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AIR FORCE T.O. 36A12-1C-1092-1

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

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

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HEADQUARTERS, DEPARTMENTS OF THE ARMY AND THE AIR FORCE

September 1998

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 used 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 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.

CHANGE NO. 2

**HEADQUARTERS
DEPARTMENTS OF THE ARMY
AND THE AIR FORCE**
Washington, D.C., 20 August 2005

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
A thru H	A thru H
none	I and J
none	Change 2 Authentication Sheet
v thru viii	v thru viii
2-5 thru 2-14	2-5 thru 2-14
2-75 thru 2-78	2-75 thru 2-78
2-113 thru 2-120	2-113 thru 2-120
2-149 thru 2-176	2-149 thru 2-176
2-615 thru 2-622	2-615 thru 2-622
2-643 thru 2-662	2-643 thru 2-662
2-1067 thru 2-1070	2-1067 thru 2-1069/ (2-1070 Blank)
none	2-1070.1 and 2-1070.2
2-1071 thru 2-1072.16	2-1071 thru 2-1072.15 (2-1072.16 Blank)
C-1 and C-2	C-1 and C-2
C-7 and C-8	C-7 and C-8
F-7 and F-8	F-7 and F-8
F-13 thru F-16	F-13 thru F-16
H-1 thru H-4	H-1 thru H-4
INDEX-1 thru INDEX-6	INDEX-1 thru INDEX-6
INDEX-13 and INDEX-14	INDEX-13 and INDEX-14
INDEX-17 thru INDEX-20	INDEX-17 thru INDEX-20
INDEX-25 thru INDEX-28	INDEX-25 thru INDEX-28
FO-1 FP-69/(FP-70 Blank)	FO-1 FP-69/(FP-70 Blank)
Metric Conversion Chart /PIN	Metric Conversion Chart /PIN

DISTRIBUTION STATEMENT A: APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.

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

By Order of the Secretary of the Army:

PETER J. SCHOOMAKER
General, United States Army
Chief of Staff

*O*fficial:

SANDRA R. RILEY
Administrative Assistant to the
Secretary of the Army
0401519

By Order of the Secretary of the Air Force:

JOHN P. JUMPER
General, United States Air Force
Chief of Staff

*O*fficial:

GREGORY S. MARTIN
General, United States Air Force
Commander, Air Force Materiel Command

Distribution:

To be distributed in accordance with the initial distribution number (IDN) 380942, requirements for TM 9-2320-366-34-1.

ARMY TM 9-2320-366-34-1
AIR FORCE T.O. 36A12-1C-1092-1

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

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3. Added or revised illustrations are indicated by a vertical bar adjacent to the illustration.

Remove Pages	Insert Pages
e thru kk/(ll Blank)	e thru al
none	A thru H
i thru xi/(xii Blank)	i thru xii
none	xiii/(xiv Blank)
2-1 and 2-2	2-1 and 2-2
2-7 thru 2-16	2-7 thru 2-16
none	(2-66.1 Blank)/2-66.2 thru 2-66.9/(2-66.10 Blank)
none	2-66.11 thru 2-66.17/(2-66.18 Blank)
2-67 and 2-68	2-67 and 2-68
2-71 and 2-72	2-71 and 2-72
2-73/(2-74 Blank)	2-73 and 2-74
none	2-74.1/(2-74.2 Blank)
2-75 thru 2-202	2-75 thru 2-202
none	2-202.1 and 2-202.2
2-203 thru 2-418	2-203 thru 2-418
none	2-418.1 and 2-418.2
2-419 thru 2-590	2-419 thru 2-590
none	2-590.1 thru 2-590.4
2-591 thru 2-838	2-591 thru 2-838
none	2-838.1 and 2-838.2
2-839 thru 2-959/(2-960 Blank)	2-839 thru 2-960
none	2-960.1 thru 2-960.3/(2-960.4 Blank)
2-961 and 2-962	2-961 and 2-962
2-965 and 2-966	2-965 and 2-966
2-975 and 2-976	2-975 and 2-976
2-981 and 2-982	2-981 and 2-982
2-987 and 2-988	2-987 and 2-988
2-1005 and 2-1006	2-1005 and 2-1006
none	2-1006.1 thru 2-1006.4
2-1007 and 2-1008	2-1007 and 2-1008
none	2-1008.1 and 2-1008.2
2-1009 thru 2-1012	2-1009 thru 2-1012
2-1017 and 2-1018	2-1017 and 2-1018
2-1029 and 2-1030	2-1029 and 2-1030
2-1067 thru 2-1071/(2-1072 Blank)	2-1067 thru 2-1072
none	2-1072.1 thru 2-1072.15/ (2-1072.16 Blank)
2-1073 and 2-1074	2-1073 and 2-1074
A-1 and A-2	A-1 and A-2
C-1 thru C-8	C-1 thru C-8
none	C-9/(C-10 Blank)
D-1 and D-2	D-1 and D-2
none	D-4.1/(D-4.2 Blank)
D-5 and D-6	D-5 and D-6
D-25 thru D-28	D-25 thru D-28
D-31 and D-32	D-31 and D-32
D-39 thru D-48	D-39 thru D-48
none	D-81 thru D-86
F-1 thru F-15/(F-16 Blank)	F-1 thru F-16
none	F-17/(F-18 Blank)
G-1/(G-2 Blank)	G-1/(G-2 Blank)
none	H-1 thru H-4
INDEX-1 thru INDEX-25/ (INDEX-26 Blank)	INDEX-1 thru INDEX-26
none	INDEX-27 thru INDEX-30
DA Form 2028-2 Sample	DA Form 2028 Sample
DA Form 2028-2	DA Form 2028
DA Form 2028-2	DA Form 2028
DA Form 2028-2	DA Form 2028
FO-1 FP-1/(FP-2 Blank) thru FP-21/(FP-22 Blank)	FO-1 FP-1/(FP-2 Blank) thru FP-21/(FP-22 Blank)
FO-1 FP-25/(FP-26 Blank)	FO-1 FP-25/(FP-26 Blank)
FO-1 FP-29/(FP-30 Blank) thru FP-67/(FP-68 Blank)	FO-1 FP-29/(FP-30 Blank) thru FP-67/(FP-68 Blank)

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

Remove Pages	Insert Pages	Remove Pages	Insert Pages
FO-1 FP-75/(FP-76 Blank) thru FP-79/(FP-80 Blank) BackCover	FO-1 FP-75/(FP-76 Blank) thru FP-79/(FP-80 Blank) BackCover		

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

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.

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
Change ..... 2 ..... 20 August 2005

THE TOTAL NUMBER OF PAGES IN THIS PUBLICATION IS 4914, CONSISTING OF THE FOLLOWING:

Page No.	*Change No.
VOLUME 1	
Cover	1
Blank	0
a thru e	0
f thru al	1
A thru H	2
I and J Added	2
i	1
ii and iii	0
iv and v	1
vi and vii	2
viii thru xii	1
xiii Added	1
xiv Blank Added	1
1-1 thru 1-45	0
1-46 Blank	0
2-1	1
2-2 thru 2-4	0
2-5	2
2-6 and 2-7	0
2-8 and 2-9	2
2-10	1
2-11	2
2-12 and 2-13	1
2-14	2
2-15	1
2-16 thru 2-65	0
2-66 Blank	0
2-66.1 Blank Added	1
2-66.2 thru 2-66.9 Added	1
2-66.10 Blank Added	1
2-66.11 thru 2-66.17 Added	1
2-66.18 Blank Added	1
2-67	1
2-68 thru 2-71	0
2-72 thru 2-74	1
2-74.1 Added	1
2-74.2 Blank Added	1
2-75	2
2-76	1
2-77	2
2-78 thru 2-113	1
2-114	2
2-115	1
2-116	2
2-117	1
2-118	2
2-119	1
2-120	2
2-121 thru 2-149	1
2-150	2
2-151	1
2-152	2
2-153	1
2-154	2
2-155	1
2-156	2
2-157	1
2-158	2
2-159	1
2-160	2
2-161	1
2-162	2
2-163	1
2-164	2
2-165	1
2-166	2
2-167	1
2-168	2
2-169	1
2-170	2
2-171	1
2-172	2
2-173	1
2-174	2
2-175	1
2-176	2
2-177 thru 2-202	1
2-202.1 and 2-202.2 Added	1
2-203 thru 2-418	1
2-418.1 and 2-418.2 Added	1
2-419 thru 2-590	1
2-590.1 thru 2-590.4 Added	1
2-591 thru 2-615	1
2-616	2
2-617	1
2-618	2
2-619	1
2-620	2
2-621	1
2-622	2
2-623 thru 2-643	1
2-644	2
2-645	1
2-646	2
2-647	1
2-648	2
2-649	1
2-650	2
2-651	1
2-652	2
2-653	1
2-654	2
2-655	1
2-656	2
2-657	1
2-658	2
2-659	1
2-660	2
2-661	1
2-662	2
2-663 thru 2-838	1
2-838.1 and 2-838.2 Added	1
2-839 thru 2-960	1
2-960.1 thru 2-960.3 Added	1
2-960.4 Blank Added	1
2-961	1

* Zero in this column indicates an original page.

LIST OF EFFECTIVE PAGES

Insert latest changed pages. Destroy superseded pages.

Page No.	*Change No.
2-962 and 2-963	0
2-964 Blank	0
2-965	1
2-966 thru 2-973	0
2-974 Blank	0
2-975	1
2-976 thru 2-979	0
2-980 Blank	0
2-981	1
2-982 thru 2-985	0
2-986 Blank	0
2-987	1
2-988 thru 2-1000	0
2-1001 Blank	0
2-1002 thru 2-1005	0
2-1006	1
2-1006.1 thru 2-1006.4 Added	1
2-1007 and 2-1008	1
2-1008.1 and 2-1008.2 Added	1
2-1009 thru 2-1011	1
2-1012 thru 2-1015	0
2-1016 Blank	0
2-1017	1
2-1018 thru 2-1027	0
2-1028 Blank	0
2-1029	1
2-1030 thru 2-1052	0
2-1053 Blank	0
2-1054 thru 2-1058	0
2-1059 Blank	0
2-1060 thru 2-1065	0
2-1066 Blank	0
2-1067 thru 2-1069	2
2-1070 Blank	2
2-1070.1 and 2-1070.2 Added	2
2-1071	2
2-1072 Blank	2
2-1072.1 thru 2-1072.3	2
2-1072.4 Blank	2
2-1072.5	2
2-1072.6 Added	1
2-1072.7	2
2-1072.8 Blank	2
2-1072.9	2
2-1072.10 and 2-1072.11 Added	1
2-1072.12 thru 2-1072.15	2
2-1072.16 Blank Added	1
2-1073	1
2-1074 thru 2-1109	0
2-1110 Blank	0
2-1111 thru 2-1119	0
2-1120 Blank	0
A-1	0
A-2	1
A-3 and A-4	0
B-1 thru B-6	0
C-1	1
C-2	2
C-3 thru C-6	1
C-7 and C-8	2
C-9 Added	1
C-10 Blank Added	1
D-1	1
D-2 thru D-4	0
D-4.1 Added	1
D-4.2 Blank Added	1
D-5 and D-6	1
D-7 thru D-24	0
D-25 thru D-28	1
D-29 thru D-31	0
D-32	1
D-33 thru D-38	0
D-39	1
D-40 and D-41	0
D-42 thru D-47	1
D-48 thru D-80	0
D-81 thru D-86 Added	1
E-1 thru E-8	0
F-1 thru F-6	1
F-7	2
F-8 thru F-13	1
F-14	2
F-15	1
F-16	2
F-17 Added	1
F-18 Blank Added	1
G-1	1
G-2 Blank	0
H-1 Added	1
H-2 and H-3	2
H-4 Added	1
INDEX-1	1
INDEX-2	2
INDEX-3	1
INDEX-4 and INDEX-5	2
INDEX-6 thru INDEX-12	1
INDEX-13 and INDEX-14	2
INDEX-15 and INDEX-16	1
INDEX-17 thru INDEX-20	2
INDEX-21 thru INDEX-24	1
INDEX-25 and INDEX-26	2
INDEX-27 Added	1
INDEX-28	2
INDEX-29 and INDEX-30 Added	1
Glossary-1	0
Glossary-2 Blank	0
FO-1 FP-1	1
FO-1 FP-2 Blank	0
FO-1 FP-3	1
FO-1 FP-4 Blank	0
FO-1 FP-5	1
FO-1 FP-6 Blank	0
FO-1 FP-7	1
FO-1 FP-8 Blank	0
FO-1 FP-9	1
FO-1 FP-10 Blank	0
FO-1 FP-11	1
FO-1 FP-12 Blank	0
FO-1 FP-13	1
FO-1 FP-14 Blank	0
FO-1 FP-15	1
FO-1 FP-16 Blank	0
FO-1 FP-17	1
FO-1 FP-18 Blank	0
FO-1 FP-19	1
FO-1 FP-20 Blank	0
FO-1 FP-21	1
FO-1 FP-22 Blank	0
FO-1 FP-23	0
FO-1 FP-24 Blank	0
FO-1 FP-25	1
FO-1 FP-26 Blank	0
FO-1 FP-27	0
FO-1 FP-28 Blank	0
FO-1 FP-29	1
FO-1 FP-30 Blank	0
FO-1 FP-31	1
FO-1 FP-32 Blank	0
FO-1 FP-33	1
FO-1 FP-34 Blank	0
FO-1 FP-35	1
FO-1 FP-36 Blank	0

* Zero in this column indicates an original page.

LIST OF EFFECTIVE PAGES (CONT)

Insert latest changed pages. Destroy superseded pages.

Page No.	*Change No.
FO-1 FP-37	1
FO-1 FP-38 Blank	0
FO-1 FP-39	1
FO-1 FP-40 Blank	0
FO-1 FP-41	1
FO-1 FP-42 Blank	0
FO-1 FP-43	1
FO-1 FP-44 Blank	0
FO-1 FP-45	1
FO-1 FP-46 Blank	0
FO-1 FP-47	1
FO-1 FP-48 Blank	0
FO-1 FP-49	1
FO-1 FP-50 Blank	0
FO-1 FP-51	1
FO-1 FP-52 Blank	0
FO-1 FP-53	1
FO-1 FP-54 Blank	0
FO-1 FP-55	1
FO-1 FP-56 Blank	0
FO-1 FP-57	1
FO-1 FP-58 Blank	0
FO-1 FP-59	1
FO-1 FP-60 Blank	0
FO-1 FP-61	1
FO-1 FP-62 Blank	0
FO-1 FP-63	1
FO-1 FP-64 Blank	0
FO-1 FP-65	1
FO-1 FP-66 Blank	0
FO-1 FP-67	1
FO-1 FP-68 Blank	0
FO-1 FP-69	2
FO-1 FP-70 Blank	0
FO-1 FP-71	0
FO-1 FP-72 Blank	0
FO-1 FP-73	0
FO-1 FP-74 Blank	0
FO-1 FP-75	1
FO-1 FP-76 Blank	0
FO-1 FP-77	1
FO-1 FP-78 Blank	0
FO-1 FP-79	1
FO-1 FP-80 Blank	0
FO-2 FP-1	0
FO-2 FP-2 Blank	0
FO-2 FP-3	0
FO-2 FP-4 Blank	0
FO-2 FP-5	0
FO-2 FP-6 Blank	0
FO-2 FP-7	0
FO-2 FP-8 Blank	0
FO-3 FP-1	0
FO-3 FP-2 Blank	0
FO-3 FP-3	0
FO-3 FP-4 Blank	0
FO-3 FP-5	0
FO-3 FP-6 Blank	0
FO-3 FP-7	0
FO-3 FP-8 Blank	0
FO-3 FP-9	0
FO-3 FP-10 Blank	0
FO-3 FP-11	0
FO-3 FP-12 Blank	0
FO-3 FP-13	0
FO-3 FP-14 Blank	0
FO-3 FP-15	0
FO-3 FP-16 Blank	0
FO-4 FP-1	0
FO-4 FP-2 Blank	0
FO-4 FP-3	0
FO-4 FP-4 Blank	0
FO-5 FP-1	0
FO-5 FP-2 Blank	0
FO-5 FP-3	0
FO-5 FP-4 Blank	0
FO-5 FP-5	0
FO-5 FP-6 Blank	0
VOLUME 2	
Cover	1
Blank	0
a thru e	0
f thru al	1
A thru D	2
i	1
ii	0
iii thru vi	1
vii Added	1
viii Blank Added	1
3-1 thru 3-14	0
3-15 thru 3-19	1
3-20 thru 3-22	0
3-23	1
3-24	2
3-25	0
3-26	1
3-26.1 and 3-26.2 Added	1
3-27 thru 3-30	1
3-31	0
3-32 thru 3-39	1
3-40	0
3-41 and 3-42	1
3-42.1 Added	1
3-42.2 Blank Added	1
3-43 and 3-44	1
3-44.1 Added	1
3-44.2 Blank Added	1
3-45	1
3-46	2
3-47 and 3-48	1
3-49 thru 3-51	0
3-52 thru 3-54	1
3-54.1 Added	1
3-54.2 Blank Added	1
3-55 and 3-56	1
3-57	0
3-58	1
3-59 thru 3-80	0
3-81 thru 3-83	1
3-84 thru 3-86	0
3-87	2
3-88	1
3-88.1 Added	1
3-88.2 Blank Added	1
3-89 thru 3-110	0
3-111	2
3-112 thru 3-132	0
3-133 and 3-134	2
3-134.1 Added	2
3-134.2 Blank Added	2
3-135	2
3-136 Blank	0
4-1 thru 4-46	0
5-1	1
5-2	0
5-3 thru 5-8	1
5-9 Added	1
5-10 Blank Added	1
6-1	1
6-2 thru 6-26	0
6-27 and 6-28	1
6-29	0
6-30	1
6-31 and 6-32	0
6-33 thru 6-36	1
6-36.1 thru 6-36.15 Added	1
6-36.16 Blank Added	1
6-37	1
6-38 thru 6-44	0
7-1	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.
7-2 thru 7-4	2
7-5 thru 7-7	0
7-8	2
7-9 thru 7-13	0
7-14	2
7-15 and 7-16	0
7-16.1	2
7-16.2 Blank Added	1
7-17 and 7-18	2
7-19 and 7-20	0
7-21	1
7-22 thru 7-24	0
7-25 and 7-26	1
7-26.1 thru 7-26.19 Added	1
7-26.20 Blank Added	1
7-27 and 7-28	1
7-29	2
7-30 thru 7-46	1
7-47	2
7-48	1
7-49 thru 7-53	0
7-54	1
7-55 thru 7-68	0
7-69	1
7-70 thru 7-72	0
7-73 and 7-74	1
7-75 thru 7-82	0
7-83	1
7-84 thru 7-89	0
7-90 thru 7-93	1
7-94 thru 7-100	0
7-101 thru 7-123 Added	1
7-124	2
7-125 and 7-126 Added	1
7-127	2
7-128 thru 7-134 Added	1
8-1	2
8-2 and 8-3	1
8-4	0
8-5	2
8-6 and 8-7	1
8-8 thru 8-10	2
8-10.1	2
8-10.2 Blank Added	1
8-11 and 8-12	2
8-13	1
8-14 thru 8-16	2
8-16.1 and 8-16.2 Added	2
8-17 and 8-18	2
8-19 thru 8-23 Added	2
8-24 Blank Added	2
9-1	0
9-2	1
9-3	0
9-4 and 9-5	2
9-6	0
9-7	1
9-8 thru 9-8.2	2
9-9 and 9-10	1
9-11	0
9-12 thru 9-15	2
9-16	1
9-16.1 and 9-16.2 Added	1
9-17 thru 9-19	2
9-20	1
9-20.1 and 9-20.2	2
9-21	2
9-22 thru 9-30	0
10-1	0
10-2 and 10-3	2
10-4 thru 10-7	0
10-8 thru 10-10	1
10-10.1 Added	1
10-10.2 Blank Added	1
10-11	1
10-12	0
10-13 and 10-14	1
10-15 thru 10-17	0
10-18	1
10-19	0
10-20	1
10-20.1 and 10-20.2	2
10-21	1
10-22	2
10-22.1 Added	1
10-22.2	2
10-23 and 10-24	2
10-24.1 and 10-24.2	2
10-25 thru 10-27	1
10-28 and 10-29	0
10-30	2
10-30.1 Added	2
10-30.2 Blank Added	2
10-31 and 10-32	2
10-32.1 Added	1
10-32.2 Blank Added	1
10-33 thru 10-34.2	2
10-34.3 thru 10-34.5 Added	2
10-34.6 Blank Added	2
10-35 thru 10-37	2
10-38 thru 10-42	0
10-43 thru 10-47	1
10-48 thru 10-54	0
10-54.1 Added	1
10-54.2	2
10-54.3 Added	2
10-54.4 Blank Added	2
10-55 and 10-56	2
10-56.1 Added	2
10-56.2 Blank Added	2
10-57 and 10-58	2
10-58.1 Deleted	2
10-58.2 Blank Deleted	2
10-59	2
10-60	1
10-60.1 Added	1
10-60.2	2
10-61 and 10-62	2
11-1	0
11-2	1
11-3 thru 11-7	0
11-8 and 11-9	1
11-10 Blank	0
12-1	1
12-2 thru 12-11	0
12-12	2
12-13 and 12-14	0
12-15	1
12-16 Blank	1
12-17 and 12-18 Deleted	1
13-1 and 13-2	1
13-3 thru 13-31	0
13-32	1
13-33 and 13-34	0
13-35	1
13-36 and 13-37	0
13-38	1
13-39 thru 13-41	0
13-42	1
13-43 thru 13-45	0
13-46	1
13-47 thru 13-70	0
13-71	1
13-72	0
13-73	1
13-74 thru 13-170	0
13-171 and 13-172	2
13-173	1
13-174	2
13-175	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.
13-176	2
13-176.1 Added	1
13-176.2 Blank Added	1
13-177	1
13-178	2
13-179	1
13-180	2
13-181 thru 13-191	0
13-192	2
13-193 thru 13-205	0
13-206 thru 13-209	2
13-210 thru 13-219	0
13-220 thru 13-223	2
13-224 thru 13-236	0
13-237 thru 13-239	2
13-240 thru 13-250	0
13-251 thru 13-253	2
13-254 thru 13-268	0
13-269 thru 13-271	2
13-272 thru 13-284	0
13-285 thru 13-287	2
13-288 thru 13-300	0
13-301 thru 13-304	2
13-305 thru 13-314	0
13-315 thru 13-317	2
13-318 thru 13-328	0
13-329 thru 13-332	2
13-333 and 13-335	0
13-336 and 13-337	2
13-338 and 13-339	0
13-340 and 13-341	2
13-342 thru 13-344	0
13-345 thru 13-350	2
13-351 thru 13-356	0
13-357 thru 13-359	2
13-360 thru 13-363	0
13-364 and 13-365	2
13-366 thru 13-368	0
13-369 and 13-370	2
13-371 thru 13-373	0
13-374 and 13-375	2
13-376 thru 13-379	0
13-380	2
13-381 thru 13-394	0
13-395 thru 13-400	1
13-401 thru 13-405	0
13-406	1
13-407 thru 13-410	0
13-411	1
13-412 thru 13-415	0
13-416 thru 13-422 Added	1
13-423 and 13-424	2
13-425 thru 13-439 Added	2
13-440 Blank Added	2
14-1	0
14-2 thru 14-6	2
14-6.1 and 14-6.2 Added	2
14-7 and 14-8	2
14-9 and 14-10	1
14-11	0
14-12 thru 14-15	1
14-16	2
14-16.1 Added	1
14-16.2 Blank Added	1
14-17 thru 14-21	0
14-22	1
14-23 thru 14-27	0
14-28	1
14-29 thru 14-33	0
14-34	1
14-35 thru 14-48	0
14-49 and 14-50	1
14-51 Added	1
14-52 Blank Added	1
A-1	0
A-2	1
A-3 and A-4	0
B-1 thru B-6	0
C-1	1
C-2	2
C-3 thru C-6	1
C-7 and C-8	2
C-9 Added	1
C-10 Blank Added	1
D-1	1
D-2 thru D-4	0
D-4.1 Added	1
D-4.2 Blank Added	1
D-5 and D-6	1
D-7 thru D-24	0
D-25 thru D-28	1
D-29 thru D-31	0
D-32	1
D-33 thru D-38	0
D-39	1
D-40 and D-41	0
D-42 thru D-47	1
D-48 thru D-80	0
D-81 thru D-86 Added	1
E-1 thru E-8	0
F-1 thru F-6	1
F-7	2
F-8 thru F-13	1
F-14	2
F-15	1
F-16	2
F-17 Added	1
F-18 Blank Added	1
G-1	1
G-2 Blank	0
H-1 Added	1
H-2 and H-3	2
H-4 Added	1
INDEX-1 thru INDEX-4	1
INDEX-5 and INDEX-6	1
INDEX-7	2
INDEX-8 Blank Added	1
Glossary-1	0
Glossary-2 Blank	0
FO-1 FP-1	1
FO-1 FP-2 Blank	0
FO-1 FP-3	1
FO-1 FP-4 Blank	0
FO-1 FP-5	1
FO-1 FP-6 Blank	0
FO-1 FP-7	1
FO-1 FP-8 Blank	0
FO-1 FP-9	1
FO-1 FP-10 Blank	0
FO-1 FP-11	1
FO-1 FP-12 Blank	0
FO-1 FP-13	1
FO-1 FP-14 Blank	0
FO-1 FP-15	1
FO-1 FP-16 Blank	0
FO-1 FP-17	1
FO-1 FP-18 Blank	0
FO-1 FP-19	1
FO-1 FP-20 Blank	0
FO-1 FP-21	1
FO-1 FP-22 Blank	0
FO-1 FP-23	0
FO-1 FP-24 Blank	0
FO-1 FP-25	1
FO-1 FP-26 Blank	0
FO-1 FP-27	0
FO-1 FP-28 Blank	0
FO-1 FP-29	1
FO-1 FP-30 Blank	0

* Zero in this column indicates an original page.

LIST OF EFFECTIVE PAGES (CONT)

Insert latest changed pages. Destroy superseded pages.

Page No.	*Change No.
FO-1 FP-31	1
FO-1 FP-32 Blank	0
FO-1 FP-33	1
FO-1 FP-34 Blank	0
FO-1 FP-35	1
FO-1 FP-36 Blank	0
FO-1 FP-37	1
FO-1 FP-38 Blank	0
FO-1 FP-39	1
FO-1 FP-40 Blank	0
FO-1 FP-41	1
FO-1 FP-42 Blank	0
FO-1 FP-43	1
FO-1 FP-44 Blank	0
FO-1 FP-45	1
FO-1 FP-46 Blank	0
FO-1 FP-47	1
FO-1 FP-48 Blank	0
FO-1 FP-49	1
FO-1 FP-50 Blank	0
FO-1 FP-51	1
FO-1 FP-52 Blank	0
FO-1 FP-53	1
FO-1 FP-54 Blank	0
FO-1 FP-55	1
FO-1 FP-56 Blank	0
FO-1 FP-57	1
FO-1 FP-58 Blank	0
FO-1 FP-59	1
FO-1 FP-60 Blank	0
FO-1 FP-61	1
FO-1 FP-62 Blank	0
FO-1 FP-63	1
FO-1 FP-64 Blank	0
FO-1 FP-65	1
FO-1 FP-66 Blank	0
FO-1 FP-67	1
FO-1 FP-68 Blank	0
FO-1 FP-69	2
FO-1 FP-70 Blank	0
FO-1 FP-71	0
FO-1 FP-72 Blank	0
FO-1 FP-73	0
FO-1 FP-74 Blank	0
FO-1 FP-75	1
FO-1 FP-76 Blank	0
FO-1 FP-77	1
FO-1 FP-78 Blank	0
FO-1 FP-79	1
FO-1 FP-80 Blank	0
FO-2 FP-1	0
FO-2 FP-2 Blank	0
FO-2 FP-3	0
FO-2 FP-4 Blank	0
FO-2 FP-5	0
FO-2 FP-6 Blank	0
FO-2 FP-7	0
FO-2 FP-8 Blank	0
FO-3 FP-1	0
FO-3 FP-2 Blank	0
FO-3 FP-3	0
FO-3 FP-4 Blank	0
FO-3 FP-5	0
FO-3 FP-6 Blank	0
FO-3 FP-7	0
FO-3 FP-8 Blank	0
FO-3 FP-9	0
FO-3 FP-10 Blank	0
FO-3 FP-11	0
FO-3 FP-12 Blank	0
FO-3 FP-13	0
FO-3 FP-14 Blank	0
FO-3 FP-15	0
FO-3 FP-16 Blank	0
FO-4 FP-1	0
FO-4 FP-2 Blank	0
FO-4 FP-3	0
FO-4 FP-4 Blank	0
FO-5 FP-1	0
FO-5 FP-2 Blank	0
FO-5 FP-3	0
FO-5 FP-4 Blank	0
FO-5 FP-5	0
FO-5 FP-6 Blank	0
VOLUME 3	
Cover	1
Blank	0
a thru e	0
f thru al	1
A thru C	2
D Blank Added	1
i thru iv	1
v and vi Added	1
15-1	0
15-2	1
15-3	2
15-4 and 15-5	1
15-6 thru 15-11	0
15-12 thru 15-14	1
15-15	0
15-16 thru 15-20	1
15-21	0
15-22 and 15-23	1
15-24 thru 15-26	0
15-27	1
15-28 and 15-29	2
15-30	1
15-30.1 Added	1
15-30.2 Blank Added	1
15-31 thru 15-33	0
15-34 and 15-35	1
15-36	0
15-37 thru 15-44	1
15-45	0
15-46 thru 15-48	1
15-48.1 Added	1
15-48.2 Blank Added	1
15-49	1
15-50 thru 15-53	0
15-54	1
15-54.1 Added	1
15-54.2 Blank Added	1
15-55 thru 15-59	1
15-60	0
15-61	1
15-62 thru 15-65	0
15-66	1
15-67 thru 15-70	0
15-71	1
15-72	0
15-72.1 and 15-72.2 Added	1
15-73	1
15-74 and 15-75	0
15-76	1
15-76.1 Added	1
15-76.2 Blank Added	1
15-77	0
15-78	1
15-79 thru 15-82	0
15-82.1 Added	1
15-82.2 Blank Added	1
15-83	1
15-84 thru 15-86	0
15-87	1
15-88 thru 15-97	0
15-98 thru 15-100	1
15-101	0
15-102 thru 15-107	1
15-108 thru 15-118	0
15-119 and 15-120	1

* Zero in this column indicates an original page.

LIST OF EFFECTIVE PAGES (CONT)

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15-124.1 and 15-124.2 Added	2
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15-128.1 and 15-128.2	2
15-129	0
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15-136.1 and 15-136.2 Added	2
15-137	2
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16-99 thru 16-132	0
16-133	1
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16-170 thru 16-173	2
16-174 thru 16-261	0
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16-263 and 16-264	0
16-265	2
16-266 thru 16-341	0
16-342 thru 16-344	2
16-345 thru 16-352	1
16-353 thru 16-373	0
16-374 and 16-375	1
16-376 thru 16-388	0
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16-390	1
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16-390.4 Blank Added	1
16-391 thru 16-394	1
16-395 thru 16-400 Deleted	1
16-401	2
16-402 thru 16-407 Deleted	2
16-408 thru 16-424	0
16-425	2
16-426 Blank	2
16-427 thru 16-430 Deleted	2
16-431 thru 16-434	0
16-435 and 16-436	1
16-437 thru 16-440	0
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16-440.2 Blank Added	2
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16-447 thru 16-480	0
16-481	2
16-482	0
16-483	2
16-484	0
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16-488.2 Blank Added	1
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16-497 thru 16-500	2
16-500.1 and 16-500.2	2
16-500.3 and 16-500.4 Added	2
16-501	1
16-502	2
16-502.1 thru 16-502.12 Added	1
16-503 thru 16-505	1
16-506 and 16-507	2
16-508 thru 16-516	1
16-516.1 thru 16-516.13 Added	1
16-516.14 Blank Added	1
16-517 thru 16-520	1
16-521 thru 16-535	0
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16-538.1 Added	2
16-538.2 Blank Added	2
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16-570	2
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16-582.1 Added	1
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16-590 Blank Added	1
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17-8 Blank	1
17-9 and 17-10 Deleted	1
17-11 Blank	1
17-12	1
17-13 and 17-14	2
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17-15 thru 17-26	2
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D-25 thru D-28	1
D-29 thru D-31	0
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D-33 thru D-38	0
D-39	1
D-40 and D-41	0
D-42 thru D-47	1

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F-1 thru F-6	1
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F-8 thru F-13	1
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F-16	2
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F-18 Blank Added	1
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G-2 Blank	0
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TECHNICAL MANUAL
NO. 9-2320-366-34-1

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

HEADQUARTERS
DEPARTMENTS OF THE ARMY
AND THE AIR FORCE

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

- **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 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.
- **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.
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- **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 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.

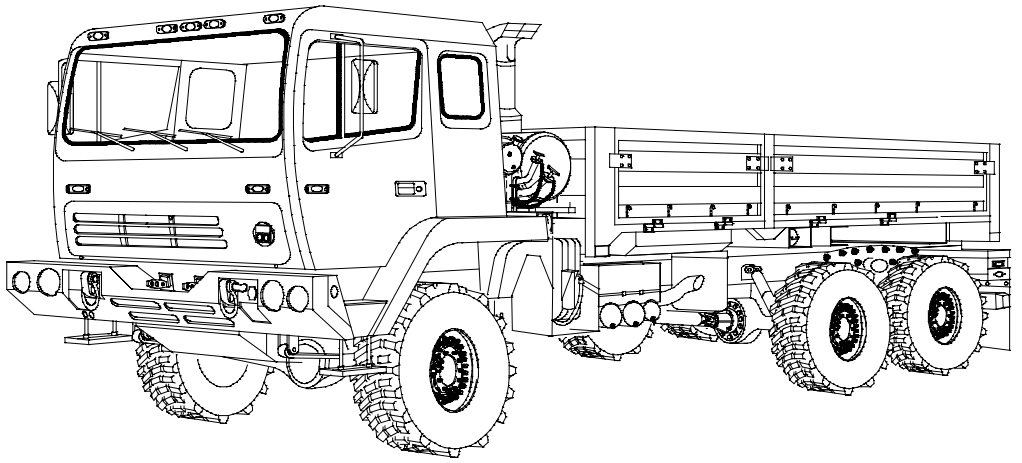
(7) M1090 - Dump truck; can be outfitted for troop transport when equipped with a troopseat kit.

(8) M1092 - Standard wheelbase vehicle chassis; this chassis will accept a standard cargo bed or may be modified for special missions.

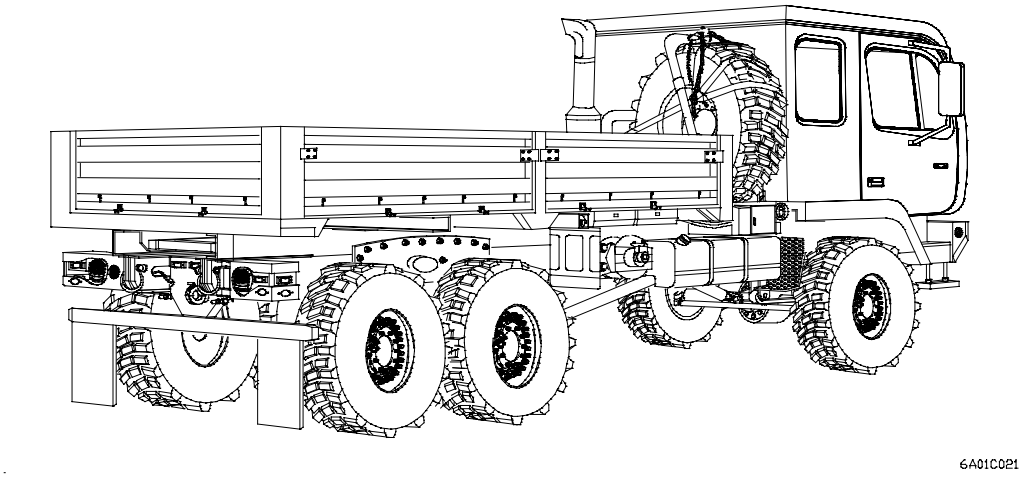
(9) M1093 - Cargo hauling vehicle; can be airdropped and outfitted for troop transport when equipped with a troopseat kit.

(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.



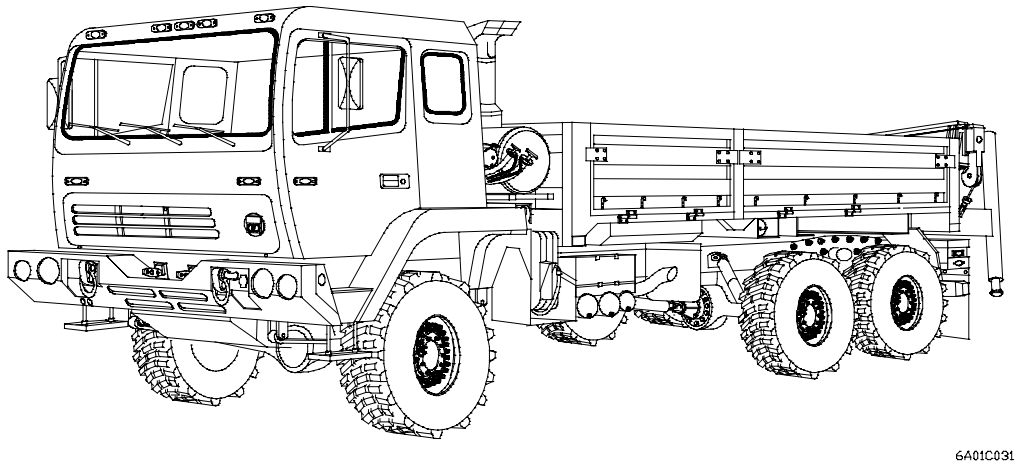
LEFT FRONT VIEW



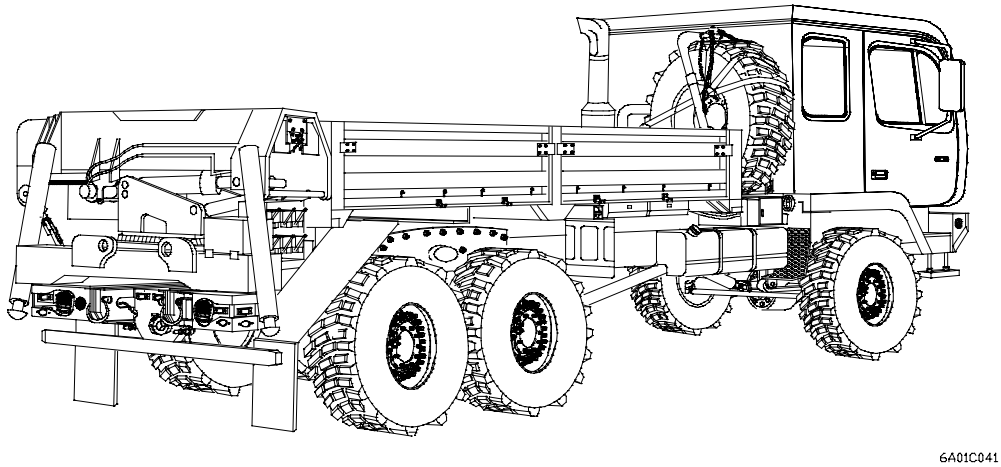
RIGHT REAR VIEW

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

1-1. SCOPE (CONT)

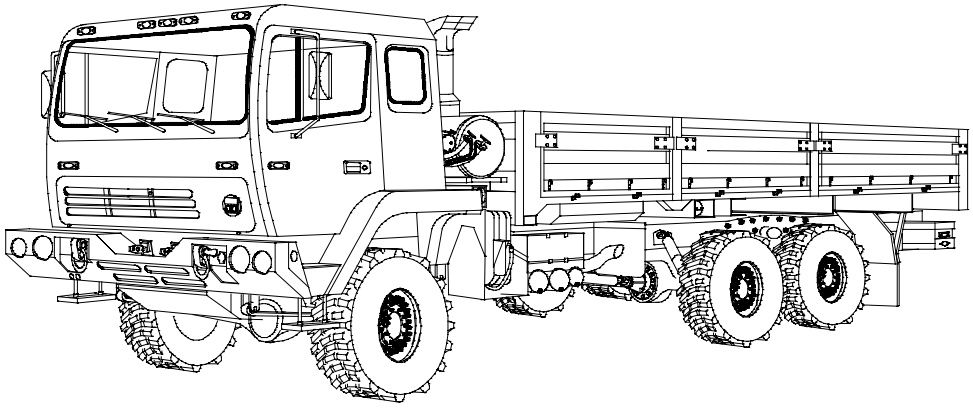


LEFT FRONT VIEW



RIGHT REAR VIEW

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



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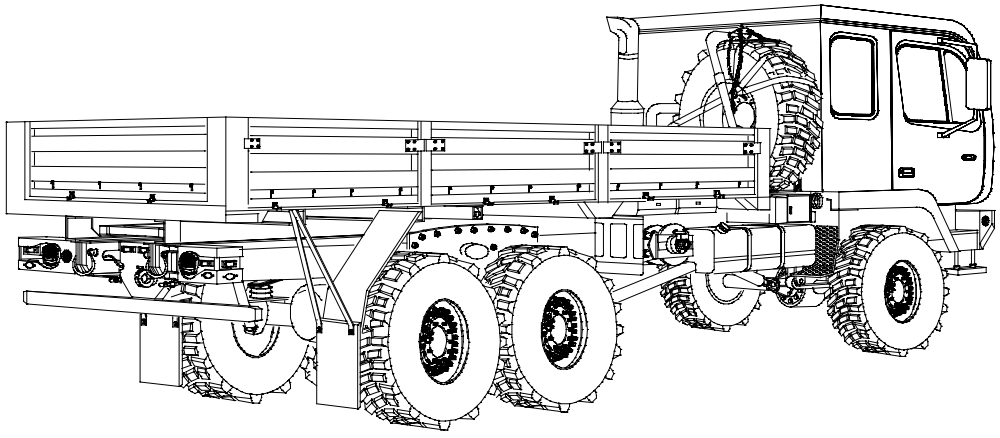
LEFT FRONT VIEW



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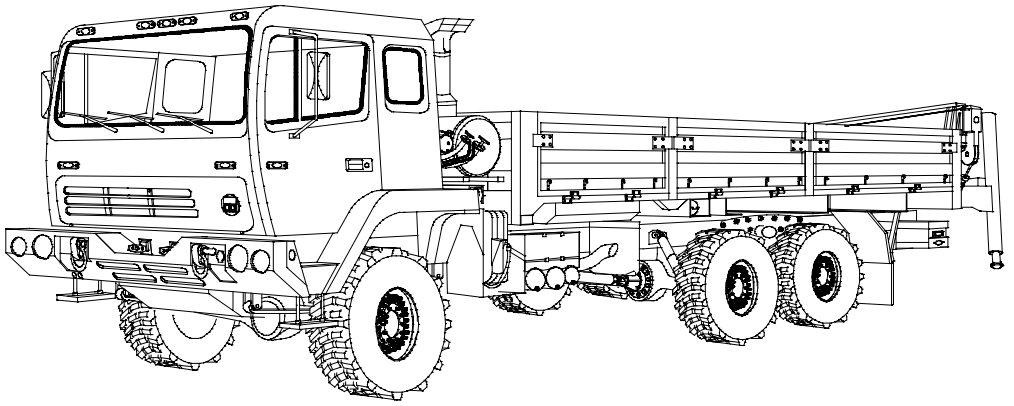
RIGHT REAR VIEW

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

1-1. SCOPE (CONT)



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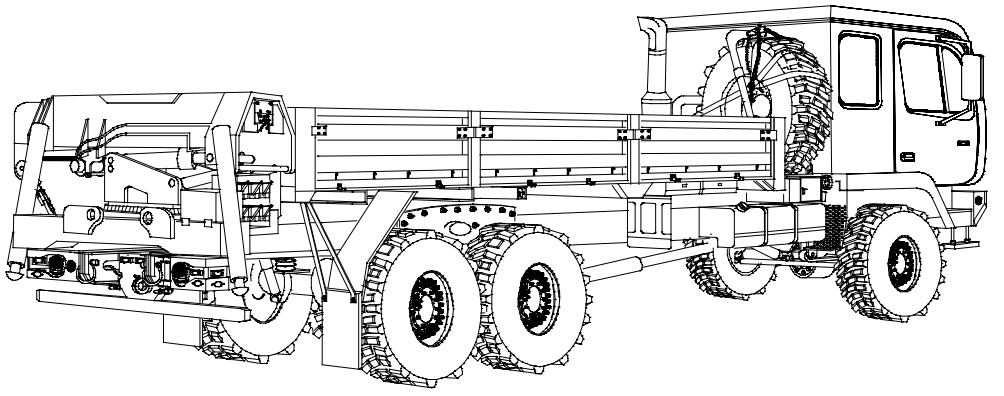
LEFT FRONT VIEW



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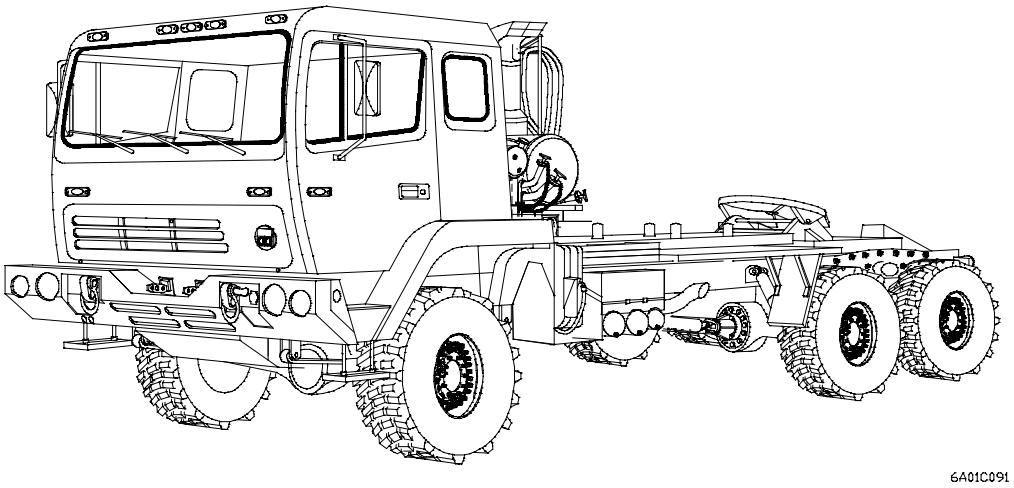
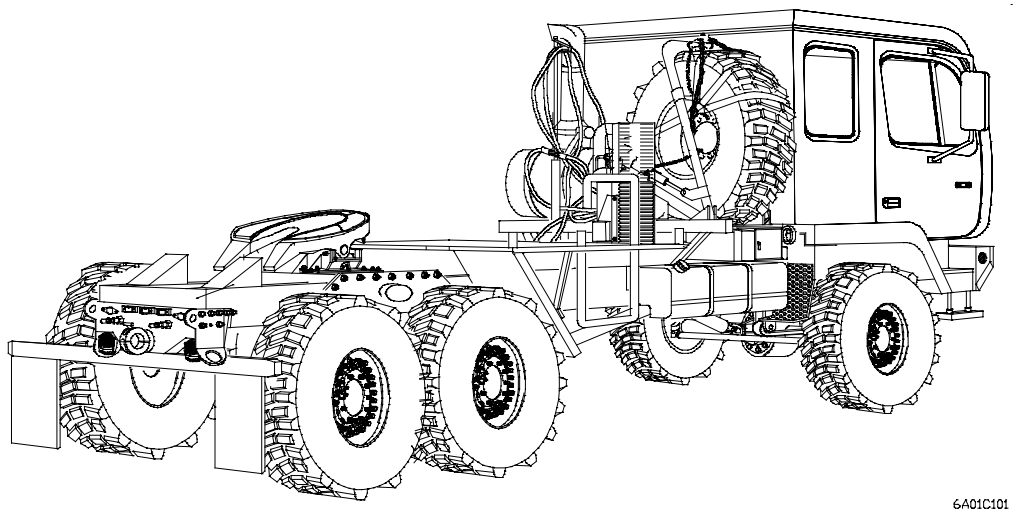
RIGHT REAR VIEW

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



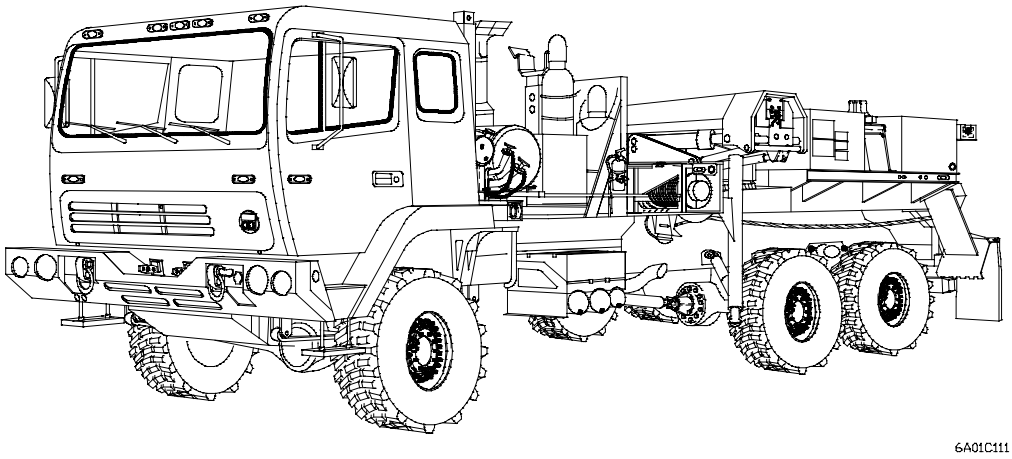
LEFT FRONT VIEW



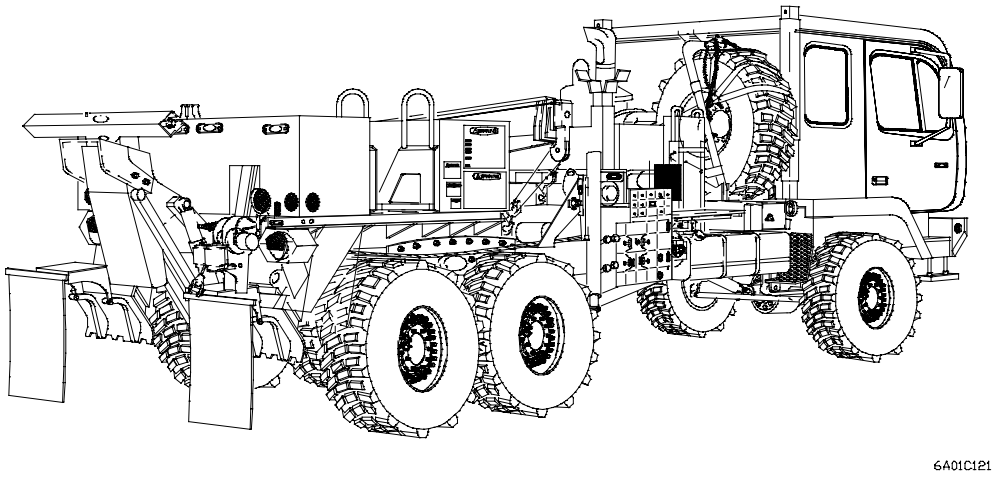
RIGHT REAR VIEW

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

1-1. SCOPE (CONT)

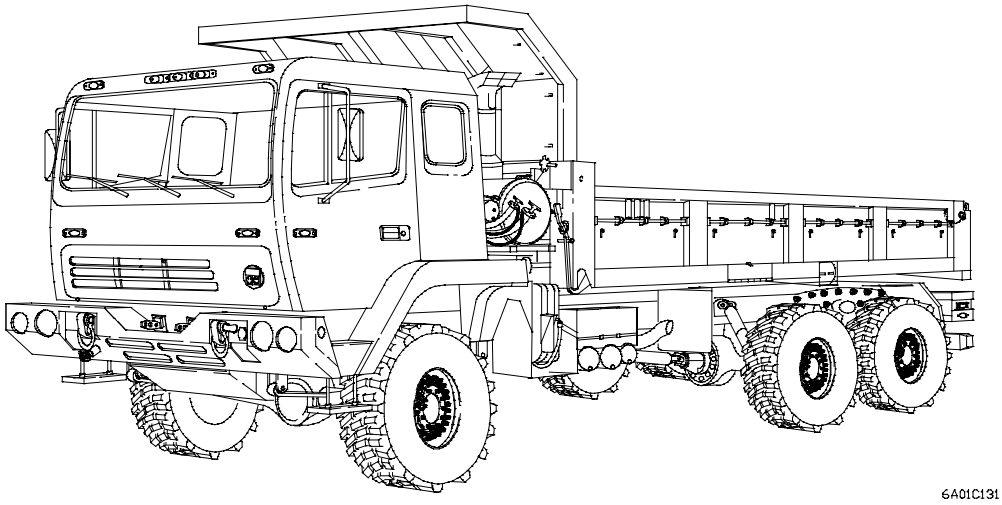


LEFT FRONT VIEW

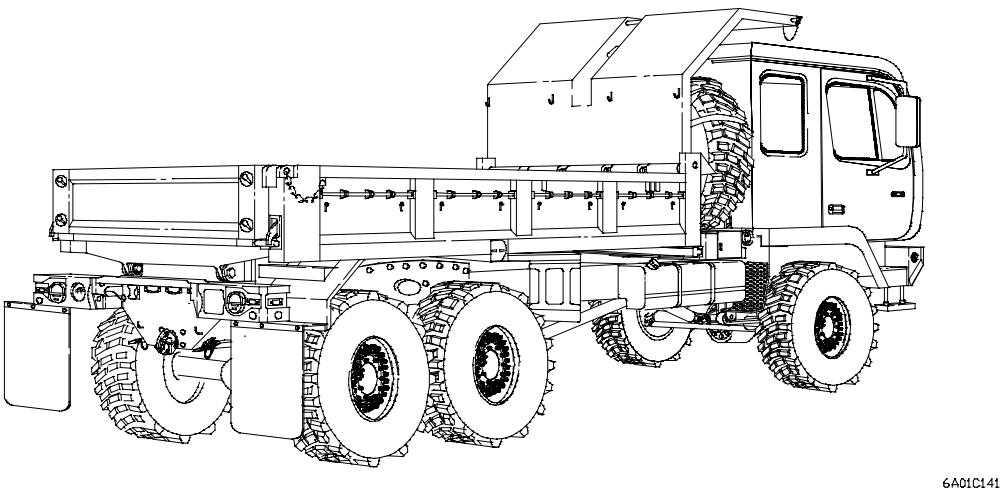


RIGHT REAR VIEW

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



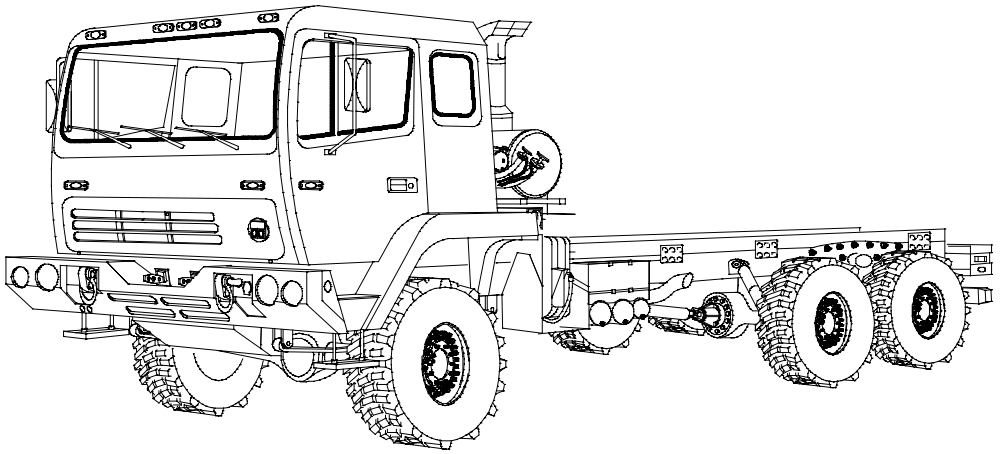
LEFT FRONT VIEW



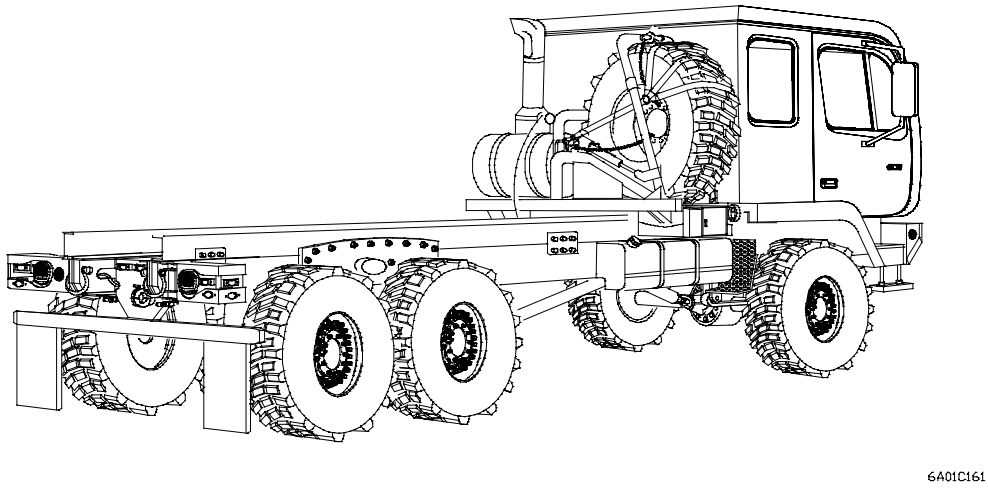
RIGHT REAR VIEW

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

1-1. SCOPE (CONT)

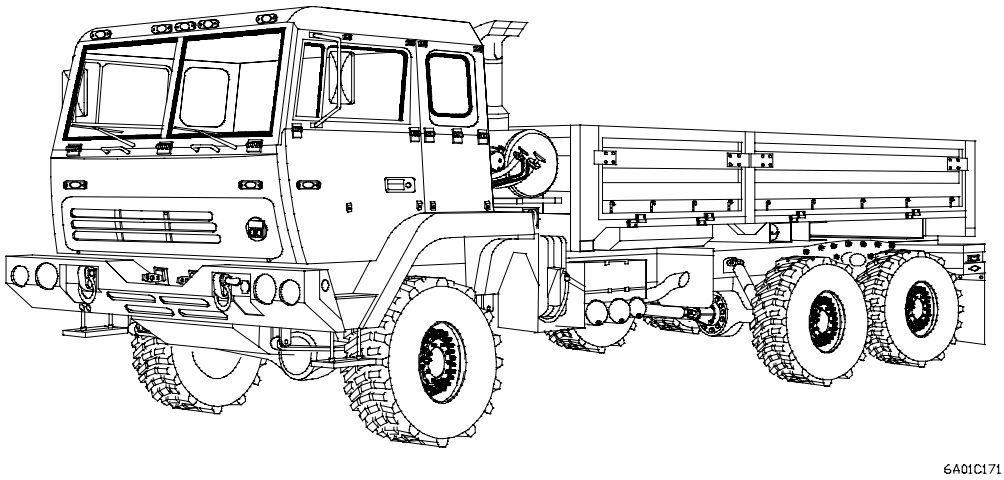


LEFT FRONT VIEW

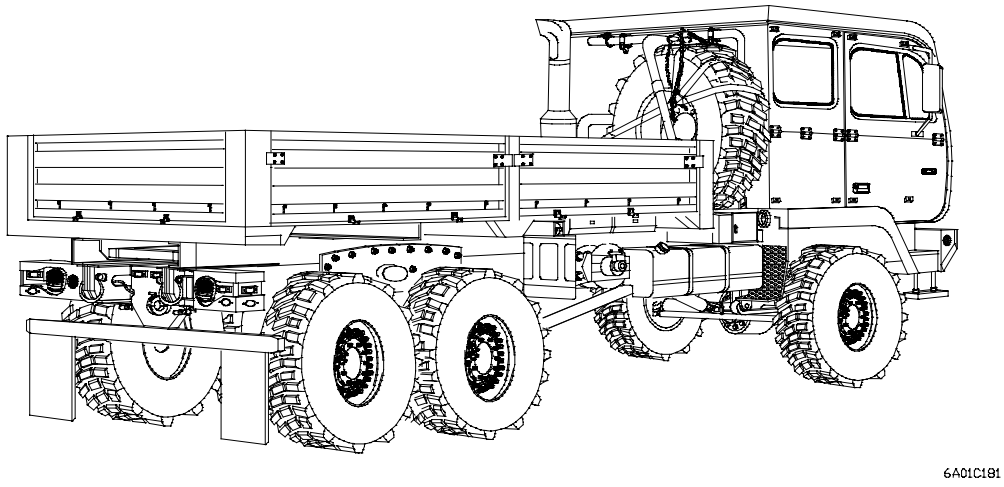


RIGHT REAR VIEW

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



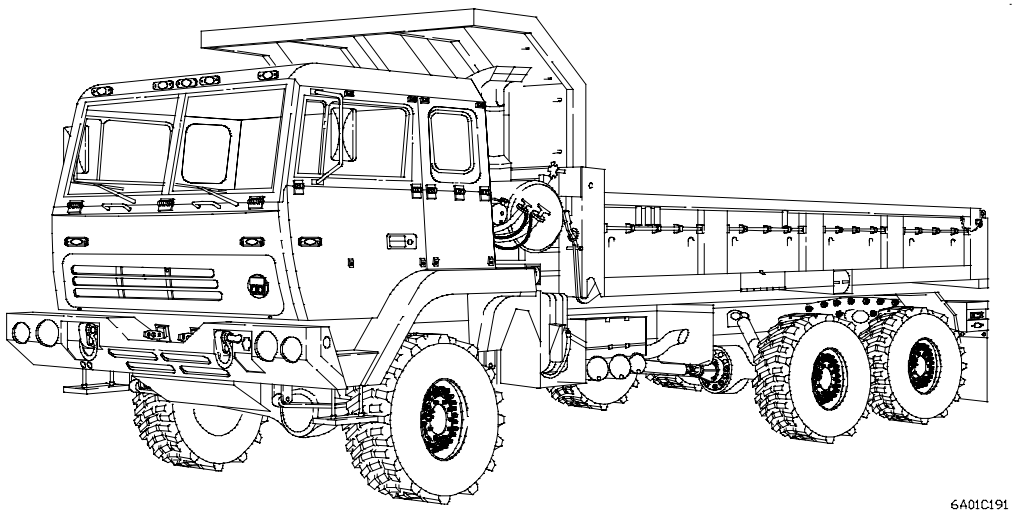
LEFT FRONT VIEW



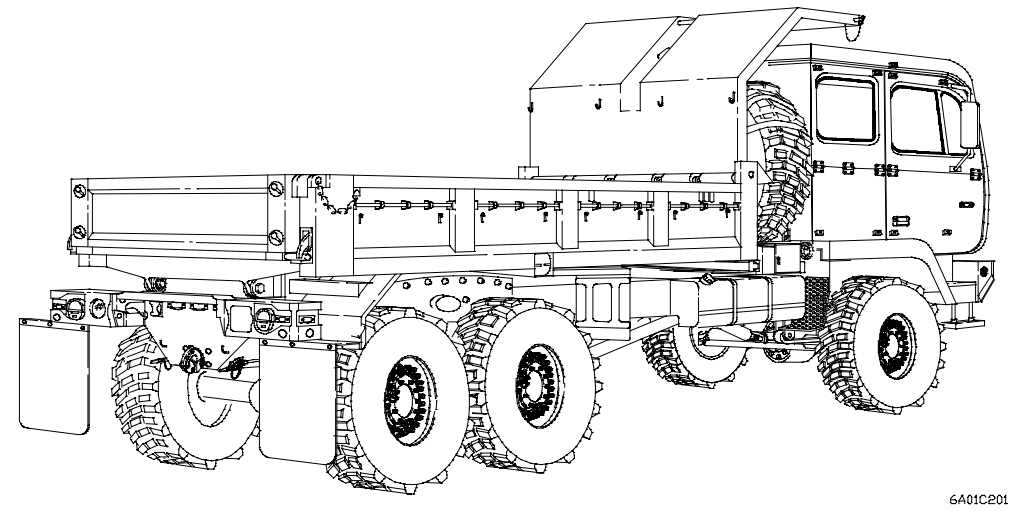
RIGHT REAR VIEW

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

1-1. SCOPE (CONT)

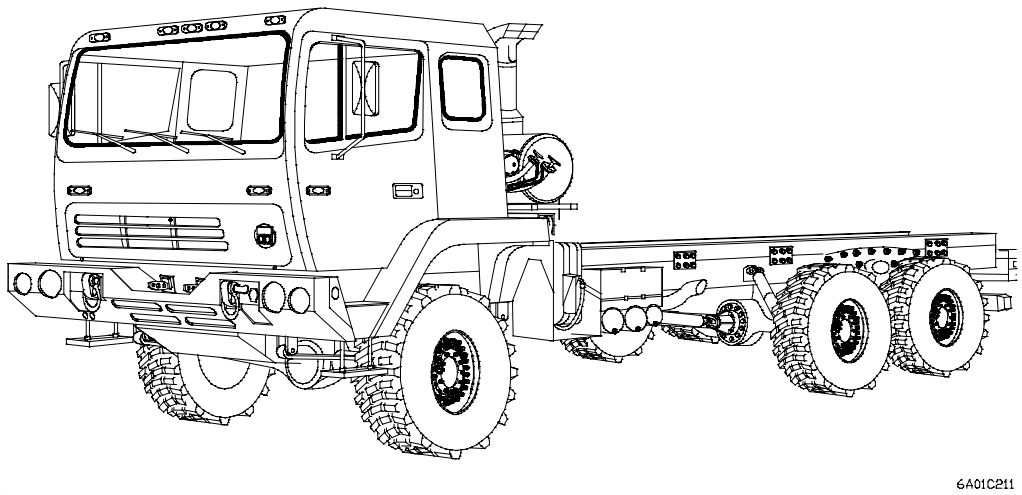


LEFT FRONT VIEW

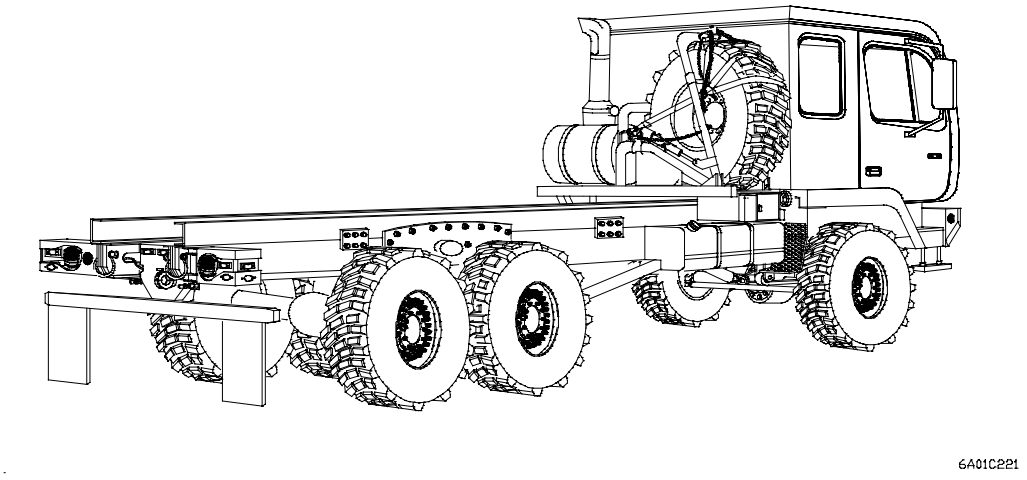


RIGHT REAR VIEW

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



LEFT FRONT VIEW



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

Common Name	Official Nomenclature
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

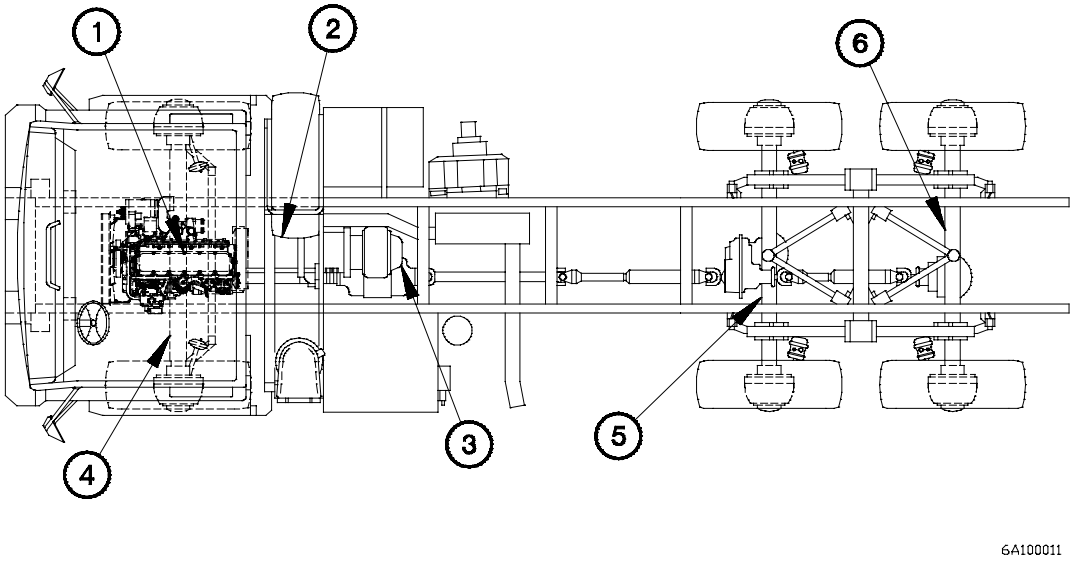


Figure 1-12. Powertrain

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)

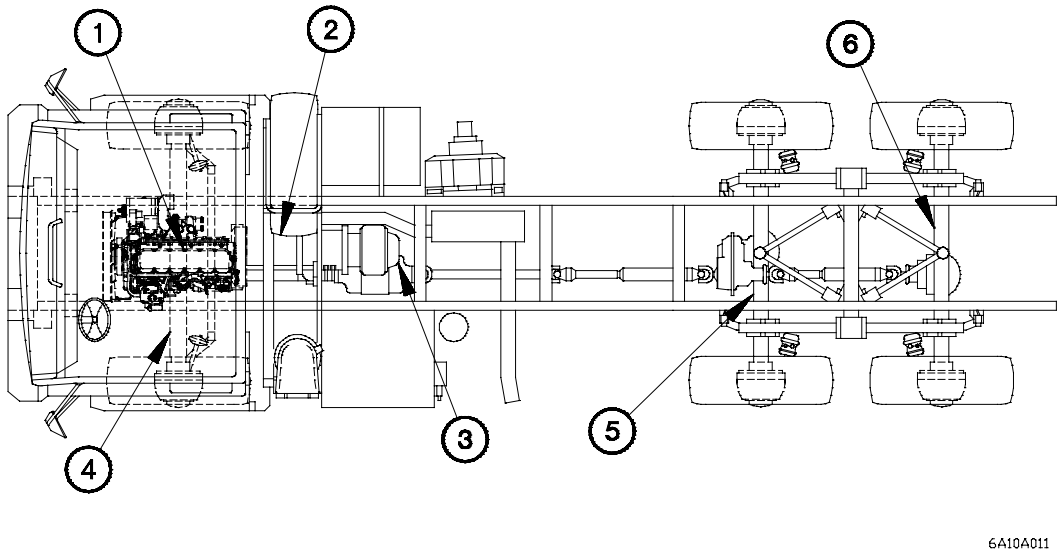


Figure 1-12. Powertrain (Cont)

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

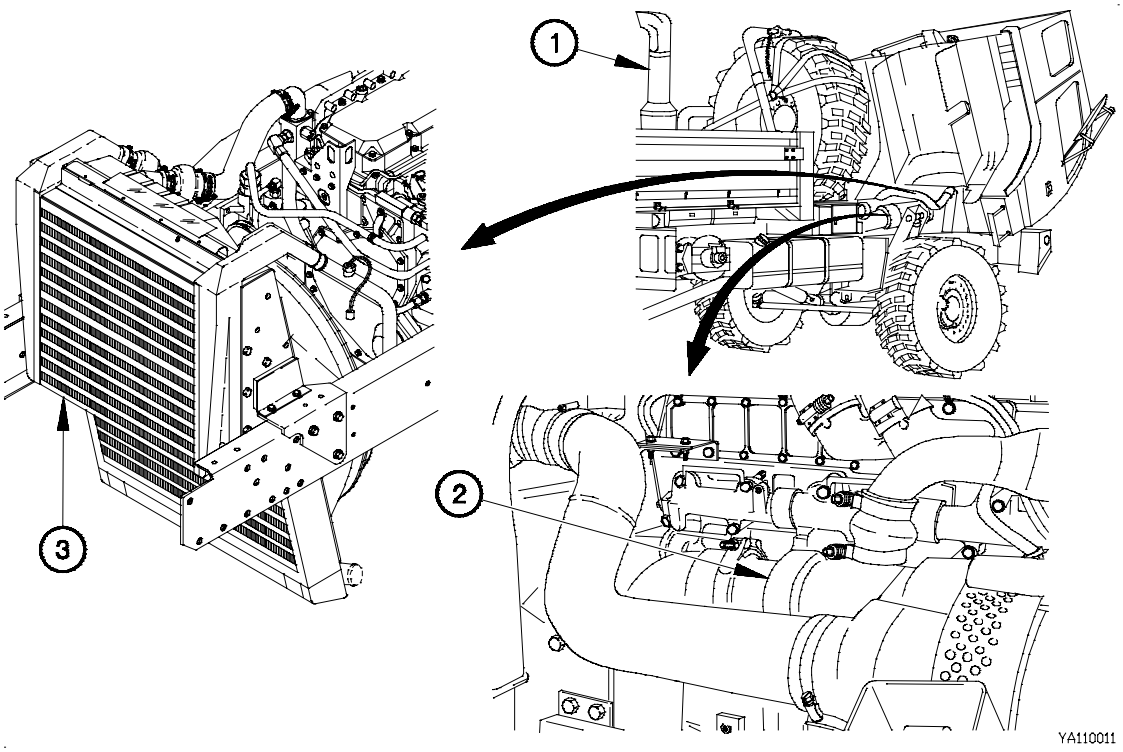


Figure 1-13. Engine Air Intake System

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

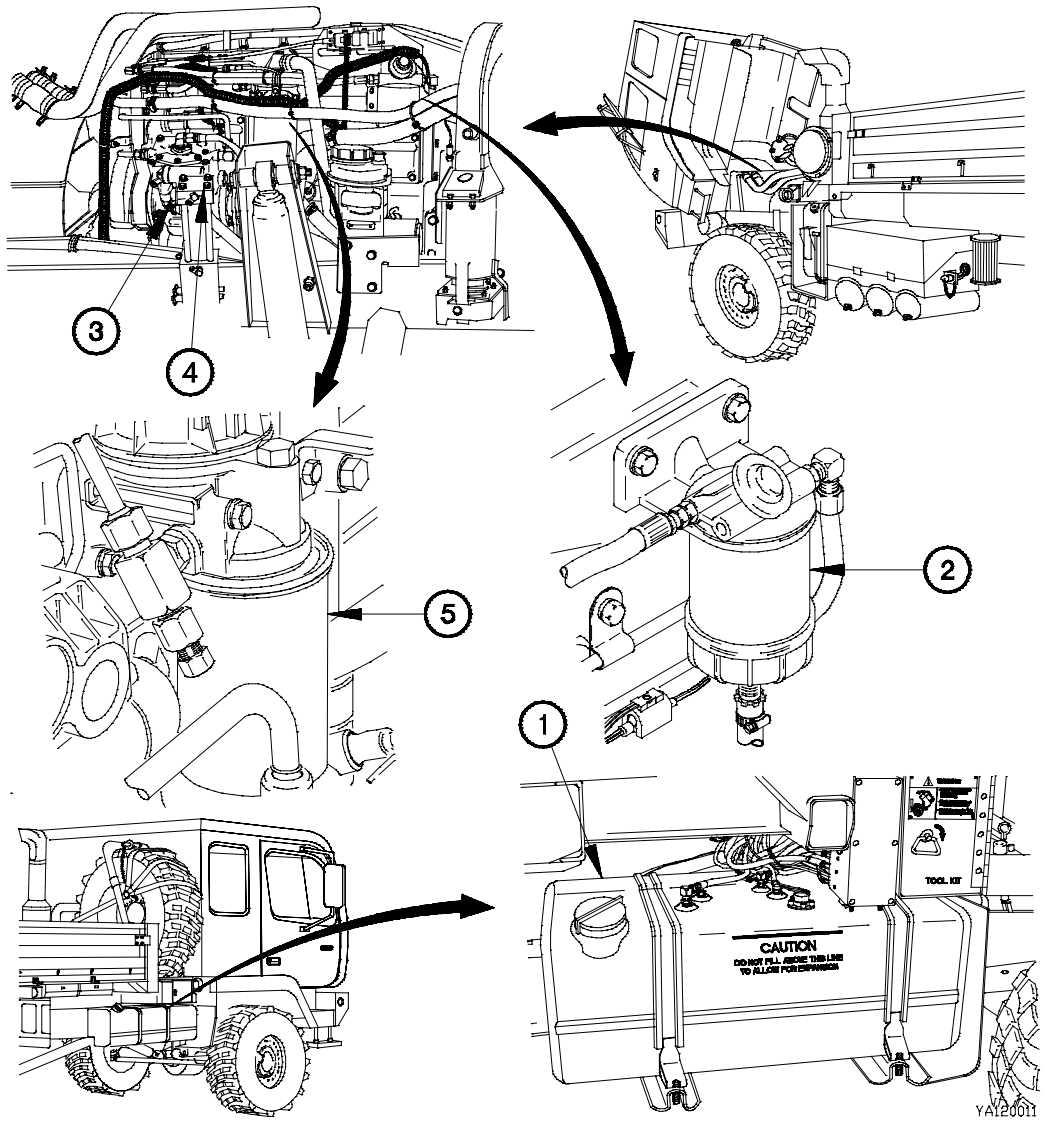


Figure 1-14. Fuel System

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.

