also provide an answer for the question in the middle column. Note the arrow connecting the test on the right-hand page to the REASON FOR QUESTION. When possible, illustrations are included to provide visual details. Notes contain additional information for testing.

b. How to Begin Troubleshooting.

- (1) Determine the symptom or condition that indicates a problem or failure. Troubleshooting is divided into symptoms peculiar to a vehicle system or component, for example: pneumatic system or engine. Refer to the Troubleshooting Fault Index (Table 2-1).
- (2) Go to the referenced page to begin troubleshooting. Open the manual flat so both the left-hand and right-hand pages are displayed before you. The information on both pages is important to resolve the problem or failure. However, the experienced technician can follow the left-hand page instructions and refer to the right-hand page when necessary.
- (3) Follow the Diagnostic Procedure. Answer question No. 1 on the left-hand page and follow the YES or NO path to either the remedy or the next question. If necessary, look on the right-hand page for test instructions and illustrations.
- (4) Observe warnings, cautions, and notes. The formatting and symbols used in this manual for warnings, cautions, and notes are as follows:

WARNING

This is the symbol for a warning statement. If you see the word WARNING above a question on the left-hand page, look on the right-hand page for the text of the message. WARNINGS describe a situation which could cause serious injury or death to personnel.

CAUTION

This is the symbol for a caution statement. If you see the word CAUTION above a question on the left-hand page, look on the right-hand page for the text of the message. CAUTIONS describe a situation which could cause damage to equipment.

NOTE

This is a symbol for a note. Notes are located directly above the test to which they refer. NOTES provide additional information for performing a test.

c. Confidence Tests. Before performing any STE/ICE-R test, a confidence test must be run to ensure proper operation of the STE/ICE-R. In addition, a confidence test must be performed after each use to ensure the STE/ICE-R is performing properly. Refer to TM 9-4910-571-12&P.

d. Verifying Repair. When troubleshooting, there is an additional step that must be performed after taking any corrective action. This step will show that the malfunction has been corrected, or that additional troubleshooting is required, example follows:

On malfunction g2. Leans to one side, or rear of vehicle sags, the question is asked "Are front shock absorbers secure and free from damage?". If the question was answered NO, the damaged shock absorber(s) was replaced. After replacing the damaged shock absorber(s), the vehicle must be checked to determine if the original malfunction is still present. If corrected, troubleshooting is completed. If malfunction is still present, continue troubleshooting.

2-8. TROUBLESHOOTING INSTRUCTIONS (CONT)

Table 2-1. Vehicle Troubleshooting

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a.1. FUEL SYSTEM TROUBLESHOOTING	
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c3. WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Codes 22 Sub Codes 15 (Prior to Serial Number 6510032369)	2-104
c4. WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Codes 22 Sub Codes 16	2-114
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c6. WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Codes 24 Sub Codes 12 or 23 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-130
c7. WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Codes 24 Sub Codes 12 or 23 (Prior to Serial Number 6510032369)	2-142

Table 2-1. Vehicle Troubleshooting (Cont)

<u>Malfunction</u>	Troubleshooting Procedure (Page)
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c11.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45 and/or 69 Sub Code 12 (Serial Number 6510032369 and Higher)	2-178	■
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c24.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 16 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-322	
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2-8. TROUBLESHOOTING INSTRUCTIONS (CONT)

Table 2-1. Vehicle Troubleshooting (Cont)

<u>Malfunction</u>	<u>Troubleshooting Procedure (Page)</u>
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■ c28. WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45 and/or 69 Sub Code 21 (Prior to Serial Number 6510032369)	2-370
c29. WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 22 (Serial Number 6510032369 and Higher)	2-380
c30. WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 22 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-390
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■ c32. WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45 and/or 69 Sub Code 23	2-414
c33. WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 24 (Serial Number 6510032369 and Higher)	2-422
c34. WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 24 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-432
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■ c37. WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45 and/or 69 Sub Code 26 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-466
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Table 2-1. Vehicle Troubleshooting (Cont)

<u>Malfunction</u>	<u>Troubleshooting Procedure (Page)</u>
c. TRANSMISSION SYSTEM TROUBLESHOOTING (CONT)	
c46. WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 52 and Any Sub Code (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-568
c47. WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 52 and Any Sub Code (Prior to Serial Number 6510032369)	2-582
c47A. WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 55 and Any Sub Code	2-590.2
c48. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 15 (Serial Number 6510032369 and Higher)	2-592
c49. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 15 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-602
c50. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 16	2-616
c51. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 24 Sub Code 12 or 23 (Serial Number 6510032369 and Higher)	2-624
c52. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 24 Sub Code 12 or 23 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-632
c53. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 32 and Any Sub Code (Serial Number 6510032369 and Higher)	2-644
c54. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 32 and Any Sub Code (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-652
c55. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, 45, 46 and/or 69 Sub Code 12 (Serial Number 6510032369 and Higher)	2-664
c56. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, 45, 46 and/or 69 Sub Code 12 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-674
c57. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 13 (Serial Number 6510032369 and Higher)	2-688
c58. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 13 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-698
c59. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 14 (Serial Number 6510032369 and Higher)	2-712
c60. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 14 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-722
c61. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 15 (Serial Number 6510032369 and Higher)	2-736
c62. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 15 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-746
c63. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 16 (Serial Number 6510032369 and Higher)	2-760

2-8. TROUBLESHOOTING INSTRUCTIONS (CONT)

Table 2-1. Vehicle Troubleshooting (Cont)

<u>Malfunction</u>	<u>Troubleshooting Procedure (Page)</u>
c. Transmission SYSTEM TROUBLESHOOTING (CONT)	
c64. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 16 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-770
c65. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, 45, 46 and/or 69 Sub Code 21 (Serial Number 6510032369 and Higher)	2-784
c66. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, 45, 46 and/or 69 Sub Code 21 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-794
c67. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 22 (Serial Number 6510032369 and Higher)	2-808
c68. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 22 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-818
c69. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, 45, 46 and/or 69 Sub Code 23	2-832
c70. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 24 (Serial Number 6510032369 and Higher)	2-840
c71. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 24 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-850
c72. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, 45, 46 and/or 69 Sub Code 26 (Serial Number 6510032369 and Higher)	2-864
c73. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, 45, 46 and/or 69 Sub Code 26 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-874
c74. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 43 Sub Code 21 (Serial Number 6510032369 and Higher)	2-888
c75. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 43 Sub Code 21 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-898
c76. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 43 Sub Code 26 (Serial Number 6510032369 and Higher)	2-912
c77. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 43 Sub Code 26 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-922
c78. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 52 and Any Sub Code (Serial Number 6510032369 and Higher)	2-936
c79. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 52 and Any Sub Code (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-946
c80. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 55 and Any Sub Code	2-960

Table 2-1. Vehicle Troubleshooting (Cont)

<u>Malfunction</u>	<u>Troubleshooting Procedure (Page)</u>
d. WHEEL TROUBLESHOOTING	
d1. Wheel Wobbles or Shimmys	2-962
e. HYDRAULIC SYSTEM TROUBLESHOOTING	
e1. Loss of Hydraulic Pressure (Single Stage Pump)	2-966
e2. Loss of Hydraulic Pressure (Three Stage Pump)	2-970
f. STEERING TROUBLESHOOTING	
f1. Hard to Steer	2-976
g. SUSPENSION SYSTEM TROUBLESHOOTING	
g1. Wanders, Pulls to One Side, or Shimmys	2-982
g2. Leans to One Side or Rear of Vehicle Sags	2-984
h. M1089 HYDRAULIC SYSTEM TROUBLESHOOTING	
h1. M1089 Fold Cylinder Does Not Work	2-988
h2. M1089 Left Stiffleg Drifts or Does Not Work	2-990
h3. M1089 Right Stiffleg Drifts or Does Not Work	2-994
h4. M1089 Stinger Cylinder Does Not Work	2-998
h5. M1089 Telescopic Lift Cylinder(s) Drifts or Does Not Work	2-1002
h6. M1089 RH 30K Winch Assembly Does Not Operate	2-1006
h7. M1089 LH 30K Winch Assembly Does Not Operate	2-1008
h8. M1089 Pay-Out Hydraulic Motor Does Not Work	2-1012
i. 15K SELF-RECOVERY WINCH (SRW) SYSTEM TROUBLESHOOTING	
i1. 15K Self-Recovery Winch (SRW) Does Not Operate	2-1018
j. M1089 MATERIAL HANDLING CRANE (MHC) HYDRAULIC SYSTEM TROUBLESHOOTING	
j1. M1089 Material Handling Crane (MHC) Does Not Operate	2-1030
j2. M1089 Material Handling Crane (MHC) Left or Right Outrigger Drifts or Does Not Work	2-1036
j3. M1089 Material Handling Crane (MHC) Mast Does Not Erect or Stow	2-1040
j4. M1089 Material Handling Crane (MHC) Outrigger Extension Cylinder Does Not Work	2-1044
j5. M1089 Material Handling Crane (MHC) Boom Swing Assembly Does Not Work	2-1048
j6. M1089 Material Handling Crane (MHC) Boom Does Not Lift Up or Down	2-1050
j7. M1089 Material Handling Crane (MHC) Boom Does Not Telescope In or Out	2-1056
j8. M1089 Material Handling Crane (MHC) Hoist Does Not Work	2-1062

2-8. TROUBLESHOOTING INSTRUCTIONS (CONT)

Table 2-1. Vehicle Troubleshooting (Cont)

<u>Malfunction</u>	<u>Troubleshooting Procedure (Page)</u>
k. DUMP BODY HYDRAULIC SYSTEM TROUBLESHOOTING	
k1. Dump Body Does Not Raise	2-1068
k2. Dump Body Does Not Lower	2-1072.10
k3. Dump Body Creeps Down from Raised Position	2-1072.12
I. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HYDRAULIC SYSTEM TROUBLESHOOTING	
11. M1084/M1086 Material Handling Crane (MHC) Hydraulic Functions Operate Slowly	2-1074
12. M1084/M1086 Material Handling Crane (MHC) Left Outrigger (Jack) Drifts or Does Not Work	2-1082
13. M1084/M1086 Material Handling Crane (MHC) Right Outrigger (Jack) Drifts or Does Not Work	2-1086
14. M1084/M1086 Material Handling Crane (MHC) Mast Does Not Erect or Stow	2-1090
15. M1084/M1086 Material Handling Crane (MHC) Hoist Does Not Work	2-1094
16. M1084/M1086 Material Handling Crane (MHC) Boom Swing Assembly Does Not Work	2-1098
17. M1084/M1086 Material Handling Crane (MHC) Boom Does Not Telescope In or Out	2-1100
18. M1084/M1086 Material Handling Crane (MHC) Swing, Telescope, Boom, and Hoist Do Not Work	2-1104
19. M1084/M1086 Material Handling Crane (MHC) Boom Does Not Lift Up or Down or Hold Under Load	2-1106

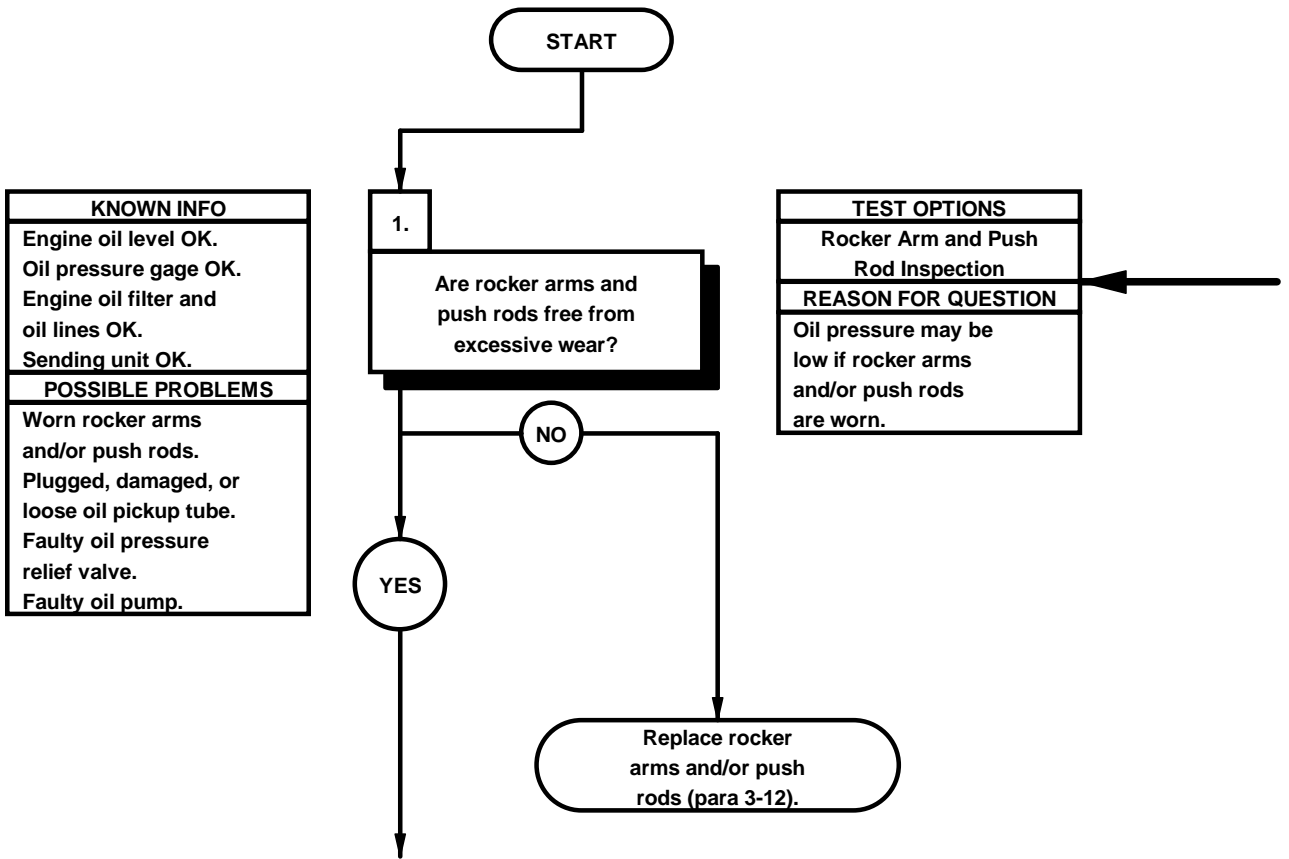
2-9. ENGINE SYSTEM TROUBLESHOOTING

This paragraph covers Engine System Troubleshooting. The Engine System Fault Index, Table 2-2, lists faults for the engine system of the vehicle.

Table 2-2. Engine System Fault Index

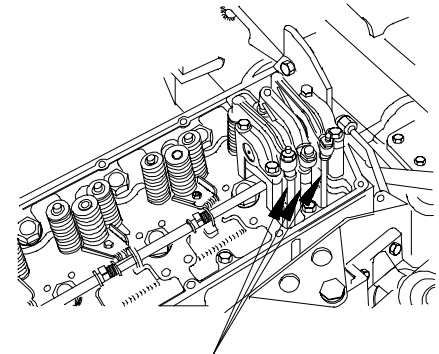
Fault No.	Description	Page
a1.	Low Engine Oil Pressure	2-16
a2.	Engine Stalls at Low RPM	2-20
a3.	Engine Speed Is Not Stable	2-26
a4.	Engine Overspeeds on Start	2-30
a5.	Too Much Vibration in Engine	2-32
a6.	Coolant in Engine Oil	2-34
a7.	Excessive Engine Oil Consumption	2-36
a8.	Engine Overheats	2-40
a9.	Excessive Black or Gray Exhaust Smoke From Engine	2-44
a10.	White Exhaust Smoke From Engine	2-48
a11.	Engine Starts but Misfires, Runs Rough, or Lacks Power	2-52
a12.	Blue Exhaust Smoke From Engine	2-62
a13.	Engine Cranks but Does Not Start	2-66.2
a14.	Engine Does Not Crank	2-66.6

a1. LOW ENGINE OIL PRESSURE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) Goggles, Industrial (Item 28, Appendix B)



ROCKER ARM AND PUSH ROD INSPECTION

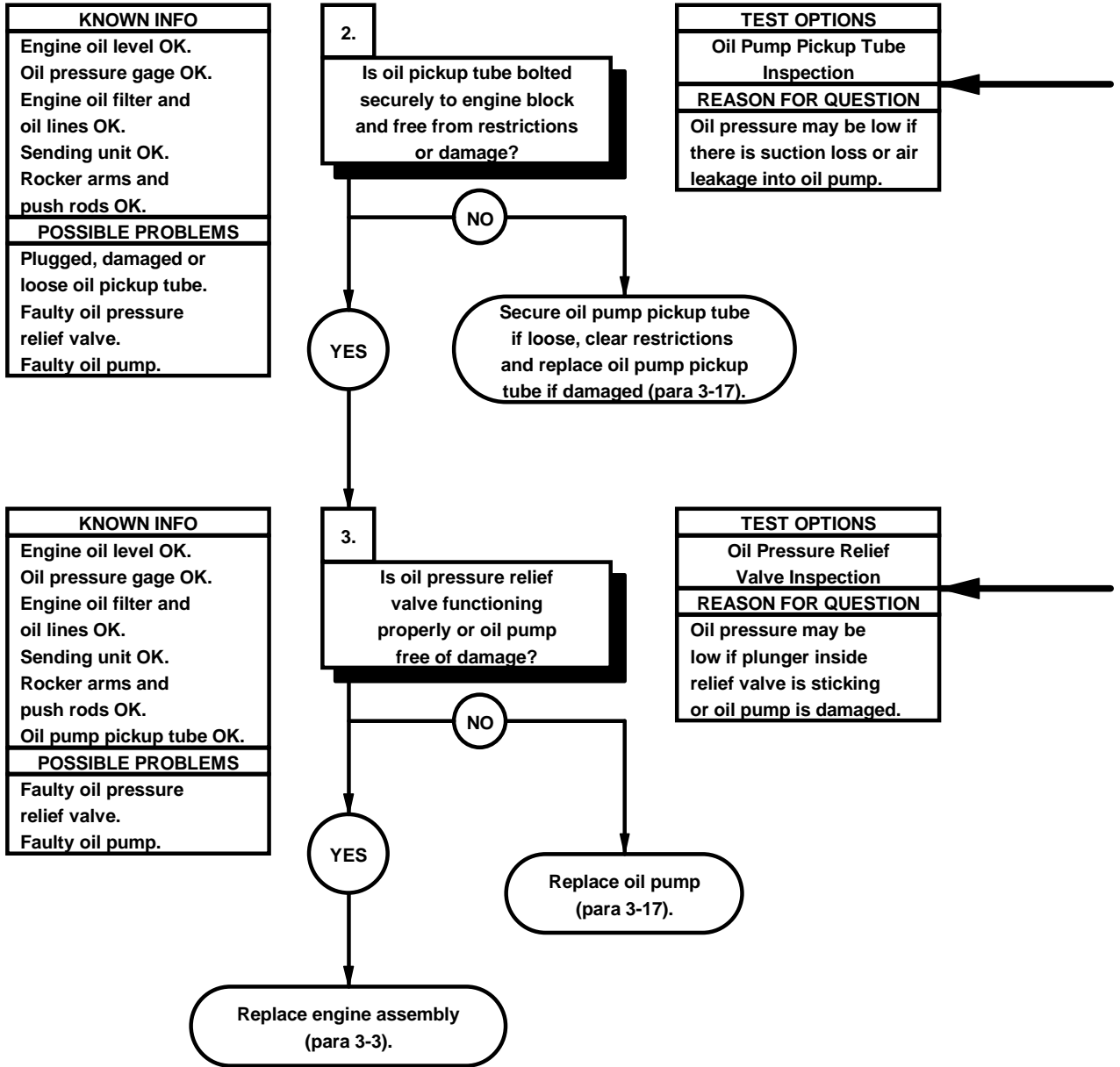
- (1) Raise cab (TM 9-2320-366-10-1).
- (2) Remove valve cover (TM 9-2320-366-20-3).
- (3) Remove rocker arm (para 3-12) and inspect for undue wear, cracks, and damage.
- (4) Inspect all three push rods for excessive wear.
- (5) Repeat steps (2 and 3) for each rocker arm and its associated push rods.
- (6) Install rocker arms (para 3-12).
- (7) Install valve cover (TM 9-2320-366-20-3).
- (8) Lower cab (TM 9-2320-366-10-1).



PUSH RODS

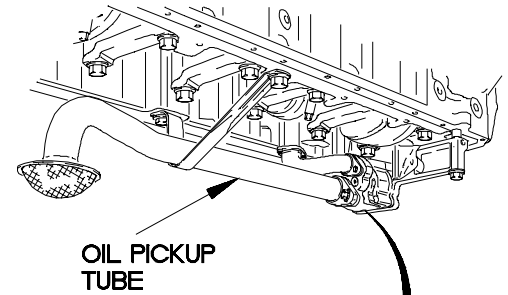
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a1. LOW ENGINE OIL PRESSURE (CONT)



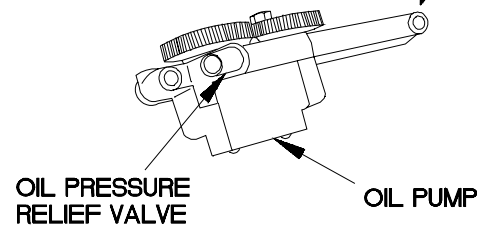
OIL PUMP PICKUP TUBE INSPECTION

- (1) Remove oil pan (para 3-16).
- (2) Check oil pickup tube for mounting hardware looseness, restrictions and damage.



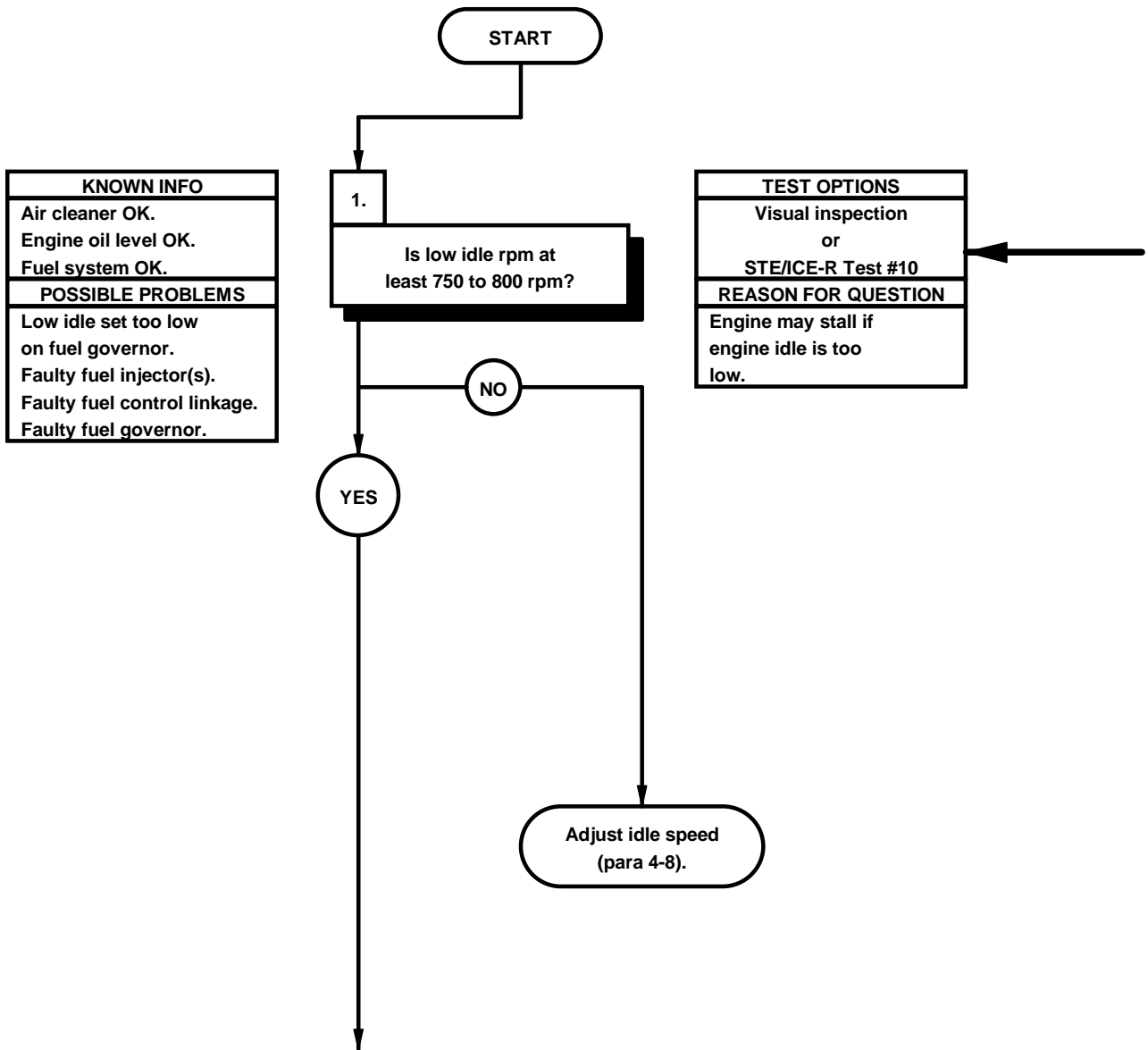
OIL PRESSURE RELIEF VALVE INSPECTION

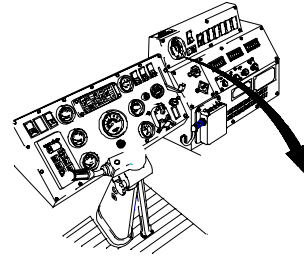
- (1) Remove oil pump (para 3-17).
- (2) Check oil pressure relief valve for sticking. If sticking, replace oil pump.
- (3) Check oil pump for damage. If damaged replace.
- (4) Install oil pump (para 3-17).
- (5) Install oil pan (para 3-16).



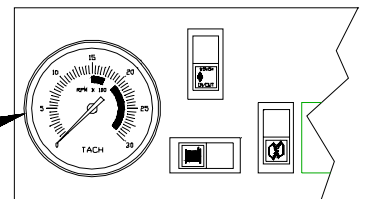
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a2. ENGINE STALLS AT LOW RPM	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) STE/ICE-R (Item 70, Appendix B)
References TM 9-4910-571-12&P	Tool Kit, Intl Comb Eng (TM 9-2320-366-20) Wrench, Torque, 0-60 N-m (Item 96, Appendix B)
Personnel Required (2)	





STEERING WHEEL
REMOVED FOR
CLARITY



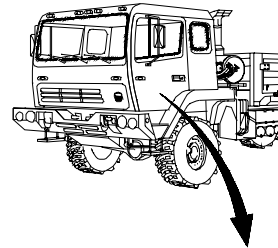
TACHOMETER

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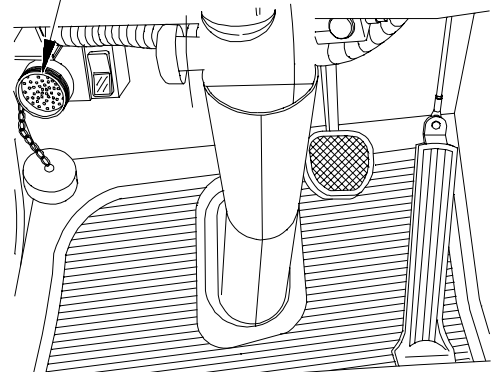
- (1) If equipped with tachometer, start engine (TM 9-2320-366-10-1). If not equipped with a tachometer, perform STE/ICE-R Test #10.
- (2) Check low idle rpm, rpm should read between 750-800 rpm.
- (3) Shut down engine (TM 9-2320-366-10-1).

STE/ICE-R TEST #10

- (1) Hook up STE/ICE-R to DCA (TM 9-4910-571-12&P).
- (2) Set TEST SELECT switches to 10.
- (3) Press and release TEST button.
- (4) Start engine (TM 9-2320-366-10-1).
- (5) Observe displayed value.
- (6) Shut down engine (TM 9-2320-366-10-1).
- (7) Remove STE/ICE-R from DCA.

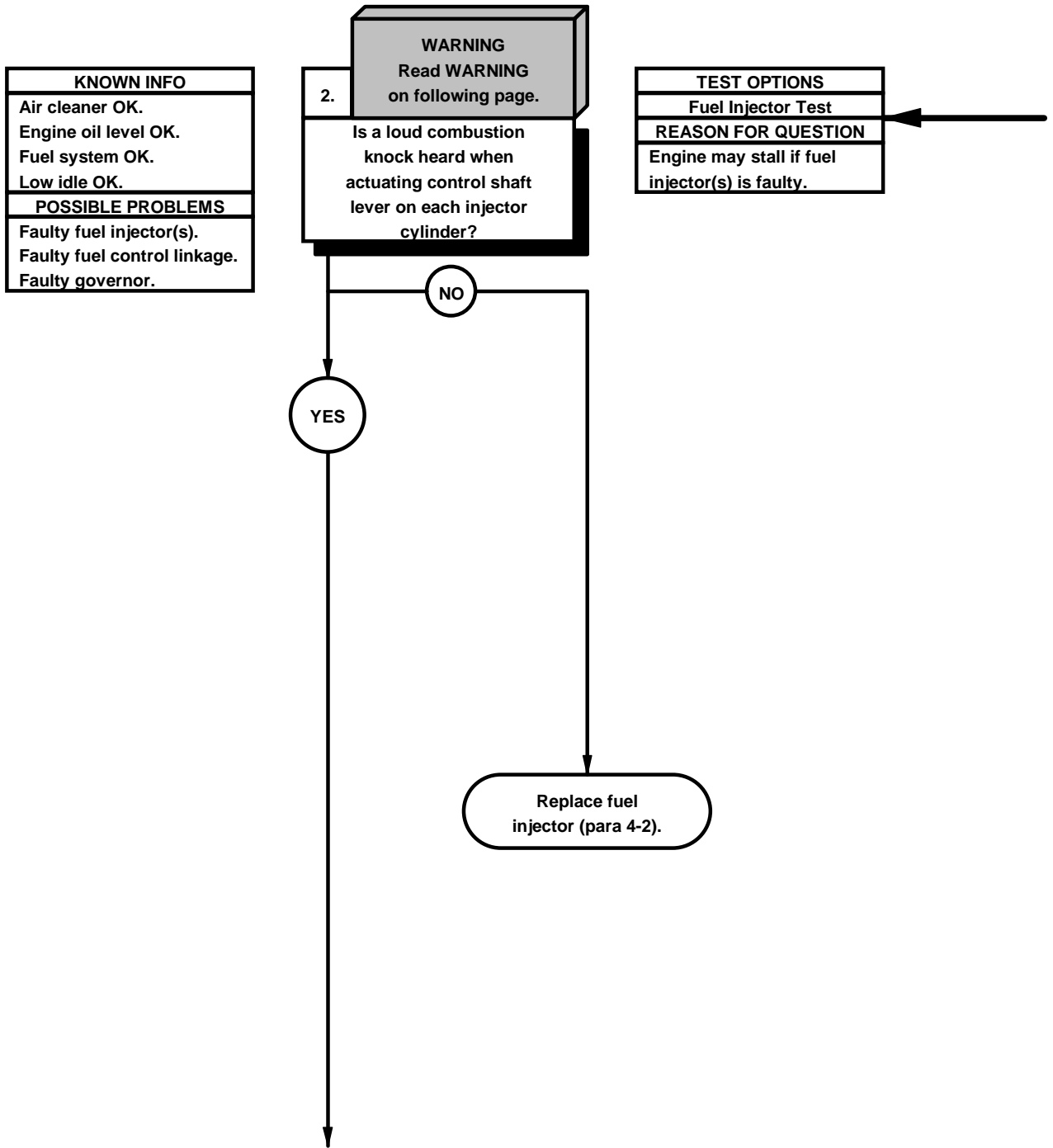


DCA CONNECTOR



Y2A0202-

a2. ENGINE STALLS AT LOW RPM (CONT)



FUEL INJECTOR TEST

- (1) Raise cab (TM 9-2320-366-10-1).
- (2) Remove valve cover (TM 9-2320-366-20-3).

WARNING

Use extreme care when opening cab door with cab raised. Failure to comply may result in injury to personnel or damage to equipment.

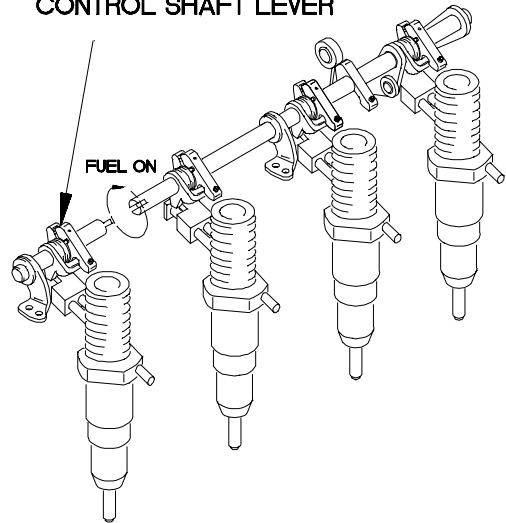
- (3) Open cab door.
- (4) Start engine (TM 9-2320-366-10-1).

NOTE

Actuating the control shaft lever places the injector in the Fuel On position for a few seconds. This causes excess fuel to be injected into that particular cylinder, causing a loud combustion knock.

- (5) Actuate No. 1 cylinder control shaft lever.
- (6) If actuating fuel injector does not result in a loud combustion knock, fuel injector is faulty.
- (7) Repeat step (5) for remaining injectors.
- (8) Shut down engine (TM 9-2320-366-10-1).
- (9) Close cab door.
- (10) Install valve cover (TM 9-2320-366-20-3).
- (11) Lower cab (TM 9-2320-366-10-1).

CONTROL SHAFT LEVER



Y2A0203-

a2. ENGINE STALLS AT LOW RPM (CONT)

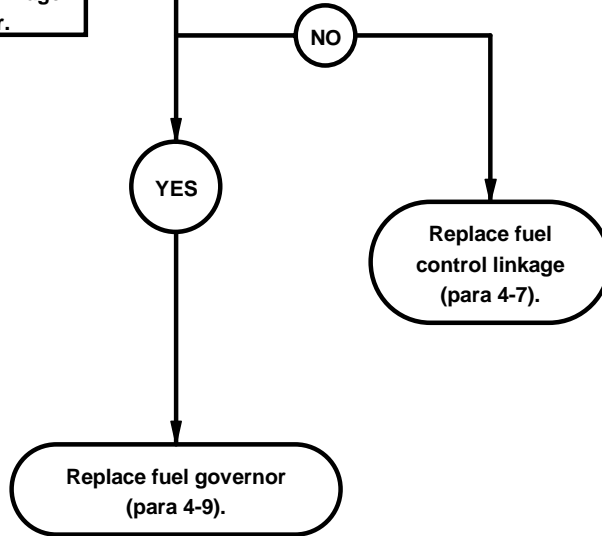
KNOWN INFO
Air cleaner OK.
Engine oil level OK.
Fuel system OK.
Low idle OK.
Fuel injectors OK.

POSSIBLE PROBLEMS
Faulty fuel control linkage.
Faulty fuel governor.

3.
Is fuel control linkage free from binding and sticking?

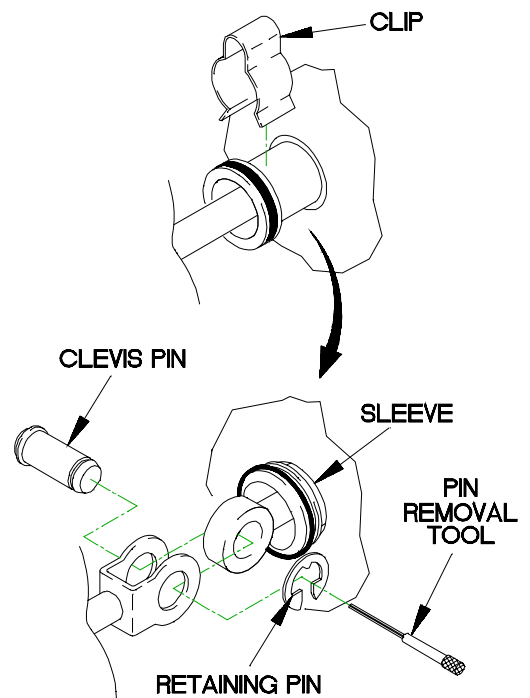
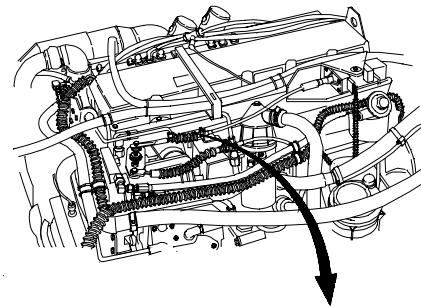
TEST OPTIONS
Fuel Control Linkage Test

REASON FOR QUESTION
Engine may stall if fuel control linkage sticks or binds.

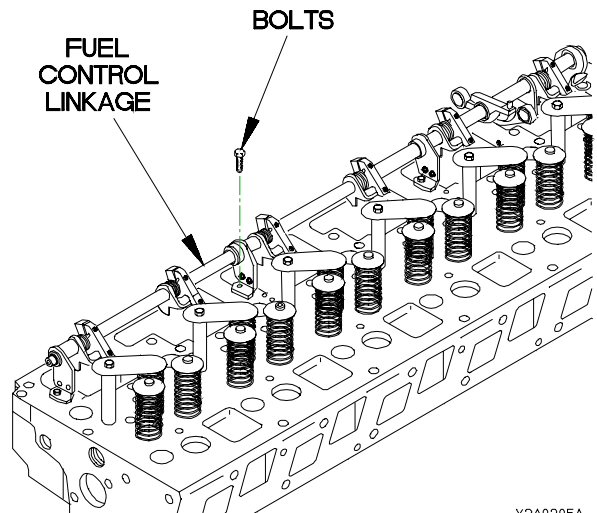


FUEL CONTROL LINKAGE TEST

- (1) Raise cab (TM 9-2320-366-10-1).
- (2) Remove valve cover (TM 9-2320-366-20-3).
- (3) Remove rocker arms (para 3-12).
- (4) Remove clip from fuel control linkage.
- (5) Slide sleeve, using soft jawed pliers, into cylinder head.
- (6) Remove retaining ring and clevis pin, using pin removal tool.
- (7) Check fuel control linkage for smooth operation.
- (8) If fuel control linkage still appears to be binding, remove fuel injectors (para 4-2).
- (9) With fuel injectors compressed, check fuel injector racks for smooth operation.
- (10) If fuel injector racks are sticky, fuel injector is faulty.
- (11) Check fuel control linkage for smooth operation.
- (12) If still binding, loosen four bolts holding fuel control linkage to cylinder head.
- (13) Operate fuel control linkage by hand.
- (14) Tighten two outer bolts in fuel control linkage to 30 lb-in. (3.5 N-m).
- (15) Tighten two inner bolts in fuel control linkage to 30 lb-in. (3.5 N-m). If fuel control linkage is still binding, replace fuel control linkage (para 4-7).
- (16) Install fuel injectors (para 4-2).
- (17) Install clevis pin and retaining ring using pin insertion tool.
- (18) Slide sleeve out of cylinder head and install clip.
- (19) Install rocker arms (para 3-12).
- (20) Install valve cover (TM 9-2320-366-20-3).
- (21) Lower cab (TM 9-2320-366-10).

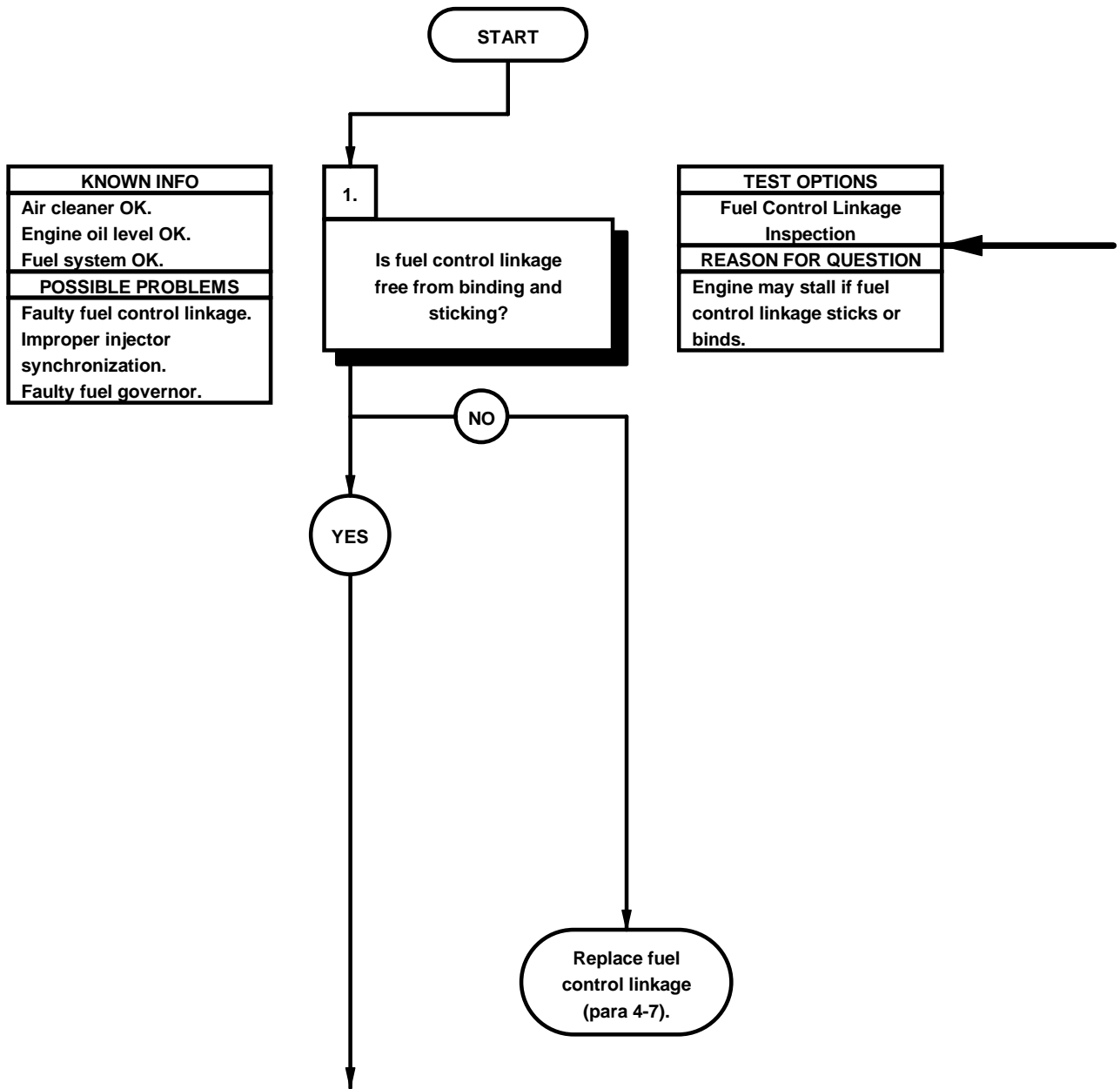


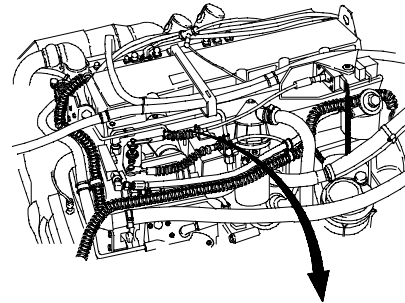
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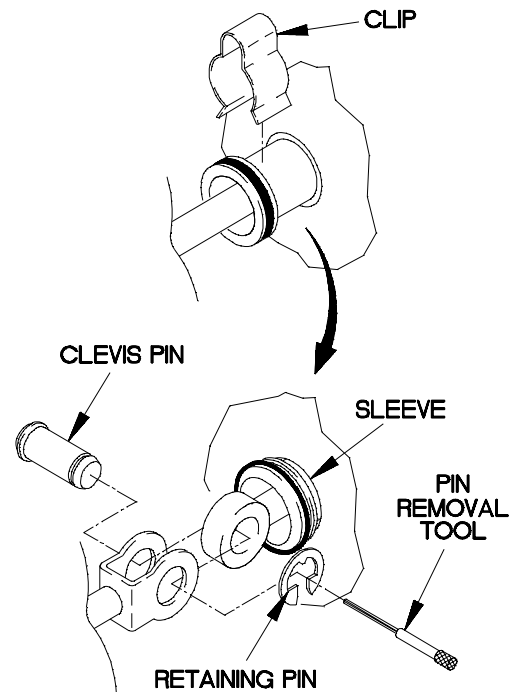
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a3. ENGINE SPEED IS NOT STABLE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) Tool Kit, Intl Comb Eng (TM 9-2320-366-20) Wrench, Torque, 0-60 N-m (Item 96, Appendix B)

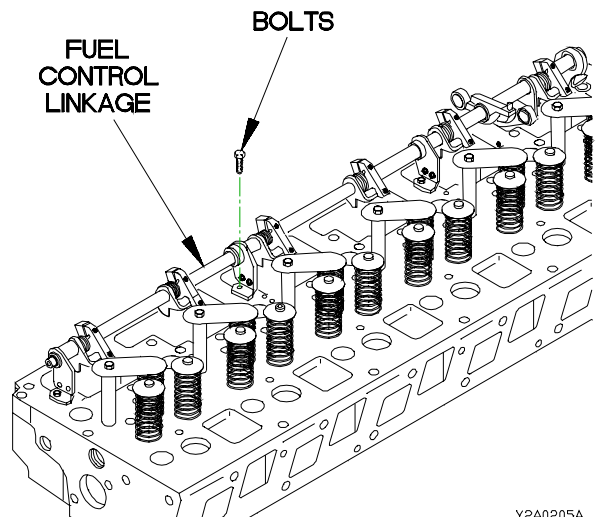




- | FUEL CONTROL LINKAGE TEST | |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (1) | Raise cab (TM 9-2320-366-10-1). |
| (2) | Remove valve cover (TM 9-2320-366-20-3). |
| (3) | Remove rocker arms (para 3-12). |
| (4) | Remove clip from fuel control linkage. |
| (5) | Slide sleeve, using soft jawed pliers, into cylinder head. |
| (6) | Remove retaining ring and clevis pin, using pin removal tool. |
| (7) | Check fuel control linkage for smooth operation. |
| (8) | If fuel control linkage still appears to be binding, remove fuel injectors (para 4-2). |
| (9) | With fuel injectors compressed, check fuel injector racks for smooth operation. |
| (10) | If fuel injector racks are sticky, fuel injector is faulty. |
| (11) | Check fuel control linkage for smooth operation. |
| (12) | If still binding, loosen four bolts holding fuel control linkage to cylinder head. |
| (13) | Operate fuel control linkage by hand. |
| (14) | Tighten two outer bolts in fuel control linkage to 30 lb-in. (3.5 N-m). |
| (15) | Tighten two inner bolts in fuel control linkage to 30 lb-in. (3.5 N-m). If fuel control linkage is still binding, replace fuel control linkage (para 4-7). |
| (16) | Install fuel injectors (para 4-2). |
| (17) | Install clevis pin and retaining ring using pin insertion tool. |
| (18) | Slide sleeve out of cylinder head and install clip. |
| (19) | Install rocker arms (para 3-12). |
| (20) | Install valve cover (TM 9-2320-366-20-3). |
| (21) | Lower cab (TM 9-2320-366-10-1). |

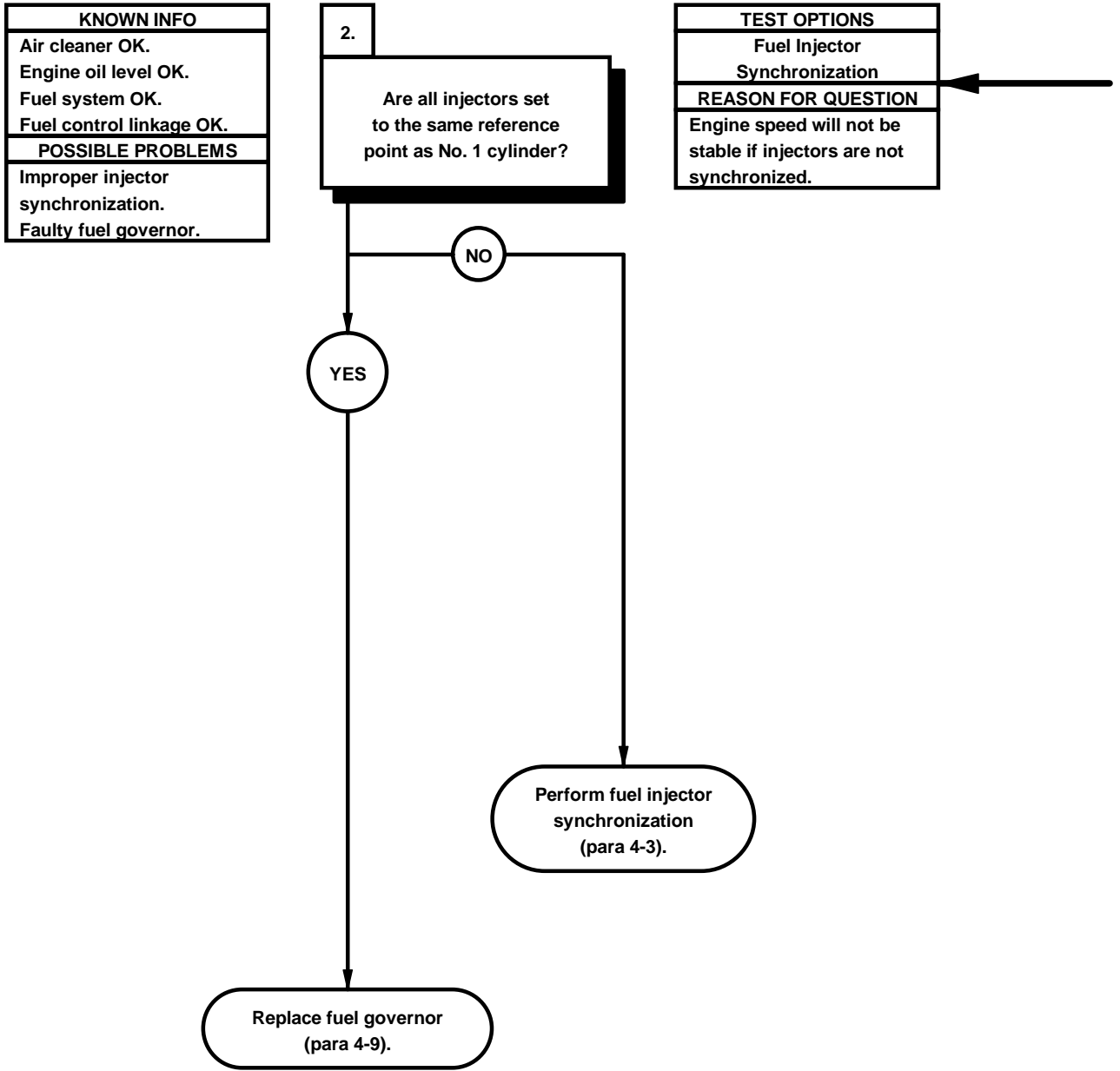


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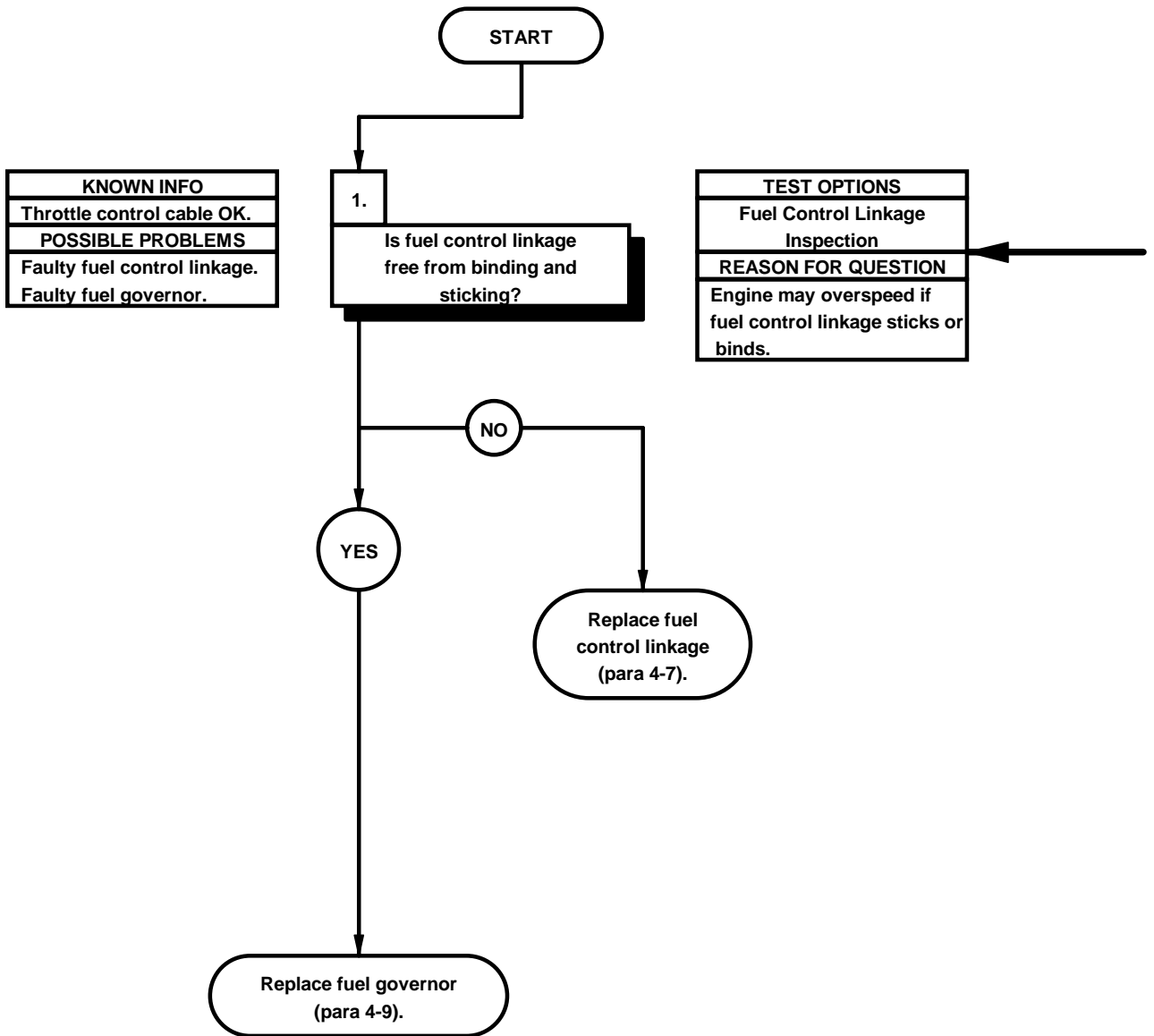
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a3. ENGINE SPEED IS NOT STABLE (CONT)



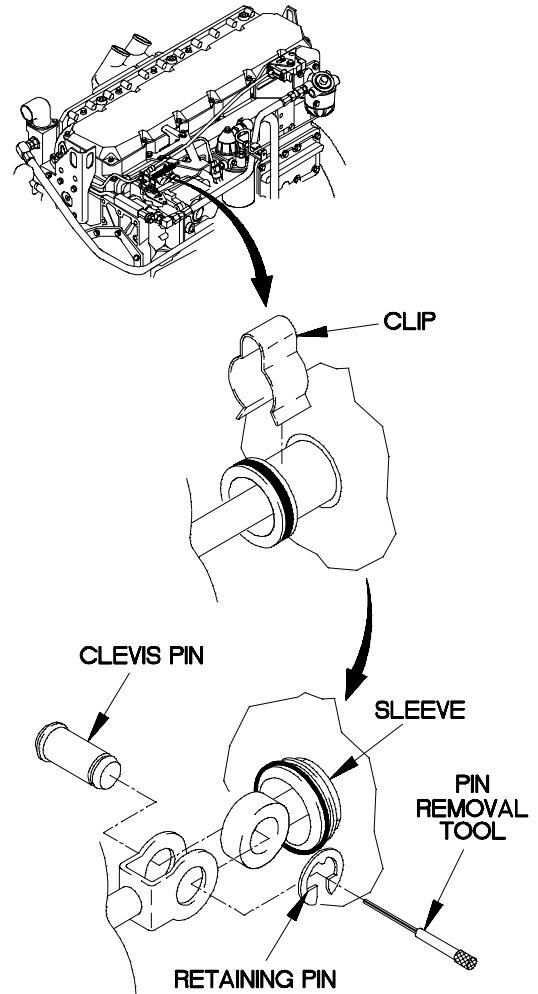
— | Perform fuel injector synchronization (para 4-3).

a4. ENGINE OVERSPEEDS ON START	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) Tool Kit, Intl Comb Eng (TM 9-2320-366-20) Wrench, Torque, 0-60 N-m (Item 96, Appendix B)

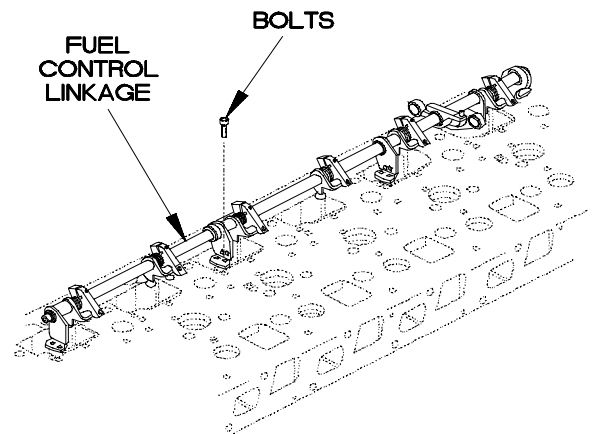


FUEL CONTROL LINKAGE TEST

- (1) Raise cab (TM 9-2320-366-10-1).
- (2) Remove valve cover (TM 9-2320-366-20-3).
- (3) Remove rocker arms (para 3-12).
- (4) Remove clip from fuel control linkage.
- (5) Slide sleeve, using soft jawed pliers, into cylinder head.
- (6) Remove retaining ring and clevis pin, using pin removal tool.
- (7) Check fuel control linkage for smooth operation.
- (8) If fuel control linkage still appears to be binding, remove fuel injectors (para 4-2).
- (9) With fuel injectors compressed, check fuel injector racks for smooth operation.
- (10) If fuel injector racks are sticky, fuel injector is faulty.
- (11) Check fuel control linkage for smooth operation.
- (12) If still binding, loosen four bolts holding fuel control linkage to cylinder head.
- (13) Operate fuel control linkage by hand.
- (14) Tighten two outer bolts in fuel control linkage to 30 lb-in. (3.5 N-m).
- (15) Tighten two inner bolts in fuel control linkage to 30 lb-in. (3.5 N-m). If fuel control linkage is still binding, replace fuel control linkage (para 4-7).
- (16) Install fuel injectors (para 4-2).
- (17) Install clevis pin and retaining ring using pin insertion tool.
- (18) Slide sleeve out of cylinder head and install clip.
- (19) Install rocker arms (para 3-12).
- (20) Install valve cover (TM 9-2320-366-20-3).
- (21) Lower cab (TM 9-2320-366-10-1).



YBA04011



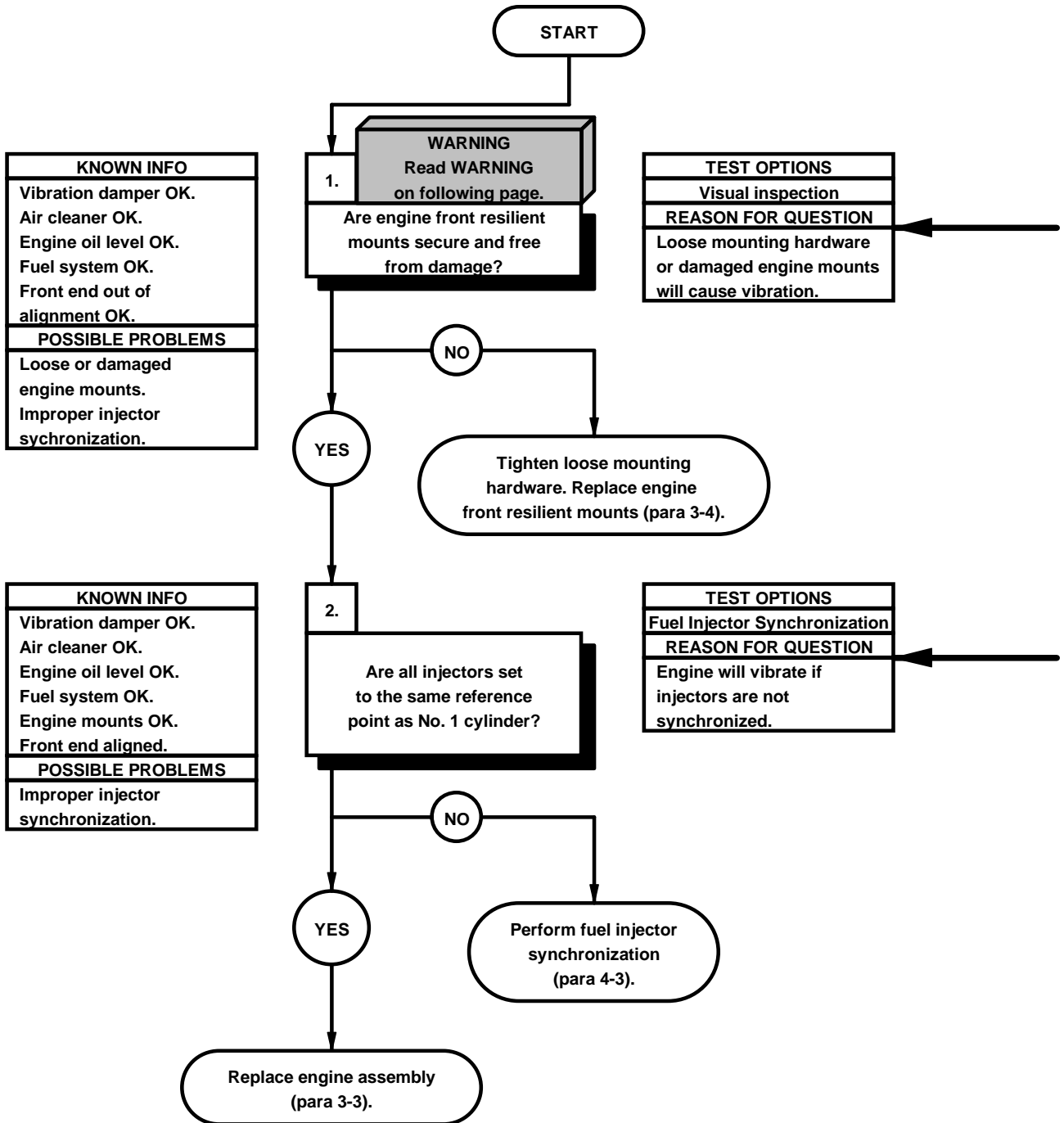
YBA04021

a5. TOO MUCH VIBRATION IN ENGINE

INITIAL SETUP

Equipment Conditions
 Engine shut down (TM 9-2320-366-10-1).

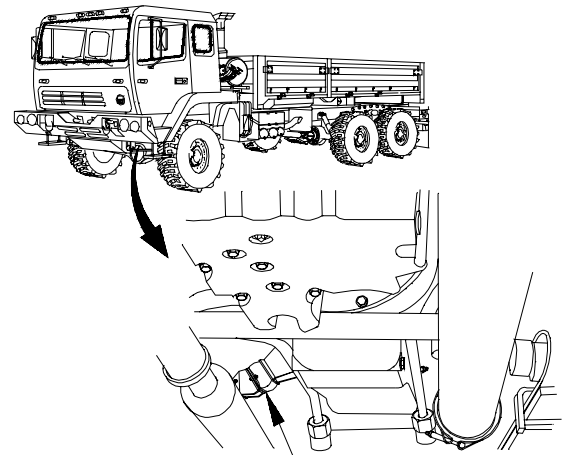
Tools and Special Tools
 Tool Kit, Genl Mech (Item 78, Appendix B)
 Tool Kit, Intl Comb Eng (TM 9-2320-366-20)
 Wrench, Torque, 0-60 N-m (Item96, Appendix B)



WARNING

Ensure engine is cool before performing troubleshooting. Failure to comply may result in severe burns.

Tighten loose mounting hardware. Replace damaged engine front resilient mounts (para 3-4).



**ENGINE FRONT
RESILIENT MOUNT**

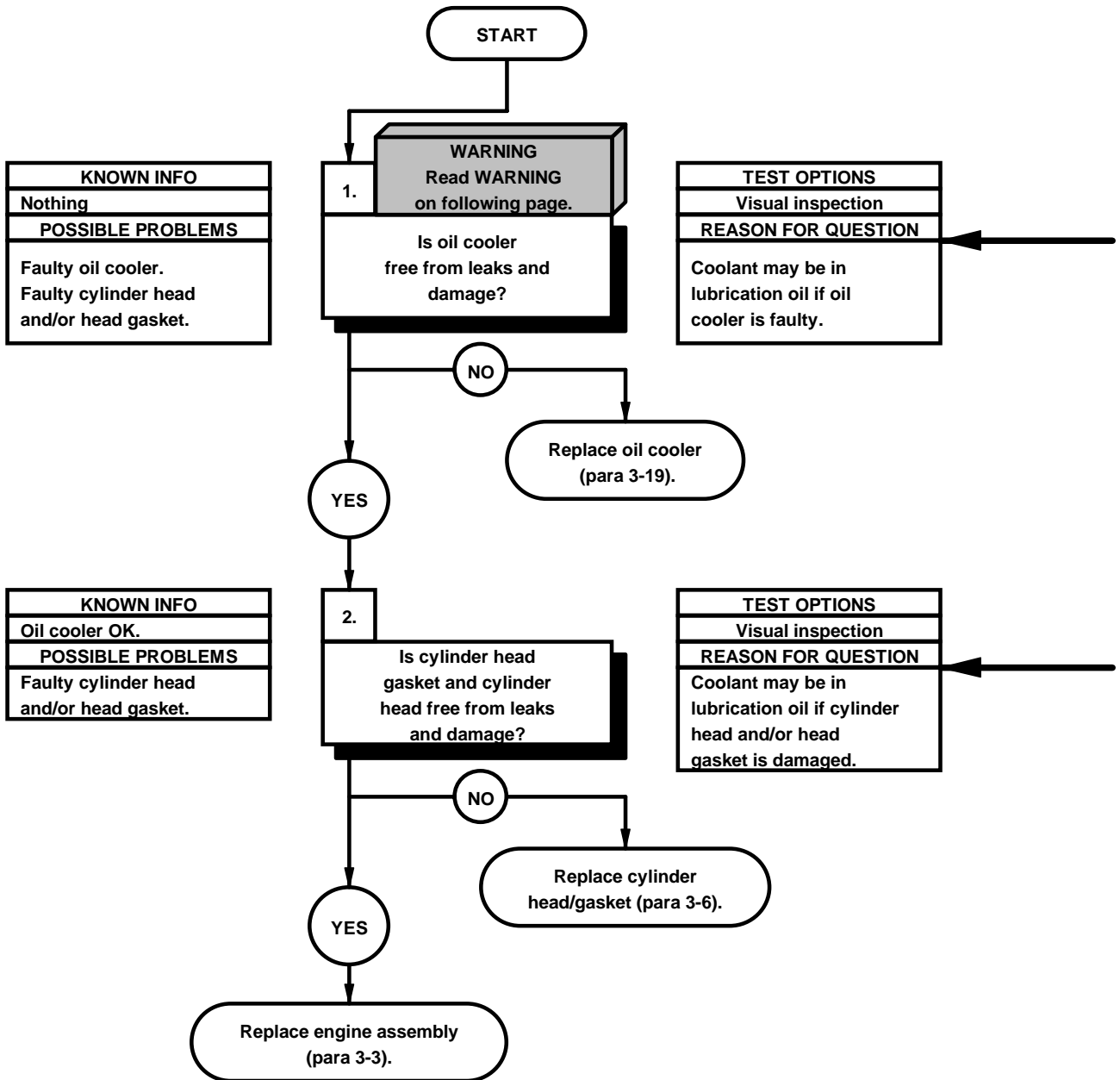
62A0501A

NOTE

Perform Engine Troubleshooting (a11. Engine Starts But Misfires, Runs Rough, or Lacks Power) before performing injector synchronization.

Perform fuel injector synchronization (para 4-3).

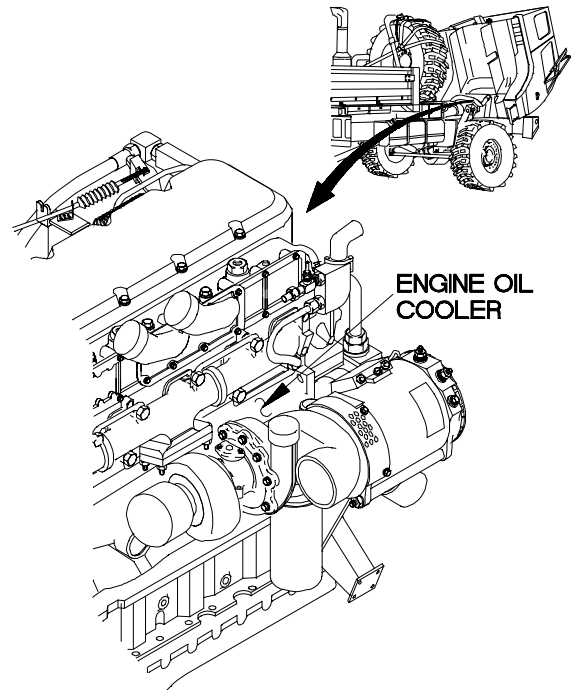
a6. COOLANT IN ENGINE OIL	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) Goggles, Industrial (Item 28, Appendix B)



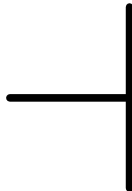
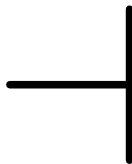
WARNING

Ensure engine is cool before performing troubleshooting. Failure to comply may result in severe burns.

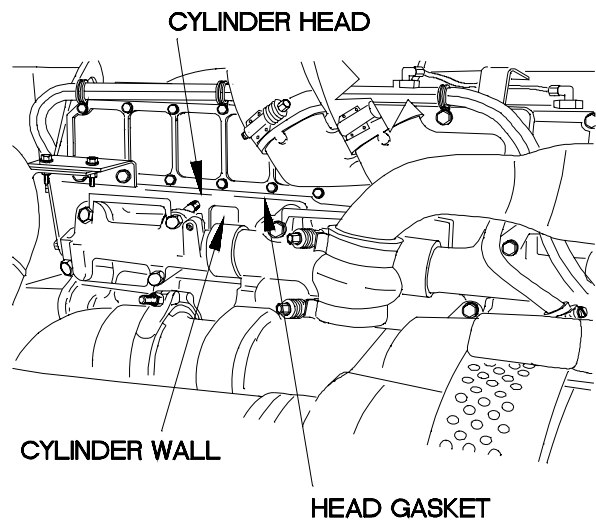
- (1) Raise cab (TM 9-2320-366-10-1).
- (2) Check oil cooler for obvious signs of damage and leakage.



62A0601A

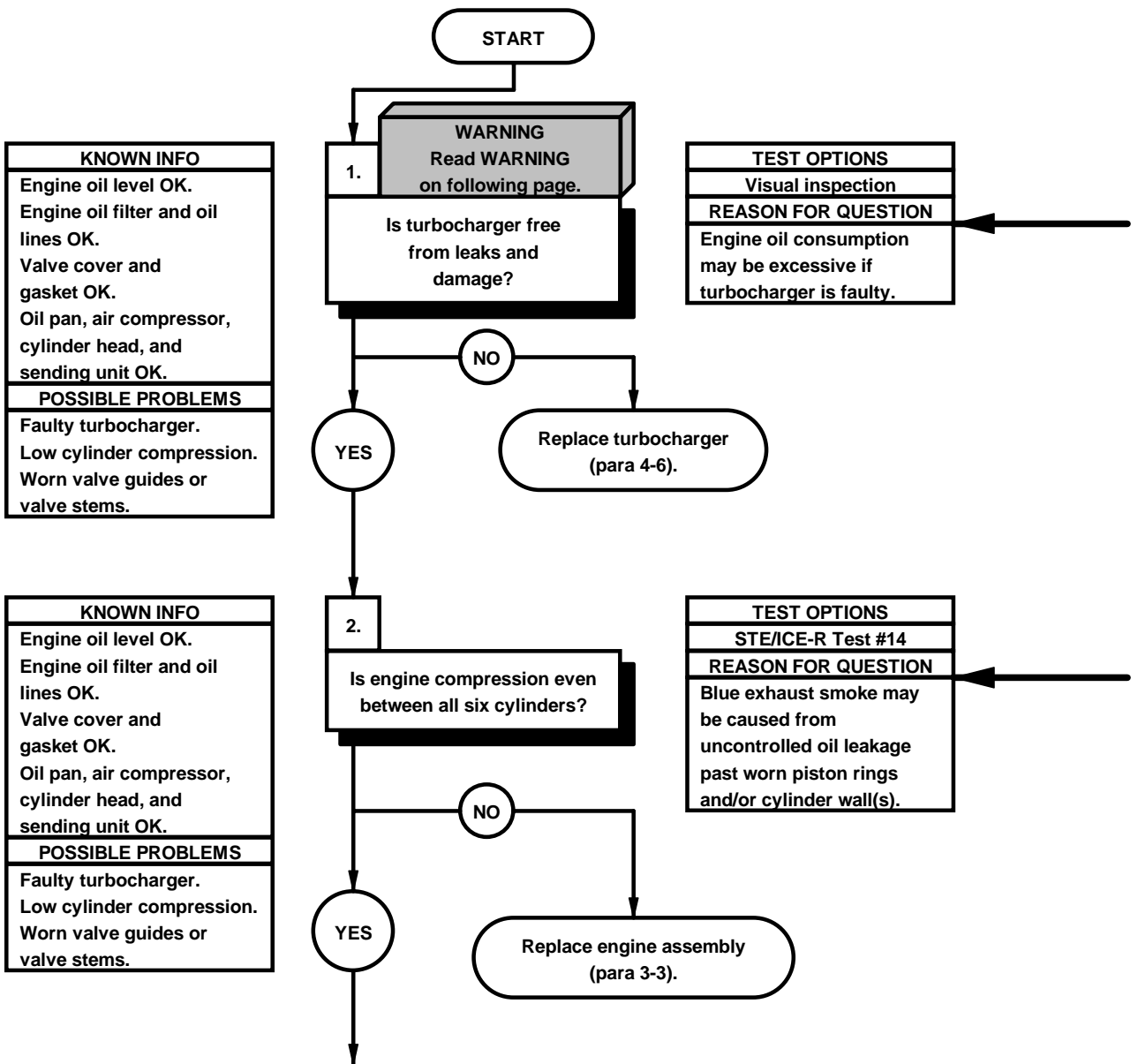


- (1) Remove cylinder head (para 3-6).
- (2) Check cylinder head, cylinder walls, and head gasket surface of cylinder block for cracks.
- (3) Install cylinder head/head gasket (para 3-6).
- (4) Lower cab (TM 9-2320-366-10-1).



62A0602-

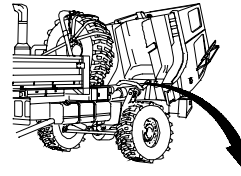
a7. EXCESSIVE ENGINE OIL CONSUMPTION	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) STE/ICE-R (Item 70, Appendix B) Goggles, Industrial (Item 28, Appendix B)
Reference TM 9-491-571-12&P	



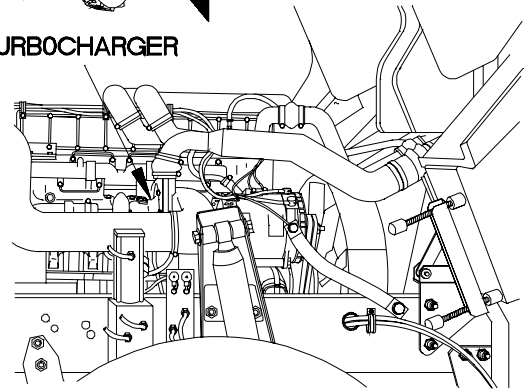
WARNING

Ensure engine is cool before performing troubleshooting. Failure to comply may result in severe burns.

- (1) Raise cab (TM 9-2320-366-10-1).
- (2) Check turbocharger for obvious signs of damage and oil leakage.



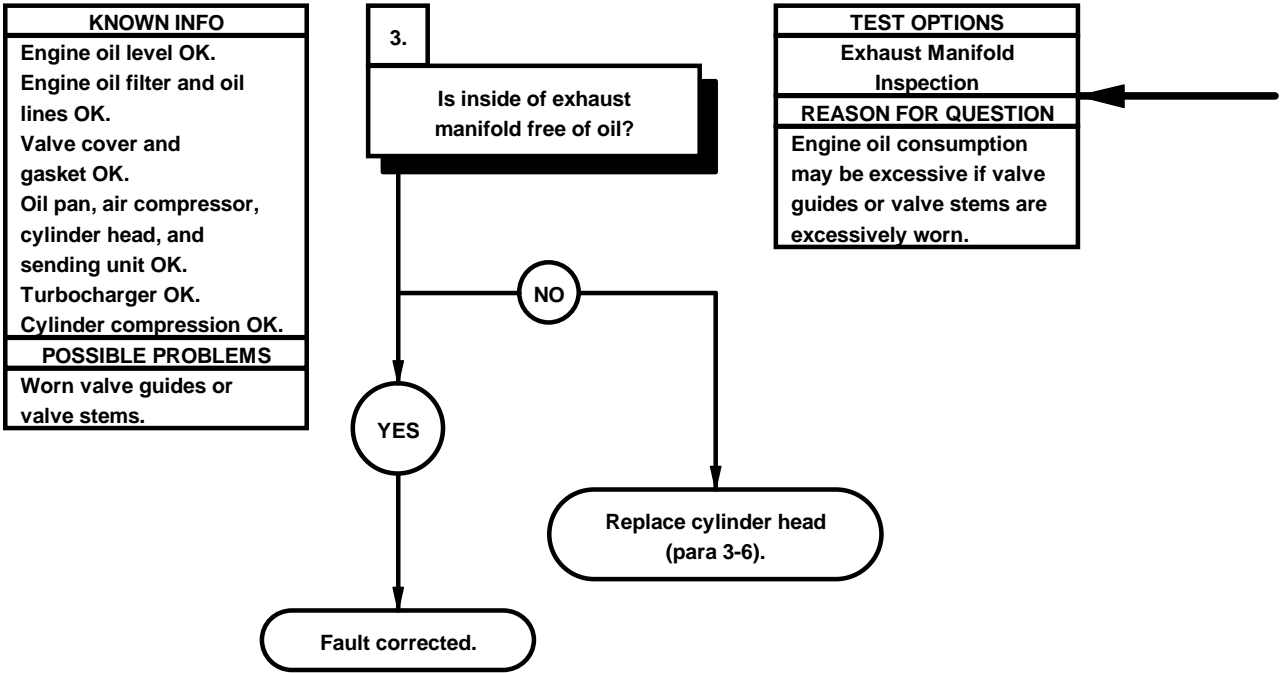
TURBOCHARGER



62A0701A

- Perform STE/ICE-R test #14.

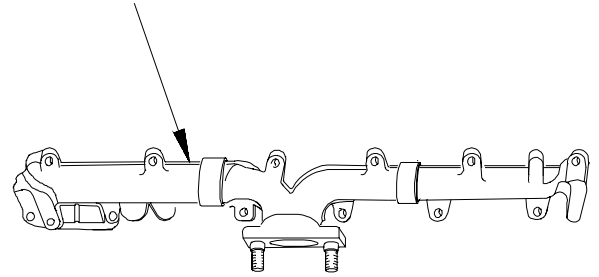
a7. EXCESSIVE ENGINE OIL CONSUMPTION (CONT)



TUBROCHARGER OIL LEAKAGE INSPECTION

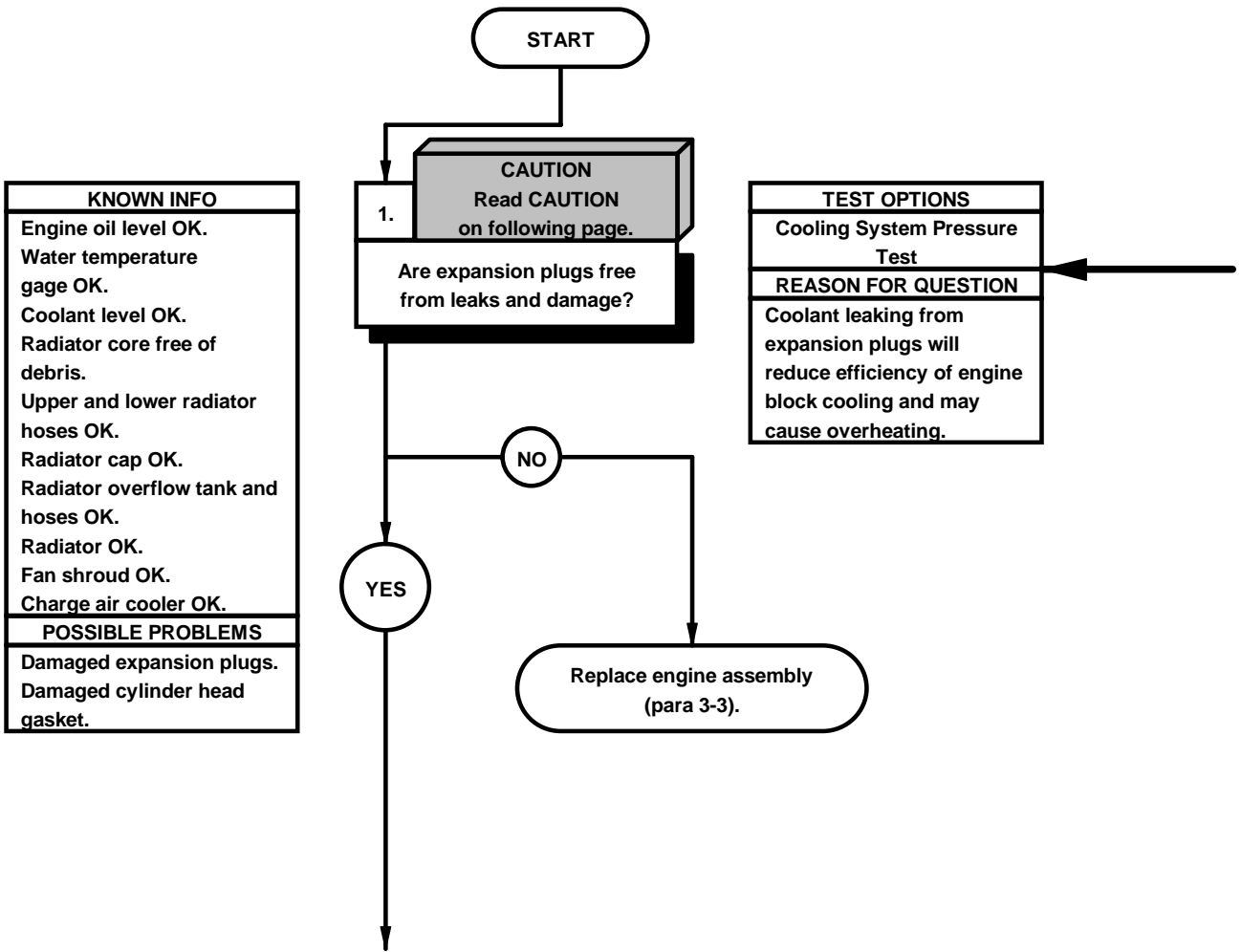
- (1) Remove exhaust manifold (para 3-23).
- (2) Check inside of exhaust manifold for oil.
- (3) Install exhaust manifold (para 3-23).
- (4) Lower cab (TM 9-2320-366-10-1).

EXHAUST MANIFOLD



62A0702A

a8. ENGINE OVERHEATS	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1). Cab raised (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) Adapter, Radiator (TM 9-2320-366-20) Pressure Tester, Radiator (Item 49, Appendix B)



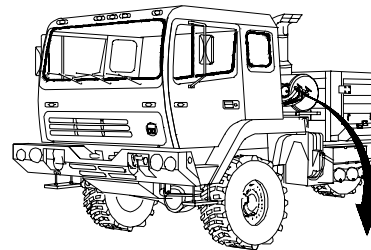
COOLING SYSTEM PRESSURE TEST

- (1) Remove radiator cap from radiator overflow tank.
- (2) Install adapter on radiator overflow tank.
- (3) Install pressure tester on adapter.

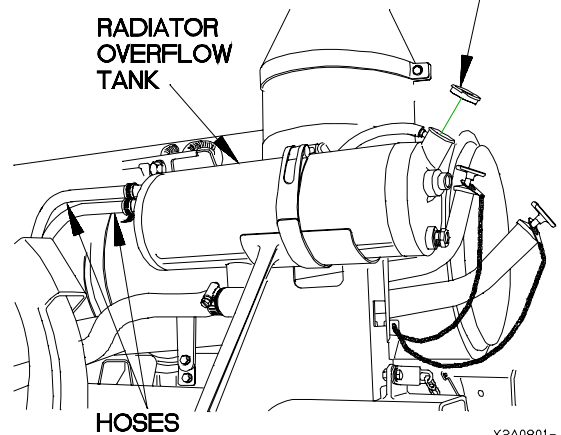
CAUTION

Do not apply pressure over 10 psi (69 kPa). Failure to comply may result in damage to cooling system.

- (4) Pressurize cooling system to 10 psi (69 kPa) and check cylinder head for leaks.
- (5) Release pressure and remove pressure tester from adapter.
- (6) Remove adapter from radiator overflow tank.
- (7) Install radiator cap on radiator overflow tank.



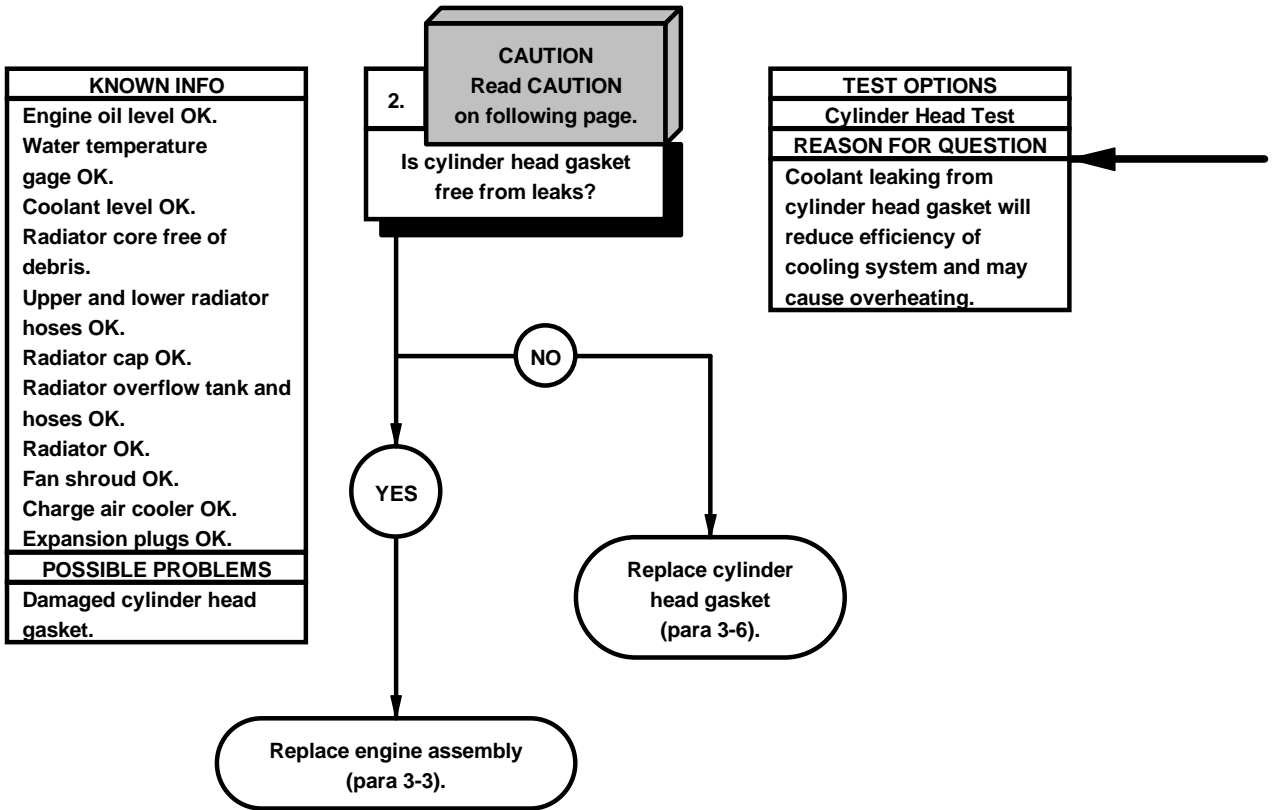
RADIATOR CAP



HOSES

Y2A0801-

a8. ENGINE OVERHEATS (CONT)



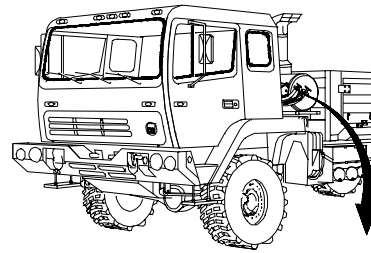
COOLING SYSTEM PRESSURE TEST

- (1) Remove radiator cap from radiator overflow tank.
- (2) Install adapter on radiator overflow tank.
- (3) Install pressure tester on adapter.

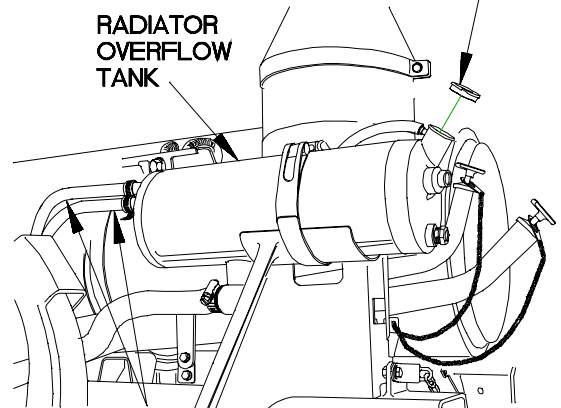
CAUTION

Do not apply pressure over 10 psi (69 kPa). Failure to comply may result in damage to cooling system.

- (4) Pressurize cooling system to 10 psi (69 kPa) and check cylinder head for leaks.
- (5) Release pressure and remove pressure tester from adapter.
- (6) Remove adapter from radiator overflow tank.
- (7) Install radiator cap on radiator overflow tank.
- (8) Lower cab (TM 9-2320-366-10-1).

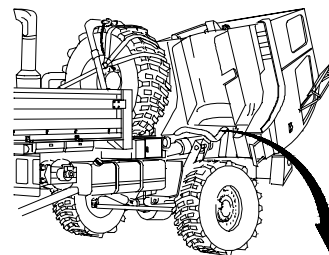


RADIATOR CAP

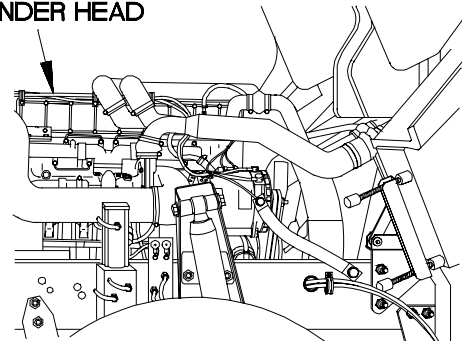


HOSES

Y2A0801-

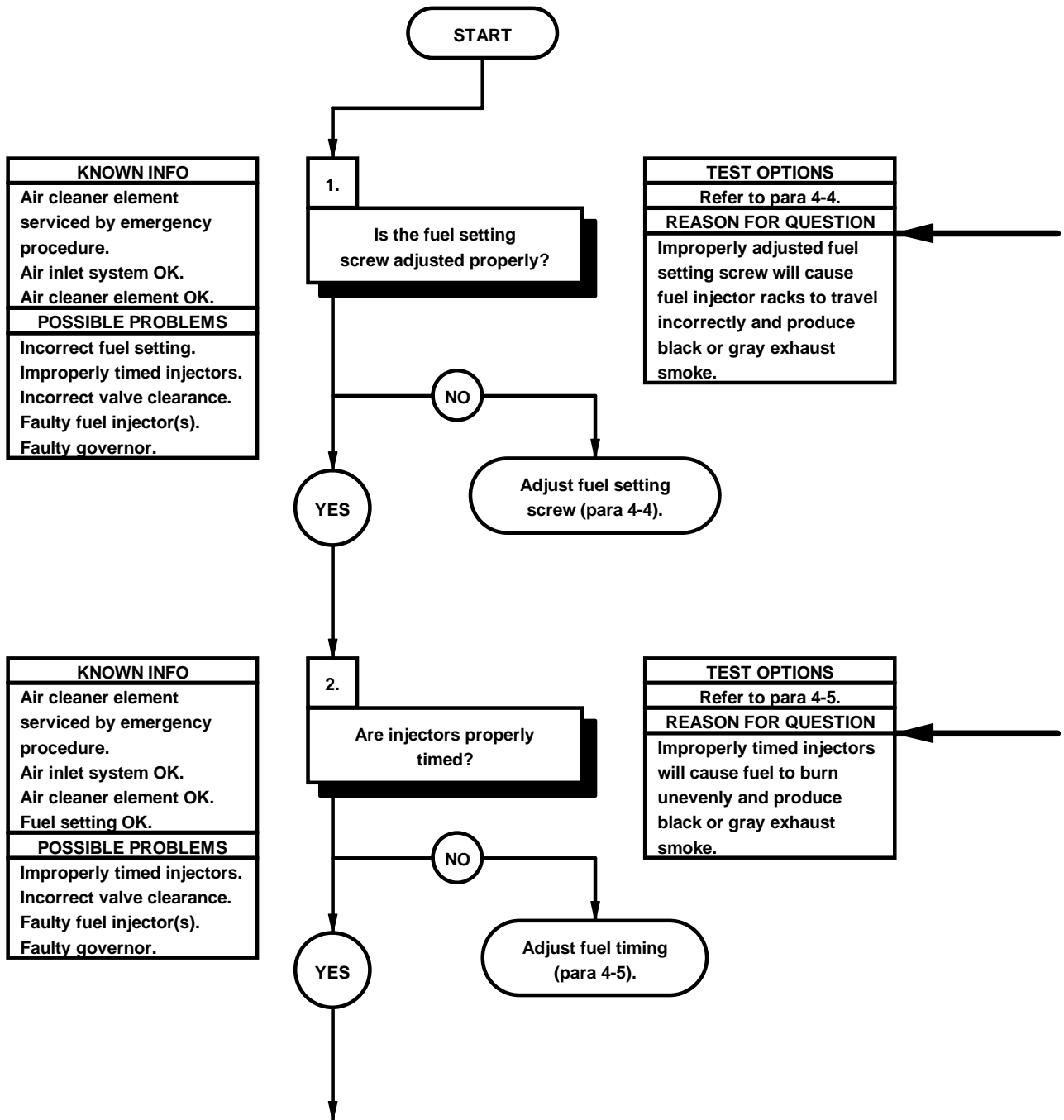


CYLINDER HEAD



62A0802A

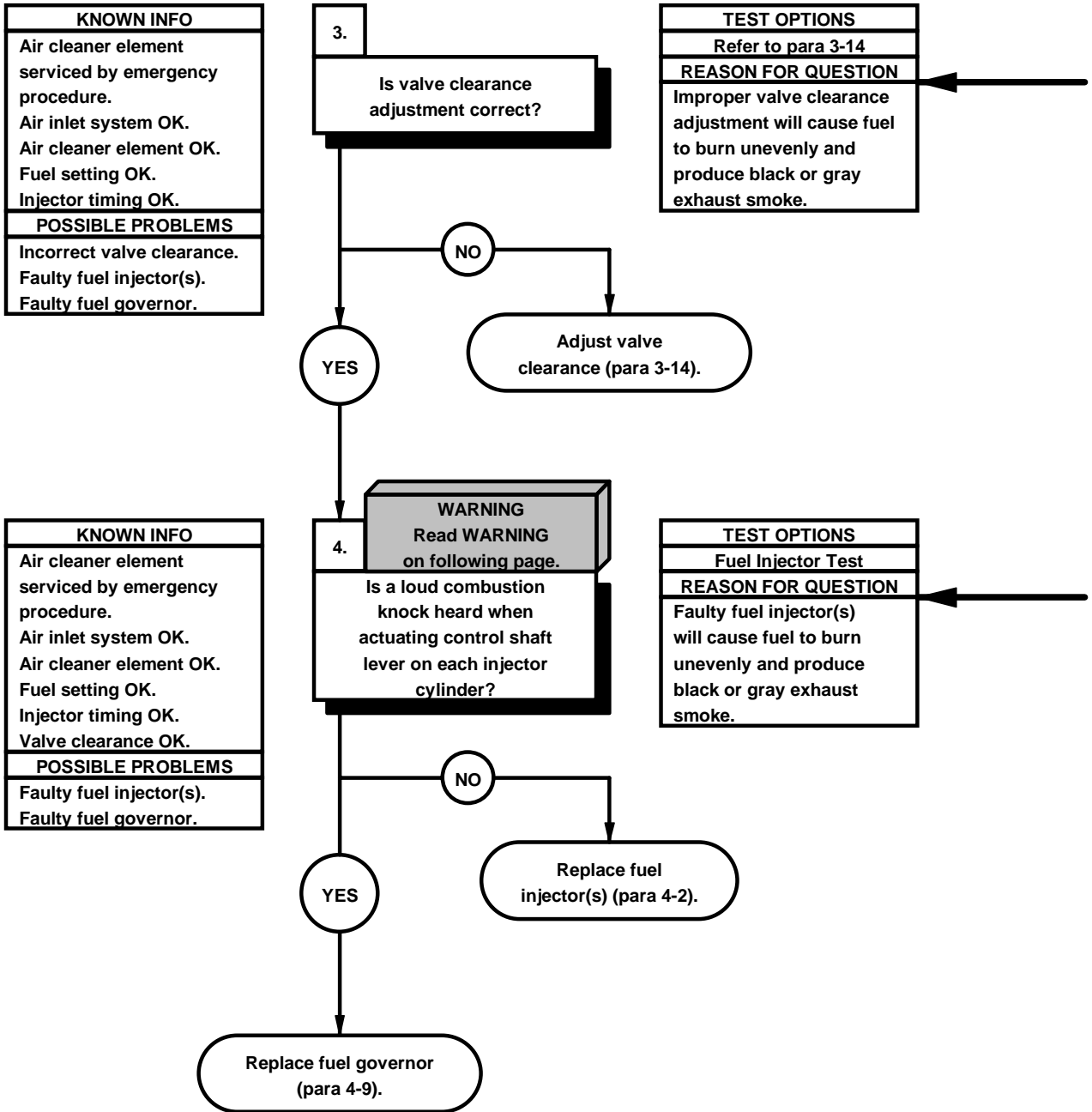
a9. EXCESSIVE BLACK OR GRAY EXHAUST SMOKE FROM ENGINE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1). Cab raised (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) Tool Kit, Intl Comb Eng (TM 9-2320-366-20) Wrench, Torque, 0-60 N-m (Item 96, Appendix B)
Personnel Required (2)	



— | Refer to para 4-4 to adjust fuel setting screw.

— | Refer to para 4-5 for fuel timing checks.

a9. EXCESSIVE BLACK OR GRAY EXHAUST SMOKE FROM ENGINE (CONT)



Refer to para 3-14 to adjust valve clearance.

FUEL INJECTOR TEST

- (1) Remove valve cover (TM 9-2320-366-20-3).

WARNING

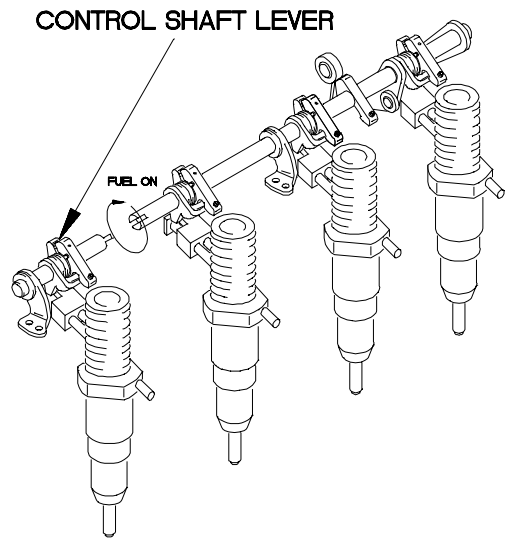
Use extreme care when opening cab door with cab raised. Failure to comply may cause injury to personnel or damage to equipment.

- (2) Open cab door.
- (3) Start engine (TM 9-2320-366-10-1).

NOTE

Actuating the control shaft lever places the injector in the Fuel On position for a few seconds. This causes excess fuel to be injected into that particular cylinder, causing a loud combustion knock.

- (4) Actuate No. 1 cylinder control shaft lever.
- (5) If actuating fuel injector does not result in a loud combustion knock, fuel injector is faulty.
- (6) Repeat step (5) for remaining injectors.
- (7) Shut down engine (TM 9-2320-366-10-1).
- (8) Close cab door.
- (9) Install valve cover (TM 9-2320-366-20-3).
- (10) Lower cab (TM 9-2320-366-10-1).



Y2A0901-

a10. WHITE EXHAUST SMOKE FROM ENGINE

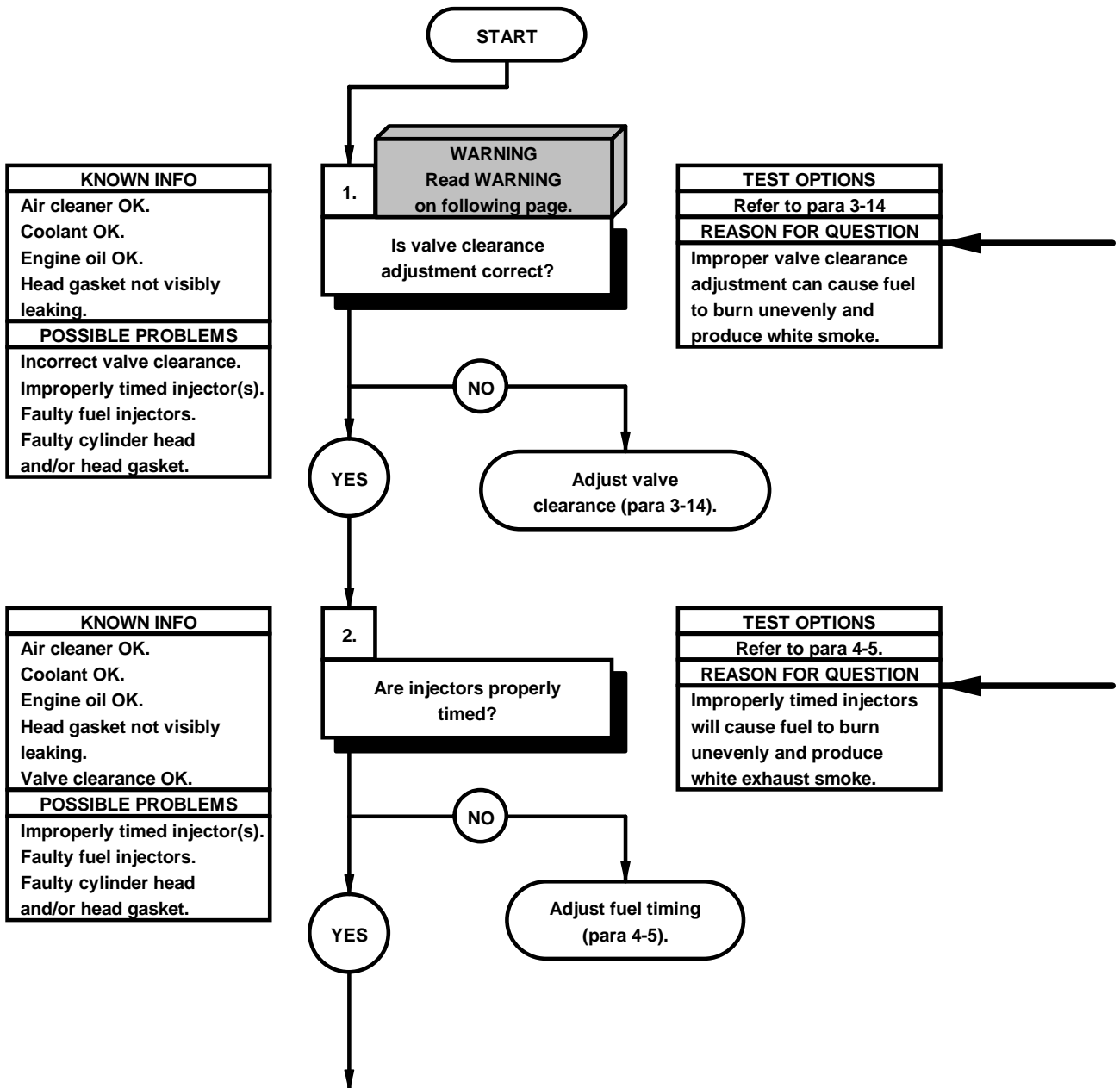
INITIAL SETUP

Equipment Conditions

Engine shut down (TM 9-2320-366-10-1).
Cab raised (TM 9-2320-366-10-1).

Tools and Special Tools

Tool Kit, Genl Mech (Item 78, Appendix B)
Adapter, Radiator (TM 9-2320-366-20)
Pressure Tester, Radiator (Item 49, Appendix B)
Tool Kit, Intl Comb Eng (TM 9-2320-366-20)
Wrench, Torque, 0-60 N-m (Item 96, Appendix B)



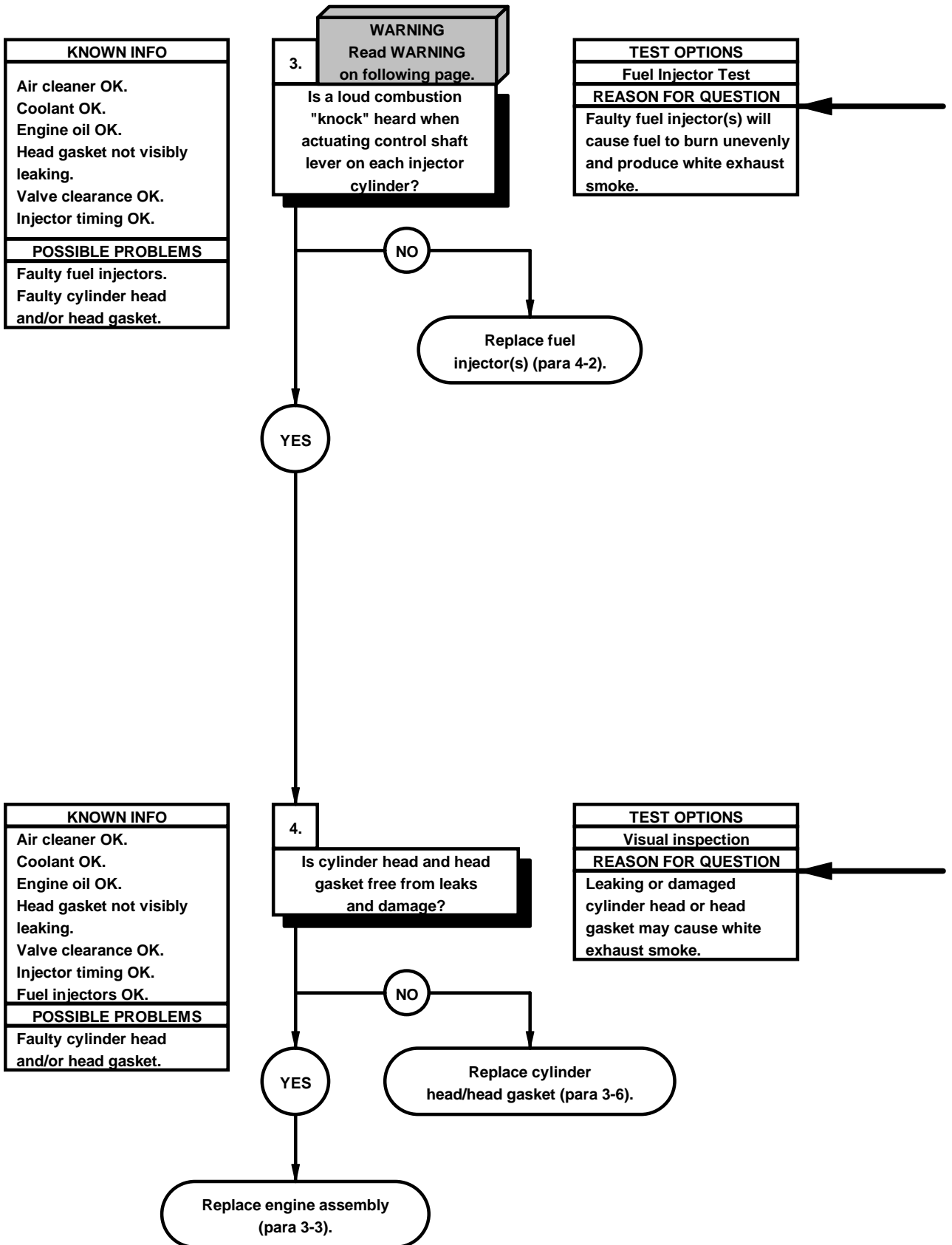
WARNING

Ensure engine is cool before performing troubleshooting. Failure to comply may result in severe burns.

— | Refer to para 3-14 to adjust valve clearance.

— | Refer to para 4-5 for fuel timing checks.

a10. WHITE EXHAUST SMOKE FROM ENGINE (CONT)



NOTE

Perform Engine Troubleshooting (a11. Engine Starts But Misfires, Runs Rough, or Lacks Power) before performing fuel injector test.

FUEL INJECTOR TEST

- (1) Remove valve cover (TM 9-2320-366-20-3).

WARNING

Use extreme care when opening cab door with cab raised. Failure to comply may cause injury to personnel or damage to equipment.

- (2) Open cab door.
- (3) Start engine (TM 9-2320-366-10-1).

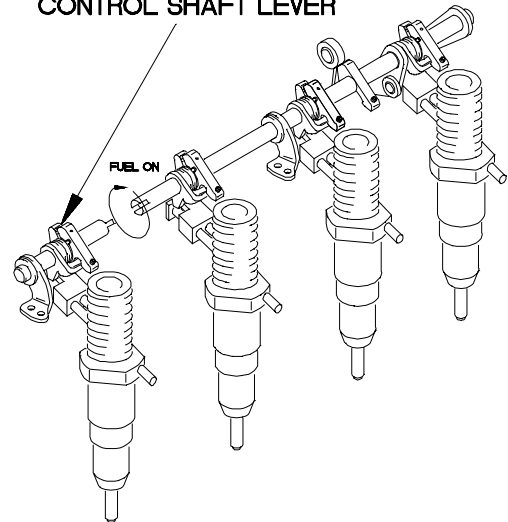
NOTE

Actuating the control shaft lever places the injector in the Fuel On position for a few seconds. This causes excess fuel to be injected into that particular cylinder, causing a loud combustion knock.

- (4) Actuate No. 1 cylinder control shaft lever.
- (5) If actuating fuel injector does not result in a loud combustion knock, fuel injector is faulty.
- (6) Repeat step (5) for remaining injectors.
- (7) Shut down engine (TM 9-2320-366-10-1).
- (8) Close cab door.
- (9) Install valve cover (TM 9-2320-366-20-3).
- (10) Lower cab (TM 9-2320-366-10-1).

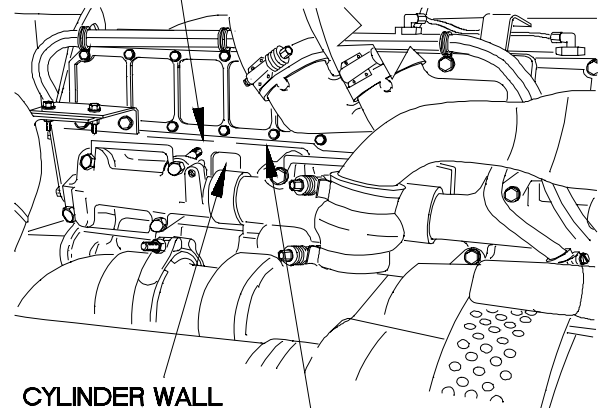
- (1) Remove cylinder head (para 3-6).
- (2) Check cylinder head, cylinder walls, and head gasket surface of cylinder block for cracks.
- (3) Install cylinder head/head gasket (para 3-6).

CONTROL SHAFT LEVER



Y2A1001-

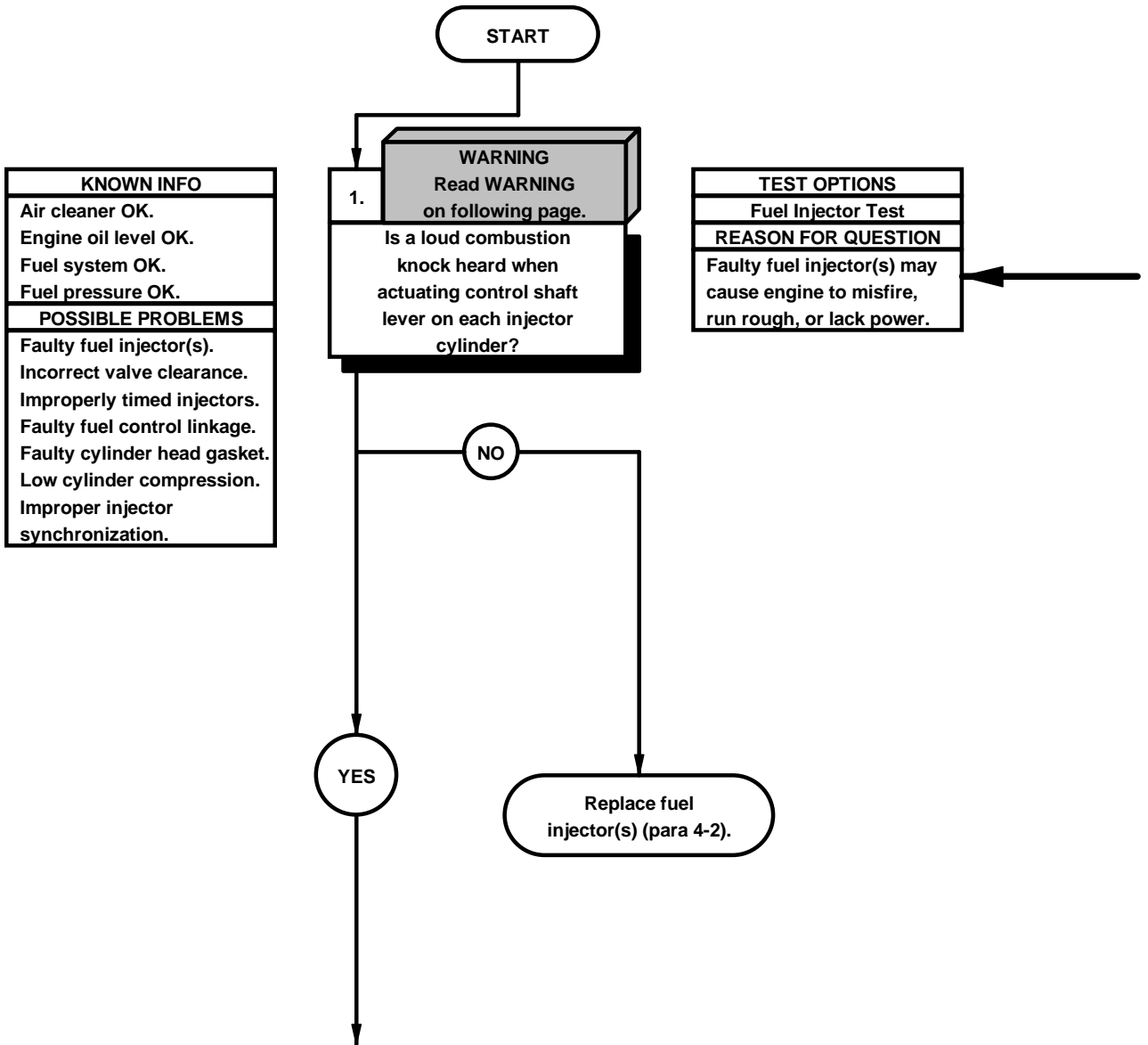
CYLINDER HEAD



HEAD GASKET

62A0602-

a11. ENGINE STARTS BUT MISFIRES, RUNS ROUGH, OR LACKS POWER	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) Wrench, Torque, 0-60 N-m (Item 96, Appendix B) STE/ICE-R (Item 70, Appendix B)
References TM 9-4910-571-12&P	Tool Kit, Intl Comb Eng (TM 9-2320-366-20) Pressure Tester, Radiator (Item 49, Appendix B) Adapter, Radiator (TM 9-2320-366-20)



FUEL INJECTOR TEST

- (1) Raise cab (TM 9-2320-366-10-1).
- (2) Remove valve cover (TM 9-2320-366-20-3).

WARNING

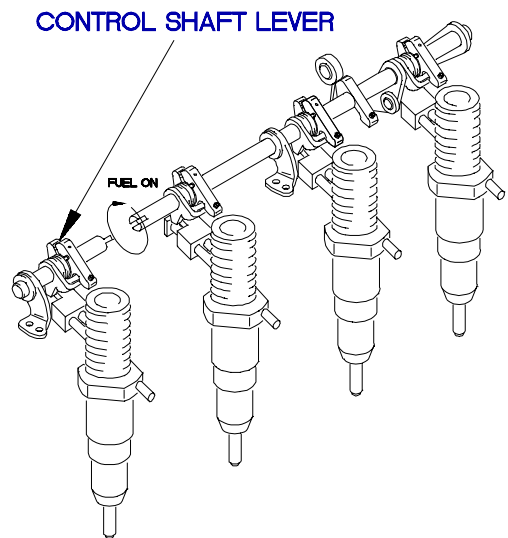
Use extreme care when opening cab door with cab raised. Failure to comply may cause injury to personnel or damage to equipment.

- (3) Open cab door.
- (4) Start engine (TM 9-2320-366-10-1).

NOTE

Actuating the control shaft lever places the injector in the Fuel On position for a few seconds. This causes excess fuel to be injected into that particular cylinder, causing a loud combustion knock.

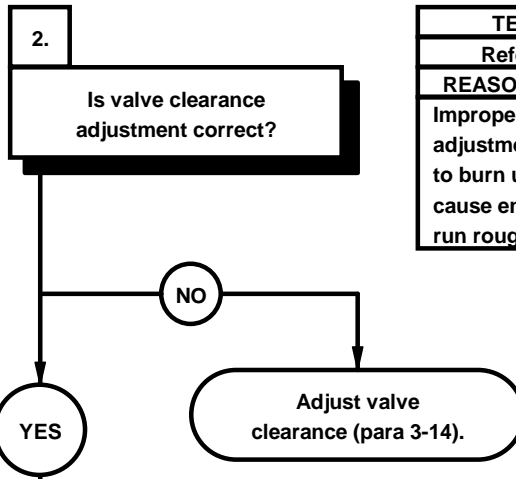
- (5) Actuate No. 1 cylinder control shaft lever.
- (6) If actuating fuel injector does not result in a loud combustion knock, fuel injector is faulty.
- (7) Repeat step (5) for remaining injectors.
- (8) Shut down engine (TM 9-2320-366-10-1).
- (9) Close cab door.
- (10) Install valve cover (TM 9-2320-366-20-3).
- (11) Lower cab (TM 9-2320-366-10-1).



Y2A1101-

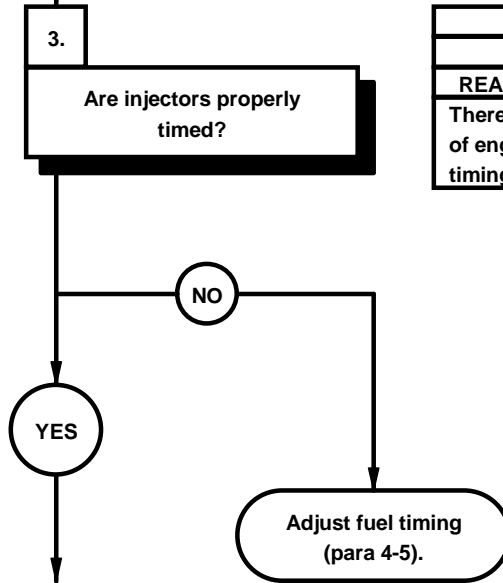
a11. ENGINE STARTS BUT MISFIRES, RUNS ROUGH, OR LACKS POWER (CONT)

KNOWN INFO
Air cleaner OK. Engine oil level OK. Fuel system OK. Fuel pressure OK. Fuel injectors OK.
POSSIBLE PROBLEMS
Incorrect valve clearance. Improperly timed injectors. Faulty fuel control linkage. Faulty cylinder head gasket. Low cylinder compression. Improper injector synchronization.



TEST OPTIONS
Refer to para 3-14
REASON FOR QUESTION
Improper valve clearance adjustment will cause fuel to burn unevenly and cause engine to misfire, run rough, or lack power.

KNOWN INFO
Air cleaner OK. Engine oil level OK. Fuel system OK. Fuel pressure OK. Fuel injectors OK. Valve clearance OK.
POSSIBLE PROBLEMS
Improperly timed injectors. Faulty fuel control linkage. Faulty cylinder head gasket. Low cylinder compression. Improper injector synchronization.



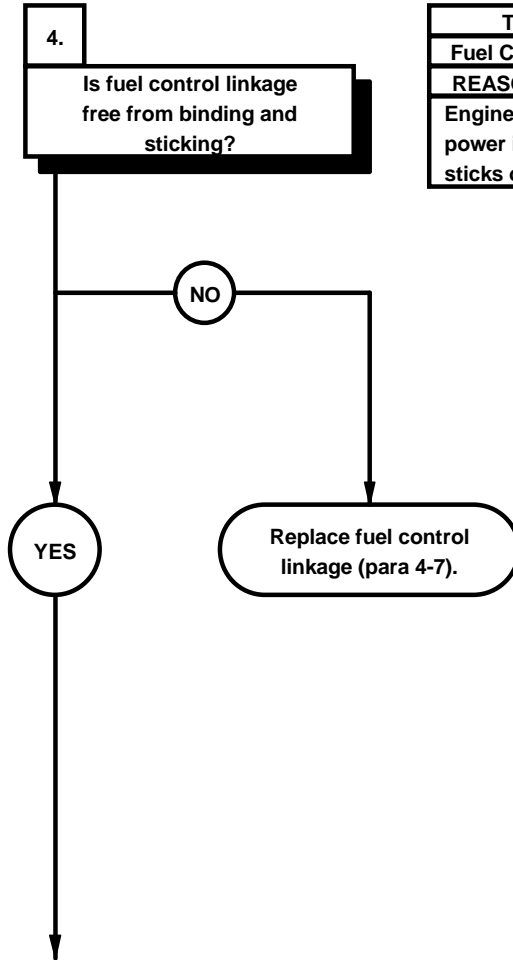
TEST OPTIONS
Refer to para 4-5
REASON FOR QUESTION
There will be a reduction of engine power if injector timing is incorrect.

— | Refer to para 3-14 to adjust valve clearance.

— | Refer to para 4-5 for fuel timing.

a11. ENGINE STARTS BUT MISFIRES, RUNS ROUGH, OR LACKS POWER (CONT)

KNOWN INFO
Air cleaner OK.
Engine oil level OK.
Fuel system OK.
Fuel pressure OK.
Fuel injectors OK.
Valve clearance OK.
Injector timing OK.
POSSIBLE PROBLEMS
Faulty fuel control linkage.
Faulty cylinder head gasket.
Low cylinder compression.
Improper injector synchronization.

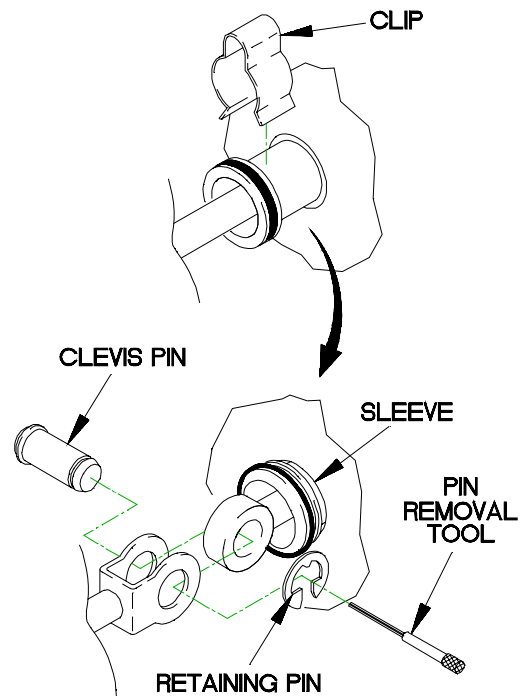
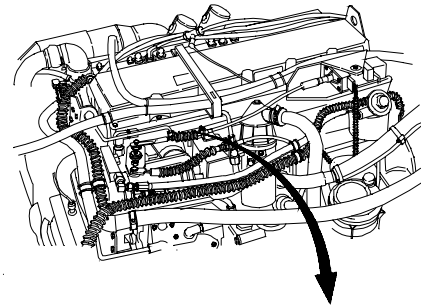


TEST OPTIONS
Fuel Control Linkage Test
REASON FOR QUESTION
Engine will not develop full power if fuel control linkage sticks or binds.

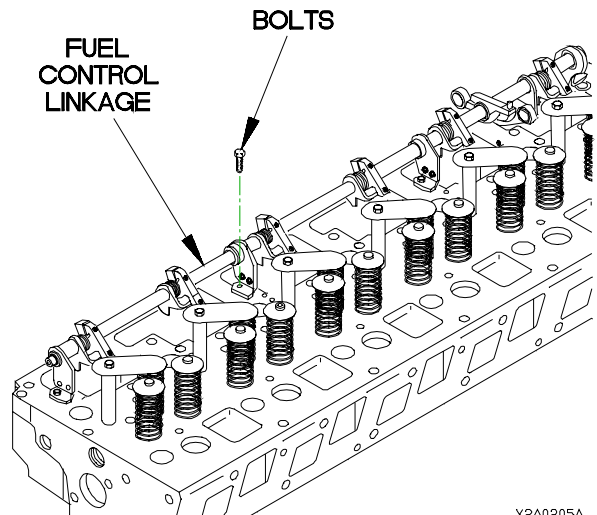


FUEL CONTROL LINKAGE TEST

- (1) Raise cab (TM 9-2320-366-10-1).
- (2) Remove valve cover (TM 9-2320-366-20-3).
- (3) Remove rocker arms (para 3-12).
- (4) Remove clip from fuel control linkage.
- (5) Slide sleeve, using soft jawed pliers, into cylinder head.
- (6) Remove retaining ring and clevis pin, using pin removal tool.
- (7) Check fuel control linkage for smooth operation.
- (8) If fuel control linkage still appears to be binding, remove fuel injectors (para 4-2).
- (9) With fuel injectors compressed, check fuel injector racks for smooth operation.
- (10) If fuel injector racks are sticky, fuel injector is faulty.
- (11) Check fuel control linkage for smooth operation.
- (12) If still binding, loosen four bolts holding fuel control linkage to cylinder head.
- (13) Operate fuel control linkage by hand.
- (14) Tighten two outer bolts in fuel control linkage to 30 lb-in. (3.5 N-m).
- (15) Tighten two inner bolts in fuel control linkage to 30 lb-in. (3.5 N-m). If fuel control linkage is still binding, replace fuel control linkage (para 4-7).
- (16) Install fuel injectors (para 4-2).
- (17) Install clevis pin and retaining ring using pin insertion tool.
- (18) Slide sleeve out of cylinder head and install clip.
- (19) Install rocker arms (para 3-12).
- (20) Install valve cover (TM 9-2320-366-20-3).
- (21) Lower cab (TM 9-2320-366-10-1).

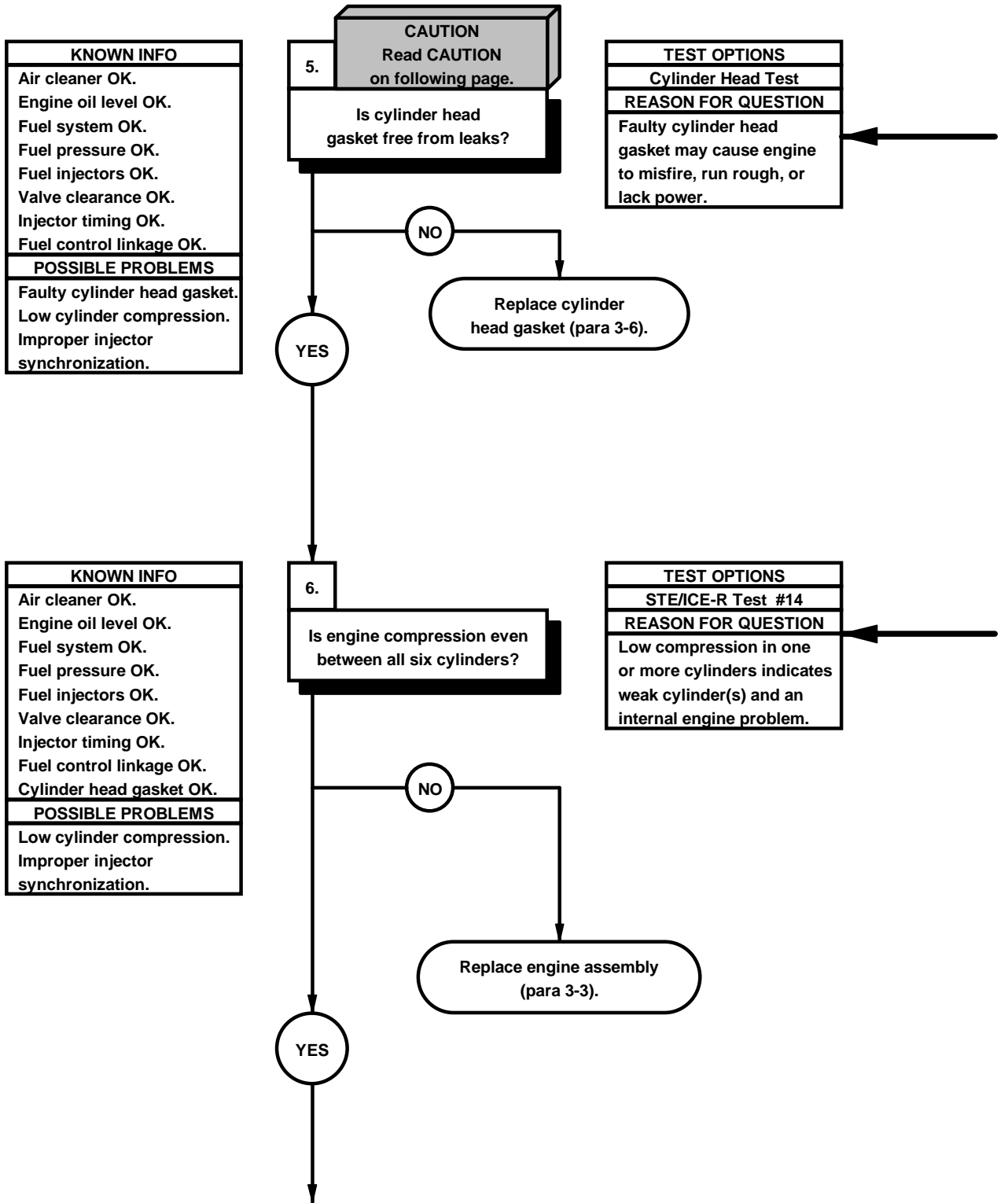


Y2A0204A



Y2A0205A

a11. ENGINE STARTS BUT MISFIRES, RUNS ROUGH, OR LACKS POWER (CONT)



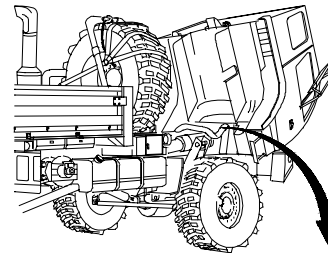
COOLING SYSTEM PRESSURE TEST

- (1) Remove radiator cap from radiator overflow tank.
- (2) Install adapter on radiator overflow tank.
- (3) Install pressure tester on adapter.
- (4) Raise cab (TM 9-2320-366-10-1).

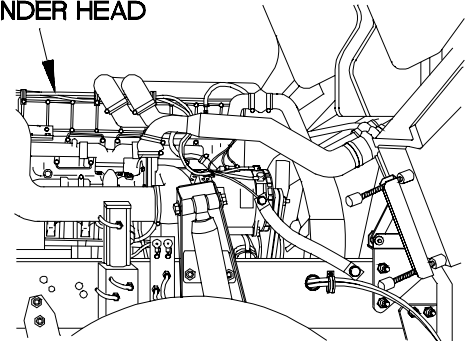
CAUTION

Do not apply pressure over 10 psi (69 kPa). Failure to comply may result in damage to cooling system.

- (5) Pressurize cooling system to 10 psi (69 kPa) and check cylinder head for leaks.
- (6) Release pressure and remove pressure tester from adapter.
- (7) Remove adapter from radiator overflow tank.
- (8) Install radiator cap on radiator overflow tank.
- (9) Lower cab (TM 9-2320-366-10-1).

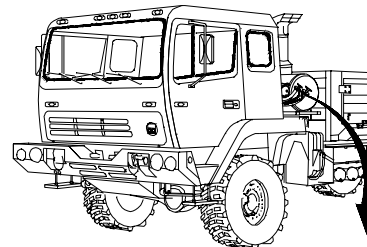


CYLINDER HEAD



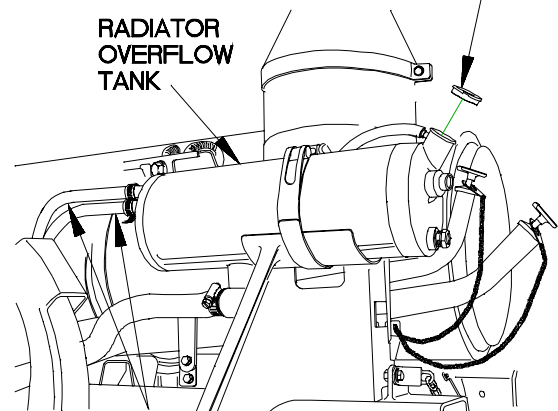
62A0802A

Perform STE/ICE-R test #14.



RADIATOR CAP

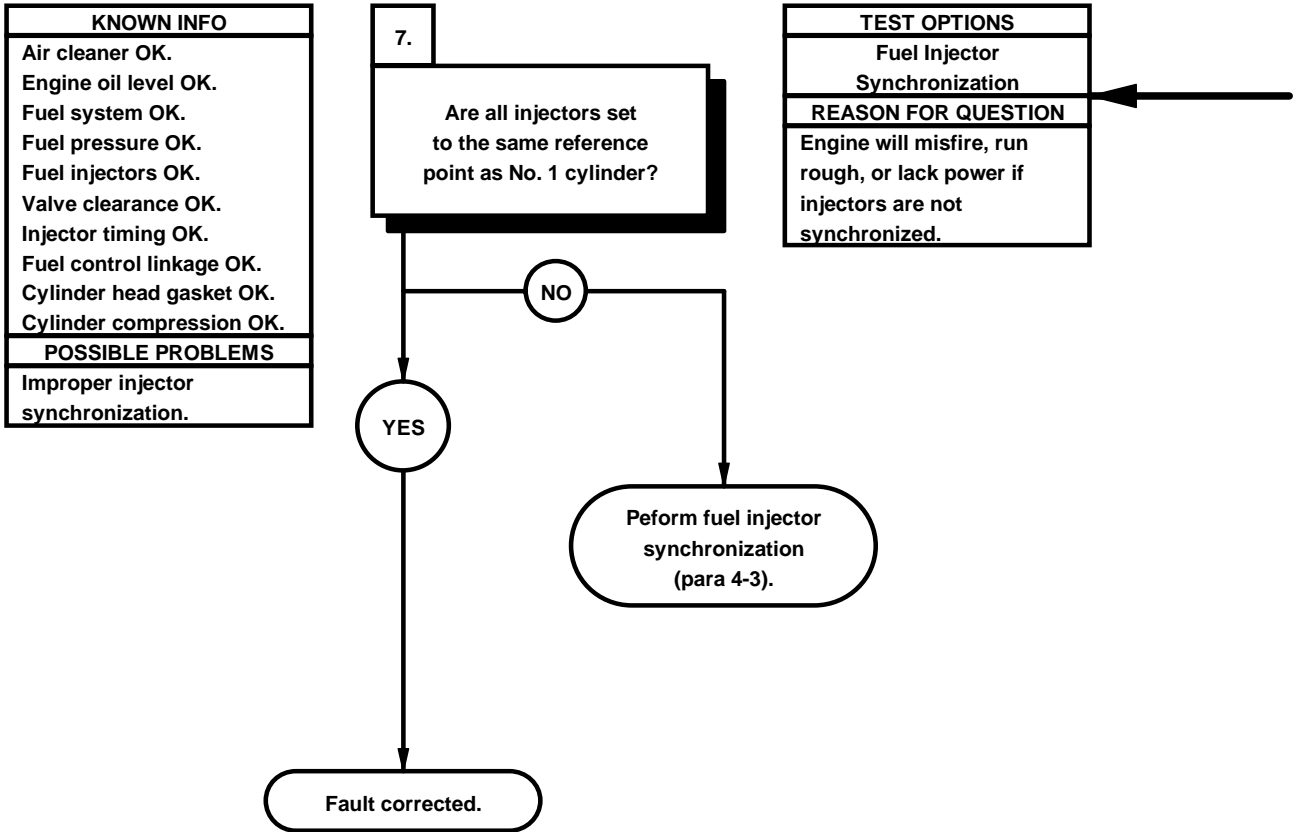
RADIATOR OVERFLOW TANK



HOSES

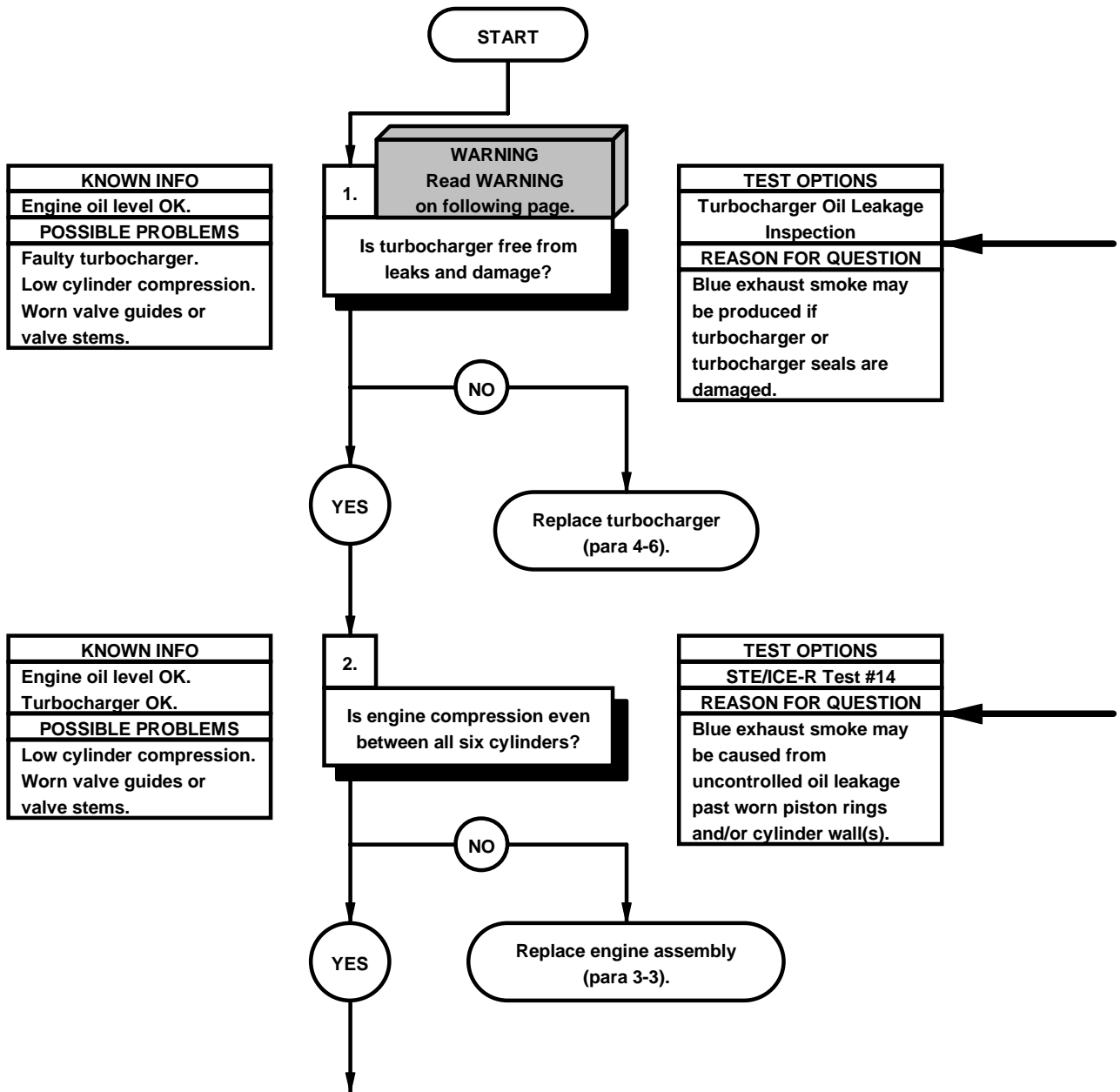
Y2A0801-

a11. ENGINE STARTS BUT MISFIRES, RUNS ROUGH, OR LACKS POWER (CONT)



— | Perform fuel injector synchronization (para 4-3).

a12. BLUE EXHAUST SMOKE FROM ENGINE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1). Cab raised (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) STE/ICE-R (Item 70, Appendix B)
References TM 9-4910-571-12&P	

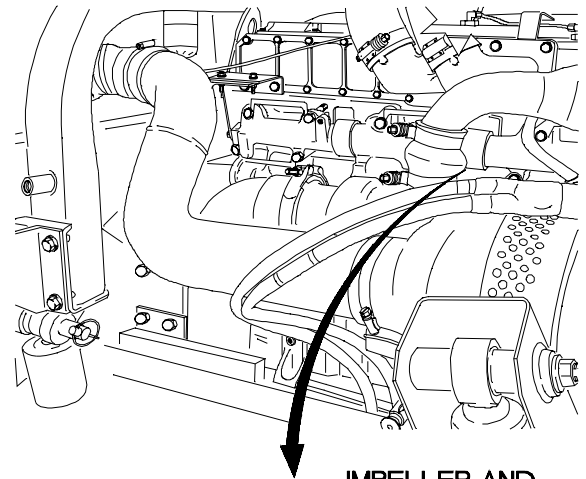


WARNING

Ensure engine is cool before performing troubleshooting. Failure to comply may result in severe burns.

TURBOCHARGER OIL LEAKAGE INSPECTION

- (1) Remove turbocharger (para 4-6).
- (2) Check oil inlet line for leakage.
- (3) Check impeller and turbine blades for oil.



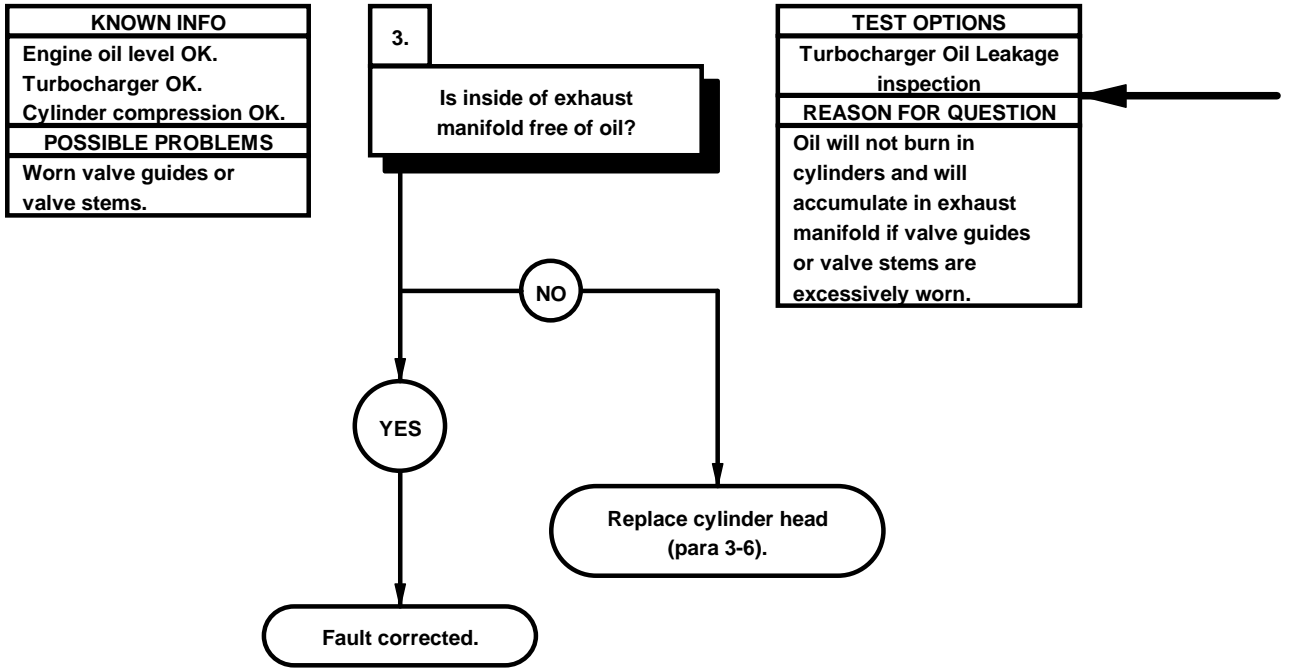
**IMPELLER AND
TURBINE BLADES**

**OIL
INLET LINE**

62A1201A

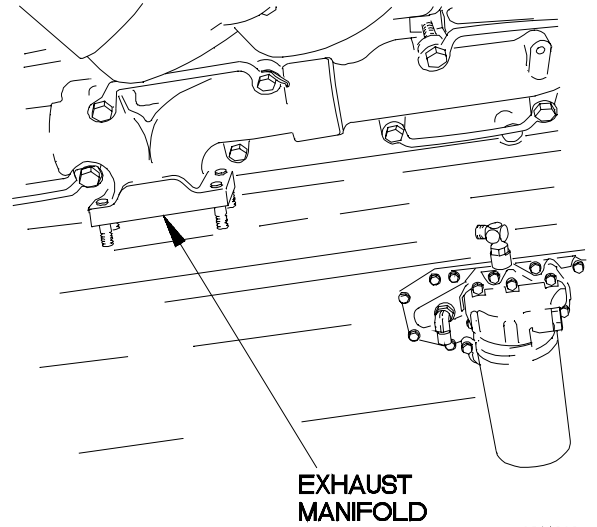
Perform STE/ICE-R test #14.

a12. BLUE EXHAUST SMOKE FROM ENGINE (CONT)



TUBROCHARGER OIL LEAKAGE INSPECTION

- (1) Check inside of exhaust manifold for oil.
- (2) Install turbocharger (para 4-6).
- (3) Lower cab (TM 9-2320-366-10-1).



62A1202-

a13. ENGINE CRANKS BUT DOES NOT START

INITIAL SETUP

Equipment Conditions

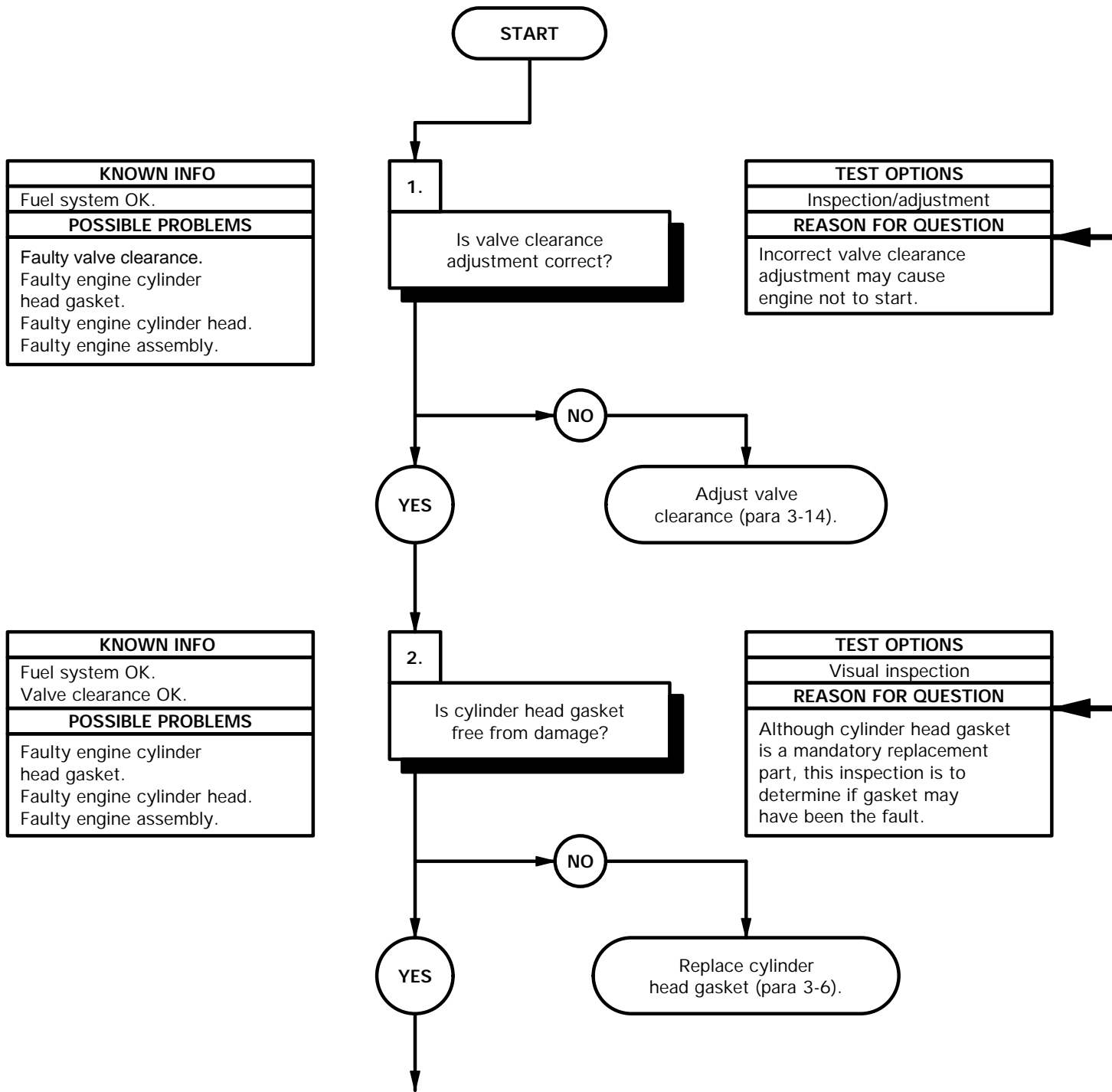
Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools

Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)

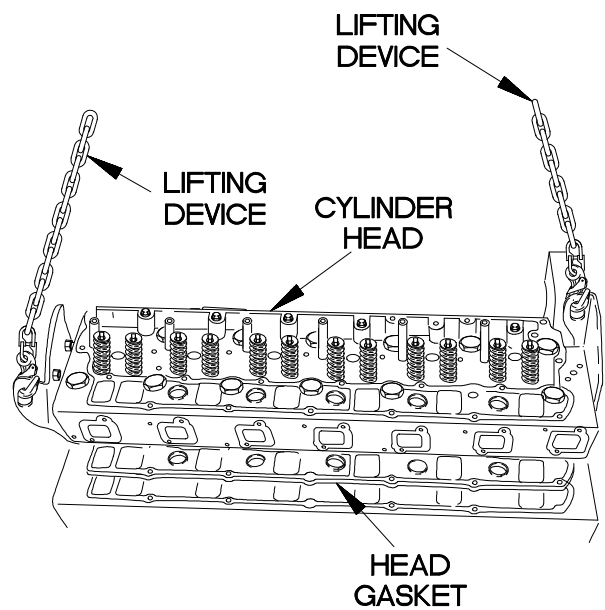
References

TM 9-4910-571-12&P



Refer to para 3-14 to adjust valve clearance.

- (1) Remove cylinder head from engine block (para 3-6).
- (2) Inspect cylinder head gasket for damage.
- (3) If cylinder head gasket is damaged, replace cylinder head gasket (para 3-6).



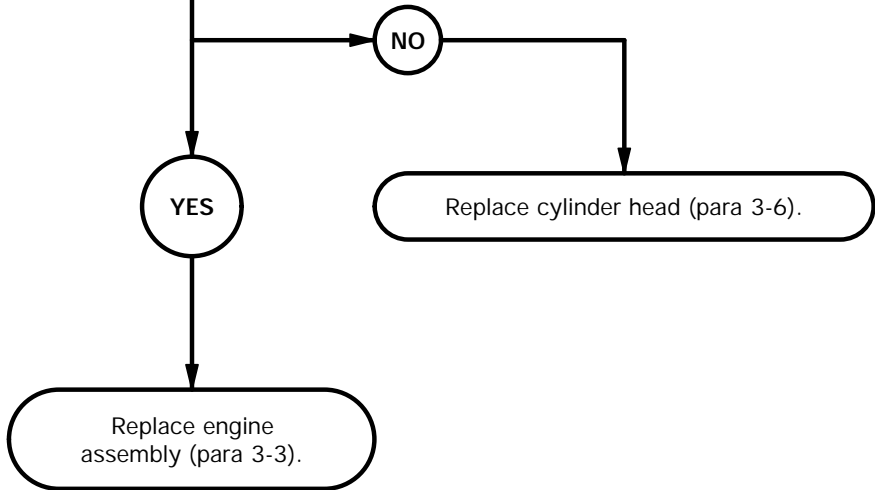
YBA1302B

a13. ENGINE CRANKS BUT DOES NOT START (CONT)

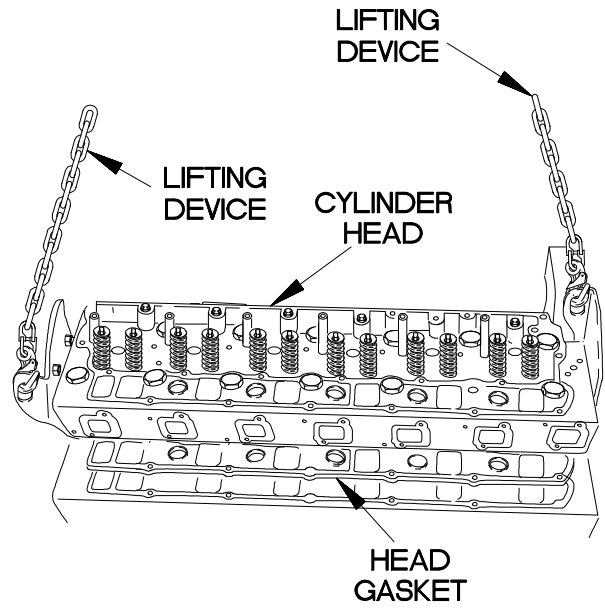
KNOWN INFO
Fuel system OK. Valve clearance OK. Engine cylinder head gasket OK.
POSSIBLE PROBLEMS
Faulty engine cylinder head. Faulty engine assembly.

3.
Is cylinder head free from damage?

TEST OPTIONS
Visual inspection
REASON FOR QUESTION
If cylinder head is damaged or cracked, cylinder head must be replaced.



- (1) Inspect cylinder head for damage or cracks.
- (2) If cylinder head is damaged or cracked, replace cylinder head (para 3-6).
- (3) If cylinder head is not damaged or cracked, replace engine assembly (para 3-3).



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a14. ENGINE DOES NOT CRANK

INITIAL SETUP

Equipment Conditions

Engine shutdown (TM 9-2320-366-10-1).
Cab raised (TM 9-2320-366-10-1).

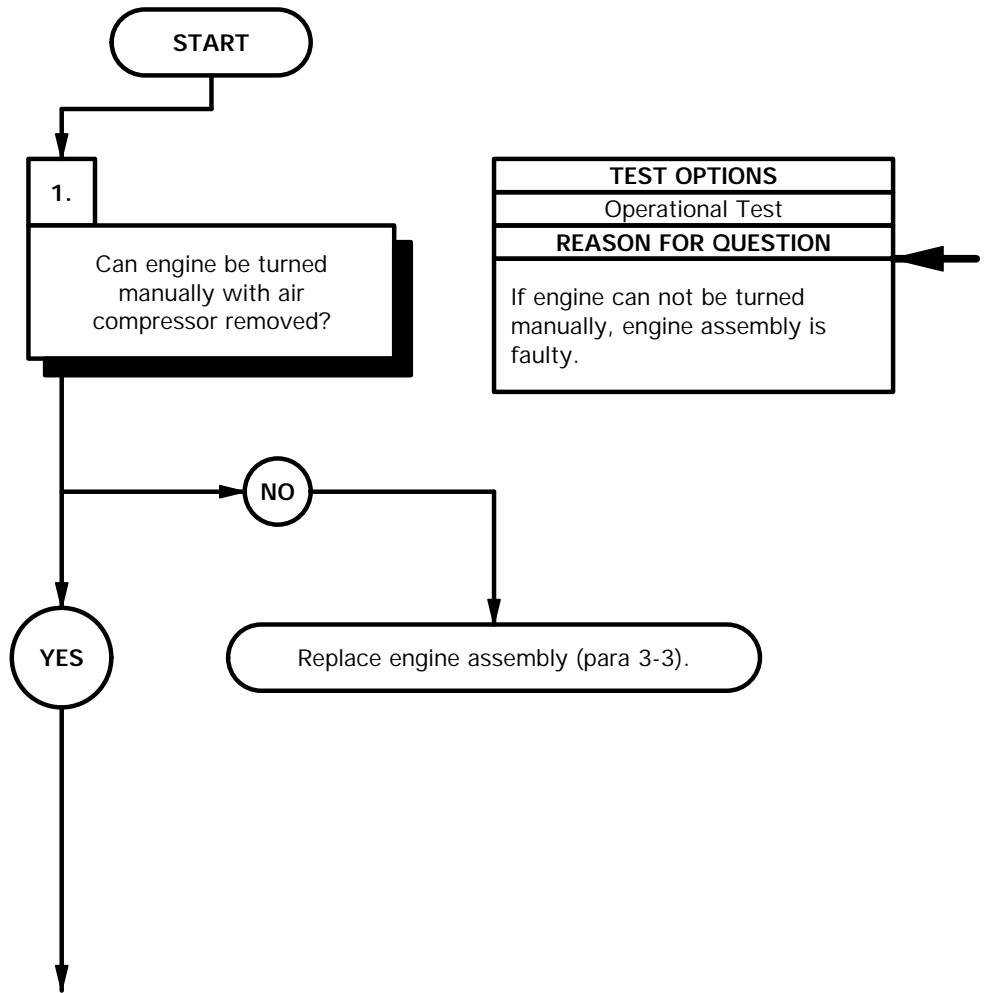
References

TM 9-4910-571-12&P

Personnel Required

(2)

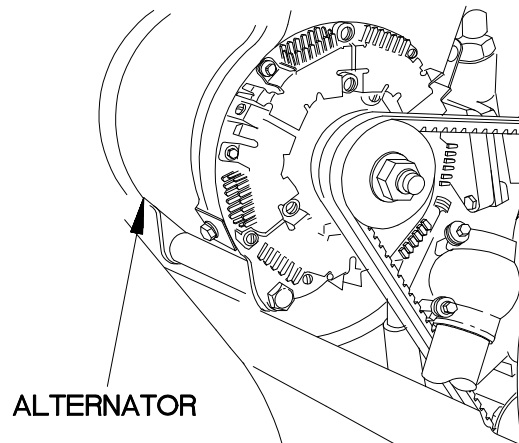
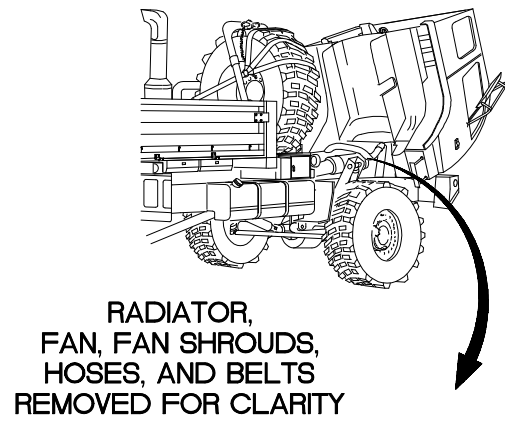
KNOWN INFO
Batteries electrolyte level OK. Battery(ies) OK.
POSSIBLE PROBLEMS
Faulty air compressor. Faulty engine assembly.



TEST OPTIONS
Operational Test
REASON FOR QUESTION
If engine can not be turned manually, engine assembly is faulty.

OPERATIONAL TEST

- (1) Remove air compressor (para 11-2).
- (2) Attempt to rotate engine by turning alternator pulley.
- (3) If engine can not be turned manually, replace engine assembly (para 3-3).



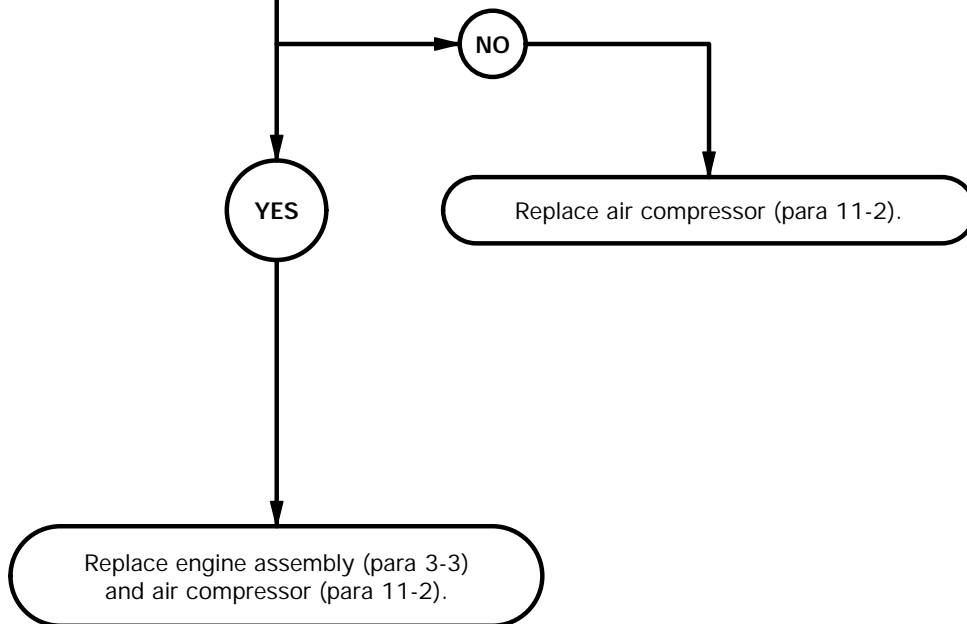
Y6a1401B

a14. ENGINE DOES NOT CRANK (CONT)

KNOWN INFO
Batteries electrolyte level OK. Battery(ies) OK. Faulty air compressor.
POSSIBLE PROBLEMS
Faulty engine assembly.

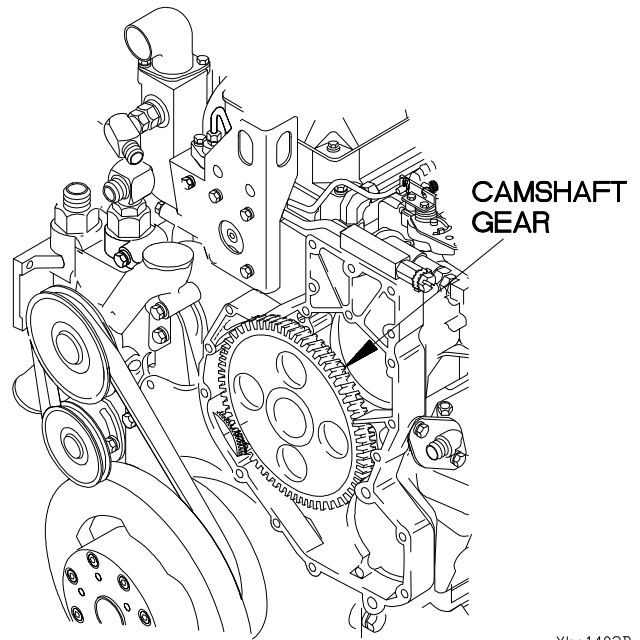
2.
Is camshaft gear damaged?

TEST OPTIONS
Visual Inspection
REASON FOR QUESTION
If camshaft gear is not damaged, air compressor is faulty. If camshaft gear is damaged, engine assembly and air compressor are faulty.



OPERATIONAL TEST

- (1) Remove engine front cover (para 3-15).
- (2) Inspect camshaft gear for damage.
- (3) If camshaft gear is not damaged, replace air compressor (para 11-2).
- (4) If camshaft gear is damaged, replace engine assembly (para 3-3) and air compressor (para 11-2).
- (5) Install engine front cover (para 3-15).



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2-9A. FUEL SYSTEM TROUBLESHOOTING

This paragraph covers Fuel System Troubleshooting. The Fuel System Fault Index, Table 2-2.1, lists faults for the fuel system of the vehicle.

Table 2-2.1. Fuel System Fault Index

Fault No.	Description	Page
a1.1.	Engine Cranks But Does Not Start	2-66.8

a.1.1. ENGINE CRANKS BUT DOES NOT START

INITIAL SETUP

Equipment Conditions

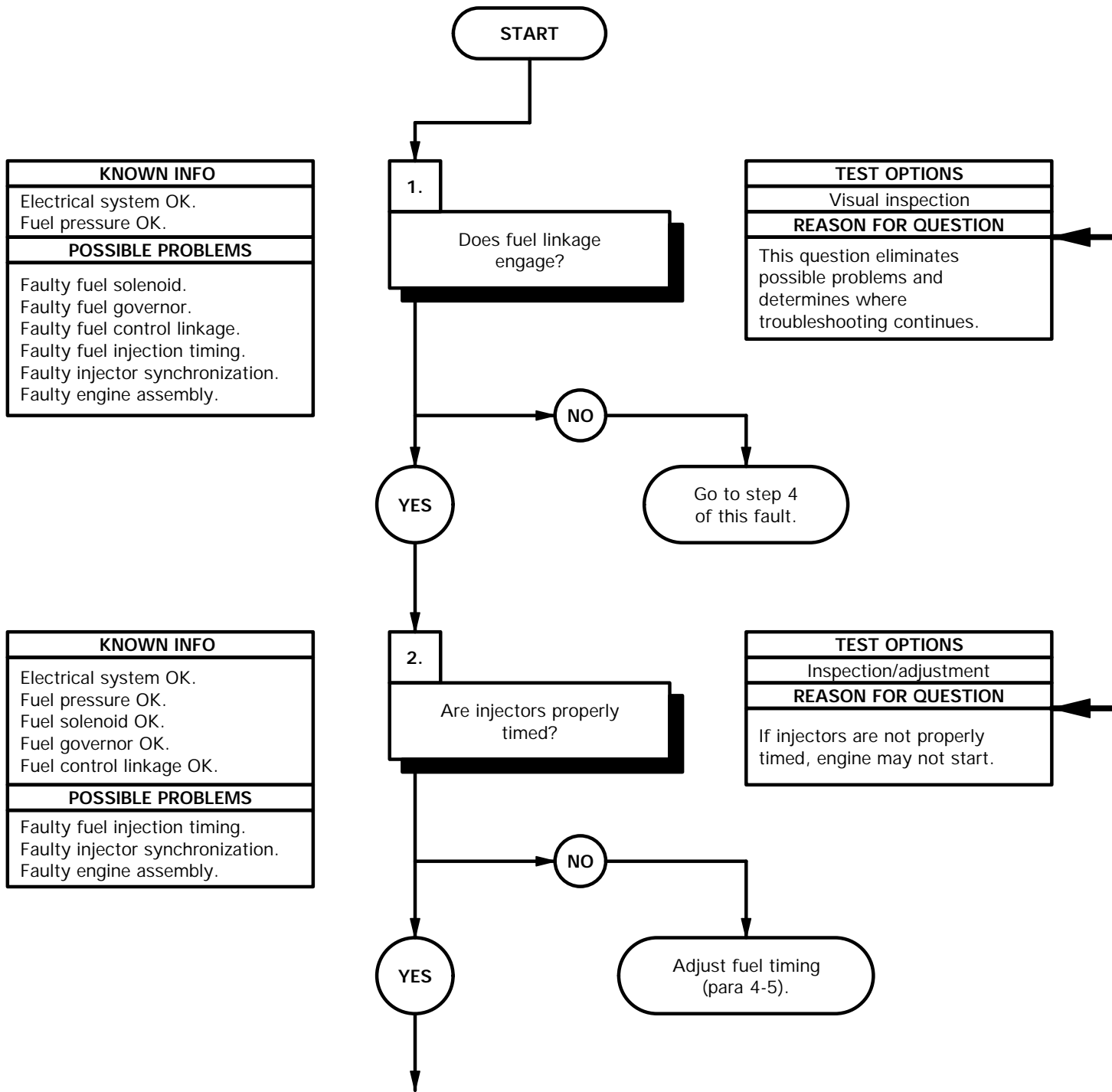
Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools

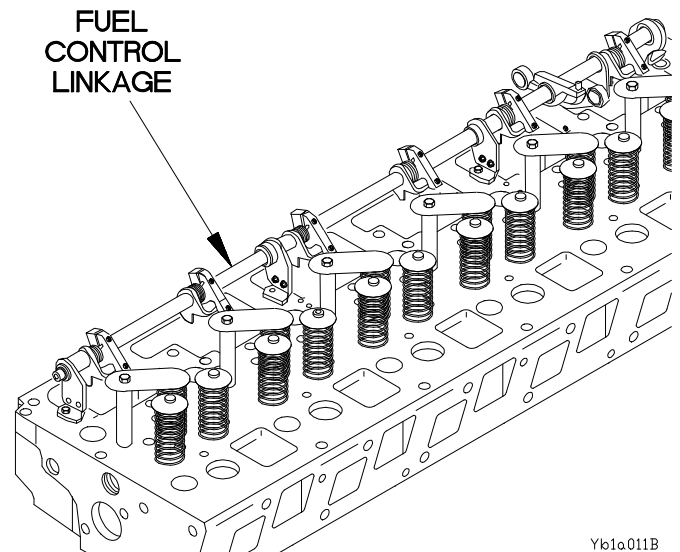
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)

References

TM 9-4910-571-12&P



- (1) Raise cab (TM 9-2320-366-10-1).
- (2) Remove valve cover (TM 9-2320-366-20-3).
- (3) Position master power switch to on (TM 9-2320-366-10-1).
- (4) If fuel linkage does not engage when ignition is turned on, go to step 4 of this fault.
- (5) Position master power switch to off (TM 9-2320-366-10-1).



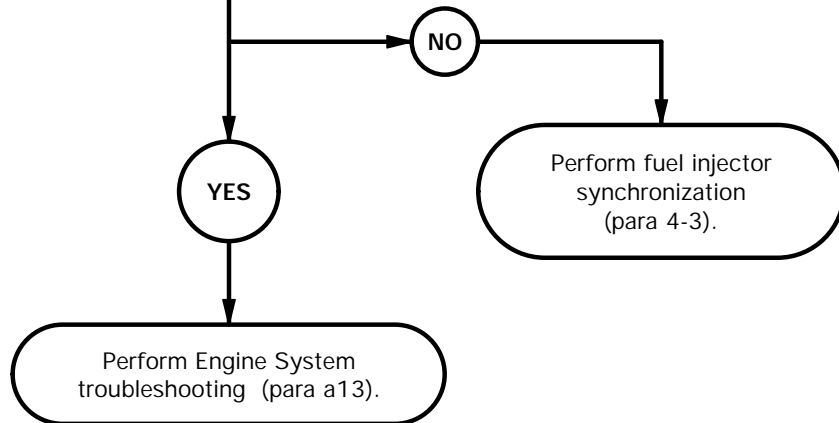
Refer to para 4-5 for fuel timing.

a.1.1. ENGINE CRANKS BUT DOES NOT START (CONT)

KNOWN INFO
Electrical system OK. Fuel pressure OK. Fuel solenoid OK. Fuel governor OK. Fuel control linkage OK. Fuel injection timing OK.
POSSIBLE PROBLEMS
Faulty injector synchronization. Faulty engine assembly.

3.
Are all injectors set to the same reference point as No. 1 cylinder?

TEST OPTIONS
Inspection/adjustment
REASON FOR QUESTION
Engine may not start if injectors are not synchronized.

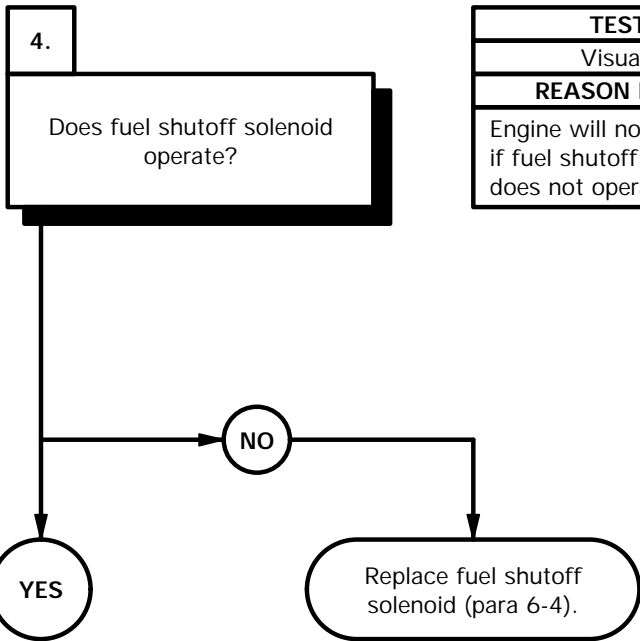


┆ Perform fuel injector synchronization (para 4-3).

a.1.1. ENGINE CRANKS BUT DOES NOT START (CONT)

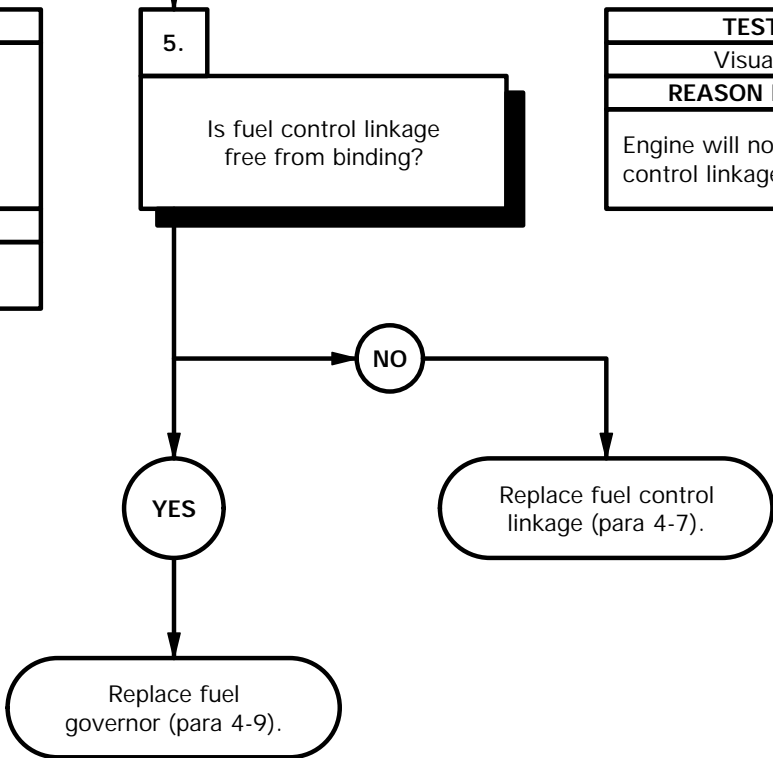
KNOWN INFO
Electrical system OK. Fuel pressure OK. Fuel injection timing OK. Injector synchronization OK.
POSSIBLE PROBLEMS
Faulty fuel solenoid. Faulty fuel governor. Faulty fuel control linkage.

TEST OPTIONS
Visual Inspection
REASON FOR QUESTION
Engine will not start if fuel shutoff solenoid does not operate.



KNOWN INFO
Electrical system OK. Fuel pressure OK. Fuel injection timing OK. Injector synchronization OK. Fuel solenoid OK.
POSSIBLE PROBLEMS
Faulty fuel governor. Faulty fuel control linkage.

TEST OPTIONS
Visual Inspection
REASON FOR QUESTION
Engine will not start if fuel control linkage is binding.

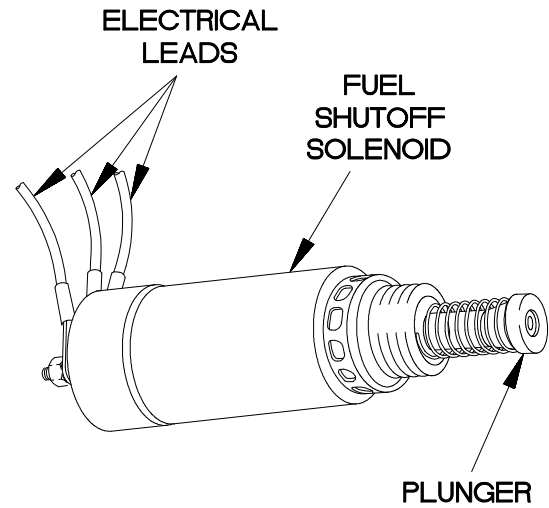


- (1) Remove fuel shutoff solenoid (para 6-4).
- (2) Reconnect electrical leads to fuel shutoff solenoid (para 6-4).
- (3) Position master power switch to on (TM 9-2320-366-10-1).
- (4) If plunger in fuel shutoff solenoid does not fully contract, replace fuel shutoff solenoid (para 6-4).
- (5) Install valve cover (TM 9-2320-366-20-3).

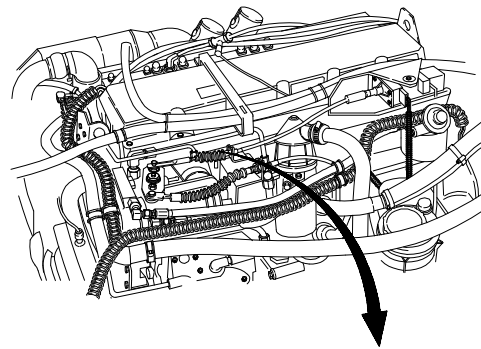
NOTE

Perform steps (6) through (8) if plunger fully contracts.

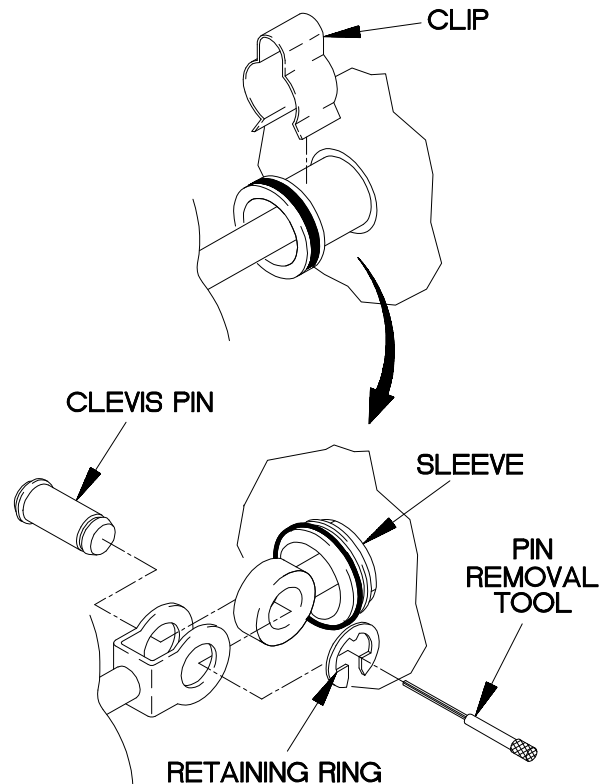
- (6) Position master power switch to off (TM 9-2320-366-10-1).
- (7) Remove electrical leads from fuel shutoff solenoid (para 6-4).
- (8) Install fuel shutoff solenoid (para 6-4).



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- (1) Remove clip from fuel control linkage.
- (2) Slide sleeve, using soft jawed pliers, into cylinder head.
- (3) Remove retaining ring and clevis pin, using pin removal tool.
- (4) Check fuel control linkage for smooth operation.
- (5) If fuel control linkage is binding, replace fuel control linkage (para 4-7).
- (6) If fuel control linkage moves freely, replace fuel governor (para 4-9).
- (7) Install valve cover (TM 9-2320-366-20-3).



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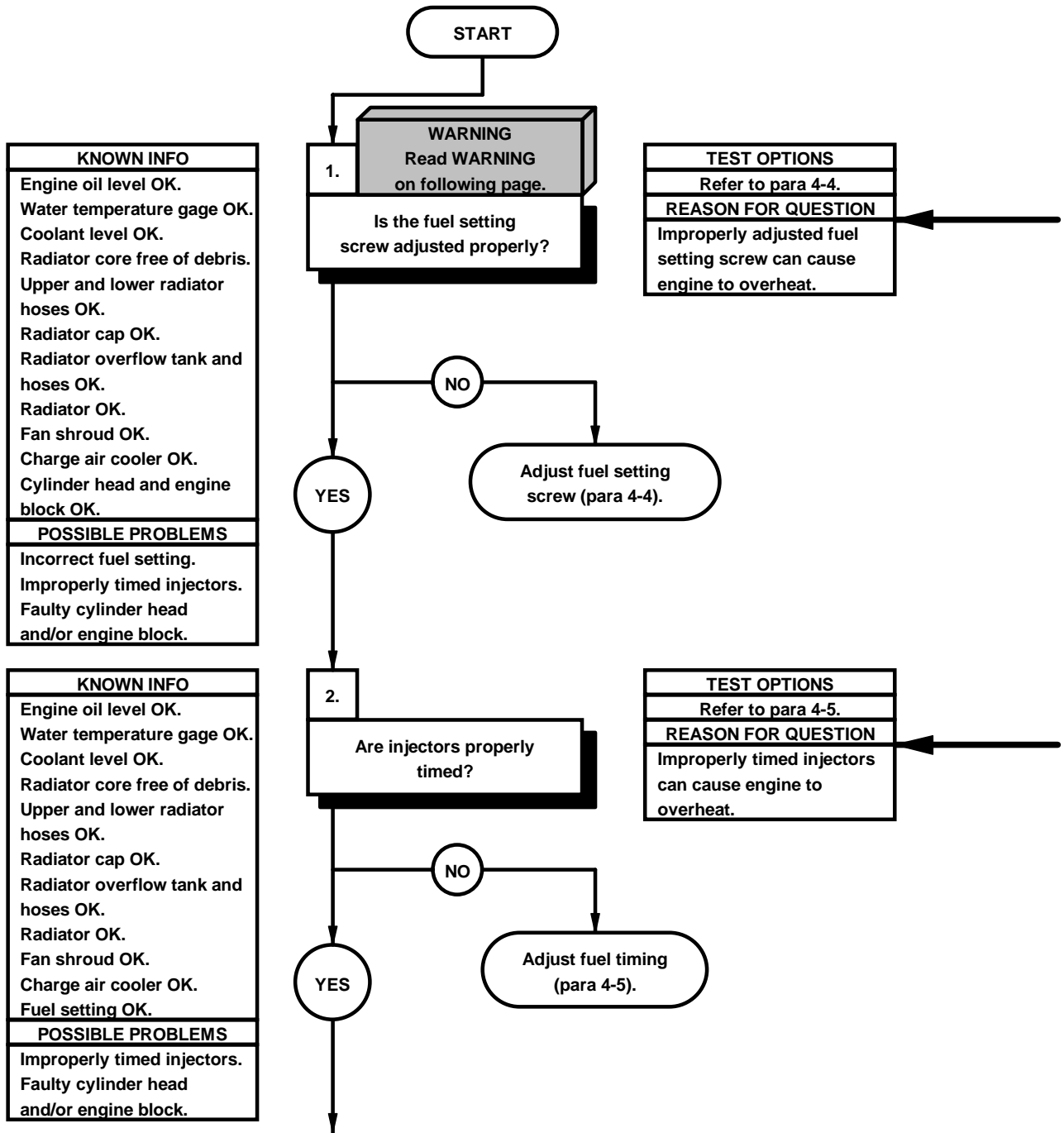
2-10. COOLING SYSTEM TROUBLESHOOTING

This paragraph covers Cooling System Troubleshooting. The Cooling System Fault Index, Table 2-3, lists faults for the cooling system of the vehicle.

Table 2-3. Cooling System Fault Index

Fault No.	Description	Page
b1.	Engine Overheats	2-68
b2.	Loss of Coolant	2-72
b3.	Oil in Cooling System	2-74

b1. ENGINE OVERHEATS	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1). Cab raised (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) Tool Kit, Intl Comb Eng (TM 9-2320-366-20) Wrench, Torque, 0-60 N-m (Item 96, Appendix B)



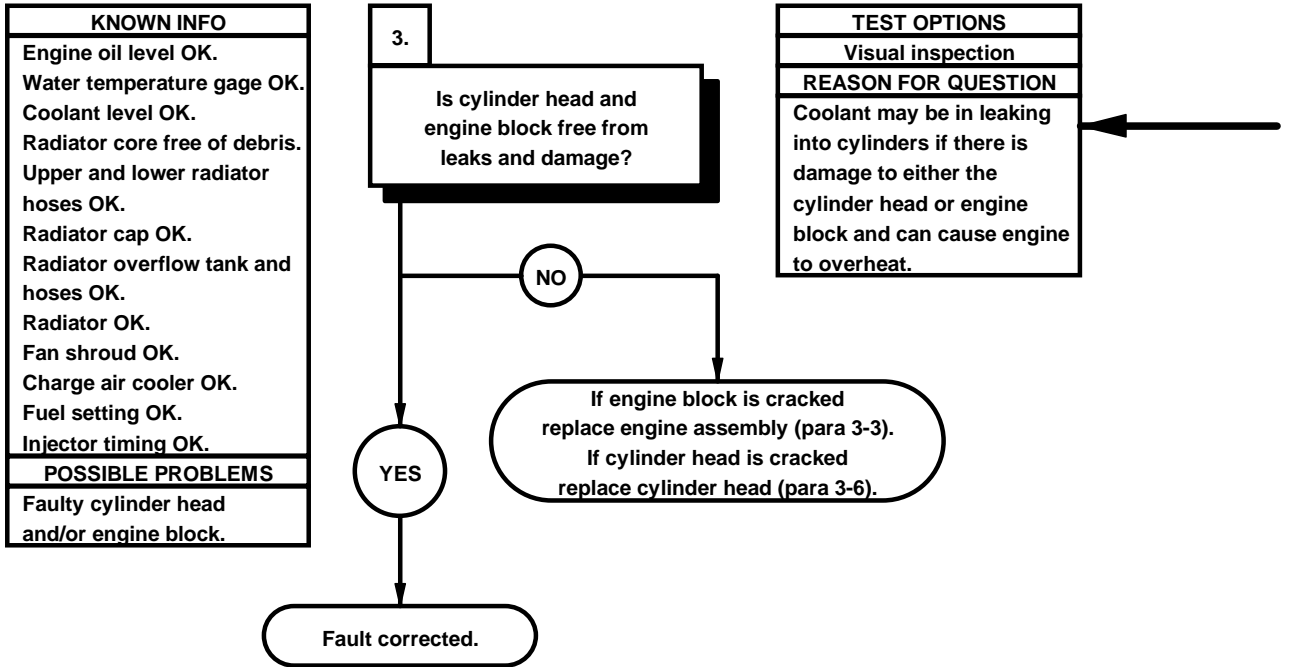
WARNING

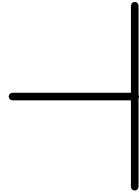
Ensure engine is cool before performing troubleshooting. Failure to comply may result in severe burns.

— | Refer to para 4-4 to adjust fuel setting screw.

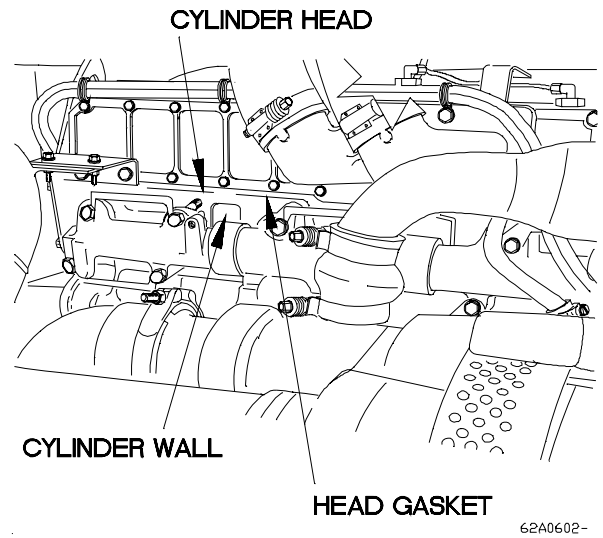
— | Refer to para 4-5 for fuel timing checks.

b1. ENGINE OVERHEATS (CONT)





- (1) Remove cylinder head (para 3-6).
- (2) Check cylinder head, cylinder walls, and head gasket surface of cylinder block for cracks.
- (3) Install cylinder head/head gasket (para 3-6).
- (4) Lower cab (TM 9-2320-366-10-1).



b2. LOSS OF COOLANT

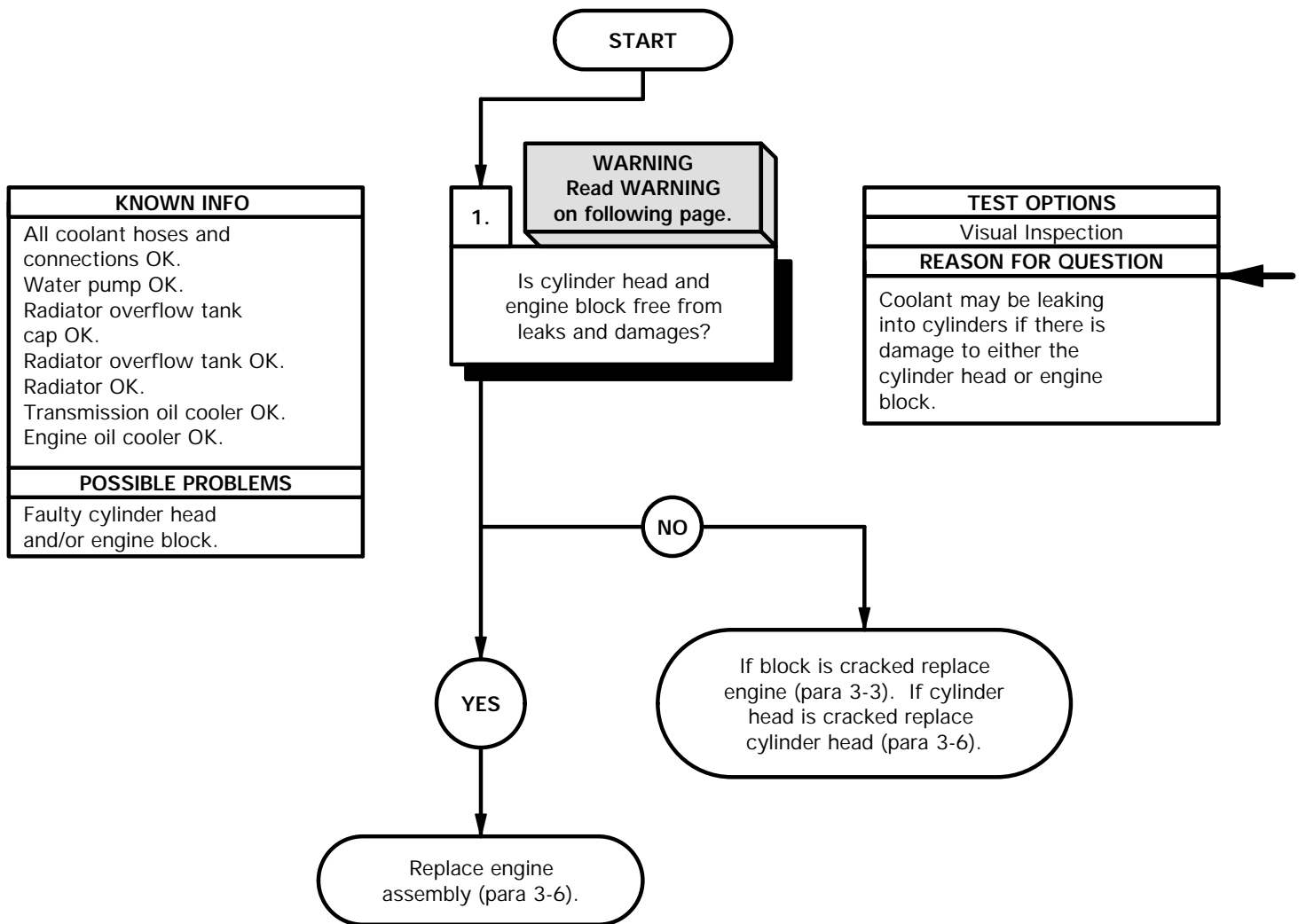
INITIAL SETUP

Equipment Conditions

Engine shut down (TM 9-2320-366-10-1).
Cab raised (TM 9-2320-366-10-1).

Tools and Special Tools

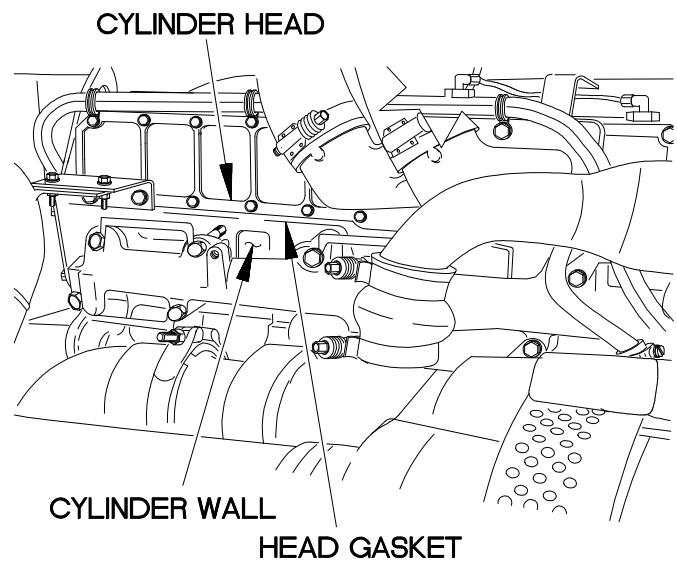
Tool Kit, Genl Mech (Item 78, Appendix B)



WARNING

Ensure engine is cool before performing troubleshooting. Failure to comply may result in severe burns.

- (1) Remove cylinder head (para 3-6).
- (2) Check cylinder head, cylinder walls, and head gasket surface of cylinder block for cracks.
- (3) If engine block is damaged, replace engine assembly (para 3-3)
- (4) If cylinder head is damaged, replace cylinder head (para 3-6).
- (5) Install cylinder head/head gasket (para 3-6).
- (6) Lower cab (TM 9-2320-366-10-1).



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b3. OIL IN COOLING SYSTEM

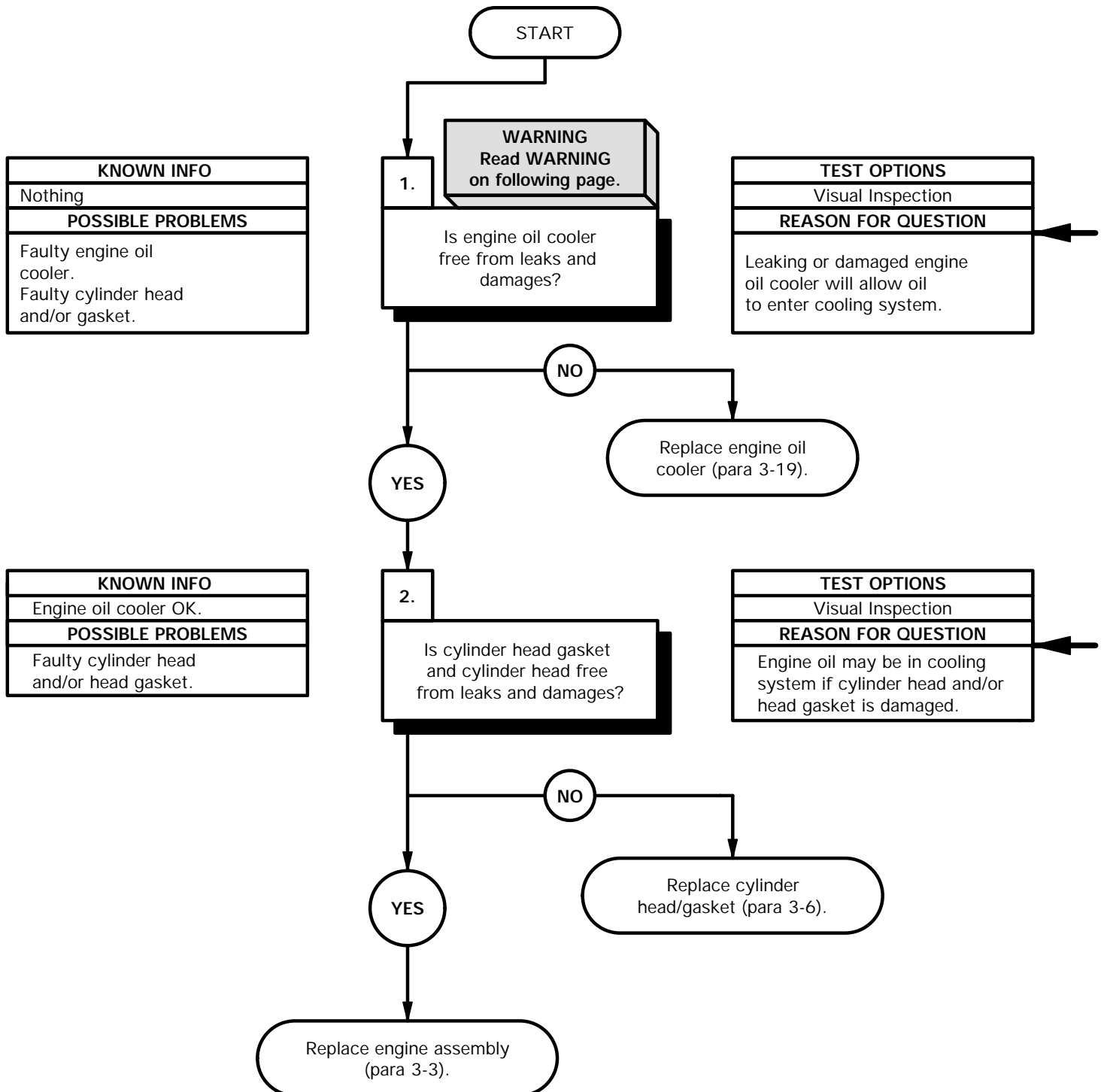
INITIAL SETUP

Equipment Conditions

Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools

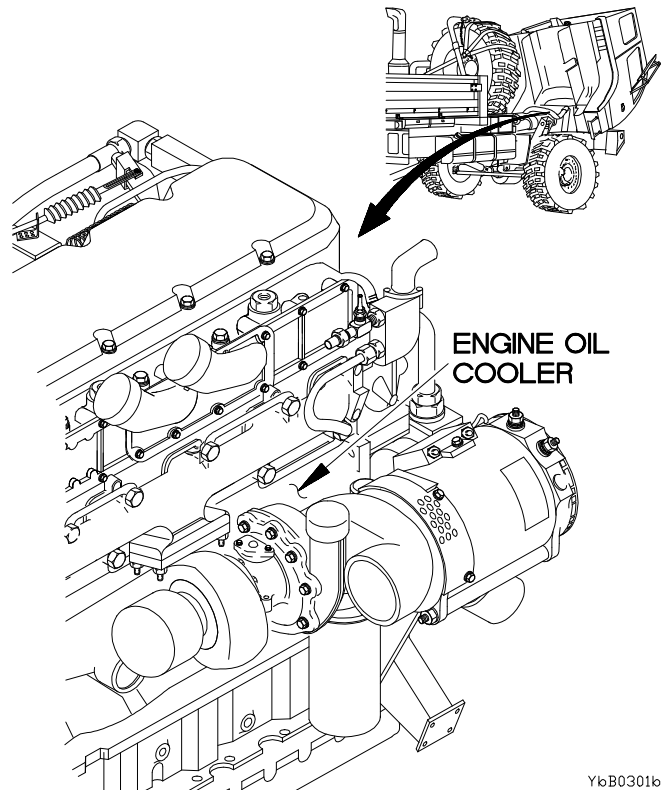
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)



WARNING

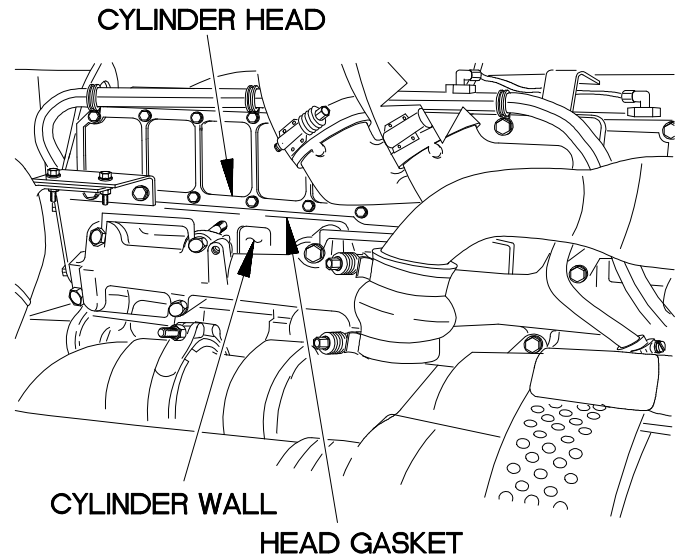
Ensure engine is cool before performing troubleshooting. Failure to comply may result in severe burns.

- (1) Raise cab (TM 9-2320-366-10-1).
- (2) Check engine oil cooler for obvious signs of leaks and damage.



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- (1) Remove cylinder head (para 3-6).
- (2) Check cylinder head, cylinder walls, and head gasket surface of cylinder block for cracks.
- (3) If cylinder head is damaged, replace cylinder head (para 3-6).
- (4) If cylinder head is not damaged, replace engine assembly (para 3-3).
- (5) Install cylinder head/head gasket (para 3-6).
- (6) Lower cab (TM 9-2320-366-10-1).



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2-11. TRANSMISSION SYSTEM TROUBLESHOOTING

This paragraph covers Transmission System Troubleshooting. The Transmission System Fault Index, Table 2-4, lists faults for the transmission system of the vehicle.

Table 2-4. Transmission System Fault Index

Fault No.	Description	Page
c1.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 15 (Serial Number 6510032369 and Higher)	2-80
c2.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 15 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-90
c3.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 15 (Prior to Serial Number 6510032369)	2-104
c4.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 16	2-114
c5.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 24 Sub Code 12 or 23 (Serial Number 6510032369 and Higher)	2-122
c6.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 24 Sub Code 12 or 23 (Prior to Serial Number 6510032369 With Transmission Adapter cable assembly)	2-130
c7.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 24 Sub code 12 or 23 (Prior to Serial Number 6510032369)	2-142
c8.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 32 and Any Sub Code (Serial Number 6510032369 and Higher)	2-150
c9.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 32 and Any Sub Code (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-158
c10.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 32 and Any Sub Code (Prior to Serial Number 6510032369)	2-170
c11.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45, and/or 69 Sub Code 12 (Serial Number 6510032369 and Higher)	2-178
c12.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45, and/or 69 Sub Code 12 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-188
c13.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45, and/or 69 Sub Code 12 (Prior to Serial Number 6510032369)	2-202
c14.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 13 (Serial Number 6510032369 and Higher)	2-210
c15.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 13 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-220
c16.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 13 (Prior to serial Number 6510032369)	2-234
c17.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 14 (Serial Number 6510032369 and Higher)	2-244
c18.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 14 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-254
c19.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 14 (Prior to Serial Number 6510032369)	2-268

2-11. TRANSMISSION SYSTEM TROUBLESHOOTING (CONT)

Table 2-4. Transmission System Fault Index (Cont)

Fault No.	Description	Page
c20.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 15 (Serial Number 6510032369 and Higher)	2-278
c21.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 15 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-288
c22.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 15 (Prior to Serial Number 6510032369)	2-302
c23.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 16 (Serial Number 6510032369 and Higher)	2-312
c24.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 16 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-322
c25.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 16 (Prior to Serial Number 6510032369)	2-336
c26.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45, and/or 69 Sub Code 21 (Serial Number 6510032369 and Higher)	2-346
c27.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45, and/or 69 Sub Code 21 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-356
c28.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45, and/or 69 Sub Code 21 (Prior to Serial Number 6510032369)	2-370
c29.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 22 (Serial Number 6510032369 and Higher)	2-380
c30.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 22 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-390
c31.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 22 (Prior to Serial Number 6510032369)	2-404
c32.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45, and/or 69 Sub Code 23	2-414
c33.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 24 (Serial Number 6510032369 and Higher)	2-422
c34.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 24 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-432
c35.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 24 (Prior to Serial Number 6510032369)	2-446
c36.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45, and/or 69 Sub Code 26 (Serial Number 6510032369 and Higher)	2-456
c37.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45, and/or 69 Sub Code 26 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-466
c38.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45, and/or 69 Sub Code 26 (Prior to Serial Number 6510032369)	2-480
c39.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 43 Sub Code 21 (Serial Number 6510032369 and Higher)	2-490

Table 2-4. Transmission System Fault Index (Cont)

Fault No.	Description	Page
c40.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 43 Sub Code 21 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-500
c41.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 43 Sub Code 21 (Prior to Serial Number 6510032369)	2-514
c42.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 43 Sub Code 26 (Serial Number 6510032369 and Higher)	2-524
c43.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 43 Sub Code 26 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-534
c44.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 43 Sub Code 26 (Prior to Serial Number 6510032369)	2-548
c45.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 52 and Any Sub Code (Serial Number 6510032369 and Higher)	2-558
c46.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 52 and Any Sub Code (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-568
c47.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 52 and Any Sub Code (Prior to Serial Number 6510032369)	2-582
c47A.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 55 and Any Sub Code	2-590.2
c48.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 15 (Serial Number 6510032369 and Higher)	2-592
c49.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 15 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-602
c50.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 16	2-616
c51.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 24 Sub Code 12 or 23 (Serial Number 6510032369 and Higher)	2-624
c52.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 24 Sub Code 12 or 23 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-632
c53.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 32 and Any Sub Code (Serial Number 6510032369 and Higher)	2-644
c54.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 32 and Any Sub Code (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-652
c55.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, 45, 46, and/or 69 Sub Code 12 (Serial Number 6510032369 and Higher)	2-664
c56.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, 45, 46, and/or 69 Sub Code 12 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-674
c57.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 13 (Serial Number 6510032369 and Higher)	2-688
c58.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 13 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-698
c59.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 14 (Serial Number 6510032369 and Higher)	2-712

2-11. TRANSMISSION SYSTEM TROUBLESHOOTING (CONT)

Table 2-4. Transmission System Fault Index (Cont)

Fault No.	Description	Page
c60.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 14 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-722
c61.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 15 (Serial Number 6510032369 and Higher)	2-736
c62.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 15 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-746
c63.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 16 (Serial Number 6510032369 and Higher)	2-760
c64.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 16 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-770
c65.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, 45, 46, and/or 69 Sub Code 21 (Serial Number 6510032369 and Higher)	2-784
c66.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, 45, 46, and/or 69 Sub Code 21 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-794
c67.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 22 (Serial Number 6510032369 and Higher)	2-808
c68.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 22 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-818
c69.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 23	2-832
c70.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 24 (Serial Number 6510032369 and Higher)	2-840
c71.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 24 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-850
c72.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, 45, 46, and/or 69 Sub Code 26 (Serial Number 6510032369 and Higher)	2-864
c73.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, 45, 46, and/or 69 Sub Code 26 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-874
c74.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 43 Sub Code 21 (Serial Number 6510032369 and Higher)	2-888
c75.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 43 Sub Code 21 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-898
c76.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 43 Sub Code 26 (Serial Number 6510032369 and Higher)	2-912
c77.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 43 Sub Code 26 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-922

Table 2-4. Transmission System Fault Index (Cont)

Fault No.	Description	Page
c78.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 52 and Any Sub (Serial Number 6510032369 and Higher)	2-936
c79.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 52 and Any Sub Code (Prior to Serial Number 6510032369 with Transmission Adapter Cable Assembly)	2-946
c80.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 55 and Any Sub Code	2-960

c1. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

Equipment Conditions

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

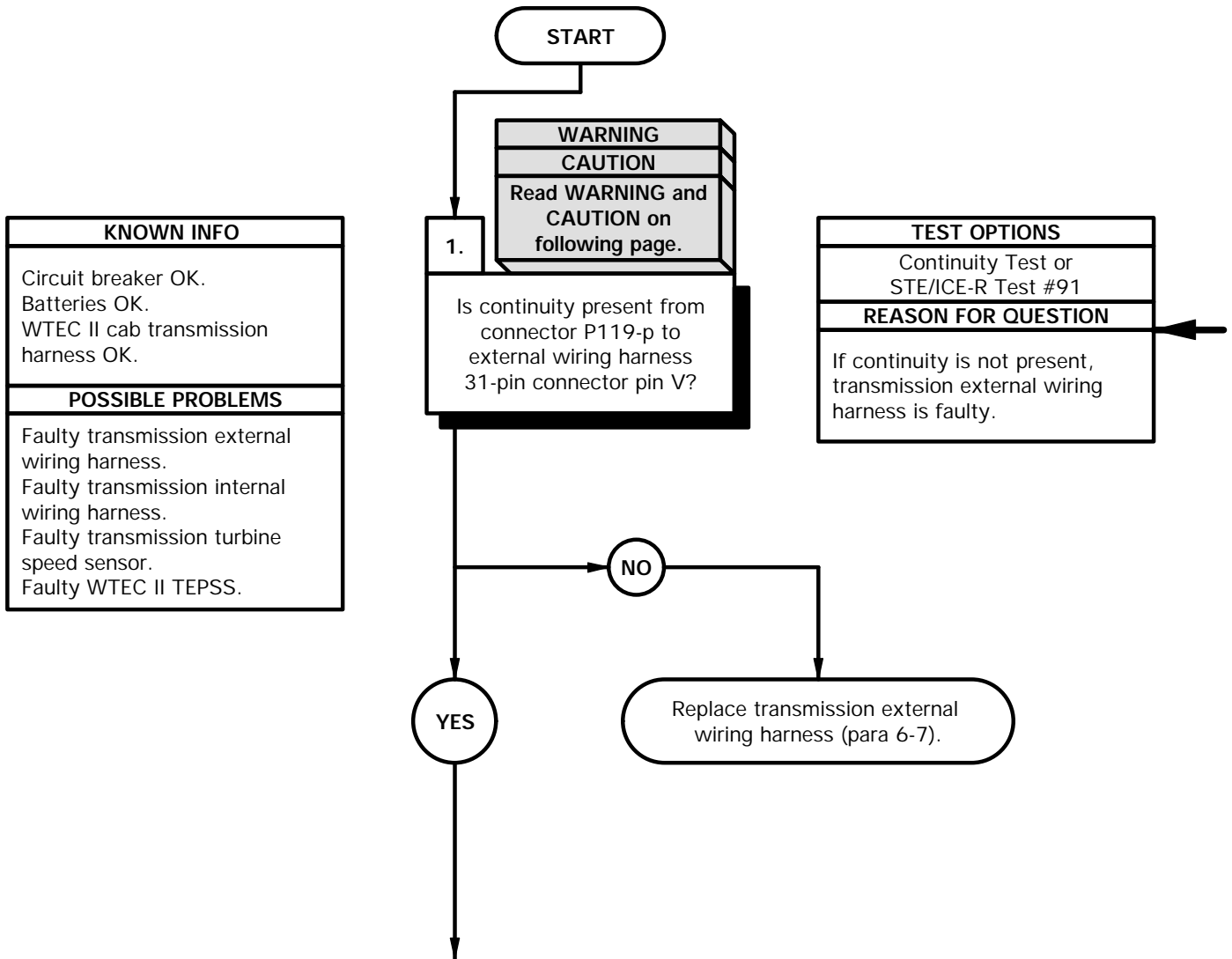
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

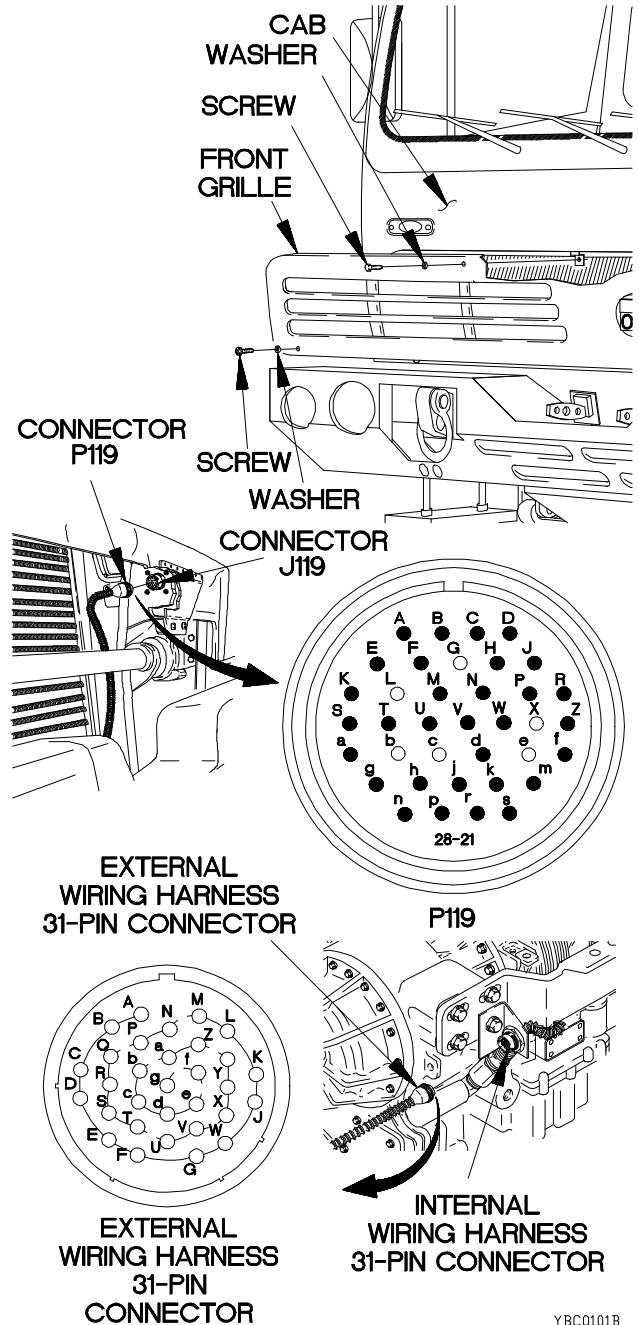
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-p.
- (8) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin V and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-p.

CONTINUITY TEST (Cont)

- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



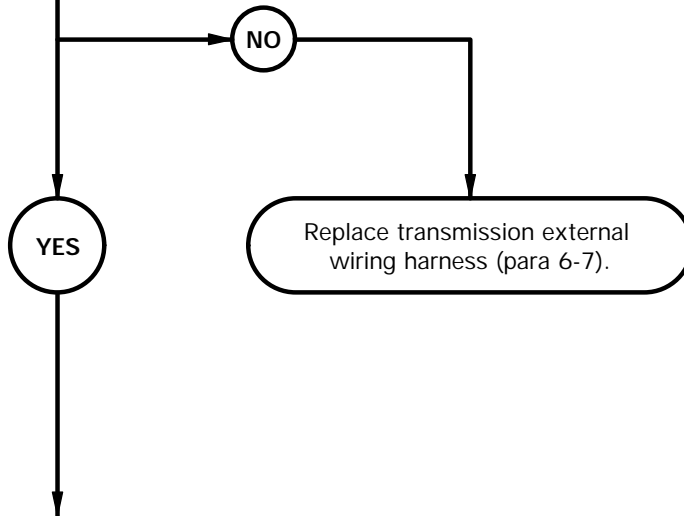
YBC0101B

c1. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty transmission turbine speed sensor. Faulty WTEC II TEPSS.

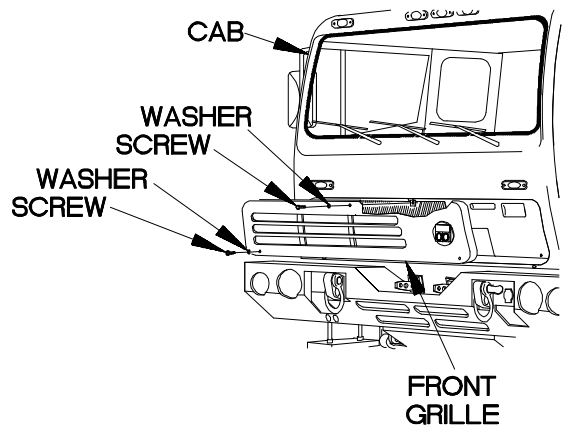
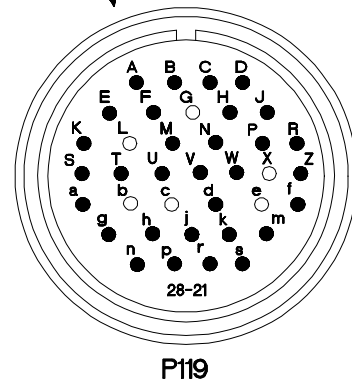
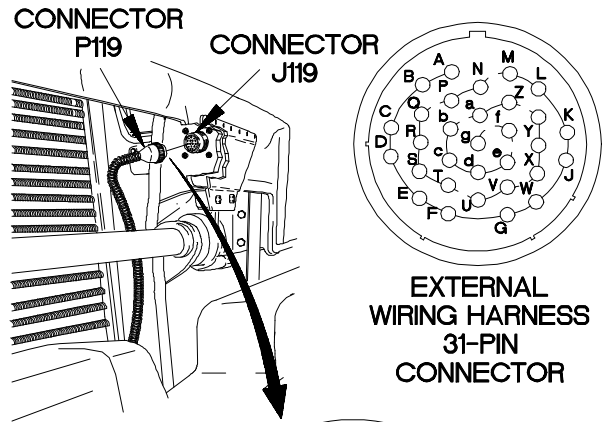
2.
Is continuity present from connector P119-r to external wiring harness 31-pin connector pin U?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-r.
- (3) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin U and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-r.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



YBC0102B

c1. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

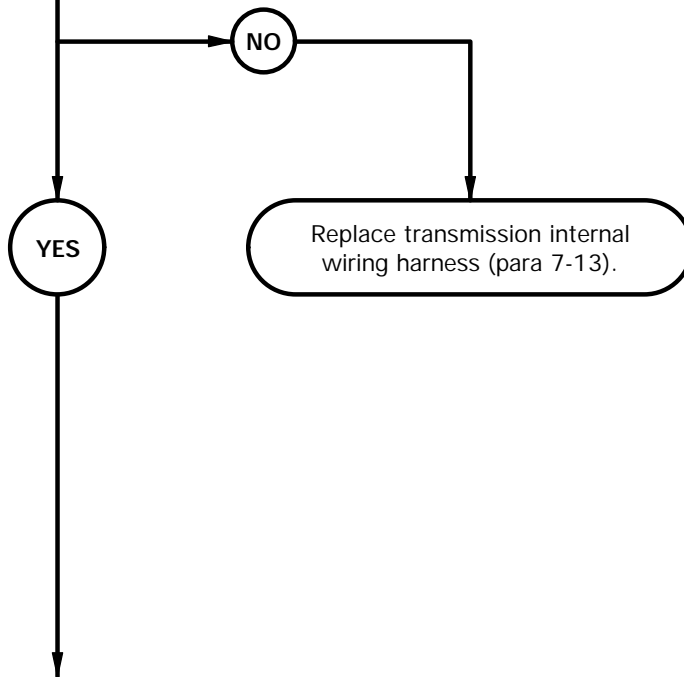
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty transmission turbine speed sensor. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin V to internal wiring harness connector TSS pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

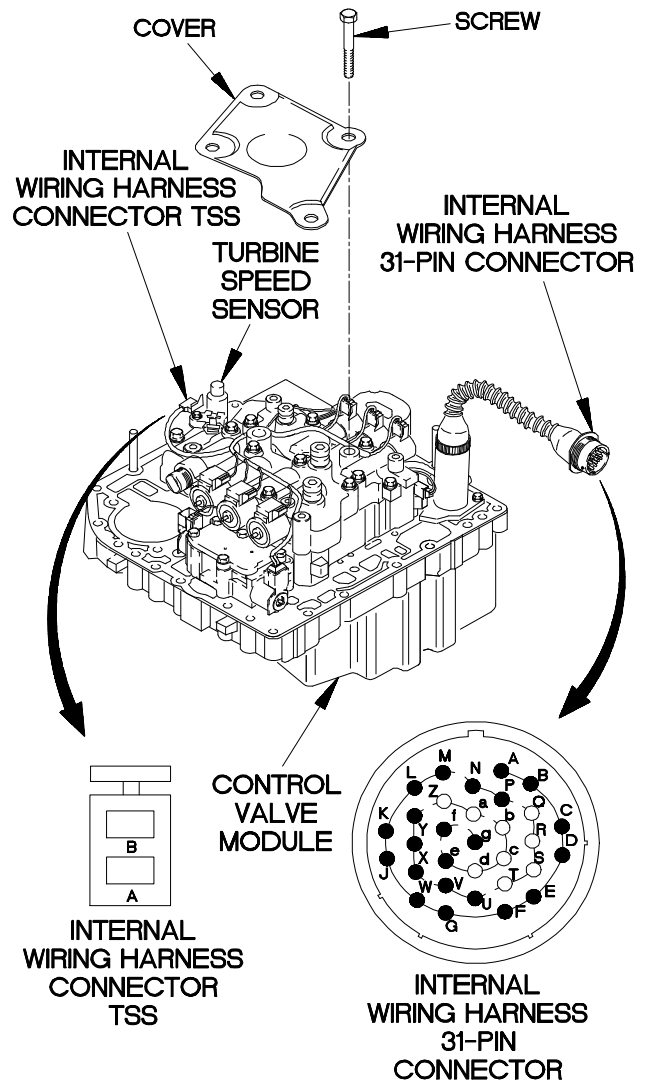


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector TSS from turbine speed sensor.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin V.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector TSS pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin V.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



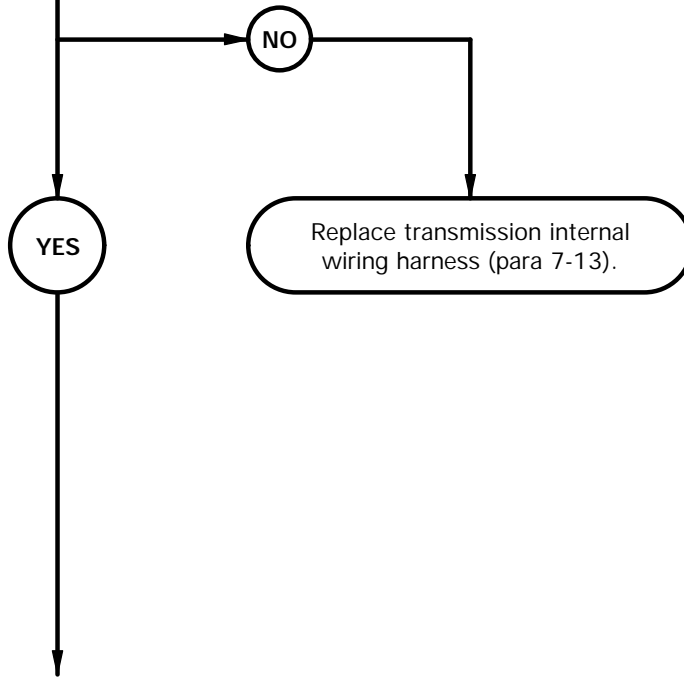
YBC0103B

c1. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (SERIAL NUMBER 6510032369) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty transmission turbine speed sensor. Faulty WTEC II TEPSS.

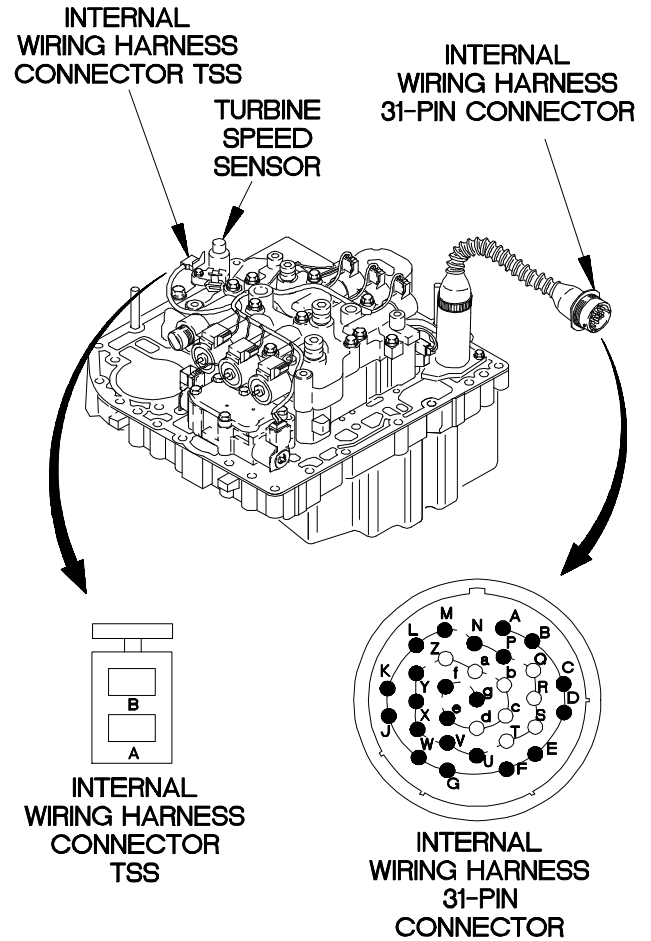
4.
Is continuity present from internal wiring harness 31-pin connector pin U to internal wiring harness connector TSS pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin U.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector TSS pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin U.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



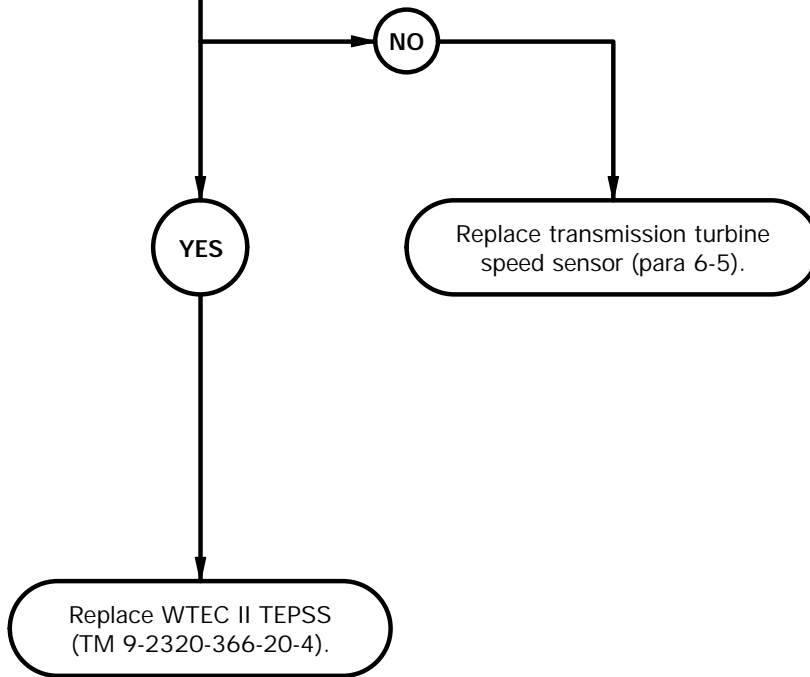
YBC0104B

c1. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission turbine speed sensor. Faulty WTEC II TEPSS.

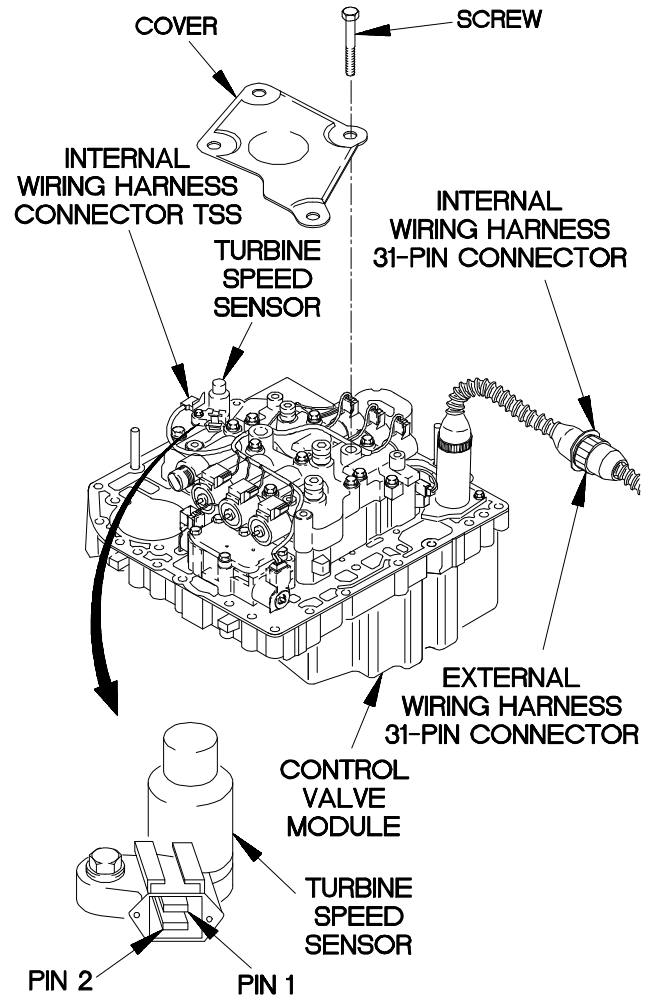
5.
Is 200-400 ohms resistance present from turbine speed sensor pin 1 to pin 2?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 200-400 ohms resistance is not present, transmission internal wiring harness is faulty. If 200-400 ohms resistance is present, WTEC II TEPSS is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin 1 of turbine speed sensor.
- (3) Connect negative (-) probe of multimeter to pin 2 of turbine speed sensor and note reading on multimeter.
- (4) If resistance is less than 200 ohms or greater than 400 ohms, replace transmission turbine speed sensor (para 6-5).
- (5) If resistance is between 200 and 400 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring connector TSS to turbine speed sensor.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect internal wiring harness 31-pin connector to external wiring harness 31-pin connector.
- (10) Connect batteries (TM 9-2320-366-20-3).



YBC0105B

c2. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY)

INITIAL SETUP

Equipment Conditions

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Tools and Special Tools

Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts

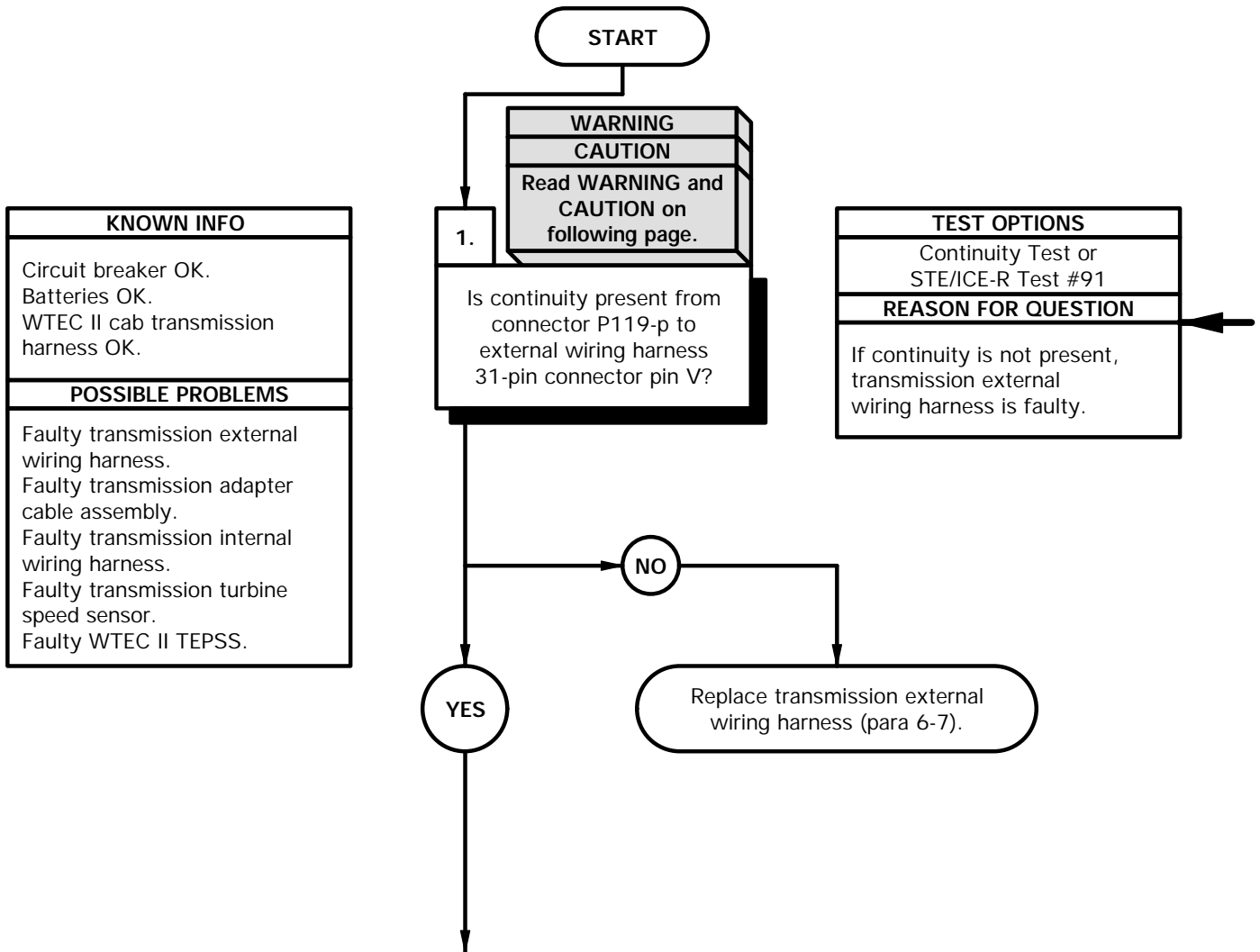
Wire, Elect, 50 ft (Item 97, Appendix C)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

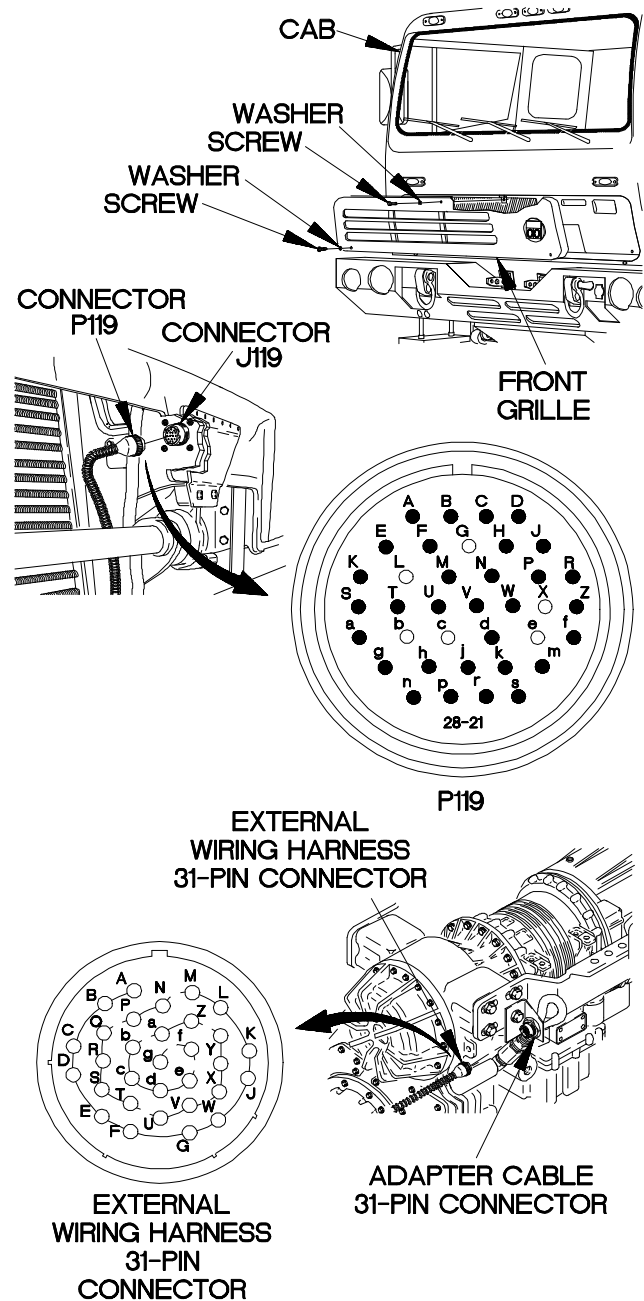
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness 31-pin from adapter cable 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to P119-p.
- (8) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin V and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-p.

CONTINUITY TEST (Cont)

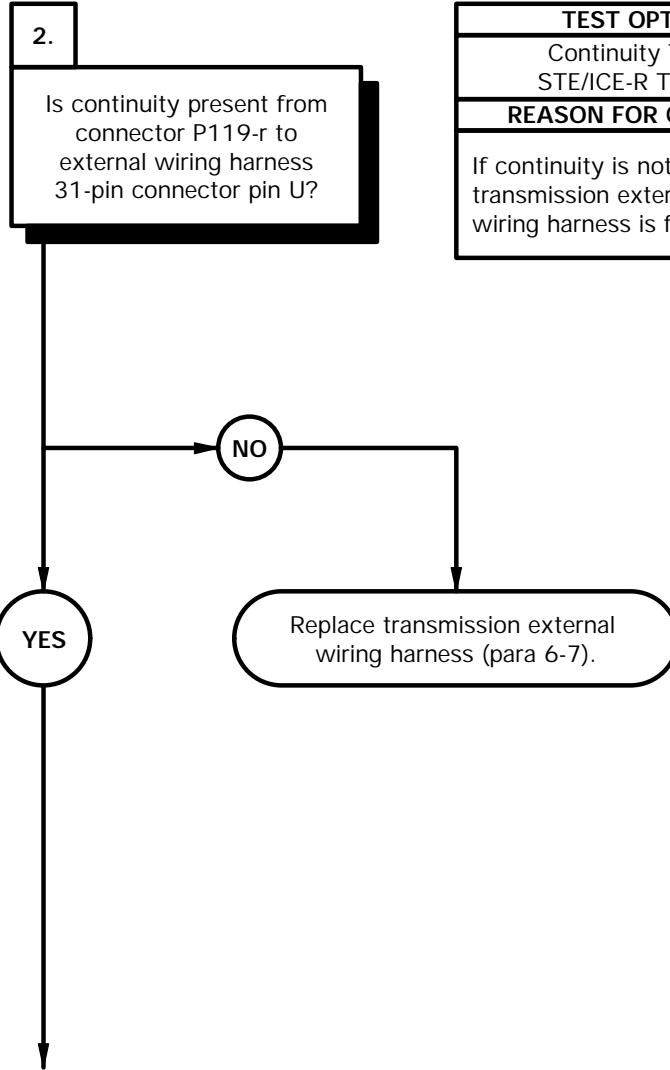
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



YBC0201B

c2. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

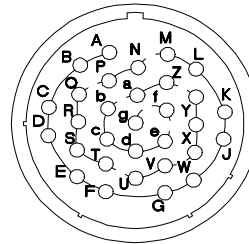
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty transmission turbine speed sensor. Faulty WTEC II TEPSS.



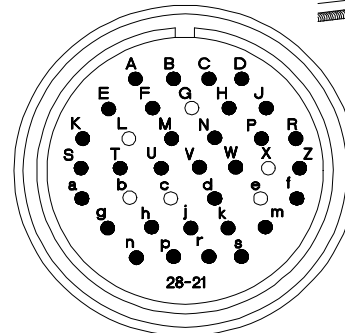
TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

CONTINUITY TEST

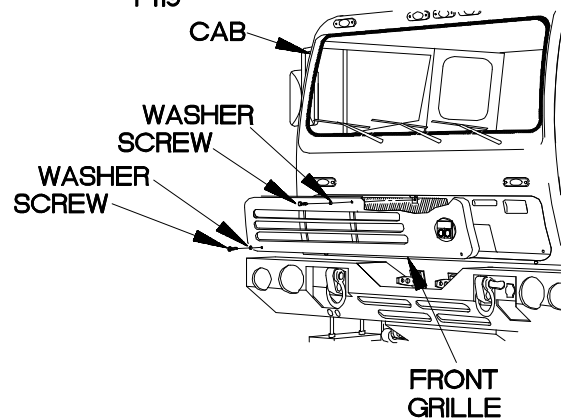
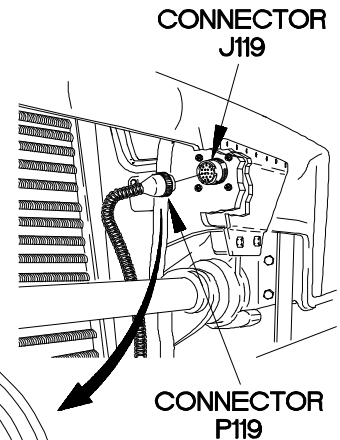
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-r.
- (3) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin U and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-r.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten two screws to 24 lb-in. (3 N·m).



EXTERNAL WIRING HARNESS 31-PIN CONNECTOR



P119



YBC0202B

c2. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

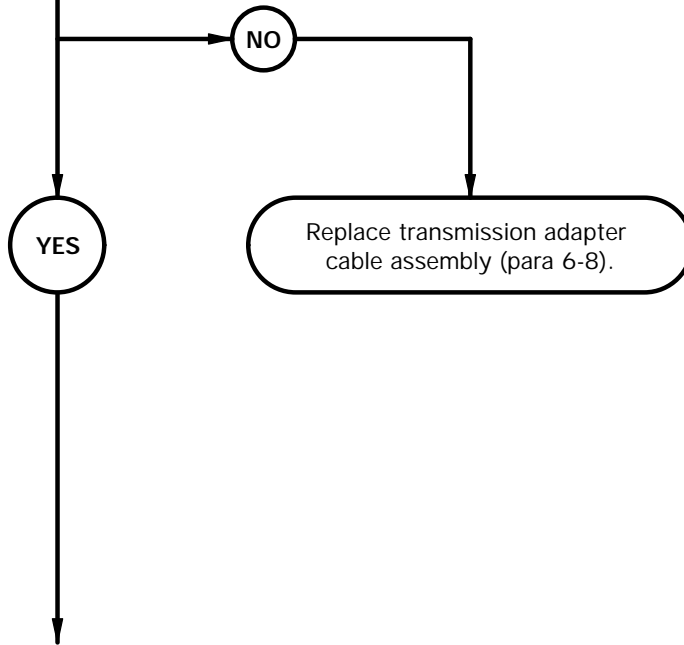
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty transmission turbine speed sensor. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin V to adapter cable 24-pin connector pin E3?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.

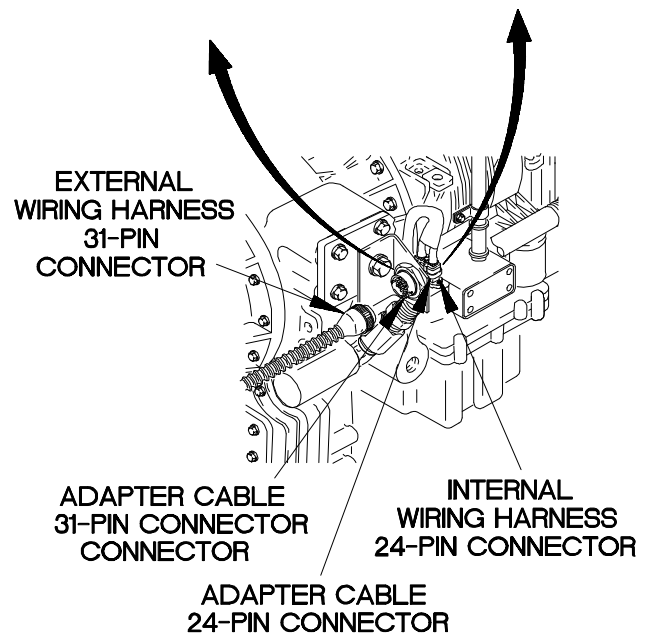
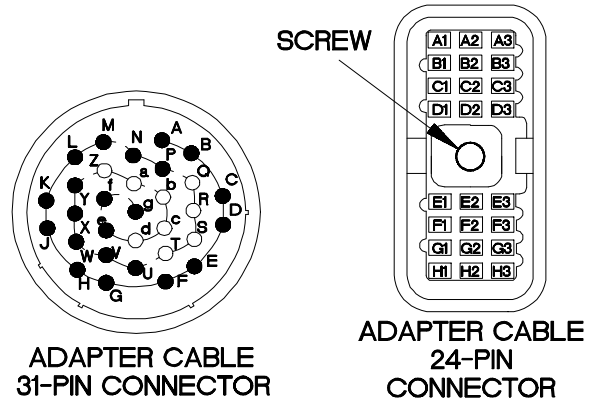


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Loosen screw in adapter cable 24-pin connector.
- (2) Disconnect adapter cable 24-pin connector from internal wiring harness 24-pin connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin V.
- (5) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin E3 and note reading on multimeter.
- (6) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (7) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin V.
- (8) Connect negative (-) probe of multimeter to all other pins in adapter cable 24-pin connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).



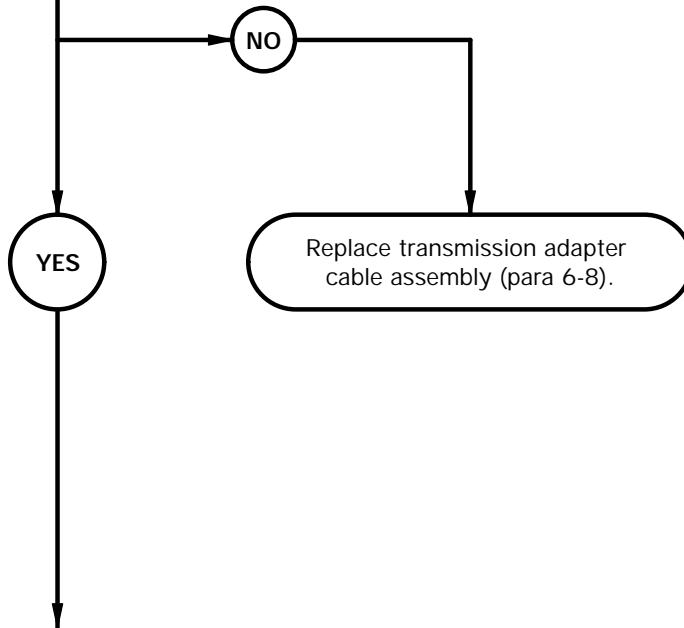
YBC0203B

c2. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty transmission turbine speed sensor. Faulty WTEC II TEPSS.

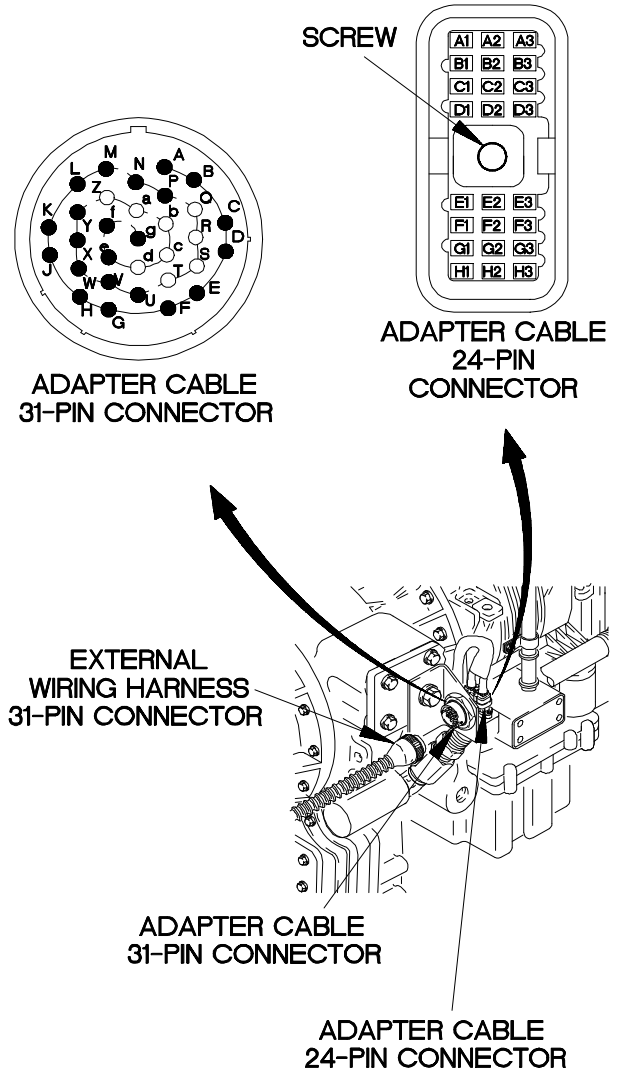
4.
Is continuity present from adapter cable 31-pin connector pin U to adapter cable 24-pin connector pin E2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin U.
- (3) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin E2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (5) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin U.
- (6) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).
- (9) Connect external wiring harness 31-pin connector to adapter cable 31-pin connector.



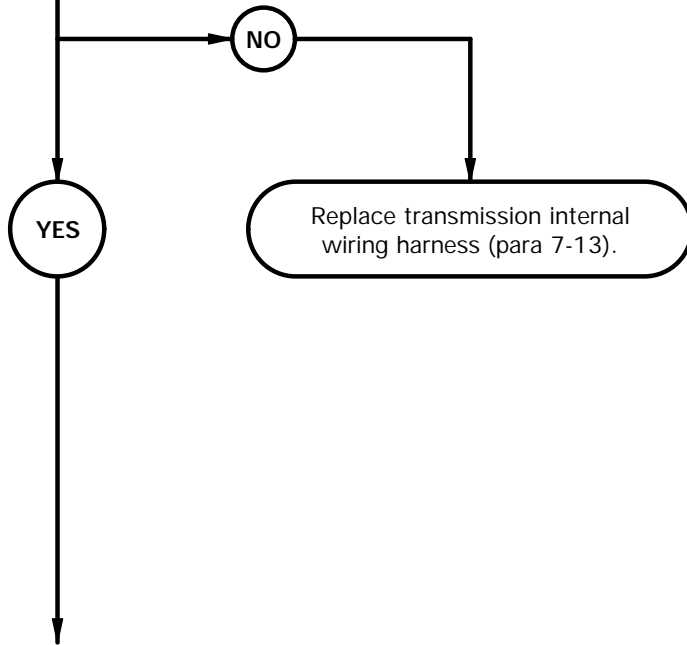
YBC0204B

c2. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty transmission turbine speed sensor. Faulty WTEC II TEPSS.

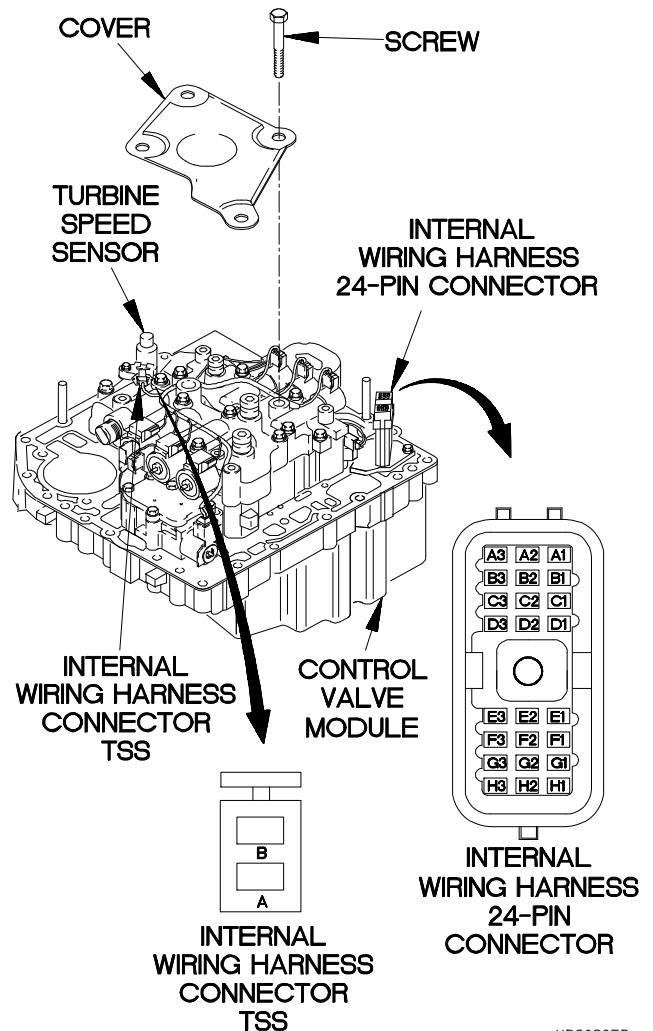
5.
Is continuity present from internal wiring harness 24-pin connector pin E2 to internal wiring harness connector TSS pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Remove internal wiring harness connector TSS from turbine speed sensor connector.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin E2.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector TSS pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin E2.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



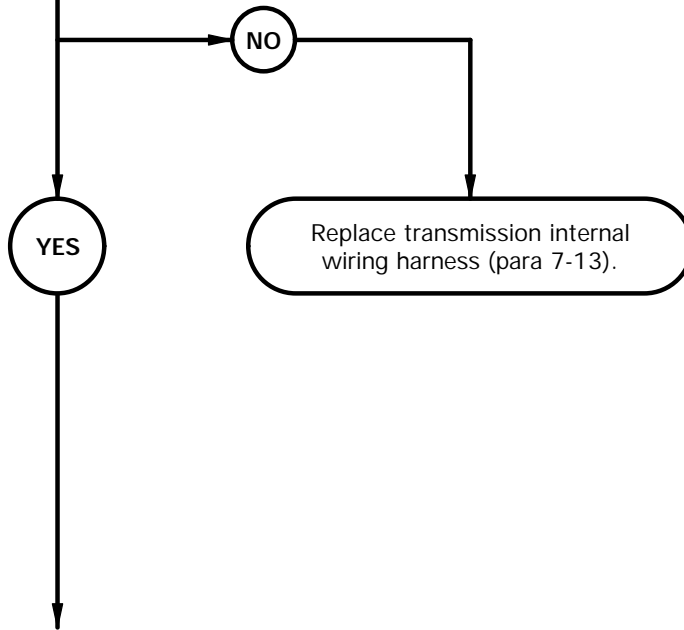
YBC0205B

c2. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty transmission turbine speed sensor. Faulty WTEC II TEPSS.

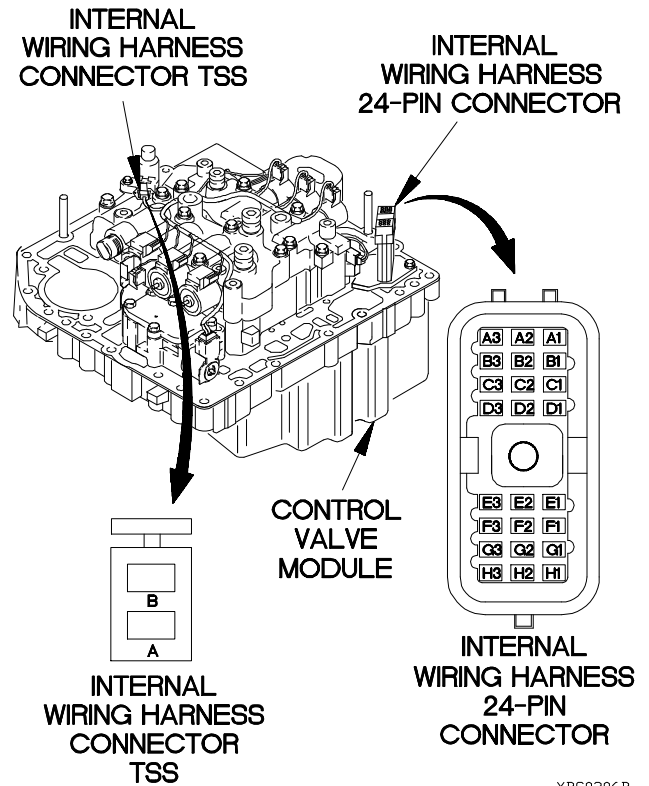
6.
 Is continuity present from internal wiring harness 24-pin connector pin E3 to internal wiring harness connector TSS pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin E3.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector TSS pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin E3.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



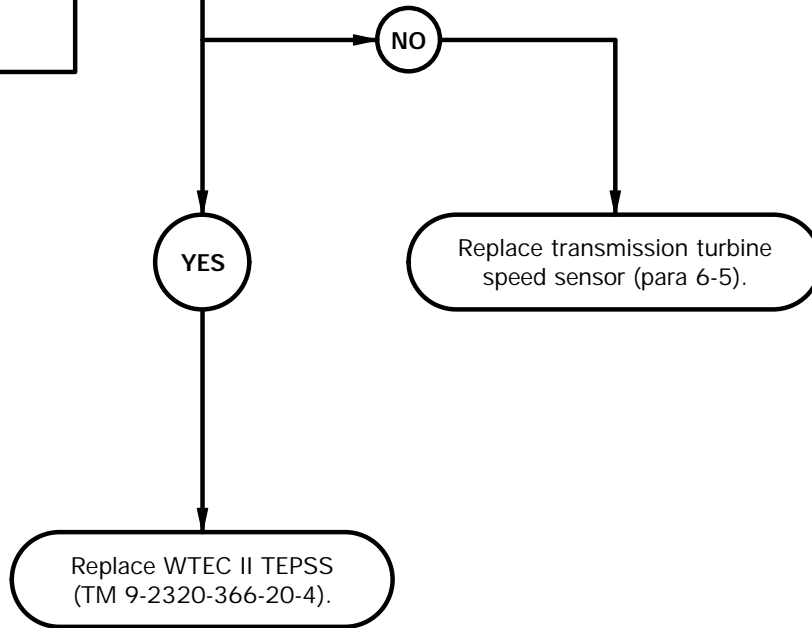
YBC0206B

c2. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission turbine speed sensor. Faulty WTEC II TEPSS.

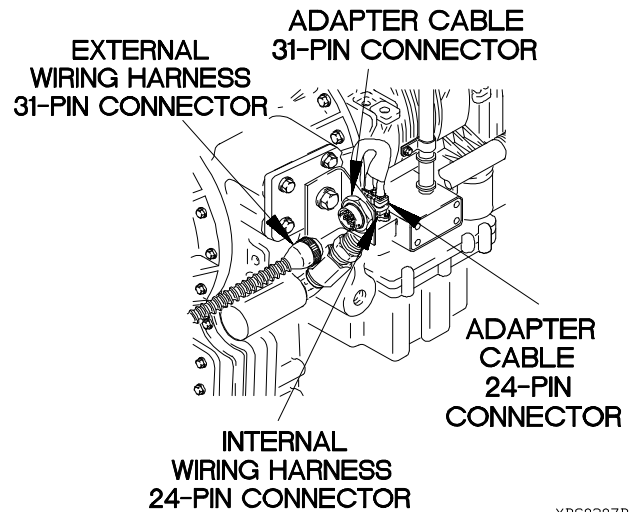
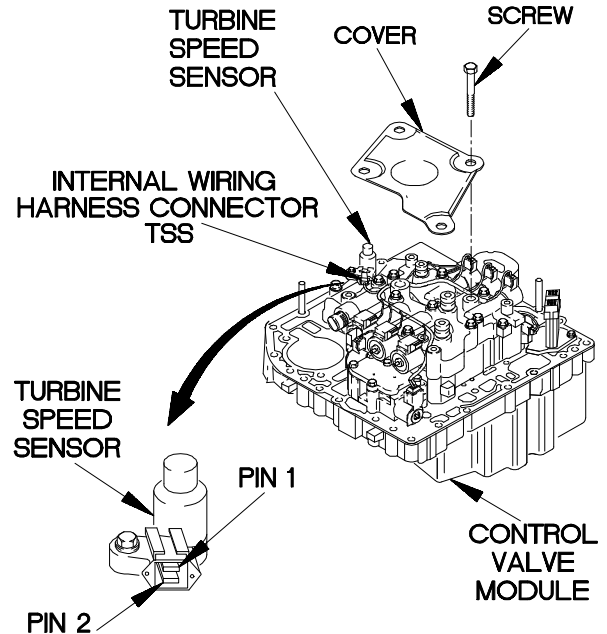
7.
 Is 200-400 ohms resistance present from transmission turbine speed sensor pin 1 to pin 2?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 200-400 ohms resistance is not present, transmission turbine speed sensor is faulty. If 200-400 ohms resistance is present, WTEC II TEPSS is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin 1 of turbine speed sensor.
- (3) Connect negative (-) probe of multimeter to pin 2 of turbine speed sensor and note reading on multimeter.
- (4) If resistance is less than 200 ohms or greater than 400 ohms, replace transmission turbine speed sensor (para 6-5).
- (5) If resistance is between 200 and 400 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector TSS to turbine speed sensor.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect adapter cable 24-pin connector to internal wiring harness 24-pin connector.
- (10) Tighten screw in adapter cable 24-pin connector.
- (11) Connect batteries (TM 9-2320-366-20-3).



YBC0207B

c3. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369)

INITIAL SETUP

Equipment Conditions

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 94, Appendix C)

Tools and Special Tools

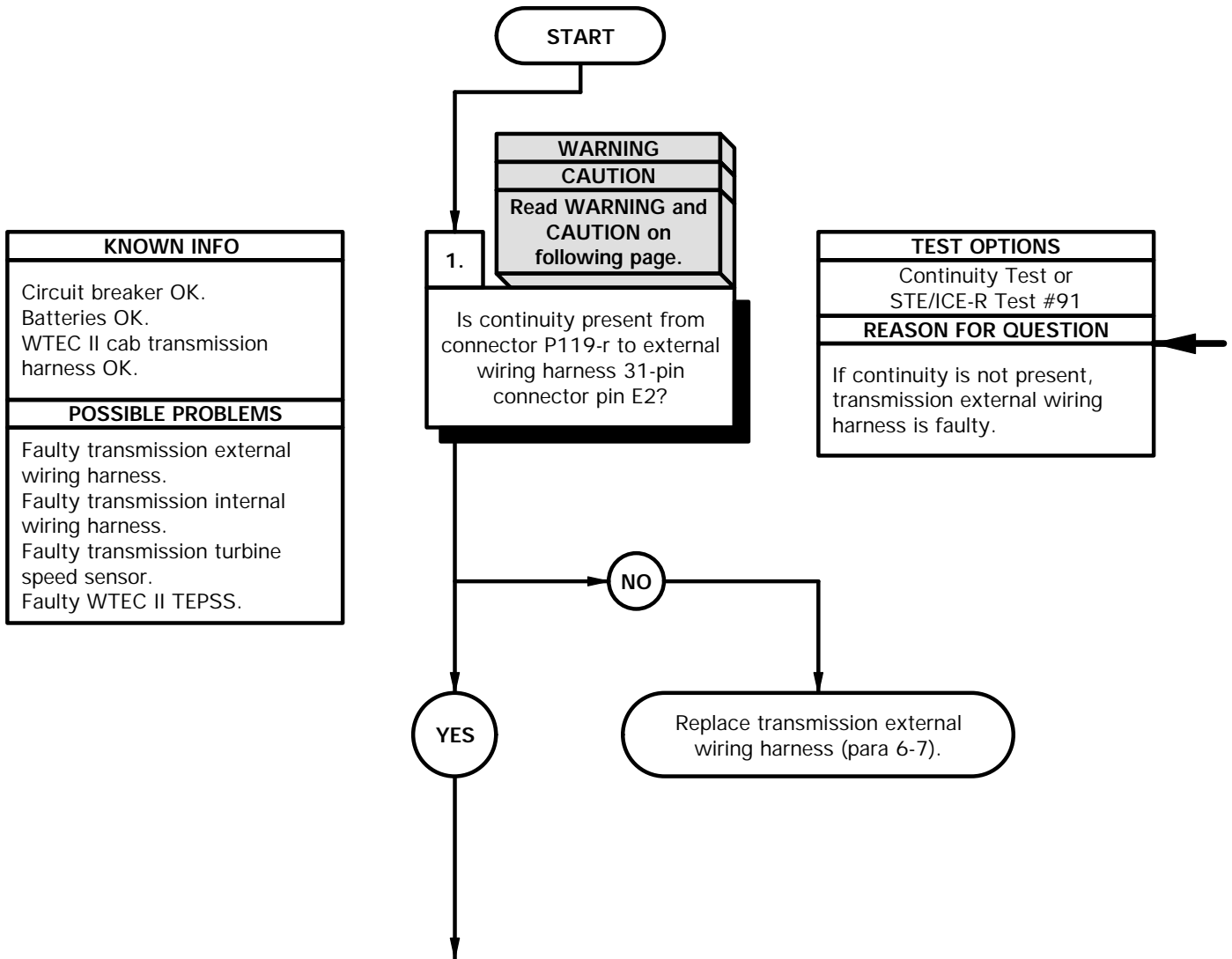
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85 Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

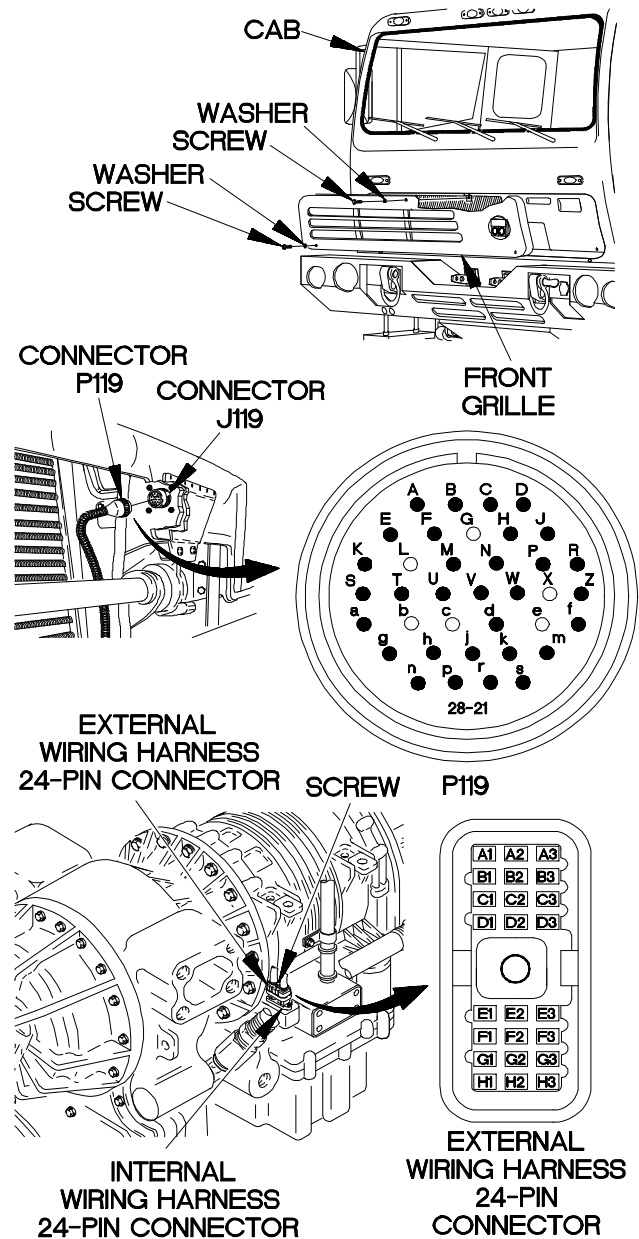
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Loosen screw in external wiring harness 24-pin connector.
- (6) Disconnect external wiring harness 24-pin connector from internal wiring harness 24-pin connector.
- (7) Set multimeter to ohms.
- (8) Connect positive (+) probe of multimeter to connector P119-r.
- (9) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin E2 and note reading on multimeter.
- (10) If continuity is not present, replace transmission external wiring harness (para 6-7).

CONTINUITY TEST (Cont)

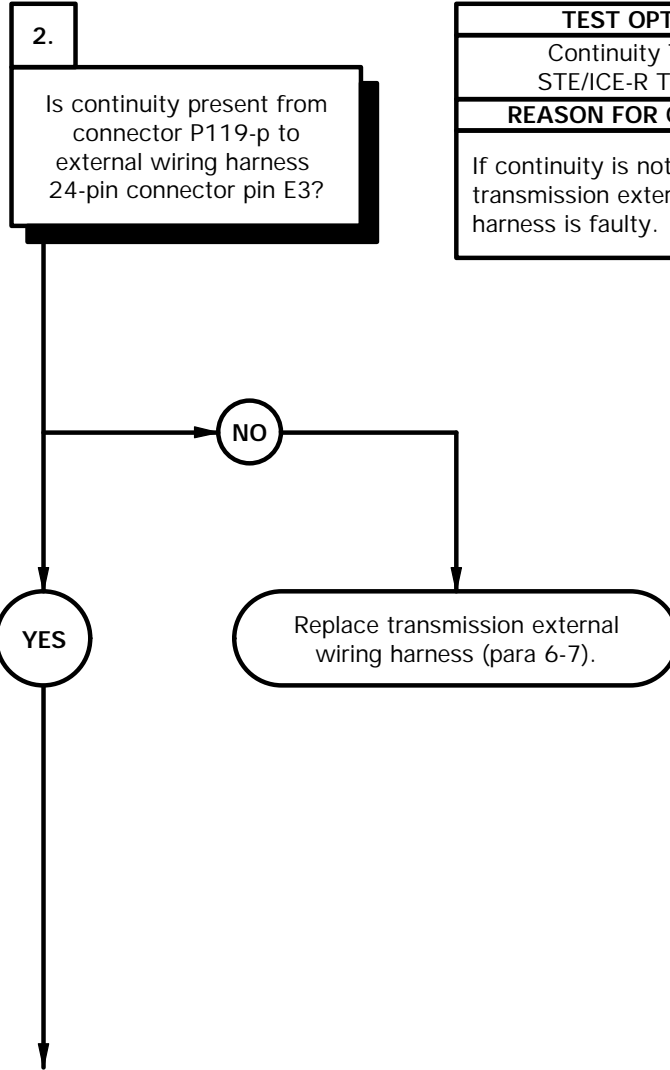
- (11) Connect positive (+) probe of multimeter to connector P119-r.
- (12) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (13) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (14) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



YBC0301B

c3. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

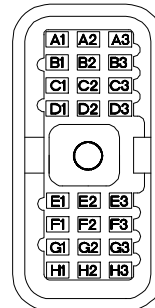
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty transmission turbine speed sensor. Faulty WTEC II TEPSS.



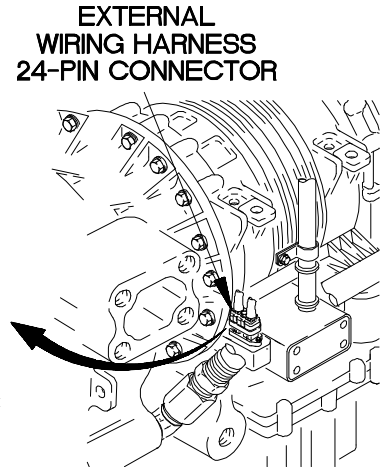
TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

CONTINUITY TEST

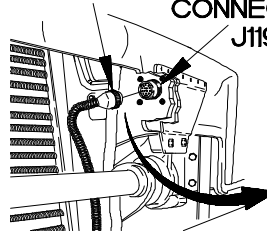
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-p.
- (3) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin E3 and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-p.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



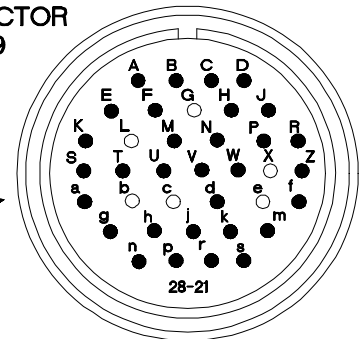
EXTERNAL WIRING HARNESS 24-PIN CONNECTOR



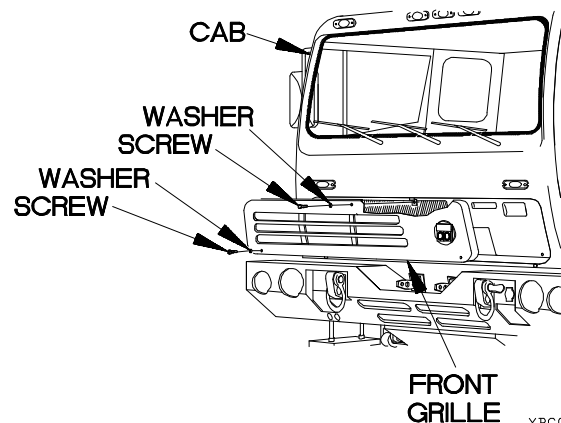
CONNECTOR P119



CONNECTOR J119



P119



c3. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

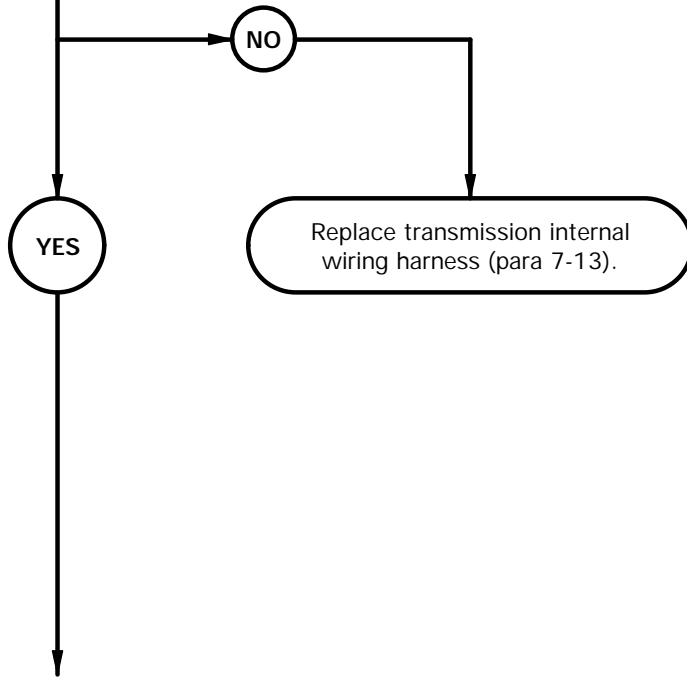
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty transmission turbine speed sensor. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin E2 to internal wiring harness connector TSS pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

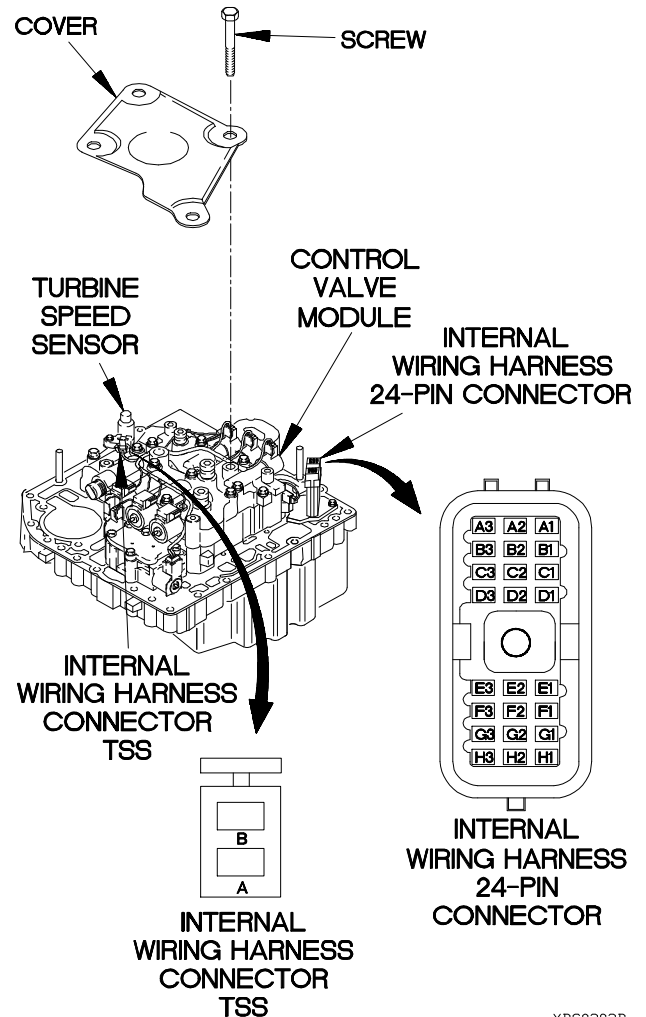


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Remove internal wiring harness connector TSS from turbine speed sensor connector.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin E2.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector TSS pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin E2.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



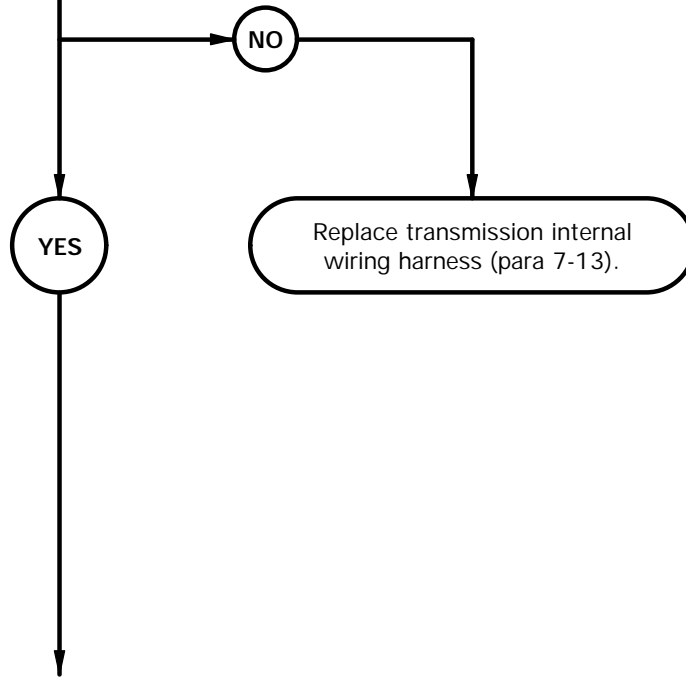
YBC0303B

c3. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty transmission turbine speed sensor. Faulty WTEC II TEPSS.

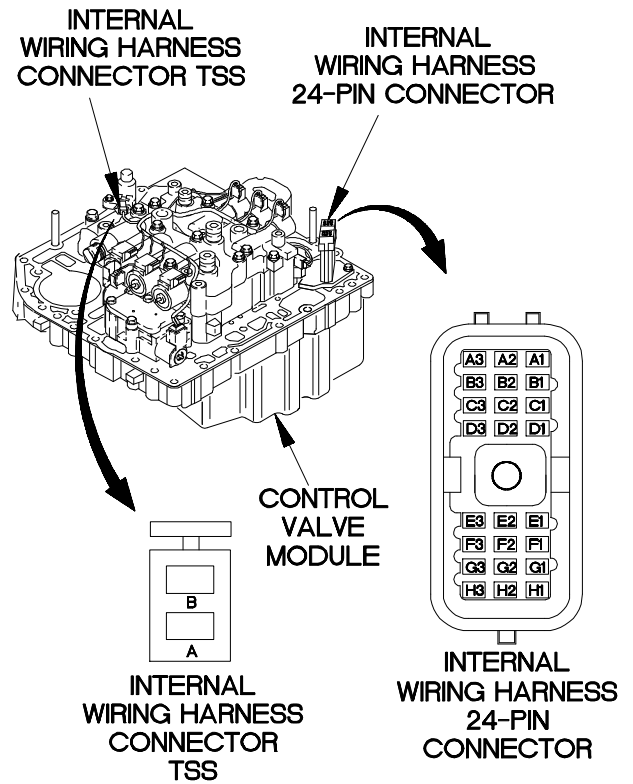
4.
Is continuity present from internal wiring harness 24-pin connector pin E3 to internal wiring harness connector TSS pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin E3.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector TSS pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin E3.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



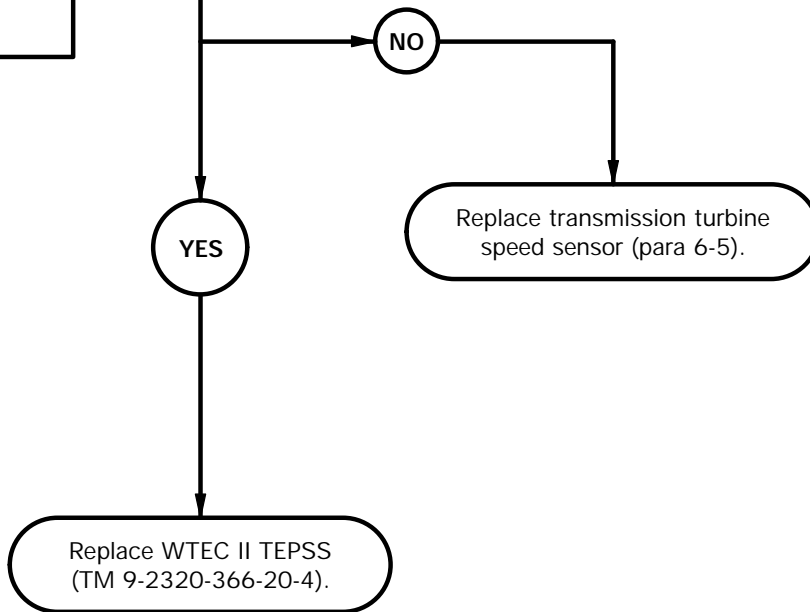
YBC0304B

c3. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission turbine speed sensor. Faulty WTEC II TEPSS.

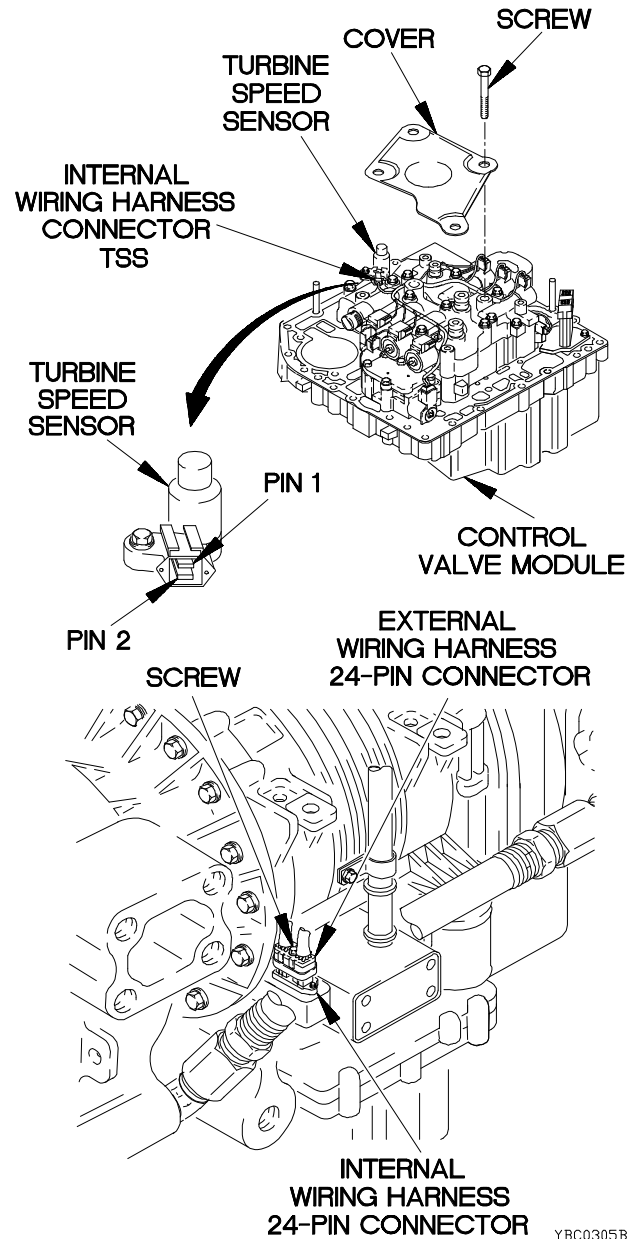
5.
Is 200-400 ohms resistance present from transmission turbine speed sensor pin 1 to pin 2?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 200-400 ohms resistance is not present, turbine speed sensor is faulty. If 200--400 ohms resistance is present, WTEC II TEPSS is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin 1 of turbine speed sensor.
- (3) Connect negative (-) probe of multimeter to pin 2 of turbine speed sensor and note reading on multimeter.
- (4) If resistance is less than 200 ohms or greater than 400 ohms, replace turbine speed sensor (para 6-5).
- (5) If resistance is between 200 and 400 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring connector TSS to turbine speed sensor.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect external wiring harness 24-pin connector to internal wiring harness 24-pin connector.
- (10) Tighten screw in external wiring harness 24-pin connector.
- (11) Connect batteries (TM 9-2320-366-20-3).



c4. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 16

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Gasket (Item 68, Appendix F)
Oil, Lubricating (Item 46, Appendix C)
Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

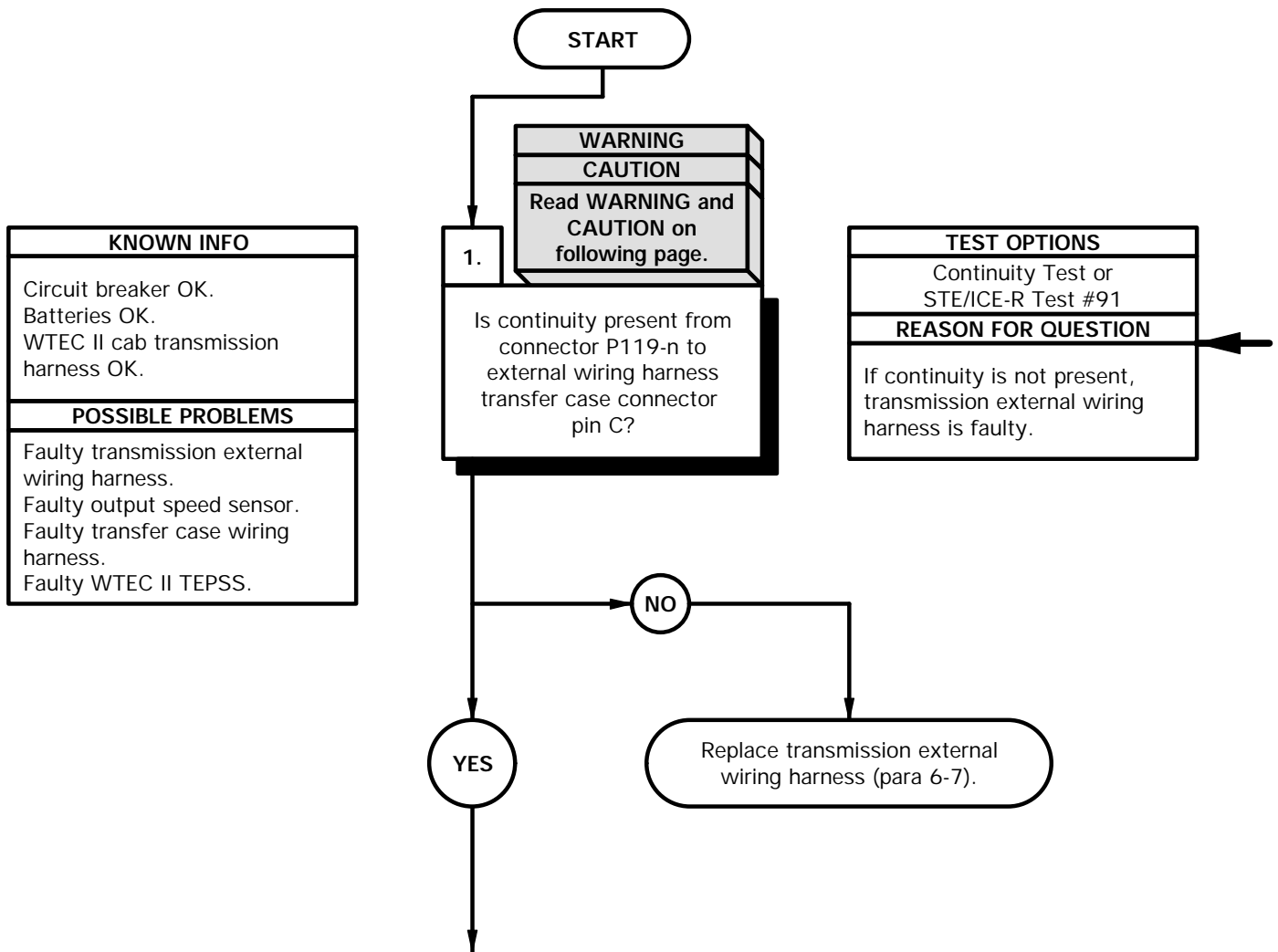
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Pan, Drain (Item 43, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

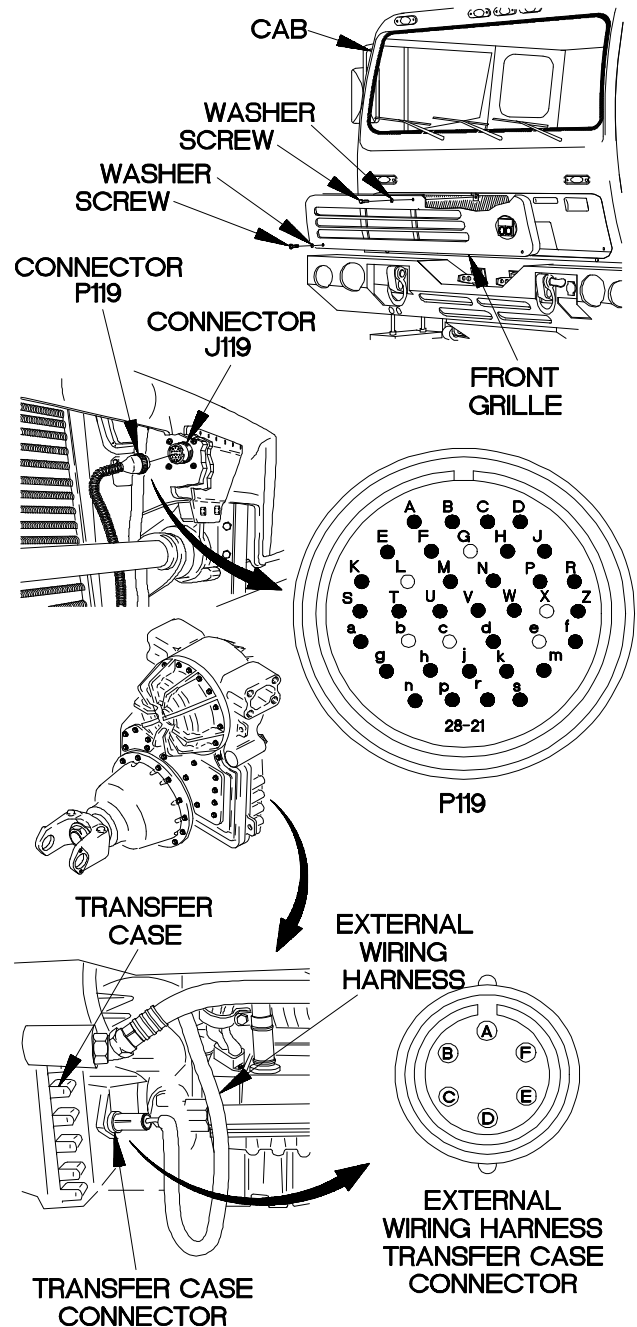
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness transfer case connector from transfer case connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-n.
- (8) Connect negative (-) probe of multimeter to external wiring harness transfer case connector pin C and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-n.

CONTINUITY TEST (Cont)

- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



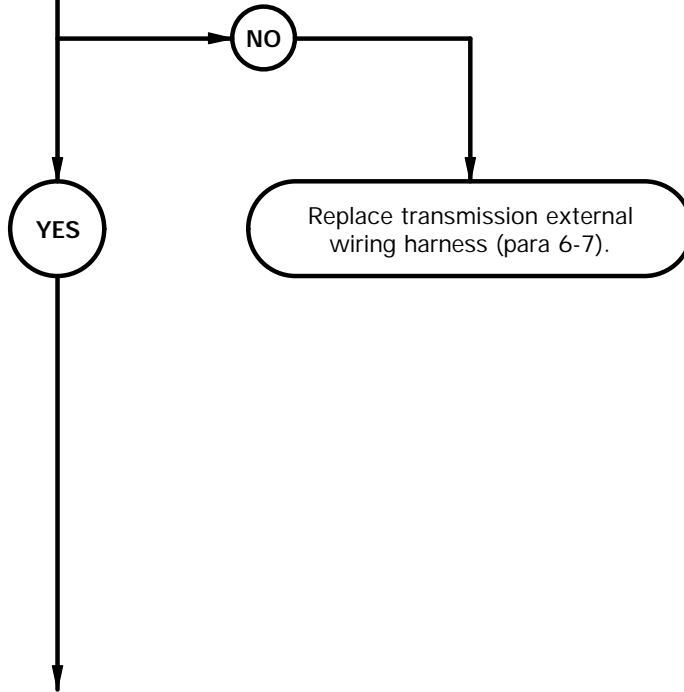
YBC0401B

c4. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 16 (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty output speed sensor. Faulty transfer case wiring harness. Faulty WTEC II TEPSS.

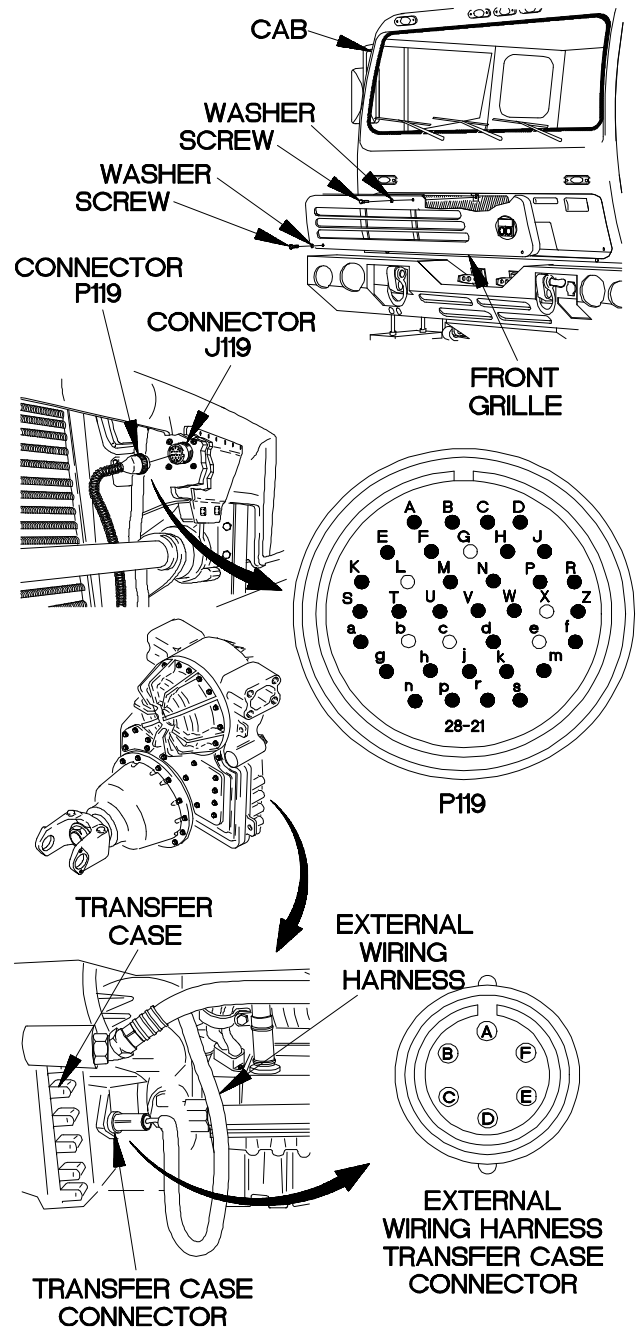
2.
Is continuity present from connector P119-g to external wiring harness transfer case connector pin D?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-g.
- (3) Connect negative (-) probe of multimeter to external wiring harness transfer case connector pin D and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-g.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



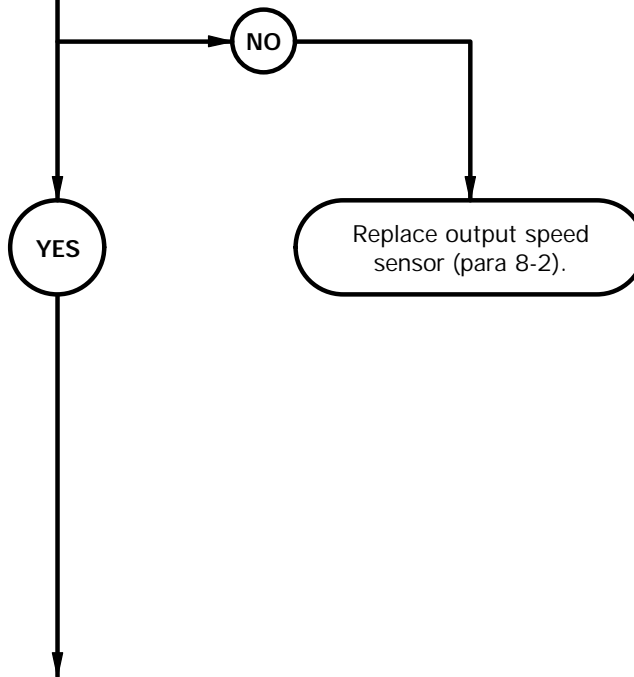
YBC0402B

c4. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 16 (Cont)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty output speed sensor. Faulty transfer case wiring harness. Faulty WTEC II TEPSS.

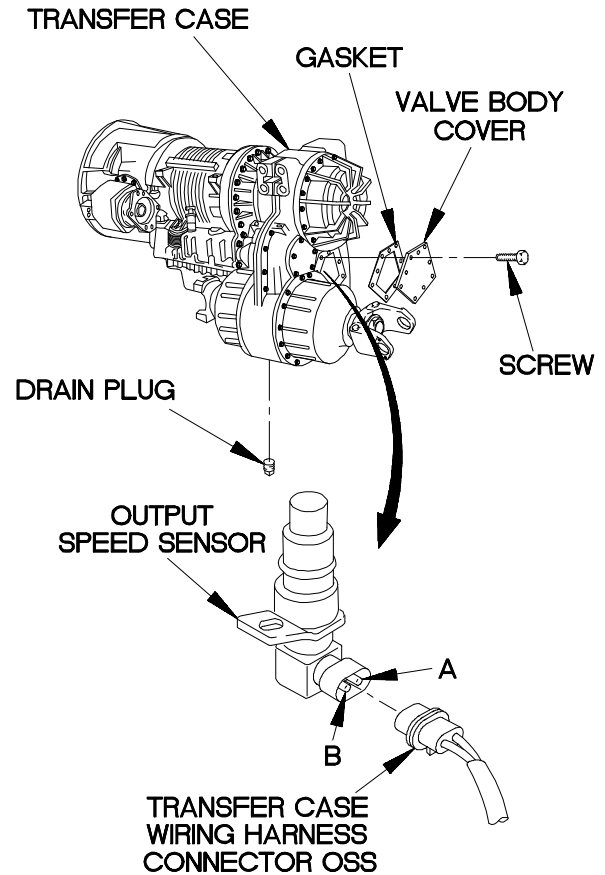
3.
Is 200-400 ohms resistance present from output speed sensor pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 200-400 ohms resistance is not present, output speed sensor is faulty.



RESISTANCE TEST

- (1) Position drain pan under valve body.
- (2) Remove drain plug from transfer case.
- (3) Drain oil from transfer case.
- (4) Install drain plug in transfer case.
- (5) Remove ten screws from valve body cover.
- (6) Remove valve body cover and gasket from transfer case. Discard gasket.
- (7) Disconnect transfer case wiring harness connector OSS from output speed sensor.
- (8) Set multimeter to ohms.
- (9) Connect positive (+) probe of multimeter to output speed sensor pin A.
- (10) Connect negative (-) probe of multimeter to output speed sensor pin B and note reading on multimeter.
- (11) If resistance is less than 200 ohms or greater than 400 ohms, replace output speed sensor (para 8-2).



YBC0403B

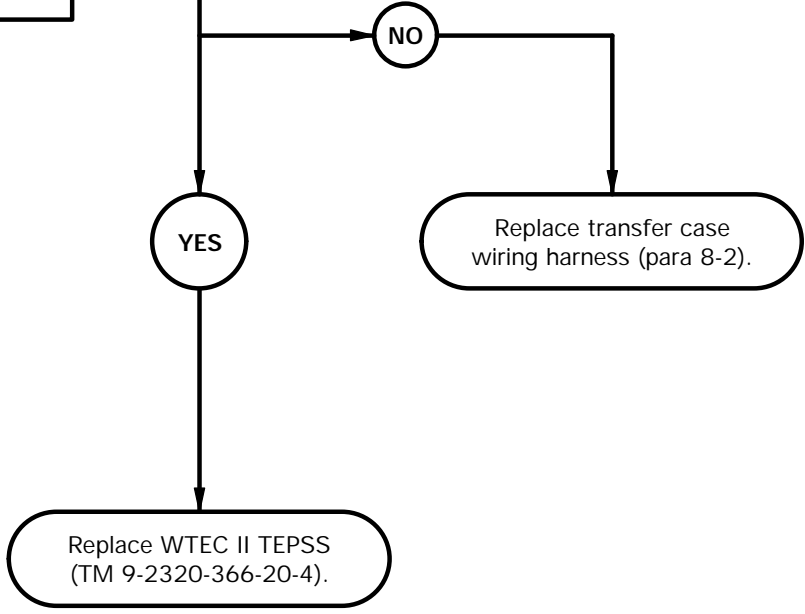
c4. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 16 (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Output speed sensor OK.
POSSIBLE PROBLEMS
Faulty transfer case wiring harness. Faulty WTEC II TEPSS.

CAUTION
Read CAUTION on following page.

4.
Is continuity present from output speed sensor connector to transfer case connector?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transfer case wiring harness is faulty. If continuity is present, WTEC II TEPSS is faulty.

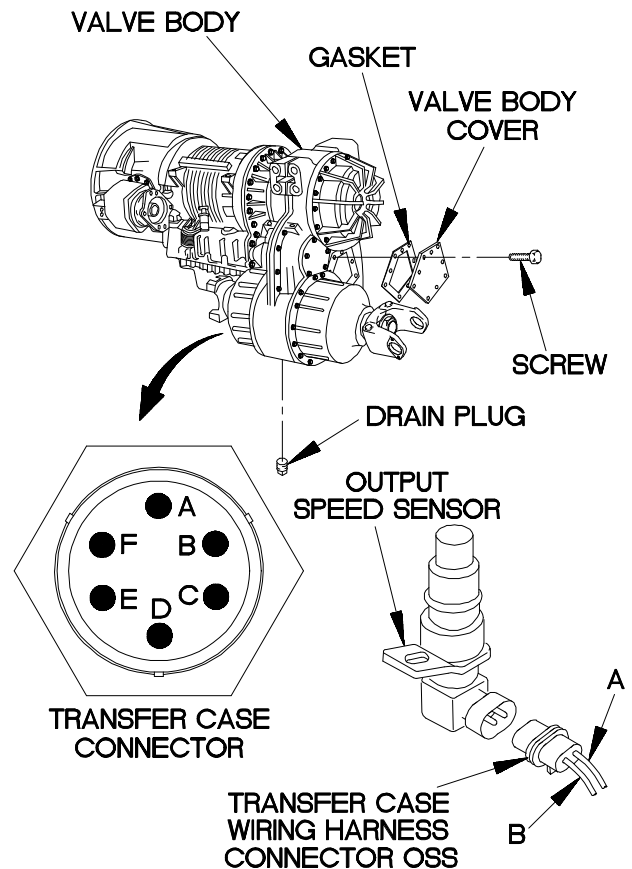


CAUTION

Use care when connecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to output speed sensor connector pin A.
- (3) Connect negative (-) probe of multimeter to transfer case connector pin A and note reading on multimeter.
- (4) If continuity is not present, replace transfer case wiring harness (para 8-2).
- (5) Connect positive (+) probe of multimeter to output speed sensor connector pin B.
- (6) Connect negative (-) probe of multimeter to transfer case connector pin B and note reading on multimeter.
- (7) If continuity is not present, replace transfer case wiring harness (para 8-2).
- (8) If continuity is present, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (9) Connect transfer case wiring harness connector OSS to output speed sensor.
- (10) Install gasket and valve body cover on transfer case with ten screws.
- (11) Connect transmission external wiring harness transfer case connector to transfer case connector.
- (12) Add lubricating oil to transmission (TM 9-2320-366-20).
- (13) Connect batteries (TM 9-2320-366-20-3).



YBC0404B

c5. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

Equipment Conditions

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

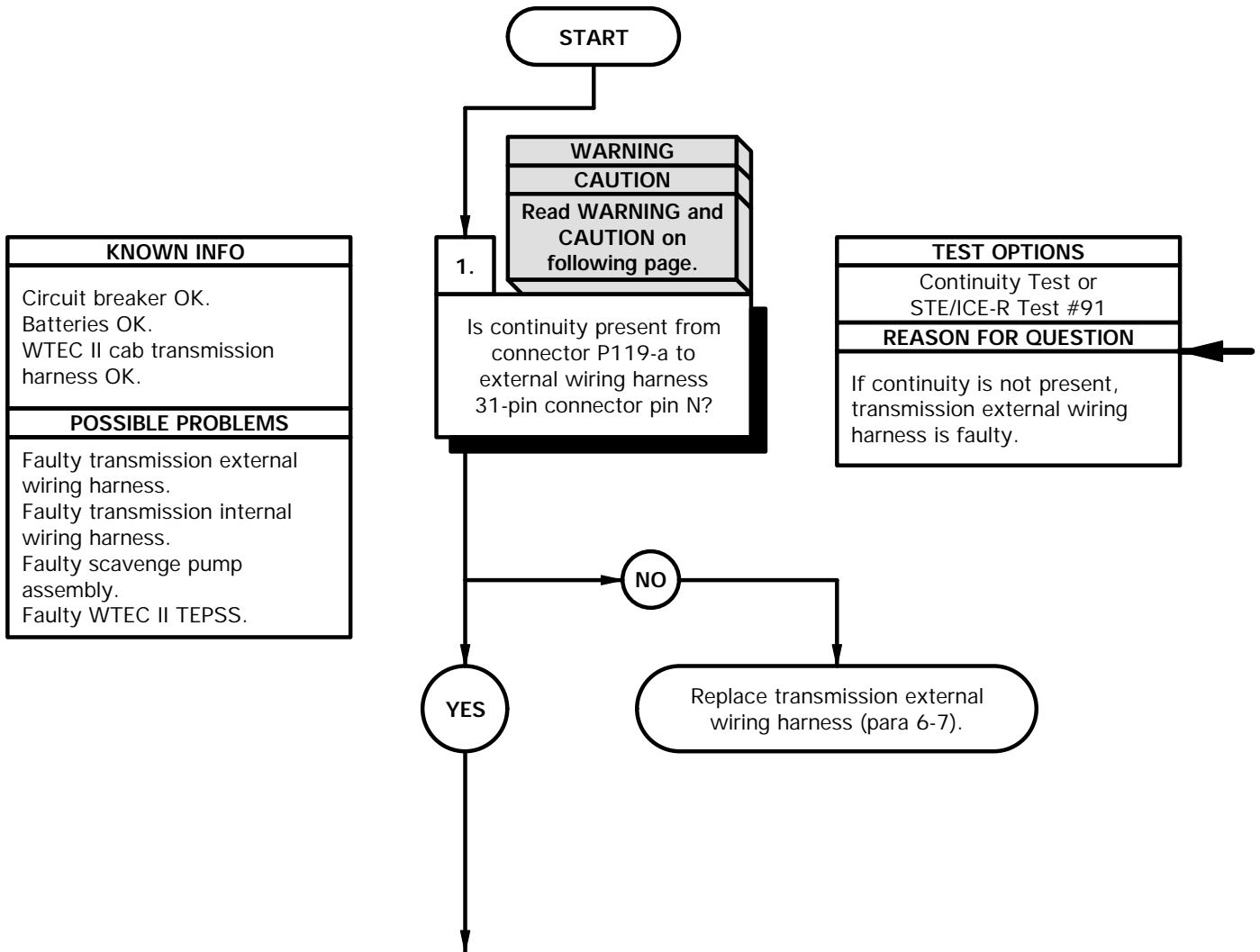
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Scket (Item 85, Appendix B)
Pan, Drain (Item 43, Appendix B)

References

TM 9-4910-571-12&P

Personnel Required

(2)



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

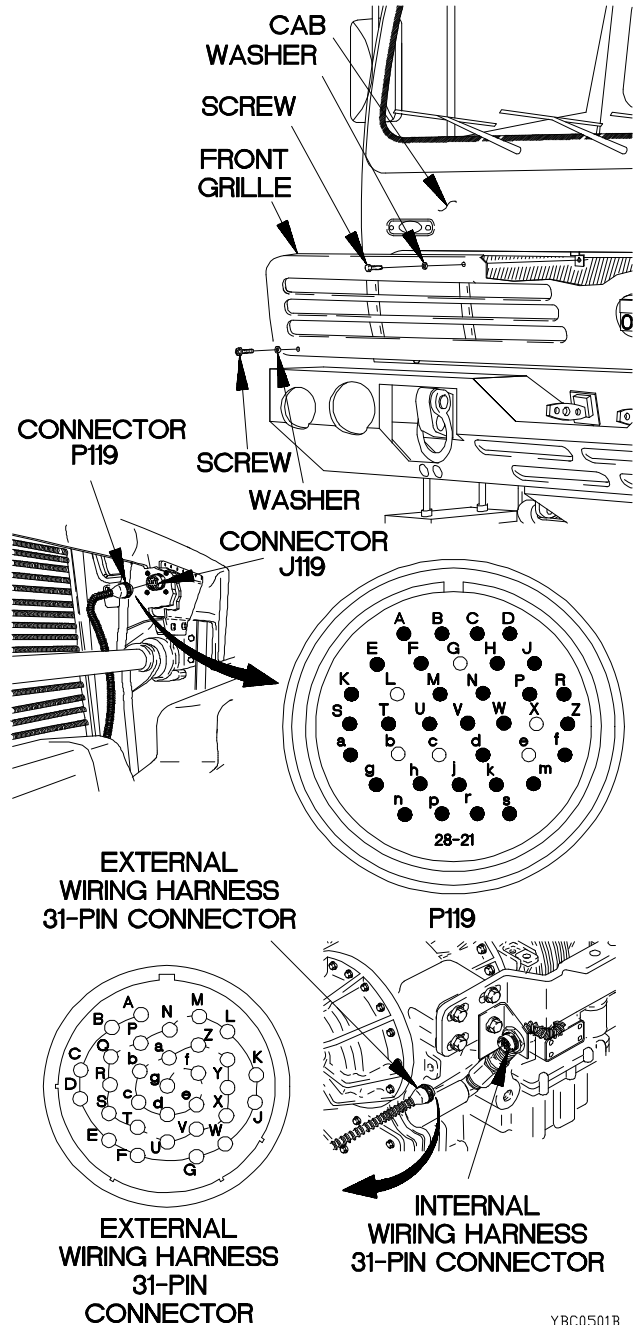
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-a.
- (8) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin N and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-a.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

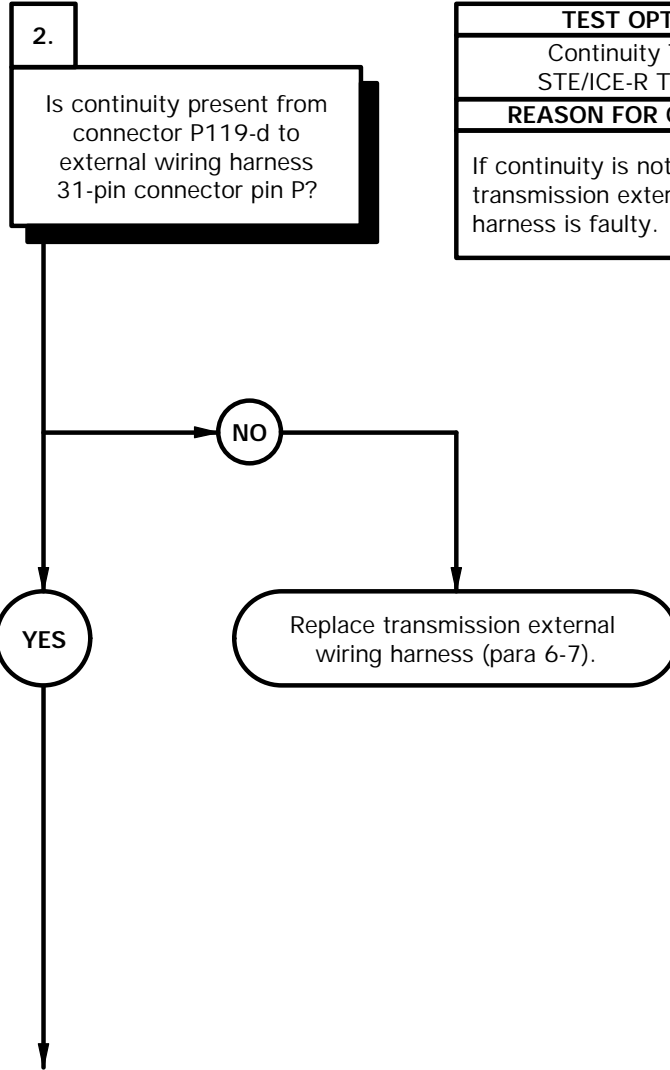
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



YBC0501B

c5. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

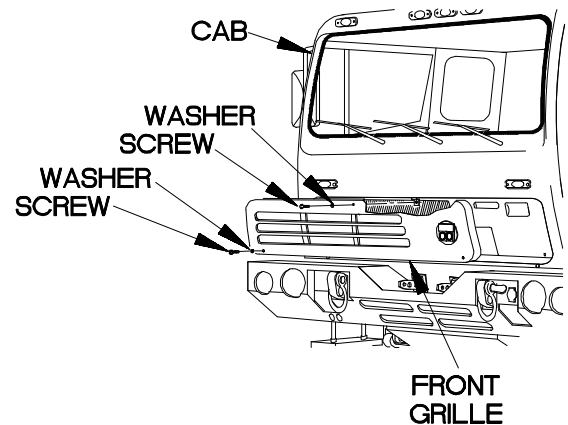
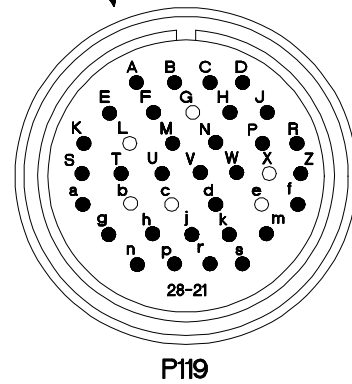
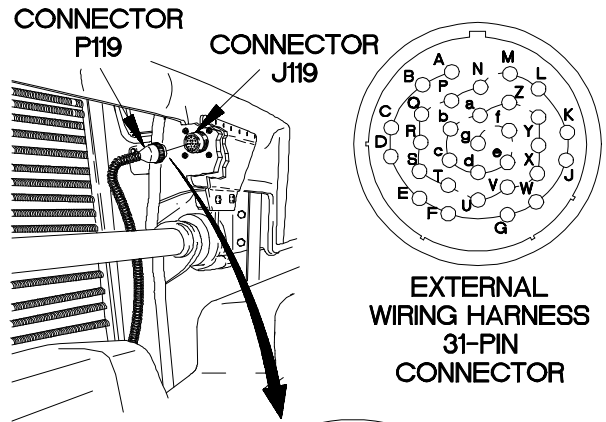
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty scavenge pump assembly. Faulty WTEC II TEPSS.



TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-d.
- (3) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin P and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-d.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



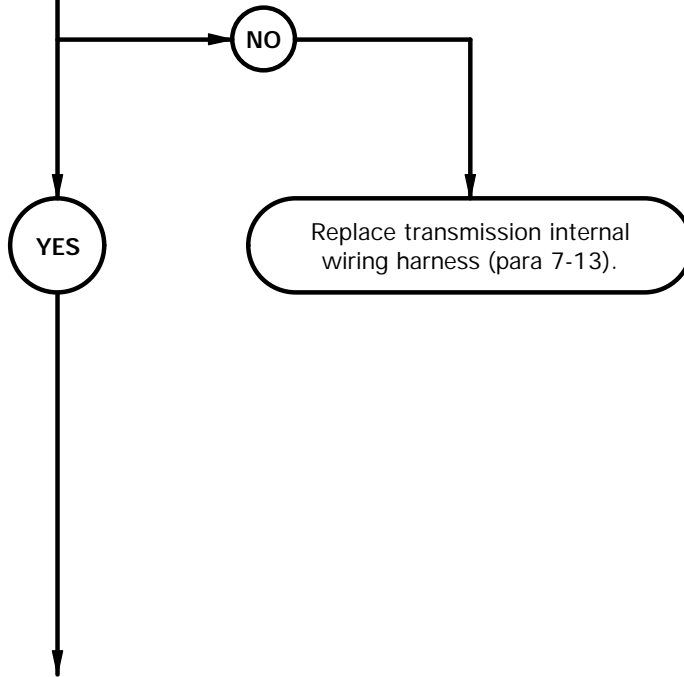
YBC0502B

c5. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty scavenge pump assembly. Faulty WTEC II TEPSS.

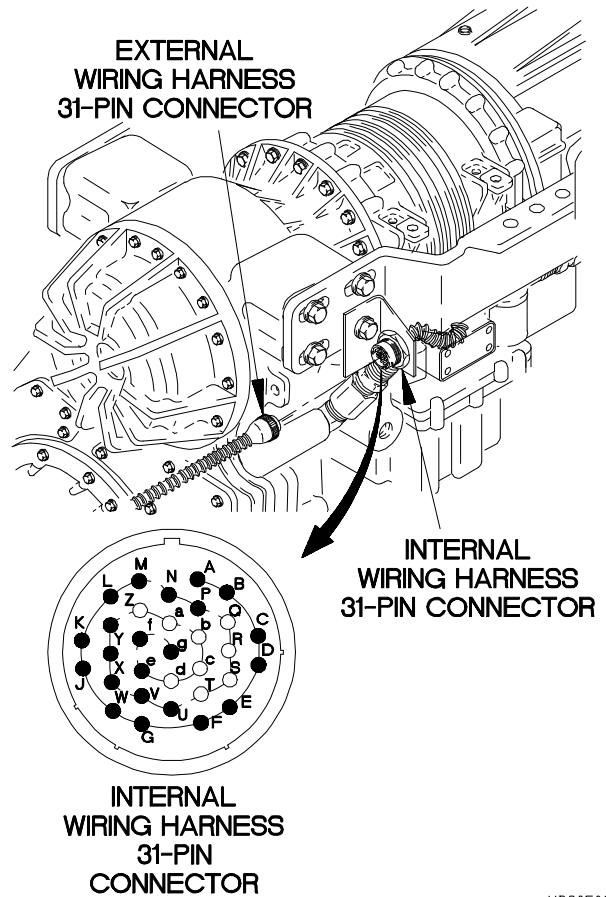
3.
Is continuity present from internal wiring harness 31-pin connector pin N to pin P?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal cable assembly is faulty.



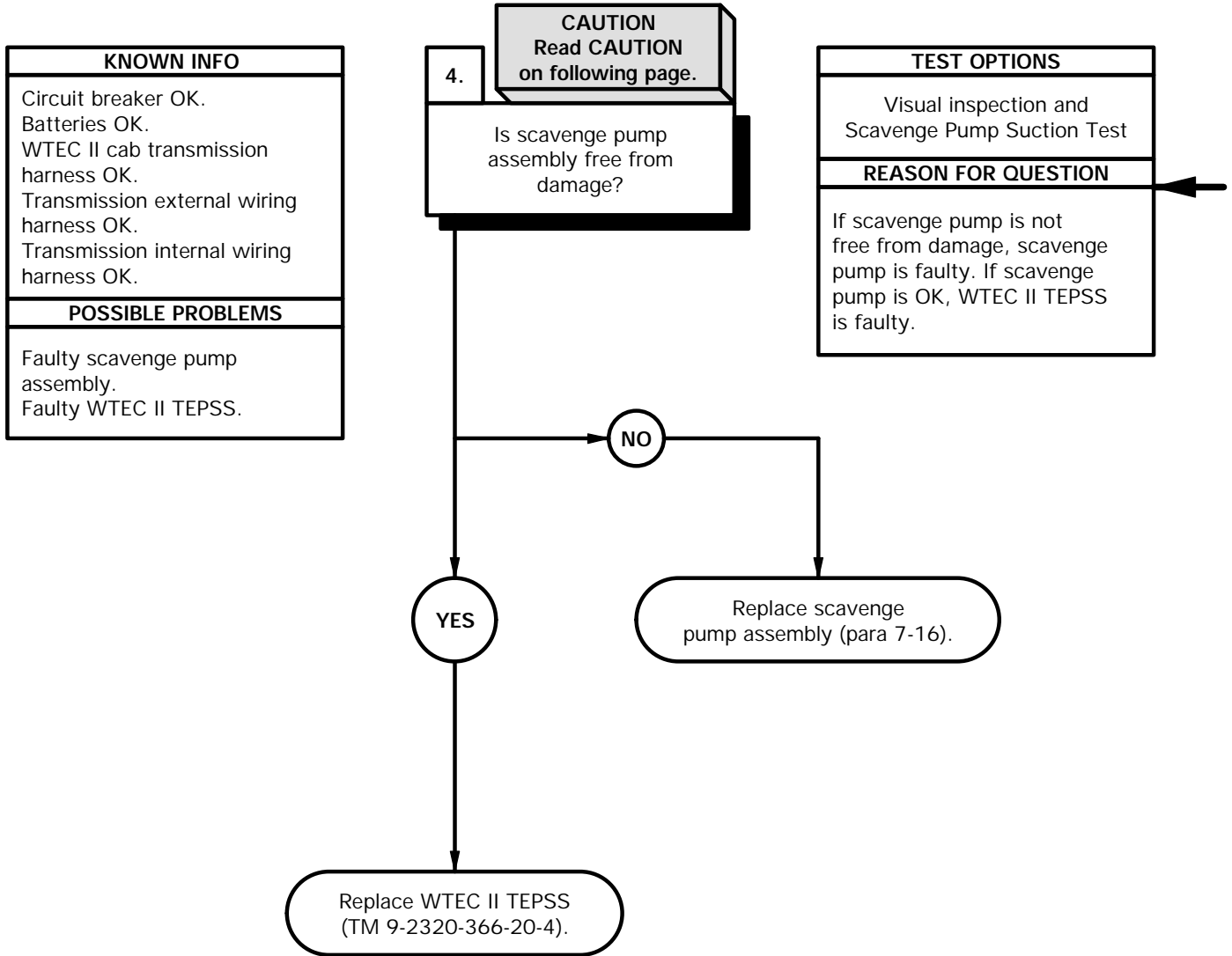
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin N.
- (3) Connect negative (-) probe of multimeter to internal wiring harness 31-pin connector pin P and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin N.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).
- (9) Connect external wiring harness 31-pin connector to internal wiring harness 31-pin connector.



YBC0503B

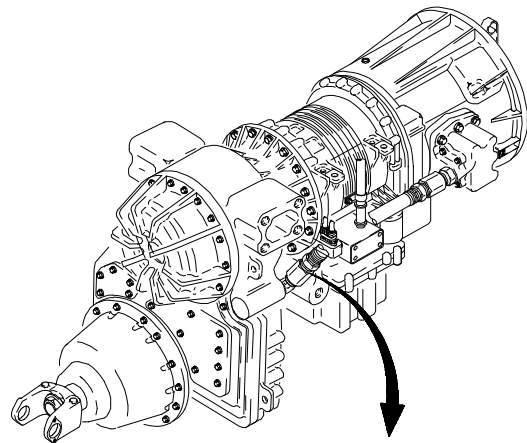
c5. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



- (1) Place drain pan under transfer case.
- (2) Disconnect scavenge pump suction hose at transfer case.
- (3) Connect batteries (TM 9-2320-366-20-3).
- (4) Start engine (TM 9-2320-366-10-1).
- (5) If oil drips or runs from fitting on transfer case, replace scavenge pump assembly (para 7-16).
- (6) Shut down engine (TM 9-2320-366-10-1).

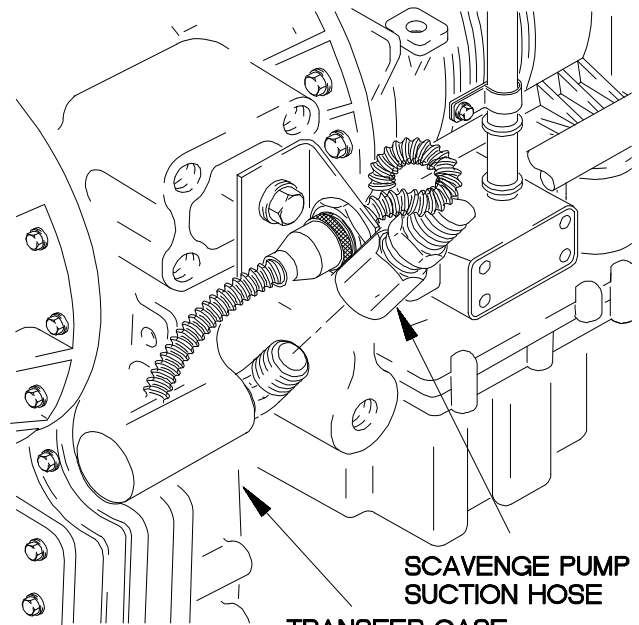
CAUTION

Shut down engine immediately when test is completed. Failure to comply may result in damage to equipment.



SCAVENGE PUMP SUCTION TEST

- (1) Place end of hose in a cup containing approximately one pint of oil.
- (2) Start engine (TM 9-2320-366-10-1).
- (3) Select neutral on WTEC II TEPSS (TM 9-2320-366-10-1) and note if oil is immediately sucked into hose by scavenge pump.
- (4) If oil is not immediately removed from cup, replace scavenge pump assembly (para 7-16).
- (5) Shut down engine (TM 9-2320-366-10-1).
- (6) Connect scavenge pump suction hose to transfer case.
- (7) Remove drain pan.



YBC0504B

c6. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY)

INITIAL SETUP

Equipment Conditions

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Tools and Special Tools

Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)
Pan, Drain (Item 43, Appendix B)

Materials/Parts

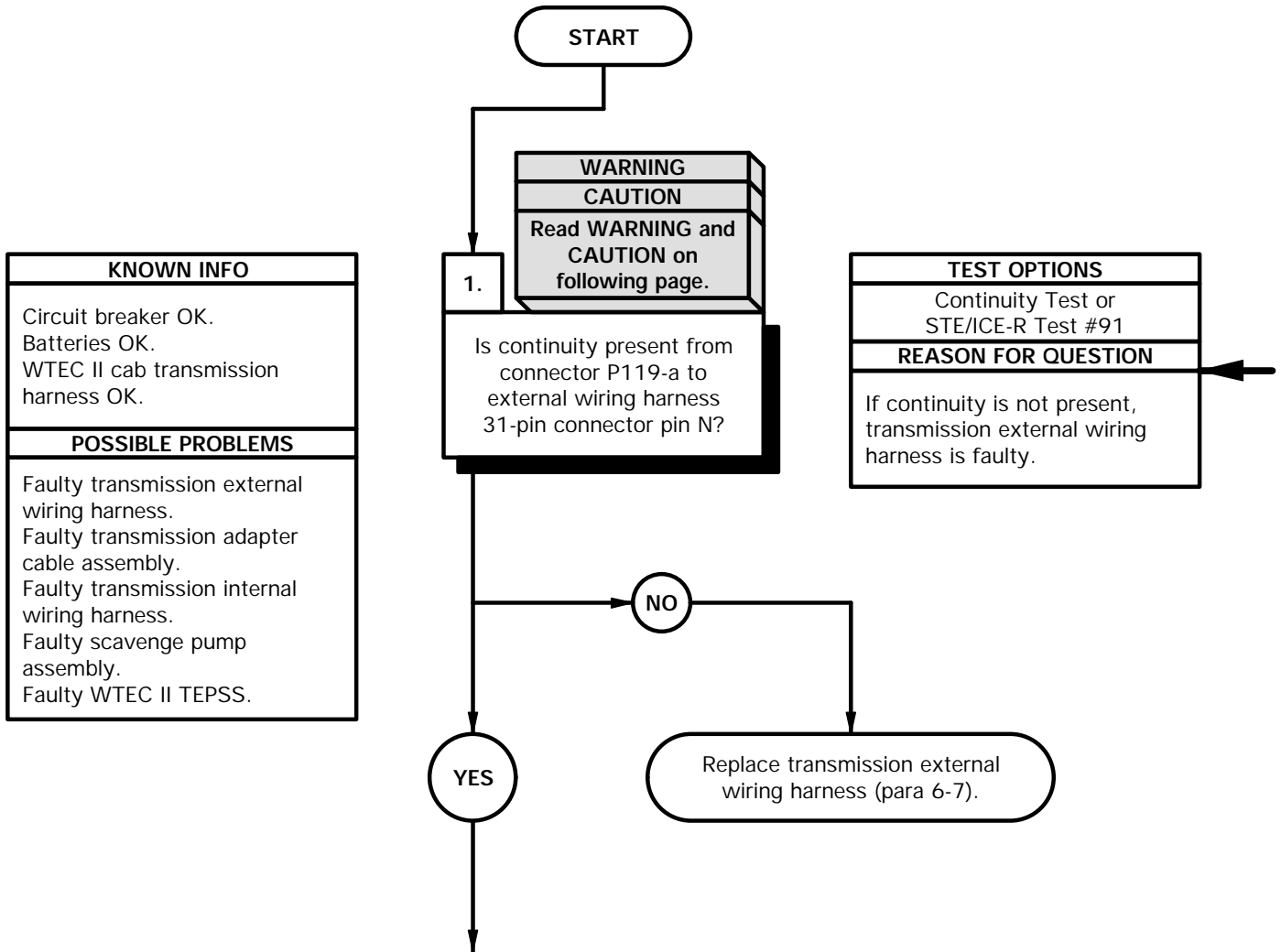
Wire, Elect, 50 ft (Item 97, Appendix C)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

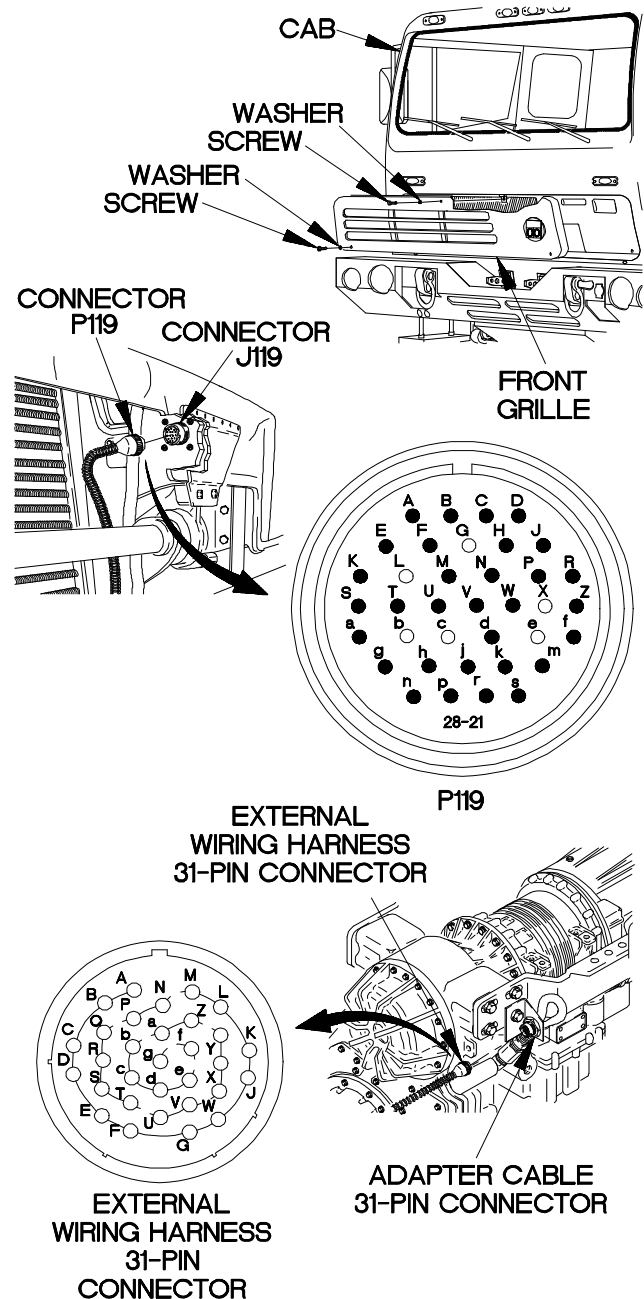
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness 31-pin connector from adaptor cable 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-a.
- (8) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin N and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-a.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



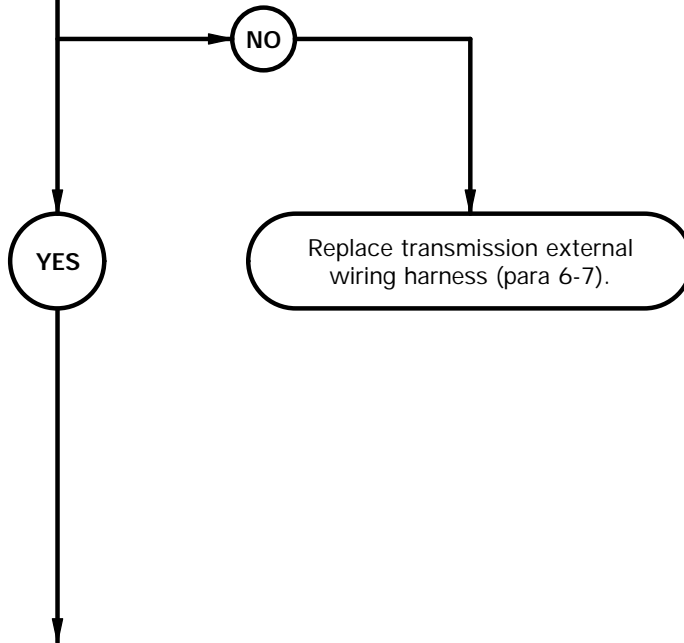
YBC0601B

c6. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty scavenge pump assembly. Faulty WTEC II TEPSS.

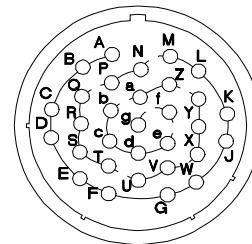
2.
Is continuity present from connector P119-d to external wiring harness 31-pin connector pin P?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

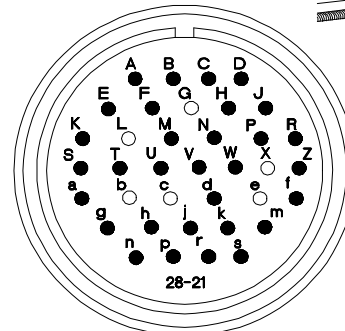


CONTINUITY TEST

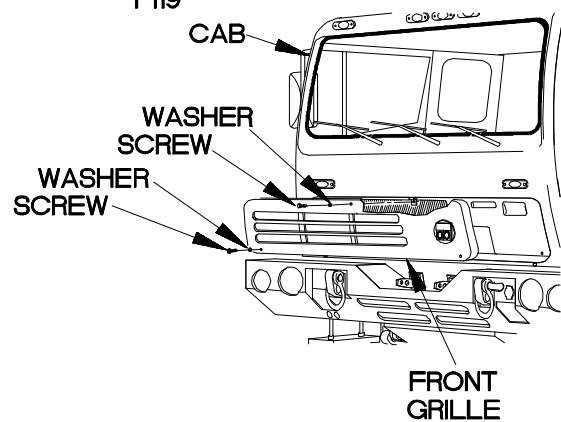
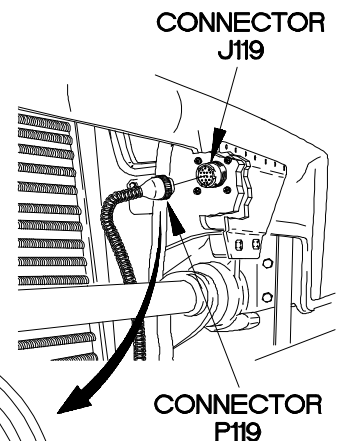
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-d.
- (3) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin P and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-d.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external cable assembly is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



EXTERNAL WIRING HARNESS 31-PIN CONNECTOR



P119



YBC0602B

c6. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (Cont)

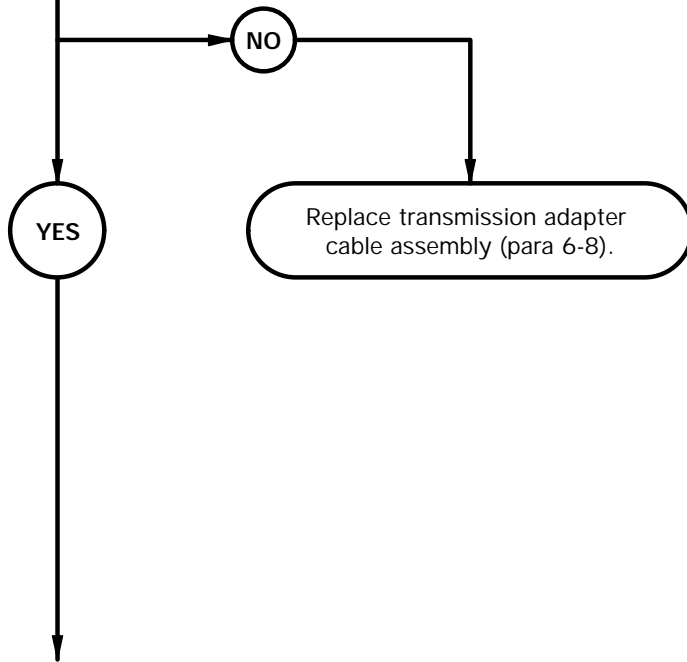
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty scavenge pump assembly. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin N to adapter cable 24-pin connector pin G2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.

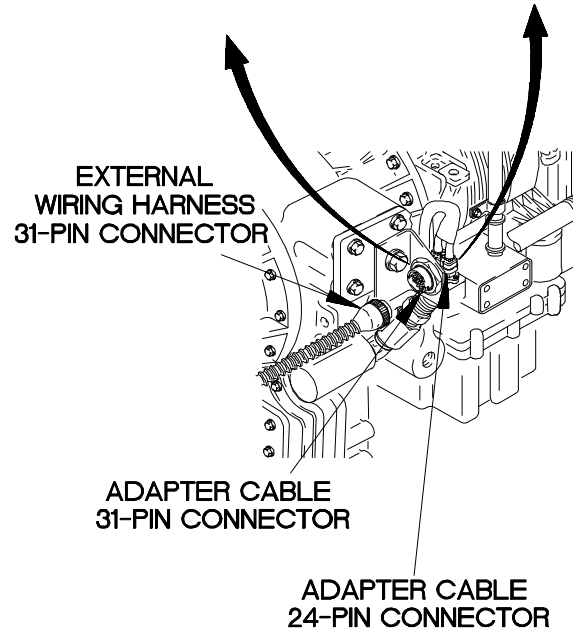
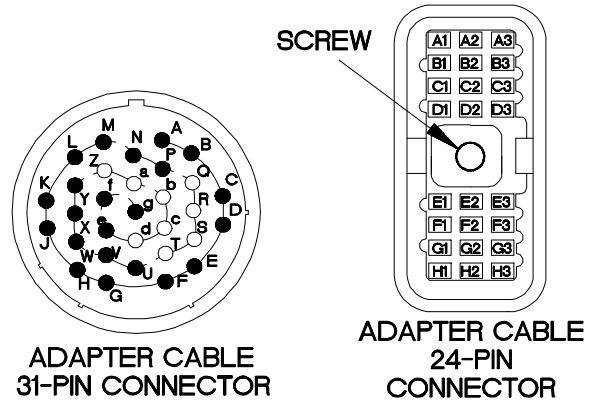


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Loosen screw in adapter cable 24-pin connector.
- (2) Disconnect adapter cable 24-pin connector from internal wiring harness 24-pin connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin N.
- (5) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin G2 and note reading on multimeter.
- (6) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (7) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin N.
- (8) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).



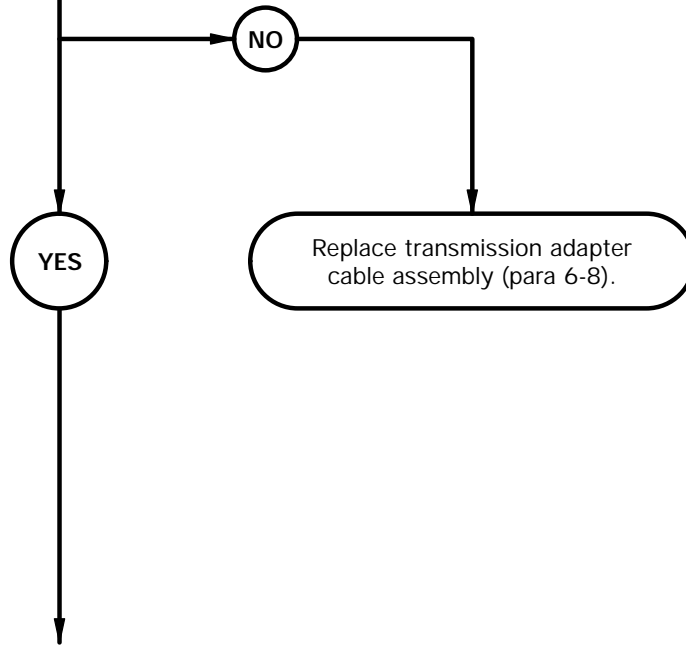
YBC0603B

c6. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty scavenge pump assembly. Faulty WTEC II TEPSS.

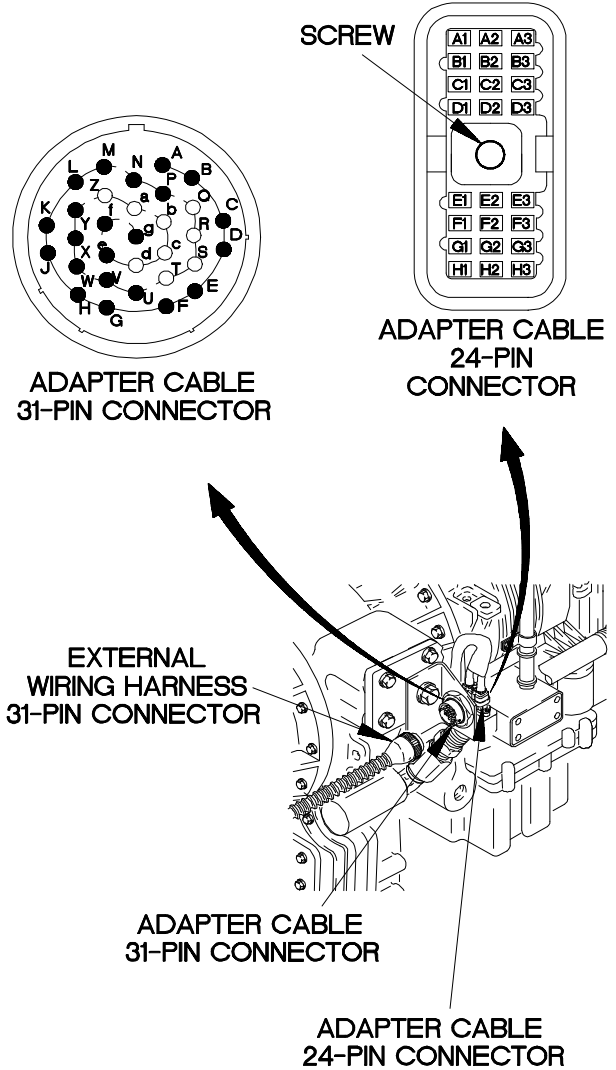
4.
Is continuity present from adapter cable 31-pin connector pin P to adapter cable 24-pin connector pin F3?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin P.
- (3) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin F3 and note reading on multimeter.
- (4) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (5) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin P.
- (6) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).
- (9) Connect external wiring harness 31-pin connector to adapter cable 31-pin connector.



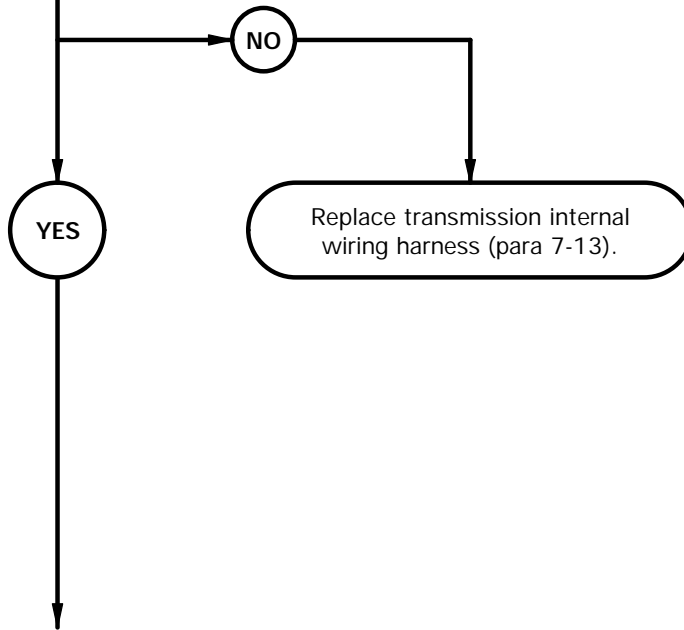
YBC0604B

c6. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty scavenge pump assembly. Faulty WTEC II TEPSS.

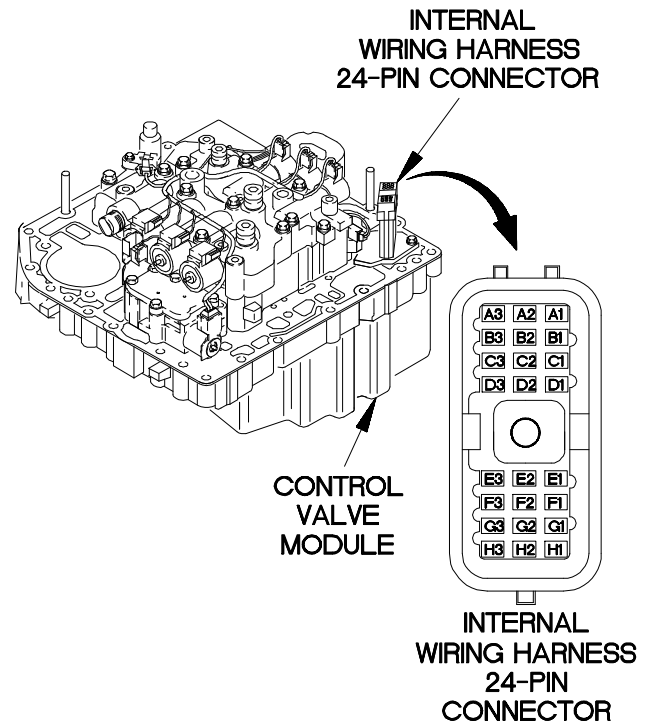
5.
 Is 300-2000 ohms resistance present from internal wiring harness 24-pin connector pin G2 to pin F3?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If less than 300 ohms or more than 2000 ohms resistance is present, transmission internal wiring harness is faulty.



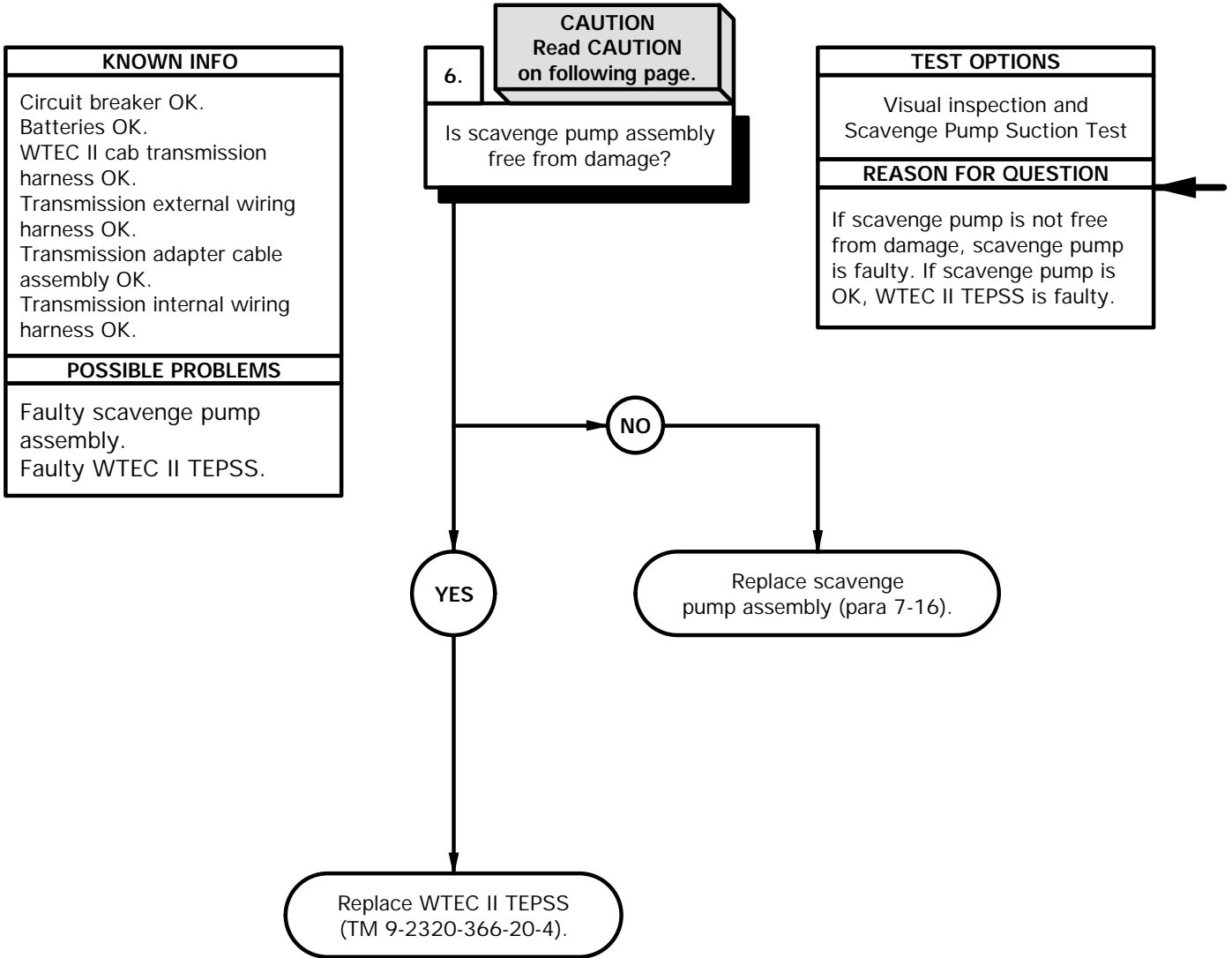
RESISTANCE TEST

- (1) Remove control valve module (para 7-10).
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin G2.
- (4) Connect negative (-) probe of multimeter to internal wiring harness 24-pin connector pin F3 and note reading on multimeter.
- (5) If resistance is less than 300 ohms or greater than 2000 ohms, replace transmission internal wiring harness (para 7-13).
- (6) Install control valve module (para 7-10).



YBC0605B

c6. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



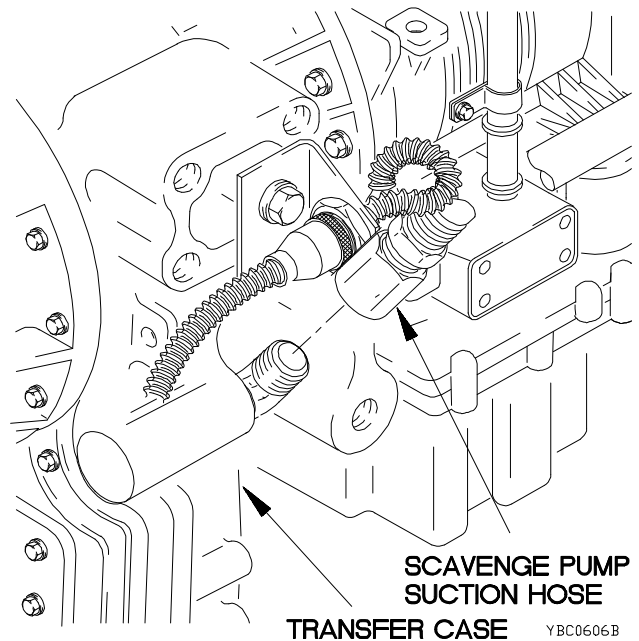
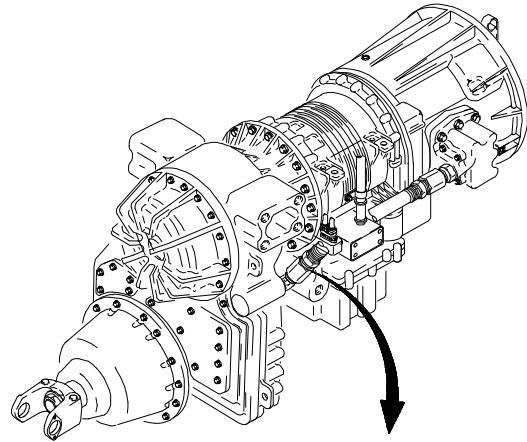
- (1) Place drain pan under transfer case.
- (2) Disconnect scavenge pump suction hose at transfer case.
- (3) Connect batteries (TM 9-2320-366-20-3).
- (4) Start engine (TM 9-2320-366-10-1).
- (5) If oil drips or runs from fitting on transfer case, replace scavenge pump assembly (para 7-16).
- (6) Shut down engine (TM 9-2320-366-10-1).

CAUTION

Shut down engine immediately when test is completed. Failure to comply may result in damage to equipment.

SCAVENGE PUMP SUCTION TEST

- (1) Place end of hose in a cup containing approximately one pint of oil.
- (2) Start engine (TM 9-2320-366-10-1).
- (3) Select neutral on WTEC II TEPSS (TM 9-2320-366-10-1) and note if oil is immediately sucked into hose by scavenge pump.
- (4) If oil is not immediately removed from cup, replace scavenge pump assembly (para 7-16).
- (5) Shut down engine (TM 9-2320-366-10-1).
- (6) Connect scavenge pump suction hose to transfer case.
- (7) Remove drain pan.



c7. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369)

INITIAL SETUP

Equipment Conditions

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

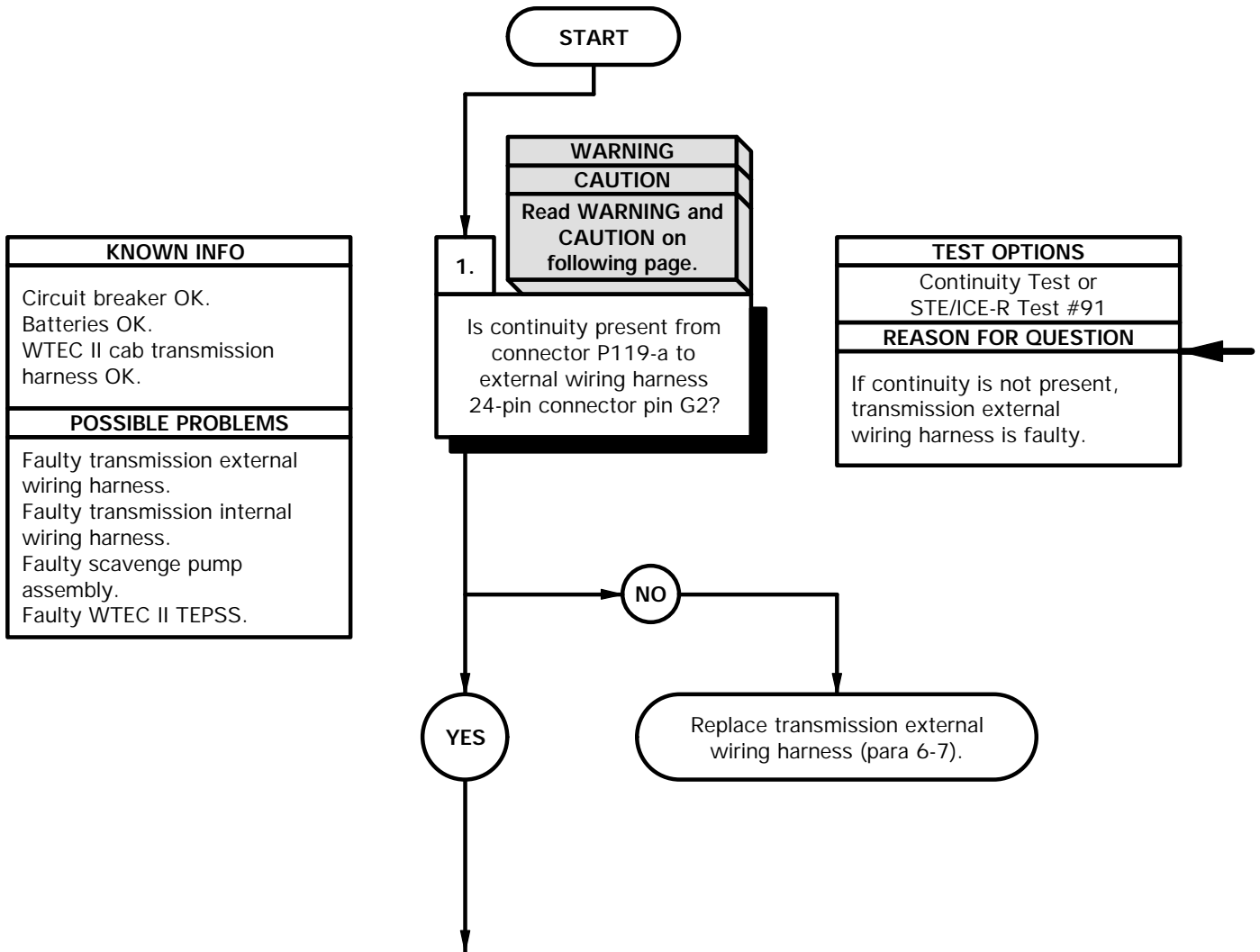
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)
Pan, Drain (Item 43, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

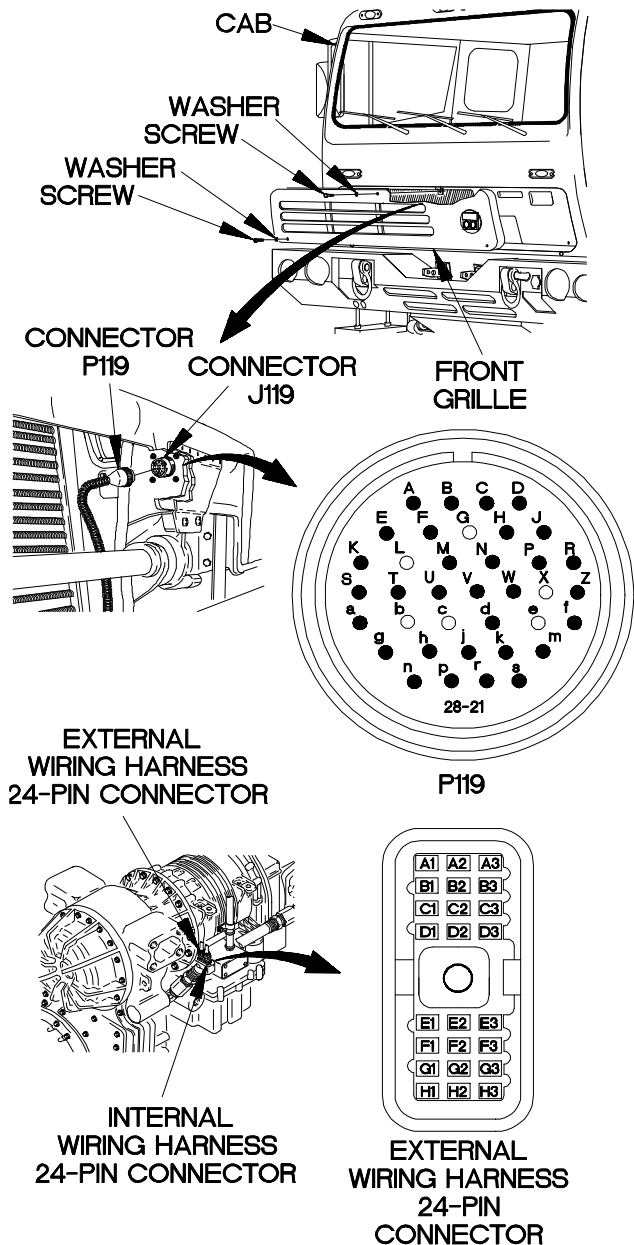
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness 24-pin connector from internal wiring harness 24-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-a.
- (8) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin G2 and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-a.

CONTINUITY TEST

- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



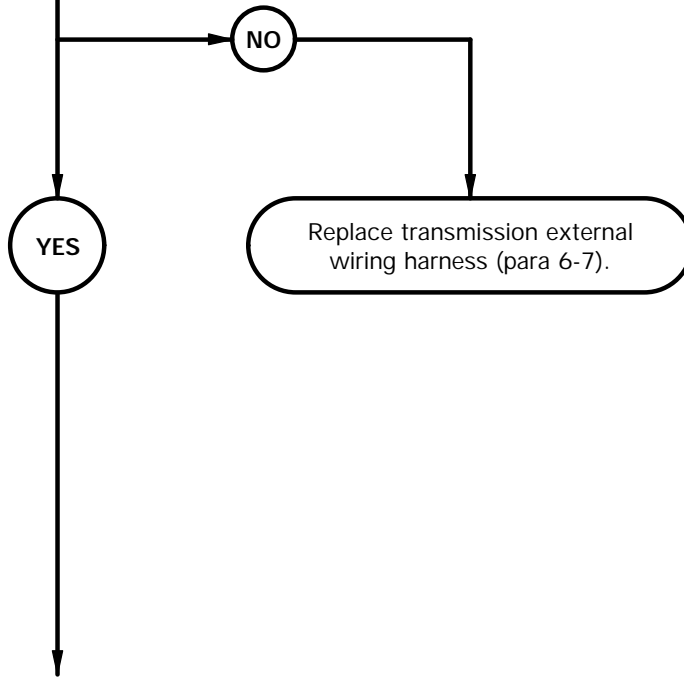
YBC0701B

c7. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty scavenge pump assembly. Faulty WTEC II TEPSS.

2.
Is continuity present from connector P119-d to external wiring harness 24-pin connector pin F3?

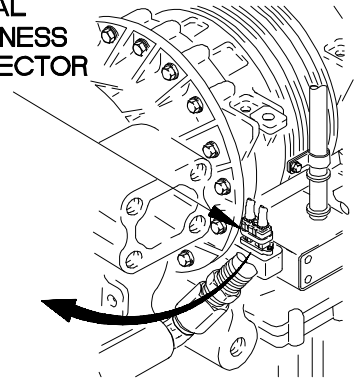
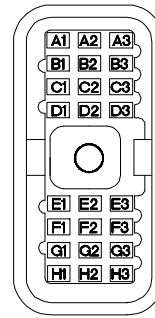
TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



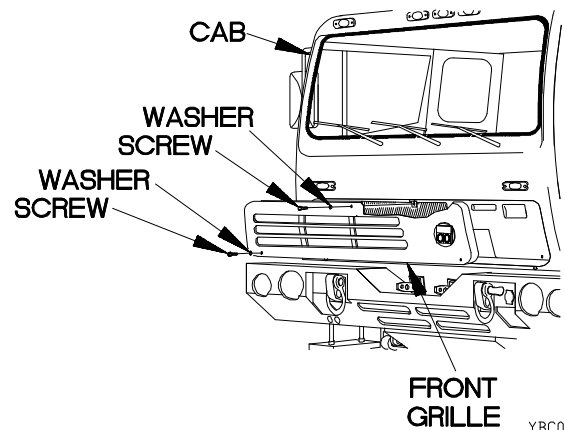
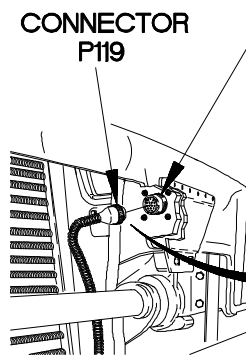
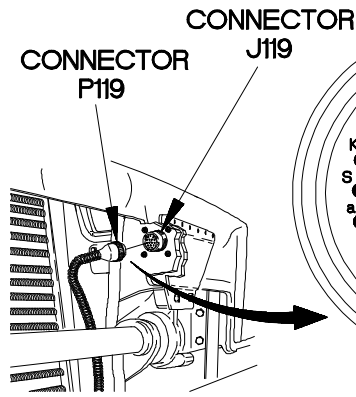
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-d.
- (3) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin F3 and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-d.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).

EXTERNAL WIRING HARNESS 24-PIN CONNECTOR



EXTERNAL WIRING HARNESS 24-PIN CONNECTOR



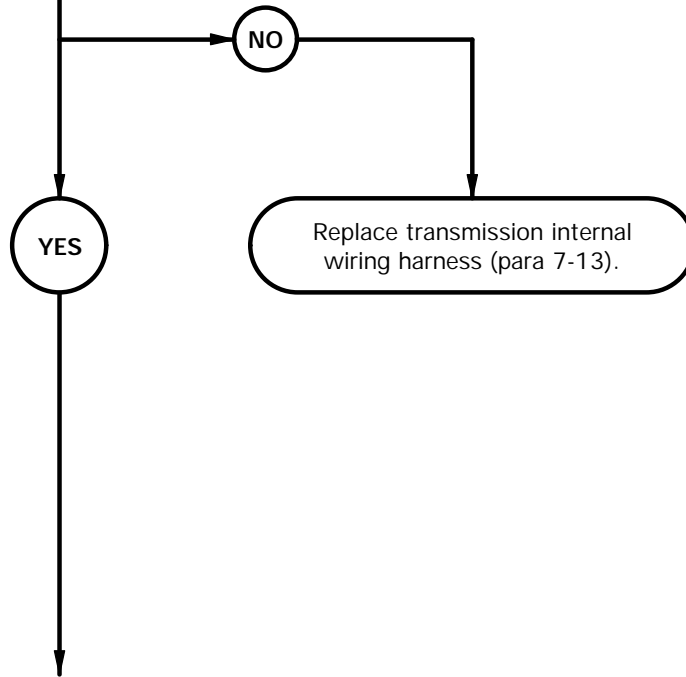
YBC0702B

c7. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty scavenge pump assembly. Faulty WTEC II TEPSS.

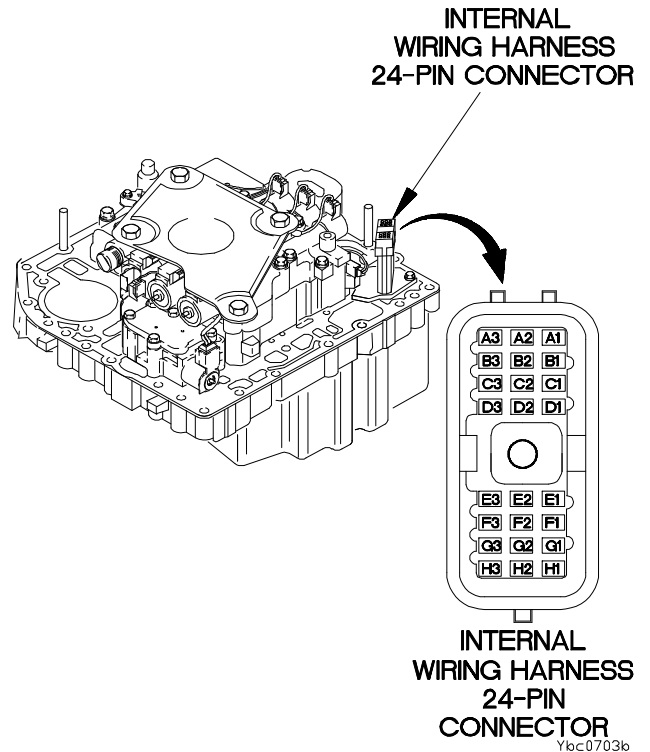
3.
Is 300-2000 ohms resistance present from internal wiring harness 24-pin connector pin G2 to pin F3?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If less than 300 ohms or more than 2000 ohms is present, transmission internal wiring harness is faulty.

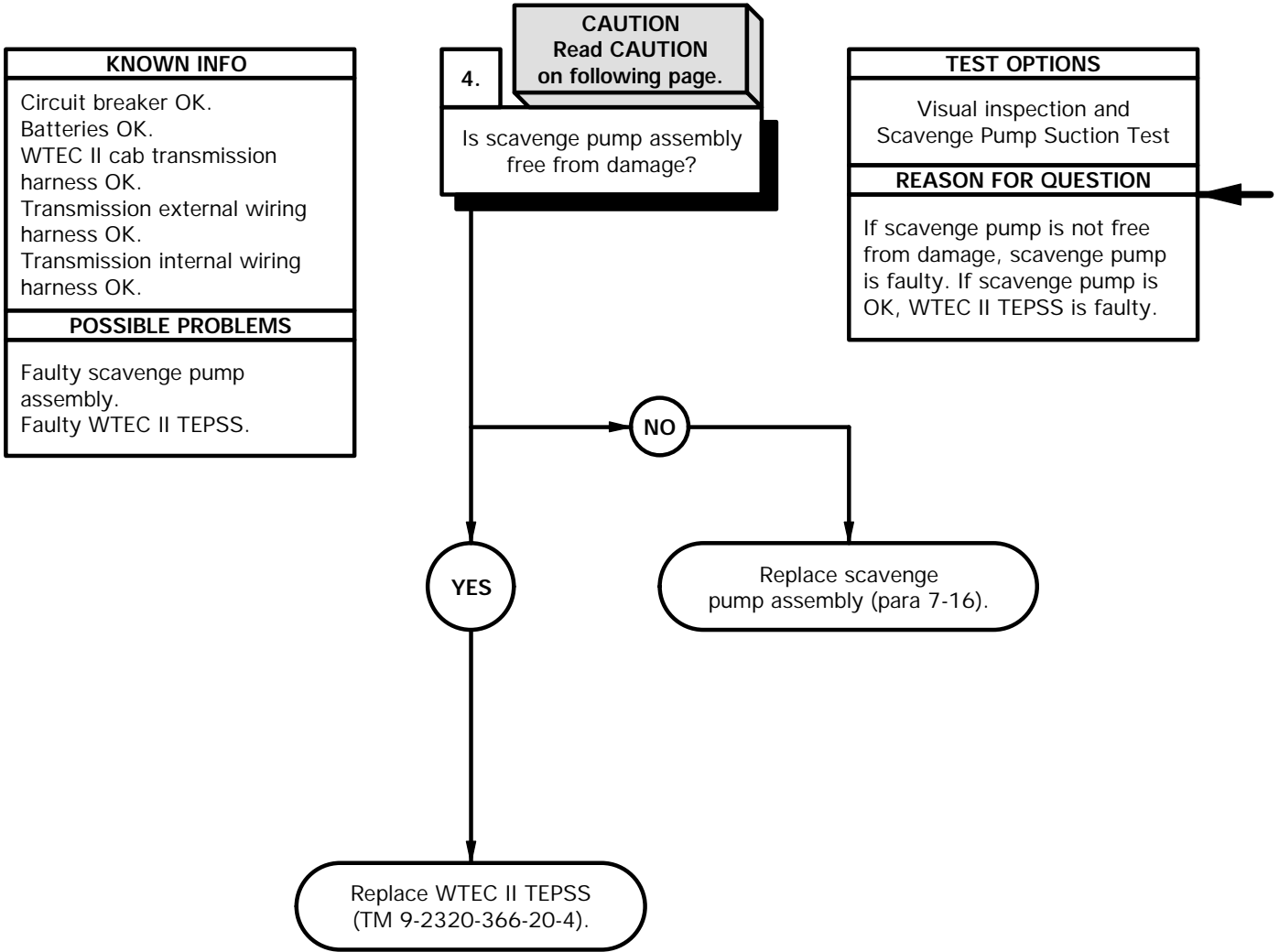


RESISTANCE TEST

- (1) Remove control valve module (para 7-10).
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin G2.
- (4) Connect negative (-) probe of multimeter to internal wiring harness 24-pin connector pin F3 and note reading on multimeter.
- (5) If resistance is less than 300 ohms or more than 2000 ohms, replace transmission internal wiring harness (para 7-13).
- (6) Install control valve module (para 7-10).



c7. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)



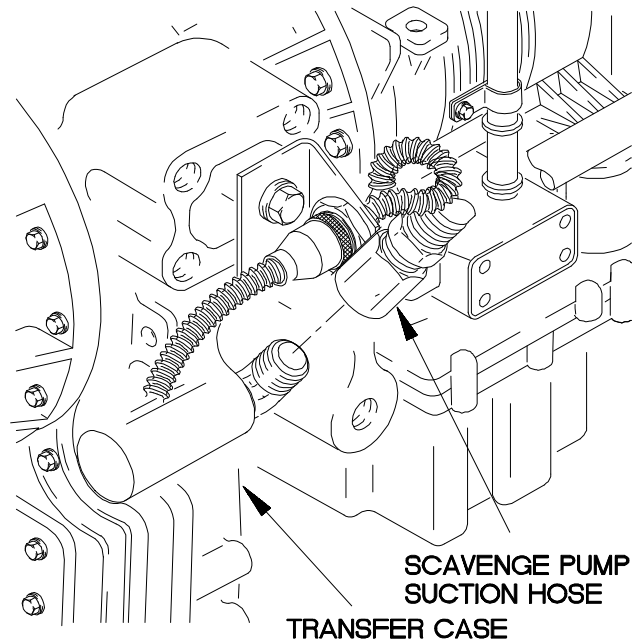
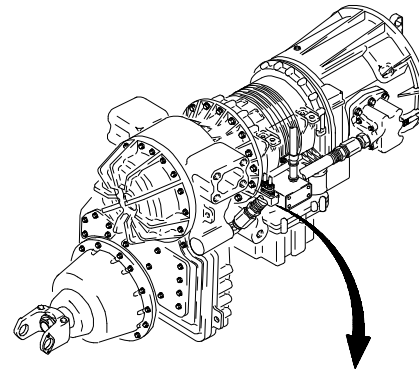
- (1) Place drain pan under transfer case.
- (2) Disconnect scavenge pump suction hose at transfer case.
- (3) Connect batteries (TM 9-2320-366-20-3).
- (4) Start engine (TM 9-2320-366-10-1).
- (5) If oil drips or runs from fitting on transfer case, replace scavenge pump assembly (para 7-16).
- (6) Shut down engine (TM 9-2320-366-10-1).

CAUTION

Shut down engine immediately when test is completed. Failure to comply may result in damage to equipment.

SCAVENGE PUMP SUCTION TEST

- (1) Place end of hose in a cup containing approximately one pint of oil.
- (2) Start engine (TM 9-2320-366-10-1).
- (3) Select neutral on WTEC II TEPSS (TM 9-2320-366-10-1) and note if oil is immediately sucked into hose by scavenge pump.
- (4) If oil is not immediately removed from cup, replace scavenge pump assembly (para 7-16).
- (5) Shut down engine (TM 9-2320-366-10-1).
- (6) Connect scavenge pump suction hose to transfer case.
- (7) Remove drain pan.



Ybc0704b

c8. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

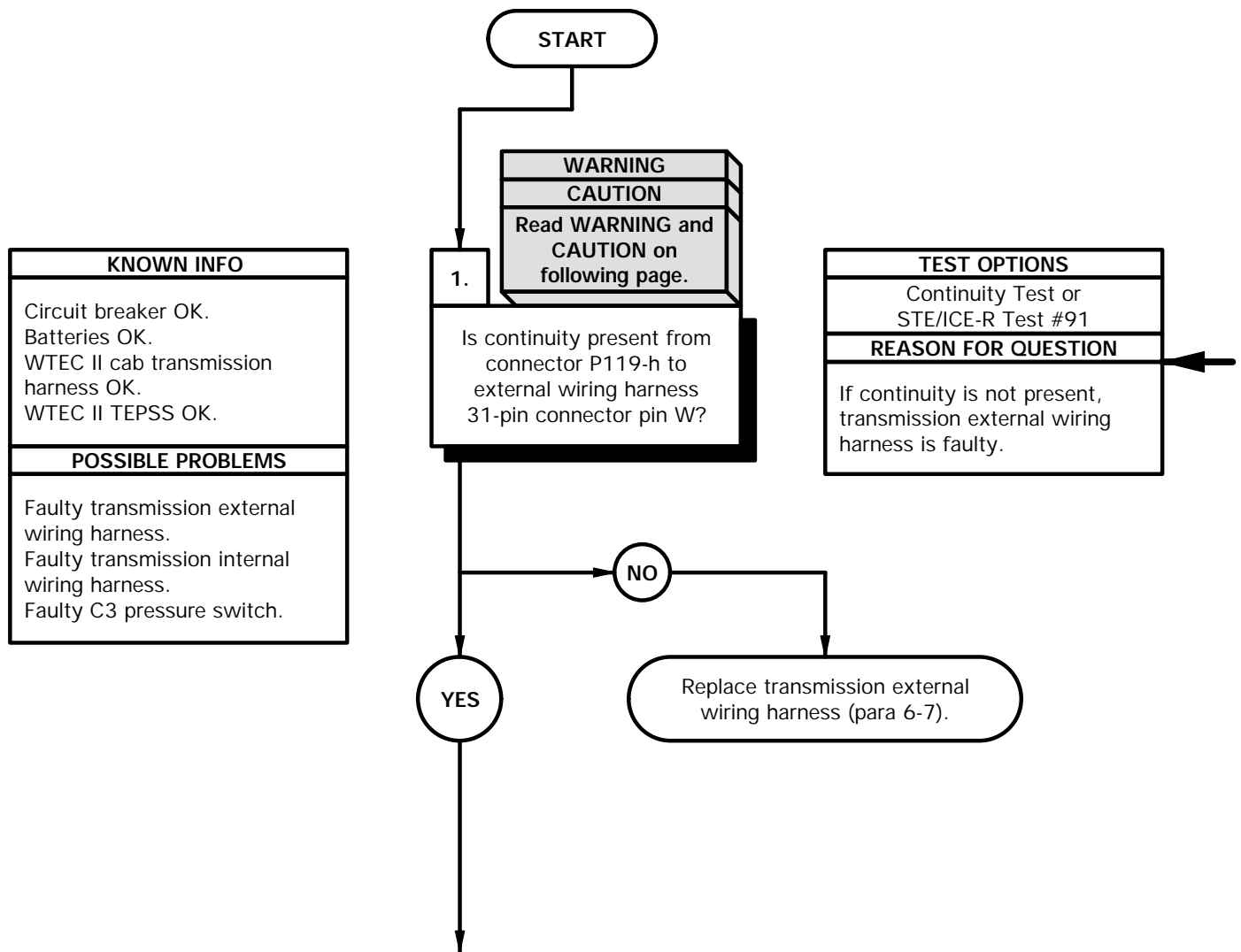
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

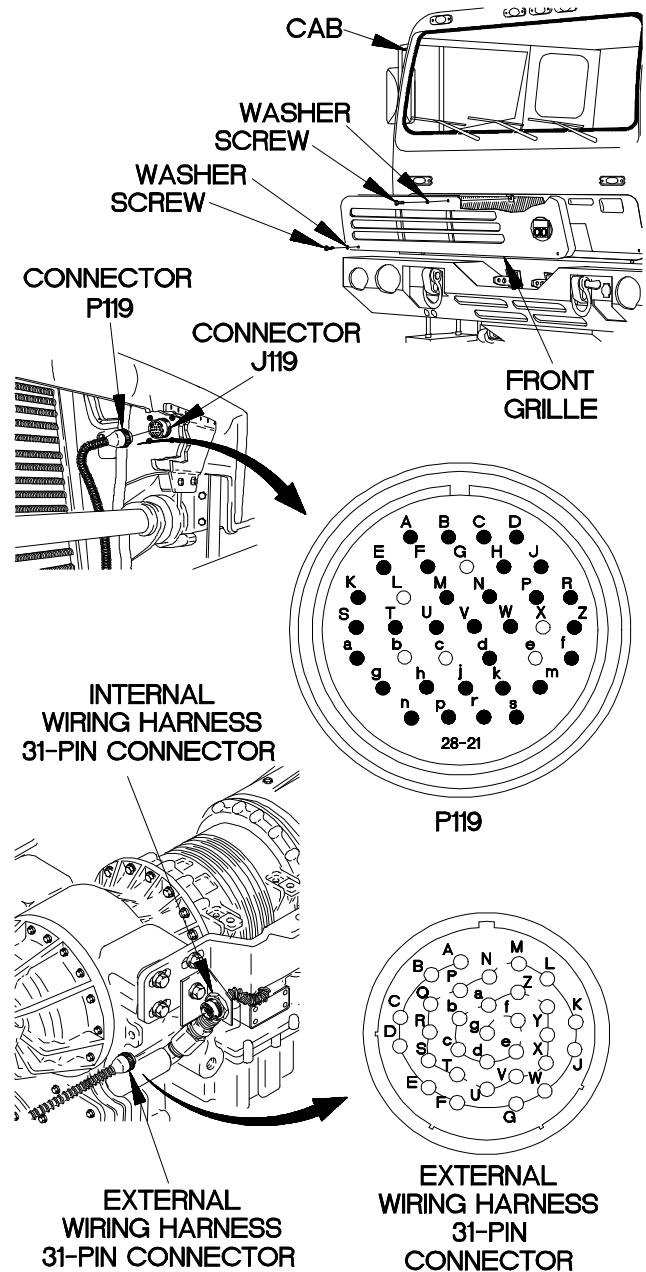
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-h.
- (8) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin W and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-h.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



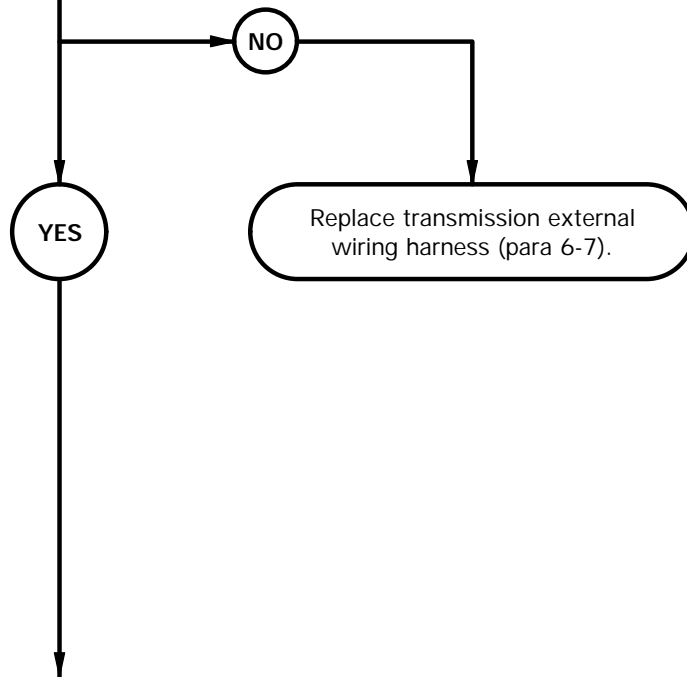
YBC0801B

c8. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. WTEC II TEPSS OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty C3 pressure switch.

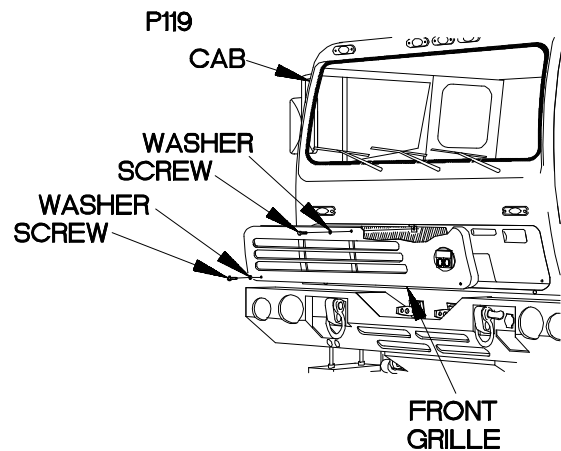
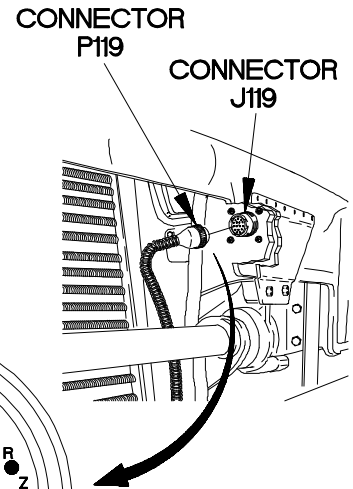
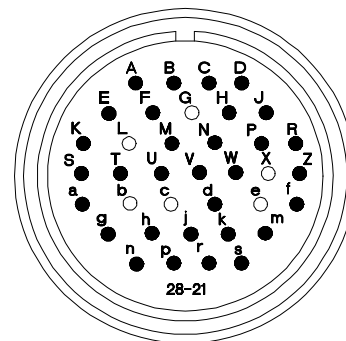
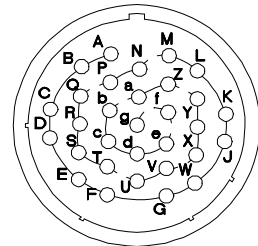
2.
Is continuity present from connector P119-j to external wiring harness 31-pin connector pin X?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-j.
- (3) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin X and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-j.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



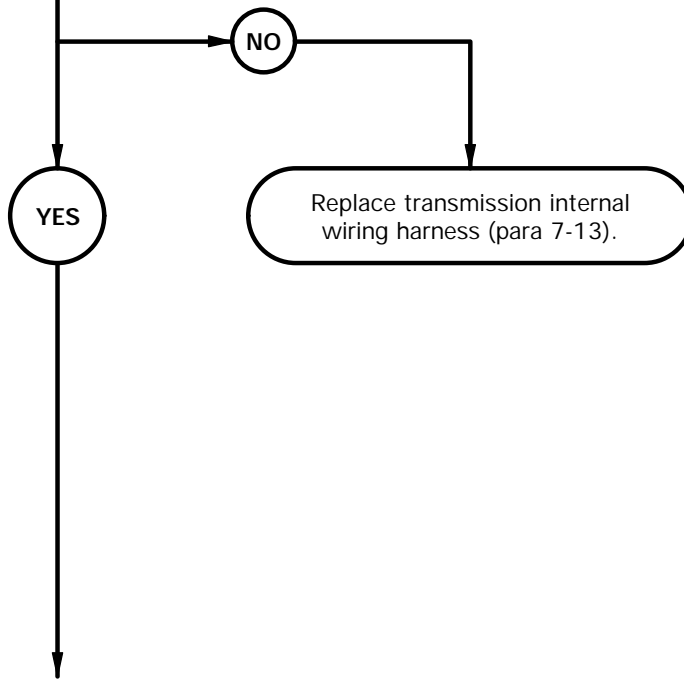
YBC0802B

c8. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. WTEC II TEPSS OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty C3 pressure switch.

3.
Is continuity present from internal wiring harness 31-pin connector pin W to internal wiring harness connector C3 pin 3B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

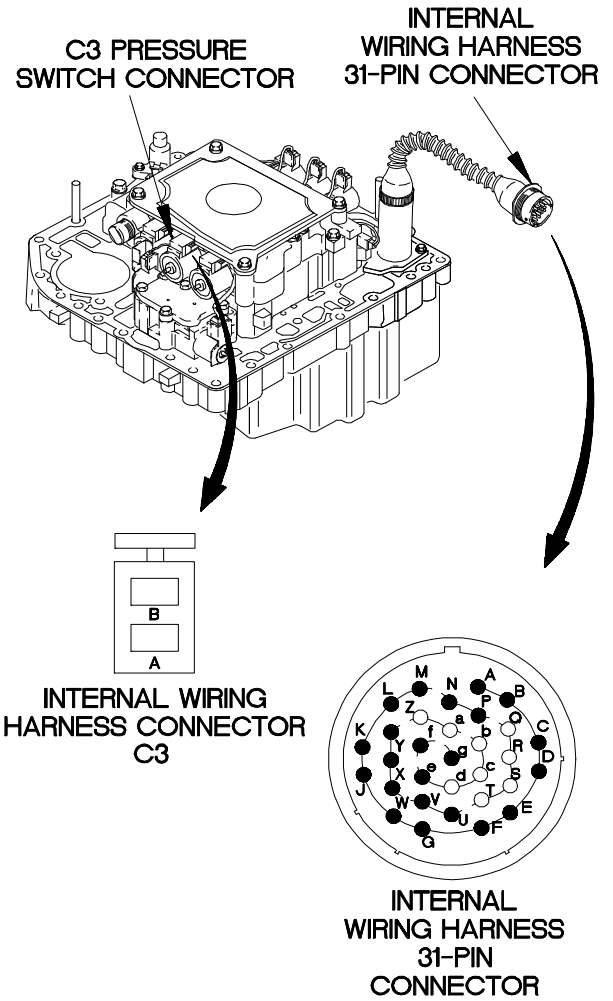


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Disconnect internal wiring harness connector C3 from C3 pressure switch connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin W.
- (5) Connect negative (-) probe of multimeter to internal wiring harness connector C3 pin 3B and note reading on multimeter.
- (6) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (7) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin W.
- (8) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



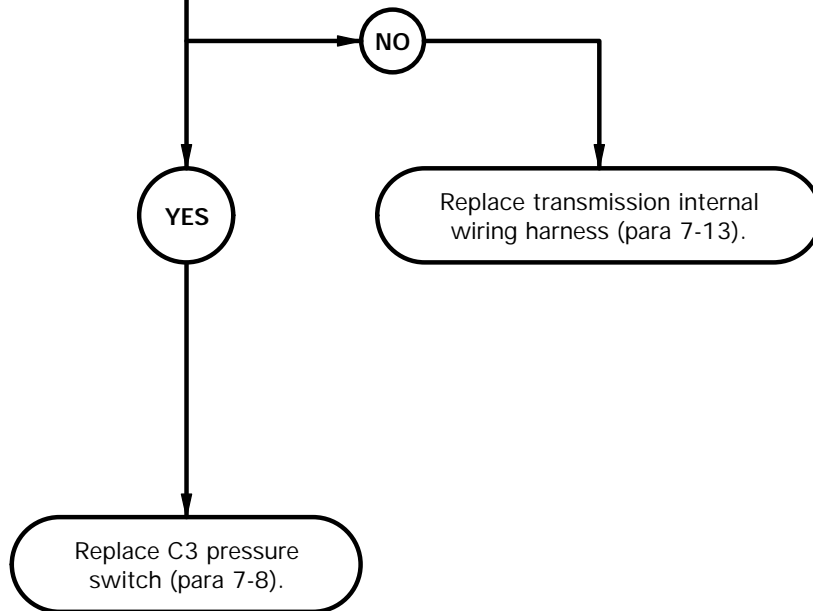
YBC0803B

c8. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. WTEC II TEPSS OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty C3 pressure switch.

4.
Is continuity present from internal wiring harness 31-pin connector pin X to internal wiring harness connector C3 pin 3A?

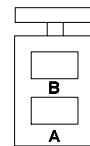
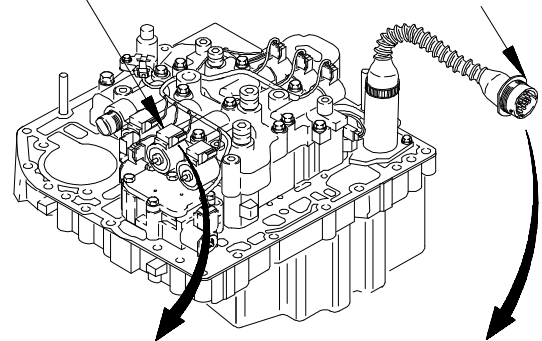
TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty. If continuity is present, C3 pressure switch is faulty.



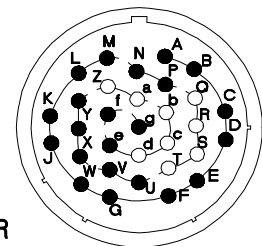
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin X.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector C3 pin 3A and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin X.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).
- (9) If continuity was present in step (3) and absent in steps (6) and (7), replace C3 pressure switch (para 7-8).
- (10) Connect internal wiring harness connector C3 to C3 pressure switch connector.
- (11) Install control valve module (para 7-10).
- (12) Connect batteries (TM 9-2320-366-20-3).

C3 PRESSURE SWITCH CONNECTOR **INTERNAL WIRING HARNESS 31-PIN CONNECTOR**

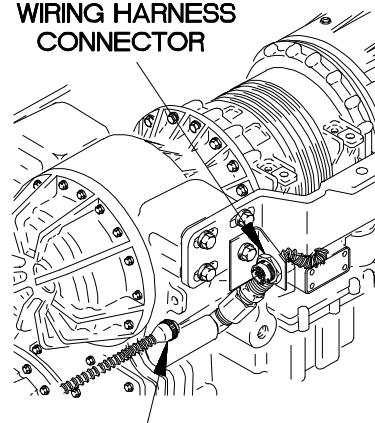


INTERNAL WIRING HARNESS CONNECTOR C3



INTERNAL WIRING HARNESS 31-PIN CONNECTOR

INTERNAL WIRING HARNESS TO EXTERNAL WIRING HARNESS CONNECTOR



EXTERNAL WIRING HARNESS 31-PIN CONNECTOR

YBC0804B

c9. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Tools and Special Tools

Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts

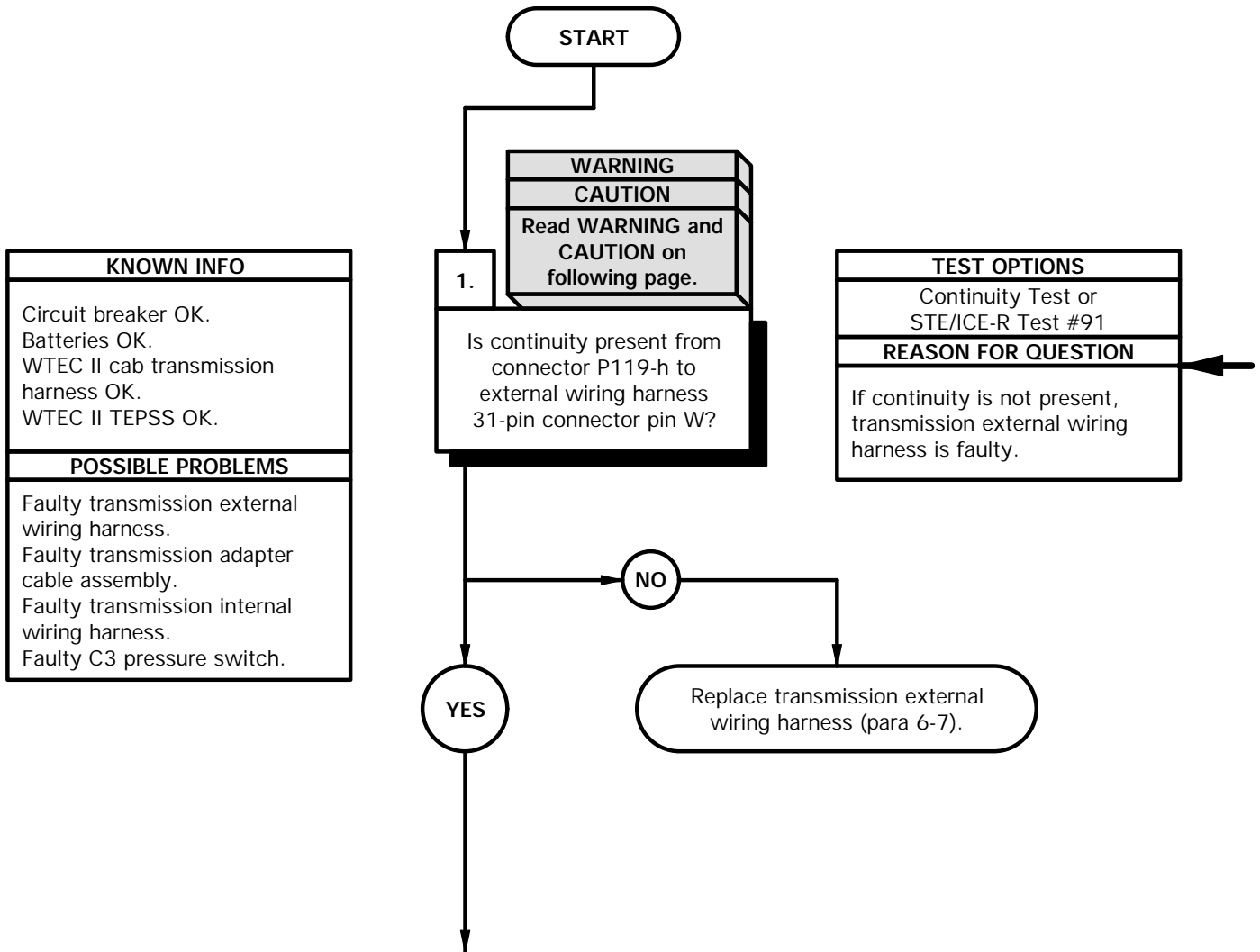
Wire, Elect, 50 ft (Item 97, Appendix C)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

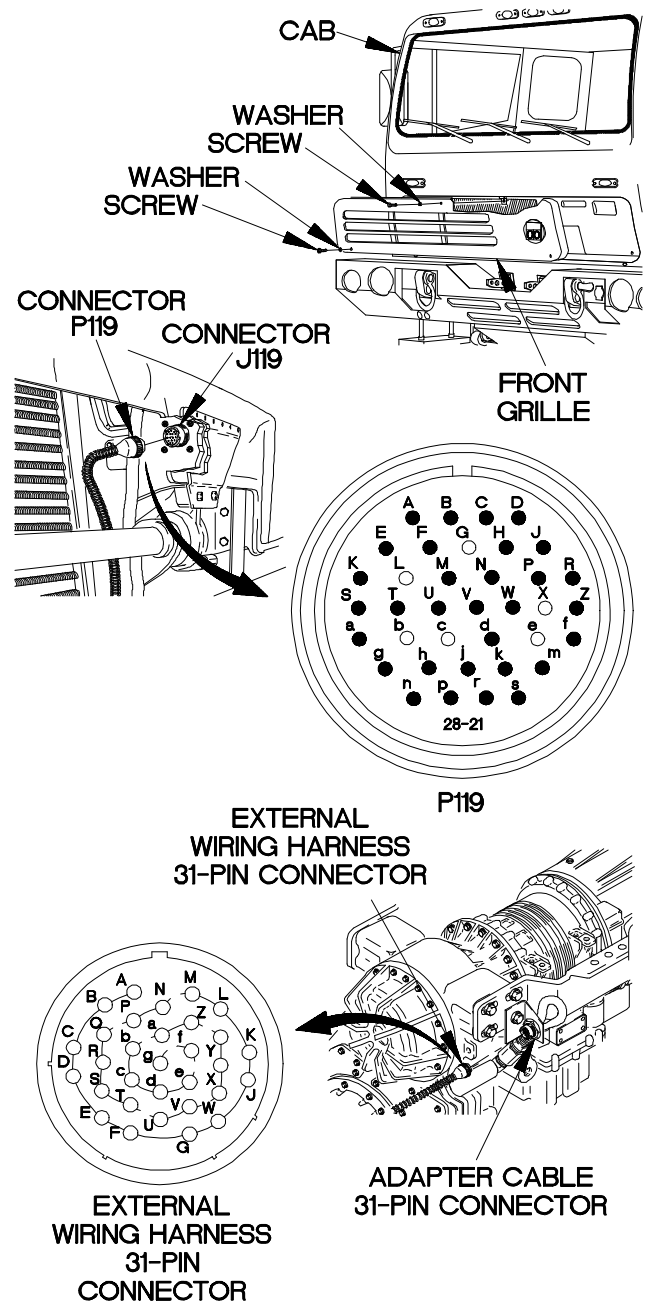
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness 31-pin connector from adapter cable 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-h.
- (8) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin W and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-h.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

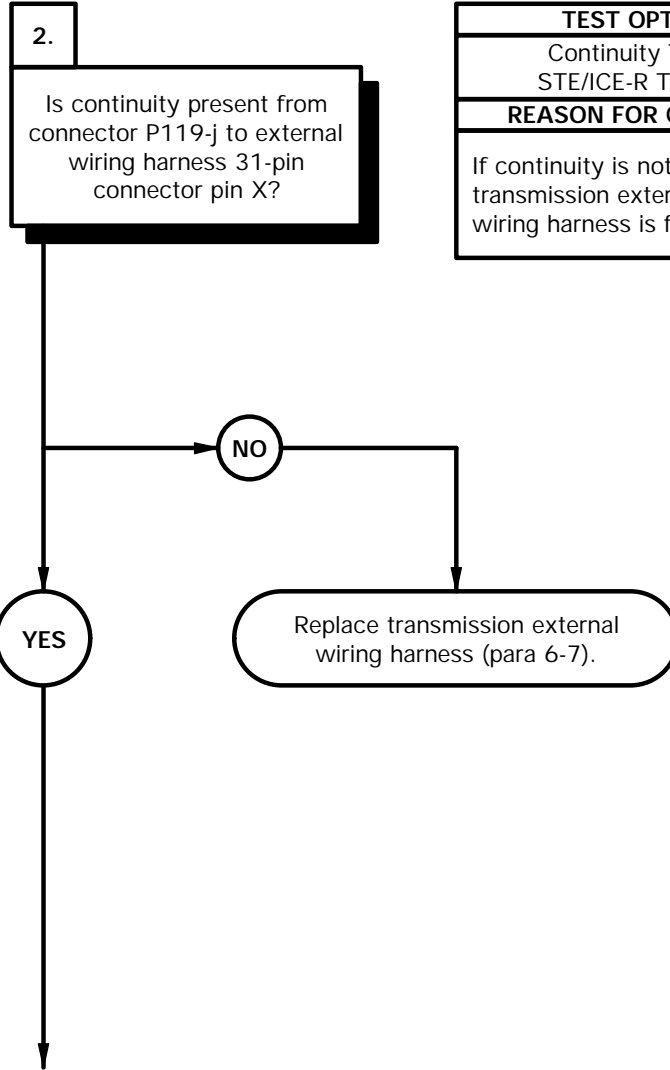
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



YBC0901B

c9. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

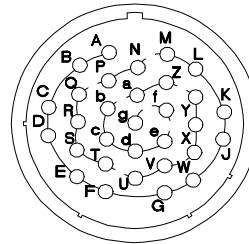
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. WTEC II TEPSS OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty C3 pressure switch.



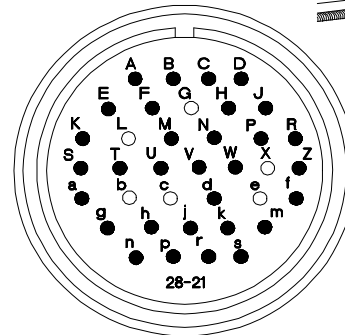
TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

CONTINUITY TEST

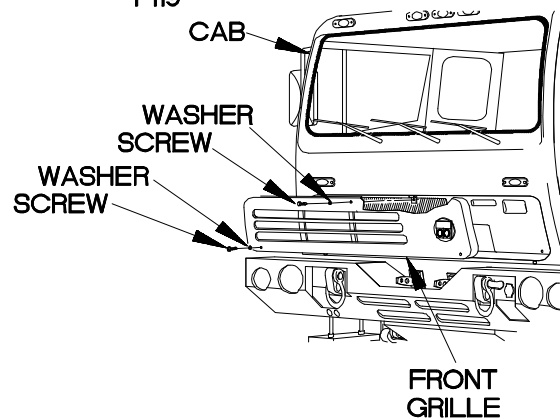
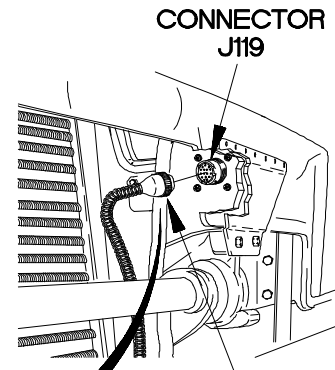
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-j.
- (3) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin X and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-j.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



EXTERNAL WIRING HARNESS 31-PIN CONNECTOR



P119



YBC0902B

c9. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

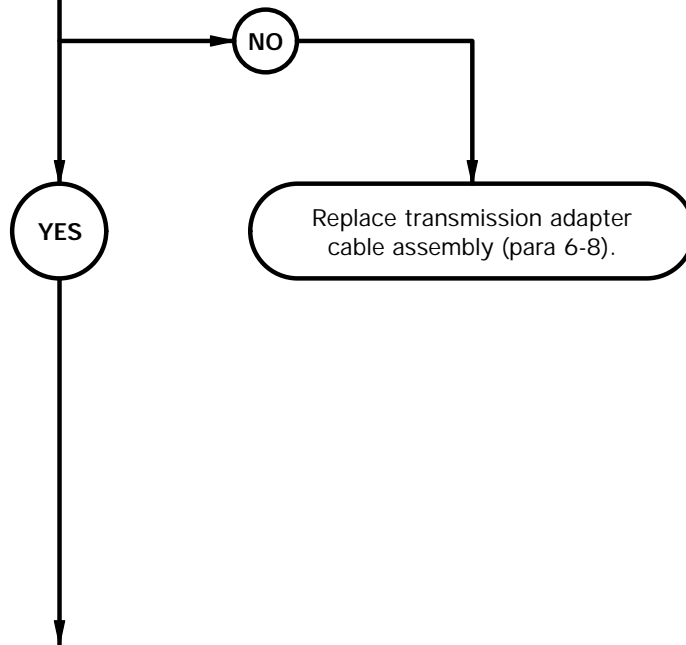
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. WTEC II TEPSS OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty C3 pressure switch.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin W to adapter cable 24-pin connector pin F2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.