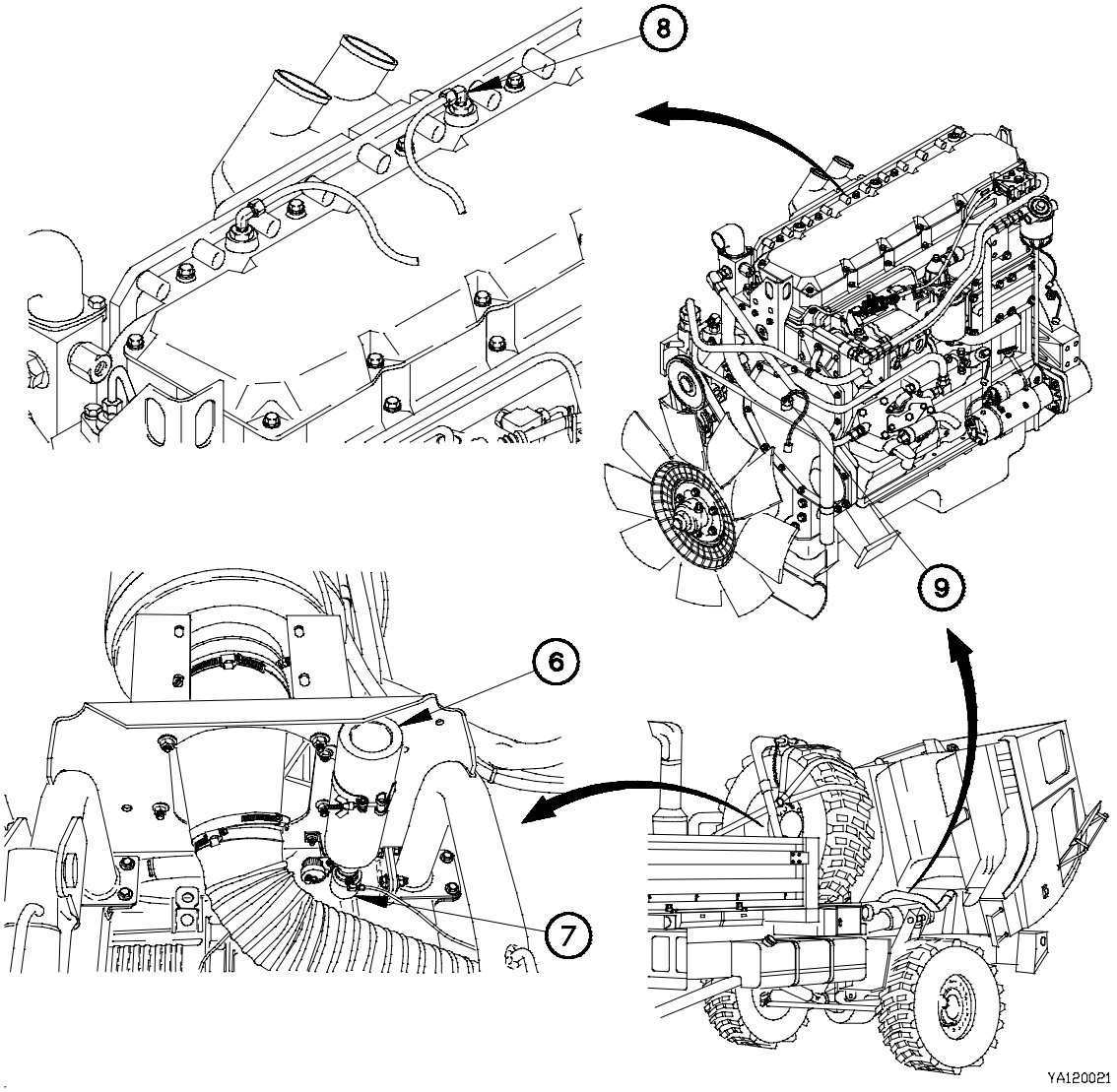


Figure 1-14. Fuel System (Cont)

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

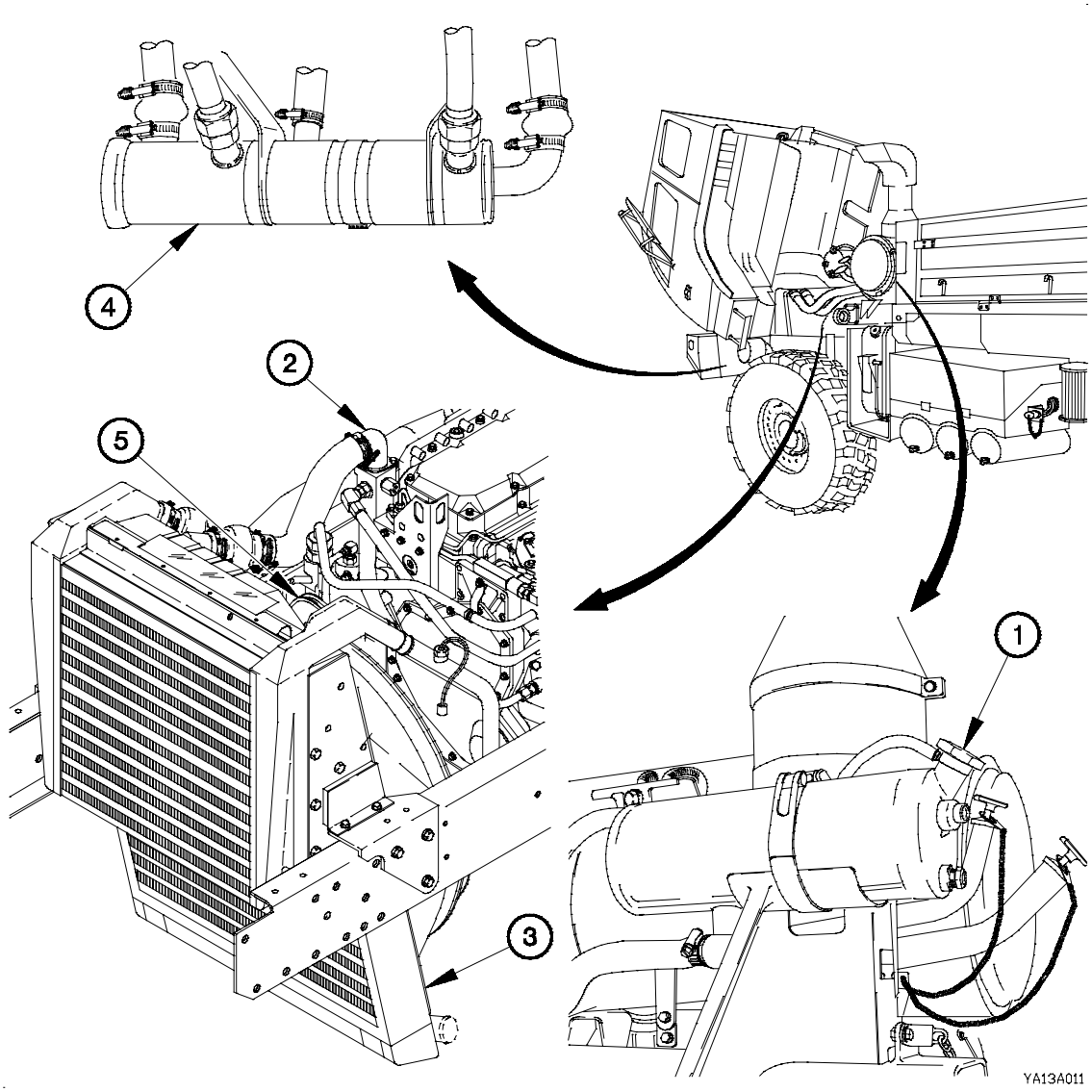


Figure 1-15. Cooling System

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.

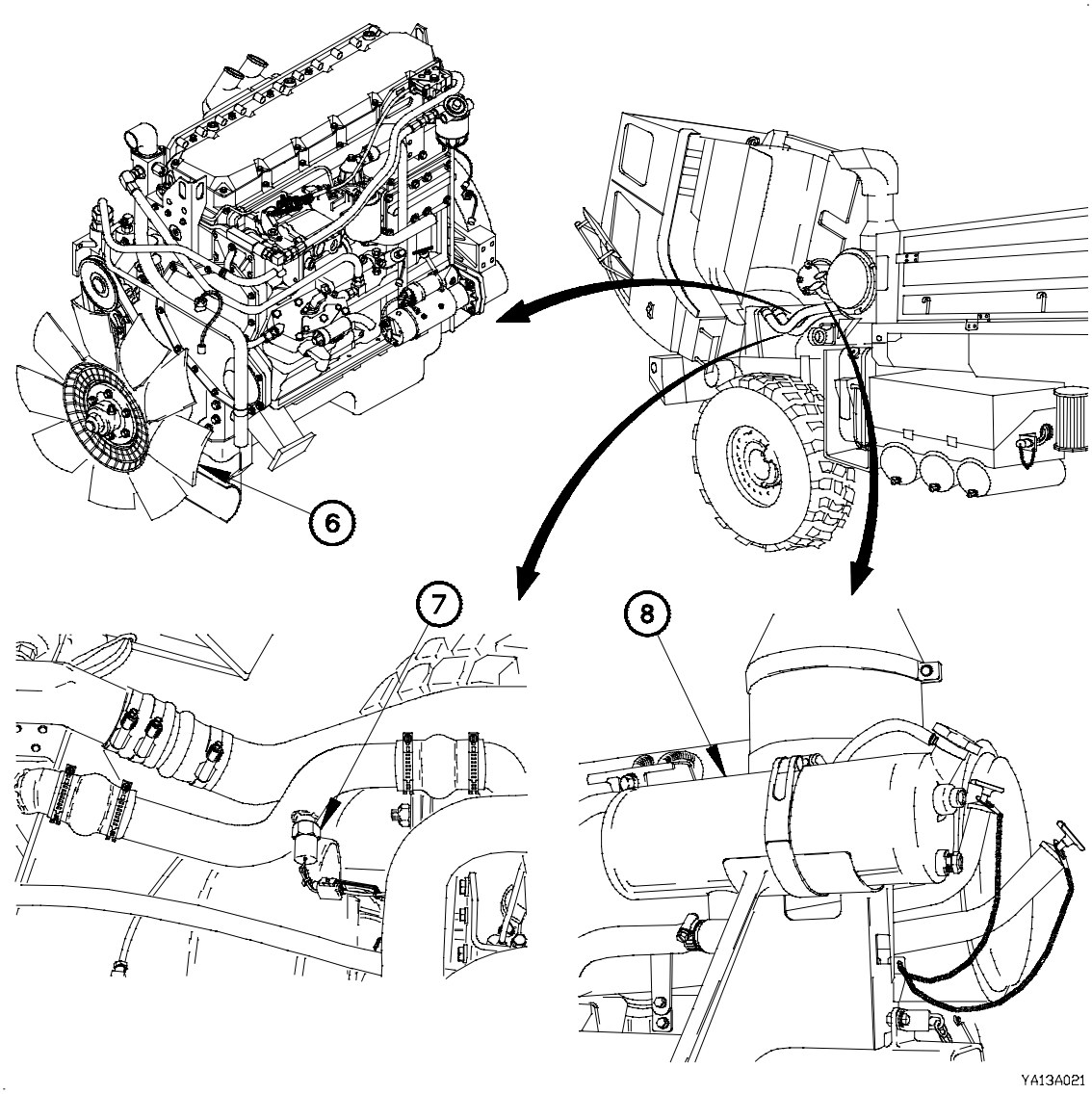


Figure 1-15. Cooling System (Cont)

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)

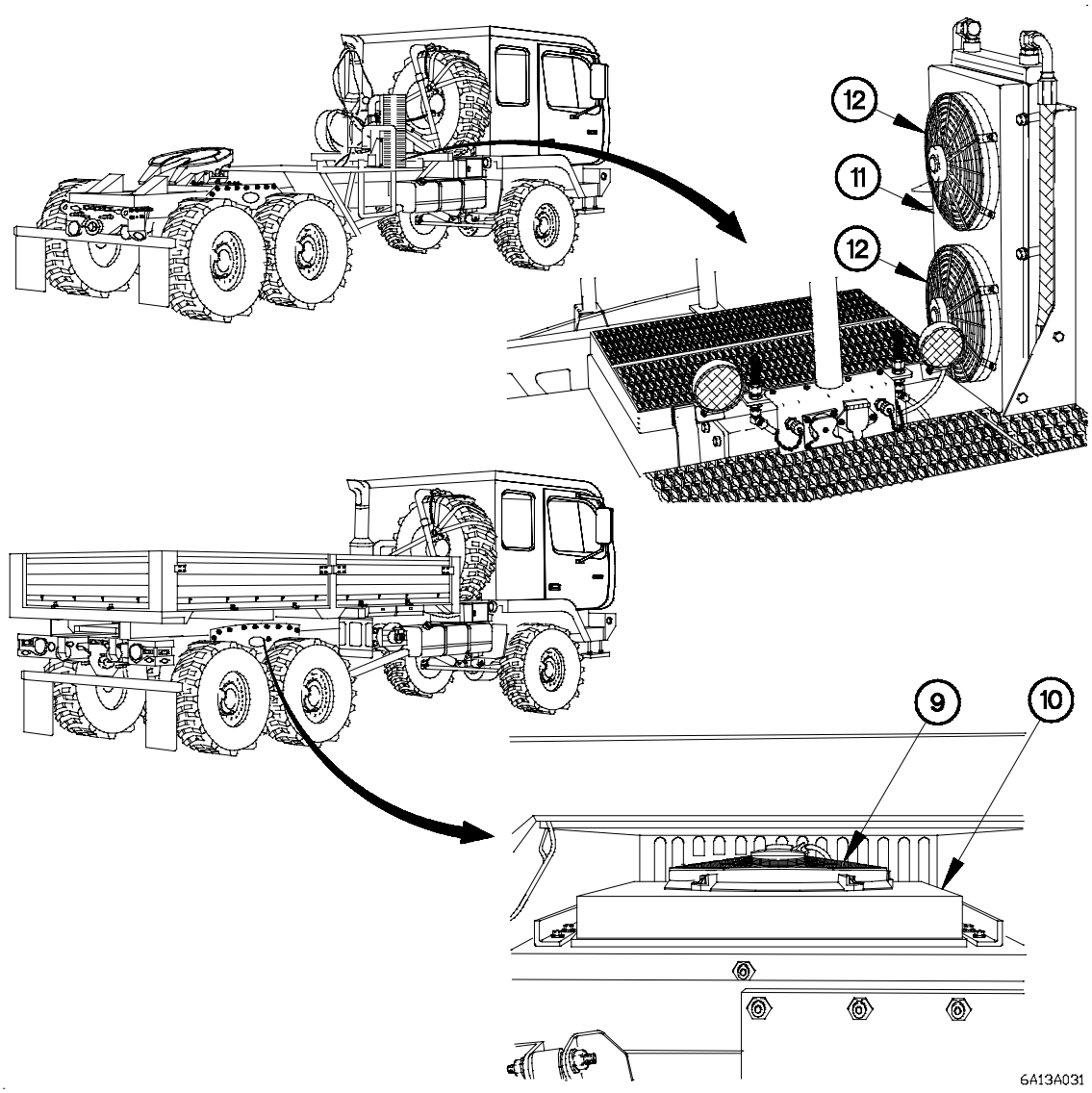


Figure 1-15. Cooling System (Cont)

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

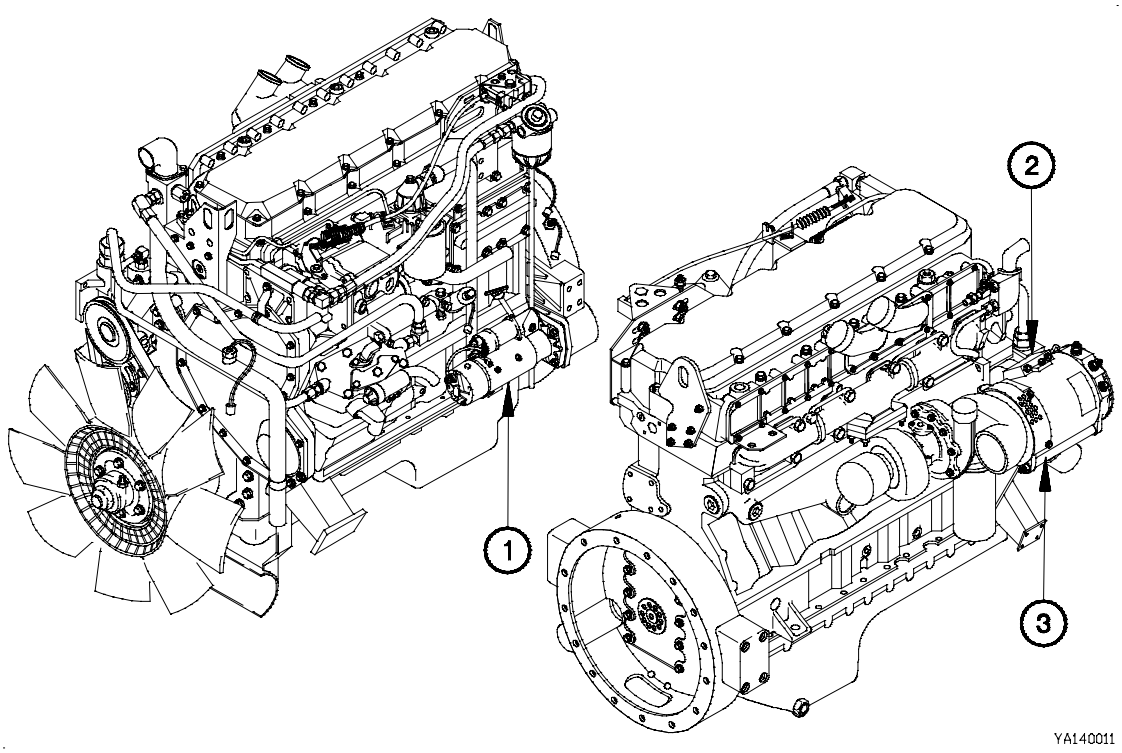


Figure 1-16. Electrical System

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)

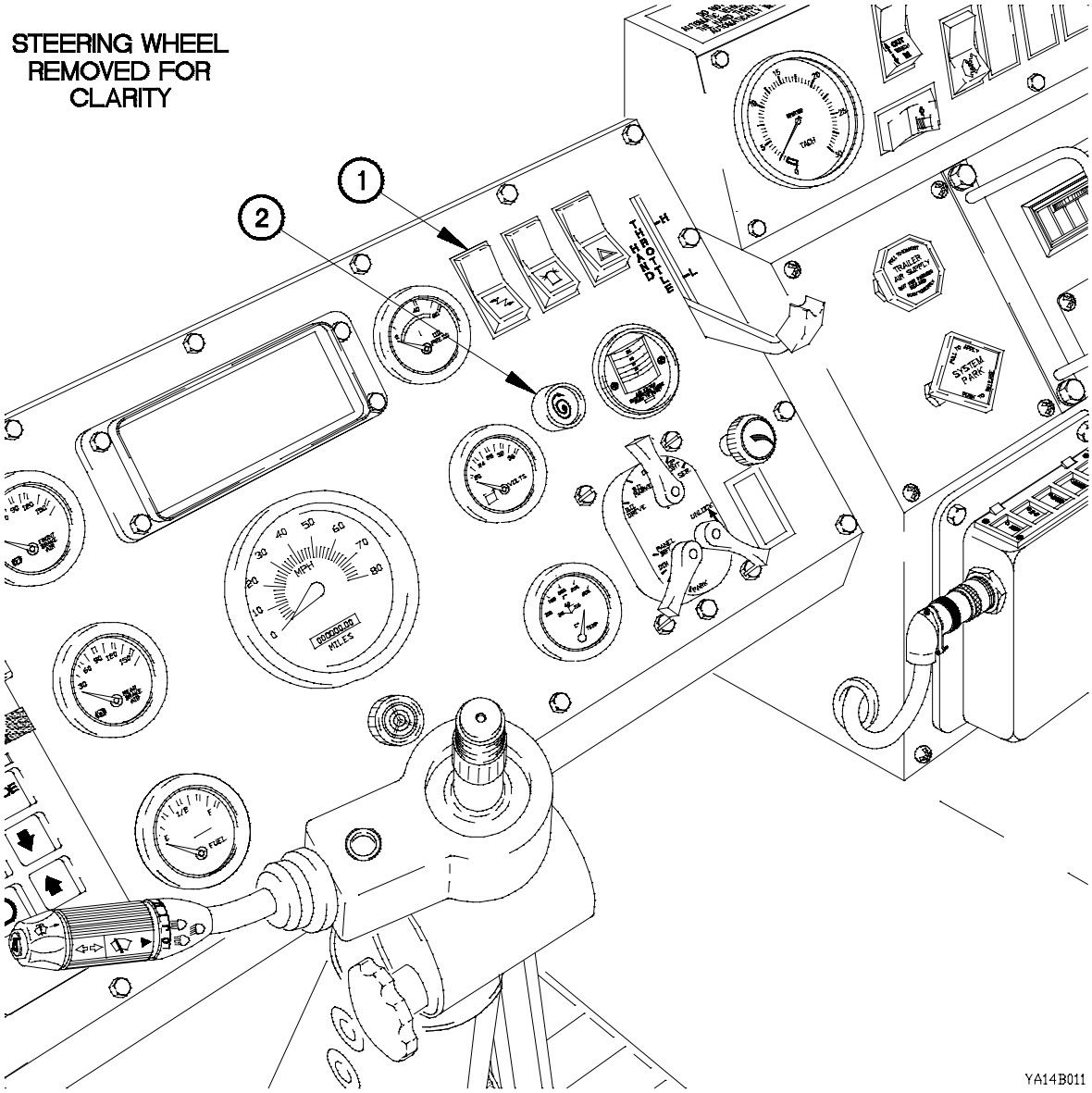


Figure 1-17. Engine Starting System

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.

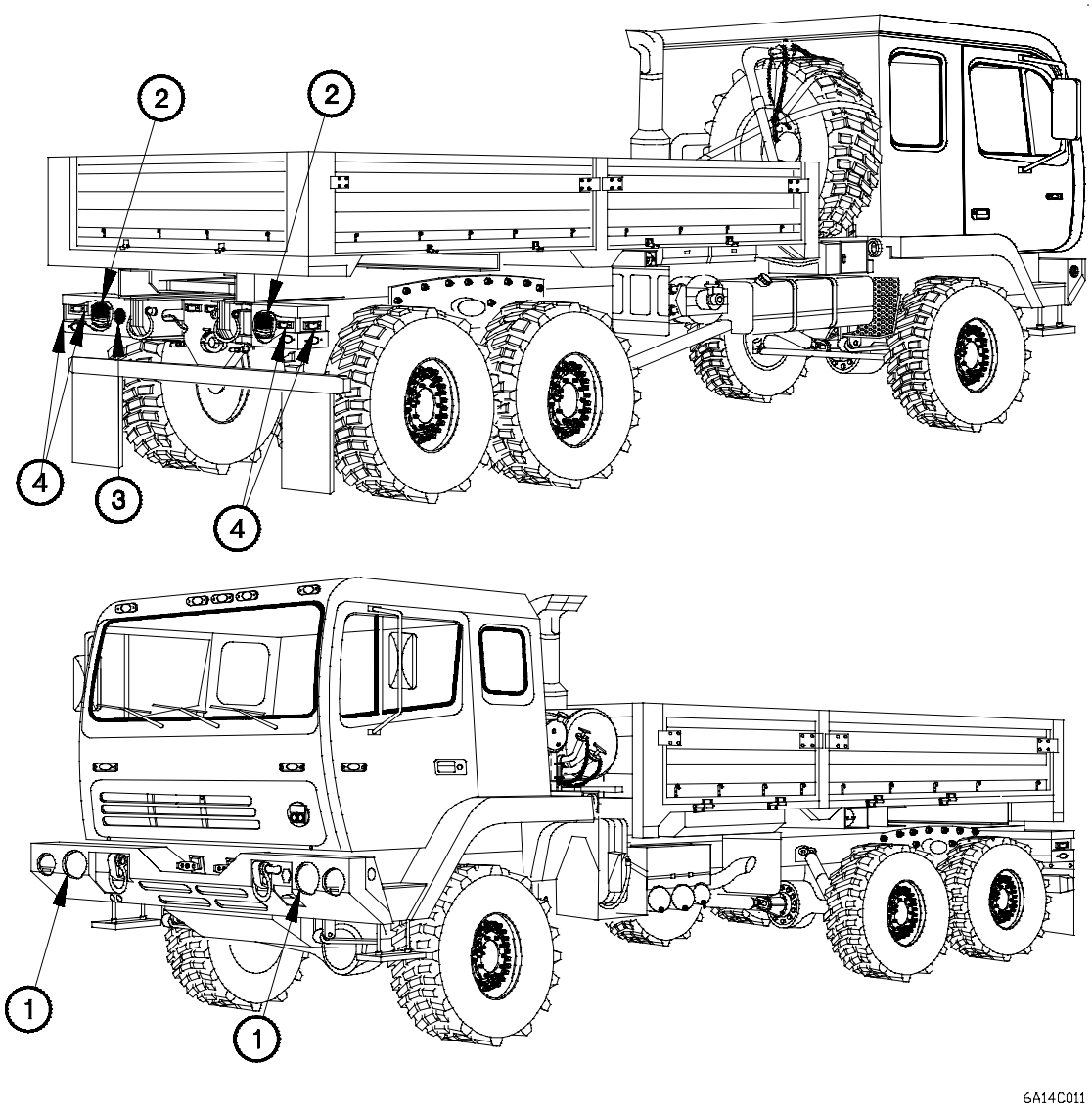


Figure 1-18. Service Lighting System

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)

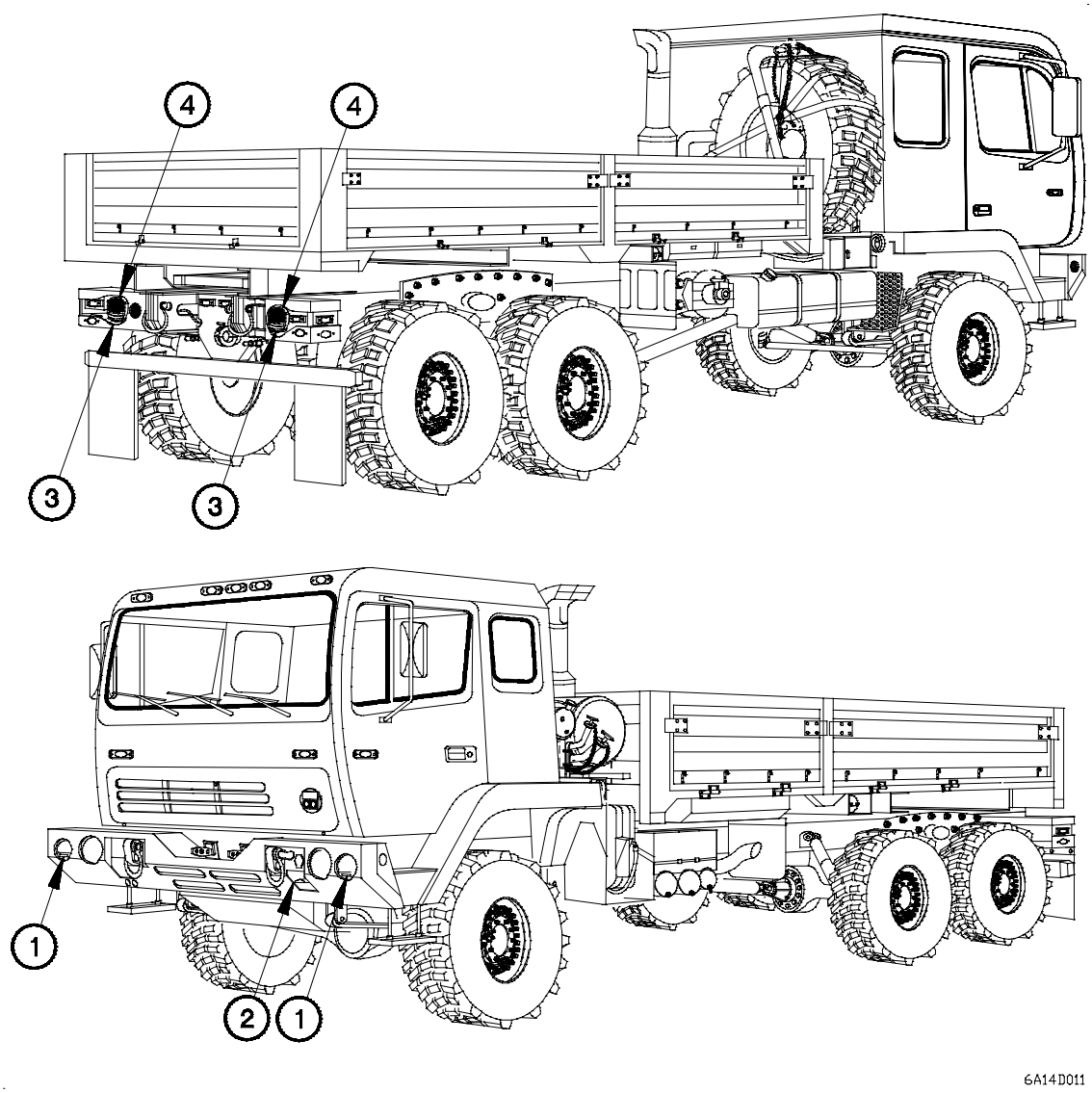


Figure 1-19. Blackout Lighting System

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.

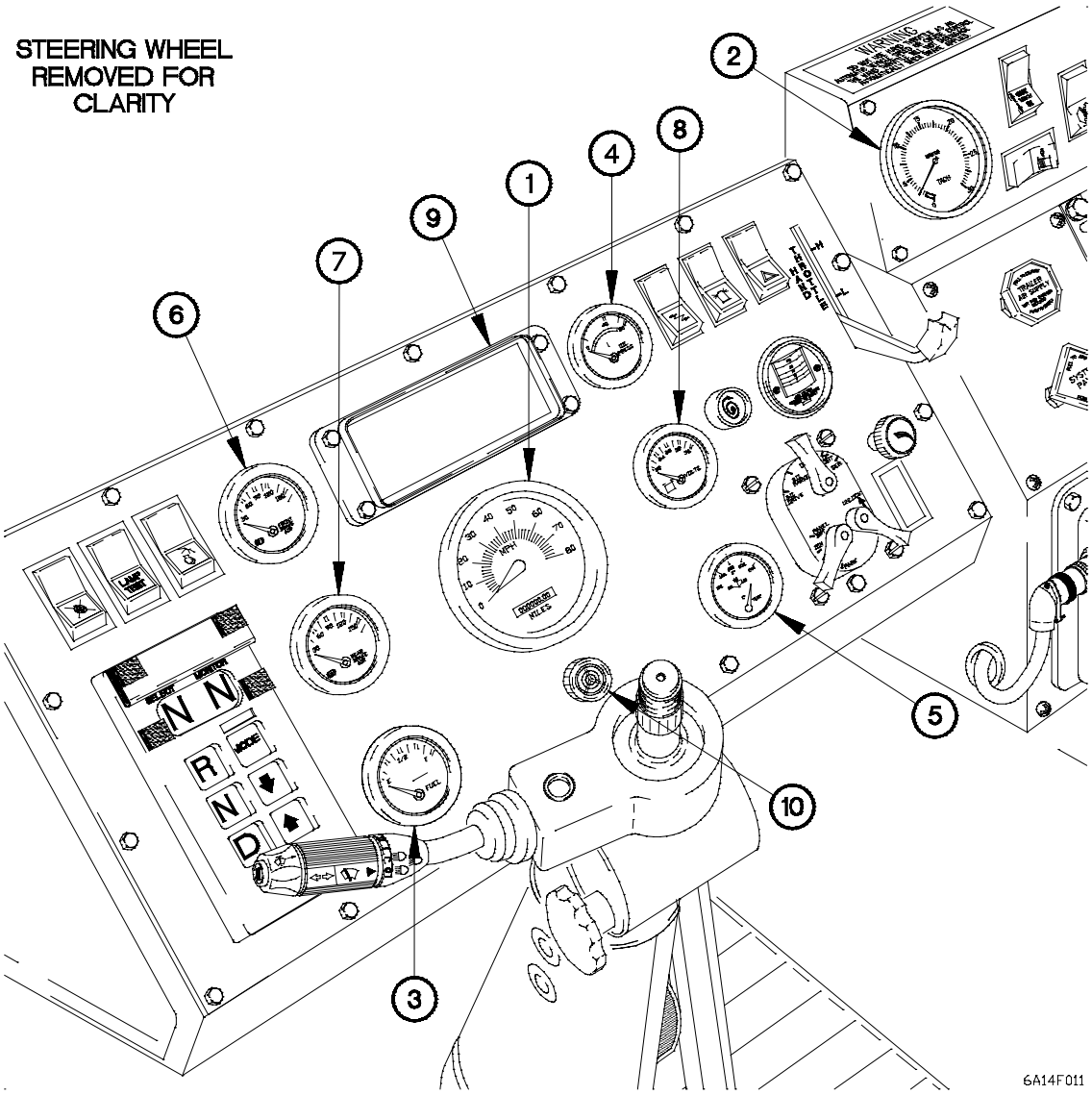


Figure 1-20. Instrument Panel

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)

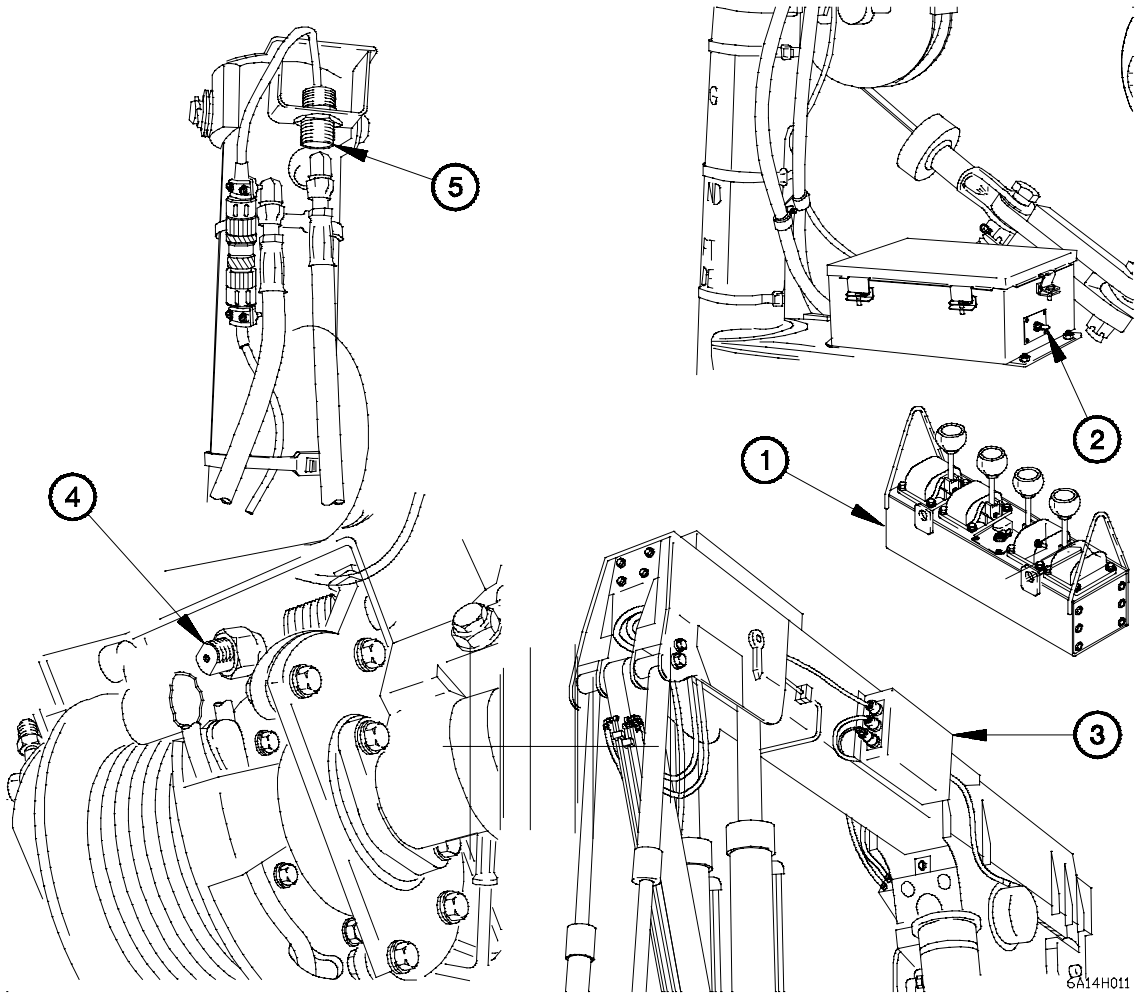


Figure 1-21. Material Handling Crane (MHC) System

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.

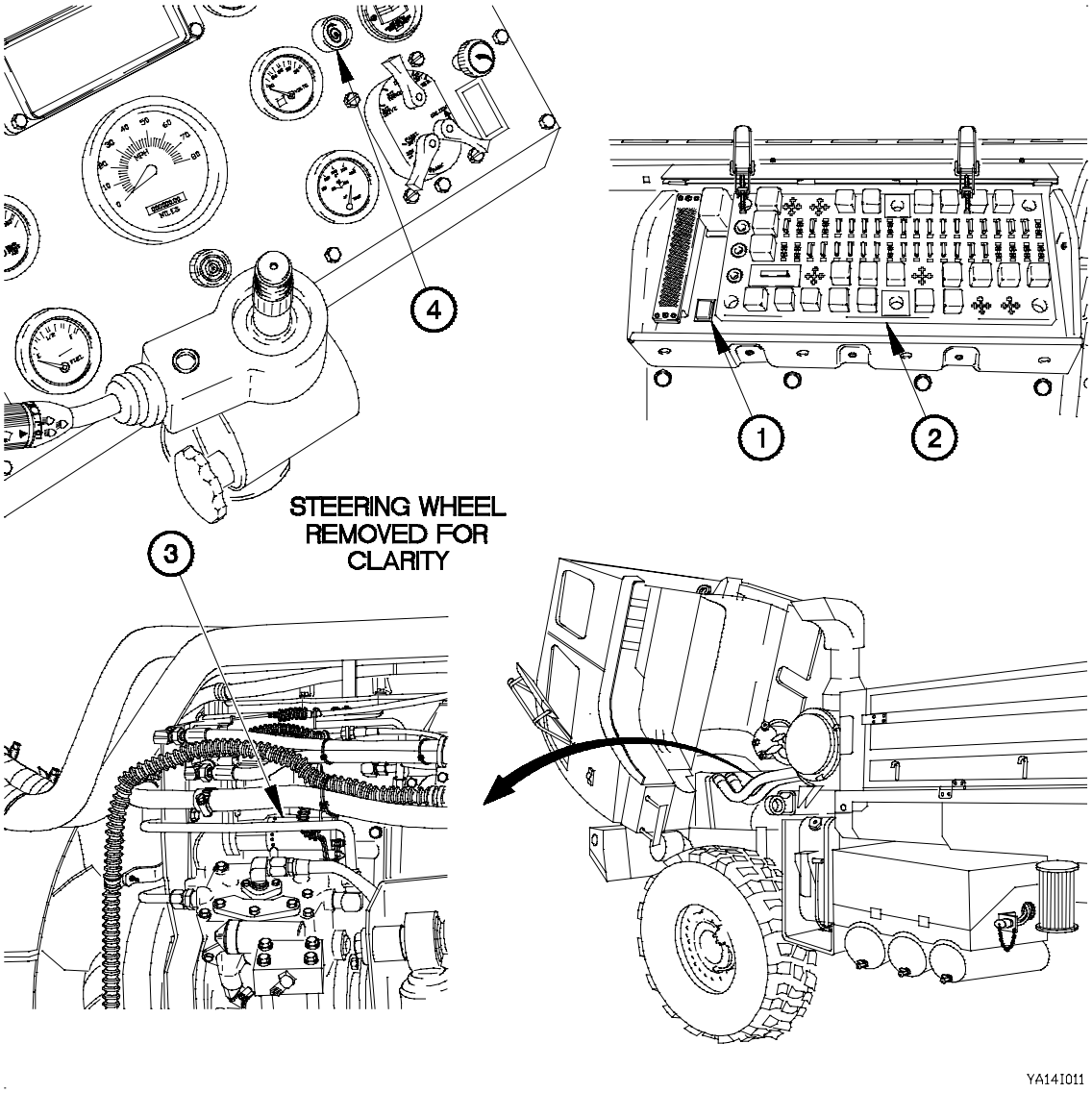


Figure 1-22. Troubleshooting Aid

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)

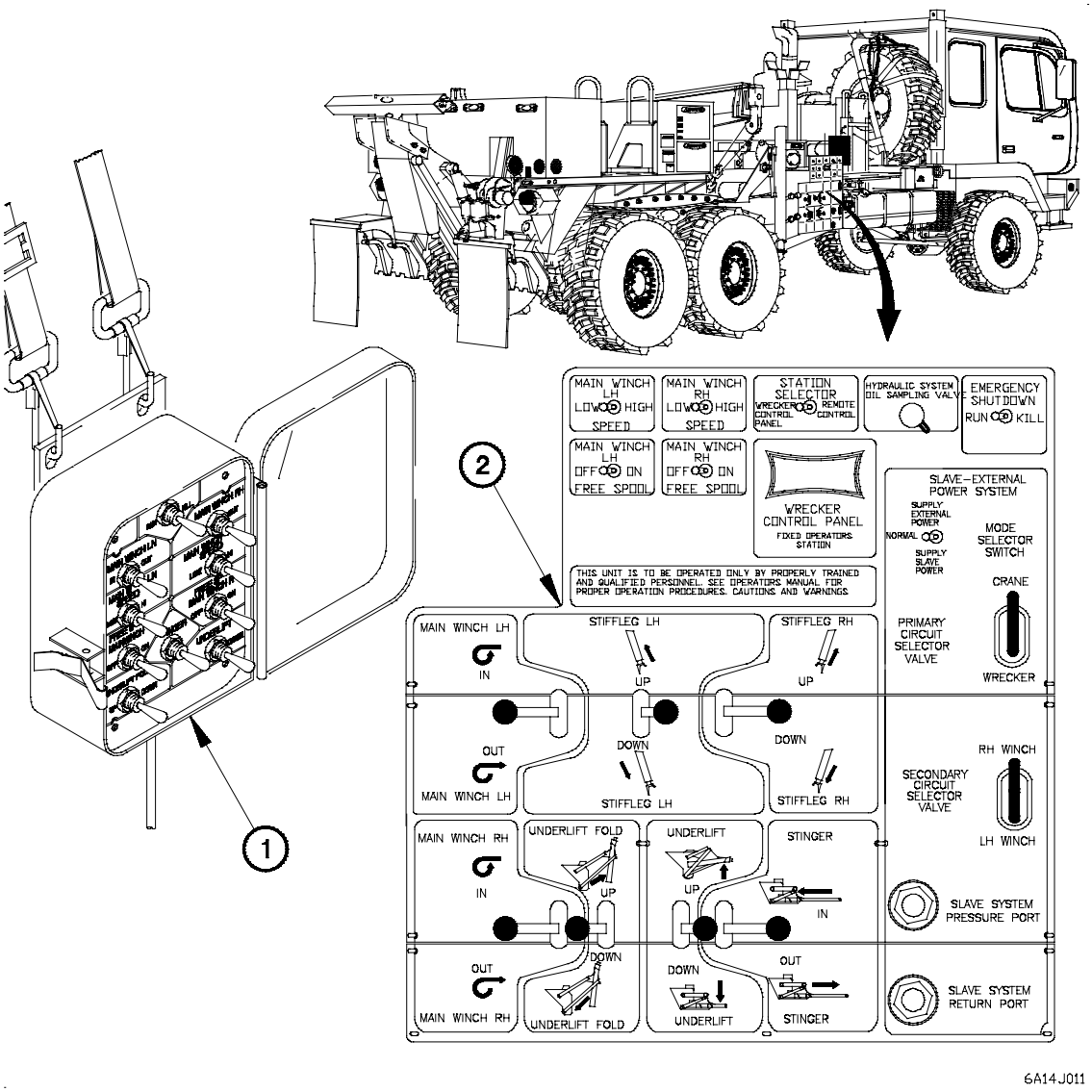


Figure 1-23. M1089 Underlift System.

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

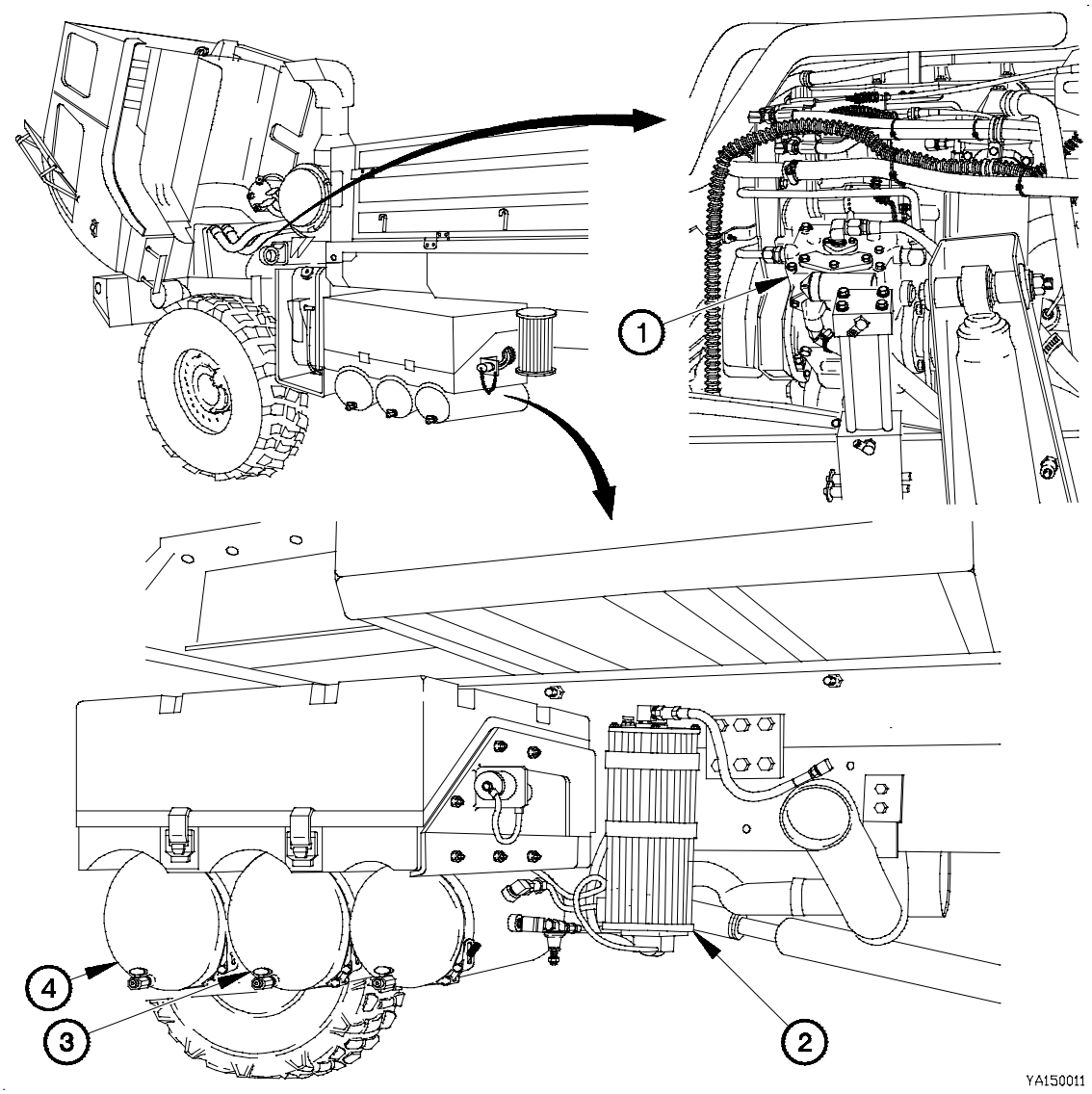


Figure 1-24. Brake System

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)

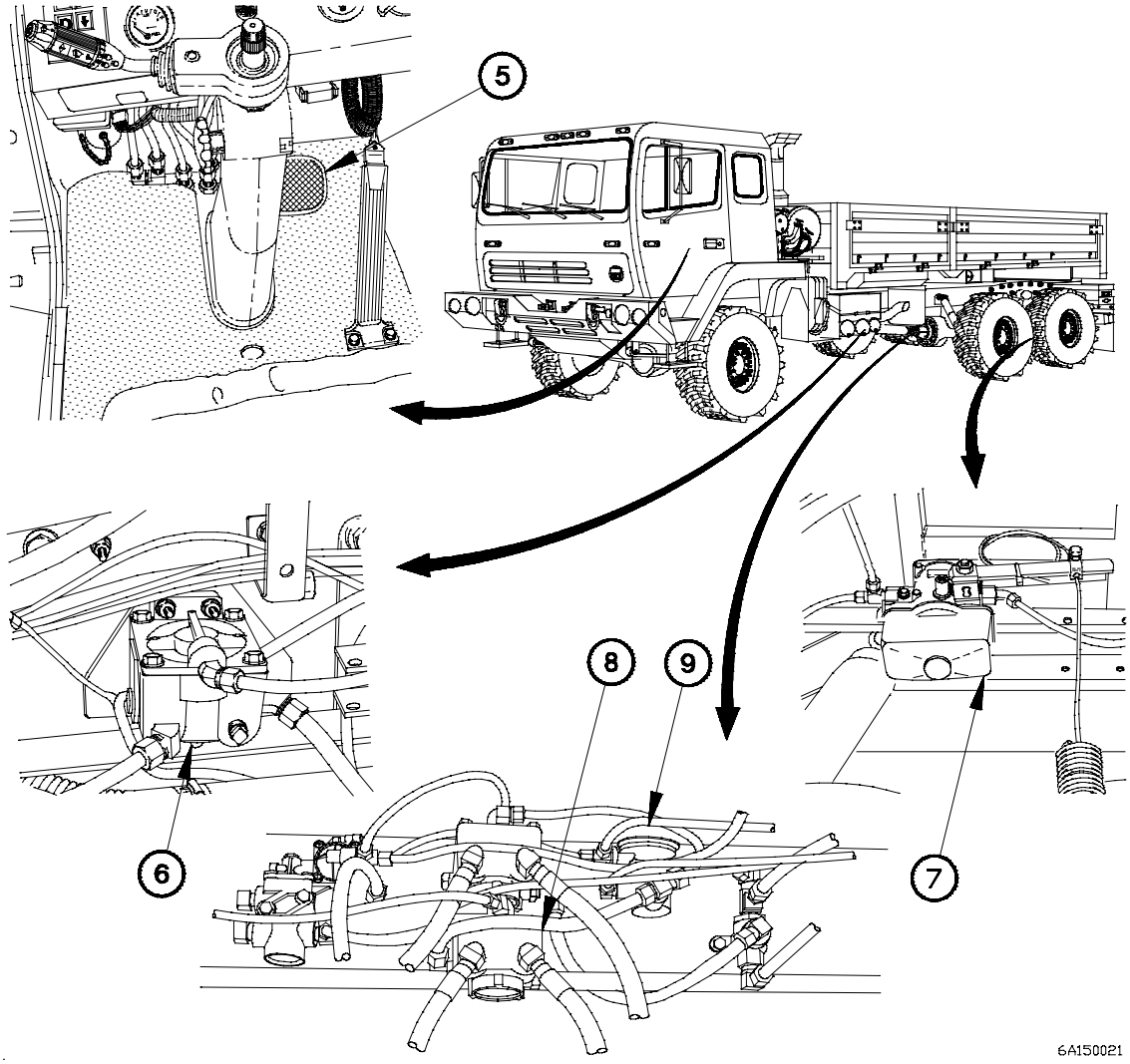


Figure 1-24. Brake System (Cont)

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

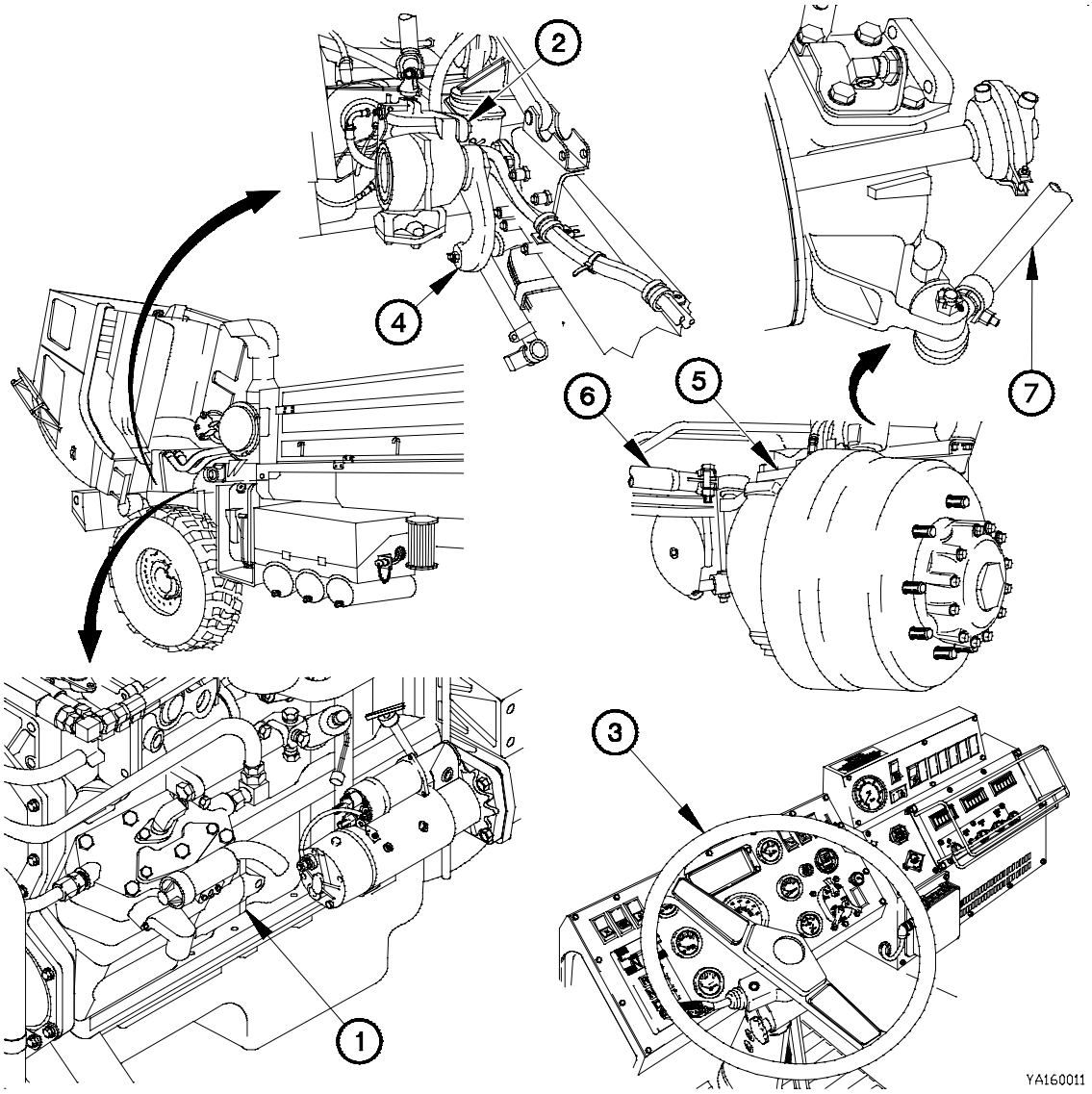


Figure 1-25. Steering System

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)

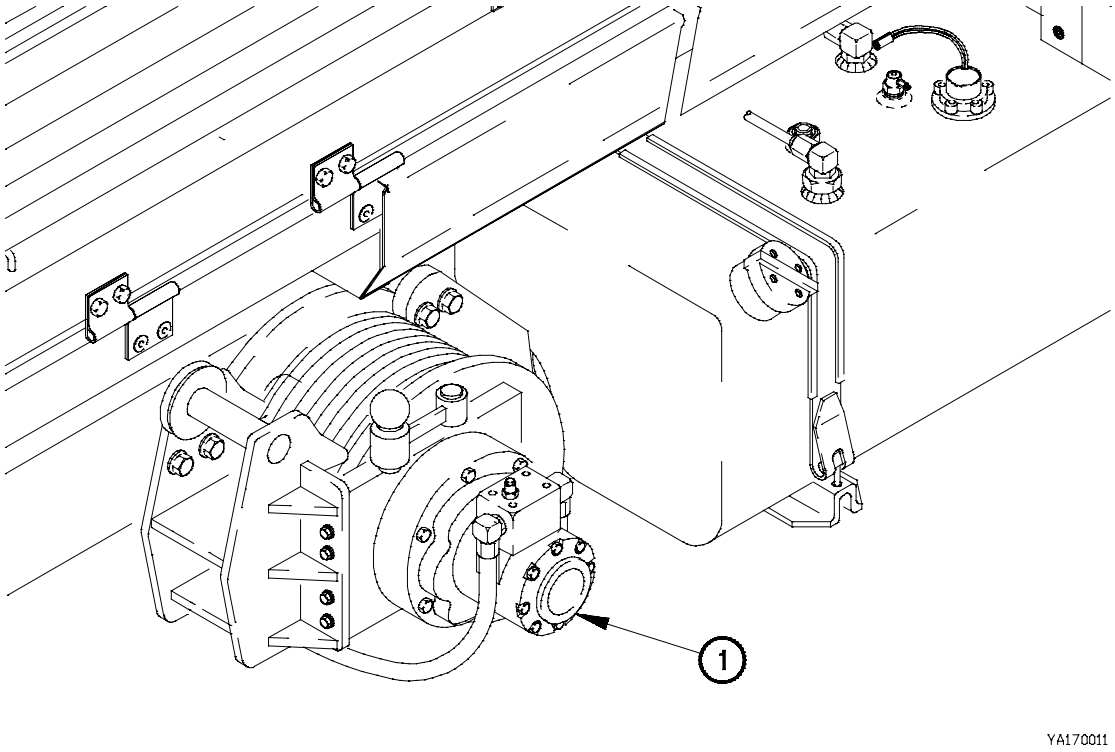


Figure 1-26. 15K Self-Recovery Winch (SRW)

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)

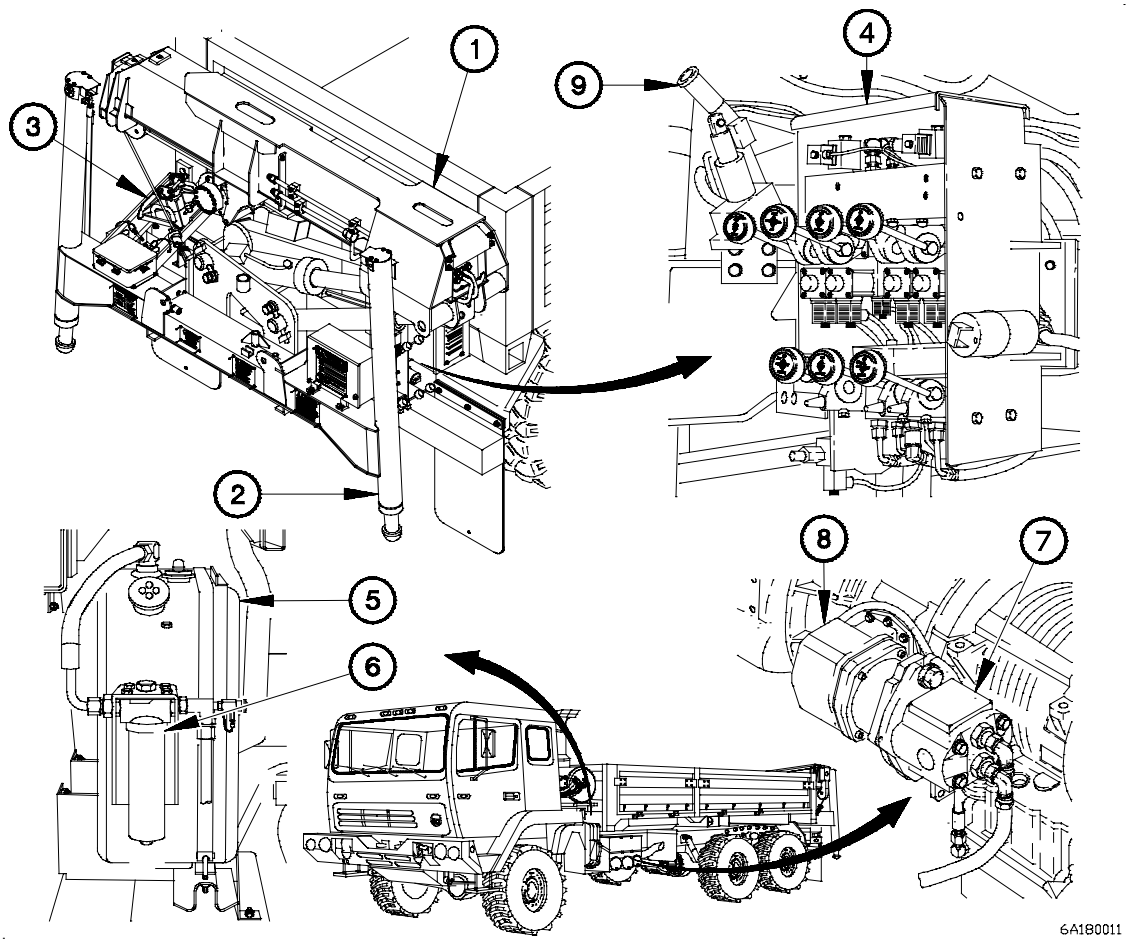


Figure 1-27. M1084/M1086 Material Handling Crane (MHC)

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)

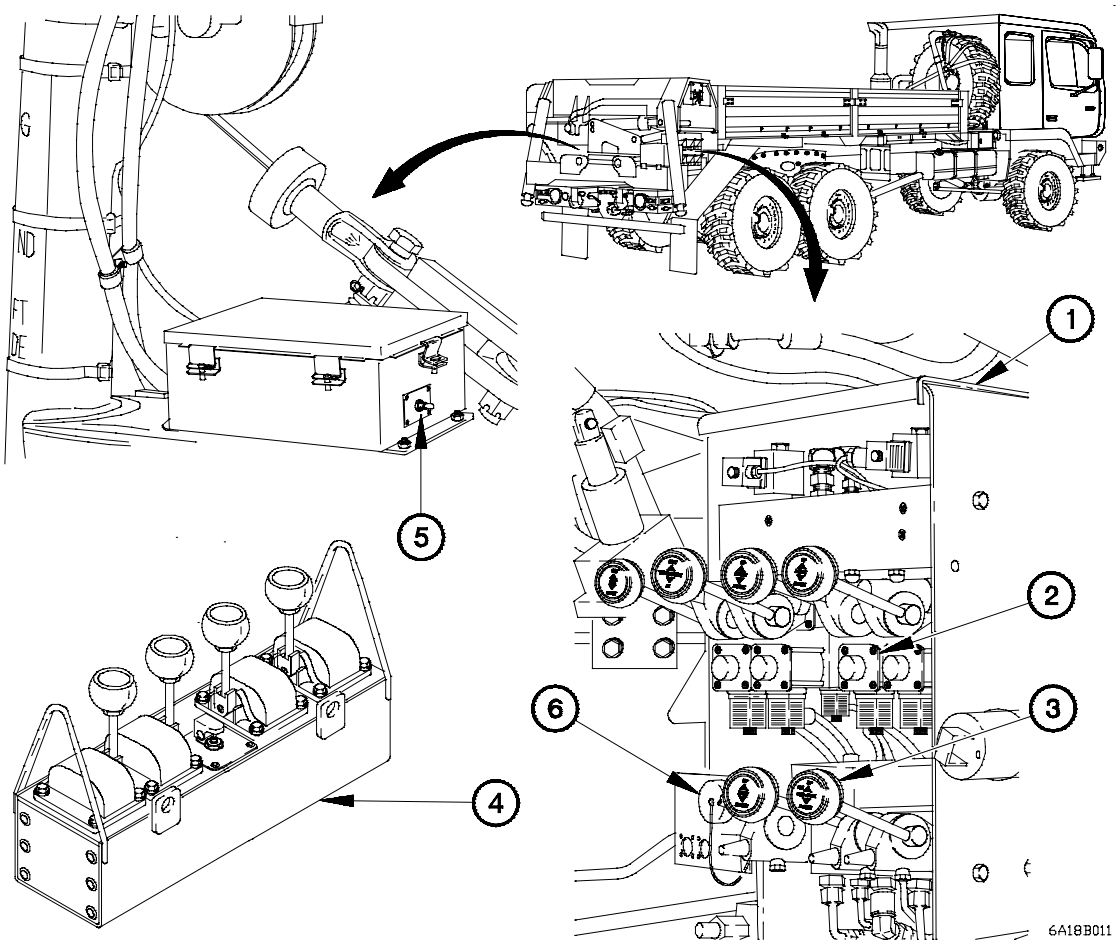


Figure 1-28. Material Handling Crane (MHC) Control Station and REMOTE CONTROL UNIT

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

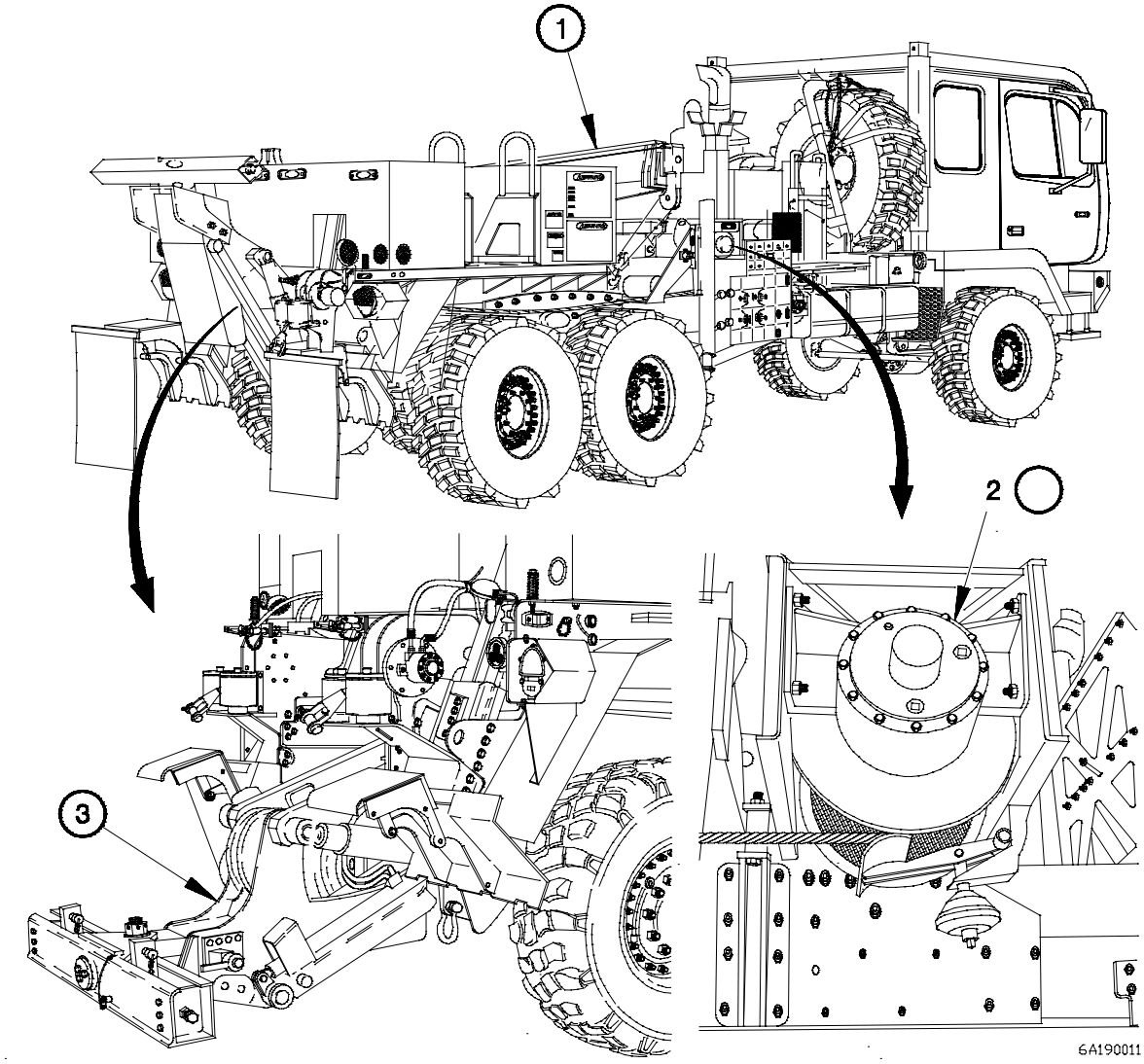
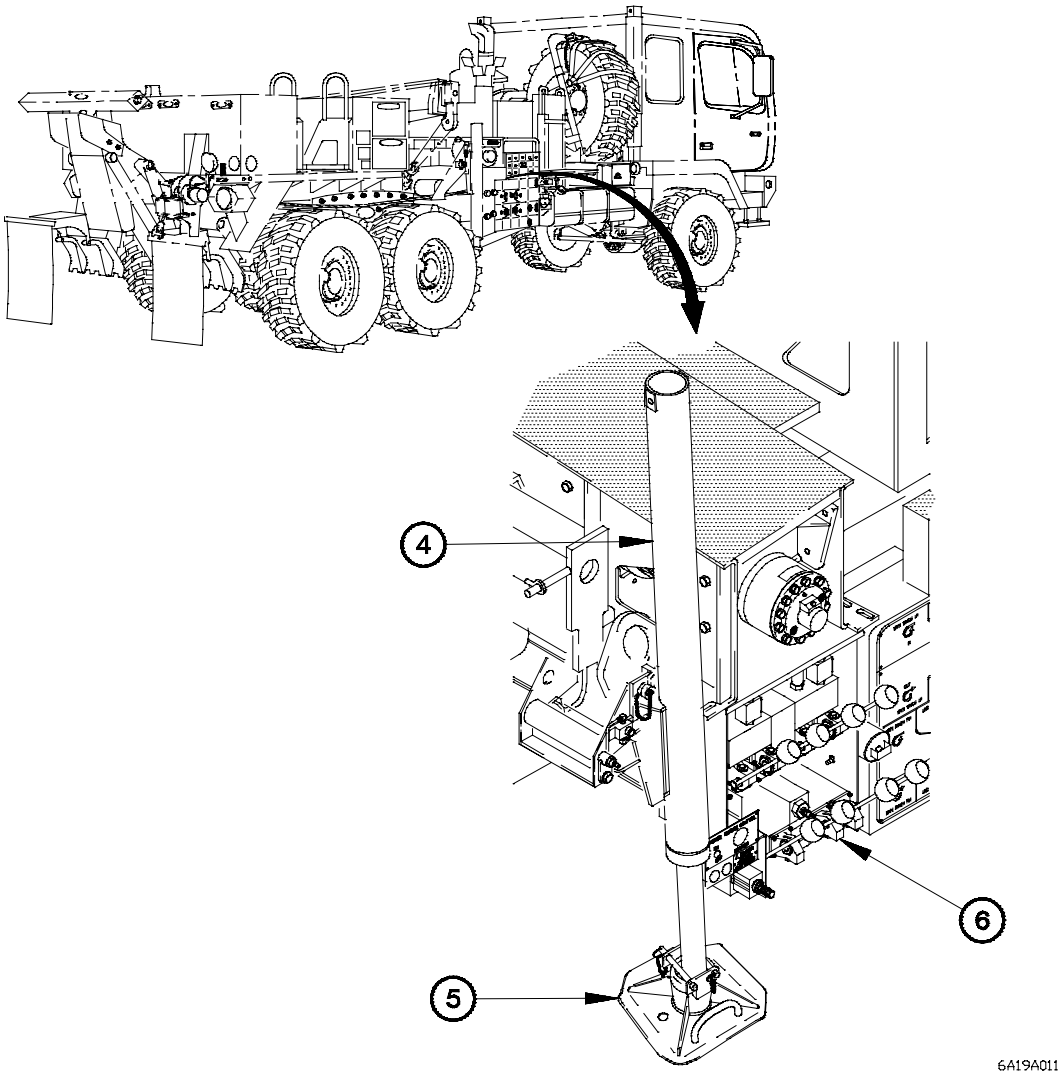


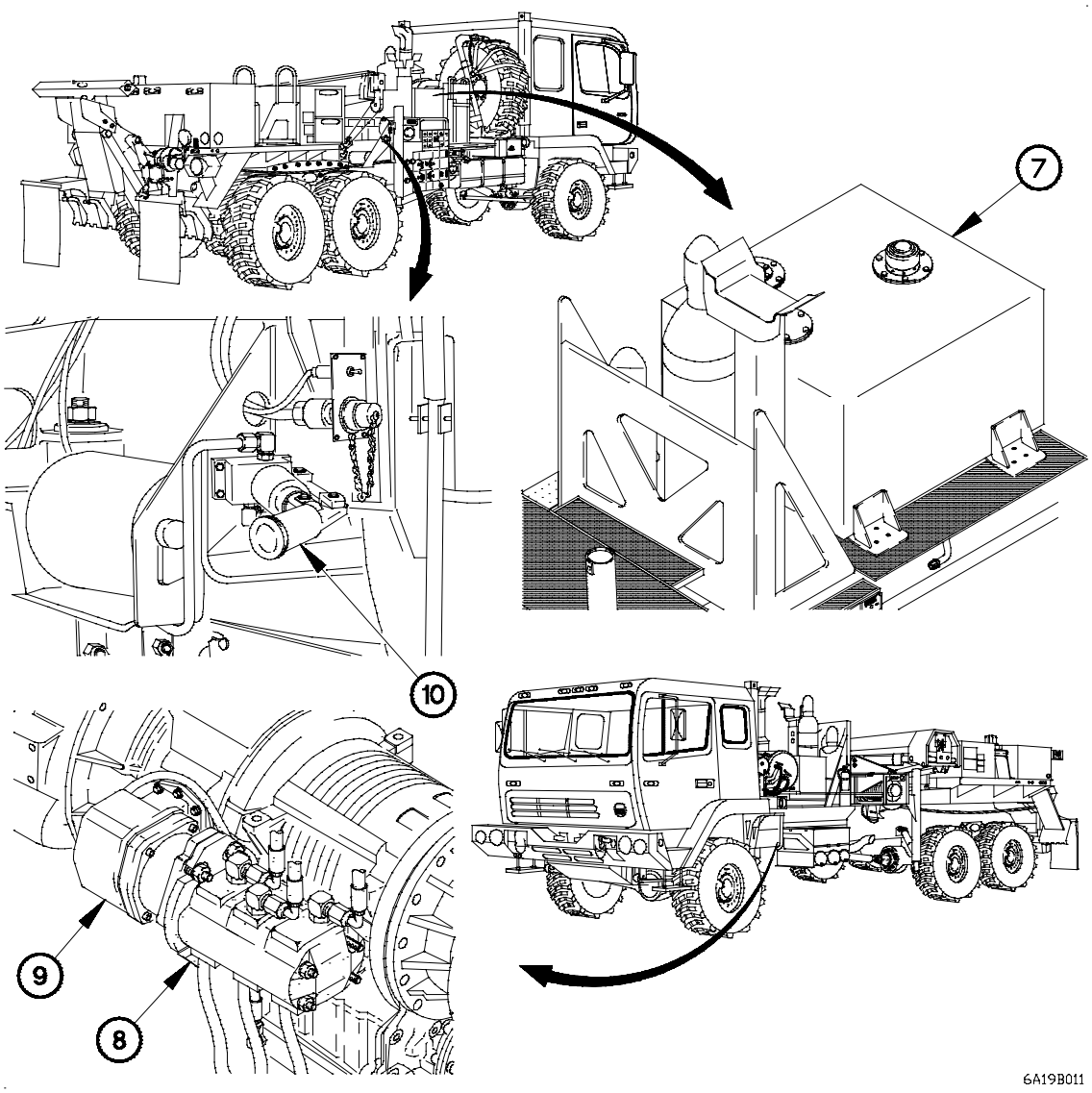
Figure 1-29. M1089 Material Handling Crane (MHC), 30K Winches, and Underlift

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)



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.



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)

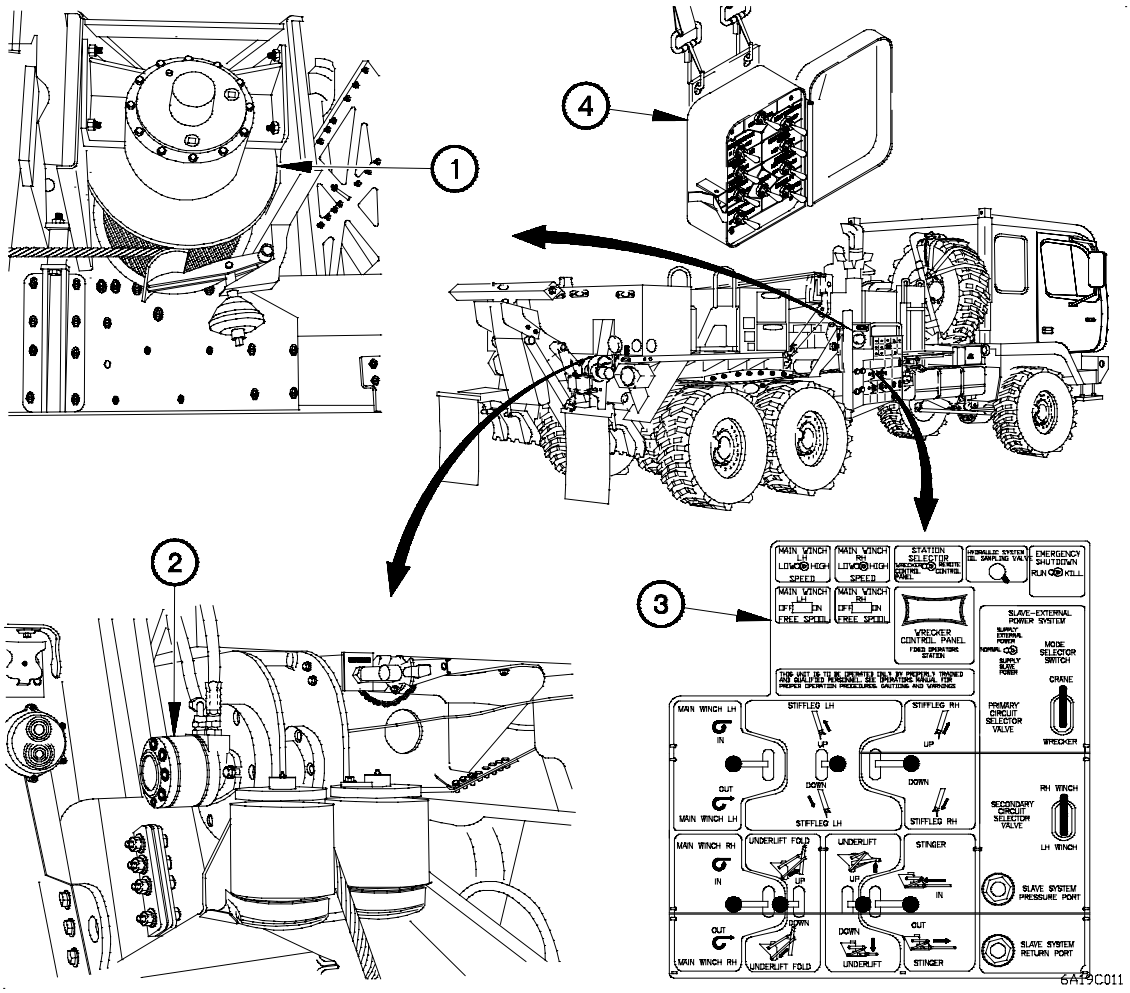


Figure 1-30. M1089 30K Winches

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).

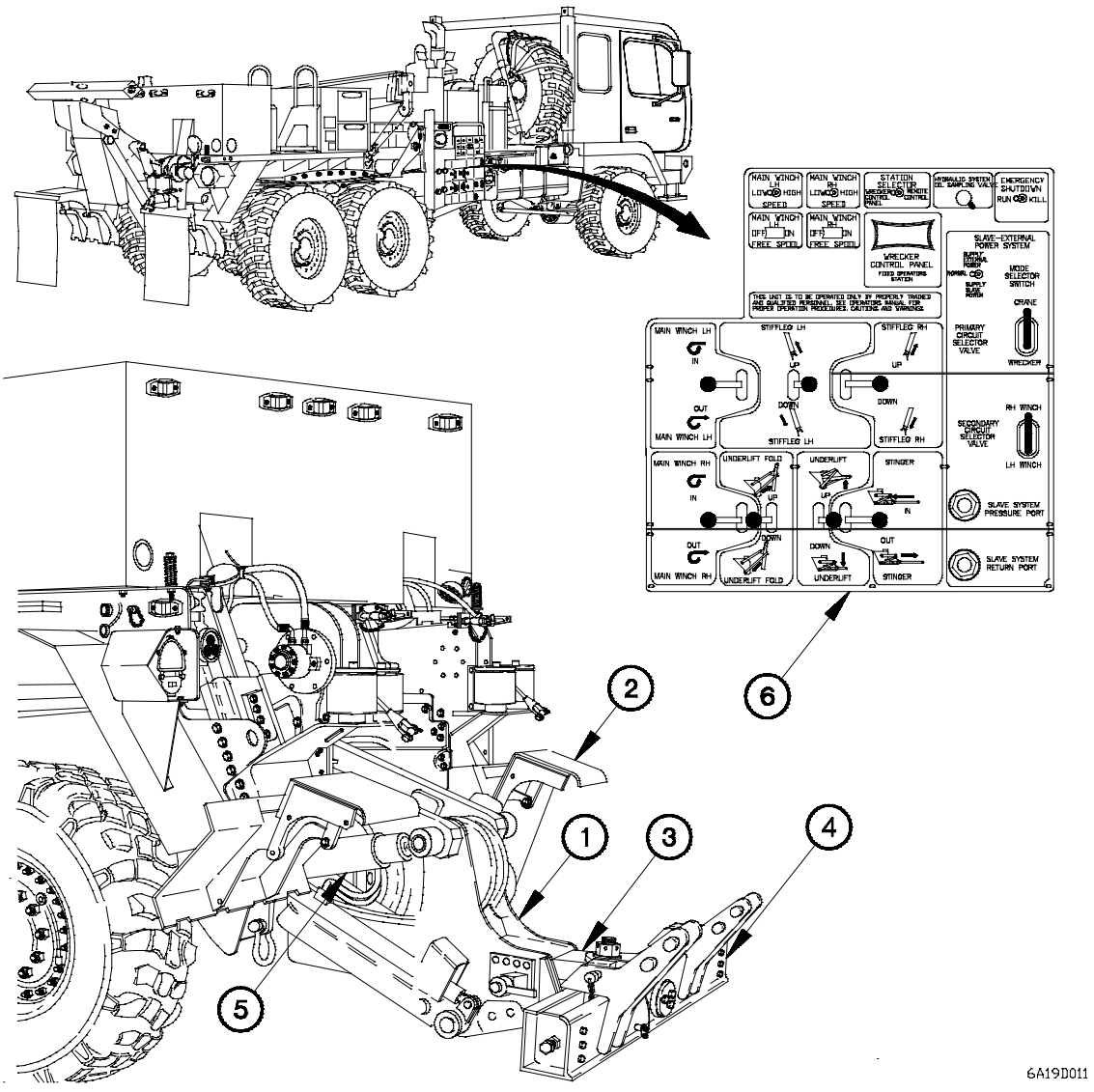


Figure 1-31. M1089 Underlift

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

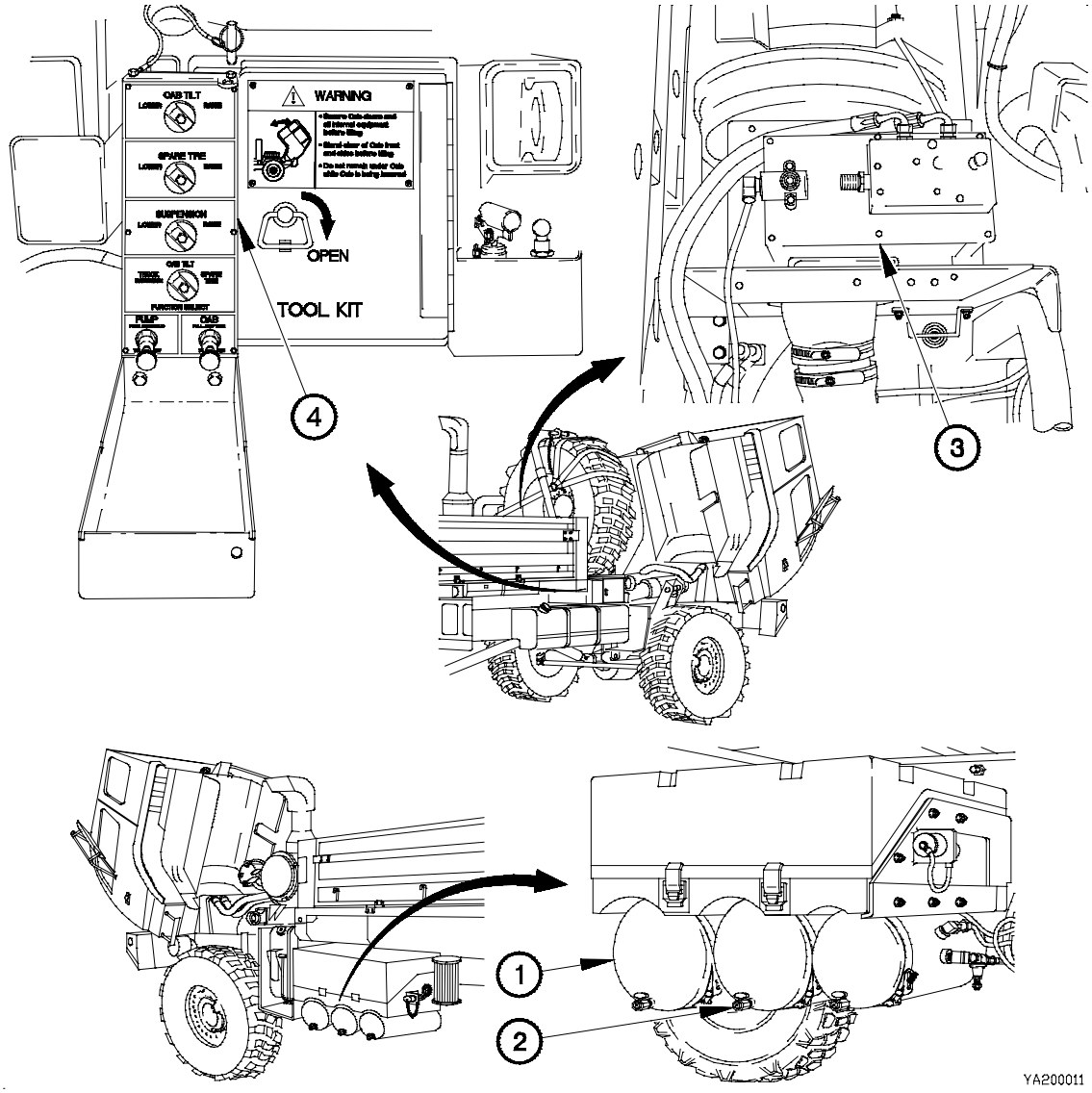


Figure 1-32. Air Transportability Hydraulic System

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).

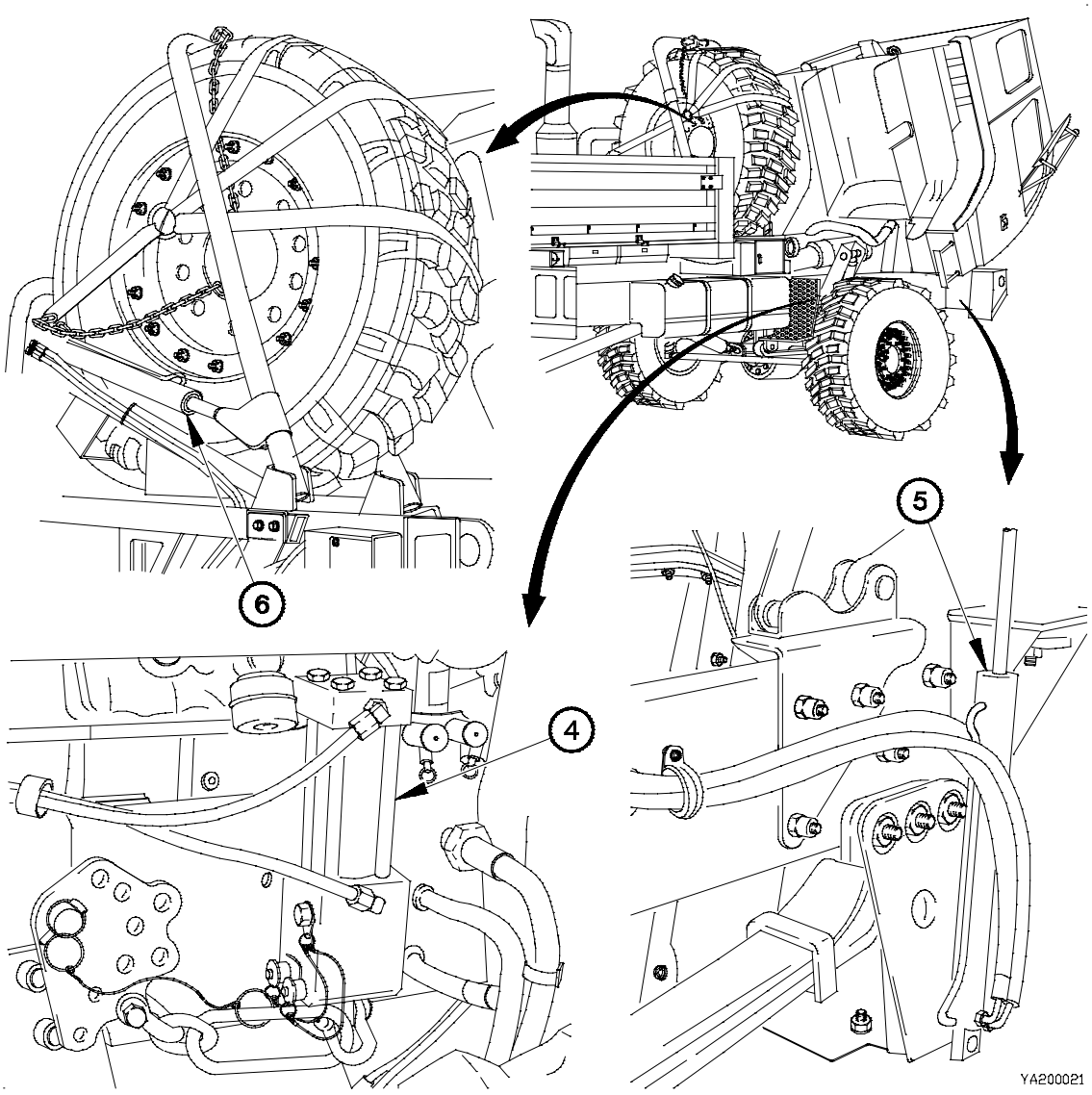


Figure 1-32. Air Transportability Hydraulic System (Cont)

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

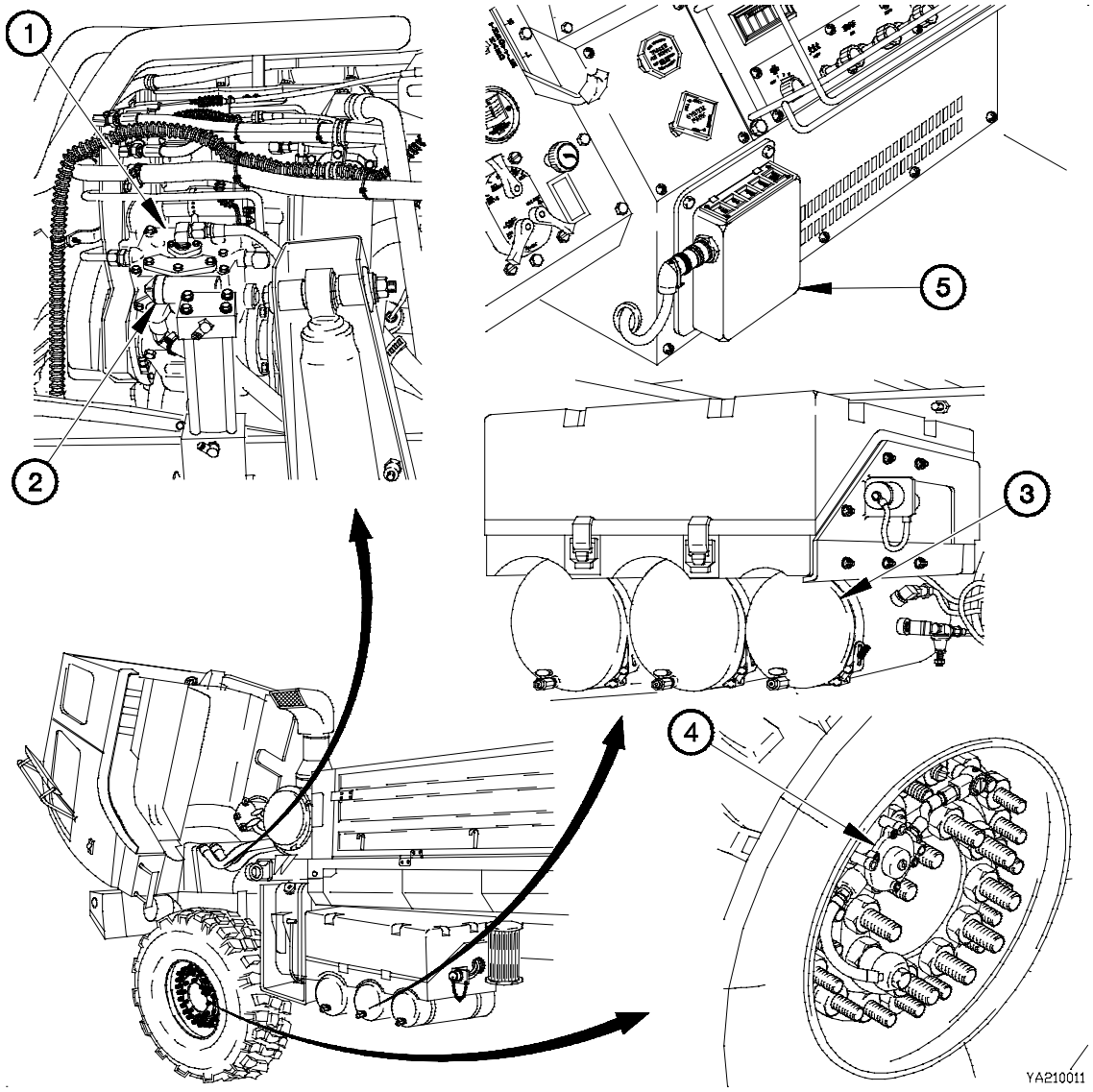


Figure 1-33. Air System

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.

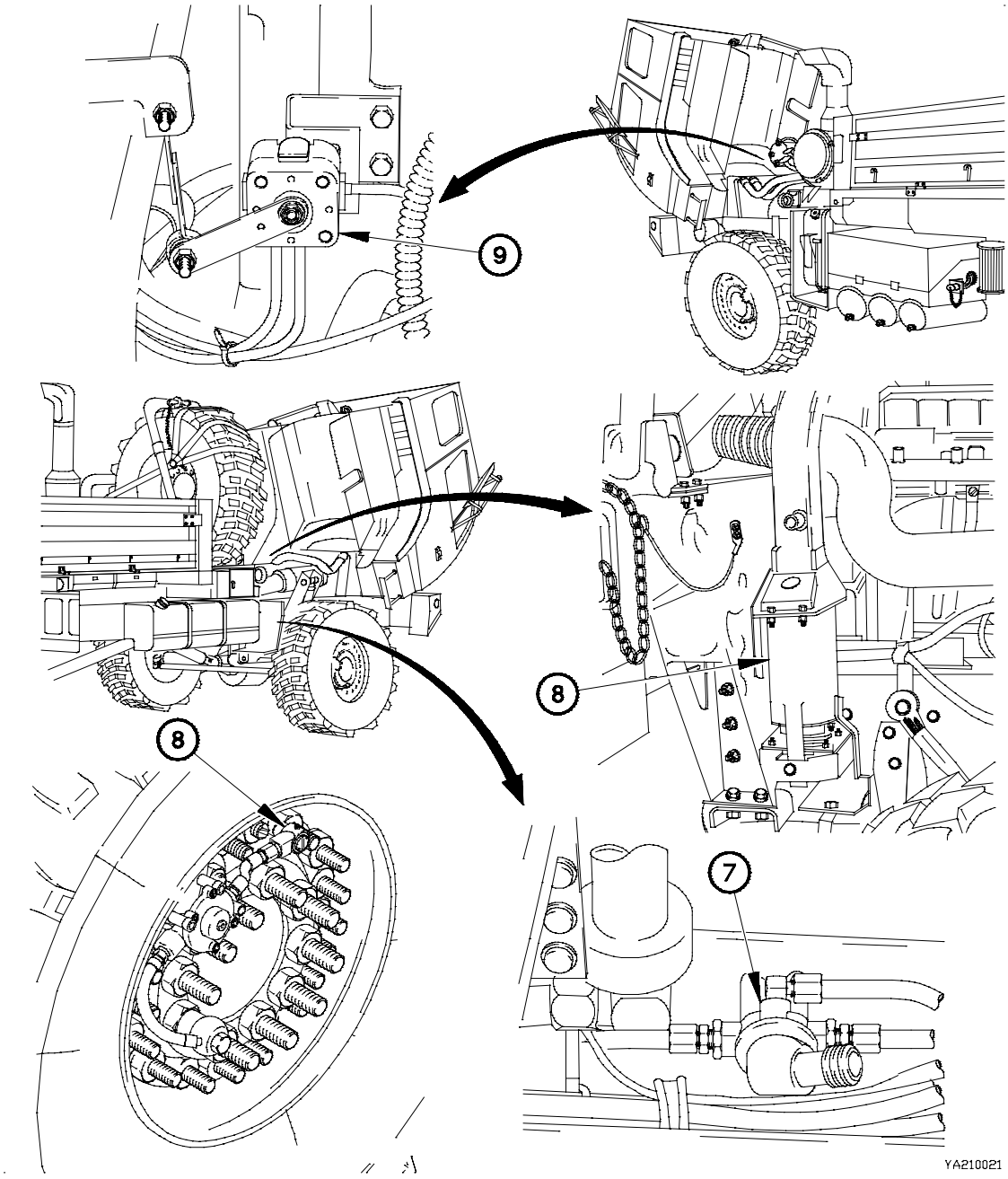


Figure 1-33. Air System

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.

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

	Malfunction	Troubleshooting Procedure (Page)
a. ENGINE SYSTEM TROUBLESHOOTING		
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
a.1. FUEL SYSTEM TROUBLESHOOTING		
a1.1.	Engine Cranks But Does Not Start	2-66.8
b. COOLING SYSTEM TROUBLESHOOTING		
b1.	Engine Overheats	2-68
b2.	Loss of Coolant	2-72
b3.	Oil in Cooling System	2-74
c. TRANSMISSION SYSTEM TROUBLESHOOTING		
c1.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Codes 22 Sub Codes 15 (Serial Number 6510032369 and Higher)	2-80
c2.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Codes 22 Sub Codes 15 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-90
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 Code 16 Or Main Code 25 And/ Or 56 And Any Sub Code	2-114
c5.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Codes 24 Sub Codes 12 or 23 (Serial Number 6510032369 and Higher)	2-122
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)

Malfunction		Troubleshooting Procedure (Page)
c. TRANSMISSION SYSTEM TROUBLESHOOTING (CONT)		
c8.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Codes 32 and/ or 57and Any Sub Codes (Serial Number 6510032369 and Higher)	2-150
c9.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Codes 32 and/ or 57and Any Sub Codes (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-158
c10.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Codes 32 and/ or 57and Any Sub Codes (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
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

2-8. TROUBLESHOOTING INSTRUCTIONS (CONT)

Table 2-1. Vehicle Troubleshooting (Cont)

Malfunction	Troubleshooting Procedure (Page)
c. TRANSMISSION SYSTEM TROUBLESHOOTING (CONT)	
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
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

Table 2-1. Vehicle Troubleshooting (Cont)

Malfunction		Troubleshooting Procedure (Page)
	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 Or Main Code 25 And/ Or 56 And Any Sub CodeSub 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/ or 57and Any Sub Code (Serial Number 6510032369 and Higher)	2-644
c54.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 32 and/ or 57and 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)

c. Transmission SYSTEM TROUBLESHOOTING (CONT)

Malfunction		Troubleshooting Procedure (Page)
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)

Malfunction		Troubleshooting Procedure (Page)
	d. WHEEL TROUBLESHOOTING	
d1.	Wheel Wobbles or Shimmies	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 Shimmies	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)

Malfunction	Troubleshooting Procedure (Page)
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 Drifts Down from Raised Position	2-1072.12
l. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HYDRAULIC SYSTEM TROUBLESHOOTING	
l1. M1084/M1086 Material Handling Crane (MHC) Hydraulic Functions Operate Slowly	2-1074
l2. M1084/M1086 Material Handling Crane (MHC) Left Outrigger (Jack) Drifts or Does Not Work	2-1082
l3. M1084/M1086 Material Handling Crane (MHC) Right Outrigger (Jack) Drifts or Does Not Work	2-1086
l4. M1084/M1086 Material Handling Crane (MHC) Mast Does Not Erect or Stow	2-1090
l5. M1084/M1086 Material Handling Crane (MHC) Hoist Does Not Work	2-1094
l6. M1084/M1086 Material Handling Crane (MHC) Boom Swing Assembly Does Not Work	2-1098
l7. M1084/M1086 Material Handling Crane (MHC) Boom Does Not Telescope In or Out	2-1100
l8. M1084/M1086 Material Handling Crane (MHC) Swing, Telescope, Boom, and Hoist Do Not Work	2-1104
l9. 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

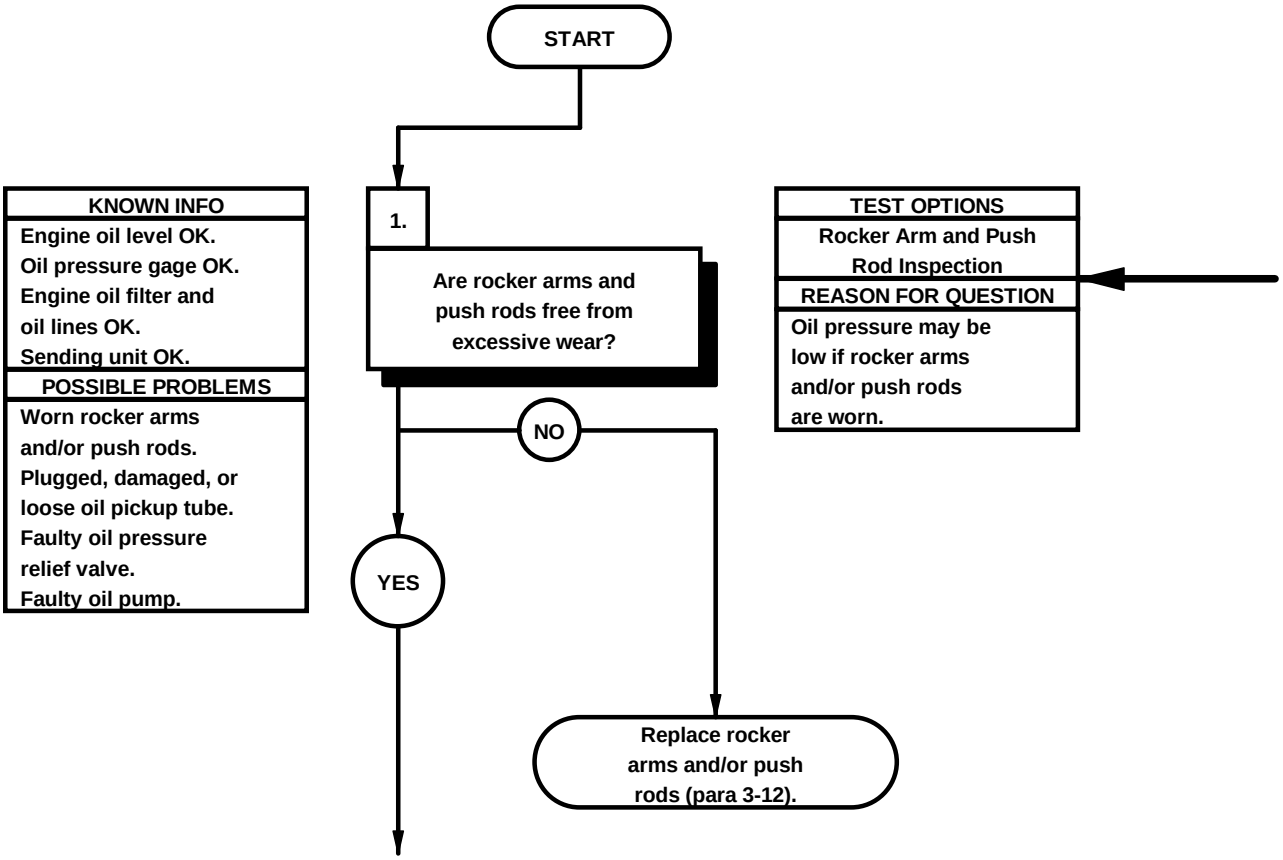
Fault No.	Description	Page
a1.	Low Engine Oil Pressure	2-16
a2.	Engine Stalls at Low RPM	2-20
a3.	Engine Speed Is Not Stable	2-26
a4.	Engine Overspeeds on Start	2-30
a5.	Too Much Vibration in Engine	2-32
a6.	Coolant in Engine Oil	2-34
a7.	Excessive Engine Oil Consumption	2-36
a8.	Engine Overheats	2-40
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

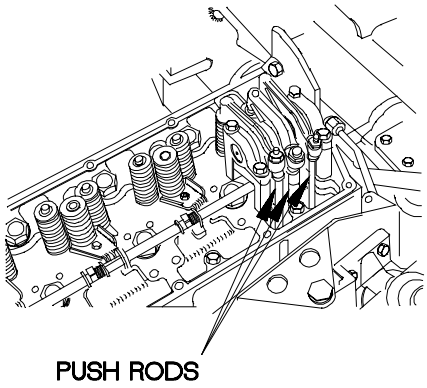
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).

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).



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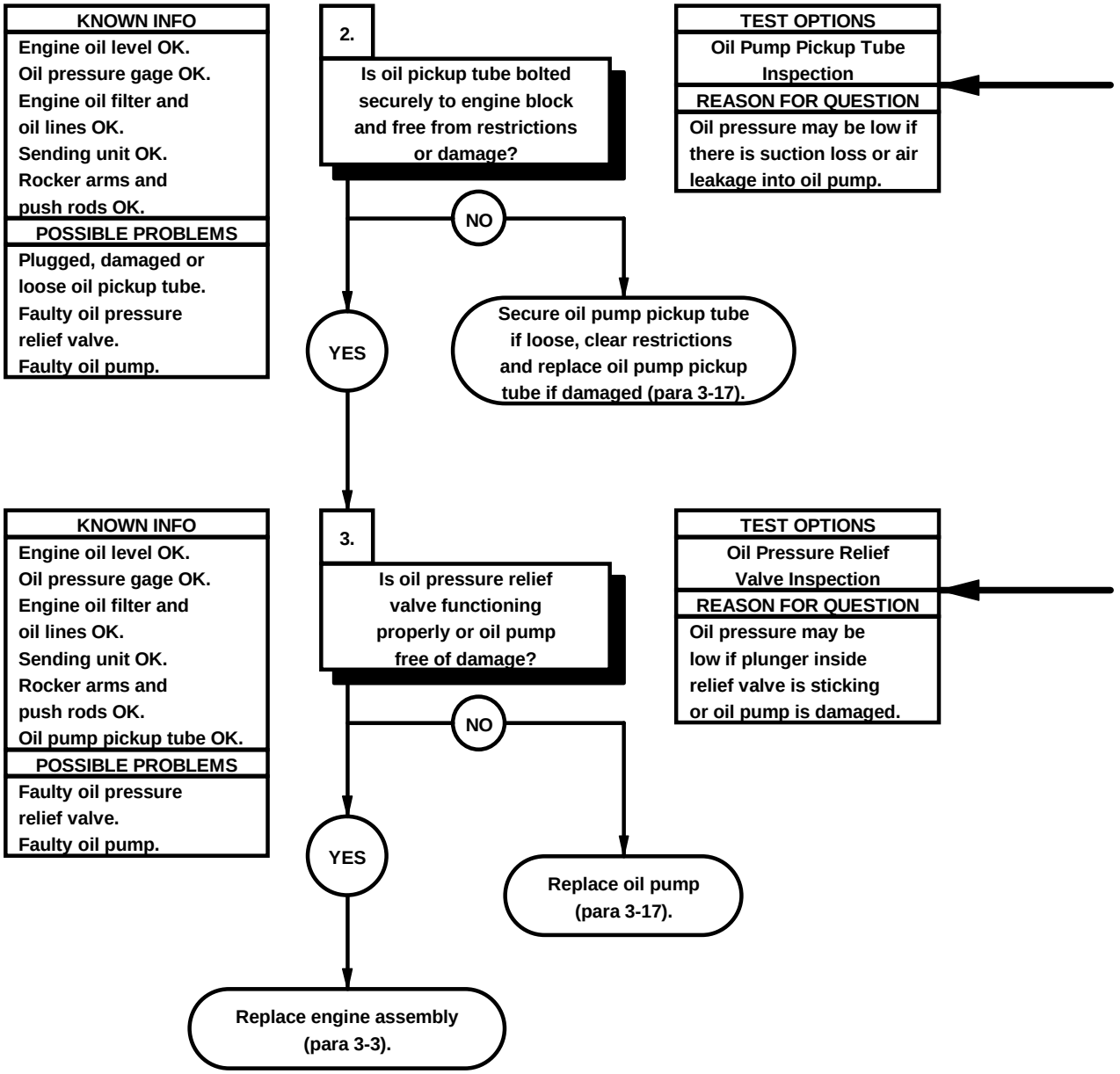
a1. LOW ENGINE OIL PRESSURE (CONT)

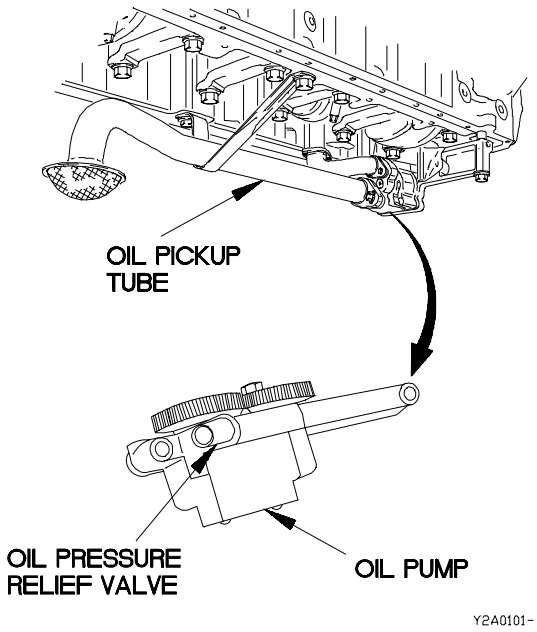


OIL PUMP PICKUP TUBE INSPECTION

(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).



a2. ENGINE STALLS AT LOW RPM

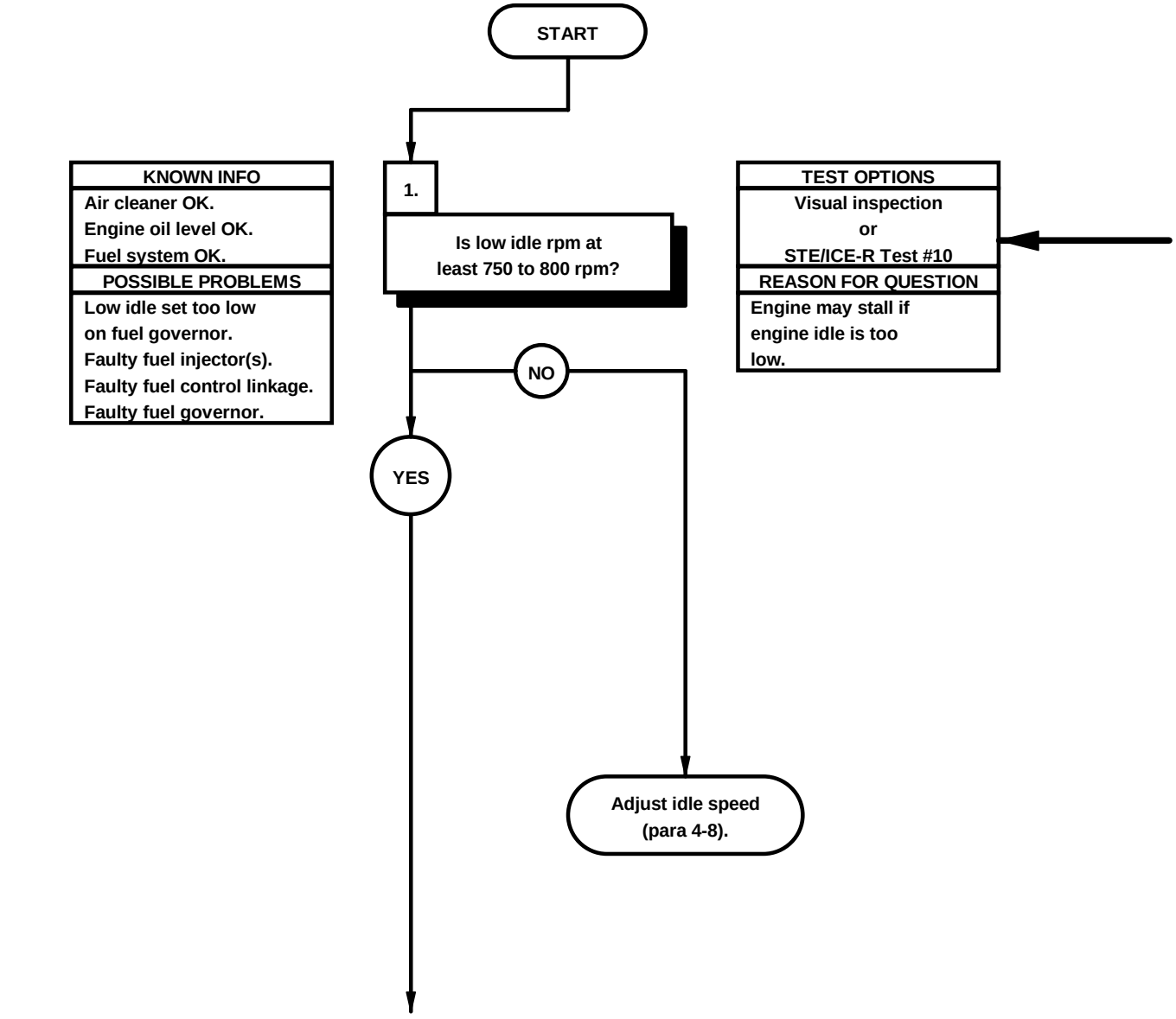
INITIAL SETUP

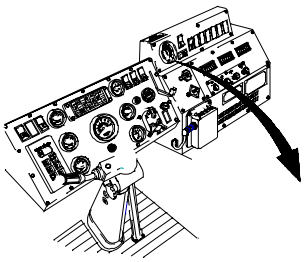
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).

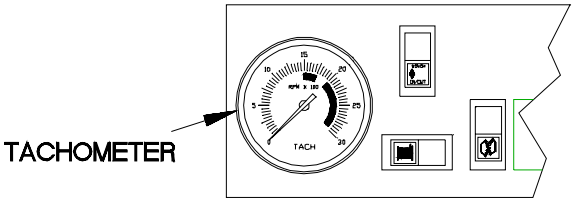
References
TM 9-4910-571-12&P

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



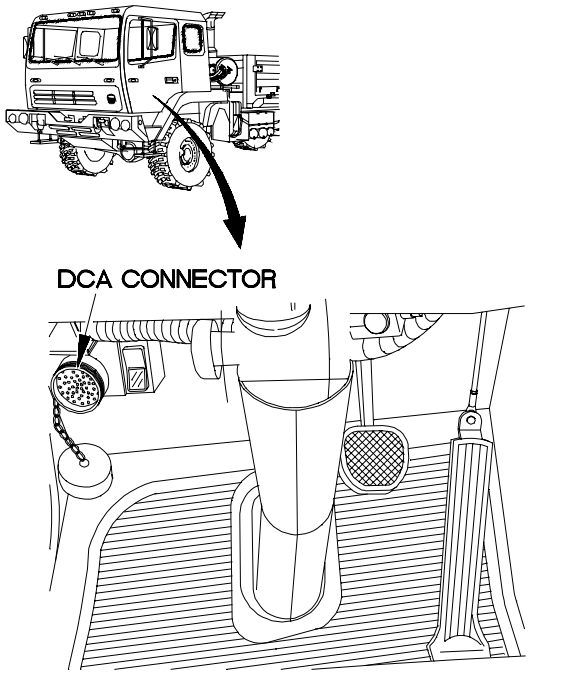




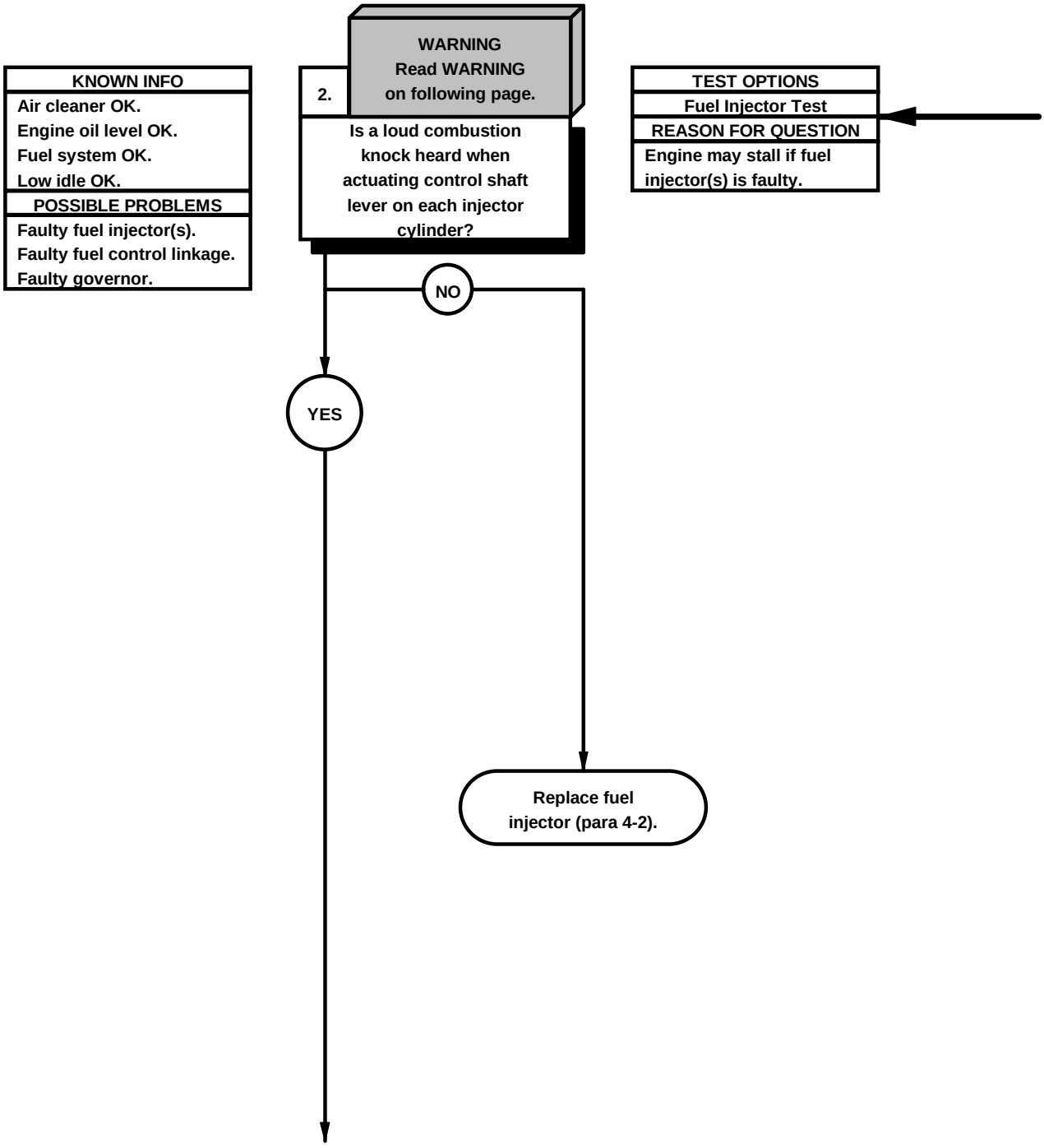
(1) If equipped with tachometer, start engine (TM 9-2320-366-10-1). If not equipped with a tachometer, perform STE/ICE-R Test #10.
(2) Check low idle rpm, rpm should read between 750-800 rpm.
(3) Shut down engine (TM 9-2320-366-10-1).

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.



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.

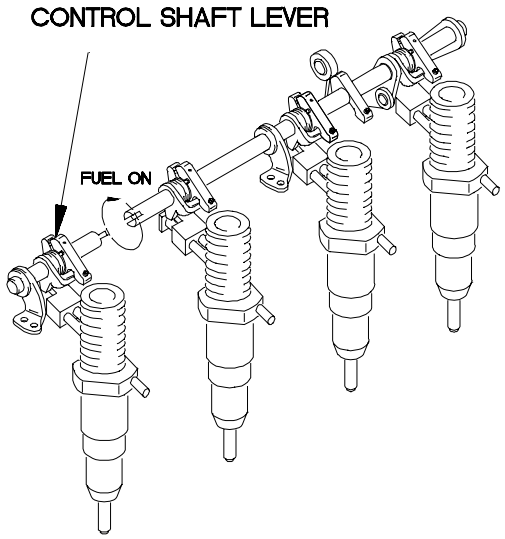
(7) Repeat step (5) for remaining injectors.

(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).



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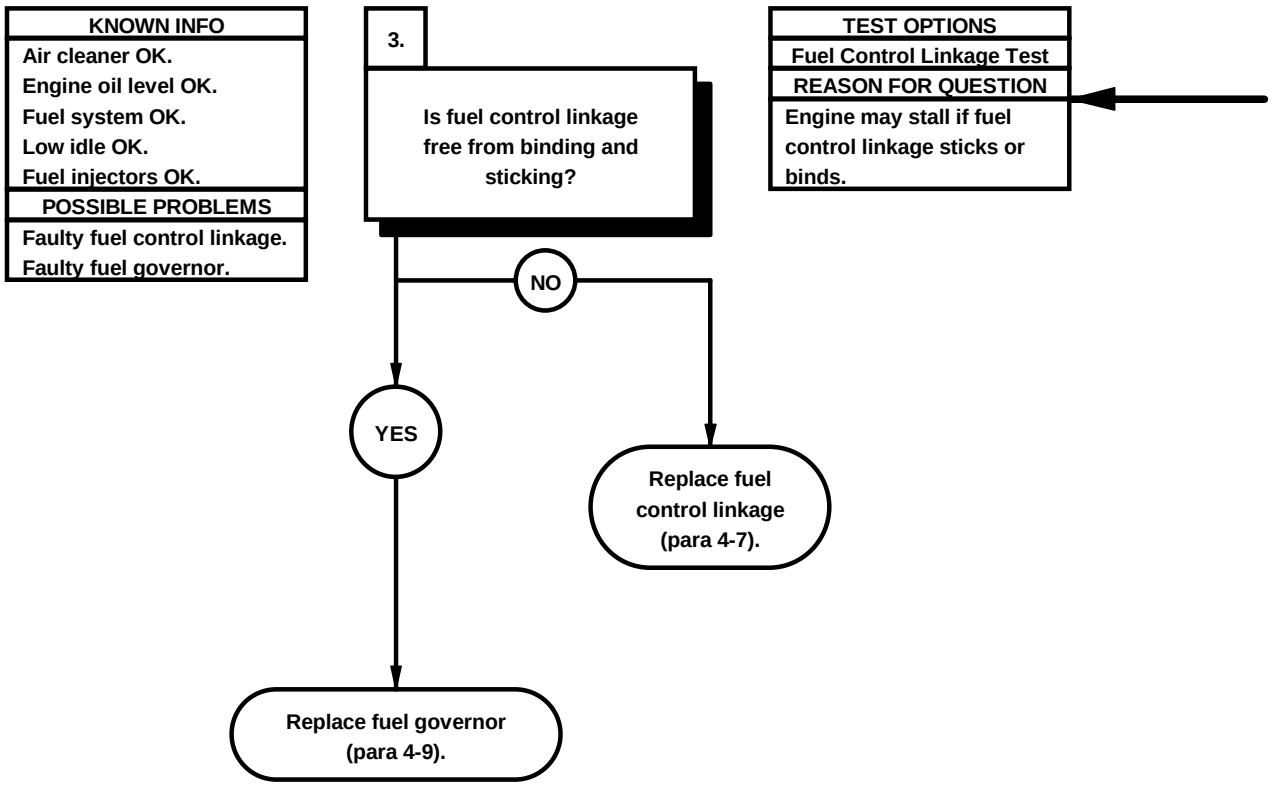
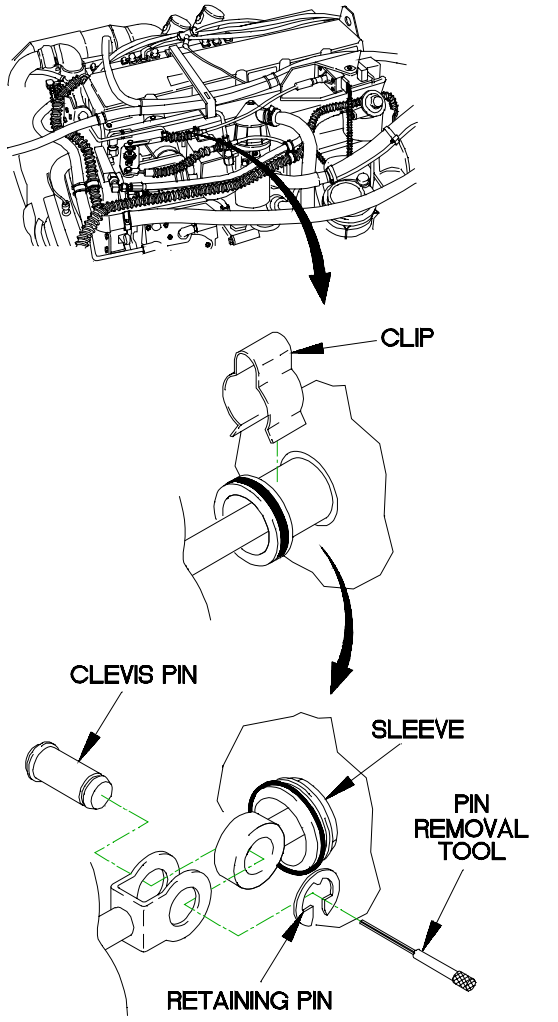
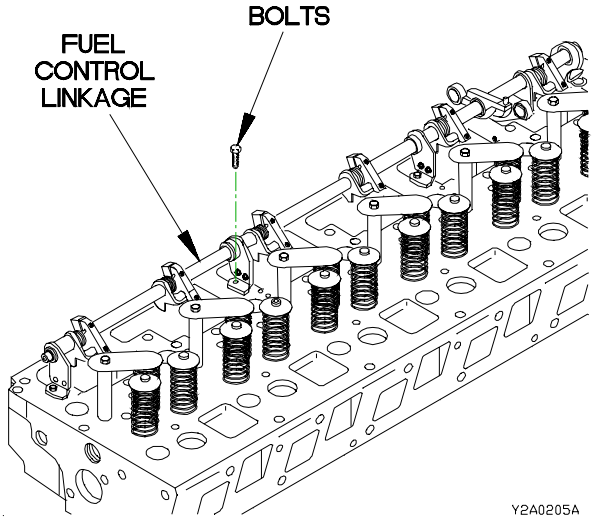
a2. ENGINE STALLS AT LOW RPM (CONT)



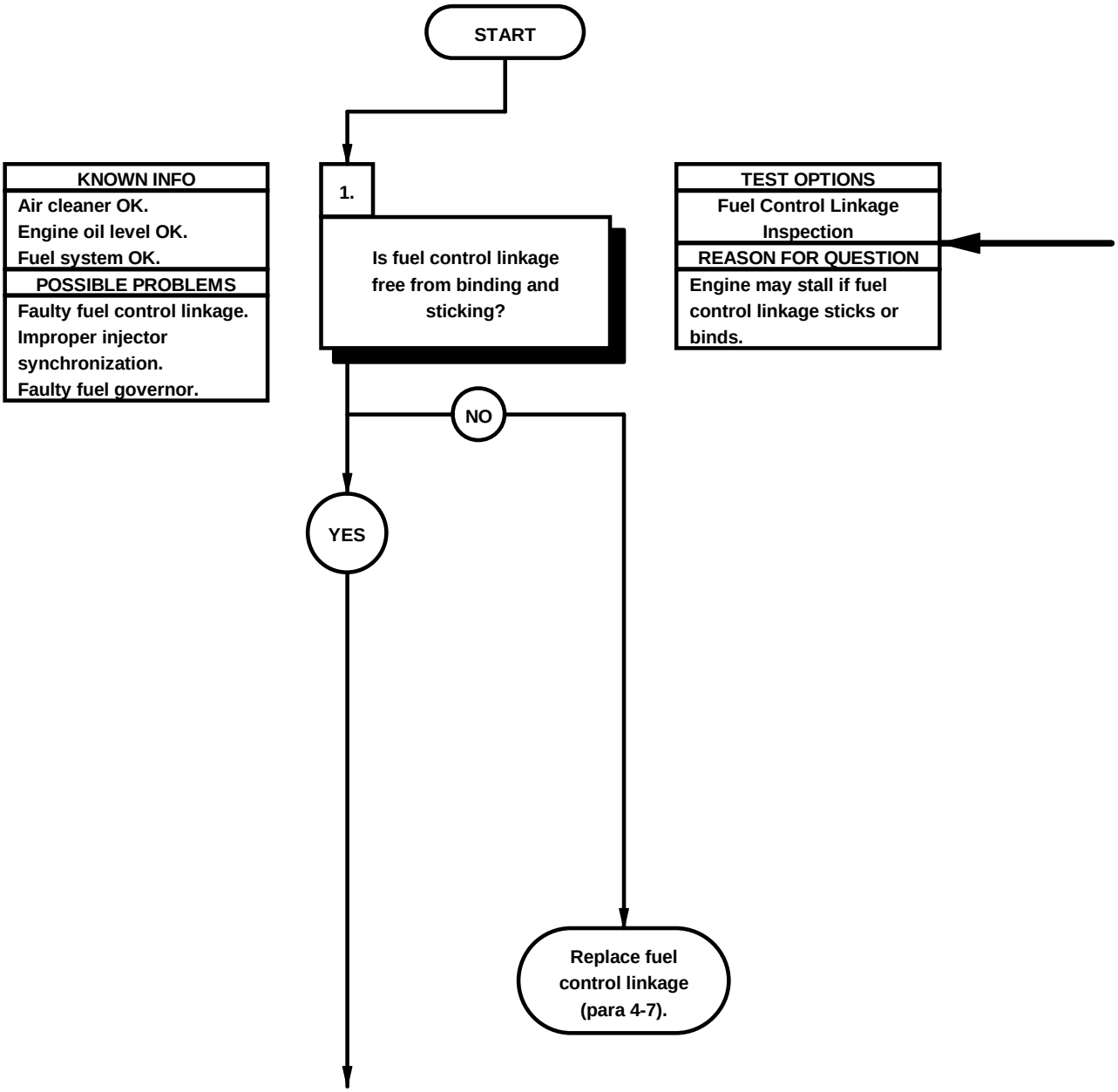
FUEL CONTROL LINKAGE TEST

(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).



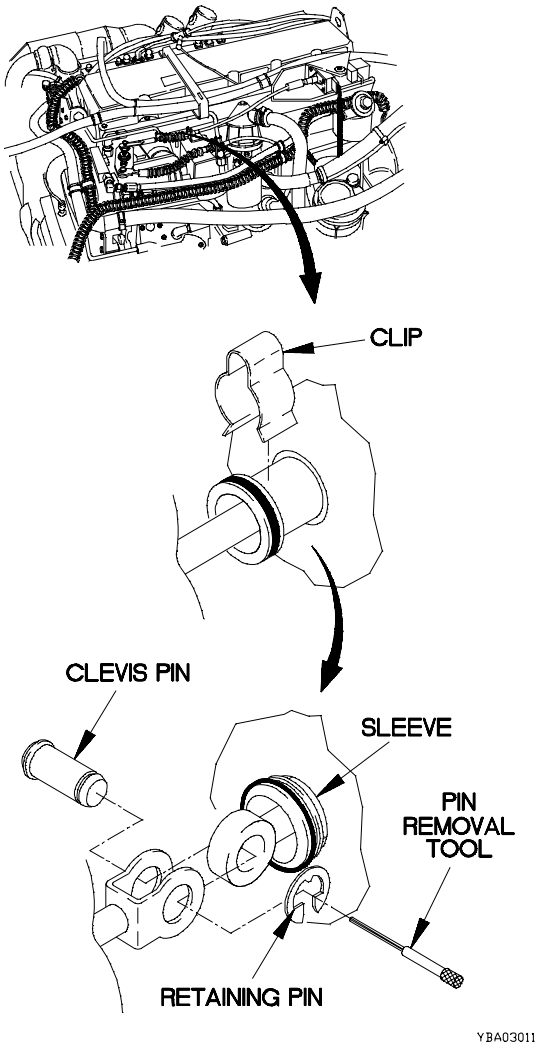


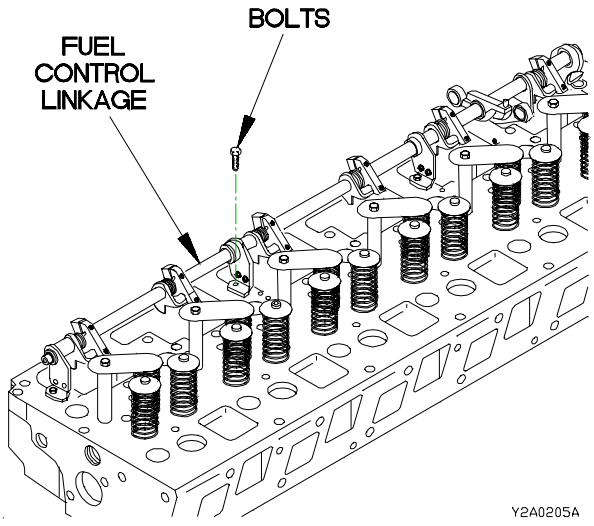
a3. ENGINE SPEED IS NOT STABLE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	**Tools and Special Tools** Tool Kit, Genl Mech (Item 78, Appendix B) Tool Kit, Intl Comb Eng (TM 9-2320-366-20) Wrench, Torque, 0-60 N·m (Item 96, Appendix B)



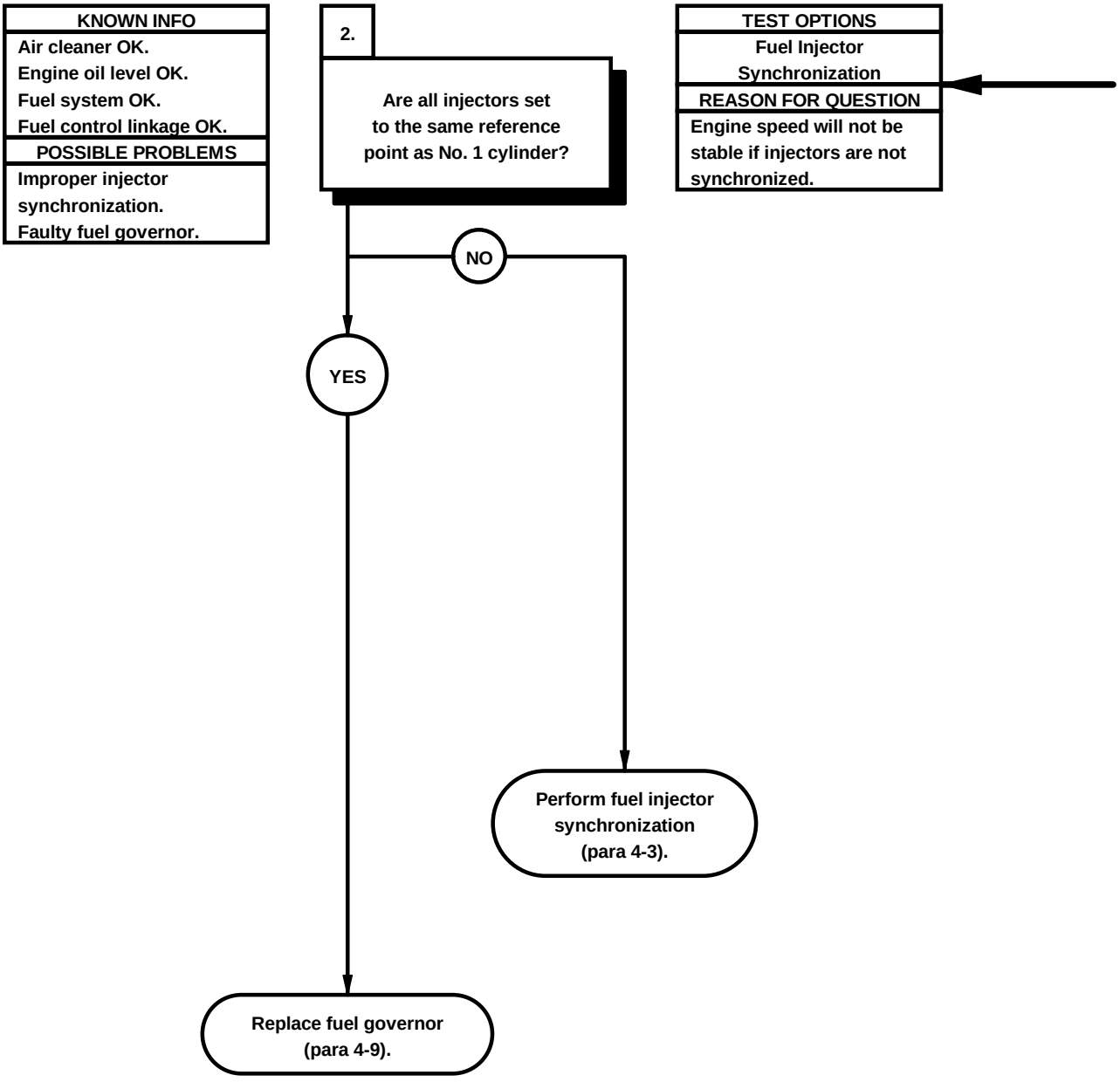
FUEL CONTROL LINKAGE TEST

(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).



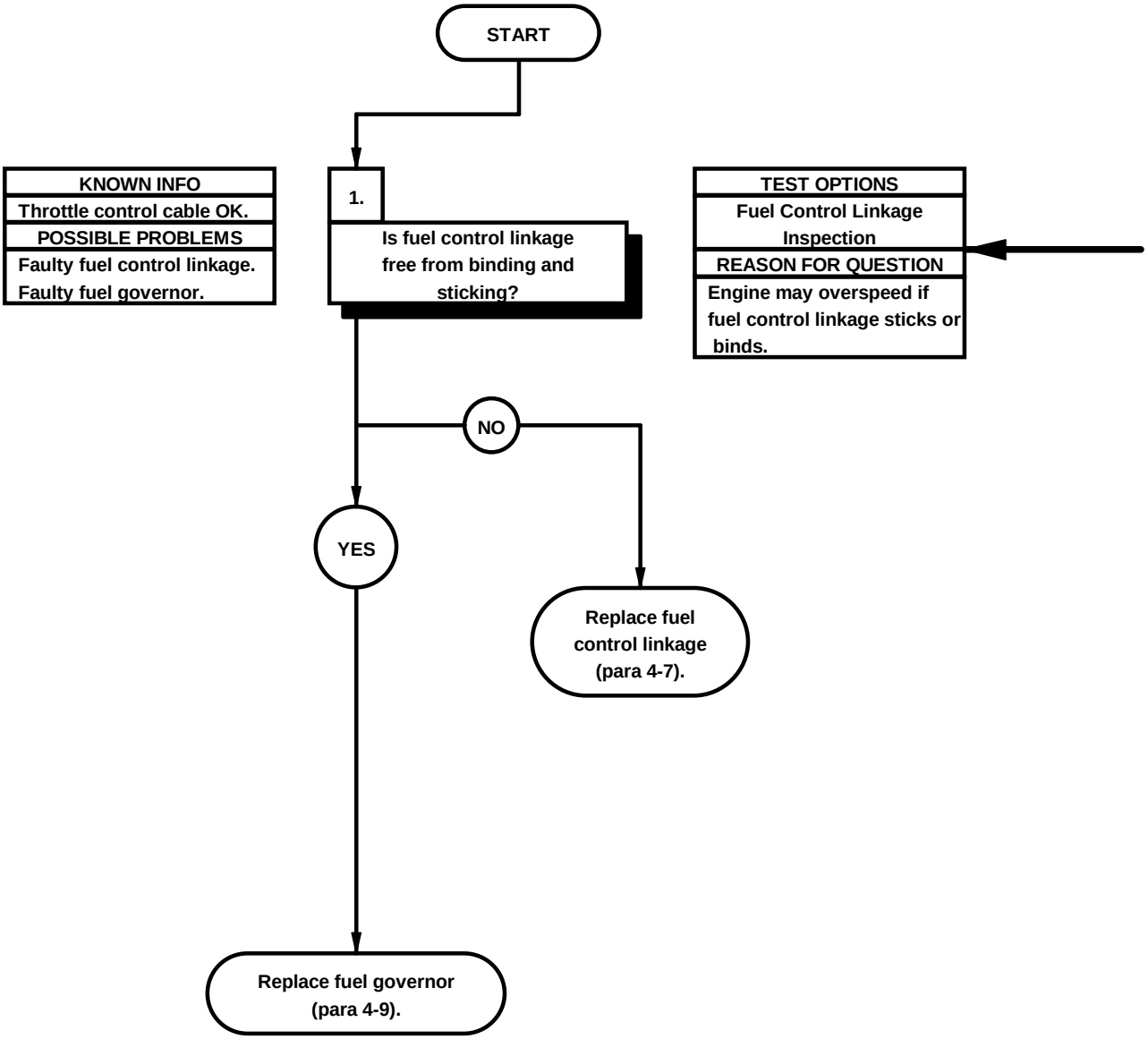


a3. ENGINE SPEED IS NOT STABLE (CONT)



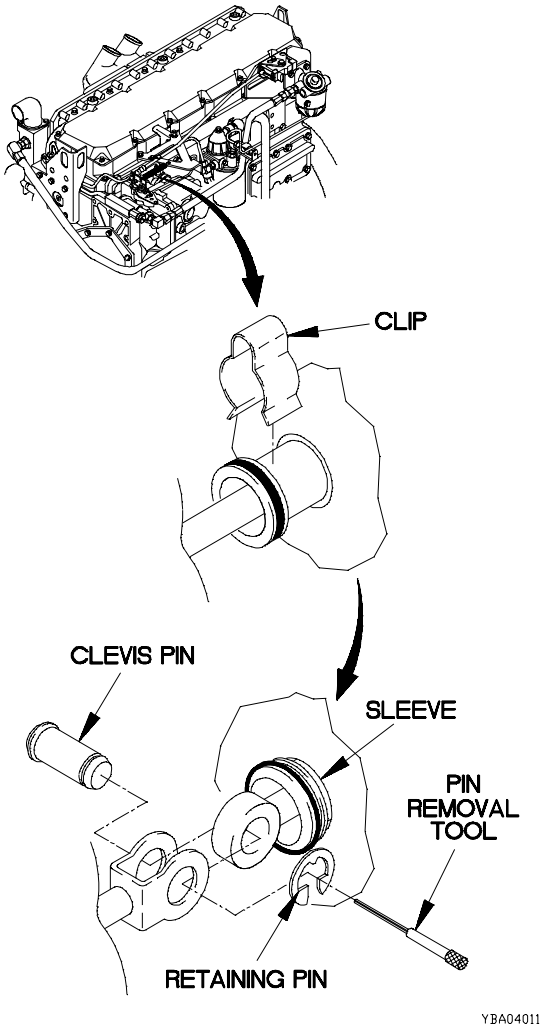
Perform fuel injector sychronization (para 4-3).