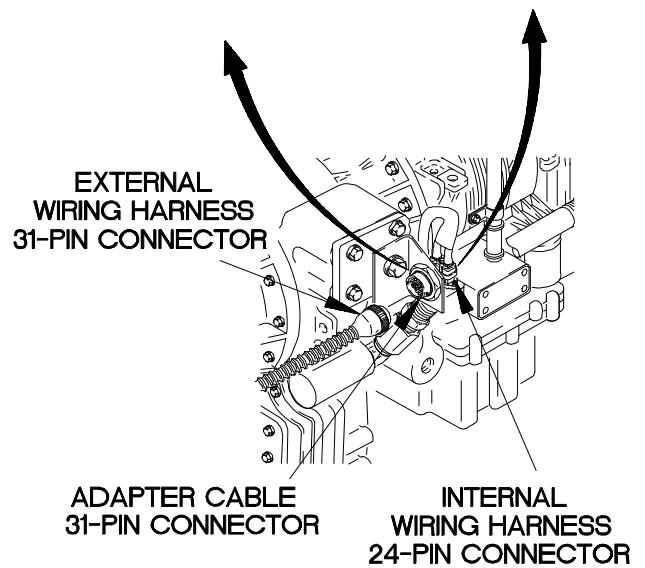
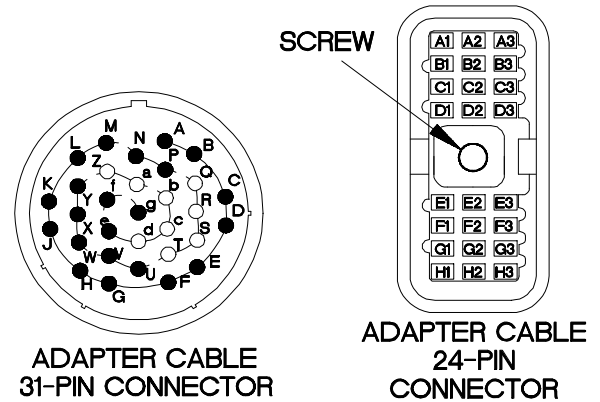


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Loosen screw in adapter cable 24-pin connector.
- (2) Disconnect adapter cable 24-pin connector from internal wiring harness 24-pin connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin W.
- (5) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin F2 and note reading on multimeter.
- (6) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (7) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin W.
- (8) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).



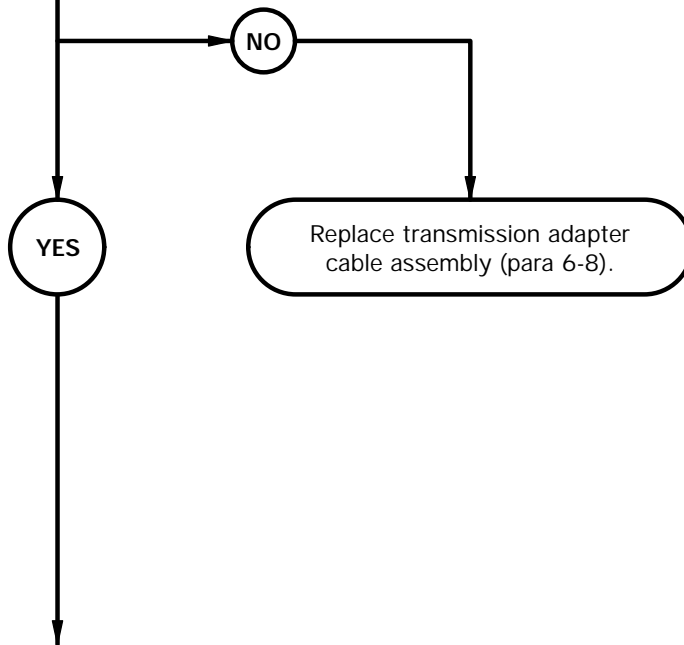
YBC0903B

c9. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. WTEC II TEPSS OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty C3 pressure switch.

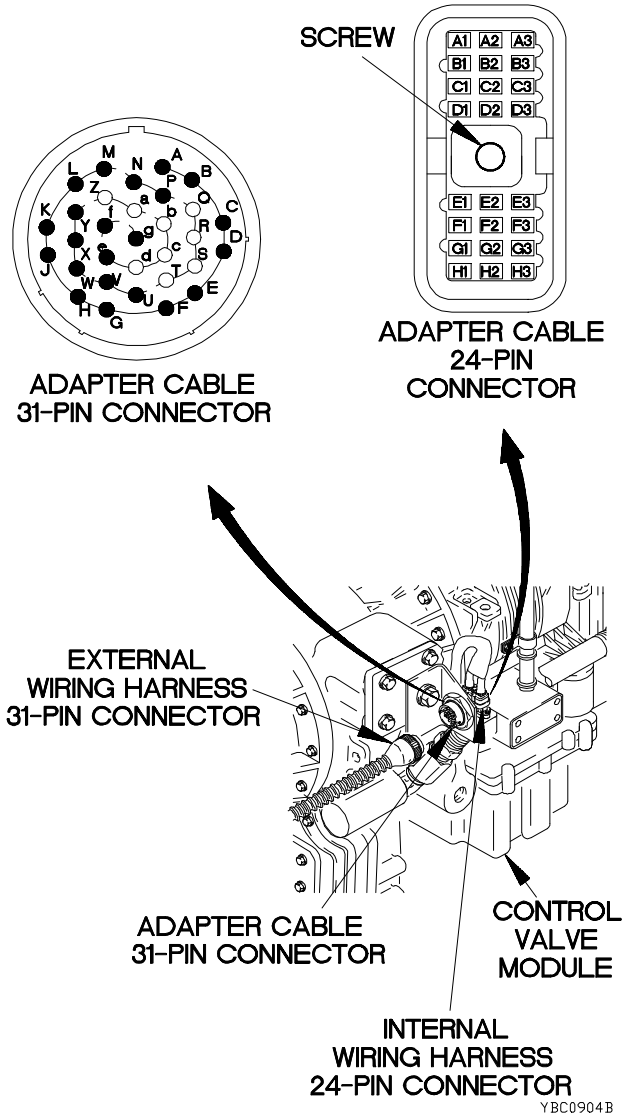
4.
 Is continuity present from adapter cable 31-pin connector pin X to adapter cable 24-pin connector pin C3?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin X.
- (3) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin C3 and note reading on multimeter.
- (4) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (5) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin X.
- (6) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).



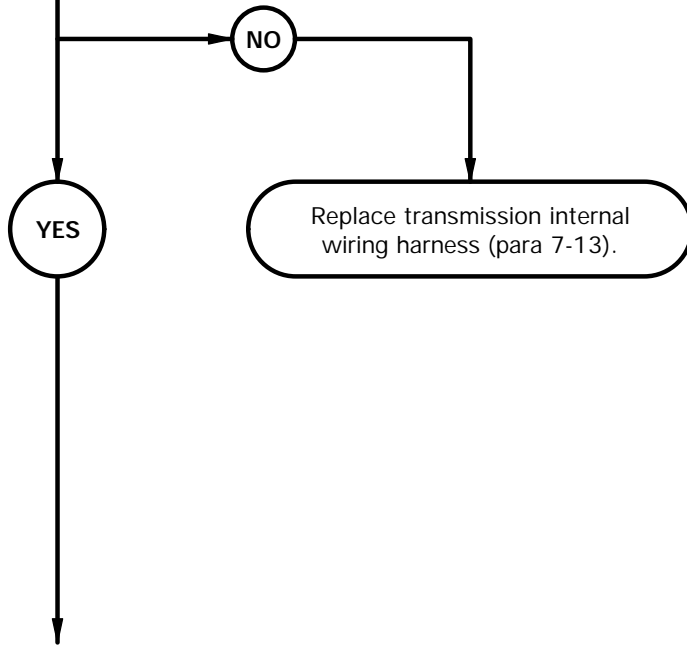
YBC0904B

c9. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. WTEC II TEPSS OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty C3 pressure switch.

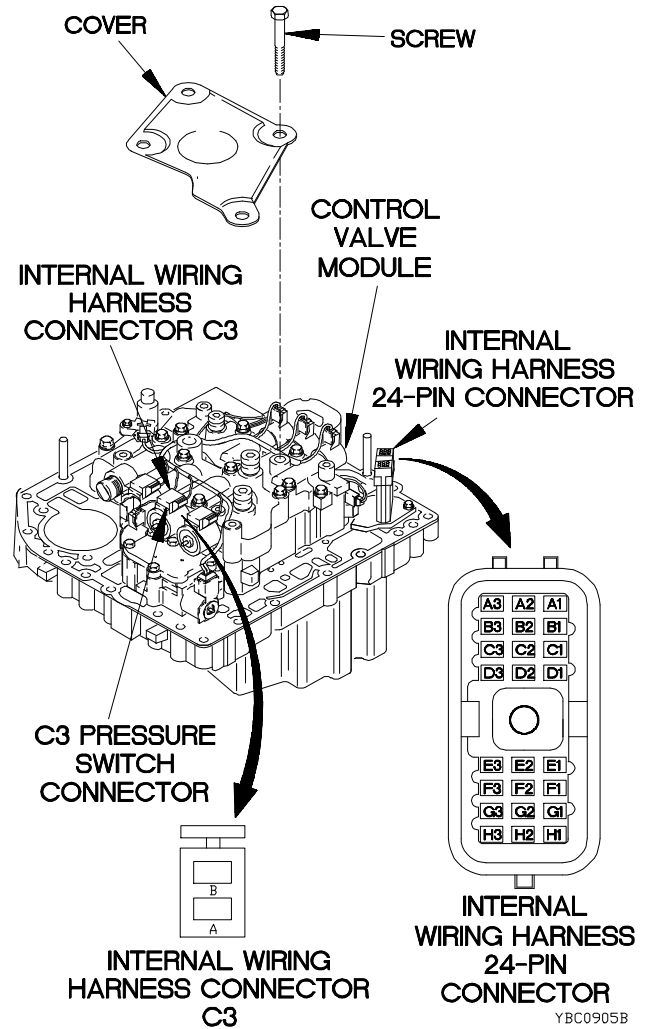
5.
Is continuity present from internal wiring harness 24-pin connector pin F2 to internal wiring harness connector C3 pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Remove internal wiring harness connector C3 from C3 pressure switch connector.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin F2.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector C3 pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin F2.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



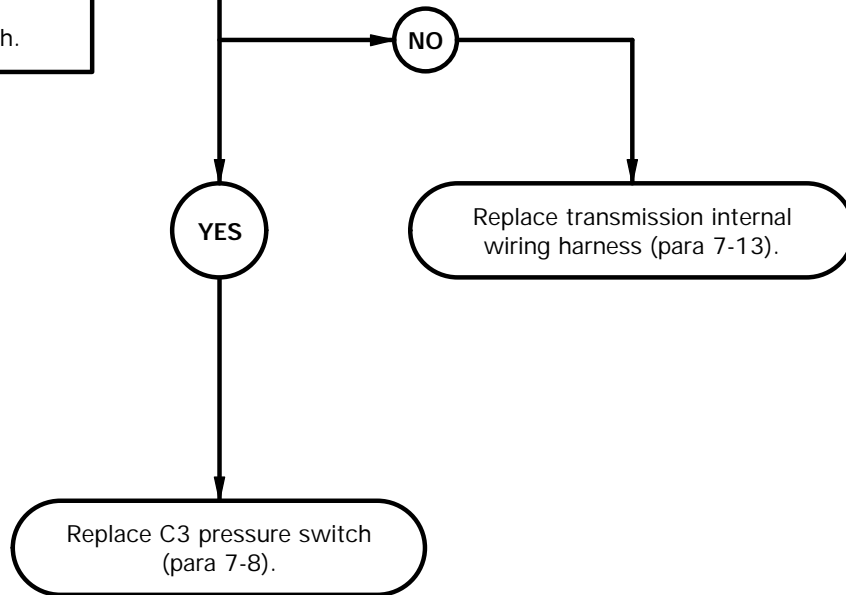
YBC0905B

c9. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. WTEC II TEPSS OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty C3 pressure switch.

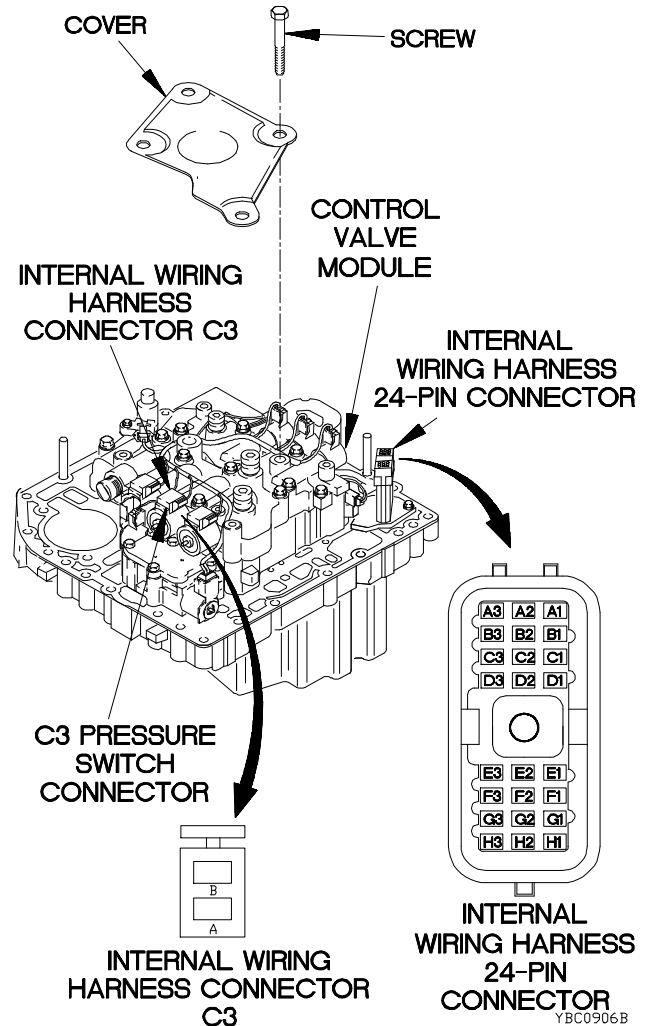
6.
Is continuity present from internal wiring harness 24-pin connector pin C3 to internal wiring harness connector C3 pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty. If continuity is present, C3 pressure switch is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin C3.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector C3 pin B.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin C3.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).
- (9) If continuity is present in step (3) and absent in steps (6) and (7), replace C3 pressure switch (para 7-8).
- (10) Connect internal wiring harness connector C3 to C3 pressure switch connector.
- (11) Install cover on control valve module with four screws.
- (12) Install control valve module (para 7-10).
- (13) Connect batteries (TM 9-2320-366-20-3).



c10. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

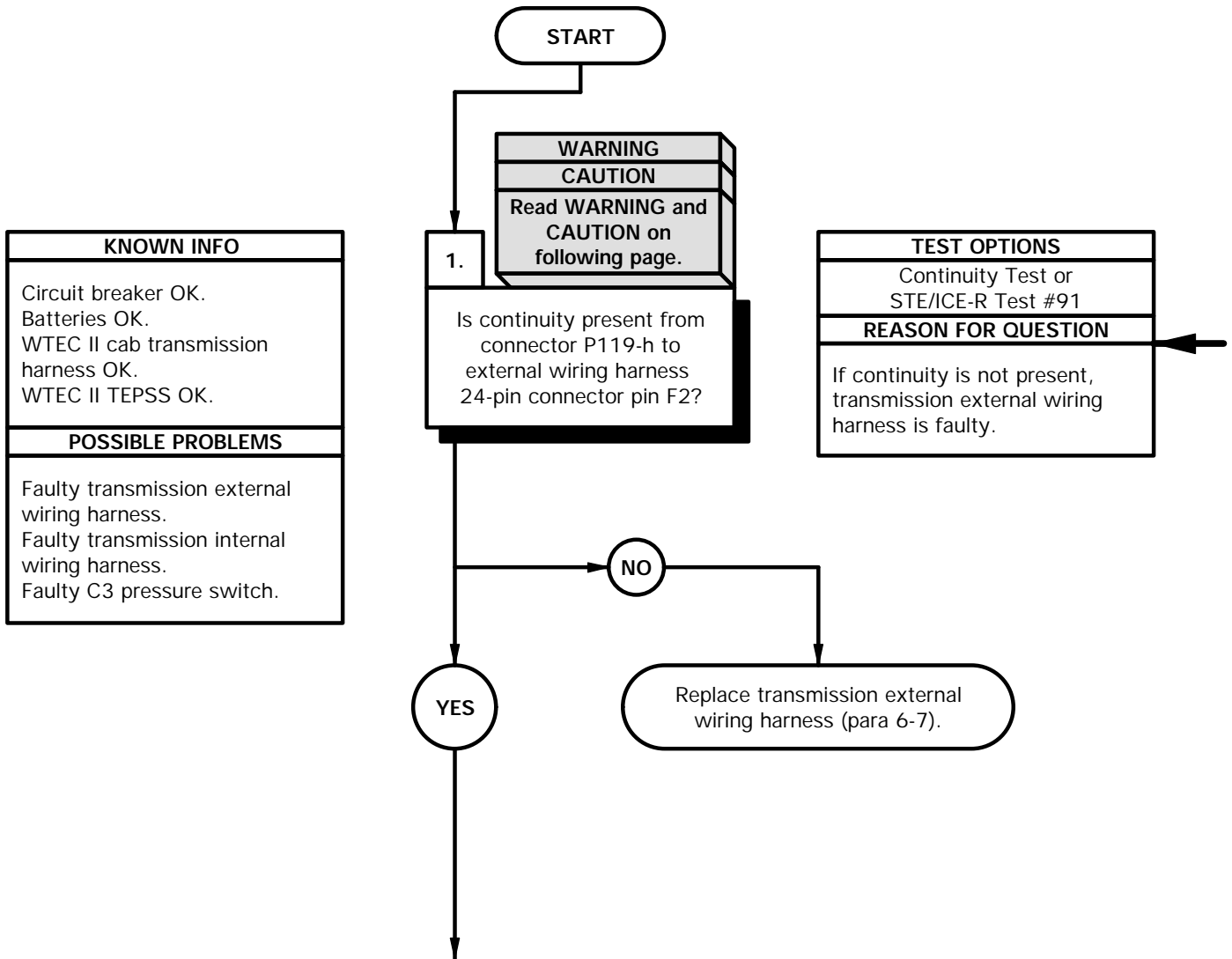
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

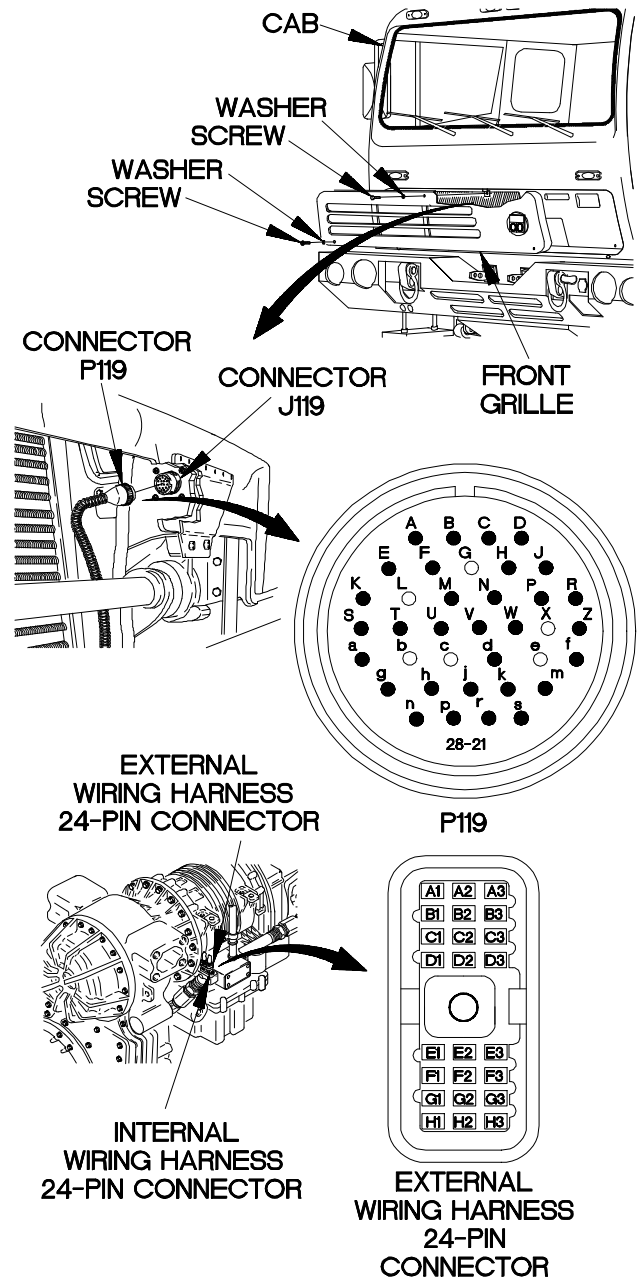
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Loosen screw in external wiring harness 24-pin connector.
- (6) Disconnect external wiring harness 24-pin connector from internal wiring harness 24-pin connector.
- (7) Set multimeter to ohms.
- (8) Connect positive (+) probe of multimeter to connector P119-h.
- (9) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin F2 and note reading on multimeter.
- (10) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (11) Connect positive (+) probe of multimeter to connector P119-h.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (13) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (14) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



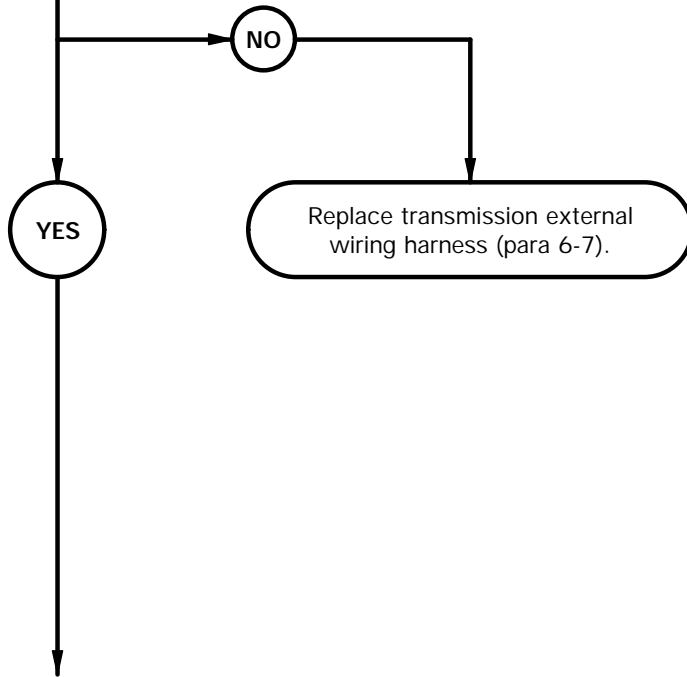
YBC1001B

c10. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. WTEC II TEPSS OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty C3 pressure switch.

2.
Is continuity present from connector P119-j to external wiring harness 24-pin connector pin C3?

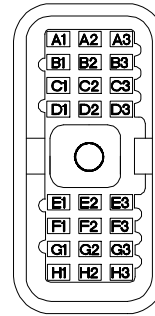
TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



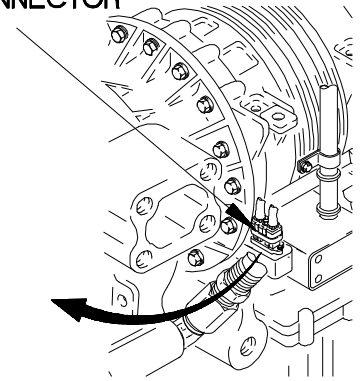
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-j.
- (3) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin C3 and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-j.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).

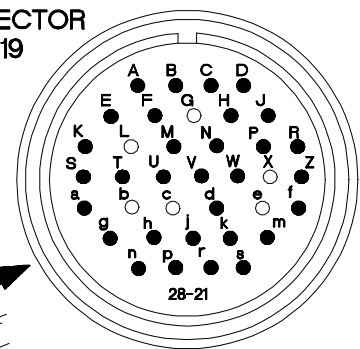
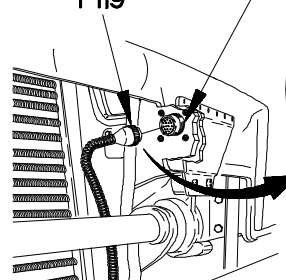
EXTERNAL WIRING HARNESS 24-PIN CONNECTOR



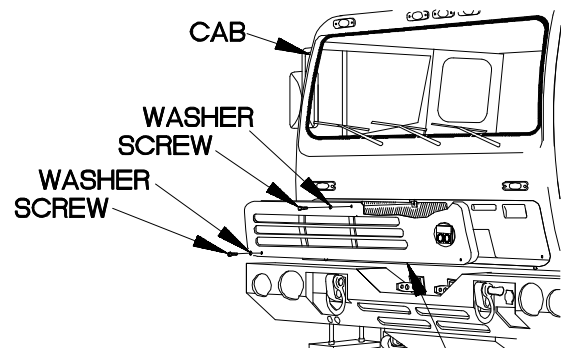
EXTERNAL WIRING HARNESS 24-PIN CONNECTOR



CONNECTOR P119 and **CONNECTOR J119**



P119



FRONT GRILLE

YBC1002B

c10. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

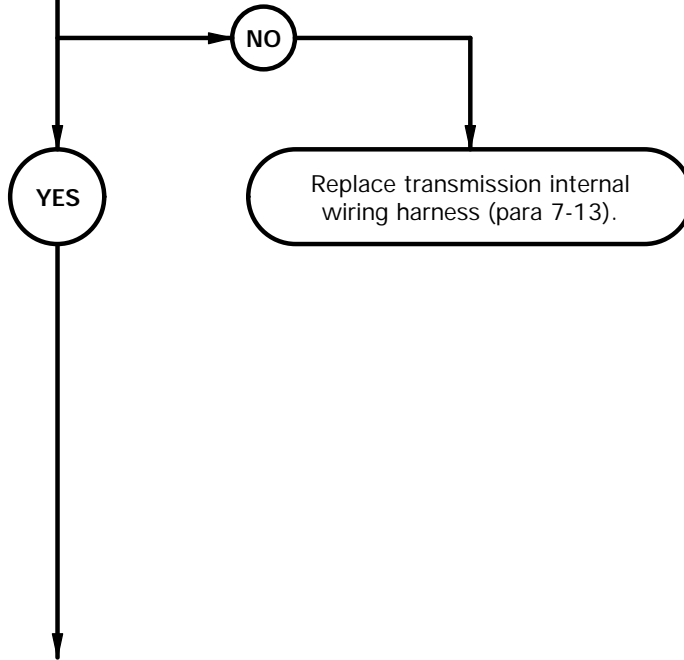
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. WTEC II TEPSS OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty C3 pressure switch.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin F2 to internal wiring harness connector C3 pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

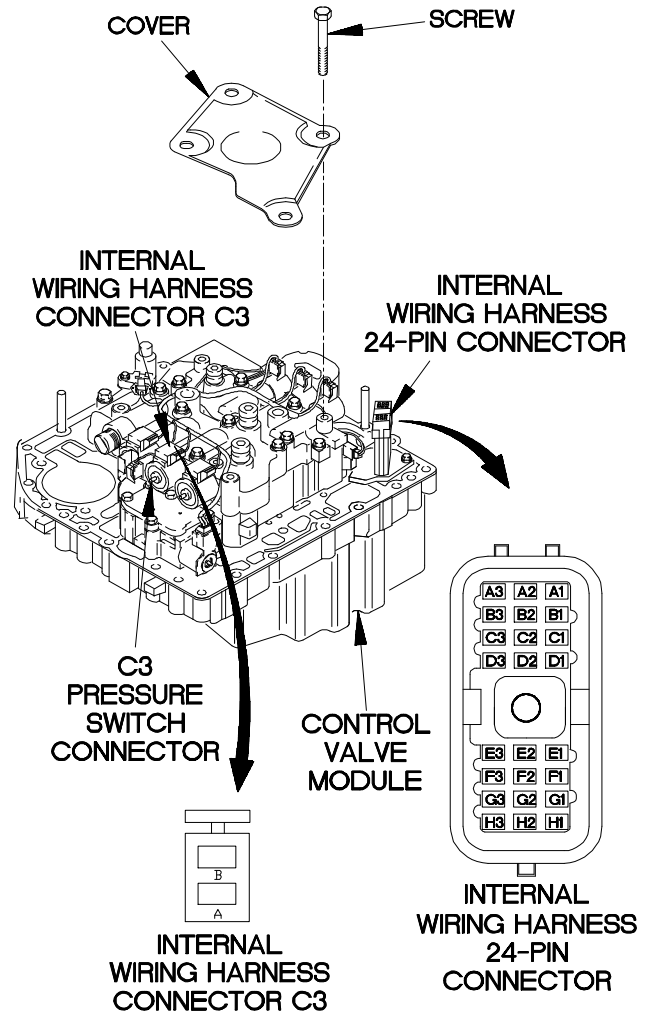


CAUTION

Use care when disconnecting transmission internal wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector C3 from C3 pressure switch connector.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin F2.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector C3 pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin F2.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



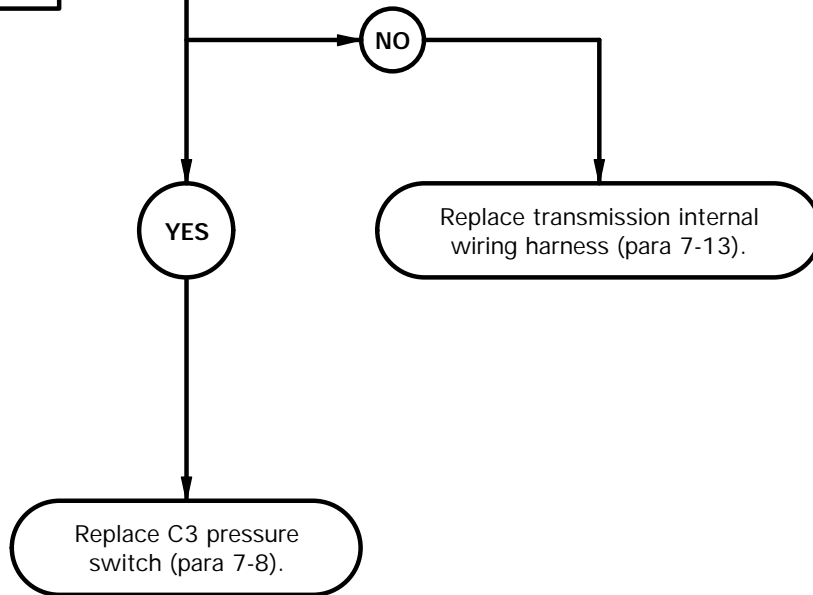
YBC1003B

c10. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. WTEC II TEPSS OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty C3 pressure switch.

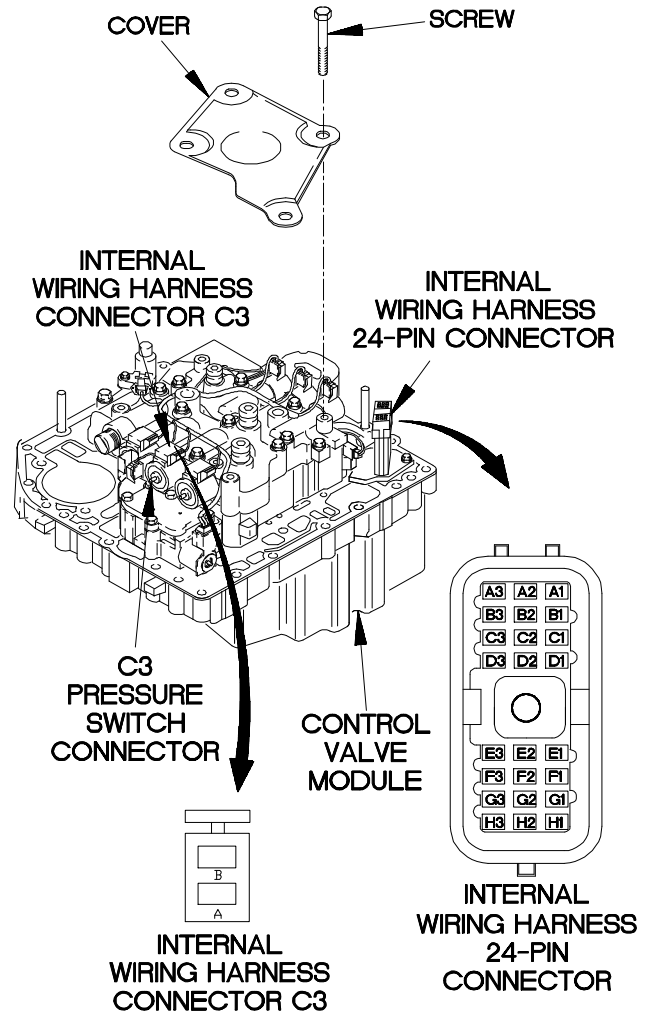
4.
Is continuity present from internal wiring harness 24-pin connector pin C3 to internal wiring harness connector C3 pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty. If continuity is present, C3 pressure switch is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin C3.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector C3 pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin C3.
- (6) Connect negative (-) probe of multimeter to all all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).
- (9) If continuity is present in step (3) and absent in steps (6) and (7), replace C3 pressure switch (para 7-8).
- (10) Connect internal wiring harness connector C3 to C3 pressure switch connector.
- (11) Install cover on control valve module with four screws.
- (12) Install control valve module (para 7-10).
- (13) Connect batteries (TM 9-2320-366-20-3).



YBC1004B

c11. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

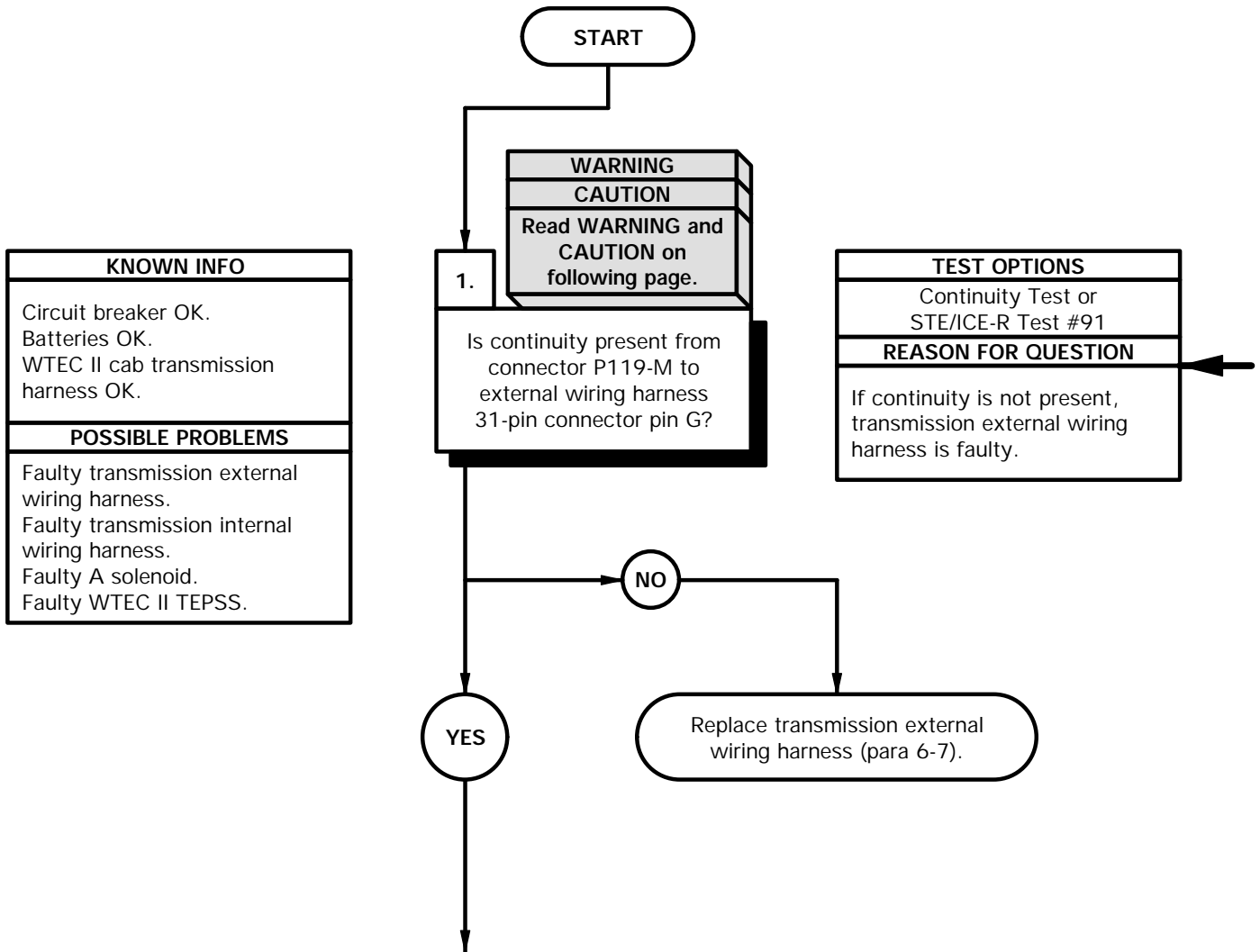
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Scoket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

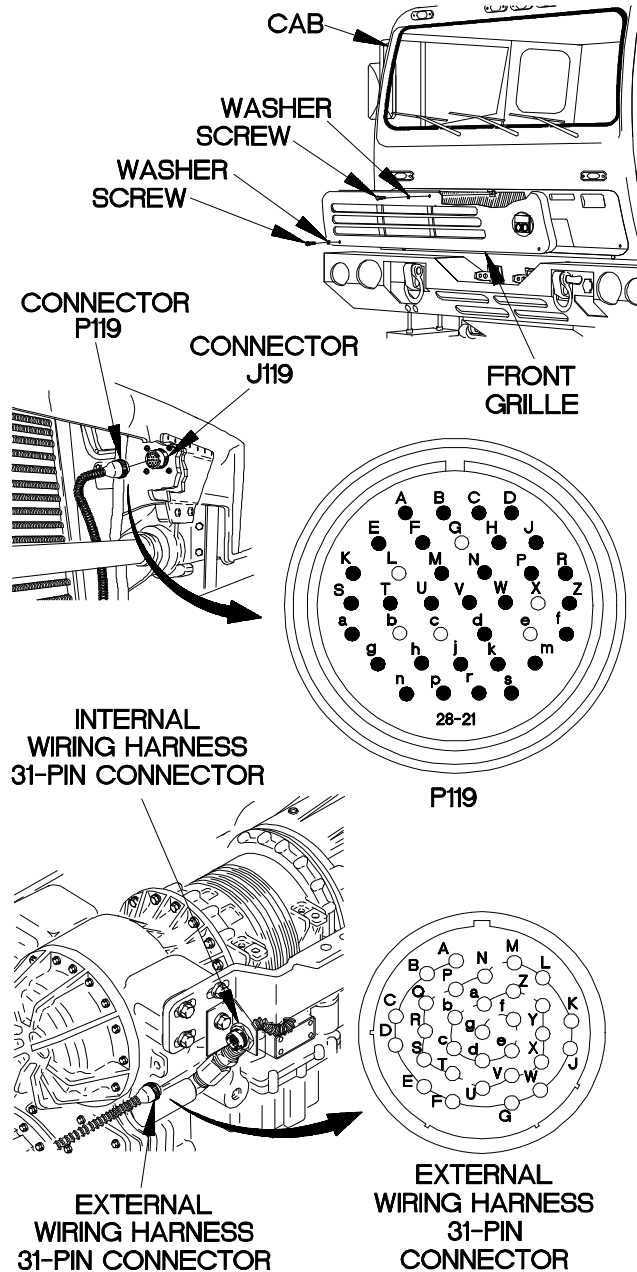
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-M.
- (8) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin G and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-M.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



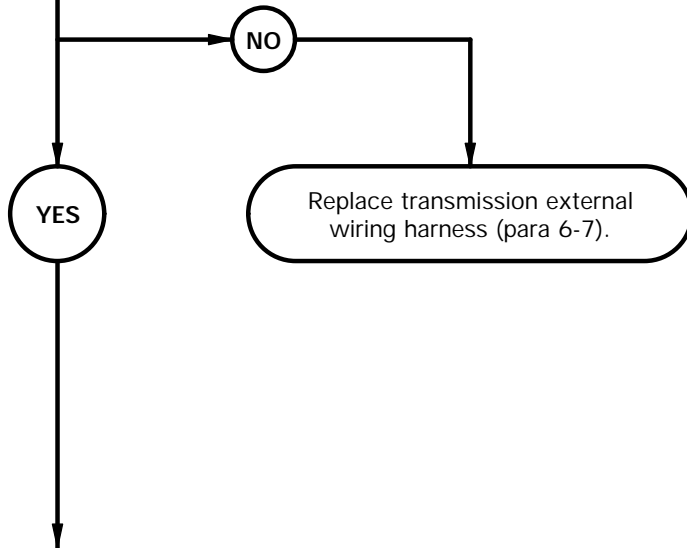
YBC1101B

c11. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty A solenoid. Faulty WTEC II TEPSS.

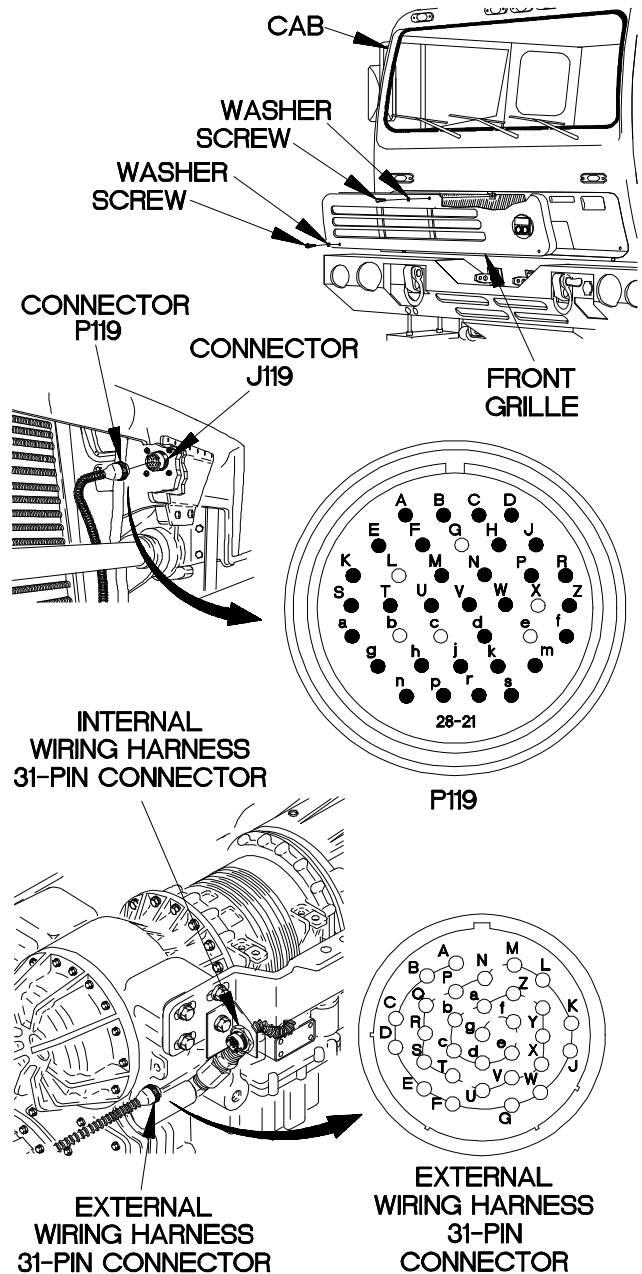
2.
Is continuity present from connector P119-B to external wiring harness 31-pin connector pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-B.
- (3) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin A and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-B.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



YBC1102B

c11. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

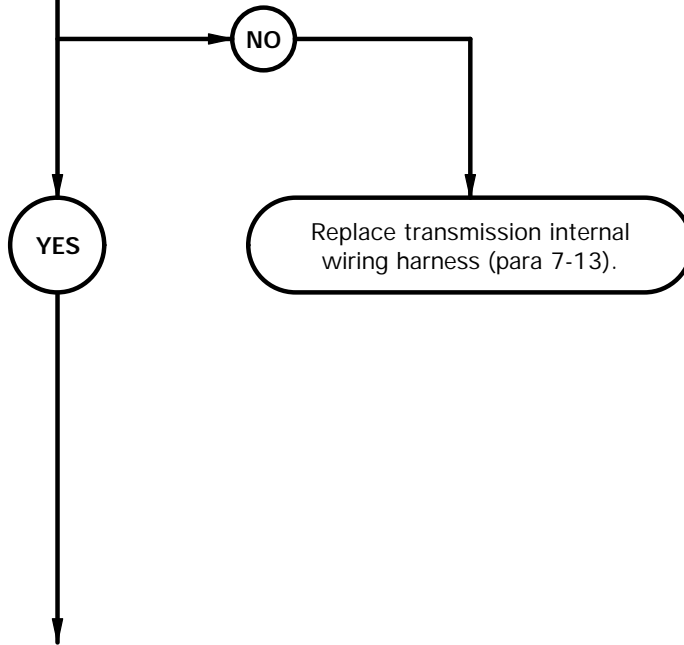
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty A solenoid. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin G to internal wiring harness connector A pin 3B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

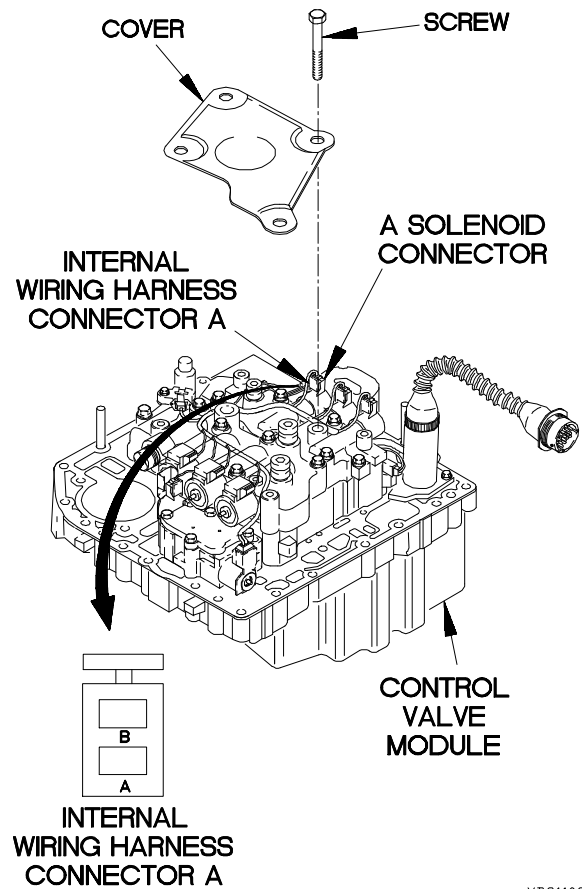


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector A from A solenoid.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin G.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector A pin 3B and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin G.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



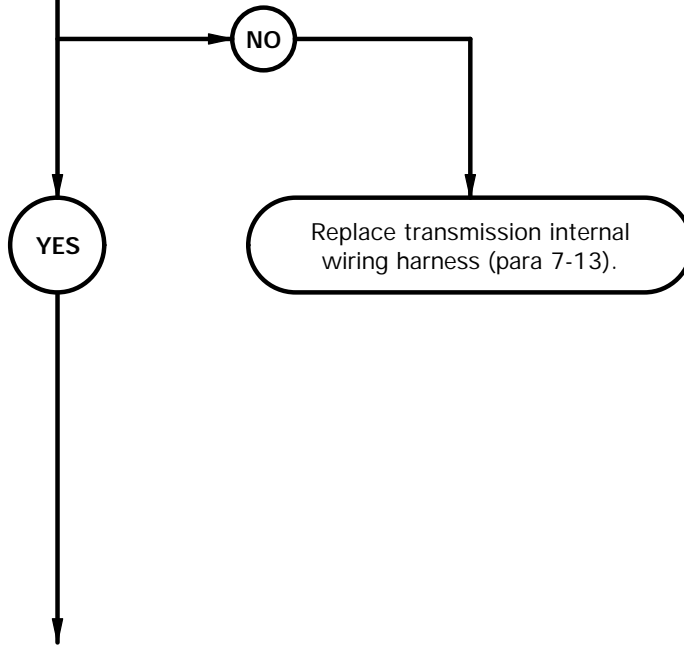
YBC1103B

c11. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty A solenoid. Faulty WTEC II TEPSS.

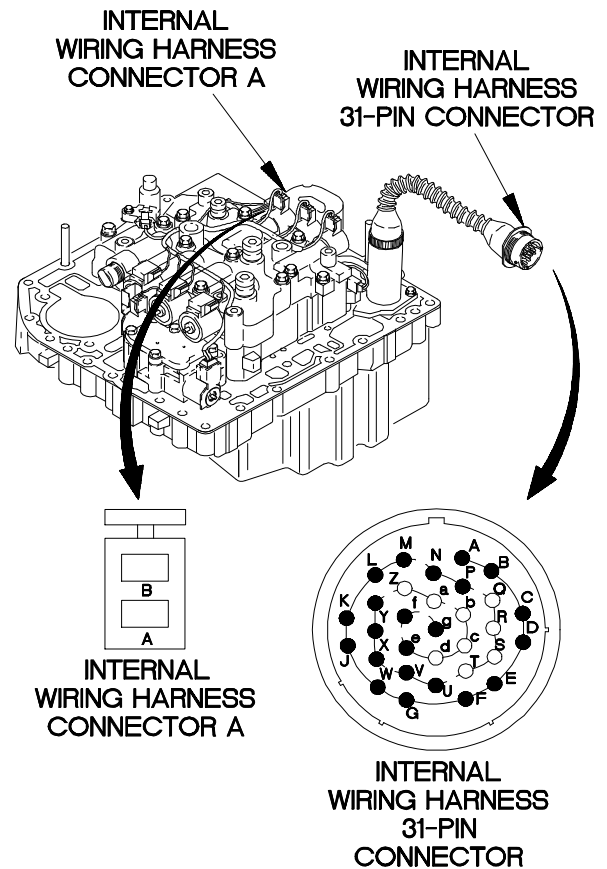
4.
Is continuity present from internal wiring harness 31-pin connector pin A to internal wiring harness connector A pin 3A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin A.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector A pin 3A and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin A.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).

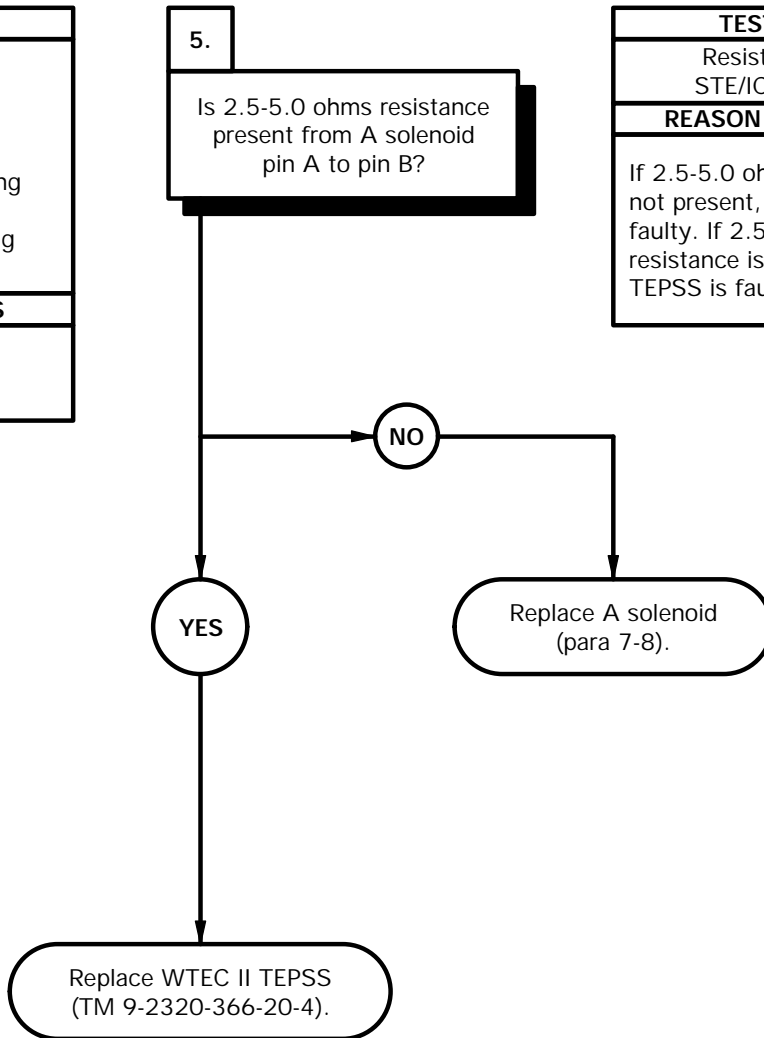


YBC1104B

c11. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

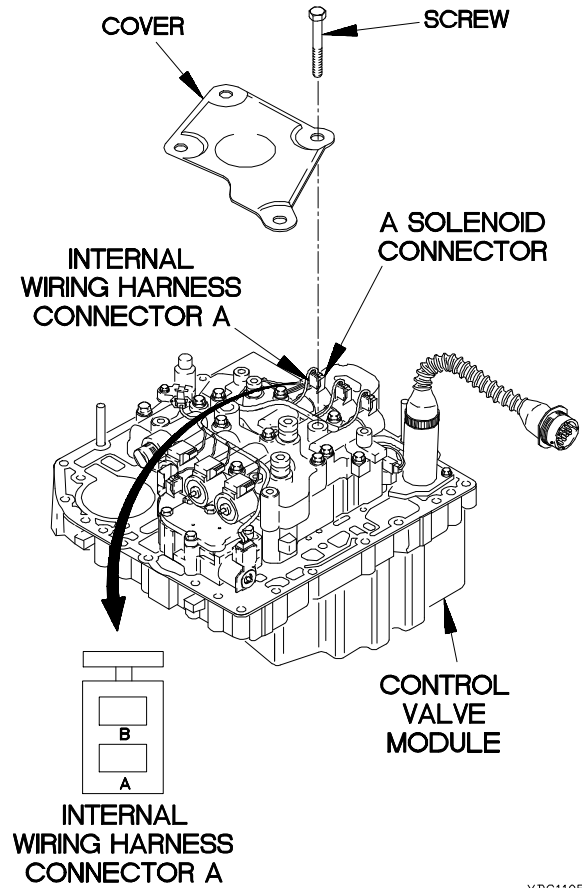
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty A solenoid. Faulty WTEC II TEPSS.

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, A solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC II TEPSS is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to A solenoid connector pin A.
- (3) Connect negative (-) probe of multimeter to A solenoid connector pin B and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or more than 5.0 ohms, replace A solenoid (para 7-8).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector A to A solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC1105B

c12. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Tools and Special Tools

Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts

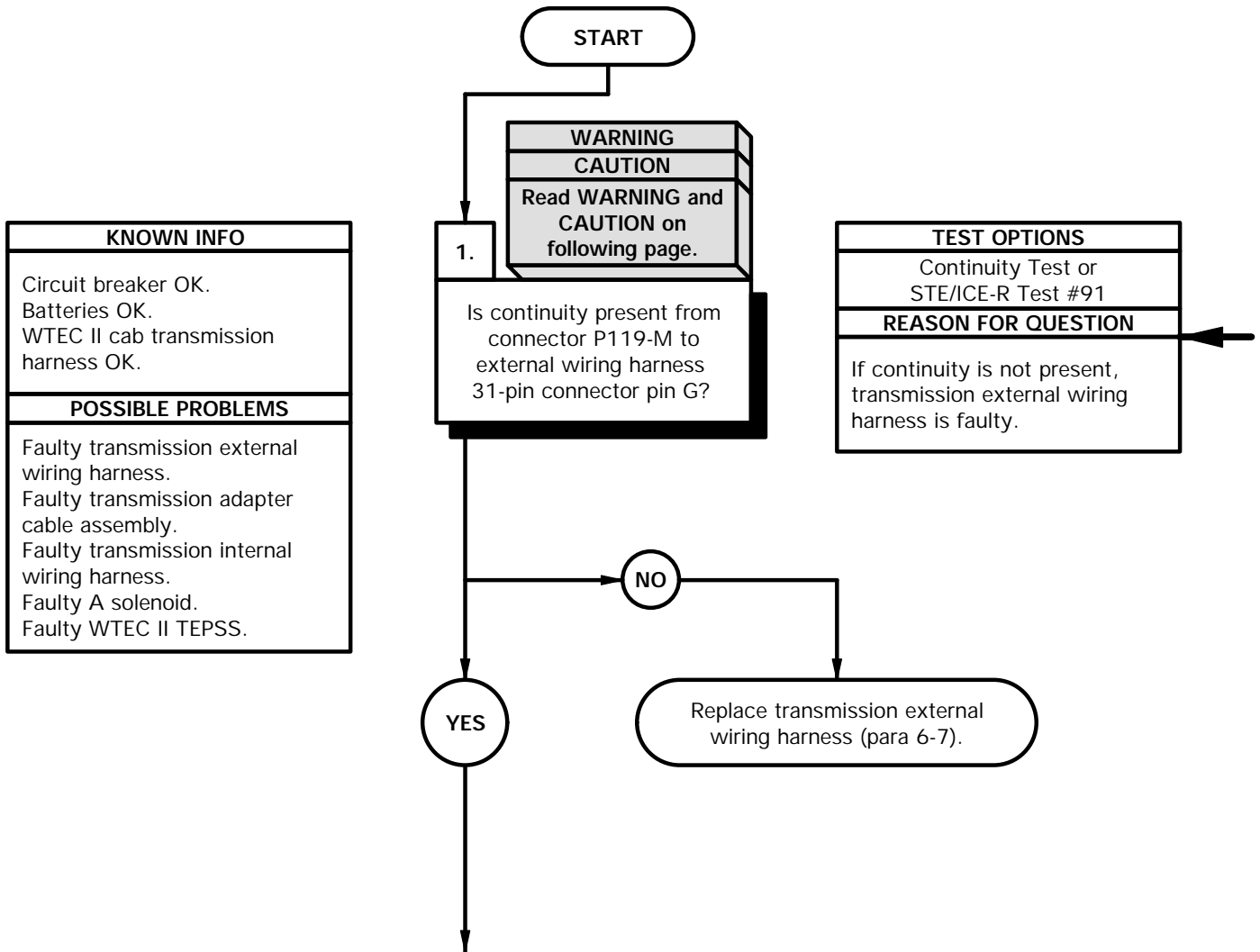
Wire, Elect, 50 ft (Item 97, Appendix C)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

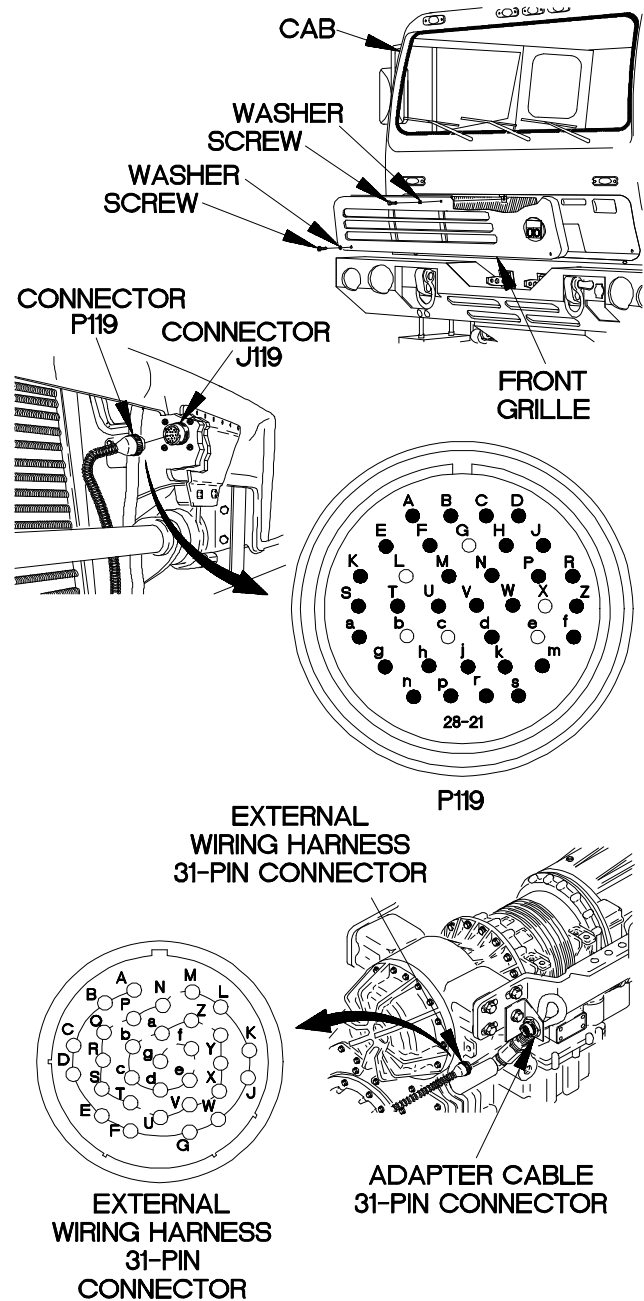
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness 31-pin from adapter cable to 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-M.
- (8) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin G and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-M.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



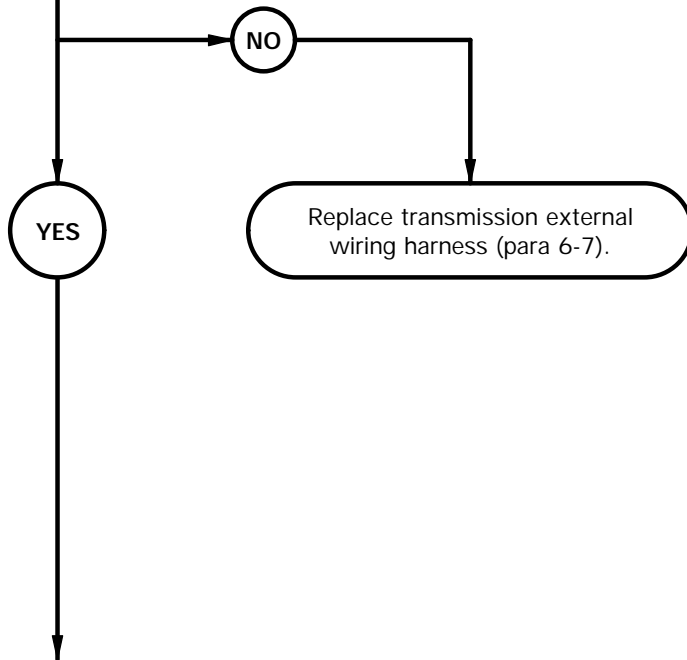
YBC1201B

c12. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty A solenoid. Faulty WTEC II TEPSS.

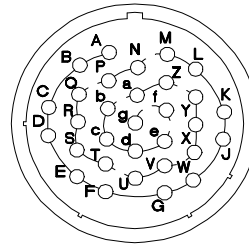
2.
Is continuity present from connector P119-B to external wiring harness 31-pin connector pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

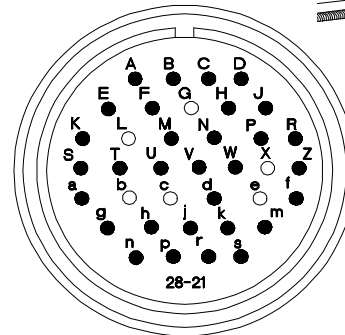


CONTINUITY TEST

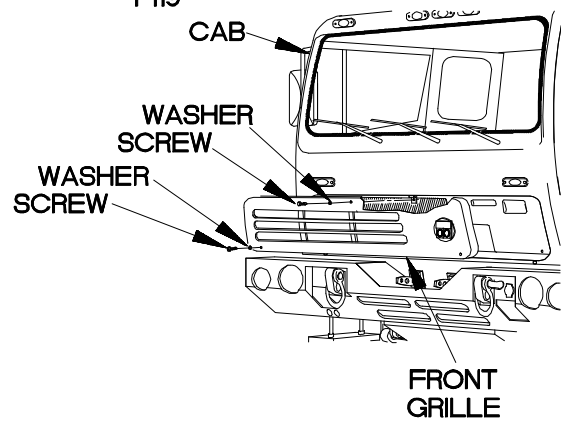
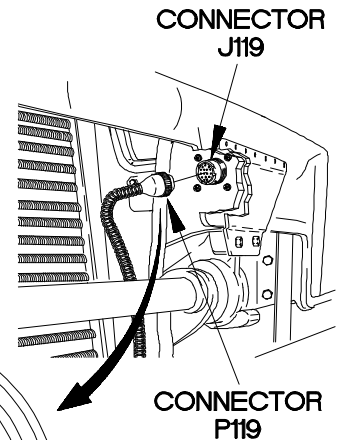
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-B.
- (3) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin A and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-B.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



EXTERNAL WIRING HARNESS 31-PIN CONNECTOR



P119



YBC1202B

c12. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

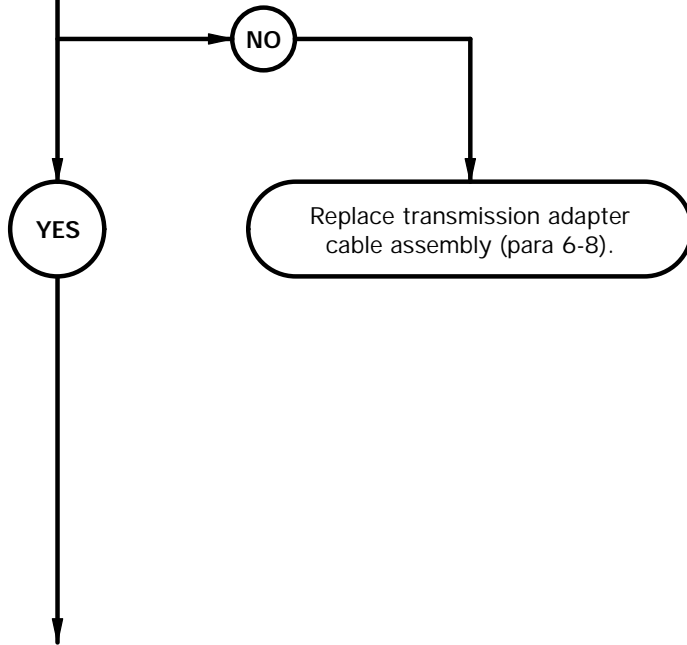
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty A solenoid. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin G to adapter cable 24-pin connector pin A1?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.

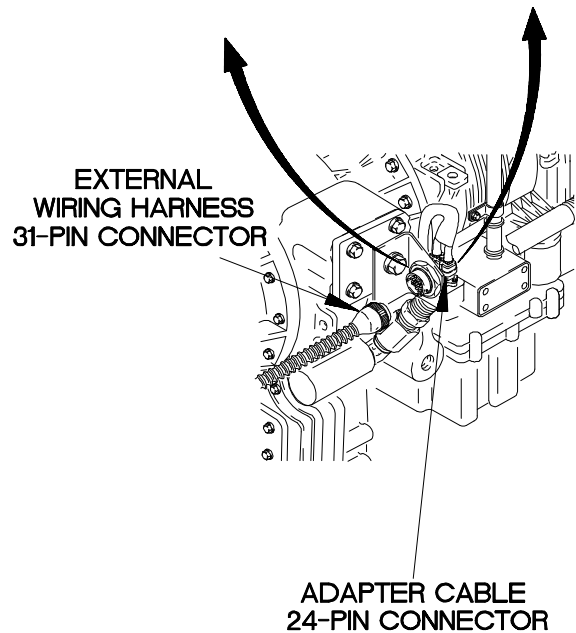
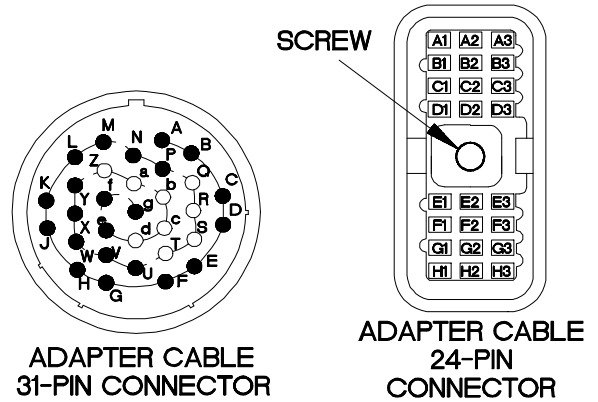


CAUTION

Use care when disconnecting transmission adapter cable connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Loosen screw in adapter cable 24-pin connector.
- (2) Disconnect adapter cable 24-pin connector from internal wiring harness 24-pin connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin G.
- (5) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin A1 and note reading on multimeter.
- (6) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (7) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin G.
- (8) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).



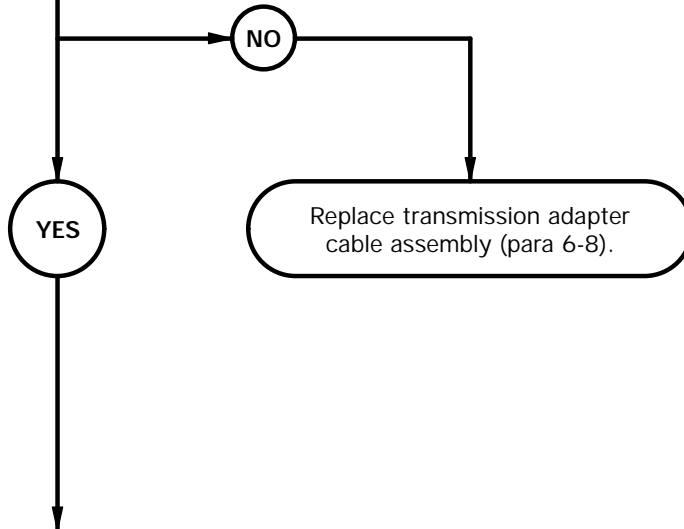
YBC1203B

c12. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty A solenoid. Faulty WTEC II TEPSS.

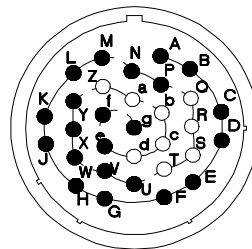
4.
Is continuity present from adapter cable 31-pin connector pin A to adapter cable 24-pin connector pin A2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.

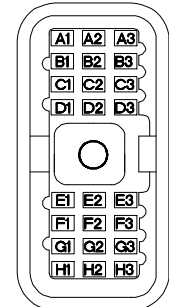


CONTINUITY TEST

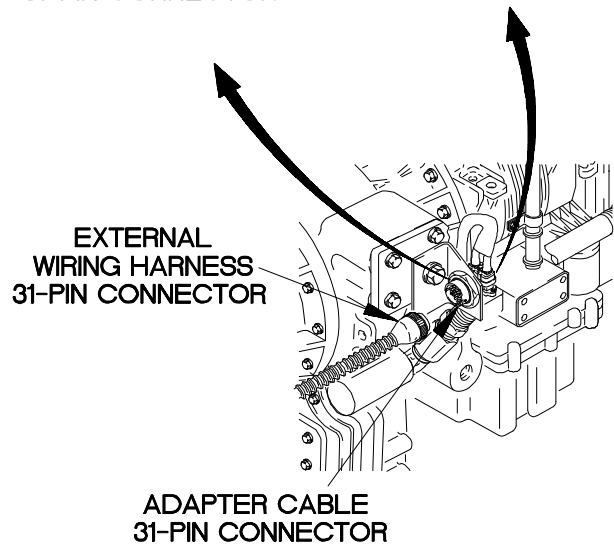
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin A.
- (3) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin A2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (5) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin A.
- (6) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).
- (9) Connect external wiring harness 31-pin connector to adapter cable 31-pin connector.



**ADAPTER CABLE
31-PIN CONNECTOR**



**ADAPTER CABLE
24-PIN
CONNECTOR**



**EXTERNAL
WIRING HARNESS
31-PIN CONNECTOR**

**ADAPTER CABLE
31-PIN CONNECTOR**

YBC1204B

c12. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

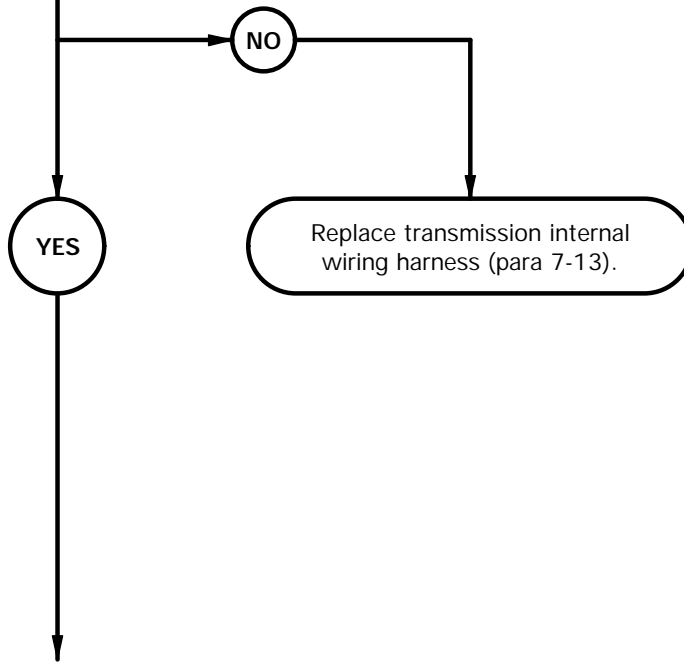
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty A solenoid. Faulty WTEC II TEPSS.

5.

CAUTION
 Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin A1 to internal wiring harness connector A pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

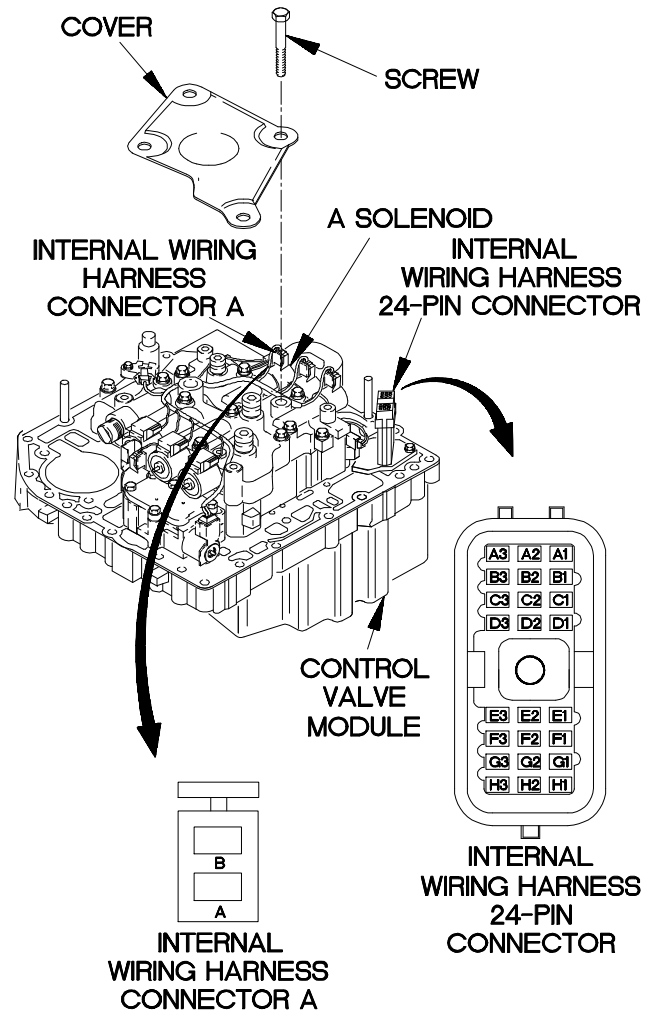


CAUTION

Use care when disconnecting internal wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector A from A solenoid.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin A1.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector A pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin A1.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector, except pins A2, D1, and H1, and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



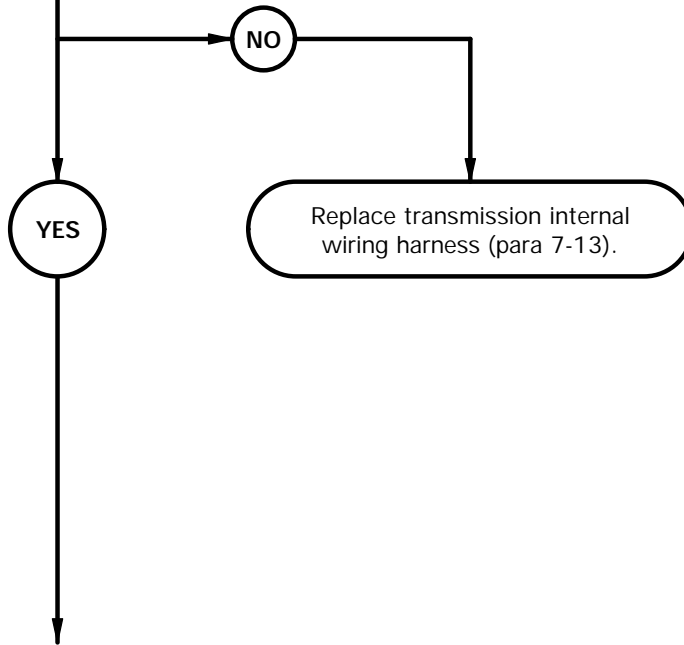
YBC1205B

c12. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty A solenoid. Faulty WTEC II TEPSS.

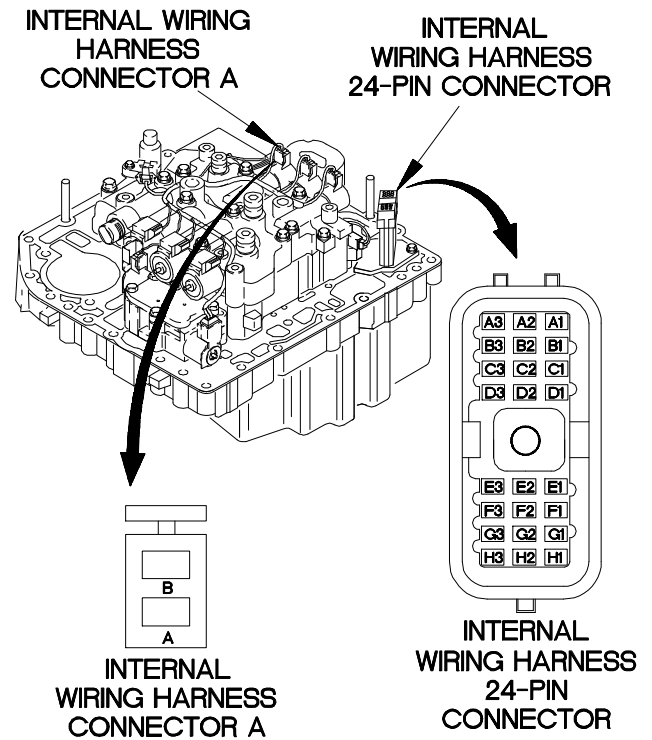
6.
Is continuity present from internal wiring harness 24-pin connector pin A2 to internal wiring harness connector A pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin A2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector A pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin A2.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector, except pins D1 and H1, and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).

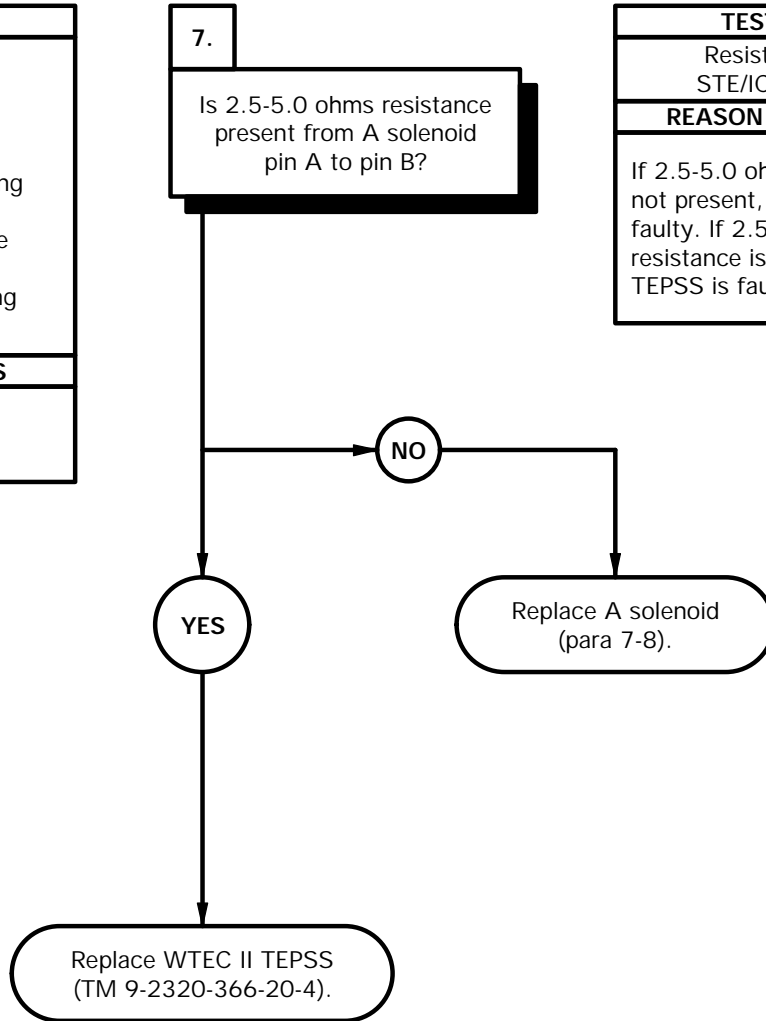


YBC1206B

c12. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

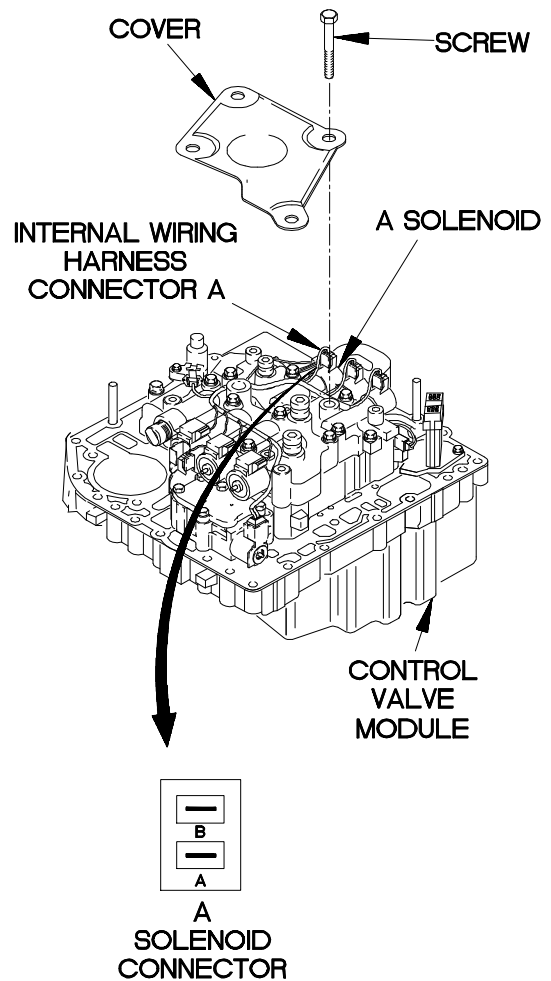
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty A solenoid. Faulty WTEC II TEPSS.

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, A solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC II TEPSS is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of A solenoid connector.
- (3) Connect negative (-) probe of multimeter to pin B of A solenoid connector and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace A solenoid (para 7-8).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector A to A solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC1207B

c13. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

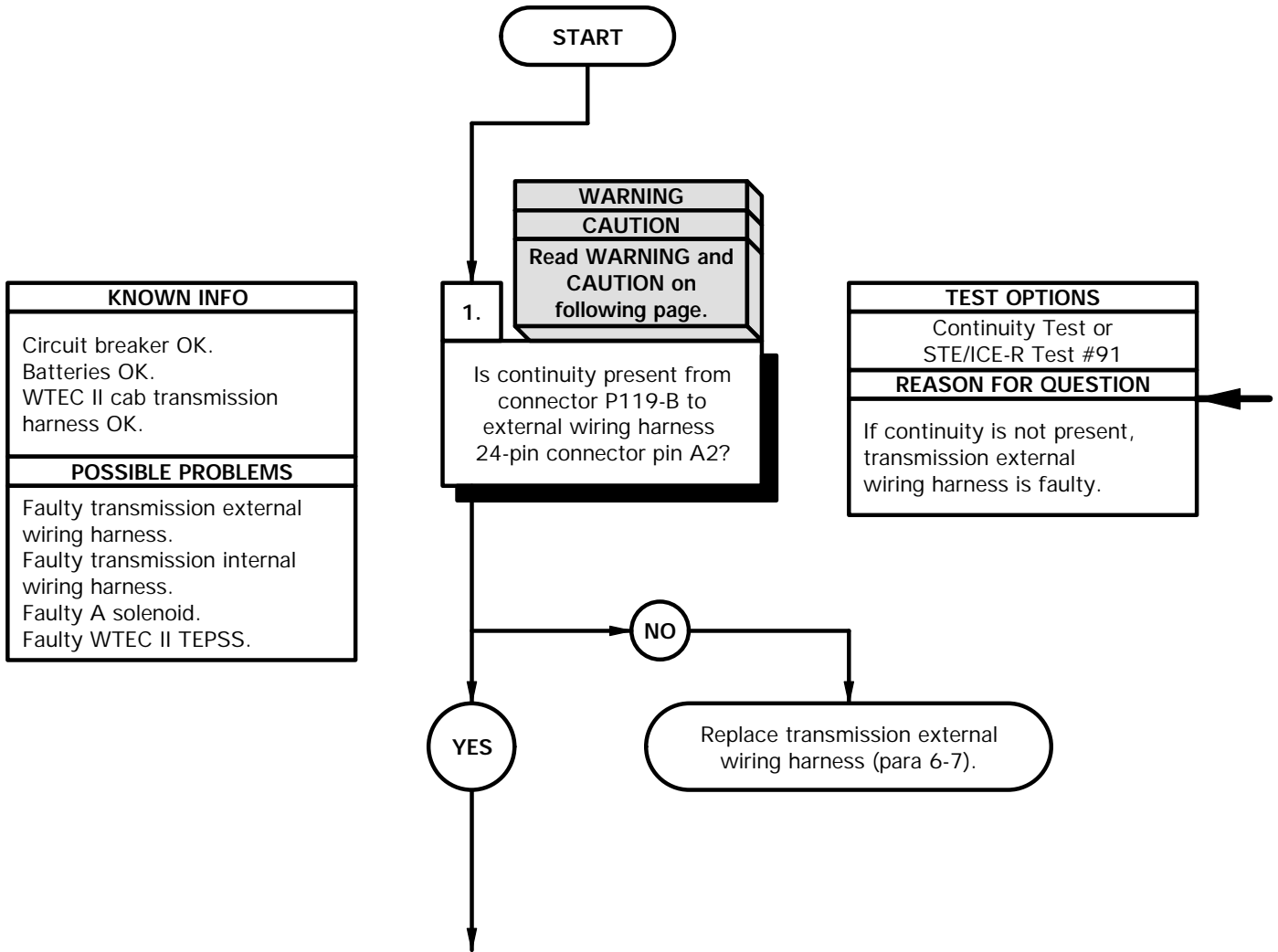
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

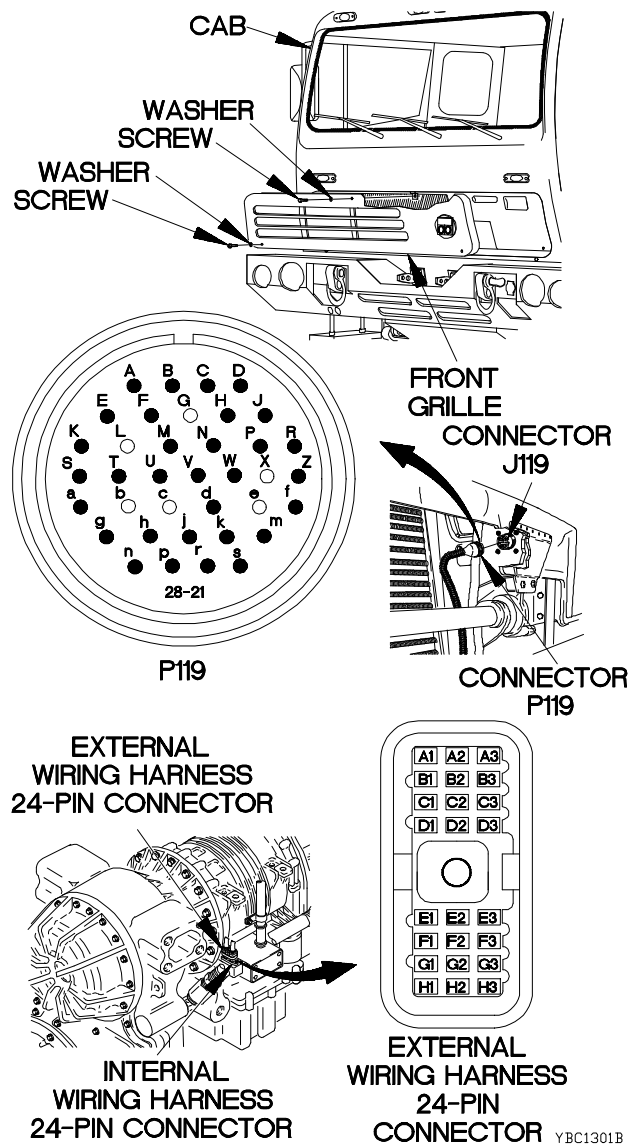
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Loosen screw in external wiring harness 24-pin connector.
- (6) Disconnect external wiring harness 24-pin connector from internal wiring harness 24-pin connector.
- (7) Set multimeter to ohms.
- (8) Connect positive (+) probe of multimeter to connector P119-B.
- (9) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin A2 and note reading on multimeter.
- (10) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (11) Connect positive (+) probe of multimeter to connector P119-B.

CONTINUITY TEST (CONT)

- (12) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (13) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (14) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).

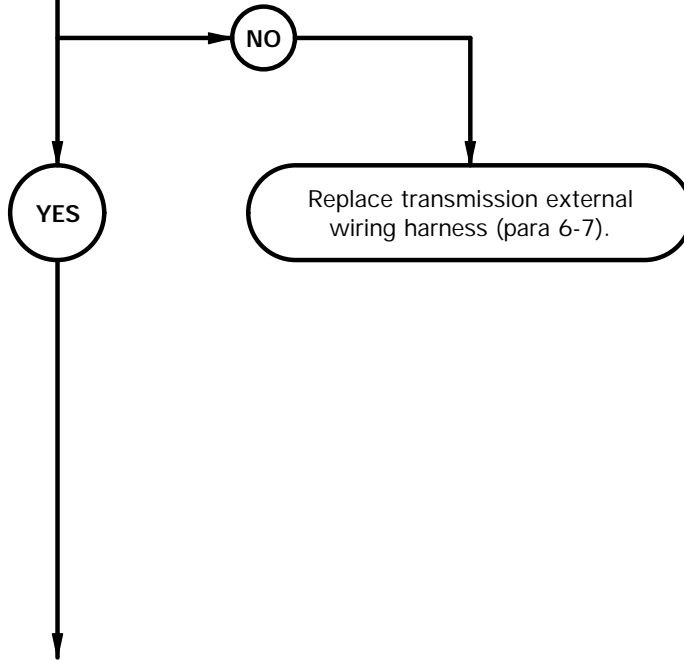


c13. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty transmission turbine speed sensor. Faulty A solenoid. Faulty WTEC II TEPSS.

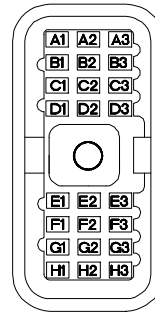
2
Is continuity present from connector P119-M to external wiring harness 24-pin connector pin A1?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

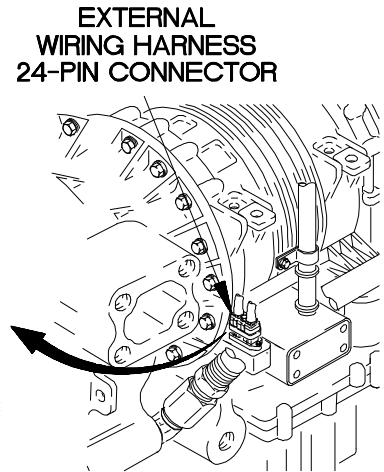


CONTINUITY TEST

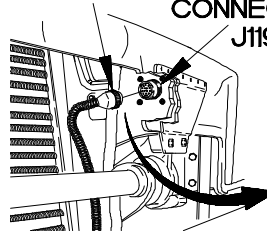
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-M.
- (3) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin A1 and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-M.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



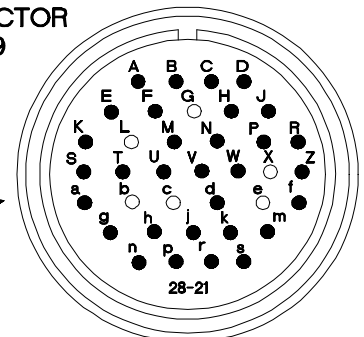
EXTERNAL WIRING HARNESS 24-PIN CONNECTOR



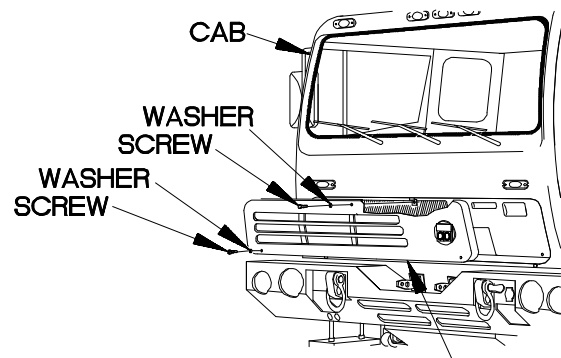
CONNECTOR P119



CONNECTOR J119



P119



FRONT GRILLE

YBC1302B

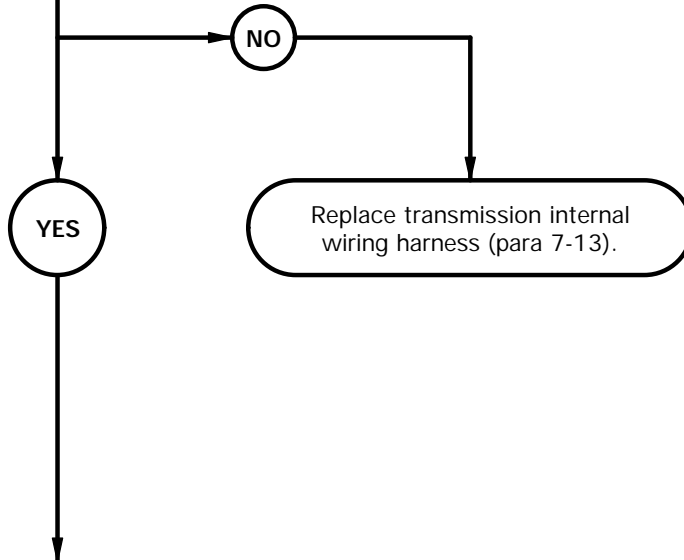
c13. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty A solenoid. Faulty WTEC II TEPSS.

3. **CAUTION**
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin A1 to internal wiring harness connector A pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

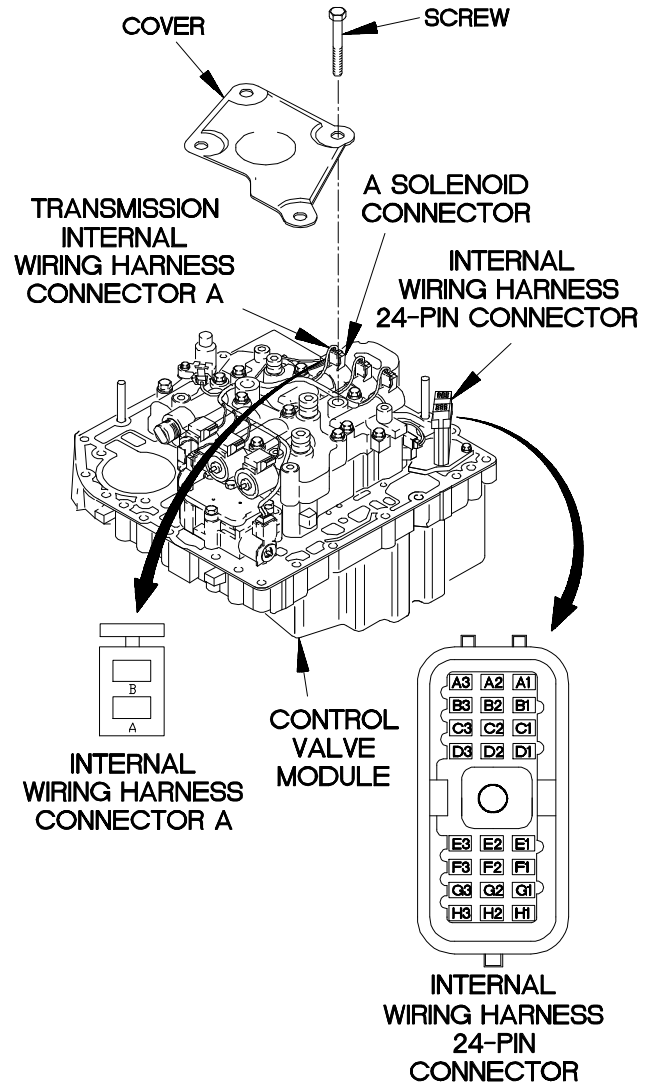


CAUTION

Use care when disconnecting transmission internal wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector A from A solenoid connector.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin A1.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector A pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin A1.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector, except A2, D1, and H1, and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission wiring harness (para 7-13).



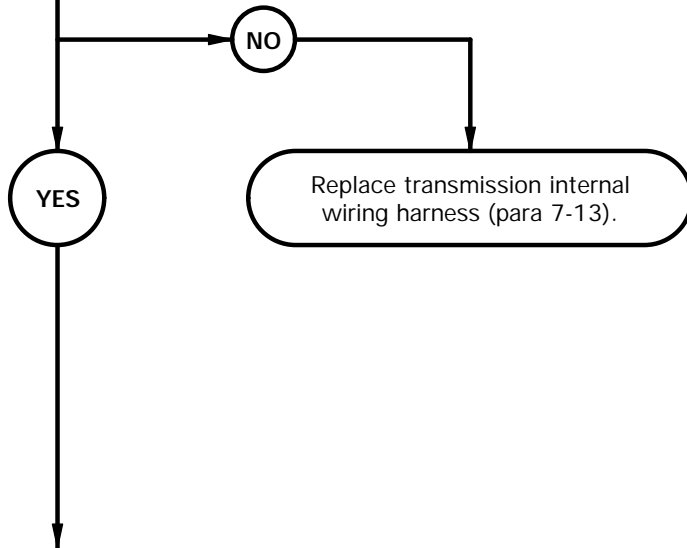
YBC1303B

c13. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty A solenoid. Faulty WTEC II TEPSS.

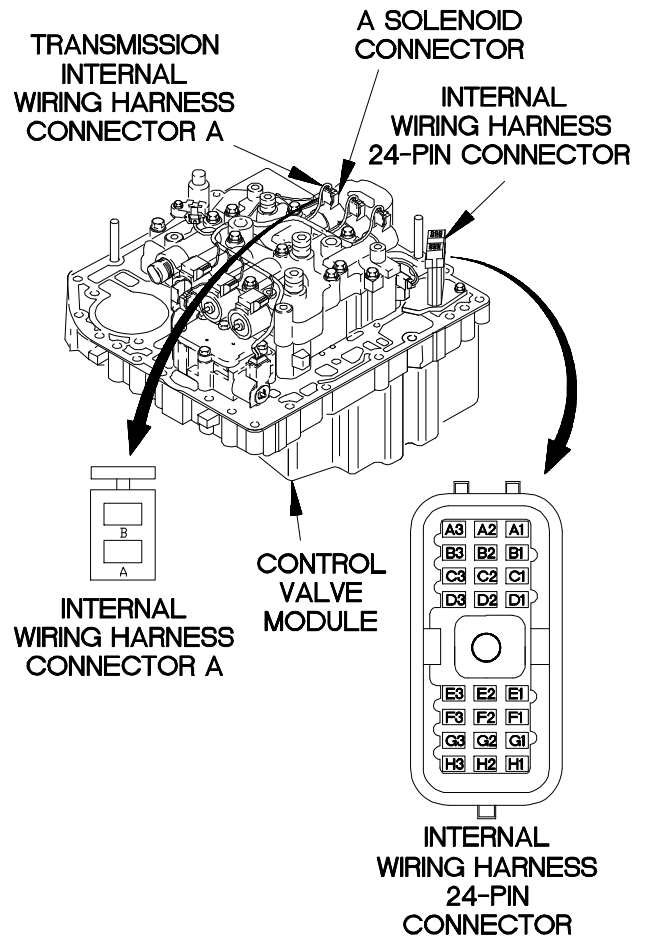
4.
Is continuity present from internal wiring harness 24-pin connector pin A2 to internal wiring harness connector A pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin A2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector A pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin A2.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector, except D1 and H1, and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



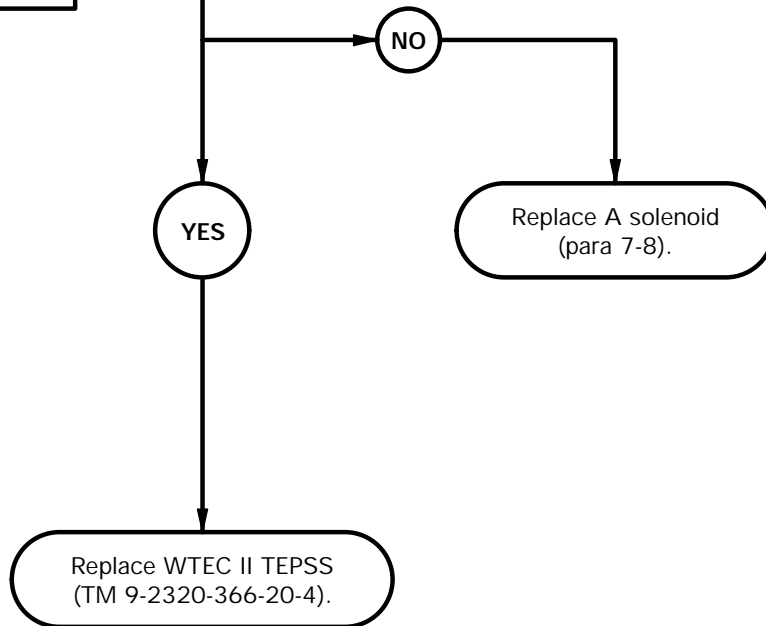
YBC1304B

c13. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty A solenoid. Faulty WTEC II TEPSS.

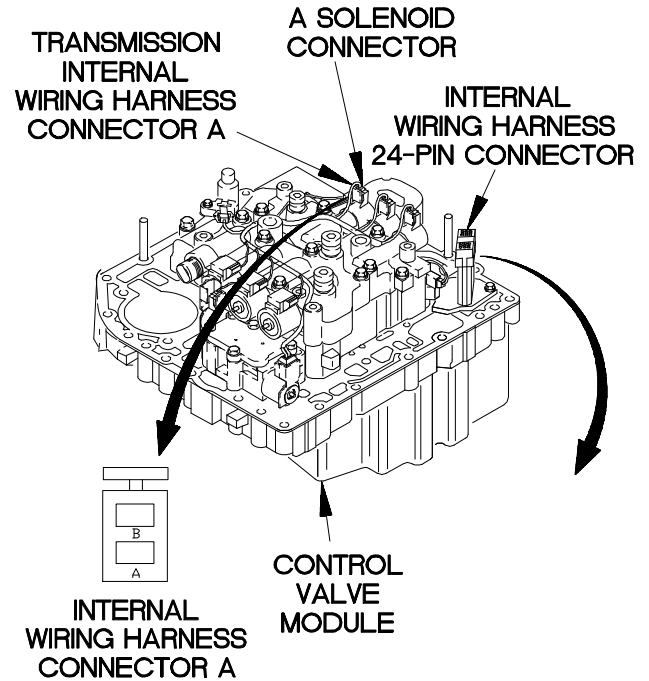
5.
Is 2.5-5.0 ohms resistance present from A solenoid pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, A solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC II TEPSS is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of A solenoid connector.
- (3) Connect negative (-) probe of multimeter to pin B of A solenoid connector and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace A solenoid (para 7-8).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect transmission internal wiring harness connector A to A solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC1305B

c14. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

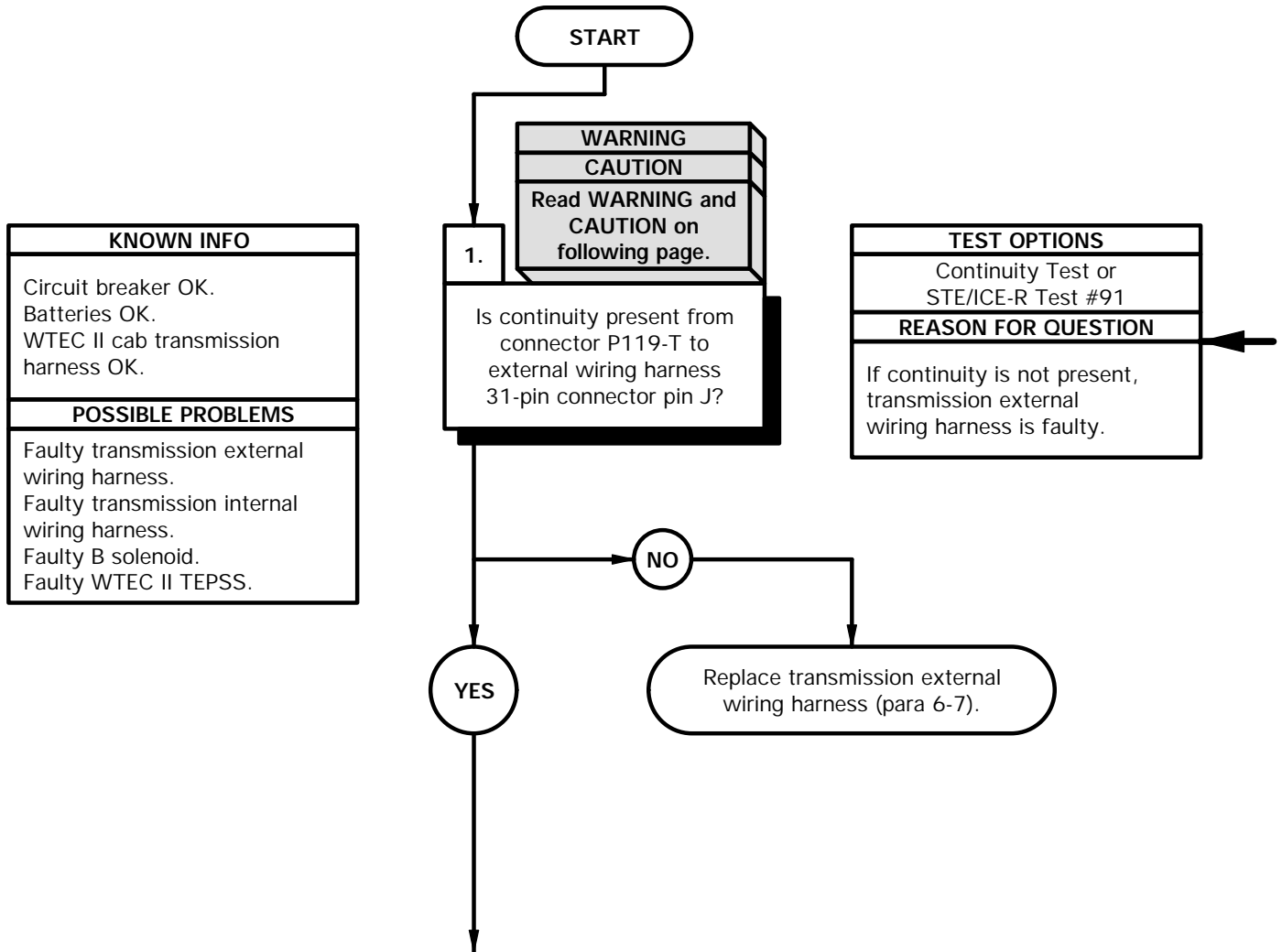
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

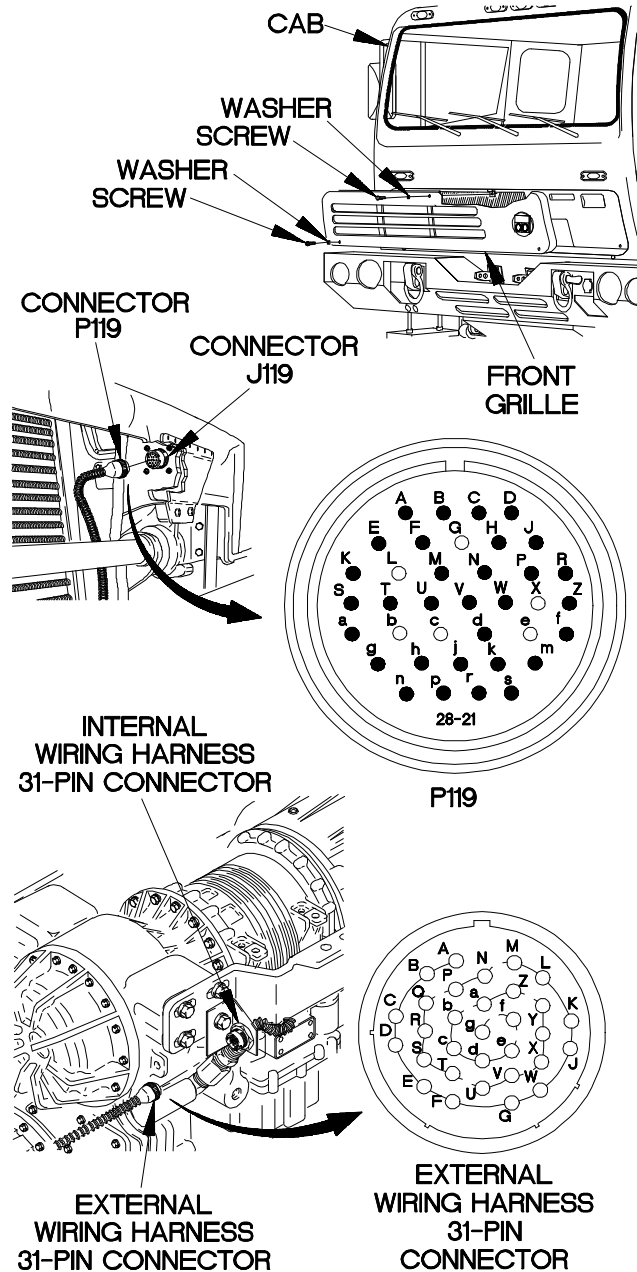
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness 31-pin from internal wiring harness 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-T.
- (8) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin J and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-T.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST

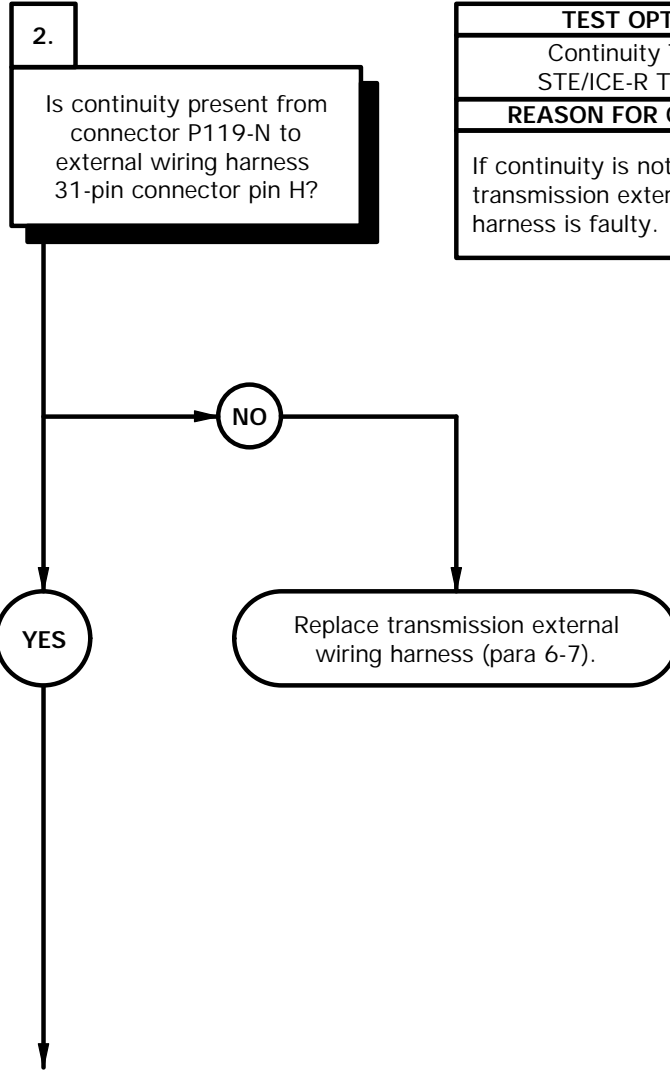
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



YBC1401B

c14. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

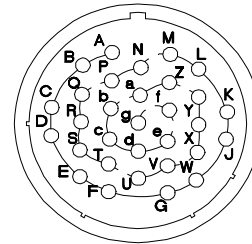
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty B solenoid. Faulty WTEC II TEPSS.



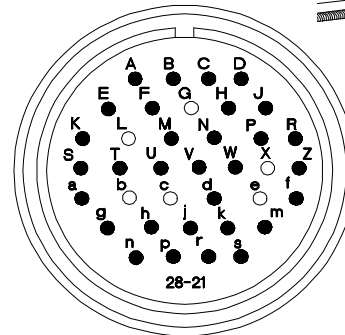
TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

CONTINUITY TEST

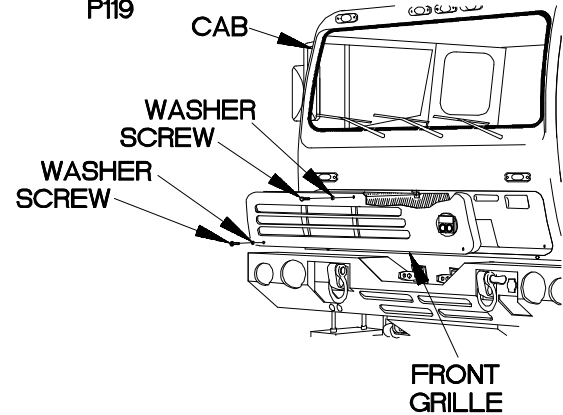
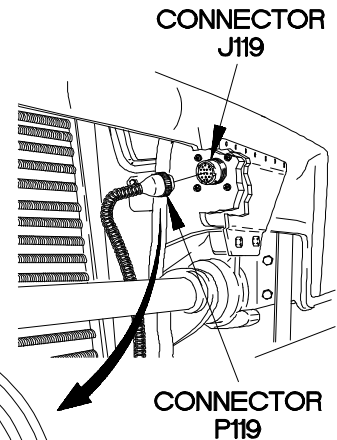
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-N.
- (3) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin H and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-N.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



EXTERNAL WIRING HARNESS 31-PIN CONNECTOR



P119



YBC1402B

c14. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

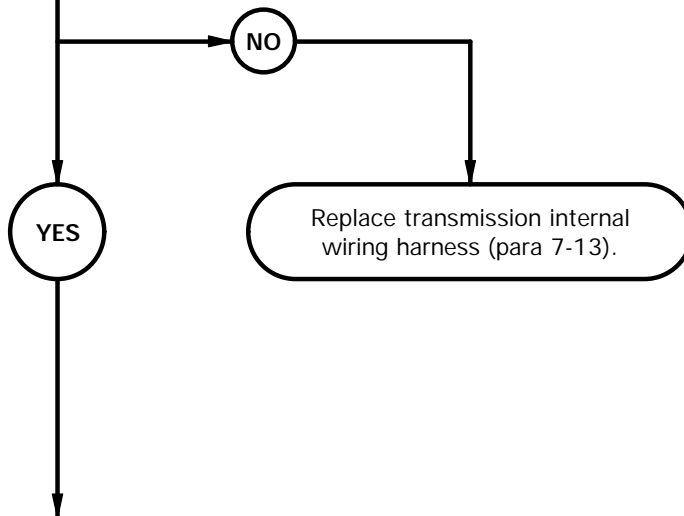
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty B solenoid. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin J to internal wiring harness connector B pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

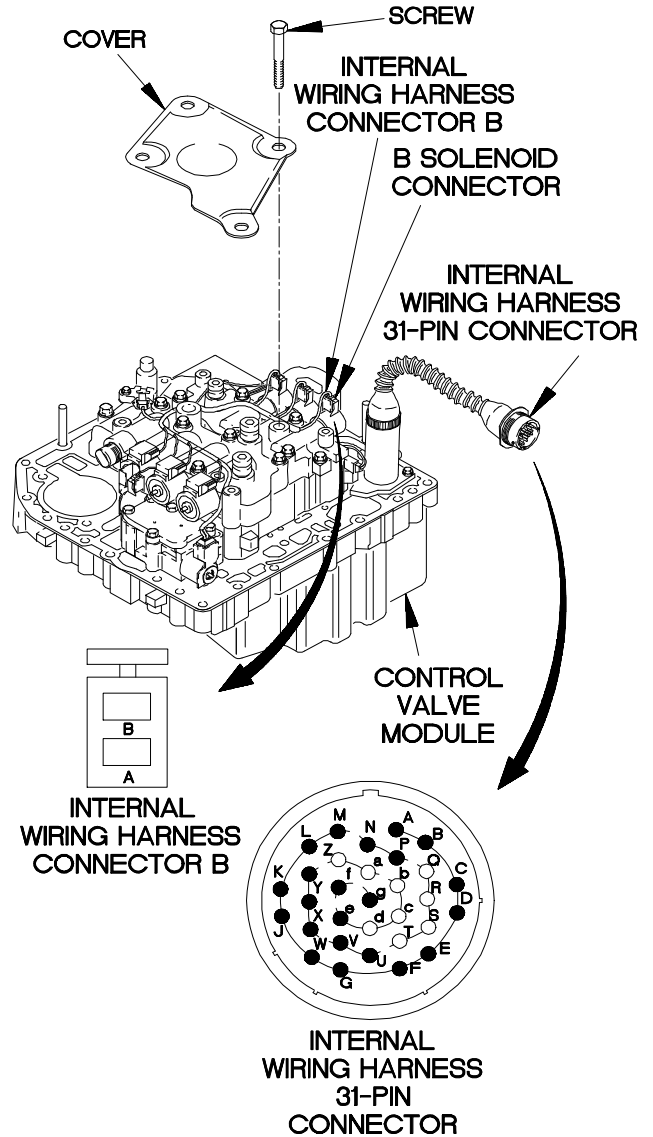


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector B from B solenoid.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin J.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector B pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin J.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



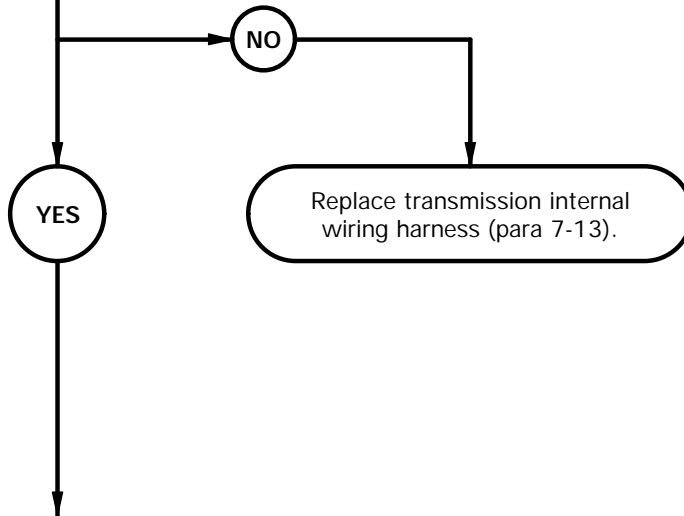
YBC1403B

c14. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty B solenoid. Faulty WTEC II TEPSS.

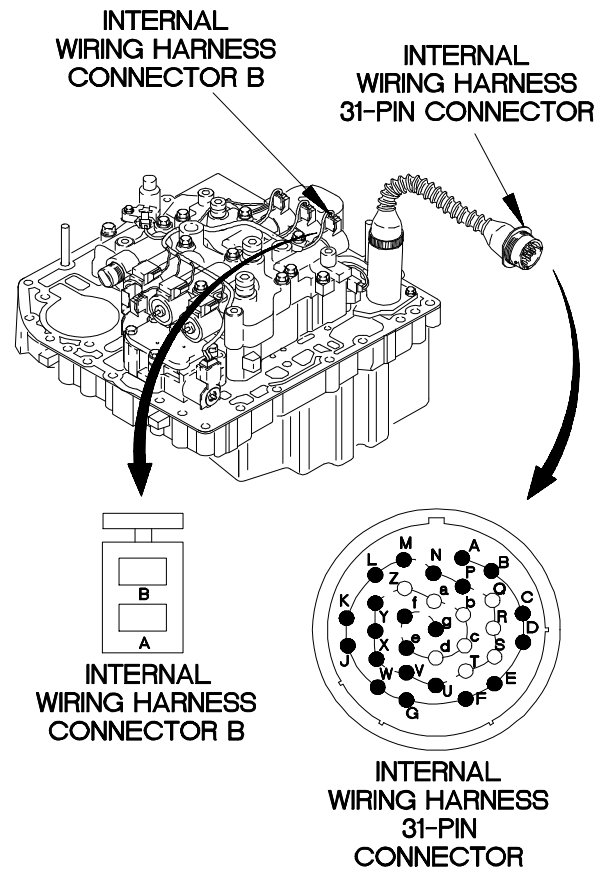
4.
Is continuity present from internal wiring harness 31-pin connector pin H to internal wiring harness connector B pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin H.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector B pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin H.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



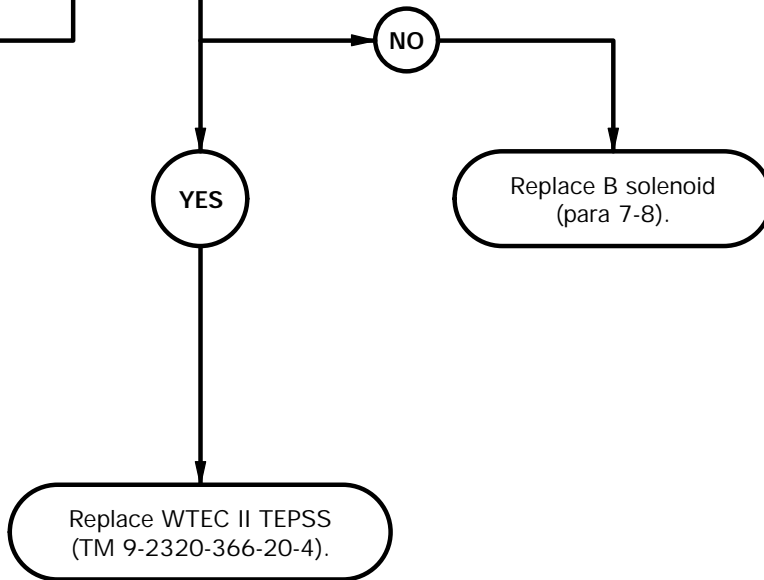
YBC1404B

c14. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty B solenoid. Faulty WTEC II TEPSS.

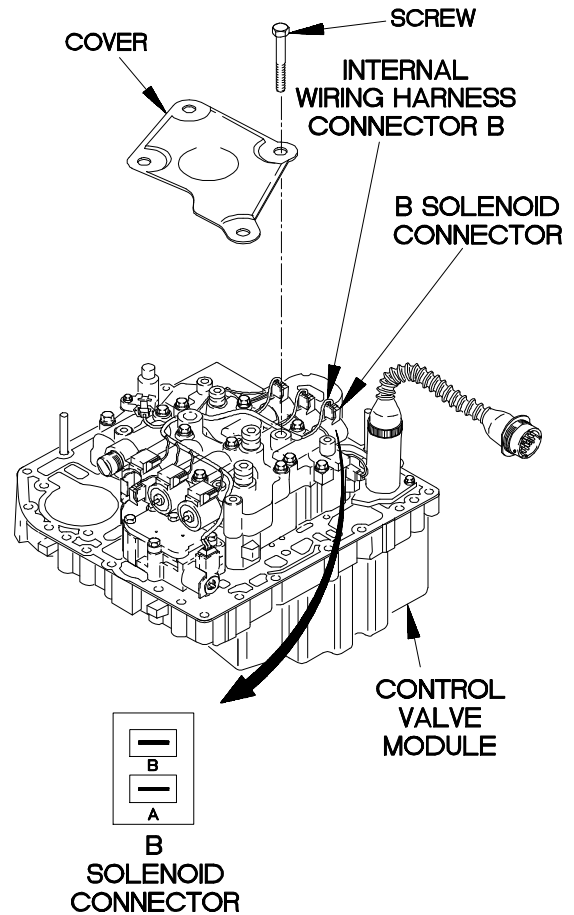
5.
Is 2.5-5.0 ohms resistance present from B solenoid pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, B solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC II TEPSS is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of B solenoid connector.
- (3) Connect negative (-) probe of multimeter to pin B of B solenoid connector and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace B solenoid (para 7-8).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector B to B solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC1405B

c15. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

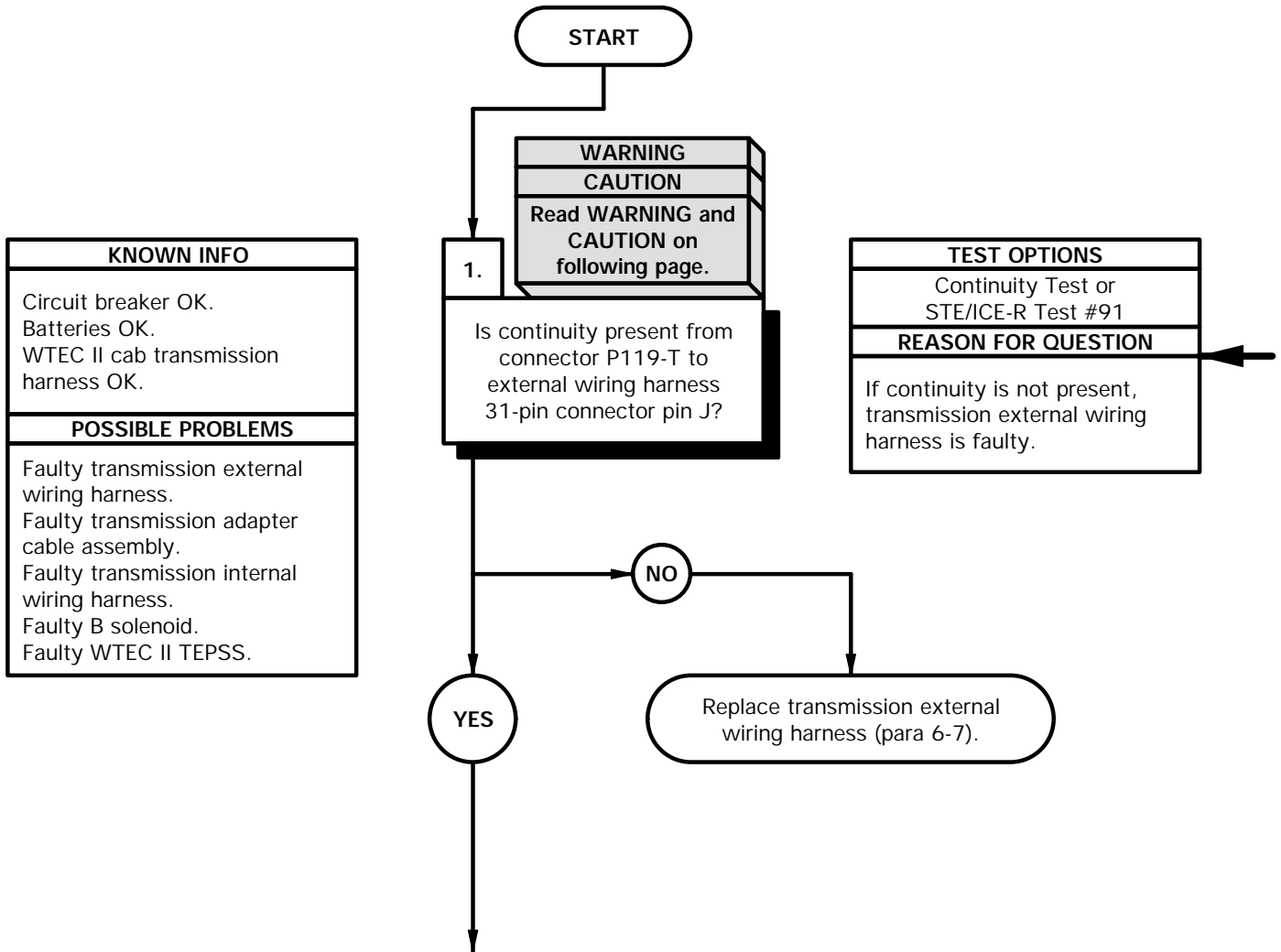
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

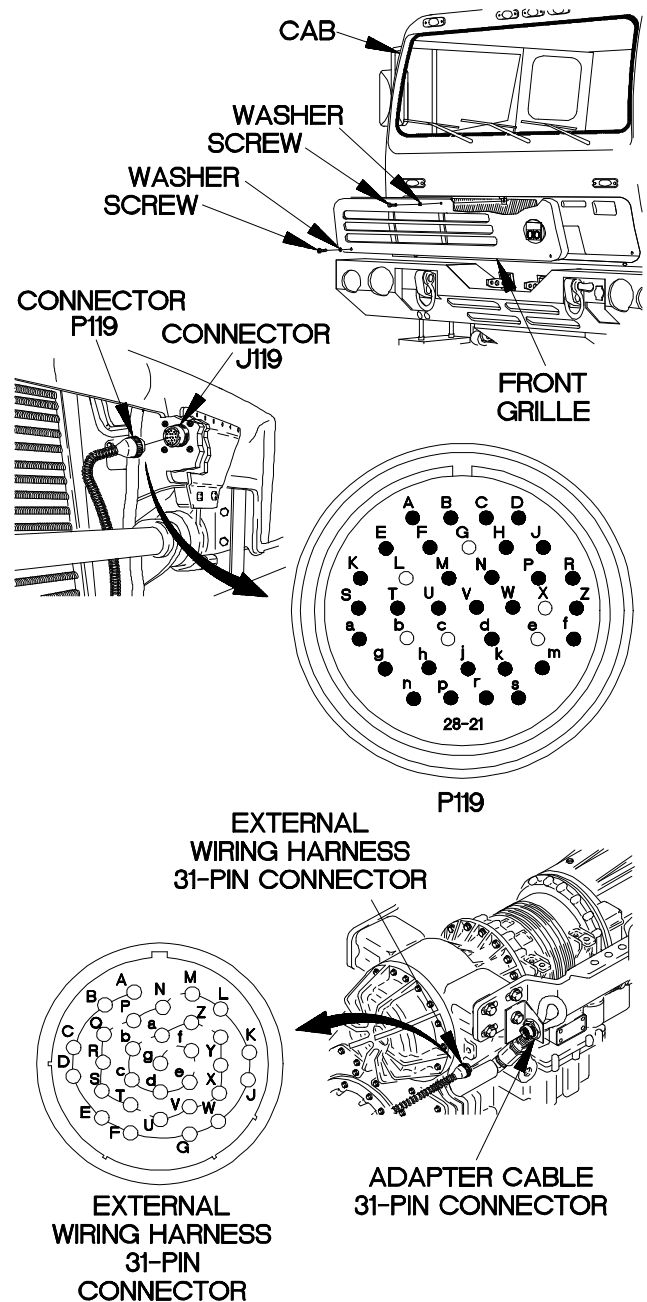
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness 31-pin connector from adapter cable 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-T.
- (8) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin J and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-T.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



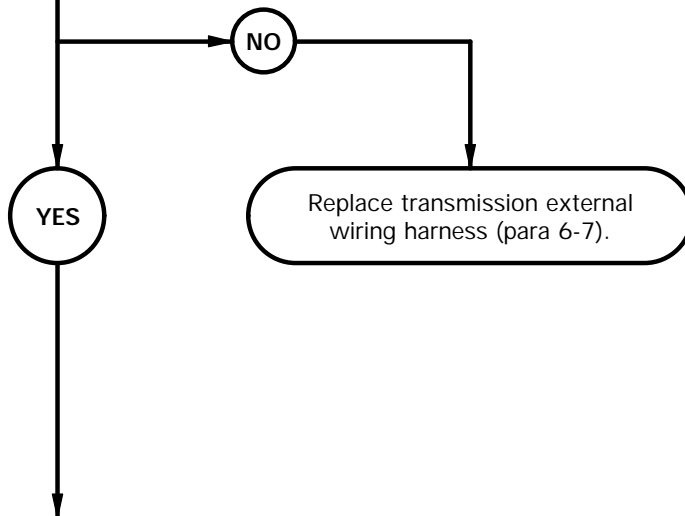
YBC1501B

c15. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty B solenoid. Faulty WTEC II TEPSS.

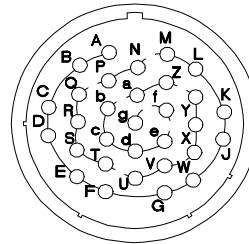
2.
Is continuity present from connector P119-N to external wiring harness 31-pin connector pin H?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

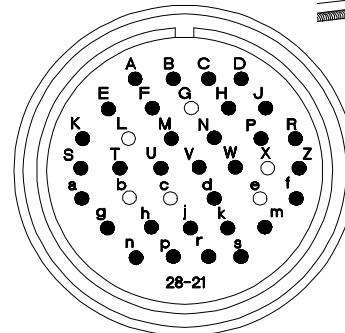


CONTINUITY TEST

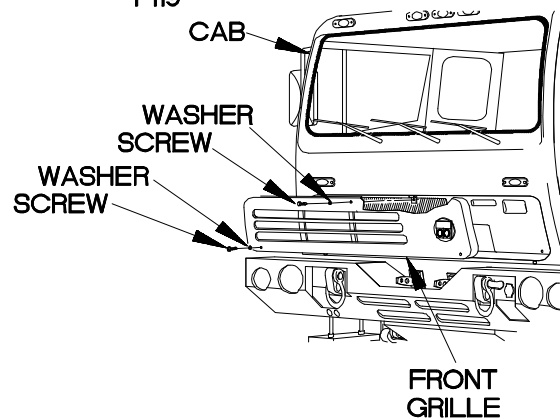
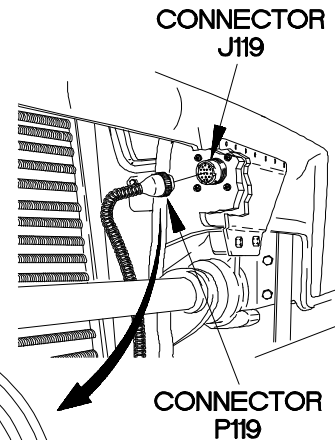
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-N.
- (3) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin H and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-N.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



EXTERNAL WIRING HARNESS 31-PIN CONNECTOR



P119



YBC1502B

c15. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

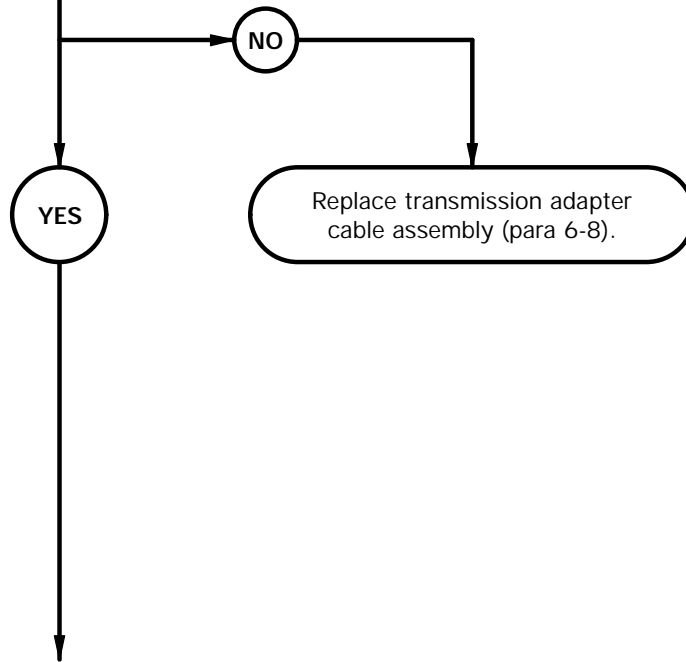
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty B solenoid. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin J to adapter cable 24-pin connector pin B1?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.

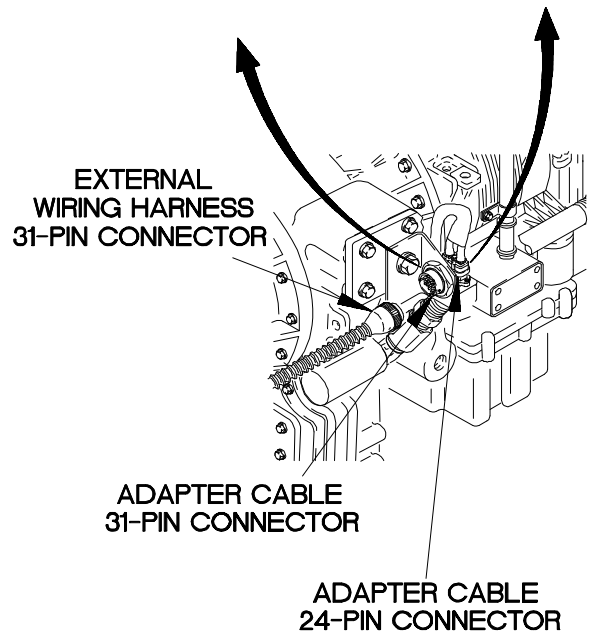
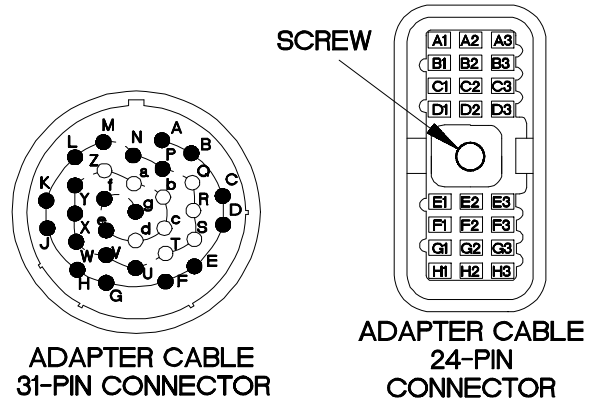


CAUTION

Use care when disconnecting adapter cable connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Loosen screw in adapter cable 24-pin connector.
- (2) Disconnect adapter cable 24-pin connector from internal wiring harness 24-pin connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin J.
- (5) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin B1 and note reading on multimeter.
- (6) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (7) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin J.
- (8) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).



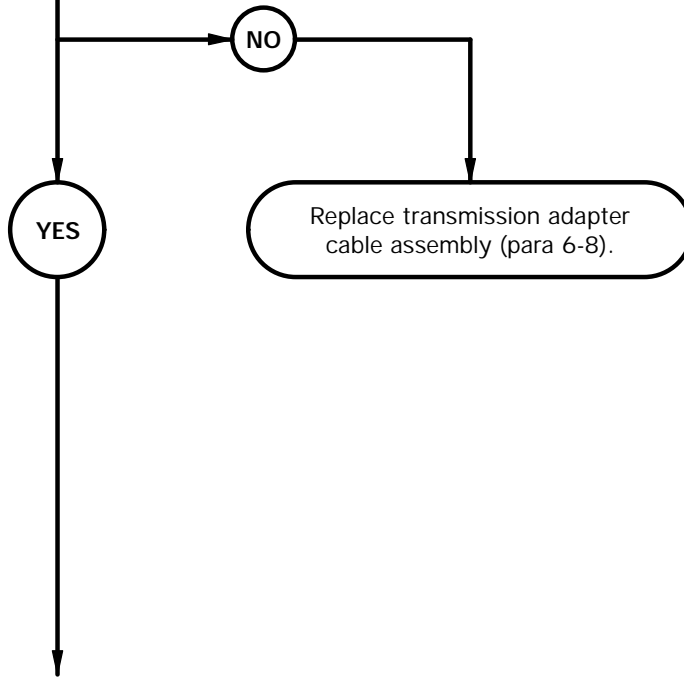
YBC1503B

c15. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty B solenoid. Faulty WTEC II TEPSS.

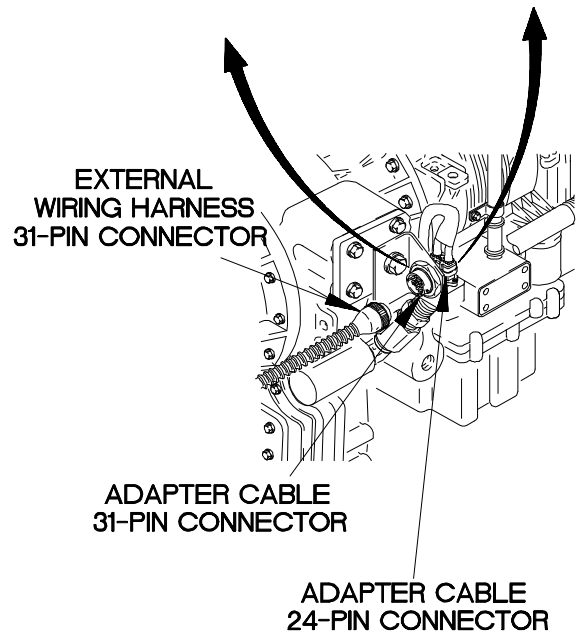
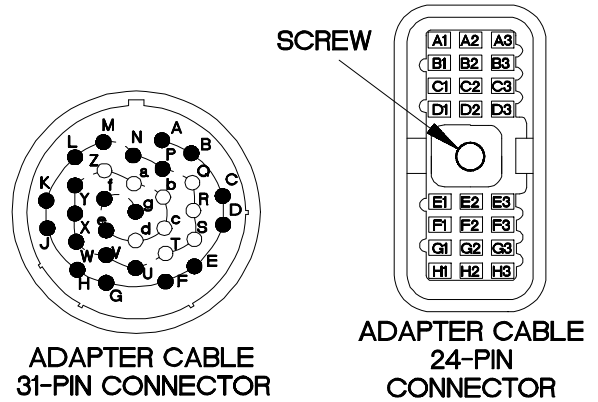
4.
Is continuity present from adapter cable 31-pin connector pin H to adapter cable 24-pin connector pin B2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.



CONTINUITY TEST

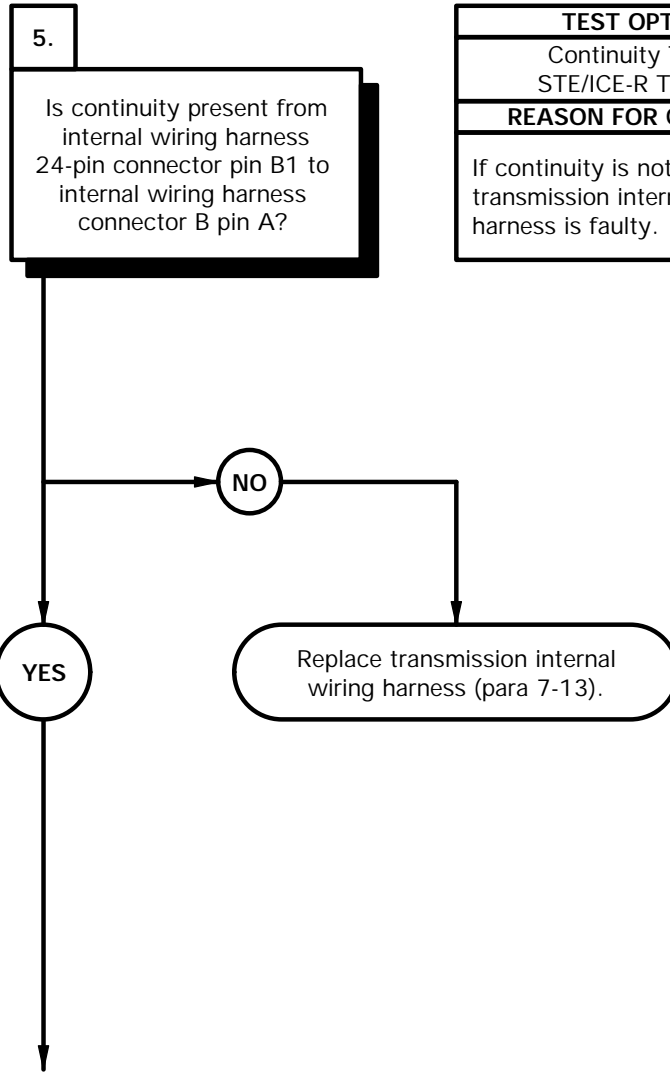
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin H.
- (3) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin B2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (5) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin H.
- (6) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).
- (9) Connect external wiring harness 31-pin connector to adapter cable 31-pin connector.



YBC1504B

c15. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

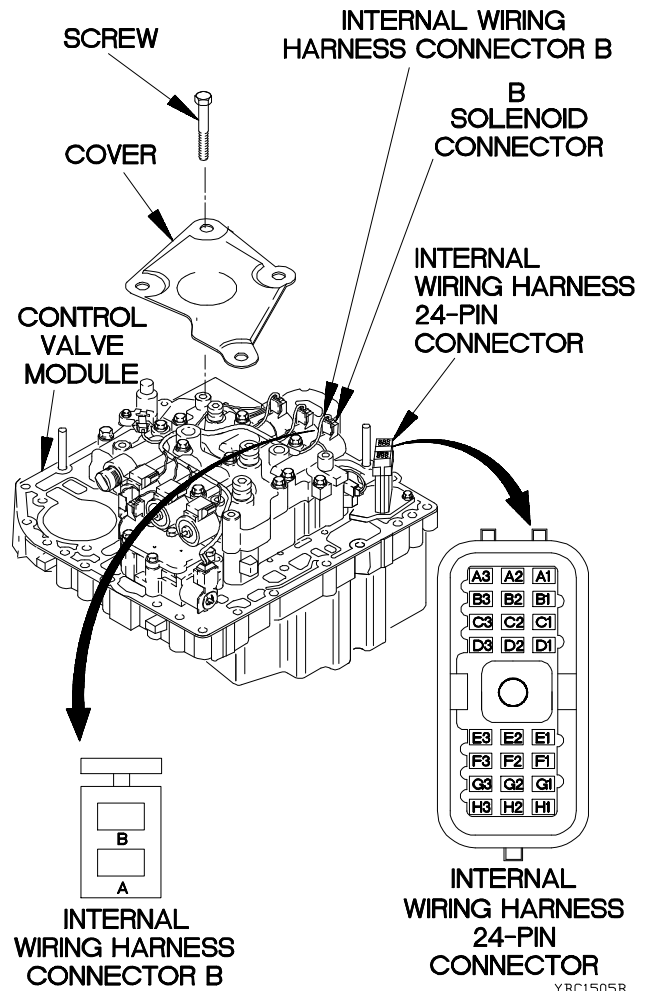
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty B solenoid. Faulty WTEC II TEPSS.



TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector B from B solenoid.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin B1.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector B pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin B1.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector, except pins B2 and E1, and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



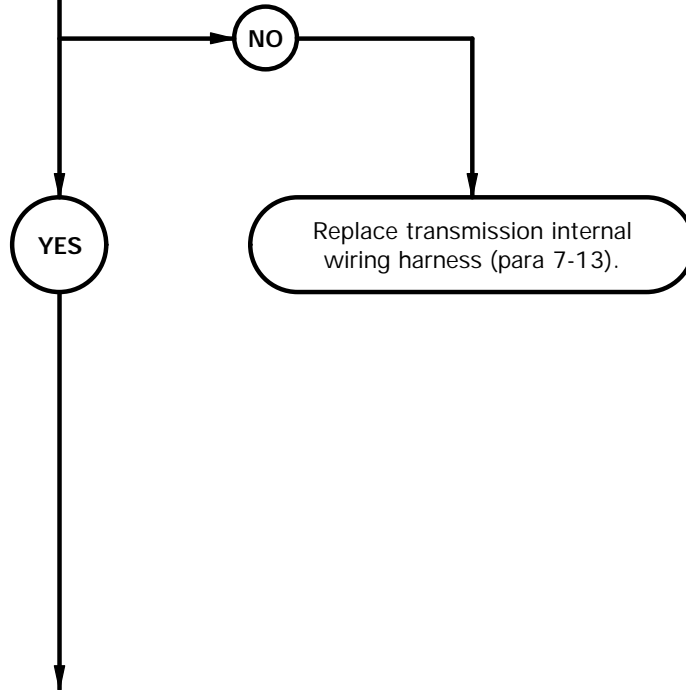
YBC1505B

c15. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty B solenoid. Faulty WTEC II TEPSS.

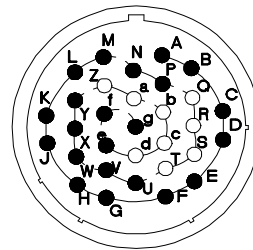
6.
Is continuity present from internal wiring harness 24-pin connector pin B2 to internal wiring harness connector B pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

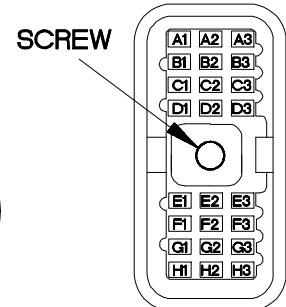


CONTINUITY TEST

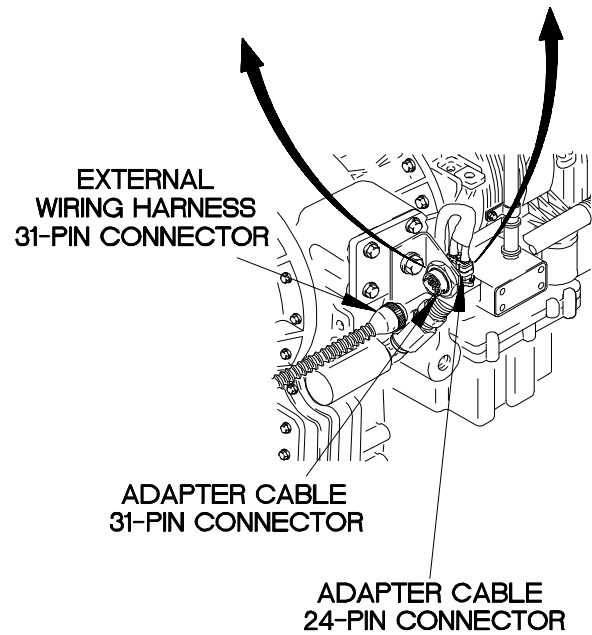
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin B2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector B pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin B2.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector, except pins B1 and E1, and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



**ADAPTER CABLE
31-PIN CONNECTOR**



**ADAPTER CABLE
24-PIN
CONNECTOR**

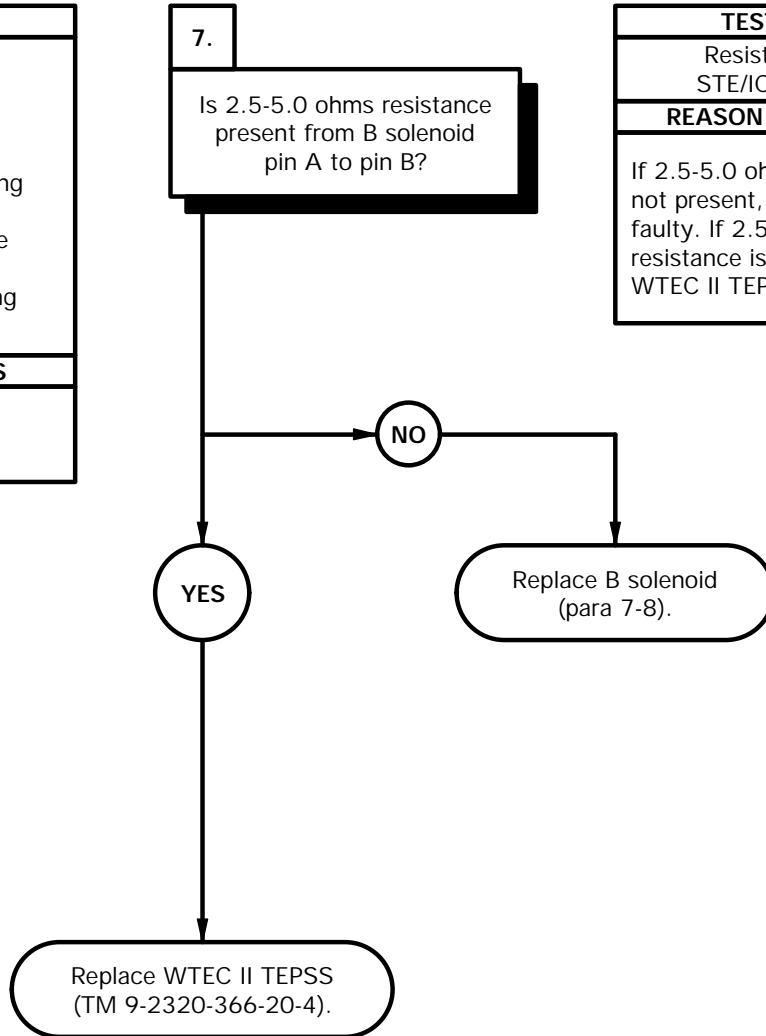


YBC1506B

c15. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

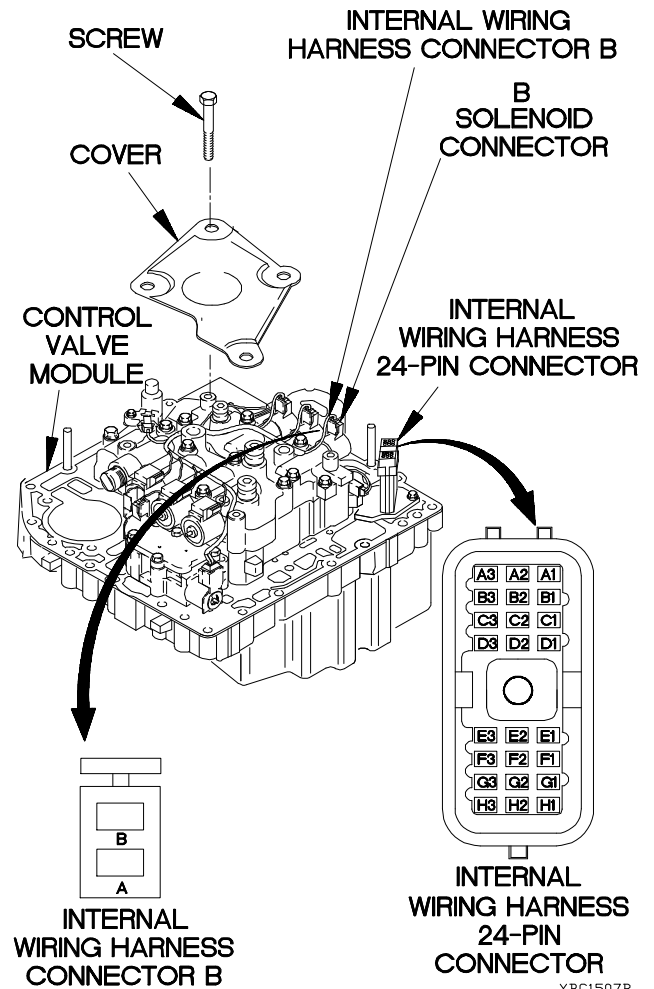
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty B solenoid. Faulty WTEC II TEPSS.

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, B solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC II TEPSS is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of B solenoid connector.
- (3) Connect negative (-) probe of multimeter to pin B of B solenoid connector and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace B solenoid (para 7-8).
- (5) If resistance is between 2.5 and 5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector B to B solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC1507B

c16. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Tools and Special Tools

Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts

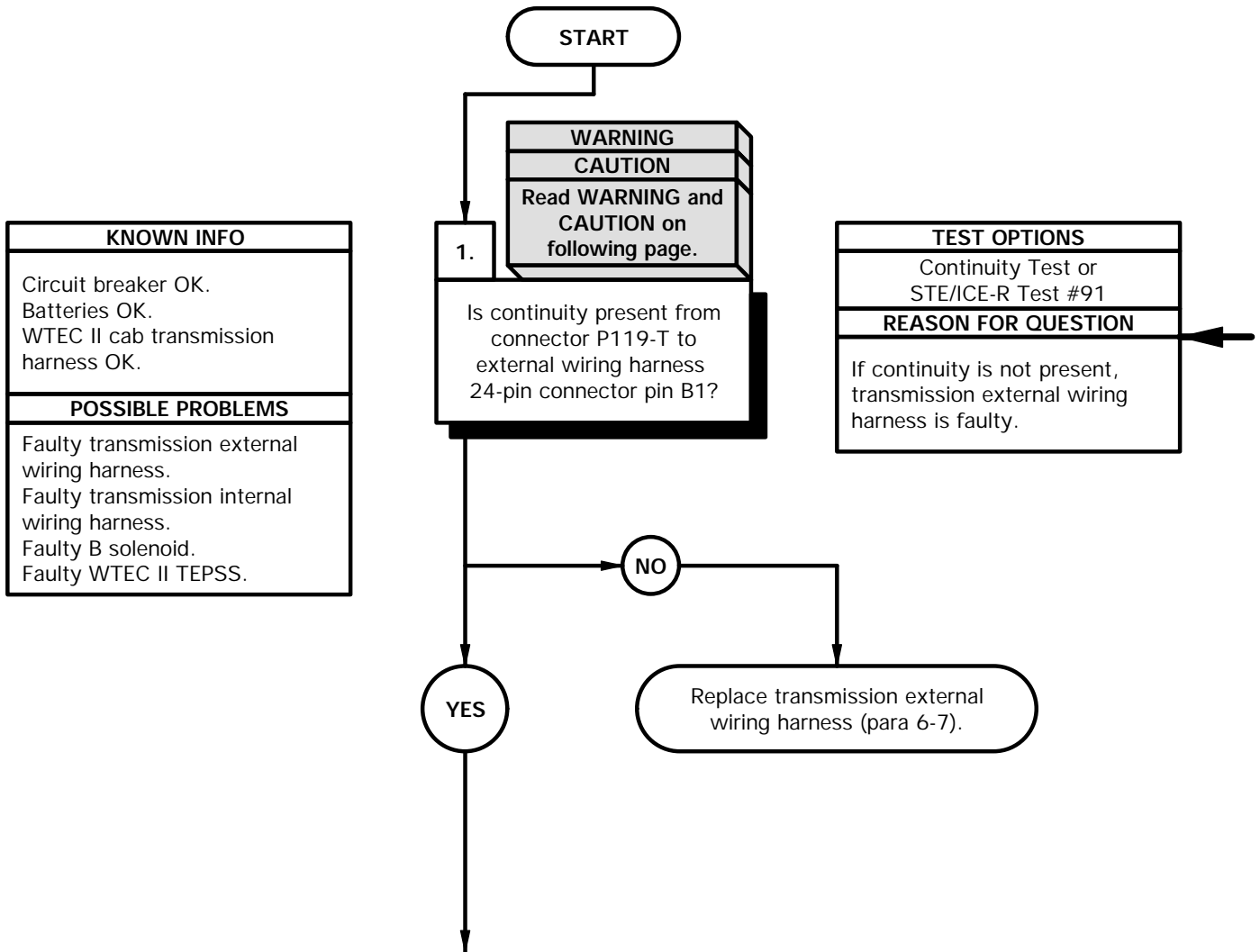
Wire, Elect, 50 ft (Item 97, Appendix C)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

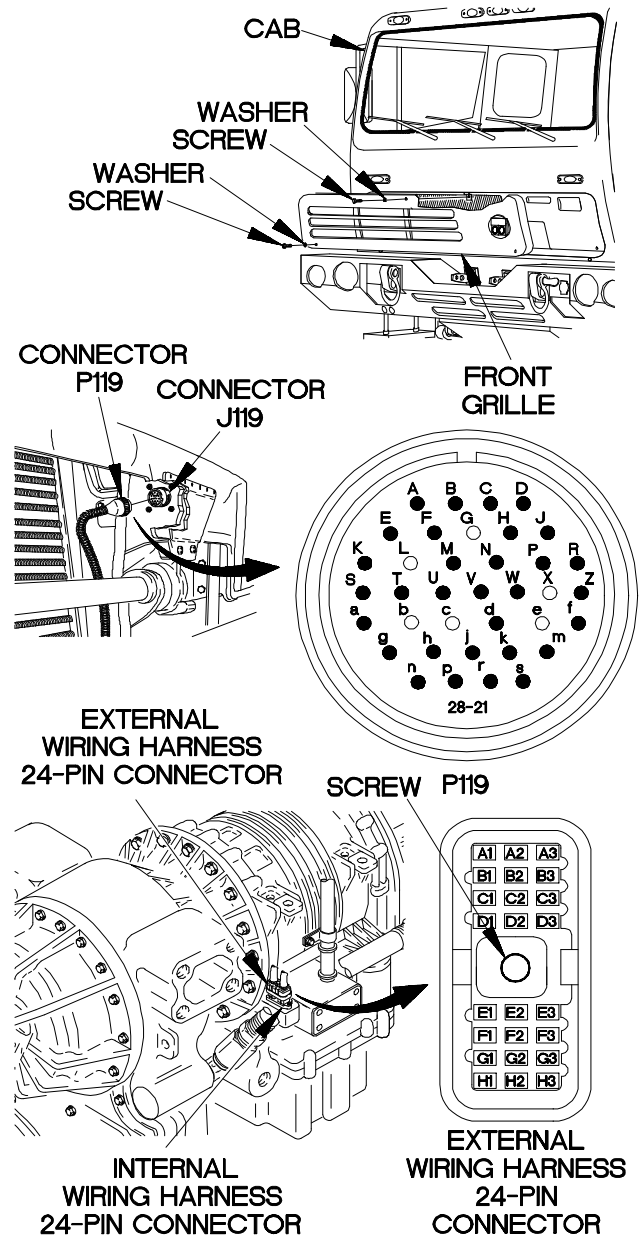
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Loosen screw in external wiring harness 24-pin connector.
- (6) Disconnect external wiring harness 24-pin connector from internal wiring harness 24-pin connector.
- (7) Set multimeter to ohms.
- (8) Connect positive (+) probe of multimeter to connector P119-T.
- (9) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin B1 and note reading on multimeter.
- (10) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (11) Connect positive (+) probe of multimeter to connector P119-T.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (13) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (14) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



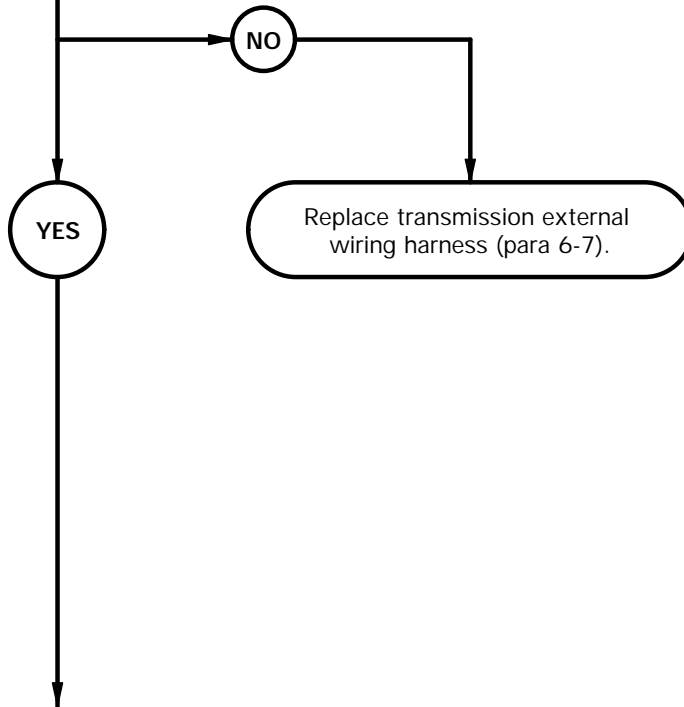
YBC1601B

c16. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty B solenoid. Faulty WTEC II TEPSS.

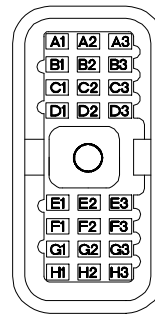
2.
Is continuity present from connector P119-N to external wiring harness 24-pin connector pin B2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

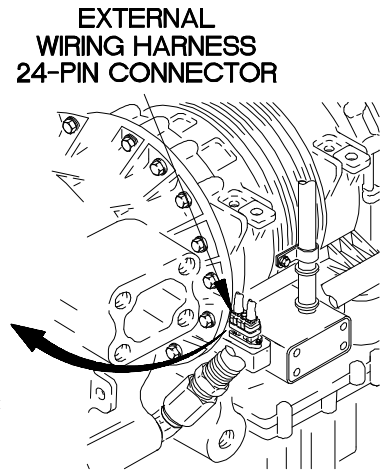


CONTINUITY TEST

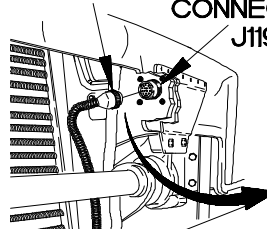
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-N.
- (3) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin B2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-N.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



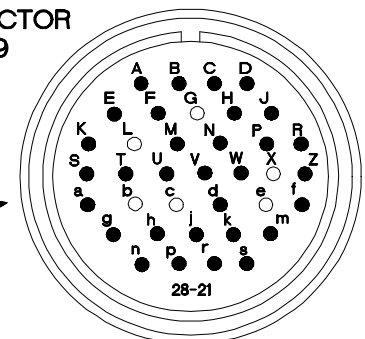
EXTERNAL WIRING HARNESS 24-PIN CONNECTOR



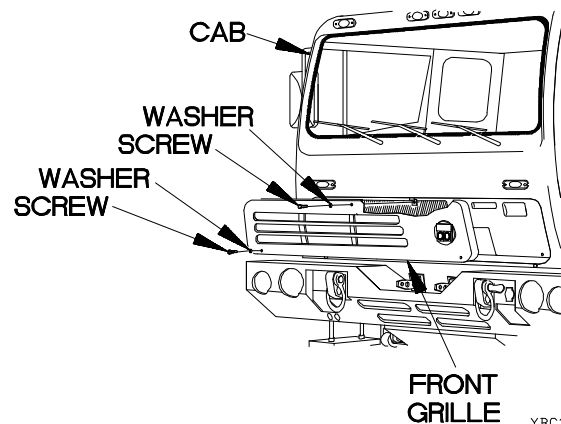
CONNECTOR P119



CONNECTOR J119



P119



YBC1602B

c16. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

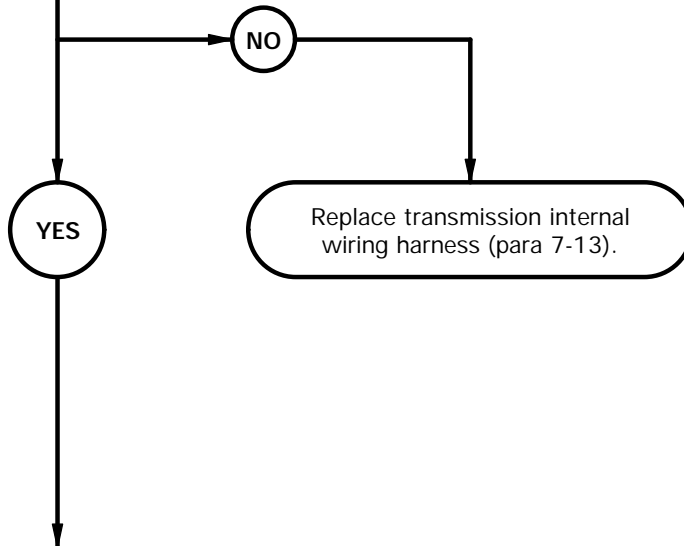
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty B solenoid. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin B1 to internal wiring harness connector B pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

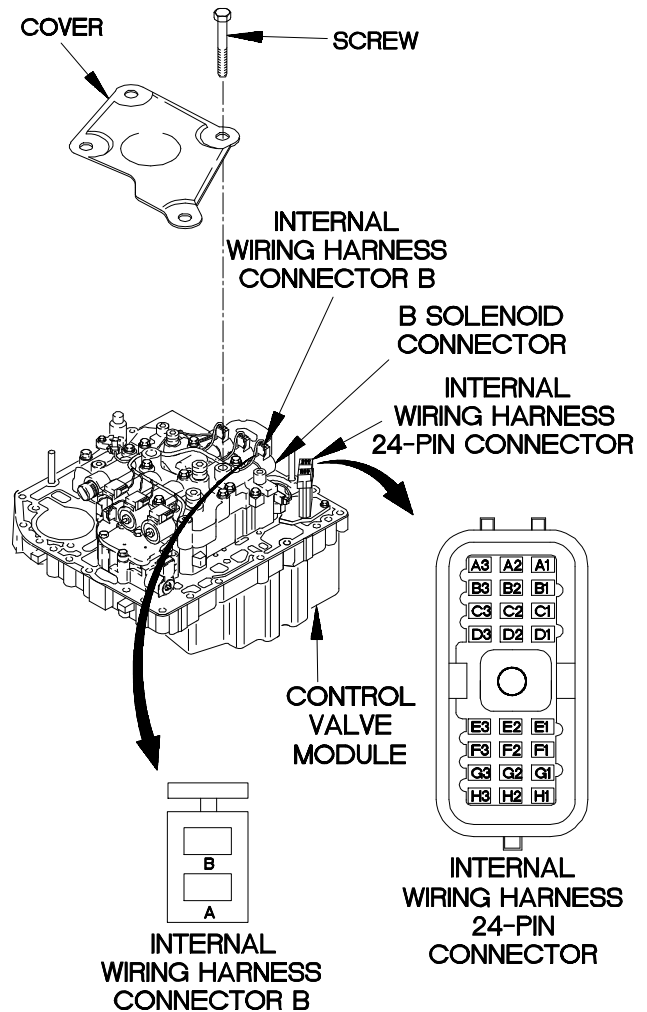


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector B from B solenoid connector.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin B1.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector B pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin B1.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



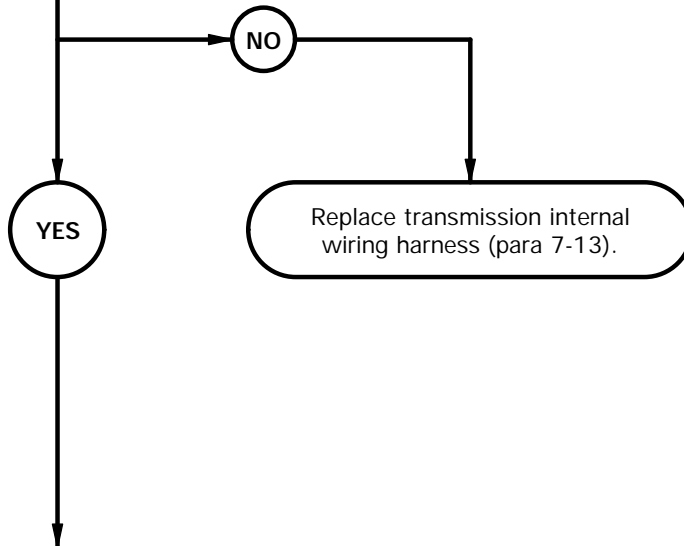
YBC1603B

c16. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty B solenoid. Faulty WTEC II TEPSS.

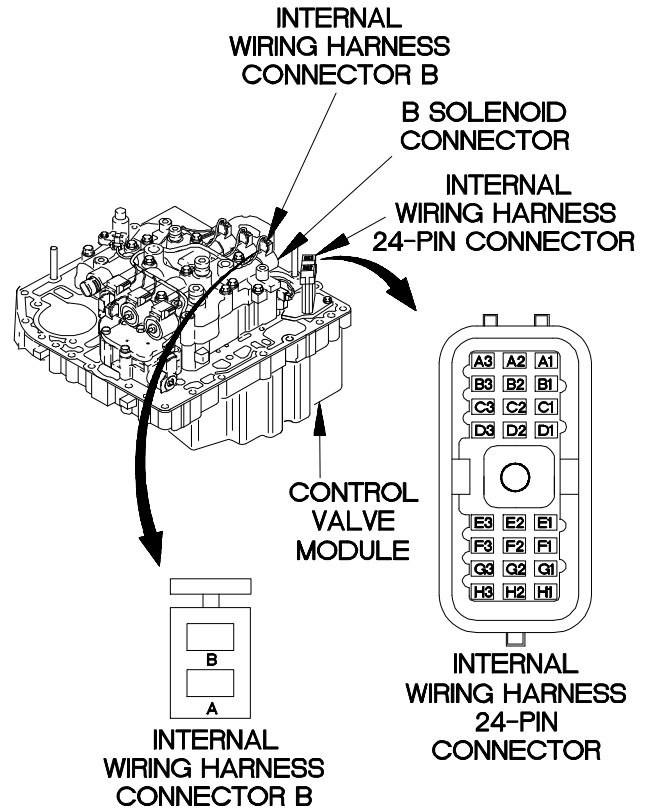
4.
Is continuity present from internal wiring harness 24-pin connector pin B2 to internal wiring harness connector B pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin B2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector B pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin B2.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector, except pins B1 and E1, and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



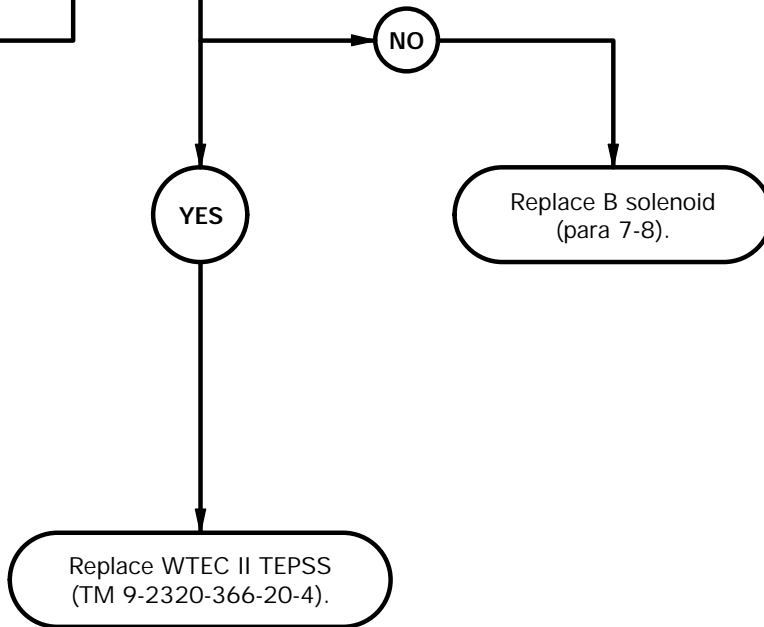
YBC1604B

c16. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. External transmission cable assembly OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty B solenoid. Faulty WTEC II TEPSS.

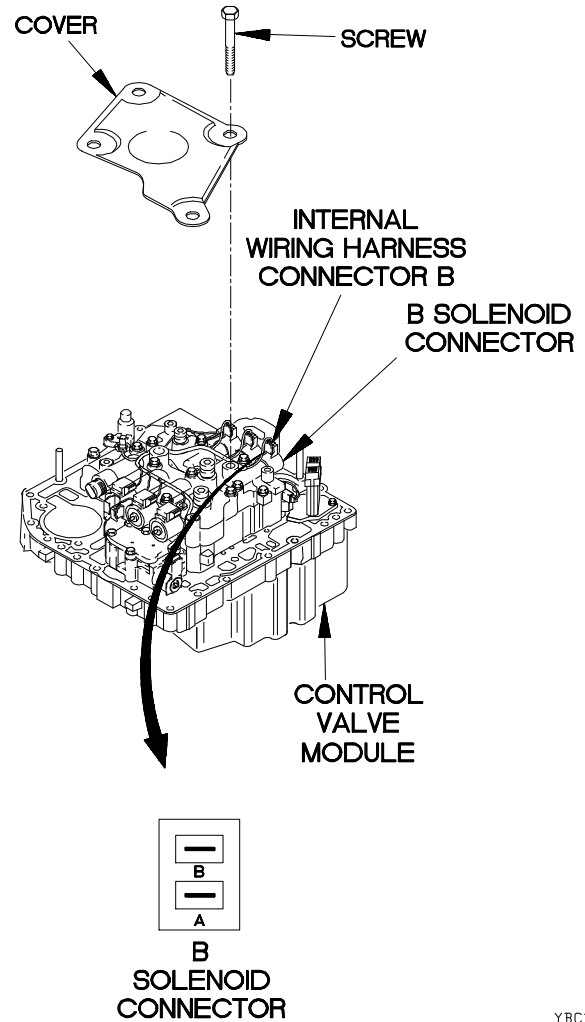
5.
Is 2.5-5.0 ohms resistance present from B solenoid pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, B solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC II TEPSS is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of B solenoid connector.
- (3) Connect negative (-) probe of multimeter to pin B of B solenoid connector and note reading on multimeter.
- (4) If resistance is less than 2.5 or greater than 5.0 ohms, replace B solenoid (para 7-8).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector B to B solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC1605B

c17. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 14 (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

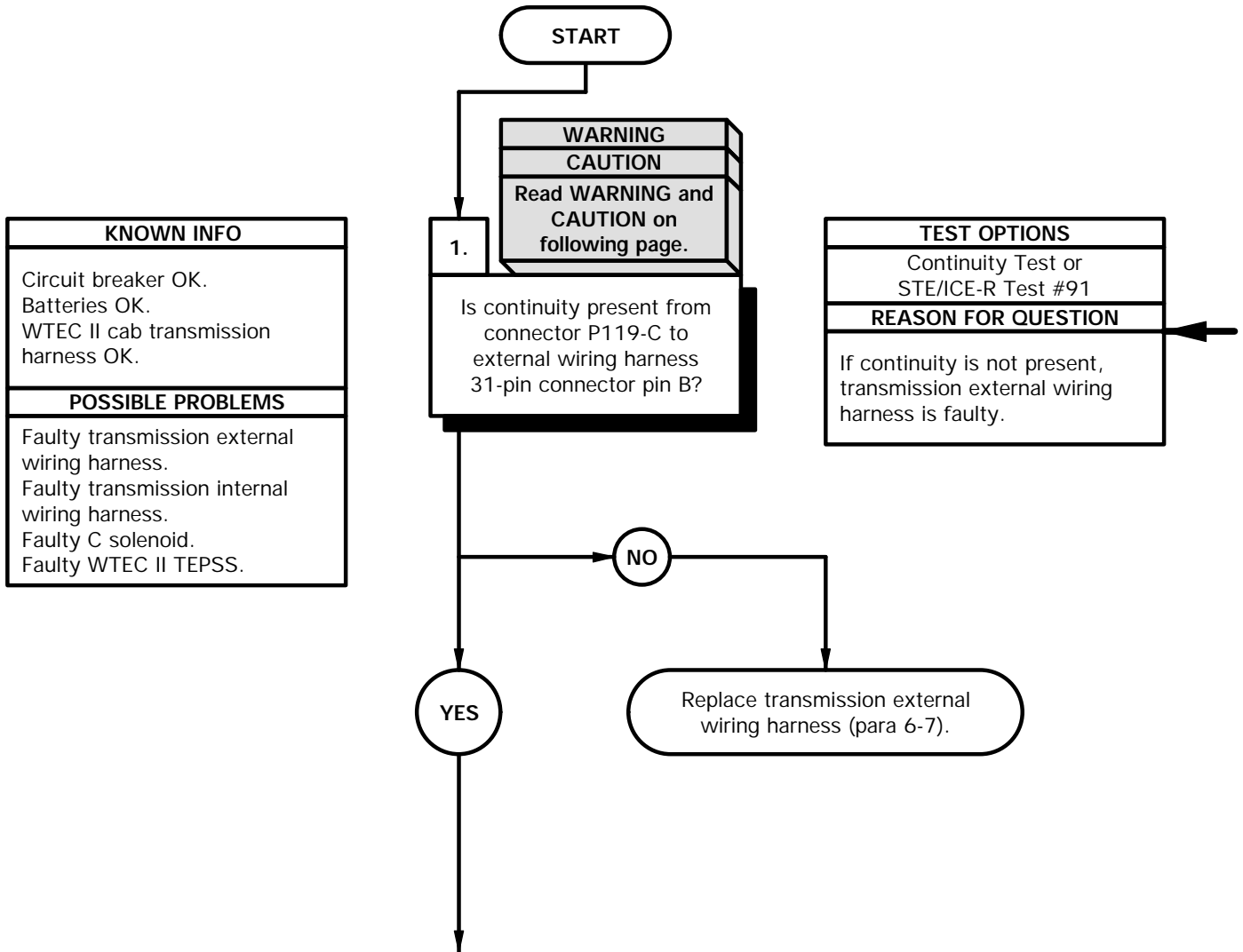
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

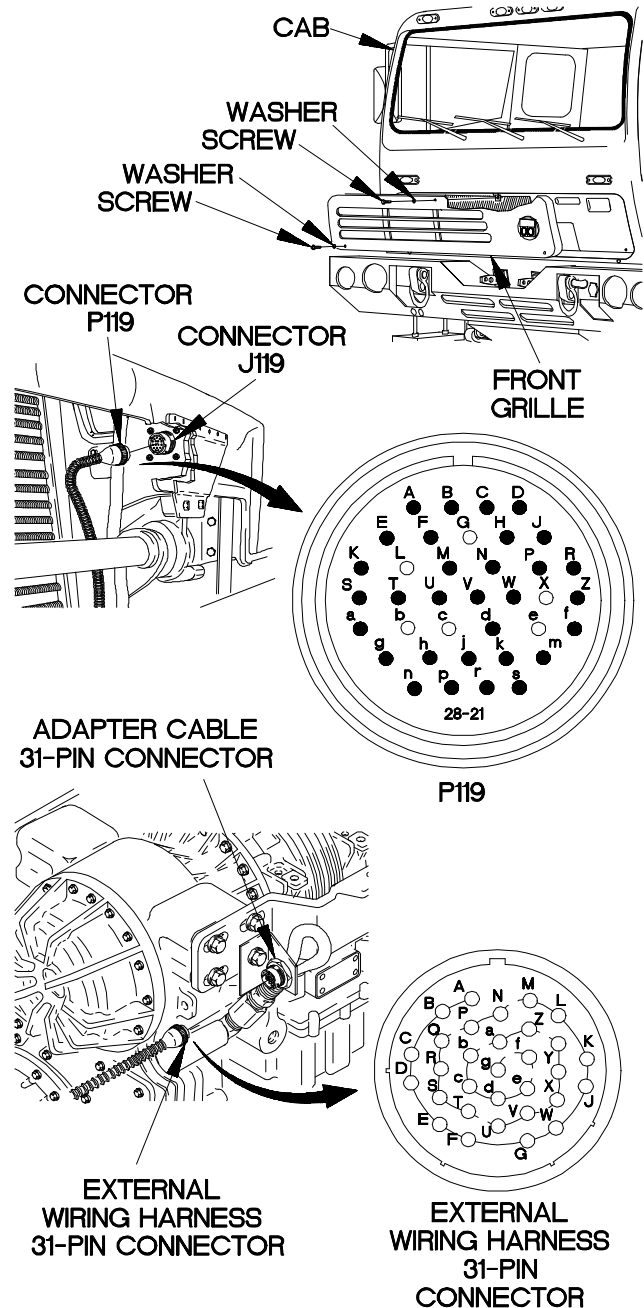
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-C.
- (8) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin B and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-C.

CONTINUITY TEST (Cont)

- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



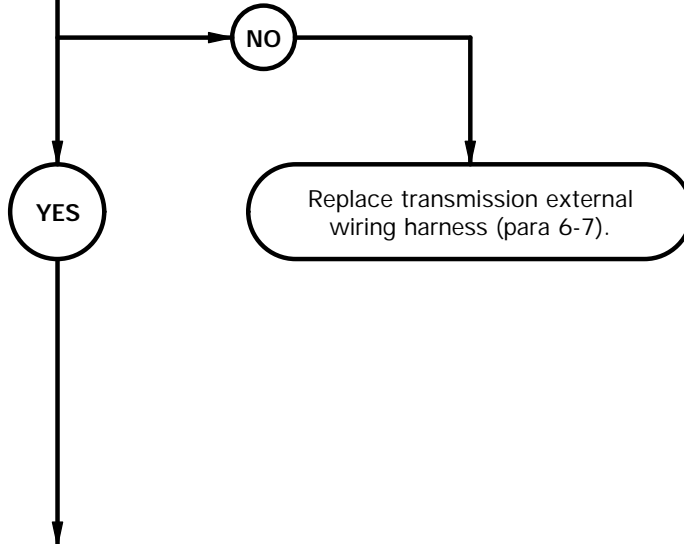
YBC1701B

c17. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 14 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty C solenoid. Faulty WTEC II TEPSS.

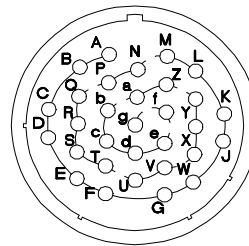
2.
Is continuity present from connector P119-V to external wiring harness 31-pin connector pin L?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

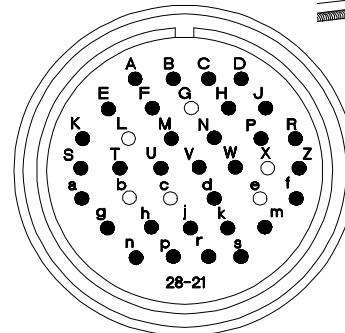


CONTINUITY TEST

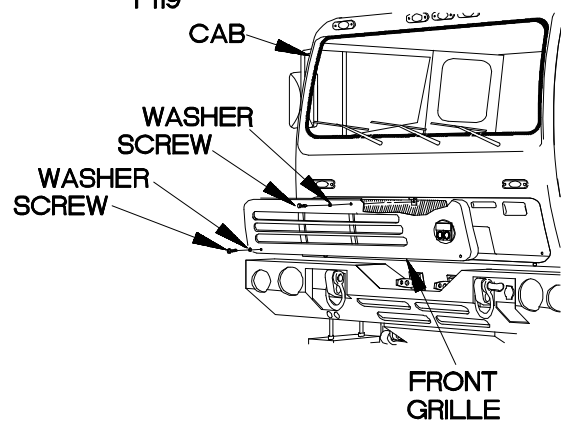
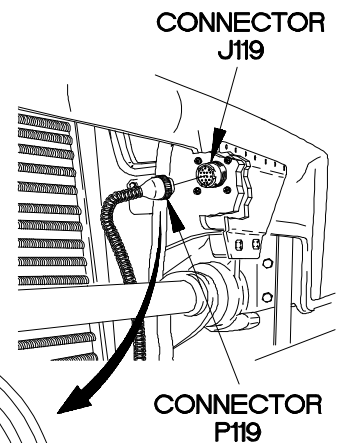
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-V.
- (3) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin L and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-V.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external cable assembly is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



EXTERNAL WIRING HARNESS 31-PIN CONNECTOR



P119



YBC1702B

c17. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 14 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

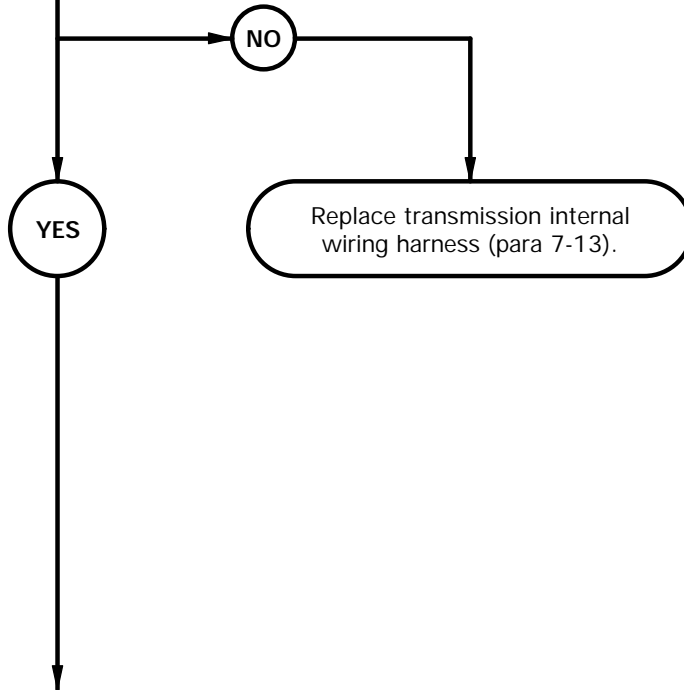
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty C solenoid. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin B to internal wiring harness connector C pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

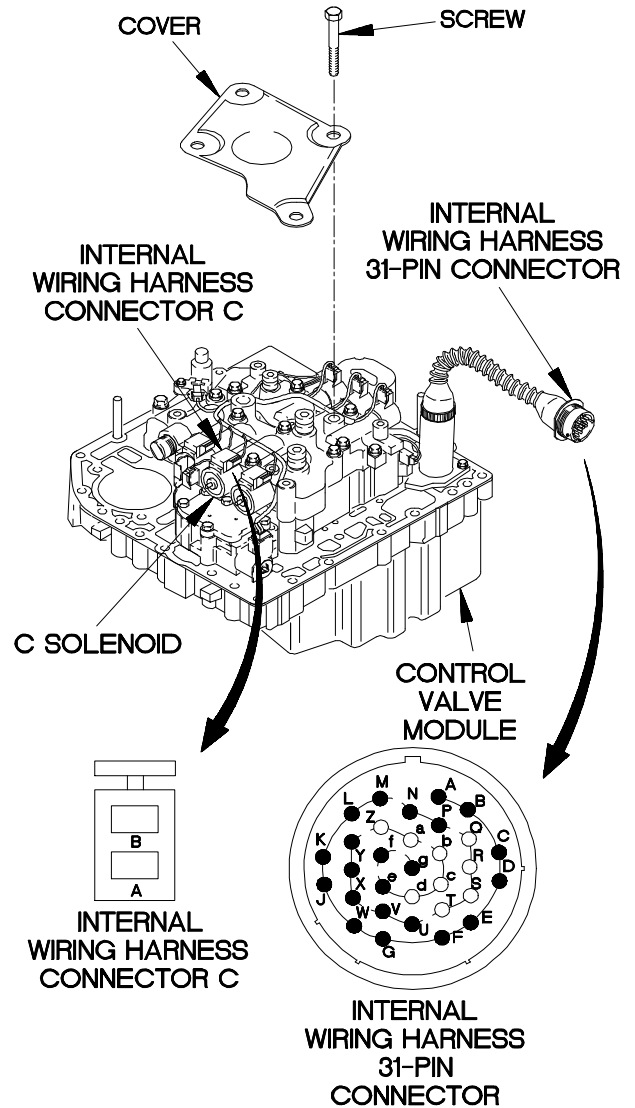


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector C from C solenoid.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin B.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector C pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin B.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



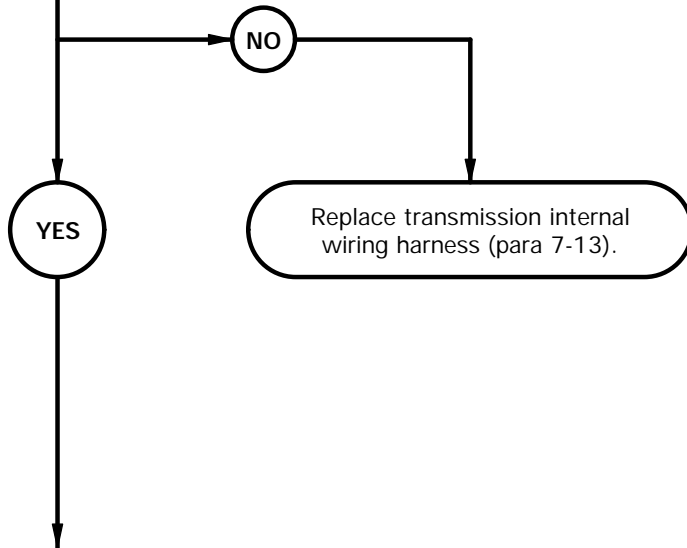
YBC1703B

c17. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 14 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty C solenoid. Faulty WTEC II TEPSS.

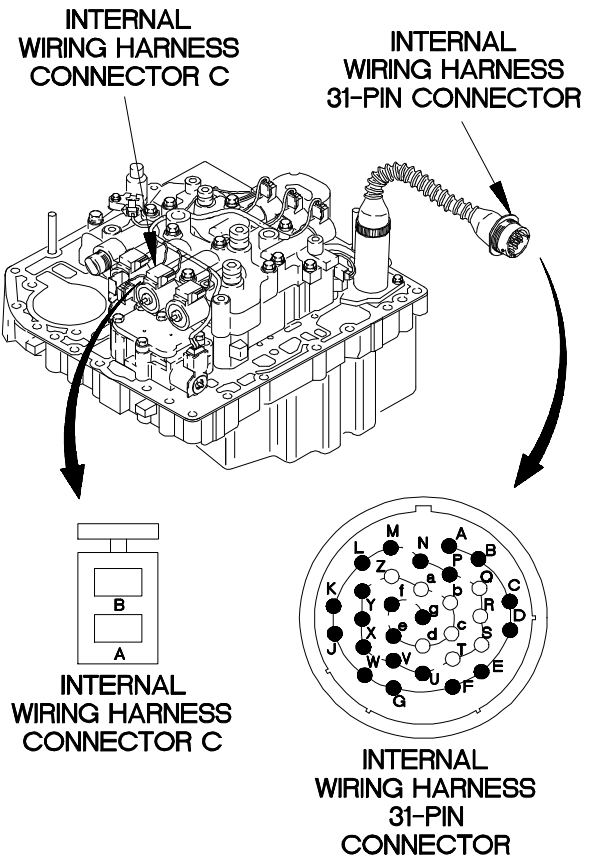
4.
Is continuity present from internal wiring harness 31-pin connector pin L to internal wiring harness connector C pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin L.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector C pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin L.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



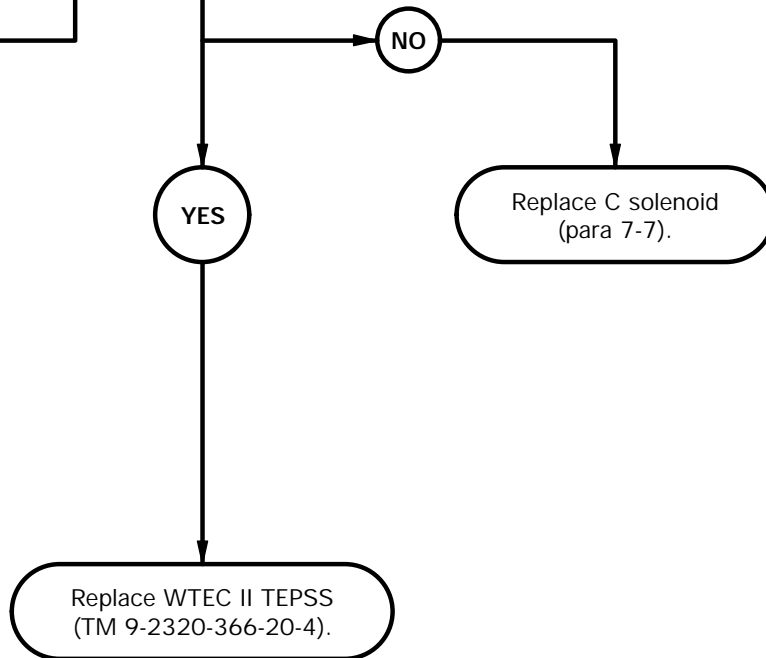
YBC1704B

c17. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 14 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty C solenoid. Faulty WTEC II TEPSS.

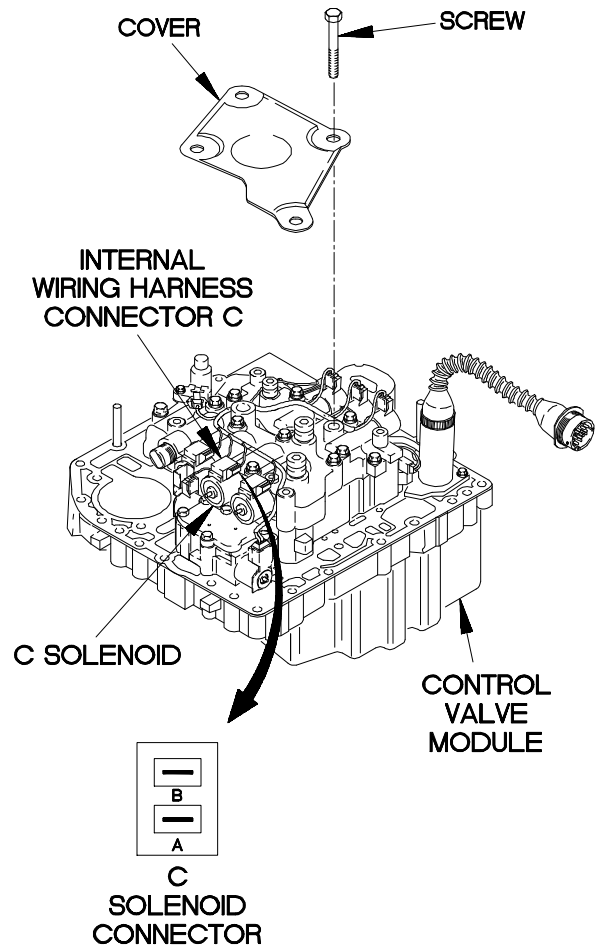
5.
Is 2.5-5.0 ohms resistance present from C solenoid pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, C solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC II TEPSS is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of C solenoid connector.
- (3) Connect negative (-) probe of multimeter to pin B of C solenoid connector and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace C solenoid (para 7-7).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect transmission internal wiring harness connector C to C solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC1705B

c18. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 14 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

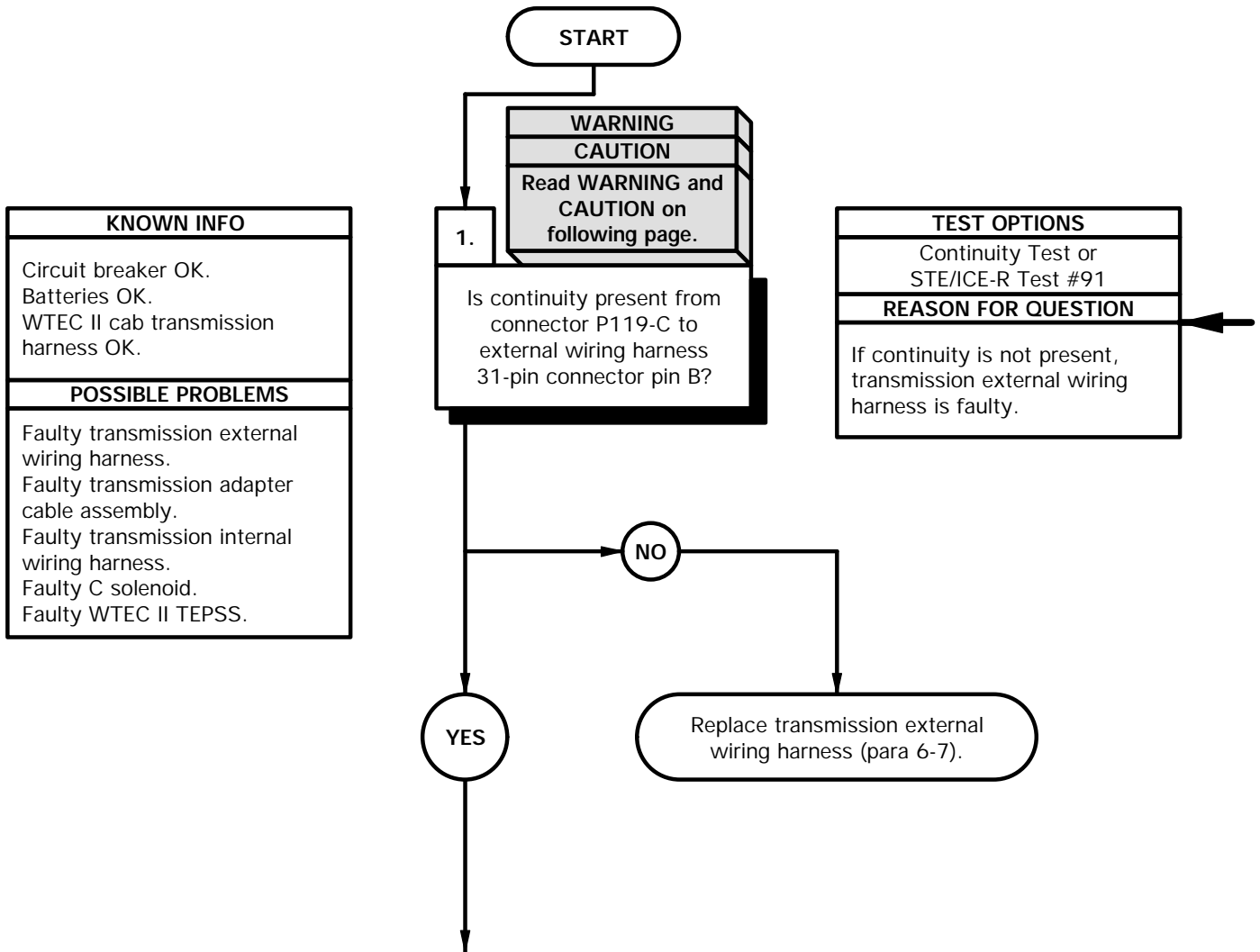
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

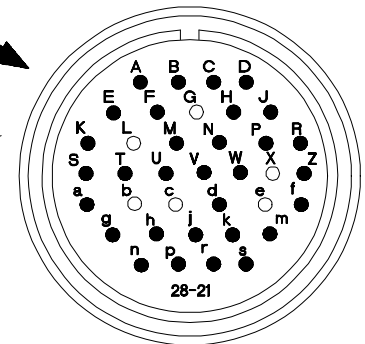
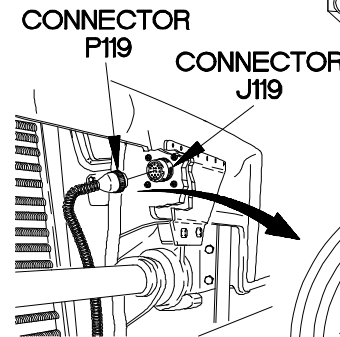
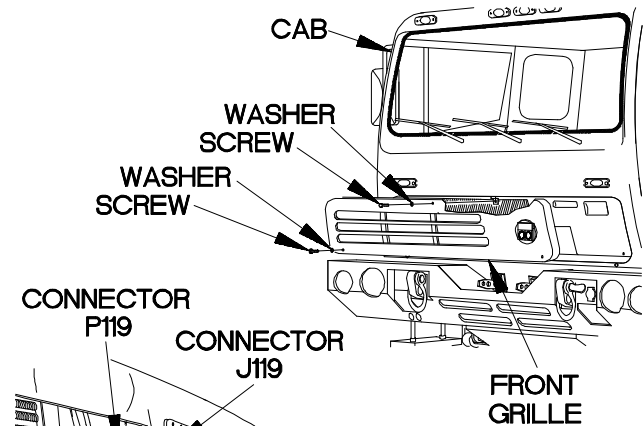
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

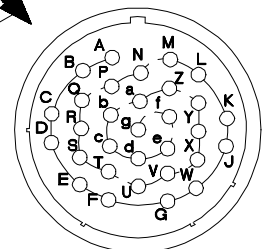
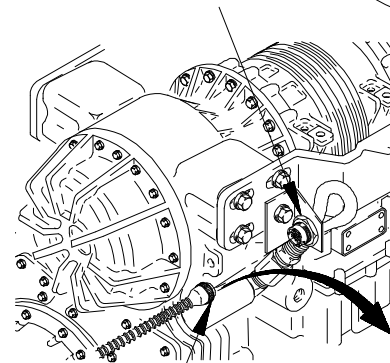
- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness 31-pin connector from adapter cable 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-C.
- (8) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin B and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (11) Connect negative (-) probe of multimeter to ground and note reading on multimeter.

CONTINUITY TEST (Cont)

- (12) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



ADAPTER CABLE 31-PIN CONNECTOR

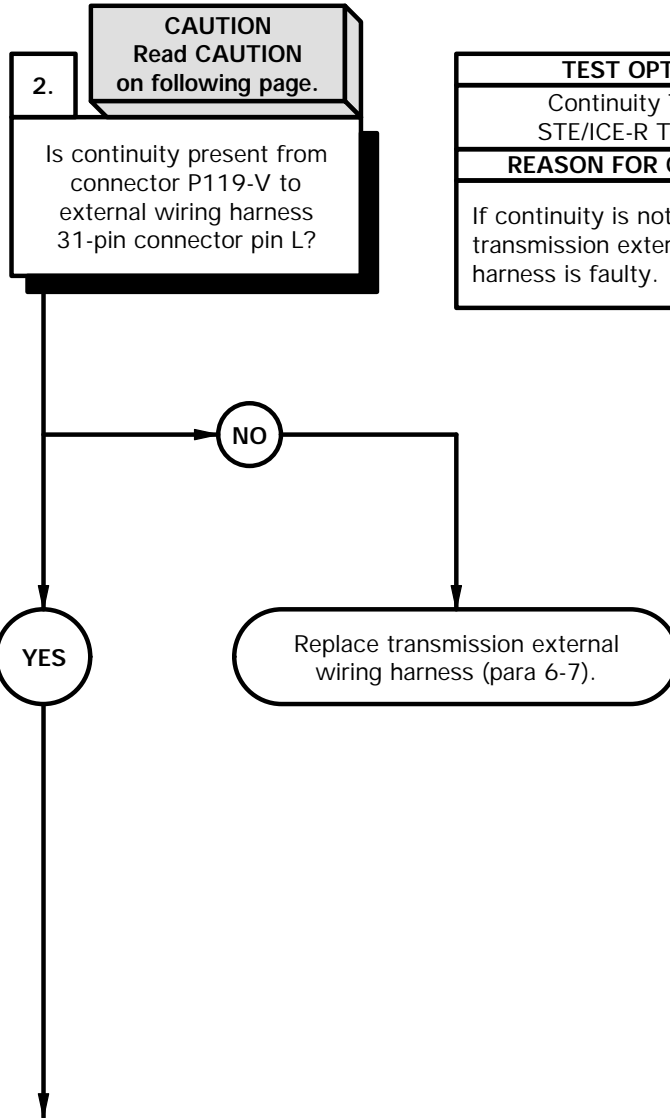


EXTERNAL WIRING HARNESS 31-PIN CONNECTOR

YBC1801B

c18. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 14 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty C solenoid. Faulty WTEC II TEPSS.



TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

CAUTION

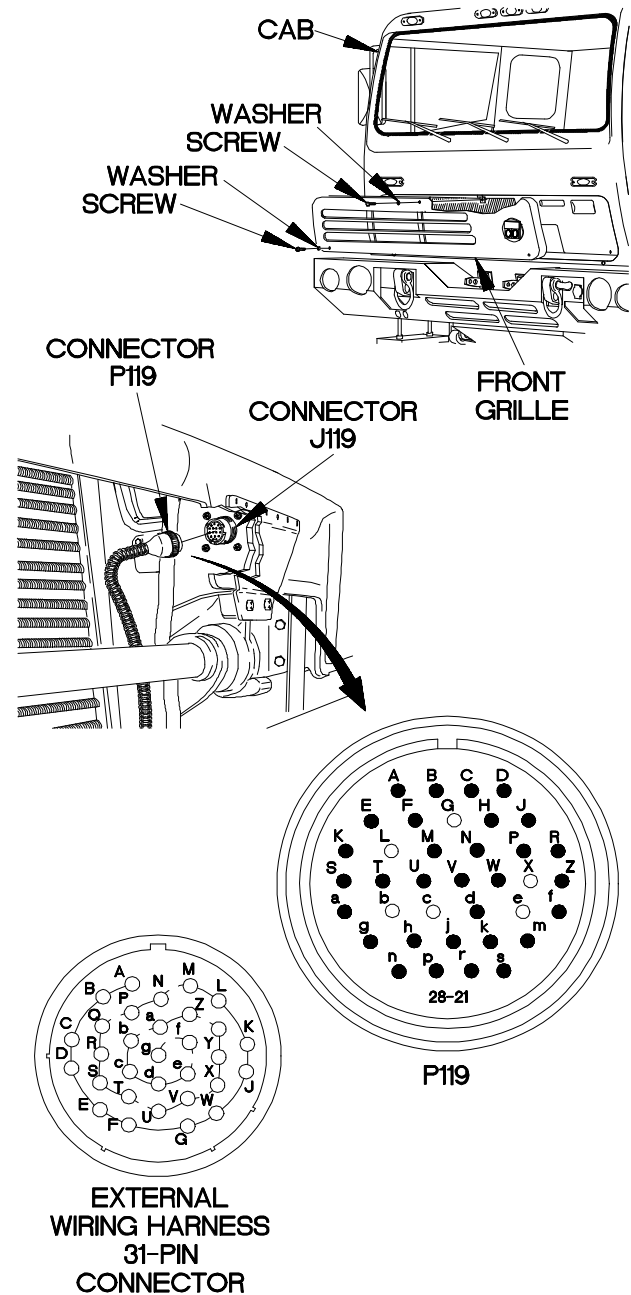
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-V.
- (3) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin L and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (7) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (8) Connect connector P119 to connector J119.
- (9) Position front grille on cab with washer and screw.
- (10) Position two washers and screws in front grille.
- (11) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (12) Tighten two screws to 24 lb-in. (3 N·m).



YBC1802B

c18. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 14 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

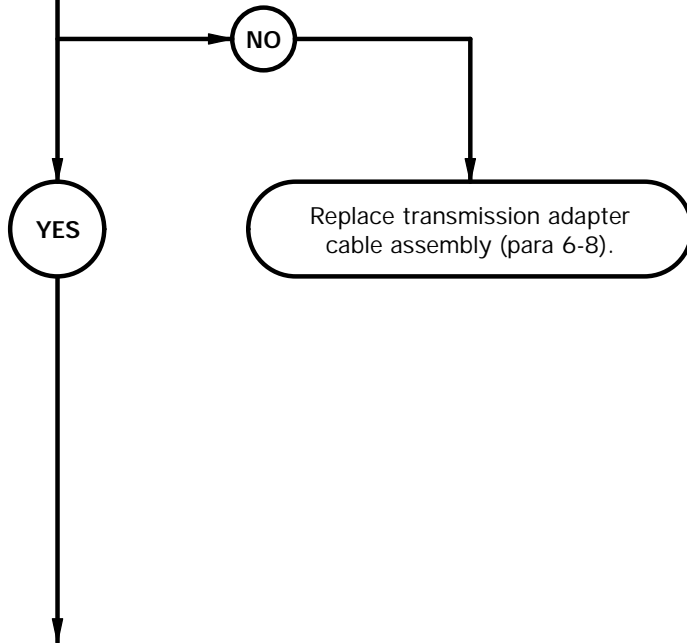
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty C solenoid. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin B to adapter cable 24-pin connector pin C1?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.



CAUTION

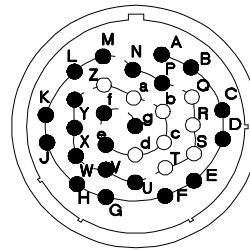
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

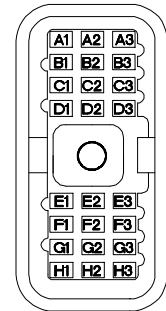
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

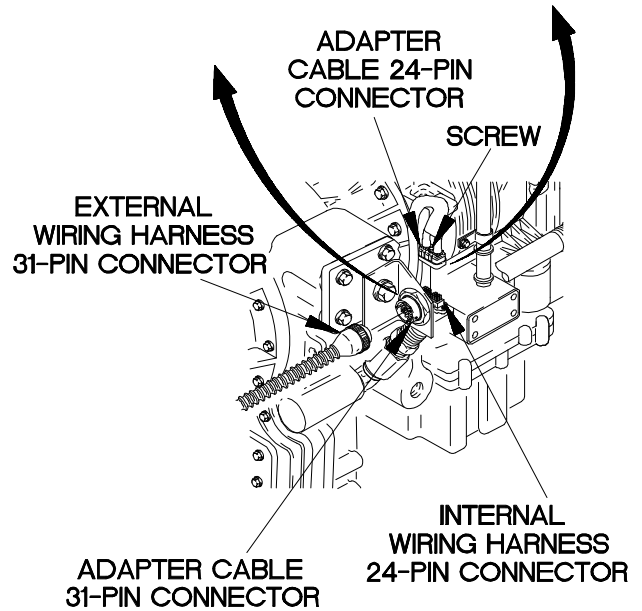
- (1) Loosen screw in adapter cable 24-pin connector.
- (2) Disconnect adapter cable 24-pin connector from internal wiring harness 24-pin connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin B.
- (5) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin C1 and note reading on multimeter.
- (6) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (7) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin B.
- (8) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).



**ADAPTER CABLE
31-PIN CONNECTOR**



**ADAPTER CABLE
24-PIN
CONNECTOR**



YBC1803B

c18. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 14 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

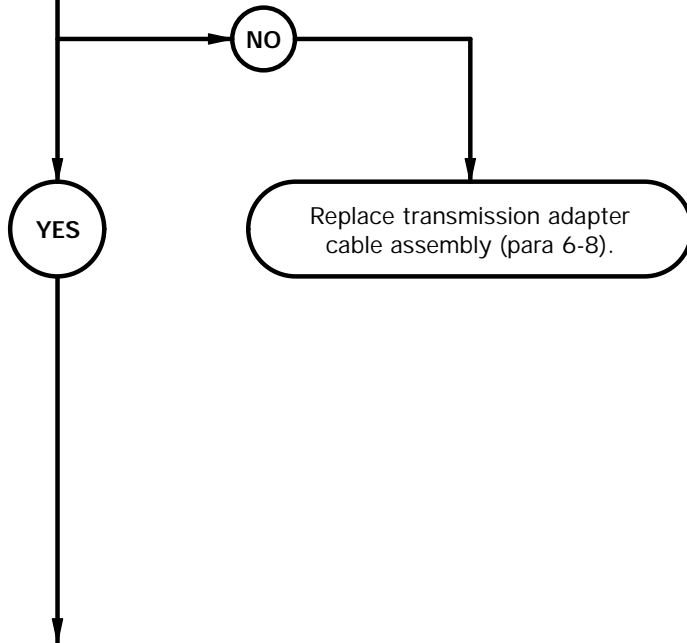
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty C solenoid. Faulty WTEC II TEPSS.

4.

CAUTION
 Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin L to adapter cable 24-pin connector pin C2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.



CAUTION

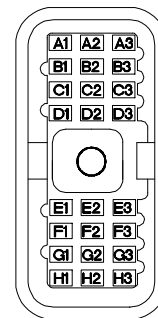
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

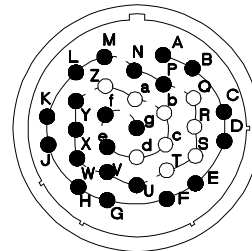
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin L.
- (3) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin C2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (5) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin L.
- (6) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).
- (9) Connect adapter cable 31-pin connector to external wiring harness 31-pin connector.



**ADAPTER CABLE
24-PIN
CONNECTOR**



**ADAPTER CABLE
31-PIN CONNECTOR**

YBC1804B

c18. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 14 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

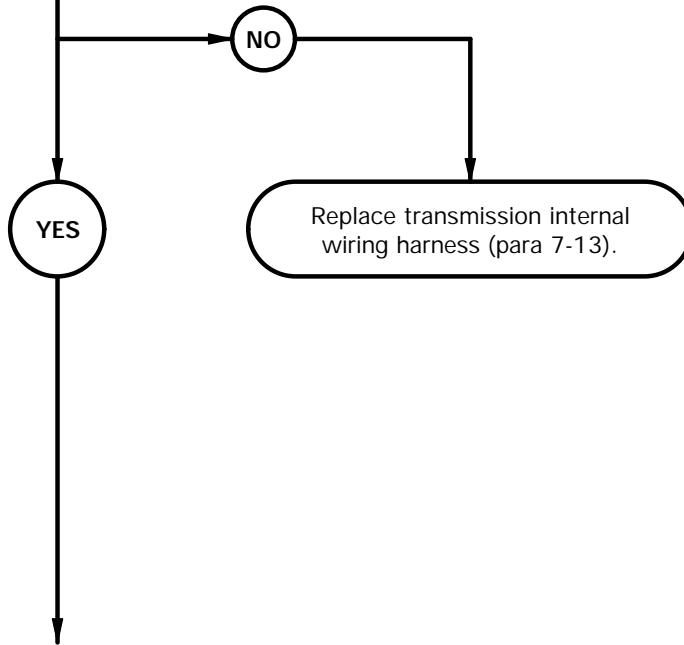
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty C solenoid. Faulty WTEC II TEPSS.

5.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin C1 to internal wiring harness connector C pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

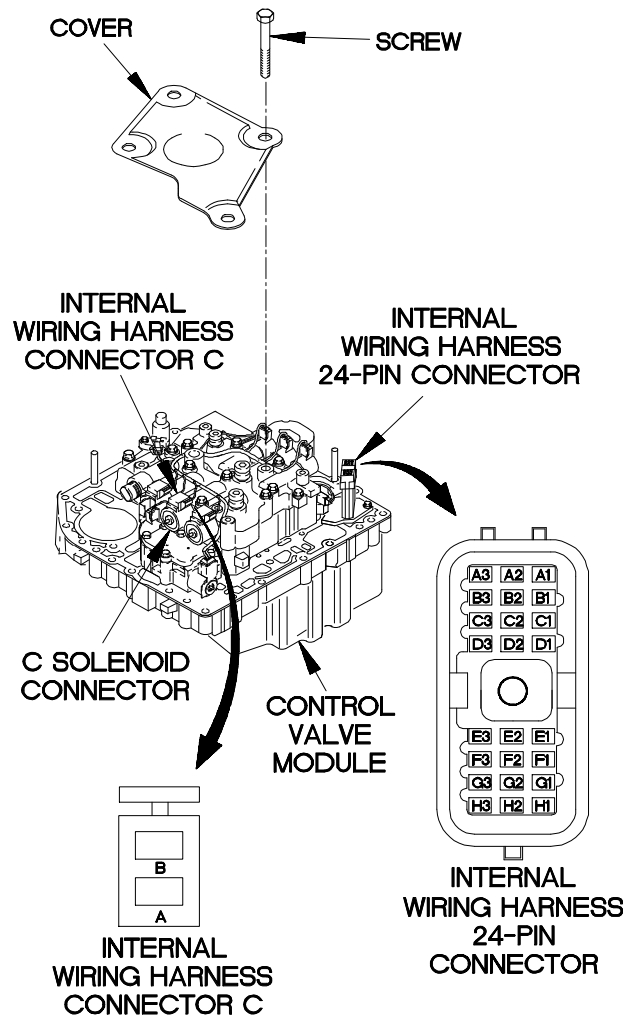
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector C from C solenoid connector.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin C1.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector C pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, replace transmission internal wiring harness (para 7-13).



YBC1805B

c18. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 14 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

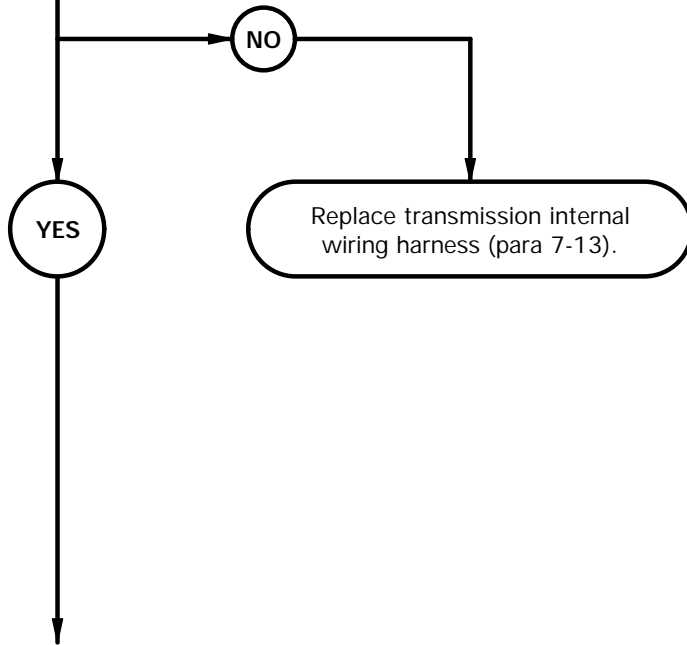
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty C solenoid. Faulty WTEC II TEPSS.

6.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin C2 to internal wiring harness connector C socket B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

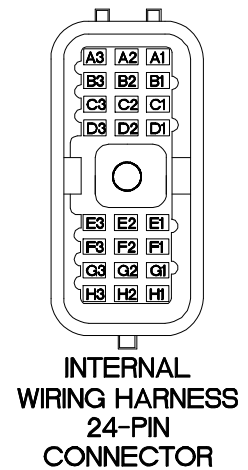
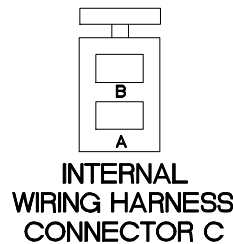
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

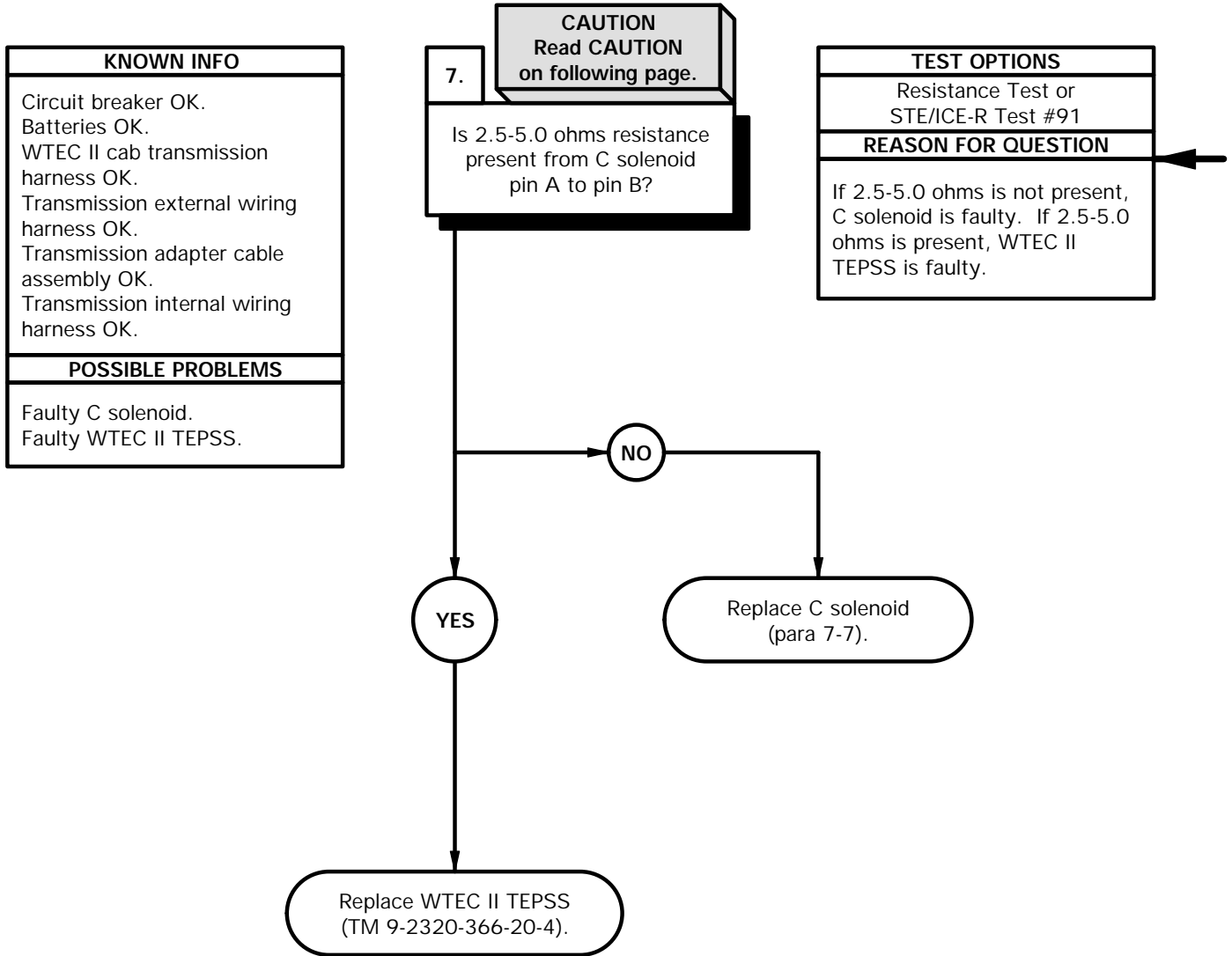
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin C2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector C socket B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (7) If continuity is present, replace transmission internal wiring harness (para 7-13).



YBC1806B

c18. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 14 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



CAUTION

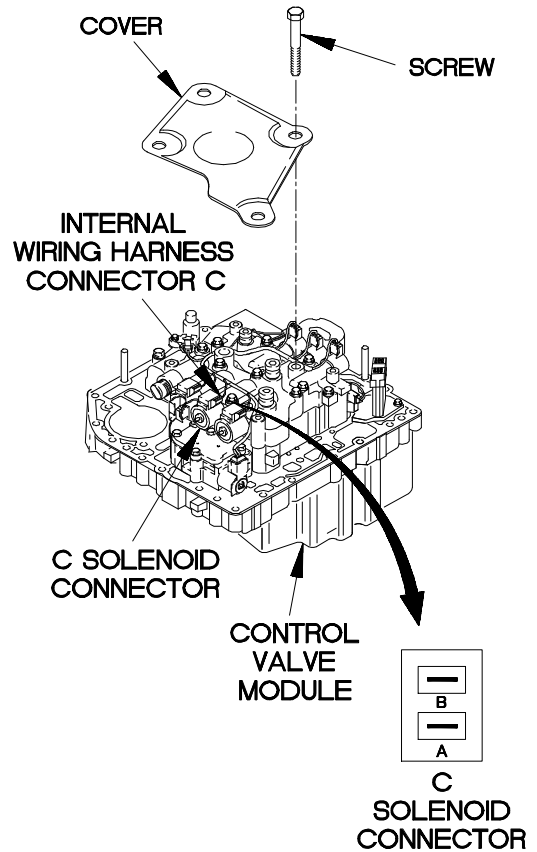
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to C solenoid connector pin A.
- (3) Connect negative (-) probe of multimeter to C solenoid connector pin B and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace C solenoid (para 7-7).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector C to C solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC1807B

c19. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 14 (PRIOR TO SERIAL NUMBER 6510032369)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

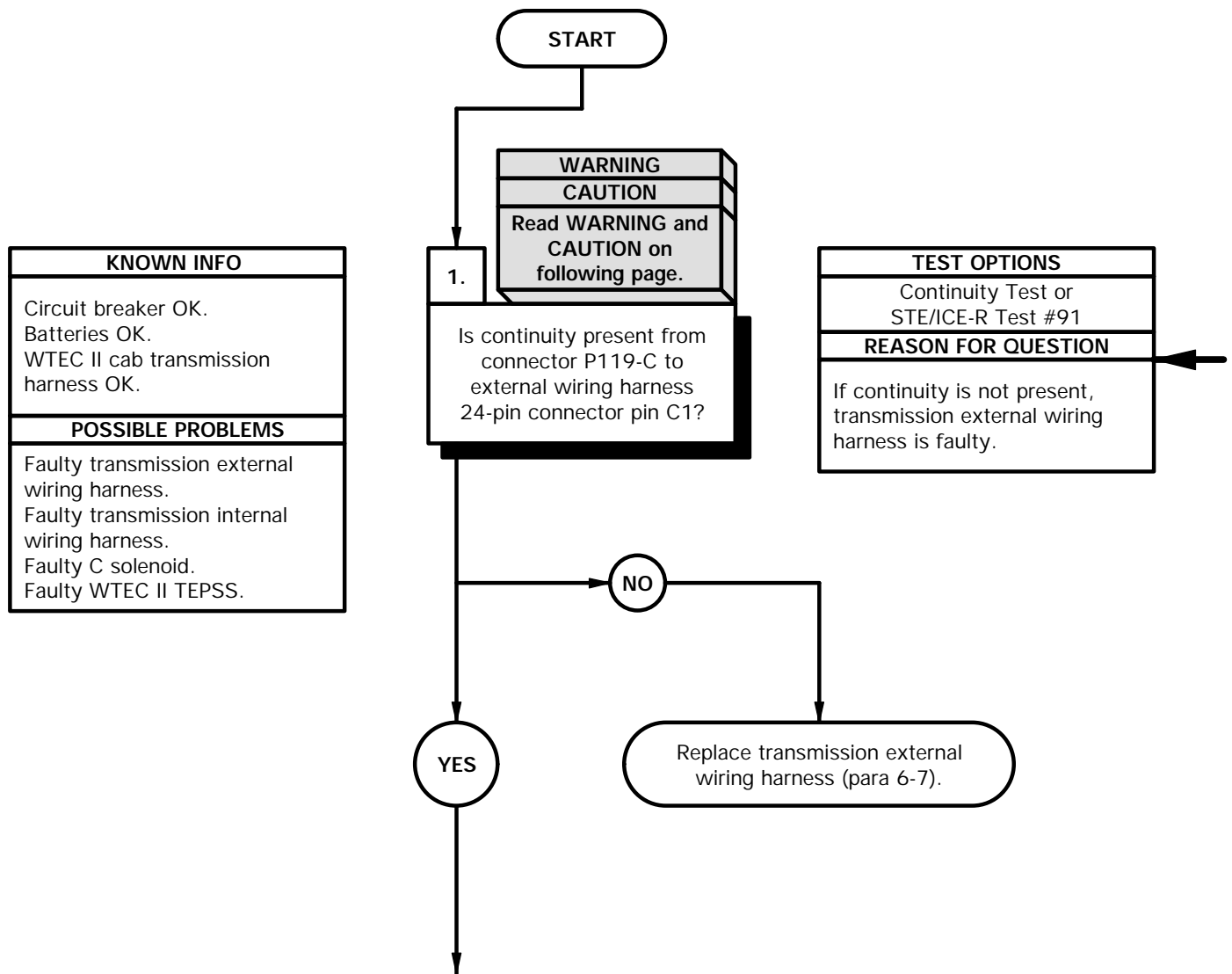
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

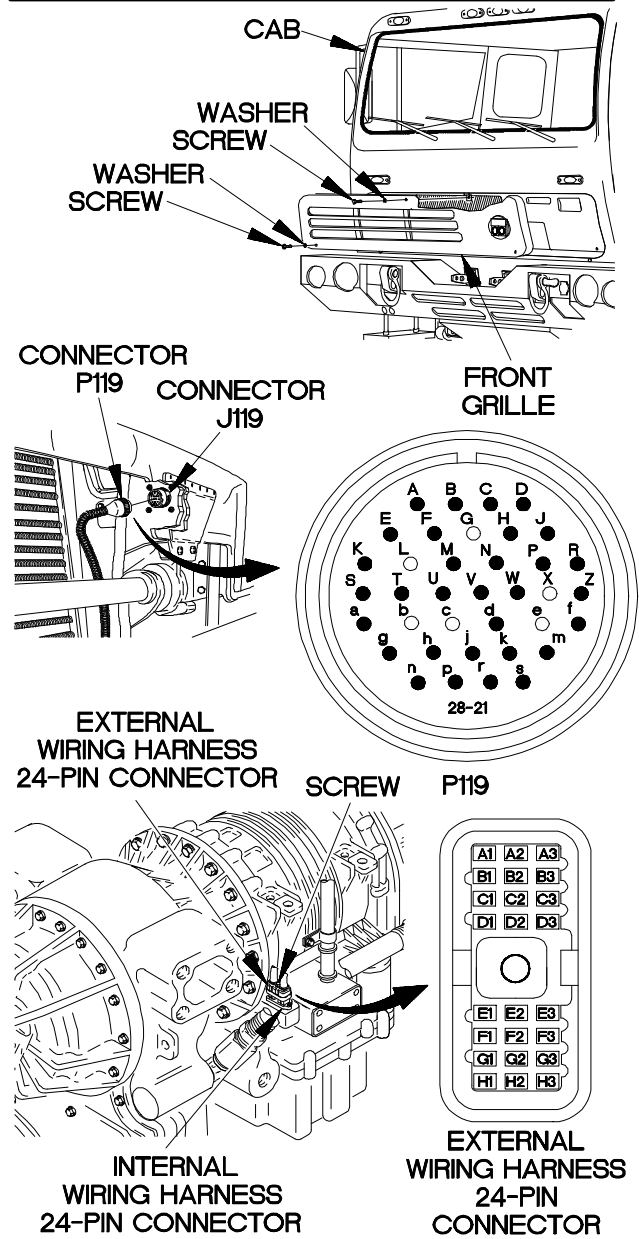
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Loosen screw in external wiring harness 24-pin connector.
- (6) Disconnect external wiring harness 24-pin connector from internal wiring harness 24-pin connector.
- (7) Set multimeter to ohms.
- (8) Connect positive (+) probe of multimeter to connector P119-C.
- (9) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin C1 and note reading on multimeter.
- (10) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (11) Connect positive (+) probe of multimeter to connector P119-C.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (13) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (14) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



YBC1901B

c19. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 14 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

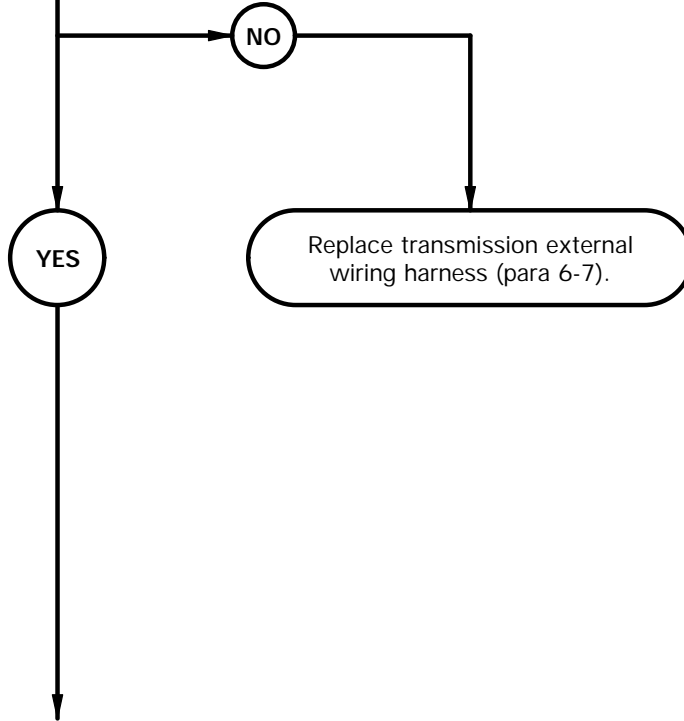
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty C solenoid. Faulty WTEC II TEPSS.

2.

CAUTION
Read CAUTION on following page.

Is continuity present from connector P119-V to external wiring harness 24-pin connector pin C2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



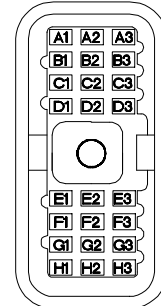
CAUTION

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

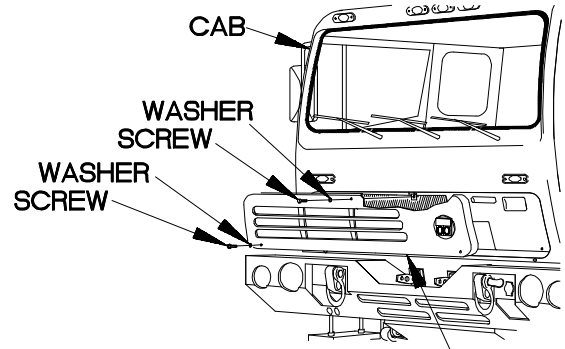
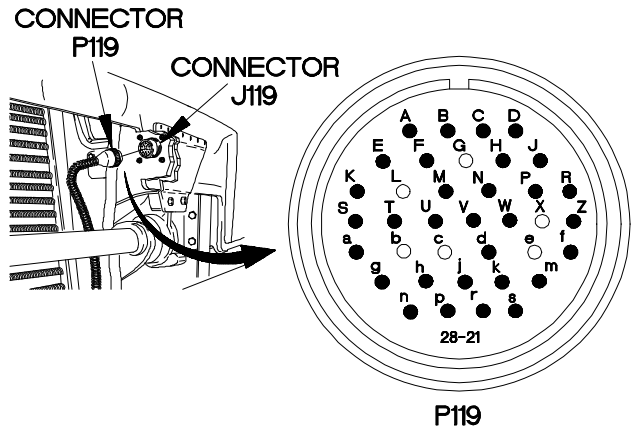
NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

- CONTINUITY TEST**
- (1) Set multimeter to ohms.
 - (2) Connect positive (+) probe of multimeter to connector P119-V.
 - (3) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin C2 and note reading on multimeter.
 - (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
 - (5) Connect positive (+) probe of multimeter to connector P119-V.
 - (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
 - (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
 - (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
 - (9) Connect connector P119 to connector J119.
 - (10) Position front grille on cab with washer and screw.
 - (11) Position two washers and screws in front grille.
 - (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
 - (13) Tighten two screws to 24 lb-in. (3 N·m).



EXTERNAL WIRING HARNESS 24-PIN CONNECTOR



FRONT GRILLE

YBC1902B

c19. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 14 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

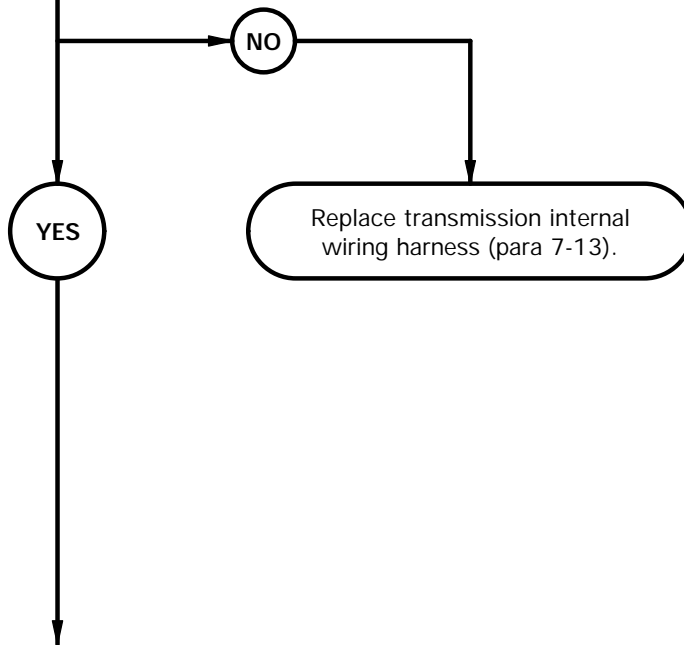
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty C solenoid. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin C1 to internal wiring harness connector C pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

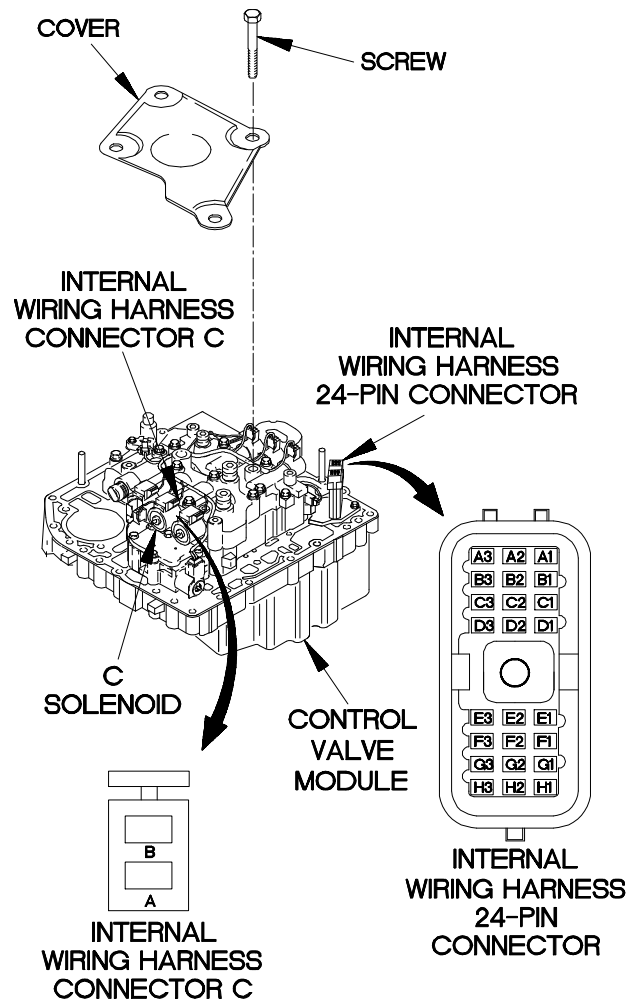
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector C from C solenoid connector.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin C1.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector C socket A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin C1.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



YBC1903B

c19. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 14 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

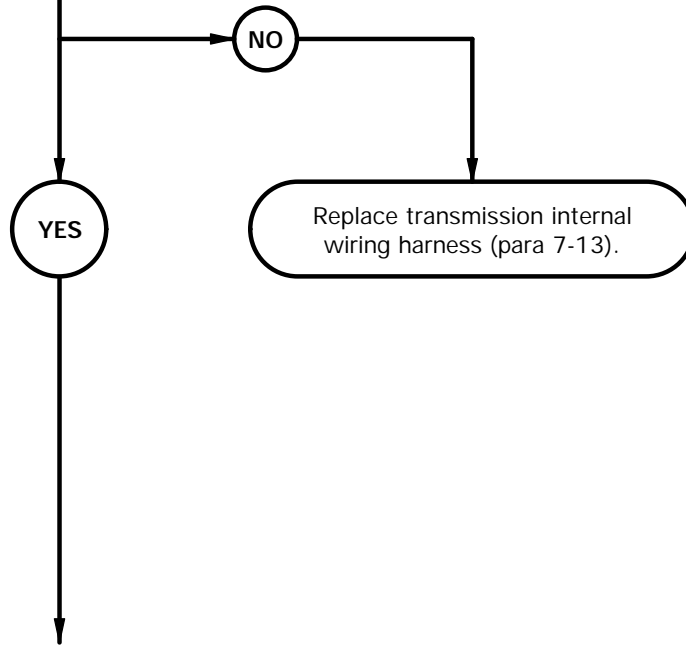
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty C solenoid. Faulty WTEC II TEPSS.

4.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin C2 to internal wiring harness connector C pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

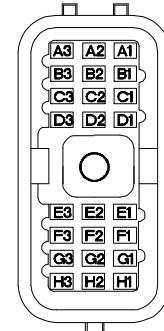
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

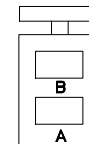
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin C2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector C socket B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin C2.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



**INTERNAL
WIRING HARNESS
24-PIN
CONNECTOR**



**INTERNAL
WIRING HARNESS
CONNECTOR C**

YBC1904B

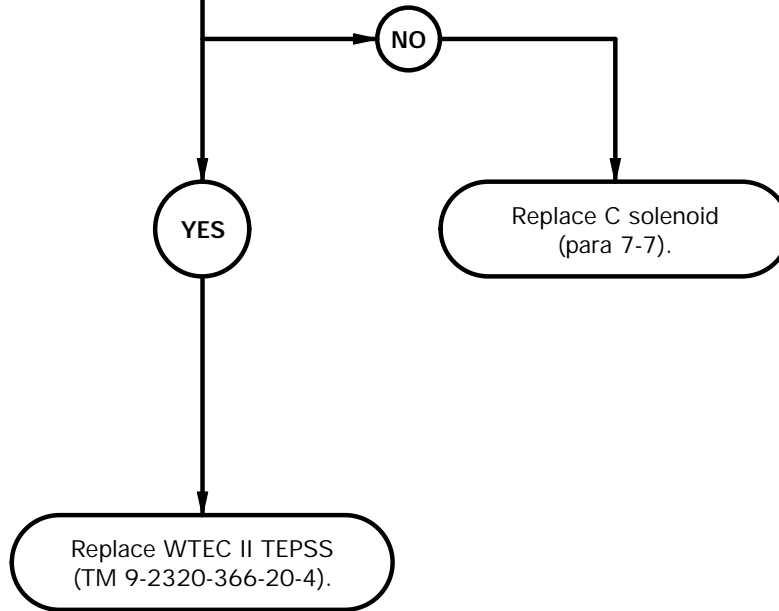
c19. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 14 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty C solenoid. Faulty WTEC II TEPSS.

5. **CAUTION**
Read CAUTION on following page.

Is 2.5-5.0 ohms resistance present from C solenoid pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms is not present, C solenoid is faulty. If 2.5-5.0 ohms is present, WTEC II TEPSS is faulty.



CAUTION

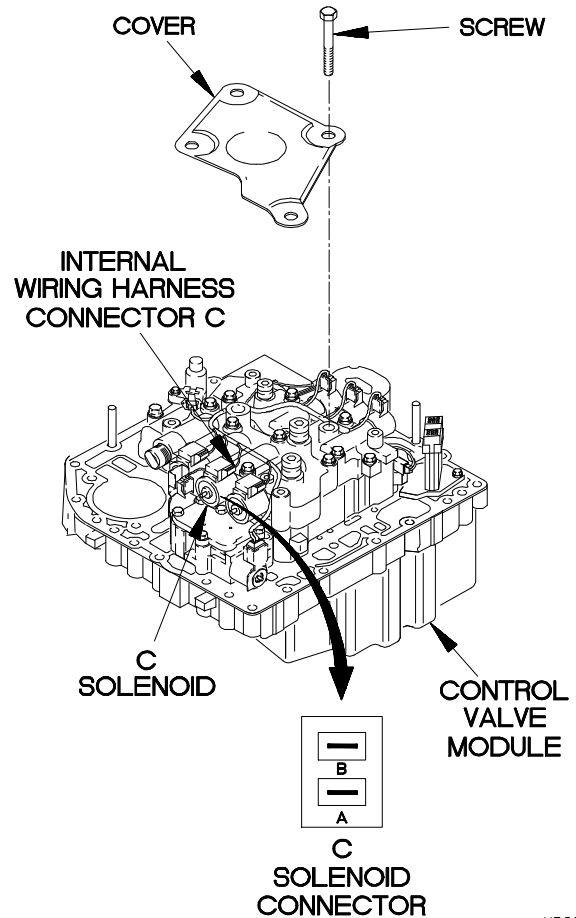
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to C solenoid connector pin A.
- (3) Connect negative (-) probe of multimeter to C solenoid connector pin B and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace C solenoid (para 7-7).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector C to C solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC1905B

c20. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

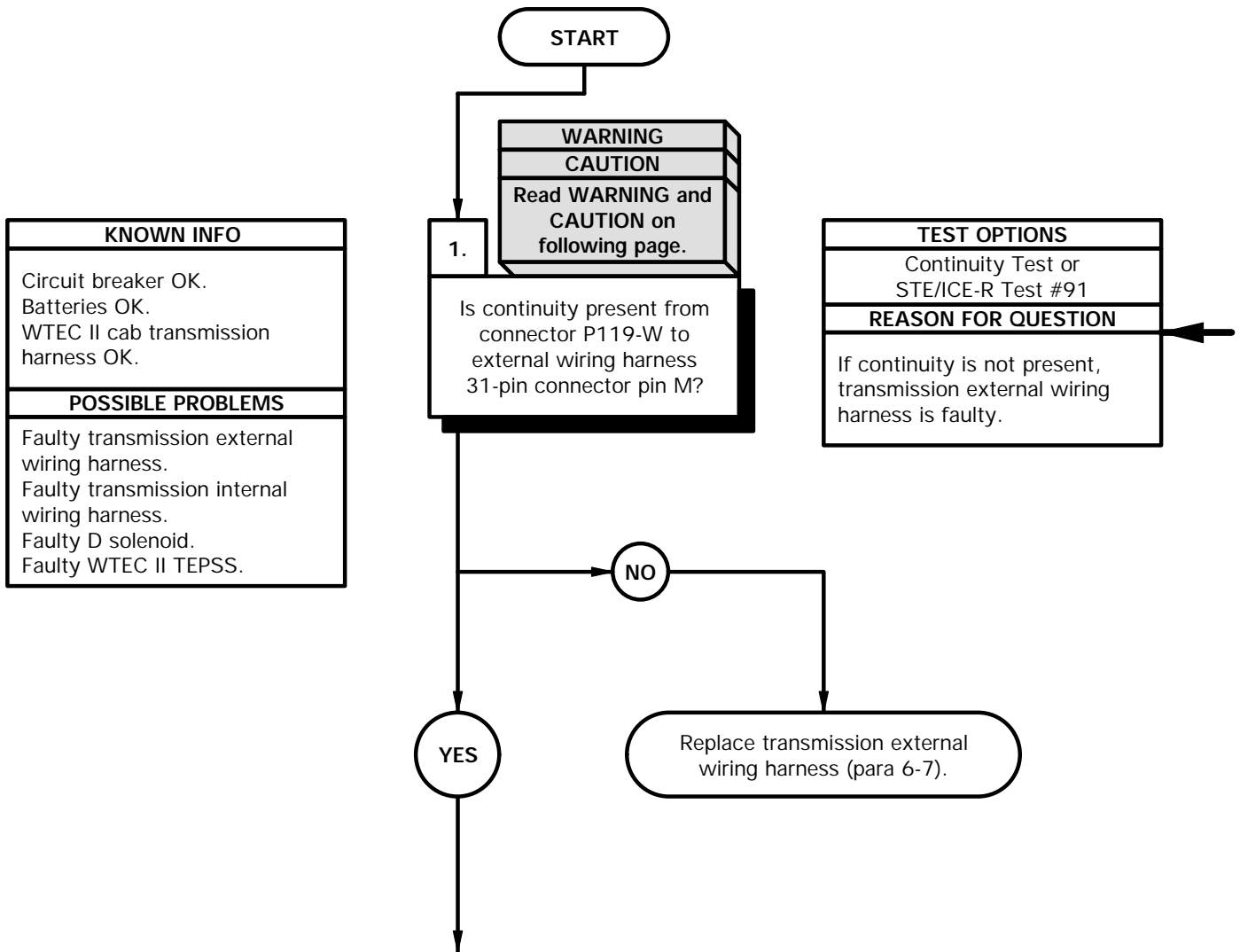
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

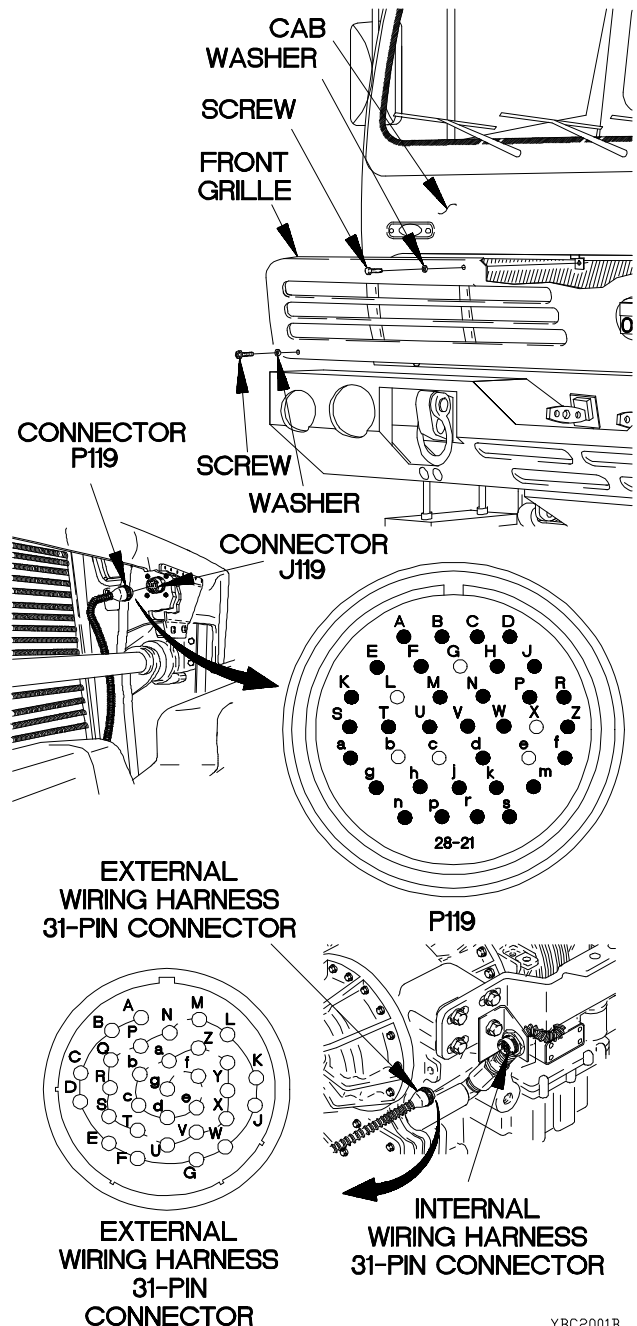
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-W.
- (8) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin M and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-W.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



YBC2001B

c20. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

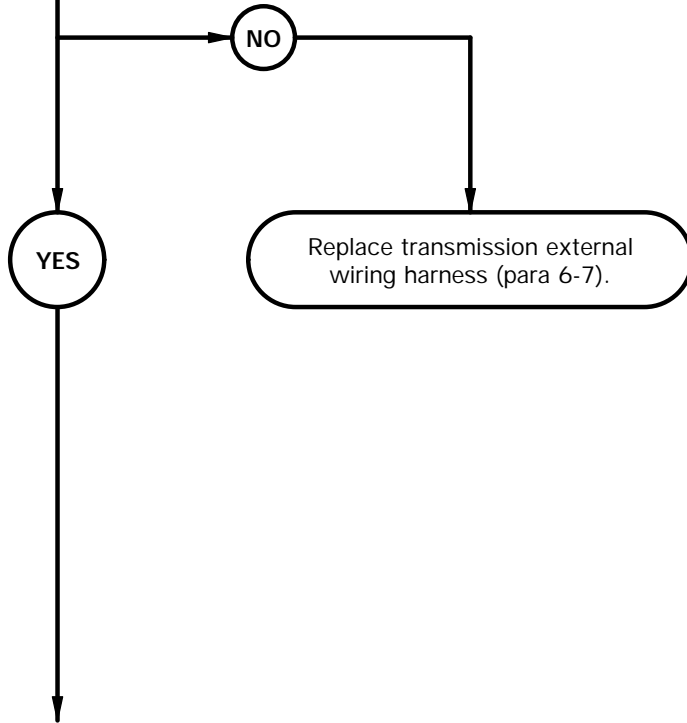
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty D solenoid. Faulty WTEC II TEPSS.

2.

CAUTION
Read CAUTION on following page.

Is continuity present from connector P119-B to external wiring harness 31-pin connector pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



CAUTION

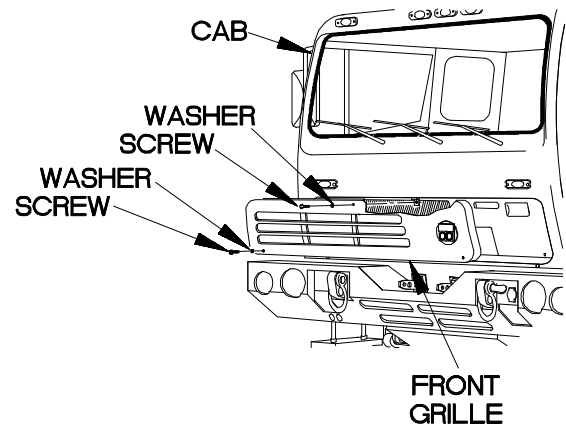
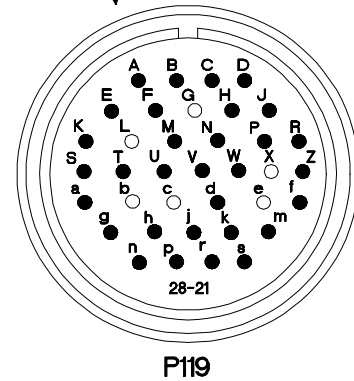
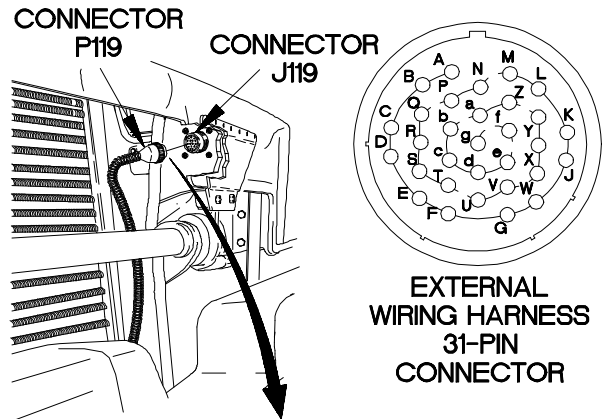
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-B.
- (3) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin A and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-B.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



c20. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

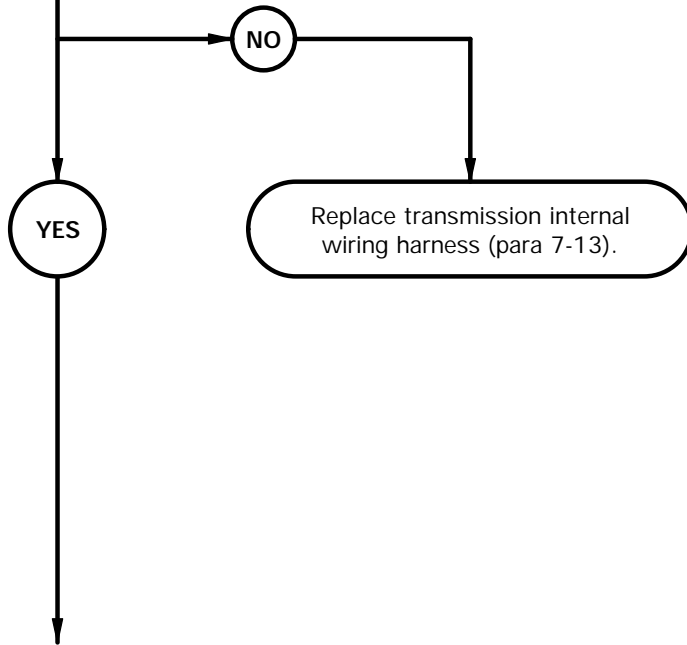
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty D solenoid. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin M to internal wiring harness connector D pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

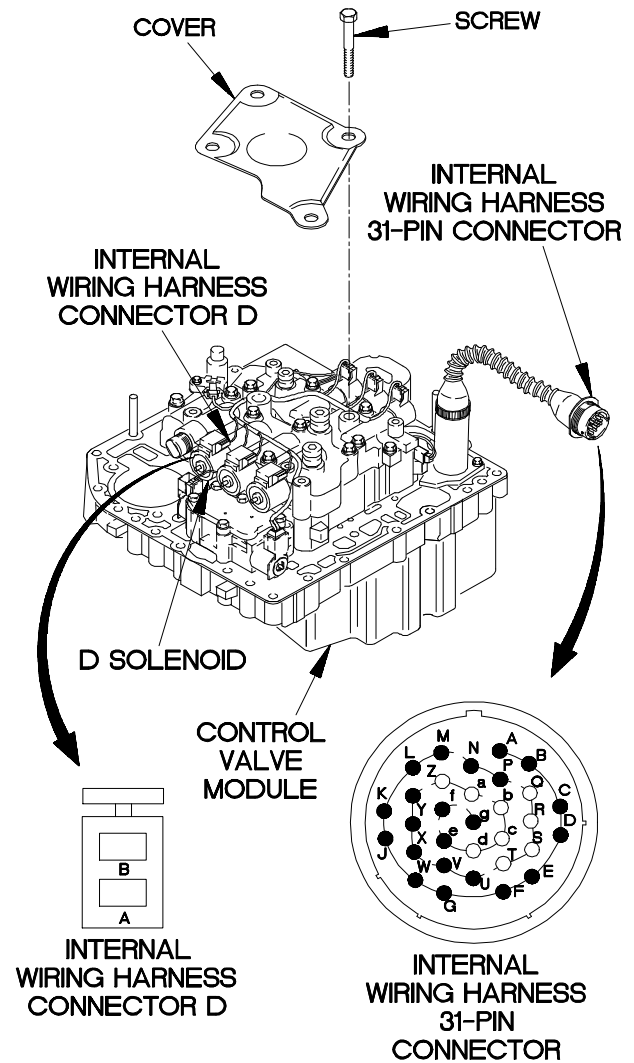
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector D from D solenoid connector.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin M.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector D pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin M.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



YBC2003B

c20. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

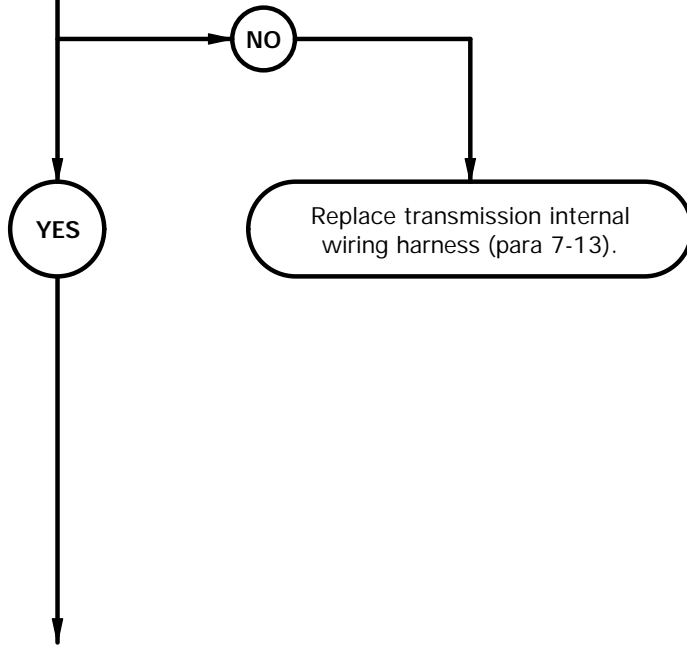
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty D solenoid. Faulty WTEC II TEPSS.

4.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin A to internal wiring harness connector D pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

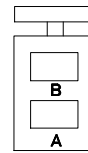
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

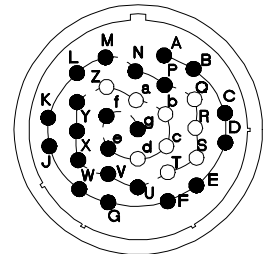
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin A.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector D pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin A.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



**INTERNAL
WIRING HARNESS
CONNECTOR D**



**INTERNAL
WIRING HARNESS
31-PIN
CONNECTOR**

YBC2004B

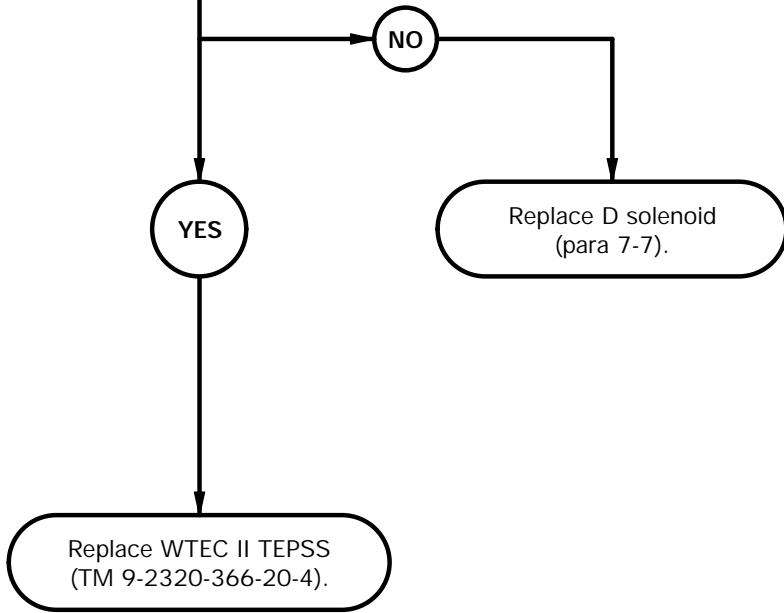
c20. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty D solenoid. Faulty WTEC II TEPSS.

5. **CAUTION**
Read CAUTION on following page.

Is 2.5-5.0 ohms resistance present from D solenoid pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms is not present, D solenoid is faulty. If 2.5-5.0 ohms is present, WTEC II TEPSS is faulty.



CAUTION

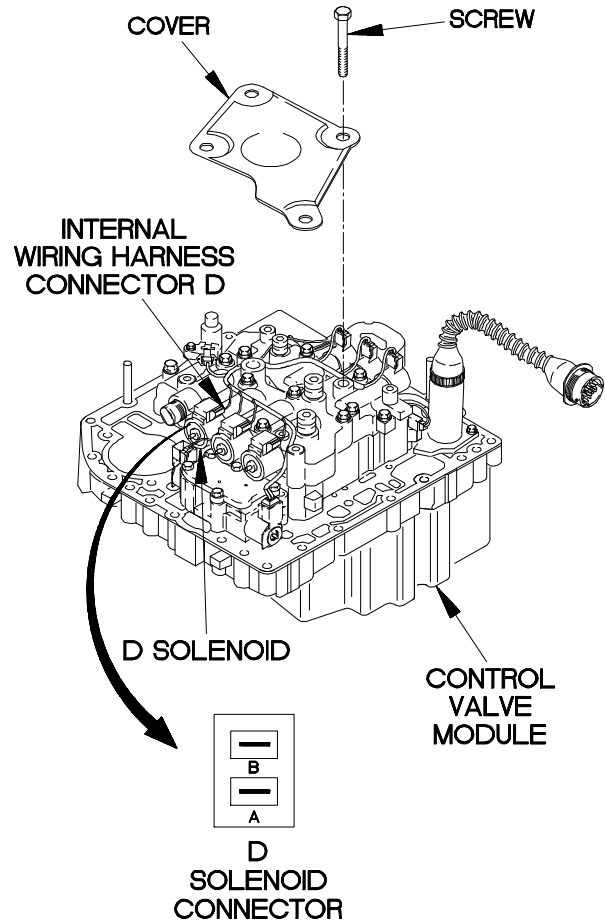
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to D solenoid connector pin A.
- (3) Connect negative (-) probe of multimeter to D solenoid connector pin B and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace D solenoid (para 7-7).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector D to D solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC2005B

c21. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

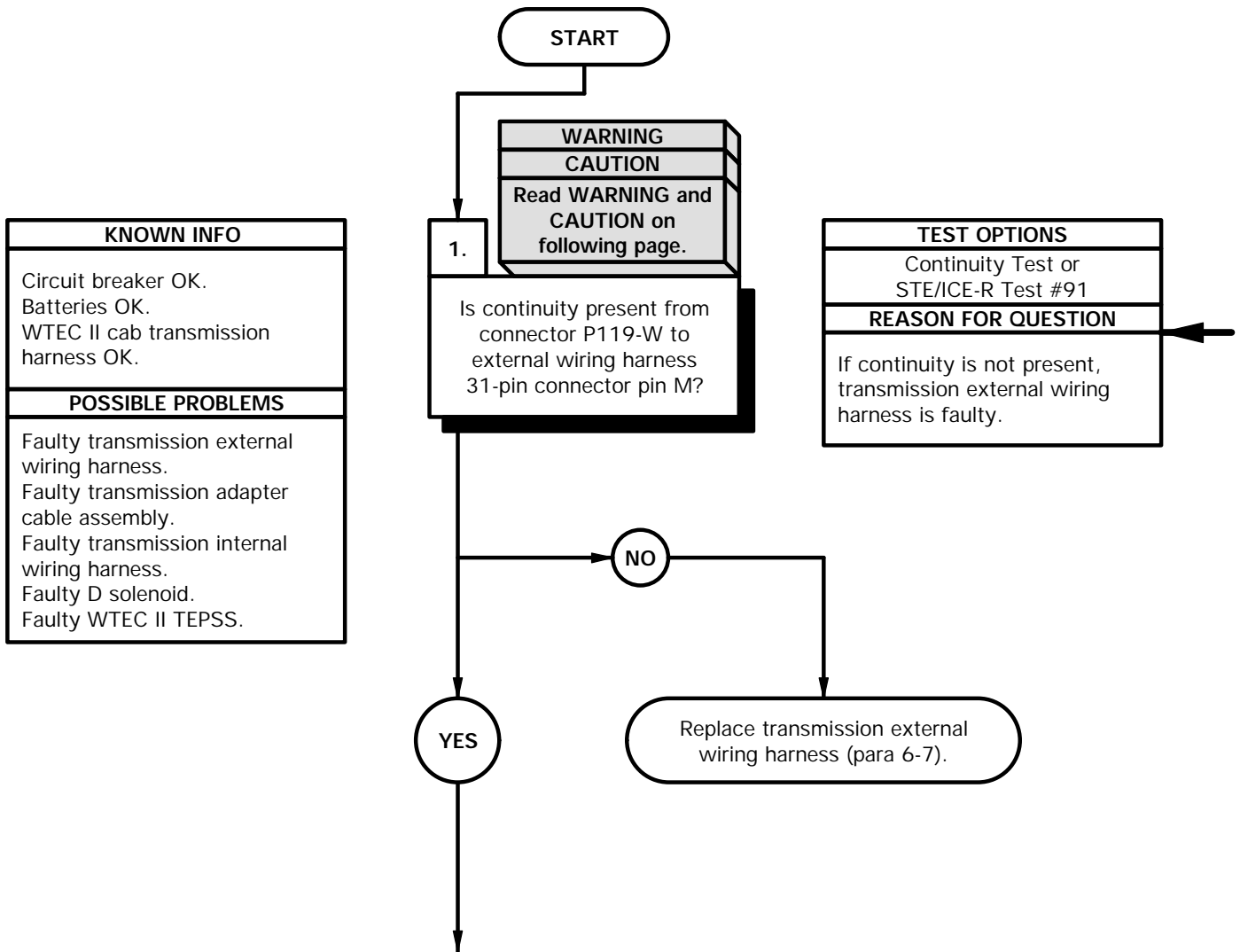
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

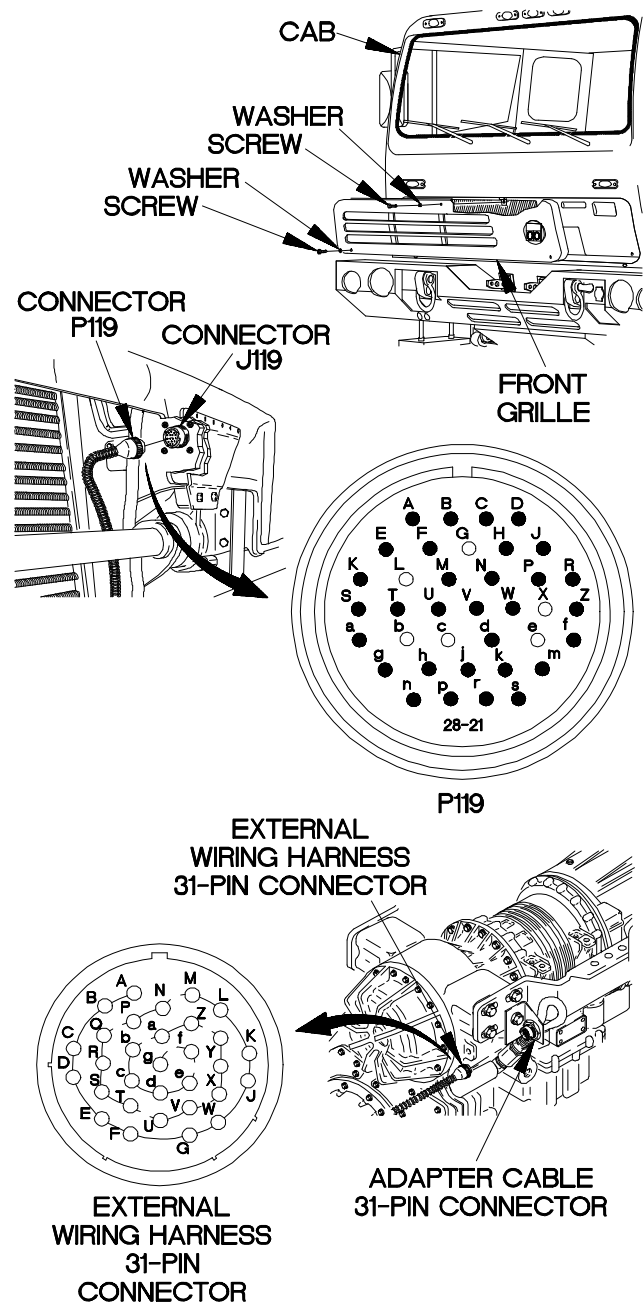
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness 31-pin connector from adapter cable 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-W.
- (8) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin M and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-W.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



YBC2101B

c21. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

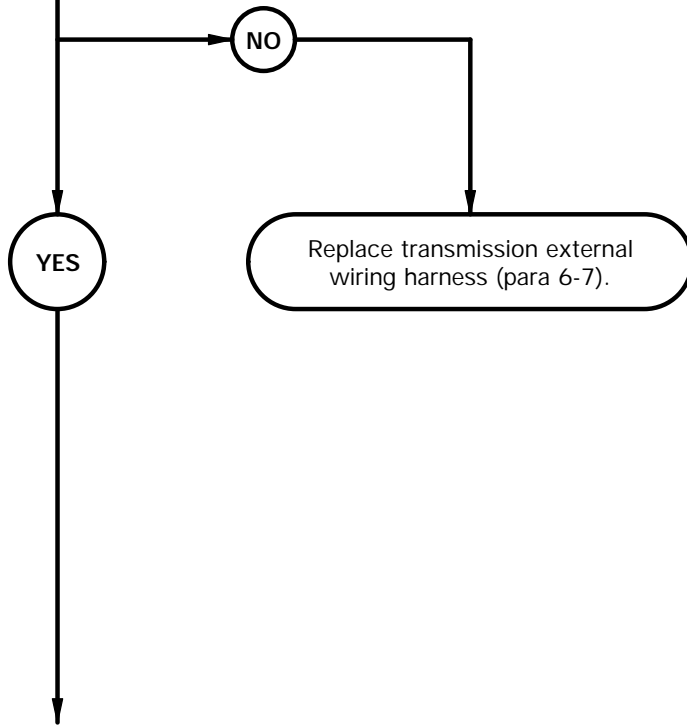
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty D solenoid. Faulty WTEC II TEPSS.

2.

CAUTION
Read CAUTION on following page.

Is continuity present from connector P119-B to external wiring harness 31-pin connector pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



CAUTION

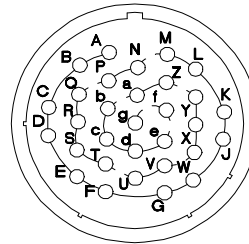
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

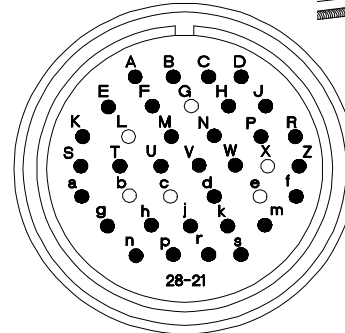
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

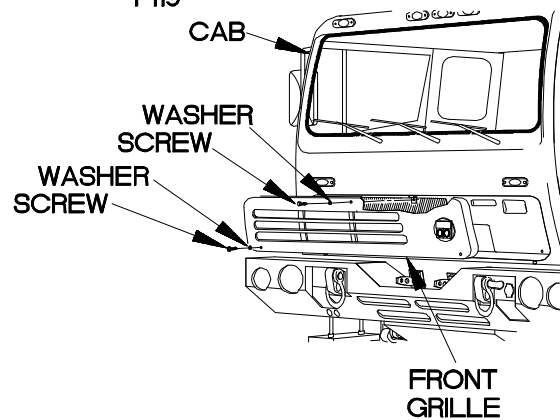
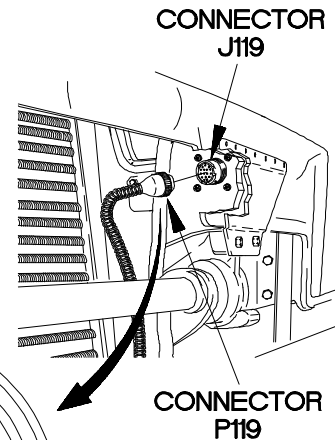
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-B.
- (3) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin A and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-B.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



EXTERNAL WIRING HARNESS 31-PIN CONNECTOR



P119



YBC2102B

c21. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

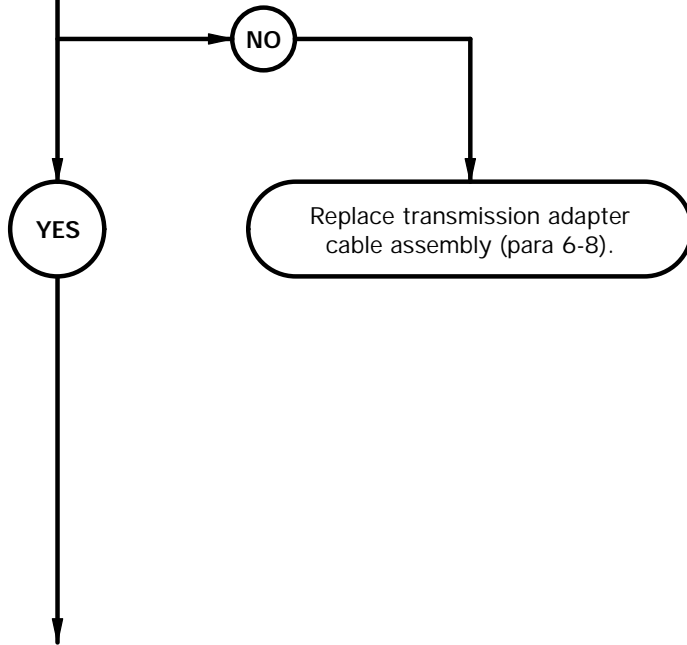
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty D solenoid. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin M to adapter cable 24-pin connector pin D1?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.

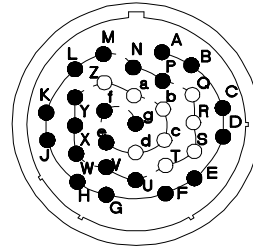


CAUTION

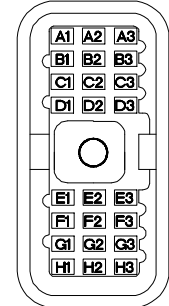
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

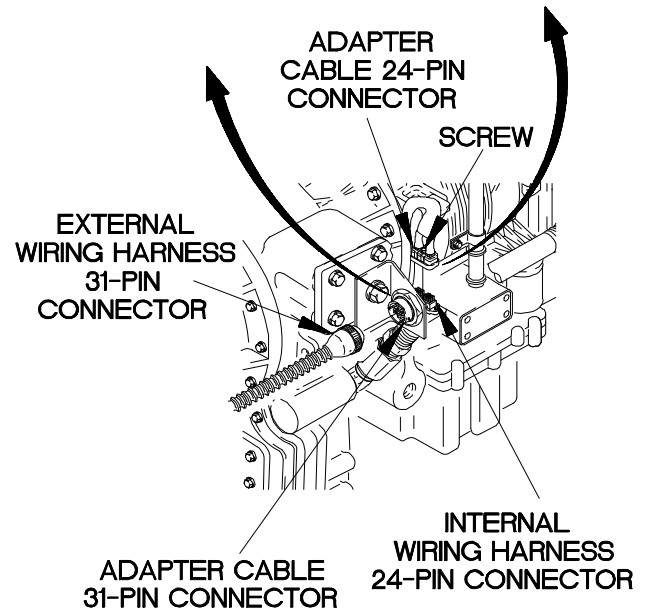
- (1) Loosen screw in adapter cable 24-pin connector.
- (2) Disconnect adapter cable 24-pin connector from internal wiring harness 24-pin connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin M.
- (5) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin D1 and note reading on multimeter.
- (6) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (7) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin M.
- (8) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).



**ADAPTER CABLE
31-PIN CONNECTOR**



**ADAPTER CABLE
24-PIN
CONNECTOR**



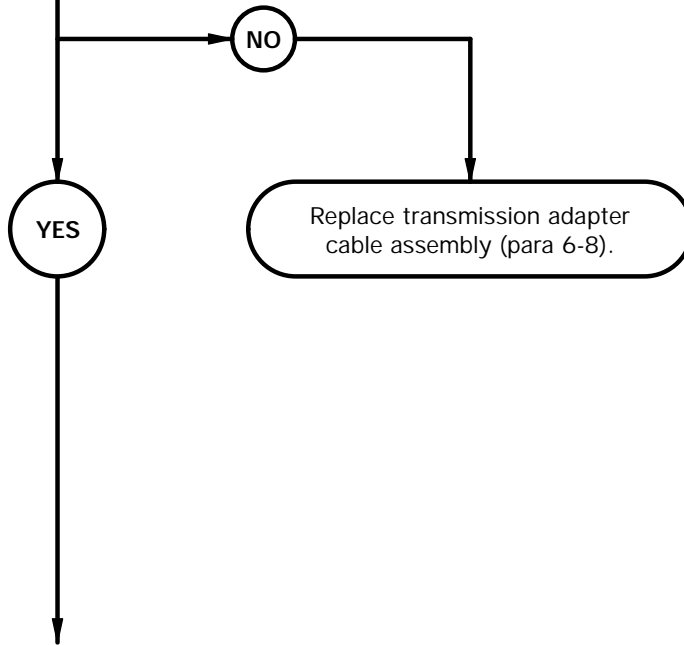
YBC2103B

c21. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty D solenoid. Faulty WTEC II TEPSS.

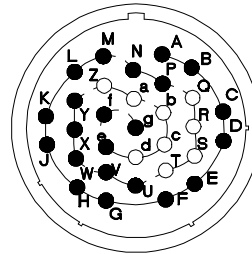
4.
Is continuity present from adapter cable 31-pin connector pin A to adapter cable 24-pin connector pin A2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.

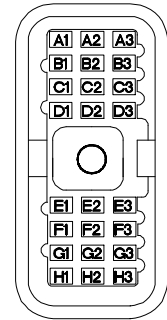


CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin A.
- (3) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin A2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (5) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin A.
- (6) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).
- (9) Connect adapter cable 31-pin connector to external wiring harness 31-pin connector.



**ADAPTER CABLE
31-PIN CONNECTOR**



**ADAPTER CABLE
24-PIN
CONNECTOR**

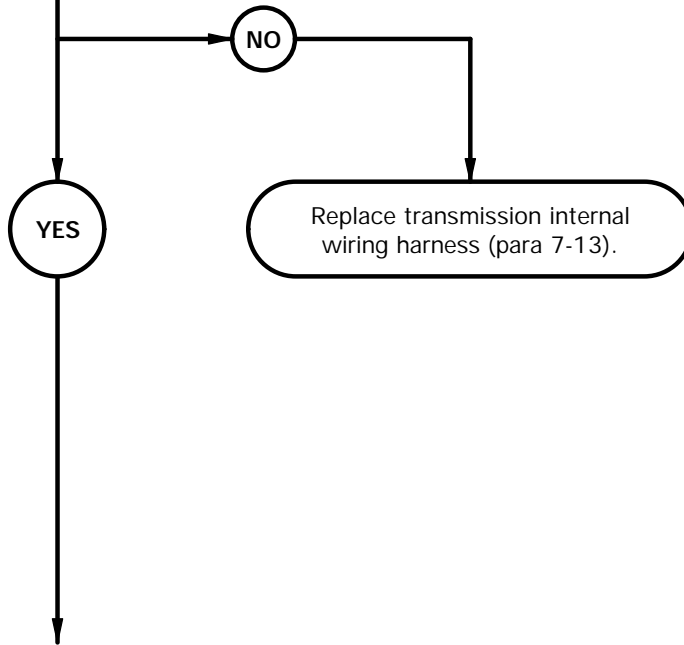
YBC2104B

c21. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty D solenoid. Faulty WTEC II TEPSS.

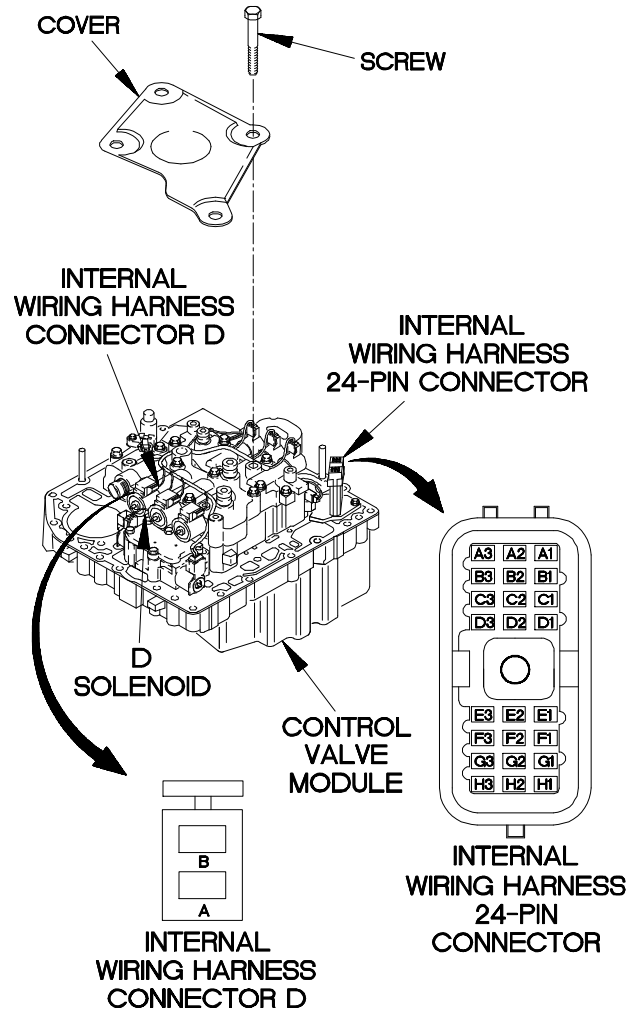
5.
Is continuity present from internal wiring harness 24-pin connector pin D1 to internal wiring harness connector D pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector D from D solenoid connector.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin D1.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector D pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin D1.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



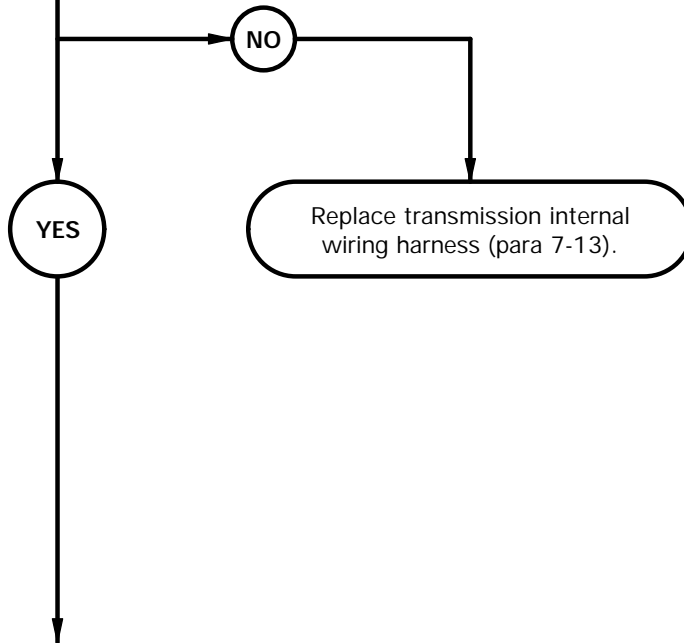
YBC2105B

c21. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty D solenoid. Faulty WTEC II TEPSS.

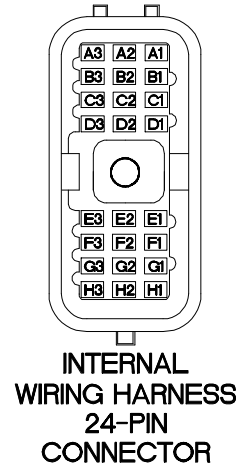
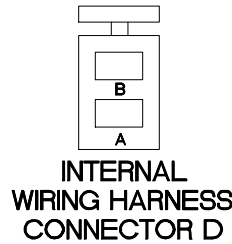
6.
 Is continuity present from internal wiring harness 24-pin connector pin A2 to internal wiring harness connector D pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin A2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector D pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin A2.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).

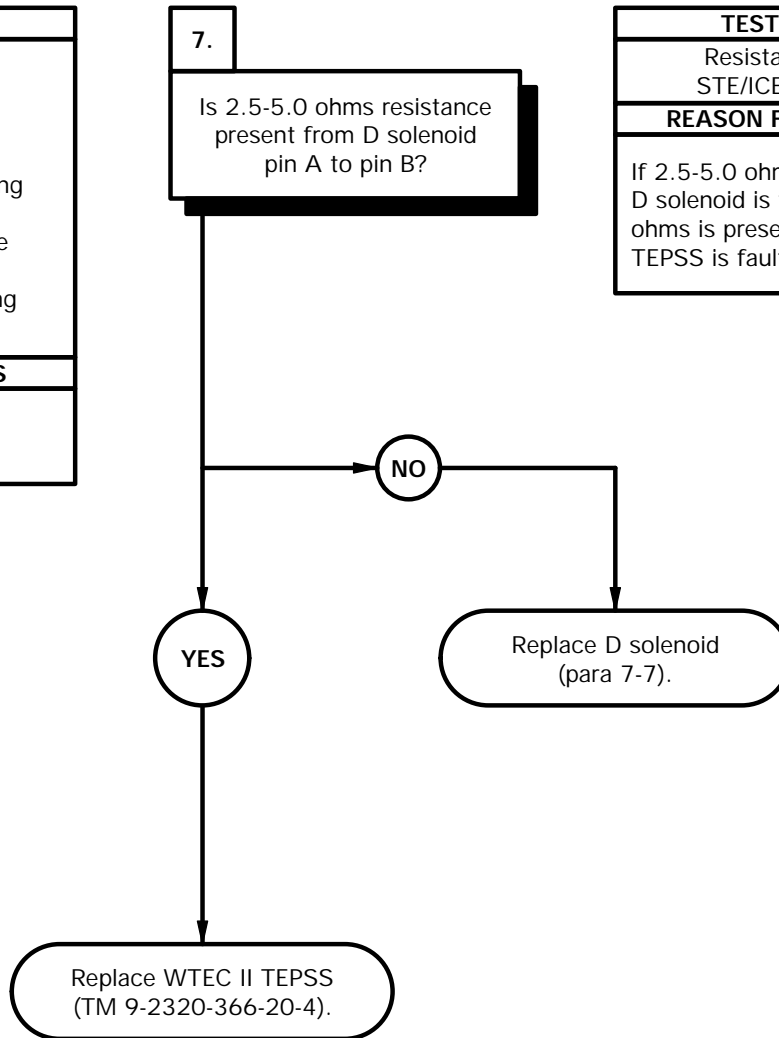


YBC2106B

c21. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

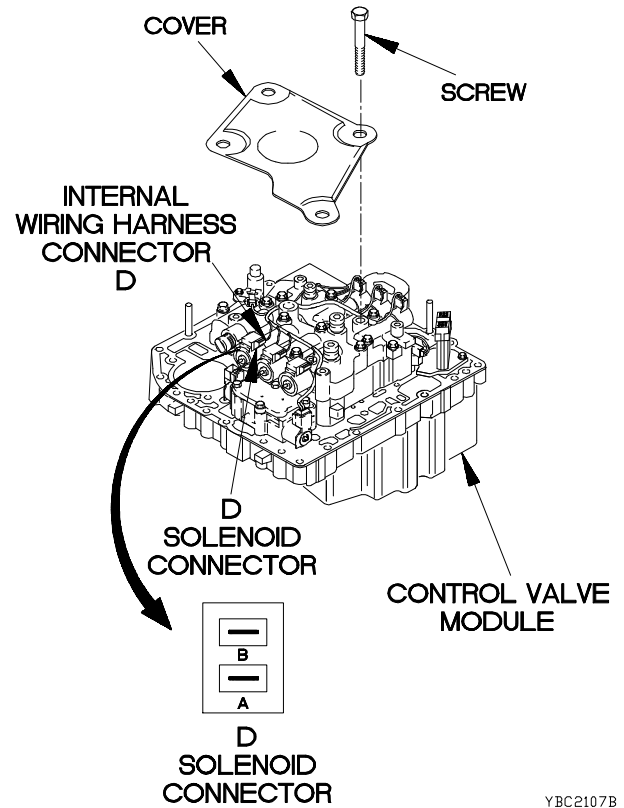
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty D solenoid. Faulty WTEC II TEPSS.

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms is not present, D solenoid is faulty. If 2.5-5.0 ohms is present, WTEC II TEPSS is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to D solenoid connector pin A.
- (3) Connect negative (-) probe of multimeter to D solenoid connector pin B and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace D solenoid (para 7-7).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector D to D solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC2107B

c22. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

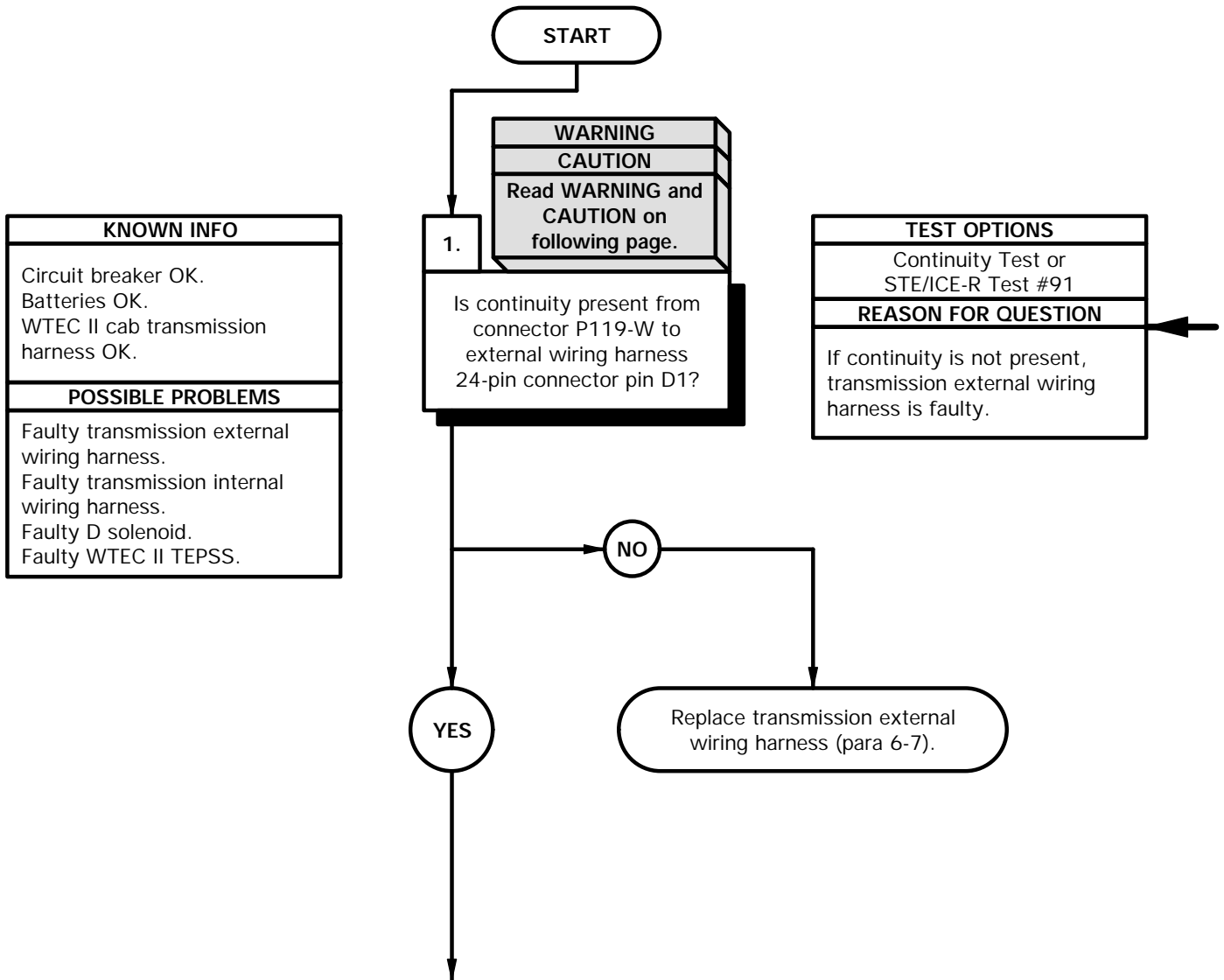
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

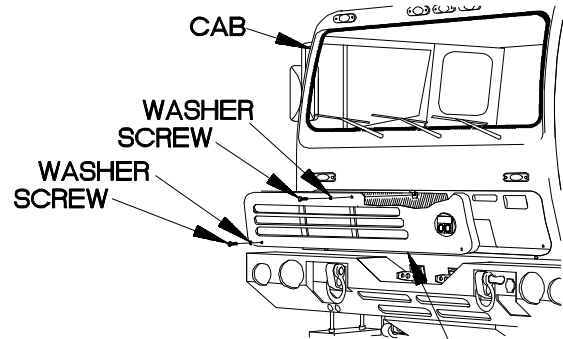
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

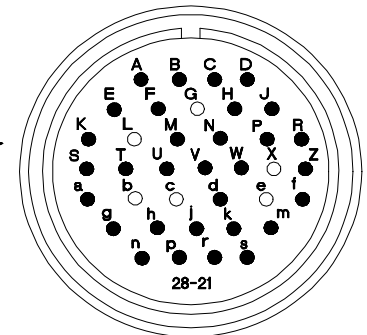
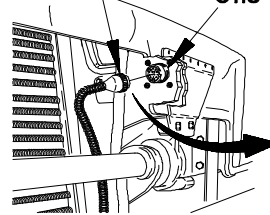
- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Loosen screw in external wiring harness 24-pin connector.
- (6) Disconnect external wiring harness 24-pin connector from internal wiring harness 24-pin connector.
- (7) Set multimeter to ohms.
- (8) Connect positive (+) probe of multimeter to connector P119-W.
- (9) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin D1 and note reading on multimeter.
- (10) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (11) Connect positive (+) probe of multimeter to connector P119-W.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (13) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (14) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).

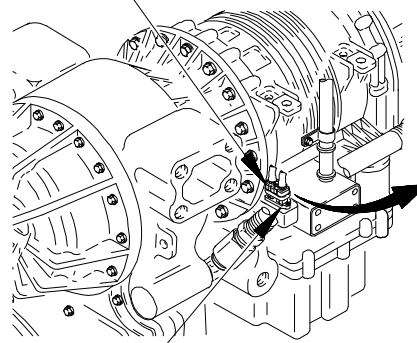


FRONT GRILLE

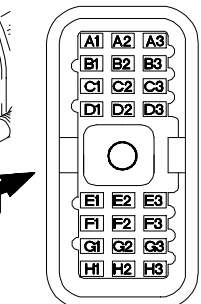


EXTERNAL WIRING HARNESS 24-PIN CONNECTOR

P119



INTERNAL WIRING HARNESS 24-PIN CONNECTOR



EXTERNAL WIRING HARNESS 24-PIN CONNECTOR

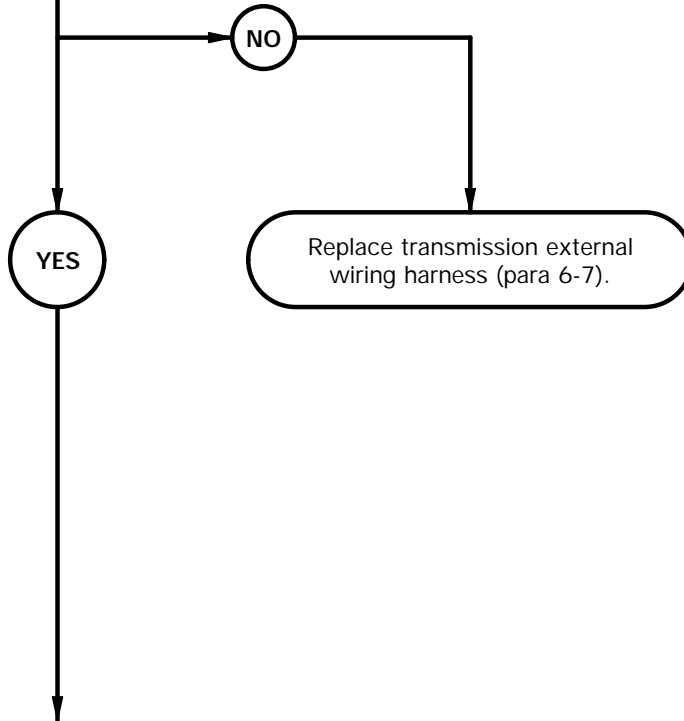
YBC2201B

c22. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty D solenoid. Faulty WTEC II TEPSS.

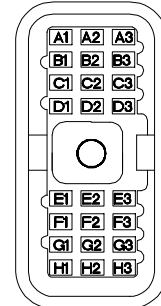
2.
Is continuity present from connector P119-B to external wiring harness 24-pin connector pin A2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

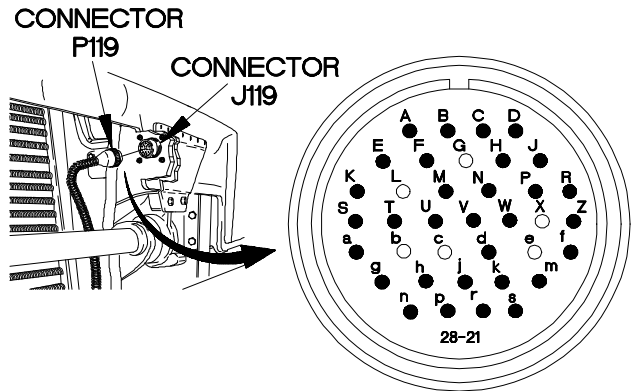


CONTINUITY TEST

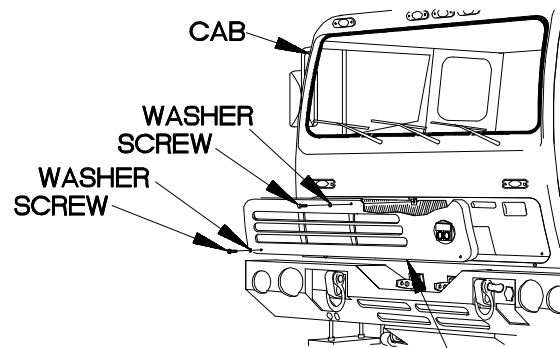
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-B.
- (3) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin A2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-B.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



**EXTERNAL
WIRING HARNESS
24-PIN
CONNECTOR**



P119



**FRONT
GRILLE**

YBC2202B

c22. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

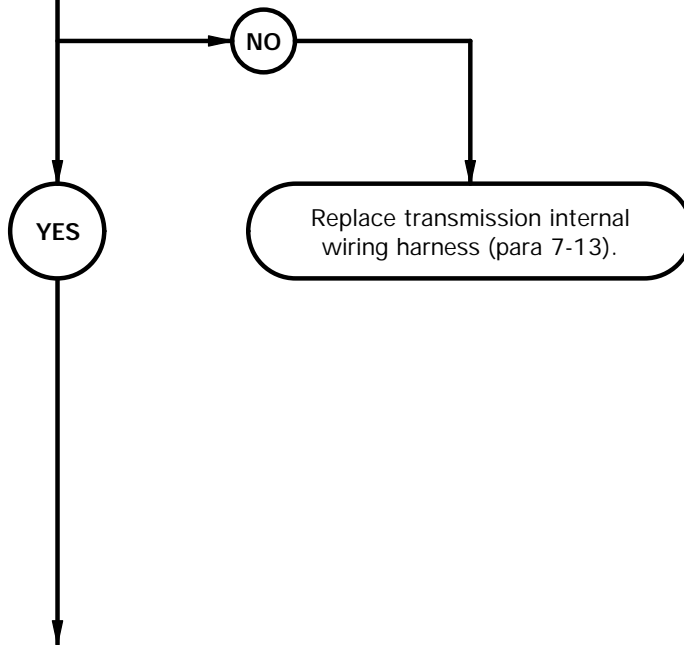
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission assembly OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty D solenoid. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin D1 to internal wiring harness connector D pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

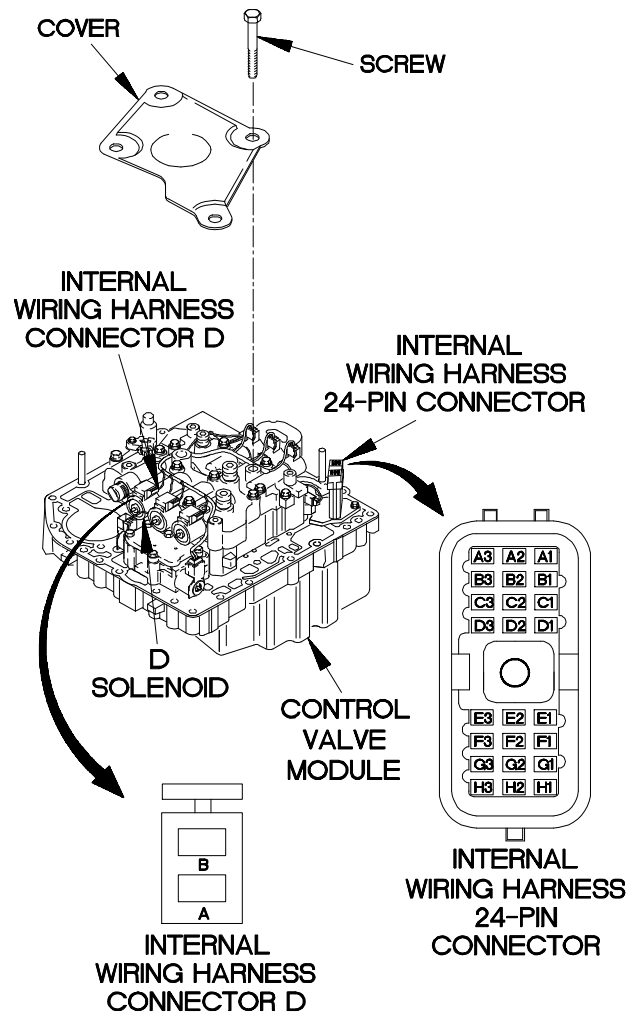
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector D from D solenoid connector.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin D1.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector D pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin D1.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



YBC2203B

c22. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

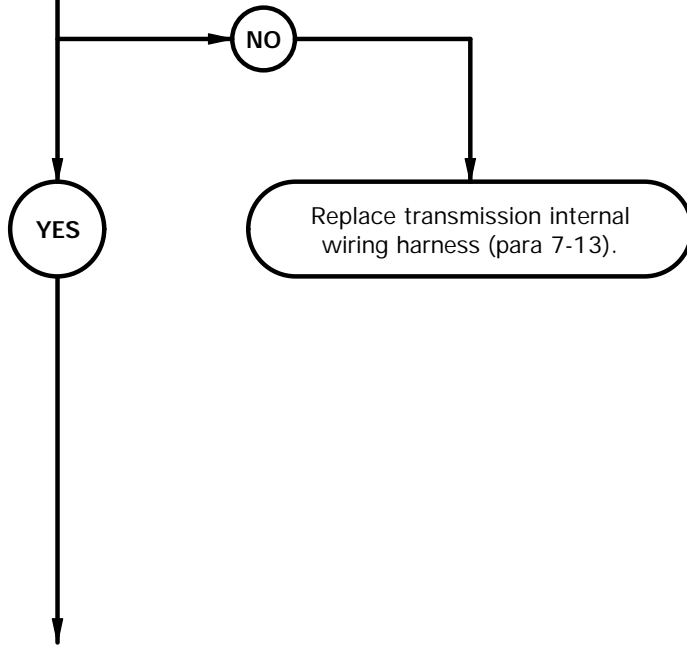
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty D solenoid. Faulty WTEC II TEPSS.

4.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin A2 to internal wiring harness connector D pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

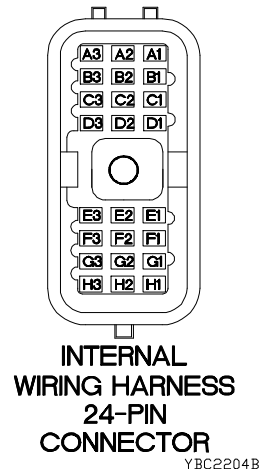
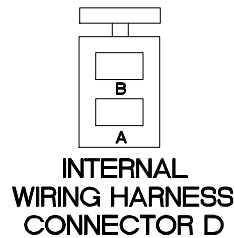
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin A2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector D pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin A2.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



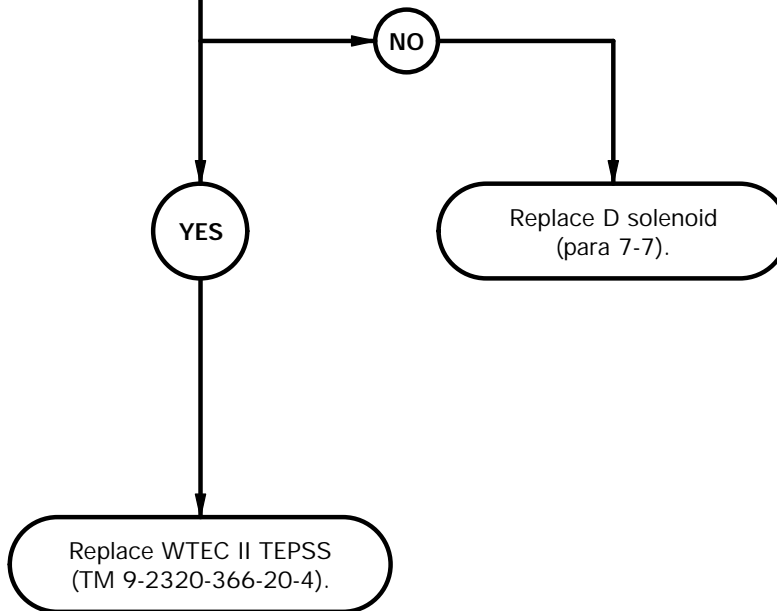
c22. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty D solenoid. Faulty WTEC II TEPSS.

5. **CAUTION**
Read CAUTION on following page.

Is 2.5-5.0 ohms resistance present from D solenoid pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms is not present, D solenoid is faulty. If 2.5-5.0 ohms is present, WTEC II TEPSS is faulty.



CAUTION

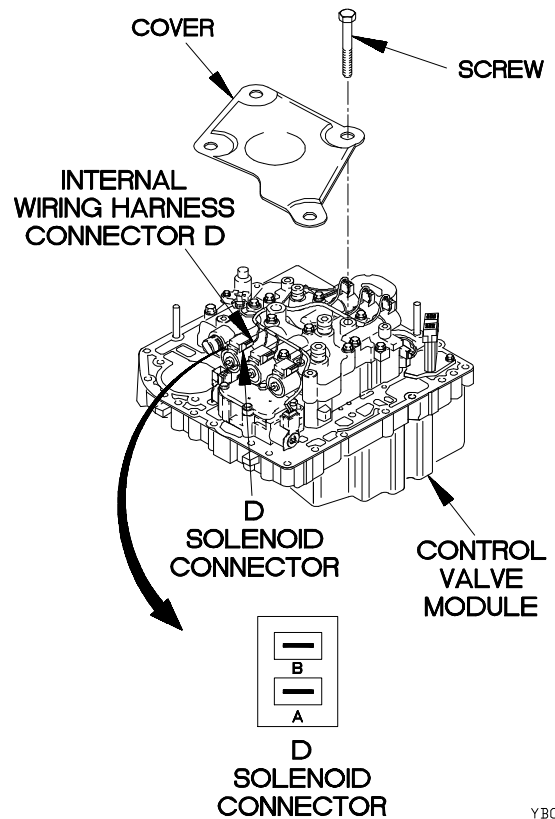
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to D solenoid connector pin A.
- (3) Connect negative (-) probe of multimeter to D solenoid connector pin B and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace D solenoid (para 7-7).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector D to D solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC2205B

c23. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 16 (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Tools and Special Tools

Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)

Materials/Parts

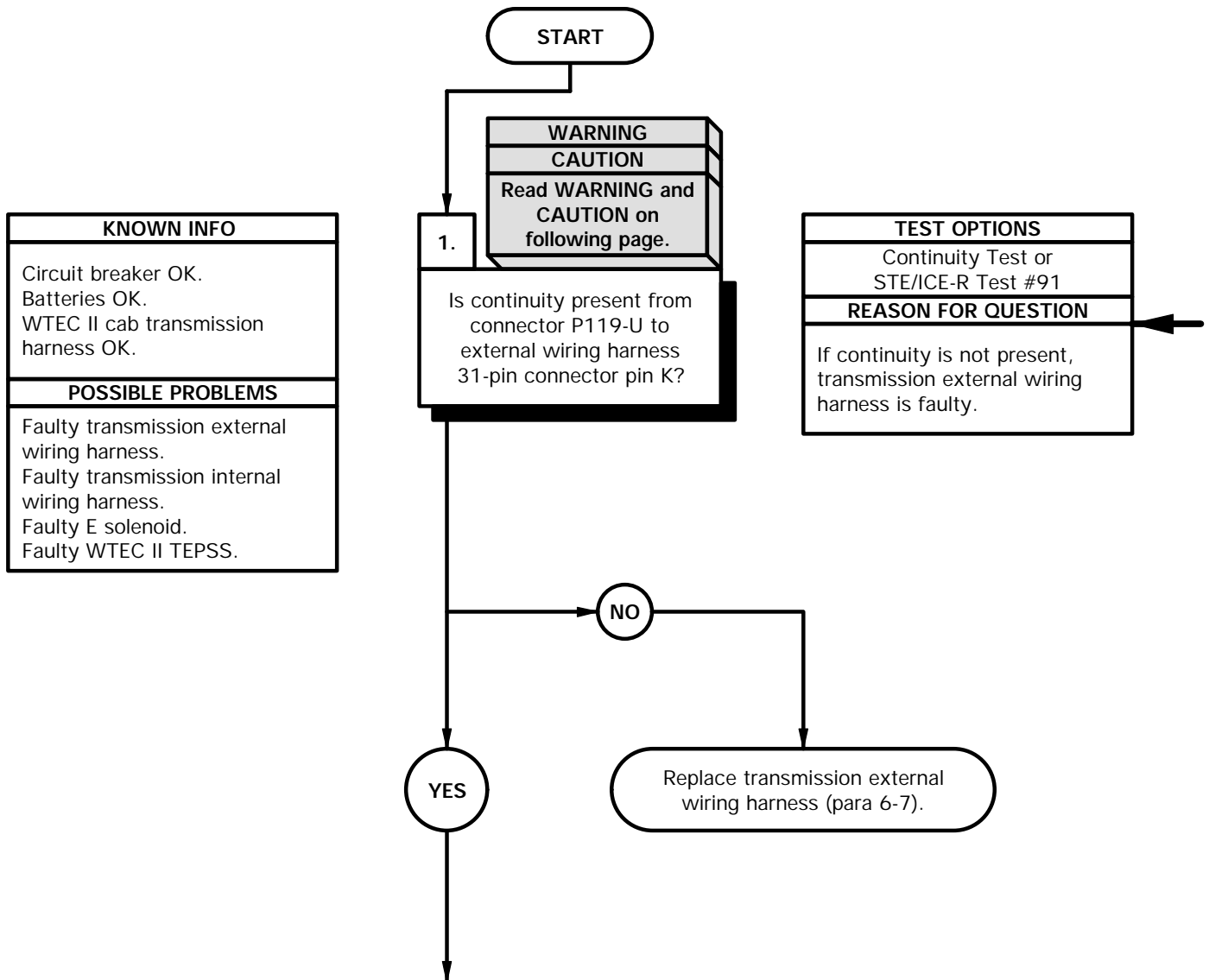
Wire, Elect, 50 ft (Item 97, Appendix C)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

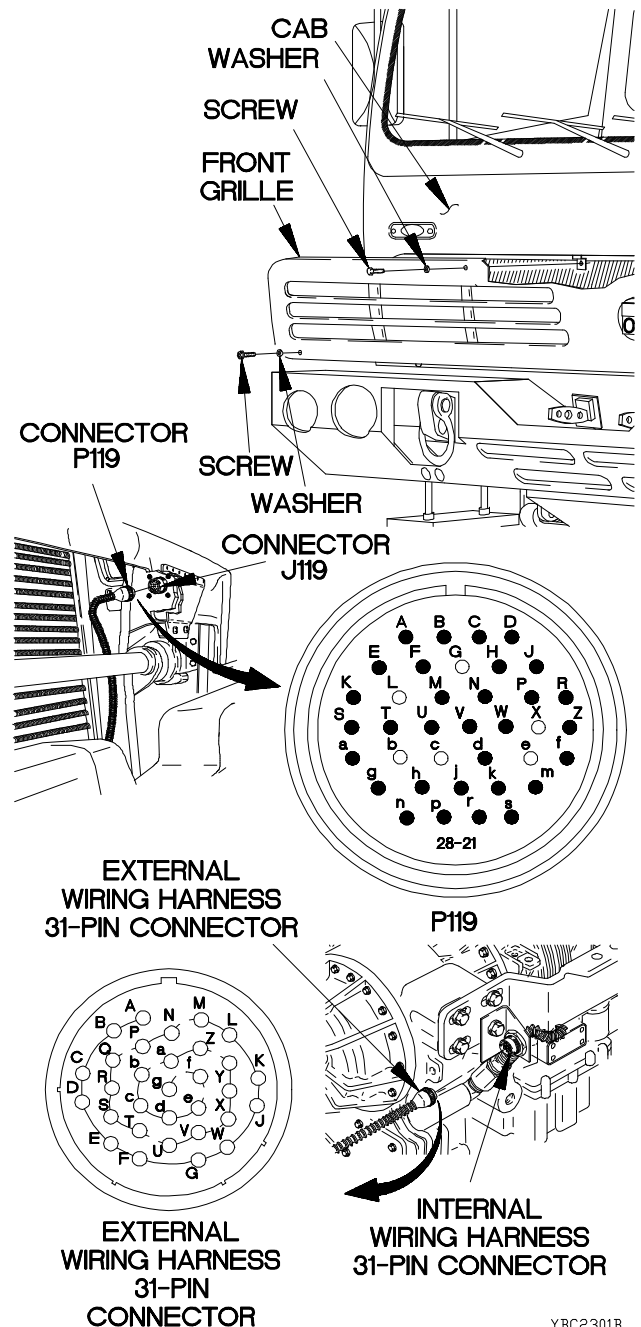
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-U.
- (8) Connect negative (-) probe of multimeter to internal wiring harness 31-pin connector pin K and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-U.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness; replace transmission external wiring harness (para 6-7).



YBC2301B

c23. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 16 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

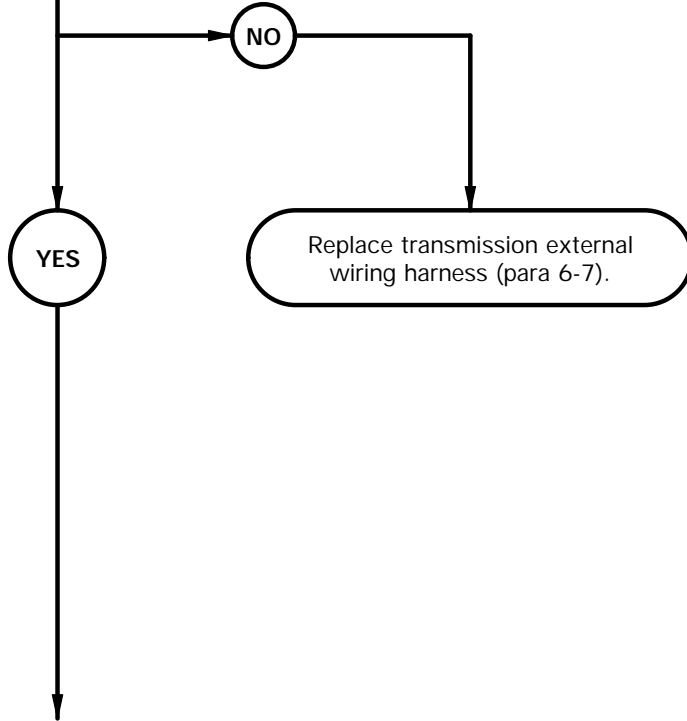
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty E solenoid. Faulty WTEC II TEPSS.

2.

CAUTION
Read CAUTION on following page.

Is continuity present from connector P119-N to external wiring harness 31-pin connector pin H?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



CAUTION

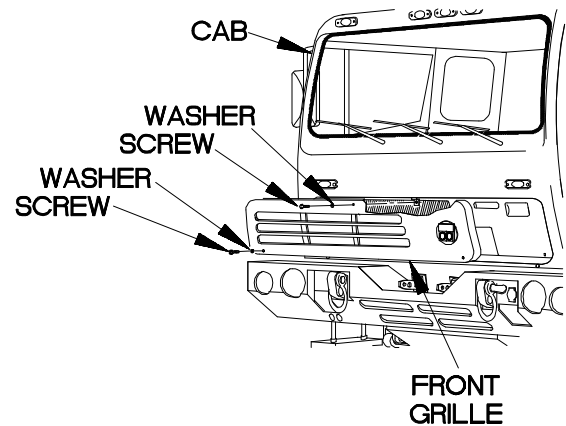
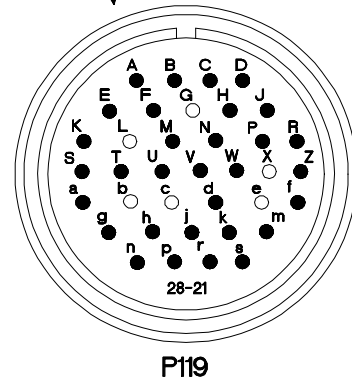
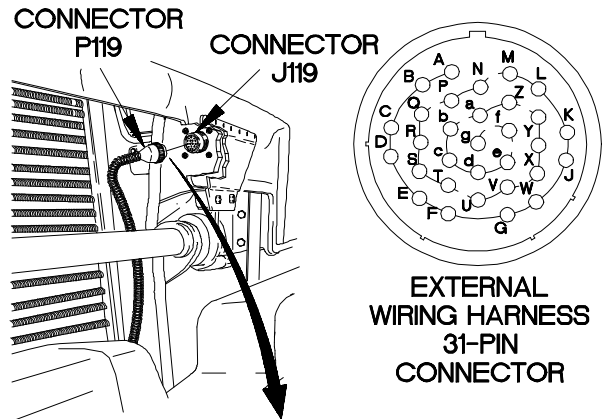
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-N.
- (3) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin H and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-N.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



YBC2302B

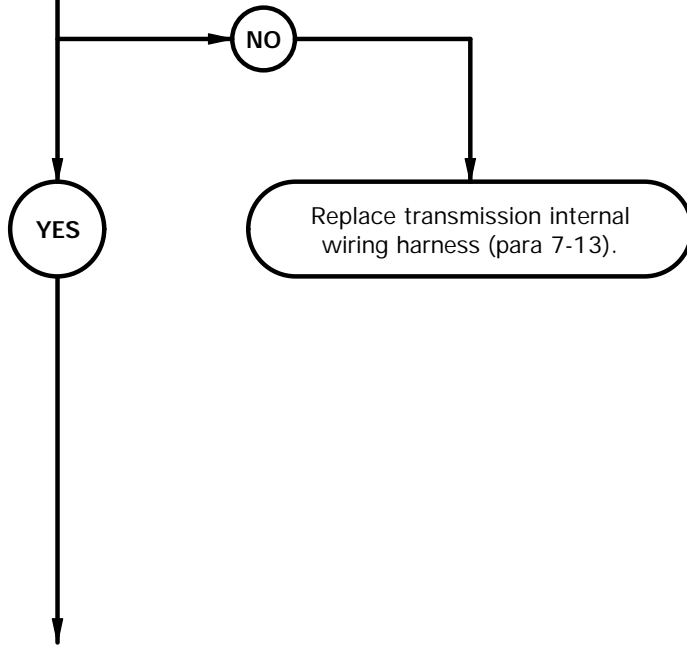
c23. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 16 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty E solenoid. Faulty WTEC II TEPSS.

3. **CAUTION**
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin K to internal wiring harness connector E pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

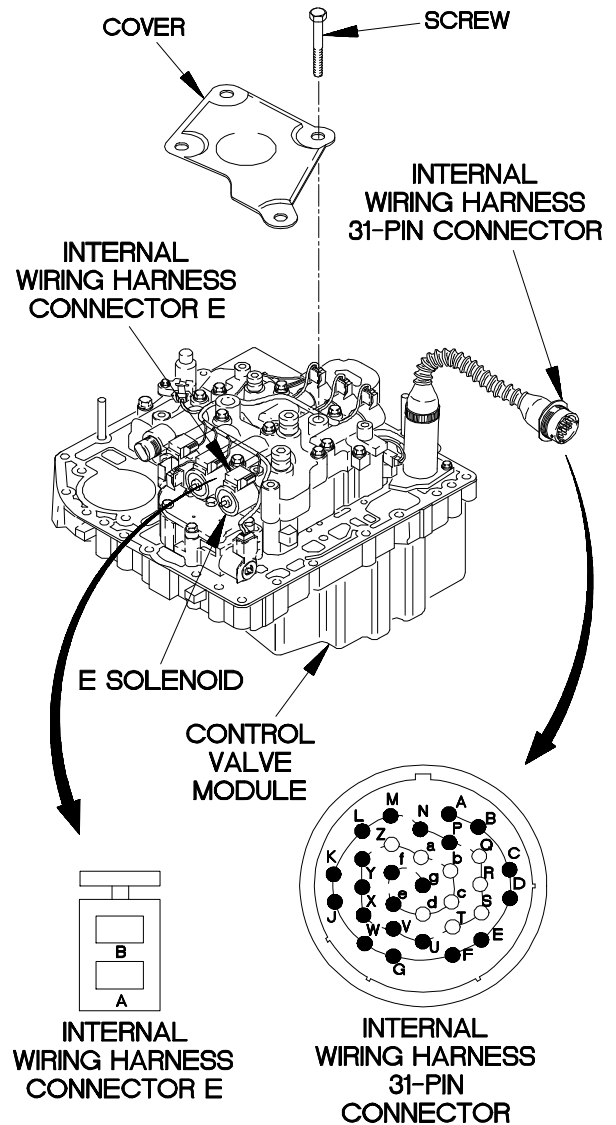
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector E from E solenoid connector.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin K.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector E pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin K.
- (9) Connect negative (-) probe of multimeter to all other pins of internal wiring harness to external wiring harness connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



YBC2303B

c23. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 16 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

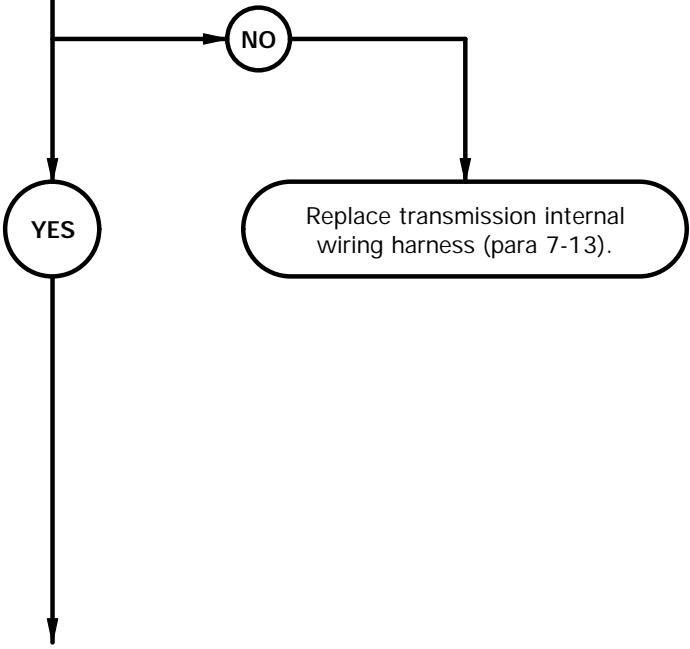
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty E solenoid. Faulty WTEC II TEPSS.

4.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin H to internal wiring harness connector E pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

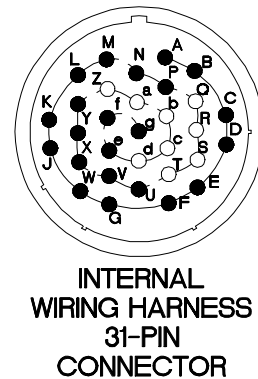
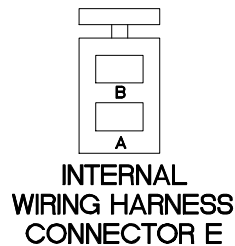
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin H.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector E pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin H.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



YBC2304B

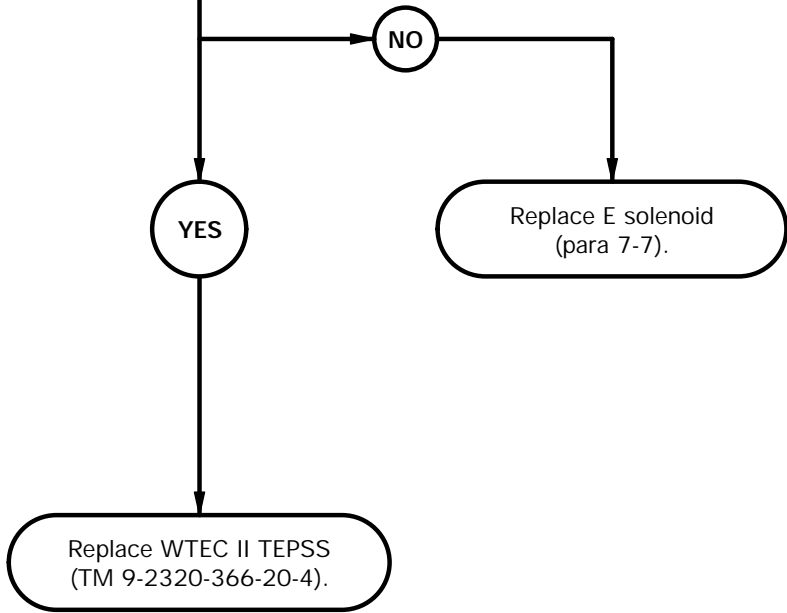
c23. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 16 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission assembly OK. Transmission external wiring harness OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty E solenoid. Faulty WTEC II TEPSS.

5. **CAUTION**
Read CAUTION on following page.

Is 2.5-5.0 ohms resistance present from E solenoid pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms is not present, E solenoid is faulty. If 2.5-5.0 ohms is present, WTEC II TEPSS is faulty.



CAUTION

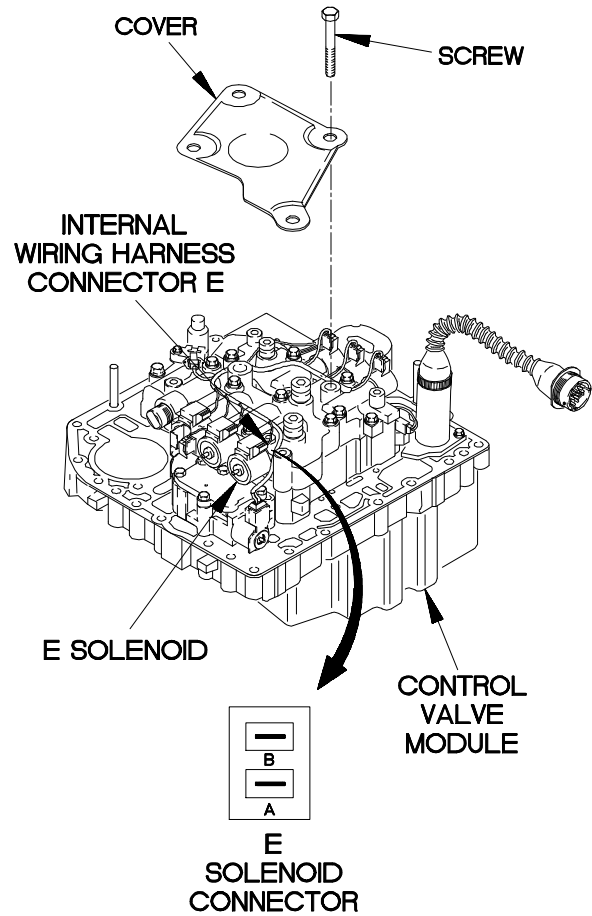
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to E solenoid connector pin A.
- (3) Connect negative (-) probe of multimeter to E solenoid connector pin B and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace E solenoid (para 7-7).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector E to E solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC2305B

c24. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 16 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

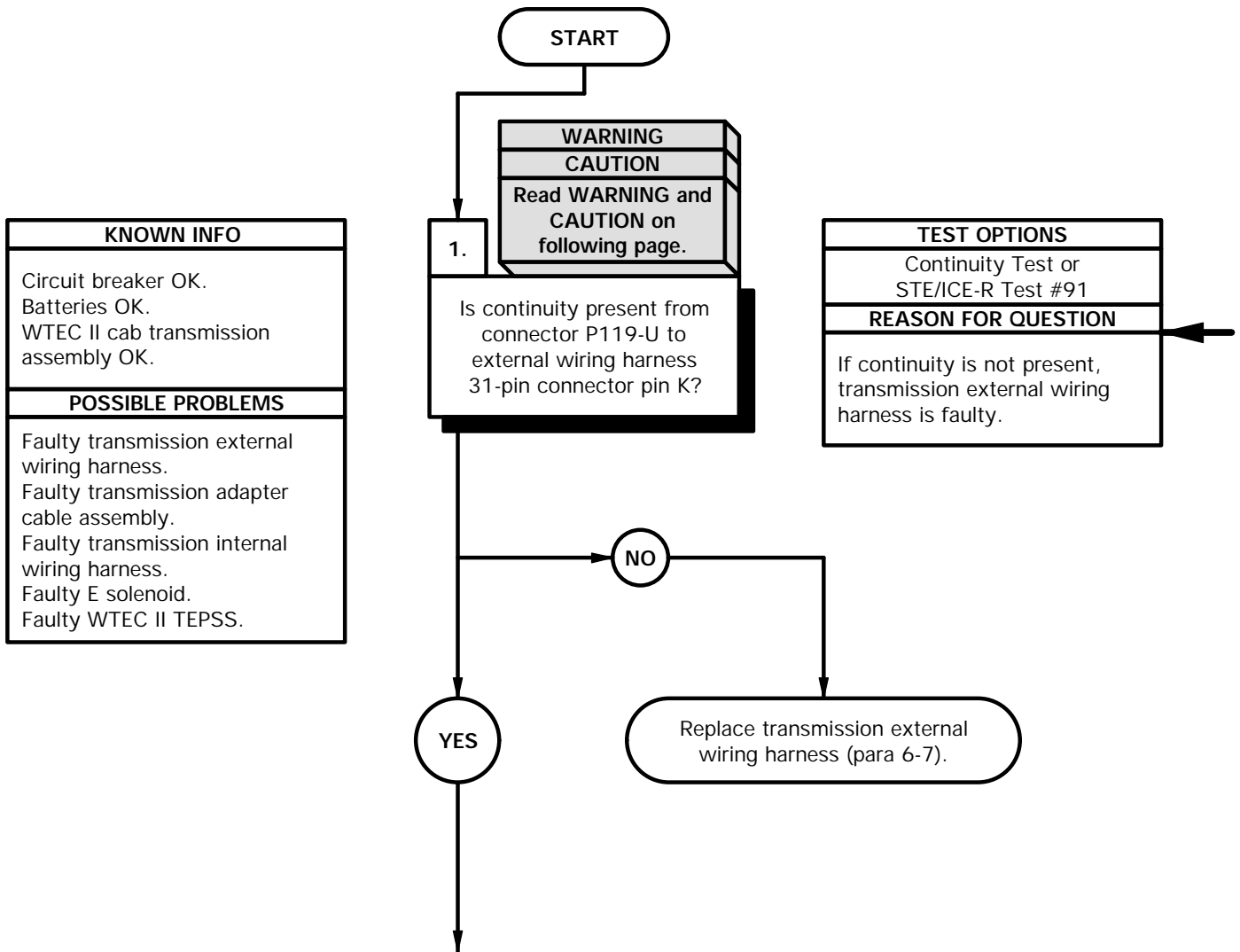
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

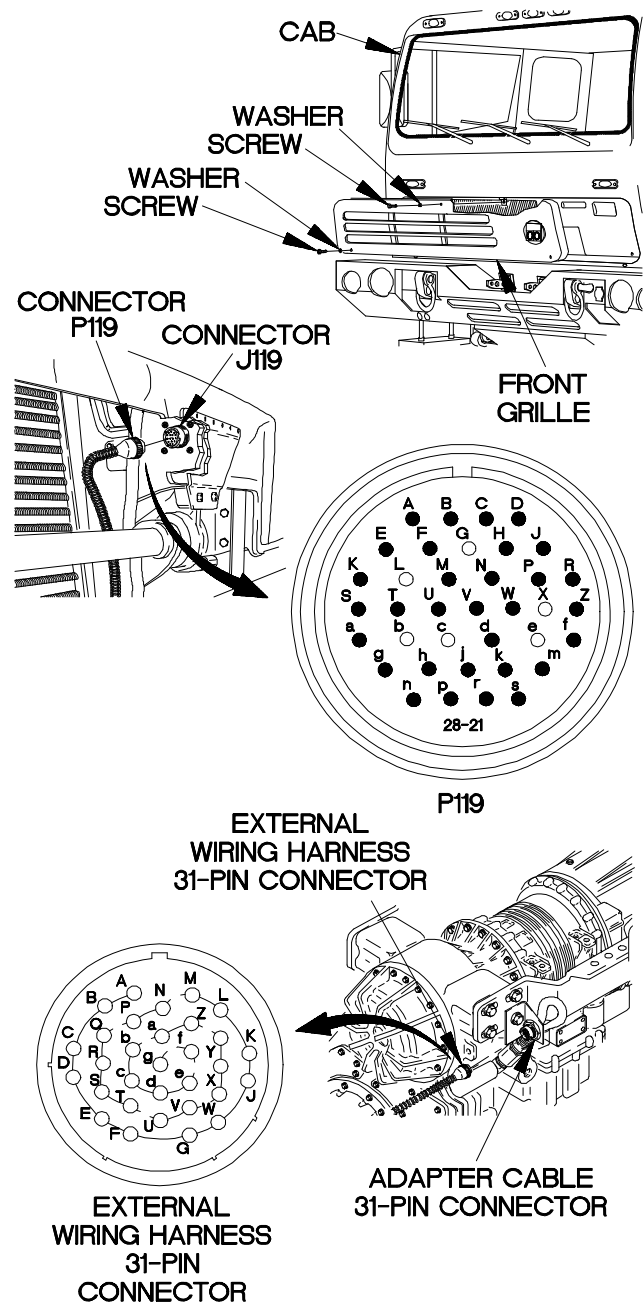
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness 31-pin connector from adapter cable 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-U.
- (8) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin K and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-U.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



YBC2401B

c24. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 16 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

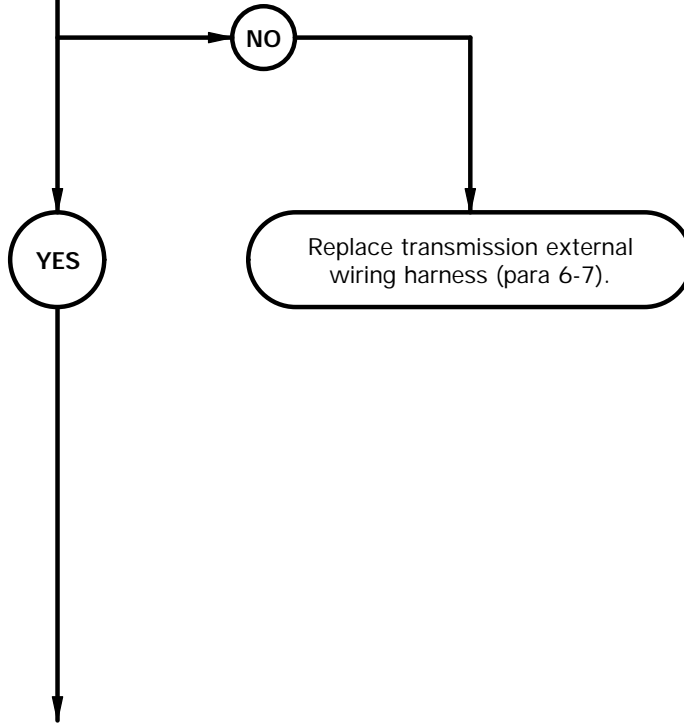
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty E solenoid. Faulty WTEC II TEPSS.

2.

CAUTION
 Read CAUTION on following page.

Is continuity present from connector P119-N to external wiring harness 31-pin connector pin H?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



CAUTION

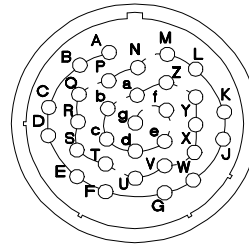
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

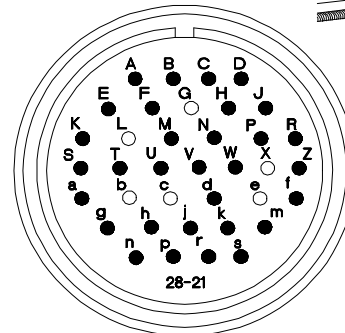
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

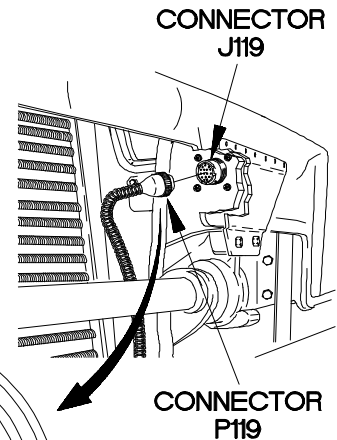
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-N.
- (3) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin H and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-N.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



EXTERNAL WIRING HARNESS 31-PIN CONNECTOR

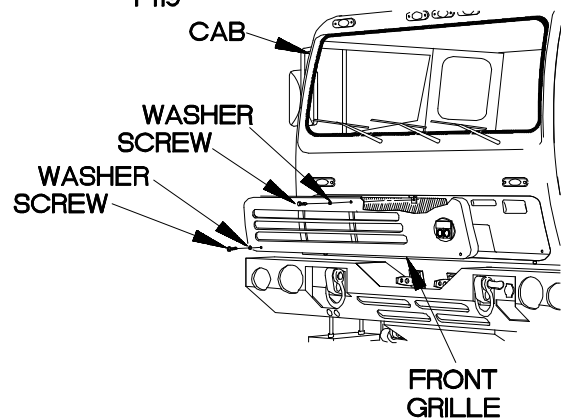


P119



CONNECTOR J119

CONNECTOR P119



FRONT GRILLE

YBC2402B

c24. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 16 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

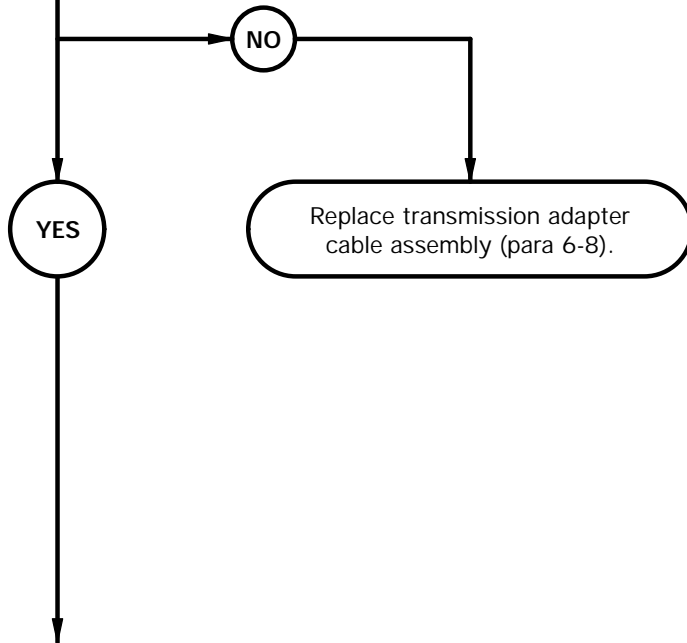
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty E solenoid. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin K to adapter cable 24-pin connector pin E1?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.



CAUTION

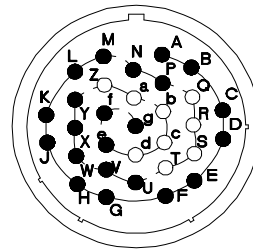
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

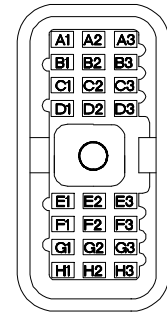
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

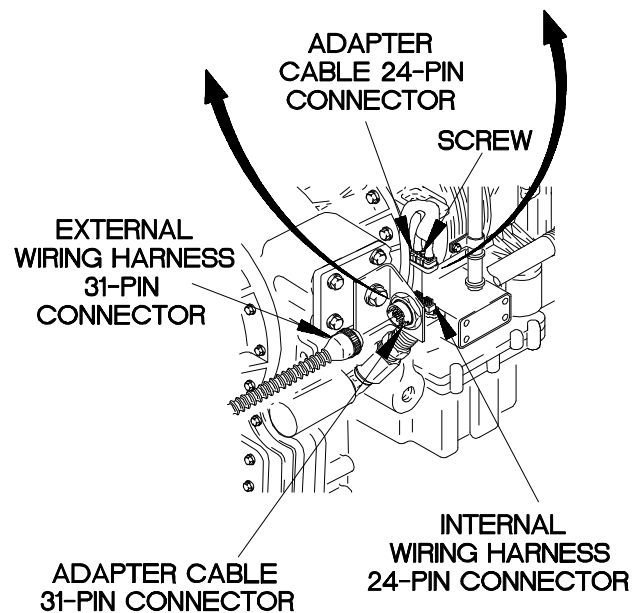
- (1) Loosen screw in adapter cable 24-pin connector.
- (2) Disconnect adapter cable 24-pin connector from internal wiring harness 24-pin connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin K.
- (5) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin E1 and note reading on multimeter.
- (6) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (7) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin K.
- (8) Connect negative (-) probe of multimeter to all other pins in external wiring harness 31-pin connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).



**ADAPTER CABLE
31-PIN CONNECTOR**



**ADAPTER CABLE
24-PIN
CONNECTOR**



YBC2403B

c24. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 16 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

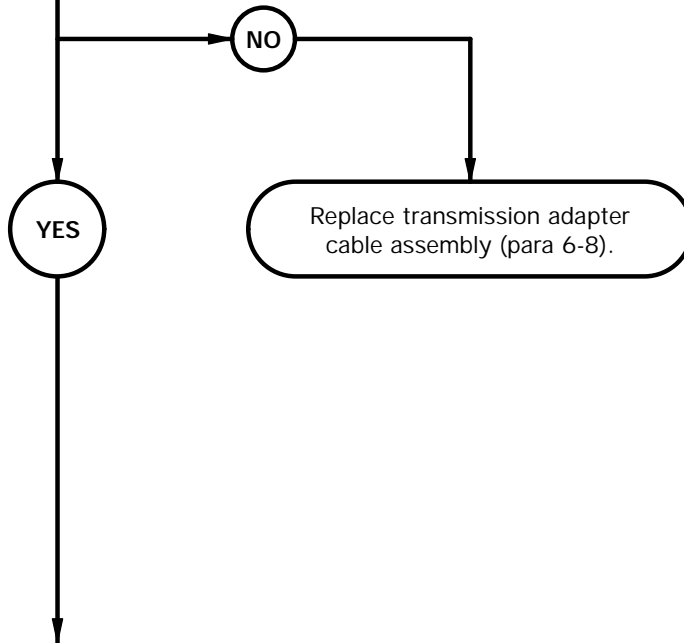
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty E solenoid. Faulty WTEC II TEPSS.

4.

CAUTION
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin H to adapter cable 24-pin connector pin B2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.



CAUTION

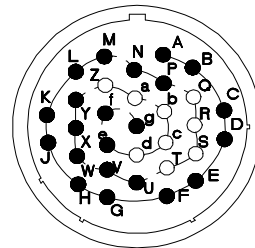
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

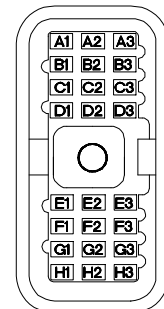
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin H.
- (3) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin B2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (5) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin H.
- (6) Connect negative (-) probe of multimeter to all other pins in external wiring harness connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).
- (9) Connect adapter cable 31-pin connector to external wiring 31-pin connector.



**ADAPTER CABLE
31-PIN CONNECTOR**



**ADAPTER CABLE
24-PIN
CONNECTOR**

YBC2404B

c24. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 16 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

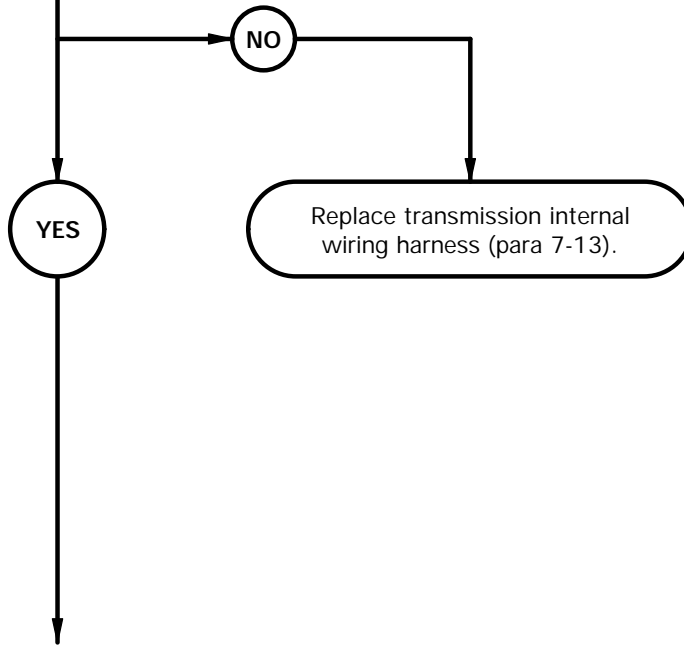
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty E solenoid. Faulty WTEC II TEPSS.

5.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin E1 to internal wiring harness connector E pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

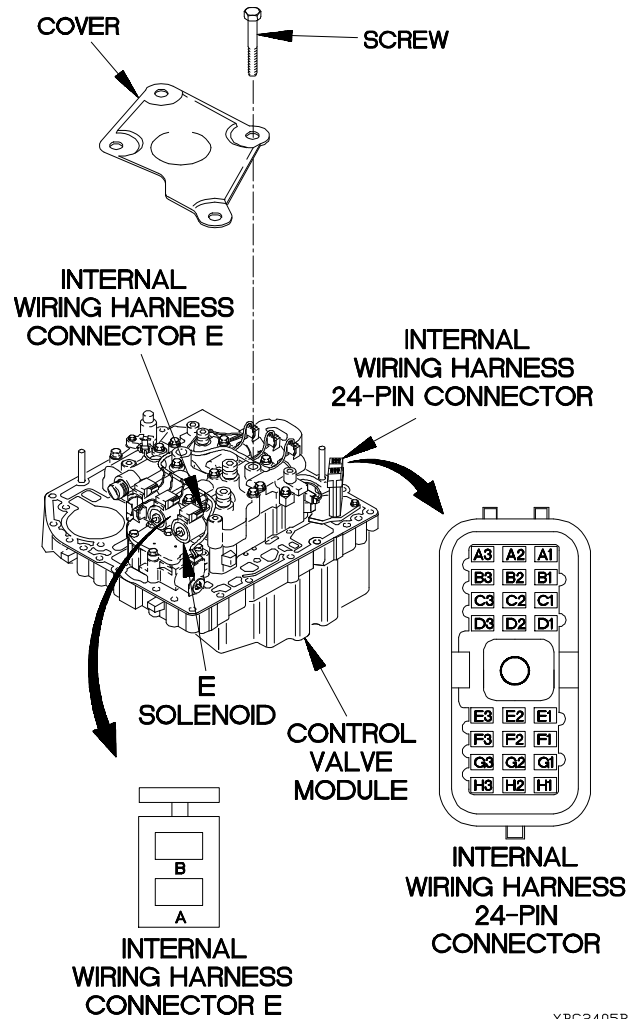
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector E from E solenoid connector.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin E1.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector E pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin E1.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



YBC2405B

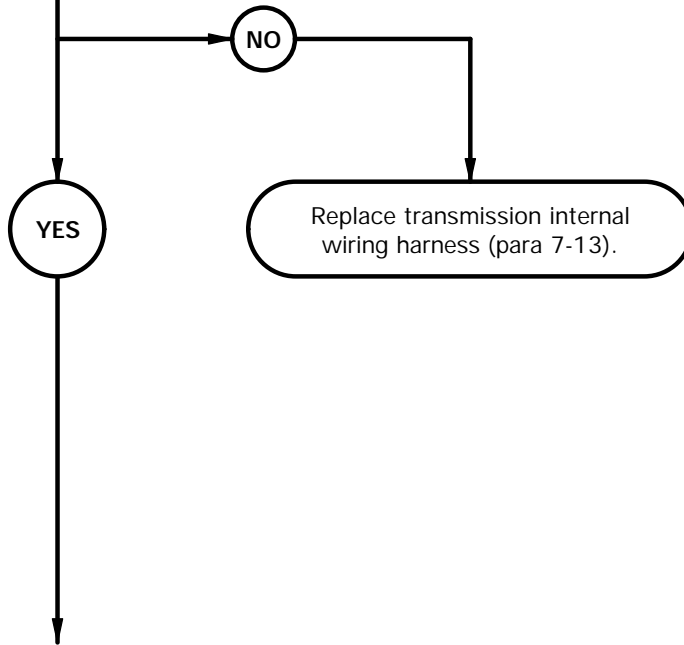
c24. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 16 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty E solenoid. Faulty WTEC II TEPSS.

6. **CAUTION**
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin B2 to internal wiring harness connector E pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

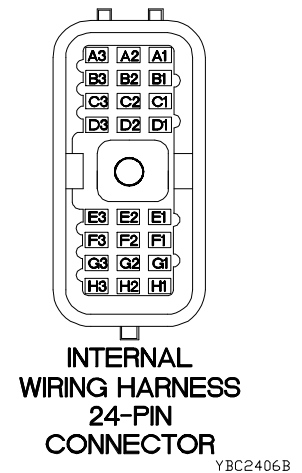
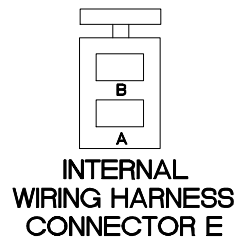
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

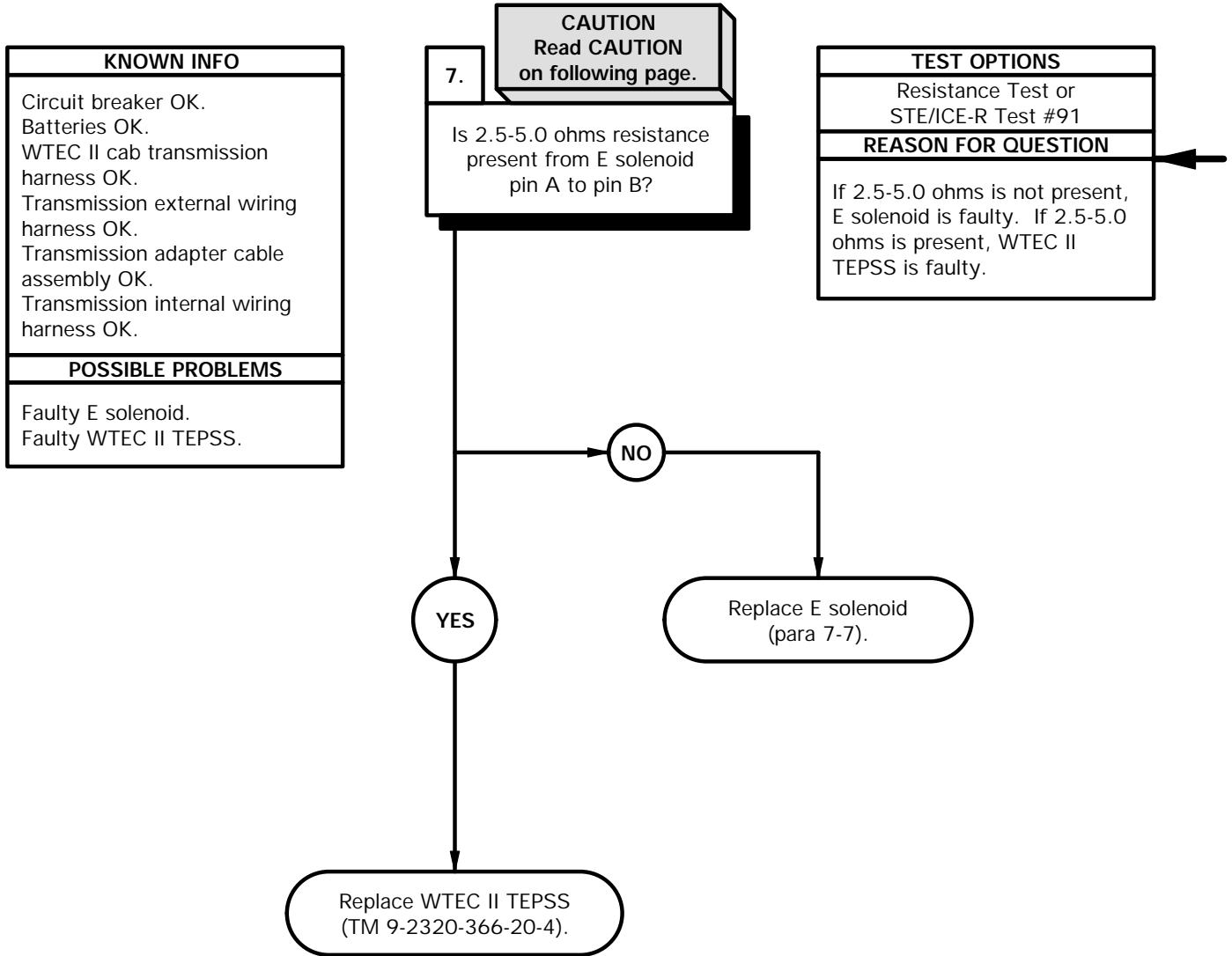
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin B2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector E pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin B2.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



c24. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 16 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



CAUTION

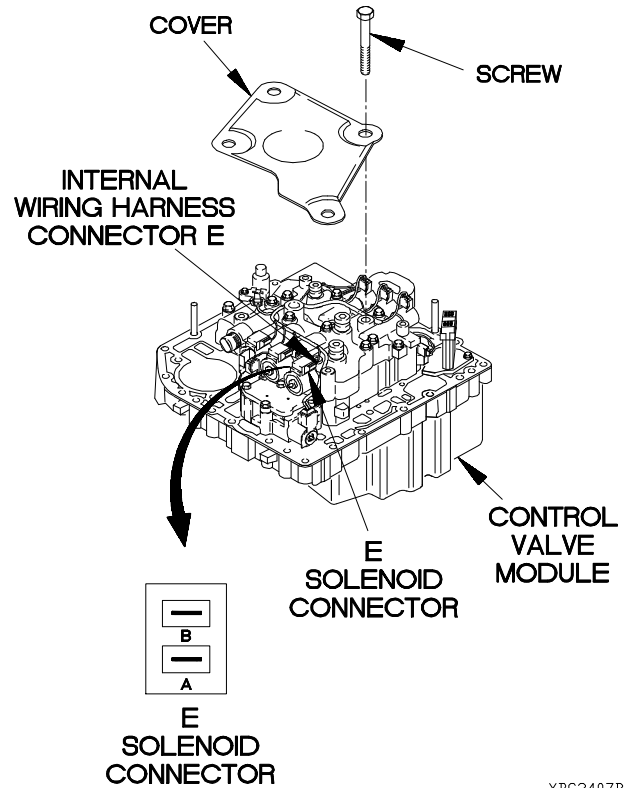
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to E solenoid connector pin A.
- (3) Connect negative (-) probe of multimeter to E solenoid connector pin B and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace E solenoid (para 7-7).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector E to E solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC2407B

c25. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 16 (PRIOR TO SERIAL NUMBER 6510032369)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

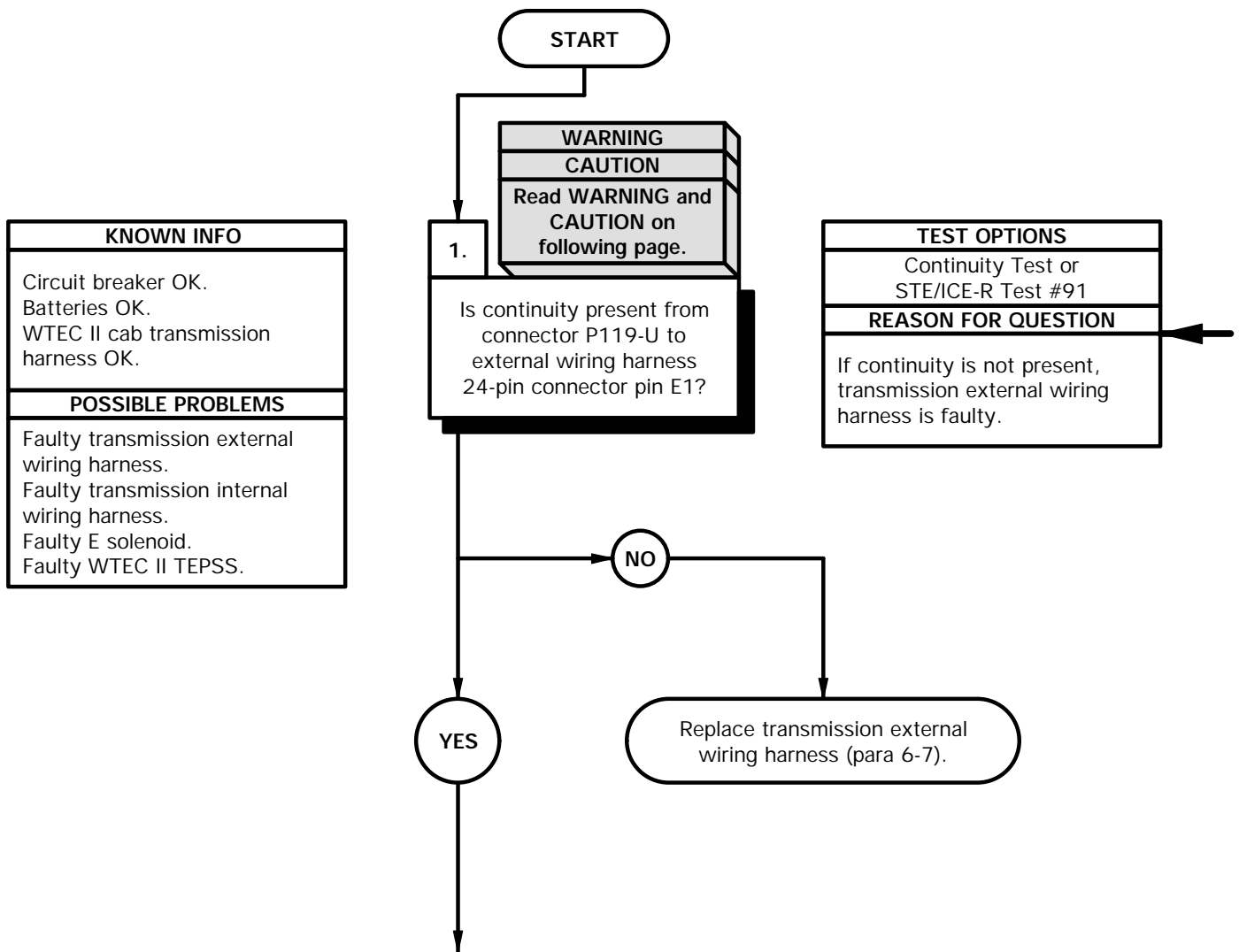
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

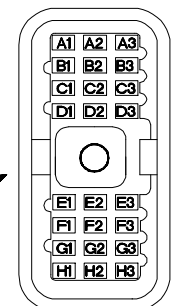
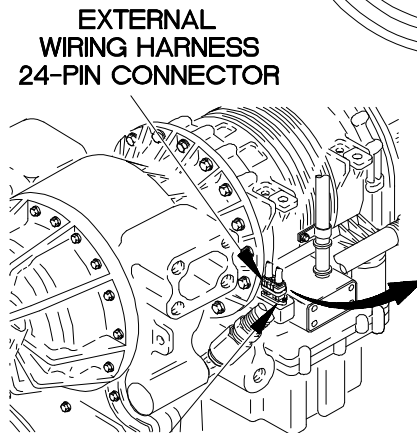
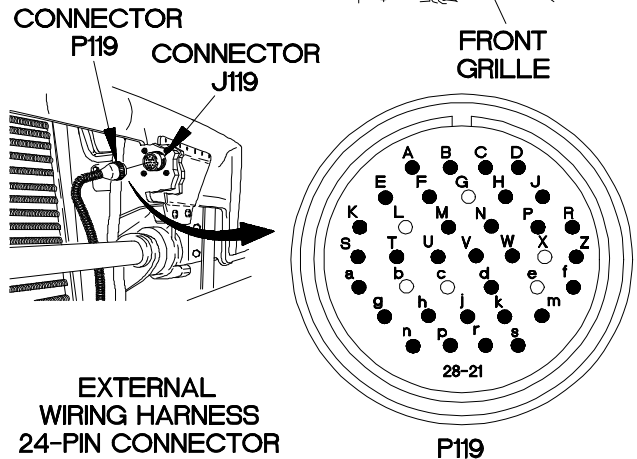
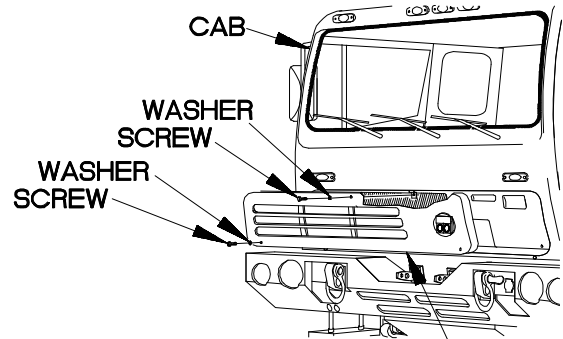
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Loosen screw in external wiring harness 24-pin connector.
- (6) Disconnect external wiring harness 24-pin from internal wiring harness 24-pin connector.
- (7) Set multimeter to ohms.
- (8) Connect positive (+) probe of multimeter to connector P119-U.
- (9) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin E1 and note reading on multimeter.
- (10) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (11) Connect positive (+) probe of multimeter to connector P119-U.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to all other pins of connector P119 and note reading on multimeter.
- (13) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (14) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



EXTERNAL WIRING HARNESS 24-PIN CONNECTOR

YBC2501B

c25. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 16 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

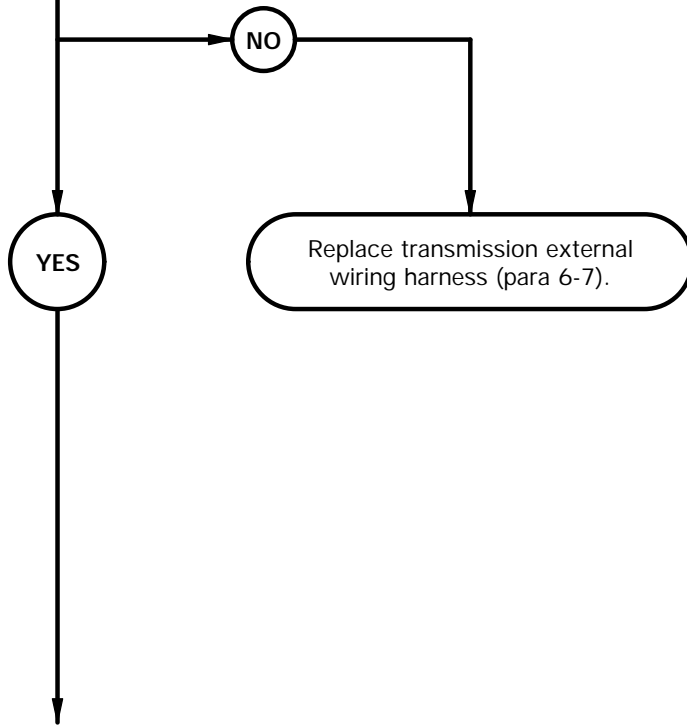
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty E solenoid. Faulty WTEC II TEPSS.

2.

CAUTION
Read CAUTION on following page.

Is continuity present from connector P119-N to external wiring harness 24-pin connector pin B2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



CAUTION

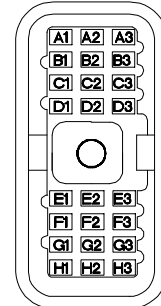
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

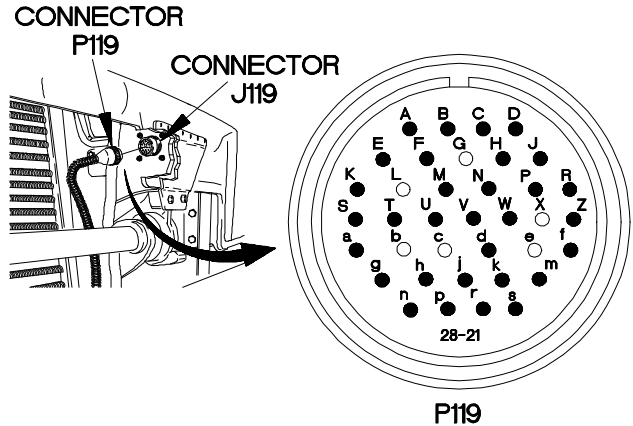
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

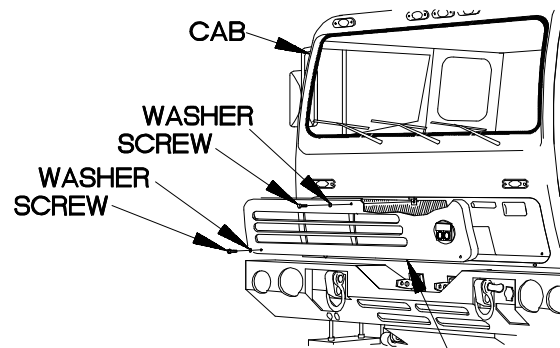
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-N.
- (3) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin B2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-N.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



EXTERNAL WIRING HARNESS 24-PIN CONNECTOR



P119



FRONT GRILLE

YBC2502B

c25. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 16 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

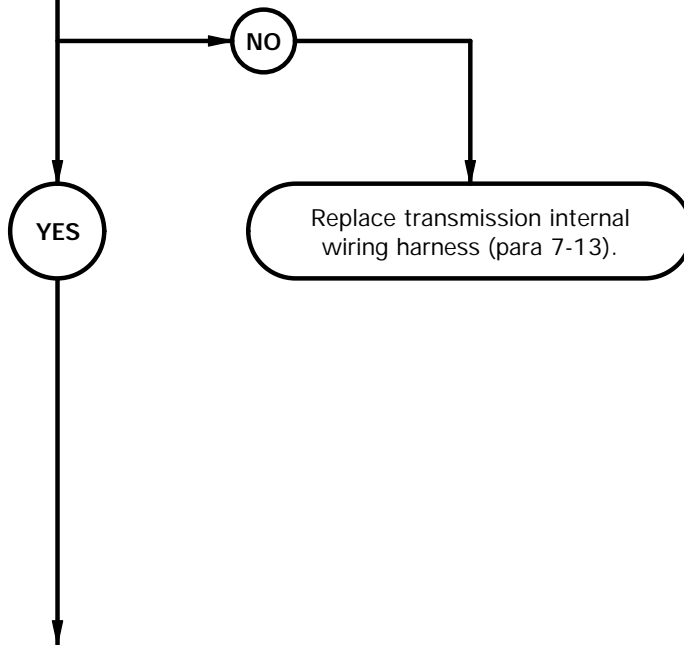
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty E solenoid. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin E1 to internal wiring harness connector E pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

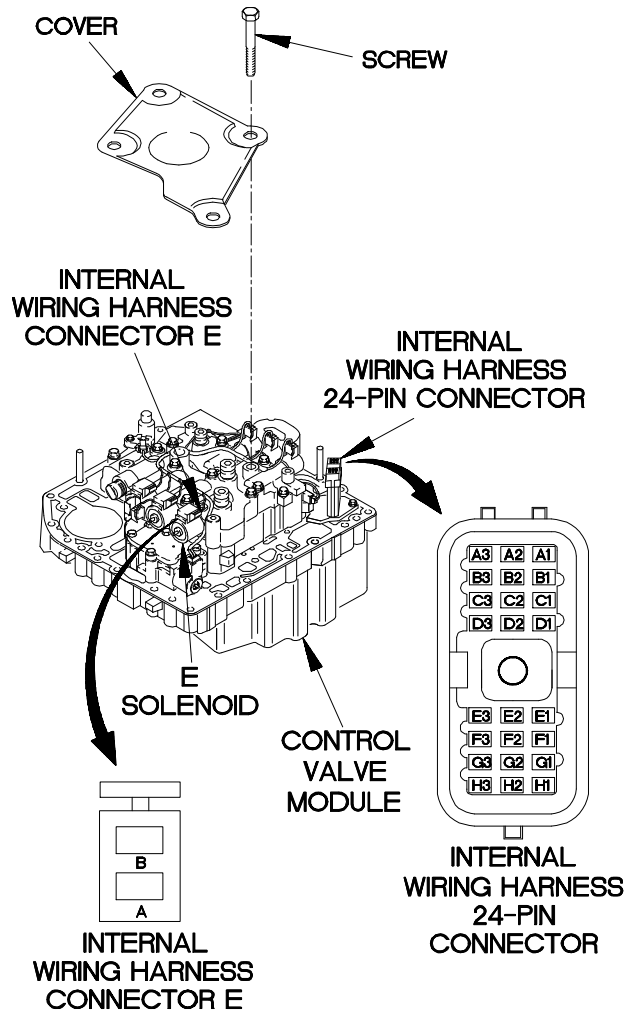
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector E from E solenoid connector.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin E1.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector E pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin E1.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



YBC2503B

c25. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 16 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

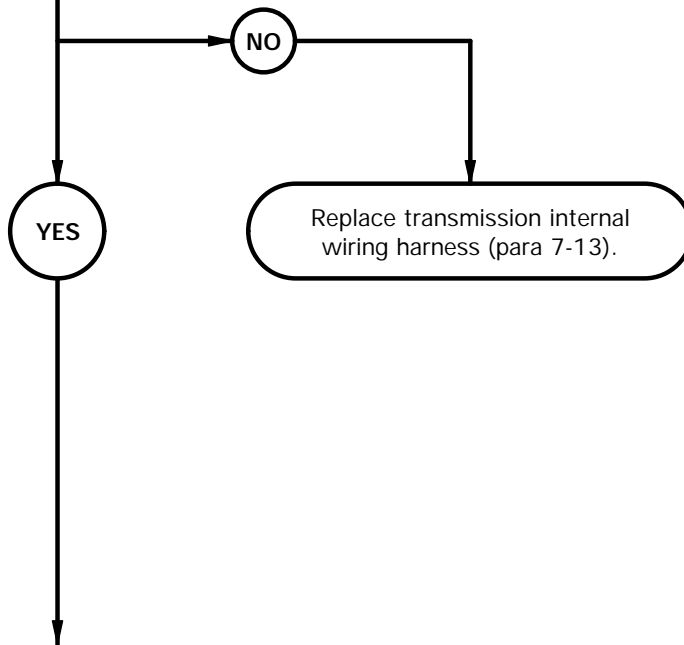
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty E solenoid. Faulty WTEC II TEPSS.

4.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin B2 to internal wiring harness connector E pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

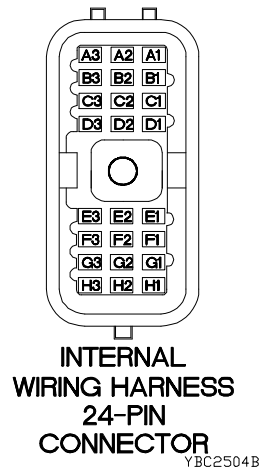
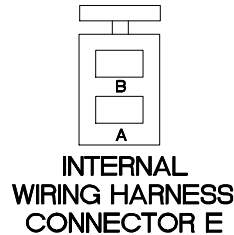
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

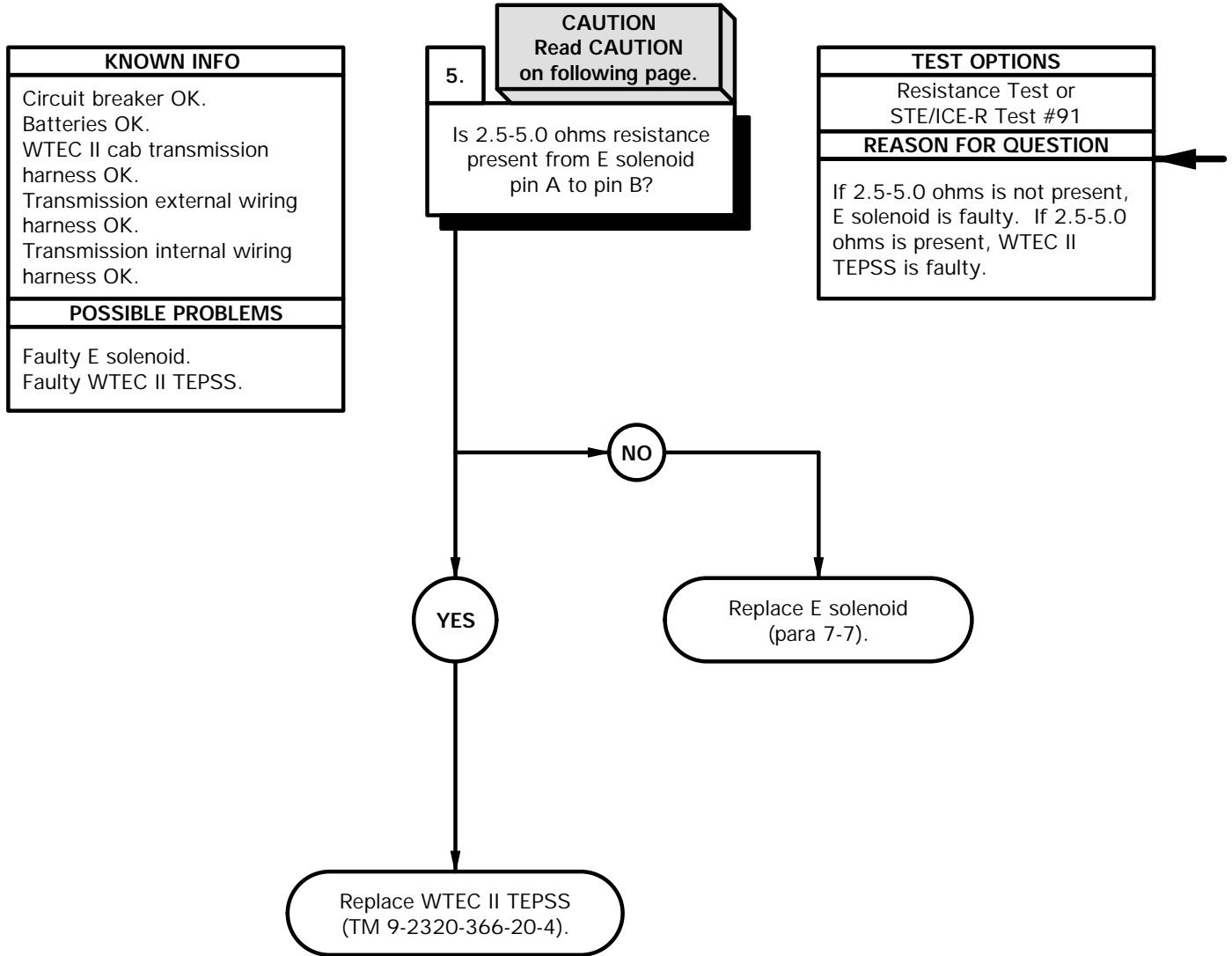
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin B2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector E pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin B2.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



c25. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 16 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)



CAUTION

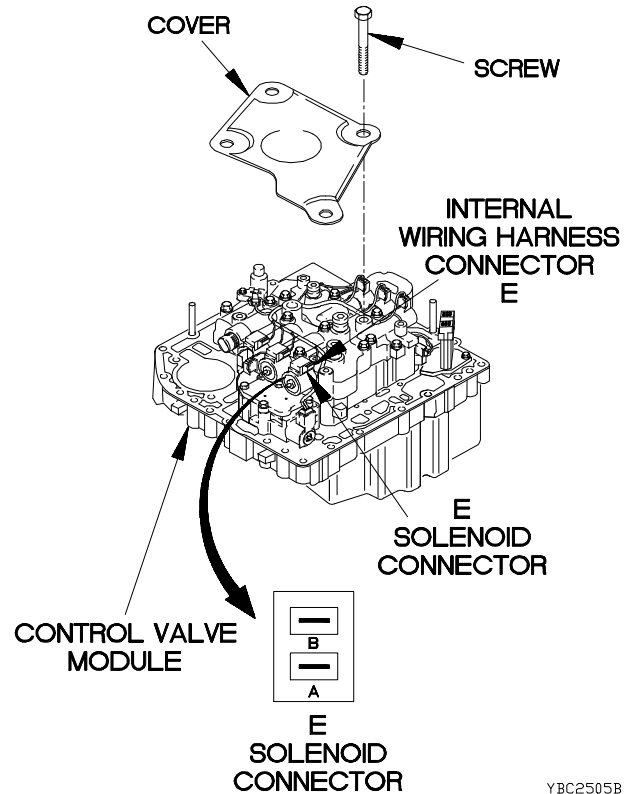
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to E solenoid connector pin A.
- (3) Connect negative (-) probe of multimeter to E solenoid connector pin B and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace E solenoid (para 7-7).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector E to E solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC2505B

c26. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

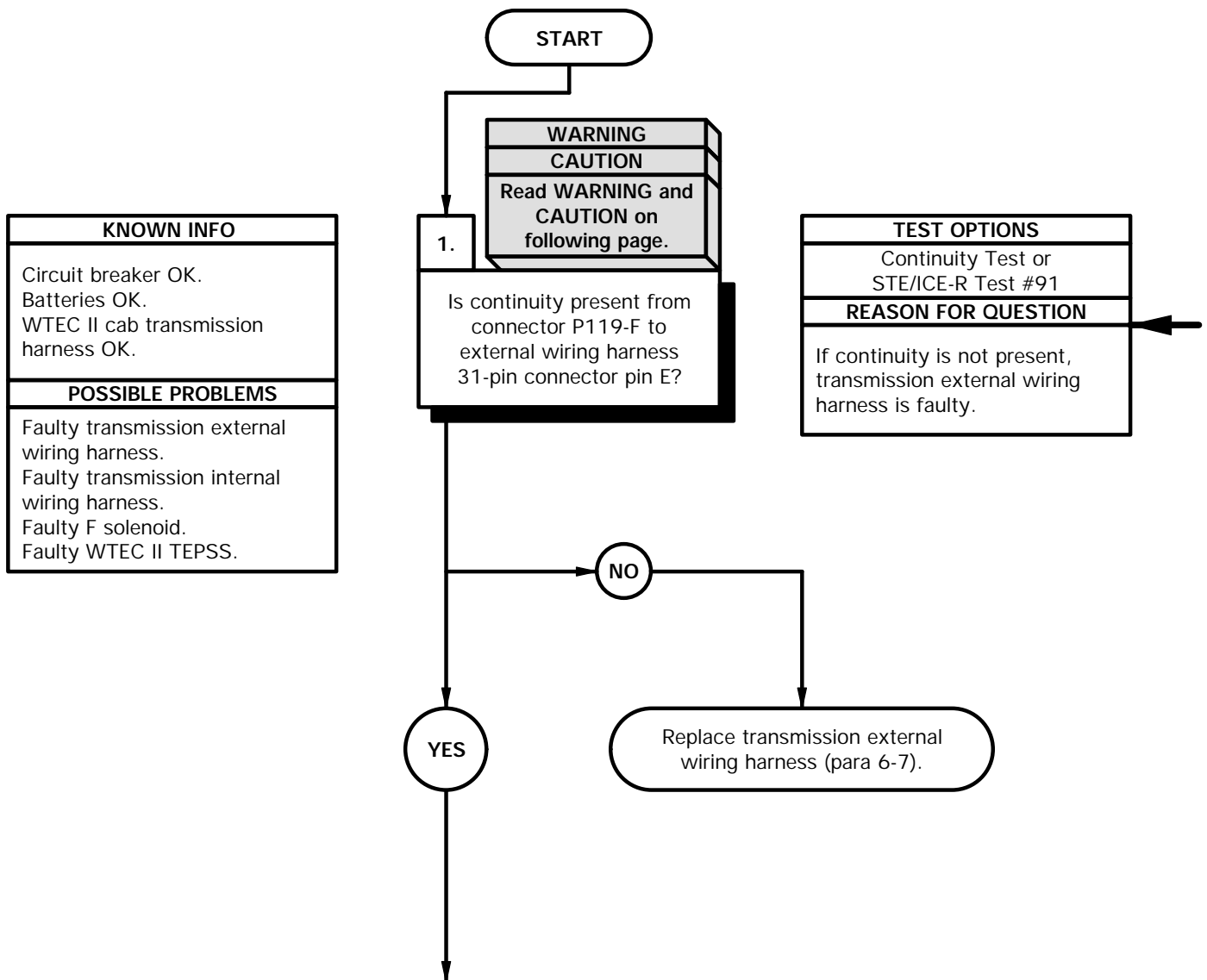
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

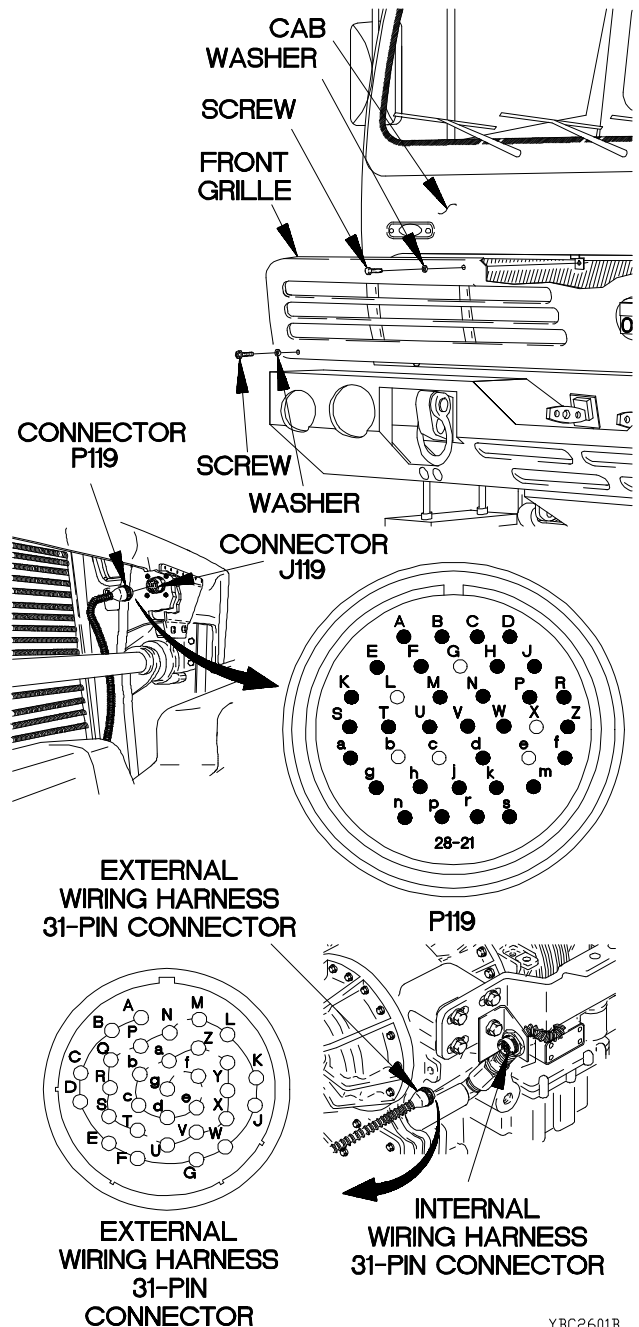
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-F.
- (8) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin E and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-F.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



YBC2601B

c26. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

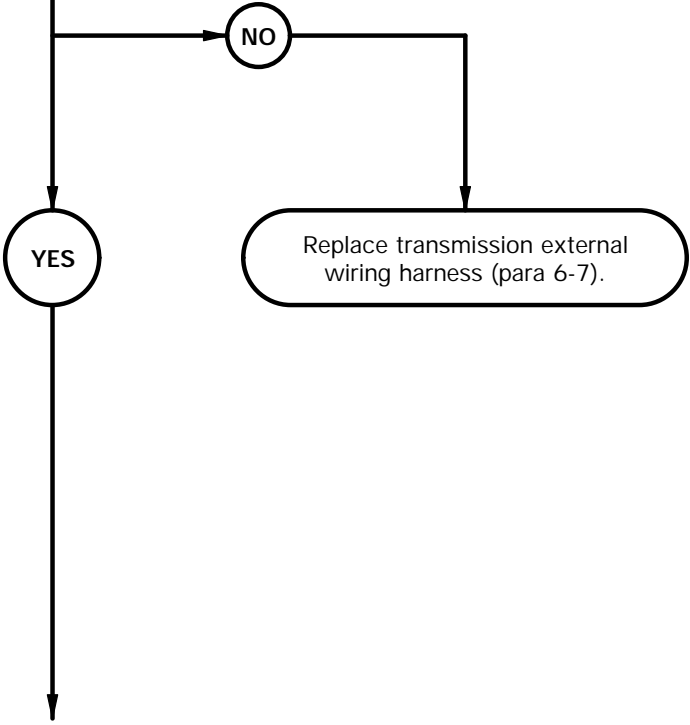
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC II TEPSS.

2.

CAUTION
Read CAUTION on following page.

Is continuity present from connector P119-H to external wiring harness 31-pin connector pin F?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



CAUTION

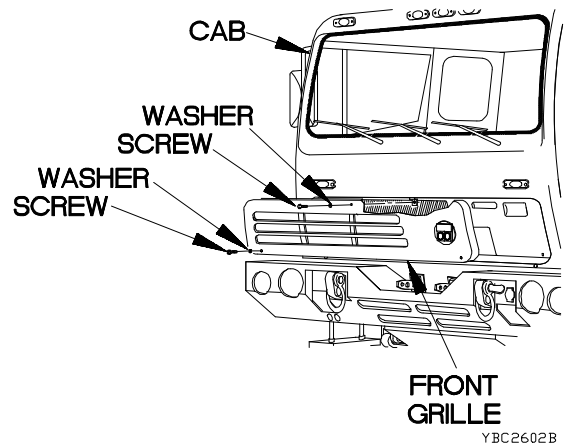
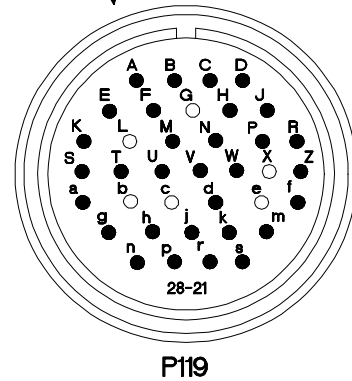
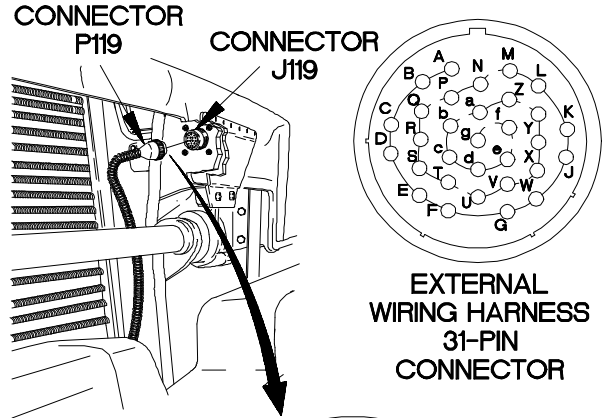
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-H.
- (3) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin F and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-H.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



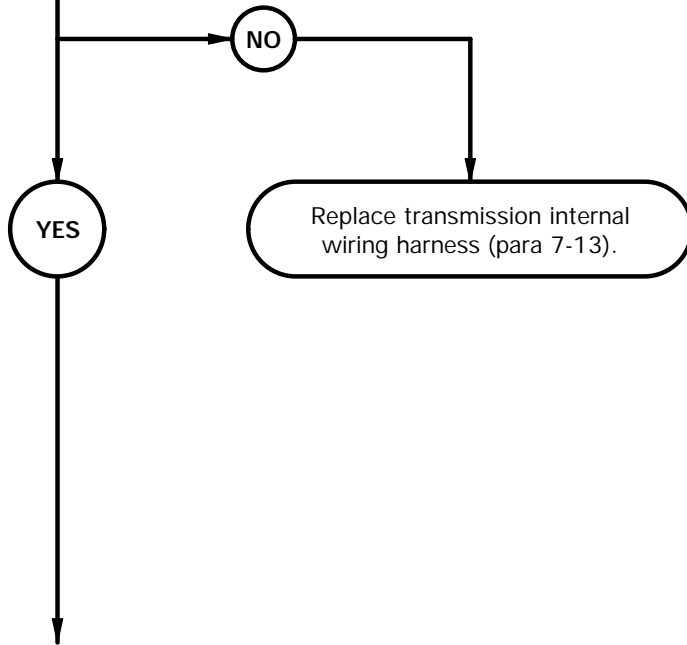
c26. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC II TEPSS.

3. **CAUTION**
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin E to internal wiring harness connector F pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

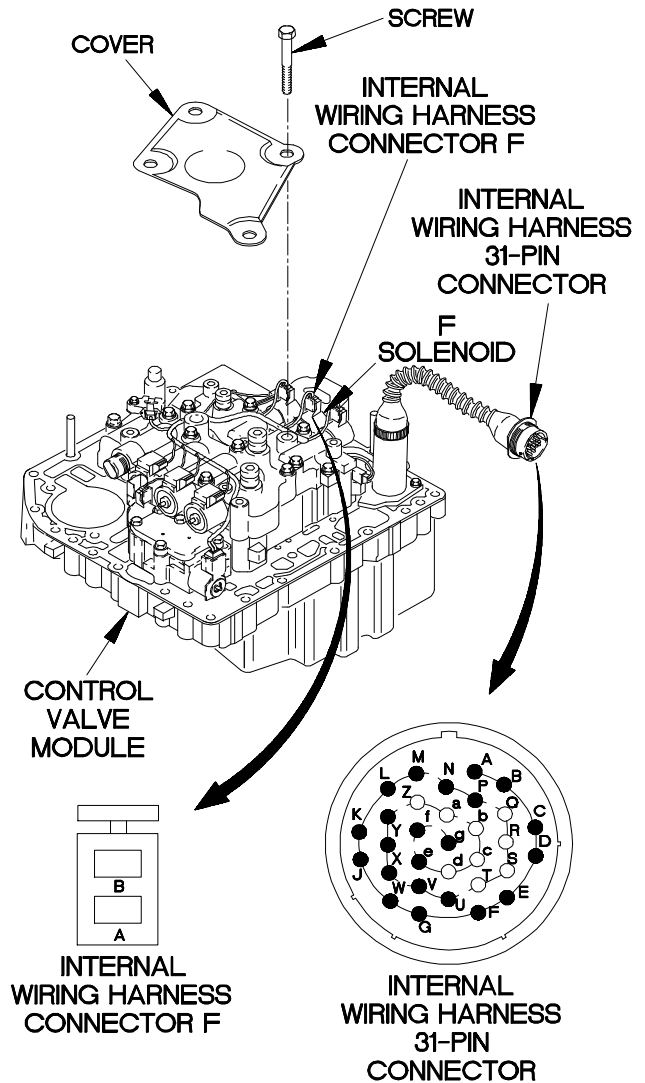
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector F from F solenoid connector.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin E.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector F pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin E.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



YBC2603B

c26. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

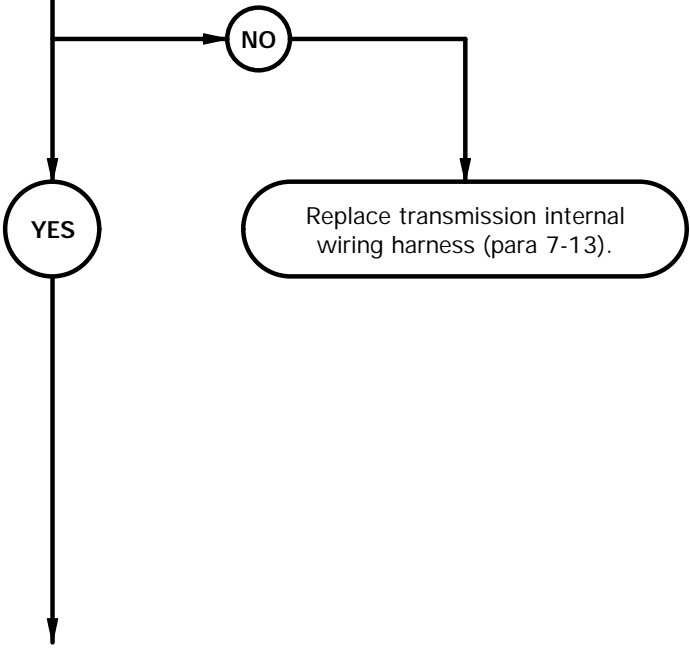
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC II TEPSS.

4.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin F to internal wiring harness connector F pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

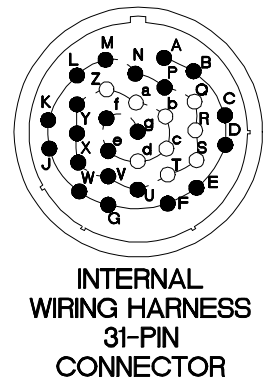
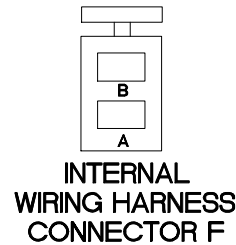
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin F.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector F pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin F.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



YBC2604B

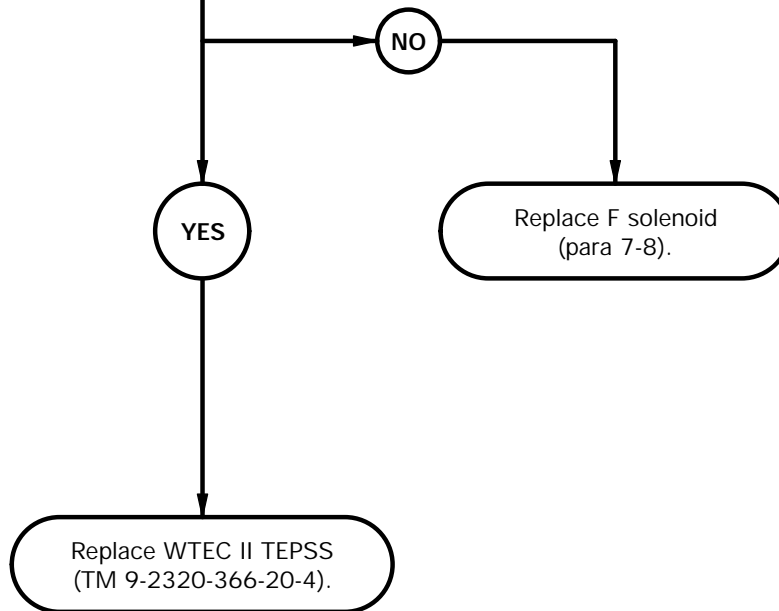
c26. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty F solenoid. Faulty WTEC II TEPSS.

5. **CAUTION**
Read CAUTION on following page.

Is 2.5-5.0 ohms resistance present from F solenoid pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms is not present, F solenoid is faulty. If 2.5-5.0 ohms is present, WTEC II TEPSS is faulty.