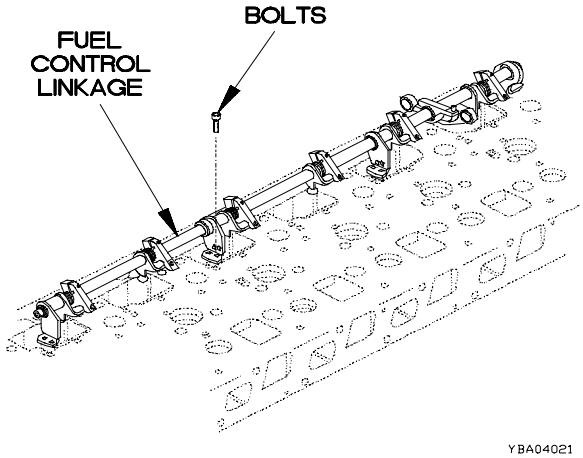
a4. ENGINE OVERSPEEDS ON START	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	**Tools and Special Tools** Tool Kit, Genl Mech (Item 78, Appendix B) Tool Kit, Intl Comb Eng (TM 9-2320-366-20) Wrench, Torque, 0-60 N·m (Item 96, Appendix B)



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).



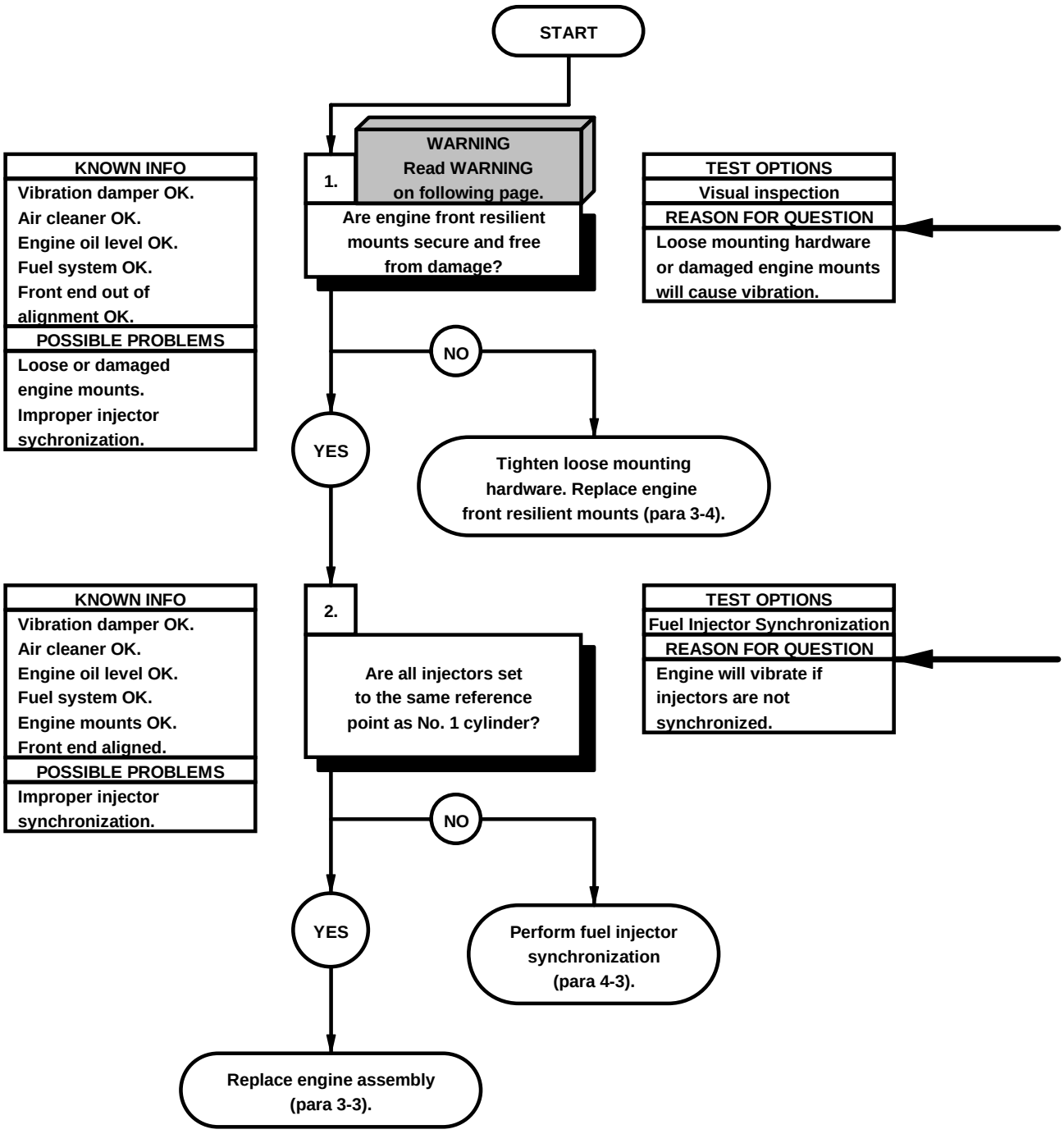


a5. TOO MUCH VIBRATION IN ENGINE

INITIAL SETUP

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

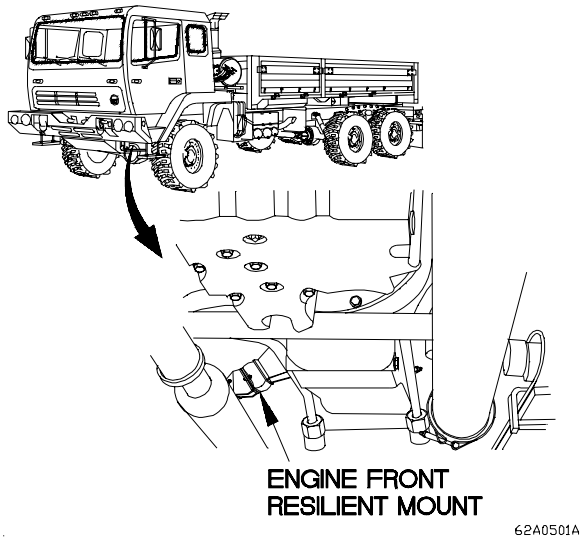
Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Tool Kit, Intl Comb Eng (TM 9-2320-366-20)
Wrench, Torque, 0-60 N·m (Item96, Appendix B)



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).



NOTE

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

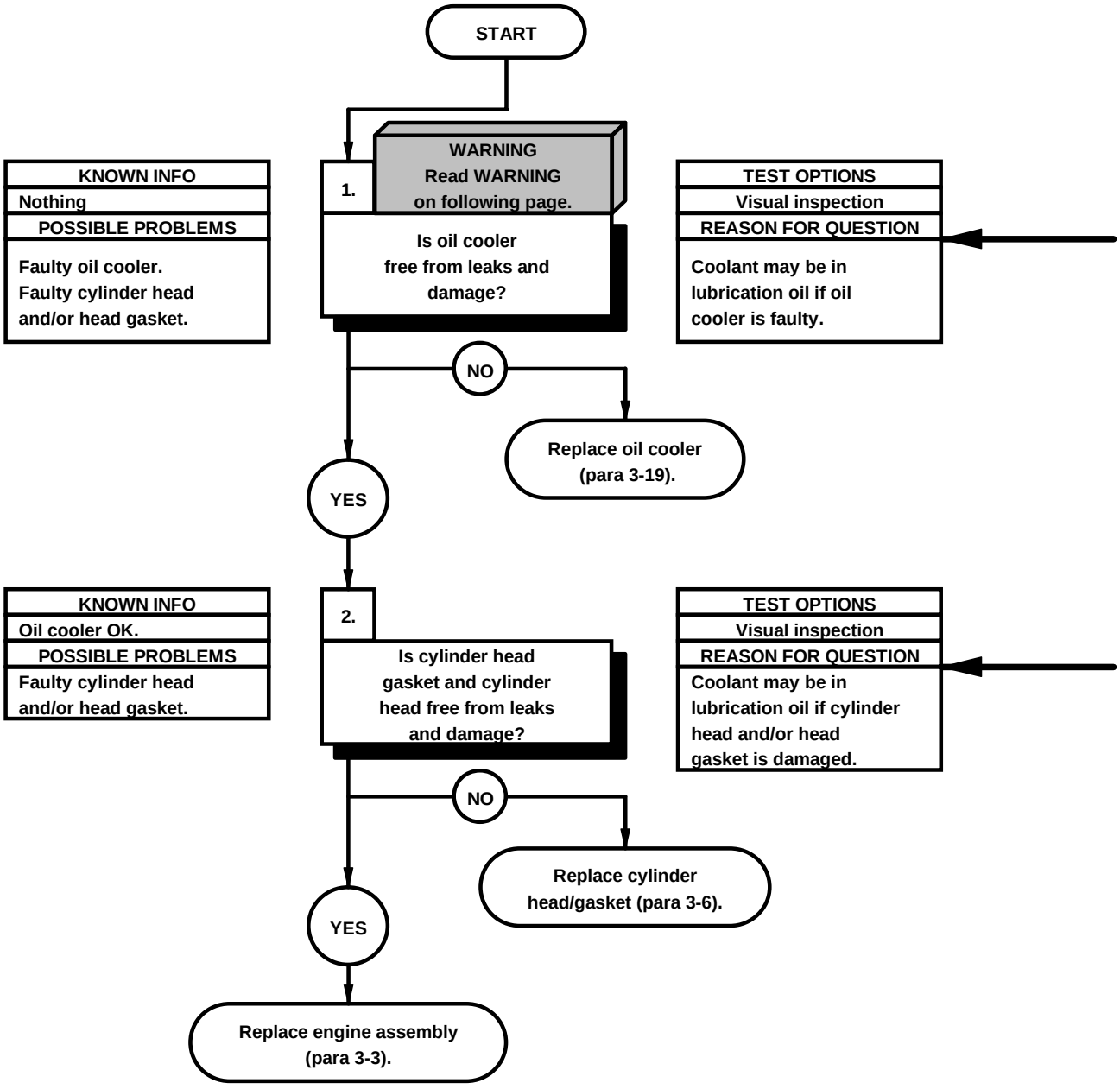
Perform fuel injector sychronization (para 4-3).

a6. COOLANT IN ENGINE OIL

INITIAL SETUP

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

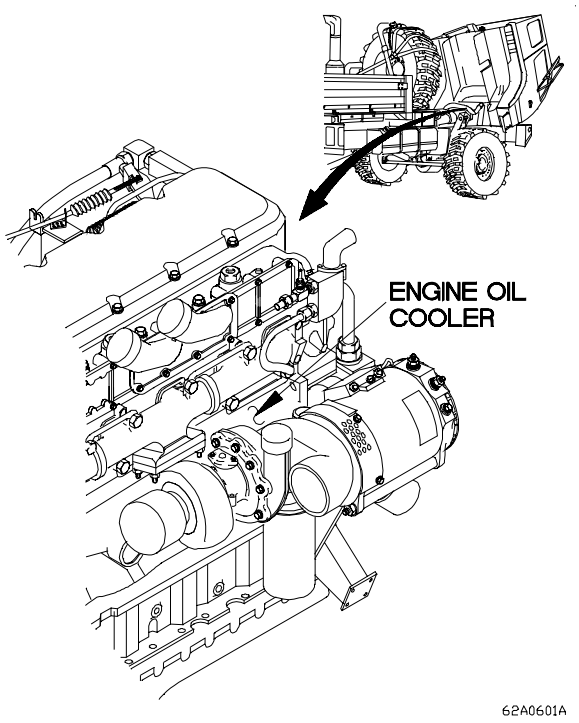
Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)



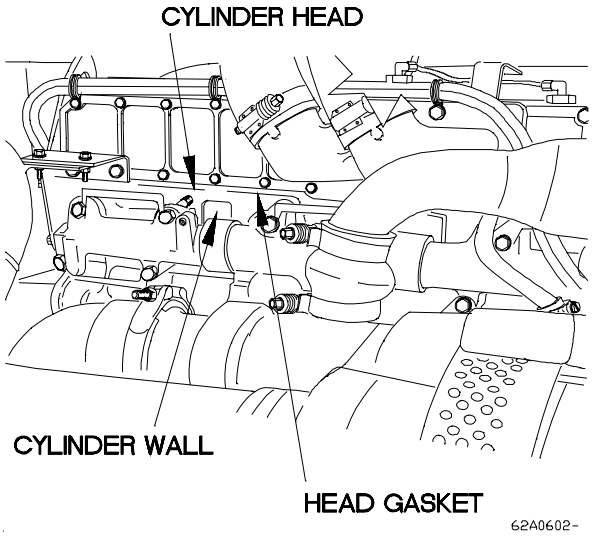
WARNING

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.



(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).



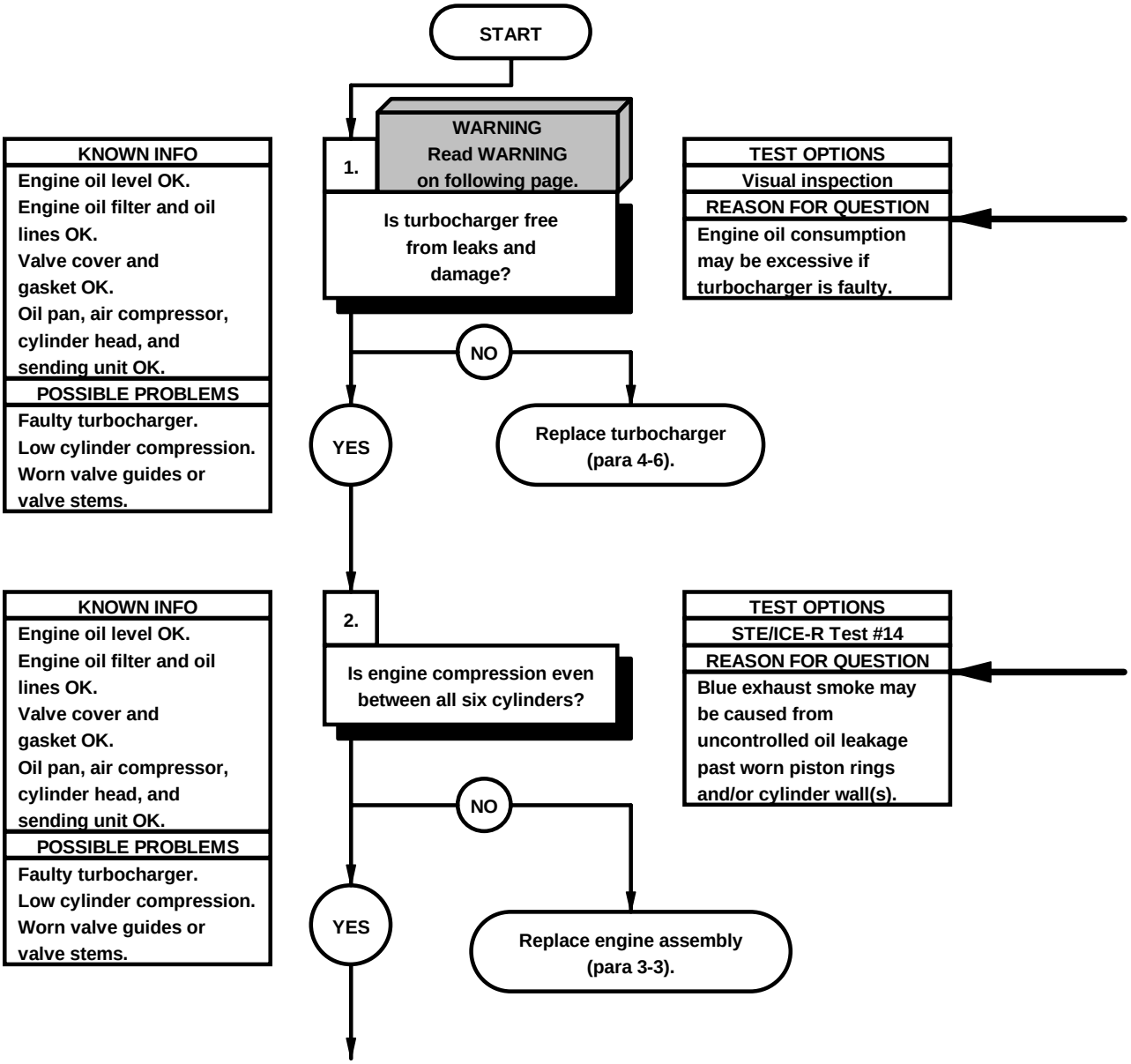
a7. EXCESSIVE ENGINE OIL CONSUMPTION

INITIAL SETUP

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

Reference
TM 9-491-571-12&P

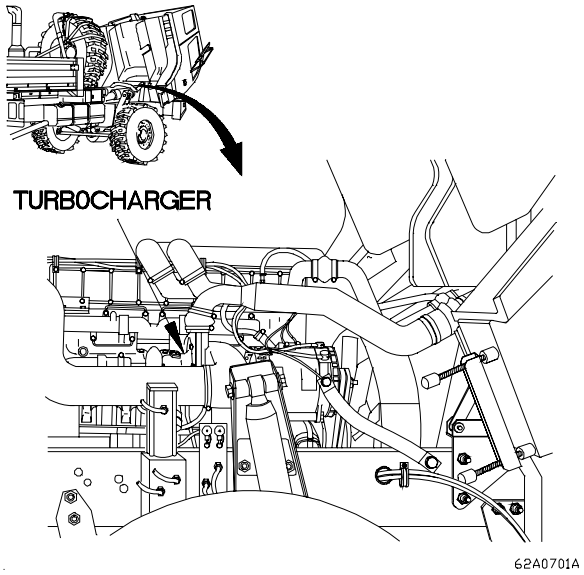
Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
STE/ICE-R (Item 70, Appendix B)
Goggles, Industrial (Item 28, Appendix B)



WARNING

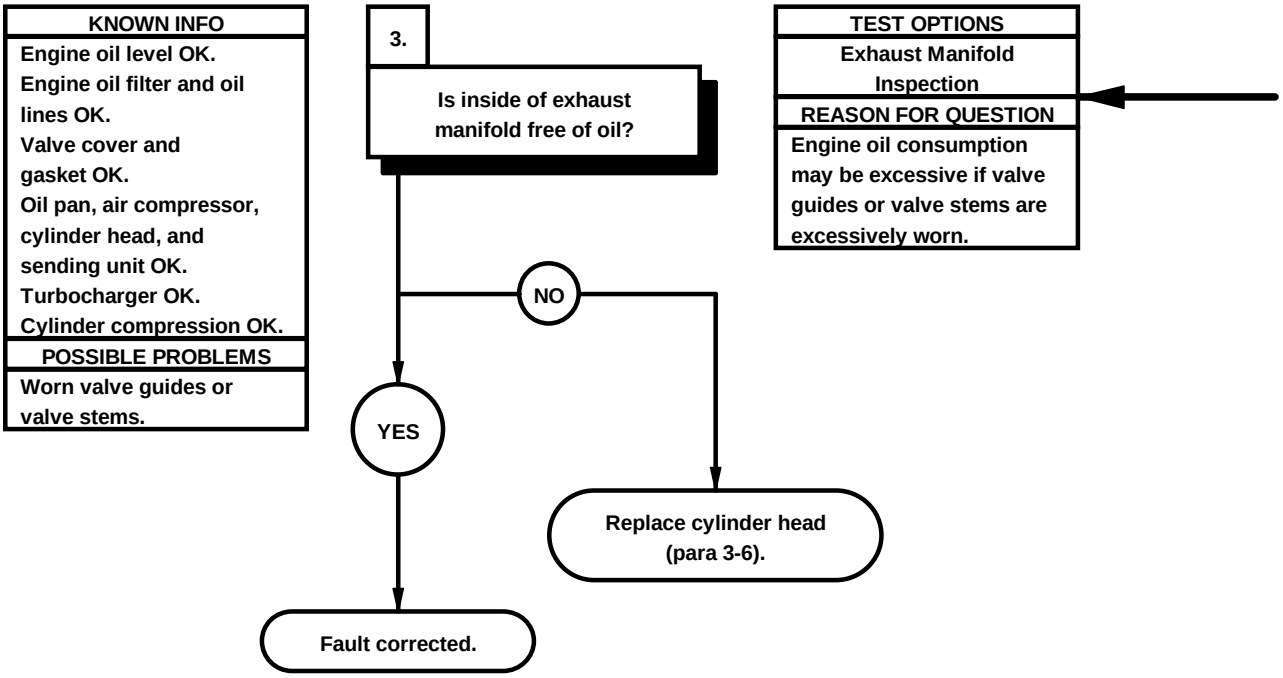
Ensure engine is cool before performing troubleshooting. Failure to comply may result in severe burns.

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

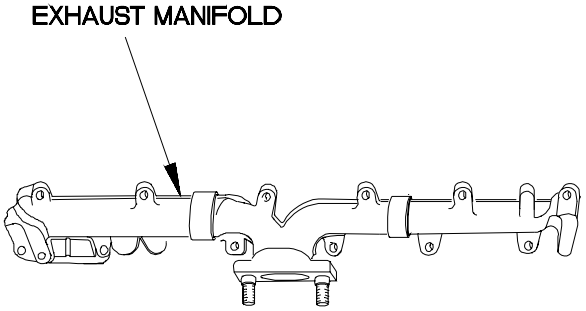


Perform STE/ICE-R test #14.

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).



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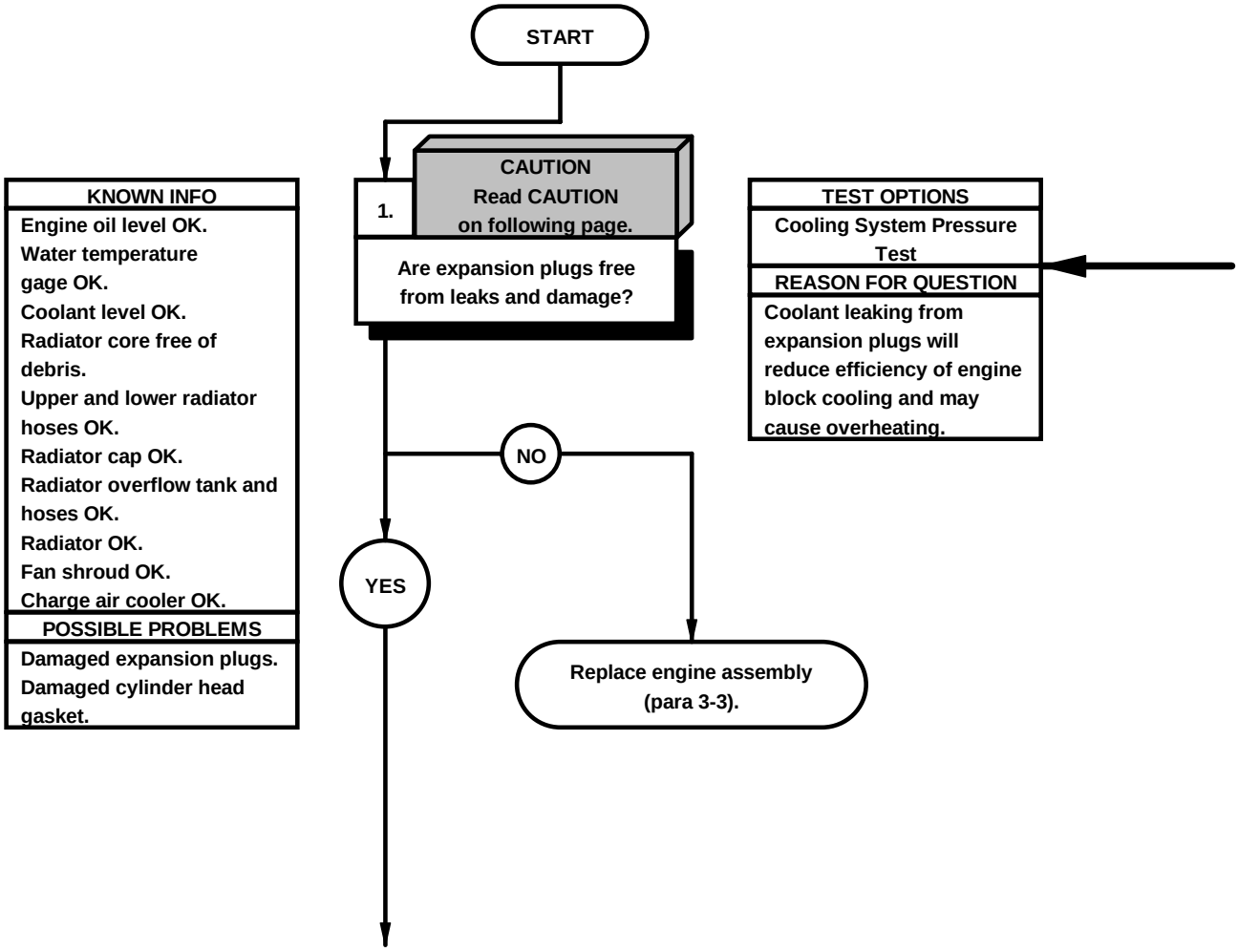
a8. ENGINE OVERHEATS

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)



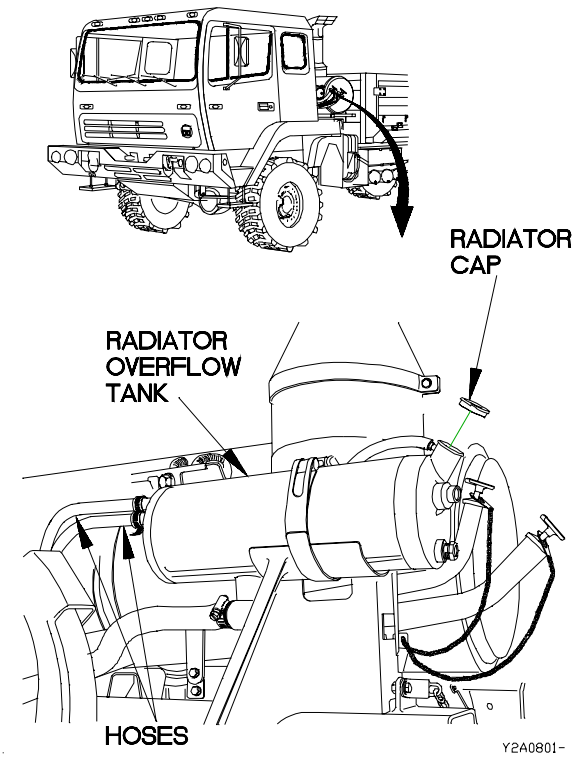
COOLING SYSTEM PRESSURE TEST

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

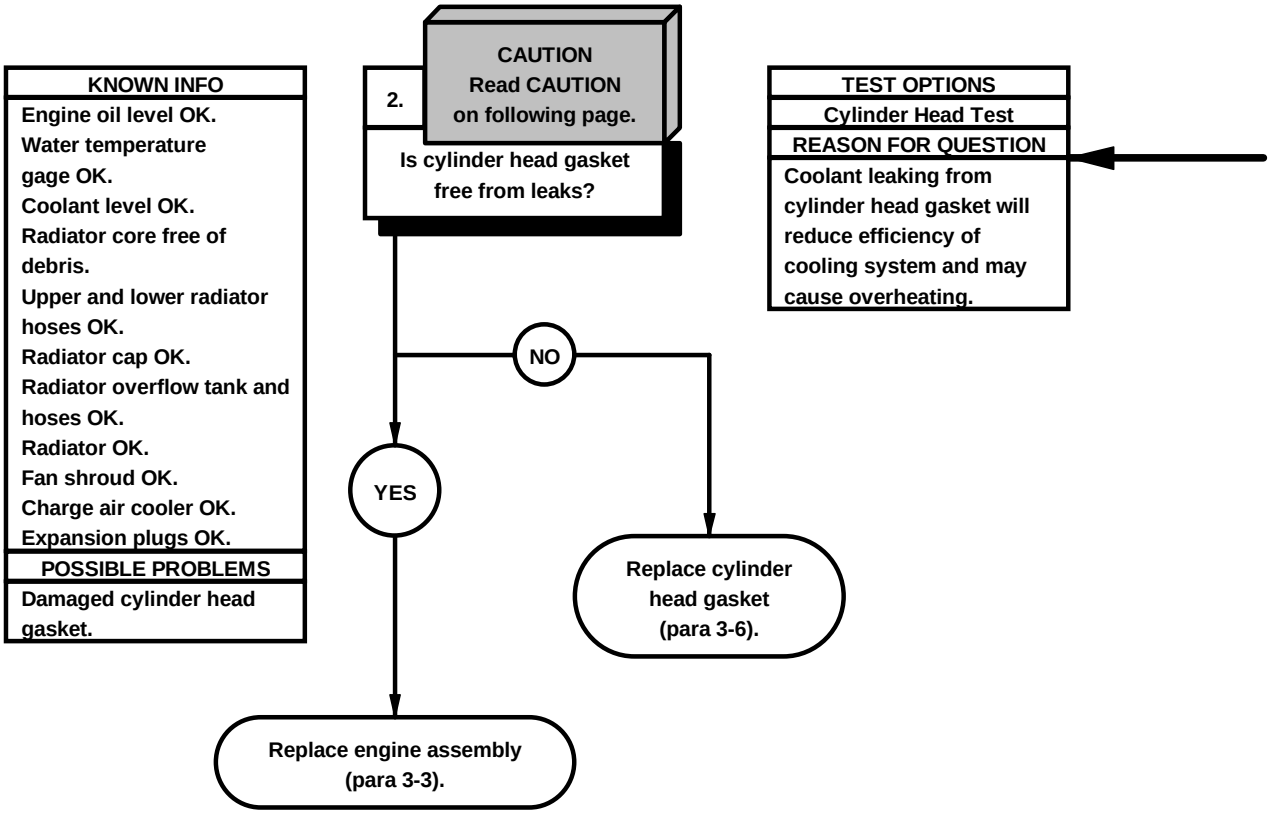
CAUTION

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.



a8. ENGINE OVERHEATS (CONT)



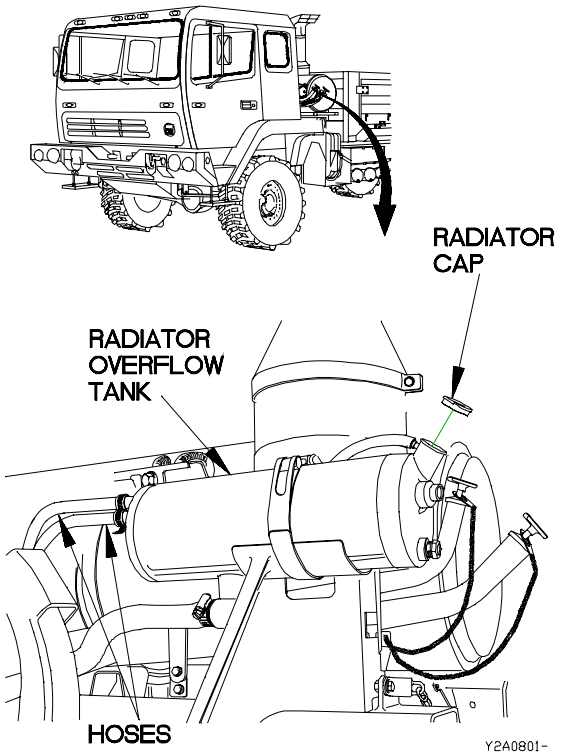
COOLING SYSTEM PRESSURE TEST

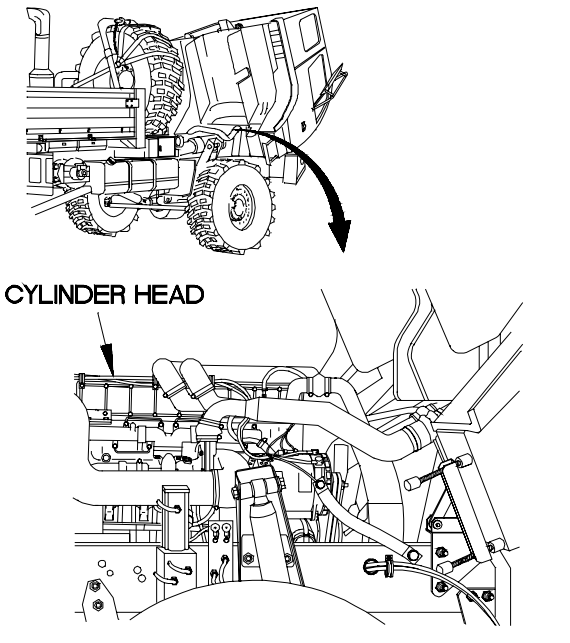
(1) Remove radiator cap from radiator overflow tank.
(2) Install adapter on radiator overflow tank.
(3) Install pressure tester on adapter.

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).





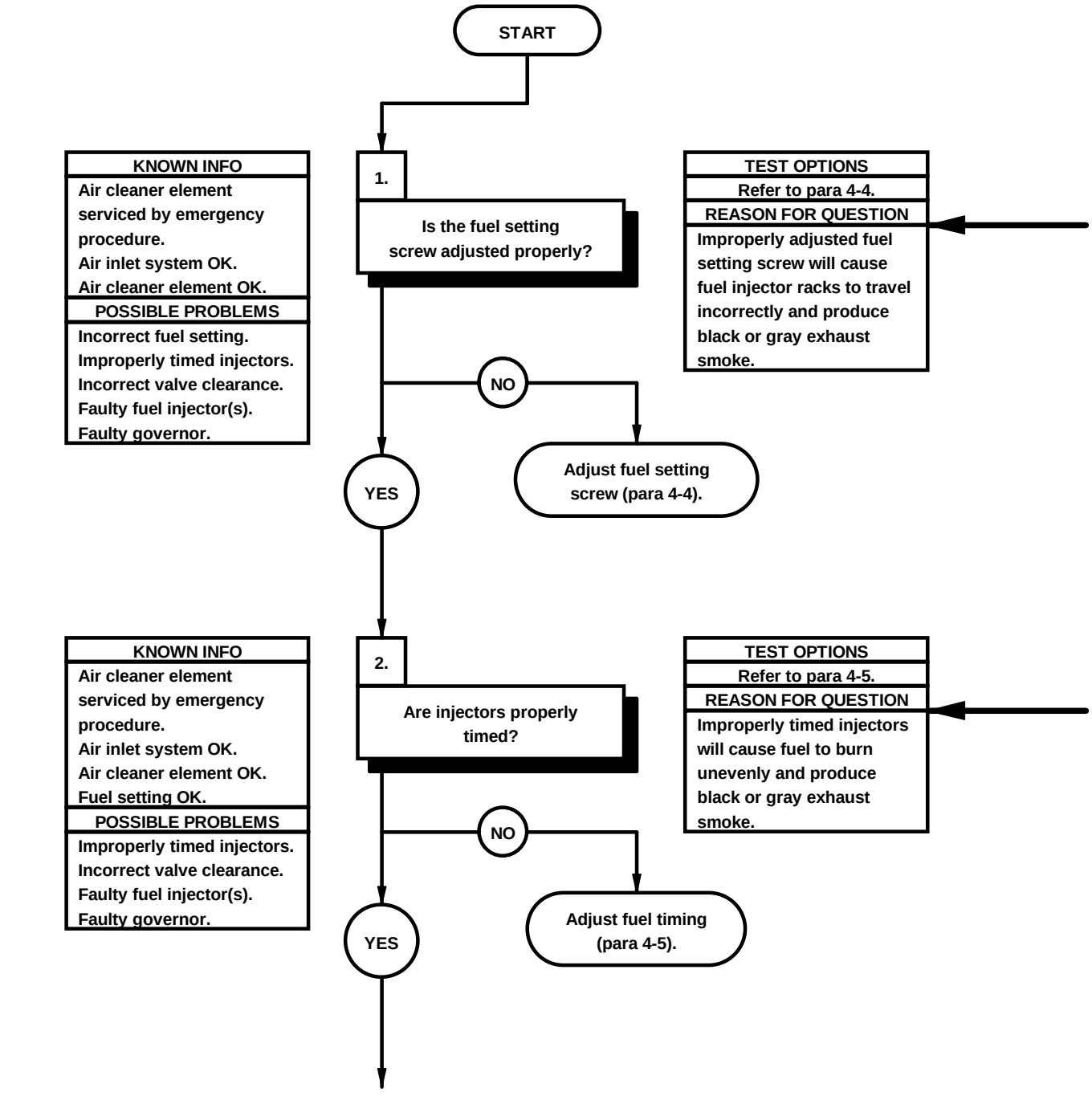
a9. EXCESSIVE BLACK OR GRAY EXHAUST SMOKE FROM ENGINE

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)

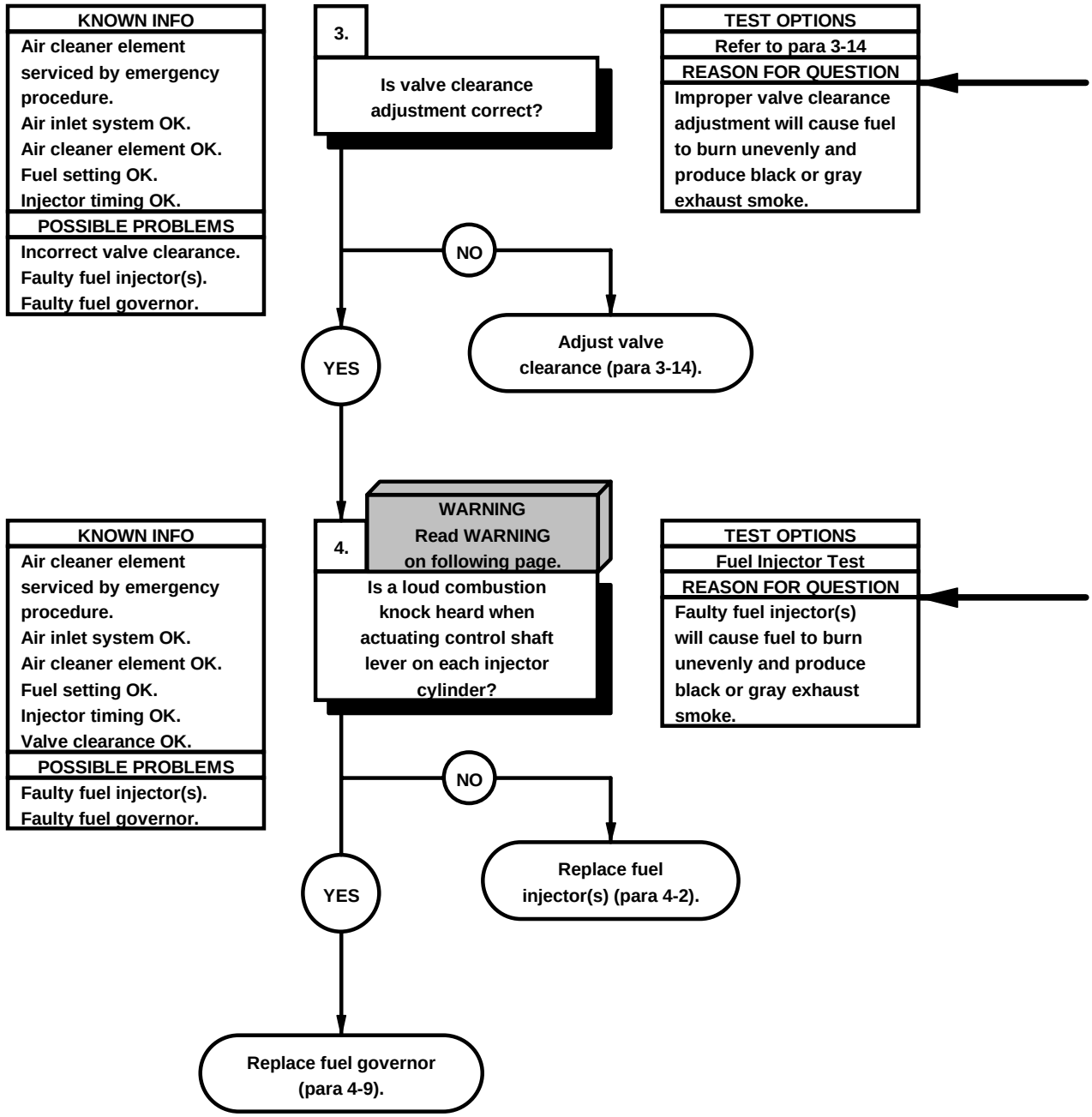
Personnel Required
- (2)



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

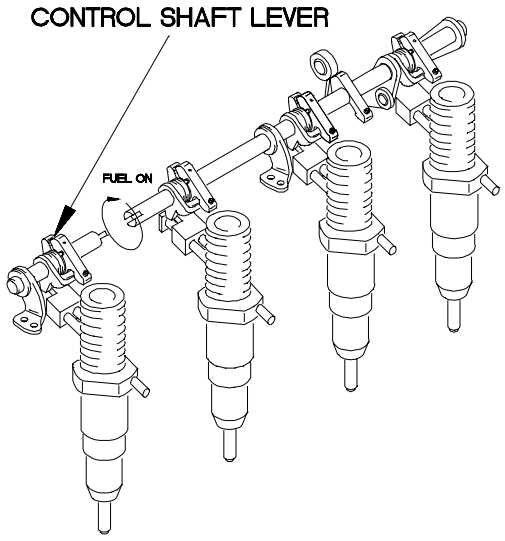
Use extreme care when opening cab door with cab raised. Failure to comply may cause injury to personnel or damage to equipment.

(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).



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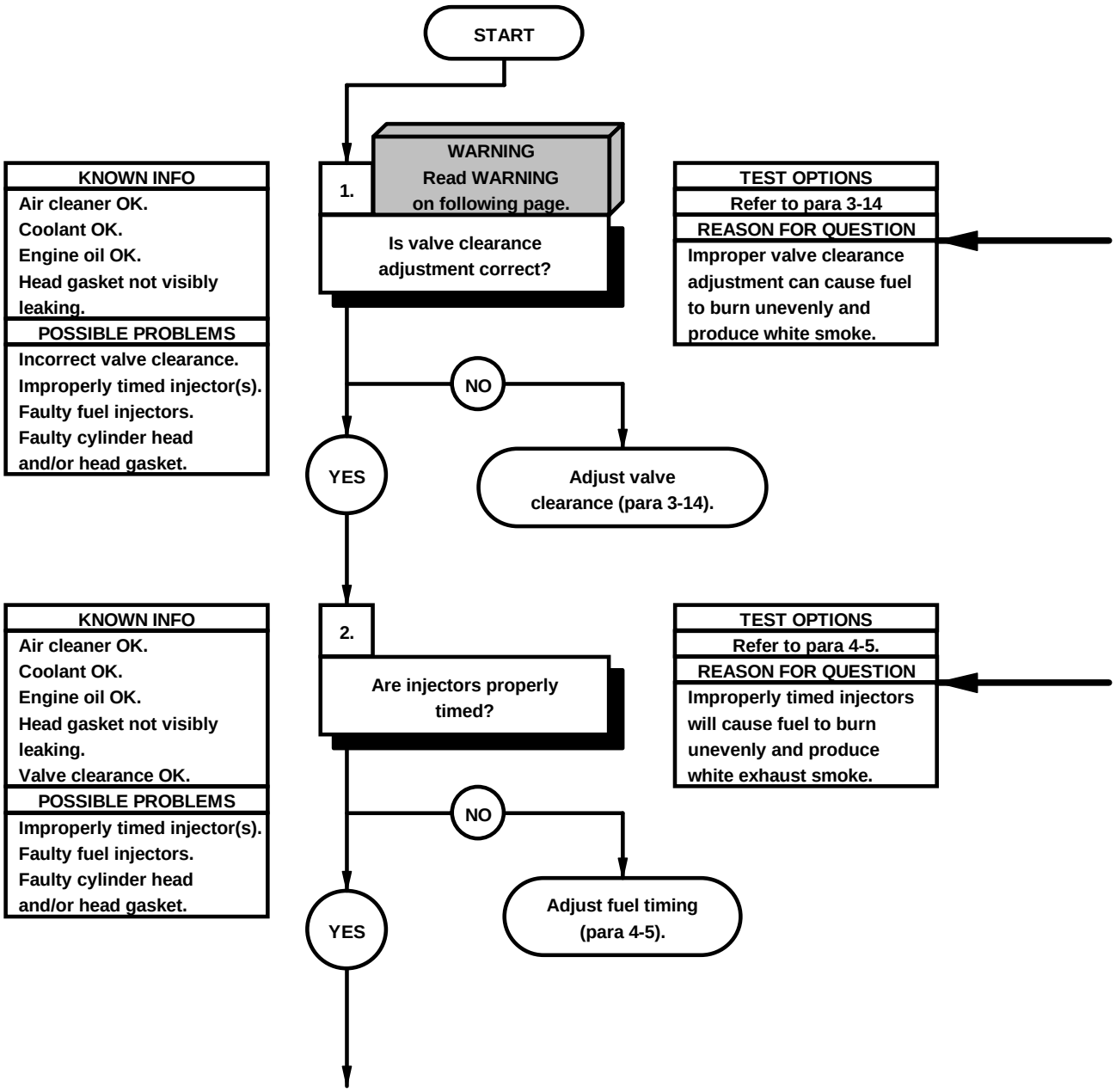
a10. WHITE EXHAUST SMOKE FROM ENGINE

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)



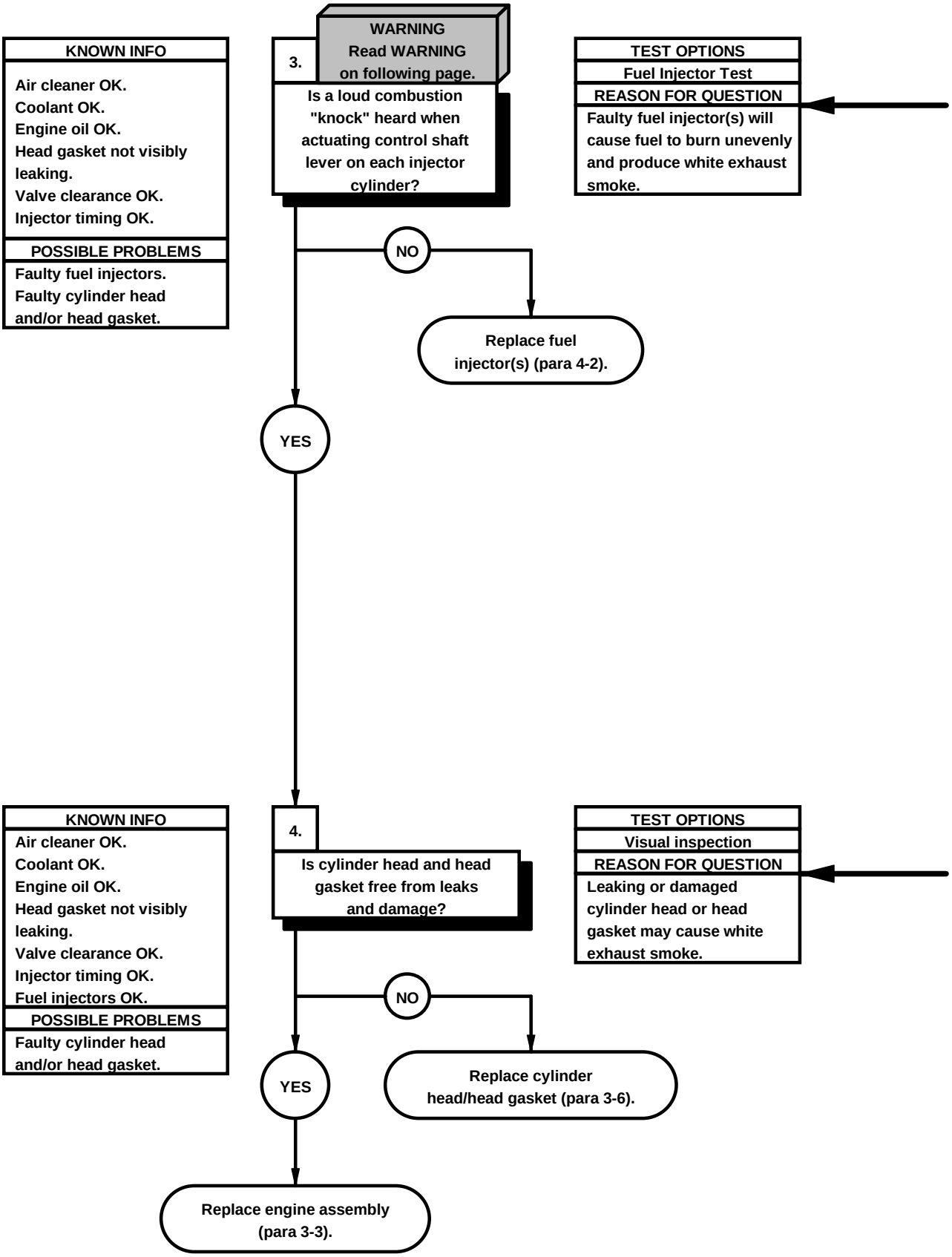
WARNING

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

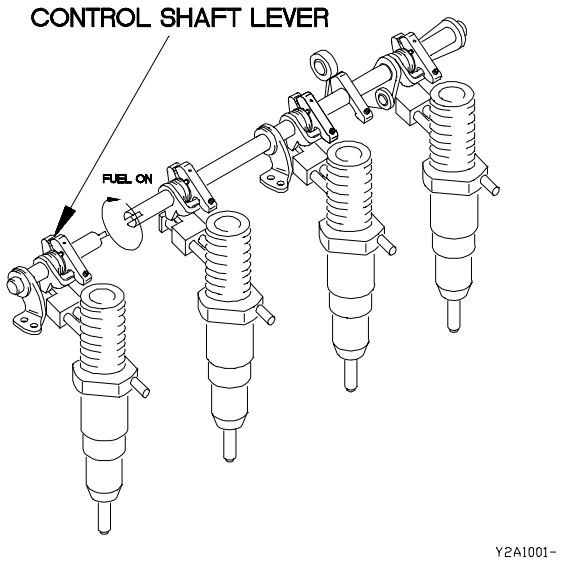
Use extreme care when opening cab door with cab raised. Failure to comply may cause injury to personnel or damage to equipment.

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

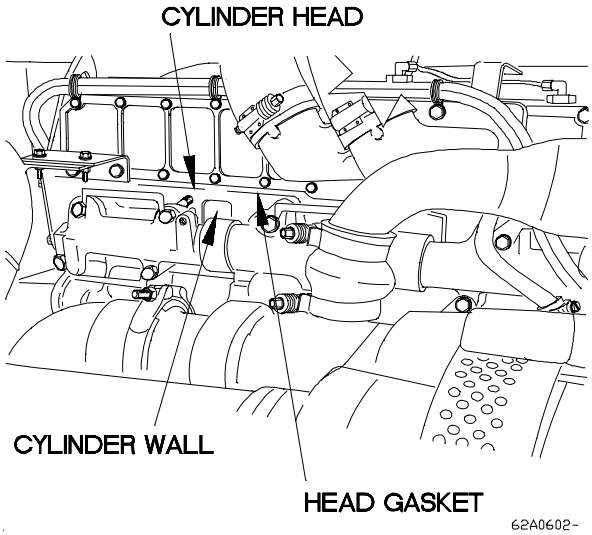
NOTE

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).



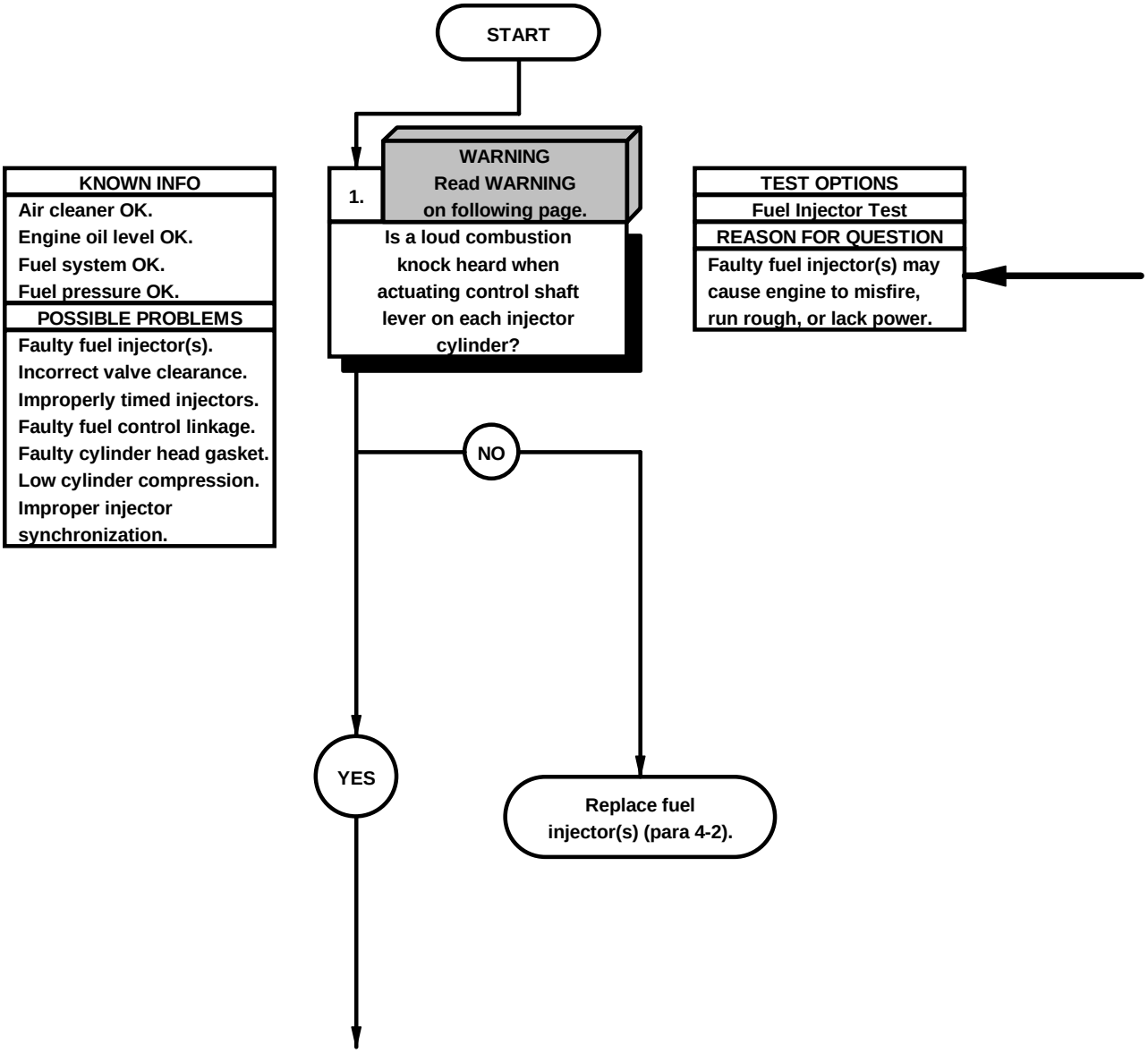
a11. ENGINE STARTS BUT MISFIRES, RUNS ROUGH, OR LACKS POWER

INITIAL SETUP

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

References
TM 9-4910-571-12&P

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)
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

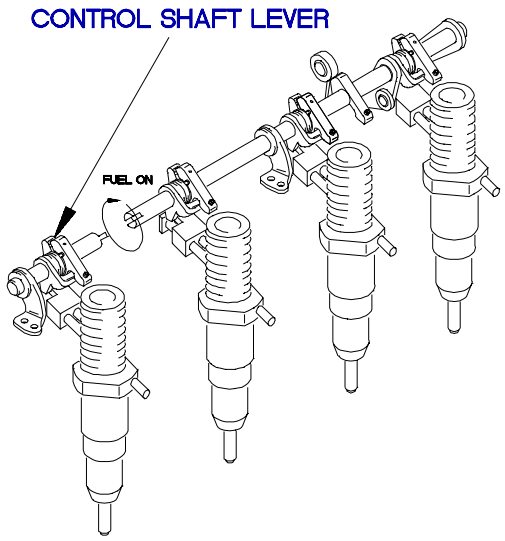
Use extreme care when opening cab door with cab raised. Failure to comply may cause injury to personnel or damage to equipment.

(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).



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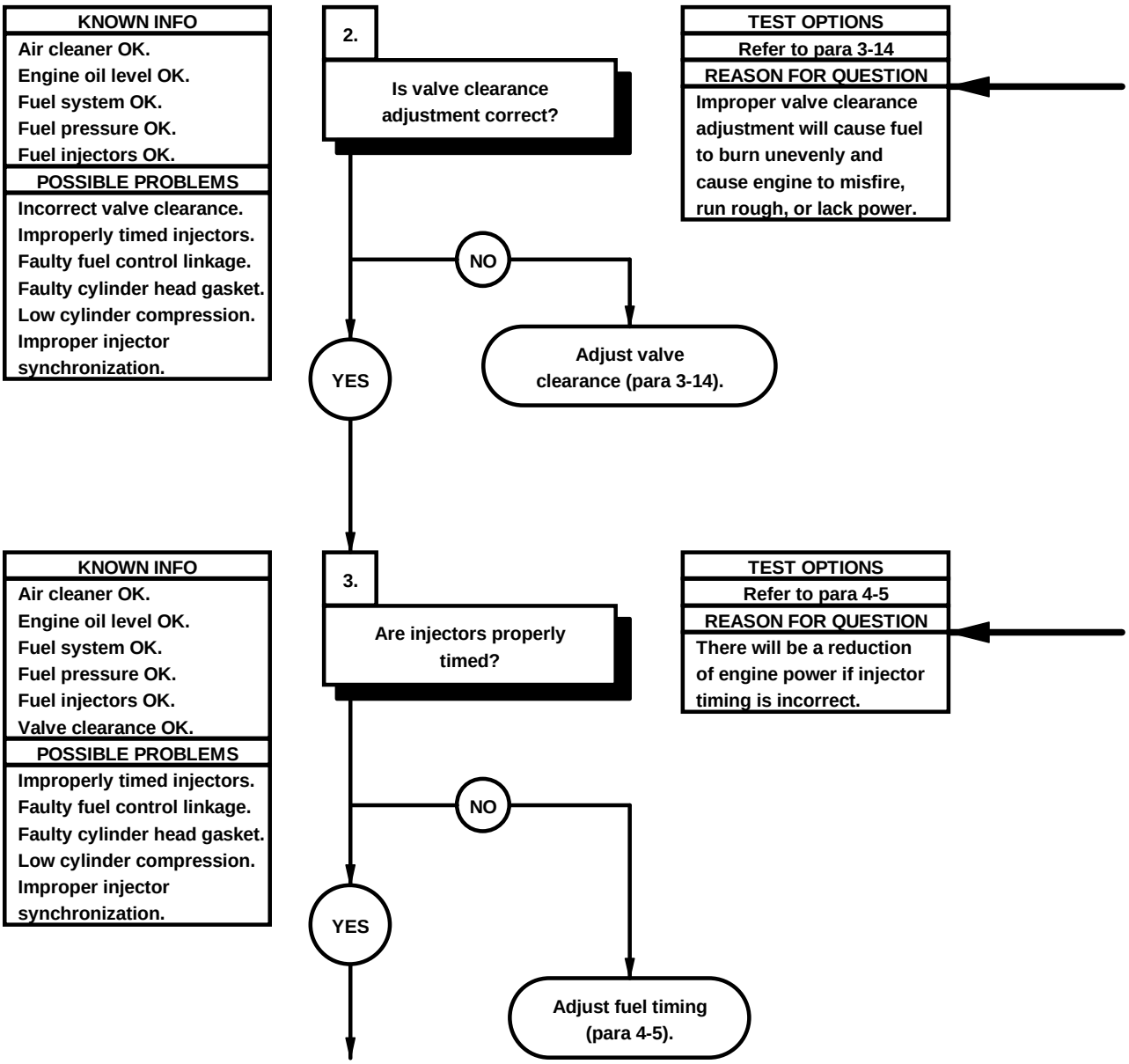
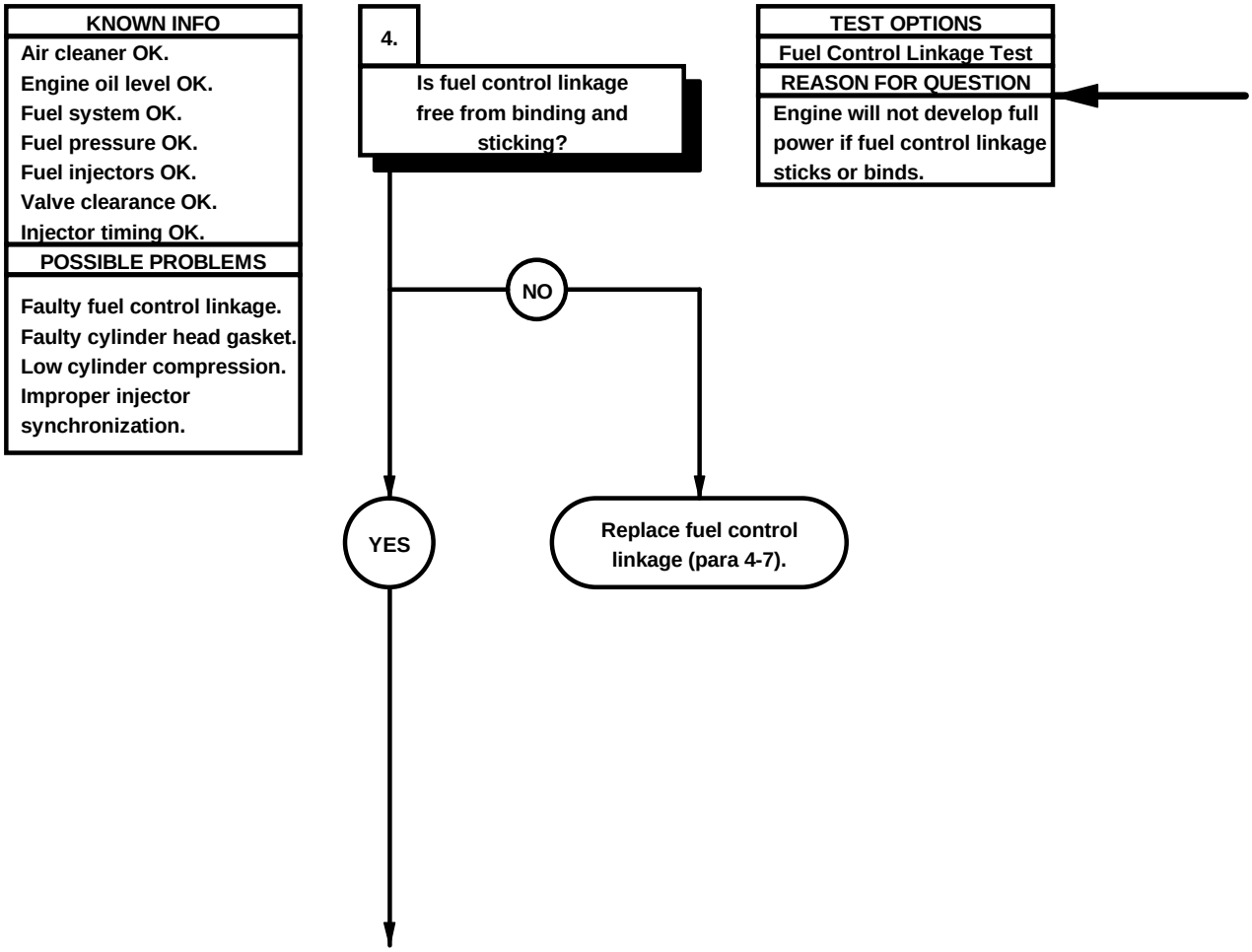
a11. ENGINE STARTS BUT MISFIRES, RUNS ROUGH, OR LACKS POWER (CONT)



Refer to para 3-14 to adjust valve clearance.

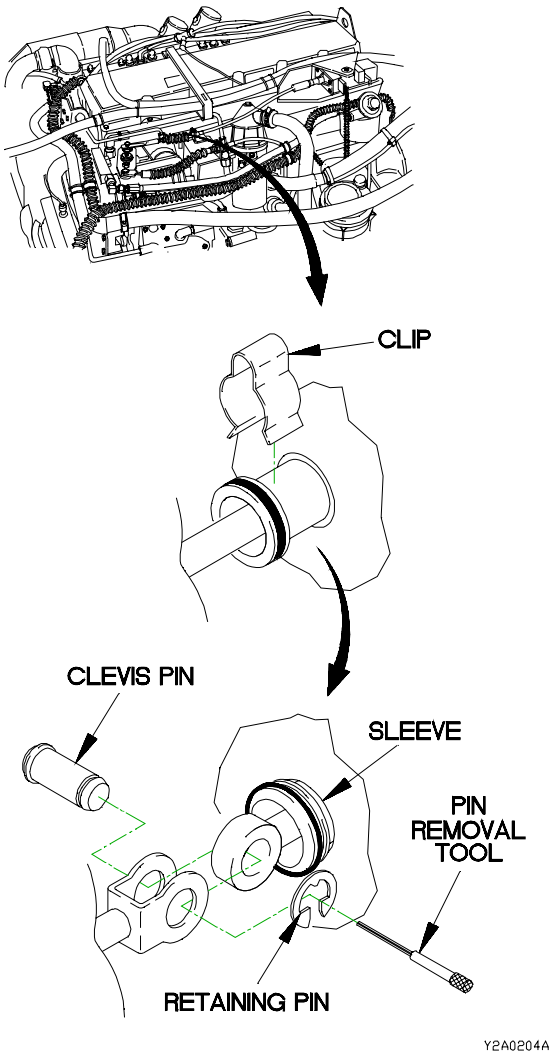
Refer to para 4-5 for fuel timing.

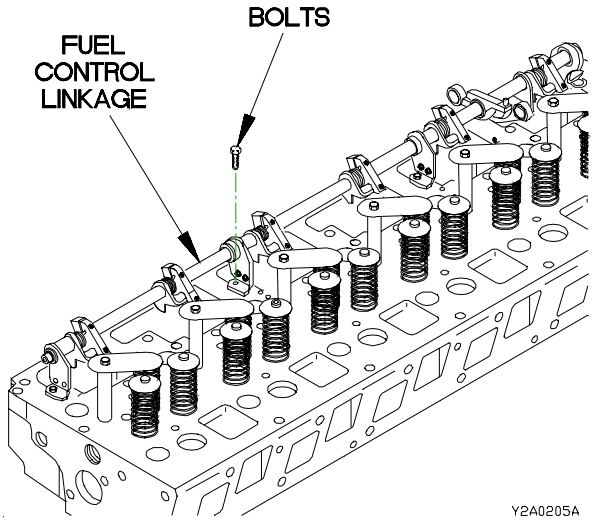
a11. ENGINE STARTS BUT MISFIRES, RUNS ROUGH, OR LACKS POWER (CONT)



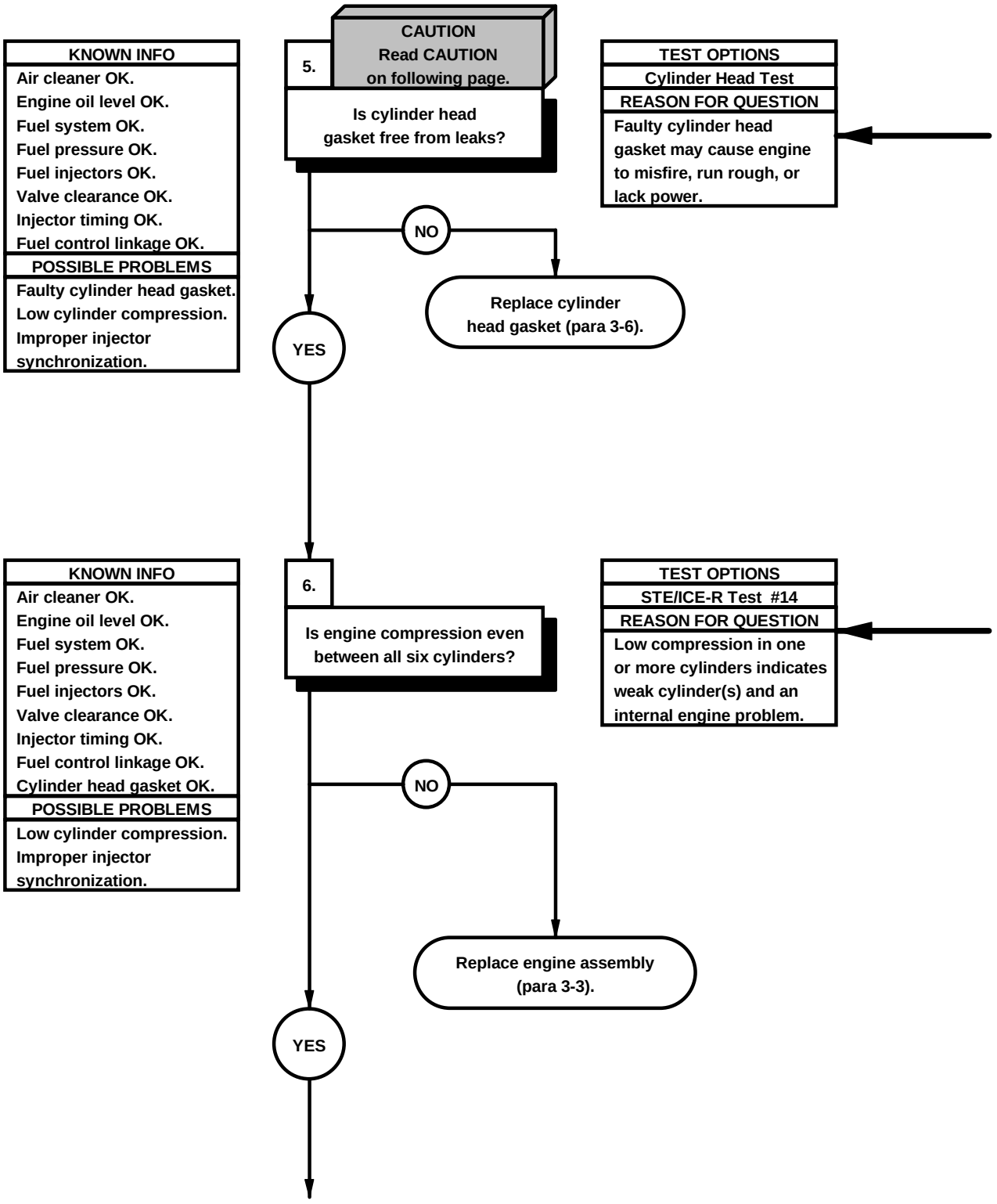
FUEL CONTROL LINKAGE TEST

(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).





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



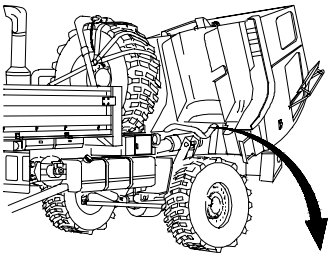
COOLING SYSTEM PRESSURE TEST

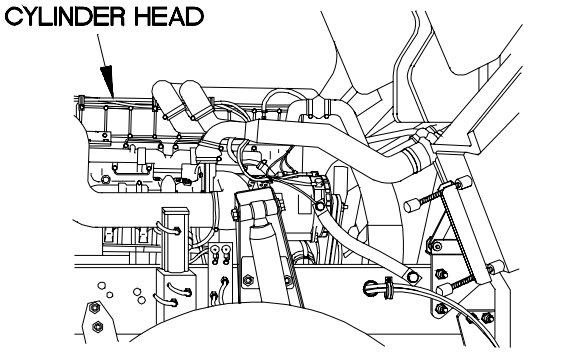
(1) Remove radiator cap from radiator overflow tank.
(2) Install adapter on radiator overflow tank.
(3) Install pressure tester on adapter.
(4) Raise cab (TM 9-2320-366-10-1).

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).





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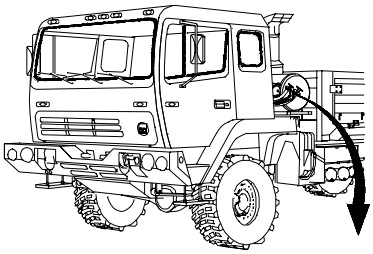
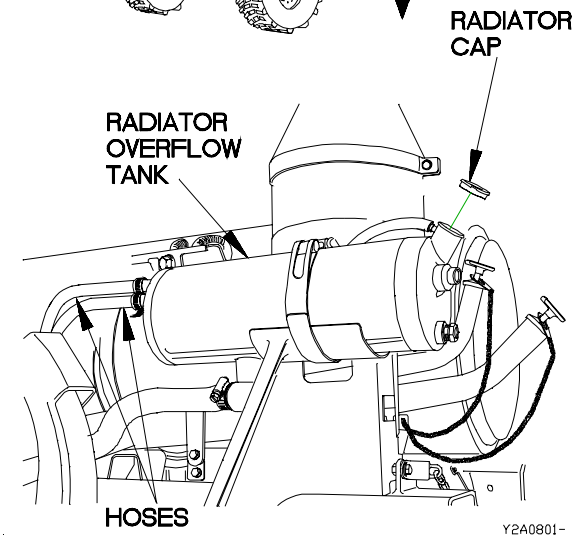
Perform STE/ICE-R test #14.





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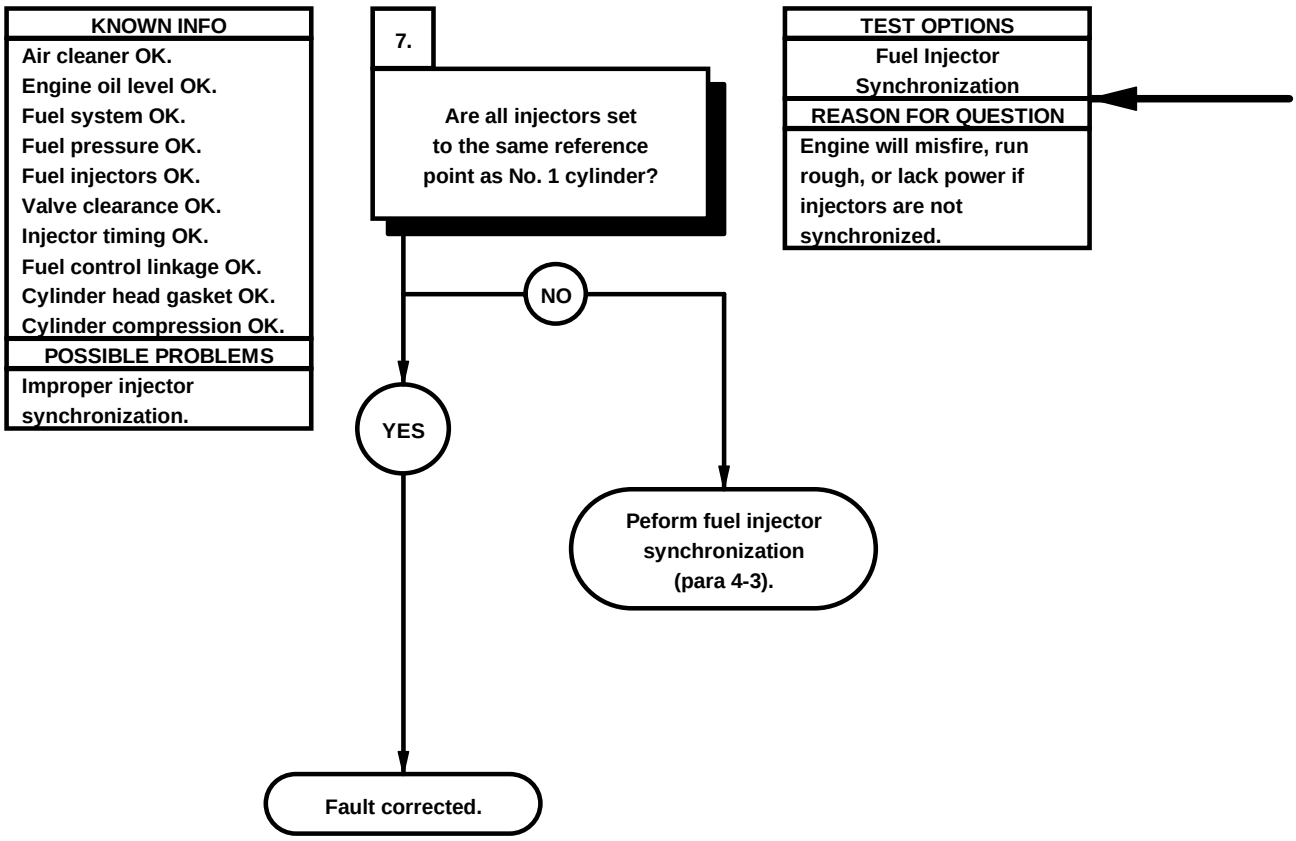
a11. ENGINE STARTS BUT MISFIRES, RUNS ROUGH, OR LACKS POWER (CONT)



Perform fuel injector sychronization (para 4-3).

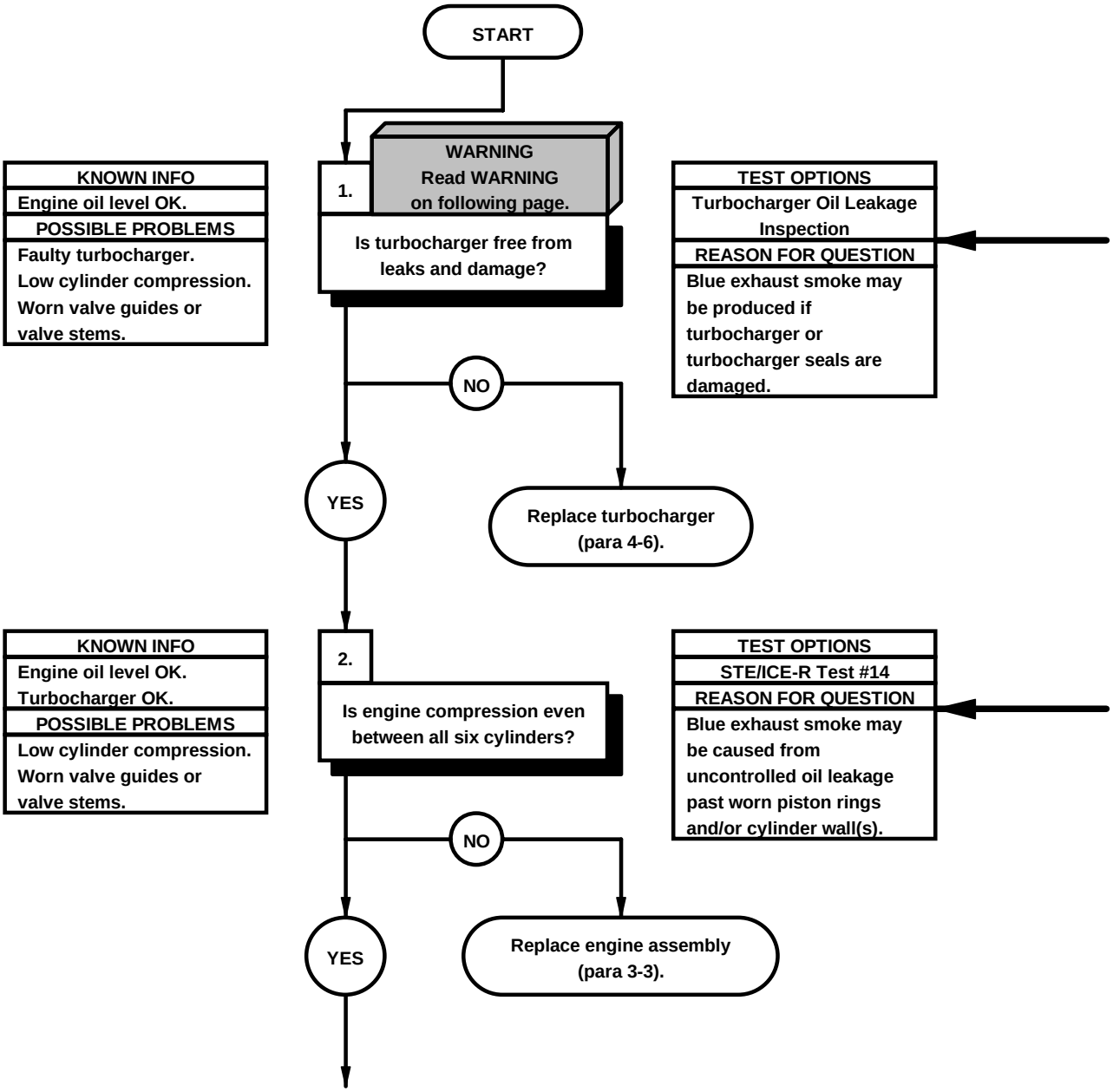
a12. BLUE EXHAUST SMOKE FROM ENGINE

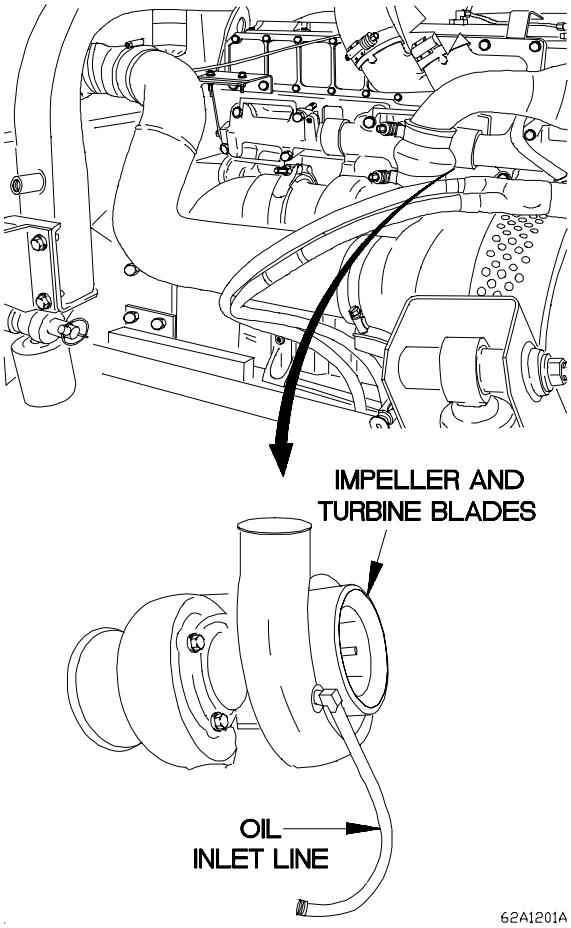
INITIAL SETUP

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

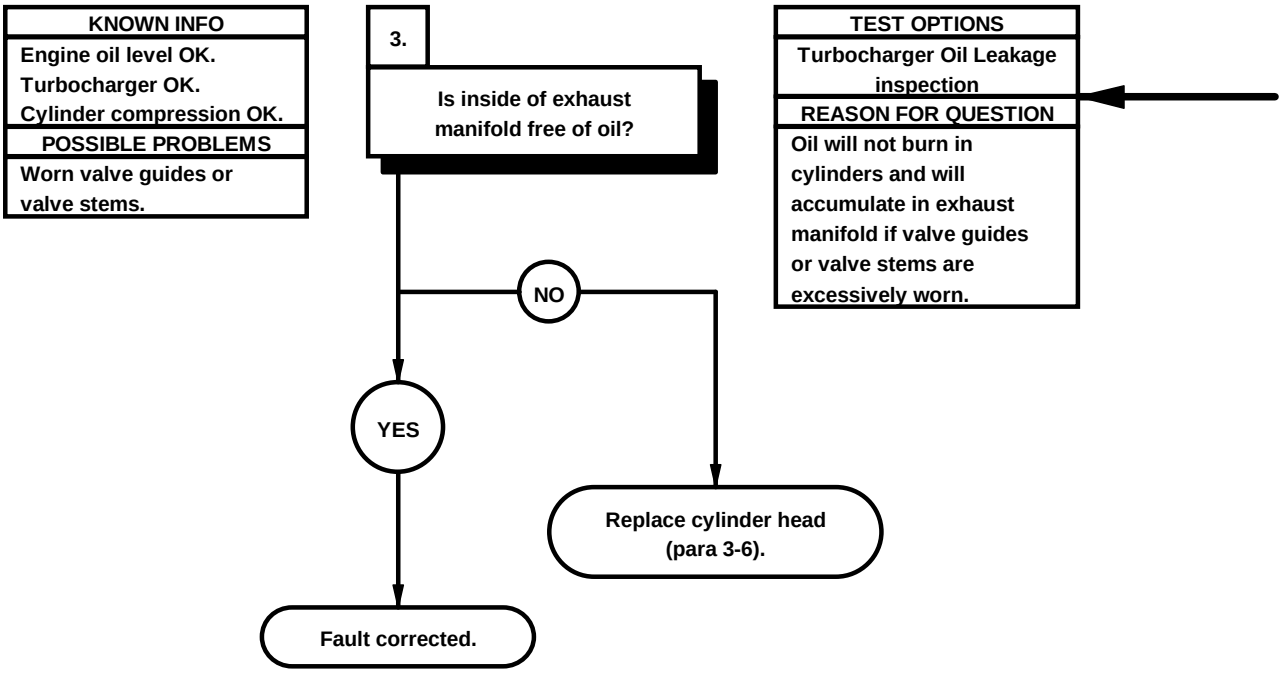
Ensure engine is cool before performing troubleshooting. Failure to comply may result in severe burns.

TUBROCHARGER OIL LEAKAGE INSPECTION

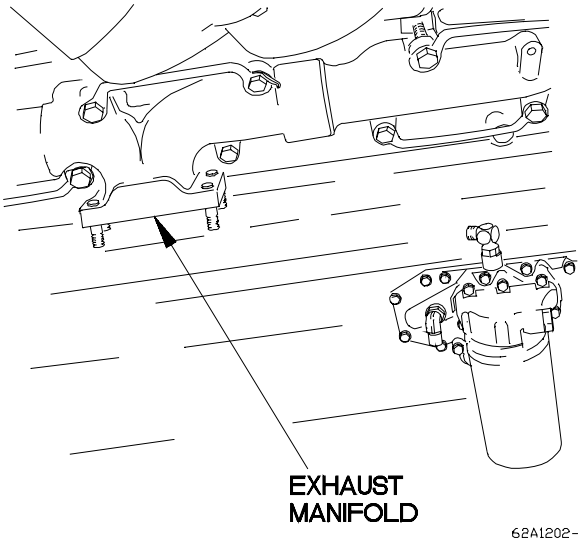
(1) Remove turbocharger (para 4-6).
(2) Check oil inlet line for leakage.
(3) Check impeller and turbine blades for oil.

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).



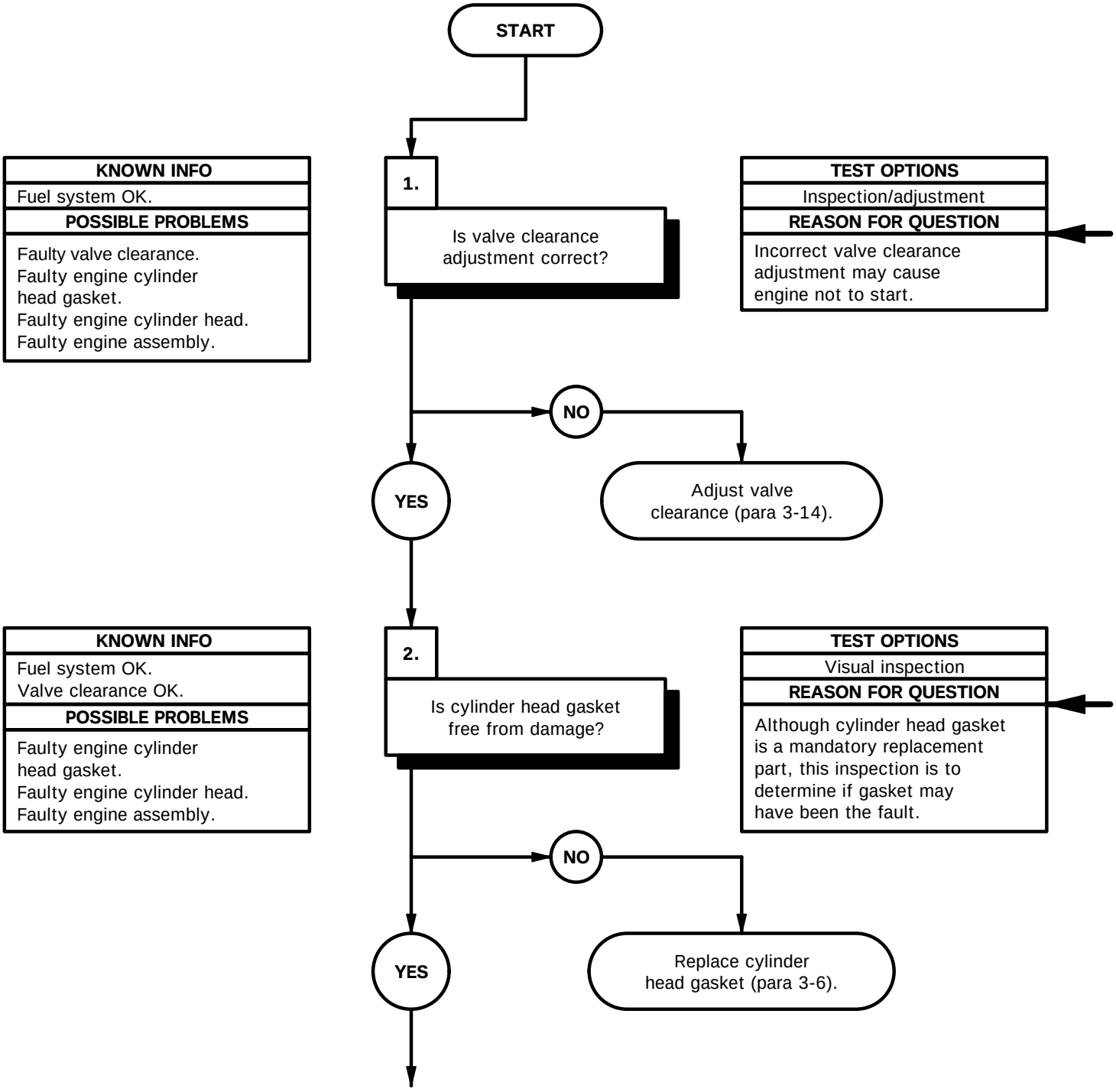
a13. ENGINE CRANKS BUT DOES NOT START

INITIAL SETUP

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

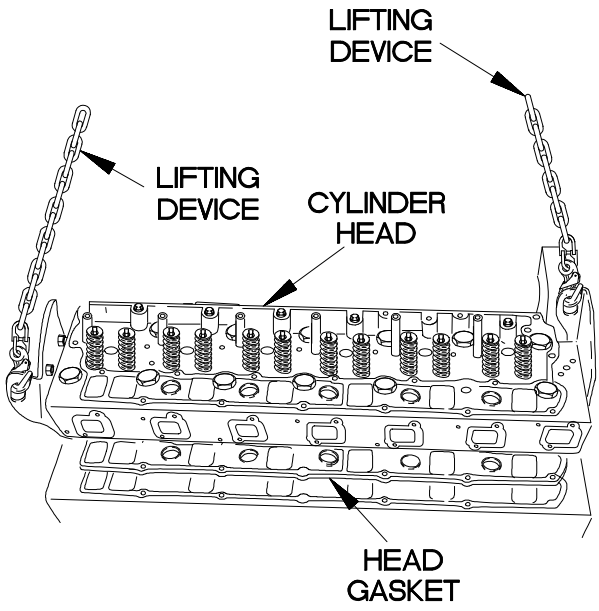
References
TM 9-4910-571-12&P

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

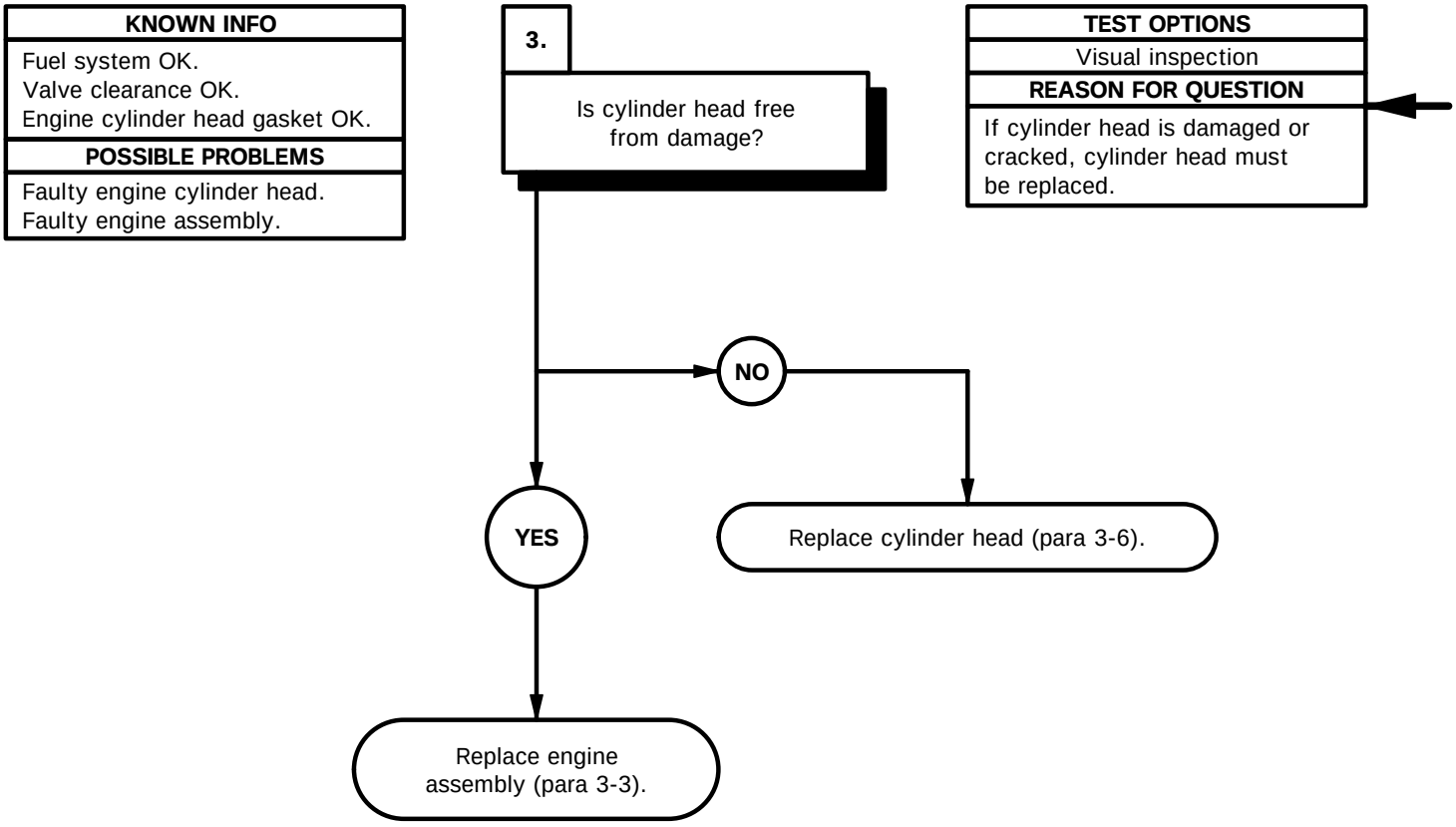


Refer to para 3-14 to adjust valve clearance.

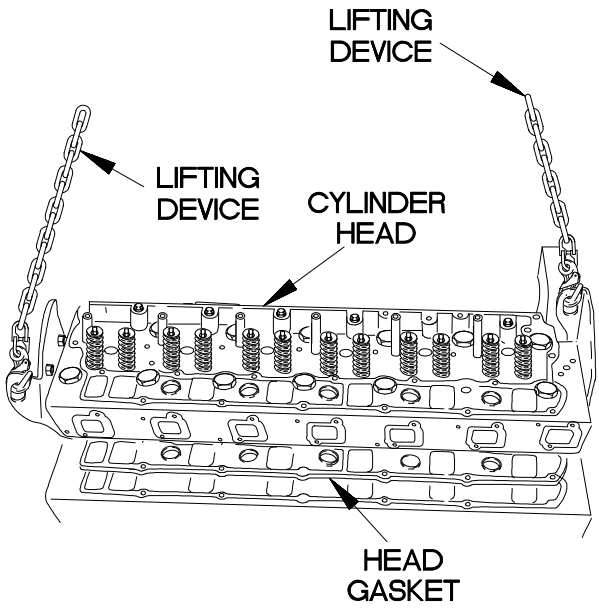
(1) Remove cylinder head from engine block (para 3-6).
(2) Inspect cylinder head gasket for damage.
(3) If cylinder head gasket is damaged, replace cylinder head gasket (para 3-6).



a13. ENGINE CRANKS BUT DOES NOT START (CONT)



(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).



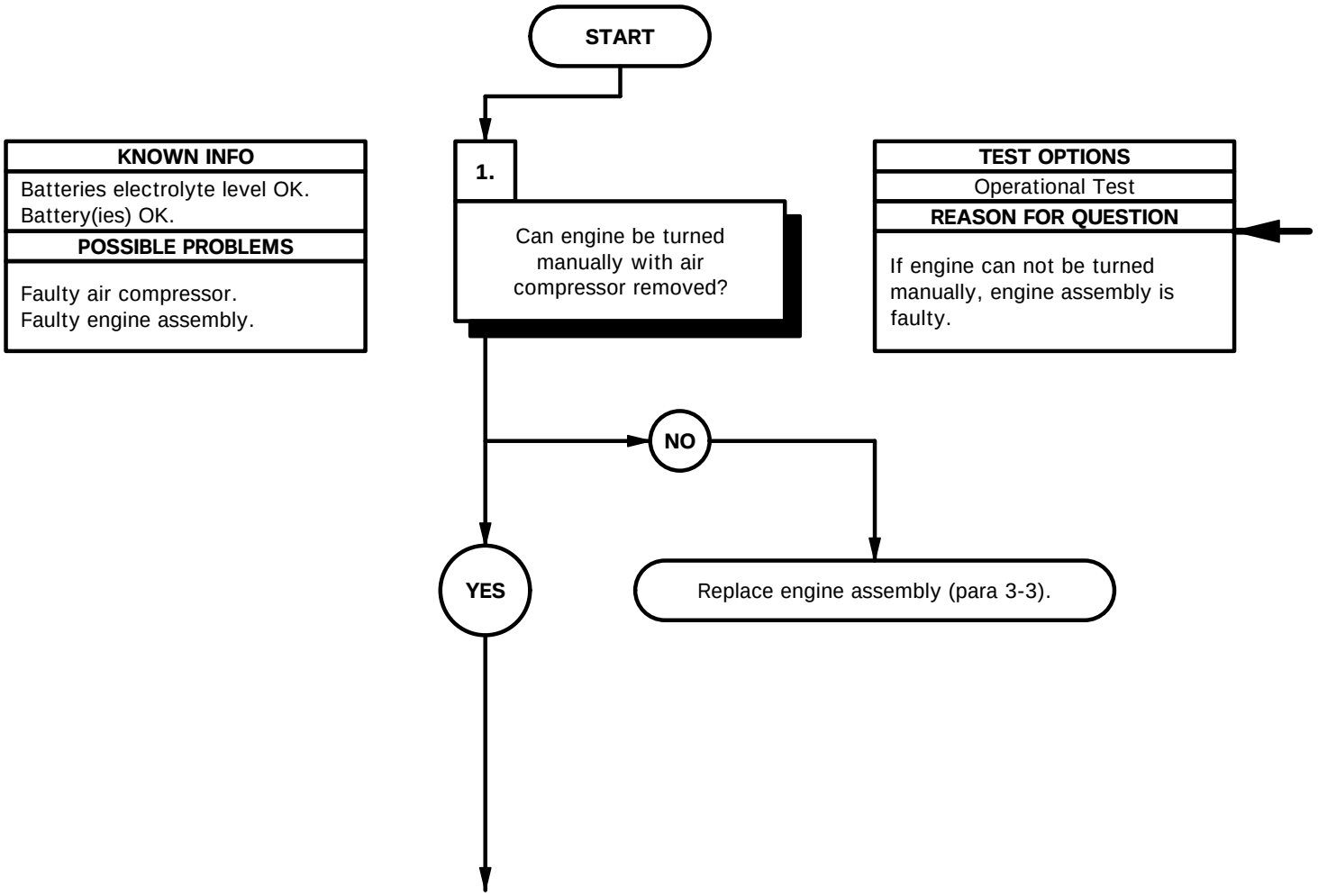
a14. ENGINE DOES NOT CRANK

INITIAL SETUP

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

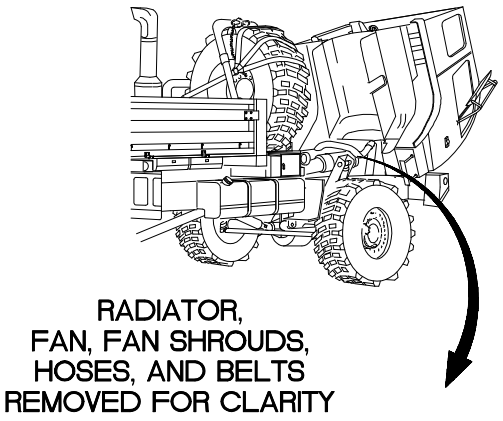
Personnel Required
(2)

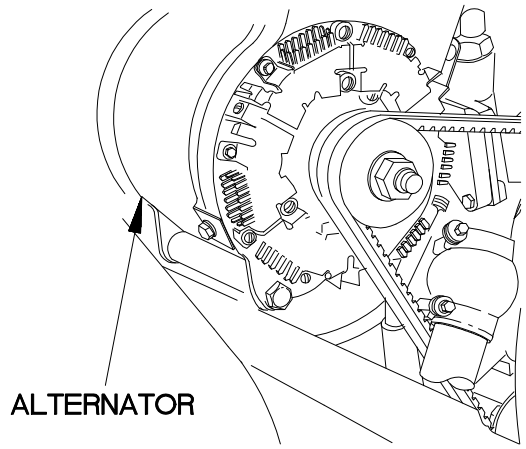
References
TM 9-4910-571-12&P



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).





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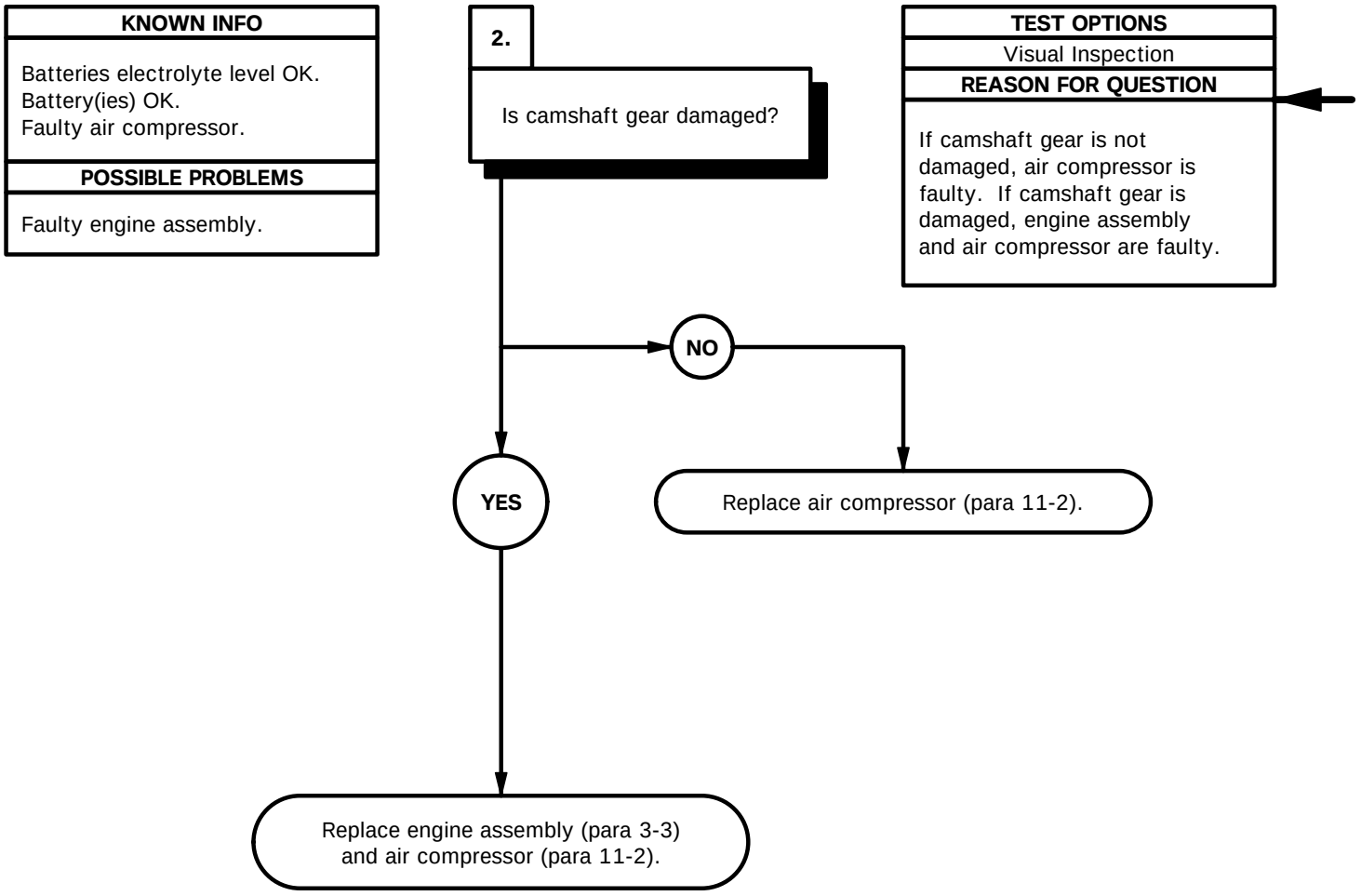
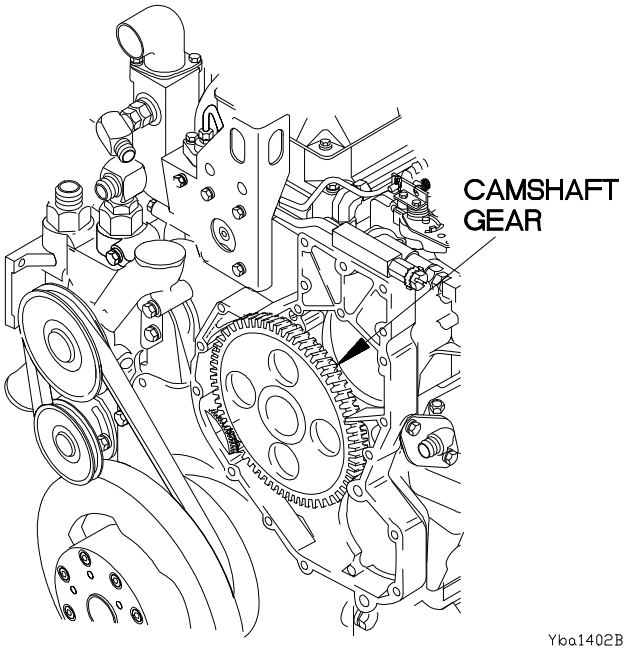
a14. ENGINE DOES NOT CRANK (CONT)



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).



Yba1402B

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

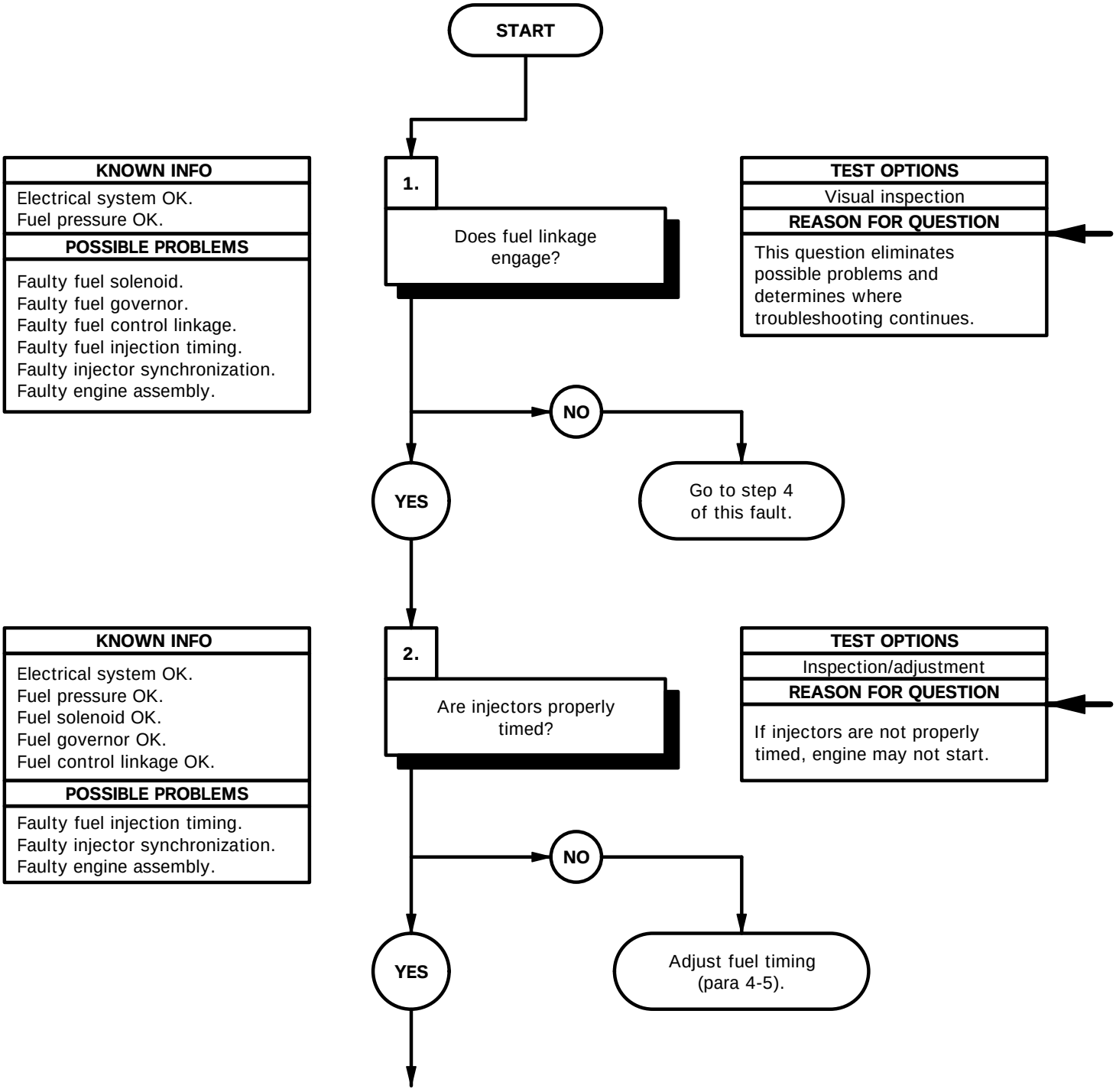
a.1.1. ENGINE CRANKS BUT DOES NOT START

INITIAL SETUP

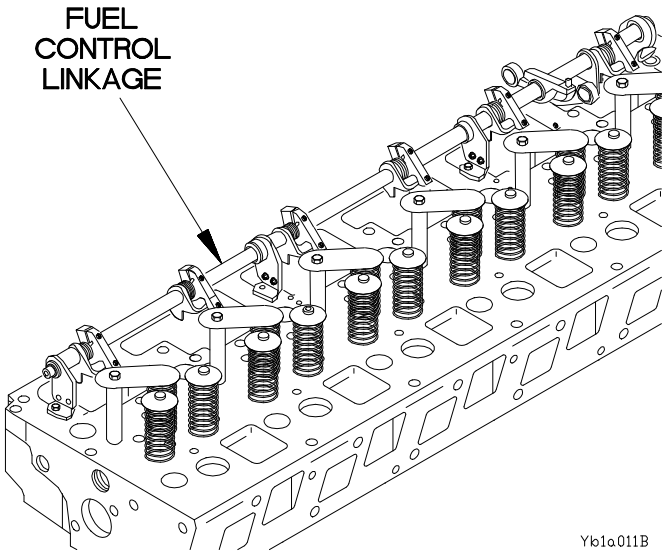
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).

References
TM 9-4910-571-12&P

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

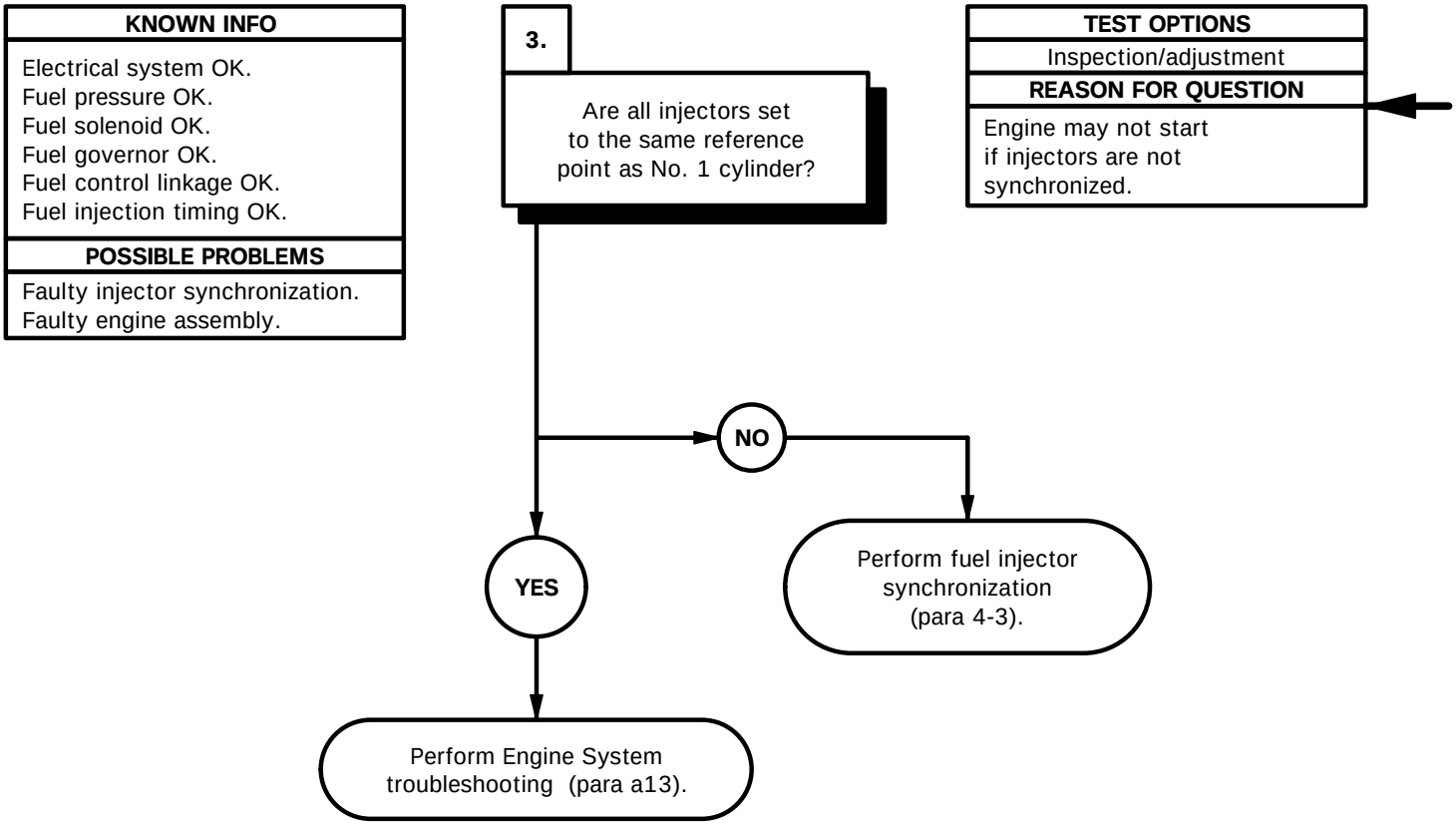


(1) Raise cab (TM 9-2320-366-10-1).
(2) Remove valve cover (TM 9-2320-366-20-3).
(3) Position master power switch to on (TM 9-2320-366-10-1).
(4) If fuel linkage does not engage when ignition is turned on, go to step 4 of this fault.
(5) Position master power switch to off (TM 9-2320-366-10-1).



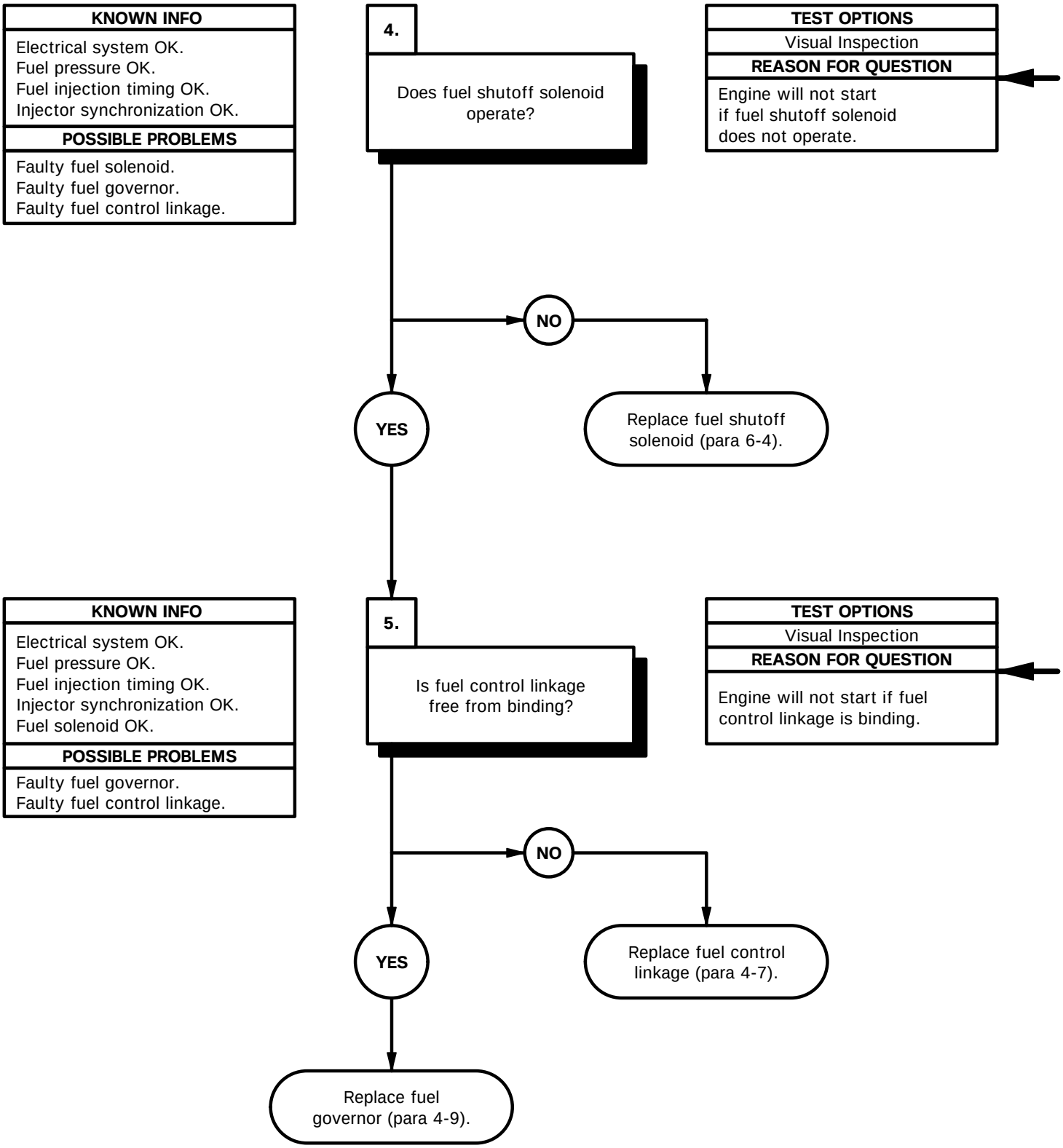
Refer to para 4-5 for fuel timing.

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



Perform fuel injector synchronization (para 4-3).

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

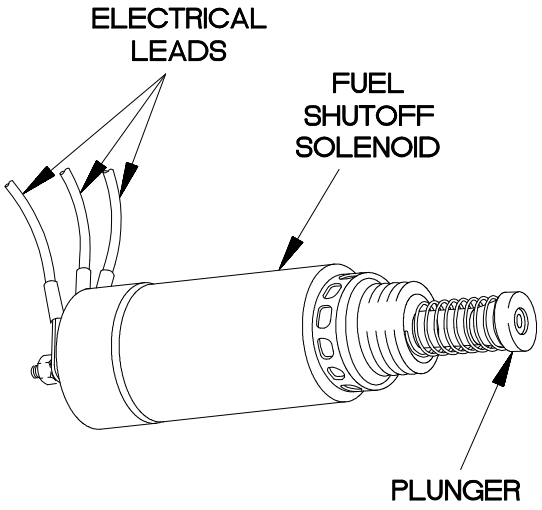


(1) Remove fuel shutoff solenoid (para 6-4).
(2) Reconnect electrical leads to fuel shutoff solenoid (para 6-4).
(3) Position master power switch to on (TM 9-2320-366-10-1).
(4) If plunger in fuel shutoff solenoid does not fully contract, replace fuel shutoff solenoid (para 6-4).
(5) Install valve cover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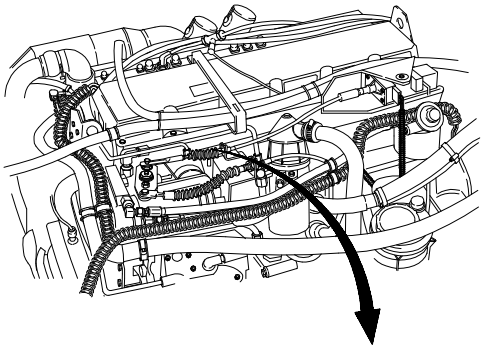
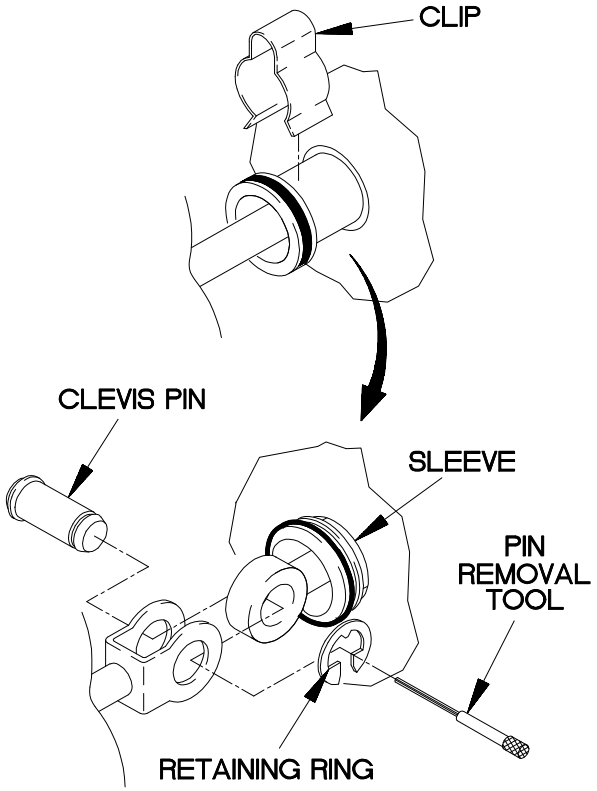


(1) Remove clip from fuel control linkage.
(2) Slide sleeve, using soft jawed pliers, into cylinder head.
(3) Remove retaining ring and clevis pin, using pin removal tool.
(4) Check fuel control linkage for smooth operation.
(5) If fuel control linkage is binding, replace fuel control linkage (para 4-7).
(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

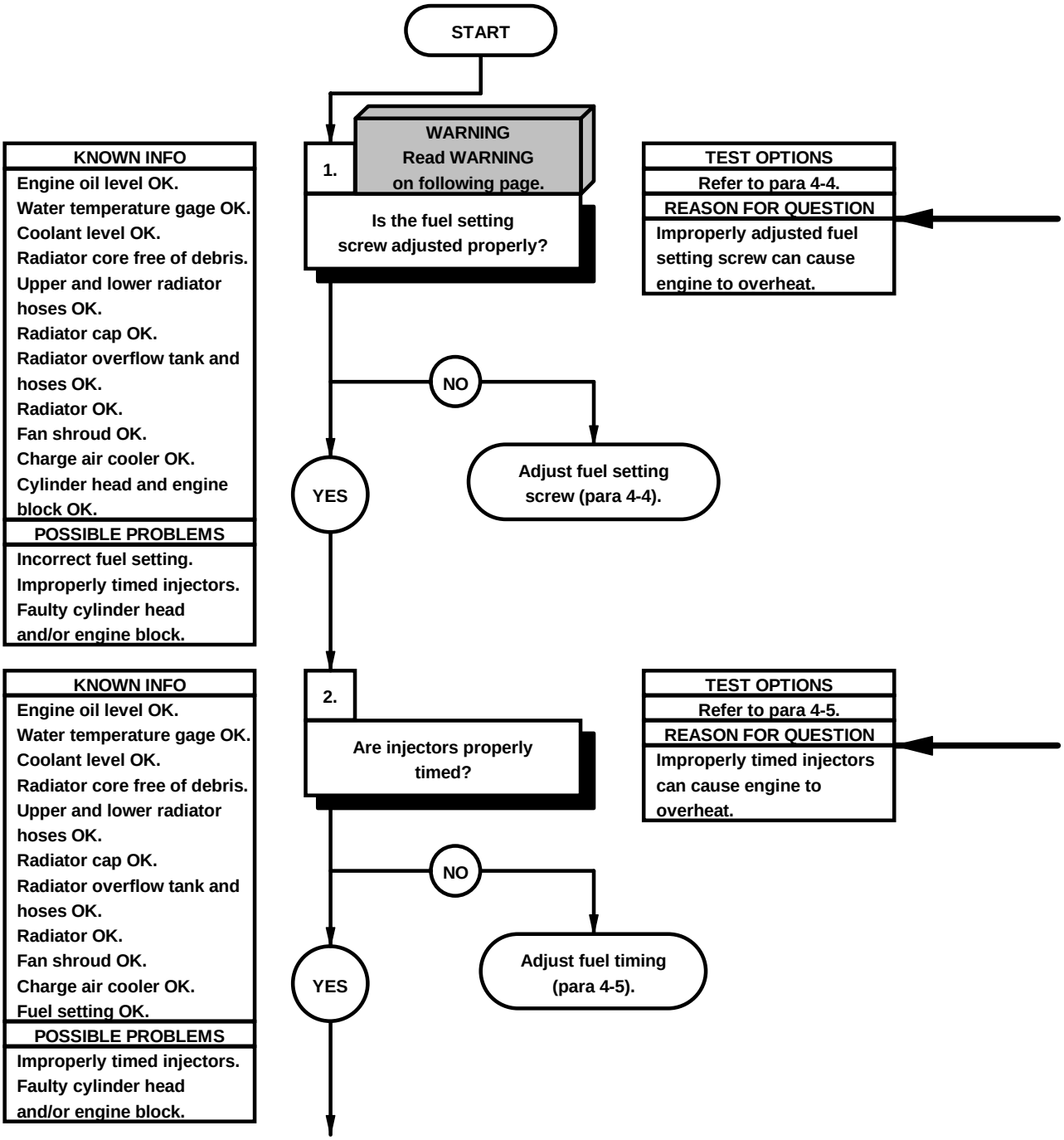
Fault No.	Description	Page
b1.	Engine Overheats	2-68
b2.	Loss of Coolant	2-72
b3.	Oil in Cooling System	2-74

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)



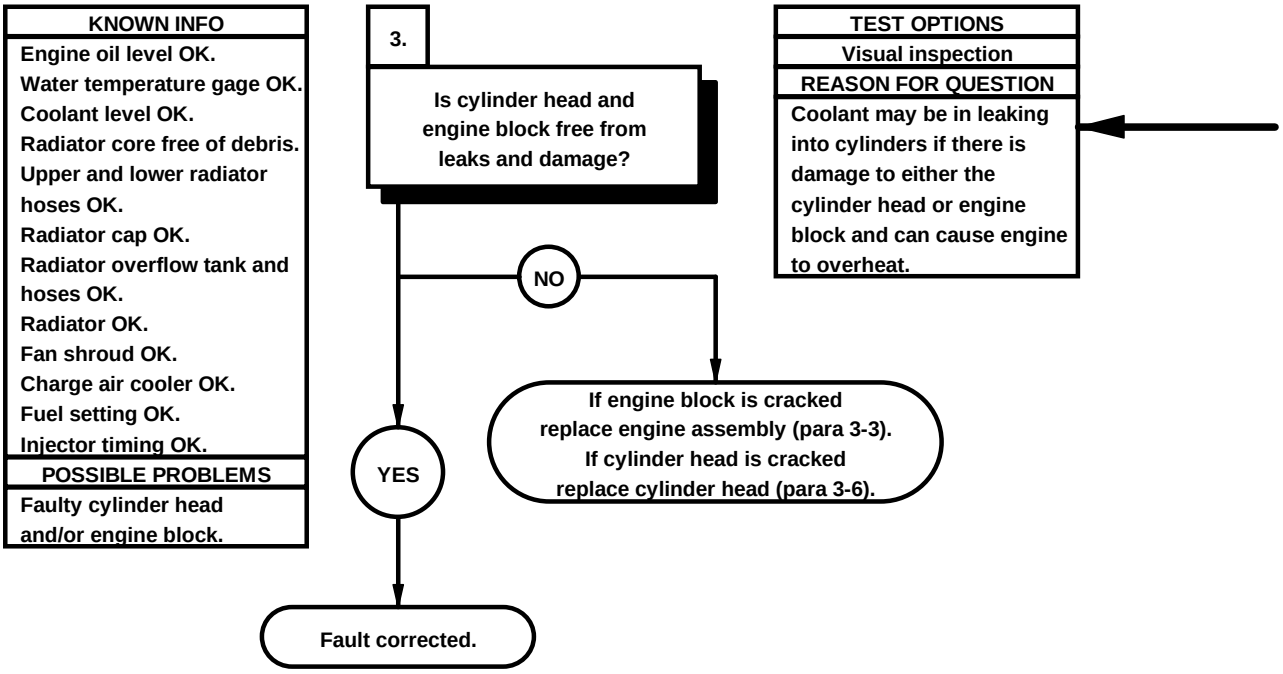
WARNING

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

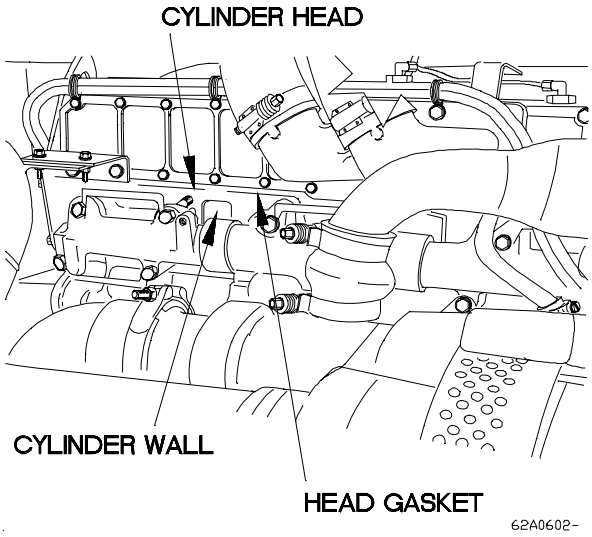
Refer to para 4-4 to adjust fuel setting screw.

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).

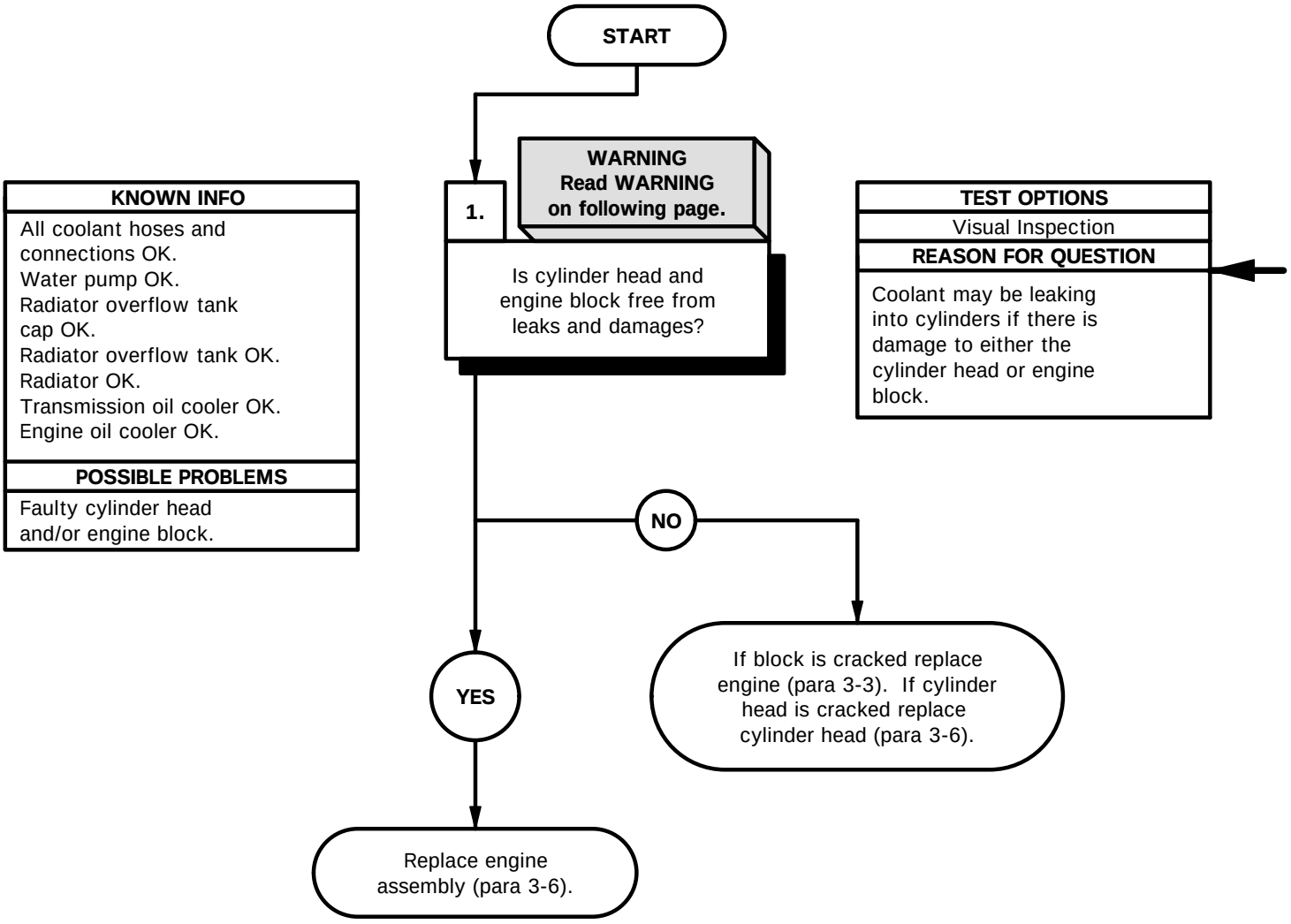


b2. LOSS OF COOLANT

INITIAL SETUP

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

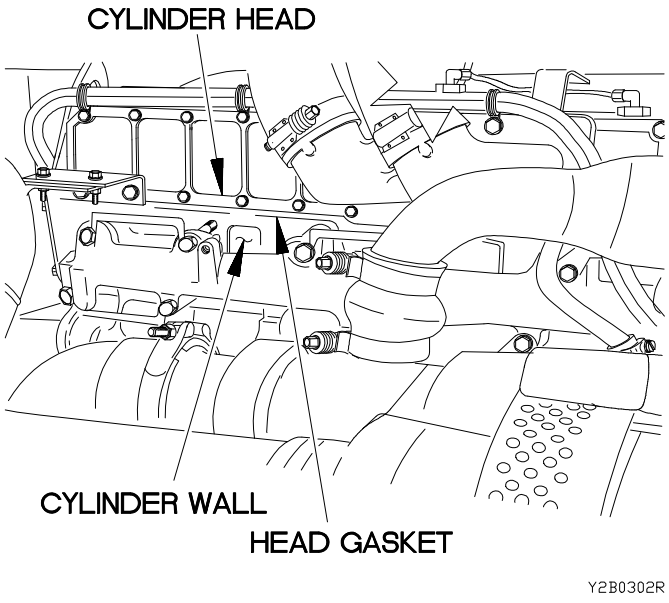
Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)



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).

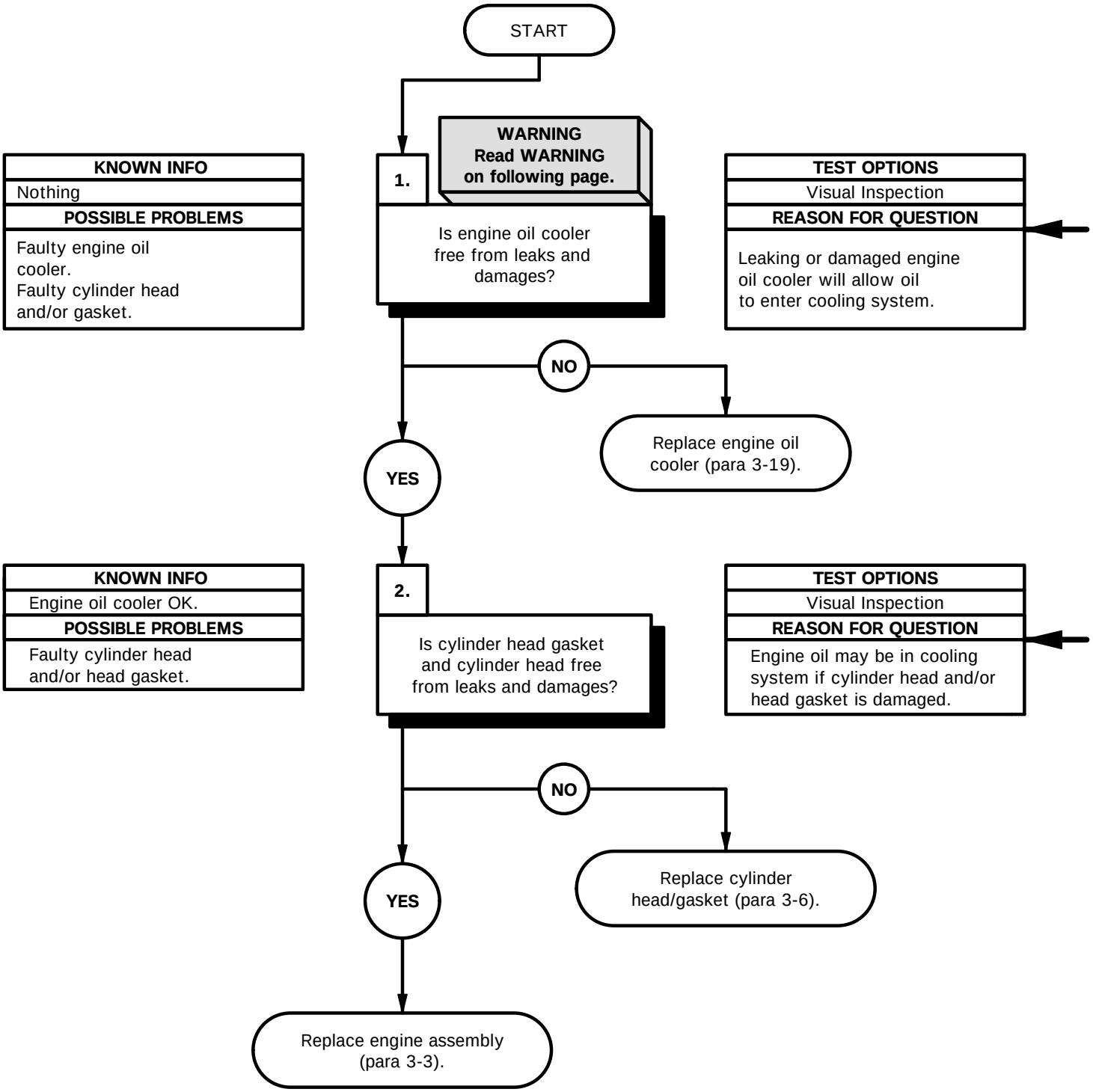


b3. OIL IN COOLING SYSTEM

INITIAL SETUP

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

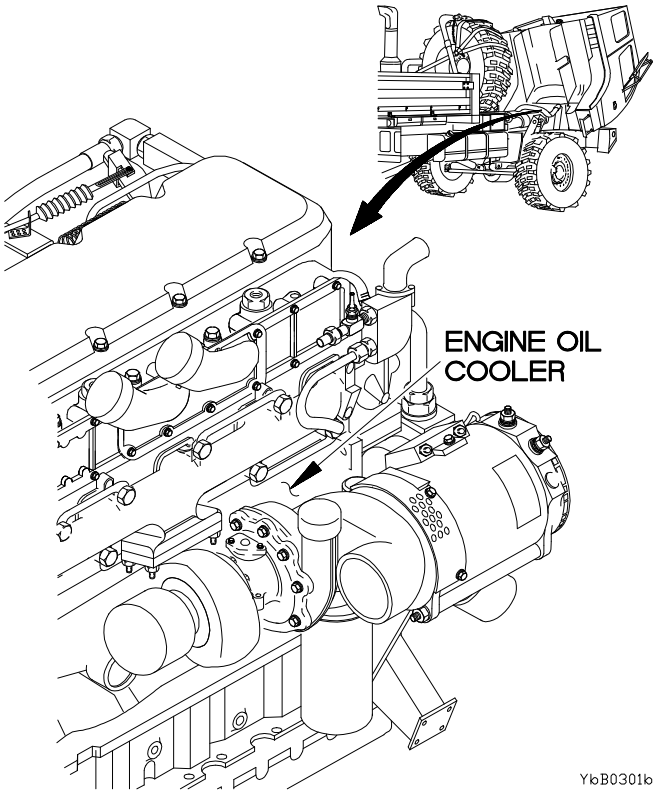
Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Goggles, Industrial (Item 28, Appendix B)



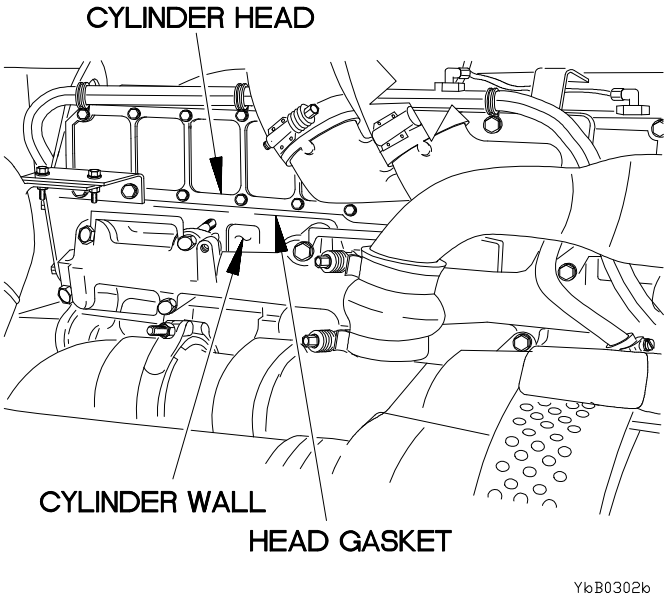
WARNING

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.



(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).