CAUTION

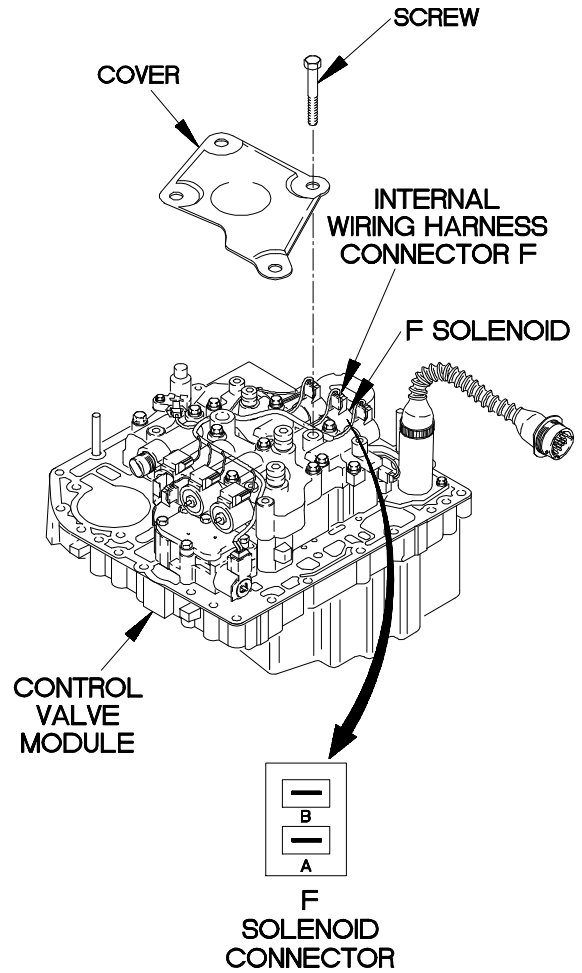
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to F solenoid connector pin A.
- (3) Connect negative (-) probe of multimeter to F solenoid connector pin B and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace F solenoid (para 7-8).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector F to F solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC2605B

c27. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

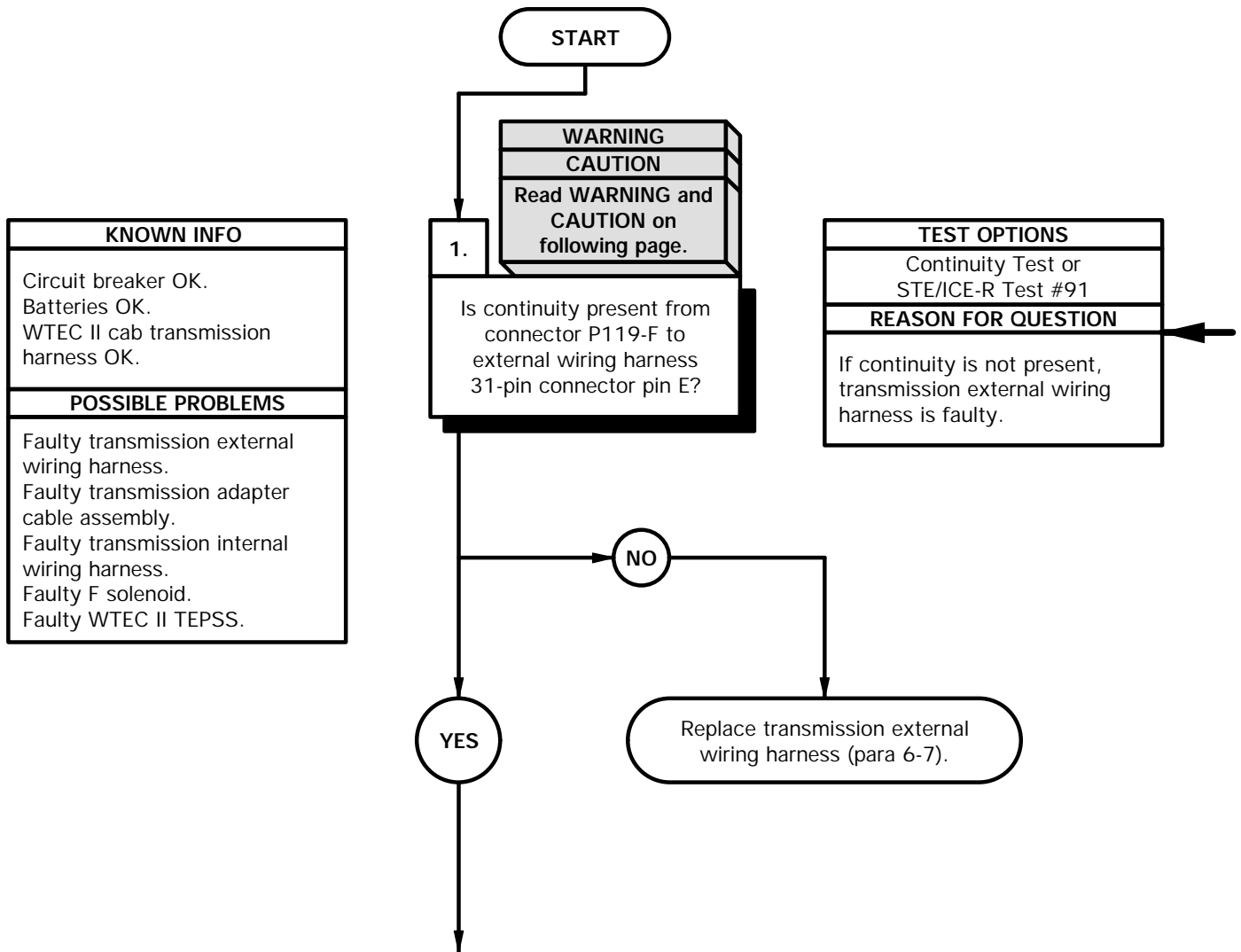
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

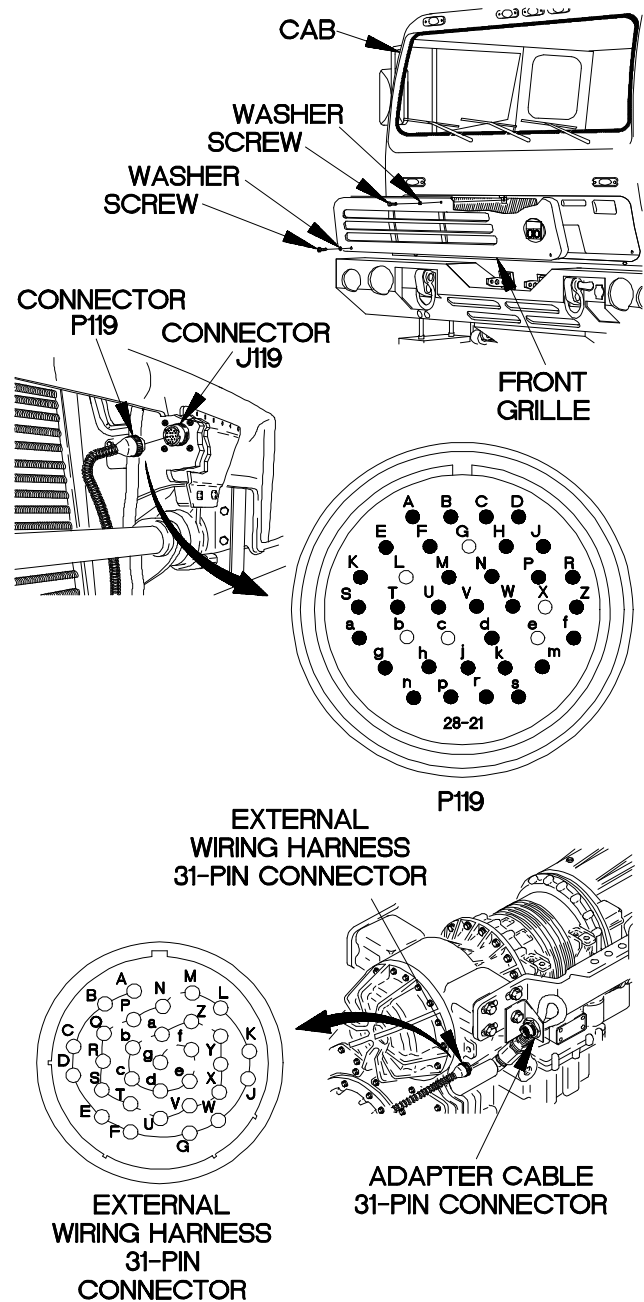
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness 31-pin connector from adapter cable 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-F.
- (8) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin E and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-F.
- (11) Connect negative (-) probe of multimeter to all other pins of connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



YBC2701B

c27. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

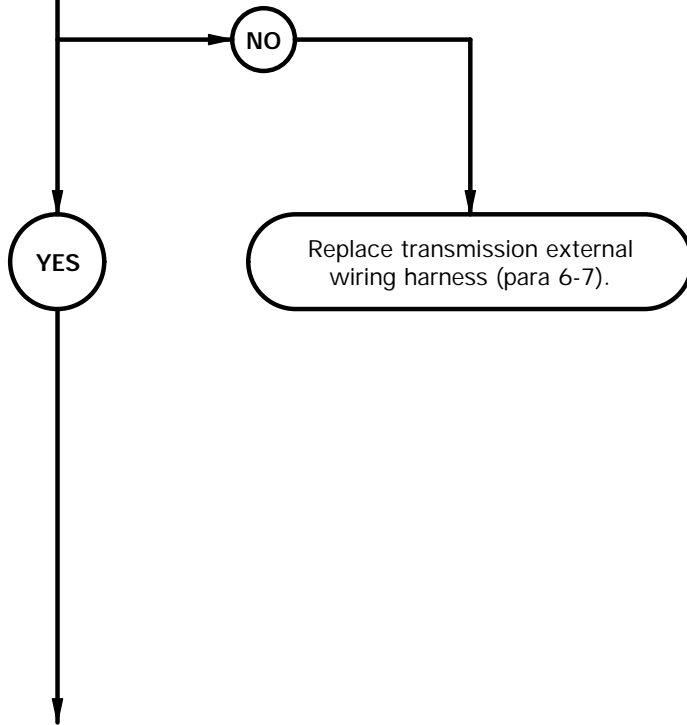
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC II TEPSS.

2.

CAUTION
Read CAUTION on following page.

Is continuity present from connector P119-H to external wiring harness 31-pin connector pin F?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



CAUTION

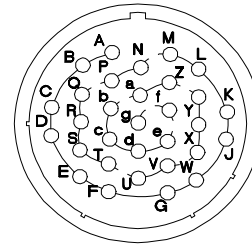
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

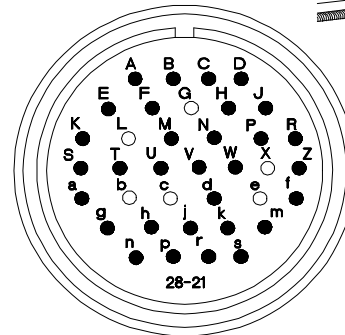
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

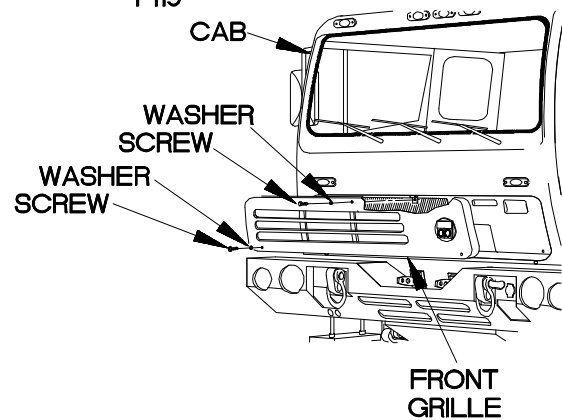
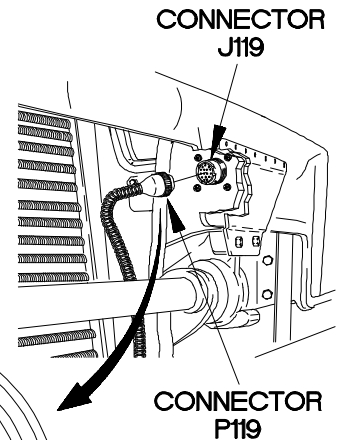
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-H.
- (3) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin F and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-H.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



EXTERNAL WIRING HARNESS 31-PIN CONNECTOR



P119



YBC2702B

c27. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

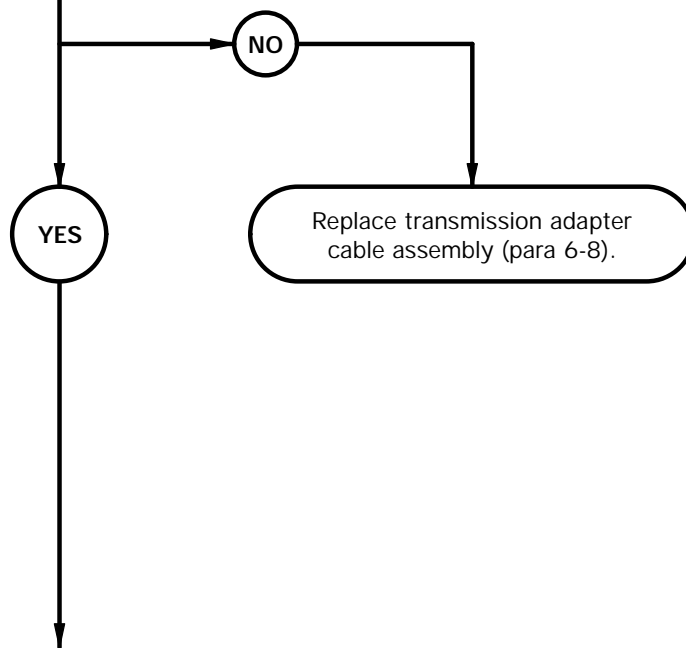
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin E to adapter cable 24-pin connector pin D3?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.



CAUTION

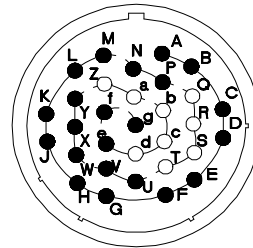
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

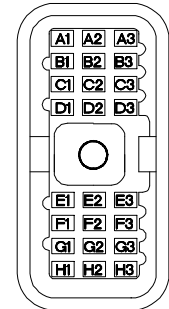
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

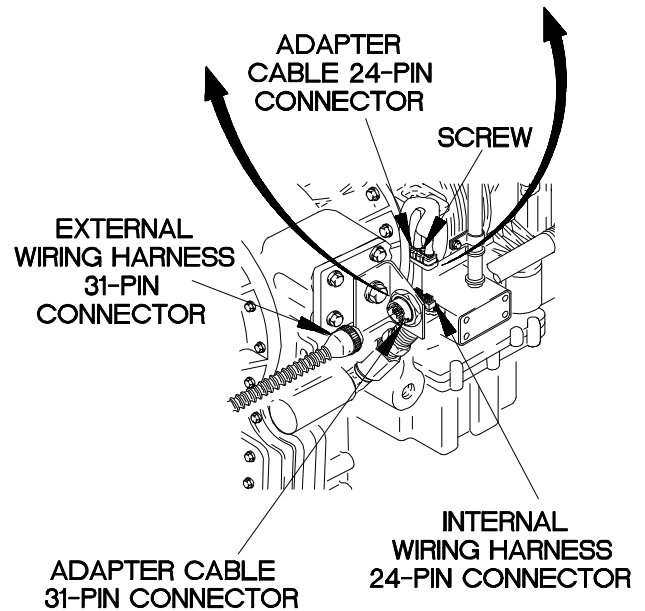
- (1) Loosen screw in adapter cable 24-pin connector.
- (2) Disconnect adapter cable 24-pin connector from internal wiring harness 24-pin connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin E.
- (5) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin D3 and note reading on multimeter.
- (6) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (7) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin E.
- (8) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).



ADAPTER CABLE 31-PIN CONNECTOR



ADAPTER CABLE 24-PIN CONNECTOR



YBC2703B

c27. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

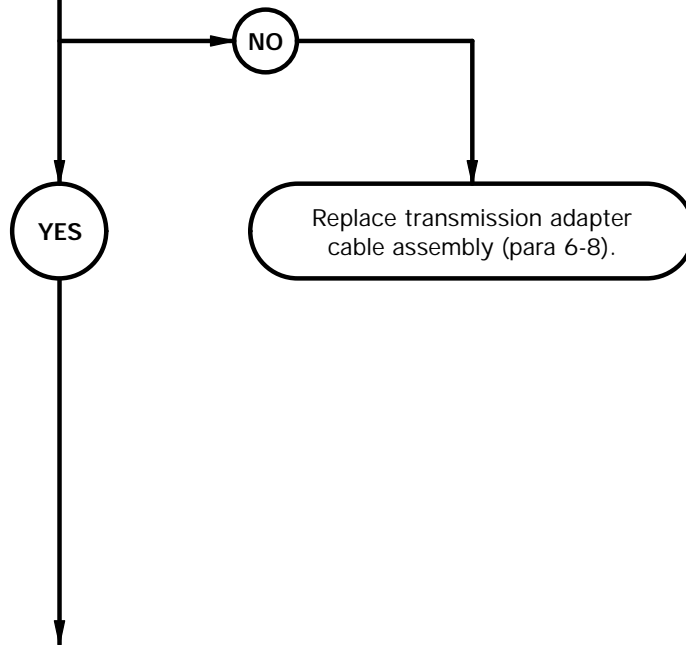
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC II TEPSS.

4.

CAUTION
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin F to adapter cable 24-pin connector pin D2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.



CAUTION

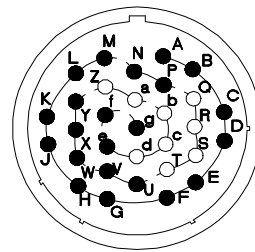
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

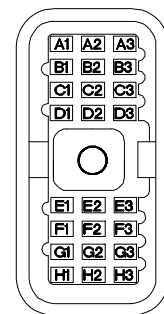
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin F.
- (3) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin D2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (5) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin F.
- (6) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).
- (9) Connect adapter cable 31-pin connector to external wiring harness 31-pin connector.



**ADAPTER CABLE
31-PIN CONNECTOR**



**ADAPTER CABLE
24-PIN
CONNECTOR**

YBC2704B

c27. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

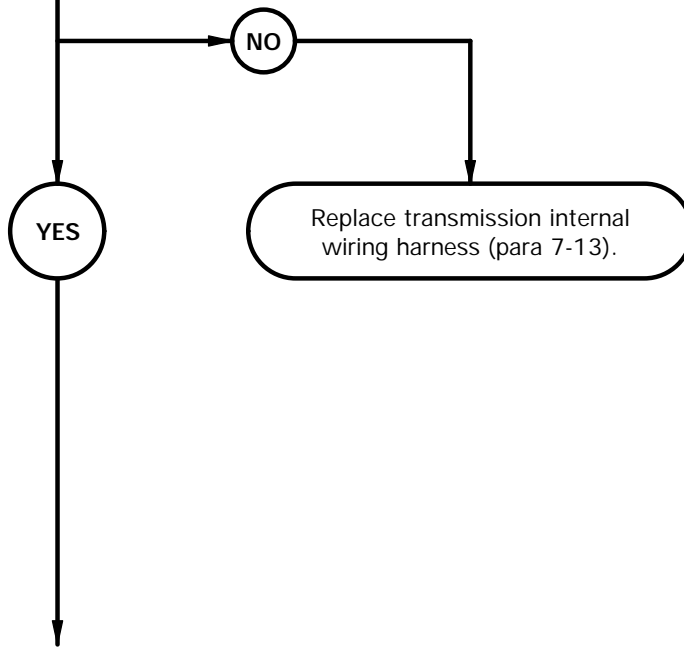
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC II TEPSS.

5.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin D3 to internal wiring harness connector F pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

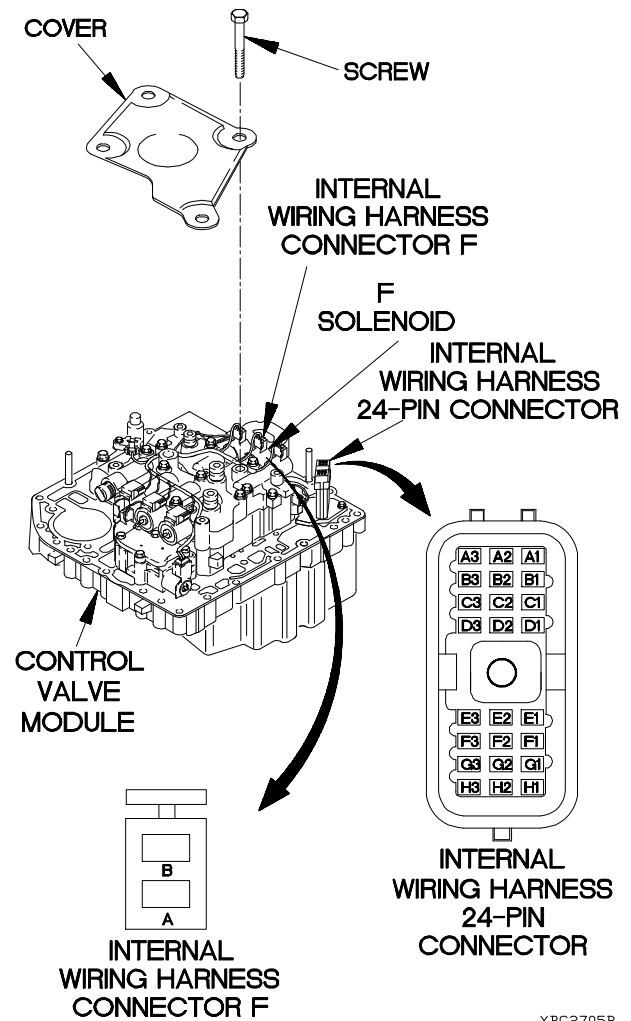
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector F from F solenoid connector.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin D3.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector F pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin D3.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



YBC2705B

c27. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

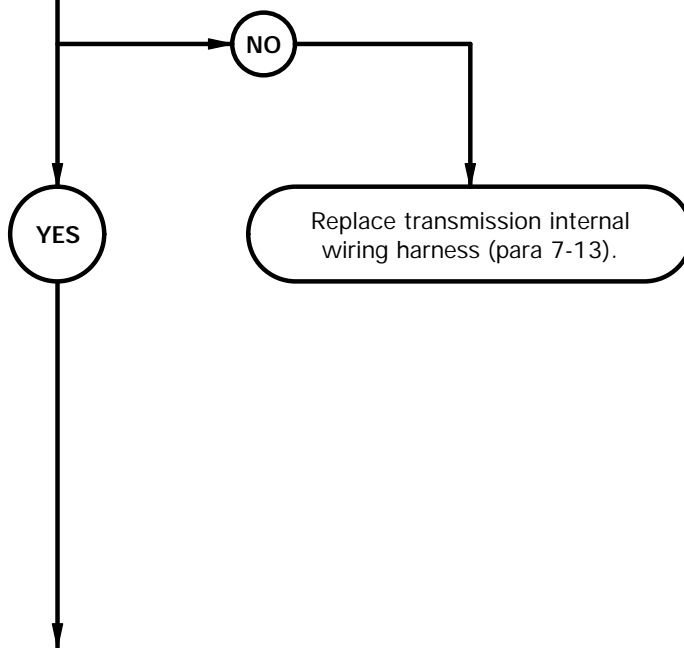
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC II TEPSS.

6.

CAUTION
 Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin D2 to internal wiring harness connector F pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

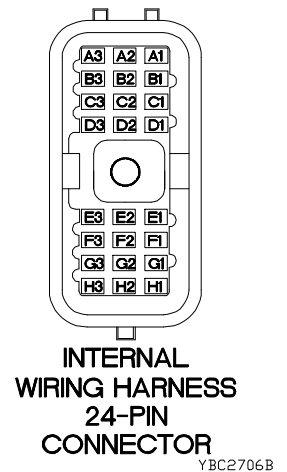
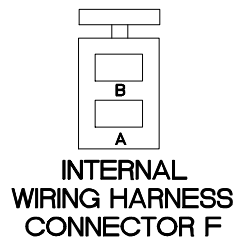
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

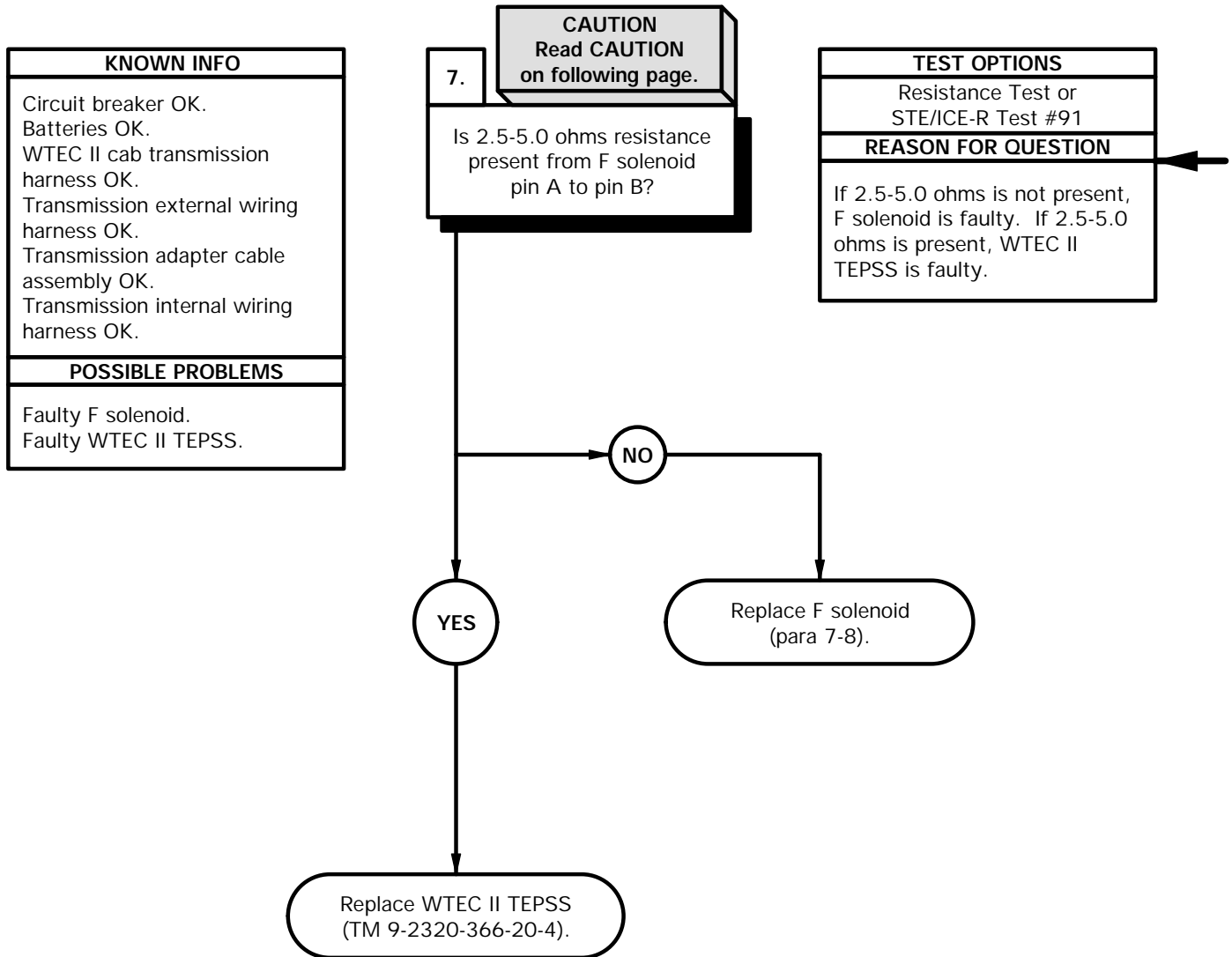
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin D2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector F pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin D2.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



c27. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



CAUTION

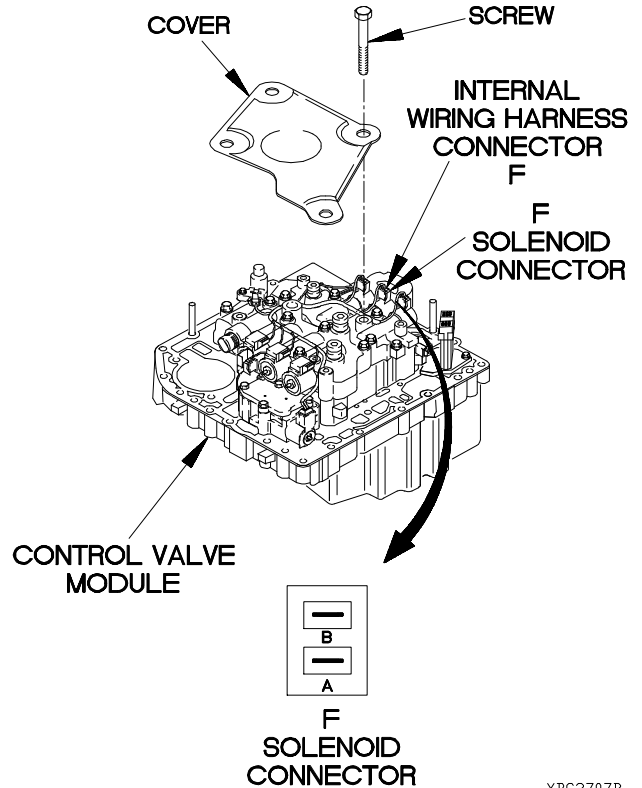
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to F solenoid connector pin A.
- (3) Connect negative (-) probe of multimeter to F solenoid connector pin B and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace F solenoid (para 7-8).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector F to F solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC2707B

c28. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45 AND/OR 69 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

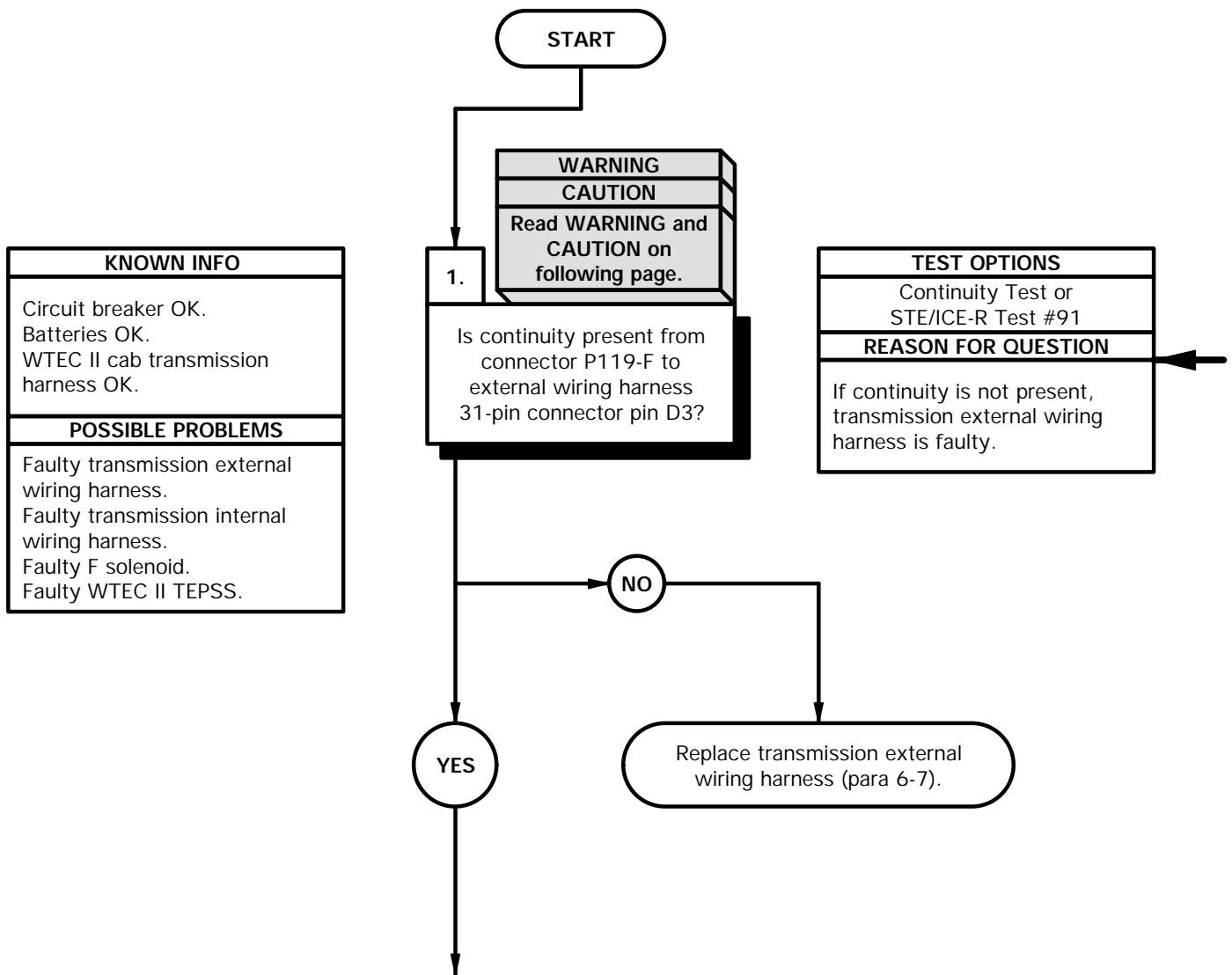
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

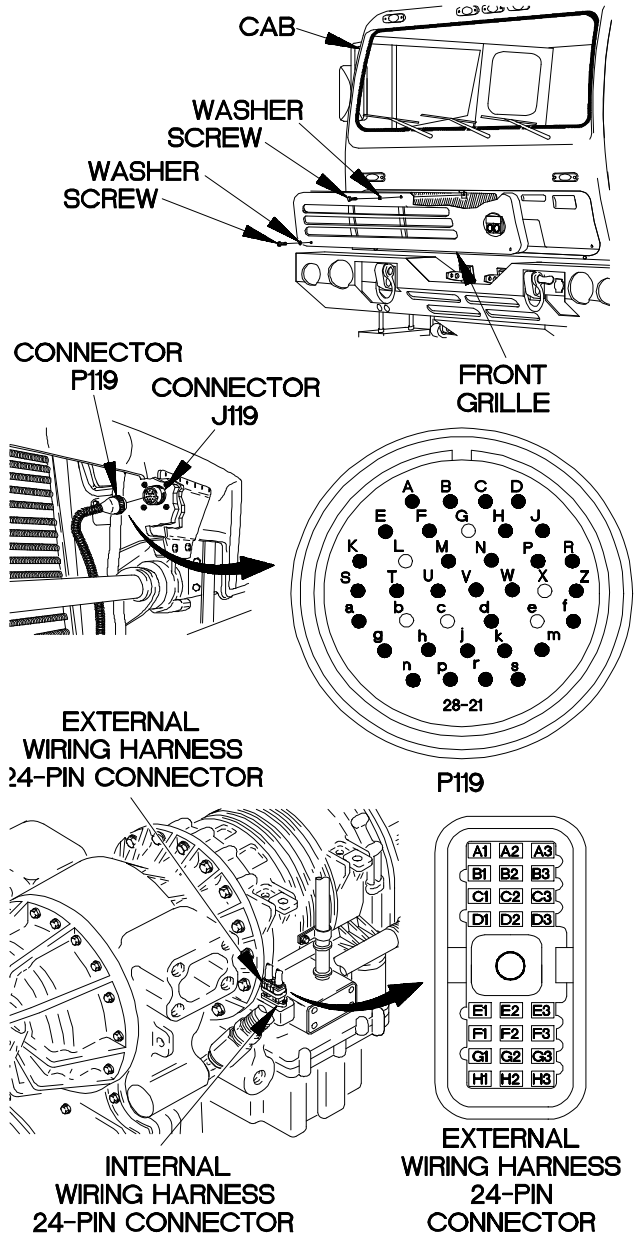
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

- CONTINUITY TEST**
- (1) Remove two screws and washers from front grille.
 - (2) Remove screw and washer from front grille.
 - (3) Remove front grille from cab.
 - (4) Disconnect connector P119 from connector J119.
 - (5) Loosen screw in external wiring harness 24-pin connector.
 - (6) Disconnect external wiring harness 24-pin connector from internal wiring harness 24-pin connector.
 - (7) Set multimeter to ohms.
 - (8) Connect positive (+) probe of multimeter to connector P119-F.
 - (9) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin D3 and note reading on multimeter.
 - (10) If continuity is not present, replace transmission external wiring harness (para 6-7).
 - (11) Connect positive (+) probe of multimeter to connector P119-F.

- CONTINUITY TEST (Cont)**
- (12) Connect negative (-) probe of multimeter to all other pins of connector P119 and note reading on multimeter.
 - (13) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
 - (14) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



YBC2801B

c28. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45 AND/OR 69 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

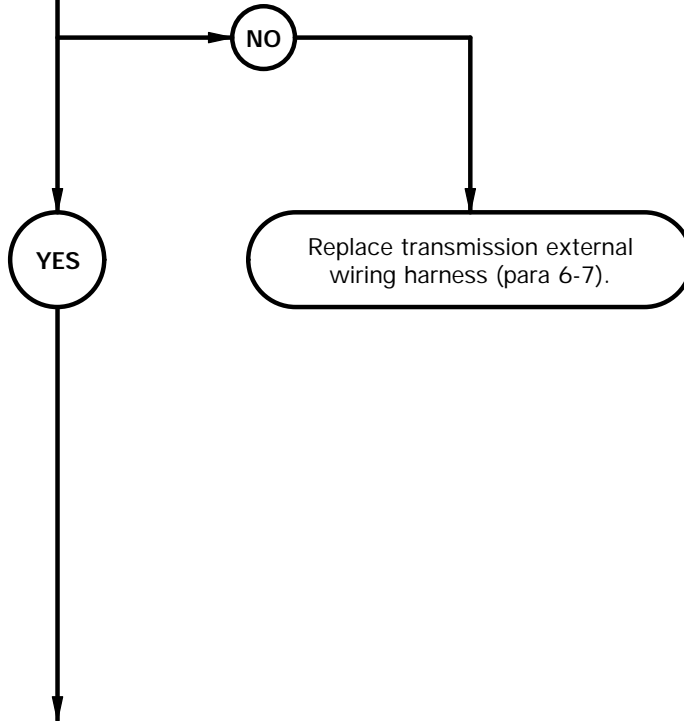
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II ab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC II TEPSS.

2.

CAUTION
Read CAUTION on following page.

Is continuity present from connector P119-H to external wiring harness 24-pin connector pin D2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



CAUTION

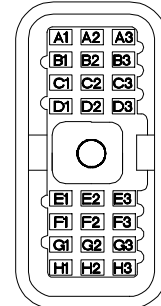
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

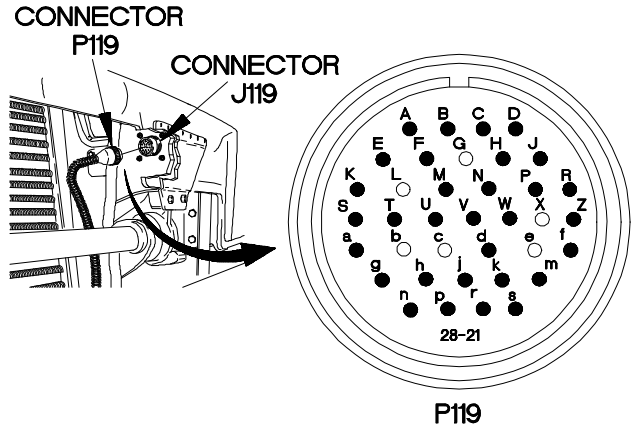
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

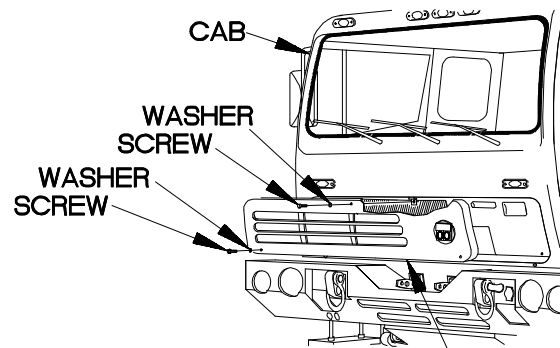
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-H.
- (3) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin D2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-H.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



EXTERNAL WIRING HARNESS 24-PIN CONNECTOR



P119



FRONT GRILLE

YBC2802B

c28. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45 AND/OR 69 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

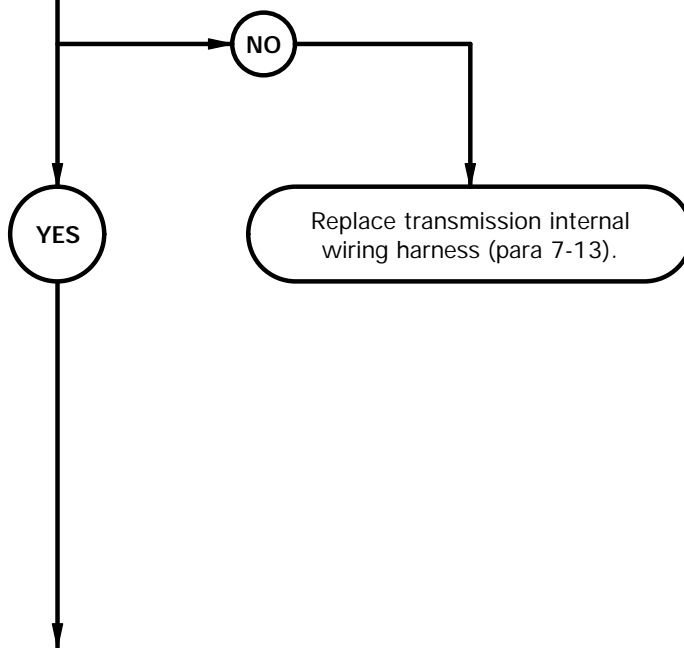
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin D3 to internal wiring harness connector F pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

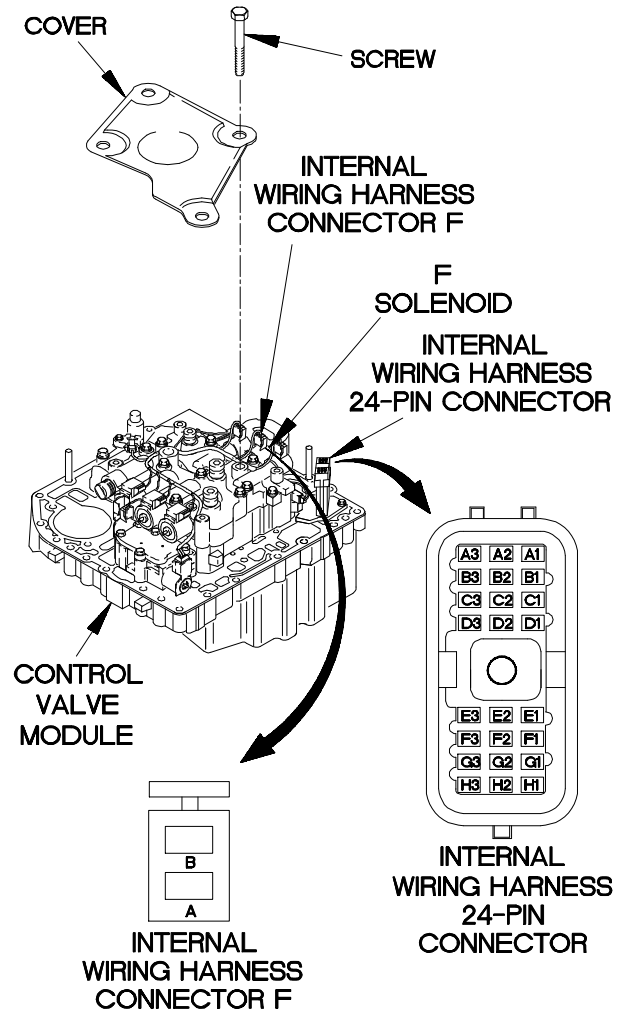
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector F from F solenoid connector.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin D3.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector F pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin D3.
- (9) Connect negative (-) probe of multimeter to all other pins internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



YBC2803B

c28. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45 AND/OR 69 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

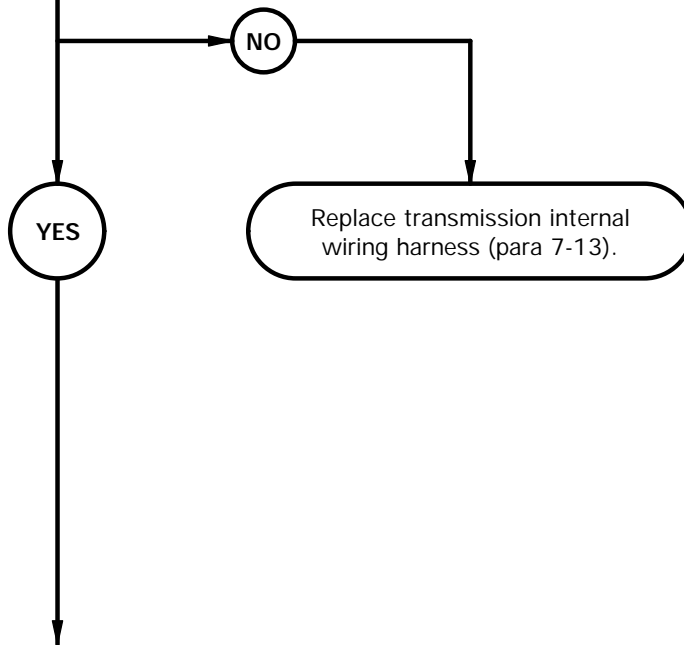
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC II TEPSS.

4.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin D2 to internal wiring harness connector F pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

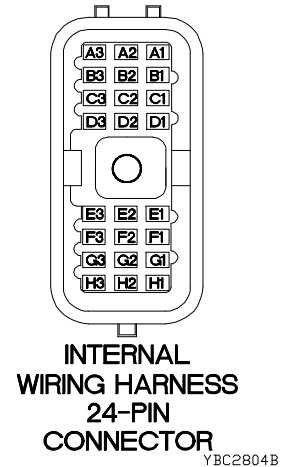
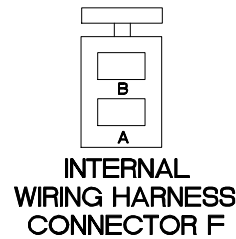
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin D2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector F pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin D2.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



c28. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45 AND/OR 69 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

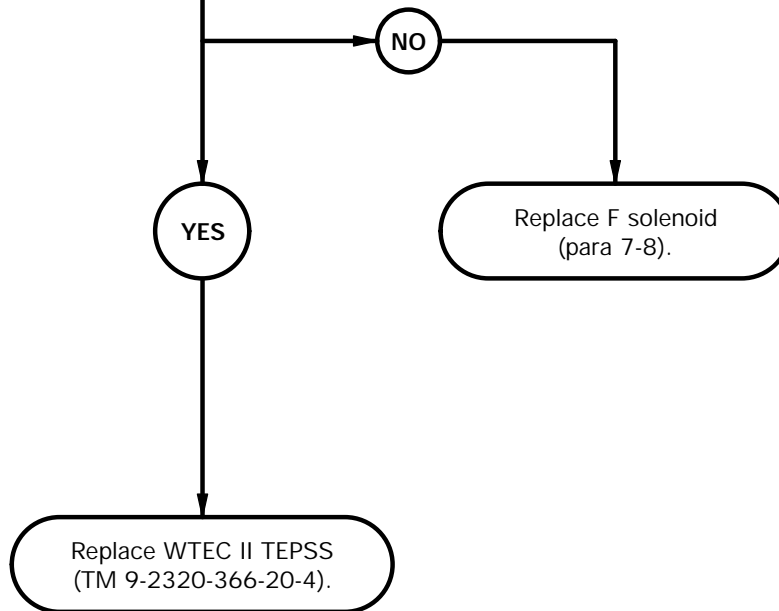
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty F solenoid. Faulty WTEC II TEPSS.

5.

CAUTION
Read CAUTION on following page.

Is 2.5-5.0 ohms resistance present from F solenoid pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms is not present, F solenoid is faulty. If 2.5-5.0 ohms is present, WTEC II TEPSS is faulty.



CAUTION

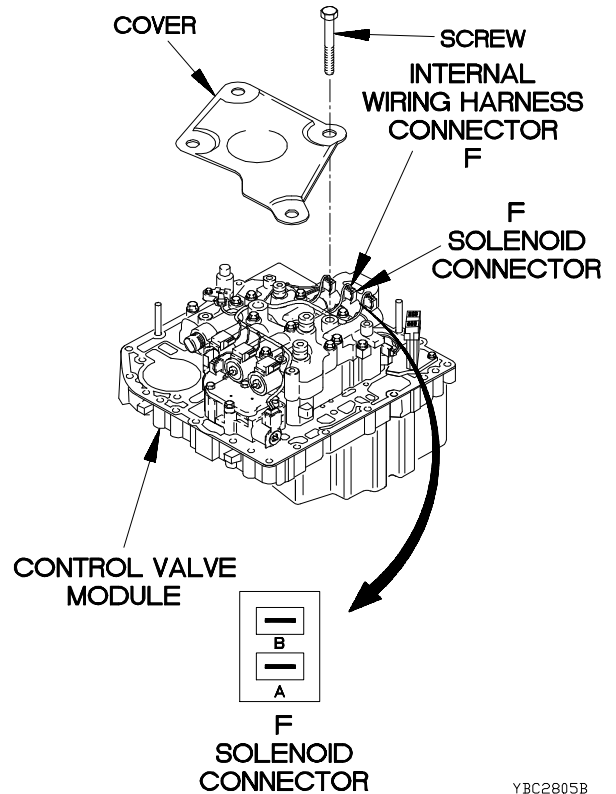
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to F solenoid connector pin A.
- (3) Connect negative (-) probe of multimeter to F solenoid connector pin B and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace F solenoid (para 7-8).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector F to F solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC2805B

c29. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 22 (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

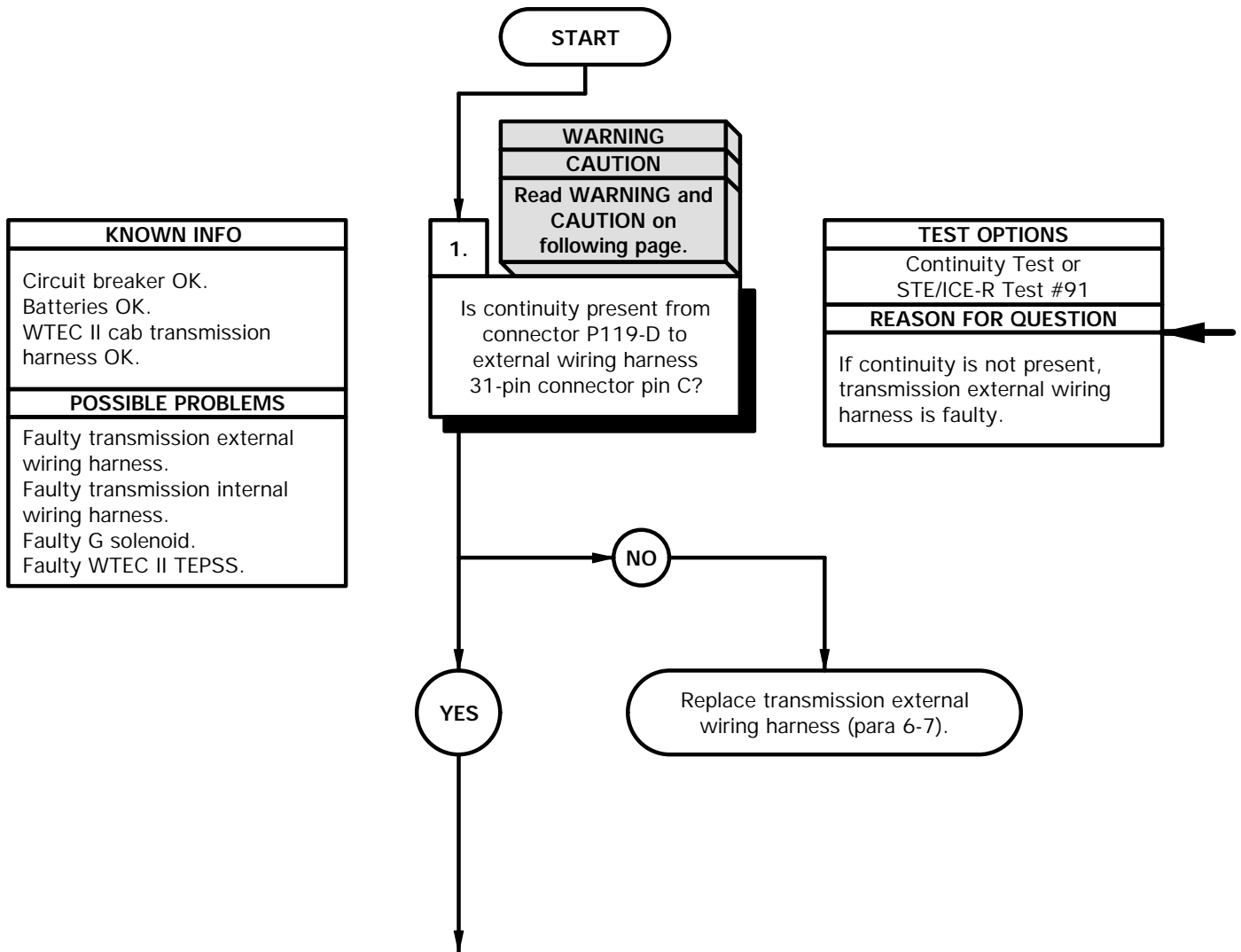
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

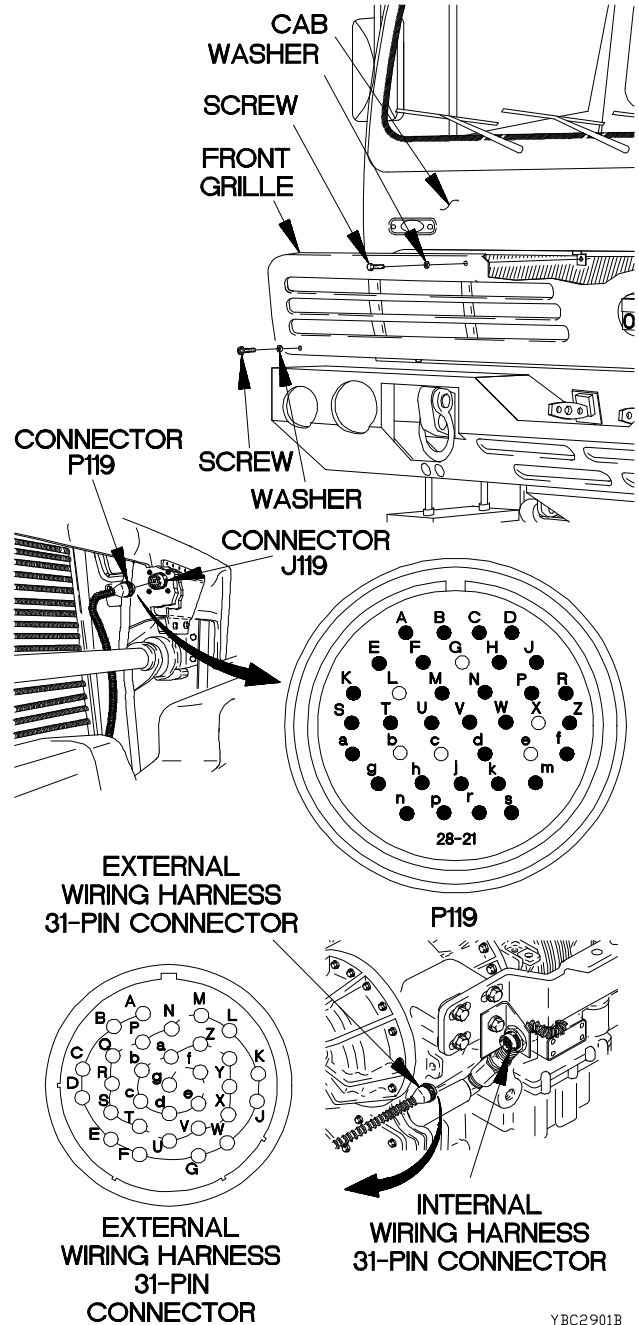
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin harness connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-D.
- (8) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin C and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-D.

CONTINUITY TEST (Cont)

- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



YBC2901B

c29. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 22 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

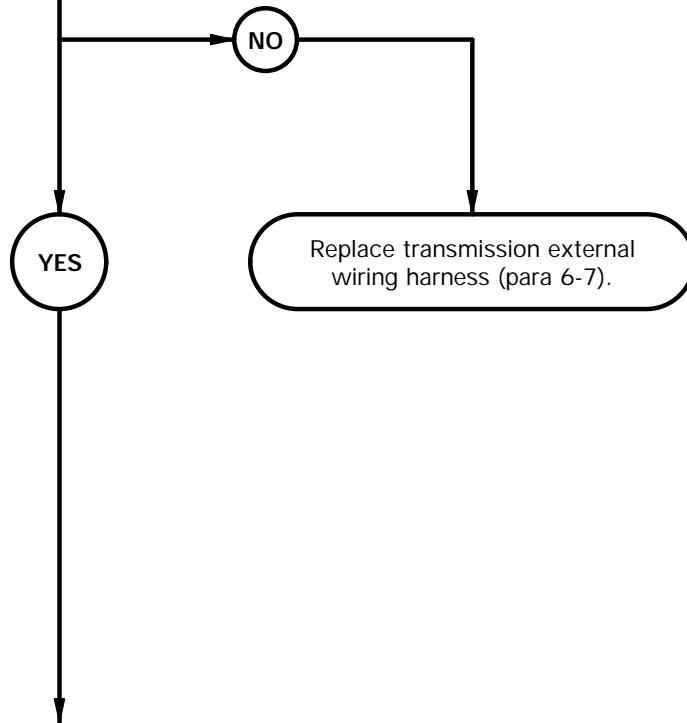
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty G solenoid. Faulty WTEC II TEPSS.

2.

CAUTION
Read CAUTION on following page.

Is continuity present from connector P119-V to external wiring harness 31-pin connector pin L?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



CAUTION

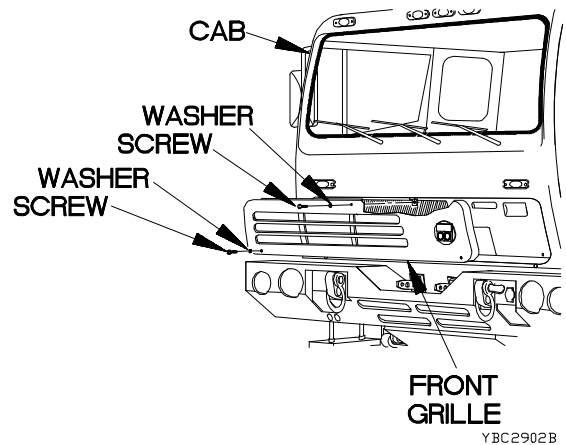
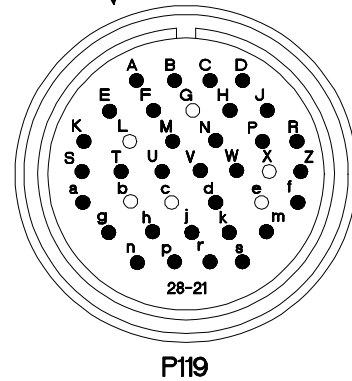
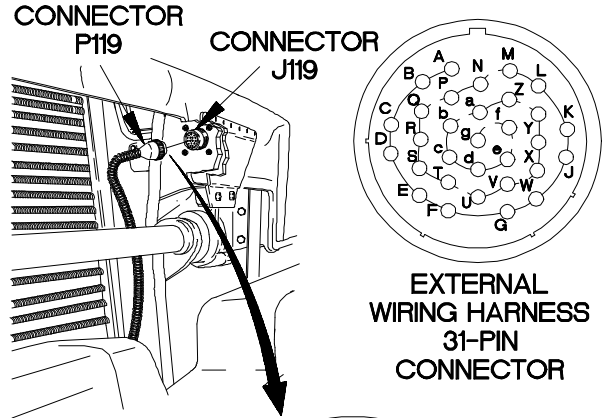
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-V.
- (3) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin L and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-V.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (8) Connect connector P119 to connector J119.
- (9) Position front grille on cab with washer and screw.
- (10) Position two washers and screws in front grille.
- (11) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (12) Tighten two screws to 24 lb-in. (3 N·m).



c29. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 22 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

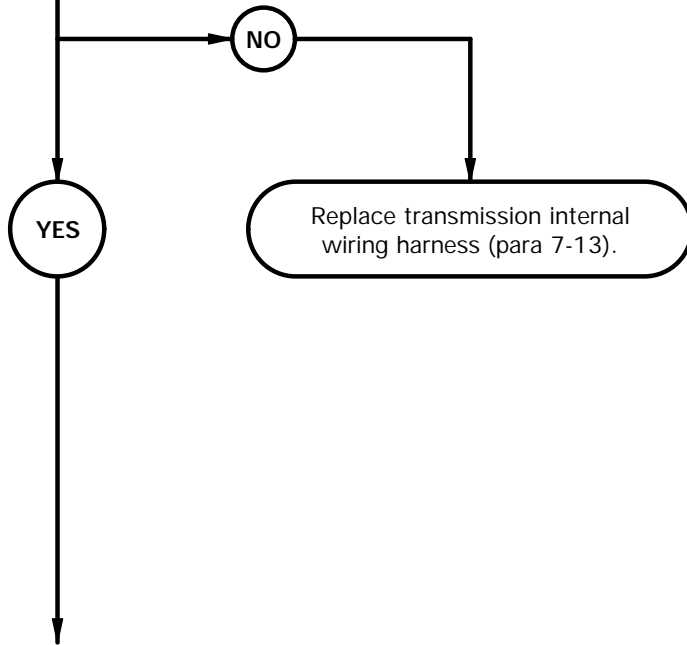
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty G solenoid. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin C to internal wiring harness connector G pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

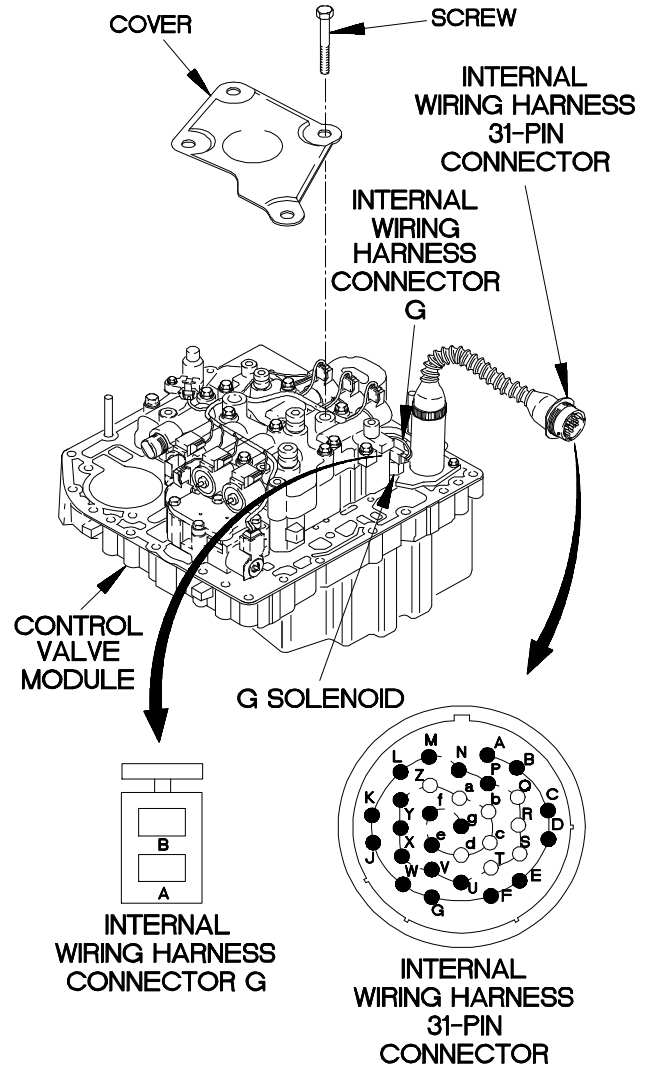
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector G from G solenoid connector.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin C.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector G pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin C.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



YBC2903B

c29. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 22 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

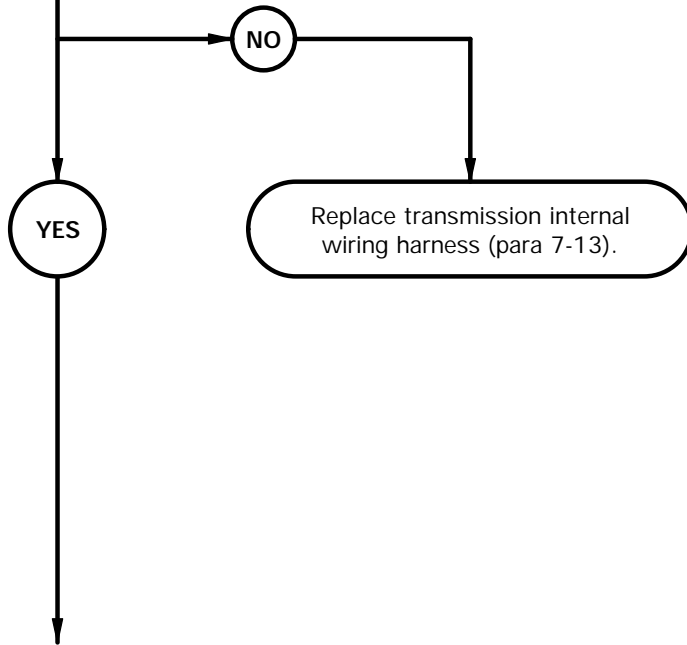
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty G solenoid. Faulty WTEC II TEPSS.

4.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin L to internal wiring harness connector G pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

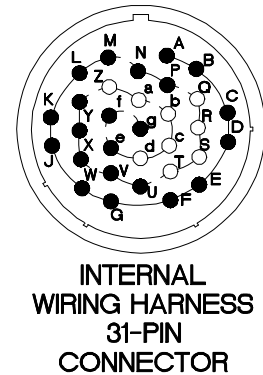
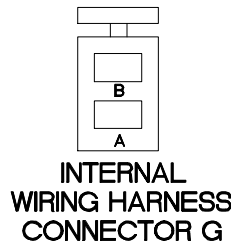
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

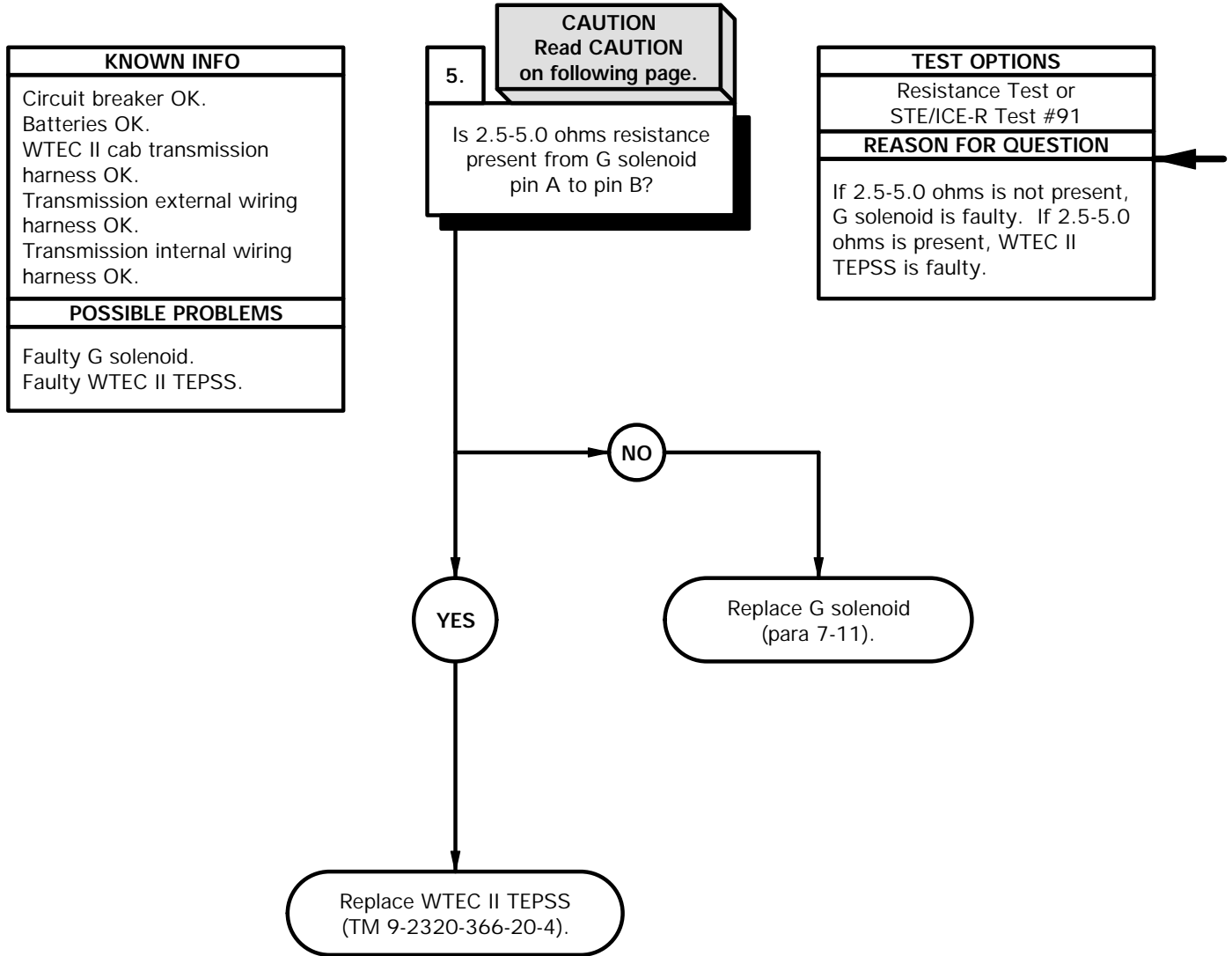
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin L.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector G pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin L.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



YBC2904B

c29. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 22 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



CAUTION

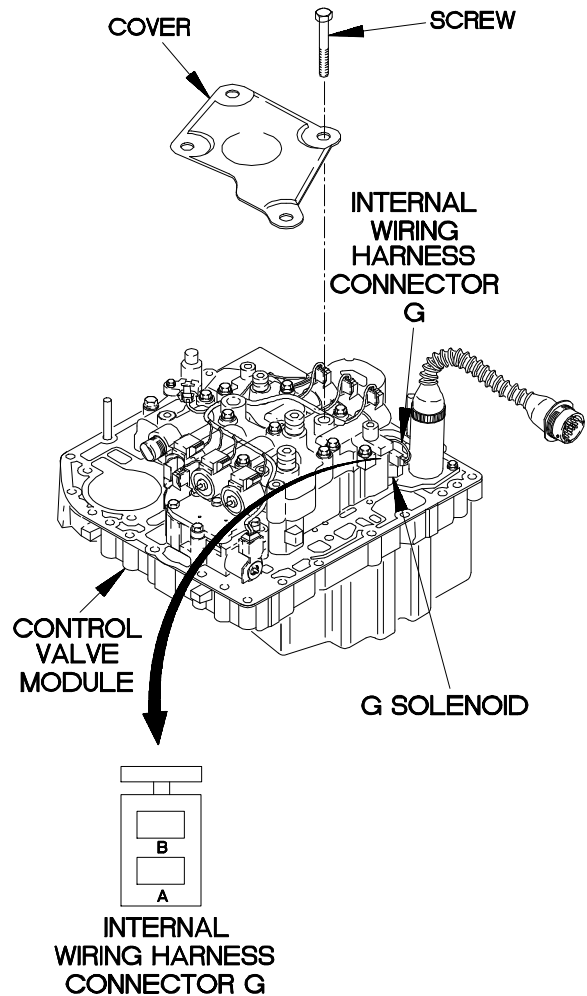
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to G solenoid connector pin A.
- (3) Connect negative (-) probe of multimeter to G solenoid connector pin B and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace G solenoid (para 7-11).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector G to G solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC2905B

c30. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 22 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

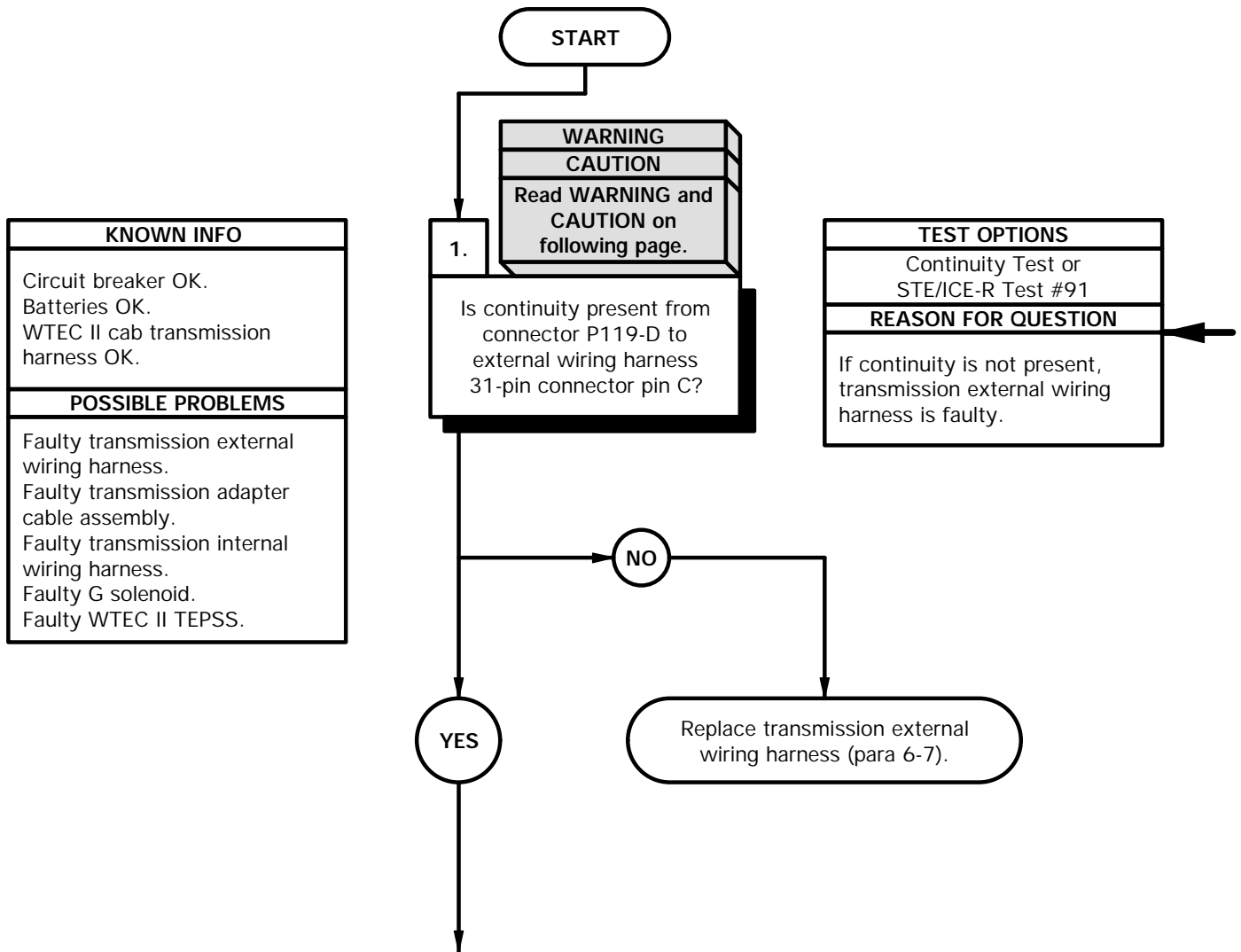
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

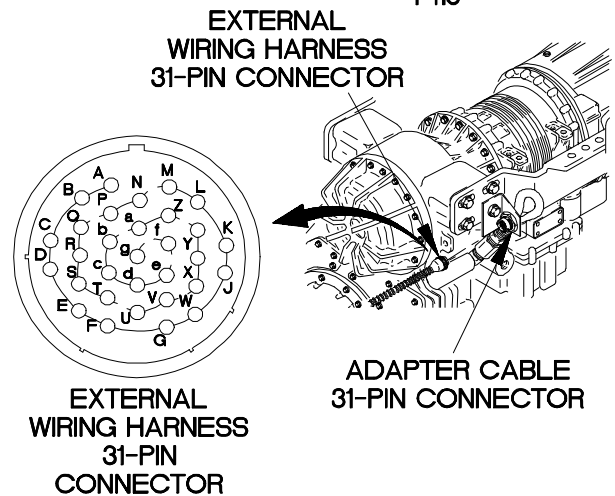
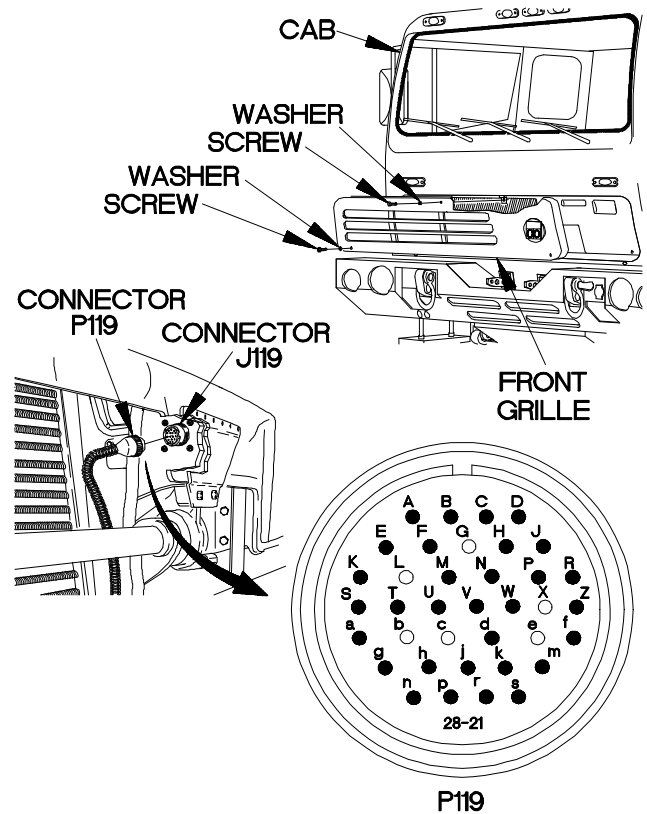
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness 31-pin connector from adapter cable 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-D.
- (8) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin C and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-D.
- (11) Connect negative (-) probe of multimeter to all other pins of connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



YBC3001B

c30. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 22 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

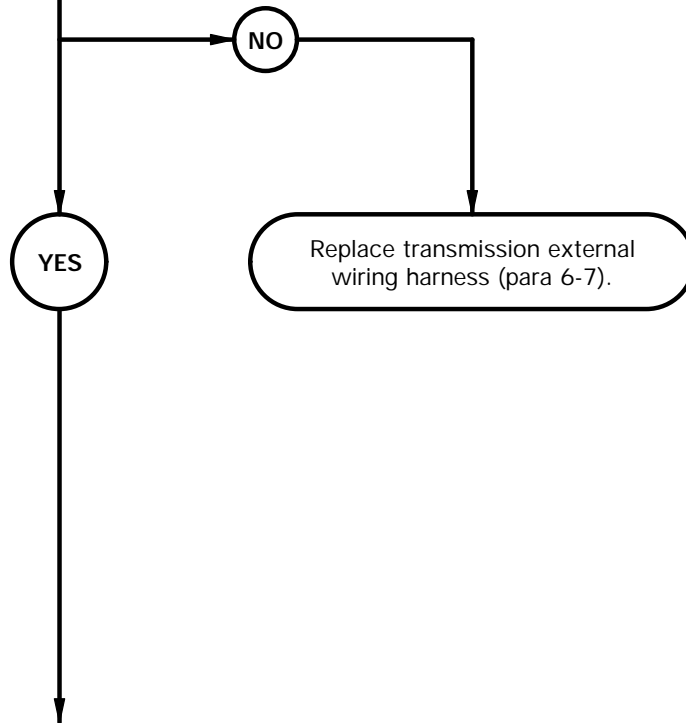
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty G solenoid. Faulty WTEC II TEPSS.

2.

CAUTION
Read CAUTION on following page.

Is continuity present from connector P119-V to external wiring harness 31-pin connector pin L?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



CAUTION

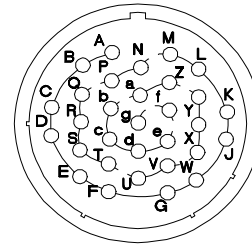
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

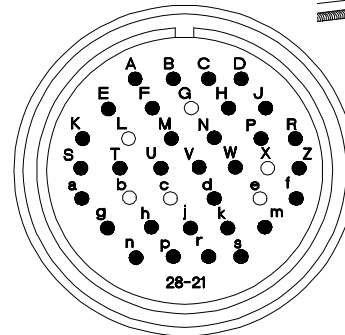
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

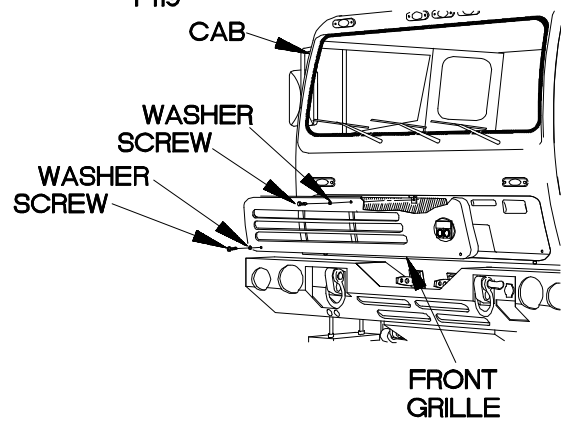
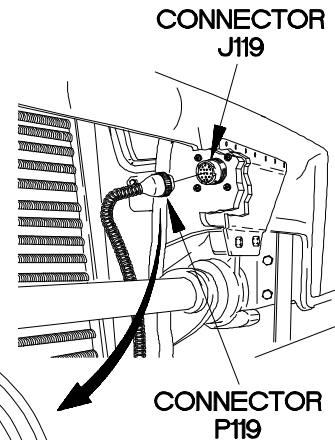
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-V.
- (3) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin L and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-V.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



EXTERNAL WIRING HARNESS 31-PIN CONNECTOR



P119



YBC3002B

c30. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 22 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

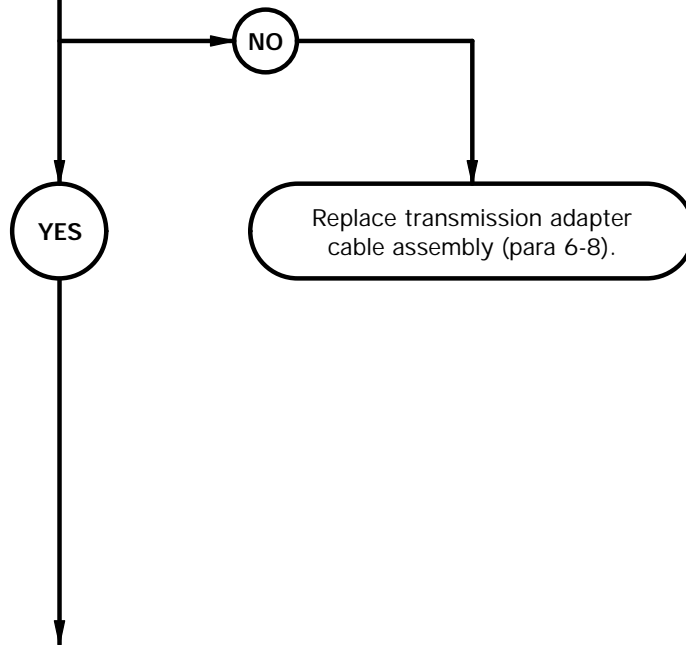
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty G solenoid. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin C to adapter cable 24-pin connector pin F1?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.



CAUTION

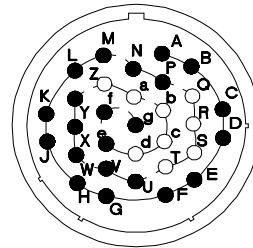
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

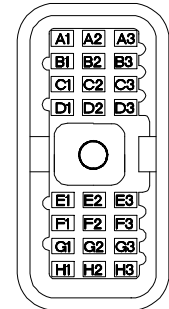
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

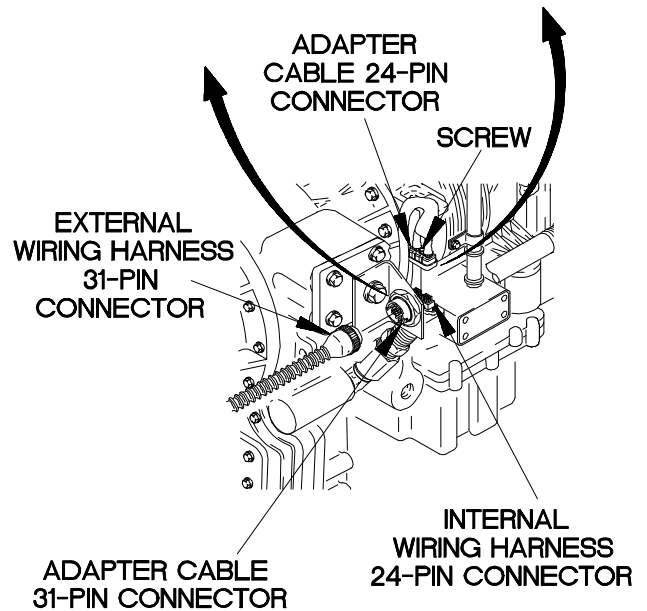
- (1) Loosen screw in adapter cable 24-pin connector.
- (2) Disconnect adapter cable 24-pin connector from internal wiring harness 24-pin connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin C.
- (5) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin F1 and note reading on multimeter.
- (6) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (7) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin C.
- (8) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).



ADAPTER CABLE 31-PIN CONNECTOR



ADAPTER CABLE 24-PIN CONNECTOR



YBC3003B

c30. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 22 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

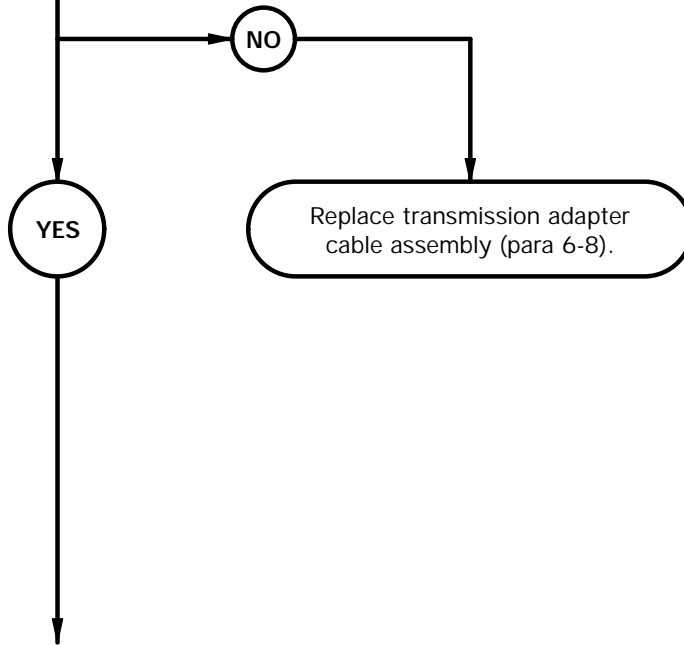
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty G solenoid. Faulty WTEC II TEPSS.

4.

CAUTION
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin L to adapter cable 24-pin connector pin C2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.



CAUTION

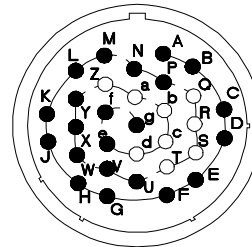
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

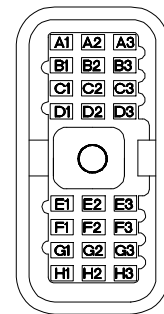
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin L.
- (3) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin C2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (5) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin L.
- (6) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).
- (9) Connect adapter cable 31-pin connector to external wiring harness 31-pin connector.



**ADAPTER CABLE
31-PIN CONNECTOR**



**ADAPTER CABLE
24-PIN
CONNECTOR**

YBC3004B

c30. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 22 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

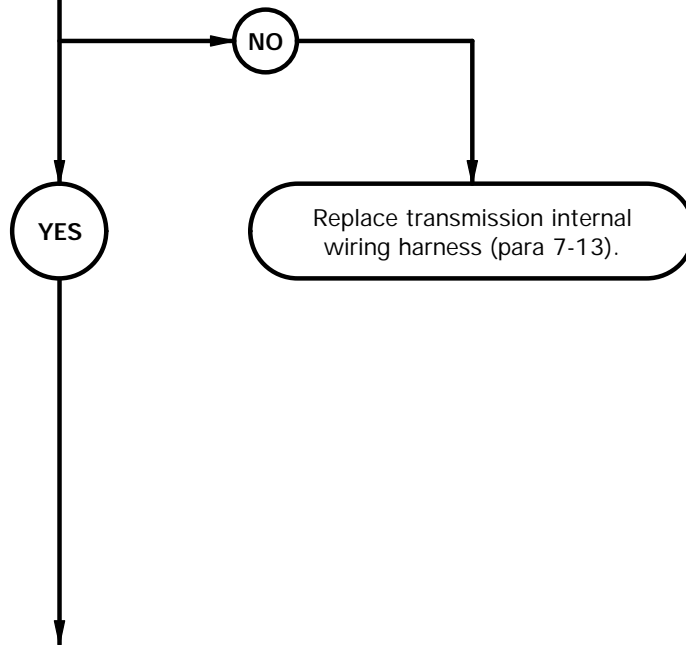
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty G solenoid. Faulty WTEC II TEPSS.

5.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin F1 to internal wiring harness connector G pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

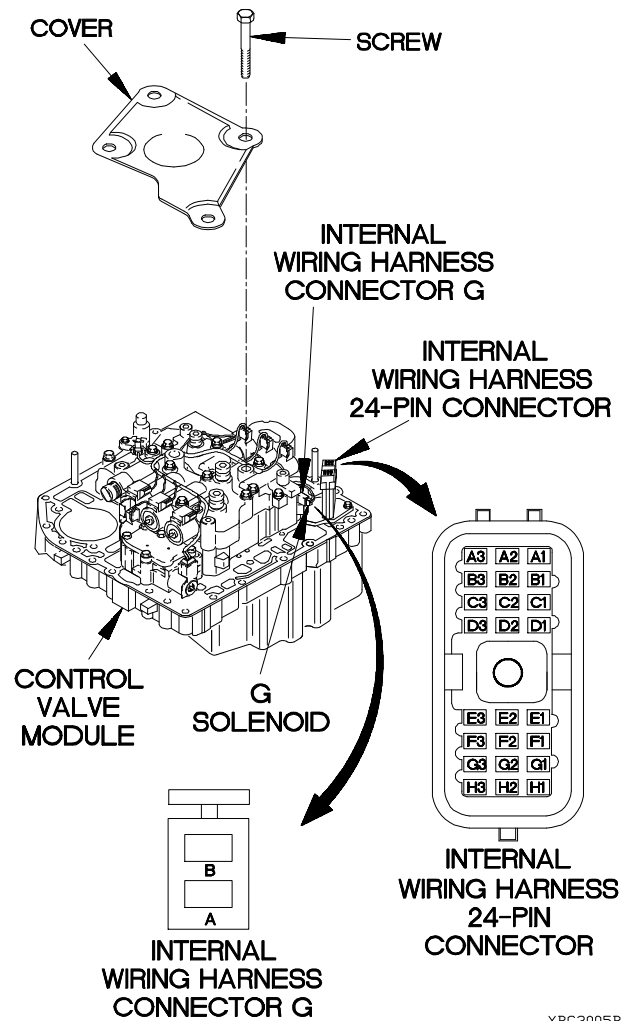
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector G from G solenoid connector.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin F1.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector G pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin F1.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



YBC3005B

c30. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 22 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

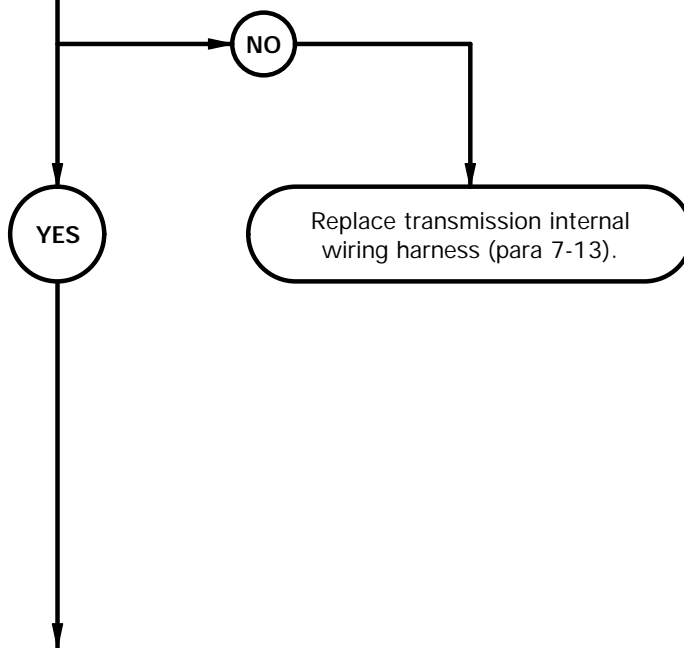
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty G solenoid. Faulty WTEC II TEPSS.

6.

CAUTION
 Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin C2 to internal wiring harness connector G pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

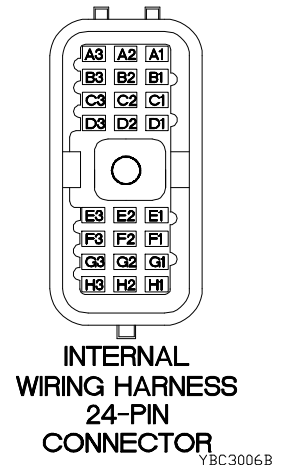
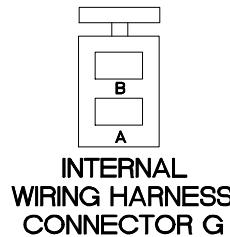
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

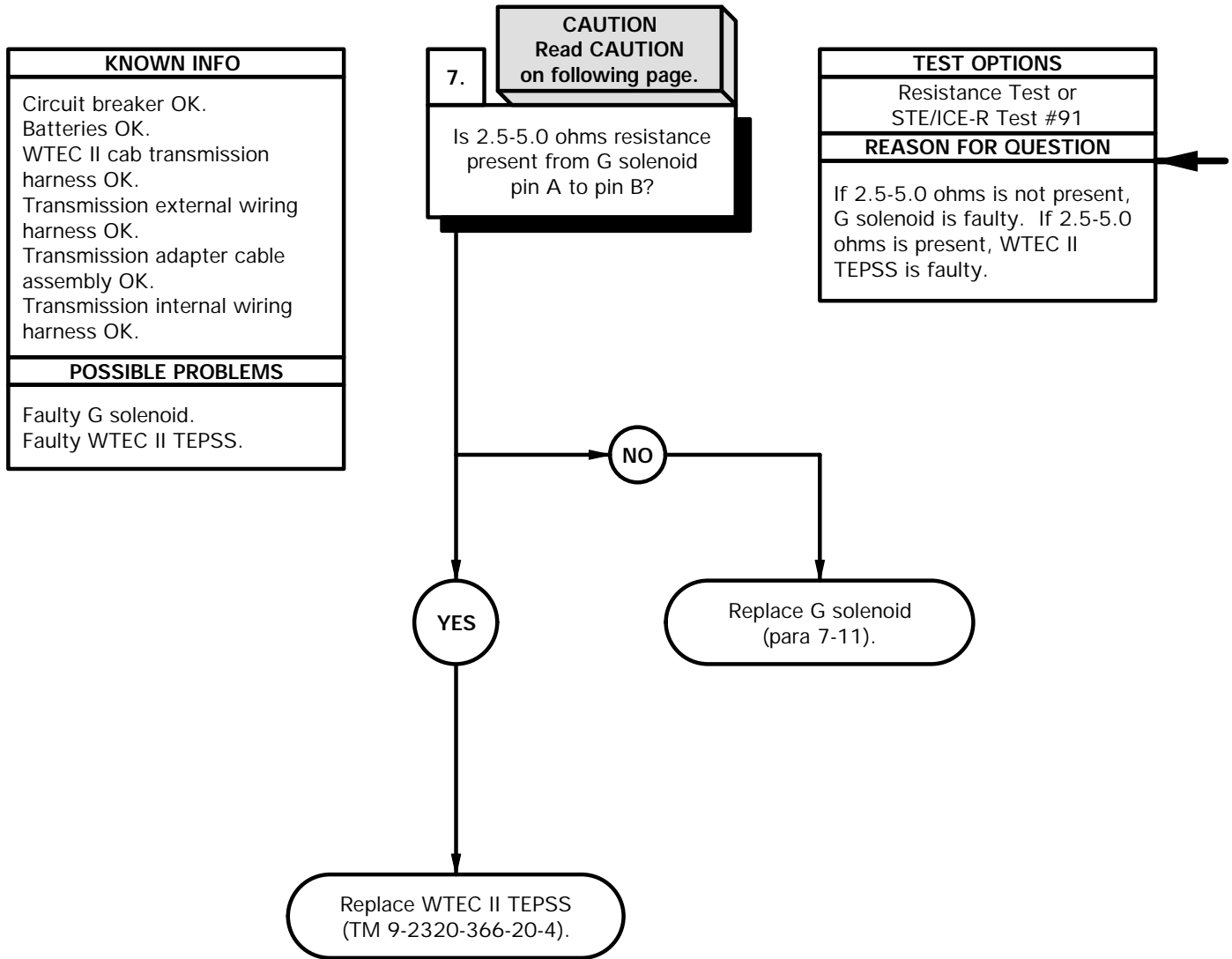
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin C2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector G pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin C2.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



c30. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 22 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



CAUTION

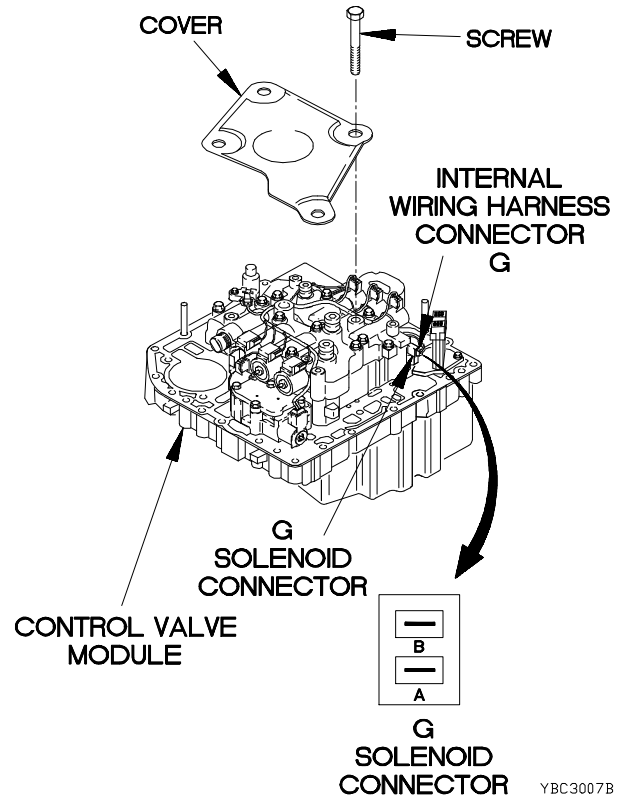
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to G solenoid connector pin A.
- (3) Connect negative (-) probe of multimeter to G solenoid connector pin B and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace G solenoid (para 7-11).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector G to G solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC3007B

c31. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 22 (PRIOR TO SERIAL NUMBER 6510032369)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

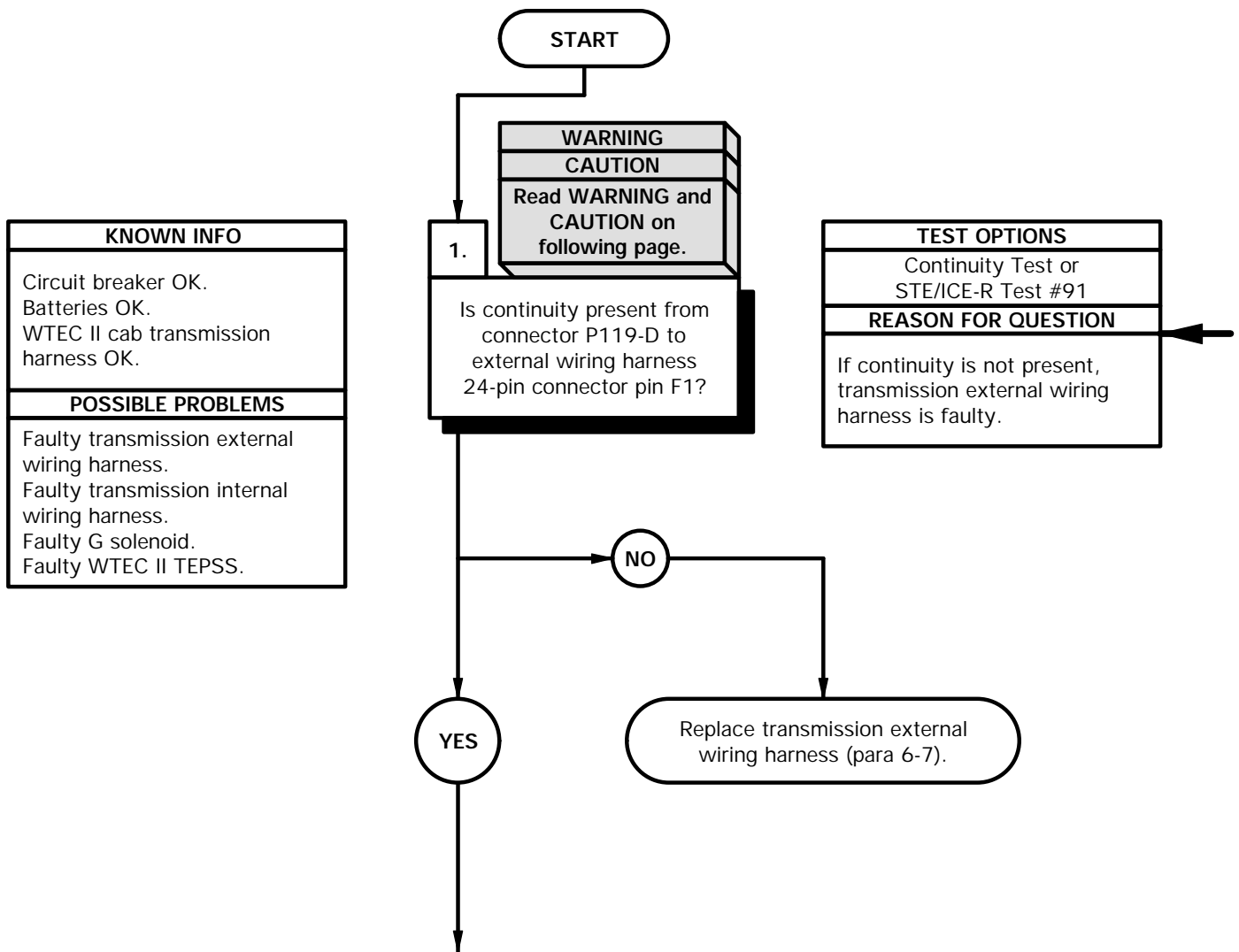
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

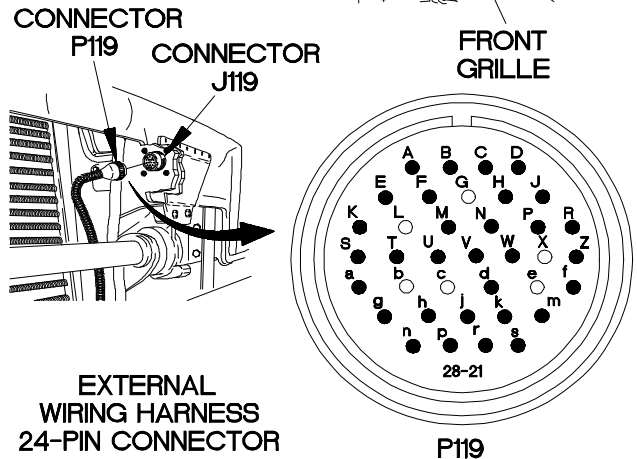
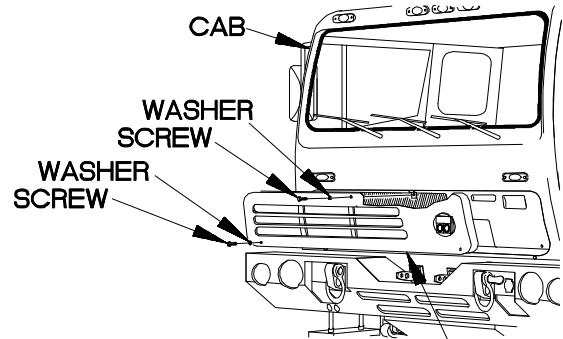
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

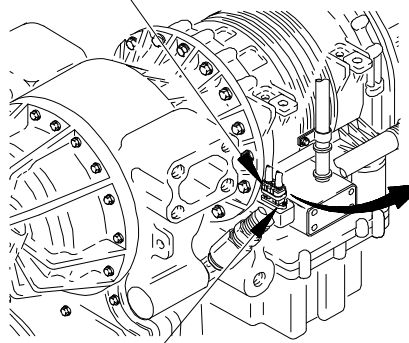
- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Loosen screw in external wiring harness 24-pin connector.
- (6) Disconnect external wiring harness 24-pin connector from internal wiring harness 24-pin connector.
- (7) Set multimeter to ohms.
- (8) Connect positive (+) probe of multimeter to connector P119-D.
- (9) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin F1 and note reading on multimeter.
- (10) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (11) Connect positive (+) probe of multimeter to connector P119-D.

CONTINUITY TEST (Cont)

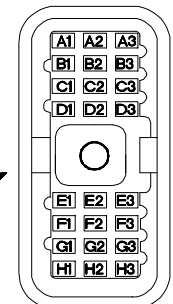
- (12) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (13) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (14) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



EXTERNAL WIRING HARNESS 24-PIN CONNECTOR



INTERNAL WIRING HARNESS 24-PIN CONNECTOR



EXTERNAL WIRING HARNESS 24-PIN CONNECTOR

YBC3101B

c31. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 22 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

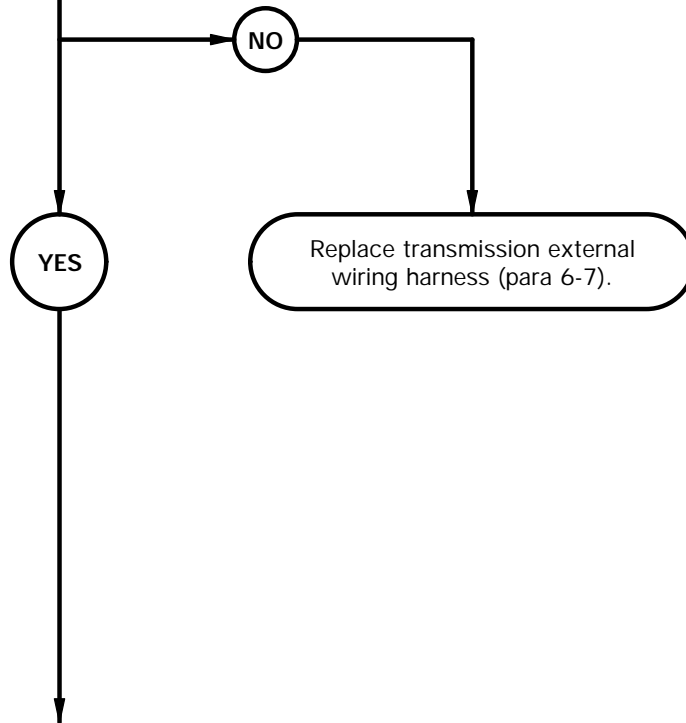
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty G solenoid. Faulty WTEC II TEPSS.

2.

CAUTION
 Read CAUTION on following page.

Is continuity present from connector P119-V to external wiring harness 24-pin connector pin C2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



CAUTION

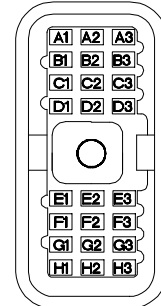
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

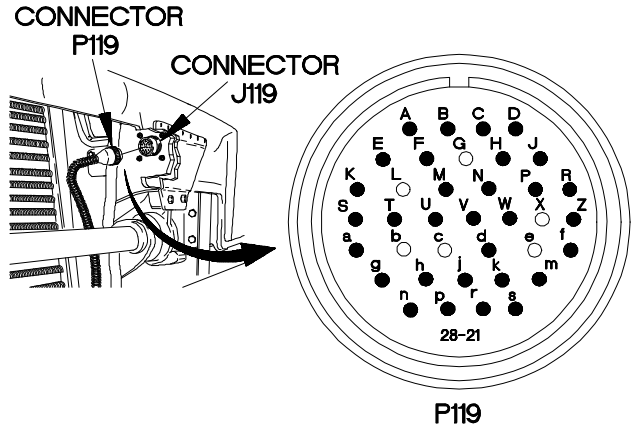
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

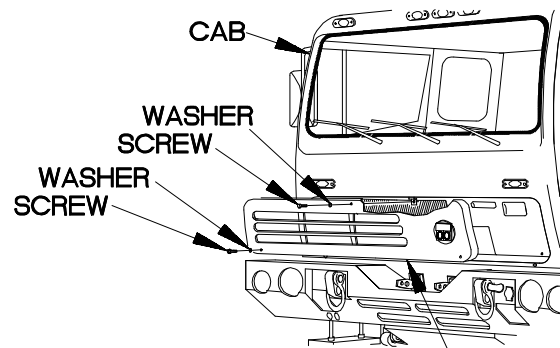
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-V.
- (3) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin C2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-V.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



EXTERNAL WIRING HARNESS 24-PIN CONNECTOR



P119



FRONT GRILLE

YBC3102B

c31. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 22 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

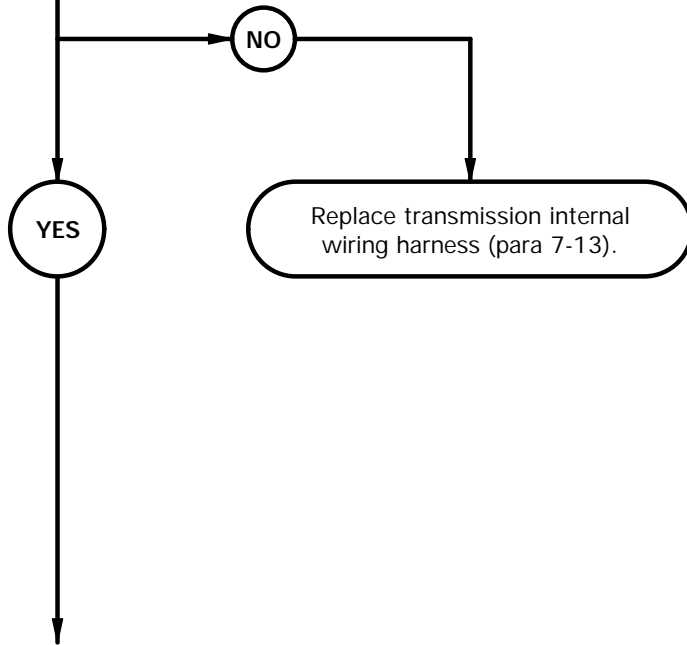
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty G solenoid. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin F1 to internal wiring harness connector G pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

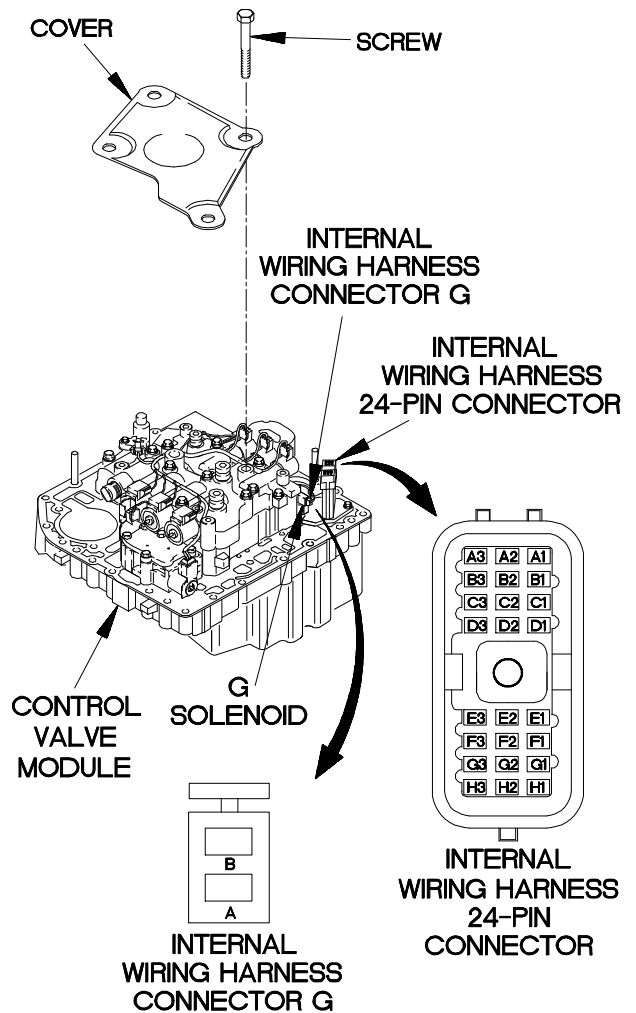
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector G from G solenoid connector.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin F1.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector G pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin F1.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



YBC3103B

c31. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 22 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

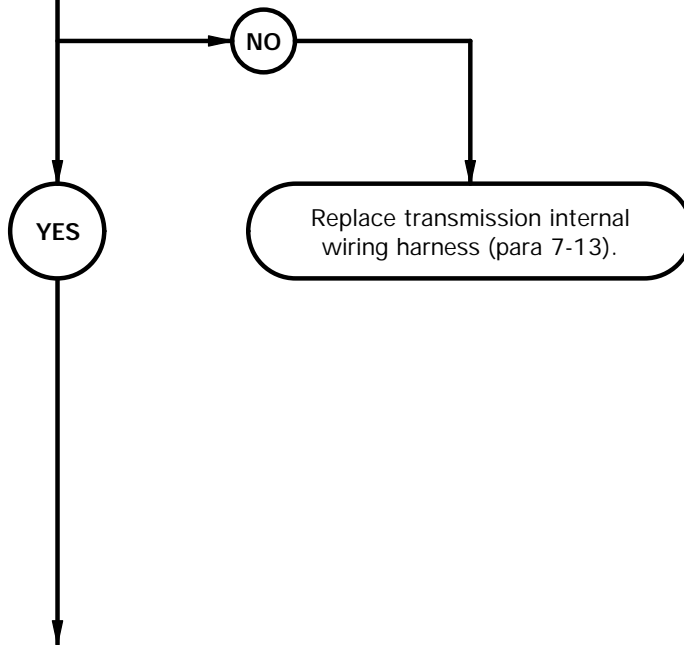
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty G solenoid. Faulty WTEC II TEPSS.

4.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin C2 to internal wiring harness connector G pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

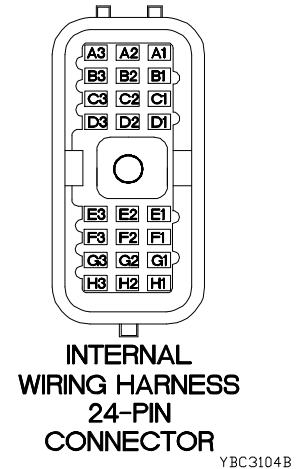
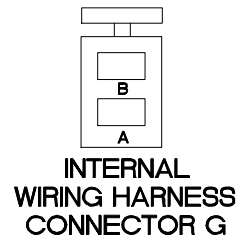
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

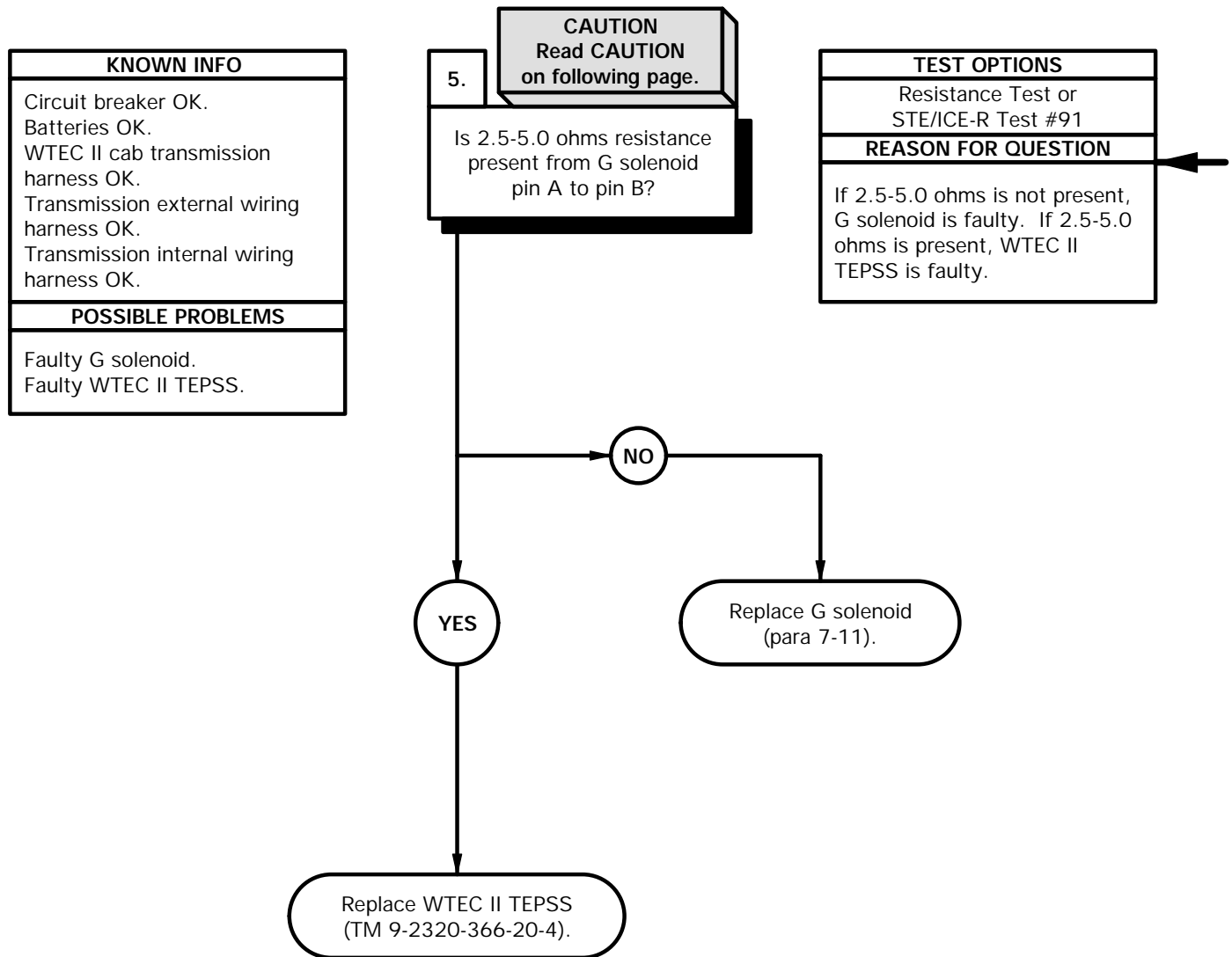
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin C2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector G pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin C2.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



c31. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 22 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)



CAUTION

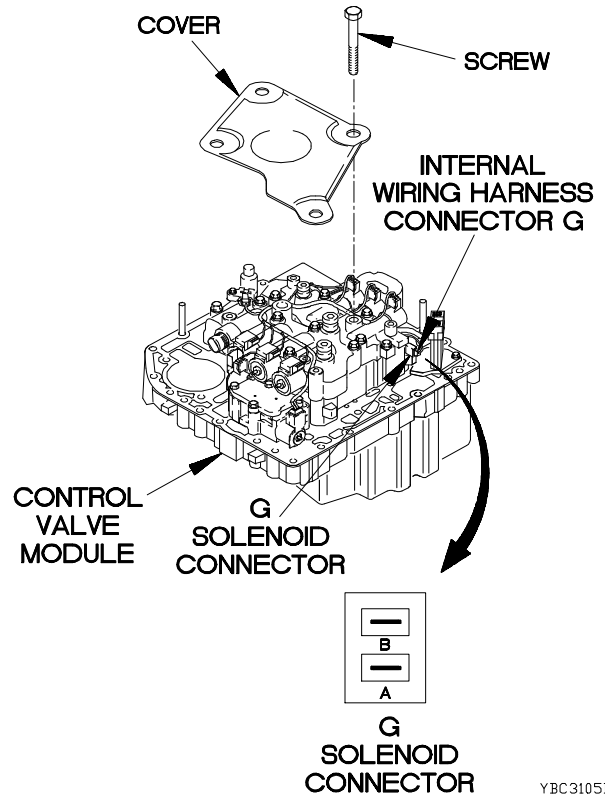
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to G solenoid connector pin A.
- (3) Connect negative (-) probe of multimeter to G solenoid connector pin B and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace G solenoid (para 7-11).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector G to G solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC3105B

c32. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45 AND/OR 69 SUB CODE 23

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

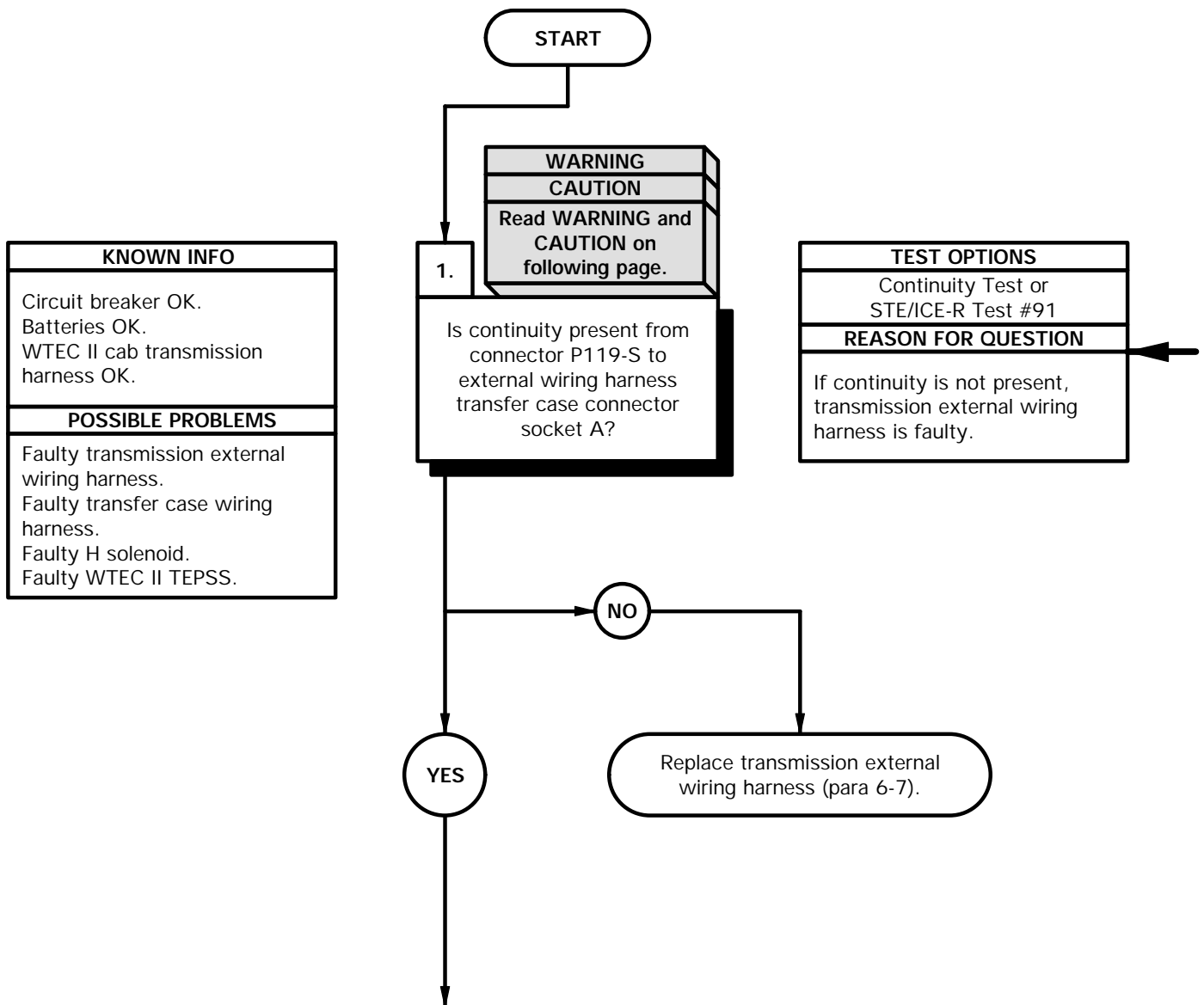
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

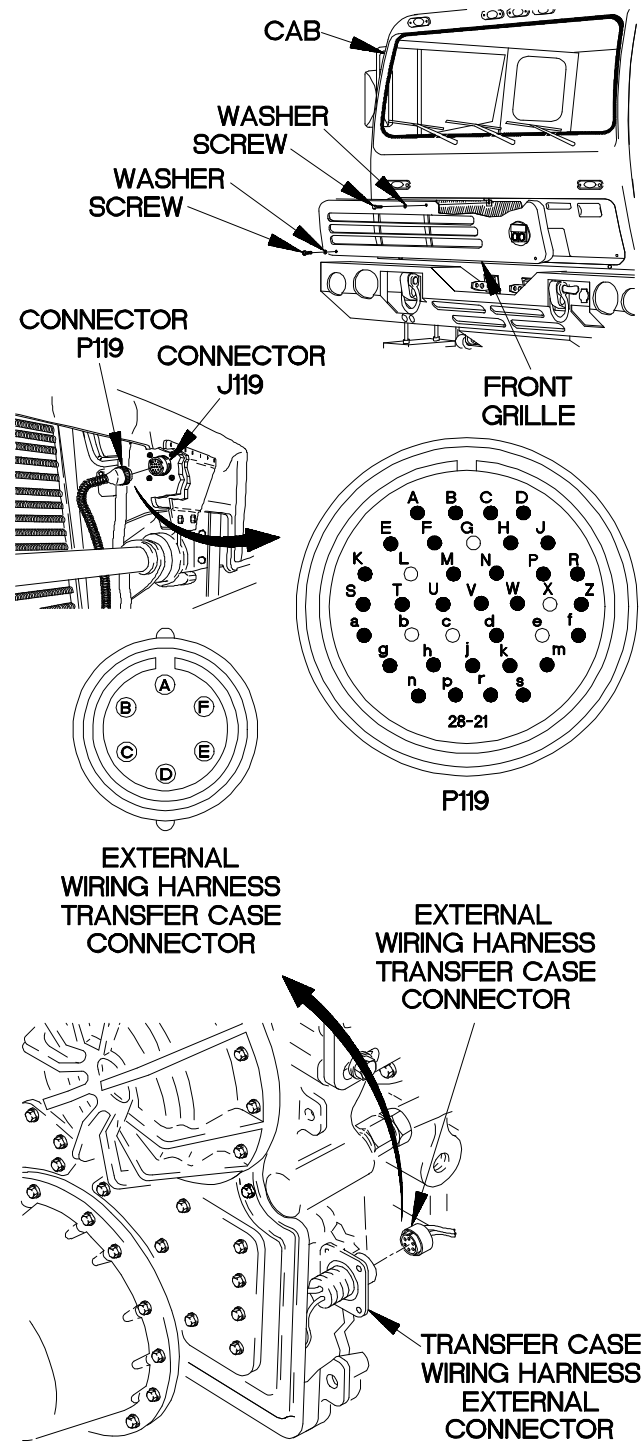
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness transfer case connector from transfer case wiring harness external connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-S.
- (8) Connect negative (-) probe of multimeter to external wiring harness transfer case connector socket A and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-S.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

ybc3201b

c32. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45 AND/OR 69 SUB CODE 23 (CONT)

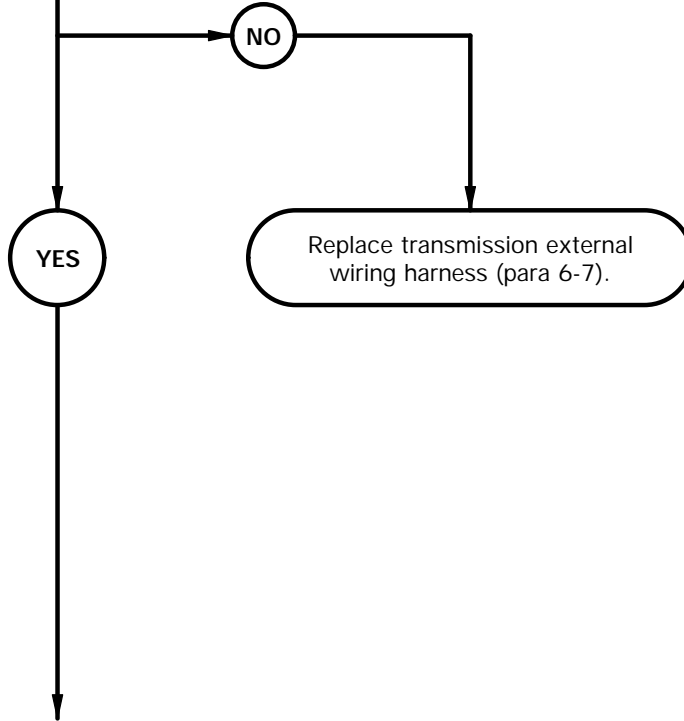
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transfer case wiring harness. Faulty H solenoid. Faulty WTEC II TEPSS.

2.

CAUTION
Read CAUTION on following page.

Is continuity present from connector P119-P to external wiring harness transfer case connector socket B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



CAUTION

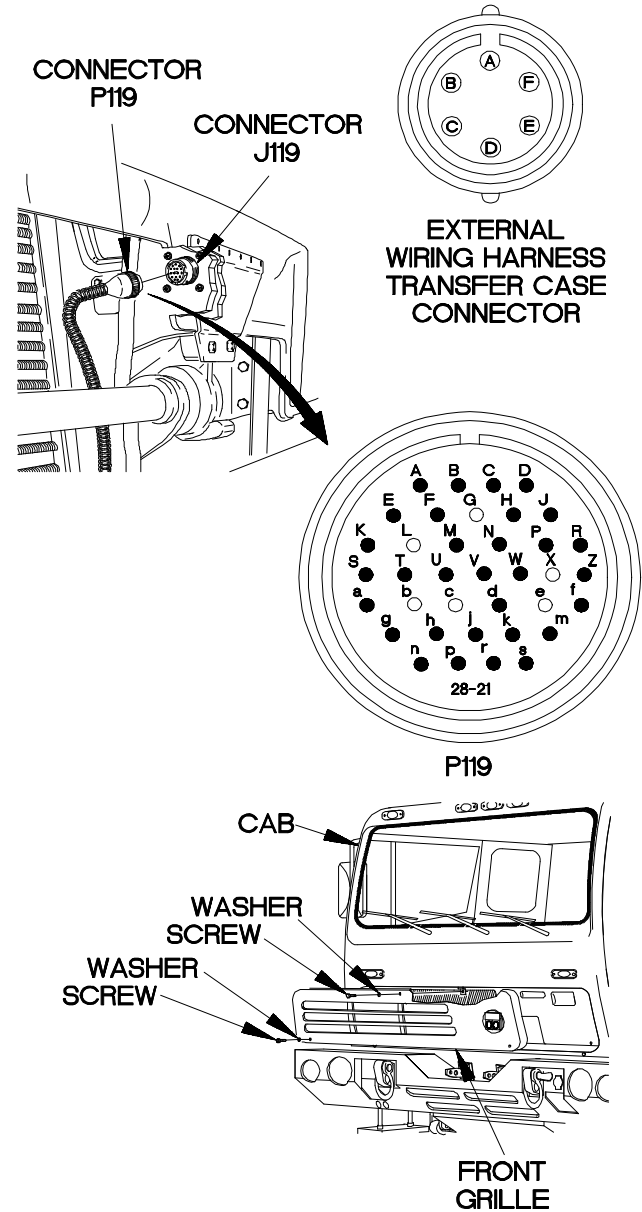
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-P.
- (3) Connect negative (-) probe of multimeter to external wiring harness transfer case connector socket B and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-P.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



YBC3202B

c32. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45 AND/OR 69 SUB CODE 23 (CONT)

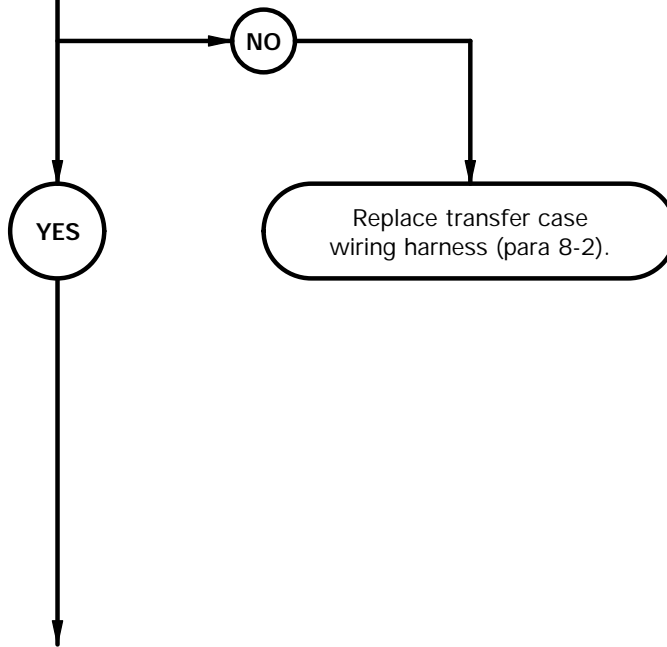
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transfer case wiring harness. Faulty H solenoid. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from transfer case wiring harness external connector pin A to transfer case wiring harness connector H socket A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transfer case wiring harness is faulty.



CAUTION

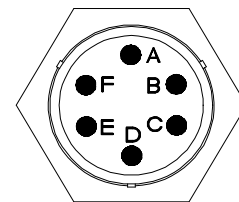
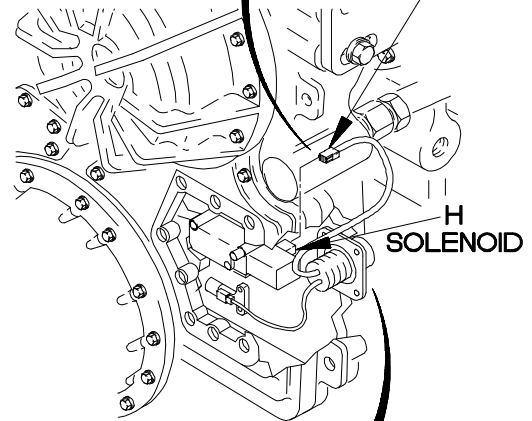
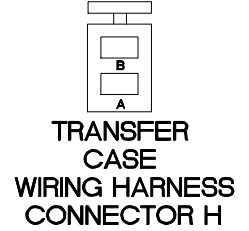
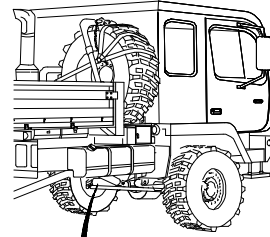
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove valve body cover (para 8-2).
- (2) Disconnect transfer case wiring harness connector H from H solenoid connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to transfer case wiring harness connector pin A.
- (5) Connect negative (-) probe of multimeter to transfer case wiring harness external connector H socket A and note reading on multimeter.
- (6) If continuity is not present, replace transfer case wiring harness (para 8-2).
- (7) Connect positive (+) probe of multimeter to transfer case wiring harness external connector pin A.
- (8) Connect negative (-) probe of multimeter to all other pins in transfer case wiring harness external connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transfer case wiring harness is shorted; replace transfer case wiring harness (para 8-2).



TRANSFER CASE WIRING HARNESS EXTERNAL CONNECTOR

YBC3203B

c32. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45 AND/OR 69 SUB CODE 23 (CONT)

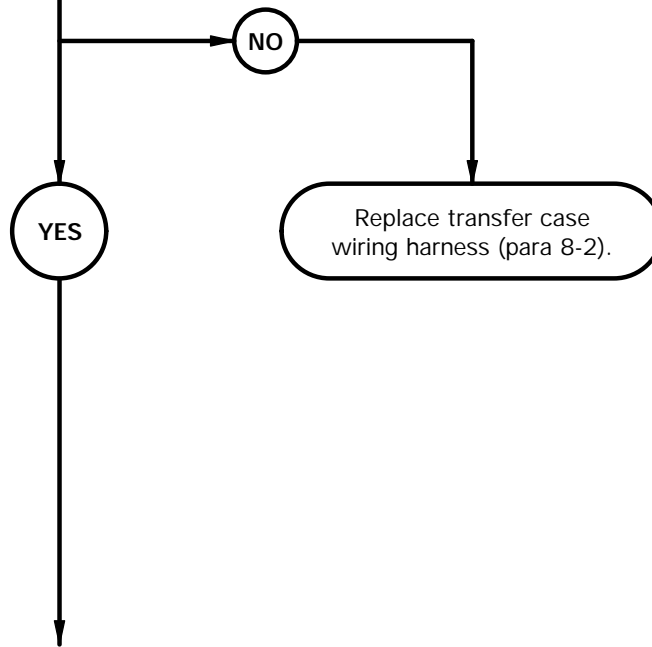
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transfer case wiring harness. Faulty H solenoid. Faulty WTEC II TEPSS.

4.

CAUTION
Read CAUTION on following page.

Is continuity present from transfer case wiring harness external connector pin B to transfer case wiring harness connector H socket B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transfer case wiring harness is faulty.



CAUTION

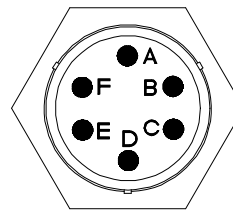
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

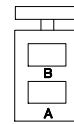
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to transfer case wiring harness external connector pin B.
- (3) Connect negative (-) probe of multimeter to transfer case wiring harness connector H socket B and note reading on multimeter.
- (4) If continuity is not present, replace transfer case wiring harness (para 8-2).
- (5) Connect positive (+) probe of multimeter to transfer case wiring harness external connector pin B.
- (6) Connect negative (-) probe of multimeter to all other pins in transfer case wiring harness external connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transfer case wiring harness is shorted replace transfer case wiring harness (para 8-2).



**TRANSFER CASE
WIRING HARNESS
EXTERNAL
CONNECTOR**



**TRANSFER
CASE
WIRING HARNESS
CONNECTOR H**

YBC3204B

c32. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45 AND/OR 69 SUB CODE 23 (CONT)

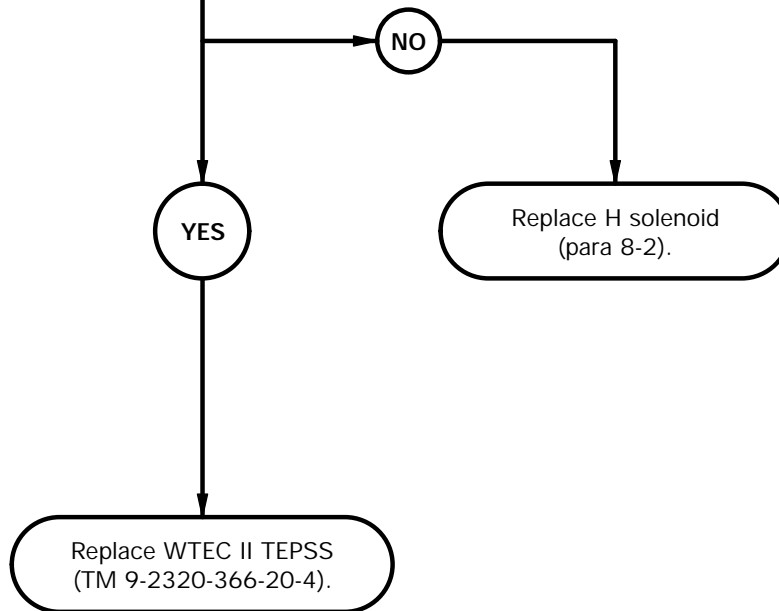
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transfer case wiring harness OK.
POSSIBLE PROBLEMS
Faulty H solenoid. Faulty WTEC II TEPSS.

5.

CAUTION
Read CAUTION on following page.

Is 2.5-5.0 ohms resistance present from H solenoid pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms is not present, H solenoid is faulty. If 2.5-5.0 ohms is present, WTEC II TEPSS is faulty.



CAUTION

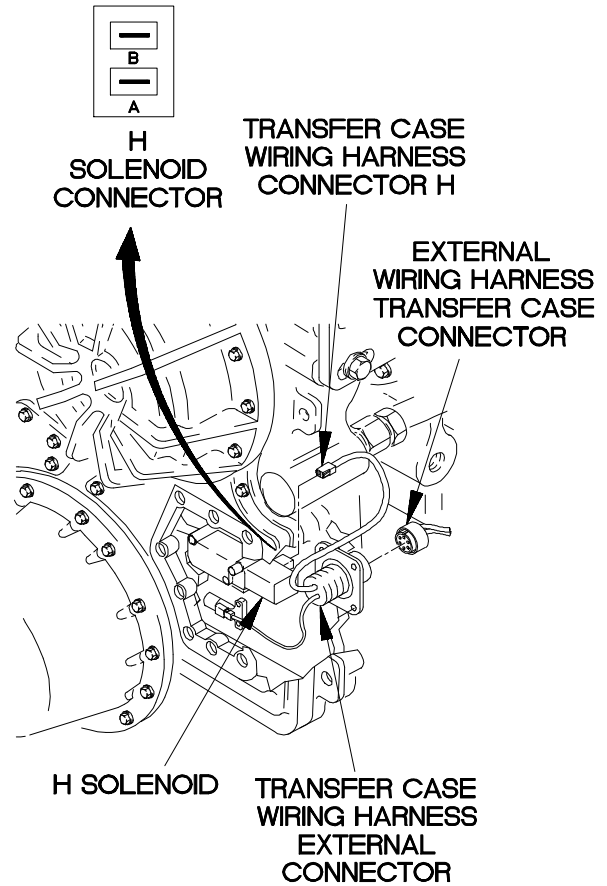
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to H solenoid connector pin A.
- (3) Connect negative (-) probe of multimeter to H solenoid connector pin B and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace H solenoid (para 8-2).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect transfer case wiring harness connector H to H solenoid connector.
- (7) Install valve body cover on transfer case (para 8-2).
- (8) Connect external wiring harness transfer case connector to transfer case wiring harness external connector.
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC3205B

c33. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 24 (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

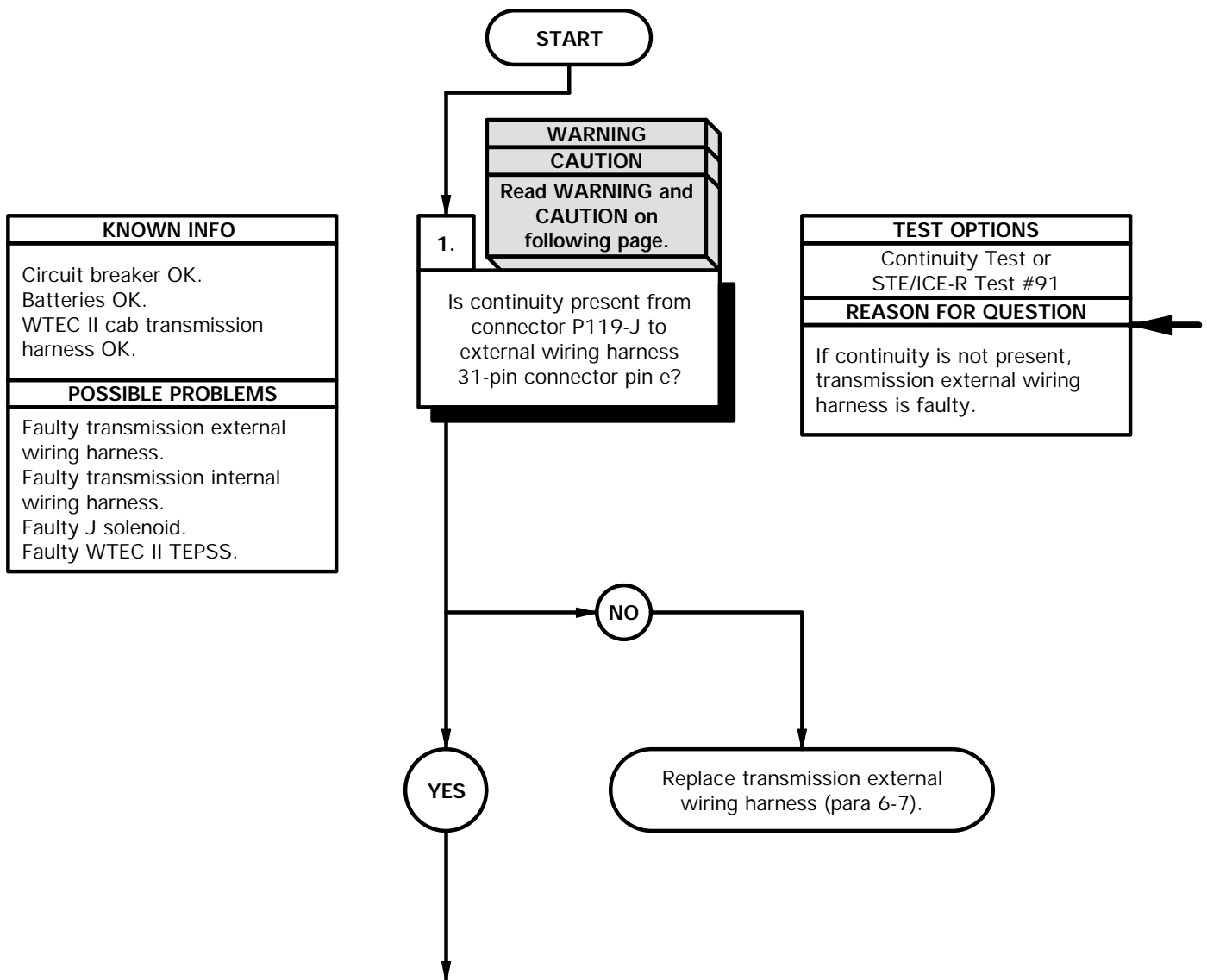
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

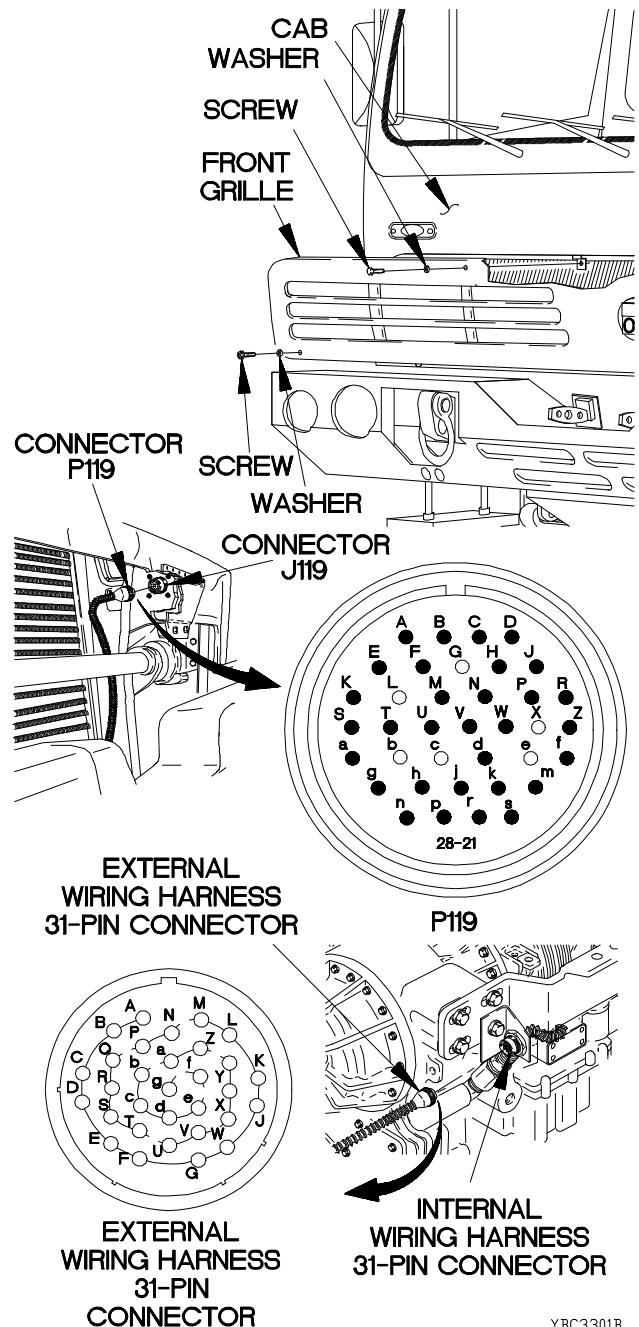
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-J.
- (8) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin e and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-J.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



YBC3301B

c33. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 24 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

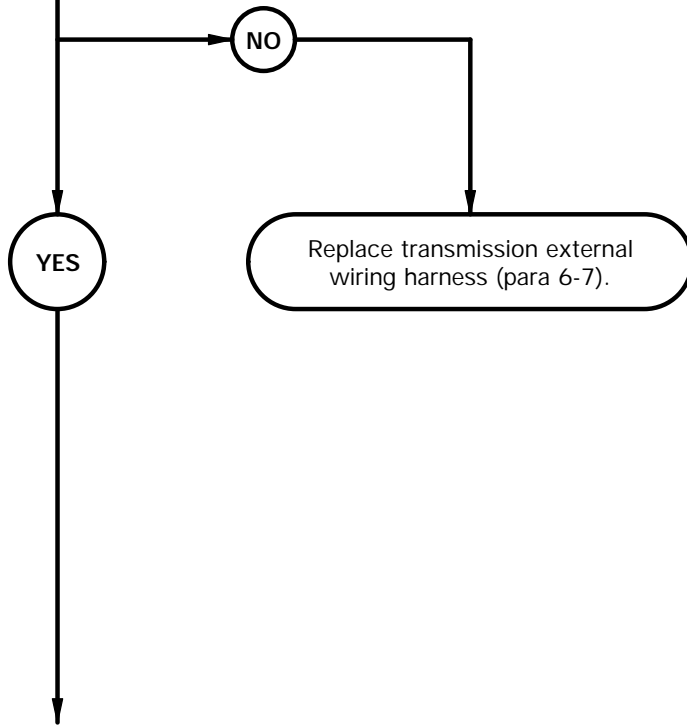
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty J solenoid. Faulty WTEC II TEPSS.

2.

CAUTION
Read CAUTION on following page.

Is continuity present from connector P119-B to external wiring harness 31-pin connector pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



CAUTION

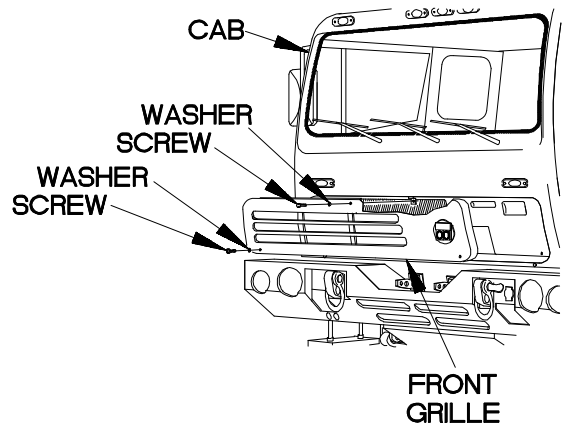
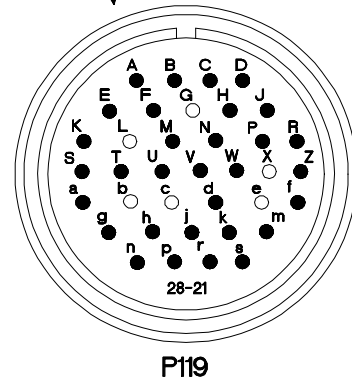
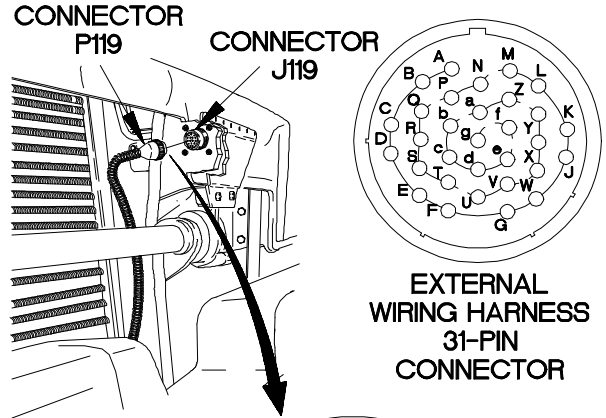
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-B.
- (3) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin A and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-B.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (8) Connect connector P119 to connector J119.
- (9) Position front grille on cab with washer and screw.
- (10) Position two washers and screws in front grille.
- (11) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (12) Tighten two screws to 24 lb-in. (3 N·m).



YBC3302B

c33. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 24 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

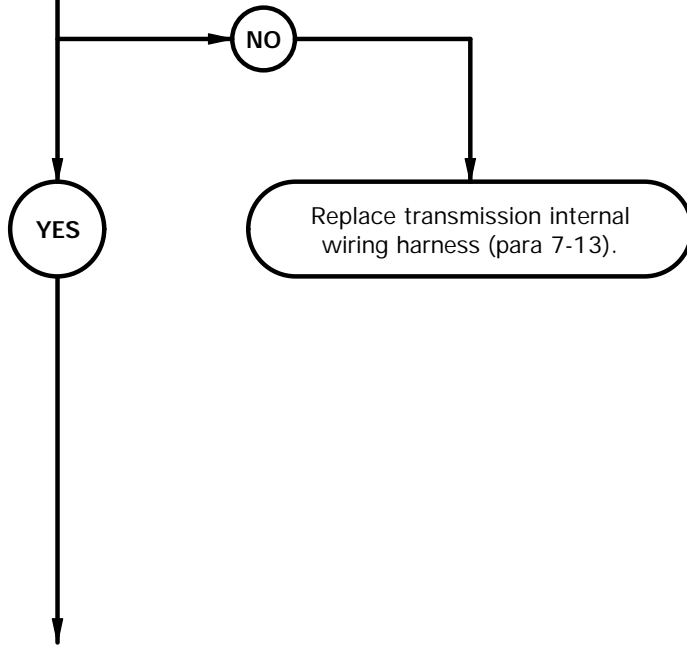
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty J solenoid. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin g to internal wiring harness connector J pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

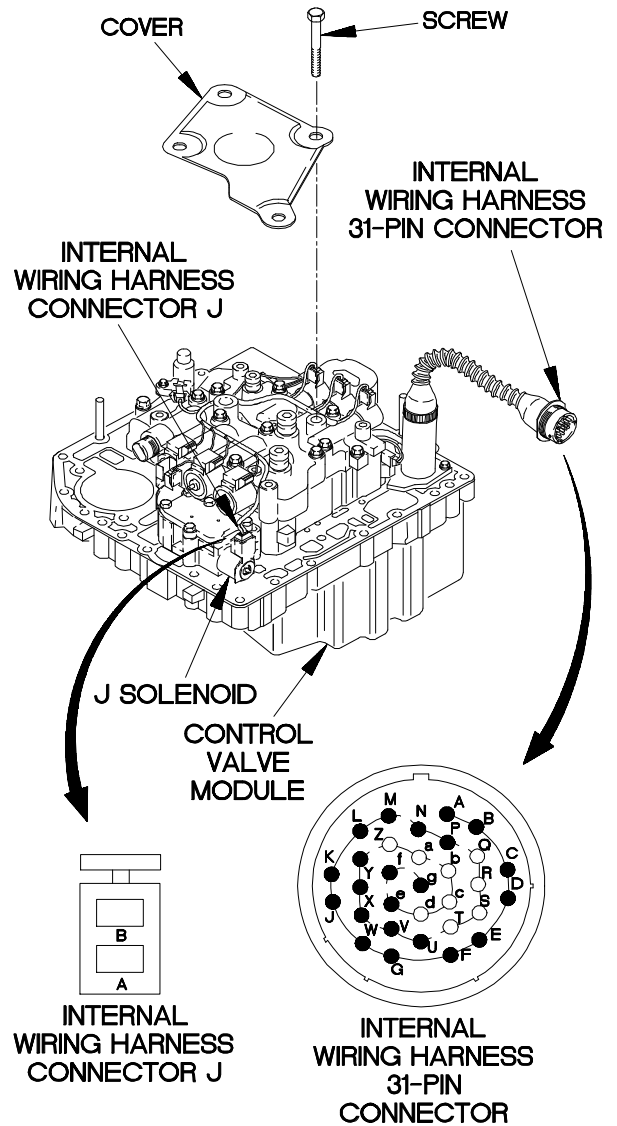
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector J from J solenoid connector.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin g.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector J pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin g.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



YBC3303B

c33. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 24 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

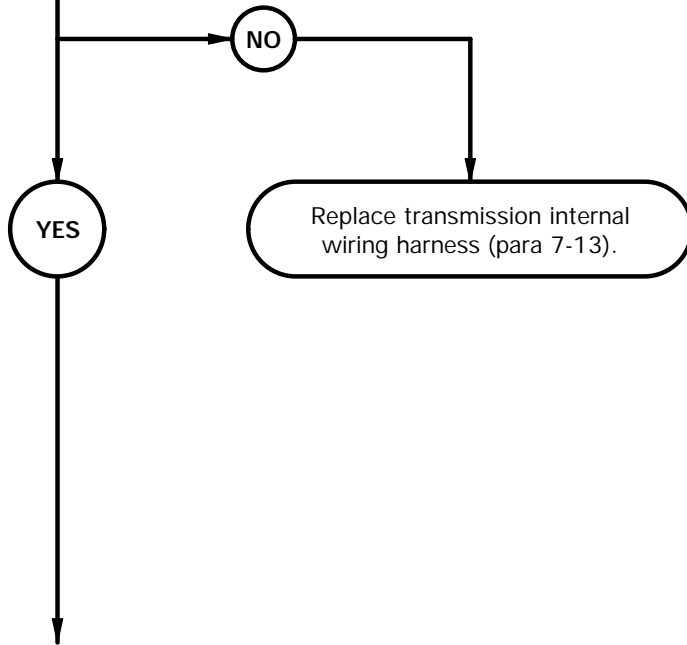
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty J solenoid. Faulty WTEC II TEPSS.

4.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin A to internal wiring harness connector J pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

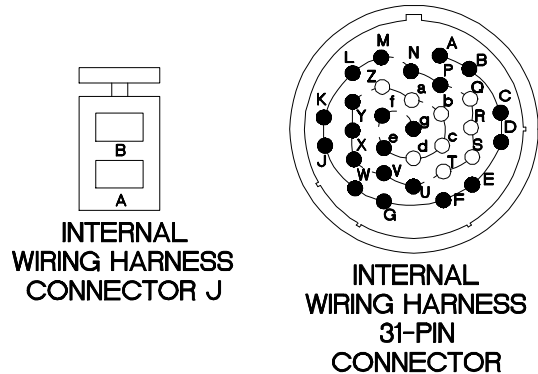
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

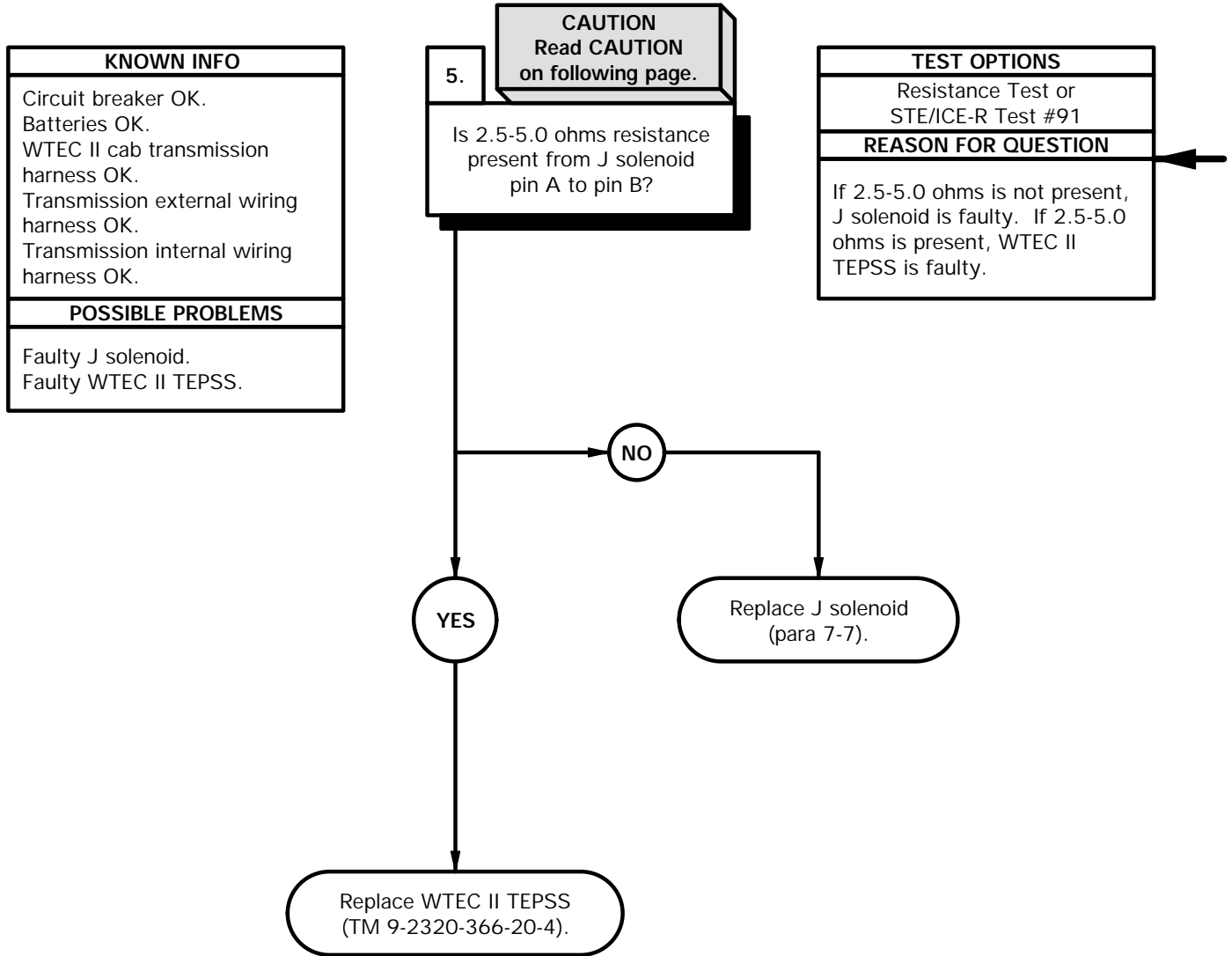
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin A.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector J pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin A.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



YBC3304B

c33. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 24 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



CAUTION

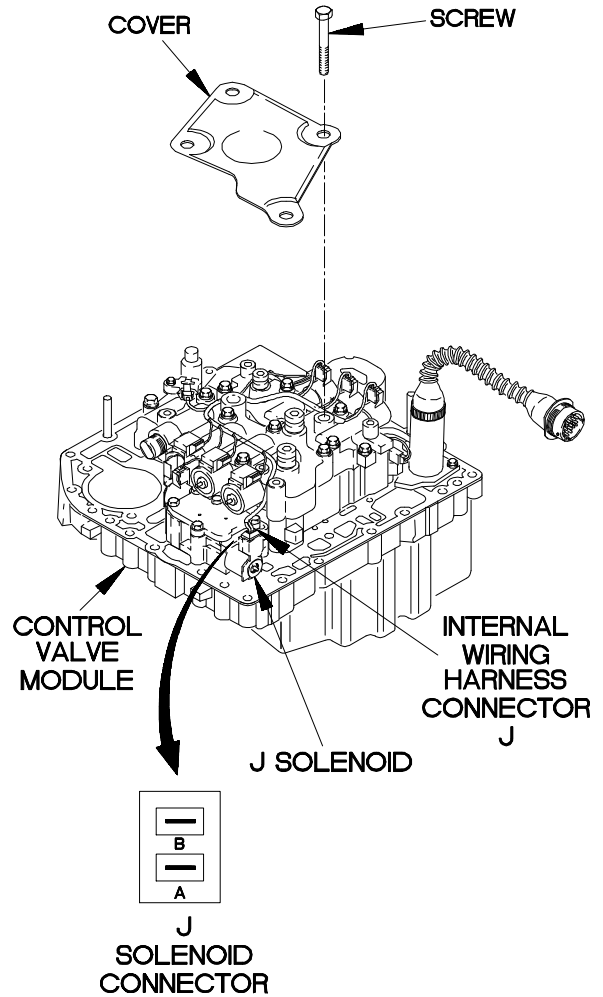
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to J solenoid connector pin A.
- (3) Connect negative (-) probe of multimeter to J solenoid connector pin B and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace J solenoid (para 7-7).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector J to J solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC3305B

c34. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 24 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

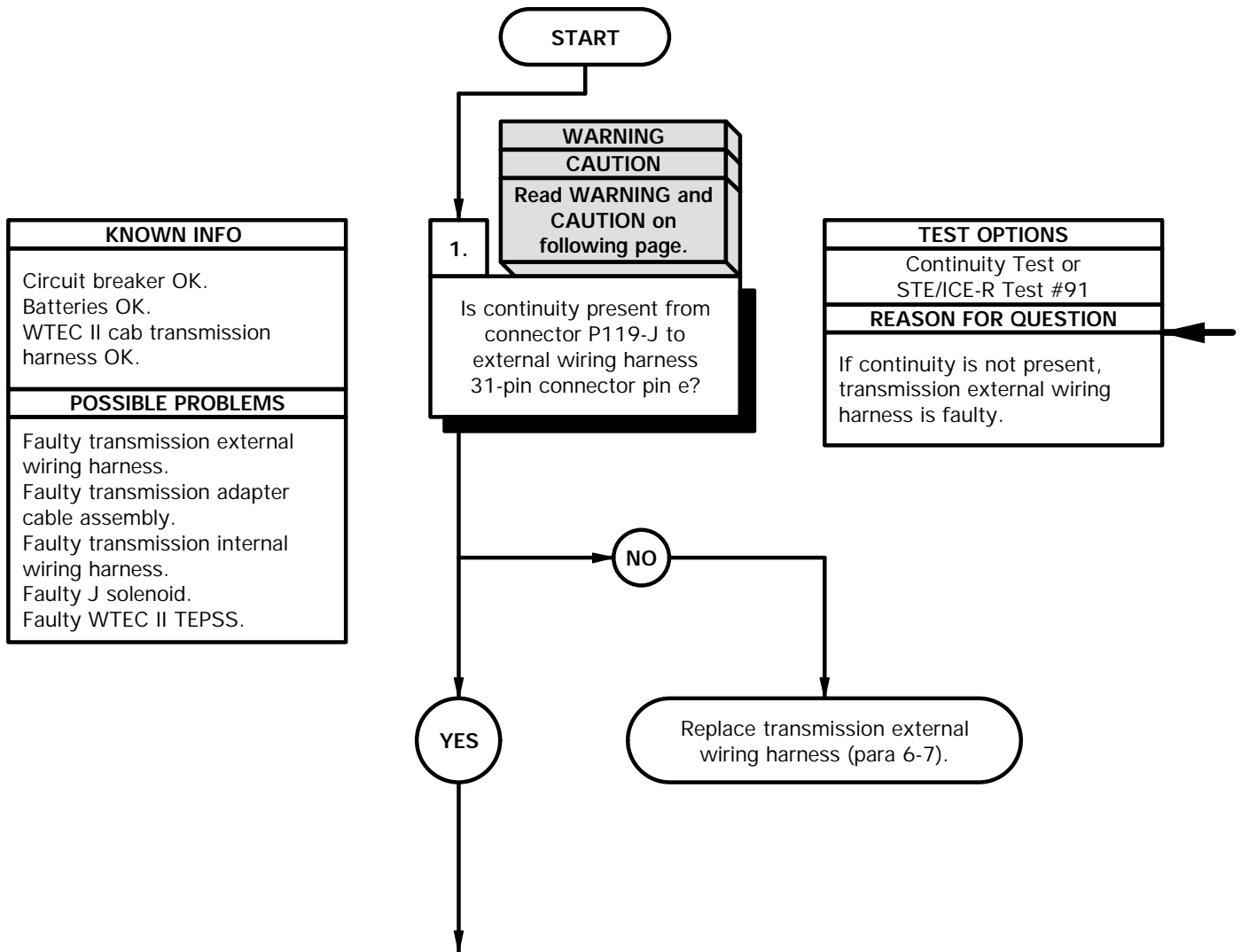
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

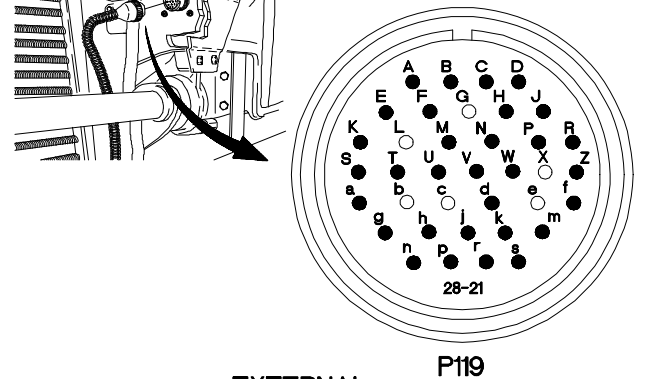
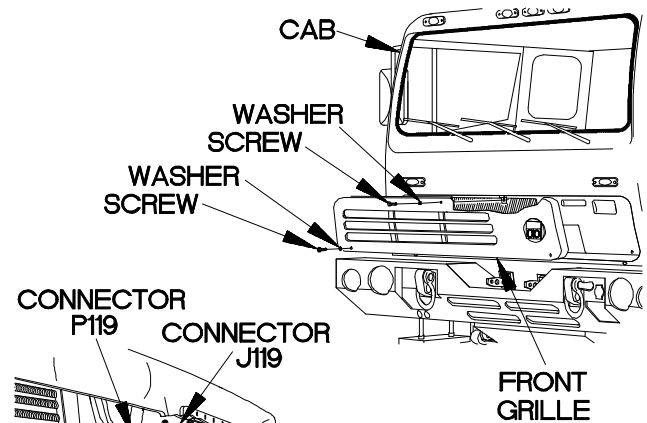
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

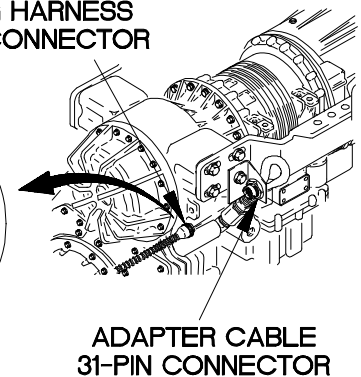
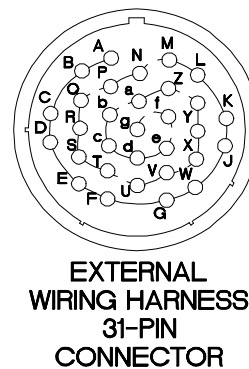
- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness 31-pin connector from adapter cable 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-J.
- (8) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin e and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-J.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



EXTERNAL WIRING HARNESS 31-PIN CONNECTOR



YBC3401B

c34. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 24 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

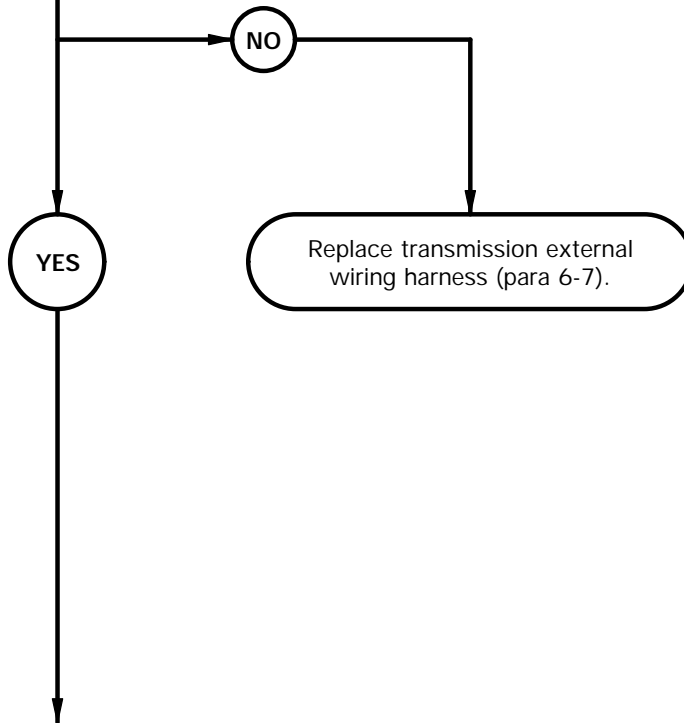
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty J solenoid. Faulty WTEC II TEPSS.

2.

CAUTION
Read CAUTION on following page.

Is continuity present from connector P119-B to external wiring harness 31-pin connector pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



CAUTION

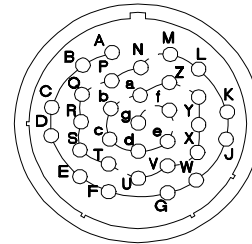
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

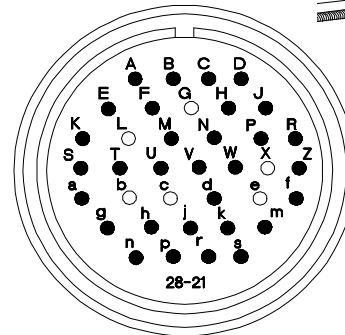
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

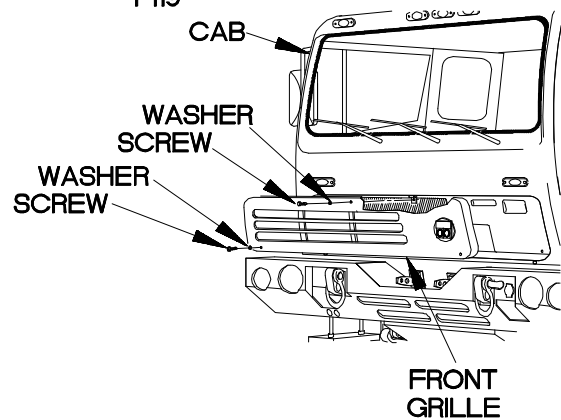
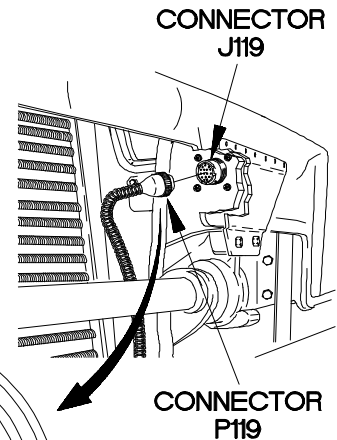
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-B.
- (3) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin A and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-B.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



EXTERNAL WIRING HARNESS 31-PIN CONNECTOR



P119



YBC3402B

c34. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 24 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

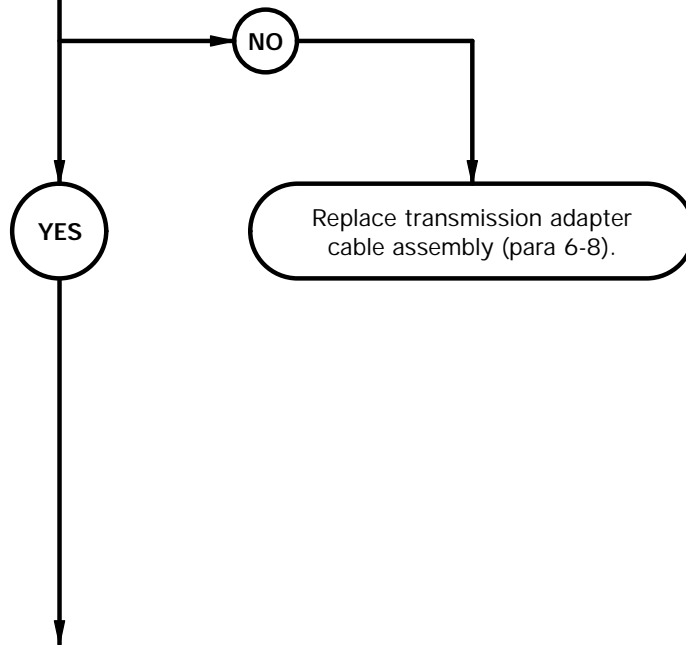
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty J solenoid. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin e to adapter cable 24-pin connector pin H1?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.



CAUTION

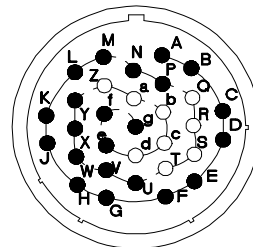
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

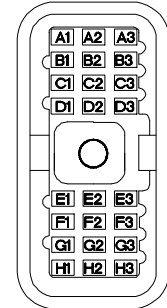
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

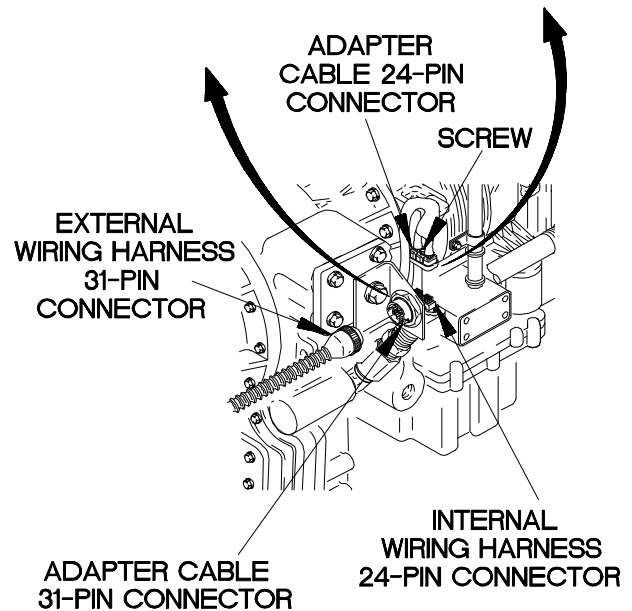
- (1) Loosen screw in adapter cable 24-pin connector.
- (2) Disconnect adapter cable 24-pin connector internal wiring harness 24-pin connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin e.
- (5) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin H1 and note reading on multimeter.
- (6) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (7) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin e.
- (8) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).



**ADAPTER CABLE
31-PIN CONNECTOR**



**ADAPTER CABLE
24-PIN
CONNECTOR**



YBC3403B

c34. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 24 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

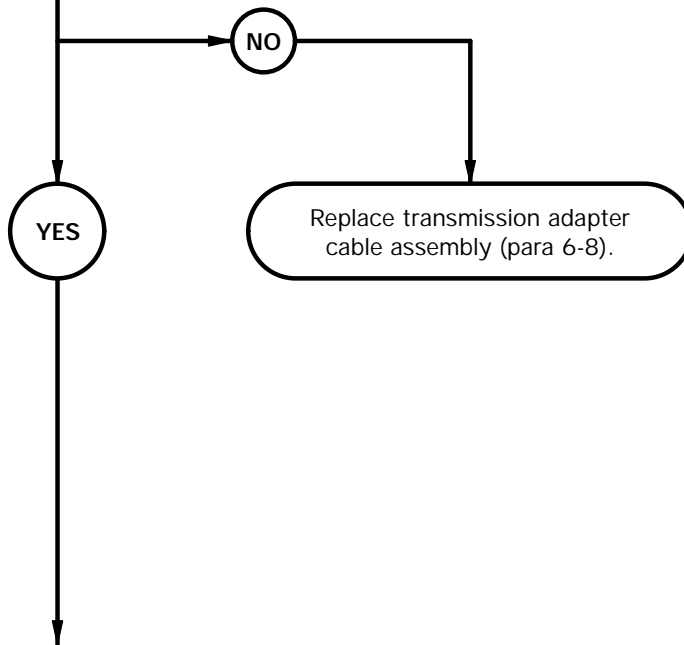
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty J solenoid. Faulty WTEC II TEPSS.

4.

CAUTION
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin A to adapter cable 24-pin connector pin A2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.



CAUTION

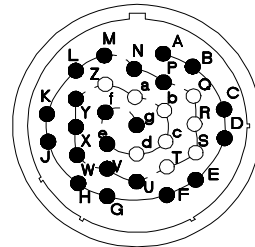
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

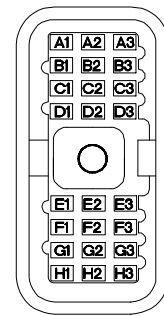
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin A.
- (3) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin A2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (5) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin A.
- (6) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).
- (9) Connect adapter cable 31-pin connector to external wiring harness 31-pin connector.



**ADAPTER CABLE
31-PIN CONNECTOR**



**ADAPTER CABLE
24-PIN
CONNECTOR**

YBC3404B

c34. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 24 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

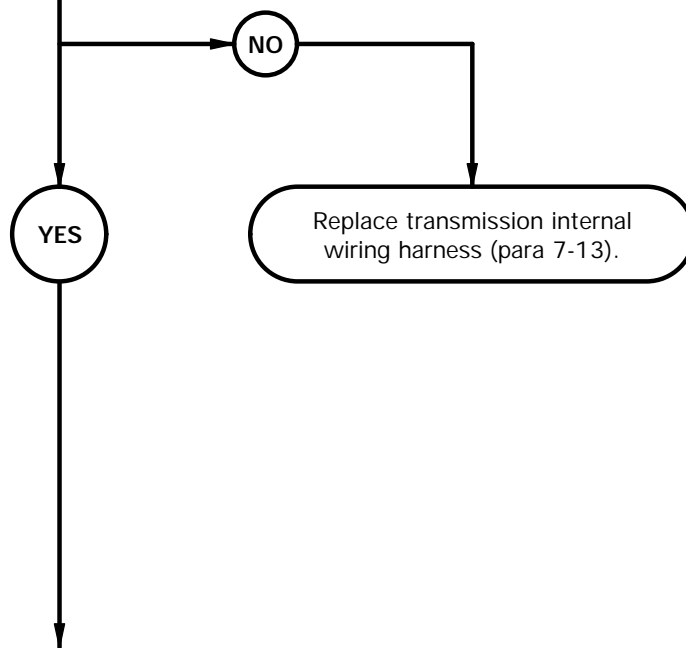
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty J solenoid. Faulty WTEC II TEPSS.

5.

CAUTION
 Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin H1 to internal wiring harness connector J pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

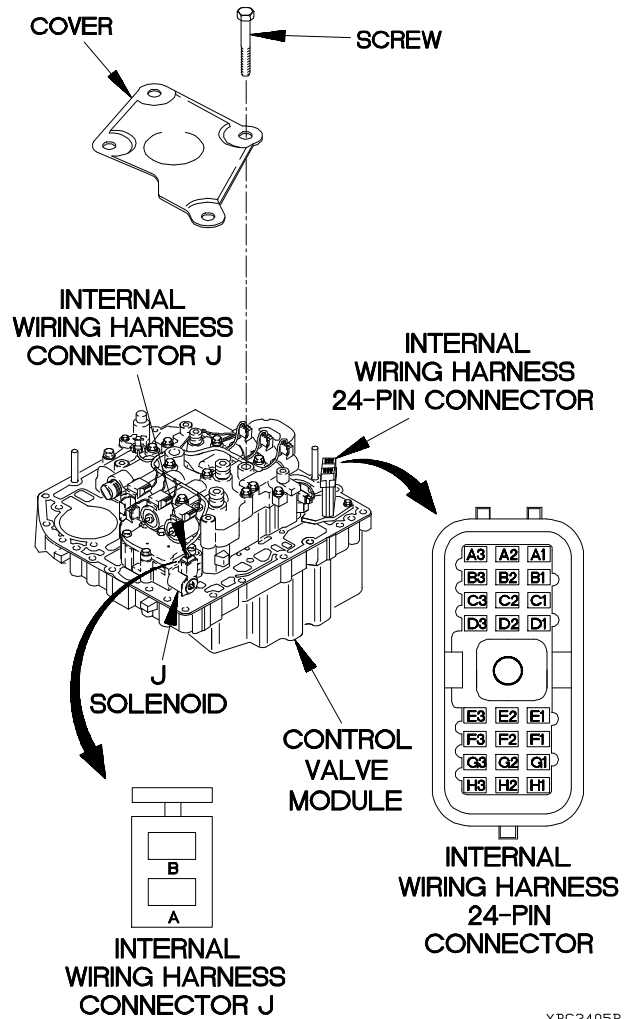
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector J from J solenoid connector.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin H1.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector J pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin H1.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



YBC3405B

c34. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 24 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

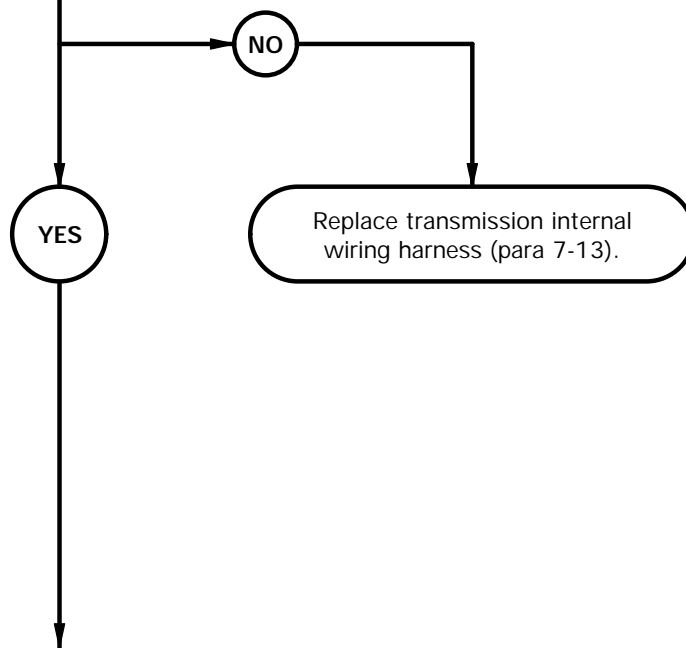
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty J solenoid. Faulty WTEC II TEPSS.

6.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin A2 to internal wiring harness connector J pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

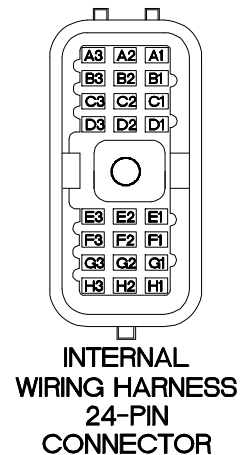
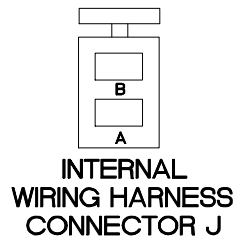
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

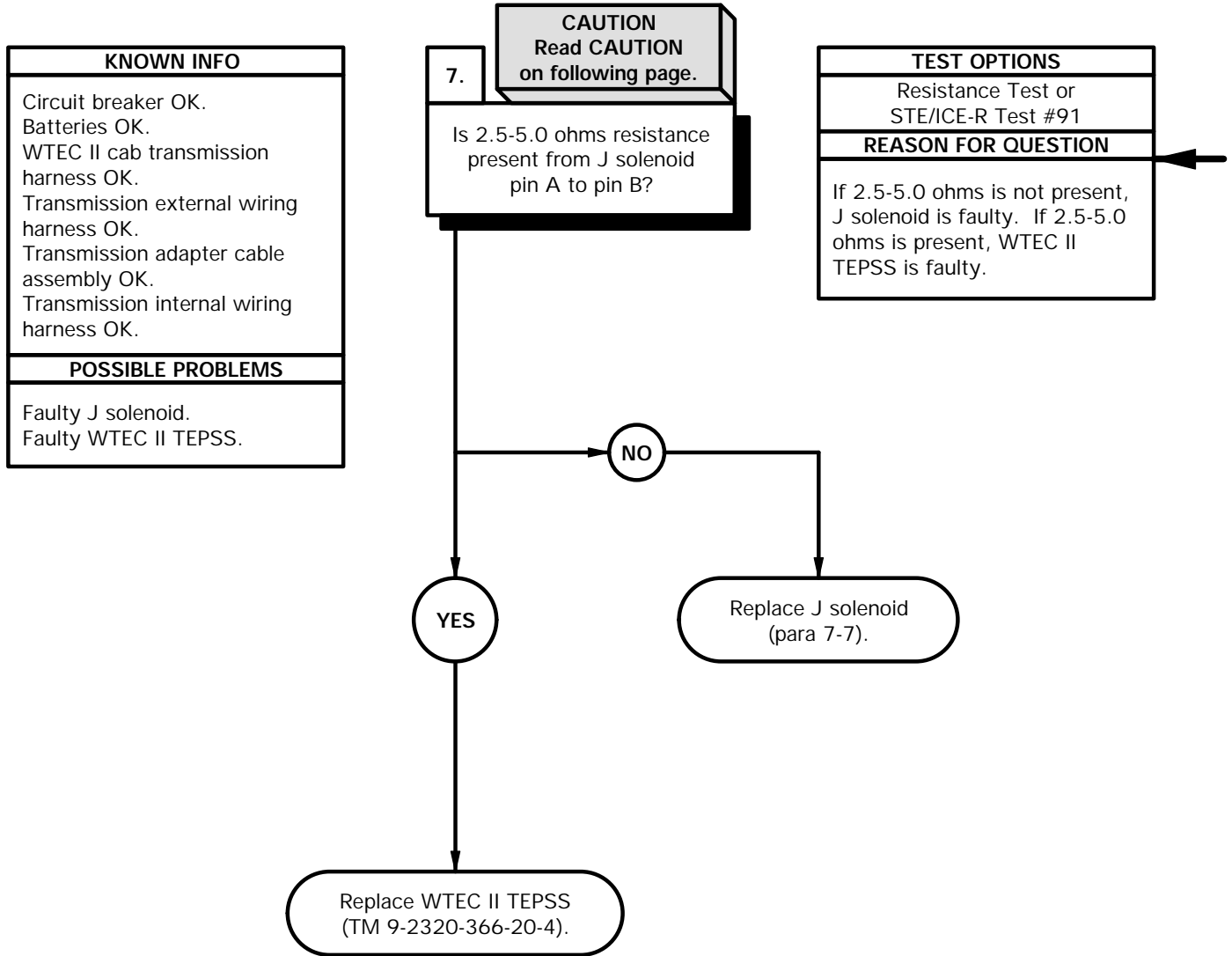
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin A2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector J pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin A2.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



YBC3406B

c34. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 24 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



CAUTION

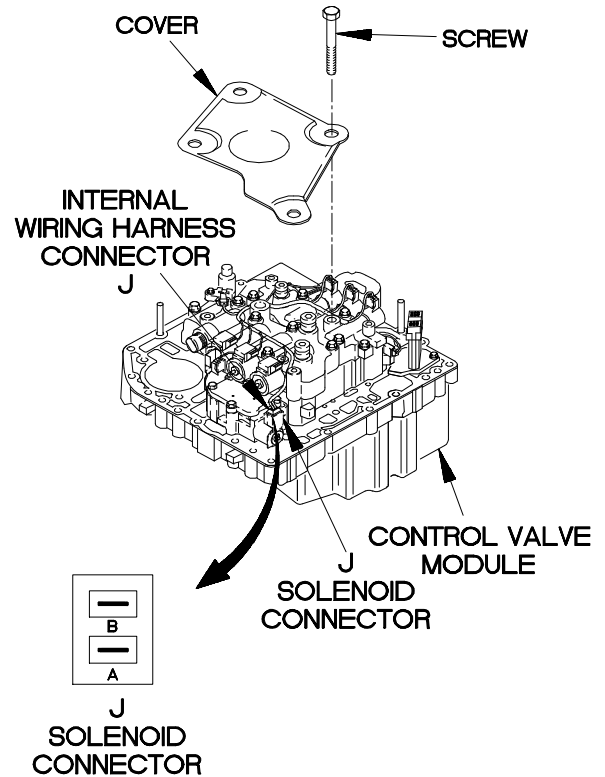
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to J solenoid connector pin A.
- (3) Connect negative (-) probe of multimeter to J solenoid connector pin B and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace J solenoid (para 7-7).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector J to J solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC3407B

c35. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 24 (PRIOR TO SERIAL NUMBER 6510032369)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

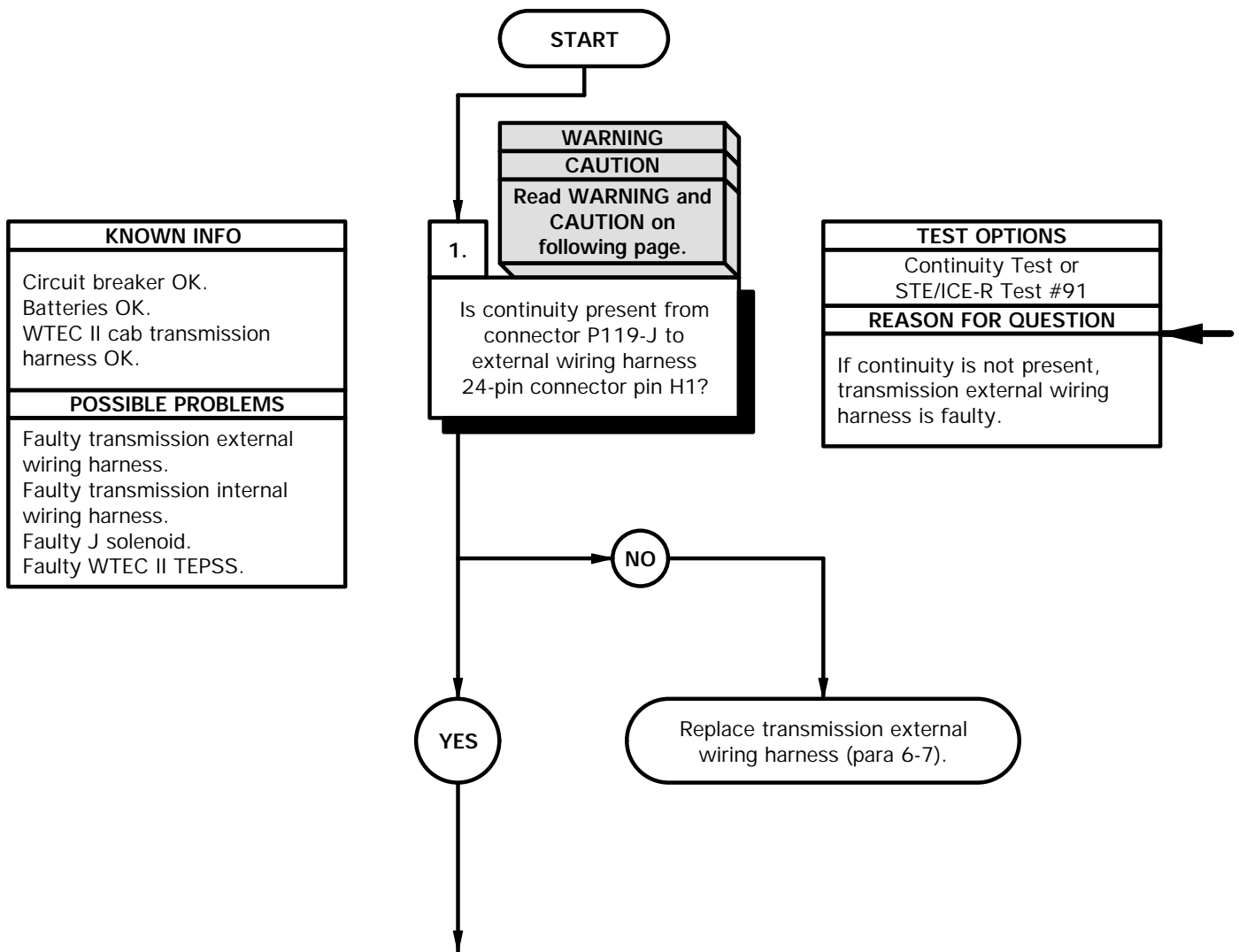
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

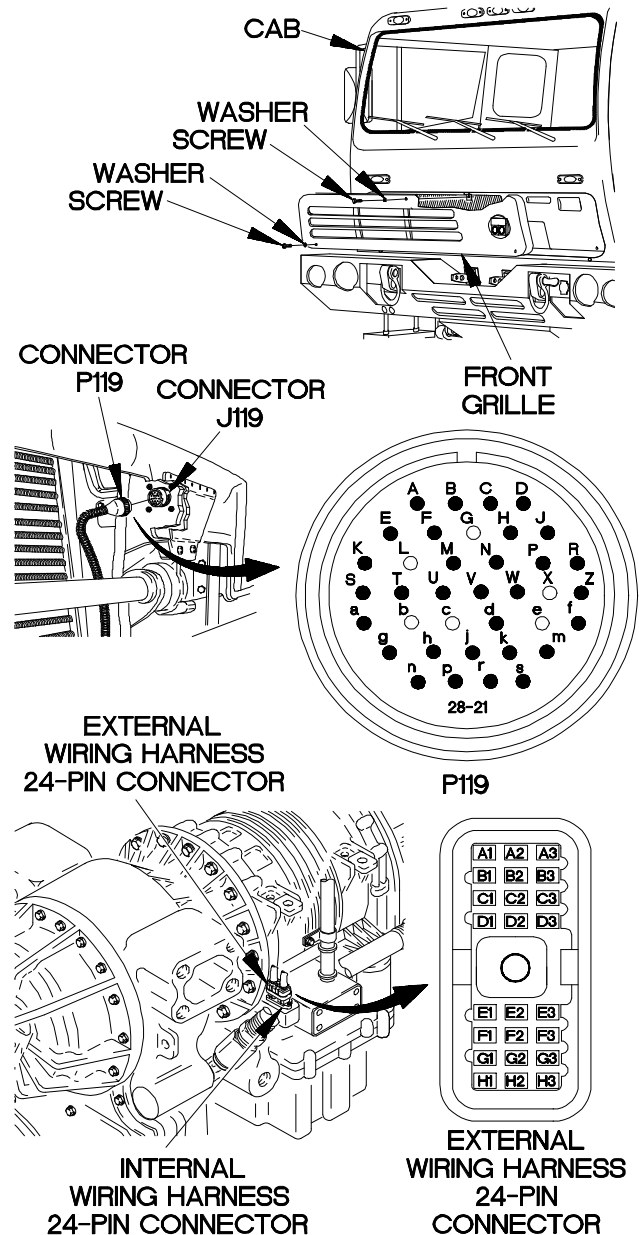
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Loosen screw in external wiring harness 24-pin connector.
- (6) Disconnect external wiring harness 24-pin connector from internal wiring harness 24-pin connector.
- (7) Set multimeter to ohms.
- (8) Connect positive (+) probe of multimeter to connector P119-J.
- (9) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin H1 and note reading on multimeter.
- (10) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (11) Connect positive (+) probe of multimeter to connector P119-J.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (13) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (14) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



YBC3501B

c35. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 24 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

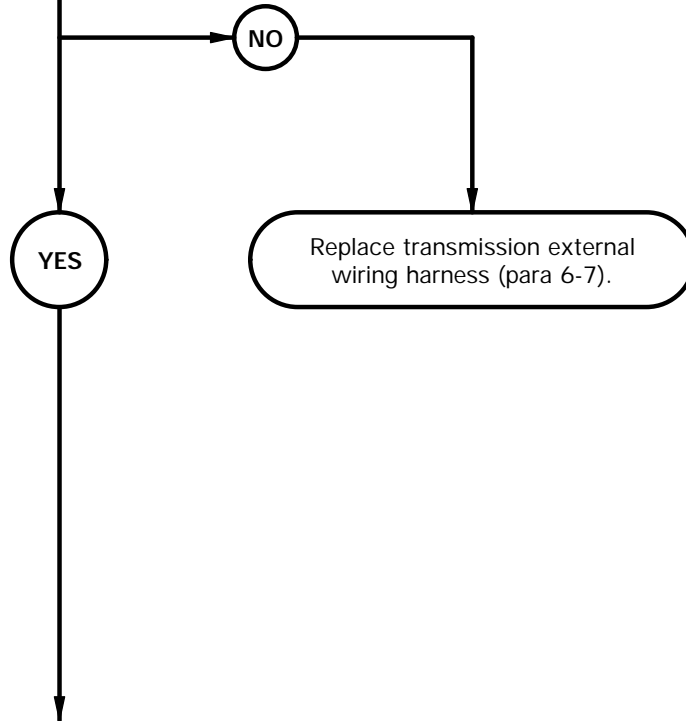
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty J solenoid. Faulty WTEC II TEPSS.

2.

CAUTION
 Read CAUTION on following page.

Is continuity present from connector P119-B to external wiring harness 24-pin connector pin A2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



CAUTION

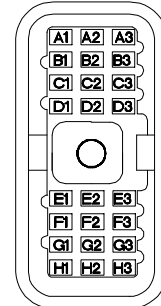
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

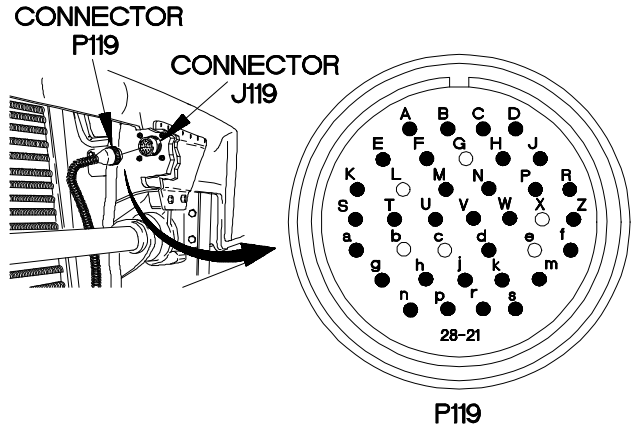
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

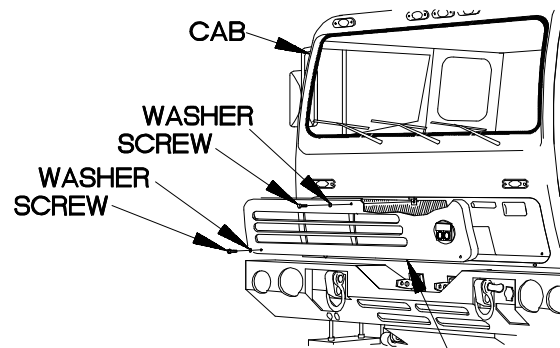
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119 pin B.
- (3) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin A2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119 pin B.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



EXTERNAL WIRING HARNESS 24-PIN CONNECTOR



P119



FRONT GRILLE

YBC3502B

c35. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 24 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

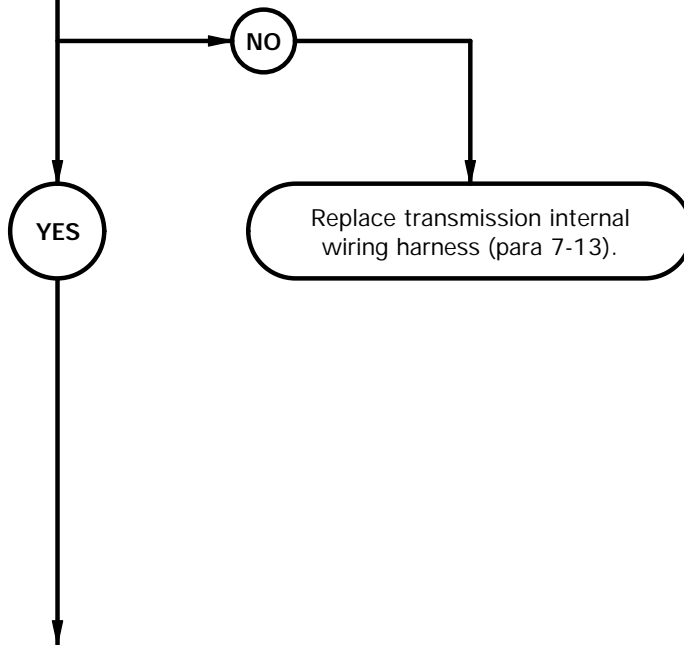
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty J solenoid. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin H1 to internal wiring harness connector J pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

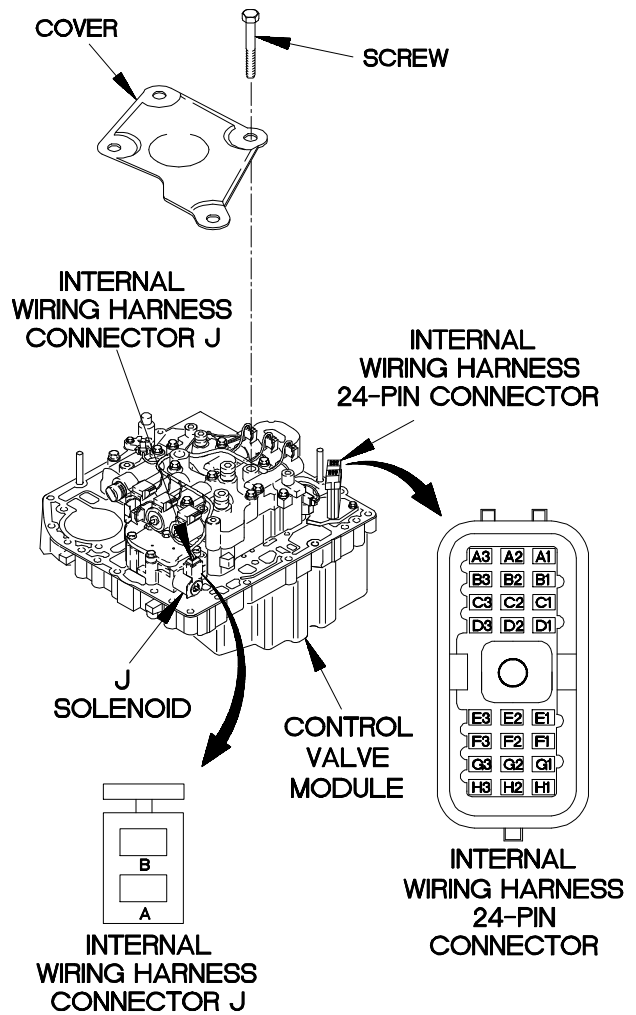
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector J from J solenoid connector.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin H1.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector J pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin H1.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



YBC3503B

c35. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 24 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

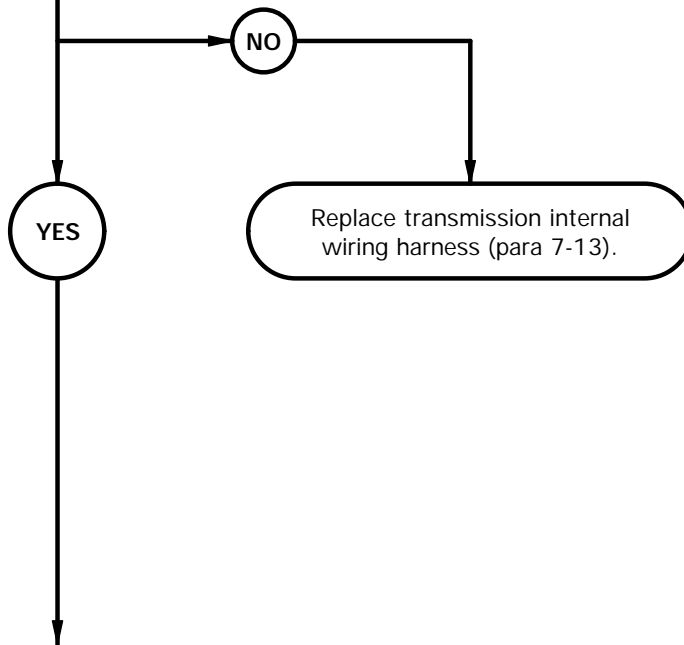
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty J solenoid. Faulty WTEC II TEPSS.

4.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin A2 to internal wiring harness connector J pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

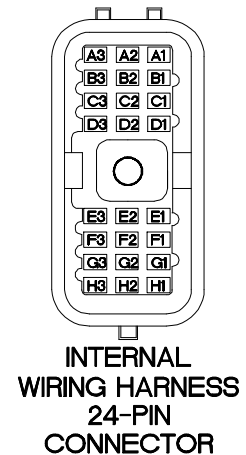
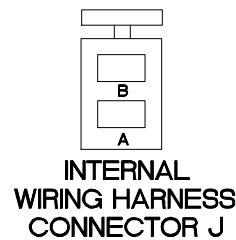
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin A2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector J pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin A2.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



YBC3504B

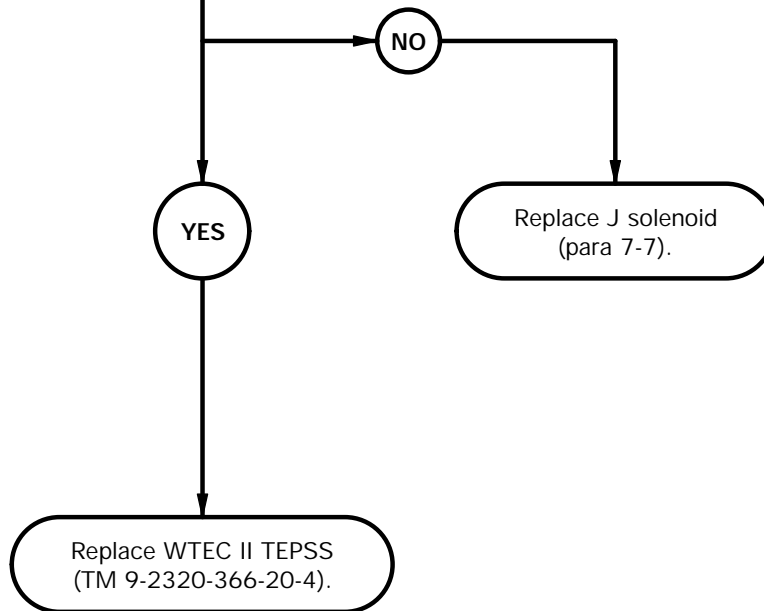
c35. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 24 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty J solenoid. Faulty WTEC II TEPSS.

5. **CAUTION**
Read CAUTION on following page.

Is 2.5-5.0 ohms resistance present from J solenoid pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms is not present, J solenoid is faulty. If 2.5-5.0 ohms is present, WTEC II TEPSS is faulty.



CAUTION

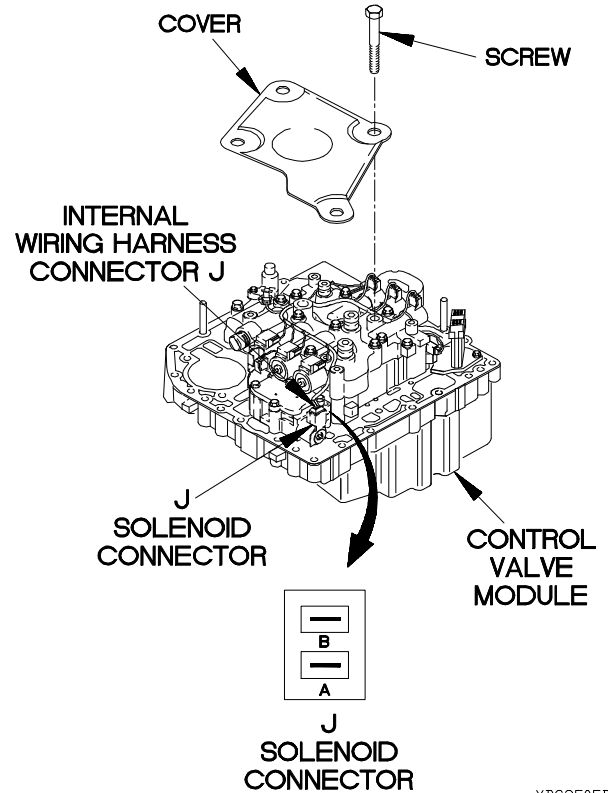
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to J solenoid connector pin A.
- (3) Connect negative (-) probe of multimeter to J solenoid connector pin B and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace J solenoid (para 7-7).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector J to J solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC3505B

c36. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

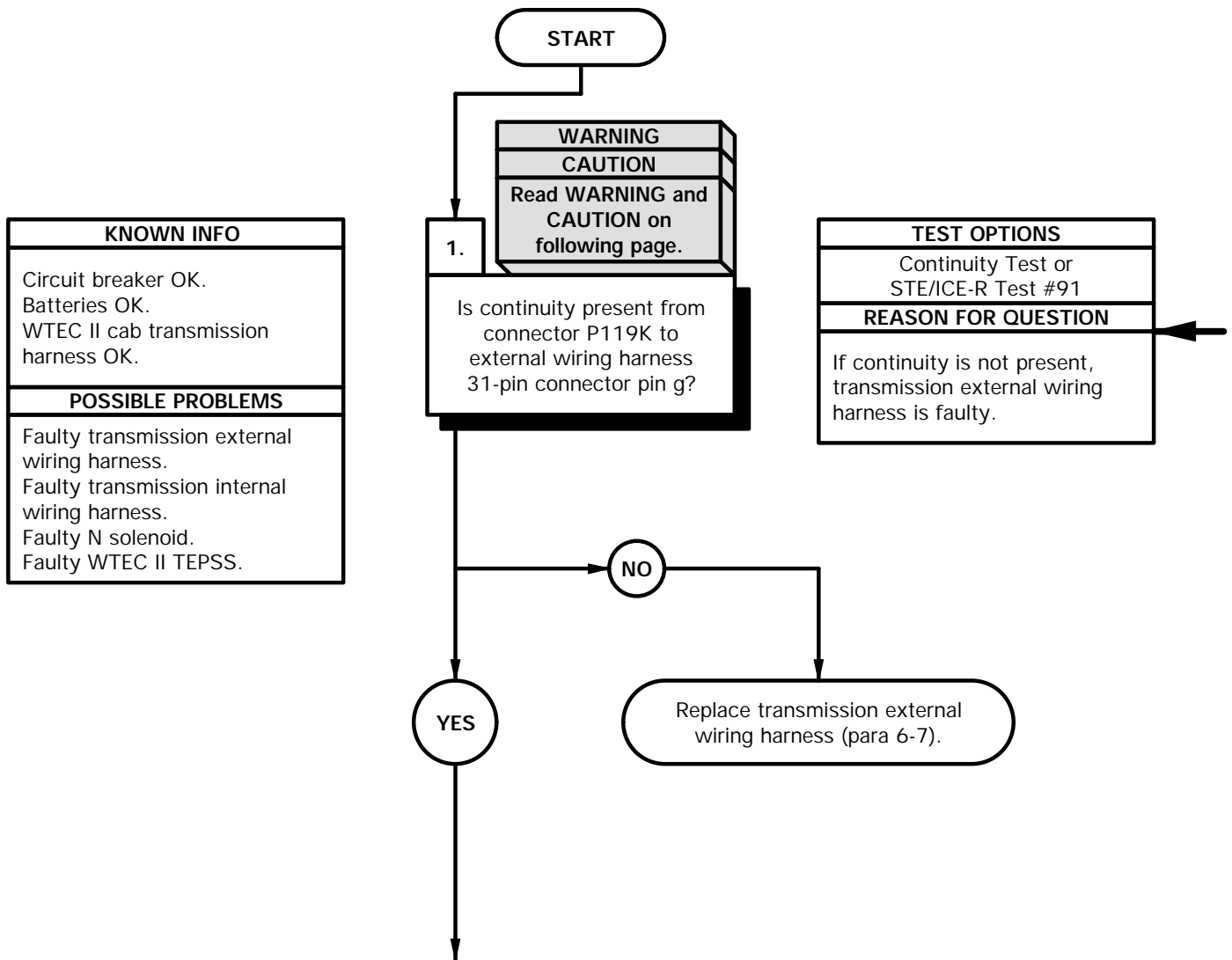
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

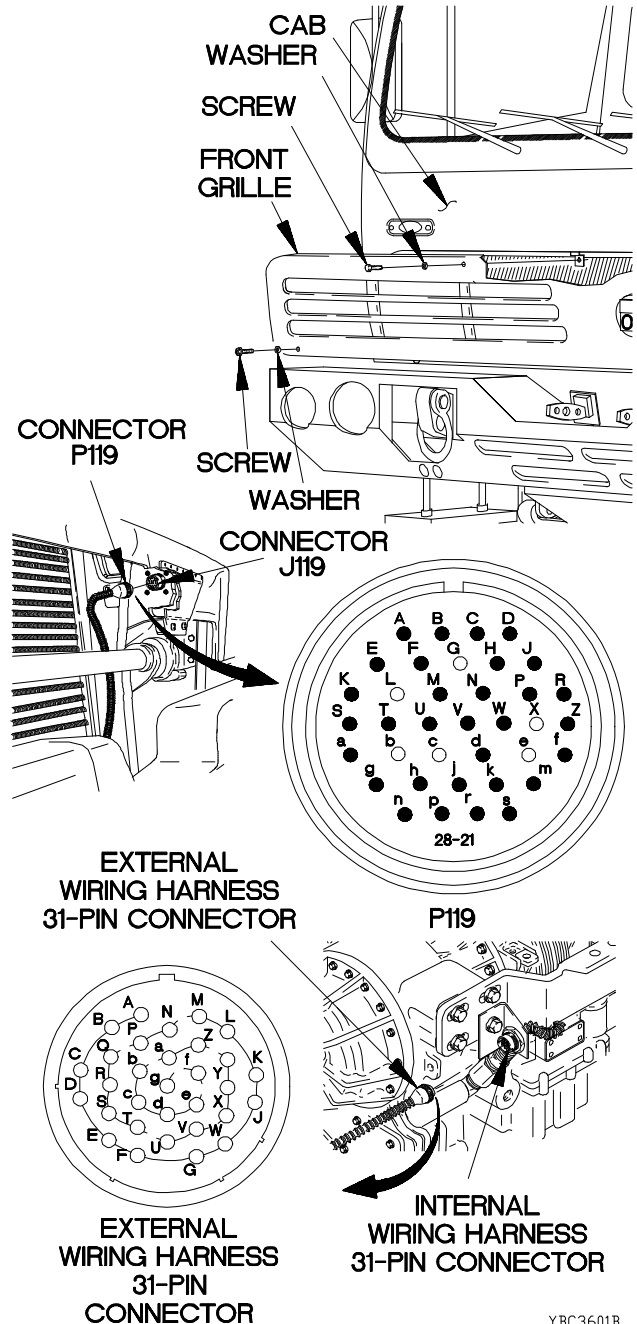
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness 31-pin connector from internal wiring 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-K.
- (8) Connect negative (-) probe of multimeter to internal wiring harness 31-pin connector pin g and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-K.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



YBC3601B

c36. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

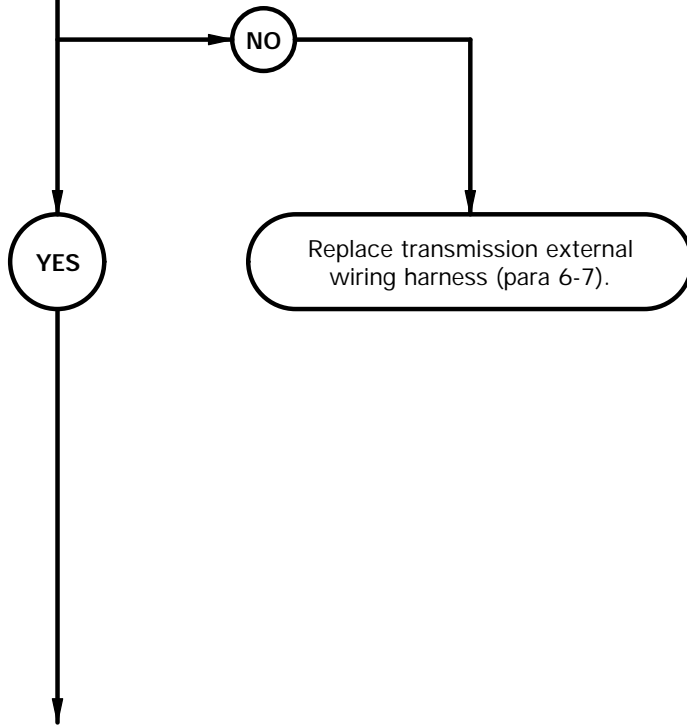
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC II TEPSS.

2.

CAUTION
Read CAUTION on following page.

Is continuity present from connector P119-A to external wiring harness 31-pin connector pin f?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



CAUTION

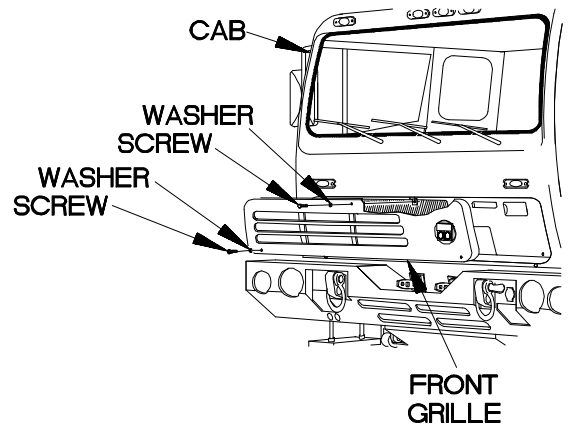
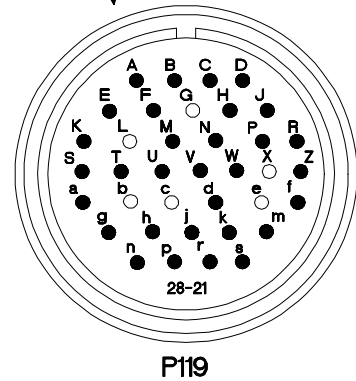
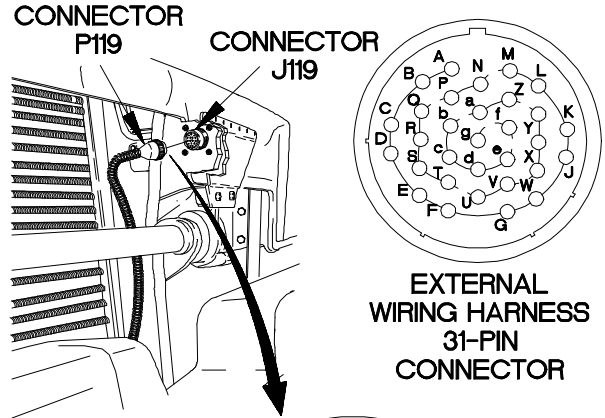
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-A.
- (3) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin f and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-A.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



YBC3602B

c36. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

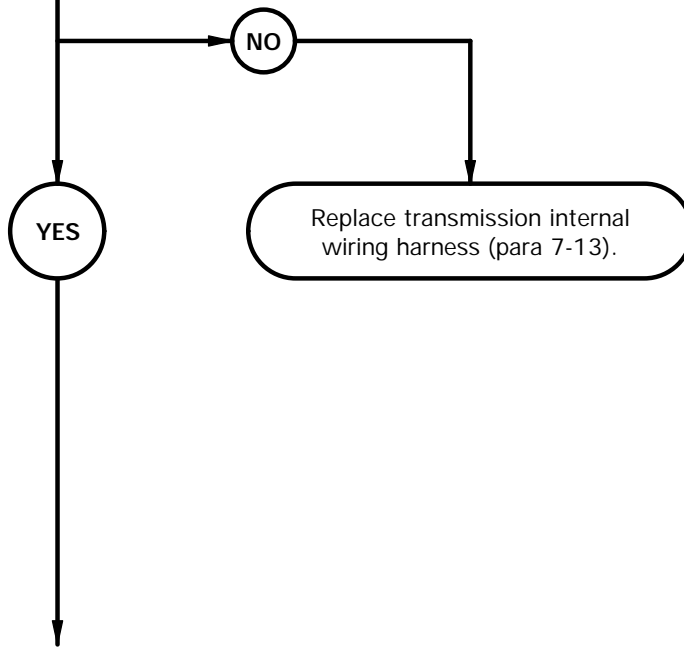
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin g to internal wiring harness connector N pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

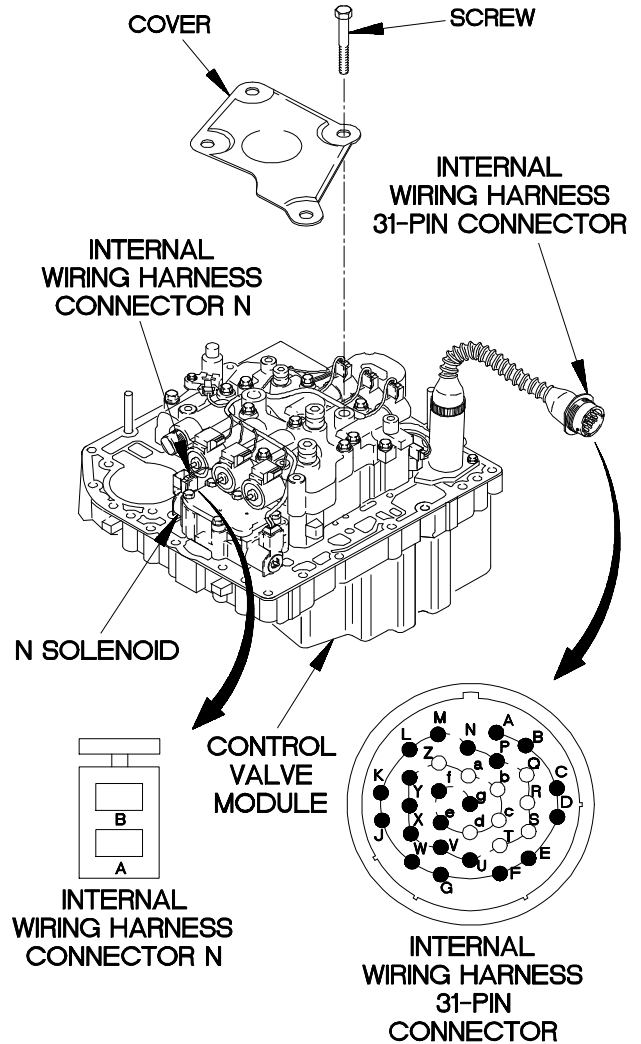
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector N from N solenoid connector.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin g.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector N pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin g.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



YBC3603B

c36. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

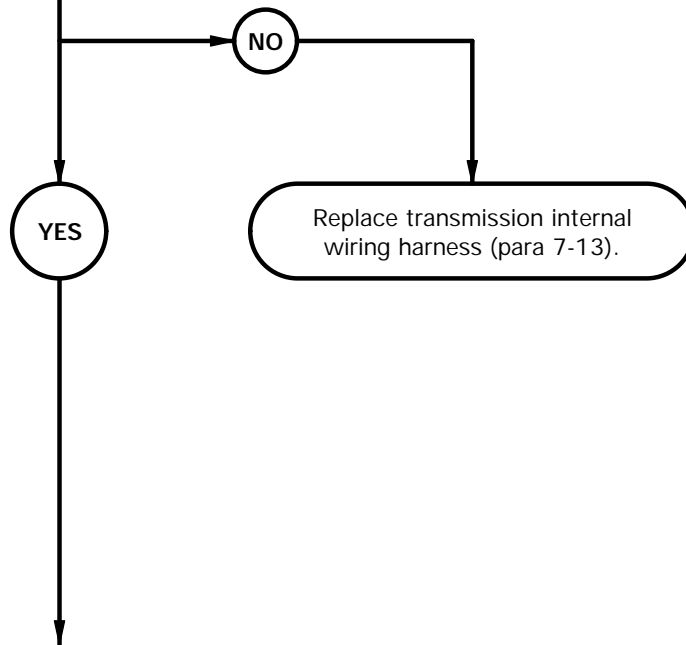
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC II TEPSS.

4.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin f to internal wiring harness connector N pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

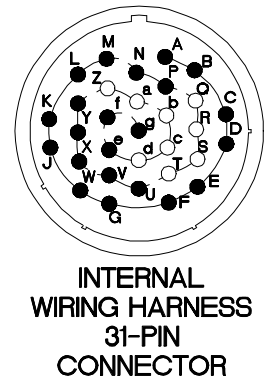
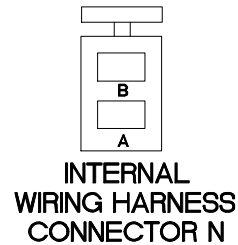
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

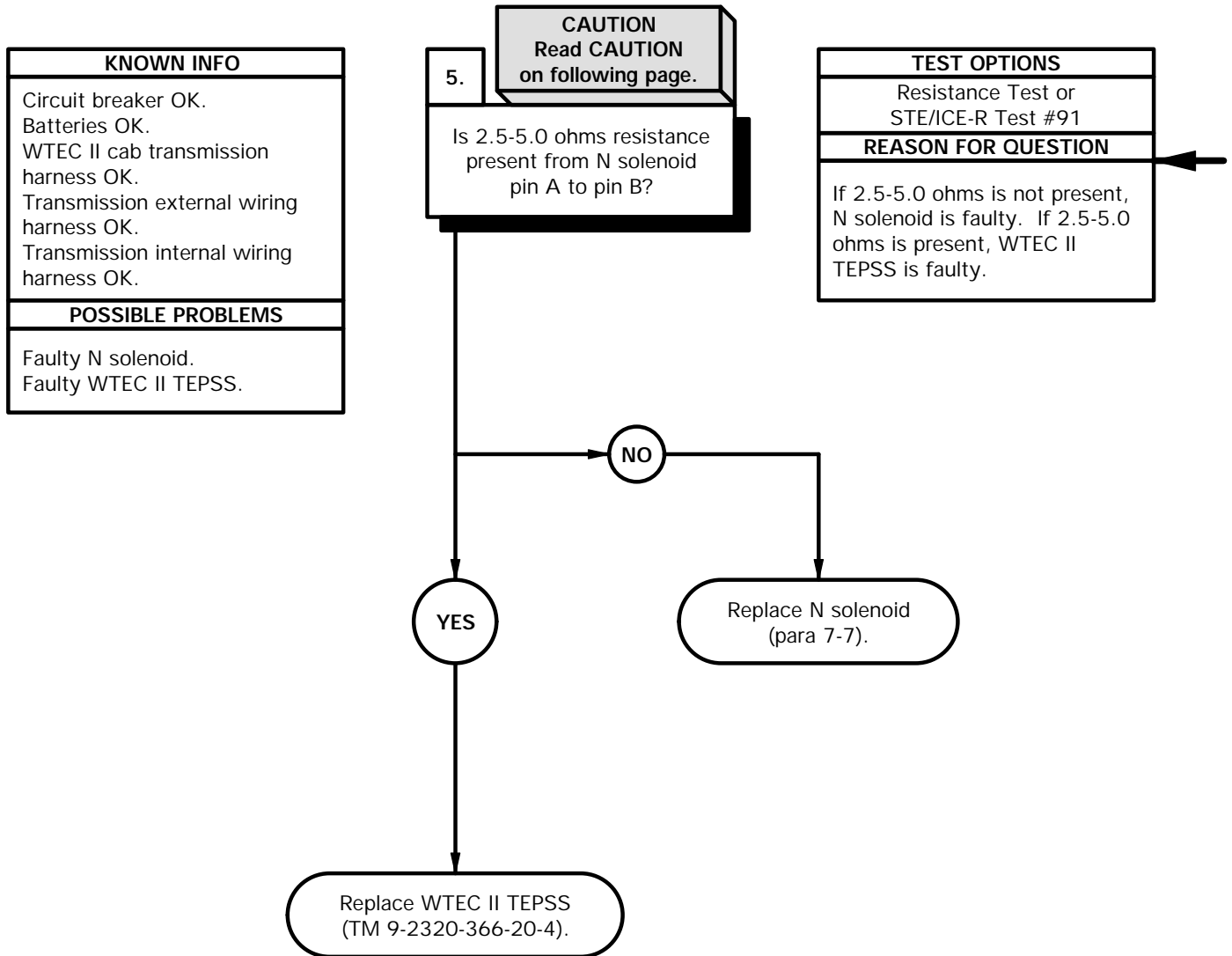
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin f.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector N pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin f.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



YBC3604B

c36. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



CAUTION

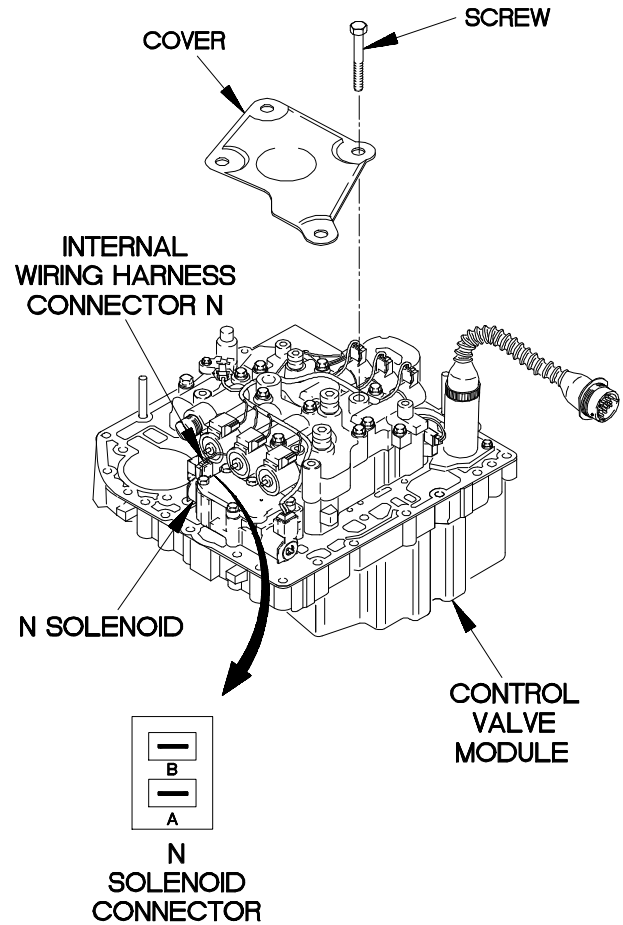
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to N solenoid connector pin A.
- (3) Connect negative (-) probe of multimeter to N solenoid connector pin B and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace N solenoid (para 7-7).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector N to N solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC3605B

c37. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45 AND/OR 69 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

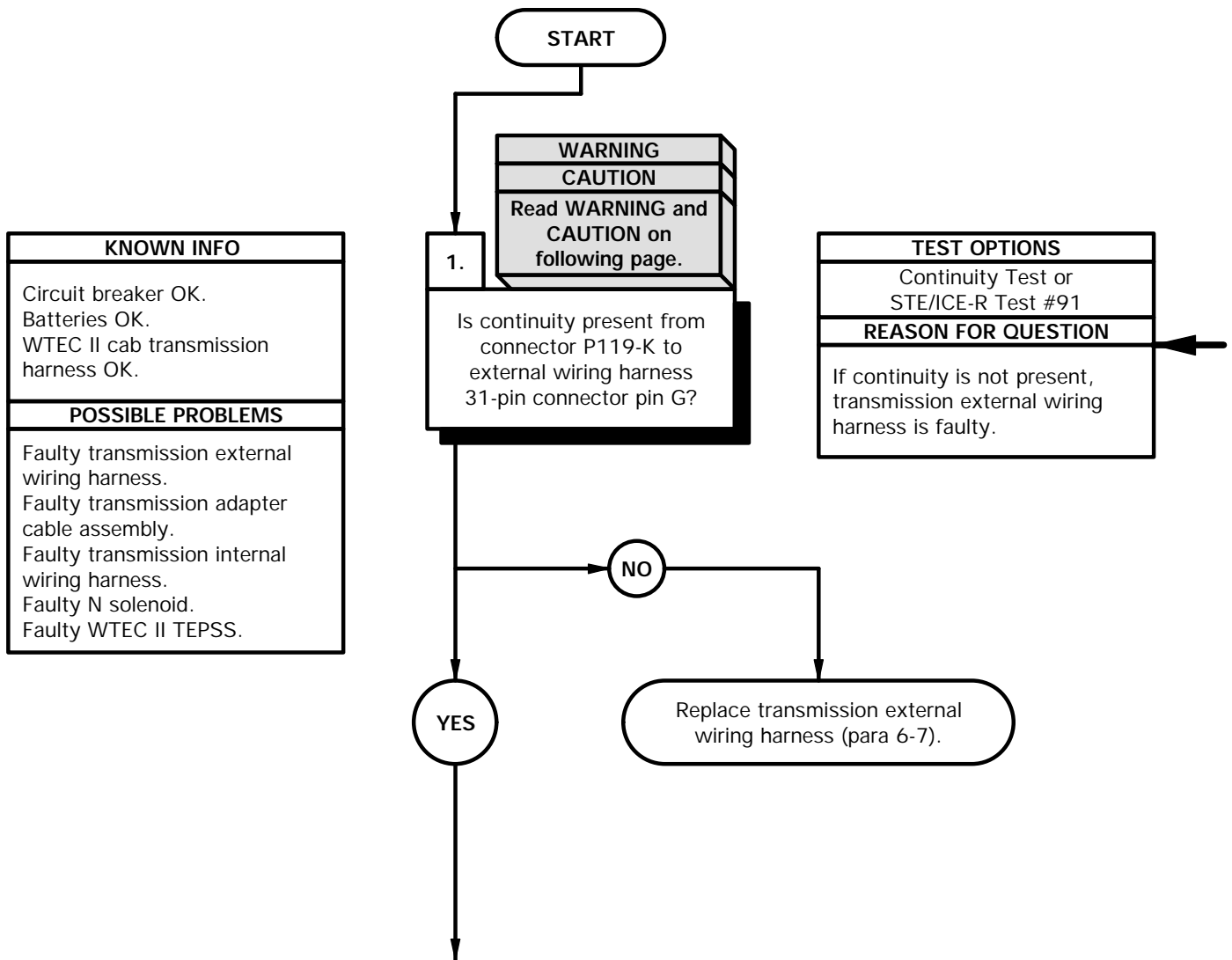
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

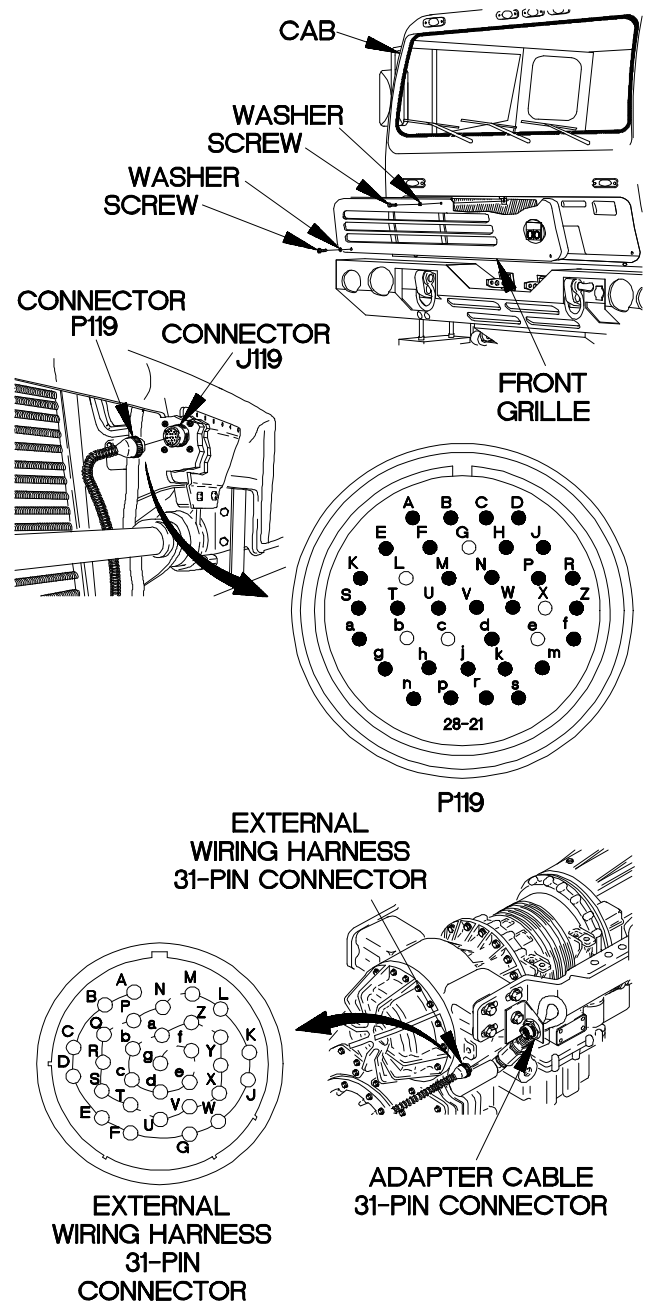
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness 31-pin connector from adapter cable 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-K.
- (8) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin G and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-K.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

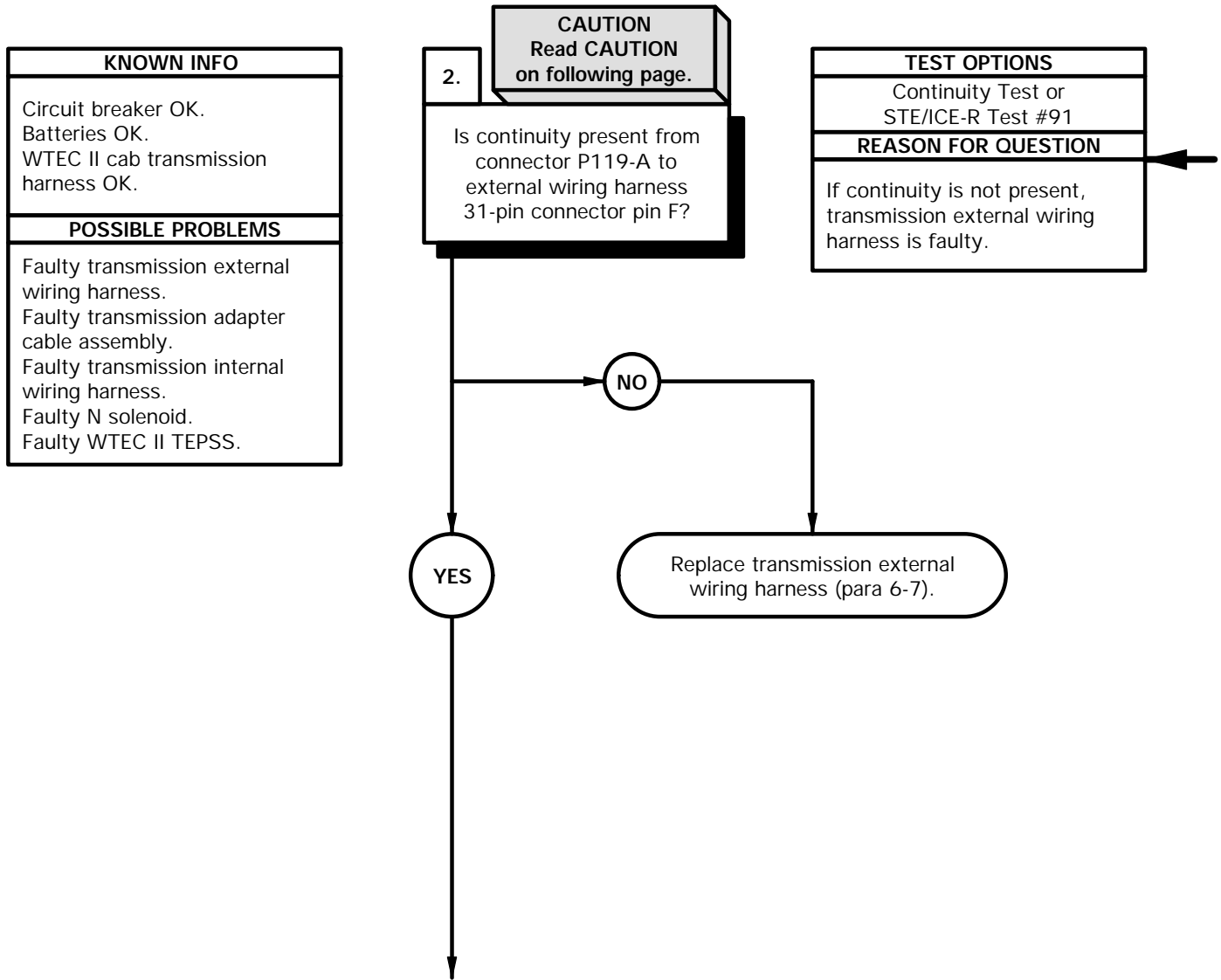
CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



YBC3701B

c37. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45 AND/OR 69 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



CAUTION

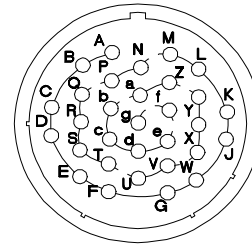
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

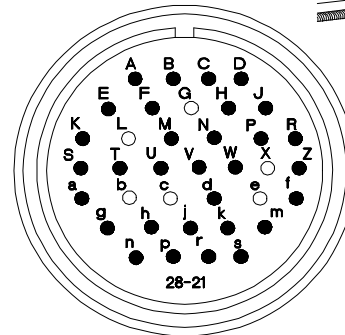
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

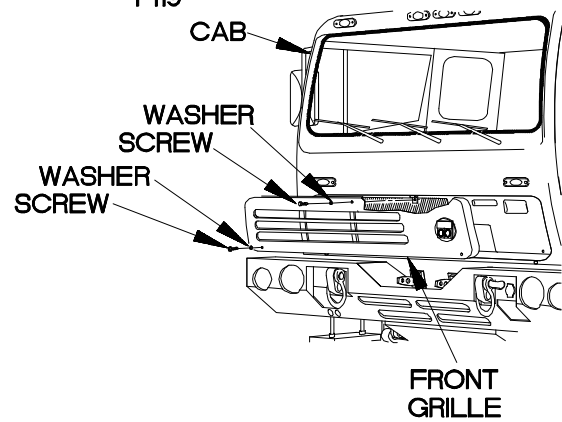
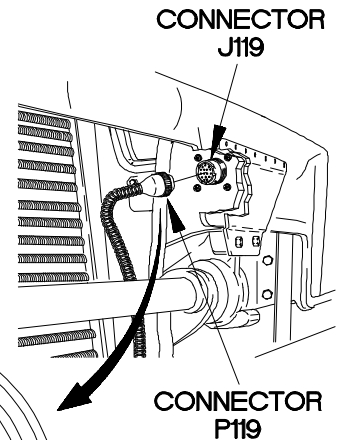
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-A.
- (3) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin F and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-A.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connect P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



EXTERNAL WIRING HARNESS 31-PIN CONNECTOR



P119



YBC3702B

c37. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45 AND/OR 69 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

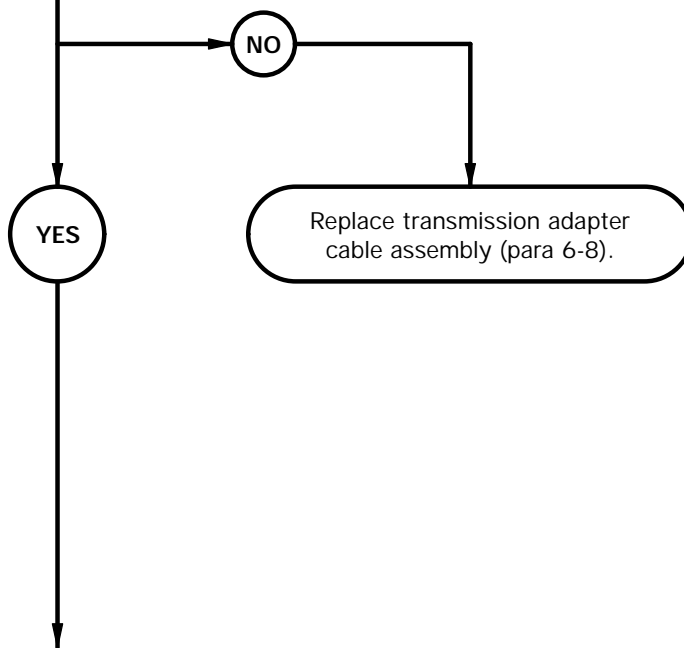
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin G to adapter cable 24-pin connector pin H3?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.



CAUTION

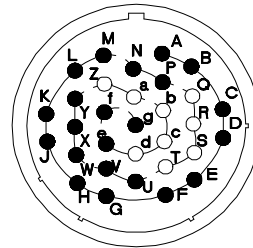
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

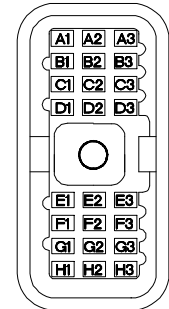
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

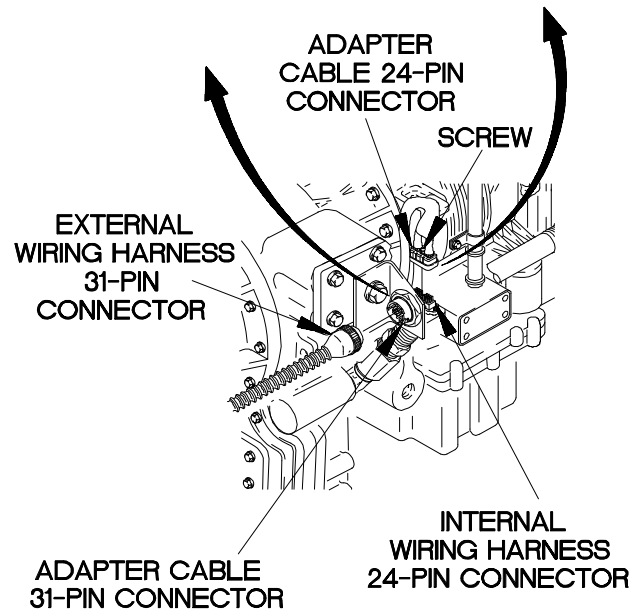
- (1) Loosen screw in adapter cable 24-pin connector.
- (2) Disconnect adapter cable 24-pin connector from internal wiring harness 24-pin connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin G.
- (5) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin H3 and note reading on multimeter.
- (6) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (7) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin G.
- (8) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).



ADAPTER CABLE 31-PIN CONNECTOR



ADAPTER CABLE 24-PIN CONNECTOR



YBC3703B

c37. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45 AND/OR 69 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

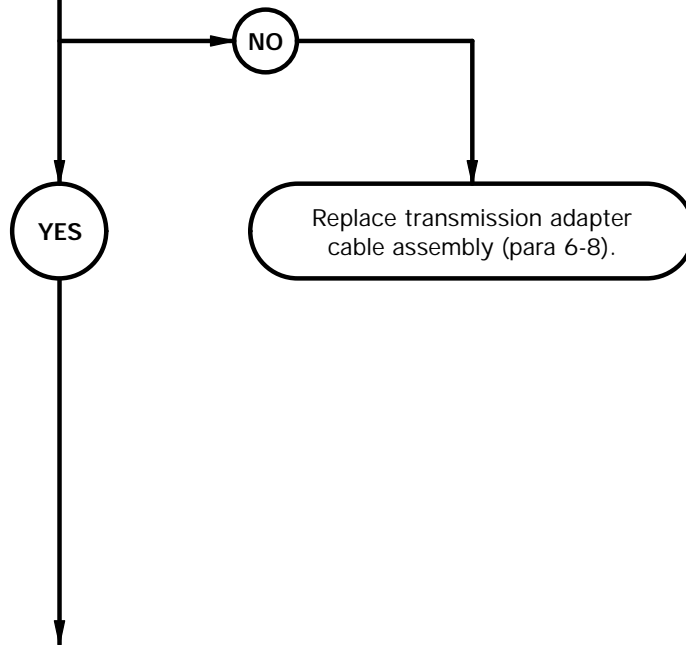
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC II TEPSS.

4.

CAUTION
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin F to adapter cable 24-pin connector pin H2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.



CAUTION

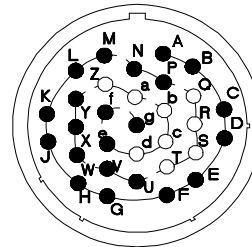
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

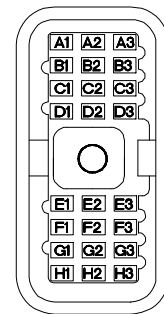
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin F.
- (3) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin H2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (5) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin F.
- (6) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).
- (9) Connect adapter cable 31-pin connector to external wiring harness 31-pin connector.



**ADAPTER CABLE
31-PIN CONNECTOR**



**ADAPTER CABLE
24-PIN
CONNECTOR**

YBC3704B

c37. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45 AND/OR 69 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

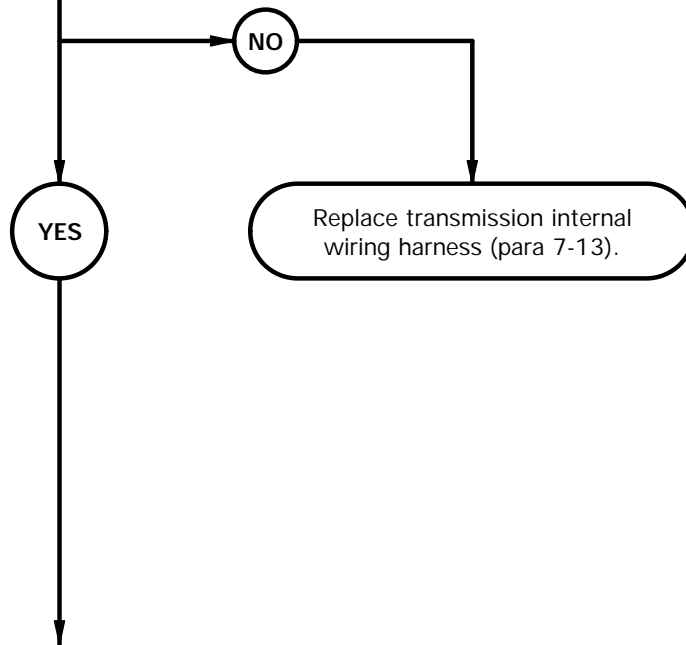
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC II TEPSS.

5.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin H3 to internal wiring harness connector N pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

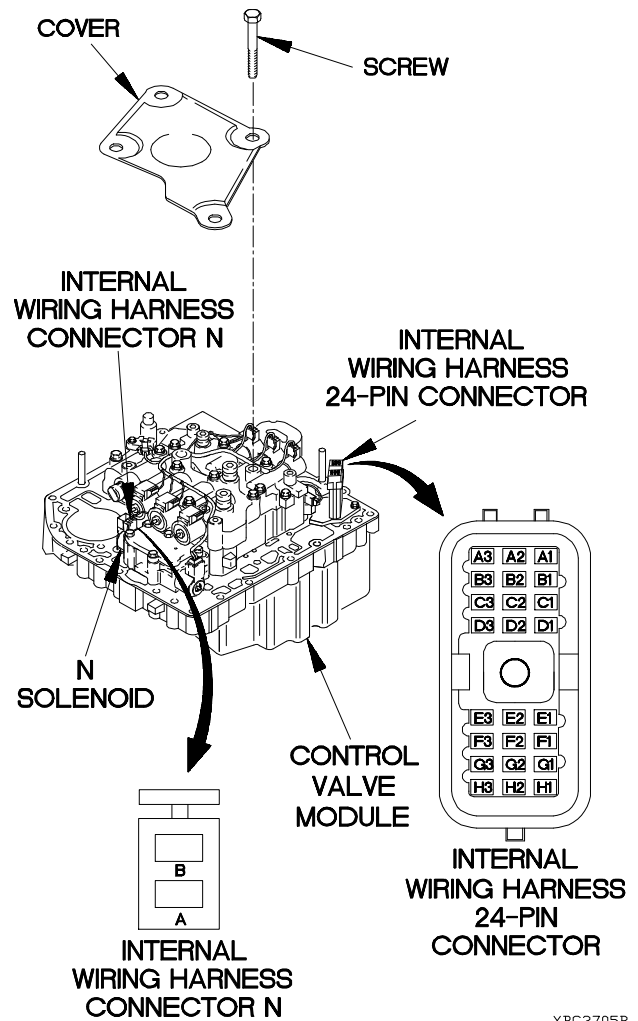
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector N from N solenoid connector.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin H3.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector N pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin H3.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



YBC3705B

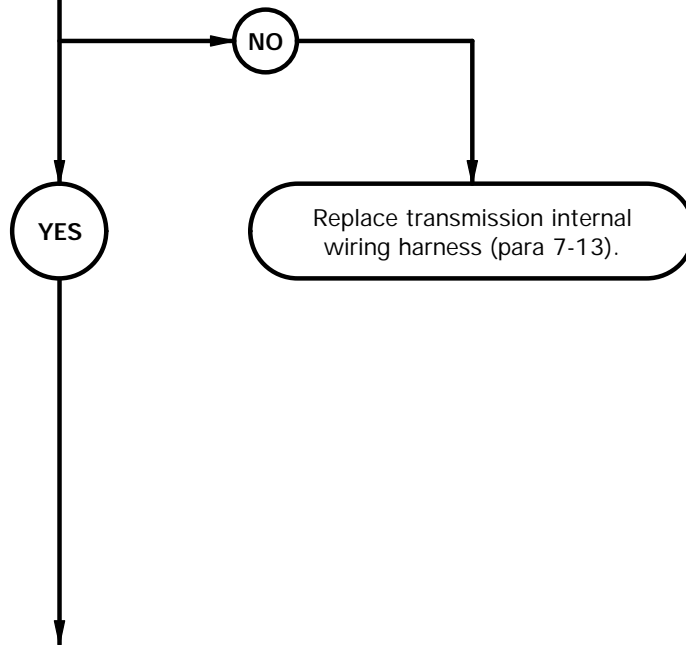
c37. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45 AND/OR 69 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC II TEPSS.

6. **CAUTION**
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin H2 to internal wiring harness connector N pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

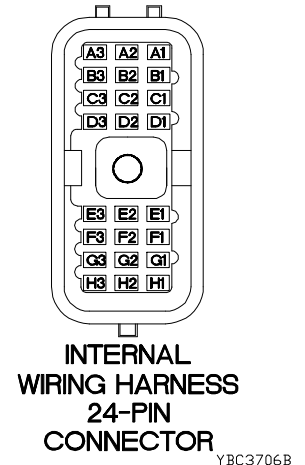
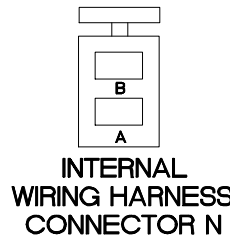
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

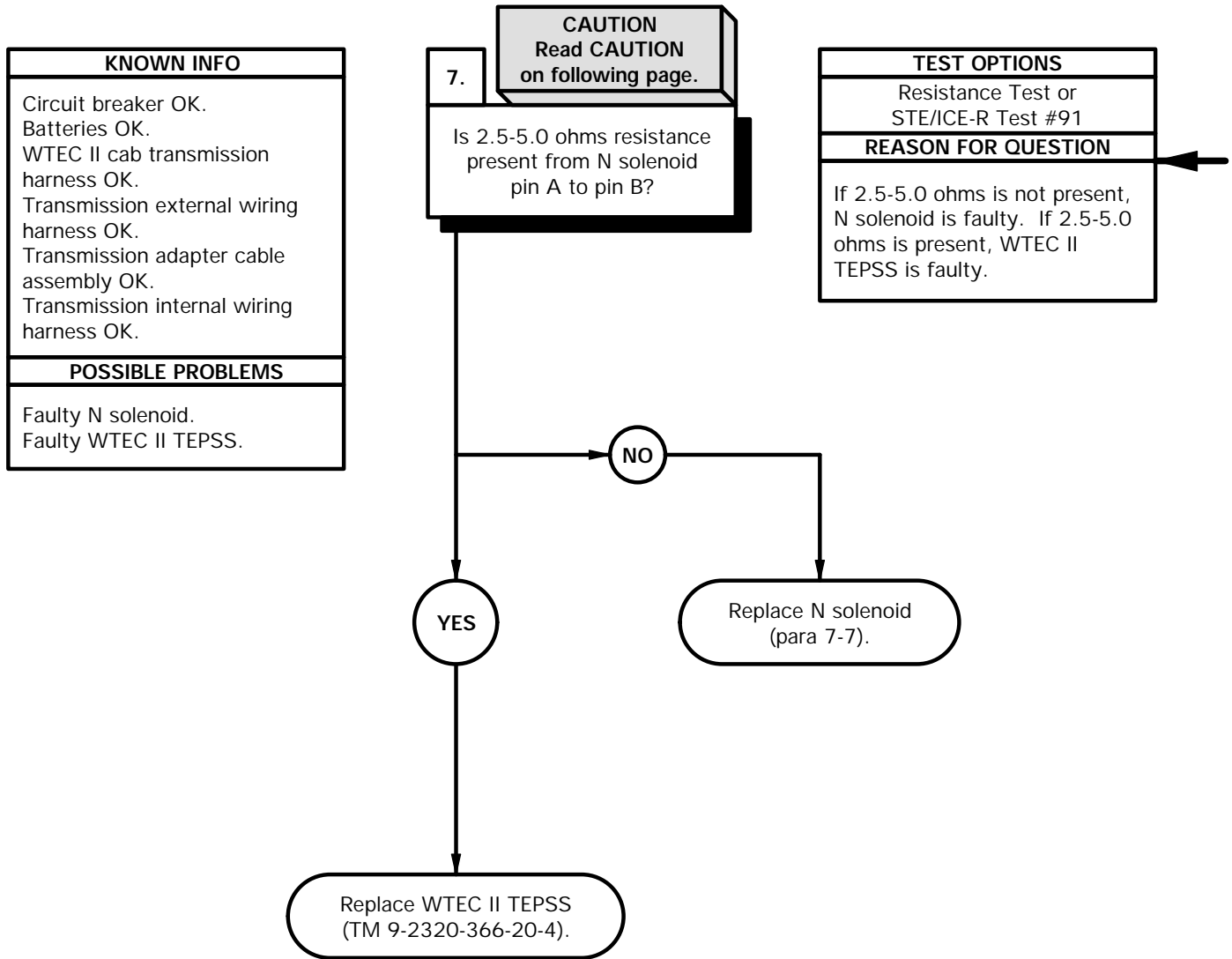
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin H2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector N pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin H2.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



c37. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45 AND/OR 69 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



CAUTION

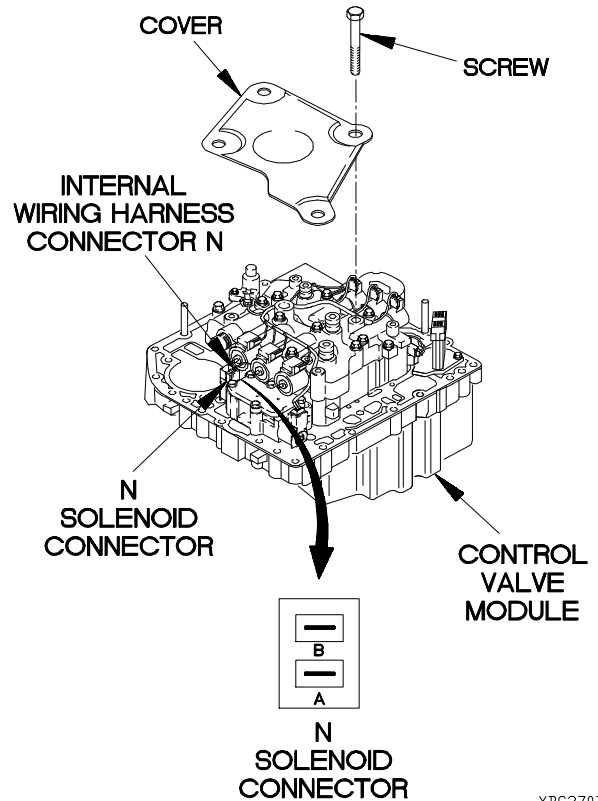
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to N solenoid connector pin A.
- (3) Connect negative (-) probe of multimeter to N solenoid connector pin B and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace N solenoid (para 7-7).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector N to N solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC3707B

c38. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

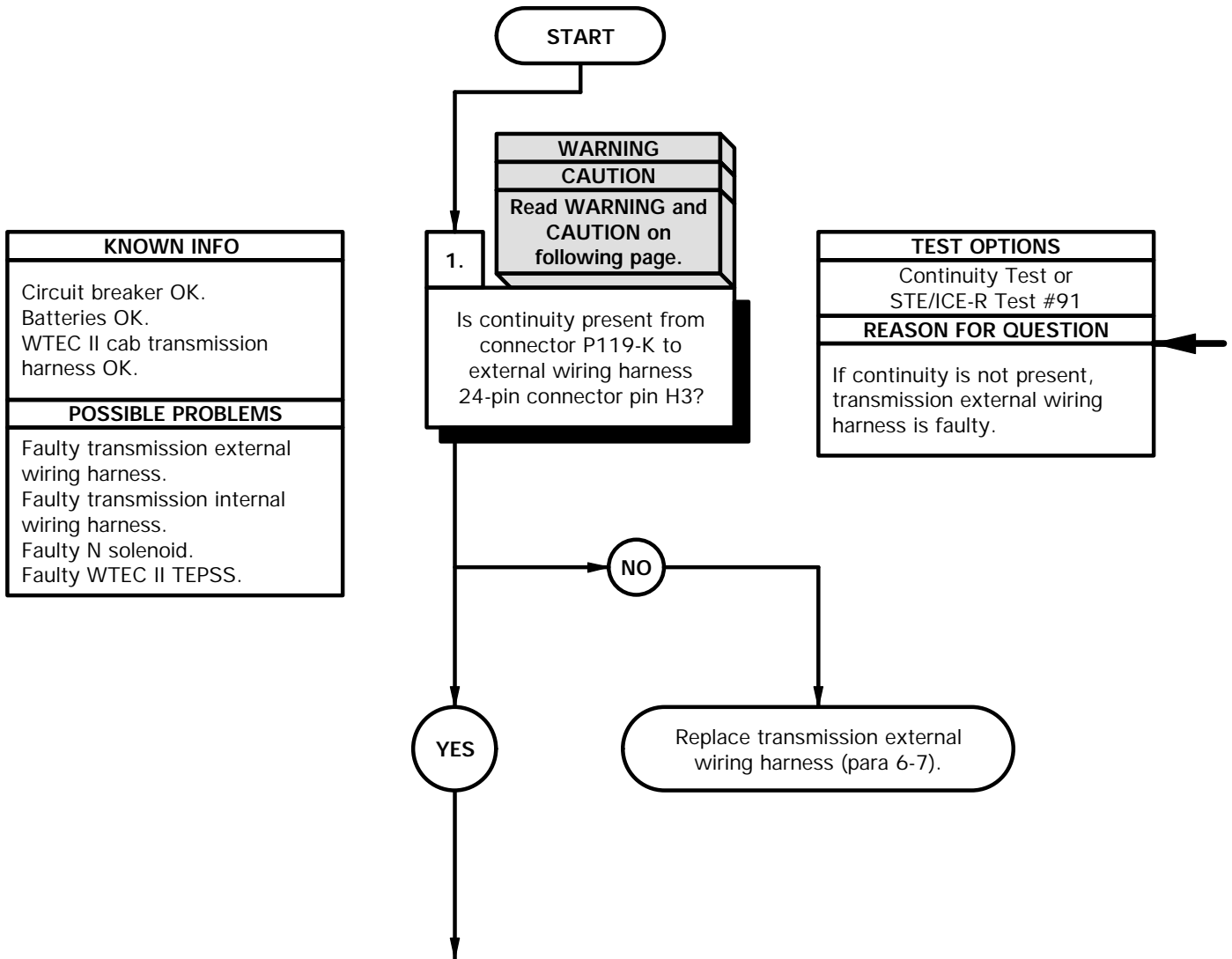
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

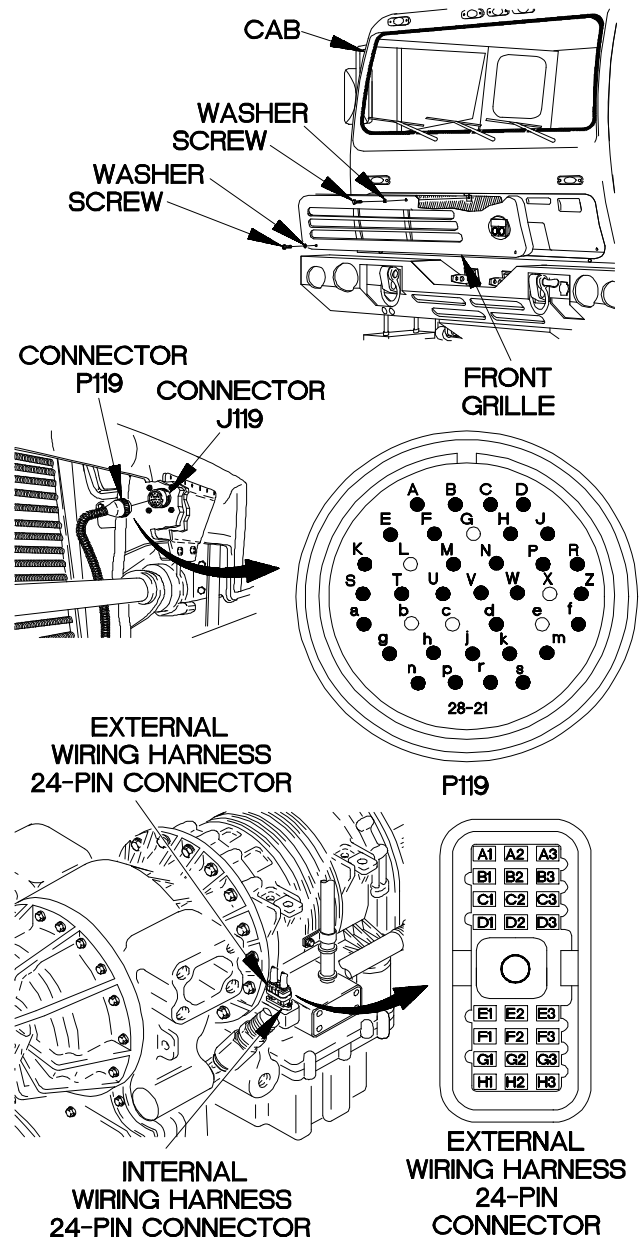
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Loosen screw in external wiring harness 24-pin connector.
- (6) Disconnect external wiring harness 24-pin from internal wiring harness 24-pin connector.
- (7) Set multimeter to ohms.
- (8) Connect positive (+) probe of multimeter to connector P119-K.
- (9) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin H3 and note reading on multimeter.
- (10) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (11) Connect positive (+) probe of multimeter to connector P119-K.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (13) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (14) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



YBC3801B

c38. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

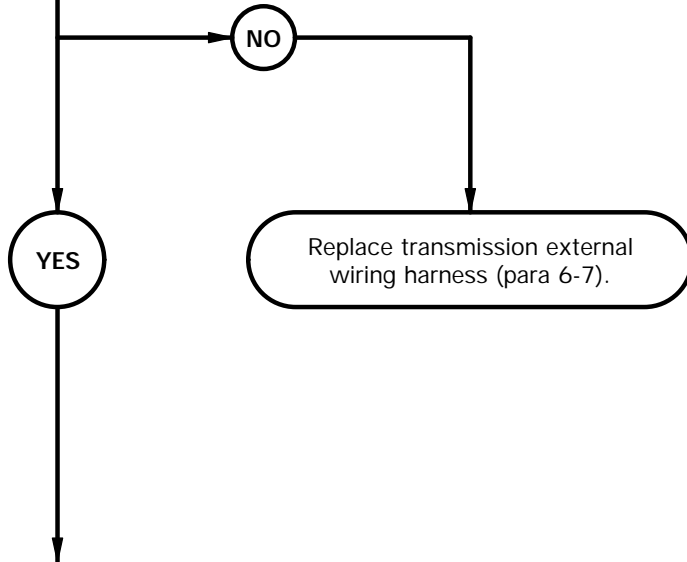
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC II TEPSS.

2.

CAUTION
Read CAUTION on following page.

Is continuity present from connector P119-A to external wiring harness 24-pin connector pin H2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



CAUTION

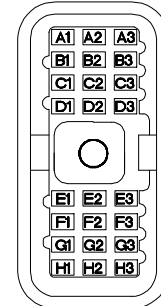
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

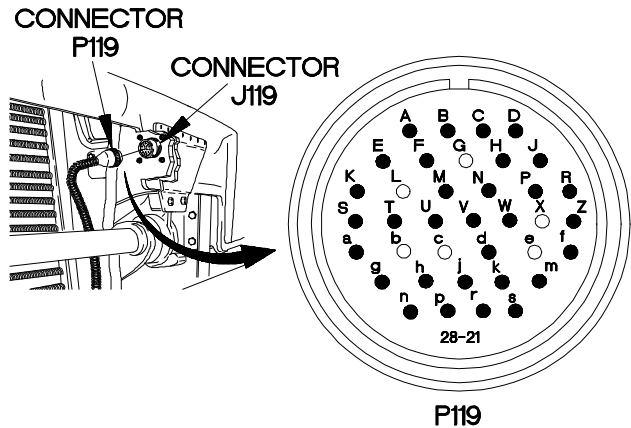
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

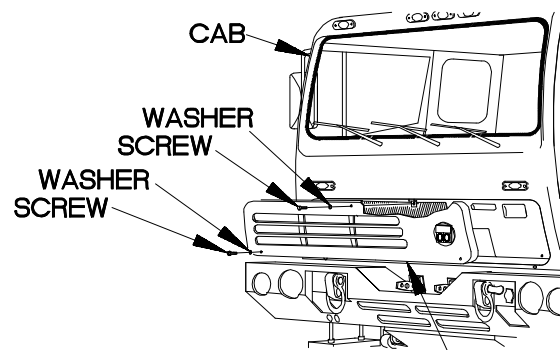
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-A.
- (3) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin H2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-A.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connect P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



EXTERNAL WIRING HARNESS 24-PIN CONNECTOR



P119



FRONT GRILLE

YBC3802B

c38. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

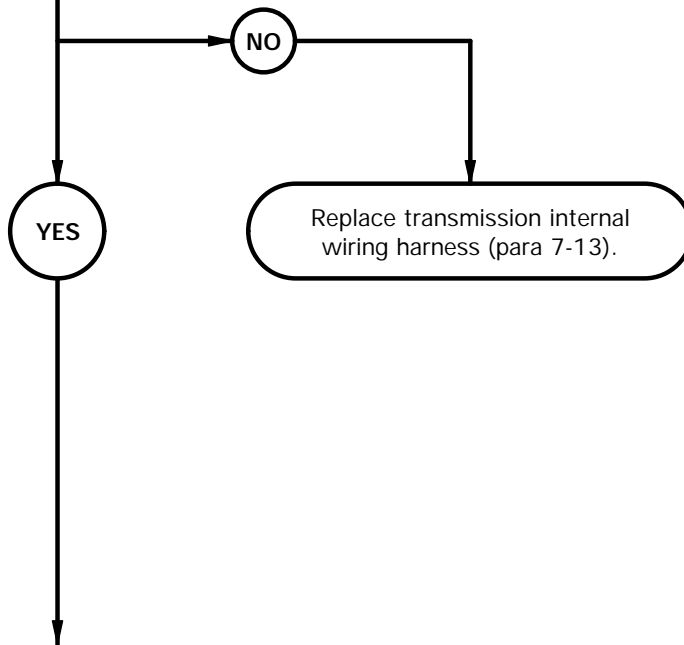
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin H3 to internal wiring harness connector N pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

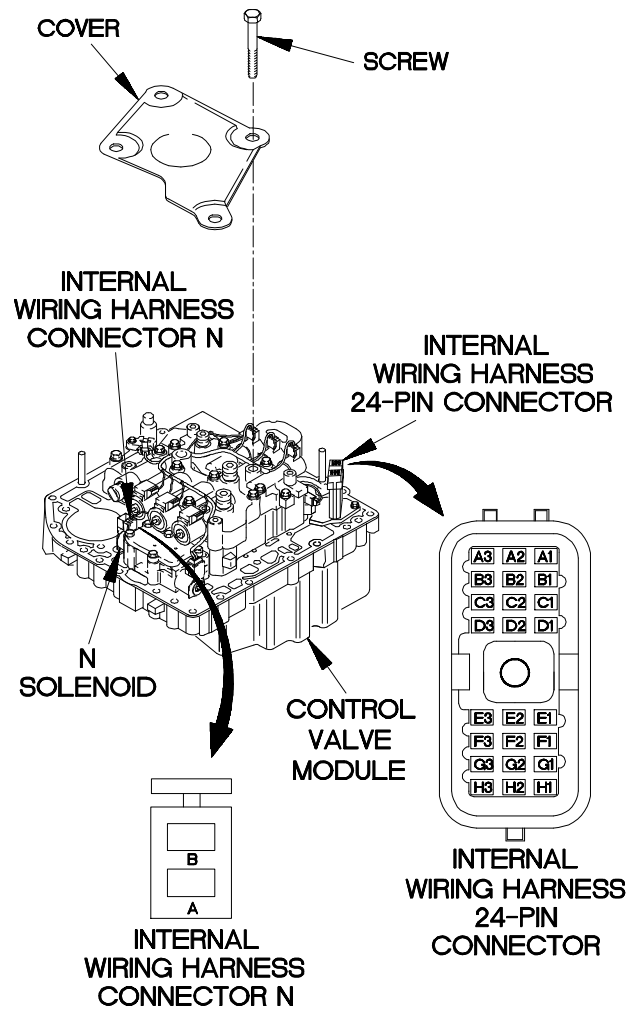
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector N from N solenoid connector.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin H3.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector N pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin H3.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



YBC3803B

c38. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

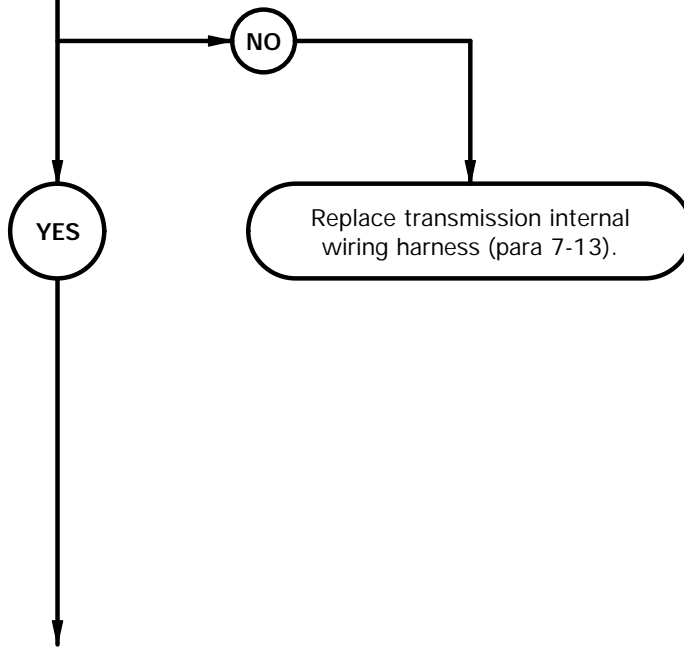
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC II TEPSS.

4.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin H2 to internal wiring harness connector N pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

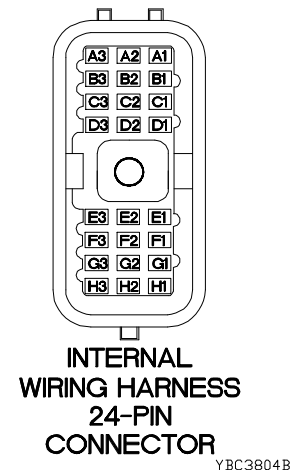
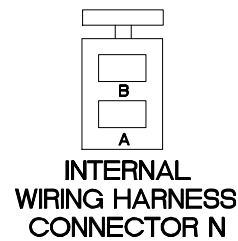
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin H2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector N pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin H2.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



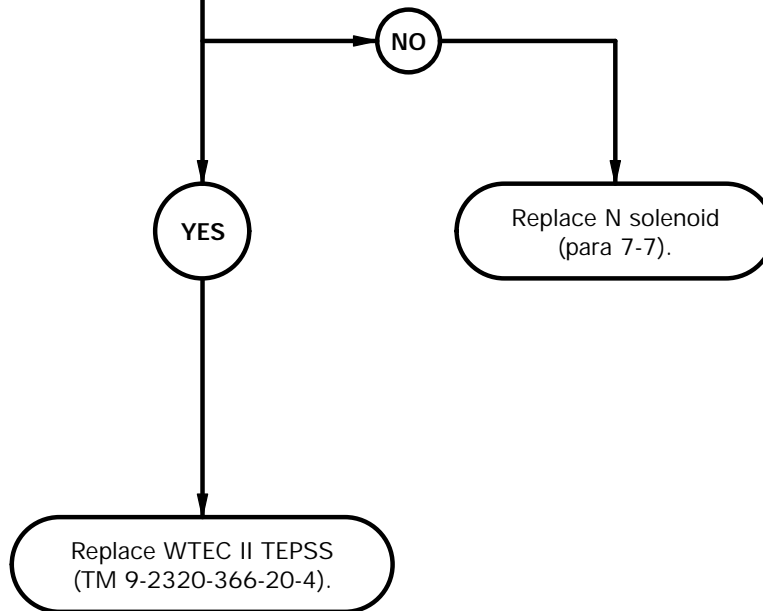
c38. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty N solenoid. Faulty WTEC II TEPSS.

5. **CAUTION**
Read CAUTION on following page.

Is 2.5-5.0 ohms resistance present from N solenoid pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms is not present, N solenoid is faulty. If 2.5-5.0 ohms is present, WTEC II TEPSS is faulty.



CAUTION

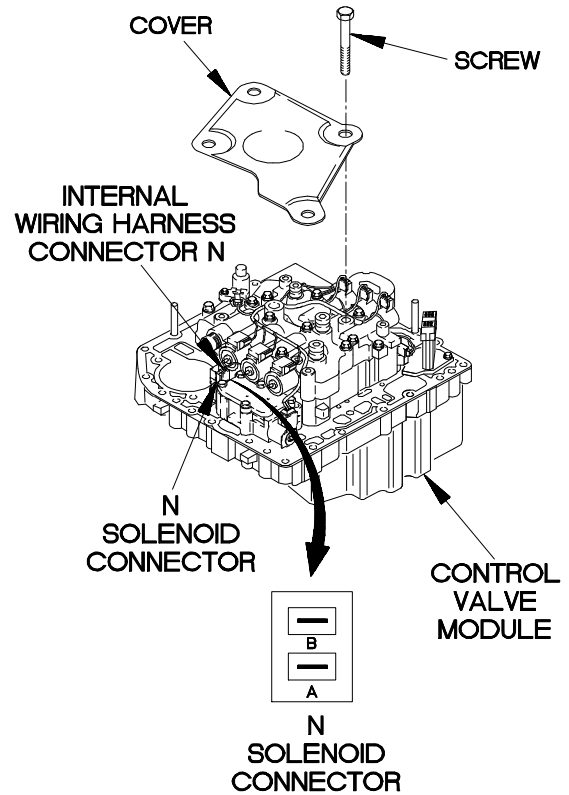
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to N solenoid connector pin A.
- (3) Connect negative (-) probe of multimeter to N solenoid connector pin B and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater 5.0 ohms, replace N solenoid (para 7-7).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector N to N solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC3805B

c39. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

Equipment Conditions

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

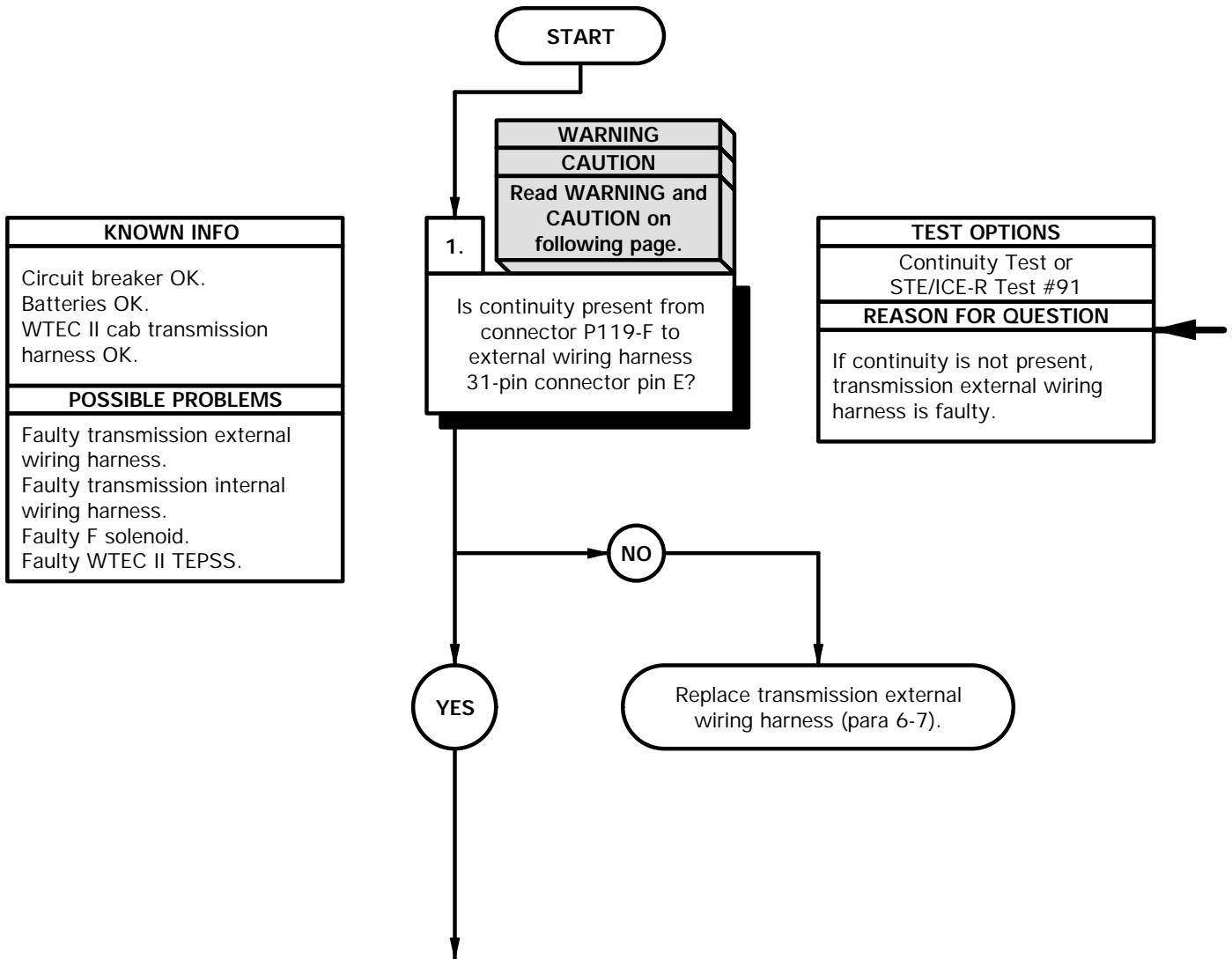
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

References

TM 9-4910-571-12&P

Personnel Required

(2)



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

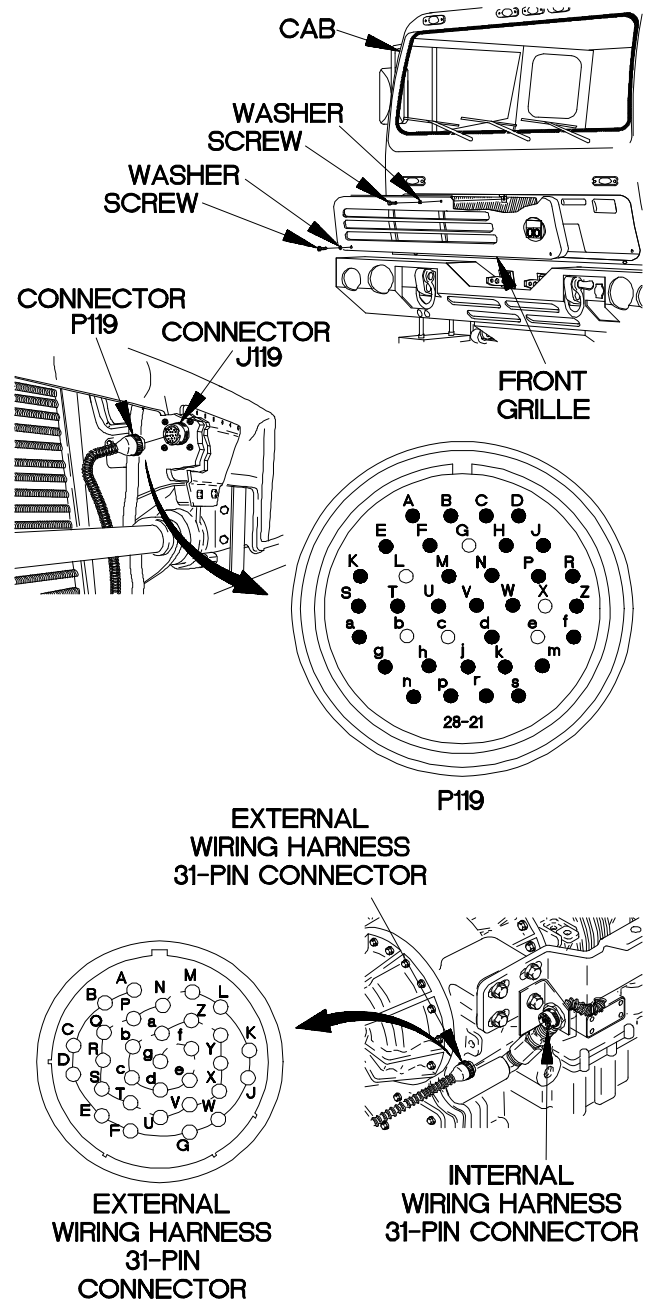
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to P119-F.
- (8) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin E and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-F.

CONTINUITY TEST (Cont)

- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted, replace transmission external wiring harness (para 6-7).



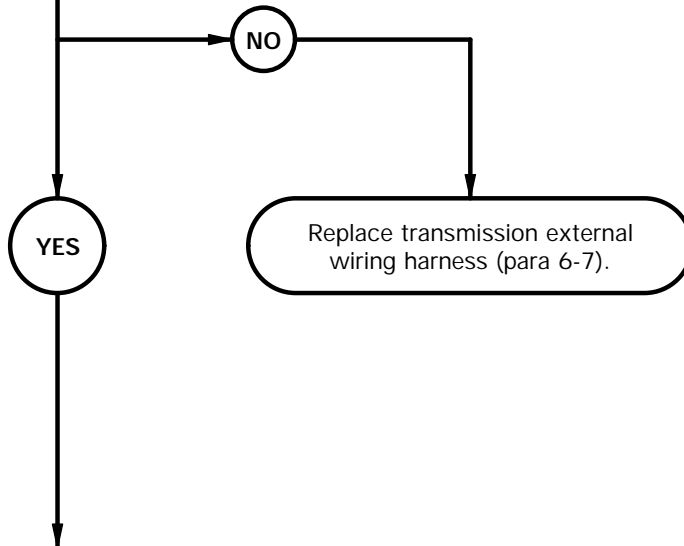
YBC3901B

c39. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC II TEPSS.

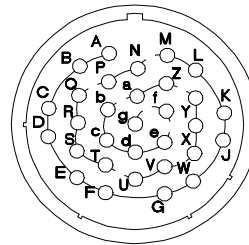
2.
Is continuity present from connector P119-H to external wiring harness 31-pin connector pin F?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

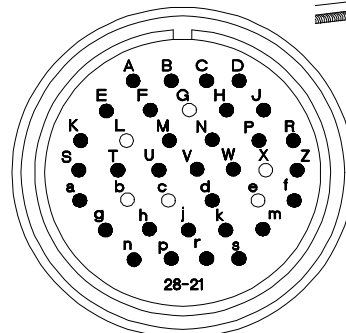
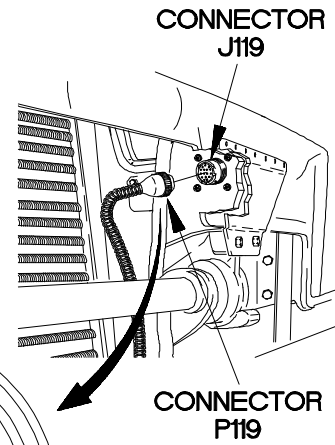


CONTINUITY TEST

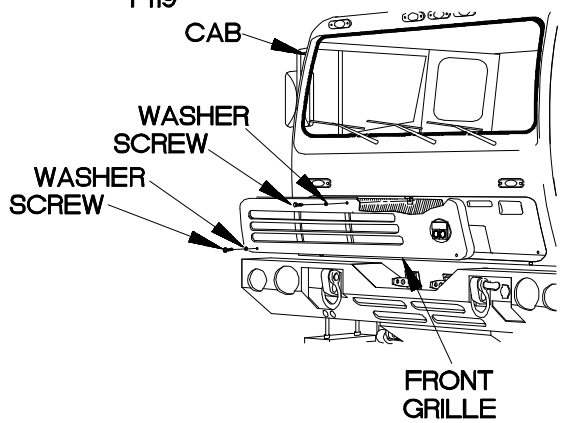
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to P119-H.
- (3) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin F and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-H.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



EXTERNAL WIRING HARNESS 31-PIN CONNECTOR



P119



YBC3902B

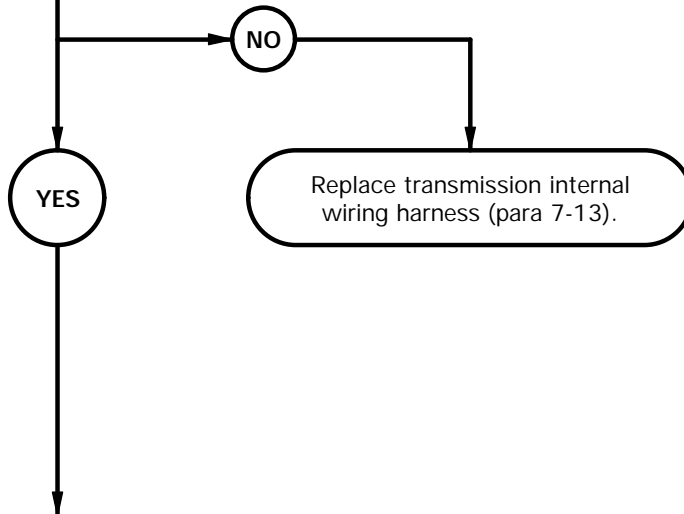
c39. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC II TEPSS.

3. **CAUTION**
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin E to internal wiring harness connector F pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

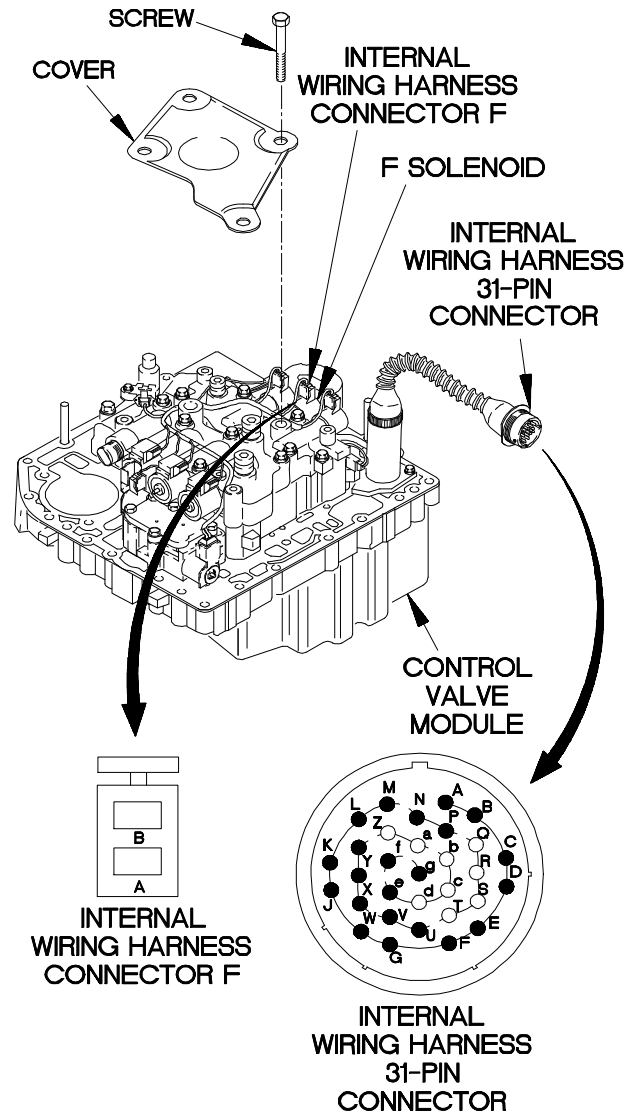


CAUTION

Use care when disconnecting wire harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect transmission internal wiring harness connector F from F solenoid.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin E.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector F pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin E.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



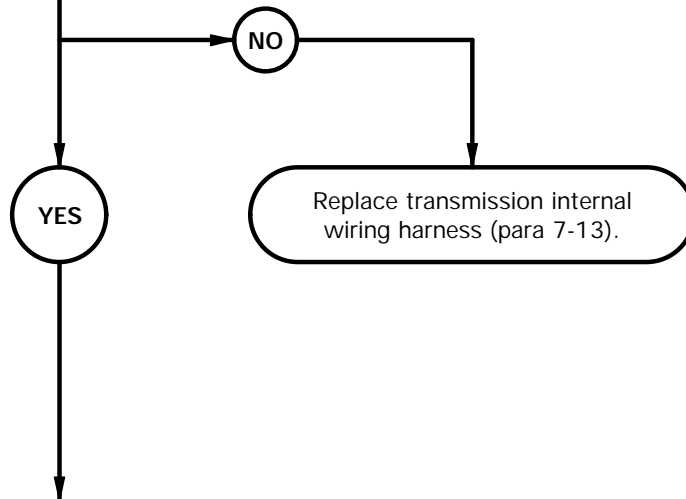
YBC3903B

c39. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC II TEPSS.

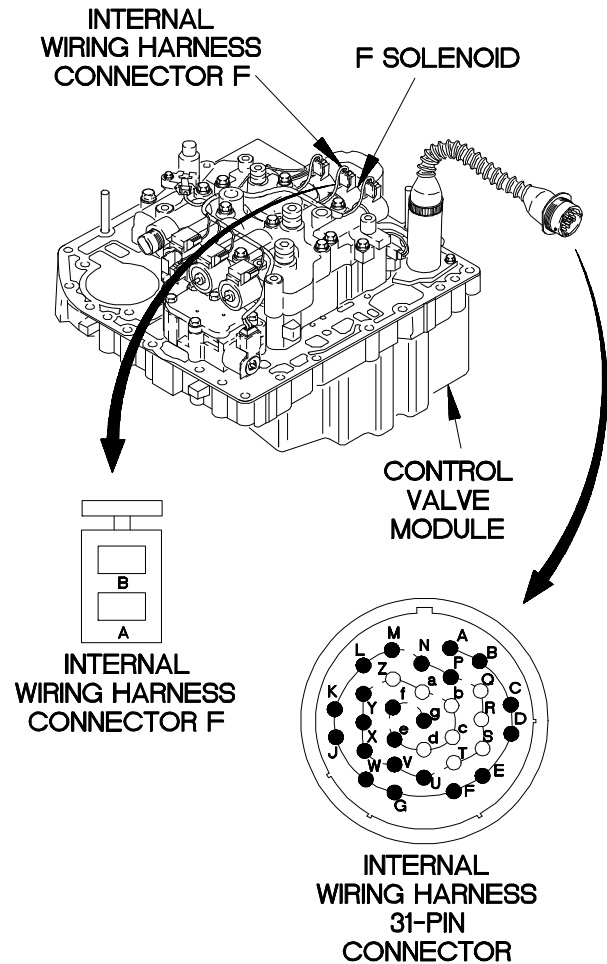
4.
Is continuity present from internal wiring harness 31-pin connector pin F to internal wiring harness connector F pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin F.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector F pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin F.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



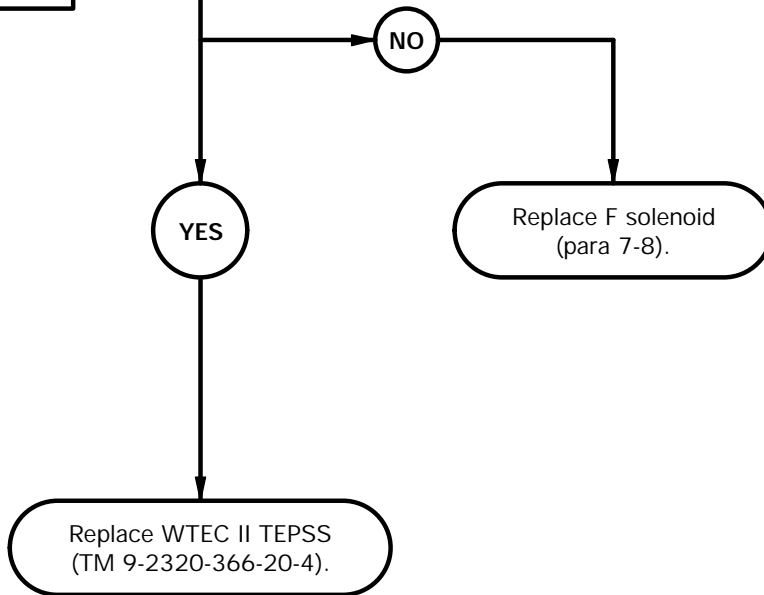
YBC3904B

c39. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty F solenoid. Faulty WTEC II TEPSS.

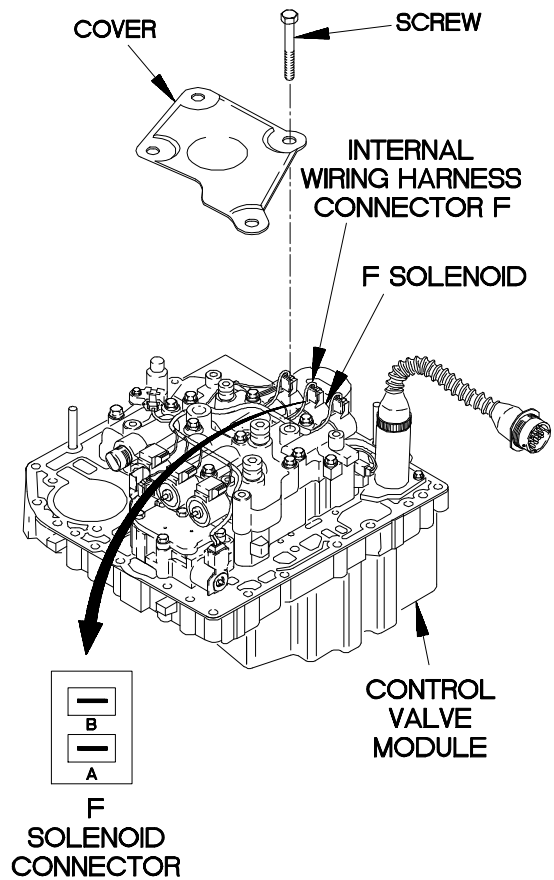
5.
Is 2.5-5.0 ohms resistance present from F solenoid pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, F solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC II TEPSS is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of F solenoid.
- (3) Connect negative (-) probe of multimeter to pin B of F solenoid and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace F solenoid (para 7-8).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring connector F to F solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC3905B

c40. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

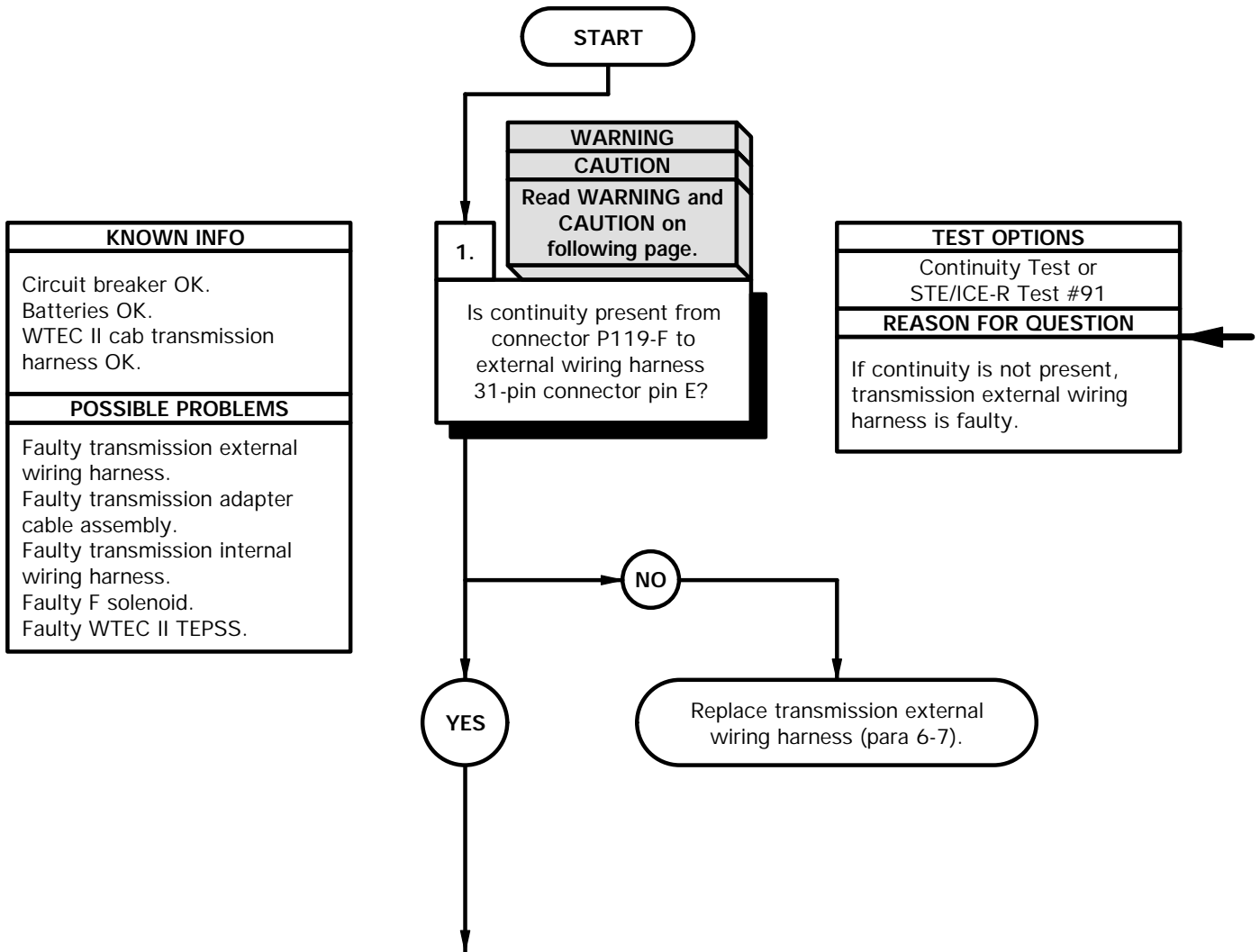
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

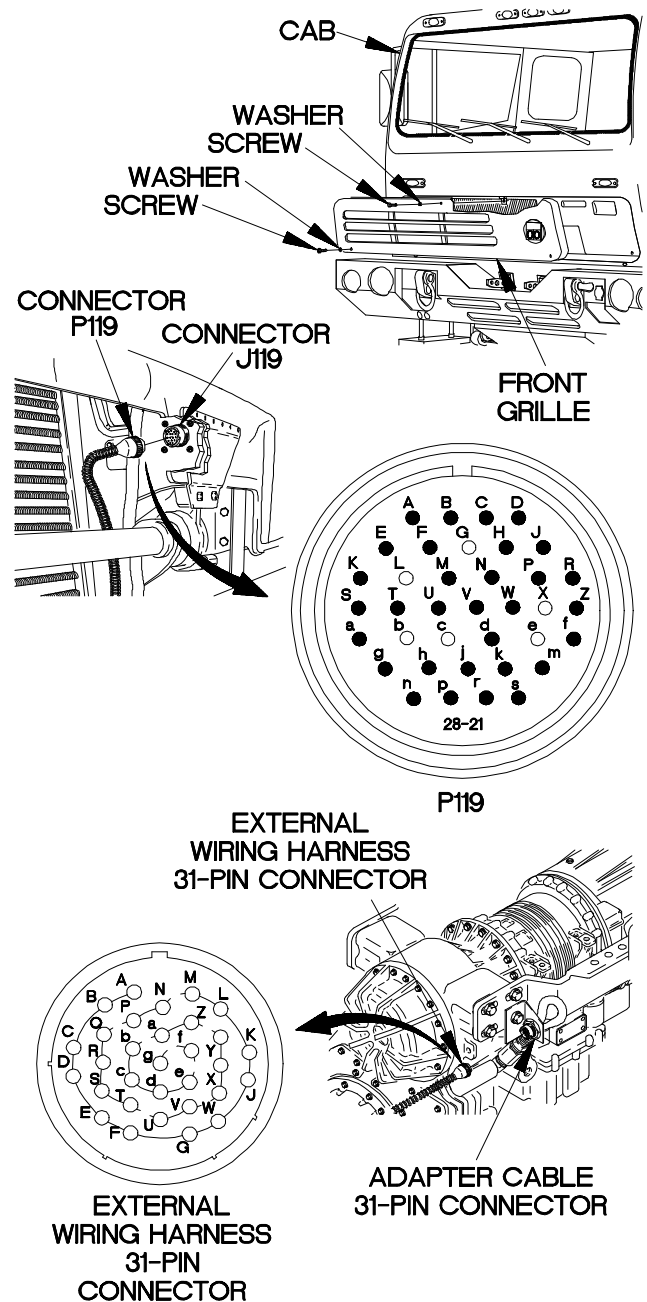
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness 31-pin connector from adapter cable 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-F.
- (8) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin E and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-F.

CONTINUITY TEST (Cont)

- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



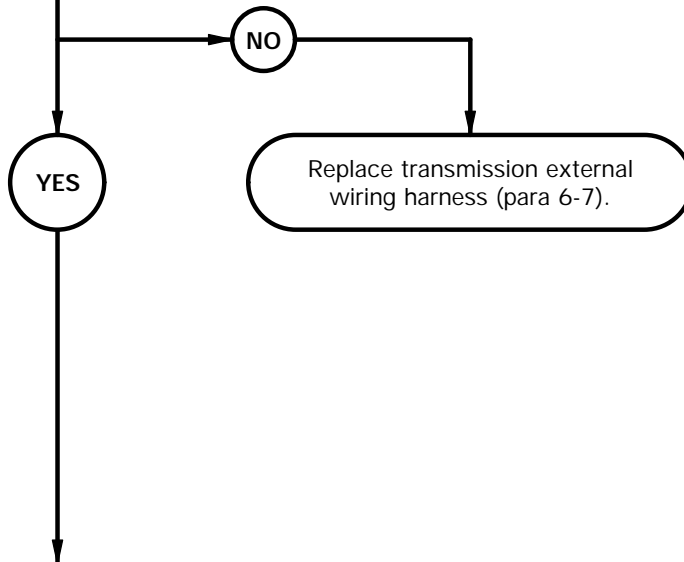
YBC4001B

c40. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC II TEPSS.

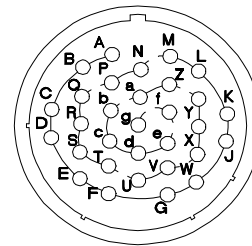
2.
Is continuity present from connector P119-H to external wiring harness 31-pin connector pin F?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

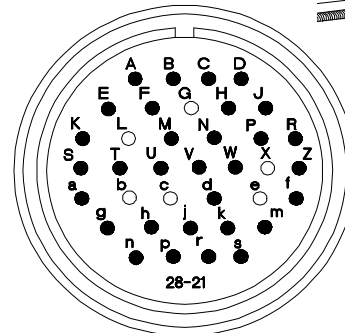


CONTINUITY TEST

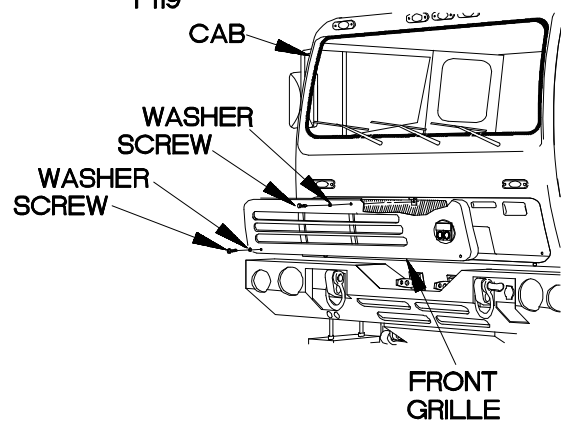
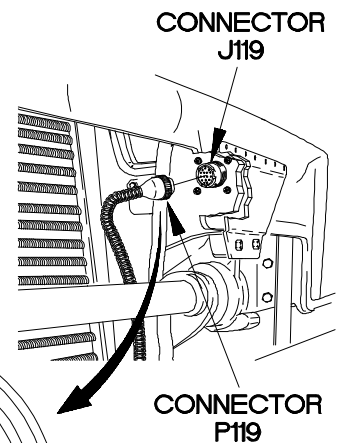
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-H.
- (3) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin F and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-H.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



EXTERNAL WIRING HARNESS 31-PIN CONNECTOR



P119



YBC4002B

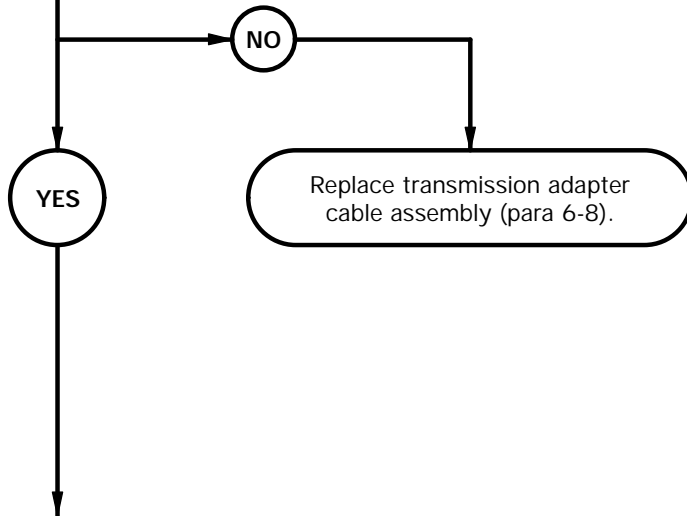
c40. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC II TEPSS.

3. **CAUTION**
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin E to adapter cable 24-pin connector pin D3?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.

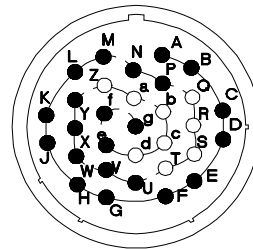


CAUTION

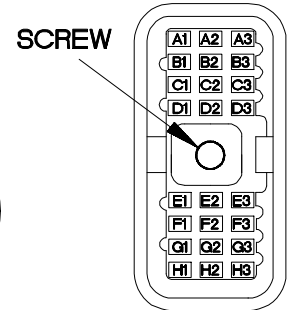
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

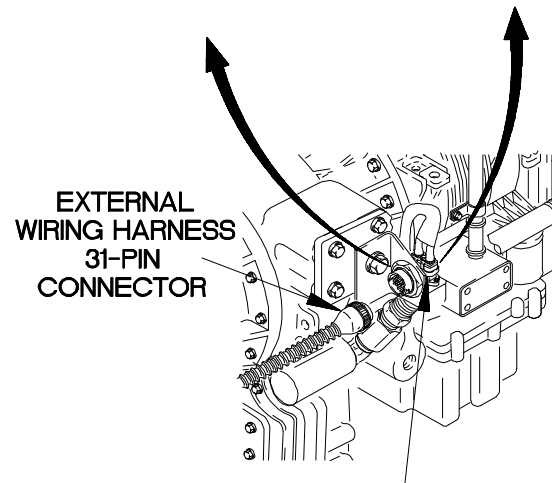
- (1) Loosen screw in adapter cable 24-pin connector.
- (2) Disconnect adapter cable 24-pin connector from internal wiring harness 24-pin connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin E.
- (5) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin D3 and note reading on multimeter.
- (6) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (7) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin E.
- (8) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).



**ADAPTER CABLE
31-PIN CONNECTOR**



**ADAPTER CABLE
24-PIN
CONNECTOR**



**ADAPTER CABLE
24-PIN CONNECTOR**

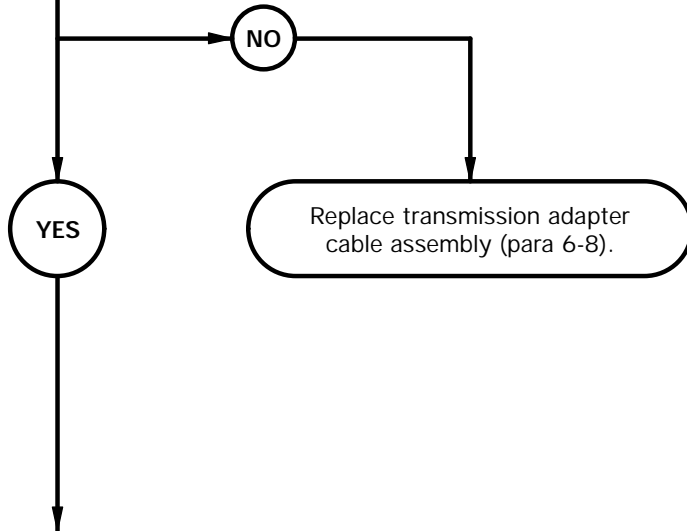
YBC4003B

c40. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC II TEPSS.

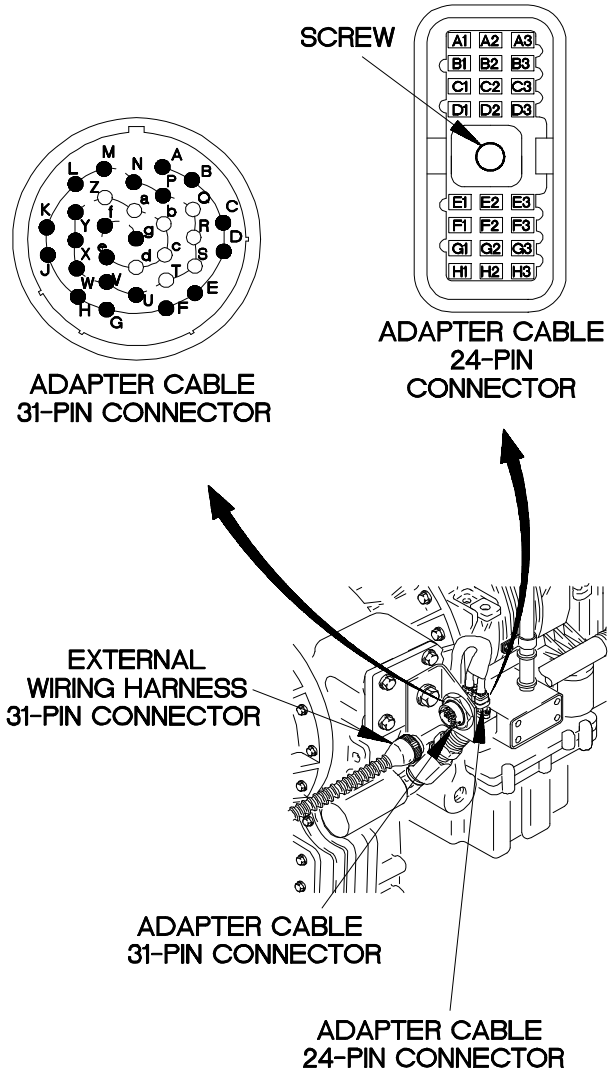
4.
Is continuity present from adapter cable 31-pin connector pin F to adapter cable 24-pin connector pin D2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin F.
- (3) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin D2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (5) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin F.
- (6) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).
- (9) Connect external wiring harness 31-pin connector to adapter cable 31-pin connector.



YBC4004B

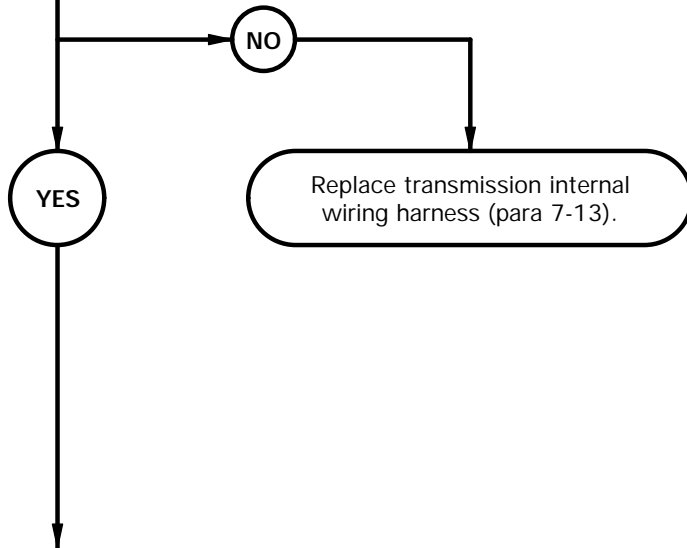
c40. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC II TEPSS.

5. **CAUTION**
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin D3 to internal wiring harness connector F pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

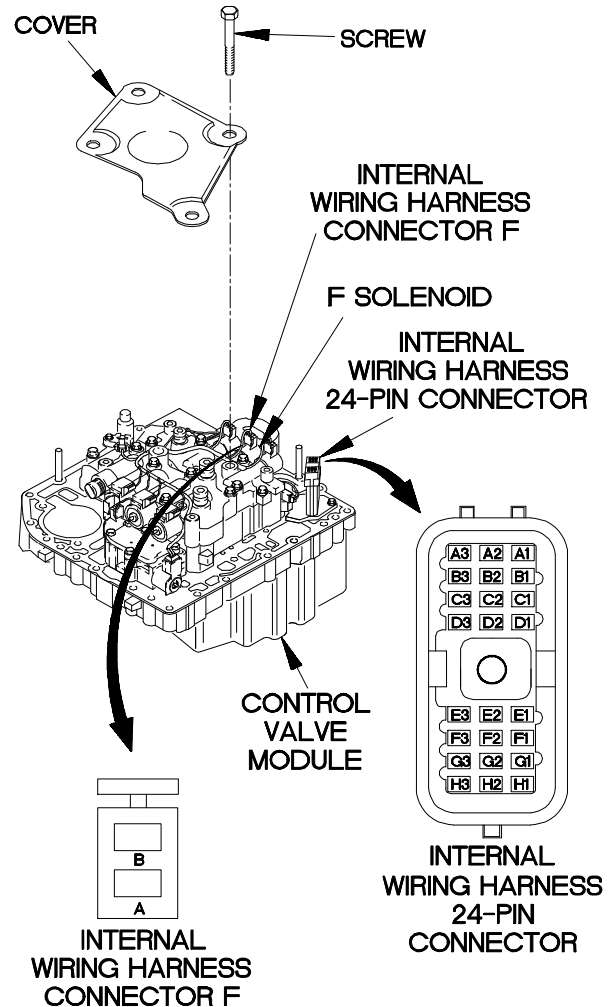


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Remove transmission internal wiring harness connector F from F solenoid.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin D3.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector F pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin D3.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



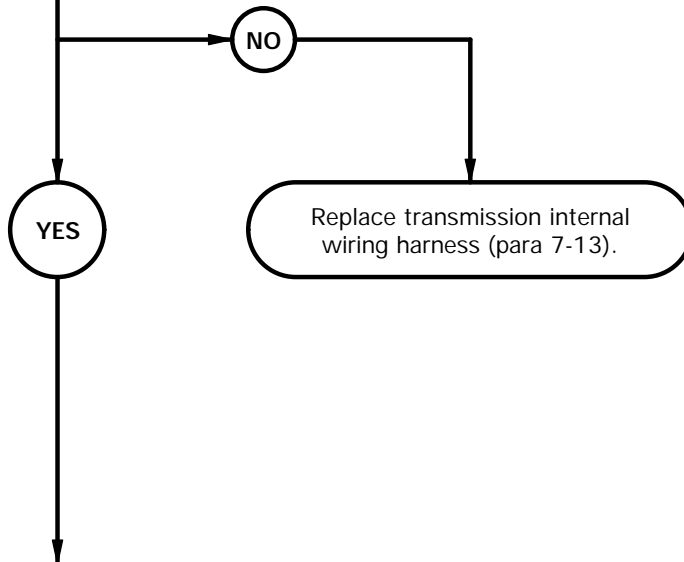
YBC4005B

c40. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC II TEPSS.

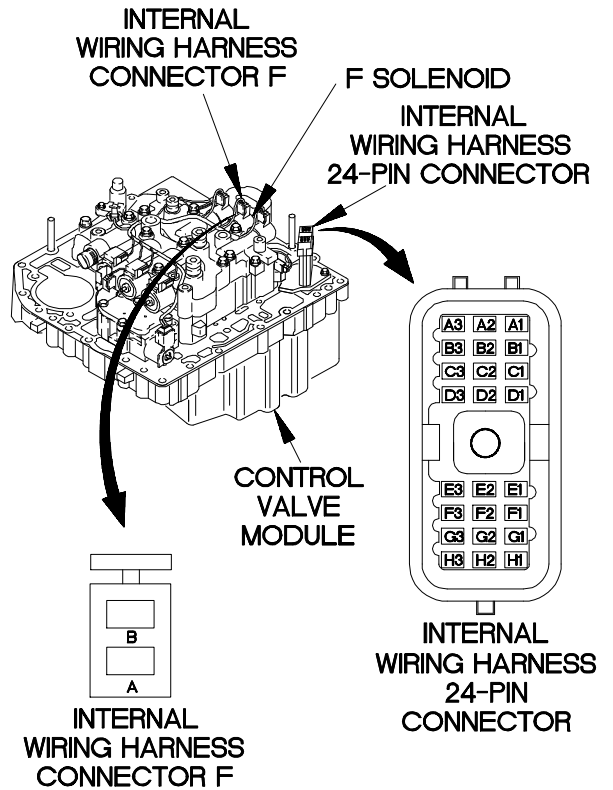
6.
Is continuity present from internal wiring harness 24-pin connector pin D2 to internal wiring harness connector F pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin D2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector F pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin D2.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



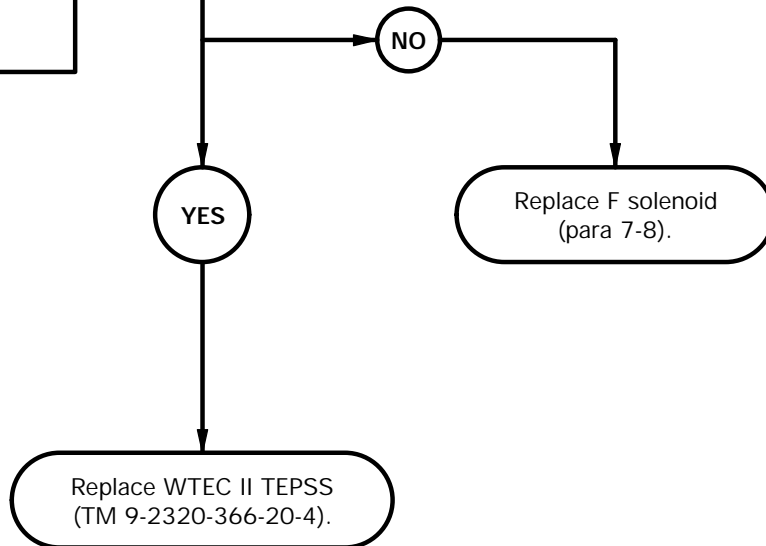
YBC4006B

c40. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty F solenoid. Faulty WTEC II TEPSS.

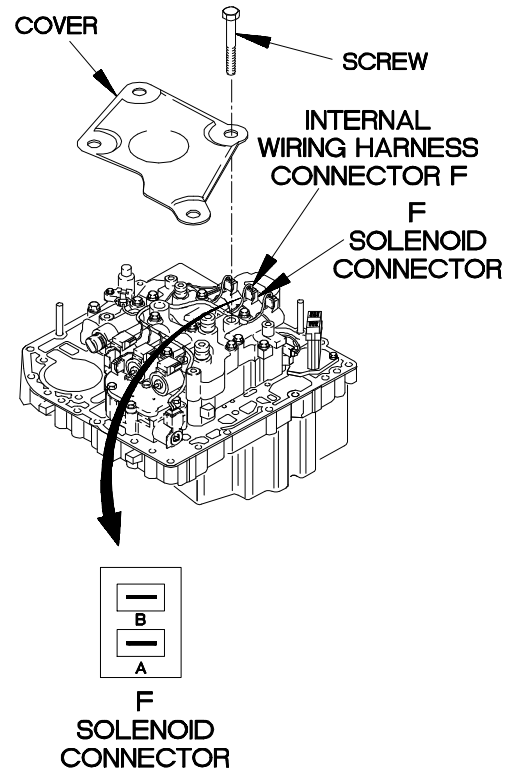
7.
Is 2.5-5.0 ohms resistance present from F solenoid pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, F solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC II TEPSS is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of F solenoid connector.
- (3) Connect negative (-) probe of multimeter to pin B of F solenoid connector and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace F solenoid (para 7-8).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector F to F solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC4007B

c41. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Tools and Special Tools

Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts

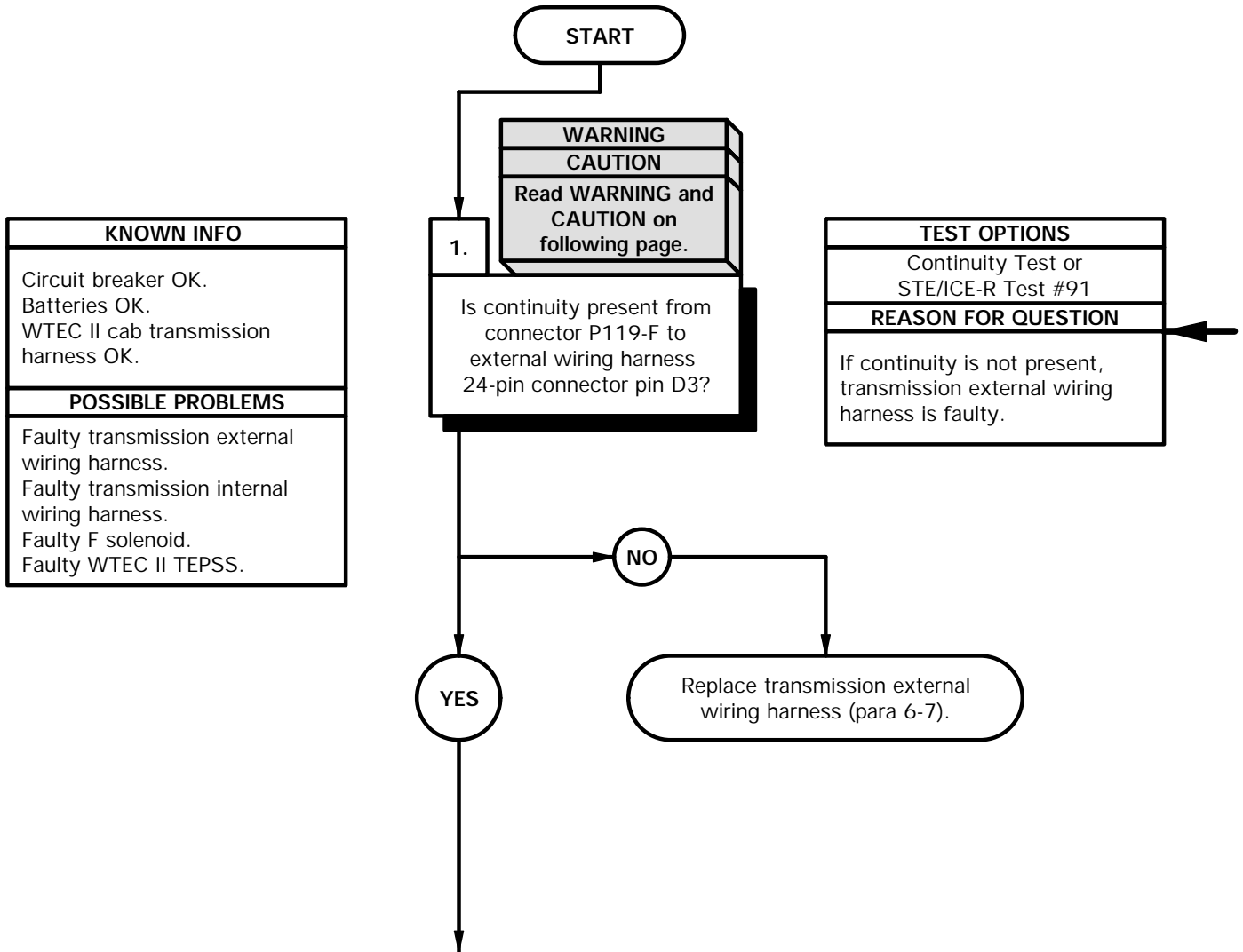
Wire, Elect, 50 ft (Item 97, Appendix C)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

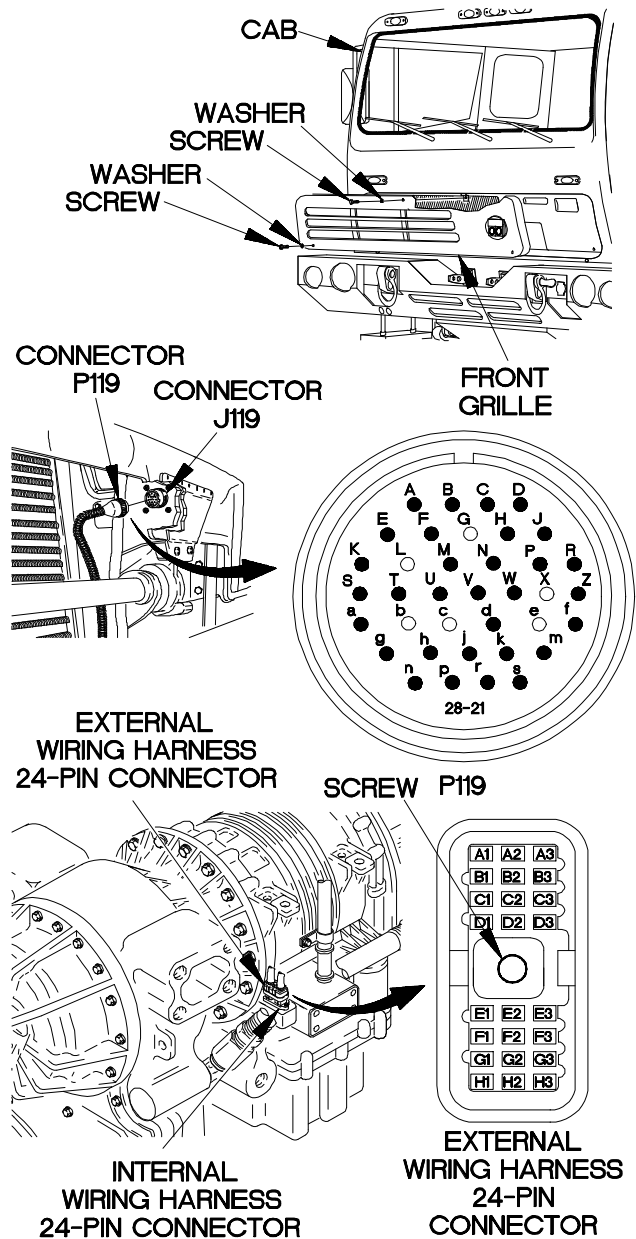
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Loosen screw in external wiring harness 24-pin connector.
- (6) Disconnect external wiring harness 24-pin connector from internal wiring harness 24-pin connector.
- (7) Set multimeter to ohms.
- (8) Connect positive (+) probe of multimeter to connector P119-F.
- (9) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin D3 and note reading on multimeter.
- (10) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (11) Connect positive (+) probe of multimeter to connector P119-F.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (13) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (14) If continuity is present, transmission external wiring harness is shorted, replace transmission external wiring harness (para 6-7).



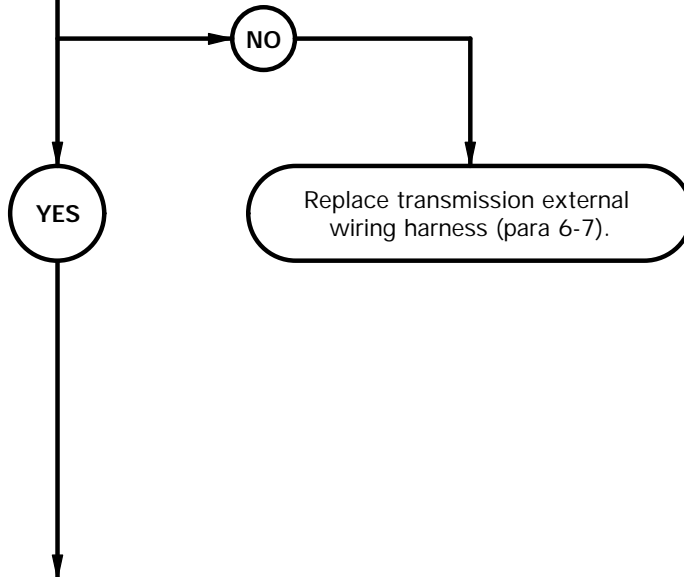
YBC4101B

c41. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC II TEPSS.

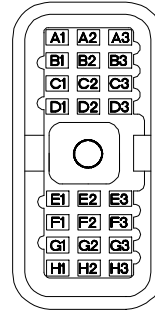
2.
Is continuity present from connector P119-H to external wiring harness 24-pin connector pin D2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

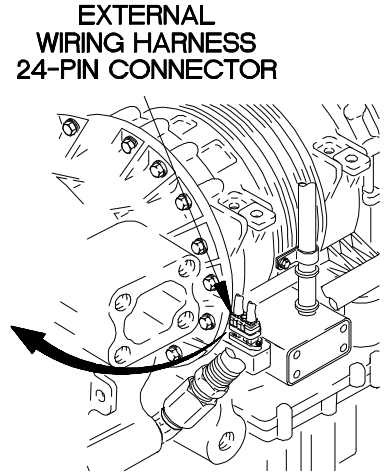


CONTINUITY TEST

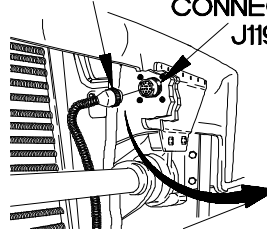
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-H.
- (3) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin D2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-H.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



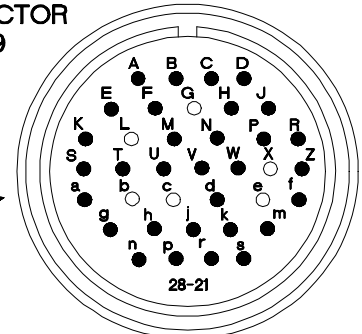
EXTERNAL WIRING HARNESS 24-PIN CONNECTOR



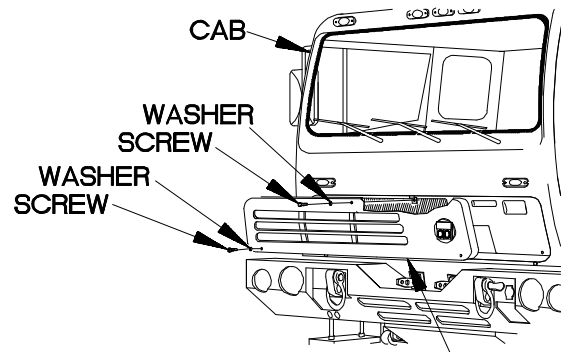
CONNECTOR P119



CONNECTOR J119



P119



FRONT GRILLE

YBC4102B

c41. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

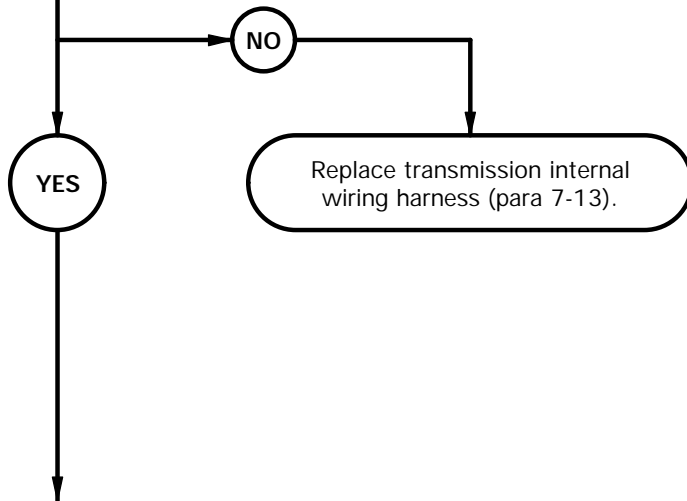
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin D3 to internal wiring harness connector F pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

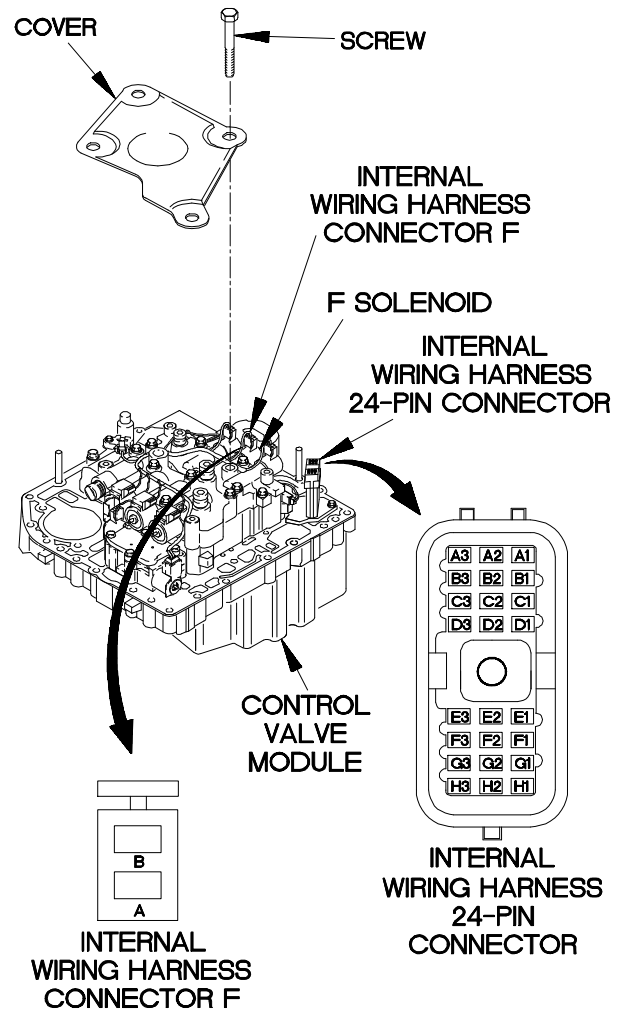


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector F from F solenoid connector.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin D3.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector F pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin D3.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



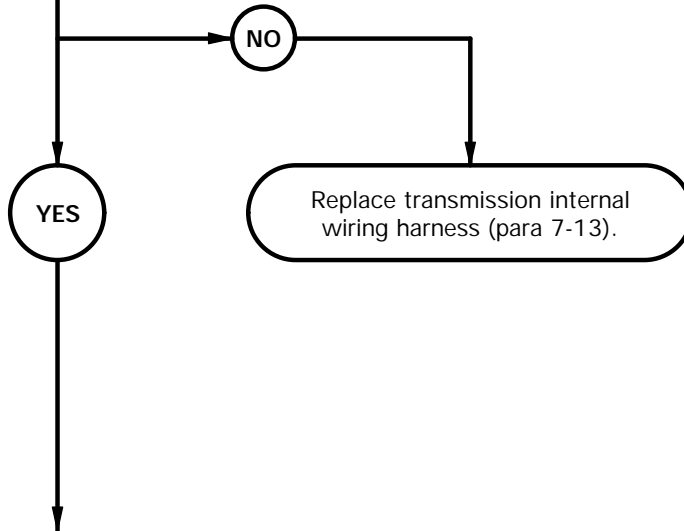
YBC4103B

c41. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC II TEPSS.

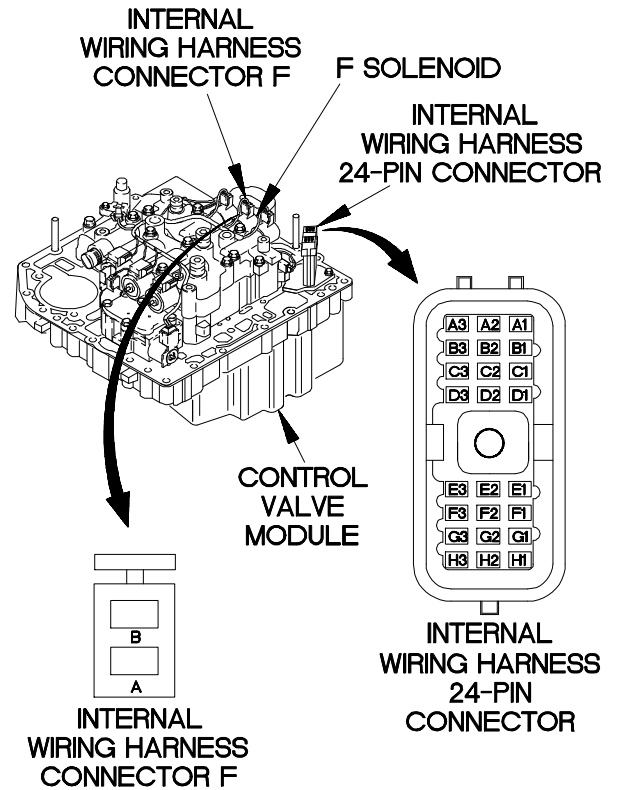
4.
Is continuity present from internal wiring harness 24-pin connector pin D2 to internal wiring harness connector F pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin D2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector F pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin D2.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector, and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



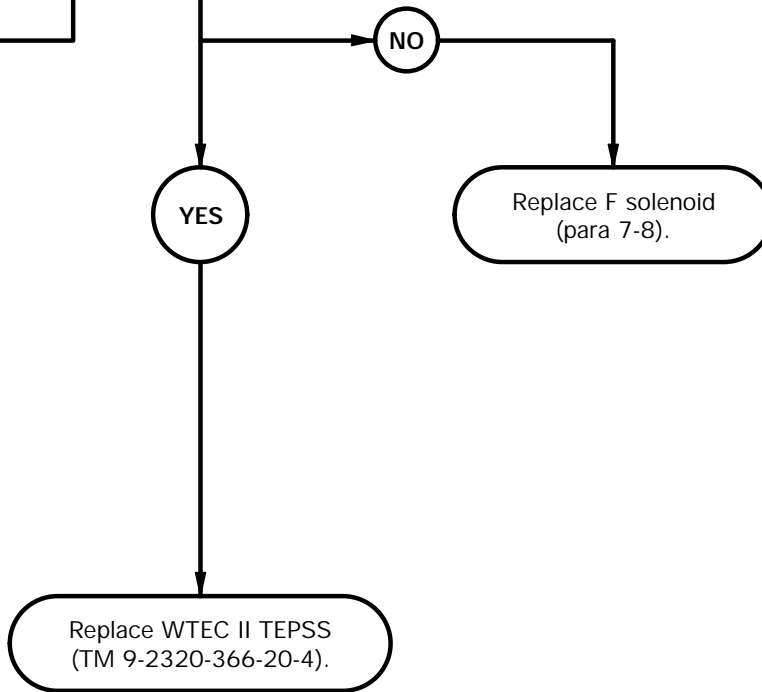
YBC4104B

c41. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. External transmission cable assembly OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty F solenoid. Faulty WTEC II TEPSS.

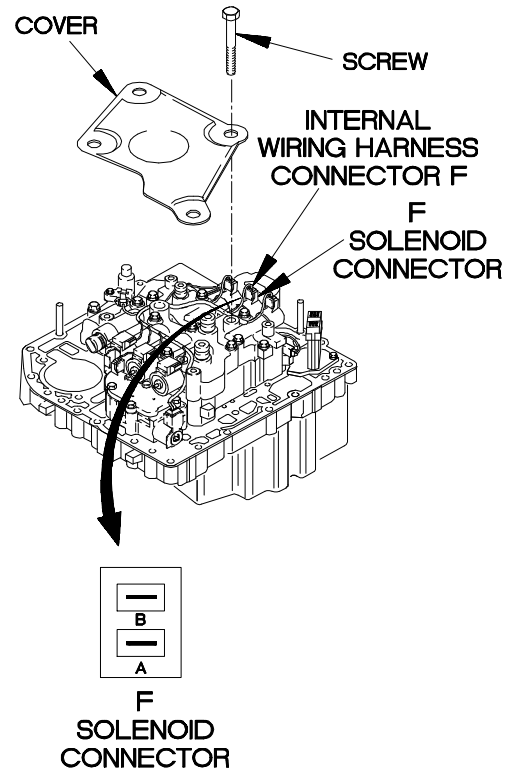
5.
Is 2.5-5.0 ohms resistance present from F solenoid pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, F solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC II TEPSS is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of F solenoid connector.
- (3) Connect negative (-) probe of multimeter to pin B of F solenoid connector and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace F solenoid (para 7-8).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector F to F solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC4105B

c42. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

Equipment Conditions

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

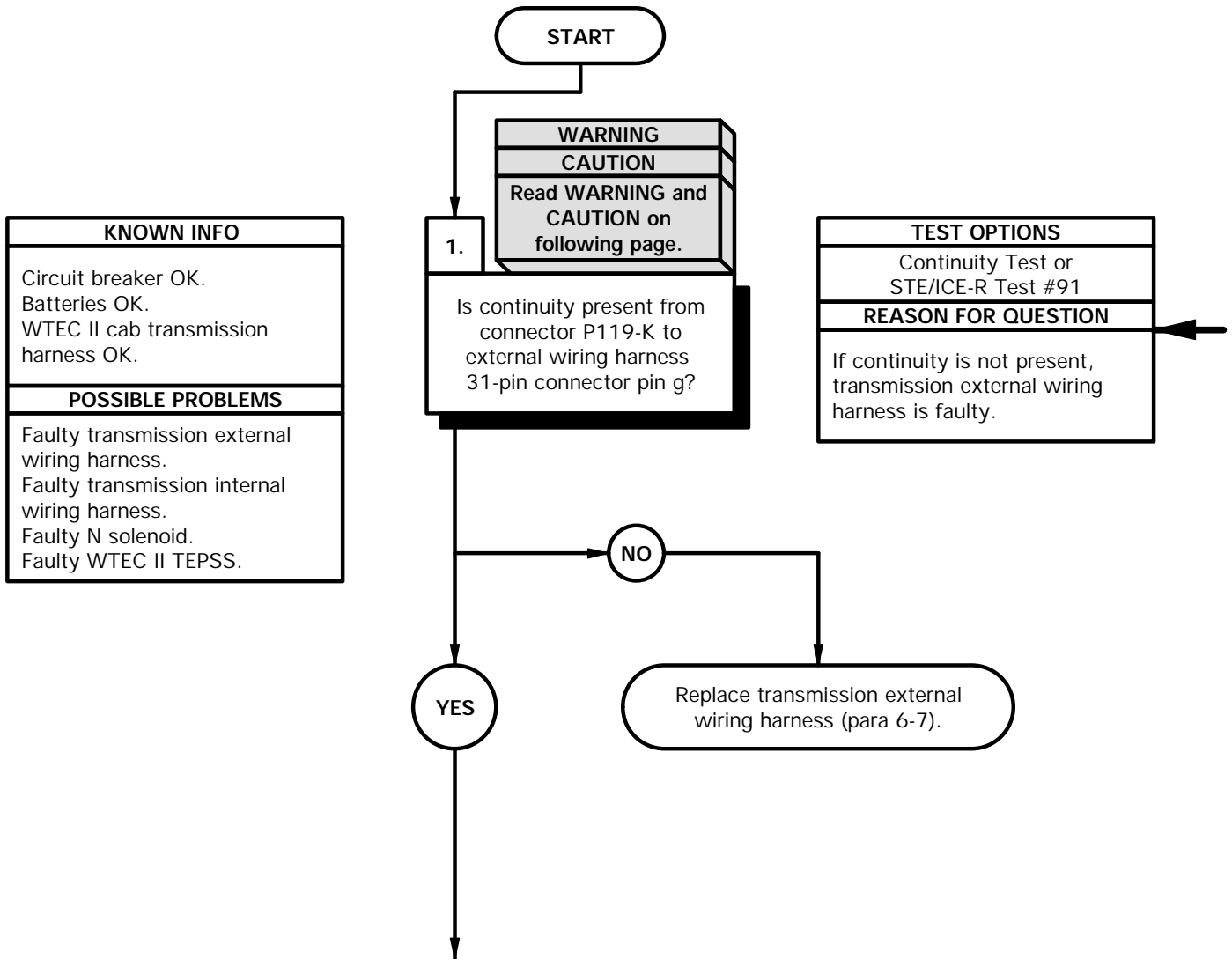
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

References

TM 9-4910-571-12&P

Personnel Required

(2)



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

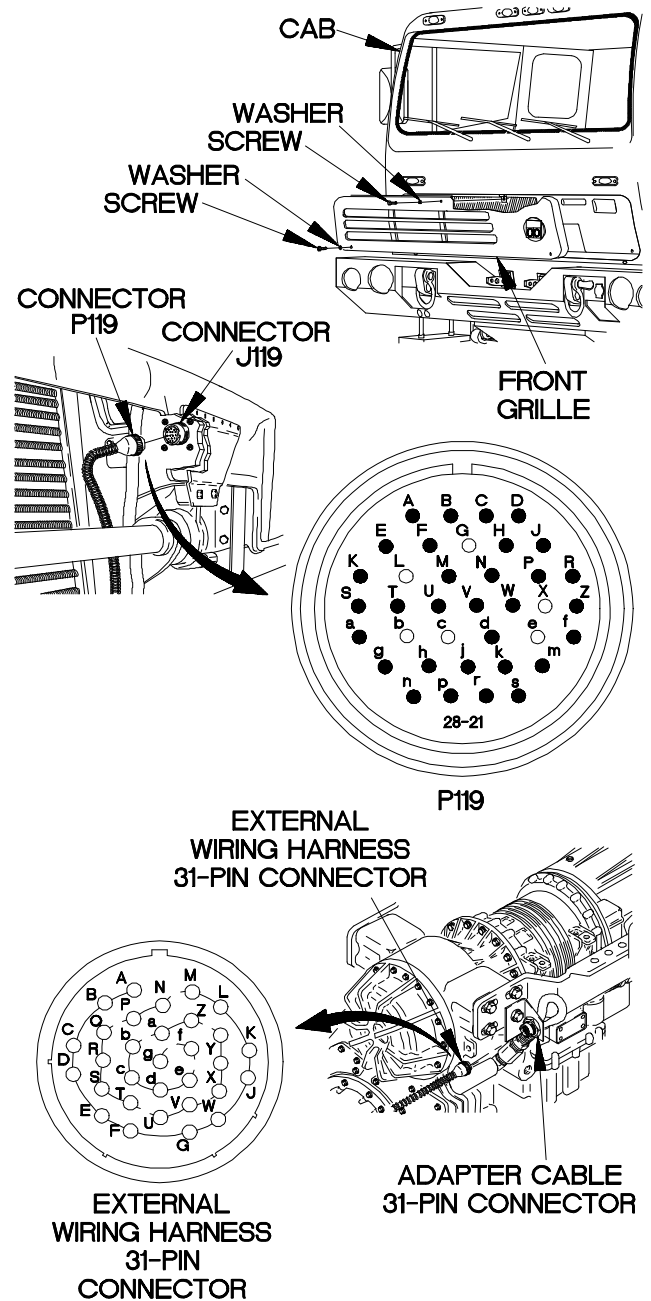
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-K.
- (8) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin g and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-K.

CONTINUITY TEST (Cont)

- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



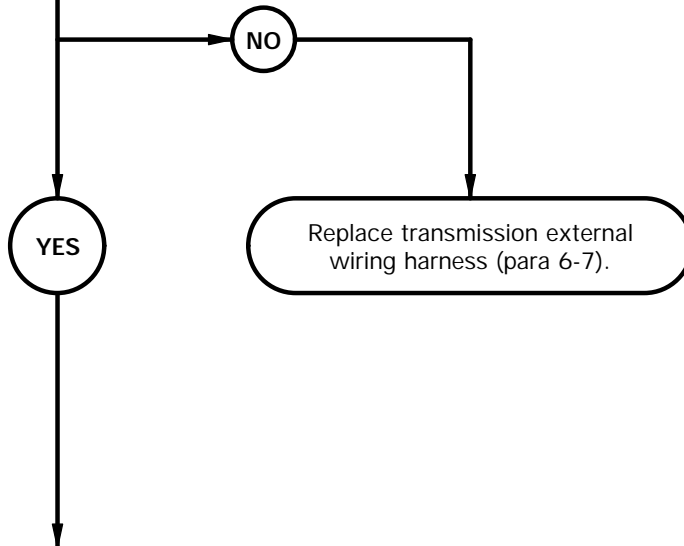
YBC4201B

c42. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC II TEPSS.

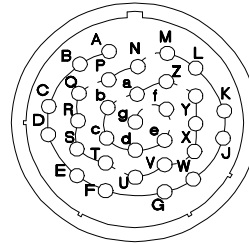
2.
Is continuity present from connector P119-A to external wiring harness 31-pin connector pin f?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

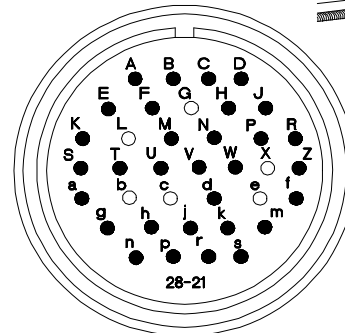
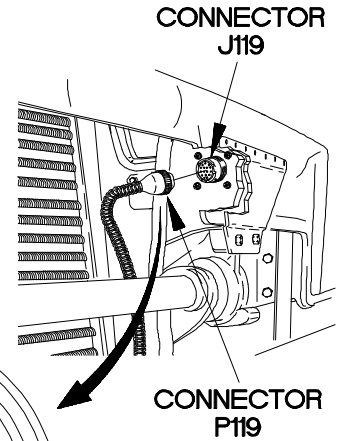


CONTINUITY TEST

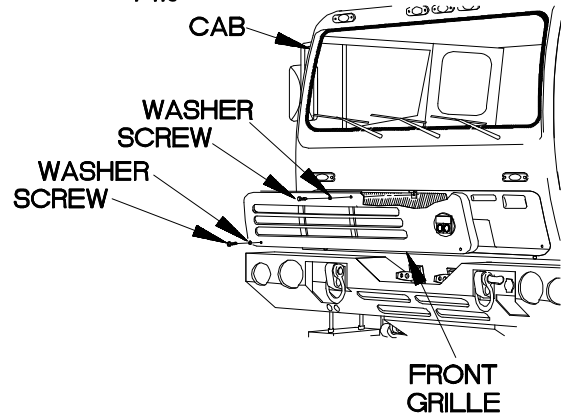
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-A.
- (3) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin f and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-A.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



EXTERNAL WIRING HARNESS 31-PIN CONNECTOR



P119



YBC4202B

c42. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

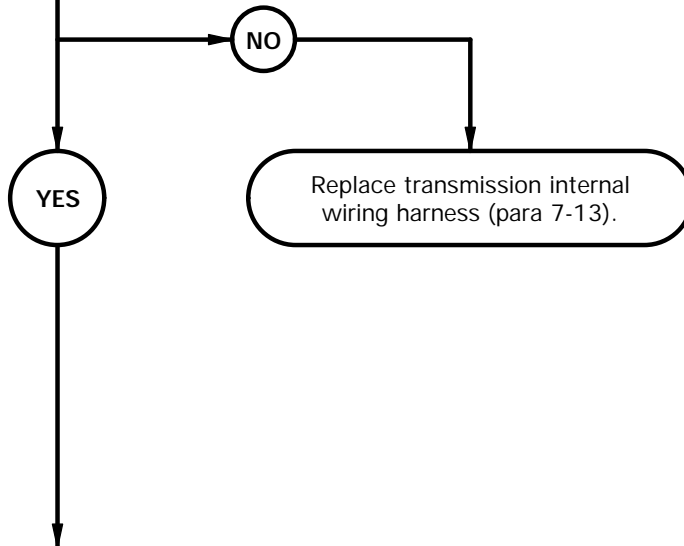
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin g to internal wiring harness connector N pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

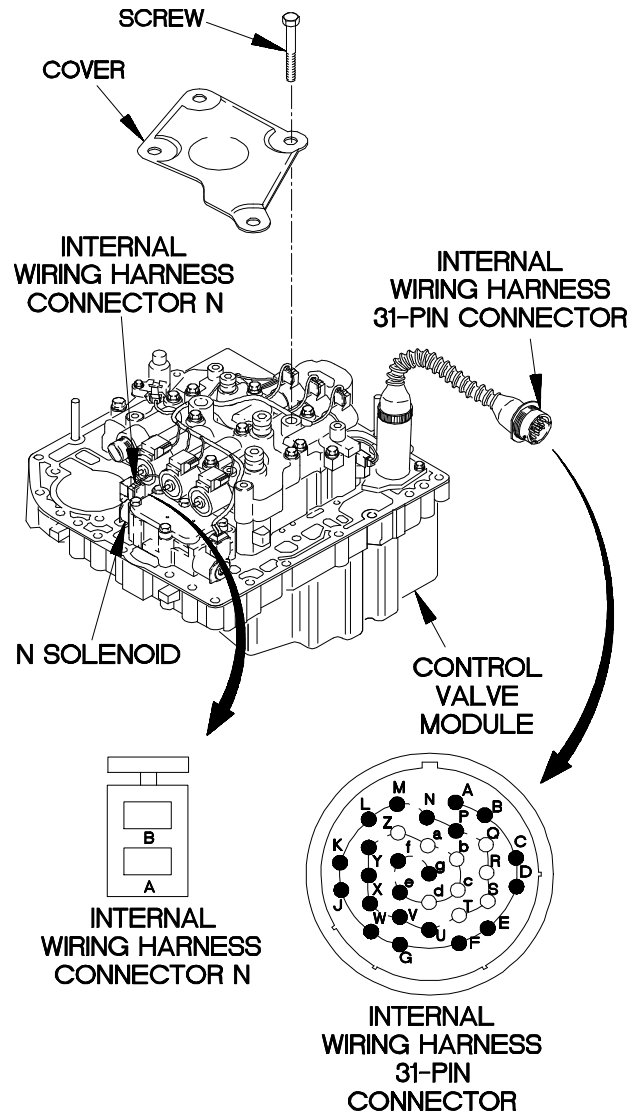


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector N from N solenoid.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin g.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector N pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin g.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



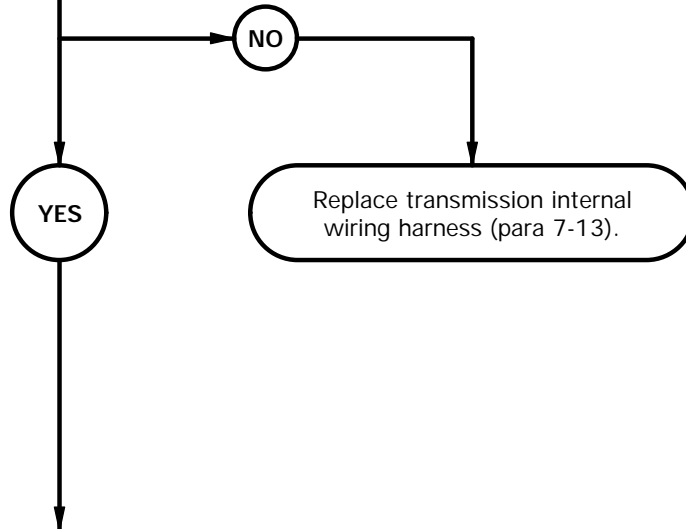
YBC4203B

c42. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC II TEPSS.

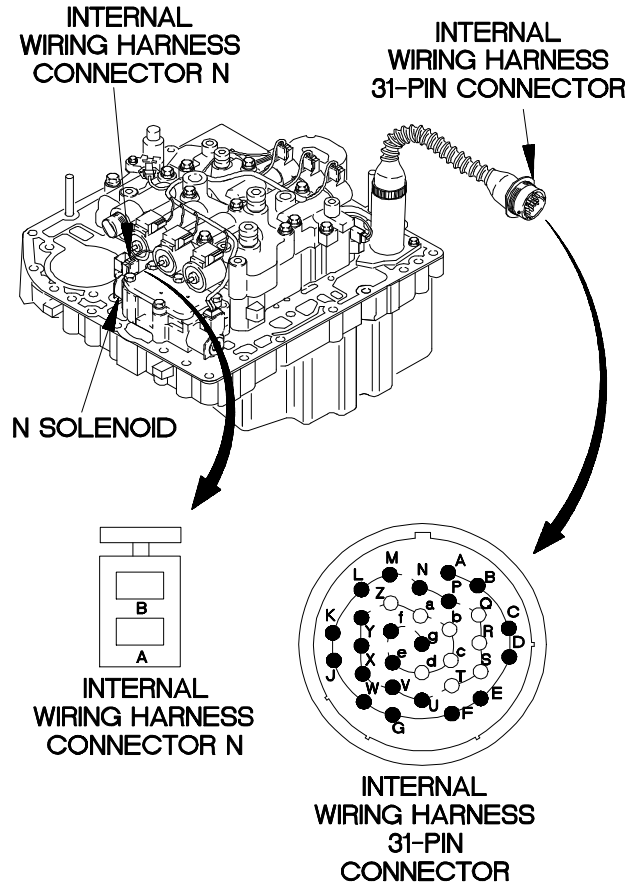
4.
Is continuity present from internal wiring harness 31-pin connector pin f to internal wiring harness connector N pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin f.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector N pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin f.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).

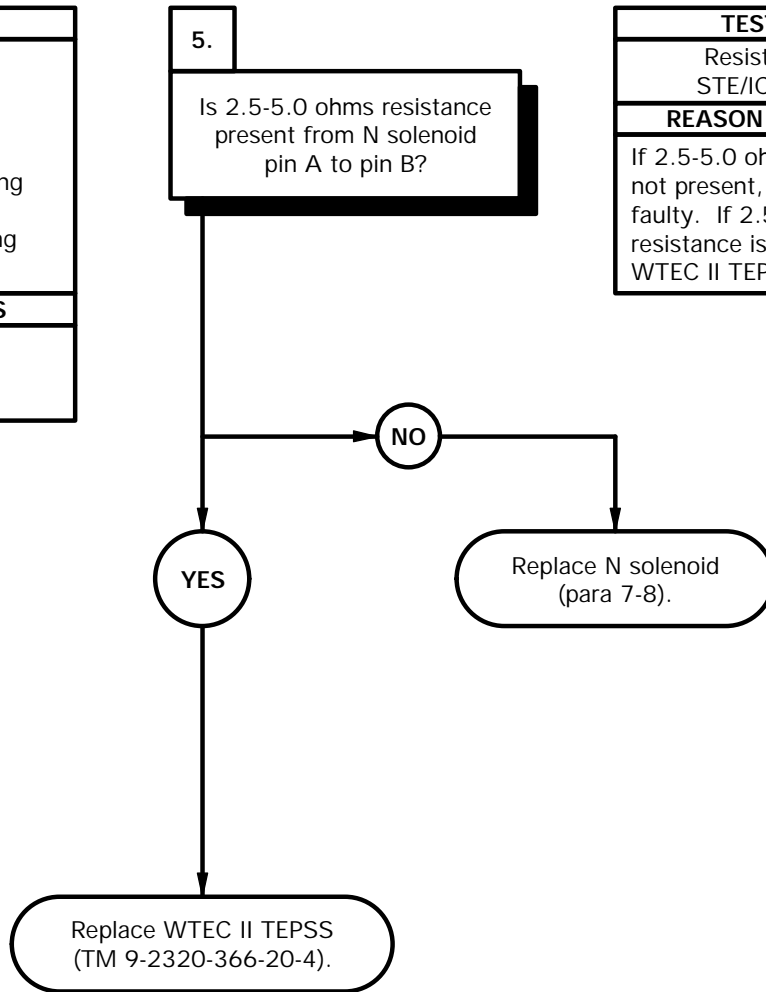


YBC4204B

c42. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

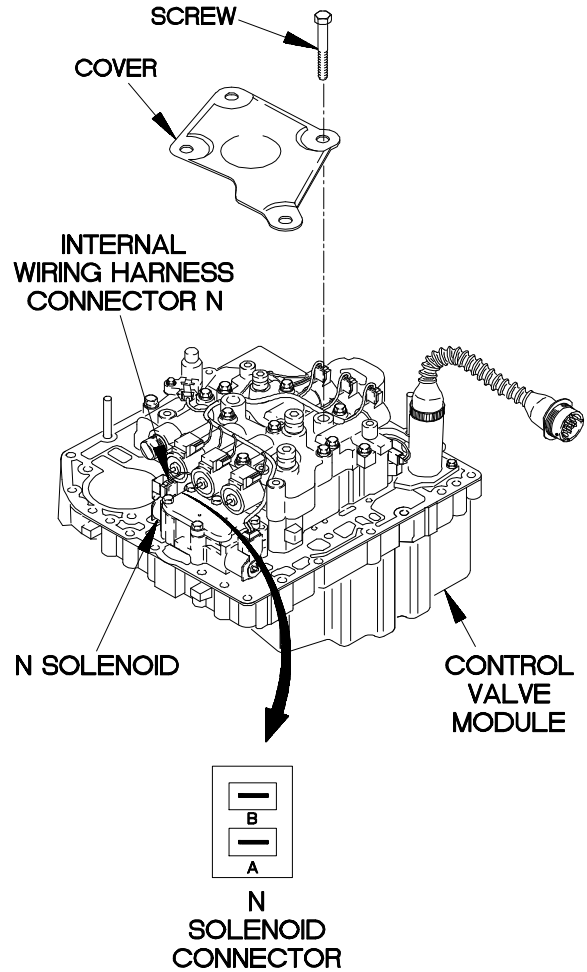
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty N solenoid. Faulty WTEC II TEPSS.

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, F solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC II TEPSS is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of N solenoid.
- (3) Connect negative (-) probe of multimeter to pin B of N solenoid and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace N solenoid (para 7-8).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector N to N solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC4205B

c43. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

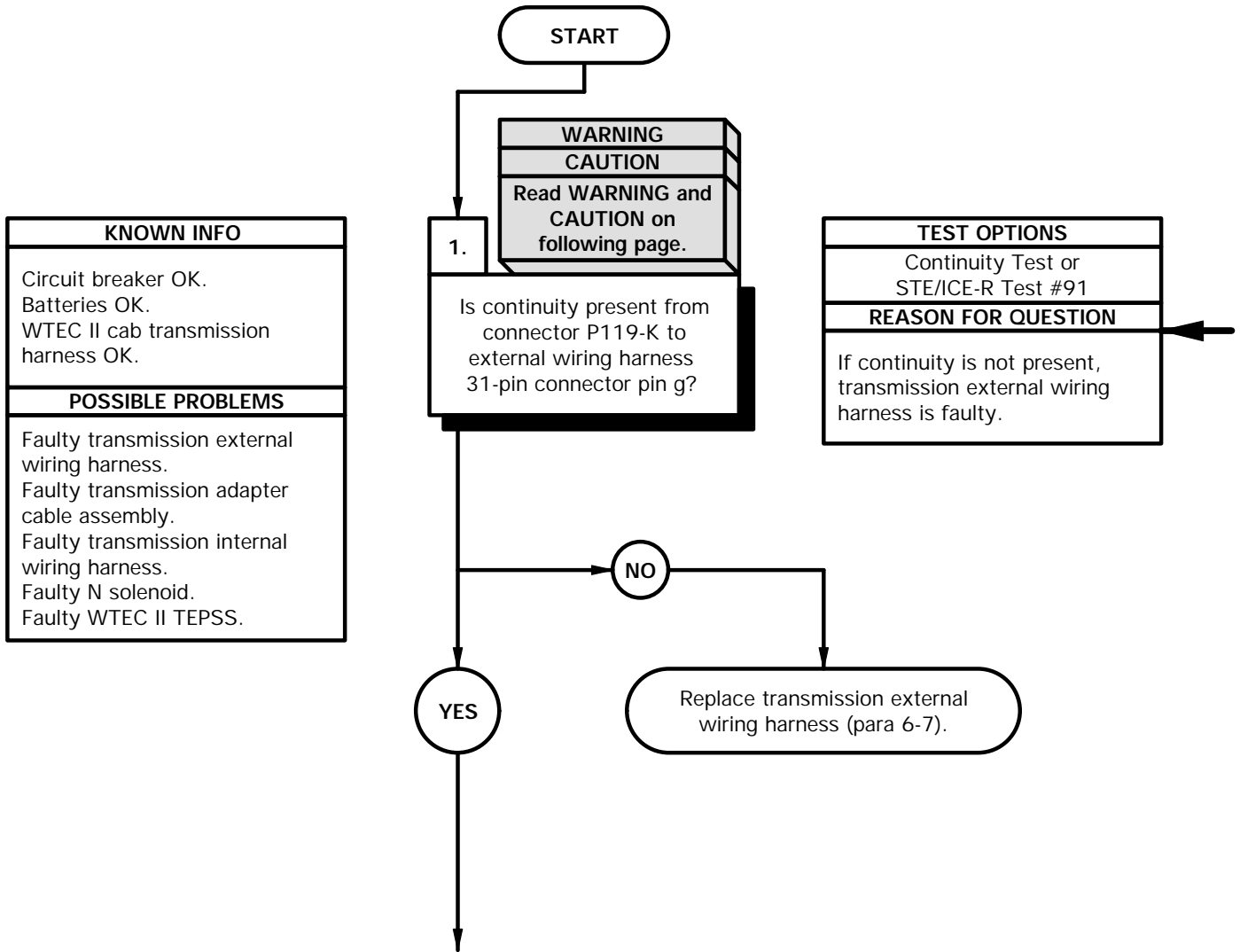
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

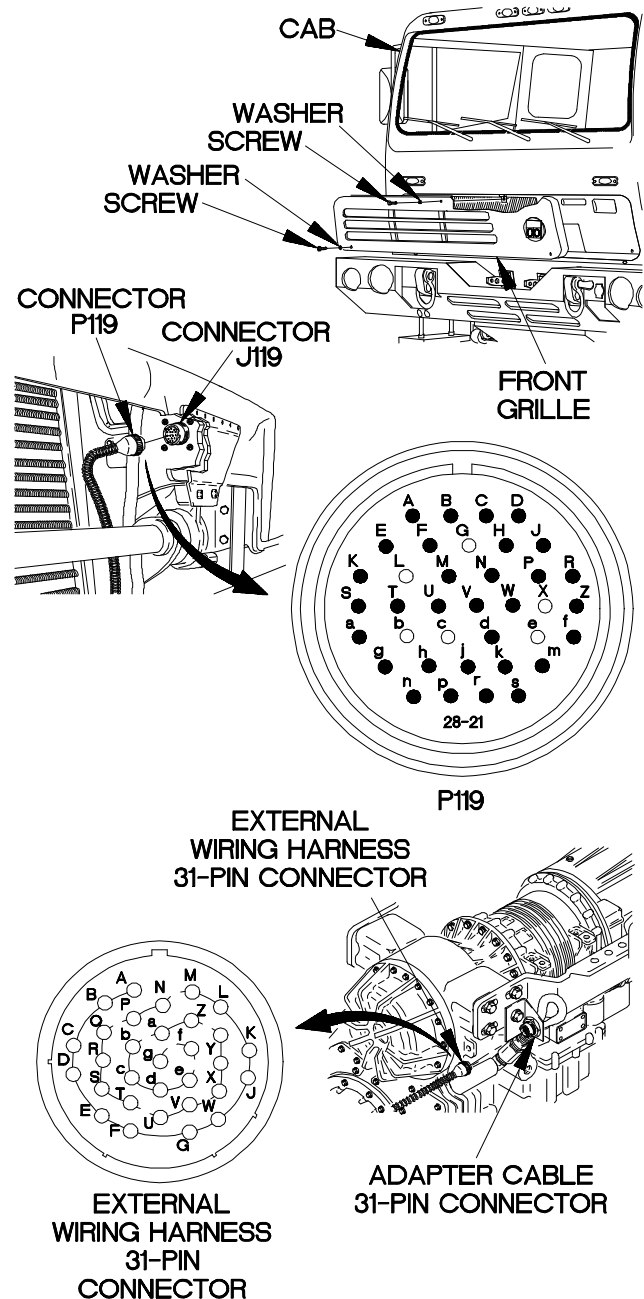
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness 31-pin connector from adapter cable 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-K.
- (8) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin g and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-K.

CONTINUITY TEST (Cont)

- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



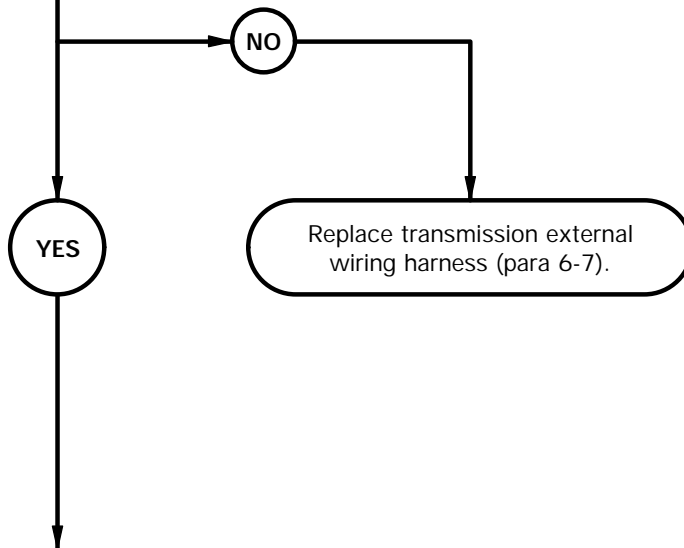
YBC4301B

c43. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC II TEPSS.

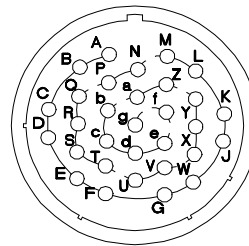
2.
Is continuity present from connector P119-A to external wiring harness 31-pin connector pin f?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

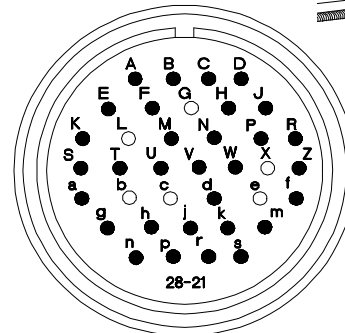


CONTINUITY TEST

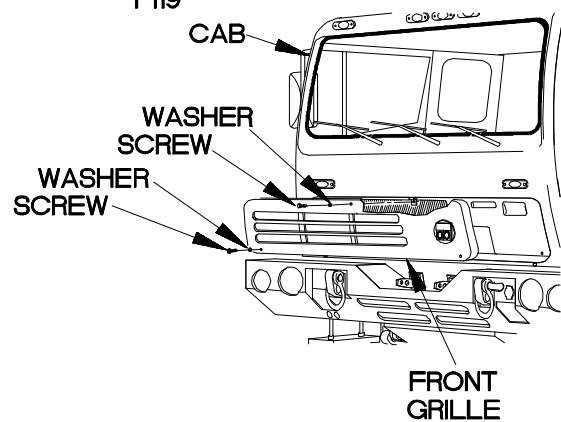
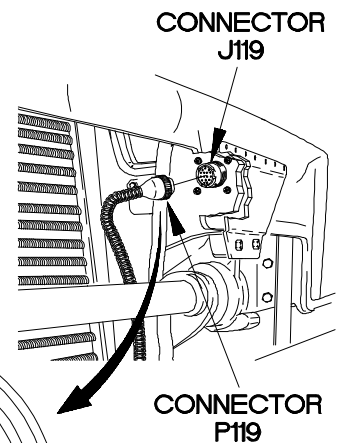
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-A.
- (3) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin f and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-A.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



EXTERNAL WIRING HARNESS 31-PIN CONNECTOR



P119



YBC4302B

c43. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

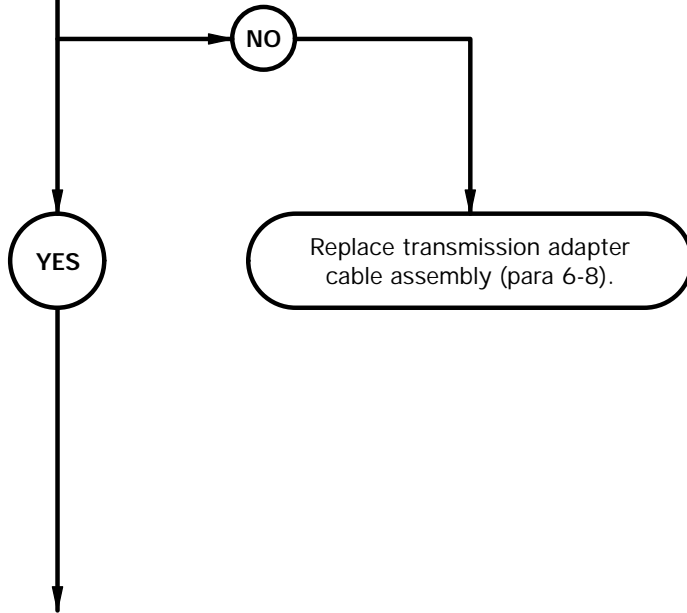
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin g to adapter cable 24-pin connector pin H3?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.

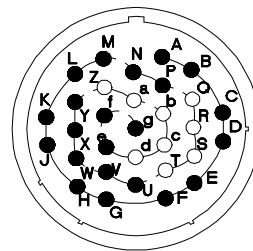


CAUTION

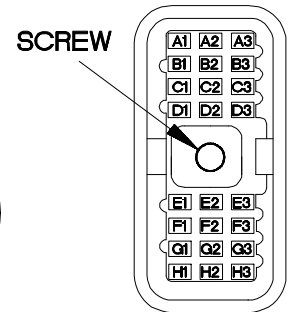
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

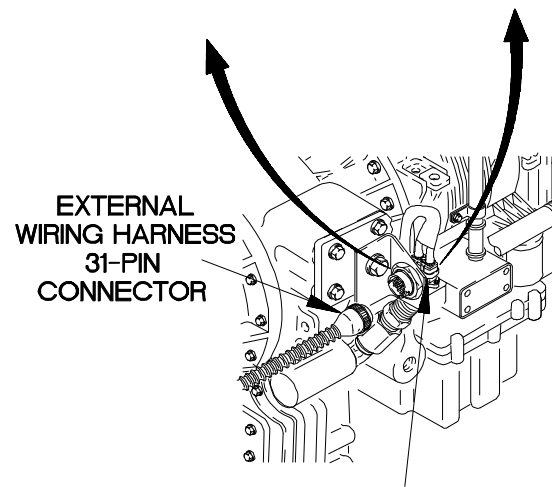
- (1) Loosen screw in adapter cable 24-pin connector.
- (2) Disconnect adapter cable 24-pin connector from internal wiring harness 24-pin connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin g.
- (5) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin H3 and note reading on multimeter.
- (6) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (7) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin g.
- (8) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).



**ADAPTER CABLE
31-PIN CONNECTOR**



**ADAPTER CABLE
24-PIN
CONNECTOR**



**EXTERNAL
WIRING HARNESS
31-PIN
CONNECTOR**

**ADAPTER CABLE
24-PIN CONNECTOR**

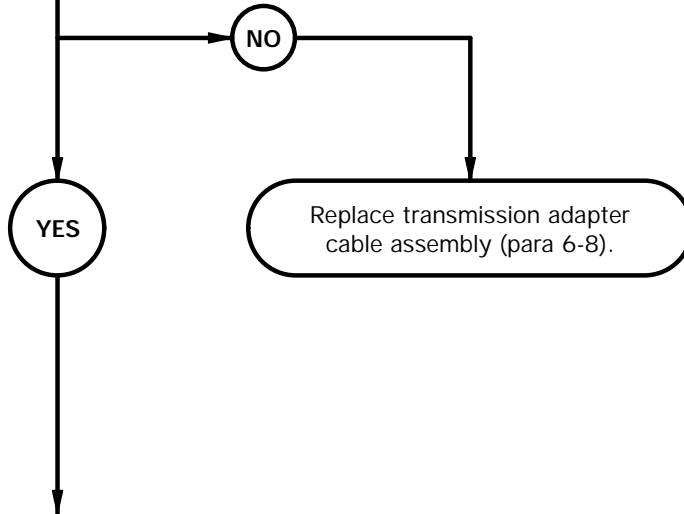
YBC4303B

c43. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC II TEPSS.

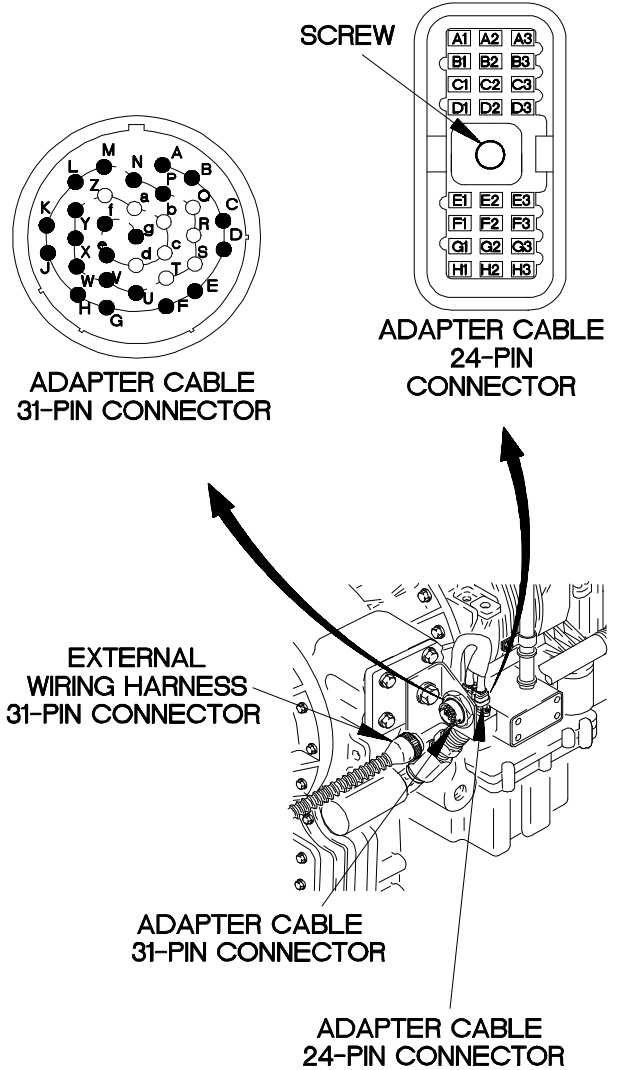
4.
Is continuity present from adapter cable 31-pin connector pin f to adapter cable 24-pin connector pin H2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin f.
- (3) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin H2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (5) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin f.
- (6) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).
- (9) Connect external wiring harness 31-pin connector to adapter cable 31-pin connector.



YBC4304B

c43. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

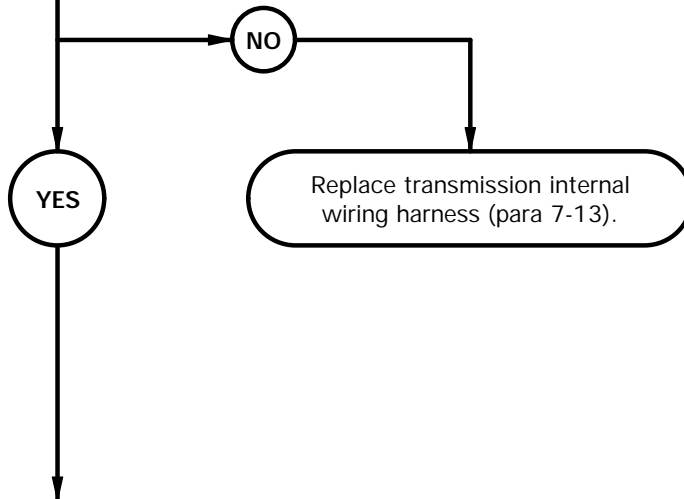
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC II TEPSS.

5.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin H3 to internal wiring harness connector N pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

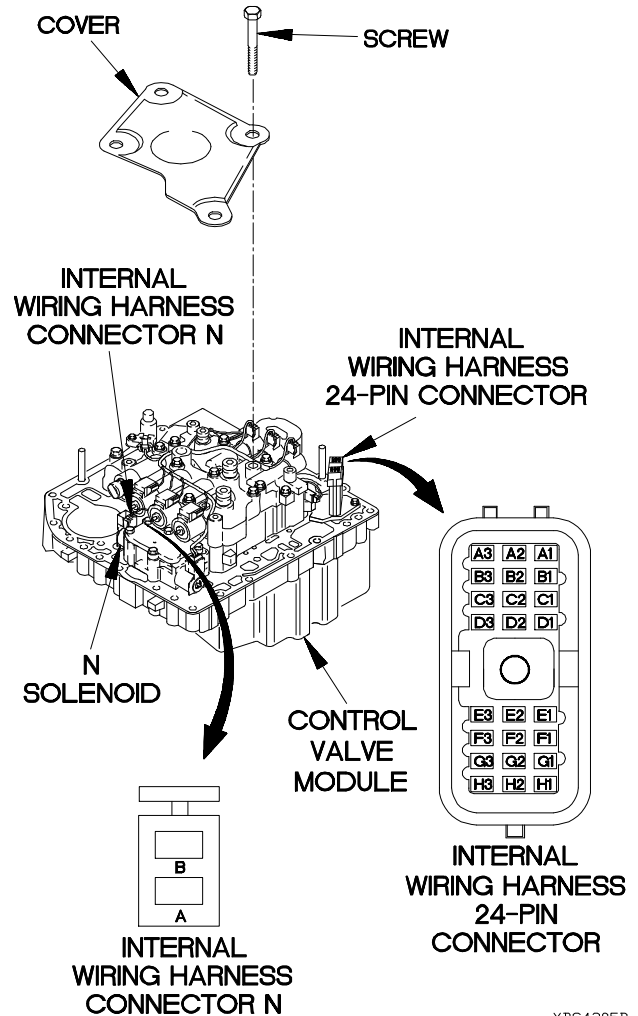


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector N from N solenoid.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin H3.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector N pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin H3.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



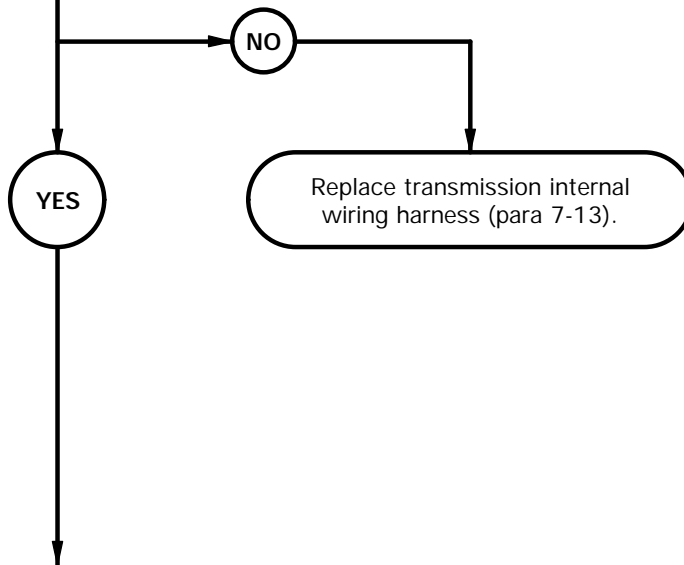
YBC4305B

c43. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC II TEPSS.

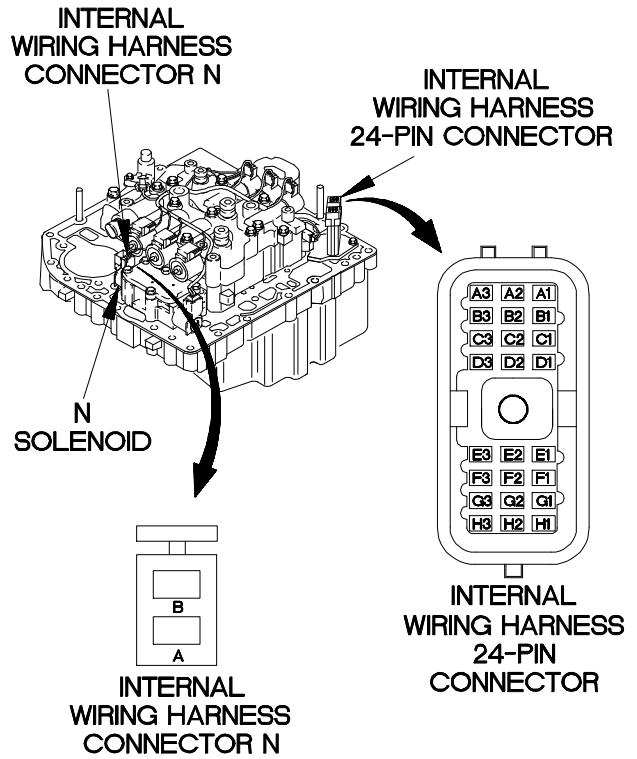
6.
Is continuity present from internal wiring harness 24-pin connector pin H2 to internal wiring harness connector N pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin H2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector N pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin H2.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).

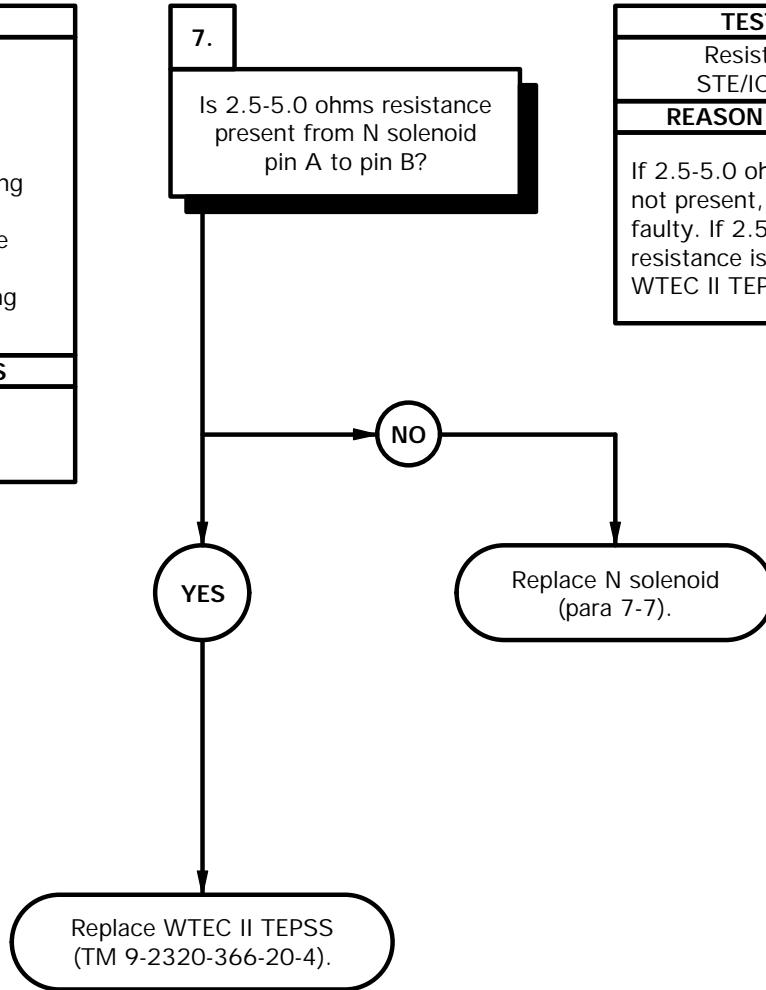


YBC4306B

c43. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

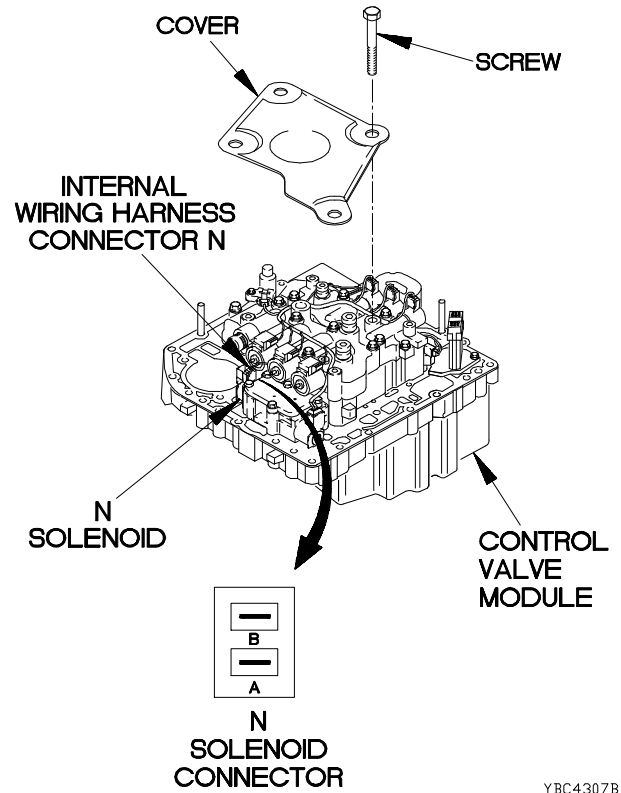
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty N solenoid. Faulty WTEC II TEPSS.

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, N solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC II TEPSS is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of N solenoid connector.
- (3) Connect negative (-) probe of multimeter to pin B of N solenoid connector and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace N solenoid (para 7-7).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector N to N solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC4307B

c44. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

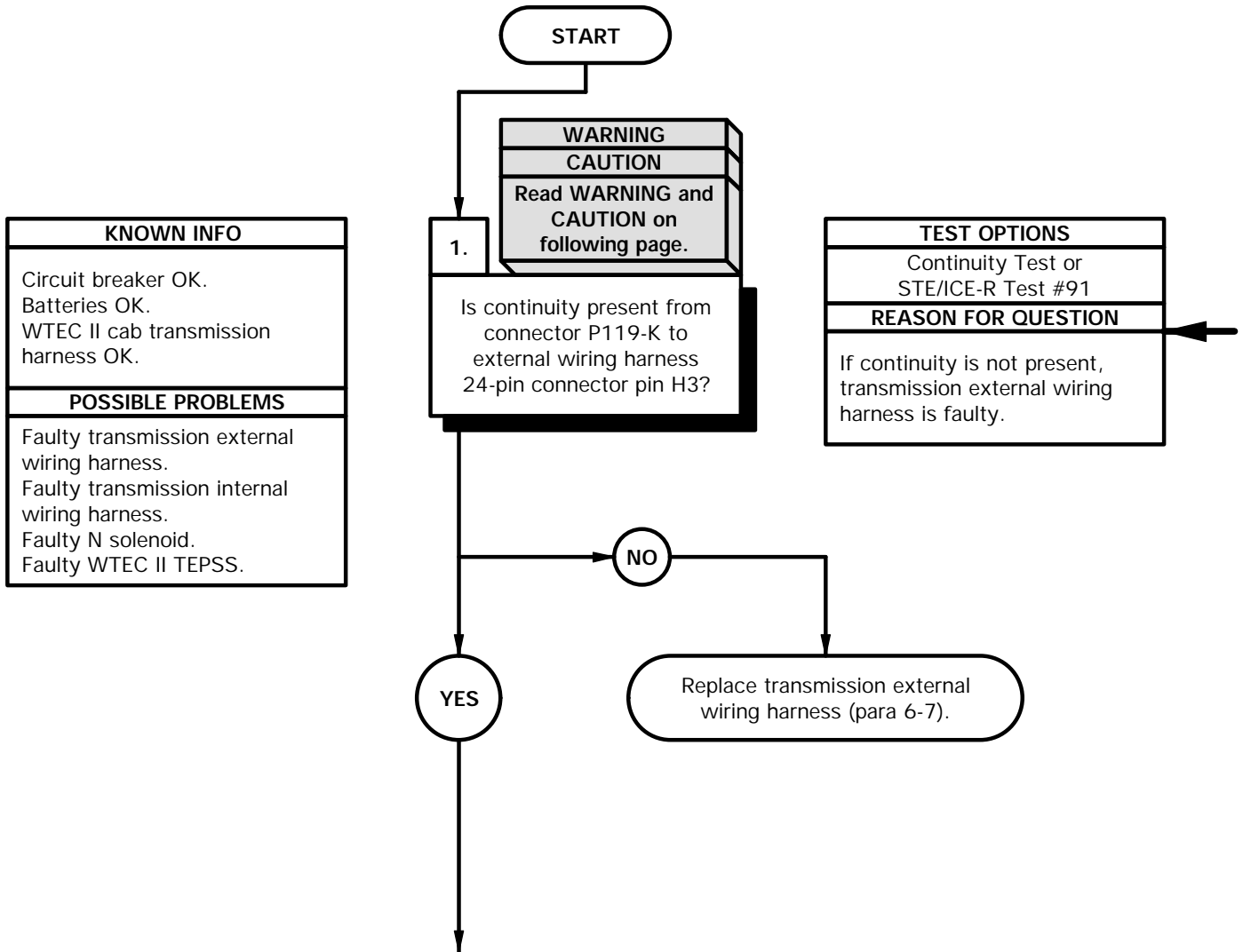
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

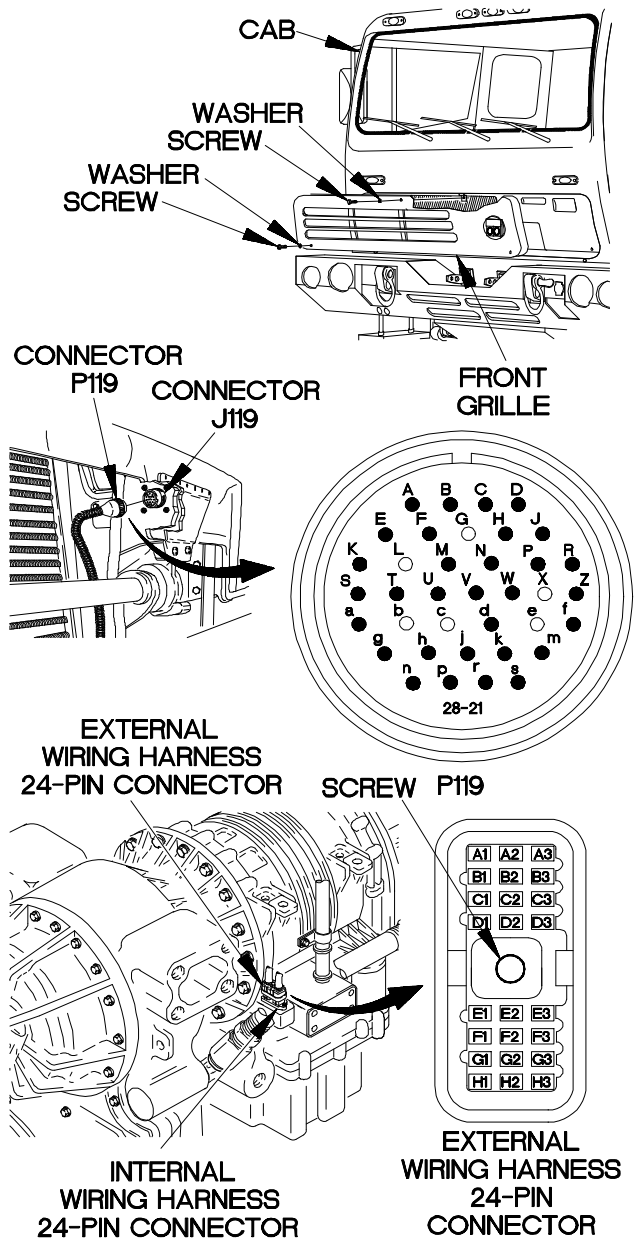
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Loosen screw in external wiring harness 24-pin connector.
- (6) Disconnect external wiring harness 24-pin connector from internal wiring harness 24-pin connector.
- (7) Set multimeter to ohms.
- (8) Connect positive (+) probe of multimeter to connector P119-K.
- (9) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin H3 and note reading on multimeter.
- (10) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (11) Connect positive (+) probe of multimeter to connector P119-K.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (13) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (14) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



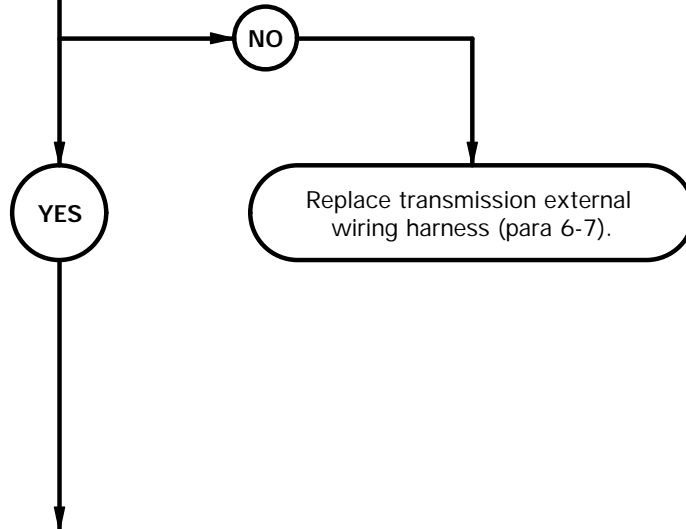
YBC4401B

c44. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC II TEPSS.

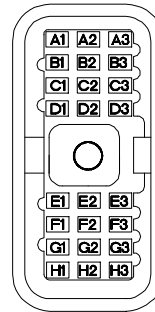
2.
Is continuity present from connector P119-A to external wiring harness 24-pin connector pin H2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

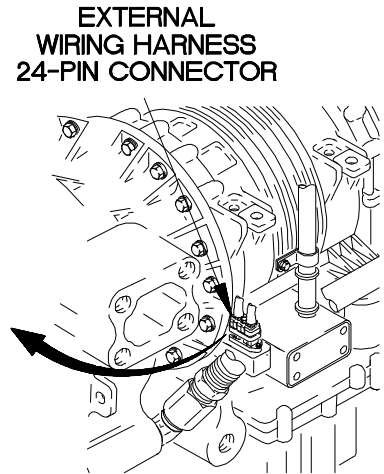


CONTINUITY TEST

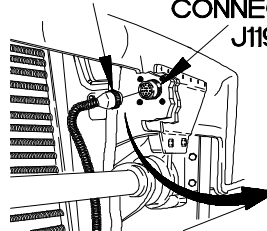
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-A.
- (3) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin H2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-A.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



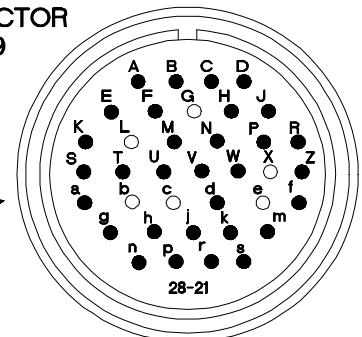
EXTERNAL WIRING HARNESS 24-PIN CONNECTOR



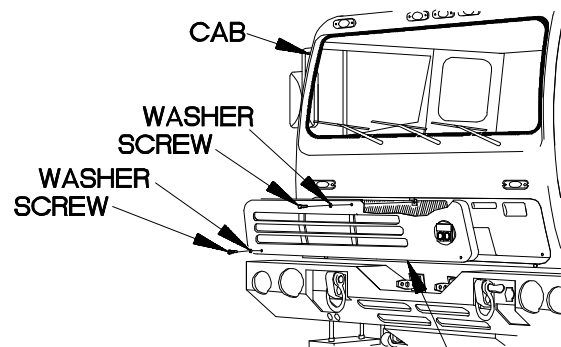
CONNECTOR P119



CONNECTOR J119



P119



FRONT GRILLE

YBC4402B

c44. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

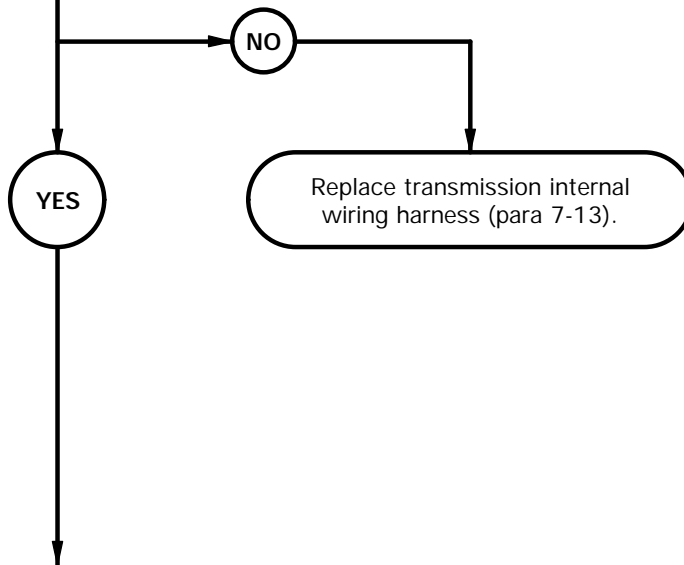
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC II TEPSS.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin H3 to internal wiring harness connector N pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

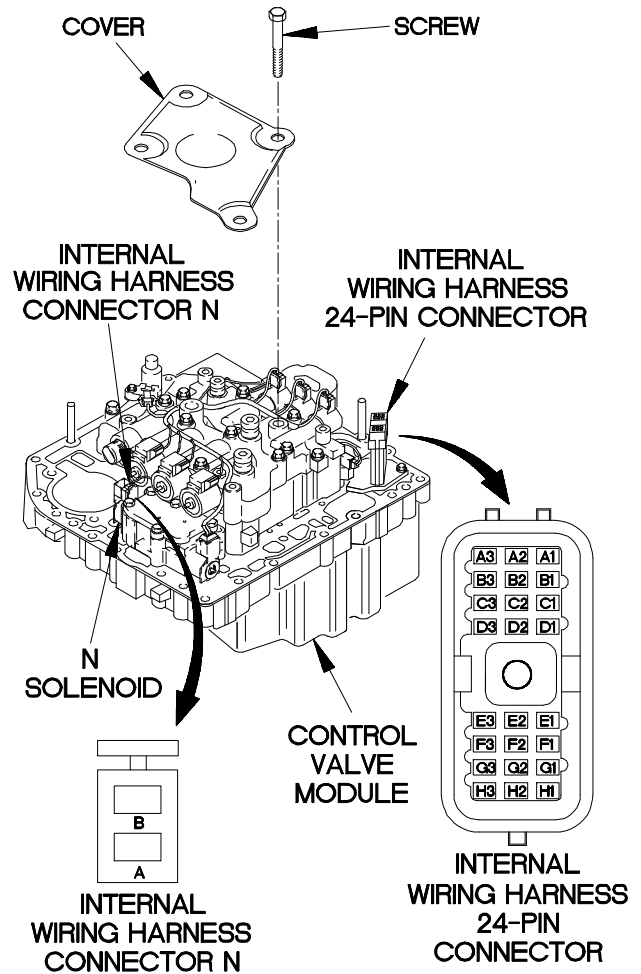


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector N from N solenoid connector.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin H3.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector N pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin H3.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



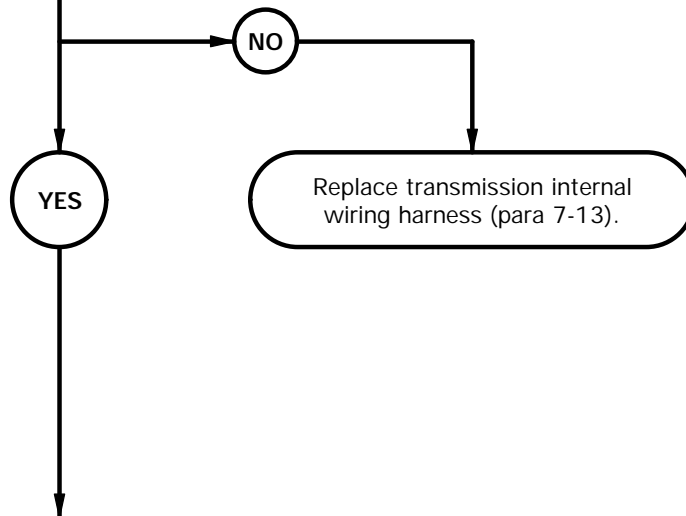
YBC4403B

c44. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC II TEPSS.