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 Or Main Code 25 And/ Or 56 And Any Sub Code	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/ or 57and Any Sub Code (Serial Number 6510032369 and Higher)	2-150
c9.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 32 and/ or 57and 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/ or 57and 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 or Main Code 25 And / Or 56 And Any Sub Code	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 / or 57and Any Sub Code (Serial Number 6510032369 and Higher)	2-644
c54.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 32 and/ or 57and 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

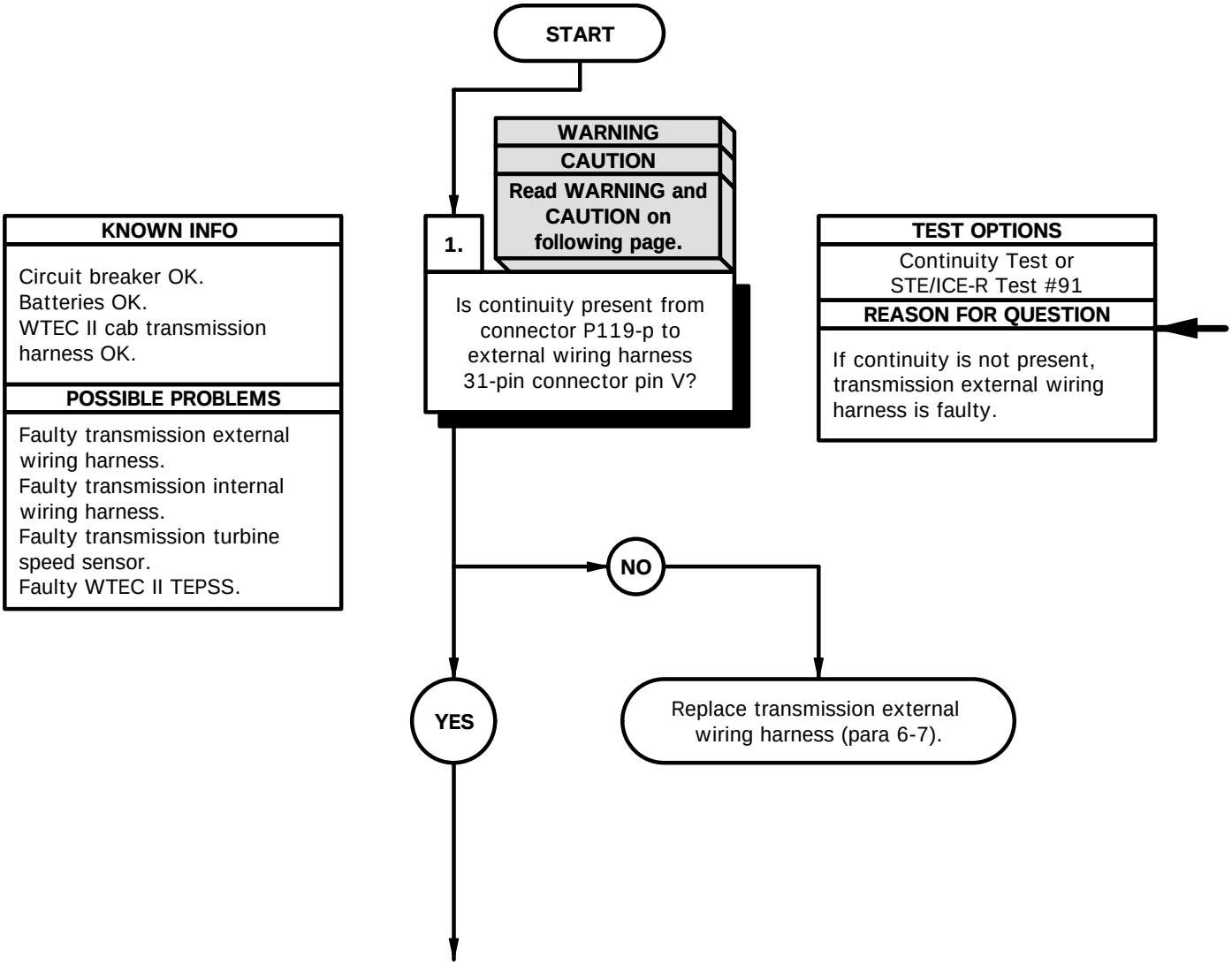
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

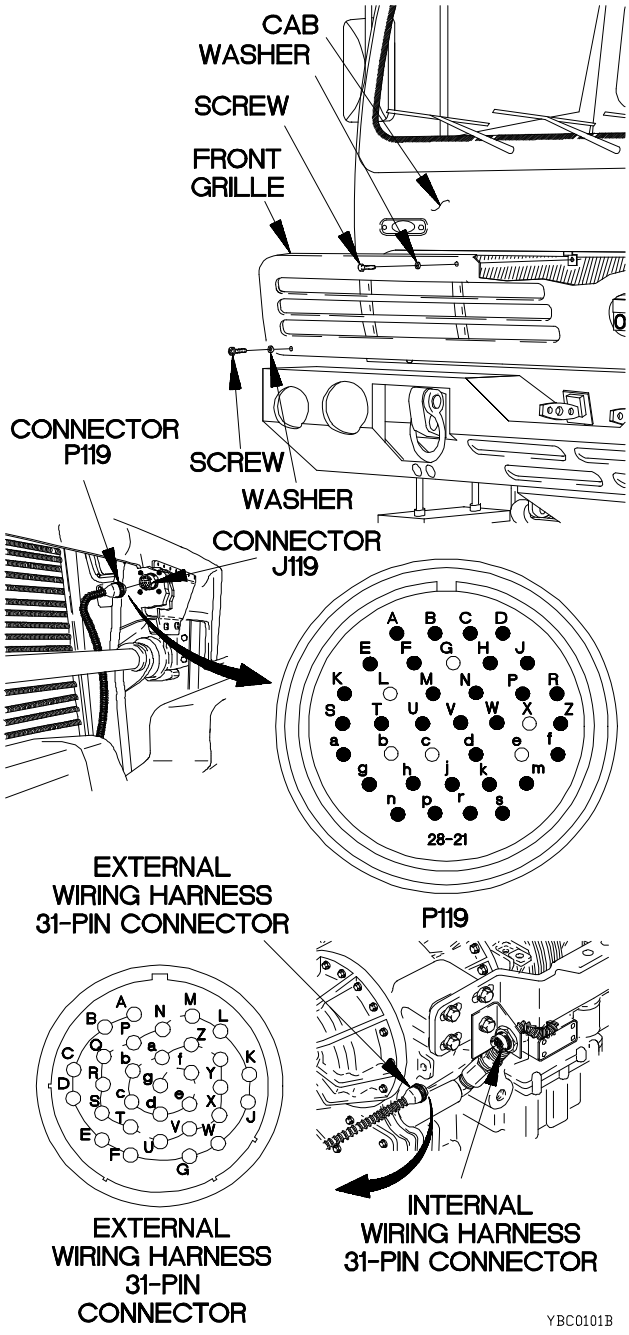
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

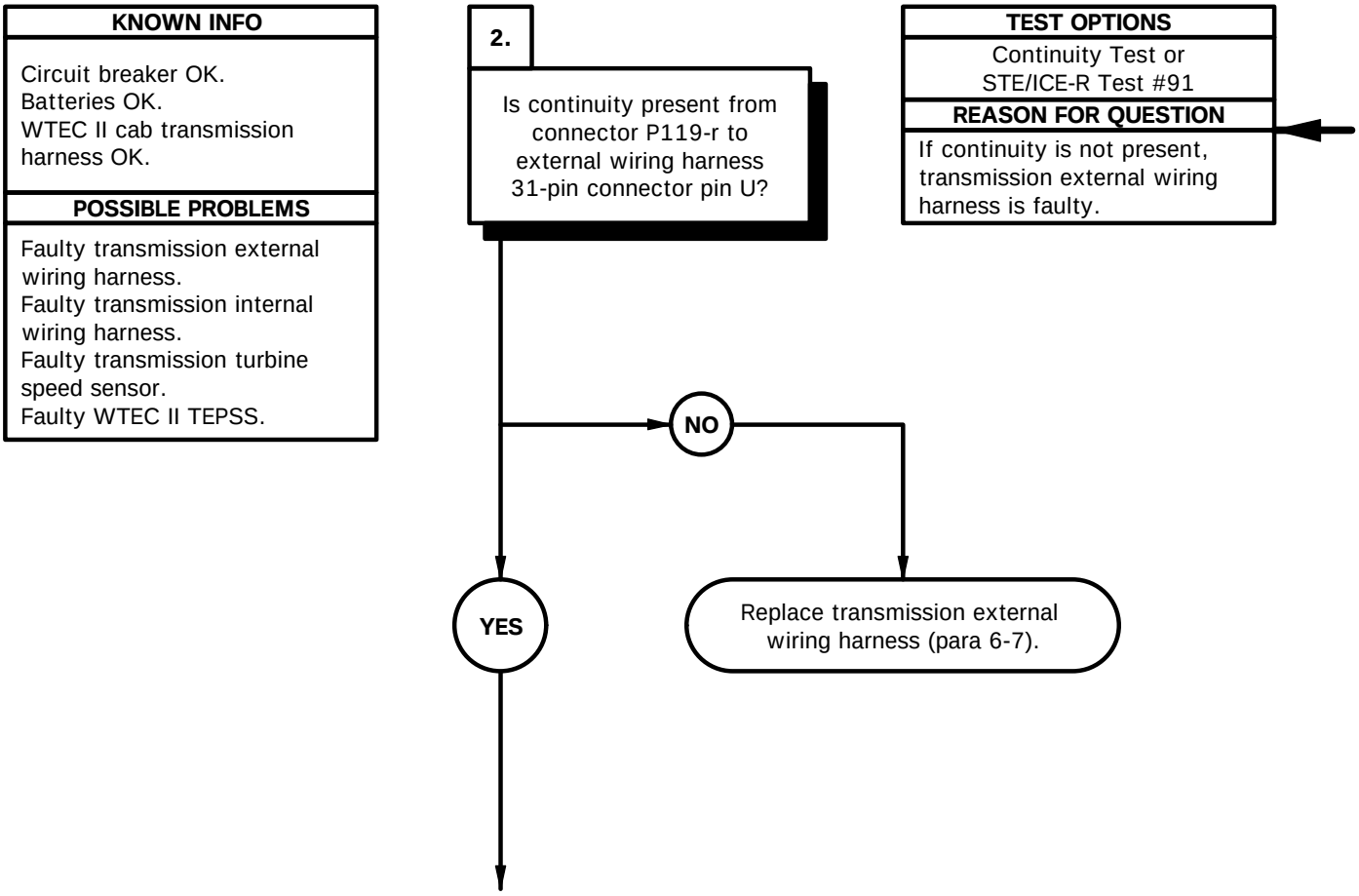
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin connector.
(6) Set multimeter 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).

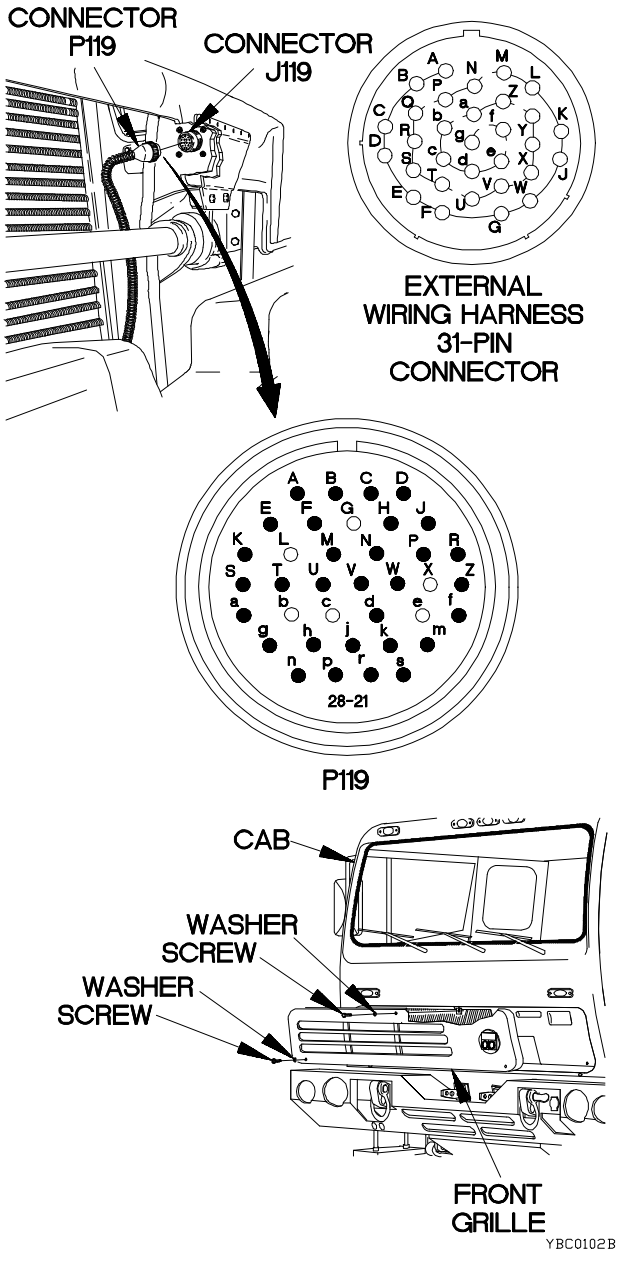


c1. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

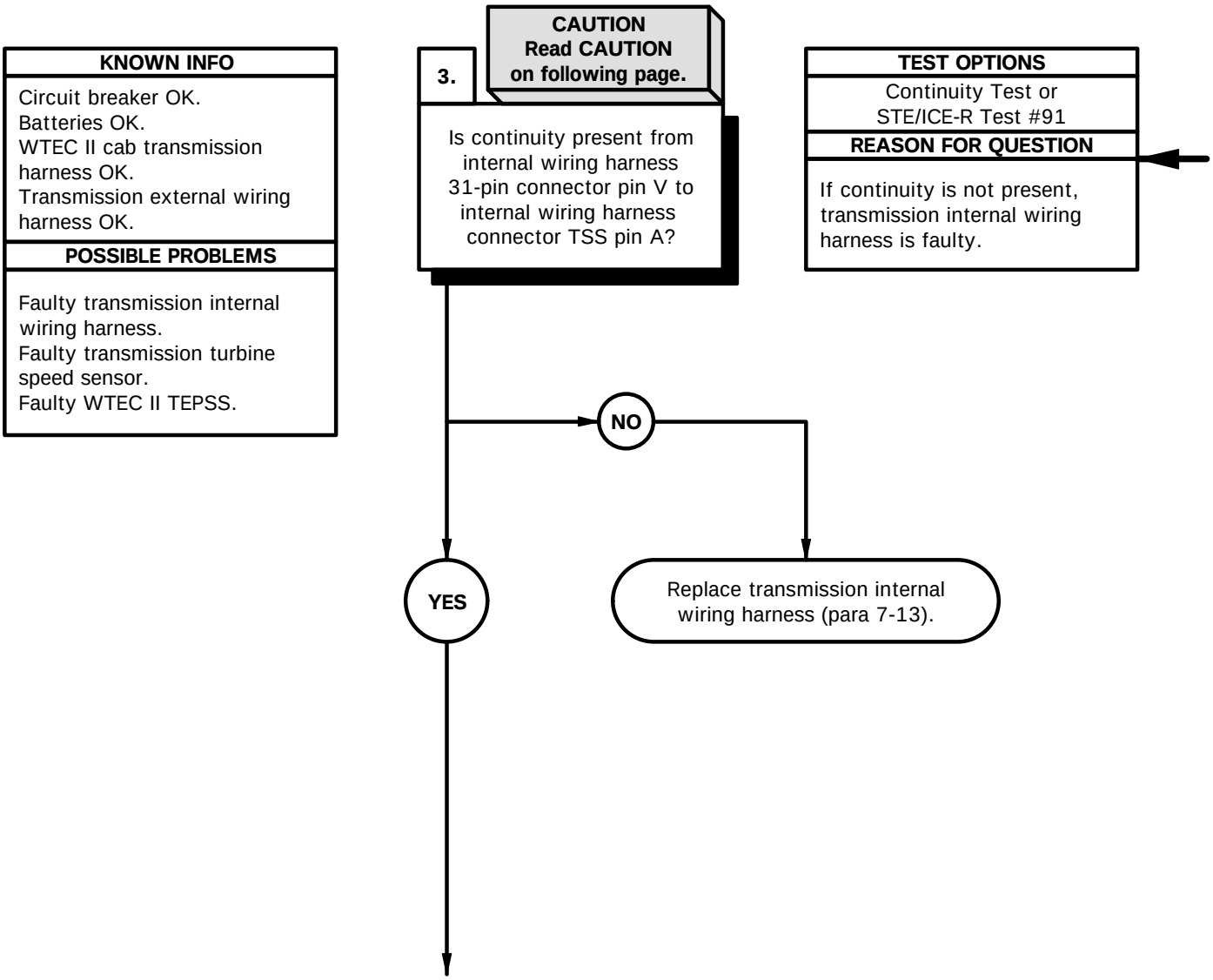


CONTINUITY TEST

(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).



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

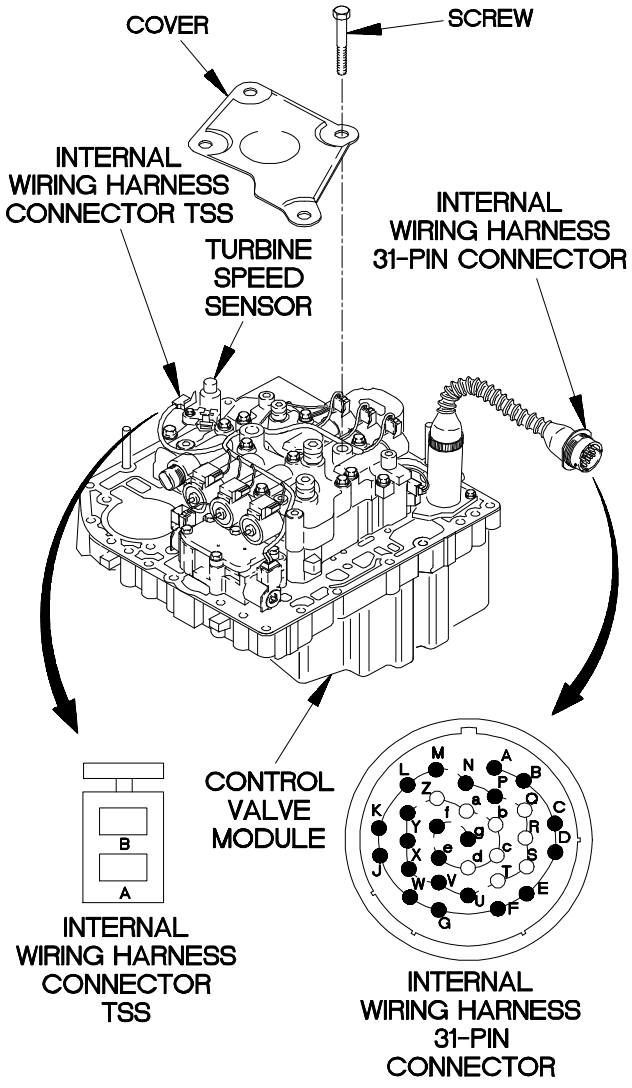


CAUTION

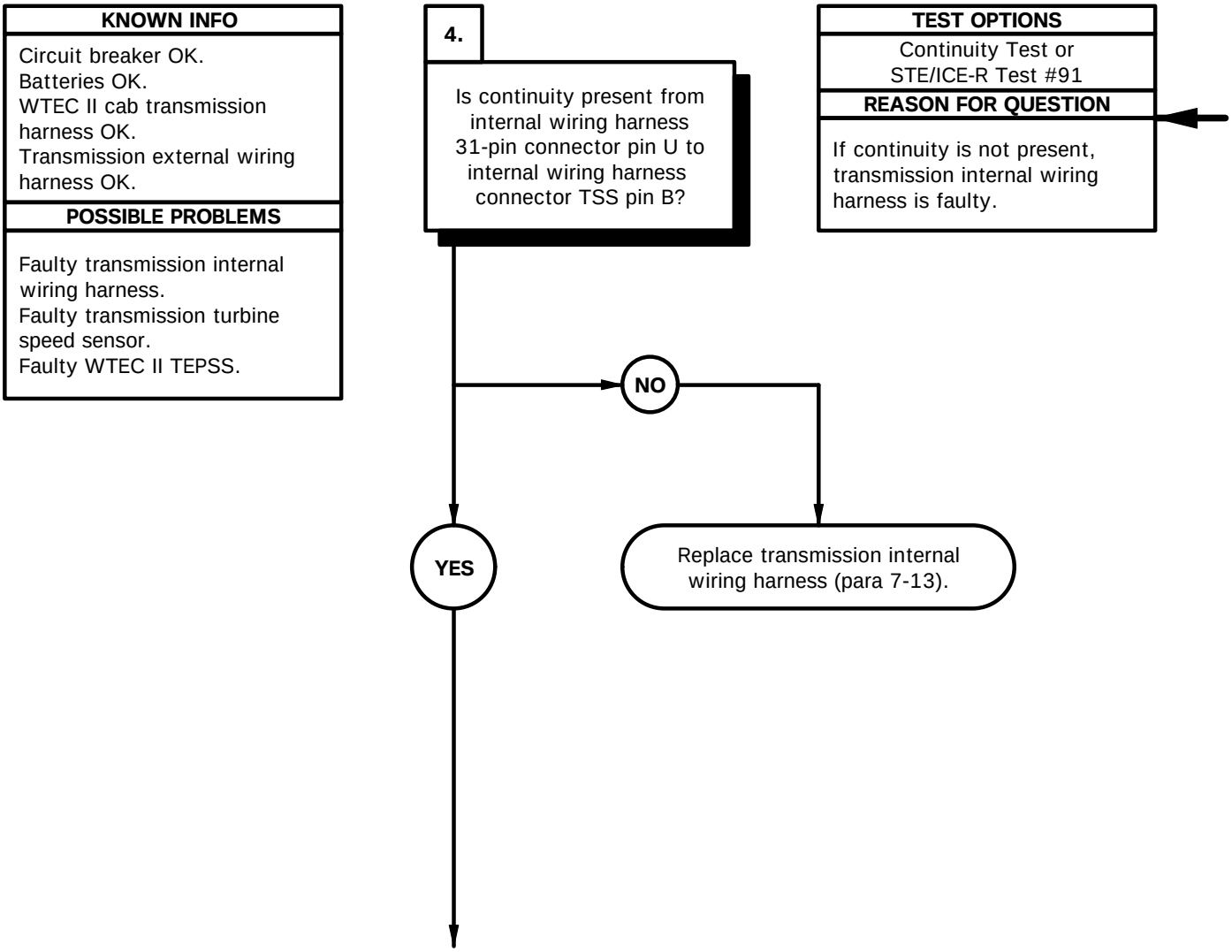
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

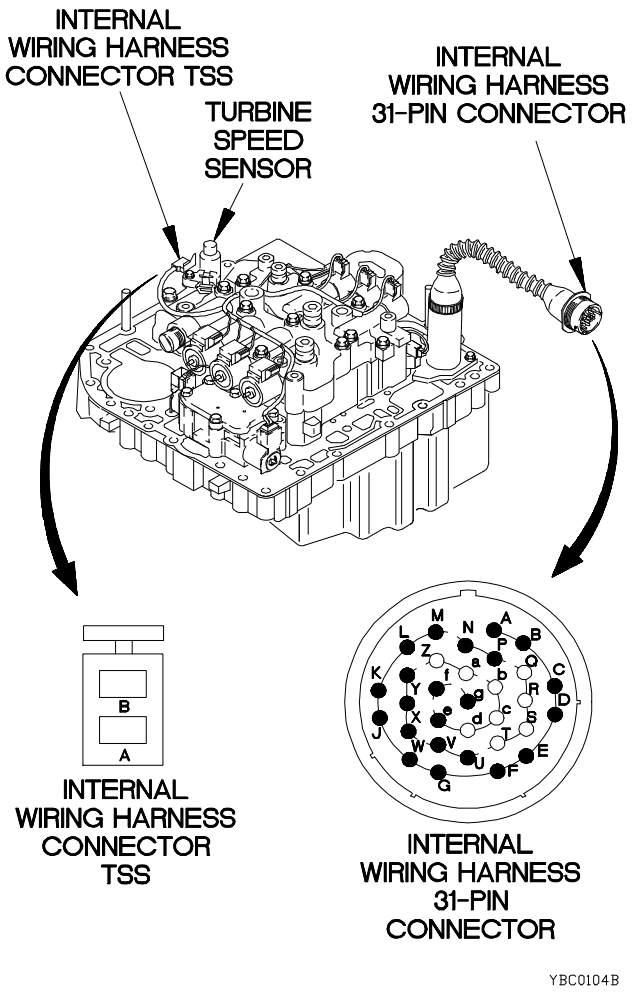


c1. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (SERIAL NUMBER 6510032369) (CONT)

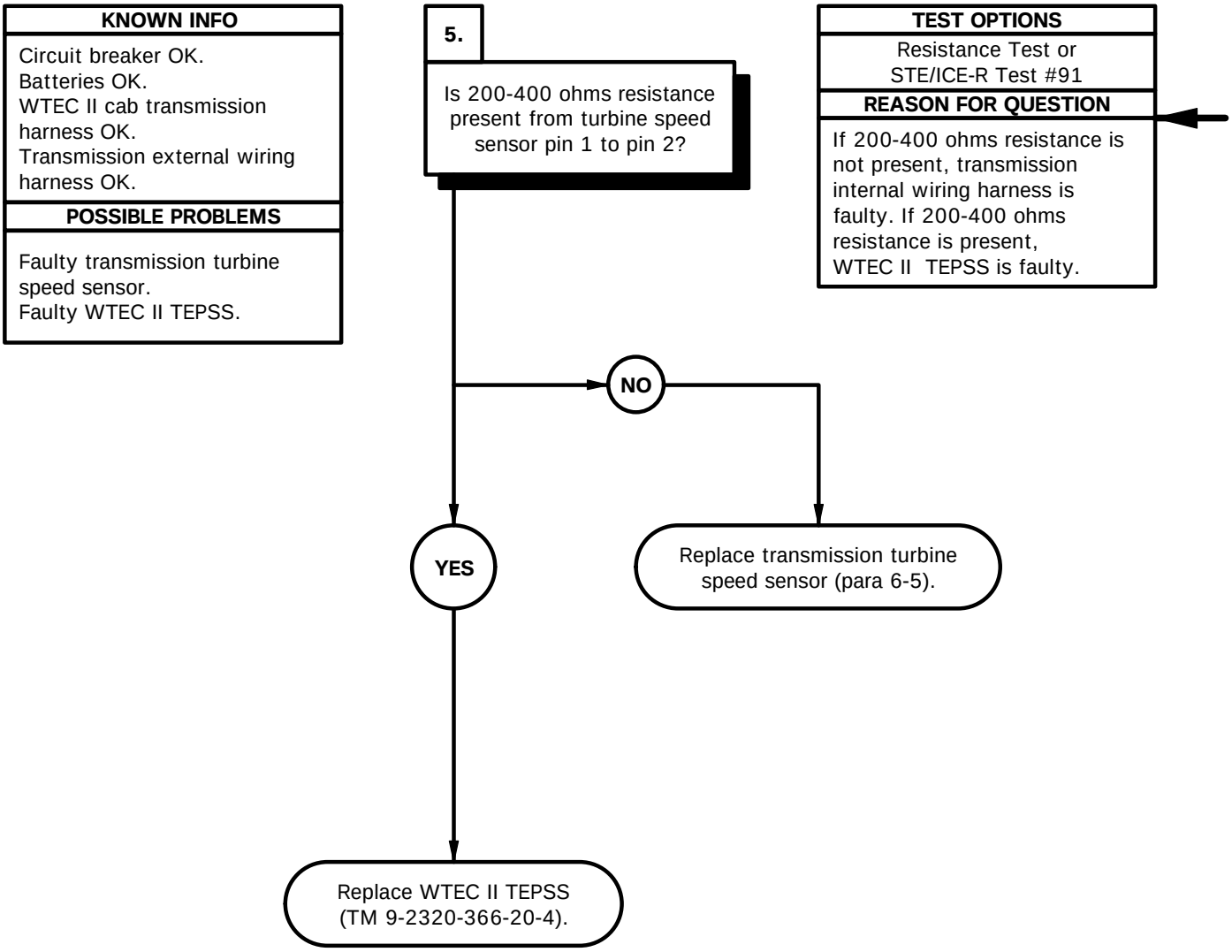


CONTINUITY TEST

(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).

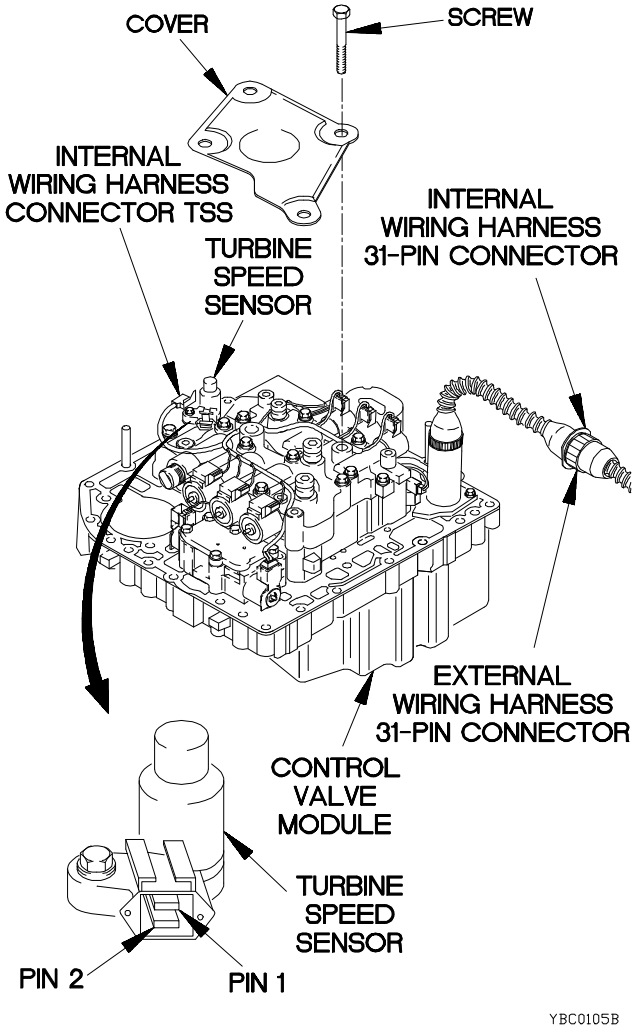


c1. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



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).



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)

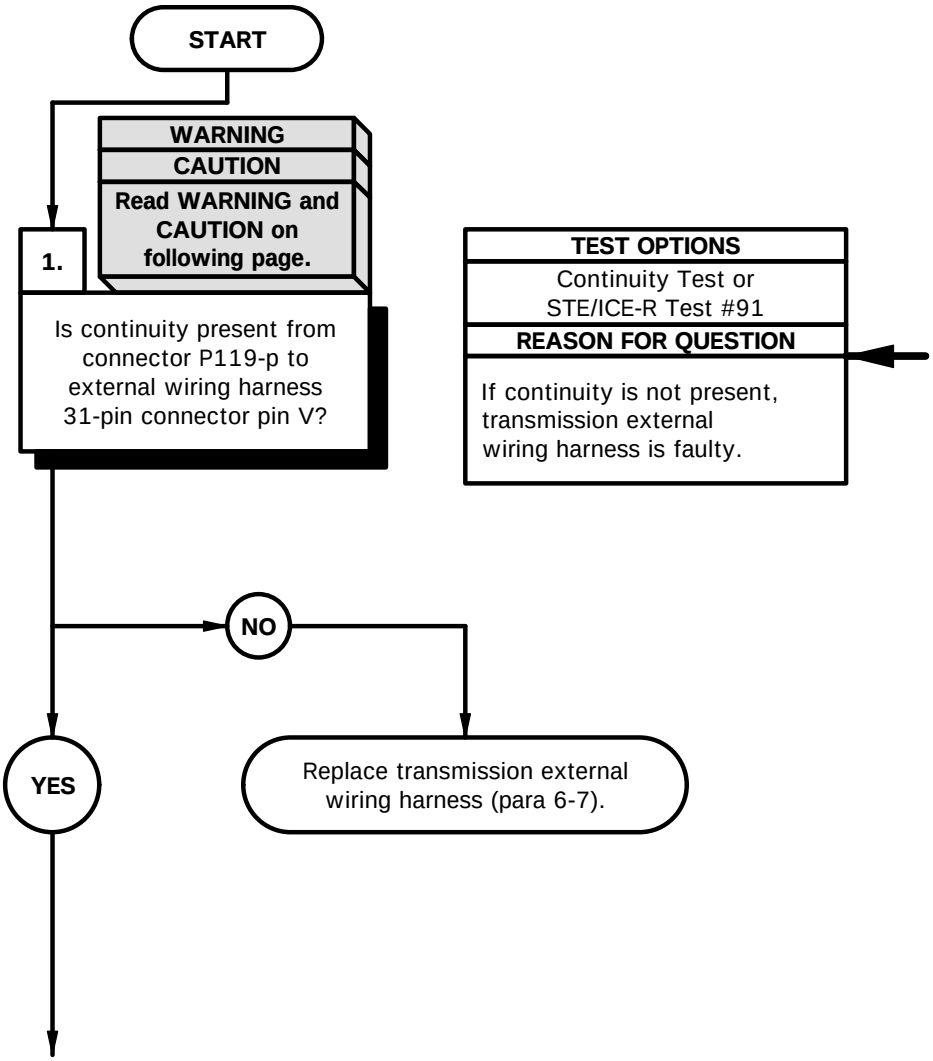
References
TM 9-4910-571-12&P

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.



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

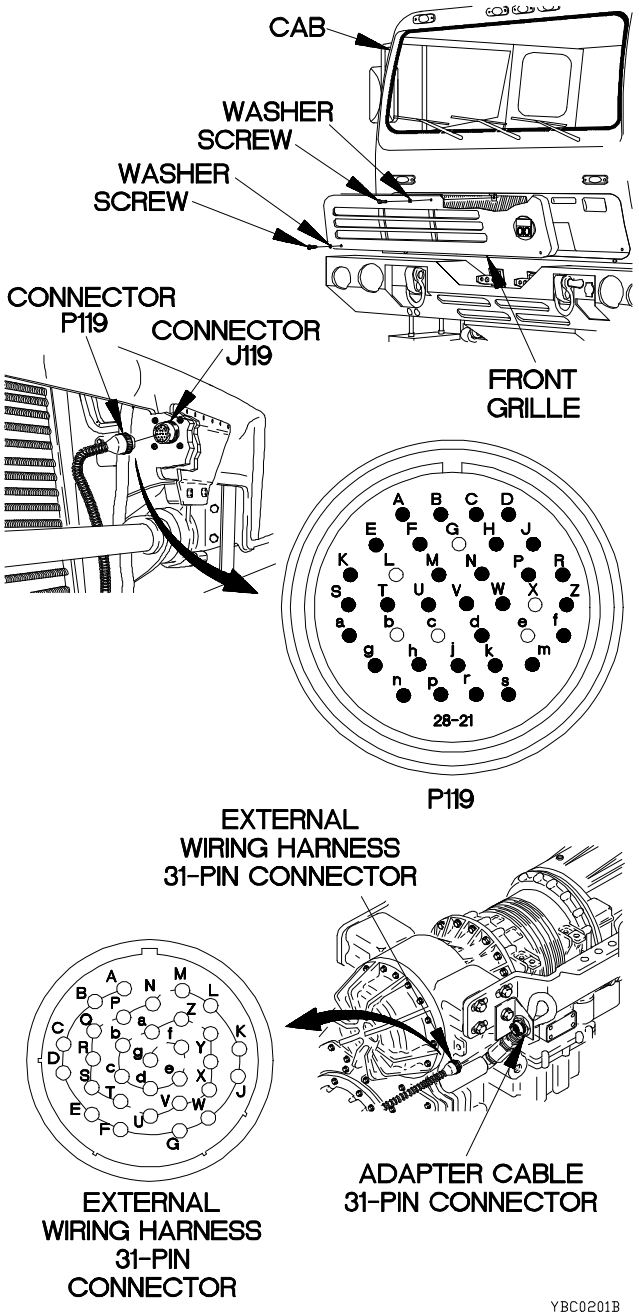
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



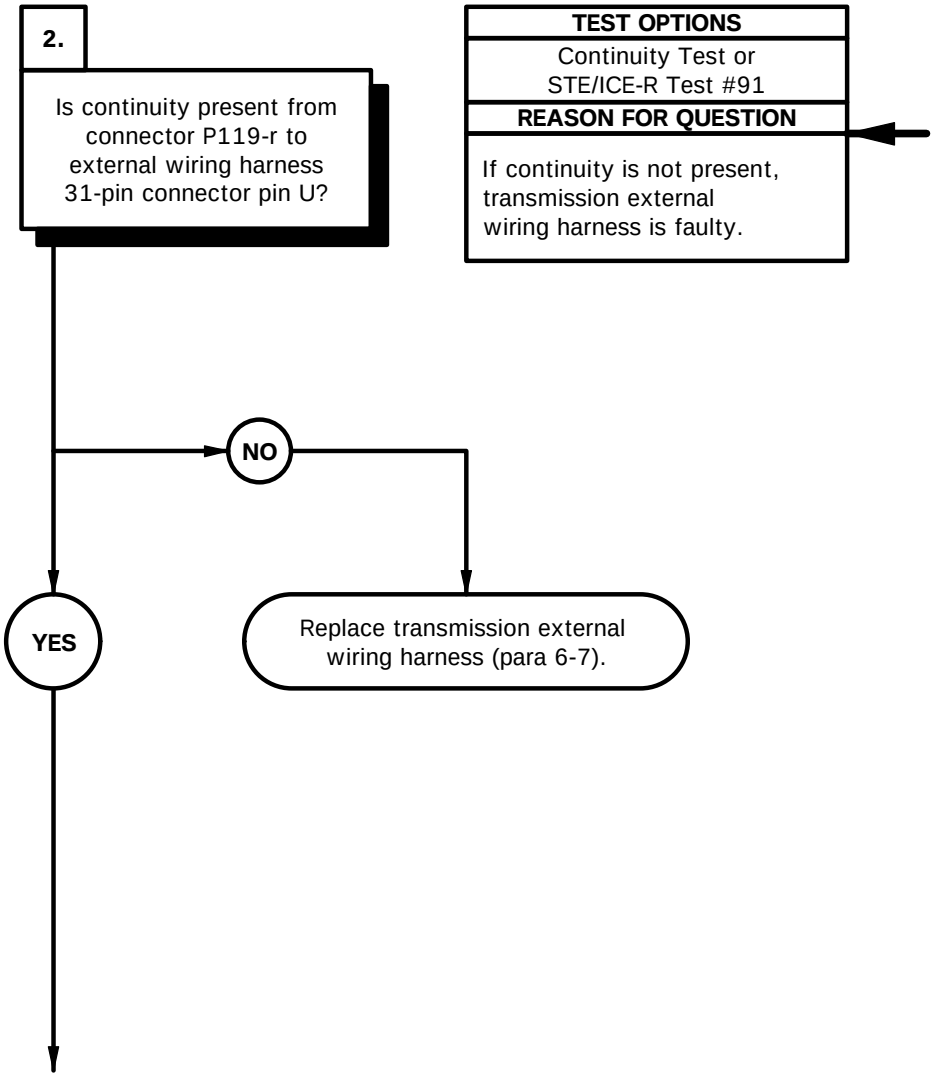
c2. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO

Circuit breaker OK.
Batteries OK.
WTEC II cab transmission harness OK.

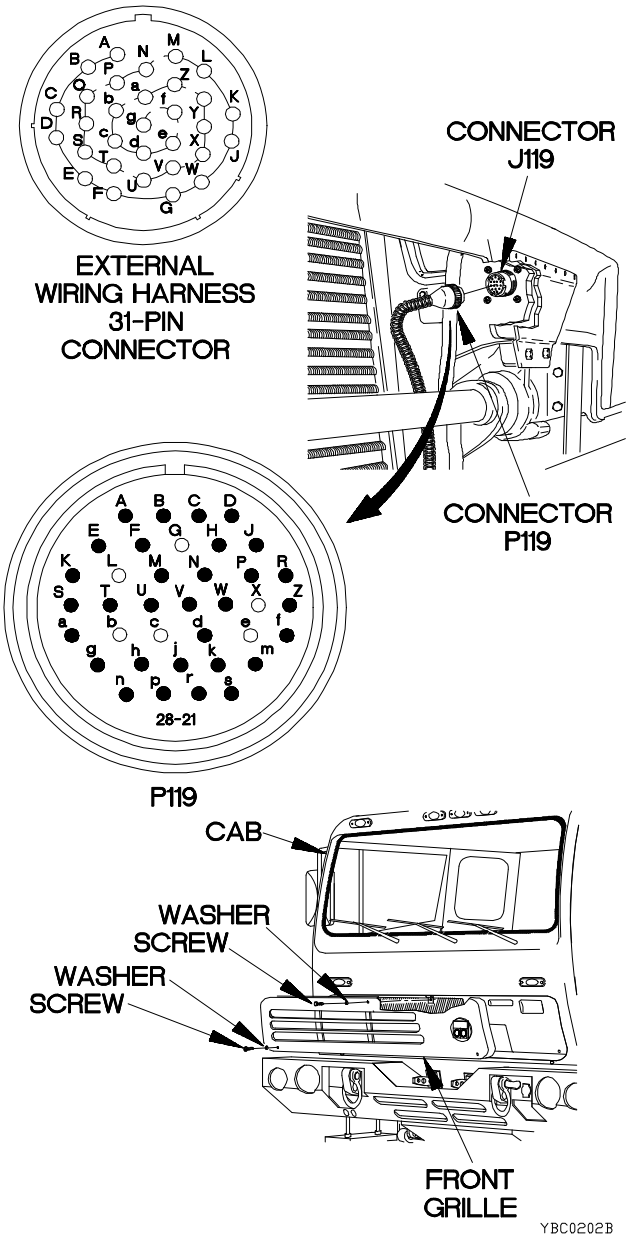
POSSIBLE PROBLEMS

Faulty transmission external wiring harness.
Faulty transmission adapter cable assembly.
Faulty transmission internal wiring harness.
Faulty transmission turbine speed sensor.
Faulty WTEC II TEPSS.

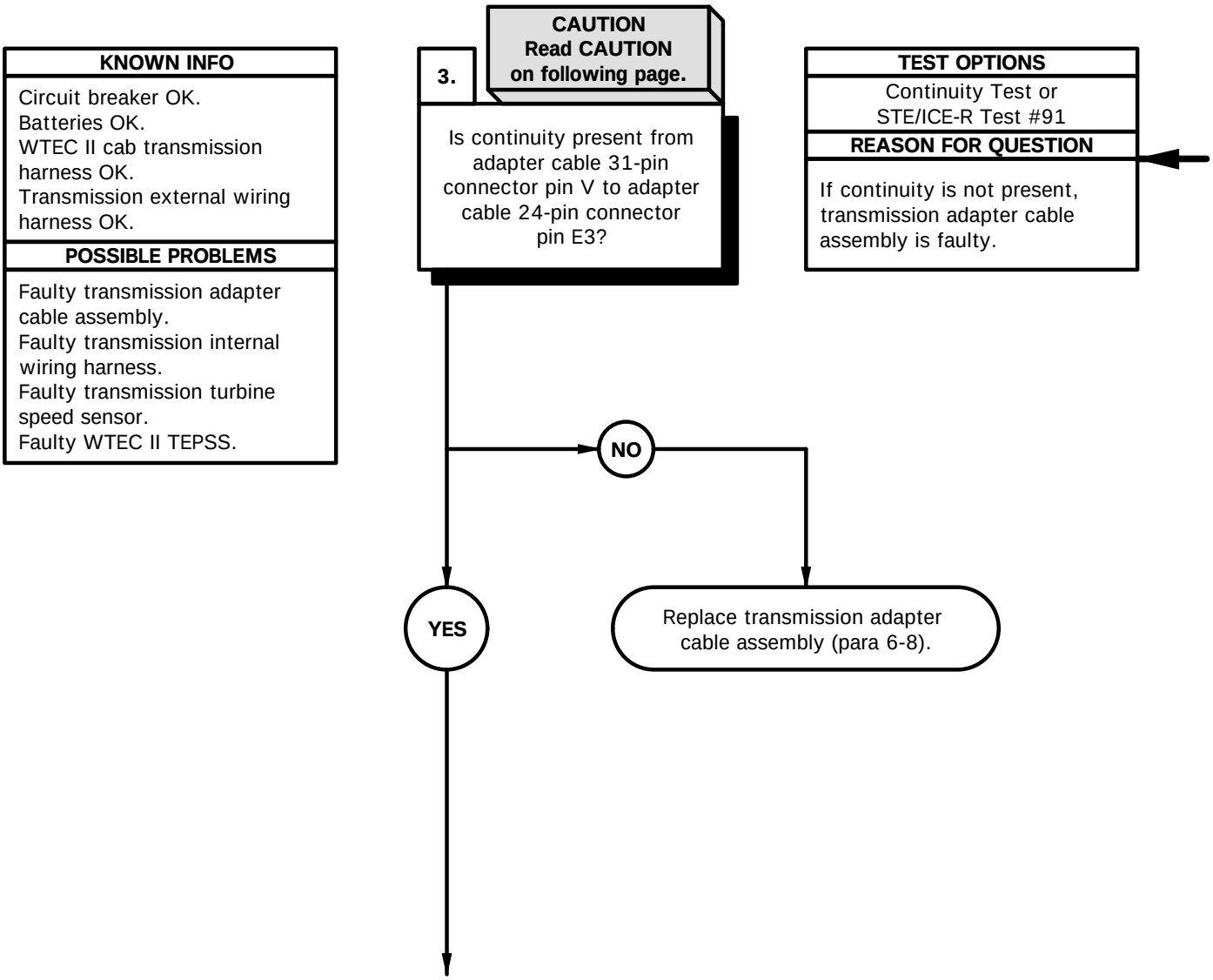


CONTINUITY TEST

(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).



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)

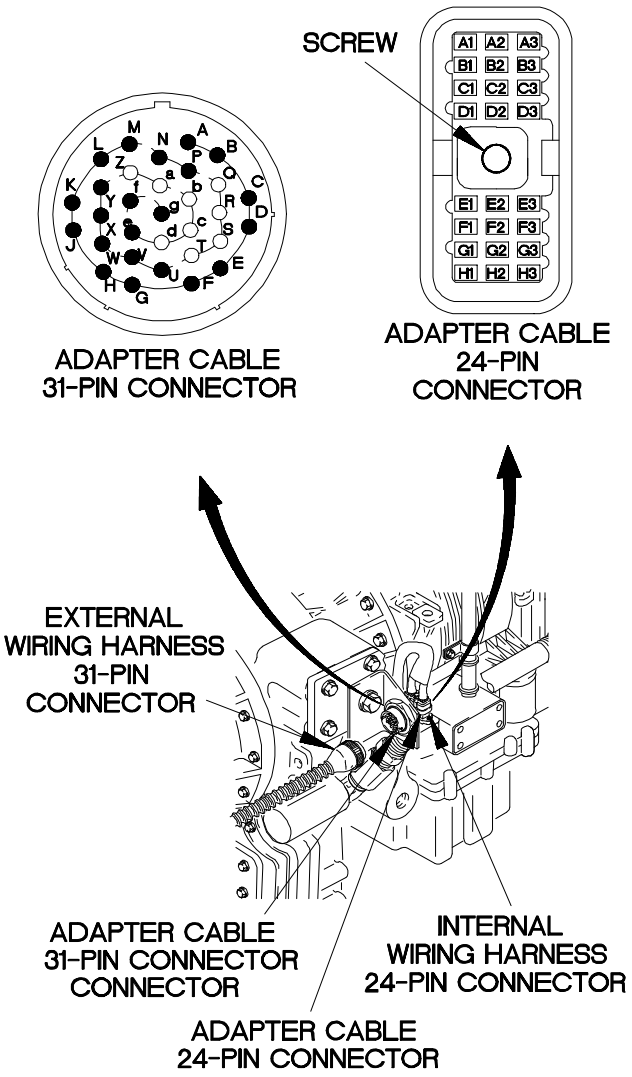


CAUTION

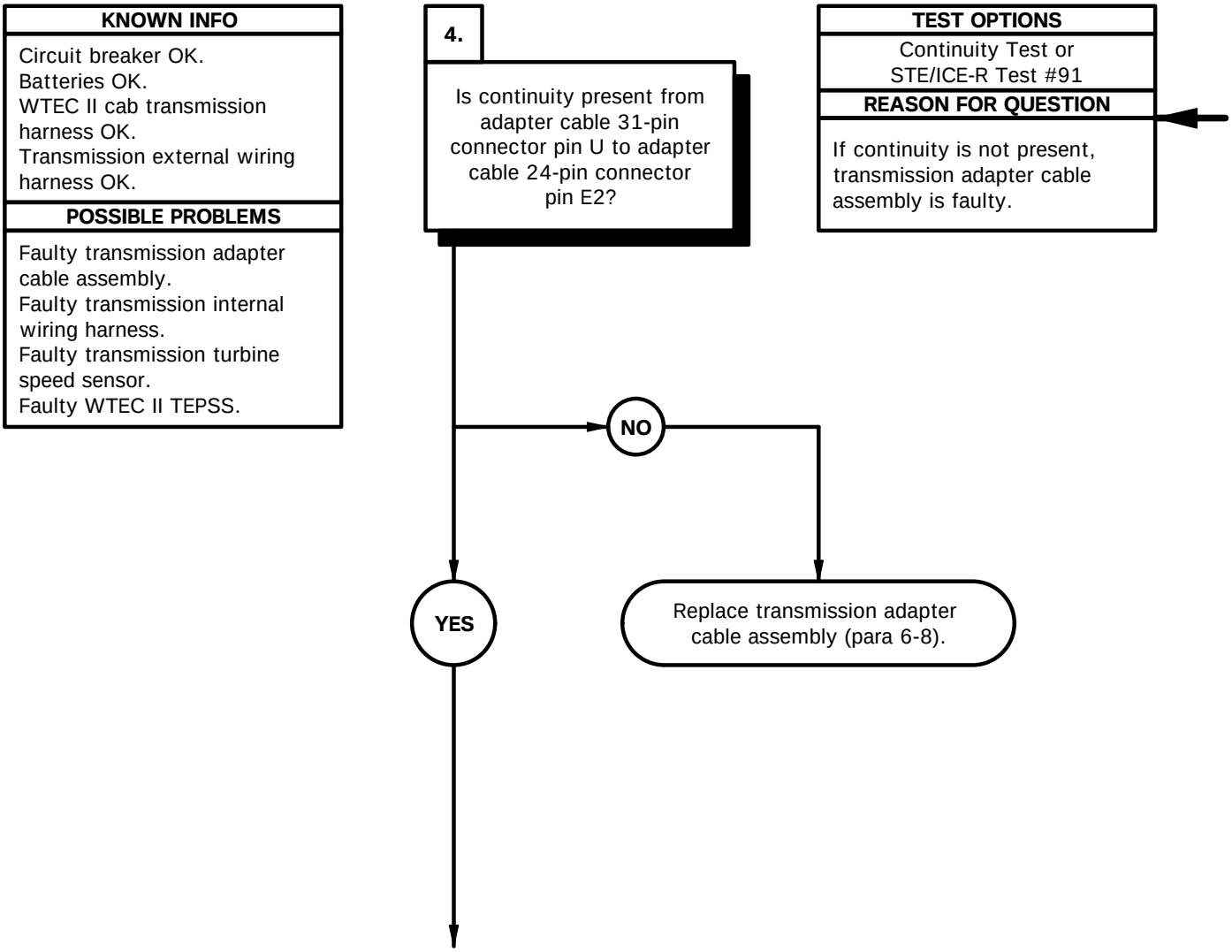
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

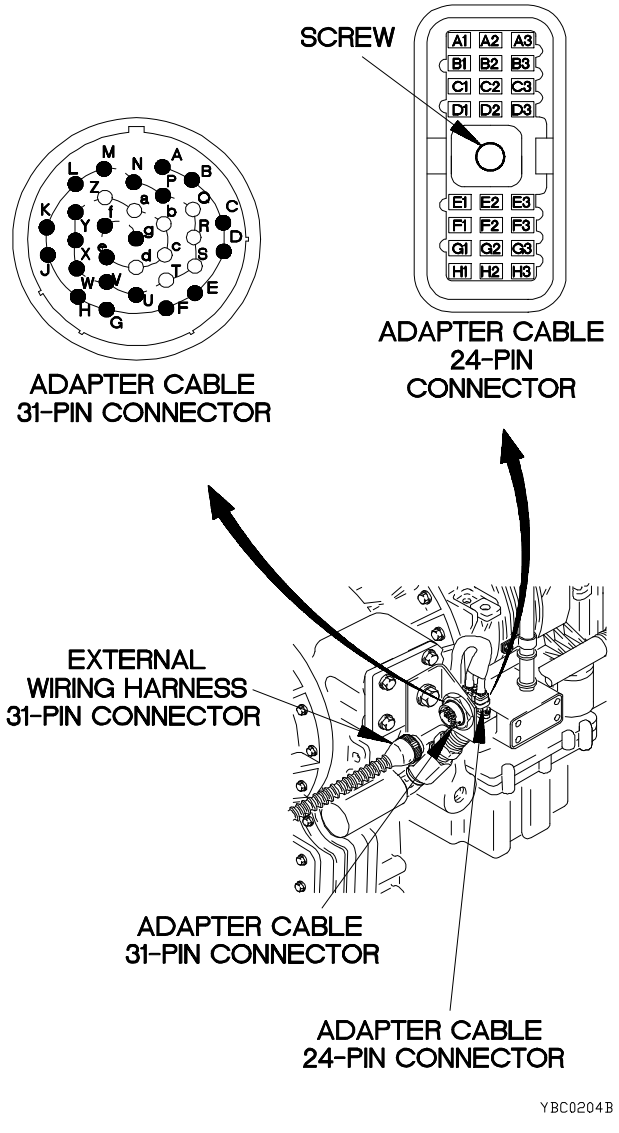


c2. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



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.



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

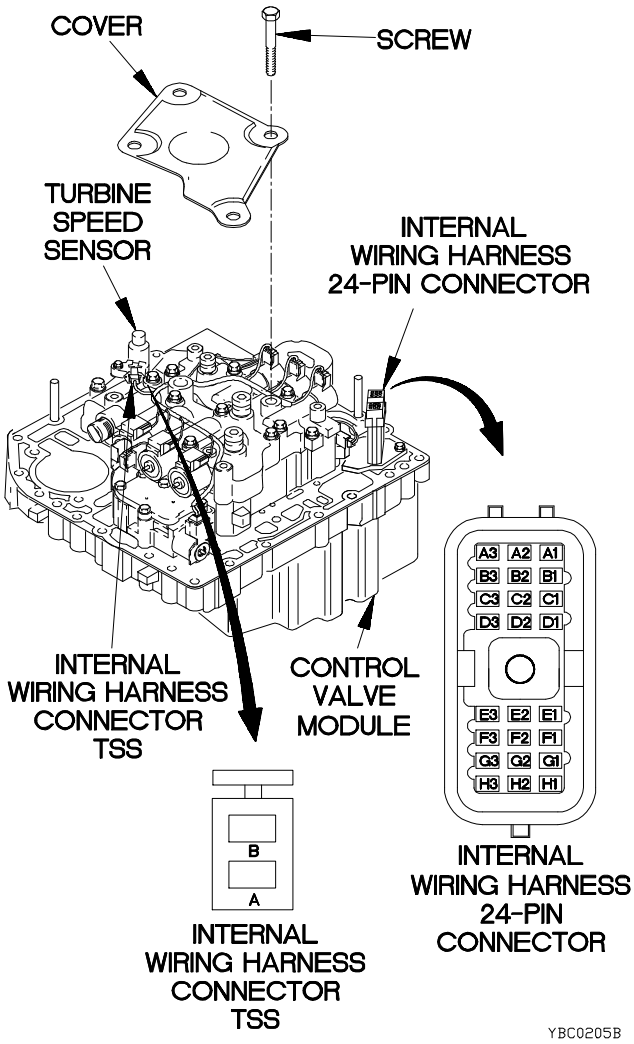
If continuity is not present, transmission internal wiring harness is faulty.

NO → Replace transmission internal wiring harness (para 7-13).

YES

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).



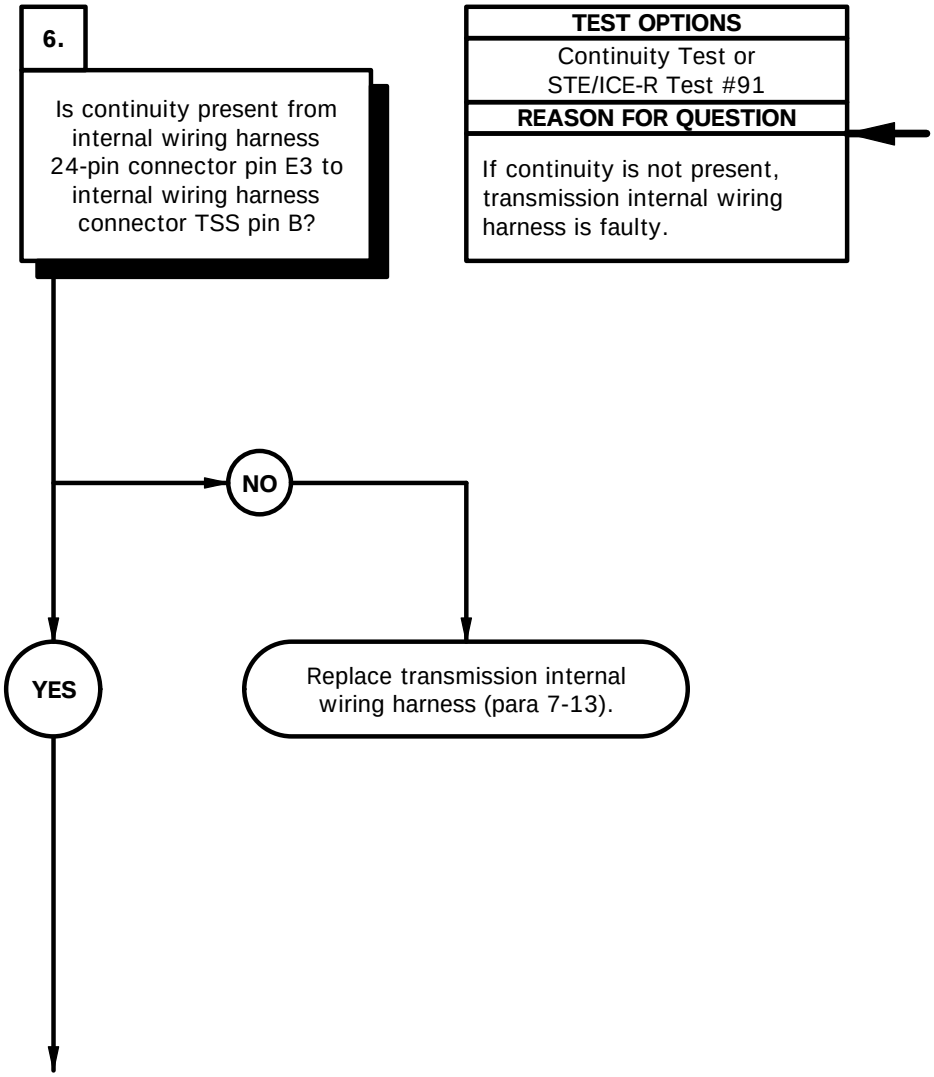
c2. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO

Circuit breaker OK.
Batteries OK.
WTEC II cab transmission harness OK.
Transmission external wiring harness OK.
Transmission adapter cable assembly OK.

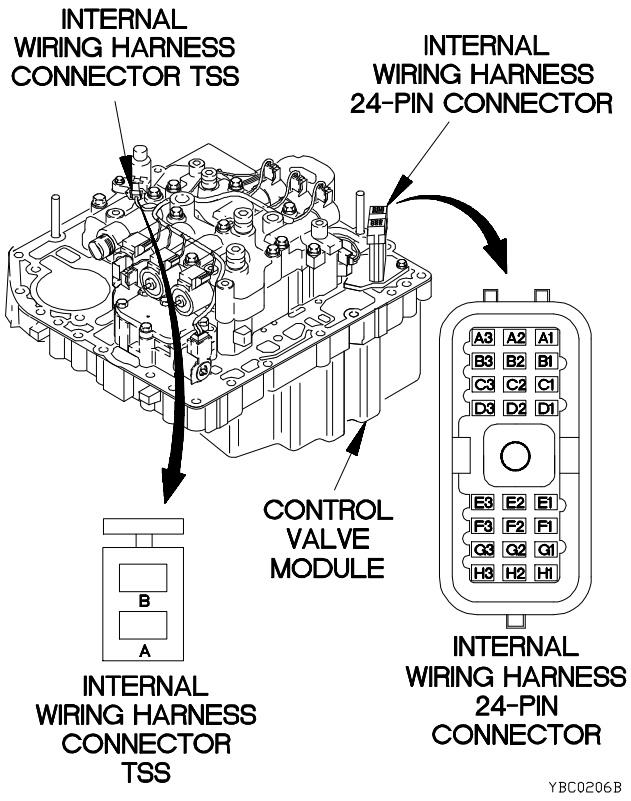
POSSIBLE PROBLEMS

Faulty transmission internal wiring harness.
Faulty transmission turbine speed sensor.
Faulty WTEC II TEPSS.

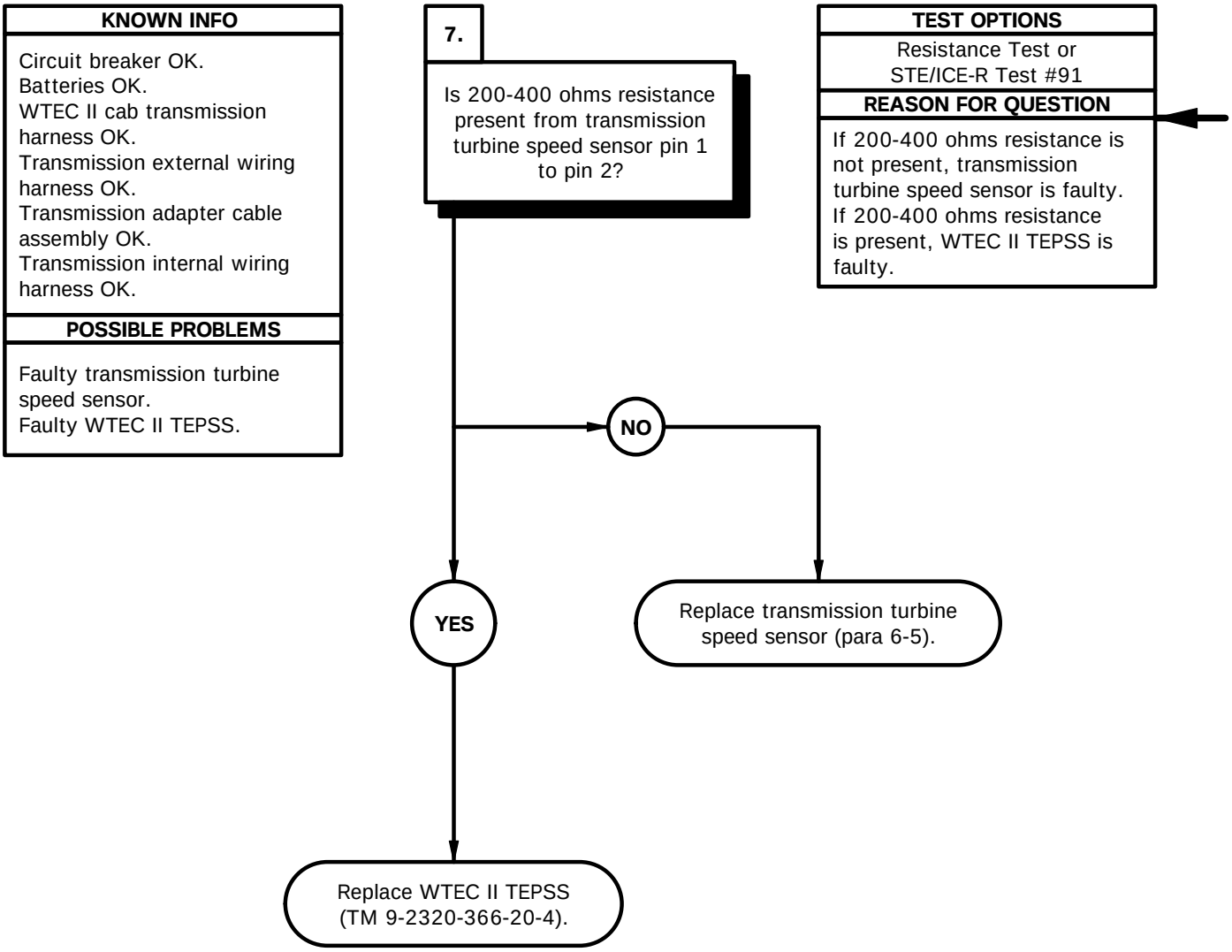


CONTINUITY TEST

(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).

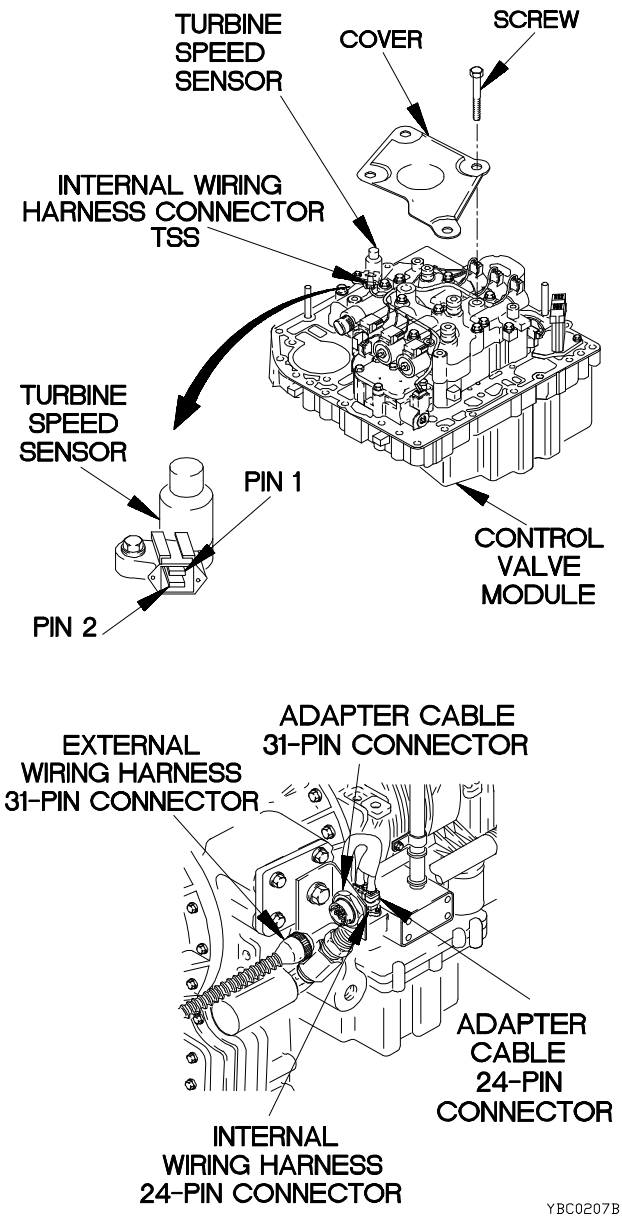


c2. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



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).



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

INITIAL SETUP

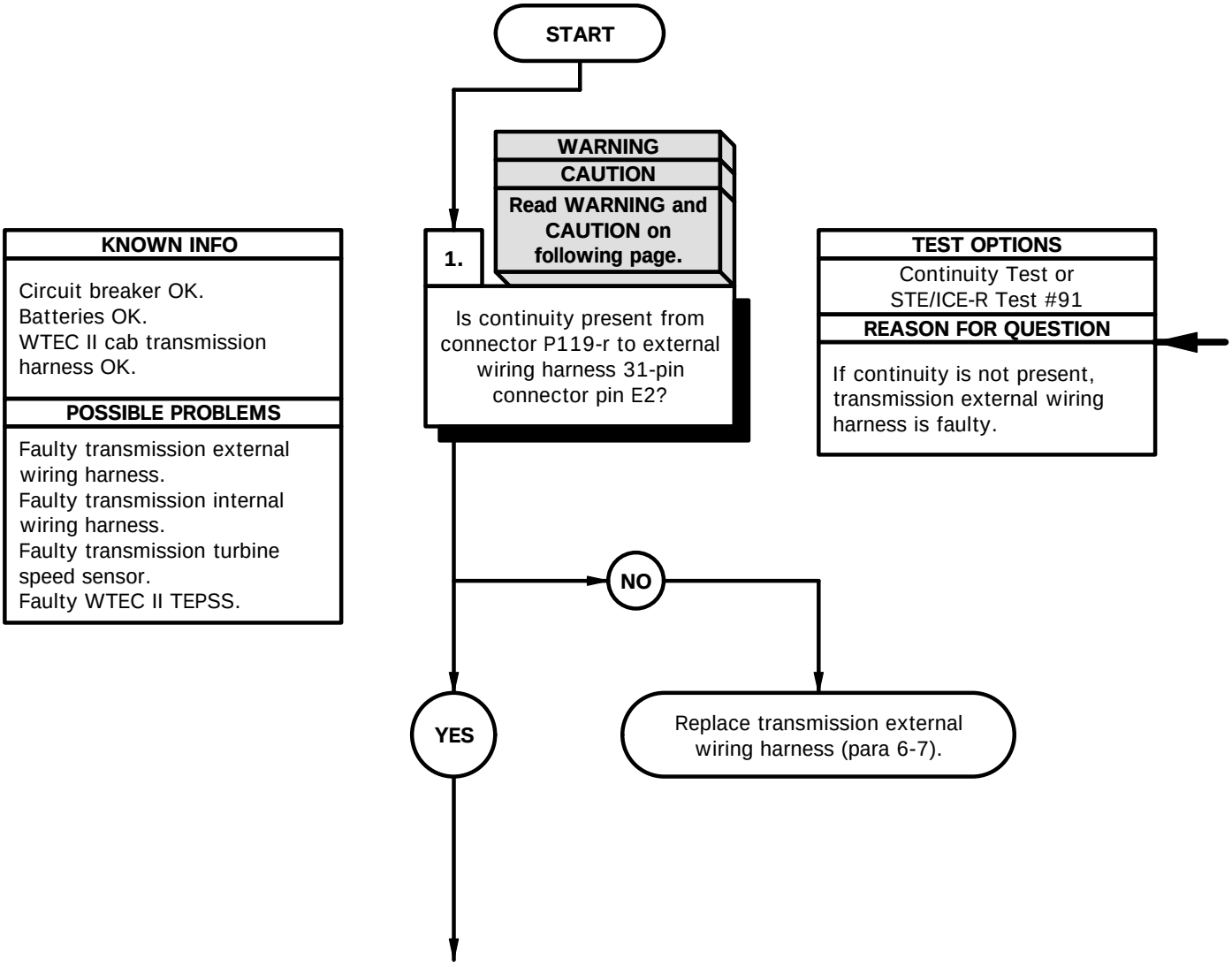
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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 94, 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 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

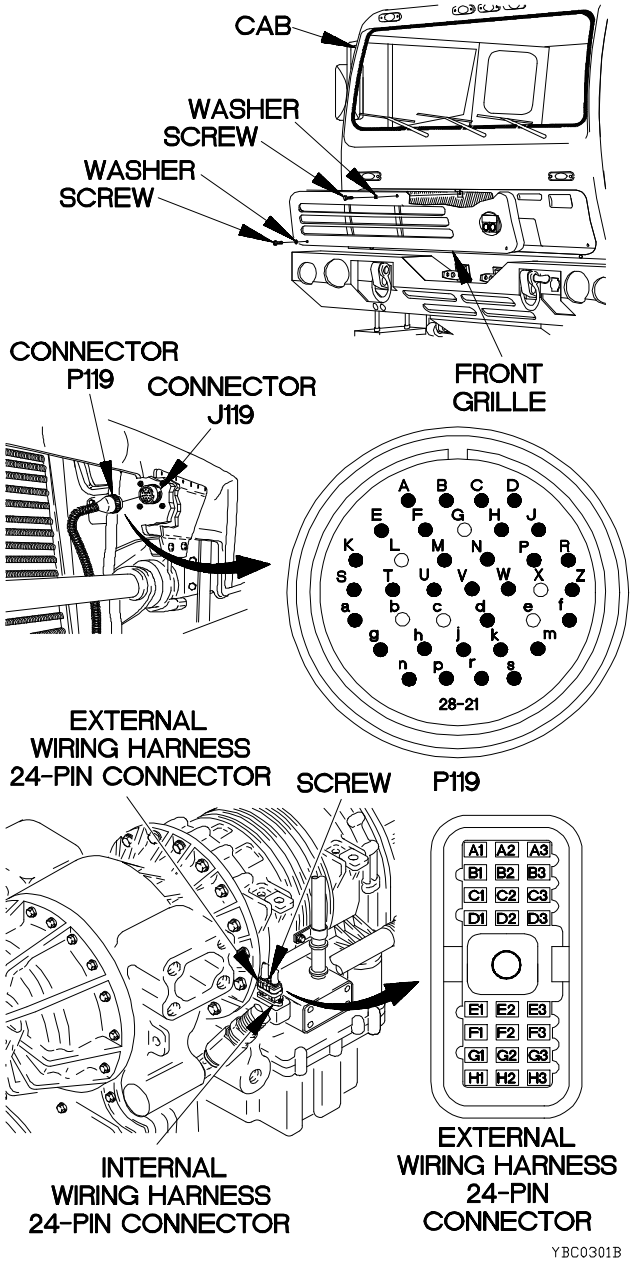
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

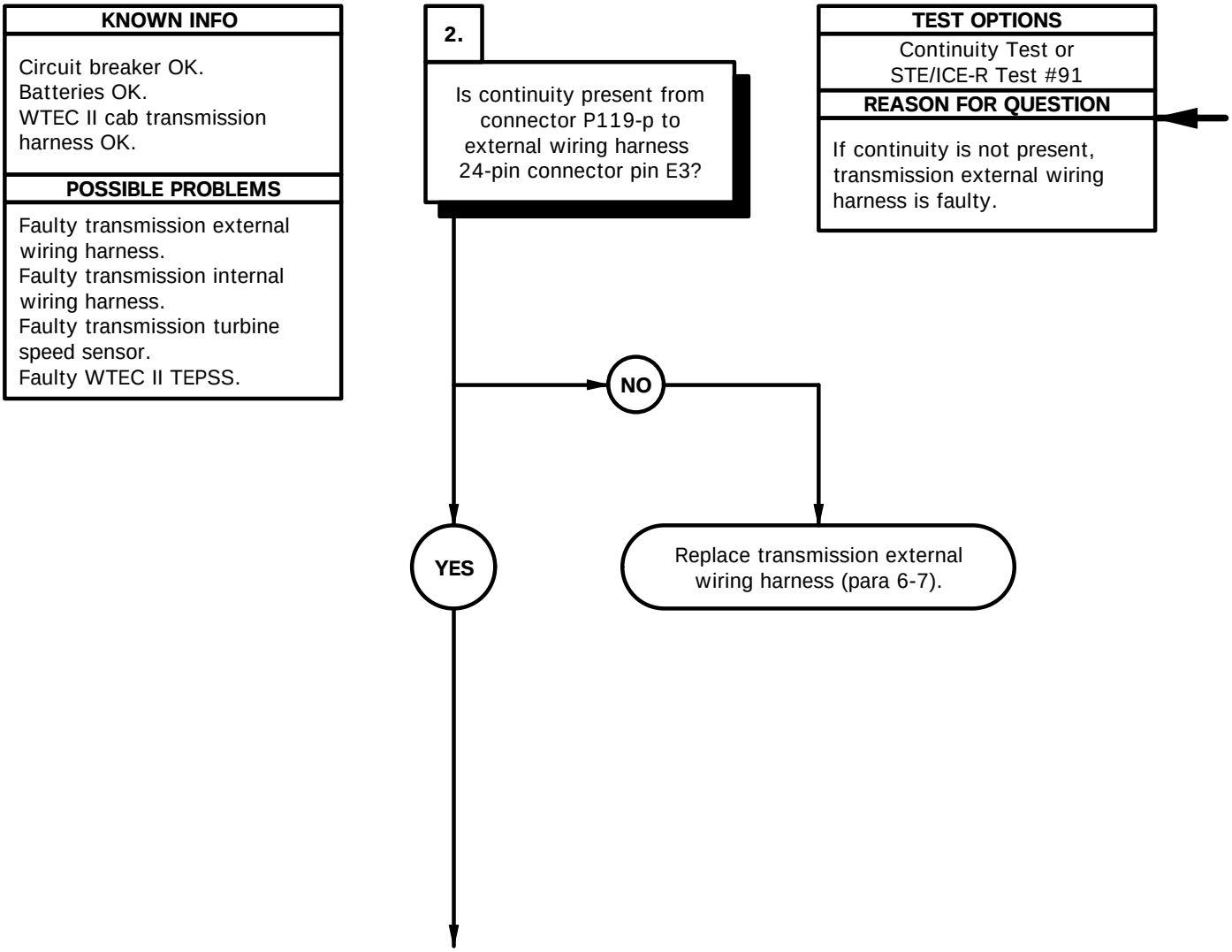
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Loosen screw in external wiring harness 24-pin connector.
(6) Disconnect external wiring harness 24-pin connector 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).

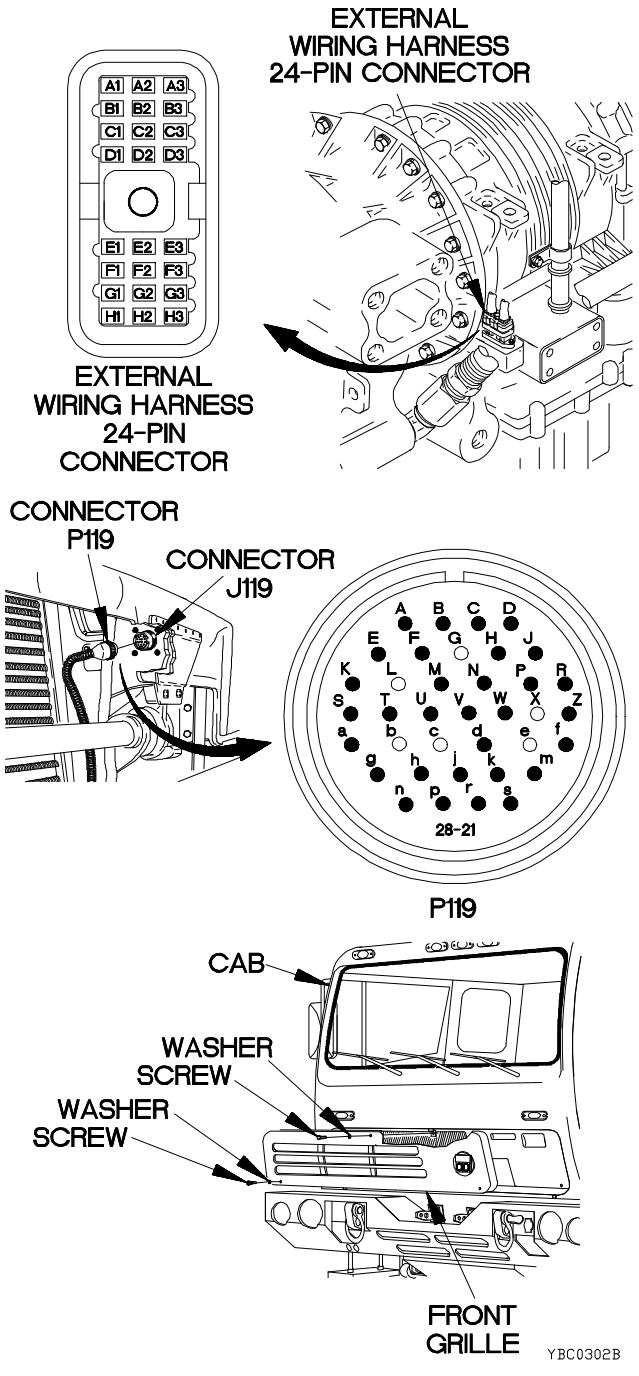


c3. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

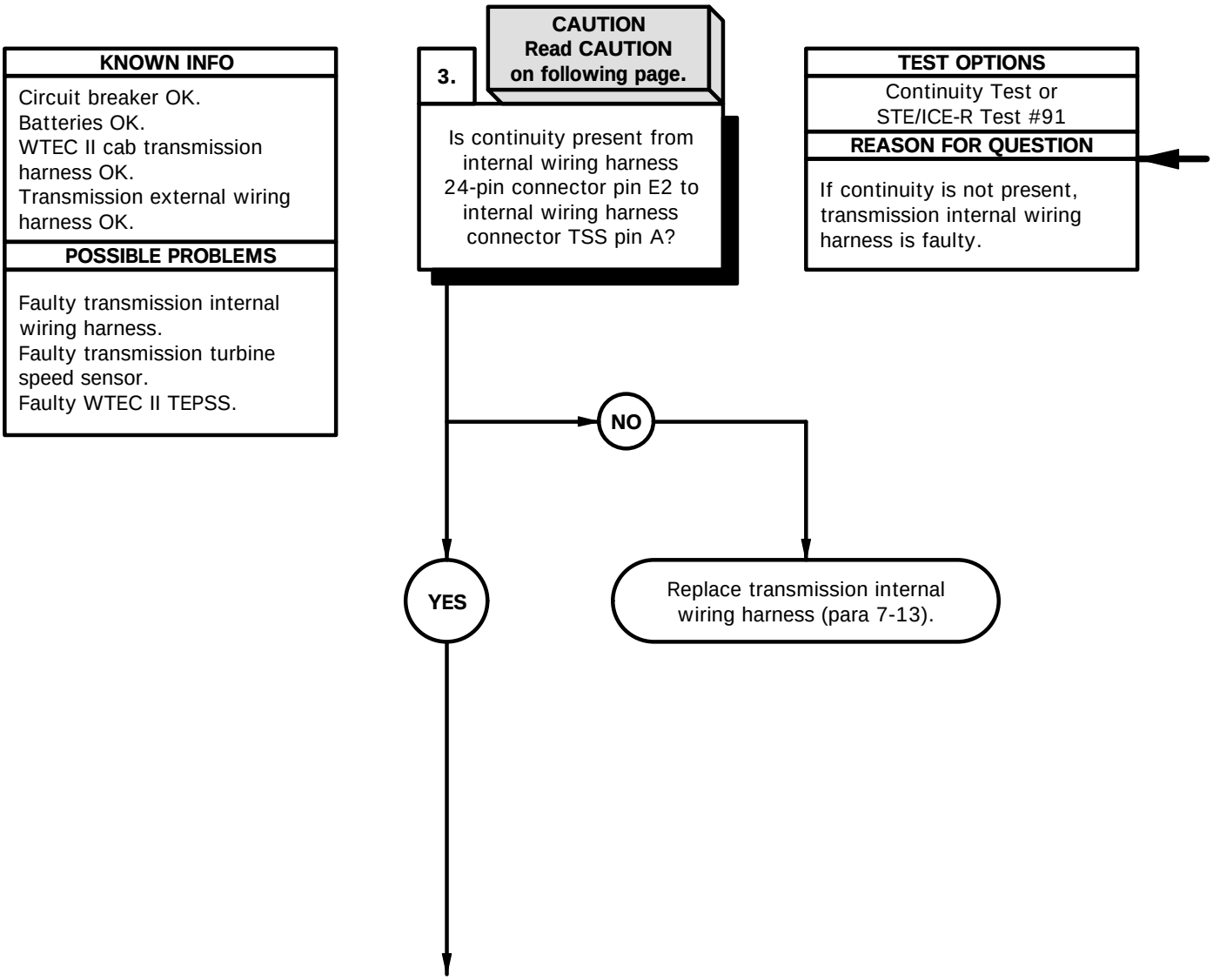


CONTINUITY TEST

(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).



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

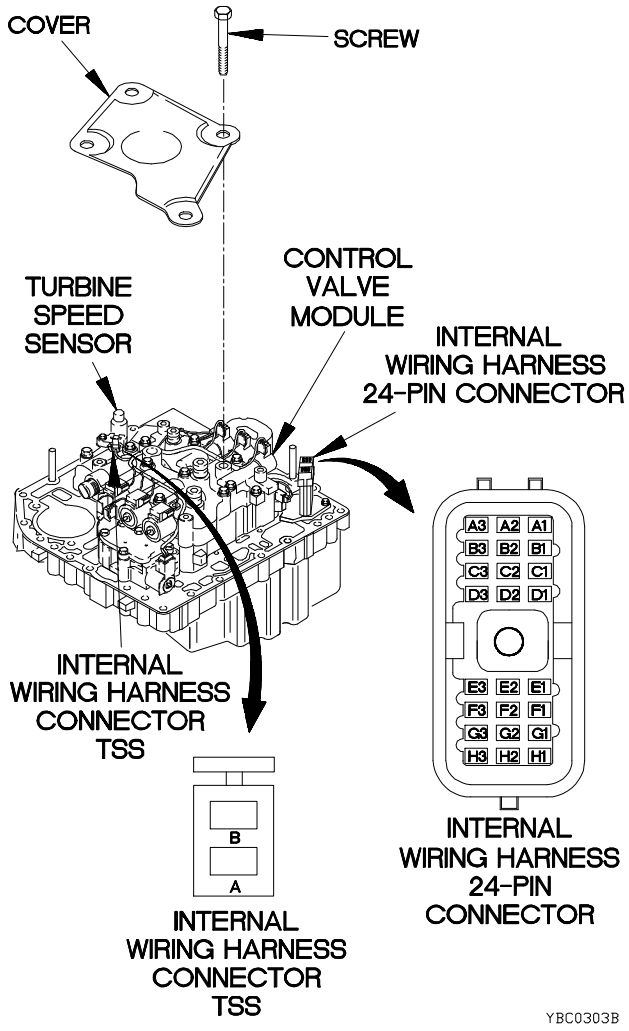


CAUTION

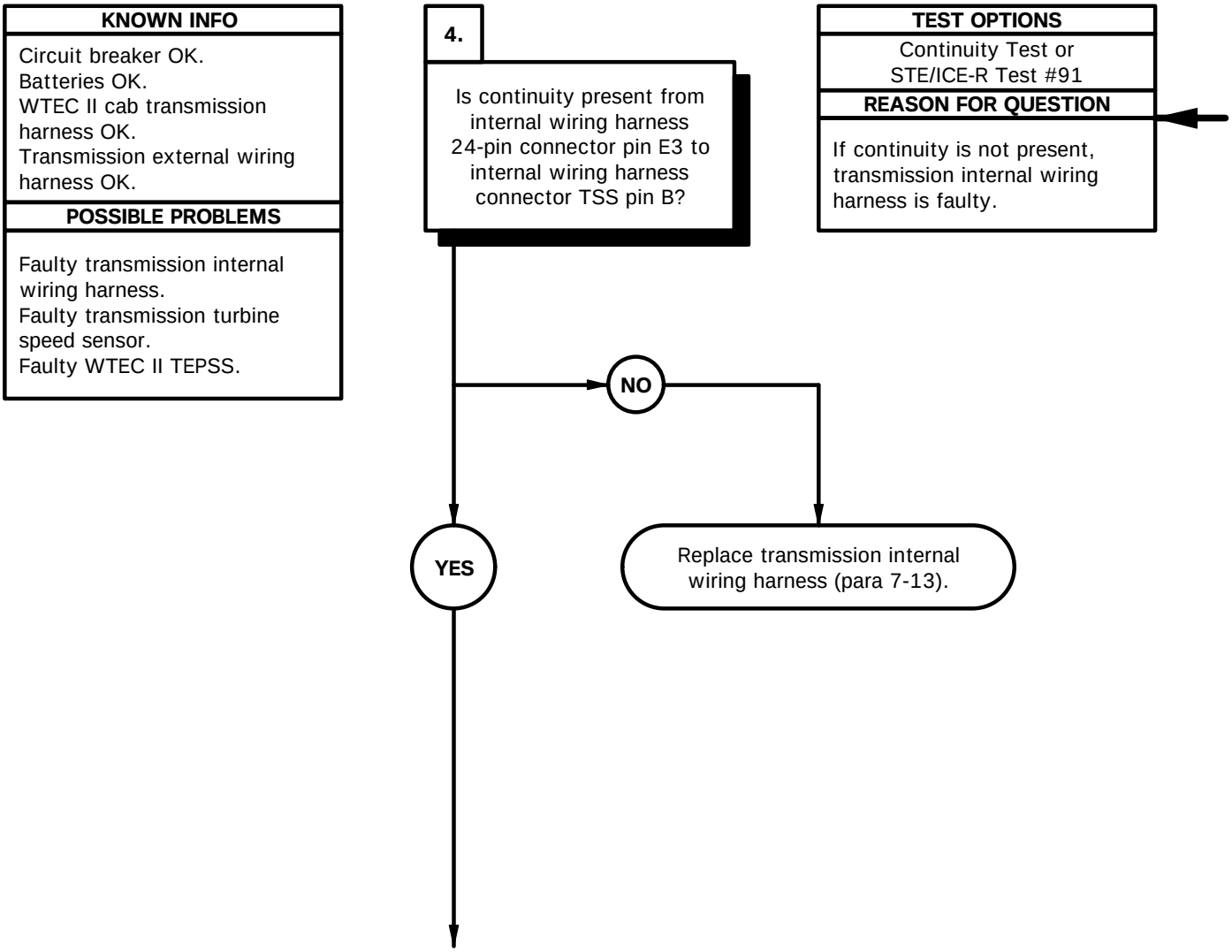
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

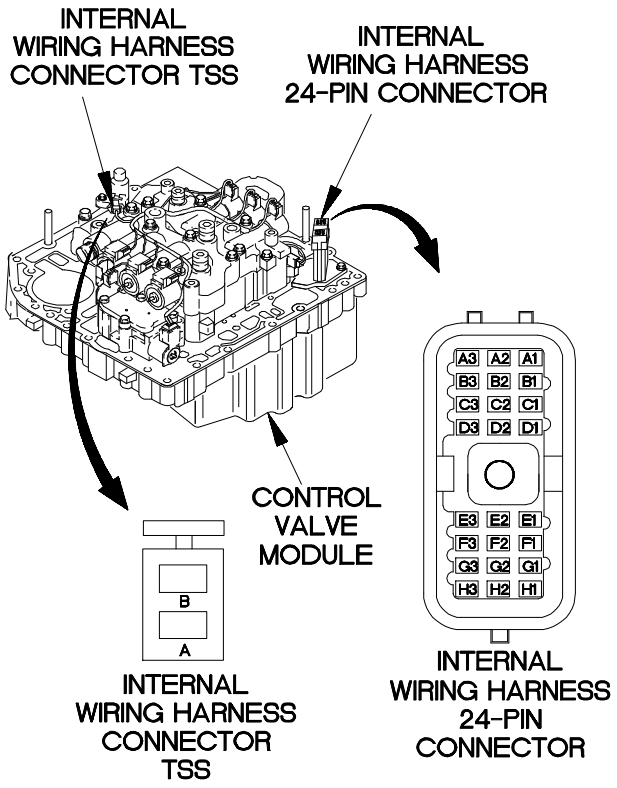


c3. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

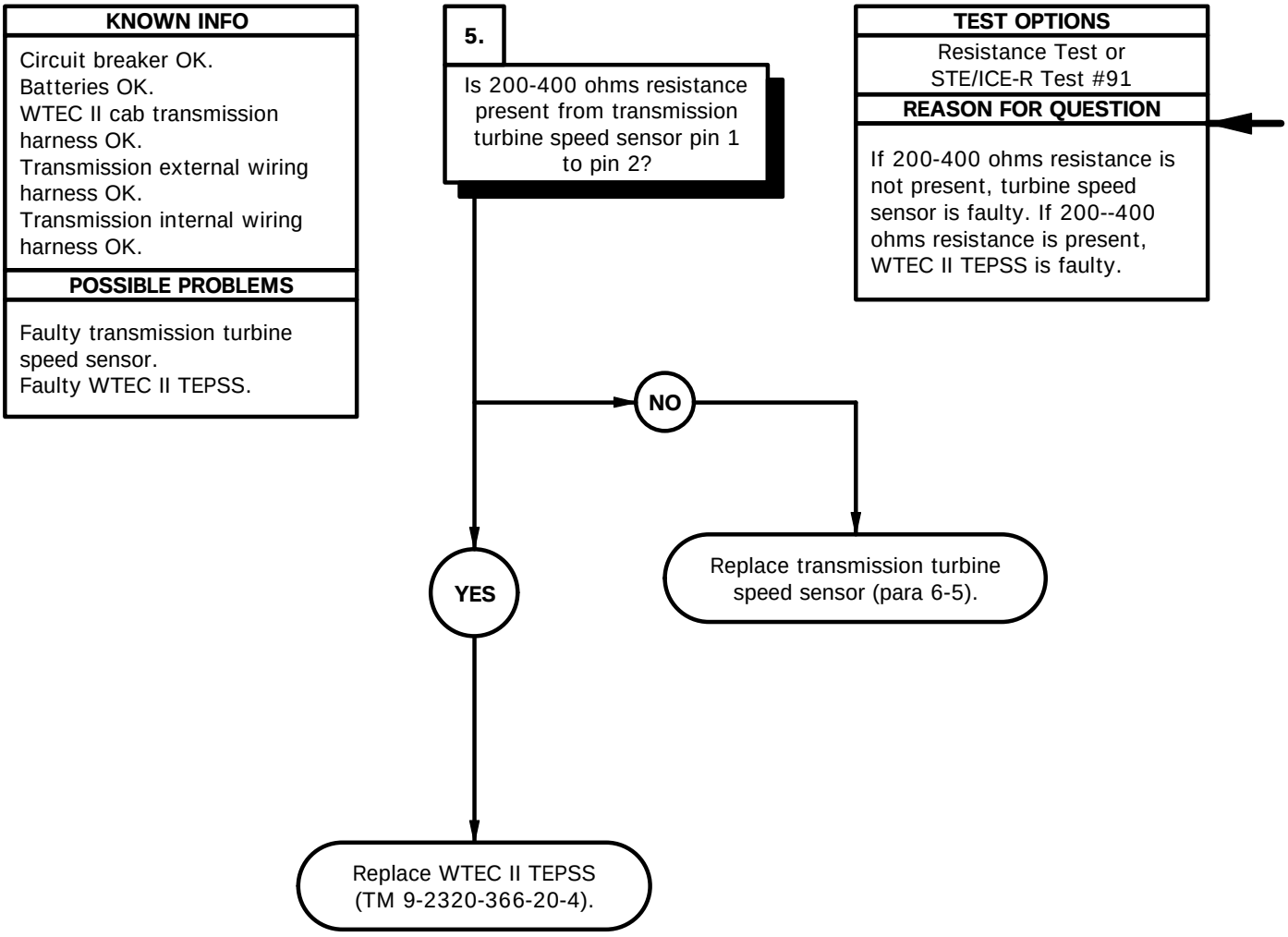


CONTINUITY TEST

(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).

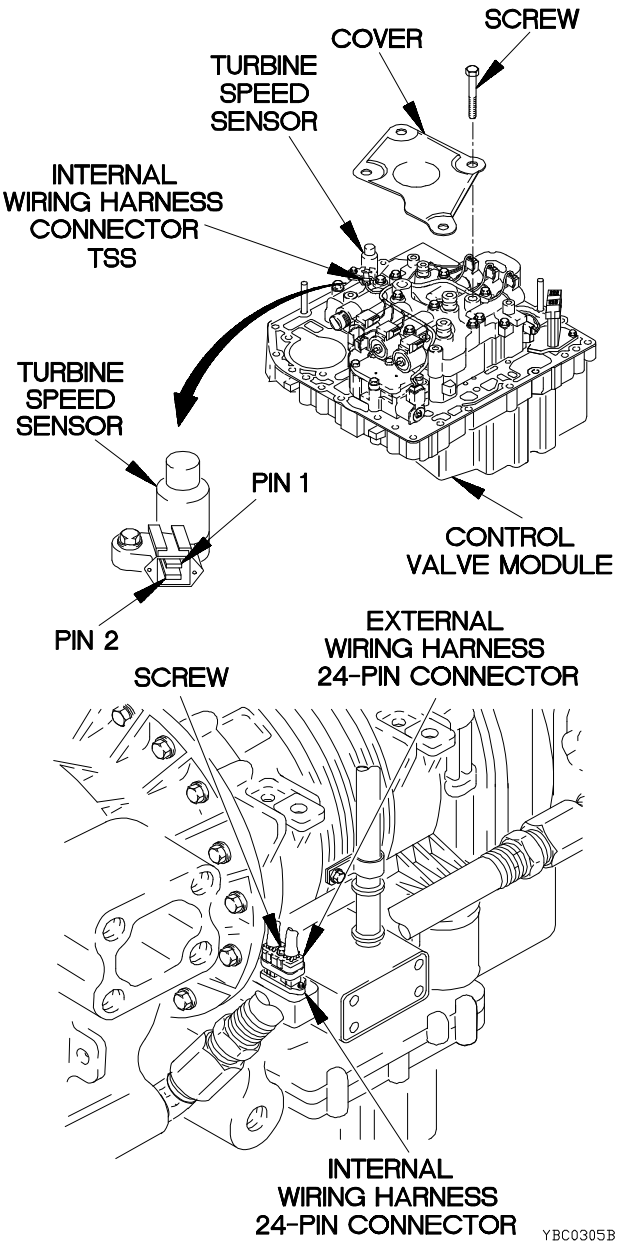


c3. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)



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).

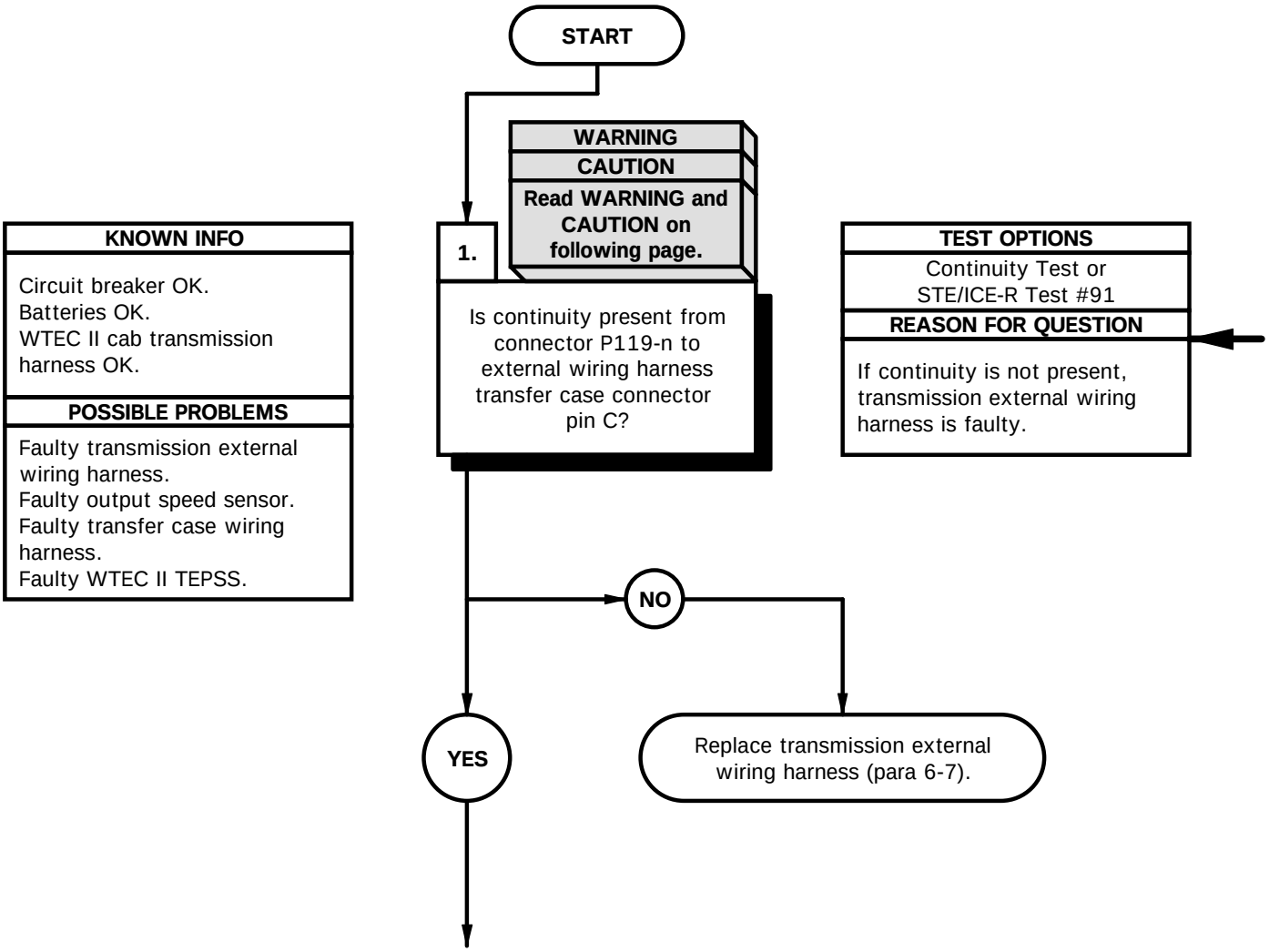


c4. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 16 OR MAIN CODE 25 AND/OR 56 AND ANY SUB CODE

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)
Pan, Drain (Item 43, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 75, 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.

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

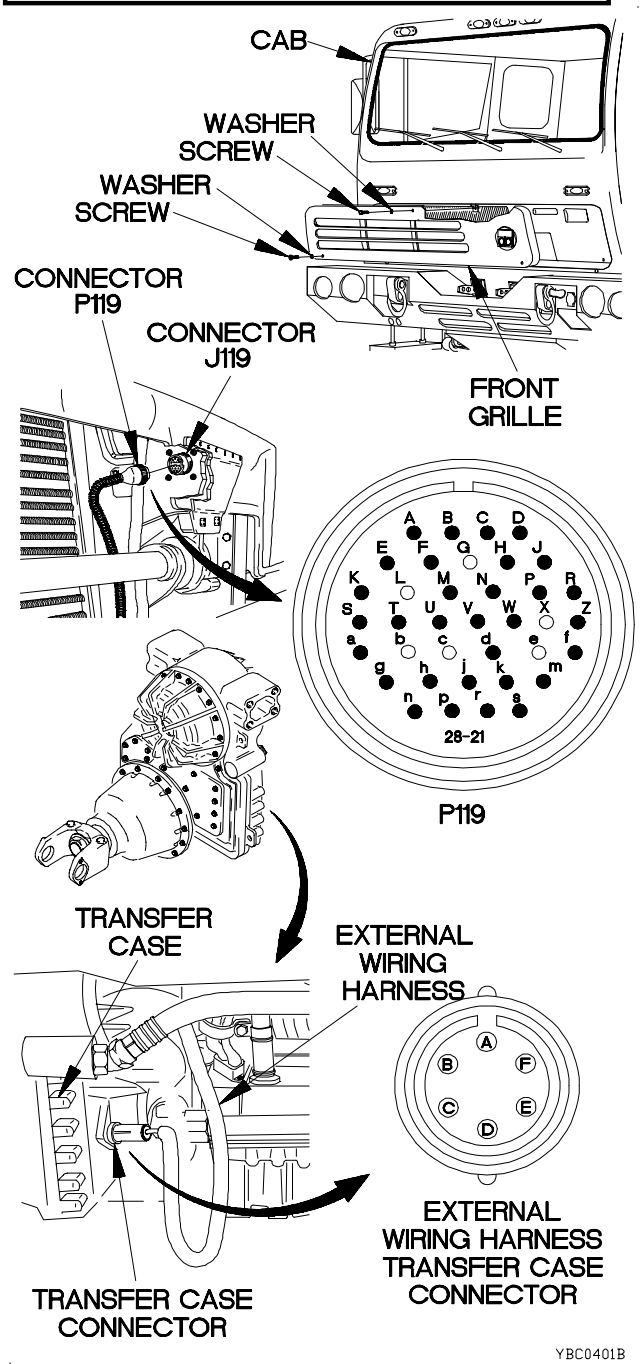
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

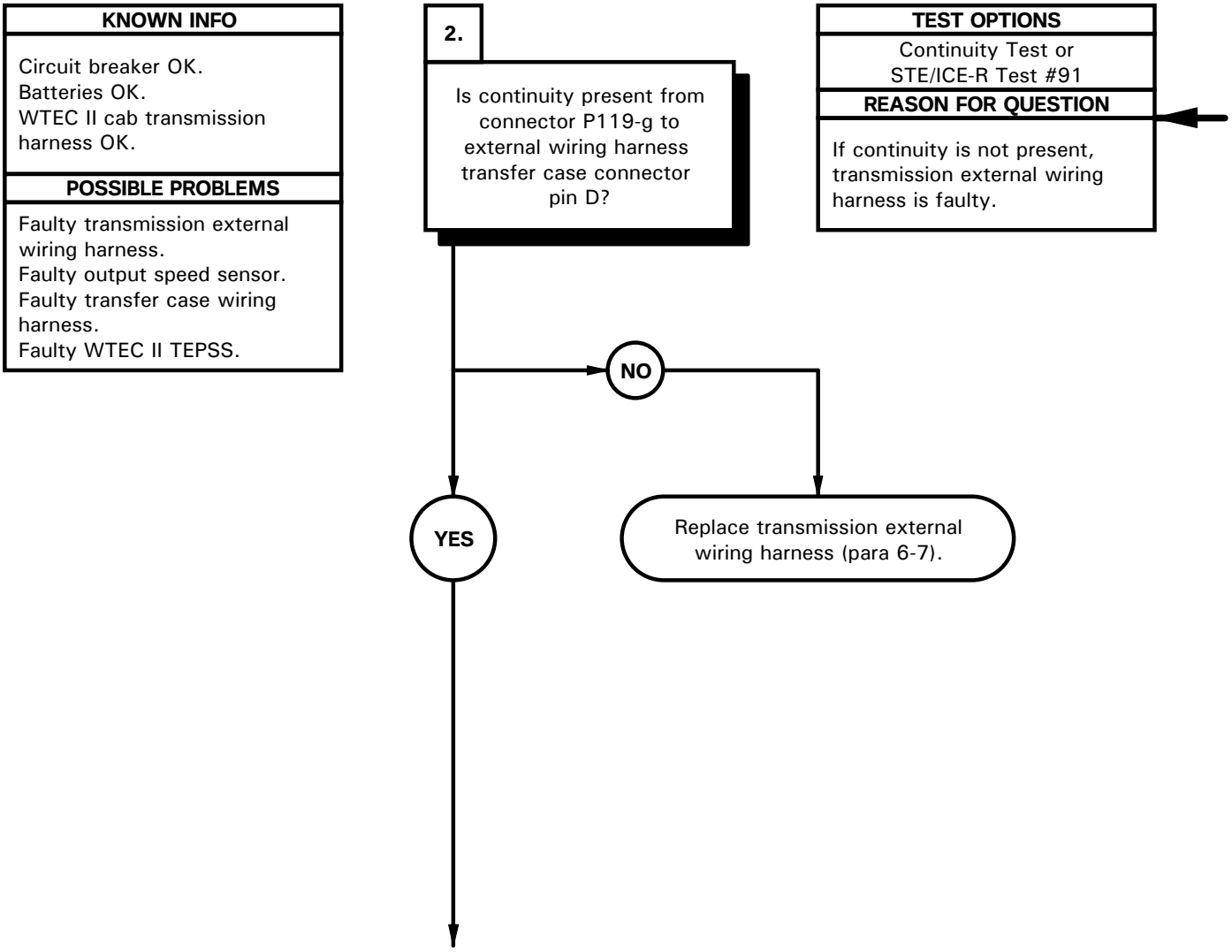
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness transfer case connector from transfer case connector.
(6) Set multimeter to ohms.
(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).

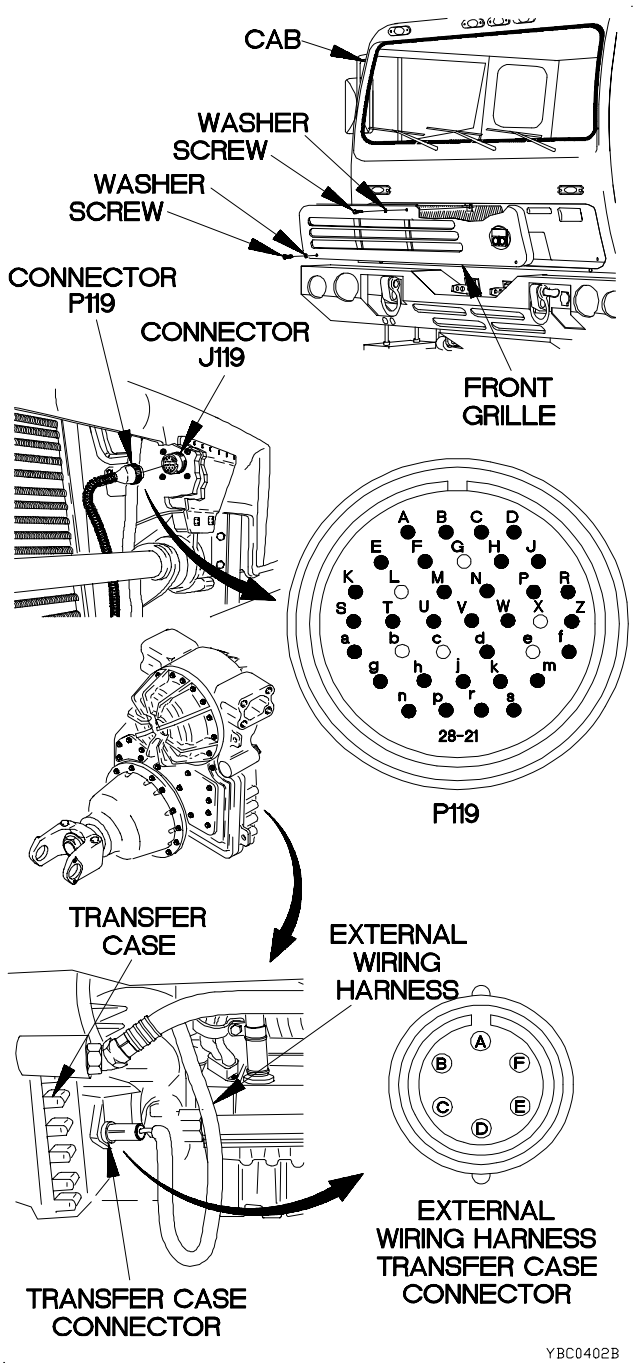


c4. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 16 OR MAIN CODE 25 AND/OR 56 AND ANY SUB CODE (CONT)

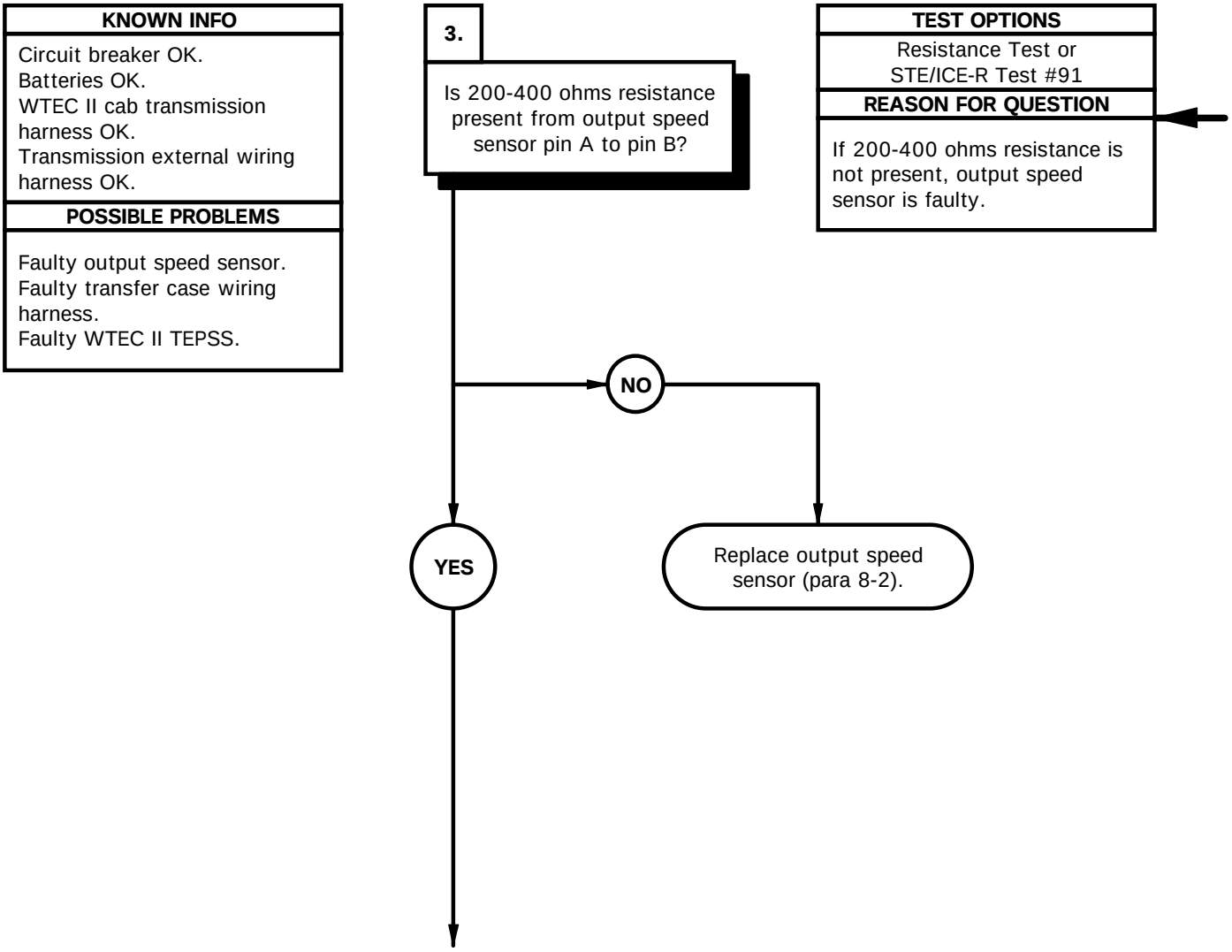


CONTINUITY TEST

(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).

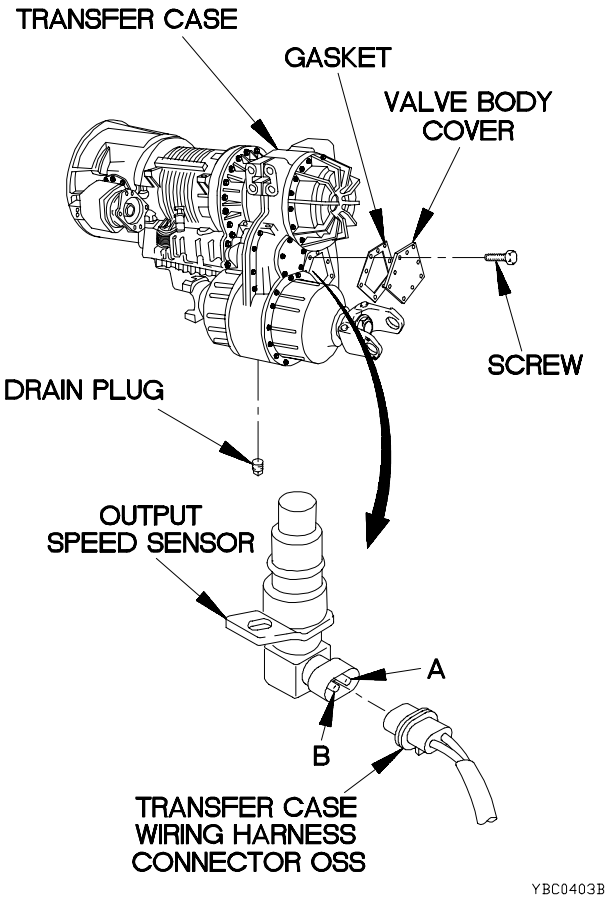


c4. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 16 OR MAIN CODE 25 AND/OR 56 AND ANY SUB CODE (CONT)

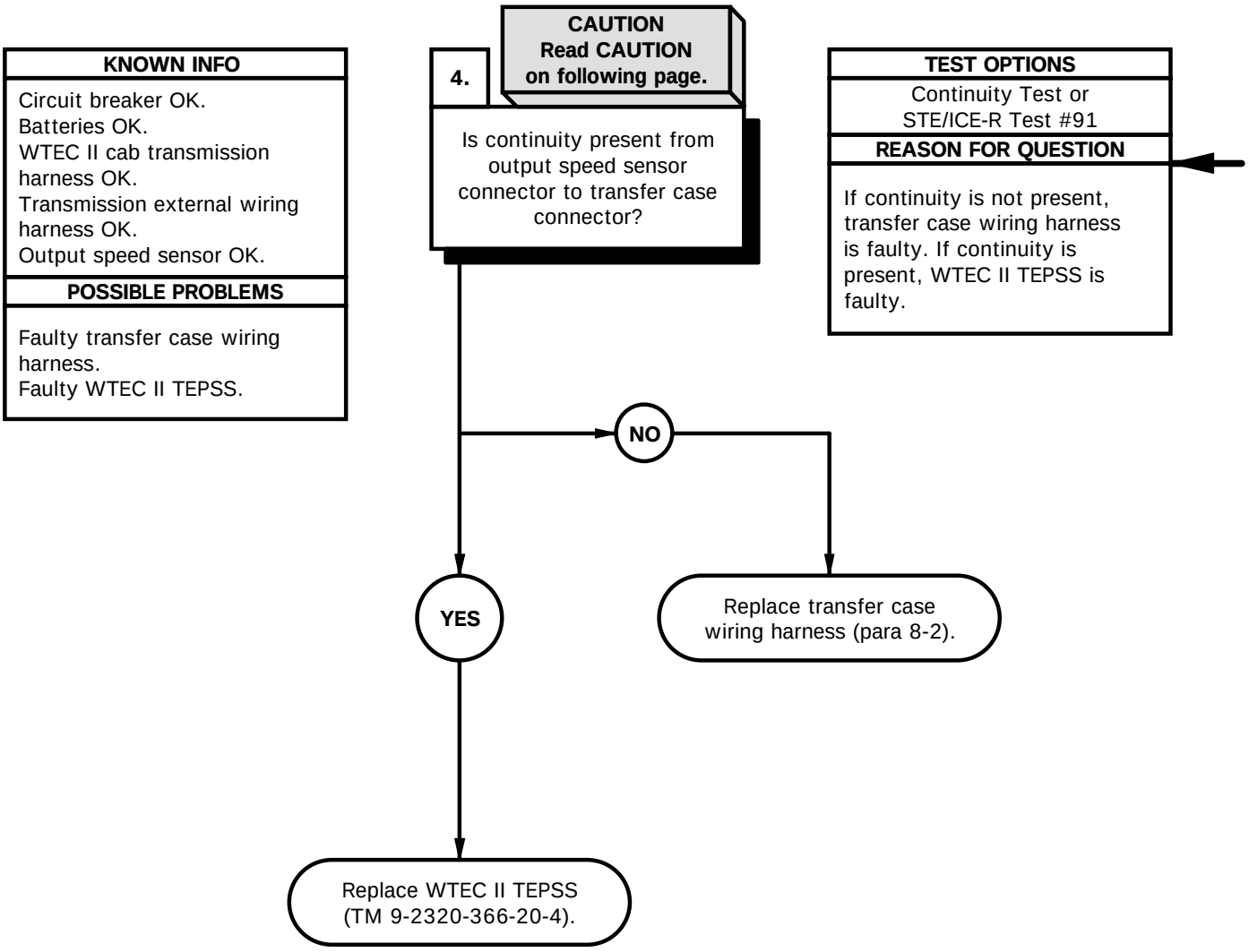


RESISTANCE TEST

(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).



c4. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 16 OR MAIN CODE 25 AND/OR 56 AND ANY SUB CODE (CONT)

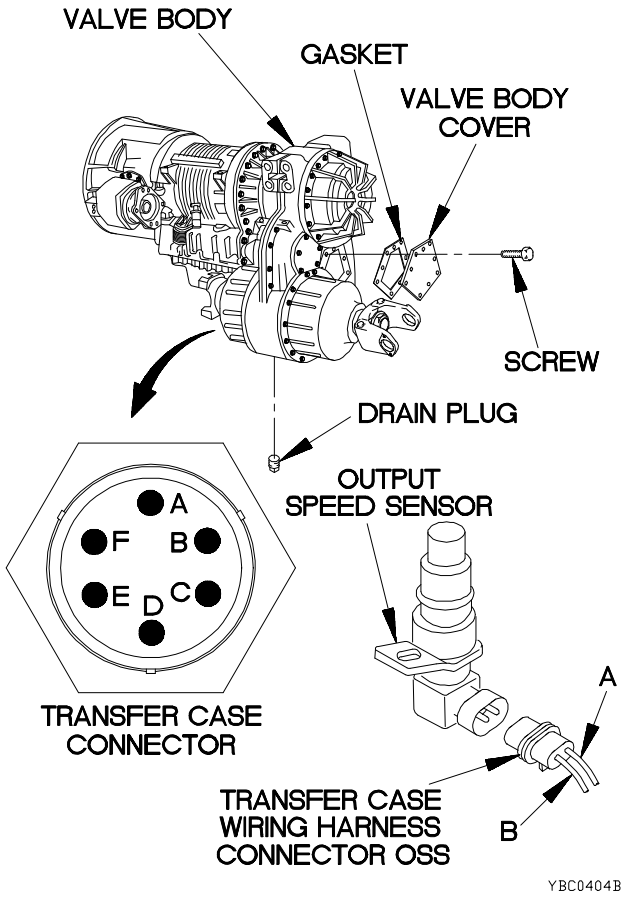


CAUTION

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).



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

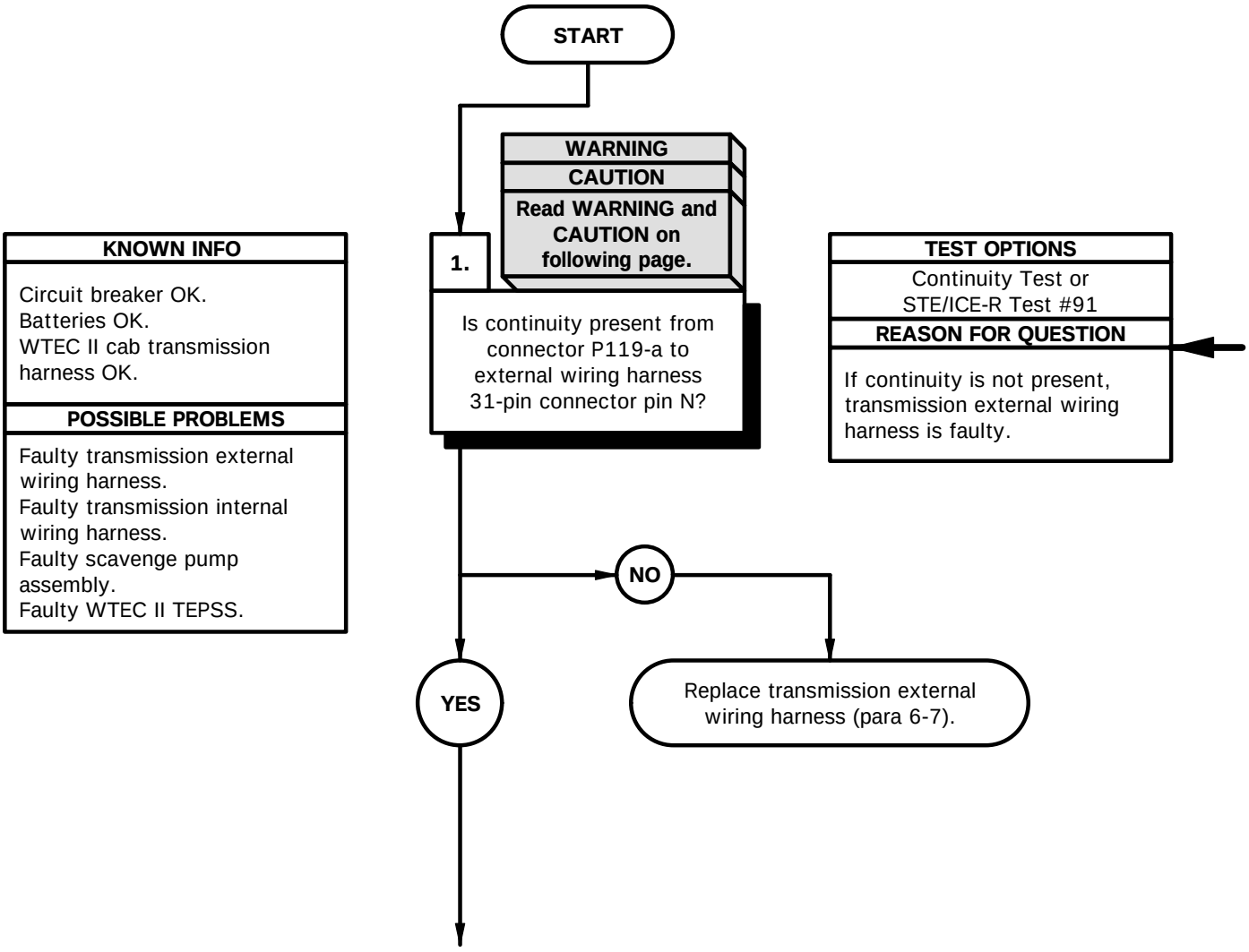
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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)
Pan, Drain (Item 43, 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

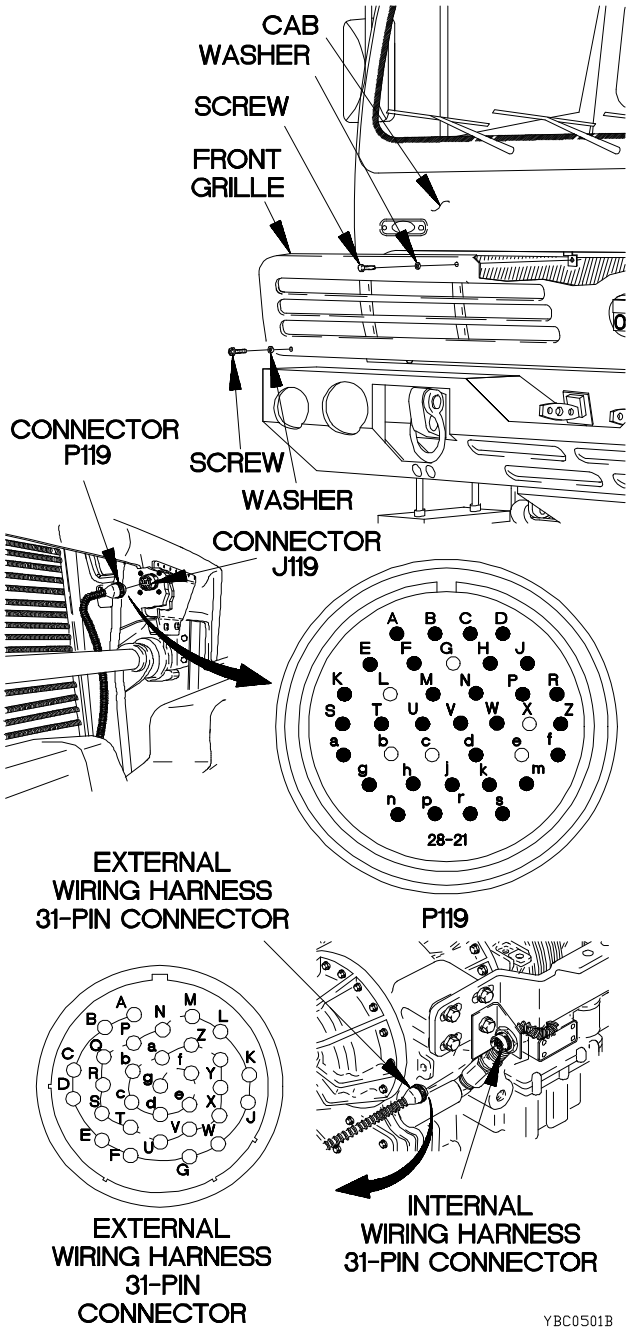
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

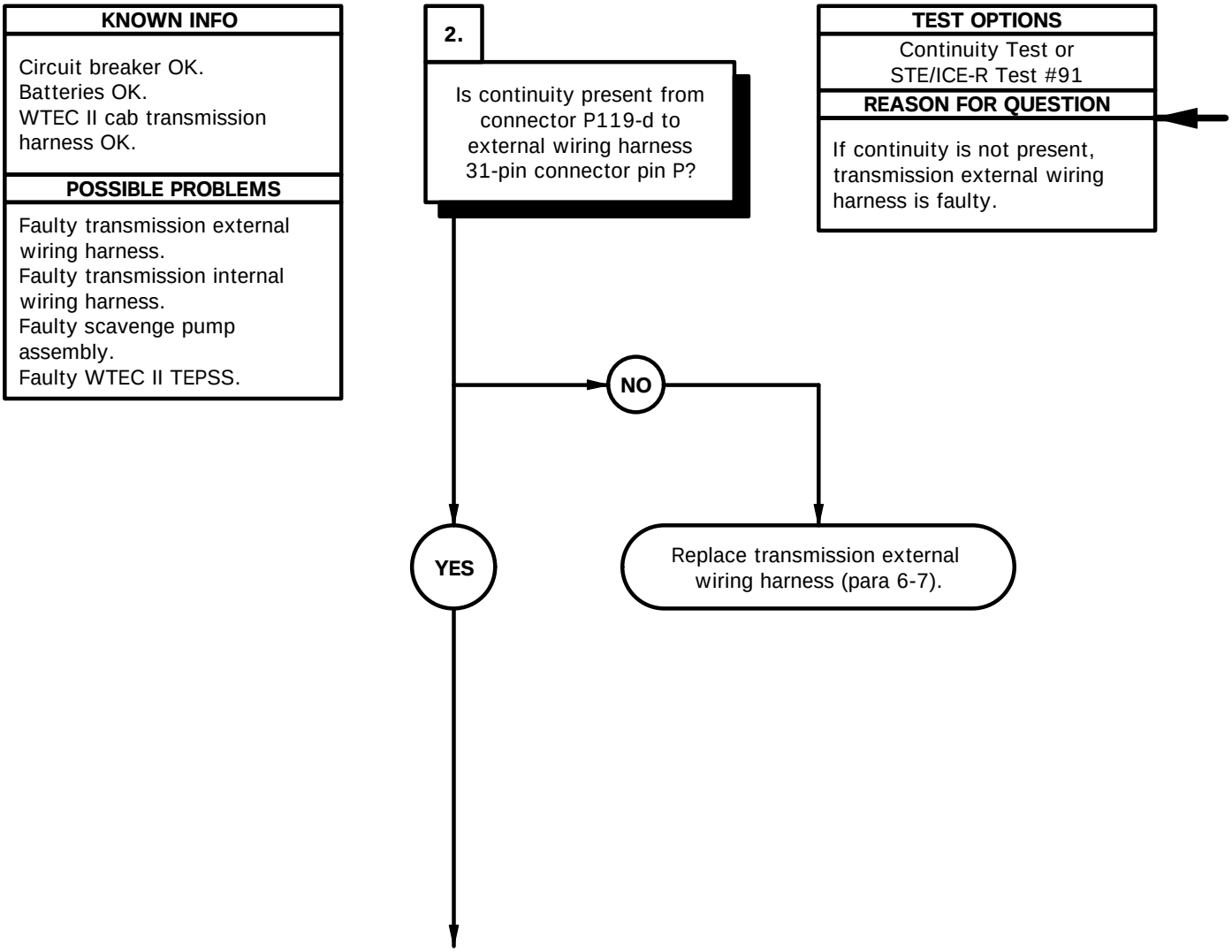
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin connector .
(6) Set multimeter 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).

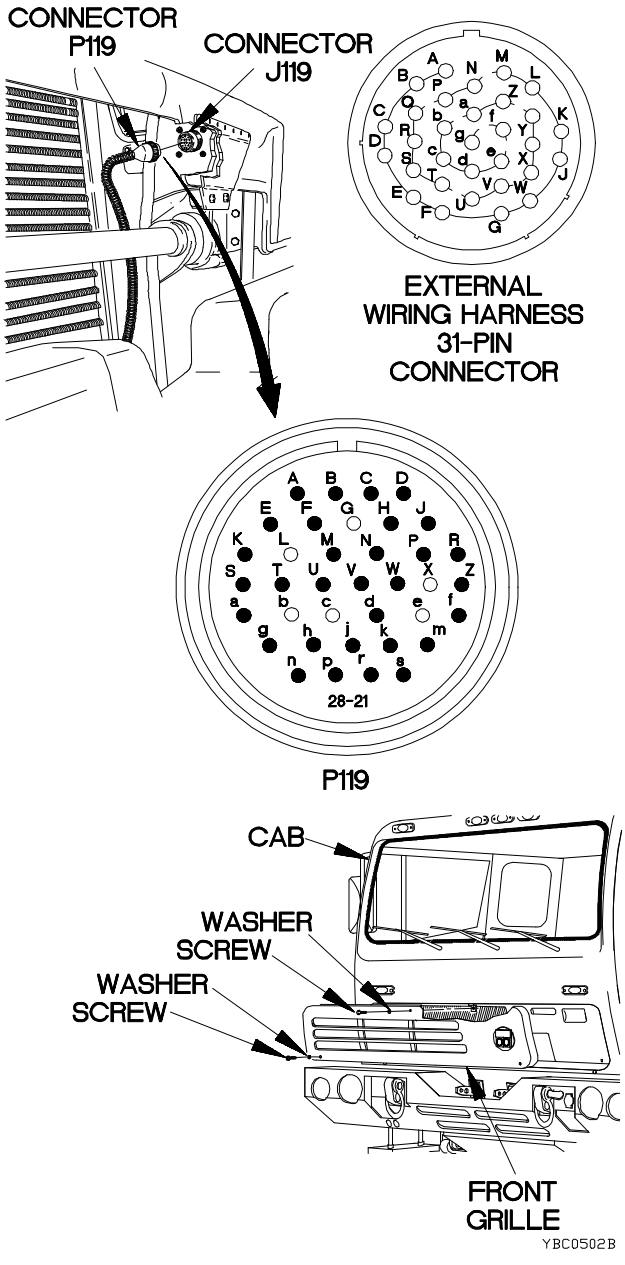


c5. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

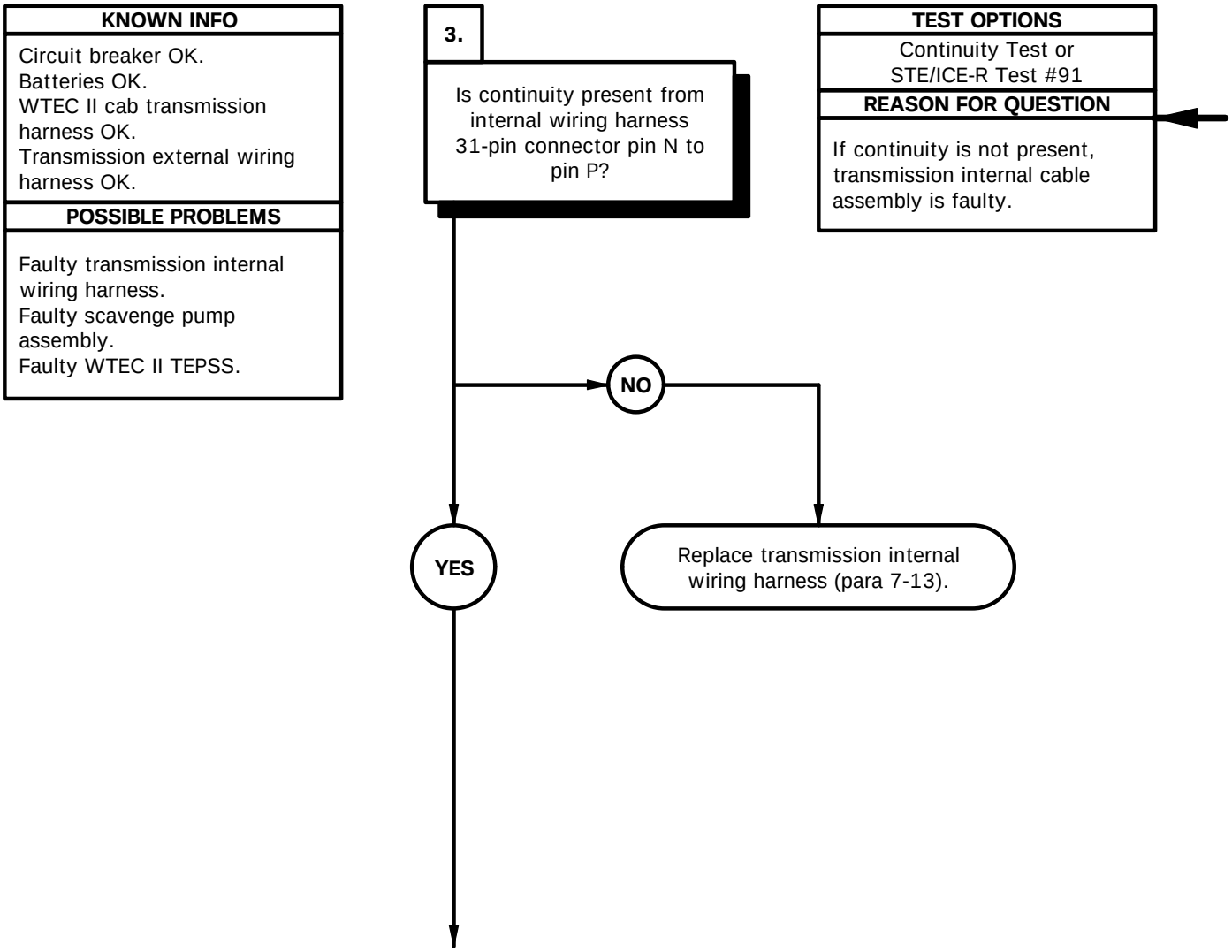


CONTINUITY TEST

(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).

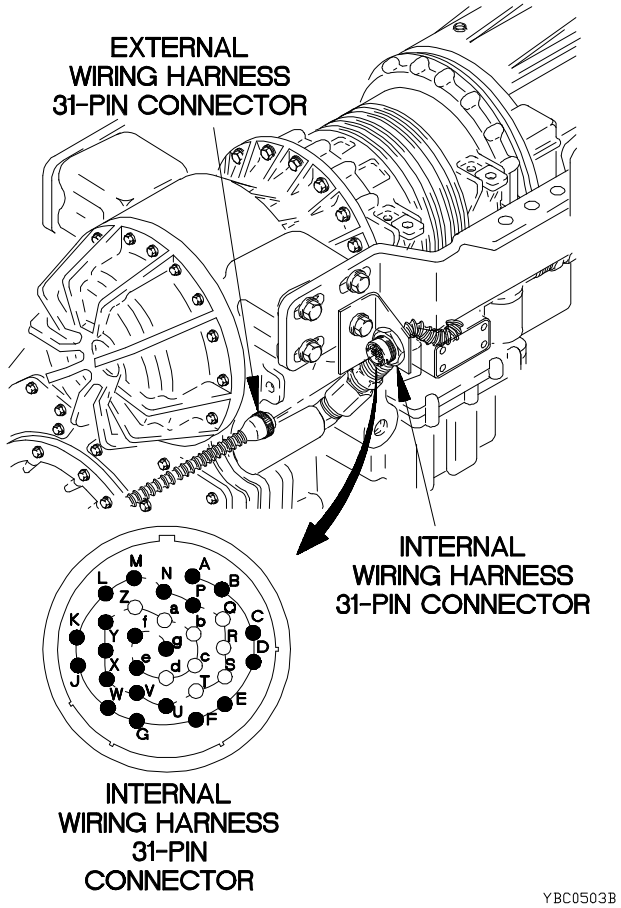


c5. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

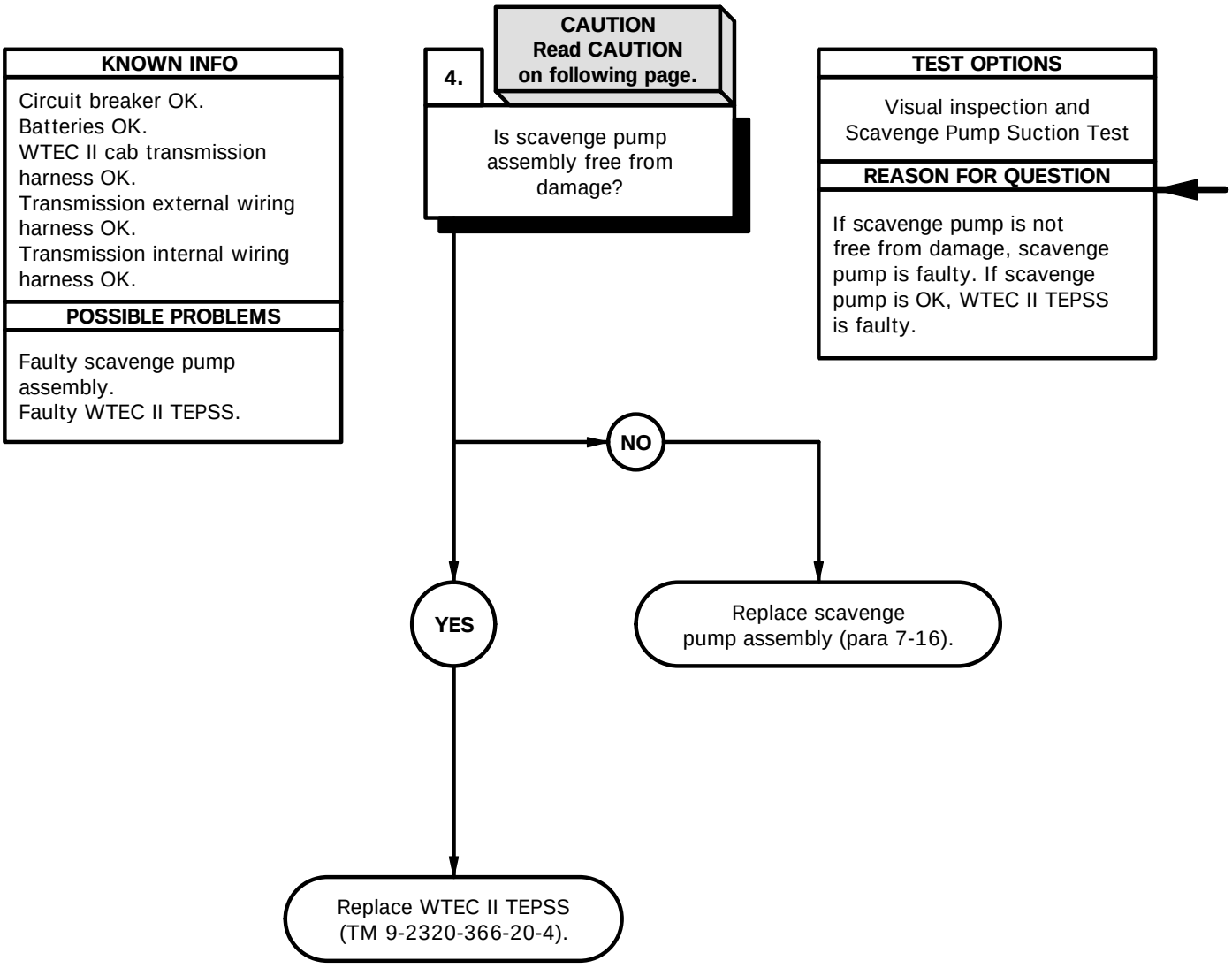


CONTINUITY TEST

(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.



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



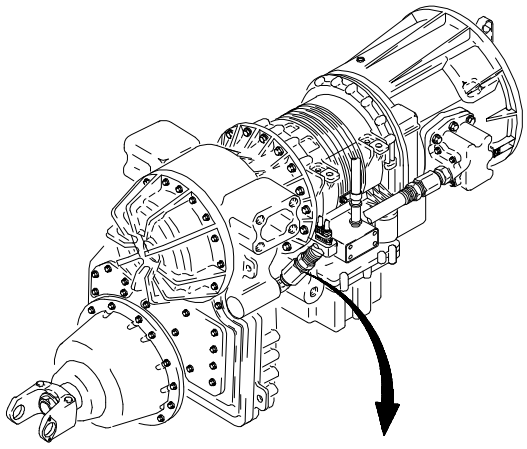
(1) Place drain pan under transfer case.
(2) Disconnect scavenge pump suction hose at transfer case.
(3) Connect batteries (TM 9-2320-366-20-3).
(4) Start engine (TM 9-2320-366-10-1).
(5) If oil drips or runs from fitting on transfer case, replace scavenge pump assembly (para 7-16).
(6) Shut down engine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

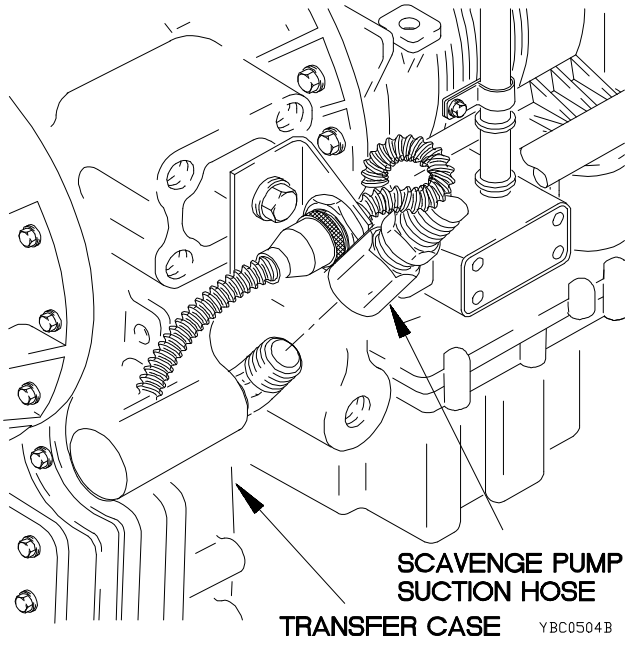
CAUTION

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.





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

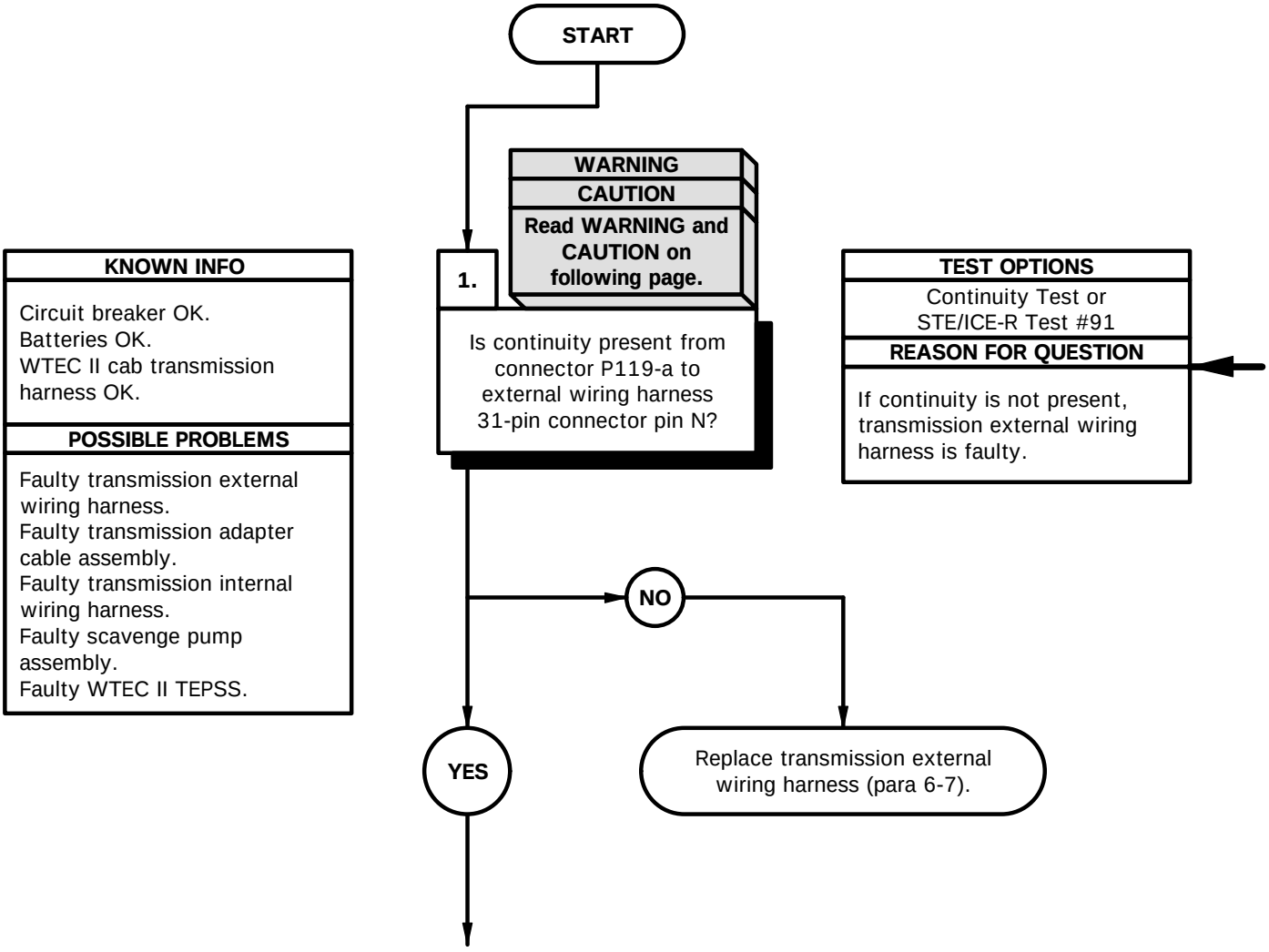
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

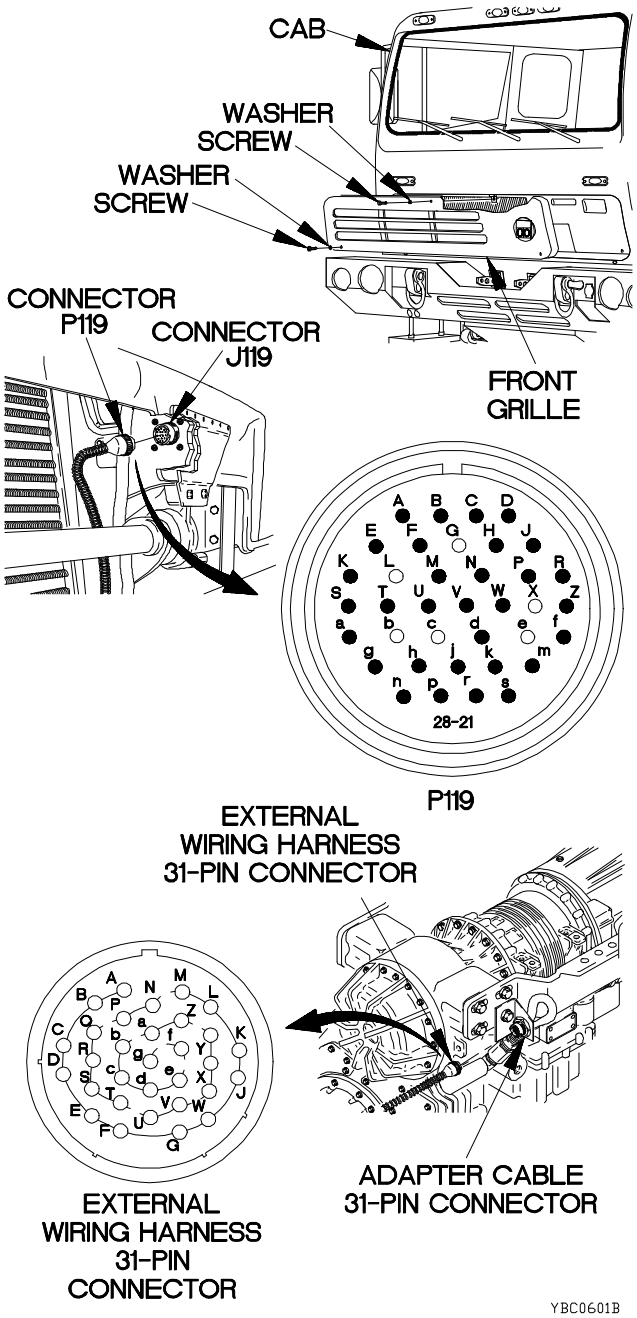
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



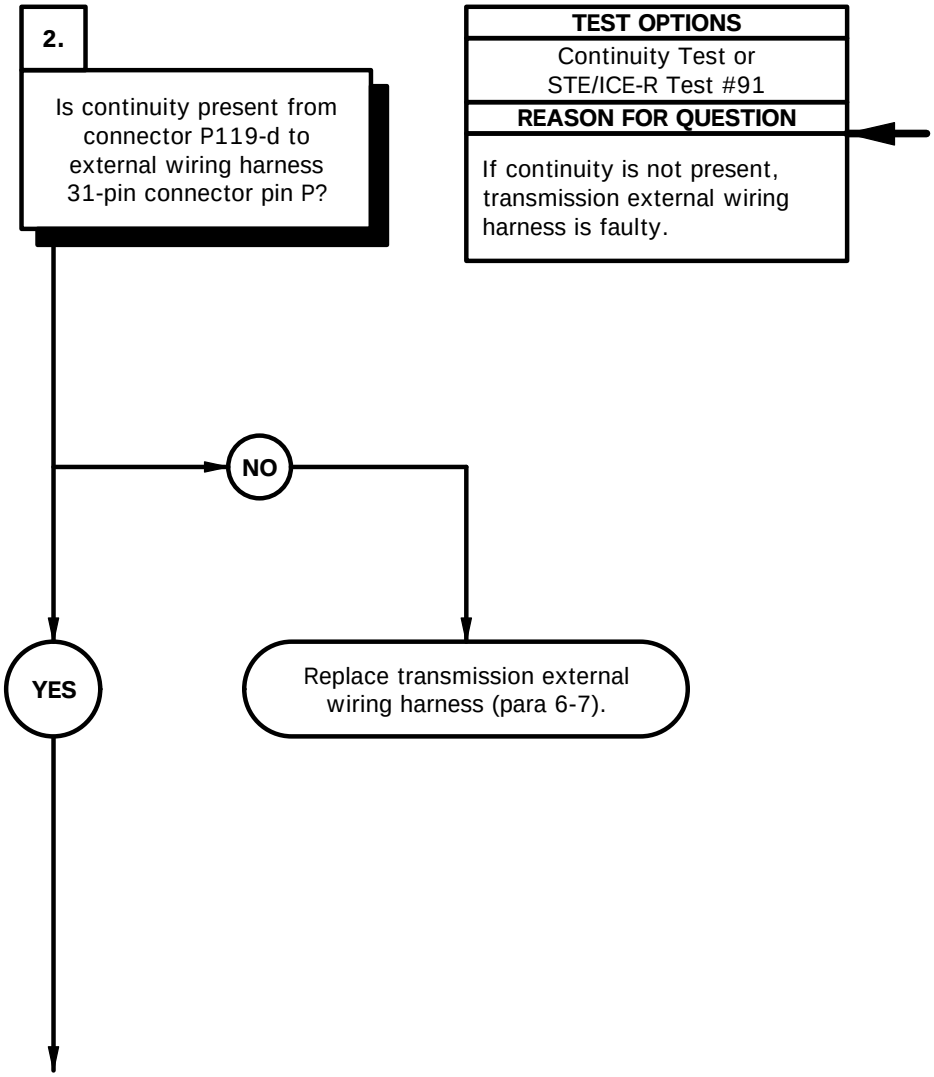
c6. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

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.