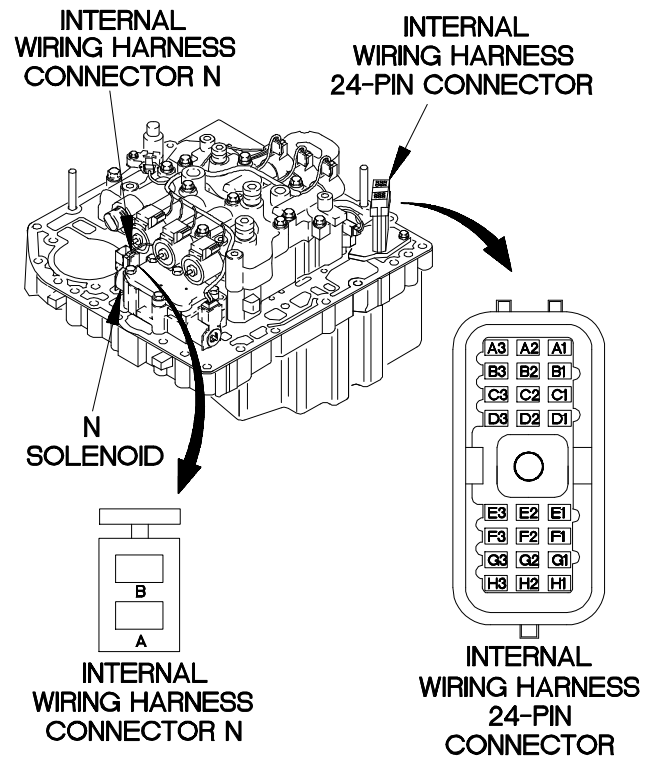
4.
Is continuity present from internal wiring harness 24-pin connector pin H2 to internal wiring harness connector N pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin H2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector N pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin H2.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector, and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



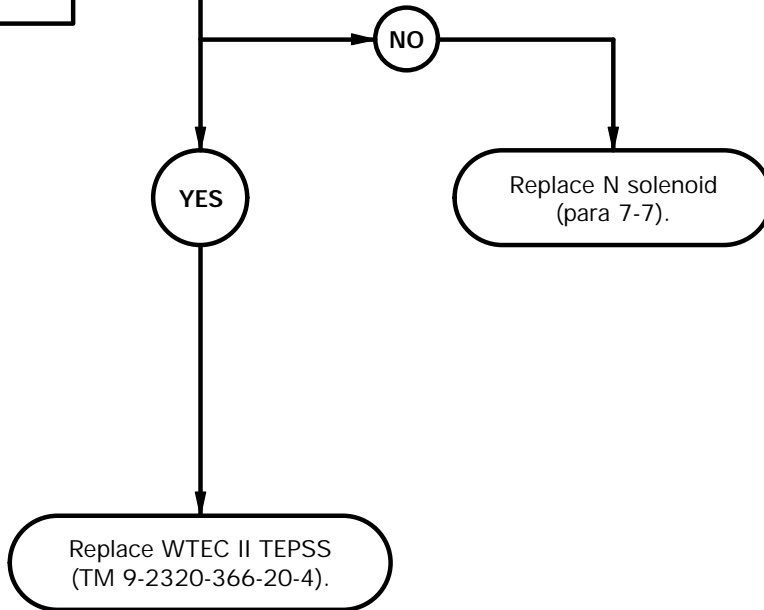
YBC4404B

c44. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Transmission external wiring harness OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty N solenoid. Faulty WTEC II TEPSS.

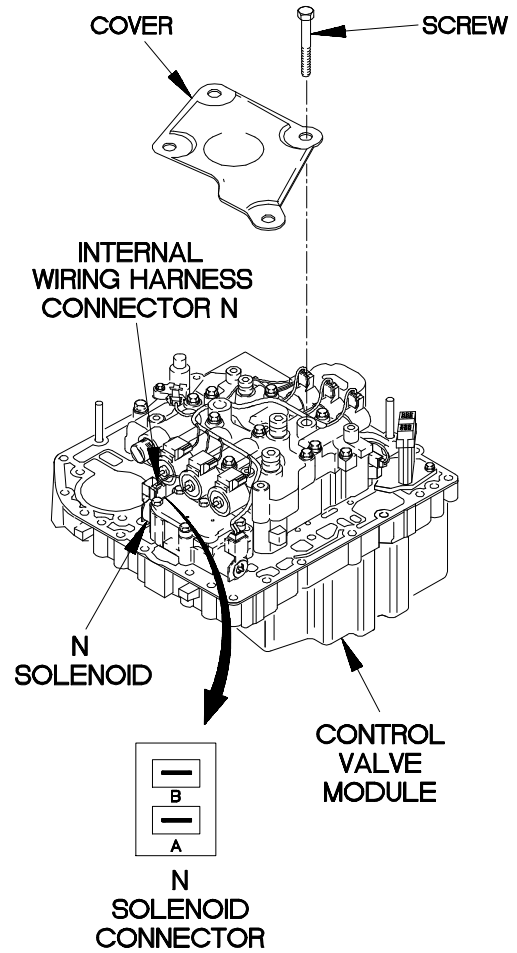
5.
Is 2.5-5.0 ohms resistance present from N solenoid pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, N solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC II TEPSS is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of N solenoid connector.
- (3) Connect negative (-) probe of multimeter to pin B of N solenoid connector and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace N solenoid (para 7-7).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC II TEPSS (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector N to N solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC4405B

c45. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

Equipment Conditions

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)
Adapter, Straight, Pipe to Tube (Item 2.1, Appendix C)
Adapter, Straight, Tube to Boss (Item 2.2, Appendix C)
Hose Assembly, Nonmetallic (Item 40.2, Appendix C)

Tools and Special Tools

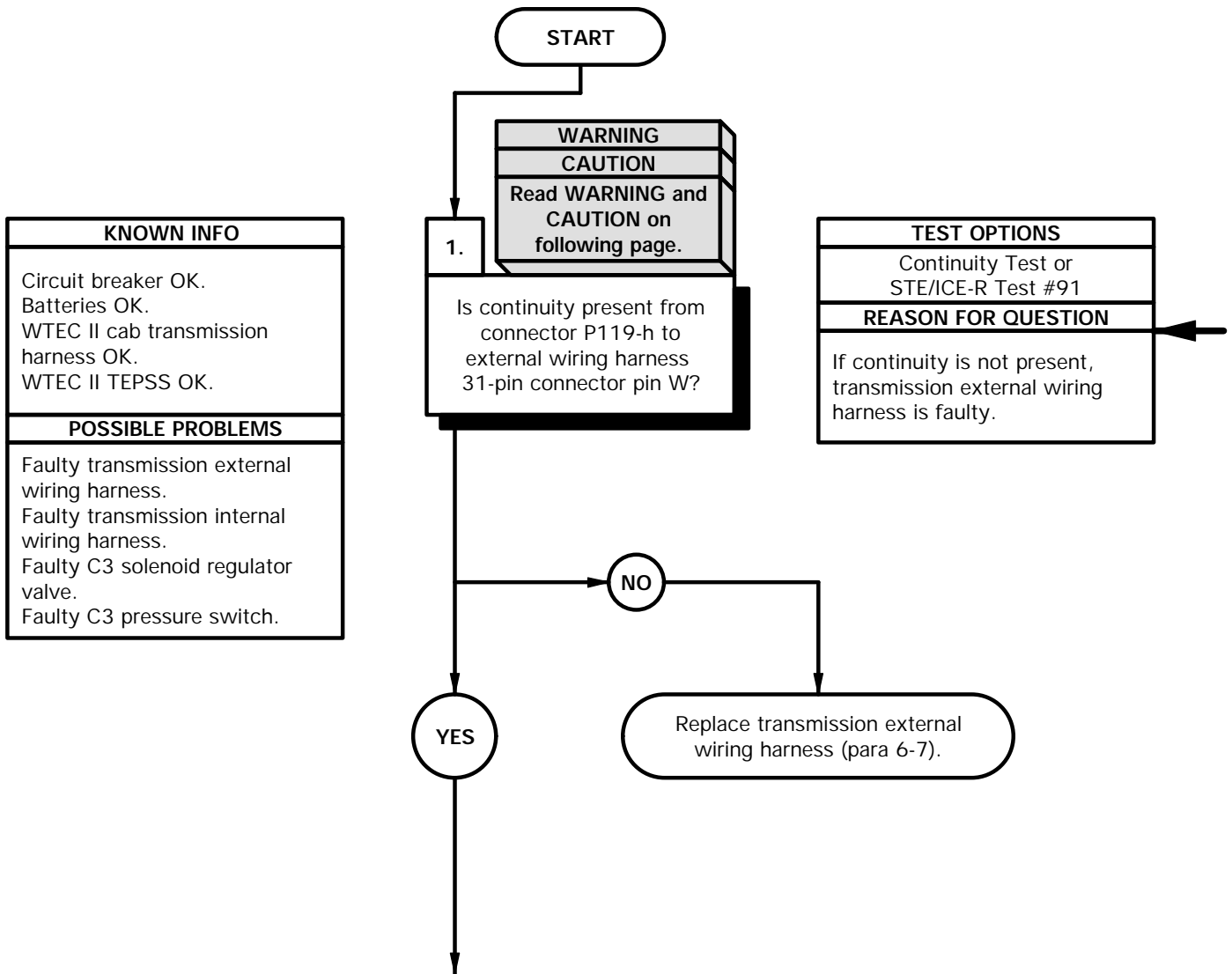
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

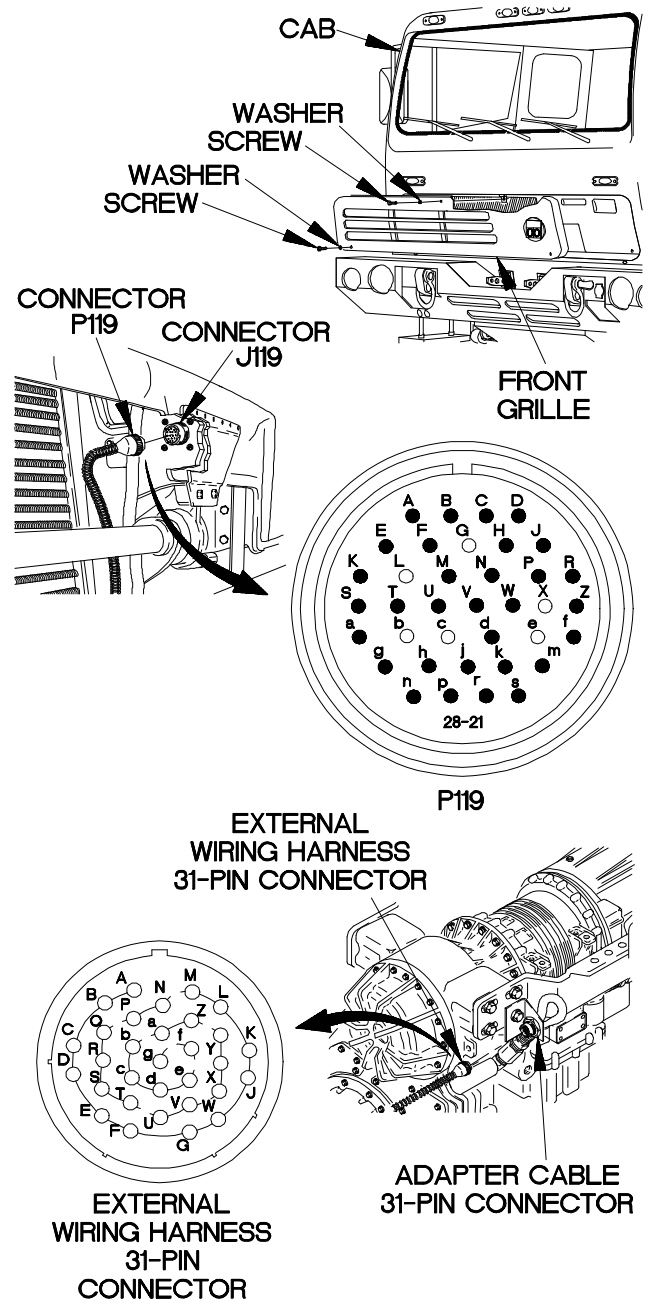
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness 31-pin connector from internal wiring 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-h.
- (8) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin W and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-h.

CONTINUITY TEST (Cont)

- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



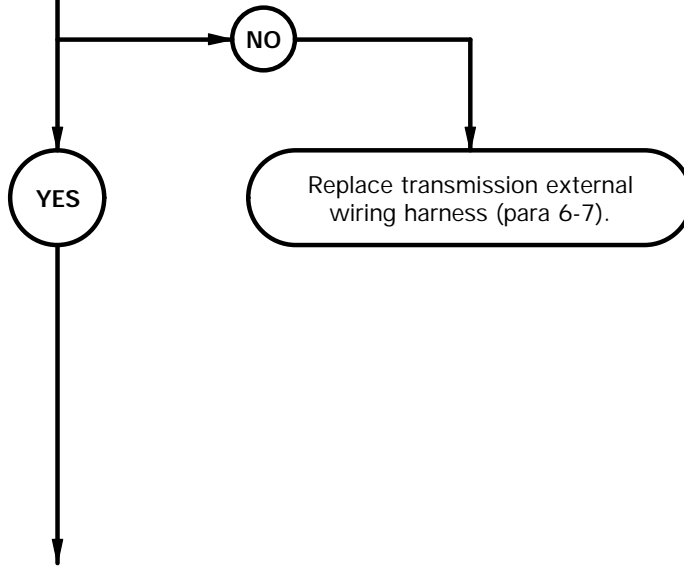
YBC4501B

c45. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. WTEC II TEPSS OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty C3 solenoid regulator valve. Faulty C3 pressure switch.

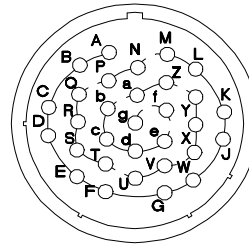
2.
Is continuity present from connector P119-j to external wiring harness 31-pin connector pin X?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

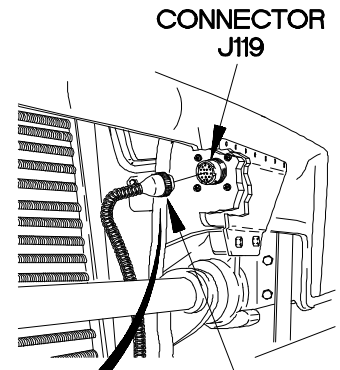


CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-j.
- (3) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin X and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-j.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).

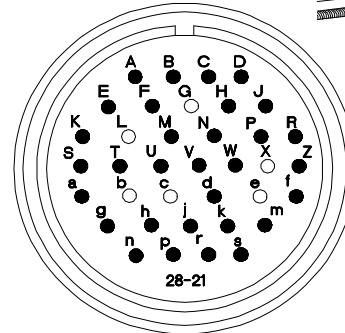


EXTERNAL WIRING HARNESS 31-PIN CONNECTOR

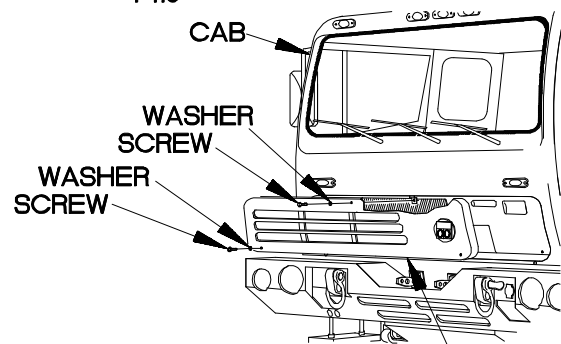


CONNECTOR J119

CONNECTOR P119



P119



FRONT GRILLE

YBC4502B

c45. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

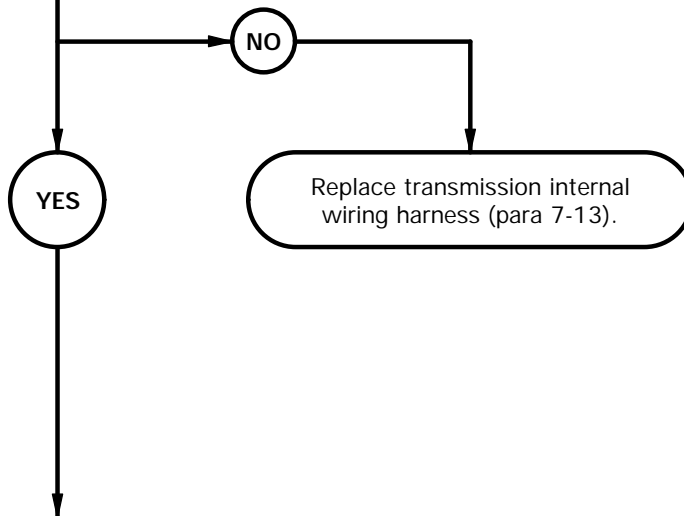
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. WTEC II TEPSS OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty C3 solenoid regulator valve. Faulty C3 pressure switch.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin W to internal wiring harness connector C3 pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

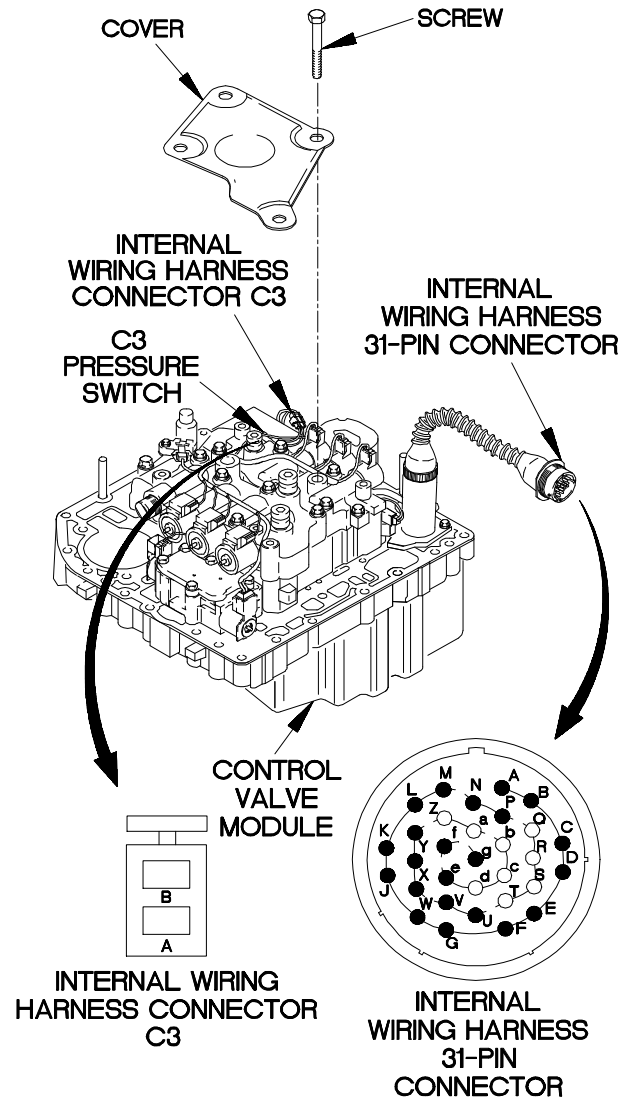


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector C3 from C3 pressure switch.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin W.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector C3 pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin W.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



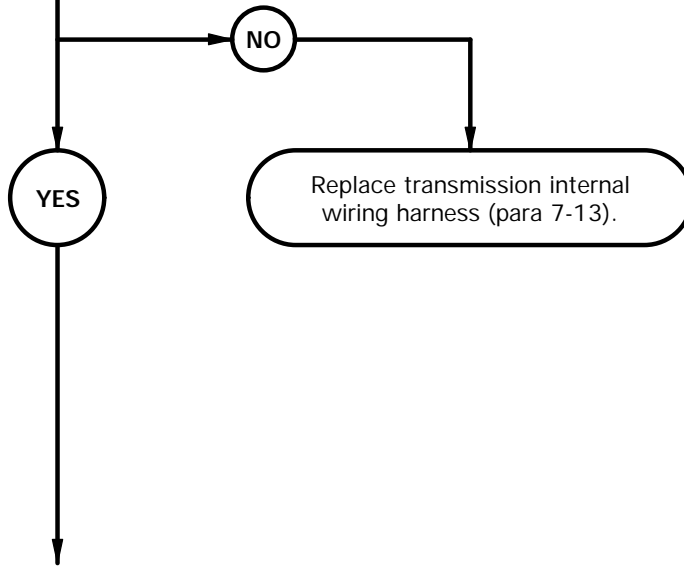
YBC4503B

c45. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. WTEC II TEPSS OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty C3 solenoid regulator valve. Faulty C3 pressure switch.

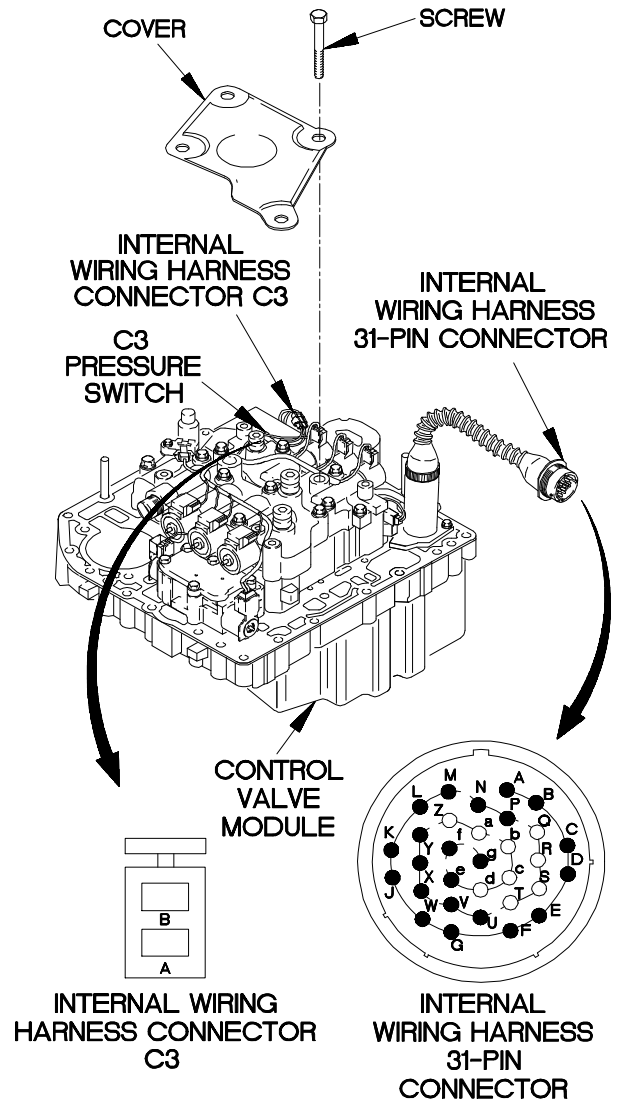
4.
Is continuity present from internal wiring harness 31-pin connector pin X to internal wiring harness connector C3 pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin X.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector C3 pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin X.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).
- (9) Connect internal wiring harness connector C3 to C3 pressure switch connector.
- (10) Install cover on control valve module with four screws.
- (11) Install control valve module (para 7-10).
- (12) Connect batteries (TM 9-2320-366-20-3).



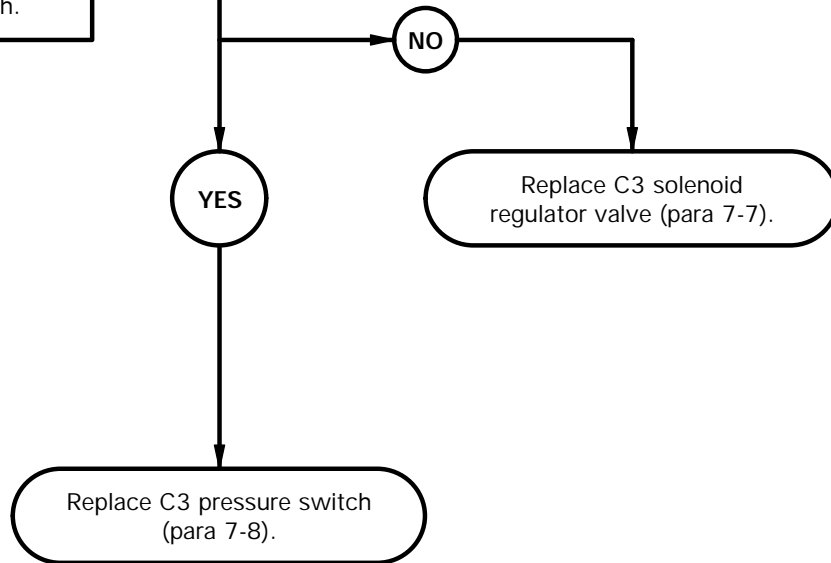
YBC4504B

c45. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. WTEC II TEPSS OK. Transmission external wiring harness OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty C3 solenoid regulator valve. Faulty C3 pressure switch.

5.
 Does C3 pressure switch open when shift is made?

TEST OPTIONS
Pressure Test or STE/ICE-R Test #50
REASON FOR QUESTION
If C3 pressure switch opens (STE/ICE-R displays greater than 0 psi), C3 solenoid regulator valve is faulty. If C3 pressure switch does not open (STE/ICE-R displays 0 psi), C3 pressure switch is faulty.



PRESSURE TEST

- (1) Remove front and intermediate propeller shafts (TM 9-2320-366-20-4).
- (2) Place drain pan under pressure tap.
- (3) Remove C3 pressure tap plug.
- (4) Connect boss to tube adapter, hose, and pipe to tube adapter to C3 pressure tap.
- (5) Connect batteries (TM 9-2320-366-20-3).
- (6) Perform STE/ICE-R test #50 (TM 9-4910-571-12&P).
- (7) Start engine (TM 9-2320-366-10-1).
- (8) With parking brake applied, make shift indicated by sub code, refer to Table 2-4.1. C3 Pressure Switch, and note reading on STE/ICE-R.
- (9) If STE/ICE-R indicates greater than 0 psi (0 kPa), replace C3 solenoid regulator valve (para 7-7).
- (10) If STE/ICE-R indicates 0 psi (0 kPa), replace C3 pressure switch (para 7-8).
- (11) Shut down engine (TM 9-2320-366-10-1).
- (12) Remove pipe to tube adapter, hose, and tube to boss adapter from C3 clutch pressure tap.
- (13) Install C3 pressure tap plug and remove drain pan.
- (14) Install front and intermediate propeller shafts (TM 9-2320-366-20-4).

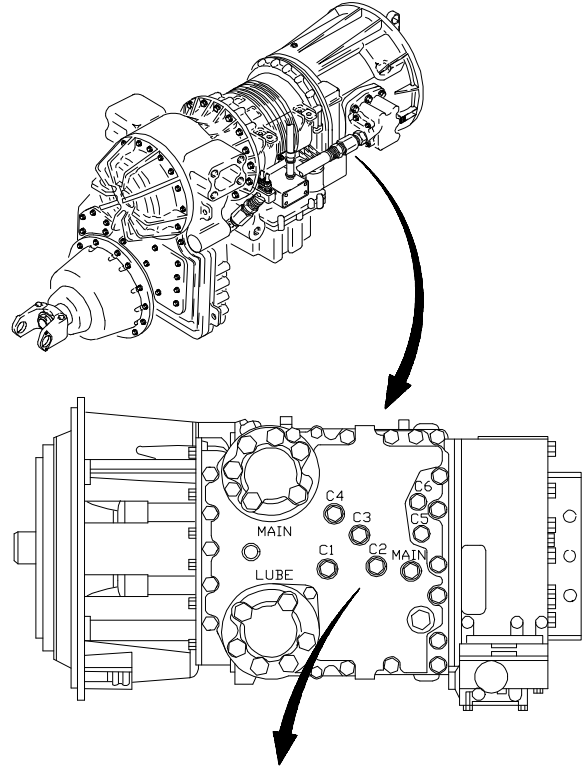
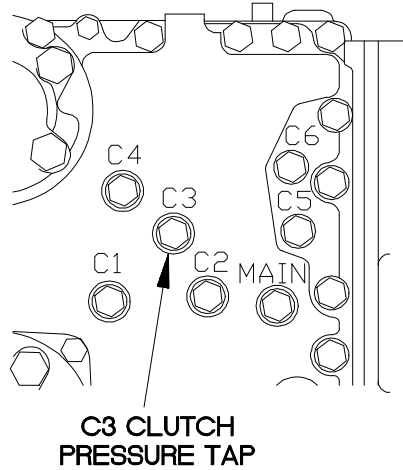


Table 2-5. C3 Pressure Switch

Sub Code	Shift From - To
01	1-2
08	2-N-2
32	4-3
34	4-5
54	6-5
56	6-7
71	R-1
72	R-2
78	R-N-1
79	R-2
99	N3-N2



YBC4505B

c46. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Tools and Special Tools

Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts

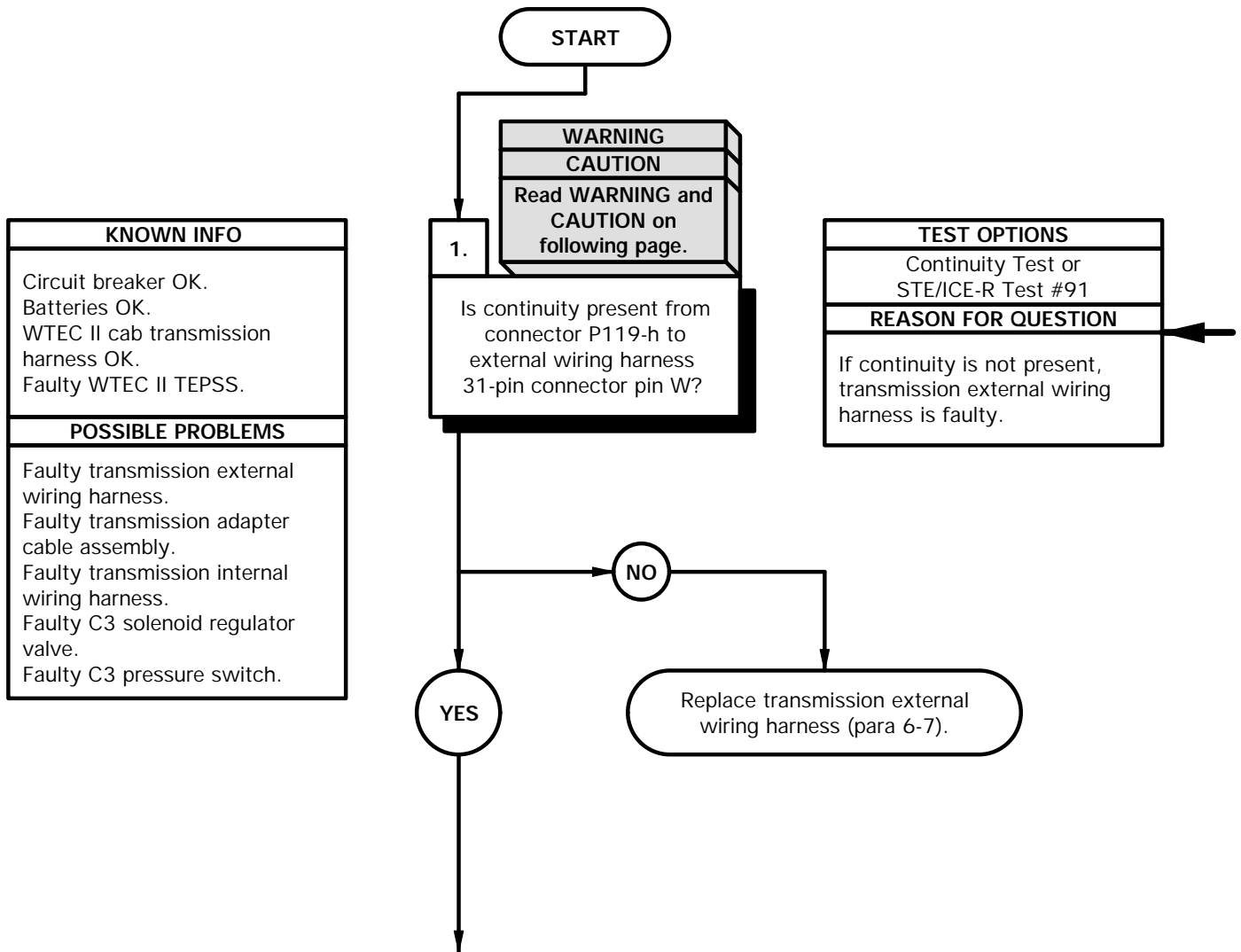
Wire, Elect, 50 ft (Item 97, Appendix C)
Adapter, Straight, Pipe to Tube (Item 2.1, Appendix C)
Adapter, Straight, Tube to Boss (Item 2.2, Appendix C)
Hose Assembly, Nonmetallic (Item 40.2, Appendix C)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

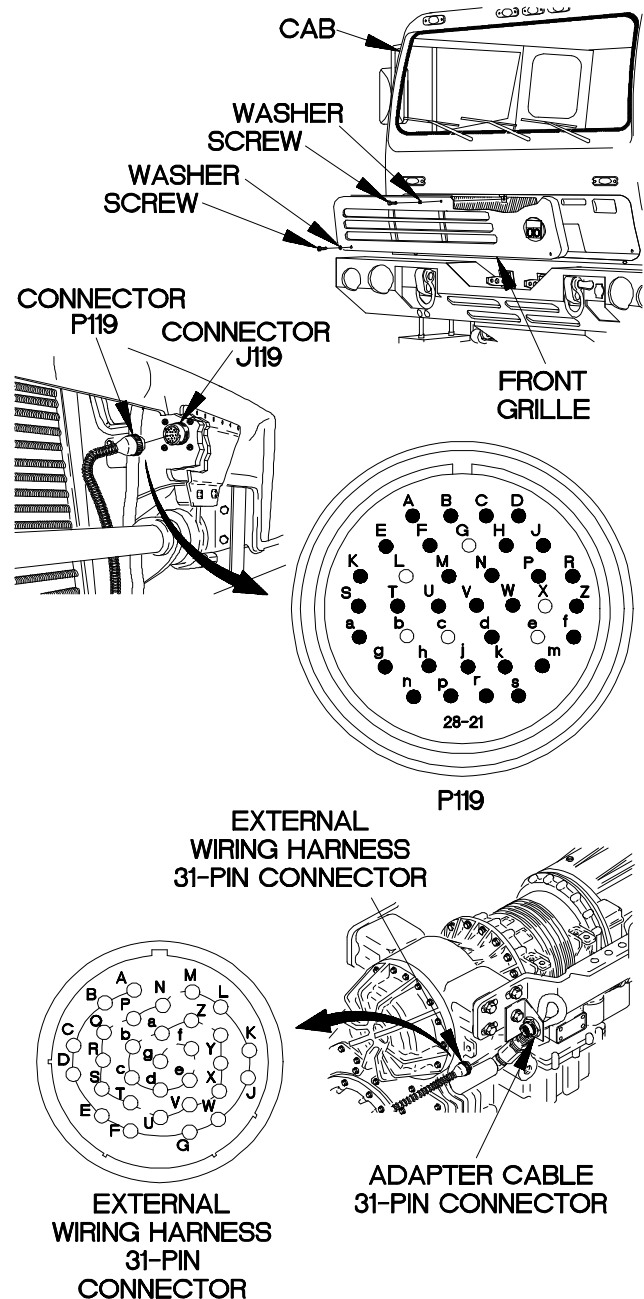
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness 31-pin connector from adapter cable 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-h.
- (8) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin W and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-h.

CONTINUITY TEST (Cont)

- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



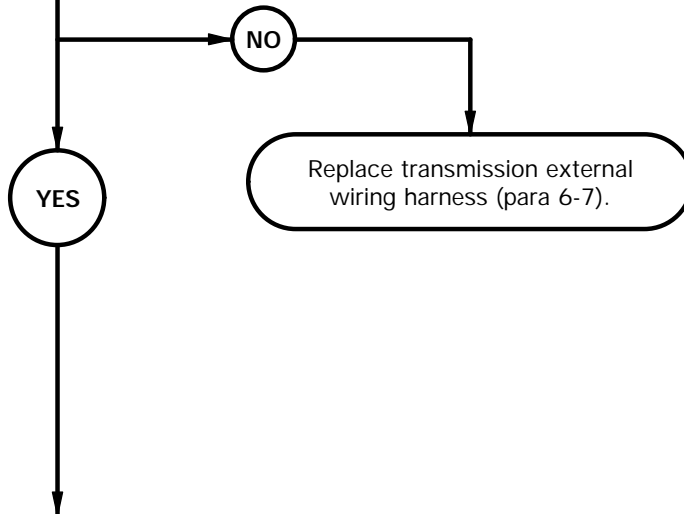
YBC4601B

c46. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Faulty WTEC II TEPSS.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty C3 solenoid regulator valve. Faulty C3 pressure switch.

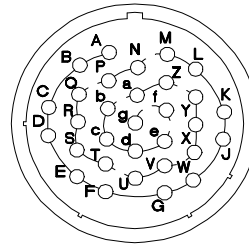
2.
Is continuity present from connector P119-j to external wiring harness 31-pin connector pin X?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

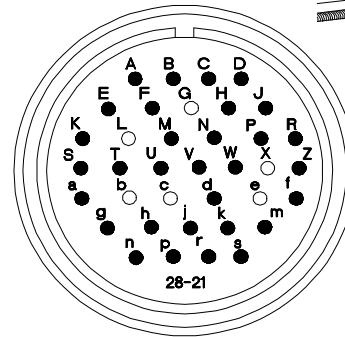


CONTINUITY TEST

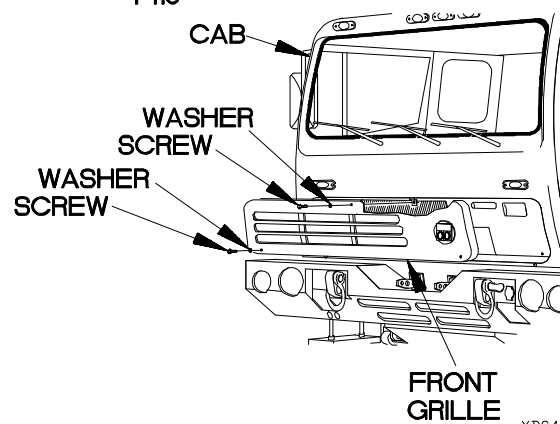
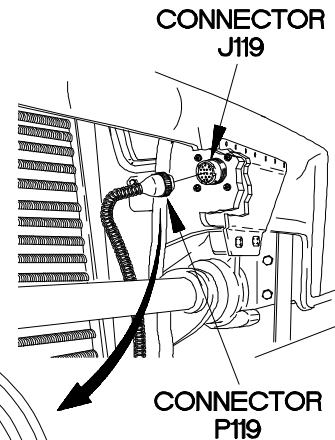
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-j.
- (3) Connect negative (-) probe of multimeter to external wiring harness 31-pin connector pin X and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-j.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



EXTERNAL WIRING HARNESS 31-PIN CONNECTOR



P119



YBC4602B

c46. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

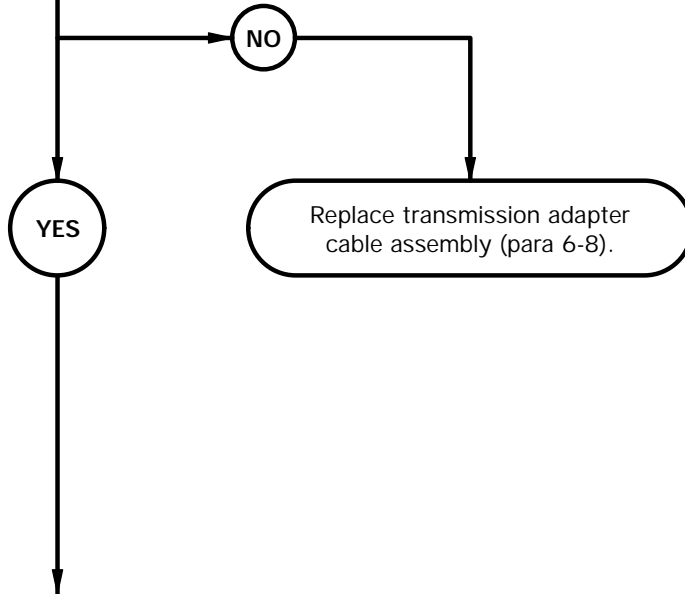
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Faulty WTEC II TEPSS. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty C3 solenoid regulator valve. Faulty C3 pressure switch.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin W to adapter cable 24-pin connector pin F2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.

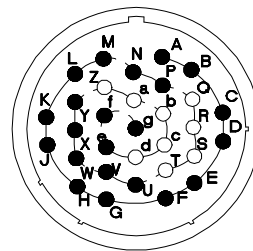


CAUTION

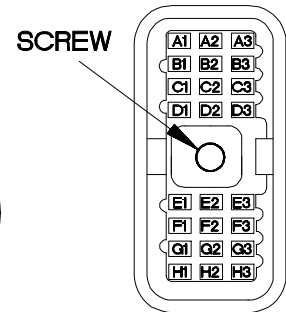
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

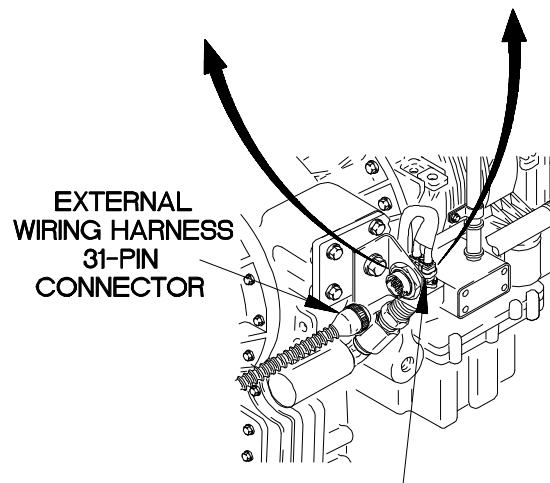
- (1) Loosen screw in adapter cable 24-pin connector.
- (2) Disconnect adapter cable 24-pin connector from internal wiring harness 24-pin connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin W.
- (5) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin F2 and note reading on multimeter.
- (6) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (7) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin W.
- (8) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).



**ADAPTER CABLE
31-PIN CONNECTOR**



**ADAPTER CABLE
24-PIN
CONNECTOR**

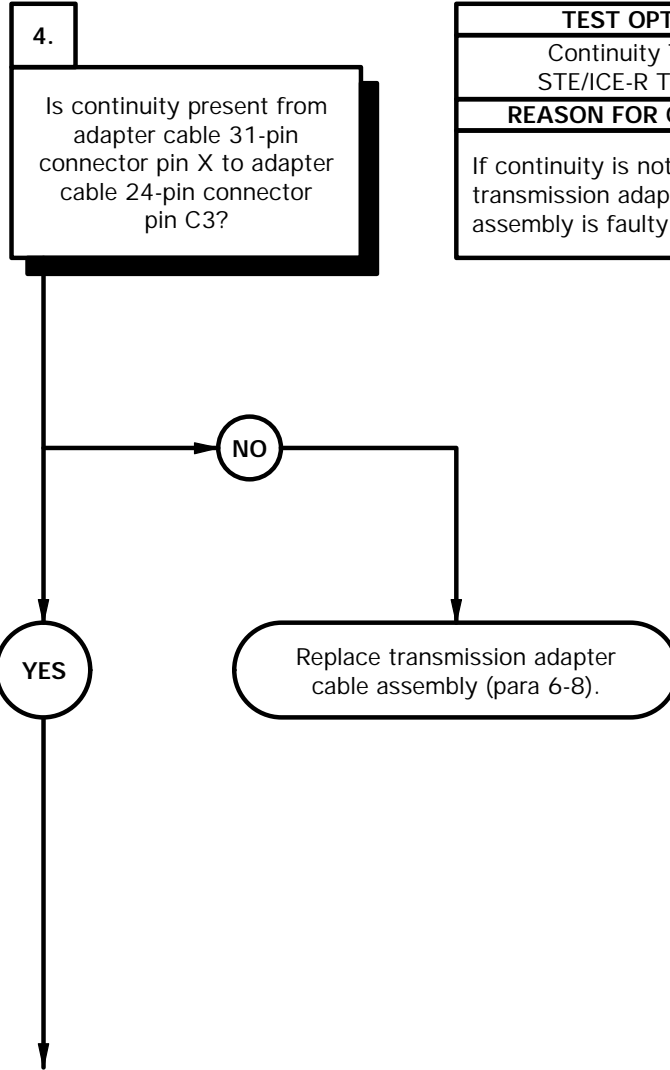


**ADAPTER CABLE
24-PIN CONNECTOR**

YBC4603B

c46. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

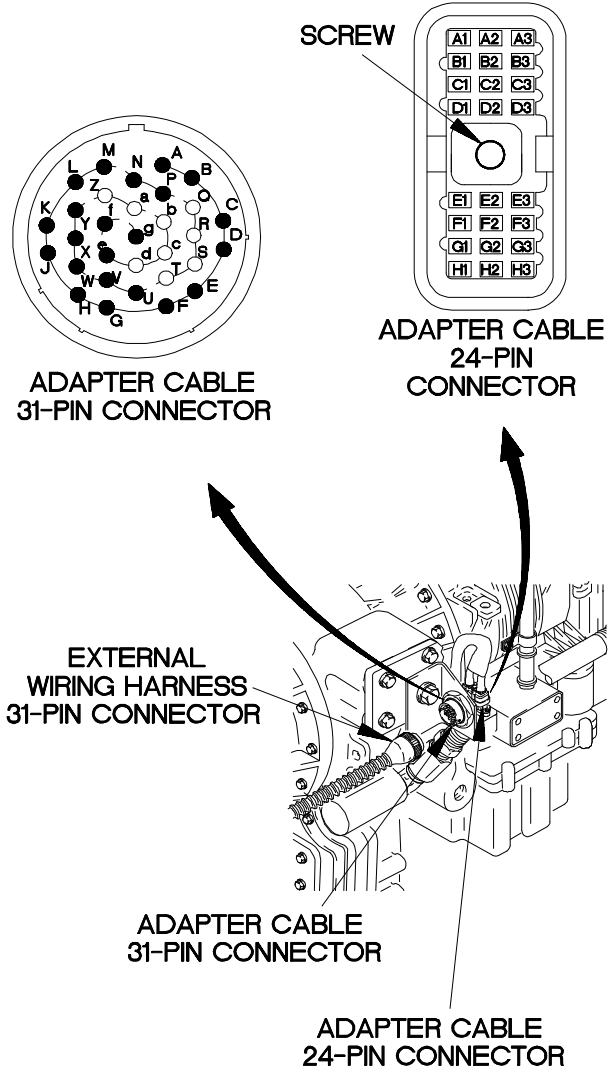
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Faulty WTEC II TEPSS. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty C3 solenoid regulator valve. Faulty C3 pressure switch.



TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin X.
- (3) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin C3 and note reading on multimeter.
- (4) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (5) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin X.
- (6) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).
- (9) Connect external wiring harness 31-pin connector to adapter cable 31-pin connector.



YBC4604B

c46. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

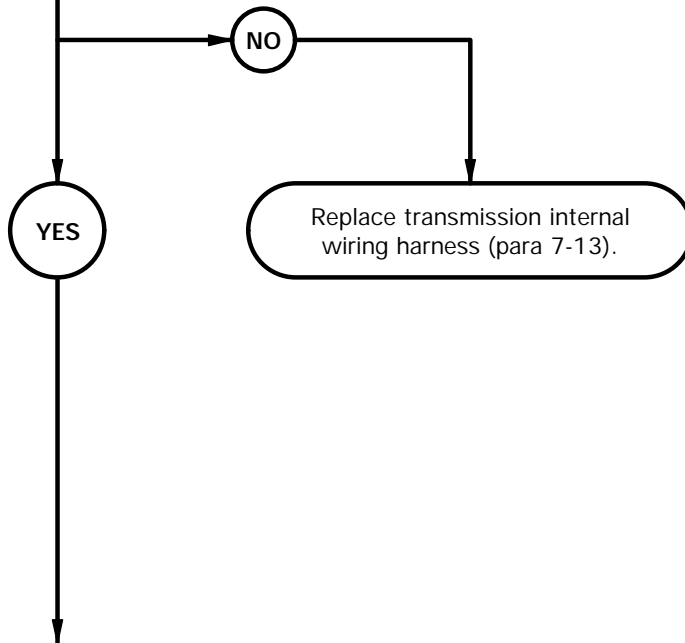
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Faulty WTEC II TEPSS. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty C3 solenoid regulator valve. Faulty C3 pressure switch.

5.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin F2 to internal wiring harness connector C3 pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

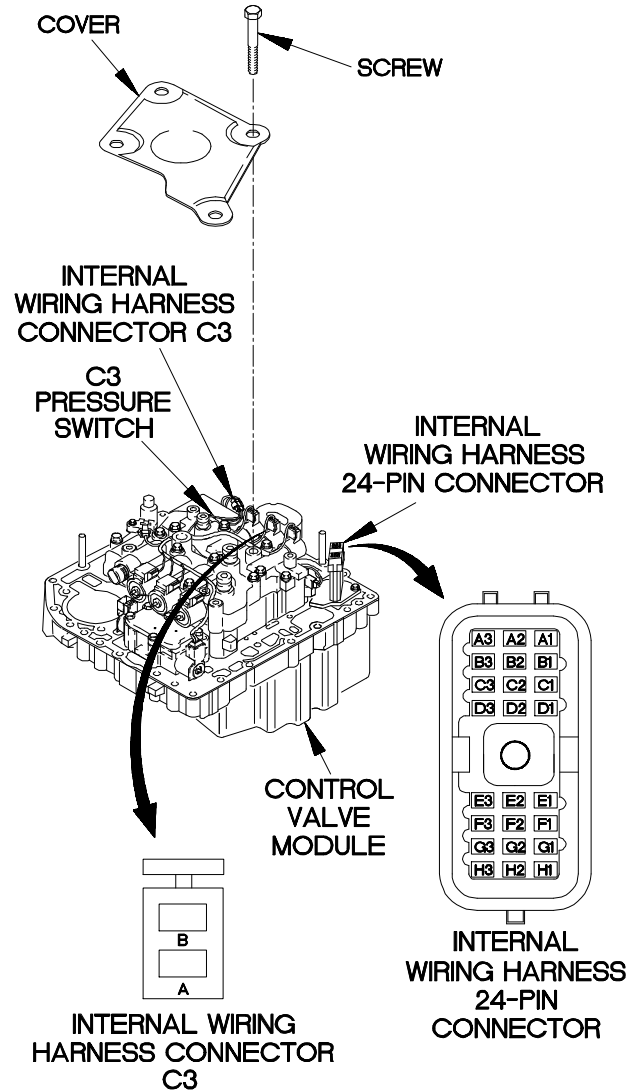


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Remove internal wiring harness connector C3 from C3 pressure switch.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin F2.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector C3 pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin F2.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



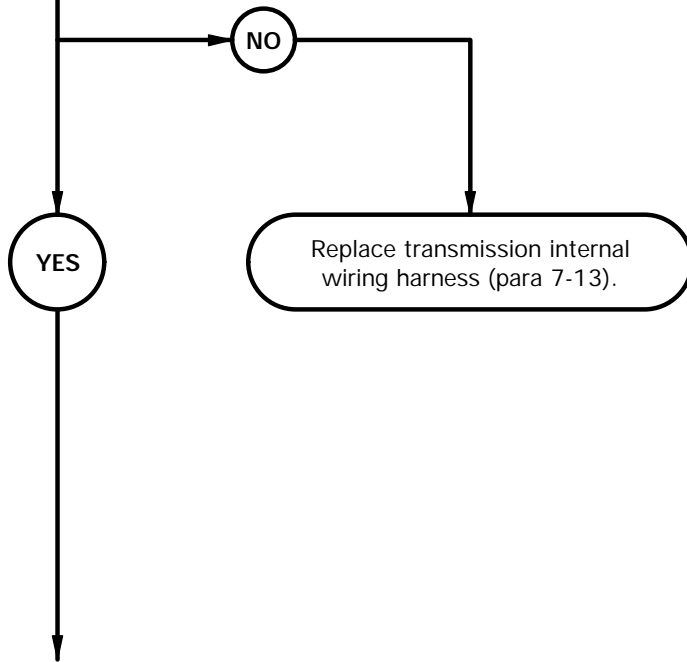
YBC4605B

c46. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Faulty WTEC II TEPSS. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty C3 solenoid regulator valve. Faulty C3 pressure switch.

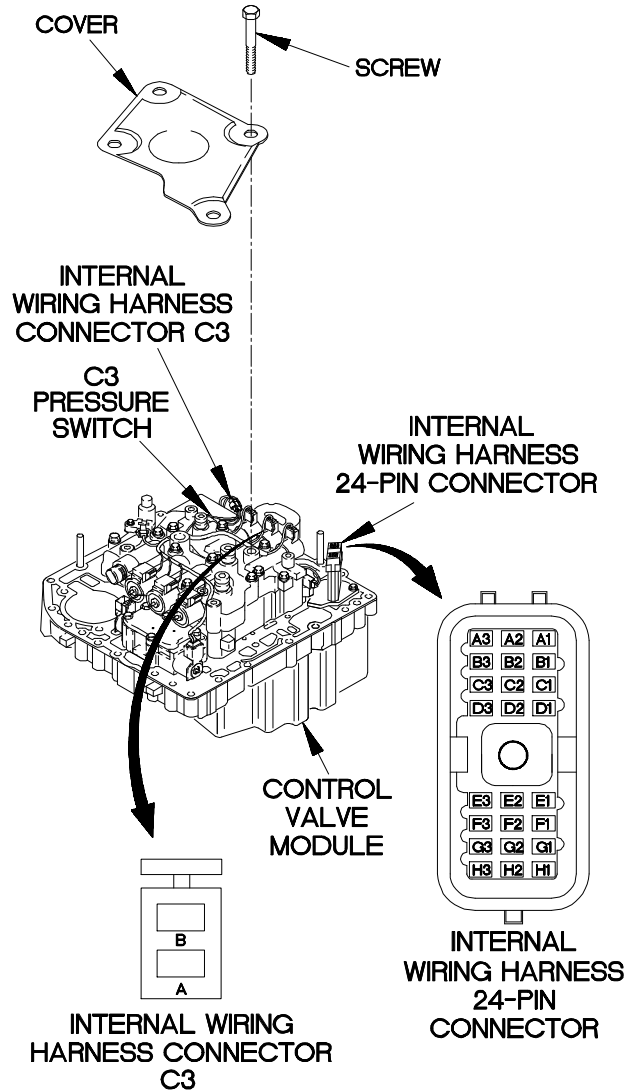
6.
Is continuity present from internal wiring harness 24-pin connector pin C3 to internal wiring harness connector C3 pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin C3.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector C3 pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin C3.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).
- (9) Connect internal wiring harness connector C3 to C3 pressure switch.
- (10) Install four screws and cover on control valve module.
- (11) Install control valve module (para 7-10).

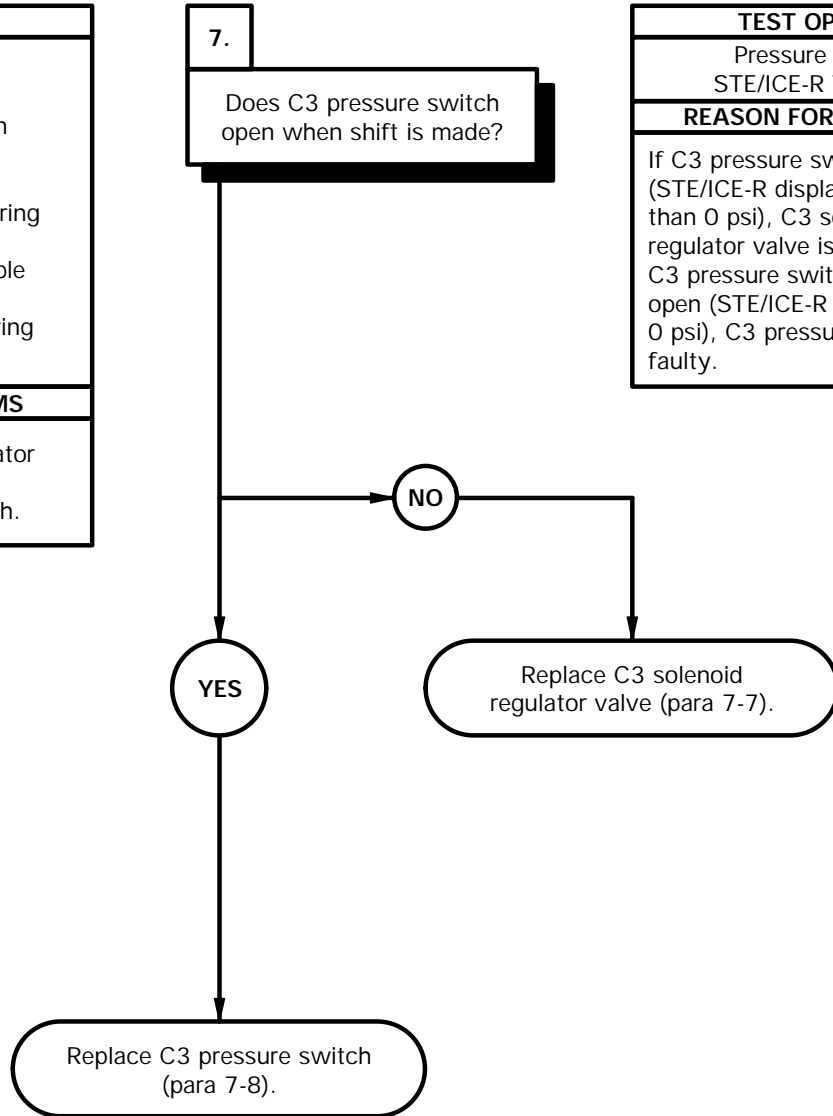


YBC4606B

c46. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. WTEC II TEPSS OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty C3 solenoid regulator valve. Faulty C3 pressure switch.

TEST OPTIONS
Pressure Test or STE/ICE-R Test #50
REASON FOR QUESTION
If C3 pressure switch opens (STE/ICE-R displays greater than 0 psi), C3 solenoid regulator valve is faulty. If C3 pressure switch does not open (STE/ICE-R displays 0 psi), C3 pressure switch is faulty.



PRESSURE TEST

- (1) Remove front and intermediate propeller shafts (TM 9-2320-366-20-4).
- (2) Place drain pan under pressure tap.
- (3) Remove C3 pressure tap plug.
- (4) Connect tube to boss adapter, hose, and pipe to tube adapter to C3 pressure tap.
- (5) Connect batteries (TM 9-2320-366-20-3).
- (6) Perform STE/ICE-R test #50 (TM 9-4910-571-12&P).
- (7) Start engine (TM 9-2320-366-10-1).
- (8) With parking brake applied, make shift indicated by sub code, refer to Table 2-4.2. C3 Pressure Switch, and note reading on STE/ICE-R.
- (9) If STE/ICE-R indicates greater than 0 psi (0 kPa), replace C3 solenoid regulator valve (para 7-7).
- (10) If STE/CE-R indicates 0 psi (0 kPa), replace C3 pressure switch (para 7-8).
- (11) Shut down engine (TM 9-2320-366-10-1).
- (12) Remove pipe to tube adapter, hose, and tube to boss adapter from C3 clutch pressure tap.
- (13) Install C3 pressure tap plug and remove drain pan.
- (14) Install front and intermediate propeller shafts (TM 9-2320-366-20-4).

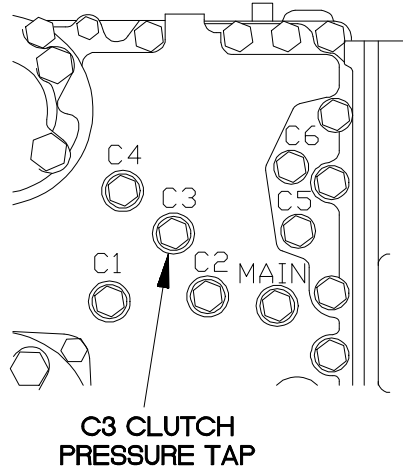
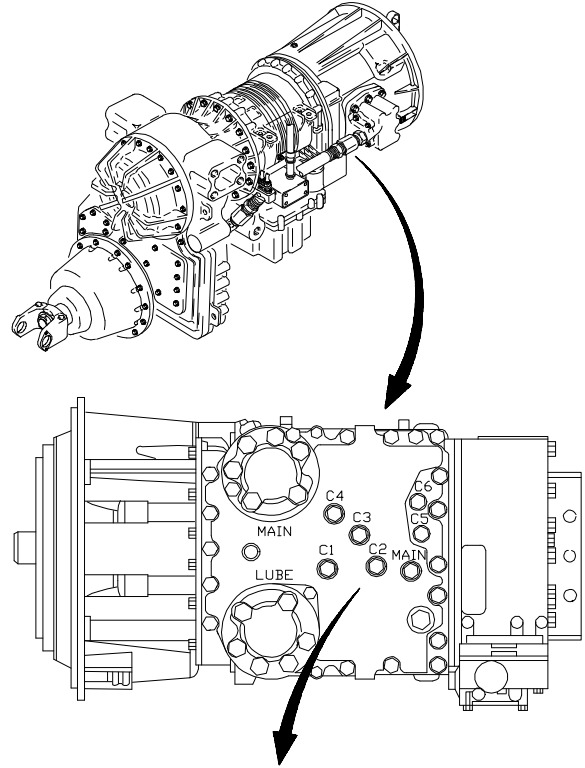


Table 2-6. C3 Pressure Switch

Sub Code	Shift From - To
01	1-2
08	2-N-2
32	4-3
34	4-5
54	6-5
56	6-7
71	R-1
72	R-2
78	R-N-1
79	R-2
99	N3-N2

YBC4607B

c47. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Tools and Special Tools

Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts

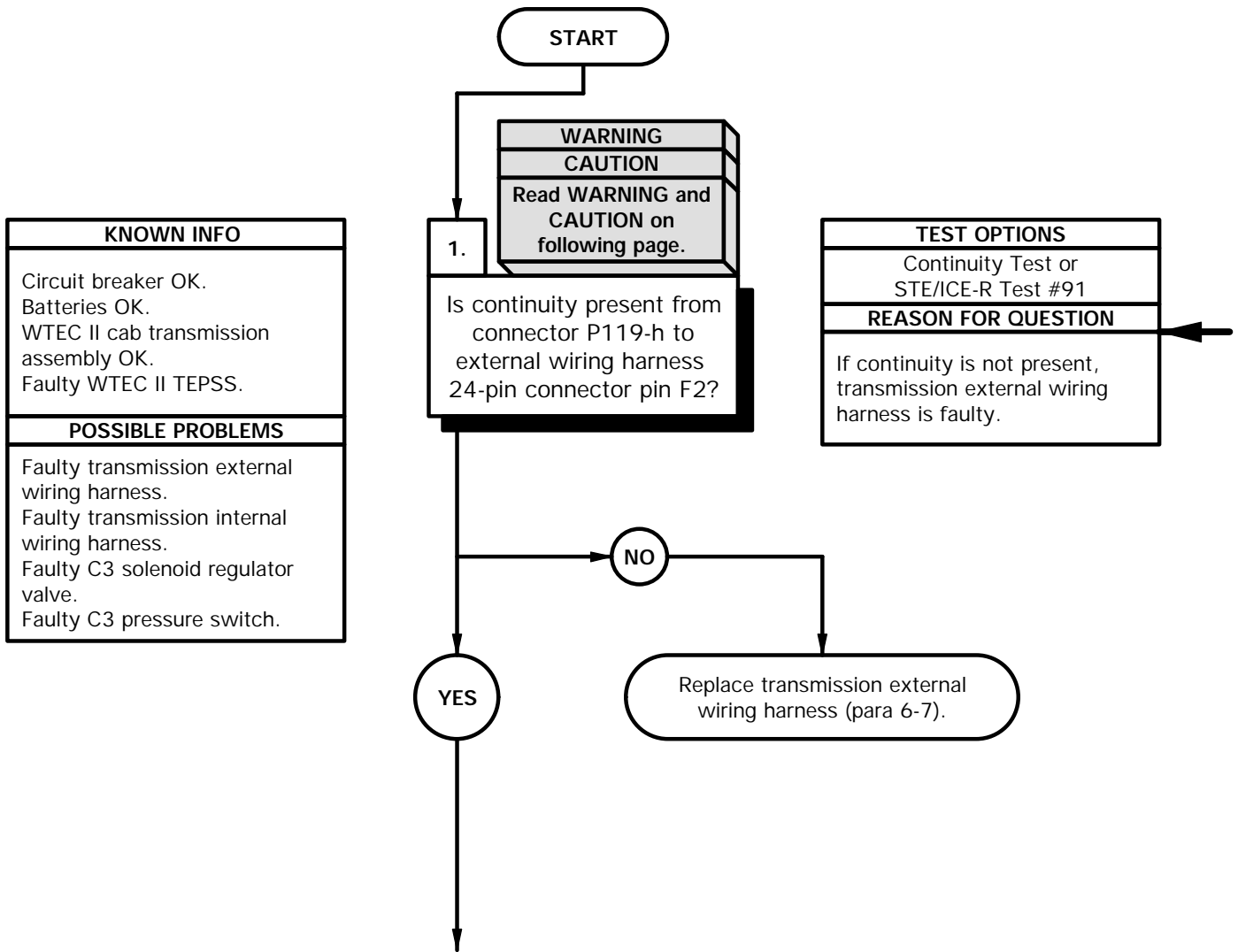
Wire, Elect, 50 ft (Item 97, Appendix C)
Adapter, Straight, Pipe to Tube (Item 2.1, Appendix C)
Adapter, Straight, Tube to Boss (Item 2.2, Appendix C)
Hose Assembly, Nonmetallic (Item 40.2, Appendix C)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

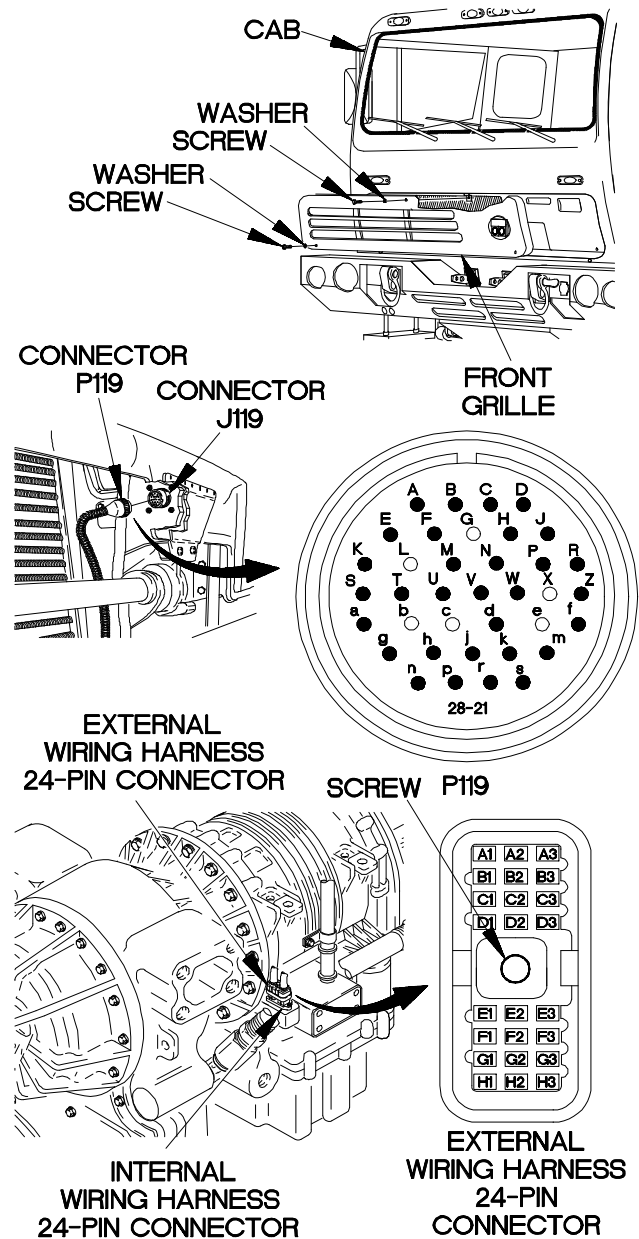
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Loosen screw in external wiring 24-pin connector.
- (6) Disconnect external wiring harness 24-pin connector from internal wiring harness 24-pin connector.
- (7) Set multimeter to ohms.
- (8) Connect positive (+) probe of multimeter to connector P119-h.
- (9) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin F2 and note reading on multimeter.
- (10) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (11) Connect positive (+) probe of multimeter to connector P119-h.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (13) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (14) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



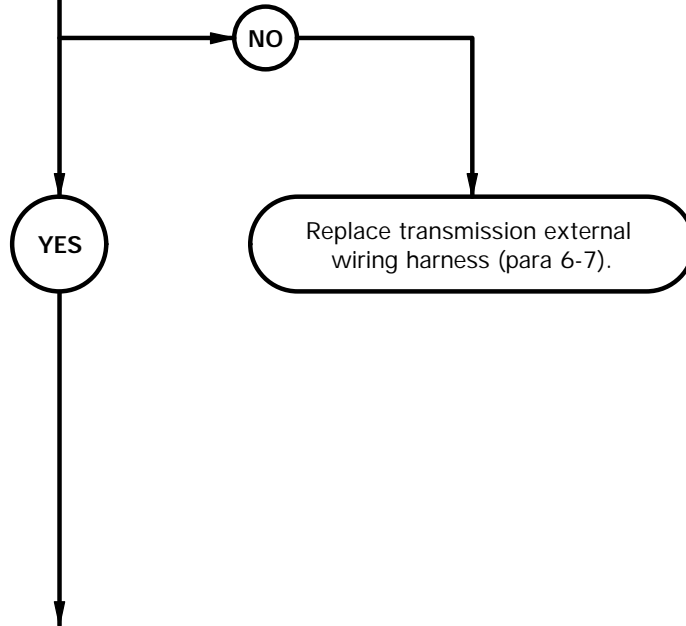
Ybc4701b

c47. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Faulty WTEC II TEPSS.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty C3 solenoid regulator valve. Faulty C3 pressure switch.

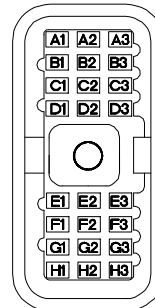
2.
Is continuity present from connector P119-j to external wiring harness 24-pin connector pin C3?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

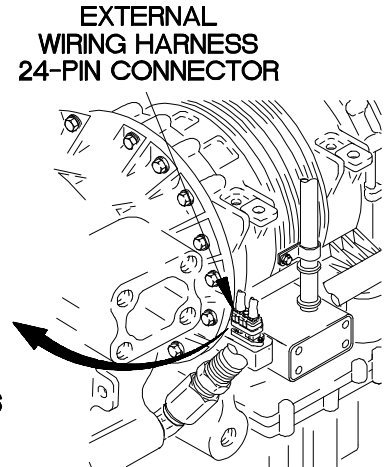


CONTINUITY TEST

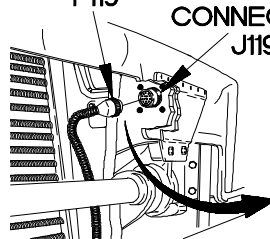
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-j.
- (3) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin C3 and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-j.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



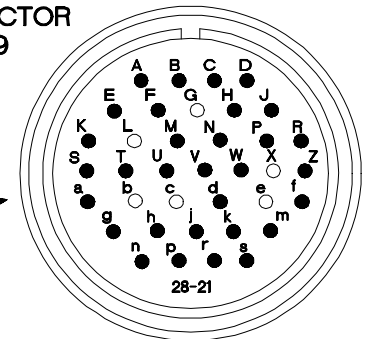
EXTERNAL WIRING HARNESS 24-PIN CONNECTOR



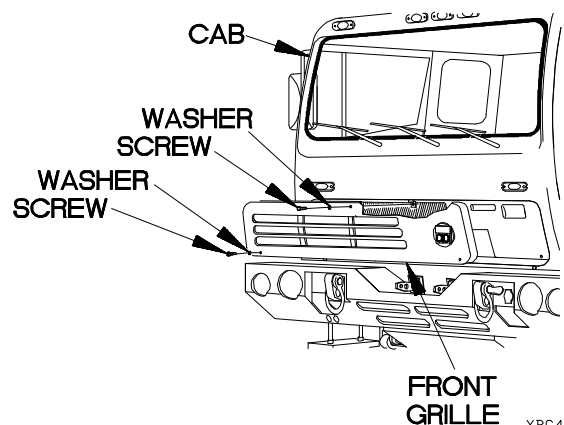
CONNECTOR P119



CONNECTOR J119



P119



YBC4702B

c47. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

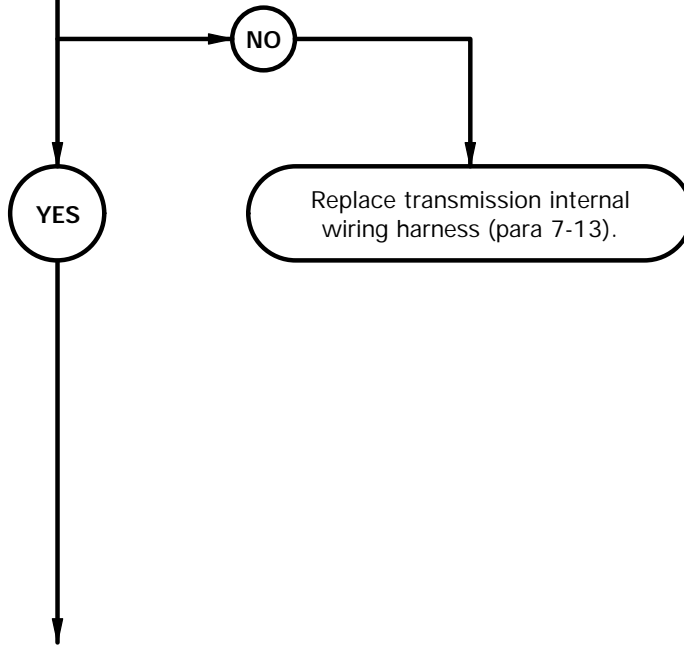
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Faulty WTEC II TEPSS. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty C3 solenoid regulator valve. Faulty C3 pressure switch.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin F2 to internal wiring harness connector C3 pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

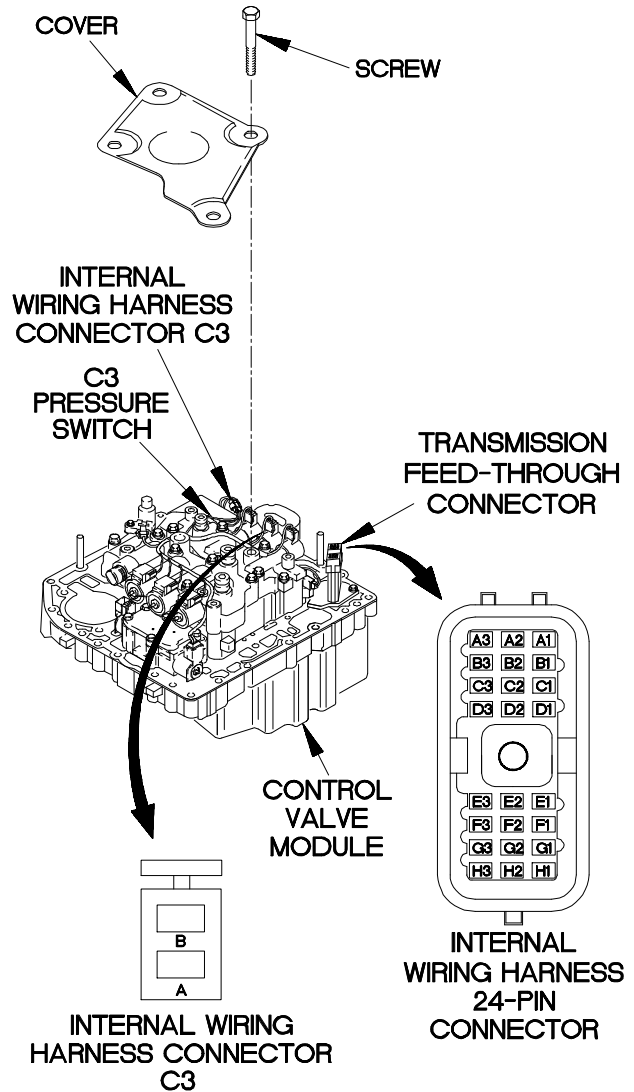


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect transmission internal wiring harness connector C3 from C3 pressure switch connector.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin F2.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector C3 pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin F2.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



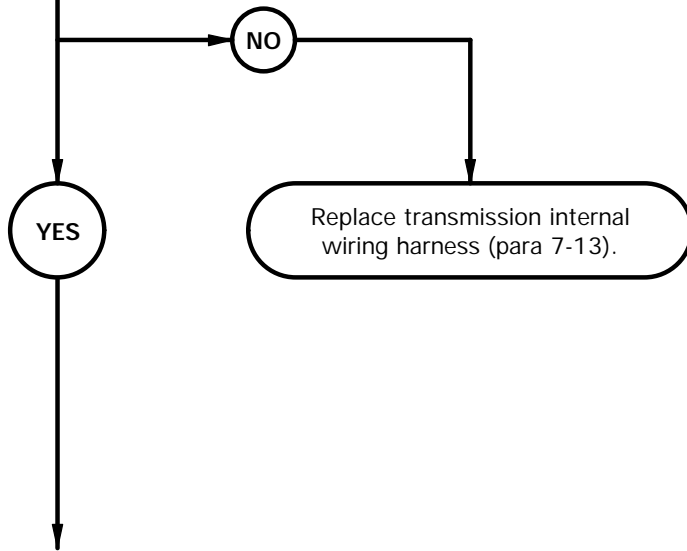
YBC4703B

c47. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. Faulty WTEC II TEPSS. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty C3 solenoid regulator valve. Faulty C3 pressure switch.

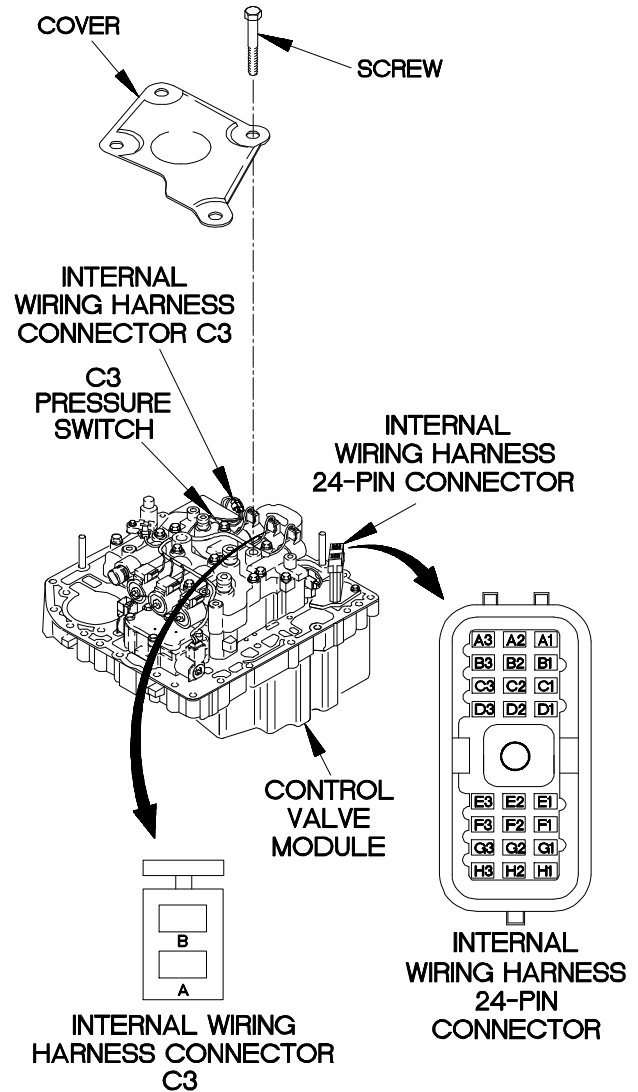
4.
Is continuity present from internal wiring harness 24-pin connector pin C3 to internal wiring harness connector C3 pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin C3.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector C3 pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin C3.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector, and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).
- (9) Connect internal wiring connector C3 to C3 pressure switch connector.
- (10) Install cover on control valve module with four screws.
- (11) Install control valve module (para 7-10).
- (12) Connect batteries (TM 9-2320-366-20-3).



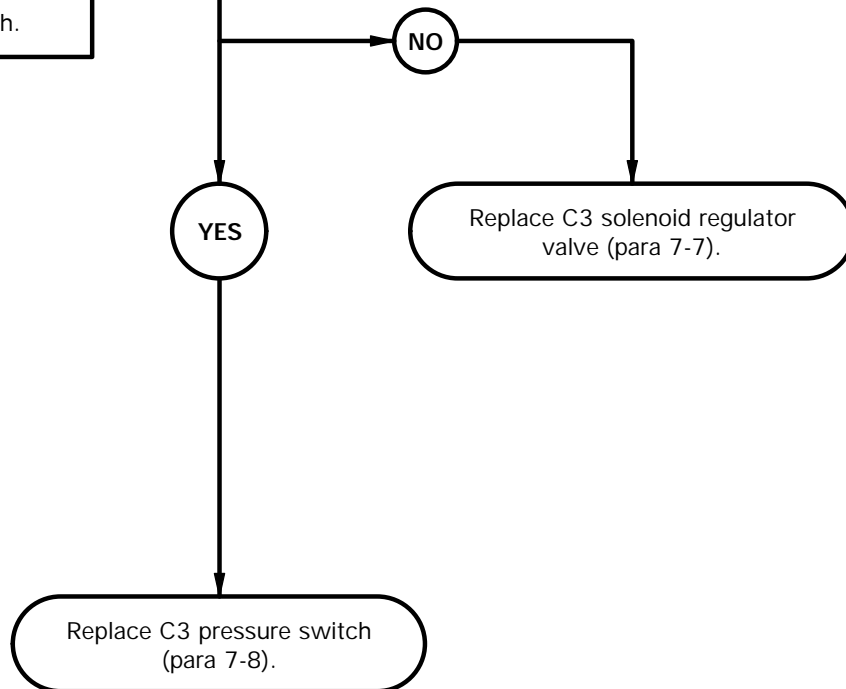
YBC4704B

c47. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC II cab transmission harness OK. WTEC II TEPSS OK. Transmission external wiring harness OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty C3 solenoid regulator valve. Faulty C3 pressure switch.

5.
Does C3 pressure switch open when shift is made?

TEST OPTIONS
Pressure Test or STE/ICE-R Test #50
REASON FOR QUESTION
If C3 pressure switch opens (STE/ICE-R displays greater than 0 psi), C3 solenoid regulator valve is faulty. If C3 pressure switch does not open (STE/ICE-R displays 0 psi), C3 pressure switch is faulty.



PRESSURE TEST

- (1) Remove front and intermediate propeller shafts (TM 9-2320-366-20-4).
- (2) Place drain pan under pressure tap.
- (3) Remove C3 pressure tap plug.
- (4) Connect tube to boss adapter, hose, and pipe to tube adapter to C3 pressure tap.
- (5) Connect batteries (TM 9-2320-366-20-3).
- (6) Perform STE/ICE-R test #50 (TM 9-4910-571-12&P).
- (7) Start engine (TM 9-2320-366-10-1).
- (8) With parking brake applied, make shift indicated by sub code, refer to Table 2-4.3. C3 Pressure Switch, and note reading on STE/ICE-R.
- (9) If STE/ICE-R indicates greater than 0 psi (0 kPa), replace C3 solenoid regulator valve (para 7-7).
- (10) If STE/CE-R indicates 0 psi (0 kPa), replace C3 pressure switch (para 7-8).
- (11) Shut down engine (TM 9-2320-366-10-1).
- (12) Remove pipe to tube adapter, hose, and tube to boss adapter from C3 clutch pressure tap.
- (13) Install C3 pressure tap plug and remove drain pan.
- (14) Install front and intermediate propeller shafts (TM 9-2320-366-20-4).

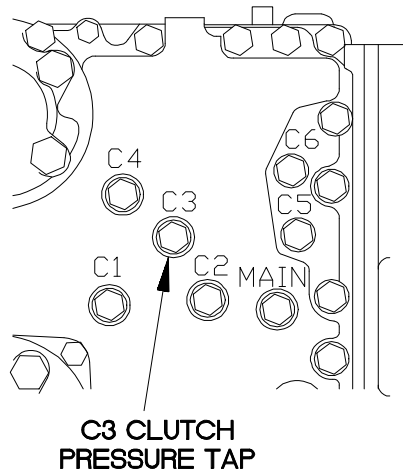
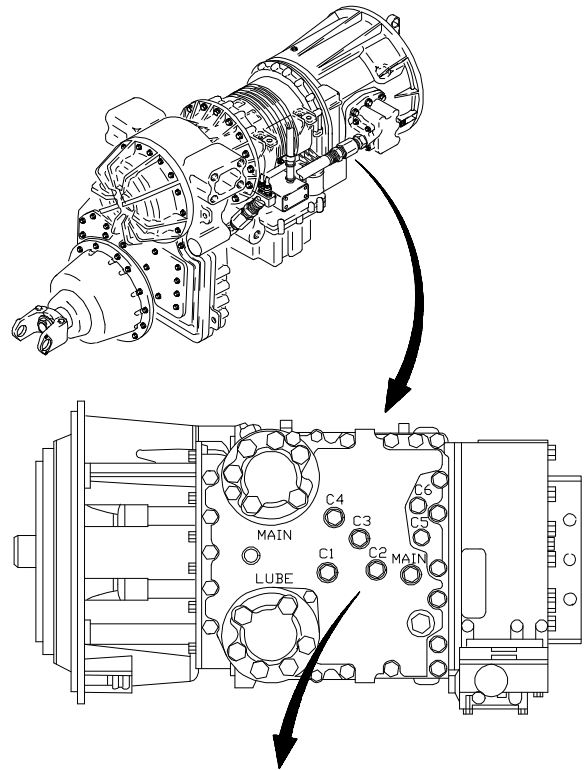


Table 2-7. C3 Pressure Switch

Sub Code	Shift From - To
01	1-2
08	2-N-2
32	4-3
34	4-5
54	6-5
56	6-7
71	R-1
72	R-2
78	R-N-1
79	R-2
99	N3-N2

YBC4705B

c47A. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 55 AND ANY SUB CODE

INITIAL SETUP

Equipment Conditions

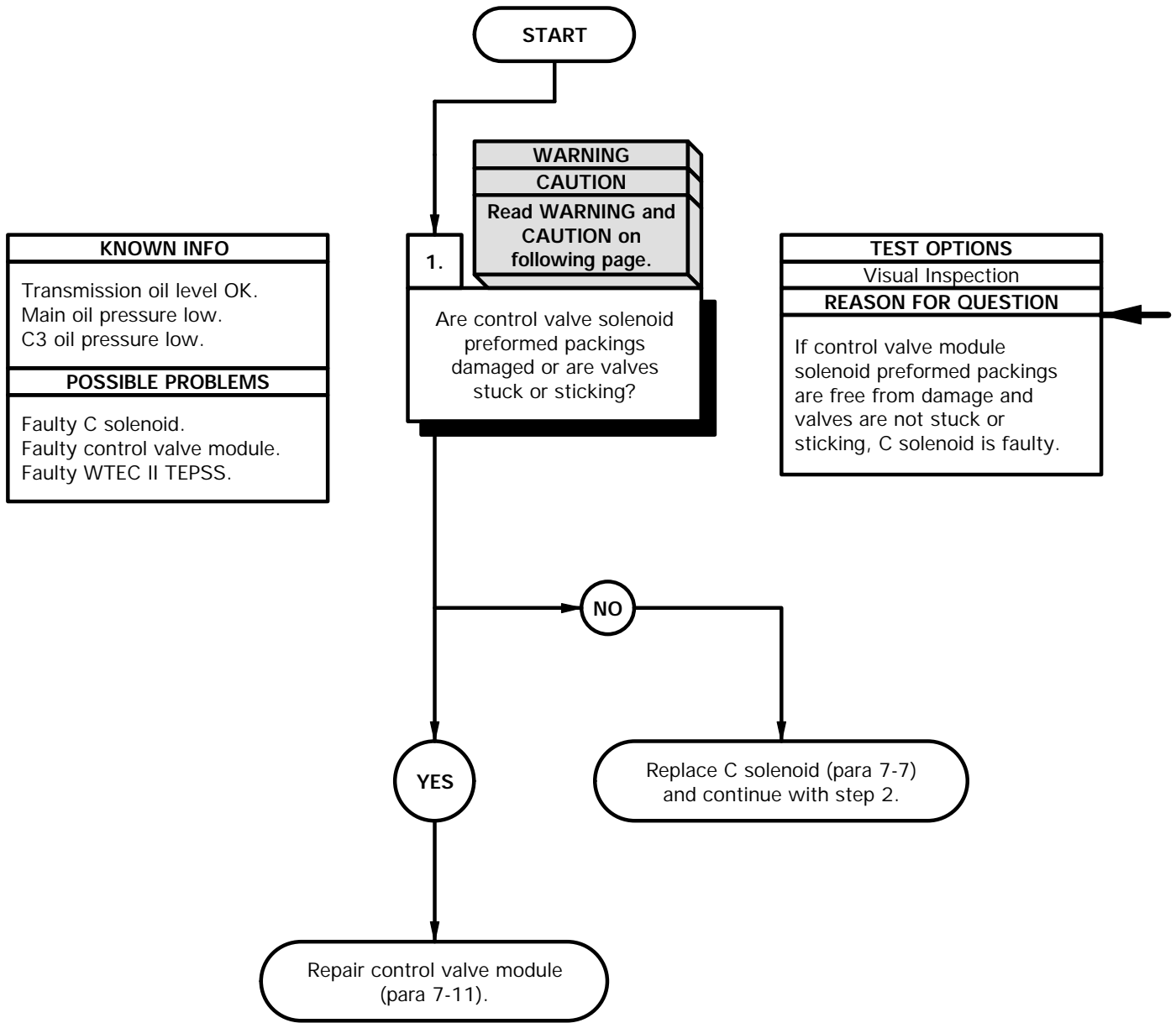
Engine shut down (TM 9-2320-366-10-1).

Personnel Required

(2)

Tools and Special Tools

Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)



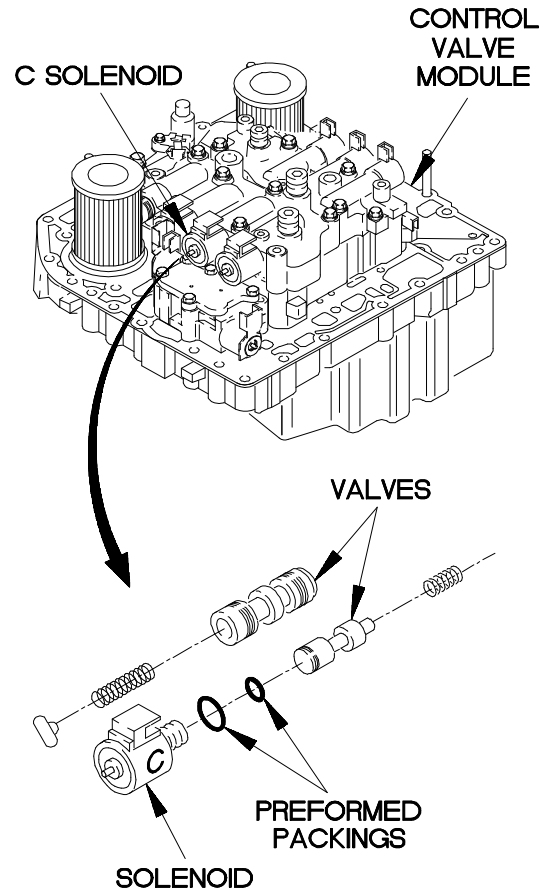
WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

- (1) Remove control valve module (para 7-10).
- (2) Remove transmission internal wiring harness (para 7-13).
- (3) Inspect solenoid preformed packings for damage (para 7-7, 7-8, and 7-12).
- (4) Inspect valves for freedom of movement, and if stuck or sticking (para 7-7, 7-8, and 7-12).
- (5) If damaged preformed packings and/or stuck or sticking valves are found, repair control valve module (para 7-11).
- (6) If no damage is found, replace C solenoid (para 7-7) and continue with step 2.
- (7) Install transmission internal wiring harness (para 7-13).
- (8) Install control valve module (para 7-10).

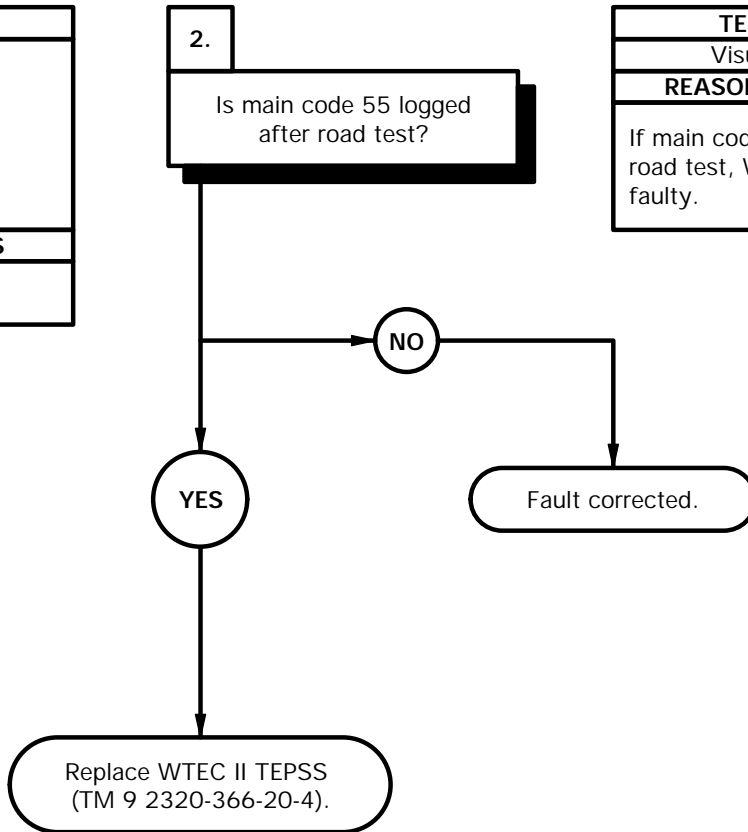




YBC47A1B

c47A. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 55 AND ANY SUB CODE (CONT)

KNOWN INFO
Transmission oil level OK. C3 oil pressure OK. Main oil pressure OK. WTEC II transmission control valve module OK.
POSSIBLE PROBLEMS
Faulty WTEC II TEPSS.

TEST OPTIONS
Visual Inspection
REASON FOR QUESTION
If main code 55 is logged after road test, WTEC II TEPSS is faulty.



- 
- (1) Clear diagnostic codes (TM 9-2320-366-20-4).
 - (2) Road test vehicle.
 - (3) Read diagnostic codes (TM 9-2320-366-20-4).
 - (4) If main code 55 is logged, replace WTEC II
TEPSS. (TM 9-2320-366-20-4).
 - (5) If main code 55 is not logged, fault has been
corrected.
- 

c48. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

Equipment Conditions

Engine shut down (TM 9-2320-366-10-1).
 Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

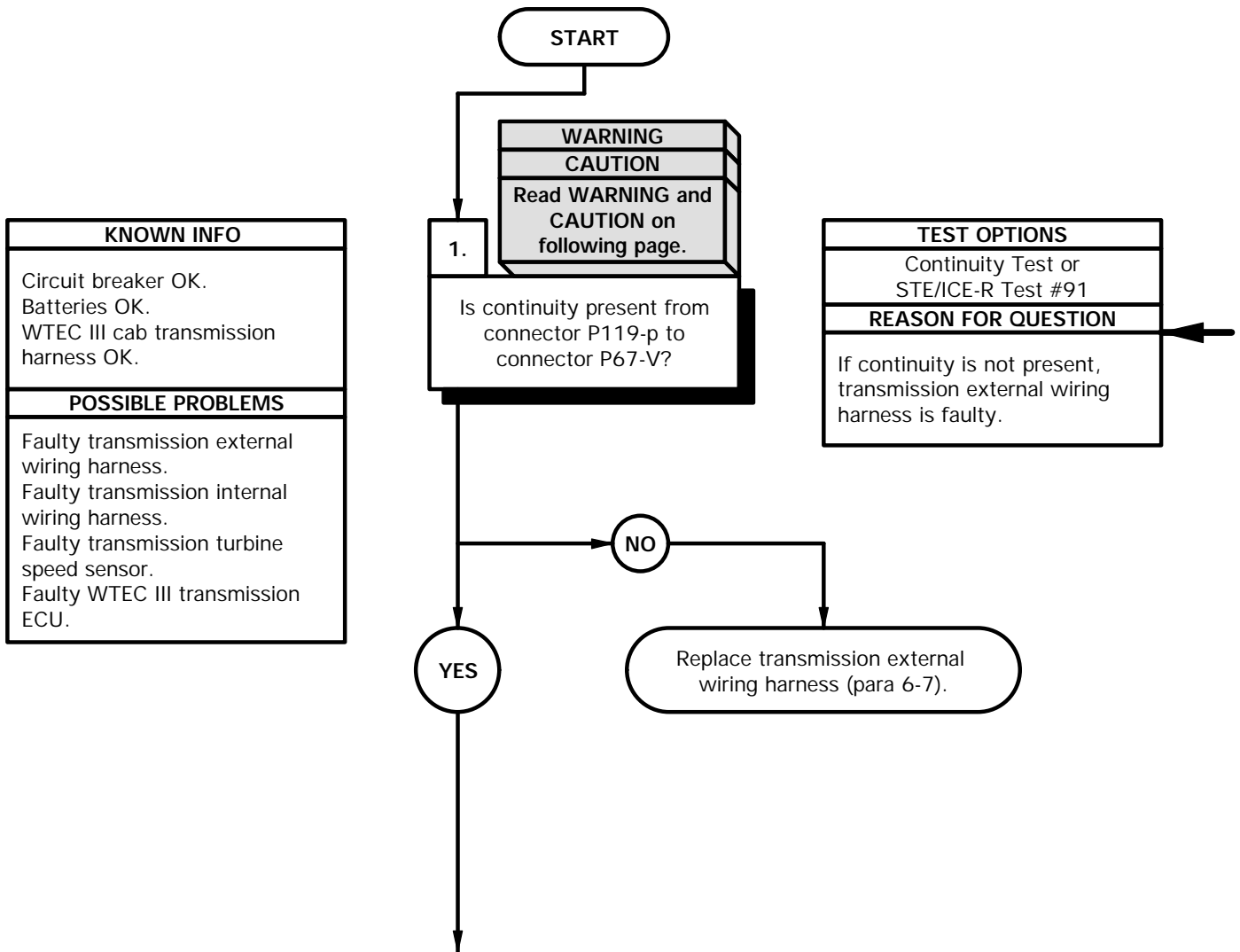
Tool Kit, Genl Mech (Item 78, Appendix B)
 STE/ICE-R (Item 70, Appendix B)
 Multimeter, Digital (Item 41, Appendix B)
 Goggles, Industrial (Item 28, Appendix B)
 Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
 Wrench Set, Socket (Item 85, Appendix B)

References

TM 9-4910-571-12&P

Personnel Required

(2)



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

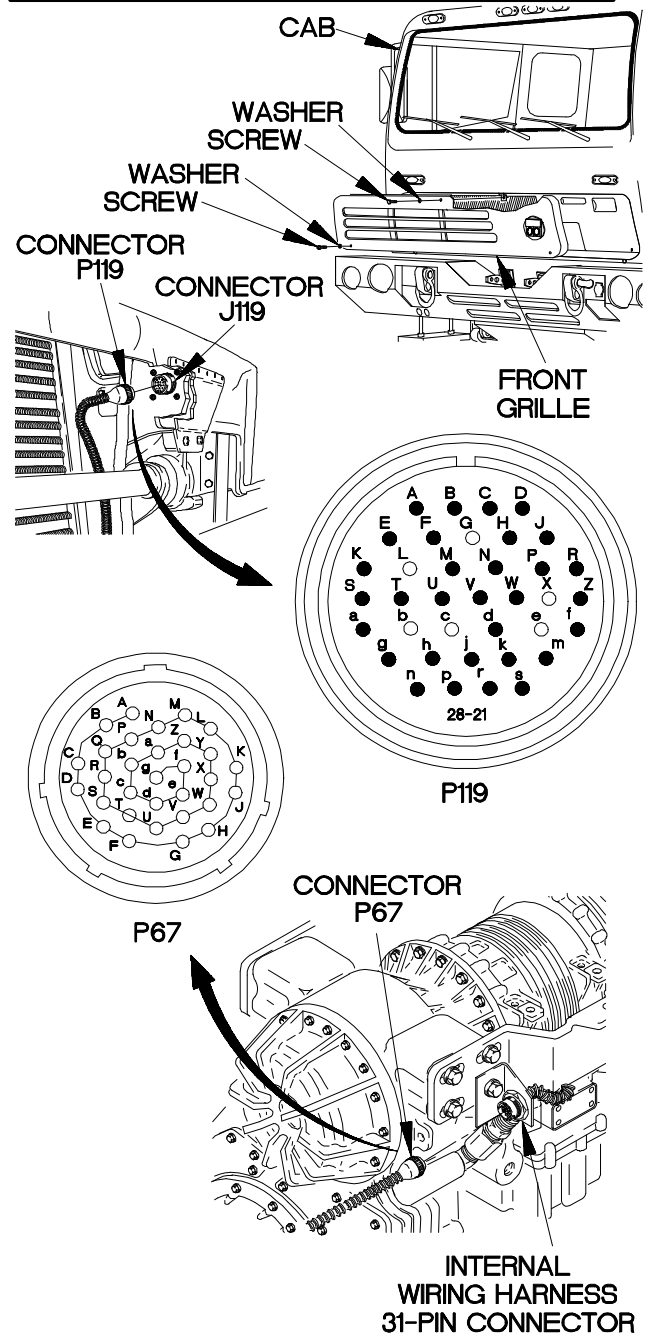
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect connector P67 from internal wiring harness 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-p.
- (8) Connect negative (-) probe of multimeter to connector P67-V and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-p.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

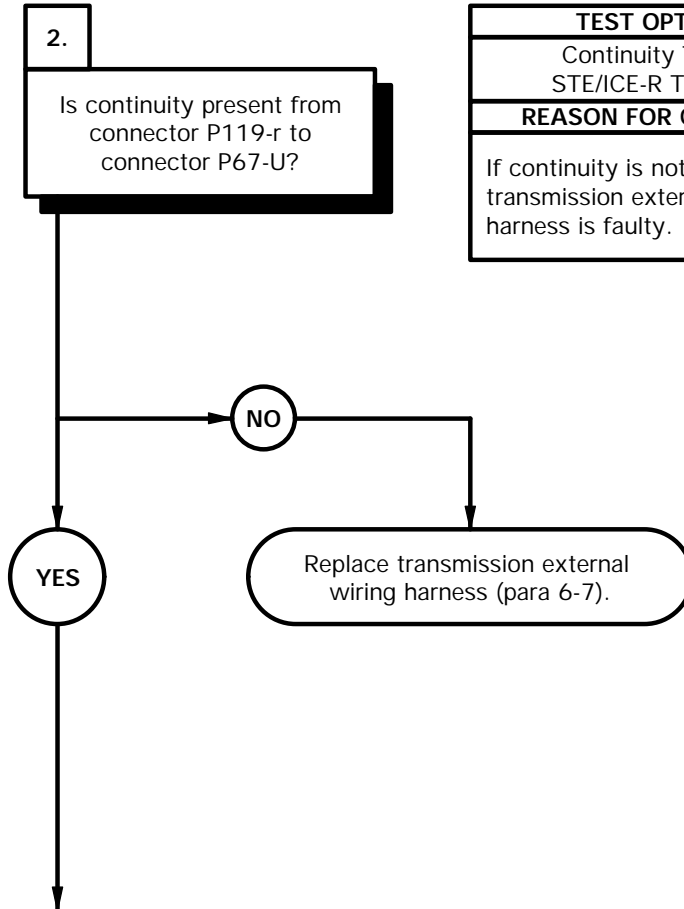
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



Ybc4801b

c48. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

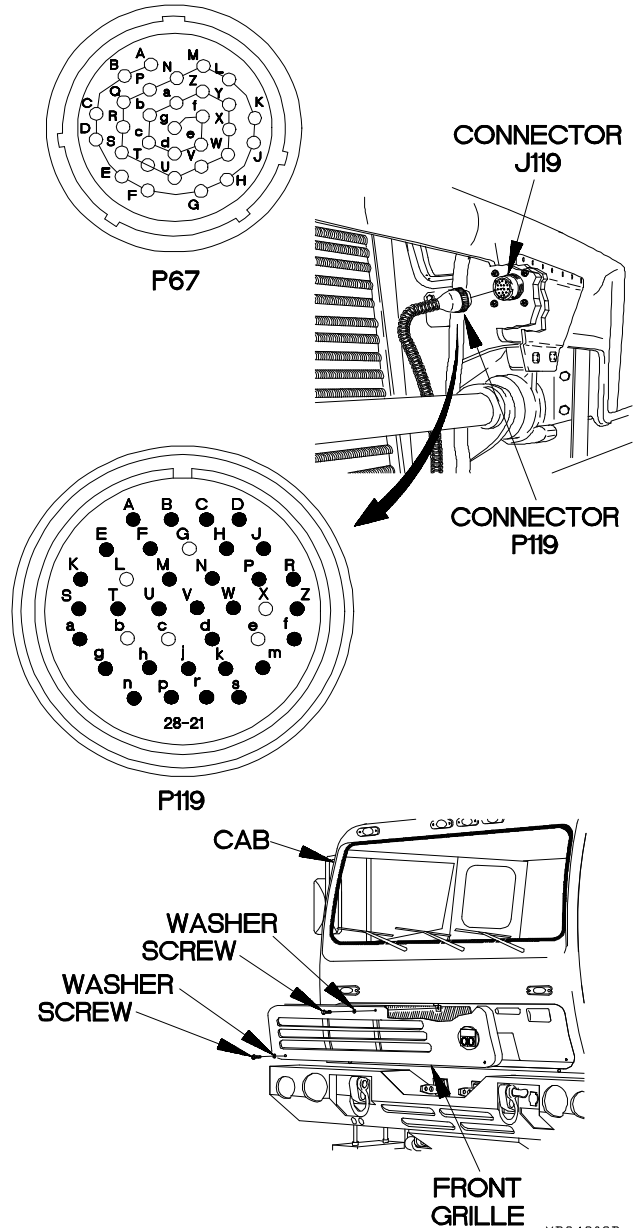
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty transmission turbine speed sensor. Faulty WTEC III transmission ECU.



TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-r.
- (3) Connect negative (-) probe of multimeter to connector P67-U and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-r.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



YBC4802B

c48. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

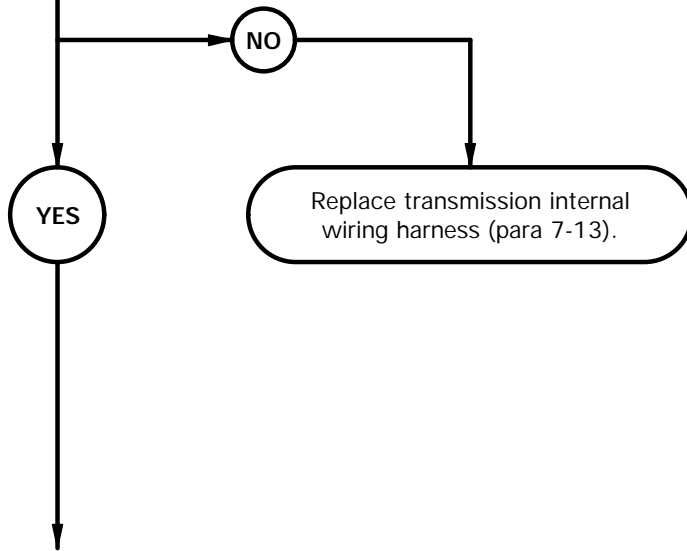
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty transmission turbine speed sensor. Faulty WTEC III transmission ECU.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin V to internal wiring harness connector TSS pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

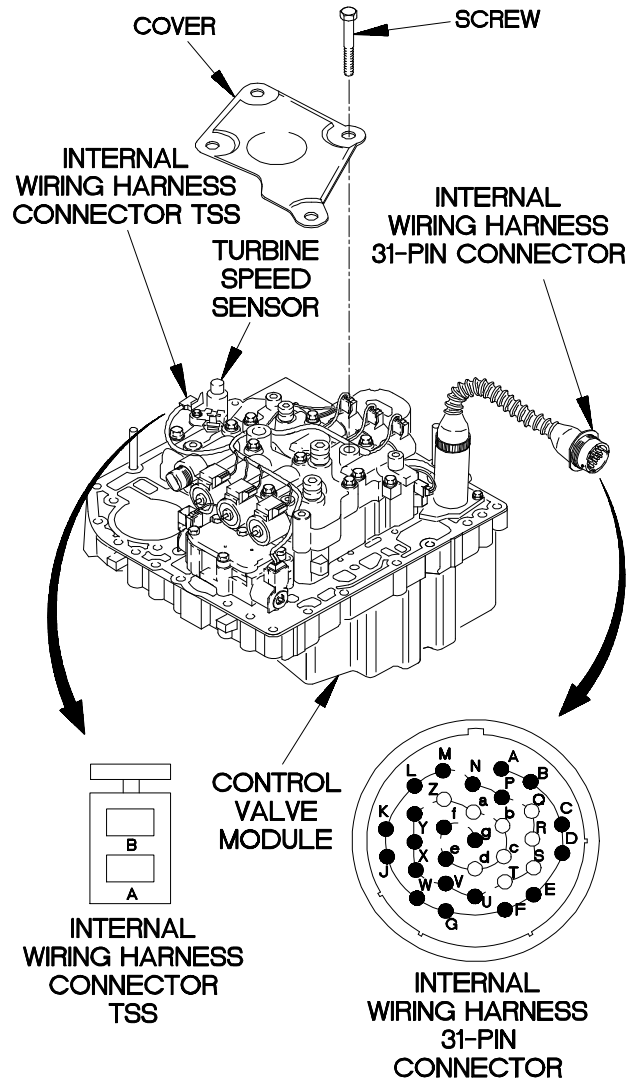


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector TSS from turbine speed sensor.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin V.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector TSS pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin V.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



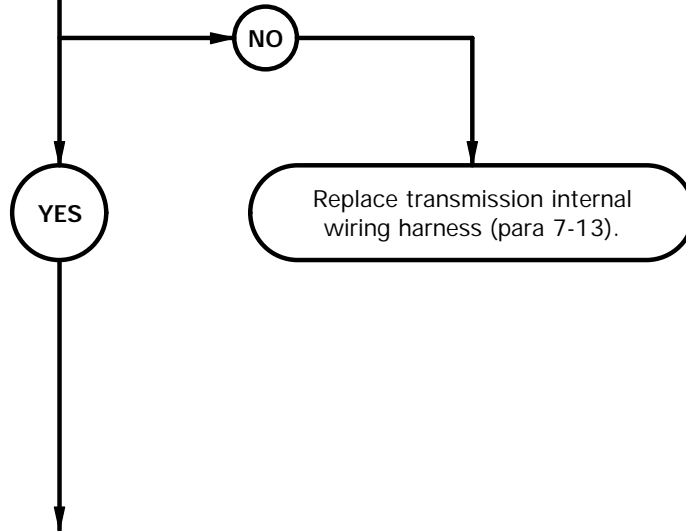
YBC4803B

c48. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty transmission turbine speed sensor. Faulty WTEC III transmission ECU.

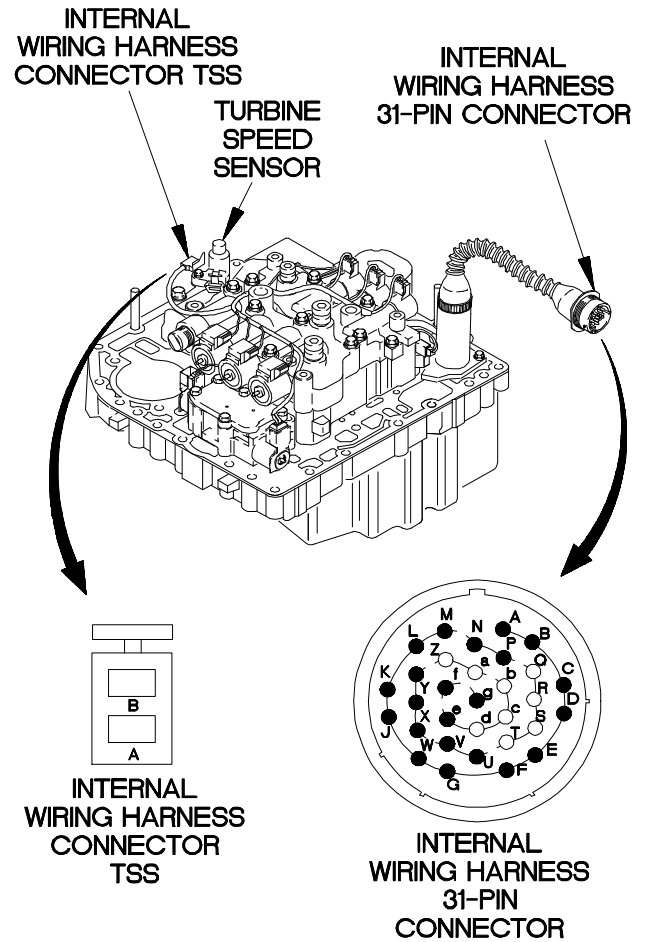
4.
Is continuity present from internal wiring harness 31-pin connector pin U to internal wiring harness connector TSS pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin U.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector TSS pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin U.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



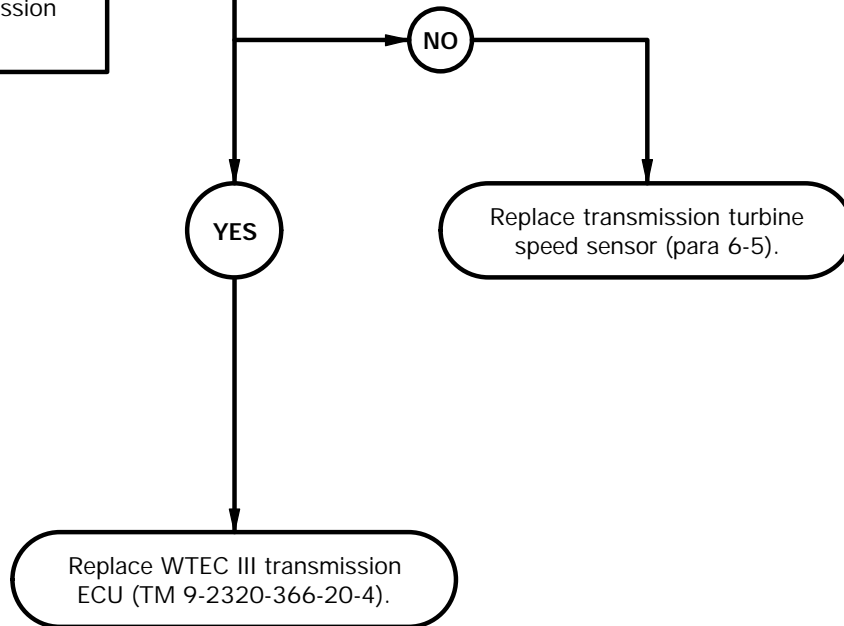
YBC4804B

c48. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission turbine speed sensor. Faulty WTEC III transmission ECU.

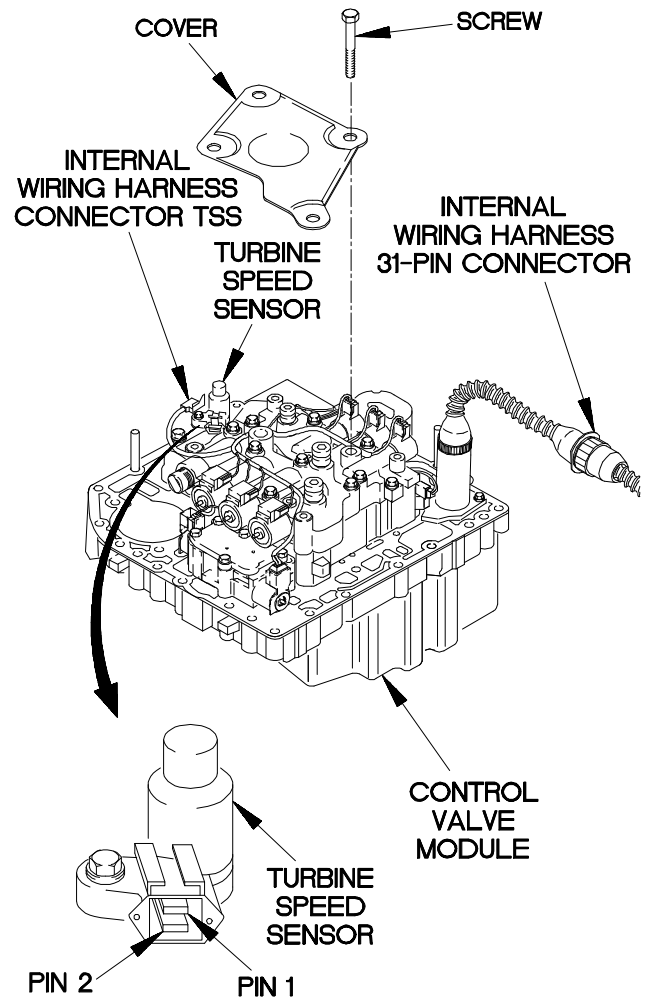
5.
Is 200-400 ohms resistance present from turbine speed sensor pin 1 to pin 2?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 200-400 ohms resistance is not present, transmission turbine speed sensor is faulty. If 200-400 ohms resistance is present, WTEC III transmission ECU is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin 1 of transmission turbine speed sensor.
- (3) Connect negative (-) probe of multimeter to pin 2 of transmission turbine speed sensor.
- (4) If resistance is less than 200 ohms or greater than 400 ohms, replace transmission turbine speed sensor (para 6-5).
- (5) If resistance is between 200-400 ohms, replace WTEC III transmission ECU (TM 9-2320-366-20-4).
- (6) Connect internal wiring connector TSS to turbine speed sensor.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



Ybc4805b

c49. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY)

INITIAL SETUP

Equipment Conditions

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Tools and Special Tools

Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts

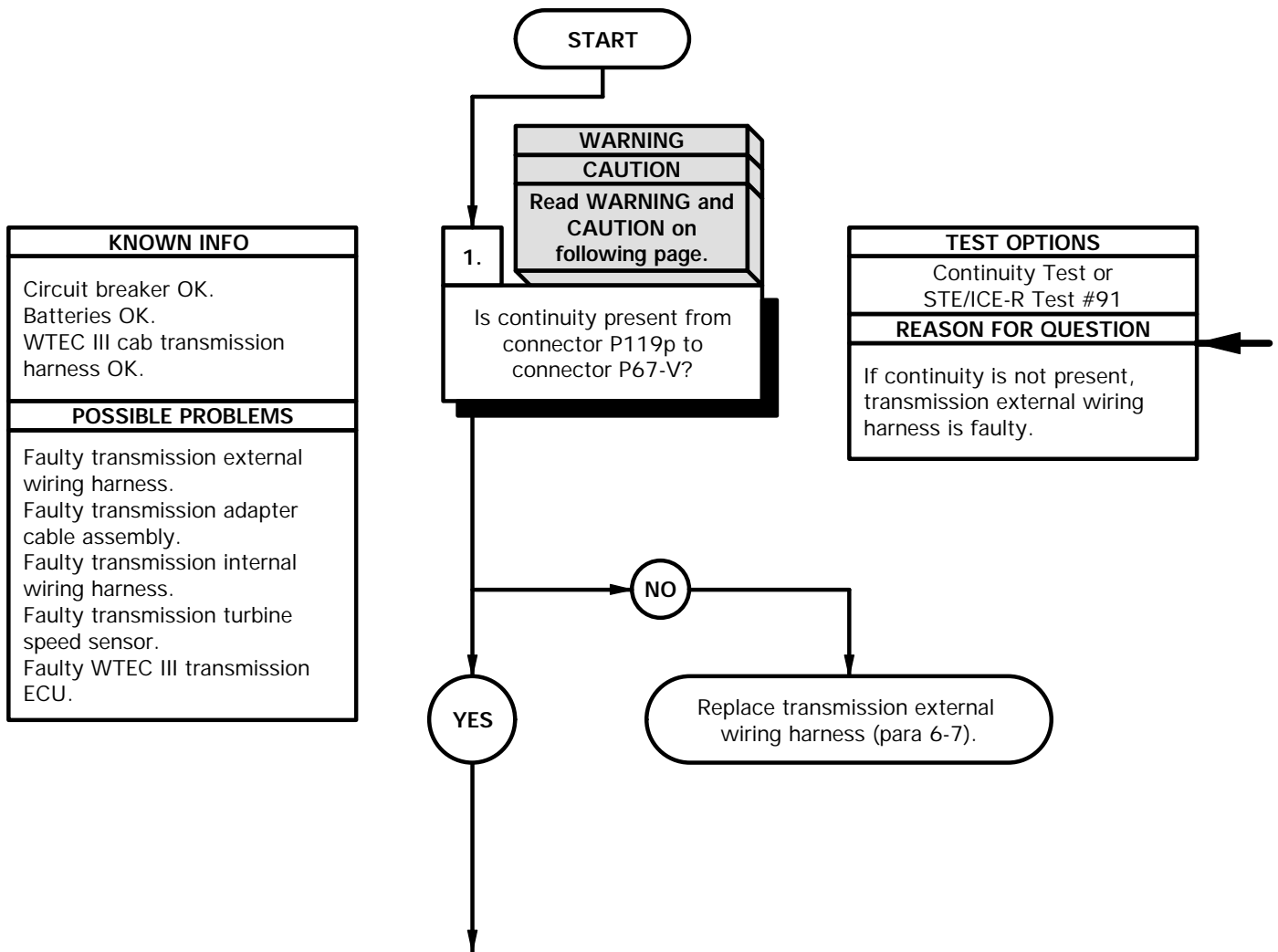
Wire, Elect, 50 ft (Item 97, Appendix C)

References

TM 9-4910-571-12&P

Personnel Required

(2)



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

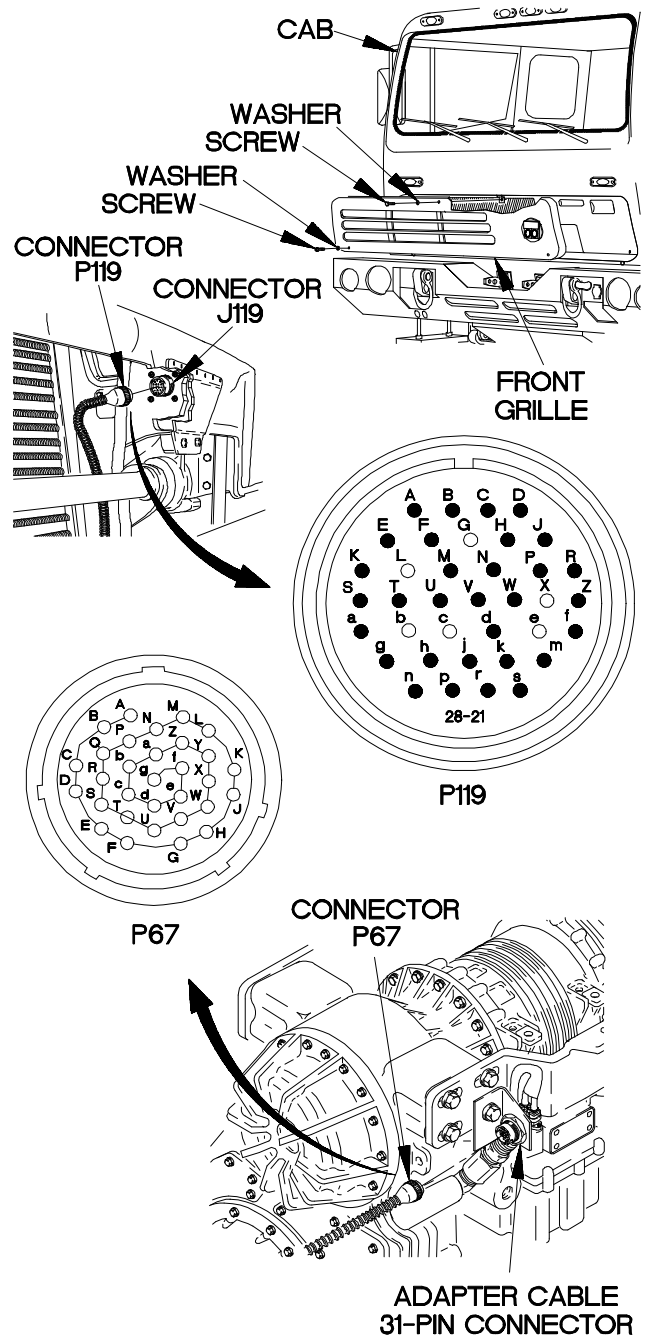
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect connector P67 from adaptor cable 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-p.
- (8) Connect negative (-) probe of multimeter to connector P67-V and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-p.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted, replace transmission external wiring harness (para 6-7).



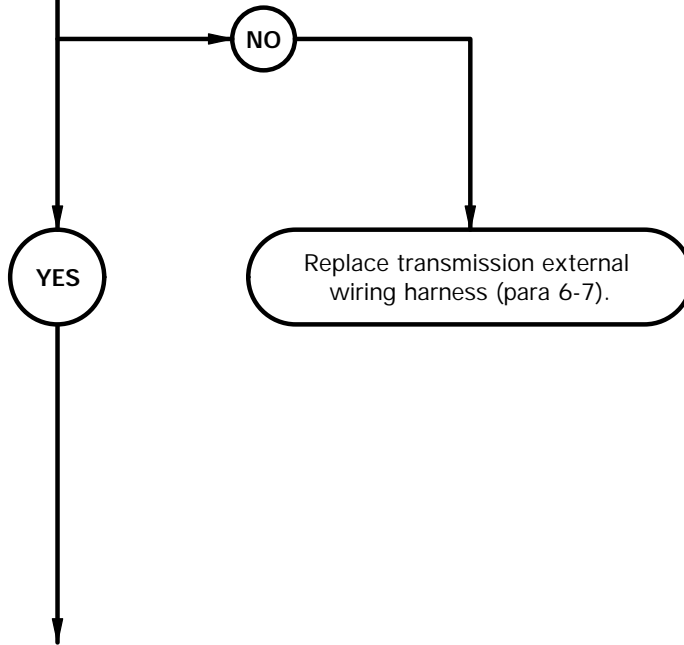
YBC4901B

c49. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty transmission turbine speed sensor. Faulty WTEC III transmission ECU.

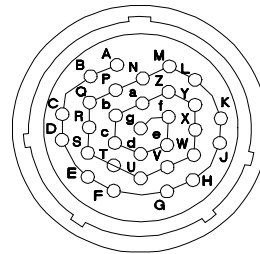
2.
Is continuity present from connector P119-r to connector P67-U?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

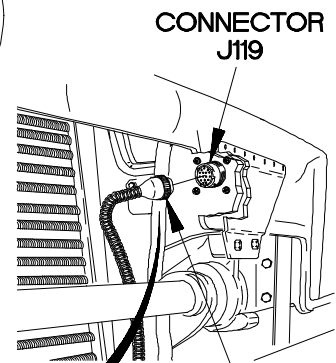


CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-r.
- (3) Connect negative (-) probe of multimeter to connector P67-U and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-r.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).

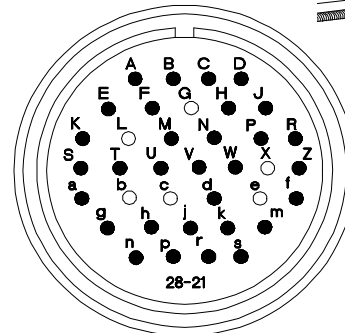


P67

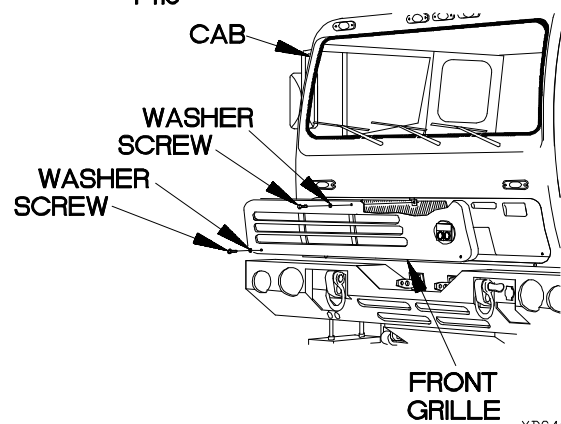


CONNECTOR J119

CONNECTOR P119



P119



FRONT GRILLE

YBC4902B

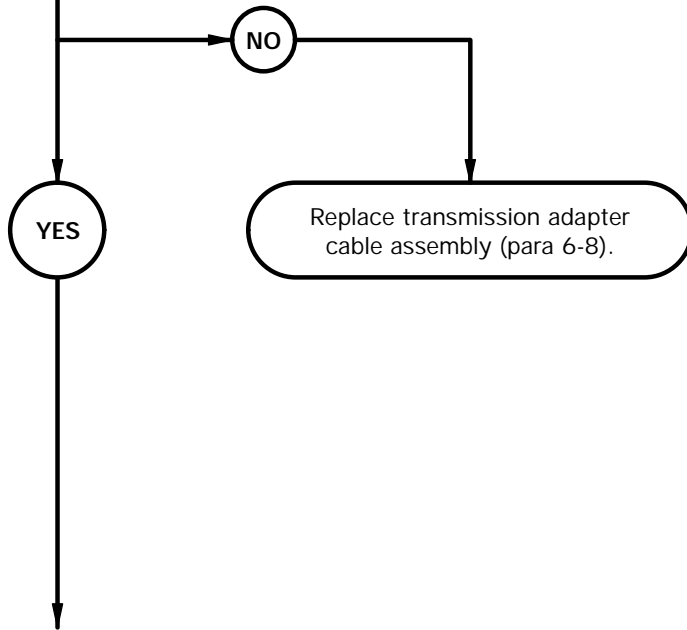
c49. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty transmission turbine speed sensor. Faulty WTEC III transmission ECU.

3. **CAUTION**
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin V to adapter cable 24-pin connector pin E3?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.

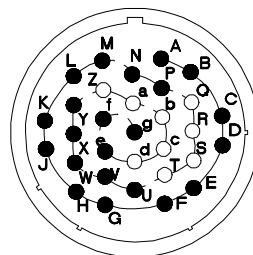


CAUTION

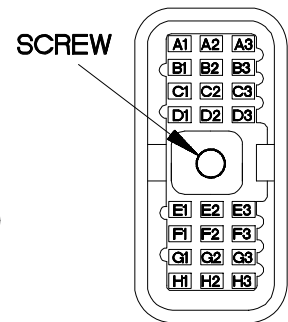
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Loosen screw in adapter cable 24-pin connector.
- (2) Disconnect adapter cable 24-pin connector from internal wiring harness 24-pin connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin V.
- (5) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin E3 and note reading on multimeter.
- (6) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (7) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin V.
- (8) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).



**ADAPTER CABLE
31-PIN CONNECTOR**



**ADAPTER CABLE
24-PIN
CONNECTOR**

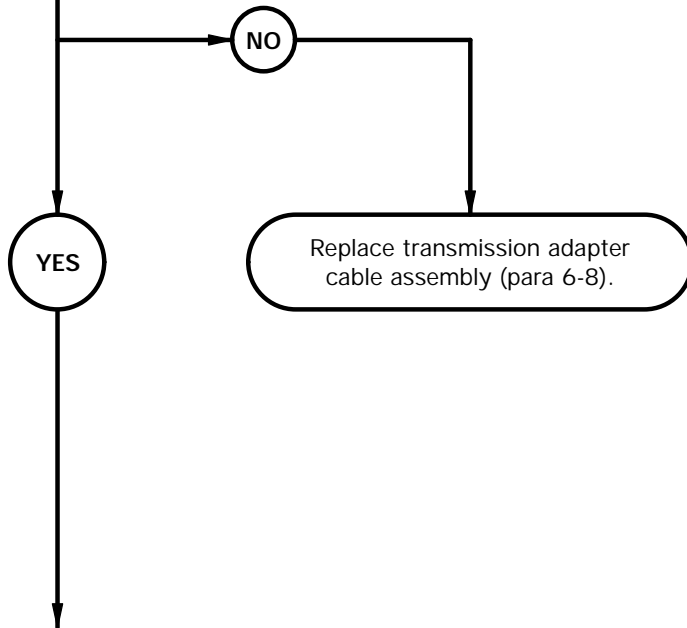
Ybc4903b

c49. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty transmission turbine speed sensor. Faulty WTEC III transmission ECU.

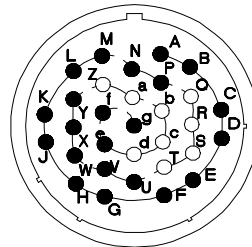
4.
Is continuity present from adapter cable 31-pin connector pin U to adapter cable 24-pin connector pin E2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.

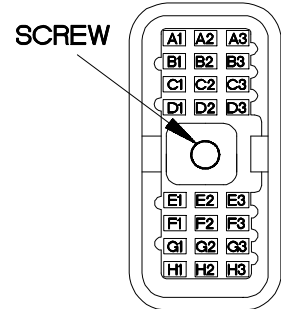


CONTINUITY TEST

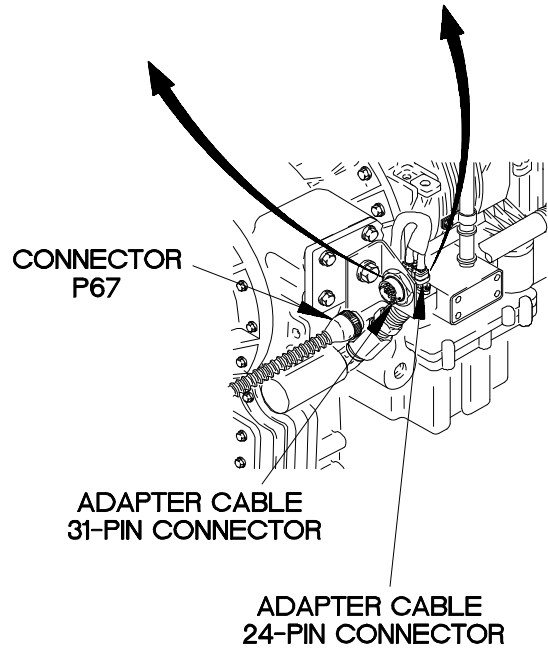
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin U.
- (3) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin E2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (5) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin U.
- (6) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).
- (9) Connect connector P67 to adapter cable 31-pin connector.



**ADAPTER CABLE
31-PIN CONNECTOR**



**ADAPTER CABLE
24-PIN
CONNECTOR**



YBC4904B

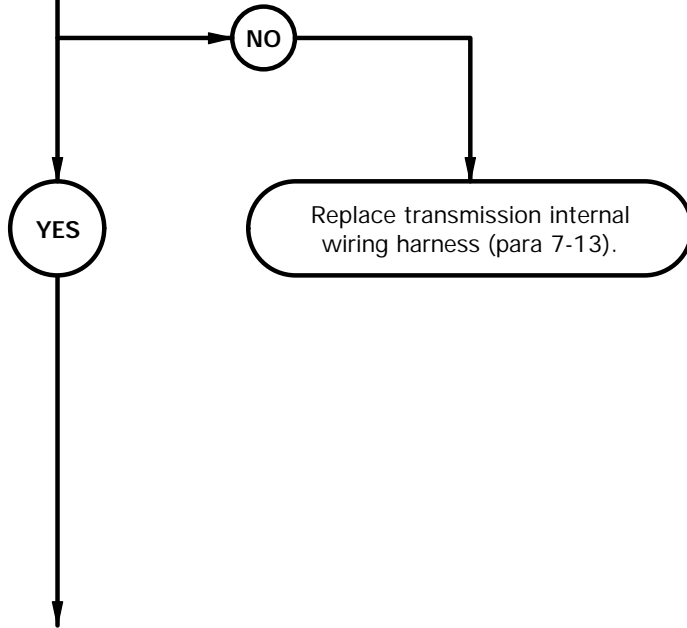
c49. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty transmission turbine speed sensor. Faulty WTEC III transmission ECU.

5. **CAUTION**
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin E2 to internal wiring harness connector TSS pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

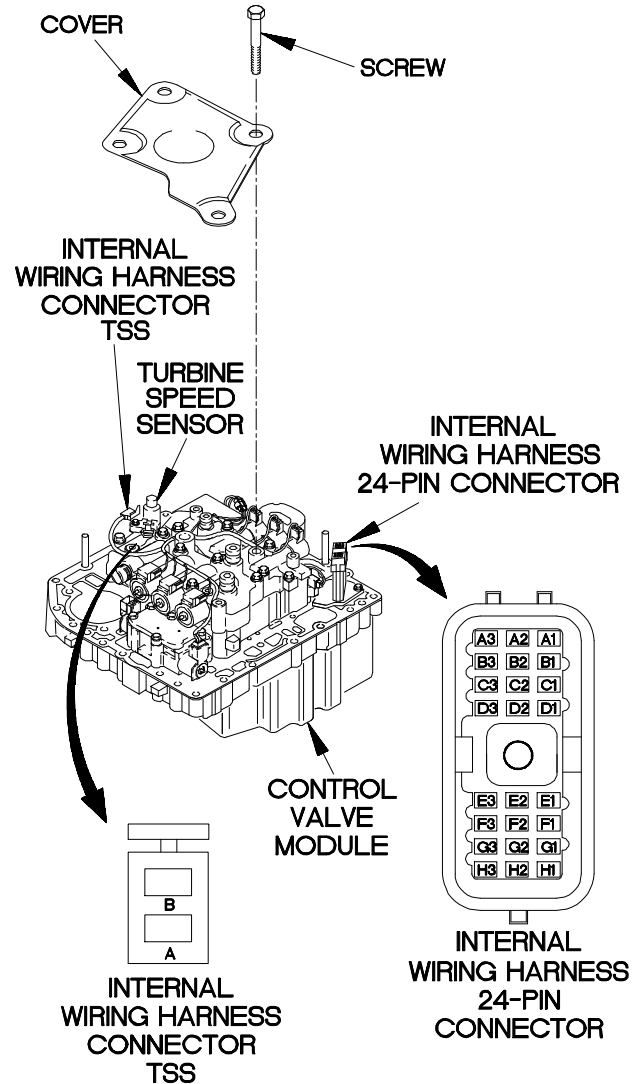


CAUTION

Use care when disconnecting wire harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector TSS from turbine speed sensor.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin E2.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector TSS pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin E2.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector, and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



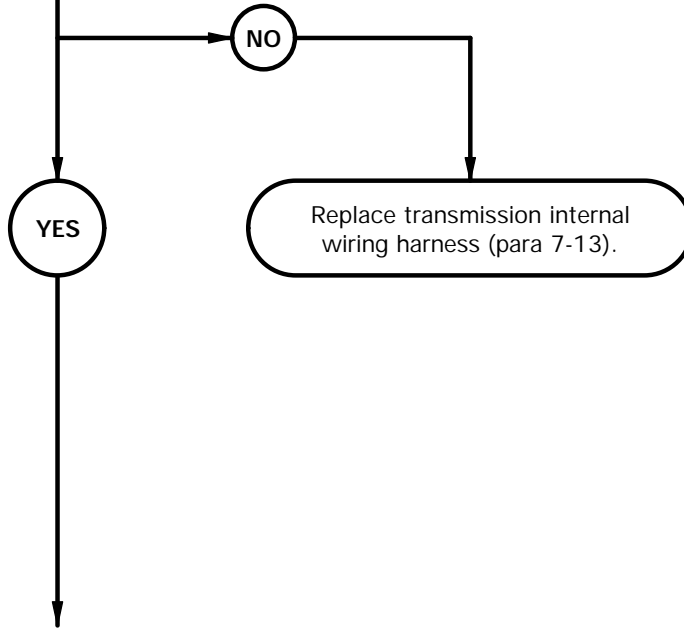
YBC4905B

c49. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty transmission turbine speed sensor. Faulty WTEC III transmission ECU.

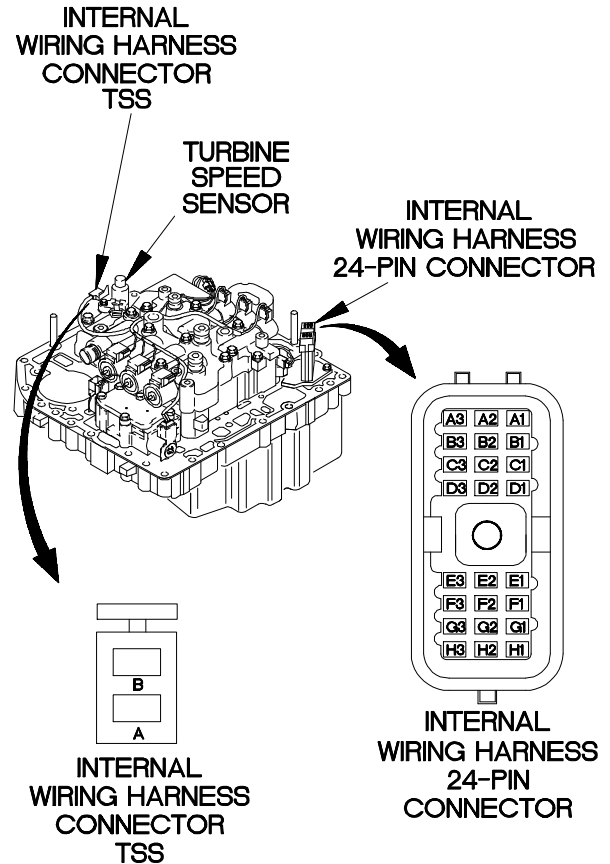
6.
Is continuity present from internal wiring harness 24-pin connector pin E3 to internal wiring harness connector TSS pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin E3.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector TSS pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin E3.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



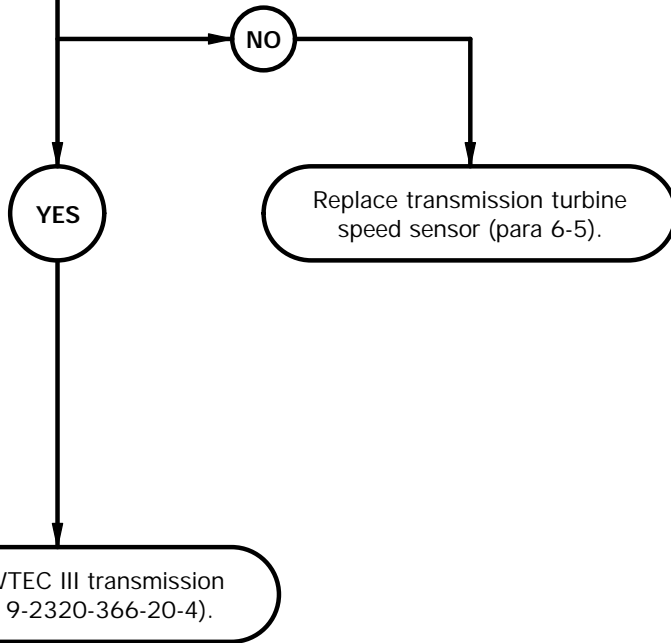
YBC4906B

c49. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission turbine speed sensor. Faulty WTEC III transmission ECU.

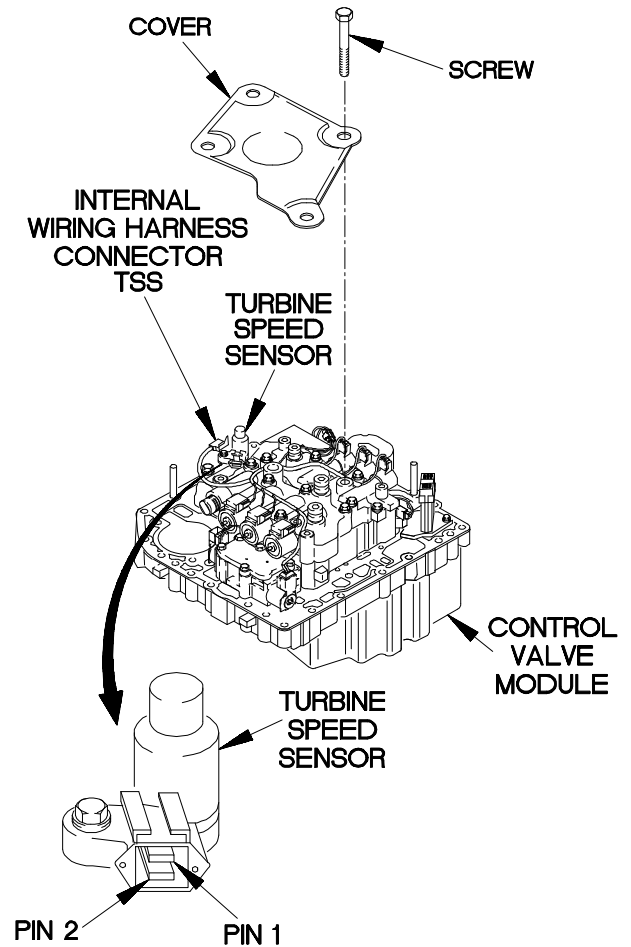
7.
Is 200-400 ohms resistance present from turbine speed sensor pin 1 to pin 2?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 200-400 ohms resistance is not present, transmission turbine speed sensor is faulty. If 200-400 ohms resistance is present, WTEC III transmission ECU is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin 1 of transmission turbine speed sensor.
- (3) Connect negative (-) probe of multimeter to pin 2 of transmission turbine speed sensor and note reading on multimeter.
- (4) If resistance is less than 200 ohms or greater than 400 ohms, replace transmission turbine speed sensor (para 6-5).
- (5) If resistance is between 200-400 ohms, replace WTEC III transmission ECU (TM 9-2320-366-20-4).
- (6) Connect internal wiring connector TSS to turbine speed sensor.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect connector P67 to adapter cable 31-pin connector.
- (10) Connect batteries (TM 9-2320-366-20-3).



Y6c4907b

c50. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 16

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Gasket (Item 68, Appendix F)
Oil, Lubricating (Item 46, Appendix C)
Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

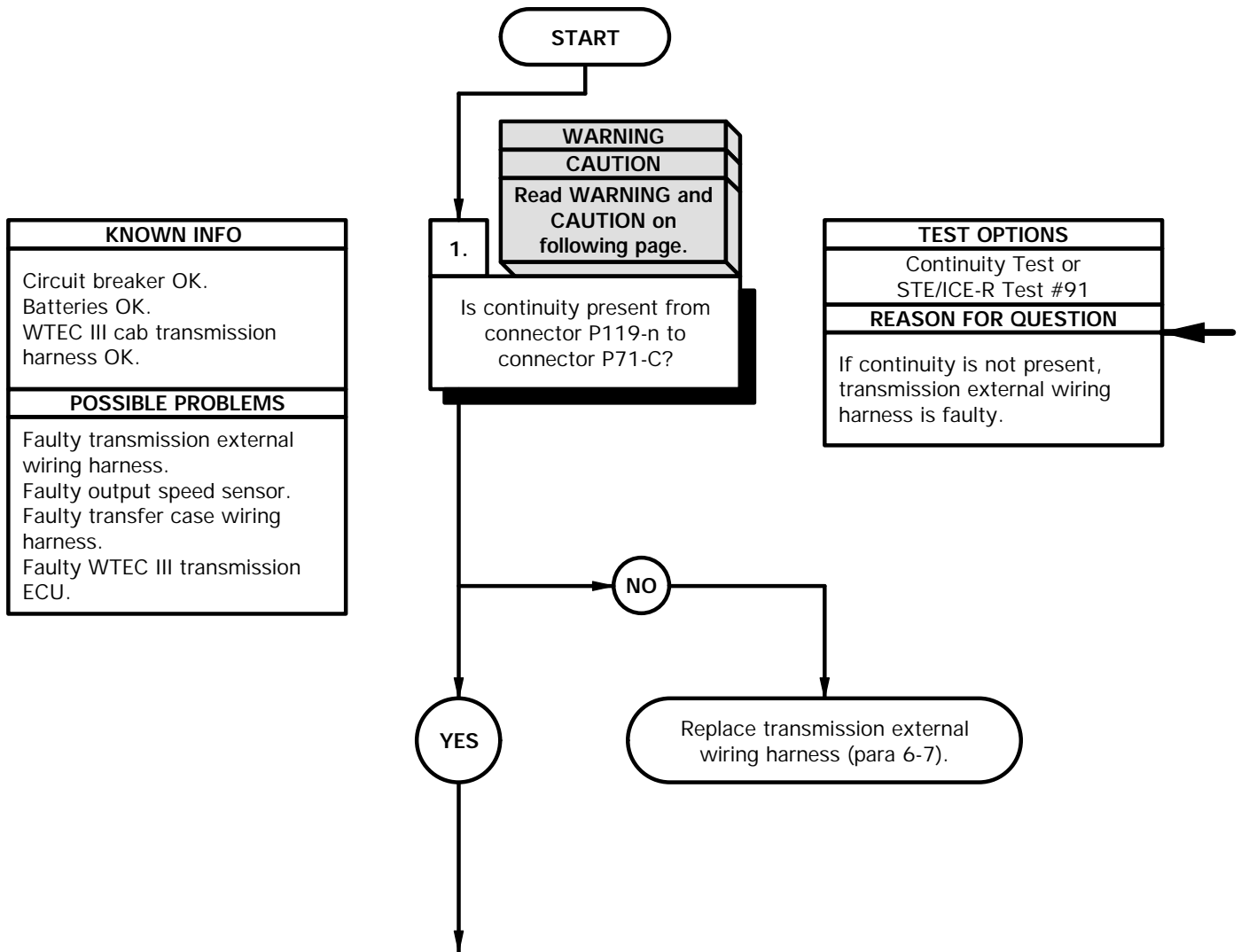
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Pan, Drain (Item 43, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

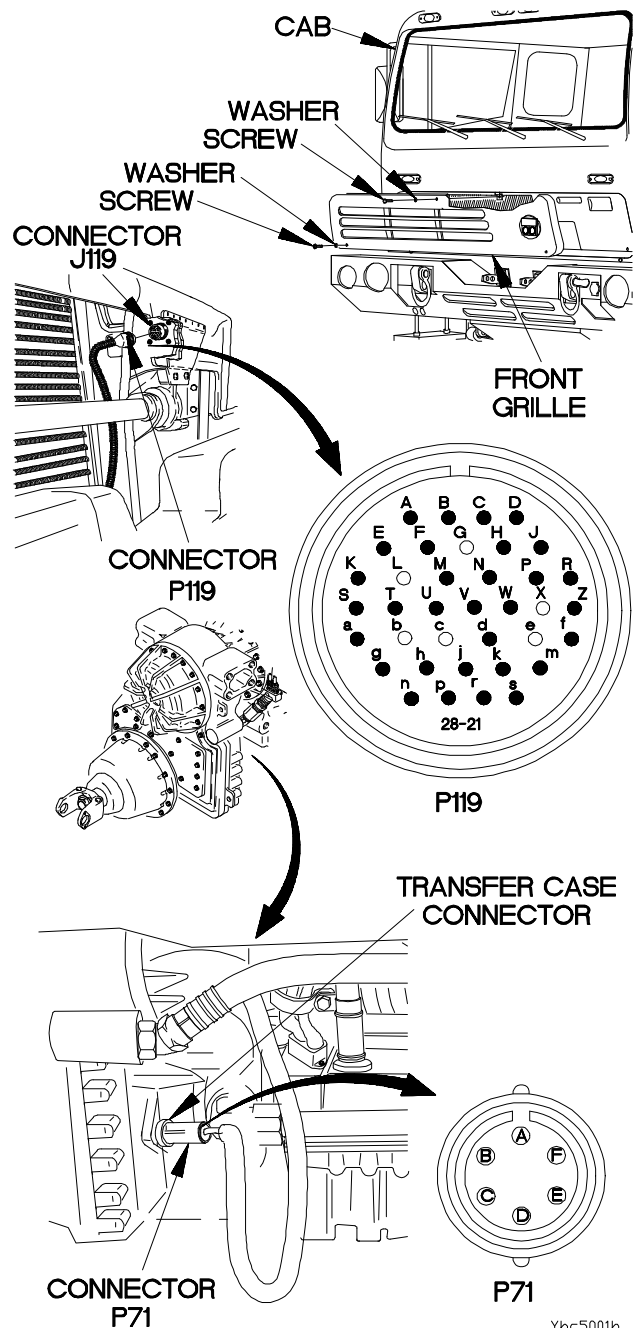
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect connector P71 from transfer case connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-n.
- (8) Connect negative (-) probe of multimeter to connector P71-C and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-n.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



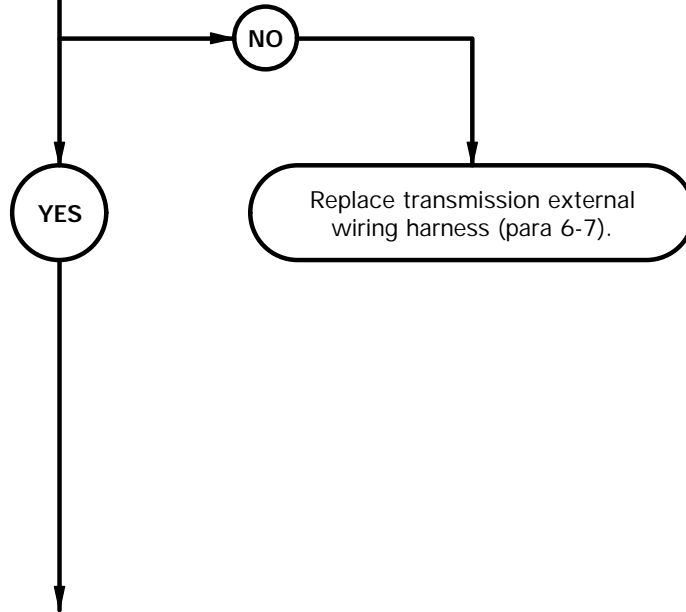
Ybc5001b

c50. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 16 (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty output speed sensor. Faulty transfer case wiring harness. Faulty WTEC III transmission ECU.

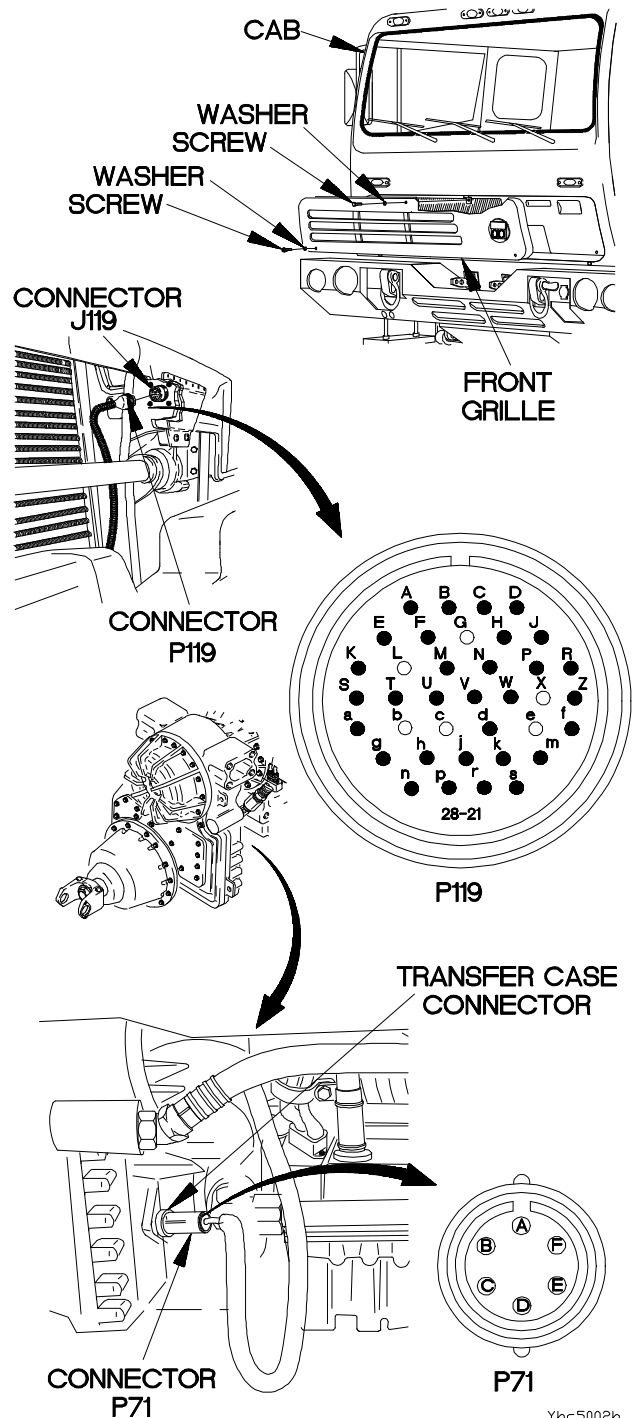
2.
Is continuity present from connector P119-g to connector P71-D?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-g.
- (3) Connect negative (-) probe of multimeter to connector P71-D and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-g.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



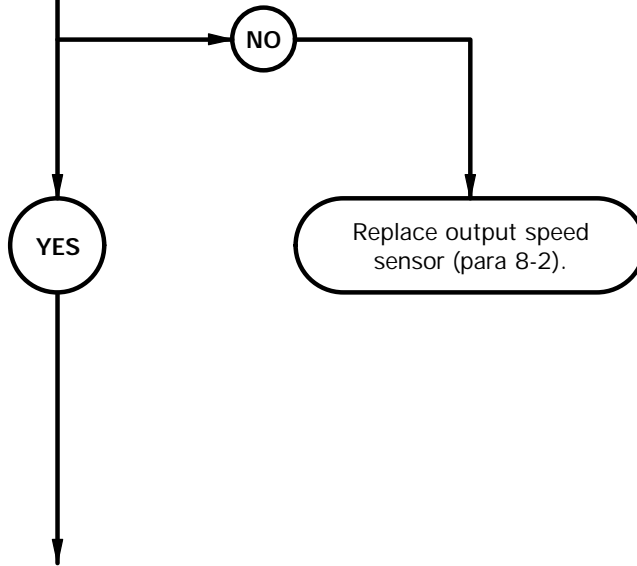
Y6c5002b

c50. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 16 (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty output speed sensor. Faulty transfer case wiring harness. Faulty WTEC III transmission ECU.

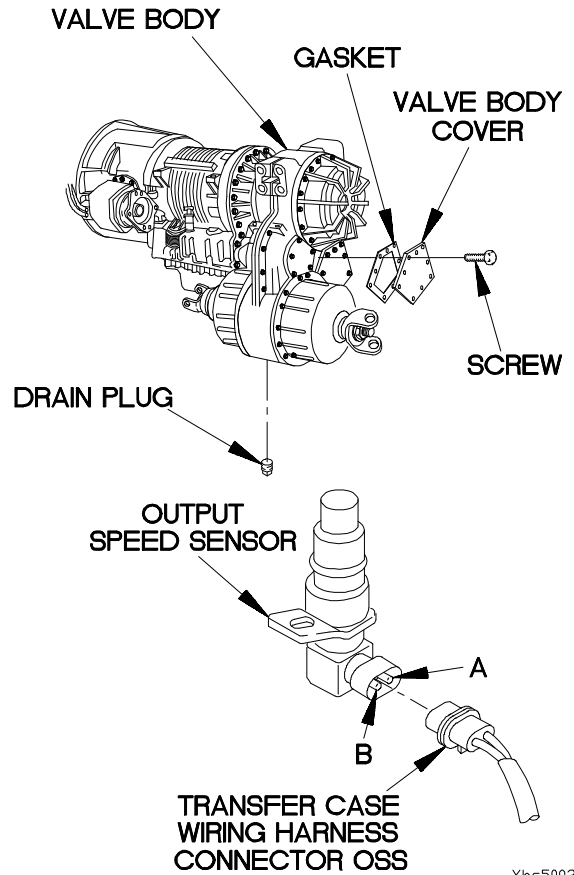
3.
Is 200-400 ohms resistance present output speed sensor pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 200-400 ohms resistance is not present, output speed sensor is faulty.



RESISTANCE TEST

- (1) Position drain pan under valve body.
- (2) Remove drain plug from transfer case.
- (3) Drain oil from transfer case.
- (4) Install drain plug in transfer case.
- (5) Remove ten screws from valve body cover.
- (6) Remove valve body cover and gasket from transfer case. Discard gasket.
- (7) Disconnect transfer case wiring harness connector OSS from output speed sensor.
- (8) Set multimeter to ohms.
- (9) Connect positive (+) probe of multimeter to pin A of output speed sensor.
- (10) Connect negative (-) probe of multimeter to pin B of output speed sensor and note reading on multimeter.
- (11) If resistance is less than 200 ohms or greater than 400 ohms, replace output speed sensor (para 8-2).



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c50. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 16 (CONT)

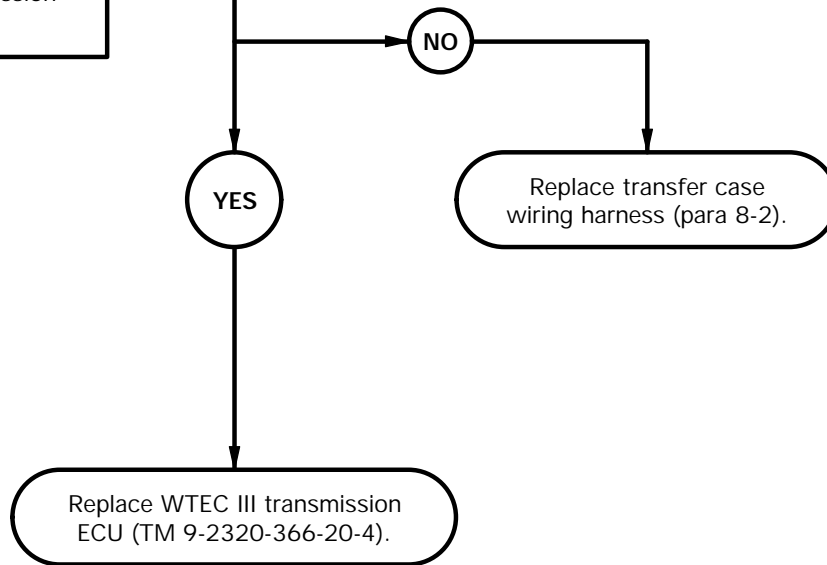
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Output speed sensor OK.
POSSIBLE PROBLEMS
Faulty transfer case wiring harness. Faulty WTEC III transmission ECU.

4.

CAUTION
Read CAUTION on following page.

Is continuity present from transfer case wiring harness connector OSS to transfer case wiring harness external connector?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transfer case wiring harness is faulty. If continuity is present, WTEC III transmission ECU is faulty.

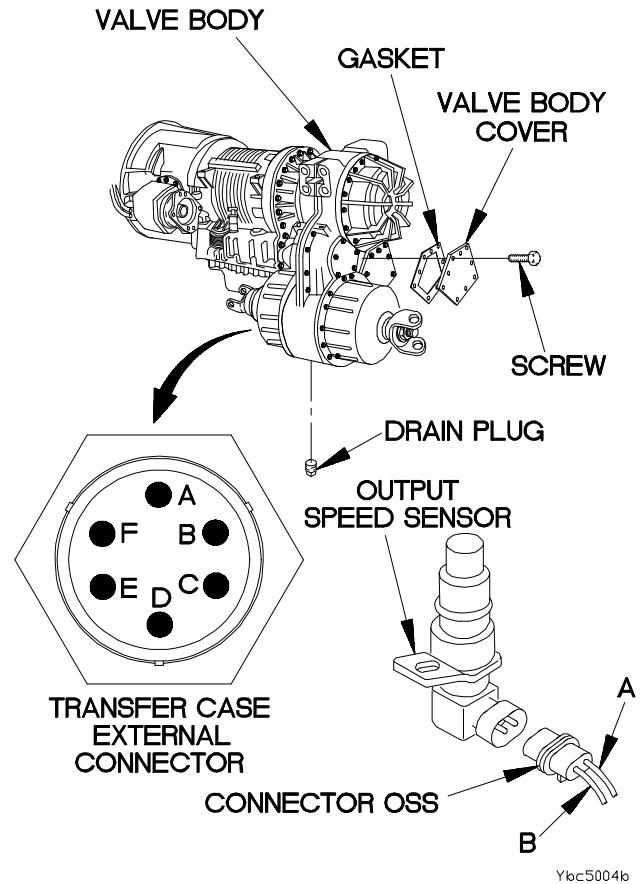


CAUTION

Use care when connecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to transfer case wiring harness connector OSS pin A.
- (3) Connect negative (-) probe of multimeter to transfer case wiring harness external connector pin A and note reading on multimeter.
- (4) If continuity is not present, replace transfer case wiring harness (para 8-2).
- (5) Connect positive (+) probe of multimeter to transfer case wiring harness connector OSS pin B.
- (6) Connect negative (-) probe of multimeter to transfer case external connector pin B and note reading on multimeter.
- (7) If continuity is not present, replace transfer case wiring harness (para 8-2).
- (8) If continuity is present in steps (3) and (6), replace WTEC III transmission ECU (TM 9-2320-366-20-4).
- (9) Connect transfer case wiring harness connector OSS to output speed sensor.
- (10) Install gasket and valve body cover on transfer case with ten screws.
- (11) Connect transmission external wiring harness transfer case connector to transfer case wiring harness external connector.
- (12) Add lubricating oil to transmission (TM 9-2320-366-20).
- (13) Connect batteries (TM 9-2320-366-20-3).



c51. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

Equipment Conditions

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Tools and Special Tools

Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)

Tools and Special Tools (Cont)

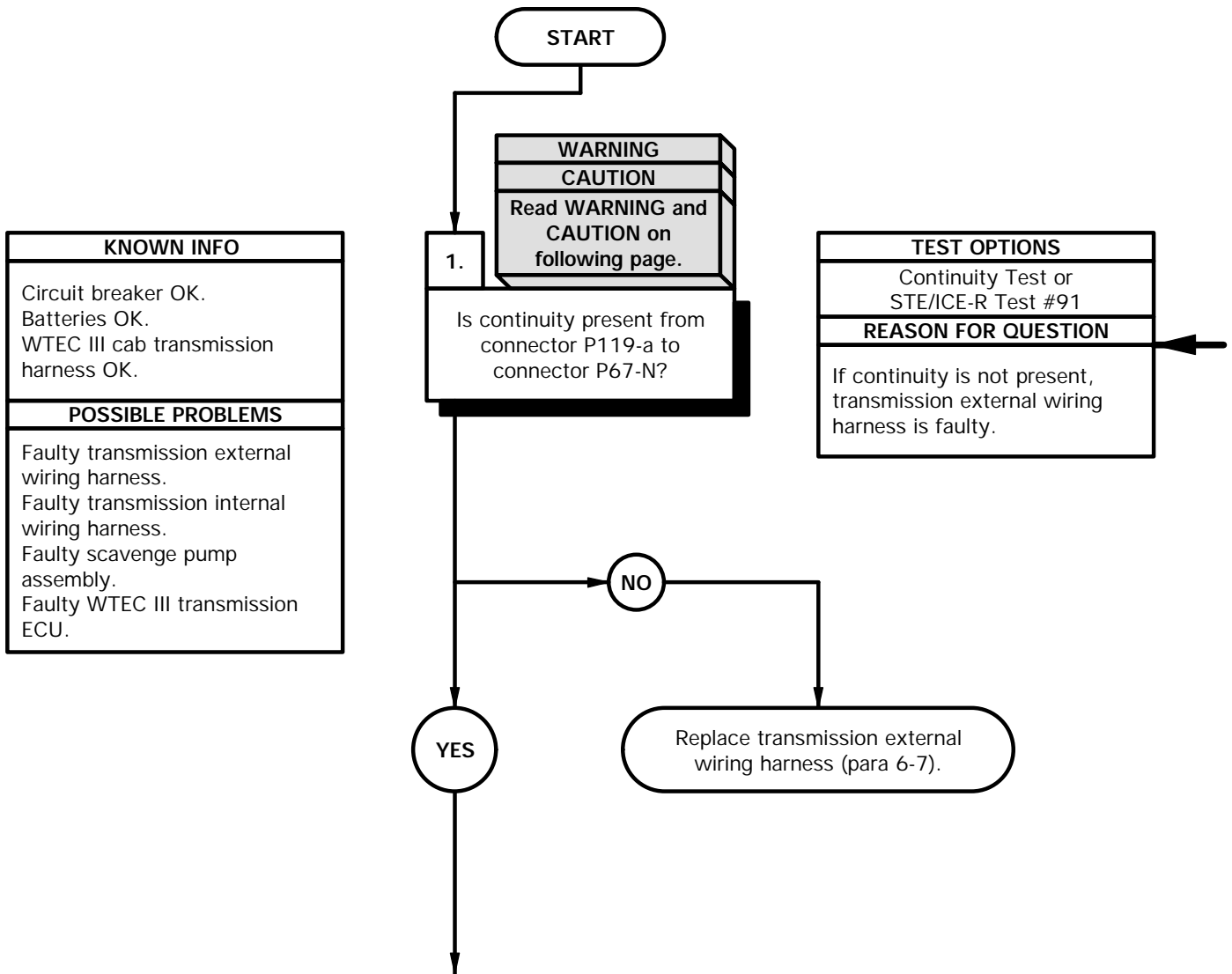
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)
Pan, Drain (Item 43, Appendix B)

References

TM 9-4910-571-12&P

Personnel Required

(2)



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

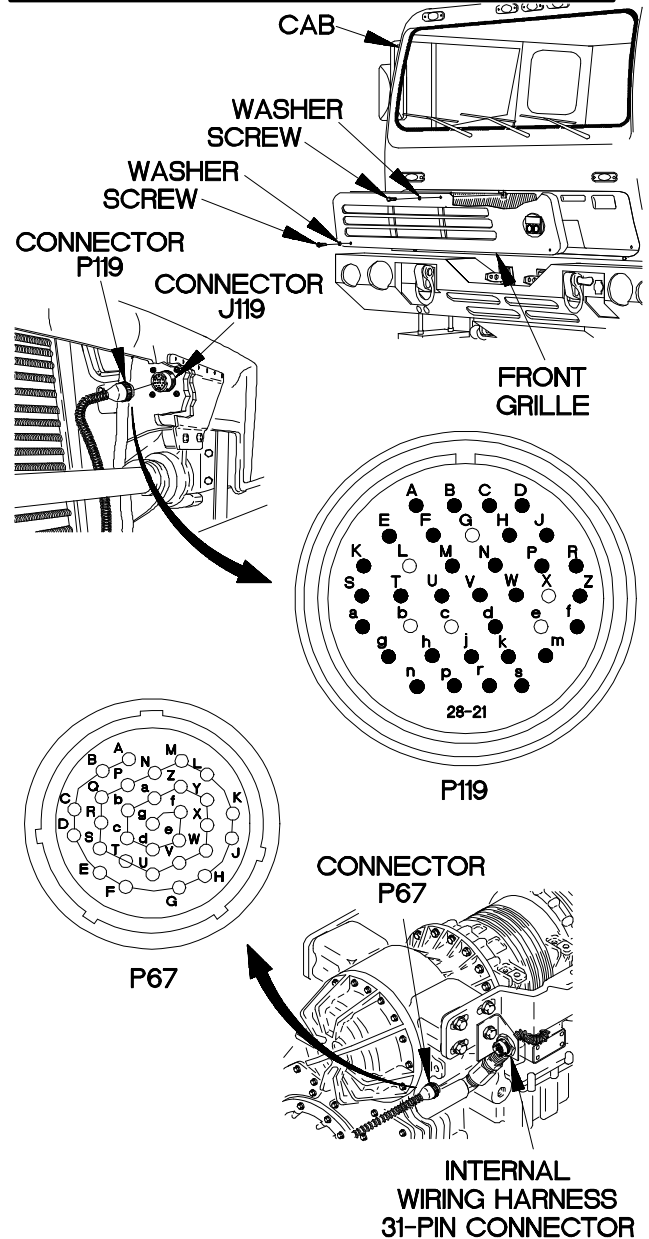
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect connector P67 from internal wiring harness 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-a.
- (8) Connect negative (-) probe of multimeter to connector P67-N and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-a.

CONTINUITY TEST (Cont)

- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



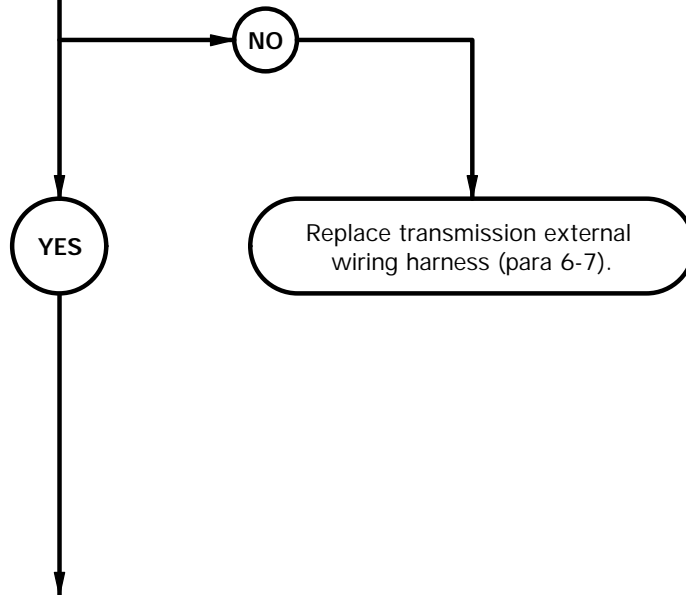
Y6c5101b

c51. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty scavenge pump assembly. Faulty WTEC III transmission ECU.

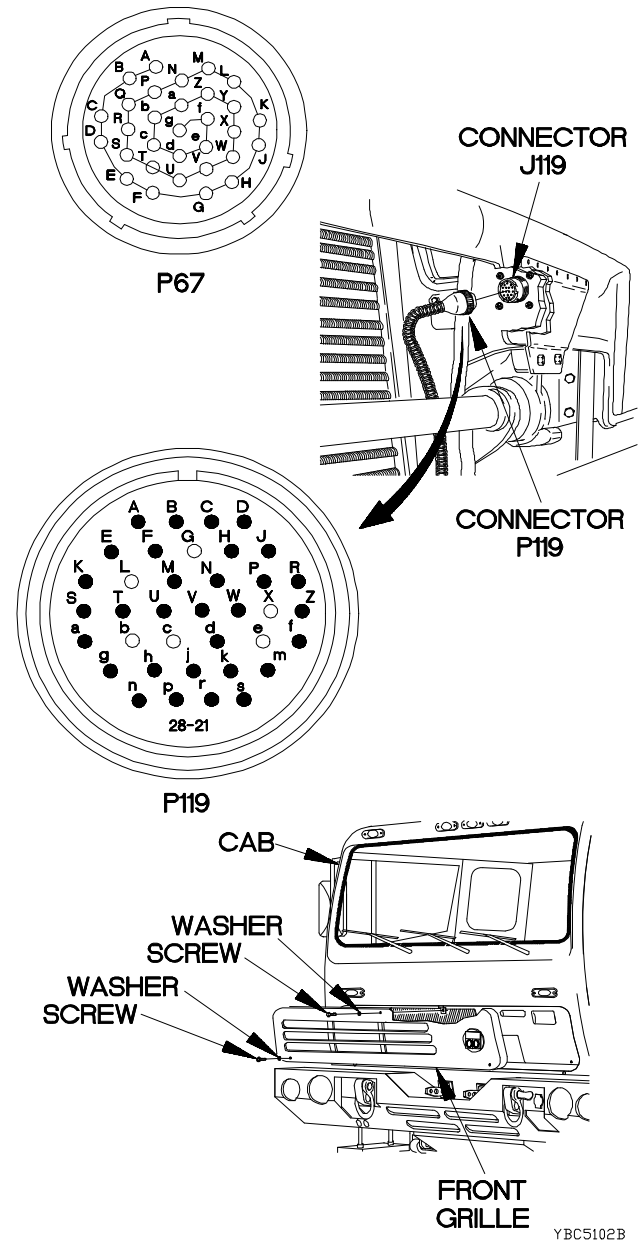
2.
Is continuity present from connector P119-d to connector P67-P?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-d.
- (3) Connect negative (-) probe of multimeter to connector P67-P and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-d.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).

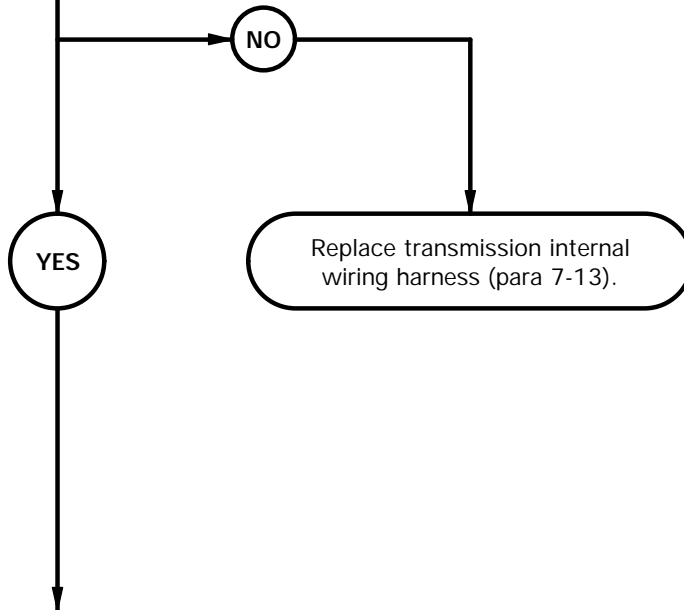


c51. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty scavenge pump assembly. Faulty WTEC III transmission ECU.

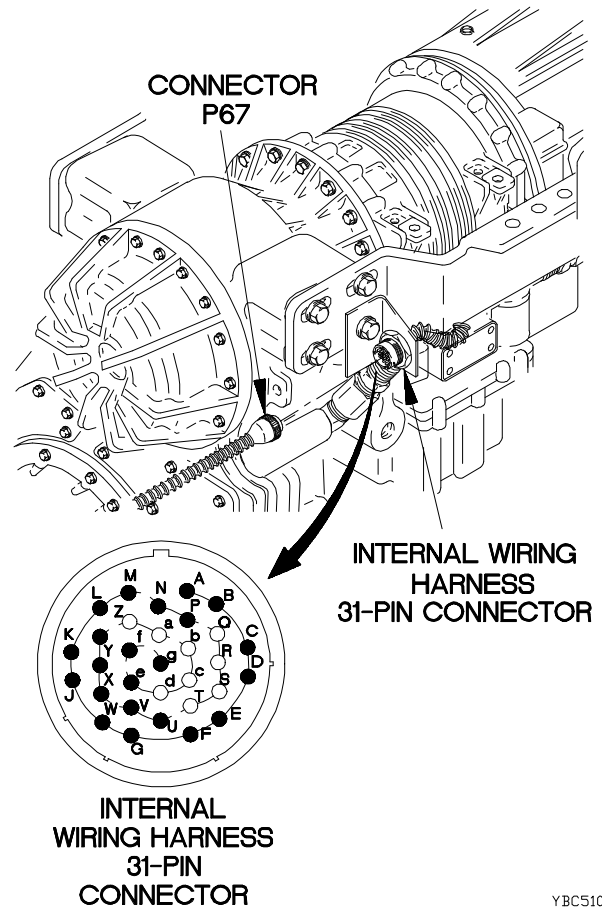
3.
Is continuity present from internal wiring harness 31-pin connector pin N to pin P?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



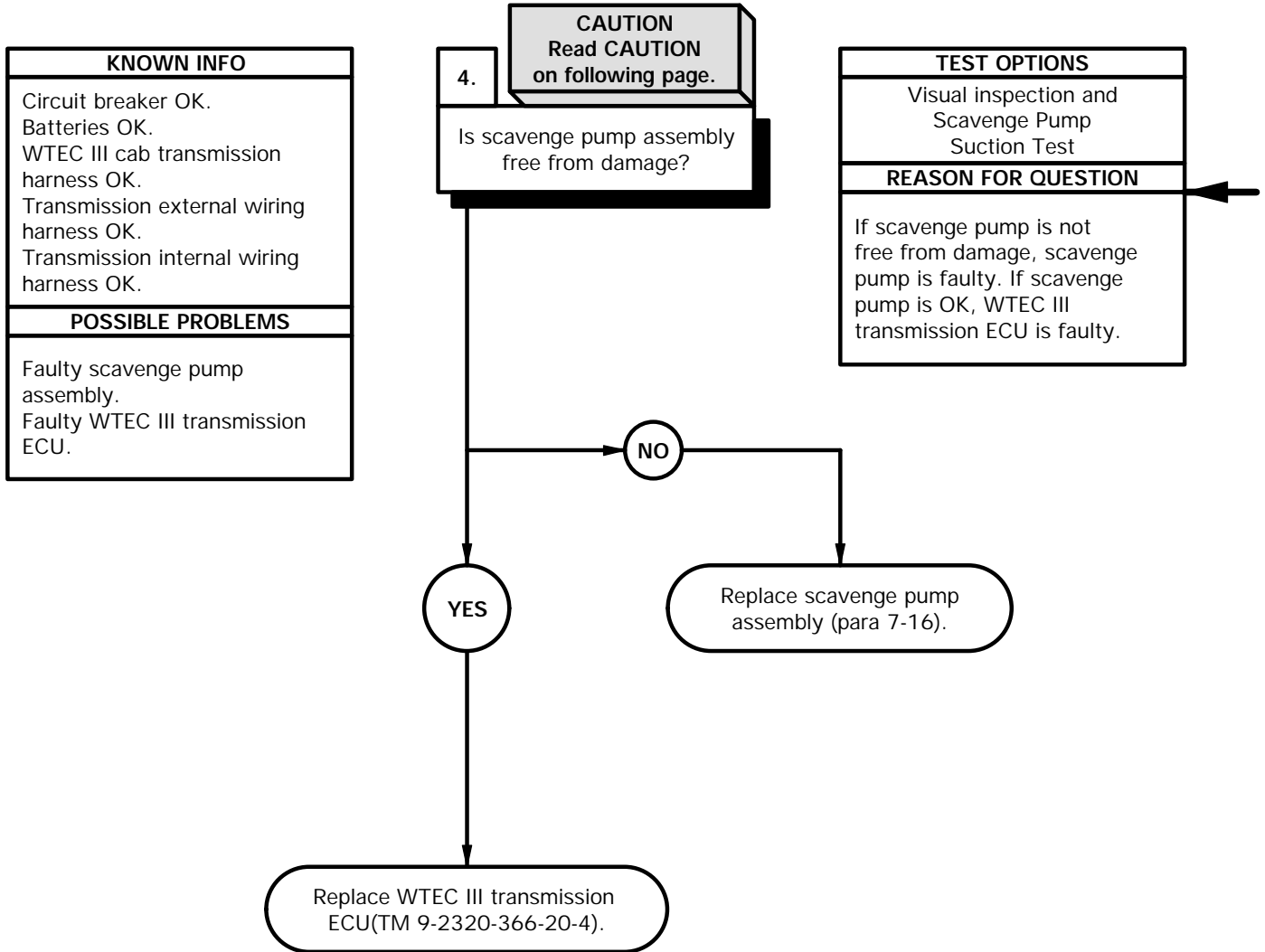
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin N.
- (3) Connect negative (-) probe of multimeter to internal wiring harness 31-pin connector pin P and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect connector P67 to internal wiring harness 31-pin connector.



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c51. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



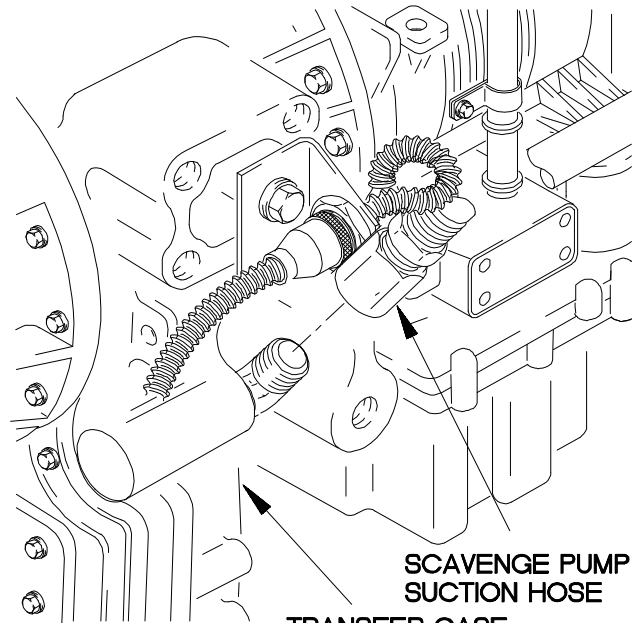
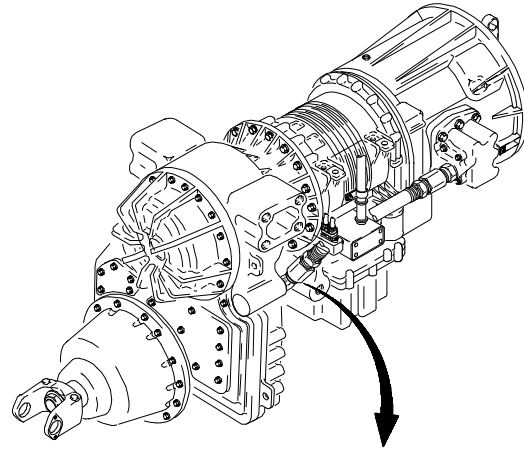
- (1) Place drain pan under transfer case.
- (2) Disconnect scavenge pump suction hose at transfer case.
- (3) Connect batteries (TM 9-2320-366-20-3).
- (4) Start engine (TM 9-2320-366-10-1).
- (5) If oil drips or runs from fitting on transfer case, replace scavenge pump assembly (para 7-16).
- (6) Shut down engine (TM 9-2320-366-10-1).

CAUTION

Shut down engine immediately when test is completed. Failure to comply may result in damage to equipment.

SCAVENGE PUMP SUCTION TEST

- (1) Place end of hose in a cup containing approximately one pint of oil.
- (2) Start engine (TM 9-2320-366-10-1).
- (3) Select neutral on WTEC III TPSS (TM 9-2320-366-10-1) and note if oil is immediately sucked into hose by scavenge pump.
- (4) If oil is not immediately removed from cup, replace scavenge pump assembly (para 7-16).
- (5) Shut down engine (TM 9-2320-366-10-1).
- (6) Connect scavenge pump suction hose to transfer case.
- (7) Remove drain pan.



c52. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY)

INITIAL SETUP

Equipment Conditions

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Tools and Special Tools (Cont)

Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Pan, Drain (Item 43, Appendix B)

Tools and Special Tools

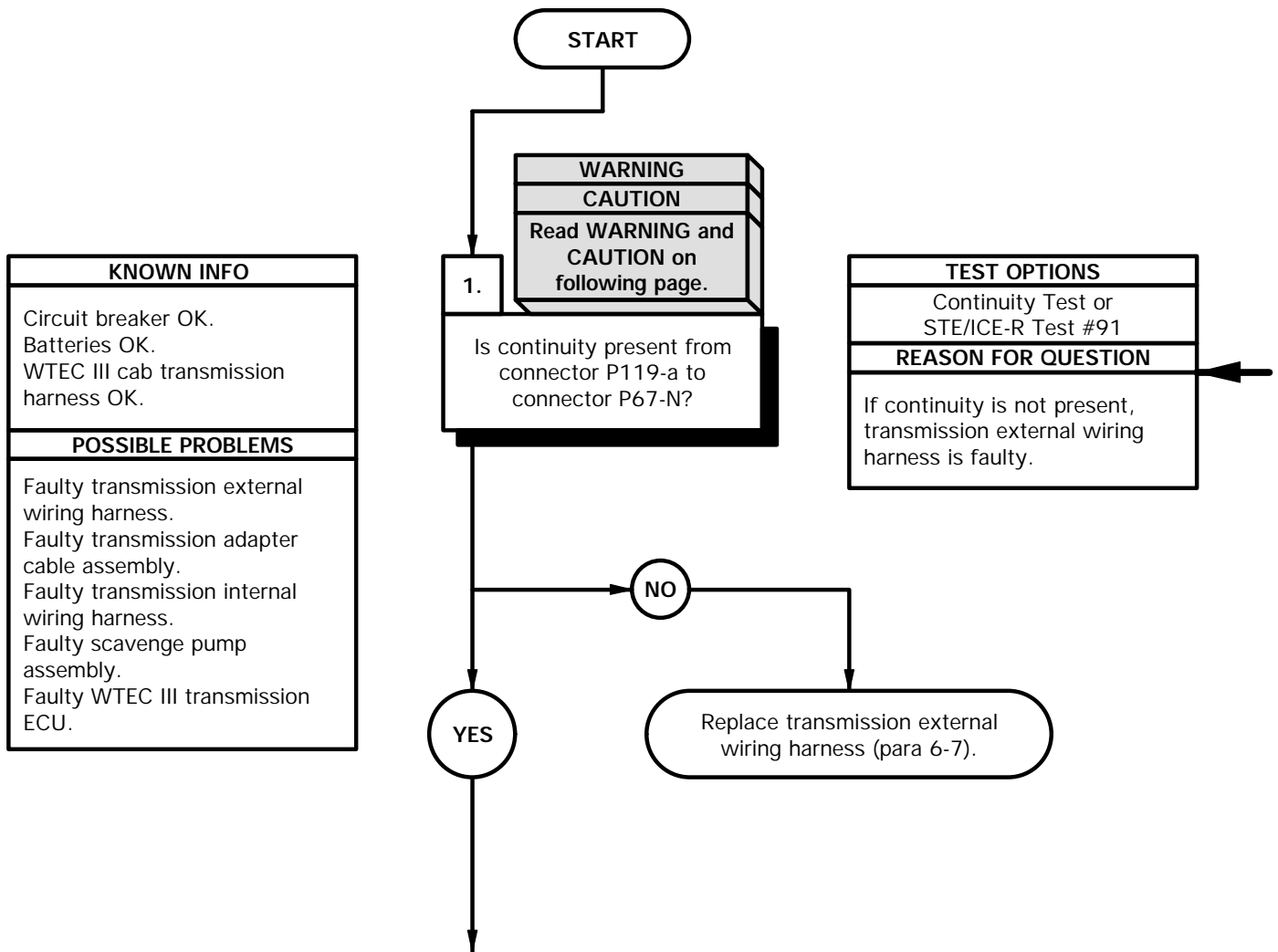
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

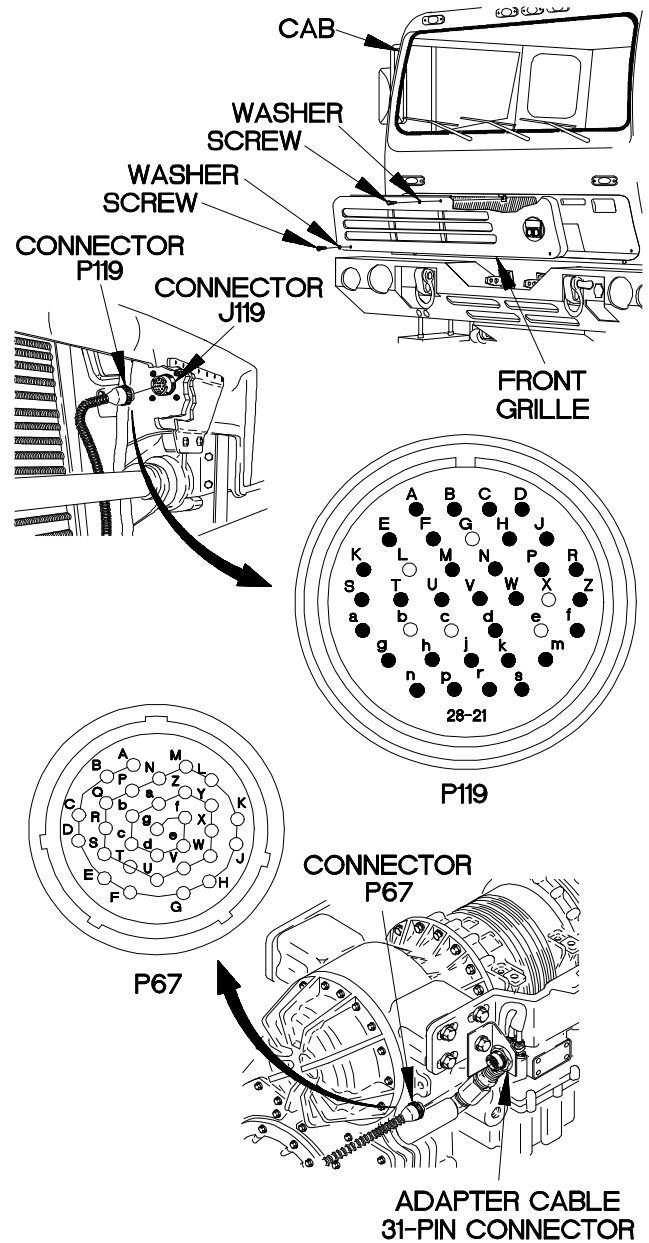
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect connector P67 from adapter cable 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-a.
- (8) Connect negative (-) probe of multimeter to connector P67-N and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-a.

CONTINUITY TEST (Cont)

- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



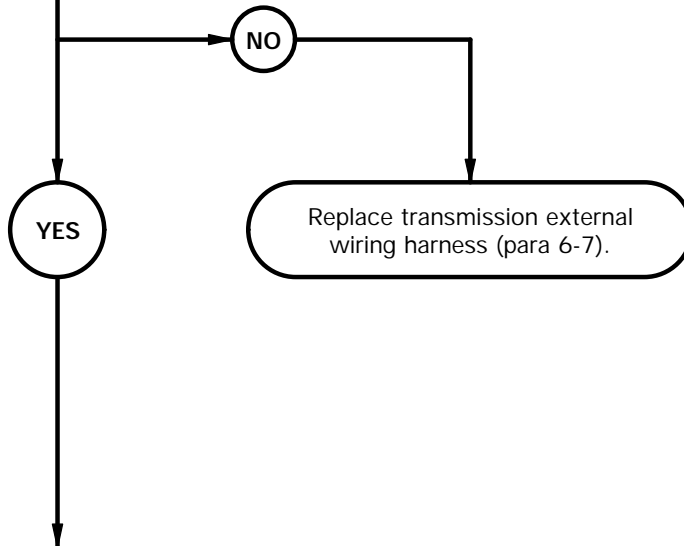
YBC5201B

c52. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty scavenge pump assembly. Faulty WTEC III transmission ECU.

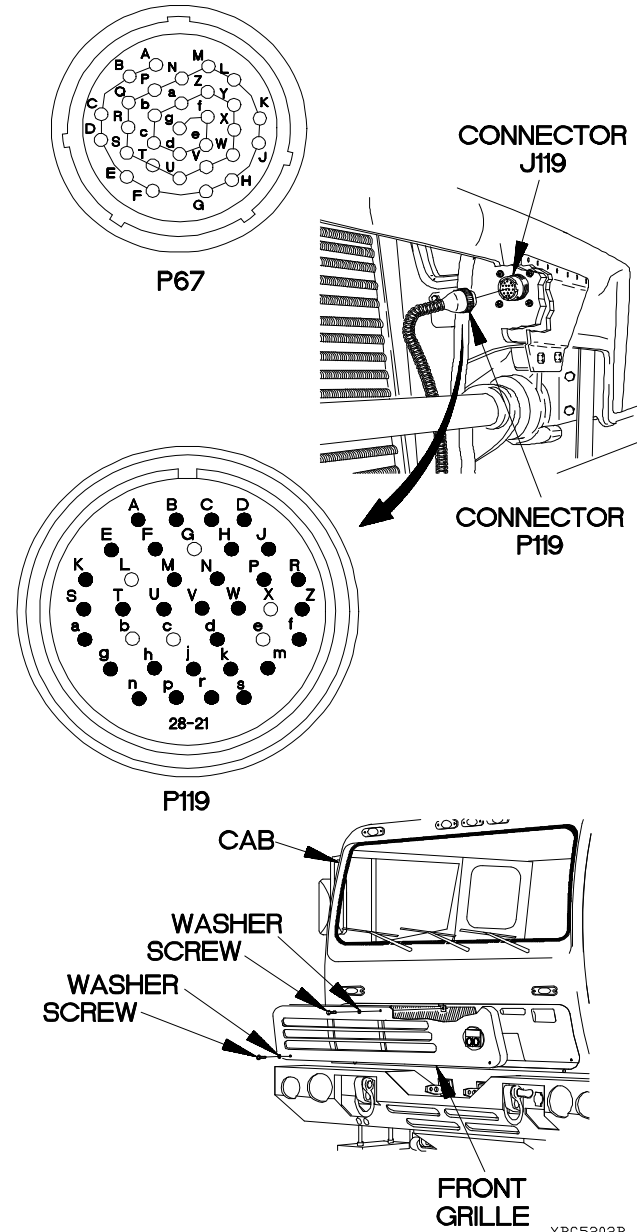
2.
Is continuity present from connector P119-d to connector P67-P?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-d.
- (3) Connect negative (-) probe of multimeter to connector P67-P and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-d.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



c52. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

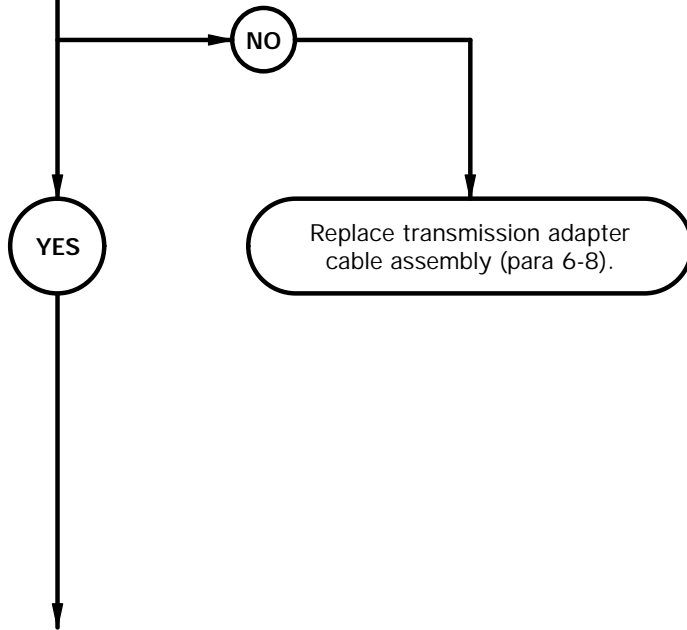
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty scavenge pump assembly. Faulty WTEC III transmission ECU.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin N to adapter cable 24-pin connector pin G2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.

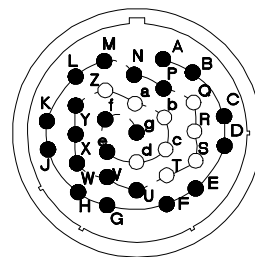


CAUTION

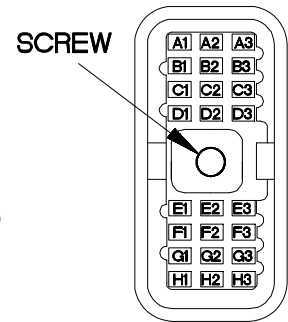
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Loosen screw in adapter cable 24-pin connector.
- (2) Disconnect adapter cable 24-pin connector from internal wiring harness 24-pin connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin N.
- (5) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin G2 and note reading on multimeter.
- (6) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (7) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin N.
- (8) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).



**ADAPTER CABLE
31-PIN CONNECTOR**



**ADAPTER CABLE
24-PIN
CONNECTOR**

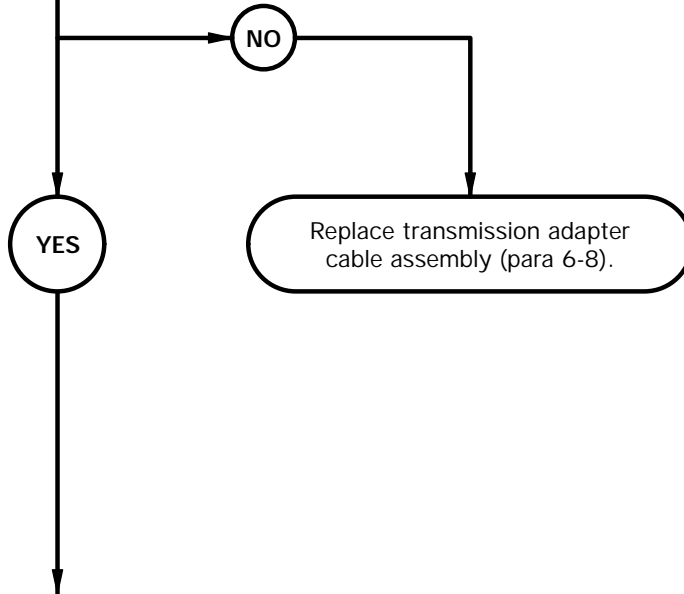
Y6c5203b

c52. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty scavenge pump assembly. Faulty WTEC III transmission ECU.

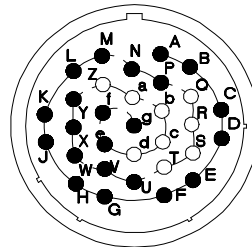
4.
Is continuity present from adapter cable 31-pin connector pin P to adapter cable 24-pin connector pin F3?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.

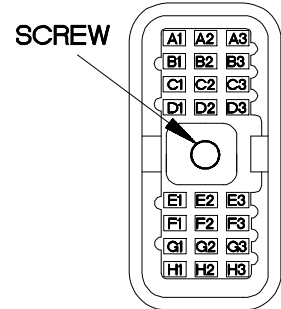


CONTINUITY TEST

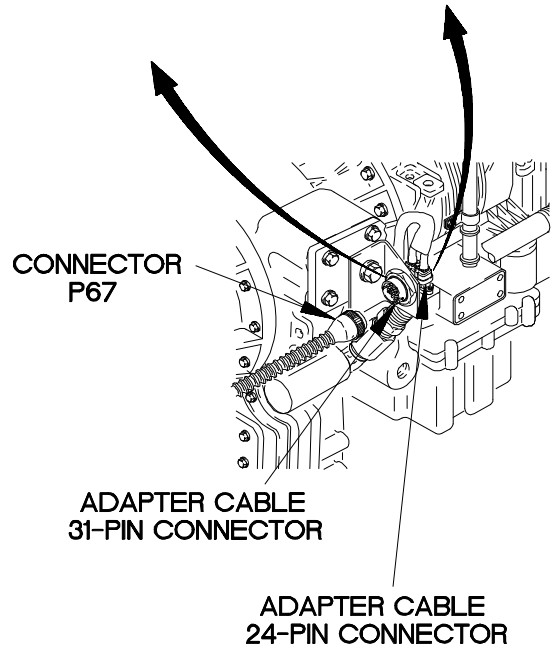
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin P.
- (3) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin F3 and note reading on multimeter.
- (4) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (5) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin P.
- (6) Connect negative (-) probe of multimeter to all other pins in adapter cable 24-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is not present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).
- (9) Connect connector P67 to adapter cable 31-pin connector.



**ADAPTER CABLE
31-PIN CONNECTOR**



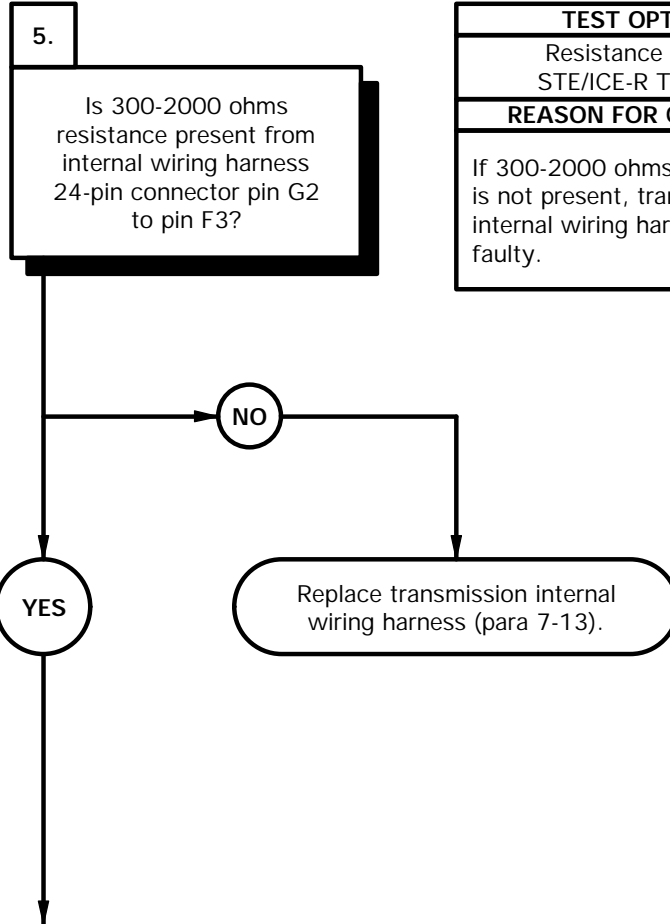
**ADAPTER CABLE
24-PIN
CONNECTOR**



Ybc5204b

c52. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

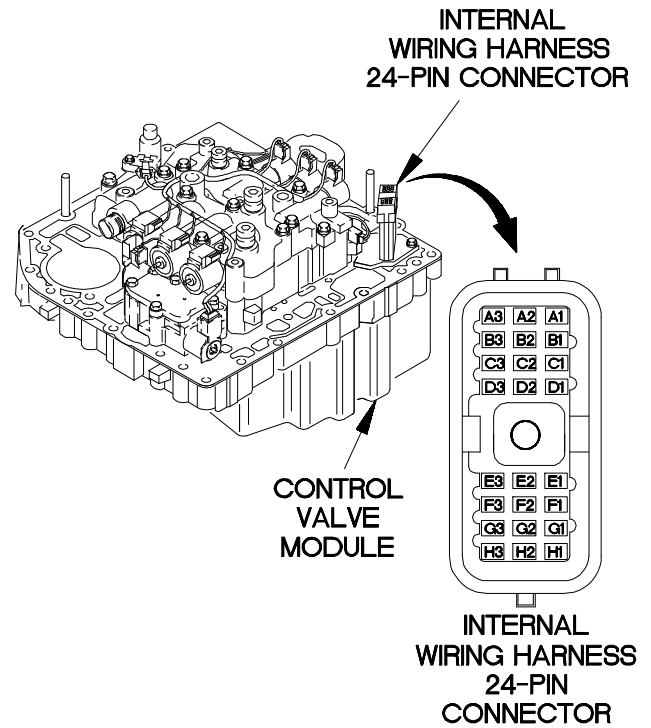
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty scavenge pump assembly. Faulty WTEC III transmission ECU.



TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 300-2000 ohms resistance is not present, transmission internal wiring harness is faulty.

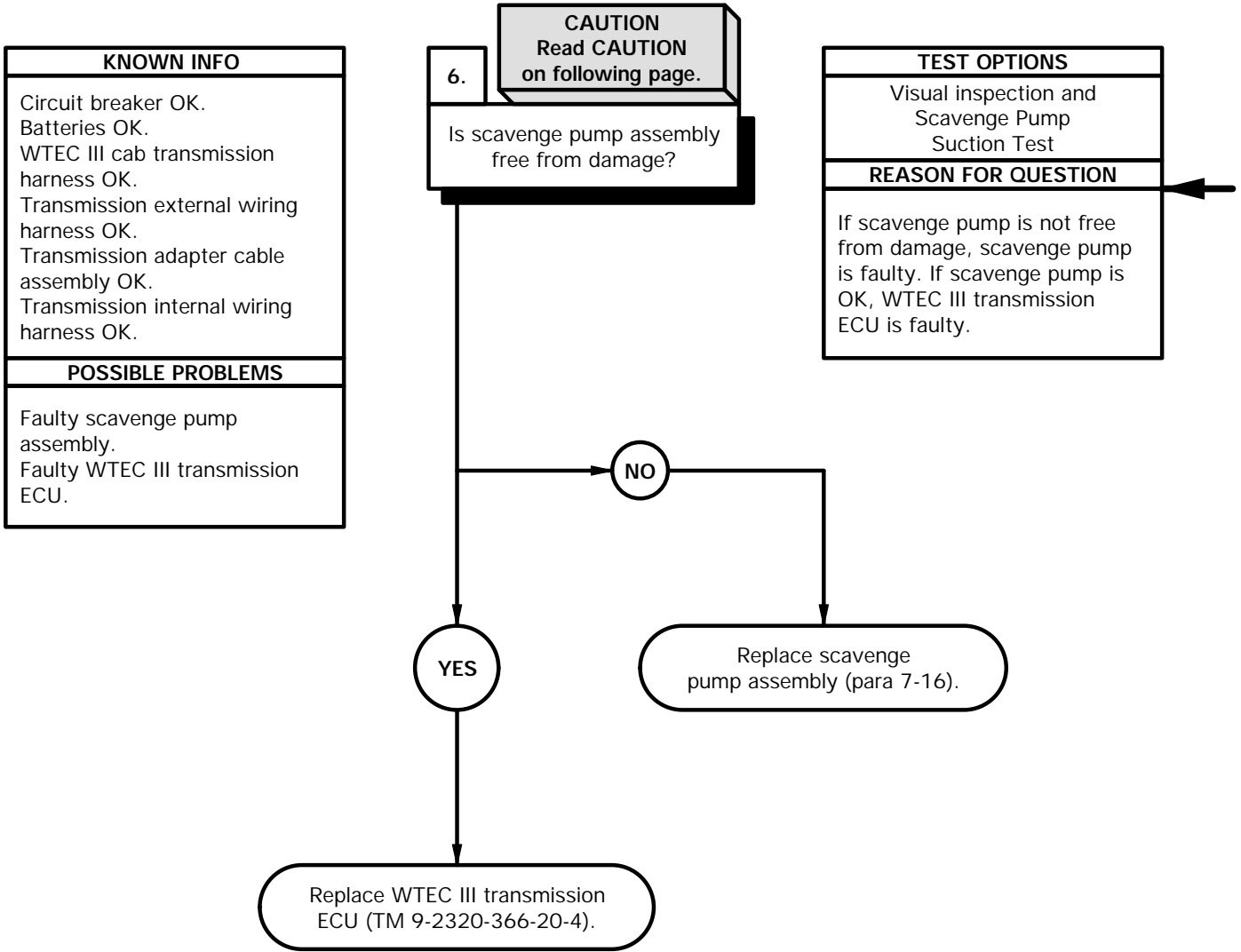
RESISTANCE TEST

- (1) Remove control valve module (para 7-10).
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin G2.
- (4) Connect negative (-) probe of multimeter to internal wiring harness 24-pin connector pin F3 and note reading on multimeter.
- (5) If resistance is less than 300 ohms or greater than 2000 ohms, replace transmission internal wiring harness (para 7-13).
- (6) Install control valve module (para 7-10).



YBC5205B

c52. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



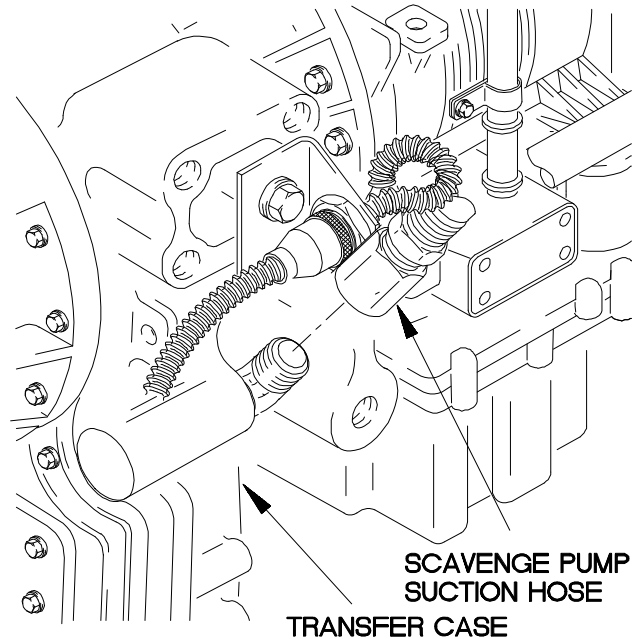
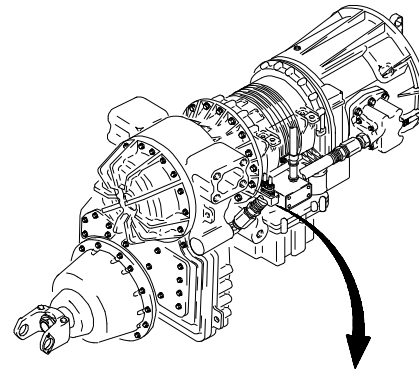
- (1) Place drain pan under transfer case.
- (2) Disconnect scavenge pump suction hose at transfer case.
- (3) Connect batteries (TM 9-2320-366-20-3).
- (4) Start engine (TM 9-2320-366-10-1).
- (5) If oil drips or runs from fitting on transfer case, replace scavenge pump assembly (para 7-16).
- (6) Shut down engine (TM 9-2320-366-10-1).

CAUTION

Shut down engine immediately when test is completed. Failure to comply may result in damage to equipment.

SCAVENGE PUMP SUCTION TEST

- (1) Place end of hose in a cup containing approximately one pint of oil.
- (2) Start engine (TM 9-2320-366-10-1).
- (3) Select neutral on WTEC III TPSS (TM 9-2320-366-10-1) and note if oil is immediately sucked into hose by scavenge pump.
- (4) If oil is not immediately removed from cup, replace scavenge pump assembly (para 7-16).
- (5) Shut down engine (TM 9-2320-366-10-1).
- (6) Connect scavenge pump suction hose to transfer case.
- (7) Remove drain pan.



YBC5206B

c53. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

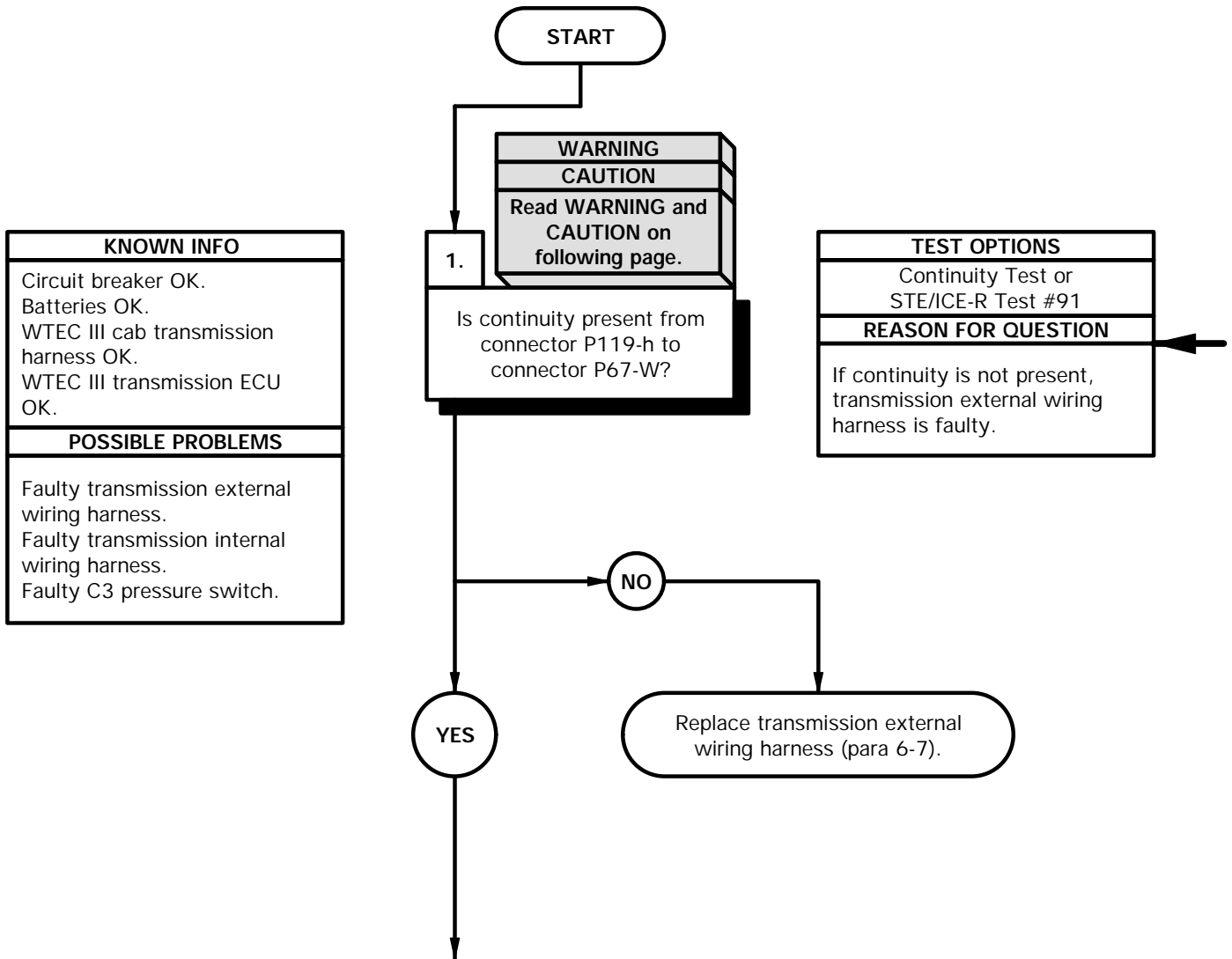
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appenmdix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

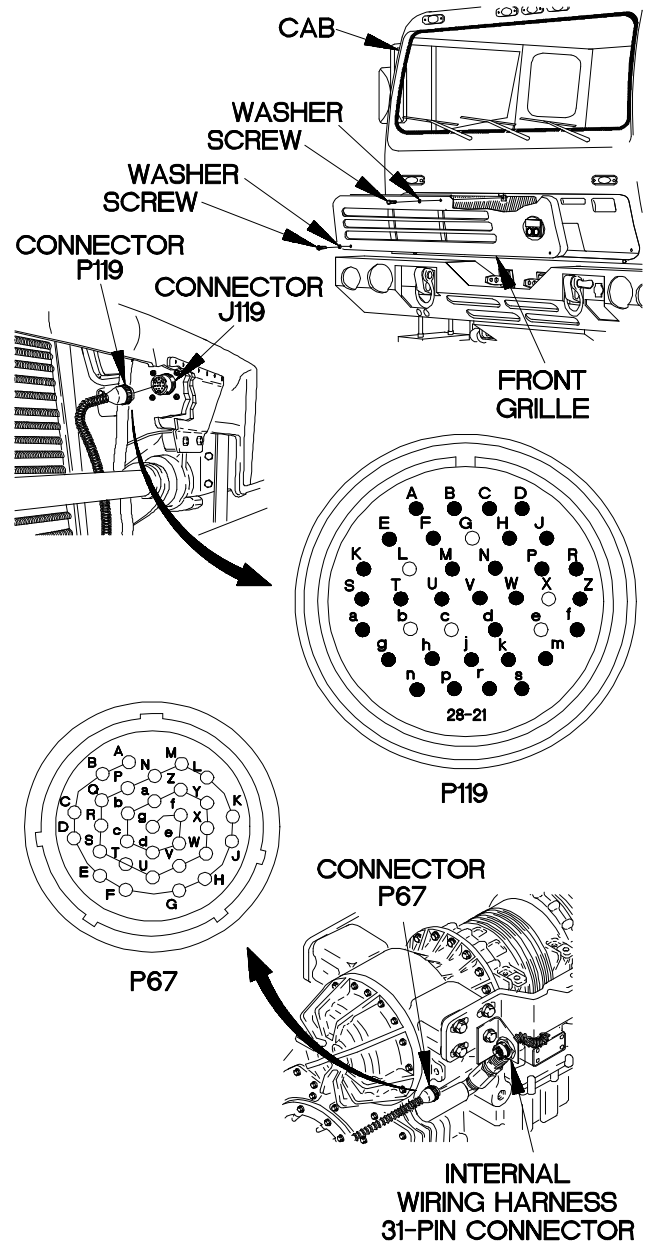
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect connector P67 from internal wiring harness 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-h.
- (8) Connect negative (-) probe of multimeter to connector P67-W and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-h.

CONTINUITY TEST (Cont)

- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



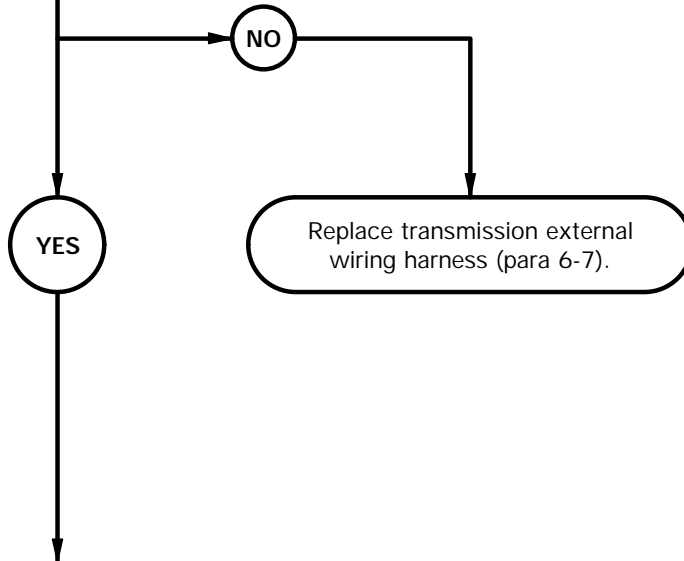
Y6c5301b

c53. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. WTEC III transmission ECU OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty C3 pressure switch.

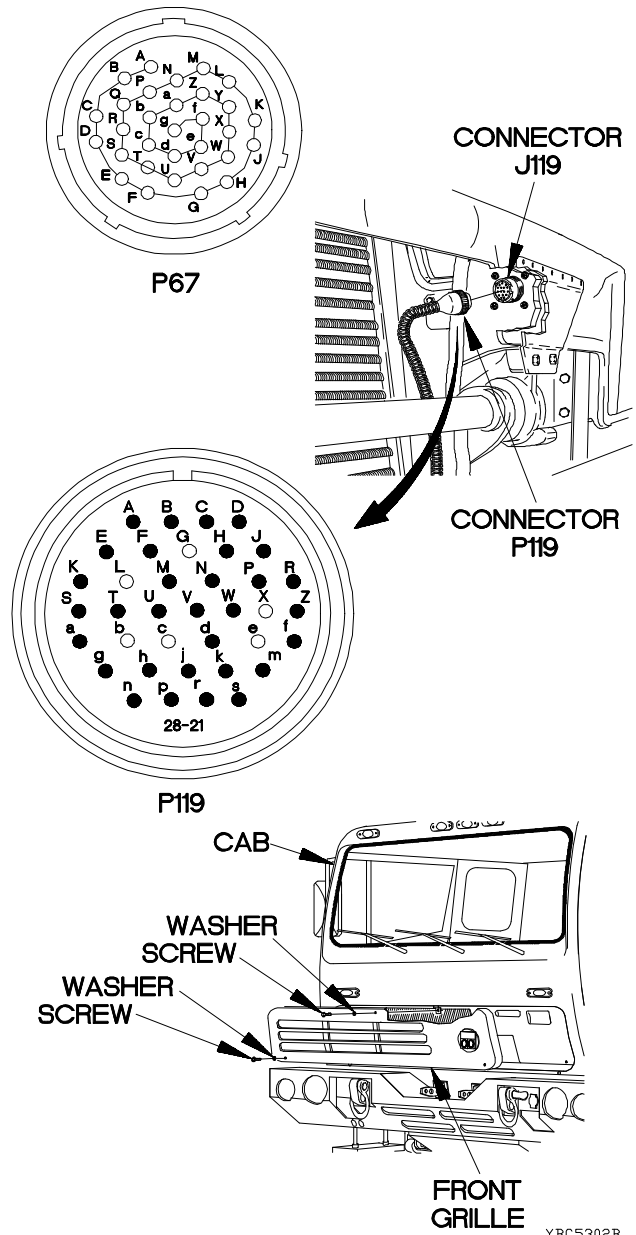
2.
Is continuity present from connector P119-j to connector P67-X?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-j.
- (3) Connect negative (-) probe of multimeter to connector P67-X and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-j.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



YBC5302B

c53. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

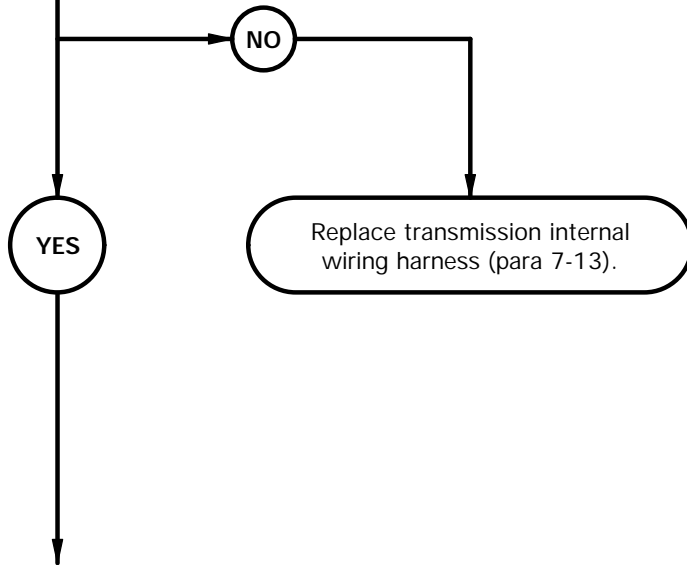
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. WTEC III transmission ECU OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty C3 pressure switch.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin W to internal wiring harness connector C3 pin 3B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

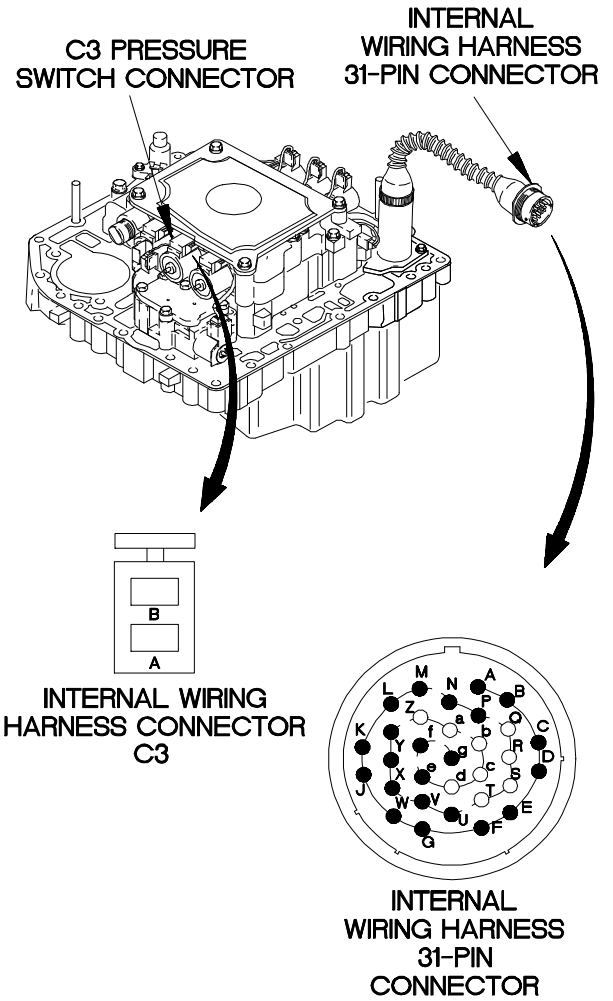


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Disconnect internal wiring harness connector C3 from C3 pressure switch connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin W.
- (5) Connect negative (-) probe of multimeter to internal wiring harness connector C3 pin 3B and note reading on multimeter.
- (6) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (7) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin W.
- (8) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



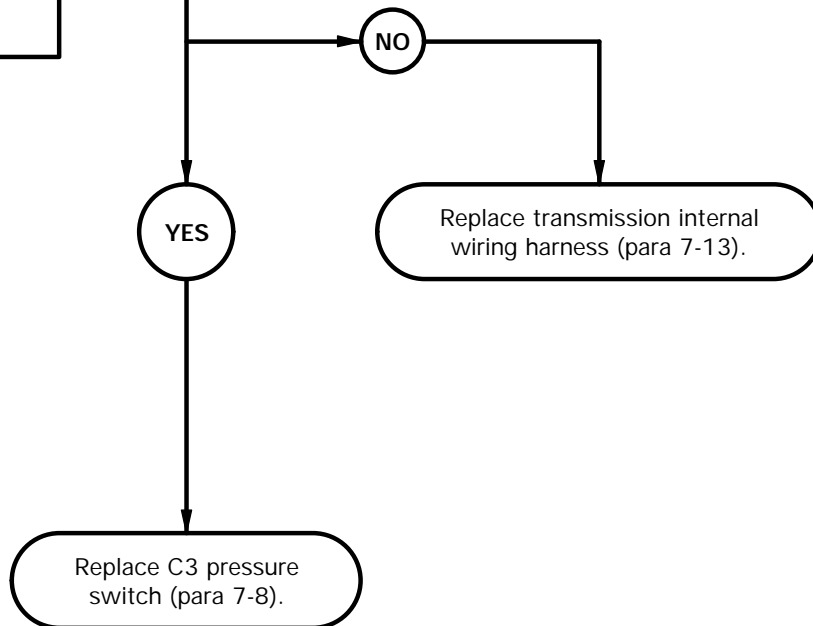
YBC5303B

c53. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. WTEC III transmission ECU OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty C3 pressure switch.

4.
Is continuity present from internal wiring harness 31-pin connector pin X to internal wiring harness connector C3 pin 3A?

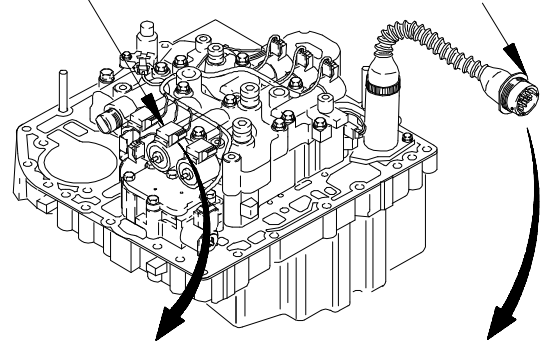
TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty. If continuity is present, C3 pressure switch is faulty.



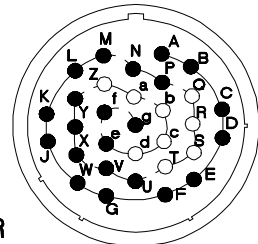
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin X.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector C3 pin 3A and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin X.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).
- (9) If continuity is present in step (3) and absent in steps (6) and (7), replace C3 pressure switch (para 7-8).
- (10) Connect transmission internal wiring harness connector C3 to C3 pressure switch connector.
- (11) Install control valve module (para 7-10).
- (12) Connect batteries (TM 9-2320-366-20-3).

C3 PRESSURE SWITCH CONNECTOR **INTERNAL WIRING HARNESS 31-PIN CONNECTOR**

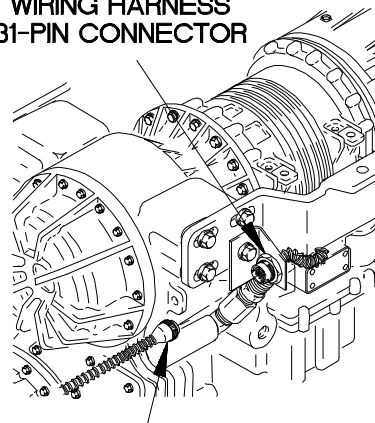


INTERNAL WIRING HARNESS CONNECTOR C3



INTERNAL WIRING HARNESS 31-PIN CONNECTOR

INTERNAL WIRING HARNESS 31-PIN CONNECTOR



CONNECTOR P67

YBC5304B

c54. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Tools and Special Tools

Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts

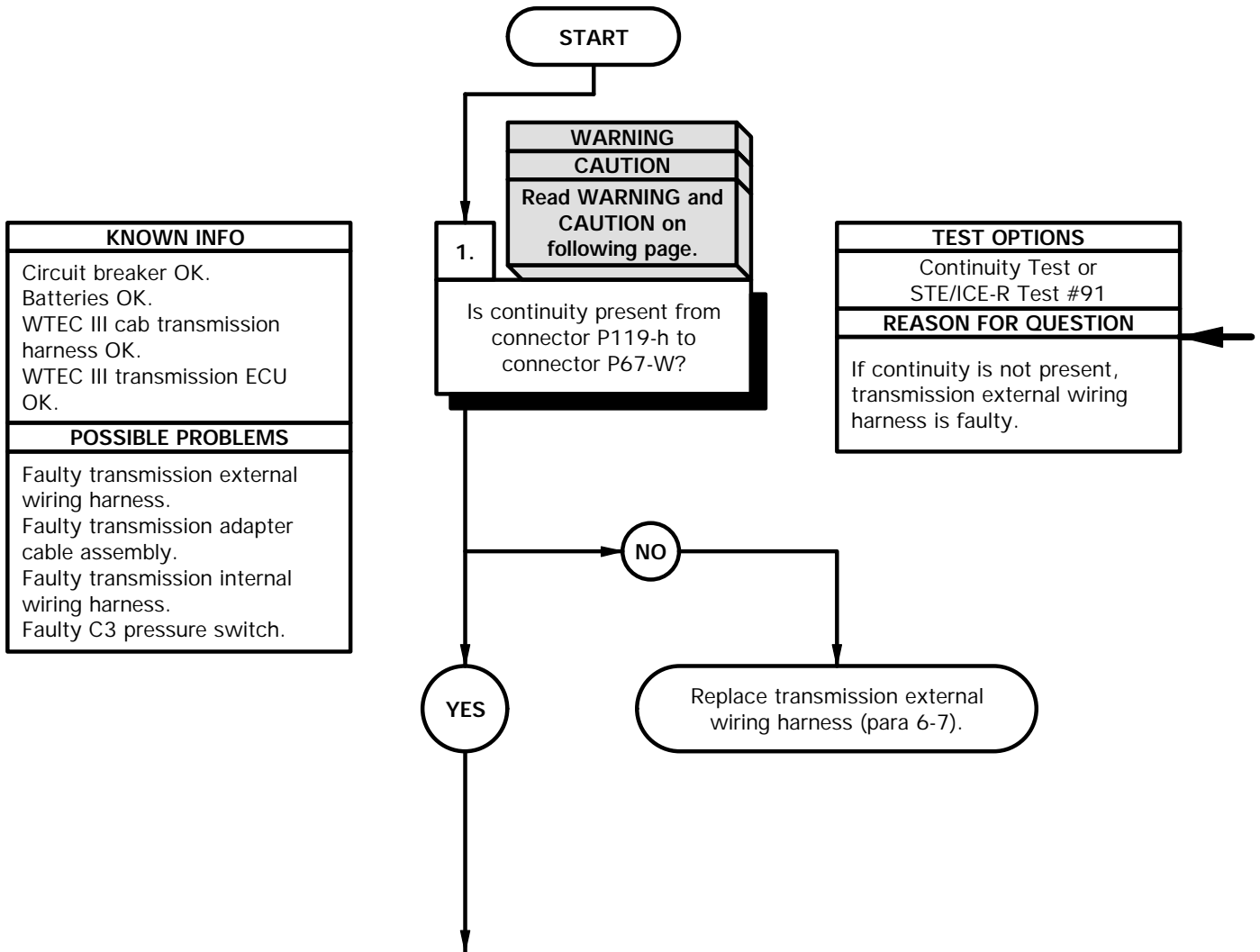
Wire, Elect, 50 ft (Item 97, Appendix C)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

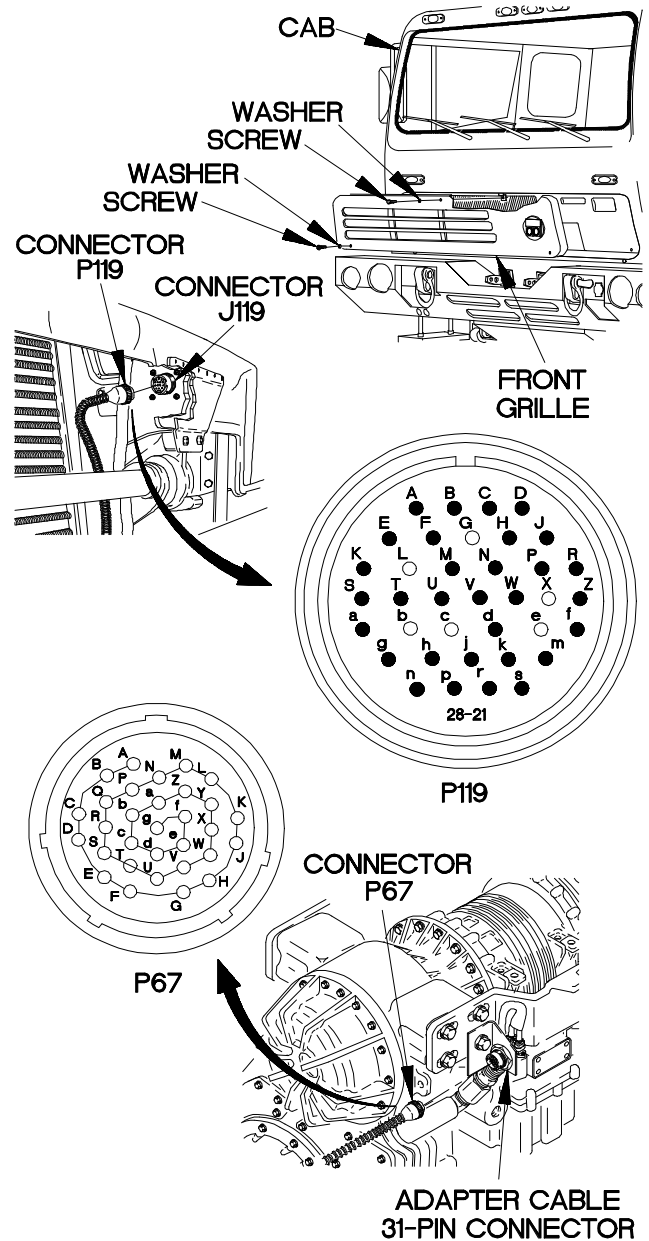
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect connector P67 from adapter cable 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-h.
- (8) Connect negative (-) probe of multimeter to connector P67-W and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-h.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

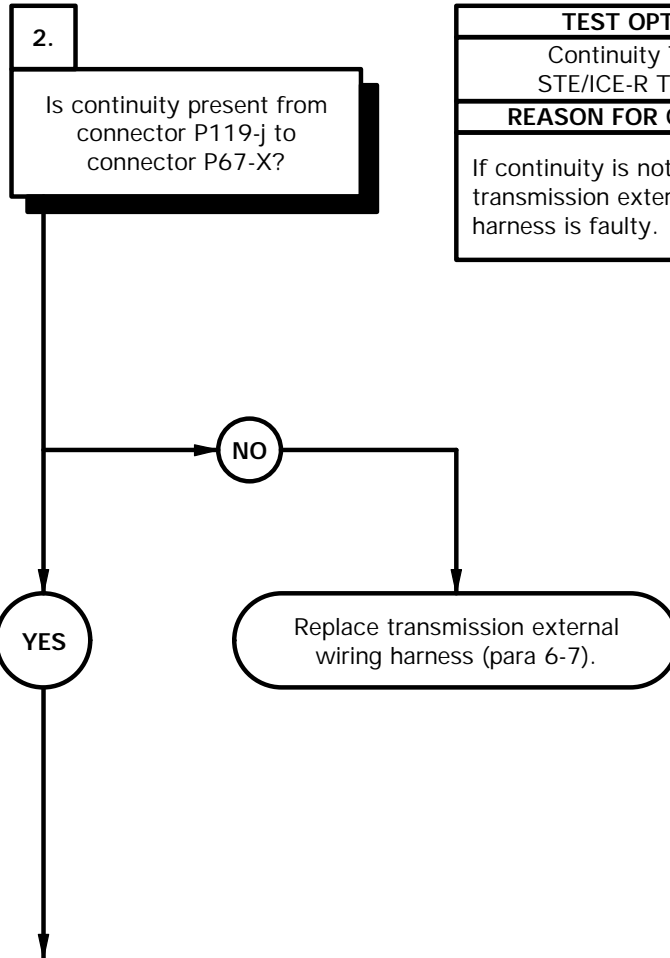
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted, replace transmission external wiring harness (para 6-7).



YBC5401B

c54. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

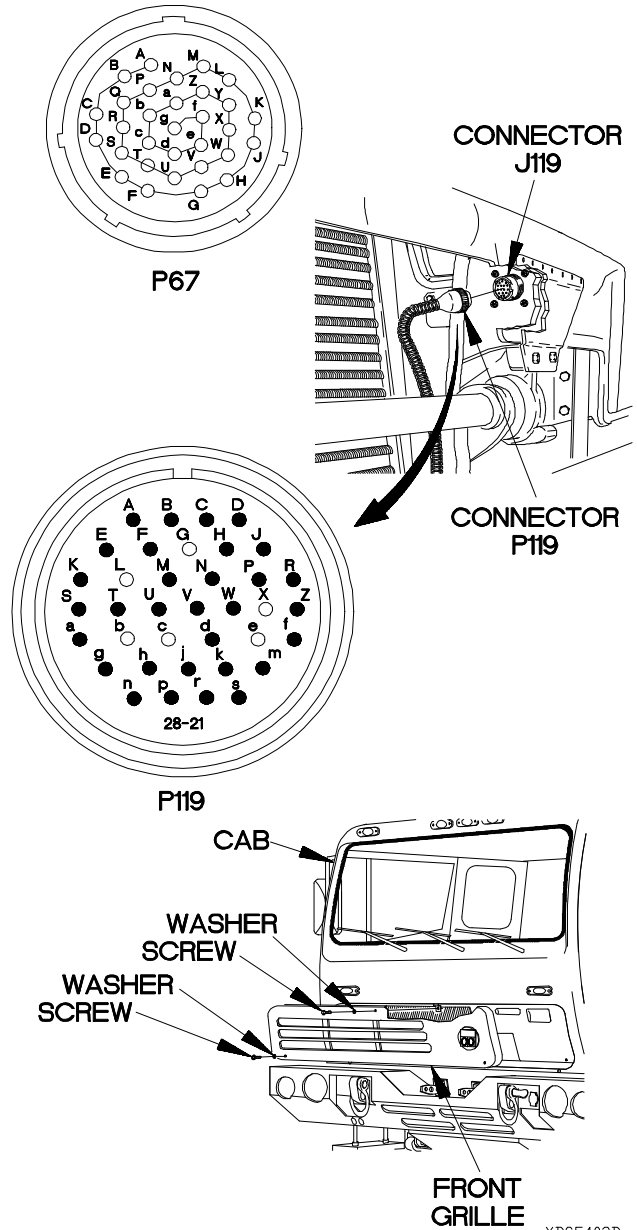
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. WTEC III transmission ECU OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty C3 pressure switch.



TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-j.
- (3) Connect negative (-) probe of multimeter to connector P67-X and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-j.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



c54. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

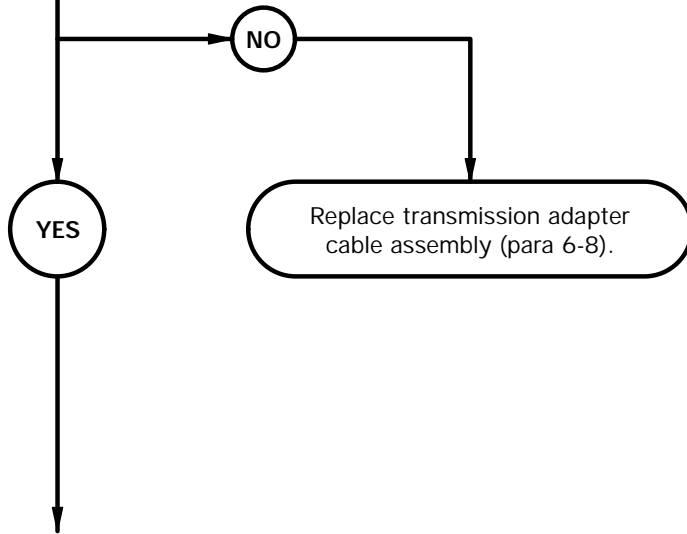
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. WTEC III transmission ECU OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty C3 pressure switch.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin W to adapter cable 24-pin connector pin F2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.

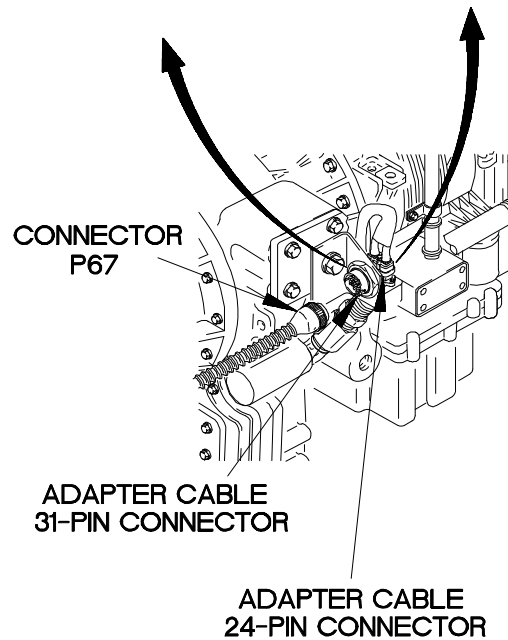
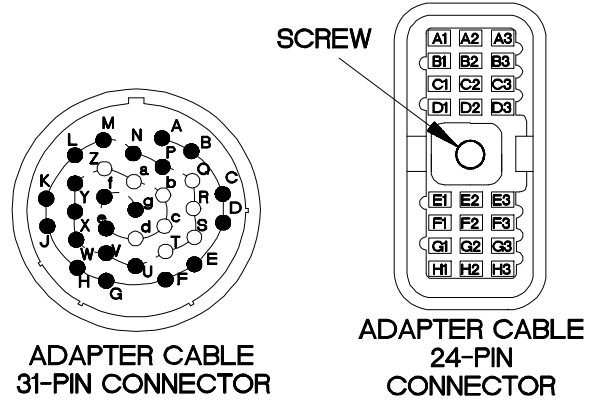


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Loosen screw in adapter cable 24-pin connector.
- (2) Disconnect adapter cable 24-pin connector from internal wiring harness 24-pin connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin W.
- (5) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin F2 and note reading on multimeter.
- (6) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (7) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin W.
- (8) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).



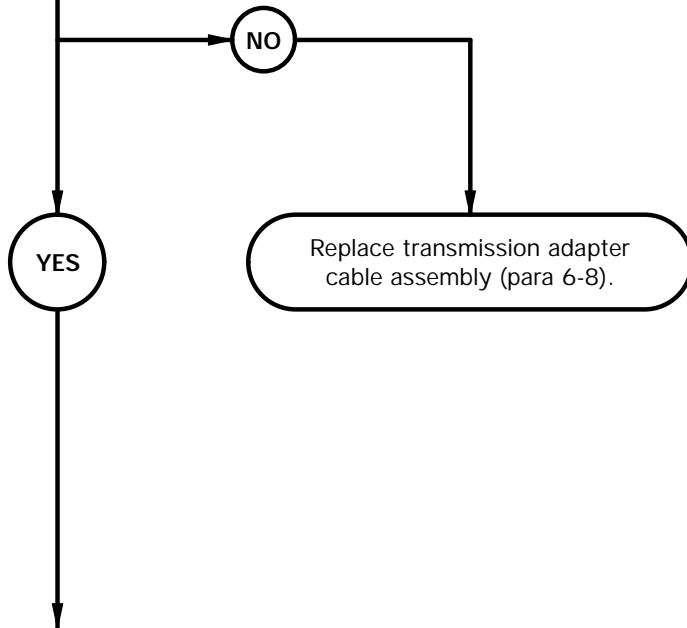
YBC5403B

c54. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. WTEC III transmission ECU OK. Transmission external wiring harness OK. Pigtail OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty C3 pressure switch.

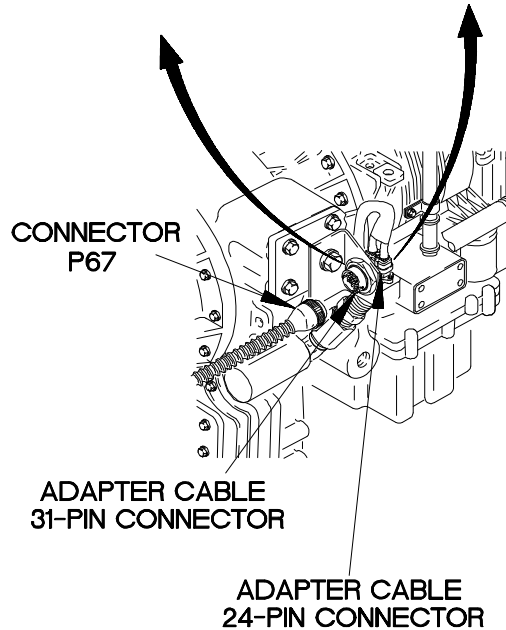
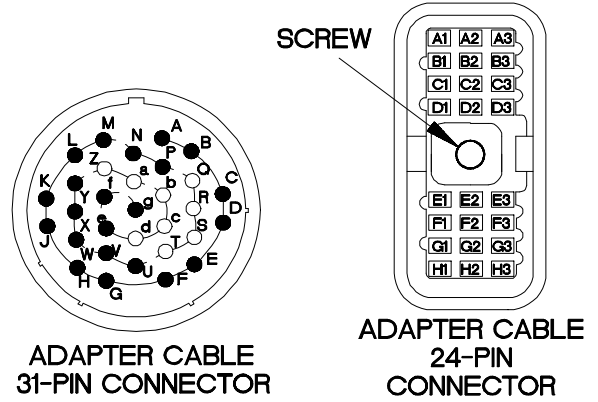
4.
Is continuity present from adapter cable 31-pin connector pin X to adapter cable 24-pin connector pin C3?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin X.
- (3) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin C3 and note reading on multimeter.
- (4) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (5) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin X.
- (6) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).



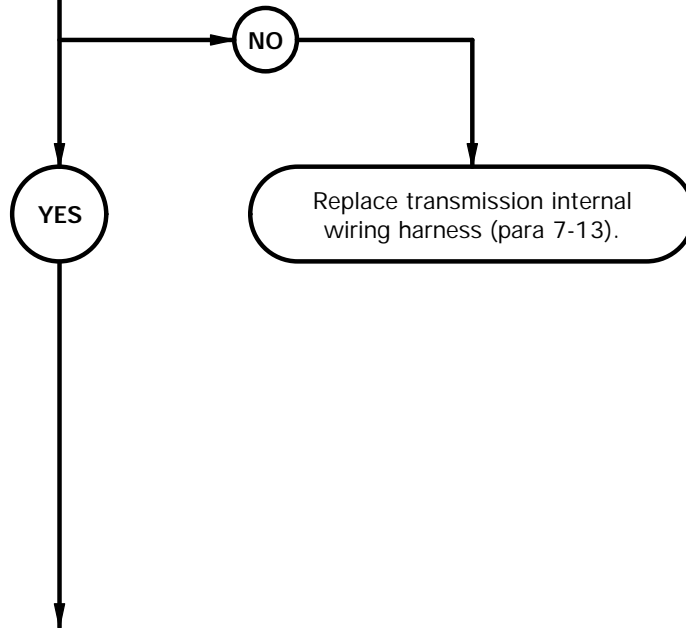
YBC5404B

c54. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. WTEC III transmission ECU OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty C3 pressure switch.

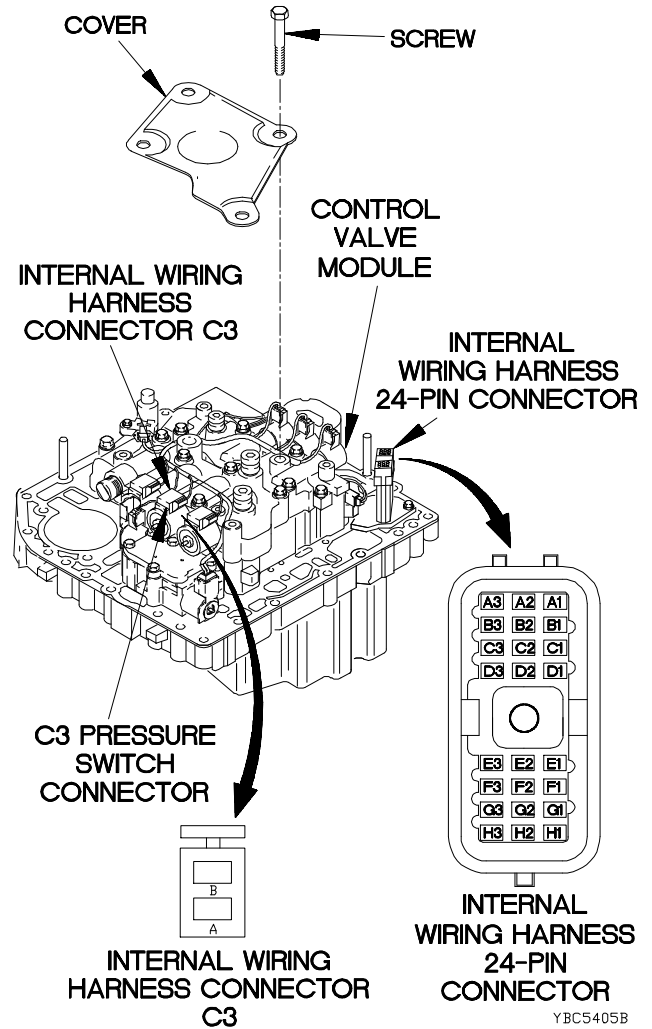
5.
Is continuity present from internal wiring harness 24-pin connector pin F2 to internal wiring harness connector C3 pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector C3 from C3 pressure switch connector.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin F2.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector C3 pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin F2.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



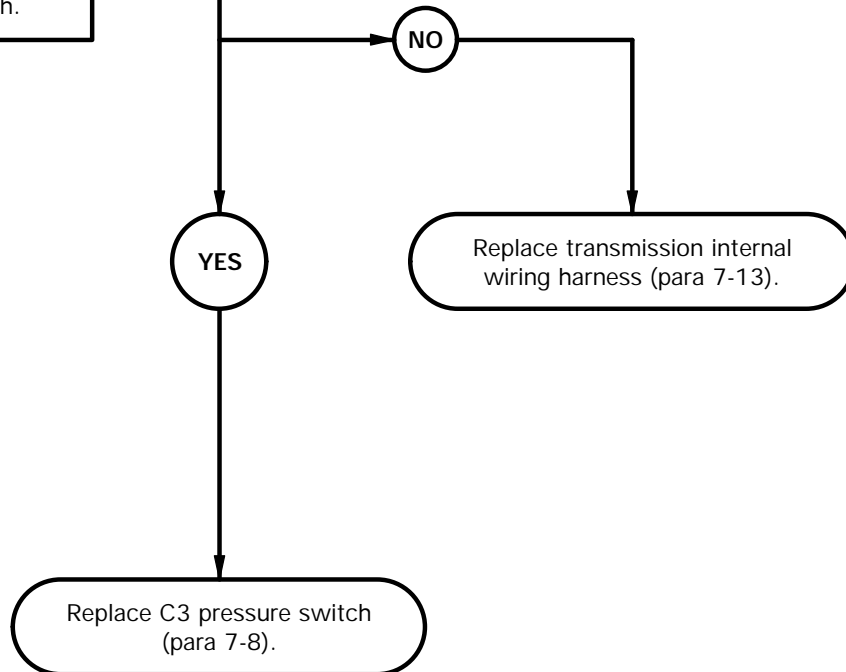
YBC5405B

c54. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. WTEC III transmission ECU OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty C3 pressure switch.

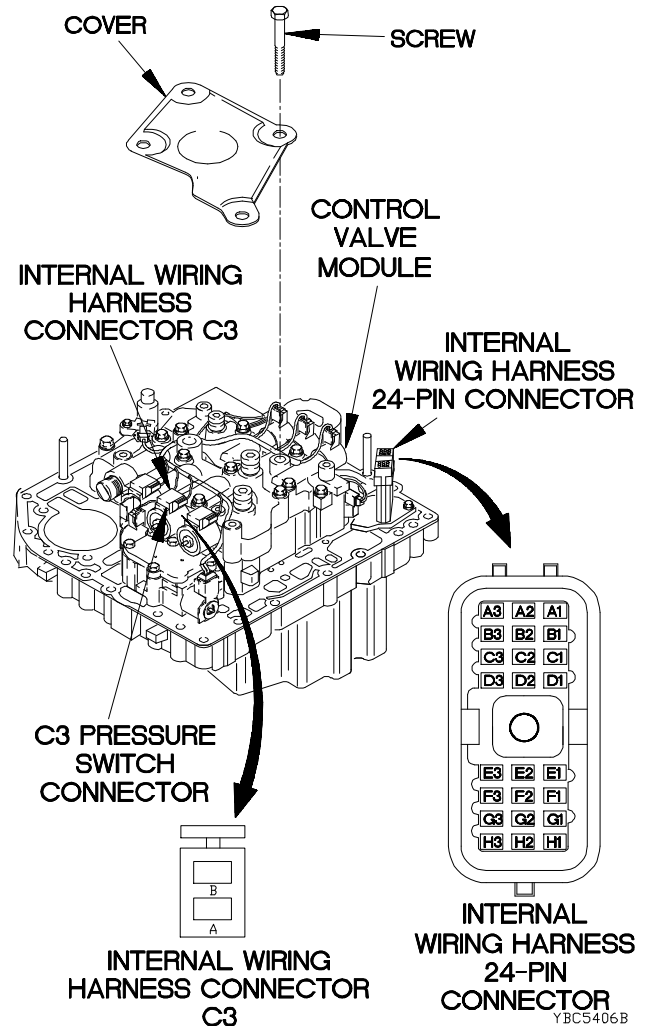
6.
 Is continuity present from internal wiring harness 24-pin connector pin C3 to internal wiring harness connector C3 pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty. If continuity is present, C3 pressure switch is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin C3.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector C3 pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin C3.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).
- (9) If continuity is present in step (3) and absent in steps (6) and (7), replace C3 pressure switch (para 7-8).
- (10) Connect internal wiring harness connector C3 to C3 pressure switch connector.
- (11) Install cover on control valve module with four screws.
- (12) Install control valve module (para 7-10).
- (13) Connect batteries (TM 9-2320-366-20-3).



c55. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 12 (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

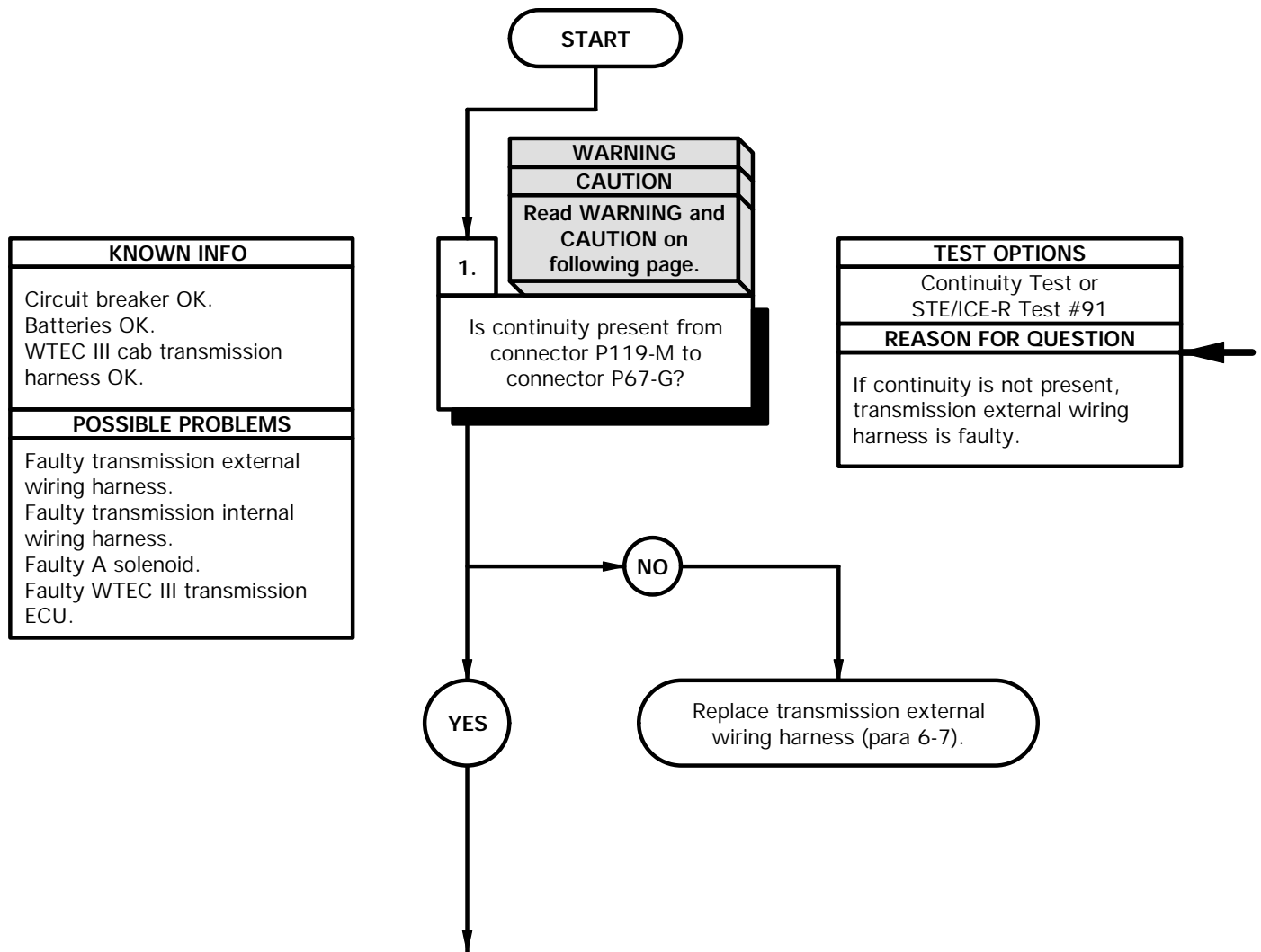
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Scket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

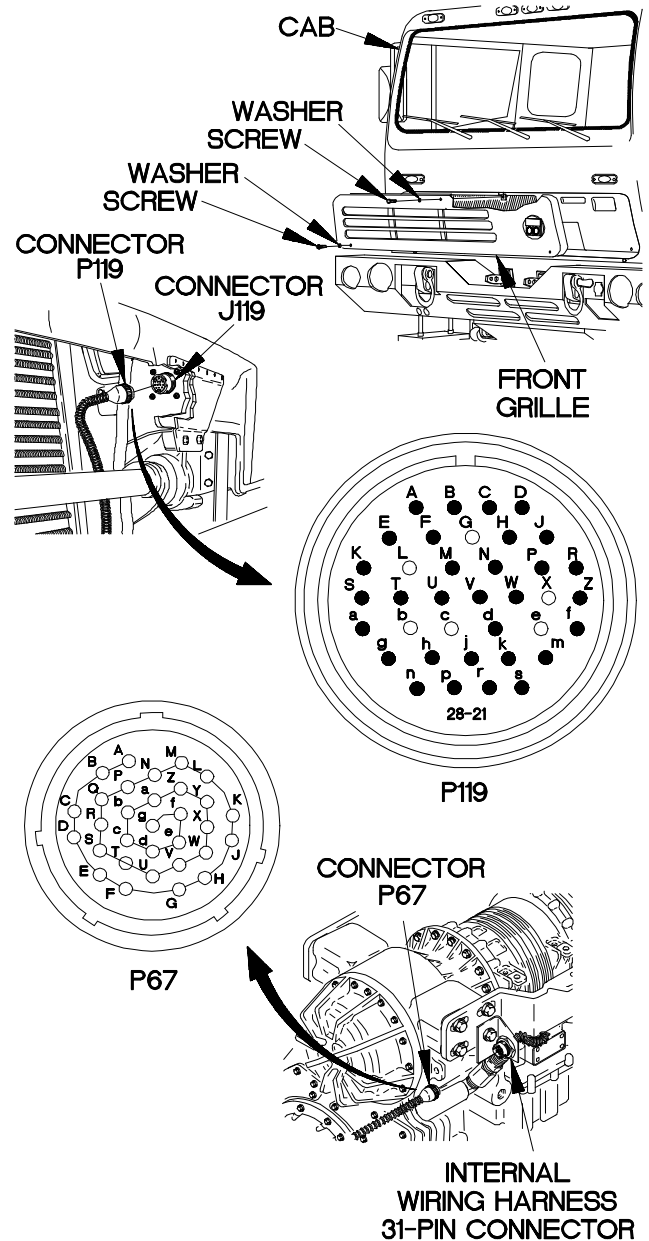
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect connector P67 from internal wiring harness 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-M.
- (8) Connect negative (-) probe of multimeter to connector P67-G and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-M.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

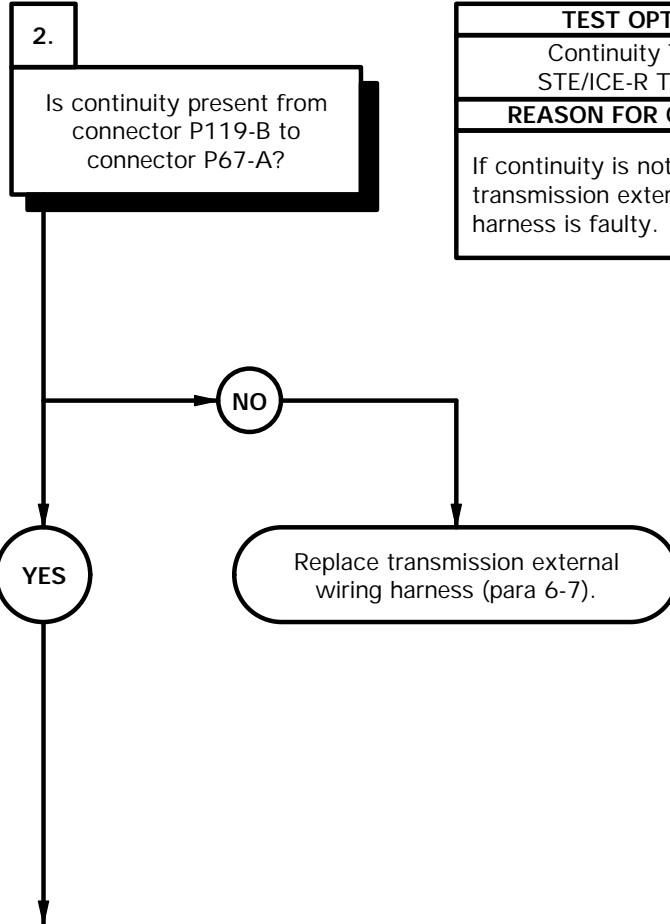
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



Y6c5501b

c55. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 12 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

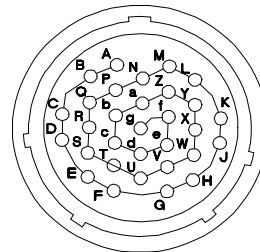
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty A solenoid. Faulty WTEC III transmission ECU.



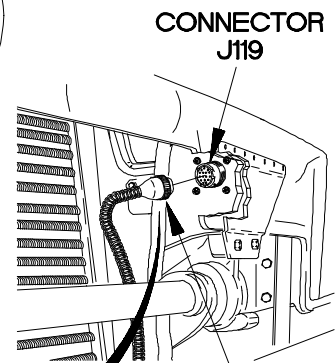
TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-B.
- (3) Connect negative (-) probe of multimeter connector P67-A and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-B.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).

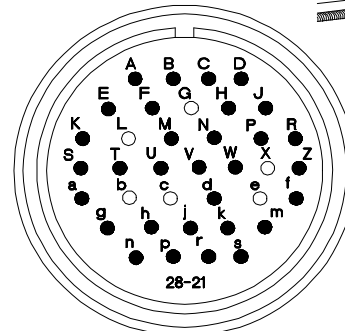


P67

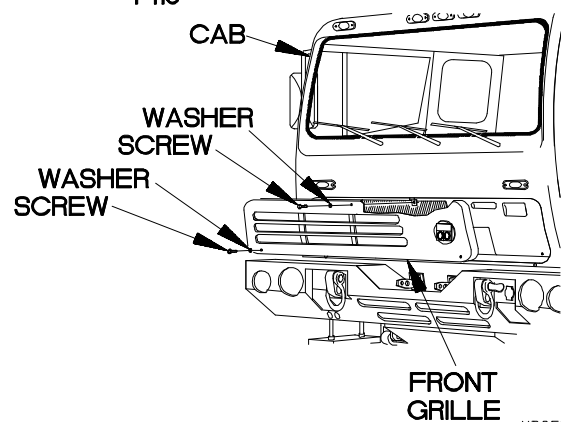


CONNECTOR J119

CONNECTOR P119



P119



YBC5502B

c55. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 12 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

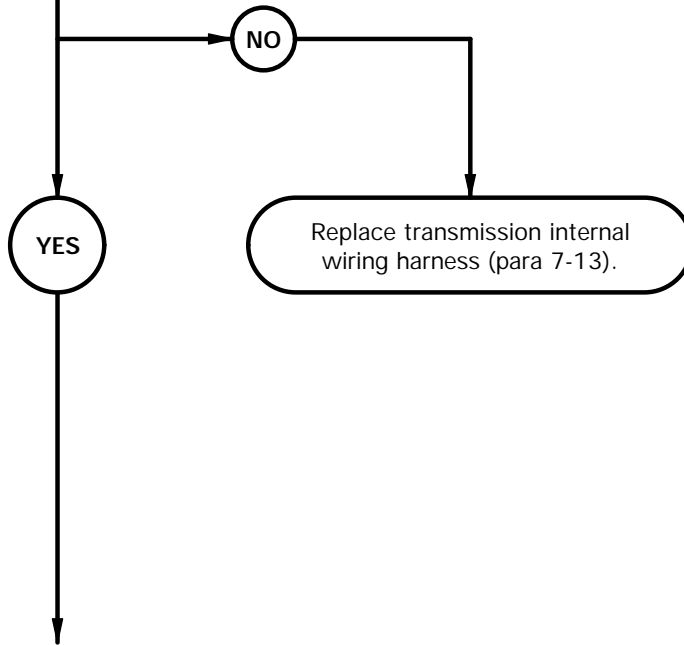
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty A solenoid. Faulty WTEC III transmission ECU.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin G to internal wiring harness connector A pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

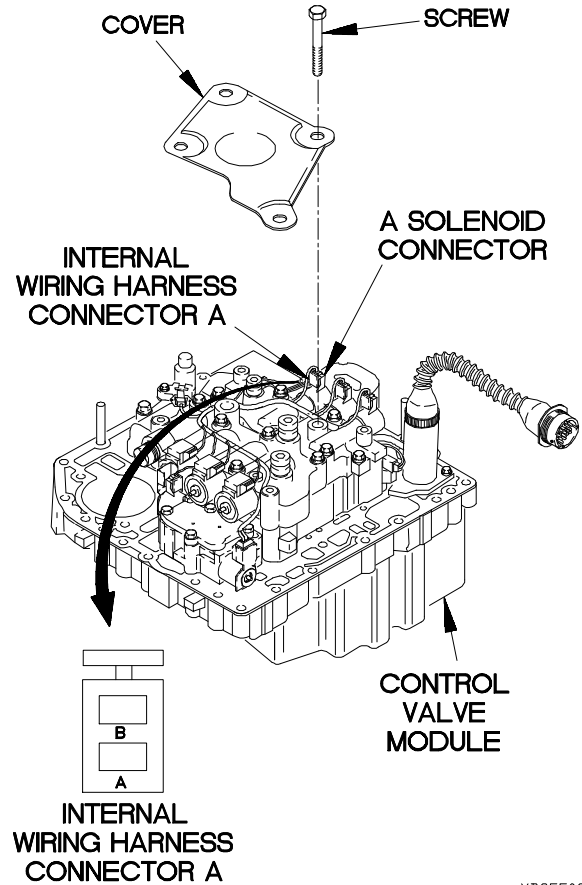


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector A from A solenoid.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin G.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector A pin B and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin G.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



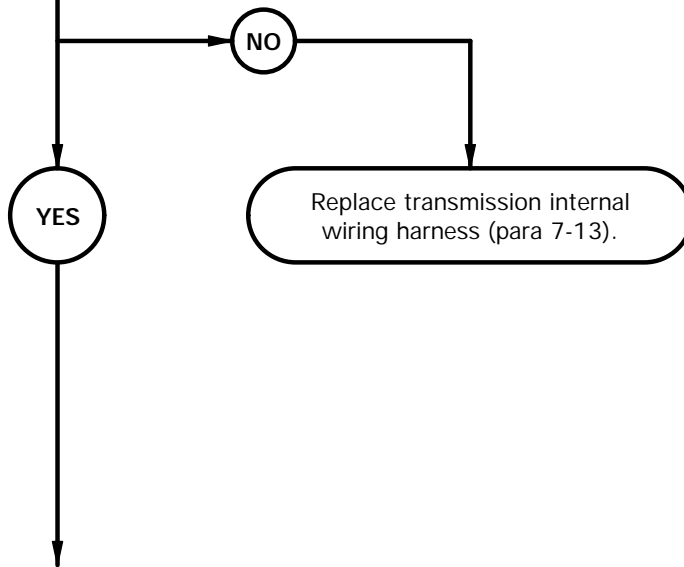
YBC5503B

c55. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 12 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty A solenoid. Faulty WTEC III transmission ECU.

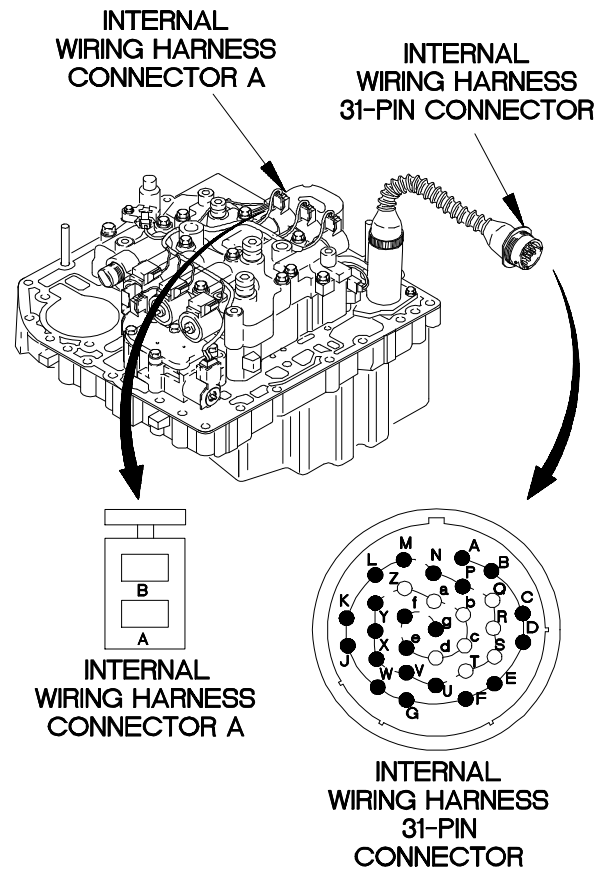
4.
Is continuity present from internal wiring harness 31-pin connector pin A to internal wiring harness connector A pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin A.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector A pin A and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin A.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



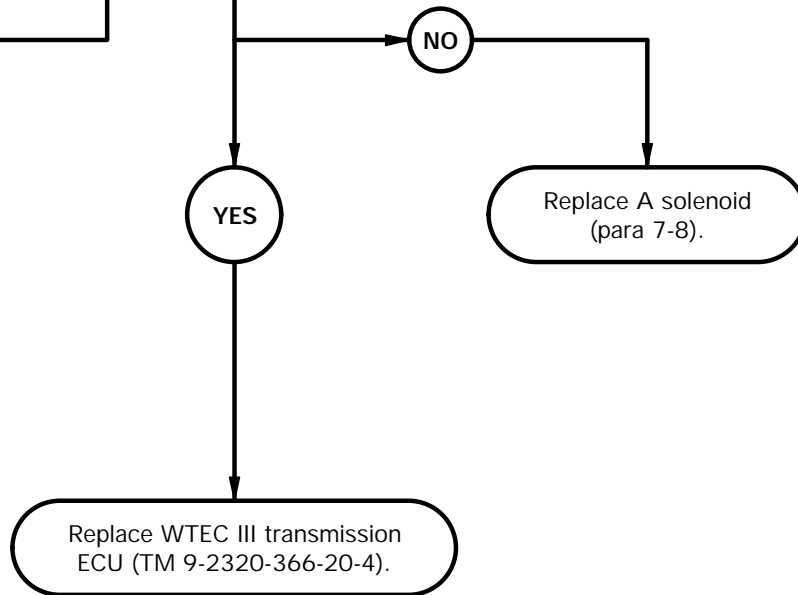
YBC5504B

c55. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 12 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty A solenoid. Faulty WTEC III transmission ECU.

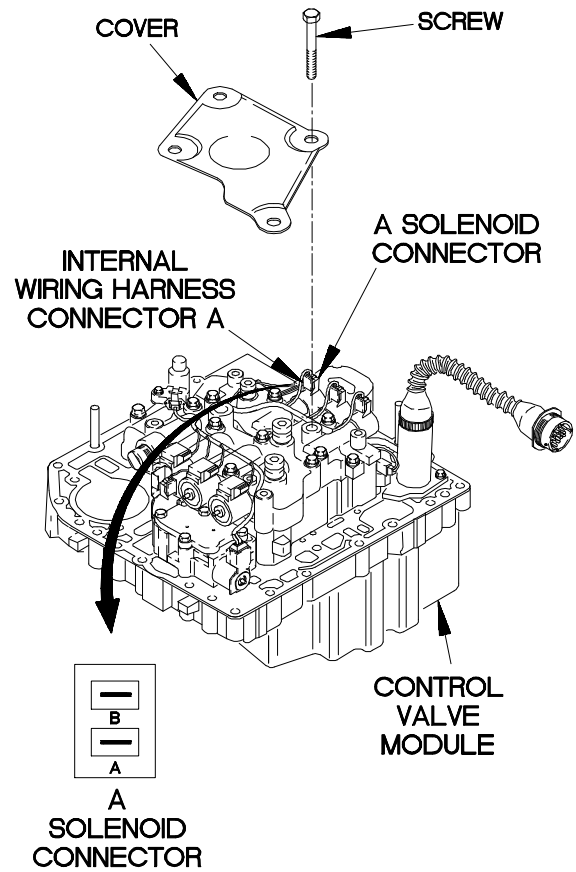
5.
Is 2.5-5.0 ohms resistance present from A solenoid pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, A solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC III transmission ECU is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of A solenoid connector.
- (3) Connect negative (-) probe of multimeter to pin B of A solenoid connector and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace A solenoid (para 7-8).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC III transmission ECU (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector A to A solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC5505B

c56. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

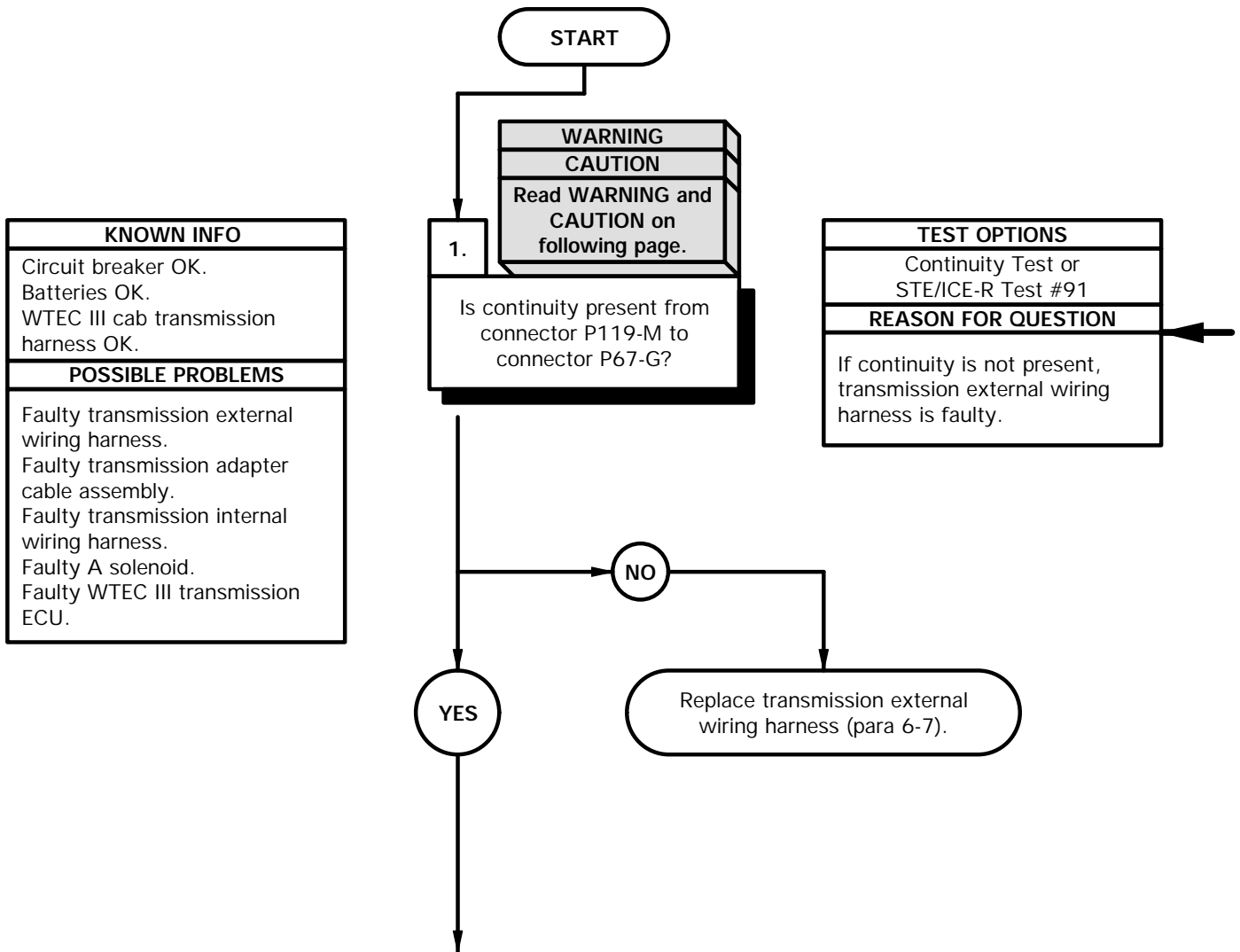
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

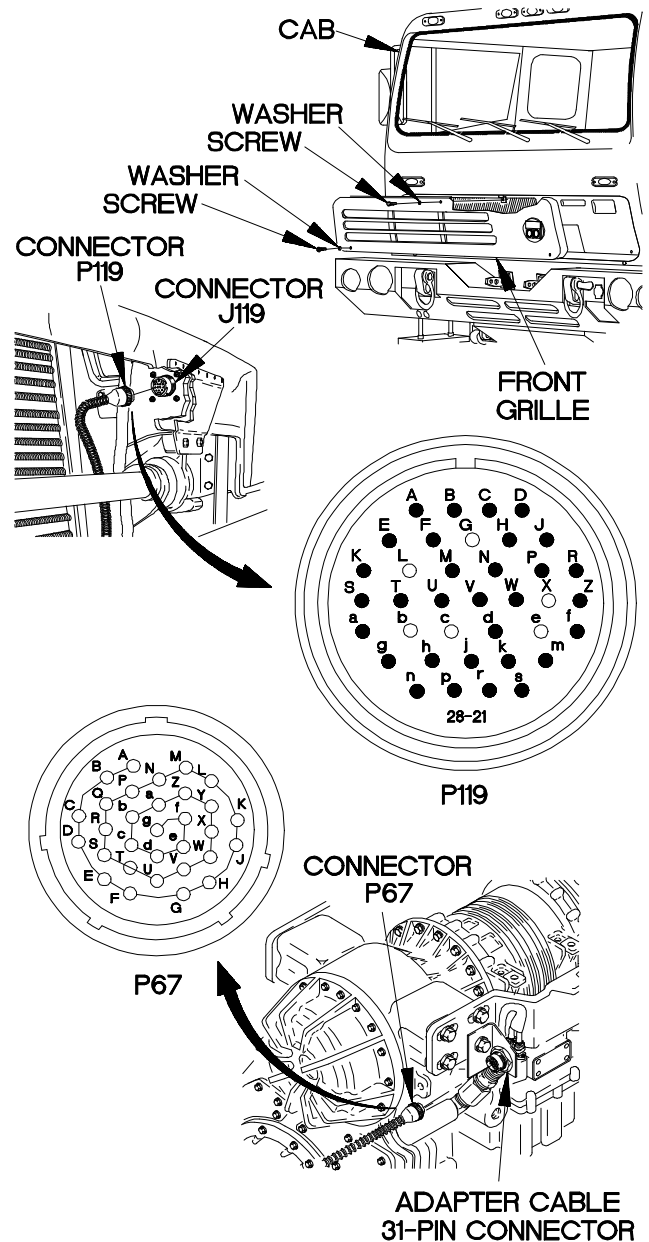
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect connector P67 from adapter cable 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-M.
- (8) Connect negative (-) probe of multimeter to connector P67-G and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-M.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

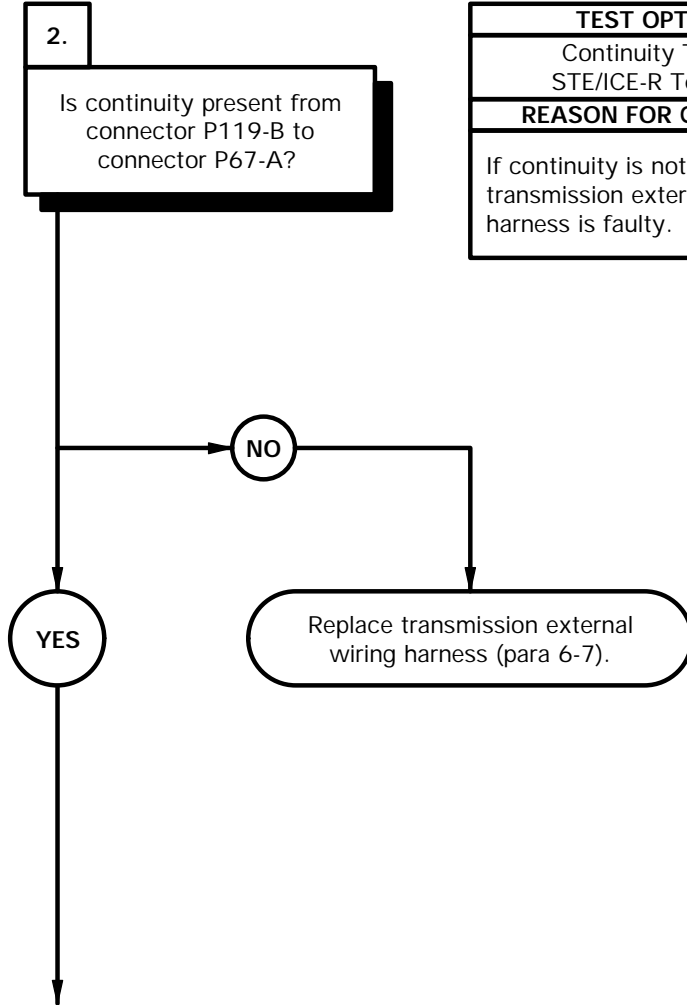
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



YBC5601B

c56. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

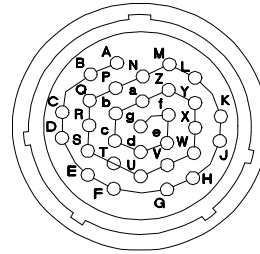
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty A solenoid. Faulty WTEC III transmission ECU.



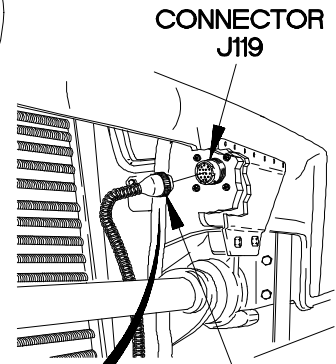
TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-B.
- (3) Connect negative (-) probe of multimeter to connector P67-A and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-B.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).

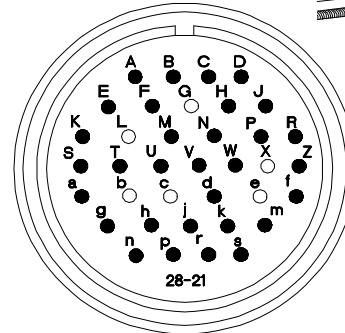


P67

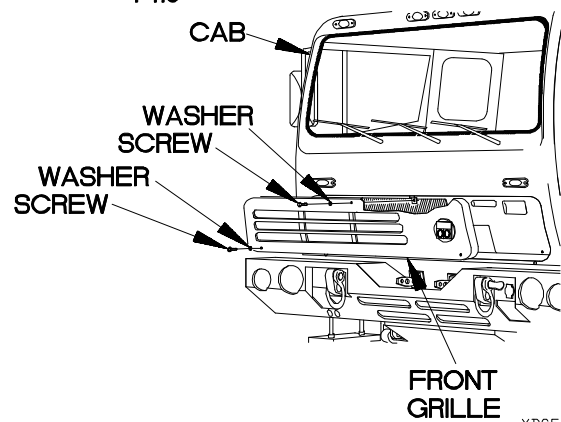


CONNECTOR J119

CONNECTOR P119



P119



c56. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

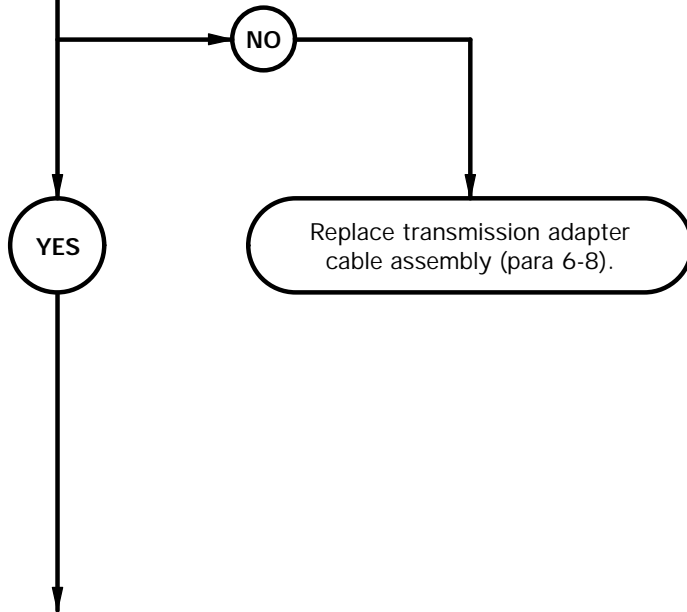
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty A solenoid. Faulty WTEC III transmission ECU.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin G to adapter cable 24-pin connector pin A1?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.

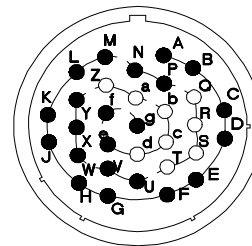


CAUTION

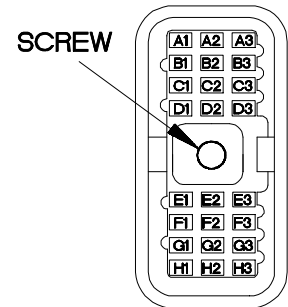
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

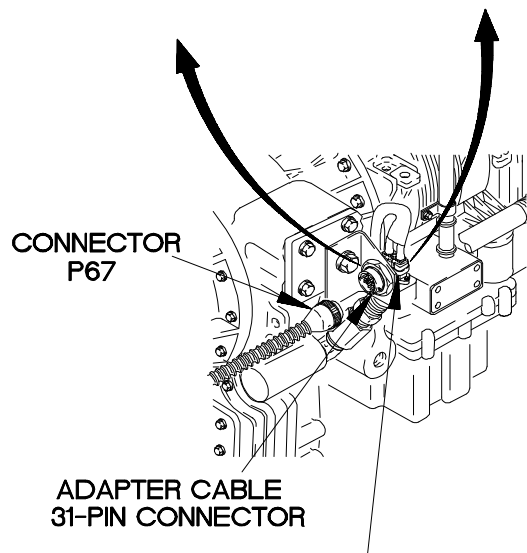
- (1) Loosen screw in adapter cable 24-pin connector.
- (2) Disconnect adapter cable 24-pin connector from internal wiring harness 24-pin connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to adapter cable 31-pin harness connector pin G.
- (5) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin A1 and note reading on multimeter.
- (6) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (7) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin G.
- (8) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).



**ADAPTER CABLE
31-PIN CONNECTOR**



**ADAPTER CABLE
24-PIN
CONNECTOR**



**ADAPTER CABLE
31-PIN CONNECTOR**

**ADAPTER CABLE
24-PIN CONNECTOR**

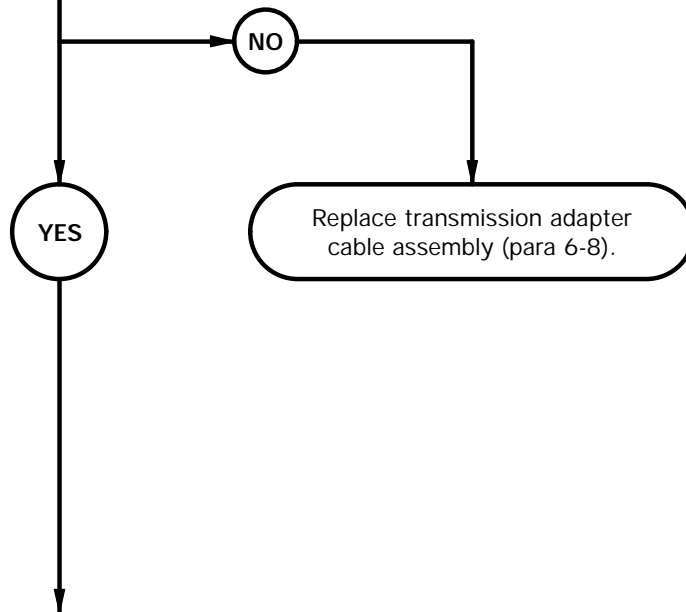
Ykc5603b

c56. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty A solenoid. Faulty WTEC III transmission ECU.

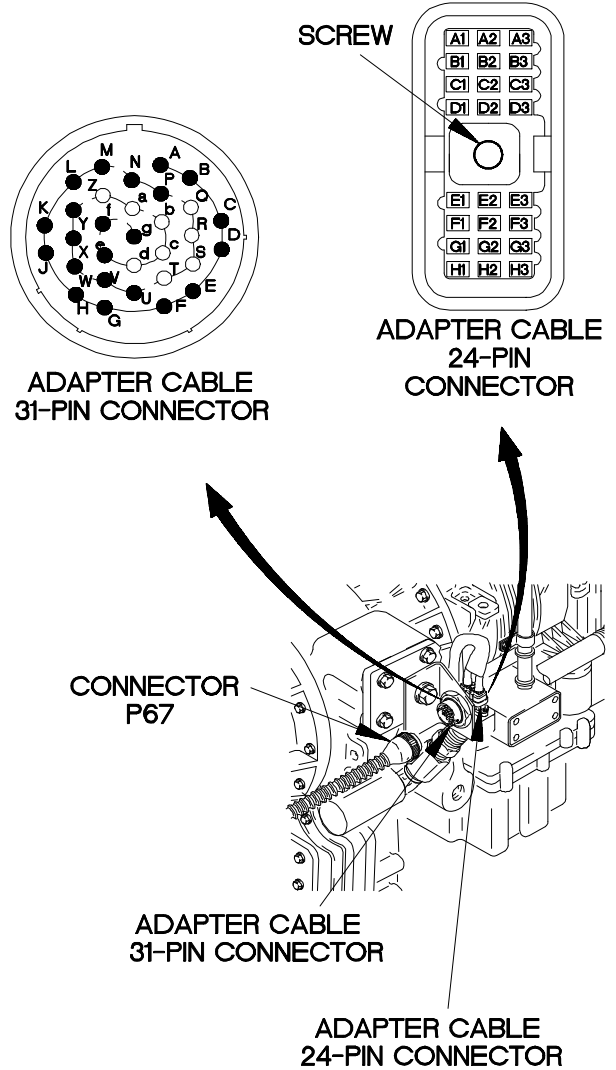
4.
Is continuity present from adapter cable 31-pin connector pin A to adapter cable 24-pin connector pin A2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin A.
- (3) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin A2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (5) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin A.
- (6) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).
- (9) Connect connector P67 to adapter cable 31-pin connector.



Ybc5604b

c56. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

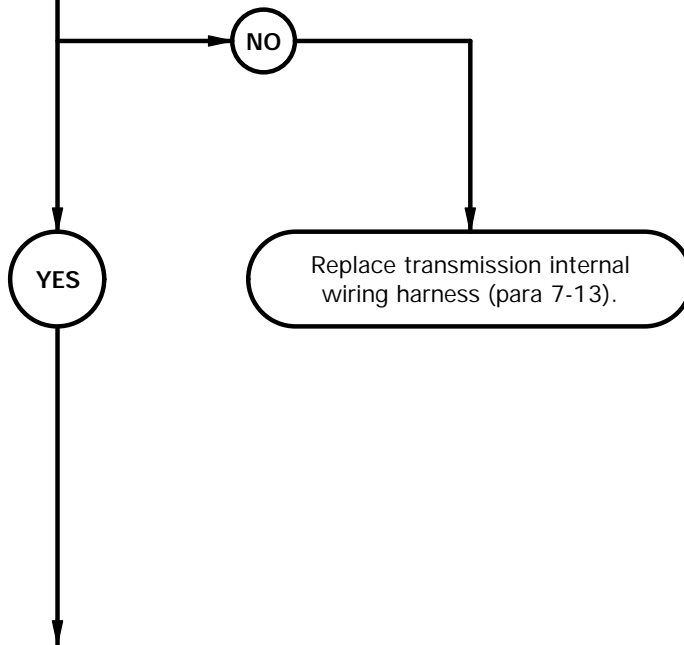
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty A solenoid. Faulty WTEC III transmission ECU.

5.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin A1 to internal wiring harness connector A pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

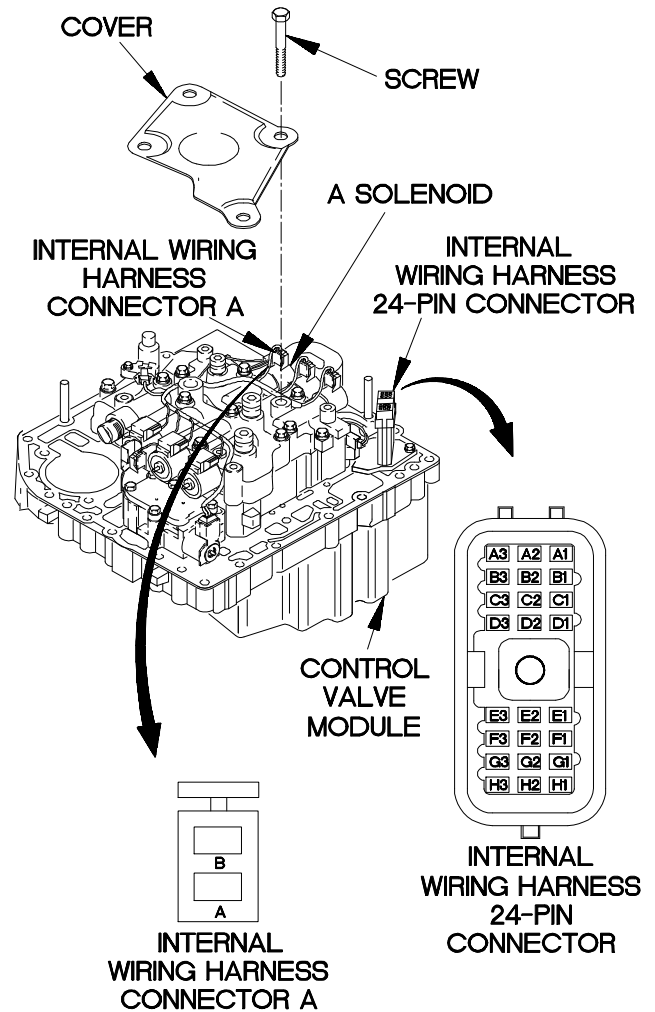


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector A from A solenoid.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin A1.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector A pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin A1.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector, except pins A2, D1, and H1, and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



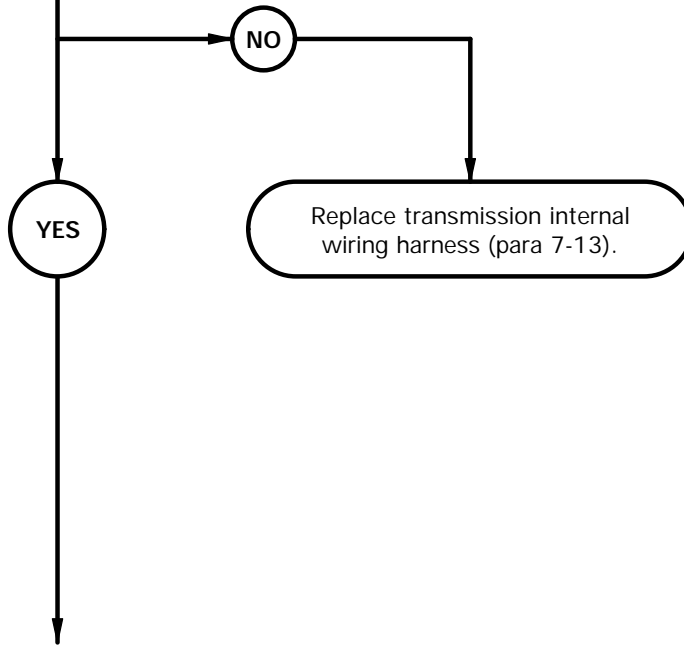
YBC5605B

c56. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty A solenoid. Faulty WTEC III transmission ECU.

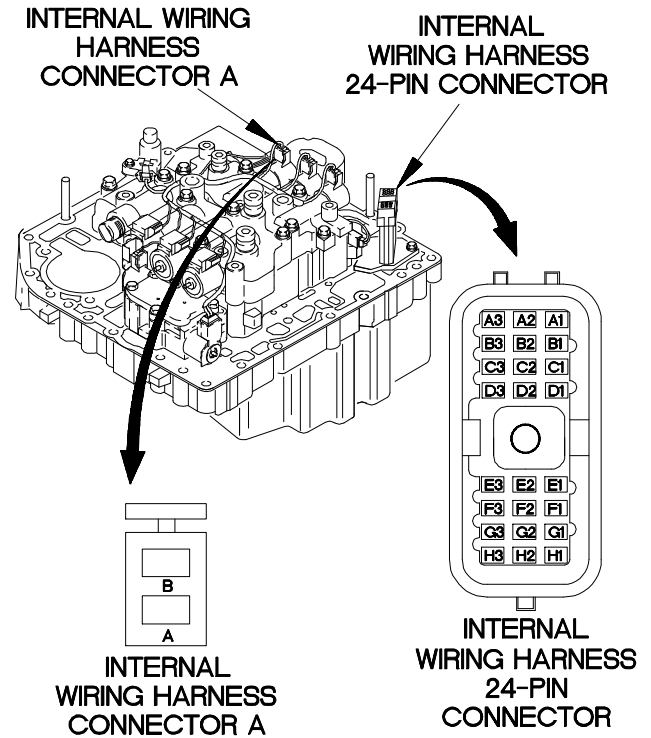
6.
 Is continuity present from internal wiring harness 24-pin connector pin A2 to internal wiring harness connector A pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin A2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector A pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin A2.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector, except pins D1 and H1, and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



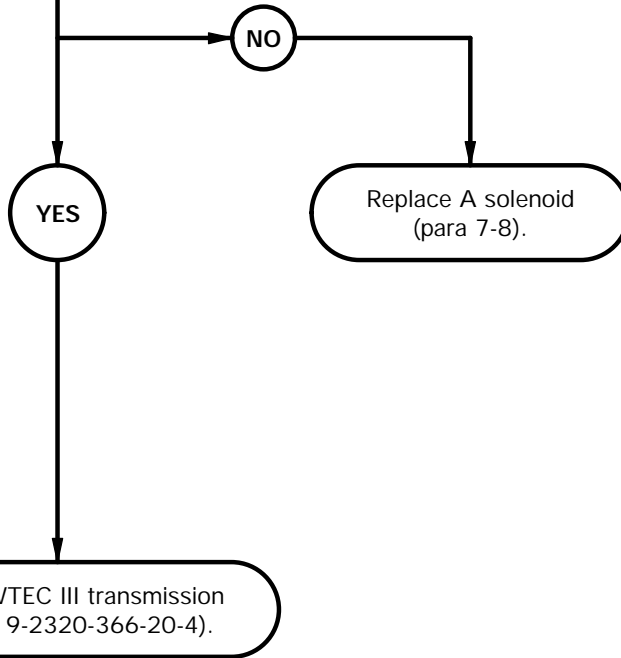
YBC5606B

c56. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty A solenoid. Faulty WTEC III transmission ECU.

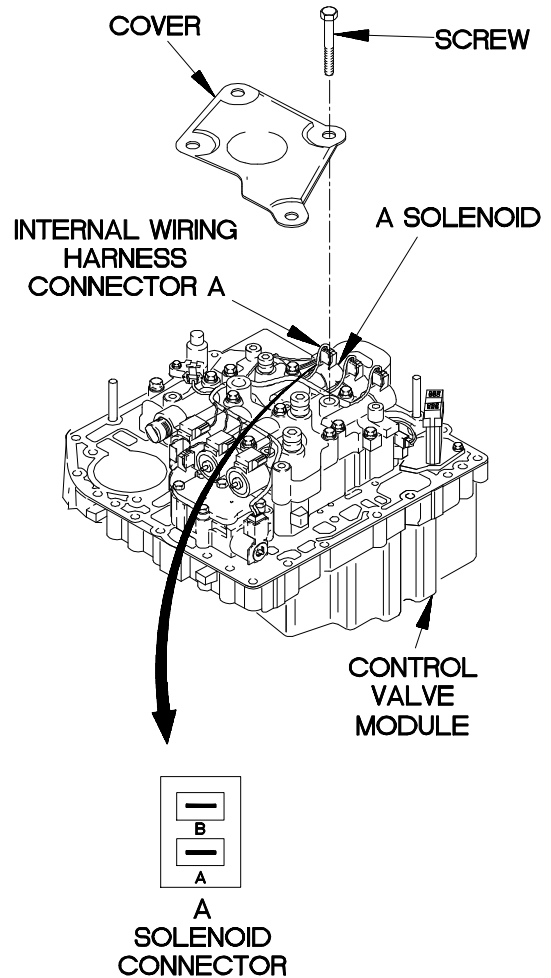
7.
 Is 2.5-5.0 ohms resistance present from A solenoid pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, A solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC III transmission ECU is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of A solenoid connector.
- (3) Connect negative (-) probe of multimeter to pin B of A solenoid connector and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace A solenoid (para 7-8).
- (5) If resistance is between 2.5 and 5.0 ohms, replace WTEC III transmission ECU (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector A to A solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC5607B

c57. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 13 (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

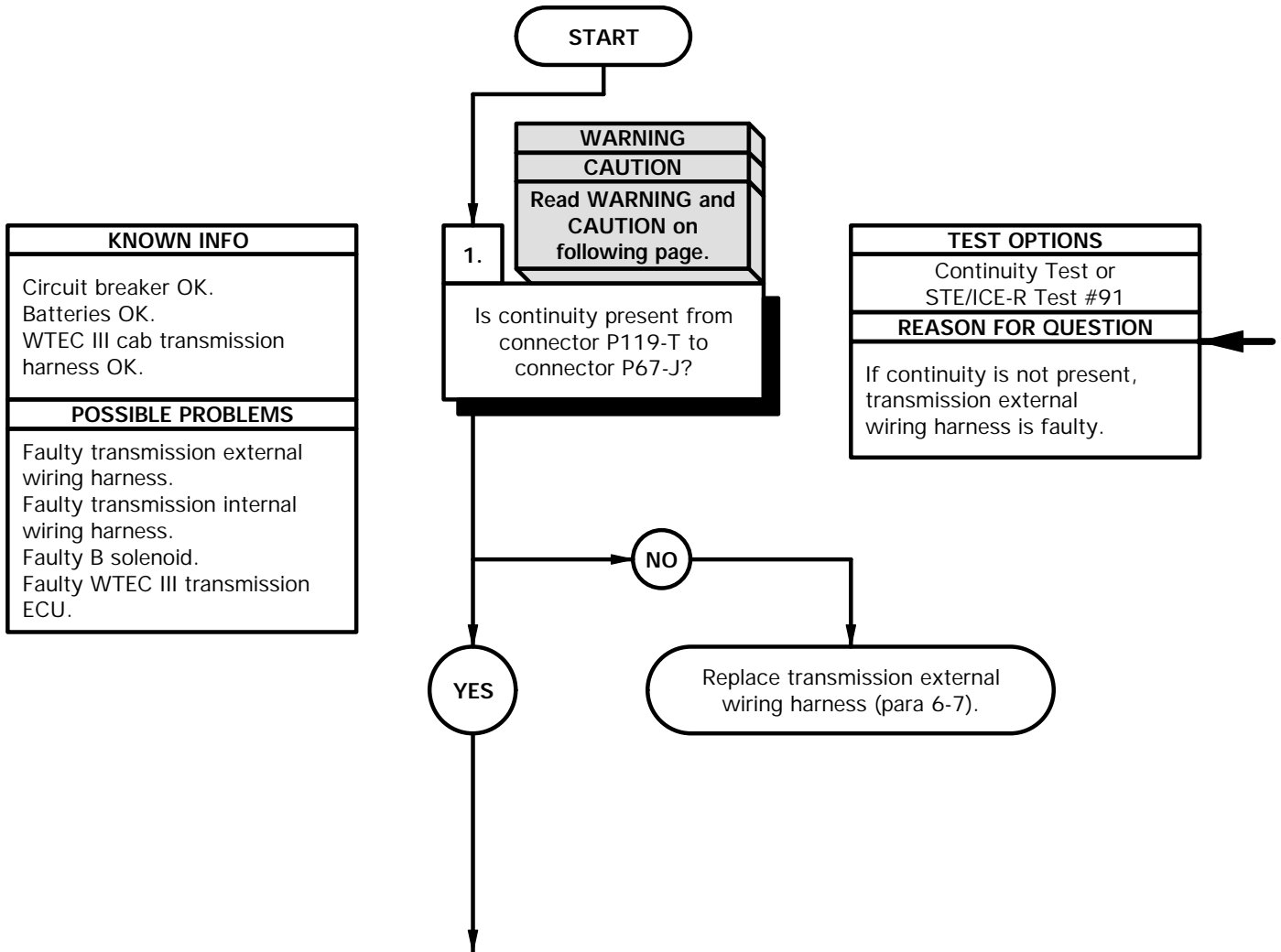
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

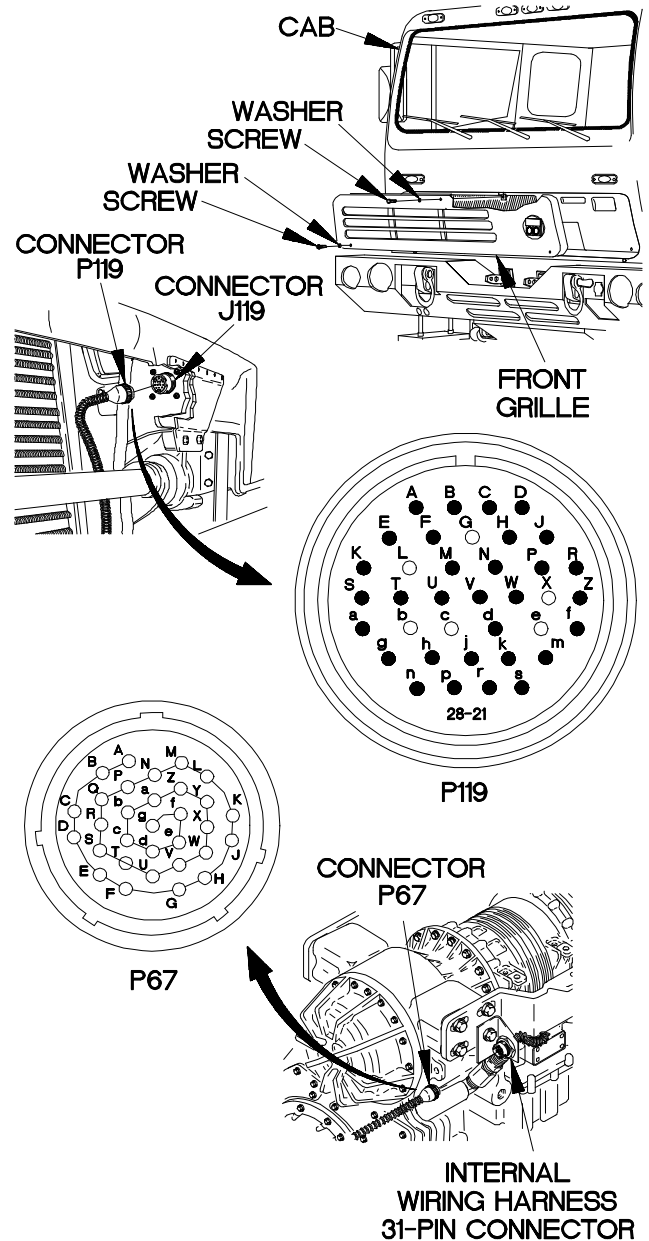
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness connector P67 from internal wiring harness 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-T.
- (8) Connect negative (-) probe of multimeter to connector P67-J and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-T.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

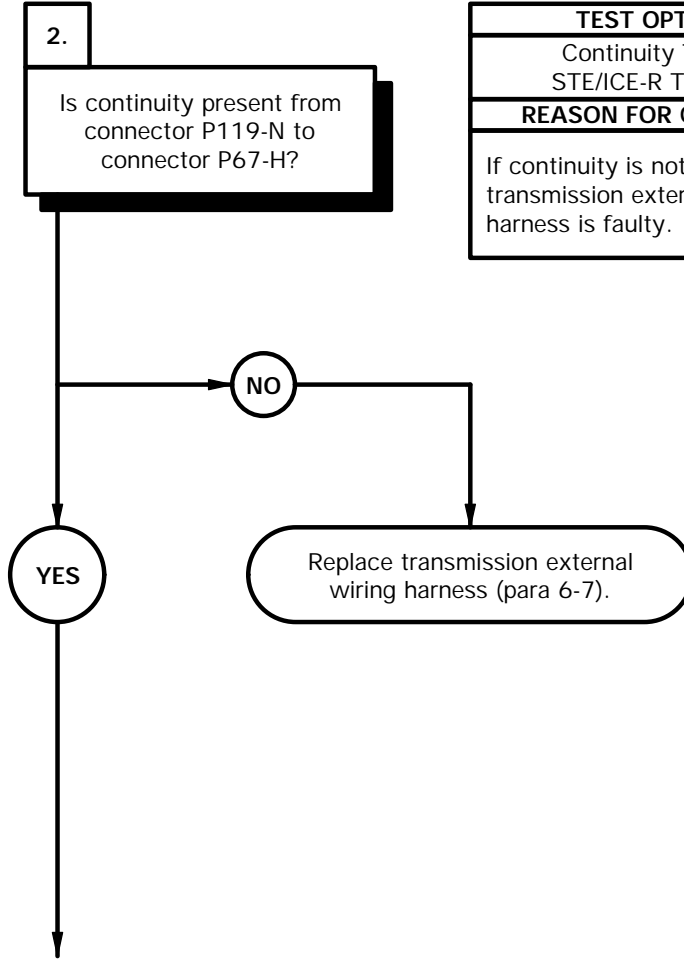
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



YBC5701B

c57. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 13 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

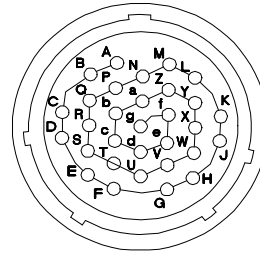
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty B solenoid. Faulty WTEC III transmission ECU.



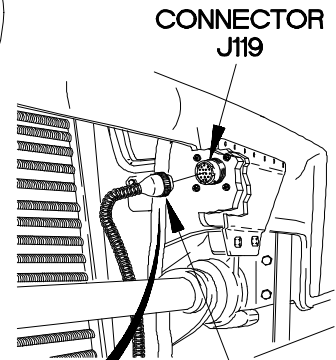
TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

CONTINUITY TEST

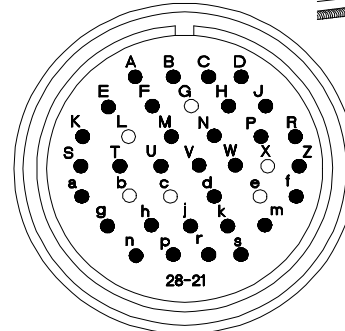
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-N.
- (3) Connect negative (-) probe of multimeter to connector P67-H and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-N.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



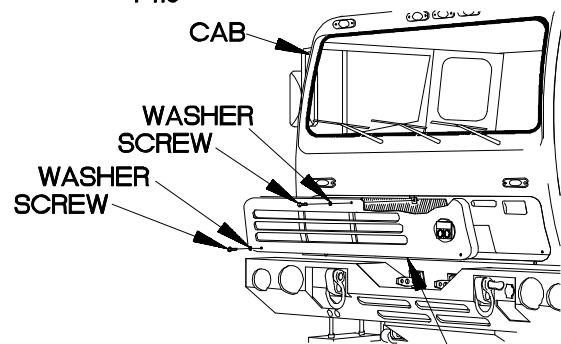
P67



CONNECTOR J119



P119



FRONT GRILLE

YBC5702B

c57. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 13 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

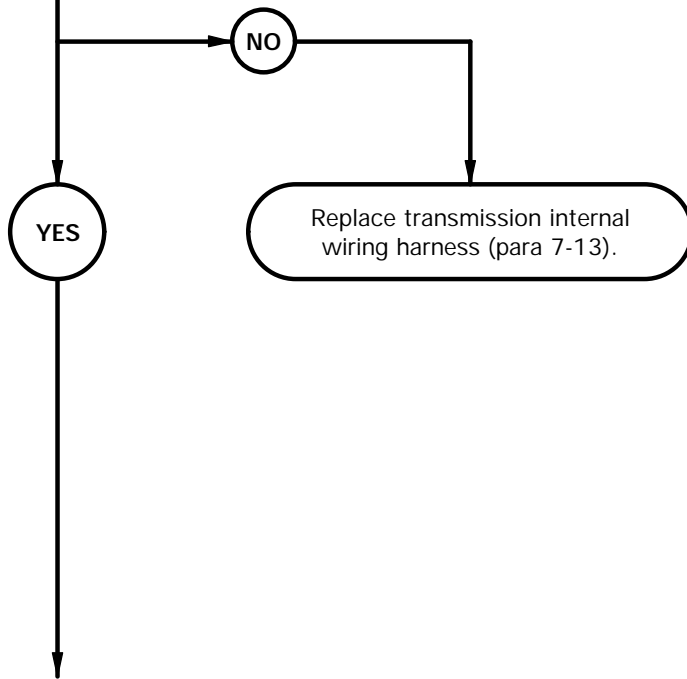
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty B solenoid. Faulty WTEC III transmission ECU.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring 31-pin connector pin J to internal wiring harness connector B pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

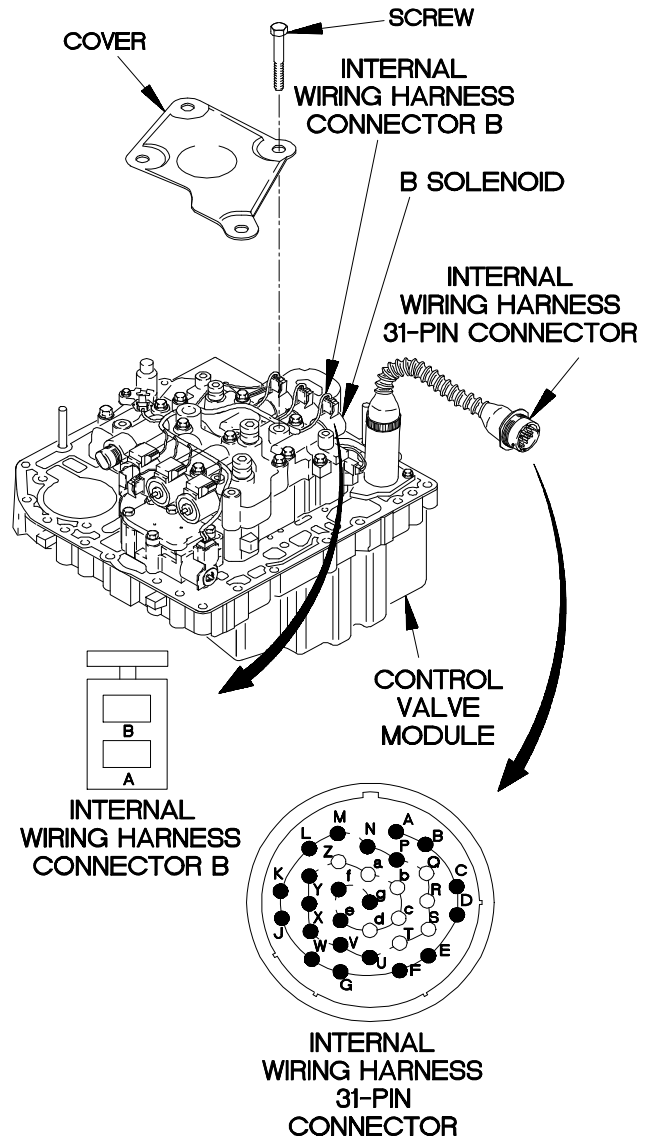


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector B from B solenoid.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin J.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector B pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin J.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (10) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



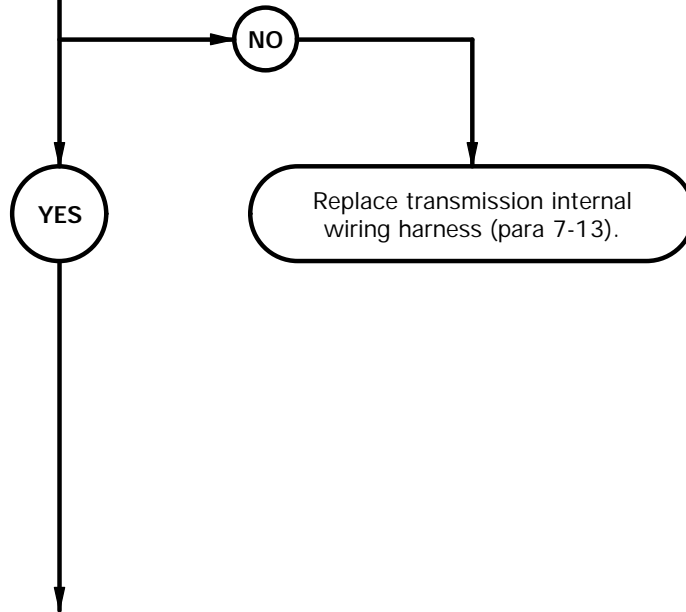
YBC5703B

c57. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 13 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty B solenoid. Faulty WTEC III transmission ECU.

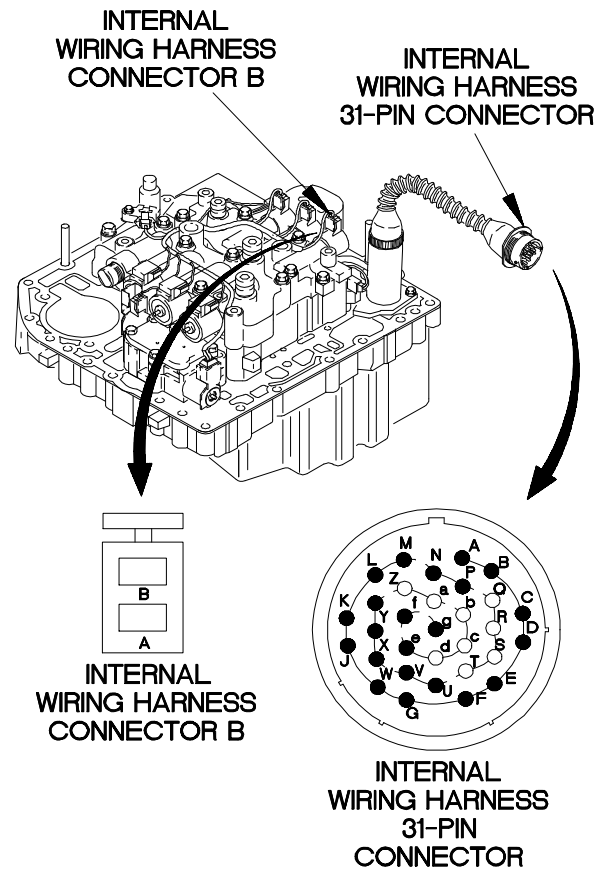
4.
Is continuity present from internal wiring harness 31-pin connector pin H to internal wiring harness connector B pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin H.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector B pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin H.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



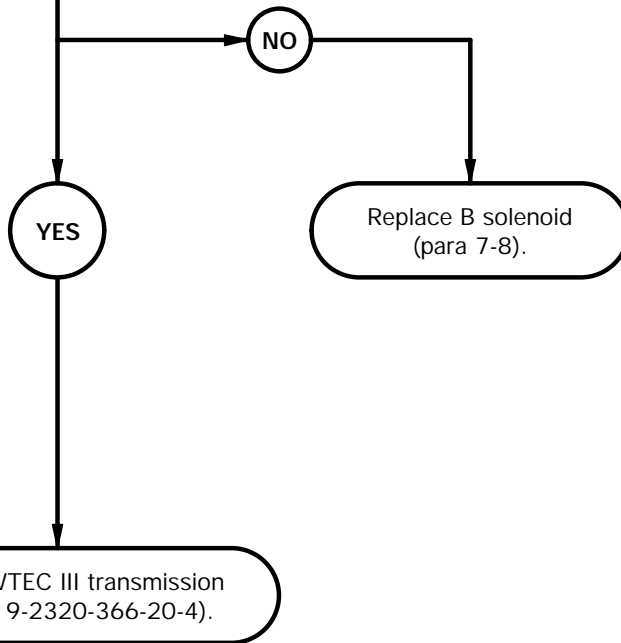
YBC5704B

c57. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 13 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty B solenoid. Faulty WTEC III transmission ECU.

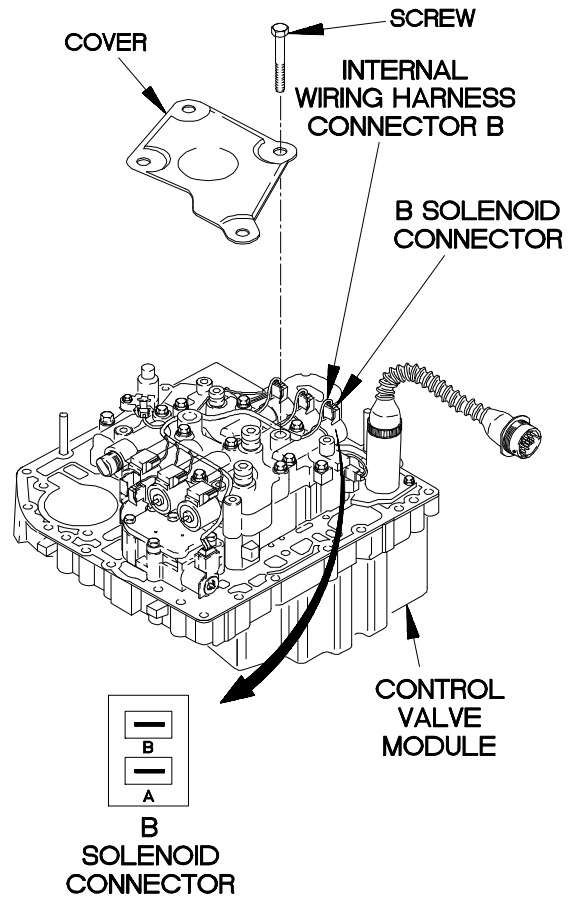
5.
Is 2.5-5.0 ohms resistance present from B solenoid pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, B solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC III transmission ECU is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of B solenoid connector.
- (3) Connect negative (-) probe of multimeter to pin B of B solenoid connector and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace B solenoid (para 7-11).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC III transmission ECU (TM 9-2320-366-20-4).
- (6) Connect transmission internal wiring harness connector B to B solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC5705B

c58. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

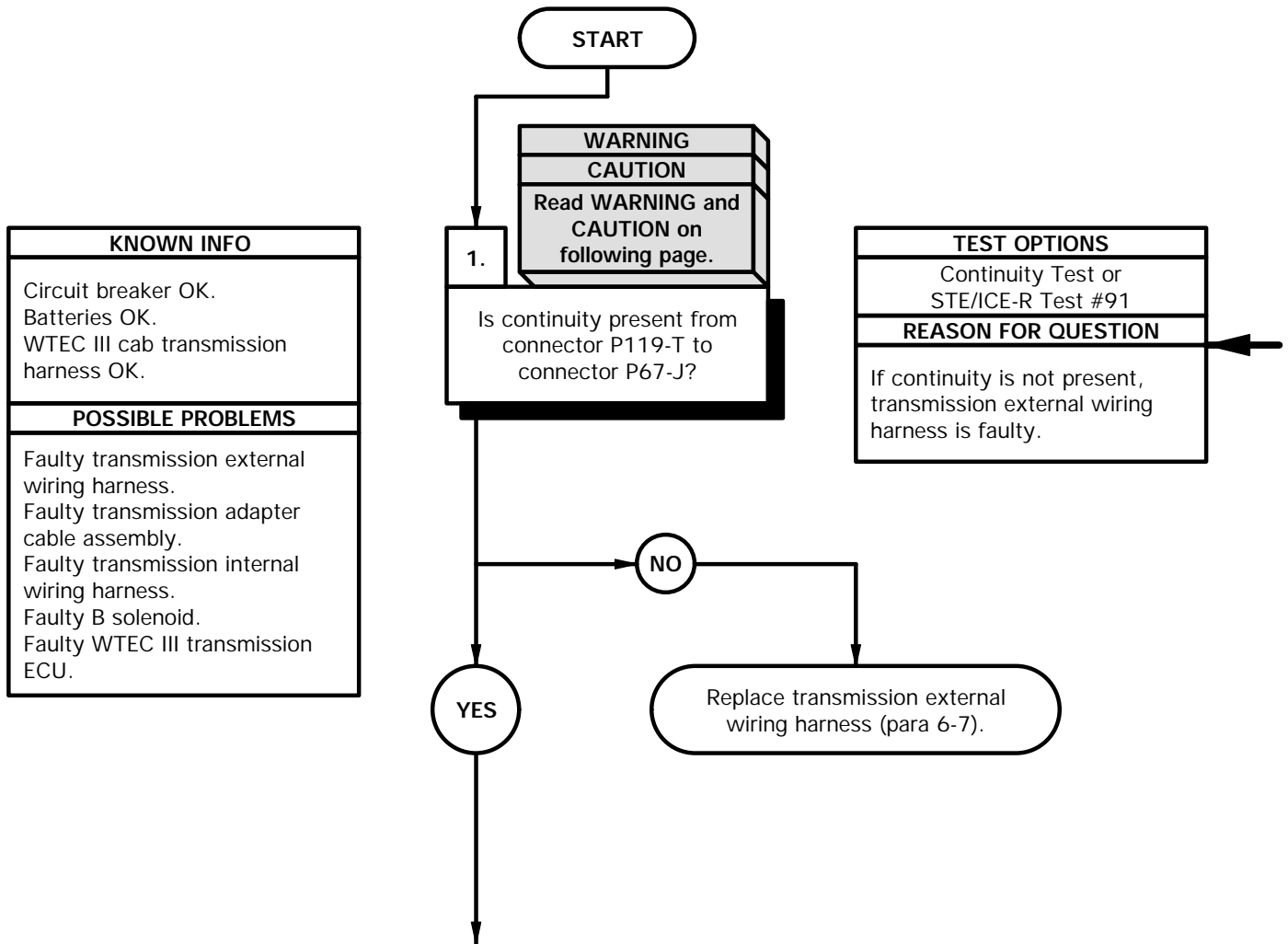
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

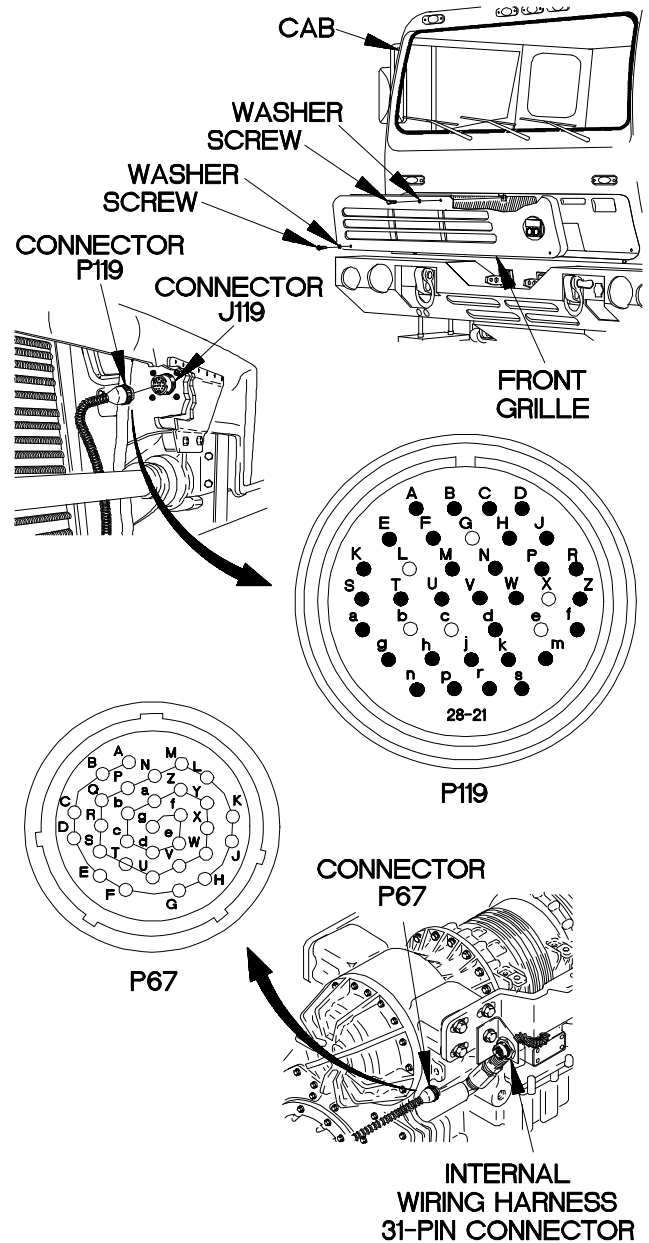
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect connector P67 from adapter cable to 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-T.
- (8) Connect negative (-) probe of multimeter to connector P67-J and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-T.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



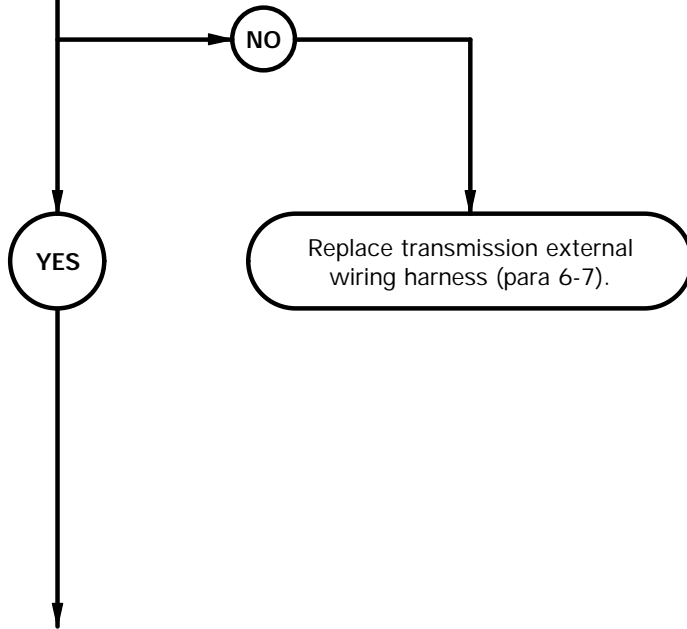
Y6c5801b

c58. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty B solenoid. Faulty WTEC III transmission ECU.

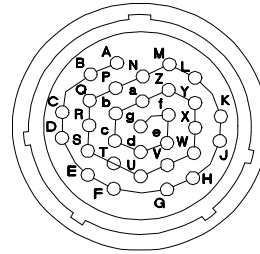
2.
Is continuity present from connector P119-N to connector P67-H?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

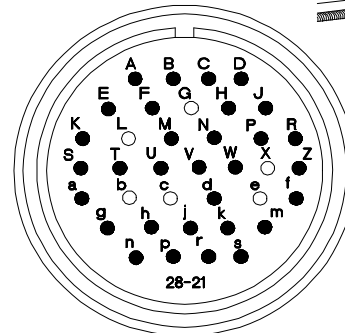
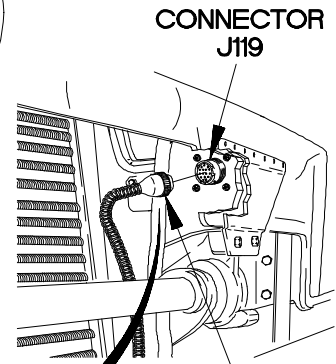


CONTINUITY TEST

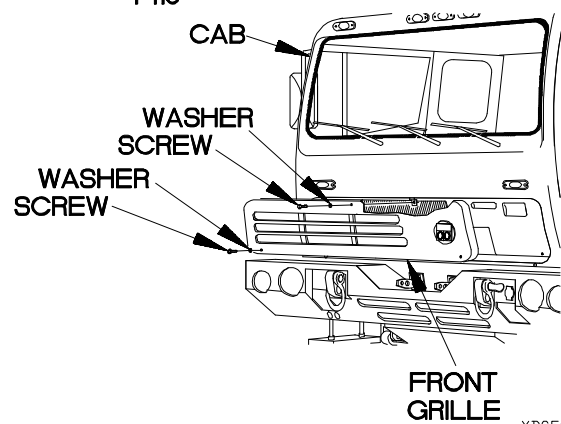
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-N.
- (3) Connect negative (-) probe of multimeter to connector P67-H and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-N.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



P67



P119



YBC5802B

c58. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

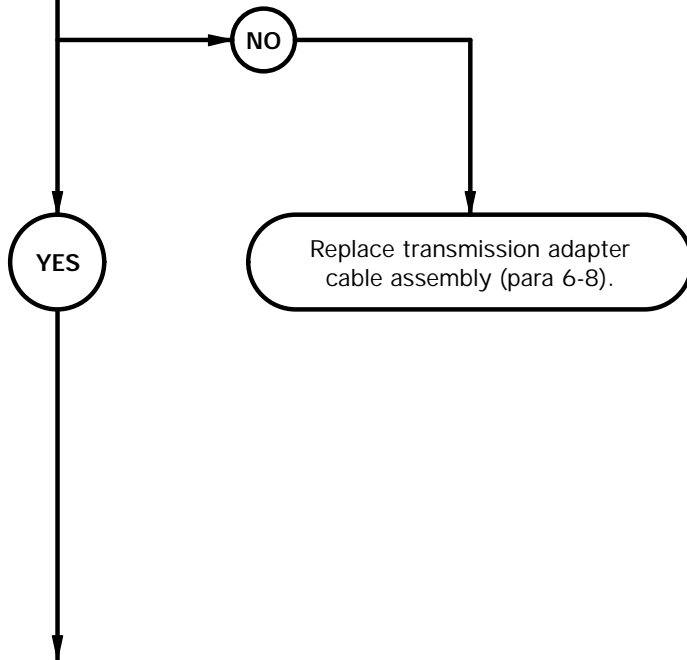
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty B solenoid. Faulty WTEC III transmission ECU.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin J to adapter cable 24-pin connector pin B1?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.

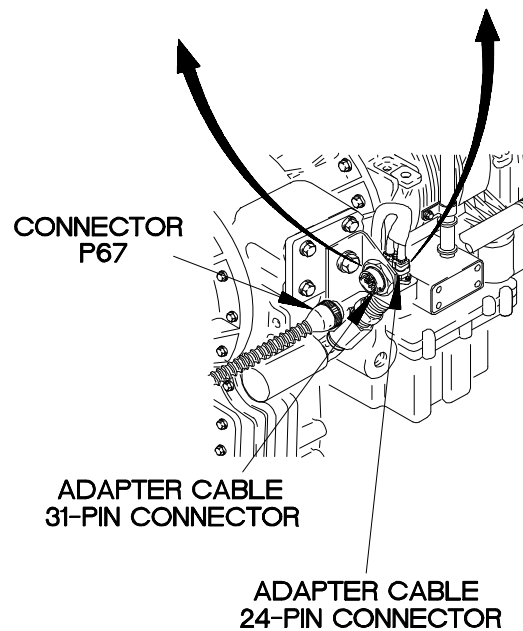
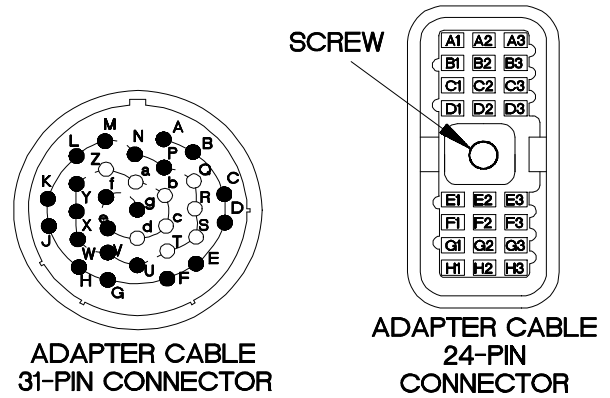


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Loosen screw in adapter cable 24-pin connector.
- (2) Disconnect adapter cable 24-pin connector from internal wiring harness 24-pin connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin J.
- (5) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin B1 and note reading on multimeter.
- (6) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (7) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin J.
- (8) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).



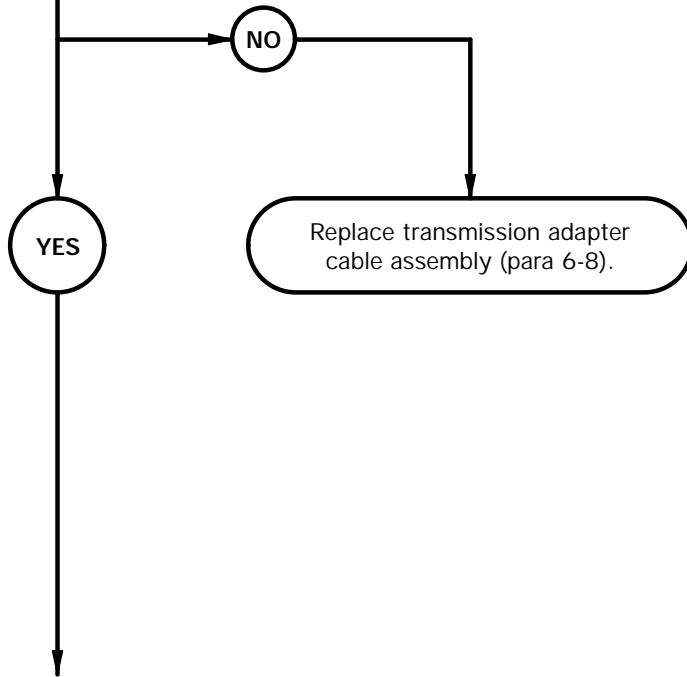
YBC5803B

c58. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty B solenoid. Faulty WTEC III transmission ECU.

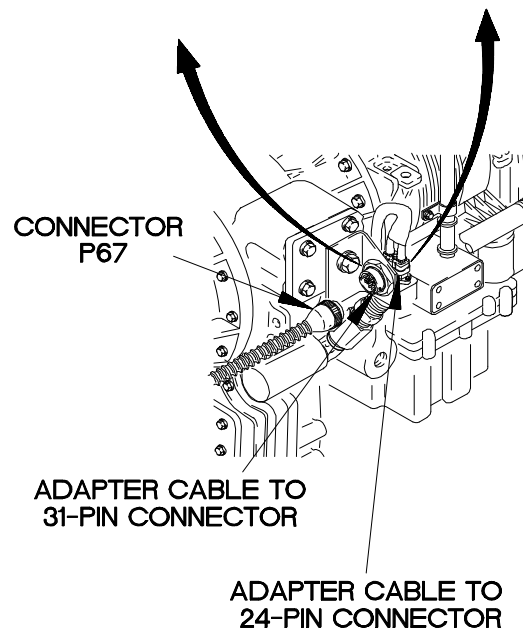
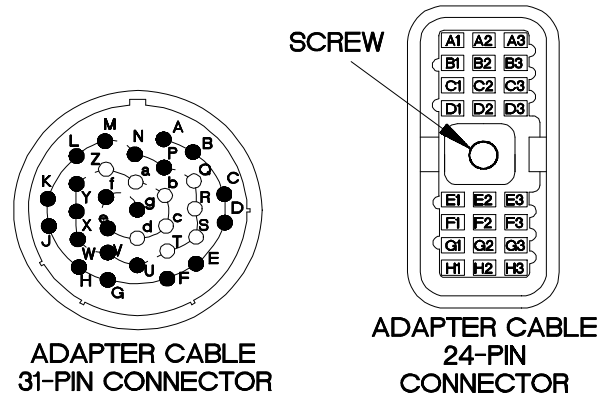
4.
Is continuity present from adapter cable 31-pin connector pin H to adapter cable 24-pin connector pin B2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin H.
- (3) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin B2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (5) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin H.
- (6) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).
- (9) Connect connector P67 to adapter cable 31-pin connector.



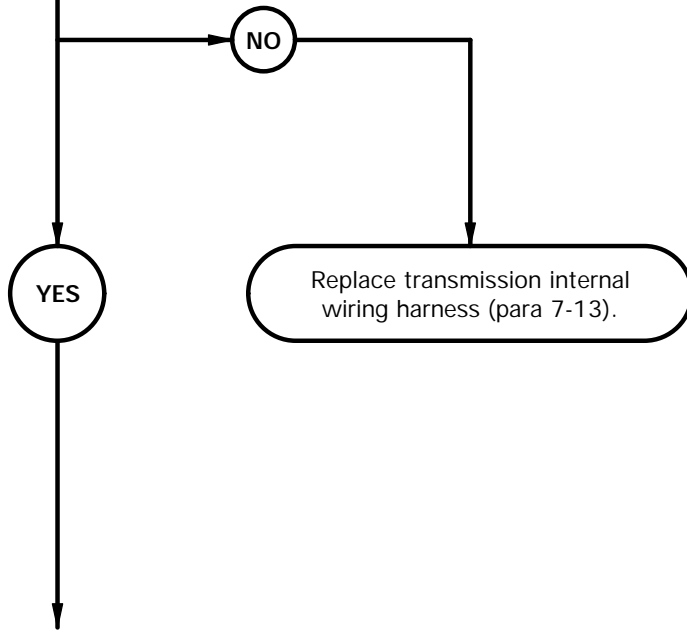
YBC5804B

c58. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty B solenoid. Faulty WTEC III transmission ECU.

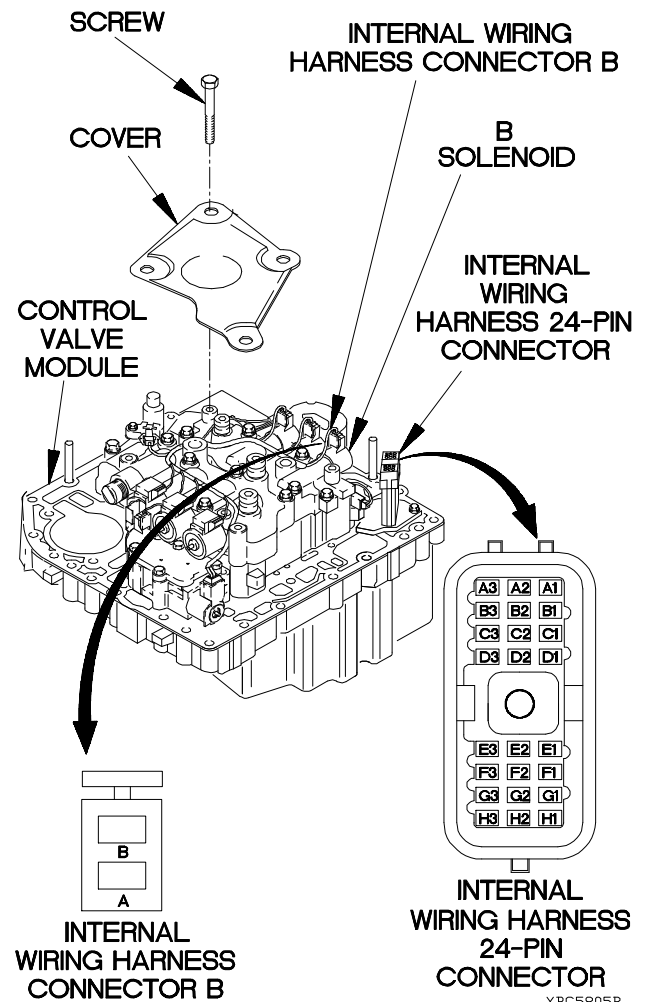
5.
Is continuity present from internal wiring harness 24-pin connector pin B1 to internal wiring harness connector B pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector B from B solenoid.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin B1.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector B pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin B1.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector, except pins B2 and E1, and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



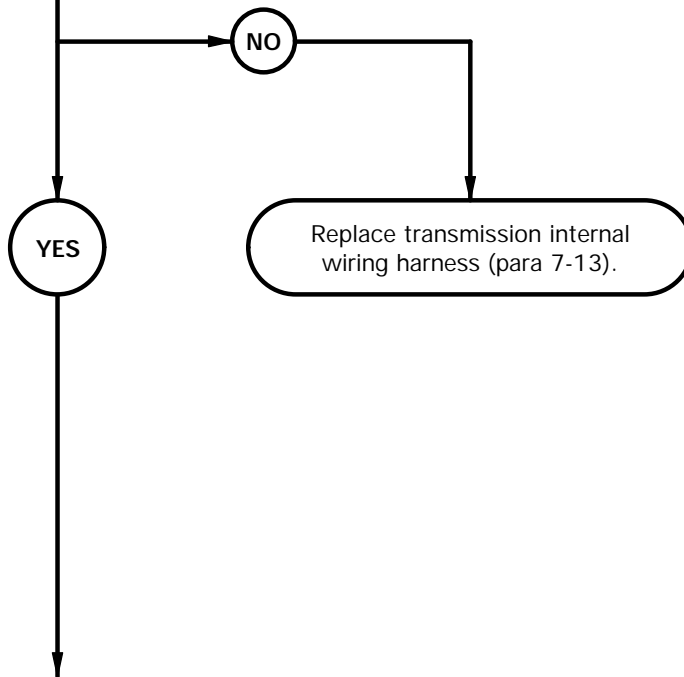
YBC5805B

c58. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty B solenoid. Faulty WTEC III transmission ECU.

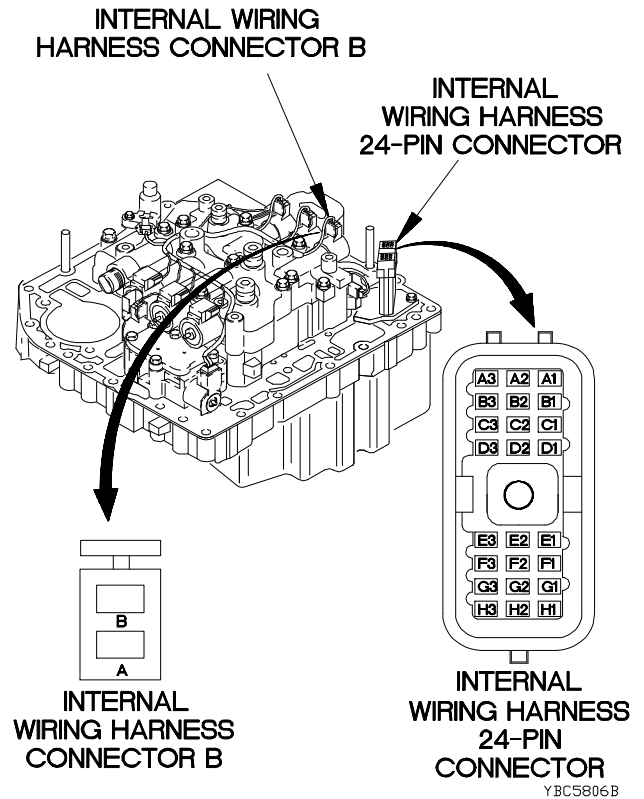
6.
Is continuity present from internal wiring harness 24-pin connector pin B2 to internal wiring harness connector B pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

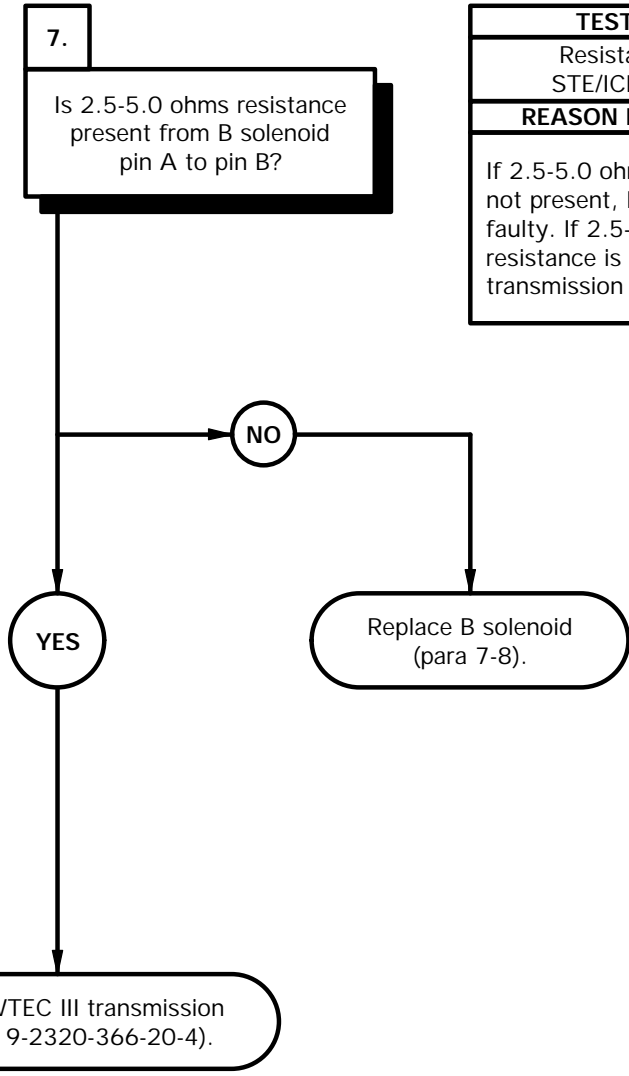
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin B2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector B pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin B2.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector, except pins B1 and E1, and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



c58. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

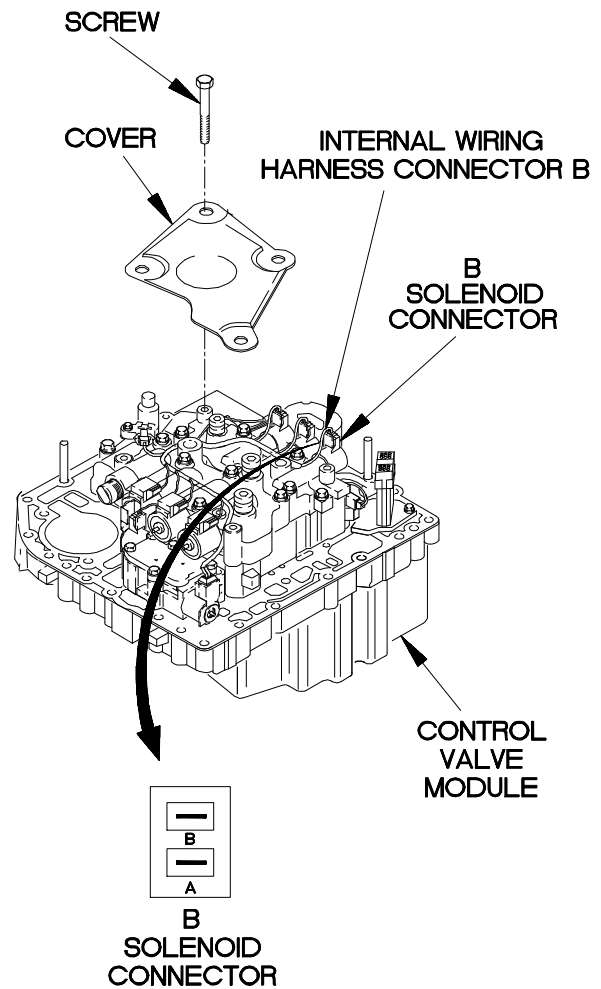
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty B solenoid. Faulty WTEC III transmission ECU.

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, B solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC III transmission ECU is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of B solenoid connector.
- (3) Connect negative (-) probe of multimeter to pin B of B solenoid connector and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace B solenoid (para 7-8).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC III transmission ECU (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector B to B solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC5807B

c59. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 14 (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

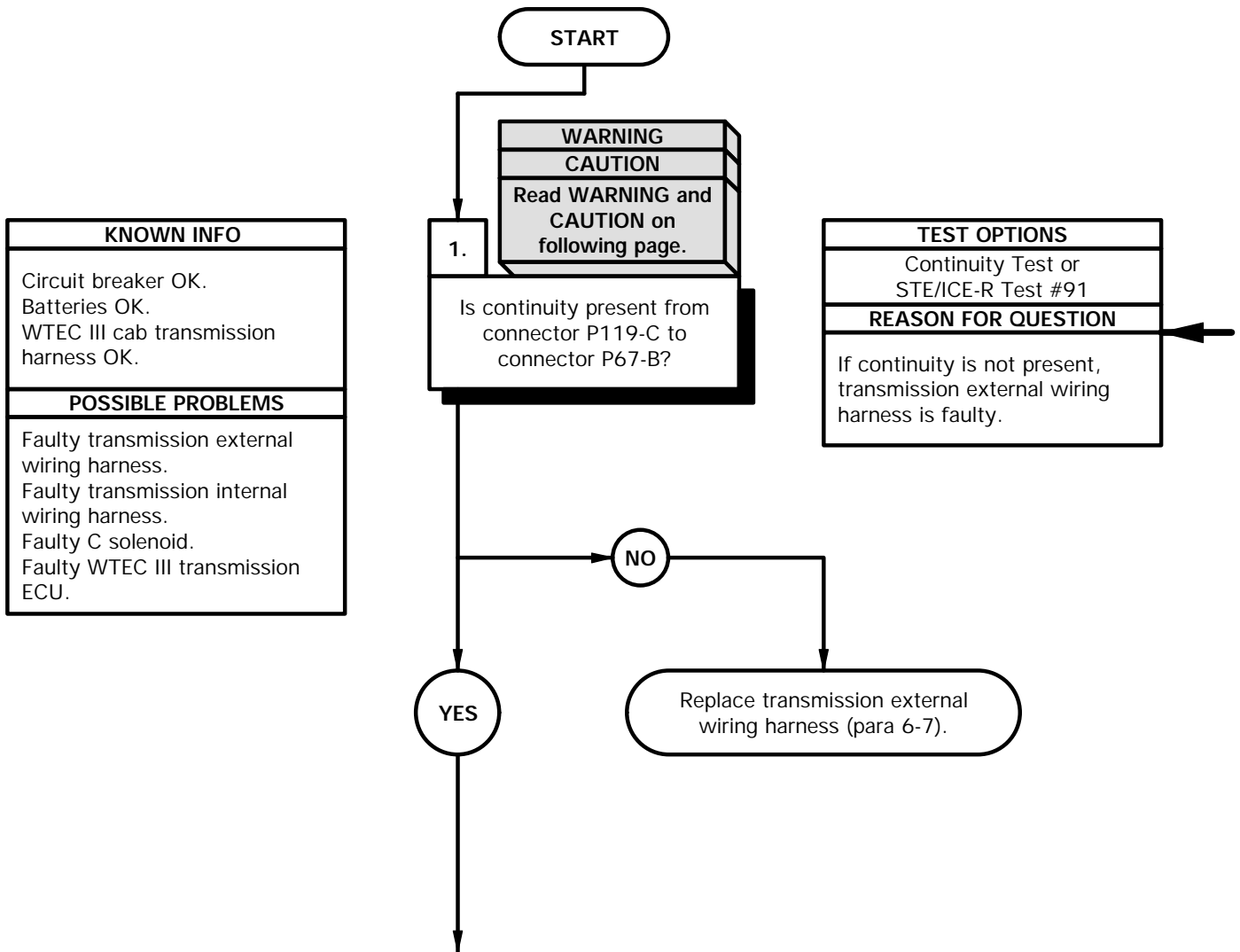
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

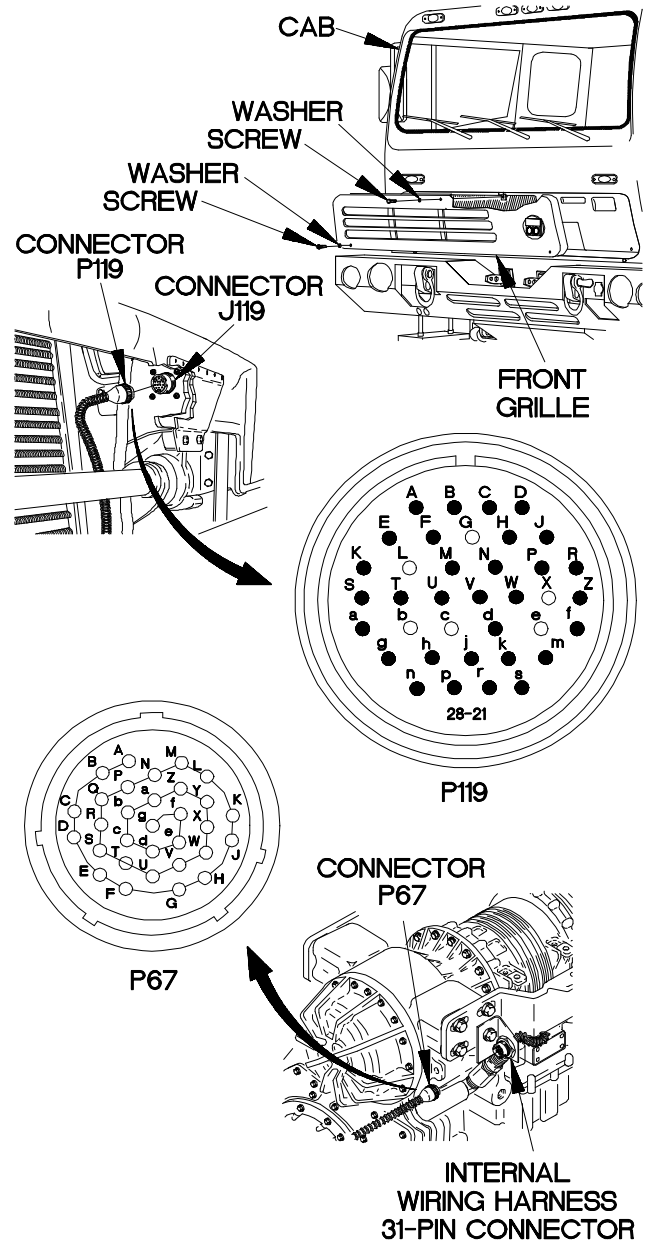
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect connector P67 from internal wiring harness 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-C.
- (8) Connect negative (-) probe of multimeter to connector P67-B and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-C.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

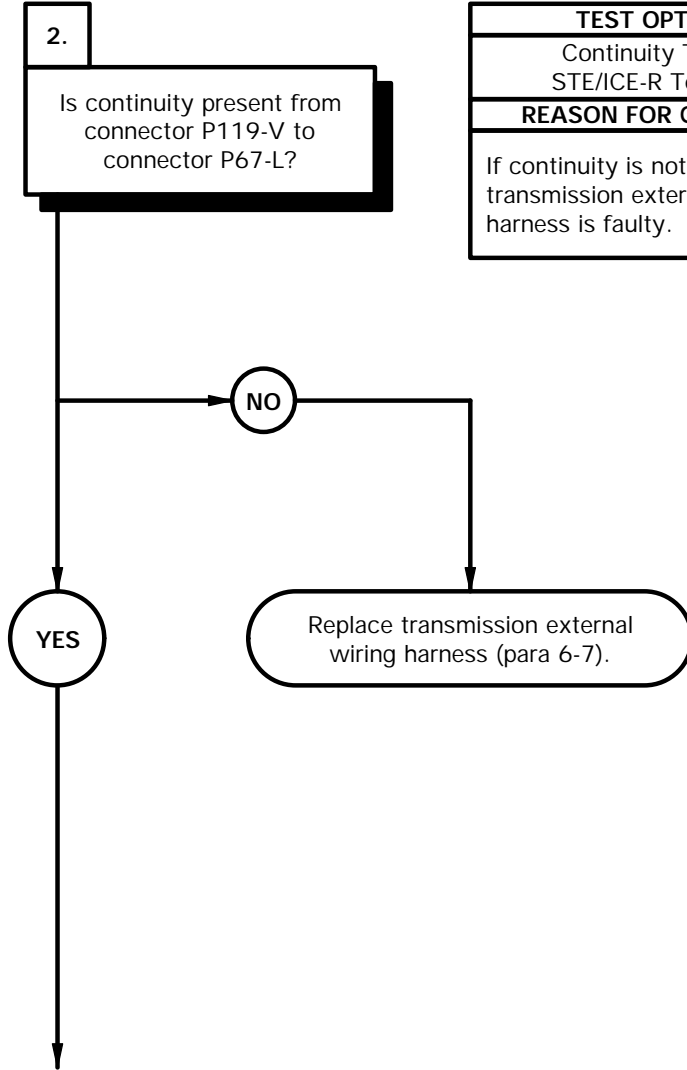
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



Y6c5901b

c59. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 14 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

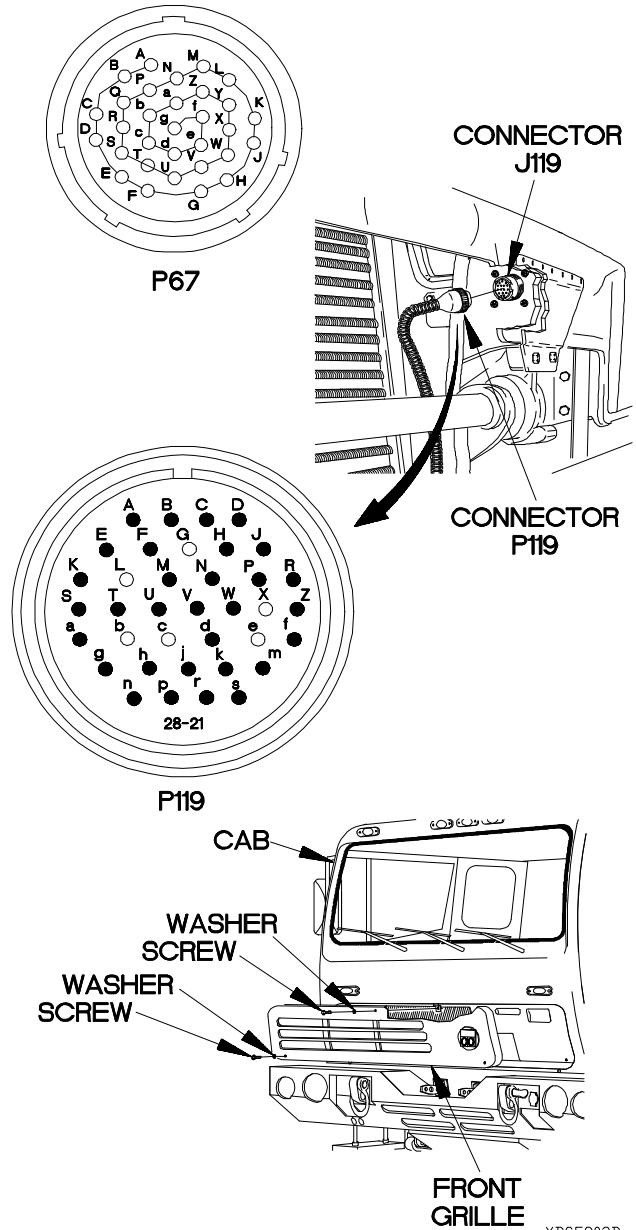
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty C solenoid. Faulty WTEC III transmission ECU.



TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-V.
- (3) Connect negative (-) probe of multimeter to connector P67-L and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-V.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external cable assembly is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



YBC5902B

c59. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 14 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

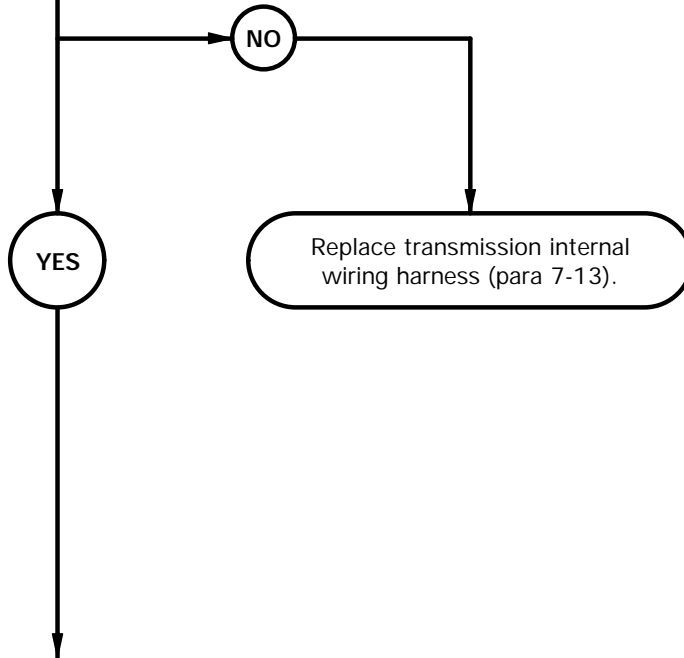
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty C solenoid. Faulty WTEC III transmission ECU.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin B to internal wiring harness connector C pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

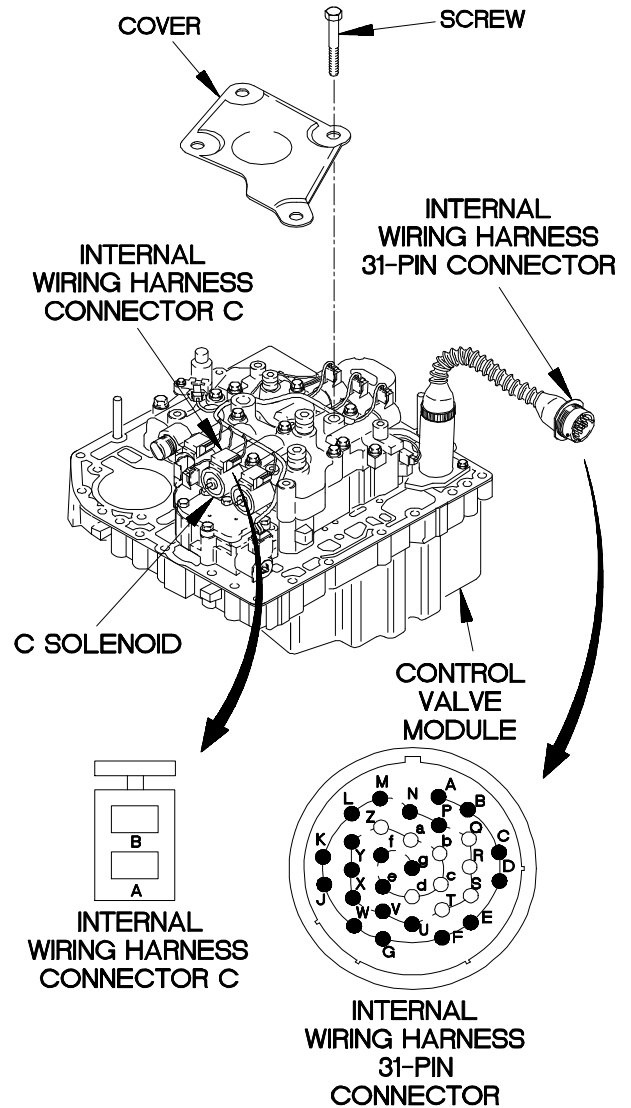


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector C from C solenoid.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin B.
- (6) Connect negative (-) probe of multimeter to internal wiring harness 24-pin connector C pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin B.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



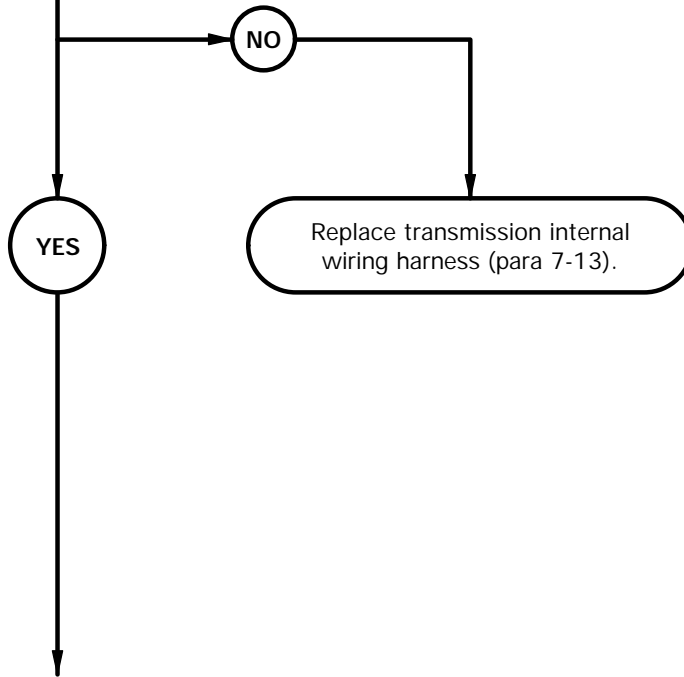
Y6c5903b

c59. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 14 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty C solenoid. Faulty WTEC III transmission ECU.

4.
Is continuity present from internal wiring harness 31-pin connector pin L to internal wiring harness connector C pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

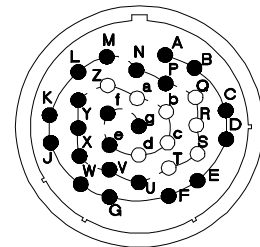
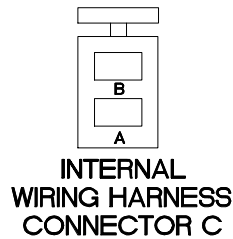
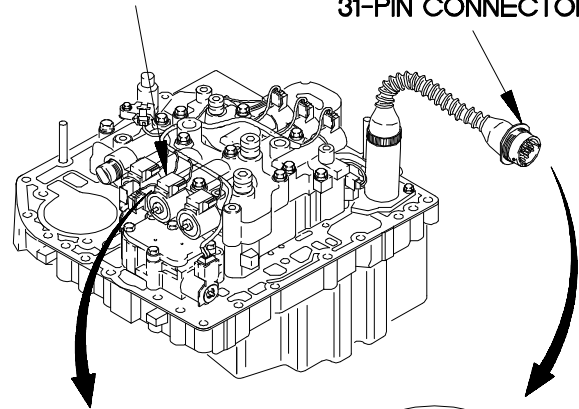


CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin L.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector C pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin L.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).

**INTERNAL
WIRING HARNESS
CONNECTOR C**

**INTERNAL
WIRING HARNESS
31-PIN CONNECTOR**



**INTERNAL
WIRING HARNESS
31-PIN
CONNECTOR**

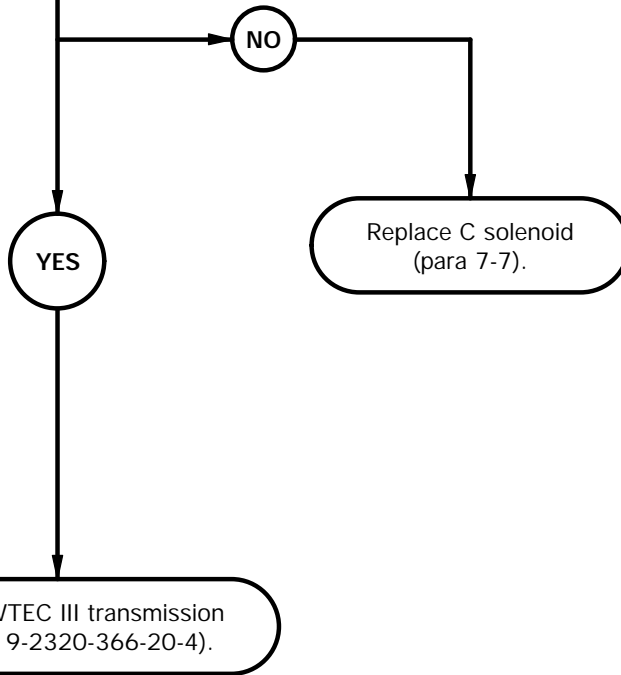
YBC5904B

c59. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 14 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty C solenoid. Faulty WTEC III transmission ECU.

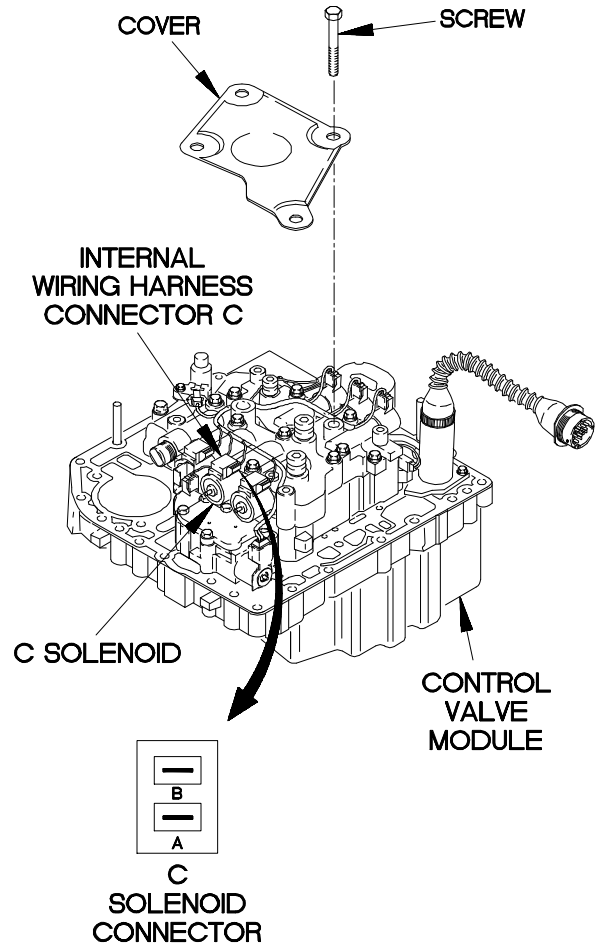
5.
Is 2.5-5.0 ohms resistance present from C solenoid pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, C solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC III transmission ECU is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of C solenoid connector.
- (3) Connect negative (-) probe of multimeter to pin B of C solenoid connector and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace C solenoid (para 7-7).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC III transmission ECU (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector C to C solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC5905B

c60. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 14 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

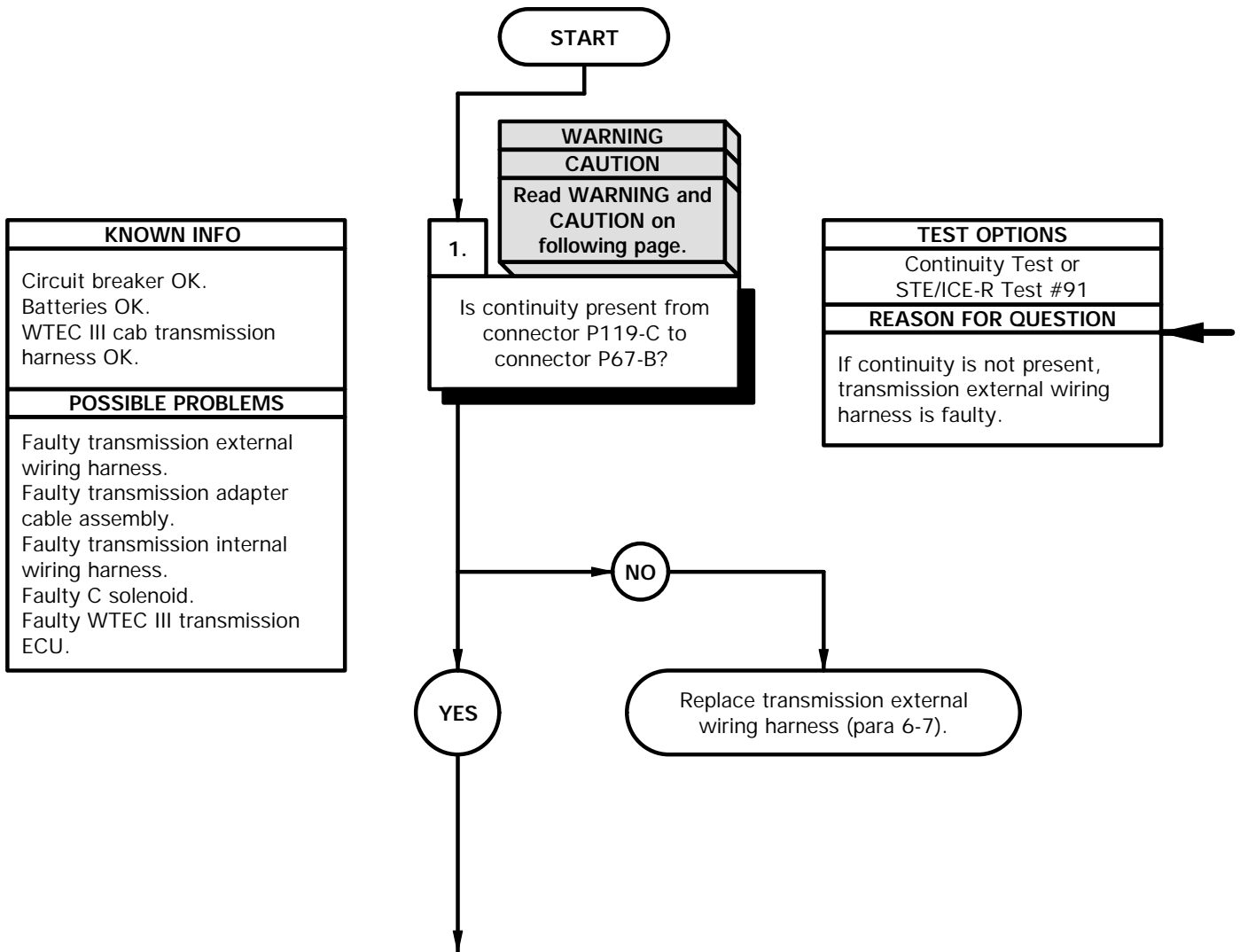
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

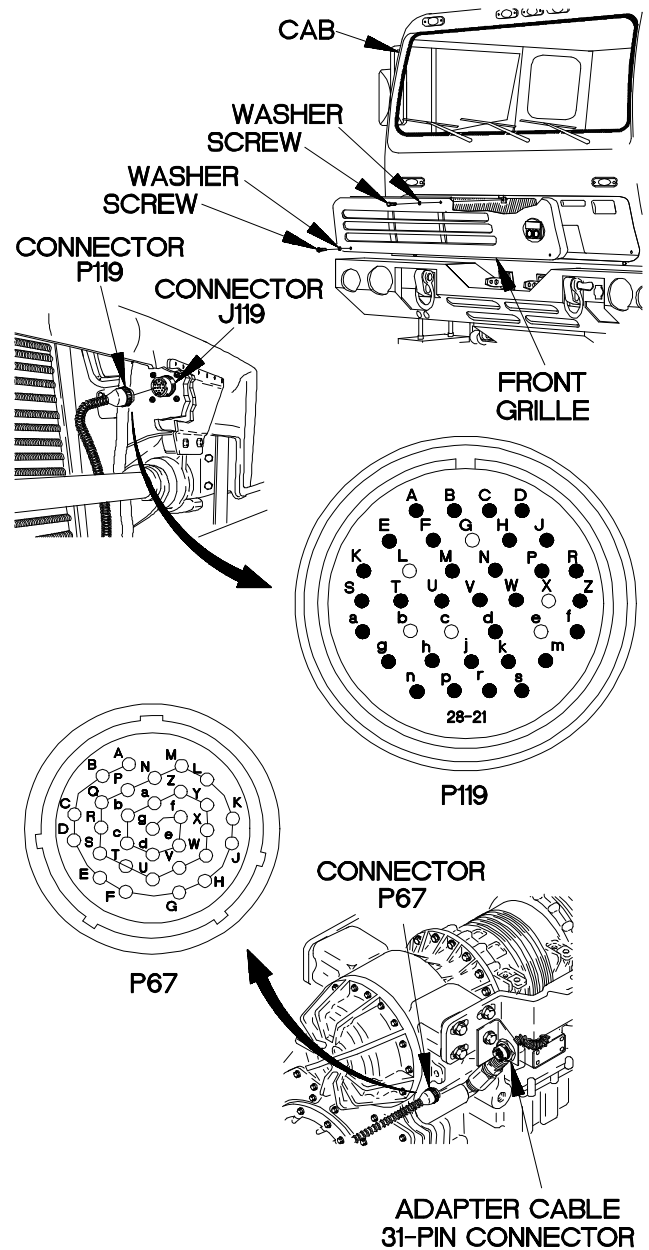
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect connector P67 from adapter cable 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-C.
- (8) Connect negative (-) probe of multimeter to connector P67-B and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-C.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



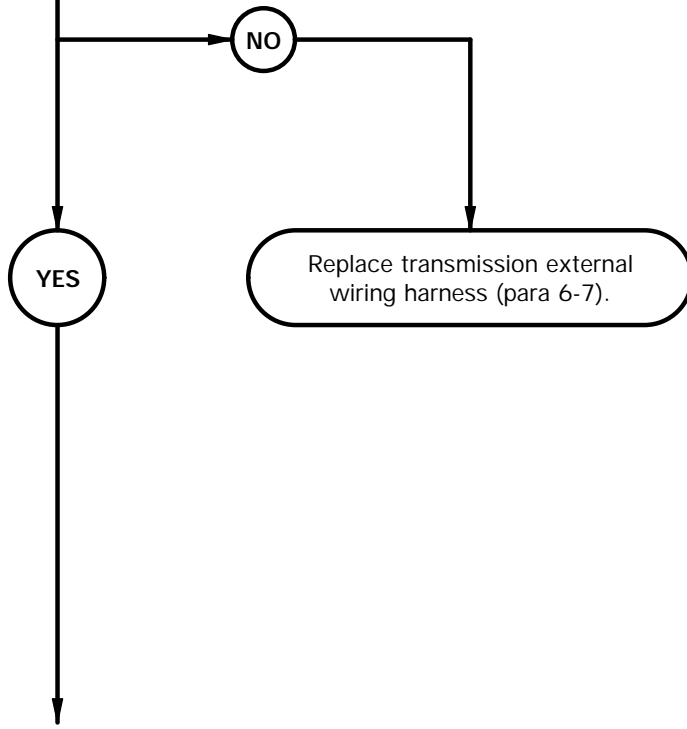
YBC6001B

c60. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 14 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty C solenoid. Faulty WTEC III transmission ECU.

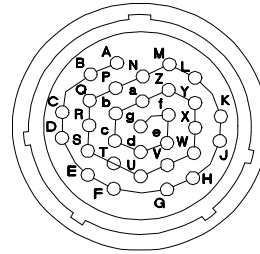
2.
Is continuity present from connector P119-V to connector P67-L?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

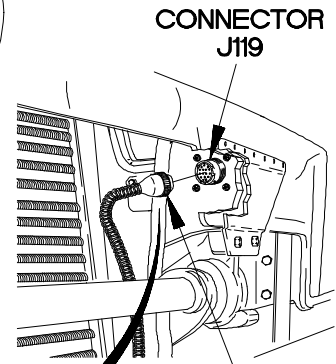


CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-V.
- (3) Connect negative (-) probe of multimeter to connector P67-L and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-V.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).

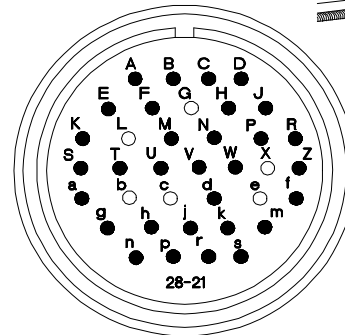


P67

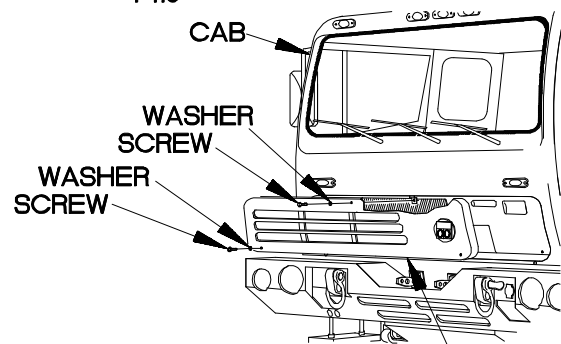


CONNECTOR J119

CONNECTOR P119



P119



FRONT GRILLE

YBC6002B

c60. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 14 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

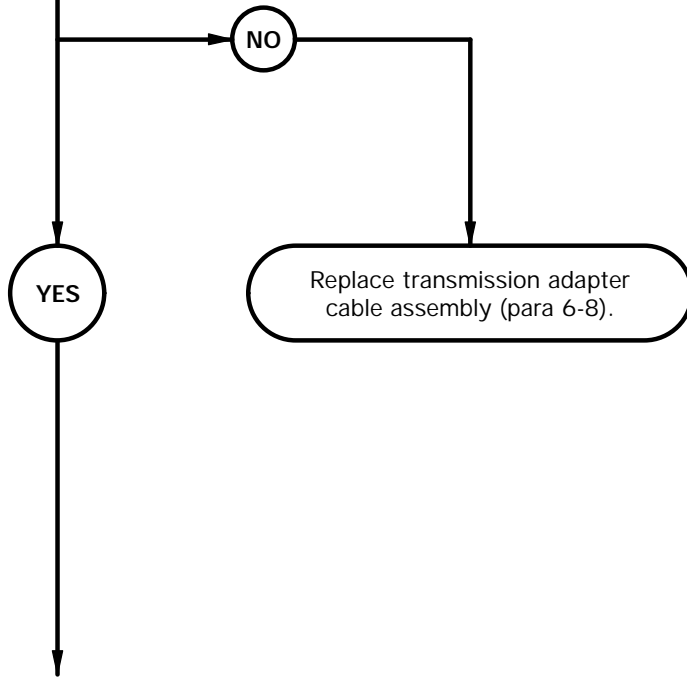
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty C solenoid. Faulty WTEC III transmission ECU.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin B to adapter cable 24-pin connector pin C1?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.

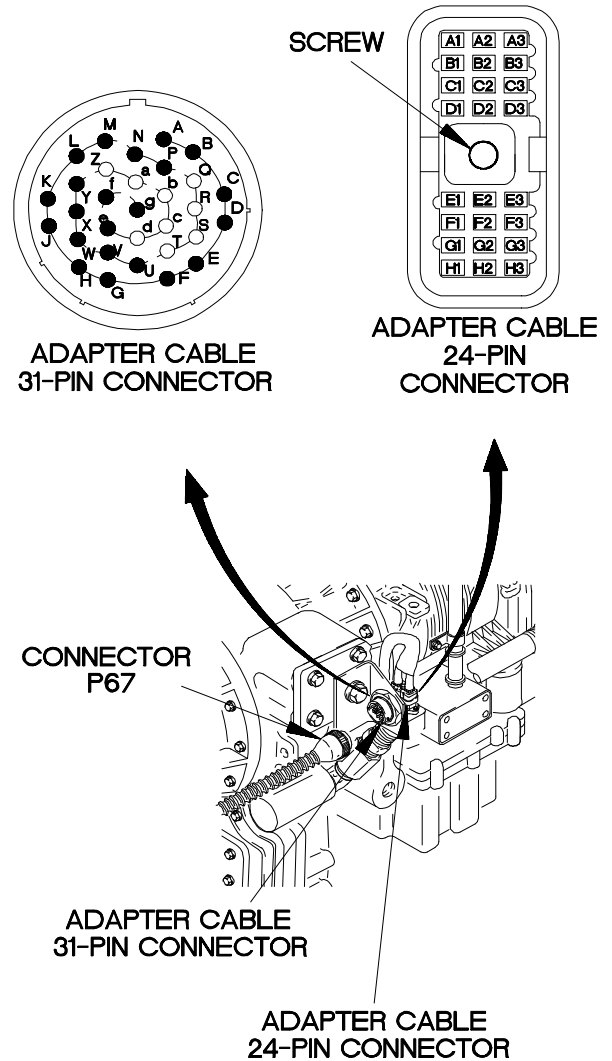


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Loosen screw in adapter cable 24-pin connector.
- (2) Disconnect adapter cable 24-pin connector from internal wiring harness 24-pin connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin B.
- (5) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin C1 and note reading on multimeter.
- (6) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (7) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin B.
- (8) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).



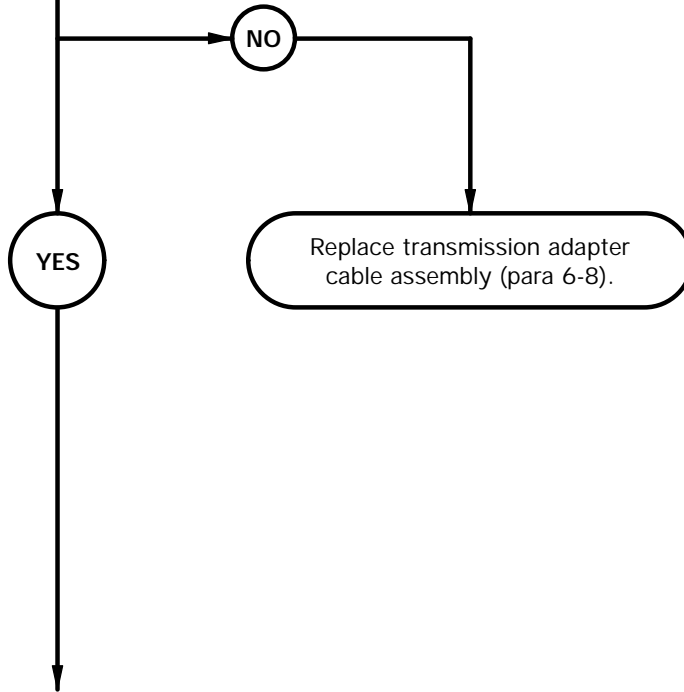
YBC6003B

c60. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 14 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty C solenoid. Faulty WTEC III transmission ECU.

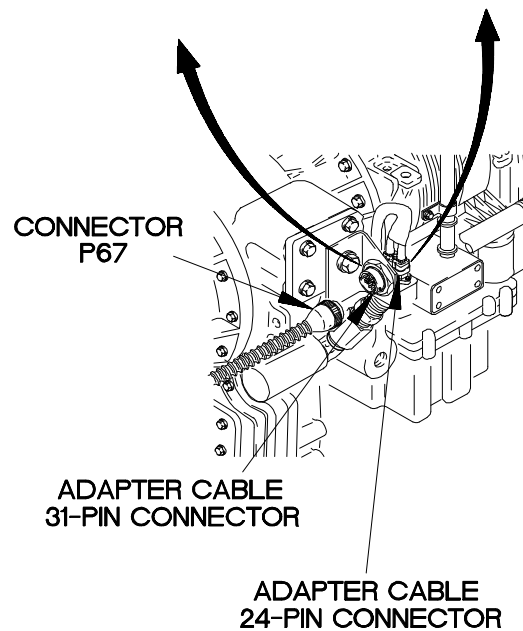
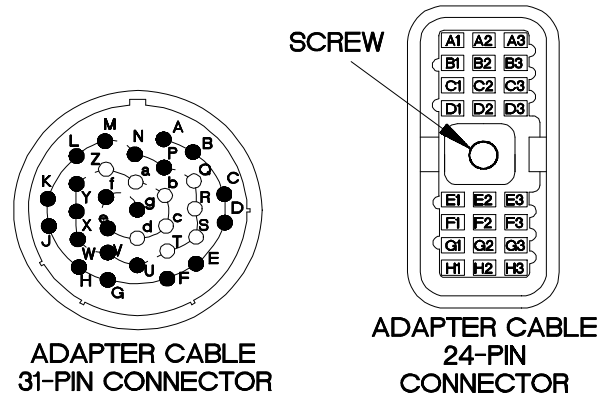
4.
Is continuity present from adapter cable 31-pin connector pin L to adapter cable 24-pin connector pin C2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin L.
- (3) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin C2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (5) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin L.
- (6) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).
- (9) Connect connector P67 to adapter cable 31-pin connector.



YBC6004B

c60. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 14 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

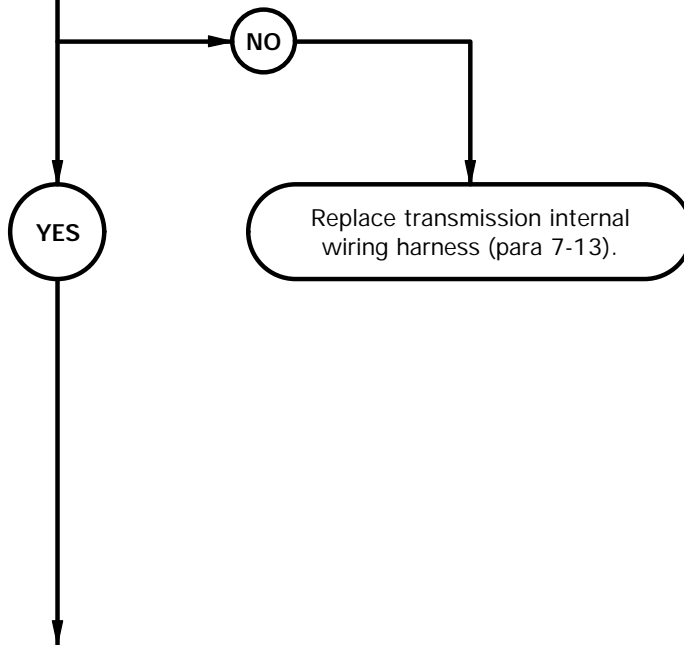
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty C solenoid. Faulty WTEC III transmission ECU.

5.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin C1 to internal wiring harness connector C pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

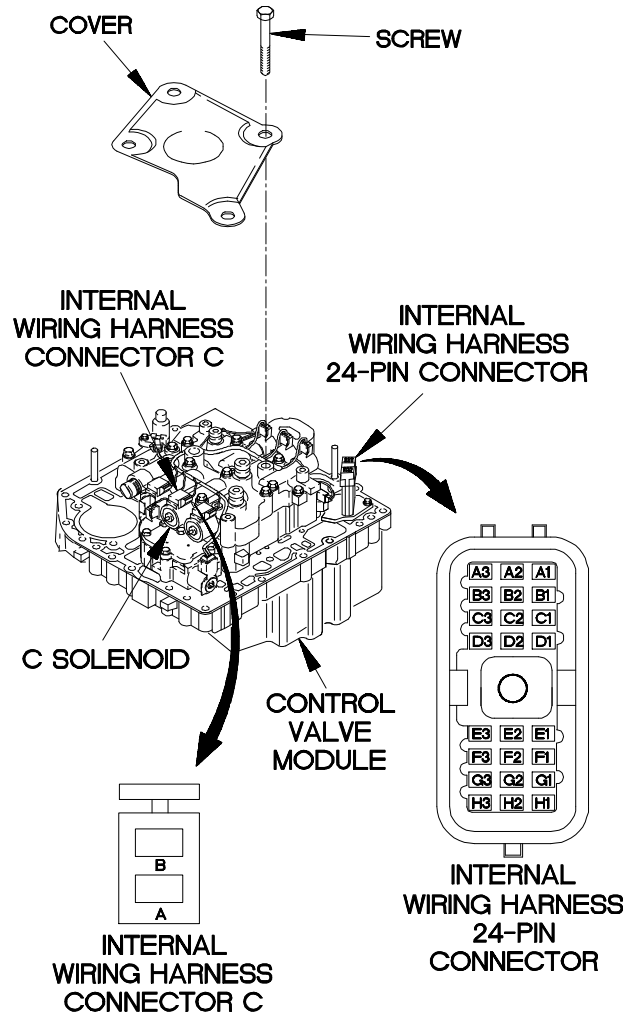


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

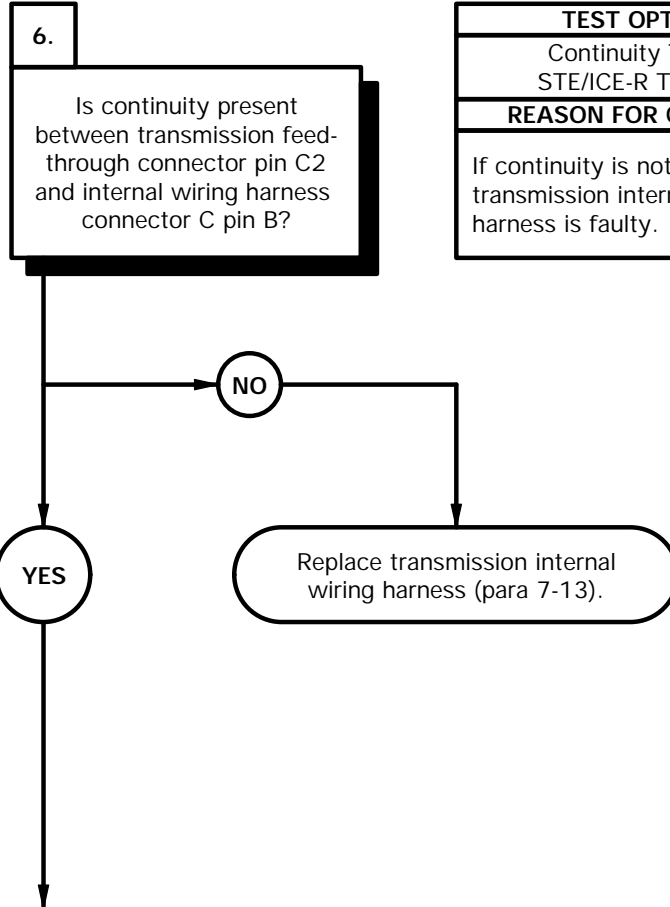
- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector C from C solenoid.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin C1.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector C pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin C1.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



YBC6005B

c60. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 14 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

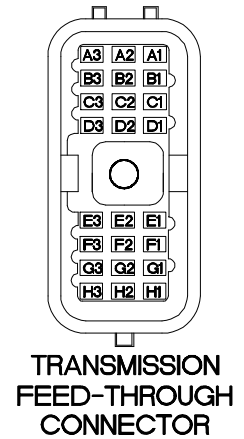
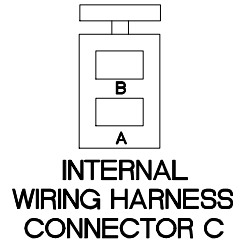
KNOWN INFO
Circuit breaker OK. Batteries OK. Cab transmission cable assembly OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty C solenoid. Faulty WTEC III transmission ECU.



TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness feed-through connector pin C2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector C pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to transmission feed through connector pin C2.
- (6) Connect negative (-) probe of multimeter to all other pins of transmission feed-through connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted, replace transmission internal wiring harness (para 7-13).

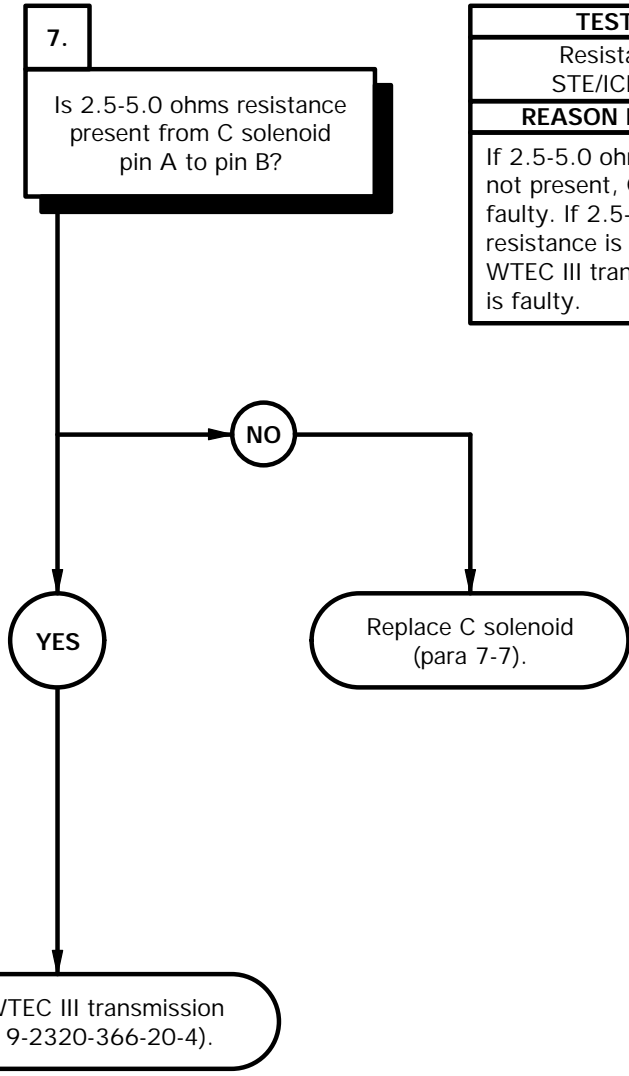


YBC6006B

c60. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 14 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

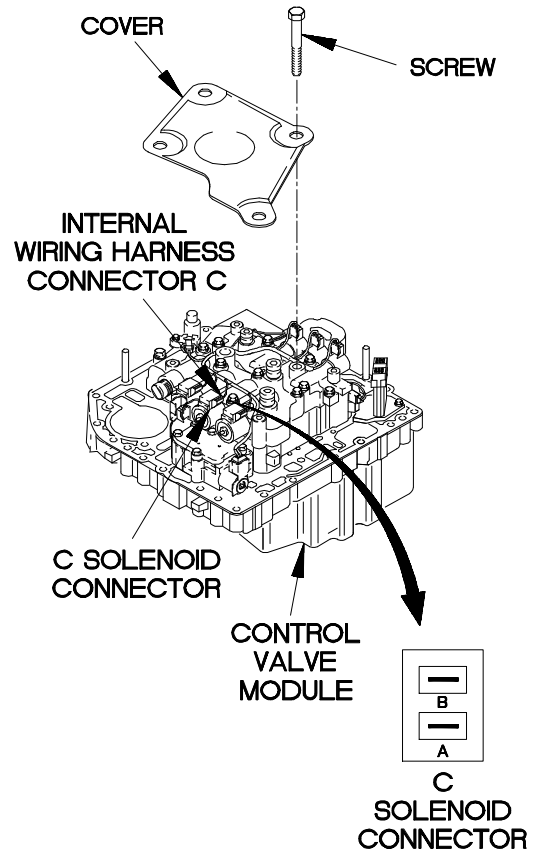
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty C solenoid. Faulty WTEC III transmission ECU.

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, C solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC III transmission ECU is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of C solenoid connector.
- (3) Connect negative (-) probe of multimeter to pin B of C solenoid connector and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace C solenoid (para 7-7).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC III transmission ECU (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector C to C solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC6007B

c61. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

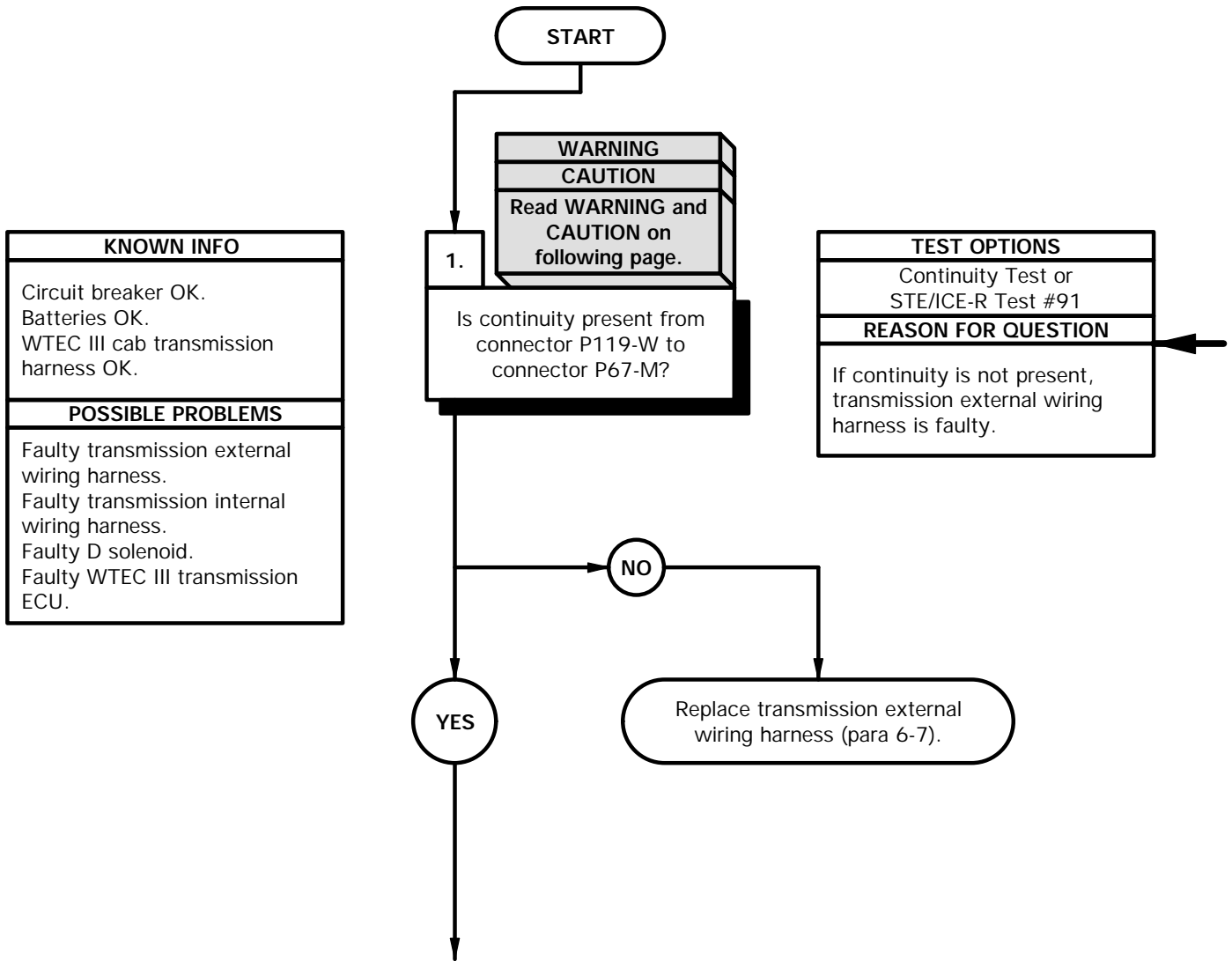
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

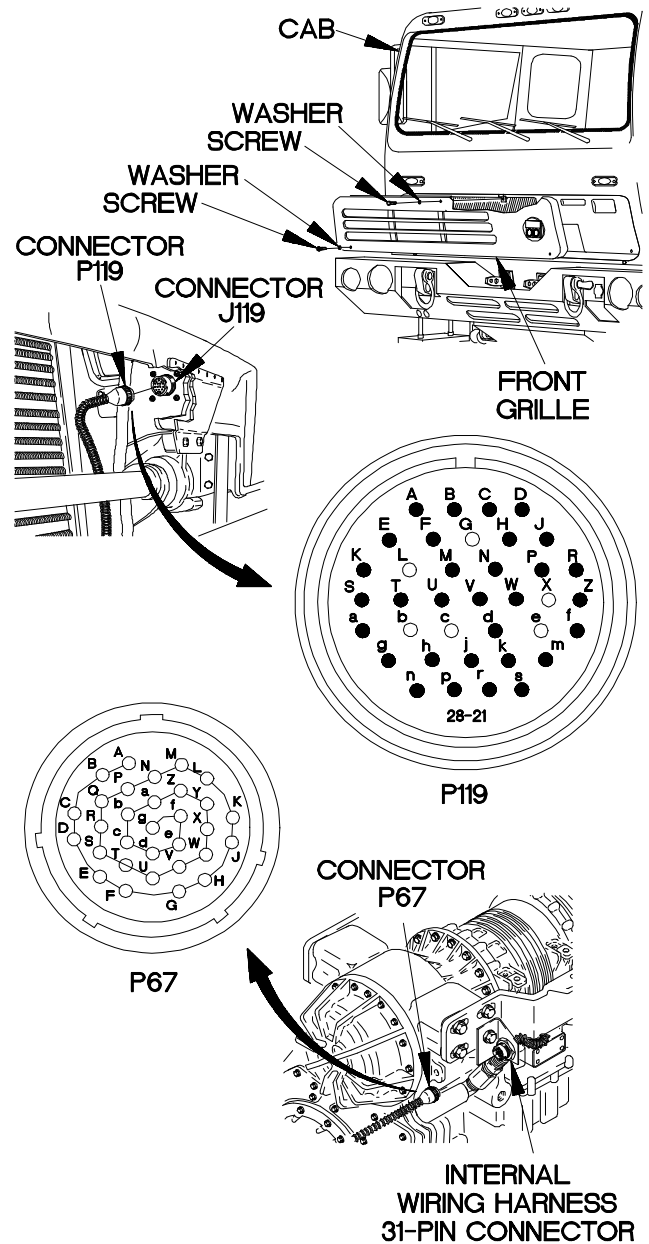
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect connector P67 from internal wiring harness 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-W.
- (8) Connect negative (-) probe of multimeter to connector P67-M and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-W.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

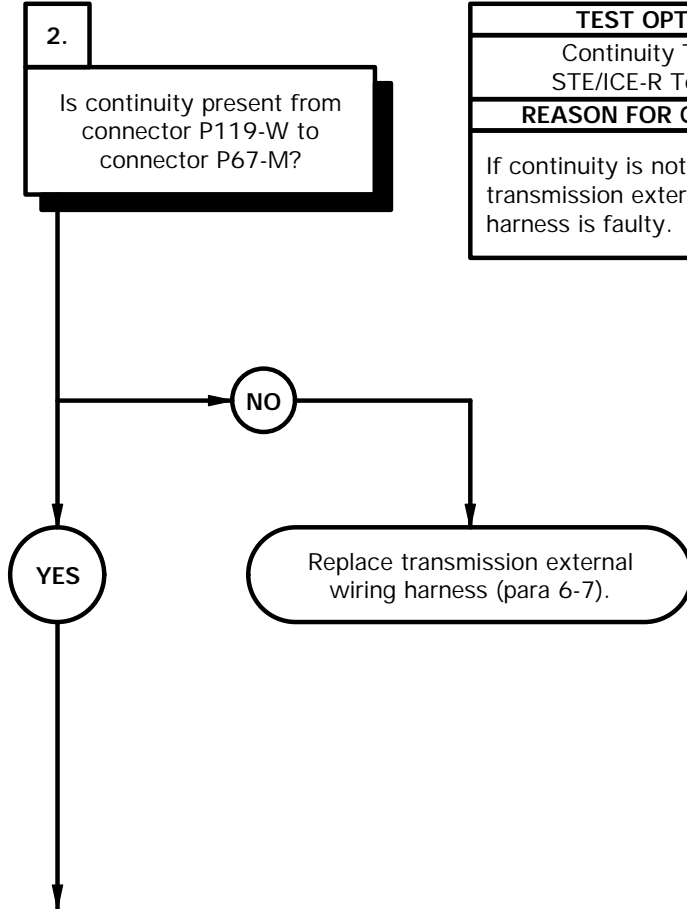
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



YBC6101B

c61. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

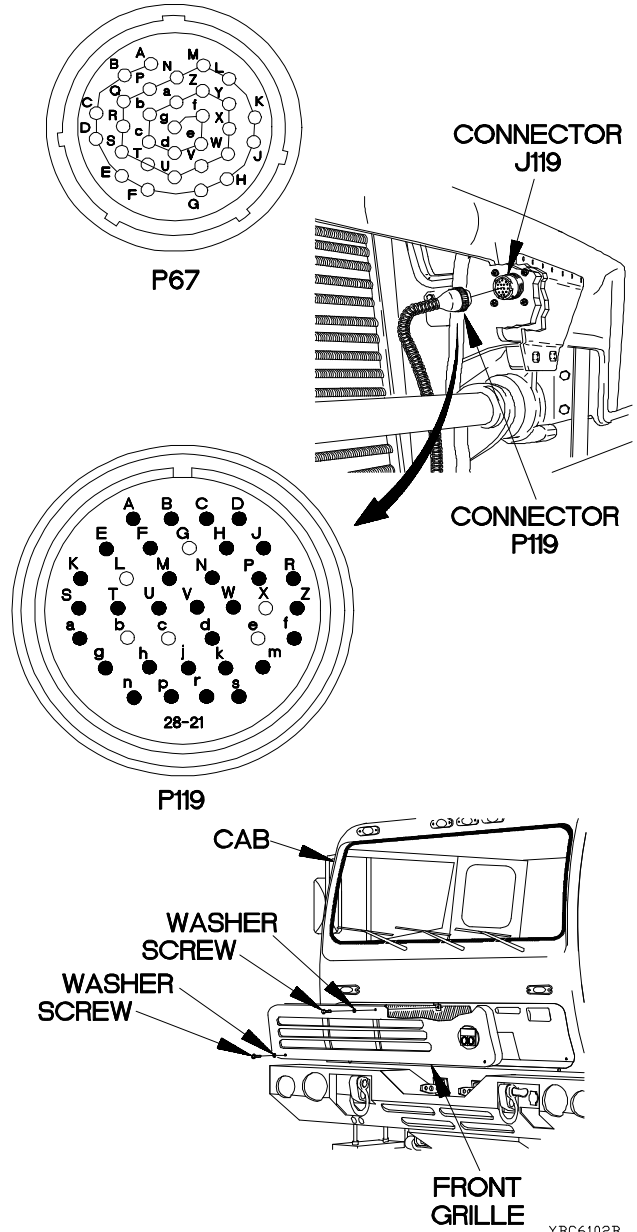
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty D solenoid. Faulty WTEC III transmission ECU.



TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-W.
- (3) Connect negative (-) probe of multimeter to connector P67-M and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-W.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external cable assembly is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



c61. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

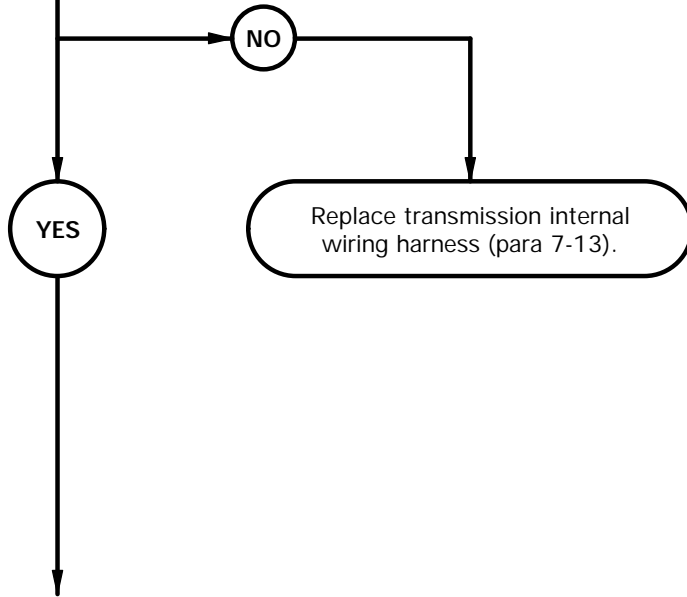
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty D solenoid. Faulty WTEC III transmission ECU.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin M to internal wiring harness connector D pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

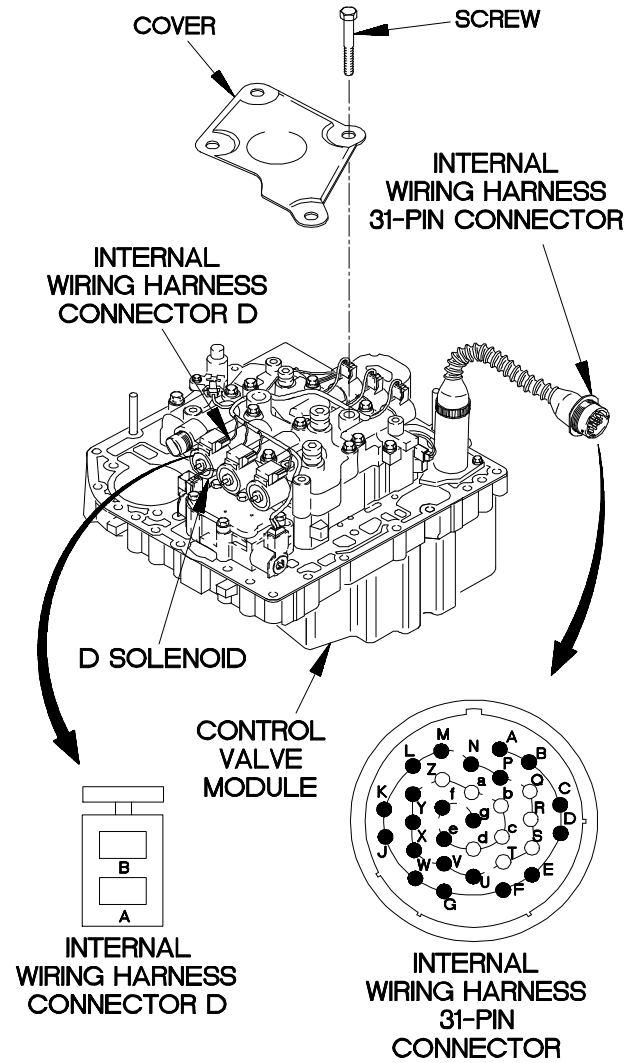


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector D from D solenoid.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin M.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector D pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin M.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



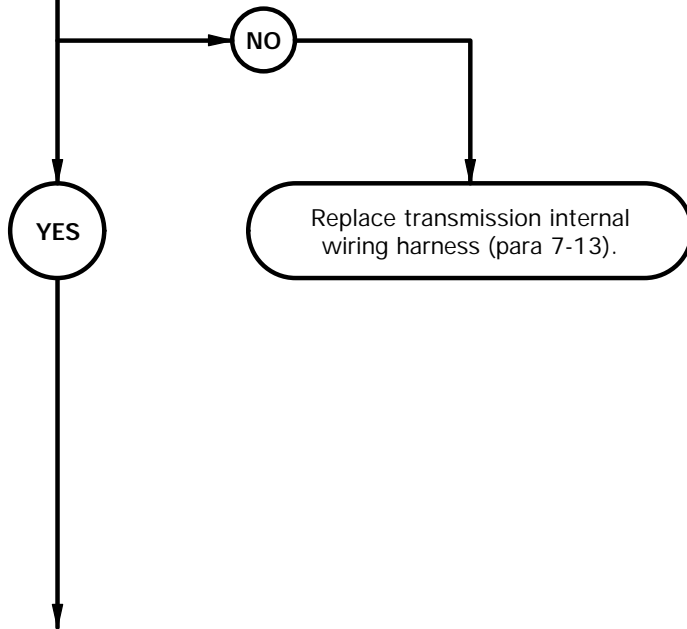
YBC6103B

c61. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty D solenoid. Faulty WTEC III transmission ECU.

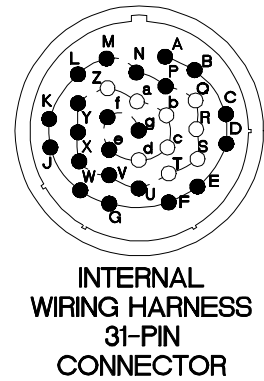
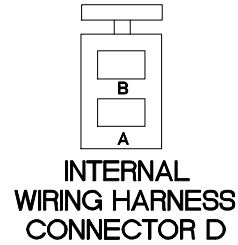
4.
Is continuity present from internal wiring harness 31-pin connector pin A to internal wiring harness connector D pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin A.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector D pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin A.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



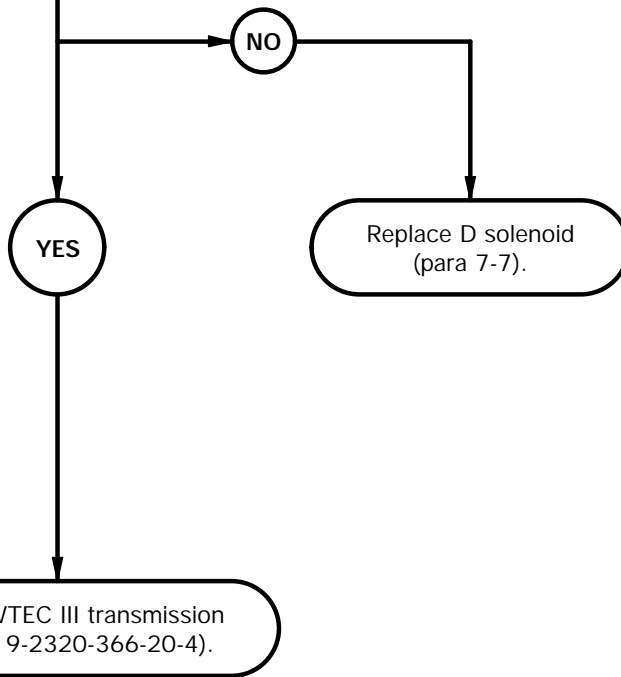
YBC6104B

c61. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty D solenoid. Faulty WTEC III transmission ECU.

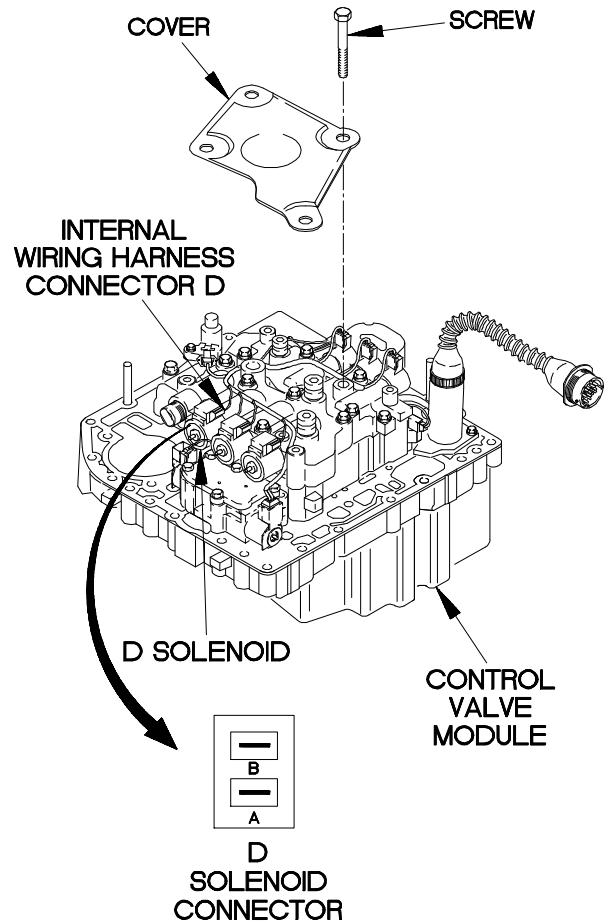
5.
Is 2.5-5.0 ohms resistance present from D solenoid pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, D solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC III transmission ECU is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of D solenoid connector.
- (3) Connect negative (-) probe of multimeter to pin B of D solenoid connector and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace D solenoid (para 7-7).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC III transmission ECU (TM 9-2320-366-20-4).
- (6) Connect transmission internal wiring harness connector D to D solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC6105B

c62. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

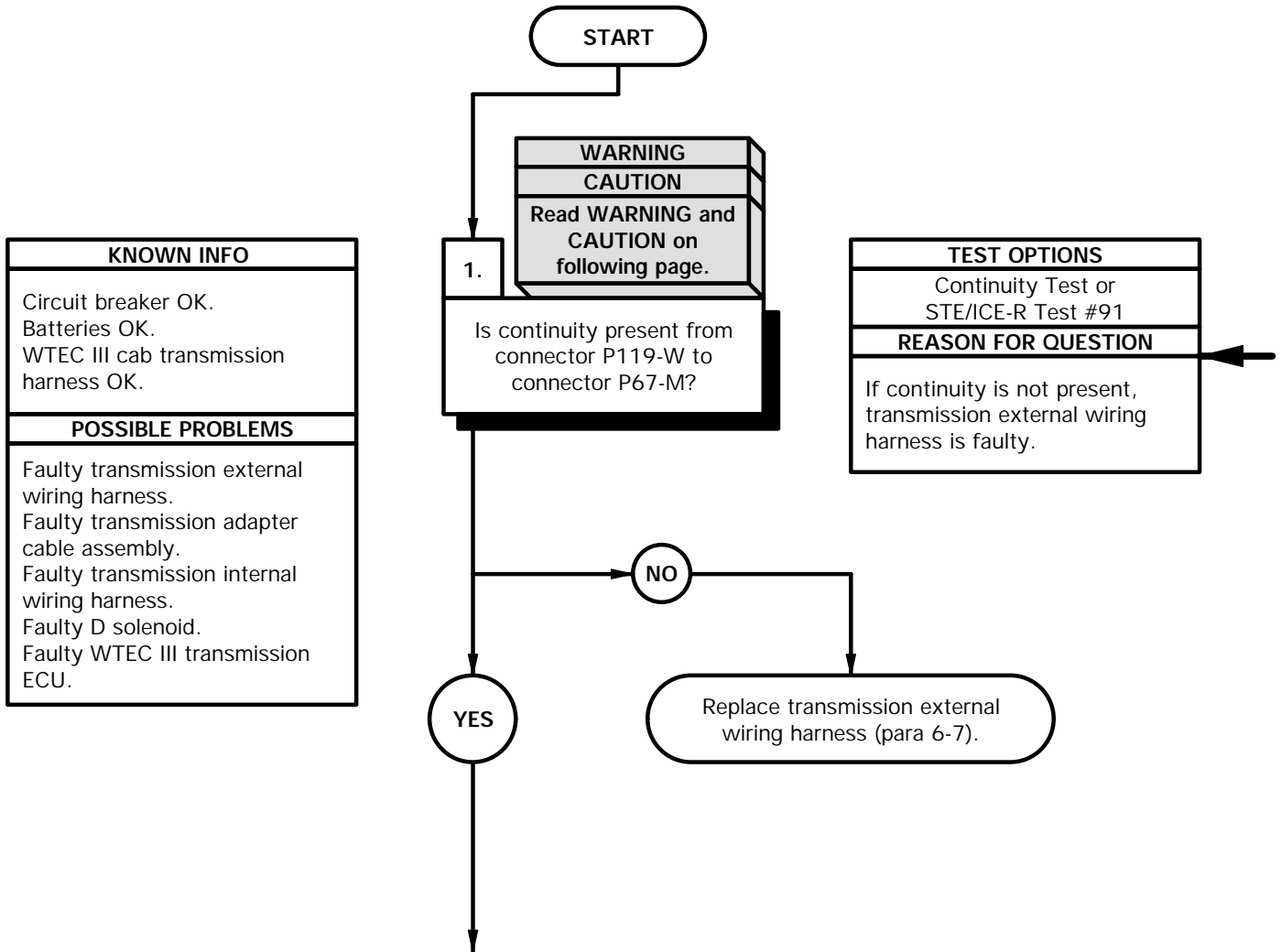
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

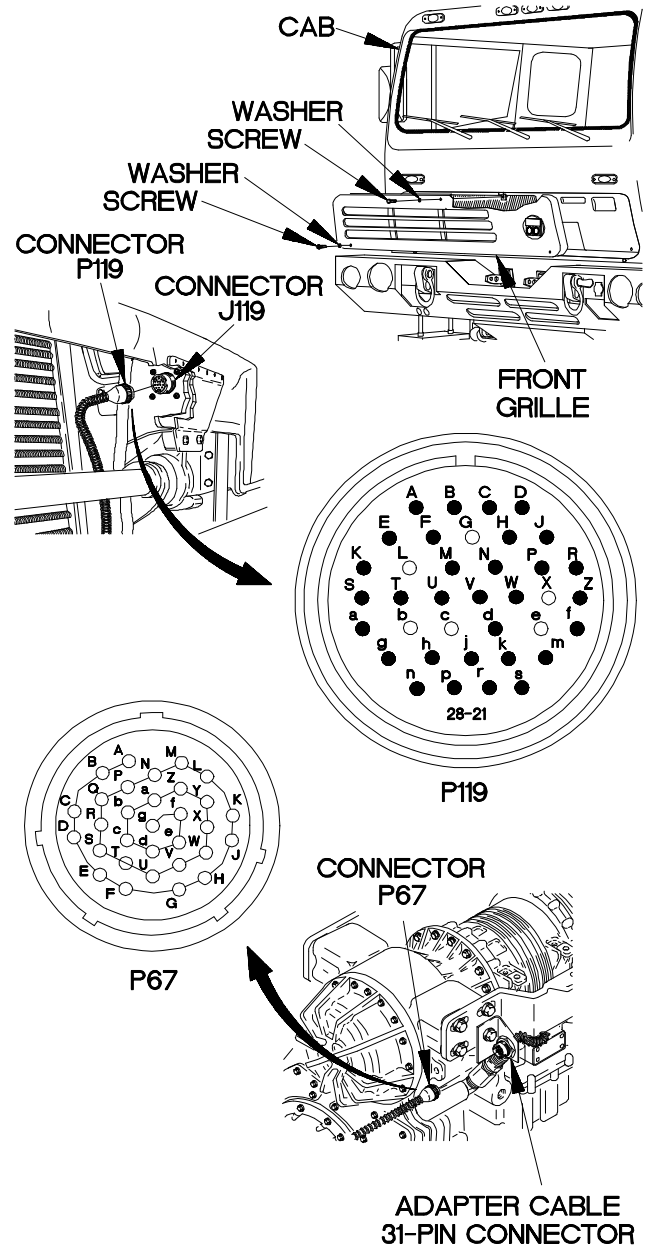
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect connector P67 from adapter cable 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-W.
- (8) Connect negative (-) probe of multimeter to connector P67-M and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-W.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (CONT)

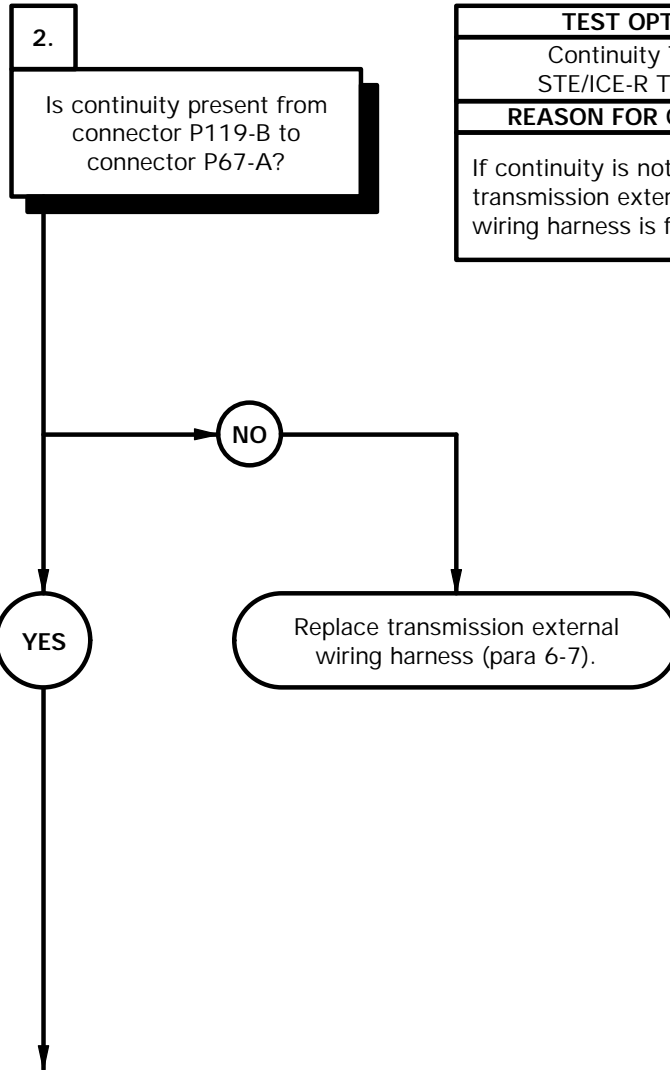
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



YBC6201B

c62. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

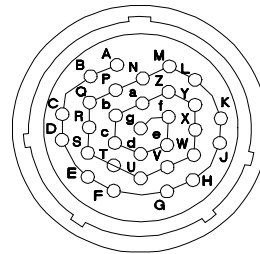
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty D solenoid. Faulty WTEC III transmission ECU.



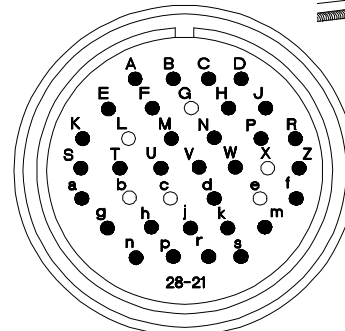
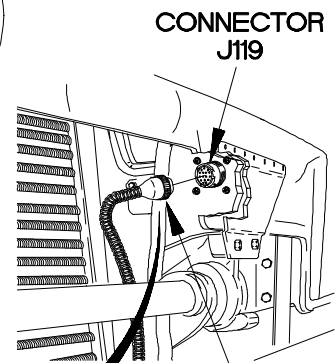
TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

CONTINUITY TEST

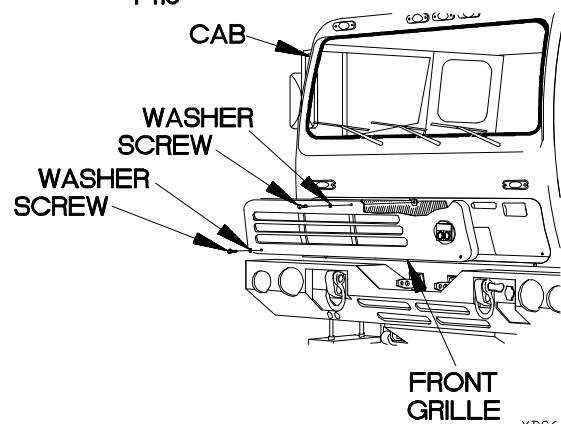
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-B.
- (3) Connect negative (-) probe of multimeter to connector P67-A and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-B.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



P67



P119



YBC6202B

c62. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

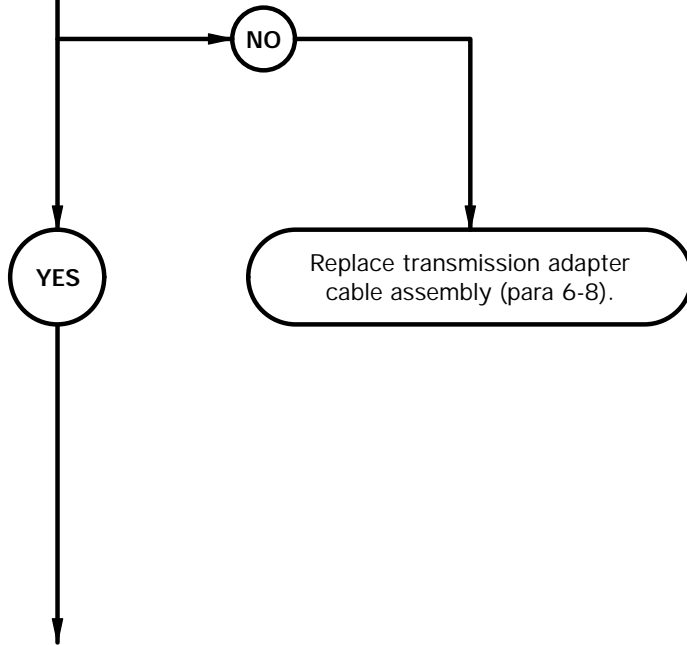
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty D solenoid. Faulty WTEC III transmission ECU.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin M to adapter cable 24-pin connector pin D1?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.

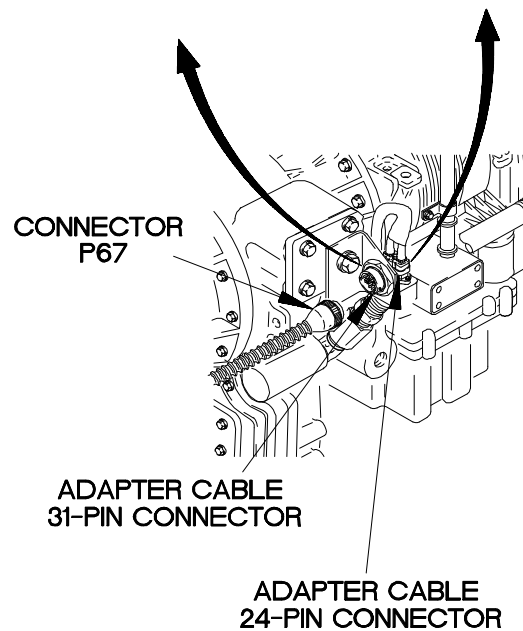
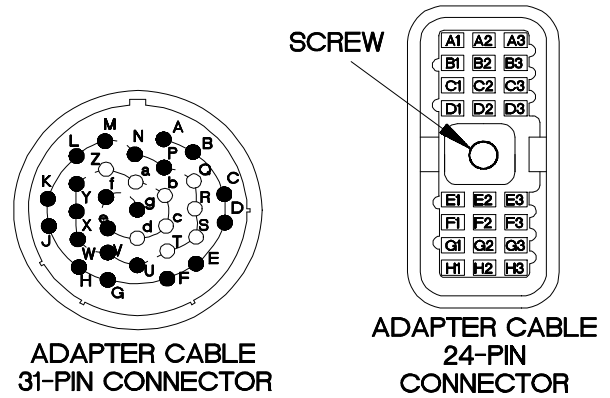


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Loosen screw in adapter cable 24-pin connector.
- (2) Disconnect adapter cable 24-pin connector from internal wiring harness 24-pin connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin M.
- (5) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin D1 and note reading on multimeter.
- (6) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (7) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin M.
- (8) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).



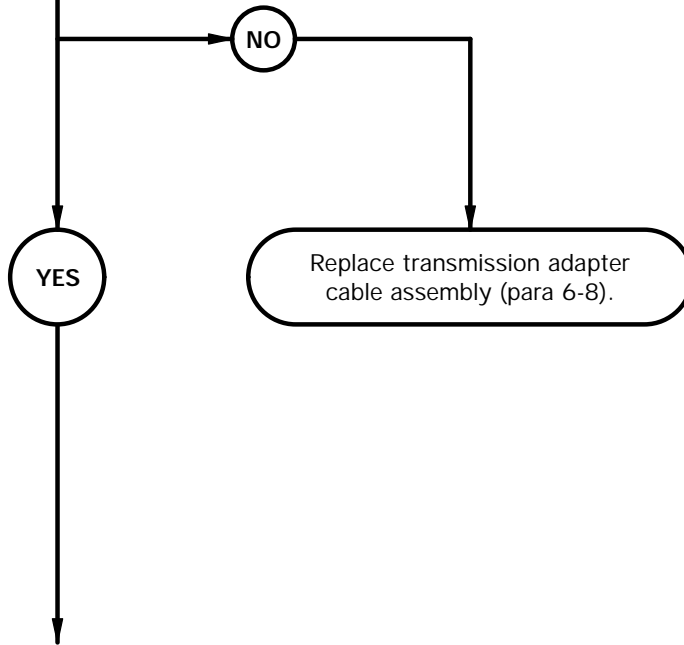
YBC6203B

c62. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty D solenoid. Faulty WTEC III transmission ECU.

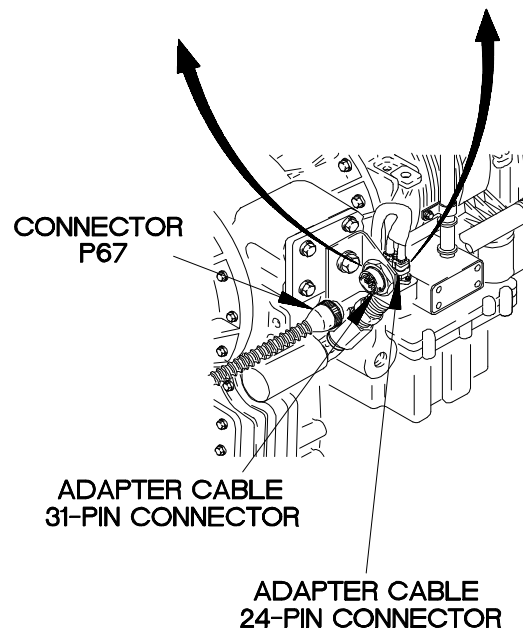
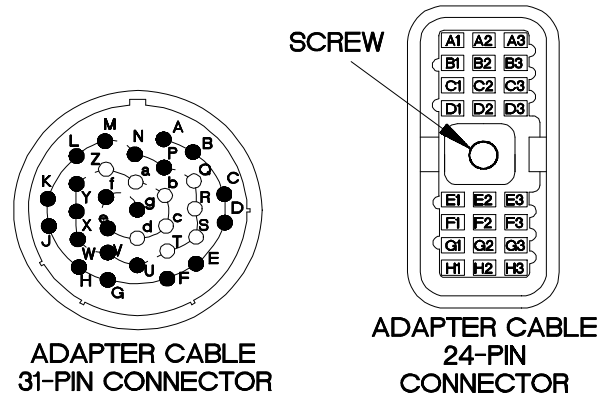
4.
Is continuity present from adapter cable 31-pin connector pin A to adapter cable 24-pin connector pin A2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin A.
- (3) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin A2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (5) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin A.
- (6) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).
- (9) Connect connector P67 to adapter cable 31-pin connector.



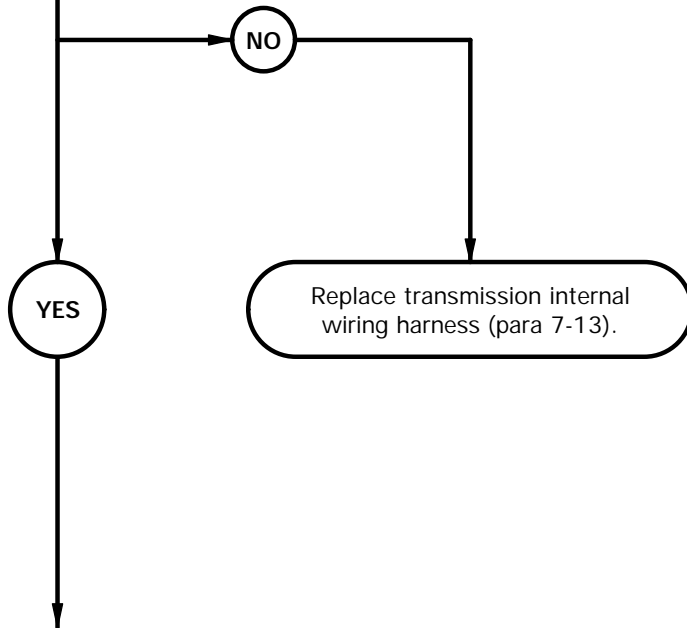
YBC6204B

c62. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty D solenoid. Faulty WTEC III transmission ECU.

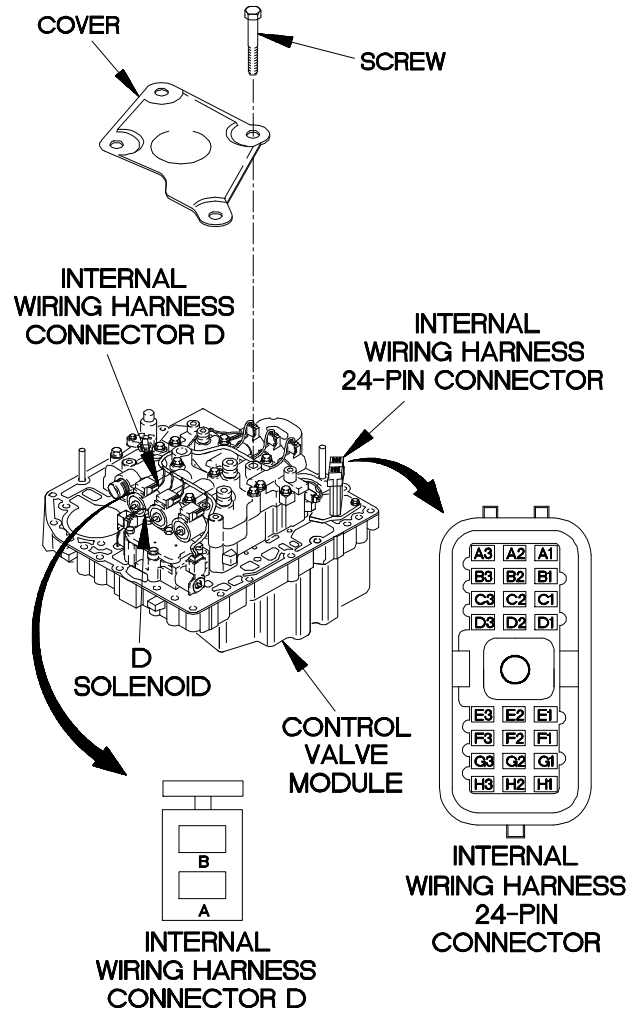
5.
 Is continuity present from internal wiring harness 24-pin connector pin D1 to internal wiring harness connector D pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector D from D solenoid.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin D1.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector D pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin D1.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



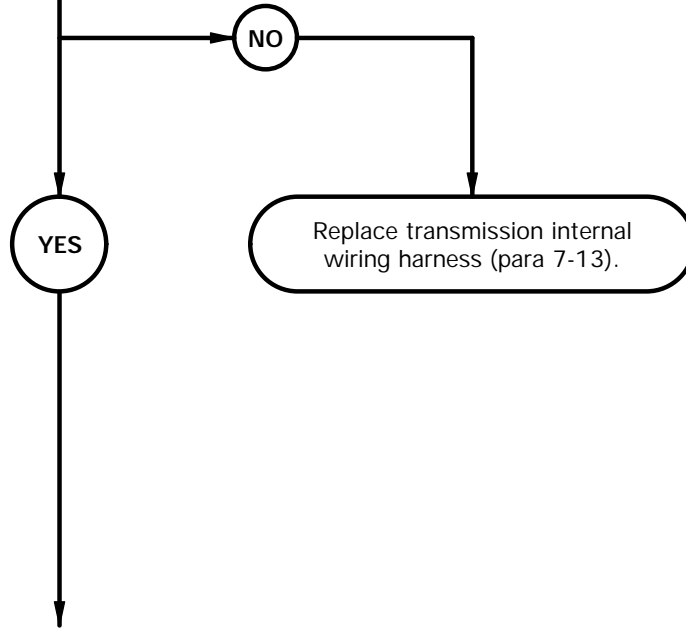
YBC6205B

c62. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty D solenoid. Faulty WTEC III transmission ECU.

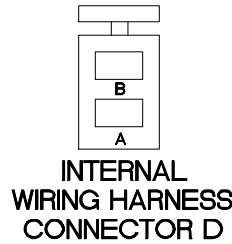
6.
Is continuity present from internal wiring harness 24-pin connector pin A2 to internal wiring harness connector D pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

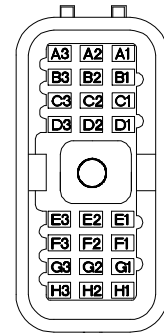


CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin A2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector D pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin A2.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector, except pins B1 and H1, and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



**INTERNAL
WIRING HARNESS
CONNECTOR D**



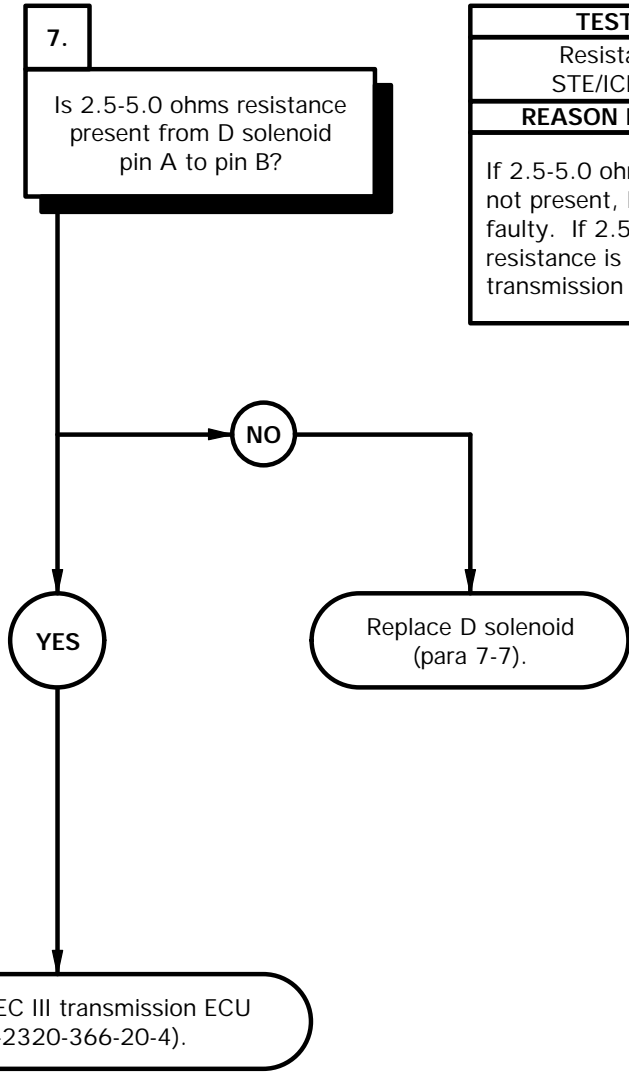
**INTERNAL
WIRING HARNESS
24-PIN
CONNECTOR**

YBC6206B

c62. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

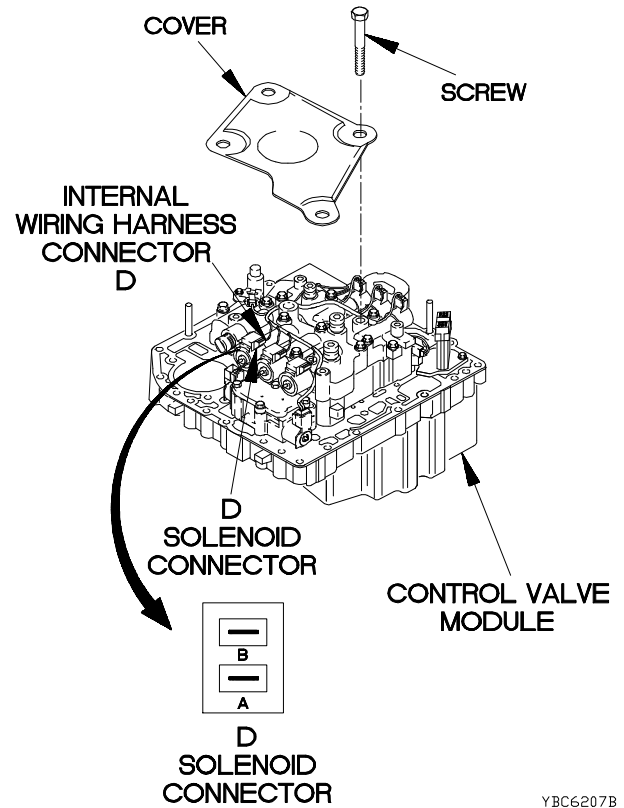
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty D solenoid. Faulty WTEC III transmission ECU.

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, D solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC III transmission ECU is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of D solenoid connector.
- (3) Connect negative (-) probe of multimeter to pin B of D solenoid connector and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace D solenoid (para 7-7).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC III transmission ECU (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector D to D solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC6207B

c63. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 16 (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

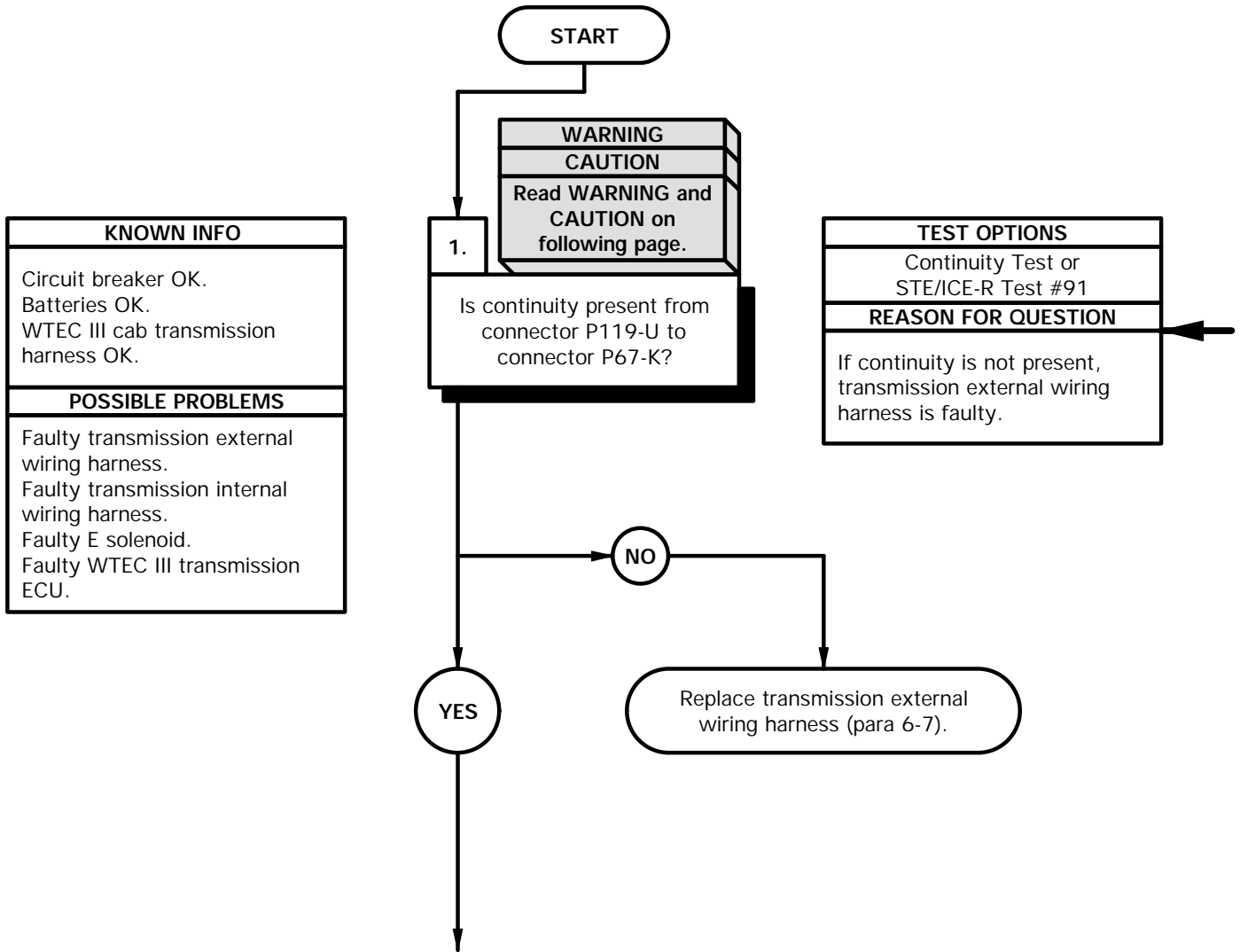
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

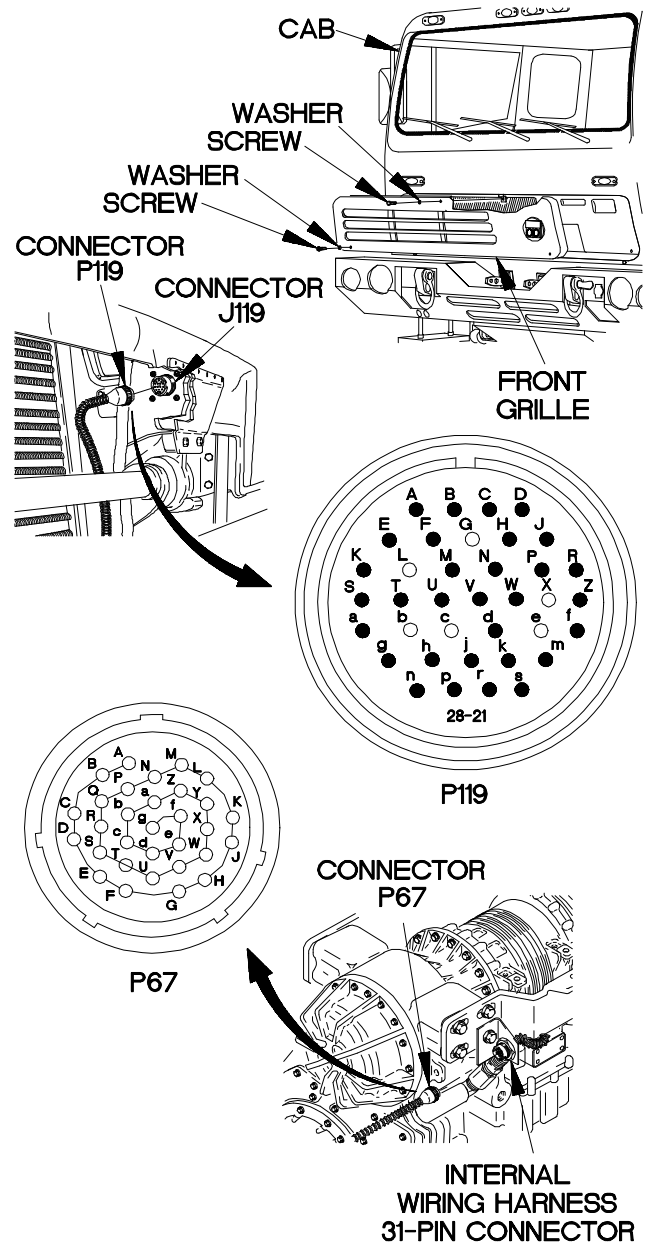
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect connector P67 from internal wiring harness 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-U.
- (8) Connect negative (-) probe of multimeter to connector P67-K and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-U.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



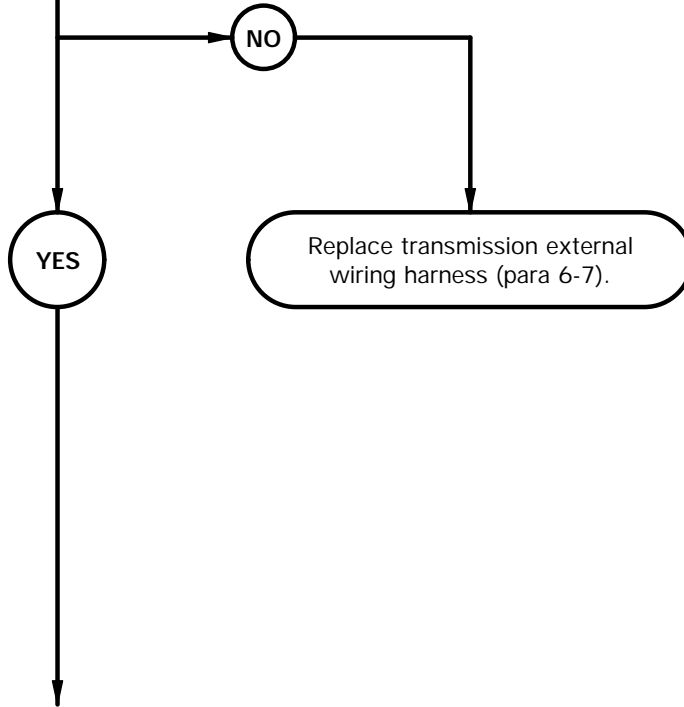
YBC6301B

c63. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 16 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty E solenoid. Faulty WTEC III transmission ECU.

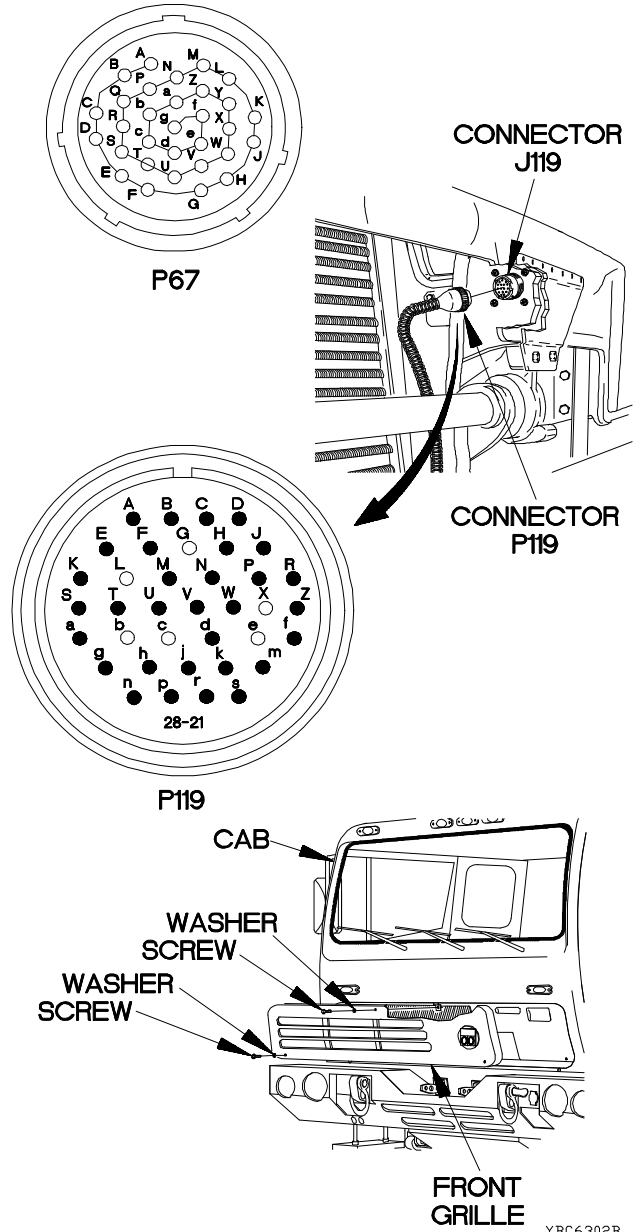
2.
Is continuity present from connector P119-N to connector P67-H?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-N.
- (3) Connect negative (-) probe of multimeter to connector P67-H and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-N.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external cable assembly is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



c63. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 16 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

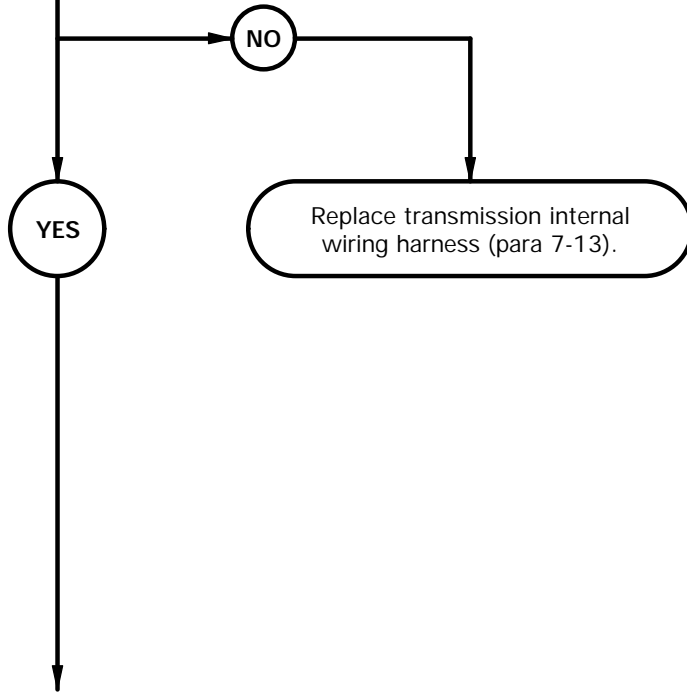
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty E solenoid. Faulty WTEC III transmission ECU.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin K to internal wiring harness connector E pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

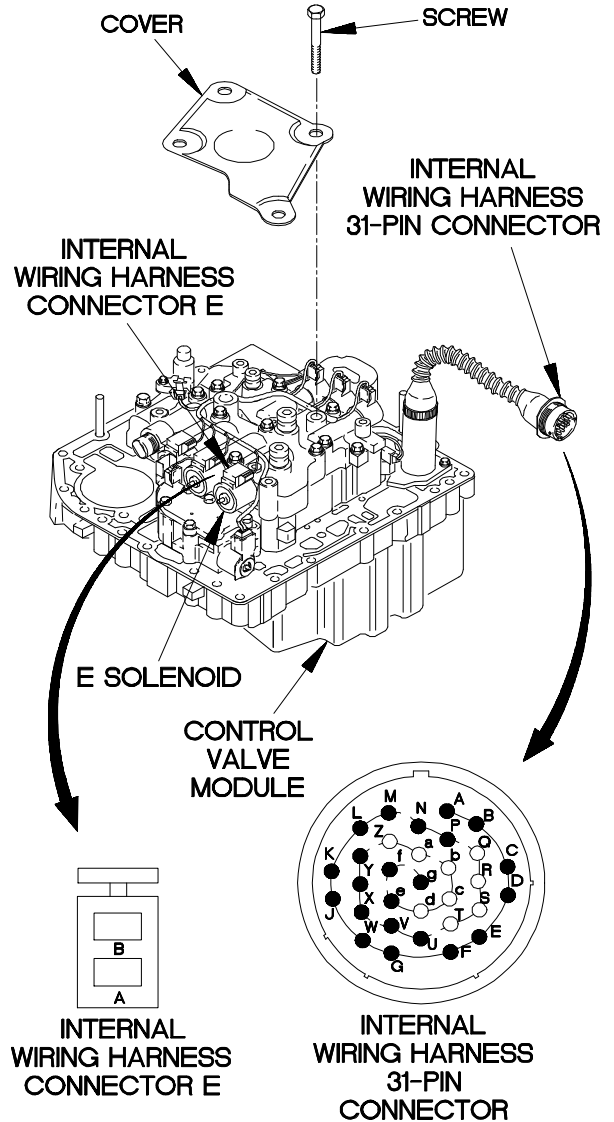


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector E from E solenoid.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin K.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector E pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin K.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



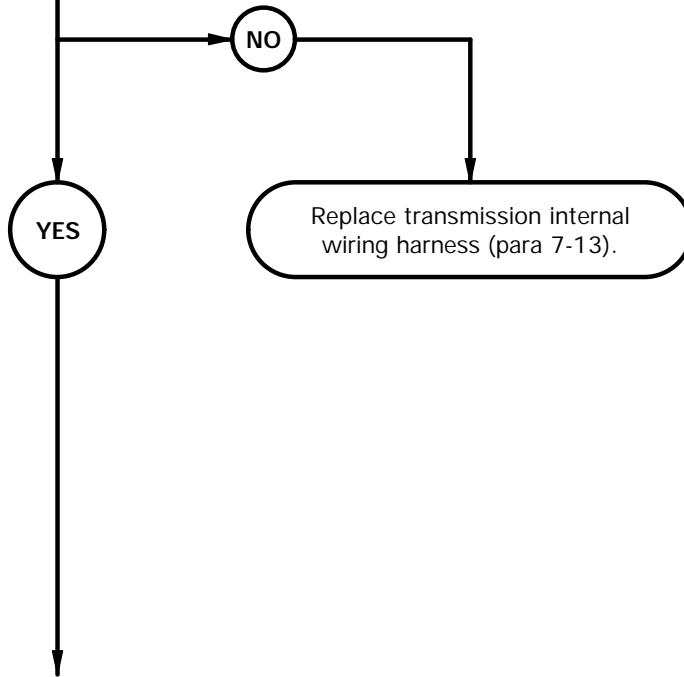
YBC6303B

c63. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 16 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty E solenoid. Faulty WTEC III transmission ECU.

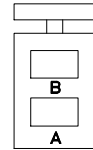
4.
Is continuity present from internal wiring harness 31-pin connector pin H to internal wiring harness connector E pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

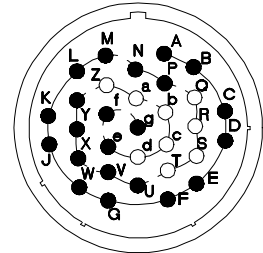


CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin H.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector E pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin H.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



**INTERNAL
WIRING HARNESS
CONNECTOR E**



**INTERNAL
WIRING HARNESS
31-PIN
CONNECTOR**

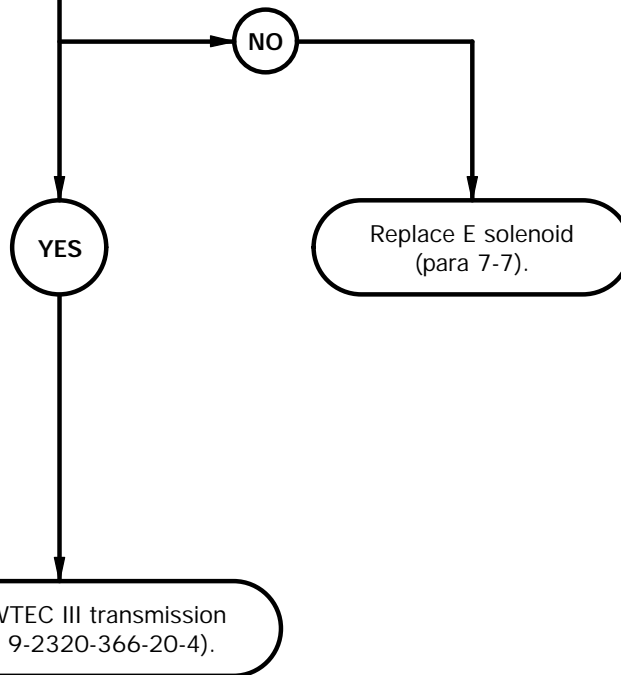
YBC6304B

c63. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 16 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. External transmission cable assembly OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty E solenoid. Faulty WTEC III transmission ECU.

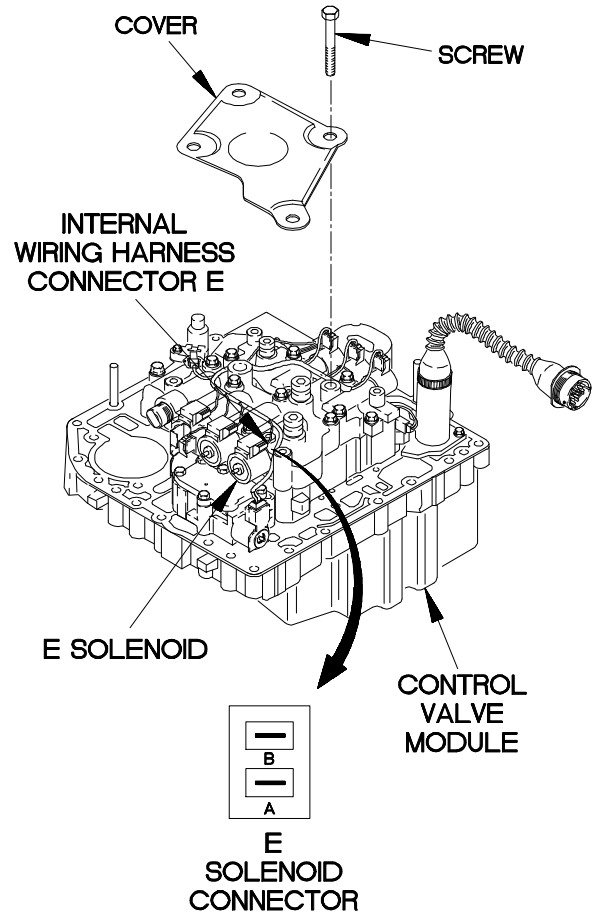
5.
Is 2.5-5.0 ohms resistance present from E solenoid pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, E solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC III transmission ECU is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of E solenoid connector.
- (3) Connect negative (-) probe of multimeter to pin B of E solenoid connector and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace E solenoid (para 7-7).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC III transmission ECU (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector E to E solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC6305B

c64. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 16 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

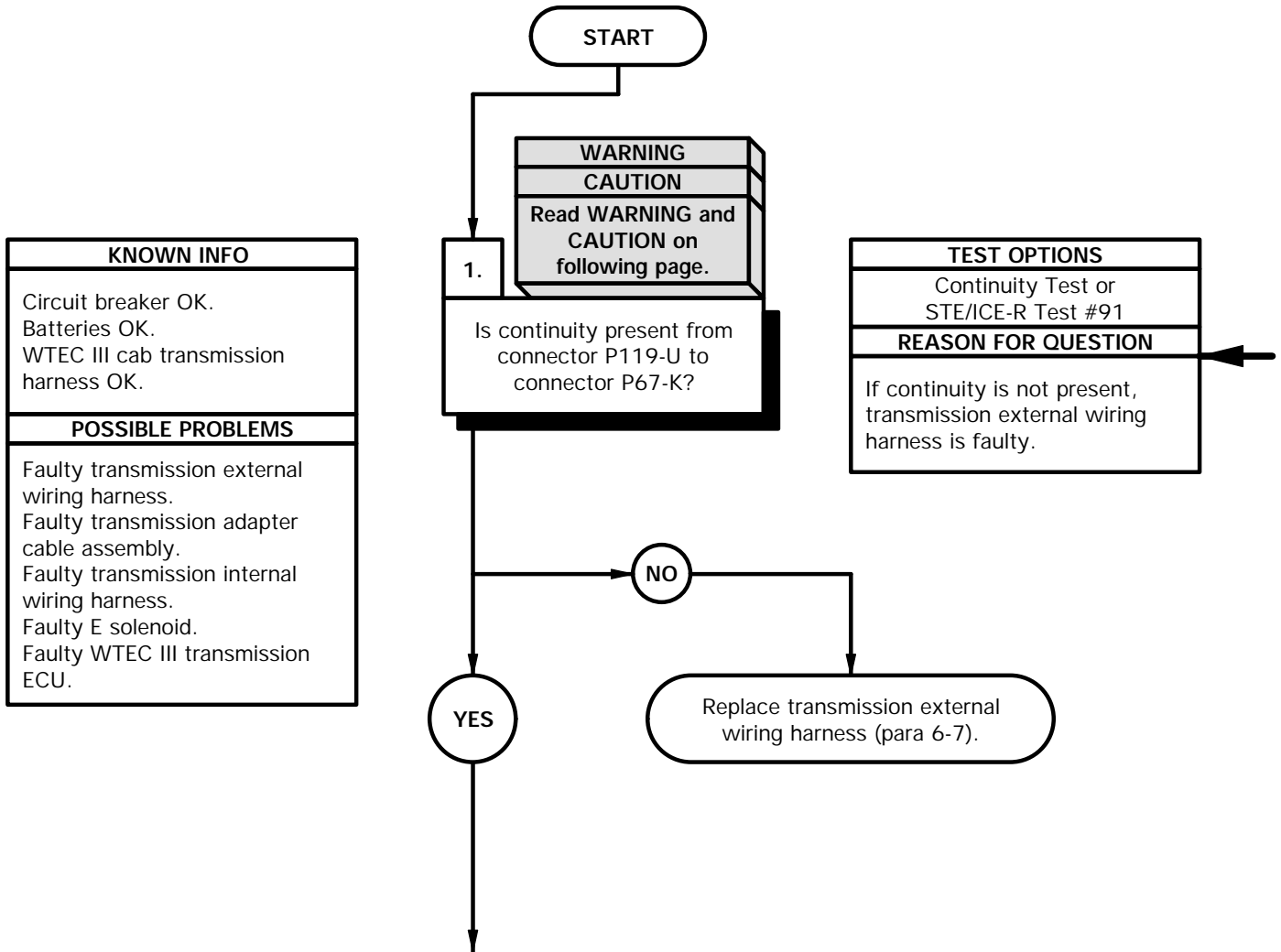
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

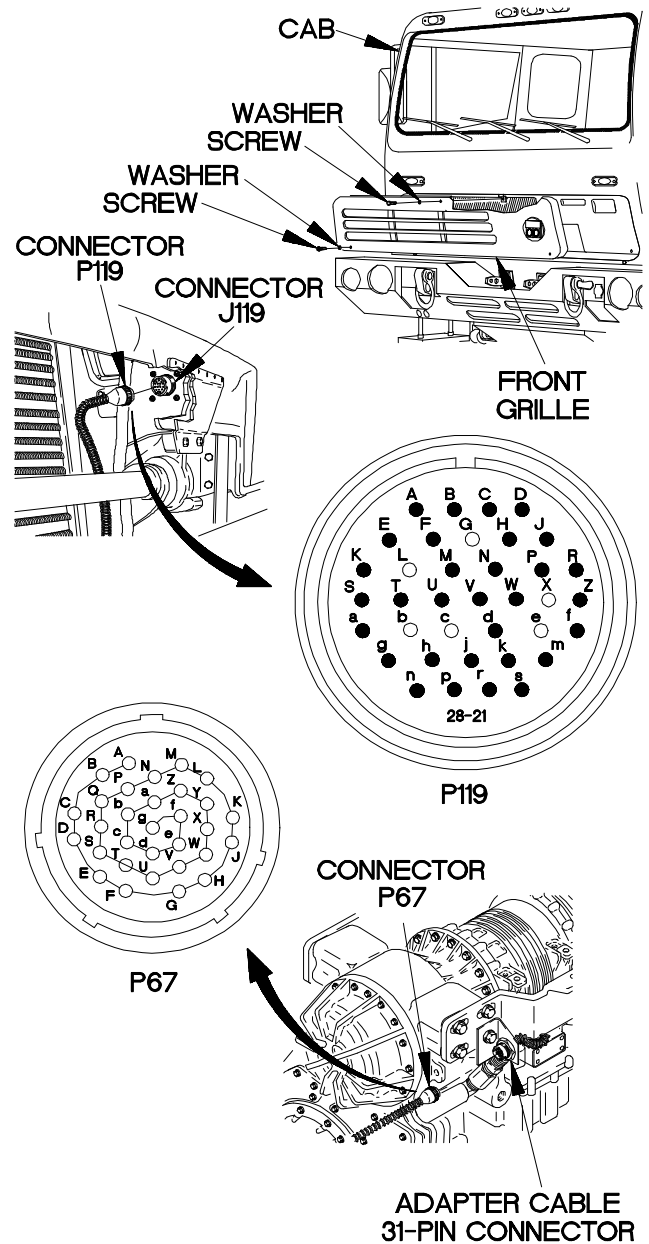
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect connector P67 from adapter cable 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-U.
- (8) Connect negative (-) probe of multimeter to connector P67-K and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-U.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



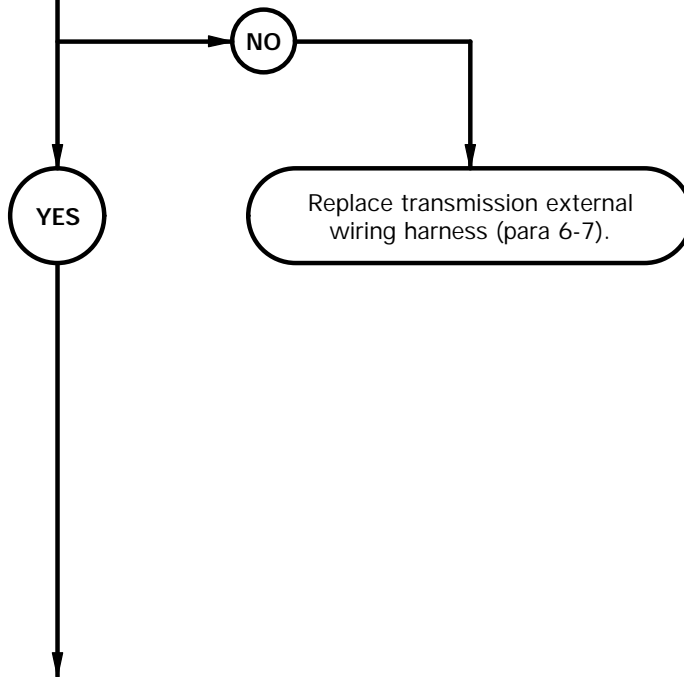
YBC6 401B

c64. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 16 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty E solenoid. Faulty WTEC III transmission ECU.

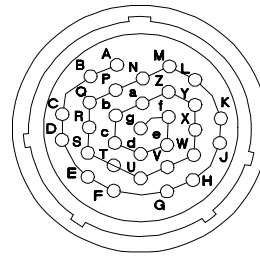
2.
Is continuity present from connector P119-N to connector P67-H?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

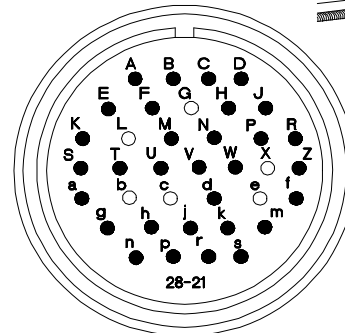
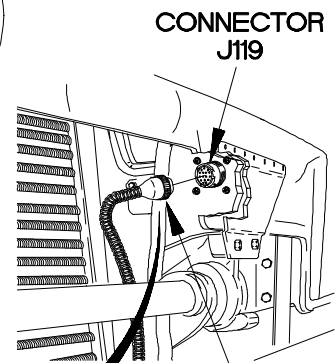


CONTINUITY TEST

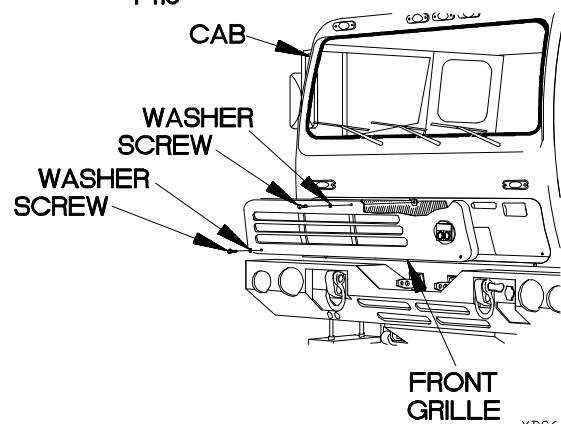
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-N.
- (3) Connect negative (-) probe of multimeter to connector P67-H and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-N.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



P67



P119



YBC6402B

c64. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 16 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

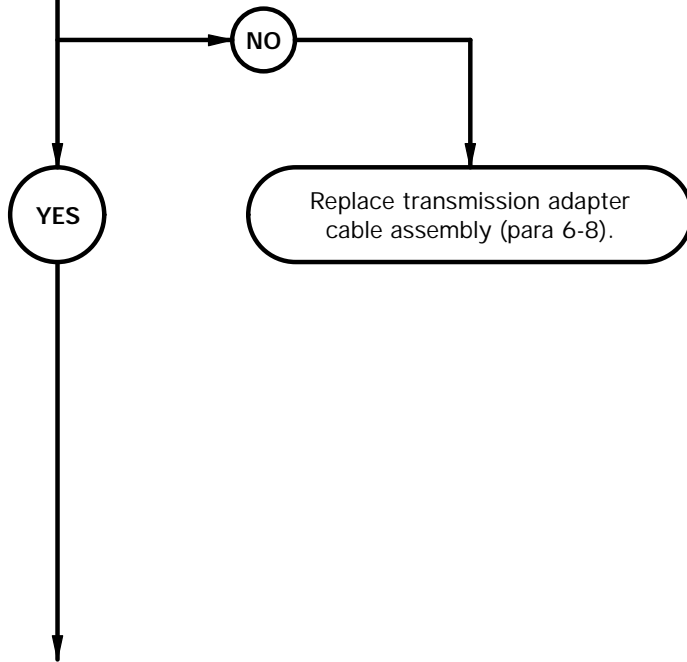
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty E solenoid. Faulty WTEC III transmission ECU.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin K to adapter cable 24-pin connector pin E1?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.

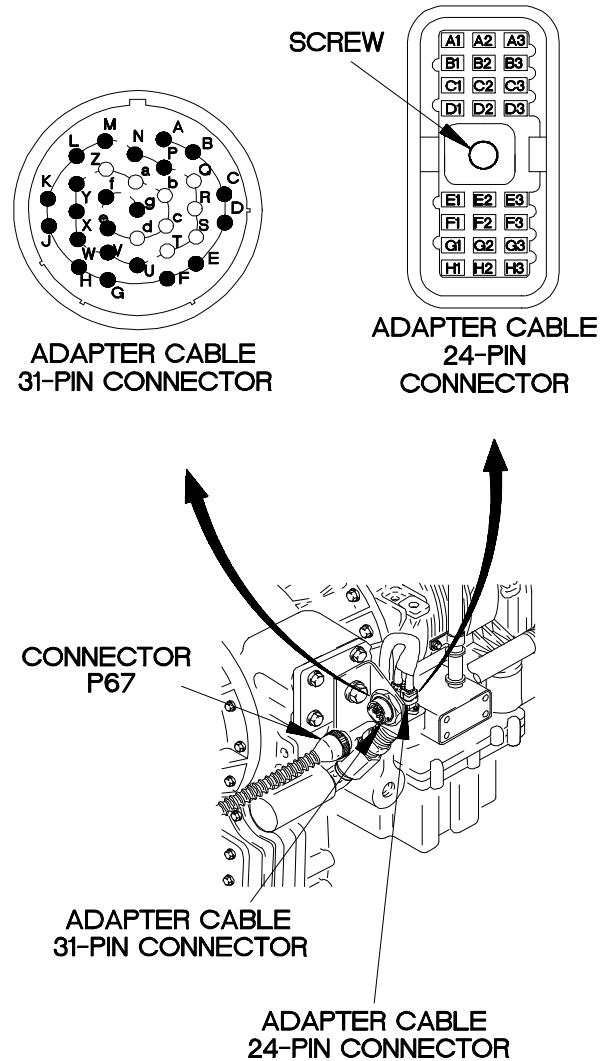


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Loosen screw in adapter cable 24-pin connector.
- (2) Disconnect adapter cable 24-pin connector from internal wiring harness 24-pin connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin K.
- (5) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin E1 and note reading on multimeter.
- (6) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (7) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin K.
- (8) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).



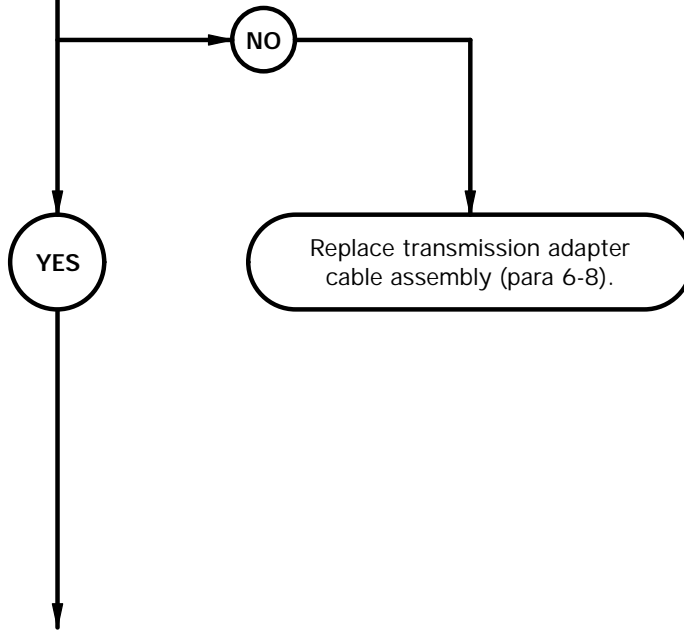
YBC6403B

c64. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 16 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty E solenoid. Faulty WTEC III transmission ECU.

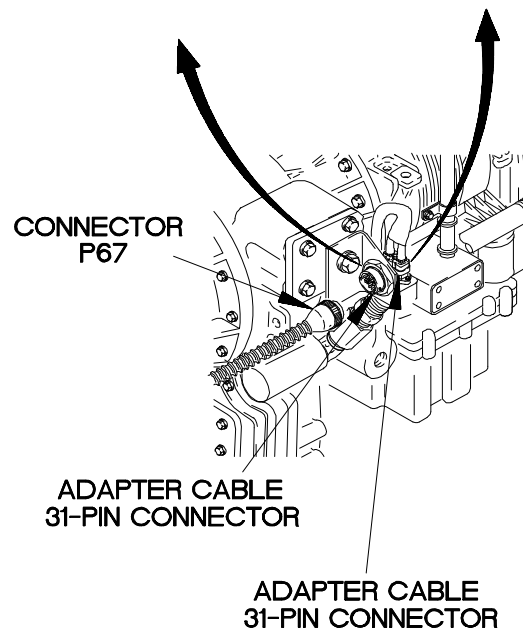
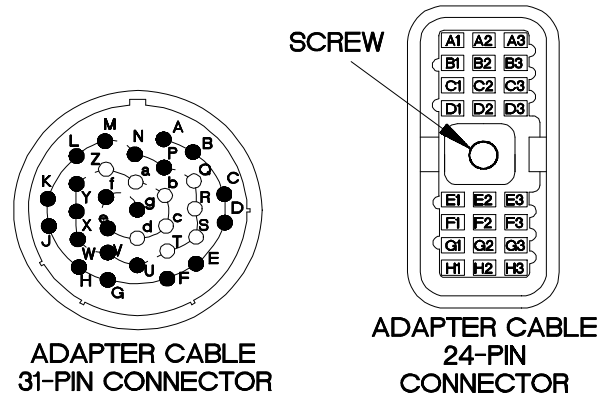
4.
Is continuity present from adapter cable 31-pin connector pin H to adapter cable 24-pin connector pin B2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin H.
- (3) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin B2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (5) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin H.
- (6) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).
- (9) Connect connector P67 to adapter cable 31-pin connector.



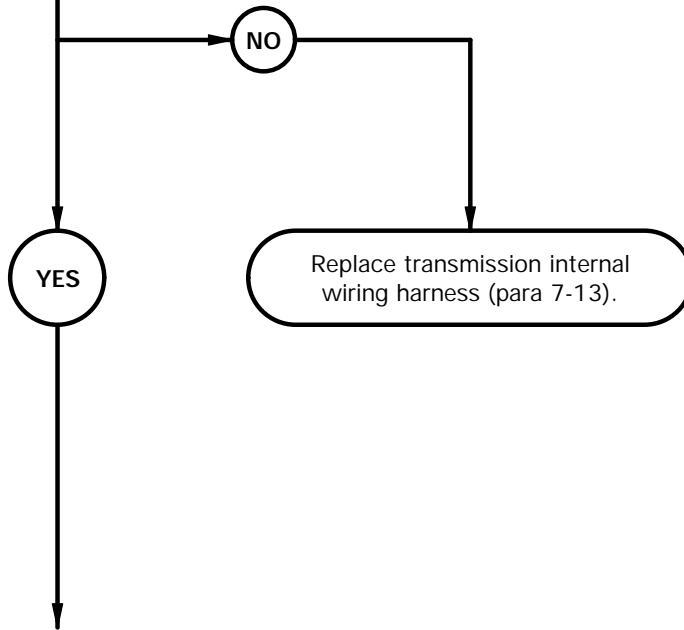
YBC6404B

c64. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 16 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty E solenoid. Faulty WTEC III transmission ECU.

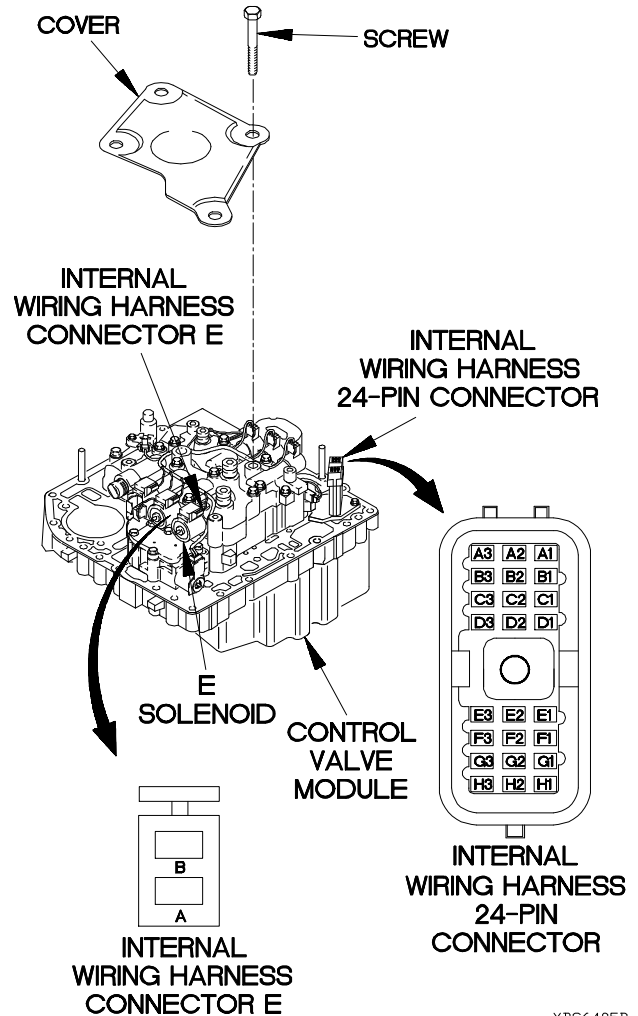
5.
Is continuity present from internal wiring harness 24-pin connector pin E1 to internal wiring harness connector E pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Remove control valve module (para 7-5).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector E from E solenoid.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin E1.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector E pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin E1.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



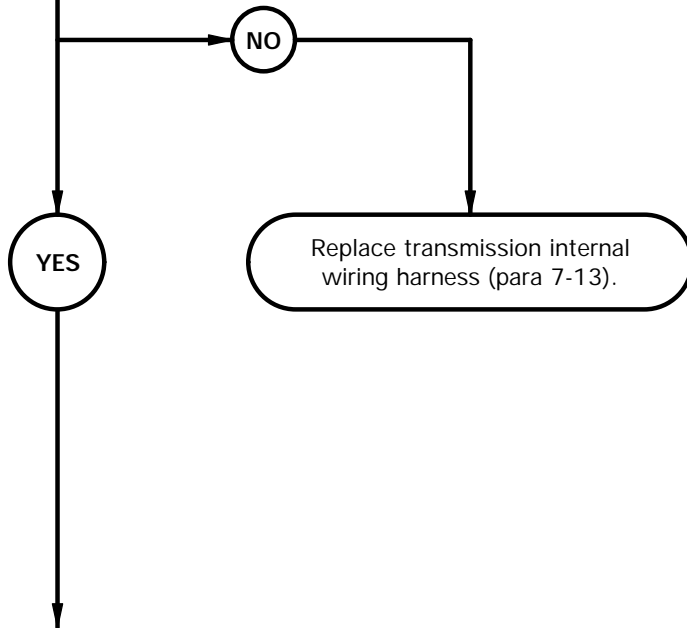
YBC6405B

c64. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 16 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty E solenoid. Faulty WTEC III transmission ECU.

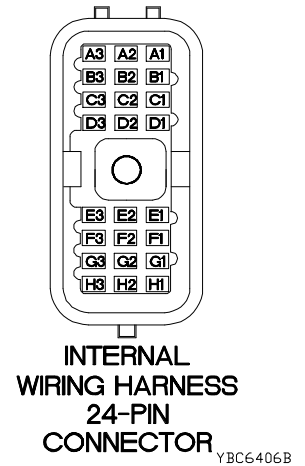
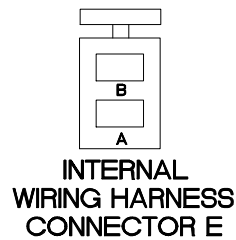
6.
Is continuity present from internal wiring harness 24-pin connector pin B2 to internal wiring harness connector E pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

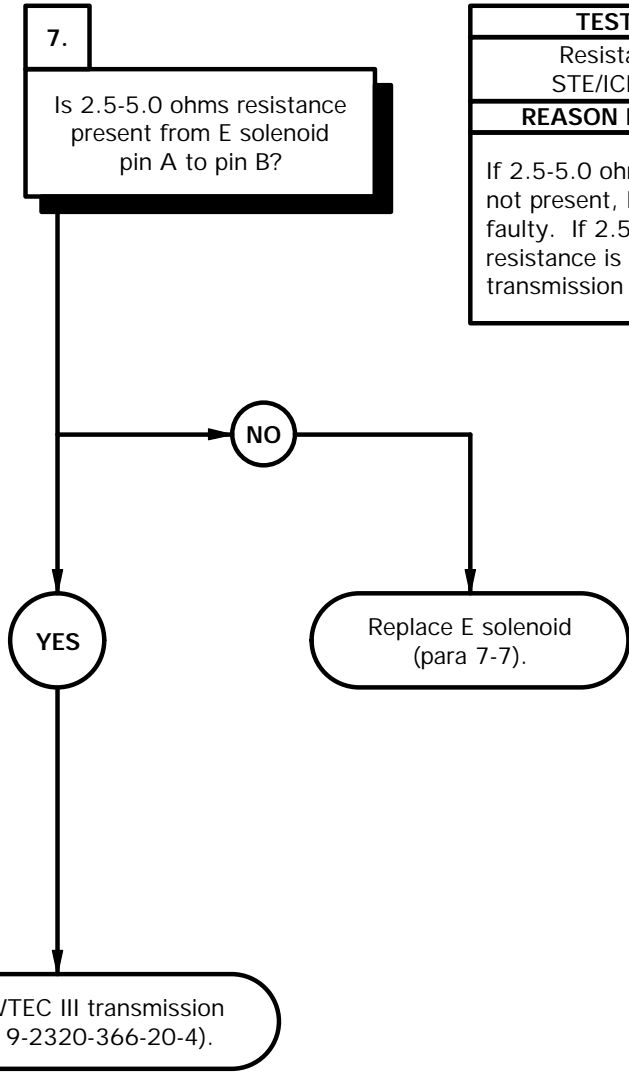
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin B2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector E pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin B2.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector, except pin B1, and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



c64. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 16 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

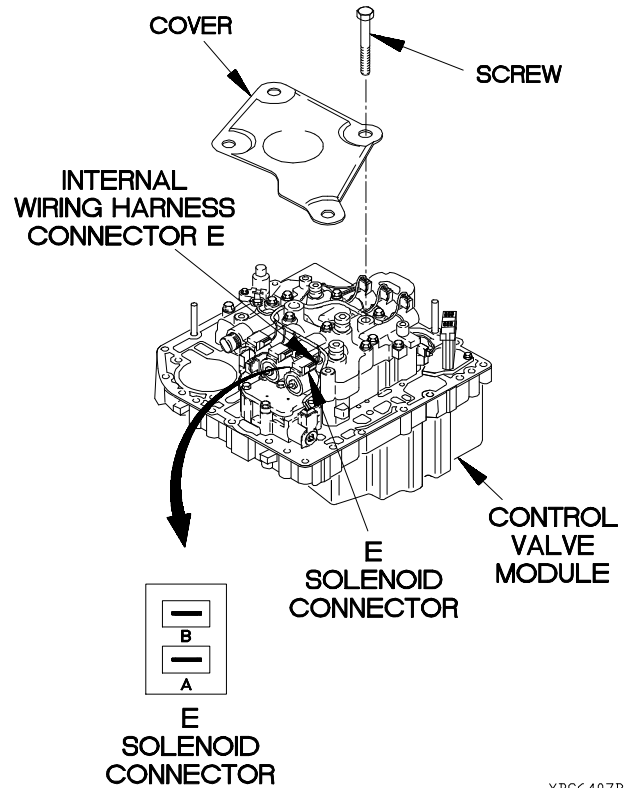
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty E solenoid. Faulty WTEC III transmission ECU.

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, E solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC III transmission ECU is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of E solenoid connector.
- (3) Connect negative (-) probe of multimeter to pin B of E solenoid connector and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace E solenoid (para 7-7).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC III transmission ECU (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector E to E solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC6407B

c65. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

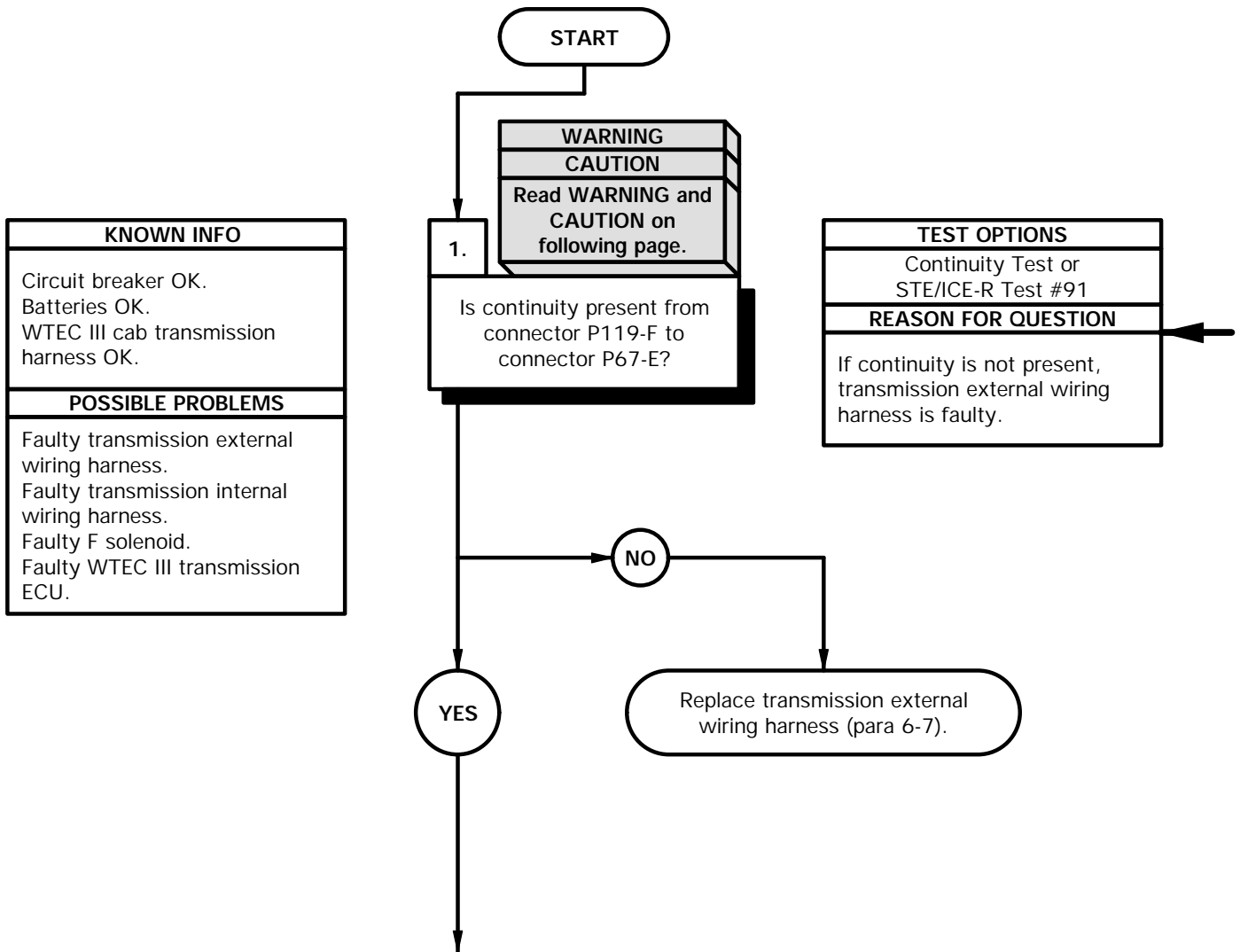
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

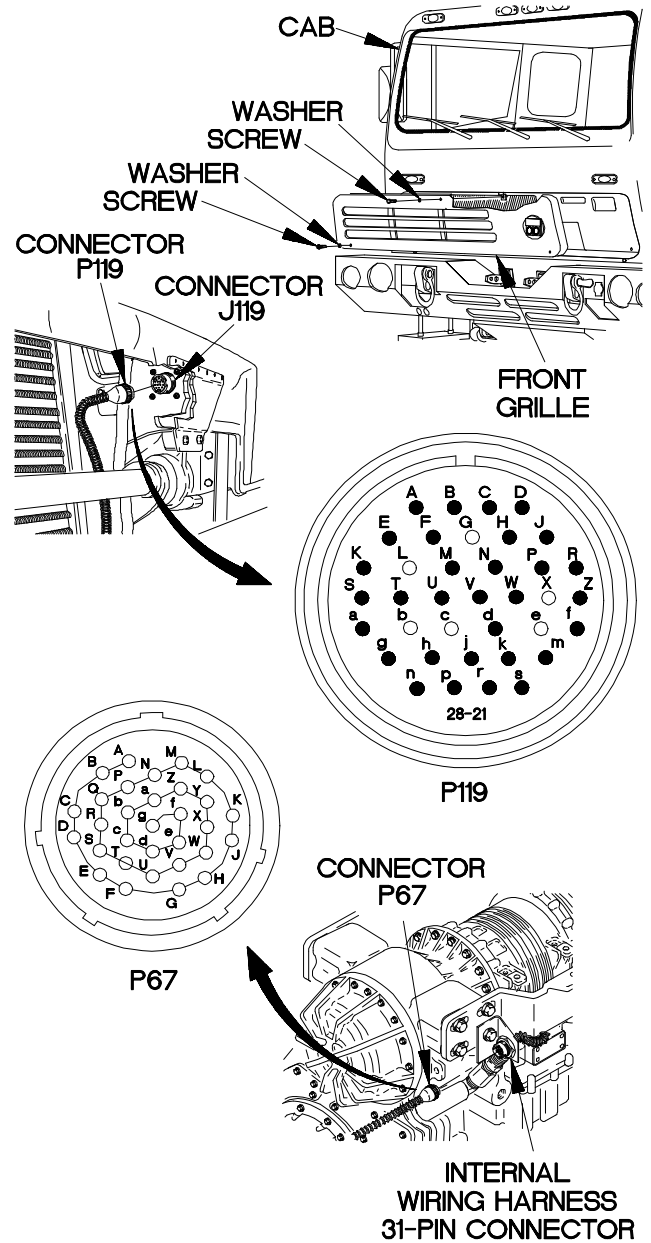
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect external wiring harness connector P67 from internal wiring harness 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-F.
- (8) Connect negative (-) probe of multimeter to connector P67-E and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-F.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



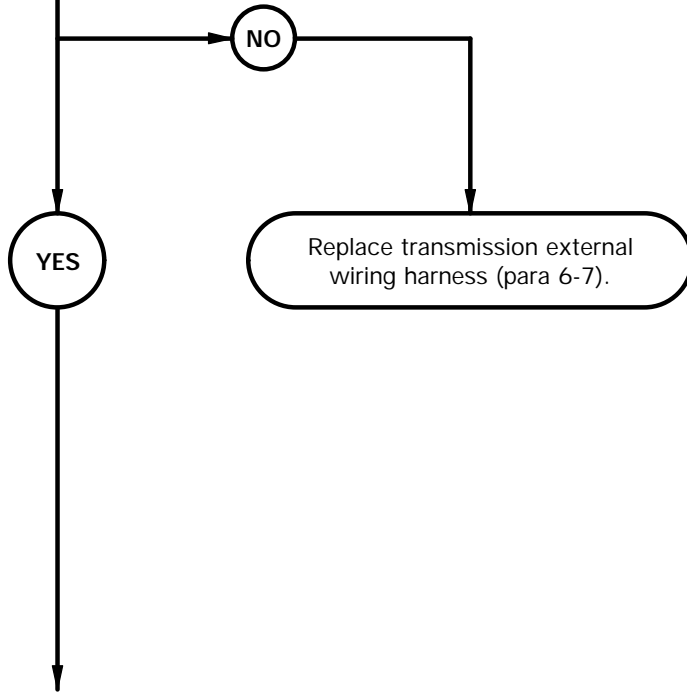
YBC6501B

c65. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC III transmission ECU.

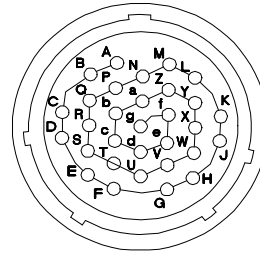
2.
Is continuity present from connector P119-H to connector P67-F?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

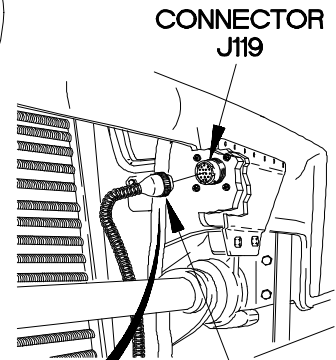


CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-H.
- (3) Connect negative (-) probe of multimeter to connector P67-F and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-H.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external cable assembly is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).

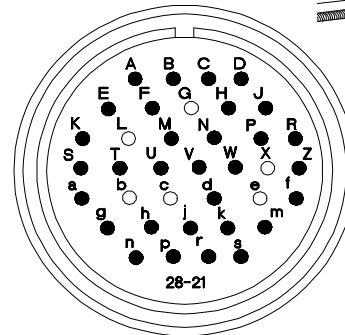


P67

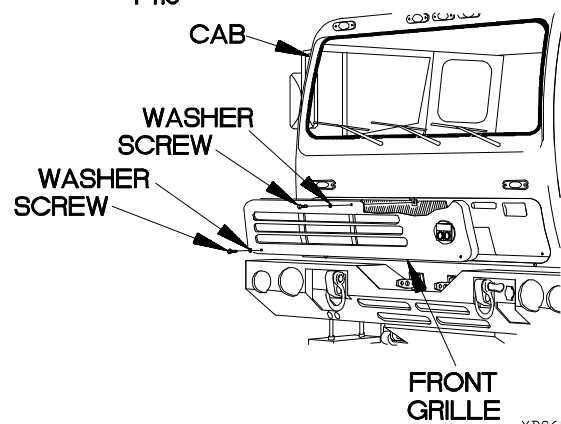


CONNECTOR J119

CONNECTOR P119



P119



FRONT GRILLE

YBC6502B

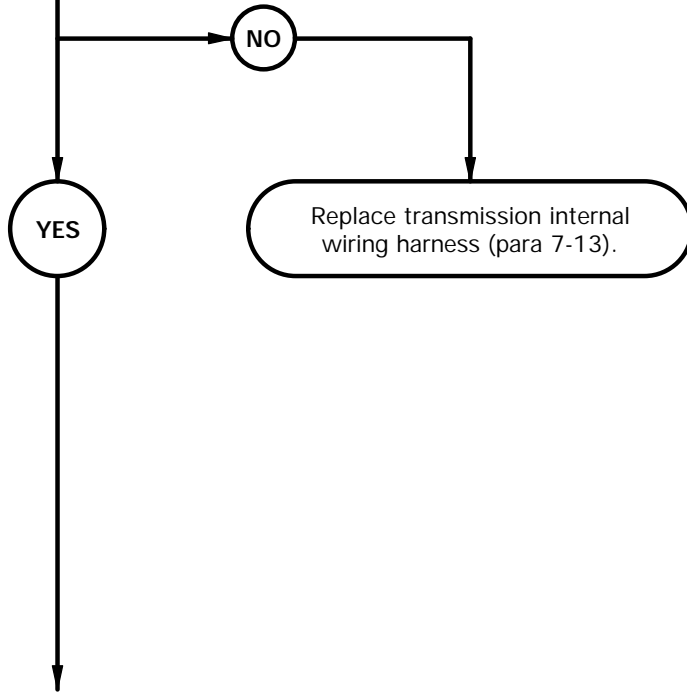
c65. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC III transmission ECU.

3. **CAUTION**
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin E to internal wiring harness connector F pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

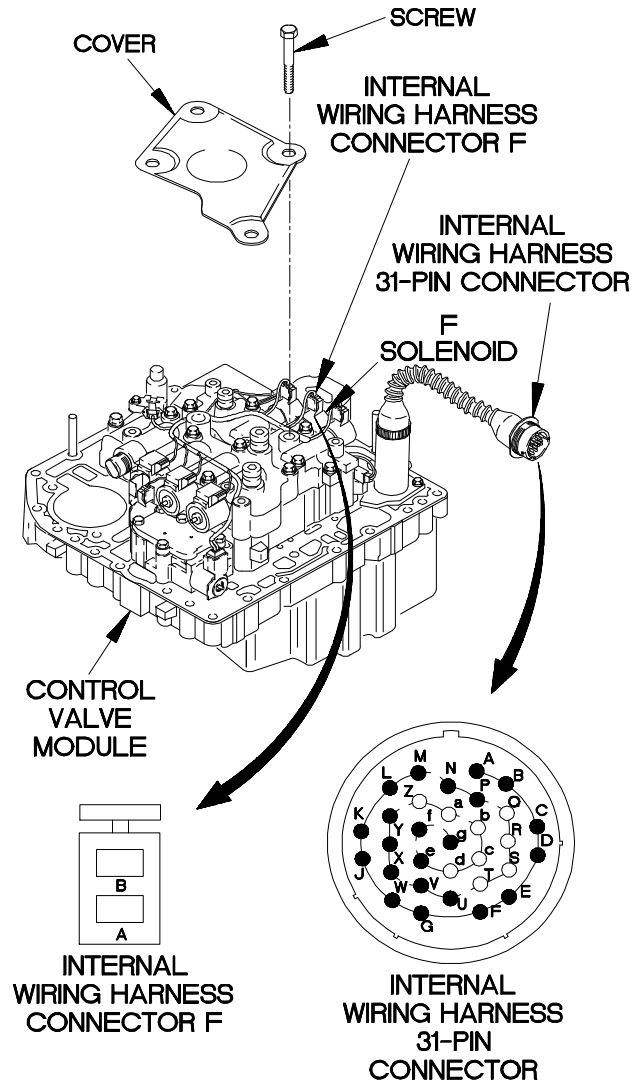


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector F from F solenoid.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin E.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector F pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin E.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



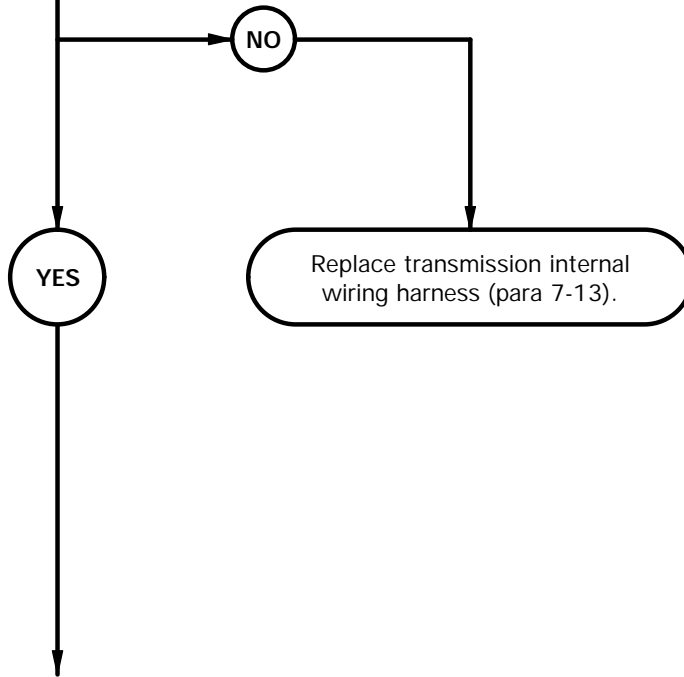
YBC6503B

c65. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC III transmission ECU.

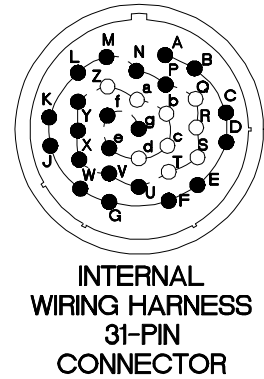
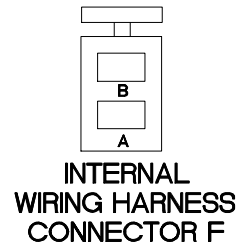
4.
Is continuity present from internal wiring harness 31-pin connector pin F to internal wiring harness connector F pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin F.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector F pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin F.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



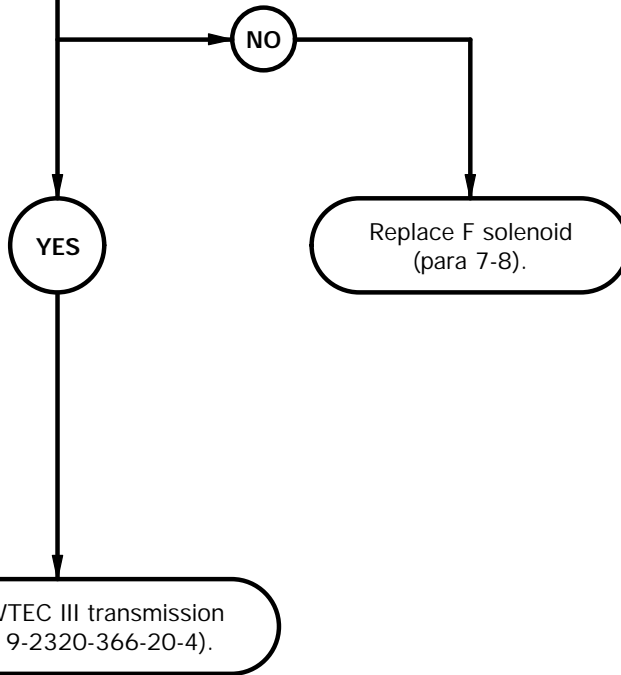
YBC6504B

c65. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty F solenoid. Faulty WTEC III transmission ECU.

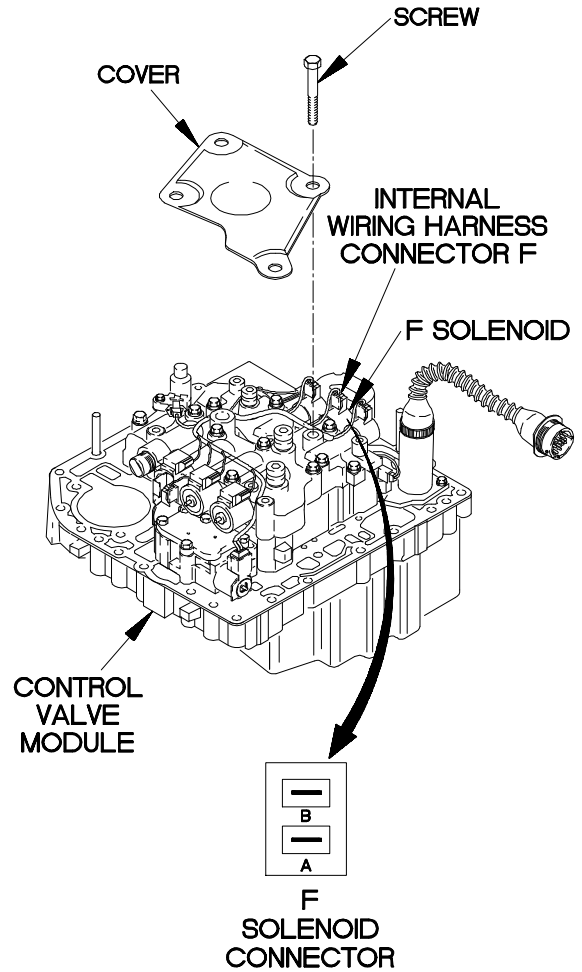
5.
Is 2.5-5.0 ohms resistance present from F solenoid pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, F solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC III transmission ECU is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of F solenoid connector.
- (3) Connect negative (-) probe of multimeter to pin B of F solenoid connector and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace F solenoid (para 7-8).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC III transmission ECU (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector F to F solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC6505B

c66. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

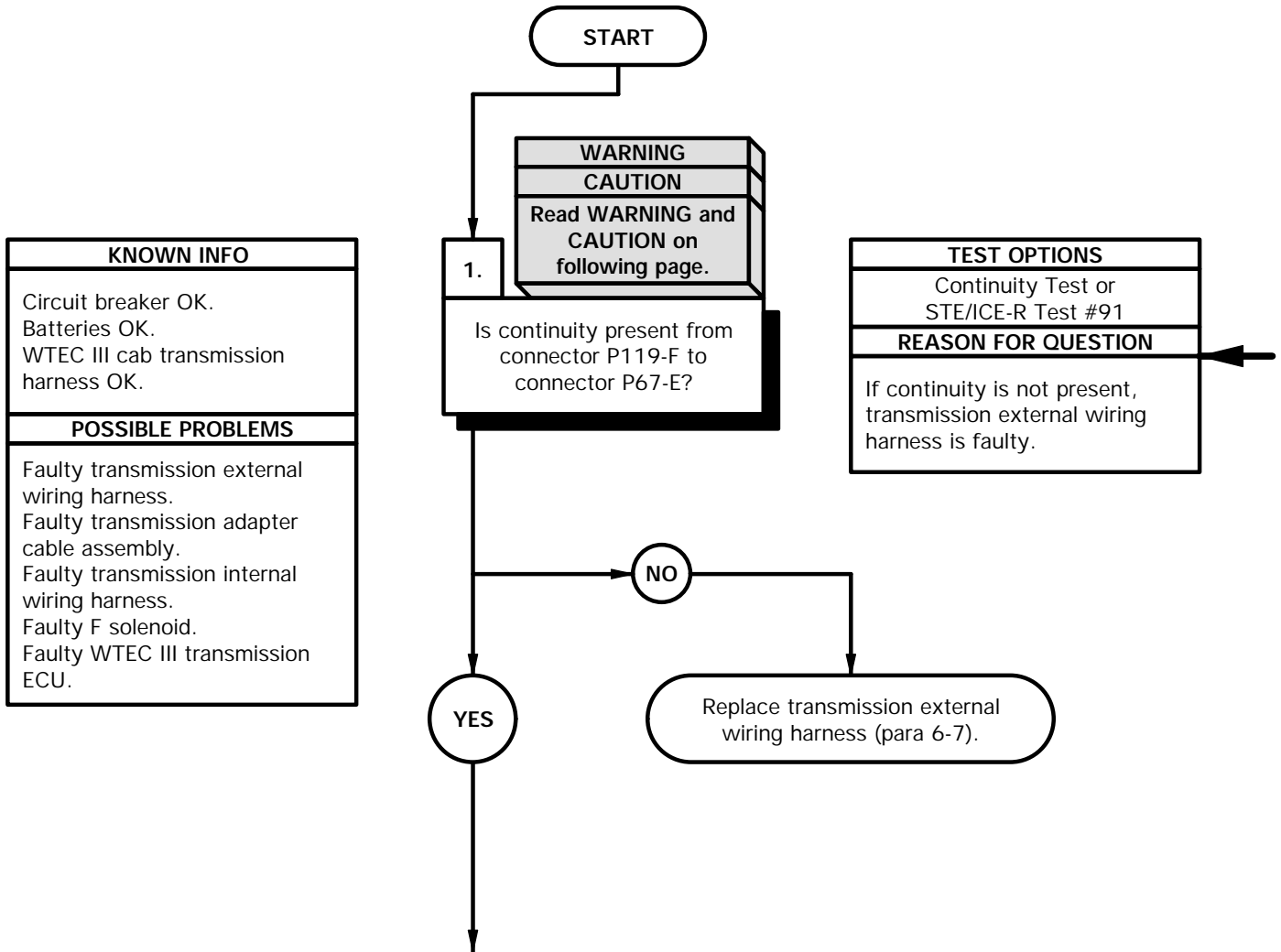
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

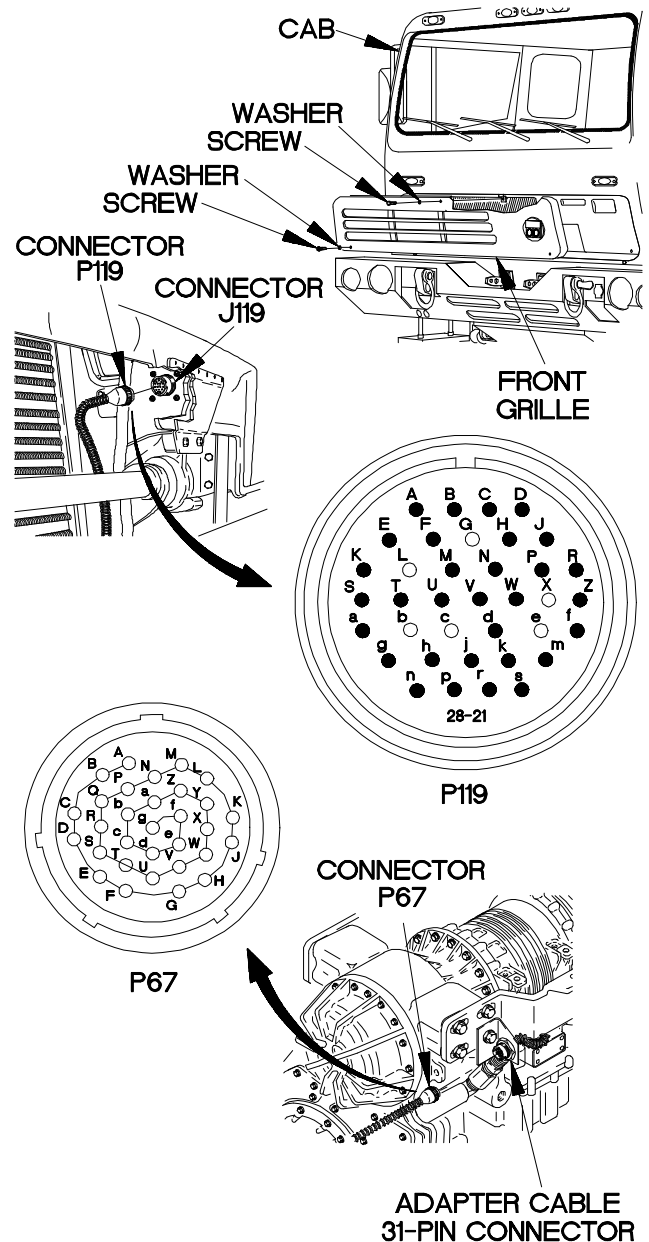
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect connector P67 from adapter cable 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-F.
- (8) Connect negative (-) probe of multimeter to connector P67-E and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-F.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

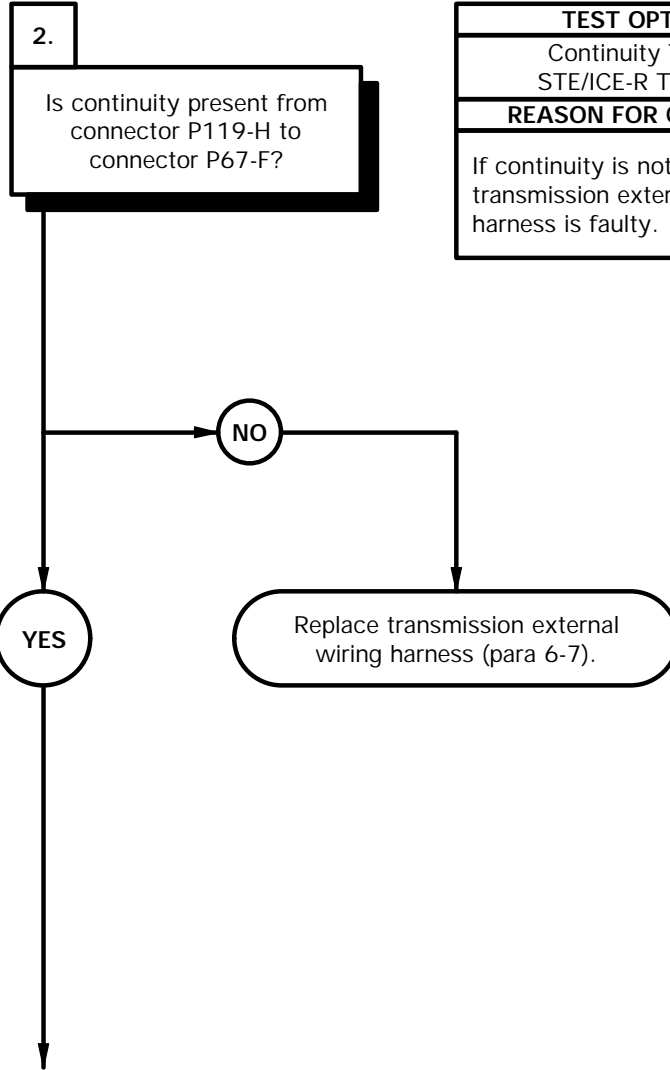
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



YBC6601B

c66. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

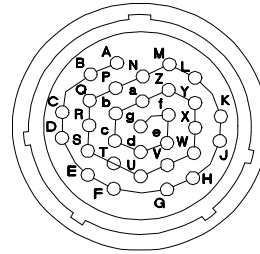
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC III transmission ECU.



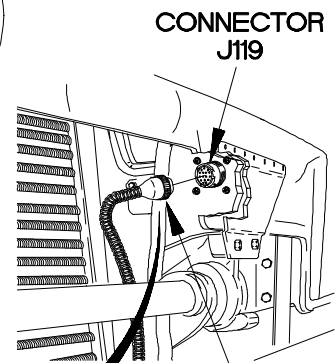
TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-H.
- (3) Connect negative (-) probe of multimeter to connector P67-F and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-H.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).

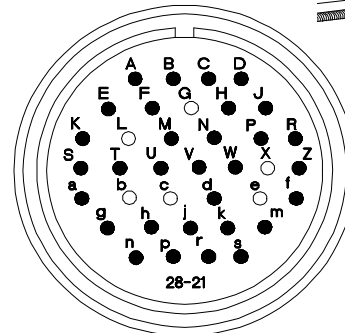


P67

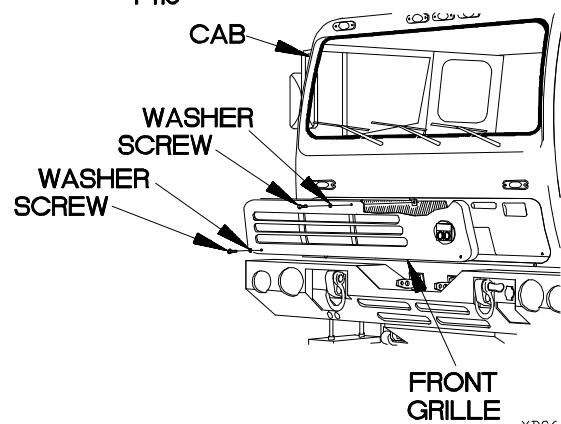


CONNECTOR J119

CONNECTOR P119



P119



YBC6602B

c66. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

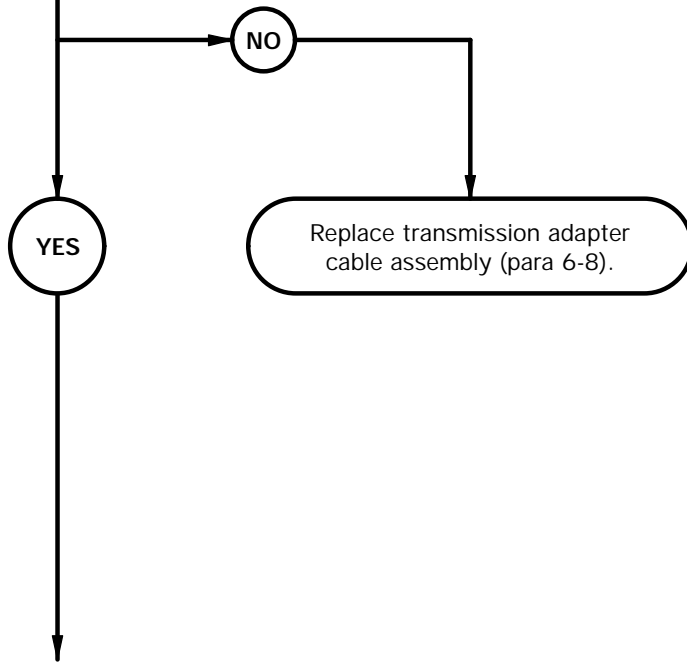
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC III transmission ECU.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin E to adapter cable 24-pin connector pin D3?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.

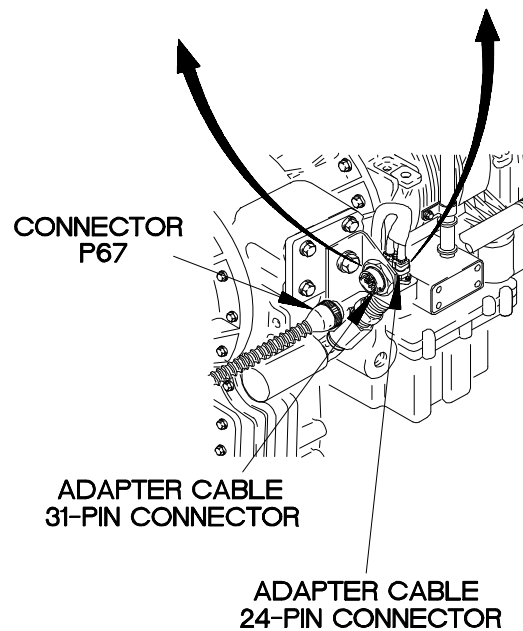
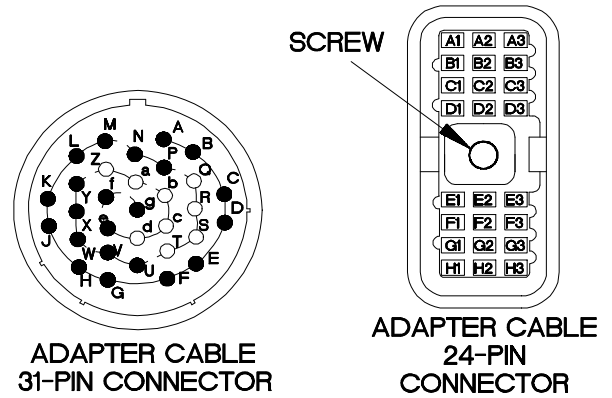


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Loosen screw in adapter cable 24-pin connector.
- (2) Disconnect adapter cable 24-pin connector from internal wiring harness 24-pin connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin E.
- (5) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin D3 and note reading on multimeter.
- (6) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (7) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin E.
- (8) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).



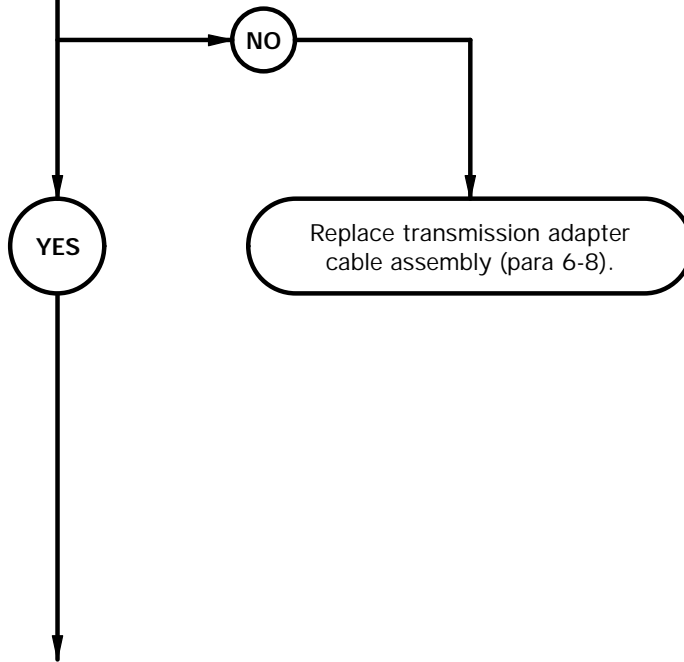
YBC6603B

c66. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC III transmission ECU.

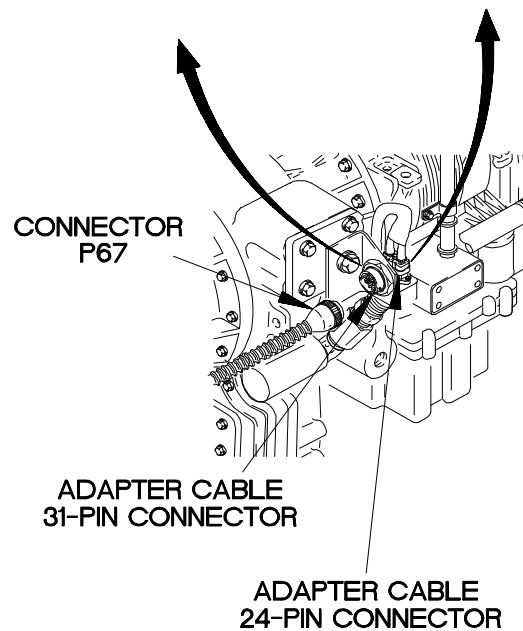
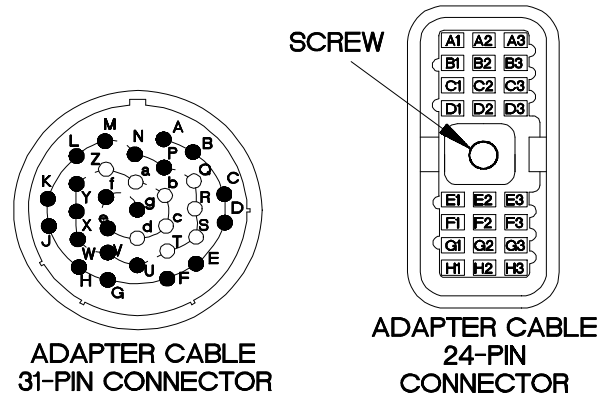
4.
Is continuity present from adapter cable 31-pin connector pin F to adapter cable 24-pin connector pin D2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin F.
- (3) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin D2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (5) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin F.
- (6) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).
- (9) Connect connector P67 to adapter cable 31-pin connector.



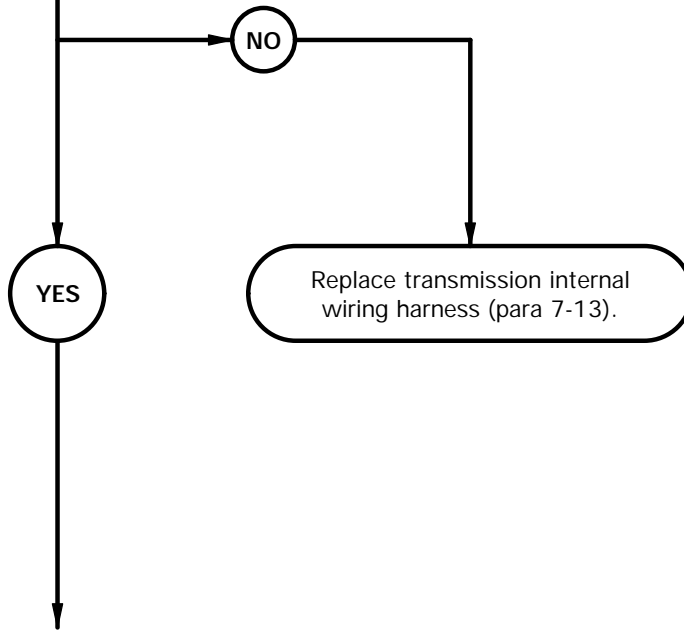
YBC6604B

c66. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC III transmission ECU.

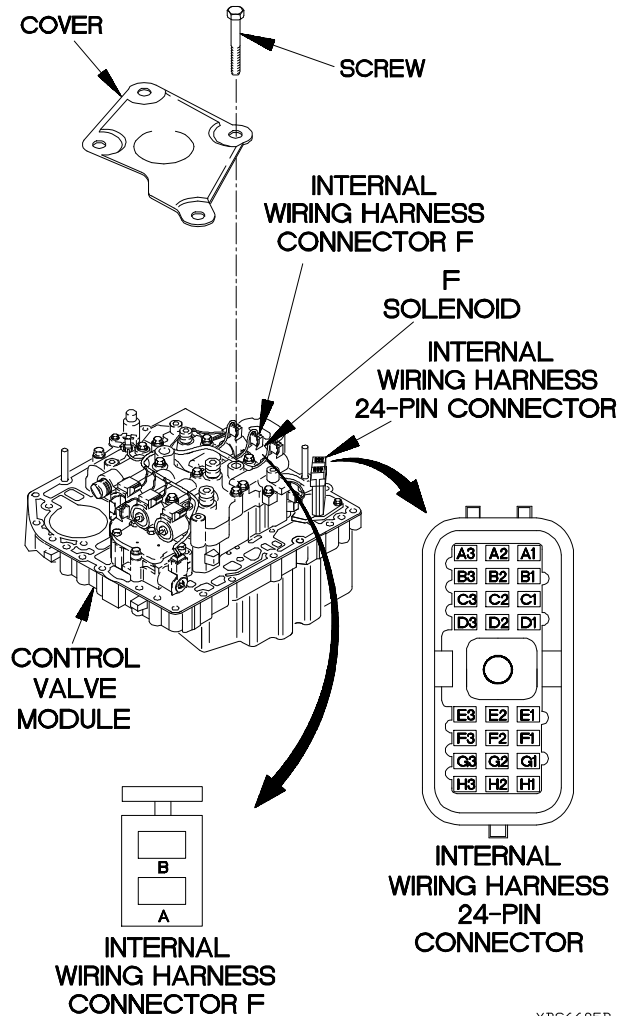
5.
Is continuity present from internal wiring harness 24-pin connector pin D3 to internal wiring harness connector F pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector F from F solenoid.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin D3.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector F pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin D3.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



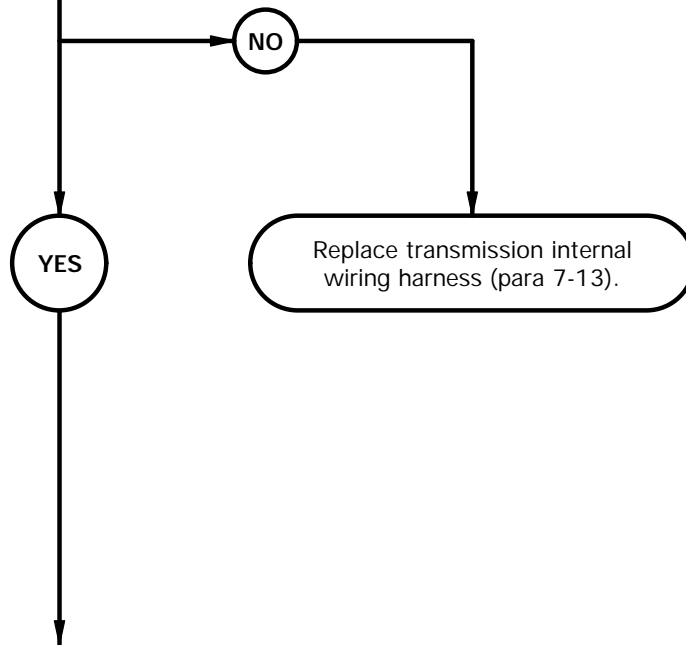
YBC6605B

c66. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC III transmission ECU.

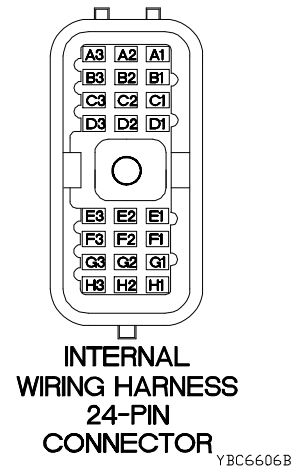
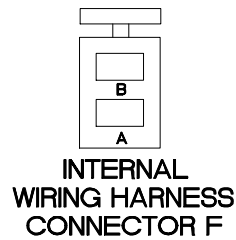
6.
Is continuity present from internal wiring harness 24-pin connector pin D2 to internal wiring harness connector F pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

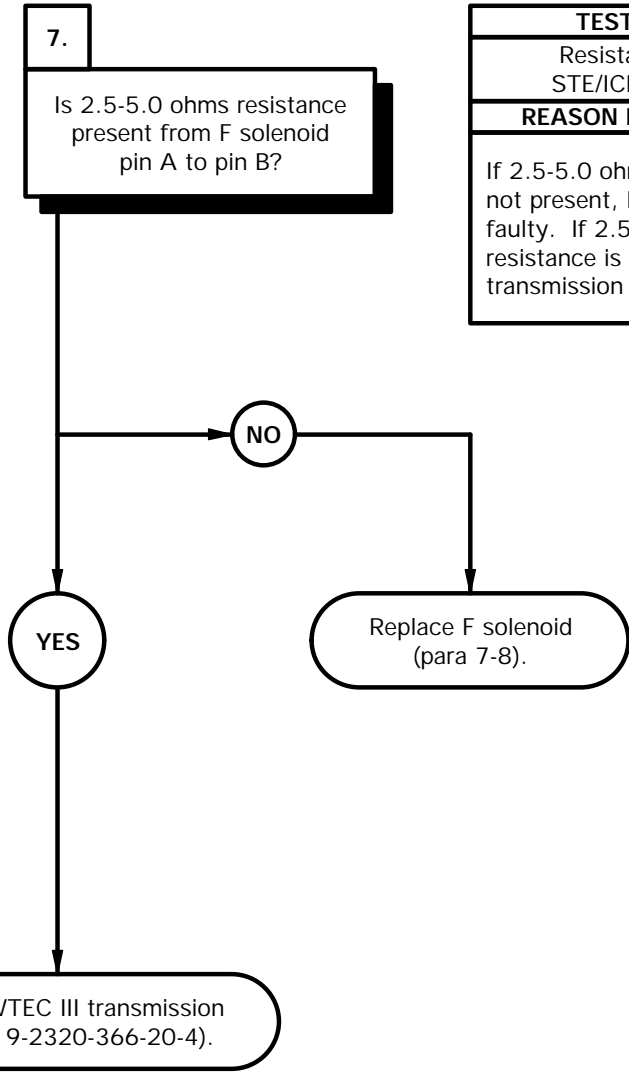
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin D2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector F pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin D2.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



c66. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

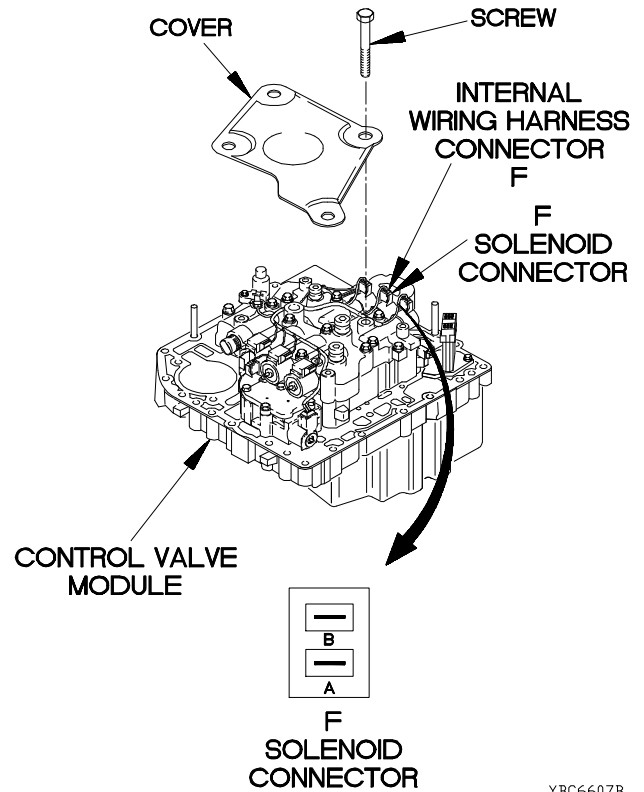
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty F solenoid. Faulty WTEC III transmission ECU.

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, F solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC III transmission ECU is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of F solenoid connector.
- (3) Connect negative (-) probe of multimeter to pin B of F solenoid connector and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace F solenoid (para 7-8).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC III transmission ECU (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector F to F solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC6607B

c67. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 22 (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

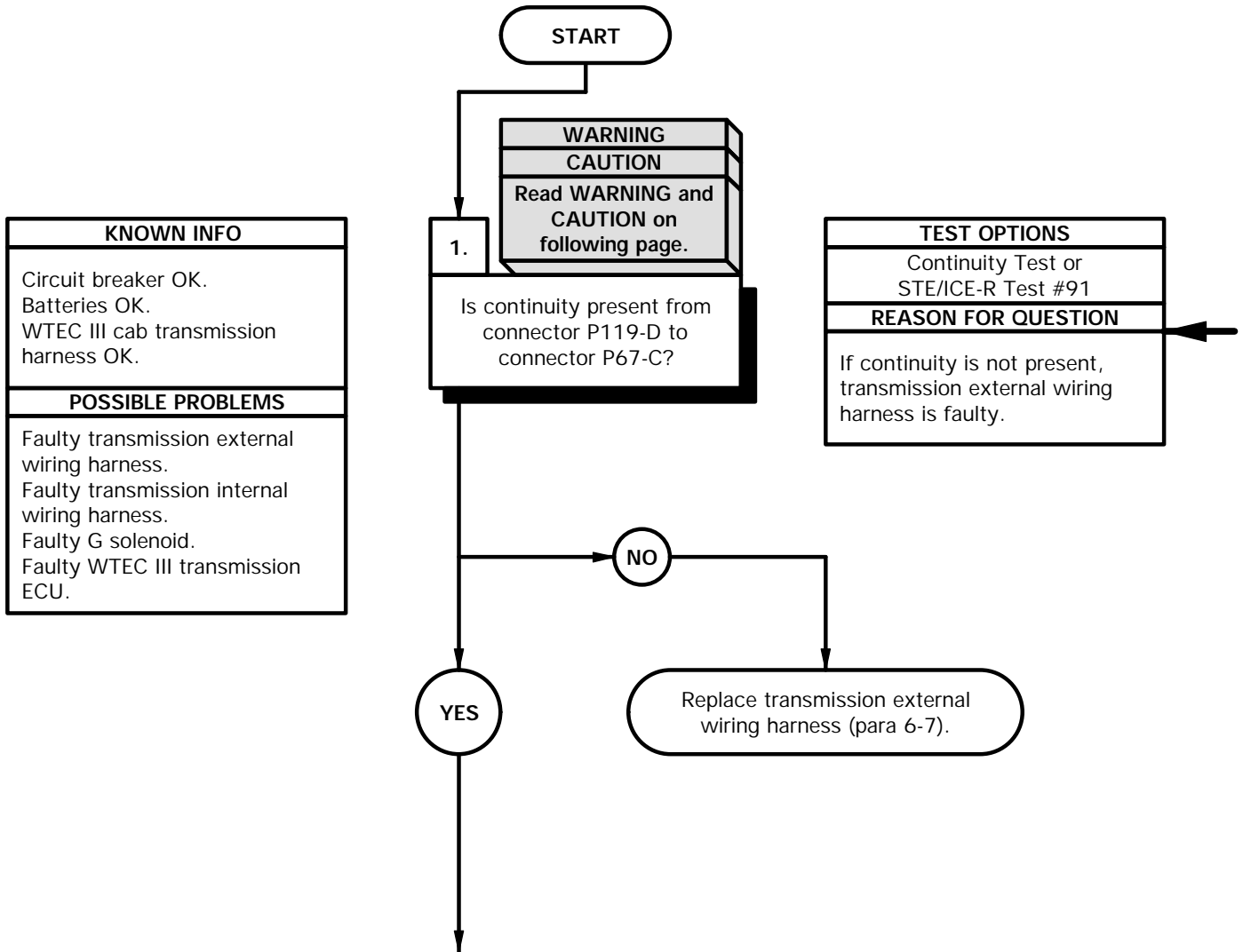
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

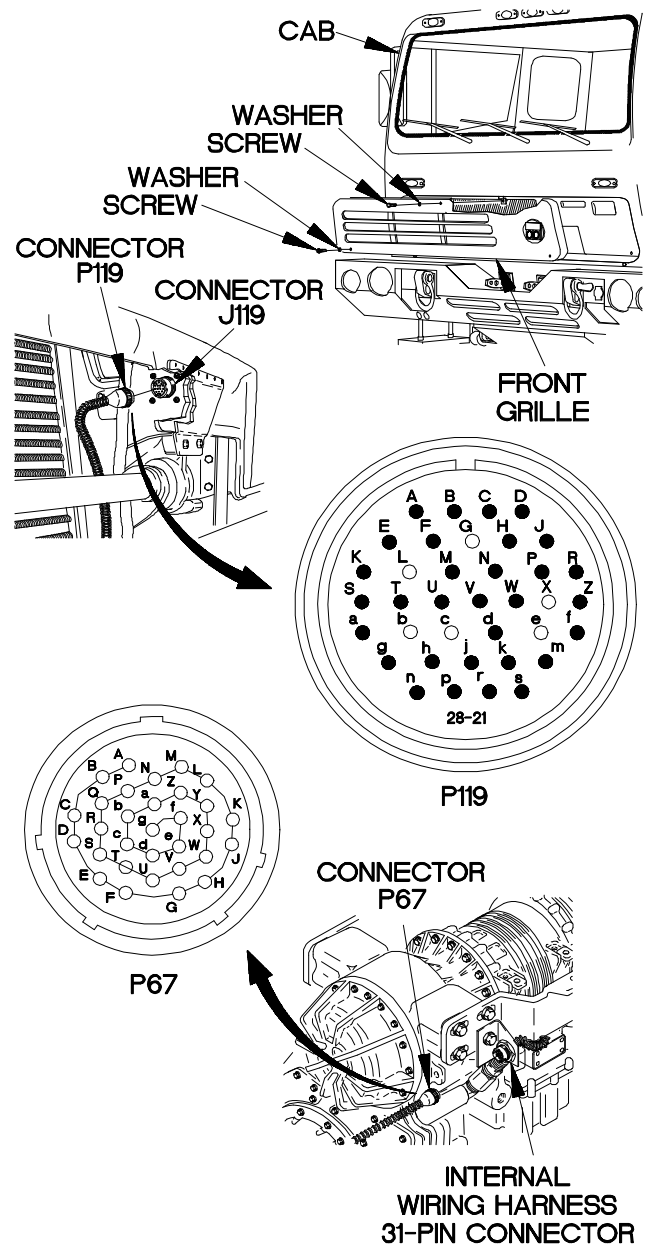
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect connector P67 from internal wiring harness 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-D.
- (8) Connect negative (-) probe of multimeter to connector P67-C and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-D.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted, replace transmission external wiring harness (para 6-7).



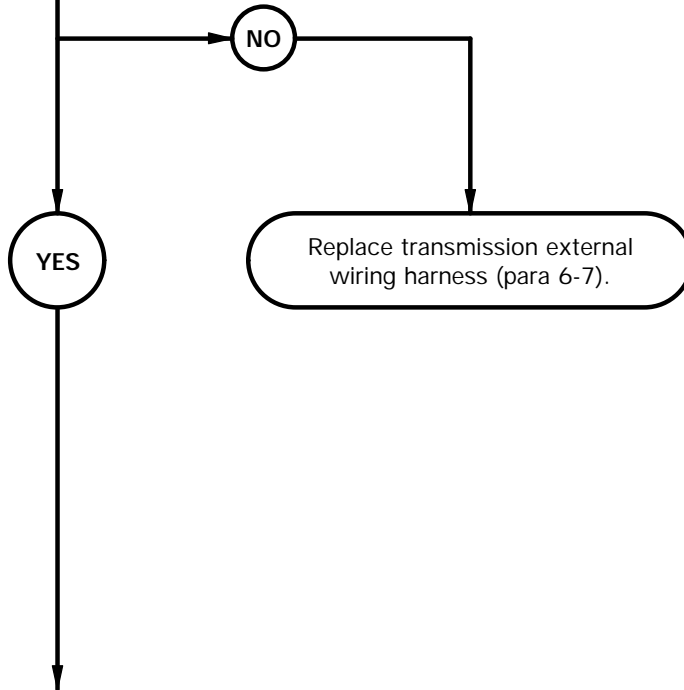
YBC6701B

c67. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 22 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty G solenoid. Faulty WTEC III transmission ECU.

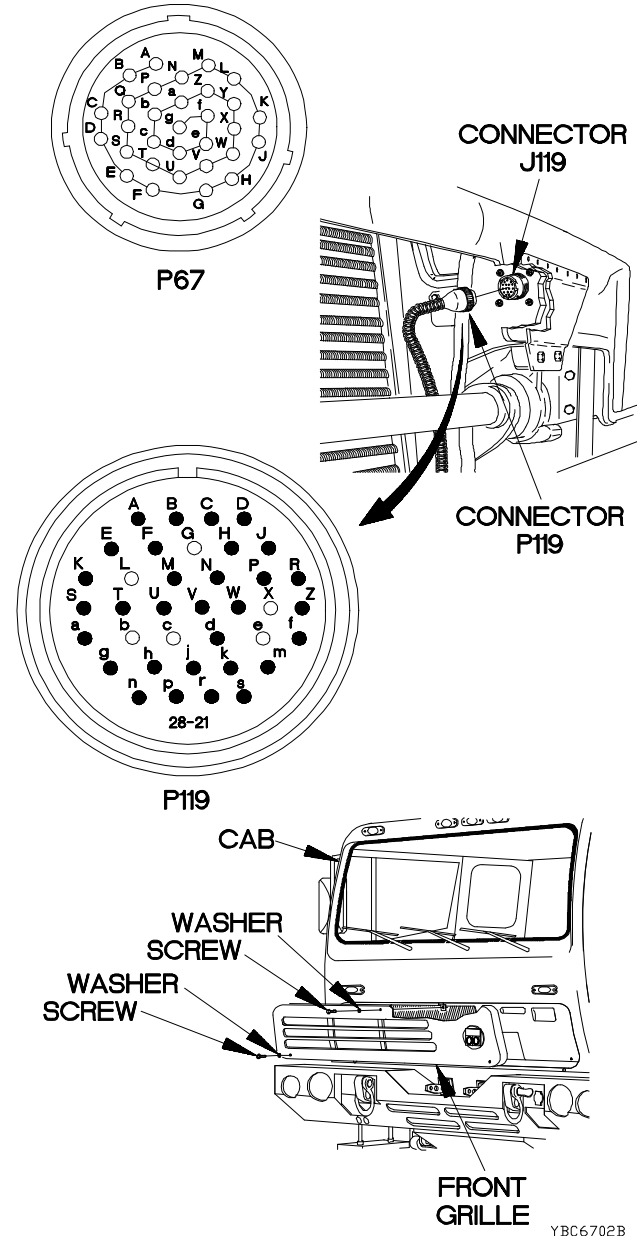
2.
Is continuity present from connector P119-V to connector P67-L?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-V.
- (3) Connect negative (-) probe of multimeter to connector P67-L and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-V.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external cable assembly is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



c67. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 22 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

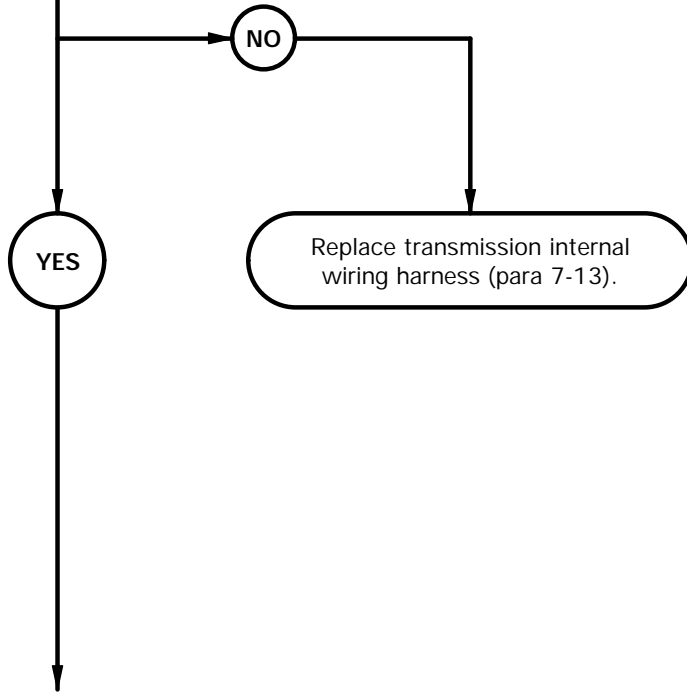
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty G solenoid. Faulty WTEC III transmission ECU.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin C to internal wiring harness connector G pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

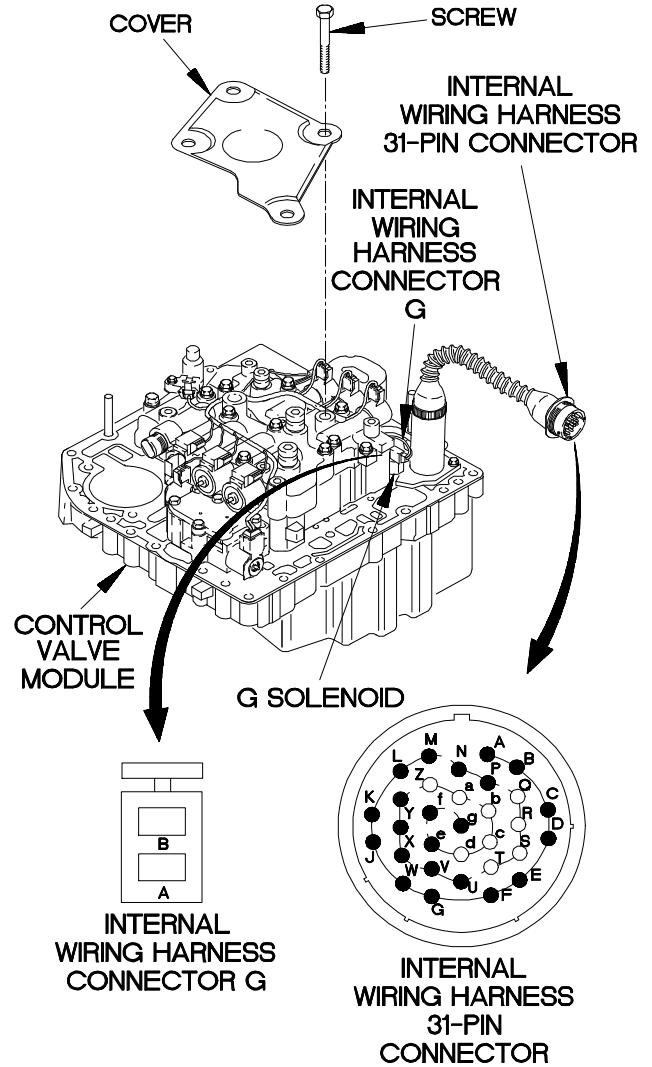


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector G from G solenoid.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin C.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector G pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin C.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



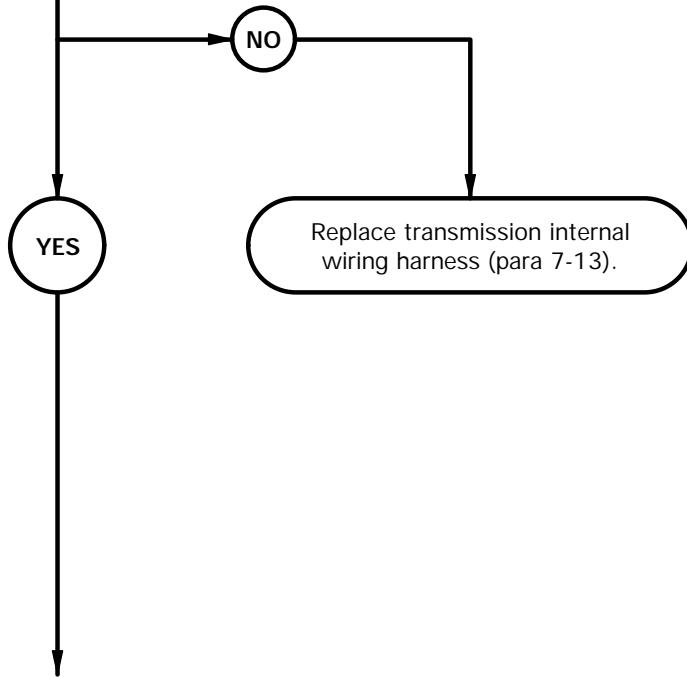
YBC6703B

c67. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 22 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty G solenoid. Faulty WTEC III transmission ECU.

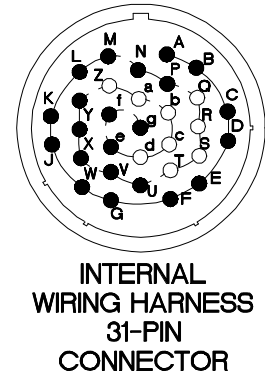
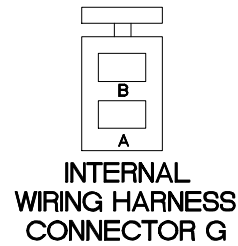
4.
Is continuity present from internal wiring harness 31-pin connector pin L to internal wiring harness connector G pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin L.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector G pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin L.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



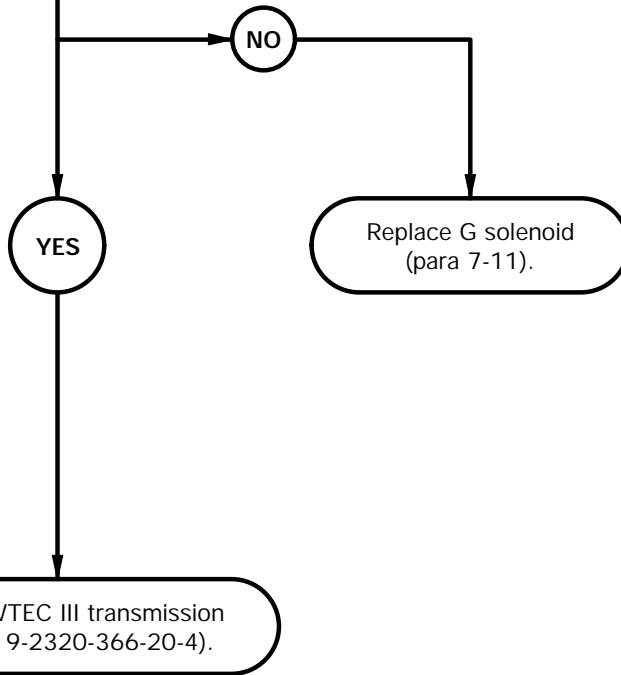
YBC6704B

c67. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 22 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty G solenoid. Faulty WTEC III transmission ECU.

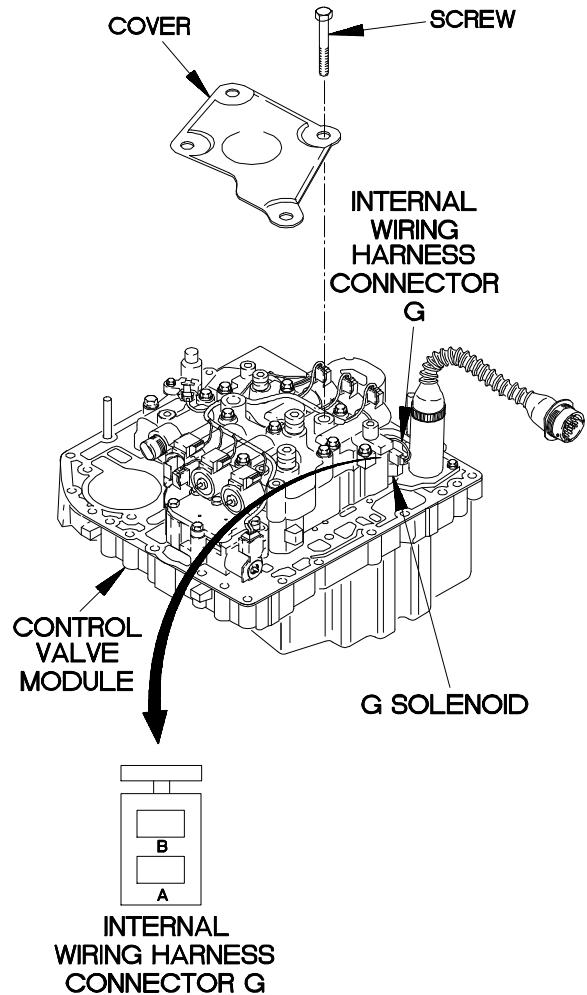
5.
Is 2.5-5.0 ohms resistance present from G solenoid pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, G solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC III transmission ECU is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of G solenoid connector.
- (3) Connect negative (-) probe of multimeter to pin B of G solenoid connector and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace G solenoid (para 7-11).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC III transmission ECU (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector G to G solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC6705B

c68. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 22 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

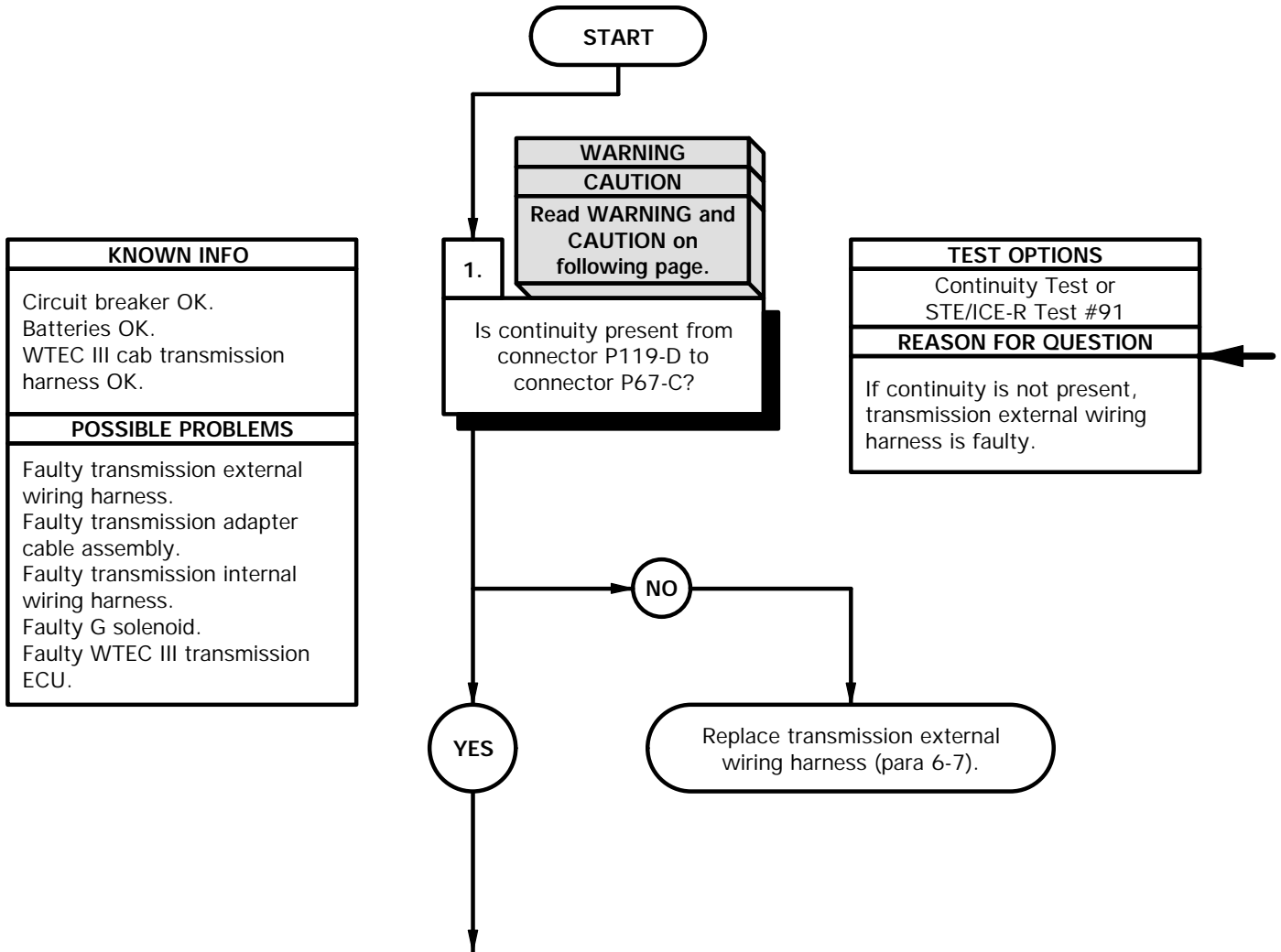
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

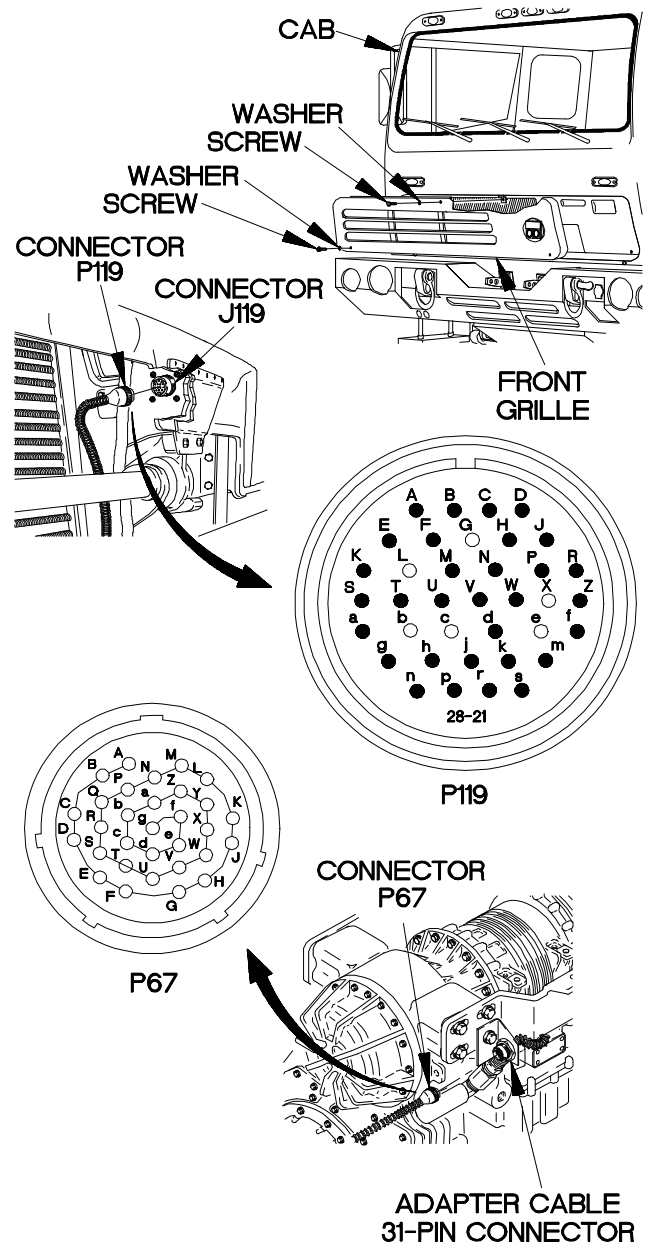
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).

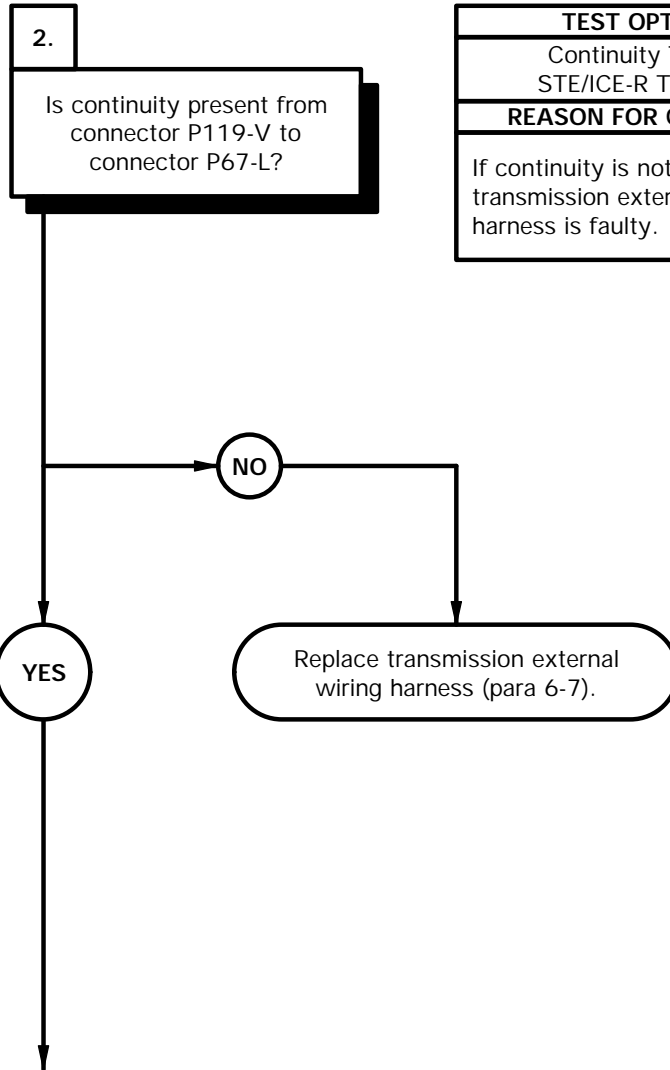


- CONTINUITY TEST**
- (1) Remove two screws and washers from front grille.
 - (2) Remove screw and washer from front grille.
 - (3) Remove front grille from cab.
 - (4) Disconnect connector P119 from connector J119.
 - (5) Disconnect connector P67 from adapter cable 31-pin connector.
 - (6) Set multimeter to ohms.
 - (7) Connect positive (+) probe of multimeter to connector P119-D.
 - (8) Connect negative (-) probe of multimeter to connector P67-C and note reading on multimeter.
 - (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
 - (10) Connect positive (+) probe of multimeter to connector P119-D.
 - (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

YBC6801B

c68. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 22 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

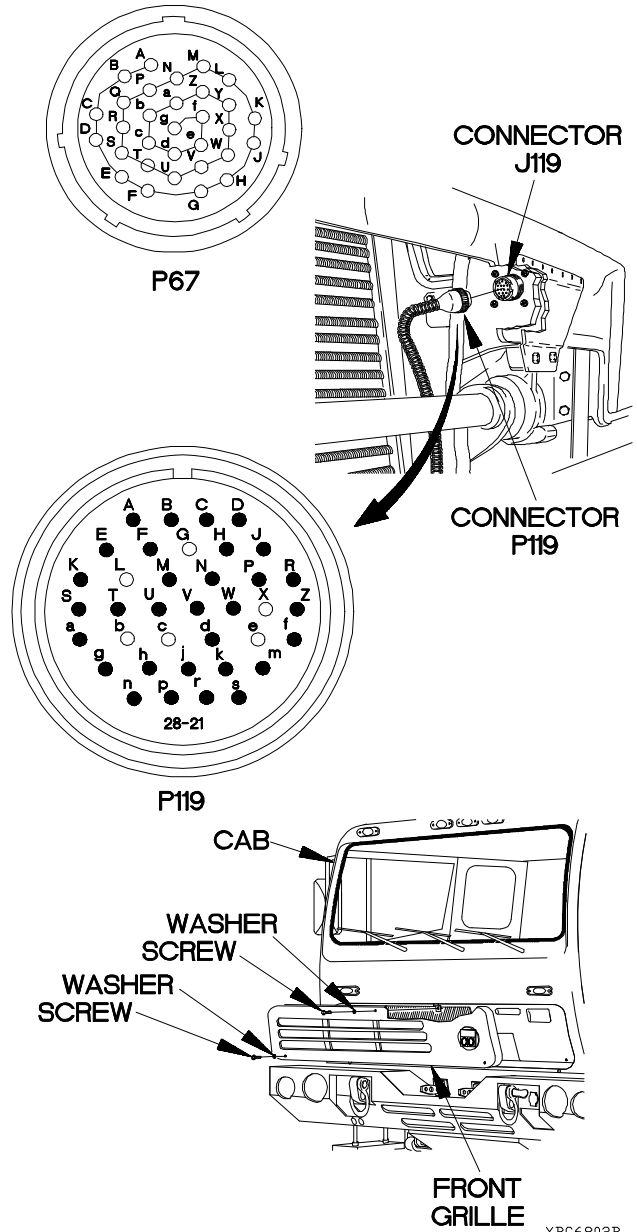
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty G solenoid. Faulty WTEC III transmission ECU.



TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-V.
- (3) Connect negative (-) probe of multimeter to connector P67-L and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-V.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



c68. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 22 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

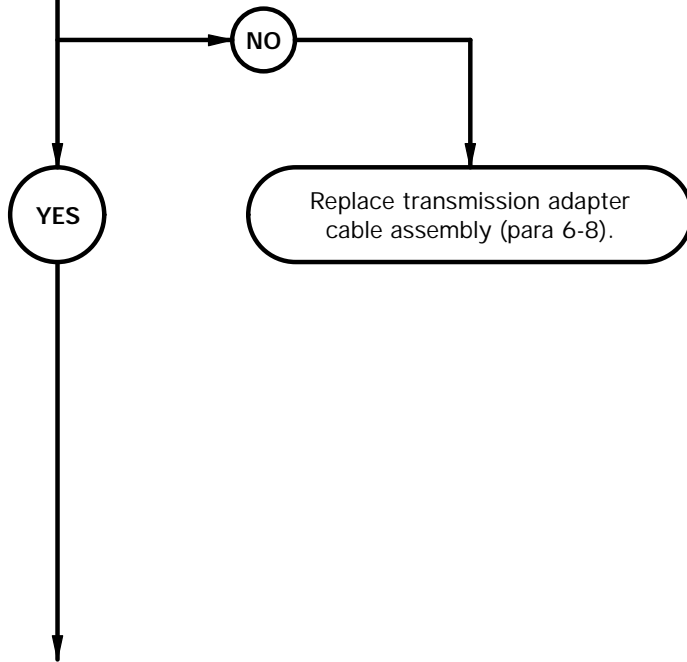
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty G solenoid. Faulty WTEC III transmission ECU.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin C to adapter cable 24-pin connector pin F1?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.

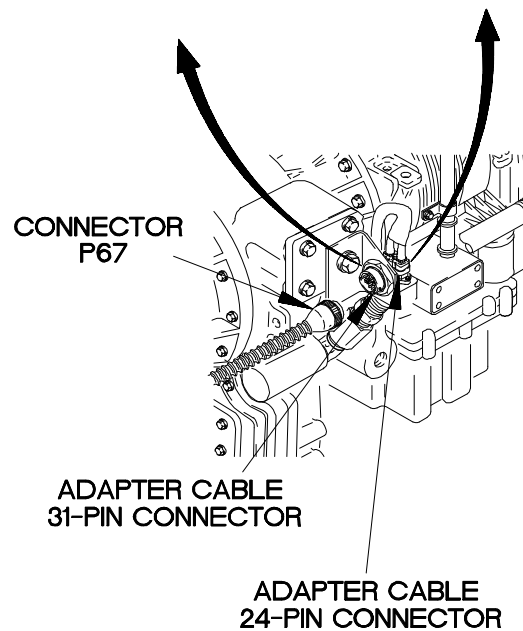
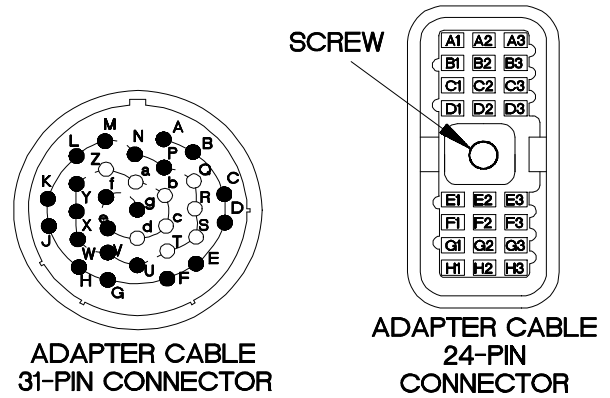


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Loosen screw in adapter cable 24-pin connector.
- (2) Disconnect adapter cable 24-pin connector from internal wiring harness 24-pin connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin C.
- (5) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin F1 and note reading on multimeter.
- (6) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (7) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin C.
- (8) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).



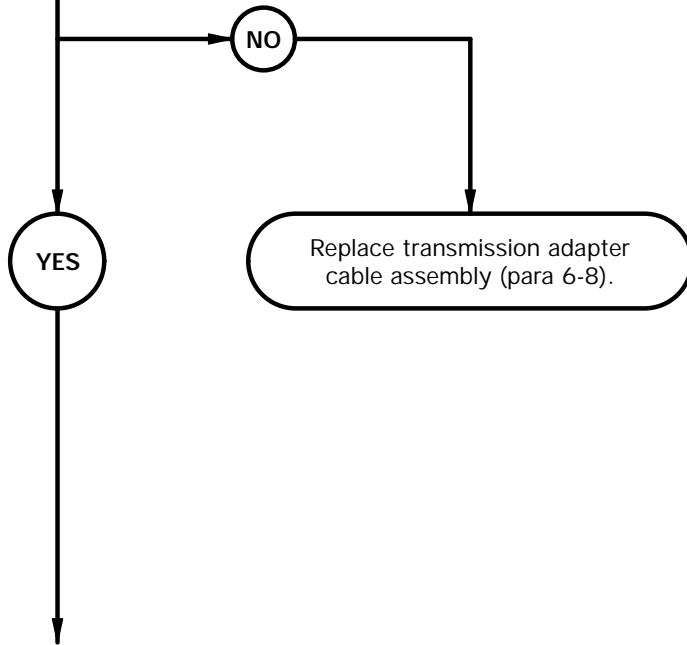
YBC6803B

c68. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 22 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty G solenoid. Faulty WTEC III transmission ECU.

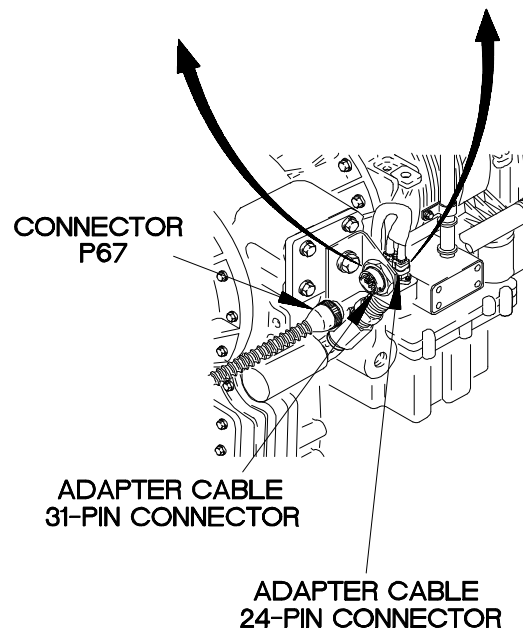
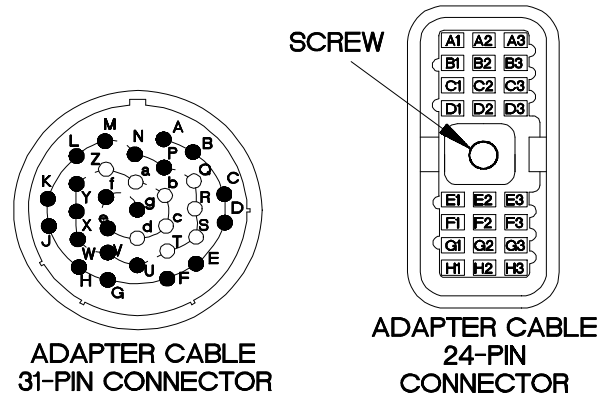
4.
Is continuity present from adapter cable 31-pin connector pin L to adapter cable 24-pin connector pin C2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin L.
- (3) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin C2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (5) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin L.
- (6) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).
- (9) Connect connector P67 to adapter cable 31-pin connector.



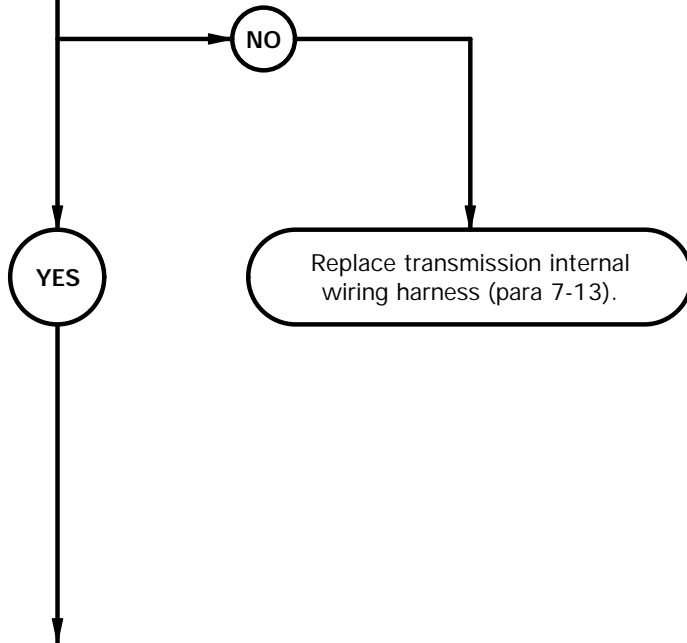
YBC6804B

c68. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 22 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty G solenoid. Faulty WTEC III transmission ECU.

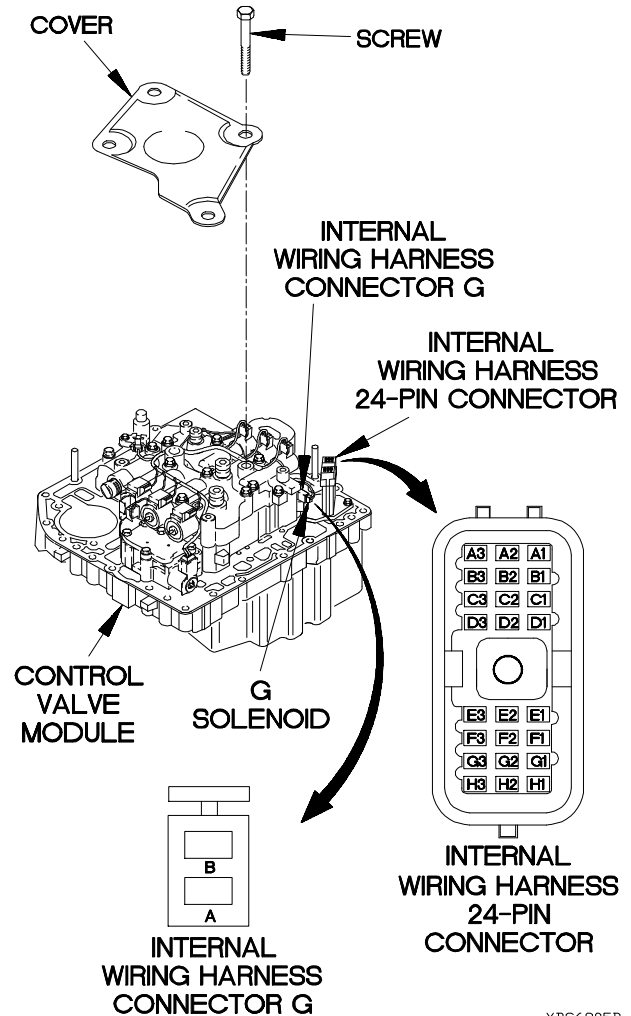
5.
Is continuity present from internal wiring harness 24-pin connector pin F1 to internal wiring harness connector G pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector G from G solenoid.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin F1.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector G pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin F1.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



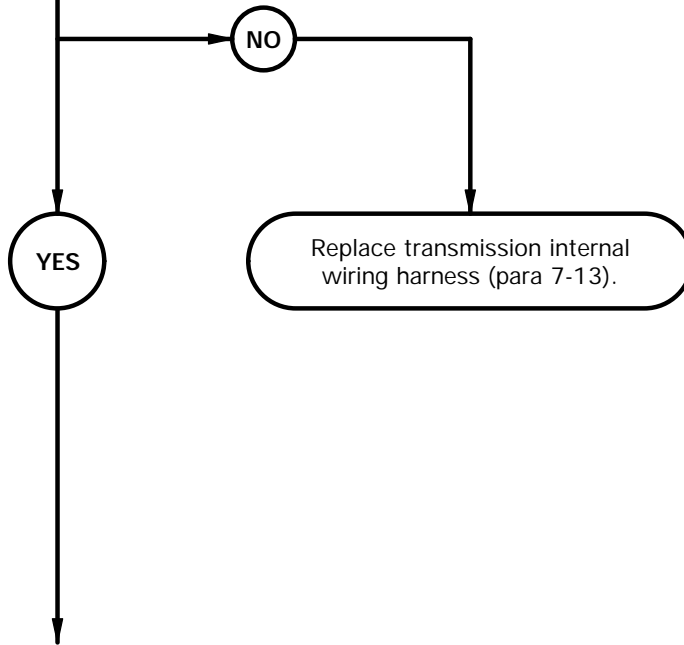
YBC6805B

c68. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 22 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty G solenoid. Faulty WTEC III transmission ECU.

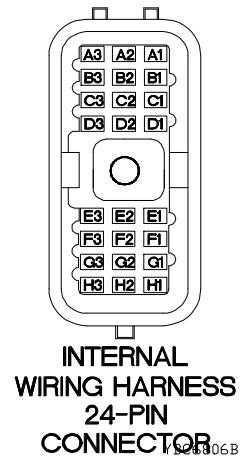
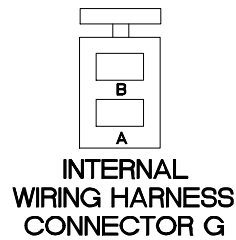
6.
 Is continuity present from internal wiring harness 24-pin connector pin C2 to internal wiring harness connector G pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

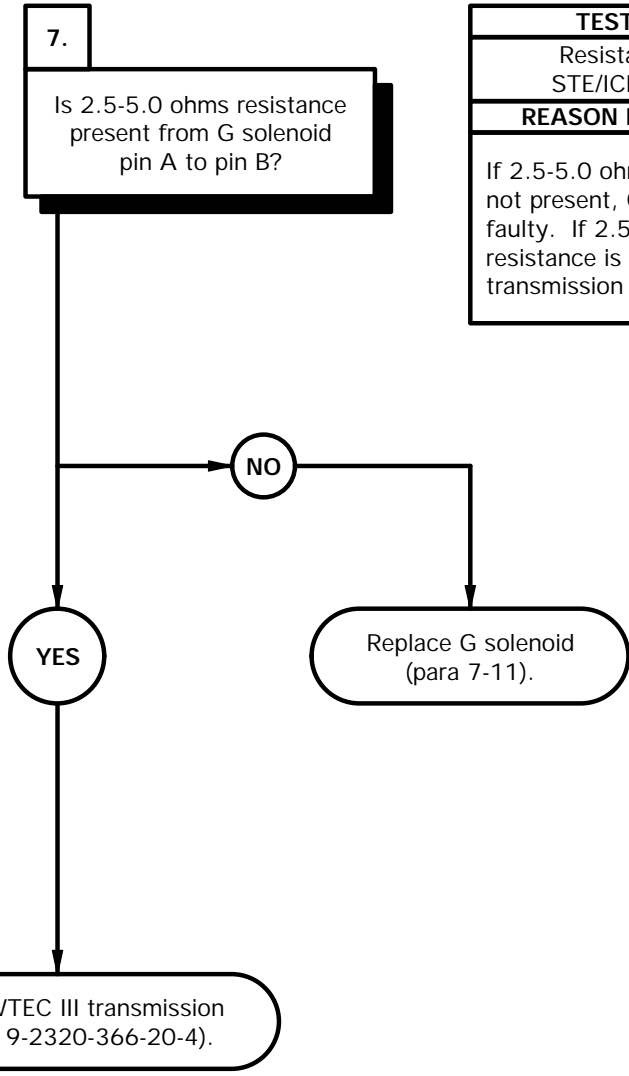
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin C2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector G pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin C2.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector, except pin C1, and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



c68. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 22 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

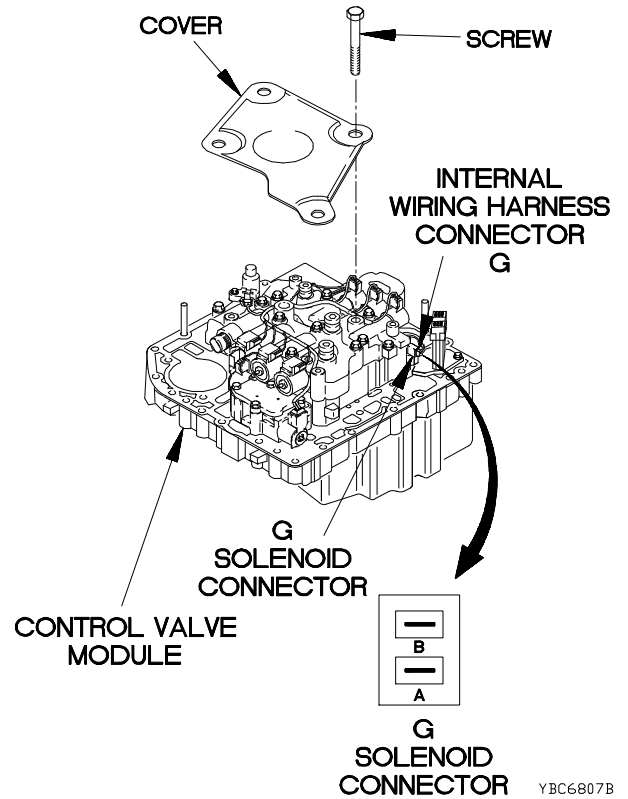
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty G solenoid. Faulty WTEC III transmission ECU.

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, G solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC III transmission ECU is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of G solenoid connector.
- (3) Connect negative (-) probe of multimeter to pin B of G solenoid connector and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace G solenoid (para 7-11).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC III transmission ECU (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector G to G solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



c69. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46 AND/OR 69 SUB CODE 23

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

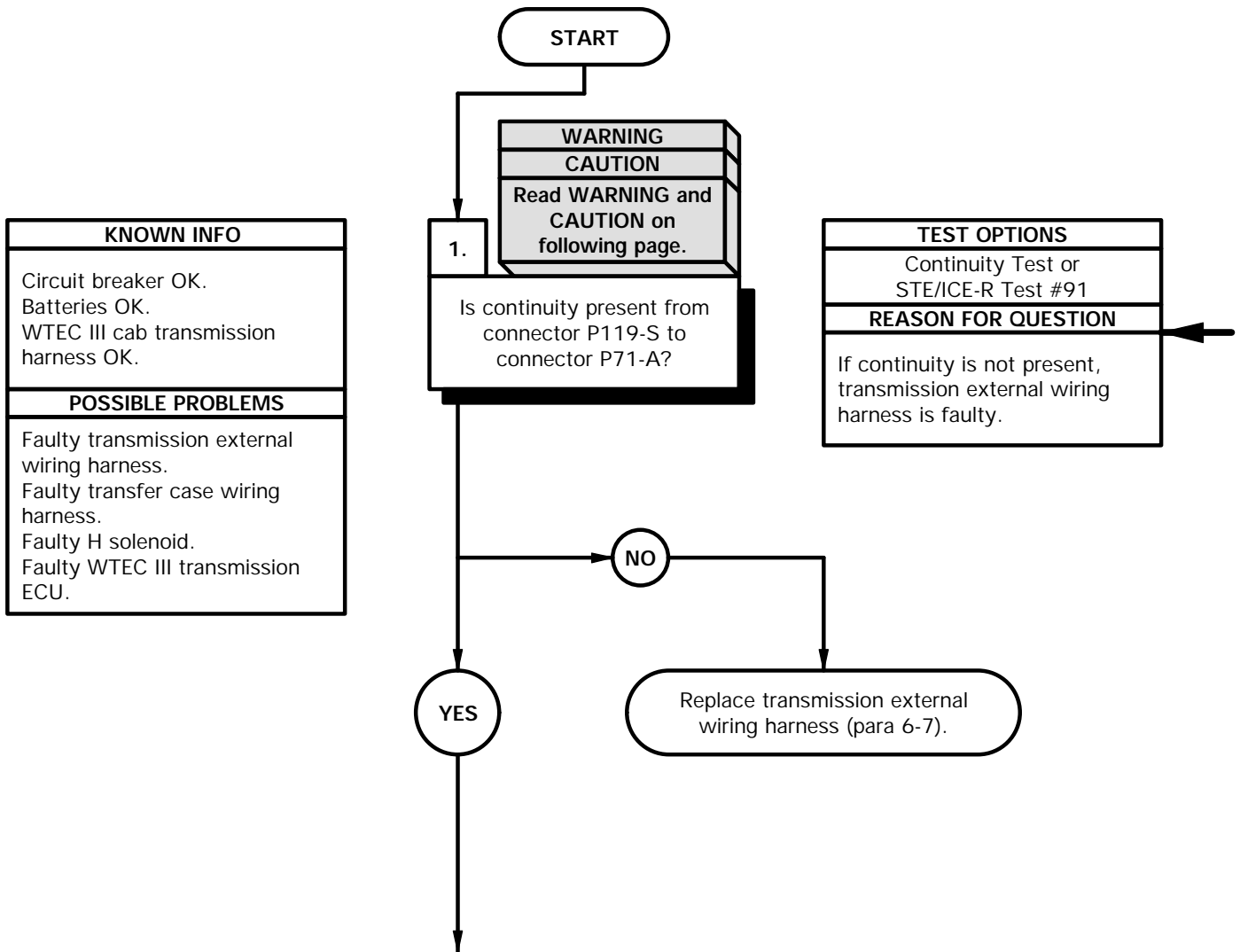
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

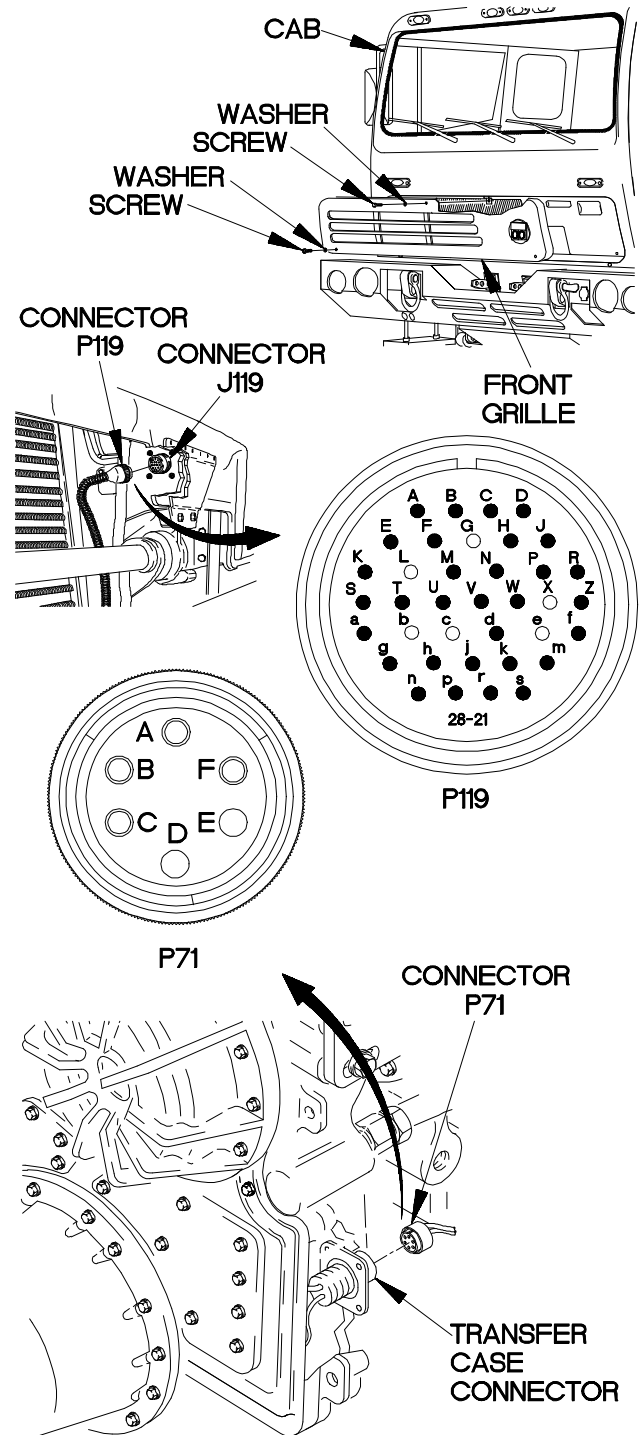
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect connector P71 from transfer case connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-S.
- (8) Connect negative (-) probe of multimeter to connector P71-A and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-S.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.

CONTINUITY TEST (Cont)

- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



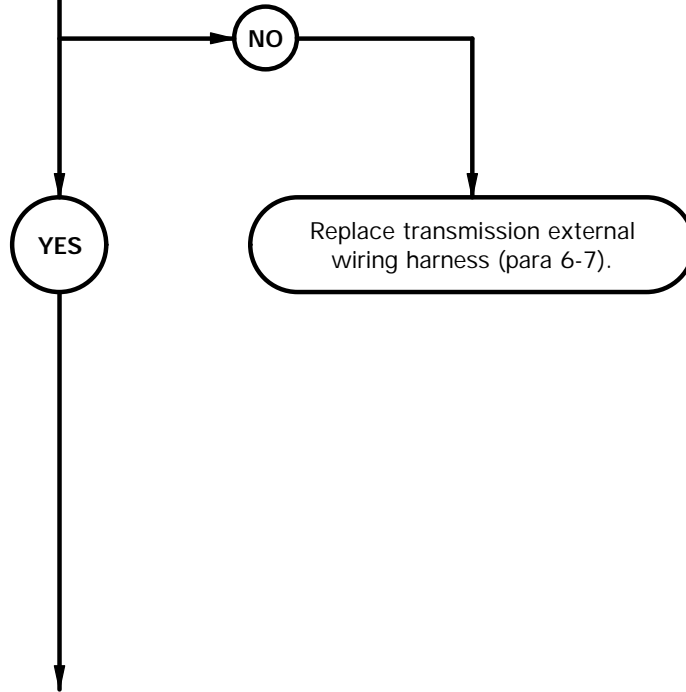
YBC6901B

c69. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46 AND/OR 69 SUB CODE 23 (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transfer case wiring harness. Faulty H solenoid. Faulty WTEC III transmission ECU.

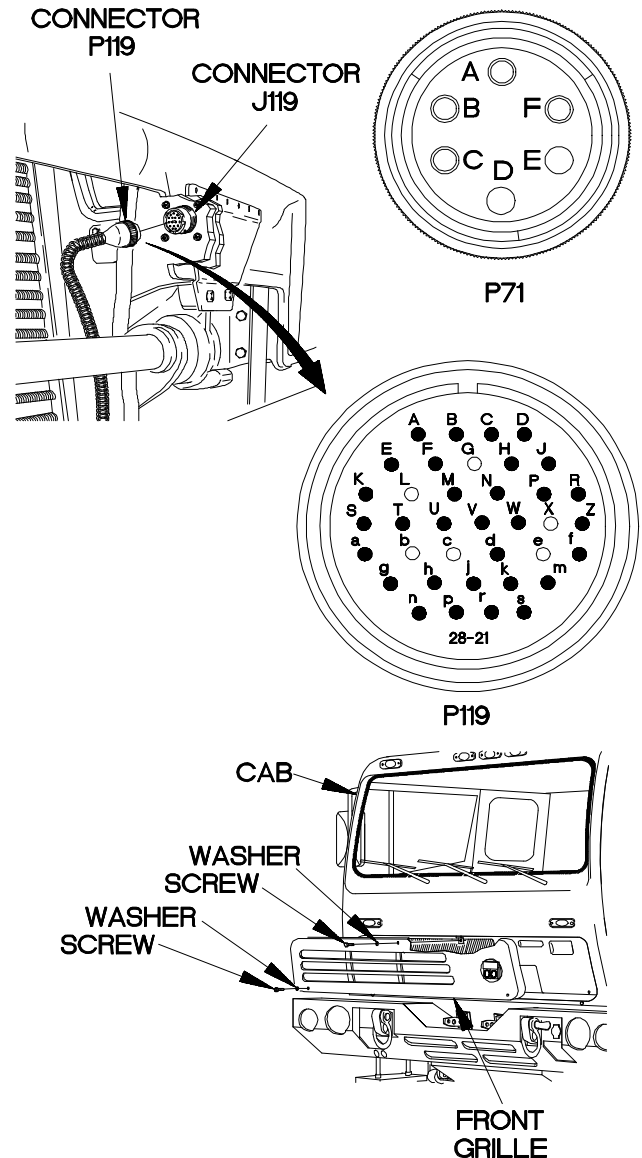
2.
Is continuity present from connector P119-P to connector P71-B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-P.
- (3) Connect negative (-) probe of multimeter to connector P71-L and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-P.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external cable assembly is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



YBC6902B

c69. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46 AND/OR 69 SUB CODE 23 (CONT)

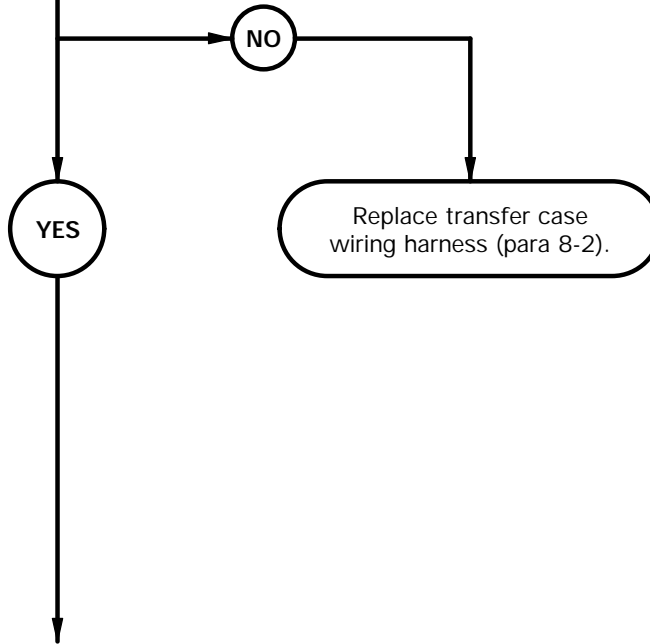
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transfer case wiring harness. Faulty H solenoid. Faulty WTEC III transmission ECU.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from transfer case connector pin A to transfer case wiring harness connector H socket A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transfer case wiring harness is faulty.

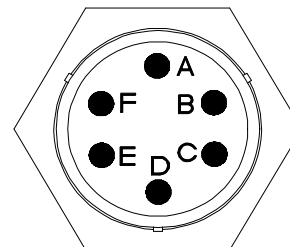
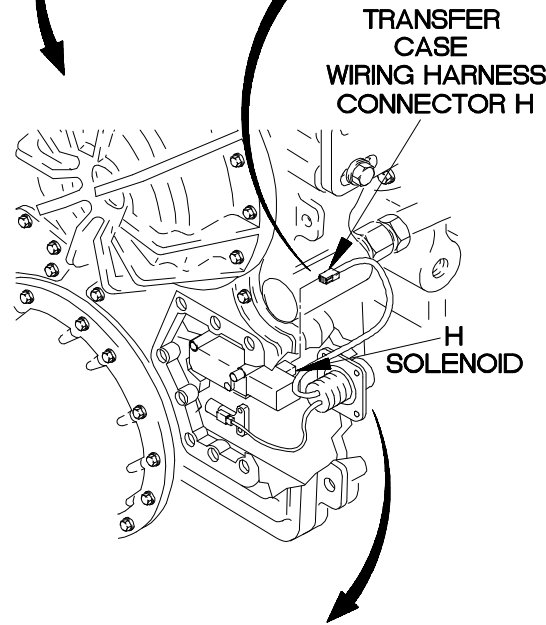
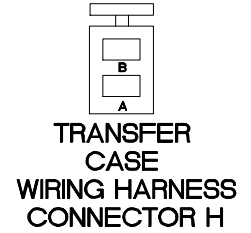
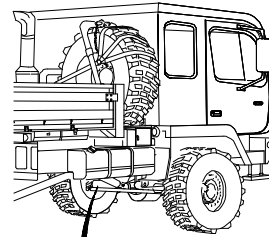


CAUTION

Use care when disconnecting transmission internal wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove valve body cover (para 8-2).
- (2) Disconnect transfer case wiring harness connector H from H solenoid.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to transfer case connector pin A.
- (5) Connect negative (-) probe of multimeter to transfer case wiring harness connector socket A.
- (6) If continuity is not present, replace transfer case wiring harness (para 8-2).
- (7) Connect positive (+) probe of multimeter to transfer case connector pin A.
- (8) Connect negative (-) probe of multimeter to all other pins in transfer case connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transfer case wiring harness is shorted; replace transfer case wiring harness (para 8-2).



TRANSFER CASE CONNECTOR

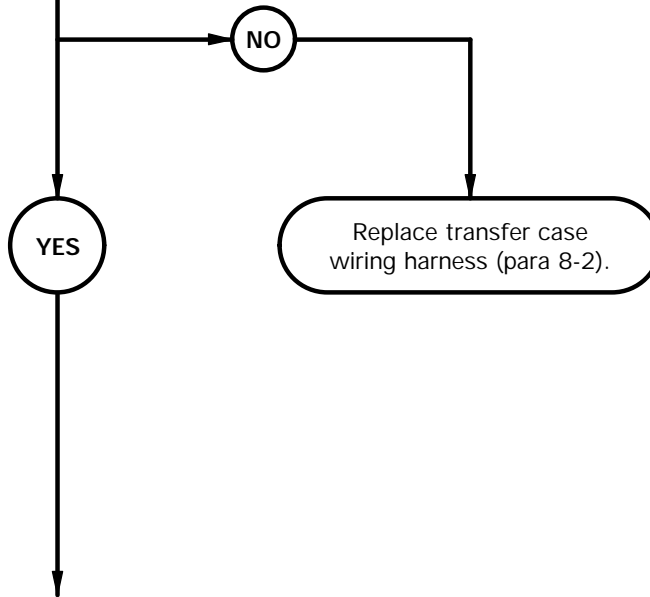
YBC6903B

c69. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46 AND/OR 69 SUB CODE 23 (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transfer case wiring harness. Faulty H solenoid. Faulty WTEC III transmission ECU.

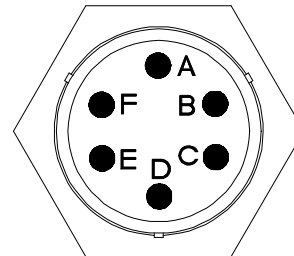
4.
Is continuity present from transfer case connector pin B to transfer case wiring harness connector H socket B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transfer case wiring harness is faulty.

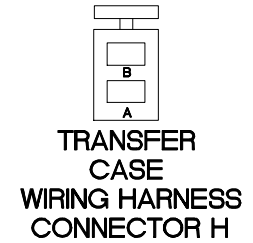


CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to transfer case connector pin B.
- (3) Connect negative (-) probe of multimeter to transfer case wiring harness connector socket B and note reading on multimeter.
- (4) If continuity is not present, replace transfer case wiring harness (para 8-2).
- (5) Connect positive (+) probe of multimeter to transfer case connector pin B.
- (6) Connect negative (-) probe of multimeter to all other pins in transfer case connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transfer case wiring harness is shorted; replace transfer case wiring harness (para 8-2).



**TRANSFER CASE
CONNECTOR**



**TRANSFER
CASE
WIRING HARNESS
CONNECTOR H**

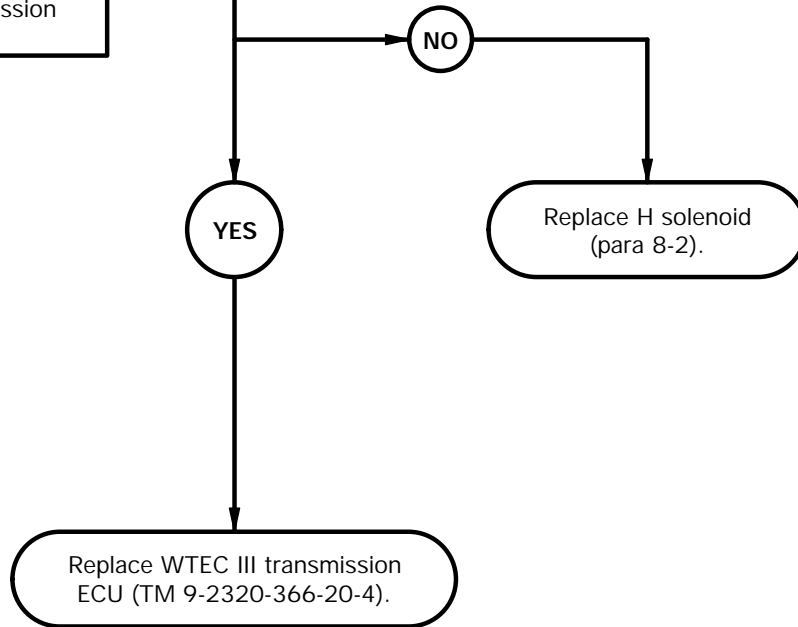
YBC6904B

c69. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46 AND/OR 69 SUB CODE 23 (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. External transmission cable assembly OK. Transfer case wiring harness OK.
POSSIBLE PROBLEMS
Faulty H solenoid. Faulty WTEC III transmission ECU.

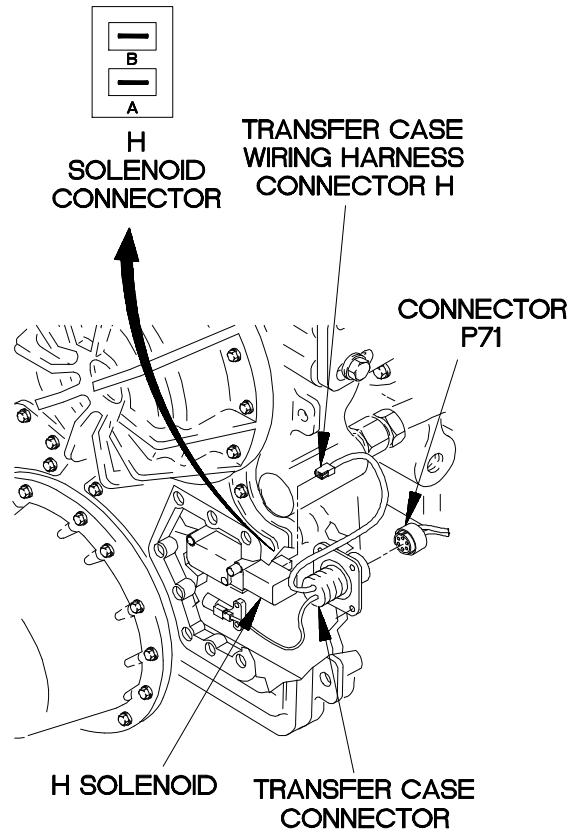
5.
Is 2.5-5.0 ohms resistance present from H solenoid pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, H solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC III transmission ECU is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of H solenoid connector.
- (3) Connect negative (-) probe of multimeter to pin B of H solenoid connector and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace H solenoid (para 8-2).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC III transmission ECU (TM 9-2320-366-20-4).
- (6) Connect transfer case wiring harness connector H to H solenoid connector.
- (7) Install valve body cover on transfer case (para 8-2).
- (8) Connect connector P71 to transfer case connector.
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC6905B

c70. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 24 (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

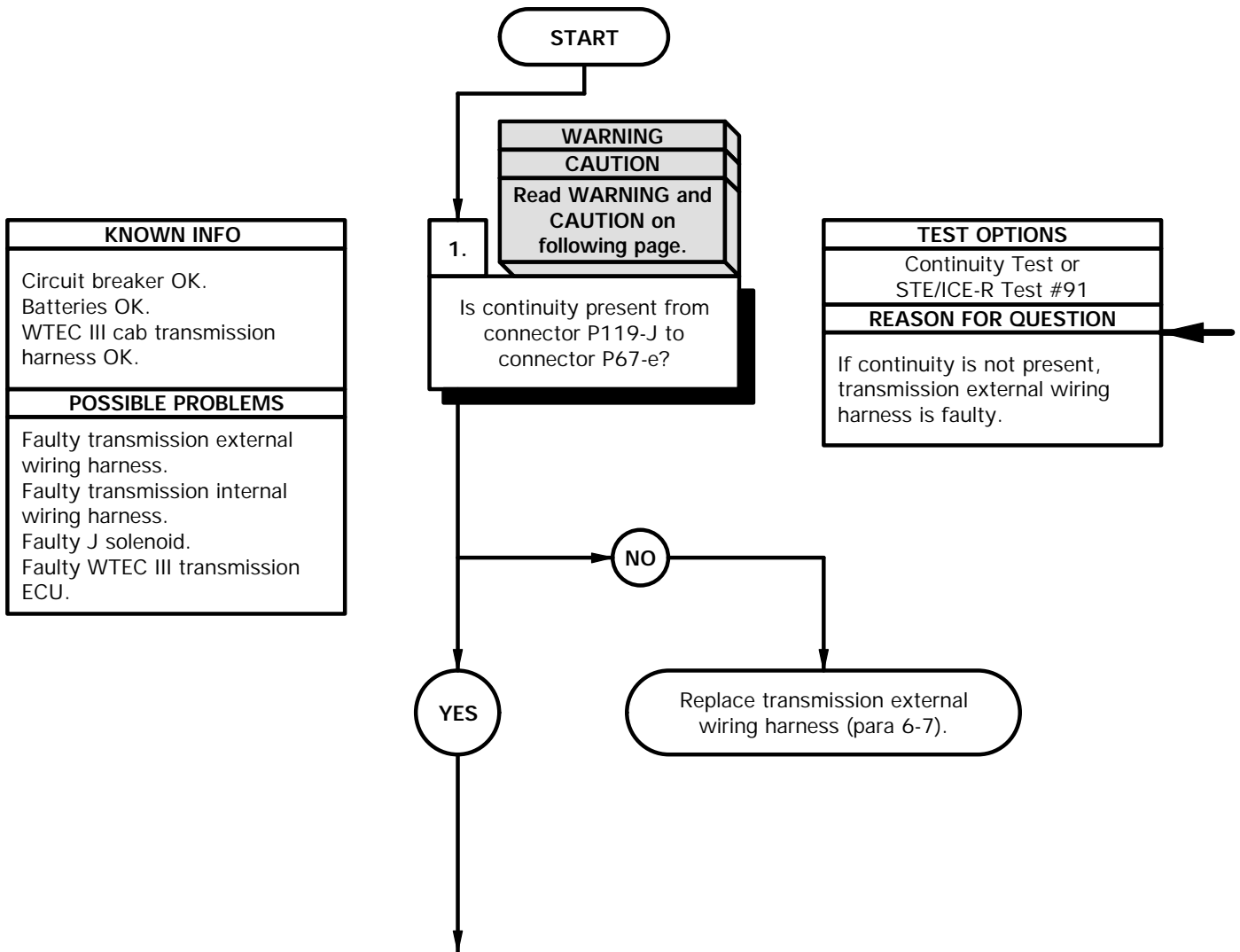
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

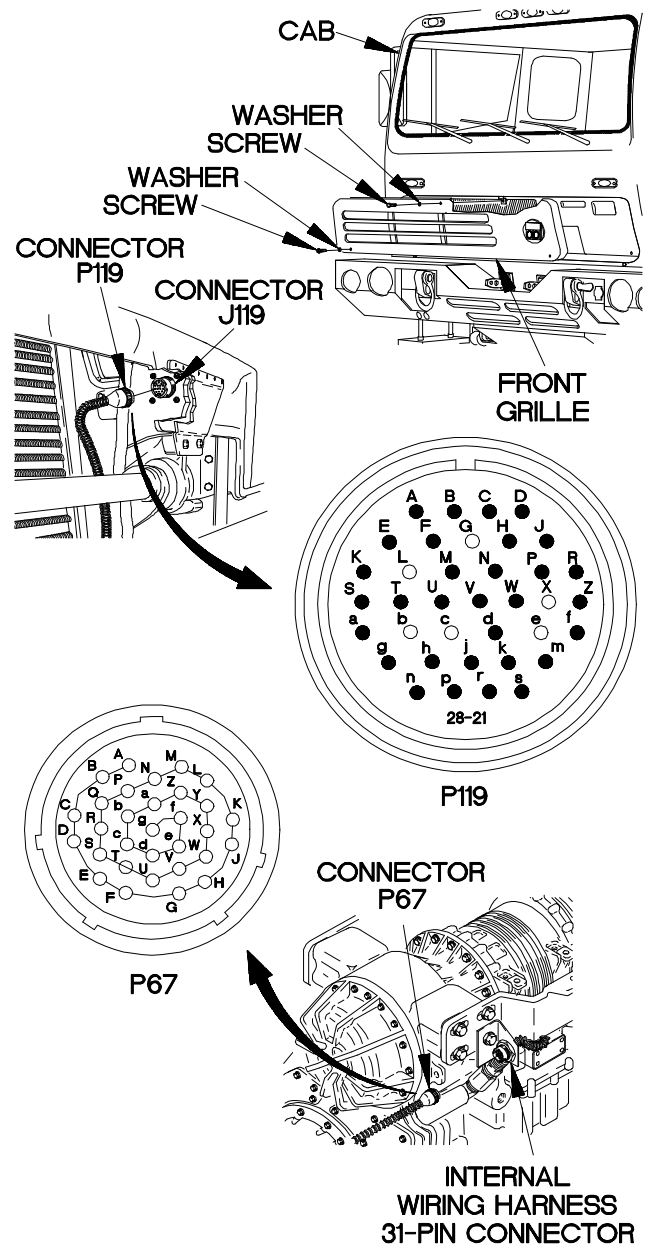
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect connector P67 from internal wiring 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-J.
- (8) Connect negative (-) probe of multimeter to connector P67-e and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-J.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



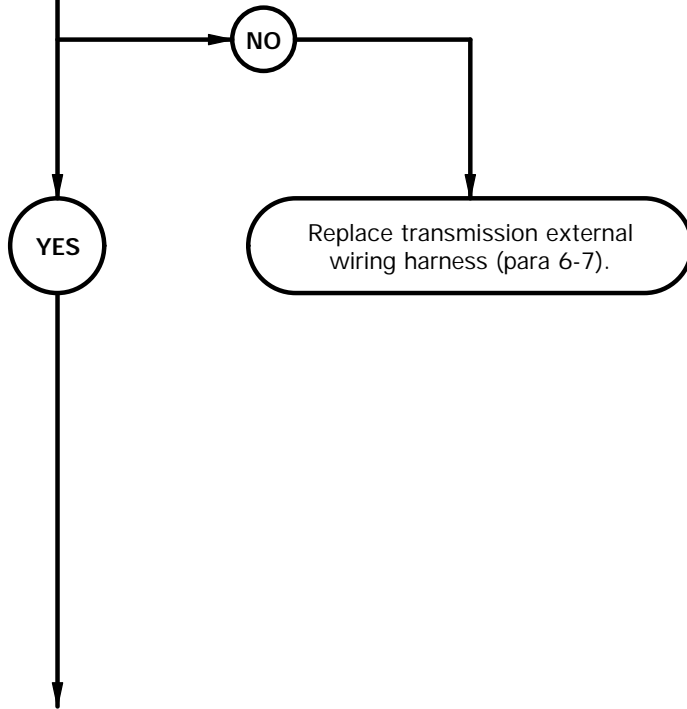
Ybc7001b

c70. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 24 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty J solenoid. Faulty WTEC III transmission ECU.

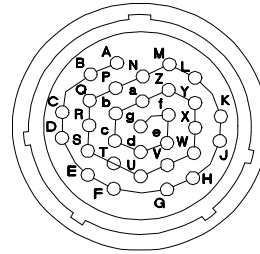
2.
Is continuity present from connector P119-B to connector P67-A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

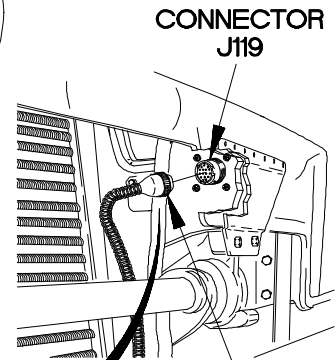


CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-B.
- (3) Connect negative (-) probe of multimeter to connector P67-A and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-B.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external cable assembly is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).

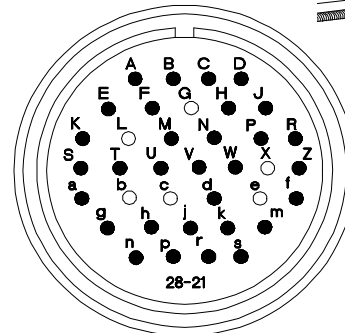


P67

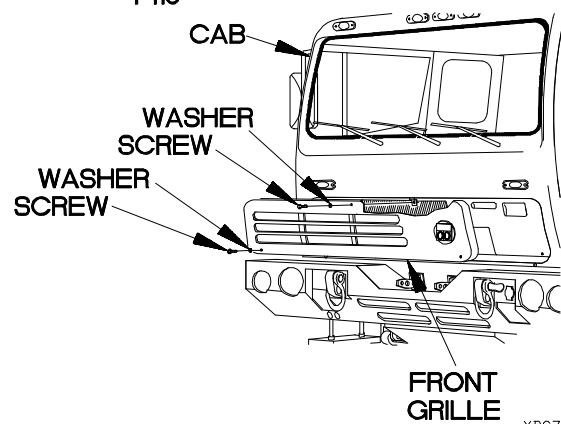


CONNECTOR J119

CONNECTOR P119



P119



FRONT GRILLE

YBC7002B

c70. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 24 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

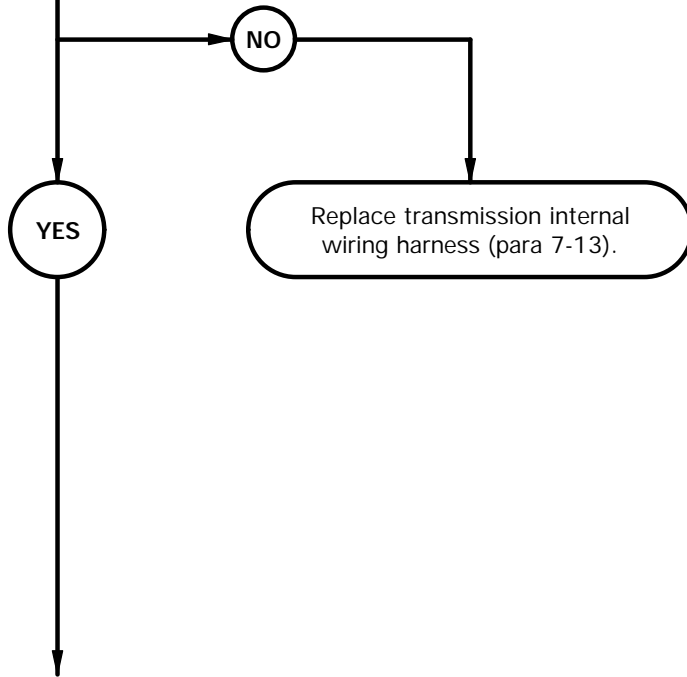
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty J solenoid. Faulty WTEC III transmission ECU.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin g to internal wiring harness connector J pin A?

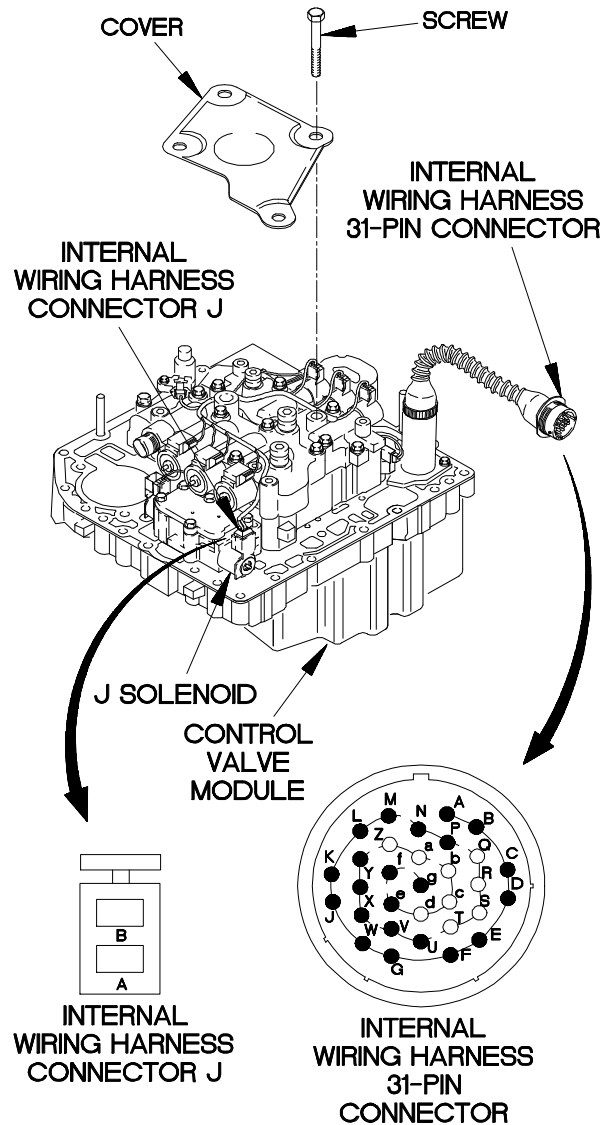
TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

- CONTINUITY TEST**
- (1) Remove control valve module (para 7-10).
 - (2) Remove four screws and cover from control valve module.
 - (3) Disconnect internal wiring harness connector J from J solenoid.
 - (4) Set multimeter to ohms.
 - (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin g.
 - (6) Connect negative (-) probe of multimeter to internal wiring harness connector J pin A and note reading on multimeter.
 - (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
 - (8) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin g.
 - (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
 - (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
 - (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



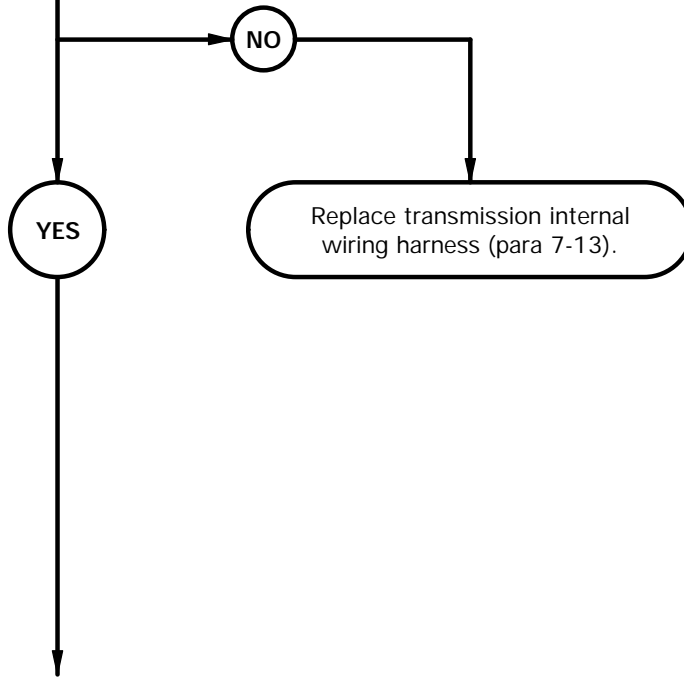
YBC7003B

c70. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 24 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty J solenoid. Faulty WTEC III transmission ECU.

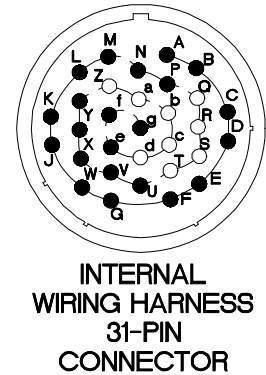
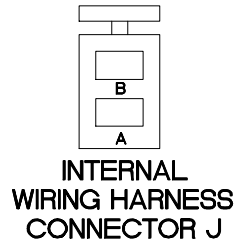
4.
Is continuity present from internal wiring harness 31-pin connector pin A to internal wiring harness connector J pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin A.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector J pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin A.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



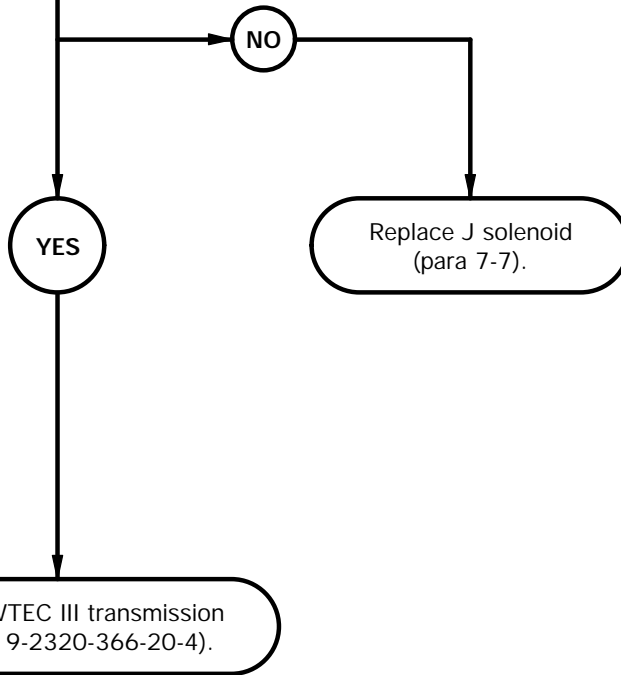
YBC7004B

c70. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 24 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty J solenoid. Faulty WTEC III transmission ECU.

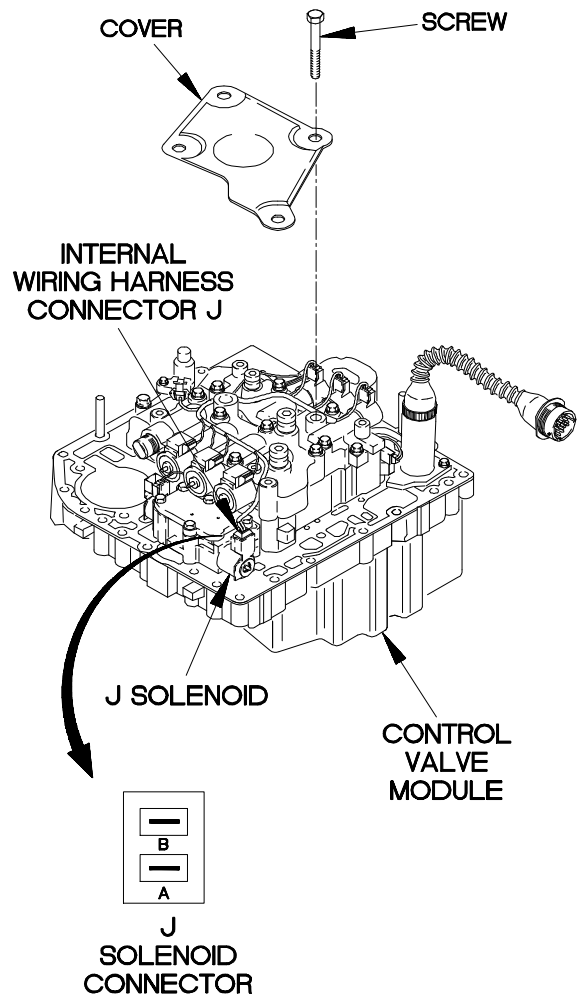
5.
Is 2.5-5.0 ohms resistance present from J solenoid pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, J solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC III transmission ECU is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of J solenoid connector.
- (3) Connect negative (-) probe of multimeter to pin B of J solenoid connector and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace J solenoid (para 7-7).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC III transmission ECU (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector J to J solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC7005B

c71. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 24 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

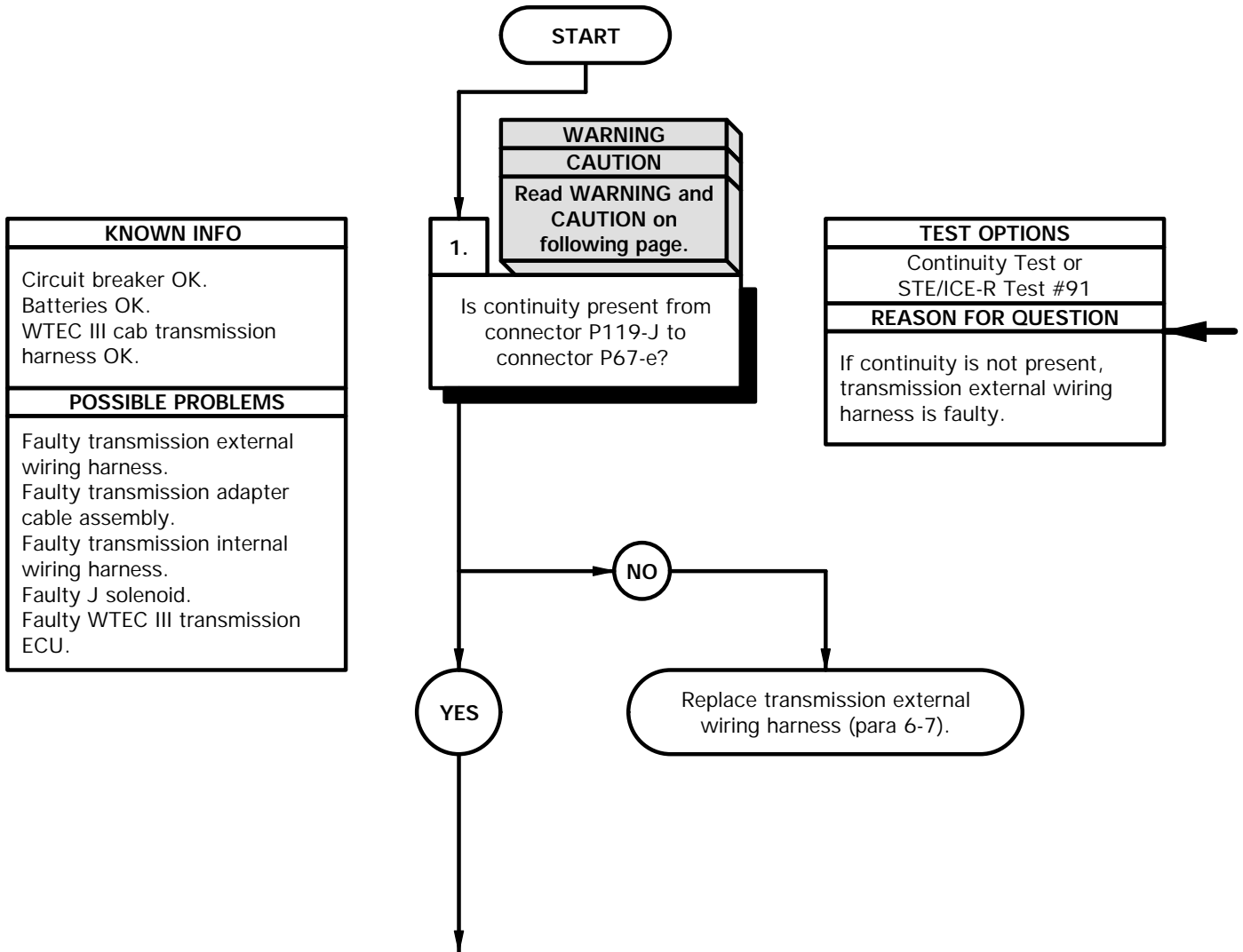
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

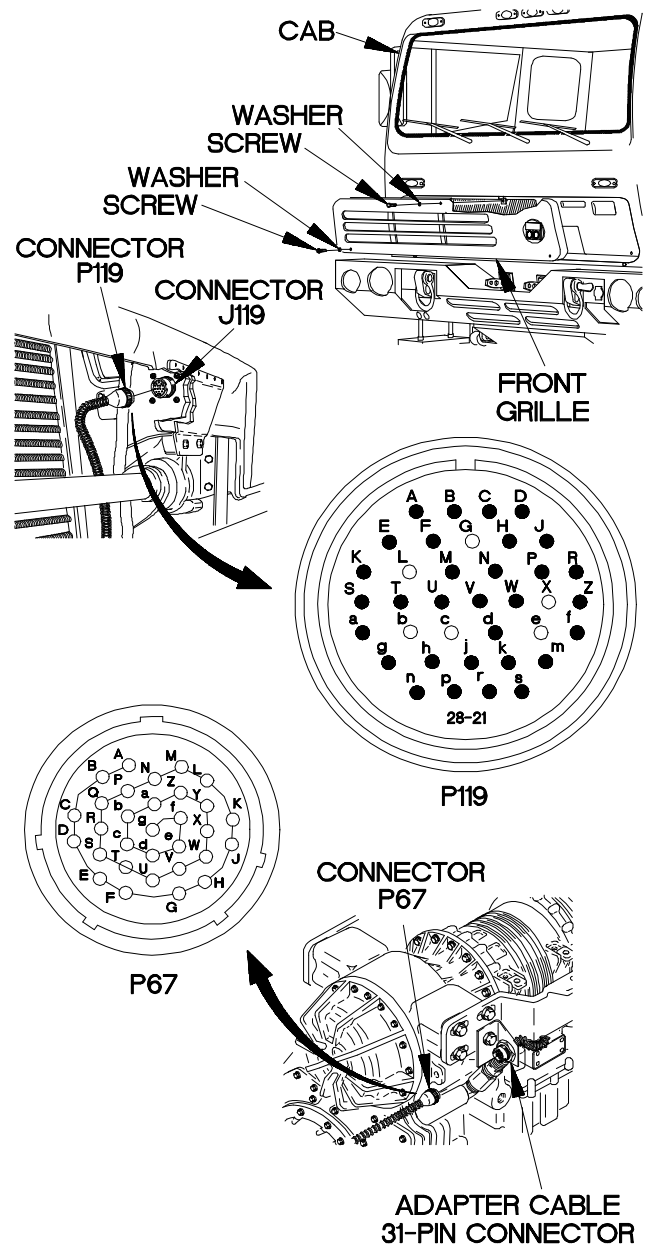
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect connector P67 from adapter cable 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-J.
- (8) Connect negative (-) probe of multimeter connector P67-e and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-J.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



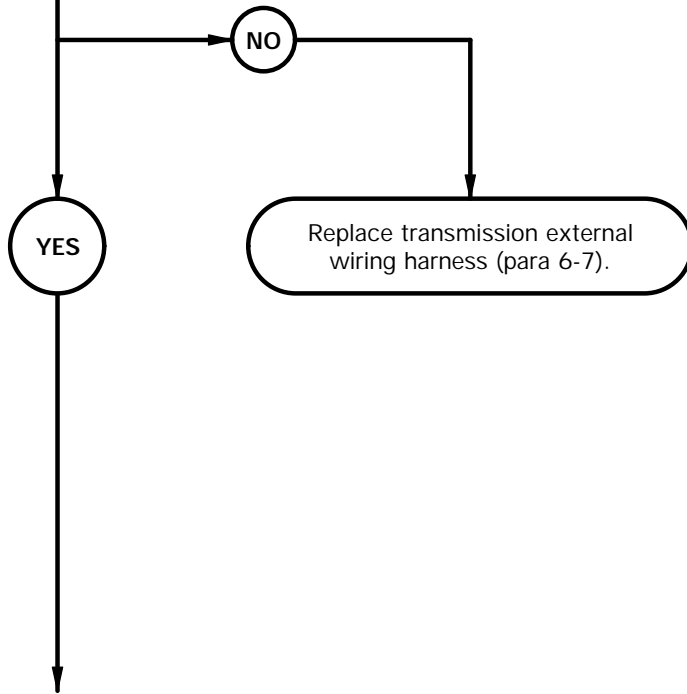
Y6c7101b

c71. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 24 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty J solenoid. Faulty WTEC III transmission ECU.

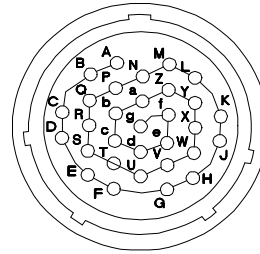
2.
Is continuity present from connector P119-N to connector P 67-A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

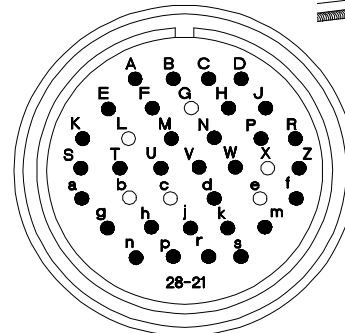
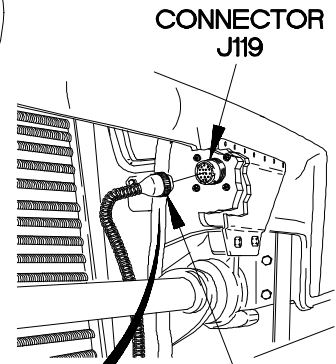


CONTINUITY TEST

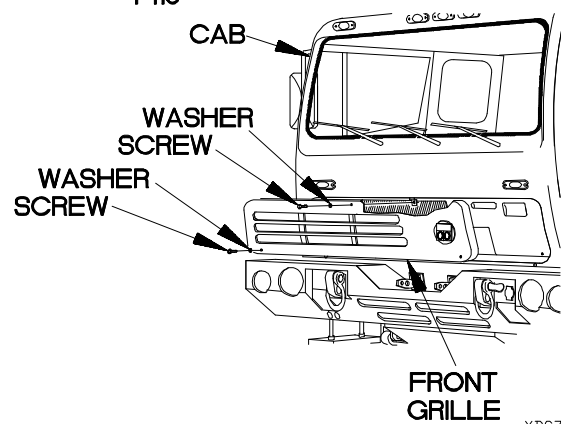
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-N.
- (3) Connect negative (-) probe of multimeter to connector P67-A and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-N.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



P67



P119



YBC7102B

c71. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 24 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

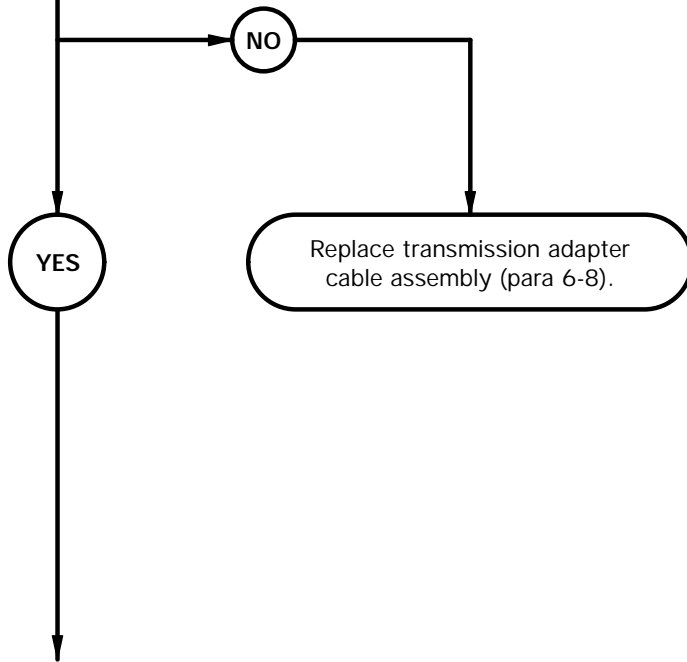
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty J solenoid. Faulty WTEC III transmission ECU.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin E to adapter cable 24-pin connector pin H1?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.

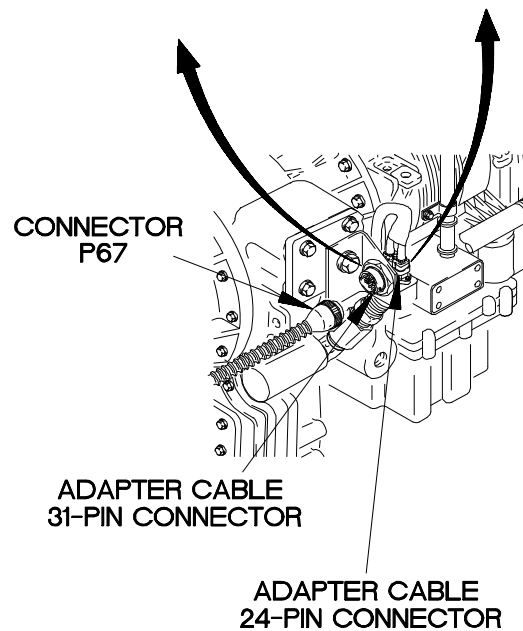
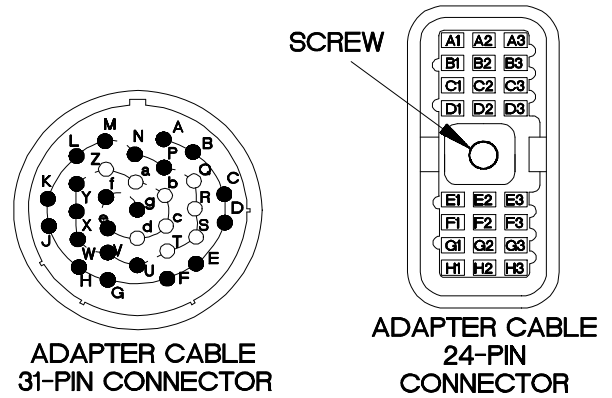


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Loosen screw in adapter cable 24-pin connector.
- (2) Disconnect adapter cable 24-pin connector from internal wiring harness 24-pin connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin E.
- (5) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin H1 and note reading on multimeter.
- (6) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (7) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin E.
- (8) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).



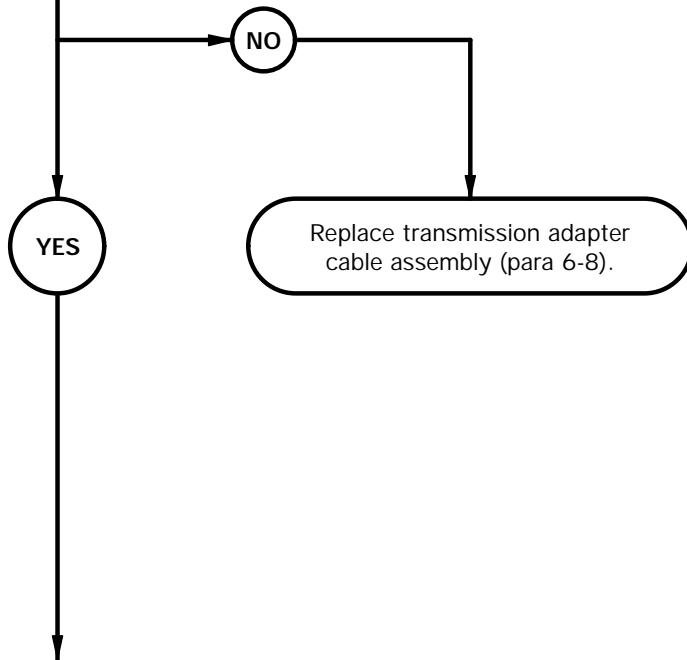
YBC7103B

c71. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 24 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty J solenoid. Faulty WTEC III transmission ECU.

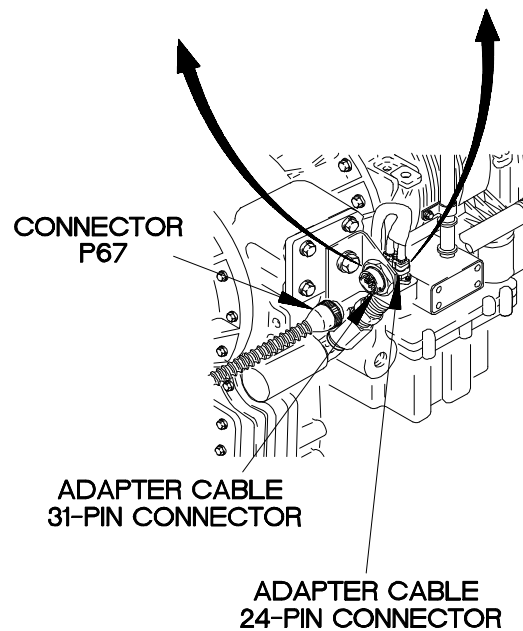
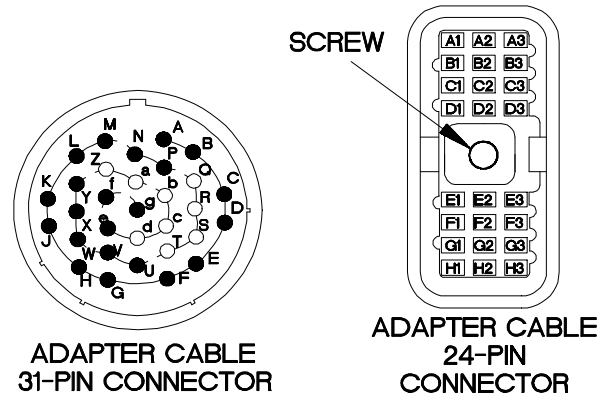
4.
Is continuity present from adapter cable 31-pin connector pin A to adapter cable 24-pin connector pin A2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin A.
- (3) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin A2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (5) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin A.
- (6) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).
- (9) Connect connector P67 to adapter cable 31-pin connector.



YBC7104B

c71. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 24 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

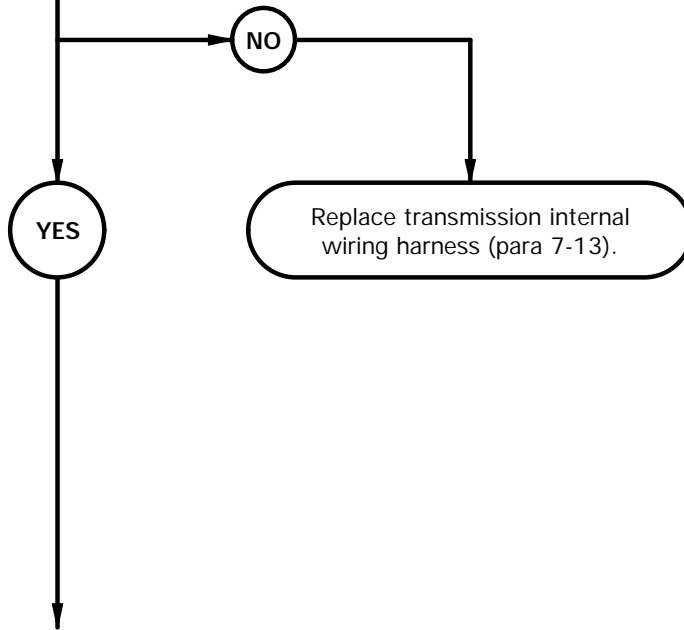
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty J solenoid. Faulty WTEC III transmission ECU.

5.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin H1 to internal wiring harness connector J pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

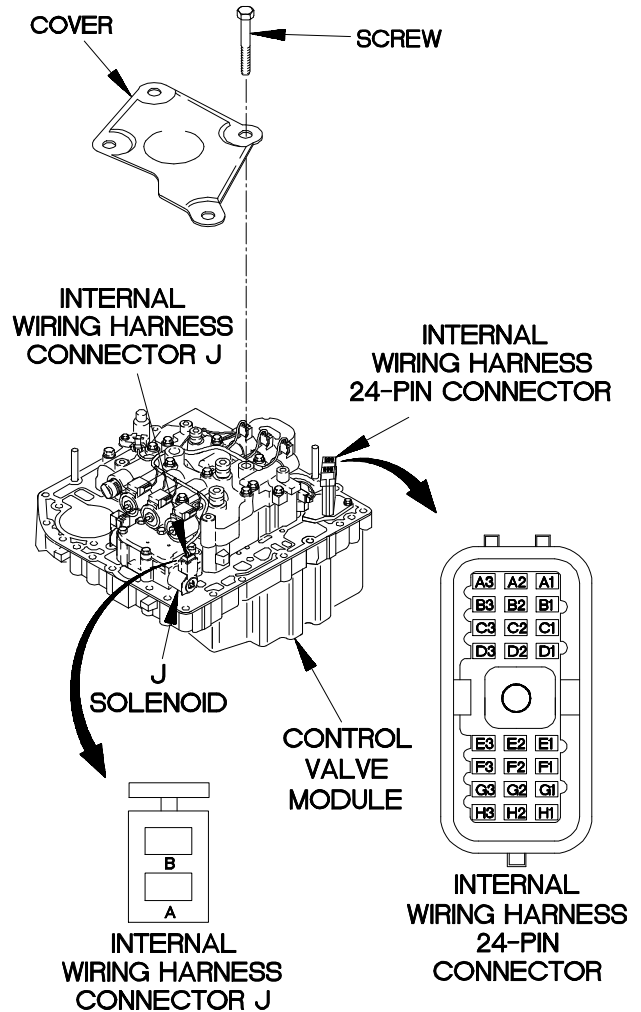


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

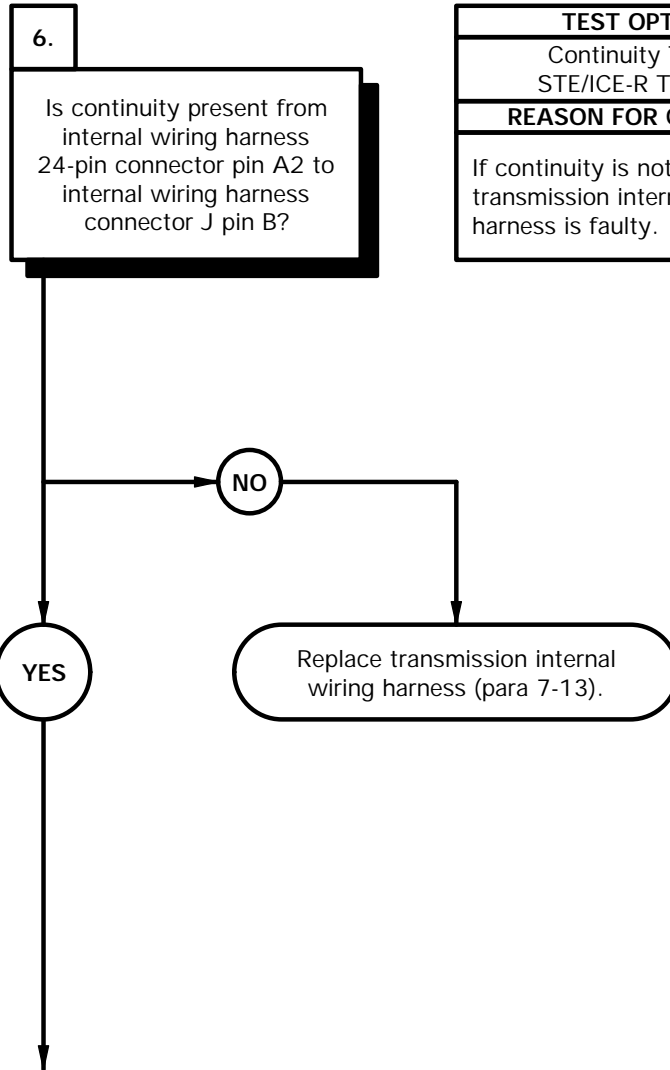
- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector J from J solenoid.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin H1.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector J pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin H1.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



YBC7105B

c71. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 24 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

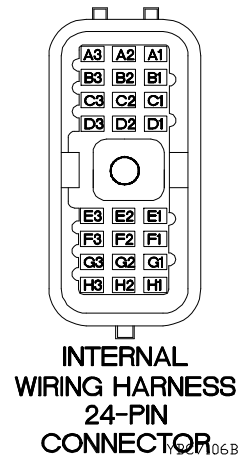
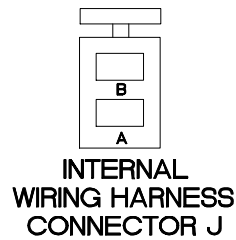
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty J solenoid. Faulty WTEC III transmission ECU.



TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

CONTINUITY TEST

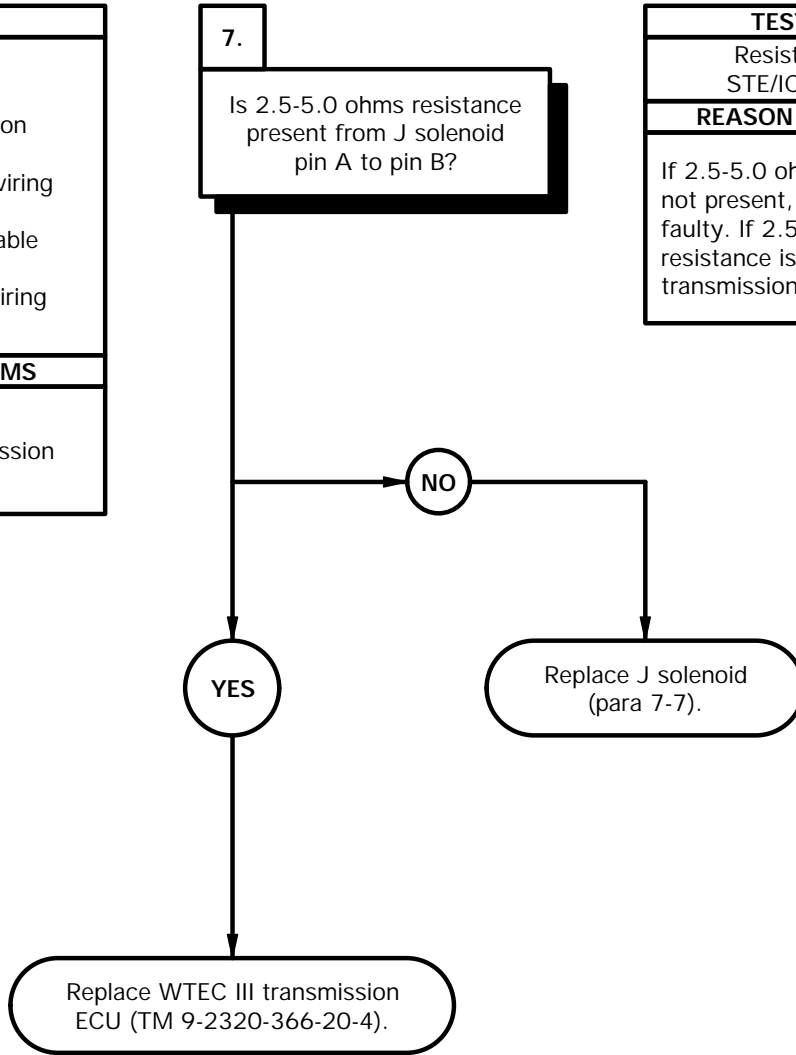
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin A2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector J pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin A2.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



c71. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 24 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

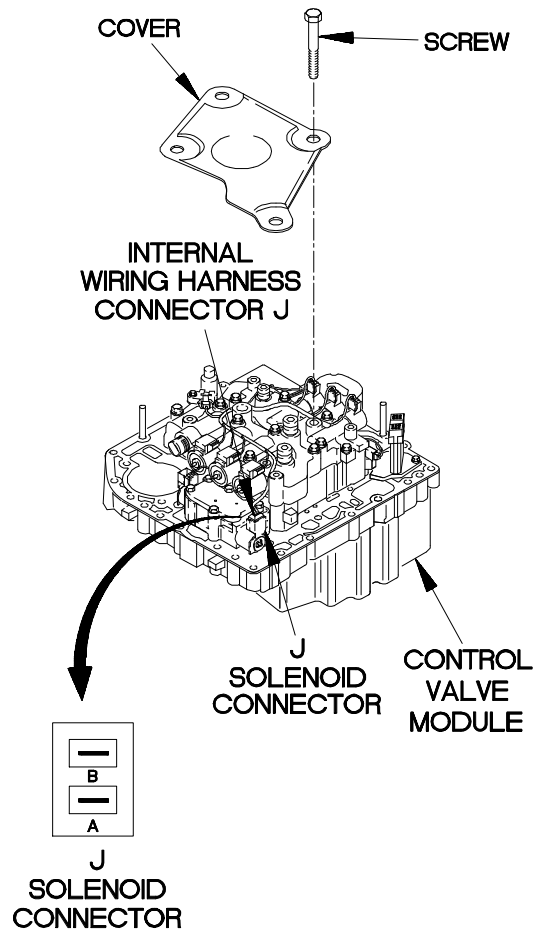
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty J solenoid. Faulty WTEC III transmission ECU.

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, J solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC III transmission ECU is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of J solenoid connector.
- (3) Connect negative (-) probe of multimeter to pin B of J solenoid connector and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace J solenoid (para 7-11).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC III transmission ECU (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector J to J solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC7107B

c72. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

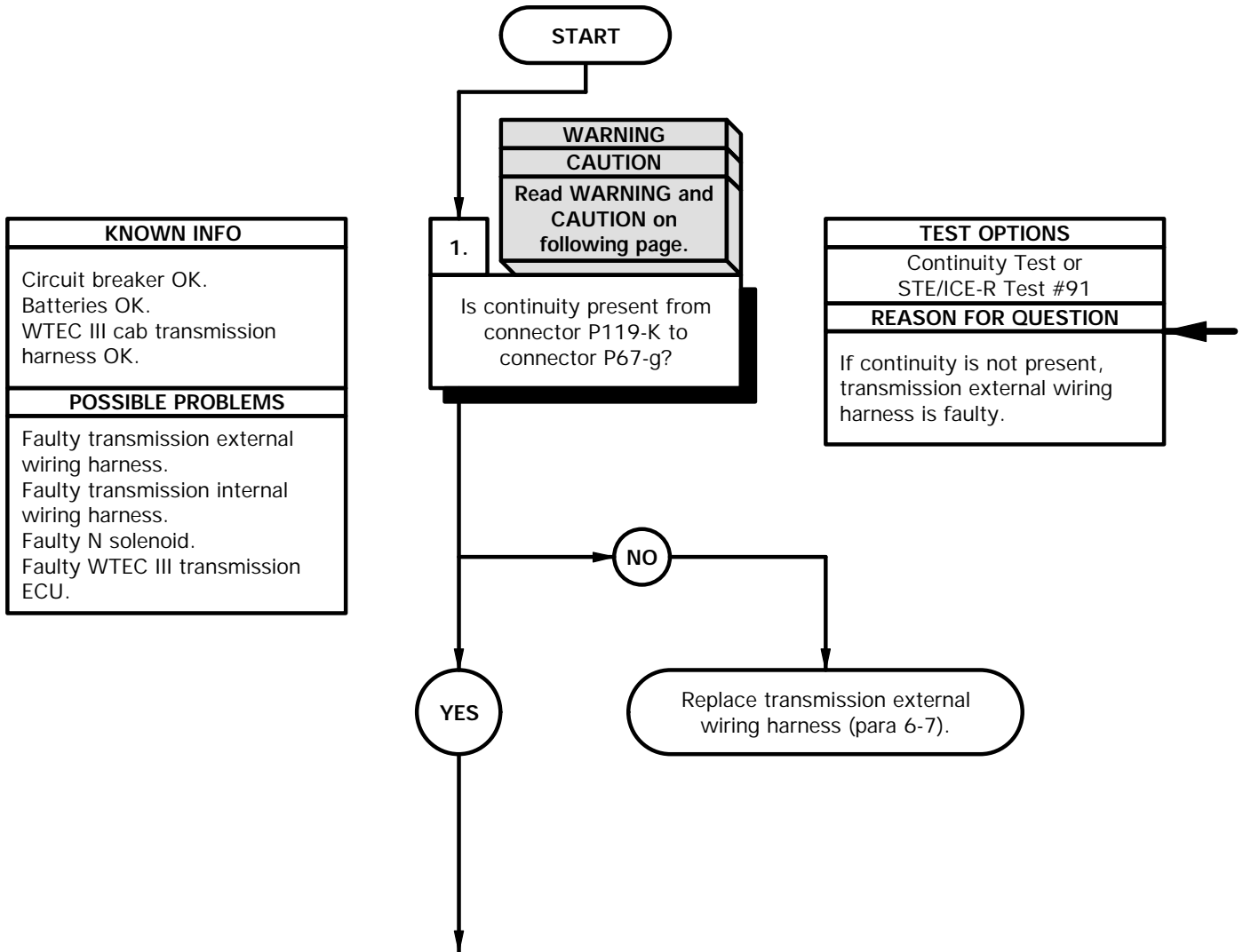
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

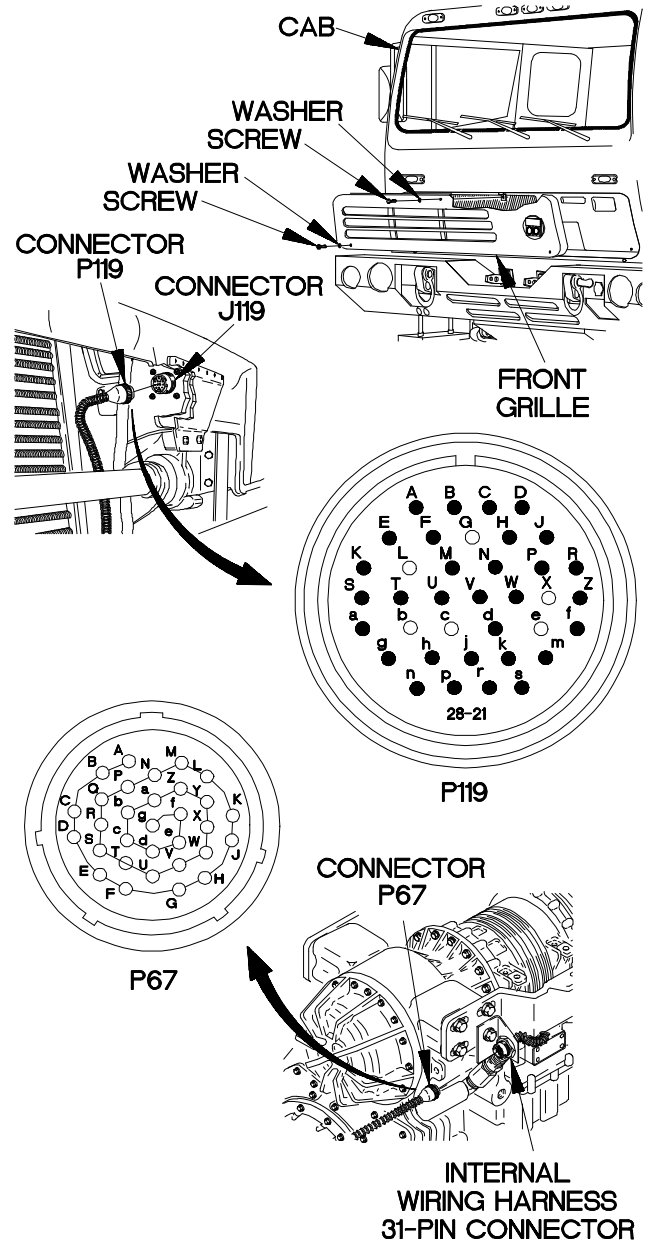
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect connector P67 from internal wiring harness 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-K.
- (8) Connect negative (-) probe of multimeter to connector P67-g and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-K.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



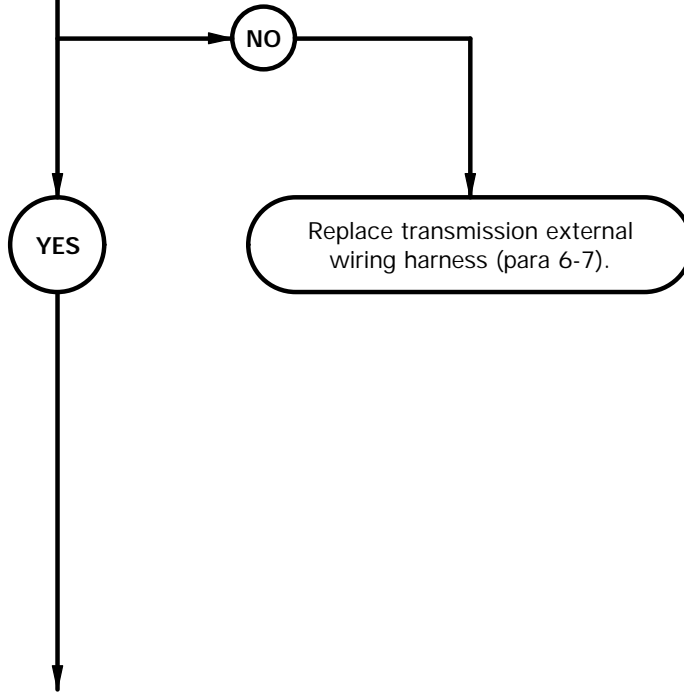
Y6c7201b

c72. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC III transmission ECU.

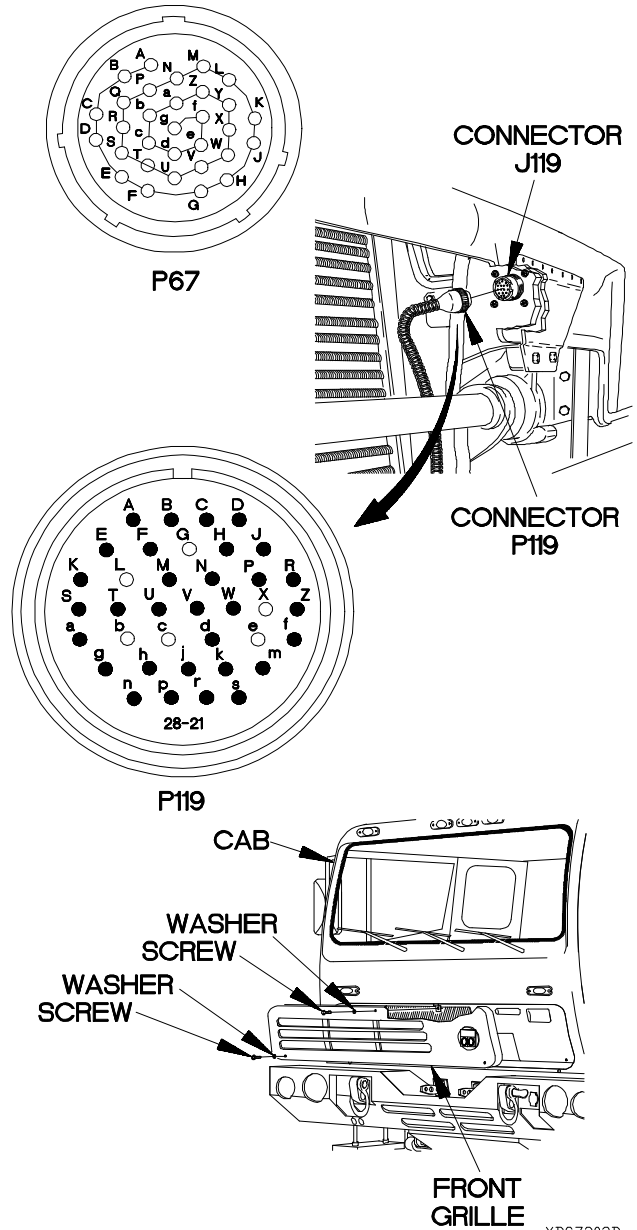
2.
Is continuity present from connector P119-A to connector P67-f?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-A.
- (3) Connect negative (-) probe of multimeter to connector P67-f and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-A.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external cable assembly is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



YBC7202B

c72. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

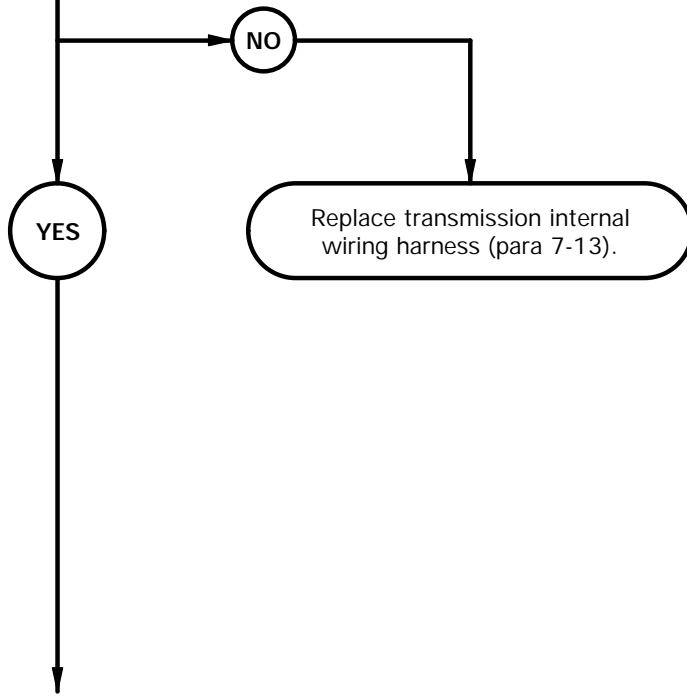
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC III transmission ECU.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin g to internal wiring harness connector N pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

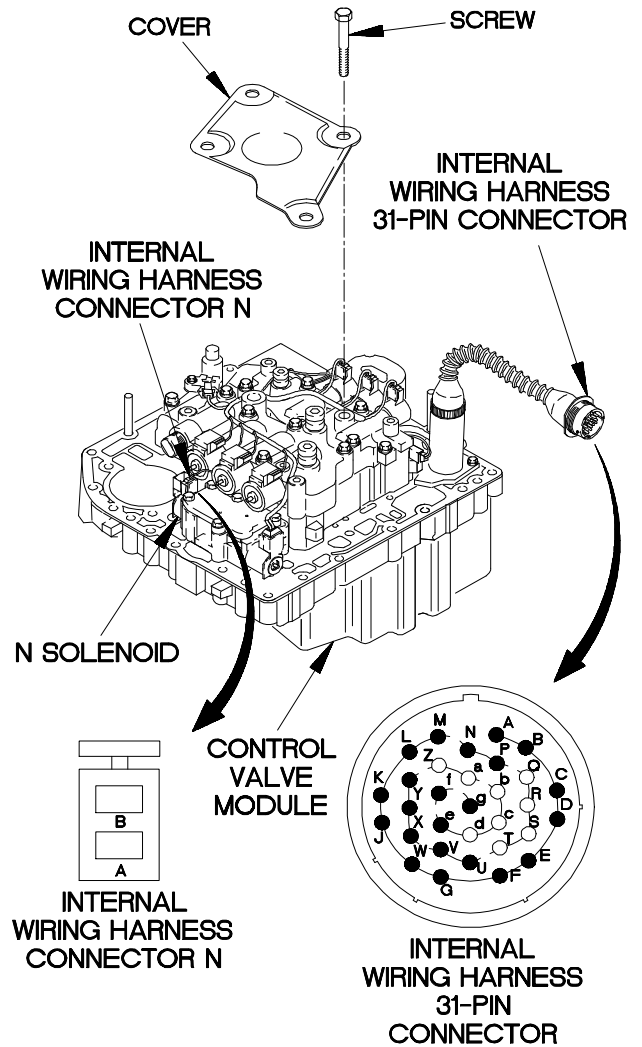


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector N from N solenoid.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin g.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector N pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin g.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



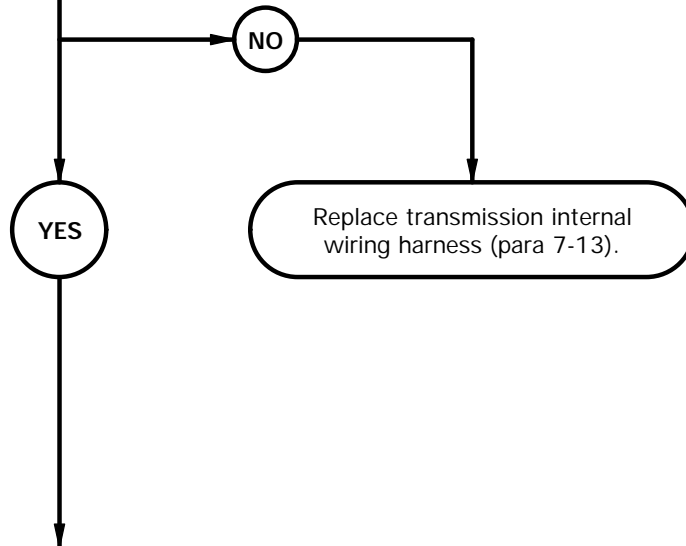
YBC7203B

c72. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC III transmission ECU.

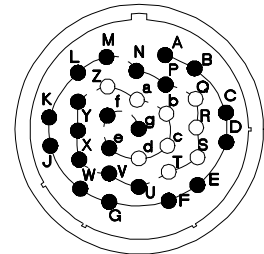
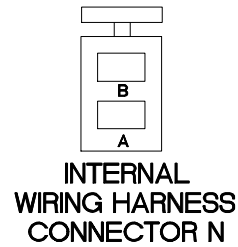
4.
Is continuity present from internal wiring harness 31-pin connector pin f to internal wiring harness connector N pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin f.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector N pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin f.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



**INTERNAL
WIRING HARNESS
31-PIN
CONNECTOR**

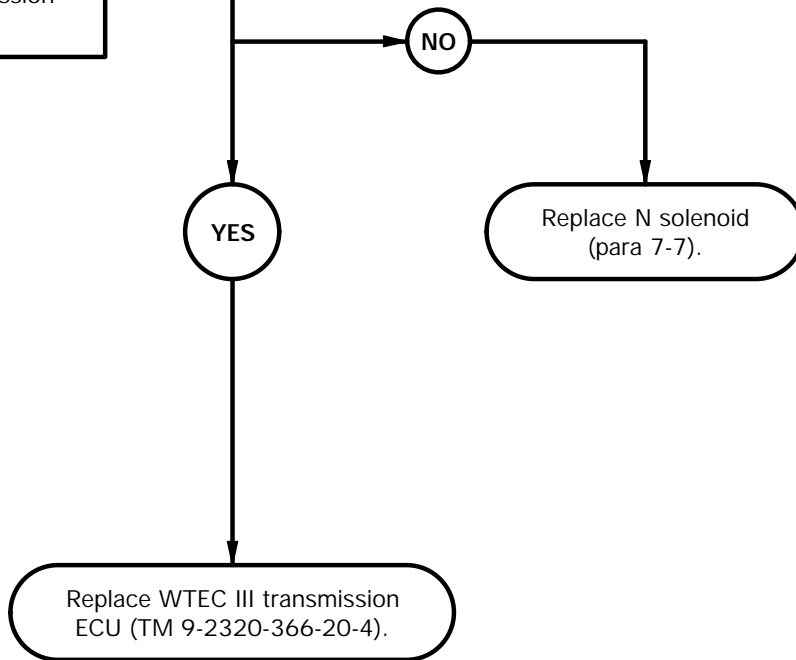
YBC7204B

c72. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty N solenoid. Faulty WTEC III transmission ECU.

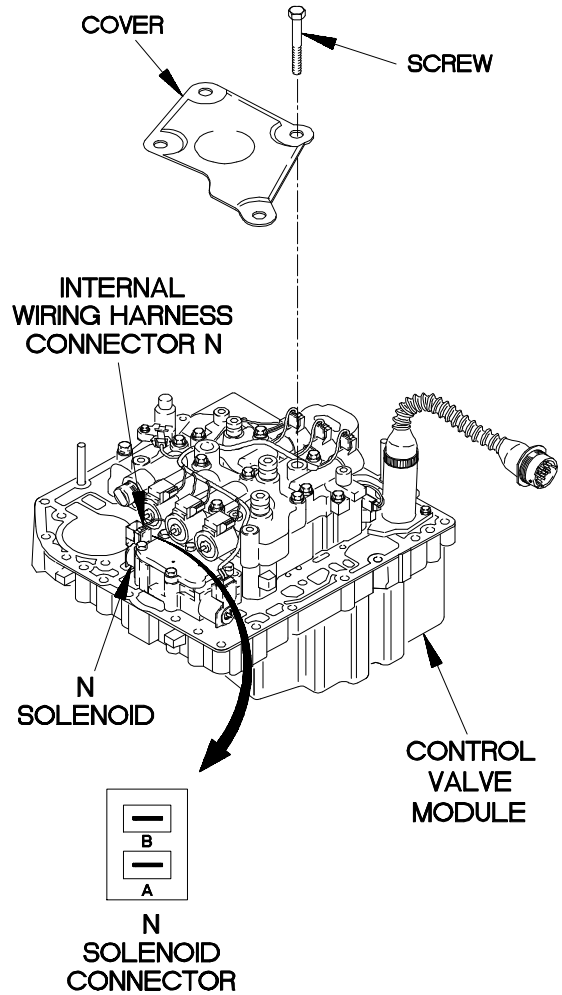
5.
Is 2.5-5.0 ohms resistance present from N solenoid pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, N solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC III transmission ECU is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of N solenoid connector.
- (3) Connect negative (-) probe of multimeter to pin B of N solenoid connector and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace N solenoid (para 7-7).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC III transmission ECU (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector N to N solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC7205B

c73. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

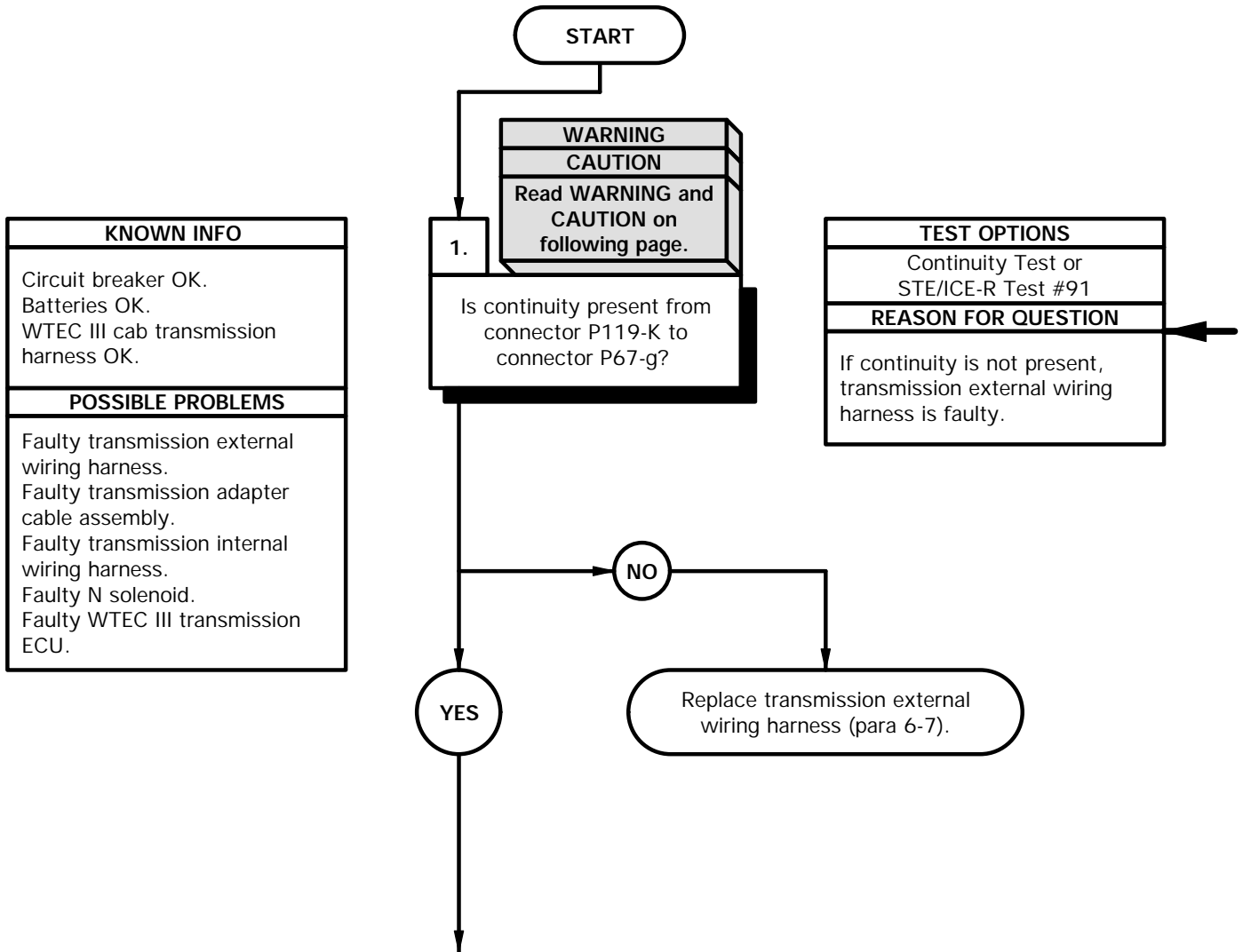
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

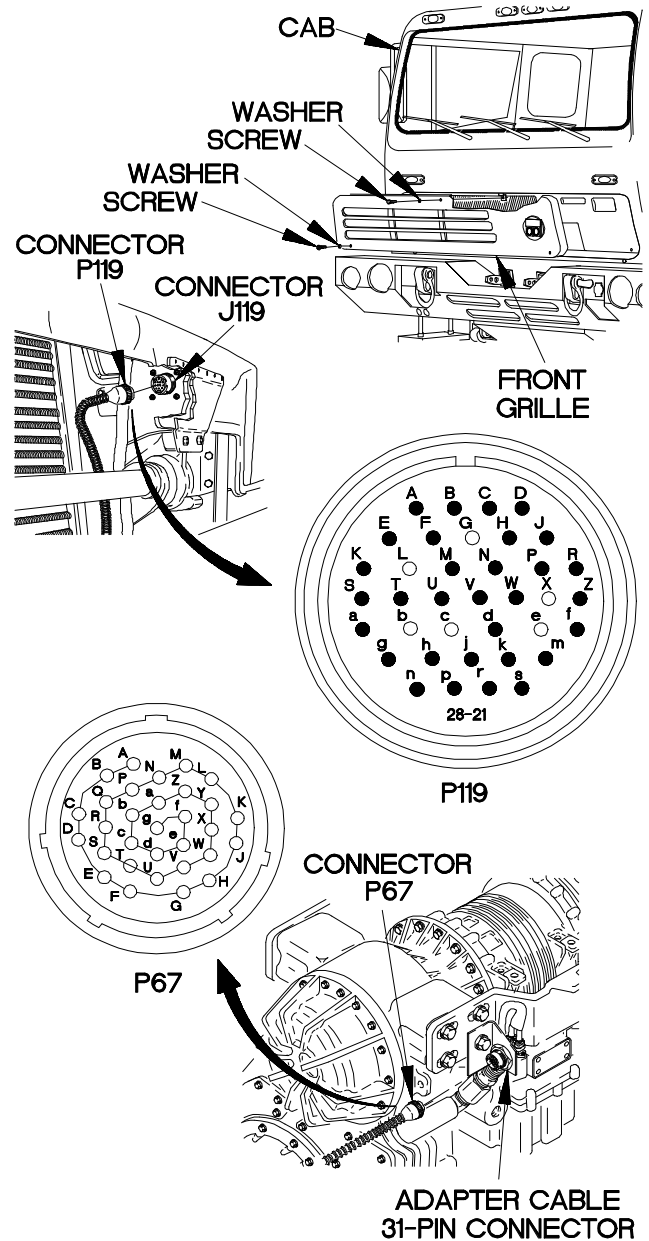
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect connector P67 from adapter cable 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-K.
- (8) Connect negative (-) probe of multimeter to connector P67-g and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-K.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



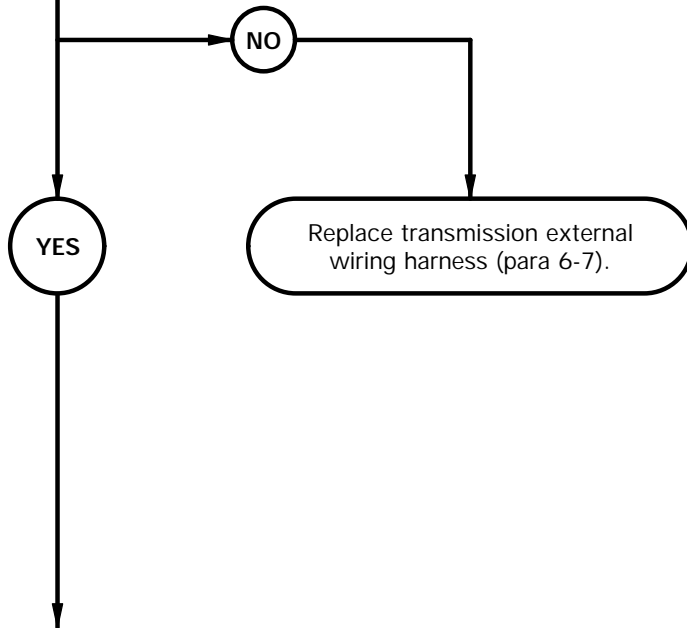
YBC7301B

c73. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC III transmission ECU.

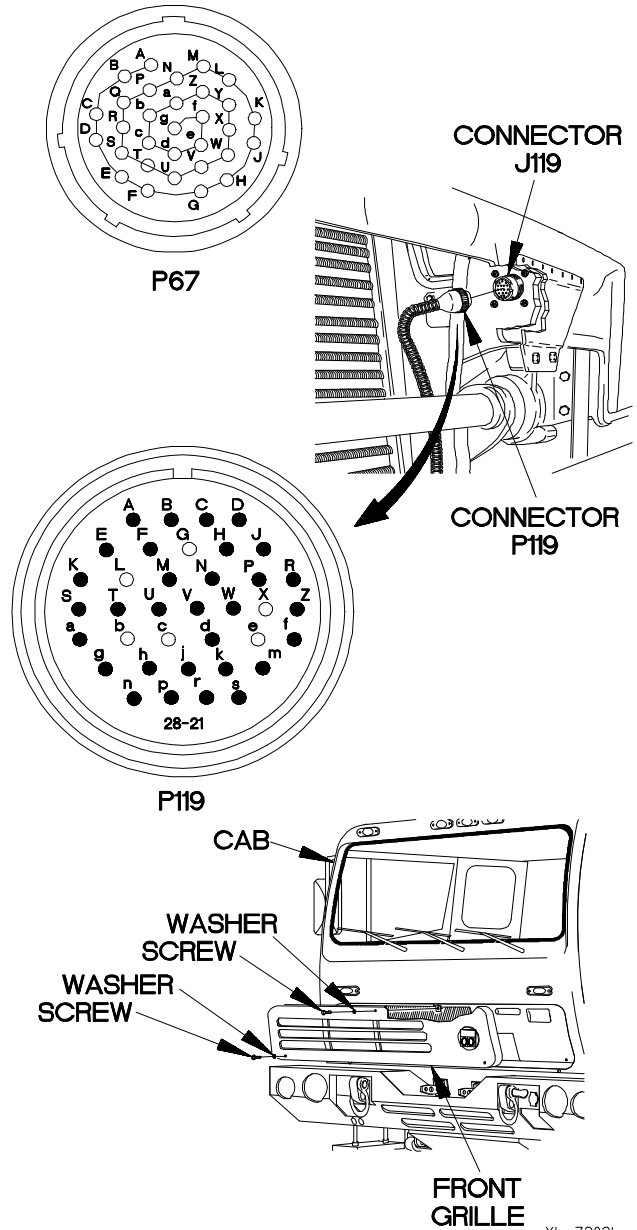
2.
Is continuity present from connector P119-A to connector P67-f?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-A.
- (3) Connect negative (-) probe of multimeter to connector P67-f and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-A.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



c73. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

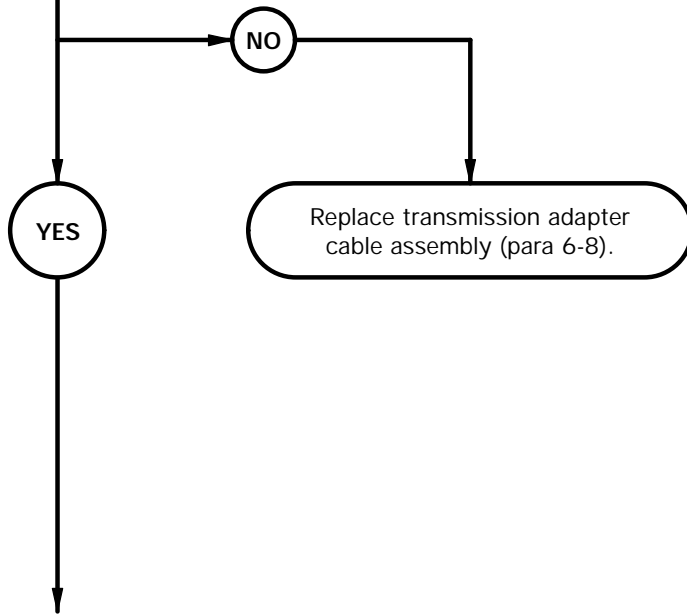
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC III transmission ECU.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin G to adapter cable 24-pin connector pin H3?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.

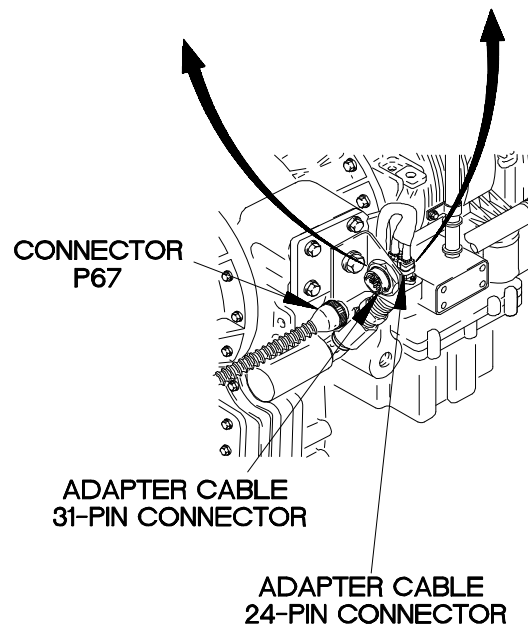
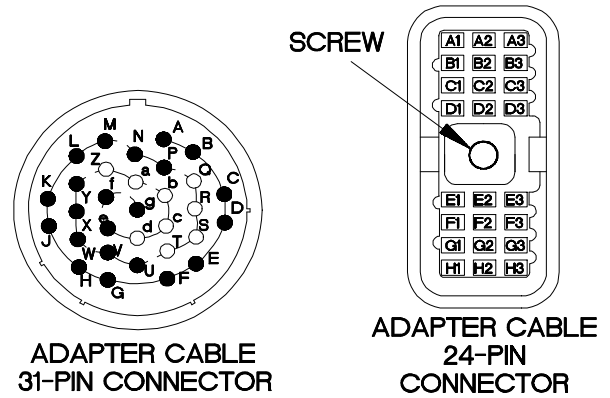


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Loosen screw in adapter cable 24-pin connector.
- (2) Disconnect adapter cable 24-pin connector from internal wiring harness 24-pin connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin G.
- (5) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin H3 and note reading on multimeter.
- (6) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (7) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin G.
- (8) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).



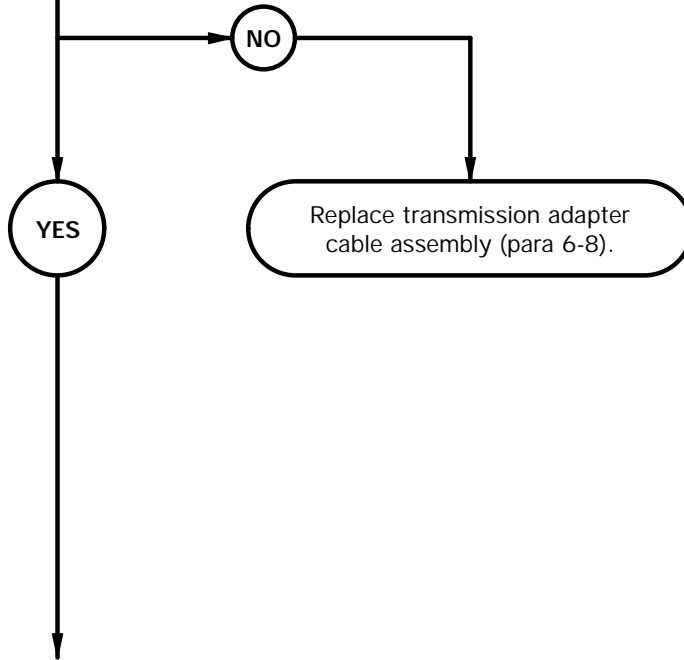
Y6c7303b

c73. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC III transmission ECU.

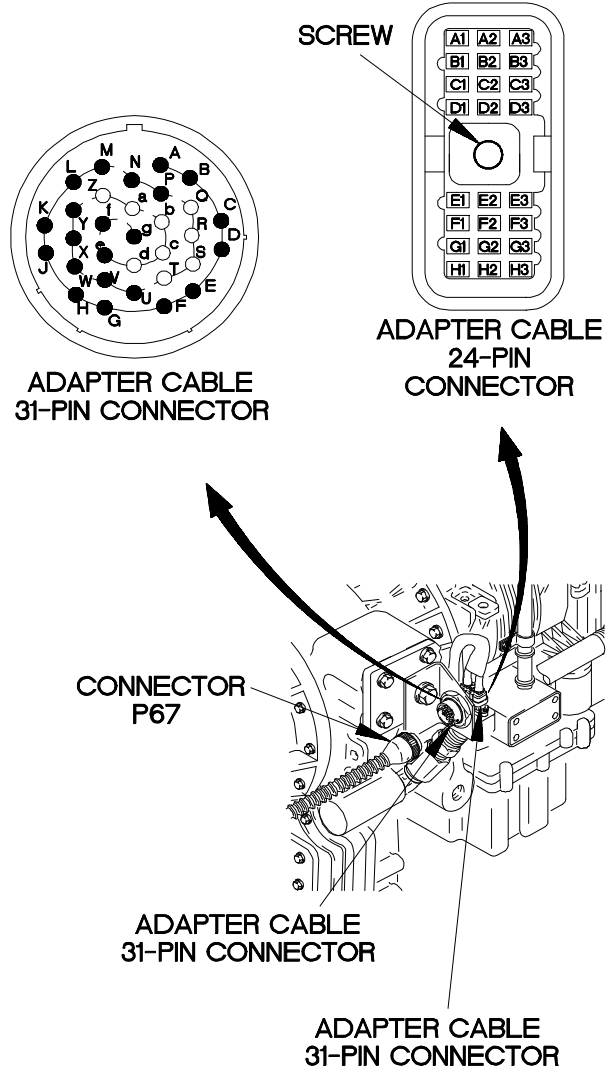
4.
Is continuity present from adapter cable 31-pin connector pin F to adapter cable 24-pin connector pin H2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin F.
- (3) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin H2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (5) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin F.
- (6) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).
- (9) Connect connector P67 to adapter cable 31-pin connector.



Ybc7304b

c73. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

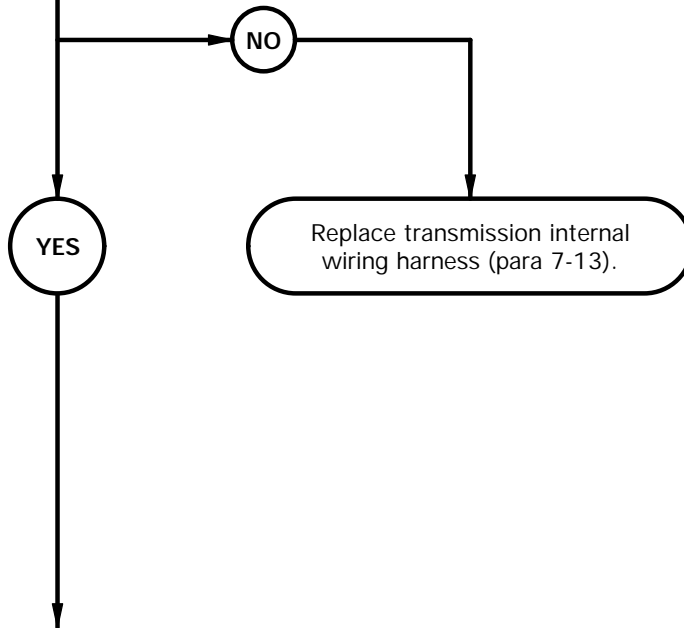
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC III transmission ECU.

5.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin H3 to internal wiring harness connector N pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

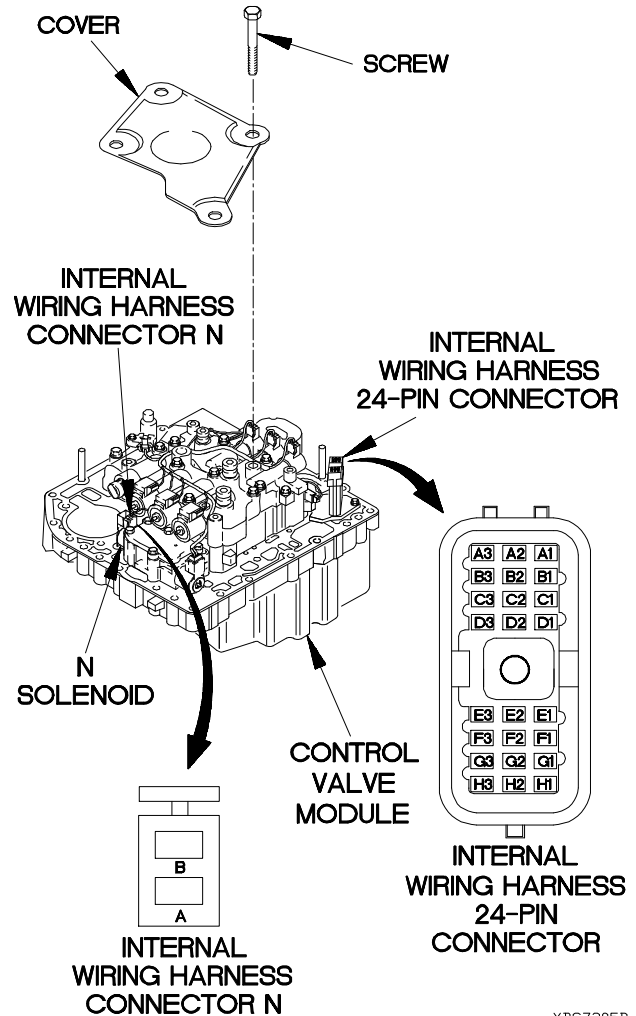


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector N from N solenoid.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin H3.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector N pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin H3.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector, except pins B2 and E1, and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



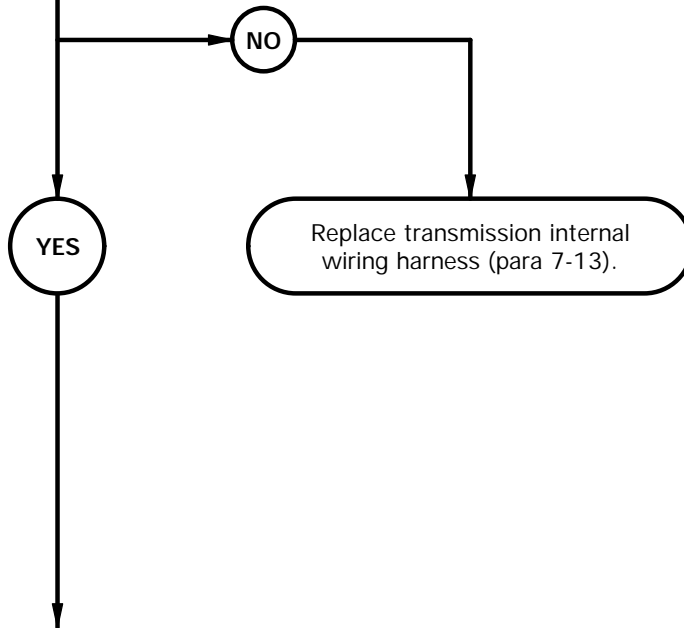
YBC7305B

c73. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC III transmission ECU.

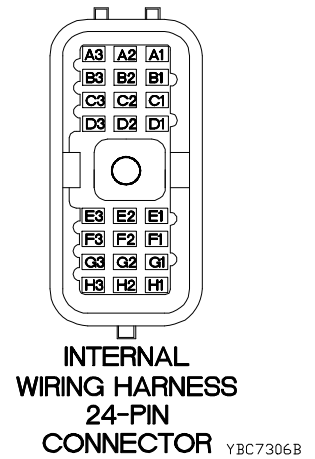
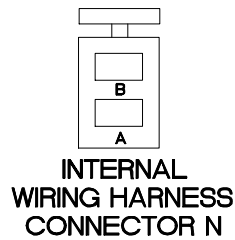
6.
 Is continuity present from internal wiring harness 24-pin connector pin H2 to internal wiring harness connector N pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

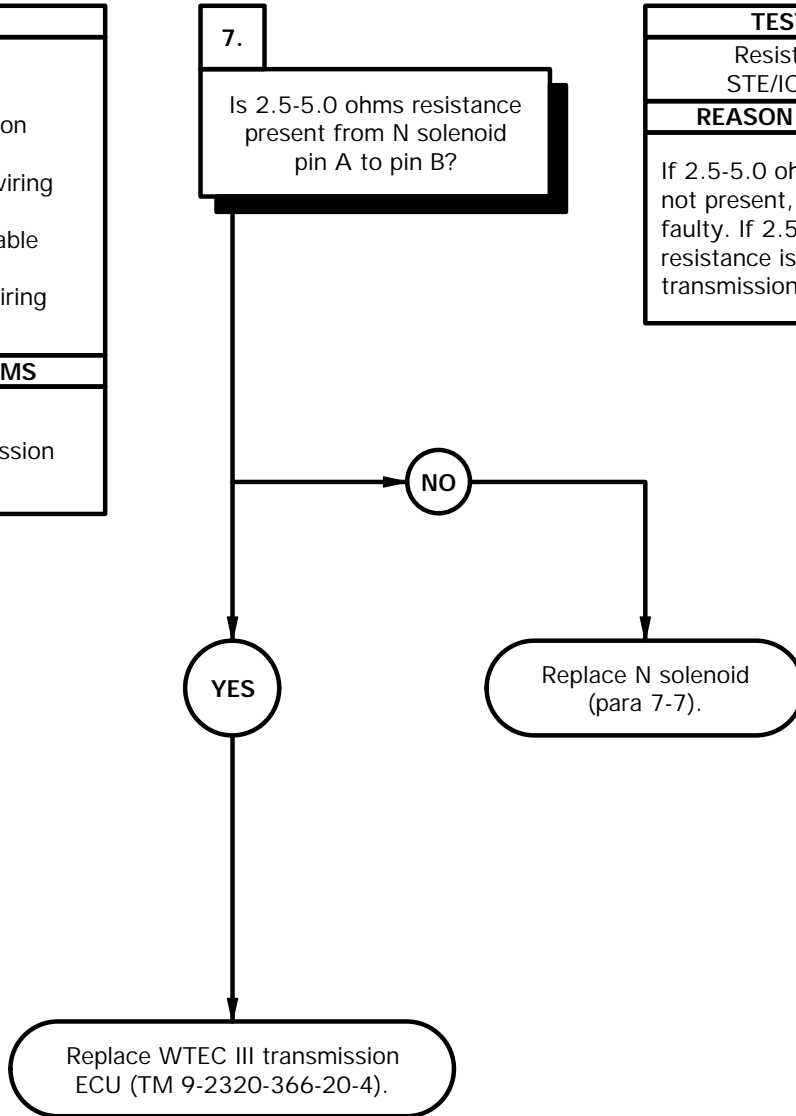
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin H2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector N pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin H2.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



c73. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

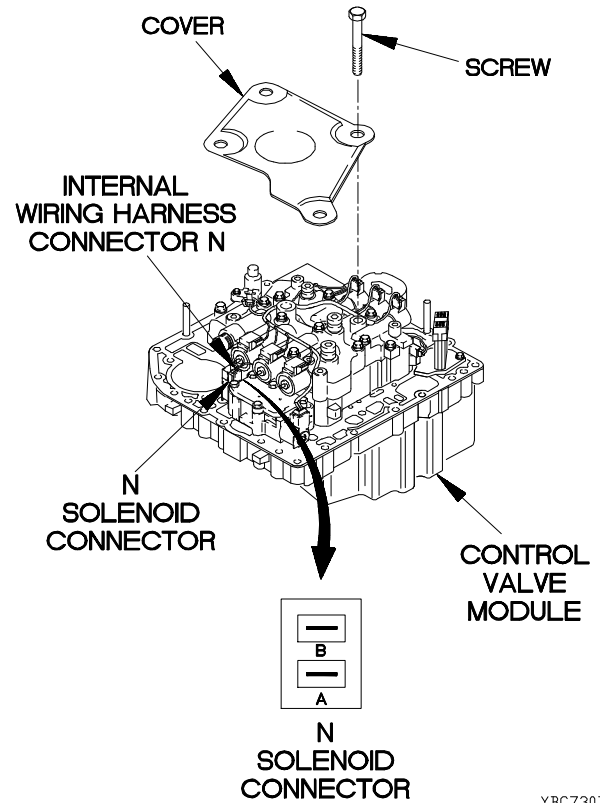
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty N solenoid. Faulty WTEC III transmission ECU.

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, N solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC III transmission ECU is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of N solenoid connector.
- (3) Connect negative (-) probe of multimeter to pin B of N solenoid connector and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace N solenoid (para 7-7).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC III transmission ECU (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector N to N solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YEC7307B

c74. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

Equipment Conditions

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Material/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

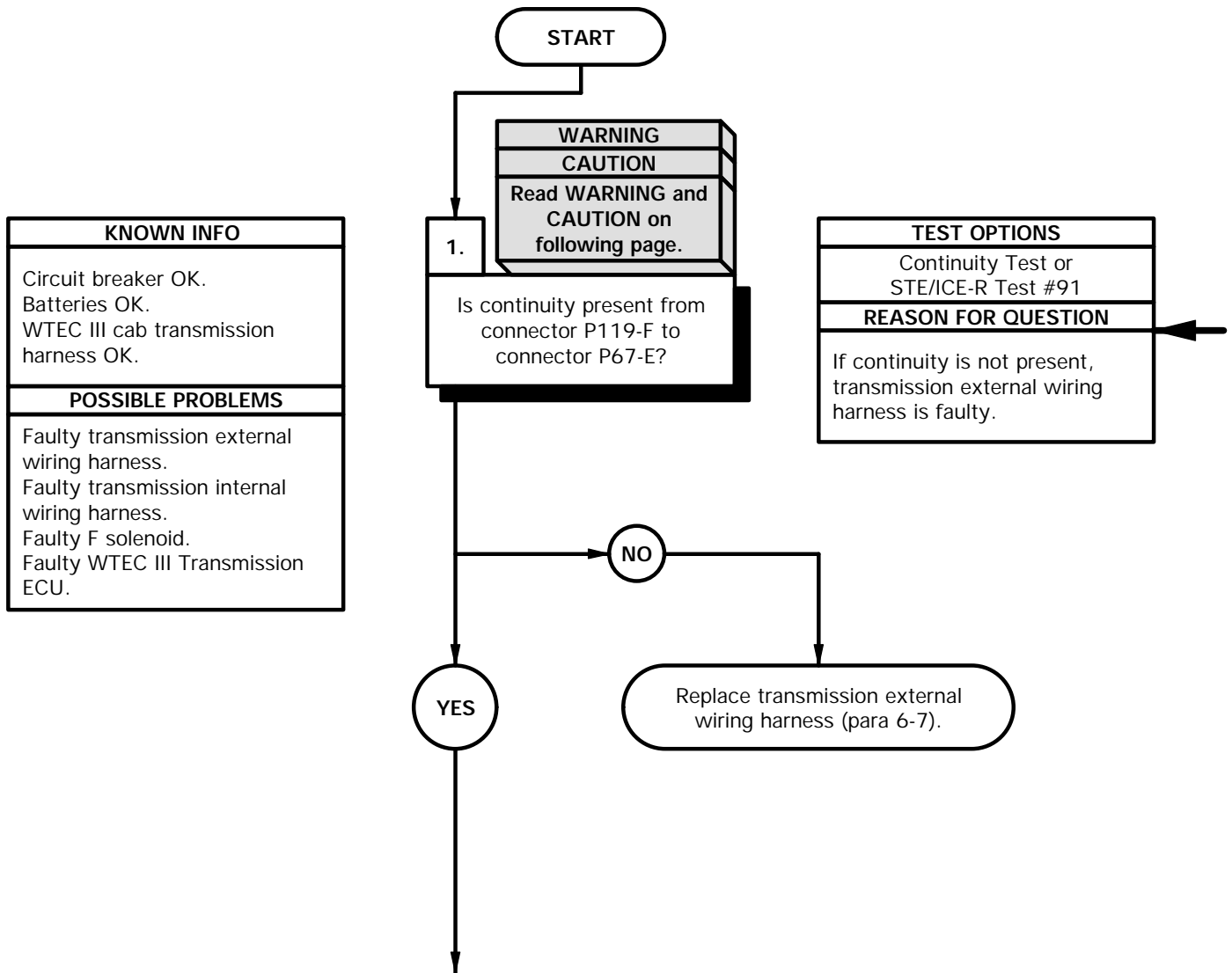
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

References

TM 9-4910-571-12&P

Personnel Required

(2)



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

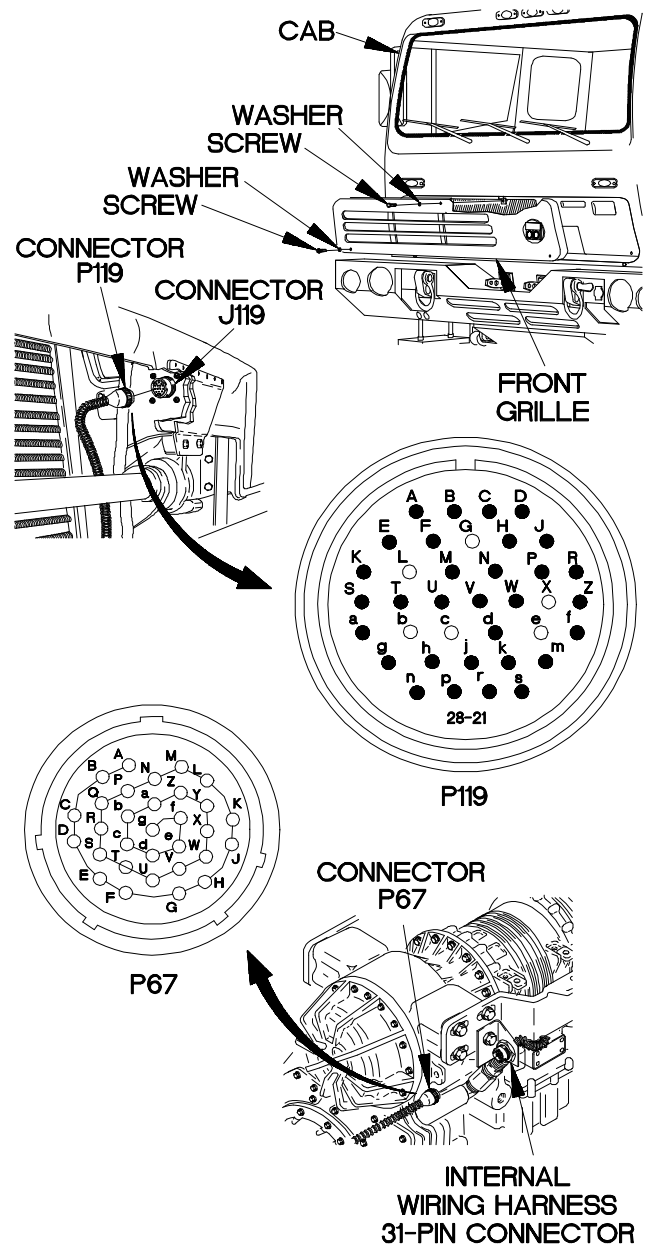
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect connector P67 from internal wiring harness 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-F.
- (8) Connect negative (-) probe of multimeter to connector P67-E and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-F.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



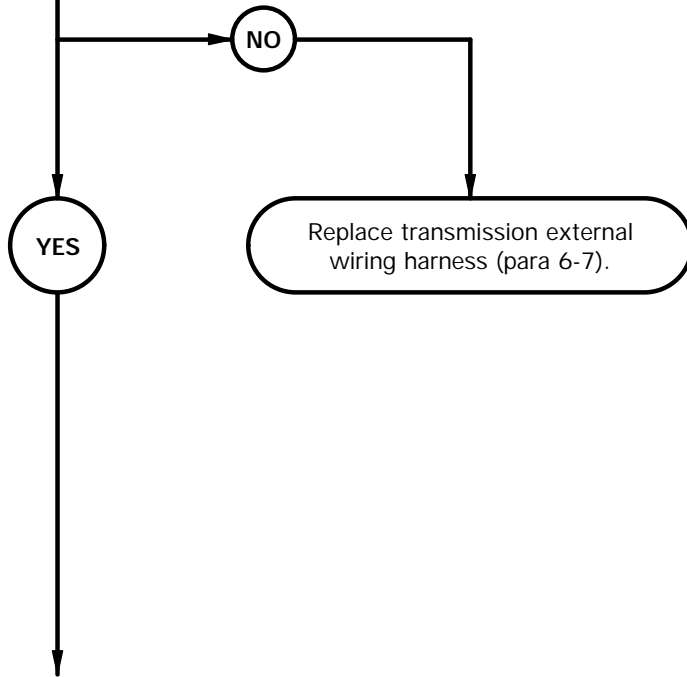
Y6c7401b

c74. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC III transmission ECU.

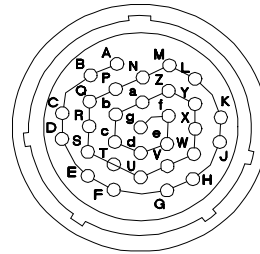
2.
Is continuity present from connector P119-H to connector P67-F?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

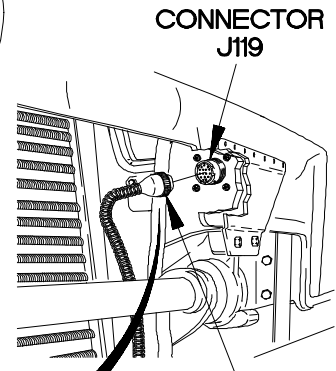


CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-H.
- (3) Connect negative (-) probe of multimeter to connector P67-F and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-H.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).

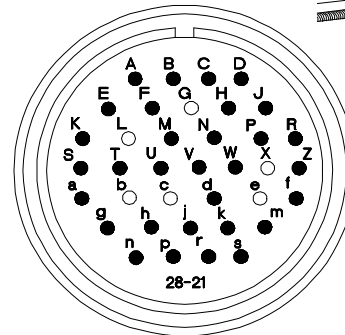


P67

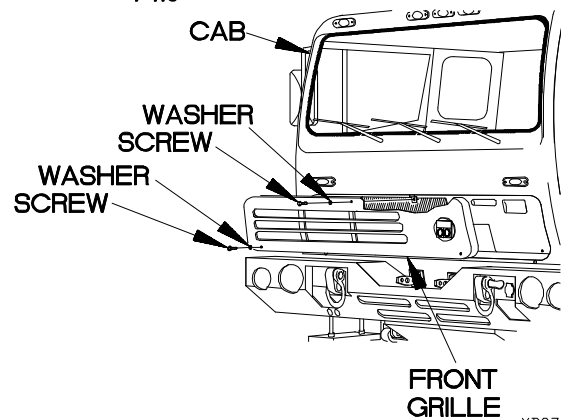


CONNECTOR J119

CONNECTOR P119



P119



YBC7402B

c74. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

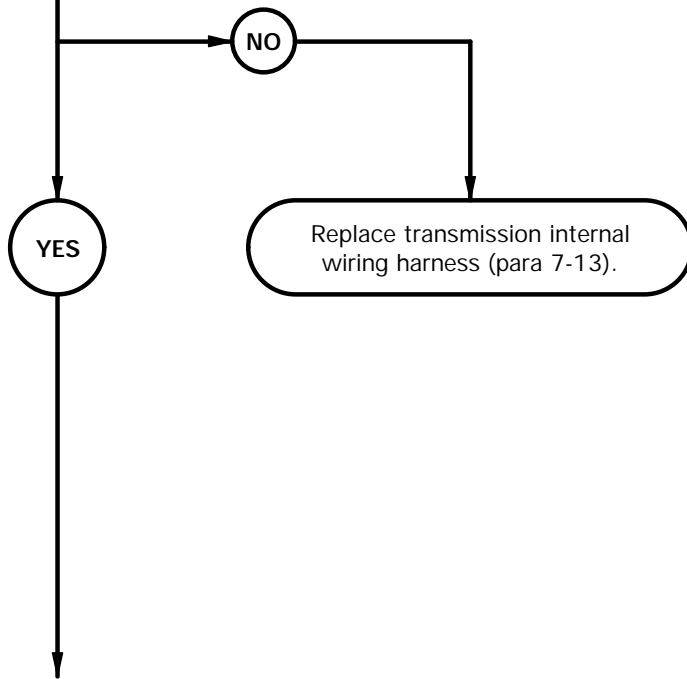
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC III transmission ECU.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin E to internal wiring harness connector F pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

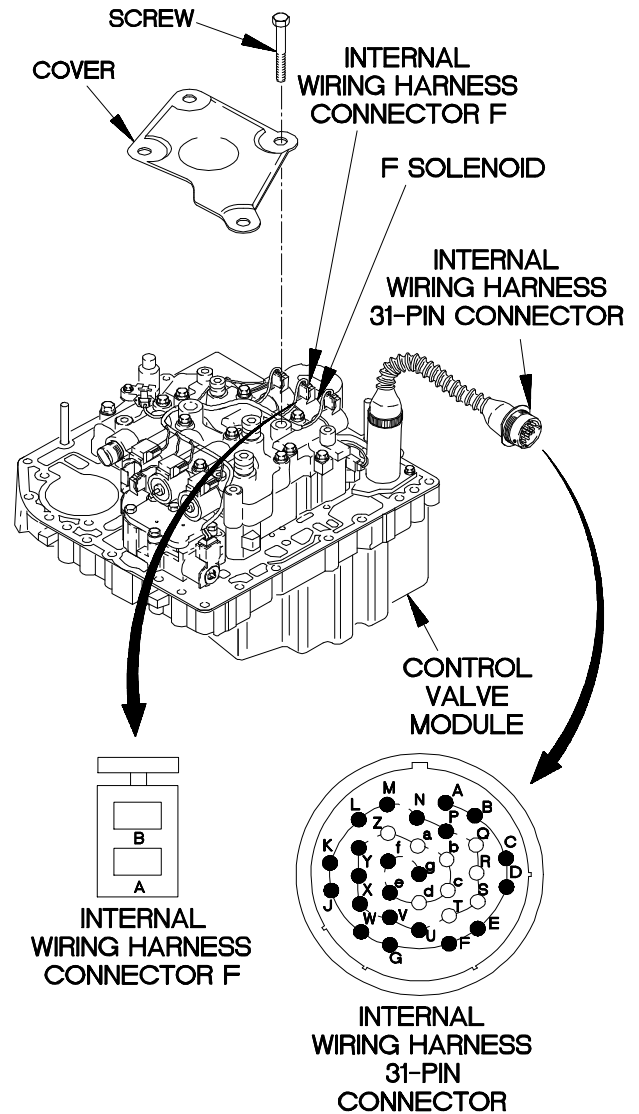


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector F from F solenoid.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin E.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector F pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin E.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



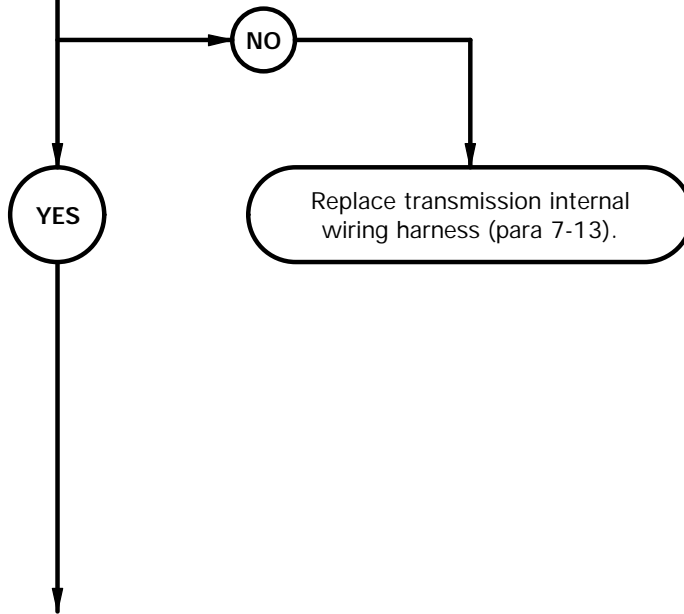
YBC7403B

c74. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC III transmission ECU.

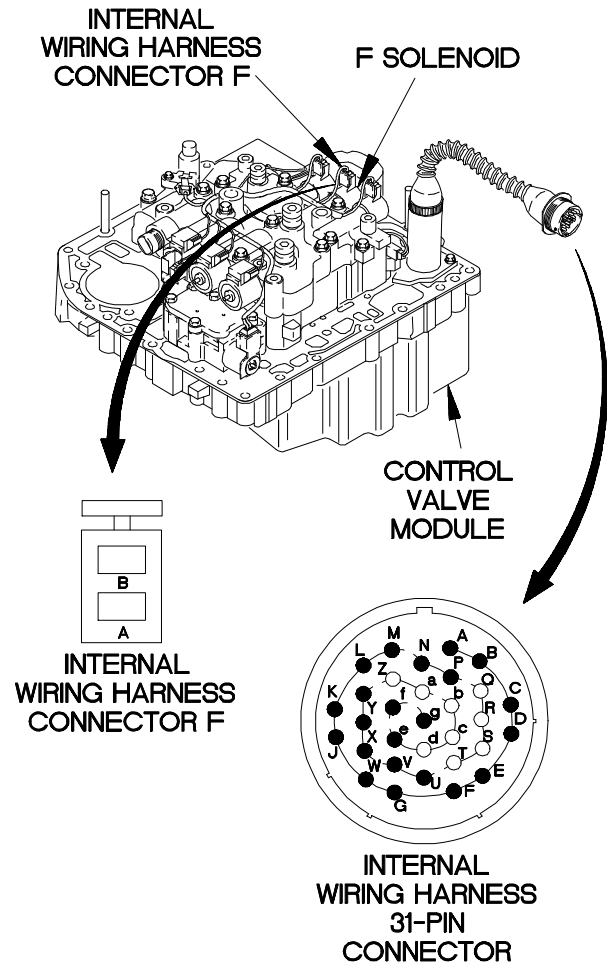
4.
Is continuity present from internal wiring harness 31-pin connector pin F to internal wiring harness connector F pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin F.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector F pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin F.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



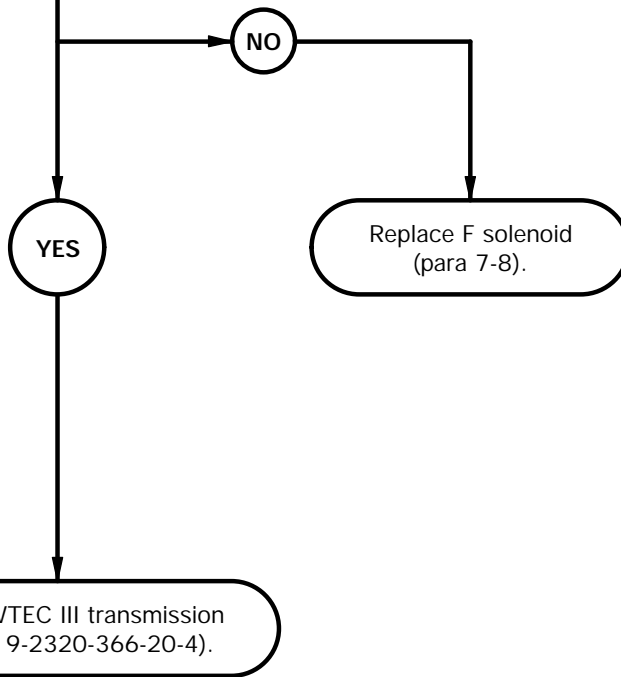
YBC7404B

c74. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty F solenoid. Faulty WTEC III transmission ECU.

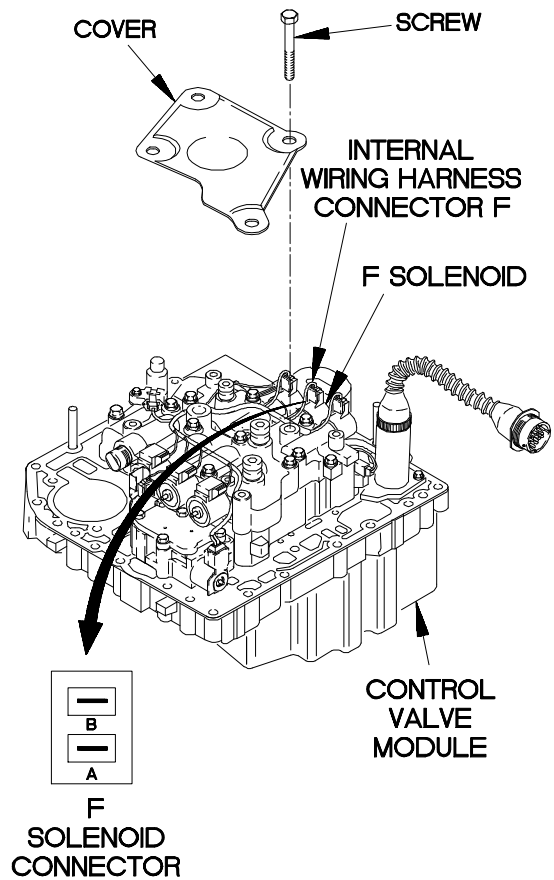
5.
Is 2.5-5.0 ohms resistance present from F solenoid pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, F solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC III transmission ECU is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of F solenoid.
- (3) Connect negative (-) probe of multimeter to pin B of F solenoid and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace F solenoid (para 7-8).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC III transmission ECU (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector F to F solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC7405B

c75. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

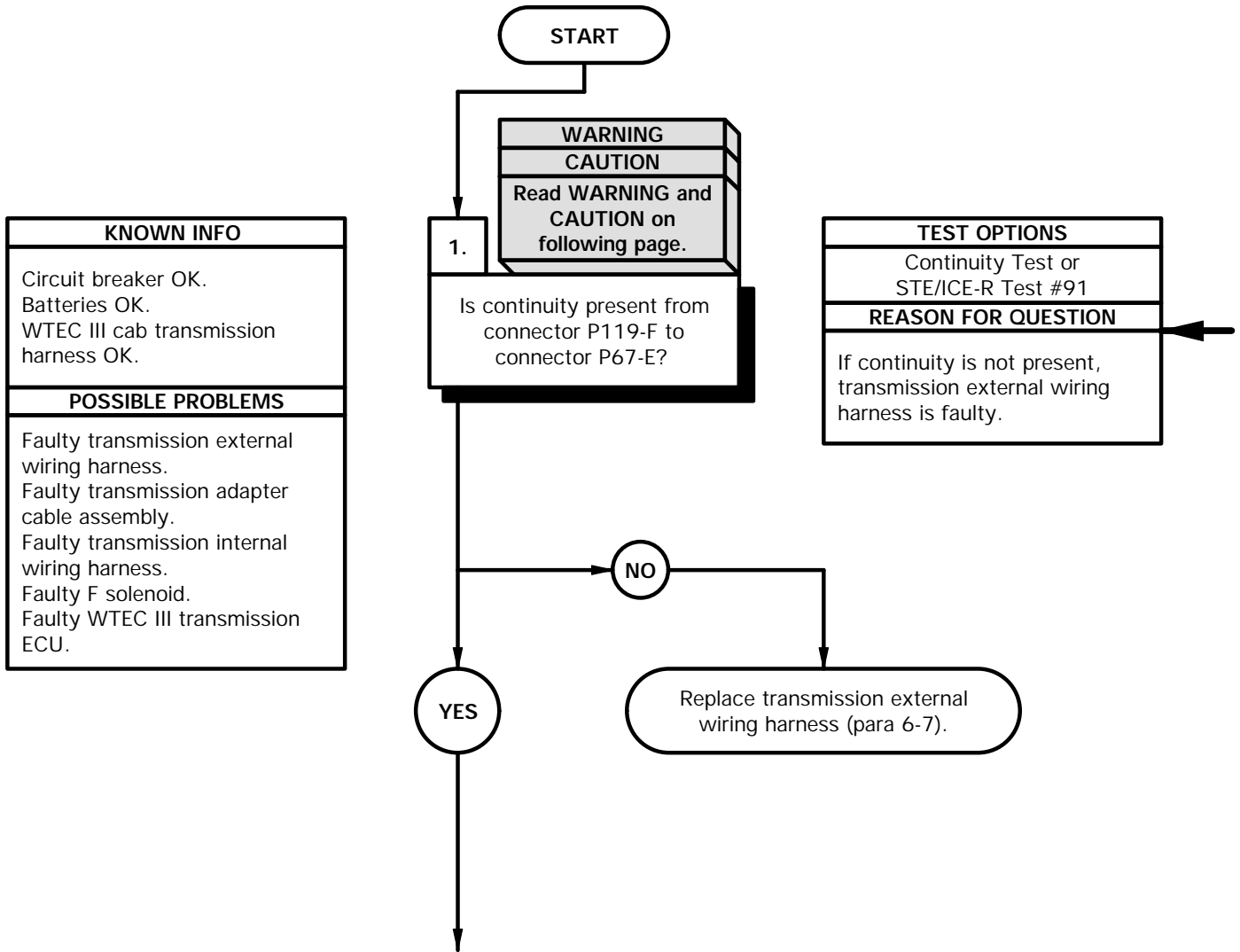
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

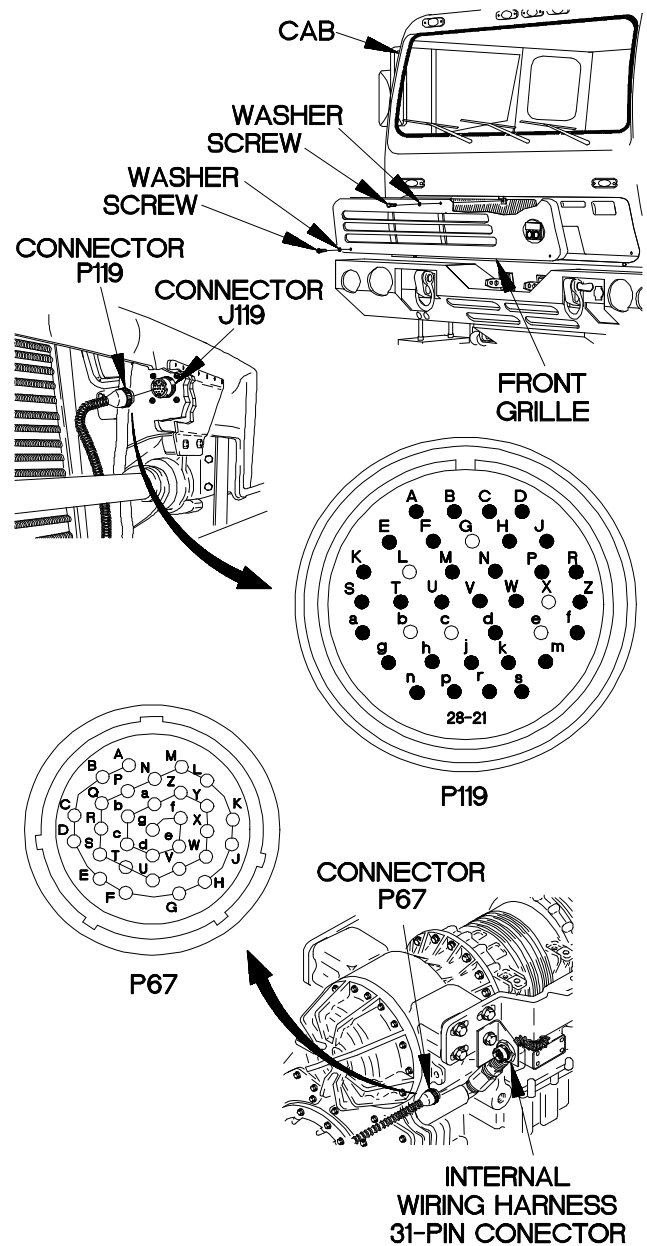
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect connector P67 from adapter cable 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-F.
- (8) Connect negative (-) probe of multimeter to connector P67-E and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-F.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

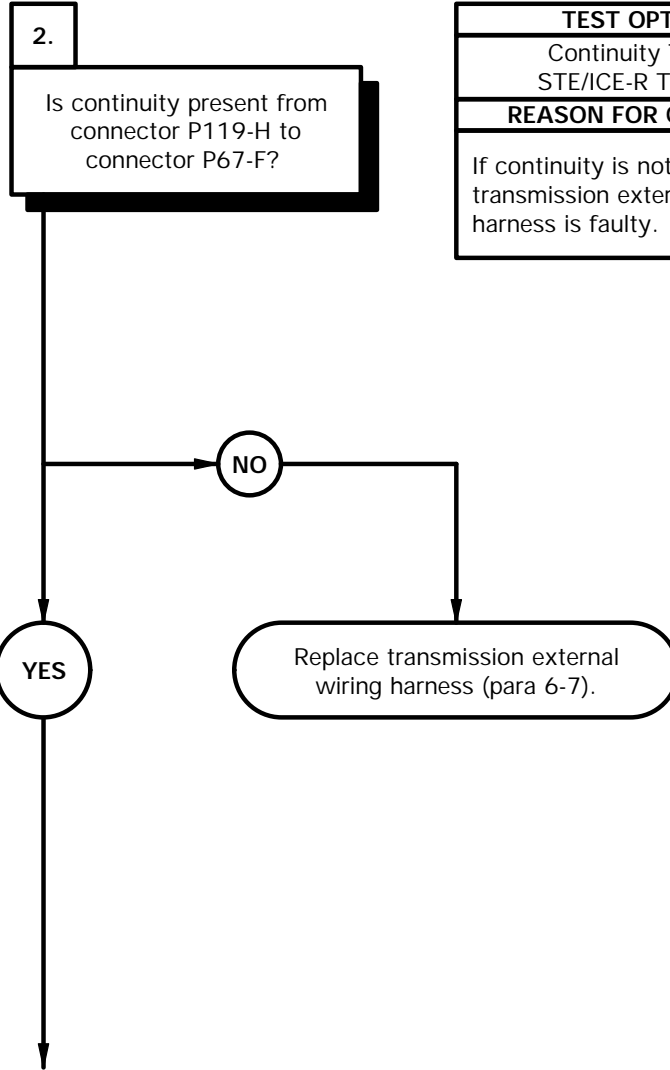
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



Y6c7501b

c75. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

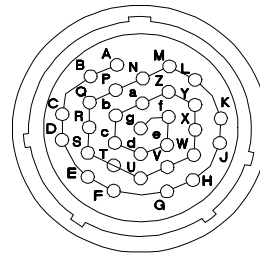
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC III transmission ECU.



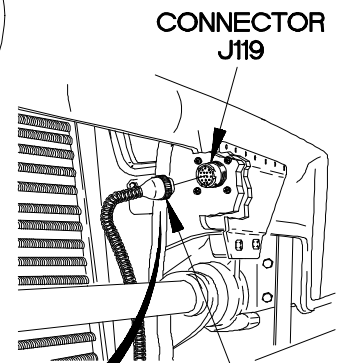
TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-H.
- (3) Connect negative (-) probe of multimeter to connector P67-F and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-H.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).

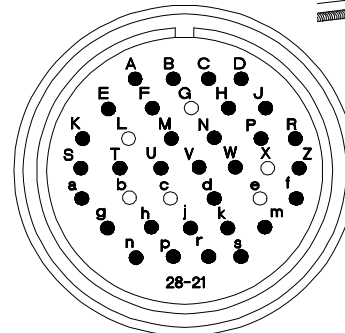


P67

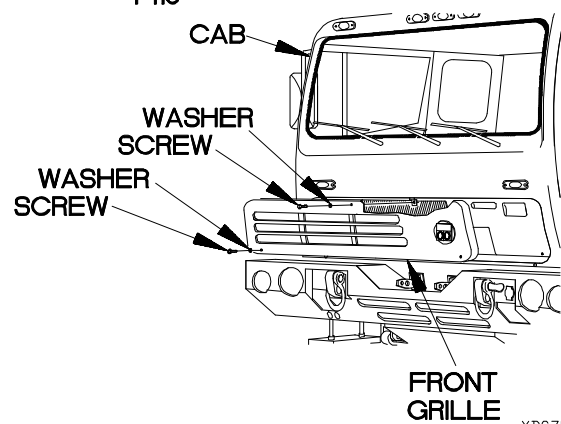


CONNECTOR J119

CONNECTOR P119



P119



c75. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

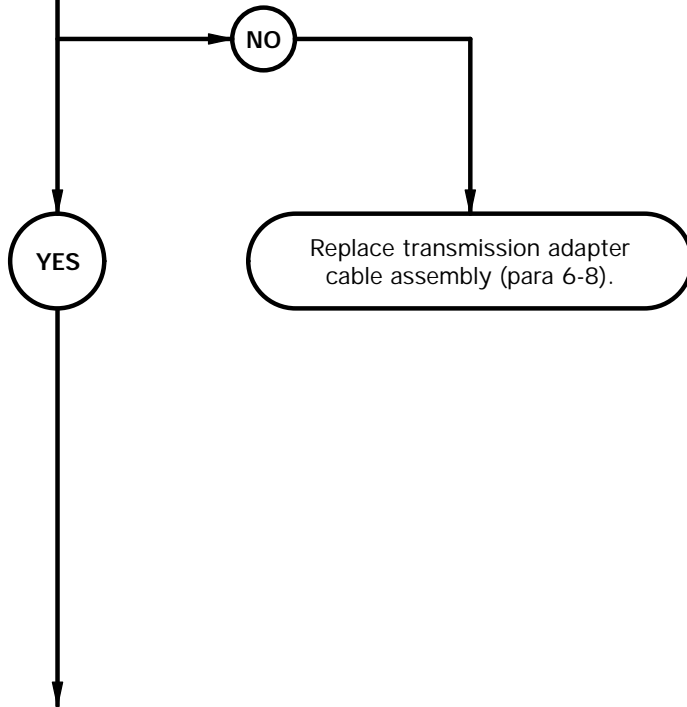
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC III transmission ECU.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin E to adapter cable 24-pin connector pin D3?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.

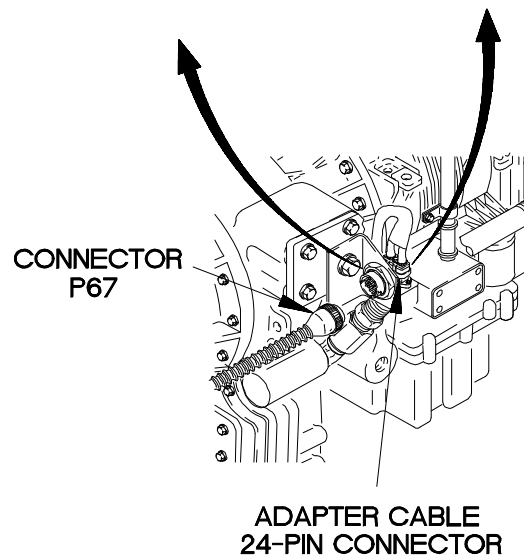
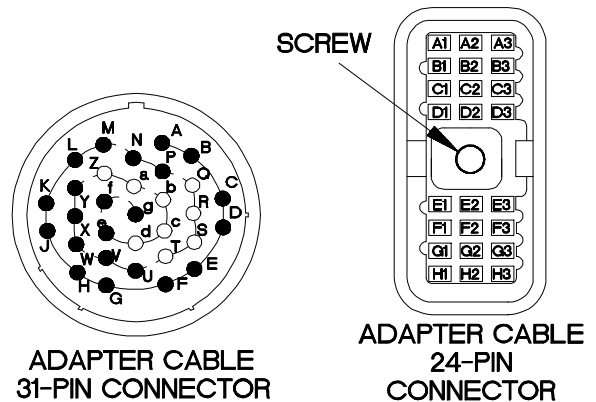


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Loosen screw in adapter cable 24-pin connector.
- (2) Disconnect adapter cable 24-pin connector from internal wiring harness 24-pin connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin E.
- (5) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin D3 and note reading on multimeter.
- (6) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (7) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin E.
- (8) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).



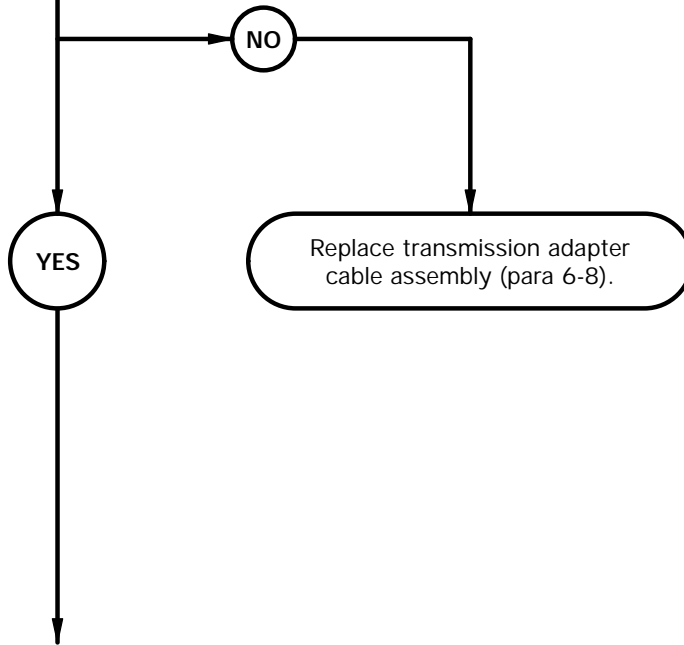
Ybc7503b

c75. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC III transmission ECU.

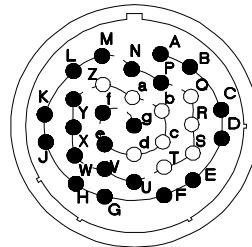
4.
Is continuity present from adapter cable 31-pin connector pin F to adapter cable 24-pin connector pin D2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.

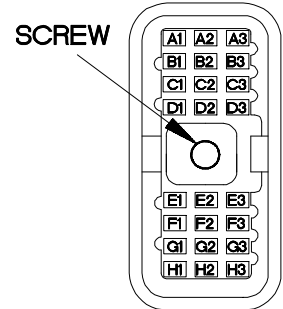


CONTINUITY TEST

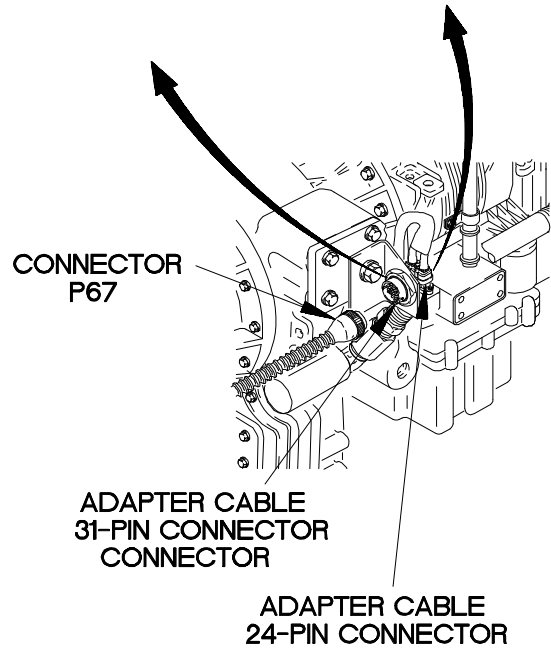
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin F.
- (3) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin D2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (5) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin F.
- (6) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).
- (9) Connect connector P67 to adapter cable 31-pin connector.



**ADAPTER CABLE
31-PIN CONNECTOR**



**ADAPTER CABLE
24-PIN
CONNECTOR**



Ybc7504b

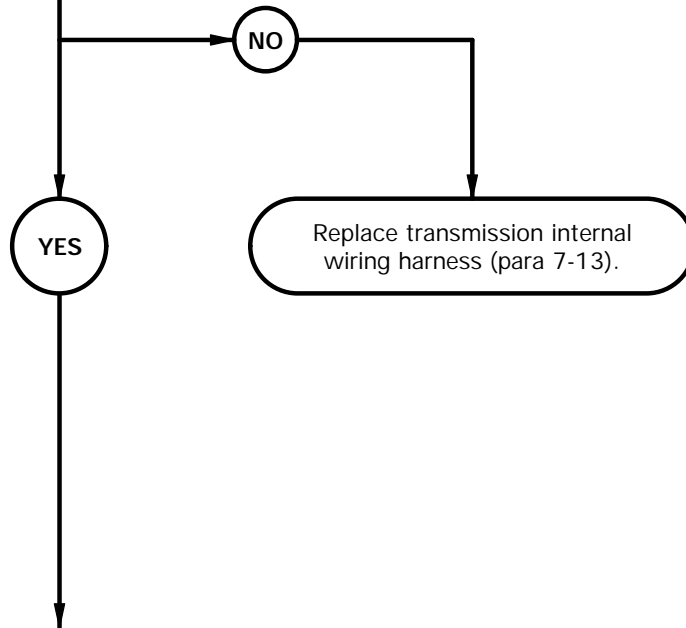
c75. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC III transmission ECU.

5. **CAUTION**
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin D3 to internal wiring harness connector F pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

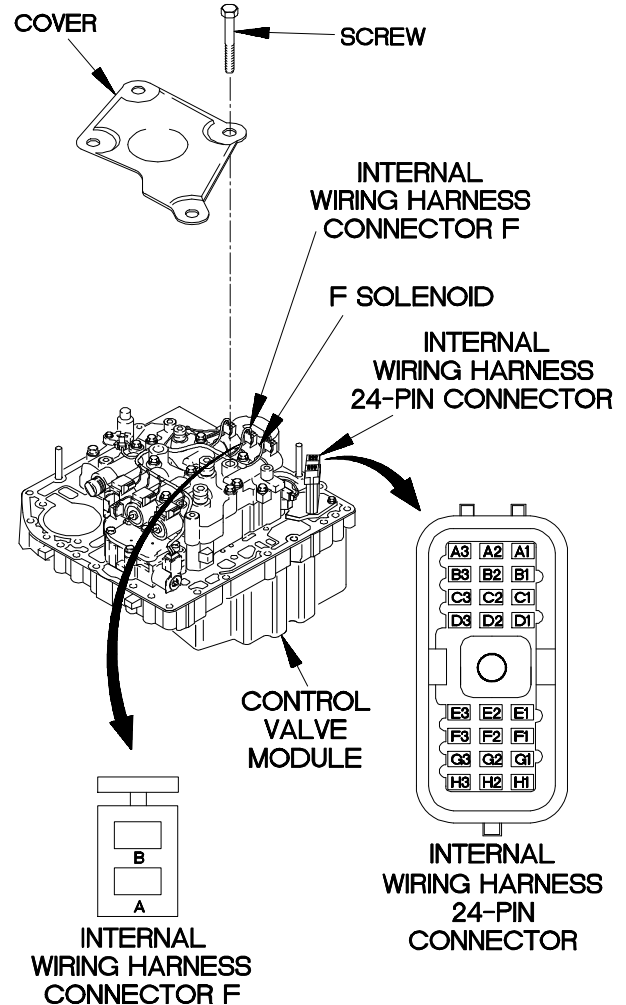


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

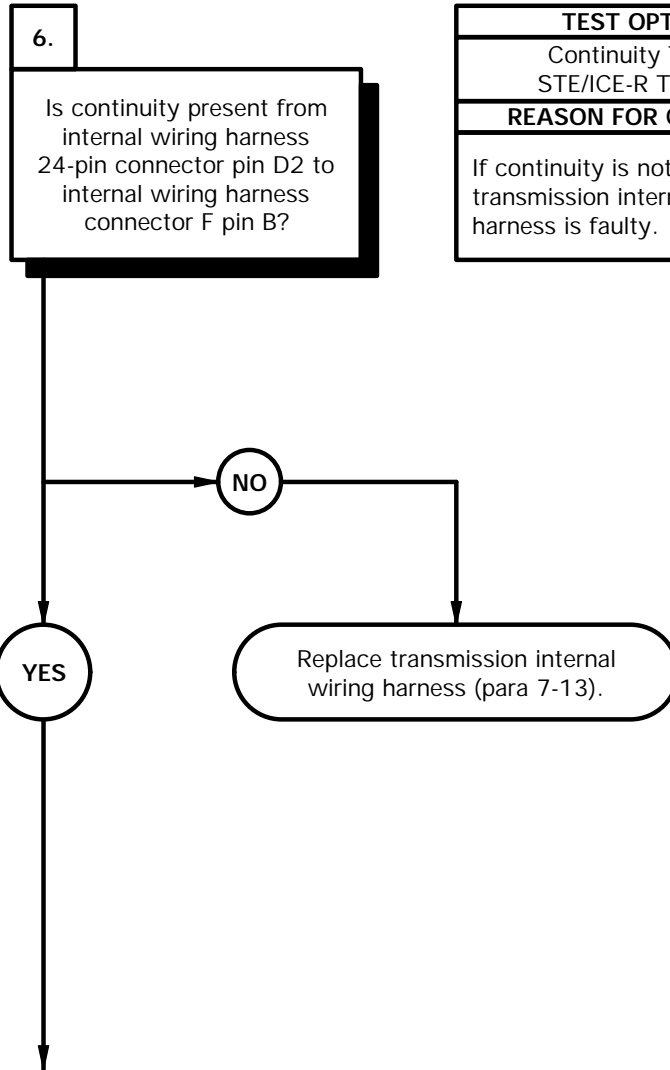
- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector F from F solenoid.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin D3.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector F pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin D3.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



YBC7505B

c75. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

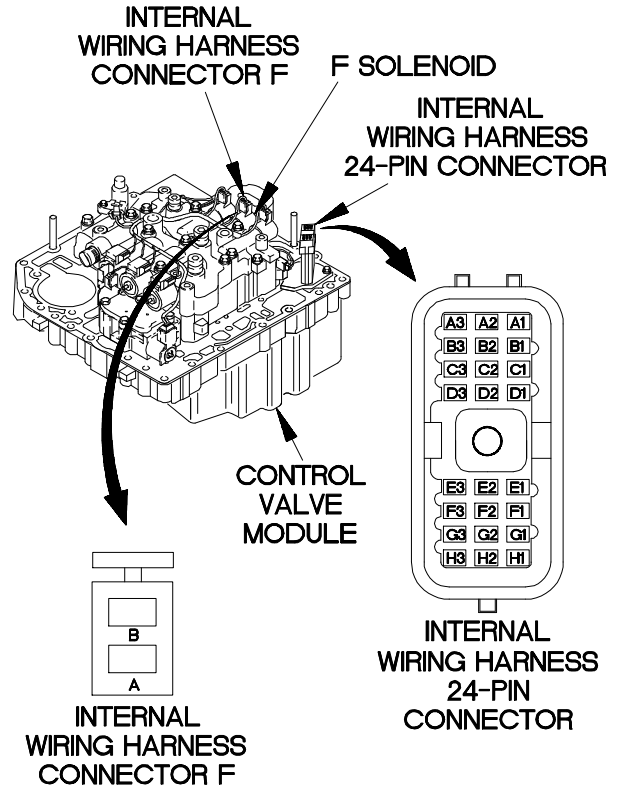
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty F solenoid. Faulty WTEC III transmission ECU.



TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin D2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector F pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin D2.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).

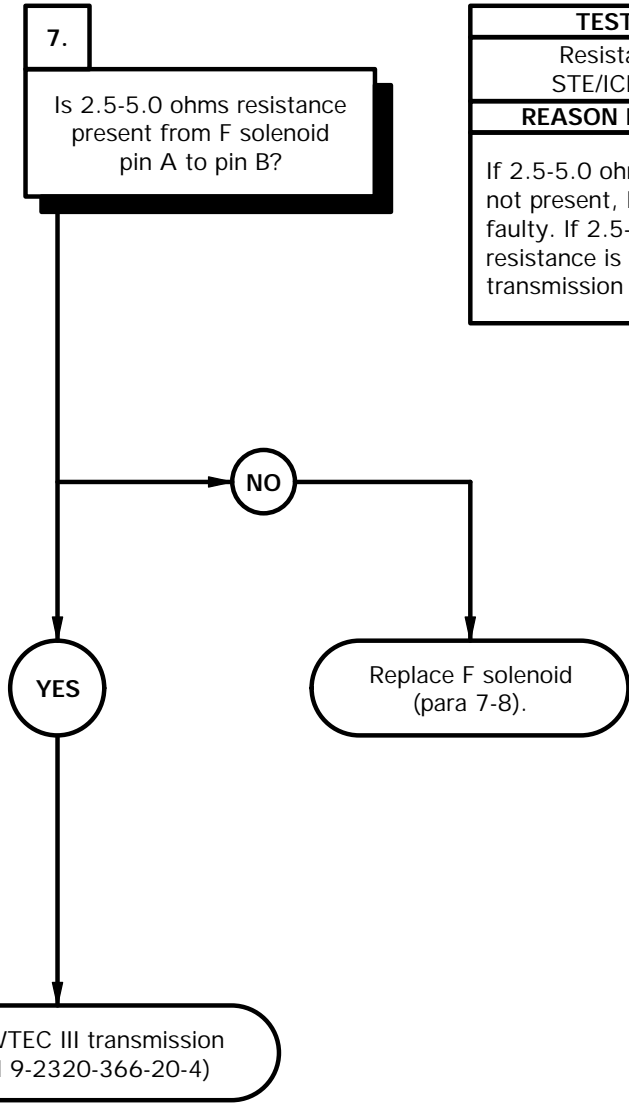


YEC7506B

c75. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

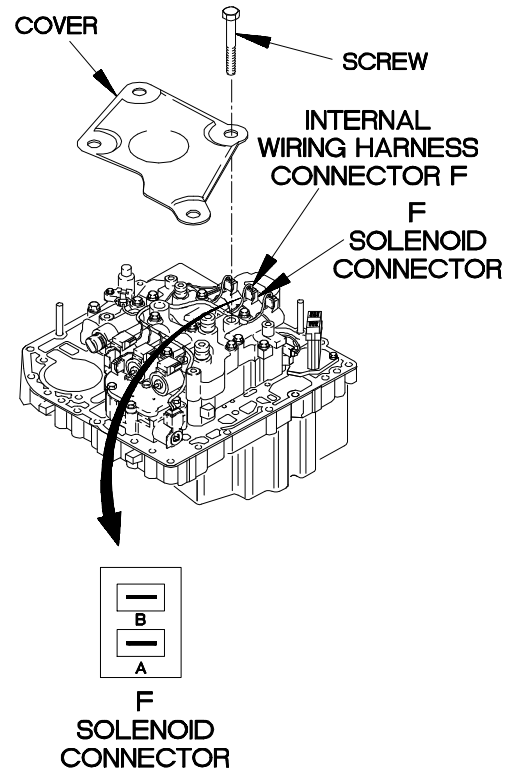
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty F solenoid. Faulty WTEC III transmission ECU.

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, F solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC III transmission ECU is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of F solenoid connector.
- (3) Connect negative (-) probe of multimeter to pin B of F solenoid connector and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace F solenoid (para 7-8).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC III transmission ECU (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector F to F solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YEC7507B

c76. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

Equipment Conditions

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

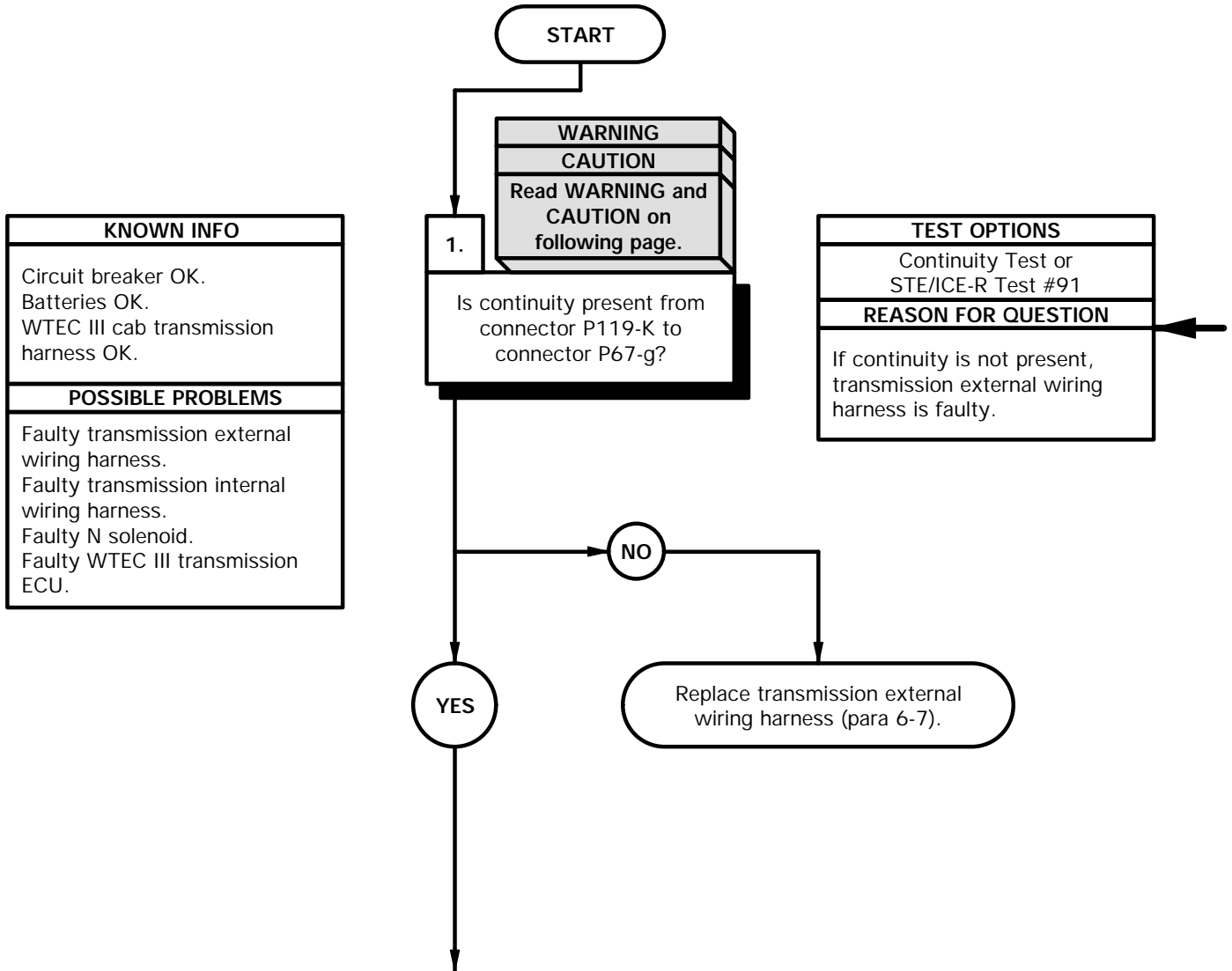
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

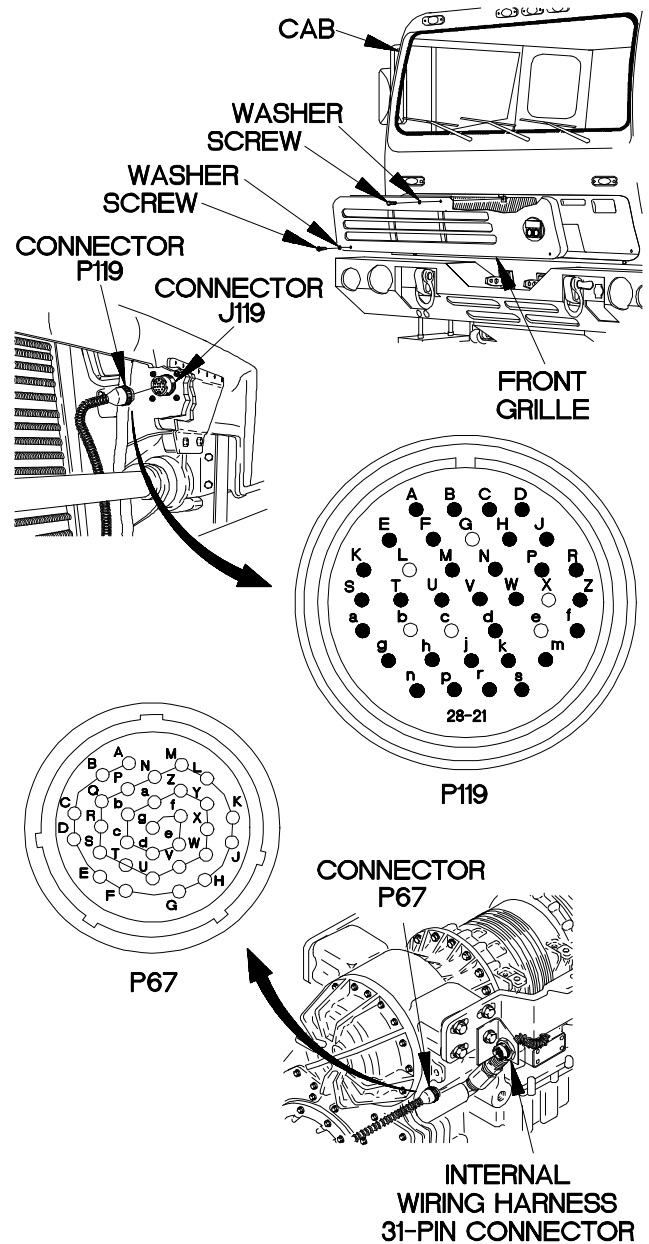
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect connector P67 from internal wiring harness 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-K.
- (8) Connect negative (-) probe of multimeter to connector P67-g and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-K.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



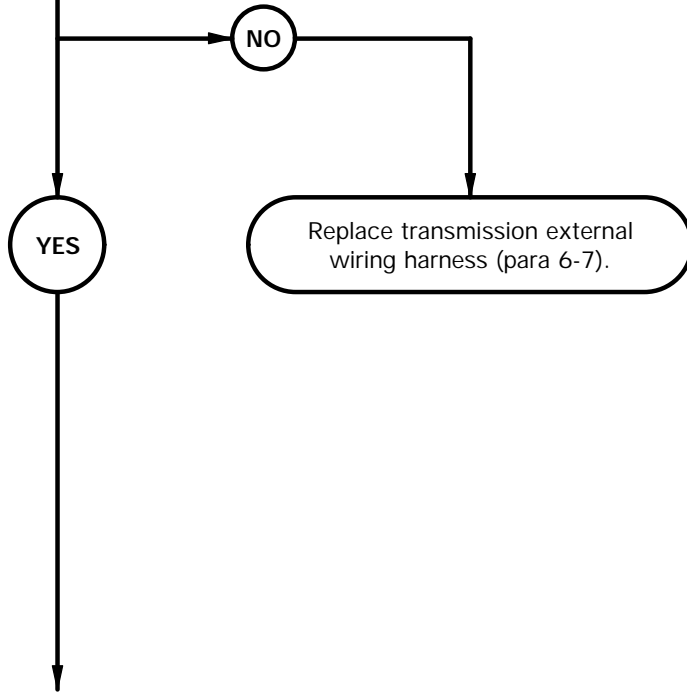
Y6c7601b

c76. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC III transmission ECU.

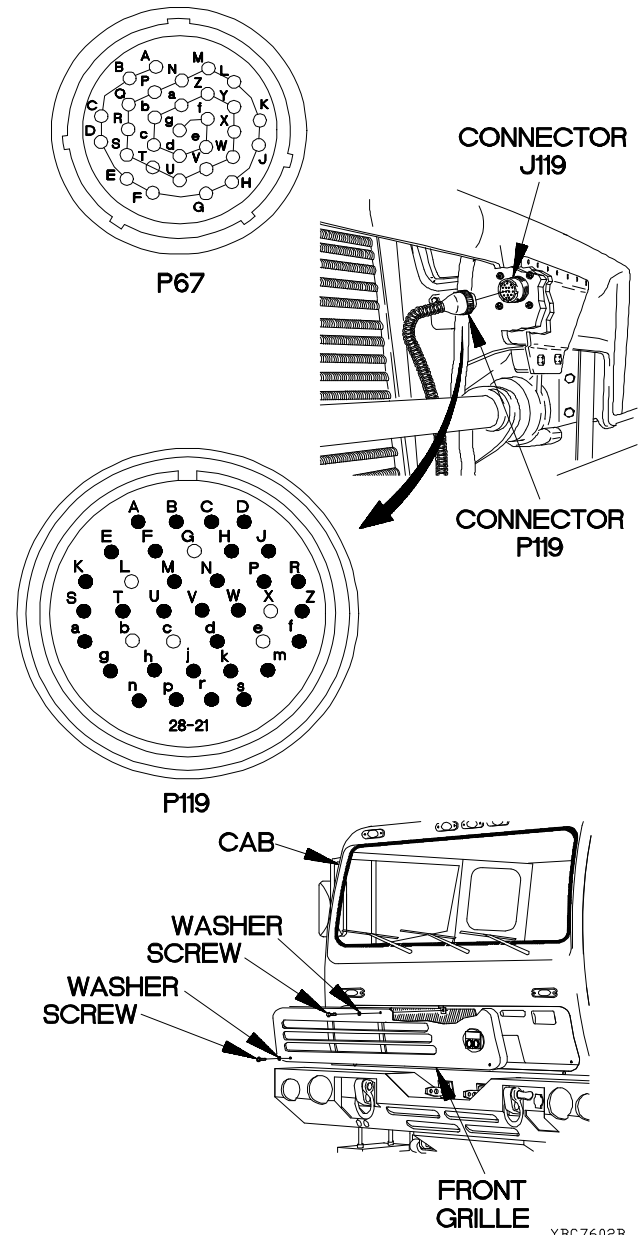
2.
Is continuity present from connector P119-A to connector P67-f?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-A.
- (3) Connect negative (-) probe of multimeter to connector P67-f and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-A.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



c76. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

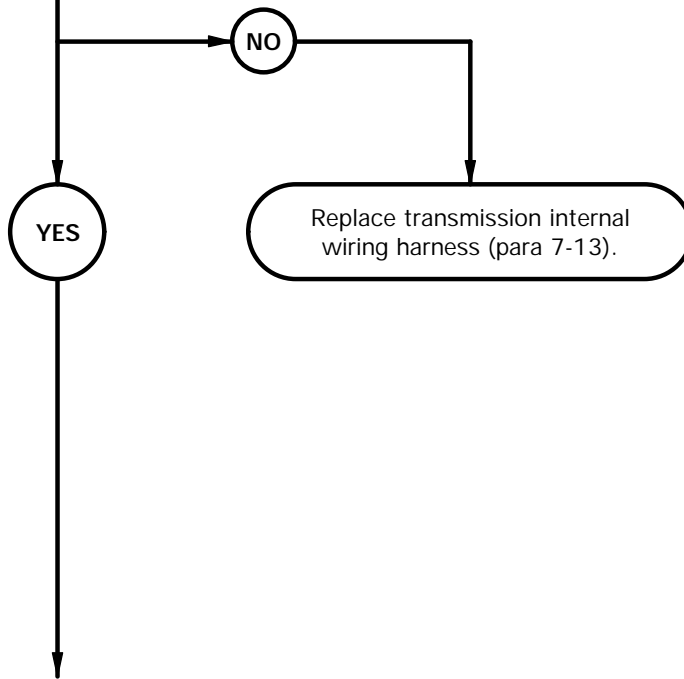
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC III transmission ECU.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin g to internal wiring harness connector N pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

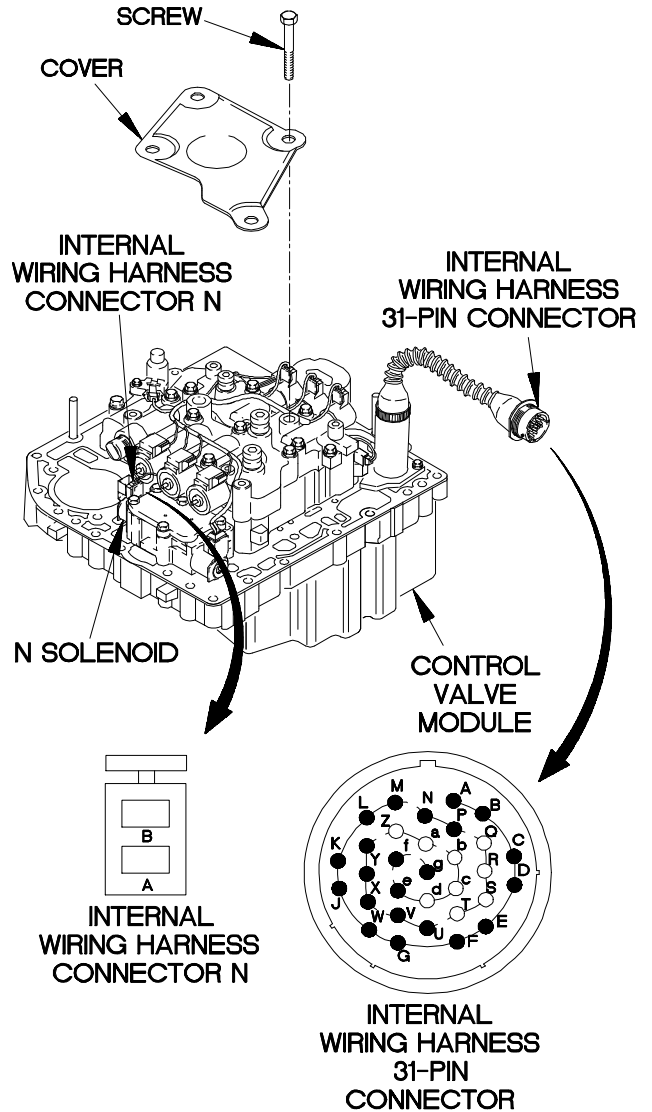


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect transmission internal wiring harness connector N from N solenoid.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin g.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector N pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin g.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



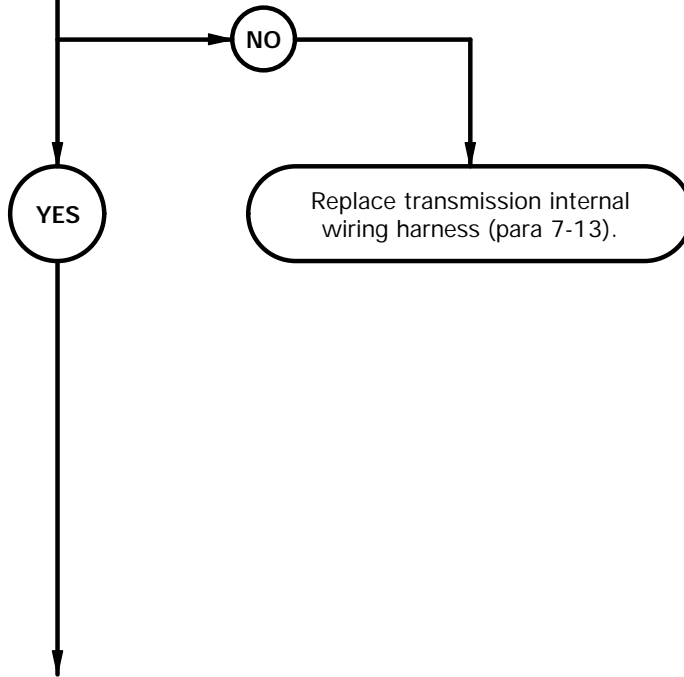
Ybc7603b

c76. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC III transmission ECU.

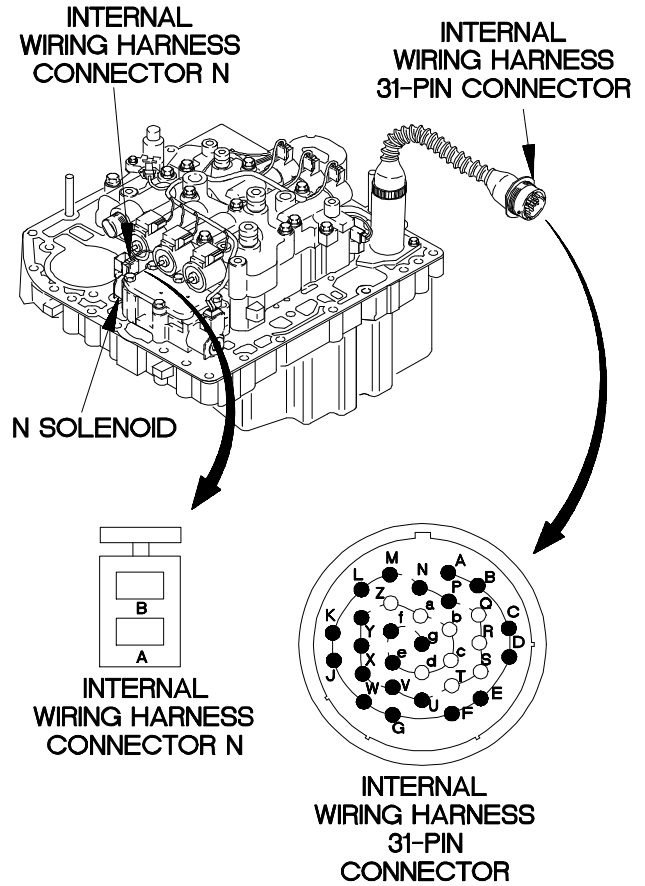
4.
Is continuity present from internal wiring harness 31-pin connector pin f to internal wiring harness connector N pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin f.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector N pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin f.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



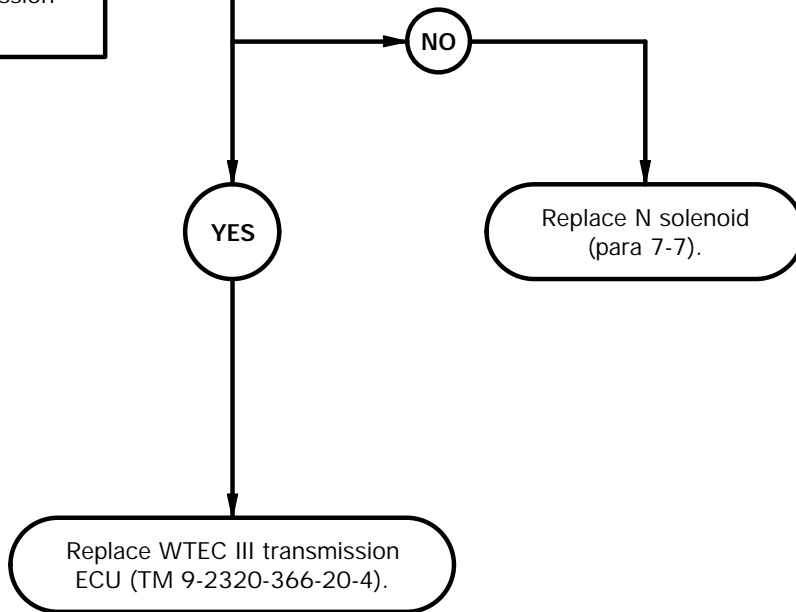
YBC7604B

c76. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty N solenoid. Faulty WTEC III transmission ECU.

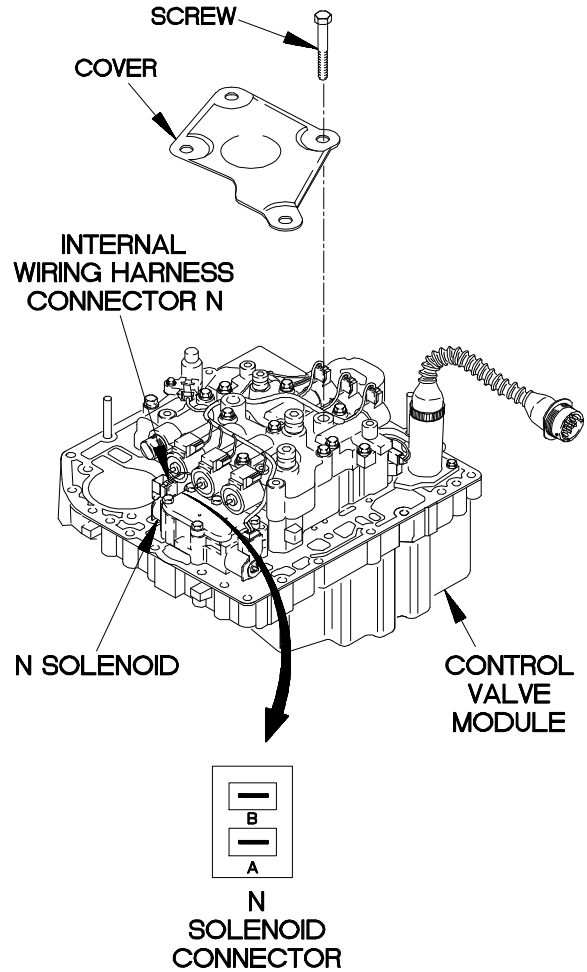
5.
Is 2.5-5.0 ohms resistance present from N solenoid pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, N solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC III transmission ECU is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of N solenoid.
- (3) Connect negative (-) probe of multimeter to pin B of N solenoid and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace N solenoid (para 7-7).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC III transmission ECU (TM 9-2320-366-20-4).
- (6) Connect internal wiring connector N to N solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-4).



YBC7605B

c77. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Materials/Parts

Wire, Elect, 50 ft (Item 97, Appendix C)

Tools and Special Tools

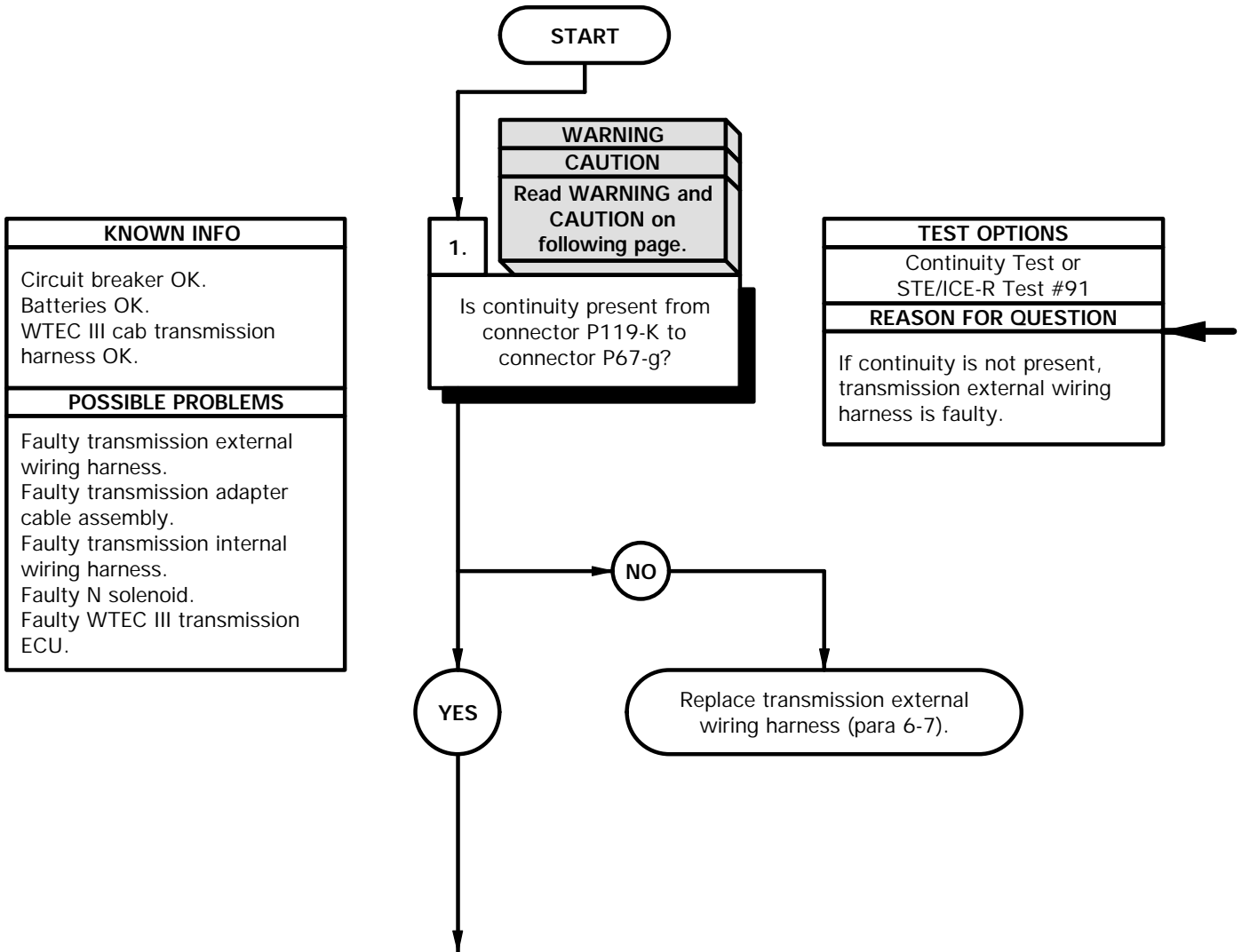
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Personnel Required

(2)

References

TM 9-4910-571-12&P



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

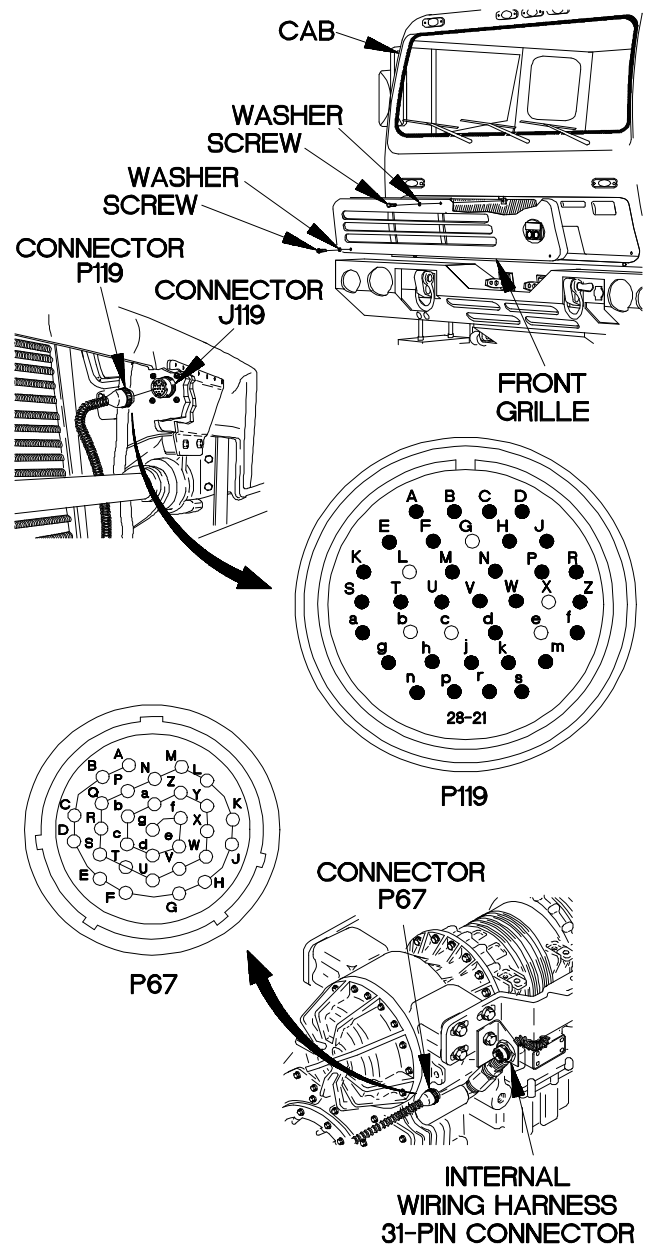
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect connector P67 from adapter cable 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-K.
- (8) Connect negative (-) probe of multimeter to connector P67-g and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-K.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

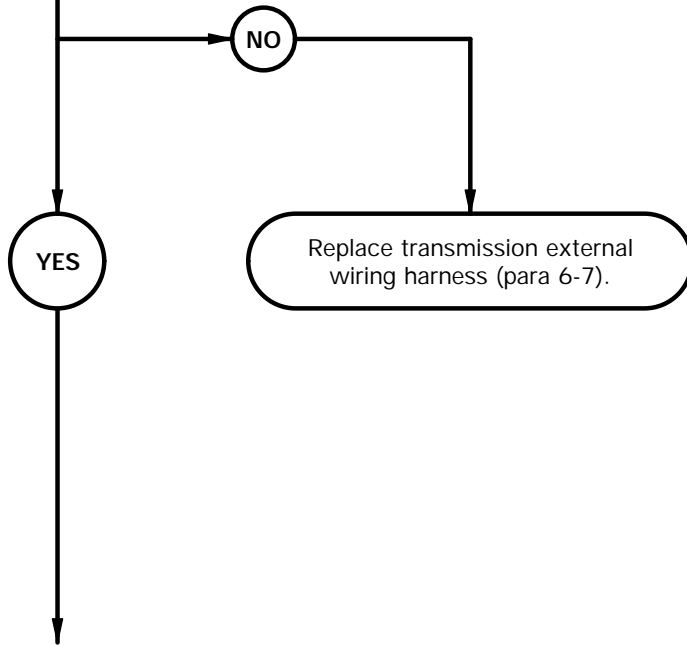
Y6c7701b

c77. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC III transmission ECU.

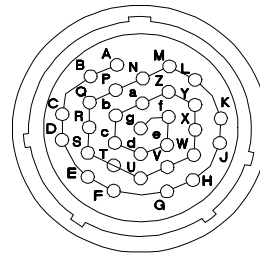
2.
Is continuity present from connector P119-A to connector P67-f?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

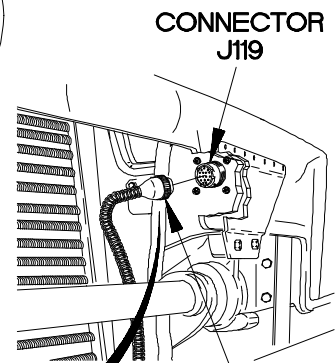


CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-A.
- (3) Connect negative (-) probe of multimeter to connector P67-f and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-A.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).

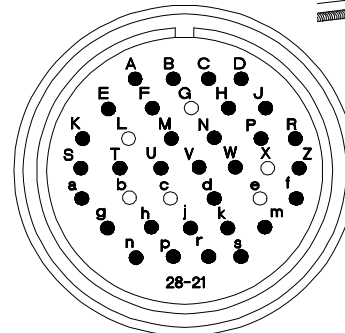


P67

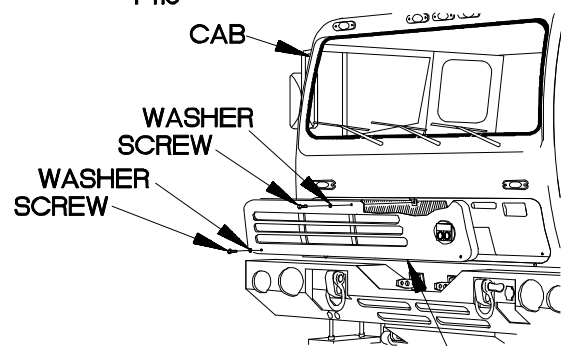


CONNECTOR J119

CONNECTOR P119



P119



FRONT GRILLE

YBC7702B

c77. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

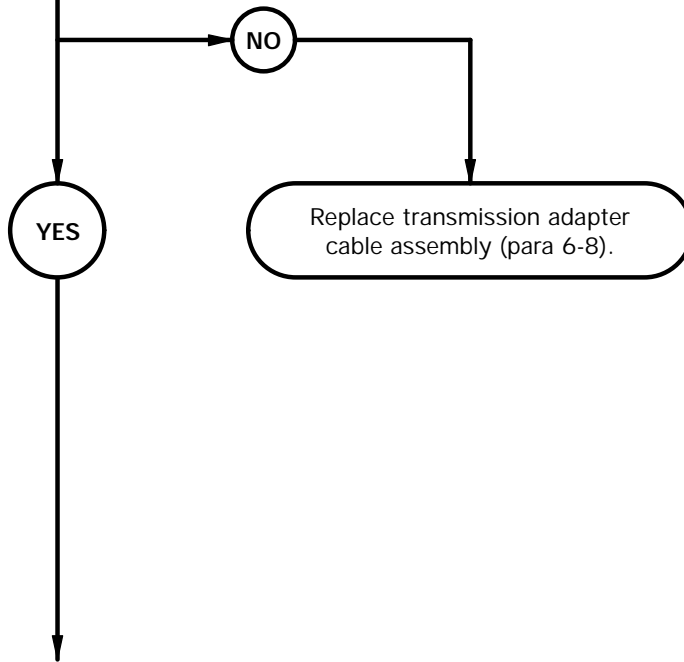
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC III transmission ECU.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin g to adapter cable 24-pin connector pin H3?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.

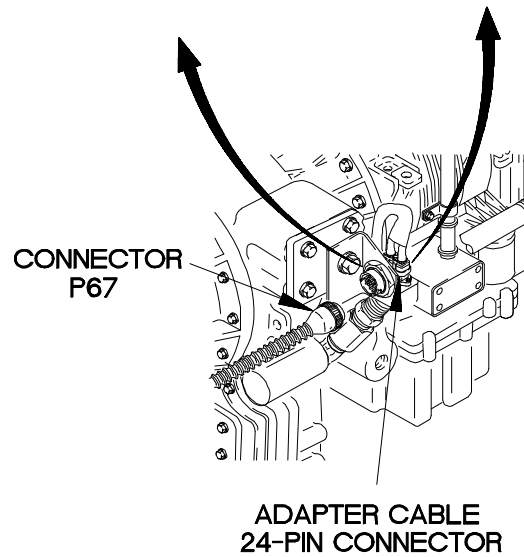
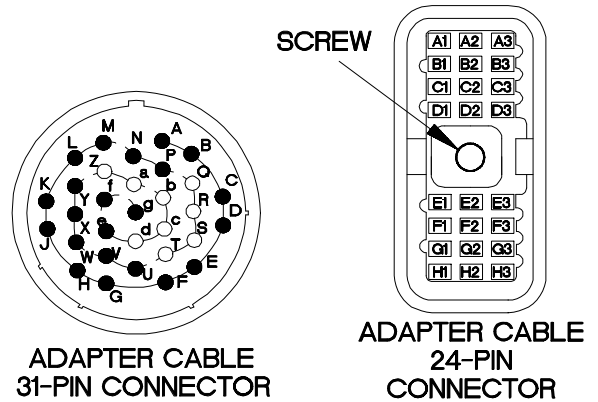


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Loosen screw in adapter cable 24-pin connector.
- (2) Disconnect adapter cable 24-pin connector from internal wiring harness 24-pin connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to adapter cable 24-pin connector pin g.
- (5) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin H3 and note reading on multimeter.
- (6) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (7) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin g.
- (8) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).



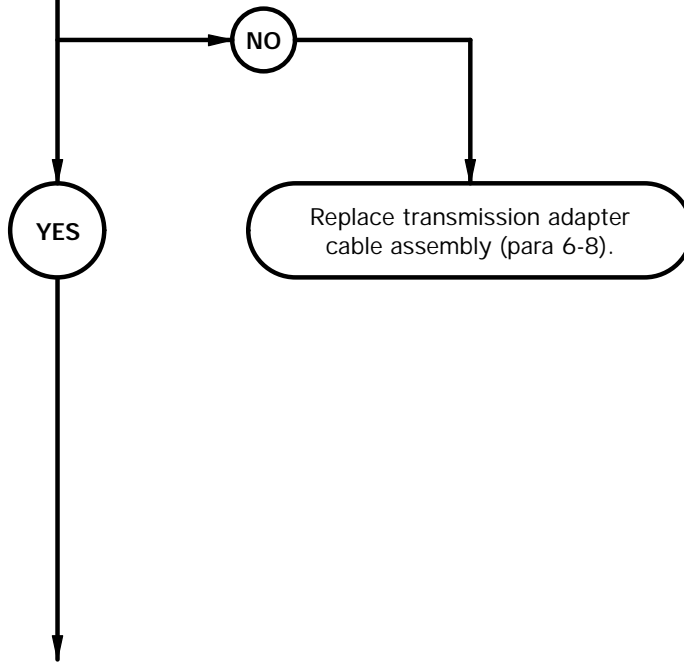
Ybc7703b

c77. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC III transmission ECU.

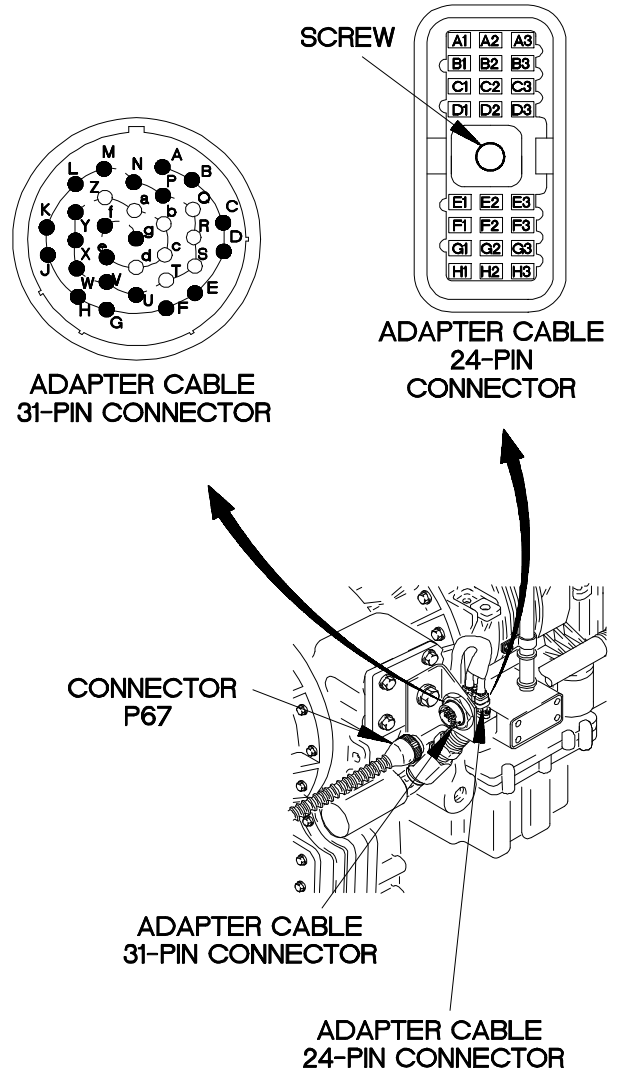
4.
Is continuity present from adapter cable 31-pin connector pin f to adapter cable 24-pin connector pin H2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin f.
- (3) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin H2 and note reading on multimeter.
- (4) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (5) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin f.
- (6) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).
- (9) Connect connector P67 to adapter cable 31-pin connector.



Ybc7704b

c77. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

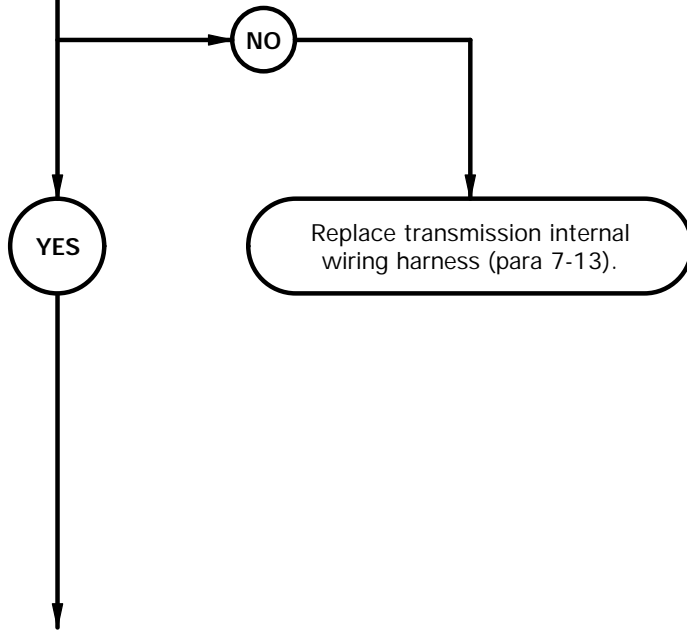
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC III transmission ECU.

5.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin H3 to internal wiring harness connector N pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

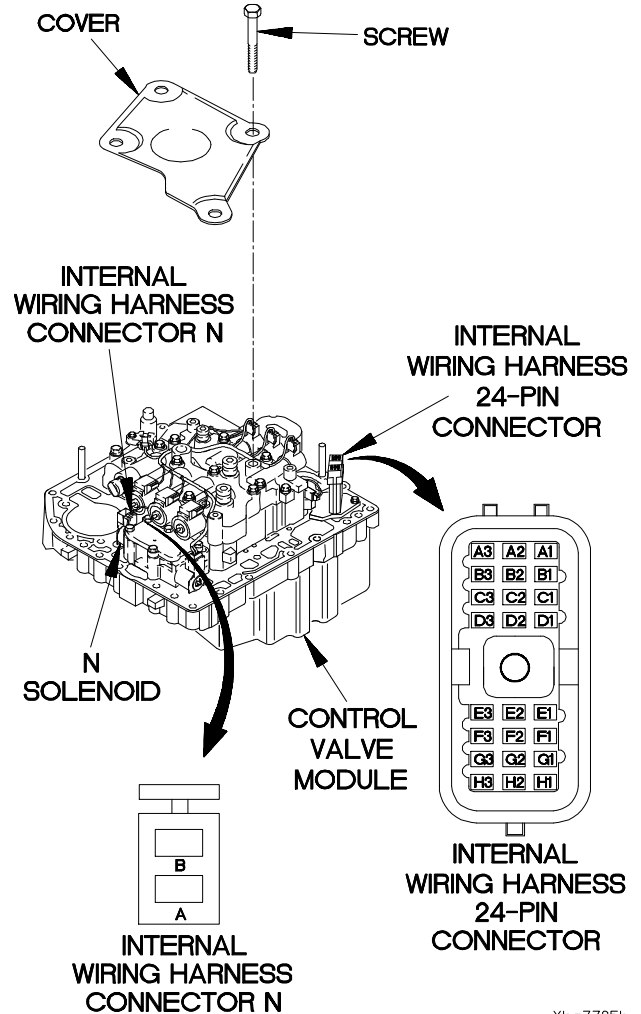


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector N from N solenoid.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin H3.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector N pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin H3.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



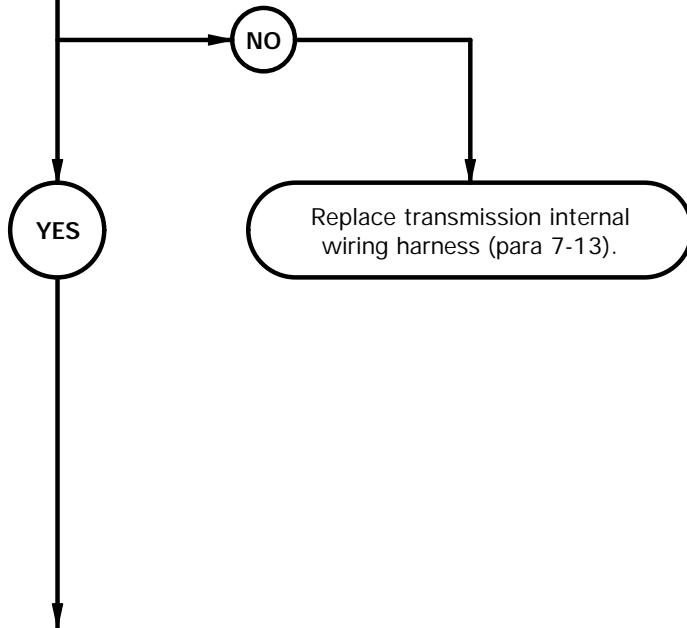
Y6c7705b

c77. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty N solenoid. Faulty WTEC III transmission ECU.

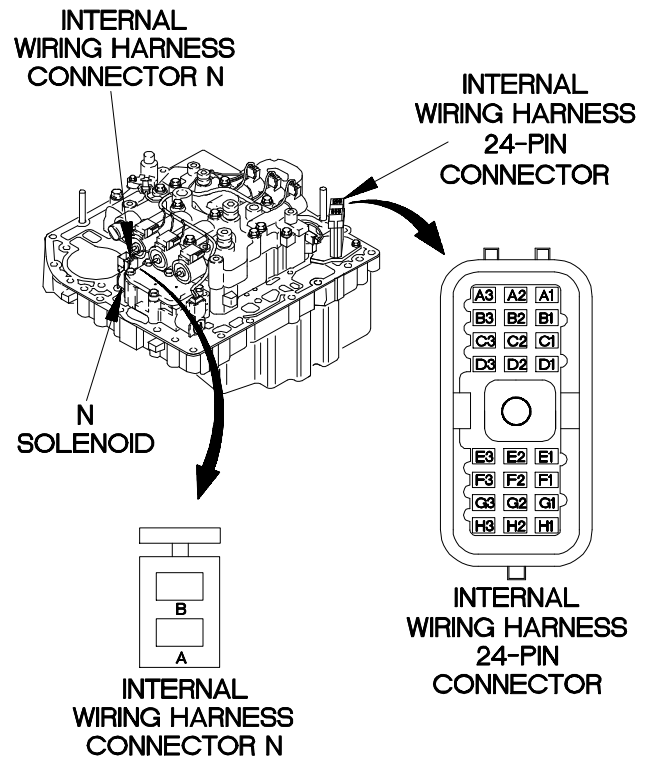
6.
Is continuity present from internal wiring harness 24-pin connector pin H2 to internal wiring harness connector N pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin H2.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector N pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin H2.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



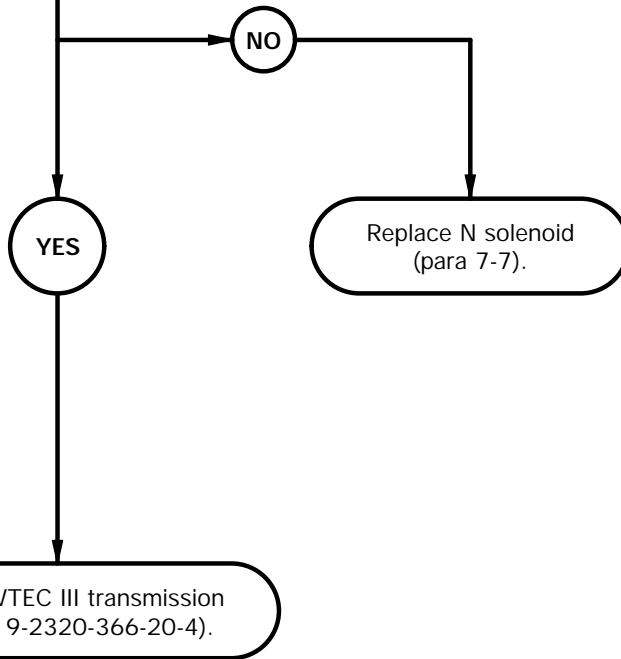
Ybc7706b

c77. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty N solenoid. Faulty WTEC III transmission ECU.

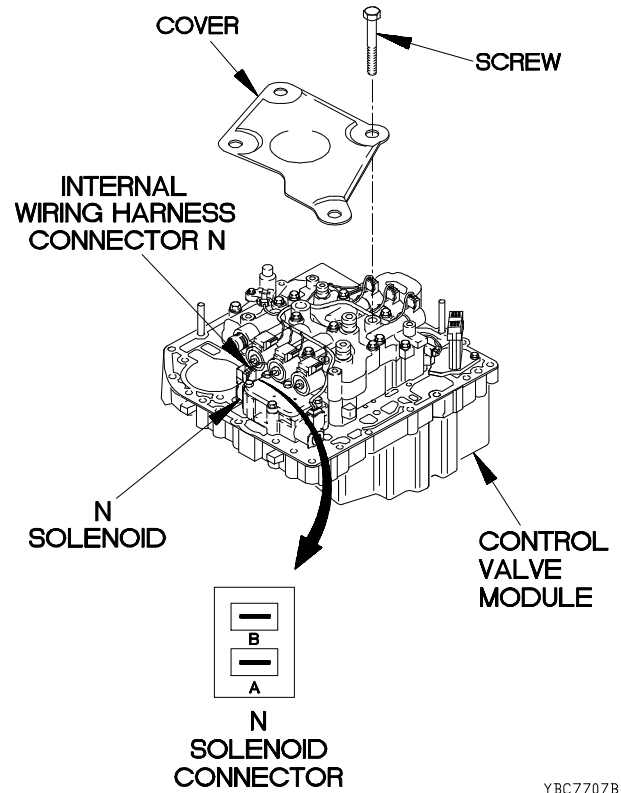
7.
Is 2.5-5.0 ohms resistance present from N solenoid pin A to pin B?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 2.5-5.0 ohms resistance is not present, N solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC III transmission ECU is faulty.



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin A of N solenoid connector.
- (3) Connect negative (-) probe of multimeter to pin B of N solenoid connector and note reading on multimeter.
- (4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace N solenoid (para 7-7).
- (5) If resistance is between 2.5-5.0 ohms, replace WTEC III transmission ECU (TM 9-2320-366-20-4).
- (6) Connect internal wiring harness connector N to N solenoid connector.
- (7) Install cover on control valve module with four screws.
- (8) Install control valve module (para 7-10).
- (9) Connect batteries (TM 9-2320-366-20-3).



YBC7707B

c78. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

Equipment Conditions

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Tools and Special Tools

Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts

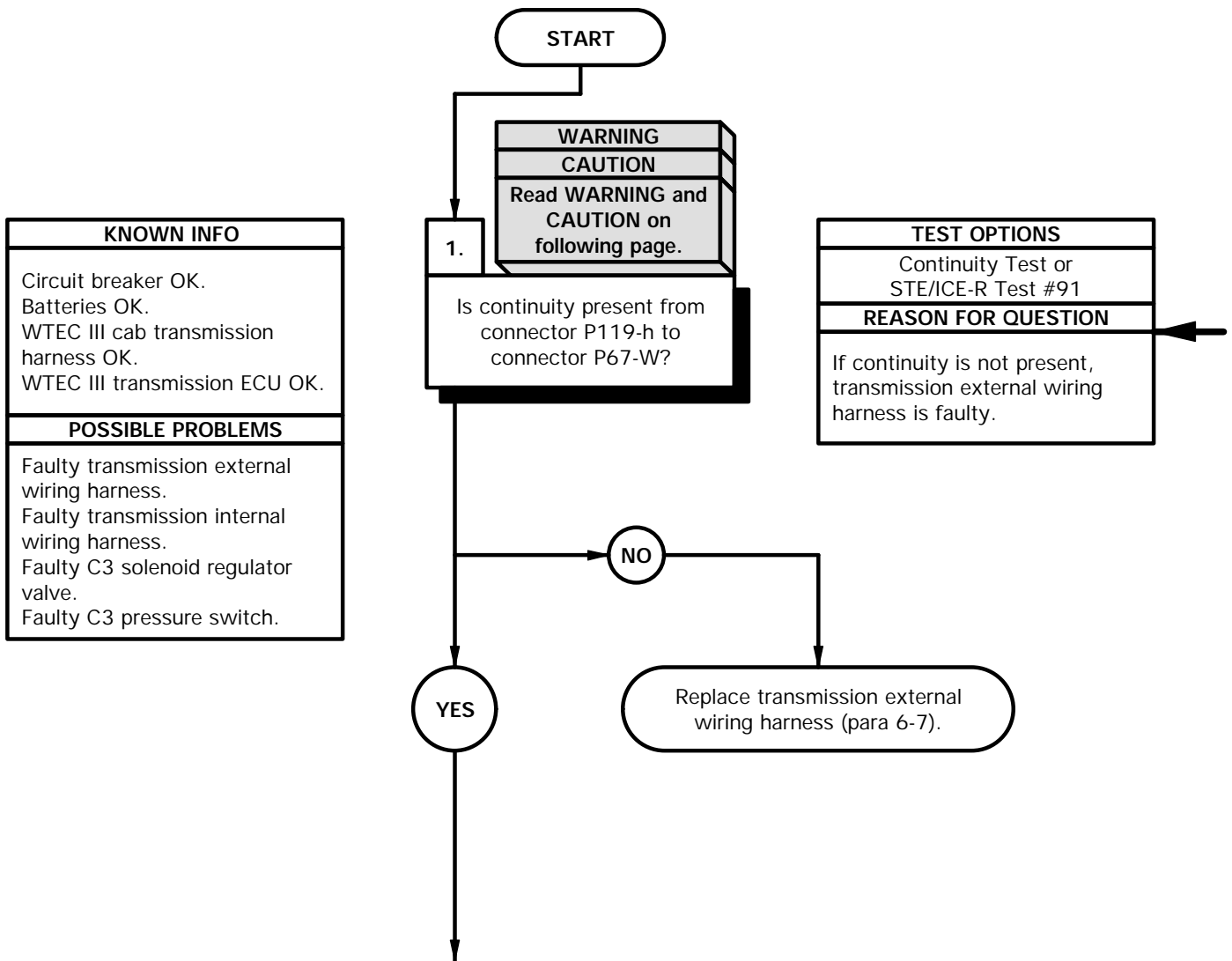
Wire, Elect, 50 ft (Item 97, Appendix C)
Adapter, Straight, Pipe to Tube (Item 2.1, Appendix C)
Adapter, Straight, Tube to Boss (Item 2.2, Appendix C)
Hose Assembly, Nonmetallic (Item 40.2, Appendix C)

References

TM 9-4910-571-12&P

Personnel Required

(2)



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

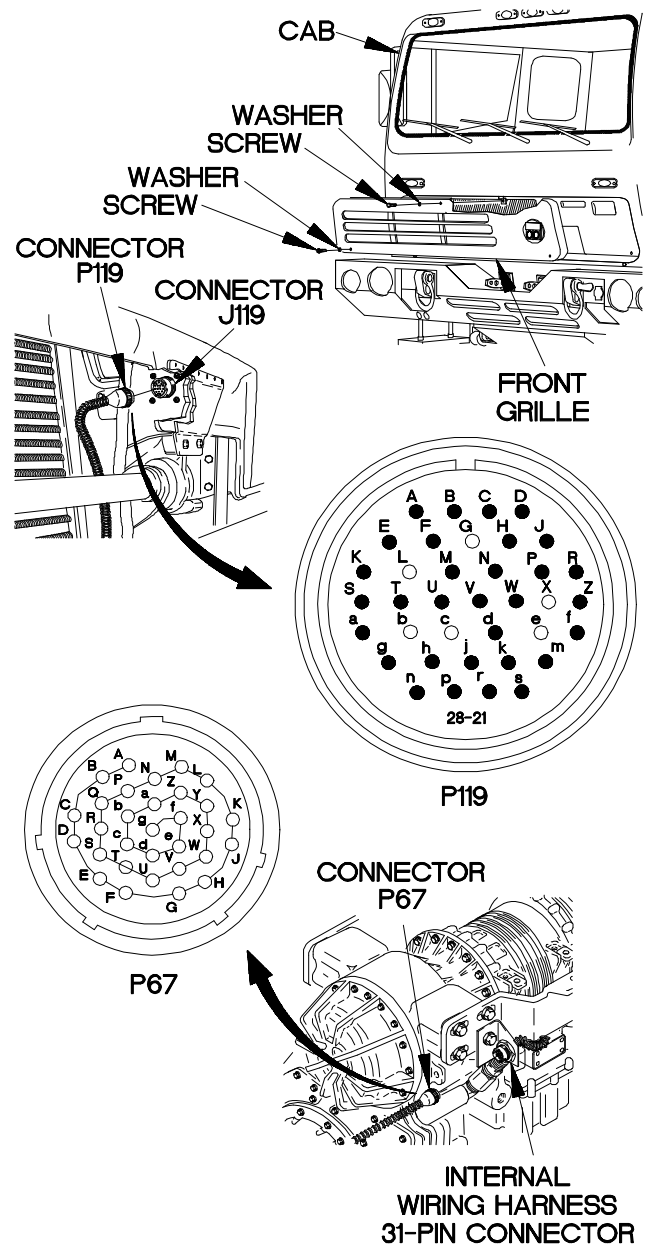
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect connector P67 from internal wiring harness 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-h.
- (8) Connect negative (-) probe of multimeter to connector P67-W and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-h.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



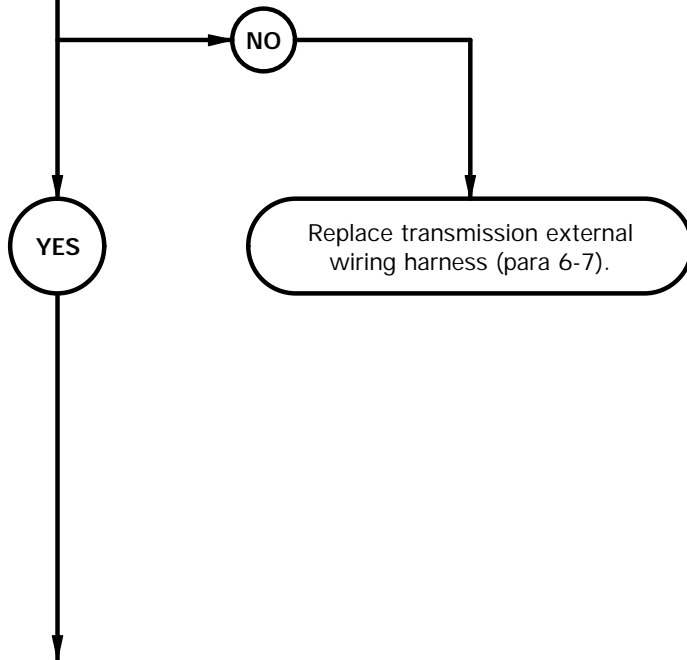
Y6c7801b

c78. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. WTEC III transmission ECU OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission internal wiring harness. Faulty C3 solenoid regulator valve. Faulty C3 pressure switch.

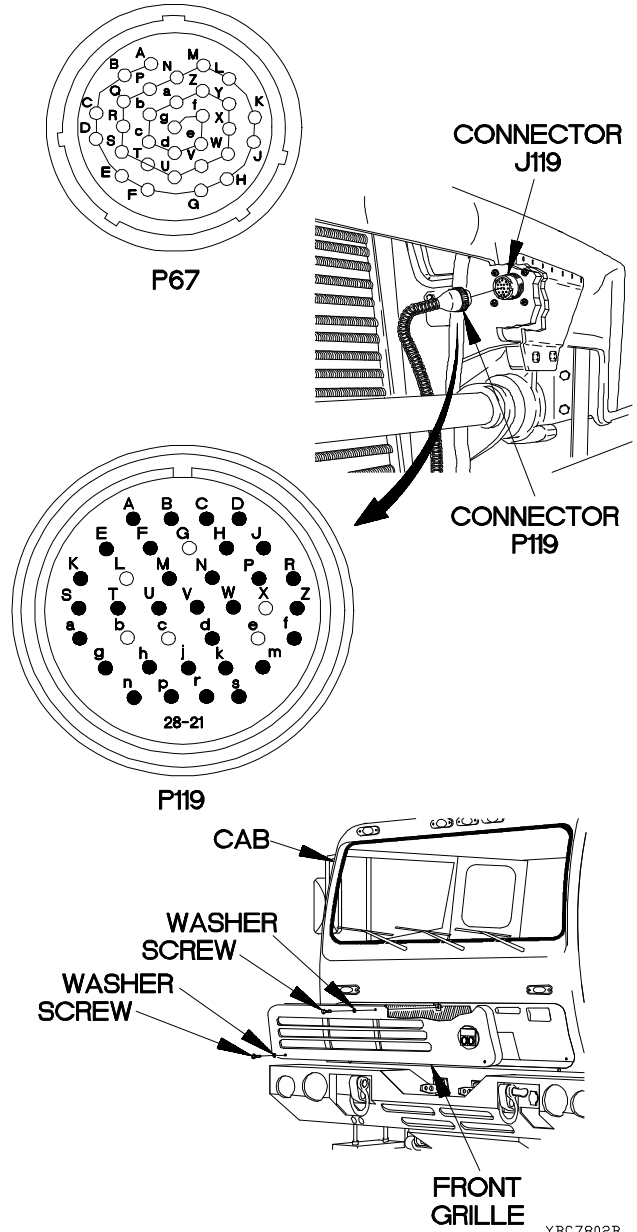
2.
Is continuity present from connector P119-j to connector P67-X?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-j.
- (3) Connect negative (-) probe of multimeter to connector P67-X and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-j.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).



c78. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

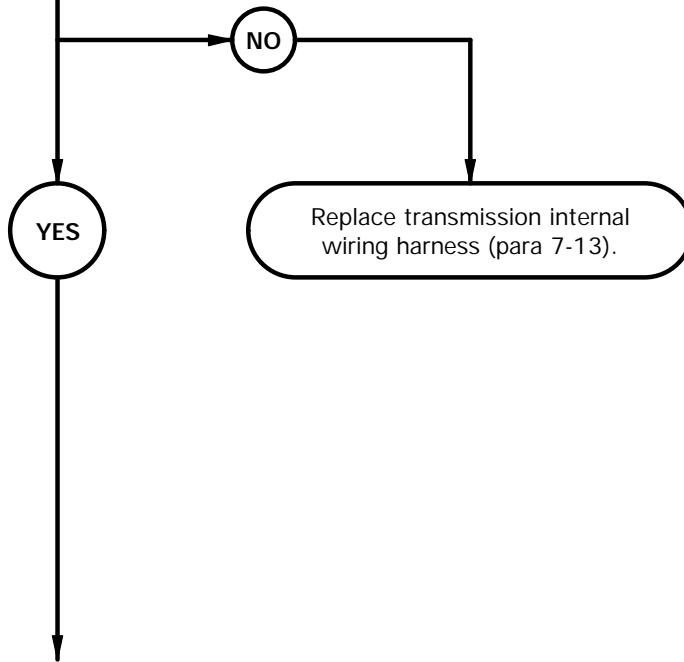
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. WTEC III transmission ECU OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty C3 solenoid regulator valve. Faulty C3 pressure switch.

3.

CAUTION
Read CAUTION on following page.

Is continuity present from internal wiring harness 31-pin connector pin W to internal wiring harness connector C3 pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

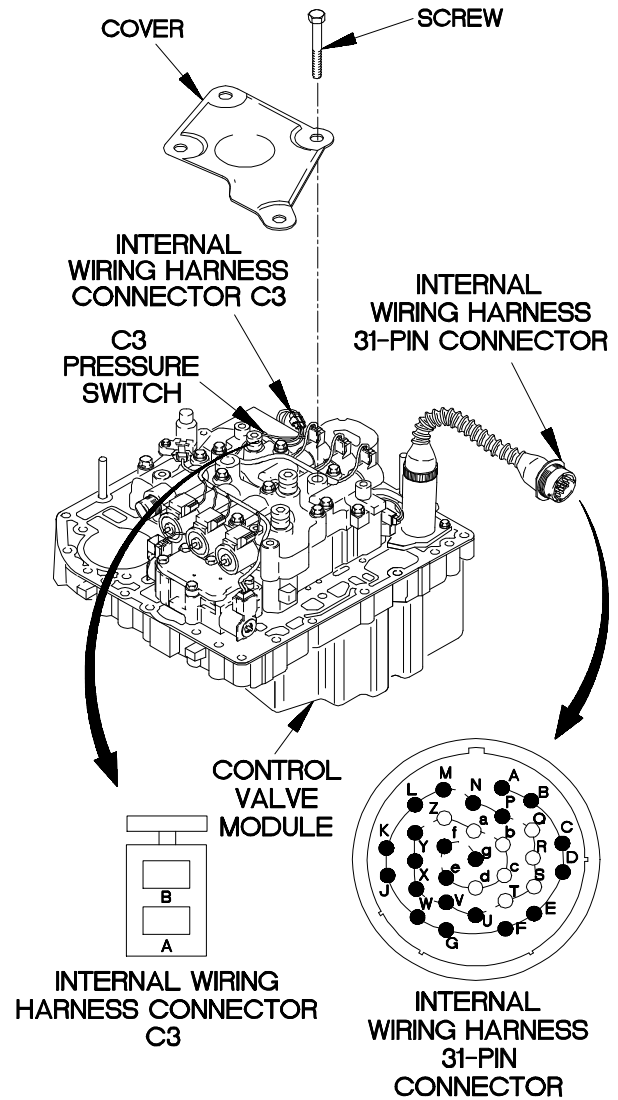


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector C3 from C3 pressure switch.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin W.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector C3 pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin W.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



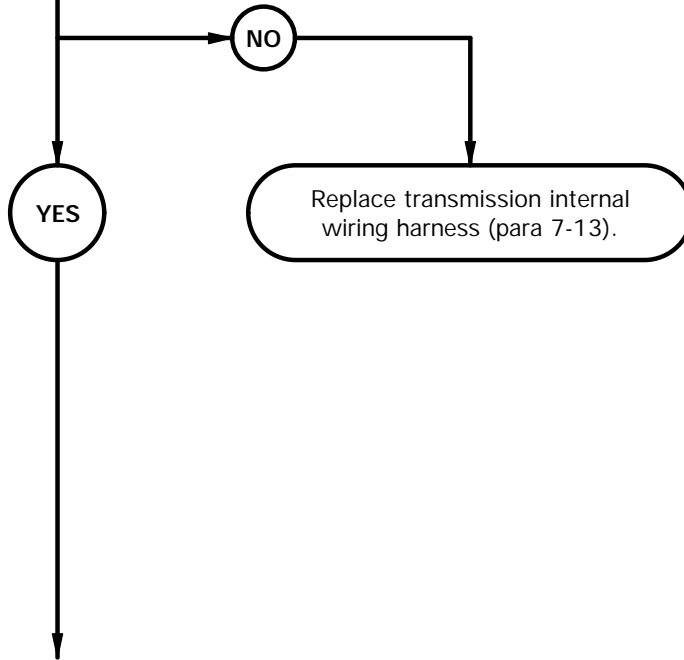
YBC7803B

c78. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. WTEC III transmission ECU OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty C3 solenoid regulator valve. Faulty C3 pressure switch.

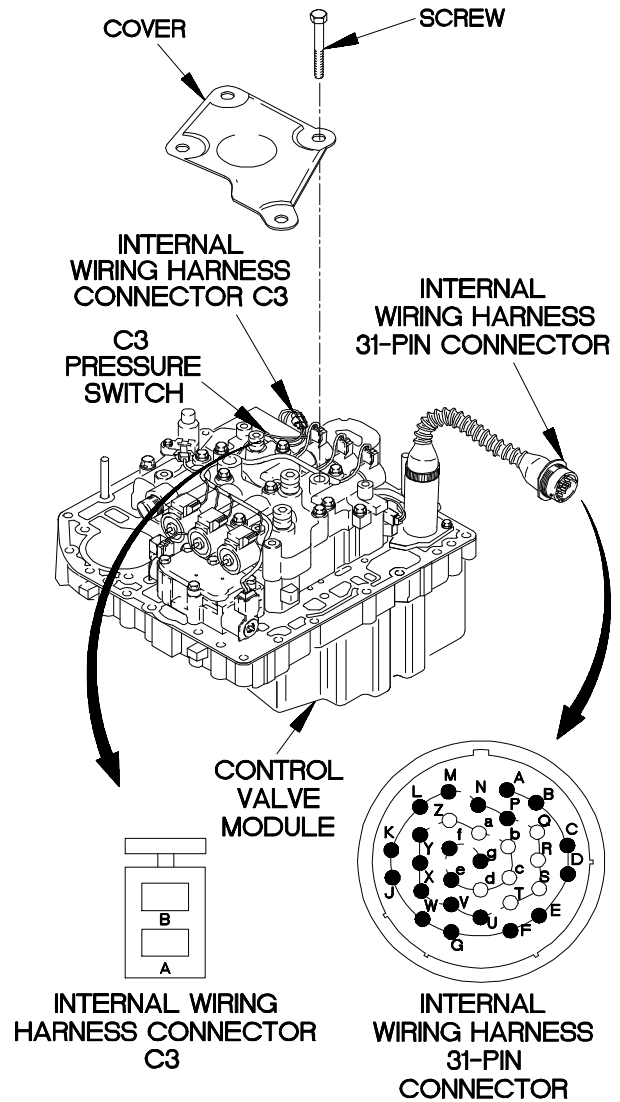
4.
Is continuity present from internal wiring harness 31-pin connector pin X to internal wiring harness connector C3 pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin X.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector C3 pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector pin X.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).
- (9) Connect internal wiring connector C3 to C3 pressure switch connector.
- (10) Install cover on control valve module with four screws.
- (11) Install control valve module (para 7-10).
- (12) Connect batteries (TM 9-2320-366-20-3).



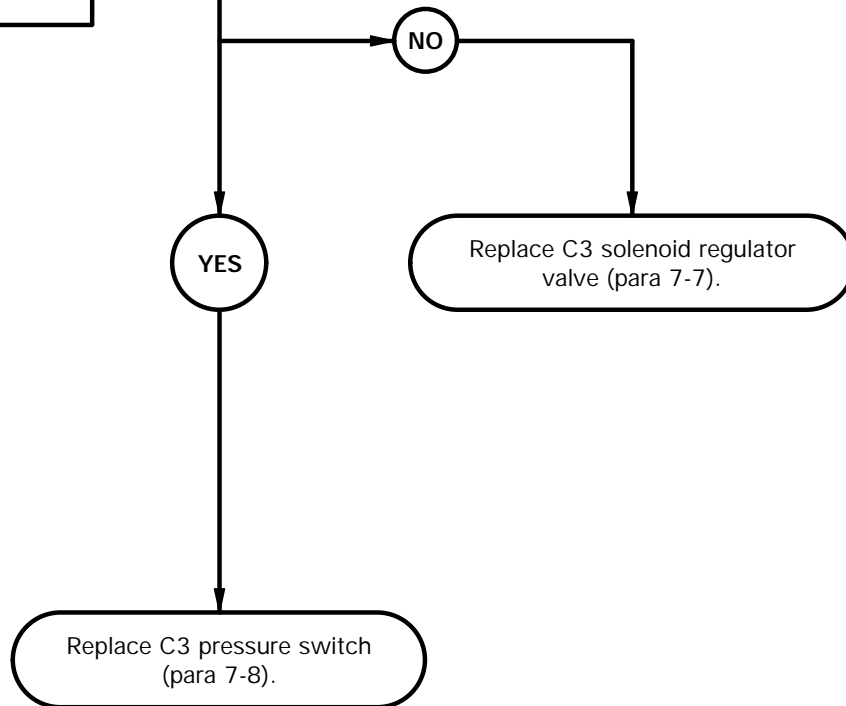
YBC7804B

c78. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. WTEC III transmission ECU OK. Transmission external wiring harness OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty C3 solenoid regulator valve. Faulty C3 pressure switch.

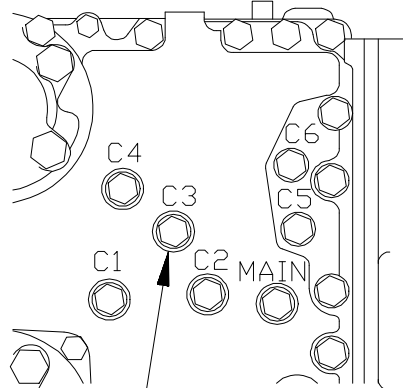
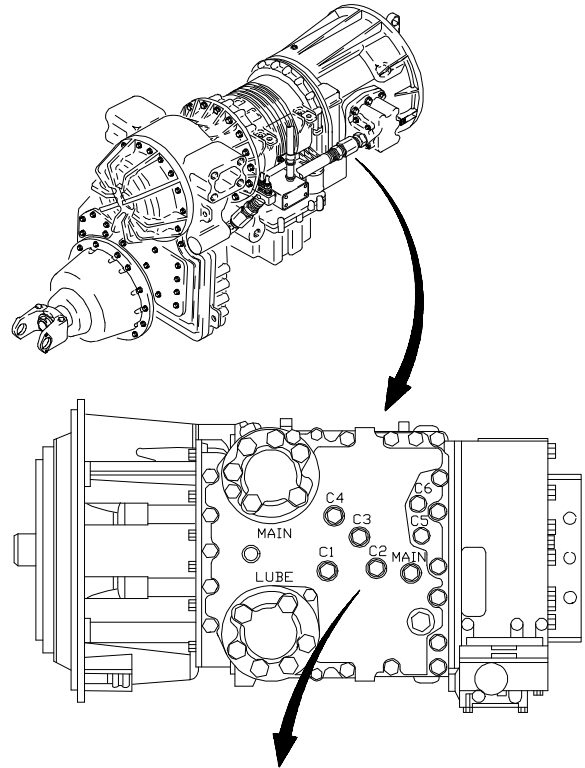
5.
Does C3 pressure switch open when shift is made?

TEST OPTIONS
Pressure Test or STE/ICE-R Test #50
REASON FOR QUESTION
If C3 pressure switch opens (STE/ICE-R displays greater than 0 psi), C3 solenoid regulator valve is faulty. If C3 pressure switch does not open (STE/ICE-R displays 0 psi), C3 pressure switch is faulty.



PRESSURE TEST

- (1) Remove front and intermediate propeller shafts (TM 9-2320-366-20-4).
- (2) Place drain pan under pressure tap.
- (3) Remove C3 pressure tap plug.
- (4) Connect tube to boss adapter, hose assembly, and pipe to tube adapter to C3 pressure tap.
- (5) Connect batteries (TM 9-2320-366-20-3).
- (6) Perform STE/ICE-R test #50 (TM 9-4910-571-12&P).
- (7) Start engine (TM 9-2320-366-10-1).
- (8) With parking brake applied, make shift indicated by sub code, refer to Table 2-4.4. C3 Pressure Switch, and note reading on STE/ICE-R.
- (9) If STE/ICE-R indicates greater than 0 psi (0 kPa), replace C3 solenoid regulator valve (para 7-7).
- (10) If STE/CE-R indicates 0 psi (0 kPa), replace C3 pressure switch (para 7-8).
- (11) Shut down engine (TM 9-2320-366-10-1).
- (12) Remove pipe to tube adapter, hose, and tube to boss adapter from C3 clutch pressure tap.
- (13) Install C3 pressure tap plug and remove drain pan.
- (14) Install front and intermediate propeller shafts (TM 9-2320-366-20-4).



C3 CLUTCH PRESSURE TAP

Table 2-8. C3 Pressure Switch

Sub Code	Shift From - To
01	1-2
08	2-N-2
32	4-3
34	4-5
54	6-5
56	6-7
71	R-1
72	R-2
78	R-N-1
79	R-2
99	N3-N2

YBC7805B

c79. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY)

INITIAL SETUP

Equipment Condition

Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Tools and Special Tools

Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Multimeter, Digital (Item 41, Appendix B)
Goggles, Industrial (Item 28, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts

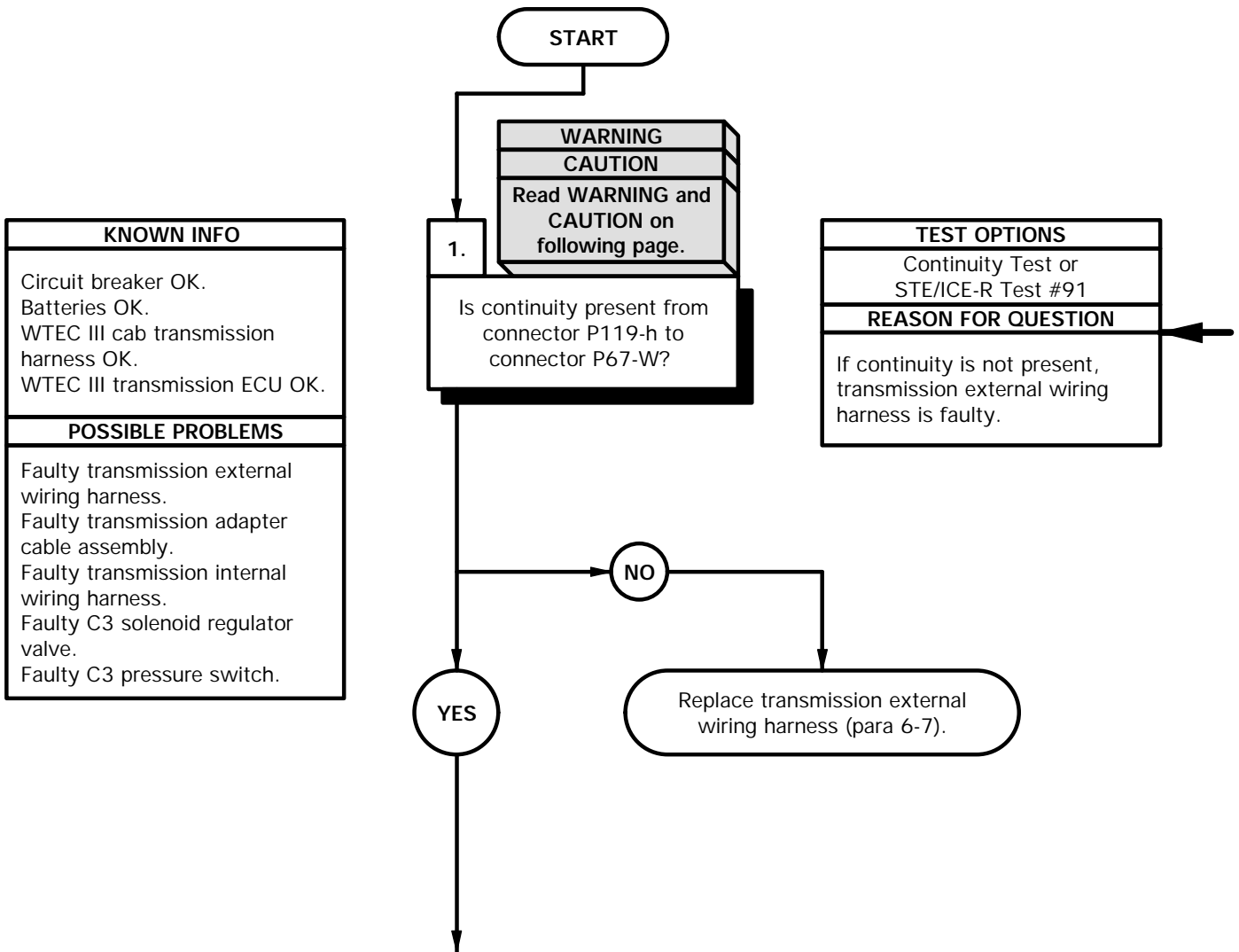
Wire, Elect, 50 ft (Item 97, Appendix C)
Adapter, Straight, Pipe to Tube (Item 2.1, Appendix C)
Adapter, Straight, Tube to Boss (Item 2.2, Appendix C)
Hose Assembly, Nonmetallic (Item 40.2, Appendix C)

References

TM 9-4910-571-12&P

Personnel Required

(2)



WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Ensure exhaust system is cool before performing troubleshooting. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

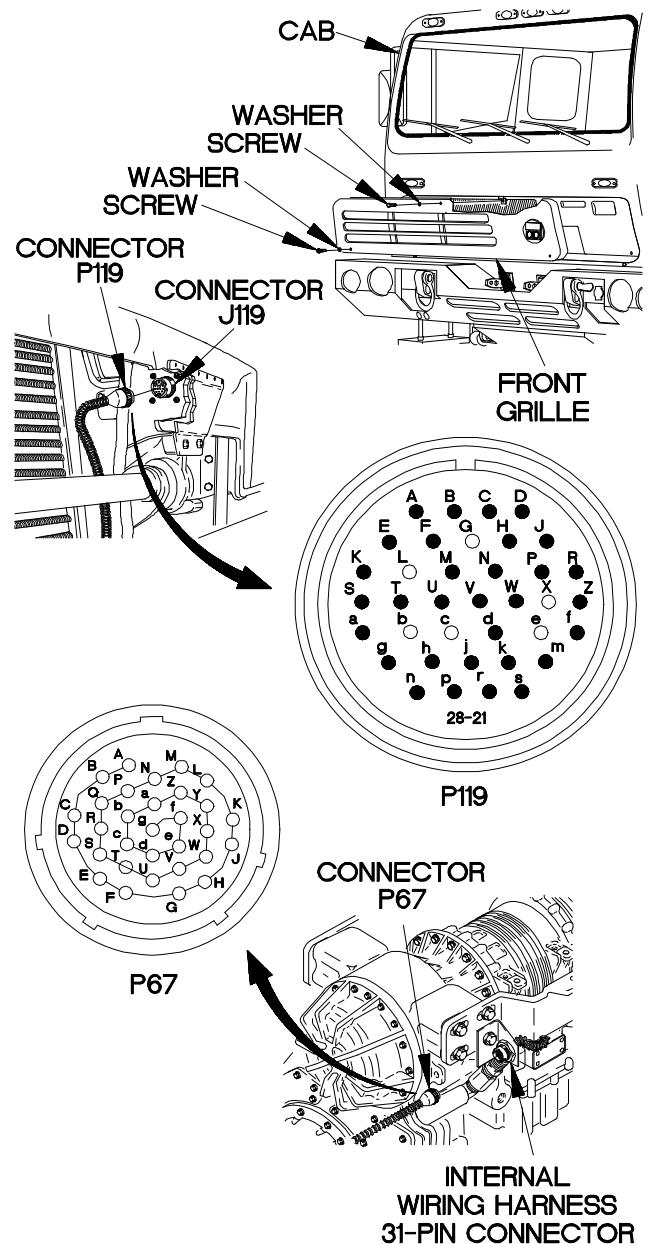
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Disconnect connector P67 from adapter cable 31-pin connector.
- (6) Set multimeter to ohms.
- (7) Connect positive (+) probe of multimeter to connector P119-h.
- (8) Connect negative (-) probe of multimeter to connector P67-W and note reading on multimeter.
- (9) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (10) Connect positive (+) probe of multimeter to connector P119-h.
- (11) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.

CONTINUITY TEST (Cont)

- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).



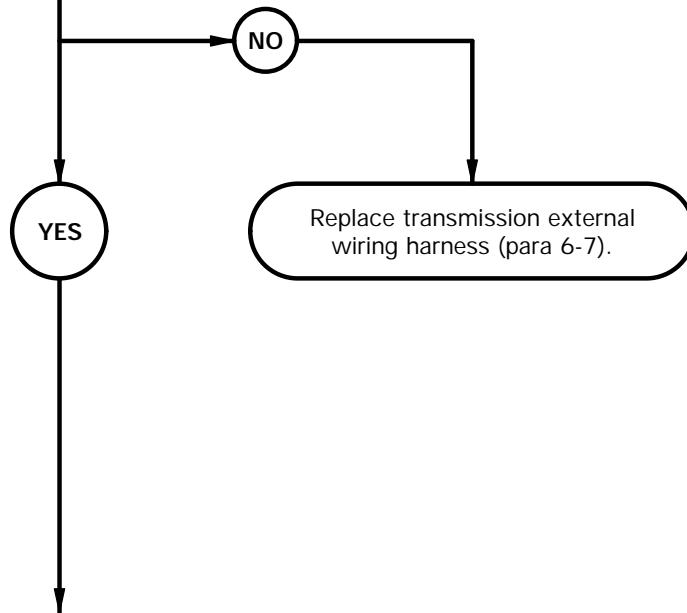
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c79. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. WTEC III transmission ECU OK.
POSSIBLE PROBLEMS
Faulty transmission external wiring harness. Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty C3 solenoid regulator valve. Faulty C3 pressure switch.

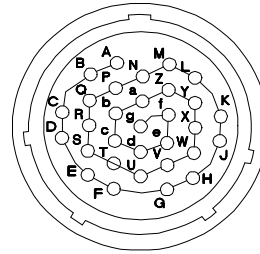
2.
Is continuity present from connector P119-j to connector P67-X?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission external wiring harness is faulty.

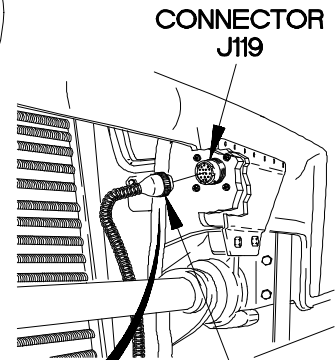


CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119-j.
- (3) Connect negative (-) probe of multimeter to connector P67-X and note reading on multimeter.
- (4) If continuity is not present, replace transmission external wiring harness (para 6-7).
- (5) Connect positive (+) probe of multimeter to connector P119-j.
- (6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (13) Tighten two screws to 24 lb-in. (3 N·m).

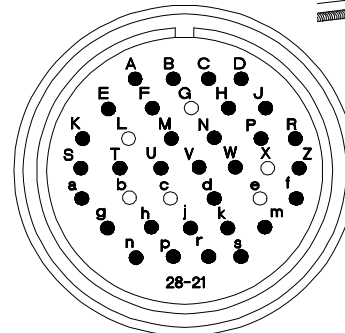


P67

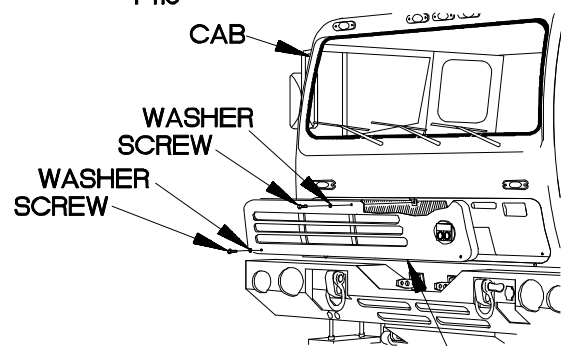


CONNECTOR J119

CONNECTOR P119



P119



FRONT GRILLE

YBC7902B

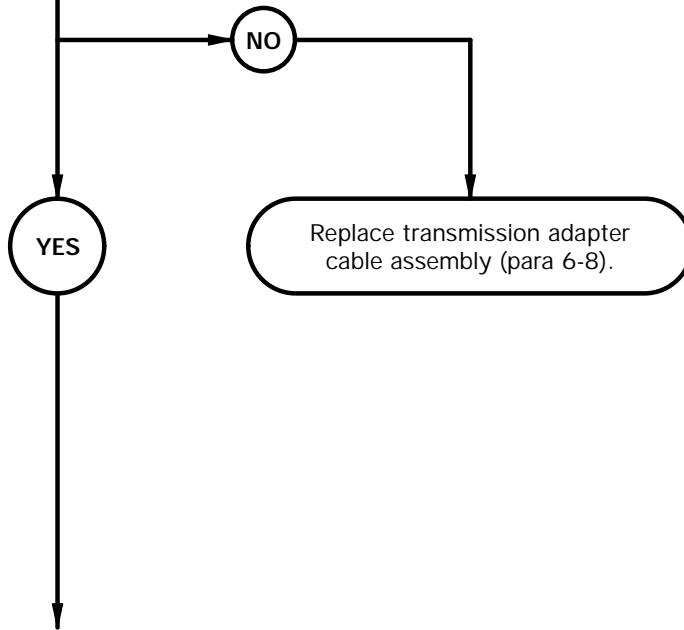
c79. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. WTEC III transmission ECU OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty C3 solenoid regulator valve. Faulty C3 pressure switch.

3. **CAUTION**
Read CAUTION on following page.

Is continuity present from adapter cable 31-pin connector pin W to adapter cable 24-pin connector pin F2?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.

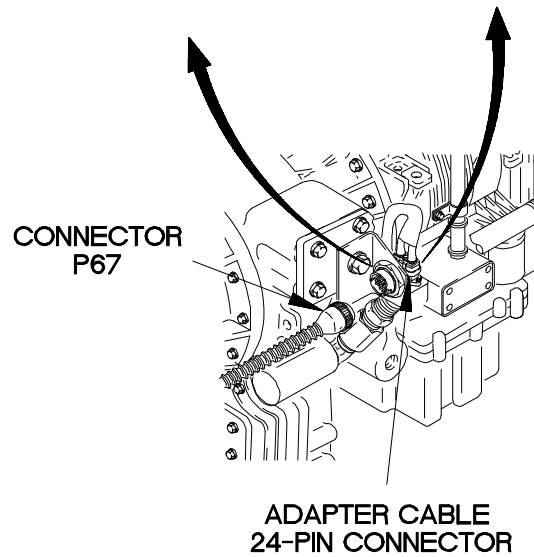
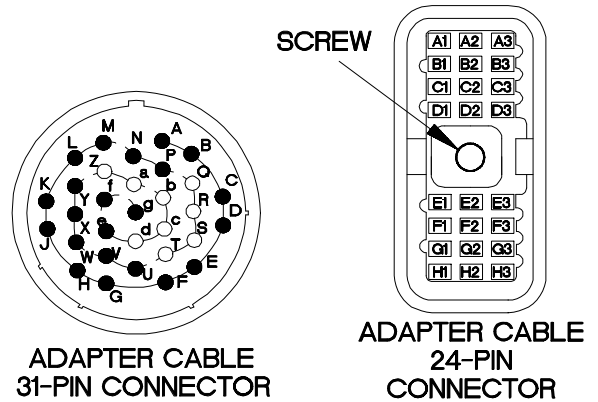


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Loosen screw in adapter cable 24-pin connector.
- (2) Disconnect adapter cable 24-pin connector from internal wiring harness 24-pin connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin W.
- (5) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin F2 and note reading on multimeter.
- (6) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (7) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin W.
- (8) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).



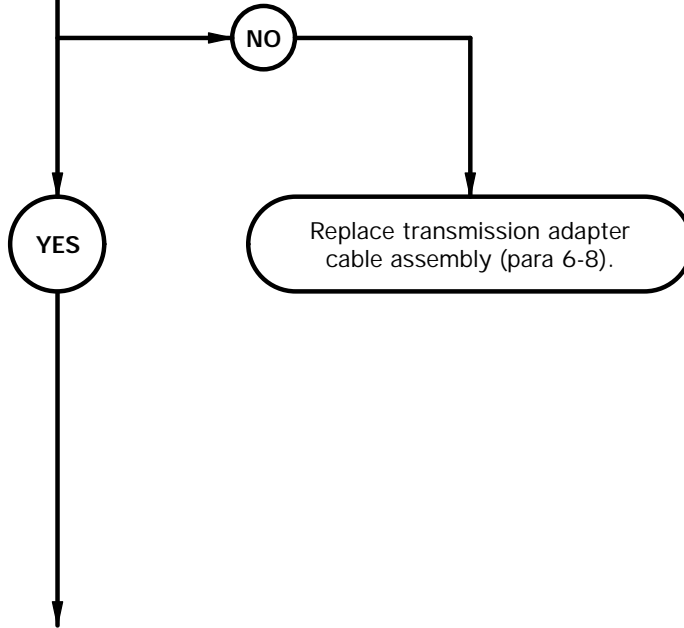
Ybc7903b

c79. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. WTEC III transmission ECU OK. Transmission external wiring harness OK.
POSSIBLE PROBLEMS
Faulty transmission adapter cable assembly. Faulty transmission internal wiring harness. Faulty C3 solenoid regulator valve. Faulty C3 pressure switch.

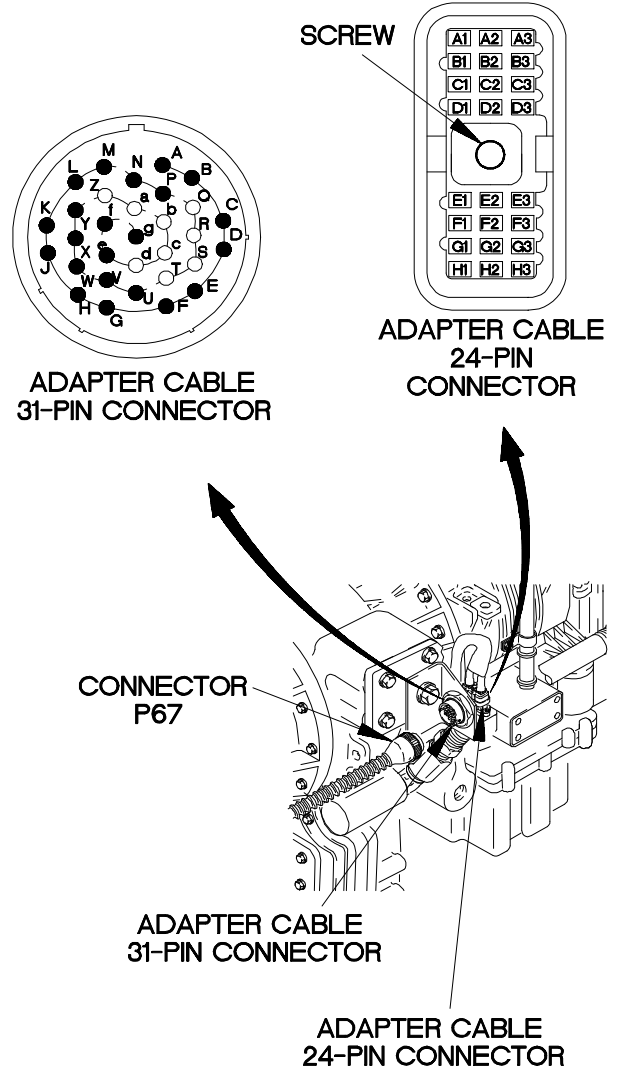
4.
Is continuity present from adapter cable 31-pin connector pin X to adapter cable 24-pin connector pin C3?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission adapter cable assembly is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin X.
- (3) Connect negative (-) probe of multimeter to adapter cable 24-pin connector pin C3 and note reading on multimeter.
- (4) If continuity is not present, replace transmission adapter cable assembly (para 6-8).
- (5) Connect positive (+) probe of multimeter to adapter cable 31-pin connector pin X.
- (6) Connect negative (-) probe of multimeter to all other pins in adapter cable 31-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission adapter cable assembly is shorted; replace transmission adapter cable assembly (para 6-8).
- (9) Connect connector P67 to adapter cable 31-pin connector.



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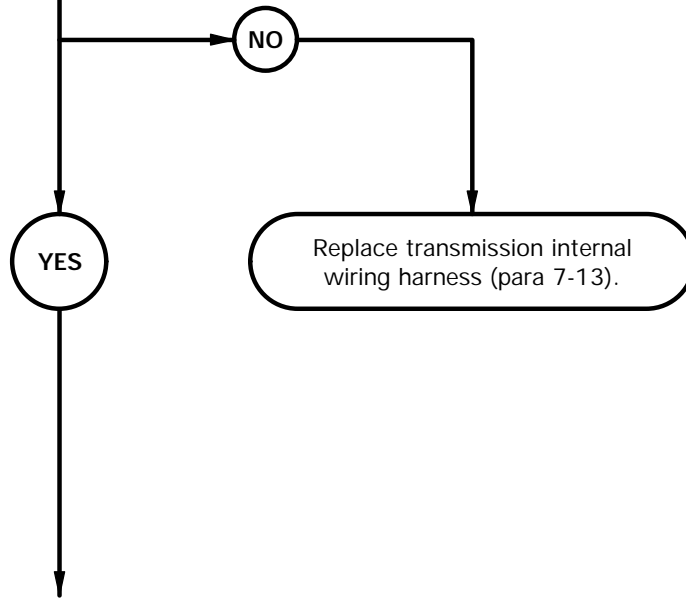
c79. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. WTEC III transmission ECU OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty C3 solenoid regulator valve. Faulty C3 pressure switch.

5. **CAUTION**
Read CAUTION on following page.

Is continuity present from internal wiring harness 24-pin connector pin F2 to internal wiring harness connector C3 pin A?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.

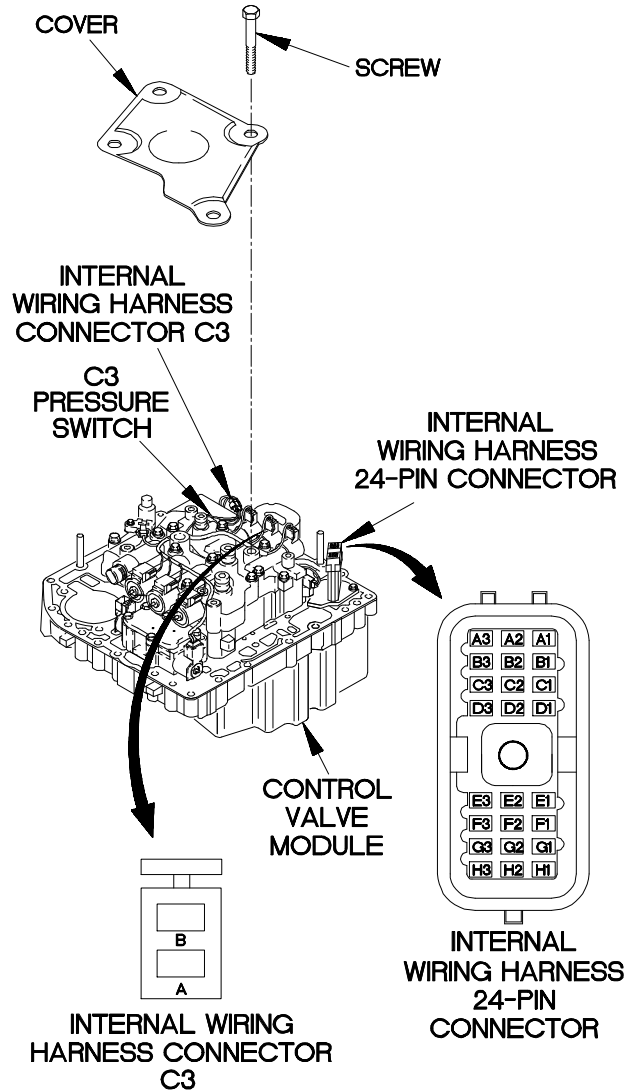


CAUTION

Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

CONTINUITY TEST

- (1) Remove control valve module (para 7-10).
- (2) Remove four screws and cover from control valve module.
- (3) Disconnect internal wiring harness connector C3 from C3 pressure switch.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin F2.
- (6) Connect negative (-) probe of multimeter to internal wiring harness connector C3 pin A and note reading on multimeter.
- (7) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (8) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin F2.
- (9) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



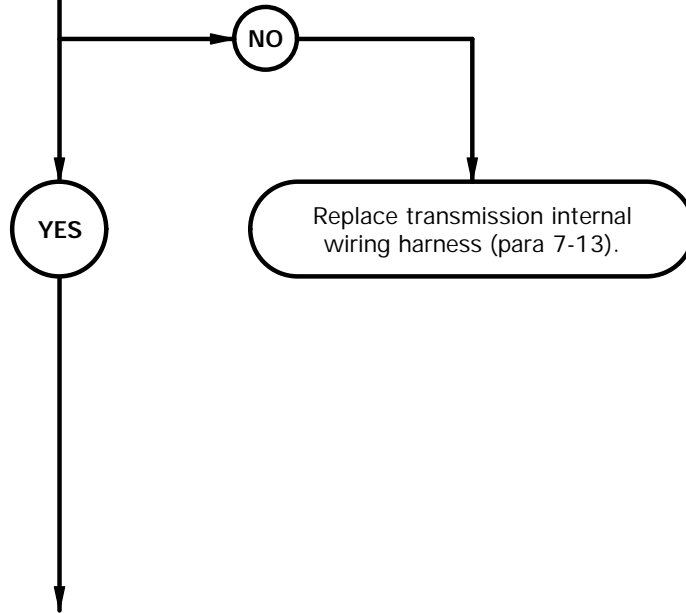
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c79. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. WTEC III transmission ECU OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK.
POSSIBLE PROBLEMS
Faulty transmission internal wiring harness. Faulty C3 solenoid regulator valve. Faulty C3 pressure switch.

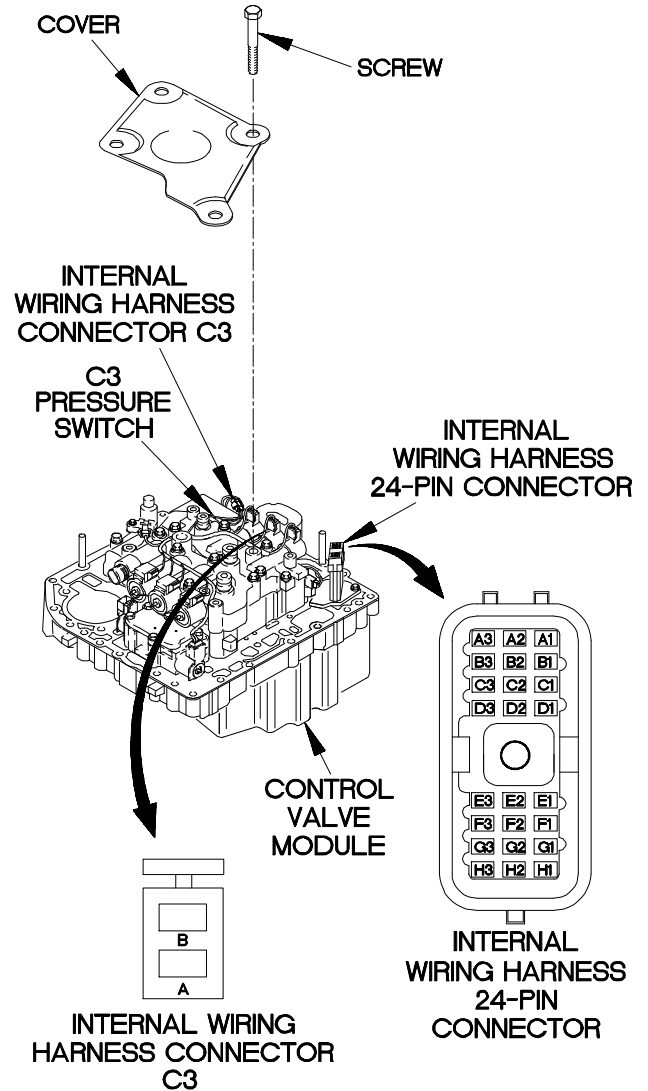
6.
Is continuity present from internal wiring harness 24-pin connector pin C3 to internal wiring harness connector C3 pin B?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, transmission internal wiring harness is faulty.



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin C3.
- (3) Connect negative (-) probe of multimeter to internal wiring harness connector C3 pin B and note reading on multimeter.
- (4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
- (5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin C3.
- (6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).
- (9) Connect internal wiring harness connector C3 to C3 pressure switch.
- (10) Install cover on control valve module with four screws.
- (11) Install control valve module (para 7-10).

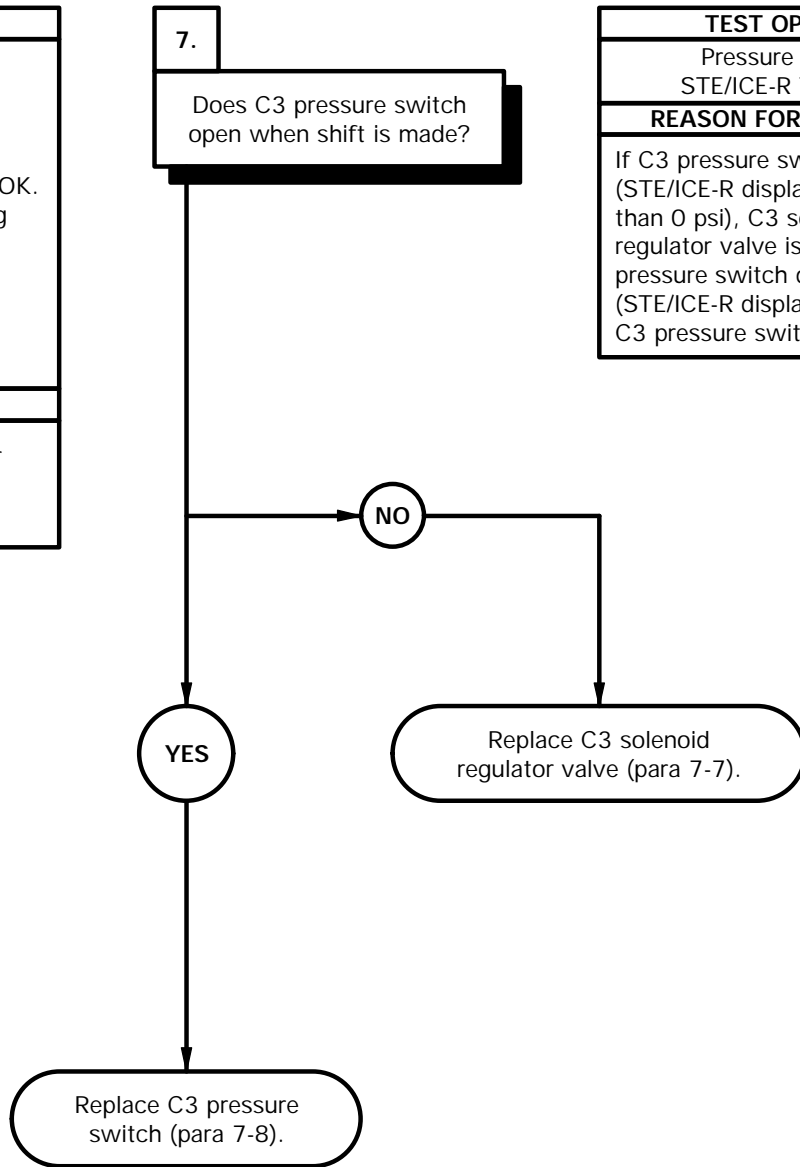


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c79. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

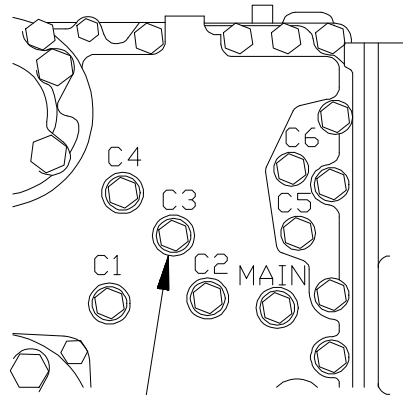
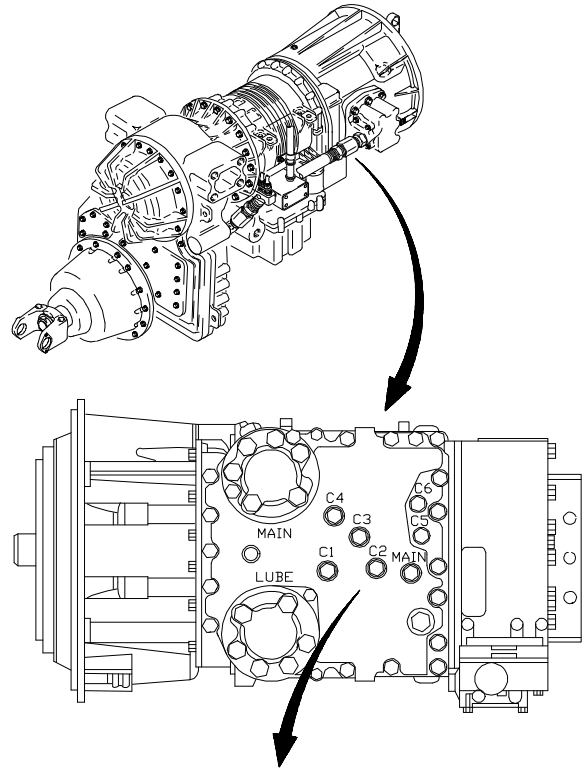
KNOWN INFO
Circuit breaker OK. Batteries OK. WTEC III cab transmission harness OK. WTEC III transmission ECU OK. Transmission external wiring harness OK. Transmission adapter cable assembly OK. Transmission internal wiring harness OK.
POSSIBLE PROBLEMS
Faulty C3 solenoid regulator valve. Faulty C3 pressure switch.

TEST OPTIONS
Pressure Test or STE/ICE-R Test #50
REASON FOR QUESTION
If C3 pressure switch opens (STE/ICE-R displays greater than 0 psi), C3 solenoid regulator valve is faulty. If C3 pressure switch does not open (STE/ICE-R displays 0 psi), C3 pressure switch is faulty.



PRESSURE TEST

- (1) Remove front and intermediate propeller shafts (TM 9-2320-366-20-4).
- (2) Place drain pan under pressure tap.
- (3) Remove C3 pressure tap plug.
- (4) Connect tube to boss adapter, hose, and pipe to tube adapter to C3 pressure tap.
- (5) Connect batteries (TM 9-2320-366-20-3).
- (6) Perform STE/ICE-R test #50 (TM 9-4910-571-12&P).
- (7) Start engine (TM 9-2320-366-10-1).
- (8) With parking brake applied, make shift indicated by sub code, refer to Table 2-4.5. C3 Pressure Switch, and note reading on STE/ICE-R.
- (9) If STE/ICE-R indicates greater than 0 psi (0 kPa), replace C3 solenoid regulator valve (para 7-7).
- (10) If STE/CE-R indicates 0 psi (0 kPa), replace C3 pressure switch (para 7-8).
- (11) Shut down engine (TM 9-2320-366-10-1).
- (12) Remove pipe to tube adapter, hose, and tube to boss adapter from C3 pressure tap.
- (13) Install C3 pressure tap plug and remove drain pan.
- (14) Install front and intermediate propeller shafts (TM 9-2320-366-20-4).



**C3 CLUTCH
PRESSURE TAP**

Table 2-9. C3 Pressure Switch

Sub Code	Shift From - To
01	1-2
08	2-N-2
32	4-3
34	4-5
54	6-5
56	6-7
71	R-1
72	R-2
78	R-N-1
79	R-2
99	N3-N2

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c80. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 55 AND ANY SUB CODE

INITIAL SETUP

Equipment Conditions

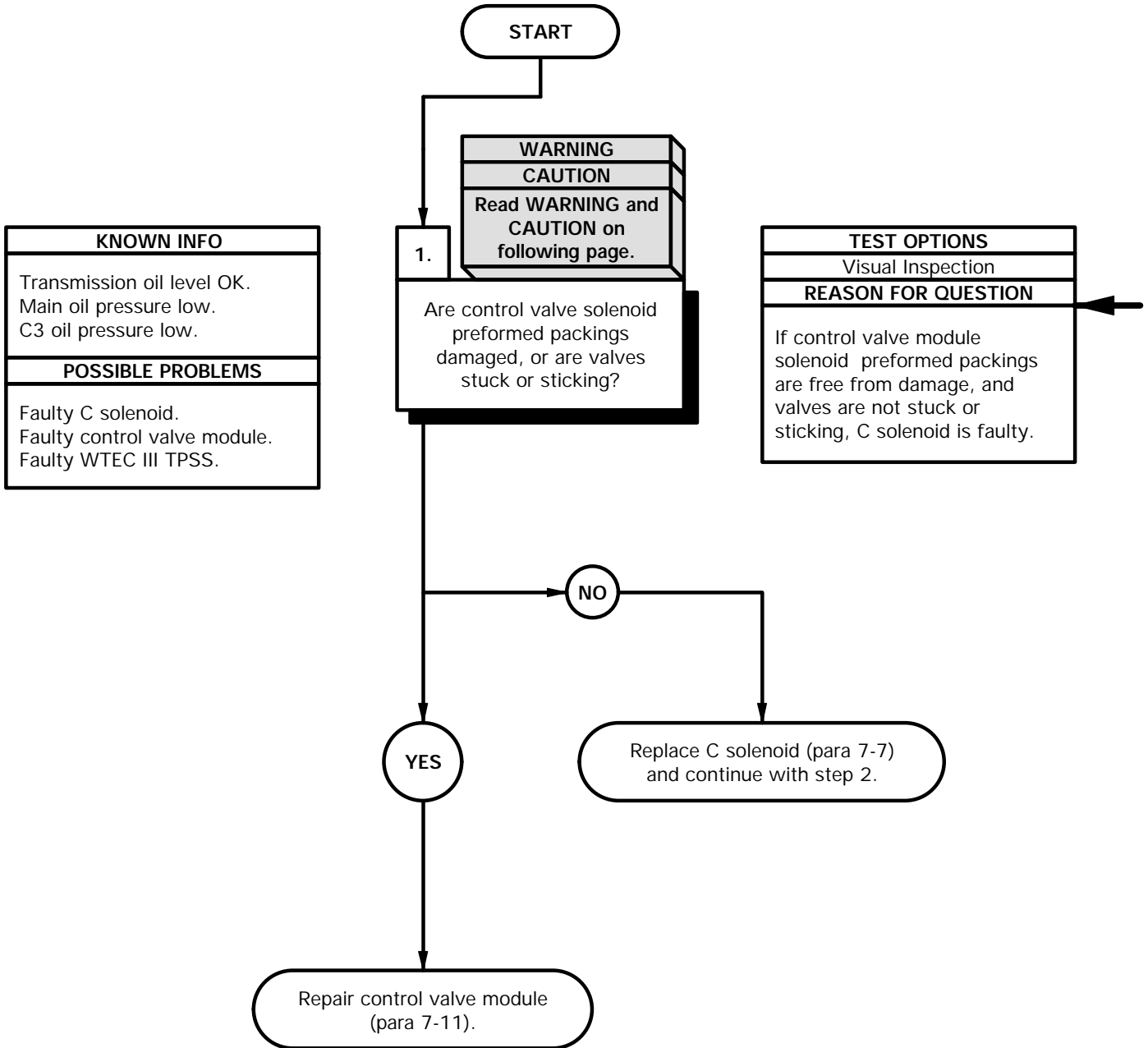
Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools

Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)

Personnel Required

(2)



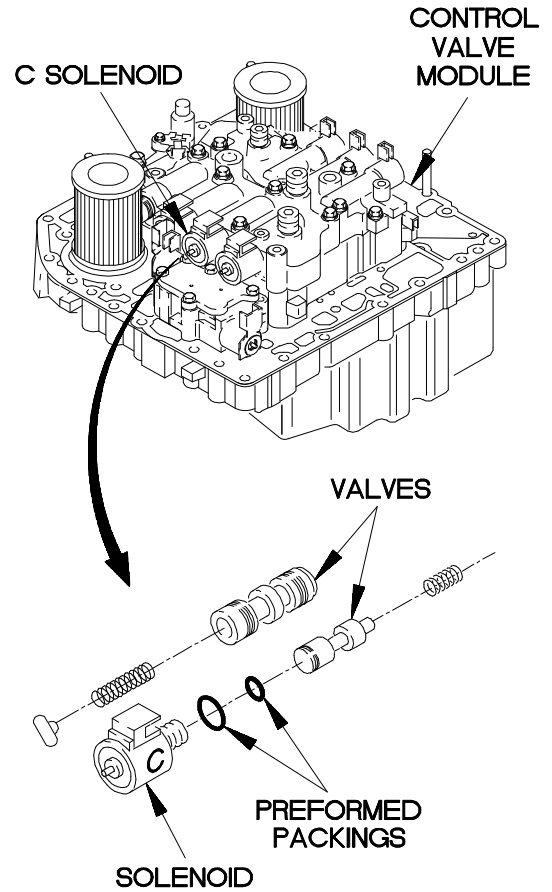
WARNING

Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

- (1) Remove control valve module (para 7-10).
- (2) Remove transmission internal wiring harness (para 7-13).
- (3) Inspect solenoid preformed packings for damage (para 7-7, 7-8, and 7-12).
- (4) Inspect valves for freedom of movement, or if stuck or sticking (para 7-7, 7-8, and 7-12).
- (5) If damaged preformed packings and/or stuck or sticking valves are found, repair control valve module (para 7-11).
- (6) If no damage is found, replace C solenoid (para 7-7) and continue with step 2.
- (7) Install transmission internal wiring harness (para 7-13).
- (8) Install control valve module (para 7-10).

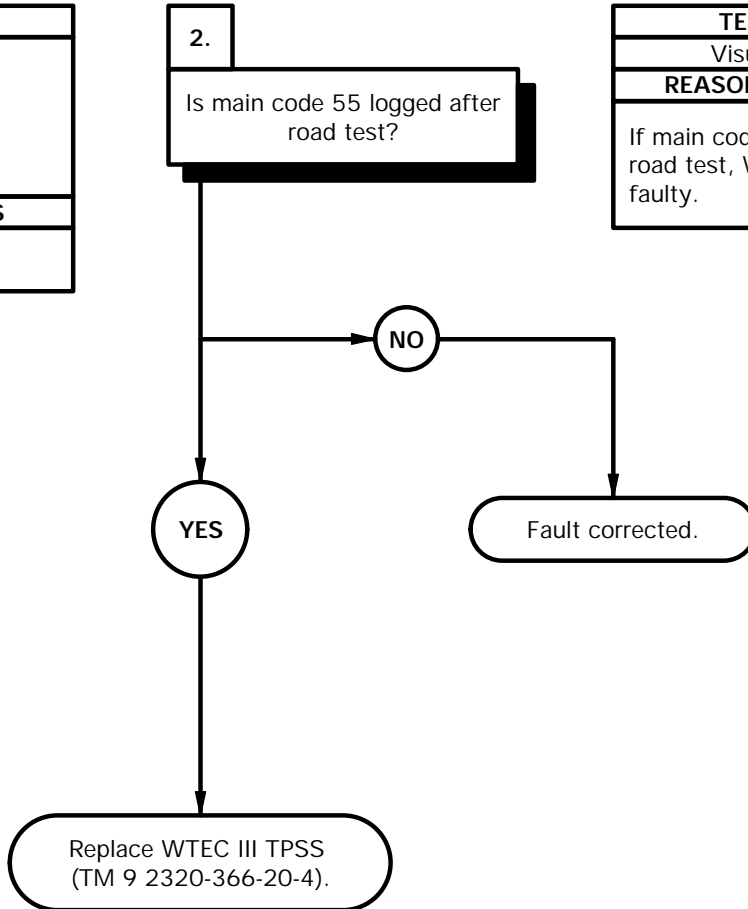




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c80. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 55 AND ANY SUB CODE (CONT)

KNOWN INFO
Transmission oil level OK. C3 oil pressure OK. Main oil pressure OK. Control valve module OK.
POSSIBLE PROBLEMS
Faulty WTEC III TPSS.

TEST OPTIONS
Visual Inspection
REASON FOR QUESTION
If main code 55 is logged after road test, WTEC III TPSS is faulty.



- 
- (1) Clear diagnostic codes (TM 9-2320-366-20-4).
 - (2) Road test vehicle.
 - (3) Read diagnostic codes (TM 9-2320-366-20-4).
 - (4) If main code 55 is logged, replace WTEC III TPSS.
(TM 9-2320-366-20-4).
 - (5) If main code 55 is not logged, fault has been corrected.
- 

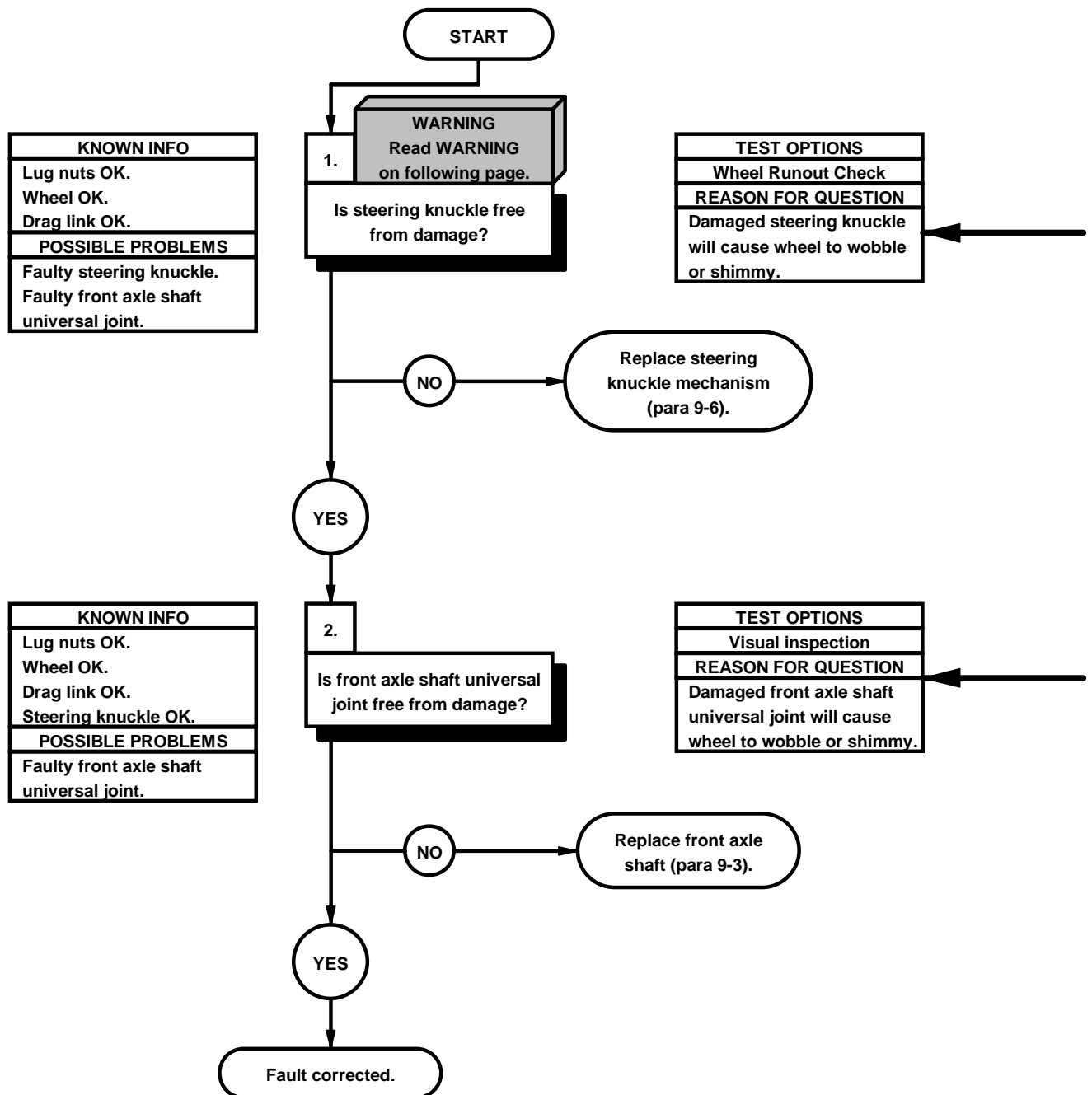
2-12. WHEEL TROUBLESHOOTING

This paragraph covers Wheel Troubleshooting. The Wheel Fault Index, Table 2-10, lists faults for the Wheel of the vehicle.

Table 2-10. Wheel Fault Index

Fault No.	Description	Page
d1.	Wheel Wobbles or Shimmys	2-962

d1. WHEEL WOBBLES OR SHIMMIES	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) Jack, Dolly-Type, Hydraulic, (Item 37, Appendix B) Trestle, Motor Vehicle Maintenance (Item 81, Appendix B)
Personnel Required (2)	



WHEEL RUNOUT CHECK

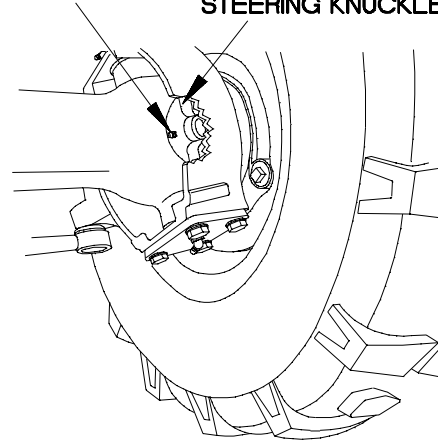
WARNING

Vehicle must be on level ground and wheels must be chocked. Failure to comply may result in injury to personnel.

- (1) Jack up vehicle (TM 9-2320-366-10-2) one wheel at a time and support with motor vehicle maintenance trestle.
- (2) Insert pry bar under tire and lift while observing steering knuckle play.
- (3) Remove motor vehicle maintenance trestle and lower vehicle (TM 9-2320-366-10-2).

AXLE SHAFT
UNIVERSAL JOINT

STEERING KNUCKLE



YBD01011

Inspect front axle shaft universal joint for looseness, lack of lubricant, and damage.

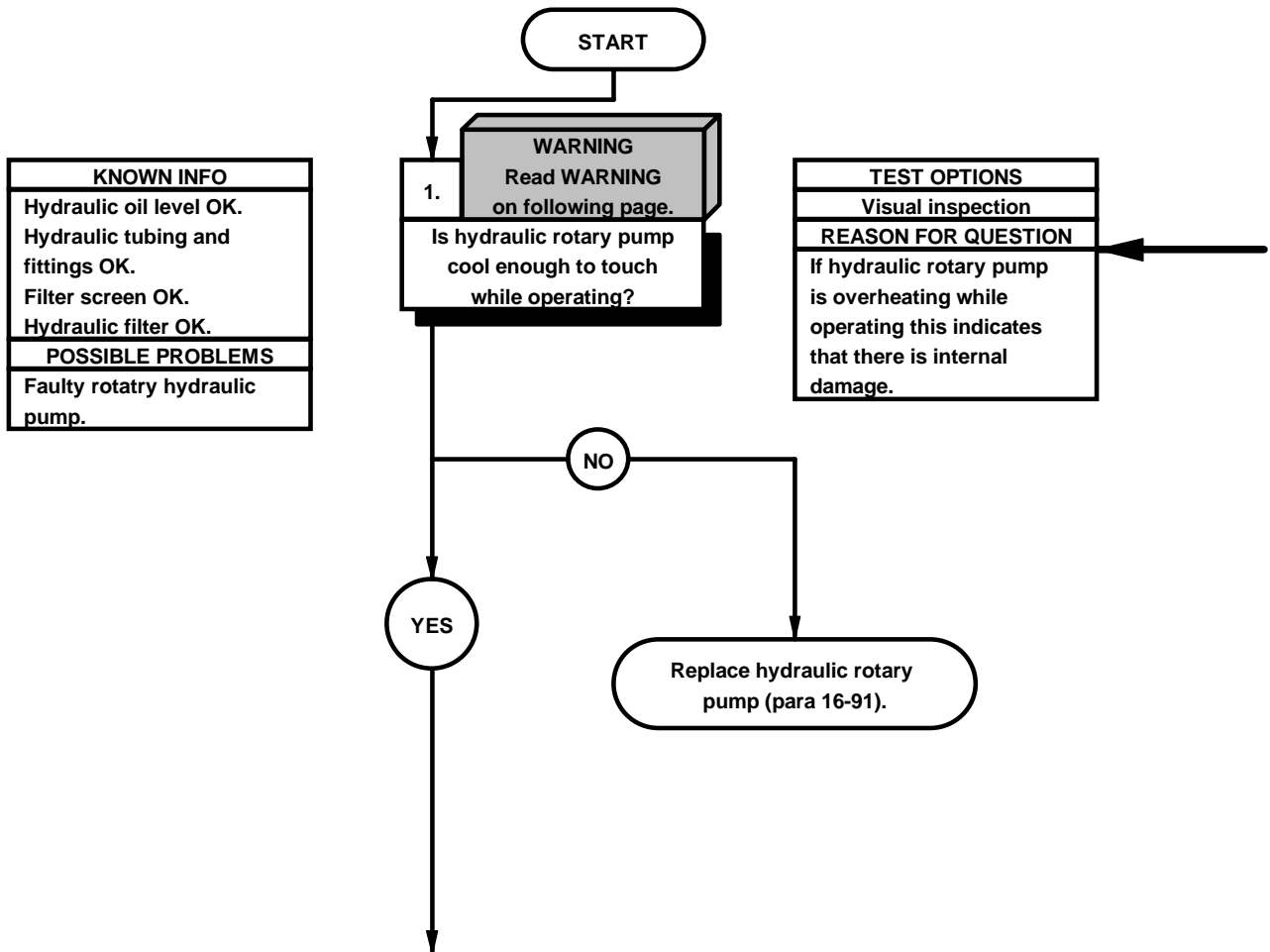
2-13. HYDRAULIC SYSTEM TROUBLESHOOTING

This paragraph covers Hydraulic System Troubleshooting. The Hydraulic System Fault Index, Table 2-11, lists faults for the Hydraulic System of the vehicle.

Table 2-11. Hydraulic System Fault Index

Fault No.	Description	Page
e1.	Loss of Hydraulic Pressure (Single Stage Pump)	2-966
e2.	Loss of Hydraulic Pressure (Three Stage Pump)	2-970

e1. LOSS OF HYDRAULIC PRESSURE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) Tester, Hydraulic (Item 73, Appendix B) Goggles, Industrial (Item 28, Appendix B) Pan, Drain (Item 43, Appendix B)
Personel Required (2)	
Materials/Parts Rag, Wiping (Item 60, Appendix C) Hose (2) (Item 40, Appendix C) Fitting (2) (Item 31, Appendix C) Adapter, Pipe (Item 1, Appendix C)	



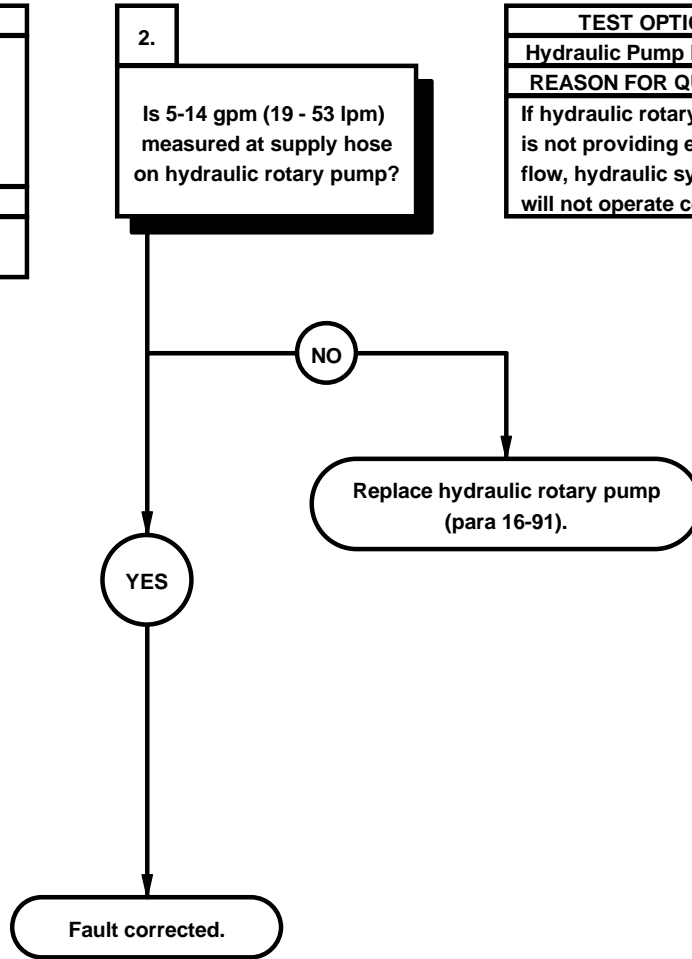
WARNING

- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

- (1) Start engine (TM 9-2320-366-10-1). Allow engine to run until reaching normal operating temperature.
- (2) Engage PTO (TM 9-2320-366-10-1).
- (3) Increase engine rpm, using hand throttle lever, until 1250-1450 rpm is reached.
- (4) Check hydraulic pump for overheating with engine at normal operating temperature.
- (5) Decrease engine rpm to 750 rpm.
- (6) Disengage PTO (TM 9-2320-366-10-1).
- (7) Shut down engine (TM 9-2320-366-10-1).

e1. LOSS OF HYDRAULIC PRESSURE (CONT)

KNOWN INFO
Hydraulic oil level OK. Hydraulic tubing and fittings OK. Filter screen OK. Hydraulic filter OK.
POSSIBLE PROBLEMS
Faulty hydraulic rotary pump.

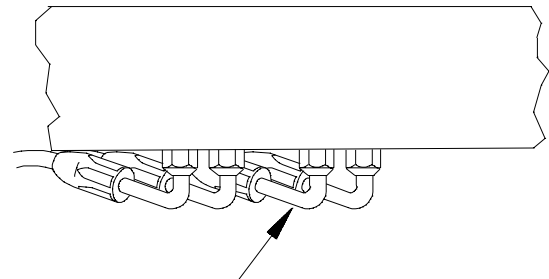
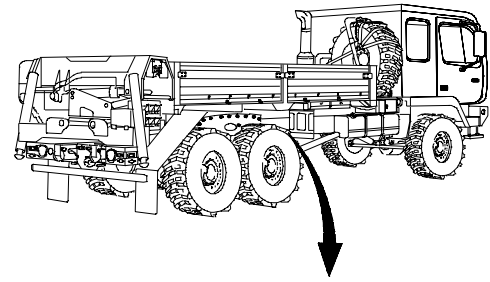


TEST OPTIONS
Hydraulic Pump Flow Test
REASON FOR QUESTION
If hydraulic rotary pump is not providing enough flow, hydraulic system will not operate correctly.



HYDRAULIC PUMP FLOW TEST

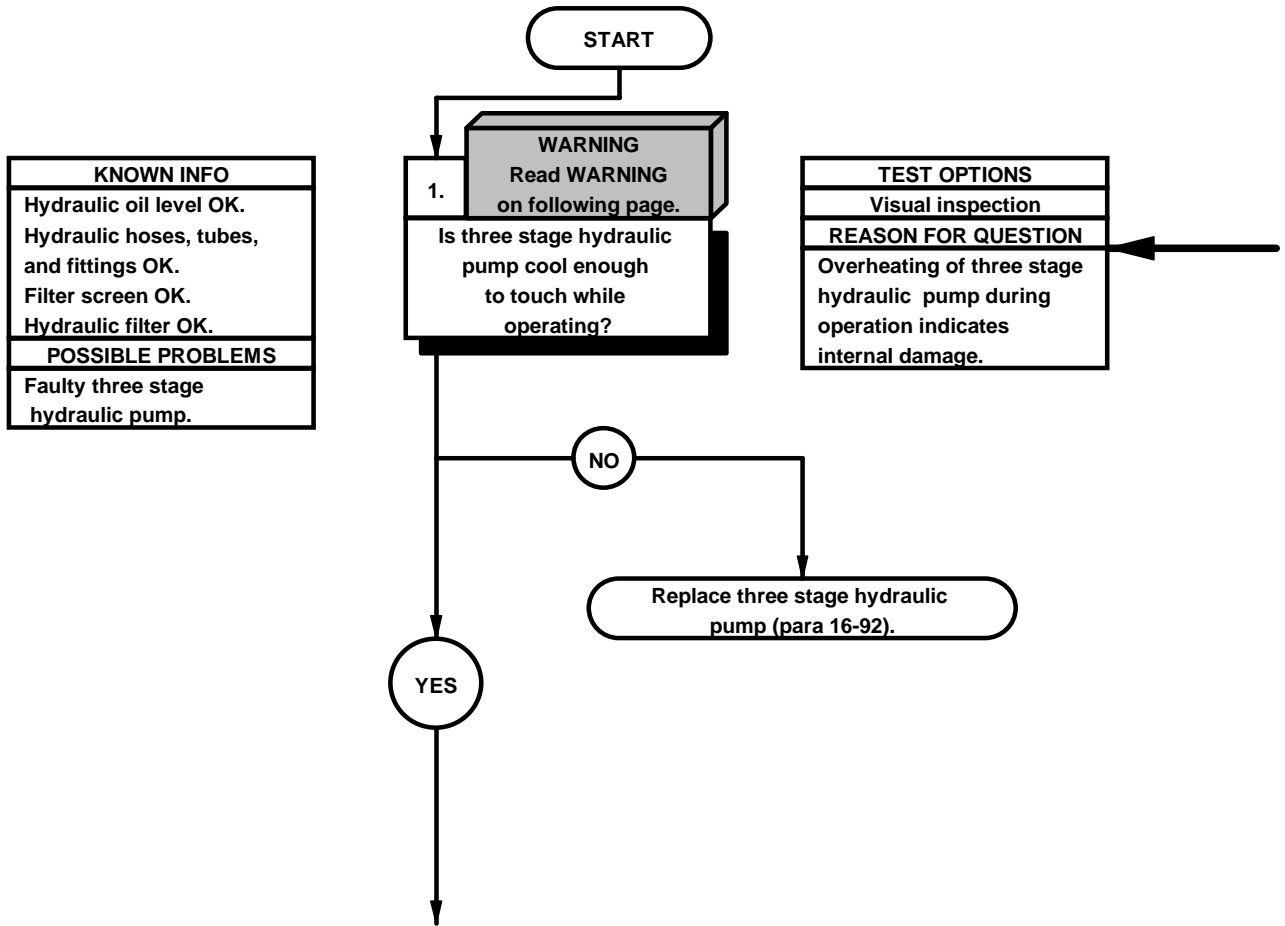
- (1) Place drain pan under vehicle.
- (2) Disconnect supply hose from pressure port at winch control valve.
- (3) Connect hydraulic tester:
 - (a) Connect winch control valve fitting to hose.
 - (b) Connect hose to output port of hydraulic tester.
 - (c) Connect second hose to input port of hydraulic tester.
 - (d) Connect second hose to adapter and adapter to vehicle supply hose.
- (4) Completely open hydraulic tester load valve.
- (5) Start and run engine until reaching normal operating temperature (TM 9-2320-366-10-1).
- (6) Engage PTO (TM 9-2320-366-10-1).
- (7) Increase engine rpm, using hand throttle, until 1250-1450 rpm is reached and note reading on flow meter.
- (8) If flow is less than 5 gpm (19 lpm), replace hydraulic rotary pump (para 16-91).
- (9) Decrease engine rpm to 750 rpm.
- (10) Disengage PTO (TM 9-2320-366-10-1).
- (11) Shut down engine (TM 9-2320-366-10-1).
- (12) Disconnect pressure/flow kit from vehicle and disassemble test equipment: adapter from hose, hoses from pressure/flow kit.
- (13) Connect supply hose to fitting.
- (14) Remove drain pan from under vehicle.



**PRESSURE HOSE
AT WINCH CONTROL VALVE**

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e2. LOSS OF HYDRAULIC PRESSURE (Three Stage Pump)	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) Tester, Hydraulic (Item 73, Appendix B) Goggles, Industrial (Item 28, Appendix B) Pan, Drain (Item 43, Appendix B)
Personnel Required (2)	
Materials/Parts Rag, Wiping (Item 60, Appendix C) Hose (2) (Item 40, Appendix C) Fitting (2) (Item 31, Appendix C) Reducer, Tube (Item 61, Appendix C)	



WARNING

- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

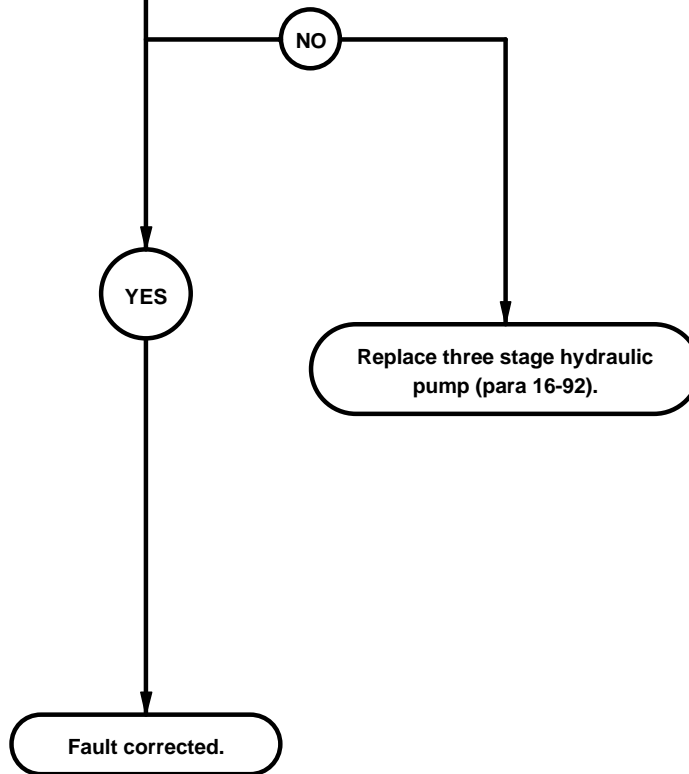
- (1) Start engine (TM 9-2320-366-10-1). Allow engine to run until reaching normal operating temperature.
- (2) Engage PTO (TM 9-2320-366-10-1).
- (3) Increase engine RPM until 1250-1450 RPM is reached (TM 9-2320-366-10-1).
- (4) Check three stage hydraulic pump for overheating with engine at normal operating temperature.
- (5) Decrease engine rpm to 750 rpm.
- (6) Disengage PTO (TM 9-2320-366-10-1).
- (7) Shut down engine (TM 9-2320-366-10-1).

e2. LOSS OF HYDRAULIC PRESSURE (THREE STAGE PUMP) (CONT)

KNOWN INFO
Hydraulic oil level OK. Hydraulic hoses, tubes, and fittings OK. Filter screen OK. Hydraulic filter OK.
POSSIBLE PROBLEMS
Faulty three stage hydraulic pump.

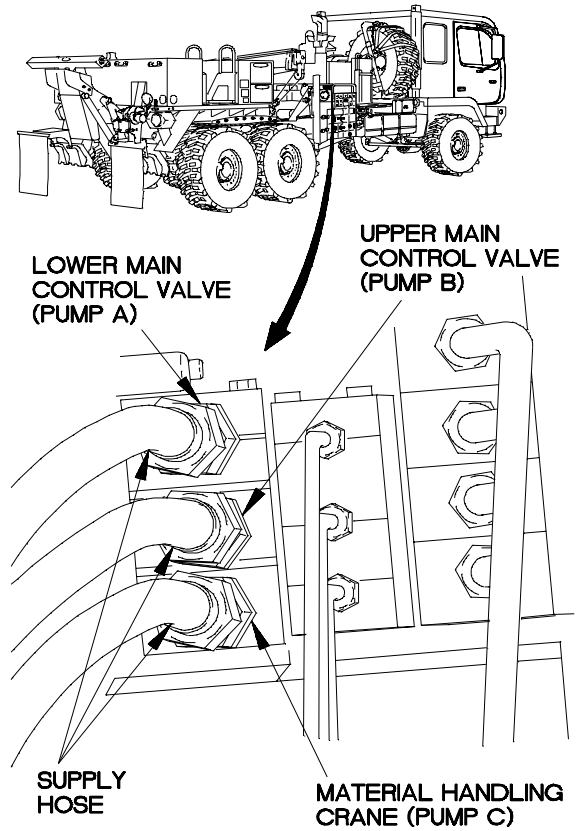
2.
Is 5-14 gpm (19 - 53 lpm)
measured at supply hose
on three stage hydraulic
pump?

TEST OPTIONS
Hydraulic Rotary Pump Flow Test
REASON FOR QUESTION
If three stage hydraulic pump is not providing enough flow, hydraulic system will not operate correctly.



THREE STAGE HYDRAYLIC PUMP FLOW TEST

- (1) Place drain pan under vehicle.
- (2) Disconnect supply hose from affected pump stage (A, B, or C) at back of control panel.
- (3) Connect hydraulic tester output to hose and hose to metal supply line at back of control panel.
- (4) Connect disconnected supply hose to input of hydraulic tester.
- (5) Completely open hydraulic tester load valve.
- (6) Start engine (TM 9-2320-366-10-1). Allow engine to run until reaching normal operating temperature.
- (7) Engage PTO (TM 9-2320-366-10-1).
- (8) Increase engine RPM until 1250-1450 RPM is reached (TM 9-2320-366-10-1) and note reading on hydraulic tester.
- (9) If flow is less than 5 gpm (19 lpm), replace three stage hydraulic pump (para 16-92).
- (10) Decrease engine rpm to 750 rpm.
- (11) Position PTO switch to off (TM 9-2320-366-10-1).
- (12) Shut down engine (TM 9-2320-366-10-1).
- (13) Disconnect hydraulic tester from vehicle and disassemble test equipment: two hoses from hydraulic tester.
- (14) Connect supply hose to fitting.
- (15) Remove drain pan from under vehicle.



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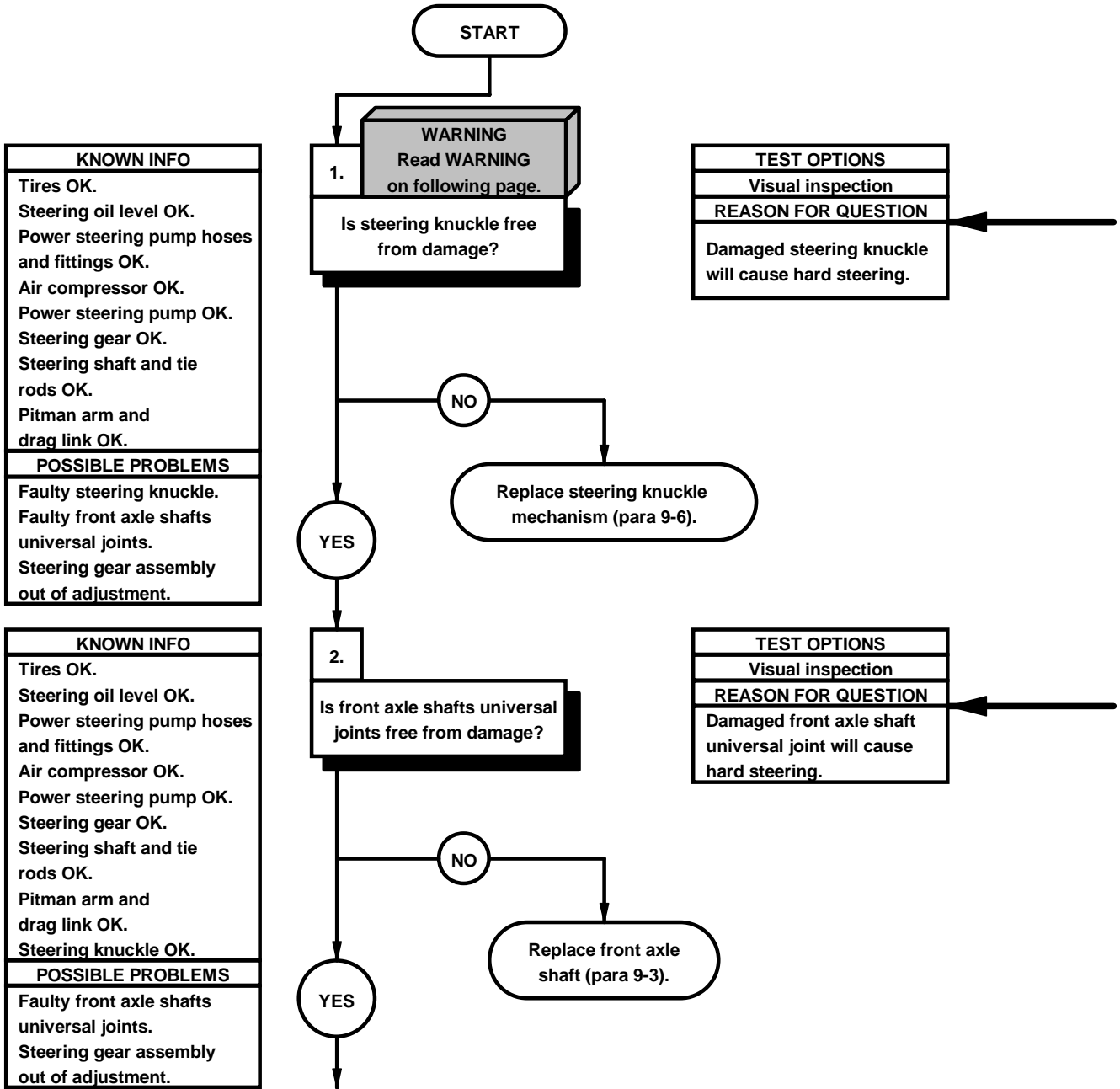
2-14. STEERING TROUBLESHOOTING

This paragraph covers Steering Troubleshooting. The Steering Fault Index, Table 2-12, lists faults for the Steering of the vehicle.

Table 2-12. Steering Fault Index

Fault No.	Description	Page
f1.	Hard to Steer	2-976

f1. HARD TO STEER	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) Jack, Dolly-Type, Hydraulic (Item 37, Appendix B) Trestle, Motor Vehicle Maintenance (Item 81, Appendix B) Goggles, Industrial (Item 28, Appendix B)
Personnel Required (2)	

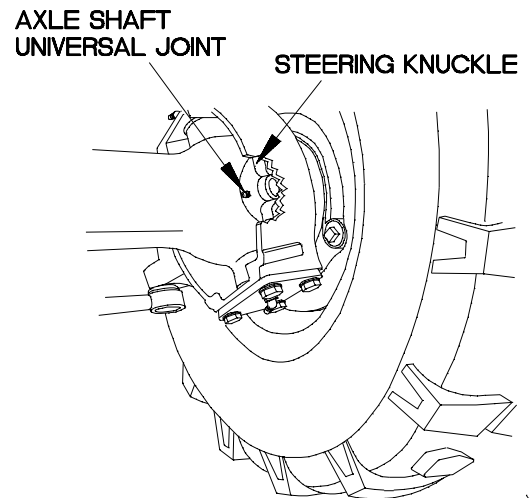


WARNING

- Vehicle must be on level ground and wheels must be chocked. Failure to comply may result in injury to personnel.
- Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

- (1) Jack up vehicle (TM 9-2320-366-10-2) one wheel at a time and place on motor vehicle maintenance trestle.
- (2) Insert pry bar under tire and lift while observing steering knuckle play.
- (3) Remove motor vehicle maintenance trestle and lower vehicle (TM 9-2320-366-10-2).

- (1) Start engine (TM 9-2320-366-10-1).
- (2) Turn steering wheel all the way to the left or right.
- (3) Shut down engine (TM 9-23320-366-10-1).
- (4) Inspect front axle shaft universal joints for looseness, lack of lubricant, and damage.

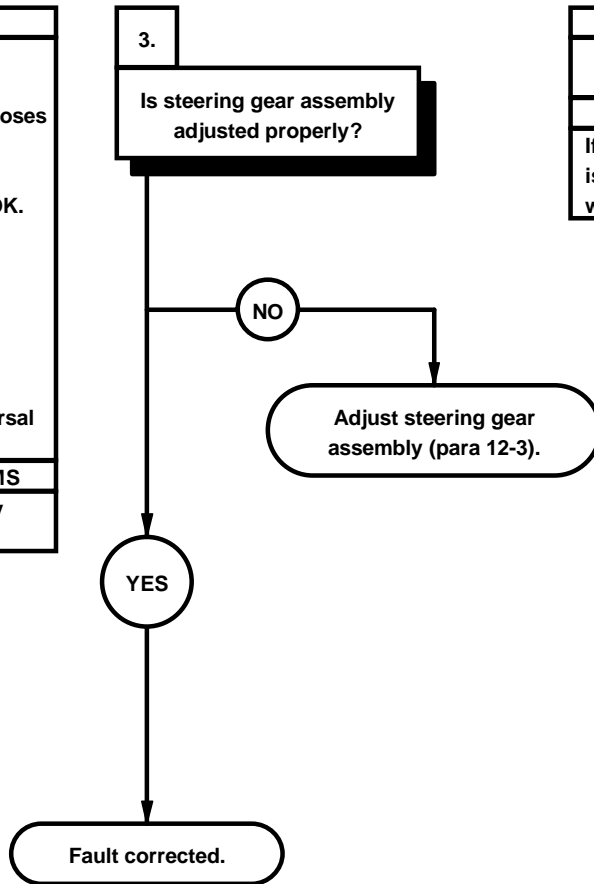


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f1. HARD TO STEER (CONT)

KNOWN INFO
Tires OK.
Steering oil level OK.
Power steering pump hoses and fittings OK.
Air compressor OK.
Power steering pump OK.
Steering gear OK.
Steering shaft and tie rods OK.
Pitman arm and drag link OK.
Steering knuckle OK.
Front axle shafts universal joints OK.

POSSIBLE PROBLEMS
Steering gear assembly out of adjustment.



TEST OPTIONS
Steering Gear Assembly Adjustment Check

REASON FOR QUESTION
If steering gear assembly is not adjusted properly it will cause hard steering.



—| Check steering gear assembly adjustment (para 12-3).

2-15. SUSPENSION SYSTEM TROUBLESHOOTING

This paragraph covers Suspension System Troubleshooting. The Suspension System Fault Index, Table 2-13, lists faults for the Suspension System of the vehicle.

Table 2-13. Suspension System Fault Index

Fault No.	Description	Page
g1.	Wanders, Pulls to One Side, or Shimmies	2-982
g2.	Leans to One Side or Rear of Vehicle Sags	2-984

g1. WANDERS, PULLS TO ONE SIDE, OR SHIMMIES

INITIAL SETUP

Equipment Conditions

Engine shut down (TM 9-2320-366-10-1).

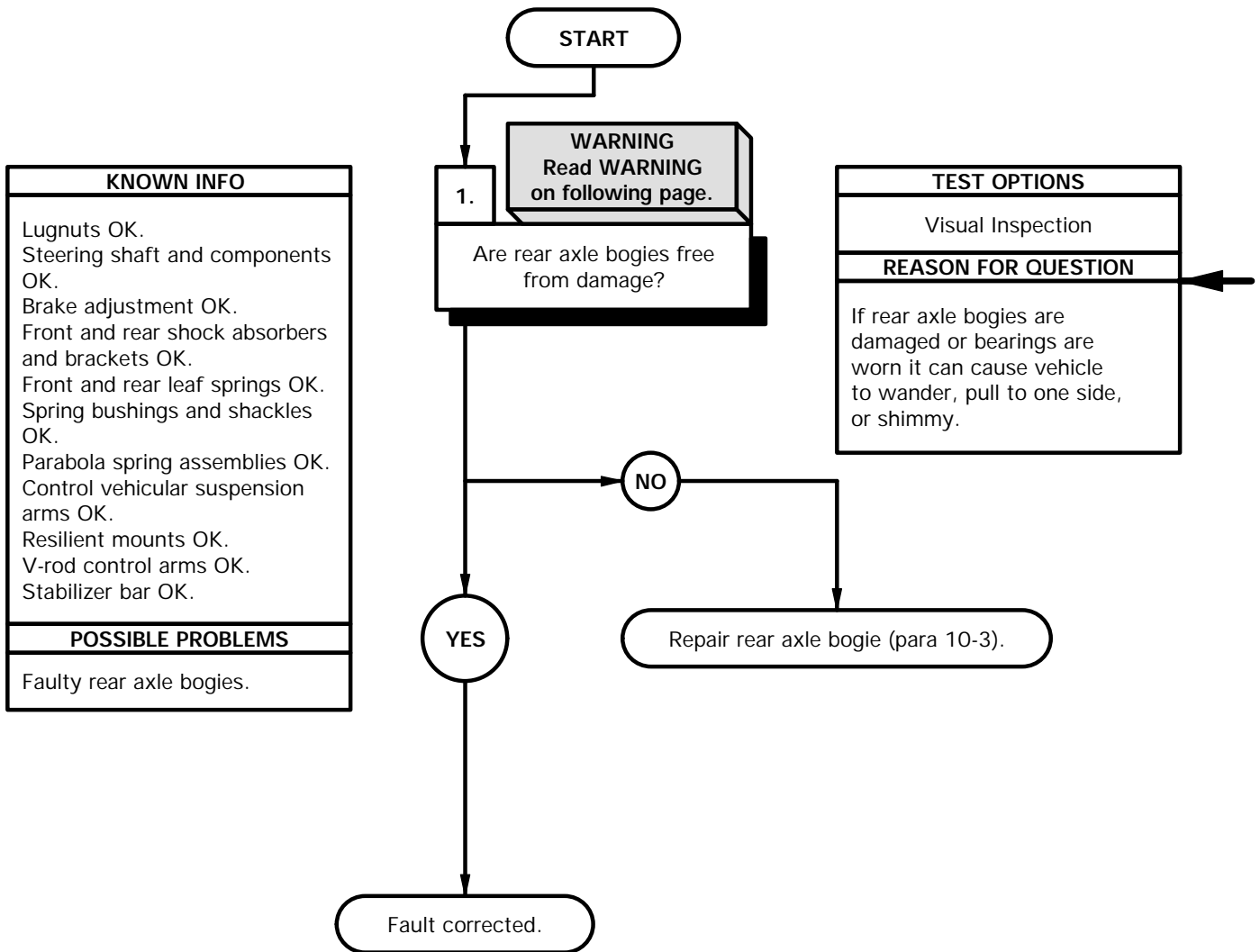
Materials/Parts

Sealing Compound (Item 75, Appendix C)

Tools and Special Tools

Tool Kit, Genl Mech (Item 78, Appendix B)
 Jack, Dolly-Type, Hydraulic (Item 37, Appendix B)
 Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B)
 Trestle, Motor Vehicle Maintenance (Item 81, Appendix B)

Personnel Required
 (2)



NOTE

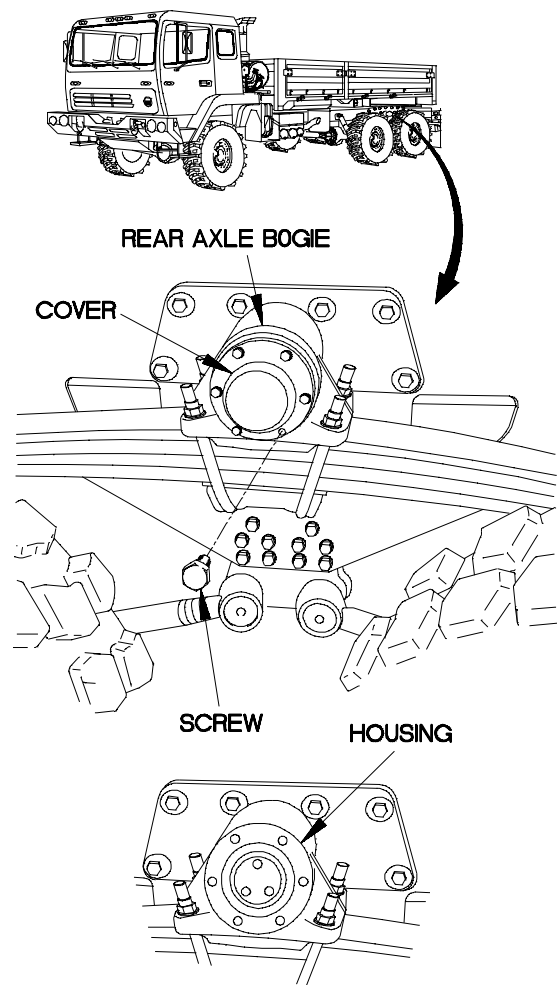
Both left and right rear axle bogies are inspected in the same manner.

- (1) Remove six screws and cover from rear axle bogie.
- (2) Inspect rear axle bogie for damage.
- (3) Jack up one of the rear axles, place on motor vehicle maintenance trestle, and look for excessive movement in axle bogie.
- (4) Remove motor vehicle maintenance trestle and lower axle.

WARNING

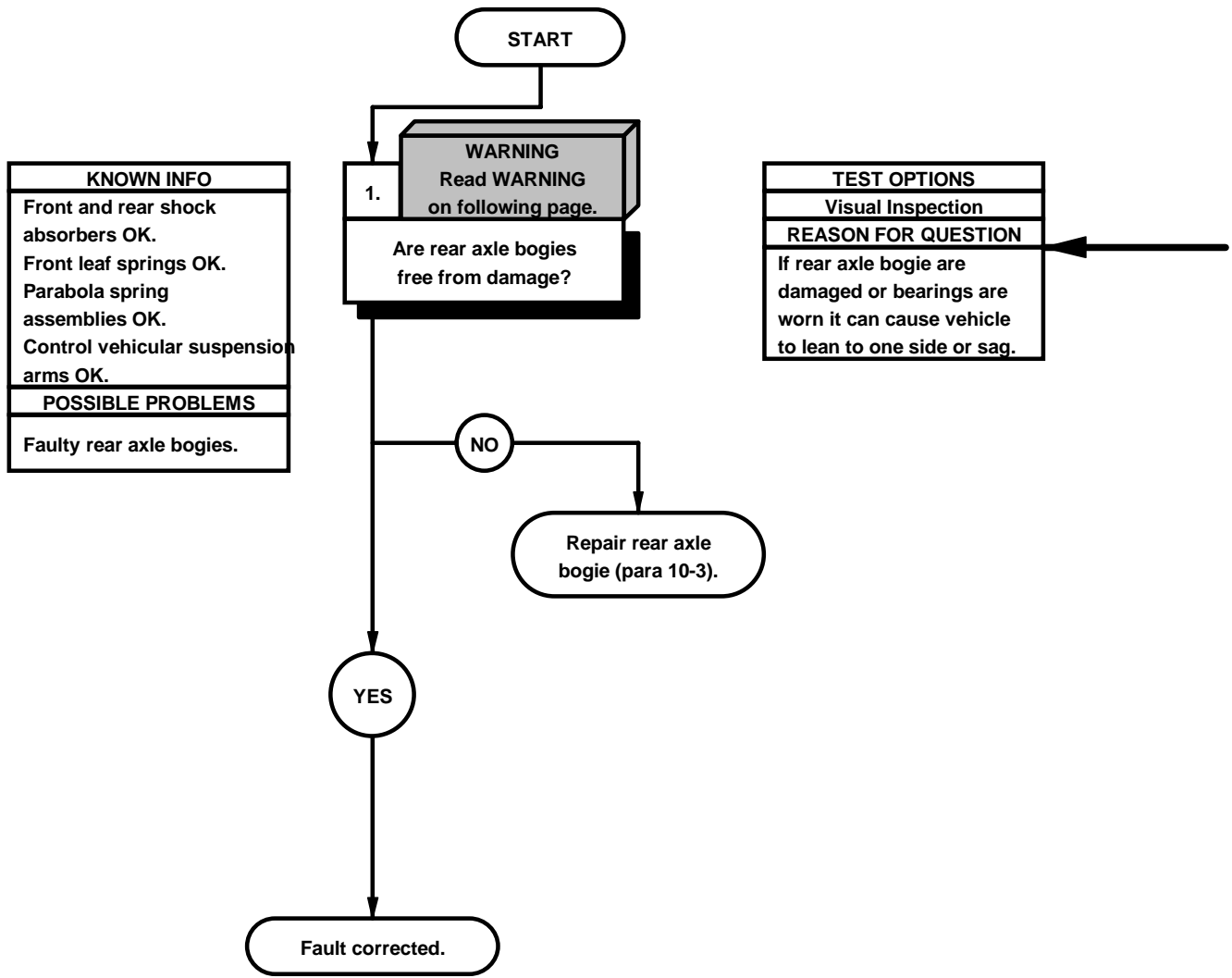
Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in a well ventilated area. If adhesive, solvent or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in serious injury or death to personnel.

- (5) Apply thin bead of sealing compound to seating surface of housing.
- (6) Install cover and six screws on housing with fill plug at the 1 o'clock position.
- (7) Tighten six screws to 24 lb-ft (32 N-m).



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g2. LEANS TO ONE SIDE OR REAR OF VEHICLE SAGS	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) Jack, Dolly-Type, Hydraulic (Item 37, Appendix B) Wrench, Torque, 0-175 lb-ft (Item 92, Appendix B) Trestle, Motor Vehicle Maintenance (Item 81, Appendix B)
Materials/Parts Sealing Compound (Item 75, Appendix C)	
Personnel Required (2)	



NOTE

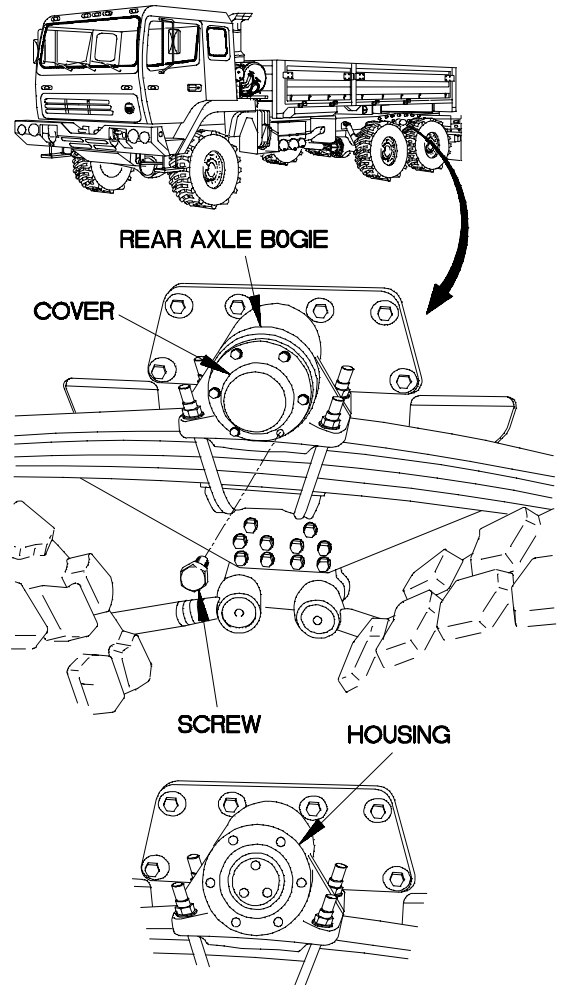
Both left and right rear axle bogies are inspected in the same manner.

- (1) Remove six screws and cover from rear axle bogie.
- (2) Inspect rear axle bogie for damage.
- (3) Jack up one of the rear axles, place on motor vehicle maintenance trestle, and look for excessive movement in axle bogie.
- (4) Remove motor vehicle maintenance trestle and lower axle.

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in a well ventilated area. If adhesive, solvent or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in serious injury or death to personnel.

- (5) Apply thin bead of sealing compound to seating surface of housing.
- (6) Install cover and six screws on housing with fill plug at the 1 o'clock position.
- (7) Tighten six screws to 24 lb-ft (32 N-m).



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2-16. M1089 HYDRAULIC SYSTEM TROUBLESHOOTING

This paragraph covers M1089 Hydraulic System Troubleshooting. The M1089 Hydraulic System Fault Index, Table 2-14, lists faults for the M1089 Hydraulic System of the vehicle.

Table 2-14. M1089 Hydraulic System Fault Index

Fault No.	Description	Page
h1.	M1089 Fold Cylinder Does Not Work	2-988
h2.	M1089 Left Stiffleg Drifts or Does Not Work	2-990
h3.	M1089 Right Stiffleg Drifts or Does Not Work	2-994
h4.	M1089 Stinger Cylinder Does Not Work	2-998
h5.	M1089 Telescopic Lift Cylinder(s) Drifts or Does Not Work	2-1002
h6.	M1089 RH 30K Winch Does Not Operate	2-1006
h7.	M1089 LH 30K Winch Does Not Operate	2-1008
h8.	M1089 Pay-Out Hydraulic Motor Does Not Work	2-1012

h1. M1089 FOLD CYLINDER DOES NOT WORK

INITIAL SETUP

Equipment Conditions

Engine shut down (TM 9-2320-366-10-1).

Personnel Required

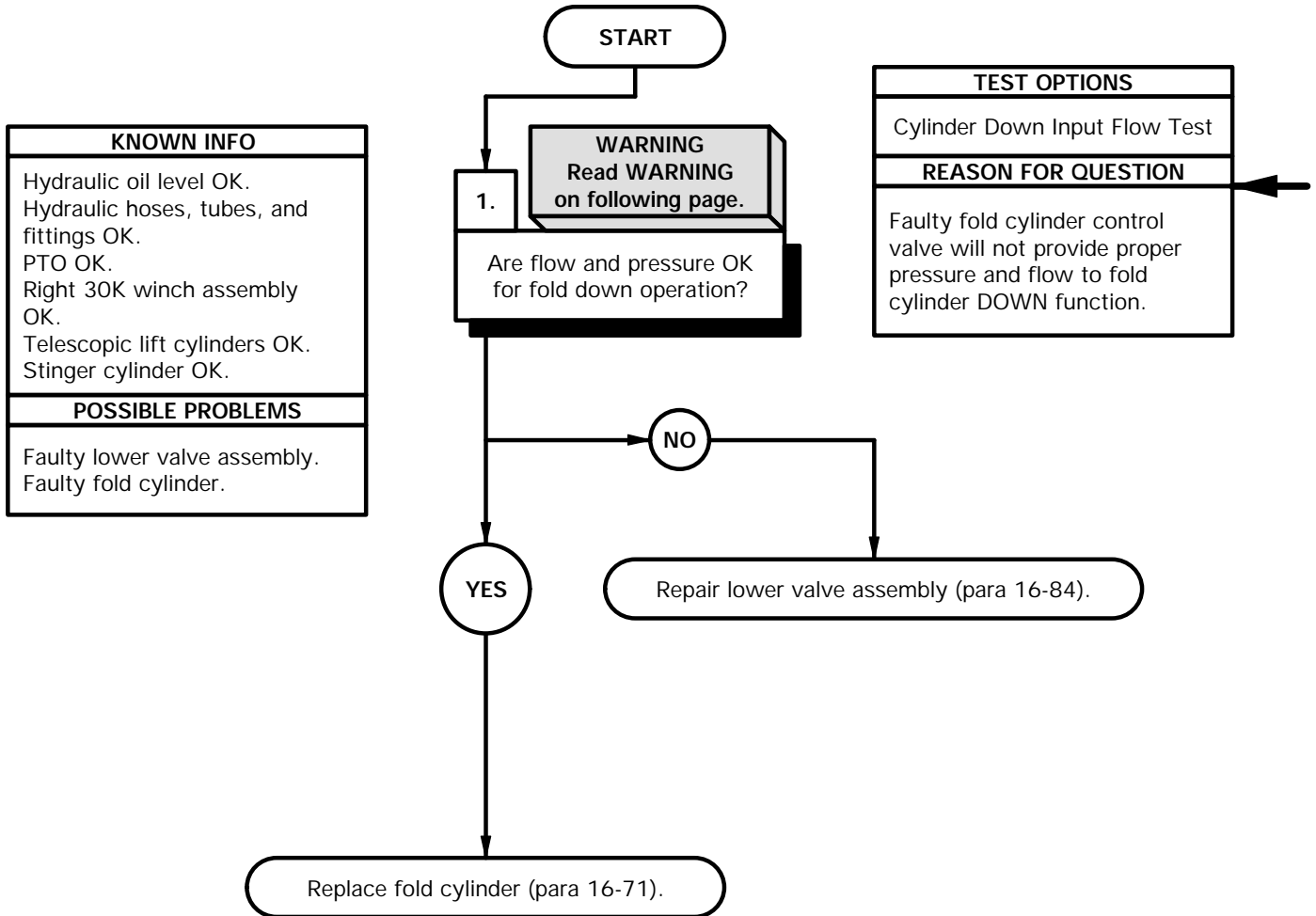
(2)

Tools and Special Tools

Tool Kit, Genl Mech (Item 78, Appendix B)
 Tester, Hydraulic (Item 73, Appendix B)
 Pan, Drain (Item 43, Appendix B)
 Goggles, Industrial (Item 28, Appendix B)

Materials/Parts

Rag, Wiping (Item 60, Appendix C)
 Hose (2) (Item 40, Appendix C)
 Fitting (2) (Item 31, Appendix C)
 Adapter, Pipe (2) (Item 2, Appendix C)
 Adapter, Swivel (2) (Item 3, Appendix C)
 Fitting (2) (Item 32, Appendix C)

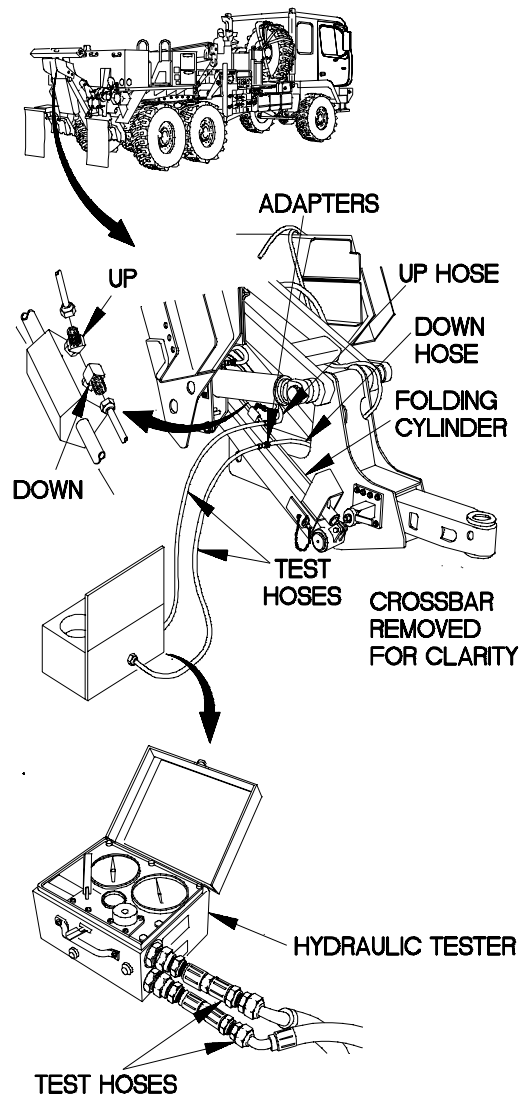


WARNING

- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

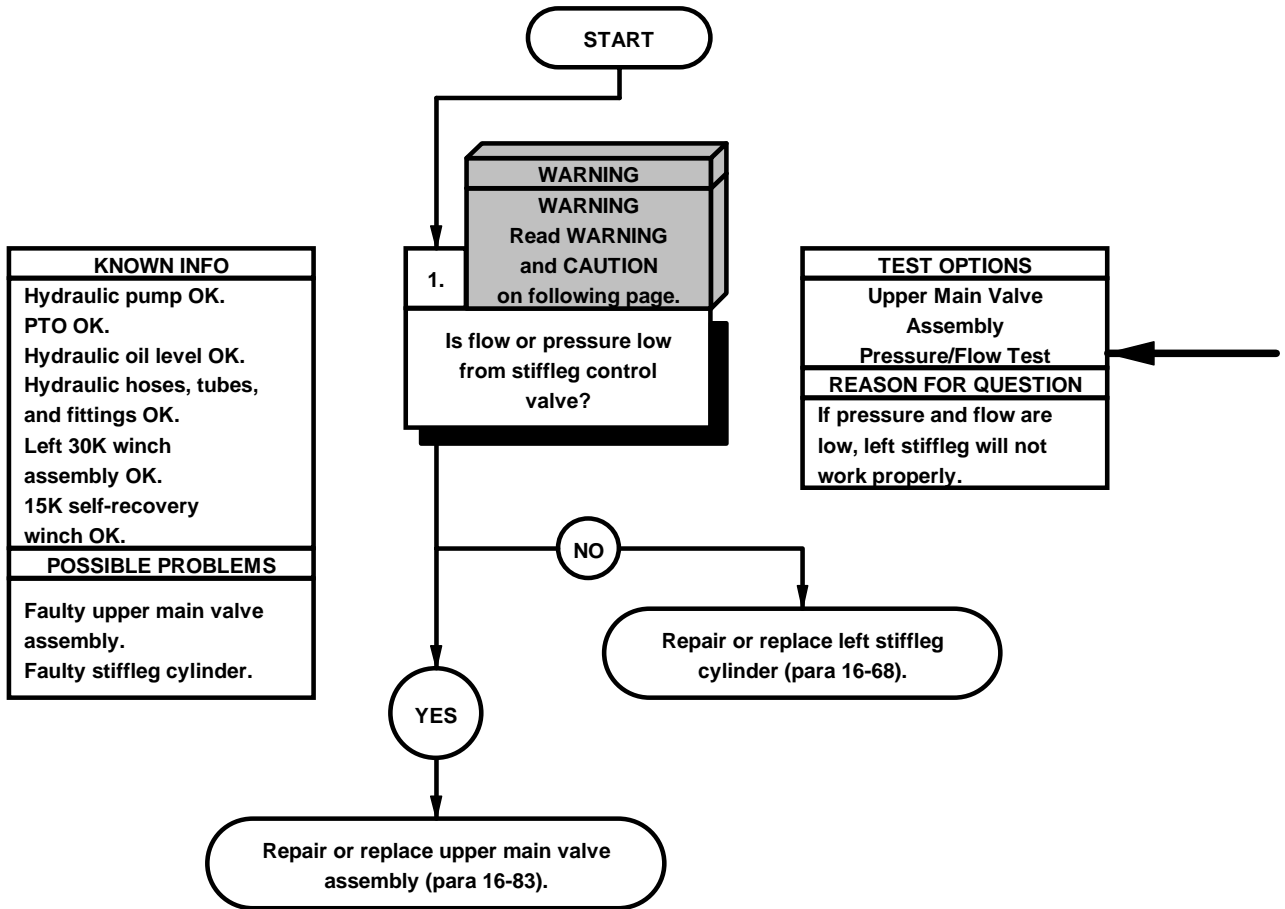
CYLINDER DOWN INPUT FLOW TEST

- (1) Place drain pan under vehicle.
- (2) Disconnect hoses from ports (UP and DOWN) on fold cylinder.
- (3) Connect hydraulic tester:
 - (a) Connect two test hoses to pressure and reservoir ports of hydraulic tester.
 - (b) Connect pressure test hose to fold cylinder DOWN hose.
 - (c) Connect reservoir test hose to fold cylinder UP hose.
- (4) Start engine (TM 9-2320-366-10-1).
- (5) Position PTO switch to on (TM 9-2320-366-10-1).
- (6) Increase engine RPM to 1250-1450 RPM (TM 9-2320-366-10-1).
- (7) Position UNDERLIFT FOLD control valve handle to DOWN.
- (8) Perform flow test and note reading on hydraulic tester.
- (9) Perform pressure test and note reading on hydraulic tester.
- (10) If flow is below 3.5 gpm (13 lpm), or pressure is below 1200 psi (8274 kPa), lower valve assembly is faulty. Repair lower valve assembly (para 16-84). If flow and pressure are OK, fold cylinder is faulty. Replace fold cylinder (para 16-71).
- (11) Position PTO switch to off (TM 9-2320-366-10-1).
- (12) Shut down engine (TM 9-2320-366-10-1).
- (13) Disconnect pressure and reservoir test hoses from fold cylinder hoses.
- (14) Connect two hoses to ports (UP and DOWN) on fold cylinder.
- (15) Remove drain pan from under vehicle.



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h2. M1089 LEFT STIFFLEG DRIFTS OR DOES NOT WORK	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Materials/Parts Rag, Wiping (Item 60, Appendix C) Hose (2) (Item 40, Appendix C) Fitting (2) (Item 31, Appendix C) Reducer, Tube (Item 61, Appendix C) Adapter, Pipe (Item 2, Appendix C) Adapter, Swivel (Item 3, Appendix C)
Personnel Required (2)	
Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) Tester, Hydraulic (Item 73, Appendix B) Goggles, Industrial (Item 28, Appendix B) Pan, Drain (Item 43, Appendix B)	



WARNING

- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

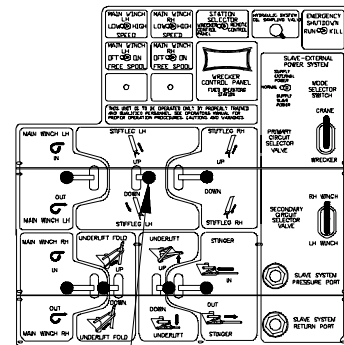
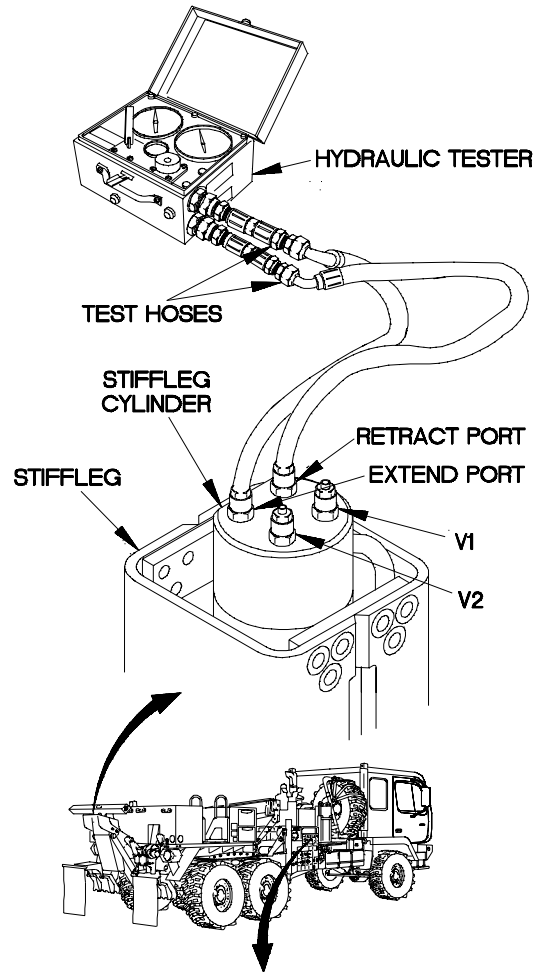
CAUTION

Exercise caution when operating stiffleg. Failure to comply may cause hoses to rub against stiffleg causing damage to equipment.

**UPPER MAIN CONTROL VALVE
PRESSURE/FLOW TEST**

- (1) Place drain pan under vehicle.
- (2) Lift lid on lefthand aft storage box and slide off cover over left stiffleg cylinder.
- (3) Disconnect extend hose from extend port of right stiffleg cylinder.
- (4) Disconnect retract hose from retract port of left stiffleg cylinder.

(Continued on next page)



**LEFT STIFFLEG
CONTROL LEVER**

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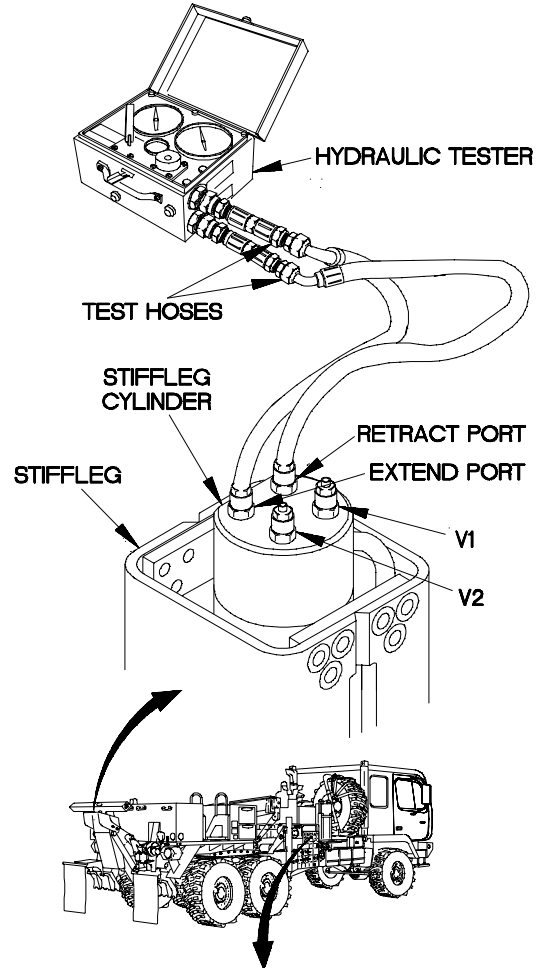
h2. M1089 LEFT STIFFLEG DRIFTS OR DOES NOT WORK (CONT)

WARNING

- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

CAUTION

Exercise caution when operating stiffleg. Failure to comply may cause hoses to rub against stiffleg causing damage to equipment.



UPPER MAIN CONTROL VALVE PRESSURE/FLOW TEST (CONT)

(Continued from previous page)

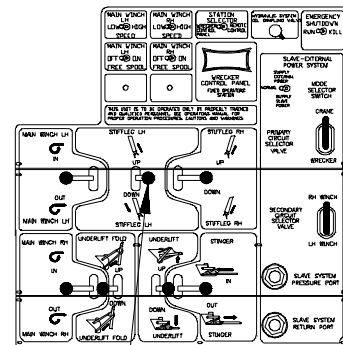
- (5) Connect hydraulic tester to hydraulic system:
 - (a) Connect test hoses to pressure and reservoir ports of hydraulic tester.
 - (b) Connect pressure test hose to left stiffleg extend hose.
 - (c) Connect reservoir test hose to left stiffleg retract hose.

NOTE

Steps (6 through 9) require the aid of an assistant.

- (6) Start engine (TM 9-2320-366-10-1).
- (7) Position PTO switch to on (TM 9-2320-366-10-1).
- (8) Increase engine RPM to 1250-1450 RPM (TM 9-2320-366-10-1).
- (9) Position LEFT STIFFLEG control valve handle DOWN.
- (10) Perform flow test and note reading.
- (11) Perform pressure test and note reading.
- (12) If flow and pressure are below 12 gpm and 2400 psi, repair or replace upper main control valve assembly (para 16-83).
- (13) If flow and pressure are 12 gpm and 2400-3000 psi, repair or replace left stiffleg cylinder (para 16-68).

(Continued on next page)



LEFT STIFFLEG CONTROL LEVER

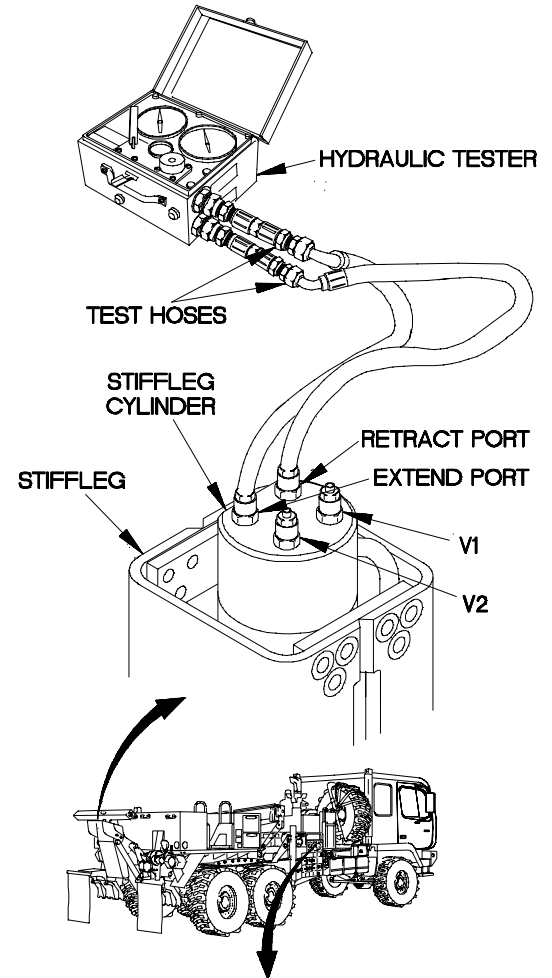
6BH02021

WARNING

- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

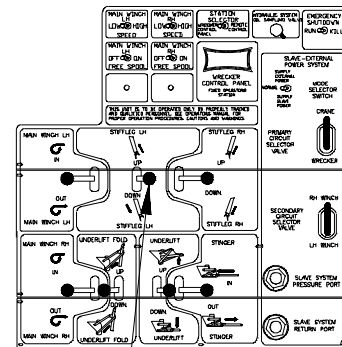
CAUTION

Exercise caution when operating stiffleg. Failure to comply may cause hoses to rub against stiffleg causing damage to equipment.



**UPPER MAIN CONTROL VALVE
PRESSURE/FLOW TEST Cont**
(Continued from previous page)

- (14) Position PTO switch to off (TM 9-2320-366-10-1).
- (15) Shutdown engine (TM 9-2320-366-10-1).
- (16) Disconnect hydraulic tester from hydraulic system:
 - (a) Disconnect reservoir test hose from left stiffleg retract hose.
 - (b) Disconnect pressure test hose from left stiffleg extend hose.
 - (c) Disconnect test hoses from pressure and reservoir ports of hydraulic tester.
- (17) Connect retract hoses to retract port of left stiffleg cylinder.
- (18) Connect extend hose to extend port of left stiffleg cylinder.
- (19) Slide on cover over left stiffleg cylinder and close lid on left hand rear storage box.
- (20) Remove drain pan from under vehicle.



**LEFT STIFFLEG
CONTROL LEVER**

6 BH-02031

h3. M1089 RIGHT STIFFLEG DRIFTS OR DOES NOT WORK

INITIAL SETUP

Equipment Conditions

Engine shut down (TM 9-2320-366-10-1).

Personnel Required

(2)

Tools and Special Tools

Tool Kit, Genl Mech (Item 78, Appendix B)

Tester, Hydraulic (Item 73, Appendix B)

Goggles, Industrial (Item 28, Appendix B)

Pan, Drain (Item 43, Appendix B)

Materials/Parts

Rag, Wiping (Item 60, Appendix C)

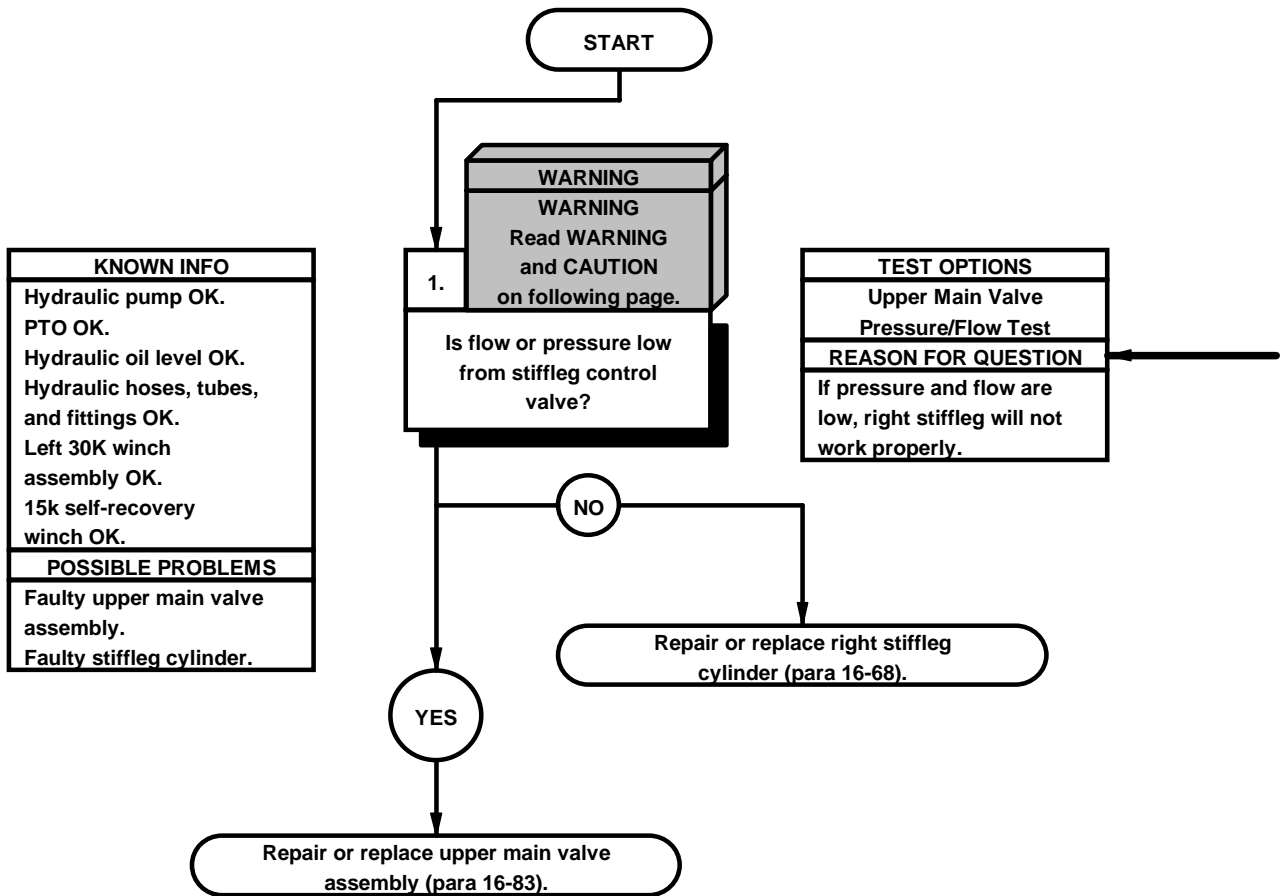
Hose (2) (Item 40, Appendix C)

Fitting (2) (Item 31, Appendix C)

Reducer, Tube (Item 61, Appendix C)

Adapter, Pipe (Item 2, Appendix C)

Adapter, Swivel (Item 3, Appendix C)



WARNING

- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

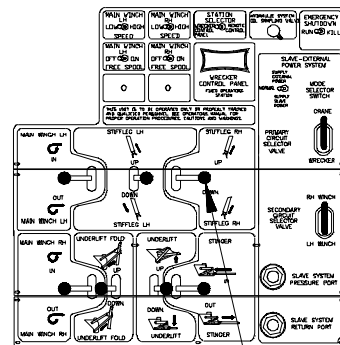
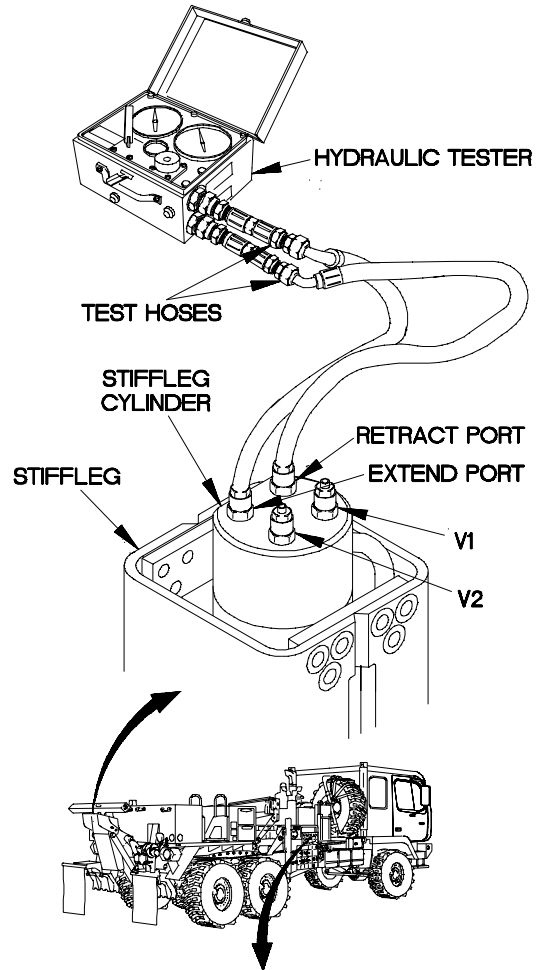
CAUTION

Exercise caution when operating stiffleg. Failure to comply may cause hoses to rub against stiffleg causing damage to equipment.

**UPPER MAIN CONTROL VALVE
PRESSURE/FLOW TEST**

- (1) Place drain pan under vehicle.
- (2) Lift lid on righthand rear storage box and slide off cover over right stiffleg cylinder.
- (3) Disconnect extend hose from extend port of right stiffleg cylinder.
- (4) Disconnect retract hose from retract port of right stiffleg cylinder.

(Continued on next page)



**RIGHT STIFFLEG
CONTROL LEVER**

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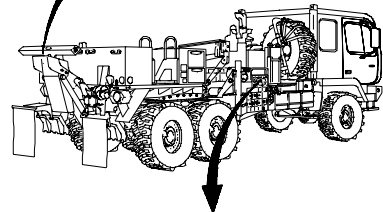
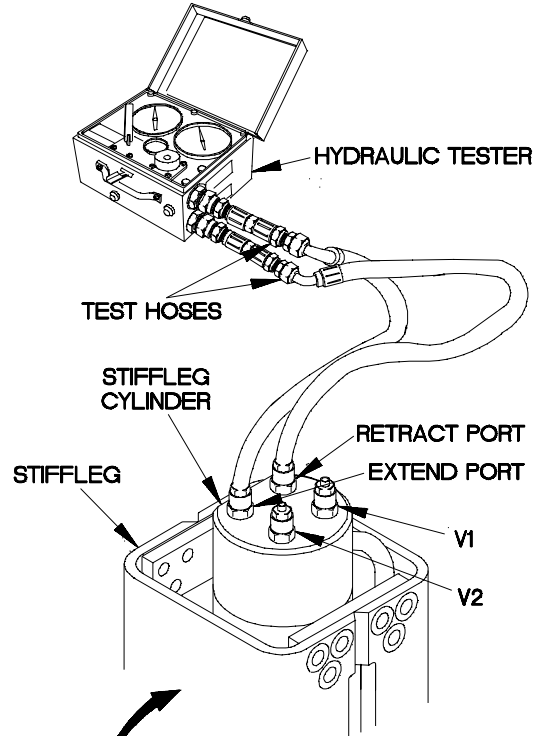
h3. M1089 RIGHT STIFFLEG DRIFTS OR DOES NOT WORK (CONT)

WARNING

- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

CAUTION

Exercise caution when operating stiffleg. Failure to comply may cause hoses to rub against stiffleg causing damage to equipment.



**UPPER MAIN CONTROL VALVE
PRESSURE/FLOW TEST (CONT)**

(Continued from previous page)

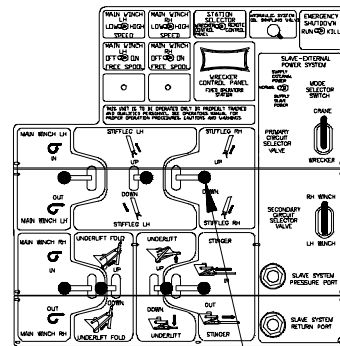
- (5) Connect hydraulic tester to hydraulic system:
 - (a) Connect test hoses to pressure and reservoir ports of hydraulic tester.
 - (b) Connect pressure test hose to right stiffleg extend hose.
 - (c) Connect reservoir test hose to right stiffleg retract hose.

NOTE

Steps (6 through 8) require the aid of an assistant.

- (6) Start engine (TM 9-2320-366-10-1).
- (7) Position PTO switch to on (TM 9-2320-366-10-1).
- (8) Increase engine RPM to 1250-1450 RPM (TM 9-2320-366-10-1).
- (9) Position RIGHT STIFFLEG control valve handle DOWN.
- (10) Perform flow test and note reading.
- (11) Perform pressure test and note reading.
- (12) If flow and pressure are below 12 gpm and 2400 psi, repair or replace upper main valve assembly (para 16-83).
- (13) If flow and pressure are 12 gpm and 2400-3000 psi, repair or replace right stiffleg cylinder (para 16-68).

(Continued on next page)



6BH03021

WARNING

- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

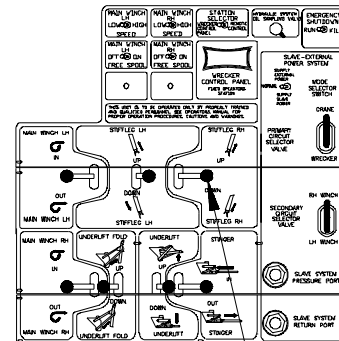
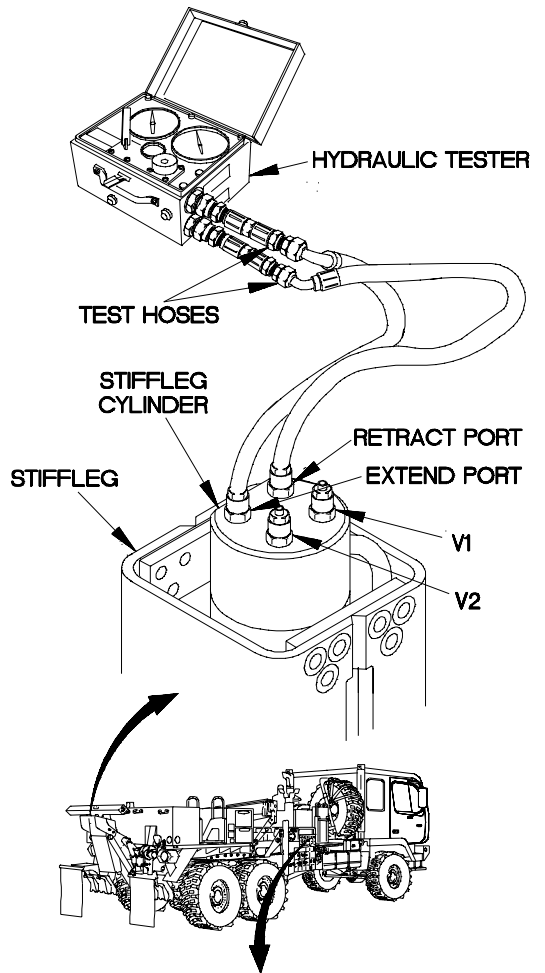
CAUTION

Exercise caution when operating stiffleg. Failure to comply may cause hoses to rub against stiffleg causing damage to equipment.

**UPPER MAIN CONTROL VALVE
PRESSURE/FLOW TEST (CONT)**

(Continued from previous page)

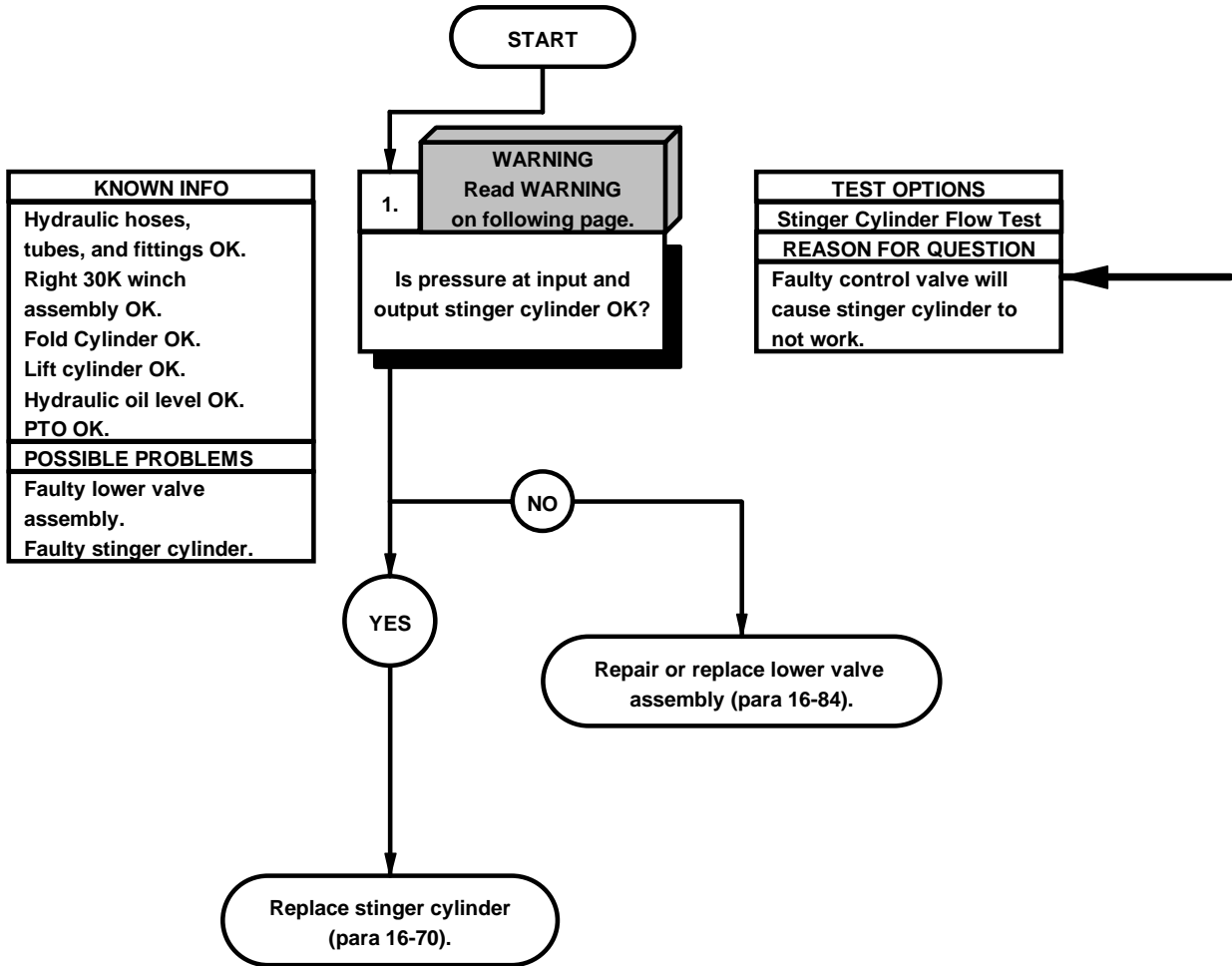
- (14) Position PTO switch to OFF (TM 9-2320-366-10-1).
- (15) Shutdown engine (TM 9-2320-366-10-1).
- (16) Disconnect hydraulic tester from hydraulic system:
 - (a) Disconnect reservoir test hose from right stiffleg retract hose.
 - (b) Disconnect pressure test hose from right stiffleg extend hose.
 - (c) Disconnect test hoses from pressure and reservoir ports of hydraulic tester.
- (17) Connect retract hoses to retract port of right stiffleg cylinder.
- (18) Connect extend hose to extend port of right stiffleg cylinder.
- (19) Slide on cover over right stiffleg assembly and close lid on right hand rear storage box.
- (20) Remove drain pan from under vehicle.



**RIGHT STIFFLEG
CONTROL LEVER**

6 BH03021

h4. M1089 STINGER CYLINDER DOES NOT WORK	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Materials/Parts Rag, Wiping (Item 60, Appendix C) Hose (2) (Item 40, Appendix C) Fitting (2) (Item 31, Appendix C) Fitting (2) (Item 32, Appendix C) Adapter, Pipe (2) (Item 2, Appendix C) Adapter, Swivel (2) (Item 3, Appendix C)
Personnel Required (2)	
Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) Tester, Hydraulic (Item 73, Appendix B) Goggles, Industrial (Item 28, Appendix B) Pan, Drain (Item 43, Appendix B)	



WARNING

- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

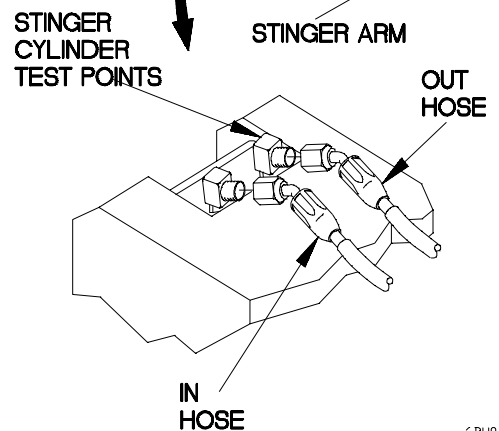
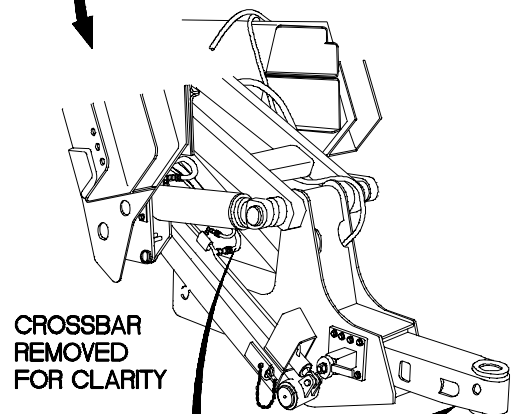
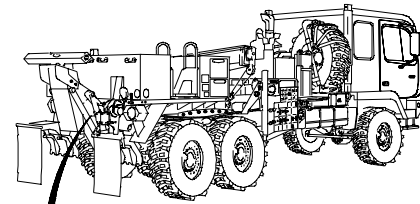
NOTE

Tag hydraulic hoses, tubes, and fittings prior to disconnecting.

STINGER CYLINDER PRESSURE TEST

- (1) Place drain pan under vehicle.
- (2) Disconnect stinger OUT (RH) and stinger IN (LH) hoses at stinger cylinder (test points).
- (3) Connect hydraulic tester between stinger OUT (RH) hose and test point fitting with fittings and adapters.
- (4) Start engine (TM 9-2320-366-10-1).
- (5) Position PTO switch to on (TM 9-2320-366-10-1).
- (6) Increase engine RPM to 1250-1450 RPM (TM 9-2320-366-10-1).
- (7) Position STINGER control valve handle to OUT, perform pressure test and note pressure reading.
- (8) Position PTO switch to off (TM 9-2320-366-10-1).
- (9) Shut down engine (TM 9-2320-366-10-1).
- (10) Disconnect hydraulic tester fittings and adapters.
- (11) Connect stinger out (RH) hose to stinger test point fitting.
- (12) Disconnect stinger in (LH) hose from stinger test point fitting.
- (13) Connect hydraulic tester between stinger IN (LH) hose and test point fitting with fittings and adapters.
- (14) Start engine (TM 9-2320-366-10-1).

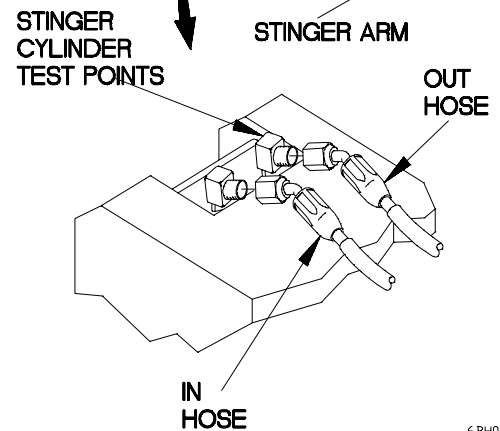
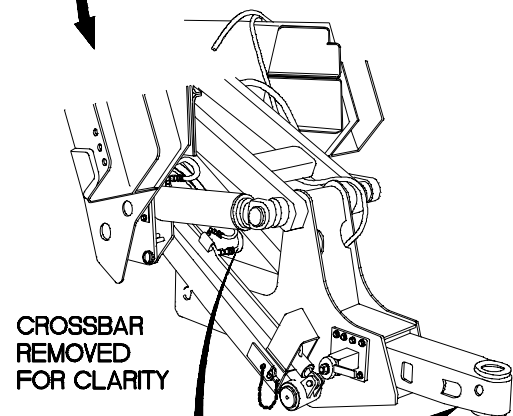
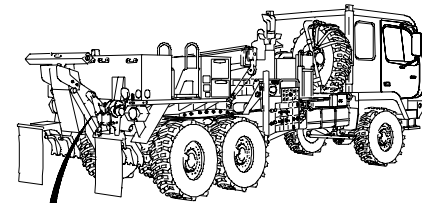
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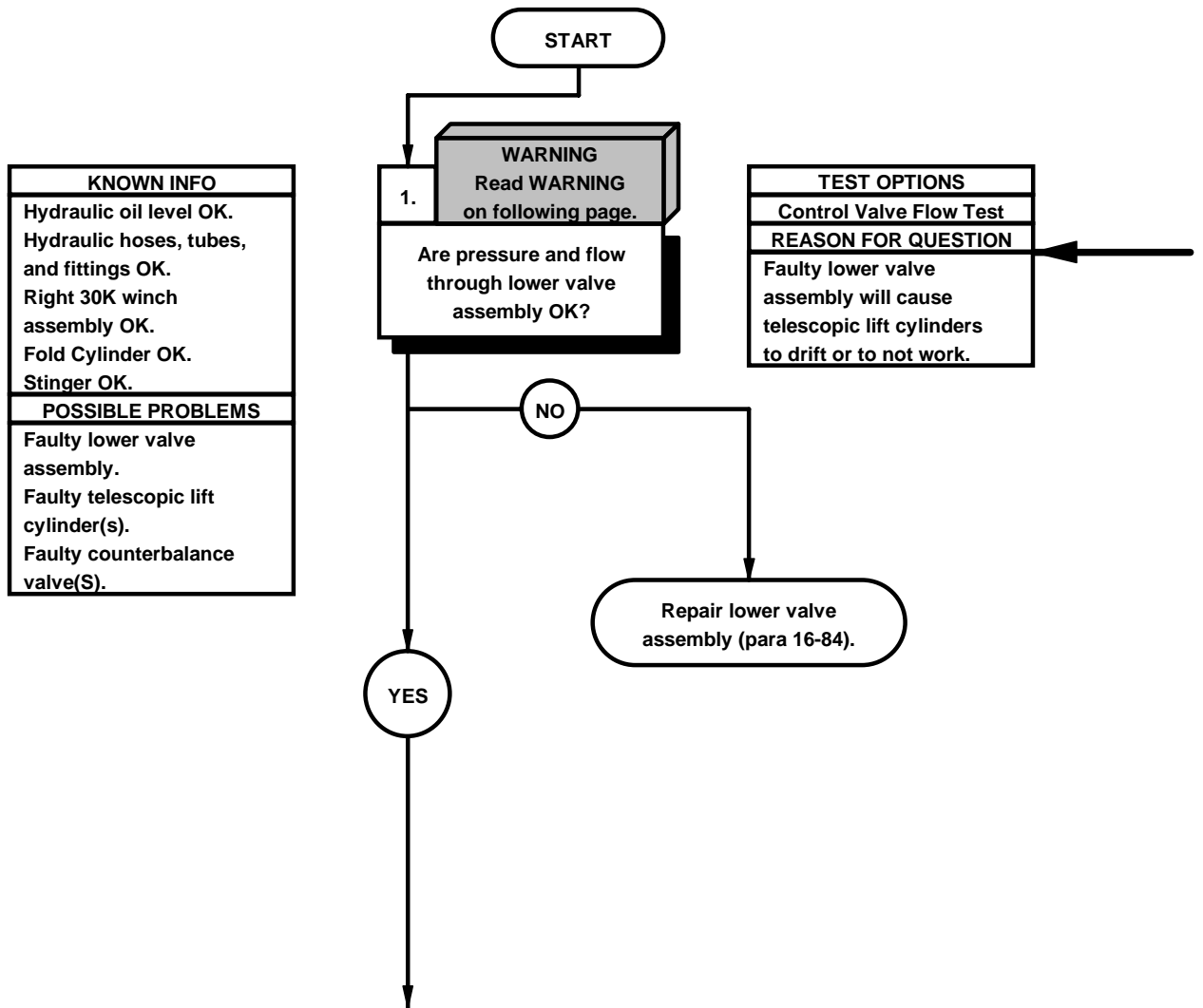
h4. M1089 STINGER CYLINDER DOES NOT WORK (CONT)

- | STINGER CYLINDER PRESSURE TEST (CONT) | |
|----------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| (Continued from previous page) | |
| (15) | Position PTO switch to on (TM 9-2320-366-10-1). |
| (16) | Position stinger control valve handle to IN, perform pressure test, and note pressure reading. |
| (17) | If pressure is not between 2400-2950 psi (16548-20340 kPa), repair or replace lower valve assembly (para 16-84). |
| (18) | If pressure is 2400-2950 psi, (16548-20340 kPa) replace stinger cylinder (para 16-70). |
| (19) | Position PTO switch to off (TM 9-2320-366-10-1). |
| (20) | Shut down engine (TM 9-2320-366-10-1). |
| (21) | Disconnect hydraulic tester, fittings, and adapters. |
| (22) | Connect stinger IN (LH) hose to test point fitting. |
| (23) | Remove drain pan from under vehicle. |



6BH0401a

h5. M1089 TELESCOPIC LIFT CYLINDER(S) DRIFTS OR DOES NOT WORK	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Materials/Parts Rag, Wiping (Item 60, Appendix C) Hose (2) (Item 40, Appendix C) Fitting (2) (Item 31, Appendix C) Reducer, Tube (Item 61, Appendix C) Adapter, Swivel (Item 3, Appendix C) Adapter, Pipe (Item 2, Appendix C)
Personnel Required (2)	
Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) Tester, Hydraulic (Item 73, Appendix B) Pan, Drain (Item 43, Appendix B) Goggles, Industrial (Item 28, Appendix B)	



WARNING

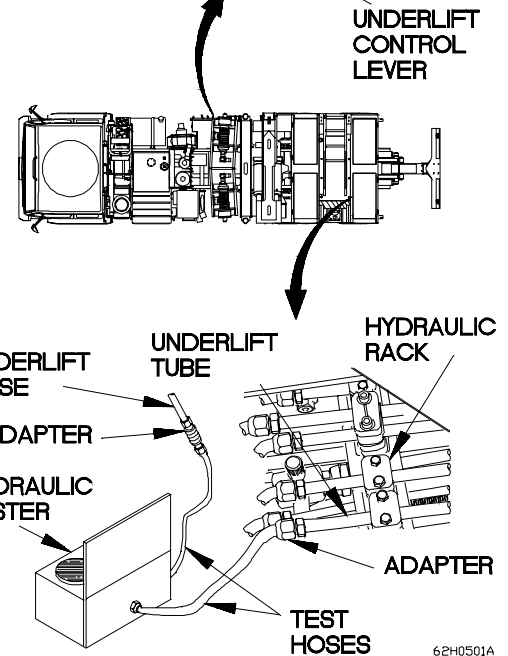
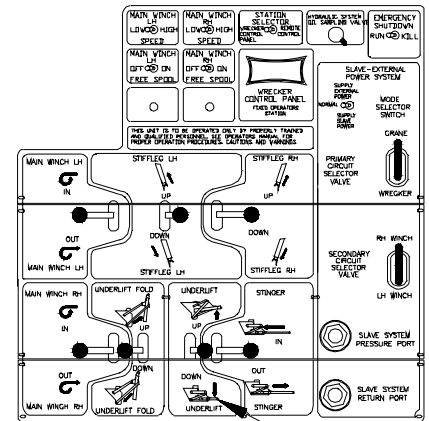
- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

NOTE

Tag hydraulic hoses, tubes, and fittings prior to disconnecting.

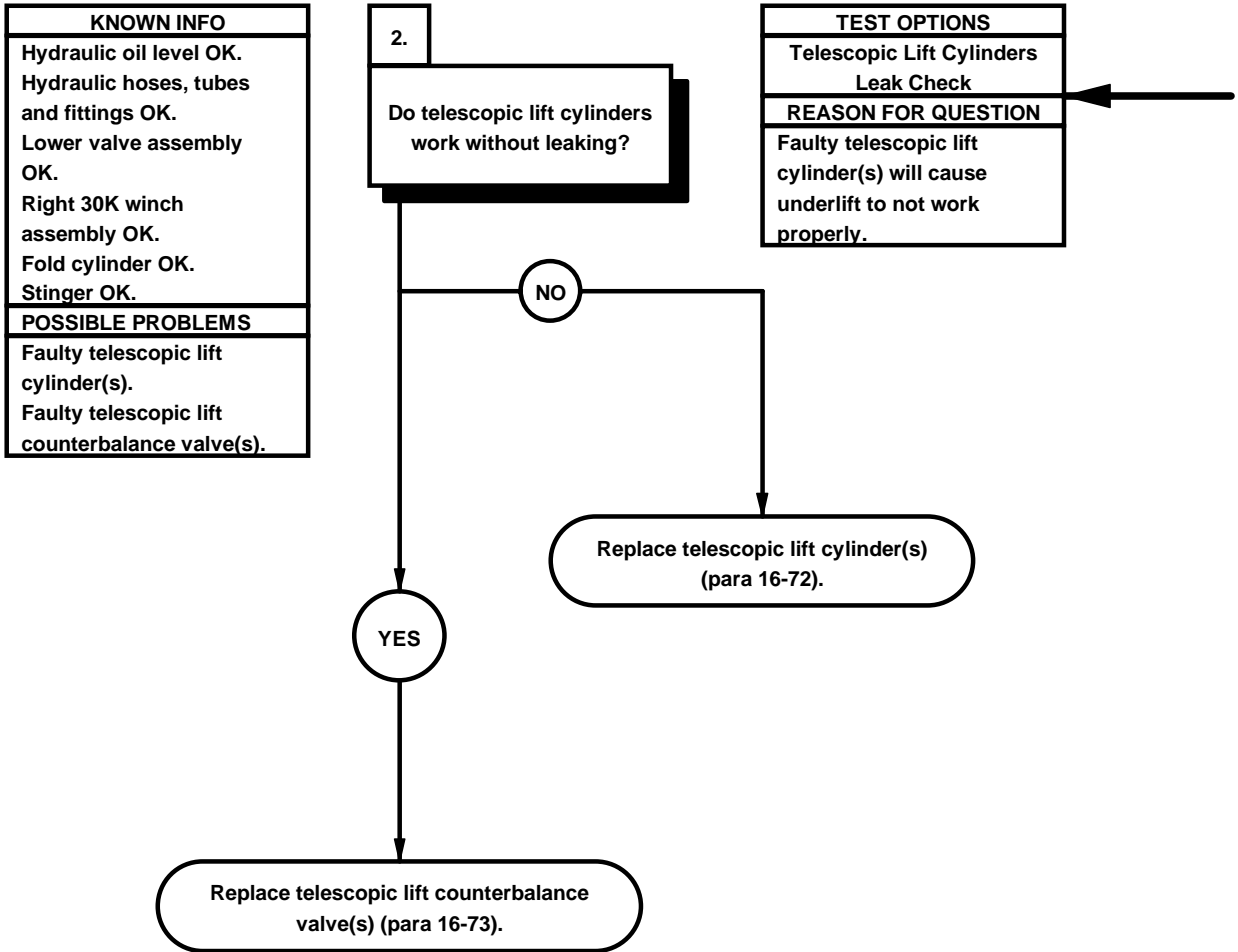
CONTROL VALVE FLOW TEST

- (1) Place drain pan under vehicle.
- (2) Disconnect underlift hose from tube at back end of hydraulic rack.
- (3) Connect hydraulic tester between hose and tube with test hoses and adapters.
- (4) Start engine (TM 9-2320-366-10-1).
- (5) Position PTO switch to ON (TM 9-2320-366-10-1).
- (6) Increase engine RPM to 1250-1450 RPM (TM 9-2320-366-10-1).
- (7) Operate UNDERLIFT UP (TM 9-2320-366-10-1).
- (8) Check for reading of 12-14 gpm (45.24-52.78 lpm) at 2400-2600 psi (16548-18927 kPa).
 - (a) If flow reading is less than 12gpm, control valve in lower main valve assembly is faulty.
 - (b) If pressure reading is more than 2600 psi, 2600 psi relief valve in lower main valve assembly is faulty. Replace 2600 psi relief valve.
- (9) Position PTO switch to OFF (TM 9-2320-366-10-1).
- (10) Shut down engine (TM 9-2320-336-10-1).
- (11) Disconnect hydraulic tester, test hoses and adapter, hose to tube.
- (12) Connect hose to underlift tube at end of hydraulic rack.



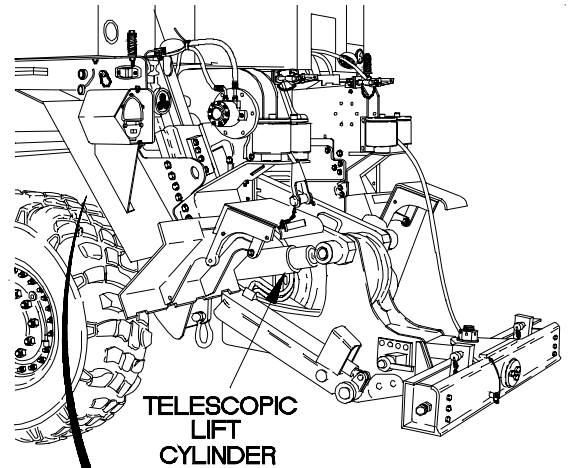
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h5. M1089 TELESCOPIC LIFT CYLINDER(S) DRIFTS OR DOES NOT WORK (CONT)

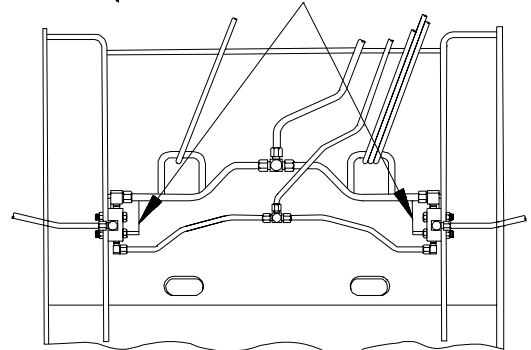


Telescopic Lift Cylinders Leaking

- (1) Check piston rod end of each telescopic lift cylinder for leaks and damage. Replace telescopic lift cylinder.
- (2) If a cylinder is leaking, it is faulty.
- (3) If cylinders are ok, telescopic lift counterbalance valve(s) is faulty. Replace telescopic lift counterbalance valve.
- (4) Remove drain pan from under vehicle.



COUNTERBALANCE VALVES



BOTTOM VIEW

62H0502A

h6. M1089 RH 30K WINCH DOES NOT OPERATE

INITIAL SETUP

Equipment Conditions

Engine shut down (TM 9-2320-366-10-1).
Control panel assembly covers, removed (TM 9-2320-366-20-5).

Tools and Special Tools

Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Transmitter, Pressure (Item 1, Appendix G)
Pan, Drain (Item 43, Appendix B)
Goggles, Industrial (Item 28, Appendix B)

Materials/Parts

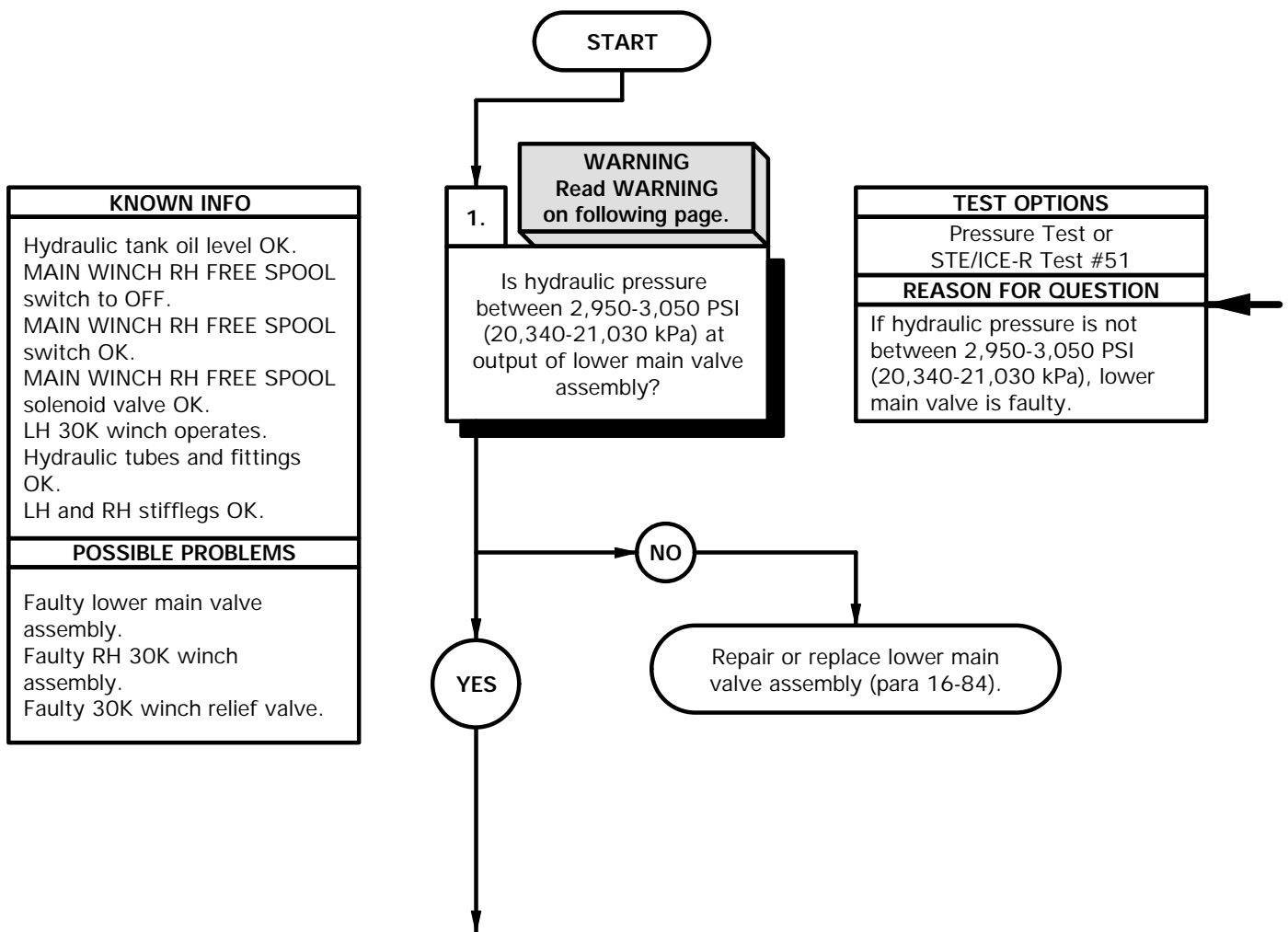
Rag, Wiping (Item 60, Appendix C)
Cap, Tube (Item 17.2, Appendix C)
Hose Assembly, Nonmetallic (Item 40.1, Appendix C)
Plug, Tube Fitting, Threaded (Item 55.1, Appendix C)
Tee, Tube (Item 88.1, Appendix C)
Dispenser, Pressure Sensitive Adhesive Tape (Item 30, Appendix C)

References

TM 9-4910-571-12&P

Personnel Required

(2)



WARNING

Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.

Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.

Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

NOTE

Tag hydraulic hoses, tubes and fittings prior to disconnecting.

LOWER MAIN VALVE ASSEMBLY PRESSURE TEST

- (1) Place drain pan under vehicle.
- (2) Disconnect hose from front fitting of lower main valve assembly.
- (3) Install plug in hose.
- (4) Install swivel run tee on fitting.
- (5) Install cap and reducer on swivel run tee.
- (6) Connect test hose, 10,000 PSI transducer, and STE/ICE-R to reducer.
- (7) Start engine (TM 9-2320-366-10-1).
- (8) Position PTO switch to on (TM 9-2320-366-10-1).

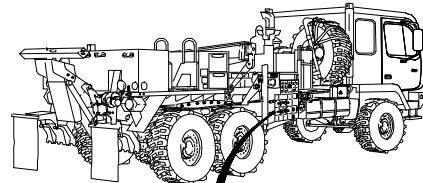
NOTE

In the event of a tachometer failure a HAND THROTTLE lever positioned to L is approximately 1,250-1,450 RPM.

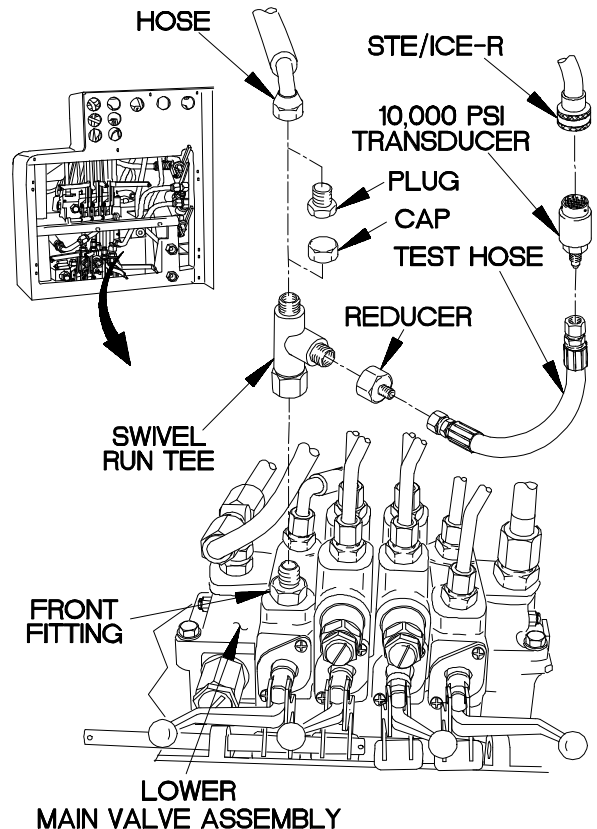
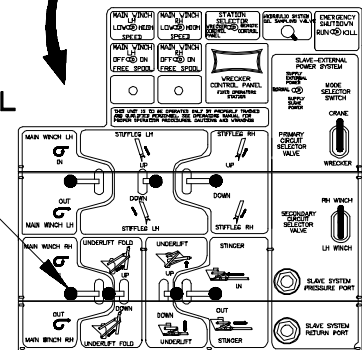
- (9) Set engine speed by increasing HAND THROTTLE lever until tachometer reads 1,250-1,450 RPM.
- (10) Position STATION SELECTOR switch to WRECKER CONTROL PANEL.
- (11) Perform STE/ICE-R test #51 (TM 9-4910-571-12&P).
- (12) Position MAIN WINCH RH lever to OUT and note reading.
- (13) If pressure is not between 2,950-3,050 PSI (20,340-21,030 kPa), repair or replace lower main valve assembly (para 16-84).
- (14) Position PTO switch to off (TM 9-2320-366-10-1).
- (15) Shut down engine (TM 9-2320-366-10-1).
- (16) Disconnect STE/ICE-R, 10,000 transducer, and test hose, from reducer.
- (17) Remove reducer and cap from swivel run tee.

LOWER MAIN VALVE ASSEMBLY PRESSURE TEST (Cont)

- (18) Remove swivel run tee from front fitting of lower main valve.
- (19) Remove plug from hose.
- (20) Connect hose to front fitting of lower main valve.



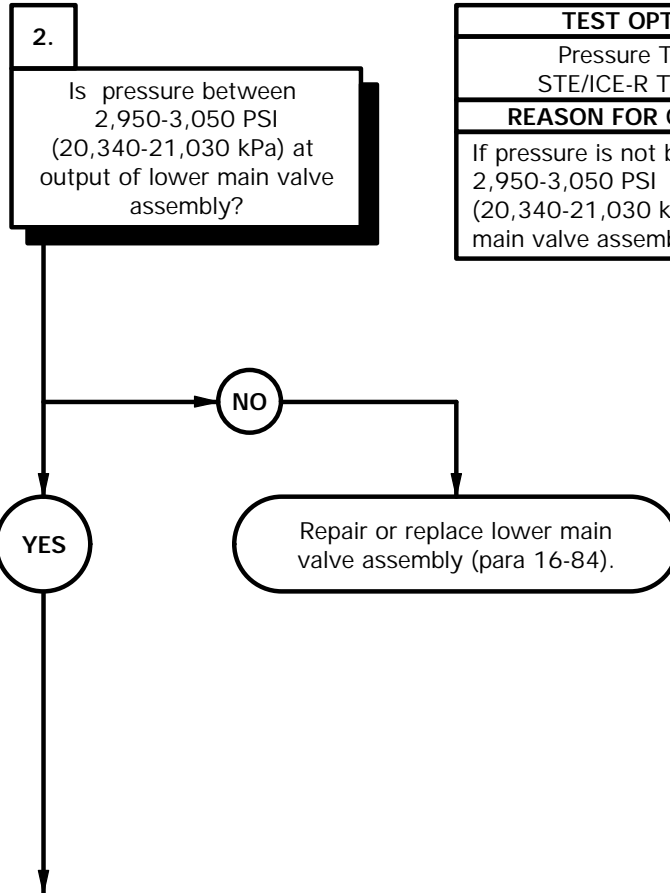
RIGHT MAIN WINCH CONTROL LEVER



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h6. M1089 RH 30K WINCH DOES NOT OPERATE (CONT)

KNOWN INFO
Hydraulic tank oil level OK. MAIN WINCH RH FREE SPOOL switch to OFF. MAIN WINCH RH FREE SPOOL switch OK. MAIN WINCH RH FREE SPOOL solenoid valve OK. LH 30K winch operates. Hydraulic tubes and fittings OK. LH and RH stifflegs OK. M1089 linear directional control valve OK.
POSSIBLE PROBLEMS
Faulty lower main valve assembly. Faulty RH 30K winch assembly. Faulty pressure relief valve assembly.



TEST OPTIONS
Pressure Test or STE/ICE-R Test #51
REASON FOR QUESTION
If pressure is not between 2,950-3,050 PSI (20,340-21,030 kPa), lower main valve assembly is faulty.

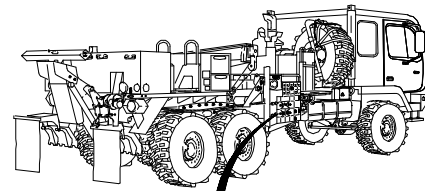
**LOWER MAIN VALVE ASSEMBLY
PRESSURE TEST**

- (1) Place drain pan under vehicle.
- (2) Disconnect hose from rear fitting of lower main valve.
- (3) Install plug in hose.
- (4) Install swivel run tee on rear fitting.
- (5) Install cap and reducer on swivel run tee.
- (6) Connect hose, 10,000 PSI transducer, and STE/ICE-R to reducer.
- (7) Start engine (TM 9-2320-366-10-1).
- (8) Position PTO switch to on (TM 9-2320-366-10-1).

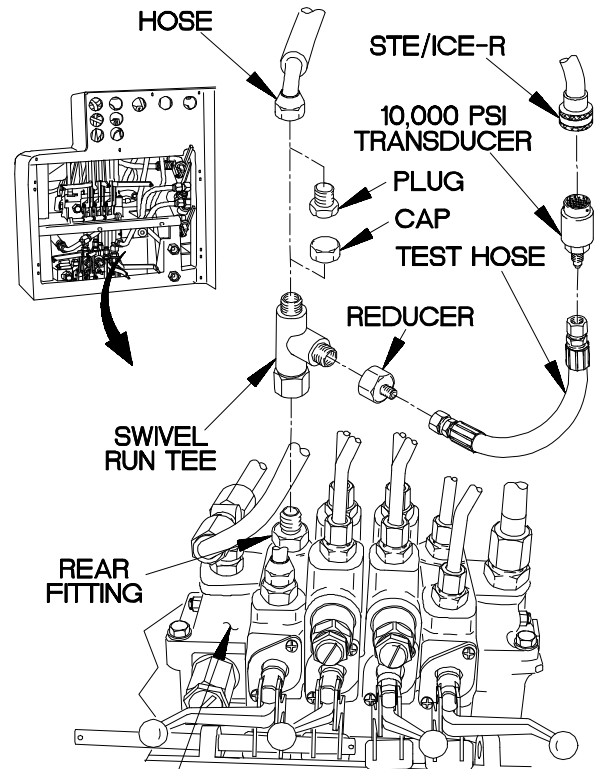
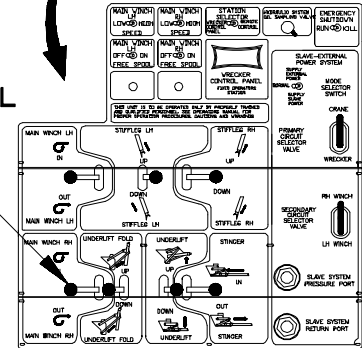
NOTE

In the event of a tachometer failure a HAND THROTTLE lever positioned to L is approximately 1,250-1,450 RPM.

- (9) Set engine speed by increasing HAND THROTTLE lever until tachometer reads 1,250-1,450 RPM.
- (10) Position STATION SELECTOR switch to WRECKER CONTROL PANEL.
- (11) Perform STE/ICE-R test #51 (TM 9-4910-571-12&P).
- (12) Position MAIN WINCH LH lever to IN and note reading hydraulic tester.
- (13) If pressure is not between 2,950-3,050 PSI (20,340-21,030 kPa), repair or replace lower main valve assembly (para 16-84).
- (14) Position PTO switch to off (TM 9-2320-366-10-1).
- (15) Shut down engine (TM 9-2320-366-10-1).
- (16) Disconnect STE/ICE-R, 10,000 transducer, and test hose, from reducer.
- (17) Remove reducer and cap from swivel run tee.
- (18) Remove swivel run tee from rear fitting of lower main valve.
- (19) Remove plug from hose.
- (20) Connect hose to lower main valve fitting.
- (21) Remove drain pan.



RIGHT MAIN WINCH CONTROL LEVER



**LOWER
MAIN VALVE ASSEMBLY**

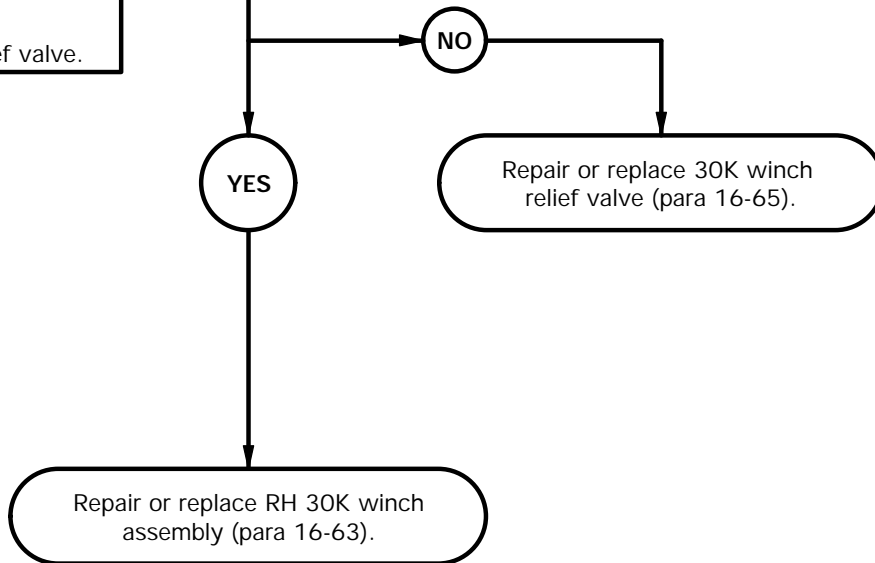
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h6. M1089 RH 30K WINCH DOES NOT OPERATE (CONT)

KNOWN INFO
Hydraulic tank oil level OK. MAIN WINCH RH FREE SPOOL switch to OFF. MAIN WINCH RH FREE SPOOL switch OK. MAIN WINCH RH FREE SPOOL solenoid valve OK. LH 30K winch operates. Hydraulic tubes and fittings OK. LH and RH stifflegs OK. Lower main control valve assembly OK.
POSSIBLE PROBLEMS
Faulty RH 30K winch assembly. Faulty 30K winch relief valve.

3.
Is pressure between 2,925-2,975 PSI (20,340-20,512 kPa) at 30K winch relief valve?

TEST OPTIONS
Pressure Test or STE/ICE-R Test #51
REASON FOR QUESTION
If pressure is not between 2,925-2,975 PSI (20,340-20,512 kPa), 30K winch relief valve is faulty. If pressure is 2,925-2,975 PSI (20,340-20,512 kPa), RH 30K winch assembly is faulty.



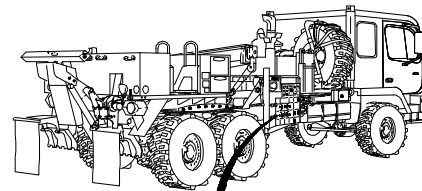
**30K WINCH RELIEF VALVE
PRESSURE TEST**

- (1) Place drain pan under vehicle.
- (2) Disconnect hose from 30K winch relief valve tee fitting.
- (3) Install plug in hose.
- (4) Install swivel run tee on tee fitting.
- (5) Install cap and reducer on swivel run tee.
- (6) Connect test hose, 10,000 PSI transducer, and STE/ICE-R to reducer.
- (7) Start engine (TM 9-2320-366-10-1).
- (8) Position PTO switch to on (TM 9-2320-366-10-1).

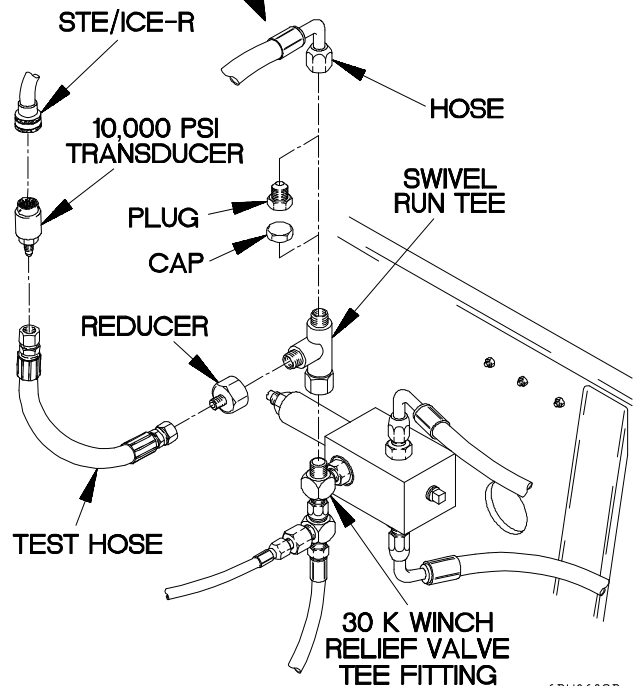
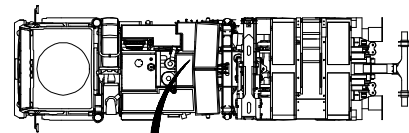
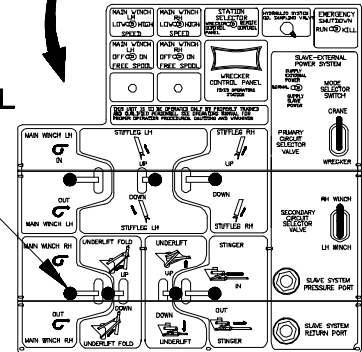
NOTE

In the event of a tachometer failure a HAND THROTTLE lever positioned to L is approximately 1,250-1,450 RPM.

- (9) Set engine speed by increasing HAND THROTTLE lever until tachometer reads 1,250-1,450 RPM.
- (10) Position STATION SELECTOR switch to WRECKER CONTROL PANEL.
- (11) Perform STE/ICE-R test #51 (TM 9-4910-571-12&P).
- (12) Momentarily position MAIN WINCH RH lever to IN and note reading.
- (13) If pressure is not between 2,925-2,975 PSI (20,340-20,512 kPa), replace or repair 30K winch relief valve (para 16-65).
- (14) If pressure is between 2,925-2,975 PSI (20,340-21,512 kPa), replace or repair RH 30K winch assembly (para 16-63).
- (15) Position PTO switch to off (TM 9-2320-366-10-1).
- (16) Shut down engine (TM 9-2320-366-10-1).
- (17) Disconnect STE/ICE-R, 10,000 PSI, and test hose from reducer.
- (18) Remove cap and reducer from swivel run tee.
- (19) Remove swivel run tee from tee fitting.
- (20) Remove plug from hose.
- (21) Connect hose to tee fitting on 30K winch relief valve.
- (22) Remove drain pan.



**RIGHT MAIN
WINCH CONTROL
LEVER**



6BH0603B

h7. M1089 LH 30K WINCH DOES NOT OPERATE

INITIAL SETUP

Equipment Conditions

Engine shut down (TM 9-2320-366-10-1).
Control panel assembly covers, removed (TM 9-2320-366-20-5).

Tools and Special Tools

Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Transmitter, Pressure (Item 1, Appendix G)
Pan, Drain (Item 43, Appendix B)
Goggles, Industrial (Item 28, Appendix B)

Materials/Parts (Cont)

Rag, Wiping (Item 60, Appendix C)
Cap, Tube (Item 17.2, Appendix C)
Hose Assembly, Nonmetallic (Item 40.1, Appendix C)
Plug, Tube Fitting, Threaded (Item 55.1, Appendix C)
Tee, Tube (Item 88.1, Appendix C)
Dispenser, Pressure Sensitive Adhesive Tape (Item 30, Appendix C)

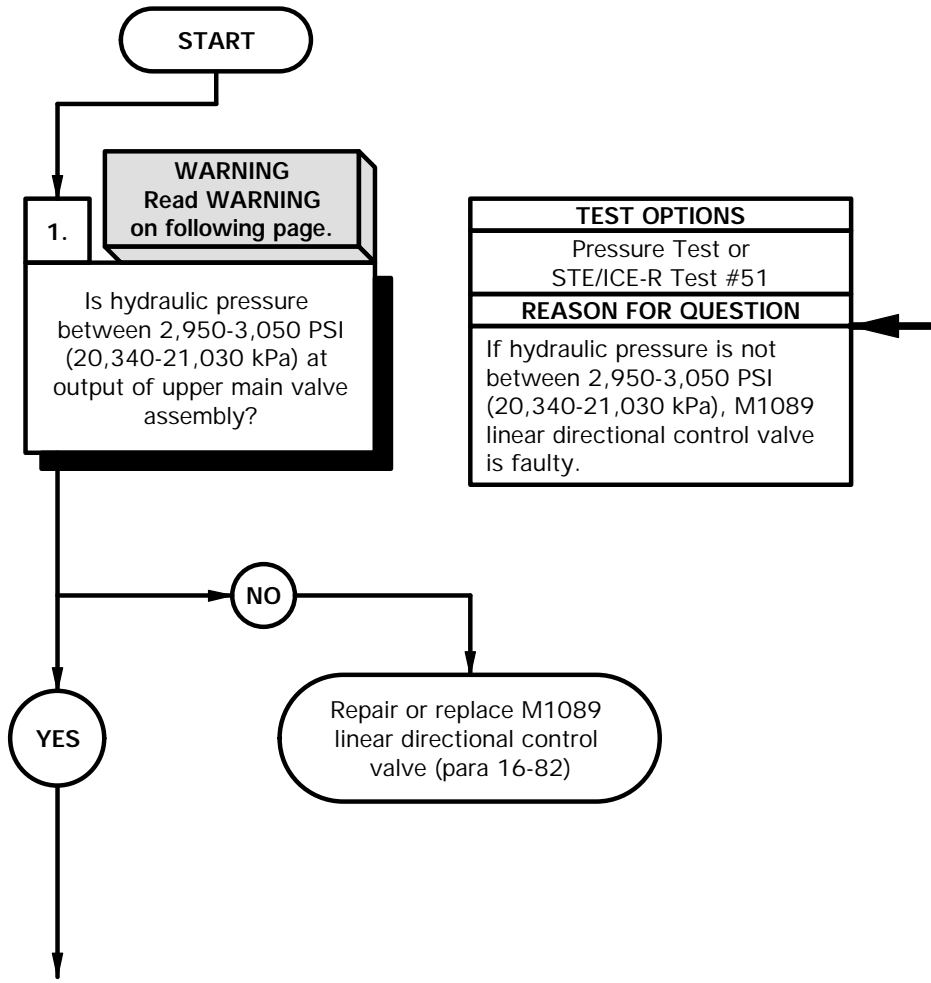
References

TM 9-4910-571-12&P

Personnel Required

(2)

KNOWN INFO
Hydraulic tank oil level OK. MAIN WINCH LH FREE SPOOL switch to OFF. MAIN WINCH LH FREE SPOOL switch OK. MAIN WINCH LH FREE SPOOL solenoid valve OK. RH 30K winch operates. Hydraulic tubes and fittings OK. LH and RH stifflegs OK.
POSSIBLE PROBLEMS
Faulty M1089 linear directional control valve. Faulty upper main valve assembly. Faulty LH 30K winch assembly. Faulty pressure relief valve assembly.



WARNING

Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.

Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.

Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

NOTE

Tag hydraulic hoses, tubes and fittings prior to disconnecting.

M1089 LINEAR DIRECTIONAL CONTROL VALVE PRESSURE TEST

- (1) Place drain pan under vehicle.
- (2) Disconnect hose from front fitting of upper main valve assembly.
- (3) Install plug in hose.
- (4) Install swivel run tee on fitting.
- (5) Install cap and reducer on swivel run tee.
- (6) Connect test hose, 10,000 PSI transducer, and STE/ICE-R to reducer.
- (7) Start engine (TM 9-2320-366-10-1).
- (8) Position PTO switch to on (TM 9-2320-366-10-1).

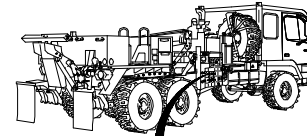
NOTE

In the event of a tachometer failure a HAND THROTTLE lever positioned to L is approximately 1,250-1,450 RPM.

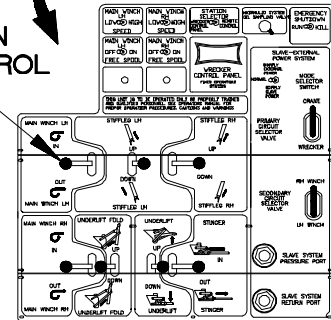
- (9) Set engine speed by increasing HAND THROTTLE lever until tachometer reads 1,250-1,450 RPM.
- (10) Position STATION SELECTOR switch to WRECKER CONTROL PANEL.
- (11) Perform STE/ICE-R test #51 (TM 9-4910-571-12&P).
- (12) Position MAIN WINCH LH lever to OUT and note reading.
- (13) If pressure is not between 2,950-3,050 PSI (20,340-21,030 kPa), repair or replace M1089 linear directional control valve (para 16-82).
- (14) Position PTO switch to off (TM 9-2320-366-10-1).
- (15) Shut down engine (TM 9-2320-366-10-1).
- (16) Disconnect STE/ICE-R, 10,000 transducer, and test hose, from reducer.
- (17) Remove reducer and cap from swivel run tee.

M1089 LINEAR DIRECTIONAL CONTROL VALVE PRESSURE TEST (Cont)

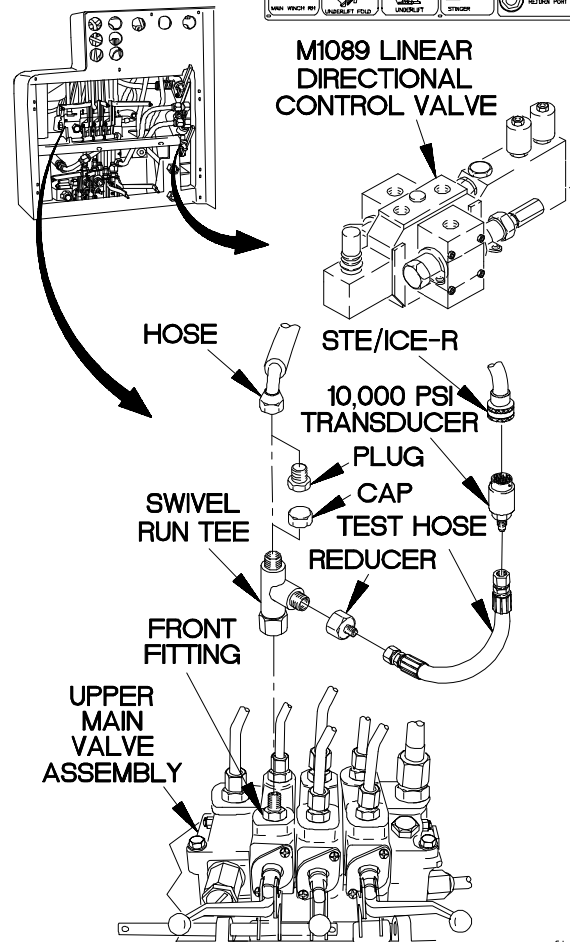
- (18) Remove swivel run tee from front fitting of upper main valve.
- (19) Remove plug from hose.
- (20) Connect hose to front fitting of upper main valve.



LEFT MAIN WINCH CONTROL LEVER



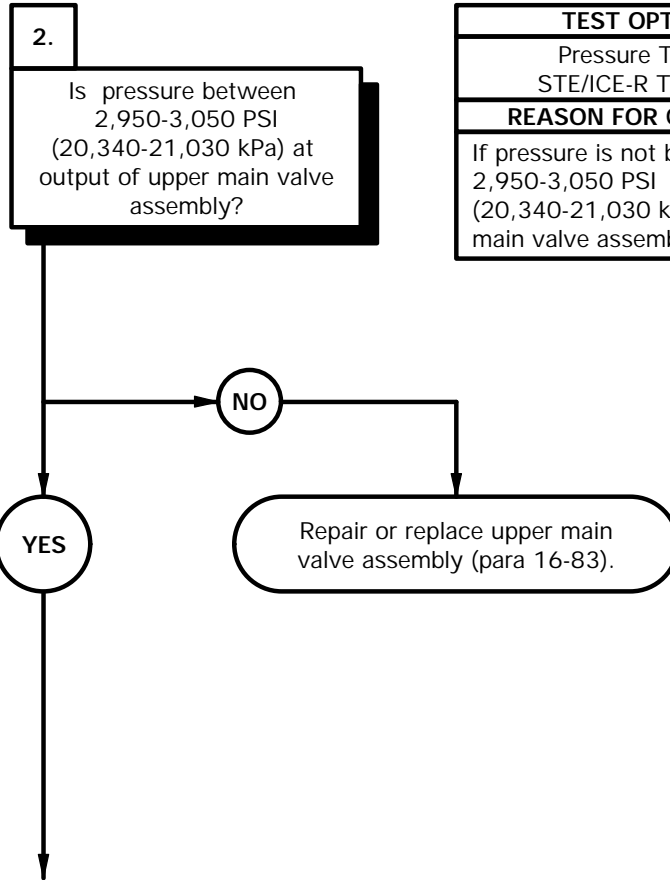
M1089 LINEAR DIRECTIONAL CONTROL VALVE



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h7. M1089 LH 30K WINCH DOES NOT OPERATE (CONT)

KNOWN INFO
Hydraulic tank oil level OK. MAIN WINCH LH FREE SPOOL switch to OFF. MAIN WINCH LH FREE SPOOL switch OK. MAIN WINCH LH FREE SPOOL solenoid valve OK. RH 30K winch operates. Hydraulic tubes and fittings OK. LH and RH stifflegs OK. M1089 linear directional control valve OK.
POSSIBLE PROBLEMS
Faulty upper main valve assembly. Faulty LH 30K winch assembly. Faulty pressure relief valve assembly.



TEST OPTIONS
Pressure Test or STE/ICE-R Test #51
REASON FOR QUESTION
If pressure is not between 2,950-3,050 PSI (20,340-21,030 kPa), upper main valve assembly is faulty.

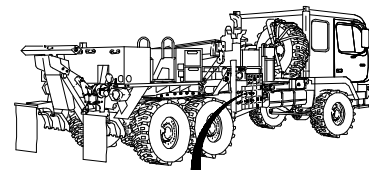
**UPPER MAIN VALVE ASSEMBLY
PRESSURE TEST**

- (1) Place drain pan under vehicle.
- (2) Disconnect hose from rear fitting of upper main valve.
- (3) Install plug in hose.
- (4) Install swivel run tee on rear fitting.
- (5) Install cap and reducer on swivel run tee.
- (6) Connect hose, 10,000 PSI transducer, and STE/ICE-R to reducer.
- (7) Start engine (TM 9-2320-366-10-1).
- (8) Position PTO switch to on (TM 9-2320-366-10-1).

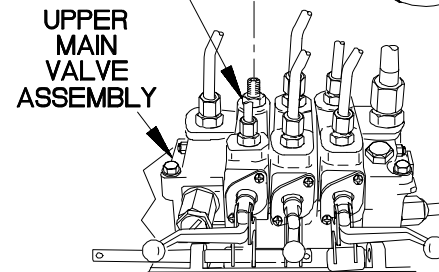
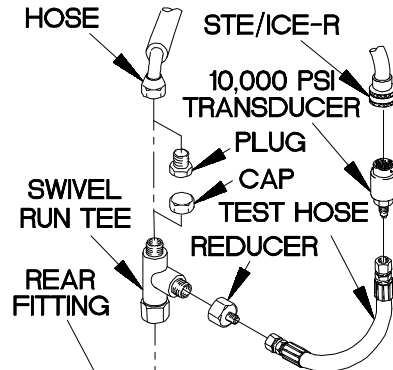
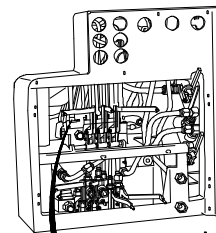
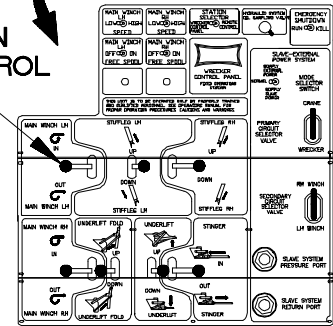
NOTE

In the event of a tachometer failure a HAND THROTTLE lever positioned to L is approximately 1,250-1,450 RPM.

- (9) Set engine speed by increasing HAND THROTTLE lever until tachometer reads 1,250-1,450 RPM.
- (10) Position STATION SELECTOR switch to WRECKER CONTROL PANEL.
- (11) Perform STE/ICE-R test #51 (TM 9-4910-571-12&P).
- (12) Position MAIN WINCH LH lever to IN and note reading hydraulic tester.
- (13) If pressure is not between 2,950-3,050 PSI (20,340-21,030 kPa), repair or replace upper main valve assembly (para 16-83).
- (14) Position PTO switch to off (TM 9-2320-366-10-1).
- (15) Shut down engine (TM 9-2320-366-10-1).
- (16) Disconnect STE/ICE-R, 10,000 transducer, and test hose, from reducer.
- (17) Remove reducer and cap from swivel run tee.
- (18) Remove swivel run tee from rear fitting of upper main valve.
- (19) Remove plug from hose.
- (20) Connect hose to upper main valve fitting.
- (21) Remove drain pan.



LEFT MAIN WINCH CONTROL LEVER



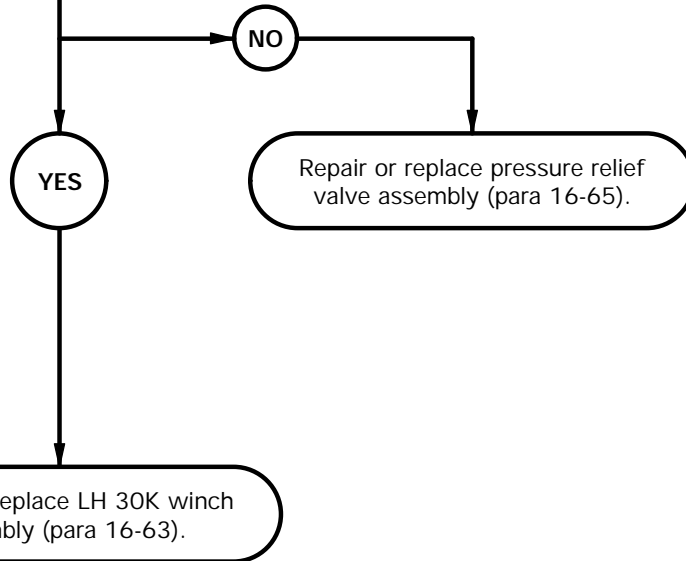
6BH0702B

h7. M1089 LH 30K WINCH DOES NOT OPERATE (CONT)

KNOWN INFO
Hydraulic tank oil level OK. MAIN WINCH LH FREE SPOOL switch to OFF. MAIN WINCH LH FREE SPOOL switch OK. MAIN WINCH LH FREE SPOOL solenoid valve OK. RH 30K winch operates. Hydraulic tubes and fittings OK. LH and RH stifflegs OK. Upper main control valve assembly OK. M1089 linear directional control valve OK
POSSIBLE PROBLEMS
Faulty LH 30K winch assembly. Faulty pressure relief valve assembly.

3.
Is pressure between 2,925-2,975 PSI (20,168-20,512 kPa) at 30K winch relief valve?

TEST OPTIONS
Pressure Test or STE/ICE-R Test #51
REASON FOR QUESTION
If pressure is not between 2,925-2,975 PSI (20,168-20,512 kPa), 30K winch relief valve is faulty. If pressure is 2,925-2,975 PSI (20,168-20,512 kPa), LH 30K winch assembly is faulty.



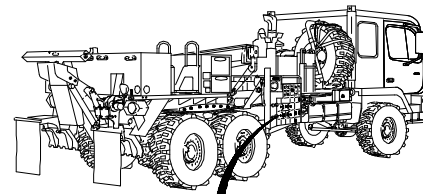
**30K WINCH RELIEF VALVE
PRESSURE TEST**

- (1) Place drain pan under vehicle.
- (2) Disconnect hose from 30K winch relief valve tee fitting.
- (3) Install plug in hose.
- (4) Install swivel run tee on tee fitting.
- (5) Install cap and reducer on swivel run tee.
- (6) Connect test hose, 10,000 PSI transducer, and STE/ICE-R to reducer.
- (7) Start engine (TM 9-2320-366-10-1).
- (8) Position PTO switch to on (TM 9-2320-366-10-1).

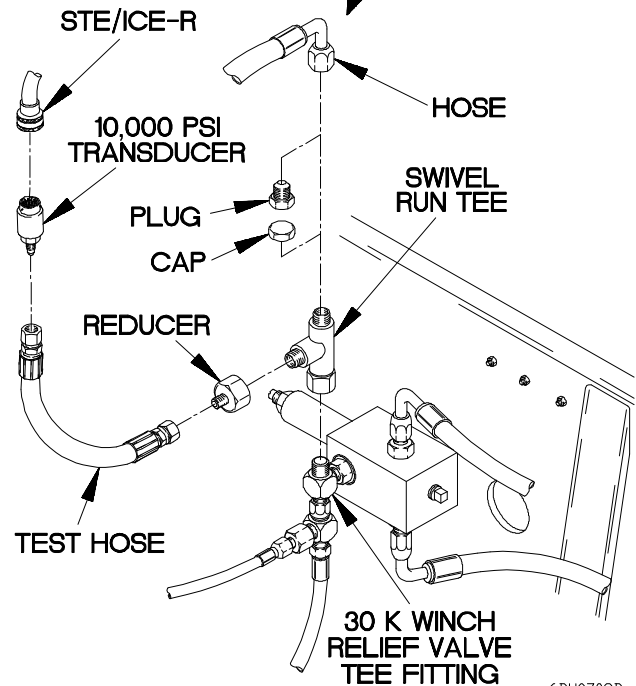
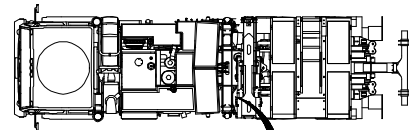
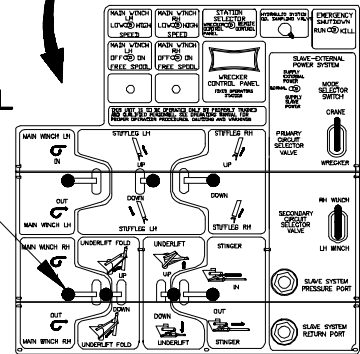
NOTE

In the event of a tachometer failure a HAND THROTTLE lever positioned to L is approximately 1,250-1,450 RPM.

- (9) Set engine speed by increasing HAND THROTTLE lever until tachometer reads 1,250-1,450 RPM.
- (10) Position STATION SELECTOR switch to WRECKER CONTROL PANEL.
- (11) Perform STE/ICE-R test #51 (TM 9-4910-571-12&P).
- (12) Momentarily position MAIN WINCH LH lever to IN and note reading.
- (13) If pressure is not between 2,925-2,975 PSI (20,168-20512 kPa), replace or repair 30K winch relief valve (para 16-65).
- (14) If pressure is between 2,925-2,975 PSI (20,168-20,512 kPa), replace or repair LH 30K winch assembly (para 16-63).
- (15) Position PTO switch to off (TM 9-2320-366-10-1).
- (16) Shut down engine (TM 9-2320-366-10-1).
- (17) Disconnect STE/ICE-R, 10,000 PSI, and test hose from reducer.
- (18) Remove cap and reducer from swivel run tee.
- (19) Remove swivel run tee from tee fitting.
- (20) Remove plug from hose.
- (21) Connect hose to tee fitting on 30K winch relief valve.
- (22) Remove drain pan.



RIGHT MAIN WINCH CONTROL LEVER



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h8. PAY-OUT HYDRAULIC MOTOR DOES NOT WORK

INITIAL SETUP

Equipment Conditions

Engine shut down (TM 9-2320-366-10-1).

Materials/Parts

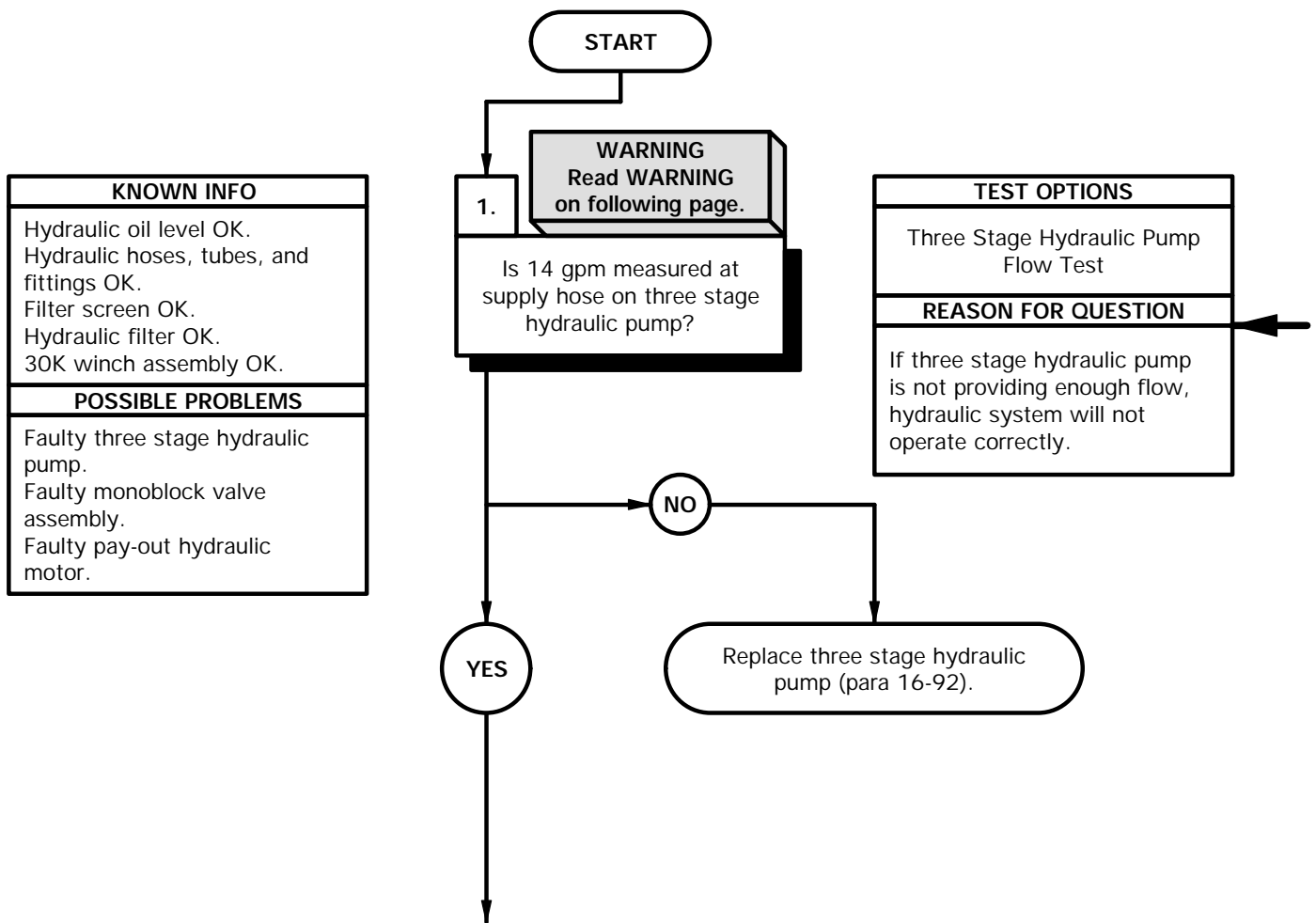
Rag, Wiping (Item 60, Appendix C)
 Hose (2) (Item 40, Appendix C)
 Fitting (2) (Item 31, Appendix C)
 Reducer, Tube (Item 61, Appendix C)

Tools and Special Tools

Tool Kit, Genl Mech (Item 78, Appendix B)
 Tester, Hydraulic (Item 73, Appendix B)
 Goggles, Industrial (Item 28, Appendix B)
 Pan, Drain (Item 43, Appendix B)

Personnel Required

(2)



WARNING

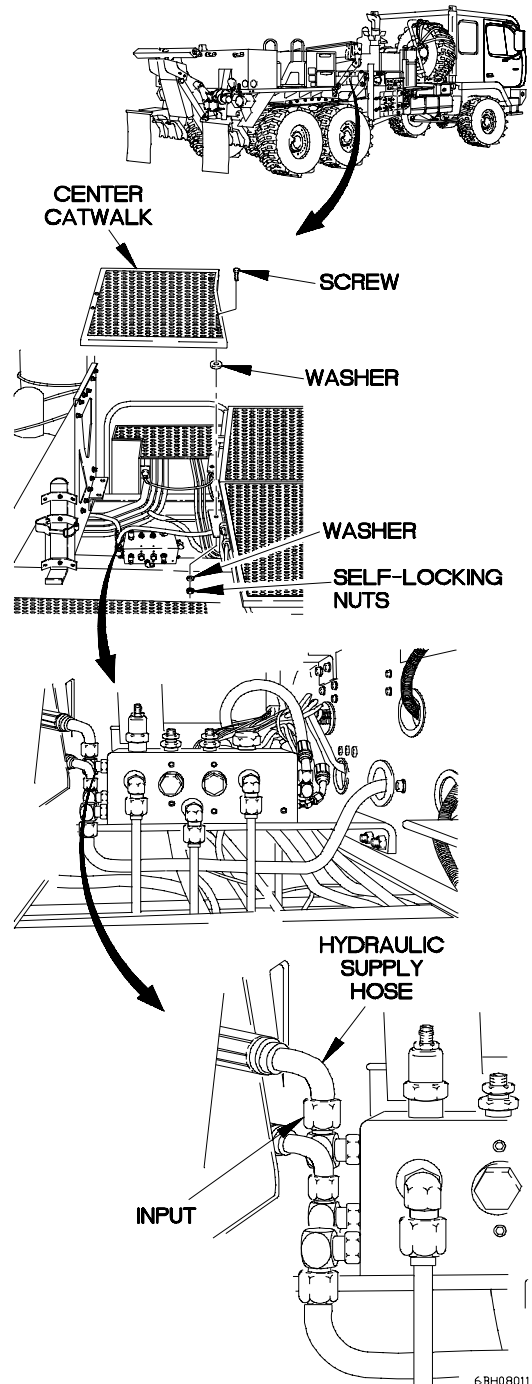
- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

NOTE

Tag hydraulic hoses, tubes and fittings prior to disconnecting.

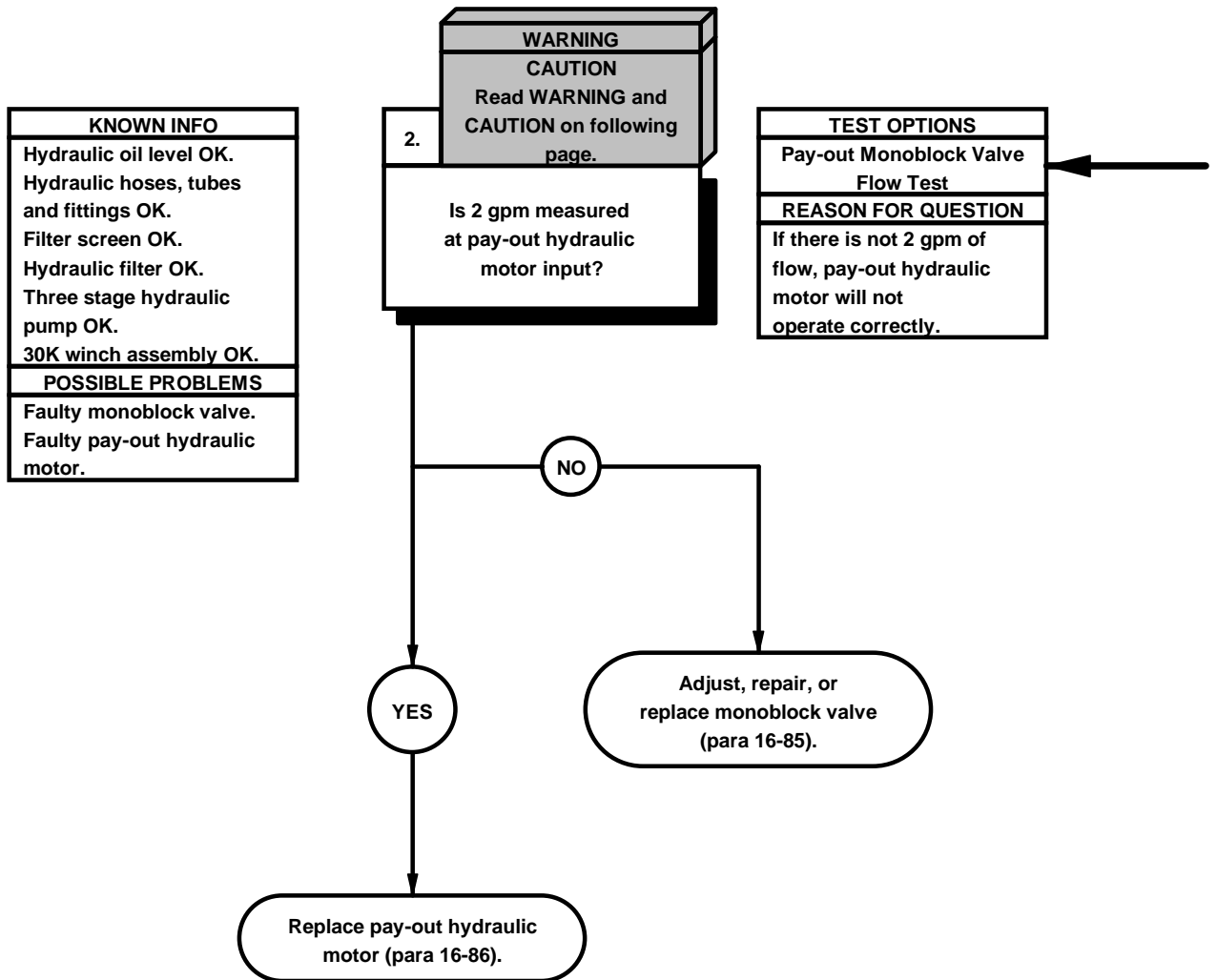
HYDRAULIC PUMP FLOW TEST

- (1) Remove four self locking nuts, washers, screws and center catwalk.
- (2) Place drain pan under vehicle.
- (3) Disconnect hydraulic supply hose at input of monoblock valve.
- (4) Connect two test hoses with fittings and adapters to hydraulic tester.
- (5) Connect hydraulic tester pressure hose to disconnected hydraulic supply hose.
- (6) Connect hydraulic tester reservoir hose to monoblock valve input fitting.
- (7) Start engine (TM 9-2320-366-10-1).
- (8) Engage PTO (TM 9-2320-366-10-1).
- (9) Increase engine RPM to 1250-1450 RPM (TM 9-2320-10-1).
- (10) Perform a flow check and note reading.
- (11) Perform a pressure check and note reading.
- (12) If flow does not read 12-14 gpm (45-53 lpm) or 2400-2950 psi (16548-20340 Kpa), replace the three stage hydraulic pump (para 16-92).
- (13) Decrease engine speed to 750 rpm.
- (14) Position PTO switch to OFF (TM 9-2320-366-10-1).
- (15) Shut down engine (TM 9-2320-366-10-1).
- (16) Disconnect flow/pressure kit and disassemble test hoses, fittings, and adapters.
- (17) Connect hydraulic supply hose to monoblock valve assembly input.
- (18) Remove drain pan.
- (19) Install four screws, washers, self-locking nuts, center catwalk.



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h8. M1089 PAY-OUT HYDRAULIC MOTOR DOES NOT WORK (CONT)

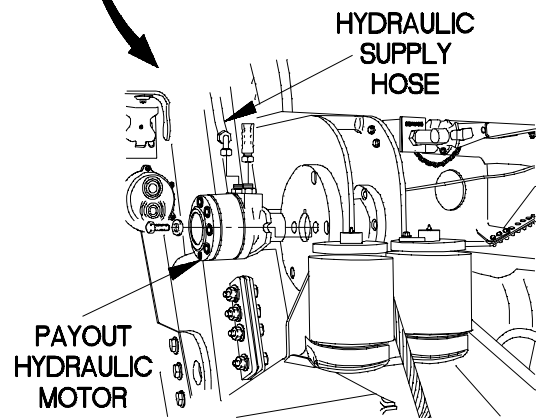
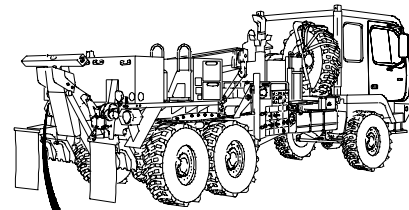


WARNING

- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

NOTE

Tag hydraulic hoses, tubes and fittings prior to disconnecting.



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MONOBLOCK VALVE ASSEMBLY FLOW TEST

- (1) Place drain pan under vehicle.
- (2) Disconnect hydraulic supply hose at input of pay-out hydraulic motor.
- (4) Connect two test hoses with fittings and adapters to hydraulic tester.
- (5) Connect hydraulic tester pressure port hose to hydraulic supply hose.
- (6) Connect hydraulic tester reservoir port hose to pay-out hydraulic motor input fitting.
- (7) Start engine (TM 9-2320-366-10-1).
- (8) Engage PTO (TM 9-2320-366-10-1).
- (9) Increase engine RPM to 1250-1450 RPM (TM 9-2320-366-10-1).
- (10) Position MAIN WINCH LH or RH lever to OUT (TM 9-2320-366-10-1) and note flow and pressure reading.
- (11) If flow does not read 2 gpm (8 lpm) or 2400-2750 psi (4800-5500 kPa), adjust, repair, or replace monoblock valve (para 16-85).
- (12) If flow reads 2 gpm (8 /pm) or 2400-2750 psi (4800-5500 kPa), replace payout hydraulic motor (para 16-86).
- (13) Decrease engine speed to 750 rpm.
- (14) Position PTO switch to off (TM 9-2320-366-10-1).
- (15) Shut down engine (TM 9-2320-366-10-1).
- (16) Disconnect hydraulic tester and disassemble test hoses, fittings, and adapters.
- (17) Connect hydraulic supply hose to pay-out hydraulic motor input fitting.
- (18) Remove drain pan.

2-17. 15K SELF-RECOVERY WINCH (SRW) SYSTEM TROUBLESHOOTING

This paragraph covers 15K SRW System Troubleshooting. The 15K SRW System Fault Index, Table 2-15, lists faults for the 15K SRW System of the vehicle.

Table 2-15. 15K Self-Recovery Winch (SRW) System Fault Index

Fault No.	Description	Page
i1.	15K Self-Recovery Winch (SRW) Does Not Work	2-1018

i1. 15K SELF-RECOVERY WINCH DOES NOT WORK

INITIAL SETUP

Equipment Conditions

Engine shut down (TM 9-2320-366-10-1).

Personnel Required

(2)

References

TM 9-4910-571-12&P

Tools and Special Tools

Tool Kit, Genl Mech (Item 78, Appendix B)

Tester, Hydraulic (Item 73, Appendix B)

Pan, Drain (Item 43, Appendix B)

Goggles, Industrial (Item 28, Appendix B)

STE/ICE-R (Item 70, Appendix B)

Materials/Parts

Rag, Wiping (Item 60, Appendix C)

Hose (2) (Item 40, Appendix C)

Fitting (2) (Item 31, Appendix C)

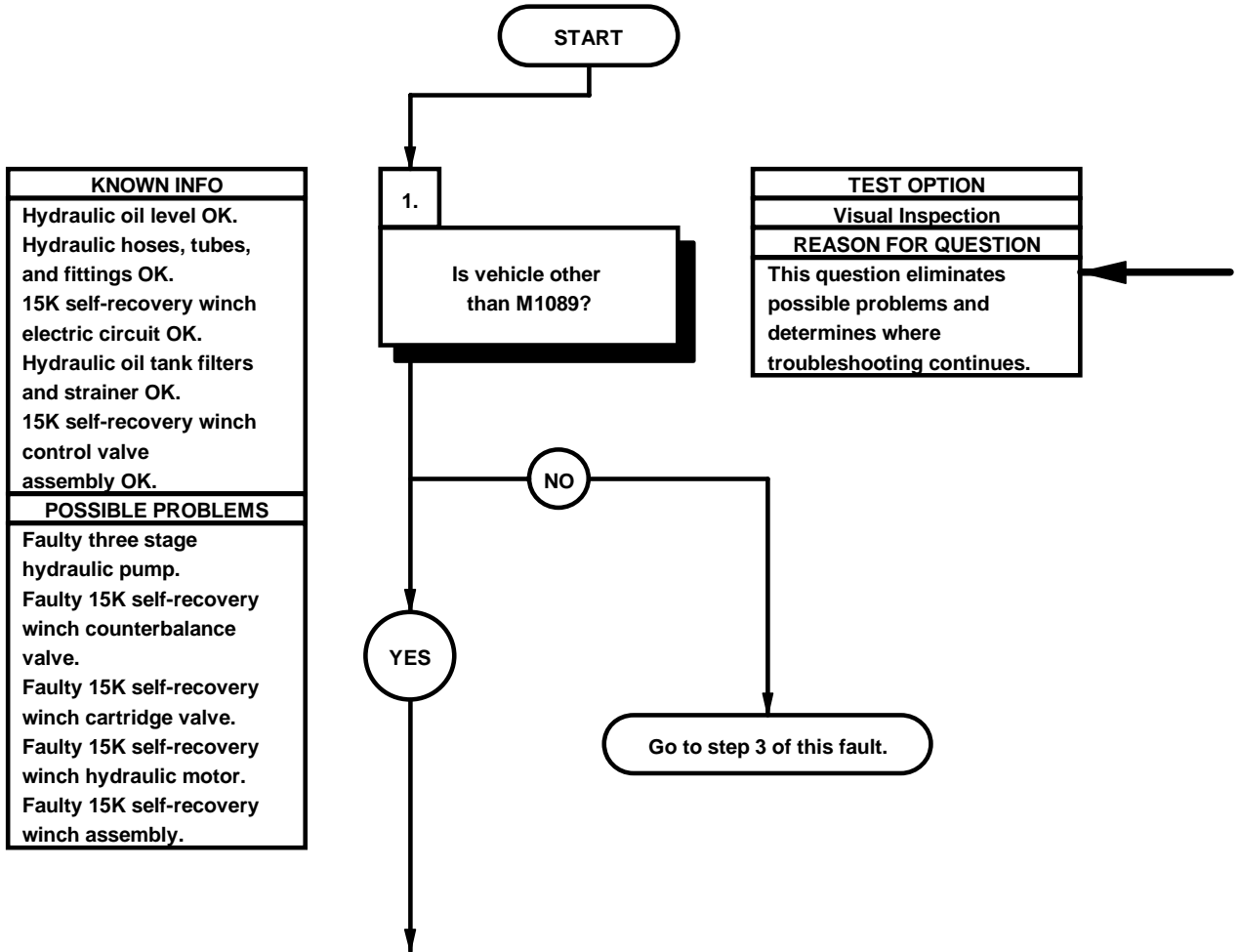
Fitting (Item 32, Appendix C)

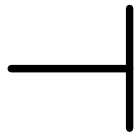
Reducer, Tube (Item 61, Appendix C)

Adapter, Swivel (Item 3, Appendix C)

Adapter, Pipe (Item 2, Appendix C)

Adapter, Pipe (Item 1, Appendix C)

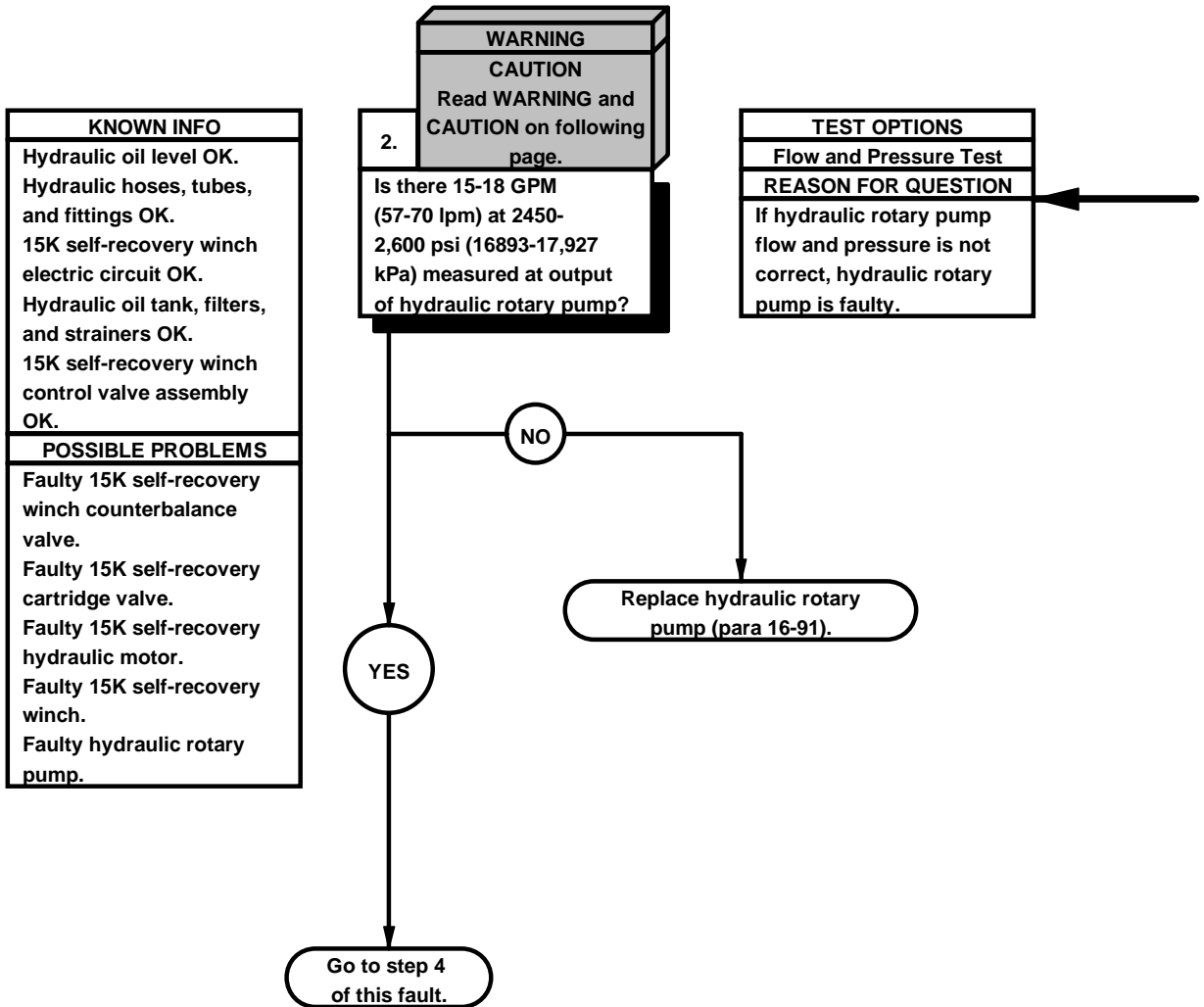




VISUAL

- (1) If vehicle is not M1089 go to step 2 of this fault.
- (2) If vehicle is M1089 go to step 3 of this fault.

i1. 15K SELF-RECOVERY WINCH DOES NOT WORK (CONT)



WARNING

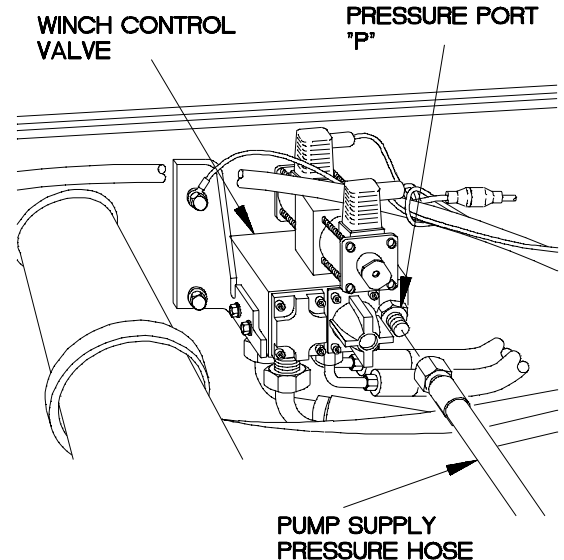
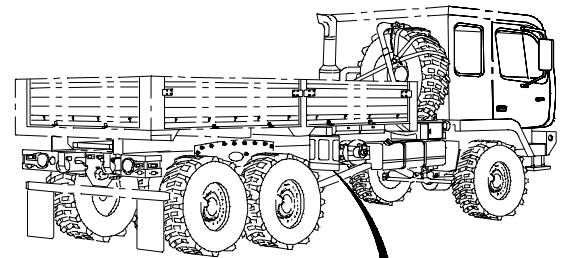
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

CAUTION

Maintain engine rpm at 1,250-1,450 rpm while performing pressure and flow tests. Failure to comply may result in damage to equipment.

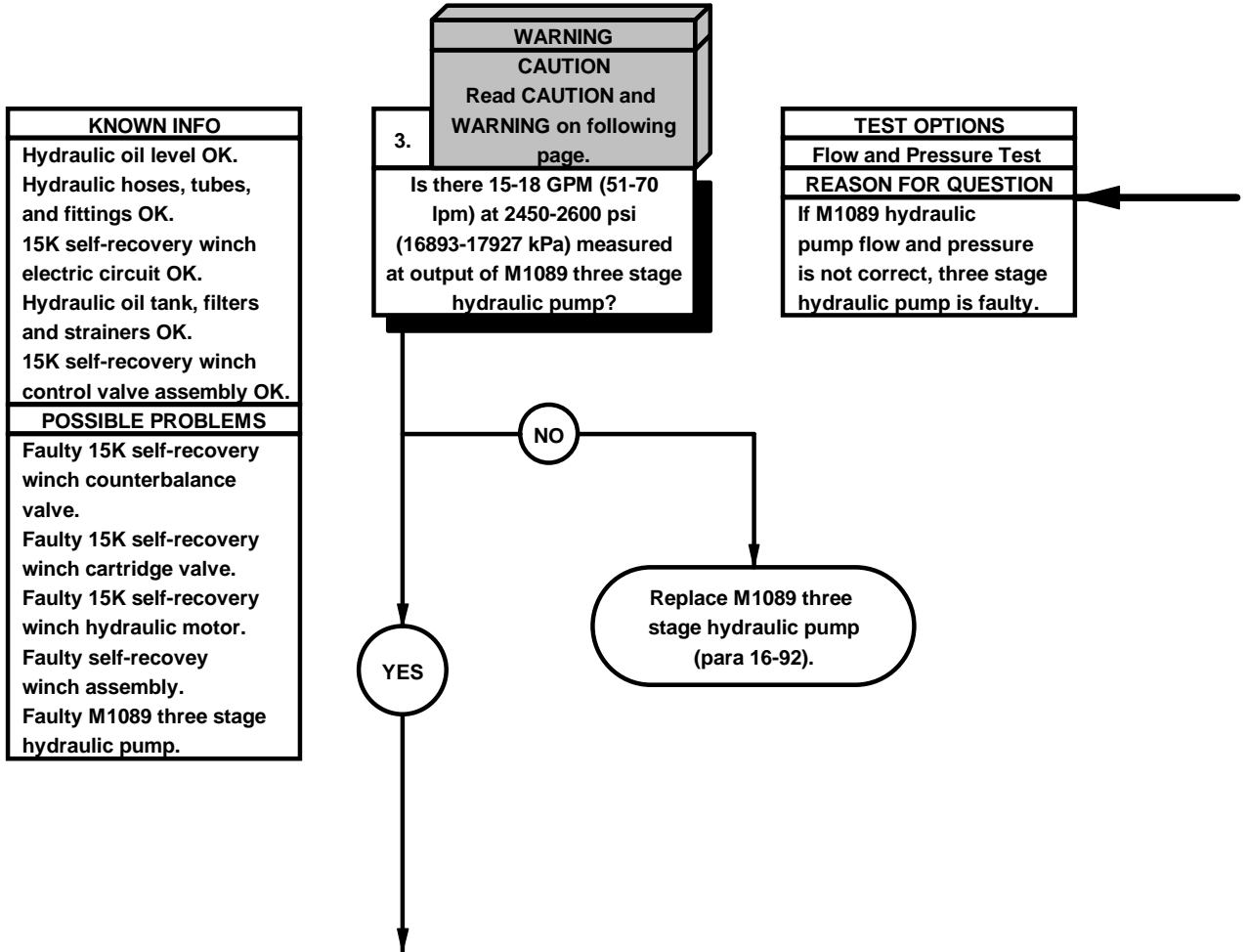
HYDRAULIC FLOW AND PRESSURE TEST

- (1) Position drain pan under winch control valve.
- (2) Disconnect pump supply pressure hose from pressure port (P) on winch control valve.
- (3) Connect pressure hose to hydraulic tester.
- (4) Connect pressure hose from hydraulic tester to pressure port (P) of winch control valve.
- (5) Completely open hydraulic tester load valve.
- (6) Start and run engine until normal operating temperature is reached (TM 9-2320-366-10-1).
- (7) Engage PTO (TM 9-2320-366-10-1).
- (8) Increase engine RPM to 1250-145- RPM (TM 9-2320-366-10-1).
- (9) Slowly close load valve on hydraulic tester until 2450-2600 psi (16893-17927 kPa) is reached and note flow on hydraulic tester.
- (10) If flow is not 15-18 GPM (57-70 lpm) at 2450-2600 psi, replace hydraulic rotary pump (para 16-91).
- (11) Open load valve on hydraulic tester.
- (12) Decrease engine speed (TM 9-2320-366-10-1).
- (13) Position PTO switch to off (TM 9-2320-366-10-1).
- (14) Shut down engine (TM 9-2320-366-10-1).
- (15) Disconnect pressure hose from hydraulic tester at pressure port (P) of winch control valve.
- (16) Disconnect pump supply pressure hose from hydraulic tester.
- (17) Connect pump supply pressure hose to port (P) on winch control valve.
- (18) Remove drain pan from under winch control valve.



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i1. 15K SELF-RECOVERY WINCH DOES NOT WORK (CONT)



WARNING

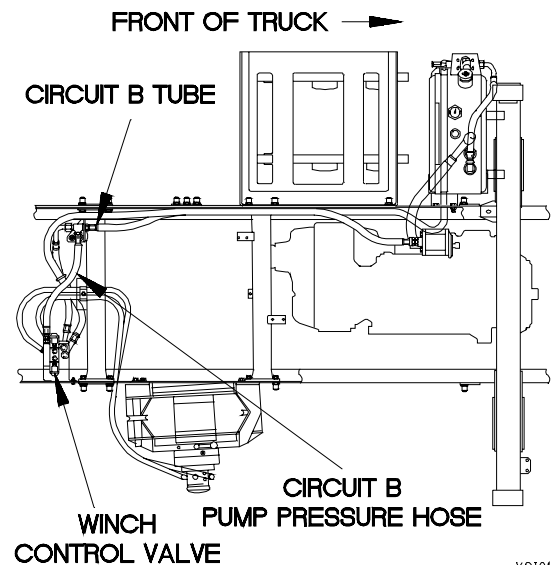
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

CAUTION

Maintain engine rpm at 1,250-1,450 rpm while performing pressure and flow test. Failure to comply may result in damage to equipment.

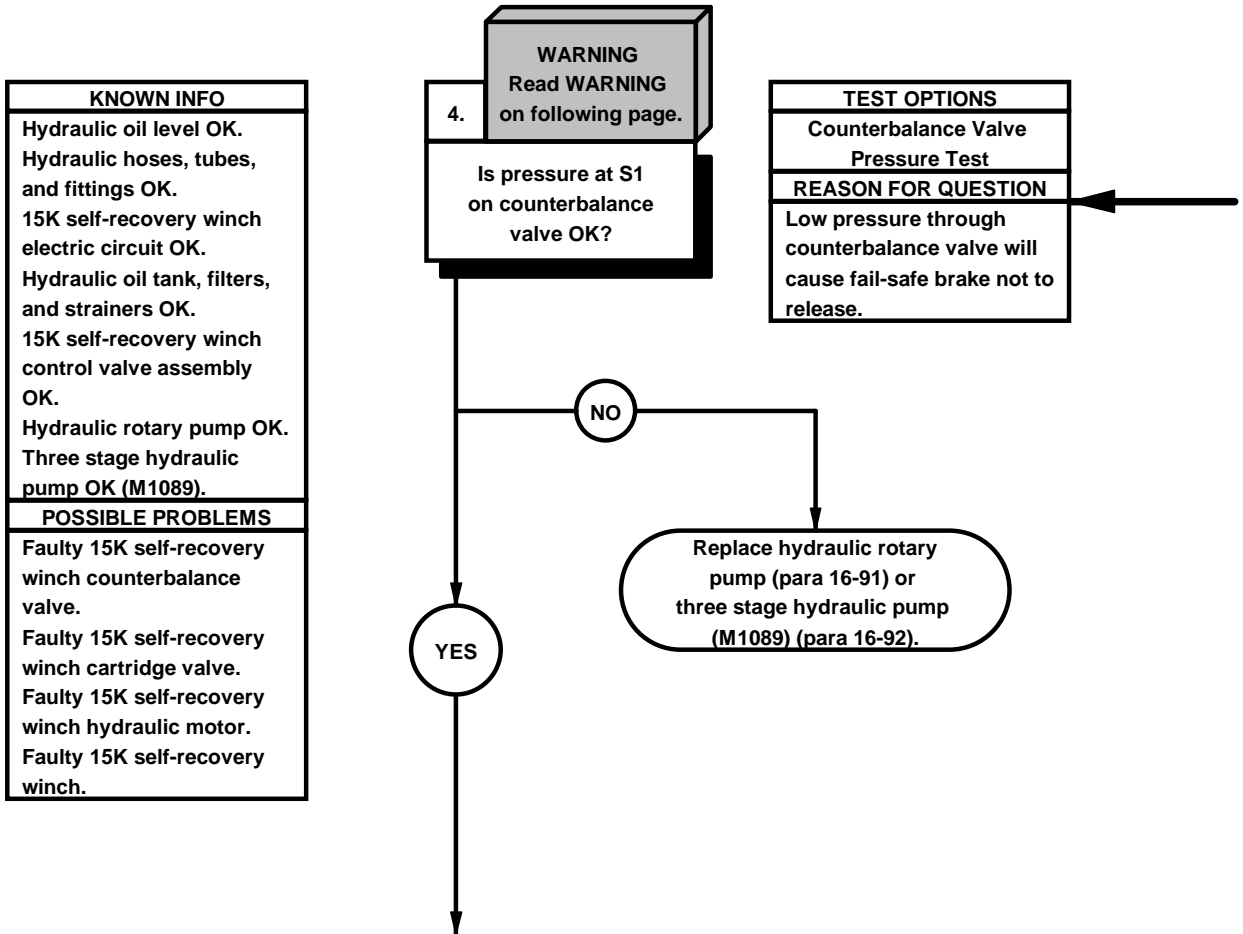
HYDRAULIC FLOW AND PRESSURE TEST

- (1) Position drain pan under winch control valve.
- (2) Disconnect circuit B pump pressure hose from circuit B tube.
- (3) Connect pressure hose to hydraulic tester
- (4) Connect pressure hose from hydraulic tester to circuit B tube.
- (5) Completely open hydraulic tester load valve.
- (6) Start and run engine until normal operating temperature is reached (TM 9-2320-366-10-1).
- (7) Engage PTO (TM 9-2320-366-10-1).
- (8) Increase engine RPM to 1250-1450 RPM (TM 9-2320-366-10-1).
- (9) Slowly close load valve on hydraulic tester until 2450-2600 psi (16893-17927 kPa) is reached and note flow on hydraulic tester.
- (10) If flow is not 15-18 GPM (51-70 lpm) at 2450-2600 psi (16893-17927 kPa), replace three stage hydraulic pump (para 16-92).
- (11) Open load valve on hydraulic tester.
- (12) Decrease engine speed (TM 9-2320-366-10-1).
- (13) Position PTO switch to off (TM 9-2320-366-10-1).
- (14) Shut down engine (TM 9-2320-366-10-1).
- (15) Disconnect pressure hose from hydraulic tester from circuit B tube.
- (16) Disconnect circuit B pressure hose from hydraulic tester.
- (17) Connect circuit B pressure hose to circuit B tube.
- (18) Remove drain pan from under winch control valve.



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i1. 15K SELF-RECOVERY WINCH DOES NOT WORK (CONT)



WARNING

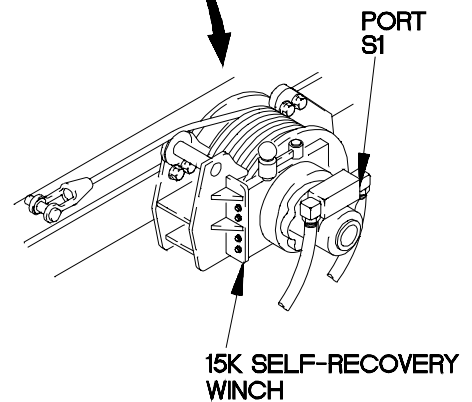
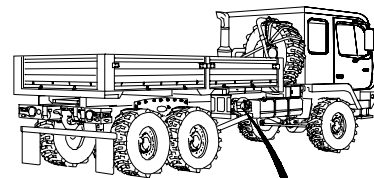
- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

NOTE

Tag all hardware prior to removal.

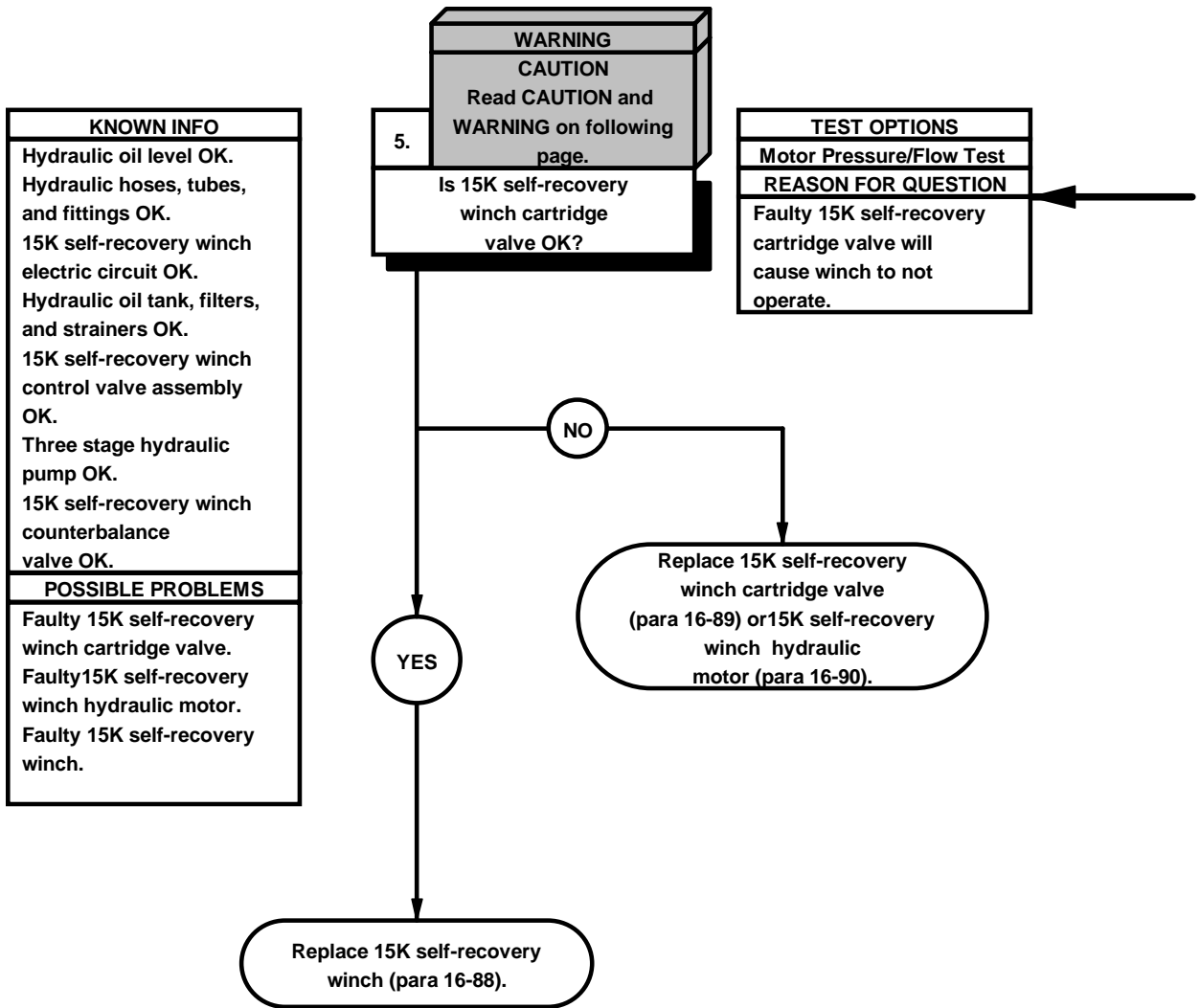
HYDRAULIC FLOW AND PRESSURE TEST

- (1) Place drain pan under vehicle.
- (2) Remove plug from port S1 (on side of self-recovery winch toward front of vehicle).
- (3) Connect STE/ICE-R (see test #50) to S1 port.
- (4) Start engine (TM 9-2320-366-10-1).
- (5) Attach stall load to winch cable (TM 9-2320-366-10-2).
- (6) Position PTO switch and WINCH POWER switch to ON (TM 9-2320-366-10-1).
- (7) Engage winch clutch (TM 9-2320-366-10-1).
- (8) Toggle WINCH IN/OUT switch to IN position and hold (TM 9-2320-366-10-1).
- (9) Perform STE/ICE-R test #50 and note reading.
- (10) If hydraulic pressure at port S1 is below 210 psi (618 kPa), counterbalance valve is faulty.
- (11) Release load and retrieve cable (TM 9-2320-366-10-2).
- (12) Position WINCH POWER and PTO switches to OFF (TM 9-2320-366-10-1).
- (13) Shut down engine (TM 9-2320-366-10-1).
- (14) Disconnect and disassemble STE/ICE-R, hoses and adapters.
- (15) Install plug in S1 port.



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i1. 15K SELF-RECOVERY WINCH DOES NOT WORK (CONT)



WARNING

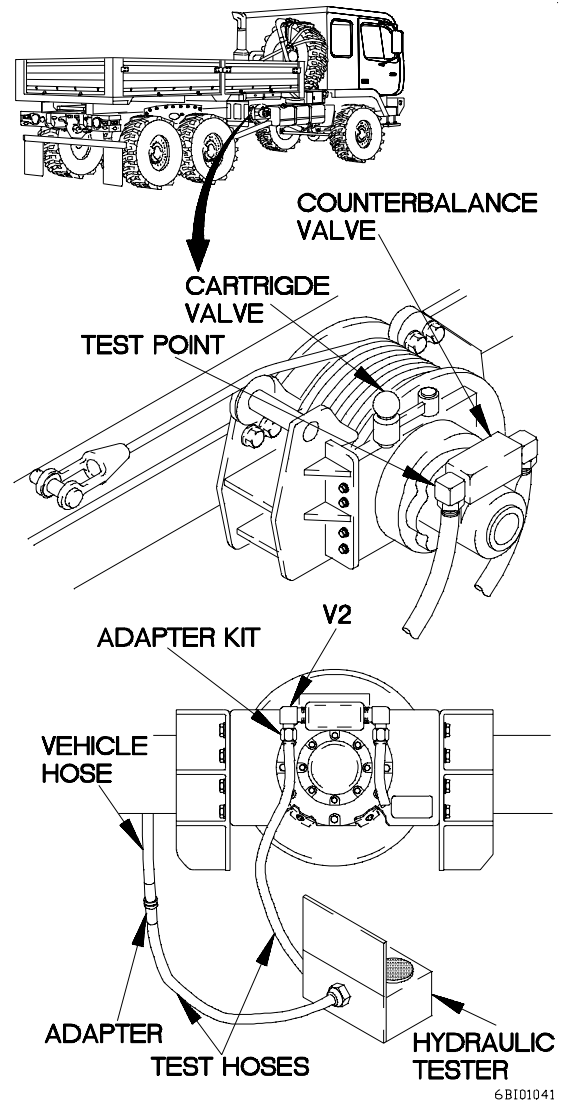
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

CAUTION

Maintain engine rpm at 1,250-1,450 rpm while performing pressure and flow test. Failure to comply may result in damage to equipment.

MOTOR FLOW TEST

- (1) Disconnect hose from port V2 on left side of winch.
- (2) Connect hydraulic tester between port V2 and hose with hoses and adapters.
- (3) Start engine (TM 9-2320-366-10-1).
- (4) Position PTO switch to ON (TM 9-2320-366-10-1).
- (5) Attach stall load to winch cable (TM 9-2320-366-10-2).
- (6) Position WINCH POWER switch to ON (TM 9-2320-366-10-1).
- (7) Engage winch clutch (TM 9-2320-366-10-1).
- (8) Toggle WINCH IN/OUT switch to IN (TM 9-2320-366-10-1).
- (9) Observe flow of 20 GPM (75.8 lpm) at minimum pressure of 2600 psi (17927 kPa).
- (10) If flow is low, winch motor or fail safe brake is faulty.
- (11) If pressure is less than 2600 psi (17927 kPa), cartridge valve is faulty.
- (12) If flow was good in motor pressure/flow test, winch drive assembly is faulty.
- (13) Position WINCH POWER and PTO switches to OFF (TM 9-2320-366-10-1).
- (14) Disconnect load and rewind cable (TM 9-2320-366-10-1).
- (15) Disengage winch clutch (TM 9-2320-366-10-1).
- (16) Shut down engine (TM 9-2320-366-10-1).
- (17) Disconnect hydraulic tester, hoses and adapters from winch.
- (18) Connect vehicle hose to V2 port.
- (19) Remove drain pan from under vehicle.



6B101041

2-18. M1089 MATERIAL HANDLING CRANE (MHC) HYDRAULIC SYSTEM TROUBLESHOOTING

This paragraph covers M1089 Material Handling Crane (MHC) Hydraulic Troubleshooting. The M1089 Material Handling Crane (MHC) Hydraulic Fault Index, Table 2-16, lists faults for the M1089 MHC Hydraulics of the vehicle.

Table 2-16. M1089 Material Handling Crane (MHC) Hydraulic Fault Index

Fault No.	Description	Page
j1.	M1089 Material Handling Crane (MHC) Does Not Operate	2-1030
j2.	M1089 Material Handling Crane (MHC) Left or Right Outrigger Drifts or Does Not Work	2-1036
j3.	M1089 Material Handling Crane (MHC) Mast Does Not Erect or Stow	2-1040
j4.	M1089 Material Handling Crane (MHC) Outrigger Extension Cylinder Does Not Work	2-1044
j5.	M1089 Material Handling Crane (MHC) Boom Swing Assembly Does Not Work	2-1048
j6.	M1089 Material Handling Crane (MHC) Boom Does Not Lift Up or Down	2-1050
j7.	M1089 Material Handling Crane (MHC) Boom Does Not Telescope In or Out	2-1056
j8.	M1089 Material Handling Crane (MHC) Hoist Does Not Work	2-1062

j1. M1089 MATERIAL HANDLING CRANE (MHC) DOES NOT OPERATE

INITIAL SETUP

Equipment Conditions

Engine shut down (TM 9-2320-366-10-1).
Center catwalk removed (TM 9-2320-366-20-4).

Tools and Special Tools

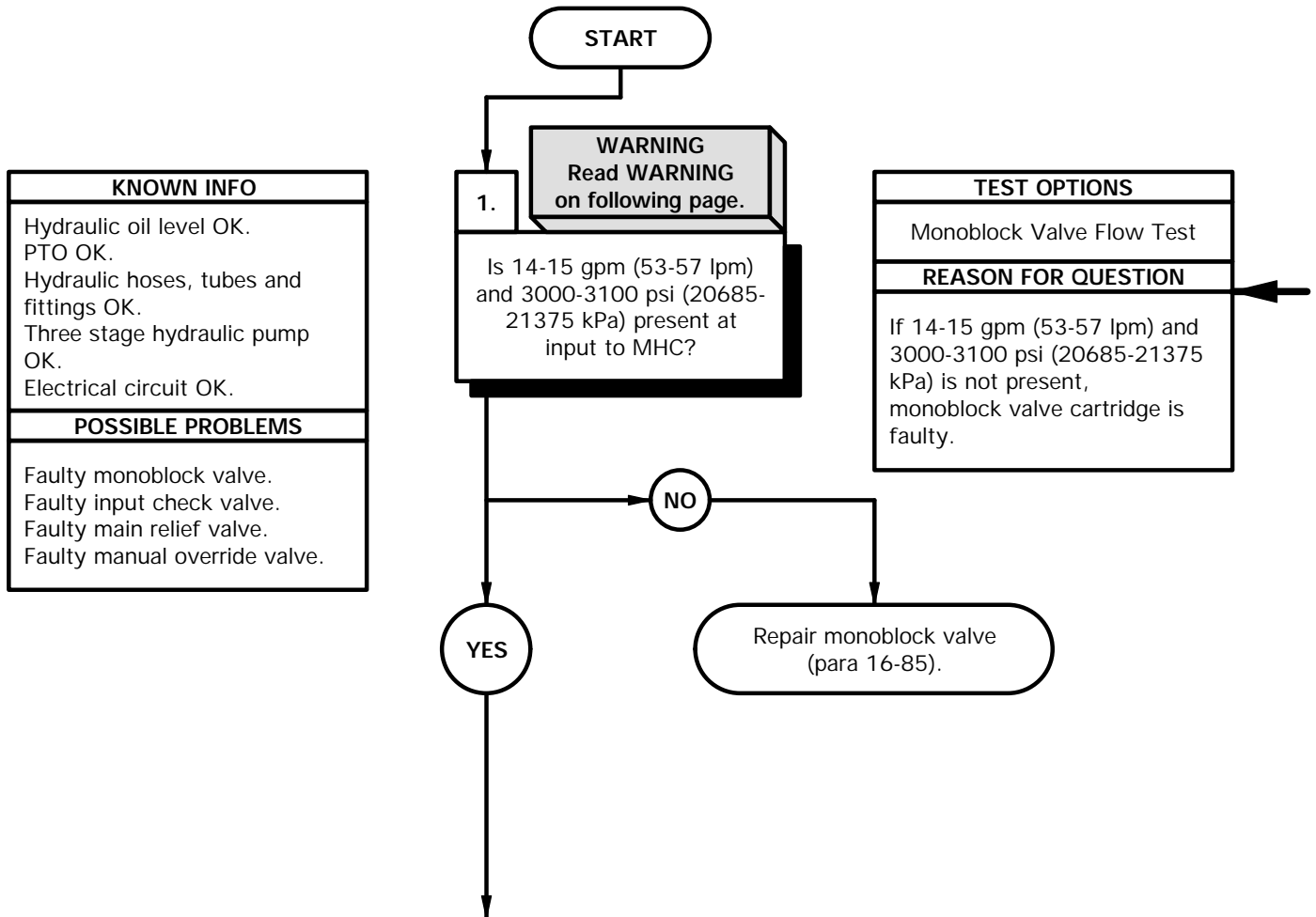
Tool Kit, Genl Mech (Item 78, Appendix B)
Tester, Hydraulic (Item 73, Appendix B)
Pan, Drain (Item 43, Appendix B)
Goggles, Industrial (Item 28, Appendix B)

Materials/Parts

Rag, Wiping (Item 60, Appendix C)
Hose (2) (Item 40, Appendix C)
Fitting (2) (Item 31, Appendix C)
Reducer, Tube (Item 61, Appendix C)
Adapter, Swivel (Item 3, Appendix C)
Adapter, Pipe (Item 2, Appendix C)
Fitting (Item 32, Appendix C)
Adapter, Pipe (Item 1, Appendix C)

Personnel Required

(2)



WARNING

- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

NOTE

Tag hydraulic hoses, tubes, and fittings prior to disconnecting.

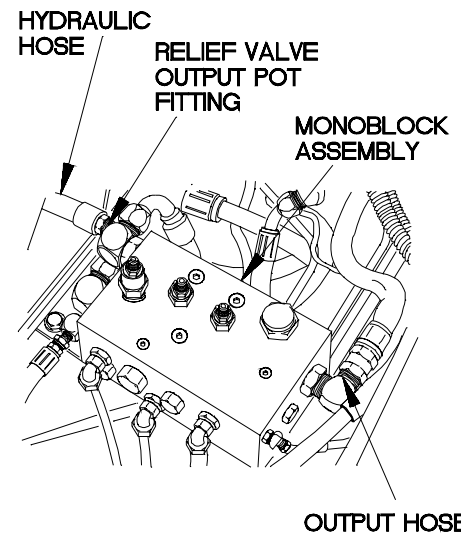
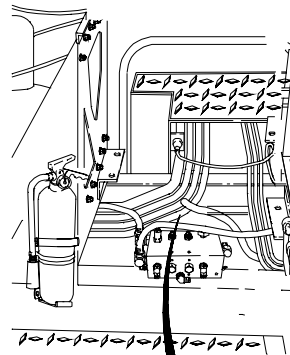
MONOBLOCK VALVE FLOW TEST

- (1) Close main return valve at hydraulic reservoir.
- (2) Place drain pan under vehicle.
- (3) Disconnect hydraulic hose from output of monoblock valve.
- (4) Connect hydraulic tester hose to monoblock valve output fitting with fittings and adapters.
- (5) Connect hydraulic tester hose to monoblock valve output hose with fittings and adapters.
- (6) Open main return valve at hydraulic reservoir.
- (7) Start engine (TM 9-2320-366-10-1).
- (8) Position PTO switch to on (TM 9-2320-366-10-1).
- (9) Increase engine RPM to 1250-1450 RPM (TM 9-2320-366-10-1).
- (10) Push in and hold MANUAL OVERRIDE (TM 9-2320-366-10-1).
- (11) Position TELESCOPE IN to IN (TM 9-2320-366-10-1) and note reading.
- (12) If flow is not between 14-15 gpm (53-57 lpm), repair monoblock valve (para 16-85).

NOTE

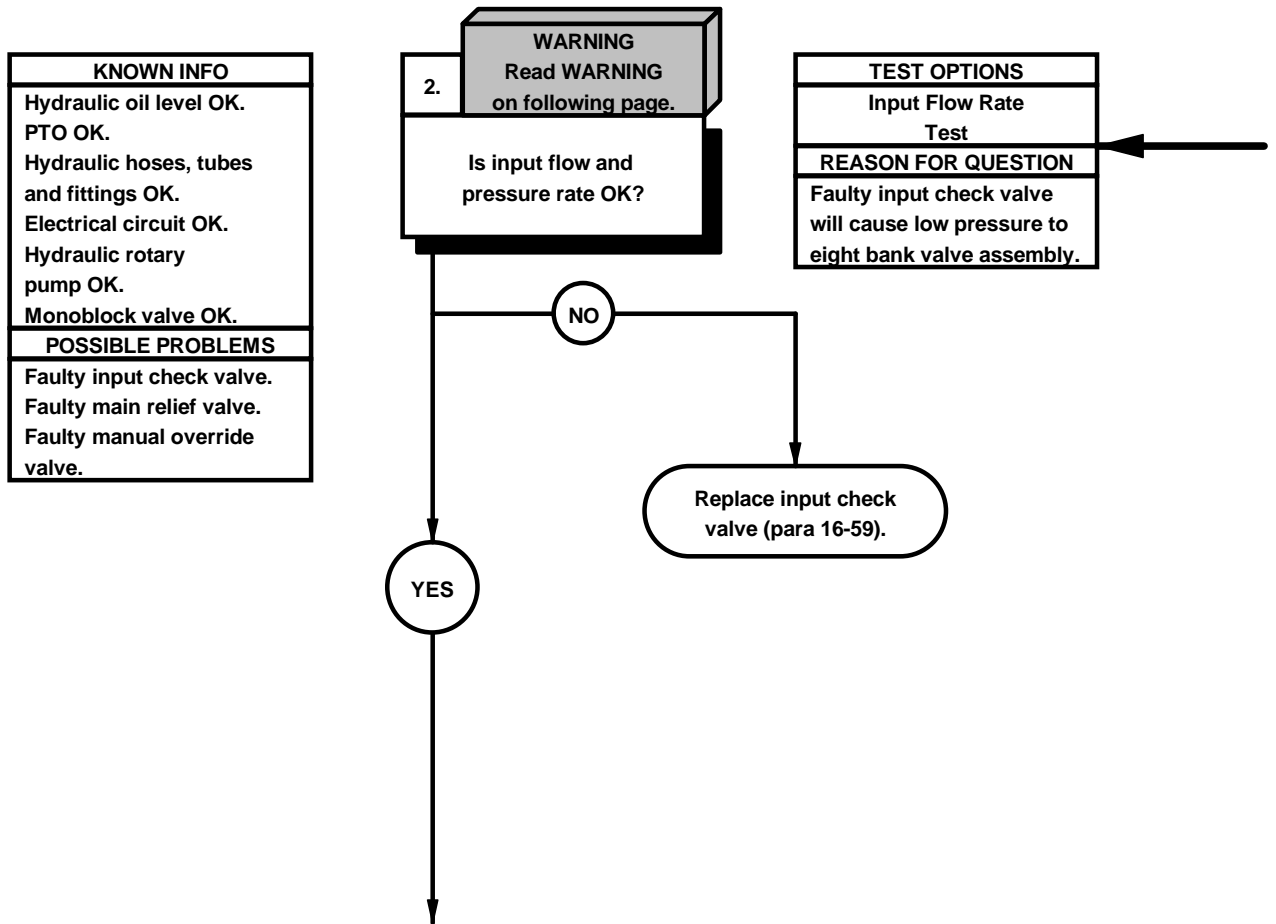
Reduce engine speed to idle before performing pressure test.

- (13) Push in and hold MANUAL OVERRIDE (TM 9-2320-366-10-1).
- (14) Position TELESCOPE IN to IN (TM 9-2320-366-10-1) and note reading.
- (15) If pressure is not between 3000-3100 psi (20685-21375 kPa), repair monoblock valve (para 16-85).
- (16) Position PTO switch to off (TM 9-2320-366-10-1).
- (17) Shut down engine (TM 9-2320-366-10-1).
- (18) Close main return valve at hydraulic reservoir.
- (19) Disconnect hydraulic tester and disassemble test equipment fittings and adapters.
- (20) Connect output hose to fitting on monoblock valve .
- (21) Open main return valve at hydraulic reservoir.
- (22) Install center catwalk (TM 9-2320-366-20-4).
- (23) Remove drain pan.



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j1. M1089 MATERIAL HANDLING CRANE (MHC) DOES NOT OPERATE (CONT)

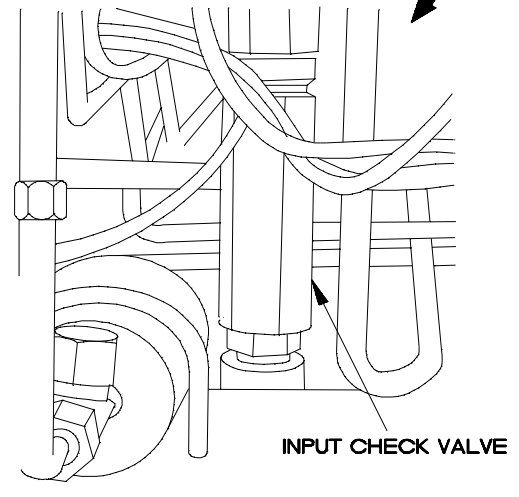
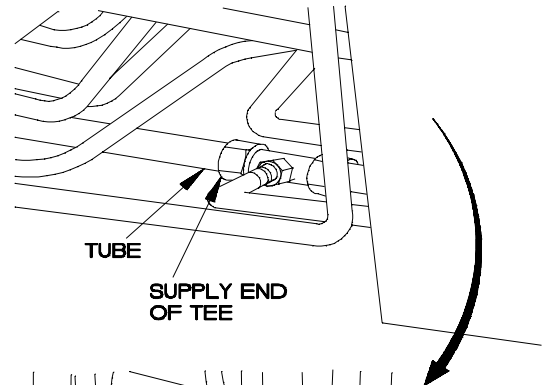
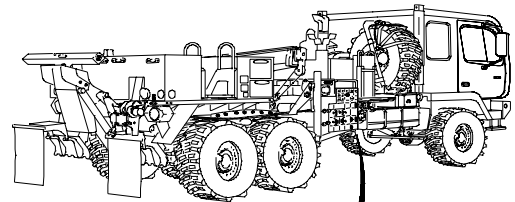


WARNING

- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

NOTE

Tag hydraulic hoses, tubes, and fittings prior to removal.

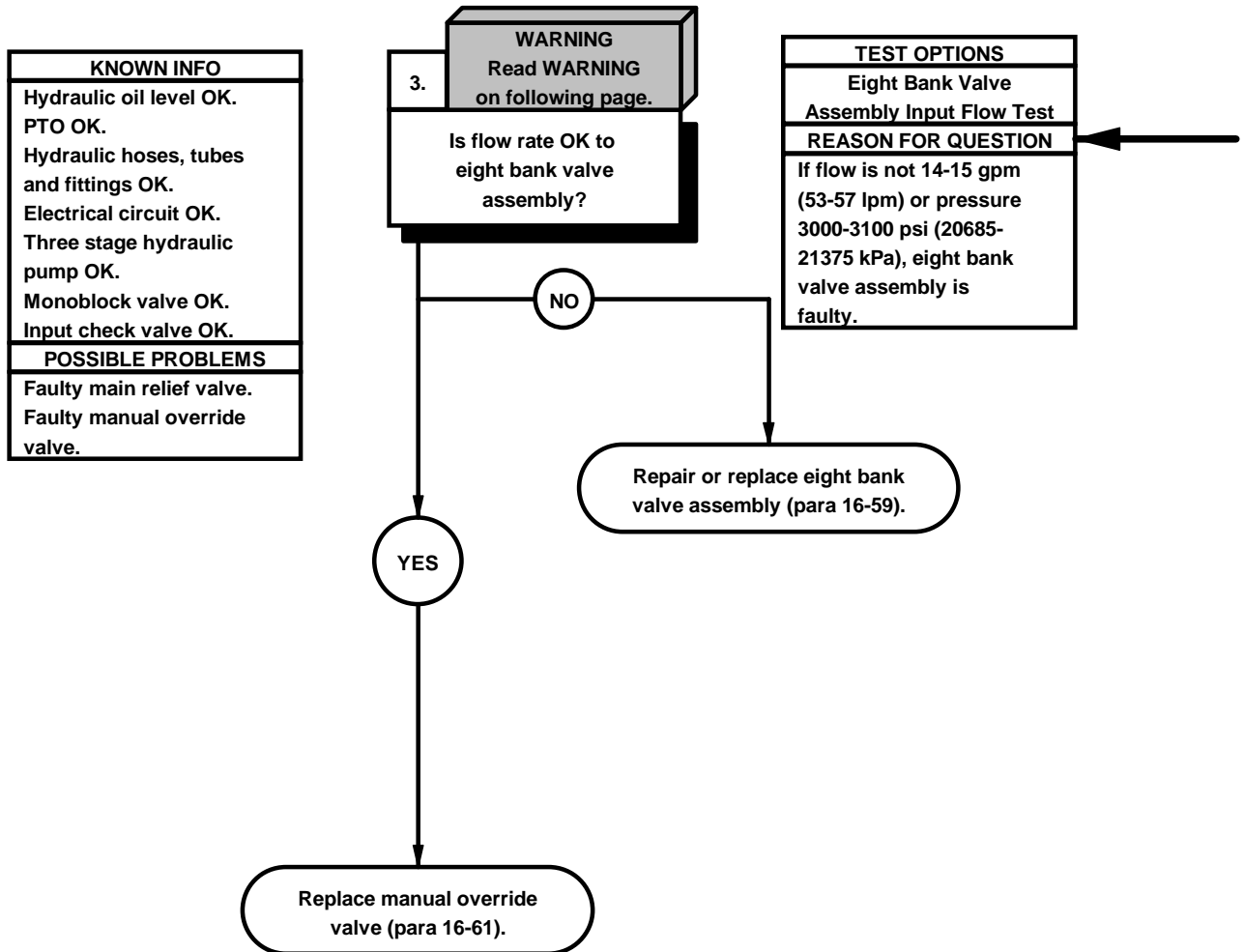


INPUT FLOW RATE TEST

- (1) Remove wrecker control panel splash guard (TM 9-2320-366-20-4).
- (2) Place drain pan under vehicle.
- (3) Disconnect tube from supply end of tee connector.
- (4) Connect hydraulic tester between hose and fitting with hoses and adapters.
- (5) Start engine (TM 9-2320-366-10-1).
- (6) Position PTO switch to on (TM 9-2320-366-10-1).
- (7) Increase engine rpm to 1250-1450 rpm (TM 9-2320-366-10-1).
- (8) Push in and hold MANUAL OVERRIDE (TM 9-2320-366-10-1).
- (9) Position TELESCOPE IN to IN (TM 9-2320-366-10-1) and note reading.
- (10) Observe flow reading of 14-15 gpm (53-57 lpm) at 3000-3100 psi (20685-21375 kPa).
- (11) If flow is not between 14-15 gpm (53-57 lpm) or pressure is not between 3000-3100 psi (20685-21375 kPa), replace input check valve (para 16-59).
- (12) Position PTO switch to off (TM 9-2320-366-10-1).
- (13) Shut down engine (TM 9-2320-366-10-1).
- (14) Disconnect hydraulic tester from fitting and tee.
- (15) Connect fitting to tee using new preformed packing.
- (16) Remove drain pan.

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j1. M1089 MATERIAL HANDLING CRANE (MHC) DOES NOT OPERATE (CONT)



WARNING

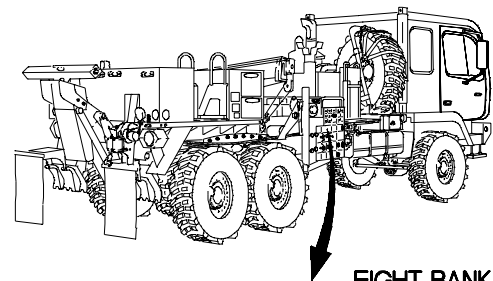
- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

NOTE

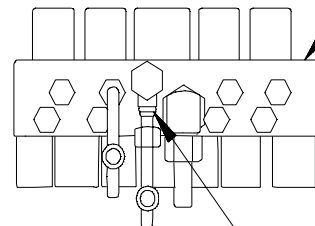
Tag hydraulic hoses, tubes, and fittings prior to removal.

**EIGHT BANK CONTROL VALVE ASSEMBLY
INPUT FLOW TEST**

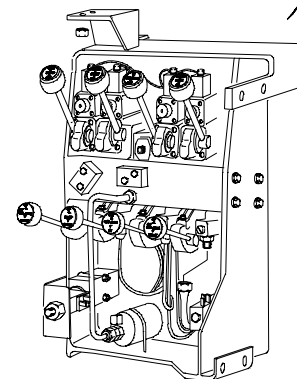
- (1) Place drain pan under vehicle.
- (2) Disconnect fitting from port P of eight bank valve assembly.
- (3) Connect hydraulic tester between fitting and port P with hoses and adapters.
- (4) Start engine (TM 9-2320-366-10-1).
- (5) Position PTO switch to ON (TM 9-2320-366-10-1).
- (6) Increase engine RPM to 1250-1450 RPM (TM 9-2320-366-10-1).
- (7) Push in and hold MANUAL OVERRIDE (TM 9-2320-366-10-1).
- (8) Position TELESCOPE IN to IN (TM 9-2320-366-10-1) and note reading.
- (9) If flow reading is not 14-15 gpm (53-57 lpm) and 3000-3100 psi (20685-21375 kPa), repair or replace eight bank valve assembly (16-59).
- (10) If flow reading is 14-15 gpm (53-57 lpm) and 3000-3100 psi (20685-21375 kPa), replace manual override valve (para 16-61).
- (11) Position PTO switch to off (TM 9-2320-366-10-1).
- (12) Shut down engine (TM 9-23-20-366-10-1).
- (13) Disconnect hydraulic tester, hoses and adapters from fitting and port P.
- (14) Connect fitting to port P.
- (15) Remove drain pan.
- (16) Install wrecker control panel splash guard (TM 9-2320-366-20-4).



**EIGHT BANK
VALVE ASSEMBLY**

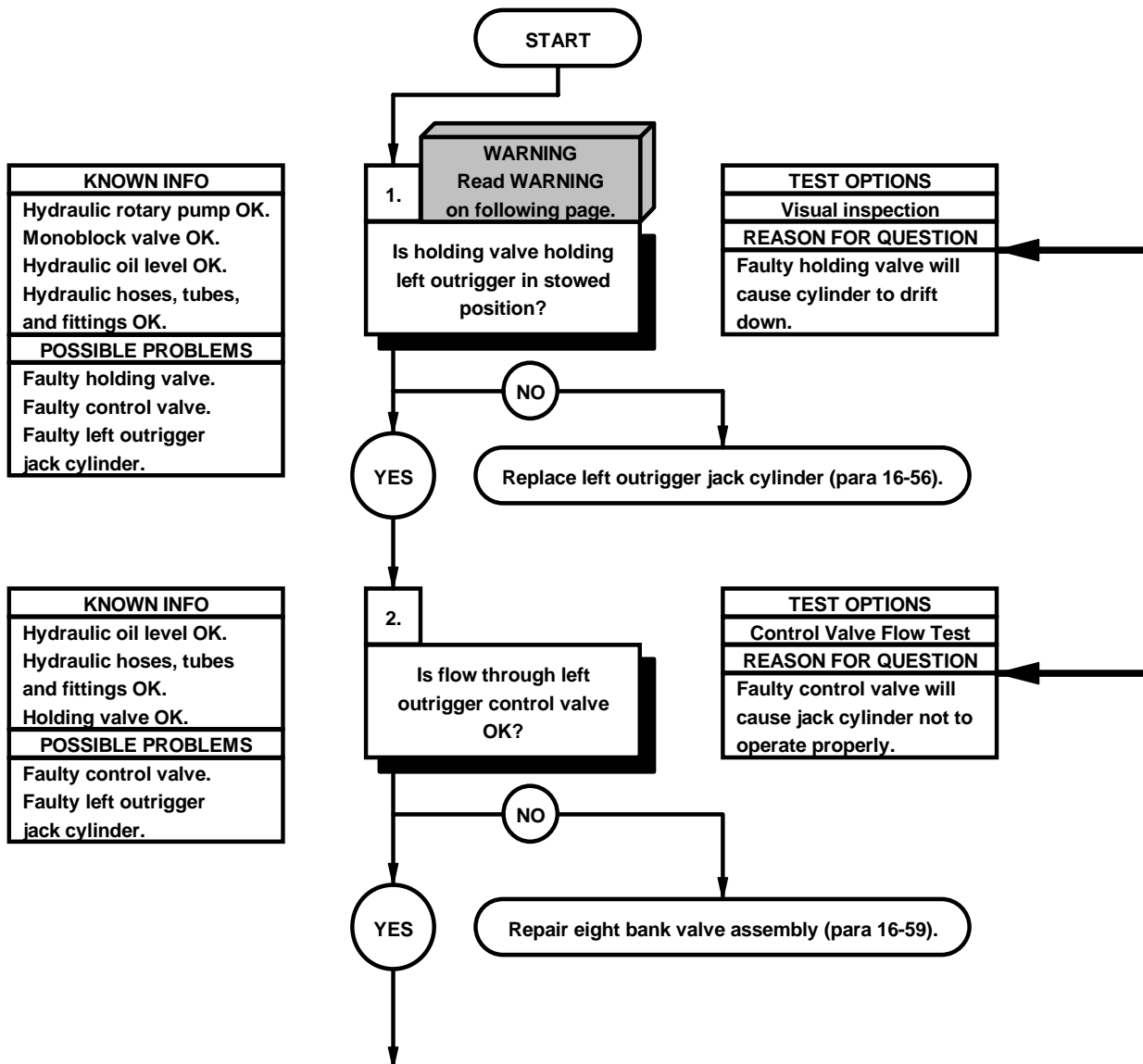


**PORT P
REAR SIDE
TOP VALVE
BANK**



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2. M1089 MATERIAL HANDLING CRANE (MHC) LEFT OR RIGHT OUTRIGGER DRIFTS OR DOES NOT WORK	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Materials/Parts Rag, Wiping (Item 60, Appendix C) Hose (2) (Item 40, Appendix C) Fitting (2) (Item 31, Appendix C) Reducer, Tube (Item 61, Appendix C) Adapter, Swivel (Item 3, Appendix C) Adapter, Pipe (Item 2, Appendix C) Fitting (Item 32, Appendix C) Adapter, Pipe (Item 1, Appendix C)
Personnel Required (2)	
Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) Tester, Hydraulic (Item 73, Appendix B) Pan, Drain (Item 43, Appendix B) Goggles, Industrial (Item 28, Appendix B)	



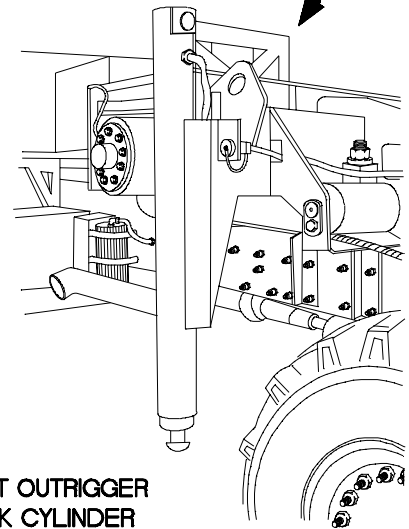
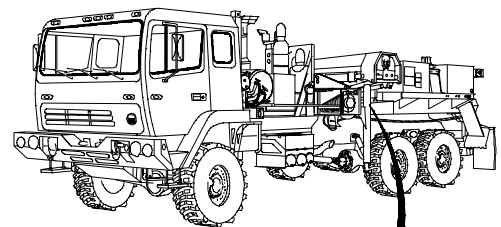
WARNING

- Drop hydraulic pressure to zero before disconnecting any hydraulic line. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

NOTE

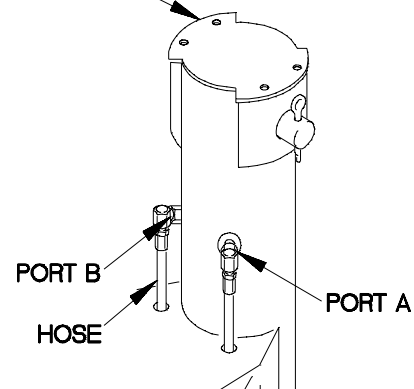
Left and right outriggers are tested the same way.
Left outrigger is shown.

Check position of left outrigger to verify that it is held in the stowed position. If left outrigger will not remain stowed over a period of time, holding valve is faulty.



LEFT OUTRIGGER JACK CYLINDER

- | CONTROL VALVE FLOW TEST |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (1) Place drain pan under vehicle. |
| (2) Disconnect hose from port B of left outrigger jack cylinder. |
| (3) Connect hydraulic tester between hose and port B with test hoses and adapters. |
| (4) Start engine (TM 9-2320-366-10-1). |
| (5) Position PTO switch to on (TM 9-2320-366-10-1). |
| (6) Position MHC power switch to on (TM 9-2320-366-10-1). |
| (7) Increase engine rpm to 1250-1450 rpm (TM 9-2320-366-10-1). |
| (8) Lower left outrigger (TM 9-2320-366-10-1). |
| (9) During lowering, observe reading of 4 gpm (15 lpm) at 3000-3100 psi (20685-21375 kPa). |
| (10) If flow reading is not 4 gpm (15 lpm) and pressure is not between 3000-3100 psi (20685-21375 kPa), replace control valve in eight bank valve assembly (para 16-59). |
| (11) Raise outrigger (TM 9-2320-366-10-1). |
| (12) Position MHC power to off (TM 9-2320-366-10-1). |
| (13) Position PTO switch to off (TM 9-2320-366-10-1). |
| (14) Shut down engine (TM 9-2320-366-10-1). |
| (15) Disconnect hydraulic tester, hoses and adapters. |
| (16) Connect hose to port B. |



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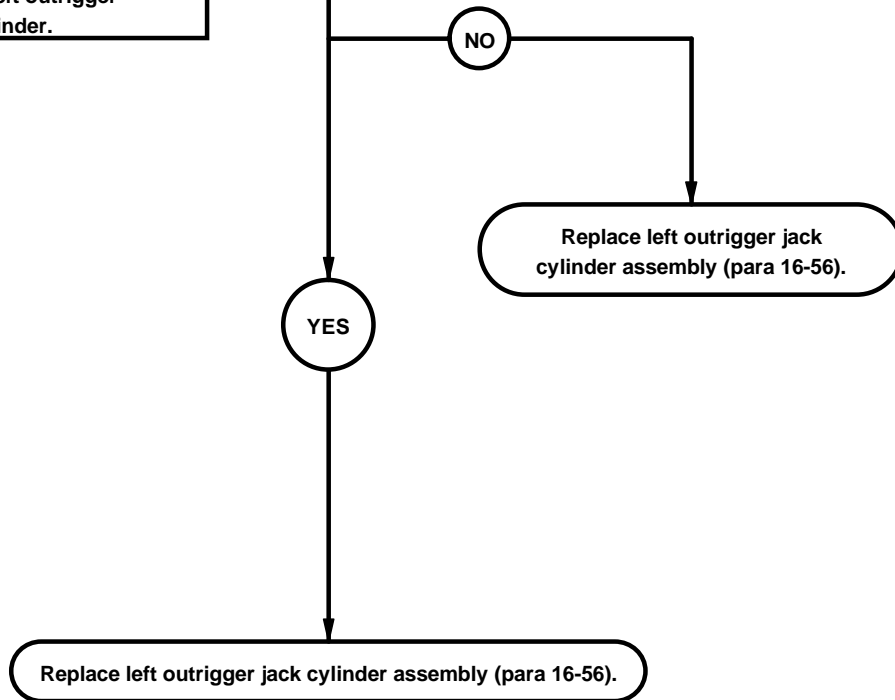
j2. M1089 MATERIAL HANDLING CRANE (MHC) LEFT OR RIGHT OUTRIGGER DRIFTS OR DOES NOT WORK (CONT)

KNOWN INFO
Hydraulic oil level OK. Hydraulic lines and fittings OK. Holding valve OK. Control valve OK.
POSSIBLE PROBLEMS
Faulty left outrigger jack cylinder.

3.

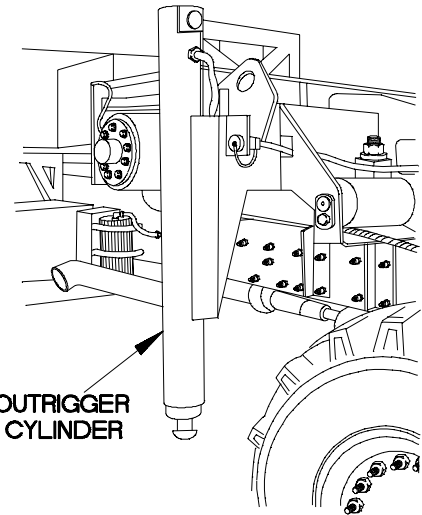
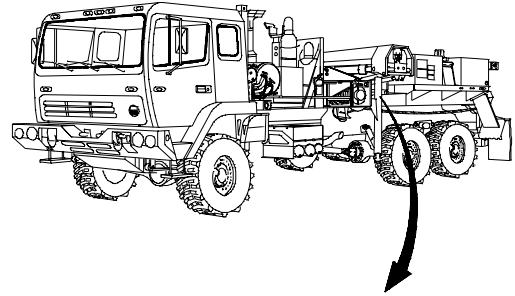
Is left outrigger cylinder leaking oil?

TEST OPTIONS
Left Outrigger Cylinder Inspection
REASON FOR QUESTION
Faulty thermal relief valve or cylinder will cause left outrigger not to work.



LEFT OUTRIGGER CYLINDER INSPECTION

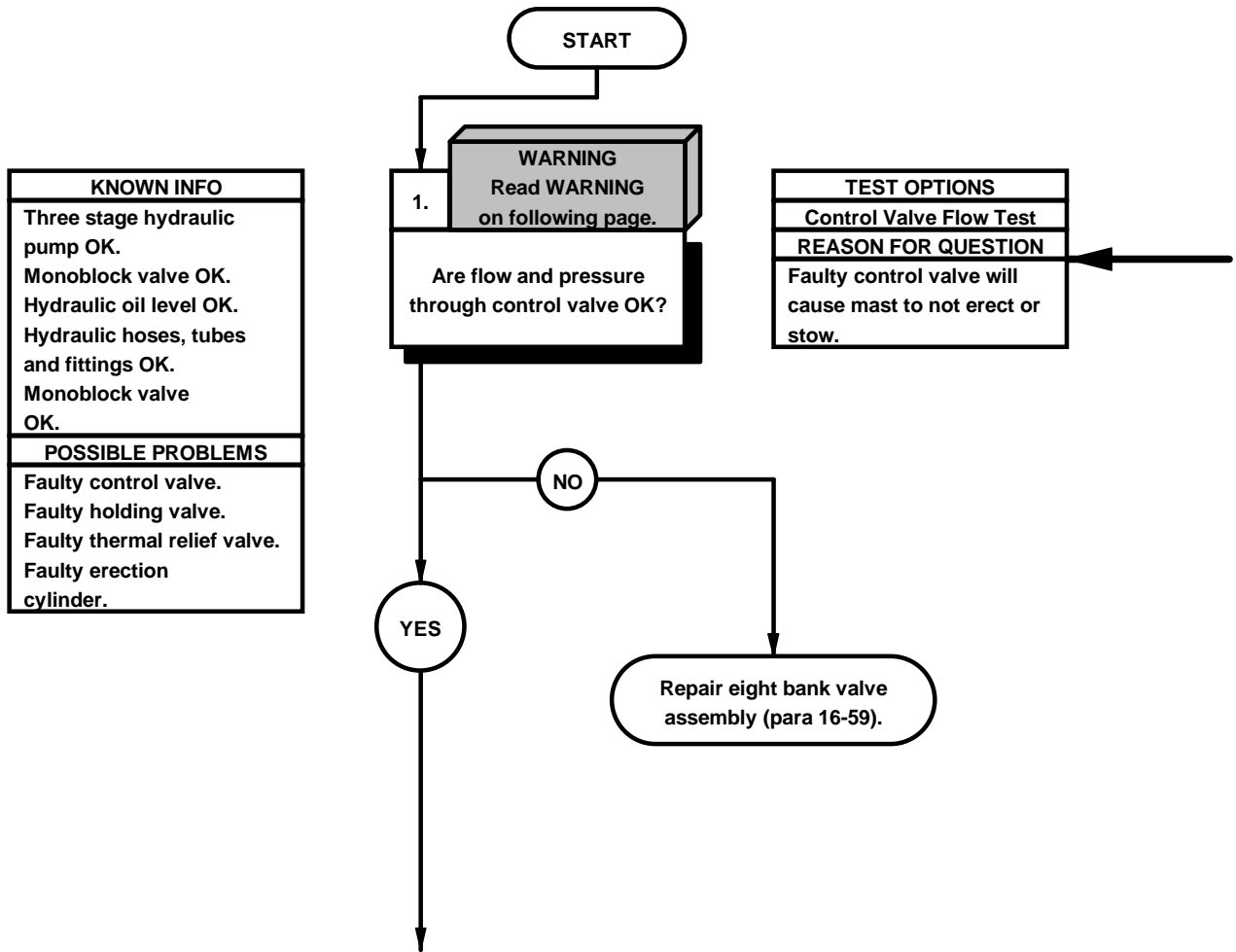
- (1) Start engine (TM 9-2320-366-10-1).
- (2) Position PTO switch to on (TM 9-2320-366-10-1).
- (3) Position MHC power switch to on (TM 9-2320-366-10-1).
- (4) Lower and raise left outrigger two or more times (TM 9-2320-366-10-1).
- (5) Observe left outrigger jack cylinder for leakage.
- (6) If left outrigger jack cylinder leaks oil, left replace outrigger jack cylinder (para 16-66).
- (7) If left outrigger jack cylinder is dry and outrigger drifts, replace outrigger jack cylinder (para 16-66).
- (8) Position MHC power switch to off (TM 9-2320-366-10-1).
- (9) Position PTO switch to off (TM 9-2320-366-10-1).
- (10) Shut down engine (TM 9-2320-366-10-1).
- (11) Remove drain pan from under vehicle.



LEFT OUTRIGGER
JACK CYLINDER

6b_j0202a

j3. M1089 MATERIAL HANDLING CRANE (MHC) MAST DOES NOT ERECT OR STOW	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Materials/Parts Rag, Wiping (Item 60, Appendix C) Hose (2) (Item 40, Appendix C) Fitting (2) (Item 31, Appendix C) Reducer, Tube (Item 61, Appendix C) Adapter, Swivel (Item 3, Appendix C) Adapter, Pipe (Item 2, Appendix C) Fitting (Item 32, Appendix C) Adapter, Pipe (Item 1, Appendix C)
Personnel Required (2)	
Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) Tester, Hydraulic (Item 73, Appendix B) Pan, Drain (Item 43, Appendix B) Goggles, Industrial (Item 28, Appendix B)	

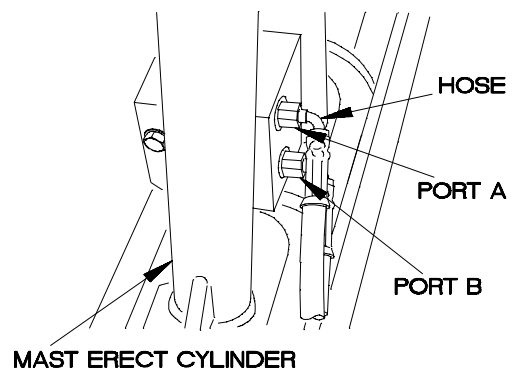
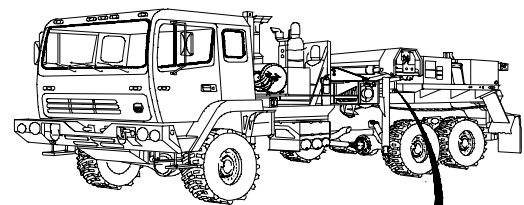


WARNING

- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

CONTROL VALVE FLOW TEST

- (1) Place drain pan under vehicle.
- (2) Disconnect hose from port A of mast erection cylinder.
- (3) Connect hydraulic tester between hose and port A with test hoses and adapters.
- (4) Start engine (TM 9-2320-366-10-1).
- (5) Position PTO switch to on (TM 9-2320-366-10-1).
- (6) Position MHC power switch to on (TM 9-2320-366-10-1).
- (7) Increase engine rpm to 1250-1450 rpm (TM 9-2320-366-10-1).
- (8) Erect mast (TM 9-2320-366-10-1).
- (9) While mast is erecting, observe flow reading of 2 gpm (8 lpm) at 3000-3100 psi (20685-21375 kPa).
- (10) If flow is not 2 gpm (8 lpm) and pressure is not between 3000-3100 psi (20685-21375 kPa), replace control valve in eight bank valve assembly (para 16-89).
- (11) Stow MHC (TM 9-2320-366-10-1).
- (12) Position MHC power to off (TM 9-2320-366-10-1).
- (13) Position PTO switch to off (TM 9-2320-366-10-1).
- (14) Shut down engine (TM 9-2320-366-10-1).
- (15) Disconnect hydraulic tester, hose and adapters from port A and hose.
- (16) Connect hose to port A.
- (17) Remove drain pan from under vehicle.



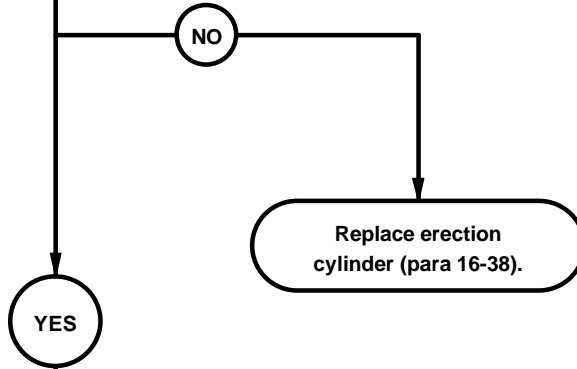
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j3. M1089 MATERIAL HANDLING CRANE (MHC) MAST DOES NOT ERECT OR STOW (CONT)

KNOWN INFO
Hydraulic oil level OK. Hydraulic hoses, tubes, and fittings OK. Three stage hydraulic pump OK. Monoblock valve OK. Control valve OK.
POSSIBLE PROBLEMS
Faulty holding valve. Faulty thermal relief valve. Faulty erection cylinder.

2.
Does mast remain erect?

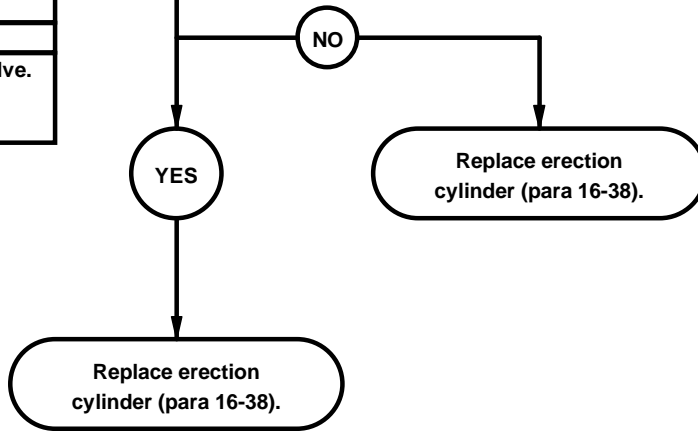
TEST OPTIONS
Holding Valve Check
REASON FOR QUESTION
Faulty holding valve will cause erection cylinder to drift.



KNOWN INFO
Hydraulic oil level OK. Hydraulic hoses, tubes, and fittings OK. Hydraulic pump OK. Monoblock valve assembly OK. Control valve OK. Holding valve OK.
POSSIBLE PROBLEMS
Faulty thermal relief valve. Faulty erection cylinder.

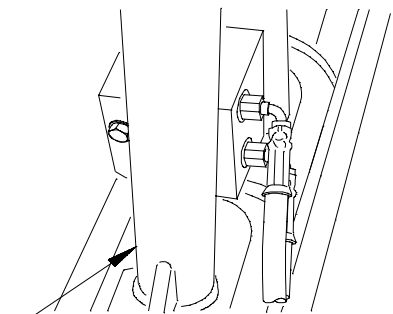
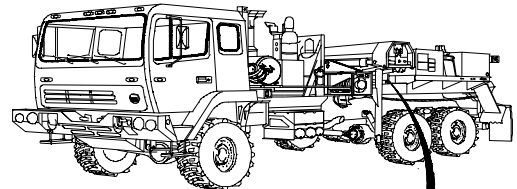
3.
Is erection cylinder leaking?

TEST OPTIONS
Erection Cylinder Check
REASON FOR QUESTION
Faulty thermal relief valve or mast erection cylinder will cause mast to not erect or stow properly.



HOLDING VALVE CHECK

- (1) Erect MHC (TM 9-2320-366-10-1).
- (2) Load test (para 16-62). If erection cylinder drifts, replace erection cylinder (para 16-38).



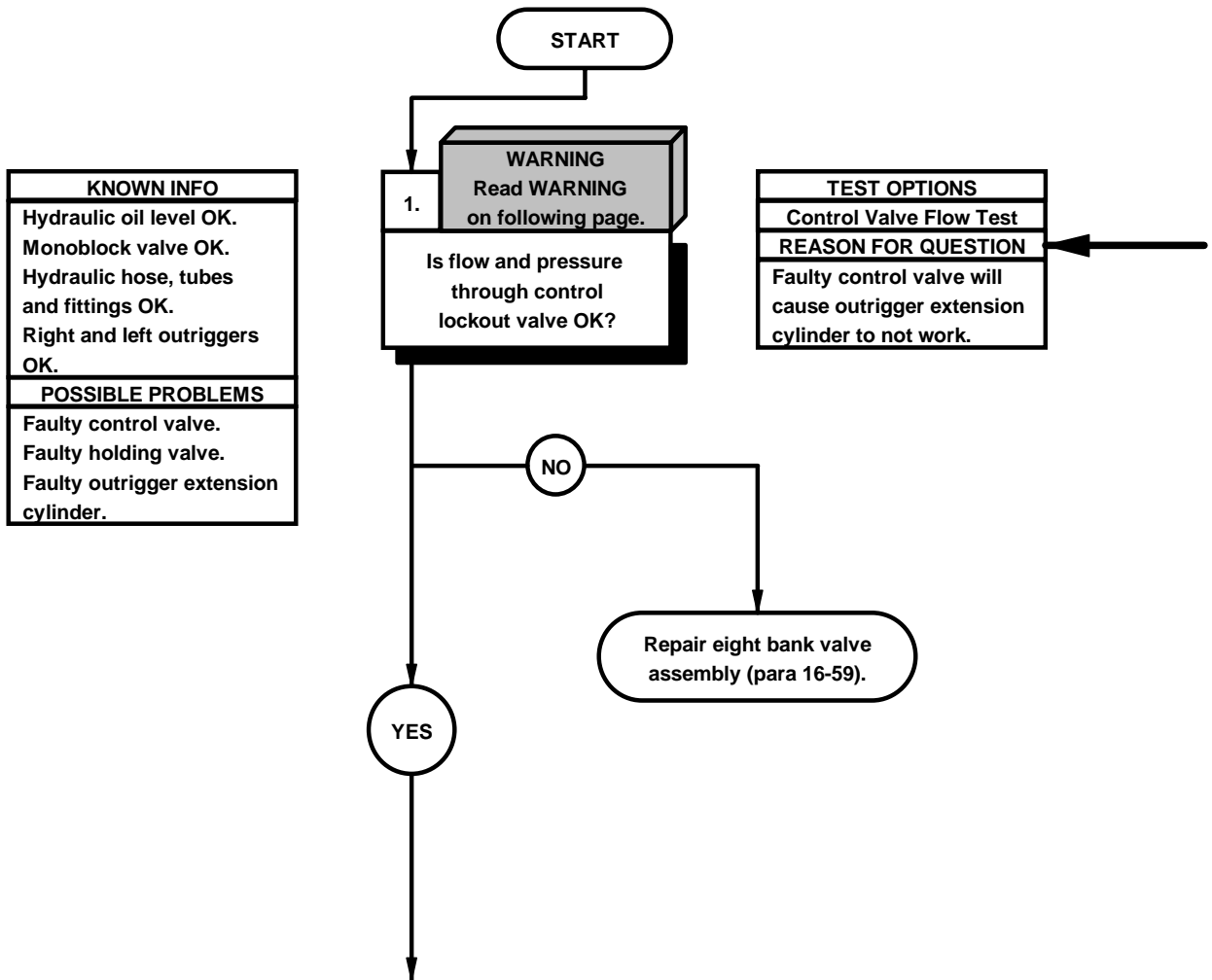
ERECTION CYLINDER

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ERECTION CYLINDER CHECK

- (1) Start engine (TM 9-2320-366-10-1).
- (2) Position PTO switch to on (TM 9-2320-366-10-1).
- (3) Position MHC power switch to on (TM 9-2320-366-10-1).
- (4) Erect and stow mast two or more times (TM 9-2320-366-10-1).
- (5) Observe erection cylinder for leakage.
- (6) If erection cylinder leaks, replace erection cylinder (para 16-38).
- (7) If erection cylinder drifts but does not leak, replace erection cylinder (para 16-38).
- (8) Stow mast (TM 9-2320-366-10-1).
- (9) Position MHC power switch to off (TM 9-2320-366-10-1).
- (10) Position PTO switch to off (TM 9-2320-366-10-1).
- (11) Shut down engine (TM 9-2320-366-10-1).

j4. M1089 MATERIAL HANDLING CRANE (MHC) OUTRIGGER EXTENSION CYLINDER DOES NOT WORK	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Materials/Parts Rag, Wiping (Item 60, Appendix C) Hose (2) (Item 40, Appendix C) Fitting (2) (Item 31, Appendix C) Reducer, Tube (Item 61, Appendix C) Adapter, Swivel (Item 3, Appendix C) Adapter, Pipe (Item 2, Appendix C) Fitting (Item 32, Appendix C) Adapter, Pipe (Item 1, Appendix C)
Personnel Required (2)	
Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) Tester, Hydraulic (Item 73, Appendix B) Pan, Drain (Item 43, Appendix B) Goggles, Industrial (Item 28, Appendix B)	

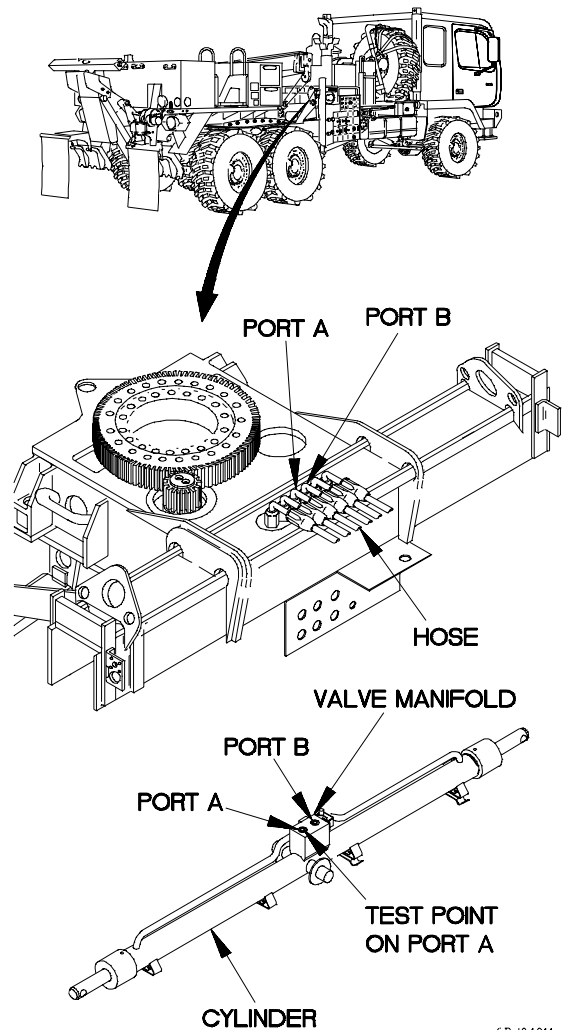


WARNING

- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

CONTROL VALVE FLOW TEST

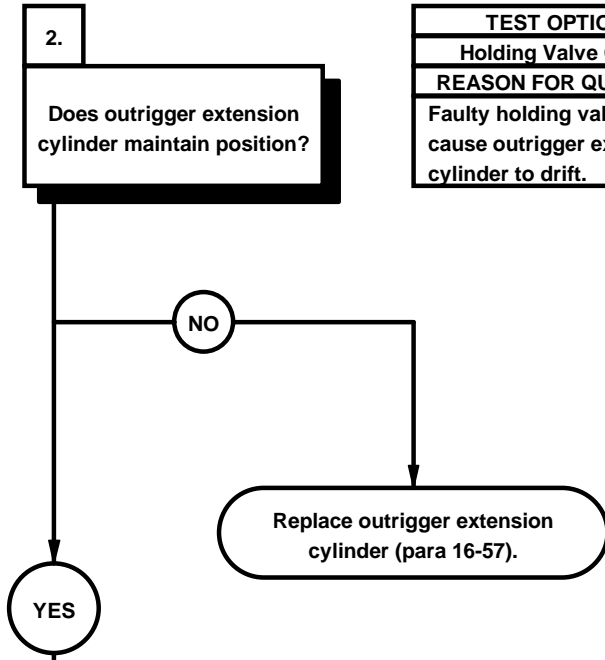
- (1) Place drain pan under vehicle.
- (2) Disconnect hose from port A of valve manifold.
- (3) Connect hydraulic tester between hose and port A with test hoses and adapters.
- (4) Start engine (TM 9-2320-366-10-1).
- (5) Position PTO switch to on (TM 9-2320-366-10-1).
- (6) Position MHC power switch to ON (TM 9-2320-366-10-1).
- (7) Increase engine rpm to 1250-1450 rpm (TM 9-2320-366-10-1).
- (8) Extend or retract outriggers (TM 9-2320-366-10-1).
- (9) Observe flow and pressure reading of about 3.5 gpm for extend (13 lpm) or 2 gpm (8 lpm) for retract at 3000-3100 psi (20685-21375 kPa).
- (10) If flow is not approximately 3.5 gpm (13 lpm) for extend or 2 gpm (8 lpm) for retract or pressure is not between 3000-3100 psi (20685-21375 kPa), replace control valve in eight bank valve assembly (para 16-59).
- (11) Stow outriggers (TM 9-2320-366-10-1).
- (12) Position MHC power switch to OFF (TM 9-2320-366-10-1).
- (13) Position PTO switch to off (TM 9-2320-366-10-1).
- (14) Shut down engine (TM 9-2320-366-10-1).
- (15) Disconnect hydraulic tester, hoses, and adapters from port.
- (16) Connect hose to port A.
- (17) Remove drain pan from under vehicle.



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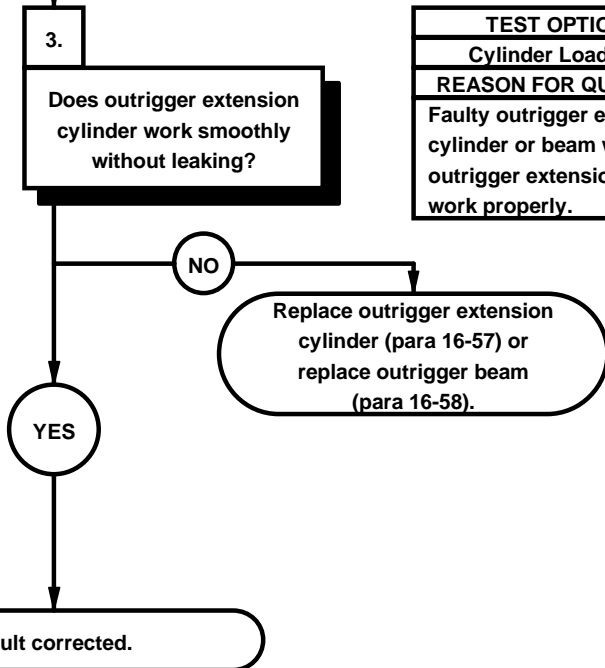
j4. M1089 MATERIAL HANDLING CRANE (MHC) OUTRIGGER EXTENSION CYLINDER DOES NOT WORK (CONT)

KNOWN INFO
Hydraulic oil level OK. Hydraulic hoses , tubes, and fittings OK. Control valve OK. Right and left outriggers OK.
POSSIBLE PROBLEMS
Faulty holding valve. Faulty outrigger extension cylinder.



TEST OPTIONS
Holding Valve Check
REASON FOR QUESTION
Faulty holding valve will cause outrigger extension cylinder to drift.

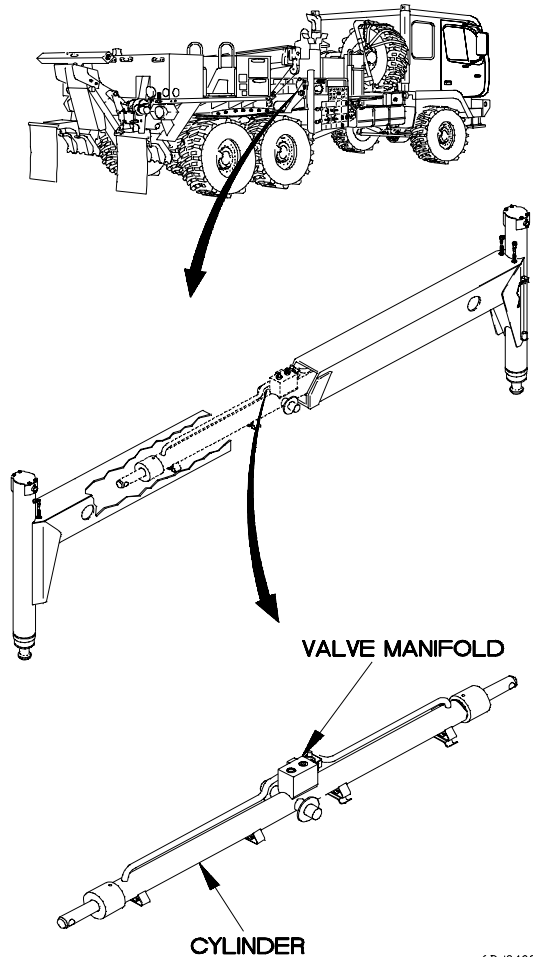
KNOWN INFO
Hydraulic oil level OK. Hydraulic hoses, tubes, and fittings OK. Control valve OK. Holding valve OK. Right and left outriggers OK.
POSSIBLE PROBLEMS
Faulty outrigger extension cylinder.



TEST OPTIONS
Cylinder Load Test
REASON FOR QUESTION
Faulty outrigger extension cylinder or beam will cause outrigger extension to not work properly.

HOLDING VALVE CHECK

- (1) Extend outriggers (TM 9-2320-366-10-1).
- (2) Load test (para 16-62). If cylinder drifts, holding valve is faulty.



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CYLINDER LOAD TEST

- (1) Start engine (TM 9-2320-366-10-1).
- (2) Position PTO switch to on (TM 9-2320-366-10-1).
- (3) Position MHC power switch to on (TM 9-2320-366-10-1).
- (4) Extend and retract outrigger two or more times (TM 9-2320-366-10-1).
- (5) Inspect outrigger extension cylinder for leakage.
 - (a) If cylinder leaks, cylinder is faulty.
 - (b) If cylinder binds, outrigger beam assembly is faulty.
- (6) Stow MHC (TM 9-2320-366-10-1).
- (7) Position MHC power switch to off (TM 9-2320-366-10-1).
- (8) Position PTO switch to off (TM 9-2320-366-10-1).
- (9) Shut down engine (TM 9-2320-366-10-1).

j5. M1089 MATERIAL HANDLING CRANE (MHC) BOOM SWING ASSEMBLY DOES NOT WORK

INITIAL SETUP

Equipment Conditions

Engine shut down (TM 9-2320-366-10-1).

Personnel Required

(2)

Tools and Special Tools

Tool Kit, Genl Mech (Item 78, Appendix B)

Tester, Hydraulic (Item 73, Appendix B)

Pan, Drain (Item 43, Appendix B)

Goggles, Industrial (Item 28, Appendix B)

Materials/Parts

Rag, Wiping (Item 60, Appendix C)

Hose (2) (Item 40, Appendix C)

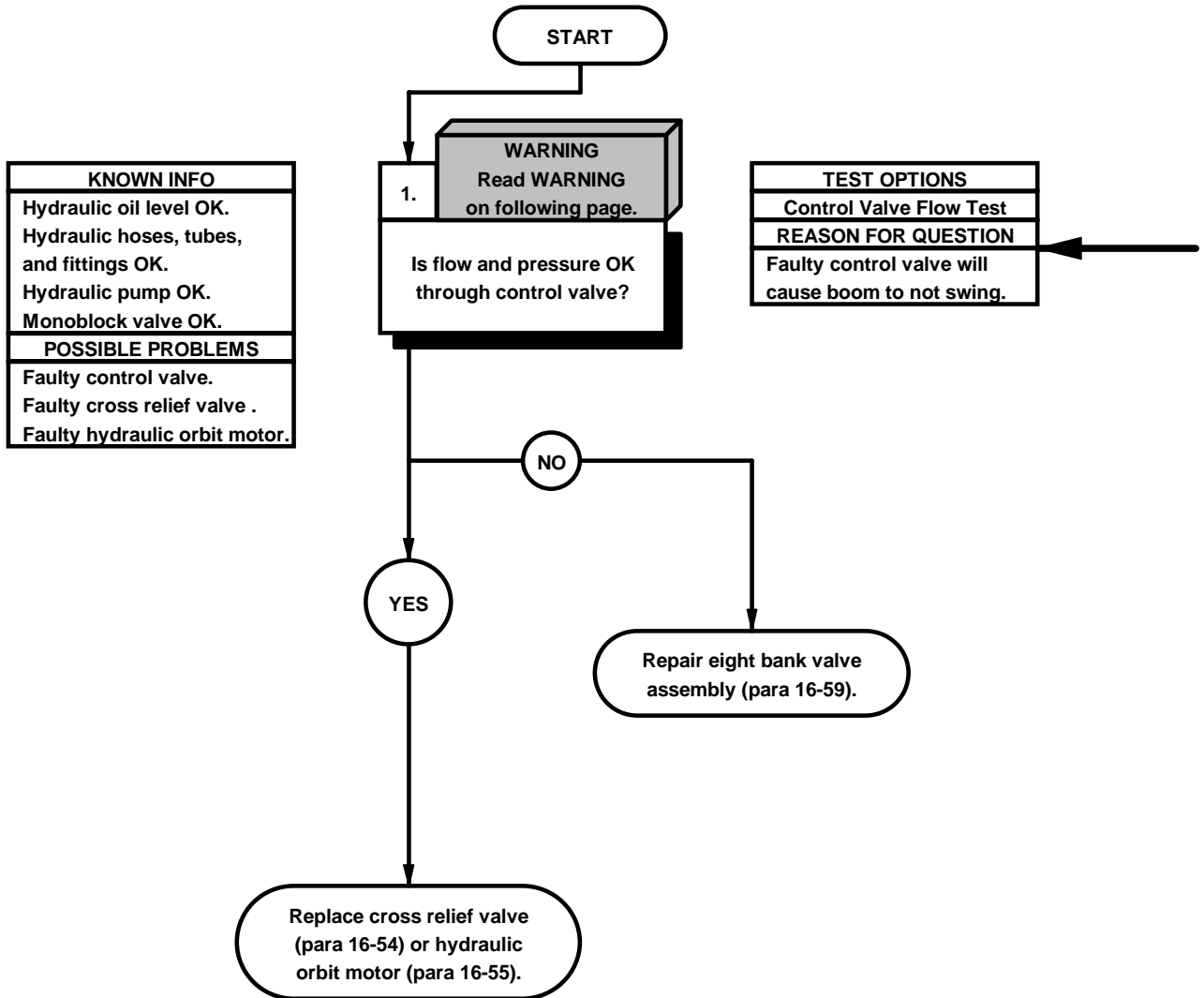
Fitting (2) (Item 31, Appendix C)

Reducer, Tube (Item 61, Appendix C)

Adapter, Swivel (Item 3, Appendix C)

Adapter, Pipe (Item 2, Appendix C)

Adapter, Pipe (Item 1, Appendix C)



WARNING

- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

CONTROL VALVE FLOW TEST

NOTE

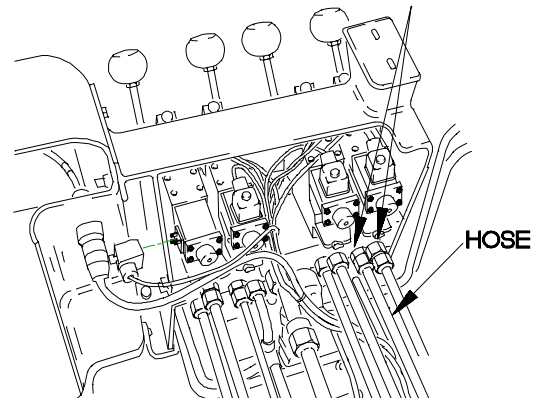
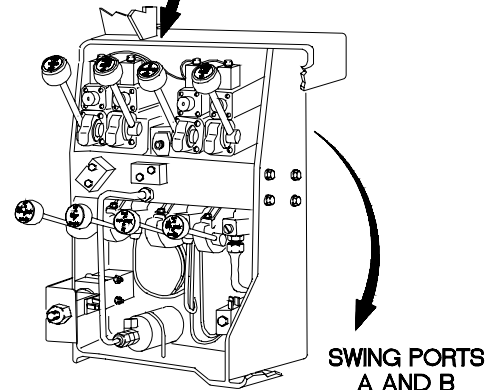
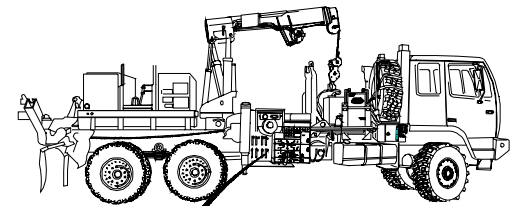
If boom swings right OK but will not swing left: substitute port B for port A, in steps (1), (2), (14), and (15), and operate swing control CCW, in step (9).

- (1) Place drain pan under vehicle.
- (2) Disconnect hose from port A of boom swing hose located underneath wrecker.
- (3) Connect hydraulic tester between hose and port A with test hoses and adapters.
- (4) Start engine (TM 9-2320-366-10-1).
- (5) Position PTO switch to on (TM 9-2320-366-10-1).
- (6) Increase engine rpm to 1250-1450 rpm (TM 9-2320-366-10-1).
- (7) Position MHC power switch to ON (TM 9-2320-366-10-1).

NOTE

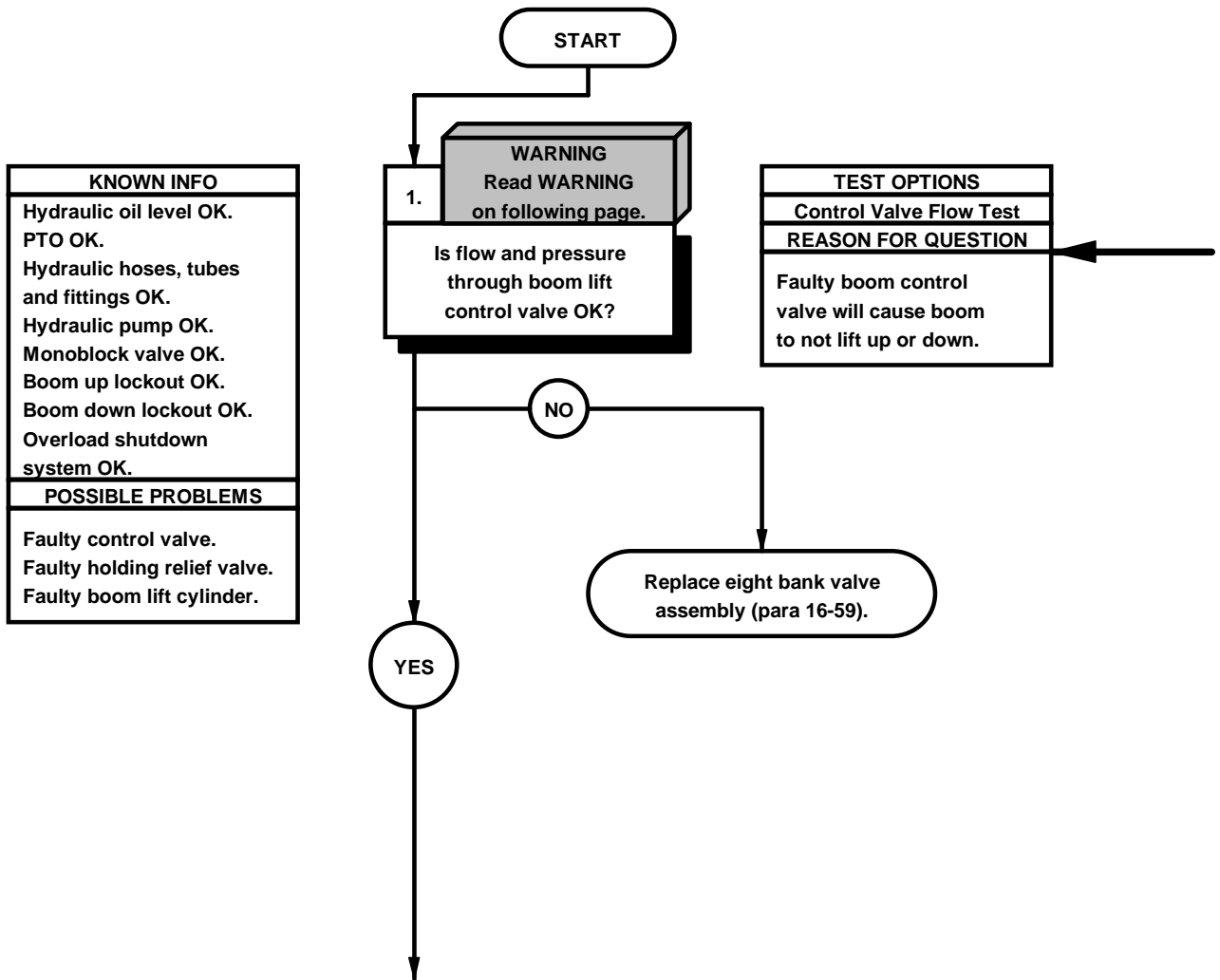
Crane must be fully erected in order to perform flow and pressure test.

- (8) Operate swing control CW (TM 9-2320-366-10-1).
- (9) Check for reading of 8-9 gpm (30-34 lpm) at 1400 psi (9653 kPa).
- (10) If flow reading is not 8-9 gpm (30-34 lpm), replace control valve (para 16-59).
- (11) If pressure is not 1400 psi (9653 kPa), replace hydraulic orbit motor (para 16-55) or cross relief valve assembly (para 16-54).
- (12) Stow MHC (TM 9-2320-366-10-1).
- (13) Position MHC power to OFF (TM 9-2320-366-10-1).
- (14) Position PTO switch to off (TM 9-2320-366-10-1).
- (15) Shut down engine (TM 9-2320-366-10-1).
- (16) Disconnect hydraulic tester, hose and adapters.
- (17) Connect hose to port A.
- (18) Remove drain pan from under vehicle.



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j6. M1089 MATERIAL HANDLING CRANE (MHC) BOOM DOES NOT LIFT UP OR DOWN	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Materials/Parts Rag, Wiping (Item 60, Appendix C) Hose (2) (Item 40, Appendix C) Fitting (2) (Item 31, Appendix C) Reducer, Tube (Item 61, Appendix C) Adapter, Swivel (Item 3, Appendix C) Adapter, Pipe (Item 2, Appendix C) Fitting (Item 32, Appendix C) Adapter, Pipe (Item 1, Appendix C)
Personnel Required (2)	
Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) Tester, Hydraulic (Item 73, Appendix B) Pan, Drain (Item 43, Appendix B) Goggles, Industrial (Item 28, Appendix B)	



WARNING

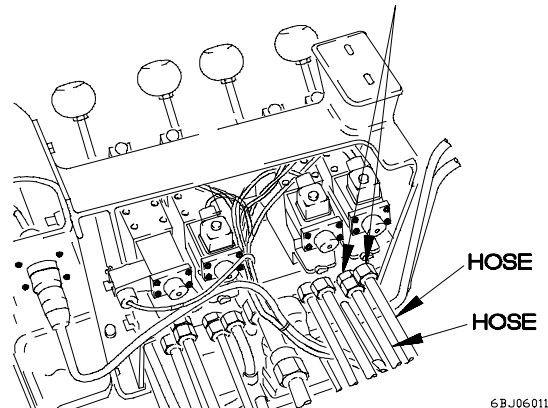
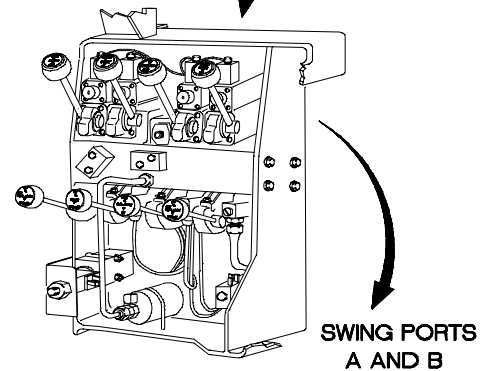
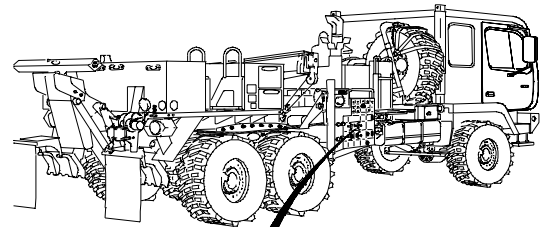
- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

NOTE

Tag hydraulic hoses, tubes, and fittings prior to disconnecting.

CONTROL VALVE FLOW AND PRESSURE TEST

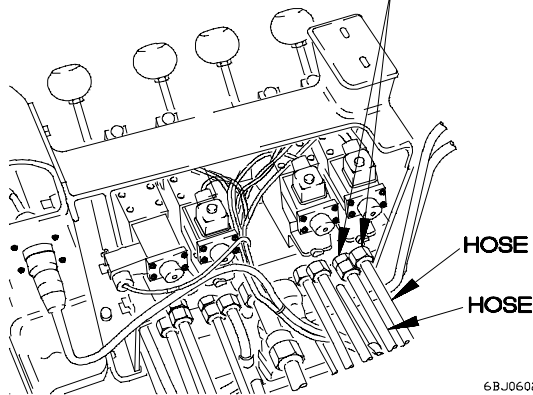
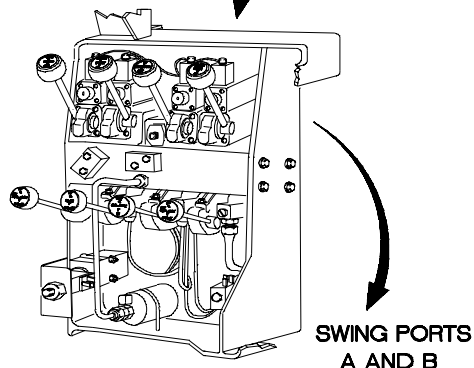
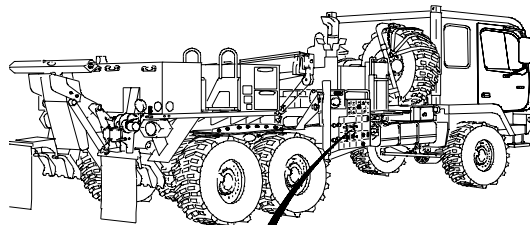
- (1) Place drain pan under vehicle.
 - (2) Disconnect hose from port A of boom lift cylinder.
 - (3) Connect hydraulic tester between hose and port A with test hoses and adapters.
 - (4) Start engine (TM 9-2320-366-10-1).
 - (5) Position PTO switch to on (TM 9-2320-366-10-1).
 - (6) Increase engine rpm to 1250-1450 rpm (TM 9-2320-366-10-1).
 - (7) Position MHC main power switch to ON (TM 9-2320-366-10-1).
 - (8) Operate boom up (TM 9-2320-366-10-1), perform flow test, and note flow reading.
 - (9) Operate boom up (TM 9-2320-366-10-1), perform pressure test, and note pressure reading.
 - (10) Position MHC main power switch to OFF (TM 9-2320-366-10-1).
 - (11) Position PTO switch to off (TM 9-2320-366-10-1).
 - (12) Shut down engine (TM 9-2320-366-10-1).
 - (13) Disconnect test hose and hydraulic tester from port A of boom lift cylinder.
- (Continued on next page)



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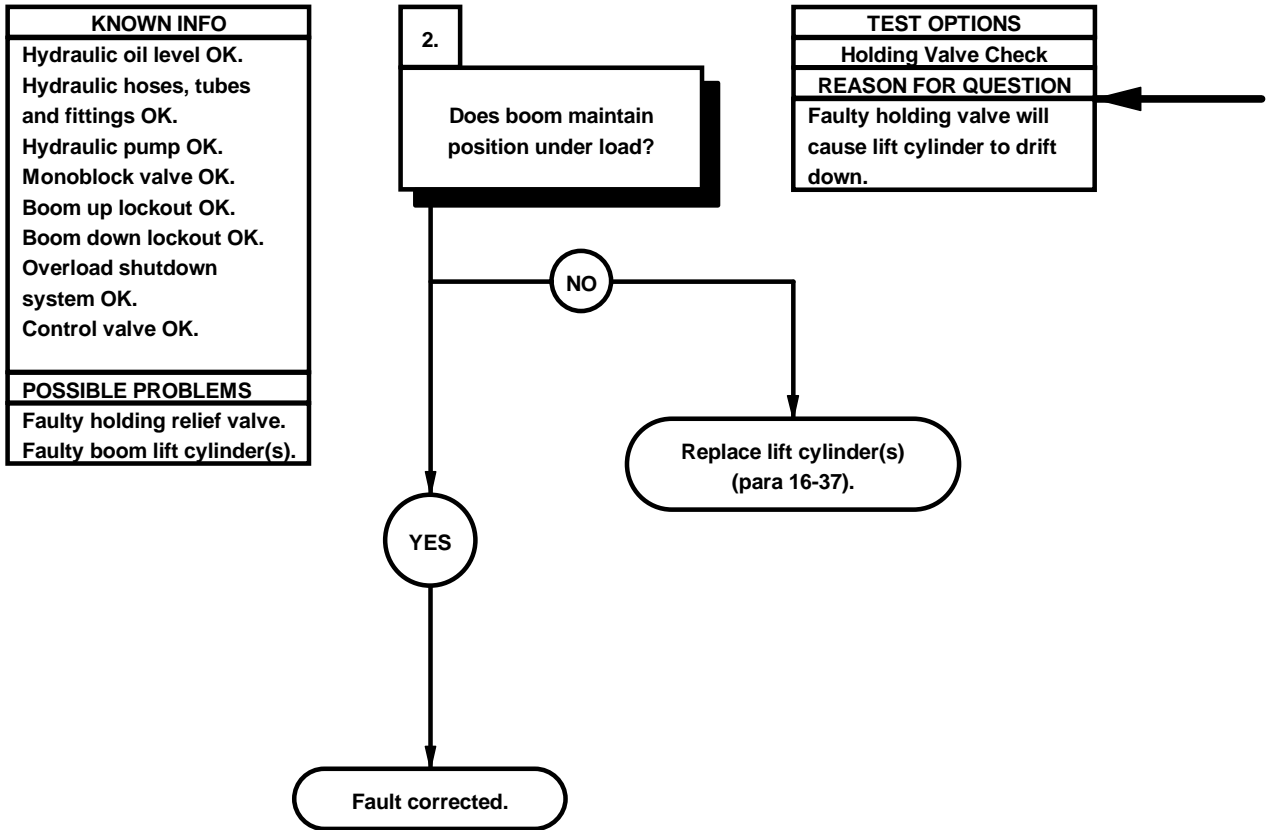
j6. M1089 MATERIAL HANDLING CRANE (MHC) BOOM DOES NOT LIFT UP OR DOWN (CONT)

- | CONTROL VALVE FLOW AND PRESSURE TEST
Cont |
|----------------------------------------------------------------------------------------------------------------------|
| (Continued from previous page) |
| (14) Connect hose to port A of boom lift cylinder. |
| (15) Disconnect hose from port B of boom lift cylinder. |
| (16) Connect hydraulic tester between hose and port B with test hose and adapter. |
| (17) Start engine (TM 9-2320-366-10-1). |
| (18) Increase engine rpm to 1250-1450 rpm (TM 9-2320-366-10-1). |
| (19) Position MHC main power switch to ON (TM 9-2320-366-10-1). |
| (20) Operate MHC boom down (TM 9-2320-366-10-1), perform flow test and note flow reading. |
| (21) Operate MHC boom up (TM 9-2320-366-10-1), perform pressure test and note pressure reading. |
| (22) If flow is not 12 gpm (45 lpm) for boom up or 8 gpm (30 lpm) for boom down, replace control valve (para 16-59). |
| (23) If pressure is not 3000-3100 psi (20685-21375 kPa), replace control valve (para 16-59). |
| (24) Position MHC main power switch to OFF (TM 9-2320-366-10). |
| (25) Position PTO switch to off (TM 9-2320-366-10). |
| (26) Disconnect test hose and hydraulic tester from port B. |
| (27) Connect hose to port B of boom lift cylinder, |
| (28) Stow MHC (TM 9-2320-366-10-1). |
| (29) Shut down engine (TM 9-2320-366-10). |



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j6. M1089 MATERIAL HANDLING CRANE (MHC) BOOM DOES NOT LIFT UP OR DOWN (CONT)



HOLDING VALVE CHECK

- (1) Perform M1089 MHC load test (para 16-62).
Lift cylinder shall maintain position for 30 minutes.
- (2) If lift cylinder drifts in less than 30 minutes, replace lift cylinder (para 16-37).
- (3) Stow crane (TM 9-2320-366-10-1).

7. M1089 MATERIAL HANDLING CRANE (MHC) BOOM DOES NOT TELESCOPE IN OR OUT

INITIAL SETUP

Equipment Conditions

Engine shut down (TM 9-2320-366-10-1).

Personnel Required

(2)

Tools and Special Tools

Tool Kit, Genl Mech (Item 78, Appendix B)

Tester, Hydraulic (Item 73, Appendix B)

Pan, Drain (Item 43, Appendix B)

Goggles, Industrial (Item 28, Appendix B)

Materials/Parts

Rag, Wiping (Item 60, Appendix C)

Hose (2) (Item 40, Appendix C)

Fitting (2) (Item 31, Appendix C)

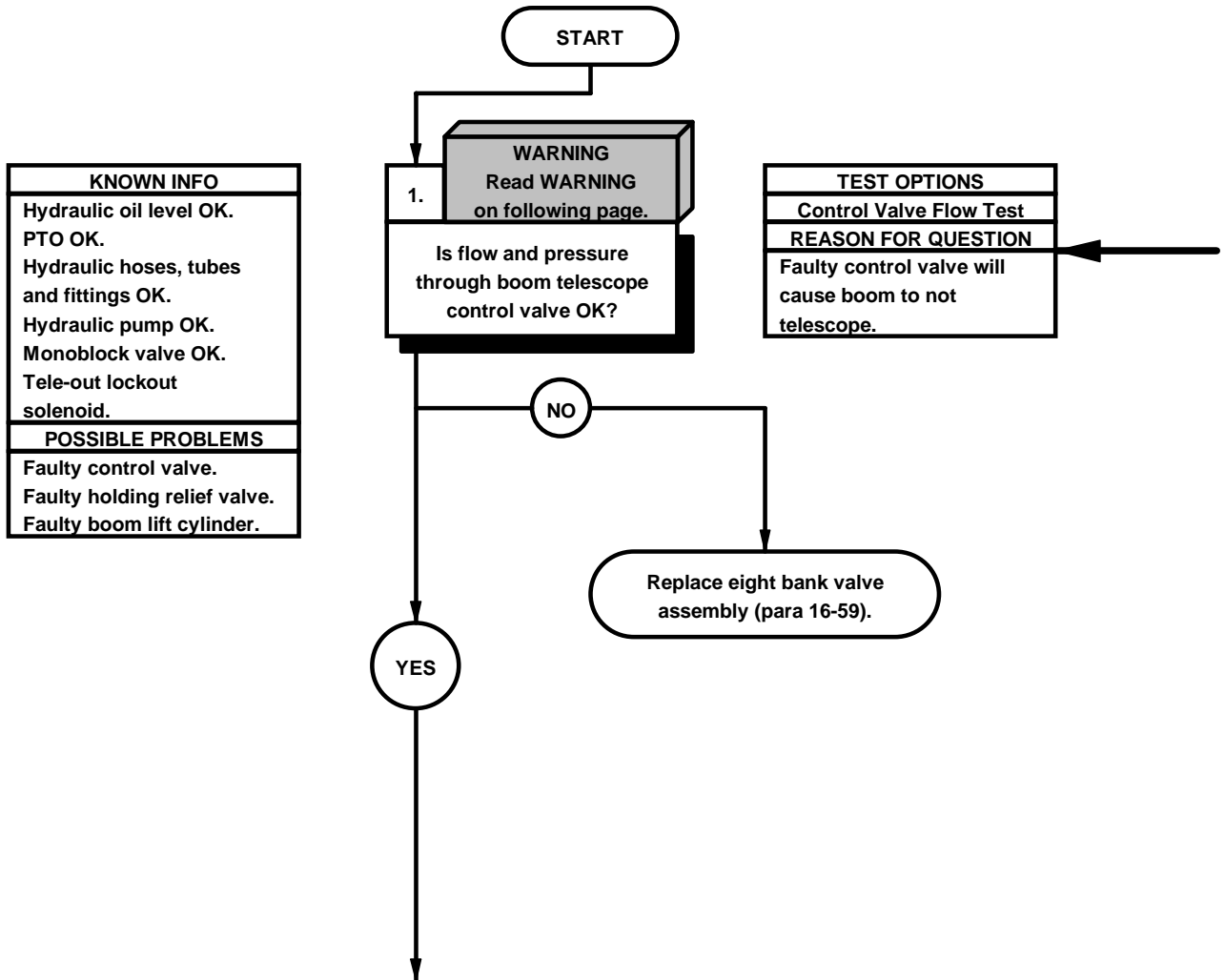
Reducer, Tube (Item 61, Appendix C)

Adapter, Swivel (Item 3, Appendix C)

Adapter, Pipe (Item 2, Appendix C)

Fitting (Item 32, Appendix C)

Adapter, Pipe (Item 1, Appendix C)



WARNING

- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

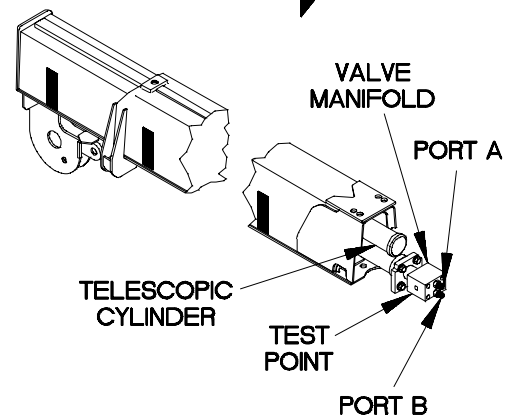
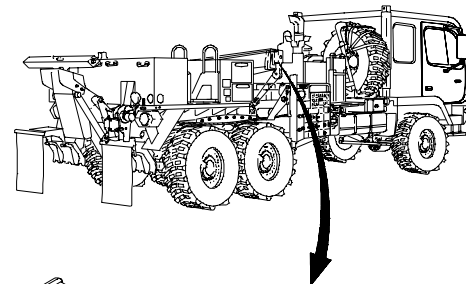
NOTE

Tag hydraulic hoses, tubes, and fittings prior to disconnecting.

CONTROL VALVE FLOW AND PRESSURE TEST

- (1) Place drain pan under vehicle.
- (2) Disconnect hose from port A of telescope cylinder.
- (3) Connect hydraulic tester between hose and port A with test hoses and adapters.
- (4) Start engine (TM 9-2320-366-10-1).
- (5) Position PTO switch to on (TM 9-2320-366-10-1).
- (6) Position MHC main power switch to ON (TM 9-2320-366-10-1).
- (7) Increase engine rpm to 1250-1450 rpm (TM 9-2320-366-10-1).
- (8) Operate telescope in (TM 9-2320-366-10-1), perform flow test, and note flow reading.
- (9) Operate telescope in (TM 9-2320-366-10-1), perform pressure test, and note pressure reading.
- (10) Position MHC main power switch to OFF (TM 9-2320-366-10-1).
- (11) Position PTO switch to off (TM 9-2320-366-10-1).
- (12) Shut down engine (TM 9-2320-366-10-1).
- (13) Disconnect test hose and hydraulic tester from port A of telescope cylinder.

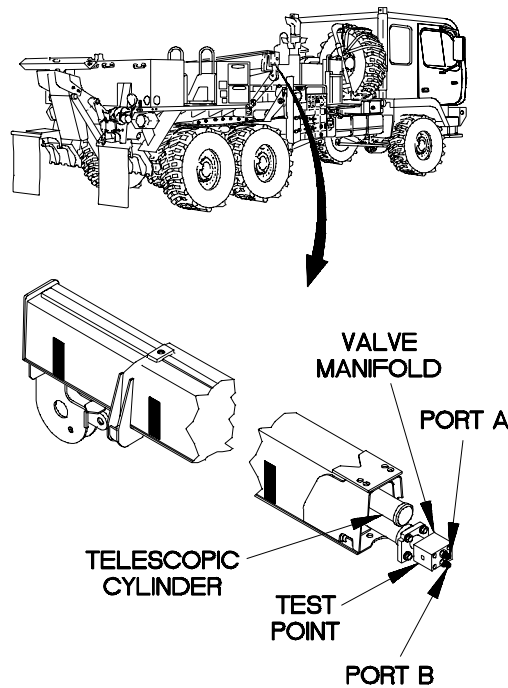
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j7. M1089 MATERIAL HANDLING CRANE (MHC) BOOM DOES NOT TELESCOPE IN OR OUT (CONT)

- | CONTROL VALVE FLOW AND PRESSURE TEST
Cont |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| (Continued from previous page) |
| (14) Connect hose to port A of telescopic cylinder. |
| (15) Disconnect hose from port B of telescope cylinder. |
| (16) Connect hydraulic tester between hose and port B with test hose and adapter. |
| (17) Start engine (TM 9-2320-366-10-1). |
| (18) Increase engine rpm to 1250-1450 rpm (TM 9-2320-366-10-1). |
| (19) Position MHC main power switch to ON (TM 9-2320-366-10-1). |
| (20) Operate MHC telescopic cylinder out (TM 9-2320-366-10-1), perform flow test and note flow reading. |
| (21) Operate MHC telescopic cylinder in (TM 9-2320-366-10-1), perform pressure test and note pressure reading. |
| (22) If flow is not 7 gpm (26.5 lpm) for telescopic cylinder in or 12 gpm (45 lpm) for telescopic cylinder out, replace control valve (para 16-59). |
| (23) If pressure is not 3000-3100 psi (20685-21375 kPa), replace eight bank valve assembly (para 16-59). |
| (24) Position MHC main power switch to OFF (TM 9-2320-366-10-1). |
| (25) Position PTO switch to off (TM 9-2320-366-10-1). |
| (26) Disconnect test hose and hydraulic tester from port B. |
| (27) Connect hose to port B of telescopic cylinder. |
| (28) Stow crane (TM 9-2320-366-10-1). |
| (29) Shut down engine (TM 9-2320-366-10-1). |



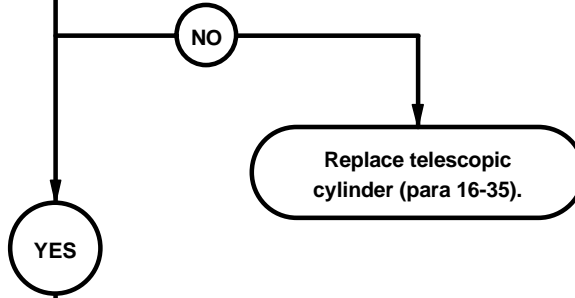
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j7. M1089 MATERIAL HANDLING CRANE (MHC) BOOM DOES NOT TELESCOPE IN OR OUT (CONT)

KNOWN INFO
Hydraulic oil level OK. Hydraulic hoses, tubes, and fittings OK. Control valve OK. Tele-out lockout valve OK.
POSSIBLE PROBLEMS
Faulty holding relief valve. Faulty telescopic cylinder.

2.
Does boom remain in position under load?

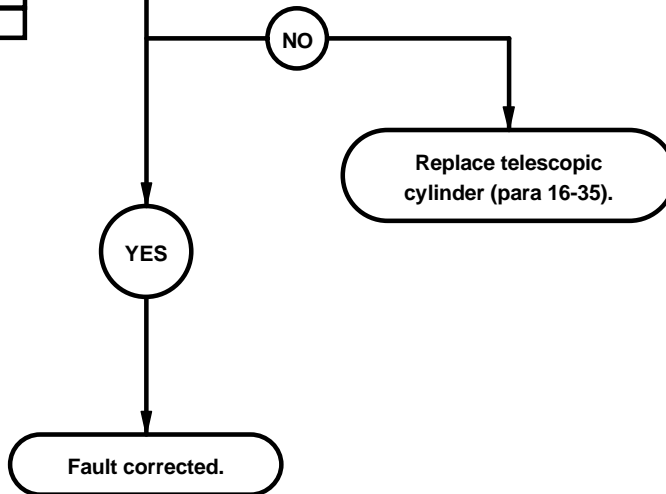
TEST OPTIONS
Holding Valve Check
REASON FOR QUESTION
Faulty holding valve will cause telescopic cylinder to drift.



KNOWN INFO
Hydraulic oil level OK. Hydraulic hoses, tubes, and fittings OK. Control valve OK. Tele-out lockout valve OK. Holding relief valve OK.
POSSIBLE PROBLEMS
Faulty telescopic cylinder.

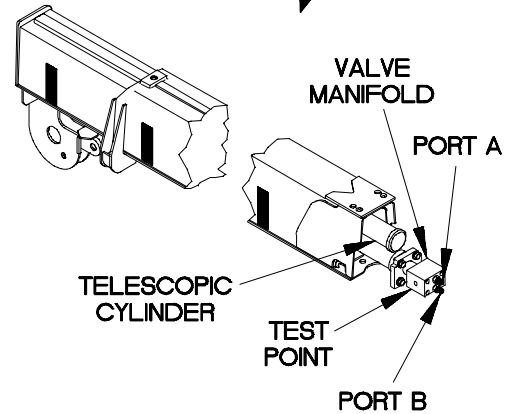
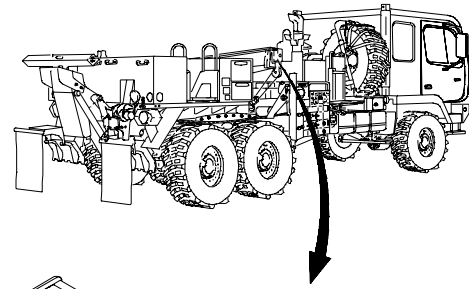
3.
Does telescopic cylinder work smoothly without leaking?

TEST OPTIONS
Telescopic Cylinder Load Test
REASON FOR QUESTION
Faulty telescopic cylinder will cause boom to not telescope in or out.



HOLDING VALVE CHECK

- (1) Pick up light load with MHC, extend boom (tele-out) and lift boom to 30 degrees (TM 9-2320-366-10-1).
- (2) Load test (para 16-62). If cylinder drifts, holding valve on telescopic cylinder is faulty.

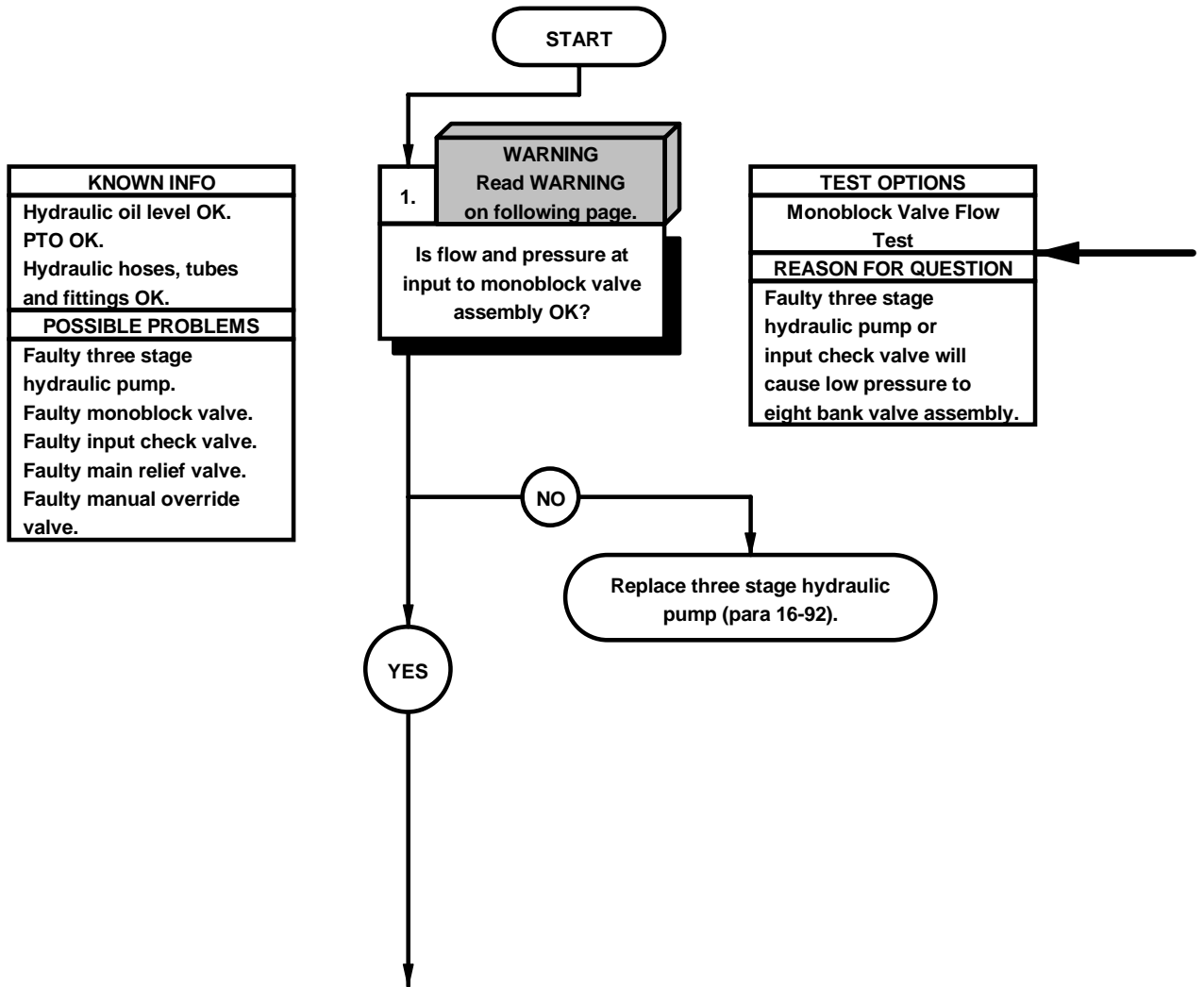


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TELESCOPIC CYLINDER LOAD TEST

- (1) Perform M1089 crane load test (para 16-62). Telescopic cylinder shall maintain position for 30 minutes.
- (2) If telescopic cylinder drifts in less than 30 minutes, replace telescopic cylinder (para 16-37).
- (3) Stow MHC (TM 9-2320-366-10-1).

j8. M1089 MATERIAL HANDLING CRANE (MHC) HOIST DOES NOT WORK	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10).	Materials/Parts Rag, Wiping (Item 60, Appendix C) Hose (2) (Item 40, Appendix C) Fitting (2) (Item 31, Appendix C) Reducer, Tube (Item 61, Appendix C) Adapter, Swivel (Item 3, Appendix C) Adapter, Pipe (Item 2, Appendix C) Fitting (Item 32, Appendix C) Adapter, Pipe (Item 1, Appendix C)
Personnel Required (2)	
Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) Tester, Hydraulic (Item 73, Appendix B) Pan, Drain (Item 43, Appendix B) Goggles, Industrial (Item 28, Appendix B)	



WARNING

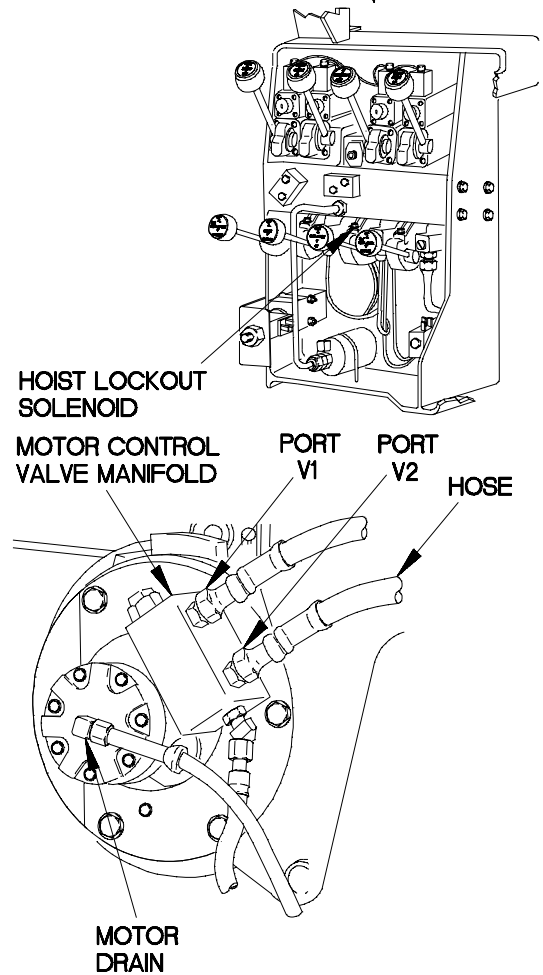
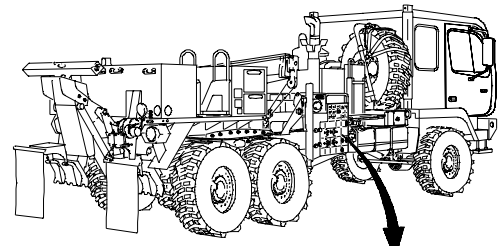
- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

NOTE

Tag hydraulic hoses, tubes, and fittings prior to disconnecting.

MONOBLOCK VALVE FLOW TEST

- (1) Place drain pan under vehicle.
- (2) Disconnect hydraulic hose from input of monoblock valve assembly control valve.
- (3) Connect hydraulic tester between hose and fitting with hoses and adapters.
- (4) Start engine (TM 9-2320-366-10).
- (5) Position PTO switch to ON (TM 9-2320-366-10).
- (6) Observe flow of 12-14 gpm (45-53 lpm) at 2400-2950 psi (16548-20340 kPa).
- (7) If flow and pressure are not between 12-14 gpm (45-53 lpm) and 2400-2950 psi (16548-20340 kPa), replace hydraulic rotary pump (para 16-91).
- (8) Position PTO switch to OFF (TM 9-2320-366-10).
- (9) Shutdown engine (TM 9-2320-366-10).
- (10) Disconnect flow/pressure kit and disassemble test equipment fittings and hoses from pressure flow kit.
- (11) Connect main valve tube to fitting.
- (12) Remove drain pan.



6BJ08011

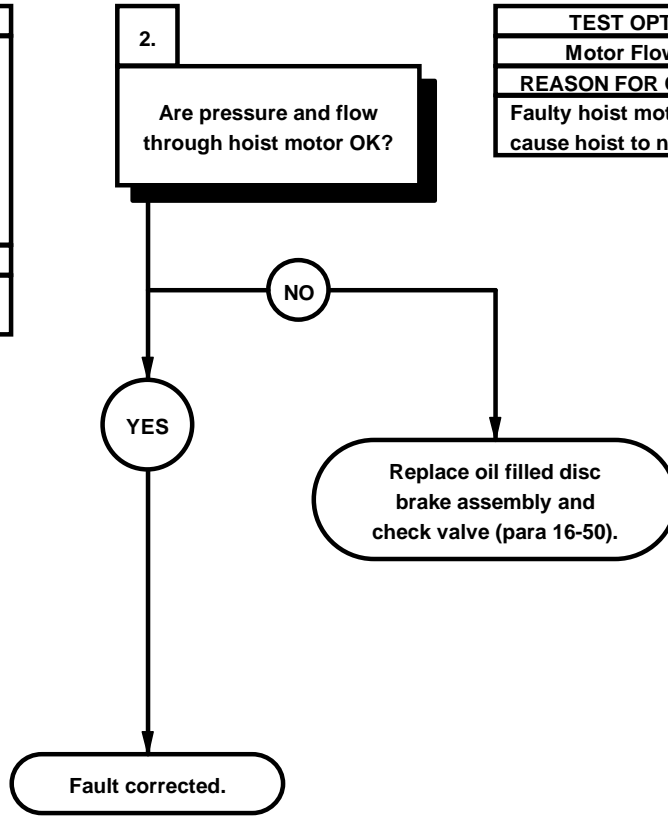
j8. M1089 MATERIAL HANDLING CRANE (MHC) HOIST DOES NOT WORK (CONT)

KNOWN INFO
Hydraulic oil level OK.
Hydraulic hoses, tubes, and fittings OK.
Control valve OK.
Hoist-up lockout valve OK.
RV1 relief valve OK.
Motor control valve OK.

POSSIBLE PROBLEMS
Faulty hoist.
Faulty check valve.

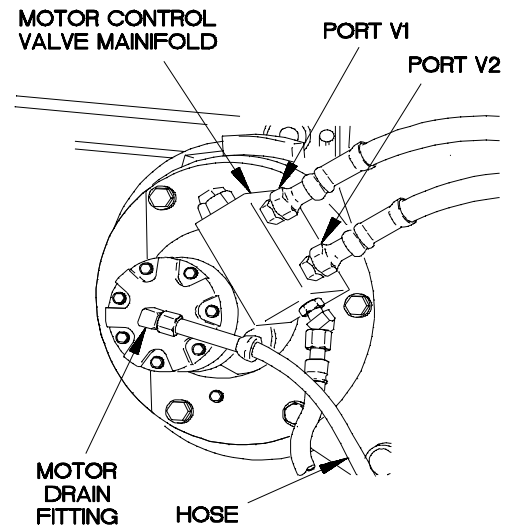
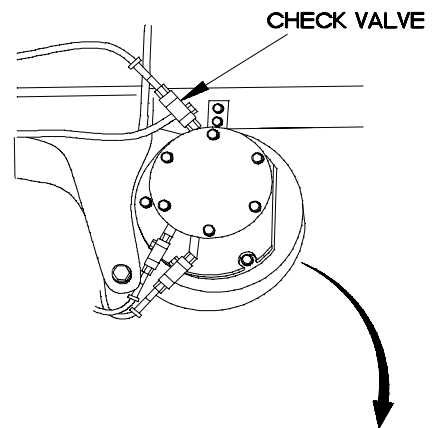
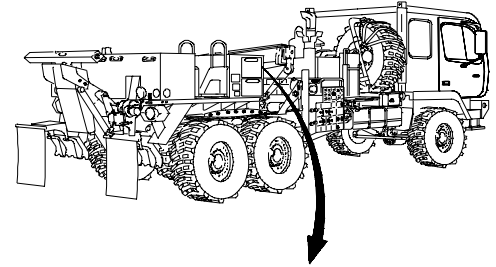
TEST OPTIONS
Motor Flow Test

REASON FOR QUESTION
Faulty hoist motor will cause hoist to not work.



MOTOR FLOW TEST

- (1) Disconnect hose from motor drain fitting.
- (2) Connect hydraulic tester between hose and motor drain fitting with test hoses and adapters.
- (3) Start engine (TM 9-2320-366-10-1).
- (4) Position PTO switch to on (TM 9-2320-366-10-1).
- (5) Increase engine RPM to 1250-1450 RPM (TM 9-2320-366-10-1).
- (6) Position MHC power switch to ON (TM 9-2320-366-10-1).
- (7) Operate MHC to hoist a moderate load.
- (8) Observe flow of 12-14 gpm (46-54 lpm) at 2100-2300 psi (14480-15859 kPa).
- (9) If flow is not 12-14 gpm (46-54 lpm) and pressure is not 2100-2300 psi (14480-15859 kPa), replace oil filled brake or check valve (para 16-50).
- (10) Stow MHC (TM 9-2320-366-10-1).
- (11) Position MHC power switch to OFF (TM 9-2320-366-10-1).
- (12) Position PTO switch to off (TM 9-2320-366-10-1).
- (13) Shut down engine (TM 9-2320-366-10-1).
- (14) Disconnect hydraulic tester, hoses and adapters.
- (15) Connect hose to motor drain fitting.
- (16) Remove drain pan from under vehicle.



6.B.J0802A

2-19. DUMP BODY HYDRAULIC SYSTEM TROUBLESHOOTING

This paragraph covers Dump Body Hydraulic System Troubleshooting. The Dump Body Hydraulic System Fault Index, Table 2-17, lists faults for the Dump Body Hydraulic System of the vehicle.

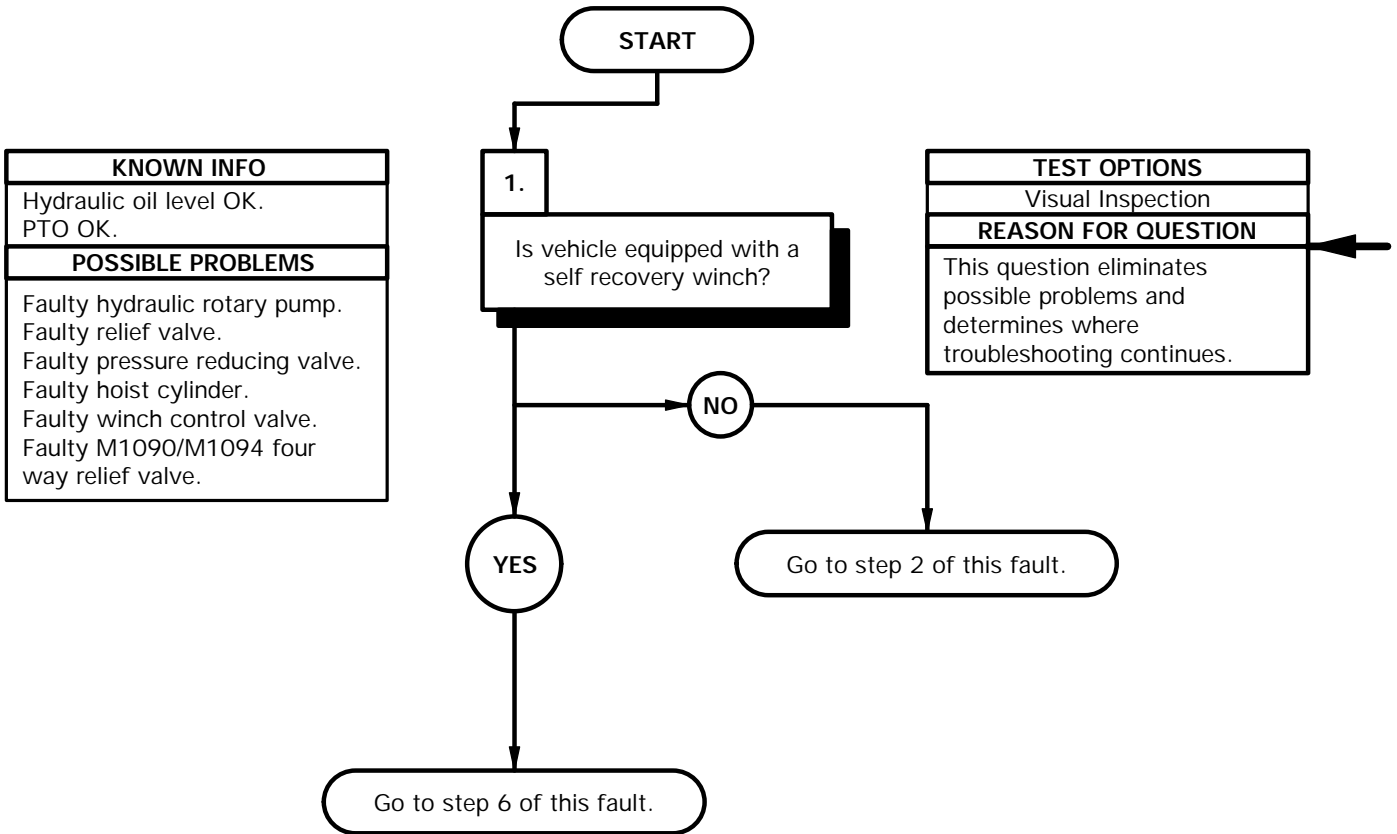
Table 2-17. Dump Body Hydraulic System Fault Index

Fault No.	Description	Page
k1.	Dump Body Does Not Raise	2-1068
k2.	Dump Body Does Not Lower	2-1072.10
k3.	Dump Body Creeps Down From Raised Position	2-1072.12

k1. DUMP BODY DOES NOT RAISE	
INITIAL SETUP	
<p>Equipment Conditions Engine shut down (TM 9-2320-366-10-1)</p> <p>Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) Pan, Drain (Item 42, Appendix B) Goggles, Industrial (Item 28, Appendix B) Lifting Bracket, Dump Body (2) (Item 8, Appendix D) Gloves, Mens (Item 34.2, Appendix C) STE/ICE-R (Item 70, Appendix B) Transmitter, Pressure (Item 1, Appendix G)</p>	<p>Materials/Parts Rag, Wiping (Item 60, Appendix C) Tee, Tube (Item 88.3, Appendix C) Tee, Tube (Item 88.2, Appendix C) Reducer, Tube (Item 60.2, Appendix C) Reducer, Tube (Item 60.1, Appendix C) Hose Assembly, Nonmetallic (Item 40.1, Appendix C) Cap, Tube (Item 17.3, Appendix C) Plug, Tube Fitting, Threaded (Item 55.3, Appendix C) Indicator, Temperature, Label (Item 40.4, Appendix C)</p> <p>Personnel Required (2)</p> <p>References TM 9-4910-571-12&P</p>

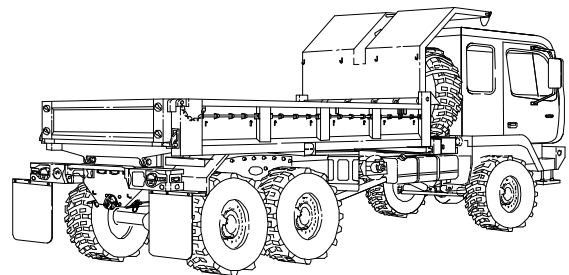
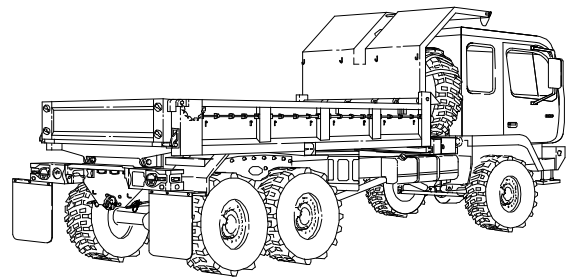
NOTE

Perform Electrical System Troubleshooting e143.
Dump Body Does Not Raise (TM 9-2320-366-20-2)
prior to beginning this task.



VISUAL INSPECTION

- (1) If vehicle is equipped with a self recovery winch go to step 6 of this fault.
- (2) If vehicle is not equipped with a self recovery winch go to step 2 of this fault.



6bk0101B

k1. DUMP BODY DOES NOT RAISE

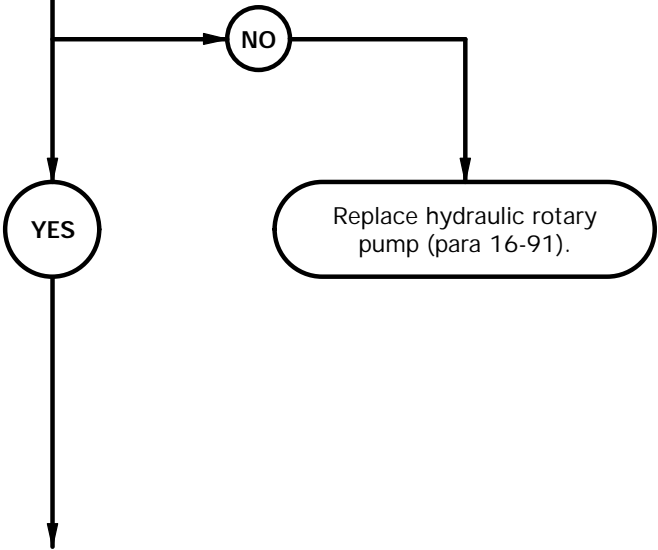
KNOWN INFO
Hydraulic oil level OK. PTO OK.
POSSIBLE PROBLEMS
Faulty hydraulic rotary pump. Faulty relief valve. Faulty pressure reducing valve. Faulty hoist cylinder. Faulty M1090/M1094 four way relief valve.

2.

WARNING
Read **WARNING**
on following page.

Is hydraulic rotary pump supplying at least 2500 PSI?

TEST OPTIONS
Pressure Test or STE/ICE-R Test #51
REASON FOR QUESTION
Faulty hydraulic rotary pump will cause dump body not to raise.



WARNING

Dump body weighs approximately 3,030 lbs. (1,376 kgs). Attach a suitable lifting device prior to lifting. Failure to comply may result in injury to personnel.

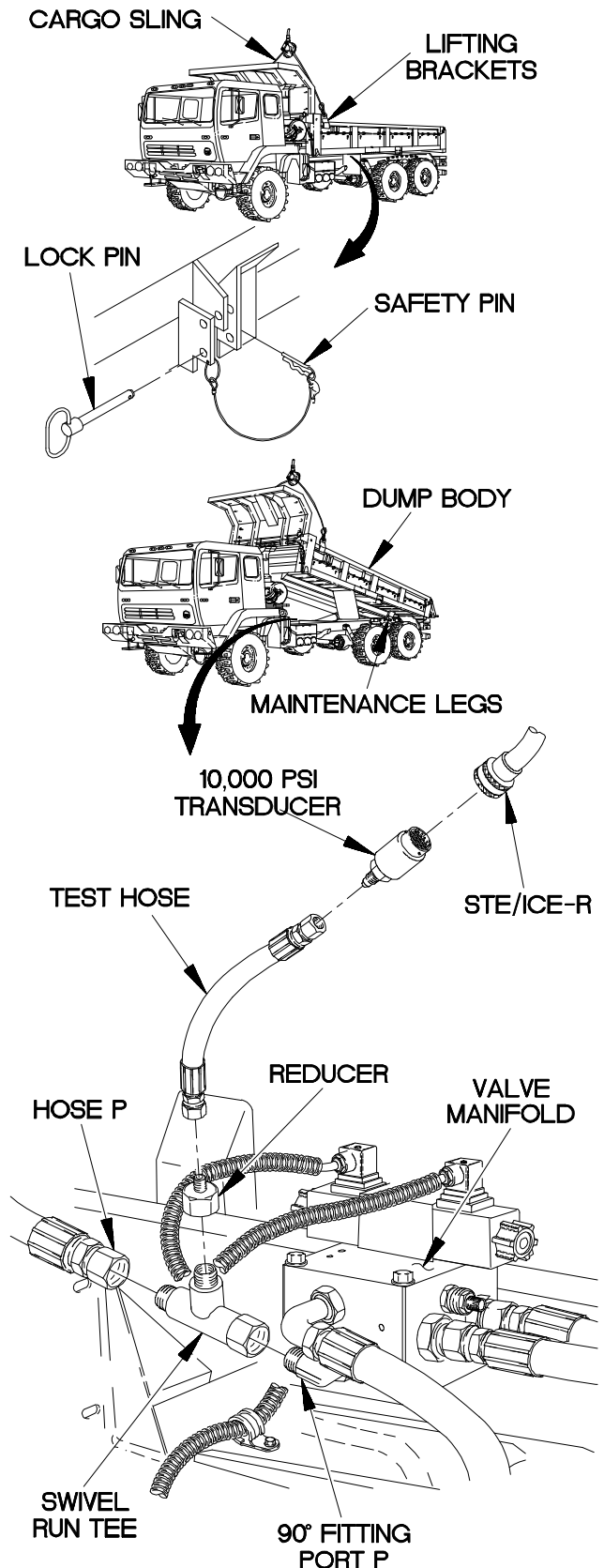
Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.

Prolonged contact with lubricating oil (MIL-L-21 04) may cause a skin rash. Skin and clothing that come in contact with lubricating oil should be thoroughly washed immediately. Saturated clothing should be removed immediately. Areas in which lubricating oil is used should be well ventilated to keep fumes to a minimum. Failure to comply may result in injury to personnel.

Lubricating oil is slippery and can cause falls. Wipe up spilled oil with rags. Failure to comply may result in injury to personnel.

PRESSURE TEST

- (1) Remove safety pin from two locking pins.
- (2) Remove two locking pins from dump body.
- (3) Install two dump body lifting brackets in slots in dump body.
- (4) Attach cargo sling to dump body lifting brackets.
- (5) Lift dump body.
- (6) Raise two maintenance legs on frame.
- (7) Lower dump body on maintenance legs.
- (8) Position drain pan under vehicle.
- (9) Disconnect hose P from 90° fitting at input port P of valve manifold.
- (10) Install swivel tee fitting on 90 degree fitting at input port P of valve manifold.
- (11) Connect hose P to swivel tee fitting.
- (12) Connect reducer, hose, and STE/ICE adaptor to swivel tee fitting.
- (13) Start engine (TM 9-2320-366-10-1).
- (14) Position PTO switch to on (TM 9-2320-366-10-1).
- (15) Set engine speed to 1250-1450 RPM (TM-9-2320-366-10-1).
- (16) Perform SET/ICE-R Test #51 (TM 9-4910-571-12&P)
- (17) Position Dump Body UP/DOWN switch to down, while assistant checks reading on STE/ICE-R.
- (18) If pressure is less than 2500 PSI (17,238 kPa), replace hydraulic pump (para 16-91).



66k0102B

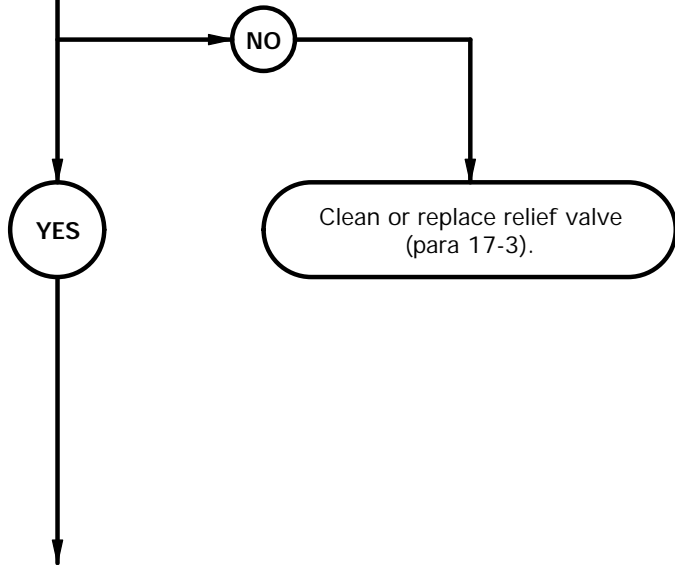
k1. DUMP BODY DOES NOT RAISE (CONT)

KNOWN INFO
Hydraulic oil level OK. PTO OK. Hydraulic rotary pump OK.
POSSIBLE PROBLEMS
Faulty relief valve. Faulty pressure reducing valve. Faulty hoist cylinder. Faulty M1090/M1094 four way relief valve.

3. **CAUTION**
Read CAUTION on following page.

Can relief valve be adjusted to 2475-2525 PSI?

TEST OPTIONS
Pressure Test or STE/ICE-R Test #51
REASON FOR QUESTION
Faulty relief valve will cause dump body not to raise.



PRESSURE TEST

- (1) Disconnect hose from fitting at output port A of valve manifold.
- (2) Install cap on output port A of valve manifold.
- (3) Install plug on output hose A.
- (4) Start engine (TM 9-2320-366-10-1).
- (5) Position PTO switch to on (TM 9-2320-366-10-1)
- (6) Increase engine RPM to 1250-1450 (TM 9-2320-366-10-1).

CAUTION

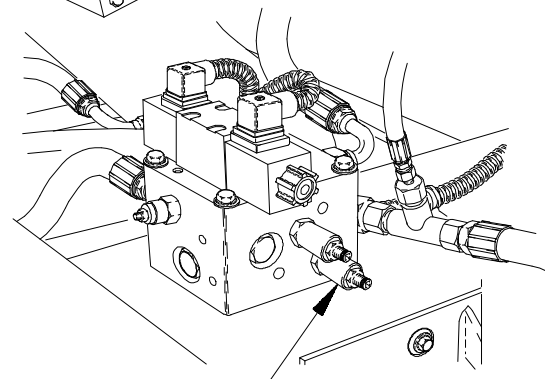
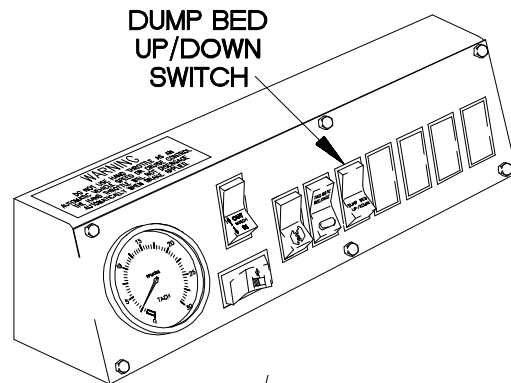
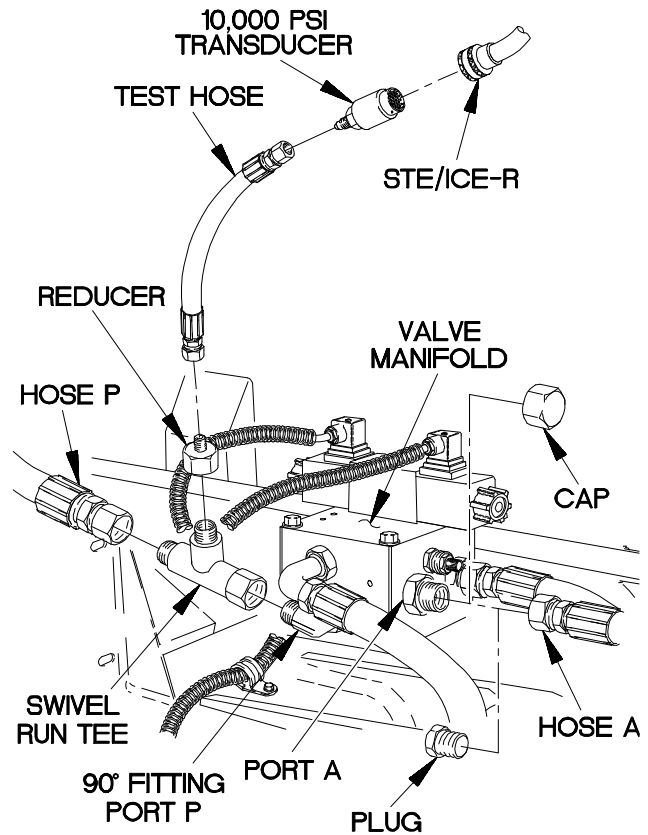
Hydraulic oil temperature must be 145° F-155° F (63° C-68° C) prior to performing troubleshooting checks. Failure to comply may result in inaccurate test results.

NOTE

Holding DUMP BED UP/DOWN switch in the down position will force hydraulic oil through relief valve and cause oil temperature to rise.

Measure hydraulic oil temperature near bottom of hydraulic reservoir.

- (7) Press and hold DUMP BED UP/DOWN switch in the DOWN position until hydraulic oil temperature reaches 145° F-155° F (63° C-68° C).
- (8) Perform STE/ICE Test #51 (TM 9-4910-571-12&P)
- (9) Hold DUMP BED UP/DOWN switch in the UP position and observe pressure reading of 2475-2525 psi (17065-17410 kPa). If pressure is low, adjust relief valve clockwise. If pressure is high, adjust relief valve counterclockwise. If pressure cannot be adjusted, clean or replace relief valve (para 17-3).
- (10) Position PTO switch to off (TM 9-2320-366-10-1).
- (11) Shut down engine (TM 9-2320-366-10-1).
- (12) Remove STE/ICE adapter, hose, and reducer from swivel run tee.
- (13) Disconnect hose P from swivel run tee.
- (14) Remove swivel run tee from 90 degree fitting at input port P of valve manifold.
- (15) Connect hose to 90 degree fitting at input port P of valve manifold.
- (16) Remove plug from port A hose.
- (17) Remove cap from output port A of valve manifold.
- (18) Connect hose to port A fitting of valve manifold.



66k0103B

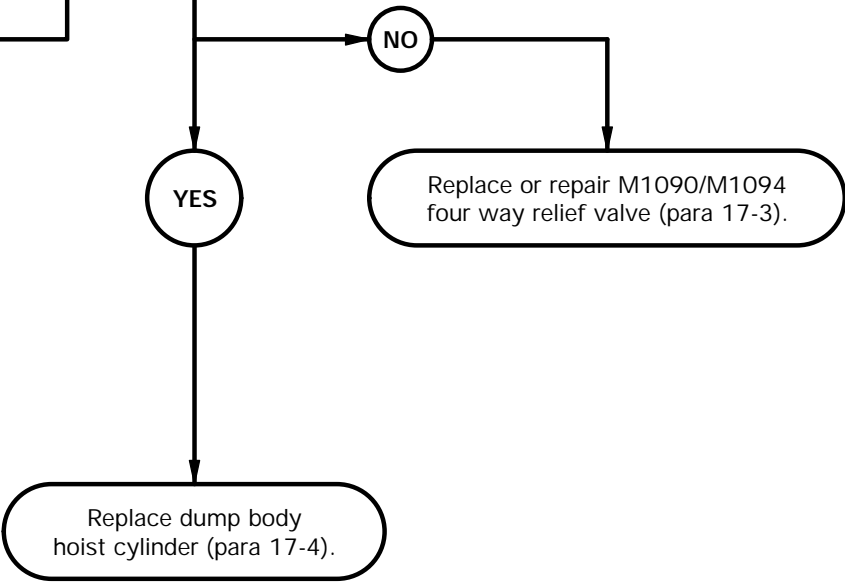
k1. DUMP BODY DOES NOT RAISE (CONT)

KNOWN INFO
Hydraulic oil level OK. PTO OK. Hydraulic rotary pump OK. Relief valve OK.
POSSIBLE PROBLEMS
Faulty pressure reducing valve. Faulty M1090/M1094 four way relief valve. Faulty hoist cylinder.

4. **CAUTION**
Read CAUTION on following page.

Is pressure at port A of valve manifold within 2375-2625 PSI of pressure read at port P?

TEST OPTIONS
Pressure Test or STE/ICE-R Test #51
REASON FOR QUESTION
Faulty M1090/M1094 four way relief valve will cause dump body not to raise.



PRESSURE TEST

- (1) Disconnect hose A from fitting at port A of valve manifold.
- (2) Install swivel run tee on fitting at port A of valve manifold.
- (3) Connect hydraulic hose A to swivel run tee.
- (4) Connect reducer, hose, and STE/ICE adaptor to swivel run tee.
- (5) Start engine (TM 9-2320-366-10-1).
- (6) Position PTO switch to on (TM 9-2320-366-10-1).
- (7) Increase engine RPM to 1250-1450 (TM 9-2320-366-10-1).

CAUTION

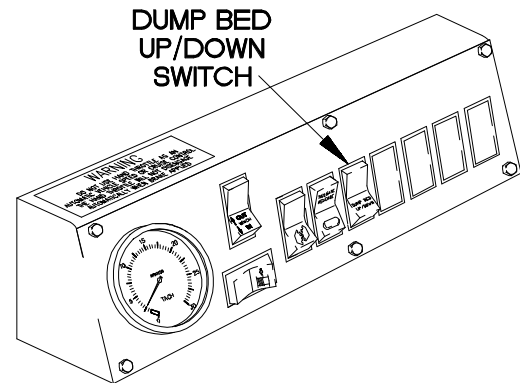
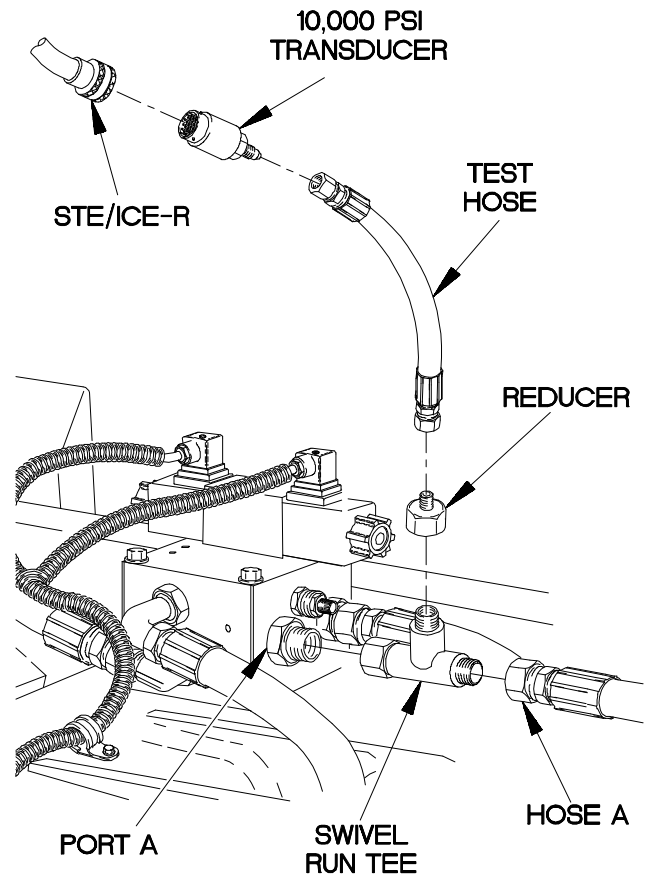
Hydraulic oil temperature must be 145° F-155° F (63° C- 68° C) prior to performing troubleshooting checks. Failure to comply may result in inaccurate test results.

NOTE

Holding DUMP BED UP/DOWN switch in the down position will force hydraulic oil through relief valve and cause oil temperature to rise.

Measure hydraulic oil temperature near bottom of hydraulic reservoir.

- (8) Press and hold DUMP BED UP/DOWN switch in the DOWN position until hydraulic oil temperature reaches 145° F-155° F (63° C-68° C).
- (9) Perform STE/ICE Test #51 (TM 9-4910-571-12&P)
- (10) Hold DUMP BED UP/DOWN switch in the UP position and observe pressure reading with in 2375-2625 psi (16,376-18,099 kPa).
- (11) If pressure is not with in 2375-2625 PSI (16,376-18,099 kPa) replace or repair M1090 /M1094 four way relief valve (para 17-3).
- (12) Reduce engine RPM to idle (TM 9-2320-366-10-1).
- (13) Position PTO switch to off (TM 9-2320-366-10-1).
- (14) Shut down engine (TM 9-2320-366-10-1).
- (15) Remove STE/ICE adaptor, hose and reducer from swivel run tee.
- (16) Remove hose A from swivel run tee.
- (17) Remove swivel run tee from port A of valve manifold.
- (18) Connect hose A to port A of valve manifold.



66k0104B

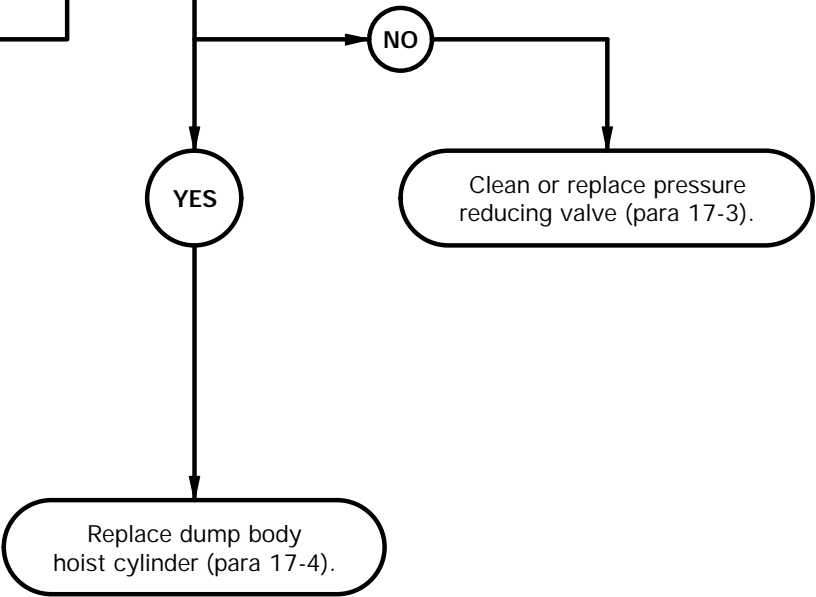
k1. DUMP BODY DOES NOT RAISE (CONT)

KNOWN INFO
Hydraulic oil level OK. PTO OK. Hydraulic rotary pump OK. Relief valve OK.
POSSIBLE PROBLEMS
Faulty pressure reducing valve. Faulty hoist cylinder.

5. **CAUTION**
Read CAUTION on following page.

Can pressure at port B of valve manifold be adjusted to 325-375 PSI ?

TEST OPTIONS
Pressure Test or STE/ICE-R Test #51
REASON FOR QUESTION
Faulty pressure reducing valve will cause dump body not to raise.



PRESSURE TEST

- (1) Disconnect hose B from fitting at port B of valve manifold.
- (2) Install swivel run tee on fitting at port B of valve manifold.
- (3) Connect hydraulic hose B to swivel run tee.
- (4) Connect reducer, hose, and STE/ICE adaptor to swivel run tee.
- (5) Start engine (TM 9-2320-366-10-1).
- (6) Position PTO switch to on (TM 9-2320-366-10-1).
- (7) Increase engine RPM to 1250-1450 (TM 9-2320-366-10-1).

CAUTION

Hydraulic oil temperature must be 145° F-155° F (63° C- 68° C) prior to performing troubleshooting checks. Failure to comply may result in inaccurate test results.

NOTE

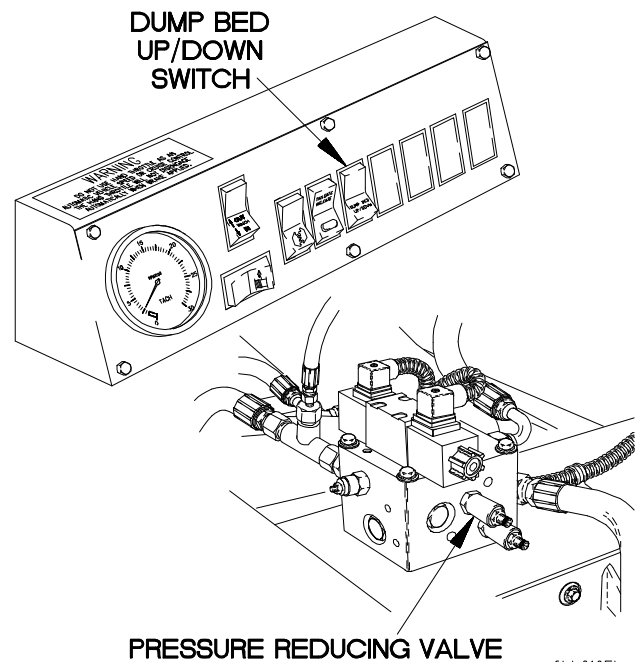
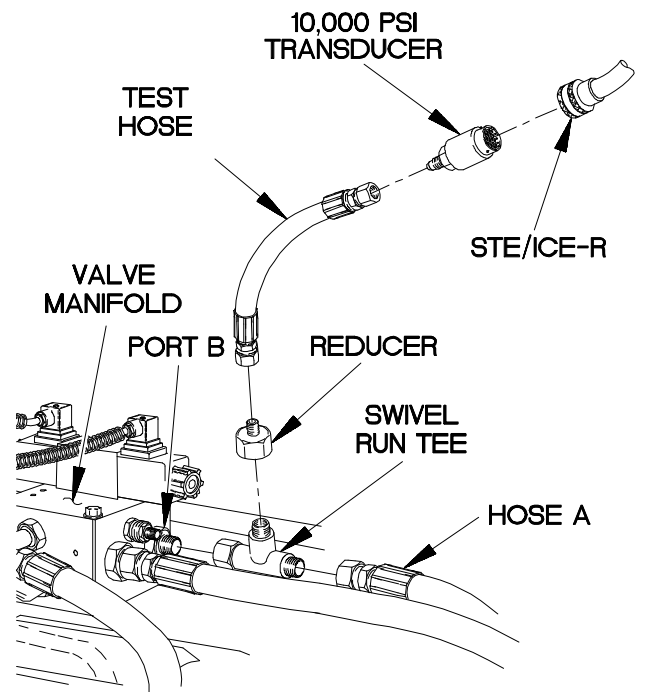
Holding DUMP BED UP/DOWN switch in the down position will force hydraulic oil through relief valve and cause oil temperature to rise.

Measure hydraulic oil temperature near bottom of hydraulic reservoir.

- (8) Press and hold DUMP BED UP/DOWN switch in the DOWN position until hydraulic oil temperature reaches 145° F-155° F (63° C-68° C).
- (9) Perform STE/ICE Test #51 (TM 9-4910-571-12&P)
- (10) Hold DUMP BED UP/DOWN switch in the DOWN position and observe pressure reading of 325-375 psi (2241-2586 kPa). If pressure is low, adjust pressure reducing valve clockwise. If pressure is high, adjust pressure reducing valve counterclockwise. If pressure cannot be adjusted, clean or replace pressure reducing valve (para 17-3).
- (11) Reduce engine RPM to idle (TM 9-2320-366-10-1).
- (12) Position PTO switch to off (TM 9-2320-366-10-1).
- (13) Shut down engine (TM 9-2320-366-10-1).
- (14) If pressure can be adjusted, but dump bed still does not raise, replace hoist cylinder (para 17-4).
- (15) Remove STE/ICE adaptor, hose and reducer from swivel run tee.

PRESSURE TEST (CONT)

- (16) Remove hose B from swivel run tee.
- (17) Remove swivel run tee from port B of valve manifold.
- (18) Connect hose B to port B of valve manifold.



66k0105b

K1. DUMP BODY DOES NOT RAISE

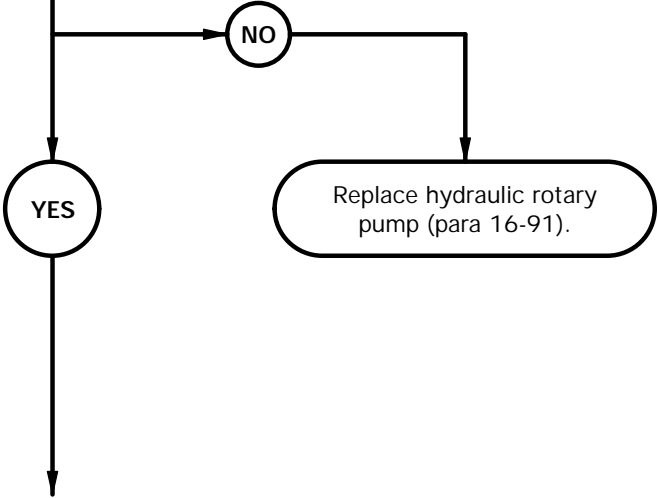
KNOWN INFO
Hydraulic oil level OK. PTO OK.
POSSIBLE PROBLEMS
Faulty hydraulic rotary pump. Faulty relief valve. Faulty flow control valve. Faulty hoist cylinder. Faulty M1090/M1094 four way relief valve.

6.

WARNING
Read **WARNING**
on following page.

Is hydraulic rotary pump supplying at least 2500 PSI?

TEST OPTIONS
Pressure Test or STE/ICE-R Test #51
REASON FOR QUESTION
Faulty hydraulic rotary pump will cause dump body not to raise.



WARNING

Dump body weighs approximately 3,030 lbs. (1,376 kgs). Attach a suitable lifting device prior to lifting. Failure to comply may result in injury to personnel.

Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.

Prolonged contact with lubricating oil (MIL-L-21 04) may cause a skin rash. Skin and clothing that come in contact with lubricating oil should be thoroughly washed immediately. Saturated clothing should be removed immediately. Areas in which lubricating oil is used should be well ventilated to keep fumes to a minimum. Failure to comply may result in injury to personnel.

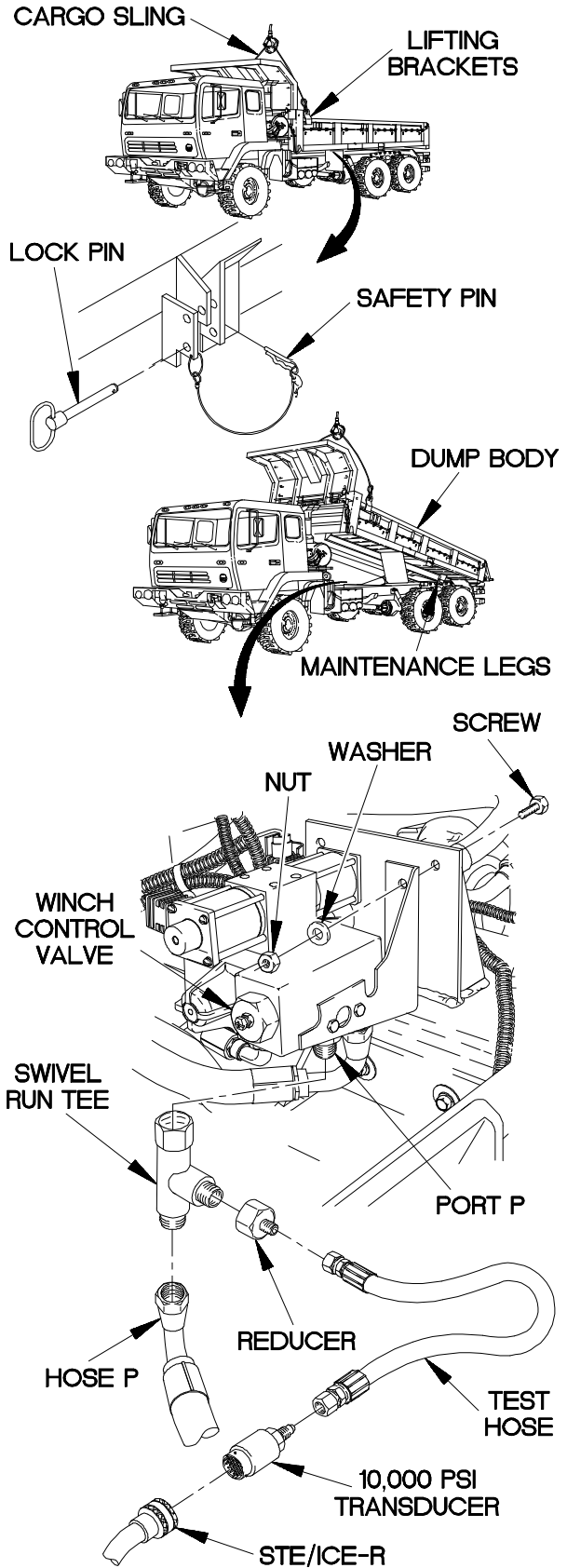
PRESSURE TEST

- (1) Remove safety pin from two locking pins.
- (2) Remove two locking pins from dump body.
- (3) Install two dump body lifting brackets in slots in dump body.
- (4) Attach cargo sling to dump body lifting brackets.
- (5) Lift dump body.
- (6) Raise two maintenance legs on frame.
- (7) Lower dump body on maintenance legs.
- (8) Position drain pan under vehicle.

WARNING

Use care in placement of test equipment and winch control valve. Hydraulic system pressures are 3000 PSI (20,685 kPa). Hoses and winch valve will move or jump under pressure. Failure to comply may result in damage to equipment or injury to personnel.

- (9) Remove four nuts, washers and screws from winch control valve to allow access.
- (10) Disconnect hose P from 90° fitting at input port P of winch control valve.
- (11) Install swivel tee fitting on 90 degree fitting at input port P of winch control valve.
- (12) Connect hose P to swivel tee fitting.
- (13) Connect reducer, hose, and STE/ICE adaptor to swivel tee fitting.
- (14) Start engine (TM 9-2320-366-10-1).
- (15) Position PTO switch to on (TM 9-2320-366-10-1).
- (16) Set engine speed to 1250-1450 RPM (TM-9-2320-10-1).
- (17) Perform SET/ICE-R Test #51 (TM 9-4910-571-12&P)
- (18) Position Dump Body UP/DOWN switch to down, while assistant checks reading on STE/ICE-R.



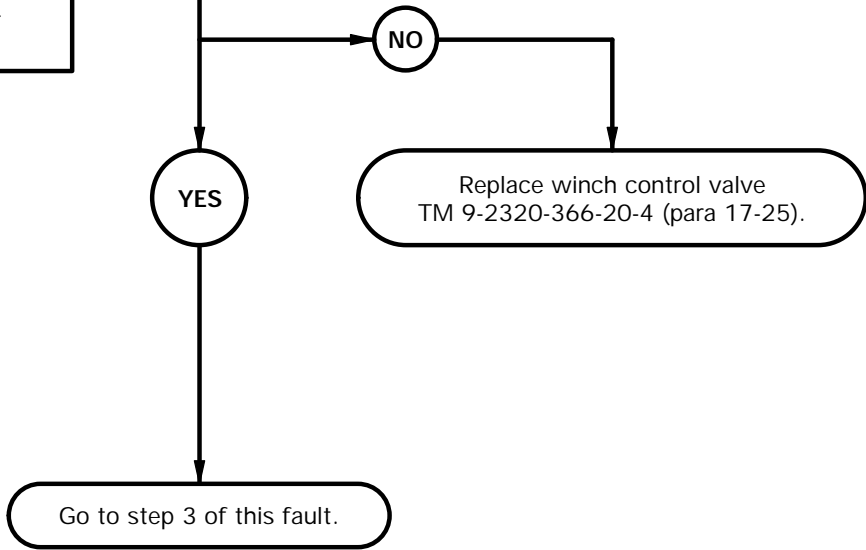
6BK0106B

k1. DUMP BODY DOES NOT RAISE

KNOWN INFO
Hydraulic oil level OK. PTO OK. Hydraulic Rotary pump OK.
POSSIBLE PROBLEMS
Faulty relief valve. Faulty pressure reducing valve. Faulty hoist cylinder. Faulty M1090/M1094 four way relief valve.

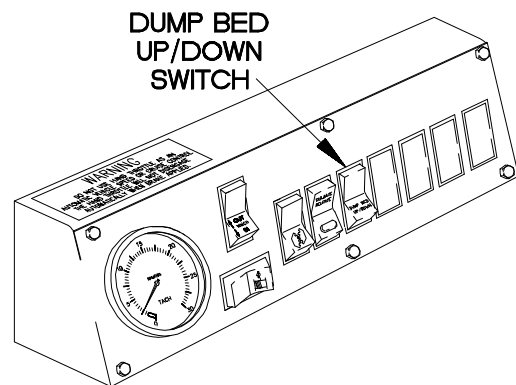
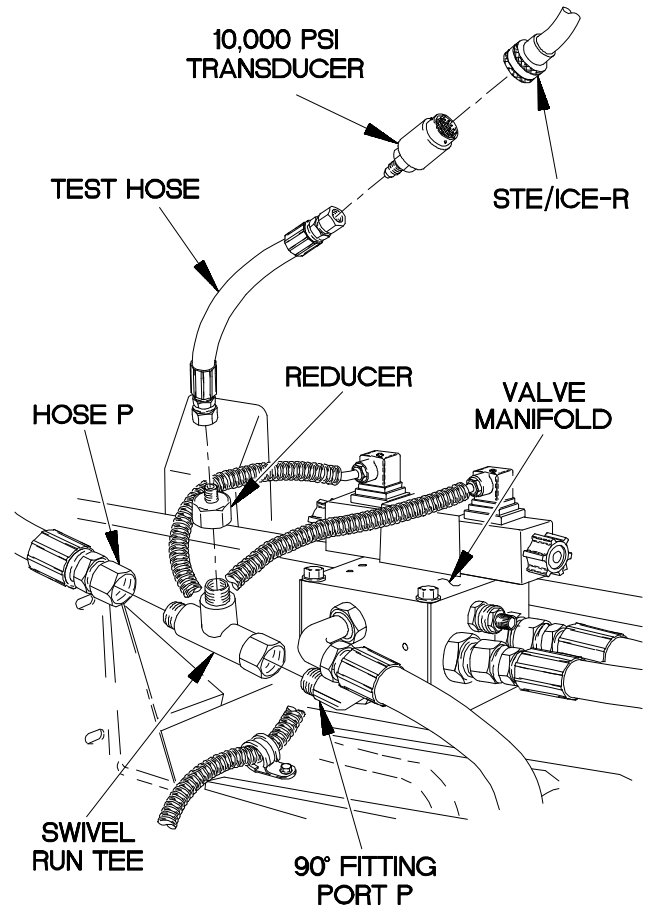
7.
Is hydraulic pressure at least 2500 PSI at input port P of valve manifold?

TEST OPTIONS
Pressure Test or STE/ICE-R Test #51
REASON FOR QUESTION
Faulty winch control valve will cause dump body not to raise.



PRESSURE TEST

- (1) Disconnect hose P from 90° fitting at input port P of valve manifold.
- (2) Install swivel tee fitting on 90 degree fitting at input port P of valve manifold.
- (3) Connect hose P to swivel tee fitting.
- (4) Connect reducer, hose, and STE/ICE adaptor to swivel tee fitting.
- (5) Start engine (TM 9-2320-366-10-1).
- (6) Position PTO switch to on (TM 9-2320-366-10-1).
- (7) Set engine speed to 1250-1450 RPM (TM-9-2320-10-1).
- (8) Perform SET/ICE-R Test #51 (TM 9-4910-571-12&P)
- (9) Position Dump Body UP/DOWN switch to down, while assistant checks reading on STE/ICE-R.
- (10) If pressure is less than 2500 PSI, replace winch control valve TM 9-2320-366-20-4 (para 17-25).

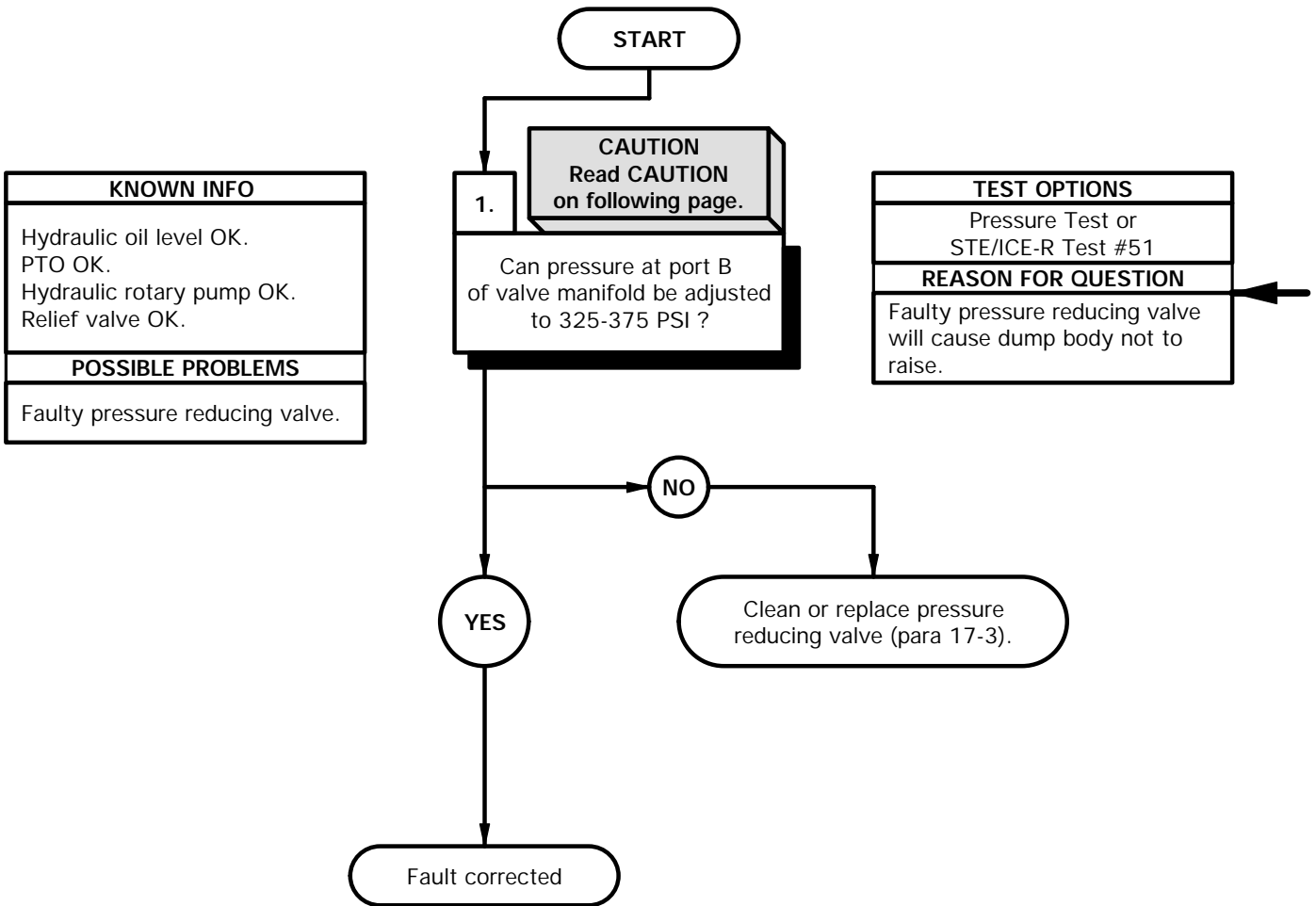


6BK0107B

k2. DUMP BODY DOES NOT LOWER	
INITIAL SETUP	
<p>Equipment Conditions Engine shut down (TM 9-2320-366-10-1)</p> <p>Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) Pan, Drain (Item 42, Appendix B) Goggles, Industrial (Item 28, Appendix B) Lifting Bracket, Dump Body (2) (Item 8, Appendix D) Gloves, Mens (Item 34.2, Appendix C) STE/ICE-R (Item 70, Appendix B) Transmitter, Pressure (Item 1, Appendix G)</p>	<p>Materials/Parts Rag, Wiping (Item 60, Appendix C) Tee (Item 88.2, Appendix C) Reducer, Tube (Item 60.1, Appendix C) Hose Assembly, Nonmetallic (Item 40.1, Appendix C) Indicator, Temperature, Label (Item 40.4, Appendix C)</p> <p>Personnel Required (2)</p> <p>References TM 9-4910-571-12&P</p>

NOTE

Perform Electrical System Troubleshooting e143. Dump Body Does Not Raise (TM 9-2320-366-20-2) prior to beginning this task.



WARNING

Dump body weighs approximately 3,030 lbs. (1,376 kgs). Attach a suitable lifting device prior to lifting. Failure to comply may result in injury to personnel.

Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.

Prolonged contact with lubricating oil (MIL-L-21 04) may cause a skin rash. Skin and clothing that come in contact with lubricating oil should be thoroughly washed immediately. Saturated clothing should be removed immediately. Areas in which lubricating oil is used should be well ventilated to keep fumes to a minimum. Failure to comply may result in injury to personnel.

Lubricating oil is slippery and can cause falls. Wipe up spilled oil with rags. Failure to comply may result in injury to personnel.

PRESSURE TEST

- (1) Disconnect hose B from fitting at port B of valve manifold.
- (2) Install swivel run tee on fitting at port B of valve manifold.
- (3) Connect hydraulic hose B to swivel run tee.
- (4) Connect adapter, hose, and STE/ICE adaptor to swivel run tee.
- (5) Start engine (TM 9-2320-366-10-1).
- (6) Position PTO switch to on (TM 9-2320-366-10-1).
- (7) Increase engine RPM to 1250-1450 (TM 9-2320-366-10-1).

CAUTION

Hydraulic oil temperature must be 145° F-155° F (63° C- 68° C) prior to performing troubleshooting checks. Failure to comply may result in inaccurate test results.

NOTE

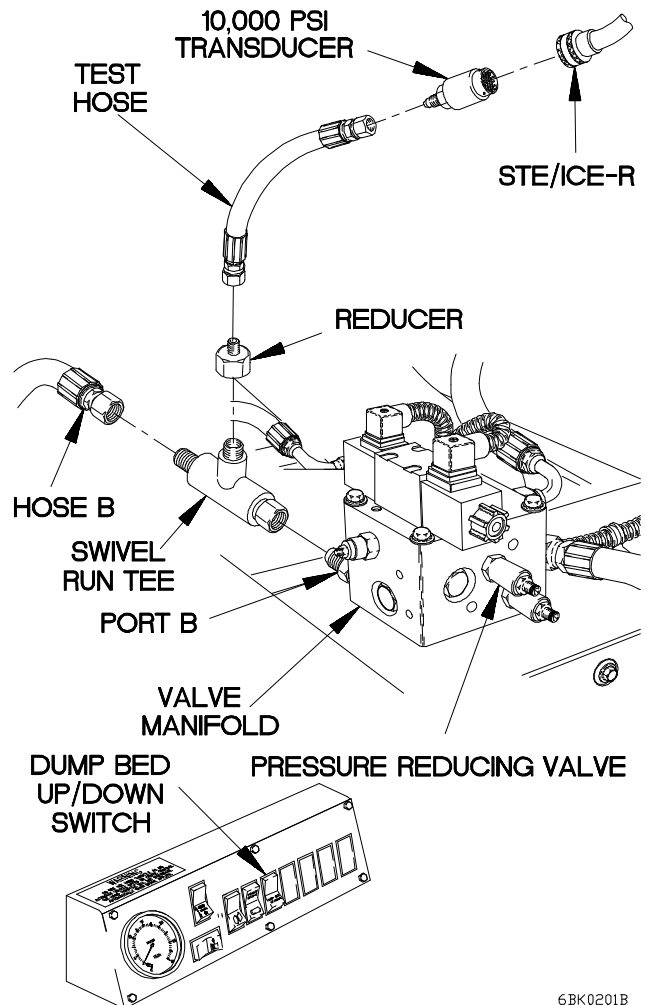
Holding DUMP BED UP/DOWN switch in the down position will force hydraulic oil through relief valve and cause oil temperature to rise.

Measure hydraulic oil temperature near bottom of hydraulic reservoir.

- (8) Press and hold DUMP BED UP/DOWN switch in the DOWN position until hydraulic oil temperature reaches 145° F-155° F (63° C-68° C).
- (9) Perform STE/ICE Test #51 (TM 9-4910-571-12&P)

PRESSURE TEST (Cont)

- (10) Hold DUMP BED UP/DOWN switch in the DOWN position and observe pressure reading of 325-375 psi (2241-2586 kPa). If pressure is low, adjust pressure reducing valve clockwise. If pressure is high, adjust pressure reducing valve counterclockwise. If pressure cannot be adjusted, clean or replace pressure reducing valve (para 17-3).
- (11) Reduce engine RPM to idle (TM 9-2320-366-10-1).
- (12) Position PTO switch to off (TM 9-2320-366-10-1).
- (13) Shut down engine (TM 9-2320-366-10-1).
- (14) If pressure can be adjusted, but dump bed still does not raise, replace hoist cylinder (para 17-4).
- (15) Remove STE/ICE adaptor, hose and adapter from swivel run tee.
- (16) Remove hose B from swivel run tee.
- (17) Remove swivel run tee from port B of valve manifold.
- (18) Connect hose B to port B of valve manifold.



6BK0201B

k3. DUMP BODY CREEPS DOWN FROM RAISED POSITION

INITIAL SETUP

Equipment Conditions

Engine shut down (TM 9-2320-366-10-1).

Materials/Parts

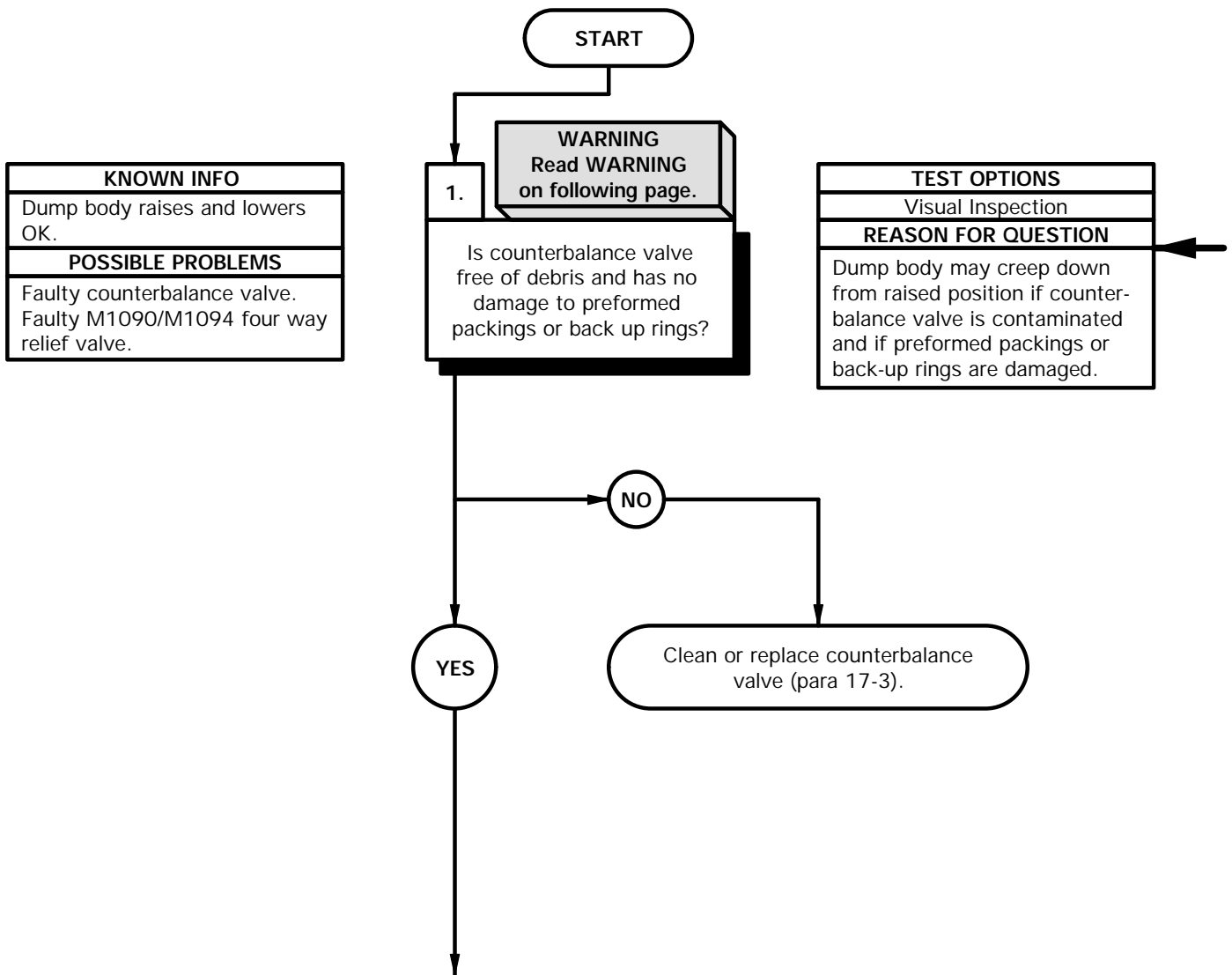
Rag, Wiping (Item 60, Appendix C)

Tools and Special Tools

Tool Kit, Genl Mech (Item 78, Appendix B)
 Pan, Drain (Item 42, Appendix B)
 Gloves, Mens (Item 40.1, Appendix C)

Personnel Required

(2)



KNOWN INFO
Dump body raises and lowers OK.
POSSIBLE PROBLEMS
Faulty counterbalance valve. Faulty M1090/M1094 four way relief valve.

TEST OPTIONS
Visual Inspection
REASON FOR QUESTION
Dump body may creep down from raised position if counterbalance valve is contaminated and if preformed packings or back-up rings are damaged.

WARNING

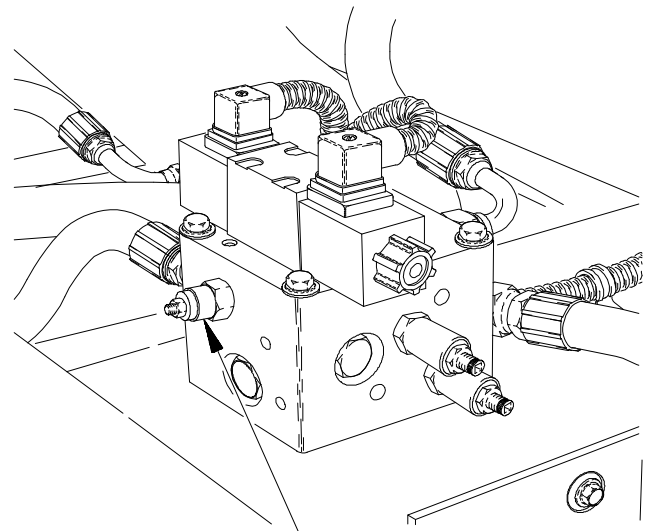
Dump body weighs approximately 3,030 lbs. (1,376 kgs). Use care while performing valve adjustments and pressure checks. Stay clear of dump body while operating. Failure to comply may result in injury to personnel.

Hydraulic components are hot when hydraulic oil reaches operating temperature. Use caution when handling hydraulic components. Wear gloves or use rags to hold metal objects. Failure to comply may result in injury to personnel.

Prolonged contact with lubricating oil (MIL-L-2104) may cause a skin rash. Skin and clothing that come in contact with lubricating oil should be thoroughly washed immediately. Saturated clothing should be removed immediately. Areas in which lubricating oil is used should be well ventilated to keep fumes to minimum. Failure to comply may result in injury to personnel.

Lubricating oil is slippery and can cause falls. Wipe up spilled oil with rags. Failure to comply may result in injury to personnel.

- (1) Raise dump body to maintenance position (TM 9-2320-366-10-1).
- (2) Position drain pan under counterbalance valve.
- (3) Remove counterbalance valve from valve manifold.
- (4) Clean counterbalance valve of any debris which could cause valve to not function.
- (5) Inspect preformed packing and back-up rings for damage.
- (6) If preformed packings or back-up rings are damaged, replace or repair counterbalance valve (para 17-3).
- (7) Install counterbalance valve in valve manifold.



**COUNTERBALANCE
VALVE**

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k3. DUMP BODY CREEPS DOWN FROM RAISED POSITION (CONT)

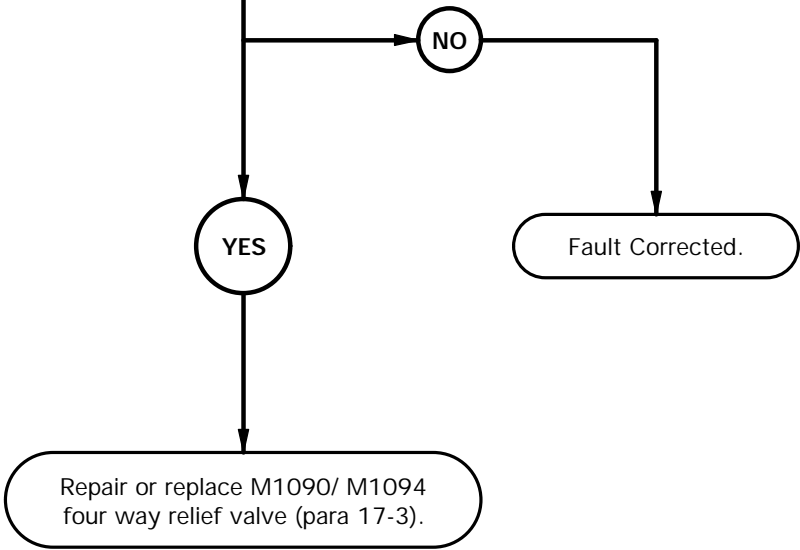
KNOWN INFO
Dump body raises and lowers OK. Counterbalance valve is free of debris.
POSSIBLE PROBLEMS
Faulty counterbalance valve. Faulty M1090/M1094 four way relief valve.

2.

WARNING
Read **WARNING**
on following page.

Does dump body creep down with counterbalance valve adjusted with in limits?

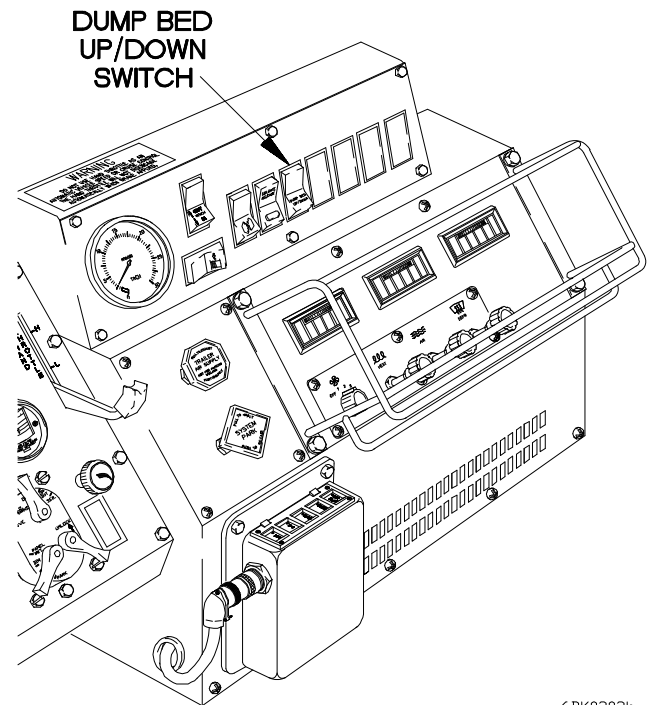
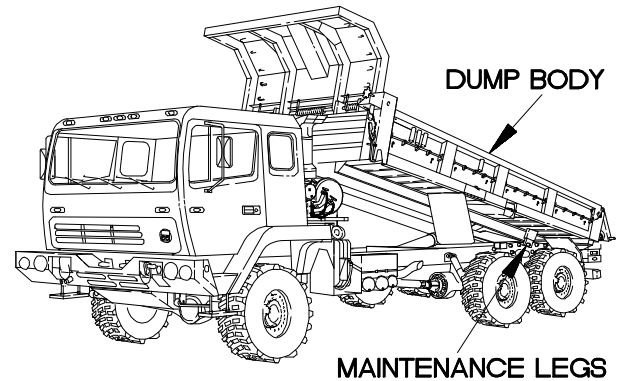
TEST OPTIONS
Visual Inspection
REASON FOR QUESTION
If dump body creeps down with counterbalance valve adjusted with in limits, M1090/ M1094 four way relief valve is faulty.



WARNING

Dump body weighs approximately 3,030 lbs. (1,376 kgs). Use care while performing valve adjustments and pressure checks. Stay clear of dump body while operating. Failure to comply may result in injury to personnel.

- (1) Adjust counterbalance valve (para 17-3j).
- (2) Start engine (TM 9-2320-366-10-1).
- (3) Position PTO switch to on (TM 9-2320-366-10-1).
- (4) Increase engine RPM to 1250-1450 RPM (TM 9-2320-366-10-1).
- (5) Press and hold DUMP BED UP/DOWN switch in the up position until dump body is approximately 8 in (200 mm) above maintenance legs,
- (6) Position PTO switch to off (TM 9-2320-366-10-1).
- (7) Observe if dump body creeps down.
- (8) If dump body continues to creep down after adjustment, replace or repair M1090 /M1094 four way relief valve (para 17-3).
- (9) If dump body does not creep down, fault is corrected.
- (10) Lower dump body (TM 9-2320-366-10-1).



6BK0302b

2-20. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HYDRAULIC TROUBLESHOOTING

This paragraph covers M1084/M1086 Material Handling Crane (MHC) Hydraulic Troubleshooting. The M1084/M1086 Material Handling Crane (MHC) Hydraulic Fault Index, Table 2-18, lists faults for the M1084/M1086 MHC Hydraulics of the vehicle.

Table 2-18. M1084/M1086 Material Handling Crane (MHC) Hydraulic Fault Index

Fault No.	Description	Page
11.	M1084/M1086 Material Handling Crane (MHC) Hydraulic Functions Operate Slowly	2-1074
12.	M1084/M1086 Material Handling Crane (MHC) Left Outrigger (Jack) Drifts or Does Not Work	2-1082
13.	M1084/M1086 Material Handling Crane (MHC) Right Outrigger (Jack) Drifts or Does Not Work	2-1086
14.	M1084/M1086 Material Handling Crane (MHC) Mast Does Not Erect or Stow	2-1090
15.	M1084/M1086 Material Handling Crane (MHC) Hoist Does Not Work	2-1094
16.	M1084/M1086 Material Handling Crane (MHC) Boom Swing Drive Assembly Does Not Work . .	2-1098
17.	M1084/M1086 Material Handling Crane (MHC) Boom Does Not Telescope In or Out	2-1100
18.	M1084/M1086 Material Handling Crane (MHC) Swing, Telescope, Boom, and Hoist Do Not Work	2-1104
19.	M1084/M1086 Material Handling Crane (MHC) Boom Does Not Lift Up or Down or Hold Under Load	2-1106

11. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HYDRAULIC FUNCTIONS OPERATE SLOWLY

INITIAL SETUP

Equipment Conditions

Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools

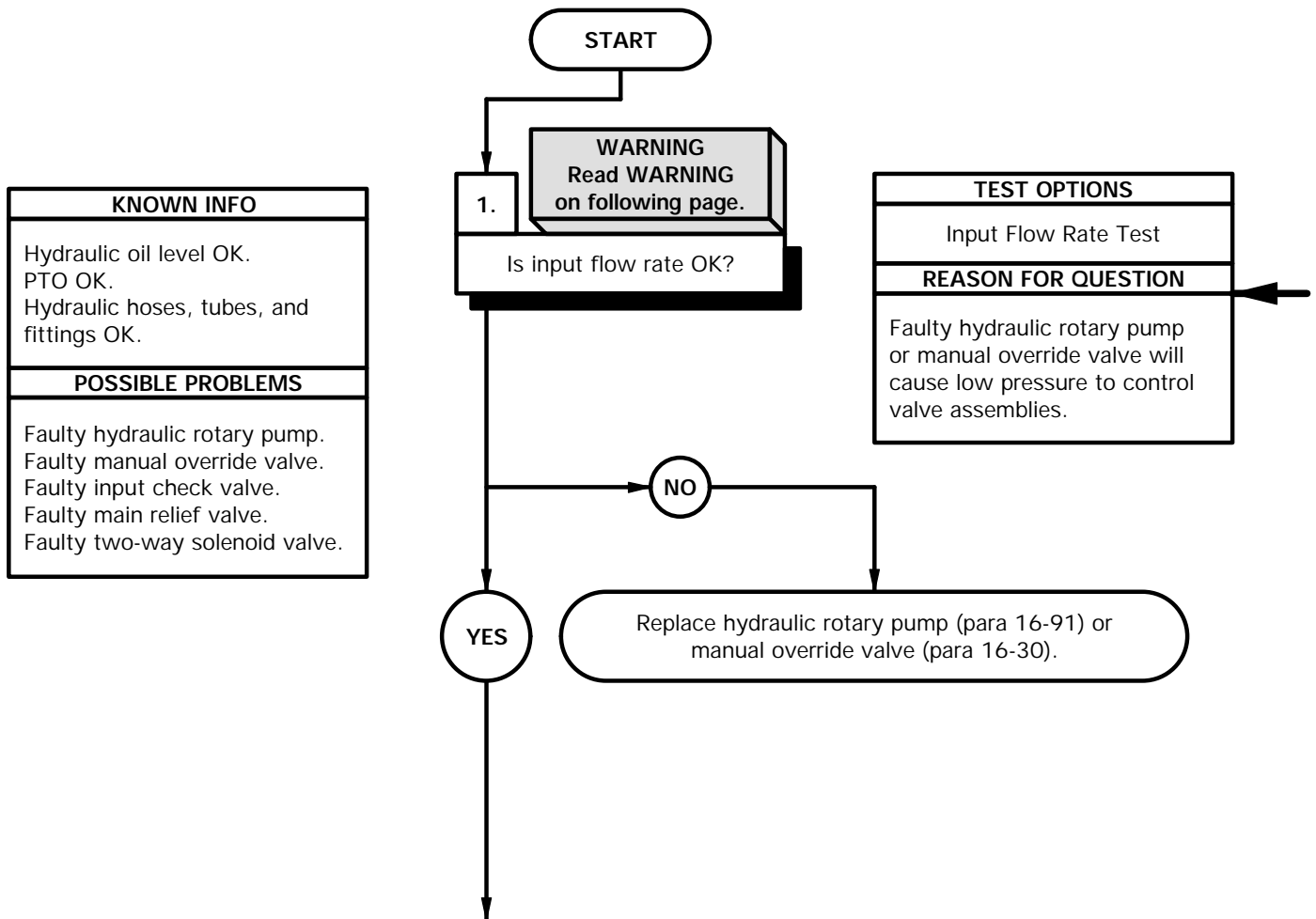
Tool Kit, Genl Mech (Item 78, Appendix B)
 Tester, Hydraulic (Item 73, Appendix B)
 Pan, Drain (Item 43, Appendix B)
 Goggles, Industrial (Item 28, Appendix B)

Materials/Parts

Rag, Wiping (Item 60, Appendix C)
 Hose (2) (Item 40, Appendix C)
 Fitting (2) (Item 31, Appendix C)
 Adapter, Swivel (Item 3, Appendix C)
 Reducer, Tube (Item 61, Appendix C)
 Adapter, Pipe (Item 1, Appendix C)
 Adapter, Pipe (Item 2, Appendix C)

Personnel Required

(2)



WARNING

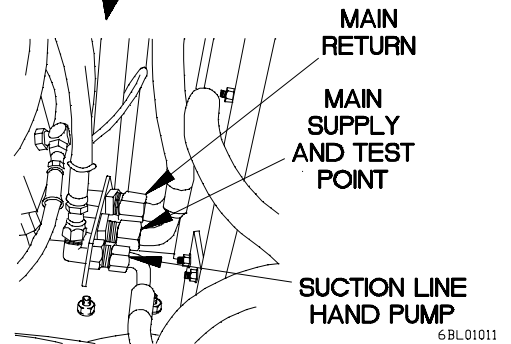
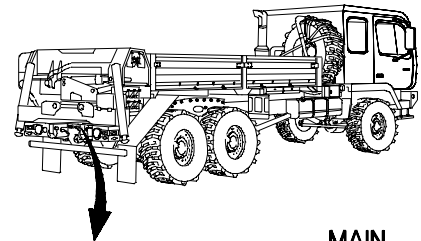
- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

NOTE

Do not apply crane electrical power, unless step requires crane power.

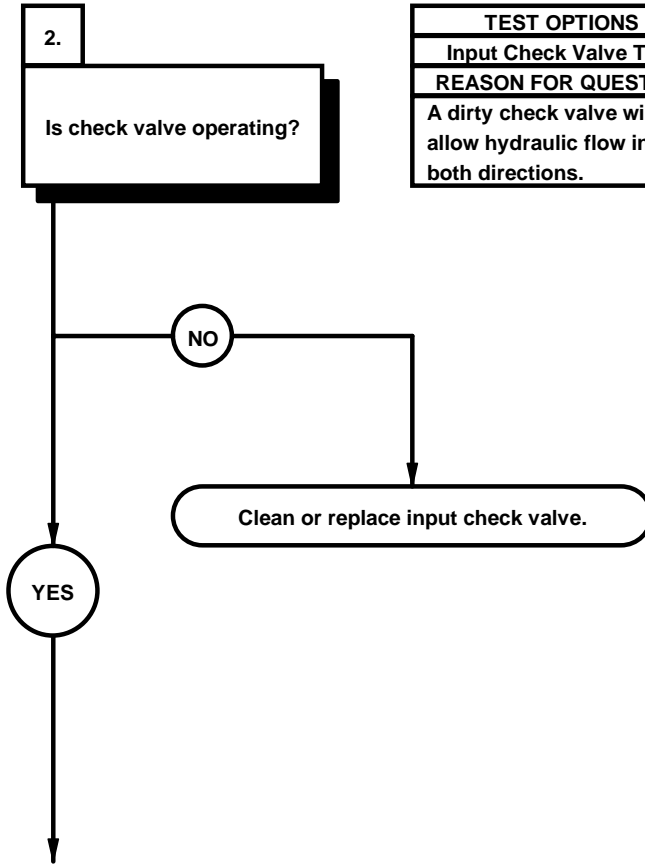
INPUT FLOW RATE TEST

- (1) Place drain pan under vehicle.
- (2) Disconnect hydraulic supply hose at frame.
- (3) Connect hydraulic tester between fitting and hose with adapters and test hoses.
- (4) Start engine (TM 9-2320-366-10-1).
- (5) Position PTO switch to on (TM 9-2320-366-10-1).
- (6) Increase engine rpm to 1250-1450 rpm (TM 9-2320-366-10-1).
- (7) Observe minimum flow reading of 12 gpm (46 lpm). If step fails, hydraulic rotary pump is faulty.
- (8) Position MHC power switch to ON (TM 9-2320-366-10-1).
- (9) Observe flow reading of 12-14 gpm (45-53 lpm) at about 3000 psi (20685 kPa).
- (10) If there is no change in flow, manual override valve is faulty.
- (11) Position MHC power switch to OFF (TM 9-2320-366-10-1).
- (12) Position PTO switch to off (TM 9-2320-366-10-1).
- (13) Shut down engine (TM 9-2320-366-10-1).
- (14) Disconnect hydraulic tester, hoses and adapters from fitting and hose.
- (15) Connect hose to supply elbow fitting.



11. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HYDRAULIC FUNCTIONS OPERATE SLOWLY (CONT)

KNOWN INFO
Hydraulic oil level OK. PTO OK. Hydraulic hoses, tubes, and fittings OK. Hydraulic rotary pump OK. Faulty manual override valve.
POSSIBLE PROBLEMS
Faulty input check valve. Faulty main relief valve. Faulty two way solenoid valve.

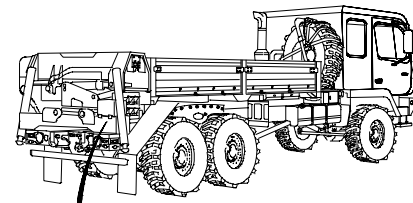


TEST OPTIONS
Input Check Valve Test
REASON FOR QUESTION
A dirty check valve will allow hydraulic flow in both directions.

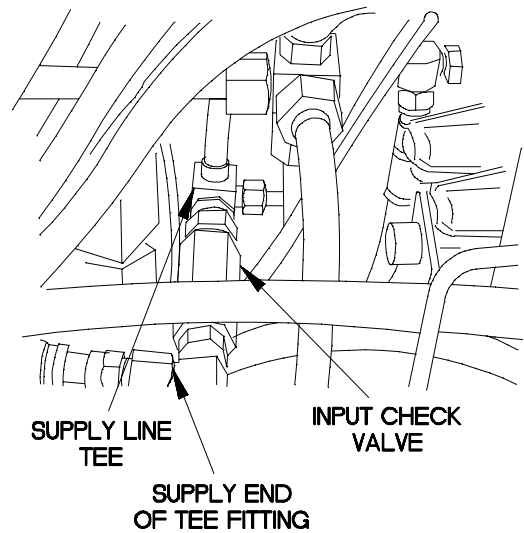
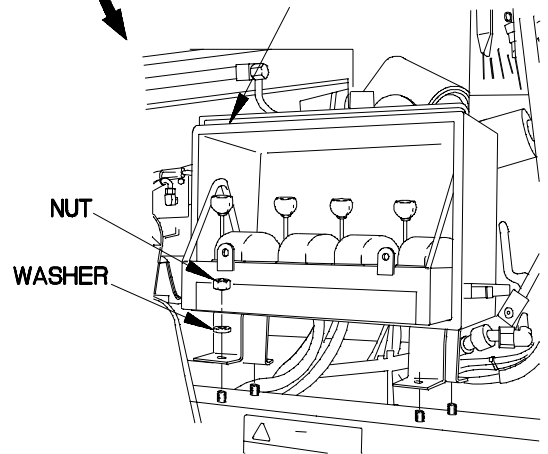


INPUT CHECK VALVE TEST

- (1) Remove four nuts and washers securing remote control unit storage box to frame.
- (2) Lift off remote control unit storage box.
- (3) Disconnect hydraulic fitting from supply end of input check valve.
- (4) Unscrew and withdraw check valve from hydraulic supply line tee.
- (5) Examine check valve and repair as needed:
 - (a) Ensure spring is not broken.
 - (b) Ensure poppet moves freely.
 - (c) Remove grit and foreign matter.
- (6) Screw input check valve into supply line tee.
- (7) Connect hydraulic fitting at aft (supply end) of check valve.
- (8) Attach remote control unit storage box to frame with four nuts and associated washers.



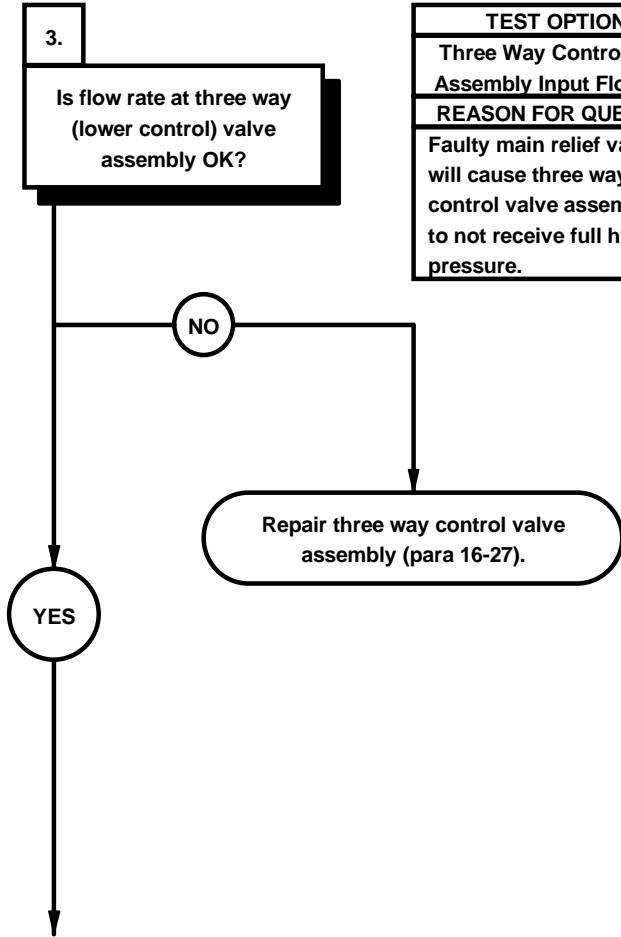
REMOTE CONTROL UNIT STORAGE BOX



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11. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HYDRAULIC FUNCTIONS OPERATE SLOWLY (CONT)

KNOWN INFO
Hydraulic oil level OK. PTO OK. Hydraulic hoses, tubes, and fittings OK. Hydraulic rotary pump OK. Manual override valve OK. Input check valve OK.
POSSIBLE PROBLEMS
Faulty main relief valve. Faulty two way solenoid valve.

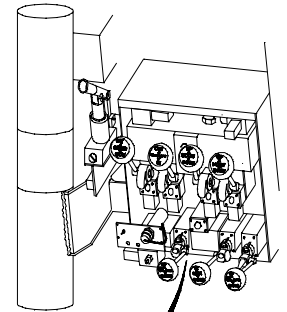
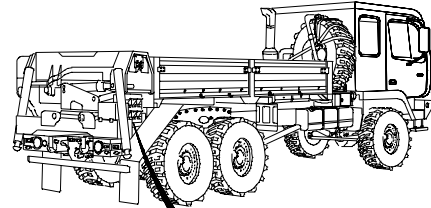


TEST OPTIONS
Three Way Control Valve Assembly Input Flow Test
REASON FOR QUESTION
Faulty main relief valve will cause three way control valve assemblies to not receive full hydraulic pressure.



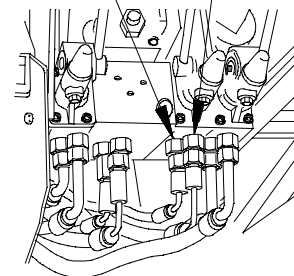
**THREE WAY CONTROL VALVE ASSEMBLY INPUT
FLOW TEST**

- (1) Disconnect hose from elbow on port P of three way (lower) control valve assembly.
- (2) Connect hydraulic tester between hose and port P with test hoses and adapters.
- (3) Start engine (TM 9-2320-366-10-1).
- (4) Position PTO switch to on (TM 9-2320-366-10-1).
- (5) Increase engine rpm to 1250-1450 rpm (TM 9-2320-366-10-1).
- (6) Position MHC power switch to ON (TM 9-2320-366-10-1).
- (7) Observe flow reading of 12-14 gpm (45-53 lpm). If flow is low, main relief valve on three way valve assembly is faulty.
- (8) Position MHC power switch to OFF (TM 9-2320-366-10-1).
- (9) Position PTO switch to off (TM 9-2320-366-10-1).
- (10) Shut down engine (TM 9-2320-366-10-1).
- (11) Disconnect hydraulic tester, hoses and adapters.
- (12) Connect hose to port P.



**THREE WAY CONTROL
VALVE ASSEMBLY
PORT T**

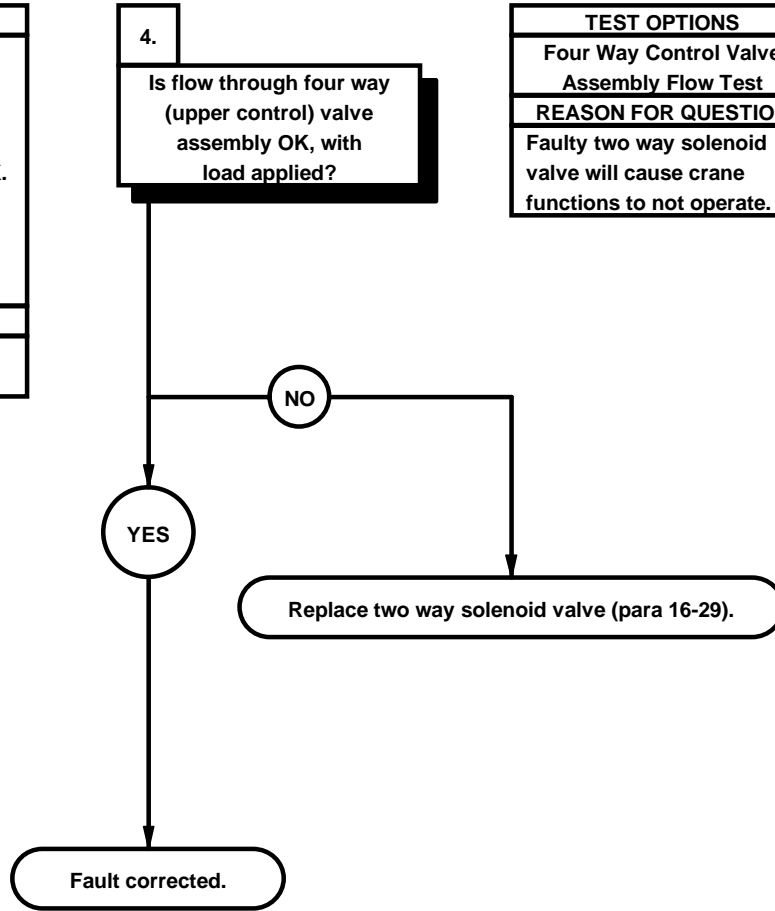
PORT P



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11. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HYDRAULIC FUNCTIONS OPERATE SLOWLY (CONT)

KNOWN INFO
Hydraulic oil level OK. PTO OK. Hydraulic hoses, tubes, and fittings OK. Hydraulic rotary pump OK. Manual override valve OK. Input check valve OK. Main relief valve OK.
POSSIBLE PROBLEMS
Faulty two way solenoid valve.

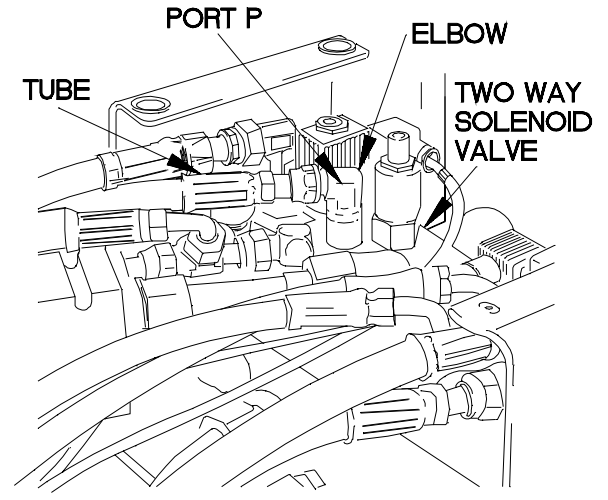


TEST OPTIONS
Four Way Control Valve Assembly Flow Test
REASON FOR QUESTION
Faulty two way solenoid valve will cause crane functions to not operate.



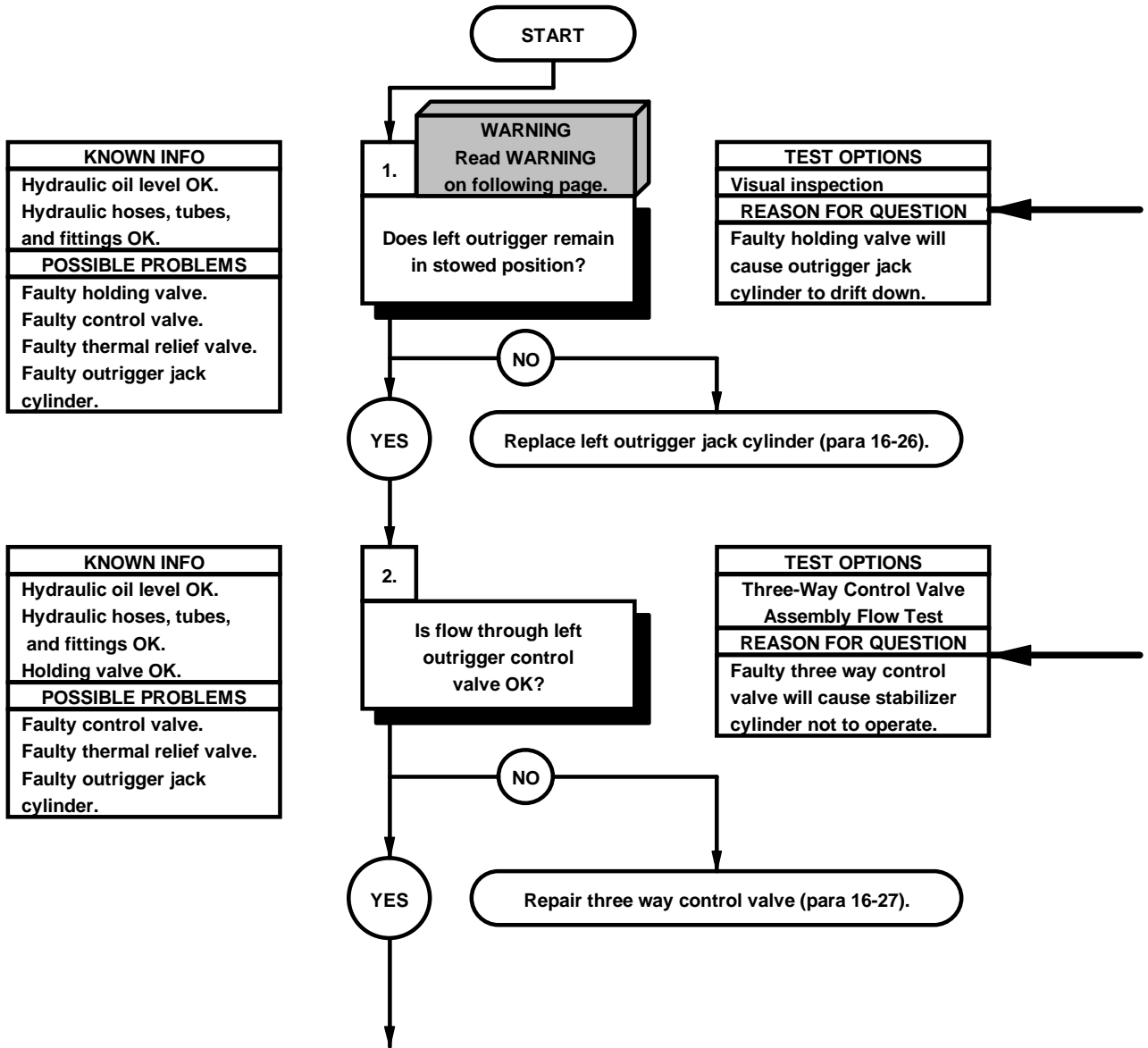
FOUR WAY CONTROL VALVE ASSEMBLY FLOW TEST

- (1) Disconnect tube to (control lockout) two way solenoid valve from elbow on port P. Remove elbow.
- (2) Connect hydraulic tester, with test hoses and adapters, between port P and tube.
- (3) Start engine (TM 9-2320-366-10-1).
- (4) Position PTO switch to on (TM 9-2320-366-10-1).
- (5) Increase engine rpm to 1250-1450 rpm (TM 9-2320-366-10-1).
- (6) Position MHC power switch to ON (TM 9-2320-366-10-1).
- (7) Operate any MHC function (Hoist, Boom, Telescope or Swing).
- (8) Observe flow of 3-9 gpm (11-34 lpm). If flow is low, two way valve is faulty.
- (9) Position MHC power switch to OFF (TM 9-2320-366-10-1).
- (10) Position PTO switch to off (TM 9-2320-366-10-1).
- (11) Shut down engine (TM 9-2320-366-10-1).
- (12) Disconnect hydraulic tester, hoses and adapters.
- (13) Install elbow to port P.
- (14) Connect tube to elbow.
- (15) Remove drain pan from under vehicle.



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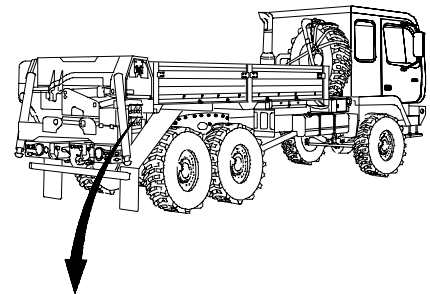
12. M1084/M1086 MATERIAL HANDLING CRANE (MHC) LEFT OUTRIGGER (JACK) DRIFTS OR DOES NOT WORK	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Materials/Parts Rag, Wiping (Item 60, Appendix C) Hose (2) (Item 40, Appendix C) Fitting (2) (Item 31, Appendix C) Fitting (Item 32, Appendix C) Adapter, Pipe (Item 1, Appendix C) Reducer, Tube (Item 61, Appendix C)
Personnel Required (2)	
Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) Tester, Hydraulic (Item 73, Appendix B) Pan, Drain (Item 43, Appendix B) Goggles, Industrial (Item 28, Appendix B)	



WARNING

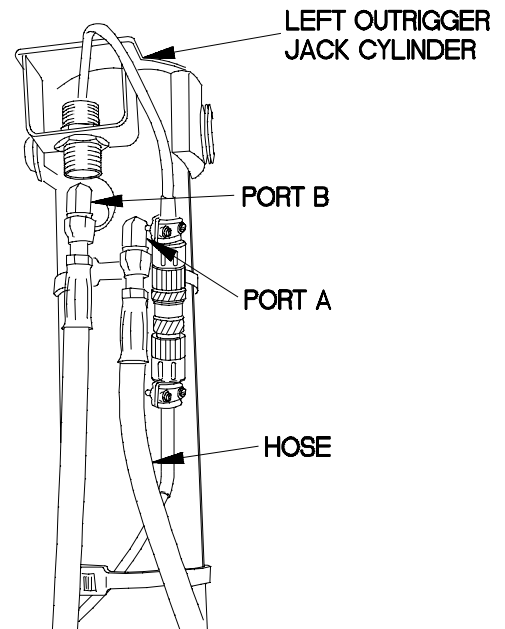
- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

Check position of left outrigger to verify that it is held in the stowed position. If left outrigger will not remain stowed over a period of time, holding valve (in outrigger jack cylinder) is faulty.



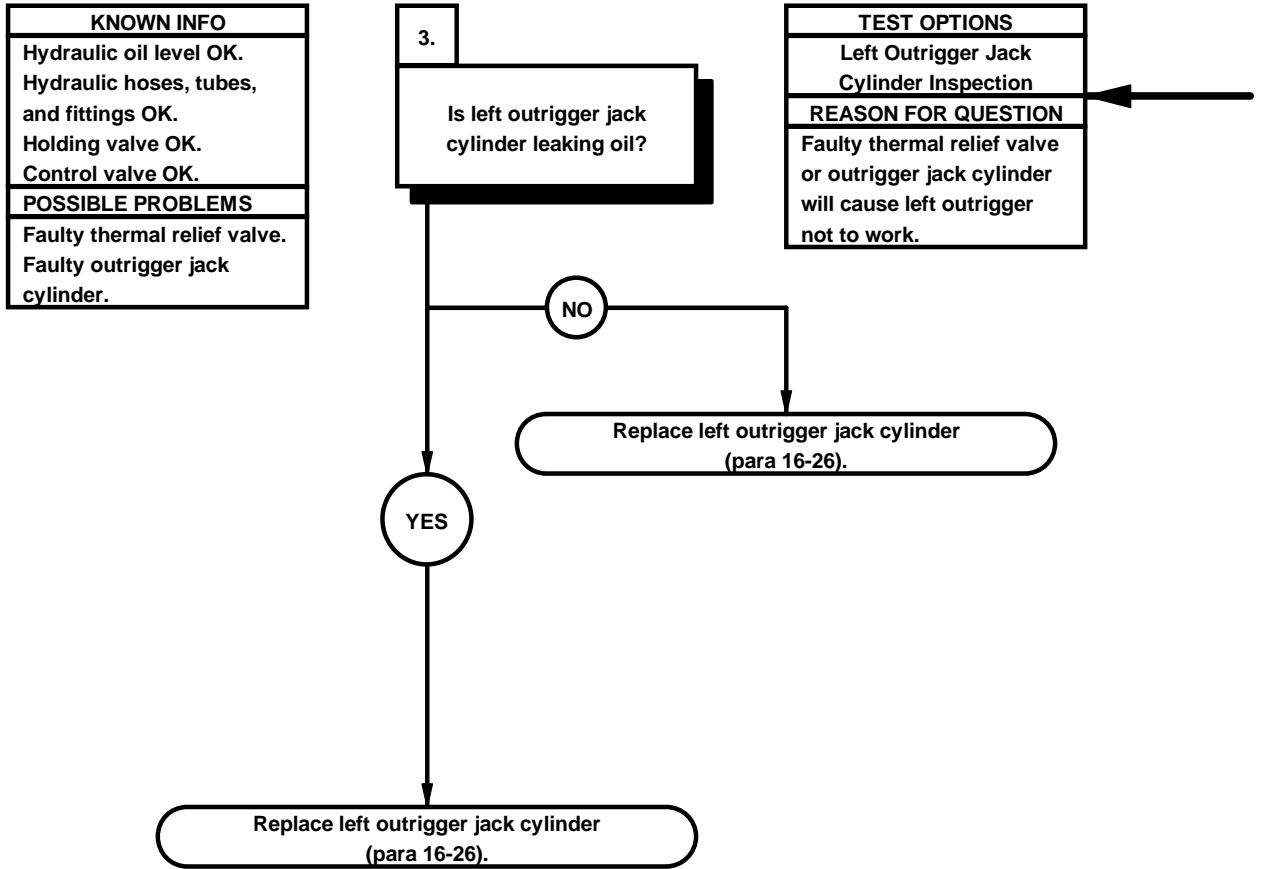
THREE-WAY CONTROL VALVE ASSEMBLY FLOW TEST

- (1) Place drain pan under vehicle.
- (2) Disconnect hose from right port (A) on top of left outrigger jack cylinder.
- (3) Connect hydraulic tester between hose and port A with test hoses and adapters.
- (4) Start engine (TM 9-2320-366-10-1).
- (5) Position PTO switch to on (TM 9-2320-366-10-1).
- (6) Increase engine rpm to 1250-1450 rpm (TM 9-2320-366-10-1).
- (7) Position MHC power switch to ON (TM 9-2320-366-10-1).
- (8) Lower left outrigger (TM 9-2320-366-10-1).
 - (a) During lowering, observe reading of 3-4 gpm (11-5 lpm) at negligible pressure. As outrigger loads, pressure will rise.
 - (b) If flow is low, replace control valve in three way (lower control) valve assembly.
- (9) Raise outrigger (TM 9-2320-366-10-1).
- (10) Position MHC power switch to OFF (TM 9-2320-366-10-1).
- (11) Position PTO switch to off (TM 9-2320-366-10-1).
- (12) Shut down engine (TM 9-2320-366-10-1).
- (13) Disconnect hydraulic tester hoses and adapters.
- (14) Connect hose to port A.
- (15) Remove drain pan from under vehicle.



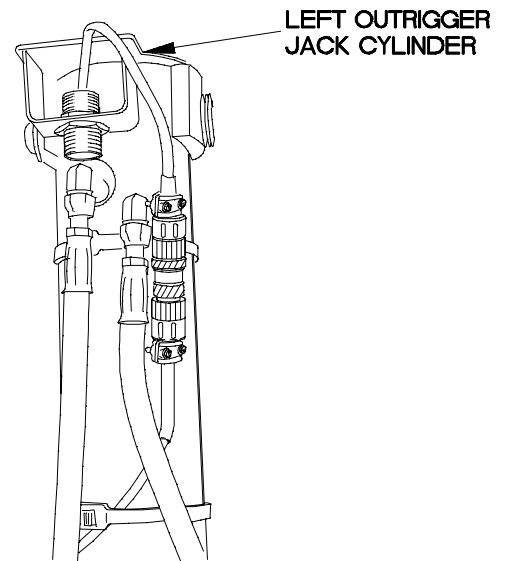
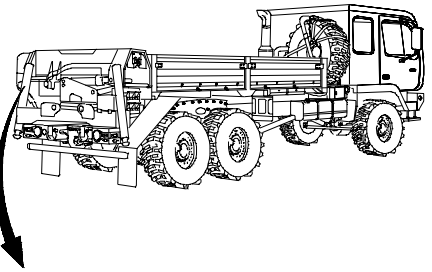
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12. M1084/M1086 MATERIAL HANDLING CRANE (MHC) LEFT OUTRIGGER (JACK) DRIFTS OR DOES NOT WORK (CONT)



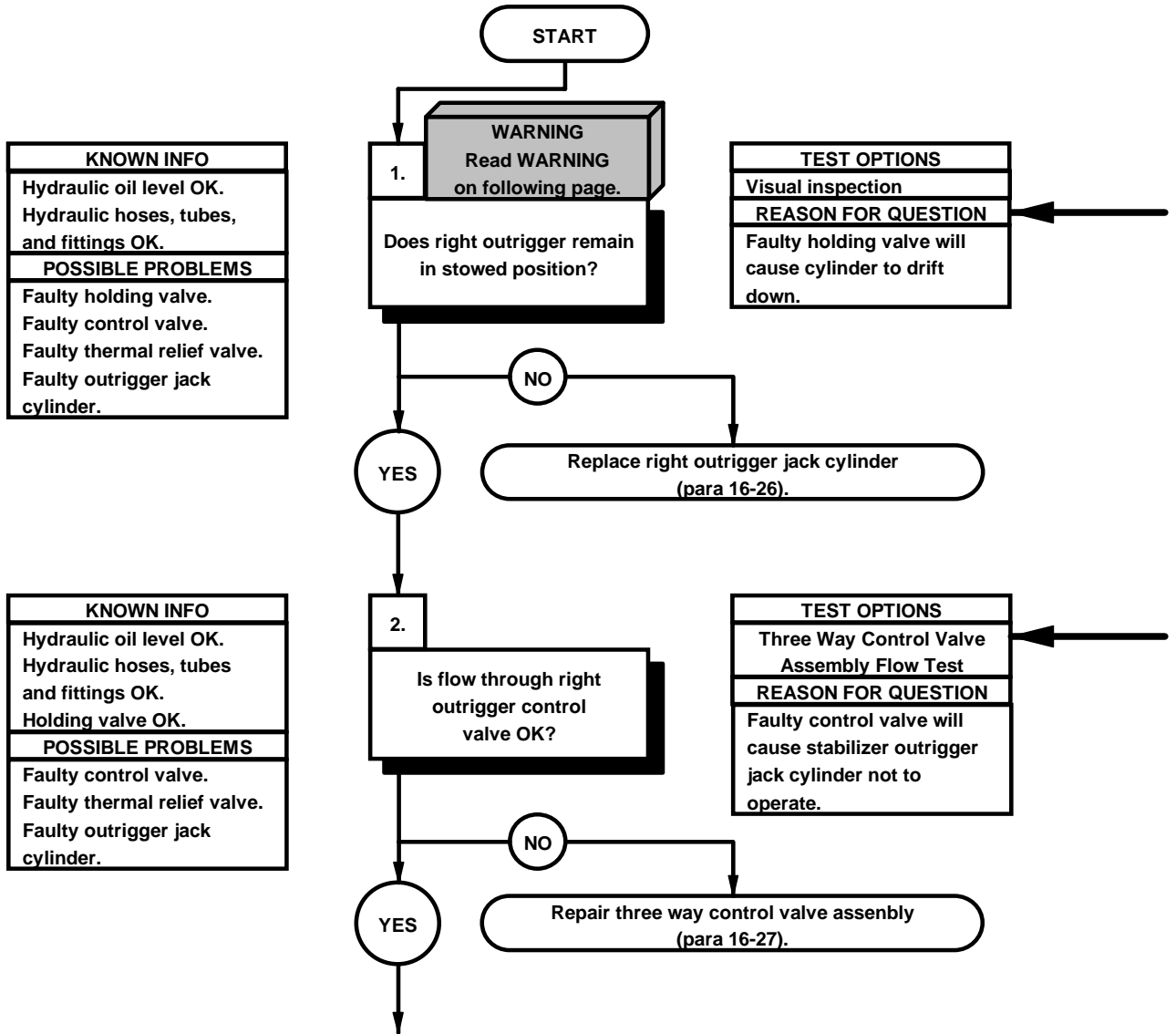
**LEFT OUTRIGGER JACK CYLINDER
INSPECTION**

- (1) Start engine (TM 9-2320-366-10-1).
- (2) Position PTO switch to on (TM 9-2320-366-10-1).
- (3) Position MHC power switch to ON (TM 9-2320-366-10-1).
- (4) Lower and raise left outrigger (TM 9-2320-366-10-1).
- (5) Observe outrigger jack cylinder for leakage.
 - (a) If outrigger jack cylinder leaks oil, outrigger jack cylinder is faulty.
 - (b) If outrigger jack cylinder is dry and outrigger drifts, thermal relief valve is faulty.
- (6) Position MHC power switch to OFF (TM 9-2320-366-10-1).
- (7) Position PTO switch to off (TM 9-2320-366-10-1).
- (8) Shut down engine (TM 9-2320-366-10-1).



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I3. M1084/M1086 MATERIAL HANDLING CRANE (MHC) RIGHT OUTRIGGER (JACK) DRIFTS OR DOES NOT WORK	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Materials/Parts Rag, Wiping (Item 60, Appendix C) Hose (2) (Item 40, Appendix C) Fitting (2) (Item 31, Appendix C) Fitting (Item 32, Appendix C) Adapter, Pipe (Item 1, Appendix C) Reducer, Tube (Item 61, Appendix C)
Personnel Required (2)	
Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) Tester, Hydraulic (Item 73, Appendix B) Pan, Drain (Item 43, Appendix B) Goggles, Industrial (Item 28, Appendix B)	



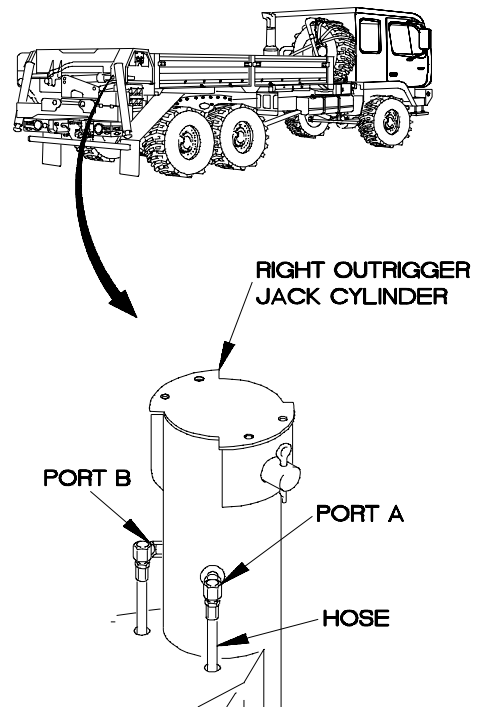
WARNING

- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

Check position of right outrigger to verify that it is held in the stowed position. If right outrigger will not remain stowed over a period of time, holding valve (in outrigger jack cylinder) is faulty.

THREE WAY CONTROL VALVE ASSEMBLY FLOW TEST

- (1) Place drain pan under vehicle.
- (2) Disconnect hose from right port A on top of right outrigger jack cylinder.
- (3) Connect hydraulic tester between hose and port P with test hoses and adapters.
- (4) Start engine (TM 9-2320-366-10-1).
- (5) Position PTO switch to on (TM 9-2320-366-10-1).
- (6) Increase engine rpm to 1250-1450 rpm (TM 9-2320-366-10-1).
- (7) Position MHC power switch to ON (TM 9-2320-366-10-1).
- (8) Lower right outrigger (TM 9-2320-366-10-1).
 - (a) During lowering, observe reading of 3-4 gpm (11-19 lpm) at negligible pressure. As outrigger loads, pressure will rise.
 - (b) If flow is low, replace control valve in three way (lower control) valve assembly.
- (9) Raise outrigger (TM 9-2320-366-10-1).
- (10) Position MHC power switch to OFF (TM 9-2320-366-10-1).
- (11) Position PTO switch to off (TM 9-2320-366-10-1).
- (12) Shut down engine (TM 9-2320-366-10-1).
- (13) Disconnect hydraulic tester, hoses and adapters.
- (14) Connect hose to port A.
- (15) Remove drain pan from under vehicle.



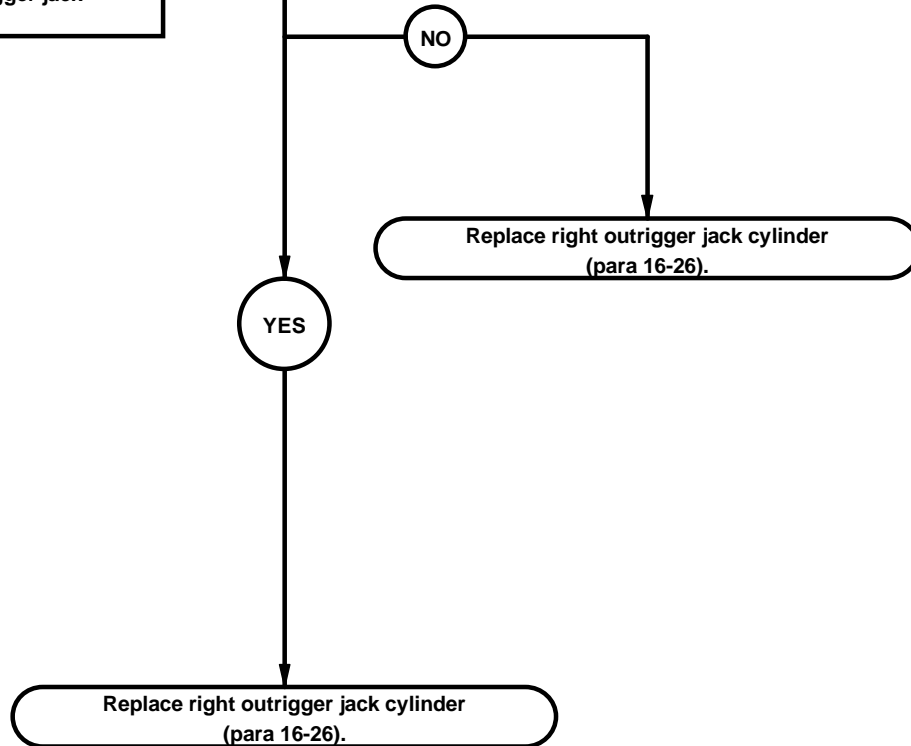
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13. M1084/M1086 MATERIAL HANDLING CRANE (MHC) RIGHT OUTRIGGER (JACK) DRIFTS OR DOES NOT WORK (CONT)

KNOWN INFO
Hydraulic oil level OK. Hydraulic hose, tubes and fittings OK. Holding valve OK. Control valve OK.
POSSIBLE PROBLEMS
Faulty thermal relief. Faulty outrigger jack cylinder.

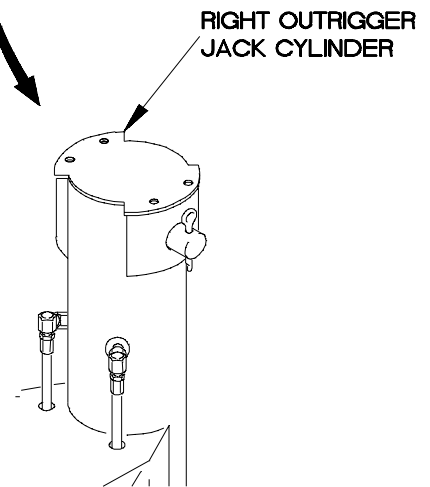
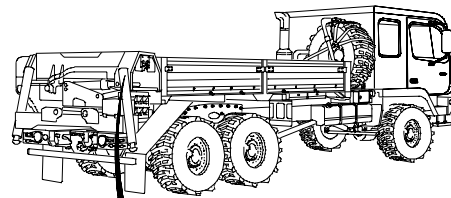
3.
Is right outrigger jack cylinder leaking oil?

TEST OPTIONS
Right Outrigger Cylinder Inspection
REASON FOR QUESTION
Faulty thermal relief valve or outrigger jack cylinder will cause left outrigger not to work.



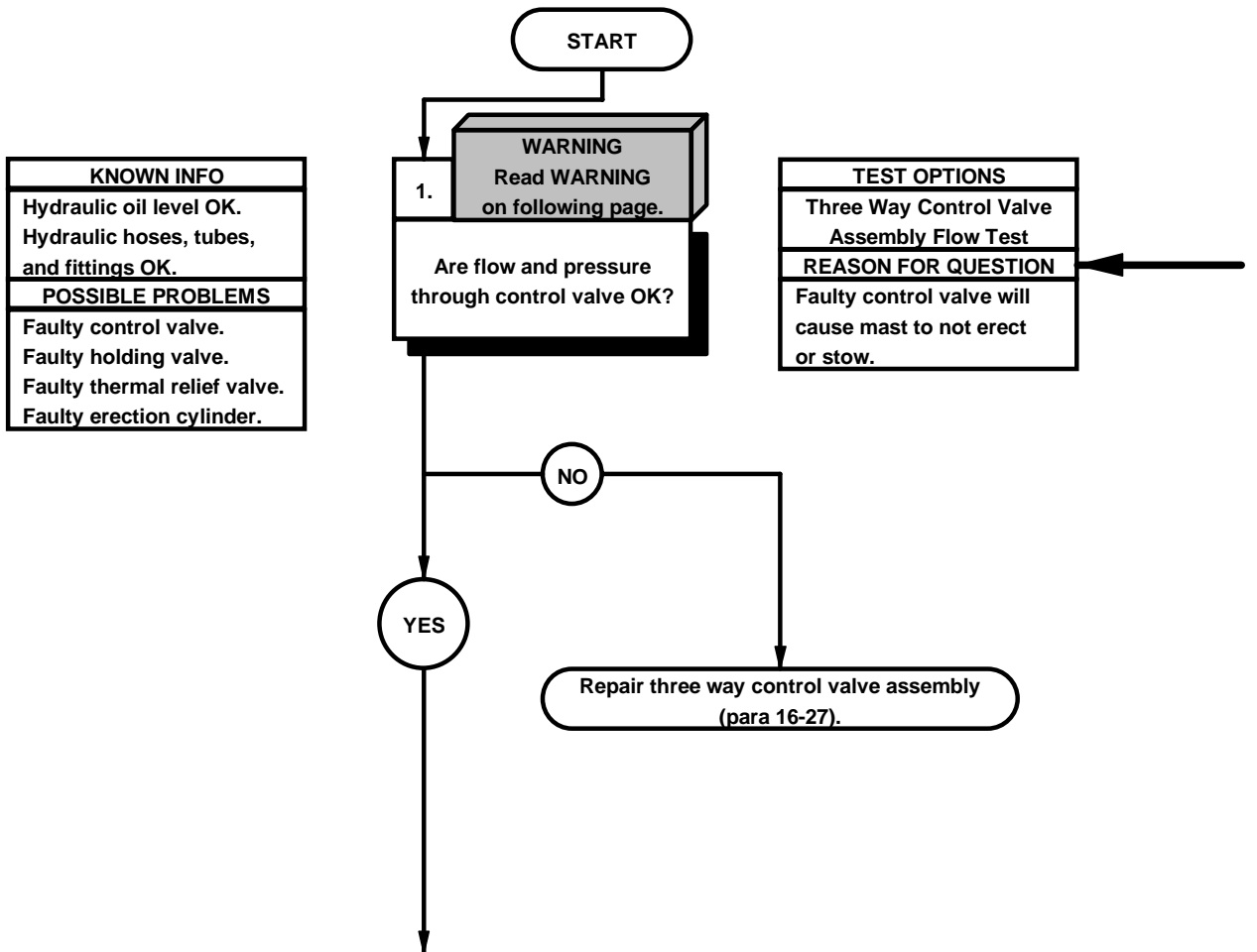
**RIGHT OUTRIGGER JACK CYLINDER
INSPECTION**

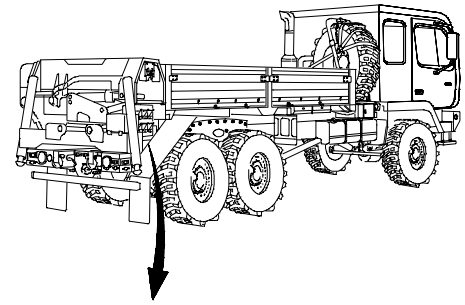
- (1) Start engine (TM 9-2320-366-10-1).
- (2) Position PTO switch to on (TM 9-2320-366-10-1).
- (3) Position MHC power switch to ON (TM 9-2320-366-10-1).
- (4) Lower and raise right outrigger (TM 9-2320-366-10-1).
- (5) Observe outrigger jack cylinder for leakage.
 - (a) If outrigger jack cylinder leaks oil, outrigger jack cylinder is faulty.
 - (b) If outrigger jack cylinder is dry and outrigger drifts, thermal relief valve is faulty.
- (6) Position MHC power switch to OFF (TM 9-2320-366-10-1).
- (7) Position PTO switch to off (TM 9-2320-366-10-1).
- (8) Shut down engine (TM 9-2320-366-10-1).



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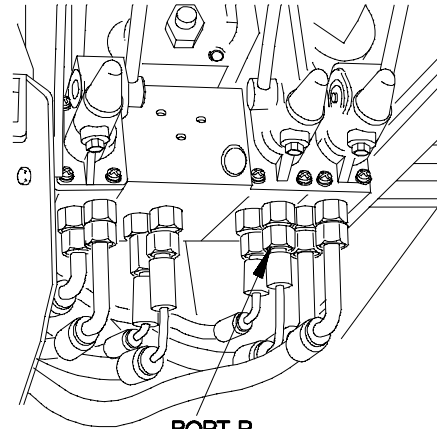
14. M1084/1086 MATERIAL HANDLING CRANE (MHC) MAST DOES NOT ERECT OR STOW	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Materials/Parts Rag, Wiping (Item 60, Appendix C) Hose (2) (Item 40, Appendix C) Fitting (2) (Item 31, Appendix C) Fitting (Item 32, Appendix C) Adapter, Swivel (Item 3, Appendix C) Reducer, Tube (Item 61, Appendix C) Adapter, Pipe (Item 1, Appendix C) Adapter, Pipe (Item 2, Appendix C)
Personnel Required (2)	
Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) Tester, Hydraulic (Item 73, Appendix B) Pan, Drain (Item 43, Appendix B) Goggles, Industrial (Item 28, Appendix B)	





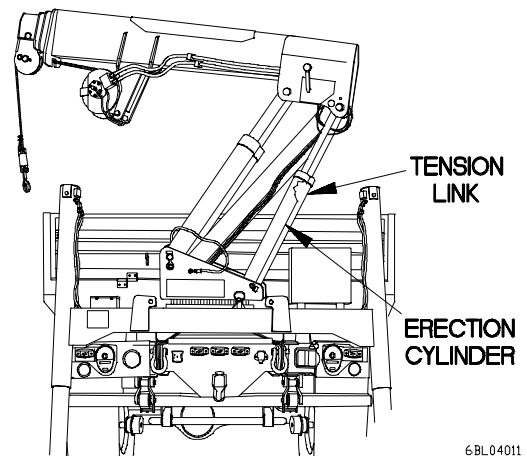
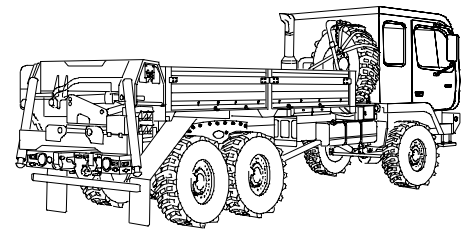
WARNING

- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.



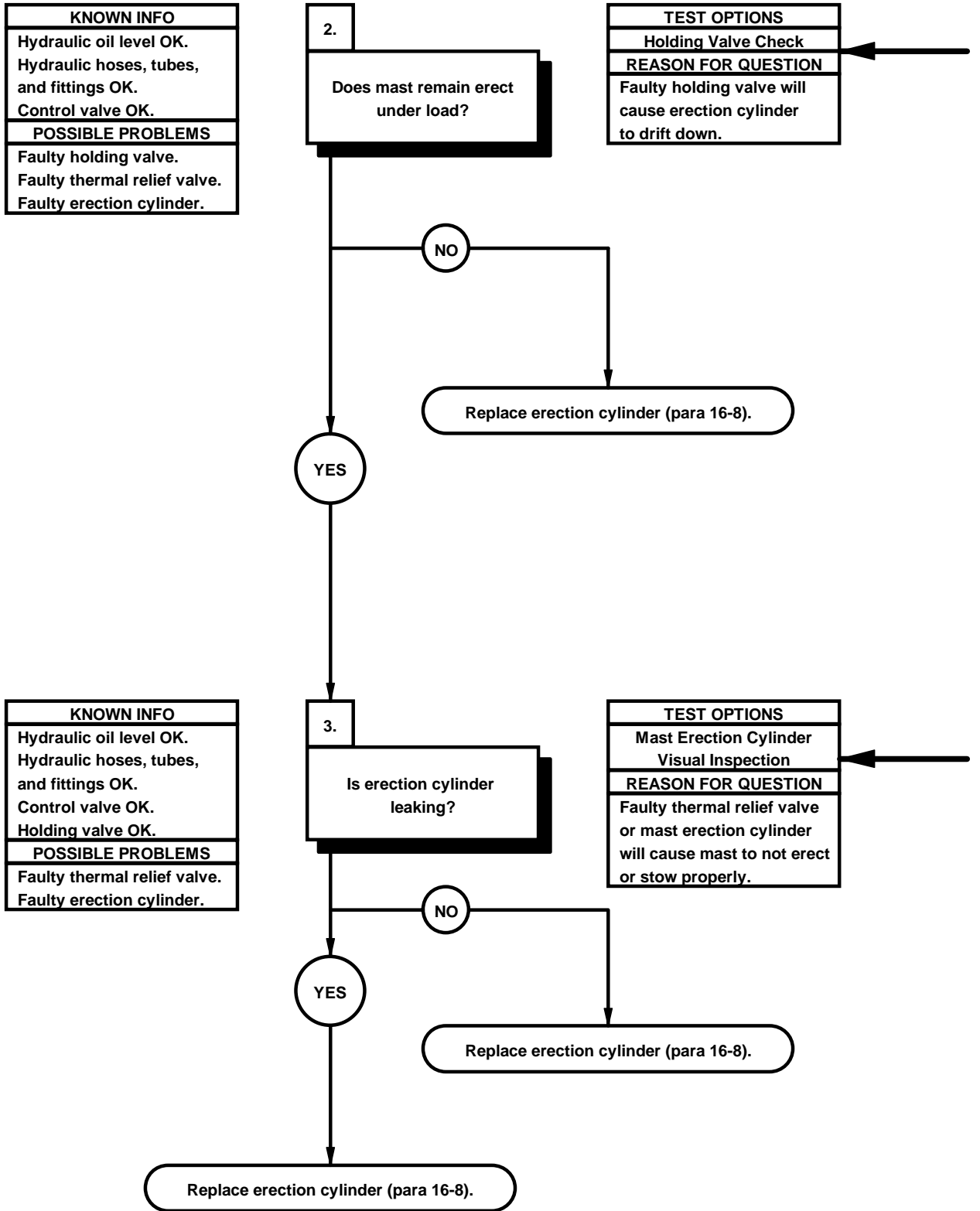
THREE WAY CONTROL VALVE ASSEMBLY FLOW TEST

- (1) Place drain pan under vehicle.
- (2) Disconnect hose from port B of mast erection control valve in three way (lower) control valve assembly.
- (3) Connect hydraulic tester between hose and port B with test hoses and adapters.
- (4) Start engine (TM 9-2320-366-10-1).
- (5) Position PTO switch to on (TM 9-2320-366-10-1).
- (6) Increase engine RPM to 1250-1450 RPM (TM 9-2320-366-10-1).
- (7) Position MHC power switch to ON (TM 9-2320-366-10-1).
- (8) Erect mast (TM 9-2320-366-10-1).
 - (a) While erecting mast observe flow of about 1 gpm.
 - (b) If flow is low, replace control valve in three way (lower) control valve assembly.
- (9) Stow MHC (TM 9-2320-366-10-1).
- (10) Position MHC power switch to OFF (TM 9-2320-366-10-1).
- (11) Position PTO switch to off (TM 9-2320-366-10-1).
- (12) Shut down engine (TM 9-2320-366-10-1).
- (13) Disconnect hydraulic tester, hoses and adapters.
- (14) Connect hose to port B.



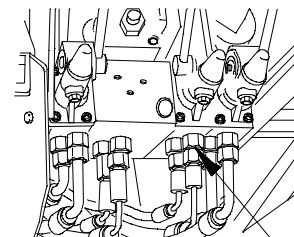
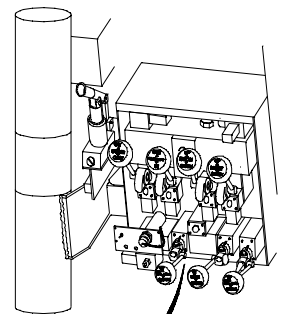
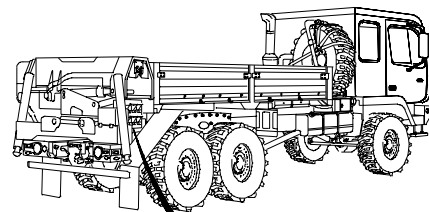
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14. M1084/M1086 MATERIAL HANDLING CRANE (MHC) MAST DOES NOT ERECT OR STOW (CONT)



HOLDING VALVE CHECK

- (1) Pick up light load with MHC (TM 9-2320-366-10-1).
- (2) Observe that erection cylinder maintains position for 30 minutes. If cylinder drifts, holding valve on erection cylinder is faulty.



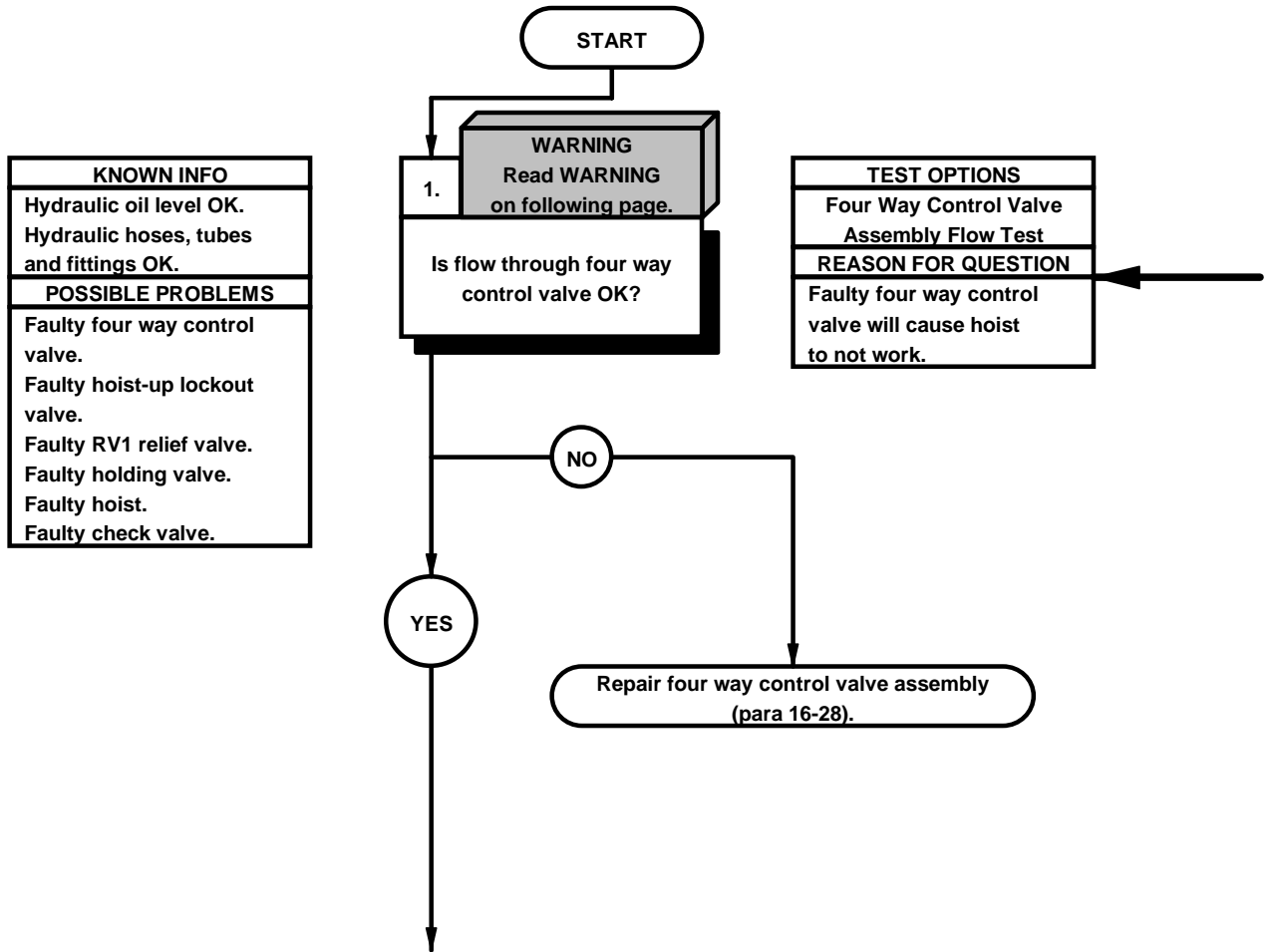
THREE WAY CONTROL VALVE ASSEMBLY
PORT T

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ERECTION CYLINDER VISUAL INSPECTION

- (1) Start engine (TM 9-2320-366-10-1).
- (2) Position PTO switch to on (TM 9-2320-366-10-1).
- (3) Position MHC power switch to ON (TM 9-2320-366-10-1).
- (4) Erect and stow mast two or more times.
- (5) Observe erection cylinder for leakage.
 - (a) If erection cylinder leaks, cylinder is faulty.
 - (b) If erection cylinder drifts but does not leak, thermal relief valve on erection cylinder is faulty.
- (6) Stow mast (TM 9-2320-366-10-1).
- (7) Position MHC power switch to OFF (TM 9-2320-366-10-1).
- (8) Position PTO switch to off (TM 9-2320-366-10-1).
- (9) Shut down engine (TM 9-2320-366-10-1).
- (10) Remove drain pan from under vehicle.

15. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HOIST DOES NOT WORK	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Materials/Parts Rag, Wiping (Item 60, Appendix C) Hose (2) (Item 40, Appendix C) Fitting (2) (Item 31, Appendix C) Adapter, Swivel (Item 3, Appendix C) Reducer, Tube (Item 61, Appendix C) Fitting (Item 32, Appendix C) Adapter, Pipe (Item 2, Appendix C) Adapter, Pipe (Item 1, Appendix C)
Personnel Required (2)	
Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) Tester, Hydraulic (Item 73, Appendix B) Pan, Drain (Item 43, Appendix B) STE/ICE-R (Item 70, Appendix B) Goggles, Industrial (Item 28, Appendix B)	



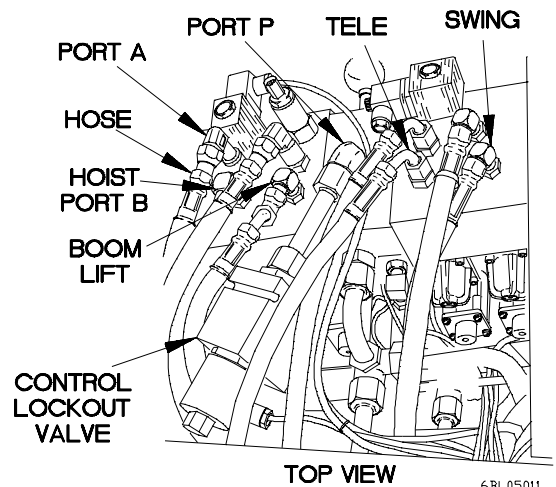
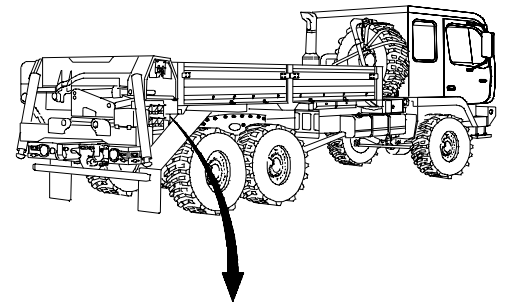
WARNING

- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

**FOUR WAY CONTROL VALVE ASSEMBLY
FLOW TEST**

NOTE

- If hoist will only work in hoist down position, perform visual inspection of winch-up lockout valve. Replace damaged winch-up lockout valve. If necessary, perform electrical system troubleshooting (TM 9-2320-366-20-2).
 - If hoist suddenly loses power, when not overloaded, or fails to shut down, when overloaded, relief valve RV1 is faulty. Clean or replace RV1.
 - To test in hoist-down position substitute port B for port A, in steps (2), (3), (14) and (15) and in step (8) operate hoist-down.
- (1) Place drain pan under vehicle.
 - (2) Disconnect hose from port A of hoist control valve.
 - (3) Connect hydraulic tester between hose and port A with test hoses and adapters.
 - (4) Start engine (TM 9-2320-366-10-1).
 - (5) Position PTO switch to on (TM 9-2320-366-10-1).
 - (6) Increase engine RPM to 1250-1450 RPM (TM 9-2320-366-10-1).
 - (7) Position MHC power switch to ON (TM 9-2320-366-10-1).
 - (8) Operate MHC to raise a moderate load with hoist (TM 9-2320-366-10-1).
 - (9) Observe reading of about 9 gpm (34 lpm). If flow is low, replace control valve in four way (upper) control valve assembly.
 - (10) Stow MHC (TM 9-2320-366-10-1).
 - (11) Position MHC power to OFF (TM 9-2320-366-10-1).
 - (12) Position PTO switch to off (TM 9-2320-366-10-1).
 - (13) Shut down engine (TM 9-2320-366-10-1).
 - (14) Disconnect hydraulic tester, hose and adapters from port A and hose.
 - (15) Connect hose to port A.



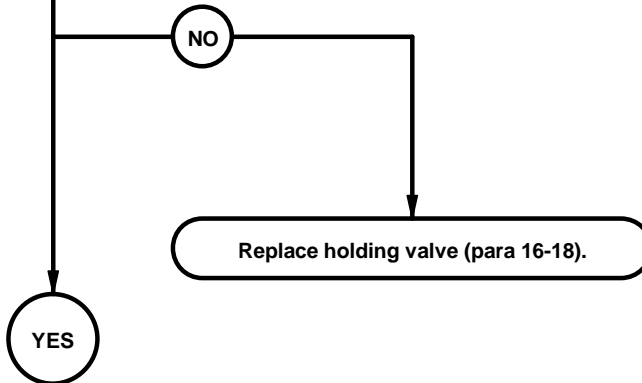
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15. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HOIST DOES NOT WORK (CONT)

KNOWN INFO
Hydraulic oil level OK. Hydraulic hoses, tubes, and fittings OK. Control valve OK. Hoist-up lockout valve OK. RV1 relief valve OK.
POSSIBLE PROBLEMS
Faulty holding valve. Faulty Hoist. Faulty check valve.

2.
Is flow and pressure to hoist hydraulic motor valve assembly OK?

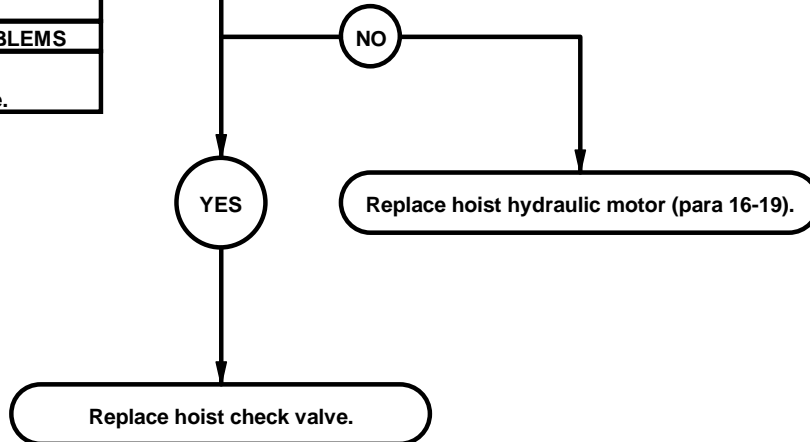
TEST OPTIONS
Hoist Hydraulic Motor Valve Assembly Flow Test
REASON FOR QUESTION
Faulty holding valve will cause hoist to not work.



KNOWN INFO
Hydraulic oil level OK. Hydraulic hoses, tubes and fittings OK. Control valve OK. Hoist-up lockout valve OK. RV1 relief valve OK. Holding valve OK.
POSSIBLE PROBLEMS
Faulty hoist. Faulty check valve.

3.
Is flow through hoist hydraulic motor OK?

TEST OPTIONS
Hoist Hydraulic Motor Flow Test
REASON FOR QUESTION
Faulty hoist hydraulic motor or check valve will cause hoist to not work.

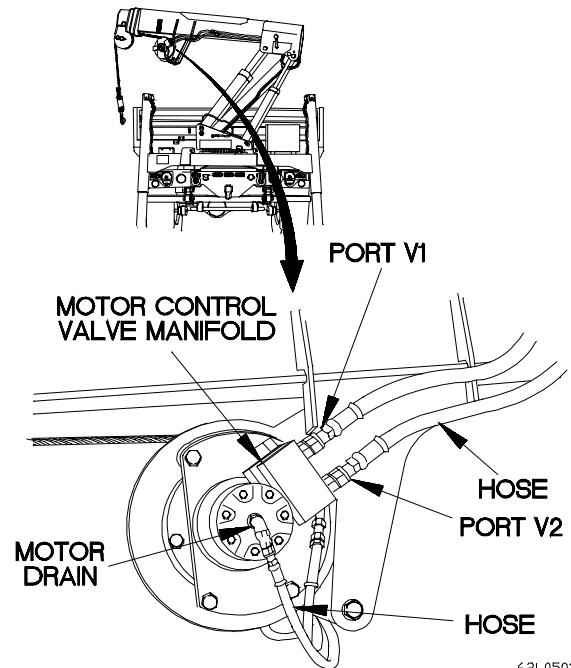


**HOIST HYDRAULIC MOTOR VALVE ASSEMBLY
FLOW TEST**

- (1) Disconnect hose from port V2 on hydraulic motor valve assembly.
- (2) Connect hydraulic tester input to port V2 and output to hose with test hoses and adapters.
- (3) Start engine (TM 9-2320-366-10-1).
- (4) Position PTO switch to on (TM 9-2320-366-10-1).
- (5) Increase engine RPM to 1250-1450 RPM (TM 9-2320-366-10-1).
- (6) Position MHC power switch to ON (TM 9-2320-366-10-1).
- (7) Operate MHC to raise a moderate load with hoist.
- (8) Observe flow of 7-9 gpm (27-34 lpm) and pressure of less than 2250-2550 psi (15514-17582 kPa). If step fails, repair or replace holding valve (para 16-18).
- (9) Stow MHC (TM 9-2320-366-10-1).
- (10) Position MHC power switch to OFF (TM 9-2320-366-10-1).
- (11) Position PTO switch to off (TM 9-2320-366-10-1).
- (12) Shut down engine (TM 9-2320-366-10-1).
- (13) Disconnect hydraulic tester, hoses and adapters from port V2 and hose.
- (14) Connect hose to port V2.

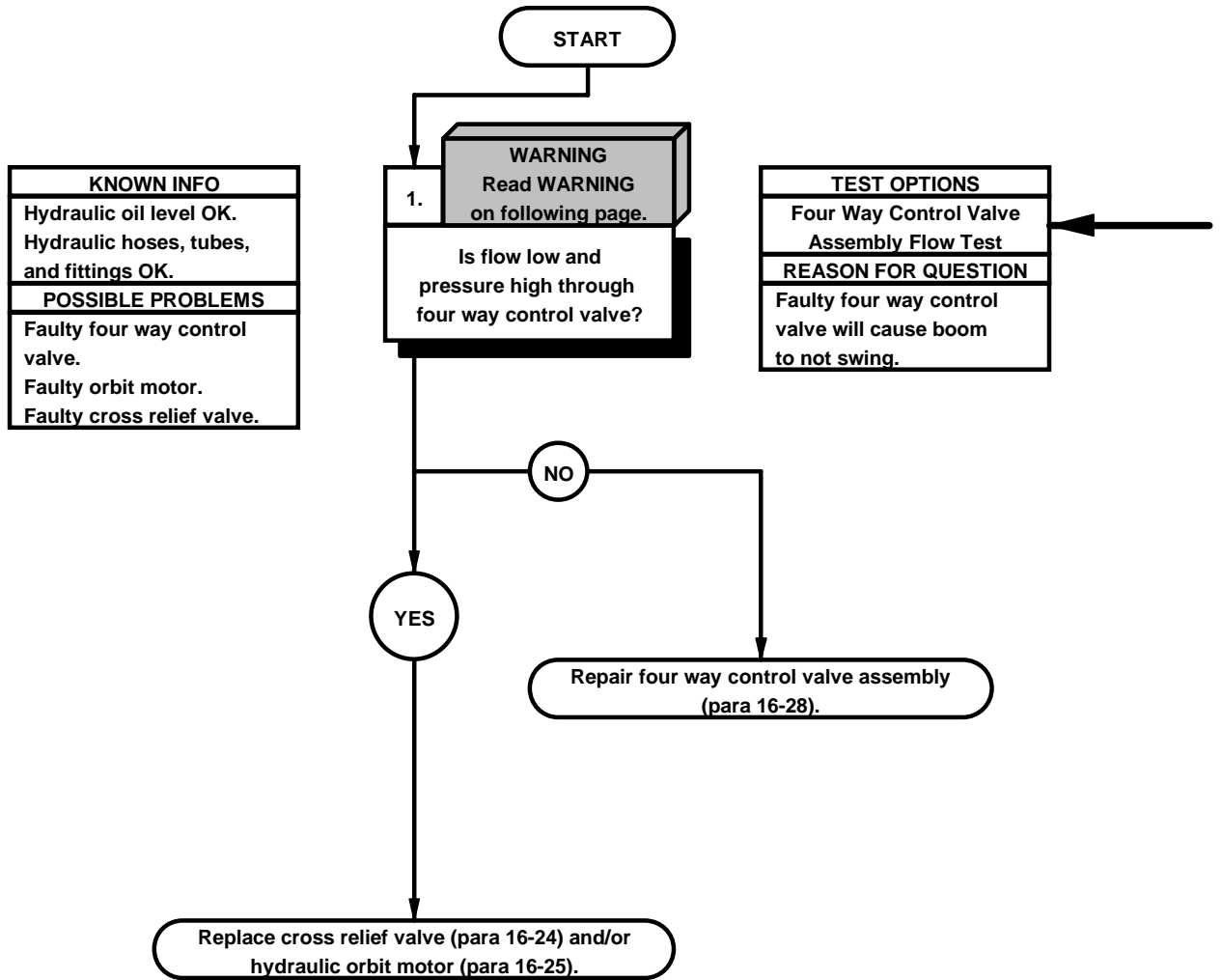
MOTOR FLOW TEST

- (1) Disconnect hose from motor drain fitting.
- (2) Connect hydraulic tester between hose and motor drain fitting with test hoses, adapters, and accessories from STE/ICE-R.
- (3) Start engine (TM 9-2320-366-10-1).
- (4) Position PTO switch to on (TM 9-2320-366-10-1).
- (5) Increase engine RPM 1250-1450 RPM (TM 9-2320-366-10-1).
- (6) Position MHC power switch to ON (TM 9-2320-366-10-1).
- (7) Operate MHC to raise a moderate load with hoist.
- (8) Observe flow of 7-9 gpm (27-34 lpm) and pressure of less than 2250-2550 psi (15514-17582 kPa).
 - (a) If pressure is high and flow is low, check valve on hoist is faulty.
 - (b) If flow and pressure are low, replace hoist hydraulic motor.
- (9) Stow MHC (TM 9-2320-366-10-1).
- (10) Position MHC power switch to OFF (TM 9-2320-366-10-1).
- (11) Position PTO switch to off (TM 9-2320-366-10-1).
- (12) Shut down engine (TM 9-2320-366-10-1).
- (13) Disconnect hydraulic tester, hoses, adapters, and STE/ICE-R accessories from fitting and hose.
- (14) Connect hose to fitting.
- (15) Remove drain pan from under vehicle.



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16. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM SWING ASSEMBLY DOES NOT WORK	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Materials/Parts Rag, Wiping (Item 60, Appendix C) Hose (2) (Item 40, Appendix C) Fitting (2) (Item 31, Appendix C) Adapter, Swivel (Item 3, Appendix C) Adapter, Pipe (Item 2, Appendix C) Adapter, Pipe (Item 1, Appendix C) Reducer, Tube (Item 61, Appendix C)
Personnel Required (2)	
Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) Tester, Hydraulic (Item 73, Appendix B) Pan, Drain (Item 43, Appendix B) Goggles, Industrial (Item 28, Appendix B)	



WARNING

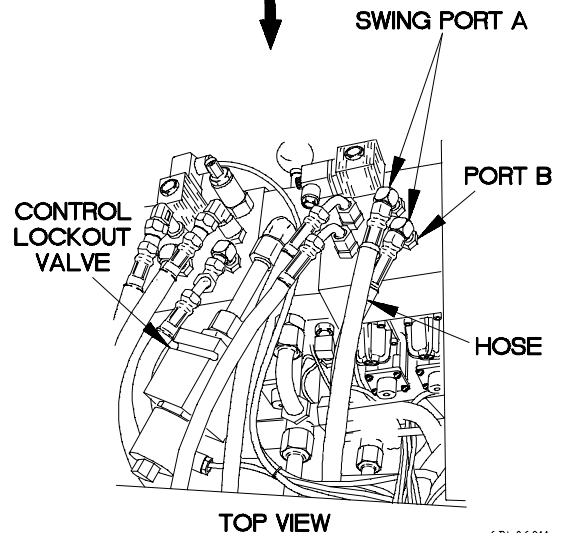
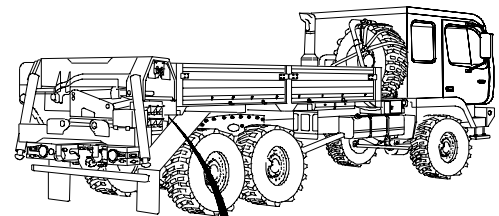
- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

FOUR WAY CONTROL VALVE ASSEMBLY FLOW TEST

NOTE

If boom swings right OK but will not swing left: substitute port B for port A, in steps (2), (3), (14) and (15), and operate swing control left, in step (8).

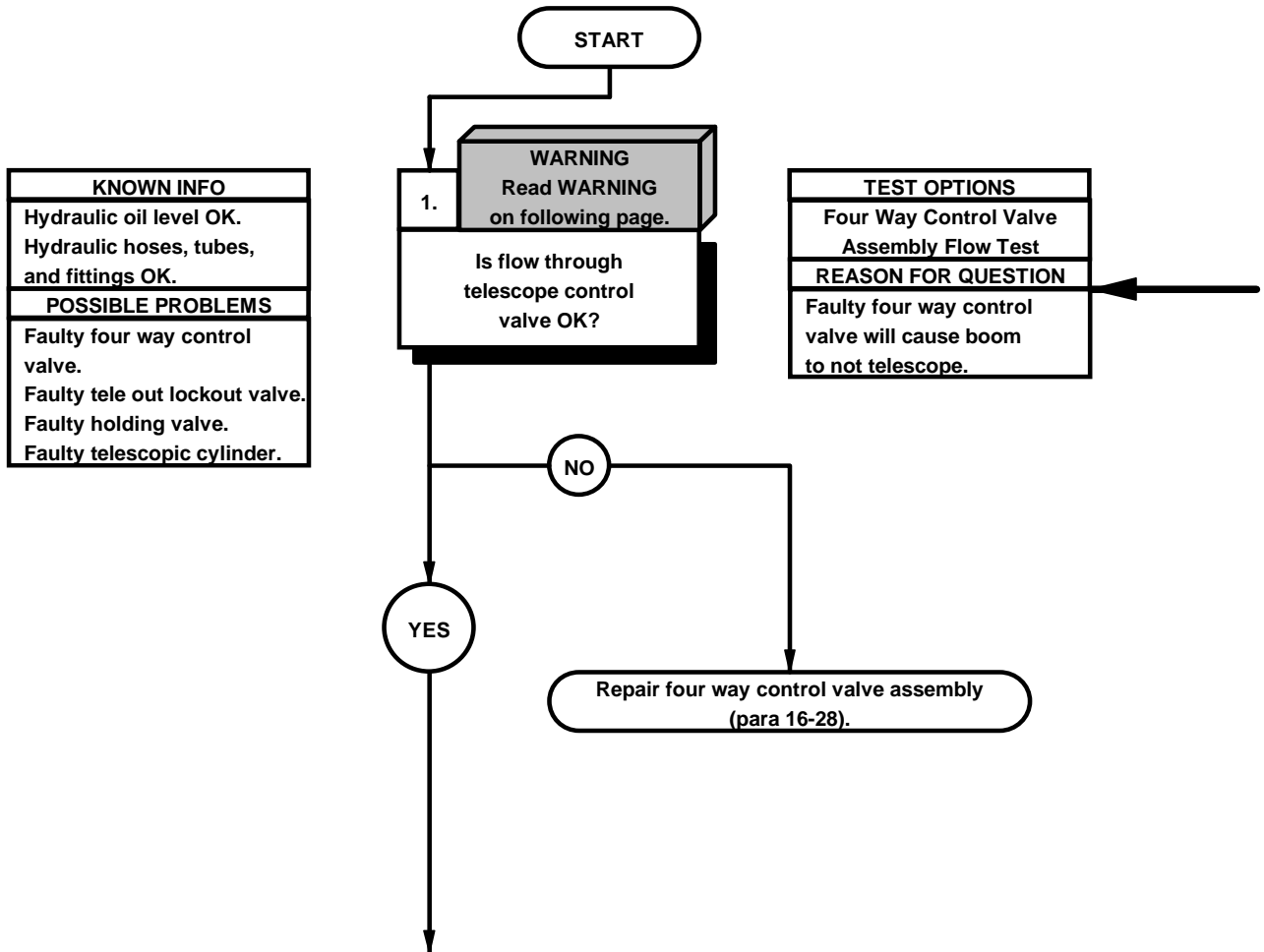
- (1) Place drain pan under vehicle.
- (2) Disconnect hose from port A of boom swing control valve in four way (upper) control valve assembly.
- (3) Connect hydraulic tester kit between hose and port A with test hoses and adapters.
- (4) Start engine (TM 9-2320-366-10-1).
- (5) Position PTO switch to on (TM 9-2320-366-10-1).
- (6) Increase engine RPM to 1250-1450 RPM (TM 9-2320-366-10-1).
- (7) Position MHC power switch to ON (TM 9-2320-366-10-1).
- (8) Operate swing control to the right (TM 9-2320-366-10-1).
- (9) Observe reading of 2-3 gpm (8-11 lpm), with low pressure.
 - (a) If flow and pressure are low, replace control valve (in four way control valve assembly).
 - (b) If pressure is high with no flow, replace cross relief valve. If fault not corrected, replace hydraulic orbit motor.
- (10) Shut down MHC (TM 9-2320-366-10-1).
- (11) Position MHC power to OFF (TM 9-2320-366-10-1).
- (12) Position PTO switch to off (TM 9-2320-366-10-1).
- (13) Shut down engine (TM 9-2320-366-10-1).
- (14) Disconnect hydraulic tester, hoses and adapters from port A and hose.
- (15) Connect hose to port A.
- (16) Remove drain pan from under vehicle.



TOP VIEW

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17. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM DOES NOT TELESCOPE IN OR OUT	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Materials/Parts Rag, Wiping (Item 60, Appendix C) Hose (2) (Item 40, Appendix C) Fitting (2) (Item 31, Appendix C) Reducer, Tube (Item 61, Appendix C) Adapter, Swivel (Item 3, Appendix C) Adapter, Pipe (Item 2, Appendix C)
Personnel Required (2)	
Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) Tester, Hydraulic (Item 73, Appendix B) Pan, Drain (Item 43, Appendix B) Goggles, Industrial (Item 28, Appendix B)	



WARNING

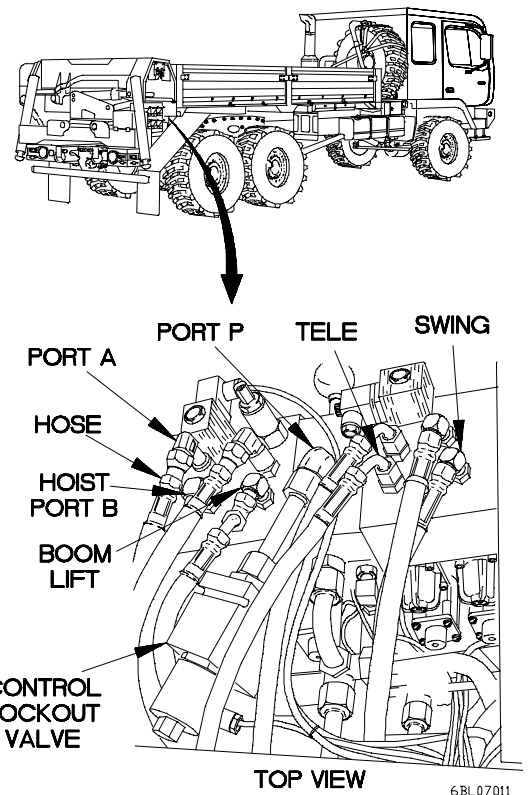
- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

FOUR WAY CONTROL VALVE ASSEMBLY FLOW TEST

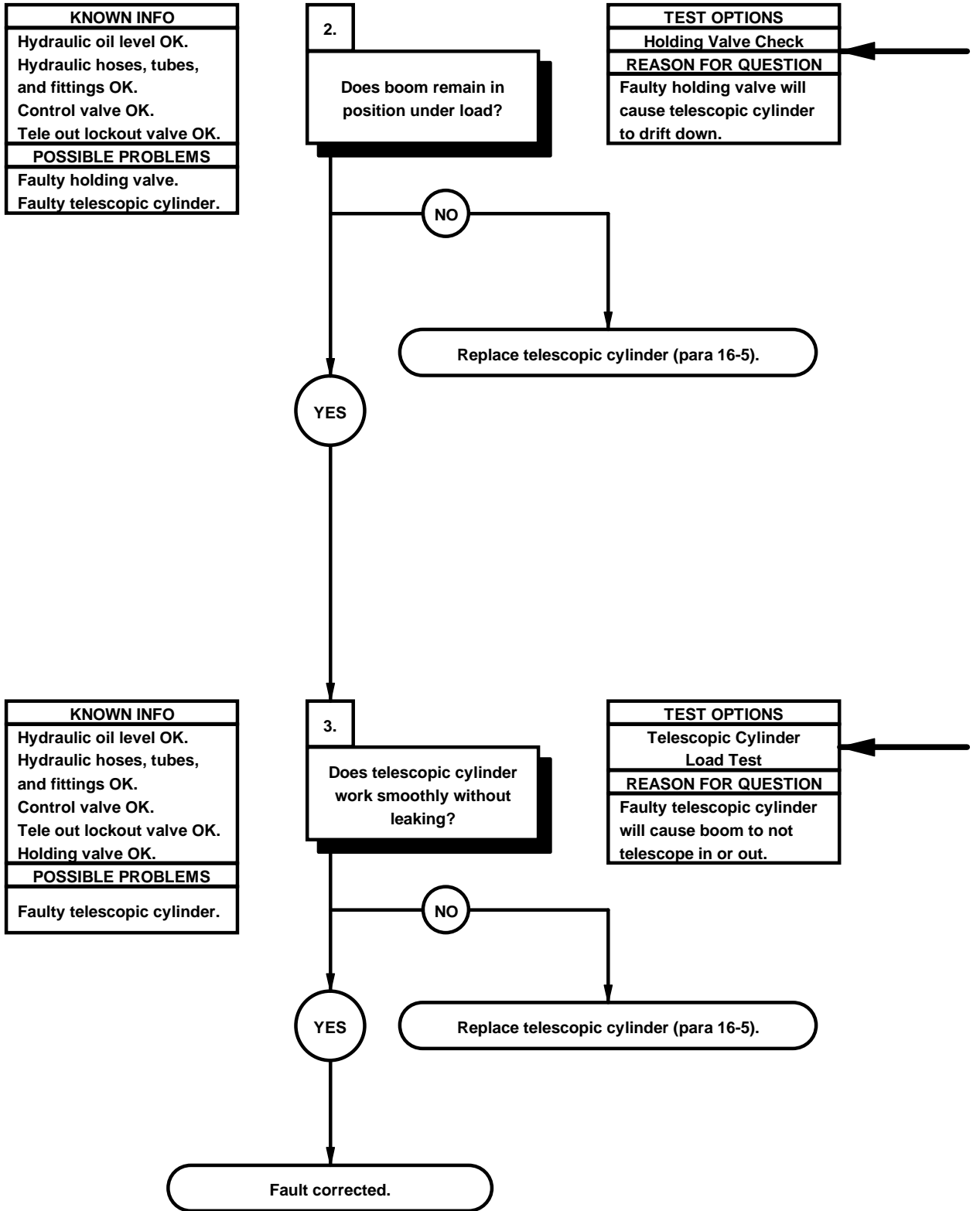
NOTE

- If boom will only work in tele in position, perform visual inspection of telescopic out lockout valve. Replace damaged telescopic out lockout valve. If necessary, perform electrical troubleshooting (e115. M1084/M1086 MHC Overload Shutdown System Stays Activated).
- Test in worst direction (tele in or tele out). To select tele in: substitute port B for port A, in steps (1), (2), (12) and (13); in step (6) operate tele in and in step (7) observe reading of about 4 gpm (15.2 lpm).

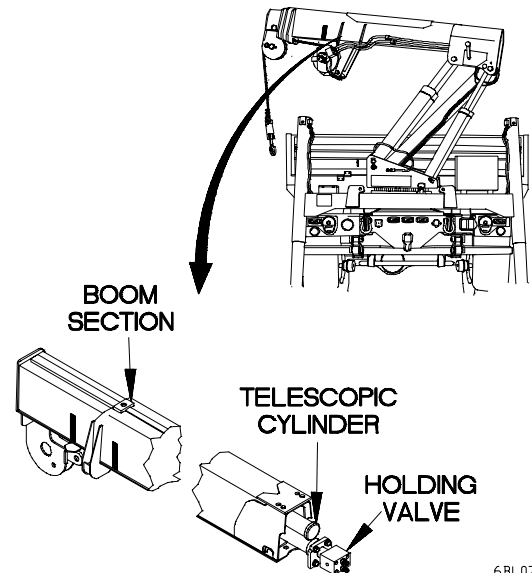
- (1) Place drain pan under vehicle.
- (2) Disconnect hose from port A of boom telescoping control valve in four way (upper) control valve assembly.
- (3) Connect hydraulic tester between hose and port A with test hoses and adapters.
- (4) Start engine (TM 9-2320-366-10-1).
- (5) Position PTO switch to on (TM 9-2320-366-10-1).
- (6) Increase engine RPM to 1250-1450 RPM (TM 9-2320-366-10-1).
- (7) Position MHC power switch to ON (TM 9-2320-366-10-1).
- (8) Operate MHC telescope out (TM 9-2320-366-10-1).
- (9) Observe reading of about 8 gpm (30 lpm). If flow is low, replace boom telescope control valve in four way control valve assembly.
- (10) Stow MHC (TM 9-2320-366-10-1).
- (11) Position MHC power switch to OFF (TM 9-2320-366-10-1).
- (12) Position PTO switch to off (TM 9-2320-366-10-1).
- (13) Shut down engine (TM 9-2320-366-10-1).
- (14) Disconnect hydraulic tester, hoses and adapters from port A and hose.
- (15) Connect hose to port A.
- (16) Remove drain pan from under vehicle.



17. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM DOES NOT TELESCOPE IN OR OUT (CONT)



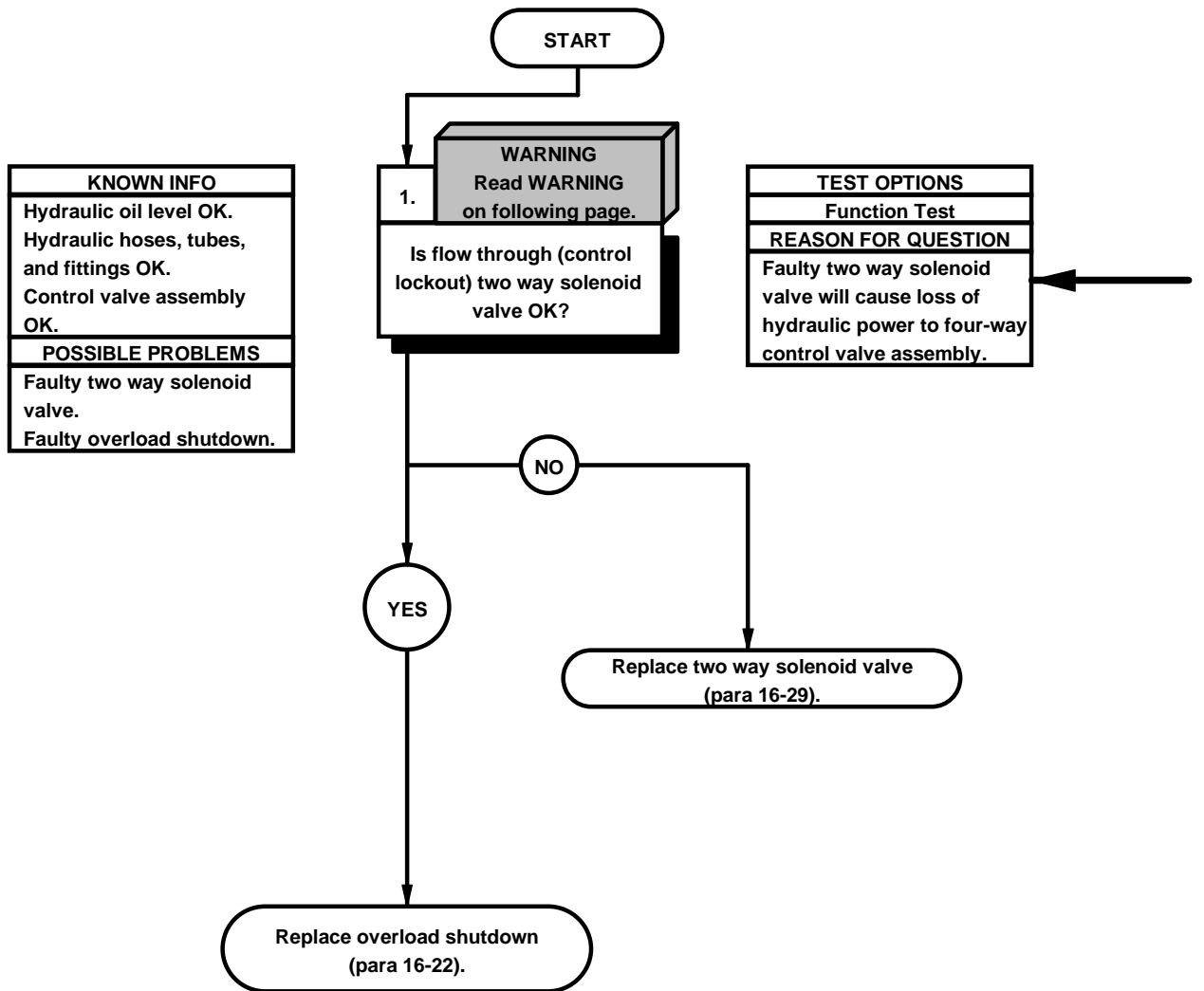
HOLDING VALVE CHECK	
	(1) Pick up light load with MHC, extend boom (telescopic out) and lift boom to 30 degrees (TM 9-2320-366-10-1).
	(2) Observe that extended boom maintains position for 30 minutes. If telescopic cylinder drifts, holding valve (in telescopic cylinder) is faulty.



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TELESCOPIC CYLINDER LOAD TEST	
	(1) Start engine (TM 9-2320-366-10-1).
	(2) Position PTO switch to on (TM 9-2320-366-10-1).
	(3) Position MHC power switch to ON (TM 9-2320-366-10-1).
	(4) Operate MHC boom up to 30 degrees, then out and in two or more times (TM 9-2320-366-10-1).
	(5) Observe telescopic cylinder for leakage. If telescopic cylinder leaks, replace cylinder.
	(6) Stow MHC (TM 9-2320-366-10-1).
	(7) Position MHC power switch to OFF (TM 9-2320-366-10-1).
	(8) Position PTO switch to off (TM 9-2320-366-10-1).
	(9) Shut down engine (TM 9-2320-366-10-1).

18. M1084/M1086 MATERIAL HANDLING CRANE (MHC) SWING, TELESCOPE, BOOM AND HOIST DOES NOT WORK	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Materials/Parts Rag, Wiping (Item 60, Appendix C) Hose (2) (Item 40, Appendix C) Fitting (2) (Item 31, Appendix C) Reducer, Tube (Item 61, Appendix C) Adapter, Swivel (Item 3, Appendix C) Adapter, Pipe (Item 2, Appendix C)
Personnel Required (2)	
Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) Tester, Hydraulic (Item 73, Appendix B) Pan, Drain (Item 43, Appendix B) Goggles, Industrial (Item 28, Appendix B)	

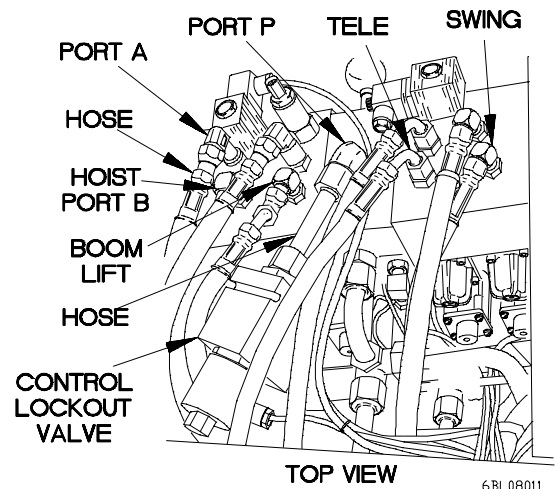
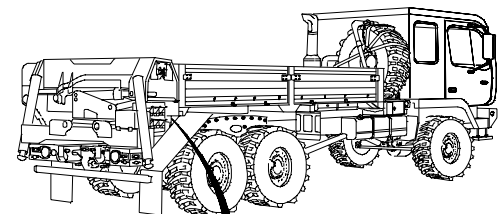


WARNING

- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

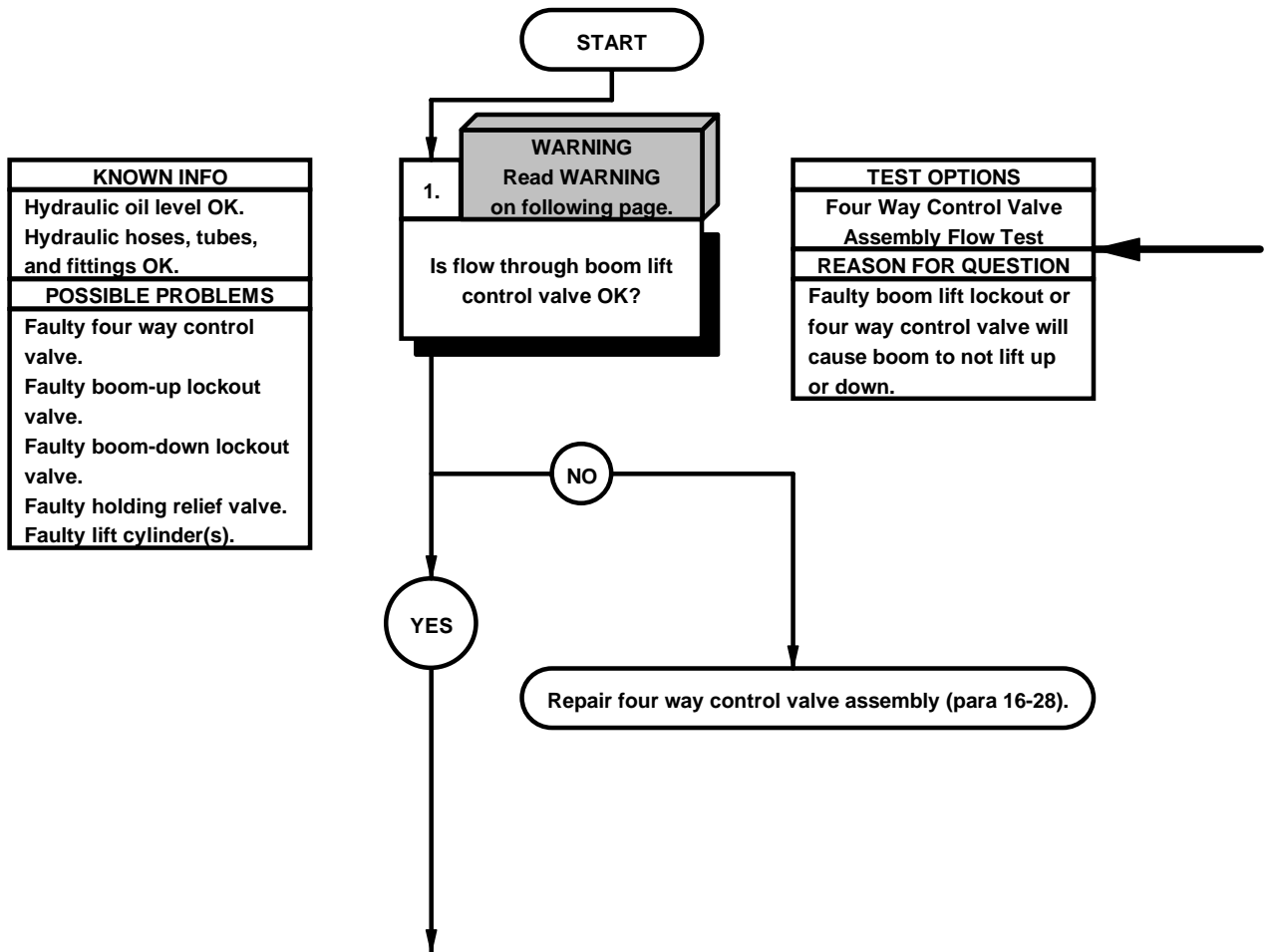
FUNCTION TEST

- (1) Place drain pan under vehicle.
- (2) Disconnect hose from input port P of four way (upper) control valve assembly.
- (3) Connect hydraulic tester between hose and port P with test hoses and adapters.
- (4) Start engine (TM 9-2320-366-10-1).
- (5) Position PTO switch to on (TM 9-2320-366-10-1).
- (6) Increase engine RPM to 1250-1450 RPM (TM 9-2320-366-10-1).
- (7) Position MHC power switch to ON (TM 9-2320-366-10-1).
- (8) Extend outriggers and erect boom (TM 9-2320-366-10-1).
- (9) Operate boom swing (TM 9-2320-366-10-1).
- (10) Observe flow reading of 11-12 gpm (38-46 lpm). If flow is low replace control lockout two way solenoid valve.
- (11) If flow is OK, replace overload shutdown (para 16-22).
- (12) Stow outriggers (TM 9-2320-366-10-1).
- (13) Position MHC power switch to OFF (TM 9-2320-366-10-1).
- (14) Position PTO switch to off (TM 9-2320-366-10-1).
- (15) Shut down engine (TM 9-2320-366-10-1).
- (16) Disconnect hydraulic tester, hoses and adapters.
- (17) Connect hose to port P.
- (18) Remove drain pan from under vehicle.



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19. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM DOES NOT LIFT UP OR DOWN OR HOLD UNDER LOAD	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Materials/Parts Rag, Wiping (Item 60, Appendix C) Hose (2) (Item 40, Appendix C) Fitting (2) (Item 31, Appendix C) Reducer, Tube (Item 61, Appendix C) Adapter, Swivel (Item 3, Appendix C) Adapter, Pipe (Item 2, Appendix C)
Personnel Required (2)	
Tools and Special Tools Tool Kit, Genl Mech (Item 78, Appendix B) Tester, Hydraulic (Item 73, Appendix B) Pan, Drain (Item 43, Appendix B) Goggles, Industrial (Item 28, Appendix B)	



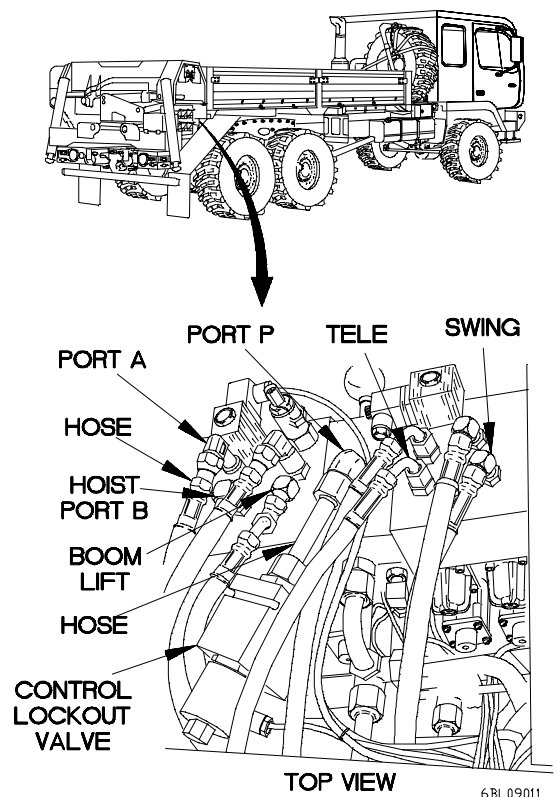
WARNING

- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.
- Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.

FOUR WAY CONTROL VALVE ASSEMBLY FLOW TEST

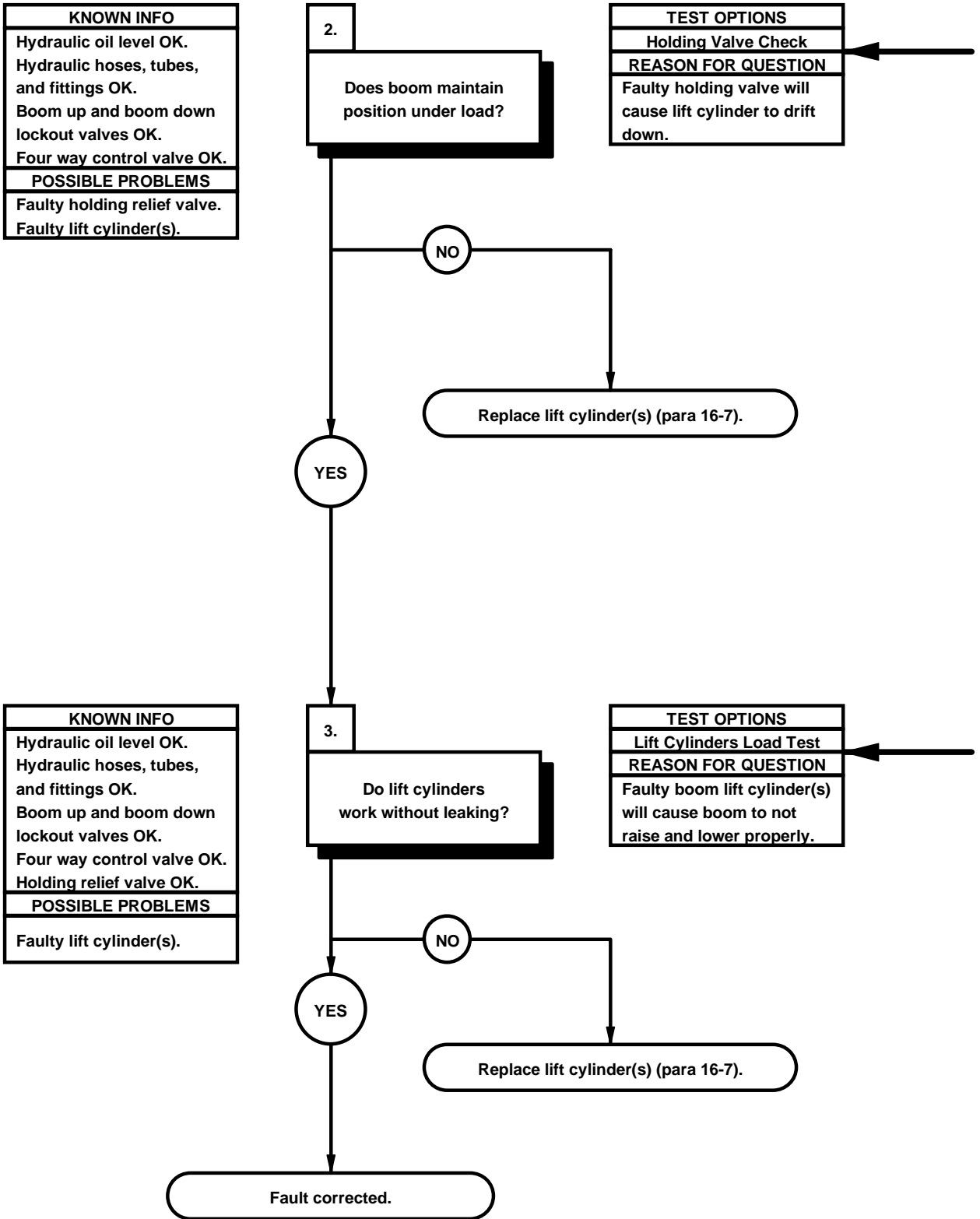
NOTE
Test in worst direction (boom up or boom down). To select boom down: substitute port B for port A, in steps (2), (3), (14) and (15), and operate boom down, in step (8).

- (1) Place drain pan under vehicle.
- (2) Disconnect hose from port A of boom lift control valve in four way (upper) control valve assembly.
- (3) Connect hydraulic tester between hose and port A with test hoses and adapters.
- (4) Start engine (TM 9-2320-366-10-1).
- (5) Position PTO switch to on (TM 9-2320-366-10-1).
- (6) Increase engine RPM to 1250-1450 RPM (TM 9-2320-366-10-1).
- (7) Position MHC power switch to ON (TM 9-2320-366-10-1).
- (8) Operate MHC boom up or down (TM 9-2320-366-10-1).
- (9) Observe reading of about 3.5 gpm (13 lpm) boom down or 5 gpm (19 lpm) for boom up at 2900-3100 psi (19996-21375 kPa). If flow is low, replace control valve.
- (10) Stow MHC (TM 9-2320-366-10-1).
- (11) Position MHC power switch to OFF (TM 9-2320-366-10-1).
- (12) Position PTO switch to off (TM 9-2320-366-10-1).
- (13) Shut down engine (TM 9-2320-336-10-1).
- (14) Disconnect hydraulic tester, hoses and adapters from port A and hose.
- (15) Connect hose to port A.
- (16) Remove drain pan from under vehicle.



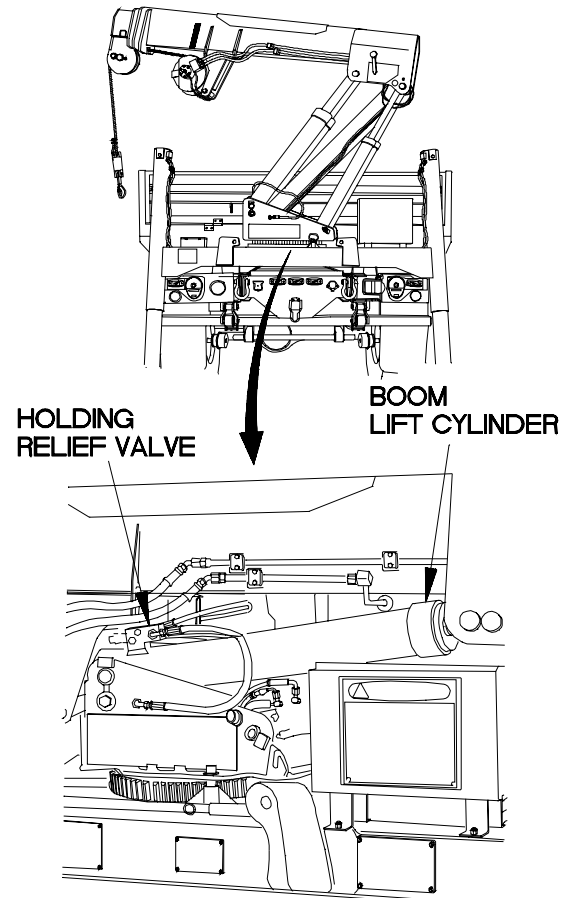
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19. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM DOES NOT LIFT UP OR DOWN OR HOLD UNDER LOAD (CONT)



HOLDING VALVE CHECK

- (1) Pick up moderate to heavy load with MHC (TM 9-2320-366-10-1).
- (2) Observe that boom lift cylinders maintain position for 30 minutes. If lift cylinder drifts, holding relief valve on lift cylinder is faulty.



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LIFT CYLINDERS LOAD TEST

- (1) Start engine (TM 9-2320-366-10-1).
- (2) Position PTO switch to on (TM 9-2320-366-10-1).
- (3) Position MHC power switch to ON (TM 9-2320-366-10-1).
- (4) Pick up heavy load, lifting and lowering boom two or more times (TM 9-2320-366-10-1).
- (5) Observe boom lift cylinders for leakage. If cylinder(s) leaks, replace cylinder(s).
- (6) Stow MHC (TM 9-2320-366-10-1).
- (7) Position MHC power switch to OFF (TM 9-2320-366-10-1).
- (8) Position PTO switch to off (TM 9-2320-366-10-1).
- (9) Shut down engine (TM 9-2320-366-10-1).

Section IV. MAINTENANCE PROCEDURES

2-21. MAINTENANCE INTRODUCTION

This section provides general procedures to be followed for the Unit, Direct Support, and General Support Maintenance level as specified in the Maintenance Allocation Chart (MAC). When a special procedure is used, the detailed procedure will be in the section covering that component.

2-22. GROUND HANDLING

- a. **Towing.** Two towing eyes are located at front and two located at rear of vehicle.
- b. **Parking.** Parking brakes are designed to hold GVW on a minimum of 7-9 percent grade, pointing either uphill or downhill per Federal Motor Carrier Safety Regulation 393.41.
- c. **Mooring and Transporting.** For forward, aft, lateral and upward movements, vehicle has four tiedown rings. Refer to TM 9-2320-366-10 for mooring condition and tiedown locations.
- d. **Hoisting.** Sling assemblies and towing eyes used for hoisting are found on the vehicle.

2-23. GENERAL REMOVAL INSTRUCTIONS

- a. **Work Required.** Remove parts if repair or replacement is required. Do not disassemble a component any further than needed.
- b. **Preparation.** Before removal of any electrical, hydraulic, or air system components, ensure system component is not energized or pressurized. Disconnect battery ground cables. Relieve air system pressure. Before removal of fasteners (nuts, locknuts) remove any paint on threads to prevent binding of fastener.
- c. **Identification.** To ease assembly and installation, tag and mark shims, connectors, wires and mating ends of lines before disconnecting them. Identify similar parts to ensure correct assembly.
- d. **Position of Valves.** Before removing valve handles, mark or diagram their positions when open and closed. This will help during assembly.
- e. **Tire Removal.** Before removing any tires, position jackstands under axles, walking beams or frame. This will secure the vehicle for safe tire removal.
- f. **Location.** Before removing cable ties, cushion clamps, hoses, tubing, wiring etc., note the location, position and routing to ensure correct assembly.

2-23. GENERAL REMOVAL INSTRUCTIONS (CONT)

g. Data Plate Removal.

WARNING

Wear appropriate eye protection when drilling out rivets. Failure to comply may result in injury to personnel.

CAUTION

Use appropriate size drill bit when drilling out rivets. Failure to comply may cause damage to equipment.

Remove rivets and data plate from vehicle.

h. Rivnut Removal.

WARNING

Wear appropriate eye protection when drilling out rivets. Failure to comply may result in injury to personnel.

CAUTION

Use appropriate size drill bit when drilling out rivets. Failure to comply may cause damage to equipment.

Remove rivets and rivnut from vehicle.

2-24. GENERAL DISASSEMBLY INSTRUCTIONS

a. Cleanliness. Work area must be as clean as possible to prevent contamination to components.

CAUTION

Self-locking fasteners that are loosened must be replaced, not tightened. Failure to comply may cause damage to equipment.

b. Locking Parts. Replace all lockwashers, cotter pins and locknuts at time of reassembly.

c. Expendable Parts. All gaskets, packings, and seals removed during repair must be discarded and replaced with new parts.

d. Removing Seals. Be sure all traces of oil, gaskets and sealants are removed from components. When possible, use wood or plastic probes and scrapers to prevent damage to machined surfaces.

CAUTION

Do not use tape to close off fuel or oil openings. Sticky surface of tape can mix with fuel and oil and cause engine malfunctions. Failure to comply may cause damage to equipment.

e. Parts Protection. To keep dust, dirt, moisture and other objects out of internal parts of systems or components, cap or tape all open tubes, hoses, air lines, fittings and components openings as soon as part is removed. Wrap all removed parts in clean paper or dip parts in preservation oil.

2-25. GENERAL CLEANING INSTRUCTIONS**WARNING**

- **Dry Cleaning Solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in well ventilated area; avoid contact with skin, eyes, and clothes, and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flashpoint for Type I Dry Cleaning Solvent is 100°F (38°C) and for Type II is 130°F (50°C). Failure to comply may result in serious injury or death to personnel.**
- **If personnel become dizzy while using Dry Cleaning Solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.**
- **Never use fuel to clean parts. Fuel is highly flammable. Serious injury could result if fuel ignites during cleaning.**

a. Cleaning Solvents. Use only approved cleaning solvents to clean parts. Dry Cleaning Solvent P-D-680 (Item 82, Appendix C) is commonly used. Always work in a well-ventilated area.

WARNING

Compressed air used for cleaning purposes will not exceed 30 psi (207 Kpa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc). Failure to comply may result in injury to personnel.

b. Removing Deposits. Soak parts in Dry Cleaning Solvent P-D-680 (Item 82, Appendix C), and wash away deposits by flushing or spraying. When necessary, brush with a soft bristle brush (not wire) moistened in solvent. Use compressed air to dry parts, except bearings, after cleaning. Bearings must drip and air dry.

c. Tools. Do not use wire brushes, abrasive wheels, or compounds to clean parts unless specifically approved in the detailed procedures. Parts may be scratched or altered and may weaken a highly stressed part.

d. Ball and Roller Bearings. When cleaning ball or roller bearings, place them in a basket and suspend them in a container of Dry Cleaning Solvent P-D-680 (Item 82, Appendix C). If needed, use a brush to remove caked grease, chips, etc. Avoid rotating bearing before solid particles are removed to prevent damaging races and balls. When bearings have been cleaned, coat them lightly with lubricating oil (Item 36, Appendix C) to remove Dry Cleaning Solvent.

2-25. GENERAL CLEANING INSTRUCTIONS (CONT)

CAUTION

Do not clean tires, lubricant seals, rubber hoses, or electrical components with solvent mixture. Failure to comply may result in damage to equipment.

e. Rubber Parts. Do not clean preformed packings or other rubber parts in Dry Cleaning Solvent. Wipe parts clean with a dry wiping rag (Item 59, Appendix C).

WARNING

Steam cleaning creates hazardous noise levels and severe burn potential. Eye, skin, and ear protection is required. Failure to comply may result in injury to personnel.

CAUTION

Steam cleaning may cause water to enter the transmission Electronic Control Unit (ECU) connector. Failure to dry off connector after steam cleaning may result in bad ECU codes.

f. Exterior Parts. Steam clean all exterior parts thoroughly before removing. This will make inspection and disassembly easier.

WARNING

Solvents used with a spray gun must be used in a spray booth with filter. Face shield must be used by personnel operating spray gun. Failure to comply may result in injury to personnel.

g. Engine, Cab, and Body. Use a spray gun and solvent mixture for cleaning exterior of engine, cab, and body. Allow mixture to remain on item surface for 10 minutes before rinsing. Rinse with hot water under 80 to 120 psi (550 to 830 Kpa), if available. An ordinary garden hose with nozzle may be used if other equipment is not available. Rinse thoroughly.

CAUTION

To prevent corrosion, parts should be dipped in rust preventive within two hours of degreasing. Failure to comply may result in damage to equipment.

h. Degreasing Machine. A degreasing machine may be used to remove heavy grease and oil from metal parts.

WARNING

- **Dry Cleaning Solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in well ventilated area; avoid contact with skin, eyes, and clothes, and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flashpoint for Type I Dry Cleaning Solvent is 100°F (38°C) and for Type II is 130°F (50°C). Failure to comply may result in serious injury or death to personnel.**
- **If personnel become dizzy while using Dry Cleaning Solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.**
- **Never use fuel to clean parts. Fuel is highly flammable. Serious injury could result if fuel ignites during cleaning.**

i. Passages. After degreasing, check all oil passages and cavities for dirt or blockage before coating with lubricating oil (Item 45, Appendix C). Run a thin, flexible wire through oil passages to make sure they are not clogged. Use a pressure spray gun and Dry Cleaning Solvent P-D-680 (Item 82, Appendix C) to clean dirty passages.

j. Electrical Parts. Electrical parts, such as coils, junction blocks, and switches should not be soaked or sprayed with cleaning solutions. Clean these parts with a clean wiping rag (Item 59, Appendix C) moistened with Dry Cleaning Solvent P-D-680 (Item 82, Appendix C).

CAUTION

Do not use soap or alkalis for cleaning tank interiors. Failure to comply may result in damage to equipment.

k. Fuel Tank. Pay special attention to all warnings and cautions when working on vehicle's fuel tank. Fuel tanks should be flushed, using a spray gun and Dry Cleaning Solvent P-D-680 (Item 82, Appendix C).

WARNING

Battery acid (electrolyte) is extremely harmful. Always wear safety goggles and rubber gloves and do not smoke when performing maintenance on batteries. Injury will result if acid contacts skin or eyes. Wear rubber apron to prevent clothing being damaged. Failure to comply may result in serious injury or death to personnel.

l. Battery. Exterior surfaces of the electrical system and battery should be cleaned with a weak solution of baking soda and water. Apply solution with a bristle brush to remove any corrosion. Pay special attention to all warnings and cautions when working on batteries.

m. Hydraulic System. When cleaning hydraulic system parts use Dry Cleaning Solvent P-D-680 (Item 82, Appendix C). Clean and dry parts thoroughly to make sure no residue remains. If a coating of preservative is required before assembly, apply a light film of lubricating oil (Item 45, Appendix C).

2-26. GENERAL INSPECTION INSTRUCTIONS

- a. Cleaning.** Clean all parts before inspection. Check for defects such as physical distortion, wear, cracks, and pitting.
- b. Sealing Surfaces.** Inspect all surfaces in contact with gaskets, packings, or seals for nicks and burrs. If any defect is found, remove it before assembly.
- c. Bearings.** Inspect bearings for rusted or pitted balls, races, or separators. Inspect balls and races for brinelling, abrasion, and serious discoloration. The following are conditions for bearing rejection:
- (1) Cuts or grooves parallel to ball or roller rotation.
 - (2) Fatigue pits (not minor machine marks or scratches).
 - (3) Cracks.
- d. Gears and Splined Shafts.** Inspect gears and splined shafts for wear, pittings, rolling, peening, scoring, burning, brinelling and fatigue cracks.
- e. Tubing and Hoses.** Inspect all hose surfaces for broken or frayed fabric. Check for breaks caused by sharp kinks or contact with other parts of the vehicle. Inspect copper tubing lines for kinks. Inspect fitting threads and mating surfaces for damage. Replace any defective part. After assembly and during initial vehicle operation period, check for leaks.
- f. Electrical Parts.** Inspect all wiring harnesses for broken, chafed, or burned wiring. Inspect all terminal connectors for loose connections and broken parts.
- g. Metal Parts.** Visually inspect all castings and weldments for cracks. Parts that carry a great load should receive magnetic particle inspection. Critical non-ferrous parts may be inspected with fluorescent penetrant.
- h. Drain Plugs.** When removing drain plugs from transmission, engine, hydraulic system components, or axle differential and planetary hubs, check amount of sediment on plugs. Accumulations of grit or fine metal particles may indicate actual or potential component failure. A few fine particles are normal. This inspection helps to determine if there are defective parts prior to internal inspection of the component and to predict degradation of the equipment.

2-27. GENERAL REPAIR INSTRUCTIONS

- a. Burrs.** Remove burrs from surface teeth with a fine-cut file or crocus cloth.
- b. Exterior Parts.** Chassis and exterior painted parts may be resurfaced when paint is damaged, or where parts have been repaired (TB 43-0242).

NOTE

Polished and machined steel parts not protected by cadmium, tin, copper, or other plating or surface treatment require protection. Bare metal parts must be free of moisture when protective coating is applied.

- c. Protecting Parts.** Protect bare steel surfaces from rust when not actually undergoing repair work. Dip parts in, or spray them with, corrosion preventive compound (Item 22, Appendix C). Aluminum parts may require protection in atmospheres having a high salt content.

d. Screws, Nuts and Fittings. Replace any screw, nut, or fitting with damaged threads. Inspect tapped holes for thread damage. If cross-threading is evident re-tap the hole for the next oversize screw or stud. If the re-tapping will weaken the part, or if the cost of the part makes re-tapping impractical, replace the part. Chasing the threads with proper size tap or die may be adequate.

e. Stud Installation. When installing studs use a proper driver. A worn stud driver may damage the end thread. Then a chasing die must be used before a nut can be screwed on. This procedure will remove cadmium plating and allow corrosion. Before installing a stud, inspect the hole for chips. Blow out foreign matter and start stud by hand. Before final insertion, coat thread with a film of antiseize compound (Item 11, Appendix C). Install stud to proper "setting height", which is the total projecting length.

f. Dents. Straighten minor body dents by tapping with a soft-faced hammer while using a wooden block backing.

g. Sheet Metal Repair. Repair minor skin cracks by installing patches.

h. Wire Repair. Replace all broken, worn, or burned electrical wiring. Wires with several broken strands must be replaced. Broken strands will increase the resistance of the wire and impair efficiency of electrical components, especially the ignition system. Wire numbers must be permanently identified on any new wiring.

2-28. GENERAL ASSEMBLY INSTRUCTIONS

a. Preparation. Remove protective grease coatings from new parts before installation.

b. Preformed Packing Installation. Lubricate all preformed packings with a thin coat of lubricating oil (Item 45, Appendix C) before installing. To install a preformed packing, first clean the groove, then stretch packing and place into position. Place component on flat surface and uniformly press packing into position.

c. Pipe Joints and Fittings. Use nonhardening sealing compound (Item 75, Appendix C) or antiseize tape (Item 84, Appendix C) to join piping and fittings.

d. Oil Seals. Coat oil seals evenly with oil or grease before installing. Install oil seals with seal lip facing toward lubricant, applying an even force to outer edge of seal. If oil seals are to be installed over keyed or splined shafts, use a guide to prevent sharp edge of keyway or splines from cutting the leather or neoprene seal. Construct guides of very thin gauge sheet metal and shape to the required diameter. Make certain guide edges are not sharp and are bent slightly inward so they do not cut the seal.

e. Bearings and Shafts. When mounting bearings on shafts always apply force to the inner races. When mounting bearings into housing always apply the force to the outer race.

f. Bearing Lubrication. Lubricate bearings before assembly with lubricant used in the related housing or container to provide the first run-in until lubricant from the system can reach the bearings.

WARNING

On direct contact, uncured silicone sealant irritates eyes. In case of contact, flush eyes with water and seek medical attention. In case of skin contact, wipe off and flush with water. Failure to comply may result in injury to personnel.

g. Silicone Sealant. Silicone sealant is often used instead of a gasket to seal mating parts. The mating parts must be clean, dry, and free of oil or grease for proper adhesion. After silicone sealant has been applied, the mating parts must be assembled immediately. Silicone sealant starts to set-up in 15 minutes and takes 24 hours to completely dry. Excess silicone sealant should be wiped off after assembling the mating parts.

2-28. GENERAL ASSEMBLY INSTRUCTIONS (CONT)

h. Gaskets. Remove all traces of previous gasket and sealant before installing new gasket. Coat both sides of gasket with sealant to provide added sealing.

2-29. GENERAL INSTALLATION INSTRUCTIONS

a. Preparation. When unpacking items, remove all packing material, barrier paper, tape, plastic bags, protective caps and protective grease coatings. Handle and store removed components carefully.

CAUTION

Use sealing compound sparingly and only on threads. Do not apply compound to hose connections. Failure to comply may result in damage to equipment.

- b. Sealing Compounds.** Use sealing compounds as required in each maintenance task.
- c. Torquing.** Tighten bolts, screws, washers, and fittings as required in Appendix E or in each maintenance task.
- d. Identification Tags.** Put hoses, tubes, lines, and electrical wiring in place by matching identification tags and markings on equipment.
- e. Hoses, Air Lines and Wiring.** After installing hoses, air lines and wiring, ensure that they do not contact moving parts or components edges. Secure in place, out of way with cable ties and cushion clamps.

f. Data Plate Installation.

Install data plate on vehicle with rivets.

g. Rivnut Installation.

Install rivnut on vehicle with rivets.

2-30. PREPARATION FOR STORAGE OR SHIPMENT INTRODUCTION

- a.** This section gives instructions for making the vehicle ready for shipment or storage.
- b.** Refer to AR 750-1 for detailed administrative storage instructions.
- c.** Refer to TB 9-2300-422-20 for security procedures.

2-31. PREPARATION FOR STORAGE OR SHIPMENT

- a.** Perform Preventive Maintenance Checks and Services (PMCS) listed in TM 9-2320-366-20-1.
- b.** Correct all deficiencies noted during inspection, if facilities are available. If repairs are required beyond the scope of Direct Support Maintenance, refer the deficiencies to General Support Maintenance.

2-32. STORAGE MAINTENANCE PROCEDURES

- a. Provide access to the vehicle during storage.

CAUTION

Ensure tires are not resting on surfaces containing grease or oil. Failure to comply may result in damage to equipment.

- b. Do not block wheels, but do be sure tires are not resting on surfaces containing grease or oil.
- c. Perform complete lubrication in accordance with TM 9-2320-366-10 and TM 9-2320-366-20.
- d. If possible, store vehicles close together, out of direct sunlight and away from electrical or generating equipment.
- e. Ensure the fuel tank contains at least 20 gallons (75.7 liters) of treated fuel. The fuel should be treated with Biobor J.F. The addition of 3 teaspoons of Biobor to 20 gallons of fuel will provide adequate protection against fungus growth. When storing a vehicle in freezing conditions, the addition of 3 ounces of isopropyl alcohol to every 20 gallons of diesel fuel will help prevent fuel-line freeze up.

f. Monthly Storage Maintenance Instructions.

- (1) Conduct visual inspection of vehicle. Check lubricant, battery electrolyte, coolant level and tire pressures. Correct any discrepancies.
- (2) Inspect oil can points. Lubricate if necessary.
- (3) Start engine and idle for 10 minutes. After 10 minutes of engine idle, operate engine for 5 minutes at 1500 rpm or until engine water temperature reaches 180 degrees F. Shift transmission slowly through all gear selector positions. Return transmission to neutral.
- (4) Move vehicle 30 feet forward and reverse.
- (5) Idle engine 10 minutes before shutdown.
- (6) Check grease coating on all chromium plated and unpainted surfaces. If grease was wiped from chromium plates or unpainted surfaces when vehicle was moved, re-coat these surfaces.

g. Quarterly Storage Maintenance Instructions.

- (1) Move vehicle at least 1/4 mile. While driving, shift transmission through all gear ranges.
- (2) Exercise all auxiliary equipment and 30K winch. While operating 30K winch or MHC, lubricate hoist and cables.

h. Yearly Storage Maintenance Instructions.

- (1) Clean exterior, engine and undercarriage. Clean interior of cab. Wash any oil or grease from tires.
- (2) Visually inspect vehicle. Check lubricant levels and tire pressures. Correct all discrepancies.
- (3) Lubricate chassis, auxiliary equipment, winch and hoist cable and oil can points.

APPENDIX A REFERENCES

A-1. SCOPE

This appendix lists all forms, field manuals, technical manuals, and other publications referenced in this manual. Those publications that should be consulted for additional information about vehicle operations are also listed.

A-2. PUBLICATIONS INDEX

The following index should be consulted frequently for latest changes or revisions and for new publications relating to material covered in this technical manual.

Consolidated Index of Army Publications and Blank Forms DA Pam 25-30

A-3. FORMS

The following forms pertain to this manual. See DA Pam 25-30 for index of blank forms. See DA Pam 738-750, The Army Maintenance Management System (TAMMS), for instructions on the use of maintenance forms pertaining to this material.

Recommended Changes to DA Publications and Blank Forms DA Form 2028-2
 Equipment Inspection and Maintenance Worksheet DA Form 2404
 Maintenance Request DA Form 2407
 Equipment Control Record DA Form 2408-9
 Processing and Deprocessing Record of Shipping, Storage, and Issue of Vehicles and
 Spare Engines DD Form 1397
 Packaging Improvement Report DD Form 6
 Report of Item Discrepancy (ROID) SF 364
 Product Quality Deficiency Report SF 368

A-4. OTHER PUBLICATIONS

The following publications contain information pertinent to the MTV and associated equipment.

a. Safety.

First Aid for Soldiers FM 21-11
 Security of Tactical Wheeled Vehicles TB 9-2300-422-20
 Safety Inspection and Testing of Lifting Devices TB 43-0142

b. MTV.

Hand Receipt Covering Contents of Components of End Item
 (COEI), Basic Issue Items (BII), and Additional
 Authorization List (AAL), for M1083 Series, 5-Ton,
 6x6, Medium Tactical Vehicles (MTV) TM 9-2320-366-10-HR

A-4. OTHER PUBLICATIONS (CONT)

b. MTV (cont)

Warranty Program for M1083 Series, 5-Ton, 6x6,
 Medium Tactical Vehicle (MTV) TB 9-2300-366-15

Operator's Manual for M1083 Series, 5-Ton, 6x6,
 Medium Tactical Vehicle (MTV) TM 9-2320-366-10

Organizational Maintenance Repair Parts and Special Tools List
 for M1083 Series, 5-Ton, 6x6, Medium Tactical Vehicle (MTV) TM 9-2320-366-24P

Organizational Maintenance Manual
 for M1083 Series, 5-Ton, 6x6, Medium Tactical Vehicle (MTV) TM 9-2320-366-20

Direct Support and General Support Repair Parts and Special Tools List
 for M1083 Series, 5-Ton, 6x6, Medium Tactical Vehicle (MTV) TM 9-2320-366-24P

c. General Vehicle Operation.

Petroleum Tank Vehicle Operations FM 10-71

Vehicle Recovery Operations FM 20-22

Manual for the Wheeled Vehicle Driver FM 21-305

Army Motor Transport Units and Operations FM 55-30

Deleted

Safety Prevention of Motor Vehicle Accidents AR 385-55

d. General Maintenance and Repair.

Rigging Techniques, Procedures, and Applications FM 5-125

Use and Care of Hand Tools and Measuring Tools TM 9-243

Materials Used for Cleaning, Preserving, Abrading, and
 Cementing Ordnance Material and Related Materials
 Including Chemicals TM 9-247

Operator's, Unit, Direct Support, and Intermediate General
 Support Maintenance Manual for Lead-Acid Storage
 Batteries TM 9-6140-200-14

Operator's and Organizational Maintenance Manual for
 Radio Sets TM 11-5820-498-12

Operator's Manual, Radio Set, AN/VRC-46 TM 11-5820-401-10-1

Operator's Manual, Radio Set, AN/VRC-90A TM 11-5820-890-10-1

Operator's Manual, Sun Test Stand TM 9-4910-485-12

Operator's Manual, GASR Test Stand TM 9-4910-663-12

Direct Support, General Support, and Depot
 Maintenance of Starter and Electrical Assemblies TM 9-2920-242-35

Cooling Systems: Tactical Vehicles TM 750-254

Army Oil Analysis Program TB 43-0211

Charging System Troubleshooting DA Pam 750-33

Camouflage Pattern Painting FM 5-20

Repair of Tents, Canvas, and Webbing FM 10-16

Metal Body Repair and Related Operations FM 43-2

Ordnance Tracked and Wheeled Vehicle Hull and Chassis Wiring, Repair of
 Description, Use, Bonding Techniques, and Properties of Adhesives TB ORD 650

Equipment Improvement Report and Maintenance Digest: TACOM Equipment TB 43-0001-39-1

Color, Marking, and Camouflage Painting of Military Vehicles TB 43-0209

Purging, Cleaning, and Coating Interior Ferrous and Terne Sheet Vehicle Fuel Tanks TB 43-0212

d. General Maintenance and Repair. (Cont)

Use of Antifreeze Solutions and Cleaning Compounds in Engine Cooling Systems TB 750-651
 Painting Instructions for Field Use TM 43-0139
 Equipment Improvement Report and Maintenance Summary TM 43-0143
 Cooling Systems: Tactical Vehicles TM 750-254
 Welding Theory and Application TM 9-237
 Organizational Care, Maintenance, and Repair of Pneumatic Tires and Inner Tubes TM 9-2610-200-14

e. Cold Weather Operation.

Operation and Maintenance of Ordnance Material in Cold
 Weather (0 to -65 °F) FM 9-207
 Basic Cold Weather Manual FM 31-70
 Northern Operations FM 31-71

f. Decontamination.

Decontamination Operations Facilities & Equipment TB 700-4
 NBC Protection FM 3-4
 NBC Decontamination FM 3-5

g. Maintenance of Special Purpose Kits.

Operator and Organizational Maintenance Manual for
 Chemical Alarm TM 3-6665-225-12
 Operator's and Unit Maintenance Manual Including Repair
 Parts and Special Tools List for Decontaminating
 Apparatus: M13 TM 3-4230-214-12&P
 Operator, Organizational, Direct Support, and General Support
 Maintenance Manual Including Repair Parts and Special Tools
 List for Various Machine Gun Mounts TM 9-1005-245-14

h. General.

Principles of Automotive Vehicles TM 9-8000
 Procedures for Destruction of Tank-Automotive Equipment to
 Prevent Enemy Use (US Army Tank-Automotive Command) TM 750-244-6
 Repair and Utilities: Concrete and masonry TM 5-615
 Soldier's Manual MOS 88M Motor Transport Operator,
 Skill Levels 1/2 STP 55-88-M12-SM
 Operator's Manual (M998 Series) TM 9-2320-280-10
 Operator's Manual (M1008 Series) TM 9-2320-289-10
 Operator's Manual (M35 Series) TM 9-2320-361-10
 Operator's Manual (M939 Series) TM 9-2320-272-10
 Route Reconnaissance and Classification FM 5-36

A-4. OTHER PUBLICATIONS (CONT)

i. Land, Sea, and Air Shipment.

Airdrop of Supplies and Equipment: Rigging 5-Ton Trucks FM 10-526
Marine Terminal Lifting Guidance MTMCTEA Pam 56-1
Multiservice Helicopter External Air Transport: Basic
Operations and Equipment FM 55-450-3
Multiservice Helicopter External Air Transport: Dual-Point
Load Rigging Procedures FM 55-450-5
Multiservice Helicopter External Air Transport: Single-Point
Load Rigging Procedures FM 55-450-4
Standard Characteristics (Dimensions, Weight, and Cube) for
Transportability of Military Vehicles and Other
Outsize/Overweight Equipment (in TOE Line Sequence) TB 55-46-1
Tiedown Handbook for Rail Movements MTMCTEA Pam 55-19
Tiedown Handbook for Truck Movements MTMCTEA Ref 92-55-20
Lifting and Tiedown of U.S. Helicopters MTMCTEA Ref 95-55-21
Marine Lifting and Lashing Handbook MTMCTEA Ref 95-55-22
Containerization of Military Vehicles MTMCTEA Ref 95-55-23

APPENDIX B TOOLS IDENTIFICATION LIST

Section I. INTRODUCTION

B-1. INTRODUCTION

This appendix lists common tools, supplements, and special tools/fixtures that are suggested for maintenance tasks performed at the direct support/general support maintenance level.

B-2. EXPLANATION OF COLUMNS

- a. **Column (1) - Item Number.** This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the item, e.g., "Bar, Pry (Item 1, Appendix B)."
- b. **Column (2) - Item Name.** This column contains the nomenclature for the item.
- c. **Column (3) - National Stock Number.** This is the national stock number assigned to the item which you can use to requisition it.
- d. **Column (4) - Part Number.** This provides the Government, manufacturer, or vendor part number for the item.
- e. **Column (5) - Reference.** This column contains the shop catalog (SC), technical manual, or other publication which provides an illustration and description of the item, or lists whether the item is fabricated.

Section II. TOOLS IDENTIFICATION LIST

(1) Item Number	(2) Item Name	(3) National Stock Number	(4) Part Number	(5) Reference
1	ADAPTER, SOCKET WRENCH	5120-00-227-8095	GGG-W-641	SC 4940-95-B20
2	ADAPTER, SOCKET WRENCH	5120-00-227-8103	A-A-2172	SC 4910-95-A31
3	ADAPTER, SOCKET WRENCH	5120-00-240-8702	GAX-1	SC 4910-95-A31
4	ADAPTER, SOCKET WRENCH	5120-00-144-5207	11655788-3	SC 4910-95-A31
5	ADAPTER, SOCKET WRENCH	5120-01-355-1895	GLA72A	SC 4910-95-CL-A72
6	BAR, WRECKING	5120-00-293-0665	55-130	SC 4910-95-CL-A72
7	BLADE, HAND, HACKSAW	5110-00-277-4587	RS1018	SC 5180-90-CL-N05

TOOLS IDENTIFICATION LIST (CONT)

(1) Item Number	(2) Item Name	(3) National Stock Number	(4) Part Number	(5) Reference
8	BRUSH, WIRE	7920-00-291-5815	D-1416	SC 4910-95-A31
9	CALIPER SET, MICROMETER, OUTSIDE	5120-01-117-0468	6181	SC 4910-95-A31
10	CALIPER, MICROMETER, INSIDE	5120-00-221-1921	124B	SC 4910-95-A02
11	CALIPER, VERNIER	5120-01-113-1548	6420	SC 4910-95-A31
12	CAPS, VISE JAW	5120-00-221-1506	404-4	SC 4910-95-A31
13	CLAMP	5120-00-203-6431	A-A-431	SC 4910-95-A02
14	CLEANER, STEAM, PRESSURE JET	4940-00-186-0027	200-A0	SC 4910-95-A31
15	COMPRESSOR UNIT, RECIPROCATING	4310-00-542-4566	MIL-C-52980	SC 4910-95-A62
16	COMPRESSOR, PISTON RING	5120-00-250-6055	GGG-C-555	SC 4910-95-A63
17	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-00-222-7975	GGG-W-646	SC 4910-95-A31
18	DEGREASER, PORTABLE LIQUID TYPE	4940-00-449-6689	MILD12491	SC 4910-95-A31
19	DISPENSING PUMP, HAND DRIVEN	4930-00-263-9886	BR2-10	SC 4910-95-A74
20	DRILL SET, TWIST	5130-00-293-0983	58	SC 4910-95-A62
21	DRILL, ELECTRIC, PORTABLE	5130-00-293-1849	W-D-661	SC 4910-95-A62
22	EXTRACTOR, SCREW	5120-00-610-1888	A-A-283SZ1-9	SC 5180-90-CL-N05
23	FRAME, HAND HACKSAW	5110-00-289-9657	163-20	SC 4910-95-A02
24	GAGE SET, TELESCOPING	5210-00-473-9350	GGG-G-17	SC 4910-95-A63
25	GAGE, DEPTH MICROMETER	5210-00-619-4045	445B-Z-6RL	CTA 50-909
26	GLOVES, RUBBER	8415-00-641-4601	ZZ-G-381	SC 4910-95-A74
27	GLOVES, WELDER'S	8415-00-268-7859	A-A-50022	SC 4910-95-A02
28	GOGGLES, INDUSTRIAL	4240-00-052-3776	A-A-1110	SC 4910-95-A74

(1) Item Number	(2) Item Name	(3) National Stock Number	(4) Part Number	(5) Reference
29	GRINDING KIT, VALVE SEAT	4910-00-473-6437	1750	SC 4910-95-A02
30	GUN, AIR BLOW	4940-00-333-5541	GGGG770	SC 4910-95-A31
31	HAMMER, HAND	5120-00-902-0093	A-A-1292	SC 4910-95-A02
32	HAMMER, HAND, NON-SPARKING	5120-01-065-2211	57-534	SC 4910-95-A31
33	HAMMER, HAND, SOFT HEAD	5120-01-065-9037	57-533	SC 5180-90-CL-N05
34	HEATER, GUN TYPE, ELECTRIC	4940-00-561-1002	500A	SC 4910-95-A31
35	HOSE ASSEMBLY, NONMETALLIC	4720-00-356-8557	ZZ-4-461	SC 4910-95-A31
36	INDICATOR, DIAL	5210-00-277-8840	196A	SC 4940-95-CL-B20
37	JACK, DOLLY TYPE, HYDRAULIC	4910-00-289-7233	93660	SC 4910-95-A31
38	KEY SET, SOCKET HEAD SCREW	5120-01-046-5079	B18.3.2M	SC 4910-95-A31
39	LIFT, TRANSMISSION AND DIFFERENTIAL	4910-00-585-3622	49	SC 4910-95-A62
40	LIFTER, VALVE SPRING	5120-00-239-8686	T286A	SC 4910-95-A63
41	MULTIMETER, DIGITAL	6625-01-139-2512	T00377	SC 4910-95-CL-A74
42	MULTIPLIER, TORQUE WRENCH	5120-00-574-9318	292	SC 4910-95-CL-A72
43	PAN, DRAIN	4910-00-387-9592	450	SC 4910-95-A31
44	PLIERS, RETAINING RING	5120-00-293-0045	0300	SC 4910-95-A31
45	PLIERS, RETAINING RING	5120-00-293-0048	0409	SC 4910-95-A31
46	PLIERS, RETAINING RING	5120-00-293-0186	0900	SC 4910-95-CL-A74
47	PLIERS, SLIP JOINT	5120-00-624-8065	529-10	SC 4910-95-A31
48	PRESS, ARBOR, HAND OPERATED	3444-00-449-7295	A-A-51194	SC 4910-95-A0249
49	PRESSURE TESTER, RADIATOR	4910-00-728-8227	J24460-01	SC 4910-95-CL-A74
50	PULLER KIT, UNIVERSAL	5180-00-313-9496	1178	SC 4910-95-A62

TOOLS IDENTIFICATION LIST (CONT)

(1) Item Number	(2) Item Name	(3) National Stock Number	(4) Part Number	(5) Reference
51	PULLER KIT, UNIVERSAL	5180-00-423-1596	PE12	SC 4910-95-A31
52	PULLER, MECHANICAL	5120-00-378-4293	1042	SC 4910-95-A31
53	PULLER, MECHANICAL	5120-00-595-9305	GGGP781	SC 4910-95-A31
54	RESPIRATOR, AIR FILTERING	4240-00-022-2524	GGG-M-125/6	SC 4910-95-A62
55	SET, TAP AND DIE	5136-01-119-0005	TDM99117	SC 4910-95-A31
56	SLING, CARGO	1670-00-823-5043	63J4261-13	CTA 50-970
57	SLING, ENGINE AND TRANSMISSION MOTOR VEHICLE	4910-01-243-5556	DFP-188	SC 4910-95-A02
58	SOCKET SET, IMPACT	5130-01-117-0466	415IMMY	SC 4910-95-A31
59	SOCKET SET, SOCKET WRENCH	5120-01-117-3876	B107.5	SC 4910-95-A31
60	SOCKET WRENCH ATTACHMENT, SCREWDRIVER	5120-00-596-8508	GGG-W-641	SC 4910-95-A31
61	SOCKET WRENCH ATTACHMENT, SCREWDRIVER	5120-01-079-8033	SAM14A	SC 4910-95-A31
62	SOCKET WRENCH ATTACHMENT, SCREWDRIVER	5120-01-101-1943	J35174-A	SC 4910-95-A31
63	SOCKET, SOCKET WRENCH	5120-00-236-2263	4707	SC 4910-95-A31
64	SOCKET, SOCKET WRENCH	5130-01-112-0558	B107.2	SC 4910-95-A31
65	SOCKET, SOCKET WRENCH	5130-01-116-1643	IMM 300	SC 4910-95-A02
66	SOLDERING & BRAZING OUTFIT, RESISTANCE HEATING	3439-00-460-7198	W-TCP-K	SC 4940-95-CL-B20
67	SQUARE, COMBINATION	5210-00-078-8948	GGG-S-656	SC 4910-95-A02

(1) Item Number	(2) Item Name	(3) National Stock Number	(4) Part Number	(5) Reference
68	STAND, RADIATOR TEST AND REPAIR	4910-00-505-4786	60A	SC 4910-95-A02
69	STAND, TRANSPORT, ENGINE	4910-00-338-6673	8708857	SC 4910-95-A62
70	STE/ICE-R	4910-222-6589	12259266	TM 9-4910-571-12&P
71	STRAIGHT EDGE	6675-00-224-8807	564000-36	SC 4910-95-A02
72	TEST STAND, AUTOMOTIVE GENERATOR AND STARTER	4910-00-767-0218	MILT4544	SC 4910-95-A02
73	TESTER, HYDRAULIC	4940-01-136-4830	13222E4767	SC 4940-95-CL-B07
74	TIE DOWN, CARGO AIRCRAFT	1670-00-725-1437	SP4067	CTA 50-970
75	TOOL KIT, AUTO FUEL & ELECTRICAL SYSTEM REPAIR	5180-00-754-0655	SC 4910-95-CLA50	SC 4910-95-CL-A50
76	TOOL KIT, BLIND RIVET	5180-01-201-4978	D-100-MIL-1	SC 4910-95-CL-A72
77	TOOL KIT, ELECTRICAL CONTACT REPAIR	5180-00-876-9336	7550526	SC 4910-95-CL-A72
78	TOOL KIT, GENERAL MECHANIC'S	5180-00-177-7033	SC 5180-90-CL-N26	SC 5180-90-CL-N26
79	TOOL KIT, VALVE SEAT RING INSERTER	5120-00-698-7979	MILT13918	SC 4910-95-A63
80	TORCH SET, CUTTING AND WELDING	3433-00-294-6743	MIL-T-13880	SC 4910-95-A02
81	TRESTLE, MOTOR VEHICLE MAINTENANCE	4910-00-251-8013	306	SC 4910-95-A31
82	WISE, MACHINIST	5120-00-293-1439	504M2	SC 4910-95-A62
83	WRENCH SET, SOCKET	5120-00-081-2309	GGG-W-641	SC 5180-90-CL-N05
84	WRENCH SET, SOCKET	5120-00-204-1999	GGG-W-641	SC 4910-95-A02
85	WRENCH SET, SOCKET	5120-00-322-6231	GGG-W-641	SC 5180-90-CL-N05
86	WRENCH, ADJUSTABLE	5120-00-264-3793	2117080	SC 4910-95-A02

TOOLS IDENTIFICATION LIST (CONT)

(1) Item Number	(2) Item Name	(3) National Stock Number	(4) Part Number	(5) Reference
87	WRENCH, ADJUSTABLE	5120-00-423-6728	6187328	SC 4910-95-A31
88	WRENCH, IMPACT, ELECTRIC	5130-00-221-0607	WW650	SC 4910-95-A31
89	WRENCH, PIPE	5120-00-277-1485	GGG-W-651	SC 5180-90-CL-N05
90	WRENCH, TORQUE, 0-150 LB-FT	5120-00-247-2540	1503BFP	SC 4910-95-A31
91	WRENCH, TORQUE, 0-150 LB-IN.	5120-00-230-6380	TQ12B	SC 4910-95-A62
92	WRENCH, TORQUE, 0-175 LB-FT	5120-00-640-6364	1753LDF	SC 4910-95-A02
93	WRENCH, TORQUE, 0-200 LB-IN.	5120-00-853-4538	F200I	SC 4910-95-CL-A72
94	WRENCH, TORQUE, 0-250 NM	5120-01-115-1723	1753DFE	SC 4910-95-A31
95	WRENCH, TORQUE, 0-300 LB-IN.	5120-00-247-2536	F300I	SC 4910-95-A31
96	WRENCH, TORQUE, 0-60 NM	5120-01-112-9531	TESI60	SC 4910-95-A31
97	WRENCH, TORQUE, 0-600 LB-FT	5120-00-221-7983	SW130-301	SC 4910-95-A31
98	WRENCH, TORQUE, 0-75 LB-IN.	5120-01-112-9532	B107.14MTY1CLCST1	SC 4910-95-A31

APPENDIX C EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

C-1. SCOPE

This appendix lists expendable and durable items that you will need to operate and maintain the MTV Truck. This listing is for information only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (except medical, class V repair parts, and heraldic items), or CTA 8-100, Army Medical Department Expendable/Durable Items.

Section I. INTRODUCTION

C-2. EXPLANATION OF COLUMNS

- a. Column (1) - Item Number.** This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the item, e.g., "Lubricating Oil (Item 19, Appendix D)."
- b. Column (2) - Level.** This column identifies the lowest level of maintenance that requires the item.
- c. Column (3) - National Stock Number.** This is the national stock number assigned to the item which you can use to requisition it.
- d. Column (4) - Item Name, Description, Commercial and Government Entity Code (CAGEC), and Part Number.** This provides the other information you need to identify the item.
- e. Column (5) - Unit of Measure.** This code shows the physical measurement or count of an item, such as gallon, dozen, gross, etc.

Section. II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
1	F/H	4730-01-270-9594	Adapter, Pipe (81343) 2022-12-12S	ea
2	F/H	4730-01-286-4614	Adapter, Pipe (81343) 2028-8-12S	ea
2.1	F	4730-01-457-4025	Adapter, Straight, Pipe to Tube (96906) MS51503B4-4	ea
2.2	F	4730-00-760-3525	Adapter, Straight, Tube to Boss (81361) C116-3-71	ea
3	F/H	8040-00-118-2695	Adapter, Swivel (81343) 2018-8-8S	ea
4	O/F/H	8040-00-728-3088	Adhesive (72799) RTV162	kt
5	F/H	8040-00-728-3088	Adhesive (78500) 1199-T-3842 6 oz kit	oz

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
5.1	F	8040-00-941-9984	Adhesive (66195) 917252C1 6 oz kit	kt
6	O/F/H	8040-01-250-3969	Adhesive (05972) 242	ea
7	F/H	8040-01-331-7470	Adhesive (81349) MIL-A-46106 5 oz tube	tu
8	F/H	8040-01-126-1422	Adhesive (52152) 1099	qt
9	O/F/H	6850-00-174-1806	Antifreeze (81349) MIL-A-11755 55 gl drum	gl
10	H		Adhesive (04963) DP-100 1.7 oz tube	tu
10.1	F		Adhesive (0FW39) 12421700	tu
10.2	O/F	8040-01-446-7842	Adhesive (01139) RTV123 10 oz	ca
11	O/F/H		Antifreeze (81349) MIL-A-46153	
		6850-00-181-7929	1 gl can	gl
		6850-00-181-7940	55 gl drum	gl
12	F/H	8030-00-597-5367	Antiseize Compound (81349) MIL-A-907 2-1/2 lb can	lb
13	F/H	8415-00-222-8074	Apron, Plastic, Disposable (32075) E2-2845 Box of 100	ea
14	F/H	5306-00-174-4150	Bolt, Machine (11083) 3B4772	ea
15	F/H	5306-00-381-9928	Bolt, Machine (19207) 12414307-080	ea
15.1	F/H		Bolt, Machine (19207) 12414307-075	ea
16	F/H	7920-00-926-5243	Bucket, Mop (88001) C1122F	ea
17	F/H	5340-00-450-5718	Cap and Plug Set (19207) 10935405	ea
17.1	F	4730-00-542-5911	Cap, Tube (96906) MS51532B10	ea
17.2	F	4730-00-585-6565	Cap, Tube (22031) 304C8	ea
17.3	F	4730-00-647-3311	Cap, Tube (96906) MS51532B12	ea
18	H		Carbon Removing Compound (81349) MIL-C-19853 TY II	
		6850-00-543-7801	5 gl can	gl
		6850-00-550-7453	55 gl drum	gl
19	F/H	7510-00-162-2910	Chalk Line, Marking Powder (89942) 09-304147 8 oz can	cn

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
20	O/F/H	6850-01-347-0073	Cleaning Compound, Windshield (81349) O-C-1901 1 gl can	gl
21	F/H	5350-00-221-0872	Cloth Abrasive Crocus Cloth (81348) P-C-458 50 sheet package	sh
22	F/H	5350-00-174-0985	Cloth, Abrasive, 600 Grit (81348) GGG-C-520 Box of 100	sh
23	F/H		Corrosive Preventive Compound (81349) MIL-C-16173	
		8030-00-062-6950	Grade 1 - 1 quart can,	qt
		8030-01-149-1731	Grade 2 - 1 quart can, Grade 3 - 1 pint can, Grade 4 - 1 pint can	qt pt pt
24	F/H	4730-00-881-1161	Coupling, Pipe (81343) 207P-6	ea
25	F/H	6850-00-856-7955	Desiccant, Activated (81349) MIL-D-3464 Eighteen, 5 gl bags	bg
26		DELETED		
27	C/O/F/H		Diesel Fuel (Arctic) (81348) VVF800FRADEDDFA	
		9140-00-286-5282	5 gl can	cn
		9140-00-286-5283	Bulk	gl
		9140-00-286-5284	55 gl drum	gl
		9140-00-286-5285	55 gl drum	gl
28	C/O/F/H		Diesel Fuel (81348) VVF800GRADEDF1WI	
		9140-00-286-5286	Bulk	gl
		9140-00-286-5287	5 gl can	gl
		9140-00-286-5288	55 gl drum	gl
		9140-00-286-5289	55 gl drum	gl
29	C/O/F/H		Diesel Fuel (81348) VVF800GRADEDF2RE	
		9140-00-286-5294	Bulk	gl
		9140-00-286-5295	5 gl can	gl
		9140-00-286-5296	55 gl drum	gl
		9140-00-286-5297	55 gl drum	gl
30	C/O/F/H	7520-01-209-1152	Dispenser, Pressure Sensitive Adhesive Tape (55203) 5006-0-9	ea
31	F/H		Fitting (81343) 190923-02S	ea
32	F/H		Fitting (81343) 2027-8-4S	ea

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
33	F/H	5210-00-640-6176	Gage, Bearing Clearance (77220) PLASTIGAGEPB1 Box of 12	ea
34	F/H	8040-01-038-5043	Gasket Cement (11083) 5H2471 8 oz can	oz
34.1	F/H	8040-01-437-6864	Gasket Cement (11083) 1U-8846	
34.2	F/H	8145-00-274-2433	Gloves, Mens (81348) KK-G-476	pr
35	F/H		Grease, Automotive and Artillery (GAA) (81349) MIL-G-10924	
		9150-00-065-0029	2-1/4 oz tube	oz
		9150-00-190-0904	1-3/4 lb can	lb
		9150-00-190-0905	6-1/2 lb can	lb
		9150-00-190-0907	35 lb can	lb
36	F/H	9150-00-180-6382	Grease, General Purpose (81349) MIL-T-24139 6-1/2 lb can	lb
37	F/H	9150-00-223-4004	Grease, Molybdenum Disulfide (81349) MIL-G-21164 6-1/2 lb can	lb
38	F/H	9150-00-664-0050	Grease, Ordnance, Extreme Pressure (12474) Molylube 80 1 pt can	pt
39	F/H	5345-01-356-8913	Honing Stone Assembly (10133) R150761-SA	ea
40	F/H		Hose FC 324-12	ea
40.1	F		Hose Assembly, Nonmetallic 4C2T-FJX-FJX-90-120	ea
40.2	F	4720-00-988-3842	Hose Assembly, Nonmetallic (50599) R25679-1	ea
40.3	O/F		Hydraulic Fluid (81349) MIL-H-5606	
		9150-00-252-6383	1 qt can	qt
		9150-00-223-4134	1 gal can	gl
40.4	F	6685-01-095-4182	Indicator, Temperature, Label (82682) 6MA-130/54	ea
41	O/F/H	5970-01-100-4464	Insulating Compound, Electrical (08800) RTV-102 White 2.8 oz tube	ea
42	O/F/H	5970-00-767-0524	Insulation Sleeving, Electrical (81349) MIL-I-23053/5 4 in.	ea

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
42.1	F	5970-01-378-3018	Insulation Sleeving, Electrical (06090) ATUM-1/4-0-4FT	lg
43	F/H	8135-01-015-4040	Kit, Banding (02563) GS-10012	kt
44	F/H	1650-00-166-4834	Lockwire (90166) 68A33 210 in. package	ea
45	C/O/F/H		Lubricating Oil, Engine (81349) MIL-L-2104OE/HDO-10	
		9150-00-183-7807	Bulk	gl
		9150-00-189-6727	1 qt can	qt
		9150-00-186-6668	5 gl can	gl
		9150-00-191-2772	55 gl drum	gl
46	F/H		Lubricating Oil, Engine (81349) MIL-L-2104 OE/HDO-30	
		9150-00-186-6681	1 qt can	qt
		9150-00-188-9858	5 gl can	gl
		9150-00-189-6729	55 gl drum	gl
47	F/H		Lubricating Oil, Engine (81349) MIL-L-46167	
		9150-00-402-4478	1 qt can	qt
		9150-00-402-2372	5 gl can	gl
		9150-00-491-7197	55 gl drum	gl
48	F/H		Lubricating Oil, Engine (81349) MIL-L-2104 OE/HDO-40	
		9150-00-405-2987	Bulk	gl
		9150-00-189-6730	1 qt can	qt
		9150-00-188-9862	55 gl drum	gl
49	O/F/H	9150-01-152-4117	Lubricating Oil, Engine (81349) MIL-L-2104 OE/HDO 15W-40 1 qt can	qt
50	O/F/H		Lubricating Oil, Gear (81349) MIL-L-2105 60-75W	
		9150-01-035-5390	1 qt can	qt
		9150-01-035-5391	5 gl can	gl
51	O/F/H		Lubricating Oil, Gear (81349) MIL-L-2105 80W-90	
		9150-01-035-5392	1 qt can	qt
		9150-01-035-5393	5 gl can	gl
		9150-01-035-5394	55 gl drum	gl
52	O/F/H	9150-01-035-5395	Lubricating Oil, Gear (81349) MIL-L-2105 85W-140 5 gl can	gl
52.1	F		Lubrication, Rubber Emulsion 5391-06 1 pt bottle	bt

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
53	F/H	5310-01-369-6073	Nut, Self-Locking (19207) 12414308-007	ea
54	F/H	5310-01-362-6171	Nut, Self-Locking (76761) N9406	ea
54.1	F		Paper, Abrasive 2347	pk
55	O/F/H	6530-01-283-6227	Paraffin and Mineral Oil (25973) 76-1026 7 lb can	lb
55.1	F	4730-01-070-9214	Plug, Tube Fitting, Threaded (81343) 8 070109C	ea
55.2	F	4730-01-249-9707	Plug, Tube Fitting, Threaded (96906) MS51518B10	ea
55.3	F	4730-01-270-9651	Plug, Tube Fitting, Threaded (81343) 12 070109C	ea
56	F/H	8030-00-043-1688	Primer, Sealing Compound (81349) MIL-S-224373 1 gl can	gl
57	F/H	4204-00-759-3290	Protector, Hearing (71483) 19A	ea
58	F/H	8010-00-652-3626	Prussian Blue, Paste, Bearing Surface (81349) MIL-P-30501 1 oz tube	oz
59	F/H		Pulley, Groove (19207) 12421165	ea
60	C/O/F/H	7920-00-205-1711	Rag, Wiping (58536) A-A-531 50 lb bale	ea
60.1	F	4730-00-719-2789	Reducer, Tube (81343) 12-4 070123SA	ea
60.2	F	4730-01-030-5207	Reducer, Tube (96906) MS51534A10-4	ea
61	F/H	4730-01-113-9251	Reducer, Tube (81343) 2027-8-12S	ea
62	F/H	4020-00-593-9584	Rope, Fibrous (96169) 9868-165X4PC50	ea
63	F/H	5210-00-293-3393	Rule, Multiple, Folding (81348) GGG-R-791	ea
64	F/H	5330-00-003-5427	Rubber Sheet, Solid (81349) MIL-R-3065	sh
64.1	F	5305-01-157-1391	Screw, Cap, Hex Hd (56161) 10501611	ea

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
64.2	F	5305-01-377-0696	Screw, Cap, Hex Hd (19207) 12414419-075	ea
65	F/H		Sealant (11083) 2P2333	ea
65.1	F	8030-00-728-9665	Sealant (62377) 80017 1 pt can	pt
66	F/H	8030-00-981-7005	Sealant, Adhesive (05972) AA15-1	ea
67	F/H		Sealant, Adhesive (78500) 1199-E-3931	ea
68	F/H		Sealant, Adhesive (78500) 2297-B-5436	ea
68.1	F	1015-01-255-4144	Sealant, Pipe (19207) 12297953 50 ml tube	tu
68.2	F	8030-00-111-6404	Sealing Compound (05972) 640-31 50 cc bottle	bt
69	O/F/H	8030-00-204-9149	Sealing Compound (05972) 592-41 250 cc tube	tu
70	F/H	8030-00-656-1426	Sealing Compound (81349) MIL-S-45180 1 pt can	pt
71	O/F/H		Sealing Compound (05972) 242	
		8030-01-104-5392	10 cc bottle (box contains 10 bottles)	bx
		8030-01-025-1692	250 cc bottle	bt
71.1	F	8030-01-142-9830	Sealing Compound (05972) 262-31 50 cc bottle	bt
72	O/F/H	8030-01-155-3238	Sealing Compound (11083) 6V6640 50 ml tube (box contains 6 tubes)	bx
73	F/H	8030-00-220-6973	Sealing Compound (81349) MIL-S-45180 4 oz can	cn
74	F/H		Sealing Compound (IN 8846)	
75	F/H	8030-01-171-7628	Sealing Compound (05972) 272-40 50 cc bottle	bt
76	O/F/H	8030-00-148-9833	Sealing Compound (05972) 271 10 cc bottle (box contains 10 bottles)	bx
76.1	F	8030-01-371-8405	Sealing Compound (83574) PR-1422 B-1/2 6 oz cartridge (case contains 36 cartridges)	ca
76.2	F	8030-01-396-3362	Sealing Compound (05972) RC-680 50 cc bottle	bt

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
77	F/H	5305-00-152-0533	Screw, Cap, Hex Hd (77873) 2-0B113	ea
78	F/H	5305-01-359-8004	Screw, Cap, Hex Hd (73342) 29505612	ea
79	F/H	5305-01-374-1087	Screw, Cap, Hex Hd (19207) 12414307-194	ea
80	F/H	4030-00-066-0184	Shackle (90202) XB178	ea
81	C/O/F/H	7930-00-082-0584	Soap, Laundry (81348) P-S-1792 2 lb box	bx
82	F/H	3439-01-164-0593	Solder (61404) 14675 5 lb spool	sl
83	C/O/F/H		Solvent, Dry Cleaning (81348) P-D-680	
		6850-00-664-5685	1 qt can	qt
		6850-00-281-1985	1 gl can	gl
83.1	F	5940-01-456-1319	Splice, Conductor (0FW39) 12420927-001	ea
84	F/H	8030-00-060-3167	Tape, Antiseizing (73165) FEL-PRO 51520 520 in. roll	ro
85	O/F/H	8030-00-889-3534	Tape, Antiseizing (81349) MIL-T-27730	ea
86	O/F/H	5640-00-103-2254	Tape, Duct (39428) 1791K70 60 yd roll	ro
87	O/F/H	5970-00-644-3167	Tape, Insulation, Electrical (80063) TL83 85 ft roll	ro
88	F/H	4730-01-146-4113	Tee, Pipe to Tube (96906) MS51514A6	ea
88.1	F	4730-00-074-0713	Tee, Tube (81343) 8-8-8 070432CA	ea
88.2	F	4730-00-738-7558	Tee, Tube (81343) 12-12-12 070432CA	ea
88.3	F	4730-01-024-0915	Tee, Tube (81343) 10-10-10 070432CA	ea
89	F/H		Tee, Swivel R6X/063T12R6X	ea
90	F/H		Tee, Union JTX/003T12JTX	ea
91	F/H	8010-00-242-2089	Thinner, Paint Products (80244) A-A-2904 TY1 1 gl can	gl

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
92	O/F/H	5935-01-379-4997	Ties, Cable, Plastic (06383) PLT3S-C-0 box of 100	bx
92.1	C		Turbine Fuel, Aviation, Kerosene Type (MIL-T-83133), Grade JP-8	
92.2	C	9140-00-255-7764 9140-00-273-2378 9140-00-273-2377	Turbine Fuel, (MIL-F-16884), (NATO Code No. F75 or F-72) 5 gl can 55 gl drum 1 gl can	cn dr cn
92.3	C	9130-00-273-2380	Turbine Fuel, (MIL-F-5624), Grade JP-4 (NATO Code No. F40) Drum, 16 gage	dr
92.4	C	9130-01-305-5596 9130-01-250-6353	Turbine Fuel, (MIL-T-5624), Grade JP-5 (NATO Code No. F-44) Bulk Drum, 16 gage	gl dr
93	F/H	4020-00-241-8893	Twine, Fibrous (80063) 6Z8827 860 ft ball	ea
94	F/H	5310-00-110-8978	Washer, Flat (05606) 133B6663-6	ea
95	F/H	5310-01-267-1686	Washer, Flat (96906) MS51412-3	ea
96	F/H	5130-00-289-9586	Wheel, Abrasive (81348) GGG-W-290	ea
97	F/H	6145-01-148-2263	Wire, Electrical (80009) 175-0825-00 50 ft	ft
98	F/H	9505-00-221-2650	Wire, Nonelectrical (96906) MS20995C20 1 lb roll	lb

APPENDIX D ILLUSTRATED LIST OF MANUFACTURED ITEMS

Section I. INTRODUCTION

D-1. INTRODUCTION

This appendix includes complete instructions for manufacturing or fabricating authorized items locally. All bulk materials needed to manufacture an item are listed by part number or specification number. Figures are provided as needed. See standards and specifications DoD-Std-00100D(AR) and ANSI Y14.5M1982 for required details.

Section II. MANUFACTURED ITEMS INDEX

ITEM NAME/PART NUMBER	ITEM DESCRIPTION	PARA NO.
Brake Adjusting Tool Support		D-1
Brake Plunger Seal Driver		D-2
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Cab Maintenance Stand		D-4
Cab Support Tool		D-5
Dump Bed Wooden Brace		D-6
Dump Body Cab Protector Pivot		D-7
Pin Removal Tool		
Dump Body Lifting Bracket		D-8
Engine Stand Bracket Assembly		D-9
Headlight Adjustment Screen		D-10
Left Front Leaf Spring U-Bolt		D-11
Socket		
Machine Gun Ring Drill Stop		D-12
Machine Gun Ring Wooden Support		D-13
Main Valve Body Spring		D-14
Compression Tool		
Marking Sleeve		D-15
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M1089 Solenoid Test Adapter		D-17
Relay Test Wire		D-18
Spanner Socket Tool		D-19
Spanner Wrench Tool		D-20
Spreader Bar		D-21
Steering Stop Shim Gage		D-22
Swingdrive Assembly Bracket		D-23
Transfer Case Lift Bracket		D-24
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Transmission Auxiliary Oil Cooler		D-25
Rubber Seal		
Transmission Lift and Mounting		D-26
Bracket Assembly		
Transmission Lifting Bracket		D-27
Wheel Bearing Shim Tool Rest		D-28
12378512	Battery 12V Cable Assembly	D-29
12378575	Battery Ground Cable Assembly	D-30
12378576	Battery 24V Cable Assembly	D-31
12420265	Double-Sided Tape	D-32

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12412332-003	Air Duct Hose	D-34
12412332-012	Air Duct Hose	D-34
12412332-040	Air Duct Hose	D-34
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12412332-066	Air Duct Hose	D-34
12412332-096	Air Duct Hose	D-34
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12414690-002	Pneumatic Tube	D-36
12414690-003	Pneumatic Tube	D-36
12414690-004	Pneumatic Tube	D-36
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12414690-006	Pneumatic Tube	D-36
12414690-007	Pneumatic Tube	D-36
12414690-008	Pneumatic Tube	D-36
12414690-009	Pneumatic Tube	D-36
12414690-010	Pneumatic Tube	D-36
12414690-101	Pneumatic Tube	D-36
12414690-102	Pneumatic Tube	D-36
12414690-103	Pneumatic Tube	D-36
12414690-104	Pneumatic Tube	D-36
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12414690-129	Pneumatic Tube	D-36
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12414690-133	Pneumatic Tube	D-36
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12414690-135	Pneumatic Tube	D-36
12414690-136	Pneumatic Tube	D-36
12414690-137	Pneumatic Tube	D-36
12414690-138	Pneumatic Tube	D-36
12414690-139	Pneumatic Tube	D-36
12414690-140	Pneumatic Tube	D-36
12414690-141	Pneumatic Tube	D-36
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12414690-144	Pneumatic Tube	D-36
12414690-145	Pneumatic Tube	D-36
12414690-146	Pneumatic Tube	D-36
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12414690-149	Pneumatic Tube	D-36
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12414690-151	Pneumatic Tube	D-36
12414690-152	Pneumatic Tube	D-36
12414690-153	Pneumatic Tube	D-36
12414690-154	Pneumatic Tube	D-36
12414690-155	Pneumatic Tube	D-36
12414690-156	Pneumatic Tube	D-36
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12414690-158	Pneumatic Tube	D-36
12414690-159	Pneumatic Tube	D-36
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12414690-165	Pneumatic Tube	D-36
12414690-166	Pneumatic Tube	D-36
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12414690-168	Pneumatic Tube	D-36
12414690-169	Pneumatic Tube	D-36
12414690-201	Pneumatic Tube	D-36
12414690-202	Pneumatic Tube	D-36
12414690-203	Pneumatic Tube	D-36
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12414690-232	Pneumatic Tube	D-36
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12414690-239	Pneumatic Tube	D-36
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12414690-241	Pneumatic Tube	D-36
12414690-242	Pneumatic Tube	D-36
12414690-243	Pneumatic Tube	D-36
12414690-244	Pneumatic Tube	D-36
12414690-245	Pneumatic Tube	D-36
12414690-246	Pneumatic Tube	D-36
12414690-247	Pneumatic Tube	D-36
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12420062-011	Pneumatic Hose Assembly	D-37
12420062-012	Pneumatic Hose Assembly	D-37
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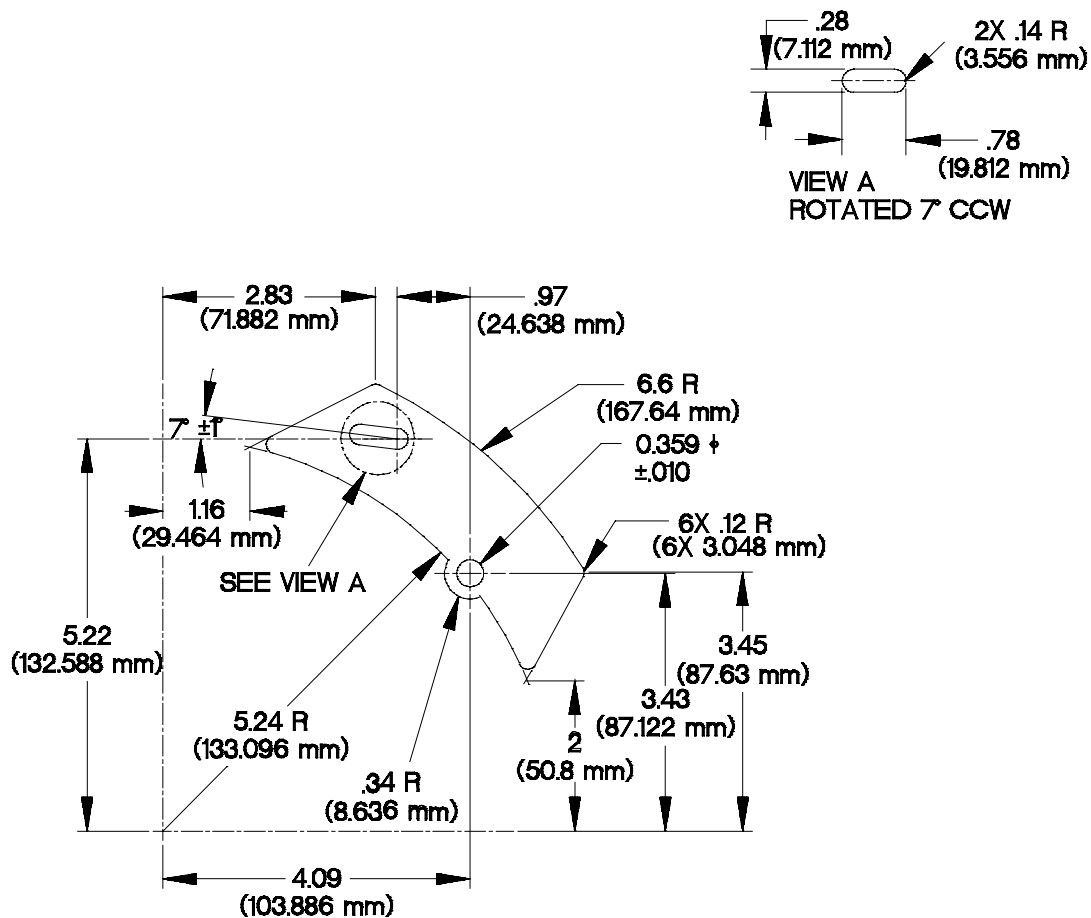
ITEM NAME/PART NUMBER	ITEM DESCRIPTION	PARA NO.
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Section III. MANUFACTURED ITEMS

D-1. BRAKE ADJUSTING TOOL SUPPORT

Make the brake adjusting tool support from .134 inch (.34 cm) flat steel stock according to the following instructions. Refer to the parts list and **Figure D-13. Brake Adjusting Tool Support** for details.

Item	Part Number	Material Description	Size	Qty
1	N/A	Steel, ASTM A569 Sheet, Hot Rolled	6.0 in. (152.4 mm) X 6.0 in. X (152.4 mm) X 0.134 in. (3.4 mm)	2

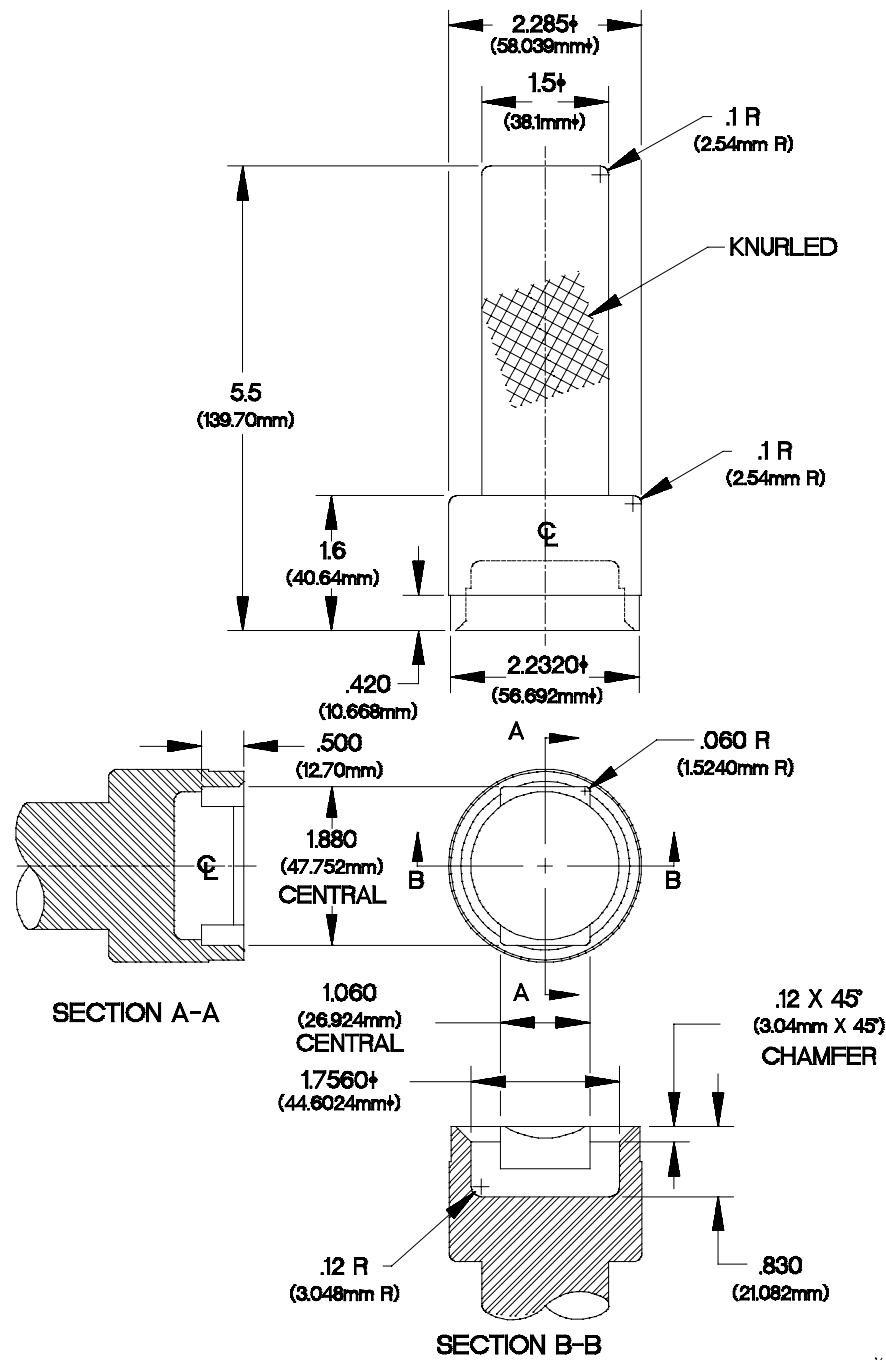


Yappd01a

Figure D-1. Brake Adjusting Tool Support

- a. All dimensions are in inches (millimeters).
- b. Cut steel sheet as shown by dimensions in **Figure D-1. Brake Adjusting Tool Support**.
- c. De-burr and remove sharp edges.

D-2. BRAKE PLUNGER SEAL DRIVER

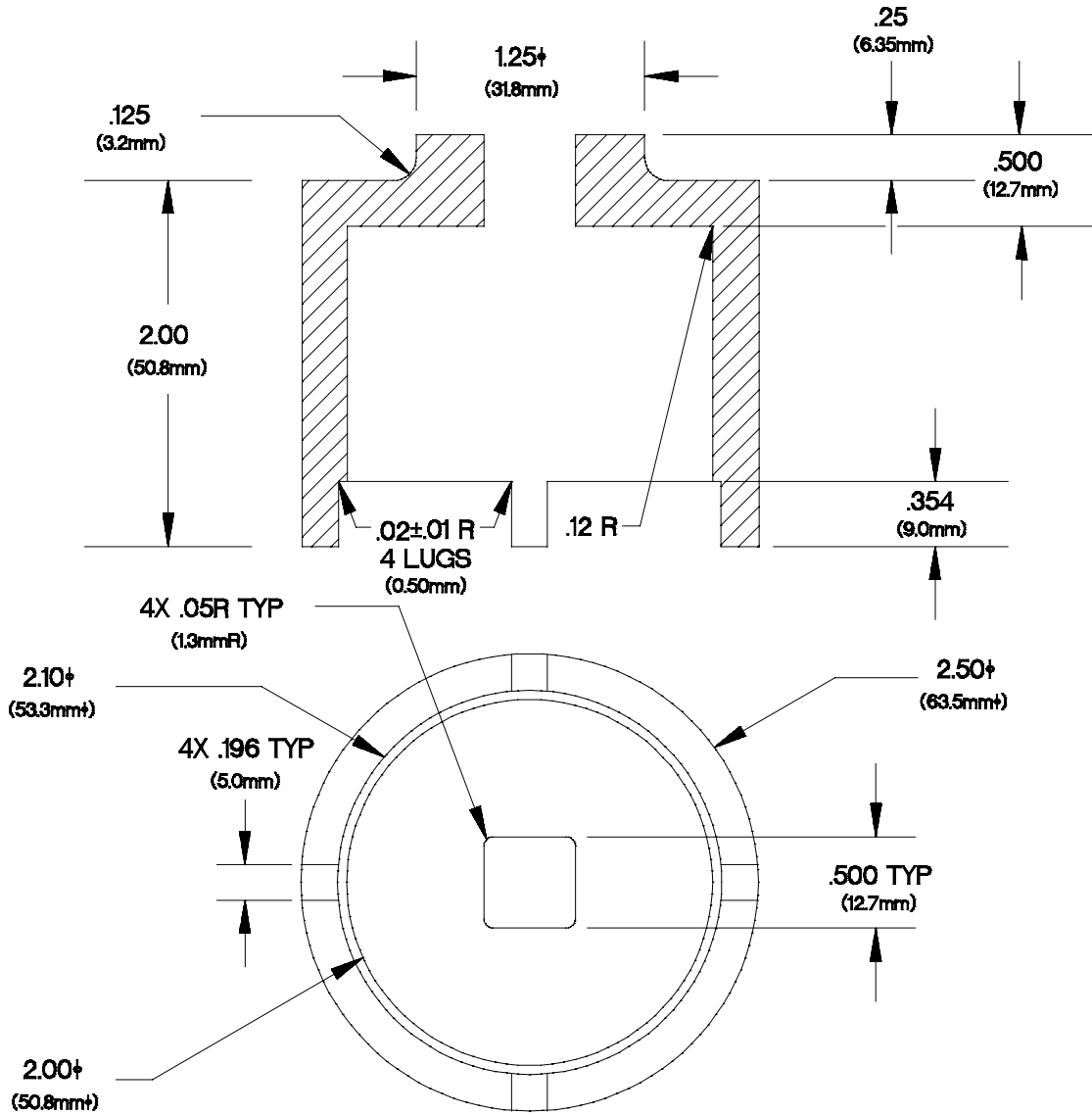


YAPPD021

Figure D-2. Brake Plunger Seal Driver

- a. All dimensions are in inches (millimeters).
- b. Manufacture from round steel stock.
- c. De-burr and remove sharp edges.

D-3. CAB FRONT SUPPORT SPANNER SOCKET



YAPPD031

Figure D-3. Cab Front Support Spanner Socket

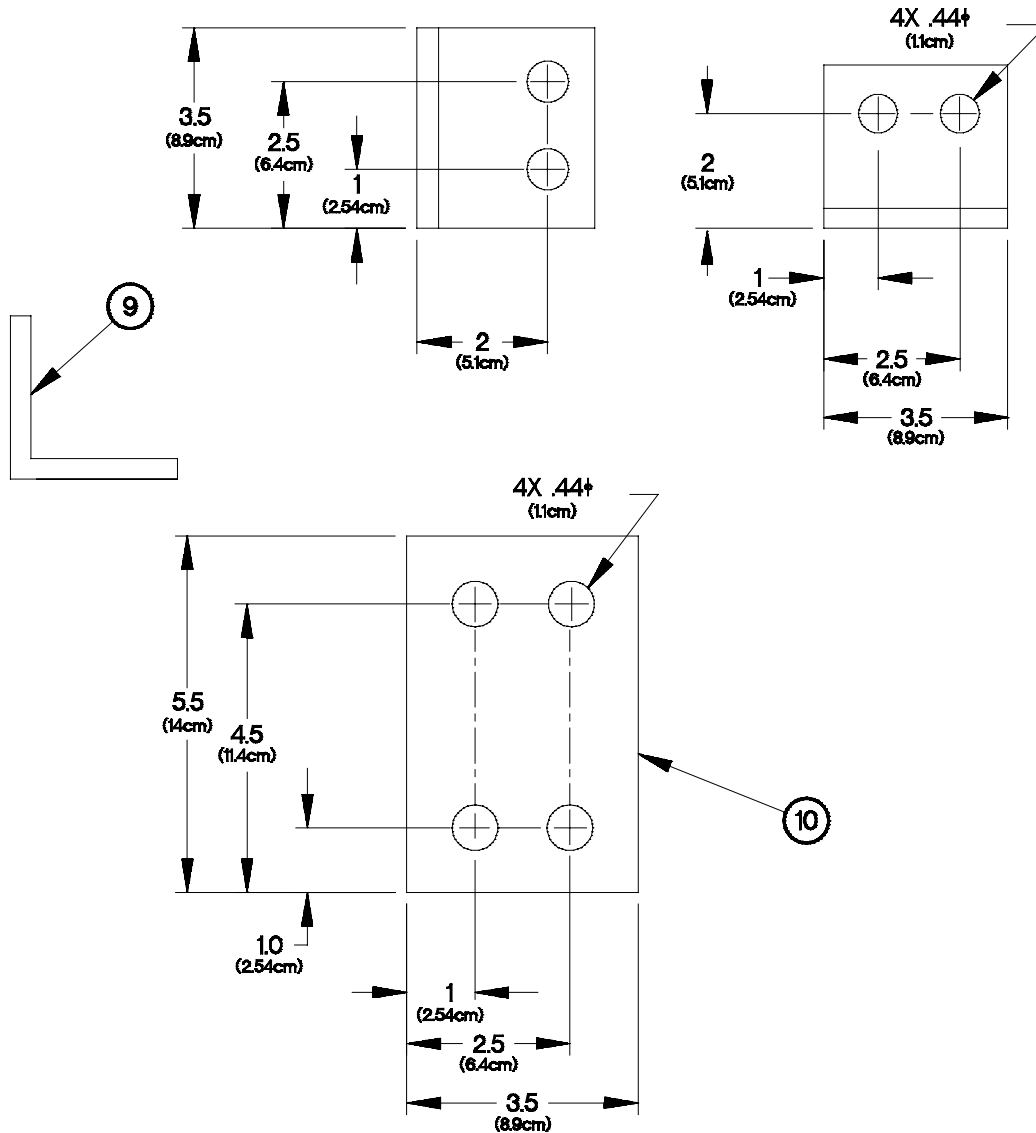
- All dimensions are in inches (millimeters).
- Fabricate from 2-1/2 inch diameter SAE 4130 bar stock conforming to MIL-T-6736 Type I Condition N (NSN 4710-00-278-0478 or equivalent).
- Tolerance:
 - 1 place $\pm .06$
 - 2 place $\pm .03$
 - 3 place $\pm .005$
 - angles $\pm 2^\circ$ unless otherwise specified.
- Surface texture: 125 $\sqrt{\text{ }}$ unless otherwise specified.

D-4. CAB MAINTENANCE STAND

Make the cab maintenance stand from steel plate, 2 inch by 4 inch and 4 inch by 4 inch lumber, and bolts, nuts and washers according to the following instructions. Refer to the parts list tables and figures **Figure D-4. Cab Maintenance Stand Angle Brackets and Straight Brackets, Figure D-5. Cab Maintenance Stand Base Angle Bracket Locations, Figure D-6. Cab Maintenance Stand Base Fabrication, Figure D-7. Cab Maintenance Stand Brace Bracket Locations, Figure D-8. Cab Maintenance Stand Brace to Base Assembly, Figure D-9. Cab Maintenance Stand Brace to Base Assembly, and Figure D-10. Cab Maintenance Stand Assembly** for details.

Item No.	Item Description	Size or Dimension	Material Description	Qty
1	Base, LH, RH	51½ x 3½ x 3½	4X4 in. Lumber (MIL-STD-731)	2
2	Base Feet	10½ x 3½ x 3½	4x4 in. Lumber	4
3	Base Spreaders	41 x 3½ x 1½	2x4 in. Lumber	6
4	Brace, Mid, and Front Supports	15½ x 3½ x 3½	4x4 in. Lumber	4
5	Brace, Rear Support	25 x 3½ x 3½	4x4 in. Lumber	2
6	Support, Rear, Front, Middle	41 x 3½ x 3½	4x4 in. Lumber	3
7	Brace Spreaders	44½ x 3½ x 1½	2x4 in. Lumber	2
8	Pads	6 x 3½ x 1½	2x4 in. Lumber	4
9	Bracket, Angle	3½ x 3½ x 1/8	1/8 in. Steel Angle Stock	6
10	Bracket, Straight	5½ x 3½ x 1/8	1/8 in. Steel Plate Stock	6
11	Bolt, 3/8 X 4 in. Carriage, NC			24
12	Bolt, 3/8 X 10 in. Carriage, NC			24
13	Washer, Flat, 3/8 in.			48
14	Lockwasher, 3/8 in.			48
15	Nut, Hex, 3/8 in.			48

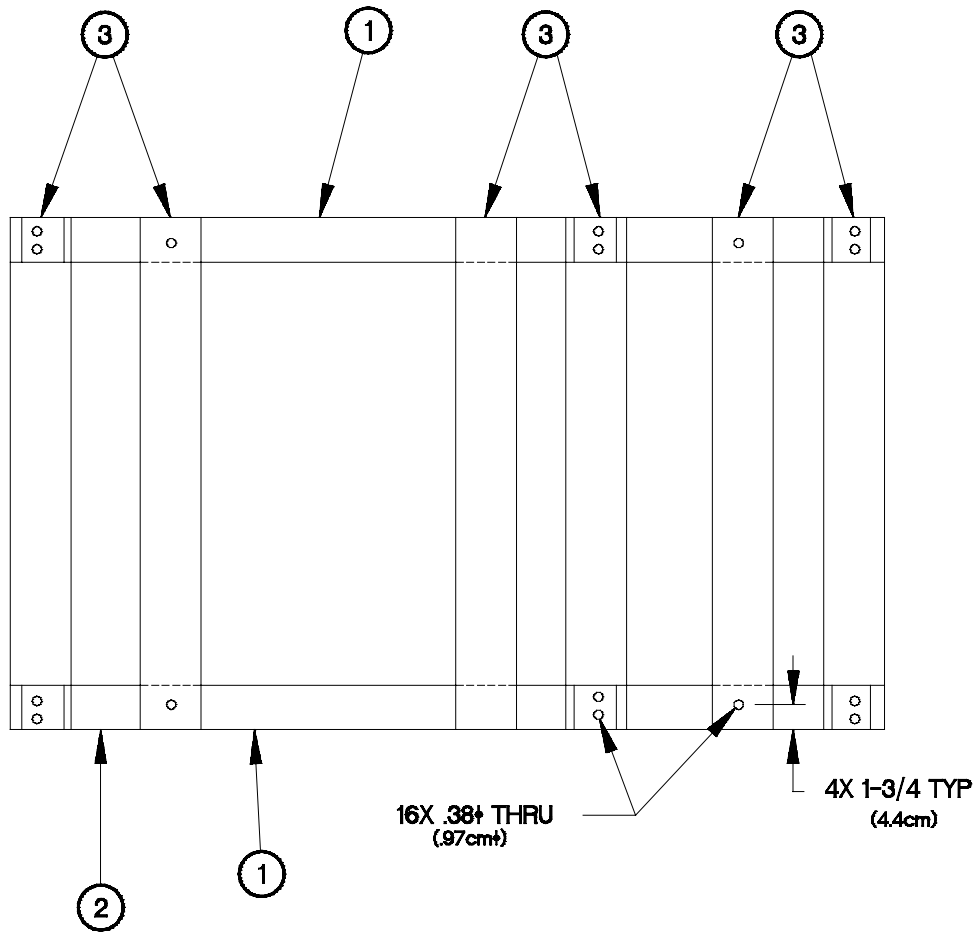
D-4. CAB MAINTENANCE STAND (CONT)



YAPPD041

Figure D-4. Cab Maintenance Stand Angle Brackets and Straight Brackets

- All dimensions are in inches (centimeters).
- Cut 6 pieces of angle steel stock for angle brackets (9) and 6 pieces of steel plate stock for straight brackets (10).
- Drill 0.44 in. (11.1 mm) diameter hole through 4 places in each angle bracket (9) and straight bracket (10) as shown in **Figure D-4. Cab Maintenance Stand Angle Brackets and Straight Brackets**.
- De-burr and remove sharp edges.

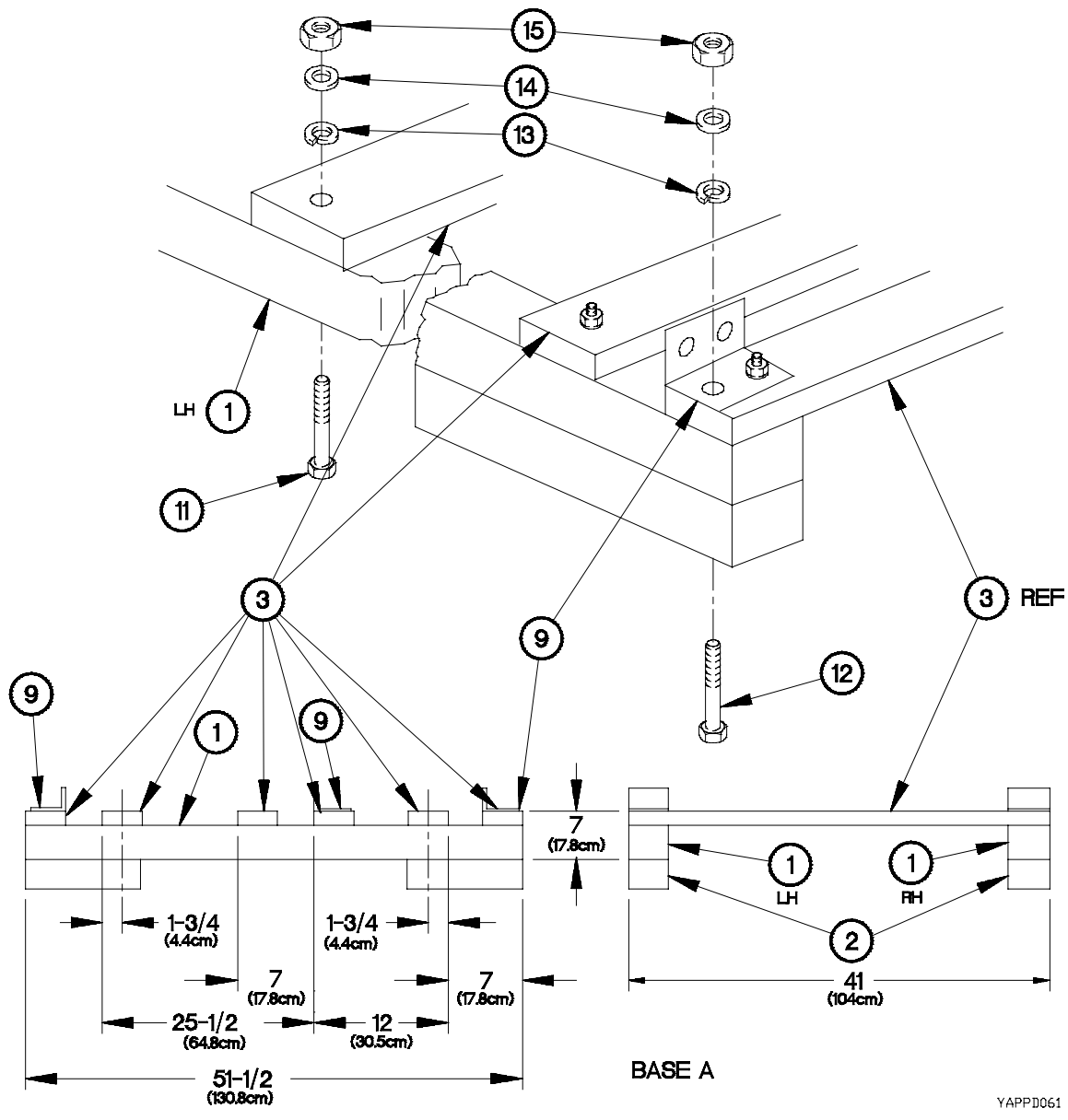


YAPPD051

Figure D-5. Cab Maintenance Stand Base Angle Bracket Locations

- e. Using angle bracket (9) as a template, mark holes and match drill .38 in (0.96 cm) holes through left side base (1), left side base feet (2), and base spreaders (3) as shown in **Figure D-5. Cab Maintenance Stand Base Angle Bracket Locations**.
- f. Repeat step e. marking holes using bracket (9) for match drilling holes through right side base (1) RH, right side base feet and the base spreaders.

D-4. CAB MAINTENANCE STAND (CONT)



YAPPD061

Figure D-6. Cab Maintenance Stand Base Fabrication

g. Make base of cab maintenance stand by securing to the left and to the right base (1); 2 base feet (2), 6 base spreaders (3) and 6 angle brackets (9) using 12 bolts (12), 6 bolts (11), 18 flat washers (13), lockwashers (14) and hex nuts (15) as shown in **Figure D-6. Cab Maintenance Stand Base Fabrication.**

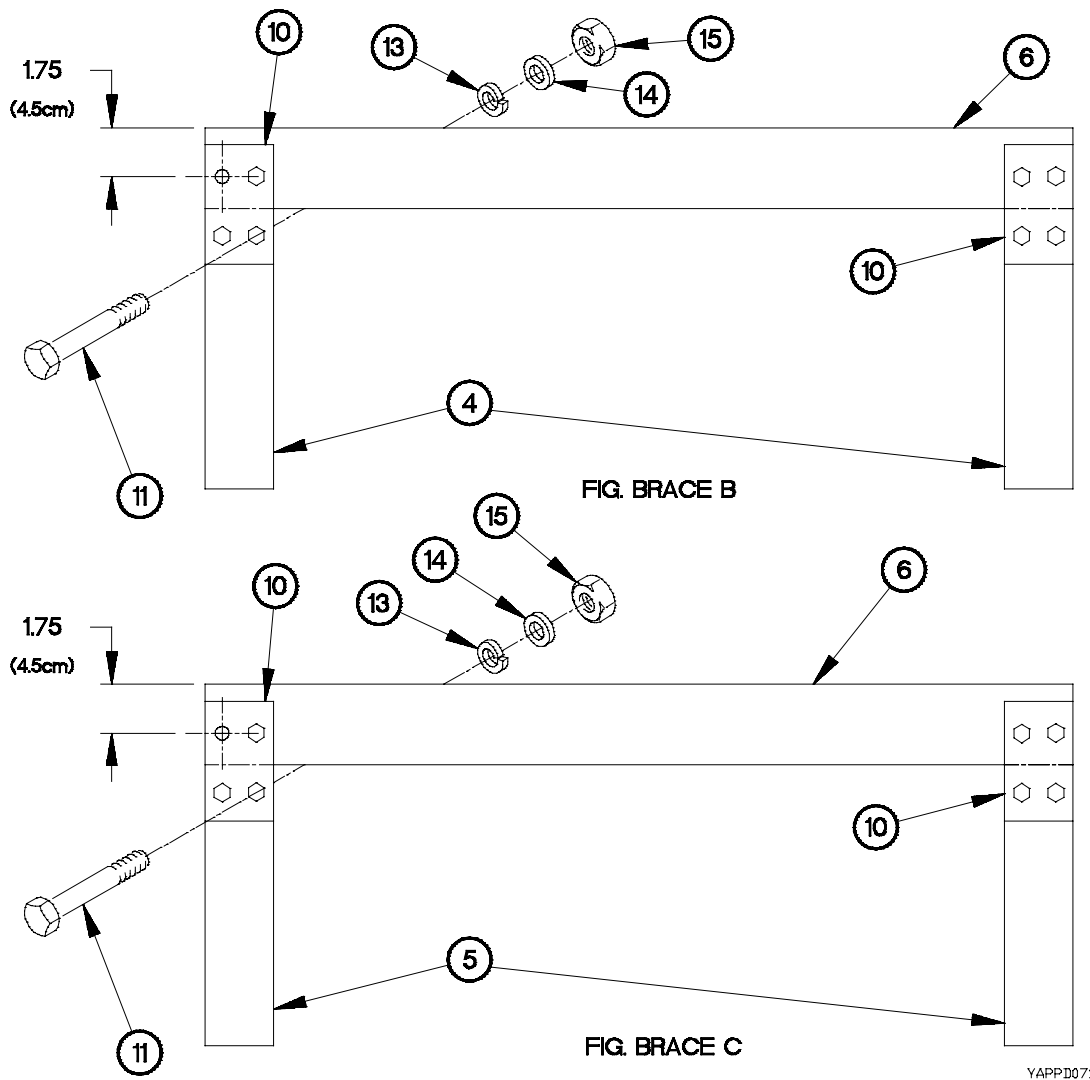
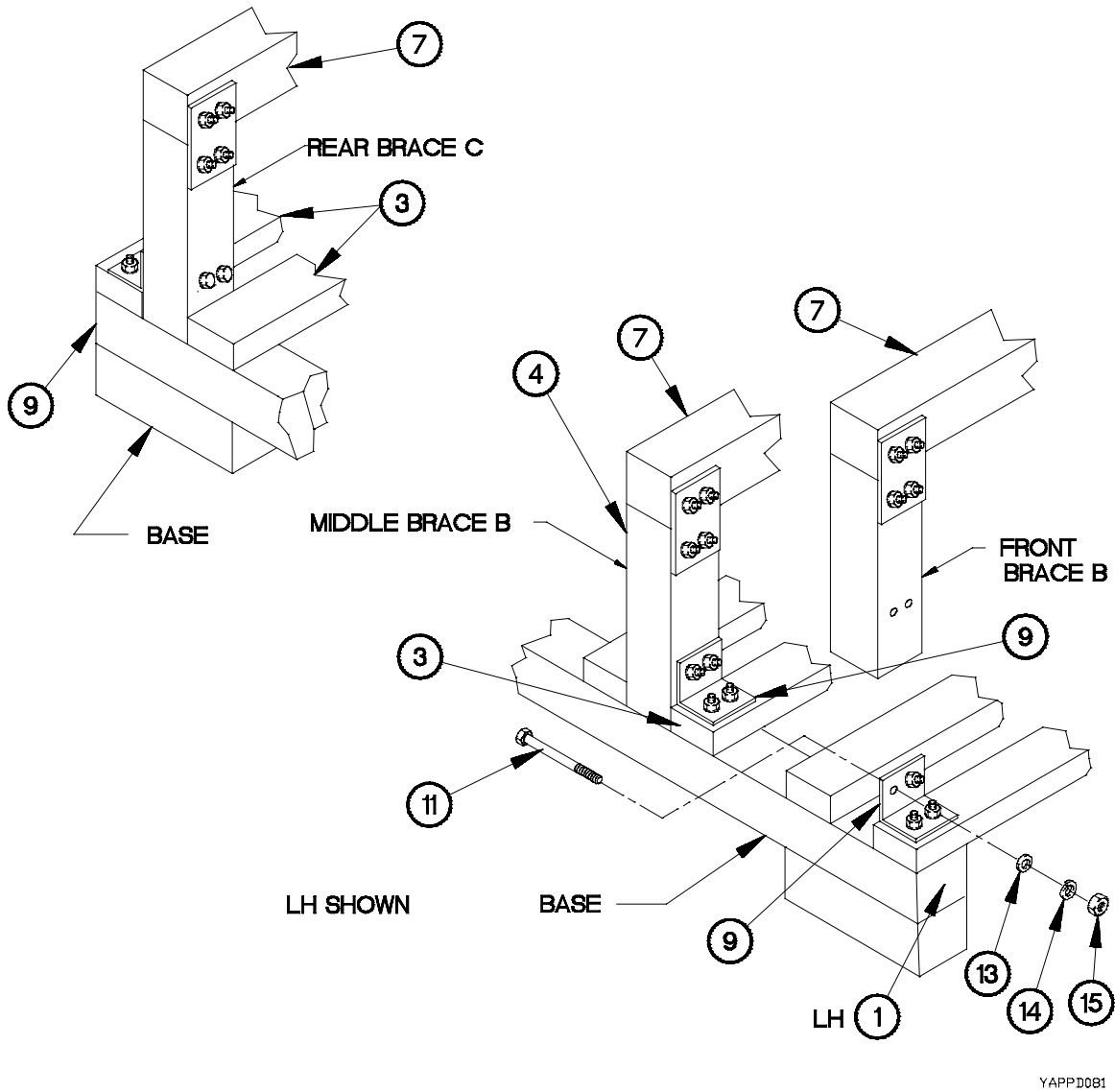


Figure D-7. Cab Maintenance Stand Brace Bracket Locations

- h. Using straight bracket (10) as a template, mark holes and match drill 0.38 in. (0.96 cm) holes through 4 support braces (4) and through 2 supports (6) as shown in **Figure D-7. Cab Maintenance Stand Brace Bracket Locations**.
- i. Make 2 B braces by securing to each end of support (6), braces (4) and straight brackets (10) using 16 bolts (11), flat washers (13), lockwashers (14), and hex nuts (15).
- j. Using straight bracket (10) as a template, mark holes and match drill 0.38 in. (0.96 cm) holes through 2 support braces (5) and through 1 support (6) as shown in **Figure D-7. Cab Maintenance Stand Brace Bracket Locations**.
- k. Make C brace by securing to each end of support (6), brace (5) and straight brackets (10) using 8 bolts (11), flat washers (13), lockwashers (14), and hex nuts (15).

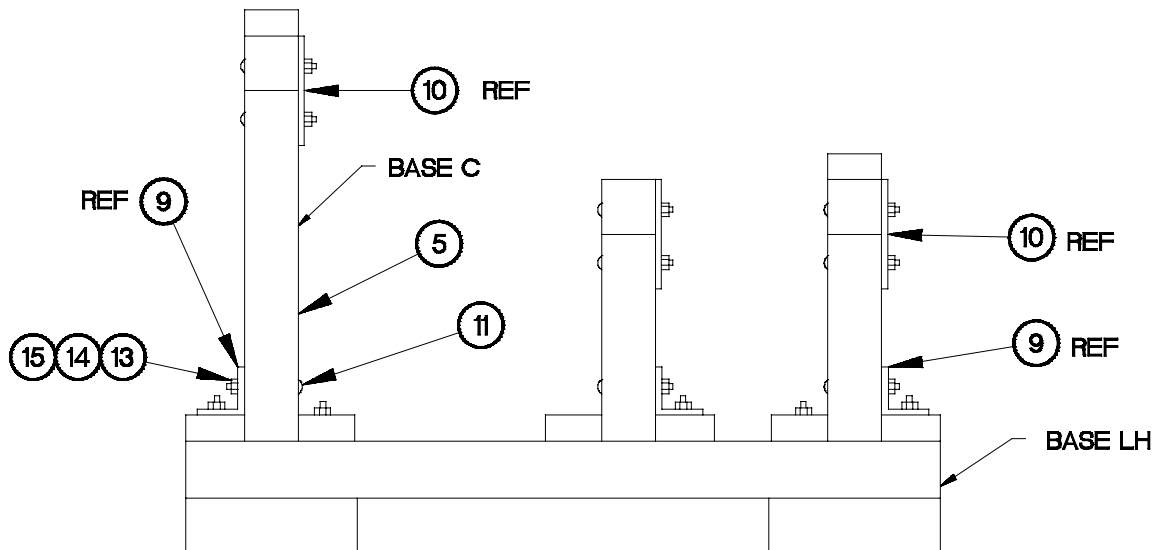
D-4. CAB MAINTENANCE STAND (CONT)



YAPPD081

Figure D-8. Cab Maintenance Stand Brace to Base Assembly

- l. At left side of base (1) LH, place middle Brace B on the base as shown in **Figure D-8. Cab Maintenance Stand Brace to Base Assembly**.
- m. Using angle bracket (9) on base as a template, mark holes on Brace B and match drill 0.38 in. (0.96 cm) hole through Brace B brace (4) as shown in **Figure D-8. Cab Maintenance Stand Brace to Base Assembly**.
- n. Secure Brace B to base spreader (3) using 2 bolts (11), flat washers (13), lockwashers (14), and hex nuts (15).
- o. Repeat steps m-n for front Brace B.

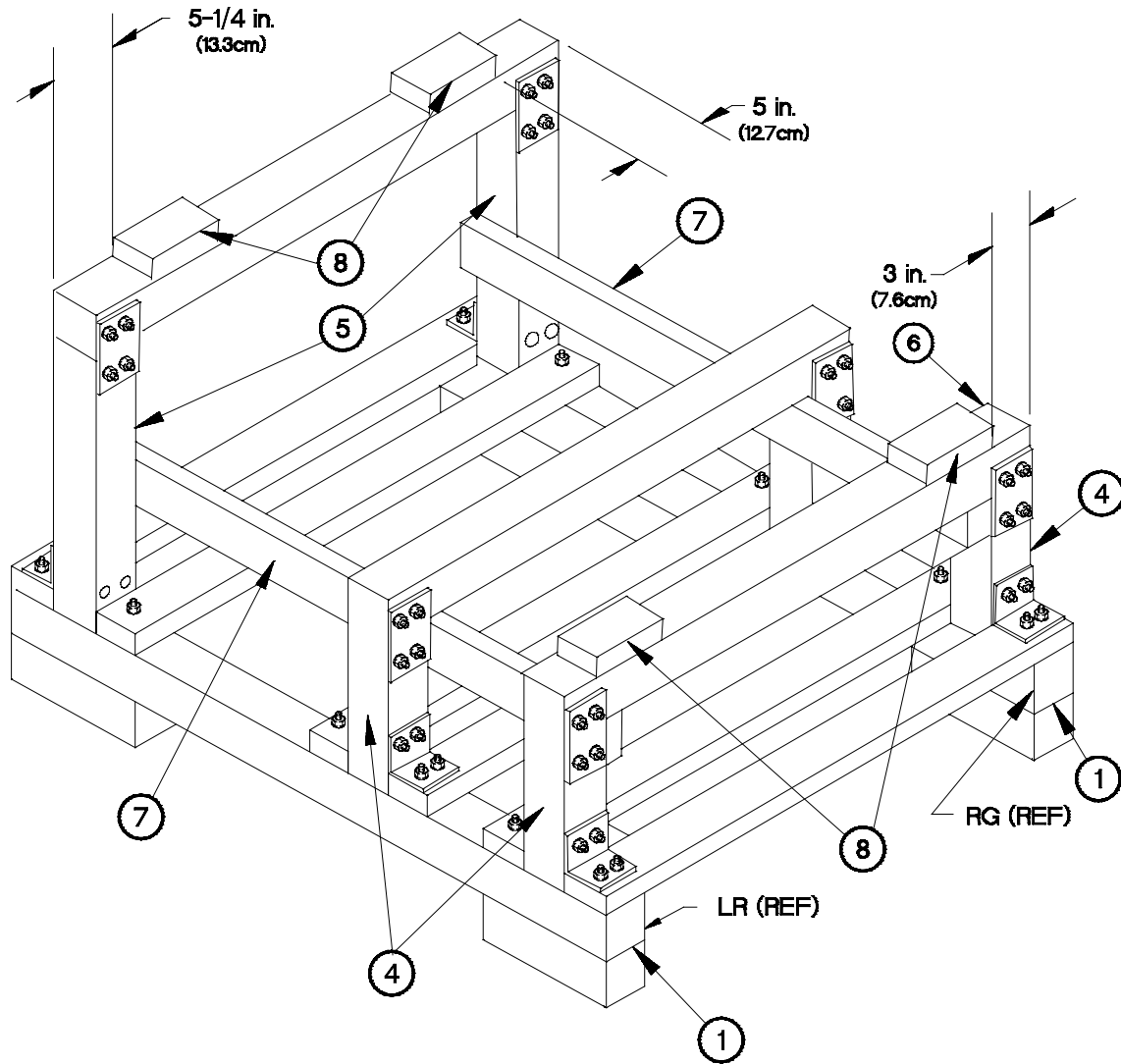


YAPPD091

Figure D-9. Cab Maintenance Stand Side Braces Side View

- p. Place Brace C on the base as shown in **Figure D-9. Cab Maintenance Stand Side Braces Side View**.
- q. Using angle bracket (9) on base as a template, mark holes on Brace C and match drill 0.38 in. (0.96 cm) holes through Brace C brace (5).
- r. Secure Brace C to base spreader (3) using 2 bolts (11), flat washers (13), lockwashers (14), and hex nuts (15) as shown in **Figure D-9. Cab Maintenance Stand Brace to Base Assembly**.
- s. Repeat steps m-r at right side base (1) RH.

D-4. CAB MAINTENANCE STAND (CONT)



YAPPD101

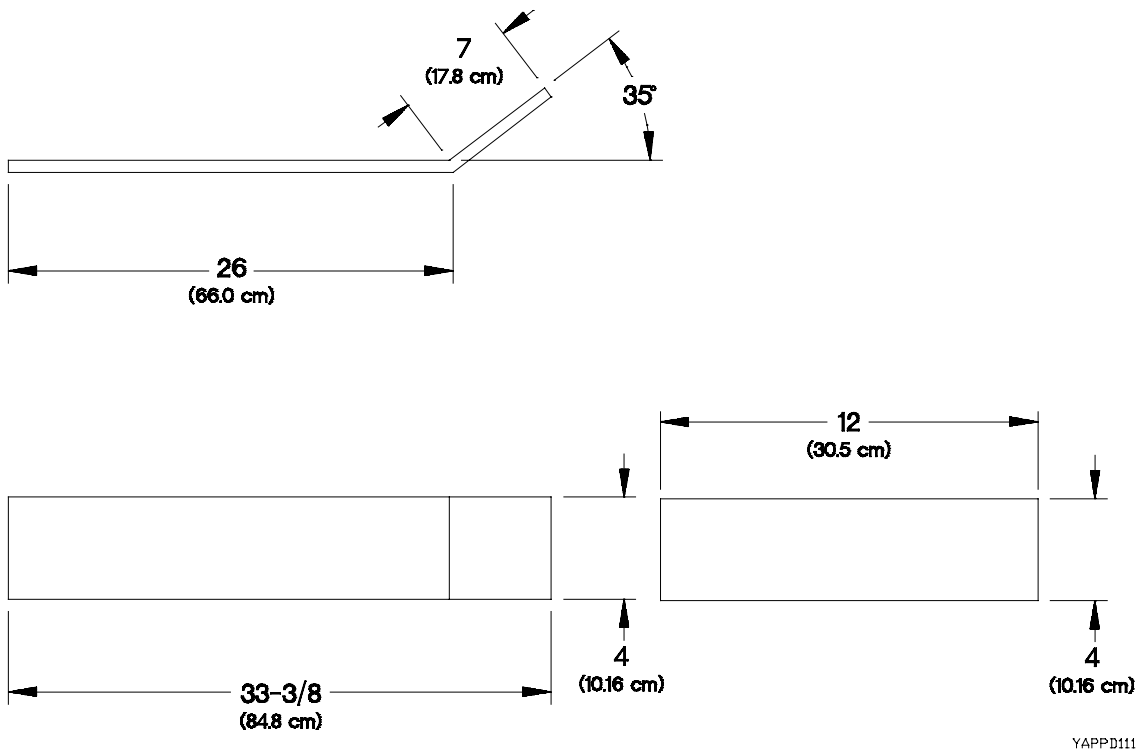
Figure D-10. Cab Maintenance Stand Assembly

- t. Nail 1 pad (8) to support (6) at rear of stand 5-1/4 in. (13.3 cm) from left hand rear brace (5). Nail 1 pad (8) to support (6) at rear of stand 5 in. (12.7 cm) from right hand rear brace (5) using number 16 nails.
- u. Nail 2 pads (8) to support (6) at front of stand 3 in. (7.6 cm) from each end of front brace (4) using number 16 nails.
- v. Nail a left side brace spreader (7) to rear brace support (5) and middle and front brace supports (4) at position shown in **Figure D-10. Cab Maintenance Stand Assembly** using number 16 nails.
- w. Nail a right side brace spreader (7) to rear brace (5) and middle and front brace supports (4) at positions shown in **Figure D-10. Cab Maintenance Stand Assembly** using number 16 nails.

D-5. CAB SUPPORT TOOL

Make the cab support tool from 0.38 inch (0.96 cm) flat steel stock and angle iron stock according to the following instructions. Refer to the parts list and **Figure D-11. Cab Support Tool Strut and Cab Rest** for details.

Item	Part Number	Material Description	Size	Qty
1	N/A	Steel, Flat Bar	4.0 in. (10.2 cm) X 33.38 in. X (84.8 cm) X 0.38 in. (0.96 cm)	1
2	N/A	Steel, Flat Bar	4.0 in. (10.2 cm) X 12.0 in. (30.5 cm) X 0.38 in. (0.96 cm)	1
3	N/A	Angle Iron	2.0 in. (5.1 cm) X 2.0 in. (5.1 cm) X 3.5 in. (8.9 cm)	2
4	H.S.105VW-1	Omsi;gro[. CSA 105 C		
5	IC 551	Coating, Compound, Plastisol	NA	1

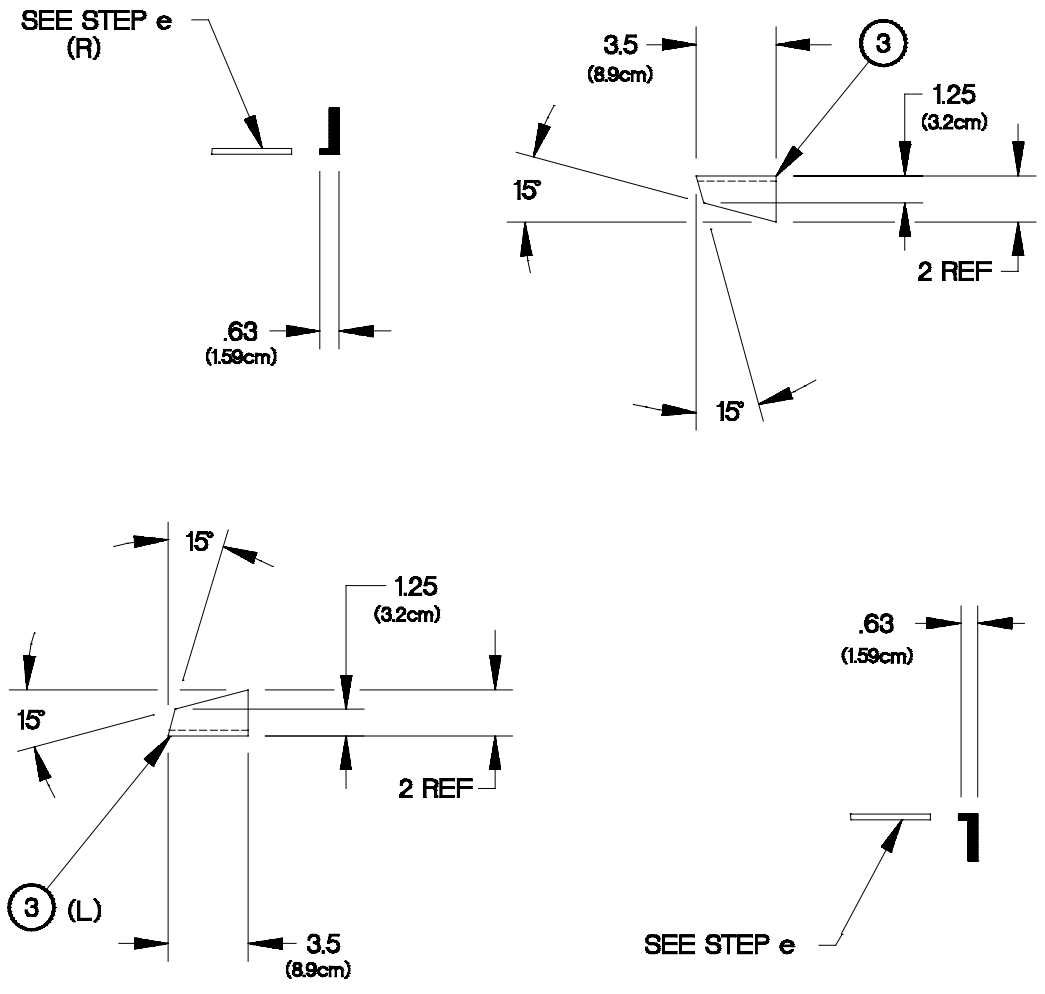


YAPPD111

Figure D-11. Cab Support Tool Strut and Cab Rest

- a. All dimensions are in inches (centimeters).
- b. Cut cab support tool strut (1) from steel flat bar and bend to shape as shown in **Figure D-11. Cab Support Tool Strut and Cab Rest**.
- c. Cut cab support tool cab rest (2) from steel flat bar.
- d. De-burr and remove sharp edges.

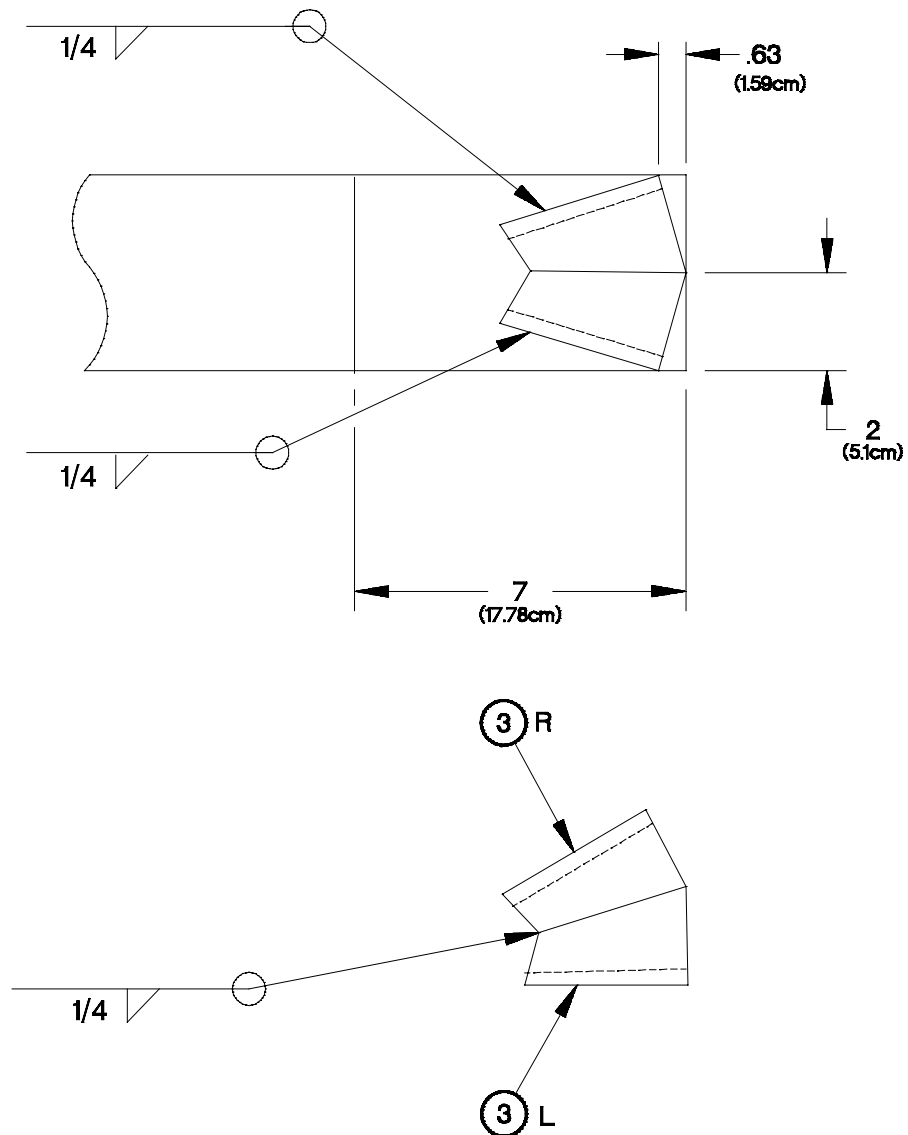
D-5. CAB SUPPORT TOOL (CONT)



YAPPD121

Figure D-12. Cab Support Tool Seat

- e. Remove flange side of cab support tool seats (3) as shown in **Figure D-12. Cab Support Tool Seat**.
- f. Cut cab support tool seats (3) L and (3) R according to dimensions and left/right orientation shown in **Figure D12. Cab Support Tool Seat**.
- g. De-burr and remove sharp edges.

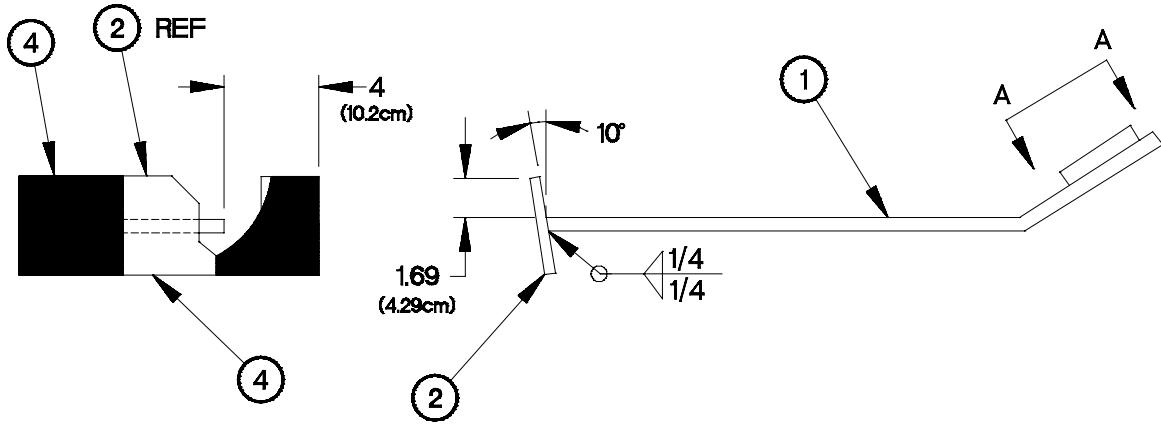


YAPPD131

Figure D-13. Cab Support Tool Seat Layout

- h. Position and clamp cab support tool seats (3) L and (3) R together as shown by dimensions in **Figure D-13. Cab Support Tool Seat Layout.**
- i. Weld cab support tool seat (3) L to cab support tool seat (3) R as identified in assembly table and **Figure D-13. Cab Support Tool Seat Layout.**
- j. Position and clamp cab support tool seats (3) L and (3) R to cab support tool strut (1) as shown by dimensions in **Figure D-4. Cab Support Tool Seat Layout.**
- k. Weld items clamped in step (j) as shown in **Figure D-4. Cab Support Tool Seat Layout.**
- l. De-burr and remove sharp edges.

D-5. CAB SUPPORT TOOL (CONT)



YAPPD141

Figure D-14. Cab Support Tool Assembly

- m. Position and clamp cab support tool strut (1) to cab support tool cab rest (2) as shown by dimensions in **Figure D-14. Cab Support Tool Assembly**, before insulgrip (4) is applied.
- n. Weld cab support tool strut (1) to cab support tool cab rest (2).
- o. Apply Insulgrip (4) to cab support tool cab rest (2) as described on material container.

D-6. DUMP BED WOODEN BRACE FABRICATION

Cut the wooden braces from bulk wood stock according to the information in the table. Finish as described in the following steps.

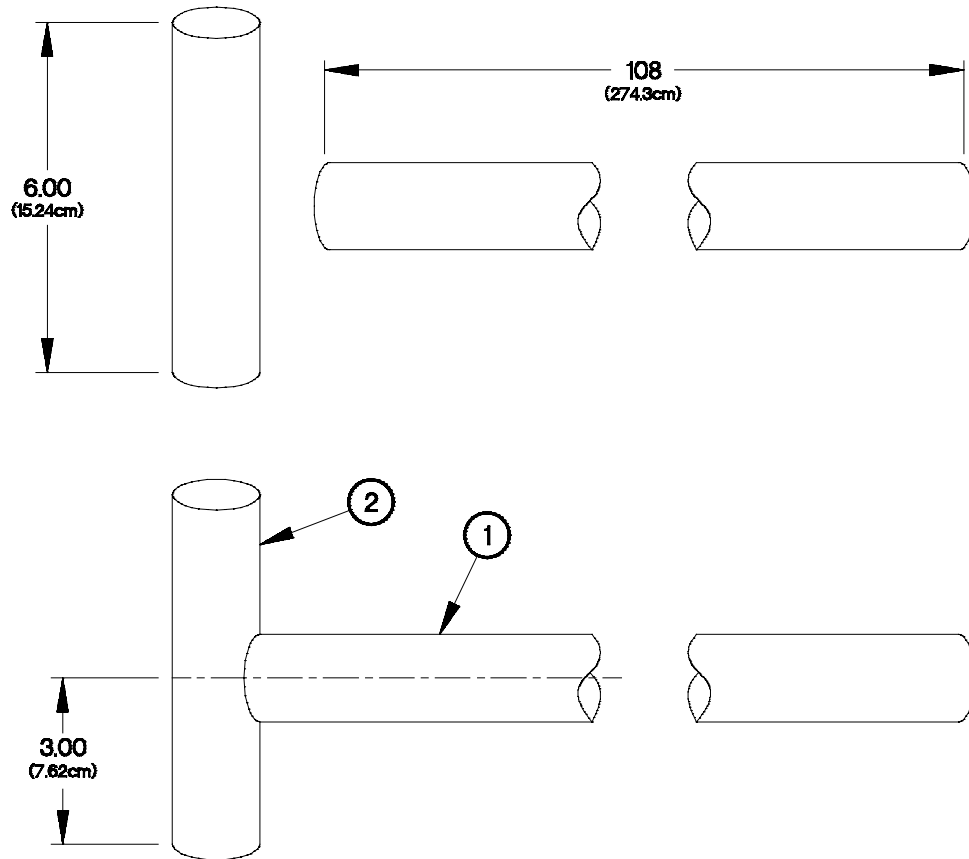
Item Description	Size or Dimension	Material Description	Qty
Braces	4 X 4 X 48 in. (10.1 X 10.1 X 121.9 cm)	4 X 4 in. Lumber (MIL-STD-731)	2

- a. All dimensions are in inches (centimeters).
- b. Cut 2 of item 1 from MIL-STD 736 Group IV untreated bulk wood stock as indicated in table.
- c. Sand and remove sharp edges.

D-7. DUMP BODY CAB PROTECTOR PIVOT PIN REMOVAL TOOL

Make the dump body cab protector pivot pin removal tool from 0.50 inch (1.3 cm) round steel stock according to the following figures. Refer to the parts list and figure for details.

Item	Part Number	Material Description	Size	Qty
1	N/A	Steel, Round Bar	108.0 in. (274.3 cm) x 0.50 in. (1.3 cm) OD	1
2	N/A	Steel, Round Bar	5.00 in. (13 cm) x 0.50 in. (1.3 cm) OD	1



YAPPD151

Figure D-15. Dump Body Cab Protector Pivot Pin Removal Tool Assembly

- All dimensions are in inches (centimeters).
- Position and clamp (1) and (2) pieces together as shown by dimensions in **Figure D-15. Dump Body Cab Protector Pivot Pin Removal Tool Assembly**.
- Weld (1) to (2) as identified on assembly table and shown in **Figure D-15. Dump Body Cab Protector Pivot Pin Removal Tool Assembly**.
- Weld both sides indicated in **Figure D-15. Dump Body Cab Protector Pivot Pin Removal Tool Assembly**.
- De-burr and remove sharp edges.

D-8. DUMP BODY LIFTING BRACKET

Make the dump body lifting bracket assembly from the front, rear, top, guide, and mount plates according to the following instructions. Refer to the parts list tables and accompanying figures for details.

Item	Part Number	Name/Description	Qty
1	N/A	Rear Plate	1
2	N/A	Top Plate	1
3	N/A </td <td>Front Plate</td> <td>1</td>	Front Plate	1
4	N/A	Guide Brace	1
5	N/A	Plate, Mounting	1

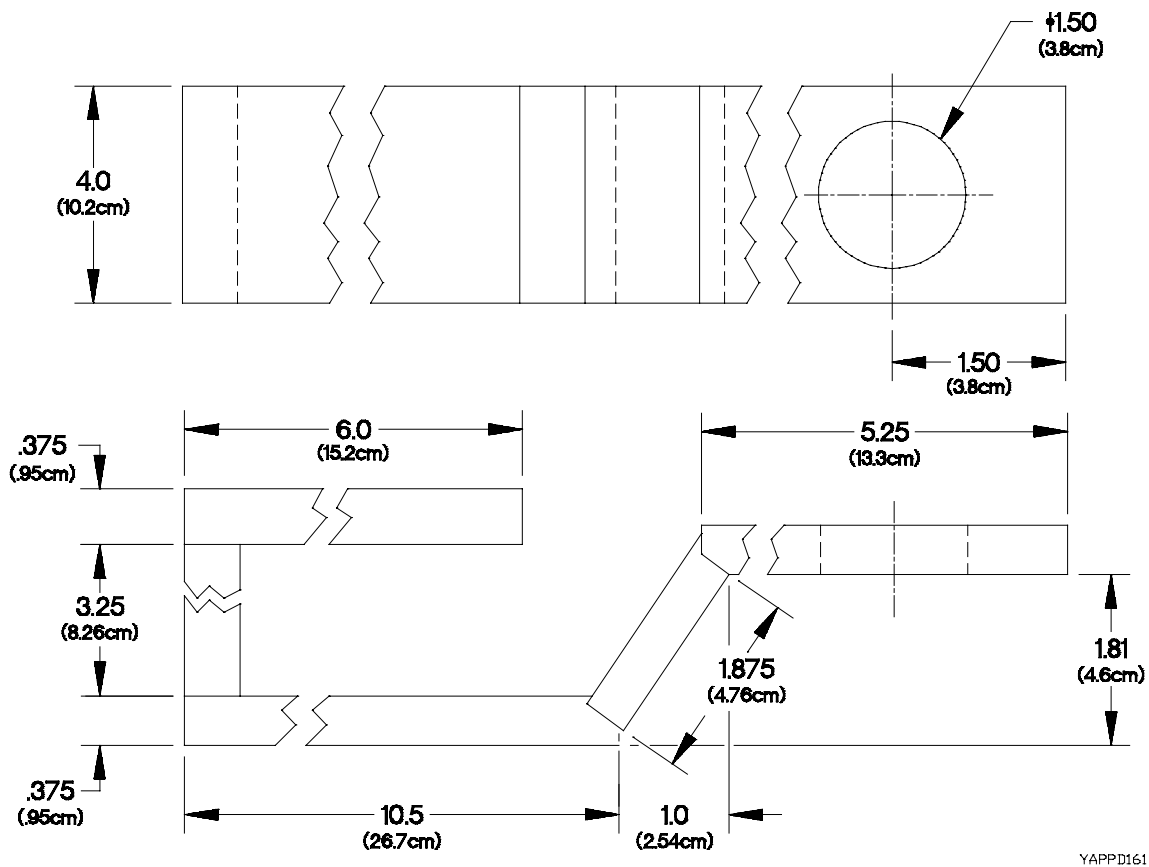
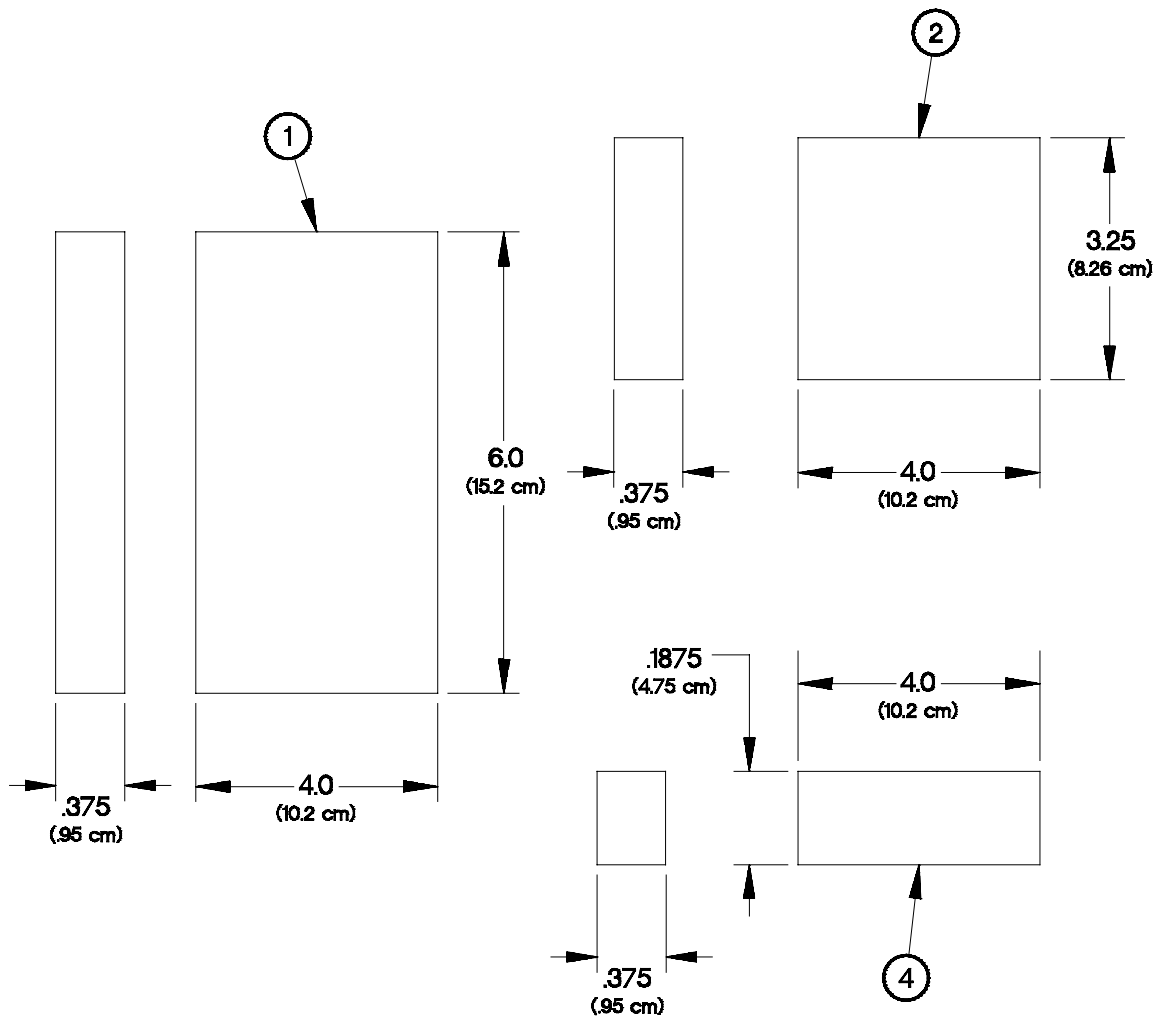


Figure D-16 Dump Body Lifting Bracket

- All dimensions are in inches (centimeters).
- Position and clamp pieces (1 through 5) together as shown by dimensions in Figure Dump Body Lifting Bracket.
- Weld pieces together as shown in **Figure D-16. Dump Body Lifting Bracket.**
- Coat all surfaces with Plastisol (6).
- Maximum lifting capacity of Dump Body Lifting Bracket is 900 lbs (409 kgs).

Item	Part Number	Material Description	Size	Qty
1	N/A	Plate, steel, ASTM A-36	6.0 in. (15.2 cm) X 4.0 in. (10.2 cm) X 0.375 in. (0.95 cm)	1
2	N/A	Plate, steel, ASTM A-36	3.25 in. (8.26 cm) X 4.0 in. (10.2 cm) X 0.375 in. (0.95 cm)	1
4	N/A	Plate, steel, ASTM A-36	1.875 in. (4.75 cm) X 4.0 in. (10.2 cm) X 0.375 in. (0.95 cm)	1



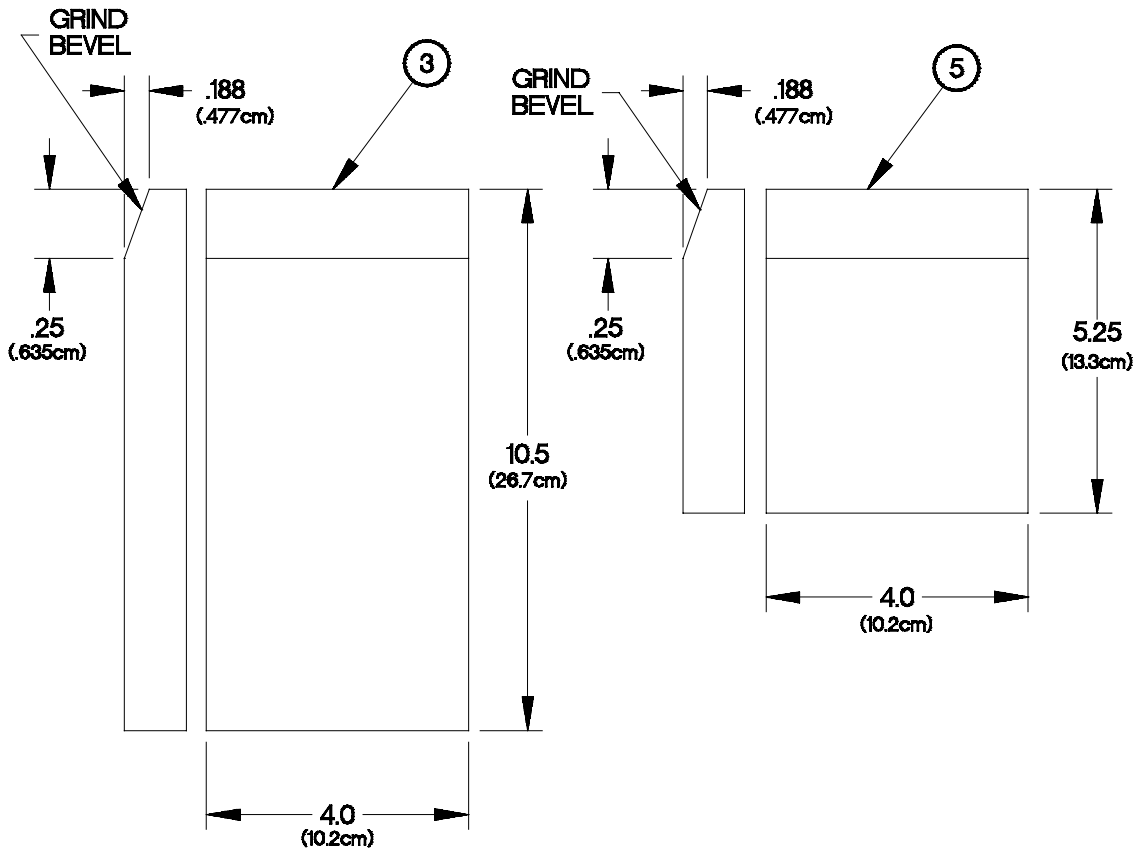
YAPPD171

Figure D-17. Rear, Top, and Guide Plate

- All dimensions are in inches (centimeters).
- Fabricate (1),(2), and (4) from ASTM A-36 steel plate as shown in **Figure D-17. Rear, Top, and Guide Plate.**
- De-burr and remove sharp edges.

D-8. DUMP BODY LIFTING BRACKET (CONT)

Item	Part Number	Material Description	Size	Qty
3	N/A	Plate steel, ASTM A36	10.5 in. (26.7 cm) X 4.0 in. (10.2 cm) X 0.375 in. (0.95 cm)	1
5	N/A	Plate steel, ASTM A36	5.25 in. (13.3 cm) X 4.0 in. (10.2 cm) X 0.375 in. (0.95 cm)	1



YAPPD181

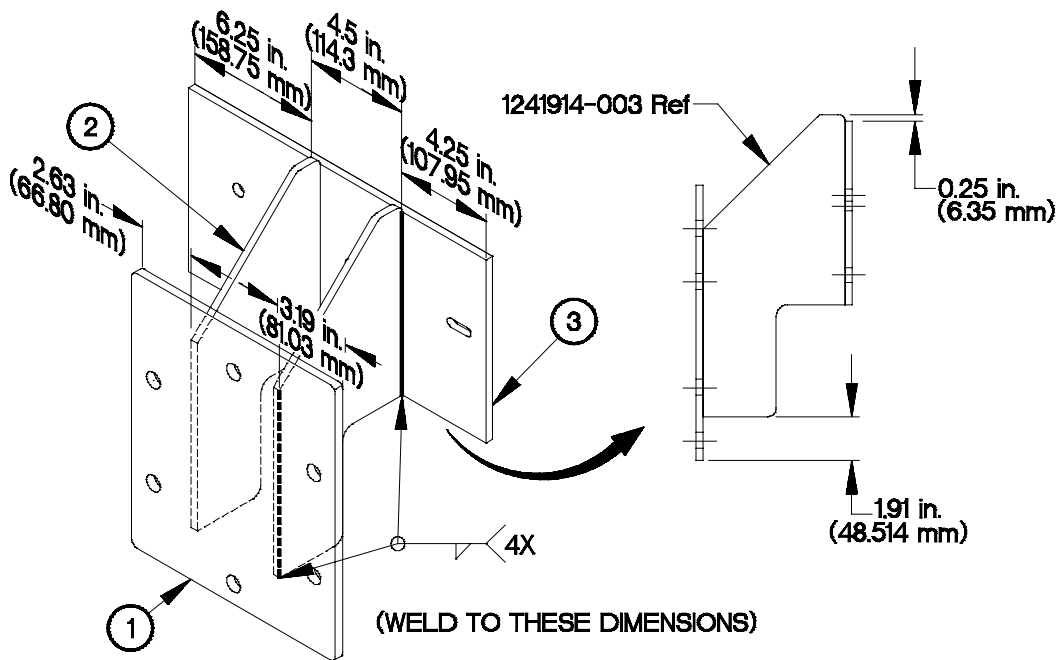
Figure D-18. Front and Mounting Plate

- All dimensions are in inches (centimeters).
- Fabricate (3) and (5) from ASTM A-36 steel plate.
- Drill 1-1/2 inch (3.84 cm) diameter hole in plate (5) as shown in **Figure D-18. Front and Mounting Plate**.
- Grind bevel on edge of each plate for weld surface as shown in **Figure D-18. Front and Mounting Plate**.
- De-burr and remove sharp edges.

D-9. ENGINE STAND BRACKET ASSEMBLY

Make the engine stand bracket assembly from the front, rear, and side plates according to the following instructions. Refer to the parts list tables and accompanying figures for details.

Item	Part Number	Name/Description	Qty
1	12419144-001	Plate, Front	1
2	12419144-002	Plate, Rear	1
3	12419144-003	Plate, Side	2



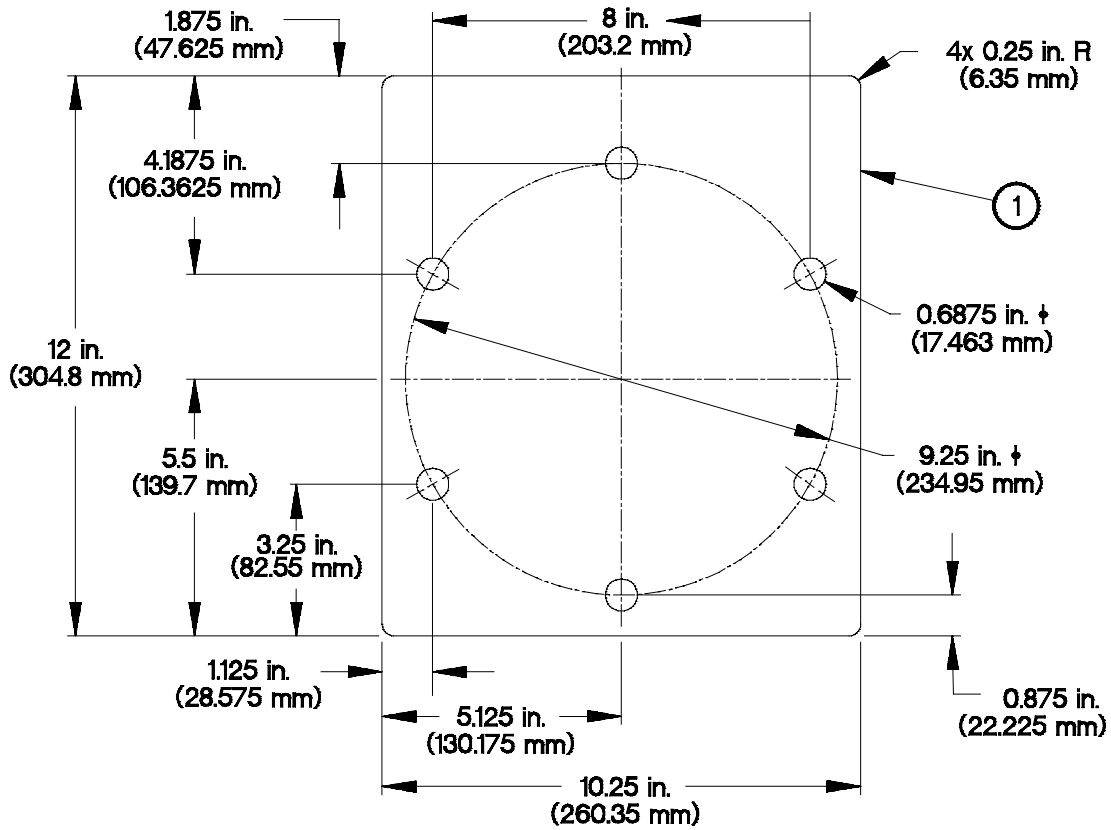
YAPPD191

Figure D-19. Engine Stand Bracket Assembly

- a. All dimensions are in inches (millimeters).
- b. Weld (1), (2) and (3) together as shown by dimensions in **Figure D-19. Engine Stand Bracket Assembly**.

D-9. ENGINE STAND BRACKET ASSEMBLY (CONT)

Item	Part Number	Material Description	Size	Qty
1	12419142-001	Plate, Steel, ASTM A-36	12.0 in. (304.8 mm) x 10.25 in. (260.3 mm) x 0.312 in. (7.9 mm) thick	1

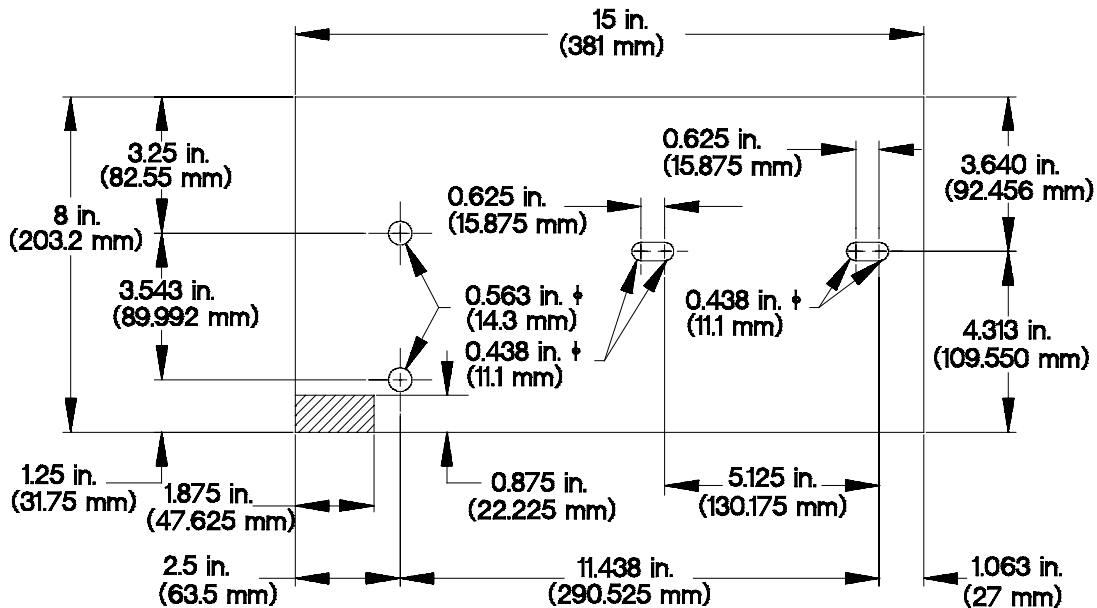


YAPPD201

Figure D-20. Engine Stand Bracket Front Plate

- a. All dimensions are in inches (millimeters).
- b. Fabricate (1) from ASTM A-36 steel plate.
- c. Drill 0.6875 in. (17.5 mm) diameter hole through 6 places on a 9.25 in. (234.9 mm) radius equally spaced at 60° as shown in **Figure D-20. Engine Stand Bracket Front Plate**.
- d. Round four corners to 0.25 in. (6.35 mm) radius as shown in **Figure D-20. Engine Stand Bracket Front Plate**.

Item	Part Number	Material Description	Size	Qty
2	12419144-002	Plate, Steel, ASTM A-36	20.62 in. (523.7 mm) x 7.25 in. (184.1 mm) x 0.312 in. (7.9 mm) thick	1



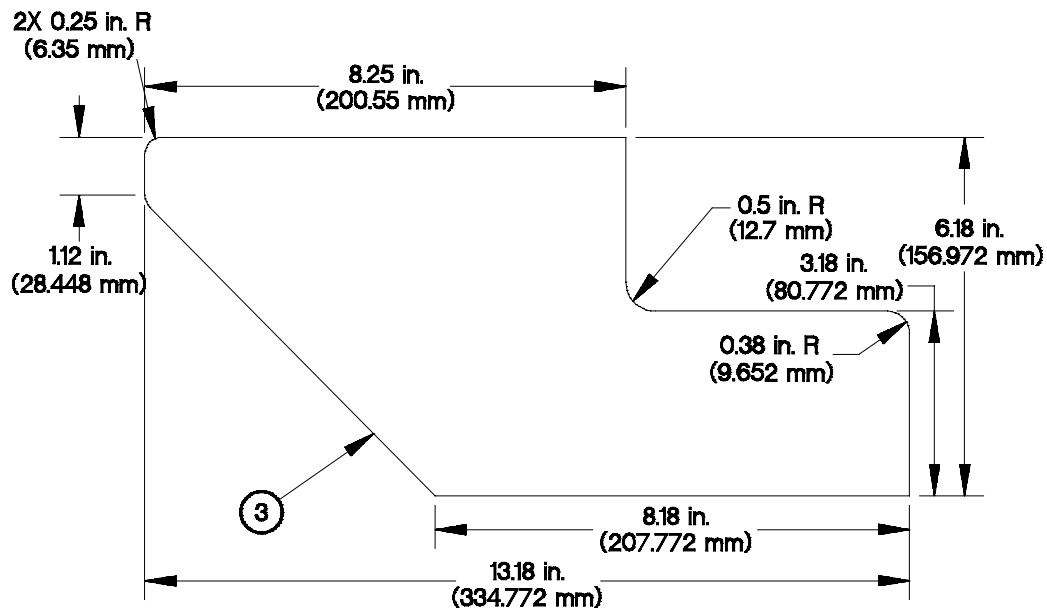
YAPPD21b

Figure D-21. Engine Stand Bracket Rear Plate

- All dimensions are in inches (millimeters).
- Fabricate (2) from ASTM A-36 steel plate.
- Drill 0.563 in. (14.3 mm) diameter hole through 2 places in rear plate as shown in **Figure D-21. Engine Stand Bracket Rear Plate**.
- Drill 0.438 in. (11.1 mm) diameter hole through 4 places in rear plate as shown in **Figure D-21. Engine Stand Bracket Rear Plate**.
- Cut or mill between 0.438 in. (11.1 mm) diameter holes as shown in **Figure D-21. Engine Stand Bracket Rear Plate**.
- De-burr and remove all sharp edges.

D-9. ENGINE STAND BRACKET ASSEMBLY (CONT)

Item	Part Number	Material Description	Size	Qty
3	124191442-003	Plate, Steel, ASTM A-36	6.18 in. (157 mm) x 13.18 in. (334.8 mm) x 0.312 in. (7.9 mm) thick	2



YAPPD221

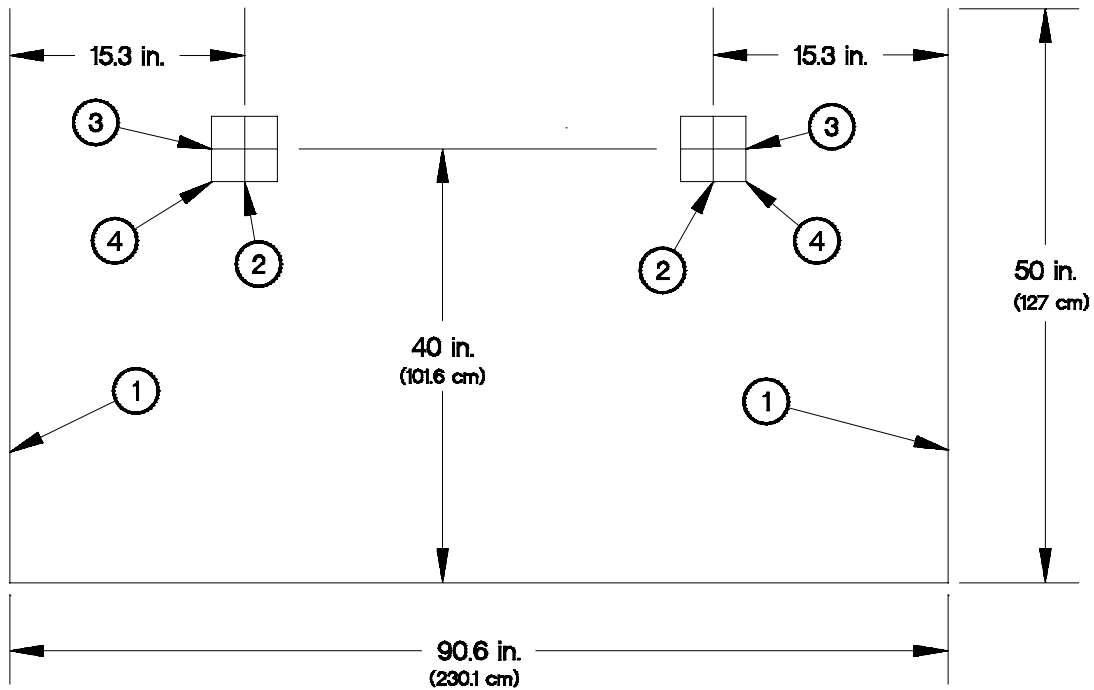
Figure D-22. Engine Stand Bracket Side Plates

- a. All dimensions are in inches (millimeters).
- b. Fabricate (3) from ASTM A-36 steel plate.
- c. Deleted.
- d. Round two corners to 0.25 in. (6.35 mm) radius as shown in **Figure D-22. Engine Stand Bracket Side Plates**.
- e. Round corner to 0.38 in. (9.65 mm) radius as shown in **Figure D-22. Engine Stand Bracket Side Plates**.
- f. De-burr and remove all sharp edges.

D-10. HEADLIGHT ADJUSTMENT SCREEN

The headlight adjustment screen may be drawn on any vertical surface at least 50 in. (127 cm) high and 100 in. (254 cm) wide.

- a. Draw two vertical lines (1) 50 in. (127 cm) high and 90.6 in. (230 cm) apart (centered on headlight adjustment screen).
- b. Locate two points 40 in. (101.6 cm) from floor and 15.3 in. (38.9 cm) toward the center from each vertical line (1).
- c. Draw vertical line (2) about 3-5 in. (8-13 cm) centered on each of the two points.
- d. Draw horizontal line (3) about 3-5 in. (8-13 cm) centered on each of the two points.
- e. Measure out 4 in. (10 cm) along each vertical line (2) and horizontal line (3) from each of the two points to make 8 in. (20 cm) squares (4).



YAPPD231

Figure D-23. Headlight Adjustment Screen

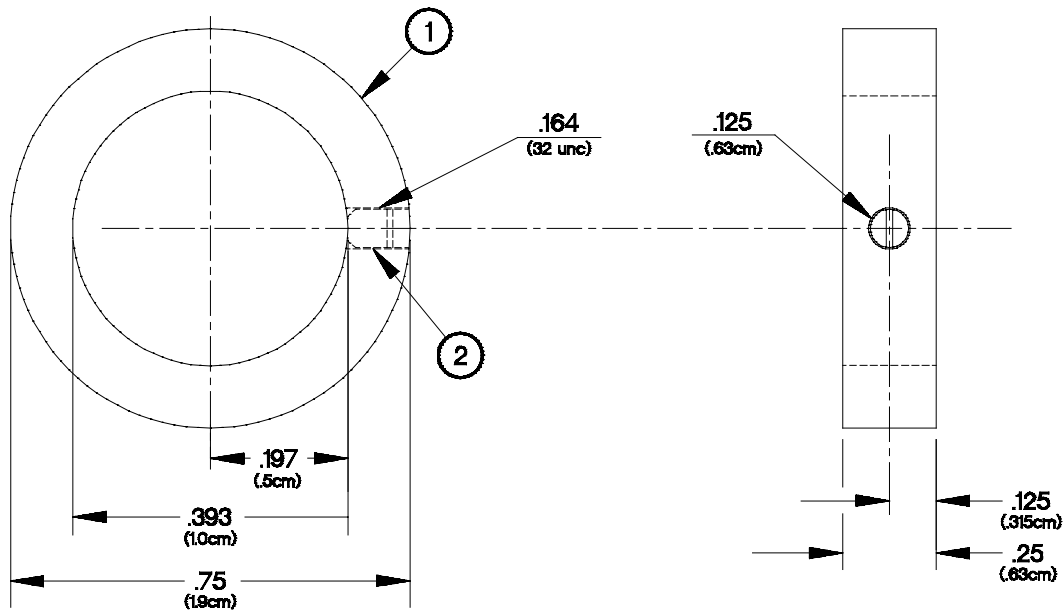
D-11. LEFT FRONT LEAF SPRING U-BOLT SOCKET

Use a 6-point 1-1/16 inch or 27 mm 3/4 inch drive impact socket. Grind down wrenching end to a maximum OD of 1.5 inches (38.3 mm) to fit rear inboard U-bolt nut on left front leaf spring. No modification is required if a 6-point, thin wall, deep 27mm impact socket can be obtained.

D-12. MACHINE GUN RING DRILL STOP

Make the Machine Gun Ring Drill Stop from round aluminum stock and setscrew according to the following instructions. Refer to the parts list and figure for details.

Item	Part Number	Material Description	Size	Qty
1	N/A	Rod, aluminum	0.75 in. OD (1.9 cm) X 0.25 in. (0.63 cm) long	1
2	5305-00-404-8272	Setscrew	0.164 in. OD (0.41 cm) x 0.125 in. length (0.32 cm) 32 UNC	1



YAPPD241

Figure D-24. Machine Gun Ring Drill Stop

- All dimensions are in inches (centimeters).
- Drill 0.393 in. (1.0 cm) diameter hole through as shown in **Figure D-24. Machine Gun Ring Drill Stop**.
- Drill 0.125 in (0.32 cm) diameter hole through for setscrew as shown in **Figure D-24. Machine Gun Ring Drill Stop**.
- Thread setscrew hole 0.164-32 UNC.
- De-burr and remove sharp edges.
- Insert setscrew (2) into Machine Gun Ring Drill Stop (1).

D-13. MACHINE GUN RING WOODEN SUPPORT FABRICATION

Cut from bulk wood stock according to the following information.

- a. Fabricate from MIL-STD 736 Group IV untreated bulk wood stock.
- b. Cut three (3) lengths of 2 X 4 inch stock 8 inches (20.3 cm) long.
- c. Sand and remove sharp edges.

D-14. MAIN VALVE BODY SPRING COMPRESSION TOOL

Make the main valve body spring compression tool from steel pipe according to the following instructions. Refer to the parts list and figure for details.

Material Description	Size	Qty
Pipe, Steel, 1/2 inch ID	1/2 in. (1.27 cm) ID X 1.50 in. (3.8 cm)	1

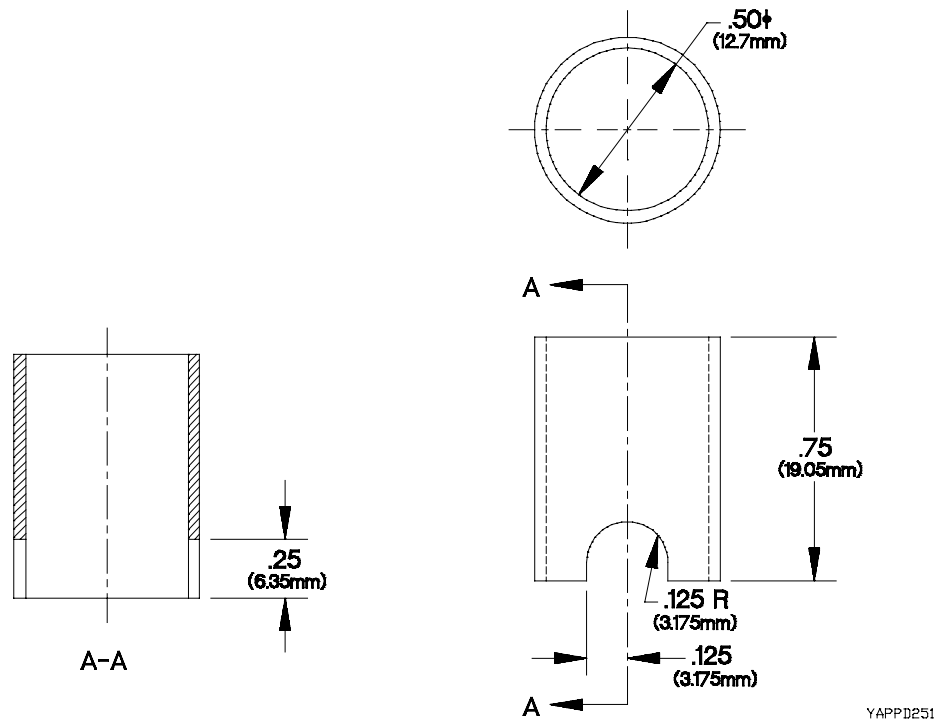


Figure D-25. Main Valve Body Spring Compression Tool

- a. All dimensions are in inches (millimeters).
- b. De-burr and remove sharp edges inside and outside compression tool surface.
- c. Tolerance:
 - 1 place +/- .06
 - 2 place +/- .03
 - 3 place +/- .005
 - angles +/- 2° unless otherwise specified.
- d. Surface texture: 125 $\sqrt{\text{.}}$ unless otherwise specified.

D-15. MARKING SLEEVE FABRICATION

Fabricate marking sleeves according to the following information.

- a. Cut from bulk sleeve material 12414663 FP-301-12.7, 2 inches (5.2 cm).
- b. All dimensions are in inches (centimeters).
- c. Identify by applying the following applicable numbers to the sleeve according to MIL-STD 130.

CAGE CODE PART NUMBER

D-16. M1089 30K WINCH TEST ADAPTER

Assemble the M1089 30K winch test adapter according to the following steps. Refer to the following parts list and **Figure D-26. M1089 30K Winch Test Adapter** for details.

Part Number	Material Description	National Stock Number	Qty
4-4-4 100401BA	Tee, Tube	4730-01-095-3430	1
4-6 100102BA	Adapter, Straight, Pipe to Tube	4730-01-096-9398	1
207P-4	Coupling, Pipe	4730-00-881-1161	1
NB-4-035	Tubing, Nonmetallic	4720-01-071-4042	4 in.
MIL-T-27730	Tape, Antiseizing	8030-00-889-3534	1 roll

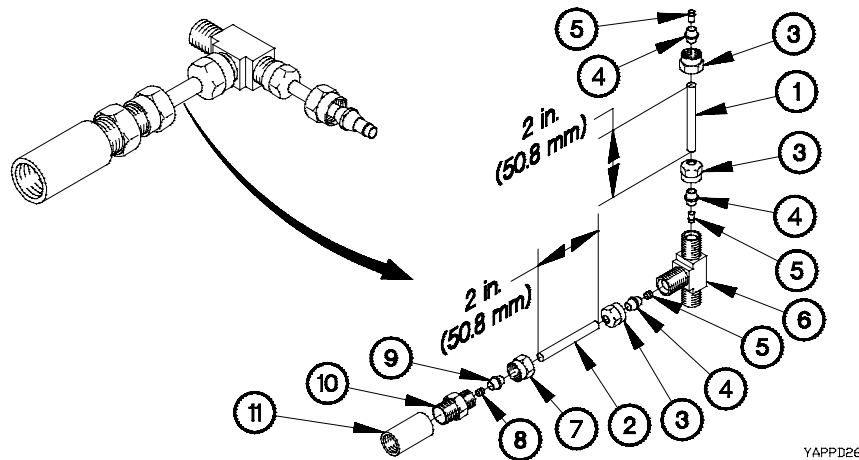


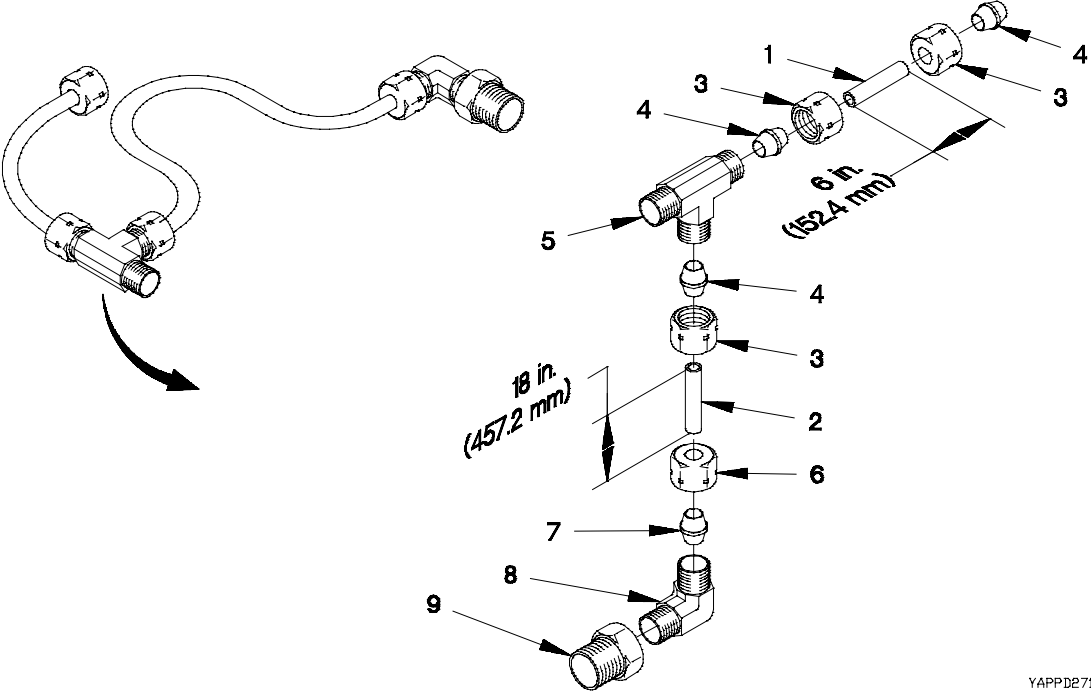
Figure D-26. M1089 30K Winch Test Adapter

- a. All dimensions are in inches (millimeters).
- b. Cut two pieces of nonmetallic tubing (1 and 2) to 2.0 in. (50.8 mm) long.
- c. Remove three nuts (3), sleeves (4), and ferrules (5) from tube tee (6).
- d. Install two nuts (3), sleeves (4), and ferrules (5) on nonmetallic tubing (1).
- e. Install nonmetallic tubing (1) on tube tee (6).
- f. Remove nut (7), sleeve (8), and ferrule (9) from straight adapter (10).
- g. Install two nuts (3 and 7), sleeves (4 and 8), and ferrules (5 and 9) on nonmetallic tubing (2).
- h. Install nonmetallic tubing (2) on tube tee (6).
- i. Install nut (9) on straight adapter (10).
- j. Apply one wrap of antiseizing tape to threads of straight adapter (10).
- k. Install pipe coupling (11) on straight adapter (10).

D-17. M1089 SOLENOID TEST ADAPTER

Assemble the M1089 solenoid test adapter according to the following steps. Refer to the following parts list and **Figure D-27. M1089 Solenoid Test Adapter** for details.

Part Number	Material Description	National Stock Number	Qty
2-2-2 080401CA	Tee, Tube	4730-01-214-6990	1
2-2 080202CA	Elbow, Pipe to Tube	4730-00-845-5345	1
4-2 130140B	Bushing, Pipe	4730-00-828-0171	1
NB-2-031	Tubing, Nonmetallic	4720-01-287-4499	24 in.



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Figure D-27. M1089 Solenoid Test Adapter

- a. All dimensions are in inches (millimeters).
- b. Cut one piece of nonmetallic tubing (1) to 6.0 in. (152.4 mm) long.
- c. Cut one piece of nonmetallic tubing (2) to 18.0 in. (457.2 mm) long.
- c. Remove three nuts (3) and ferrule sleeves (4) from tube tee (5).
- d. Install two nuts (3) and ferrule sleeves (4) on nonmetallic tubing (1).
- e. Install nonmetallic tubing (1) on tube tee (5).
- f. Remove nut (6) and ferrule sleeve (7) from pipe to tube elbow (8).
- g. Install two nuts (3 and 6) and ferrule sleeves (4 and 7) on nonmetallic tubing (2).
- h. Install nonmetallic tubing (2) on tube tee (5).
- i. Install nut (6) on pipe to tube elbow (8).
- j. Install pipe bushing (9) on pipe to tube elbow (8).

D-18. RELAY TEST WIRE

Fabricate relay test wire according to the following information.

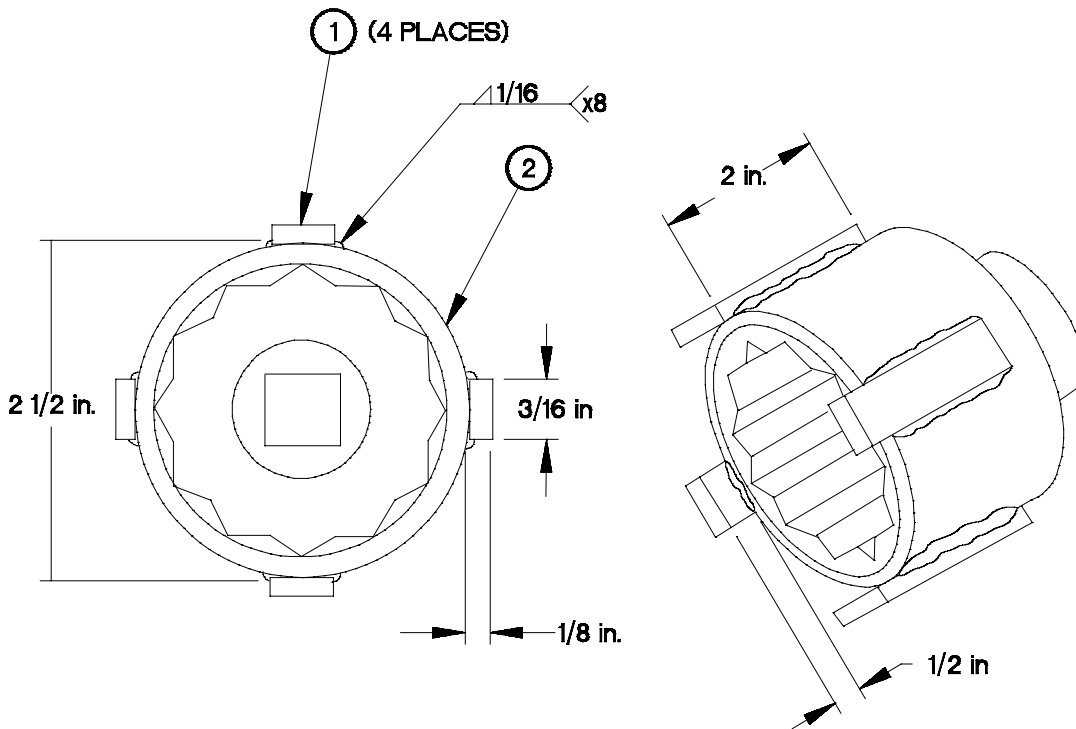
Material Description	National Stock Number	Size	Qty
Wire, Electrical	6145-00-330-3318	6 in. (152.4 mm), 20 AWG	1

- a. All dimensions are in inches (millimeters).
- b. Remove 3/4 in. (19.05 mm) insulation from each end of wire.

D-19. SPANNER SOCKET TOOL

Make the spanner socket tool from any 1/2 inch drive socket that is 2 1/2 inch OD and from 3/16 inch tool steel keystock according to the following instructions. Refer to the parts list and figure for details.

Item	Material Description	Size	Qty
1	Keystock, Tool Steel	3/16 in. X 1/8 in. X 2 in. long	4
2	Socket Wrench Socket	1/2 in. drive X 2 1/2 in. OD	1



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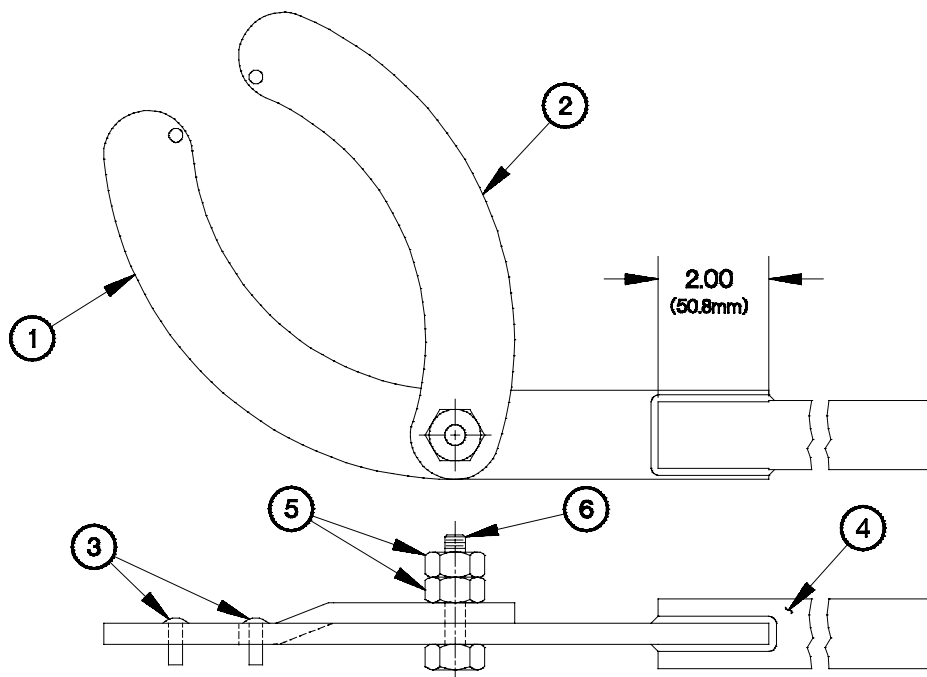
Figure D-28. Spanner Socket Tool

- a. All dimensions are in inches.
- b. To surface of socket (2), weld 2 inch steel keystock (1) in 4 places as shown in **Figure D-28. Spanner Socket Tool**. Ensure keystock extends 1/2 inch beyond socket face.
- c. Remove sharp edges.

D-20. SPANNER WRENCH TOOL

Make the spanner wrench tool from 0.38 in. (1 cm) steel stock and hardware according to the following instructions. Refer to the parts list and figure for details.

Item	Part Name/Number	Material Description	Size	Qty
1	Spanner Handle	Steel, 3/8 flat plate	6.64 in. (168.6 mm) x 11.98 in. (304.3 mm) x 0.38 in. (9.6 mm)	1
2	Spanner Jaw	Steel, 3/8 flat plate	3.05 in. (77.5 mm) x 9.08 in. (230.6 mm) x 0.38 in. (9.6 mm)	1
3	Spanner Pin	Steel, Rod	0.25 in. OD (6.35 mm) x 0.75 in. (19.0 mm) long	2
4	Handle	Steel, pipe	1.25 in. OD (31.75 mm) x 1.00 in. ID (25.4 mm) x 21.00 in. (533.4 mm) long	1
5	Nut	Nut, 3/8 Hex		2
6	Bolt	Bolt, 3/8 X 1.25	0.38 in. (9.6 mm) OD x 1.25 in. (31.75 mm) long	1



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Figure D-29. Spanner Wrench Tool Assembly

- Weld pins (3) in spanner handle (1) and spanner jaw (2) as shown in **Figure D-29. Spanner Wrench Tool Assembly**.
- Position and clamp handle (4) to spanner handle piece (1) as shown in **Figure D-29. Spanner Wrench Tool Assembly**.
- Weld handle to spanner handle on both sides of spanner handle.
- Assemble spanner jaw (2) and spanner handle using bolt (6) and 2 hex nuts (5).

D-20. SPANNER WRENCH TOOL (CONT)

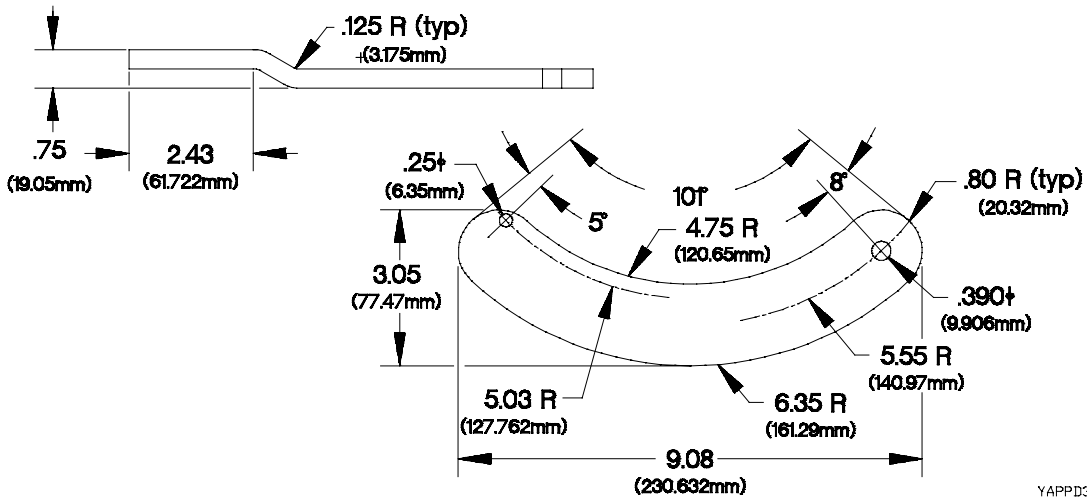


Figure D-30. Spanner Wrench Jaw

- Shape spanner jaw (2) as shown in **Figure D-30. Spanner Wrench Jaw.**
- Drill 0.25 in. (6.35 mm) and 0.39 in. (10.0 mm) diameter holes through as shown in **Figure D-29. Spanner Wrench Jaw.**
- De-burr and remove sharp edges.

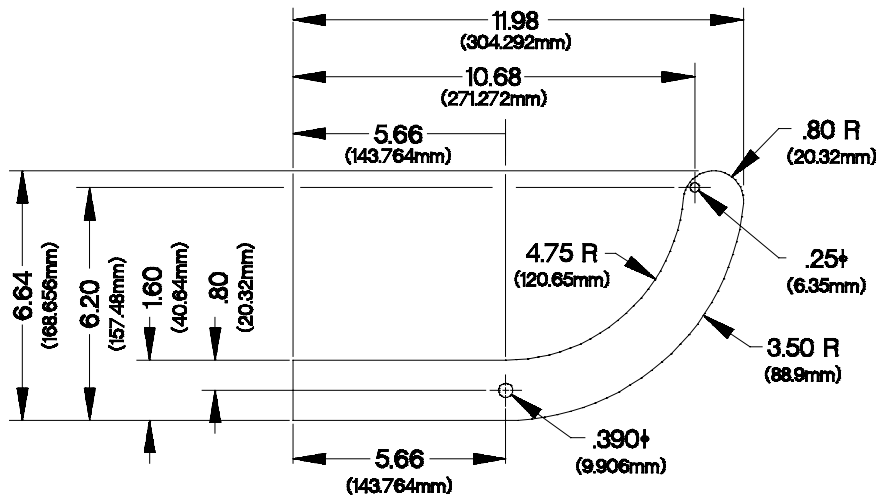


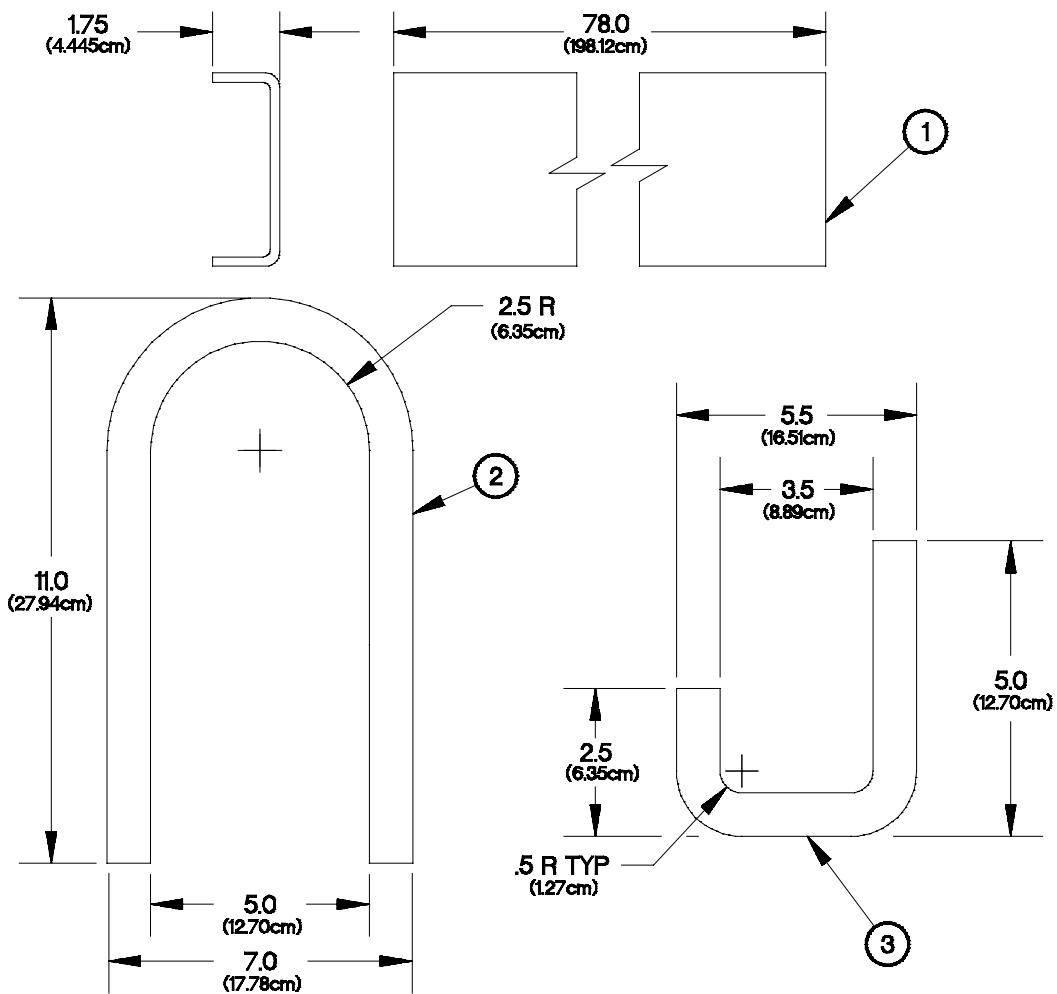
Figure D-31. Spanner Wrench Handle Piece

- Shape spanner handle piece (1) the same as (2) except as shown in **Figure D-31. Spanner Wrench Handle Piece.**
- Drill 0.25 in. (6.35 mm) and 0.39 in. (10.0 mm) diameter holes through as shown in **Figure D-31. Spanner Wrench Handle Piece.**
- Cut slot in handle (4) as shown in **Figure D-31 Spanner Wrench Handle Piece.**
- De-burr and remove sharp edges.

D-21. SPREADER BAR

Make the Spreader Bar for cab removal from steel channel stock and round rod stock according to the following steps. Refer to the parts list table and figure for details.

Item	Part Number	Material Description	Size	Qty
1	N/A	5 inch Channel, steel, ASTM A-36	78.0 in. (198 cm) X 5.00 in. (12.7 cm) X 1.75 in. (4.4 cm) X 0.38 in. (0.96 cm) thick	1
2	N/A	Rod, steel, ASTM A-36	29.0 in. (73.6 cm) X 1.00 in. OD (2.54 cm)	1
3	N/A	Rod, steel, ASTM A-36	13.0 in. (33.0 cm) X 1.00 in. OD (2.54 cm)	2

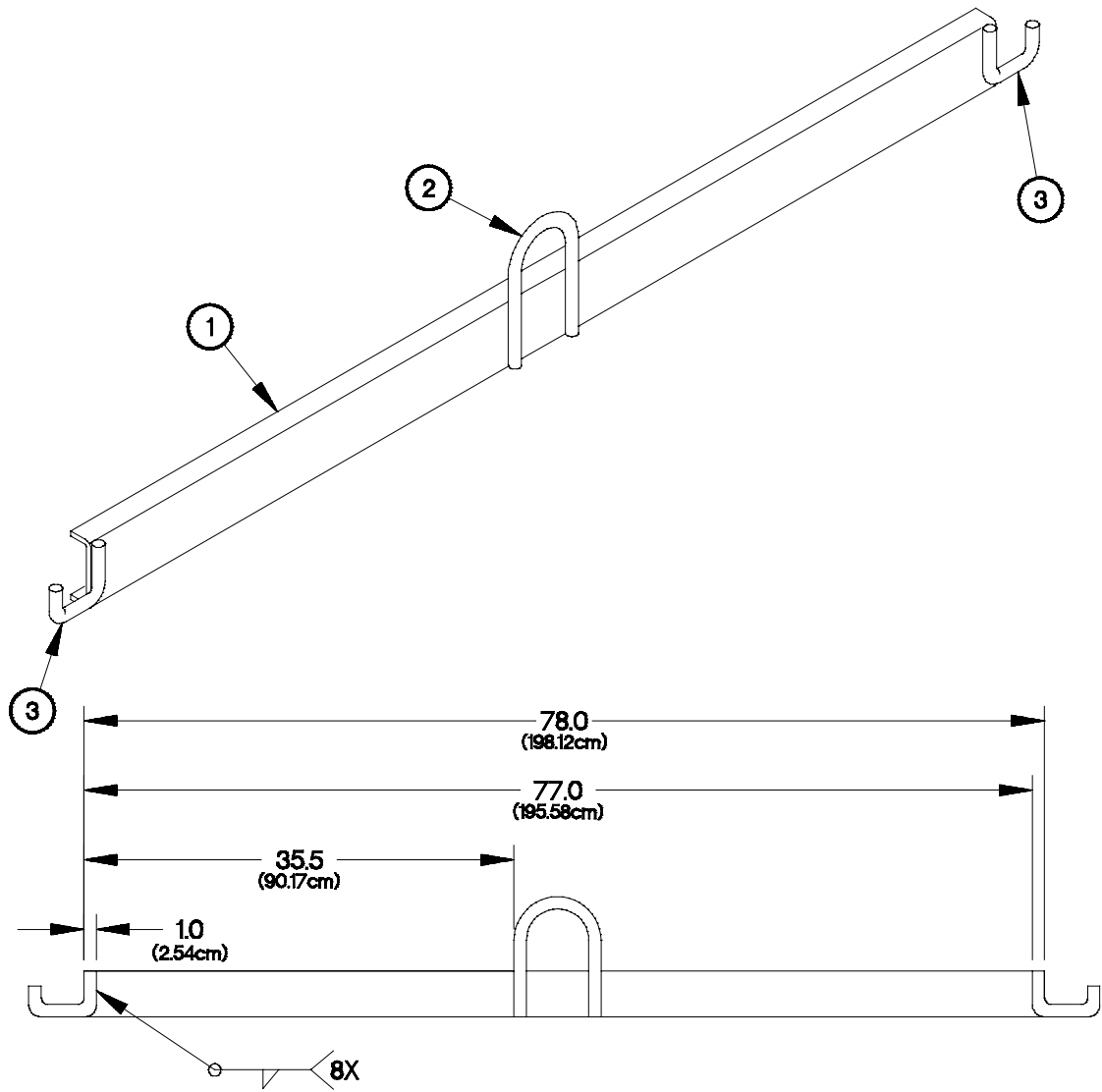


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Figure D-32. Spreader Bar Layout

- All dimensions are in inches (centimeters).
- Heat and bend lift rod (2) to dimensions shown in **Figure D-32. Spreader Bar Layout**.
- Heat and bend two guide rods (3) to dimensions shown in **Figure D-32. Spreader Bar Layout**.
- Cut lift rod (2) and guide rods (3) to final dimensions shown in **Figure D-32 Spreader Bar Layout**.
- De-burr and remove sharp edges.

D-21. SPREADER BAR (CONT)



YAPPD331

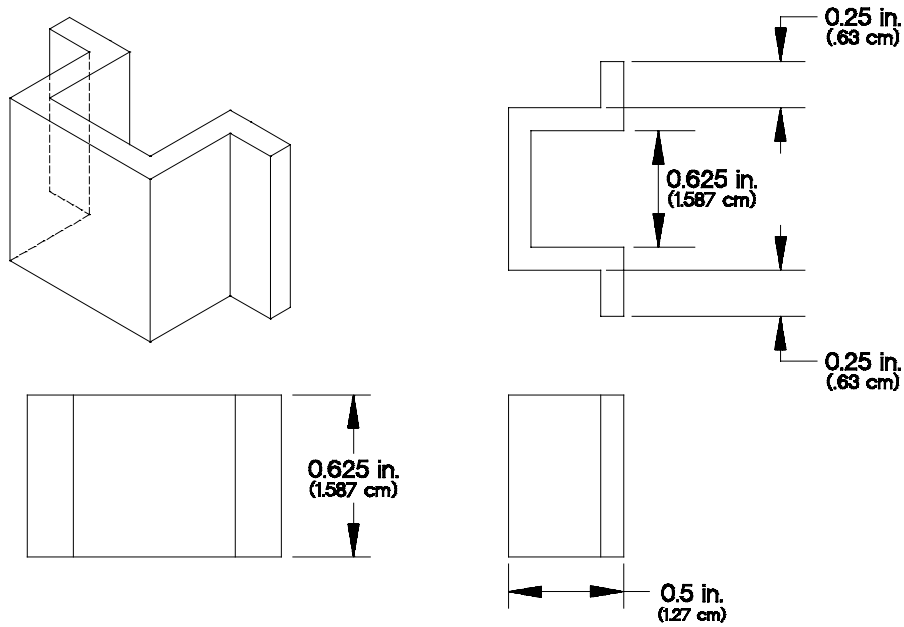
Figure D-33. Spreader Bar Assembly

- f. Position and clamp lift rod (2) and guide rods (3) to steel channel (1) as shown in **Figure D-33. Spreader Bar Assembly**.
- g. Weld lift rod (2) and guide rods (3) to steel channel (1) as shown in **Figure D-33. Spreader Bar Assembly**.
- h. Maximum lifting capacity of the spreader bar is 2040 lbs (926 kgs).

D-22. STEERING STOP SHIM GAGE

Make the steering stop shim gage from steel sheet stock according to the following instructions. Refer to the parts list and figures for details.

Item	Part Number	Material Description	Size	Qty
1	N/A	Steel, sheet .118 in. (0.3 cm) thick	2.361 in. (5.9 cm) X 0.625 in. (1.587 cm) X 0.118 (0.3 cm)	1



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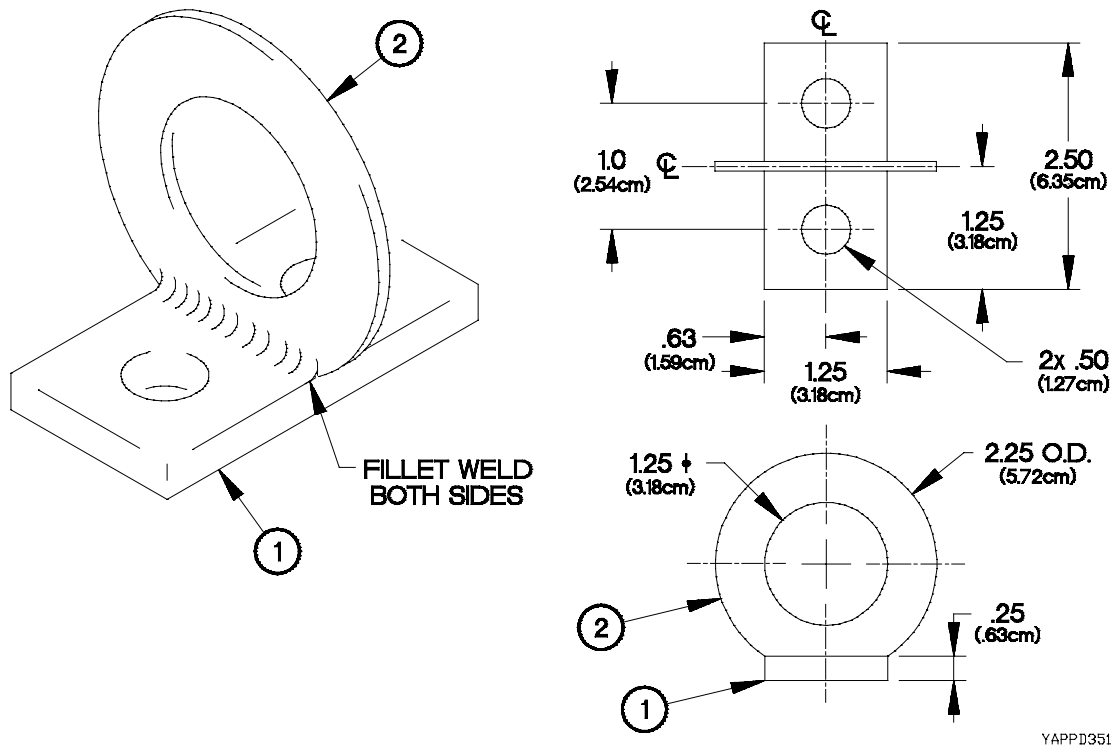
Figure D-34. Steering Stop Shim Gage

- a. All dimensions are in inches (centimeters).
- b. Form and bend steel stock to contours and dimensions shown in **Figure D-34. Steering Stop Shim Gage**.
- c. De-burr and remove sharp edges and corners.

D-23. SWINGDRIVE ASSEMBLY BRACKET

Make the swingdrive assembly bracket from the flat steel bar and flat washer according to the following instructions. Refer to the parts list tables and accompanying figure for details.

Item	Material Description	Size	Qty
1	1/4 in. (0.64 cm) flat steel bar	1.25 in. (3.2 cm) x 2.50 in. (6.4 cm)	1
2	2 1/4 in. (5.7 cm) flat washer	2 1/4 in. OD (5.7 cm) x 1.25 in. ID (3.2)	1



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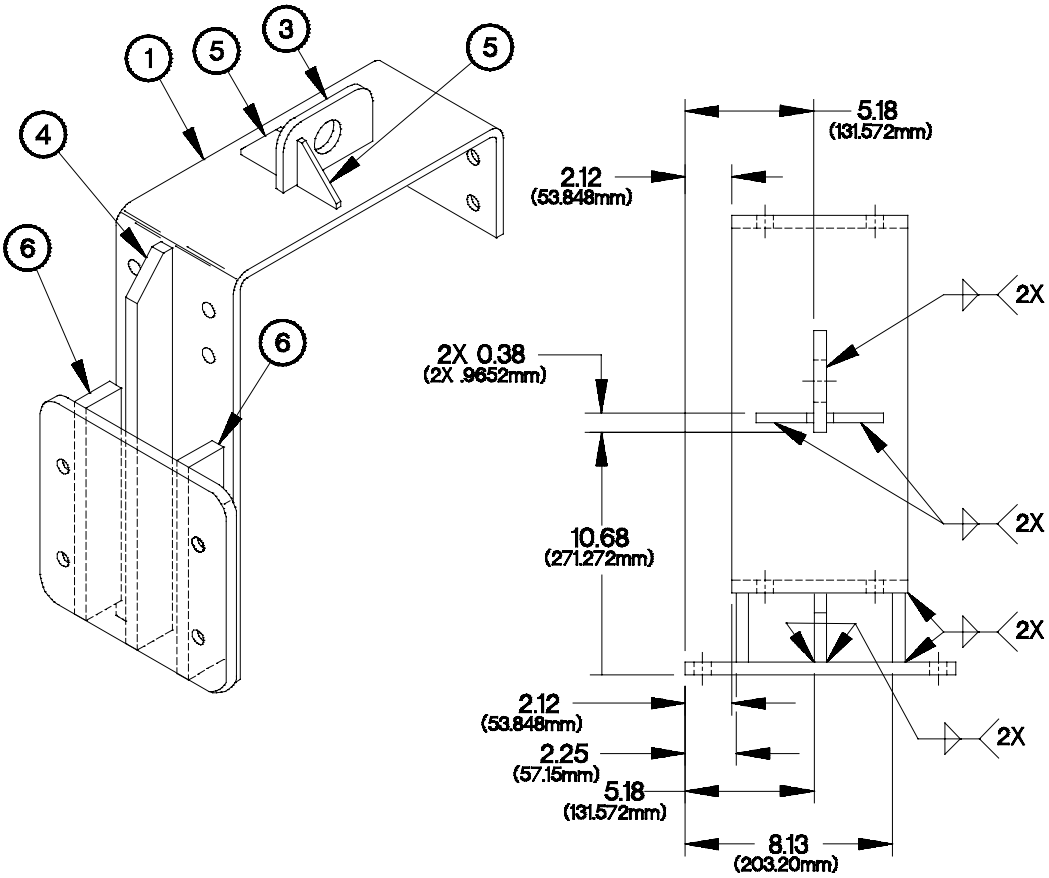
Figure D-35 Swingdrive Assembly Bracket

- All dimensions are in inches (centimeters).
- Fabricate (1) from flat steel bar and flat washer (2) as identified in table.
- Hold tolerances of dimensions given to two decimal places at ± 0.01 in. (± 0.02 cm).
- Drill 0.50 in. (1.3 cm) diameter hole 2 places as shown in **Figure D-35. Swingdrive Assembly Bracket**.
- Grind side of flat washer (2) and weld to flat bar (1) as shown in **Figure D-35. Swingdrive Assembly Bracket**.
- Dimensions shown in **Figure D-35. Swingdrive Assembly Bracket** are for machining and positioning pieces.
- De-burr and remove sharp edges.

D-24. TRANSFER CASE LIFT BRACKET ASSEMBLY

Make the transfer case lift bracket assembly from the main mounting bracket, bolt mounting bracket, lifting and support plates and support brackets according to the following instructions. Refer to the parts list tables and accompanying figures for details.

Item	Part Number	Name/Description	Qty
1	12419141-001	Bracket, Main Mounting	1
2	12419141-002	Bracket, Bolt Mounting	1
3	12419141-003	Plate, Lifting	1
4	12419141-004	Plate, Center Support	1
5	12419141-005	Brace, Lifting Plate	2
6	12319141-006	Support, Bolt Mounting Bracket	2



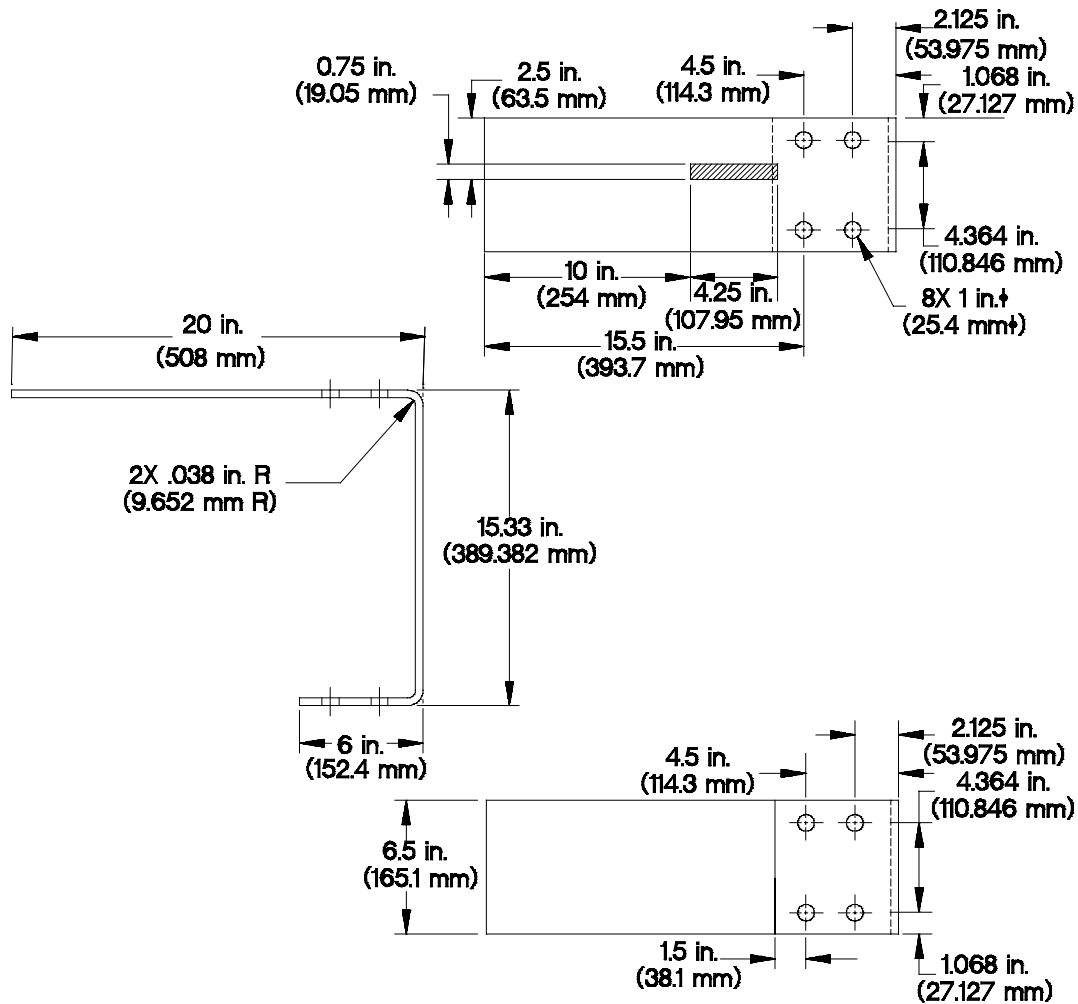
YAPPD361

Figure D-36. Transfer Case Lift Bracket Assembly

- a. All dimensions are in inches (millimeters).
- b. Position items (1 through 6) together as shown by dimensions in **Figure D-36. Transfer Case Lift Bracket Assembly**.
- c. Weld items (1 through 6) together as shown in **Figure D-36. Transfer Case Lift Bracket Assembly**.

D-24. TRANSFER CASE LIFT BRACKET ASSEMBLY (CONT)

Item	Part Number	Material Description	Size	Qty
1	12419141-001	Plate, Steel, ASTM A-36	41.33 in. (1050 mm) x 6.50 in. (165.1 mm) x 0.375 in. (9.6 mm) thick	1

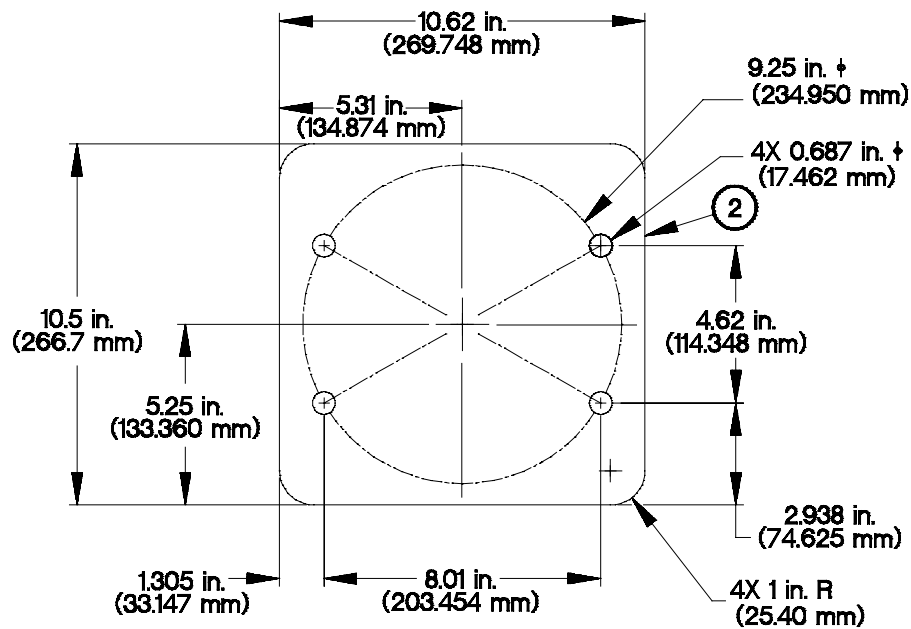


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Figure D-37. Transfer Case Lift Bracket Main Mounting Bracket

- All dimensions are in inches (millimeters).
- Fabricate main mounting bracket (1) from ASTM A-36 steel plate.
- Bend two places 90 degrees at 0.38 in. (9.6 mm) radius as shown in **Figure D-37. Transfer Case Lift Bracket Main Mounting Bracket.**
- All dimensions are after bends are made.
- Drill 1 in. (25.4 mm) diameter hole through 8 places as shown in **Figure D-37. Transfer Case Lift Bracket Main Mounting Bracket.**
- De-burr and remove sharp edges.

Item	Part Number	Material Description	Size	Qty
2	12419141-002	Plate, Steel, ASTM A-36	10.62 in. (269.7 mm) x 10.50 in. (266.7 mm) x 0.375 in. (9.6 mm) thick	1



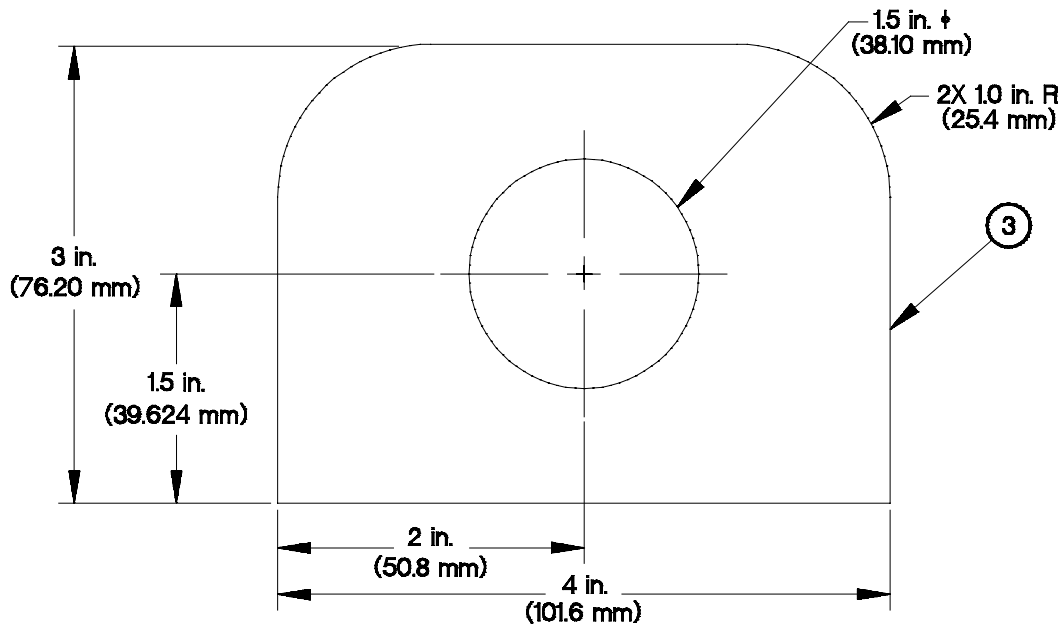
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Figure D-38. Transfer Case Lift Bracket Bolt Mounting Bracket

- All dimensions are in inches (millimeters).
- Fabricate bolt mounting bracket (2) from ASTM A-36 steel plate.
- Drill 11/16 in. (17.5 mm) diameter hole through 4 places on a 9.25 in. (234.9 mm) radius spaced as shown in **Figure D-38. Transfer Case Lift Bracket Bolt Mounting Bracket.**
- Round four corners to 1.0 in. (25.4 mm) radius as shown in **Figure D-38. Transfer Case Lift Bracket Bolt Mounting Bracket.**
- De-burr and remove sharp edges.

D-24. TRANSFER CASE LIFT BRACKET ASSEMBLY (CONT)

Item	Part Number	Material Description	Size	Qty
3	12419141-003	Plate, Steel, ASTM A-36	4.00 in. (101.6 mm) x 3.00 in. (76.2 mm) x 0.50 in. (12.7 mm) thick	1

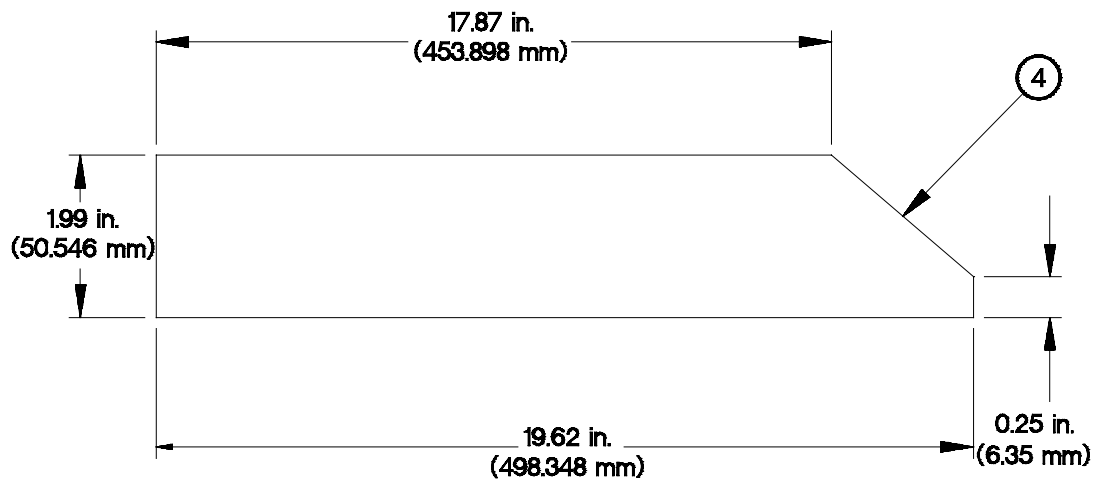


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Figure D-39. Transfer Case Lift Bracket Lifting Plate

- All dimensions are in inches (millimeters).
- Fabricate lifting plate (3) from ASTM A-36 steel plate.
- Drill 1.50 in. (38.1 mm) diameter hole through 1 place as shown in **Figure D-39. Transfer Case Lift Bracket Lifting Plate**.
- Round two corners to 1.0 in. (25.4 mm) radius as shown in **Figure D-39. Transfer Case Lift Bracket Lifting Plate**.
- De-burr and remove sharp edges.

Item	Part Number	Material Description	Size	Qty
4	T12419141-004	Plate, Steel, ASTM A-36	1.99 in. (50.5 mm) x 19.62 in. (498.3 mm) x 0.38 in. (9.6 mm) thick	1



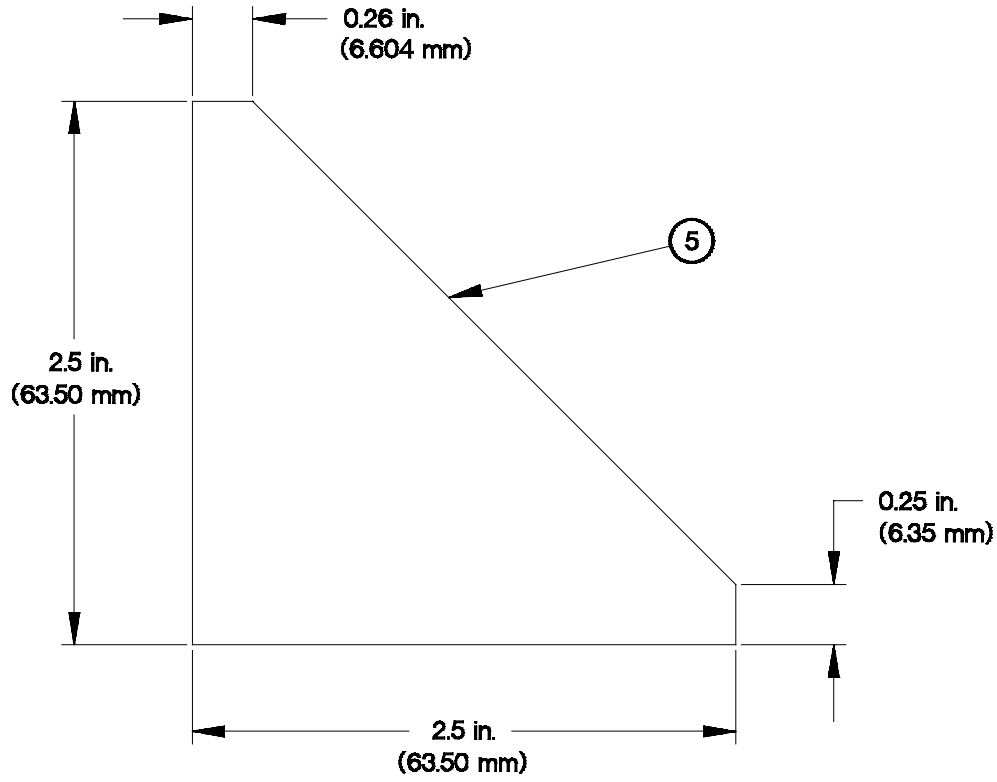
YAPPD401

Figure D-40. Transfer Case Lift Bracket Center Support Plate

- All dimensions are in inches (millimeters).
- Fabricate center support plate (4) from ASTM A-36 steel plate.
- De-burr and remove sharp edges.

D-24. TRANSFER CASE LIFT BRACKET ASSEMBLY (CONT)

Item	Part Number	Material Description	Size	Qty
5	T12419141-005	Plate, Steel, ASTM A-36	2.50 in. (63.5 mm) x 2.50 in. (63.5 mm) x 0.38 in. (9.6 mm) thick	2

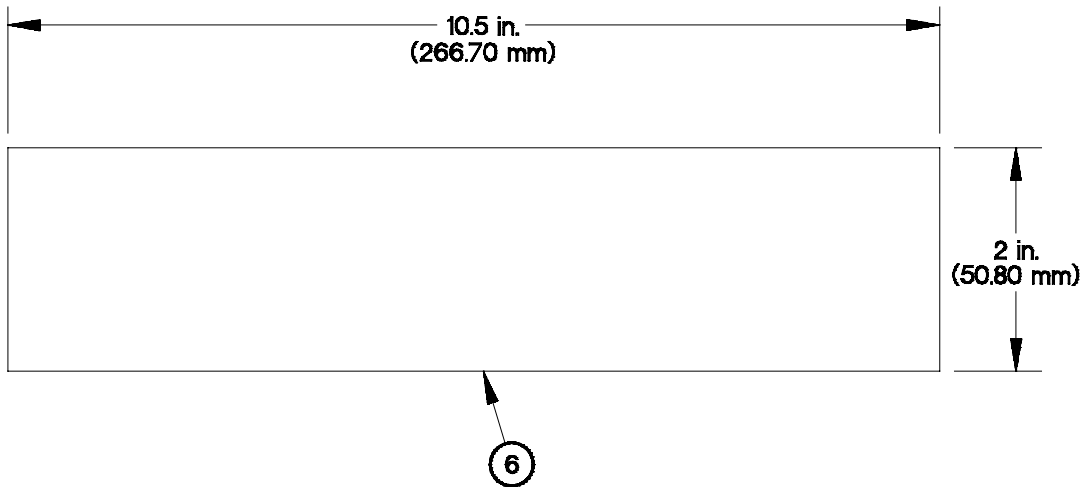


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Figure D-41. Transfer Case Lift Bracket Lifting Plate Braces

- a. All dimensions are in inches (millimeters).
- b. Fabricate two lifting plate braces (5) from ASTM A-36 steel plate.
- c. De-burr and remove sharp edges.

Item	Part Number	Material Description	Size	Qty
6	T12419141-006	Plate, Steel, ASTM A-36	2.00 in. (50.8 mm) x 10.50 in. (266.7 mm) x 0.50 in. (12.7 mm) thick	2



YAPPD421

Figure D-42. Transfer Case Lift Bracket Bolt Mounting Bracket Supports

- a. All dimensions are in inches (millimeters).
- b. Fabricate two bolt mounting bracket supports (6) from ASTM A-36 steel plate.
- c. De-burr and remove sharp edges.

D-25. TRANSMISSION AUXILIARY OIL COOLER RUBBER SEAL

Fabricate transmission auxiliary oil cooler rubber seals in accordance with the following parts list.

Part Number	Description	National Stock Number	Cut Length	
			inches	mm
MIL-R-6130	Tape, Adhesive, Rubber	9320-00-501-7537	24.7	627

D-26. TRANSMISSION LIFT AND MOUNTING BRACKET ASSEMBLY

Make the transmission lift and mounting bracket assembly from the front, rear, and side plates according to the following instructions. Refer to the parts list tables and accompanying figures for details.

Item	Part Number	Name/Description	Qty
1	T12419143-001	Plate, Bottom	1
2	T12419143-002	Plate, Side	2
3	T12419143-003	Plate, Top	1
4	T12419143-004	Brace, Top/Bottom	2
5	T12419143-005	Side Support	4
6	T12319143-006	Plate, Bolt Mounting	2

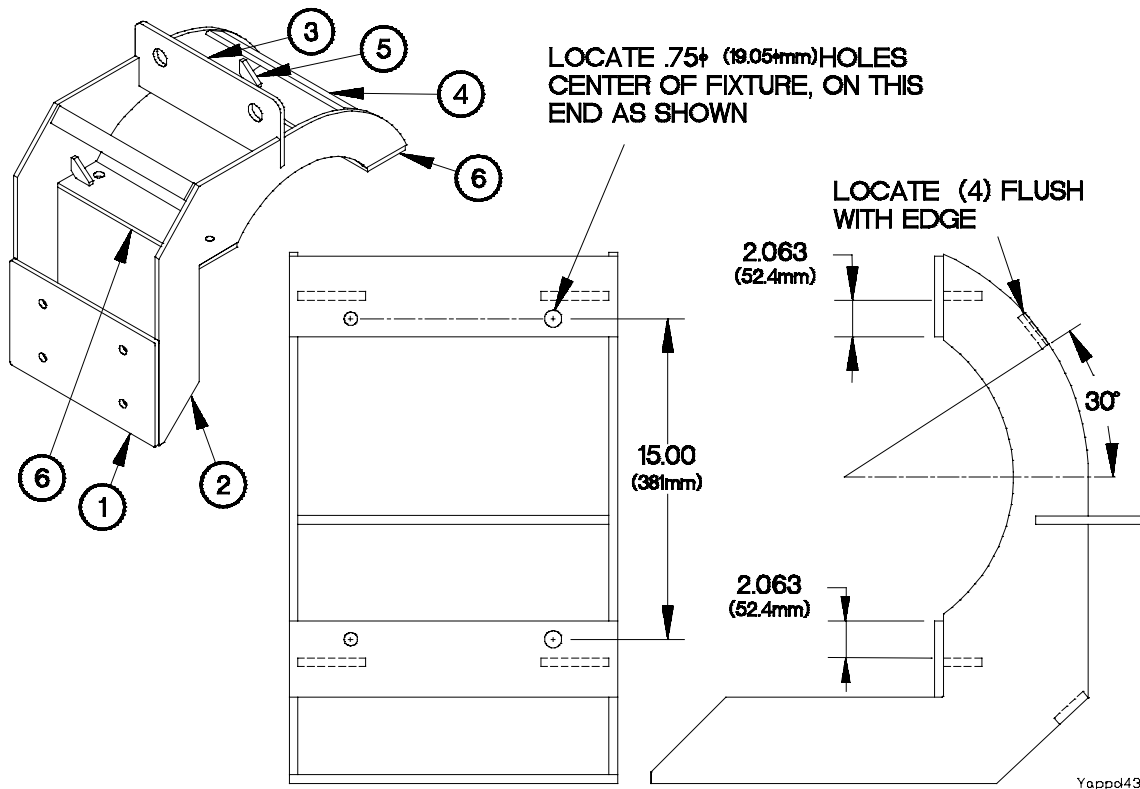
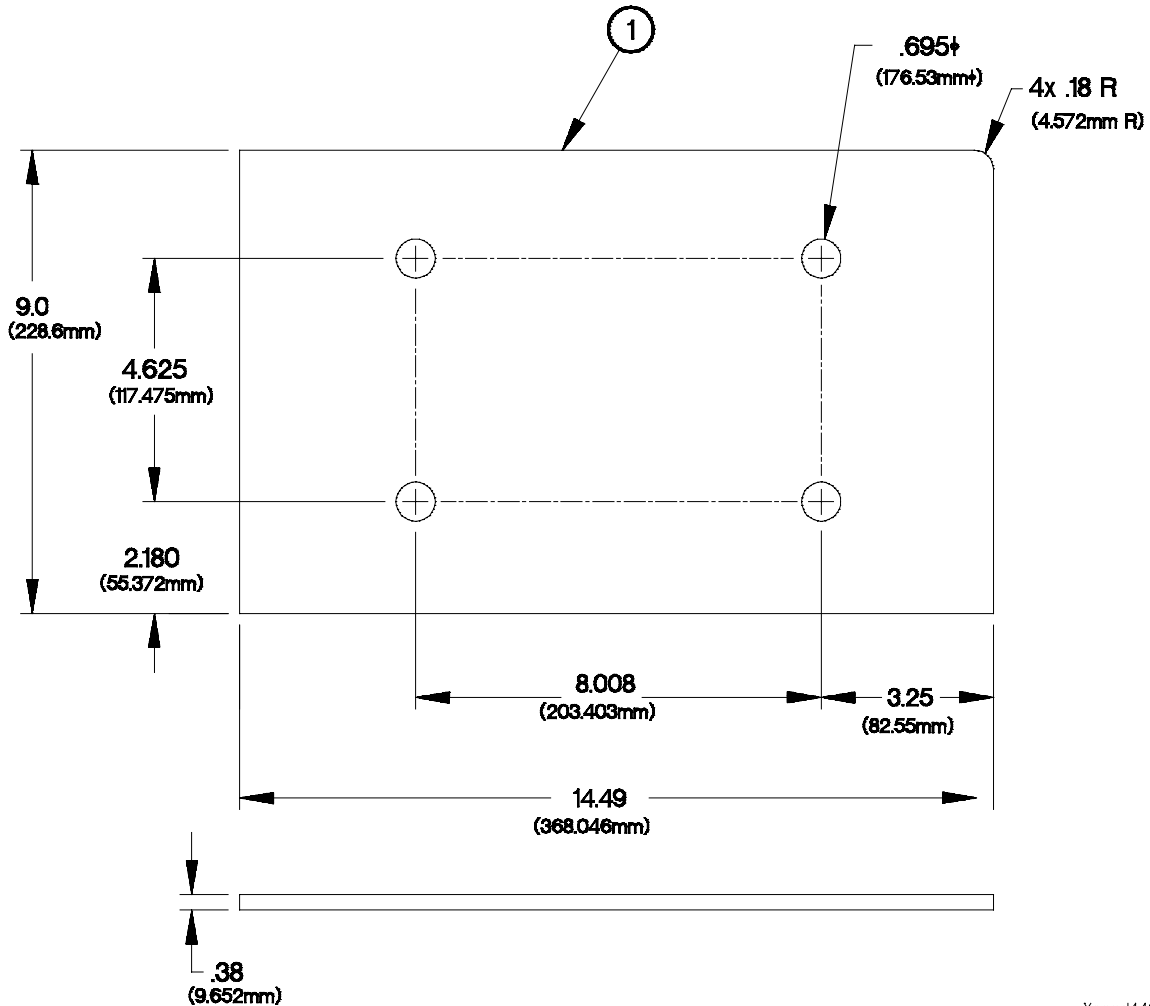


Figure D-43. Transmission Lift and Mounting Bracket Assembly

- All dimensions are in inches (millimeters).
- Position items (1 through 6) together as shown by dimensions in **Figure D-43. Transmission Lift and Mounting Bracket Assembly**.
- Weld items (1 through 6) together as shown by Section A - A in **Figure D-43. Transmission Lift and Mounting Bracket Assembly**.
- Tolerance on dimensions given to two decimal places will be held to ± 0.03 in. (± 0.76 mm).
- Drill $3/4$ in. (19 mm) diameter hole through 2 places in two bolt mounting plates (6) as shown in **Figure D-43. Transmission Lift and Mounting Bracket Assembly**.
- Drill $37/64$ in. (14.7 mm) diameter hole through 2 places in two bolt mounting plates (6) as shown in **Figure D-43. Transmission Lift and Mounting Bracket Assembly**.

Item	Part Number	Material Description	Size	Qty
1	T12419143-001	Plate, Steel, ASTM A-36	14.49 in. (368.05 mm) x 9.0 in. (228.6 mm) x 0.38 in. (9.6 mm) thick	1



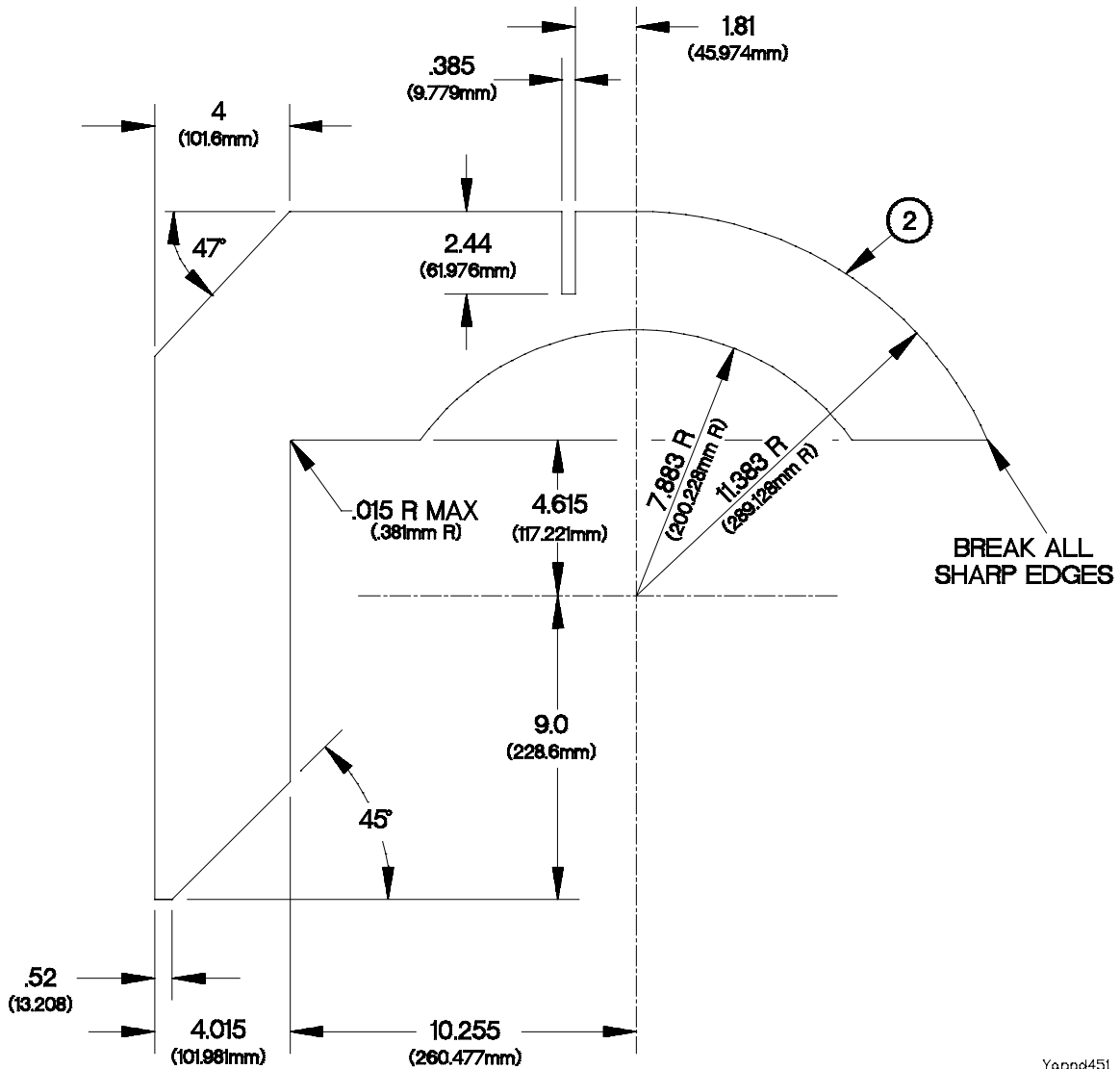
Yappd441

Figure D-44. Transmission Lift and Mounting Bracket Bottom Plate

- All dimensions are in inches (millimeters).
- Fabricate bottom plate (1) from ASTM A-36 steel plate.
- Drill 11/16 in. (17.5 mm) diameter hole through 4 places as shown in **Figure D-44. Transmission Lift and Mounting Bracket Bottom Plate.**
- Round four corners to 0.18 in. (4.6 mm) radius as shown in **Figure D-44. Transmission Lift and Mounting Bracket Bottom Plate.**
- De-burr and remove sharp edges.

D-26. TRANSMISSION LIFT AND MOUNTING BRACKET ASSEMBLY (CONT)

Item	Part Number	Material Description	Size	Qty
2	T12419143-002	Plate, Steel, ASTM A-36	18.75 in. (476.2 mm) x 20.50 in. (520.7 mm) x 0.38 in. (9.6 mm) thick	2

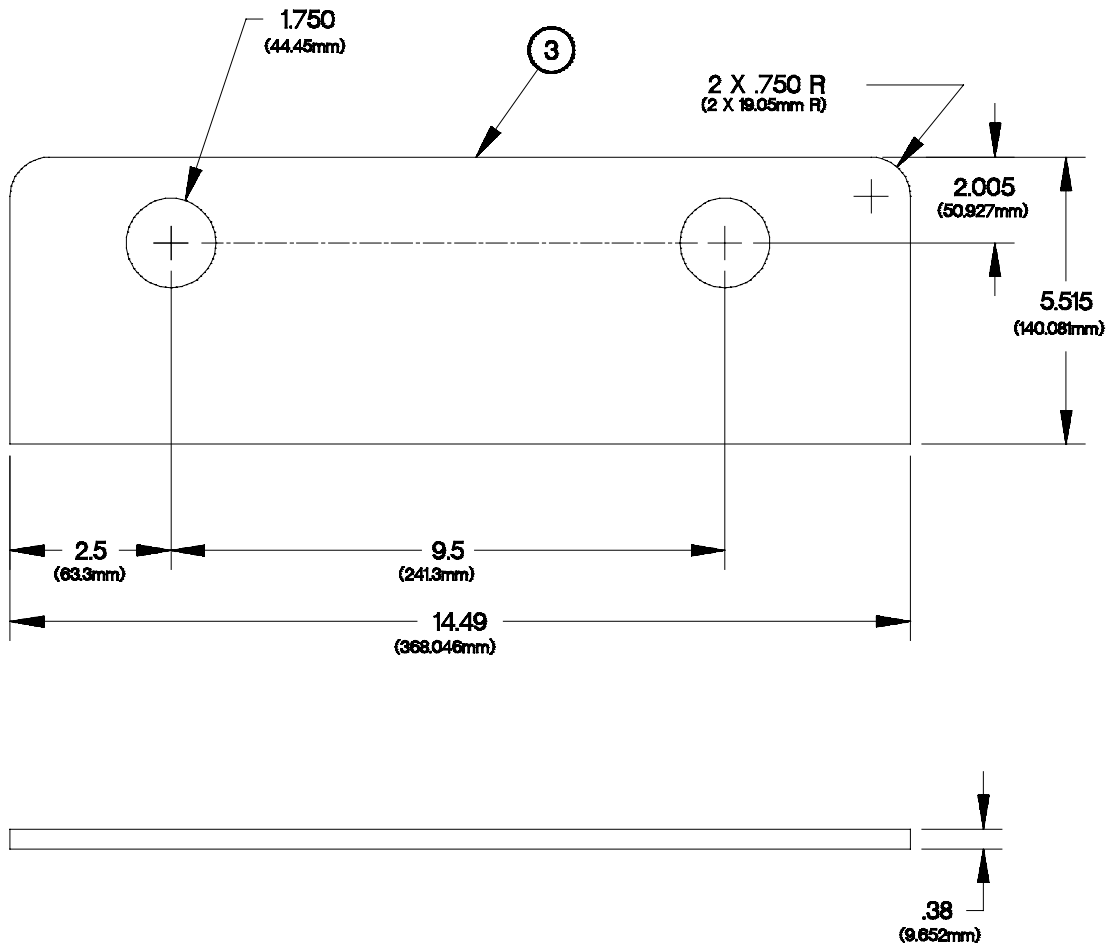


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Figure D-45. Transmission Lift and Mounting Bracket Side Plates

- All dimensions are in inches (millimeters).
- Fabricate two side plates (2) from ASTM A-36 steel plate.
- Cut slot 0.385 in. (9.8 mm) wide X 2.00 in. (50.8 mm) long in each side plate (2) as shown in **Figure D-45. Transmission Lift and Mounting Bracket Side Plates.**
- De-burr and remove sharp edges.

Item	Part Number	Material Description	Size	Qty
3	T12419143-003	Plate, Steel, ASTM A-36	14.49 in. (368 mm) x 5.50 in. (140.1 mm) x 0.38 in. (9.6 mm) thick	2



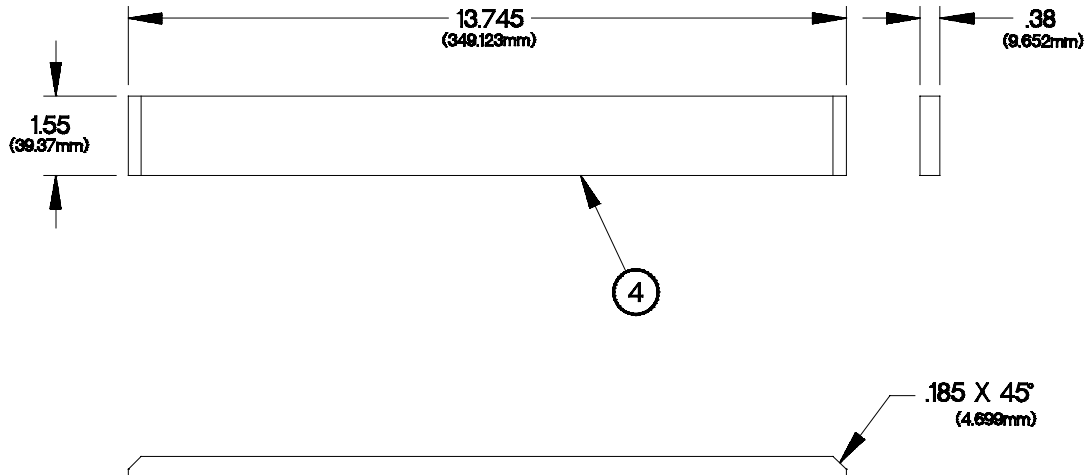
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Figure D-46. Transmission Lift and Mounting Bracket Top Plate

- All dimensions are in inches (millimeters).
- Fabricate top plate (3) from ASTM A-36 steel plate.
- Drill 1-3/4 in. (44.4 mm) diameter hole through 2 places as shown in **Figure D-46. Transmission Lift and Mounting Bracket Top Plate.**
- Round two corners to 0.750 in (19 mm) radius as shown in **Figure D-46. Transmission Lift and Mounting Bracket Top Plate.**
- De-burr and remove sharp edges.

D-26. TRANSMISSION LIFT AND MOUNTING BRACKET ASSEMBLY (CONT)

Item	Part Number	Material Description	Size	Qty
4	T12419143-004	Plate, Steel, ASTM A-36	13.745 in. (349.1 mm) x 1.55 in. (39.4 mm) x 0.38 in. (9.6 mm) thick	2

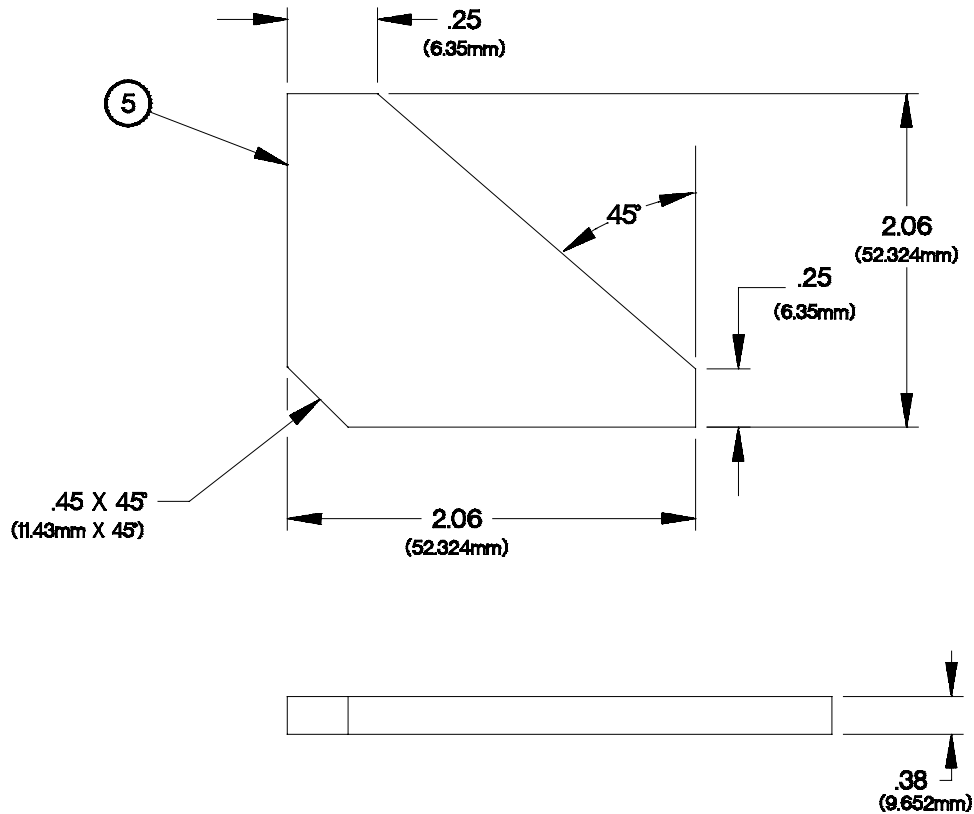


Yappd471

Figure D-47. Tansmission Lift and Mounting Bracket Top and Bottom Braces

- a. All dimensions are in inches (millimeters).
- b. Fabricate top and bottom braces (4) from ASTM A-36 steel plate.
- c. Chamfer two edges of top and bottom braces (4) as shown in **Figure D-47. Tansmission Lift and Mounting Bracket Top and Bottom Braces.**
- d. De-burr and remove sharp edges.

Item	Part Number	Material Description	Size	Qty
5	T12419143-005	Plate, Steel, ASTM A-36	2.06 in. (52.3 mm) x 2.06 in. (52.3 mm) x 0.38 in. (9.6 mm) thick	4



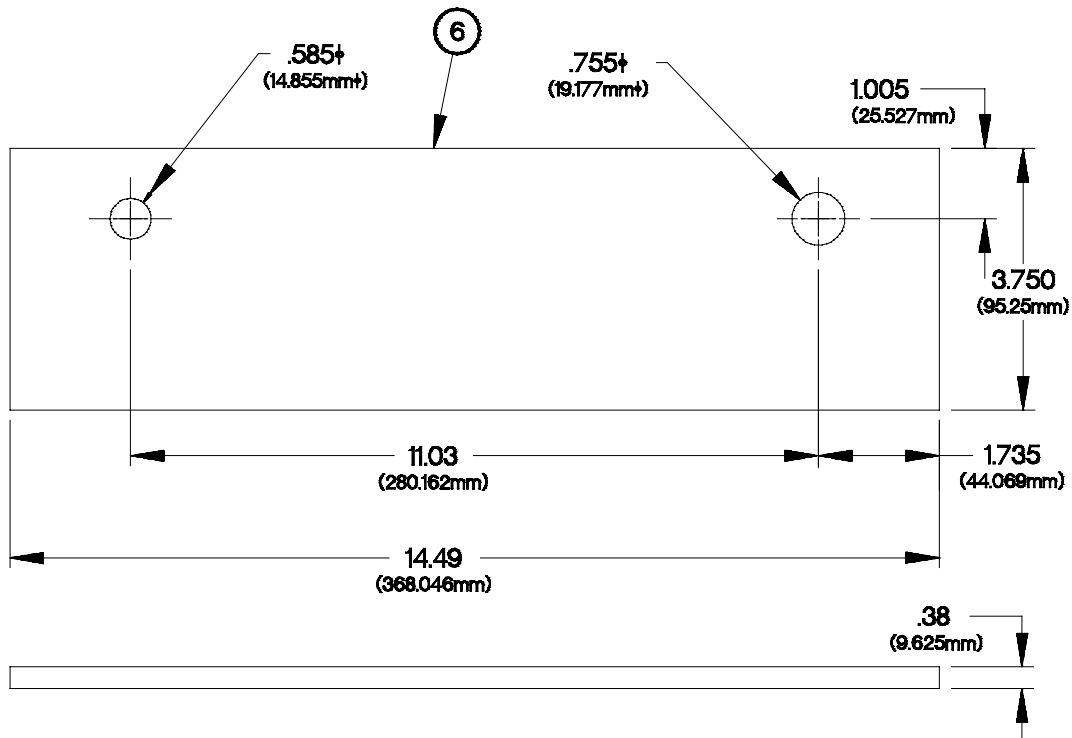
Yappd481

Figure D-48. Transmission Lift and Mounting Bracket Side Supports

- All dimensions are in inches (millimeters).
- Fabricate four side supports (5) from ASTM A-36 steel plate.
- De-burr and remove sharp edges.

D-26. TRANSMISSION LIFT AND MOUNTING BRACKET ASSEMBLY (CONT)

Item	Part Number	Material Description	Size	Qty
6	T12419143-006	Plate, Steel, ASTM A-36	14.49 in. (368 mm) x 3.75 in. (95.2 mm) x 0.38 in. (9.6 mm) thick	2



Yappd491

Figure D-49. Transmission Lift and Mounting Bracket Bolt Mounting Plates

- All dimensions are in inches (millimeters).
- Fabricate two bolt mounting plates (6) from ASTM A-36 steel plate.
- Drill 0.755 in. (19.2 mm) diameter hole through as shown in **Figure D-49. Transmission Lift and Mounting Bracket Bolt Mounting Plates**.
- Drill 0.585 in. (14.8 mm) diameter hole through as shown in **Figure D-49. Transmission Lift and Mounting Bracket Bolt Mounting Plates**.
- De-burr and remove sharp edges.

D-27. TRANSMISSION LIFTING BRACKET

Make the transmission lifting bracket assembly from upper and lower lift brackets according to the following instructions. Refer to the parts lists and accompanying figures for details.

Item	Part Number	Name/Description	Qty
1	1T12419142-001	Bracket, Lower Lift	1
2	1T12419142-002	Bracket, Upper Lift	1

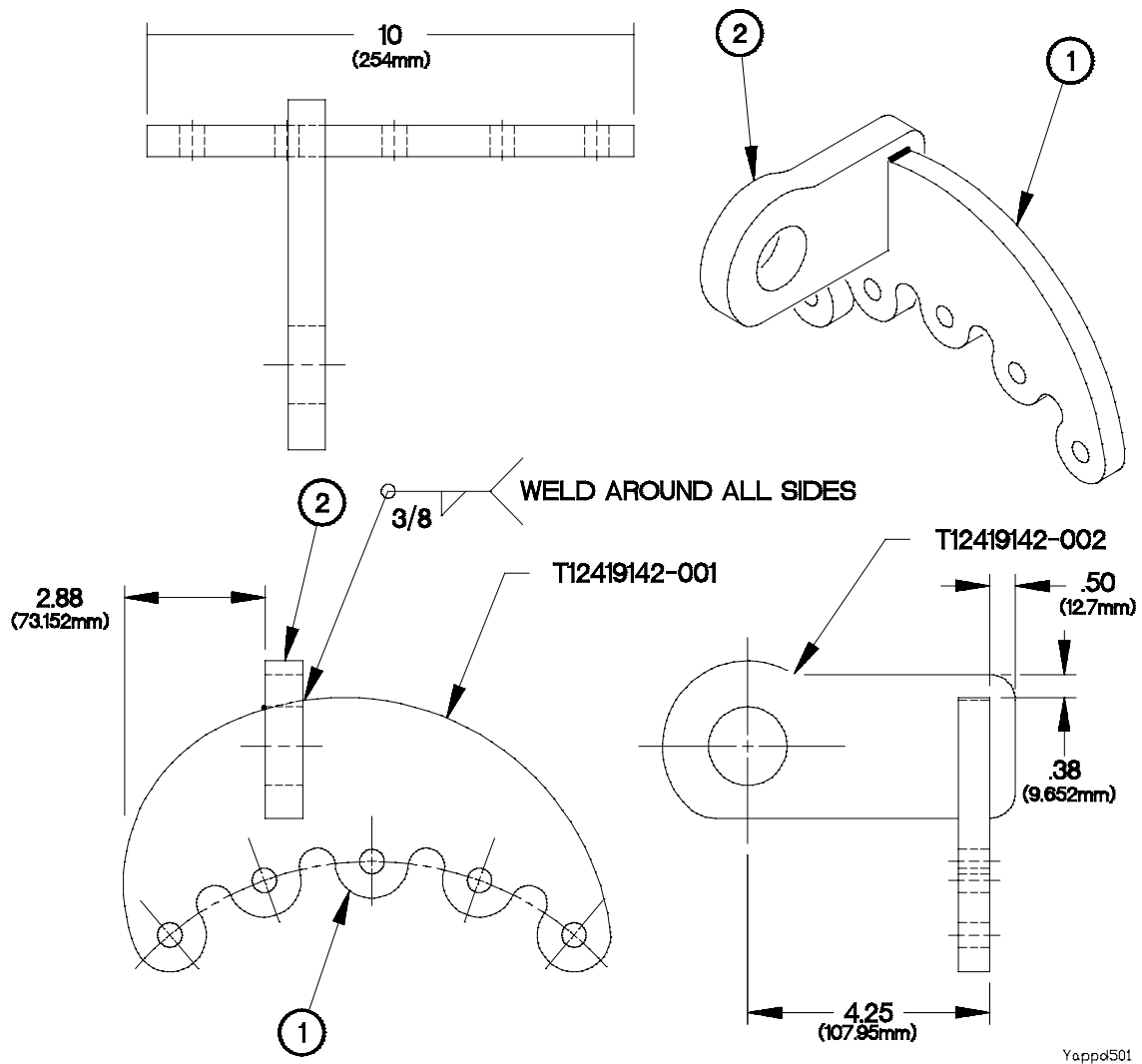
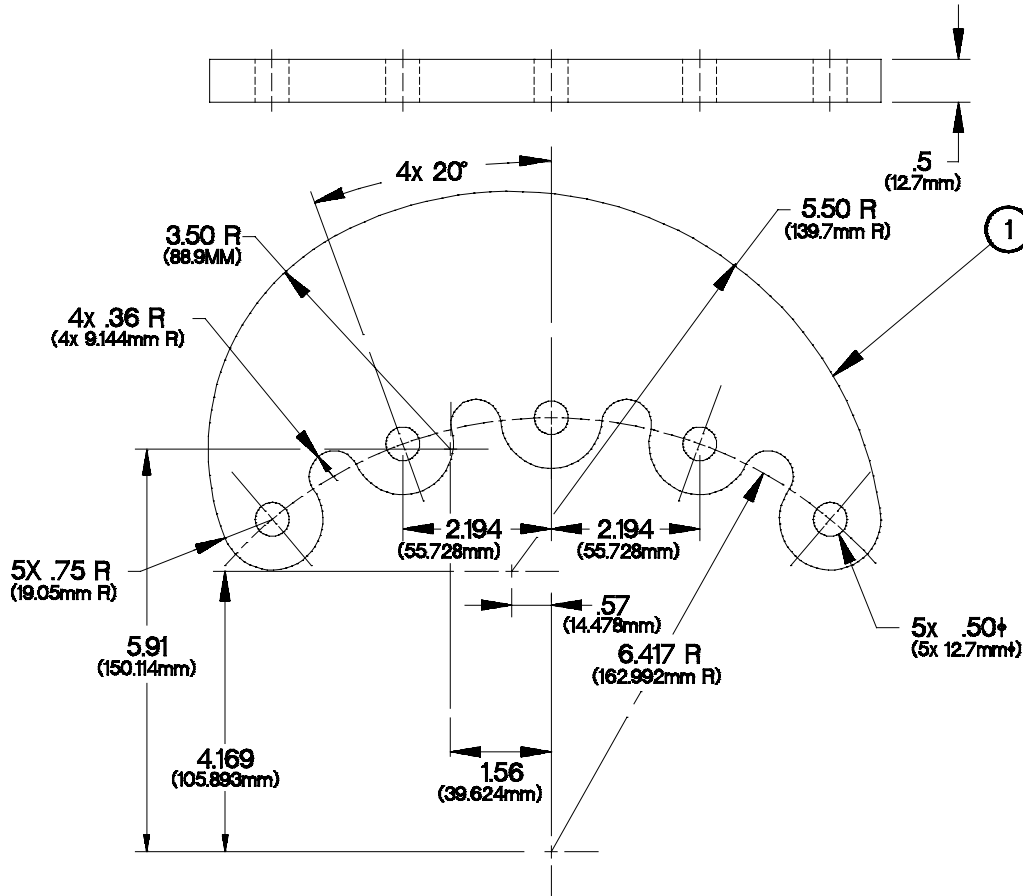


Figure D-50. Transmission Lift Bracket Assembly

- a. All dimensions are in inches (millimeters).
- b. Weld (1) to (2) on both sides in accordance with dimensions in **Figure D-50. Transmission Lift Bracket Assembly**. Weld to be magnetic particle inspected per ASTM E1444. No cracks allowed.

D-27. TRANSMISSION LIFTING BRACKET (CONT)

Item	Part Number	Material Description	Size	Qty
1	T12419142-001	Plate, Steel, ASTM A829, Grade 4130, Hardness Rockwell C28-32	10.08 in. (256 mm) x 5.50 in. (139.7 mm) x 0.50 in. (12.7 mm) thick	1

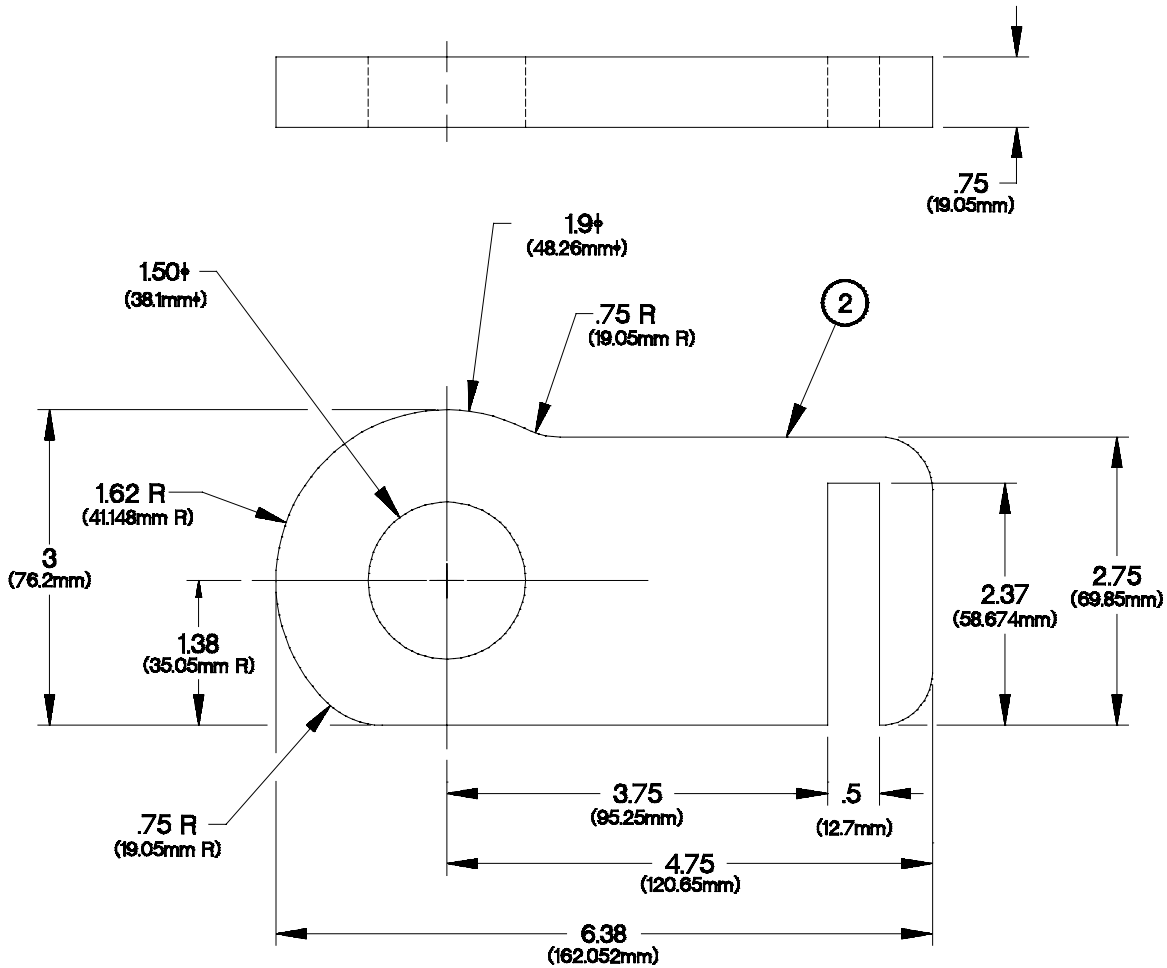


Yapp0511

Figure D-51. Lower Lift Bracket

- All dimensions are in inches (millimeters).
- Fabricate (1) from ASTM A829, Grade 4130, Hardness Rockwell C28-32 steel plate.
- Tolerance on dimensions shown to two decimal places in **Figure D-51. Lower Lift Bracket** will be held to ± 0.01 in. (± 0.25 mm).
- Tolerance on dimensions shown to three decimal places in **Figure D-51. Lower Lift Bracket** are held to ± 0.005 in. (± 0.13 mm).
- Drill 0.50 in. (12.7 mm) diameter hole through 5 places on a 6.417 in. (163 mm) radius equally spaced at 20° apart as identified in **Figure D-51. Lower Lift Bracket**.
- Round piece to 5.50 in. (139.7 mm) radius as shown in **Figure D-51. Lower Lift Bracket**.
- Drill 4 slots 0.37 inch (9.4 mm) diameter on 6.417 in. (163 mm) radius as shown in **Figure D-51. Lower Lift Bracket**.
- De-burr and remove all sharp edges.

Item	Part Number	Material Description	Size	Qty
2	T12419142-002	Plate, Steel, ASTM A829, Grade 4130, Hardness Rockwell C28-32	6.38 in. (162 mm) x 3.50 in. (69.8 mm) x 0.75 in. (19 mm) thick	1



Yappd521

Figure D-52. Upper Lift Bracket

- All dimensions are in inches (millimeters).
- Fabricate (2) from ASTM A829, Grade 4130, Hardness Rockwell C28-32 steel plate.
- Tolerance on dimensions shown as two decimal places in **Figure D-52. Upper Lift Bracket** will be held to ± 0.01 in (± 0.25 mm).
- Drill 1.50 inch (38.1 mm) diameter hole through 1 place as shown in **Figure D-52. Upper Lift Bracket**.
- Cutout slot 0.50 inch (1.27 mm) X 2.37 inch (60.2 mm) 1 place as shown in **Figure D-52. Upper Lift Bracket**.
- De-burr and remove all sharp edges.
- Round off sharp corners and round to radius shown in **Figure D-52. Upper Lift Bracket**.

D-28. WHEEL BEARING SHIM TOOL REST

Fabricate the wheel bearing shim tool rest according to the following steps. Refer to the following parts list for materials.

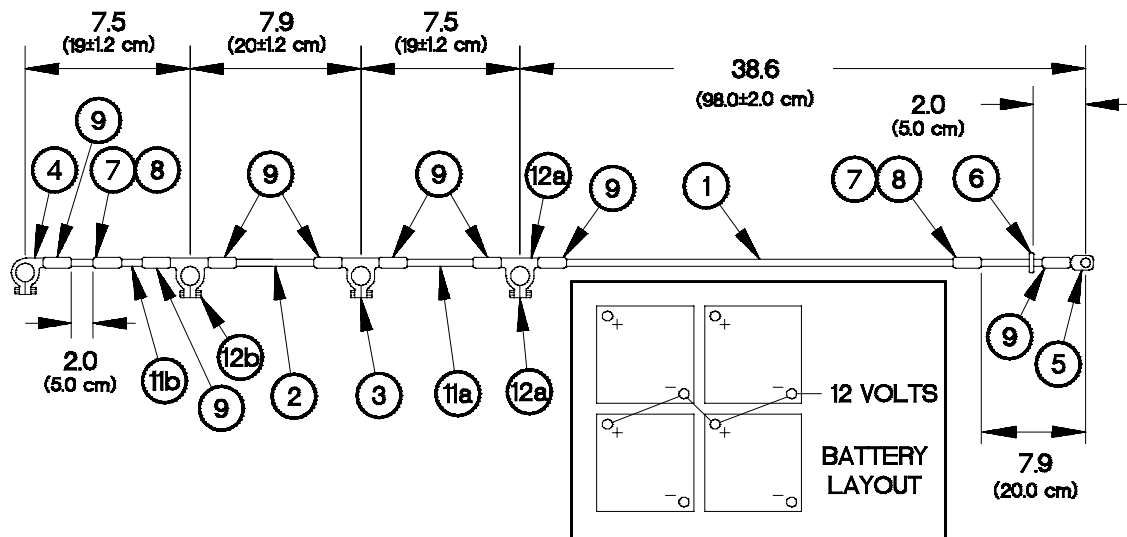
Part Number	National Stock Number	Size
QQ-T-570	9510-00-866-1037	Bar, Metal

- a. Dimensions are in inches (millimeters).
- b. Cut metal bar to 9.0 inches (228.6 mm) long.
- c. De-burr and remove sharp edges from ends of metal bar.

D-29. BATTERY 12V CABLE ASSEMBLY 12378512

Make the Battery 12V Cable Assembly from electrical cable, lug terminals, and sleeves according to the following steps. Refer to the following parts list and **Figure D-53. Battery 12V Cable Assembly** for details. Refer to specification Mil-B-43436 for requirements.

Item	Part Number	Material Description	Size		Qty
			inch	cm	
1	12378873-050	Electrical cable 2 AWG	38.6	98.0	1
2	12378873-050	Electrical cable 2 AWG	7.9	20.0	1
3	12414644-001	Positive Terminal			2
4	12414644-005	Positive Terminal			1
5	M20659-120	Terminal, Lug			1
6	M43436/1-3	Band, Marker			1
7	12414663-006	Sleeve, Band Marker	1.0	2.5	2
8	M23053/5-210C	Sleeve, Cable	1.0	2.5	2
9	M23053/4-3050	Sleeving	1.0	2.5	8
10	12414580	Thermoplastic Adhesive			A/R
11a,b	12378873-050	Electrical cable 2 AWG	7.5	19.0	2
12a,b	12414644-002	Negative Terminal			2



Yapp0531

Figure D-53. Battery 12V Cable Assembly

- a. All dimensions are in inches (centimeters).
- b. Strip 0.69 inch (1.3 cm) insulation from ends of three cables (1, 2 and 11).
- c. Install band marker (6) on cable (1) at position shown in **Figure D-53. Battery 12V Cable Assembly**.
- d. Mark two marker sleeves (7) in ink with characters 1/8 inch (0.3 cm) high, as follows: **19207-12378575**.
- e. Install marker sleeve (7) on cable (1) at position shown in **Figure D-53. Battery 12V Cable Assembly**.
- f. Install marker sleeve (7) on cable (11) at position shown in **Figure D-53. Battery 12V Cable Assembly**.
- g. Install sleeve (8) on cable over marker sleeves (7).
- h. Install sleeve (8) on cable over marker sleeves (7).
- i. Stamp **12V** using metal stamping tools on lug terminal (5). Make sure **12V** is stamped on lug terminal side that can be seen when battery 12V cable assembly is installed on vehicle battery. See battery layout in **Figure D-53. Battery 12V Cable Assembly**.
- j. Stamp a plus (+) sign using metal stamping tools on lug terminals (3 and 4). Make sure (+) is stamped on lug terminal side that can be seen when battery 12V cable assembly is installed on vehicle battery. See battery layout in **Figure D-53. Battery 12V Cable Assembly**.
- k. Stamp a minus (-) sign using metal stamping tools on two lug terminals (12). Make sure (-) is stamped on lug terminal side that can be seen when battery 12V cable assembly is installed on vehicle battery. See battery layout in **Figure D-53. Battery 12V Cable Assembly**.
- l. Install sleeving (9) over each end of cable (1).
- m. Install sleeving (9) over each end of cable (2).
- n. Install sleeving (9) over each end of cable (11a).
- o. Install sleeving (9) over each end of cable (11b).
- p. Insert ends of cable (11a) into lug terminals (12a and 3). Make sure lug terminals are turned so stamped marks on lug terminal sides can be seen when battery 12V cable assembly is installed on vehicle battery. See battery layout in **Figure D-53. Battery 12V Cable Assembly**.
- q. Crimp lug terminals (3 and 12a) to ends of cable (11a).
- r. Insert end of cable (2) into lug terminal (3).
- s. Crimp lug terminal (3) to end of cable (2).
- t. Insert end of cable (2) into lug terminal (12b). Make sure lug terminals are turned so stamped marks on lug terminal sides can be seen when battery 12V cable assembly is installed on vehicle battery. See battery layout in **Figure D-53. Battery 12V Cable Assembly**.
- u. Crimp lug terminal (12b) to end of cable (2).

D-29. BATTERY 12V CABLE ASSEMBLY 12378512 (CONT))

- v. Insert end of cable (11b) into lug terminal (12b).
- w. Crimp lug terminal (12b) to end of cable (11b).
- x. Insert end of cable (11b) into lug terminal (4). Make sure lug terminals are turned so stamped marks on lug terminal sides can be seen when battery 12V cable assembly is installed on vehicle battery. See battery layout in **Figure D-53. Battery 12V Cable Assembly.**
- y. Crimp lug terminal (4) to end of cable (11b).
- z. Insert end of cable (1) into lug terminal (12a).
- za. Crimp lug terminal (12a) to end of cable (1).
- zb. Install lug terminal (5) on end of cable (1). Make sure lug terminal is turned so stamped marks on lug terminal sides can be seen when battery 12V cable assembly is installed on vehicle battery. See battery layout in **Figure D-53. Battery 12V Cable Assembly.**
- zc. Apply thermoplastic adhesive filler (10) to eight sleeveings (9).
- zd. Seal terminal sleeveings (9) over crimp on lug terminals (5) and lug terminals (3, 4 12a and 12b) using thermal heat gun to dry thermoplastic adhesive filler.

D-30. BATTERY GROUND CABLE ASSEMBLY 12378575

Make the Battery Cable Assembly from electrical cable, lug terminals, and sleeves according to the following steps. Refer to the following parts list and **Figure D-54. Battery Ground Cable Assembly** for details. Refer to specification Mil-B-43436 for requirements.

Item	Part Number	Material Description	Size		Qty
			inches	cm	
1	12378873-050	Electrical cable 2 AWG	50.4	128.0	1
2	12378873-050	Electrical cable 2 AWG	11.8	30.0	1
3	12414644-002	Negative Terminal			1
4	12414644-004	Negative Terminal			1
5	M20659-120	Terminal, Lug			1
6	M43436/1-3	Band, Marker			1
7	12414663-006	Sleeve, Band Marker	1.0	2.5	2
8	M23053/5-210C	Sleeve, Cable	1.0	2.5	2
9	M23053/4-3050	Sleeving	1.0	2.5	4
10	12414580	Adhesive Thermoplastic			A/R

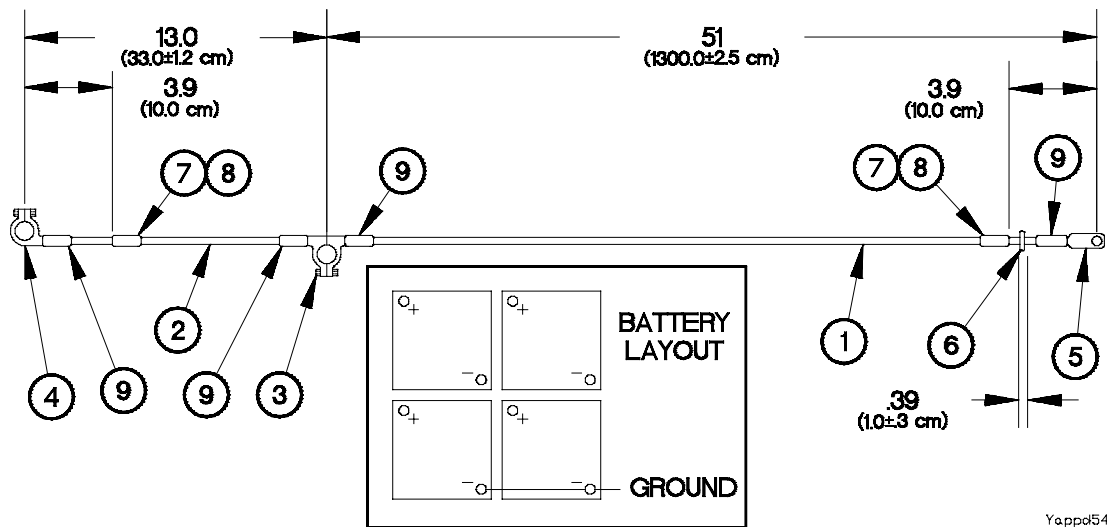


Figure D-54. Battery Ground Cable Assembly

- a. All dimensions are in inches (centimeters).
- b. Strip 0.69 inch (1.8 cm) insulation from ends of cables (1 and 2).
- c. Install band marker (6) on cable (1) at position shown on **Figure D-54. Battery Ground Cable Assembly**.
- d. Mark two marker sleeves (7) in ink with characters 0.13 inch (0.3 cm) high, as follows: **19207-12378575**.
- e. Install marker sleeve (7) on cable (1) at position shown in **Figure D-54. Battery Ground Cable Assembly**.
- f. Install marker sleeve (7) on cable (2) at position shown in **Figure D-54. Battery Ground Cable Assembly**.
- g. Install sleeve (8) on cable (1) over marker sleeve (7).
- h. Install sleeve (8) on cable (2) over marker sleeve (7).
- i. Stamp **Gnd** using metal stamping tools on lug terminal (5). Make sure (**Gnd**) is visible on terminal side that can be seen when battery ground cable assembly is installed on vehicle battery. See battery layout in **Figure D-54. Battery Ground Cable Assembly**.
- j. Stamp a minus sign (-) using metal stamping tools on lug terminals (3 and 4). Make sure (-) is stamped on terminal side that can be seen when battery ground cable assembly is installed on vehicle battery. See battery layout in **Figure D-54. Battery Ground Cable Assembly**.
- k. Install sleeving (9) over each end of cable (1).
- l. Install sleeving (9) over each end of cable (2).
- m. Insert end of cables (1 and 2) into lug terminal (3). Turn lug terminal to make sure stamped mark on lug terminal will be visible when battery ground cable assembly is installed on vehicle battery. See battery layout in **Figure D-54. Battery Ground Cable Assembly**.
- n. Crimp lug terminal (3) to end of cables (1 and 2).
- o. Insert end of cable (2) into lug terminal (4). Turn lug terminal to make sure stamped mark on lug terminal will be visible when battery ground cable assembly is installed on vehicle battery. See battery layout in **Figure D-54. Battery Ground Cable Assembly**.
- p. Crimp lug terminal (4) to end of cable (2).
- q. Insert end of cable (1) into lug terminal (5). Turn lug terminal to make sure stamped mark on lug terminal will be visible when battery ground cable assembly is installed on vehicle battery. See battery layout in **Figure D-54. Battery Ground Cable Assembly**.
- r. Crimp lug terminal (5) to end of cable (1).
- s. Apply thermoplastic adhesive filler (10) to four sleeveings (9).
- t. Seal four sleeveings (9) over crimp on lug terminal (5) and over crimps on lug terminals (3 and 4) using thermal heat gun to dry thermoplastic adhesive filler.

D-31. BATTERY 24V CABLE ASSEMBLY 12378576

Make the Battery 24V Cable Assembly from electrical cable, lug terminals, and sleeves according to the following steps. Refer to the following parts list and **Figure D-55. Battery 24V Cable Assembly** for details. Refer to specification Mil-B-43436 for requirements.

Item	Part Number	Material Description	Size		Qty
			inches	cm	
1	12378873-050	Electrical cable 2 AWG	33.5	85.0	1
2	12378873-050	Electrical cable 2 AWG	11.8	30.0	1
3	12414644-001	Positive Terminal			1
4	12414644-003	Positive Terminal			1
5	M20659-120	Terminal, Lug			1
6	M43436/1-3	Band, Marker			1
7	12414663-006	Sleeve, Band Marker	1.0	2.5	2
8	M23053/5-210C	Sleeve, Cable	1.0	2.5	2
9	M23053/4-3050	Sleeving	1.0	2.5	4
10	12414580	Adhesive Thermoplastic			A/R

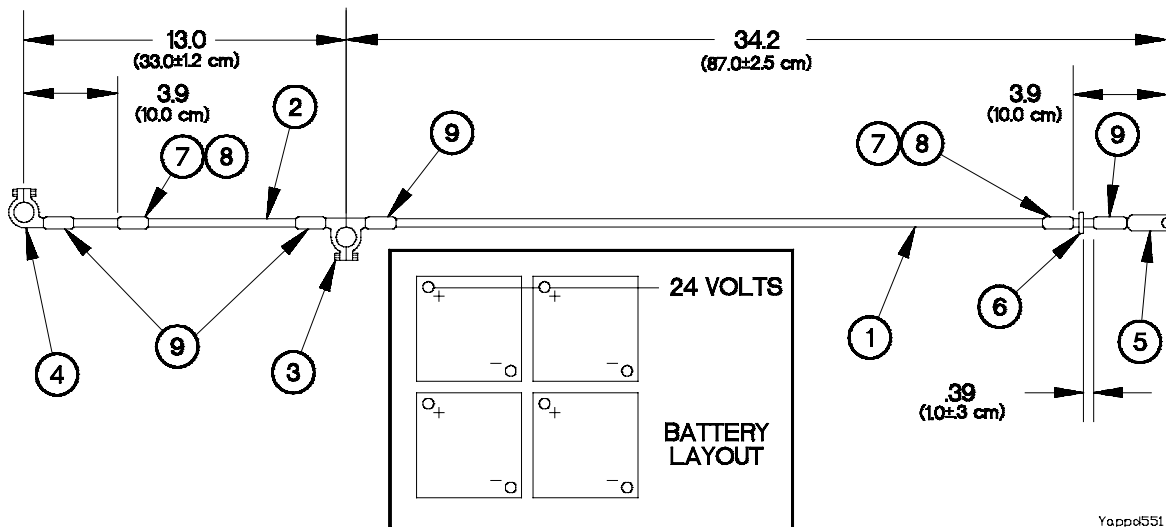


Figure D-55. Battery 24V Cable Assembly

- All dimensions are in inches (centimeters).
- Strip 0.69 inch (1.8 cm) insulation from ends of cables (1 and 2).
- Install band marker (6) on cable (1) at position shown in **Figure D-55. Battery 24V Cable Assembly**.
- Mark two marker sleeves (7) in ink with characters 0.13 inch (0.3 cm) high, as follows: **19207-12378575**.
- Install marker sleeve (7) on cable (1) at position shown in **Figure D-55. Battery 24V Cable Assembly**.
- Install marker sleeve (7) on cable (2) at position shown in **Figure D-55. Battery 24V Cable Assembly**.
- Install sleeve (8) on cable (1) over marker sleeve (7).
- Install sleeve (8) on cable (2) over marker sleeve (7).

- i. Stamp **24V** using metal stamping tools on lug terminal (5). Make sure **24V** is stamped on lug terminal side that can be seen when battery 24V cable assembly is installed on vehicle battery. See battery layout in **Figure D-55. Battery 24V Cable Assembly.**
- j. Stamp a plus sign (+) using metal stamping tools on lug terminals (3 and 4). Make sure (+) is stamped on lug terminal side that can be seen when battery 24V cable assembly is installed on vehicle battery. See battery layout in **Figure D-55. Battery 24V Cable Assembly.**
- k. Install sleeving (9) over each end of cable (1).
- l. Install sleeving (9) over each end of cable (2).
- m. Insert end of cables (1 and 2) into lug terminal (3). Turn lug terminal to make sure stamped marks on lug terminal can be seen when battery 24V cable assembly is installed on vehicle. See battery layout in **Figure D-55. Battery 24V Cable Assembly.**
- n. Crimp lug terminal (3) to ends of cables (1 and 2).
- o. Insert end of cable (2) into lug terminal (4). Turn lug terminal to make sure stamped marks on lug terminal can be seen when battery 24V cable assembly is installed on vehicle battery. See battery layout in **Figure D-55. Battery 24V Cable Assembly.**
- p. Crimp lug terminal (4) to end of cable (2).
- q. Insert end of cable (1) into lug terminal (5). Turn lug terminal to make sure stamped marks on lug terminal can be seen when battery 24V cable assembly is installed on vehicle battery. See battery layout in **Figure D-55. Battery 24V Cable Assembly.**
- r. Crimp lug terminal (5) to end of cable (1).
- s. Apply thermoplastic adhesive filler (10) to four sleeveings (9).
- t. Seal four sleeveings (9) over crimp on lug terminal (5) and over crimps on lug terminals (3 and 4) using thermal heat gun to dry thermoplastic adhesive filler.

D-32. DOUBLE-SIDED TAPE 12420265X2

Make from P/N 4940(52152) X 2 inches (5.0 cm)

D-33. BLOCK SEAL 12420489 FABRICATION

Make block seal from P/N (0VXY8) STN2.38X.5. Use a suitable cutting tool to cut seal to 0.52 inch (1.3 cm) long.

D-34. AIR DUCT HOSE FABRICATION 12412332

Cut air duct lengths from bulk hose NB-4-035 using a fine-toothed hacksaw or suitable cutting device. The following table identifies the hoses and the lengths to which they are cut.

Hose Part Number	Cut Length
12412332-003	3 in. (7.62 cm)
12412332-012	12 in. (30.48 cm)
12412332-040	40 in. (101.6 cm)
12412332-048	48 in. (121.92 cm)
12412332-066	66 in. (167.64 cm)
12412332-096	96 in. (243.84 cm)
12412332-180	180 in. (457.20 cm)

D-35. NON-METALLIC FLEX CONDUIT FABRICATION 12412367

Cut conduit lengths from bulk conduit part number 68707-R using a small toothed hacksaw or suitable cutting device. The following table lists the conduit part numbers and the lengths of the cut pieces.

12412367-038	38 (96.52)	12412367-094	94 (238.76)
12412367-046	46 (116.84)	12412367-178	178 (452.12)
12412367-064	64 (162.56)		

D-36. PNEUMATIC TUBES FABRICATION

Cut pneumatic tubes from bulk tubing stock listed **Table D-1. Pneumatic Tube Lengths**. Use a fine-toothed hacksaw or suitable cutting device and cut tubing to required length.

Table D-1. Pneumatic Tube Lengths

Tube Part Number	Bulk Tubing Part Number	Cut Length	
		inches	cm
12414690-001	NT-100-4 (79470)	18.1	46.0
12414690-002	NT-100-4 (79470)	16.0	40.6
12414690-003	NT-100-4 (79470)	15.0	38.1
12414690-004	NT-100-4 (79470)	74.8	190.0
12414690-005	NT-100-4 (79470)	69.7	177.0
12414690-006	NT-100-4 (79470)	239.0	607.0
12414690-007	NT-100-4 (79470)	254.8	647.0
12414690-008	NT-100-4 (79470)	286.3	727.0
12414690-009	NT-100-4 (79470)	394.1	747.0
12414690-010	NT-100-4 (79470)	180.0	457.2
12414690-101	J844TYBSIZE 3/8 (81343)	18.0	45.7
12414690-102	J844TYBSIZE 3/8 (81343)	35.4	90.0
12414690-103	J844TYBSIZE 3/8 (81343)	20.9	53.0
12414690-104	J844TYBSIZE 3/8 (81343)	13.8	35.0
12414690-105	J844TYBSIZE 3/8 (81343)	11.8	30.0
12414690-106	J844TYBSIZE 3/8 (81343)	20.5	52.0
12414690-107	J844TYBSIZE 3/8 (81343)	39.0	99.0
12414690-108	J844TYBSIZE 3/8 (81343)	15.4	39.0
12414690-109	J844TYBSIZE 3/8 (81343)	23.0	58.4
12414690-112	J844TYBSIZE 3/8 (81343)	80.0	198.0
12414690-113	J844TYBSIZE 3/8 (81343)	11.4	29.0
12414690-115	J844TYBSIZE 3/8 (81343)	82.8	210.2
12414690-118	J844TYBSIZE 3/8 (81343)	11.8	30.0
12414690-120	J844TYBSIZE 3/8 (81343)	11.9	30.2
12414690-125	J844TYBSIZE 3/8 (81343)	10.8	27.3
12414690-129	J844TYBSIZE 3/8 (81343)	39.3	99.7

Table D-1. Pneumatic Tube Lengths (Cont)

Tube Part Number	Bulk Tubing Part Number	Cut Length	
		inches	cm
12414690-129	J844TYBSIZE 3/8 (81343)	39.3	99.7
12414690-130	J844TYBSIZE 3/8 (81343)	164.4	417.5
12414690-131	J844TYBSIZE 3/8 (81343)	180.1	457.5
12414690-132	J844TYBSIZE 3/8 (81343)	219.5	557.5
12414690-133	J844TYBSIZE 3/8 (81343)		
12414690-134	J844TYBSIZE 3/8 (81343)	277.4	704.5
12414690-135	J844TYBSIZE 3/8 (81343)	325.0	825.5
12414690-136	J844TYBSIZE 3/8 (81343)	332.5	844.6
12414690-137	J844TYBSIZE 3/8 (81343)	51.0	129.5
12414690-138	J844TYBSIZE 3/8 (81343)	67.0	170.2
12414690-139	J844TYBSIZE 3/8 (81343)	98.5	250.2
12414690-140	J844TYBSIZE 3/8 (81343)	106.0	269.2
12414690-141	J844TYBSIZE 3/8 (81343)	52.5	133.4
12414690-142	J844TYBSIZE 3/8 (81343)	68.5	174.0
12414690-143	J844TYBSIZE 3/8 (81343)	100.0	254.0
12414690-144	J844TYBSIZE 3/8 (81343)	107.5	273.0
12414690-145	J844TYBSIZE 3/8 (81343)		
12414690-146	J844TYBSIZE 3/8 (81343)	267.3	679.0
12414690-147	J844TYBSIZE 3/8 (81343)	283.1	719.0
12414690-148	J844TYBSIZE 3/8 (81343)	314.6	799.0
12414690-149	J844TYBSIZE 3/8 (81343)	322.4	819.0
12414690-150	J844TYBSIZE 3/8 (81343)	296.1	752.0
12414690-151	J844TYBSIZE 3/8 (81343)	343.5	872.5
12414690-152	J844TYBSIZE 3/8 (81343)	36.0	91.5
12414690-153	J844TYBSIZE 3/8 (81343)	32.0	81.3
12414690-154	J844TYBSIZE 3/8 (81343)	48.0	122.0
12414690-155	J844TYBSIZE 3/8 (81343)	79.5	202.0
12414690-156	J844TYBSIZE 3/8 (81343)	87.0	221.0
12414690-157	J844TYBSIZE 3/8 (81343)	59.5	151.1
12414690-158	J844TYBSIZE 3/8 (81343)	66.5	169.0
12414690-159	J844TYBSIZE 3/8 (81343)	98.0	249.0
12414690-160	J844TYBSIZE 3/8 (81343)	105.5	268.0
12414690-161	J844TYBSIZE 3/8 (81343)	48.0	122.0
12414690-162	J844TYBSIZE 3/8 (81343)	36.0	91.5
12414690-163	J844TYBSIZE 3/8 (81343)	161.5	410.2
12414690-164	J844TYBSIZE 3/8 (81343)	120.0	304.8
12414690-165	J844TYBSIZE 3/8 (81343)	78.0	198.1
12414690-166	J844TYBSIZE 3/8 (81343)	108.0	274.3
12414690-167	J844TYBSIZE 3/8 (81343)	168.0	426.7

Table D-1. Pneumatic Tube Lengths (Cont)

Tube Part Number	Bulk Tubing Part Number	Cut Length	
		inches	cm
12414690-168	J844TYBSIZE 3/8 (81343)	108.0	274.3
12414690-169	J844TYBSIZE 3/8 (81343)	72.0	182.9
12414690-201	C608-100BLK (13174)	14.8	37.5
12414690-202	C608-100BLK (13174)	14.1	35.7
12414690-203	C608-100BLK (13174)	6.5	16.5
12414690-205	C608-100BLK (13174)	14.5	36.8
12414690-206	C608-100BLK (13174)	14.8	37.7
12414690-207	C608-100BLK (13174)	15.6	39.5
12414690-208	C608-100BLK (13174)	6.7	17.0
12414690-209	C608-100BLK (13174)	19.5	49.5
12414690-210	C608-100BLK (13174)	15.5	39.3
12414690-211	C608-100BLK (13174)	8.0	20.3
12414690-212	C608-100BLK (13174)	17.0	43.0
12414690-215	C608-100BLK (13174)	163.0	414.0
12414690-216	C608-100BLK (13174)	160.0	406.4
12414690-217	C608-100BLK (13174)	62.6	159.0
12414690-218	C608-100BLK (13174)	119.8	304.2
12414690-219	C608-100BLK (13174)	69.0	175.3
12414690-220	C608-100BLK (13174)	45.5	115.6
12414690-221	C608-100BLK (13174)	12.6	32.0
12414690-222	C608-100BLK (13174)	5.5	14.0
12414690-223	C608-100BLK (13174)	14.6	37.1
12414690-224	C608-100BLK (13174)	170.0	431.8
12414690-225	C608-100BLK (13174)	174.0	442.0
12414690-228	C608-100BLK (13174)	3.5	8.9
12414690-229	C608-100BLK (13174)	62.2	158.1
12414690-230	C608-100BLK (13174)	14.6	37.0
12414690-231	C608-100BLK (13174)	60.5	153.7
12414690-232	C608-100BLK (13174)	126.4	321.0
12414690-233	C608-100BLK (13174)	142.1	361.0
12414690-234	C608-100BLK (13174)		
12414690-235	C608-100BLK (13174)		
12414690-236	C608-100BLK (13174)	131.9	355.0
12414690-237	C608-100BLK (13174)	147.6	375.0
12414690-238	C608-100BLK (13174)	179.5	456.0
12414690-239	C608-100BLK (13174)	187.0	475.0
12414690-240	C608-100BLK (13174)	111.5	283.2
12414690-241	C608-100BLK (13174)	127.5	324.0
12414690-242	C608-100BLK (13174)	159.0	404.0
12414690-243	C608-100BLK (13174)	166.5	423.0

Table D-1. Pneumatic Tube Lengths (Cont)

Tube Part Number	Bulk Tubing Part Number	Cut Length	
		inches	cm
12414690-244	C608-100BLK (13174)	41.0	104.2
12414690-245	C608-100BLK (13174)	57.0	144.8
12414690-246	C608-100BLK (13174)	88.6	225.0
12414690-247	C608-100BLK (13174)	96.0	244.0
12414690-248	C608-100BLK (13174)	48.0	122.0
12414690-249	C608-100BLK (13174)	54.0	137.2
12414690-301	PFT-10B-BLK-100 (61424)	19.0	48.3
12414690-302	PFT-10B-BLK-100 (61424)	56.0	142.2
12414690-303	PFT-10B-BLK-100 (61424)	118.1	300.0

D-37. PNEUMATIC HOSE ASSEMBLY FABRICATION

Make pneumatic hose assemblies by cutting hose lengths from bulk hose using a fine-toothed hacksaw or suitable cutting device and assembling to end fittings. The following hose table list the assemblies and the components from which the assemblies are made.

Hose Assembly Part Number	Bulk Hose Part Number	Cutoff Length in inches (cm)	Fitting A	Fitting B
12420062-008	J30R2Type1 1/2 ID	61. (155.0)	8-8 3014xx 3/4-16	8-8 3001xx 3/4-16
12420062-009	J30R2Type1 1/2 ID	79. (200.6)	8-8 3014xx 3/4-16	8-8 3001xx 3/4-16
12420062-010	J30R2Type1 1/2 ID	97. (246.3)	8-8 3014xx 3/4-16	8-8 3001xx 3/4-16
12420062-011	4720-00-912-3092	100. (254.0)	6-6 3014xx 5/8-18	6-6 3001xx 5/8-18
12420062-012	J30R2Type1 1/2 ID	120. (304.8)	8-8 3014xx 3/4-16	8-8 3001xx 3/4-16
12420062-013	4720-00-912-3092	120. (304.8)	8-8 3014xx 5/8-16	8-8 3001xx 5/8-16
12420062-014	J30R2Type1 1/2 ID	58. (147.4)	8-8 3014xx 3/4-16	8-8 3001xx 3/4-16
12420062-016	4720-00-912-3092	128. (325.2)	6-6 3014xx 5/8-18	6-6 3001xx 5/8-18
12420062-017	J30R2Type1 1/2 ID	12.8 (325.2)	8-8 3014xx 3/4-16	8-8 3001xx 3/4-16
12420063-002	J30R2Type1 1/2 ID	39. (99.1)	8-8 3014xx 3/4-16	8-8 1501-1/2 NPTF
12420063-004	J30R2Type1 1/2 ID	37. (94.0)	8-8 3014xx 3/4-16	8-8 1501-1/2 NPTF
12420064-001	4720-00-912-3092	25. (63.5)	4-4 3001xx 7/16-20	4-4 3001xx 7/16-20
12420064-002	4720-00-912-3092	30. (76.2)	4-4 3001xx 7/16-20	4-4 3001xx 7/16-20
12420064-003	4720-00-912-3092	116. (294.7)	4-4 3001xx 7/16-20	4-4 3001xx 7/16-20
12420064-004	4720-00-912-3092	107. (271.8)	4-4 3001xx 7/16-20	4-4 3001xx 7/16-20
12420064-006	J30R2Type1 1/2 ID	13. (34.0)	8-8 3001xx 3/4-16	8-8 3001xx 3/4-16
12420064-007	4720-00-143-9390	15. (37.8)	6-6 3002xx 5/8-18	6-6 3002xx 5/8-18
12420064-008	J30R2Type1 1/2 ID	14. (35.6)	8-8 3001xx 3/4-16	8-8 3001xx 3/4-16
12414694-X508	4720-00-095-1011	20. (50.8)	300166 5/8-18 UNF	150166 3/8 NPTF
12414694-X558	4720-00-095-1011	22. (55.8)	300166 5/8-18 UNF	150166 3/8 NPTF

D-38. NON-METALLIC ELECTRICAL CABLE CONDUIT FABRICATION

Make conduit to cover electrical cables described on 1241638 from bulk tube stock listed in **Table D-2. Non-Metallic Electrical Cable Conduit Lengths**. Use a fine-toothed hacksaw or suitable cutting device and cut hose/tube to required length.

Table D-2. Non-Metallic Electrical Cable Conduit Lengths

Tube Part Number	Bulk Tube Part Number	Cut Length	
		inch	cm
12416381P1	49008	8.9	22.6
12416381P10	49008	17.8	45.2
12416381P11	49008	29.9	75.9
12416381P12	49008	33.0	83.8
12416381P13	49008	13.9	35.3
12416381P14	49008	4.0	10.2
12416381P15	49008	17.4	44.2
12416381P16	49008	3.2	8.1
12416381P17	49008	4.5	11.4
12416381P2	49008	16.2	41.1
12416381P20	27413	32.8	83.3
12416381P21	27413	9.2	23.4
12416381P22	27413	8.0	20.3
12416381P23	27413	23.3	59.2
12416381P26	49008	2.5	6.4
12416381P3	27413	7.3	18.5
12416381P30	49007	17.0	43.2
12416381P32	49005	1.7	4.3
12416381P34	49005	20.7	52.6
12416381P35	49005	21.8	55.4
12416381P36	49005	5.5	14.0
12416381P37	49005	8.0	20.3
12416381P38	49008	3.7	9.4
12416381P4	49008	12.0	30.5
12416381P5	49008	26.0	66.0
12416381P6	49008	7.7	19.6
12416381P7	49008	26.7	67.8
12416381P8	49008	5.2	13.2
12416381P9	49008	16.8	42.7

D-39. COMPRESSOR HOSE FABRICATION 12417926

Cut compressor hoses from bulk hose using a fine-toothed hacksaw or suitable cutting device. Assemble the cut hoses to the fittings. The following table lists the hoses and the components from which the assemblies are made.

Hose Assembly Part Number	Bulk Hose Part Number	Cutoff Length in inches (cm)	Fitting A	Fitting B
12417926-001	SAE 100R14-10	110 (279.4)	SAE 30011010	SAE 30011010
12417926-002	SAE 100R14-10	16.5 (41.9)	SAE 30011010	SAE 30011010
12417926-004	SAE 100R14-4	16.5 (41.9)	SAE 300144	SAE 300144

D-40. STEERING GEAR RETURN HOSE AND TRANSMISSION OIL COOLER HOSES FABRICATION

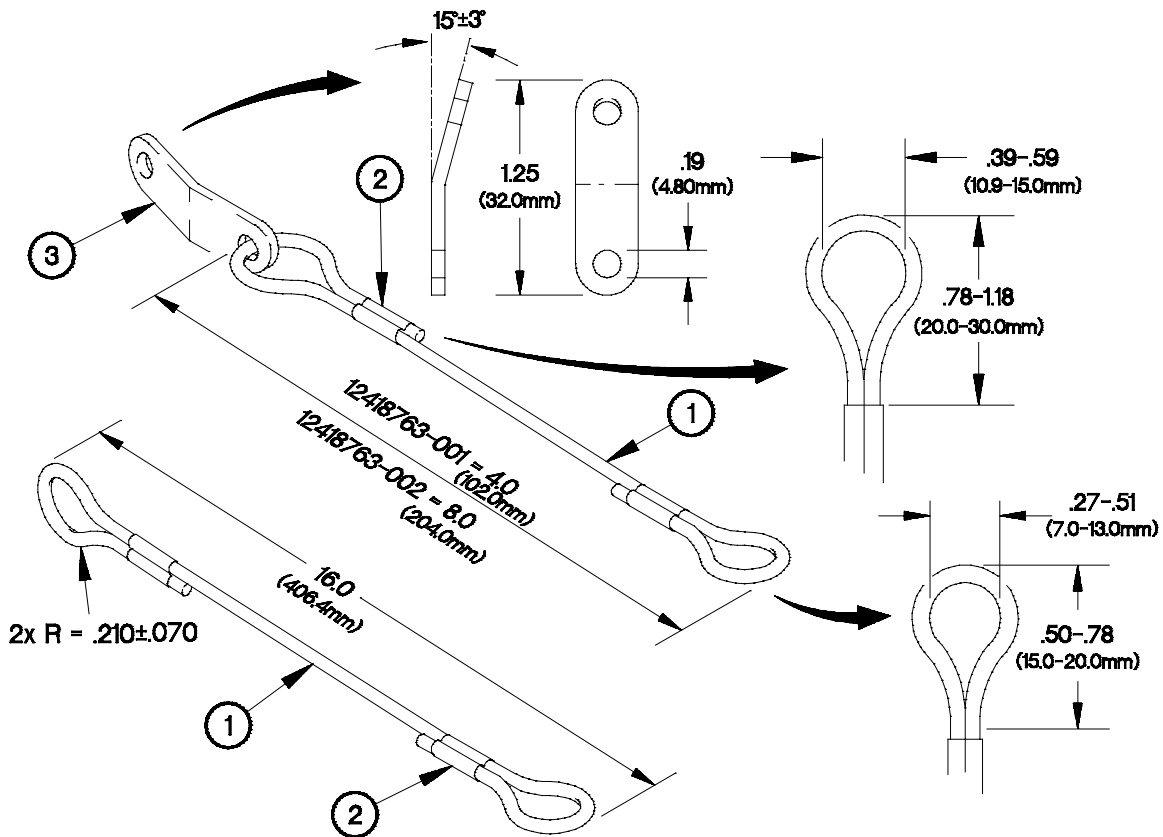
Cut the following hoses from bulk hose using a fine-toothed hacksaw or suitable cutting device.

Hose Part Number	Bulk Hose Part Number	Cut Length	
		inches	cm
12418037	A110 (30327)	75.5	191.7
12418460-001	MS521302B110360 (96906)	17.5	44.4
12418460-002	MS521301A206R (96906)	16.0	40.6

D-41. LANYARD ASSEMBLIES P/N 12418763 AND 12420196 FABRICATION

Make the following lanyard assemblies from bulk cable material, sleeves, and tab material and assemble according to **Figure D-56. Lanyard Assembly**. The following parts list identifies part numbers and lengths of cut pieces.

Item	Part Number	Material Description	Size	Qty
1	MIL-W-83420 Type 1, Comp B	1/16 in. stranded wire cable	4 in. (102 mm)	1
2	MS51844-22	Sleeve		2
3	N/A	Tab, Stainless Steel ASTM A617	0.06 in. (1.5 mm) X 0.37 in. (9.5 mm) X 1.25 in. (32 mm)	1



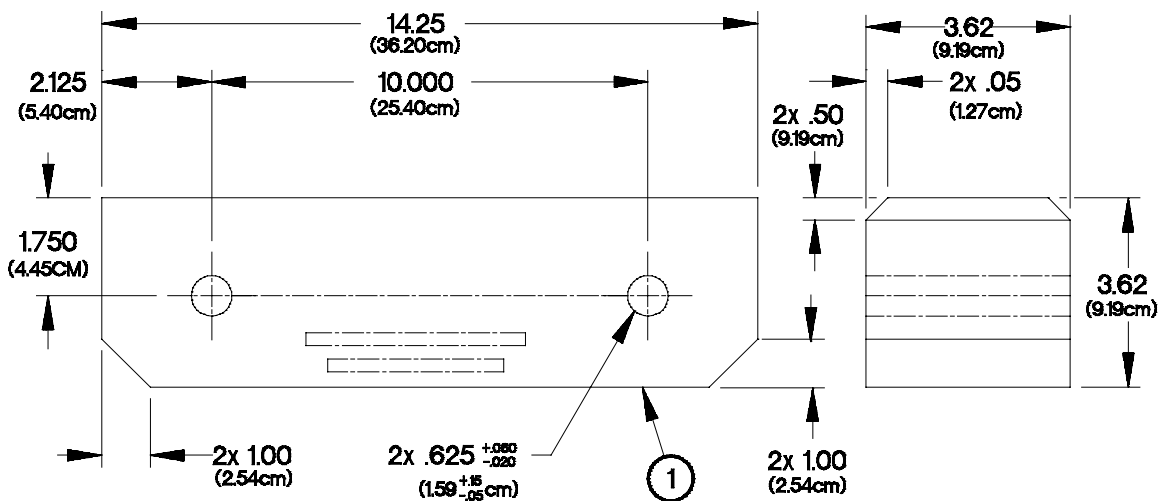
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Figure D-56. Lanyard Assembly

- All dimensions are in inches (millimeters).
- Make from bulk cable and flat steel material as identified in parts list.
- Drill two 0.19 in. (4.8 mm) diameter holes through tab material as shown in **Figure D-56 Lanyard Assembly**.
- De-burr and remove sharp edges.
- Bend tab as shown in **Figure D-56 Lanyard Assembly**.
- Form loops on cable ends and insert sleeve material over cable on one end of cable and over cable and through sleeve at other end of cable as shown in **Figure D-56. Lanyard Assembly**.
- Crimp two sleeves over cable ends.

D-42. WOODEN SKID FABRICATION 12420036

Cut, shape and drill the wooden skid from bulk wood stock according to the following information. **Figure D-57. Wooden Skid** illustrates the dimensions and hole locations.



Yappd571

Figure D-57. Wooden Skid

- All dimensions are in inches (centimeters).
- Fabricate (1) from MIL-STD 736 Group IV untreated bulk wood stock as illustrated in **Figure D-57. Wooden Skid**.
- Drill 0.625 inch (1.58 cm) diameter hole 2 places as shown in **Figure D-57. Wooden Skid**.
- Sand and remove sharp edges.
- Mark 19207-12420036 with characters 0.25 inch (0.65 cm) high using ink TT-I-1795 where shown in **Figure D-57 Wooden Skid** and clear coat with lacquer per TT-L-50.

D-43. NON-METALLIC VENT AIR HOSES FABRICATION

Cut the following vent air hoses from bulk hose using a fine-toothed hacksaw or suitable cutting device.

Hose Part Number	Bulk Hose Part Number	Cut Length	
		inches	cm
12420197-001	483666 (02280)	180.0	457.2
12420197-002	483666 (02280)	120.0	304.8
12420197-003	483666 (02280)	96.0	243.8
12420197-004	483666 (02280)	36.0	91.4
12420197-005	483666 (02280)	156.0	396.2
12420197-006	483666 (02280)	72.0	182.9
12420198-001	881-16 (98441)	120.0	304.8
12420198-002	11657469	36.0	91.4

D-44. PERSONNEL HEATER AIR DUCT HOSE FABRICATION

Cut the following hoses from bulk hose using a fine-toothed hacksaw or suitable cutting device.

Hose Part Number	Bulk Hose Part Number	Cut Length	
		inches	cm
12420308-457	8711054 (19207)	18.3	46.4
12420308-760	8711054 (19207)	30.4	77.2

D-45. CTIS QUICK RELEASE VALVE SPACER FABRICATION 12420398

Cut the spacer to length from bulk ASTM A53 Type F or ASTM A106 seamless tubing according to the following information.

- a. Cut 1 inch (2.54 cm) from bulk stock using fine toothed hack saw.
- b. Remove burrs from edges and corners.
- c. Overcoat with Zinc plate chromate in accordance with ASTM B633.

D-46. CTIS VENT HOSE FABRICATION 12420419

Cut vent hoses from bulk hose using a fine-toothed hacksaw or suitable cutting device. The table list the hoses and the components from which the assemblies are made.

Hose Assembly Part Number	Bulk Hose Part Number	Cutoff Length in inches (cm)	Fitting A	Fitting B
12420419-001	4720-01-226-3715	39.0 (99.1)	10-10301447	10-10300147
12420419-002	4720-01-226-3715	37.0 (94.)	10-1031447	10-10300147

D-48. FRONT AXLE SHAFT SEAL DRIVER (3256-J-1050)

NOTES ON USE OF DRIVER

- 1) SEAL END OF DRIVER TO BE CLEAN OF DEBRIS, DIRT, NICKS AND BURRS
- 2) DO NOT USE A METAL HAMMER ON DRIVER
A RUBBER, PLASTIC, WOOD OR SOME OTHER DEAD BLOW TYPE Mallet IS TO BE USED
- 3) SLIGHTLY GREASE SEAL END OF DRIVER PRIOR TO INSTALLING SEAL

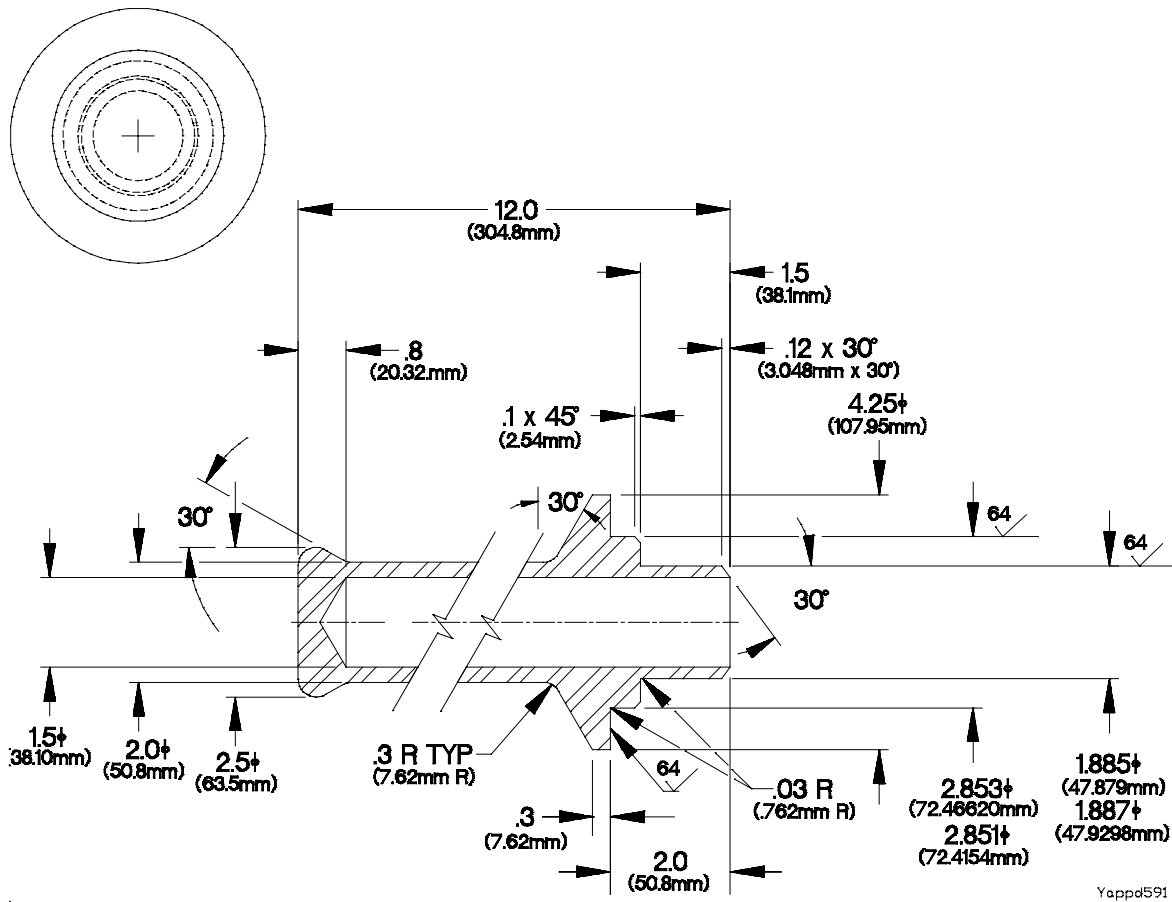


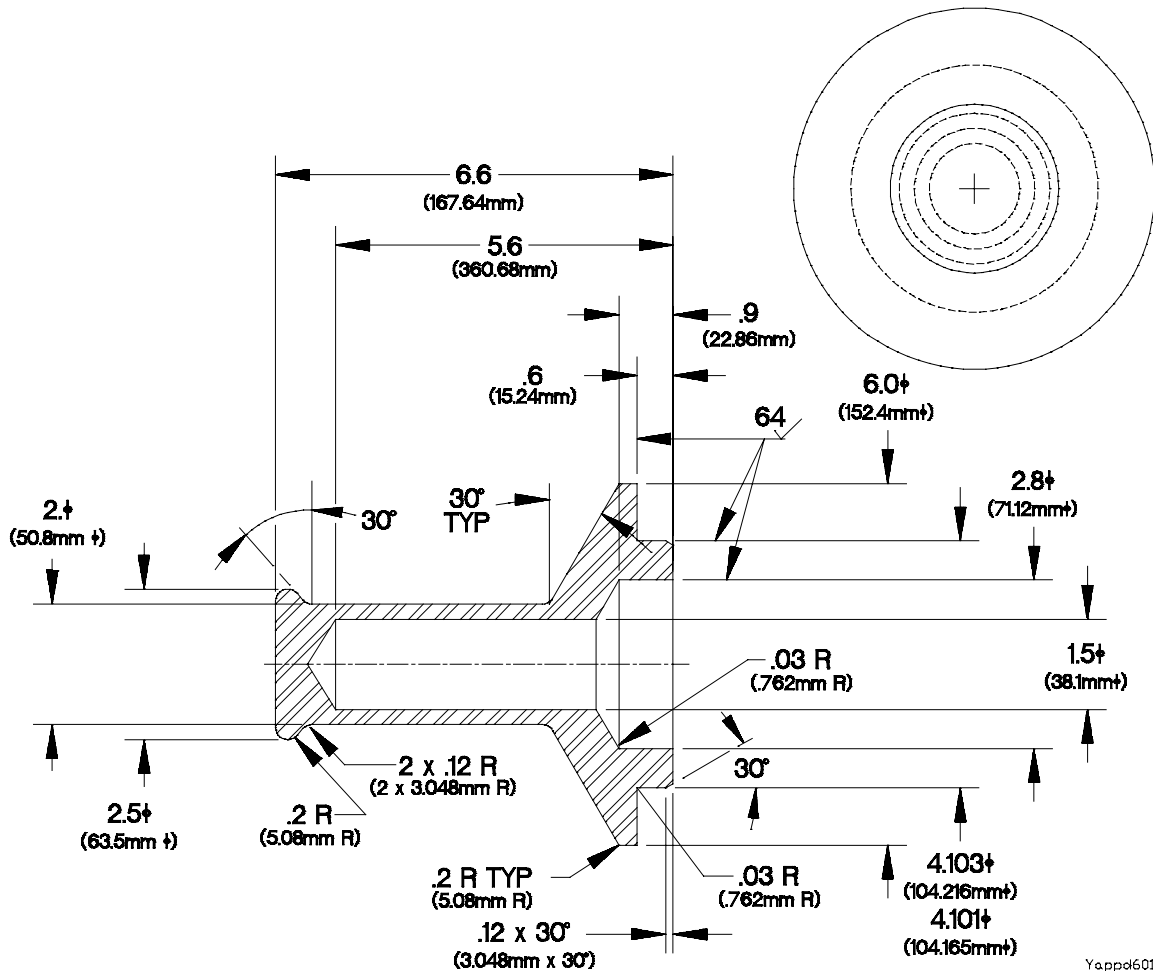
Figure D-59. Front Axle Shaft Seal Driver

- a. All dimensions are in inches (millimeters).
- b. Manufacture from round steel stock.
- c. De-burr and remove sharp edges.
- d. Tolerance:
 - 1 place +/- .06
 - 2 place +/- .03
 - 3 place +/- .005
 - angles +/- 2°
 unless otherwise specified.
- e. Surface texture: 125 $\sqrt{\text{ }}$ unless otherwise specified.

D-49. WHEEL HUB GREASE SEAL DRIVER (3256-K-1051)

NOTES ON USE OF DRIVER

- 1) SEAL END OF DRIVER TO BE CLEAN OF DEBRIS, DIRT, NICKS AND BURRS
- 2) DO NOT USE A METAL HAMMER ON DRIVER
A RUBBER, PLASTIC, WOOD OR SOME OTHER DEAD BLOW TYPE MALLET IS TO BE USED
- 3) SLIGHTLY GREASE SEAL END OF DRIVER PRIOR TO INSTALLING SEAL



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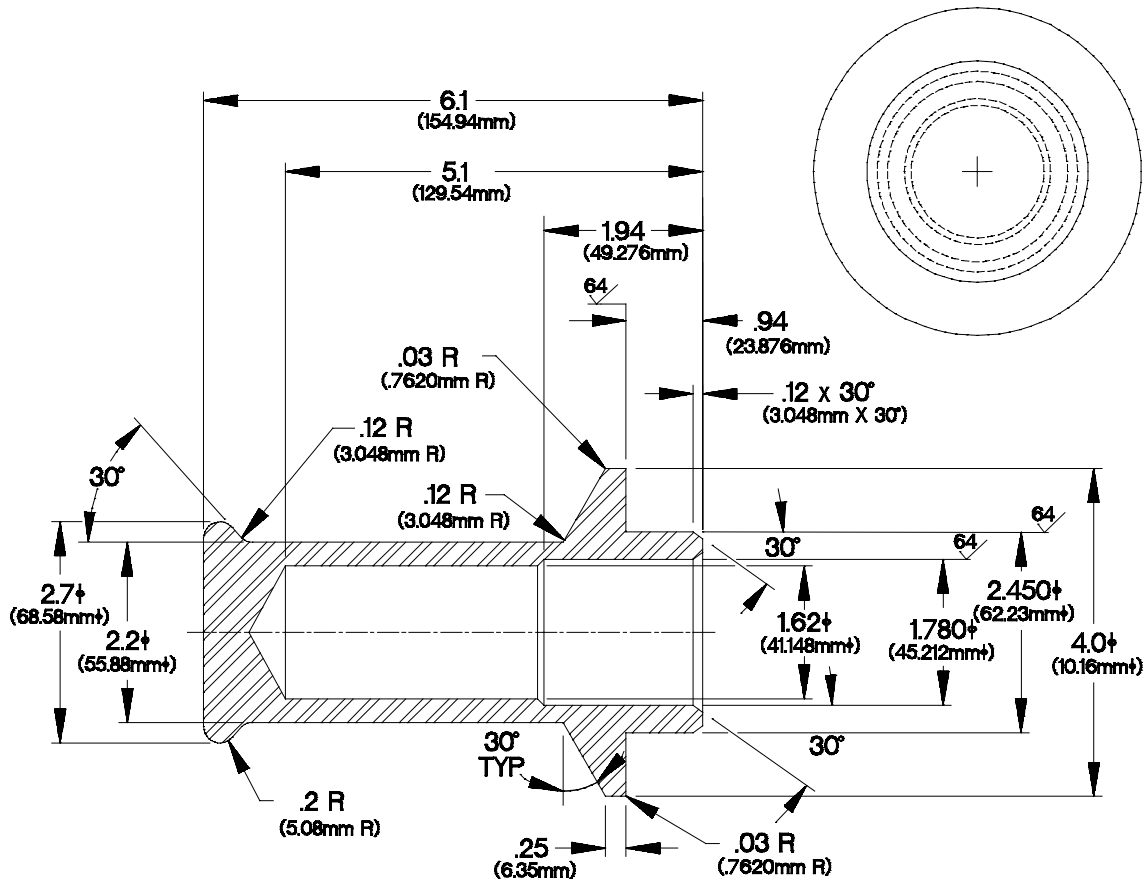
Figure D-60. Wheel Hub Grease Seal Driver

- a. All dimensions are in inches (millimeters).
- b. Manufacture from round steel stock.
- c. De-burr and remove sharp edges.
- d. Tolerance:
 - 1 place +/- .06
 - angles +/- 2°
 unless otherwise specified.

**D-50. INTERMEDIATE DIFFERENTIAL OUTPUT (REAR) PINION SEAL DRIVER
(3256-L-1052)**

NOTES ON USE OF DRIVER

- 1) SEAL END OF DRIVER TO BE CLEAN OF DEBRIS, DIRT, NICKS AND BURRS
- 2) DO NOT USE A METAL HAMER ON DRIVER
A RUBBER, PLASTIC, WOOD OR SOME OTHER DEAD BLOW TYPE MALLET IS TO BE USED
- 3) SLIGHTLY GREASE SEAL END OF DRIVER PRIOR TO INSTALLING SEAL



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Figure D-61. Intermediate Differential Output (Rear) Seal Driver

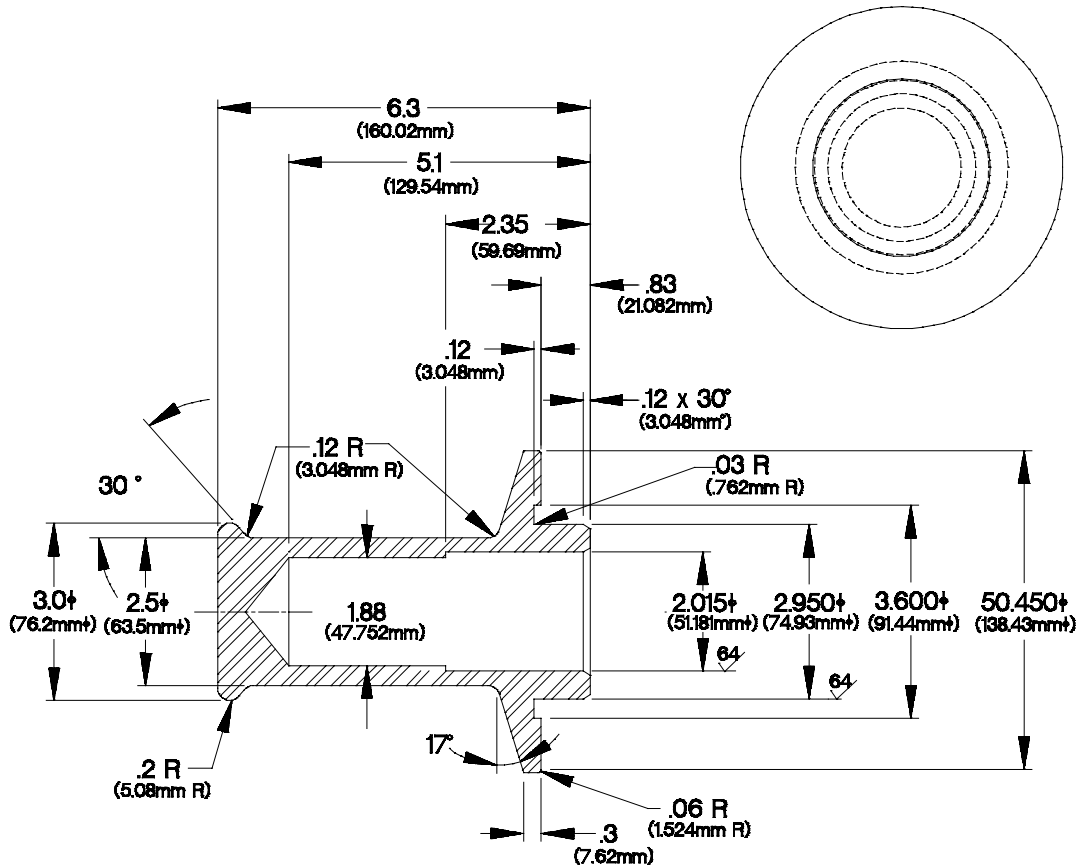
- a. All dimensions are in inches (millimeters).
- b. Manufacture from round steel stock.
- c. De-burr and remove sharp edges.
- d. Tolerance:
 - 1 place +/- .06
 - 2 place +/- .03
 - 3 place +/- .005
 - angles +/- 2°
 unless otherwise specified.
- e. Surface texture: 125 $\sqrt{\text{ }}$ unless otherwise specified.

D-51. DIFFERENTIAL PINION SEAL DRIVER (3256-M-1053)

Used on Front, Intermediate, and Rear Differential Pinion Seals.

NOTES ON USE OF DRIVER

- 1) SEAL END OF DRIVER TO BE CLEAN OF DEBRIS, DIRT, NICKS AND BURRS
- 2) DO NOT USE A METAL HAMER ON DRIVER
A RUBBER, PLASTIC, WOOD OR SOME OTHER DEAD BLOW TYPE Mallet IS TO BE USED
- 3) SLIGHTLY GREASE SEAL END OF DRIVER PRIOR TO INSTALLING SEAL

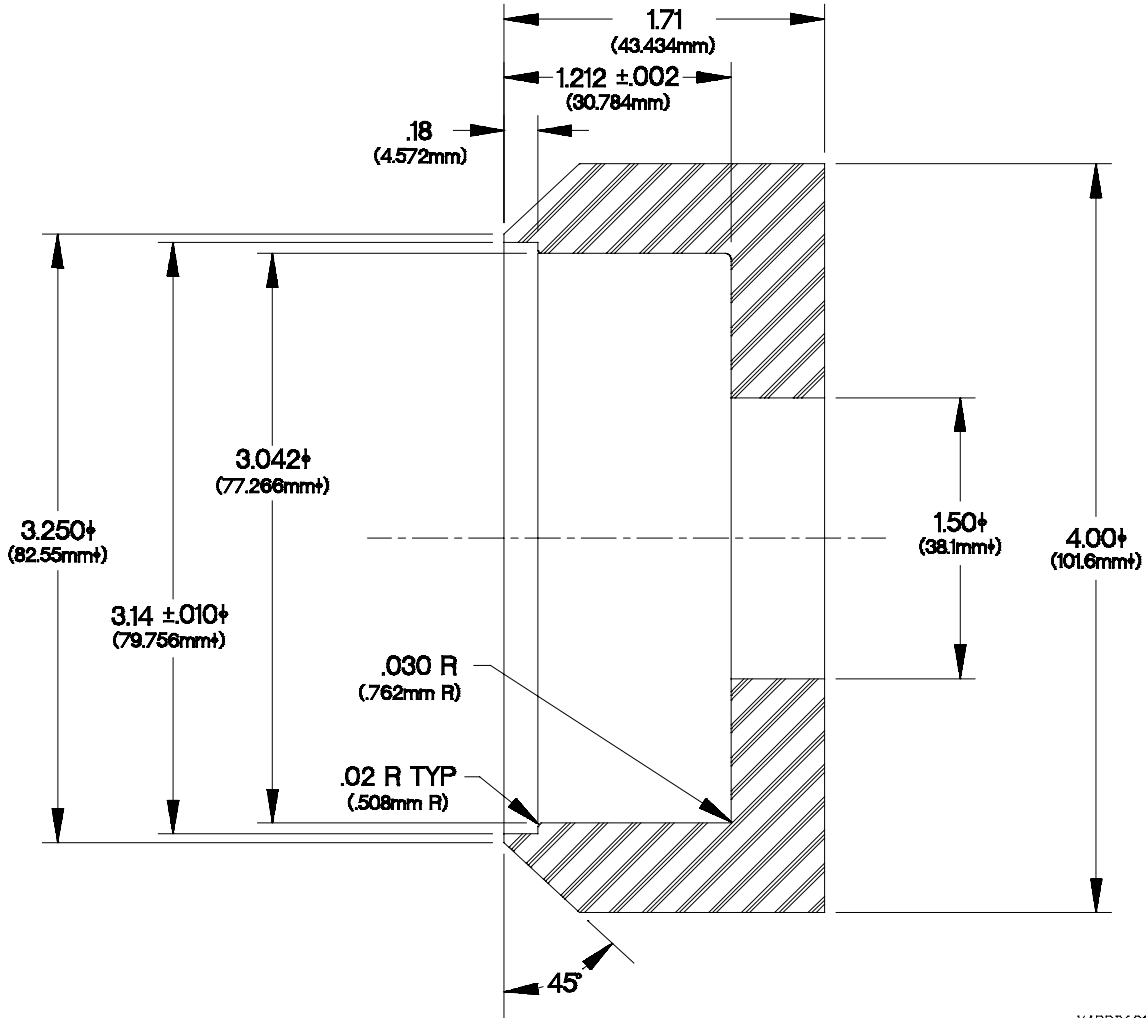


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Figure D-62. Differential Pinion Seal Driver

- a. All dimensions are in inches (millimeters).
- b. Manufacture from round steel stock.
- c. De-burr and remove sharp edges.
- d. Tolerance:
 - 1 place +/- .06
 - 2 place +/- .03
 - 3 place +/- .005
 - angles +/- 2° unless otherwise specified.
- e. Surface texture: 125 $\sqrt{\text{ }}$ unless otherwise specified.

D-52. INTERMEDIATE INPUT (FRONT) YOKE SEAL DRIVER (3256-Q-1057)

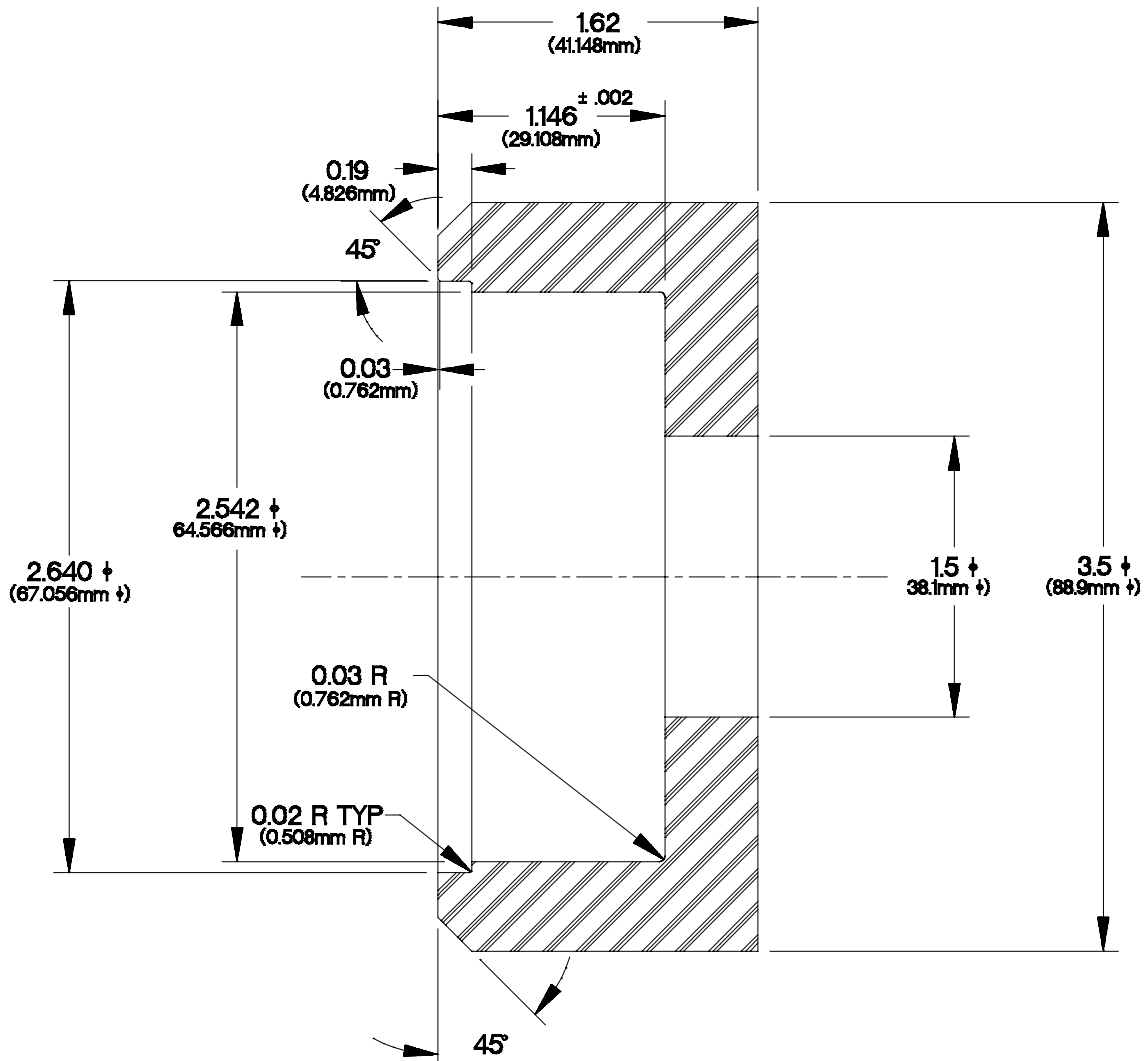


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Figure D-63. Intermediate Input Yoke Seal Driver

- a. All dimensions are in inches (millimeters).
- b. Manufacture from hard plastic.
- c. De-burr and remove sharp edges.
- d. Tolerance:
 - 1 place +/- .06
 - 2 place +/- .03
 - 3 place +/- .015
 - angles +/- 2° unless otherwise specified.
- e. Surface texture: 125 $\sqrt{\text{in}}$ unless otherwise specified.

D-53. INTERMEDIATE OUTPUT (REAR) YOKE SEAL DRIVER (3256-R-1058)



YAPPD641

Figure D-64. Intermediate Output Yoke Seal Driver

- a. All dimensions are in inches (millimeters).
- b. Manufacture from hard plastic.
- c. De-burr and remove sharp edges.
- d. Tolerance:
 - 1 place +/- .06
 - 2 place +/- .03
 - 3 place +/- .005
 - angles +/- 2° unless otherwise specified.
- e. Surface texture: 125 $\sqrt{\text{in}}$ unless otherwise specified.

D-54. FRONT AND REAR DIFFERENTIAL YOKE SEAL DRIVER (3256-S-1059)

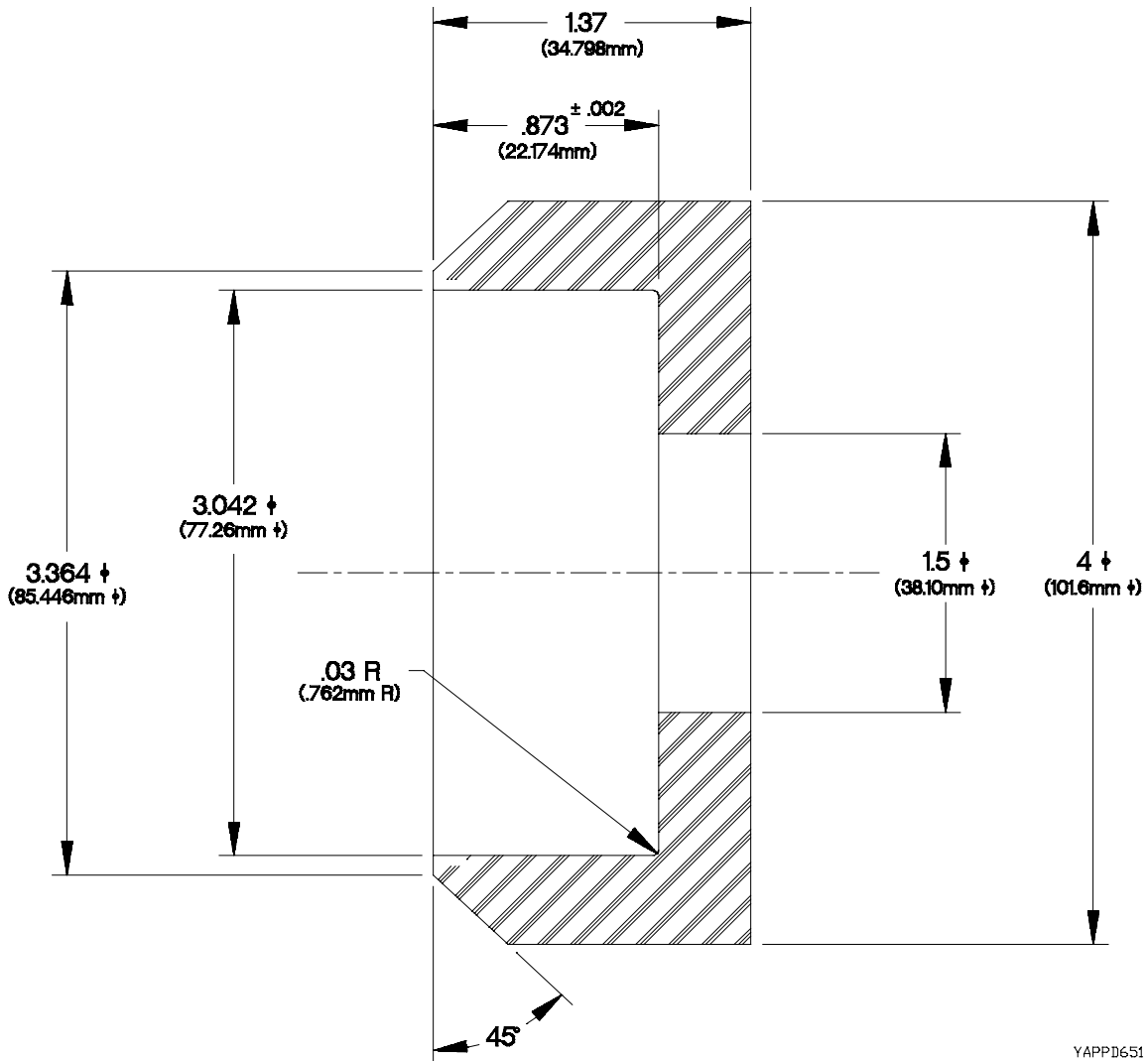


Figure D-65. Front and Rear Differential Yoke Seal Driver

- a. All dimensions are in inches (millimeters).
- b. Manufacture from hard plastic.
- c. De-burr and remove sharp edges.
- d. Tolerance:
 - 1 place +/- .06
 - 2 place +/- .03
 - 3 place +/- .015
 - angles +/- 2° unless otherwise specified.
- e. Surface texture: 125 $\sqrt{\text{in}}$ unless otherwise specified.

D-55. DIMMER SWITCH TEST WIRE

Fabricate the dimmer switch test wire according to the following steps. Refer to the following parts list for materials.

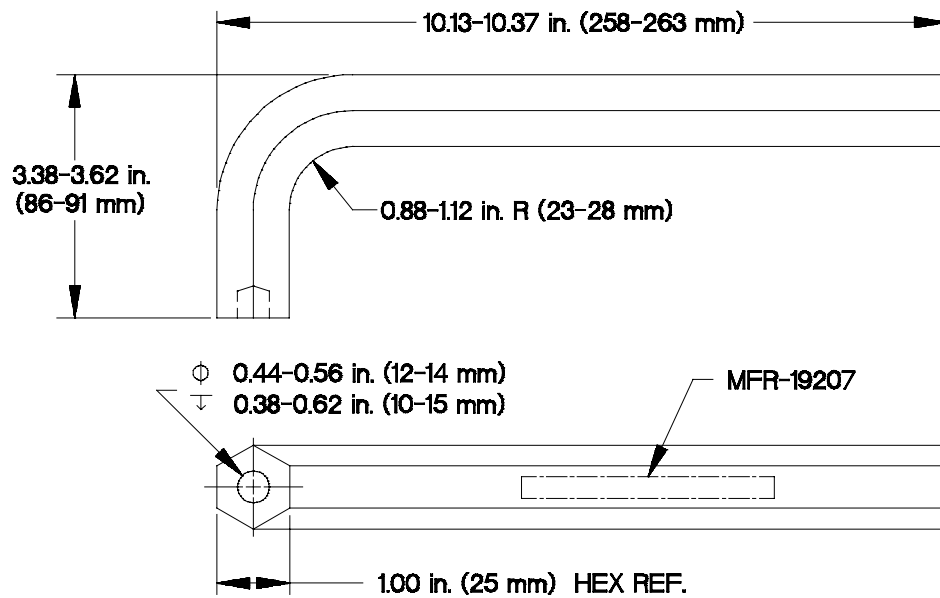
Material Description	National Stock Number	Quantity	Cut Length
Wire, Electrical (M168678/14BKE9)	6145-01-229-4134	1	12 in (305 mm)
Pin, Grooved, Headless (12258939-1)	5315-01-156-6314	1	
Contact, Electrical (12258939-2)	5999-01-150-8808	1	

- a. Dimensions are in inches (millimeters).
- b. Cut a length of electrical wire approximately 12 in. (305 mm) long.
- c. Remove approximately 1/4 in. (6 mm) of insulation from each end of electrical wire.
- d. Crimp headless grooved pin on one end of electrical wire.
- e. Crimp electrical contact on opposite end of electrical wire.

D-56. PURGE VALVE TOOL

Fabricate Purge Valve Tool according to the following instructions. Refer to Figure D-66. Purge Valve Tool for details.

Item	Part Number	Material Description	Size	Qty
1	N/A	Steel, ASTM A 108 or A576 Grade 1015-1025, BAR (Ref UNS G10150-G10250). Finish Black Oxide Coat, Class I, IAW MIL-C-13924.	14.0 in. (356 mm)	1



Xappe17b

Figure D-66. Purge Valve Tool

- All dimensions are in inches (cm).
- Cut steel bar (1) and bend to shape as shown in Figure D-66.
- Dimensional limits apply after coating.
- All edges shall be broken and free from burrs.
- Metal Stamp, electro etch, or engrave with the following marking IAW MIL-STD-130: 19207-12379968 MFR-19207.

D-57. M1089 30K WINCH AIR HOSES

Cut air hoses and convoluted tubing from bulk hose stock listed in Table D-3. M1089 30K Winch Air Hose Lengths and Fittings. Use a fine-toothed hacksaw or suitable cutting device and cut air hoses and convoluted tubing to required length.

Table D-3. M1089 30K Air Hose Lengths and Fittings

Hose Name	Bulk Hose P/N	Hose Cut Length		Bulk Convoluted Tubing P/N	Convoluted Tubing Cut Length		Fittings P/N	Fittings Qty.
		in.	mm		in.	mm		
Air Supply	NB-4-035	96.0	2438	12420924-001	94.0	2388	4-100110B 4-100115B 63NTA-4	2 2 2
Manifold Supply	NB-4-035	40.0	1016	12420924-001	38.0	965	4-100110B 4-100115B 63NTA-4	2 2 2
LH Free Spool	NB-4-035	66.0	1676	12420924-001	64.0	1626	4-100110B 4-100115B 63NTA-4	2 2 2
RH Free Spool	NB-4-035	48.0	1219	12420924-001	46.0	1168	4-100110B 4-100115B 63NTA-4	2 2 2
LH Regulator Input	NB-4-035	12.0	305	N/A	N/A	N/A	4-100110B 4-100115B 63NTA-4	2 2 2
RH Regulator Input	NB-4-035	12.0	305	N/A	N/A	N/A	4-100110B 4-100115B 63NTA-4	2 2 2
LH Check Valve Return	NB-4-035	3.0	76	N/A	N/A	N/A	4-100110B 4-100115B 63NTA-4	2 2 2
RH Check Valve Return	NB-4-035	3.0	76	N/A	N/A	N/A	4-100110B 4-100115B 63NTA-4	2 2 2
Front LH Tension Supply	NB-4-035	48.0	1219	12420924-001	46.0	1168	4-100110B 4-100115B 63NTA-4	2 2 2
Front RH Tension Supply	NB-4-035	66.0	1676	12420924-001	64.0	1626	4-100110B 4-100115B 63NTA-4	2 2 2

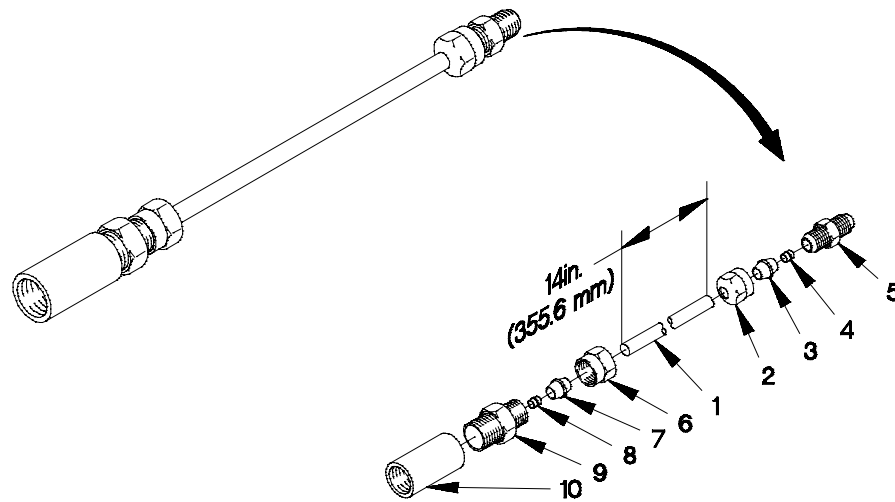
Table D-3. M1089 30K Air Hose Lengths and Fittings (Cont)

Hose Name	Bulk Hose P/N	Hose Cut Length		Bulk Convoluted Tubing P/N	Convoluted Tubing Cut Length		Fittings P/N	Fittings Qty.
		in.	mm		in.	mm		
RH 30K Winch Supply	NB-2-016	40.0	1016	N/A	N/A	N/A	2-2 100102BA 2-2 100202BA	1 1
RH 30K Winch Return	NB-2-016	40.0	1016	N/A	N/A	N/A	2-2 100102BA	2
Underlift Fold Supply	NB-2-016	40.0	1016	N/A	N/A	N/A	2-2 100102BA	1
Underlift Fold Return	NB-2-016	40.0	1016	N/A	N/A	N/A	2-2 100102BA 2-2 100202BA	1 1
Underlift Supply	NB-2-016	40.0	1016	N/A	N/A	N/A	2-2 100102BA	2
Underlift Return	NB-2-016	40.0	1016	N/A	N/A	N/A	2-2 100102BA 2-2 100202BA	1 1
Stinger Supply	NB-2-016	40.0	1016	N/A	N/A	N/A	2-2 100102BA	2
Stinger Return	NB-2-016	40.0	1016	N/A	N/A	N/A	2-2 100102BA 2-2 100202BA	1 1
LH 30K Winch Supply	NB-2-016	40.0	1016	N/A	N/A	N/A	2-2 100102BA 2-2 100202BA	1 1
LH 30K Winch Return	NB-2-016	40.0	1016	N/A	N/A	N/A	2-2 100102BA	2

D-58. M1089 30K WINCH PNEUMATIC TEST ADAPTER

Assembly the M1089 30K winch pneumatic test adapter to the following steps. Refer to the following parts list and Figure D-67. M1089 30K Winch Pneumatic Test Adapter for details.

Part Number	Material Description	National Stock Number	Qty.
NB-4-035	Tubing, Nonmetallic	4720-01-071-4042	14 in. (355.6 mm)
MIL-T-27730	Tape, antiseizing	8030-00-889-3534	1 roll
207P-4	Coupling, Pipe	4730-00-881-1161	1
4-6 100102 BA	Adapter, Straight, Pipe to Tube	4730-01-096-9398	1
4-4 100101 BA	Nipple, Tube	4730-01-091-4012	1



Xappe18b

Figure D-67. M1089 30K Winch Pneumatic Test Adapter

- a. All dimensions are in inches (millimeter).
- b. Cut piece of nonmetallic tubing (1) to 14.0 in. (355.6 mm).
- c. Remove two nuts (2), ferrules (3), and sleeves (4) from tube nipple (5).
- d. Install nut (2), ferrule (3), and sleeve (4) on nonmetallic tubing (1).
- e. Install nonmetallic tubing (1) on tube nipple (5).
- f. Remove nut (6), ferrule (7), and sleeve (8) from straight adapter (9).
- g. Install nut (6), ferrule (7), and sleeve (8) on nonmetallic tubing (1).
- h. Install nonmetallic tubing (1) on straight adapter (9).
- i. Apply on wrap of antiseizing tape to threads of straight adapter (9).
- j. Install pipe coupling (10) on straight adapter (9).
- k. Retain nut (2), ferrule (3), and sleeve (4) for future use.

D-59. BLOCK SEAL 12420489 FABRICATION_y

Make block seal from P/N (0VXY8) STN2.38X.5. Use a suitable cutting tool to cut seal to 0.52 inch (1.3 cm) long.

APPENDIX E TORQUE LIMITS

E-1. GENERAL

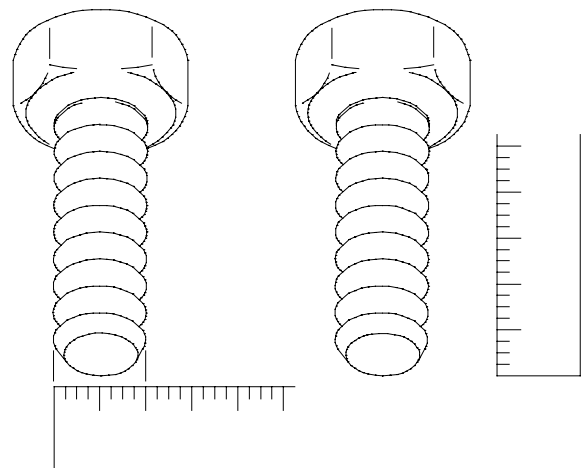
This appendix provides general torque limits for screws and nuts used on the vehicle. Special torque limits are shown in the maintenance procedures for applicable components. Use the general torque limit given in this appendix when specific torque limits are not given in the maintenance procedure. These general torque limits can not be applied to screws that retain rubber components. The rubber components will be damaged before the torque limit is reached. If a special torque limit is not given in the maintenance instructions for a fastener which retains a rubber component, tighten the screw or nut until it touches metal, then tighten one more turn. Whenever possible, the tightening force (torque) should be applied to the nut side of the fastener group.

E-2. TORQUE LIMITS

Refer to **Table E-1. Torque Limits for SAE and ANSI Fasteners** for torque limits on standard (SAE and ANSI) screws and free spinning nuts. Refer to **Table E-2. Torque Limits for SAE and ANSI Prevailing Torque Nuts** for torque limits on standard (SAE and ANSI) self-locking nuts. Refer to **Table E-3. Torque Limits for Metric Screws and Free Spinning Nuts** for torque limits on metric screws and free spinning nuts. Refer to **Table E-4. Torque Limits for Metric Prevailing Torque Nuts** for torque limits on metric self-locking nuts.

E-3. USE OF TORQUE TABLES

- (1) Measure the diameter of the screw to be installed.
- (2) Count the number of threads per inch.
- (3) Under the heading DIAMETER look down the column until the diameter of the screw is found. (There are usually two lines beginning with the same diameter.)
- (4) Under the heading THREADS PER INCH (SAE and ANSI) or THREAD PITCH (metric), find the number of threads per inch that matches the number counted in step (2).
- (5) To find the grade of the screw, match the markings on the head to the correct picture under CAPSCREW HEAD MARKINGS on the torque table.
- (6) Look down the column under the picture found in step (5) until the torque limit (lb-ft or N·m) for the diameter and threads per inch (or thread pitch, in the case of metric fasteners) of the screw are located.



YAPPE011

APPENDIX E TORQUE LIMITS

Table E-1. Dry Torque Limits for SAE and ANSI Screws and Free Spinning Nuts

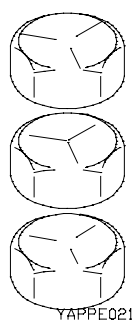
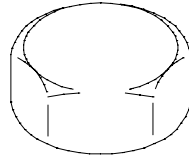
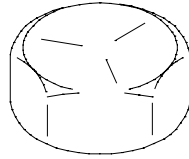
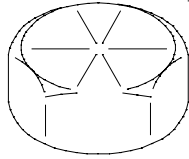
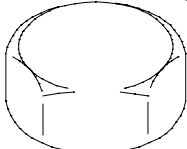
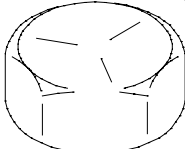
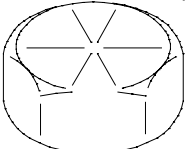
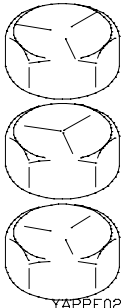
 <p>NOTE Manufacturer's marks may vary. These are all SAE Grade 5.</p>		Material Grade Markings					
		 <p>YAPPE031 SAE Grade 2</p>		 <p>YAPPE041 SAE Grade 5</p>		 <p>YAPPE051 SAE Grade 8</p>	
		Torque					
Diameter	Threads per inch						
inch		lb-ft	N-m	lb-ft	N-m	lb-ft	N-m
1/4	20	3-5	5-7	5-7	8-10	8-10	10-14
1/4	28	4-6	5-7	6-8	9-11	8-12	12-16
1/4	32	4-6	5-7	7-9	9-11	9-13	12-16
5/16	18	7-9	9-13	11-15	15-21	15-21	21-29
5/16	24	8-10	11-15	12-16	17-23	17-23	24-32
5/16	32	9-11	12-16	14-18	18-24	19-25	27-34
3/8	16	13-17	17-23	20-26	27-35	28-38	38-50
3/8	24	15-19	20-26	22-30	31-41	32-42	43-57
3/8	32	15-21	21-27	24-32	33-43	33-45	55-61
7/16	14	20-28	28-38	32-42	43-57	44-60	61-81
7/16	20	23-31	31-41	35-47	48-64	49-67	68-90
7/16	28	25-33	33-45	37-51	51-69	54-72	73-97
1/2	13	32-42	43-57	49-65	66-88	68-92	93-123
1/2	20	35-47	48-64	55-73	74-98	77-103	105-139
1/2	28	38-50	51-67	58-78	79-105	82-110	111-149
9/16	12	55-61	62-82	70-94	95-127	98-132	134-178
9/16	18	50-68	69-91	78-104	105-141	109-147	149-199
9/16	24	53-71	72-96	82-110	111-149	115-155	158-210
5/8	11	62-84	85-113	95-129	131-175	136-182	184-246
5/8	18	70-94	96-128	108-146	148-198	154-206	209-279
5/8	24	73-99	100-134	114-154	155-207	161-217	219-293

Table E-1. Dry Torque Limits for SAE and ANSI Screws and Free Spinning Nuts (Cont)

		Material Grade Markings					
		 YAPPE031 SAE Grade 2		 YAPPE041 SAE Grade 5		 YAPPE051 SAE Grade 8	
 YAPPE021 Manufacturer's marks may vary. These are all SAE Grade 5							
Diameter	Threads per inch	Torque					
inch		lb-ft	N-m	lb-ft	N-m	lb-ft	N-m
11/16	24	99-133	135-181	153-207	209-279	217-291	296-394
3/4	10	110-148	150-200	171-229	232-310	240-324	328-438
3/4	16	123-165	168-224	190-256	259-345	269-361	366-488
3/4	20	127-171	174-232	197-265	268-358	278-374	379-505
13/16	20			252-340	345-459	357-481	487-649
7/8	9			275-369	374-498	387-521	528-704
7/8	14			303-407	413-551	427-575	583-777
7/8	20			319-429	435-579	450-606	614-818
15/16	20			395-531	538-718	558-750	760-1014
1	8			411-553	560-748	581-781	792-1056
1	12			450-606	614-818	636-856	867-1155
1	20			483-649	658-878	681-917	929-1239
1-1/16	18			576-776	782-1044	813-1095	1109-1479
1-1/8	7			507-683	693-923	824-1108	1123-1497
1-1/8	12			570-766	776-1034	923-1241	1258-1678
1-1/8	18			600-806	817-1089	971-1307	1324-1766
1-3/16	18			709-953	966-1288	1149-1545	1566-2088
1-1/4	7			716-964	976-1302	1161-1563	1584-2112
1-1/4	12			793-1067	1081-1441	1286-1730	1754-2338
1-1/4	18			831-1117	1132-1510	1346-1812	1835-2447
1-5/16	18			965-1299	1316-1754	1565-2105	2134-2846
1-3/8	6			939-1263	1281-1707	1523-2049	2076-2768

APPENDIX E TORQUE LIMITS

Table E-2. Dry Torque Limits for SAE and ANSI Prevailing Torque Nuts

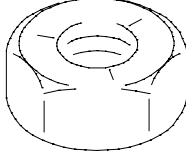
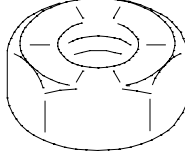
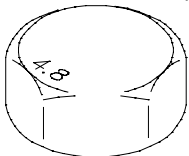
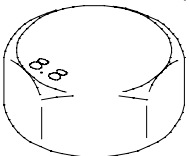
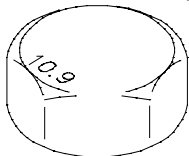
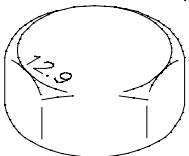
		Material Grade Markings				
		 YAPPE061 SAE Grade 5				 YAPPE071 SAE Grade 8
Hole Diameter	Threads per inch	Torque				
		lb-ft	N-m	lb-ft	N-m	
1/4	20	10-12	14-16	15-17	20-24	
1/4	28	12-14	16-18	14-18	21-25	
5/16	18	20-24	27-33	26-32	36-44	
5/16	24	22-26	30-36	29-35	40-48	
3/8	16	35-41	47-55	48-58	65-77	
3/8	24	38-46	53-63	53-63	72-86	
7/16	14	55-65	74-88	75-91	103-123	
7/16	20	60-70	81-97	80-98	110-132	
1/2	13	86-102	116-138	113-137	154-184	
1/2	20	92-110	125-149	127-153	177-207	
9/16	12	120-144	162-194	168-202	229-273	
9/16	18	135-161	183-219	179-217	244-294	
5/8	11	165-199	226-270	226-272	306-368	
5/8	18	181-219	246-296	244-296	331-401	
3/4	10	296-354	402-480	395-479	538-648	
3/4	16	310-376	422-508	424-516	576-698	
7/8	9	460-554	625-749	612-746	833-1009	
7/8	14	503-607	684-822	652-800	888-1082	
1	8	686-828	933-1121	941-1141	1280-1544	

Table E-3. Dry Torque Limits for Metric Screws and Free Spinning Nuts

		Material Grade Markings							
		 YAPPE081 Metric Grade 4.8	 YAPPE091 Metric Grade 8.8	 YAPPE101 Metric Grade 10.9	 YAPPE111 Metric Grade 12.9				
Diameter	Thread Pitch	Torque							
		lb-ft	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft	N-m
6	1	3	4-5	5-7	7-9	7-9	10-13	8-11	11-15
8	1.25	7-9	9-11	13-17	17-23	17-23	23-31	21-27	27-37
8	1	7-9	9-13	14-18	18-24	19-25	25-33	21-29	29-39
10	1.5	13-17	17-23	25-33	33-45	34-46	46-62	40-54	54-72
10	1.25	14-18	18-24	26-34	35-47	36-48	49-65	42-56	57-77
10	0.75	15-19	21-27	29-39	39-53	40-54	54-72	47-63	63-85
12	1.75	22-30	30-40	43-57	58-78	60-80	81-107	69-93	94-126
12	1.5	23-31	32-42	46-60	61-81	63-83	85-113	73-97	99-131
12	1.25	24-32	33-45	47-63	65-85	65-87	88-118	76-102	104-138
12	1	26-34	34-46	49-65	67-89	68-90	93-123	80-106	108-144
14	2	36-48	48-74	69-91	93-125	95-127	129-173	112-148	151-201
14	1.5	39-51	52-70	75-99	99-135	103-137	140-186	120-160	163-217
15	1	51-69	69-93	100-132	135-179	137-183	187-249	160-214	218-290
16	2	55-73	75-99	107-143	145-193	148-198	201-267	173-231	235-313
16	1.5	59-79	80-106	114-152	155-207	158-210	214-286	184-246	250-334
18	1.5			166-222	225-301	230-306	311-415	268-358	364-486
20	2.5			209-279	283-377	289-385	392-522	338-450	458-610
20	1.5			232-308	315-419	321-427	435-579	375-499	508-678
20	1			244-324	330-440	337-449	457-609	394-524	534-712
22	2.5			285-379	387-515	394-524	534-712	461-613	624-832
22	1.5			313-417	424-566	432-576	586-782	664-884	900-1200
24	3			361-481	489-653	499-665	677-903	584-778	791-1055
24	2			394-524	534-712	545-725	738-984	725-965	982-1310
25	1.5			467-621	633-843	645-859	875-1167	754-1004	1023-1363

APPENDIX E TORQUE LIMITS

Table E-4. Dry Torque Limits for Metric Prevailing Torque Nuts

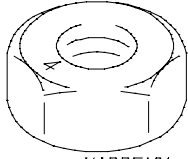
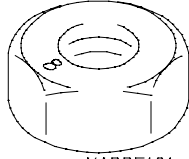
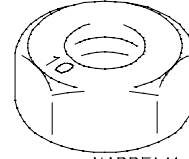
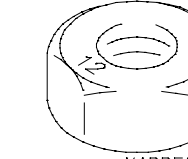
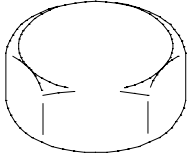
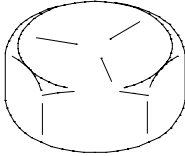
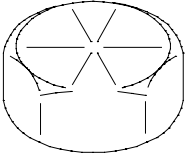
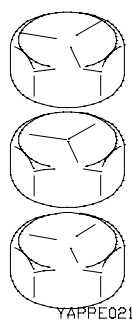
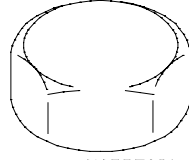
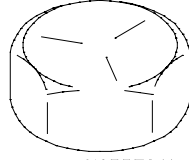
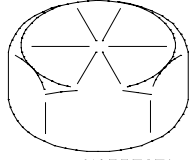
		Material Grade Markings							
		 YAPPE121 Metric Grade 4.8	 YAPPE131 Metric Grade 8.8	 YAPPE141 Metric Grade 10.9			 YAPPE151 Metric Grade 12.9		
Diameter	Thread Pitch	Torque							
		lb-ft	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft	N-m
6	1	5-6	7-8	7-9	10-12	10-12	14-17	11-14	15-19
8	1.25	12-14	16-18	18-22	24-30	24-30	32-40	27-33	36-46
8	1	12-14	16-20	19-23	25-31	25-31	34-42	28-36	38-48
10	1.5	21-25	28-34	33-41	44-56	44-56	60-76	50-64	68-86
10	1.25	21-25	29-35	34-42	46-58	46-58	63-79	53-67	71-91
10	0.75	23-27	31-37	37-47	49-63	50-64	68-86	57-73	77-99
12	1.75	33-41	46-56	55-69	74-94	75-95	102-128	85-109	115-147
12	1.5	35-43	47-57	56-72	77-97	78-98	106-134	89-113	120-152
12	1.25	36-44	48-60	58-74	79-101	81-103	109-139	91-117	125-159
12	1	37-45	50-62	61-77	82-104	84-106	114-144	95-121	129-165
14	2	53-65	72-88	87-109	117-149	118-150	160-204	134-172	182-232
14	1.5	57-69	76-94	92-116	125-159	126-160	171-217	143-183	194-248
16	2	79-97	107-131	130-166	177-225	178-228	243-309	204-262	277-355
16	1.5	82-102	112-138	138-176	187-239	189-241	256-328	215-277	292-376
18	1.5			197-253	267-343	271-347	367-471	309-399	420-542
20	2.5			248-318	337-431	342-438	464-594	391-503	530-682
20	1.5			271-349	369-473	374-480	507-651	428-552	580-750
20	1			283-365	384-494	390-502	529-681	447-577	606-784
22	2.5			335-429	455-583	460-592	624-802	526-680	714-922
22	1.5			363-467	492-634	499-643	676-872	730-950	990-1290
24	3			420-540	569-733	577-743	783-1009	662-856	897-1161
24	2			453-583	614-792	622-804	844-1090	803-1043	1088-1416

Table E-5. Wet Torque Limits for SAE and ANSI Screws and Free Spinning Nuts

		Material Grade Markings					
		 YAPPE031 SAE Grade 2		 YAPPE041 SAE Grade 5		 YAPPE051 SAE Grade 8	
Diameter	Threads per inch	Torque					
		lb-ft	N-m	lb-ft	N-m	lb-ft	N-m
inch							
1/4	20	4	6	6	8	9	12
1/4	28	5	7	7	9	10	14
5/16	18	8	11	13	18	18	24
5/16	24	9	12	14	19	20	27
3/8	16	15	20	23	31	35	47
3/8	24	17	23	25	34	35	47
7/16	14	24	33	35	47	55	75
7/16	20	25	34	40	54	60	81
1/2	13	35	47	55	75	80	108
1/2	20	40	54	65	88	90	122
9/16	12	50	68	80	108	110	149
9/16	18	55	75	90	122	130	176
5/8	11	70	95	110	149	170	231
5/8	18	80	108	130	176	180	244
3/4	10	120	163	200	271	280	380
3/4	16	140	190	220	298	320	434
7/8	9	110	149	300	407	460	624
7/8	14	120	163	320	434	500	678
1	8	160	217	440	597	680	922
1	12	170	231	480	651	740	1003
1-1/8	7	220	298	600	814	960	1302
1-1/8	12	260	353	660	895	1080	1464

APPENDIX E TORQUE LIMITS

Table E-5. Wet Torque Limits for SAE and ANSI Screws and Free Spinning Nuts (Cont)

 <p style="text-align: center; font-size: small;">YAPPE021</p> <p style="text-align: center; font-size: small;">YAPPE031</p> <p style="text-align: center; font-size: small;">YAPPE041</p> <p style="text-align: center; font-size: small;">YAPPE051</p> <p style="text-align: center; font-size: small;">Manufacturer's marks may vary. These are all SAE Grade 5</p>		Material Grade Markings					
		 <p style="text-align: center; font-size: small;">YAPPE031</p> <p style="text-align: center;">SAE Grade 2</p>		 <p style="text-align: center; font-size: small;">YAPPE041</p> <p style="text-align: center;">SAE Grade 5</p>		 <p style="text-align: center; font-size: small;">YAPPE051</p> <p style="text-align: center;">SAE Grade 8</p>	
		Torque					
Diameter	Threads per inch						
inch		lb-ft	N·m	lb-ft	N·m	lb-ft	N·m
1-1/4	7	320	434	840	1139	1360	1844
1-1/4	12	360	488	920	1248	1500	2034
1-3/8	6	420	570	1100	1492	1780	2414
1-3/8	12	460	624	1260	1709	2040	2766

APPENDIX F MANDATORY REPLACEMENT PARTS

Section I. INTRODUCTION

F-1. SCOPE

This appendix lists mandatory replacement parts you will need to maintain the MTV vehicle.

F-2. EXPLANATION OF COLUMNS

- a. **Column (1) - Item Number.** This number is assigned to each entry in the listing and is referenced in the Initial Setup of the applicable task under Materials/Parts.
- b. **Column (2) - Nomenclature.** Name or identification of the part.
- c. **Column (3) - Part Number.** The manufacturer's part number.
- d. **Column (4) - National Stock Number.** The National stock number of the part.

Section II. MANDATORY REPLACEMENT PARTS LIST

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
1	BEARING, WASHER, THRUST	1225K1259	3120-01-362-4365
2	BOLT, MACHINE	12414307-079	5306-01-381-9941
3	BOLT, MACHINE	12414307-080	5306-01-381-9928
4	BOLT, MACHINE	12414307-081	5306-01-371-7162
5	BOLT, MACHINE	12414307-083	
6	BOLT, MACHINE	12414307-084	
7	BOLT, MACHINE	12414307-140	5306-01-372-3536
8	BOLT, MACHINE	12414307-141	5306-01-371-7161
9	BOLT, MACHINE	12414307-142	5306-01-372-3537
10	BOLT, MACHINE	12414307-143	5306-01-372-0787
11	BOLT, MACHINE	12414307-145	5306-01-386-3966
12	BOLT, MACHINE	12414307-146	5306-01-381-9797
13	BOLT, MACHINE	12414307-147	5306-01-377-0750
14	BOLT, MACHINE	12414307-148	5306-01-453-8618
15	BOLT, MACHINE	12414307-149	5306-01-384-3485

MANDATORY REPLACEMENT PARTS (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
16	BOLT, SHOULDER	12421697-001	5306-01-444-7489
17	BOLT, SHOULDER	12421697-002	5306-01-445-3744
18	BOLT, SHOULDER	12421697-003	5306-01-444-8354
19	BOLT, SHOULDER	12421697-004	5306-01-444-8359
20	BOLT, SHOULDER	12421697-005	5306-01-444-8364
20.1	BOLT, U	12418027-001	5306-01-369-0767
20.2	BOLT, U	12418027-003	5306-01-369-3501
20.3	BOOT	225313 (35510)	
21	BRACKET	3280-M-9243	
22	BRUSH SET	5702711	3120-00-089-2707
23	BRUSH SET, ELECTRICAL CONTACT	71035	5977-00-758-9555
24	BUSHING, SLEEVE	9-150-010181	3120-01-461-2735
25	BUSHING, BLANK	4001-40690-01	5365-01-331-9503
26	BUSHING, NON-METALLIC	12418159	5365-01-371-9556
27	BUSHING, SLEEVE	N9405	3120-01-362-5005
27.1	BUSHING, SLEEVE	Z082095780	3120-01-306-9870
28	BUSHING, SLEEVE	12418155	3120-01-371-7961
29	BUSHING, SLEEVE	12419961	3120-01-420-8269
29.1	BUSHING, SLEEVE	71059	3120-00-064-1723
29.2	BUSHING, SLEEVE	73644	3120-00-111-3711
30	CAP, PROTECTIVE, DUST	15036-2A	5340-01-372-9888
31	EXCLUDER	4R9999	5330-01-469-7592
32	FILTER ELEMENT	29502194	2940-01-360-7986
33	GASKET	1S7057	5330-00-105-0339
34	GASKET	115-4202	5330-01-424-7906
35	GASKET	113-6250	5330-01-360-5933
36	GASKET	3N4087	5330-01-061-8003
36.1	GASKET	12421155	5330-01-295-0115
37	GASKET	4P1623	5330-01-360-5932
38	GASKET	4P6930	5330-01-360-7172

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
39	GASKET	6D1004	5330-01-059-9593
40	GASKET	113-6200	5330-01-424-3523
41	GASKET	7C0358	5330-01-360-5936
42	GASKET	7C1160	5330-01-360-5937
43	GASKET	7C7431	5330-01-360-5940
44	GASKET	7E0844	5330-01-360-5492
45	GASKET	7E9817	5330-01-360-5938
46	GASKET	7W2398	5330-01-360-5935
47	GASKET	7W5340	5330-01-360-7173
48	GASKET	7W6552	5330-01-360-5929
49	GASKET	7W8860	5330-01-360-5939
50	GASKET	7W9699	5330-01-360-5928
51	GASKET	9Y4634	5330-01-360-5930
52	GASKET	22-P-53	5330-01-043-5832
53	GASKET	35P-74	5330-01-381-2357
54	GASKET	11262	5330-01-148-9729
55	GASKET	250001-011	5330-01-329-3800
56	GASKET	350903	5330-00-576-4626
57	GASKET	6776456	5330-01-329-9093
58	GASKET	12420037	5330-01-394-2410
59	GASKET	12420056	5330-01-394-2411
60	GASKET	23048037	5330-01-360-7520
61	GASKET	29501144	5330-01-407-1644
62	GASKET	29503185	5330-01-360-7518
63	GASKET	29503263	5330-01-360-9034
64	GASKET	29503283	5330-01-360-9035
65	GASKET	29503288	5330-01-361-0274
66	GASKET	29534357	5330-01-360-7521
67	GASKET	29506211	5330-01-360-7519
68	GASKET	29506212	5330-01-360-9038
69	GASKET	29506213	5330-01-360-9039
70	GASKET	29506323	5330-01-360-5262

MANDATORY REPLACEMENT PARTS (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
71	GASKET	29506352	5330-01-360-9037
71.1	GROMMET, NONMETALLIC	MS21266-7N	5325-00-238-6037
72	INSULATION PANEL	12418384-001	2510-01-377-4333
73	INSULATION PANEL	12418384-004	2510-01-428-9699
74	INSULATION PANEL	12418384-005	2510-01-428-1691
75	INSULATION PANEL	12418384-006	2510-01-428-1696
76	INSULATION PANEL	12418384-007	2510-01-445-7001
77	INSULATION PANEL	12418384-008	2510-01-445-6998
78	INSULATION SLEEVING, ELECTRICAL	EPS-3003/4B	5970-01-379-7195
79	INSULATION SLEEVING, ELECTRICAL	M23053/4-302-0	5970-01-161-6796
80	INSULATION SLEEVING, ELECTRICAL	M23053/4-304-0	5970-01-163-1103
81	INSULATION SLEEVING, ELECTRICAL	M23053/4-305-0	5970-01-210-3272
82	INSULATION SLEEVING, ELECTRICAL	M23053/5-210-C	5970-00-990-9911
83	INSULATION SLEEVING, ELECTRICAL	M23053/5-303-9	5970-01-312-5497
84	INSULATION SLEEVING, ELECTRICAL	313H232-6-250	5970-01-373-5692
85	INSULATION SLEEVING, ELECTRICAL	313H243-6-250	5970-01-373-5690
86	INSULATION SLEEVING, ELECTRICAL	313H253-6-250	5970-01-373-5691
87	INSULATION SLEEVING, ELECTRICAL	313H274-6-250	5970-01-374-0823
88	INSULATION SLEEVING, ELECTRICAL	313H285-6-250	5970-01-374-0822
89	INSULATION SLEEVING, ELECTRICAL	333H263-6-250	5970-01-374-0339
90	INSULATION SLEEVING, ELECTRICAL	333H274-6-250	5970-01-387-7088
91	INSULATION SLEEVING, ELECTRICAL	333H285-6-250	5970-01-387-7193
92	KEY, WOODRUFF	N9040	5315-01-199-2355
93	KIT, HOIST SEAL	9-752-100508	2590-01-196-4734
94	KIT, REPAIR	9-752-100810	3040-01-408-1504
95	KIT, REPAIR	9-752-100811	5330-01-406-7489
96	KIT, REPAIR	9-752-100812	3040-01-408-3171
97	KIT, REPAIR	9-752-100818	5330-01-377-5195
98	KIT, REPAIR	9-752-100819	5330-01-431-3096
99	KIT, REPAIR	9-752-100820	5330-01-431-3083
100	KIT, REPAIR	9-752-100821	5330-01-431-3078

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
101	KIT, REPAIR	9-752-100961	5330-01-436-5568
102	KIT, REPAIR	9-752-100962	5330-01-393-4779
103	KIT, REPAIR	9-752-100964	3040-01-408-1503
104	KIT, REPAIR	9-752-101052	5330-01-431-3091
105	KIT, REPAIR	9-752-101082	3040-01-408-3172
105.1	KIT, REPAIR	1033-05432-02	
106	KIT, SEAL	SKMEH-3	5330-01-372-5297
107	KIT, SEAL	SKMEH-4	5330-01-372-5296
108	KIT, SEAL	SKMEH-5	
109	KIT, SEAL	SK2-10-2	5330-01-226-6810
110	KIT, SEAL	SK2-16-4	4820-01-335-7318
111	KIT, SEAL	SK3-10-4	5330-01-463-9558
112	KIT, SEAL	SK3-16-3S	5330-01-358-3740
113	KIT, SEAL	SK10-2K	5330-01-431-3259
114	KIT, SEAL	SK10-3	5330-01-186-0851
115	KIT, SEAL	3J3598	5330-01-162-8277
116	KIT, SEAL	9638	5330-01-344-2573
117	KIT, SEAL	9290-345	
118	KIT, SEAL	9692	5330-01-460-4642
119	KIT, SEAL	75215-07SK	
120	KIT, SEAL	75215-08SK	5330-01-431-3316
121	KIT, SEAL	75215-09SK	5330-01-430-7240
122	KIT, SEAL	13024-33327	
123	KIT, SEAL	13026-33328	
124	KIT, SEAL	13807-30306	
125	KIT, SEAL	13811-34357	
126	LOCKNUT, TUBE FITTING	9X6620	4730-01-360-4179
127	LOCKWASHER	MS19070-101	5310-00-186-0969
128	LOCKWASHER	MS35335-18	5310-00-596-7691
129	LOCKWASHER	MS35335-30	5310-00-209-0788
130	LOCKWASHER	MS35335-37	5310-00-209-5116
131	LOCKWASHER	MS35335-38	5310-00-616-6354

MANDATORY REPLACEMENT PARTS (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
132	LOCKWASHER	MS35335-43	5310-00-045-3296
133	LOCKWASHER	MS35335-62	5310-00-184-9562
134	LOCKWASHER	MS35335-63	5310-00-209-0790
135	LOCKWASHER	MS35338-138	5310-00-933-8120
136	LOCKWASHER	MS35338-141	5310-00-984-7042
137	LOCKWASHER	MS35338-43	5310-00-045-3296
138	LOCKWASHER	MS35338-44	5310-00-582-5965
139	LOCKWASHER	MS35338-45	5310-00-407-9566
140	LOCKWASHER	MS35338-46	5310-00-637-9541
141	LOCKWASHER	MS35338-48	5310-00-584-5272
142	LOCKWASHER	MS35338-50	5310-00-004-5034
143	LOCKWASHER	MS35338-61	5310-00-527-3634
144	LOCKWASHER	MS51414-6	5310-01-251-9277
145	LOCKWASHER	MS51414-8	5310-01-358-2863
146	LOCKWASHER	MS35335-33	5310-00-209-0786
147	LOCKWASHER	XB-T-45-1	5310-01-249-4216
148	LOCKWASHER	N9015	5310-01-046-0186
149	LOCKWASHER	N9018	5310-01-032-4827
150	LOCKWASHER	N9265	5310-01-136-4888
151	LOCKWASHER	N9459	5310-01-348-8893
152	LOCKWASHER	N9461	5310-01-348-8392
153	LOCKWASHER	N9574	5310-01-439-0818
154	LOCKWASHER	Z0930-78423	5310-01-145-4355
155	LOCKWASHER	1388	5310-01-162-5737
156	LOCKWASHER	1395	5310-01-166-3657
157	LOCKWASHER	1144	5310-01-165-3363
158	LOCKWASHER	1495	5310-01-161-2527
159	LOCKWASHER	2434	5310-00-755-5139
160	LOCKWASHER	2523	5310-00-775-5182
161	LOCKWASHER	10241	5310-01-416-3010
162	LOCKWASHER	6V5839	5310-01-360-0983

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
163	LOCKWASHER	9B7233	5310-00-559-0070
164	LOCKWASHER	12414560-017	5310-01-395-0820
165	LOCKWASHER	12414560-018	5310-01-381-3281
166	LOCKWASHER	12414560-029	5310-01-395-0817
167	LOCKWASHER	3059-00870-03	5310-00-397-4524
168	MOUNT, RESILIENT	12414590	5340-01-374-0501
169	NUT, CLINCH	ALS3-610-4.2	5310-01-381-9929
170	NUT, CLINCH	ALS3-4470-.20	5310-01-384-7280
171	NUT, PLAIN, HEX	0770-023-003	5310-01-423-3725
172	NUT, PLAIN, KNURLED	ALS3-470-2.0	5310-01-384-7280
173	NUT, SELF-LOCKING	MS20500-524	5310-00-208-4023
174	NUT, SELF-LOCKING	MS21043-6	5310-00-881-0943
175	NUT, SELF-LOCKING	MS21083N6	5310-00-926-1852
176	NUT, SELF-LOCKING	MS51922-17	5310-00-087-4652
177	NUT, SELF-LOCKING	MS51922-1	5310-00-088-1251
178	NUT, SELF-LOCKING	MS51922-2	5310-00-929-1807
179	NUT, SELF-LOCKING	MS51922-33	5310-00-225-6993
180	NUT, SELF-LOCKING	MS51922-49	5310-00-269-4040
181	NUT, SELF-LOCKING	MS51922-9	5310-00-984-3806
182	NUT, SELF-LOCKING	MS51943-52	5310-00-241-6666
183	NUT, SELF-LOCKING	XB-HNH-34F	5310-01-162-4753
184	NUT, SELF-LOCKING	N9091	5310-01-050-5005
185	NUT, SELF-LOCKING	N9099	5310-01-165-1312
186	NUT, SELF-LOCKING	N9406	5310-01-362-6171
187	NUT, SELF-LOCKING	N9556	5310-01-423-0880
188	NUT, SELF-LOCKING	N9410	5310-01-348-8398
189	NUT, SELF-LOCKING	N9467	5310-01-350-4257
190	NUT, SELF-LOCKING	N9416	5310-01-348-8360
191	NUT, SELF-LOCKING	DIN 934 ST M6	5310-01-342-2739
192	NUT, SELF-LOCKING	40-X-1041	5310-01-391-5251
193	NUT, SELF-LOCKING	40-X-1241	5310-01-391-5249
194	NUT, SELF-LOCKING	40-X-1244	

MANDATORY REPLACEMENT PARTS (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
195	NUT, SELF-LOCKING	9-522-010009	5310-01-373-6791
196	NUT, SELF-LOCKING	50066	5310-00-007-0225
196.1	NUT, SELF-LOCKING	11602502	5310-00-930-7979
197	NUT, SELF-LOCKING	11649930	5310-00-402-5220
198	NUT, SELF-LOCKING	12418084	5310-01-371-8419
199	NUT, SELF-LOCKING	12412476-09	5310-01-445-6346
199.1	NUT, SELF-LOCKING	12412476-11	5310-01-407-7178
199.2	NUT, SELF-LOCKING	12412476-13	5310-01-407-7181
200	NUT, SELF-LOCKING	12412478-04	5310-01-381-9901
201	NUT, SELF-LOCKING	12412478-11	5310-01-381-9942
202	NUT, SELF-LOCKING	12414308-002	5310-01-381-9819
203	NUT, SELF-LOCKING	12414308-003	5310-01-374-1382
204	NUT, SELF-LOCKING	12414308-007	5310-01-369-6073
205	NUT, SELF-LOCKING	12414308-016	5310-01-381-9945
206	NUT, SELF-LOCKING	12414308-017	5310-01-381-9830
207	NUT, SELF-LOCKING	12414308-018	5310-01-369-3337
208	NUT, SELF-LOCKING	12414308-019	5310-01-369-9522
209	NUT, SELF-LOCKING	12414308-020	5310-01-381-9849
210	NUT, SELF-LOCKING	12414308-021	5310-01-369-3338
211	NUT, SELF-LOCKING	12414308-025	5310-01-369-6706
212	NUT, SELF-LOCKING	12414308-027	5310-01-369-3339
213	NUT, SELF-LOCKING	12414315-003	5310-01-374-1382
214	NUT, SELF-LOCKING	12414315-004	5310-01-342-2739
214.1	NUT, SELF-LOCKING	12414315-005	5310-01-372-3023
215	NUT, SELF-LOCKING	12414315-006	5310-01-369-3332
216	NUT, SELF-LOCKING	12414315-011	5310-01-368-8667
217	NUT, SELF-LOCKING	12414315-017	5310-01-368-8065
218	NUT, SELF-LOCKING	12414315-020	5310-01-372-6337
219	NUT, SELF-LOCKING	12414315-021	5310-01-434-3778
220	NUT, SELF-LOCKING	15635-93M	5310-01-434-0078
221	NUT, SELF-LOCKING	29507834	5310-01-359-8789

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
221.1	NUT, SELF-LOCKING	40-X-1241	5310-01-391-5249
222	PACKING WITH RETAINER	75-1740-199-025- FB	5330-01-368-8828
223	PACKING, PREFORMED	114-8718	5330-01-348-2720
224	PACKING, PREFORMED	125-8274	5330-01-360-6012
224.1	PACKING, PREFORMED	F4001-16	5331-01-466-0354
224.2	PACKING, PREFORMED	J515-16-3	5331-01-465-3634
224.3	PACKING, PREFORMED	MS28775-006	5330-00-292-0580
224.4	PACKING, PREFORMED	MS28775-010	5331-00-584-0266
225	PACKING, PREFORMED	MS28775-110	5330-00-585-6663
226	PACKING, PREFORMED	MS28775-246	5330-00-585-8249
227	PACKING, PREFORMED	MS28775-208	5330-01-105-7263
228	PACKING, PREFORMED	MS28775-224	5330-00-641-3407
229	PACKING, PREFORMED	MS28778-10	5310-00-285-9842
230	PACKING, PREFORMED	MS28778-12	5330-00-251-8839
231	PACKING, PREFORMED	MS28778-14	5330-00-472-2783
232	PACKING, PREFORMED	MS28778-16	5330-01-804-5694
233	PACKING, PREFORMED	MS28778-20	5330-00-816-3546
234	PACKING, PREFORMED	MS28778-3	5320-00-835-7485
235	PACKING, PREFORMED	MS28778-4	5330-00-805-2966
236	PACKING, PREFORMED	MS28778-6	5330-00-804-5695
237	PACKING, PREFORMED	MS28778-8	5330-00-006-2249
238	PACKING, PREFORMED	MS29512-16	5330-00-263-8034
239	PACKING, PREFORMED	MS9955-113	5330-01-374-2325
240	PACKING, PREFORMED	A82777	5330-00-579-6495
241	PACKING, PREFORMED	M83248-2-906	5331-00-165-1981
242	PACKING, PREFORMED	M83248-2-908	5330-00-167-5173
243	PACKING, PREFORMED	M83461/1-442	5330-01-183-0987
243.1	PACKING, PREFORMED	XA-2265	5331-01-459-5254
244	PACKING, PREFORMED	Z053-074979	5330-00-579-6495
244.1	PACKING, PREFORMED	Z053095777	5331-01-304-3453
245	PACKING, PREFORMED	1J9671	5330-00-613-6500
246	PACKING, PREFORMED	1T1068	5330-01-336-8776

MANDATORY REPLACEMENT PARTS (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
247	PACKING, PREFORMED	2M9780	5330-00-939-0687
248	PACKING, PREFORMED	3J1907	5330-01-333-6444
249	PACKING, PREFORMED	3J7354	5330-00-952-8008
250	PACKING, PREFORMED	3K0360	5330-00-948-6482
251	PACKING, PREFORMED	3P1156	5330-00-385-7587
252	PACKING, PREFORMED	4F7391	5330-00-562-1073
253	PACKING, PREFORMED	4F9029	5330-00-118-6559
254	PACKING, PREFORMED	4F9653	5330-00-038-4327
255	PACKING, PREFORMED	4J5477	5330-00-885-8059
255.1	PACKING, PREFORMED	405952	5330-00-454-0528
256	PACKING, PREFORMED	5F9657	5330-00-291-9572
256.1	PACKING, PREFORMED	5X1159	
256.2	PACKING, PREFORMED	5X556	5330-00-203-1172
257	PACKING, PREFORMED	6F6673	5330-00-865-0404
257.1	PACKING, PREFORMED	7-755-018010	5331-01-420-5127
257.2	PACKING, PREFORMED	71041	5331-00-633-6827
258	PACKING, PREFORMED	74980	5330-00-838-6729
259	PACKING, PREFORMED	8L2786	5330-00-973-8301
260	PACKING, PREFORMED	8M4445	5330-00-914-5821
261	PACKING, PREFORMED	2-011-N507-90	5330-01-265-8308
262	PACKING, PREFORMED	2-012-N507-90	5330-01-092-5502
263	PACKING, PREFORMED	2-014-N507-90	5330-01-366-5377
264	PACKING, PREFORMED	2-018-N507-90	5330-01-092-5503
265	PACKING, PREFORMED	2-112-N507-90	5330-01-093-3504
266	PACKING, PREFORMED	2-232-N674-70	5330-01-030-1825
267	PACKING, PREFORMED	2-240-N507-9	5330-01-036-2817
267.1	PACKING, PREFORMED	225163 (35510)	
268	PACKING, PREFORMED	3-906-N552-90	5330-01-104-1093
269	PACKING, PREFORMED	7-755-912003	5330-01-420-5128
270	PACKING, PREFORMED	28-P-120	5330-00-832-9514
271	PACKING, PREFORMED	28-P-121	5330-01-064-6284

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
272	PACKING, PREFORMED	28-P-190	5331-01-443-8050
273	PACKING, PREFORMED	28-P-191	5330-01-361-6959
274	PACKING, PREFORMED	22-P-92	5330-01-361-6962
275	PACKING, PREFORMED	4119-59	5330-00-510-3255
276	PACKING, PREFORMED	11446	5330-00-247-4174
277	PACKING, PREFORMED	9002-00491-68	5330-01-393-5630
278	PACKING, PREFORMED	9002-00741-58	5330-01-195-1500
279	PACKING, PREFORMED	9086-2	5330-01-106-1159
280	PACKING, PREFORMED	250192	5330-01-417-5105
281	PACKING, PREFORMED	9091-1	5330-01-244-8964
282	PACKING, PREFORMED	9612	5330-01-357-0846
283	PACKING, PREFORMED	9891	5330-01-374-2437
284	PACKING, PREFORMED	9972	5330-01-359-2151
285	PACKING, PREFORMED	15058	5330-00-304-9008
286	PACKING, PREFORMED	420828	5340-01-417-3788
287	PACKING, PREFORMED	53125	5365-00-062-3992
288	PACKING, PREFORMED	53155	5330-01-410-7122
289	PACKING, PREFORMED	60539	5330-01-302-2413
290	PACKING, PREFORMED	251216	5331-01-417-5107
291	PACKING, PREFORMED	251391	5310-01-417-1041
292	PACKING, PREFORMED	197755	
293	PACKING, PREFORMED	23014057	5330-01-360-6016
294	PACKING, PREFORMED	23043446	5331-01-424-6629
295	PACKING, PREFORMED	23046274	5330-01-360-6018
296	PACKING, PREFORMED	29500969	5330-01-360-7852
297	PACKING, PREFORMED	29501439	5330-01-388-1528
298	PACKING, PREFORMED	29503380	5330-01-360-6014
299	PACKING, PREFORMED	29503381	5330-01-360-6015
300	PACKING, PREFORMED	29503382	5330-01-360-6013
301	PACKING, PREFORMED	29503383	5330-01-360-6017
302	PACKING, PREFORMED	29507700	5331-01-424-4552
303	PACKING, RETAINER	23049377	5330-01-361-9052

MANDATORY REPLACEMENT PARTS (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
304	PACKING, RETAINER	29503208	5330-01-361-9785
305	PANEL, DEFROSTER	12420495-004	2540-01-437-1411
306	PARTS KIT	SKD1VW	5330-01-309-2603
307	PARTS KIT	SK10-2	5330-01-350-4474
308	PARTS KIT	SK10-3	5330-01-186-0851
309	PARTS KIT	990-011-007	5330-01-332-7167
310	PARTS KIT	990-220-006	
311	PARTS KIT, DISC AND SPRING	9401	2530-01-344-5748
312	PARTS KIT, ENGINE FUEL PUMP	5R9065	2910-01-363-6816
313	PARTS KIT, FIFTH WHEEL	RK63506	2510-01-134-8880
313.1	PARTS KIT, SEAL REPLACEMENT	391-1803-387	
313.2	PARTS KIT, SEAL REPLACEMENT	391-1803-457	5330-01-366-5634
313.3	PARTS KIT, SEAL REPLACEMENT	391-1803-469	
313.4	PARTS KIT, SEAL REPLACEMENT	4452	5330-01-469-5782
313.5	PARTS KIT, SEAL REPLACEMENT	4453	5330-01-469-5786
314	PARTS KIT, SEAL REPLACEMENT	9403	5330-01-344-2572
315	PARTS KIT, SEAL REPLACEMENT	60540	5330-01-316-1440
316	PARTS KIT, SEAL REPLACEMENT	61267	5330-01-355-3582
317	PARTS KIT, SEAL REPLACEMENT	23042434	5330-01-360-5459
318	PARTS KIT, SEAL REPLACEMENT	29503974	5330-01-388-1576
319	PARTS KIT, SEAL REPLACEMENT	9752100915	5330-01-354-3834
320	PARTS KIT, SEAL REPLACEMENT	990-011-007	5330-01-332-7167
321	PARTS KIT, WINCH	9402	2590-01-374-2510
322	PARTS KIT, WINCH	9406	5330-01-470-0839
323	PARTS KIT, WINCH	9450	
324	PIN, COTTER	MS24665-181	5315-00-187-9374
325	PIN, COTTER	MS24665-360	5315-00-298-1499
325.1	PIN, COTTER	MS24665-385	5315-00-187-9382
326	PIN, COTTER	MS24665-394	5315-00-234-1628
327	PIN, COTTER	C1949	5315-00-010-3426
328	PIN, COTTER	MS24665-423	5315-00-013-7228

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
329	PIN, COTTER	MS24665-457	5315-00-187-9393
330	PIN, COTTER	MS24665-459	5315-00-187-9394
331	PIN, COTTER	MS24665-498	5315-00-849-9854
332	PIN, COTTER	MS24665-655	5315-00-187-9414
333	PIN, COTTER	XB-781-1	5315-01-369-1346
334	PIN, COTTER	K-2412-Z	5315-01-179-9882
335	PIN, COTTER	1199R2176	5315-00-880-6027
336	PIN, SPRING	XB-07508	5315-01-199-2088
337	PIN, SPRING	XB-21-S-375-1750	5315-01-159-6395
338	PIN, SPRING	1-647-0100004196	
339	PIN, SPRING	586031	5315-00-257-1652
339.1	PIN, STRAIGHT, HEADED	12417962-081	5315-01-447-2297
340	PLUG	3H5552	5340-00-007-6350
341	PLUG, EXPANSION	2M6471	5340-00-410-6762
342	PLUG, MACHINE THREAD	391-2281-010	5365-01-280-5570
343	PLUG, MACHINE THREAD	29503360	5365-01-360-0937
344	PLUG, PLASTIC	12418065-004	4730-01-375-1450
345	PLUG, PLASTIC	12418065-005	4730-01-375-0329
346	PLUG, RUBBER	12417526	5340-01-375-3042
347	PLUG, RUBBER	12417527	5340-01-377-1543
348	PLUG, RUBBER	12417599	5340-01-381-3855
349	PLUG, RUBBER	12420305-001	5340-01-384-1120
350	PLUG, RUBBER	12420305-003	5970-01-089-7447
351	PLUG, RUBBER	12418348	5340-01-384-0869
352	RETAINER, PACKING	MS28783-26	5330-00-944-9577
353	RETAINER, PACKING	MS28783-18	5330-00-171-6761
354	RETAINER, PACKING	8-224-N300-90	5330-00-005-0572
355	RETAINER, PACKING	202624	5330-01-417-7794
356	RETAINER, PACKING	11863-012	5330-01-417-7795
357	RETAINER, PACKING	22000-2	5330-01-322-2471
357.1	RETAINER, PACKING	7-755-016609	5330-01-420-5027
357.2	RETAINER, PACKING	7-755-018609	5330-01-420-5056

MANDATORY REPLACEMENT PARTS (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
358	RING	9852	5365-01-224-2304
359	RING, RETAINING	N9008	5365-01-032-4222
360	RING, RETAINING	N9009	5365-01-034-2757
361	RING, RETAINING	6I3033	5365-01-360-0953
362	RING, RETAINING	6I3035	5365-01-360-0954
362.1	RING, SEAL	225148	5331-01-459-6517
363	RING, SEAL	9M4849	5330-00-847-4351
364	RING, WEAR	7-753-000173	3040-01-370-2823
364.1	RIVET, BLIND	12421770-004	
365	RIVET, COMPRESSION	12420756	5325-01-433-4746
366	RUBBER STRIP	VC08G1R08	5330-01-389-6109
366.1	SCREW, CAP	CSH5-24-39	5305-01-479-7857
367	SCREW, CAP	639AS2710	5305-01-081-7393
368	SCREW, CAPTIVE	12421366	5305-01-439-3247
368.1	SCREW, SELF-LOCKING	7X3347	5305-01-360-0952
369	SEAL	BA3026-1	5330-01-077-4674
370	SEAL	1205F2164	5330-01-362-3392
371	SEAL	9890	5330-01-375-0243
372	SEAL	12415307	5340-01-376-0672
373	SEAL	12417485	5330-01-375-2909
374	SEAL	12418327	5365-01-381-3976
375	SEAL	23046376	5330-01-360-6006
376	SEAL	23048727	5330-01-360-7826
376.1	SEAL KIT	CBV1/2-10	
376.2	SEAL KIT	DG4V-3S	
376.3	SEAL KIT	FCV7-10	
376.4	SEAL KIT	PFR1-16	
376.5	SEAL KIT	PRV1-10	
376.6	SEAL KIT	RV5-10	
377	SEAL, CONNECTOR TUBE	4K1388	5330-00-933-3305
378	SEAL, PLAIN ENCASED	A-1205-E-2501	5330-01-432-2692

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
379	SEAL, PLAIN ENCASED	A-1205-F-2502	5330-01-432-2690
380	SEAL, PLAIN ENCASED	A-1205-D-2500	5330-01-432-2689
381	SEAL, PLAIN	3018-01507-01	5330-01-393-5626
382	SEAL, PLAIN	3018-01519-01	5330-01-331-9283
383	SEAL, PLAIN	3912884-019	5330-01-340-8159
384	SEAL, PLAIN	9057-14	5330-01-306-3438
385	SEAL, PLAIN ENCASED	A-1205-S-2255S	5330-01-360-7754
386	SEAL, PLAIN ENCASED	A-1205-T-2256	5330-01-362-1262
386.1	SEAL, PLAIN ENCASED	KIT-4451	5330-01-362-6102
387	SEAL, PLAIN ENCASED	4R8831	5330-01-360-9023
388	SEAL, PLAIN ENCASED	115-4109	5330-01-361-1456
389	SEAL, PLAIN ENCASED	28-P-119	5330-01-044-6592
390	SEAL, PLAIN ENCASED	28-P-123	
391	SEAL, PLAIN ENCASED	S-19751	5330-01-459-8204
392	SEAL, PLAIN ENCASED	13585	5330-00-202-1292
393	SEAL, PLAIN ENCASED	29515690	5330-01-430-3477
394	SEAL, PLAIN ENCASED	29507528	5330-01-360-5917
395	SEAL, PLAIN ENCASED	A-1205-D-2344	5330-01-360-5253
396	SEAL, PLAIN ENCASED	97799	5330-01-079-6372
397	SEAL, PLAIN ENCASED	S-19750	5330-01-459-8205
398	SEAL, URETHANE FOAM	12420420-001	5680-01-453-8912
399	SEAL, URETHANE FOAM	12420420-003	5680-01-453-8486
400	SEALRING	23045611	5330-01-360-9009
401	SEALRING	23045612	5330-01-360-9100
402	SEALRING	23045614	5330-01-360-9102
403	SEALRING	23045615	5330-01-360-9103
404	SEALRING	23045654	5330-01-360-9104
405	SEALRING	23045655	5330-01-360-9105
406	SEALRING	23041189	5330-01-360-5978
407	SEALRING	29501190	5330-01-360-5979
408	SEALRING	29502161	5365-01-360-1675
409	SEALRING	29502164	5365-01-360-1674

MANDATORY REPLACEMENT PARTS (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
410	SEALRING	29506399	5330-01-360-5980
411	SEALRING	23046868	2835-01-360-1757
412	SETSCREW	29506222	5305-01-360-1667
413	SHIM	12421159-001	
414	SHIM	12421159-002	
415	SHIM	12421159-003	
416	SHIM	12421159-004	
417	SHIM	9-684-010052	5365-01-461-0456
418	SHIM, OUTPUT BEARING	29505947	5365-01-360-1030
419	SHIM, OUTPUT BEARING	29505948	5365-01-360-1029
420	SHIM, OUTPUT BEARING	29505949	5365-01-360-1028
421	SPACER, NYLON	1926-33	5365-01-408-5374
422	SPACER, PLATE	XA-0014	5365-01-133-0041
423	SPLICE, CONDUCTOR	JANTX1N3957	5961-00-181-0661
424	SPRING	4088-40615-01	5360-01-392-9389
425	SPRING, COMPRESSION	9L9188	5360-00-175-2701
426	SPRING, COMPRESSION	2322	5360-01-345-5384
427	SPRING, FLAT	29500064	5360-01-360-2023
428	STRAINER, SUCTION	29503670	4730-01-360-4458
429	VALVE CHECK	7C1493	4820-01-284-5435
430	WASHER, FIBER	Z095077721	3120-01-302-9301
431	WASHER	1229-M-1625	5310-01-059-7130
431.1	WASHER, FLAT	12414473-014	5310-01-363-0740
431.2	WASHER, FLAT	78302	5310-01-112-1738
432	WASHER, FLAT	78332	5310-01-204-0219
433	WASHER, FLAT	36900	5310-00-482-1999
433.1	WASHER, INSULATION	MES-76 (35510)	
433.2	WASHER, SEAL	XA 1470	5310-01-460-5998
434	WASHER, SEAL	25008.35	
435	WASHER, SEAL	29500025	5310-01-359-8840
436	WASHER, BRAKE HOUSING	1911644	5310-00-130-8033

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
437	WASHER, SPRING TENSION	D63474/1-27	5310-01-416-4339
438	WASHER, SPRING TENSION	D63474/1-39	5310-01-PAE-6547
438.1	WASHER, SPRING TENSION	75777	5310-01-112-1740
438.2	WASHER, THRUST	57023	3120-01-460-9421
439	WASHER, WAVE	53117-1	
440	WICK	225165	9390-01-459-7969
441	WICK	99278	9390-01-204-7151

APPENDIX G ADDITIONAL AUTHORIZATION LIST (AAL)

Section I. INTRODUCTION

G-1. SCOPE

This appendix lists additional items you are authorized for the support of the LMTV.

G-2. GENERAL

This list identifies items that do not have to accompany the LMTV and that do not have to be turned in with it. These items are all authorized to you by Common Tables of Allowance (CTA), Modification Table of Organization and Equipment (MTOE), Tables of Distribution and Allowances (TDA), or Joint Table of Allowance (JTA).

G-3. EXPLANATION OF LISTING

National Stock Numbers, description, and quantities are provided to help you identify and request the additional items you require to support this equipment.

Section II. ADDITIONAL AUTHORIZATION LIST

(1) National Stock Number	(2) Description (CAGE) Part Number	(3) U/M	(4) Qty Auth
6685-01-193-1733	Transmitter, Pressure (0-10,000 PSI) (19207) 12258956	EA	1

APPENDIX H TRANSMISSION/TRANSMISSION CONTROLS ADAPTABILITY CHART

Section I. INTRODUCTION

H-1. INTRODUCTION

This appendix lists the various transmission controls and configuration modifications that may be required to permit the transmission to function correctly. This appendix will guide the mechanic through the hardware selection process by identifying compatibility issues between the transmission controls (WTEC II/WTEC III) and the numerous revisions of the Allison MD3070PT transmission (PRE-ID w/ 24-pin connector, PRE-ID w/ 31-pin connector, TID 1, TID 2, and TID 3). Refer to Figure 1. After replacing any component of the transmission controls or the transmission assembly, perform calibration procedures in TM 9-2320-366-20-4 paragraph 8-2 or 8-3.

H-2. EXPLANATION OF COLUMNS

- a. **Column (1) - Installed Controls or Controls Being Installed.** This column lists all of the variables concerning which version of transmission controls are installed in the vehicle, or may need to be installed, to communicate correctly with the transmission.
- b. **Column (2) - Installed Transmission or Transmission Being Installed.** This column lists all of the various revisions of the Allison MD3070PT transmissions that may be installed in the vehicle.
- c. **Column (3) - Required Modification.** This column lists the various electrical interface (hardware) modifications that may be required to allow the transmission controls to communicate with the transmission.

H-3. HOW TO USE THIS CHART

- a. Determine which controls and transmission are installed in the vehicle.
- b. Determine which component requires replacement.
- c. Read across the row to column (3) to determine the required modification.

Section II.

TRANSMISSION/TRANSMISSION CONTROLS ADAPTABILITY CHART

(1) Installed Controls or Controls Being Installed	(2) Installed Transmission or Transmission Being Installed	(3) Required Modification (Refer to Section III)
WTEC II (with 24-pin connector)	PRE-ID w/ 24-pin connector (transmission serial number prior to 6510032369)	No modification required.
WTEC II (with 24-pin connector)	PRE-ID w/ 31-pin connector (transmission serial number 6510032369 to 6510090785)	Install 31-pin connector.
WTEC II (with 24-pin connector)	TID 1 (transmission serial number 6510090786 to 6510142171)	Install 31-pin connector.
WTEC II (with 24-pin connector)	TID 2 (transmission serial number 6510142172 to 6510262116)	Install 31-pin connector and replace transmission internal wiring harness.

TRANSMISSION/TRANSMISSION CONTROLS ADAPTABILITY CHART (CONT)

(1) Installed Controls or Controls Being Installed	(2) Installed Transmission or Transmission Being Installed	(3) Required Modification (Refer to Section III)
WTEC II (with 24-pin connector)	TID 3 (transmission serial number 6510262117 and subsequent)	Install 31-pin connector, replace transmission internal wiring harness, and reprogram WTEC II TEPSS. ¹
WTEC II (with 31-pin connector)	PRE-ID w/ 24-pin connector (transmission serial number prior to 6510032369)	Install adapter cable assembly.
WTEC II (with 31-pin connector)	PRE-ID w/ 31-pin connector (transmission serial number 6510032369 to 6510090785)	No modification required.
WTEC II (with 31-pin connector)	TID 1 (transmission serial number 6510090786 to 6510142171)	No modification required.
WTEC II (with 31-pin connector)	TID 2 (transmission serial number 6510142172 to 6510262116)	Replace transmission internal wiring harness.
WTEC II (with 31-pin connector)	TID 3 (transmission serial number 6510262117 and subsequent)	Replace transmission internal wiring harness and reprogram WTEC II TEPSS. ¹
WTEC III (with ECU manufactured prior to October 1999) ²	PRE-ID w/ 24-pin connector (transmission serial number prior to 6510032369)	Install adapter cable assembly and ID harness.
WTEC III (with ECU manufactured prior to October 1999) ²	PRE-ID w/ 31-pin connector (transmission serial number 6510032369 to 6510090785)	Install ID harness.
WTEC III (with ECU manufactured prior to October 1999) ²	TID 1 (transmission serial number 6510090786 to 6510142171)	No modification required.
WTEC III (with ECU manufactured prior to October 1999) ²	TID 2 (transmission serial number 6510142172 to 6510262116)	No modification required.
WTEC III (with ECU manufactured prior to October 1999) ²	TID 3 (transmission serial number 6510262117 and subsequent)	Reprogram WTEC III ECU ¹ or install new WTEC III ECU (P/N 12421787- 002).
WTEC III (with ECU manufactured after to October 1999) ³	PRE-ID w/ 24-pin connector (transmission serial number prior to 6510032369)	Install adapter cable assembly and ID harness.
WTEC III (with ECU manufactured after to October 1999) ³	PRE-ID w/ 31-pin connector (transmission serial number 6510032369 to 6510090785)	Install ID harness.
WTEC III (with ECU manufactured after to October 1999) ³	TID 1 (transmission serial number 6510090786 to 6510142171)	No modification required.

¹ Reprogramming can only be accomplished by an authorized Allison Transmission distributor. You must provide the transmission serial number of the transmission being installed to ensure correct reprogramming. If at a later time, an earlier version transmission is installed in a WTEC II equipped vehicle, WTEC II TEPSS will require reprogramming again.

² Vehicle serial number 012477 and lower. Refer to Figure 1.

³ Vehicle serial number 012478 and higher. Refer to Figure 1.

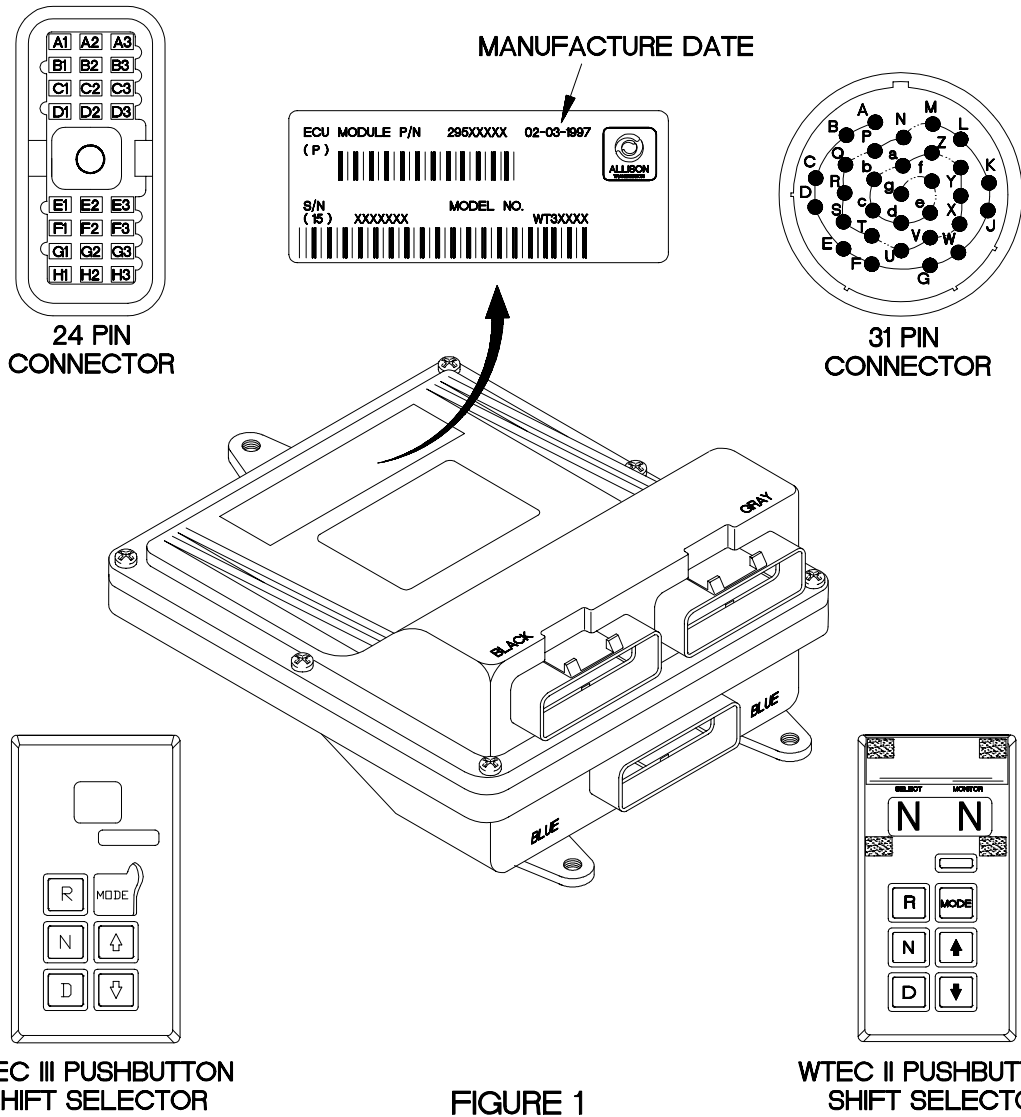
(1) Installed Controls or Controls Being Installed	(2) Installed Transmission or Transmission Being Installed	(3) Required Modification (Refer to Section III)
WTEC III (with ECU manufactured after to October 1999) ³	TID 2 (transmission serial number 6510142172 to 6510262116)	No modification required.
WTEC III (with ECU manufactured after to October 1999) ³	TID 3 (transmission serial number 6510262117 and subsequent)	No modification required.

Section III.

MODIFICATION PARTS IDENTIFICATION

Identification	Part Number	Description
31-pin connector	29519127	Converts a transmission external wiring harness from a 24-pin ("D" type) connector to a 31-pin (round type) connector.
Transmission internal wiring harness	29529474	Converts a TID 2 transmission to a TID 1 configuration to allow WTEC II controls to communicate with the transmission.
ID harness	200100	Allows WTEC III controls to communicate with a PRE-ID transmission.
Adapter cable assembly	29519210	Adapts a PRE-ID transmission with 24-pin ("D" type) connector to a transmission external wiring harness with a 31-pin (round) connector.

MODIFICATION PARTS IDENTIFICATION (CONT)



4WTEC111

SUBJECT INDEX

Subject	Para	Subject	Para
A		B	
Adapter Housing Module Repair	21-6	Bearing(s)	
Air		Camshaft and Bearing Replacement	
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- Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 15 (Prior to Serial Number 6510032369) 2-11

Subject Para

W (Cont)

WTEC II (Cont)

- Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 16 (Serial Number 6510032369 and Higher) 2-11
- Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 16 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly) 2-11
- Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 16 (Prior to Serial Number 6510032369) 2-11
- Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45 and/or 69 Sub Code 21 (Serial Number 6510032369 and Higher) 2-11
- Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45 and/or 69 Sub Code 21 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly) 2-11
- Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45 and/or 69 Sub Code 21 (Prior to Serial Number 6510032369) 2-11
- Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 22 (Serial Number 6510032369 and Higher) 2-11
- Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 22 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly) 2-11
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Subject Para

W (Cont)

WTEC III (Cont)

- Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 32 and Any Sub Code (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly) 2-11
- Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, 45, 46 and/or 69 Sub Code 12 (Serial Number 6510032369 and Higher) 2-11
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W (Cont)

WTEC III (Cont)

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WTEC III (Cont)

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Y

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GLOSSARY ABBREVIATIONS

CTIS	Central Tire Inflation System
ECU	Electronic Control Unit
LH	.....	Left Hand
LMHC	.....	Light Material Handling Crane
MHC	.....	Material Handling Crane
O/R	.....	Outrigger
PTO	.....	Power Takeoff
RH	.....	Right Hand
SRW	.....	15K Self-Recovery Winch
STE/ICE-R	.....	Simplified Test Equipment/Internal Combustion Engine-Reprogrammable
TEPSS	.....	Transmission ECU Pushbutton Shift Selector
TM	.....	Technical Manual
TPS	.....	Throttle Position Sensor
TPSS	.....	Transmission Pushbutton Shift Selector
VIM	.....	Vehicle Interface Module
WTEC II	.....	World Transmission Electronic Controls (version 2)
WTEC III	World Transmission Electronic Controls (version 3)

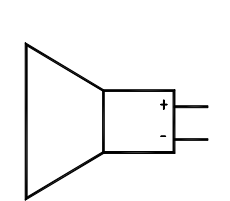
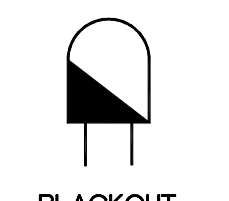
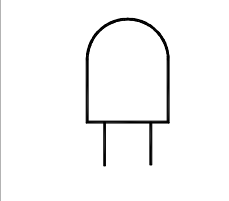
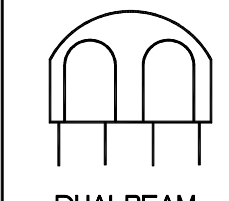
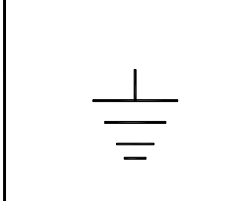
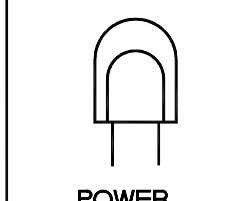
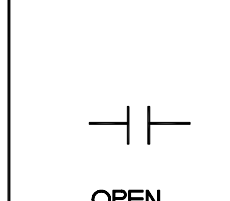
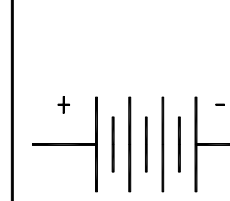
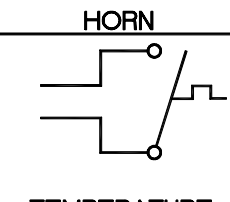
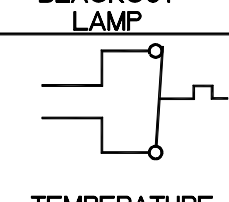
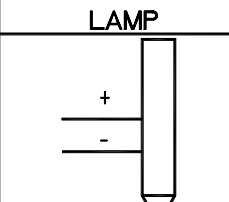
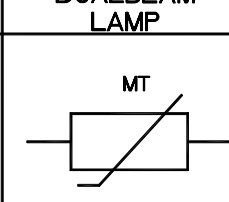
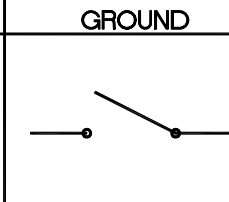
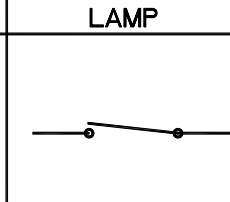
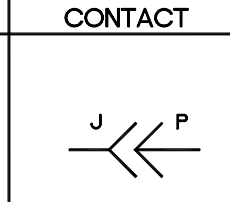
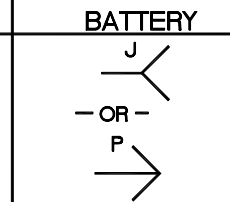
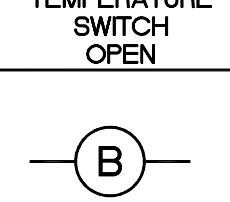
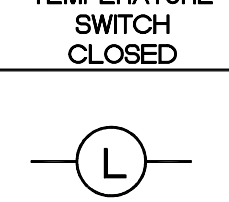
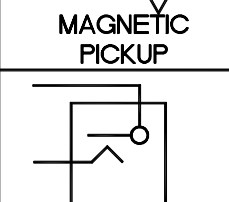
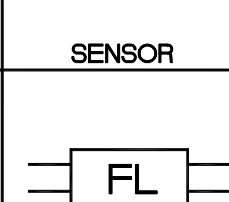
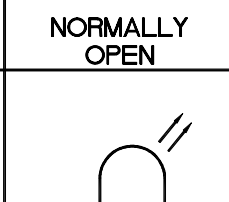
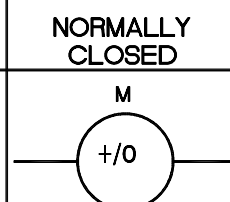
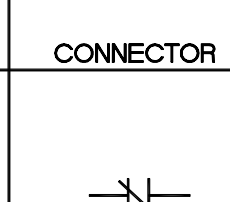
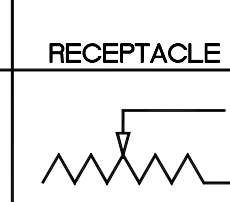
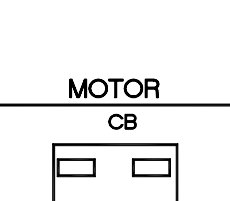
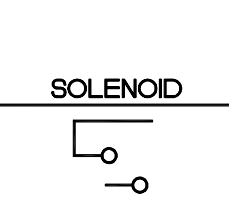
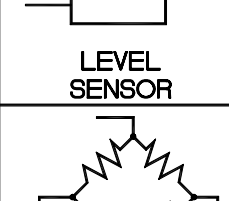
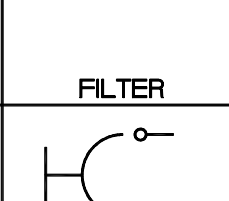
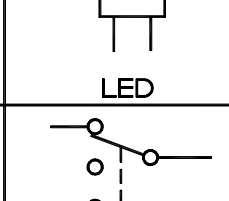
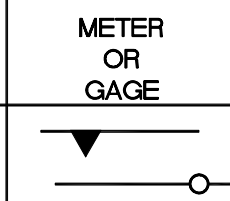
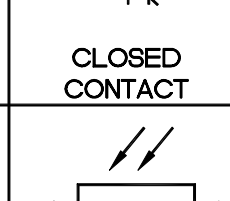
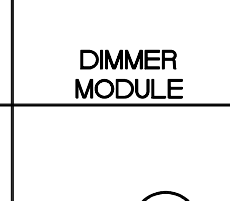
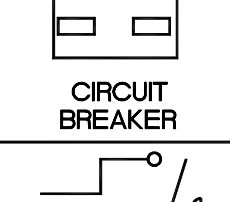
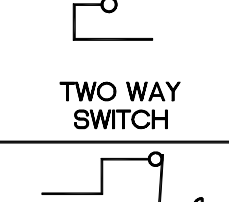
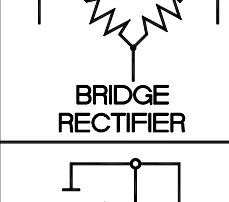
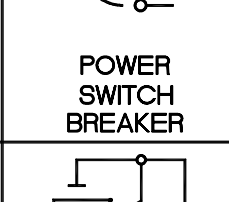
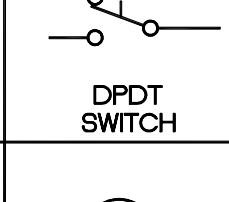
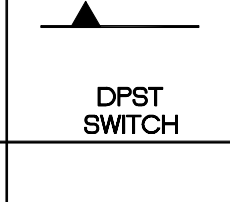
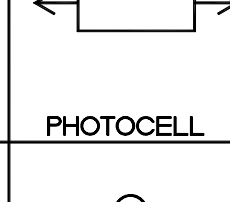
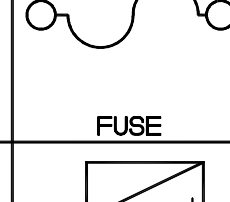
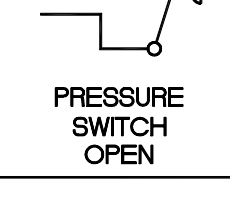
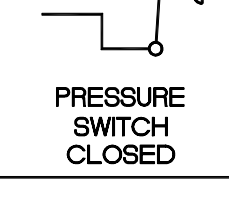
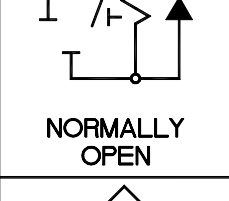
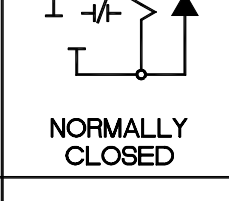
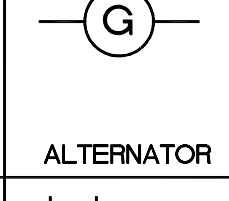
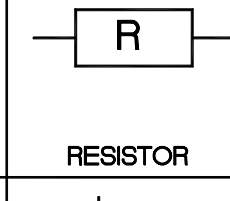
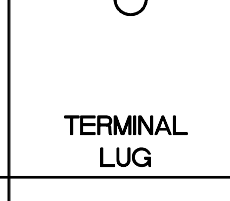
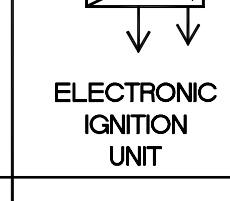
	1	2	3	4	5	6	7	8	9
A									
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C									
D									
E									
F									
G									
H									
	1	2	3	4	5	6	7	8	9

FIGURE FO-1 ELECTRICAL SYSTEM SCHEMATIC
 FOLDOUT 1 OF 40
 SIZE B ILL. NO. 6WD01L1B FP-1/ (FP-2 BLANK)

	10	11	12	13	14	15	16	17	18											
A	CONNECTORS			CONNECTORS (CONTINUED)			CONNECTORS (CONTINUED)			CONNECTORS (CONTINUED)										
	NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION				
	CABLE A	G315	35	OVERLOAD SHUTDOWN SYSTEM	J52	B239	27	CHASSIS - FRONT	P8	B47	6	BLACKOUT MARKER RIGHT FRONT	P60	E242	27	MIDDLE FRONT TOP CLEARANCE LIGHT	P85	A233	26	LH SIDE MARKER LIGHT
	CABLE A	D317	36	WRECKER MATERIAL HANDLING CRANE	J53	F236	27	AIRDROP ONLY	P9	C47	6	FRONT RIGHT TURN SIGNAL	P61	E215	24	RH COMPOSITE LIGHT	P86	A206	23	LH REAR MARKER LIGHT
	CABLE A	F324	36	OVERLOAD SHUTDOWN SYSTEM	J55	C94	11	CAB MARKER LIGHT FRONT UPPER RIGHT	P10	B47	6	PARKING LIGHT FRONT RIGHT	P61	F206	23	RH COMPOSITE LIGHT	P86	A215	24	LH REAR MARKER LIGHT
	CABLE A	D340	38	WRECKER CONTROLS	J57	D94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT	P12	D47	6	RIGHT HEADLIGHT	P61	F224	25	RH COMPOSITE LIGHT	P86	A224	25	LH REAR MARKER LIGHT
	CABLE B	A307	35	CARGO MATERIAL HANDLING CRANE	J59	C94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT	P13	C47	6	RIGHT HEADLIGHT	P61	F233	26	RH COMPOSITE LIGHT	P86	A233	26	LH REAR MARKER LIGHT
	CABLE C	G308	35	CARGO MATERIAL HANDLING CRANE	J60	D94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE	P14	C47	6	RIGHT HEADLIGHT	P62	D215	24	RH COMPOSITE LIGHT	P87	C206	23	BACKUP LIGHT
	CABLE F	B308	36	INTERNAL REMOTE CONNECTOR	J62	E97	11	ROTARY WARNING LIGHT CONNECTOR	P17	H47	6	BLACKOUT DRIVE LIGHT	P62	F206	23	RH COMPOSITE LIGHT	P87	B215	24	BACKUP LIGHT
	CABLE G	F299	35	CARGO MATERIAL HANDLING CRANE	J65	E195	22	ROTARY WARNING LIGHT CONNECTOR	P18	D47	6	LEFT HEADLIGHT	P62	F224	25	RH COMPOSITE LIGHT	P87	C224	25	BACKUP LIGHT
	CABLE G	A324	36	INTERNAL REMOTE CONTROL CONNECTOR	J78	F194	22	CAB RADIO CONNECTOR	P19	E47	6	LEFT HEADLIGHT	P62A	B236	27	ROTARY WARNING LIGHT CONNECTOR	P87	C233	26	BACKUP LIGHT
	CABLE H	F304	35	CRANE CONTROL PANEL	J80	A299	34	AIR DRYER CONNECTOR	P20	D47	6	LEFT HEADLIGHT	P63	F224	25	RH COMPOSITE LIGHT	P88	B206	23	RH SIDE MARKER LIGHT
	CABLE H	E313	36	CRANE CONTROL PANEL	J80	D87	10	AIR DRYER (EXCEPT DUMP)	P22	G47	6	PARKING LIGHT FRONT LEFT	P63	G206	23	RH COMPOSITE LIGHT	P88	H224	25	RH SIDE MARKER LIGHT
	CABLE I	G313	35	CRANE CONTROL PANEL	J93	B59	7	CHASSIS - SPARE TIRE	P23	F47	6	FRONT LEFT TURN SIGNAL	P63	G206	23	RH COMPOSITE LIGHT	P88	H233	26	RH SIDE MARKER LIGHT
	CABLE I	F322	36	CRANE CONTROL PANEL	J95	E47	6	12V INTERVEHICULAR	P24	H47	6	BLACKOUT MARKER LEFT FRONT	P63	D215	24	RH COMPOSITE LIGHT	P89	G206	23	RH REAR MARKER LIGHT
	CABLE J	G313	35	CRANE CONTROL PANEL	J95	B242	27	ENGINE	P25	G94	11	WINDSHIELD WASHER ROTARY PUMP (B3)	P63	G233	26	RH COMPOSITE LIGHT	P89	C215	24	RH REAR MARKER LIGHT
	CABLE J	F322	36	CRANE CONTROL PANEL	J99	E196	22	CHEMICAL ALARM CONNECTOR	P27	A52	6	CHASSIS - FRONT	P64	F206	23	RH COMPOSITE LIGHT	P89	G224	25	RH REAR MARKER LIGHT
	CABLE K	G304	35	CRANE CONTROL PANEL	J106	F59	7	CHEMICAL DETECTOR RECEPTACLE	P31	E65	8	ENGINE	P64	F224	25	RH COMPOSITE LIGHT	P89	G233	26	RH REAR MARKER LIGHT
	CABLE K	F322	36	CRANE CONTROL PANEL	J108	B258	29	CAB - DASH - CENTER - OPTIONS PANEL	P31X	D65	8	ENGINE	P64	D215	24	RH COMPOSITE LIGHT	P107	B199	23	WRECKER REAR LIGHTS
	CABLE L	D304	35	CRANE CONTROL PANEL	J111	E131	15	CTIS ELECTRONIC CONTROL UNIT	P32	F68	8	ENGINE OIL PRESSURE SENSOR	P64	F233	26	RH COMPOSITE LIGHT	P108	B258	29	CAB - DASH - CENTER - OPTIONS PANEL
	CABLE L	C322	36	CRANE CONTROL PANEL	J113	G195	22	CTIS PRESSURE TRANSDUCER	P33	H68	8	FUEL/WATER SEPARATOR	P65	E195	22	ROTARY WARNING LIGHT CONNECTOR	P108	F199	23	WRECKER REAR LIGHTS
	CABLE M	D313	35	CRANE CONTROL PANEL	J114	B173	20	CAB - DASH - LEFT - TRANSMISSION HARNESS - WTEC II	P34	E68	8	OIL PRESSURE WARNING LIGHT SWITCH	P67	A83	10	PRE-BLOCK SEVEN WITH PIGTAIL TRANSMISSION EXTERNAL WIRING HARNESS TO TRANSMISSION CONNECTOR	P110	E128	15	CTIS ELECTRONIC CONTROL UNIT
	CABLE M	C322	36	CRANE CONTROL PANEL	J114	C353	40	WTEC III CAB TRANSMISSION HARNESS (TID1) CONNECTOR	P36	A66	8	WATER COOLER TEMPERATURE	P67	B78	9	TID1, TID2, AND TID3 TRANSMISSION EXTERNAL WIRING HARNESS TO TRANSMISSION CONNECTOR	P111	E131	15	CTIS ELECTRONIC CONTROL UNIT
	CABLE N	D313	35	CRANE CONTROL PANEL	J114	C357	40	WTEC III CAB TRANSMISSION HARNESS (TID2) CONNECTOR	P37	C66	8	WATER TEMPERATURE SWITCH	P69	D68	8	ENGINE	P112	G132	15	CAB - DASH - CENTER - HEATER/CTIS ECU
	CABLE N	D322	36	CRANE CONTROL PANEL	J115	C163	19	CAB - DASH - LEFT - WTEC III TRANSMISSION HARNESS	P38	F70	8	ENGINE SPEED MAGNETIC PICKUP	P71	E75	9	PRE-BLOCK SEVEN TRANSMISSION OUTPUT SPEED SENSOR CONNECTOR	P113	F132	15	CTIS ELECTRONIC CONTROL UNIT
CABLE O	C313	35	CRANE CONTROL PANEL	J116	C168	19	CAB - DASH - LEFT - WTEC III TRANSMISSION HARNESS	P39	G70	8	ENGINE	P71	E79	9	TID1, TID2, AND TID3 TRANSMISSION OUTPUT SPEED SENSOR CONNECTOR	P114	C350	39	WTEC III CAB TRANSMISSION HARNESS (TID2)	
CABLE O	G322	36	CRANE CONTROL PANEL	J116	E346	39	WTEC III TRANSMISSION ECU CONNECTOR	P41	B66	8	WATER TEMPERATURE SENSOR	P71	E83	10	PRE-BLOCK SEVEN WITH PIGTAIL TRANSMISSION OUTPUT SPEED SENSOR CONNECTOR	P115	C346	39	WTEC III CAB - DASH - RIGHT - KICK PANEL	
CABLE P	C313	35	CRANE CONTROL PANEL	J117	F170	19	CAB - DASH - LEFT - WTEC III TRANSMISSION HARNESS	P42	F66	8	ETHER SENSOR SWITCH	P72	F79	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P116	E346	39	WTEC III CAB - DASH - RIGHT - KICK PANEL	
CABLE P	C322	36	CRANE CONTROL PANEL	J118	D170	19	CAB - DASH - LEFT - WTEC III TRANSMISSION HARNESS	P43	G51	6	CHASSIS - FRONT	P72	F75	9	PRE-BLOCK SEVEN TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P116	C194	22	CAB - DASH - RIGHT - UNDERDASH WTEC II	
CABLE Q	E313	35	CRANE CONTROL PANEL	J119	B178	20	CAB - DASH - LEFT - TRANSMISSION HARNESS	P43X	F51	6	CHASSIS - FRONT	P72	F79	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P118	D170	19	CAB - DASH - LEFT - TRANSMISSION HARNESS	
CABLE Q	E322	36	CRANE CONTROL PANEL	J119	C355	40	WTEC III CAB TRANSMISSION HARNESS (TID1)	P50	E94	11	CAB MARKER LIGHT FRONT UPPER LEFT	P72	F75	9	PRE-BLOCK SEVEN TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P119	B178	20	CAB - DASH - LEFT - TRANSMISSION HARNESS	
CABLE R	E313	35	CRANE CONTROL PANEL	J119	C359	40	WTEC III CAB TRANSMISSION HARNESS (TID2)	P50	F242	27	LH FRONT TOP CAB MARKER LIGHT	P72	F79	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P119	D73	9	PRE-BLOCK SEVEN TRANSMISSION CONNECTOR	
CABLE R	D322	36	CRANE CONTROL PANEL	J129	F94	11	CAB MARKER LIGHT FRONT LOWER LEFT	P51	D199	23	CAB - DASH - RIGHT - POWER DISTRIBUTION PANEL	P72	F79	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P119	D78	9	TID1, TID2, AND TID3 TRANSMISSION CONNECTOR	
CABLE S	F313	35	CRANE CONTROL PANEL	J130	F94	11	CAB MARKER LIGHT LEFT DOOR	P51	D208	24	REAR LIGHTS TRACTOR	P74	E83	10	PRE-BLOCK SEVEN W/PIGTAIL TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P119	D82	10	PRE-BLOCK SEVEN WITH PIGTAIL TRANSMISSION CONNECTOR	
CABLE S	E322	36	CRANE CONTROL PANEL	J131	B94	11	CAB MARKER LIGHT RIGHT DOOR	P51	D217	25	LONG WHEEL BASE	P74	F75	9	PRE-BLOCK SEVEN TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P125	G83	11	WINDSHIELD WASHER ROTARY PUMP (B3)	
CABLE T	F313	35	CRANE CONTROL PANEL	J132	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT	P51	D226	26	CAB - DASH - RIGHT - POWER DISTRIBUTION PANEL	P74	F75	9	PRE-BLOCK SEVEN TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P129	F94	11	CAB MARKER LIGHT FRONT LOWER LEFT	
CABLE T	E322	36	CRANE CONTROL PANEL	J132	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT	P52F	E47	6	CHASSIS - FRONT	P74	F79	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P130	F94	11	CAB MARKER LIGHT LEFT DOOR	
CABLE U	A314	35	CRANE REMOTE CONNECTOR	J133	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT	P52M	G208	24	REAR LIGHTS TRACTOR	P74	F79	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P131	A94	11	CAB MARKER LIGHT RIGHT DOOR	
CABLE V	E313	35	CRANE CONTROL PANEL	J133	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT	P52R	E205	23	WRECKER REAR LIGHTS	P74	F79	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P132	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT	
CONN F	C335	38	WRECKER REMOTE	J133	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT	P52R	G214	24	REAR LIGHTS TRACTOR	P74	F79	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P133	A199	23	LH WORKLIGHTS	
CONN G	C340	38	WRECKER REMOTE	J133	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT	P52R	G214	24	REAR LIGHTS TRACTOR	P74	F79	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P133	B209	24	LH WORKLIGHTS	
J2	A194	22	EMI FILTER	J133	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT	P52R	E233	26	LONG WHEEL BASE	P74	F79	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P133	B209	24	LH WORKLIGHTS	
J3	D241	27	AIRDROP ONLY	J133	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT	P52R	E233	26	LONG WHEEL BASE	P74	F79	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P133A	B199	23	LH WORKLIGHTS	
J4	E340	38	WRECKER CONTROLS	J133	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT	P52R	E233	26	LONG WHEEL BASE	P74	F79	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P133A	B209	24	LH WORKLIGHTS	
J5	A47	6	VEHICLE HORN	J133	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT	P52R	E233	26	LONG WHEEL BASE	P74	F79	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P133A	B209	24	LH WORKLIGHTS	
J6	A47	6	VEHICLE HORN	J133	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT	P52R	E233	26	LONG WHEEL BASE	P74	F79	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P134	G199	23	RH WORKLIGHTS	
J7	A197	22	WTEC II TRANSMISSION PUSHBUTTON SHIFT SELECTOR DIMMER MODULE	J133	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT	P52R	E233	26	LONG WHEEL BASE	P74	F79	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P134	C209	24	RH WORKLIGHTS	
J8	B47	6	BLACKOUT MARKER LIGHT FRONT	J133	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT	P52R	E233	26	LONG WHEEL BASE	P74	F79	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P134A	F199	23	RH WORKLIGHTS	
J9	C47	6	FRONT RIGHT TURN SIGNAL	J133	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT	P52R	E233	26	LONG WHEEL BASE	P74	F79	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P134A	B209	24	RH WORKLIGHTS	
J10	B47	6	PARKING LIGHT FRONT RIGHT	J133	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT	P52R	E233	26	LONG WHEEL BASE	P74	F79	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P135	D260	29	CAB - DASH - CENTER - OPTIONS PANEL	
J12	D47	6	RIGHT HEADLIGHT	J133	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT	P52R	E233	26	LONG WHEEL BASE	P74	F79	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P136	C260	29	CAB - DASH - CENTER - OPTIONS PANEL	
J13	C47	6	RIGHT HEADLIGHT	J133	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT	P52R	E233	26	LONG WHEEL BASE	P74	F79	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P172	A300	34	DUMP BODY CONNECTOR	
J14	C47	6	RIGHT HEADLIGHT	J133	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT	P52R	E233	26	LONG WHEEL BASE	P74	F79	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P201	G70	8	ENGINE	
J17	H47	6	BLACKOUT DRIVE LIGHT	J133	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT	P52R	E233	26	LONG WHEEL BASE	P74	F79	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P209A	F268	30	TRANSMISSION AUXILIARY OIL COOLER FAN	
J18	D47	6	LEFT HEADLIGHT	J133	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT	P52R	E233	26	LONG WHEEL BASE	P74	F79	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P209B	G264	30	DUMP, CARGO LWB, CARGO W/MHC, CARGO LWB W/MHC	
J19	E47	6	LEFT HEADLIGHT	J133	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT	P52R	E233	26	LONG WHEEL BASE	P74	F79	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P209B	G268	30	TRANSMISSION AUXILIARY OIL COOLER FAN	
J19	C186	21	CAB - DASH - LEFT - UNDERDASH	J133	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT	P52R	E233	26	LONG WHEEL BASE	P74	F79	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P210	F258	29	CAB - DASH - CENTER - OPTIONS PANEL	
J20	D47	6	LEFT HEADLIGHT	J133	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT	P52R	E233	26	LONG WHEEL BASE	P74	F79	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P210	C263	30	PTO EQUIPPED	
J22	G47	6	PARKING LIGHT FRONT LEFT	J133	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT	P52R	E233	26	LONG WHEEL BASE	P74	F79	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P215	E266	30	PTO EQUIPPED	
J23	F47	6	FRONT LEFT TURN SIGNAL	J133	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT	P52R	E233	26	LONG WHEEL BASE	P74	F79	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P216	E265	30	PTO EQUIPPED	
J24	H47	6	BLACKOUT MARKER LEFT FRONT	J133	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT	P52R	E233	26	LONG WHEEL BASE	P74	F79	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P216	A304	34	PTO PRESSURE SWITCH CONNECTOR	
J25	G94	11	WINDSHIELD WASHER ROTARY PUMP (B3)	J133	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT	P52R	E233	26	LONG WHEEL BASE	P74	F79	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR	P217	C265			

19			20			21			22			23			24			25			26			27					
CONNECTORS (CONTINUED)						LIGHTS (CONTINUED)						LIGHTS (CONTINUED)						CIRCUIT BREAKERS (CONTINUED)						TERMINAL LUGS (CONTINUED)					
NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION		
P905A	B247	28	CAB - DASH - CENTER - OPTIONS PANEL	DS16	E110	13	HIGH BEAM	DS53	H46	6	BLACKOUT DRIVE LIGHT	CB22	C158	18	FAN/ETHER	TL17	C233	26	BACKUP LIGHT										
P906	A248	28	CAB - DASH - CENTER - OPTIONS PANEL	DS17	D128	15	HEATER CONTROL PANEL ILLUMINATION	DS54	D93	11	CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT	CB23	C156	18	HEATER BLOWER	TL17	C206	23	WRECKER REAR LIGHTS										
P906A	B248	28	CAB - DASH - CENTER - OPTIONS PANEL	DS18	A244	28	CAB - DASH - CENTER - OPTIONS PANEL	DS54	F242	27	LH FRONT TOP CAB CLEARANCE LIGHT	CB30	C148	17	CHEMICAL ALARM	TL17	C215	24	REAR LIGHTS TRACTOR										
P908	A251	28	CAB - DASH - CENTER - OPTIONS PANEL	DS19	E110	13	RADIATOR FAN OFF	DS55	D93	11	CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE	CB35	D158	18	WTEC II VIM POWER	TL17	C224	25	LONG WHEEL BASE										
P908A	B251	28	CAB - DASH - CENTER - OPTIONS PANEL	DS21	C110	13	EMERGENCY BRAKE	DS55	E242	27	MIDDLE FRONT TOP CLEARANCE LIGHT	CB36	C156	18	HORN POWER	TL18	C206	23	WRECKER REAR LIGHTS										
P909	A256	29	CAB - DASH - CENTER - OPTIONS PANEL	DS22	D110	13	PARKING BRAKE	DS56	C93	11	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT	CB37	C160	18	WINDSHIELD WIPER/WASHER	TL18	H215	24	REAR LIGHTS TRACTOR										
P909A	B256	29	CAB - DASH - CENTER - OPTIONS PANEL	DS23	C110	13	PTO ON	DS56	D242	27	RH FRONT TOP CAB CLEARANCE LIGHT	CB38	D156	18	ROTATING BEACON	TL18	C224	25	LONG WHEEL BASE REAR LIGHTS										
P910	B251	28	CAB - DASH - CENTER - OPTIONS PANEL	DS24	D110	13	OIL PRESSURE	DS57	C93	11	CAB MARKER LIGHT FRONT UPPER RIGHT	CB39	C155	18	TRAILER BLACKOUT STOP	TL18	C233	26	LONG WHEEL BASE										
P910A	D251	28	CAB - DASH - CENTER - OPTIONS PANEL	DS25	C110	13	WATER TEMPERATURE	DS57	D242	27	RH FRONT TOP CAB MARKER LIGHT	CB40	C159	18	CTIS COOLER	TL19	H206	23	WRECKER REAR LIGHTS										
P911	B256	29	CAB - DASH - CENTER - OPTIONS PANEL	DS27	C110	13	REAR BRAKE AIR	DS58	E93	11	CAB MARKER LIGHT FRONT UPPER LEFT	CB41	C151	17	TRAILER REAR LIGHTS POWER	TL19	H224	25	LONG WHEEL BASE										
P911A	D256	29	CAB - DASH - CENTER - OPTIONS PANEL	DS28	E110	13	FRONT AIR BRAKE	DS58	F242	27	LH FRONT TOP CAB MARKER LIGHT	CB42	C151	17	BLACKOUT MARKER LIGHTS POWER	TL19	H233	26	RH SIDE MARKER LIGHT										
P912	B133	15	CAB - DASH - CENTER - HEATER/CTIS - ECU	DS29	D110	13	ENGINE OIL LEVEL	DS59	B93	11	CAB MARKER LIGHT RIGHT DOOR	CB43	C152	17	REAR COMPOSITE LIGHTS / WTEC III ECU	TL20	G233	26	RH REAR MARKER LIGHT										
P912A	F134	15	CAB - DASH - CENTER - HEATER/CTIS - ECU	DS30	F110	13	MASTER STOP	DS60	F93	11	CAB MARKER LIGHT FRONT LOWER LEFT	CB44	C152	17	REAR COMPOSITE LIGHTS	TL20	C215	24	TRACTOR REAR LIGHTS										
P913	B131	15	CAB - DASH - CENTER - HEATER/CTIS - ECU	DS31	D249	28	TRACTOR BLACKOUT CENTER - OPTIONS PANEL	DS61	A93	11	CAB MARKER LIGHT RIGHT DOOR	CB45	C148	17	FUEL PREHEAT	TL20	G224	25	LONG WHEELBASE REAR LIGHTS										
P913	F245	28	CAB - DASH - CENTER - OPTIONS PANEL	DS32	B110	13	CHEMICAL DETECT	DS62	F93	11	CAB MARKER LIGHT LEFT DOOR	CB48	C149	17	ARCTIC CAB/ENGINE KILL	TL20	G206	23	WRECKER REAR LIGHTS										
P914	A250	28	CAB - DASH - CENTER - OPTIONS PANEL	DS34	C110	13	CTIS OVERSPEED	DS63	B246	28	CAB - DASH - CENTER - OPTIONS PANEL	CB49	C160	18	PTO POWER	TL21	G206	23	WRECKER REAR LIGHTS										
P914A	B250	28	CAB - DASH - CENTER - OPTIONS PANEL	DS35	C207	23	WRECKER BLACKOUT STOP LEFT REAR	DS64	B248	28	CAB - DASH - CENTER - OPTIONS PANEL	CB50	C155	18	SWINGFIRE PUMP POWER	TL21	D215	24	REAR LIGHTS TRACTOR										
P921	G70	8	TROOP TRANSPORT ALARM	DS35	B216	24	TRACTOR BLACKOUT STOP LEFT REAR	DS65	A207	23	WRECKER LH SIDE MARKER LIGHT	CB53	D149	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL	TL21	G224	25	LONG WHEEL BASE										
P94	A199	23	LH INTERMEDIATE MARKER	DS35	C225	25	LONG WHEEL BASE BLACKOUT STOP LEFT REAR	DS65	A225	25	LONG WHEEL BASE LH SIDE MARKER LIGHT	CB54	D151	17	BLACKOUT HEADLIGHT	TL21	G233	26	RH COMPOSITE LIGHT										
P94	A217	25	LH INTERMEDIATE MARKER	DS35	C234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE BLACKOUT STOP LEFT REAR	DS66	A207	23	WRECKER LH REAR MARKER LIGHT	CB61	D162	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL	TL22	D94	11	CAB MARKER LIGHTS										
P95	G199	23	RH INTERMEDIATE MARKER	DS36	G207	23	WRECKER BLACKOUT STOP RIGHT REAR	DS66	A216	24	TRACTOR LH REAR MARKER LIGHT	CB62	D162	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL	TL22	E242	27	LH FRONT TOP CAB CLEARANCE LIGHT										
P95	G217	25	RH INTERMEDIATE MARKER	DS36	D216	24	TRACTOR BLACKOUT STOP RIGHT REAR	DS66	A225	25	LONG WHEEL BASE LH REAR MARKER LIGHT	CB63	D160	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL	TL23	D56	7	24V AUXILIARY STARTER SOLENOID										
P99	F195	22	CHEMICAL ALARM CONNECTOR	DS36	G225	25	LONG WHEEL BASE BLACKOUT STOP RIGHT REAR	DS66	A234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE LH REAR MARKER LIGHT	CB64	D160	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL	TL24	D56	7	24V AUXILIARY STARTER SOLENOID										
PX1	A101	12	ENGINE FAN OFF SWITCH	DS36	G234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE BLACKOUT STOP RIGHT REAR	DS67	H207	23	WRECKER RH SIDE MARKER LIGHT	CB65	D149	17	PARKING LIGHTS	TL25	C56	7	CHASSIS - FRONT										
PX10	D116	13	CAB - DASH - LEFT - INSTRUMENT PANEL	DS37	B207	23	WRECKER REAR LEFT COMPOSITE	DS67	H225	25	LONG WHEEL BASE RH SIDE MARKER LIGHT	CB66	D152	17	BLACKOUT MARKER POWER	TL25	C71	8	STARTER/STARTER SOLENOID										
PX11	G116	13	CAB - DASH - LEFT - INSTRUMENT PANEL	DS37	A216	24	TRACTOR REAR LEFT COMPOSITE	DS67	H234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE RH SIDE MARKER LIGHT	CB67	D148	17	MARKER LIGHTS	TL26	B56	7	CHASSIS - FRONT										
PX12	C121	14	ROTATING WARNING LIGHT SWITCH	DS37	B225	25	LONG WHEEL BASE REAR LEFT COMPOSITE	DS68	G207	23	WRECKER RH REAR MARKER LIGHT	CB68	C161	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL	TL26	C71	8	STARTER/STARTER SOLENOID										
PX12A	E121	14	CAB - DASH - LEFT - INSTRUMENT PANEL	DS37	B234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE REAR LEFT COMPOSITE	DS68	G226	25	TRACTOR RH REAR MARKER LIGHT	CB70	D155	18	IGNITION/MAIN LIGHT SWITCH	TL27	E94	11	CAB MARKER LIGHTS										
PX13	F101	12	ETHER STARTER SWITCH	DS38	F207	23	WRECKER REAR RIGHT COMPOSITE	DS68	G225	25	LONG WHEEL BASE RH REAR MARKER LIGHT	CB71	D158	18	HAZARD/FLASHER WORKLIGHTS	TL27	F242	27	LH FRONT TOP CAB MARKER LIGHT										
PX13A	G101	12	CAB - DASH - LEFT - INSTRUMENT PANEL	DS38	E216	24	TRACTOR REAR RIGHT COMPOSITE	DS68	G234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE RH REAR MARKER LIGHT	CB72	D148	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL	TL28	G66	8	FUEL SOLENOID										
PX14	F121	14	FULL HAZARD WARNING SWITCH	DS38	F225	25	LONG WHEEL BASE REAR RIGHT COMPOSITE	DS69	D207	23	WRECKER LEFT REAR MARKER	CB73	D159	18	BACK-UP LIGHT POWER	TL29	H66	8	FUEL SOLENOID										
PX14A	H121	14	CAB - DASH - LEFT - INSTRUMENT PANEL	DS38	F234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE REAR RIGHT COMPOSITE	DS69	D225	25	LONG WHEEL BASE LEFT REAR MARKER	CB74	D159	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL	TL30	D206	23	WRECKER REAR LIGHTS										
PX15	C124	14	MAIN LIGHT SWITCH	DS39	F46	6	FRONT LEFT TURN SIGNAL	DS69	D234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE LEFT REAR MARKER	CB76	D152	17	BLACKOUT STOP RELAY POWER	TL30	E215	24	REAR LIGHTS TRACTOR										
PX17	A121	14	IGNITION SWITCH	DS41	D110	13	TRANSMISSION OIL TEMPERATURE	DS70	E207	23	WRECKER MIDDLE REAR MARKER	CB77	C161	18	ENGINE INSTR POWER	TL30	D224	25	LONG WHEEL BASE										
PX17A	C112	14	CAB - DASH - LEFT - INSTRUMENT PANEL	DS42	C47	6	FRONT RIGHT TURN SIGNAL	DS70	F216	24	TRACTOR MIDDLE REAR MARKER	CB78	D156	18	HEADLIGHTS	TL30	D233	26	LEFT REAR MARKER										
PX1A	B101	12	CAB - DASH - LEFT - INSTRUMENT PANEL	DS43	D248	28	CAB - DASH - CENTER - OPTIONS PANEL	DS70	E225	25	LONG WHEEL BASE MIDDLE REAR MARKER	CB79	C159	18	WTEC II VIM POWER / WTEC III REVERSE WARNING RELAY	TL31	E206	23	WRECKER REAR LIGHTS										
PX2	D101	12	LAMP TEST SWITCH	DS44	D46	6	RIGHT HEADLIGHT	DS70	E234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE MIDDLE REAR MARKER	TL31	F215	24	REAR LIGHTS TRACTOR														
PX20	C197	22	TURN SIGNAL FLASHER	DS45	D207	23	WRECKER BACKUP LIGHT	DS71	E207	23	WRECKER RIGHT REAR MARKER	TL31	E224	25	LONG WHEEL BASE														
PX21	A143	16	WIPER DELAY MODULE	DS45	C216	24	TRACTOR BACKUP LIGHT	DS71	E216	24	TRACTOR RIGHT REAR MARKER	TL31	E233	26	MIDDLE REAR MARKER														
PX22	A193	22	EMI FILTER	DS45	C225	25	LONG WHEEL BASE BACKUP LIGHT	DS71	E225	25	LONG WHEEL BASE RIGHT REAR MARKER	TL32	E206	23	WRECKER REAR LIGHTS														
PX24	G124	14	INSTRUMENT PANEL LIGHTS DIMMER MODULE	DS45	C234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE BACKUP LIGHT	DS71	E234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE RIGHT REAR MARKER	TL32	G215	24	REAR LIGHTS TRACTOR														
PX25	C128	15	CAB - DASH - CENTER - HEATER/CTIS - ECU	DS46	D246	28	CAB - DASH - CENTER - OPTIONS PANEL	DS72	B207	23	WRECKER REAR LEFT COMPOSITE	TL32	E224	25	LONG WHEEL BASE														
PX26	B188	21	CAB - DASH - LEFT - UNDERDASH	DS47	Q46	6	PARKING LIGHT FRONT LEFT	DS72	B216	24	TRACTOR REAR LEFT COMPOSITE	TL32	E233	26	RIGHT REAR MARKER														
PX2A	E101	12	CAB - DASH - LEFT - INSTRUMENT PANEL	DS48	B47	6	PARKING LIGHT FRONT RIGHT	DS72	B225	25	LONG WHEEL BASE REAR LEFT COMPOSITE	TL320	E268	30	PTO EQUIPPED														
PX33	B191	22	CAB - DASH - RIGHT - UNDERDASH	DS49	Q46	6	BLACKOUT MARKER LEFT FRONT	DS72	B234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE REAR LEFT COMPOSITE	TL320	C277	31	ARCTIC KIT W/PTO EQUIPPED														
PX33	G346	39	WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR	DS50	B47	6	BLACKOUT MARKER RIGHT FRONT	DS73	F207	23	WRECKER REAR RIGHT COMPOSITE	TL33	E56	7	24V AUXILIARY STARTER SOLENOID														
PX34	E197	22	FRONT AIR PRESSURE METER	DS51	B207	23	WRECKER BLACKOUT MARKER LEFT REAR	DS73	E216	24	TRACTOR REAR RIGHT COMPOSITE	TL35	D70	8	ALTERNATOR														
PX4	F106	12	FAN SOLENOID	DS51	B216	24	TRACTOR BLACKOUT MARKER LEFT REAR	DS73	F225	25	LONG WHEEL BASE REAR RIGHT COMPOSITE	TL36	B62	7	POLARITY PROTECTION														
PX5	B106	12	REAR AIR PRESSURE METER	DS51	B225	25	LONG WHEEL BASE BLACKOUT MARKER LEFT REAR	DS73	F234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE REAR RIGHT COMPOSITE	TL36	F63	7	200 AMP														
PX50	D197	22	INTER-AXLE DIFFERENTIAL SOLENOID	DS52	F207	23	WRECKER BLACKOUT MARKER RIGHT REAR	DS74	D46	6	LEFT HEADLIGHT	TL37	F63	7	200 AMP														
PX6	B116	13	CAB - DASH - LEFT - INSTRUMENT PANEL	DS52	D216	24	TRACTOR BLACKOUT MARKER RIGHT REAR	DS96	B251	28	CAB - DASH - CENTER - OPTIONS PANEL	TL37	B63	7	POLARITY PROTECTION														
PX7	A113	13	CAB - DASH - LEFT - INSTRUMENT PANEL	DS52	F225	25	LONG WHEEL BASE BLACKOUT MARKER RIGHT REAR	DS97	B255	29	CAB - DASH - CENTER - OPTIONS PANEL	TL38	D59	7	SHUNT														
PX8	G111	13	CAB - DASH - LEFT - INSTRUMENT PANEL	DS52	F234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE BLACKOUT MARKER RIGHT REAR	DS98	D251	28	CAB - DASH - CENTER - OPTIONS PANEL	TL39	C61	7	CHASSIS - REAR (REF E1)														
PX9	D106	12	FUEL LEVEL METER	DS53	H46	6	BLACKOUT DRIVE LIGHT	DS99	D255	29	CAB - DASH - CENTER - OPTIONS PANEL	TL41	B62	7	POLARITY PROTECTION														
LIGHTS						LIGHTS						CIRCUIT BREAKERS						TERMINAL LUGS											
NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION		
DS1	D105	12	CAB - DASH - LEFT - INSTRUMENT PANEL	DS53	H46	6	BLACKOUT DRIVE LIGHT	DS96	B251	28	CAB - DASH - CENTER - OPTIONS PANEL	TL1	B63	7	POLARITY PROTECTION														
DS2	G115	12	CAB - DASH - LEFT - INSTRUMENT PANEL	DS54	D93	11	CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT	DS97	B255	29	CAB - DASH - CENTER - OPTIONS PANEL	TL1	E69	8	ALTERNATOR														
DS3	F105	12	CAB - DASH - LEFT - INSTRUMENT PANEL	DS54	F242	27	LH FRONT TOP CAB CLEARANCE LIGHT	DS98	D251	28	CAB - DASH - CENTER - OPTIONS PANEL	TL1	F62	7	200 AMP														
DS4	B105	12	CAB - DASH - LEFT - INSTRUMENT PANEL	DS55	D93	11	CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE	DS99	D255	29	CAB - DASH - CENTER - OPTIONS PANEL	TL2	D62	7	200 AMP														
DS5	B115	13	CAB - DASH - LEFT - INSTRUMENT PANEL	DS56	C93	11	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT	DS100	B249	28	CAB - DASH - CENTER - OPTIONS PANEL	TL2	B62	7	POLARITY PROTECTION														
DS6	G110	13	CAB - DASH - LEFT - INSTRUMENT PANEL	DS56	D242	27	RH FRONT TOP CAB CLEARANCE LIGHT	DS101	D128	15	HEATER CONTROL PANEL ILLUMINATION	TL2	D69	8	ALTERNATOR														
DS7	D115	13	CAB - DASH - LEFT - INSTRUMENT PANEL	DS57	C93	11	CAB MARKER LIGHT FRONT UPPER RIGHT	DS108	E100	12	CAB - DASH - LEFT - INSTRUMENT PANEL	TL2	D69	8	ALTERNATOR														
DS8	C100	12	CAB - DASH - LEFT - INSTRUMENT PANEL	DS58	E93	11	CAB MARKER LIGHT FRONT UPPER LEFT	CIRCUIT BREAKERS						TL2	D69	8	ALTERNATOR												
DS9	B110	13	DUMP BODY UP	DS58	F242	27	LH FRONT TOP CAB MARKER LIGHT	NUMBER	ZONE	SH	DESCRIPTION	TL2	D69	8	ALTERNATOR														
DS10	E120	14	CAB - DASH - LEFT - INSTRUMENT PANEL	DS59	B93	11	CAB MARKER LIGHT RIGHT DOOR	CB20	C149	17	CAB RADIO	TL3	C94	11	CAB MARKER LIGHT FRONT UPPER RIGHT														
DS11	G100	12	CAB - DASH - LEFT - INSTRUMENT PANEL	DS60	F93	11	CAB MARKER LIGHT FRONT LOWER LEFT	CB21	C158	18	WTEC II VIM STE/CE	TL3	D242	27	RH FRONT TOP CAB MARKER LIGHT														
DS12	H120	14	CAB - DASH - LEFT - INSTRUMENT PANEL	DS61	A93	11	CAB MARKER LIGHT RIGHT DOOR	TERMINAL LUGS						TL3	D242	27	RH FRONT TOP CAB MARKER LIGHT												
DS13	C120	14	CAB - DASH - LEFT - INSTRUMENT PANEL	DS62	F93	11	CAB MARKER LIGHT LEFT DOOR	NUMBER	ZONE	SH	DESCRIPTION	TL4	C94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT														
DS14	B110	13	LEFT TURN SIGNAL	DS63	B246	28	CAB - DASH - CENTER - OPTIONS PANEL	TL1	B63	7	POLARITY PROTECTION	TL4																	

		37	38	39	40	41	42	43	44	45				
A	MISCELLANEOUS (CONTINUED)											A		
	NUMBER	ZONE	SH	DESCRIPTION										
	E89	C115	13	CAB - DASH - LEFT - INSTRUMENT PANEL										
	E90	E354	40	WTEC III CAB TRANSMISSION HARNESS (TID1)										
	E90	E358	40	WTEC III CAB TRANSMISSION HARNESS (TID2)										
	E91	C354	40	WTEC III CAB TRANSMISSION HARNESS (TID1)										
	E91	C358	40	WTEC III CAB TRANSMISSION HARNESS (TID2)										
	FL	E183	22	WTEC II VEHICLE INTERFACE MODULE										
	FL1	G85	11	EMI FILTER										
	FL2	A184	22	EMI FILTER										
	FL3	C118	15	FAN MOTOR										
	G1	D70	8	ALTERNATOR										
	B	MPU1	F61	8	ENGINE SPEED MAGNETIC PICKUP									
		MT3	G69	8	ENGINE OIL PRESSURE SENSOR									
		MT4	E177	21	SENSOR/FRONT AIR PRESSURE TRANSMITTER									
		MT5	G186	21	SENSOR/REAR AIR PRESSURE TRANSMITTER									
		MT6	B66	8	WATER COOLER TEMPERATURE									
		MT7	B61	7	FUEL TANK LEVEL SENSOR									
		NS	E192	22	WTEC II VEHICLE INTERFACE MODULE									
		NS	F192	22	WTEC II VEHICLE INTERFACE MODULE									
		R11	D59	7	SHUNT									
		C	TB	C309	35	CARGO MATERIAL HANDLING CRANE								
	TB		F309	35	CARGO MATERIAL HANDLING CRANE									
	TB		D319	36	WRECKER MATERIAL HANDLING CRANE									
	TB		E247	38	WRECKER CONTROLS									
	TB1		C137	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PANEL									
	TB2		F139	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PANEL									
	X1		C146	17	24 VDC									
	X11		F61	7	NATO SLAVE RECEPTACLE									
	X2		D146	17	24 VDC									
	X3		F146	17	GROUND									
	D	TRANSMISSION											D	
		NUMBER	ZONE	SH	DESCRIPTION									
		A10	B192	22	WTEC II VEHICLE INTERFACE MODULE									
		A11	C347	39	WTEC III TRANSMISSION ECU									
		A12	G347	39	WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR									
		A13	A75	9	PRE-BLOCK SEVEN TRANSMISSIONS									
		A13	A78	9	TID1, TID2 AND TID3 TRANSMISSIONS									
		A13	A82	10	PRE-BLOCK SEVEN WITH PIGTAIL TRANSMISSIONS									
		B10	E76	9	PRE-BLOCK SEVEN TRANSMISSION OUTPUT SPEED SENSOR									
		B10	E85	10	PRE-BLOCK SEVEN TRANSMISSION WITH PIGTAIL OUTPUT SPEED SENSOR									
	E	B10	E80	9	TID1, TID2, AND TID3 TRANSMISSION OUTPUT SPEED SENSOR									
		MT9	F76	9	PRE-BLOCK SEVEN TRANSMISSION ENGINE SPEED SENSOR									
MT9		F85	10	PRE-BLOCK SEVEN WITH PIGTAIL TRANSMISSION ENGINE SPEED SENSOR										
MT9		F80	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR										
F		MT11	G76	9	PRE-BLOCK SEVEN TRANSMISSION THROTTLE POSITION SENSOR									
		MT11	F85	10	PRE-BLOCK SEVEN WITH PIGTAIL TRANSMISSION THROTTLE POSITION SENSOR									
		MT11	F80	9	TID1, TID2, AND TID3 TRANSMISSION THROTTLE POSITION SENSOR									
G		REV	C192	22	WTEC II VEHICLE INTERFACE MODULE									
		RW	D192	22	WTEC II VEHICLE INTERFACE MODULE									
		S02	F192	22	WTEC II VEHICLE INTERFACE MODULE									
	S03	F192	22	WTEC II VEHICLE INTERFACE MODULE										
	SF01	D192	22	WTEC II VEHICLE INTERFACE MODULE										
	SF01	D192	22	WTEC II VEHICLE INTERFACE MODULE										
	SF02	C192	22	WTEC II VEHICLE INTERFACE MODULE										
	SF02	D192	22	WTEC II VEHICLE INTERFACE MODULE										
	SF3	F192	22	WTEC II VEHICLE INTERFACE MODULE										
	SF04	C192	22	WTEC II VEHICLE INTERFACE MODULE										
SF4	D192	22	WTEC II VEHICLE INTERFACE MODULE											
H	FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 5 OF 40											H		
	SIZE		B		ILL. NO.		6WD01L5B		FP-9 / (FP-10 BLANK)					

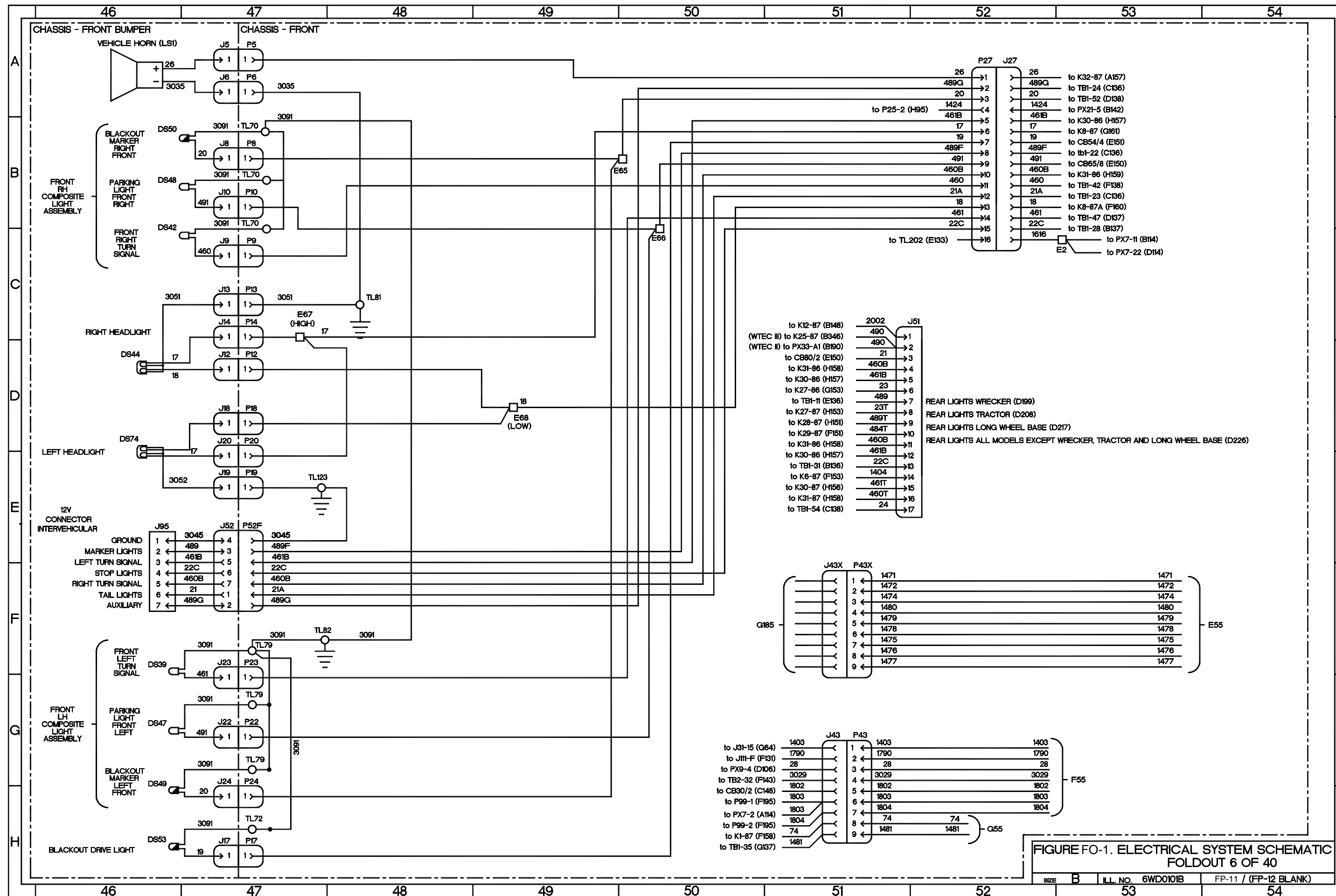


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 6 OF 40

SIZE	B	ILL. NO.	6WD0101B	FP-11 / (FP-12 BLANK)
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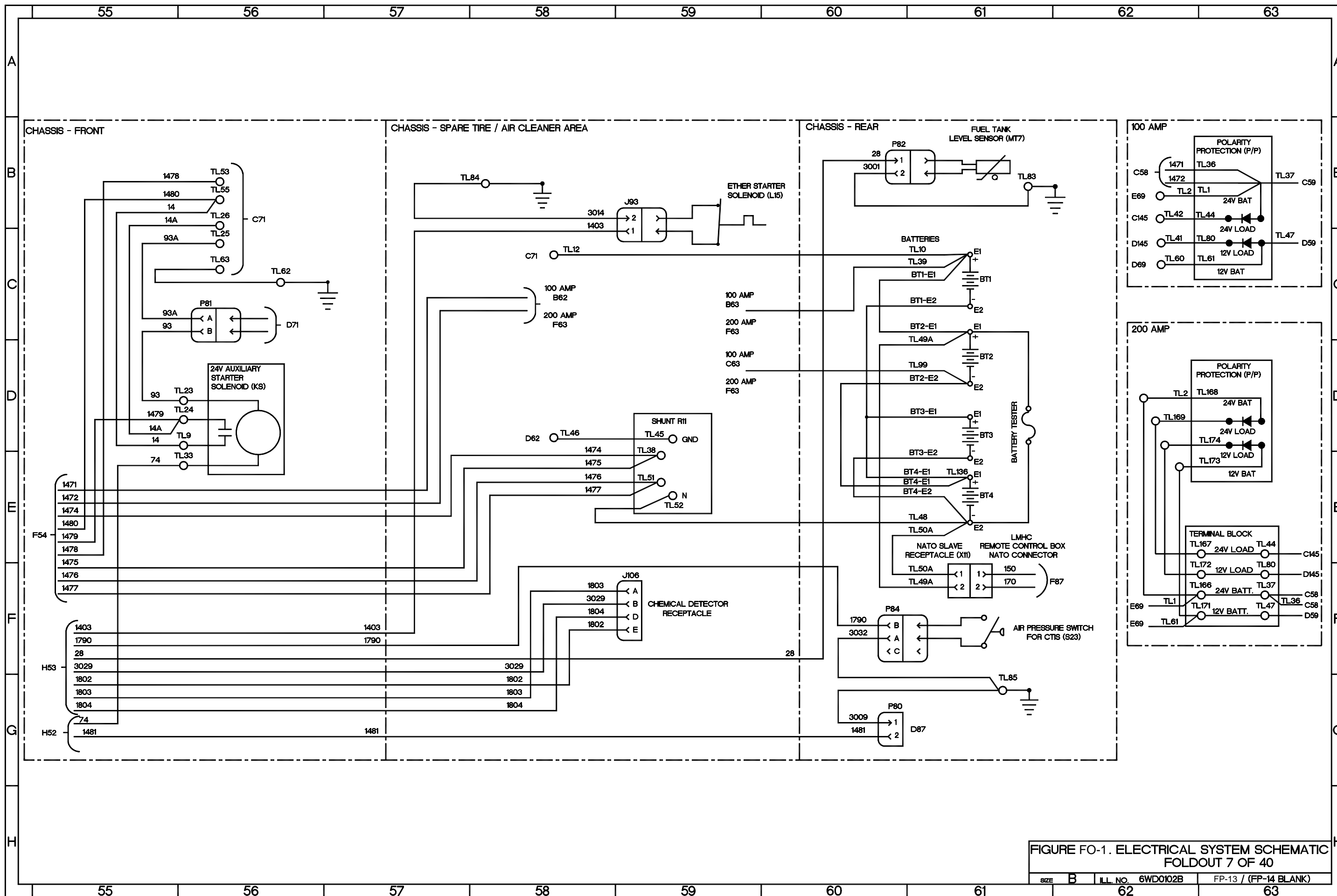


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 7 OF 40

SIZE	B	ILL. NO.	6WD0102B	FP-13 / (FP-14 BLANK)
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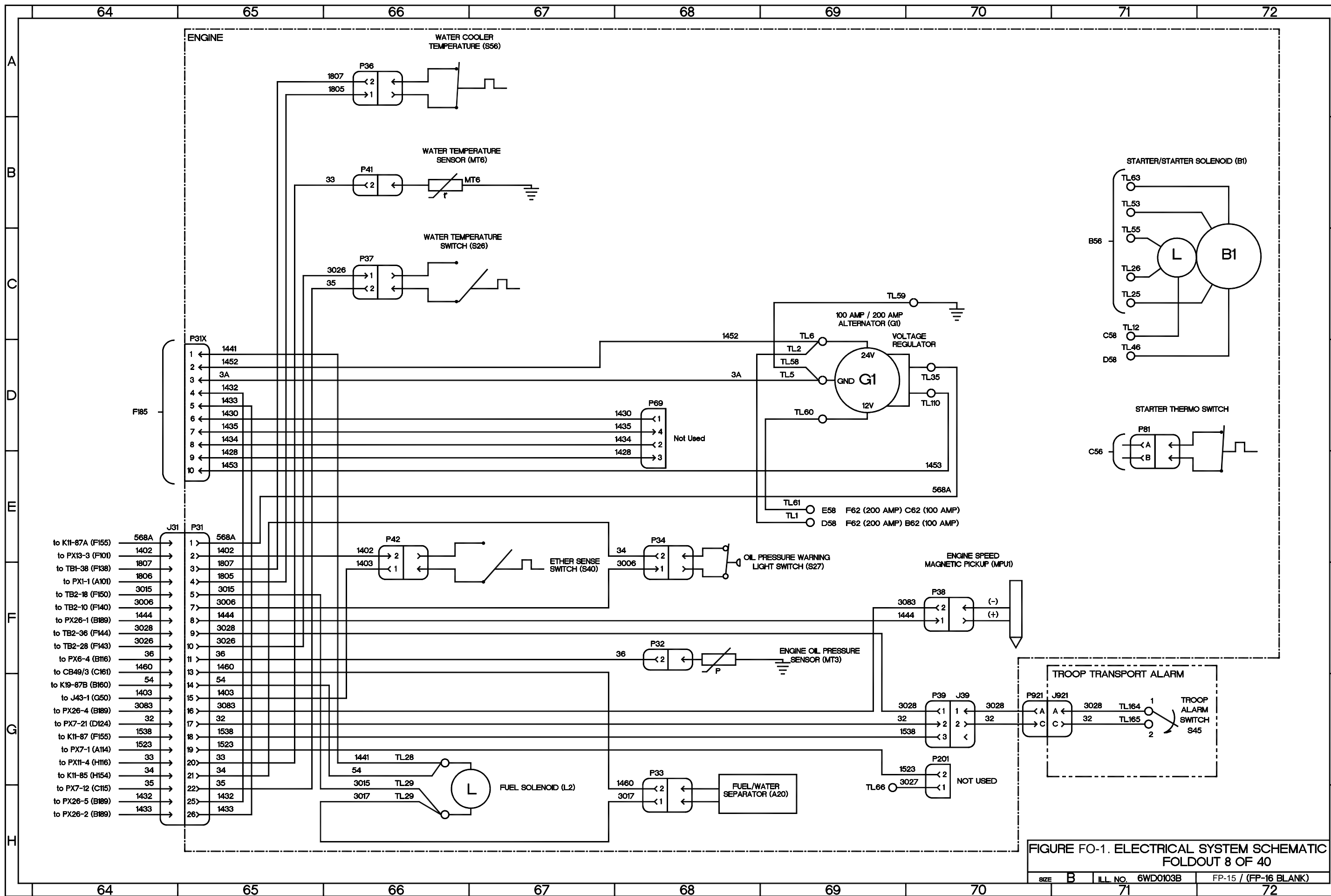
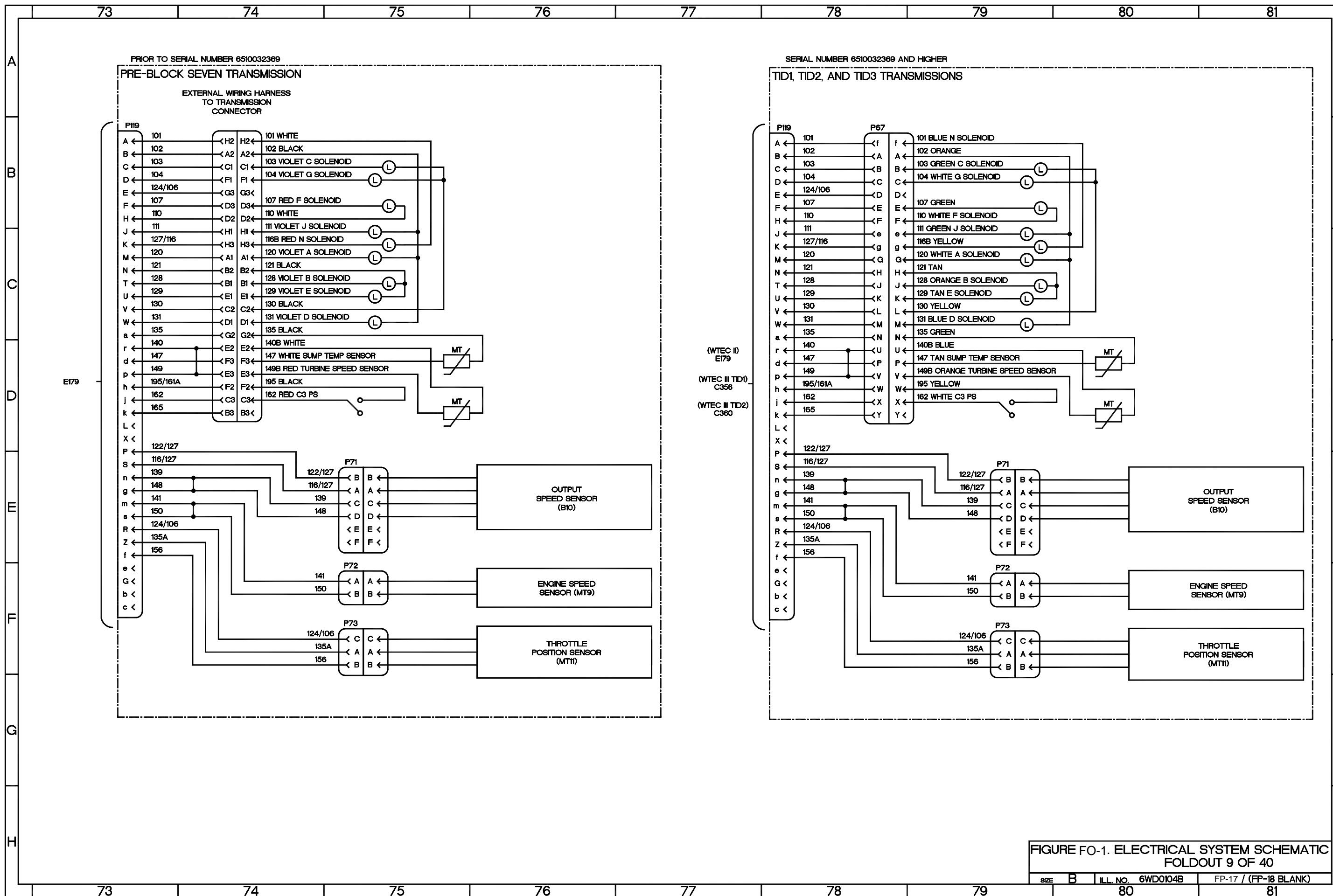


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 8 OF 40

SIZE	B	ILL. NO.	6WD0103B	FP-15 / (FP-16 BLANK)
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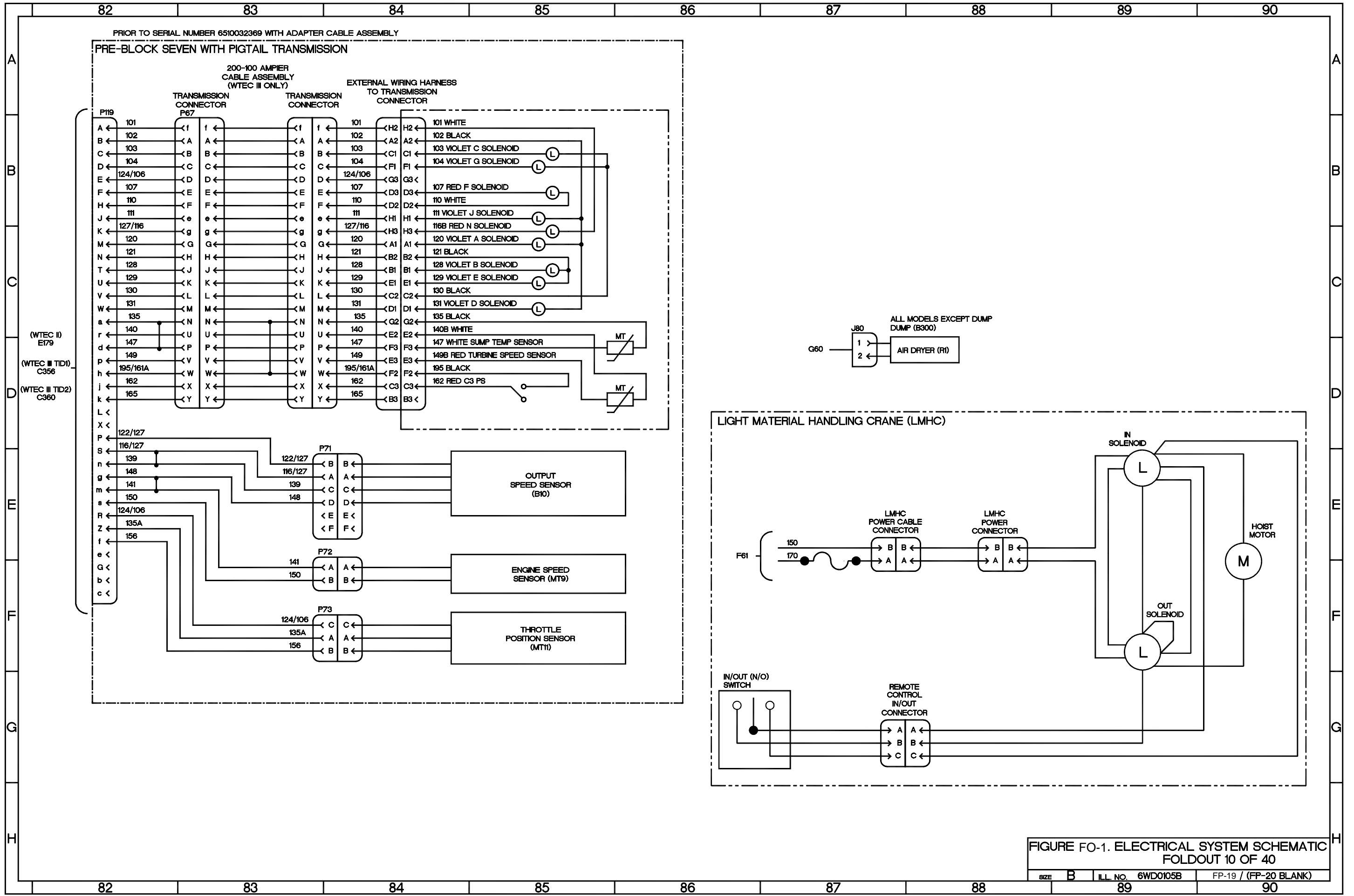
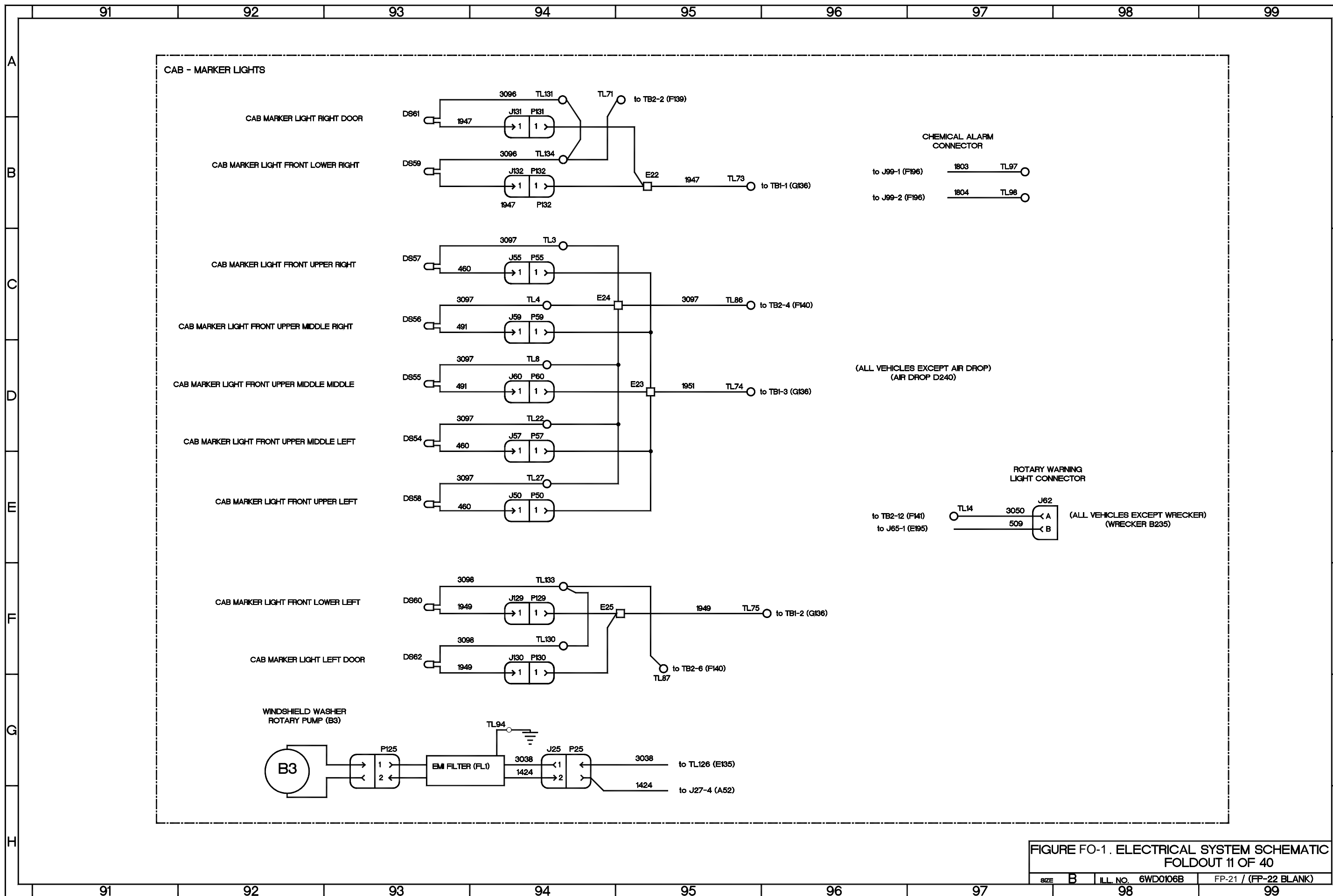


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 10 OF 40

SIZE	B	ILL. NO.	6WD0105B	FP-19 / (FP-20 BLANK)
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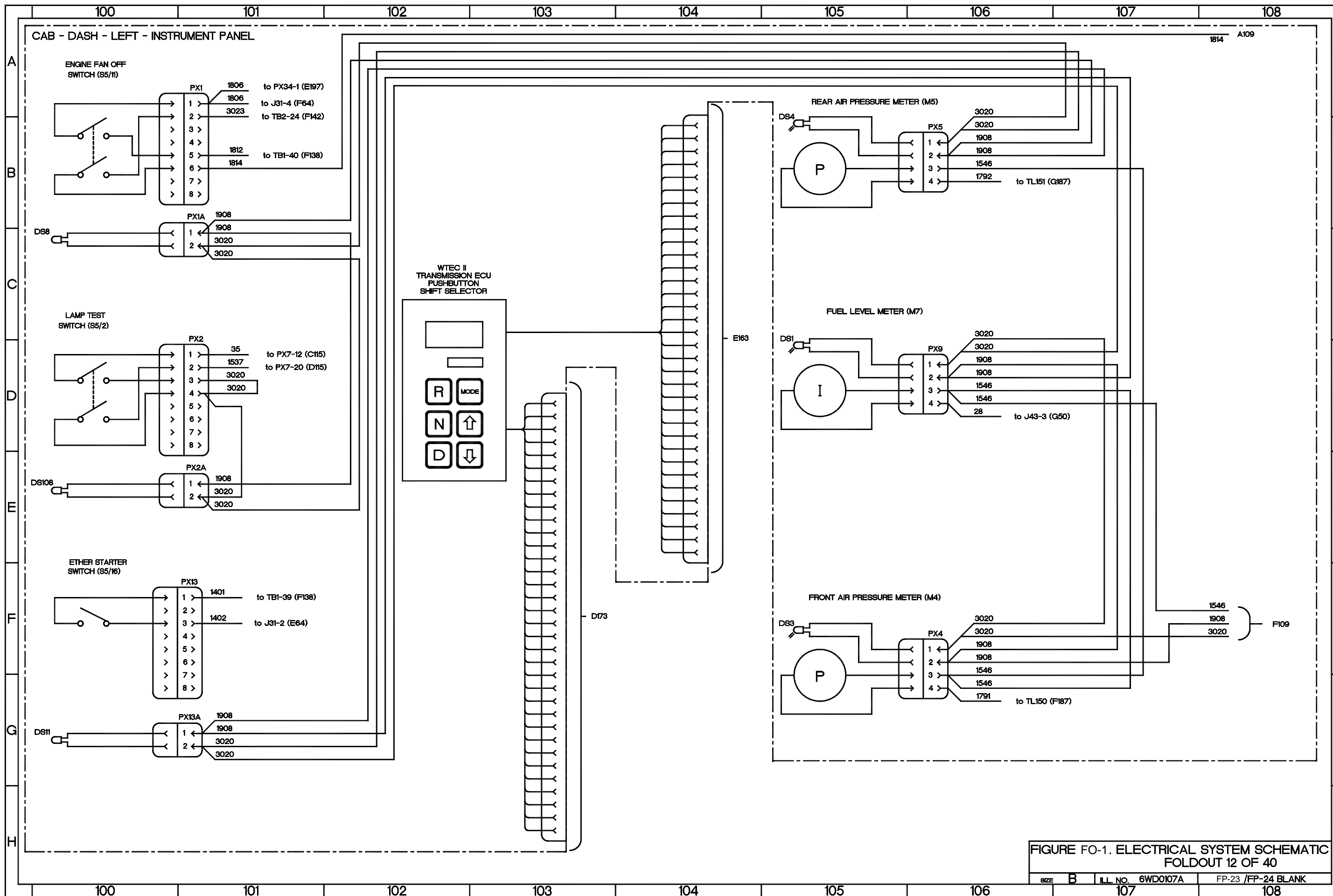


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 12 OF 40

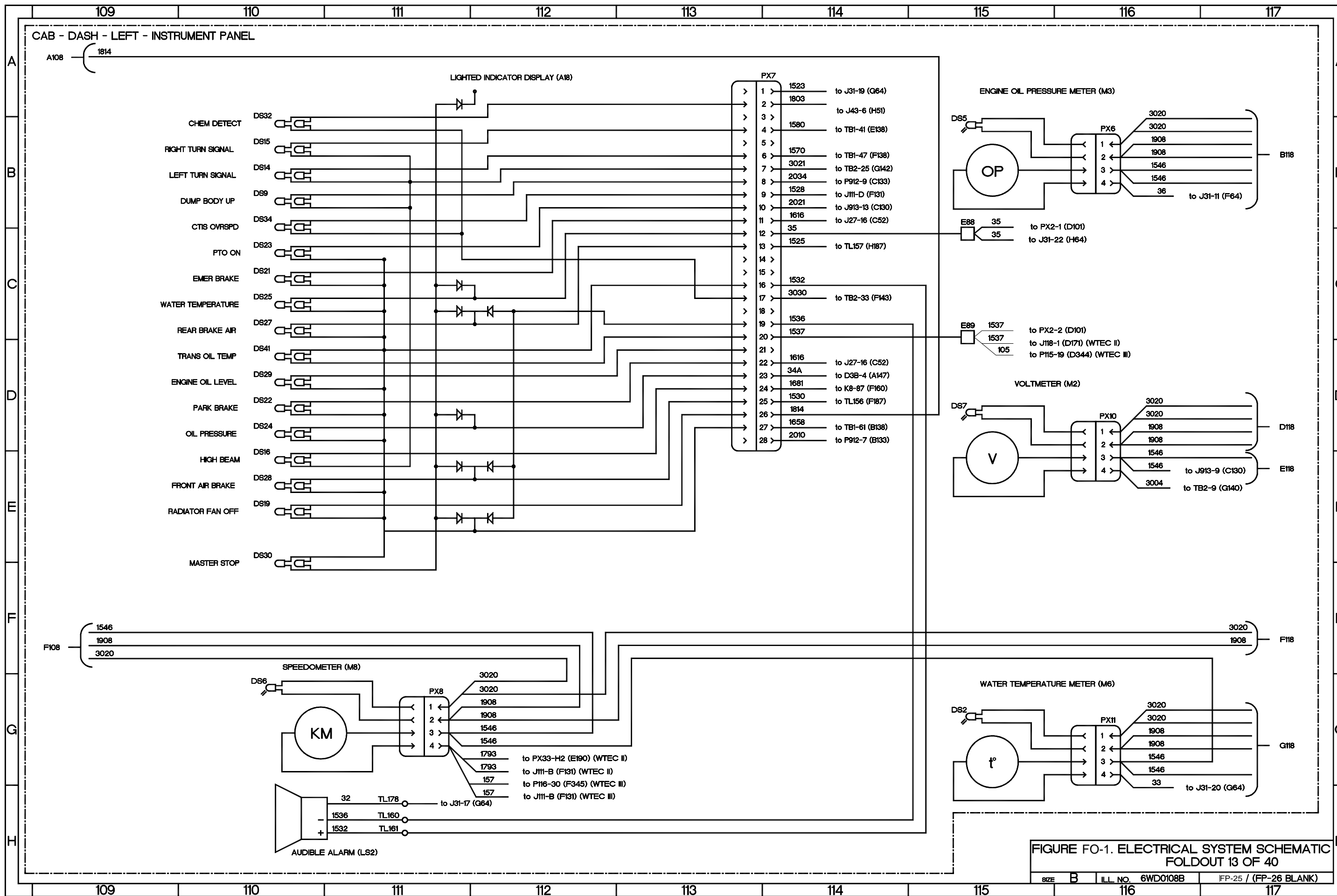


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 13 OF 40

SIZE	B	ILL. NO.	6WD0108B	FP-25 / (FP-26 BLANK)
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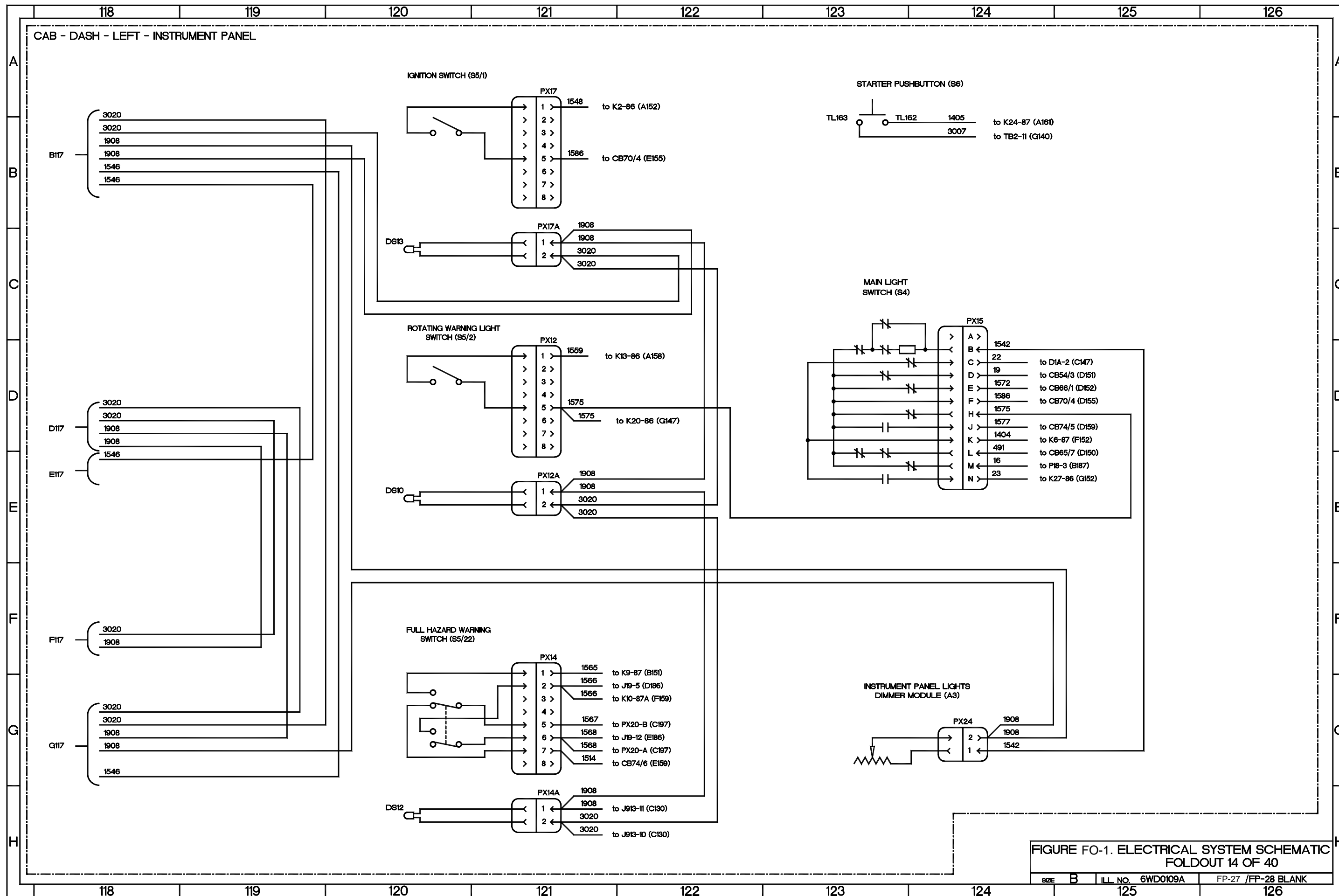


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 14 OF 40

SIZE B ILL. NO. 6WD0109A FP-27 /FP-28 BLANK

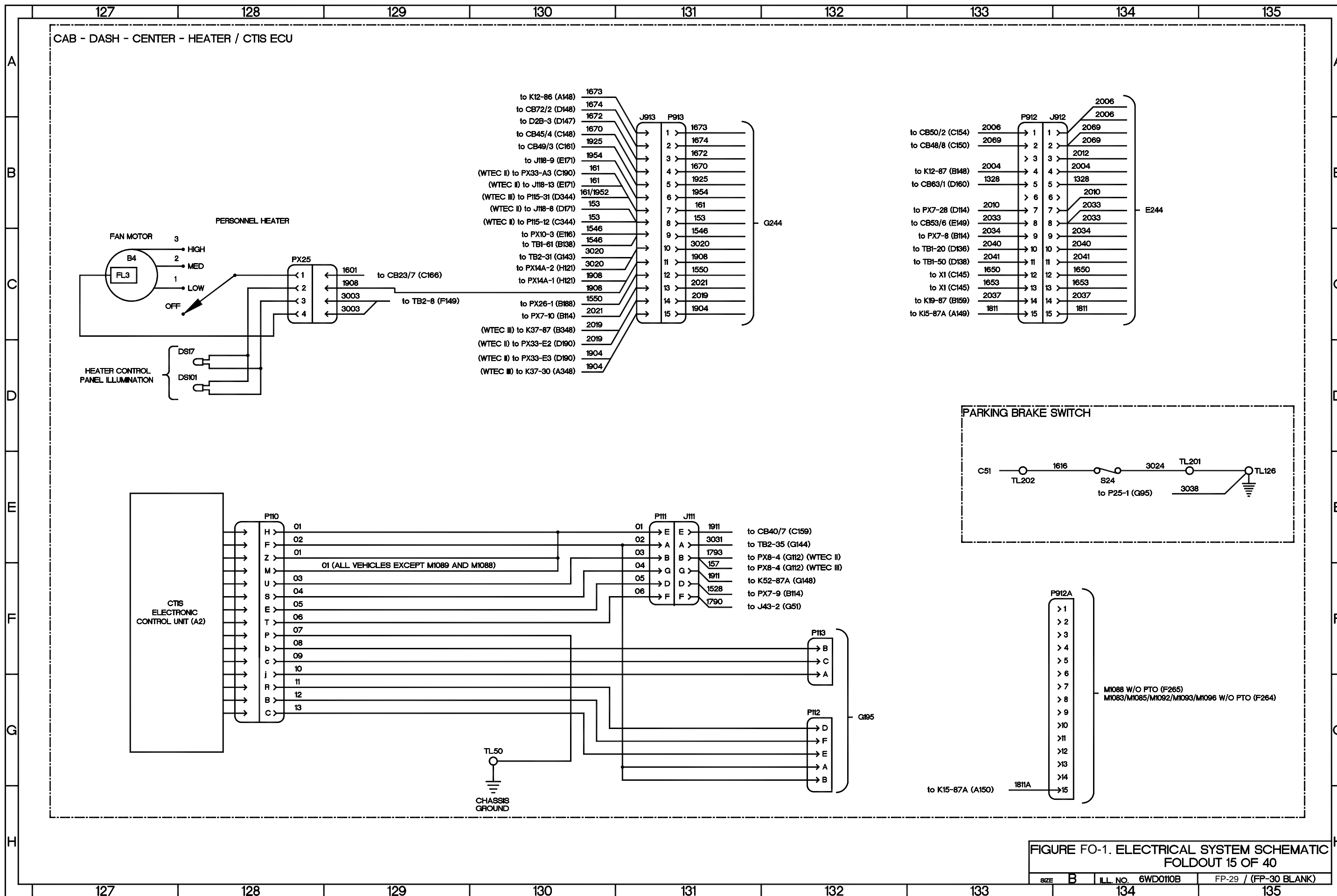


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 15 OF 40

SIZE B ILL. NO. 6WD010B FP-29 / (FP-30 BLANK)

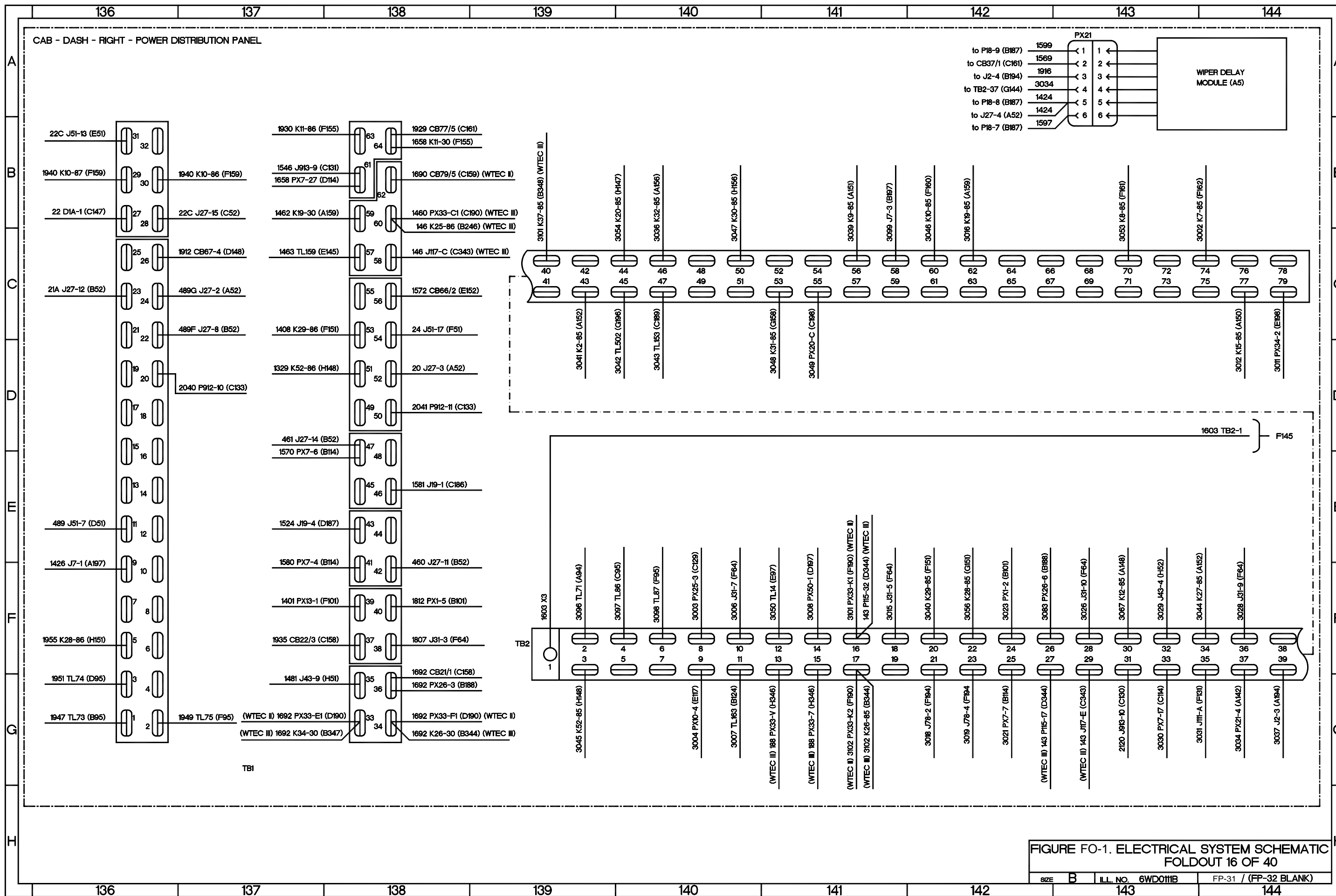
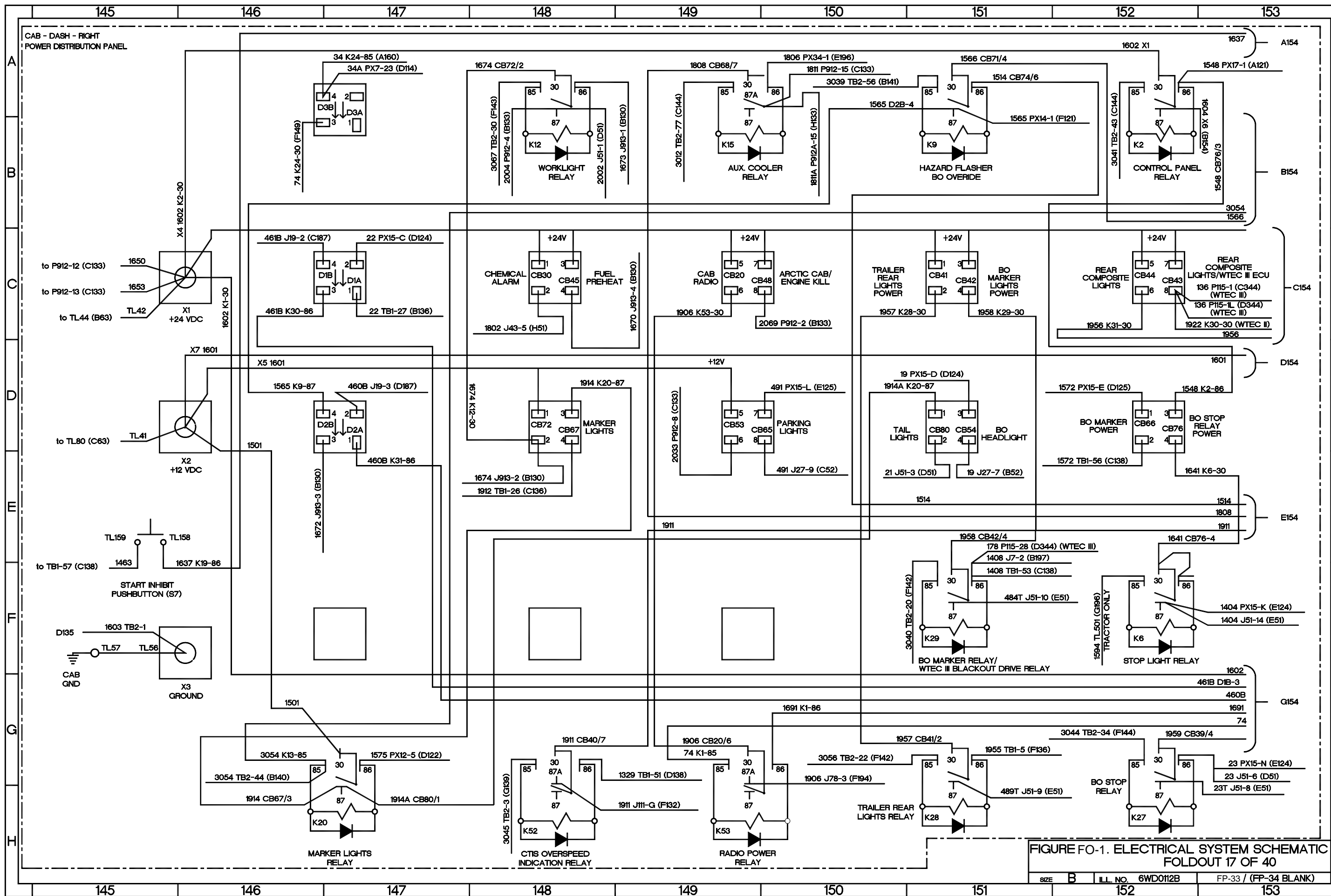


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 16 OF 40

SIZE	B	ILL. NO.	6WDO111B	FP-31 / (FP-32 BLANK)
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**FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 17 OF 40**

SIZE	B	ILL. NO.	6WD0112B	FP-33 / (FP-34 BLANK)
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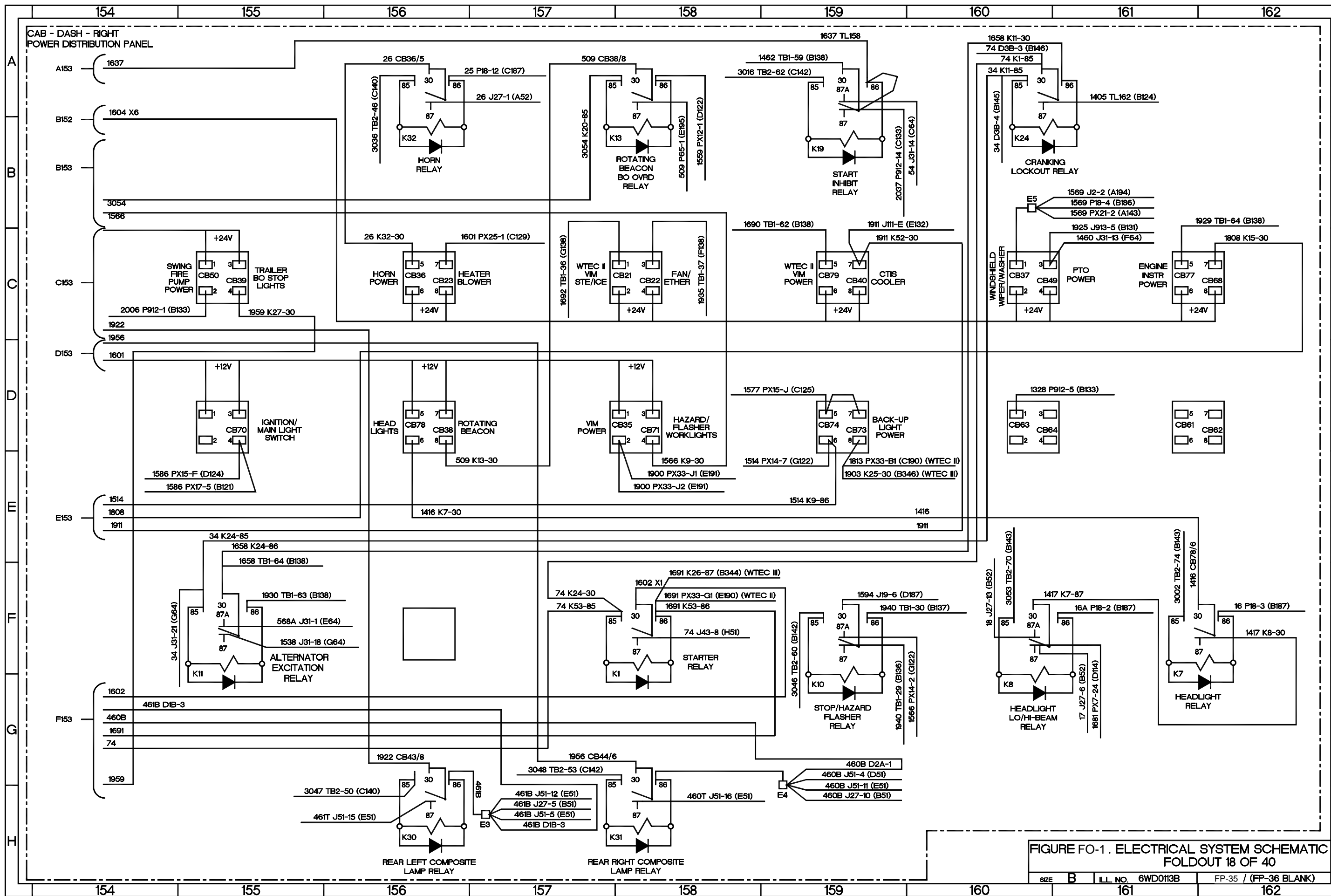


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 18 OF 40

SIZE	B	ILL. NO.	6WD0113B	FP-35 / (FP-36 BLANK)
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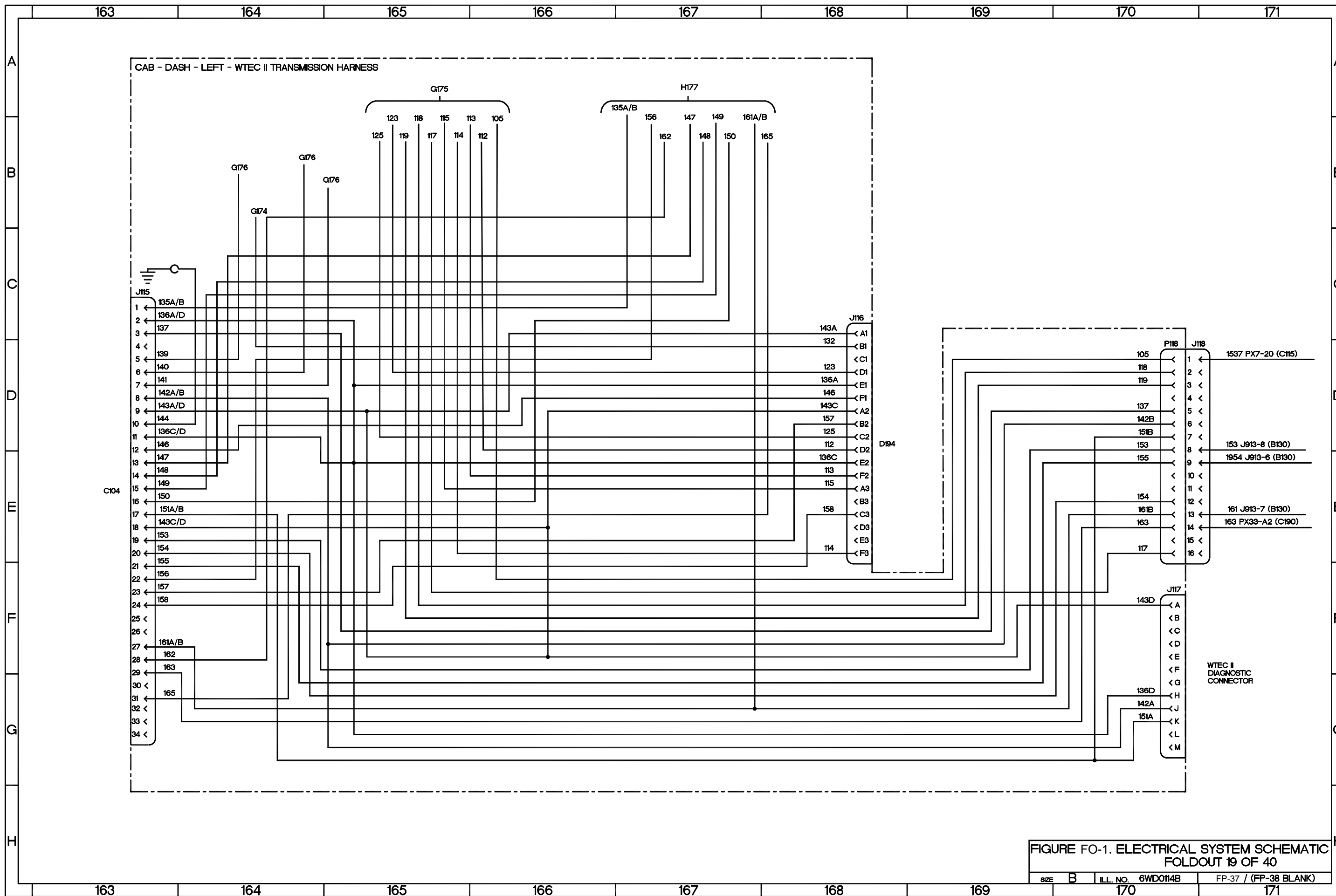


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 19 OF 40

SIZE	B	ILL. NO.	6WD0114B	FP-37 / (FP-38 BLANK)
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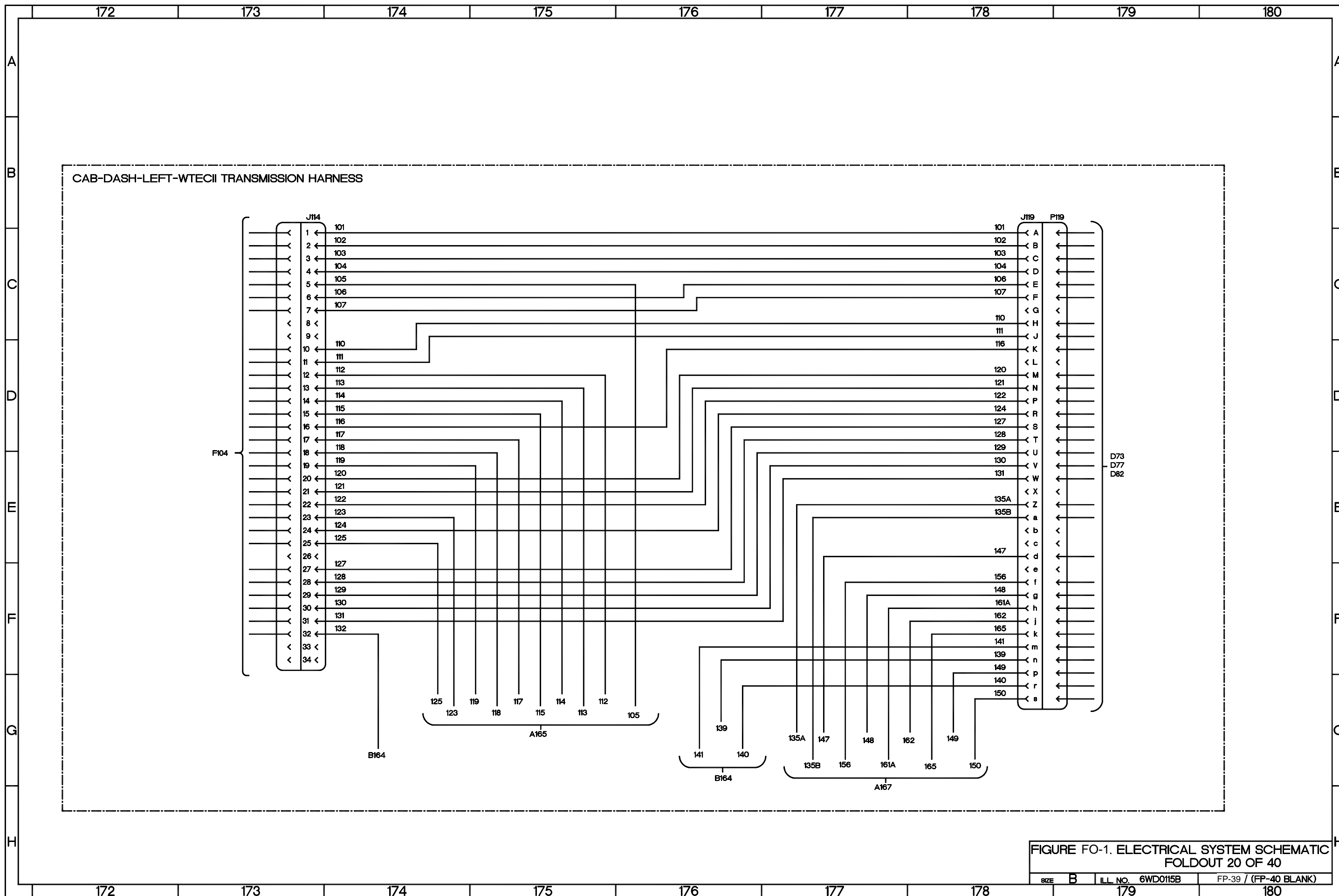


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 20 OF 40

SIZE	B	ILL. NO.	6WD0115B	FP-39 / (FP-40 BLANK)
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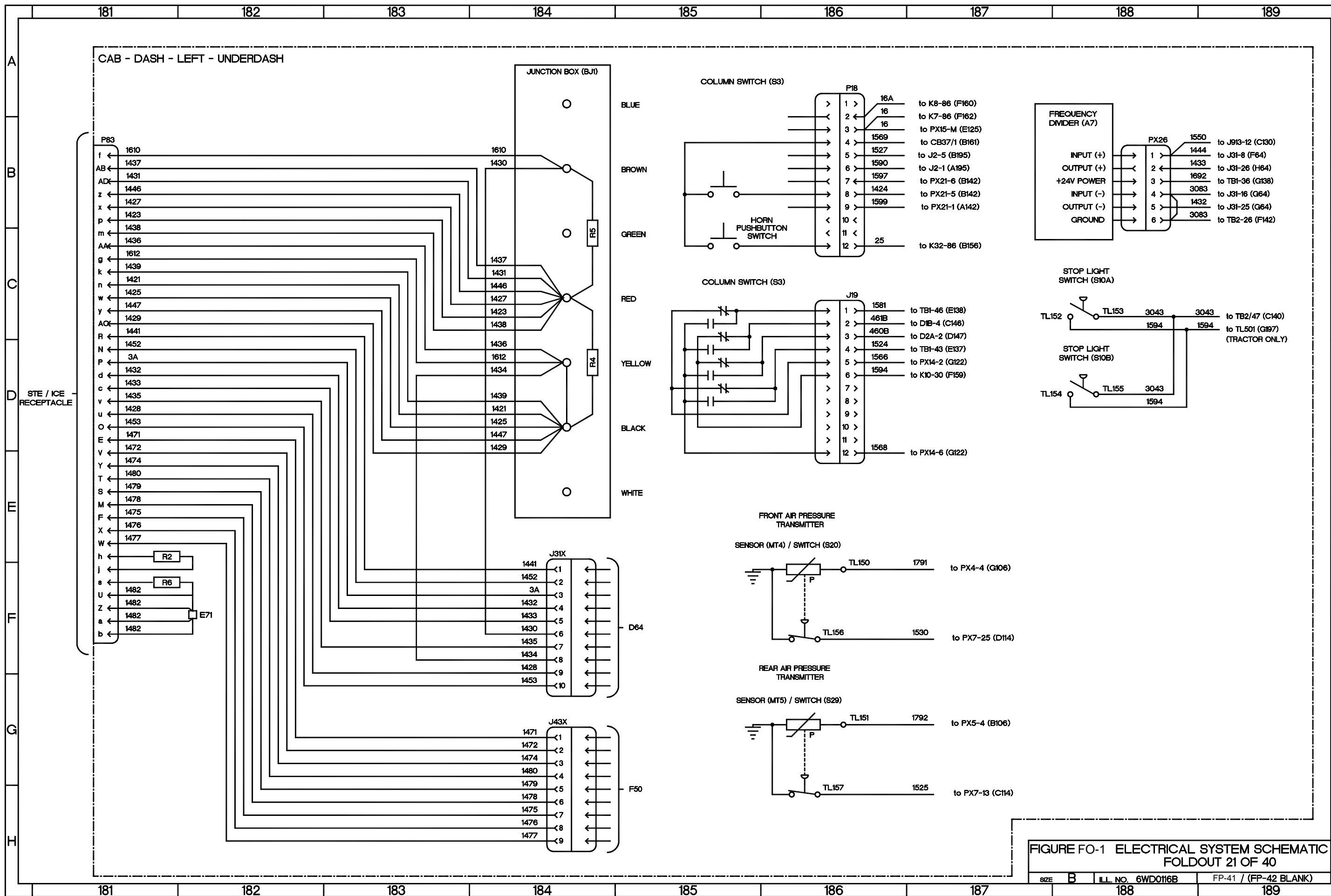
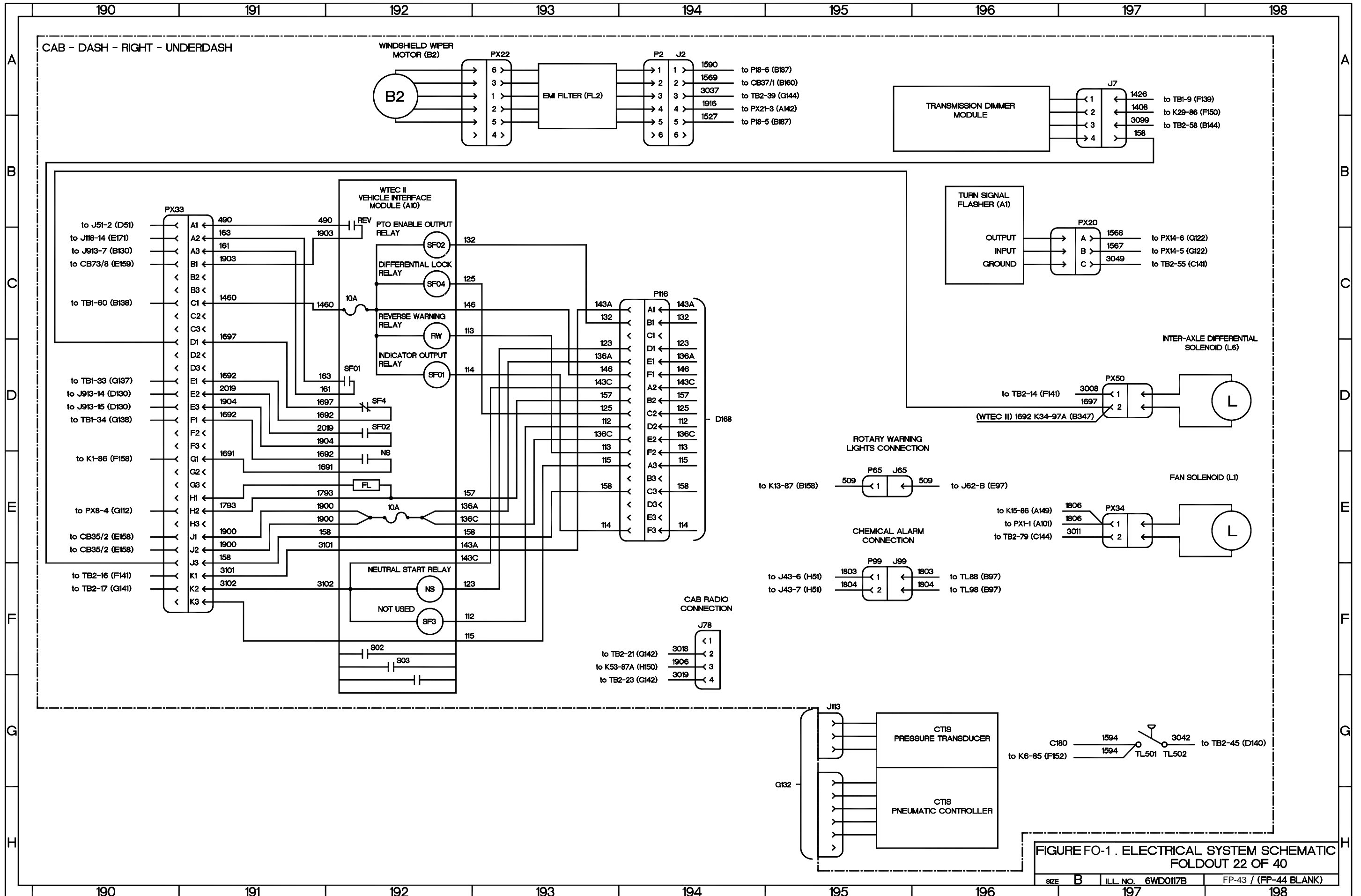


FIGURE FO-1 ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 21 OF 40

SIZE B ILL. NO. 6WD0116B FP-41 / (FP-42 BLANK)



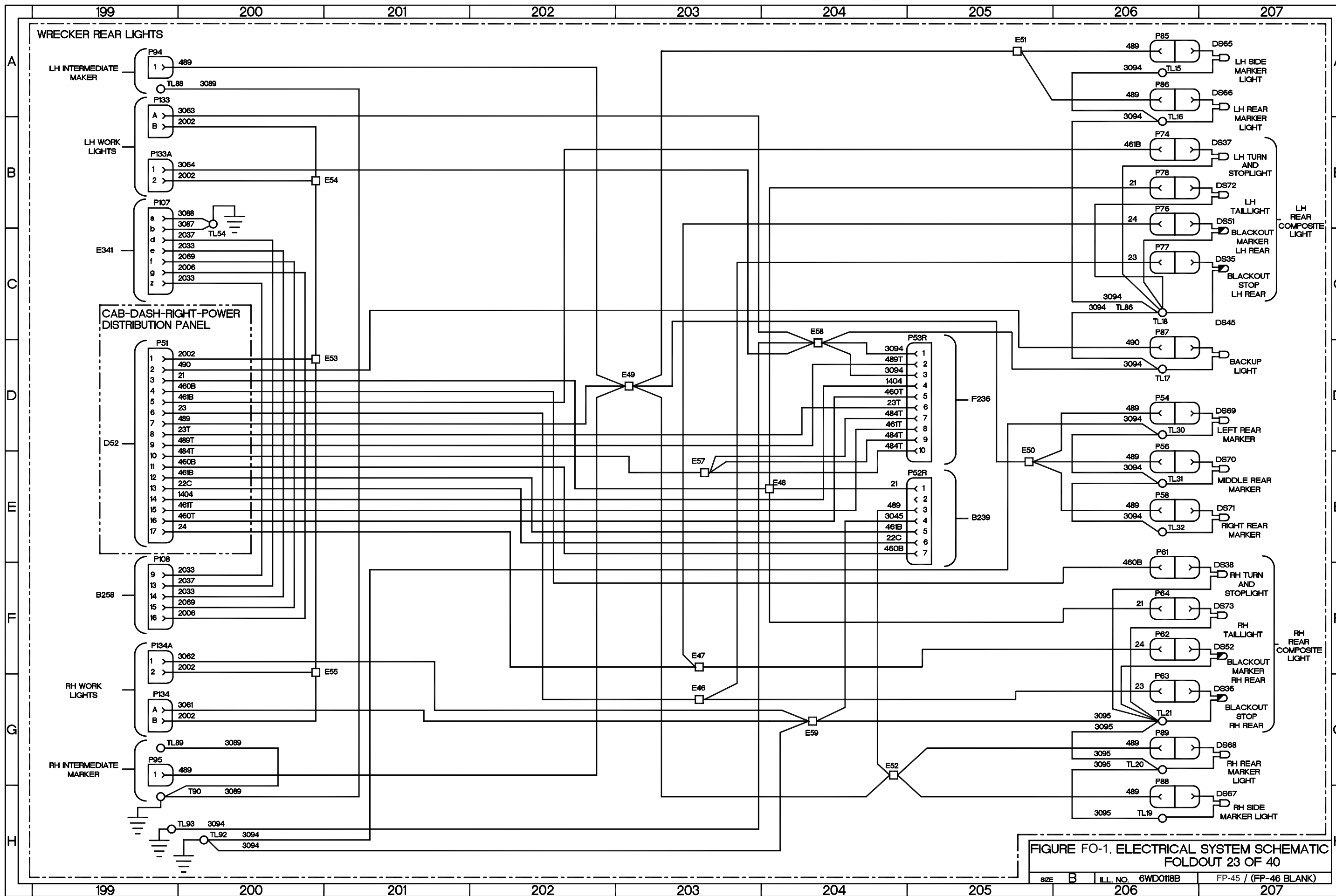


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 23 OF 40

SIZE	B	ILL. NO.	6WD0118B	FP-45 / (FP-46 BLANK)
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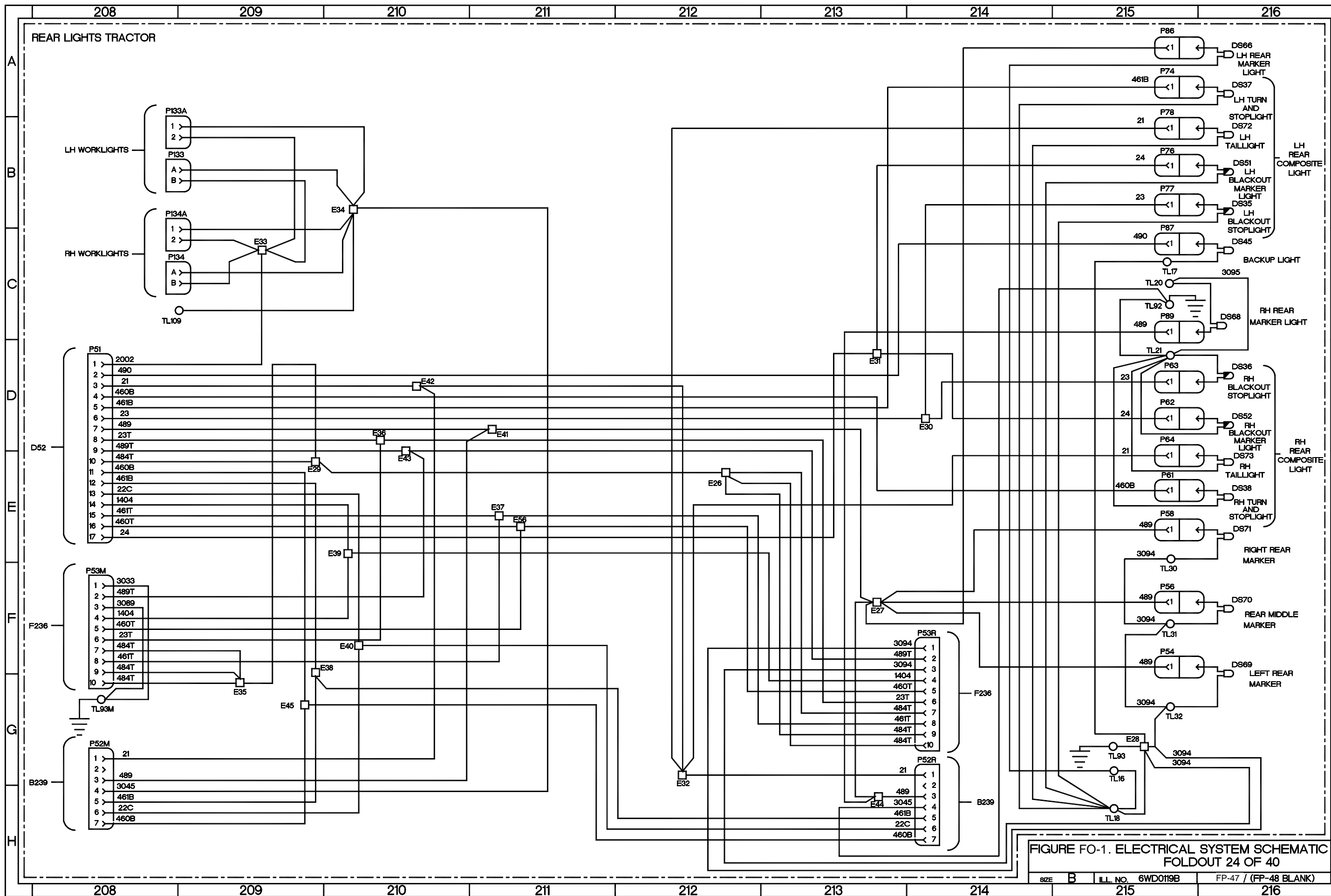


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 24 OF 40
 SIZE B ILL. NO. 6WD0119B FP-47 / (FP-48 BLANK)

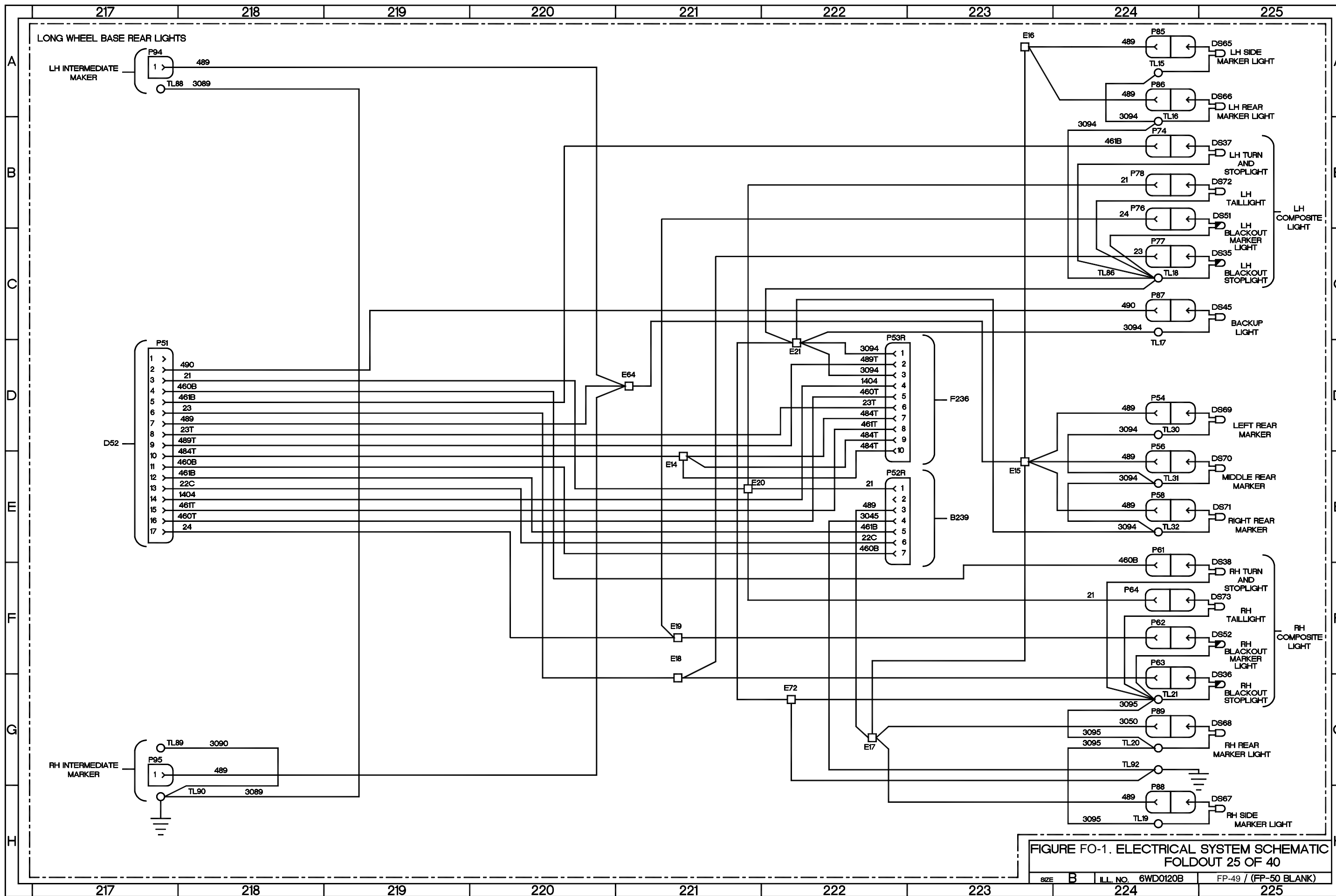


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 25 OF 40

SIZE B ILL. NO. 6WD0120B FP-49 / (FP-50 BLANK)

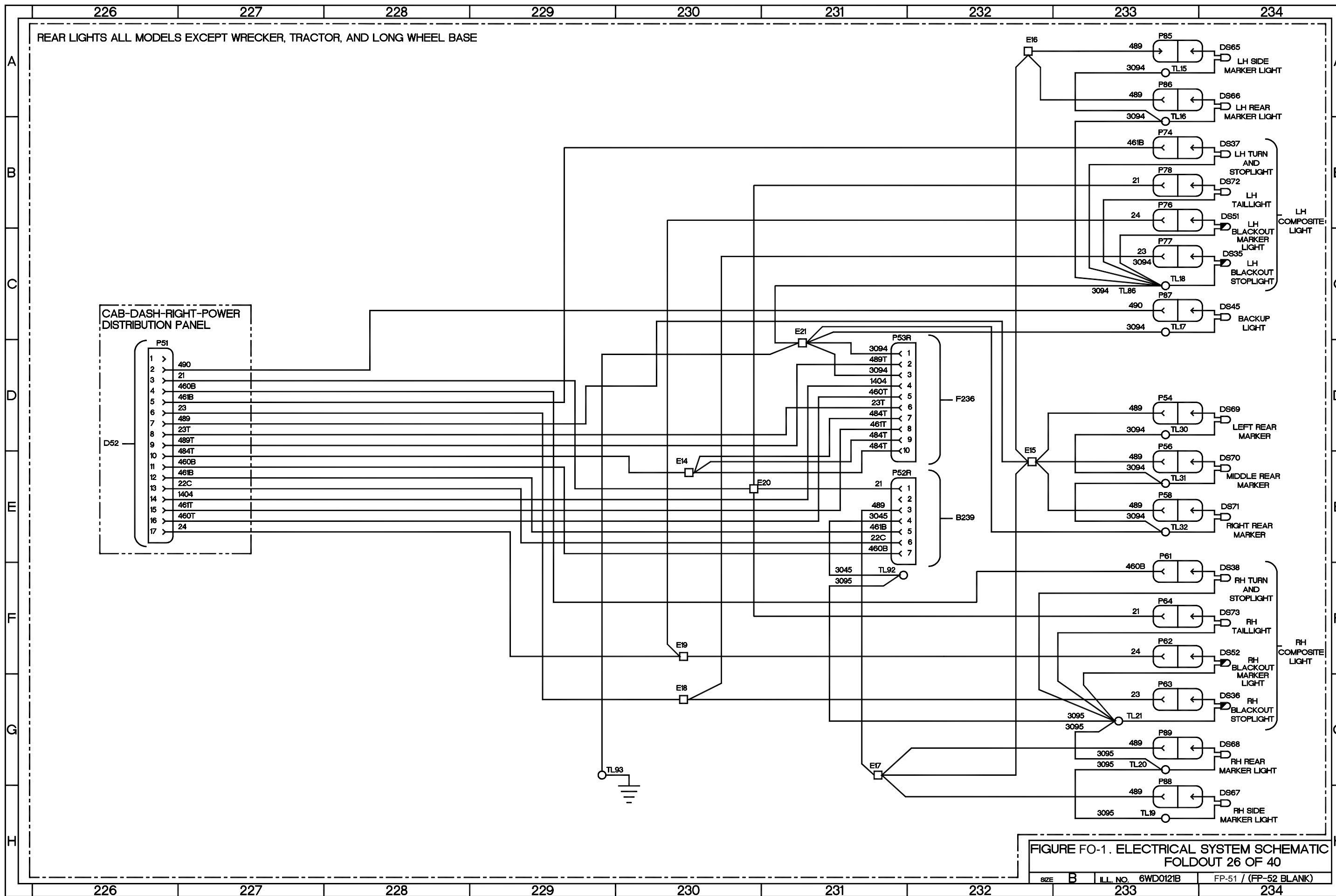


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 26 OF 40

SIZE B ILL. NO. 6WD0121B FP-51 / (FP-52 BLANK)

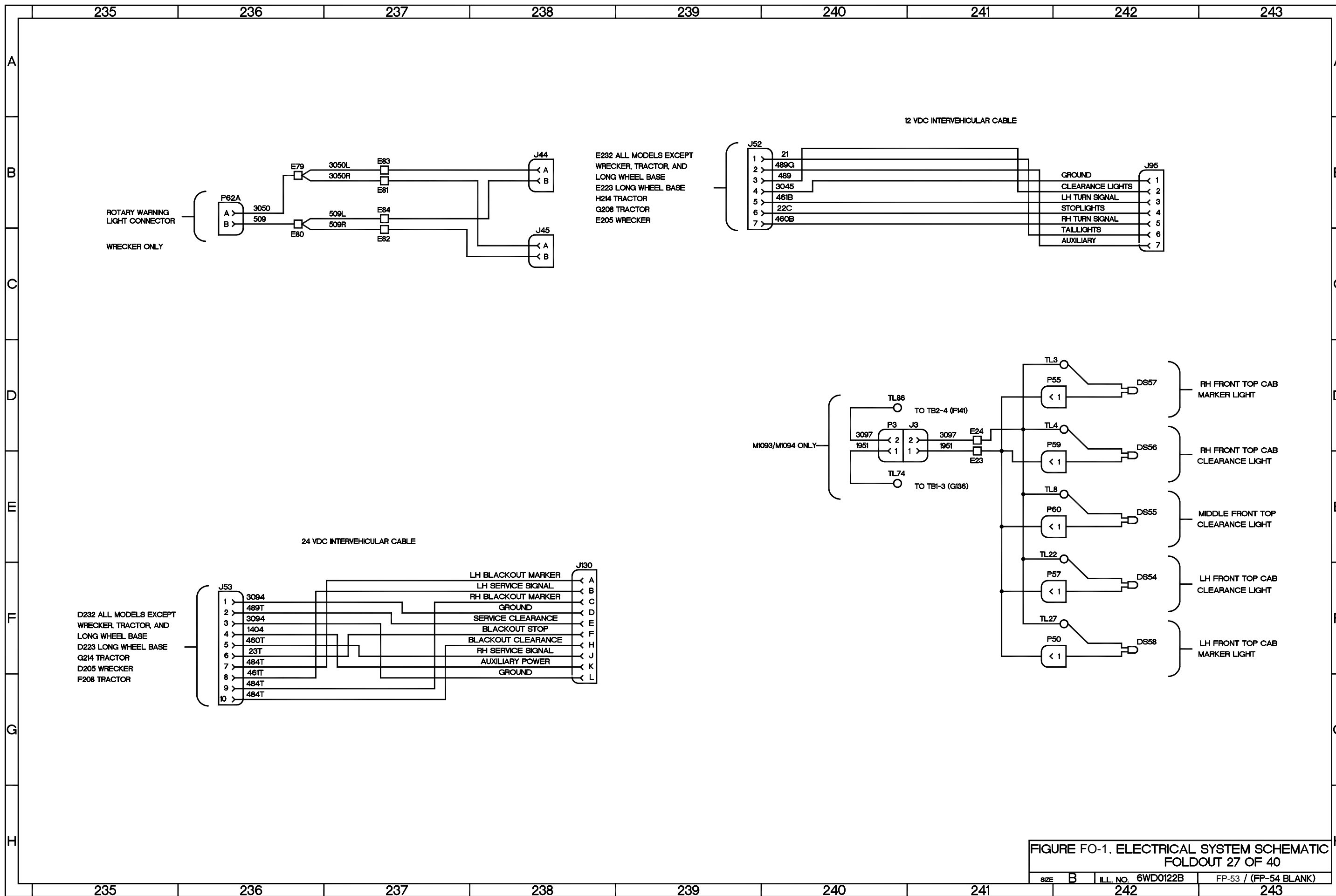


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 27 OF 40

SIZE	B	ILL. NO.	6WD0122B	FP-53 / (FP-54 BLANK)
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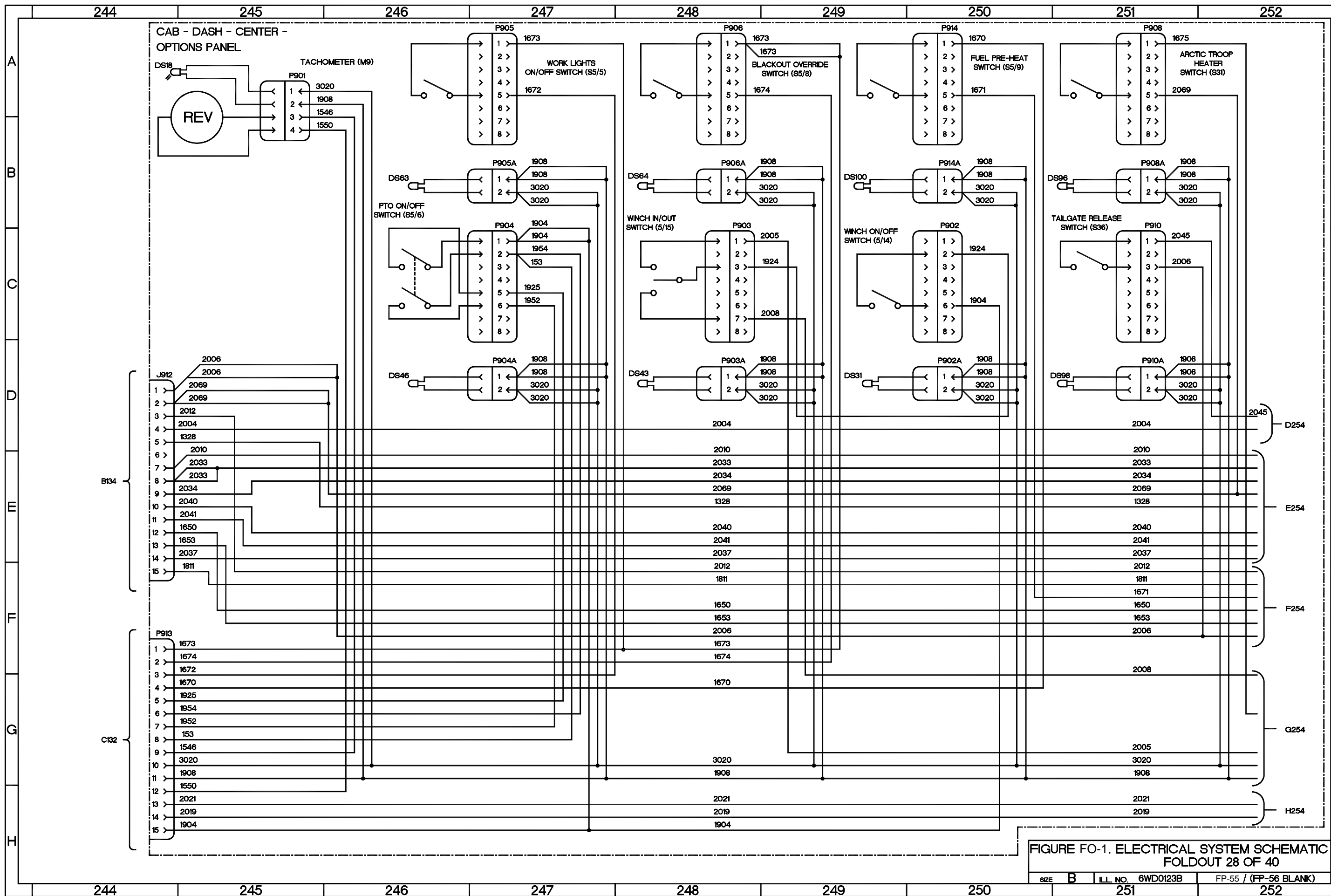


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 28 OF 40
 SIZE B ILL. NO. 6WD0123B FP-55 / (FP-56 BLANK)

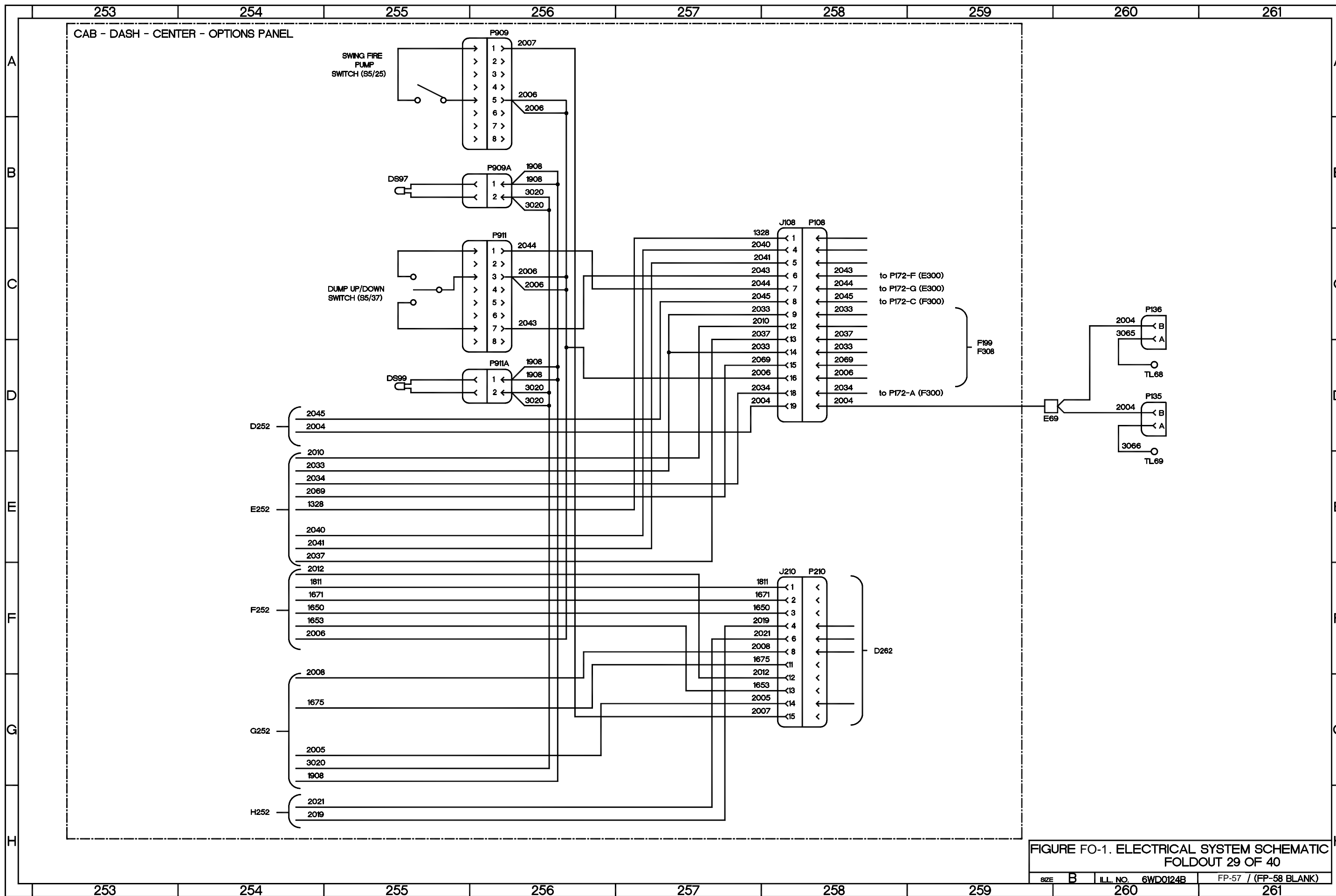


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 29 OF 40

SIZE	B	ILL. NO.	6WD0124B	FP-57 / (FP-58 BLANK)
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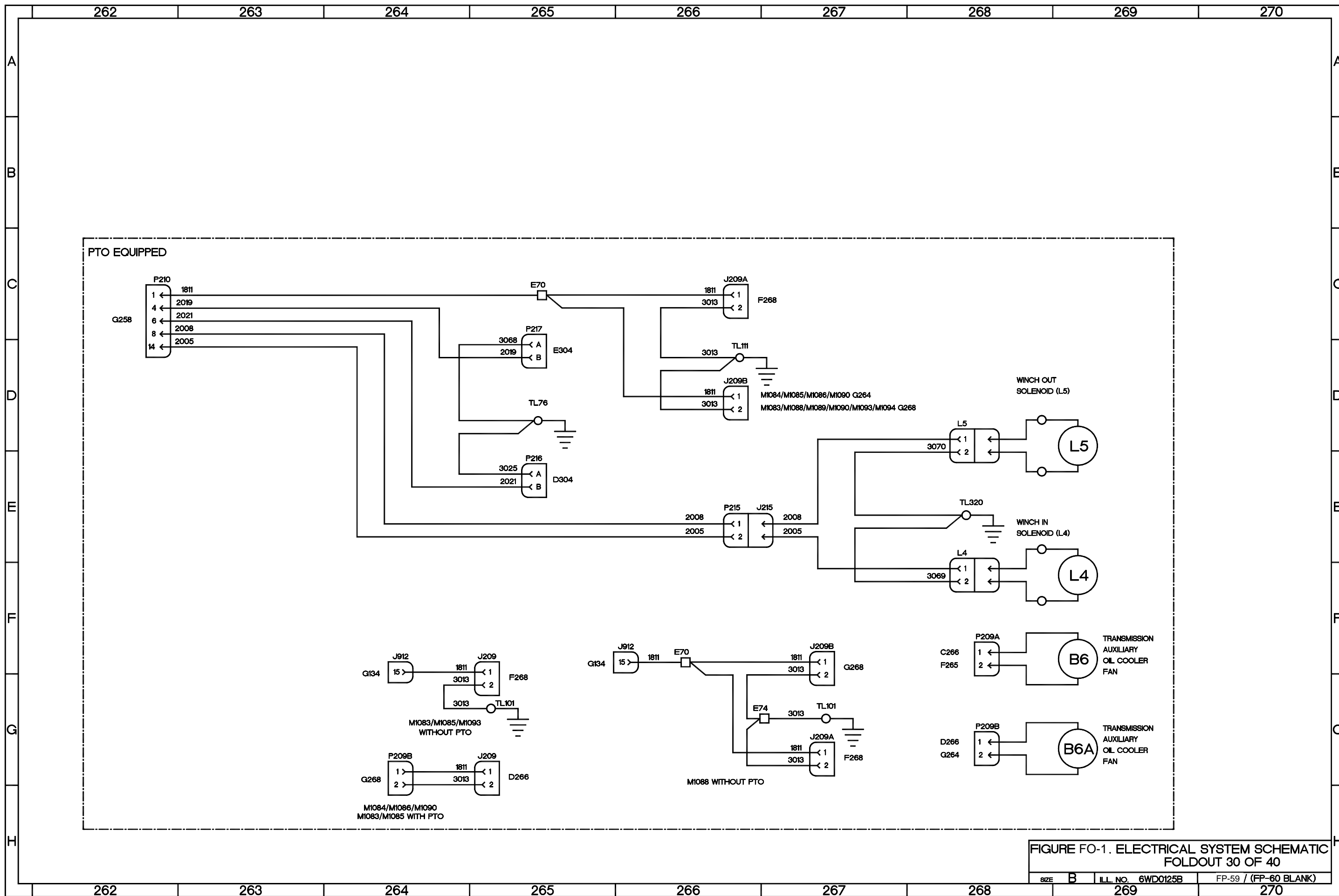


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 30 OF 40

SIZE	B	ILL. NO.	6WD0125B	FP-59 / (FP-60 BLANK)
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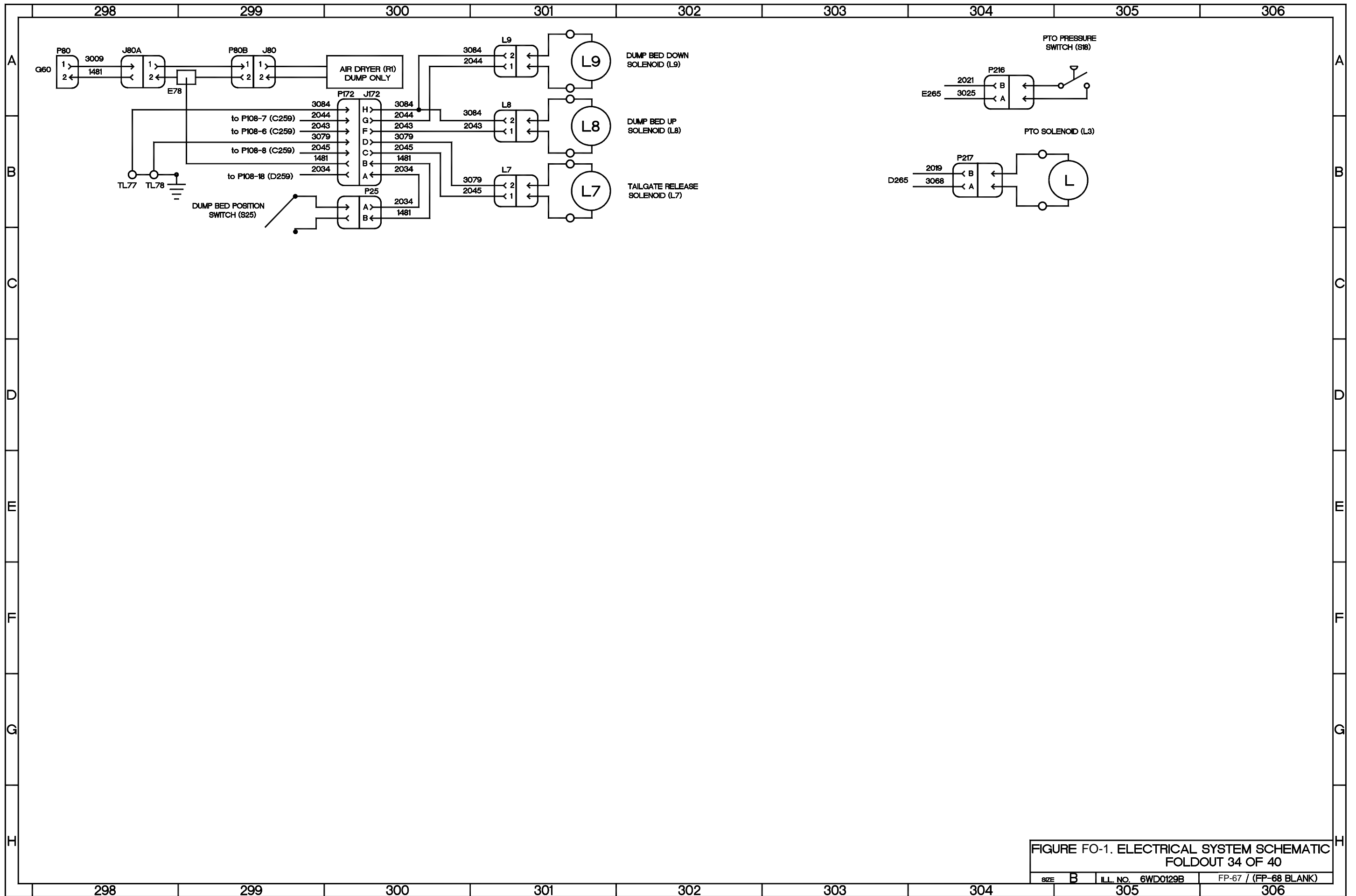


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
 FOLDOUT 34 OF 40

SIZE	B	ILL. NO.	6WD0129B	FP-67 / (FP-68 BLANK)
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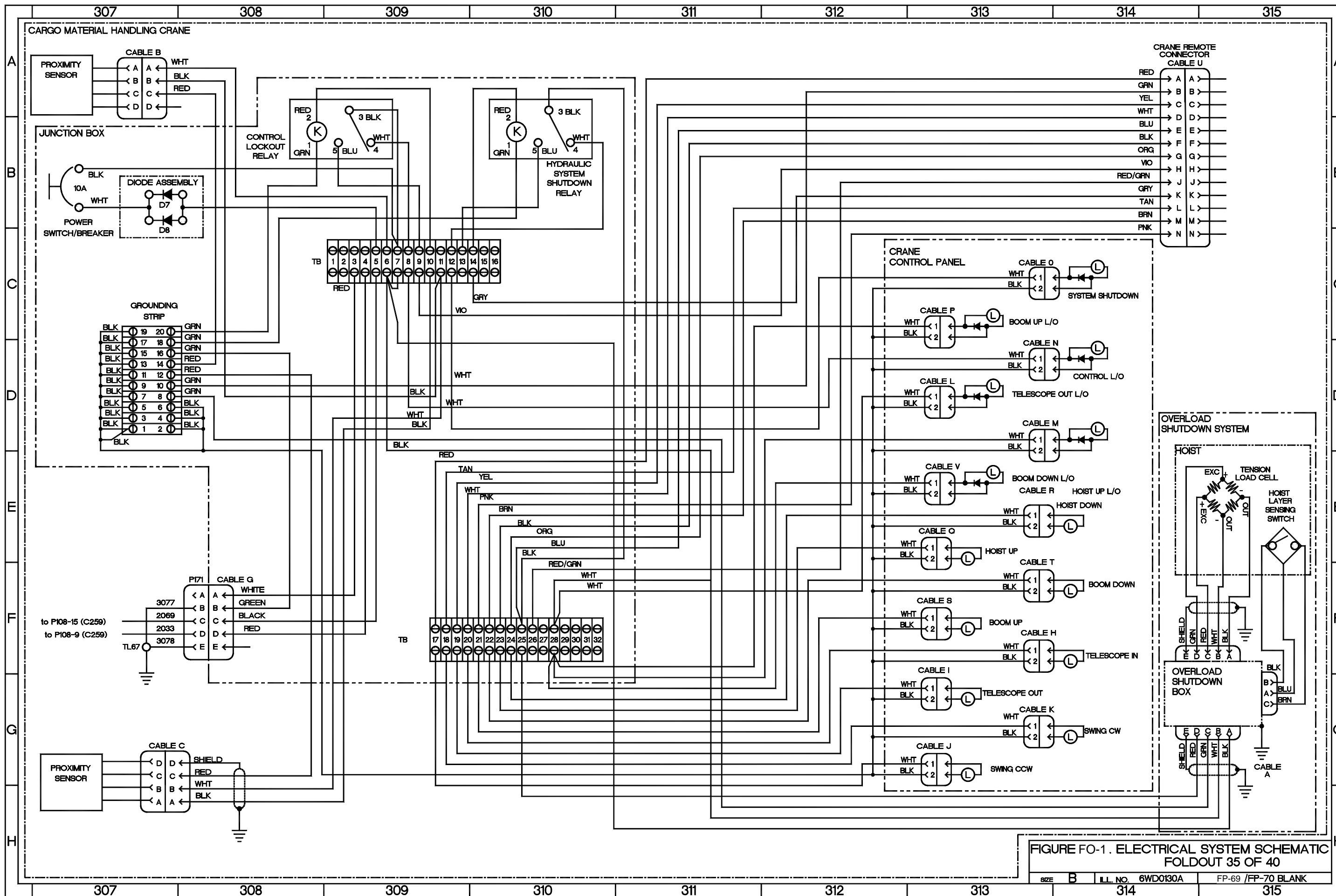


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 35 OF 40

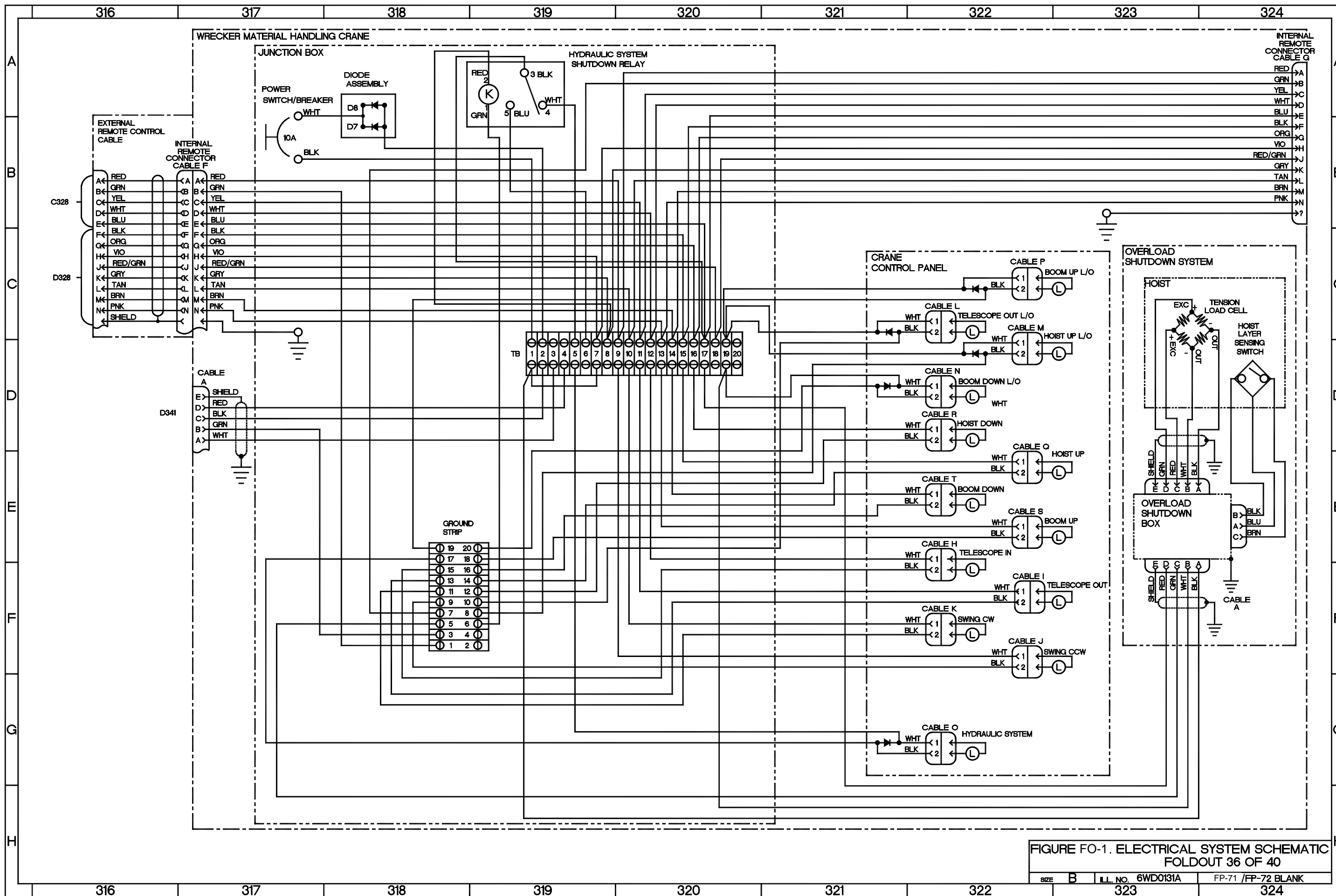


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 36 OF 40

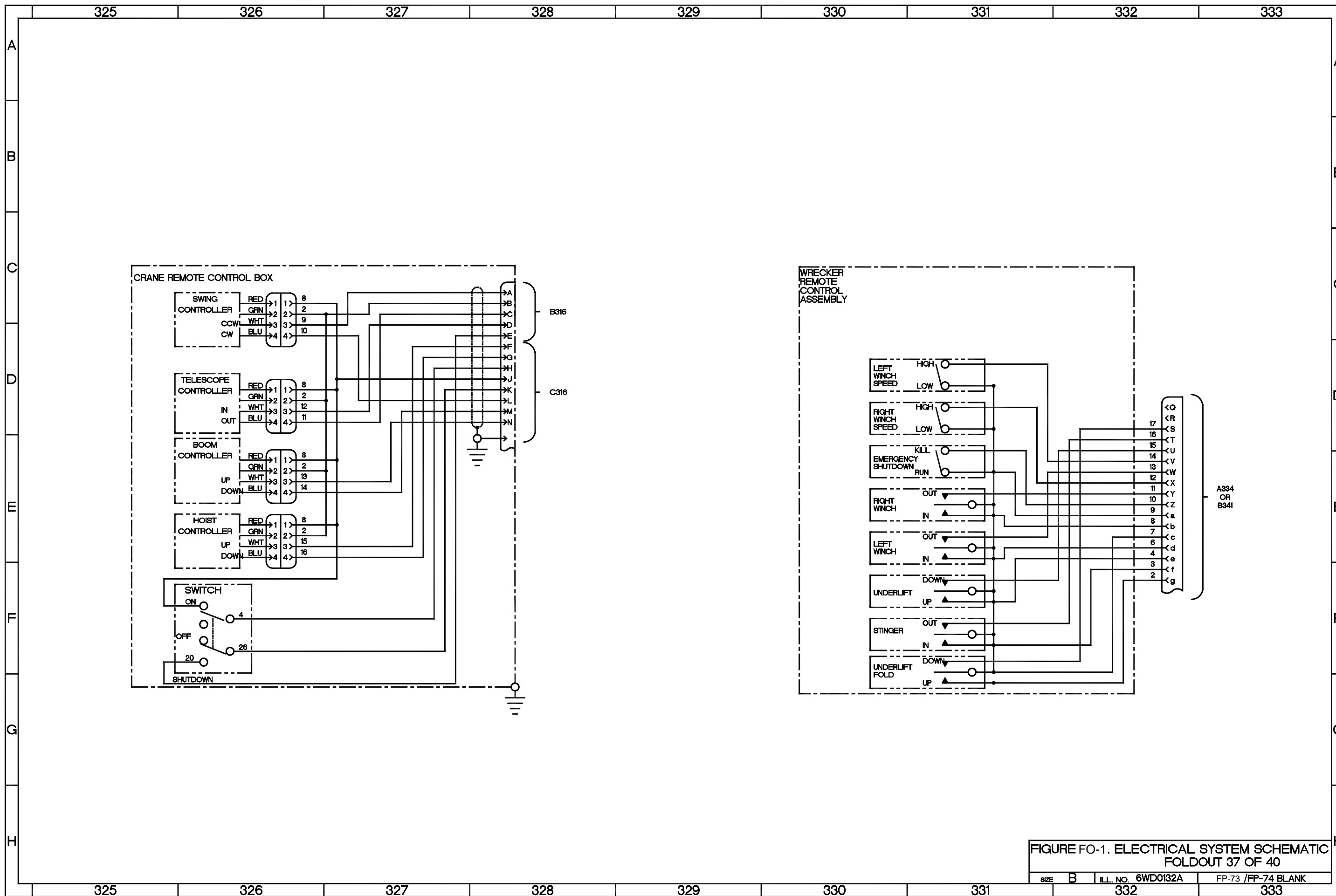


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 37 OF 40

SIZE	B	ILL. NO.	6WD0132A	FP-73 /FP-74 BLANK
			332	333

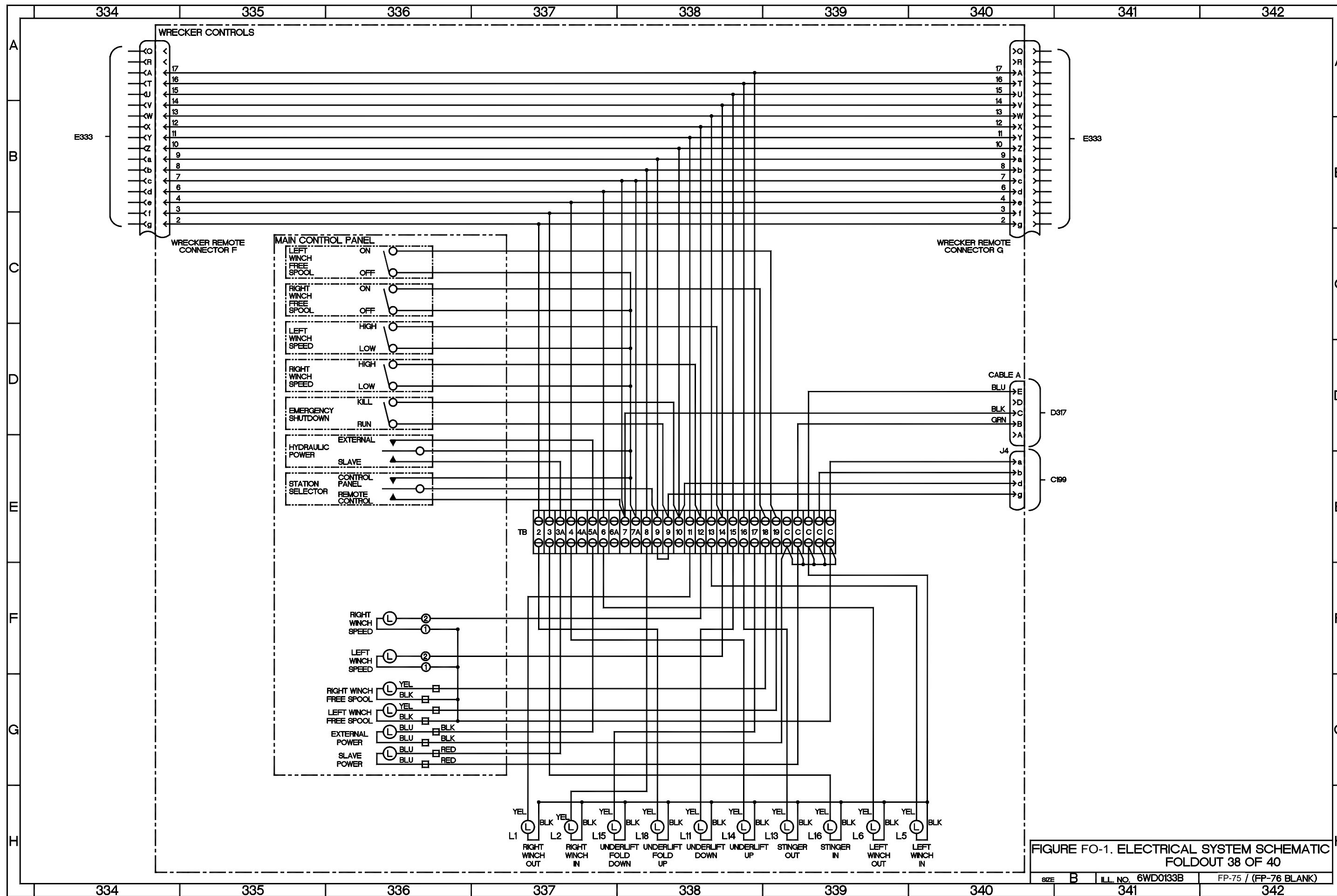


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 38 OF 40

SIZE B ILL. NO. 6WD0133B FP-75 / (FP-76 BLANK)

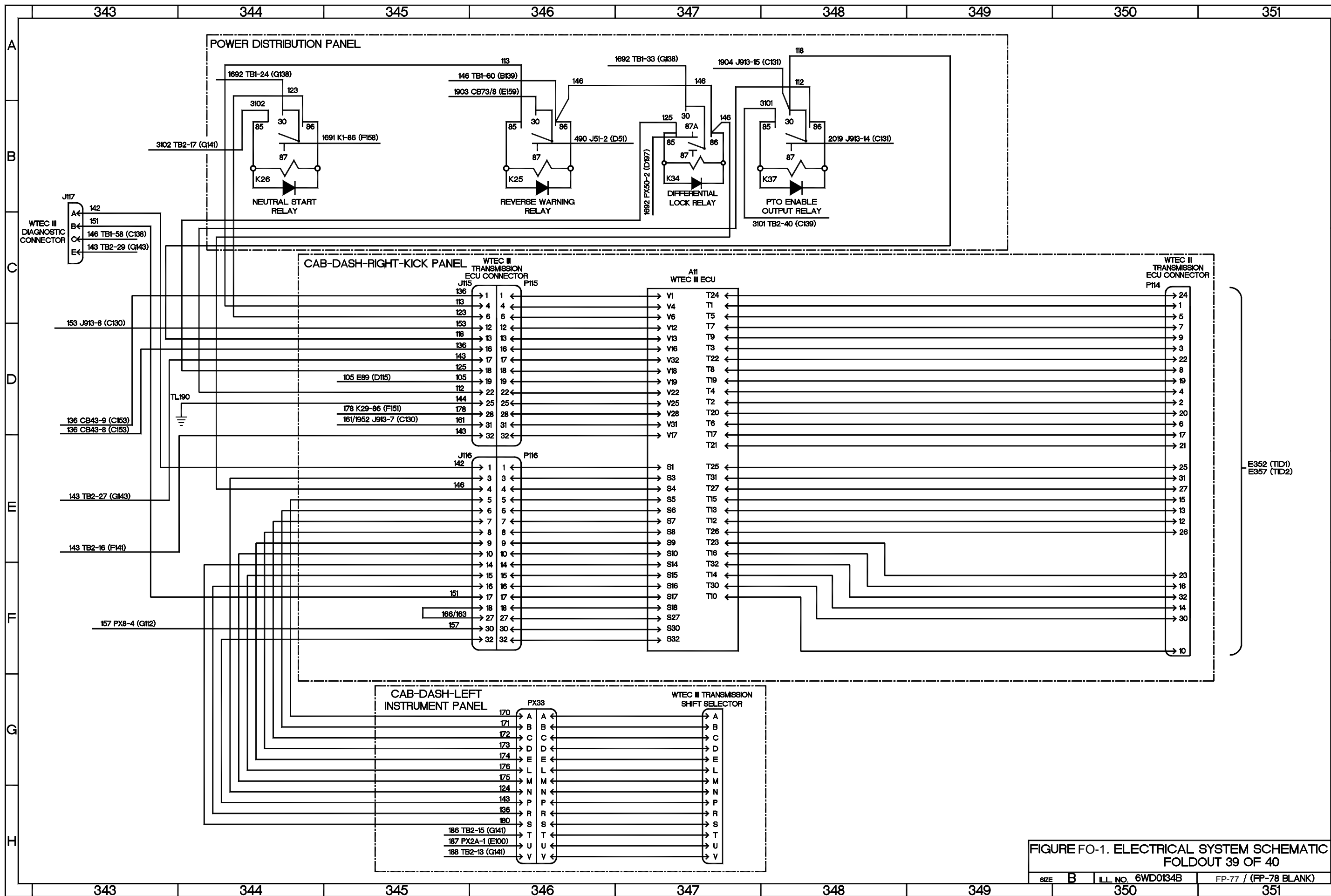


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 39 OF 40

SIZE B ILL. NO. 6WD0134B FP-77 / (FP-78 BLANK)

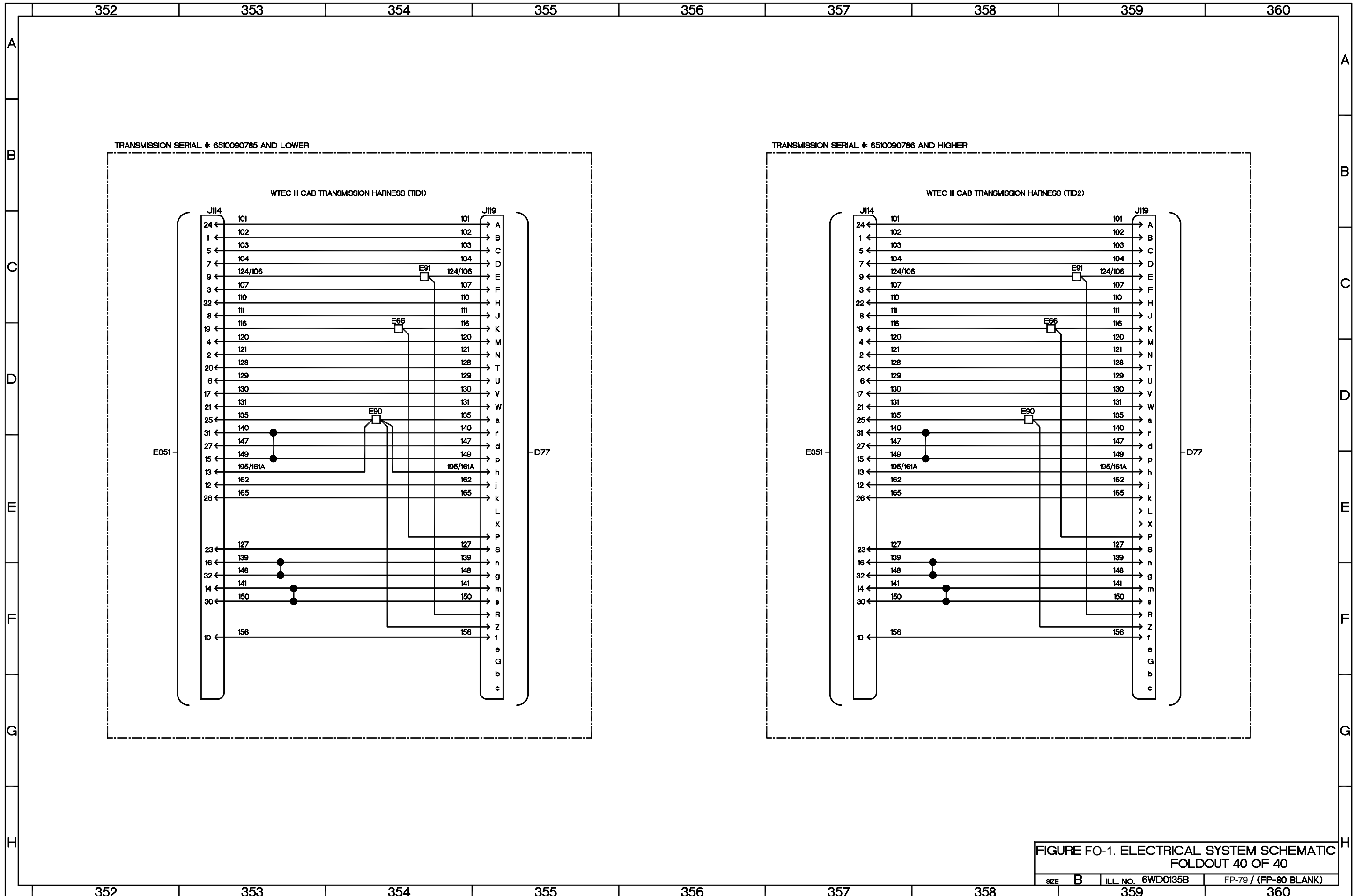


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 40 OF 40

SIZE	B	ILL. NO.	6WD0135B	FP-79 / (FP-80 BLANK)
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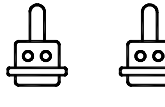
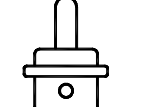
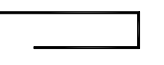
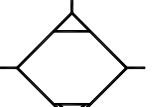
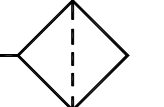
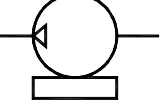

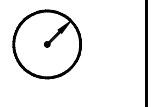



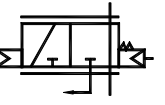
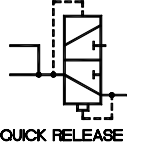
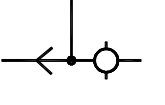
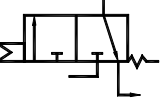
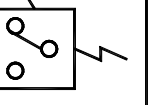
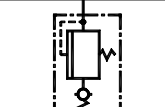

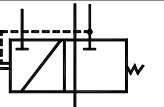
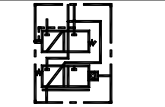
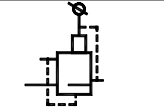
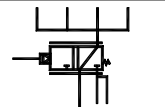
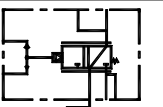
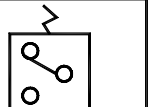
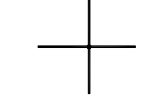
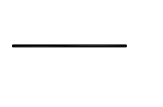
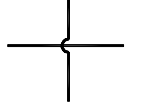
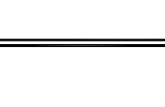
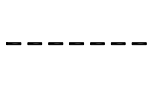
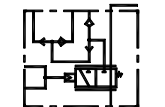
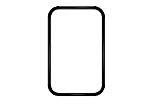
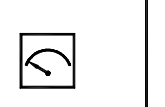
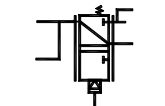
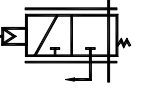
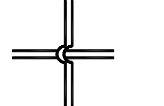
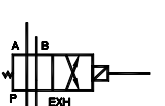
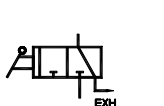
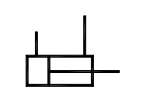
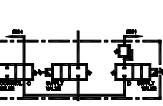
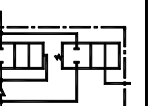
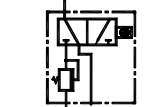
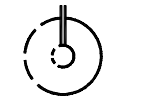
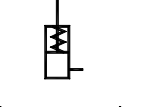
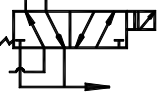
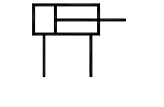
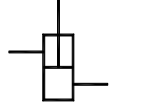
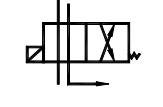
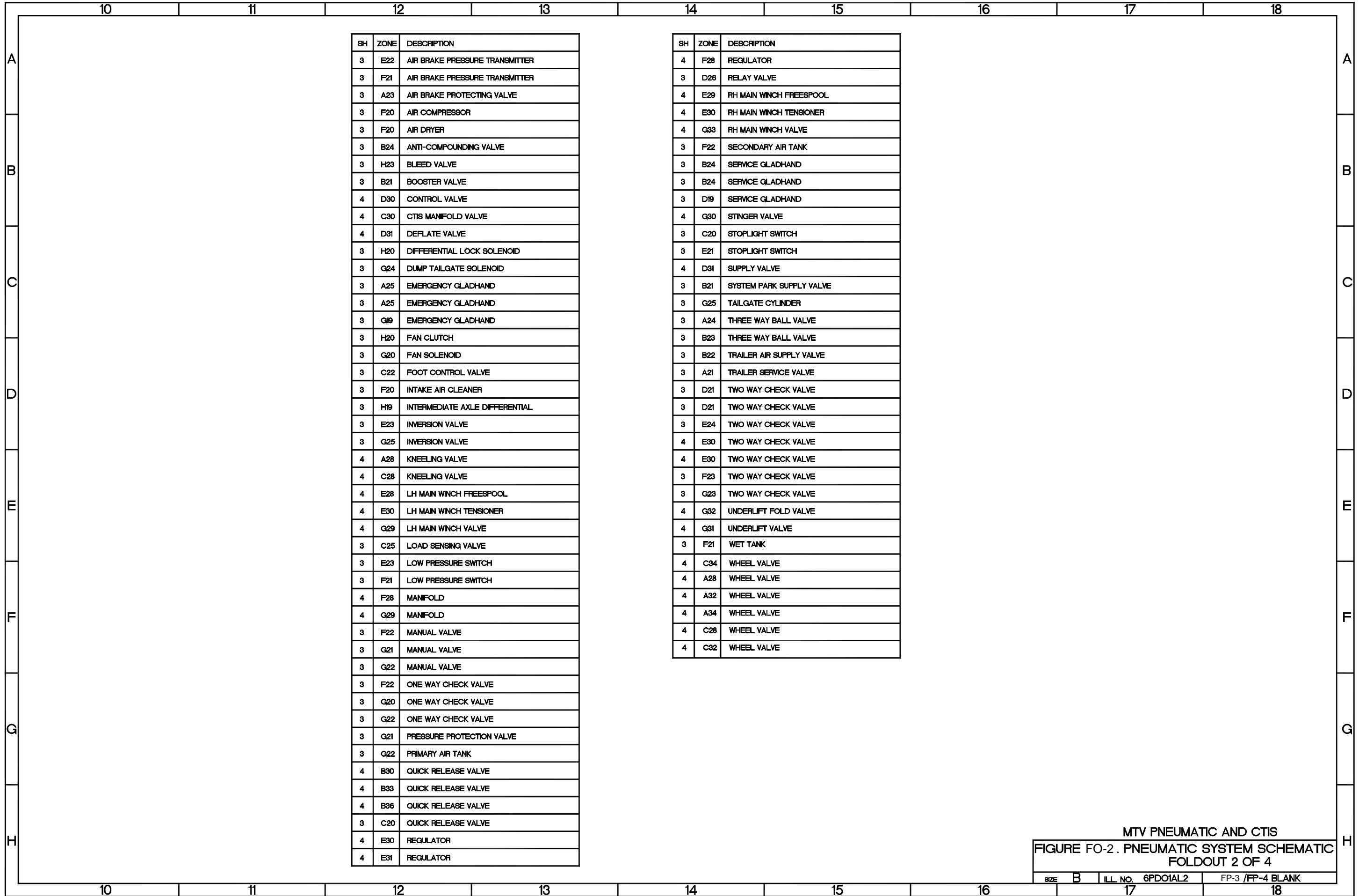
	1	2	3	4	5	6	7	8	9
A									
B	 REAR AXLE BRAKE CHAMBER	 FRONT AXLE BRAKE CHAMBER	 COUPLER AIR BRAKE	 AIR DRYER	 AIR CLEANER INTAKE	 AIR COMPRESSOR WITH GOVERNOR	 AIR TANK	 DASH GAUGE	
C	 MANUAL VALVE	 ONE WAY CHECK VALVE	 FAN CLUTCH	 MODULATED CONTROL VALVE	 QUICK RELEASE VALVE	 TWO WAY CHECK VALVE	 3/2 WAY SOLENOID VALVE	 PRESSURE SWITCH	
D	 PRESSURE RELIEF VALVE	 FOOT CONTROL VALVE	 PARK CONTROL VALVE (HAND OPERATED)	 TRAILER AIR SUPPLY VALVE (HAND OPERATED)	 LOAD SENSING VALVE (MECHANICALLY CONTROLLED)	 DIRECTIONAL RELAY VALVE	 CONTROL VALVE WITH TWO WAY CHECK VALVE	 STOPLIGHT SWITCH	
E	 CONNECTION	 SUPPLY AIR HOSE	 NO CONNECTION	 DELIVERY AIR HOSE	 PARK/EMERGENCY AIR HOSE	 AIR BRAKE PROTECTING VALVE	 INTERMEDIATE DIFFERENTIAL	 AIR BRAKE PRESSURE TRANSMITTER	
F	 BOOSTER VALVE	 AIR/HYDRAULIC INVERSION VALVE	 DELIVERY AIR HOSE NO CONNECTION	 DUMP TAILGATE SOLENOID	 BLEED VALVE	 TAILGATE CYLINDER	 CTIS MANIFOLD VALVE	 WHEEL VALVE	
G	 KNEELING VALVE	 TIRE	 (SINGLE ACTING) CYLINDER RETURN SPRING	 2-POSITION SPRING OFFSET SOLENOID VALVE	 (DOUBLE ACTING) CYLINDER	 MANIFOLD VALVE	 2-POSITION SOLENOID VALVE		
H									

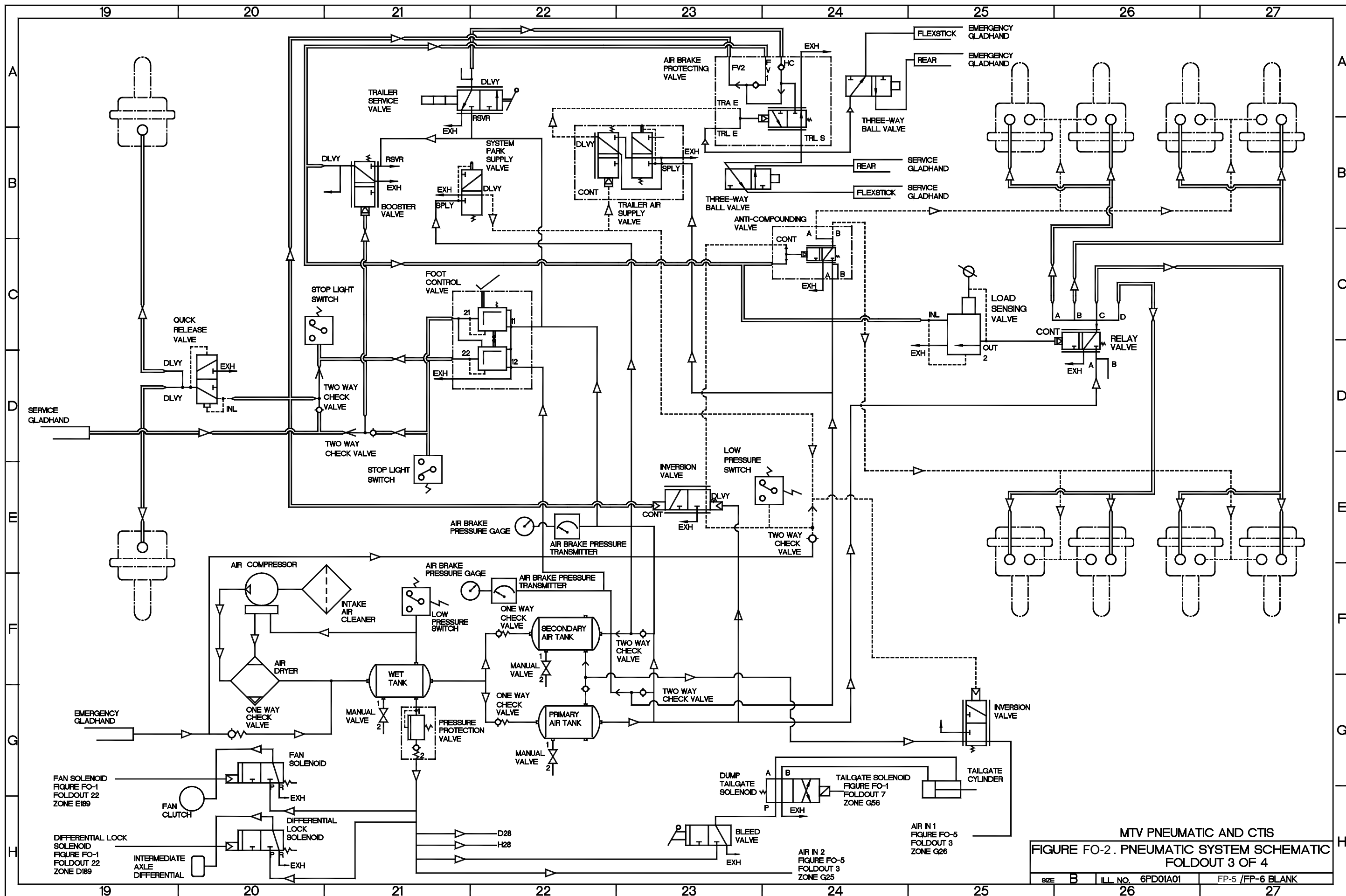
FIGURE FO-2 PNEUMATIC SYSTEM SCHEMATIC
FOLDOUT 1 OF 4
SIZE B ILL. NO. 6PD01A1 FP-1/FP-2 BLANK



SH	ZONE	DESCRIPTION
3	E22	AIR BRAKE PRESSURE TRANSMITTER
3	F21	AIR BRAKE PRESSURE TRANSMITTER
3	A23	AIR BRAKE PROTECTING VALVE
3	F20	AIR COMPRESSOR
3	F20	AIR DRYER
3	B24	ANTI-COMPOUNDING VALVE
3	H23	BLEED VALVE
3	B21	BOOSTER VALVE
4	D30	CONTROL VALVE
4	C30	CTIS MANIFOLD VALVE
4	D31	DEFLATE VALVE
3	H20	DIFFERENTIAL LOCK SOLENOID
3	G24	DUMP TAILGATE SOLENOID
3	A25	EMERGENCY GLADHAND
3	A25	EMERGENCY GLADHAND
3	G19	EMERGENCY GLADHAND
3	H20	FAN CLUTCH
3	G20	FAN SOLENOID
3	C22	FOOT CONTROL VALVE
3	F20	INTAKE AIR CLEANER
3	H19	INTERMEDIATE AXLE DIFFERENTIAL
3	E23	INVERSION VALVE
3	G25	INVERSION VALVE
4	A28	KNEELING VALVE
4	C28	KNEELING VALVE
4	E28	LH MAIN WINCH FREESPOOL
4	E30	LH MAIN WINCH TENSIONER
4	G29	LH MAIN WINCH VALVE
3	C25	LOAD SENSING VALVE
3	E23	LOW PRESSURE SWITCH
3	F21	LOW PRESSURE SWITCH
4	F28	MANIFOLD
4	G29	MANIFOLD
3	F22	MANUAL VALVE
3	G21	MANUAL VALVE
3	G22	MANUAL VALVE
3	F22	ONE WAY CHECK VALVE
3	G20	ONE WAY CHECK VALVE
3	G22	ONE WAY CHECK VALVE
3	G21	PRESSURE PROTECTION VALVE
3	G22	PRIMARY AIR TANK
4	B30	QUICK RELEASE VALVE
4	B33	QUICK RELEASE VALVE
4	B36	QUICK RELEASE VALVE
3	C20	QUICK RELEASE VALVE
4	E30	REGULATOR
4	E31	REGULATOR

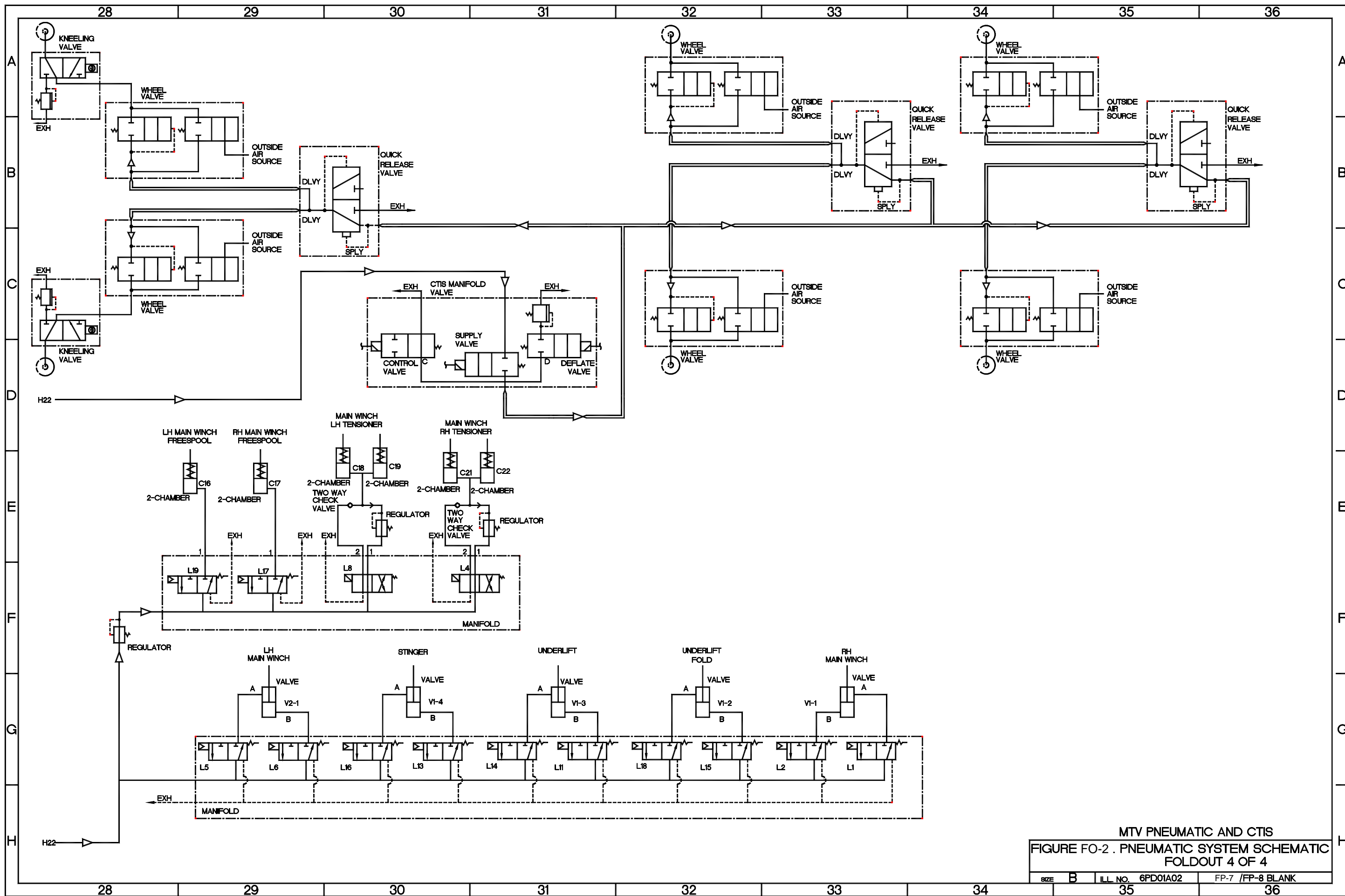
SH	ZONE	DESCRIPTION
4	F28	REGULATOR
3	D26	RELAY VALVE
4	E29	RH MAIN WINCH FREESPOOL
4	E30	RH MAIN WINCH TENSIONER
4	G33	RH MAIN WINCH VALVE
3	F22	SECONDARY AIR TANK
3	B24	SERVICE GLADHAND
3	B24	SERVICE GLADHAND
3	D19	SERVICE GLADHAND
4	G30	STINGER VALVE
3	C20	STOPLIGHT SWITCH
3	E21	STOPLIGHT SWITCH
4	D31	SUPPLY VALVE
3	B21	SYSTEM PARK SUPPLY VALVE
3	G25	TAILGATE CYLINDER
3	A24	THREE WAY BALL VALVE
3	B23	THREE WAY BALL VALVE
3	B22	TRAILER AIR SUPPLY VALVE
3	A21	TRAILER SERVICE VALVE
3	D21	TWO WAY CHECK VALVE
3	D21	TWO WAY CHECK VALVE
3	E24	TWO WAY CHECK VALVE
4	E30	TWO WAY CHECK VALVE
4	E30	TWO WAY CHECK VALVE
3	F23	TWO WAY CHECK VALVE
3	G23	TWO WAY CHECK VALVE
4	G32	UNDERLIFT FOLD VALVE
4	G31	UNDERLIFT VALVE
3	F21	WET TANK
4	C34	WHEEL VALVE
4	A28	WHEEL VALVE
4	A32	WHEEL VALVE
4	A34	WHEEL VALVE
4	C28	WHEEL VALVE
4	C32	WHEEL VALVE

MTV PNEUMATIC AND CTIS
 FIGURE FO-2. PNEUMATIC SYSTEM SCHEMATIC
 FOLDOUT 2 OF 4
 SIZE B ILL. NO. 6PDO1A2 FP-3 /FP-4 BLANK



MTV PNEUMATIC AND CTIS
 FIGURE FO-2. PNEUMATIC SYSTEM SCHEMATIC
 FOLDOUT 3 OF 4

SIZE	B	ILL. NO.	6PD01A01	FP-5 /FP-6 BLANK
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MTV PNEUMATIC AND CTIS
 FIGURE FO-2 . PNEUMATIC SYSTEM SCHEMATIC
 FOLDOUT 4 OF 4

SIZE	B	ILL. NO.	6PD01A02	FP-7 /FP-8	BLANK
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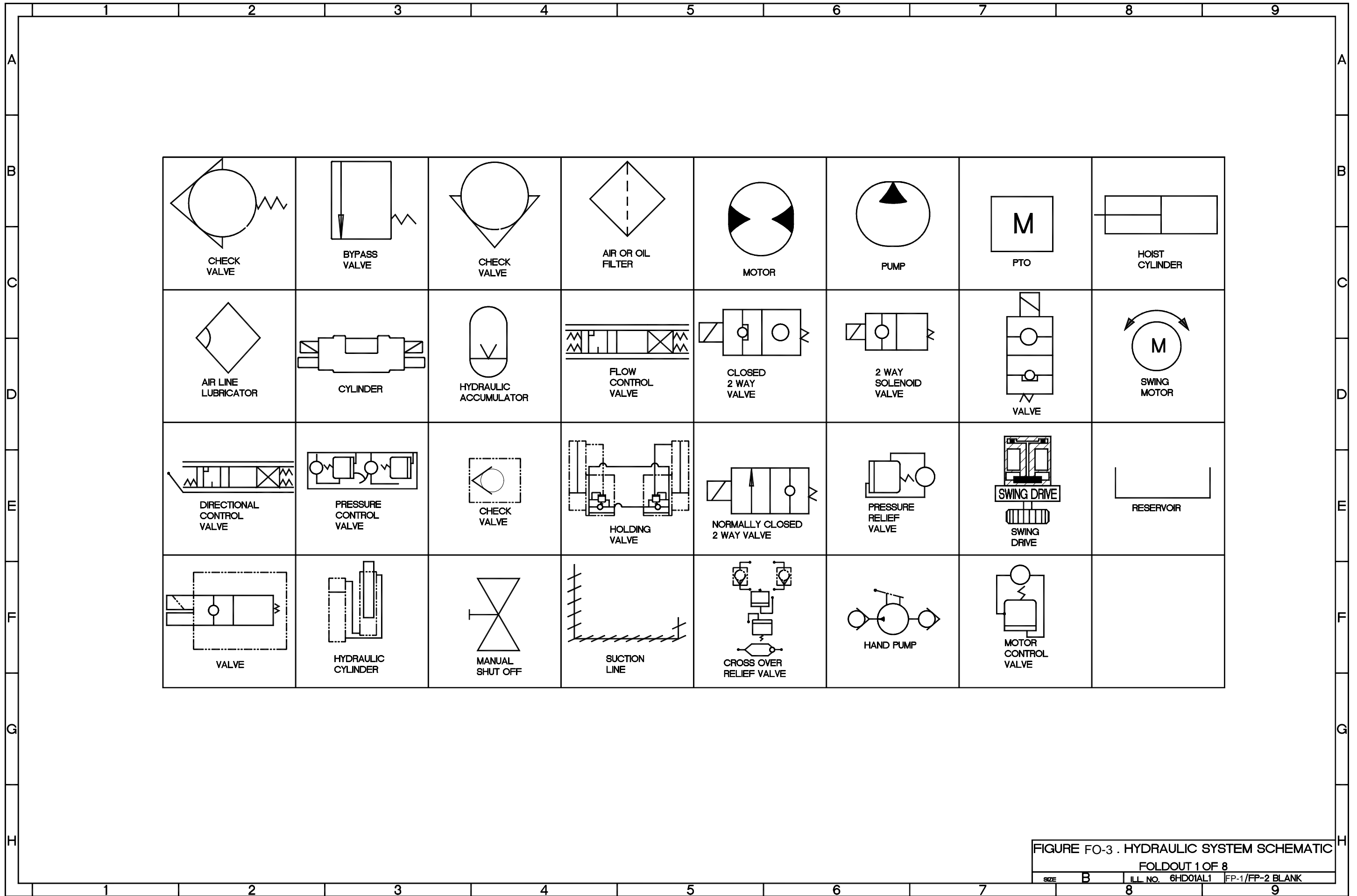
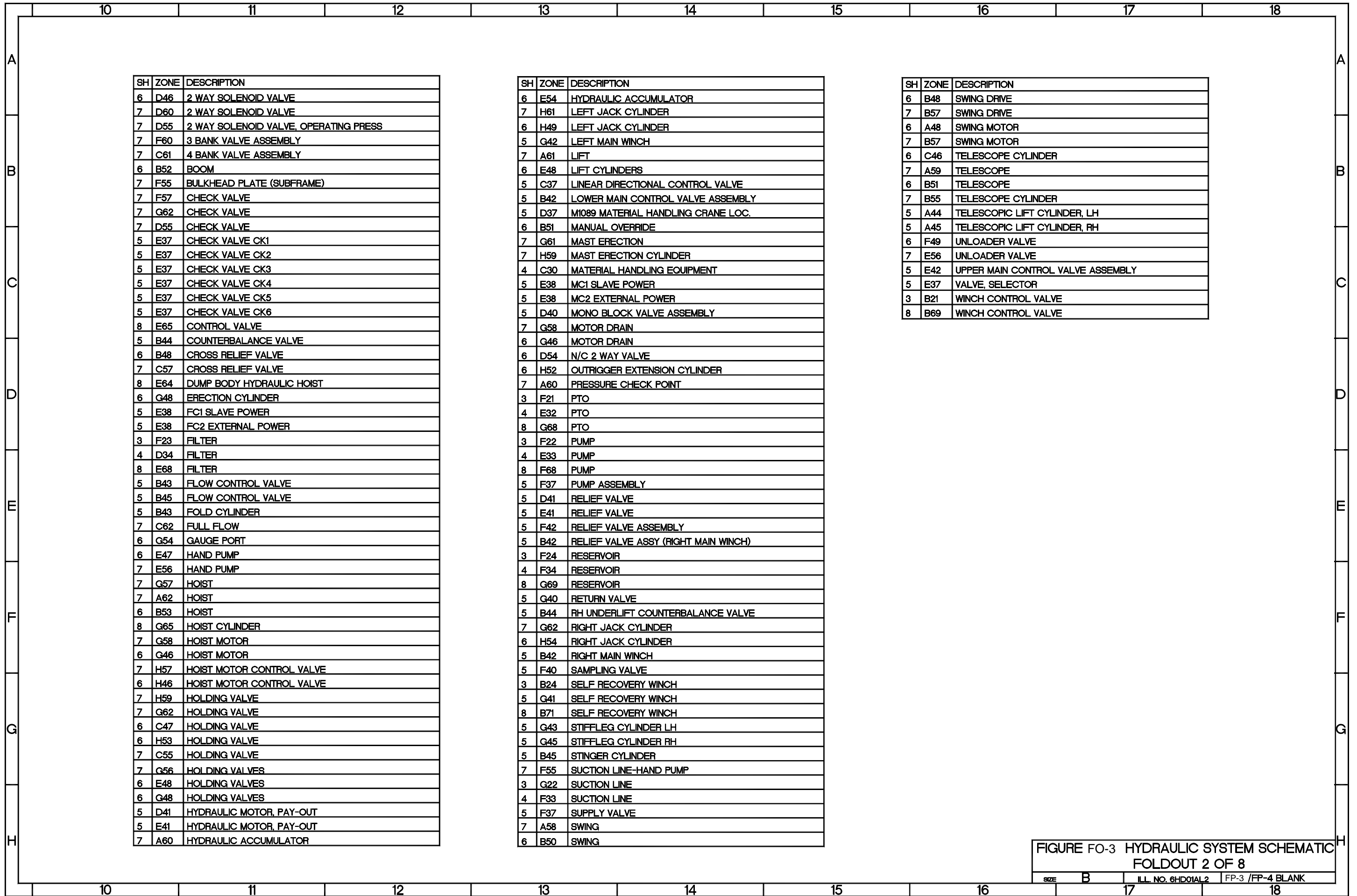


FIGURE FO-3 . HYDRAULIC SYSTEM SCHEMATIC
 FOLDOUT 1 OF 8
 SIZE B ILL. NO. 6HDO1AL1 FP-1/FP-2 BLANK

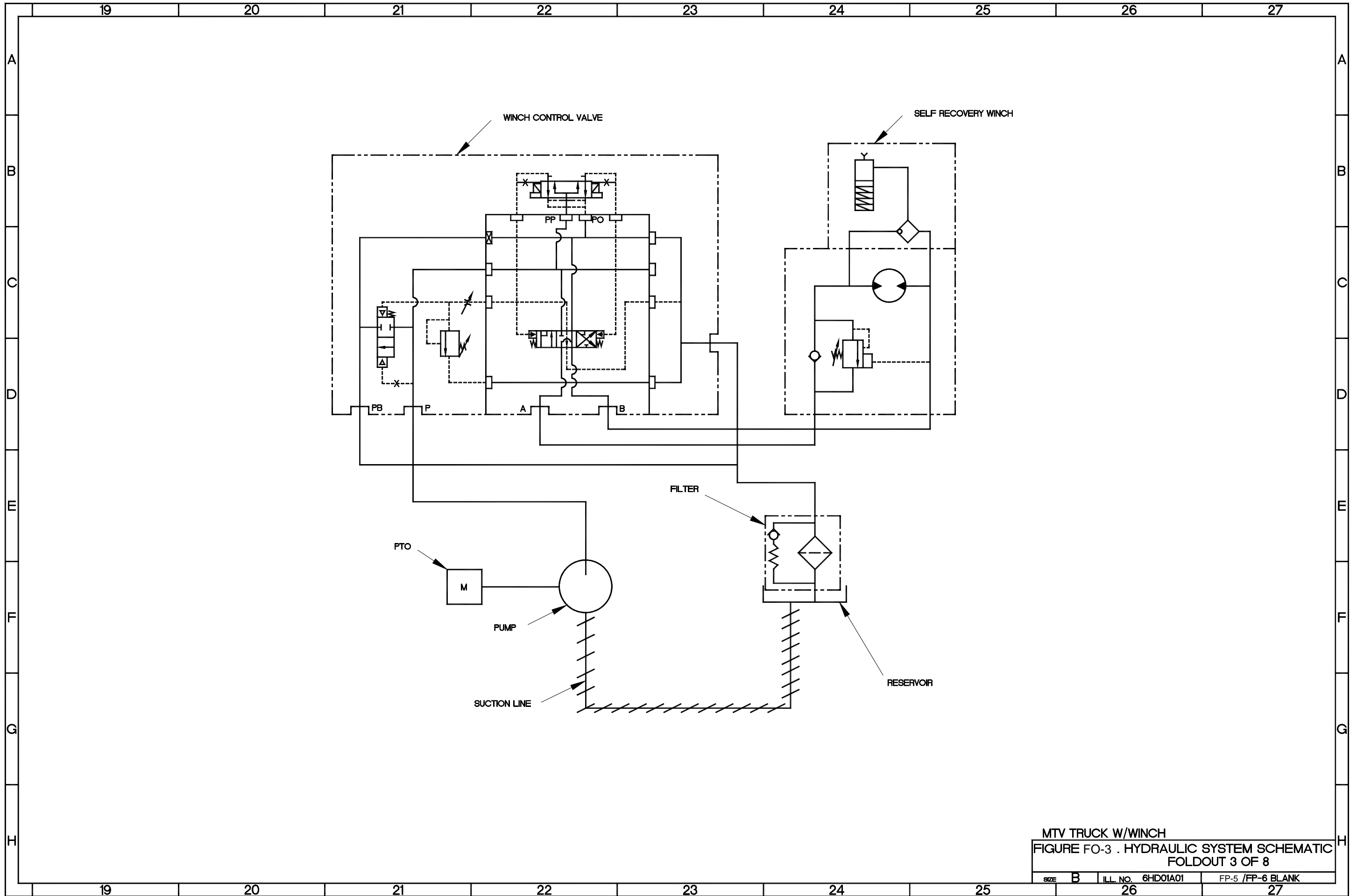


SH	ZONE	DESCRIPTION
6	D46	2 WAY SOLENOID VALVE
7	D60	2 WAY SOLENOID VALVE
7	D55	2 WAY SOLENOID VALVE, OPERATING PRESS
7	F60	3 BANK VALVE ASSEMBLY
7	C61	4 BANK VALVE ASSEMBLY
6	B52	BOOM
7	F55	BULKHEAD PLATE (SUBFRAME)
7	F57	CHECK VALVE
7	G62	CHECK VALVE
7	D55	CHECK VALVE
5	E37	CHECK VALVE CK1
5	E37	CHECK VALVE CK2
5	E37	CHECK VALVE CK3
5	E37	CHECK VALVE CK4
5	E37	CHECK VALVE CK5
5	E37	CHECK VALVE CK6
8	E65	CONTROL VALVE
5	B44	COUNTERBALANCE VALVE
6	B48	CROSS RELIEF VALVE
7	C57	CROSS RELIEF VALVE
8	E64	DUMP BODY HYDRAULIC HOIST
6	G48	ERECTION CYLINDER
5	E38	FC1 SLAVE POWER
5	E38	FC2 EXTERNAL POWER
3	F23	FILTER
4	D34	FILTER
8	E68	FILTER
5	B43	FLOW CONTROL VALVE
5	B45	FLOW CONTROL VALVE
5	B43	FOLD CYLINDER
7	C62	FULL FLOW
6	G54	GAUGE PORT
6	E47	HAND PUMP
7	E56	HAND PUMP
7	G57	HOIST
7	A62	HOIST
6	B53	HOIST
8	G65	HOIST CYLINDER
7	G58	HOIST MOTOR
6	G46	HOIST MOTOR
7	H57	HOIST MOTOR CONTROL VALVE
6	H46	HOIST MOTOR CONTROL VALVE
7	H59	HOLDING VALVE
7	G62	HOLDING VALVE
6	C47	HOLDING VALVE
6	H53	HOLDING VALVE
7	C55	HOLDING VALVE
7	G56	HOLDING VALVES
6	E48	HOLDING VALVES
6	G48	HOLDING VALVES
5	D41	HYDRAULIC MOTOR, PAY-OUT
5	E41	HYDRAULIC MOTOR, PAY-OUT
7	A60	HYDRAULIC ACCUMULATOR

SH	ZONE	DESCRIPTION
6	E54	HYDRAULIC ACCUMULATOR
7	H61	LEFT JACK CYLINDER
6	H49	LEFT JACK CYLINDER
5	G42	LEFT MAIN WINCH
7	A61	LIFT
6	E48	LIFT CYLINDERS
5	C37	LINEAR DIRECTIONAL CONTROL VALVE
5	B42	LOWER MAIN CONTROL VALVE ASSEMBLY
5	D37	M1089 MATERIAL HANDLING CRANE LOC.
6	B51	MANUAL OVERRIDE
7	G61	MAST ERECTION
7	H59	MAST ERECTION CYLINDER
4	C30	MATERIAL HANDLING EQUIPMENT
5	E38	MC1 SLAVE POWER
5	E38	MC2 EXTERNAL POWER
5	D40	MONO BLOCK VALVE ASSEMBLY
7	G58	MOTOR DRAIN
6	G46	MOTOR DRAIN
6	D54	N/C 2 WAY VALVE
6	H52	OUTRIGGER EXTENSION CYLINDER
7	A60	PRESSURE CHECK POINT
3	F21	PTO
4	E32	PTO
8	G68	PTO
3	F22	PUMP
4	E33	PUMP
8	F68	PUMP
5	F37	PUMP ASSEMBLY
5	D41	RELIEF VALVE
5	E41	RELIEF VALVE
5	F42	RELIEF VALVE ASSEMBLY
5	B42	RELIEF VALVE ASSY (RIGHT MAIN WINCH)
3	F24	RESERVOIR
4	F34	RESERVOIR
8	G69	RESERVOIR
5	G40	RETURN VALVE
5	B44	RH UNDERLIFT COUNTERBALANCE VALVE
7	G62	RIGHT JACK CYLINDER
6	H54	RIGHT JACK CYLINDER
5	B42	RIGHT MAIN WINCH
5	F40	SAMPLING VALVE
3	B24	SELF RECOVERY WINCH
5	G41	SELF RECOVERY WINCH
8	B71	SELF RECOVERY WINCH
5	G43	STIFFLEG CYLINDER LH
5	G45	STIFFLEG CYLINDER RH
5	B45	STINGER CYLINDER
7	F55	SUCTION LINE-HAND PUMP
3	G22	SUCTION LINE
4	F33	SUCTION LINE
5	F37	SUPPLY VALVE
7	A58	SWING
6	B50	SWING

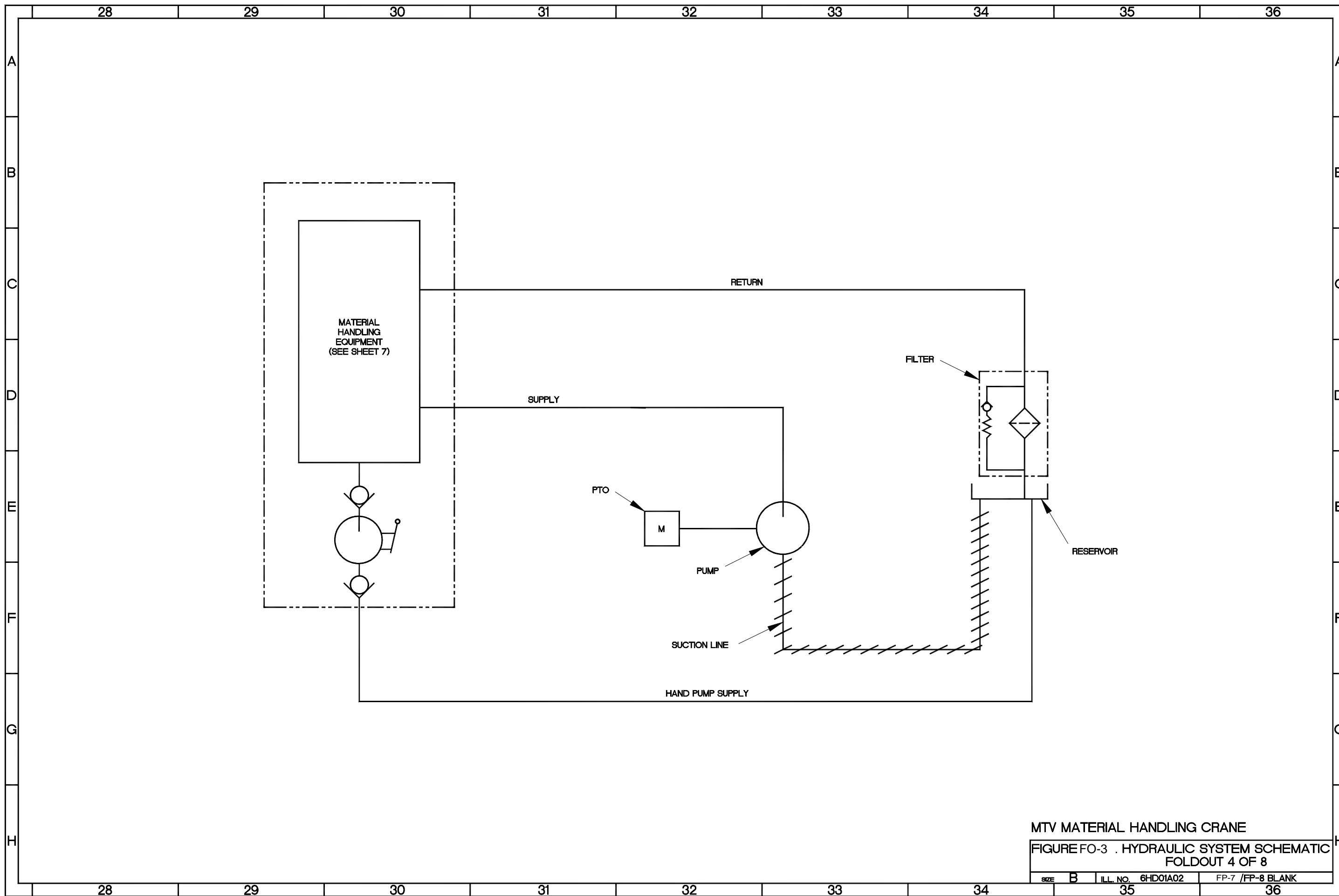
SH	ZONE	DESCRIPTION
6	B48	SWING DRIVE
7	B57	SWING DRIVE
6	A48	SWING MOTOR
7	B57	SWING MOTOR
6	C46	TELESCOPE CYLINDER
7	A59	TELESCOPE
6	B51	TELESCOPE
7	B55	TELESCOPE CYLINDER
5	A44	TELESCOPIC LIFT CYLINDER, LH
5	A45	TELESCOPIC LIFT CYLINDER, RH
6	F49	UNLOADER VALVE
7	E56	UNLOADER VALVE
5	E42	UPPER MAIN CONTROL VALVE ASSEMBLY
5	E37	VALVE, SELECTOR
3	B21	WINCH CONTROL VALVE
8	B69	WINCH CONTROL VALVE

FIGURE FO-3 HYDRAULIC SYSTEM SCHEMATIC
 FOLDOUT 2 OF 8
 SIZE B ILL. NO. 6HDO1A2 FP-3 /FP-4 BLANK



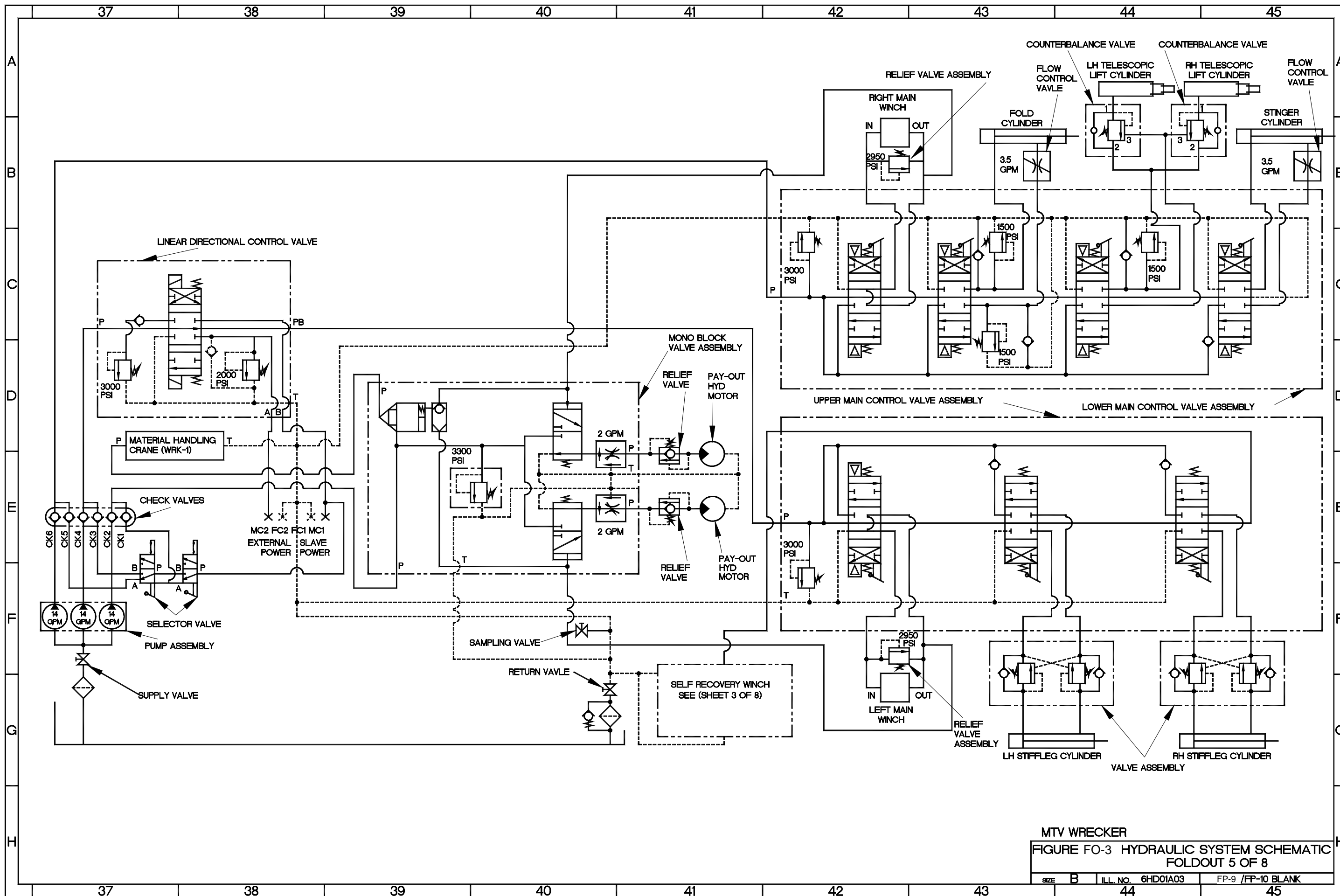
MTV TRUCK W/WINCH
FIGURE FO-3 . HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 3 OF 8

SIZE	B	ILL. NO.	6HD01A01	FP-5 /FP-6	BLANK
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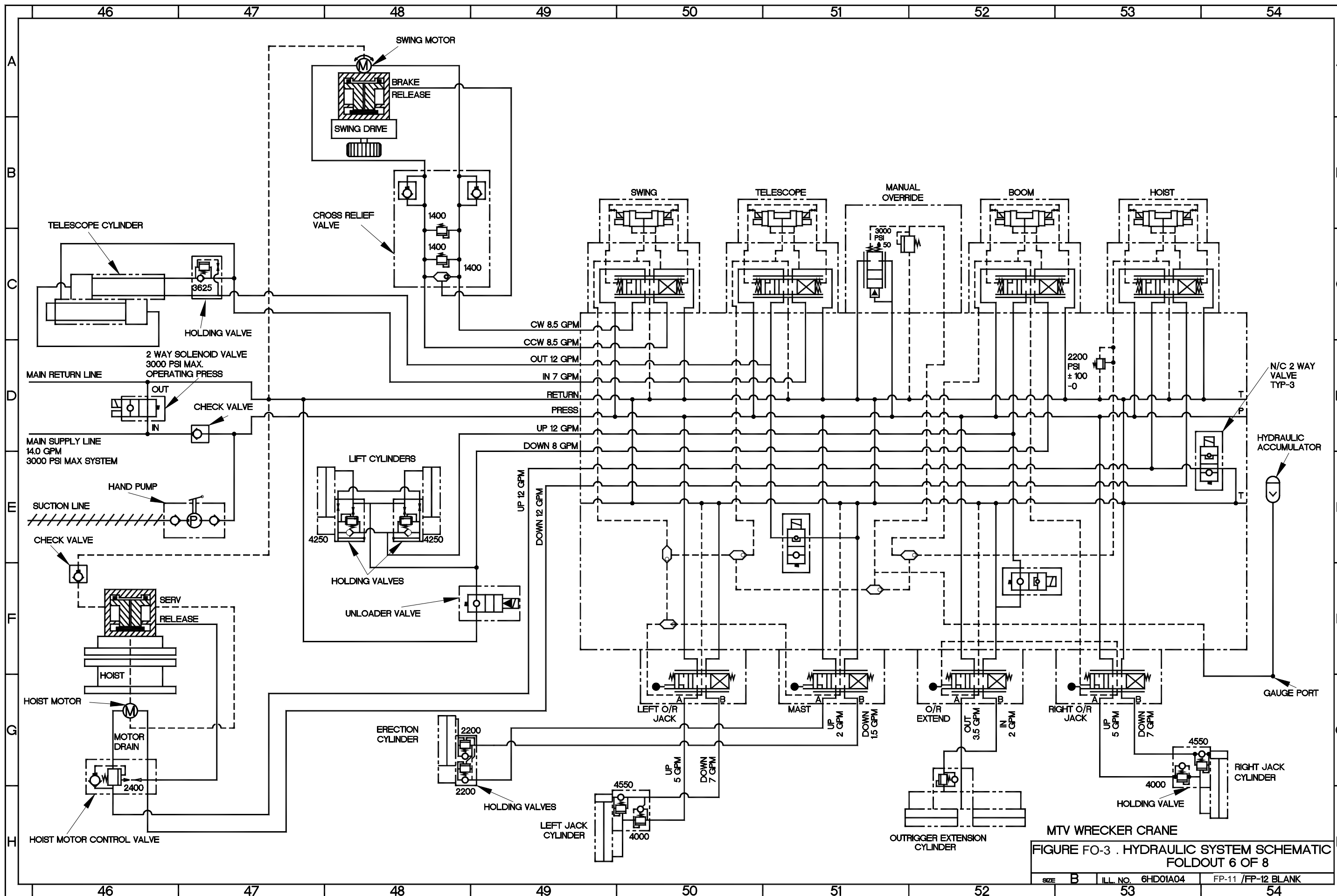
MTV MATERIAL HANDLING CRANE
 FIGURE FO-3 . HYDRAULIC SYSTEM SCHEMATIC
 FOLDOUT 4 OF 8

SIZE	B	ILL. NO.	6HD01A02	FP-7 /FP-8 BLANK

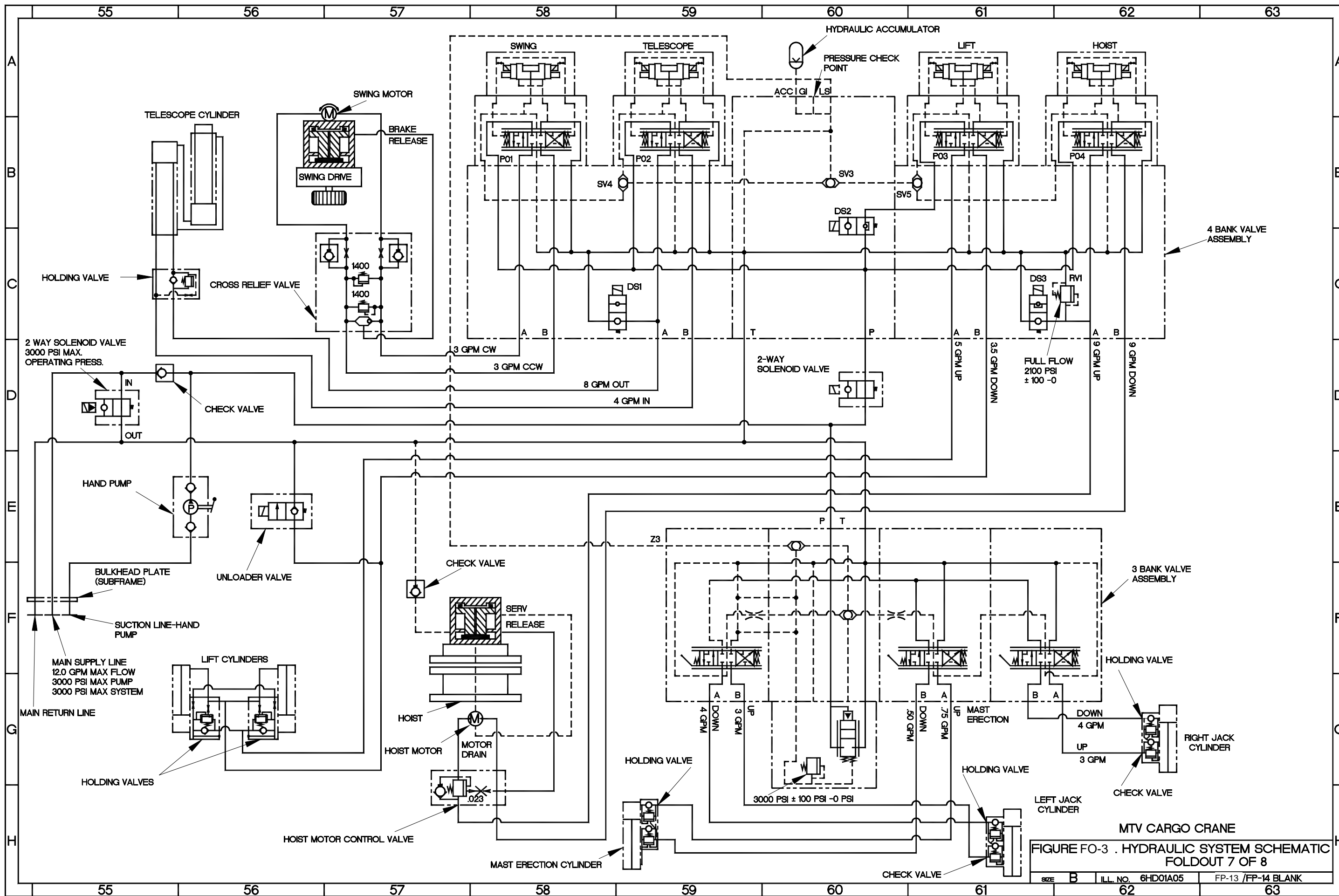


MTV WRECKER
 FIGURE FO-3 HYDRAULIC SYSTEM SCHEMATIC
 FOLDOUT 5 OF 8

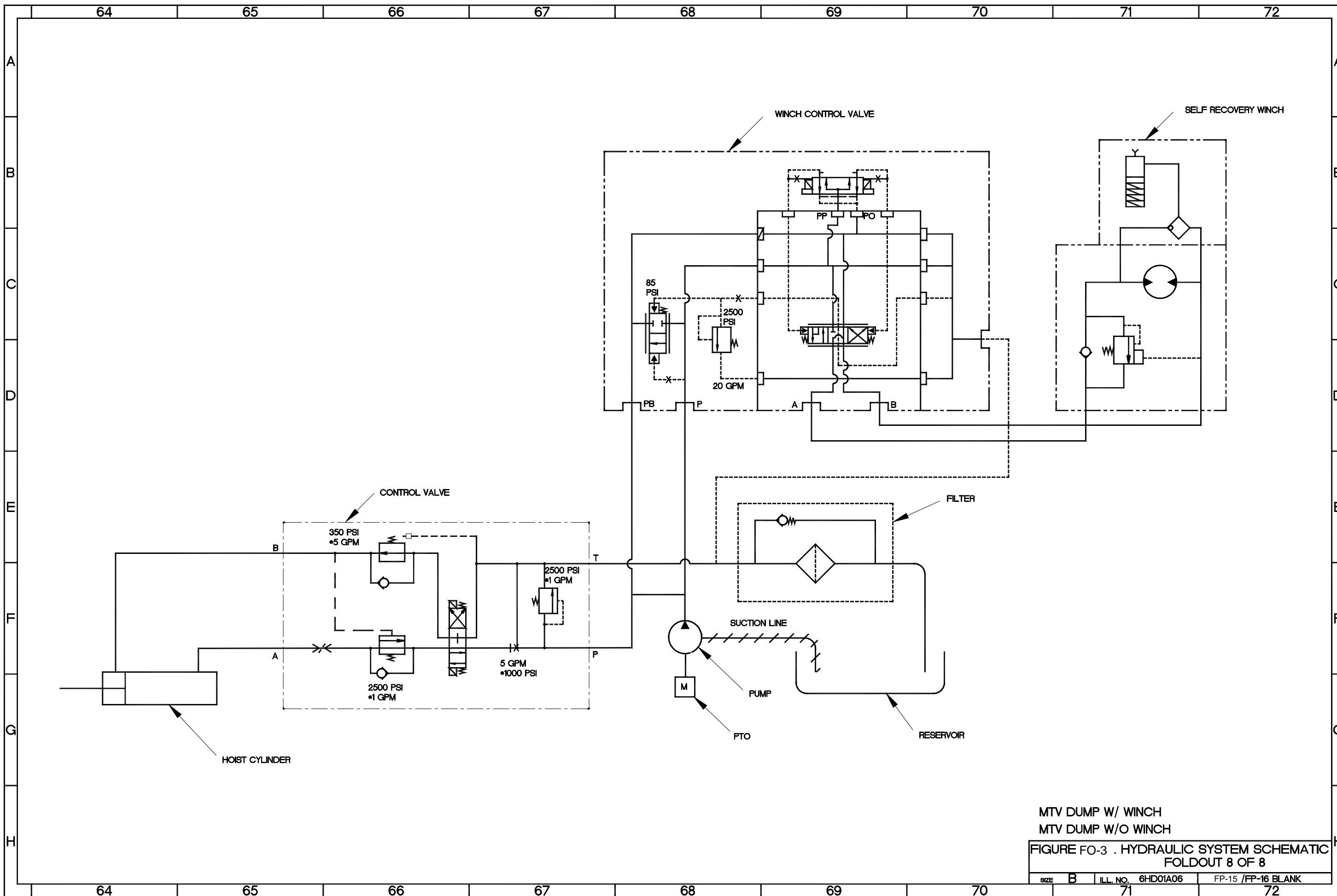
SIZE	B	ILL. NO.	6HD01A03	FP-9 /FP-10 BLANK
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MTV WRECKER CRANE
 FIGURE FO-3 . HYDRAULIC SYSTEM SCHEMATIC
 FOLDOUT 6 OF 8
 SIZE B ILL. NO. 6HD01A04 FP-11 /FP-12 BLANK

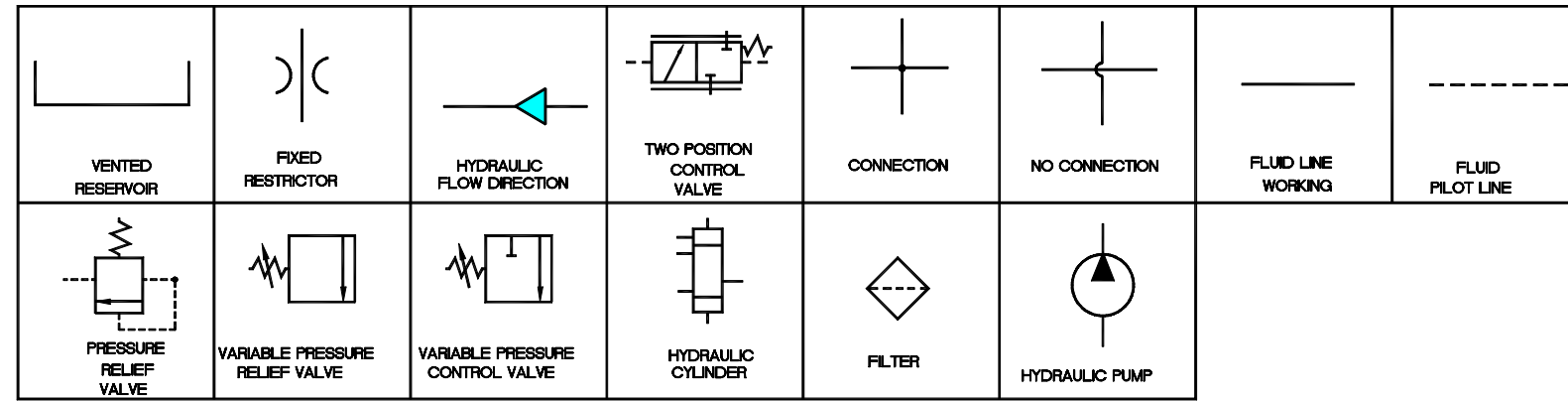


MTV CARGO CRANE
 FIGURE FO-3 . HYDRAULIC SYSTEM SCHEMATIC
 FOLDOUT 7 OF 8
 SIZE B ILL. NO. 6HD01A05 FP-13 /FP-14 BLANK



MTV DUMP W/ WINCH
 MTV DUMP W/O WINCH
 FIGURE FO-3 . HYDRAULIC SYSTEM SCHEMATIC
 FOLDOUT 8 OF 8

SIZE	B	ILL. NO.	6HD01A06	FP-15 /FP-16 BLANK
			71	72



SH	ZONE	DESCRIPTION
2	D11	FILTER
2	D14	FIXED RESTRICTOR
2	E17	HYDRAULIC CYLINDER
2	E13	HYDRAULIC PUMP
2	C13	PRESSURE RELIEF VALVE
2	D13	TWO POSITION CONTROL VALVE
2	E16	VARIABLE PRESSURE CONTROL VALVE
2	E16	VARIABLE PRESSURE RELIEF VALVE
2	C11	VENTED RESERVOIR

FIGURE FO-4 HYDRAULIC STEERING SYSTEM

FOLDOUT 1 OF 2

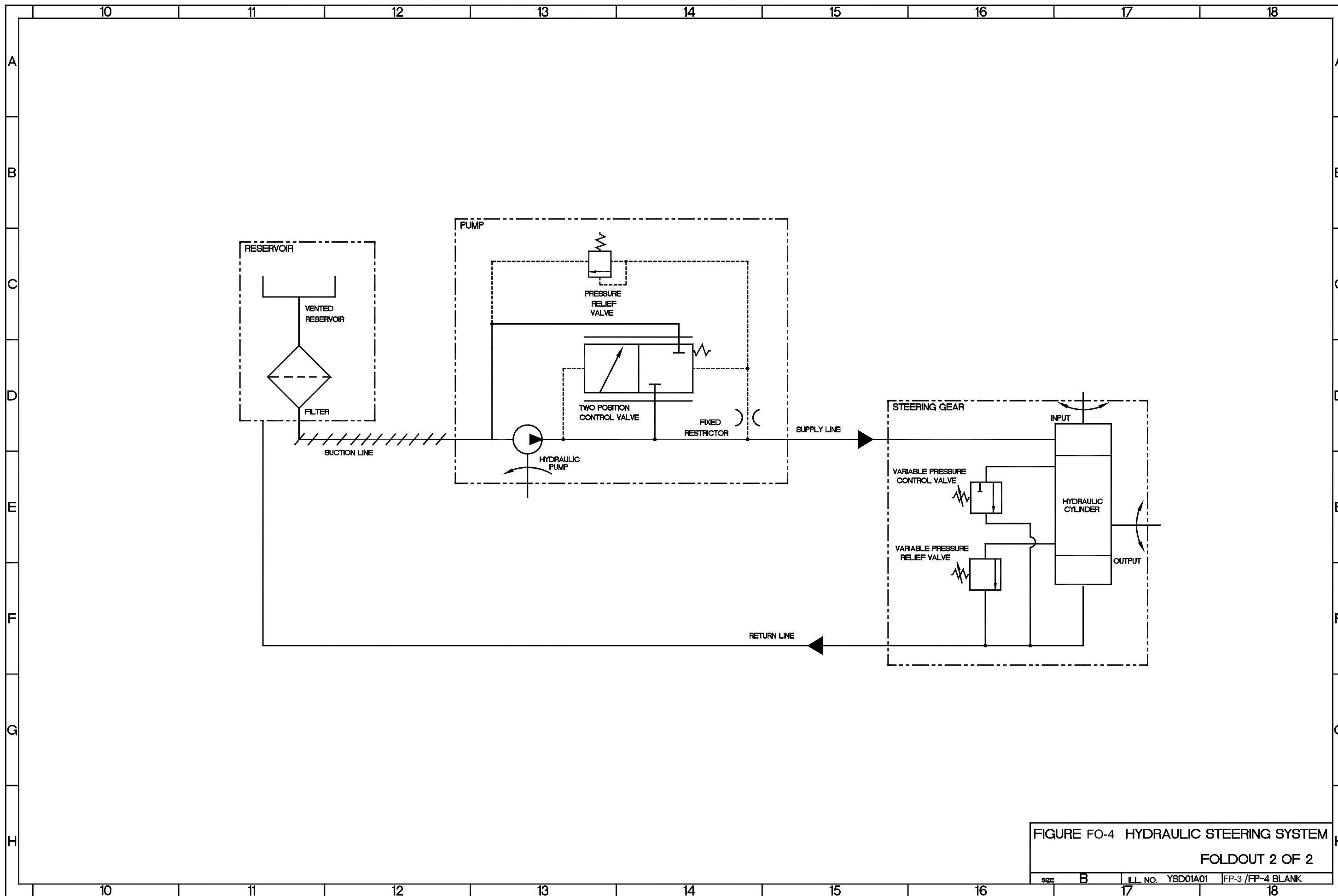


FIGURE FO-4 HYDRAULIC STEERING SYSTEM
 FOLDOUT 2 OF 2
 SIZE B ILL. NO. YSD01A01 FP-3 /FP-4 BLANK

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B									
C									
D									
E									
F									
G									
H									

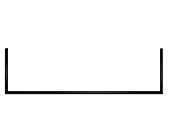

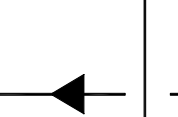
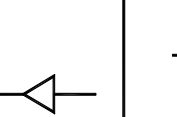
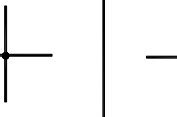
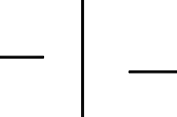

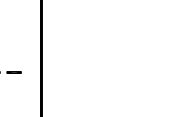
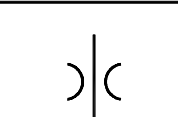
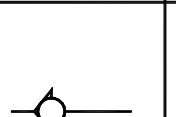

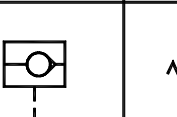
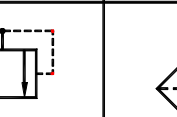


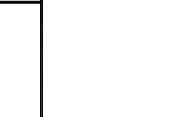
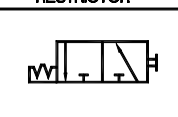
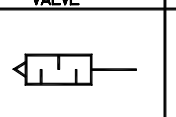
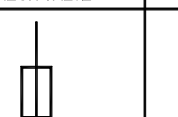
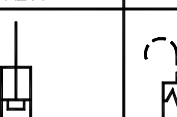
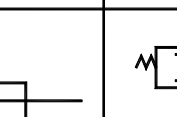
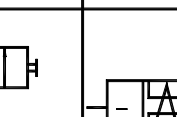

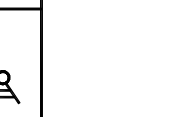
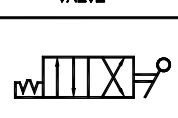
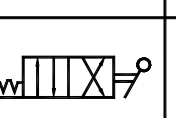
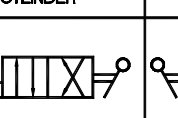
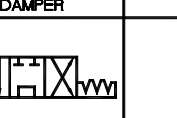
							
VENTED RESERVOIR	ABOVE FLUID LEVEL RESERVOIR	HYDRAULIC FLOW DIRECTION	PNEUMATIC FLOW DIRECTION	CONNECTION	NO CONNECTION	FLUID LINE WORKING	FLUID PILOT LINE
							
FIXED RESTRICTOR	CHECK VALVE	VARIABLE CONTROL CHECK VALVE	CHECK PILOT	PRESSURE RELIEF VALVE	FILTER	HAND PUMP	DETENT
							
TWO POSITION CAB SUSPENSION VALVE	MUFFLER	HYDRAULIC CYLINDER	CAB AIR SUSPENSION W/DAMPER	REAR CAB LATCH	TWO POSITION AIR PUMP VALVE	PRESSURE INTENSIFIER	HEIGHT CONTROL VALVE
							
TWO POSITION CAB TILT VALVE	TWO POSITION SUSPENSION VALVE	TWO POSITION SPARE TIRE VALVE	THREE POSITION SELECTION VALVE				

FIGURE FO-5 AIR TRANSPORTABILITY
HYDRAULIC/PNEUMATIC SYSTEM SCHEMATIC
FOLDOUT 1 OF 3
SIZE B ILL. NO. YADO1A11 FP-1/FP-2 BLANK

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A	<table border="1"> <thead> <tr> <th>SH</th> <th>ZONE</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr><td>3</td><td>A25</td><td>CAB AIR SUSPENSION W/DAMPER</td></tr> <tr><td>3</td><td>F21</td><td>CHECK PILOT</td></tr> <tr><td>3</td><td>A22</td><td>CHECK VALVE</td></tr> <tr><td>3</td><td>A23</td><td>CHECK VALVE</td></tr> <tr><td>3</td><td>B22</td><td>CHECK VALVE</td></tr> <tr><td>3</td><td>B23</td><td>CHECK VALVE</td></tr> <tr><td>3</td><td>B25</td><td>CHECK VALVE</td></tr> <tr><td>3</td><td>C20</td><td>CHECK VALVE</td></tr> <tr><td>3</td><td>C21</td><td>CHECK VALVE</td></tr> <tr><td>3</td><td>E19</td><td>CHECK VALVE</td></tr> <tr><td>3</td><td>E24</td><td>CHECK VALVE</td></tr> <tr><td>3</td><td>E25</td><td>CHECK VALVE</td></tr> <tr><td>3</td><td>F19</td><td>CHECK VALVE</td></tr> <tr><td>3</td><td>F21</td><td>CHECK VALVE</td></tr> <tr><td>3</td><td>G21</td><td>CHECK VALVE</td></tr> <tr><td>3</td><td>A22</td><td>FILTER</td></tr> <tr><td>3</td><td>B22</td><td>FILTER</td></tr> <tr><td>3</td><td>A24</td><td>FILTER</td></tr> <tr><td>3</td><td>B24</td><td>FILTER</td></tr> <tr><td>3</td><td>D19</td><td>FILTER</td></tr> <tr><td>3</td><td>D20</td><td>FILTER</td></tr> <tr><td>3</td><td>D21</td><td>FILTER</td></tr> <tr><td>3</td><td>E19</td><td>FILTER</td></tr> <tr><td>3</td><td>G19</td><td>FILTER</td></tr> <tr><td>3</td><td>G21</td><td>FILTER</td></tr> <tr><td>3</td><td>A22</td><td>FIXED RESTRICTOR</td></tr> <tr><td>3</td><td>B22</td><td>FIXED RESTRICTOR</td></tr> <tr><td>3</td><td>A23</td><td>FIXED RESTRICTOR</td></tr> <tr><td>3</td><td>B23</td><td>FIXED RESTRICTOR</td></tr> <tr><td>3</td><td>F19</td><td>HAND PUMP</td></tr> <tr><td>3</td><td>B25</td><td>HEIGHT CONTROL VALVE</td></tr> <tr><td>3</td><td>B22</td><td>HYDRAULIC CYLINDER</td></tr> <tr><td>3</td><td>B23</td><td>HYDRAULIC CYLINDER</td></tr> <tr><td>3</td><td>C21</td><td>HYDRAULIC CYLINDER</td></tr> <tr><td>3</td><td>F20</td><td>MUFFLER</td></tr> <tr><td>3</td><td>F21</td><td>PRESSURE INTENSIFIER</td></tr> <tr><td>3</td><td>F19</td><td>PRESSURE RELIEF VALVE</td></tr> <tr><td>3</td><td>A24</td><td>REAR CAB LATCH</td></tr> <tr><td>3</td><td>E21</td><td>THREE POSITION SELECTION VALVE</td></tr> <tr><td>3</td><td>D26</td><td>TWO POSITION AIR PUMP VALVE</td></tr> <tr><td>3</td><td>D25</td><td>TWO POSITION CAB SUSPENSION VALVE</td></tr> <tr><td>3</td><td>C24</td><td>TWO POSITION CAB TILT VALVE</td></tr> <tr><td>3</td><td>C23</td><td>TWO POSITION SPARE TIRE VALVE</td></tr> <tr><td>3</td><td>D21</td><td>TWO POSITION SUSPENSION VALVE</td></tr> <tr><td>3</td><td>G22</td><td>VARIABLE CONTROL CHECK VALVE</td></tr> <tr><td>3</td><td>G22</td><td>VENTED RESERVOIR</td></tr> </tbody> </table>									SH	ZONE	DESCRIPTION	3	A25	CAB AIR SUSPENSION W/DAMPER	3	F21	CHECK PILOT	3	A22	CHECK VALVE	3	A23	CHECK VALVE	3	B22	CHECK VALVE	3	B23	CHECK VALVE	3	B25	CHECK VALVE	3	C20	CHECK VALVE	3	C21	CHECK VALVE	3	E19	CHECK VALVE	3	E24	CHECK VALVE	3	E25	CHECK VALVE	3	F19	CHECK VALVE	3	F21	CHECK VALVE	3	G21	CHECK VALVE	3	A22	FILTER	3	B22	FILTER	3	A24	FILTER	3	B24	FILTER	3	D19	FILTER	3	D20	FILTER	3	D21	FILTER	3	E19	FILTER	3	G19	FILTER	3	G21	FILTER	3	A22	FIXED RESTRICTOR	3	B22	FIXED RESTRICTOR	3	A23	FIXED RESTRICTOR	3	B23	FIXED RESTRICTOR	3	F19	HAND PUMP	3	B25	HEIGHT CONTROL VALVE	3	B22	HYDRAULIC CYLINDER	3	B23	HYDRAULIC CYLINDER	3	C21	HYDRAULIC CYLINDER	3	F20	MUFFLER	3	F21	PRESSURE INTENSIFIER	3	F19	PRESSURE RELIEF VALVE	3	A24	REAR CAB LATCH	3	E21	THREE POSITION SELECTION VALVE	3	D26	TWO POSITION AIR PUMP VALVE	3	D25	TWO POSITION CAB SUSPENSION VALVE	3	C24	TWO POSITION CAB TILT VALVE	3	C23	TWO POSITION SPARE TIRE VALVE	3	D21	TWO POSITION SUSPENSION VALVE	3	G22	VARIABLE CONTROL CHECK VALVE	3	G22	VENTED RESERVOIR	A
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3	D26	TWO POSITION AIR PUMP VALVE																																																																																																																																																					
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FIGURE FO-5 AIR TRANSPORTABILITY
HYDRAULIC/PNEUMATIC SYSTEM SCHEMATIC
FOLDOUT 2 OF 3

SIZE B ILL. NO. YAD01AL2 FP-3/FP-4 BLANK

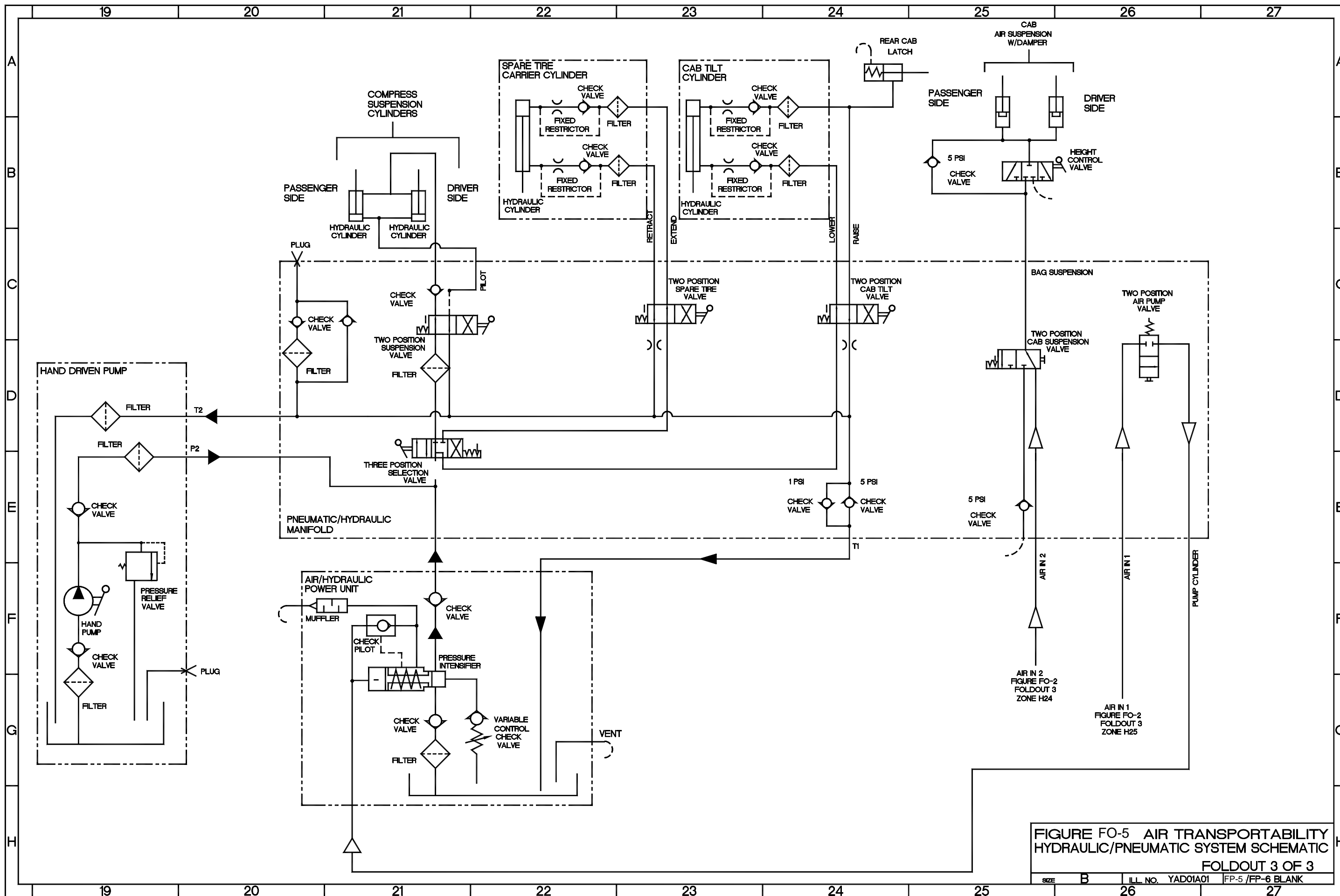
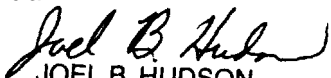


FIGURE FO-5 AIR TRANSPORTABILITY HYDRAULIC/PNEUMATIC SYSTEM SCHEMATIC FOLDOUT 3 OF 3

By Order of the Secretary of the Army:

DENNIS J. REIMER
General, United States Army
Chief of Staff

Official:


JOEL B. HUDSON
Administrative Assistant to the
Secretary of the Army
05186

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ITEM	PAGE	PARA-GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON
10	15-33	15-7		4		Item 10. Change Illustration. Reason: Text calls out 90-degree fitting. Art shows straight fitting. Text is correct. Step (4) of removal says to disconnect four hydraulic hoses from manifold. The correct number of hydraulic hoses is five. correct the text to reflect the actual quantity of hydraulic hoses. The supporting illustration is correct.
	19-6	19-2				

** Reference to line numbers within the paragraph or subparagraph.*

TYPED NAME, GRADE OR TITLE Your title	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION Your telephone number	SIGNATURE Your signature
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PUBLICATION NUMBER			DATE				TITLE	
			Publication Date				Your Title	
PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

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For use of this form, see AR 25-30; the proponent agency is OAASA							
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PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS							
PUBLICATION/FORM NUMBER						DATE	TITLE
ITEM	PAGE	PARA- GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON	
<i>* Reference to line numbers within the paragraph or subparagraph.</i>							
TYPED NAME, GRADE OR TITLE				TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION		SIGNATURE	

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TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
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THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
 1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
 1 Kilometer = 1000 Meters = 0.621 Miles

SQUARE MEASURE

1 Sq Centimeter = 100 Sq Millimeters = 0.155 Sq Inches
 1 Sq Meter = 10,000 Sq Centimeters = 10.76 Sq Feet
 1 Sq Kilometer = 1,000,000 Sq Meters = 0.386 Sq Miles

WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
 1 Kilogram = 1000 Grams = 2.2 Lb
 1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

CUBIC MEASURE

1 Cu Centimeter = 1000 Cu Millimeters = 0.06 Cu Inches
 1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

LIQUID MEASURE

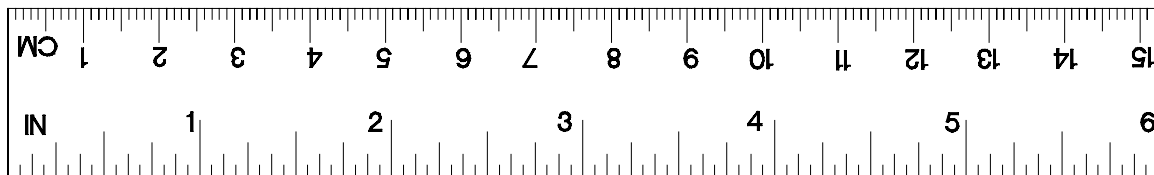
1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
 1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

TEMPERATURE

$5/9 (^{\circ}\text{F} - 32) = ^{\circ}\text{C}$
 212° Fahrenheit is equivalent to 100° Celsius
 90° Fahrenheit is equivalent to 32.2° Celsius
 32° Fahrenheit is equivalent to 0° Celsius
 $9/5 \text{ C}^{\circ} + 32 = \text{F}^{\circ}$

APPROXIMATE CONVERSION FACTORS

<u>TO CHANGE</u>	<u>TO</u>	<u>MULTIPLY BY</u>	<u>TO CHANGE</u>	<u>TO</u>	<u>MULTIPLY BY</u>
Inches	Centimeters	2.540	Centimeters	Inches	0.394
Inches	Millimeters	25.4	Millimeters	Inches	0.0394
Feet	Meters	0.305	Meters	Feet	3.280
Yards	Meters	0.914	Meters	Yards	1.094
Miles	Kilometers	1.609	Kilometers	Miles	0.621
Square Inches	Square Centimeters	6.451	Sq Centimeters	Square Inches	0.155
Square Feet	Square Meters	0.093	Square Meters	Square Feet	10.764
Square Yards	Square Meters	0.836	Square Meters	Square Yards	1.196
Square Miles	Square Kilometers	2.590	Square Kilometers	Square Miles	0.386
Acres	Square Hectometers	0.405	Sq Hectometers	Acres	2.471
Cubic Feet	Cubic Meters	0.028	Cubic Meters	Cubic Feet	35.315
Cubic Yards	Cubic Meters	0.765	Cubic Meters	Cubic Yards	1.308
Fluid Ounces	Milliliters	29.57	Milliliters	Fluid Ounces	0.034
Pints	Liters	0.473	Liters	Pints	2.113
Quarts	Liters	0.946	Liters	Quarts	1.057
Gallons	Liters	3.785	Liters	Gallons	0.264
Ounces	Grams	28.35	Grams	Ounces	0.035
Pounds	Kilograms	0.454	Kilograms	Pounds	2.205
Pounds (force)	Newtons	4.448	Newtons	Pounds (force)	0.2248
Short Tons	Metric Tons	0.907	Metric Tons	Short Tons	1.102
Pound-Feet	Newton-Meters	1.356	Newton-Meters	Pound-Feet	0.738
Pounds/Sq Inch	Kilopascals	6.895	Kilopascals	Pounds per Sq Inch	0.145
Miles per Gallon	Kilometers per Liter	0.425	Km per Liter	Miles per Gallon	2.354
Miles per Hour	Kilometers per Hour	1.609	Km per Hour	Miles per Hour	0.621



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