TEST OPTIONS

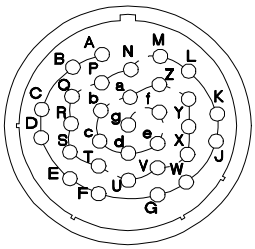
Continuity Test or
STE/ICE-R Test #91

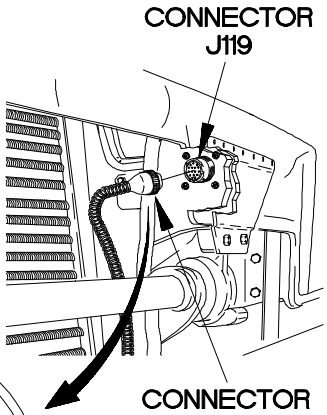
REASON FOR QUESTION

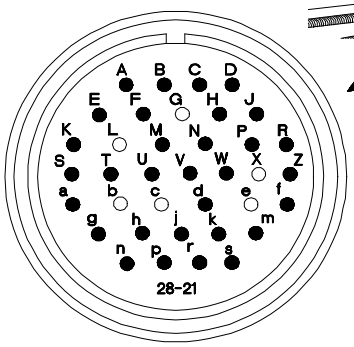
If continuity is not present, transmission external wiring harness is faulty.

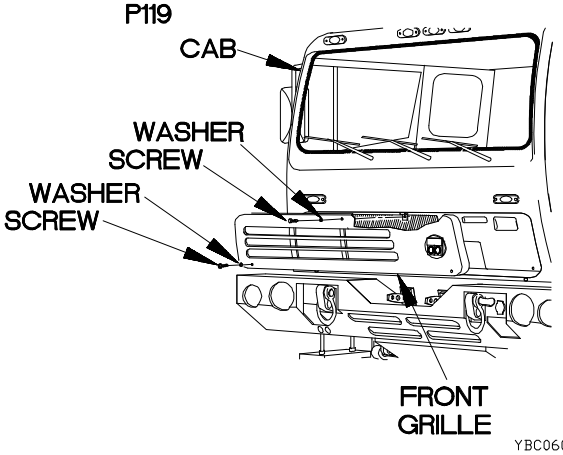
CONTINUITY TEST

(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).

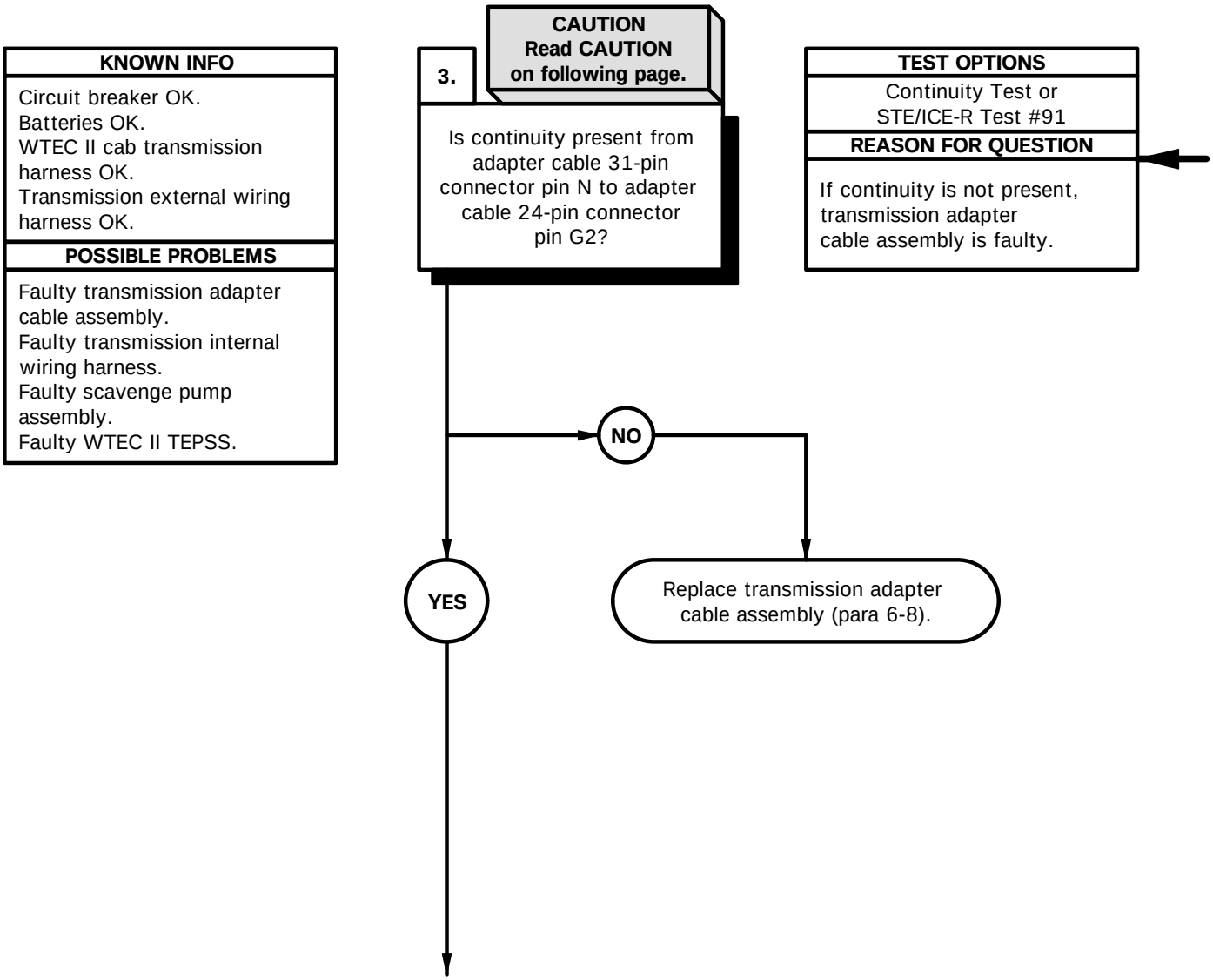








c6. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (Cont)

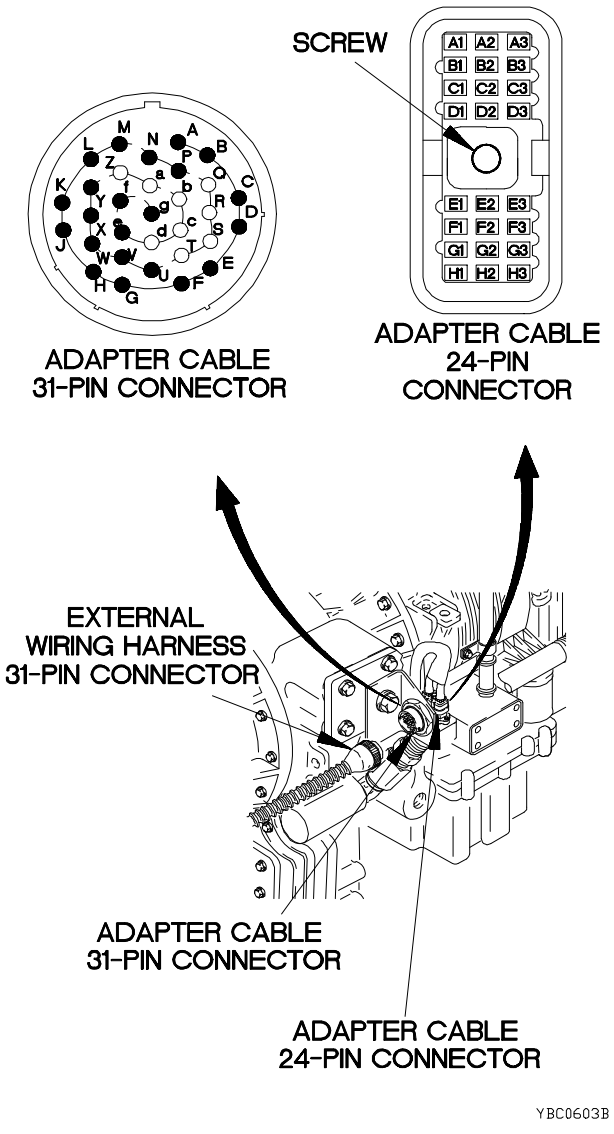


CAUTION

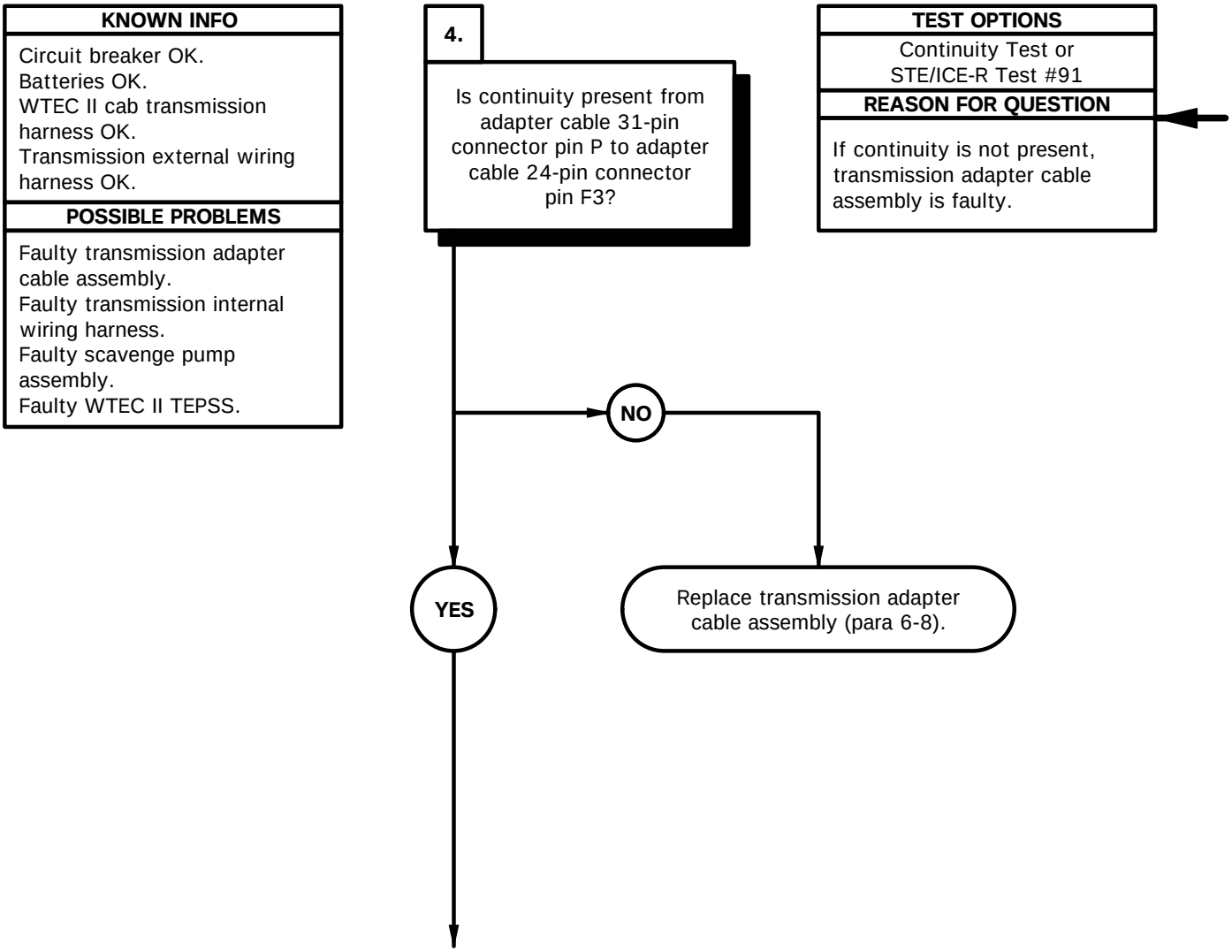
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

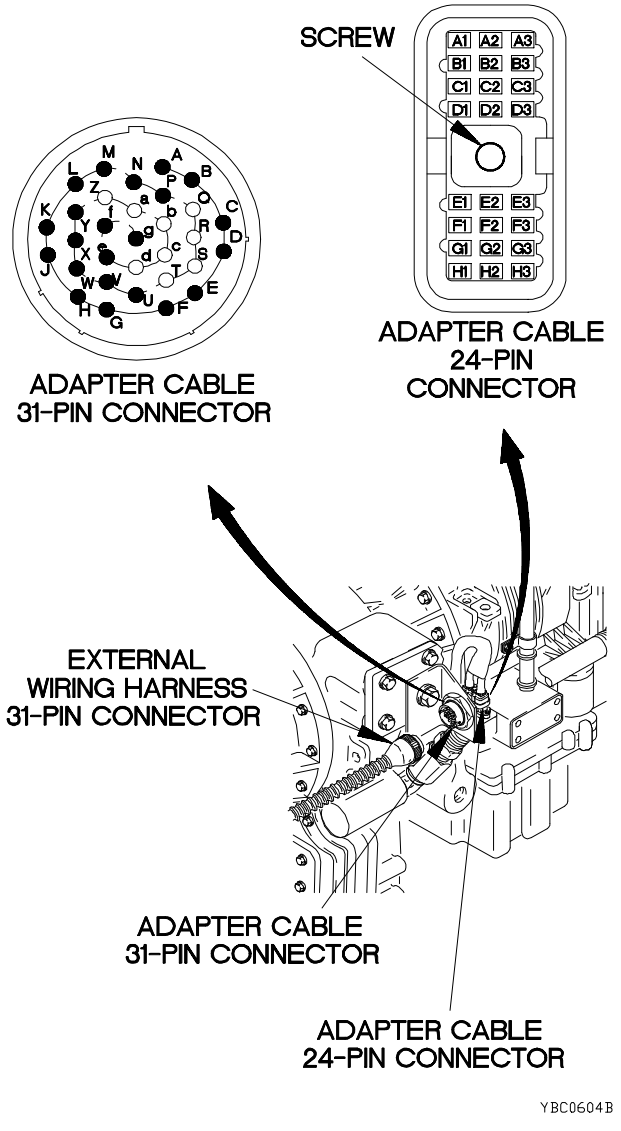


c6. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



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.



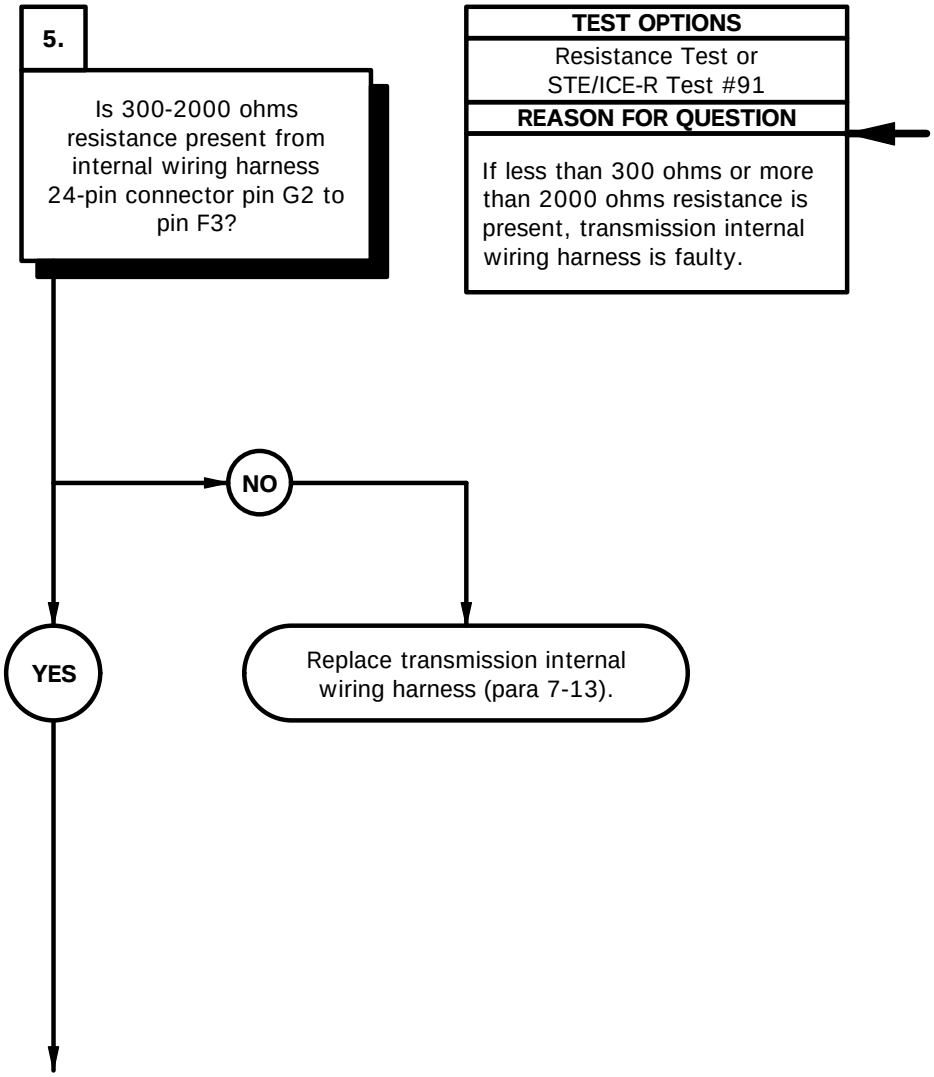
c6. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO

Circuit breaker OK.
Batteries OK.
WTEC II cab transmission harness OK.
Transmission external wiring harness OK.
Transmission adapter cable assembly OK.

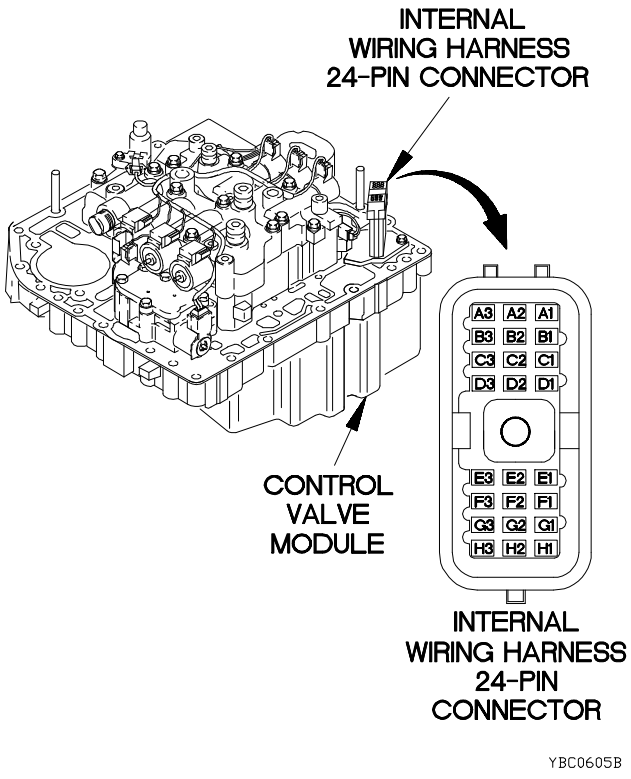
POSSIBLE PROBLEMS

Faulty transmission internal wiring harness.
Faulty scavenge pump assembly.
Faulty WTEC II TEPSS.

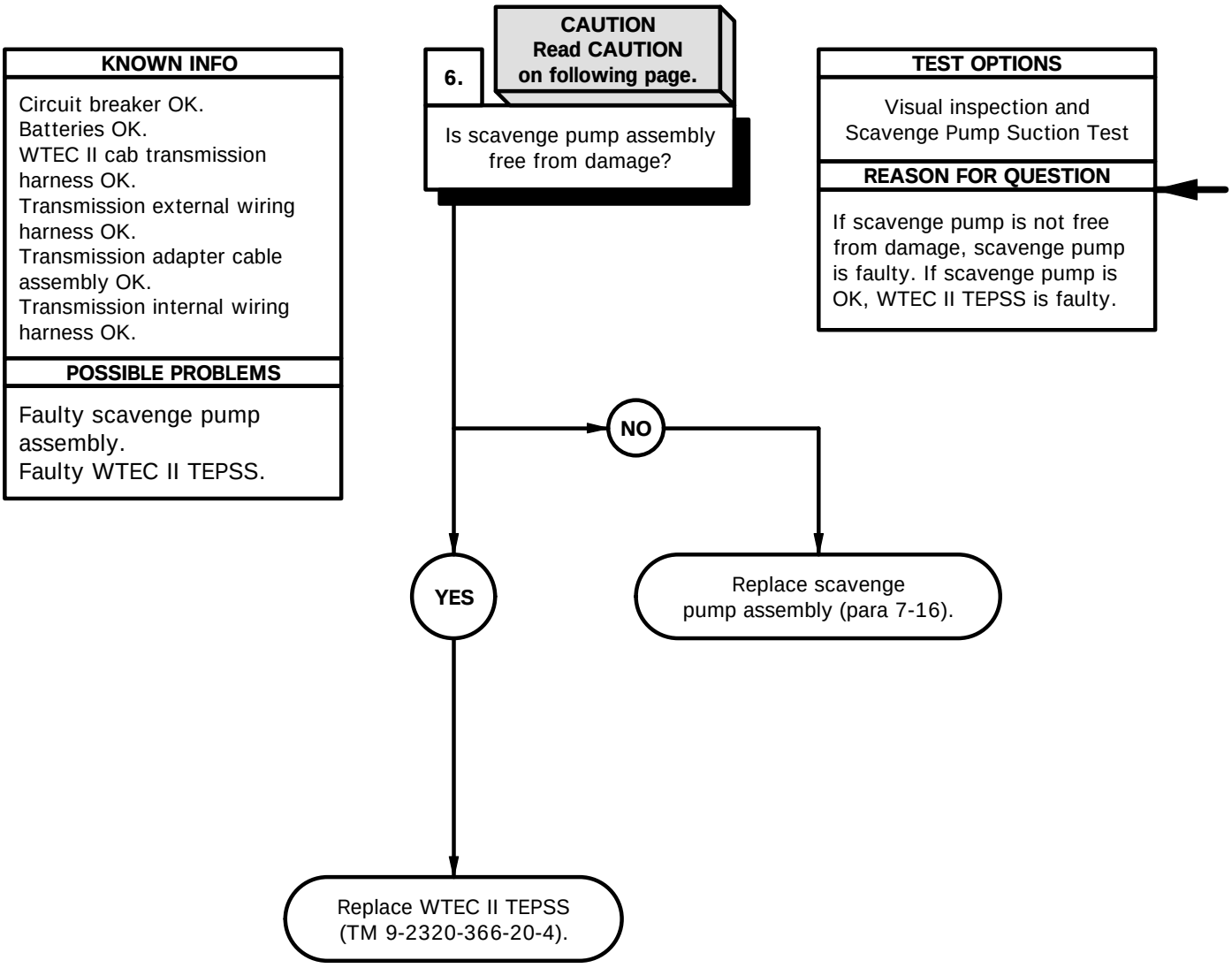


RESISTANCE TEST

(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).



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)



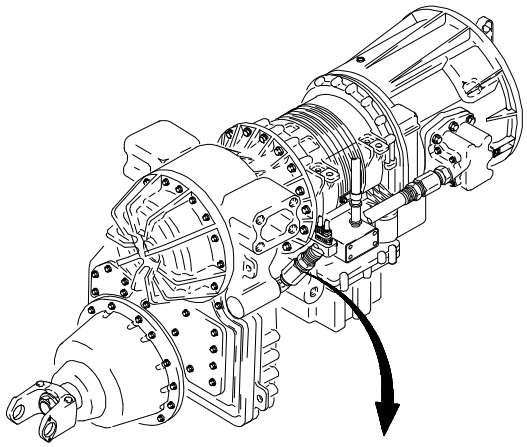
(1) Place drain pan under transfer case.
(2) Disconnect scavenge pump suction hose at transfer case.
(3) Connect batteries (TM 9-2320-366-20-3).
(4) Start engine (TM 9-2320-366-10-1).
(5) If oil drips or runs from fitting on transfer case, replace scavenge pump assembly (para 7-16).
(6) Shut down engine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

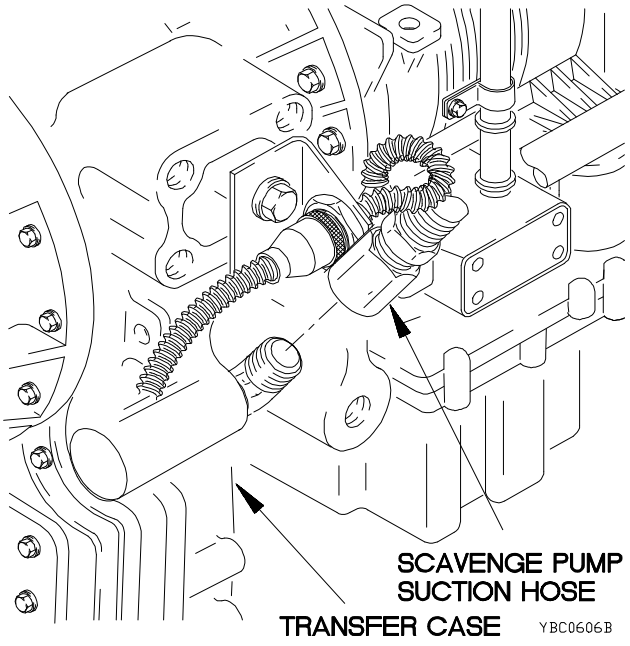
CAUTION

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

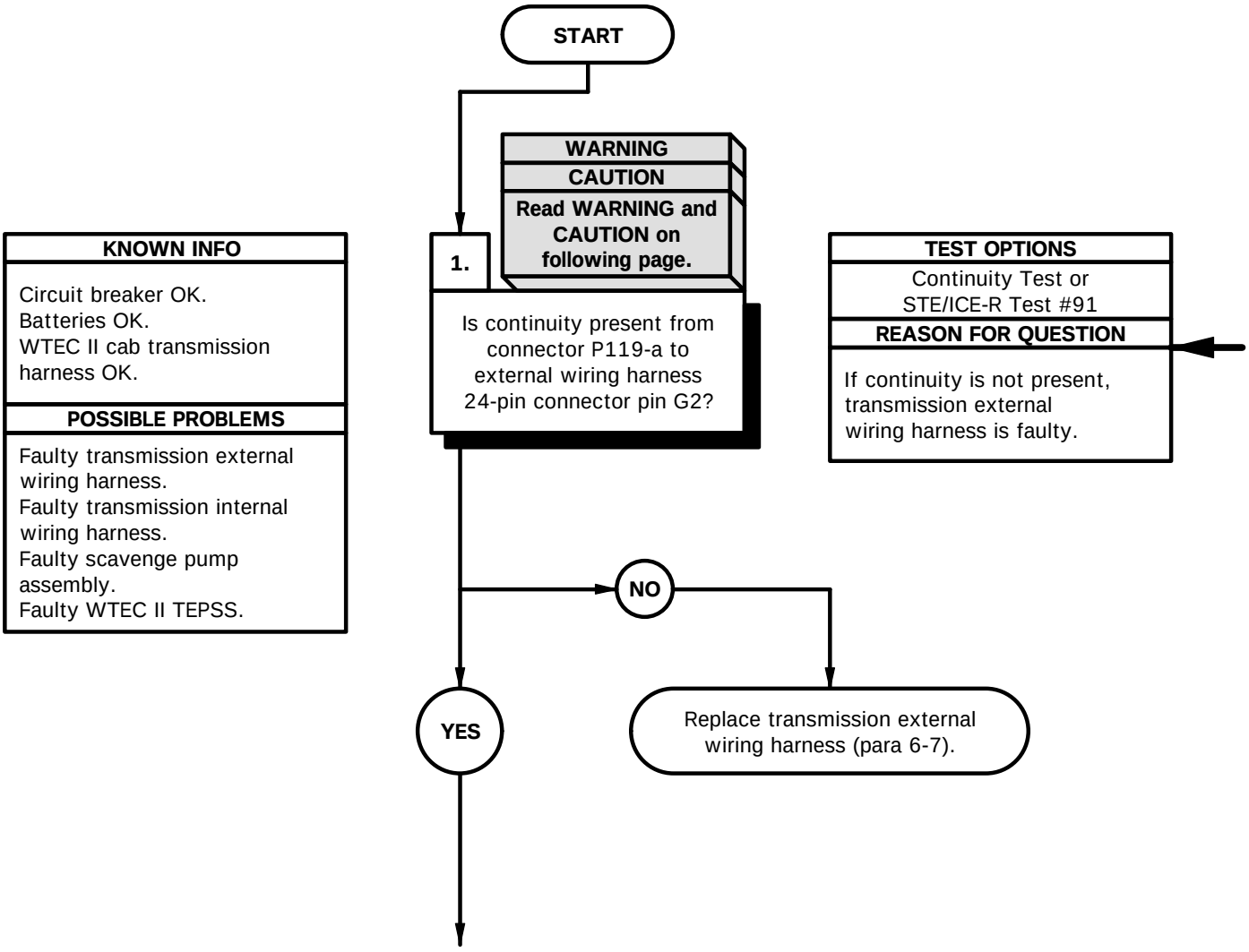
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

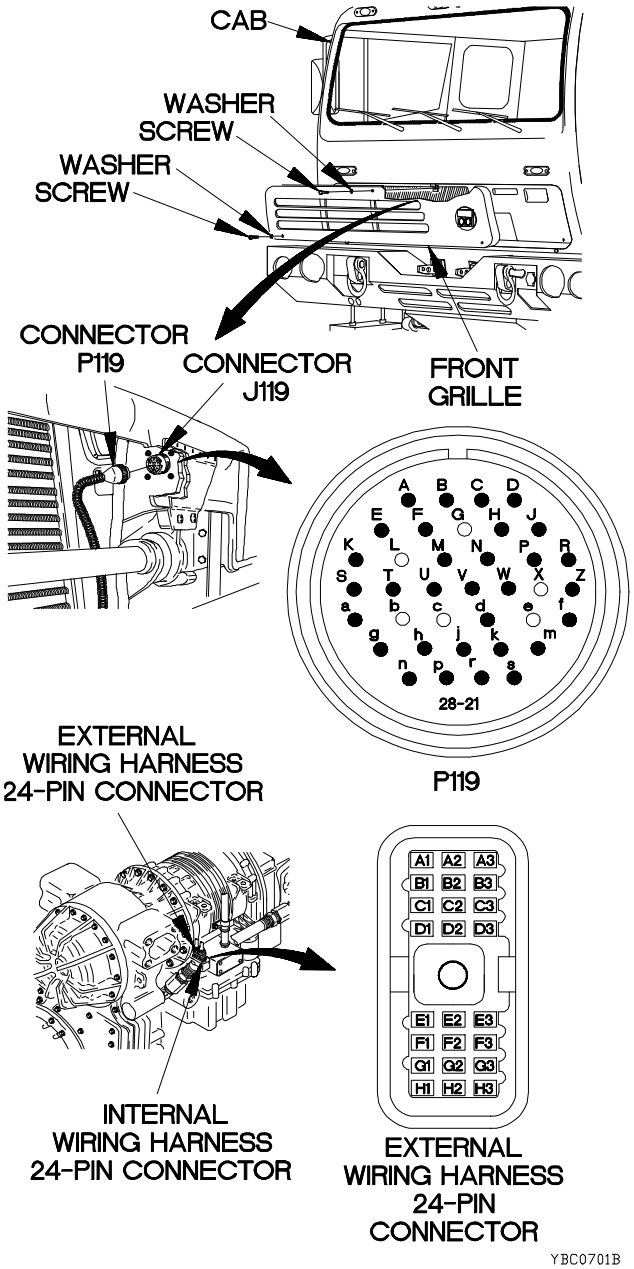
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

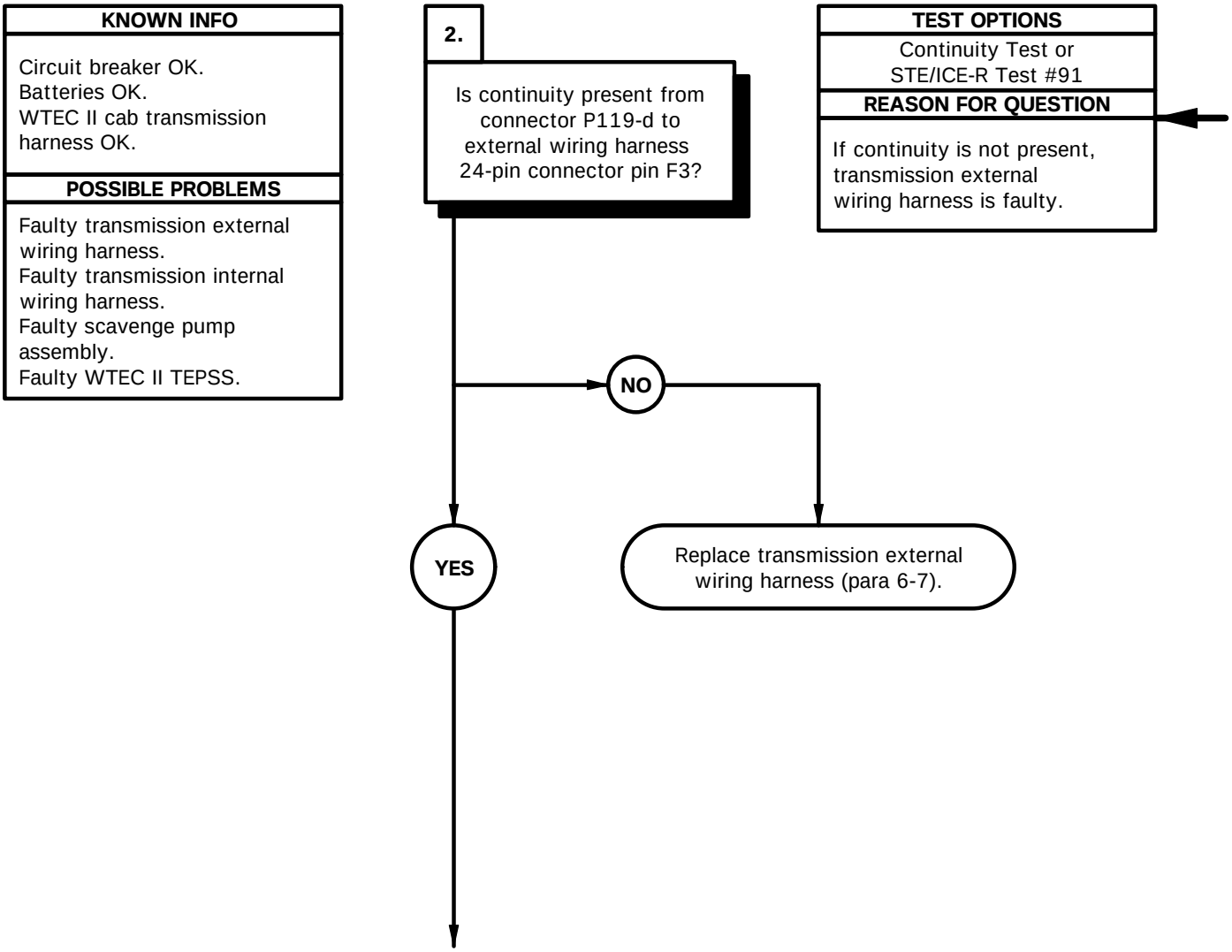
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 24-pin connector from internal wiring harness 24-pin connector.
(6) Set multimeter 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).

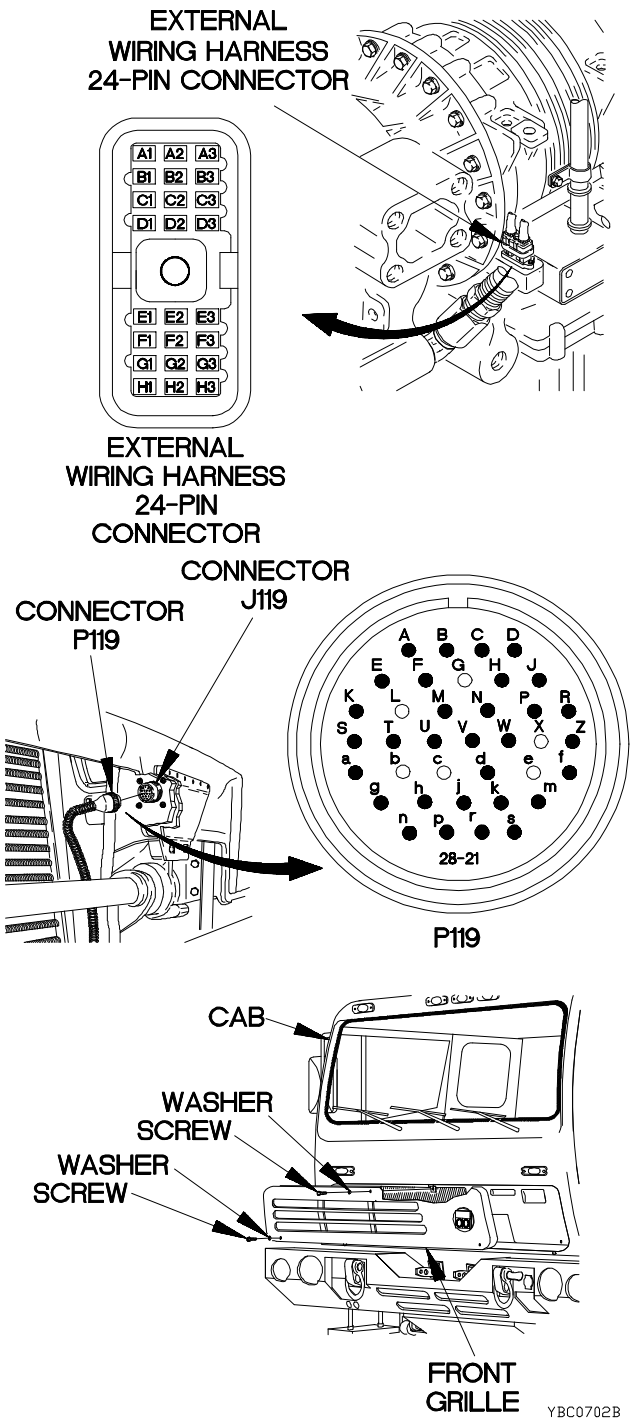


c7. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

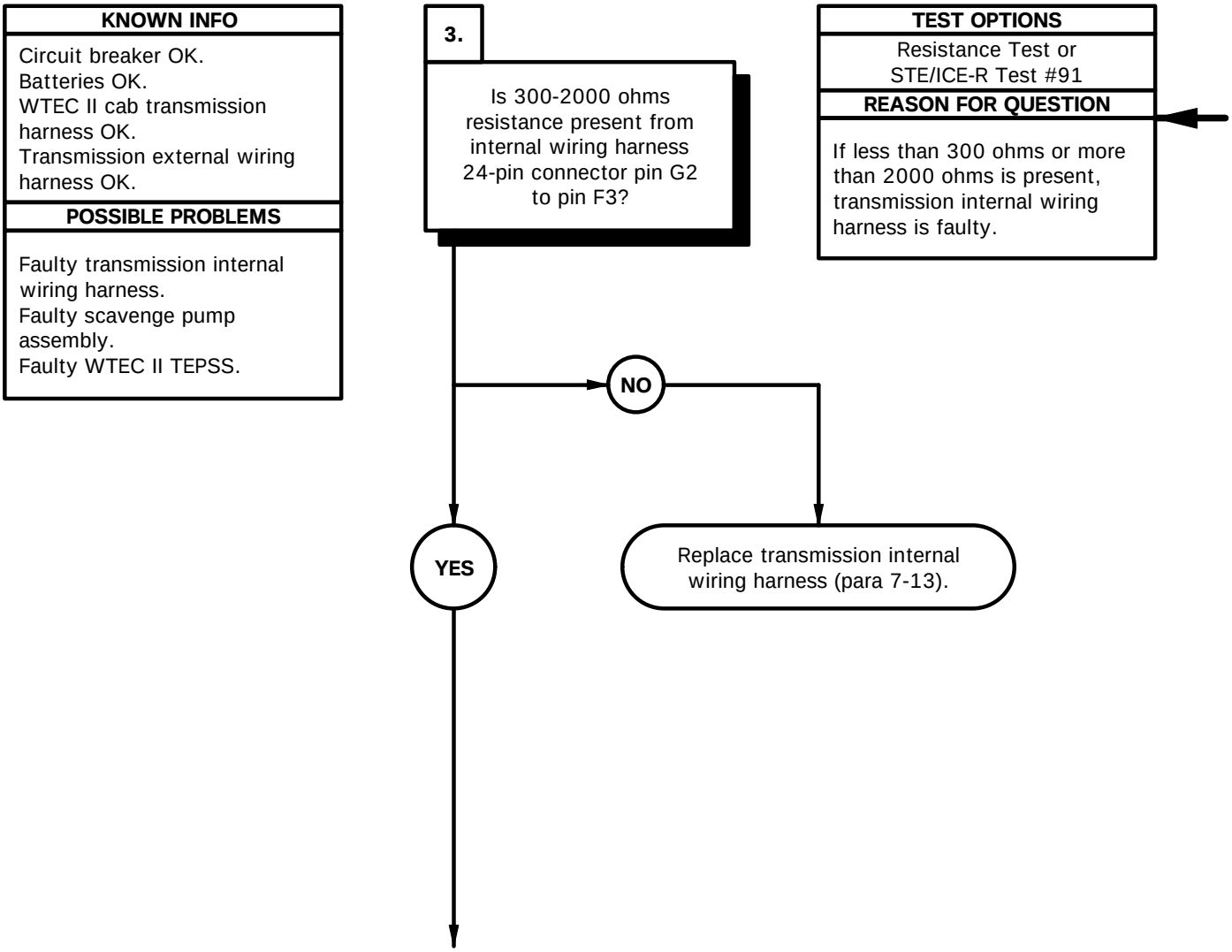


CONTINUITY TEST

(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).

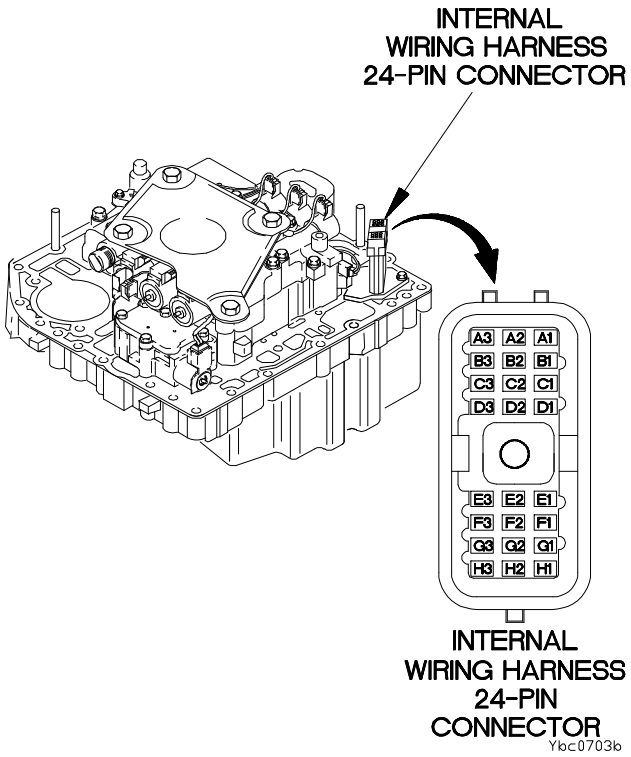


c7. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

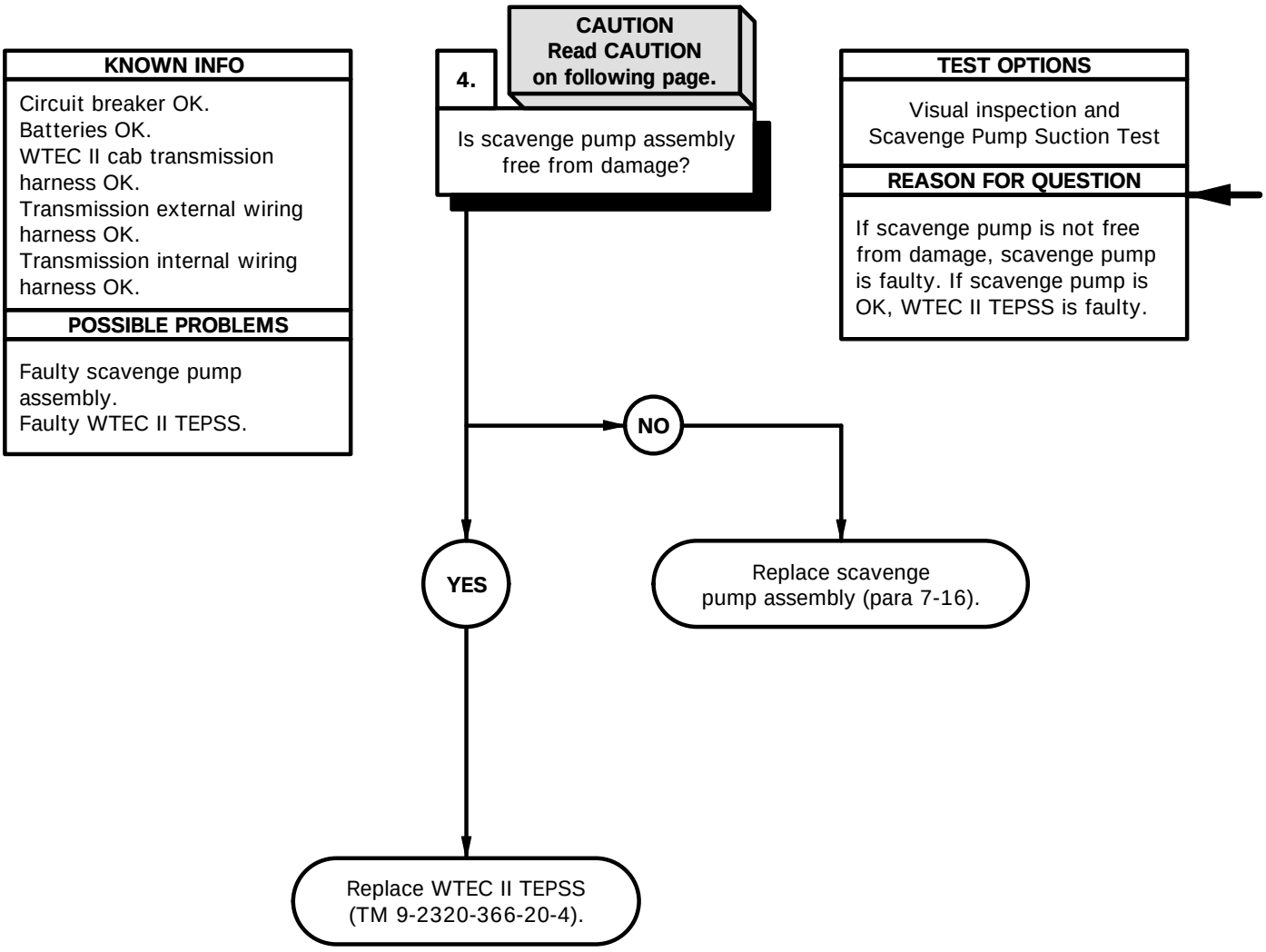


RESISTANCE TEST

(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)



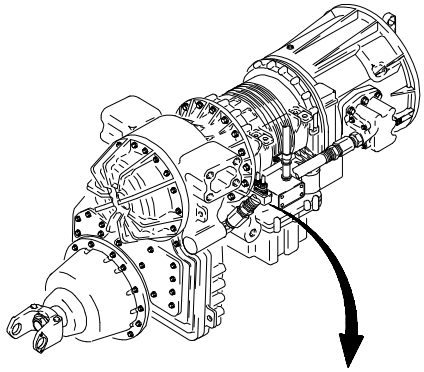
(1) Place drain pan under transfer case.
(2) Disconnect scavenge pump suction hose at transfer case.
(3) Connect batteries (TM 9-2320-366-20-3).
(4) Start engine (TM 9-2320-366-10-1).
(5) If oil drips or runs from fitting on transfer case, replace scavenge pump assembly (para 7-16).
(6) Shut down engine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

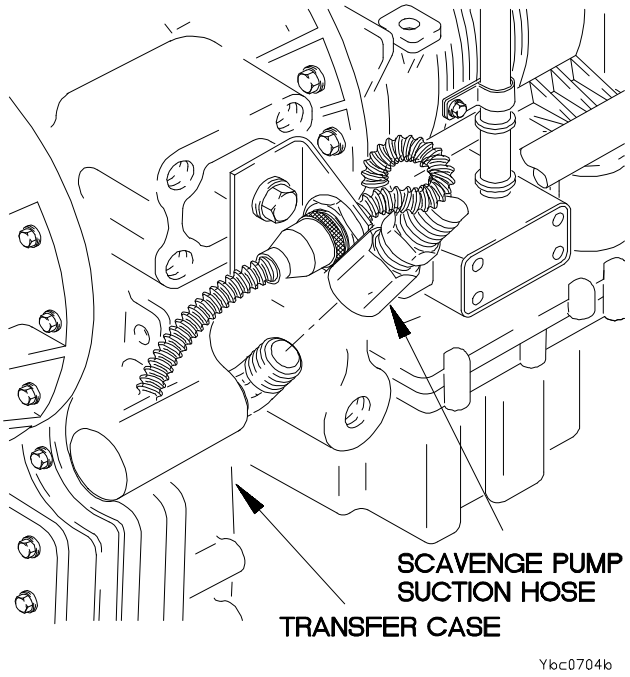
CAUTION

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.





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c8. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND/OR 57 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

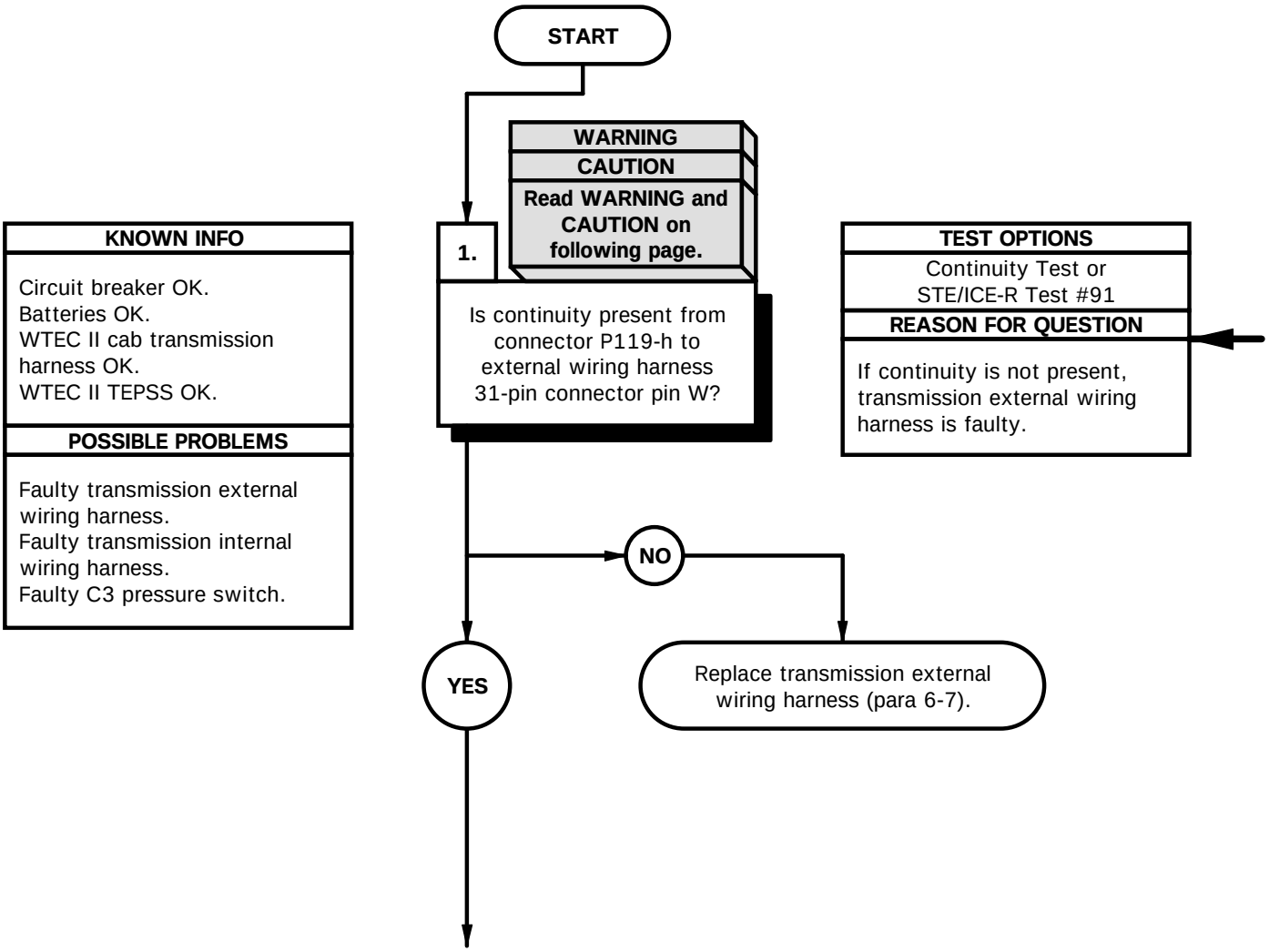
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

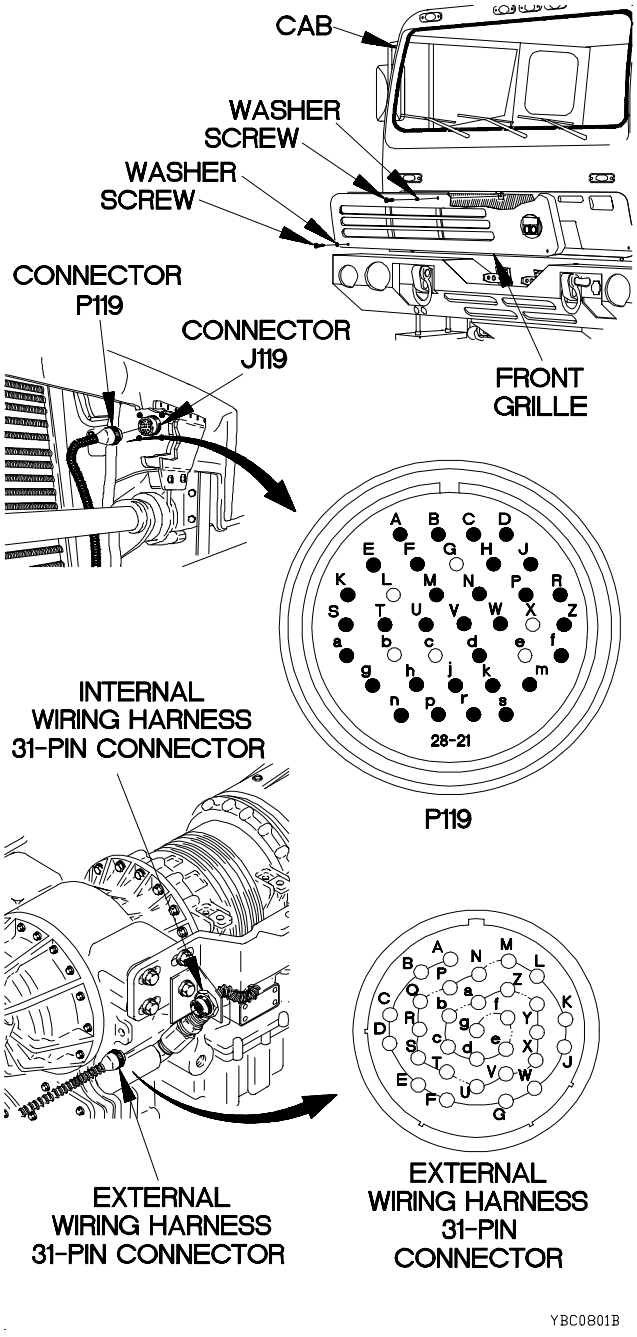
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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 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).



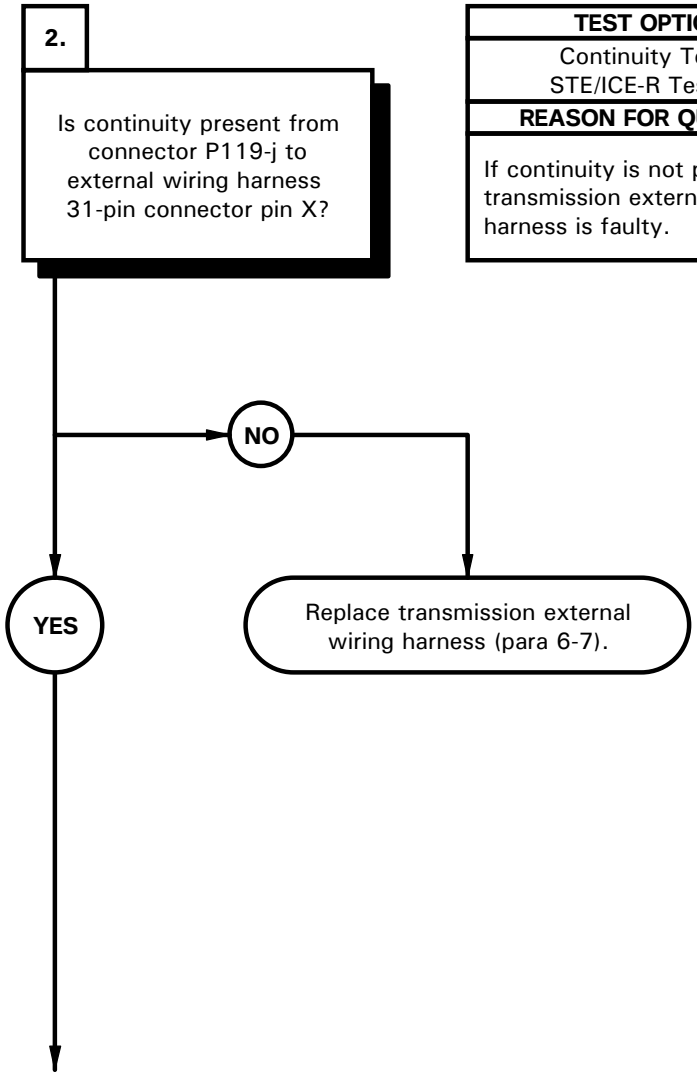
c8. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND/OR 57 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

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.



TEST OPTIONS

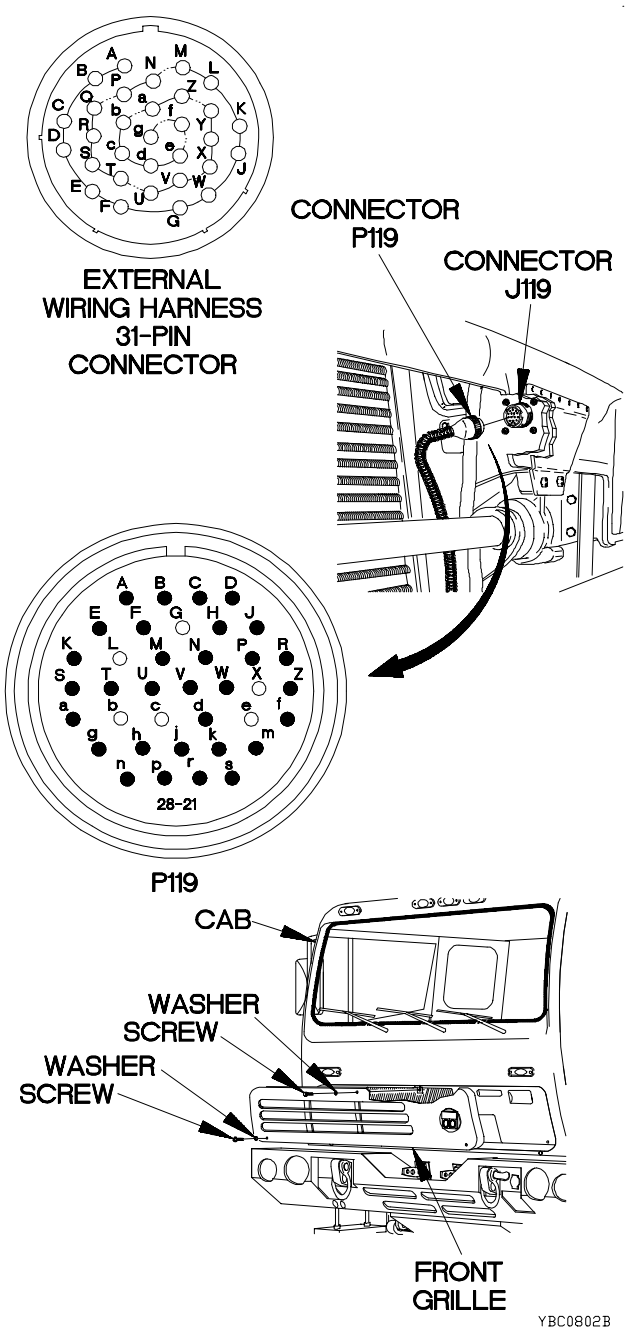
Continuity Test or
STE/ICE-R Test #91

REASON FOR QUESTION

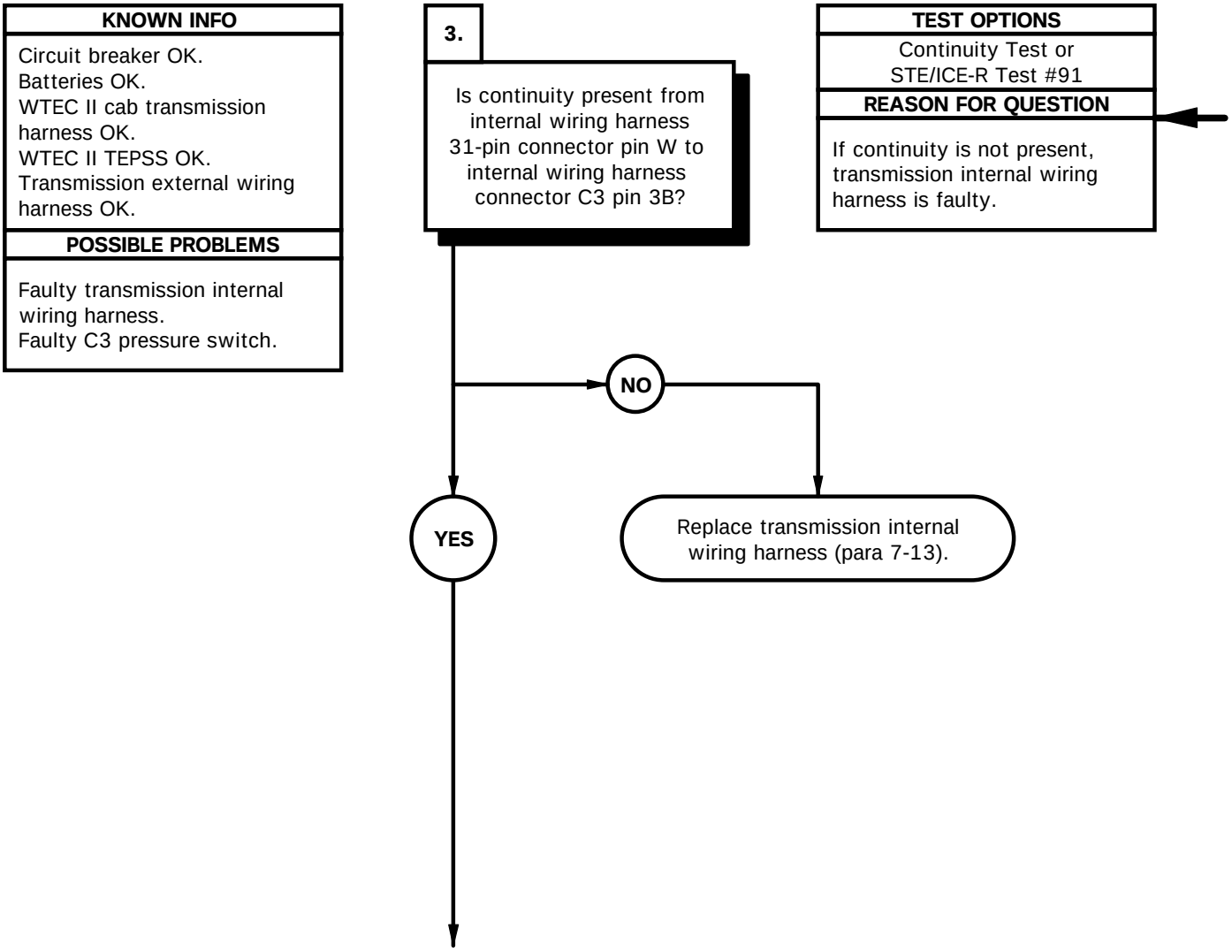
If continuity is not present, transmission external wiring harness is faulty.

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).



c8. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND/OR 57 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

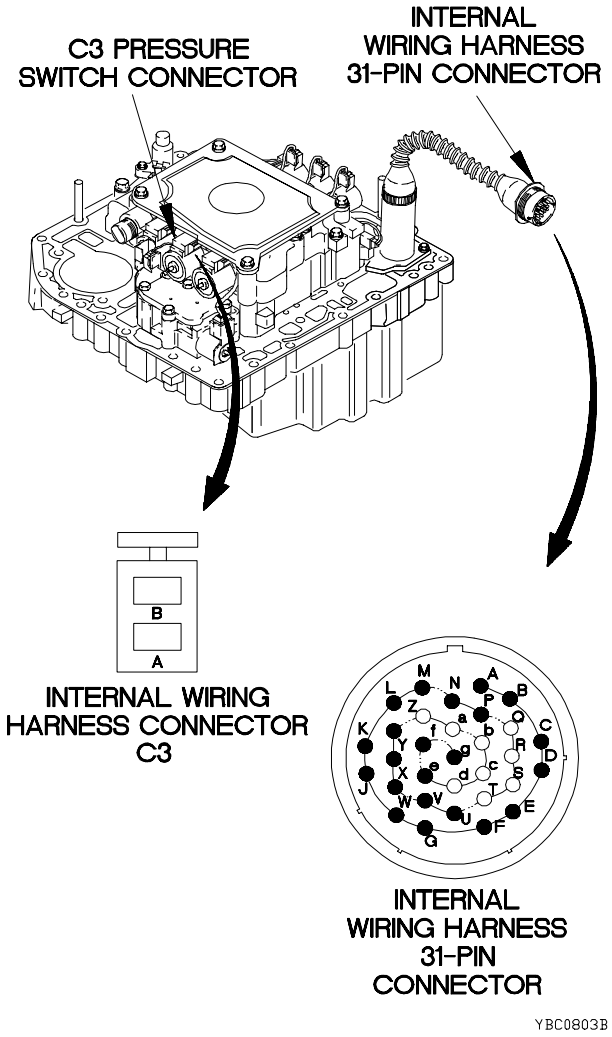


CAUTION

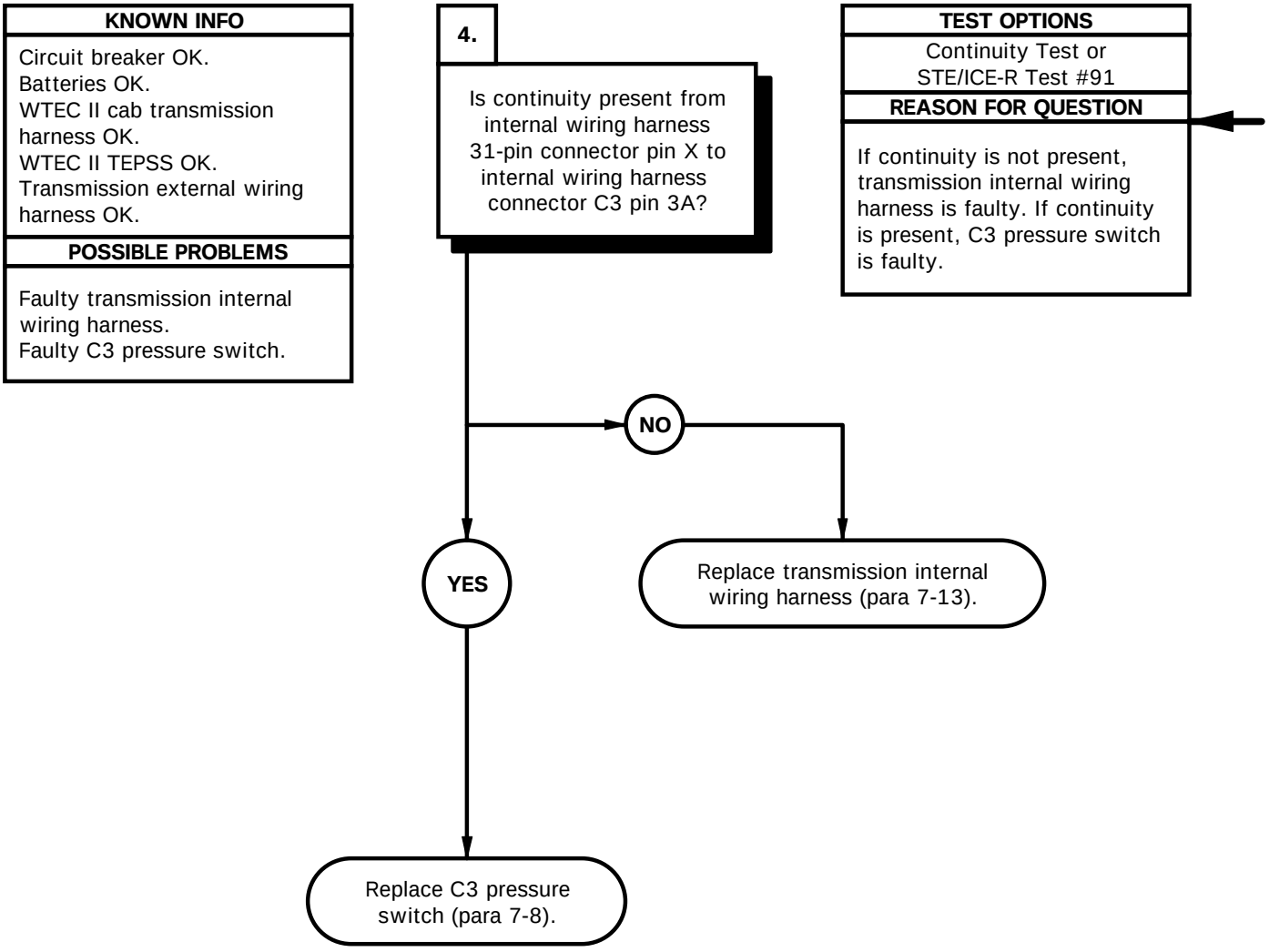
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

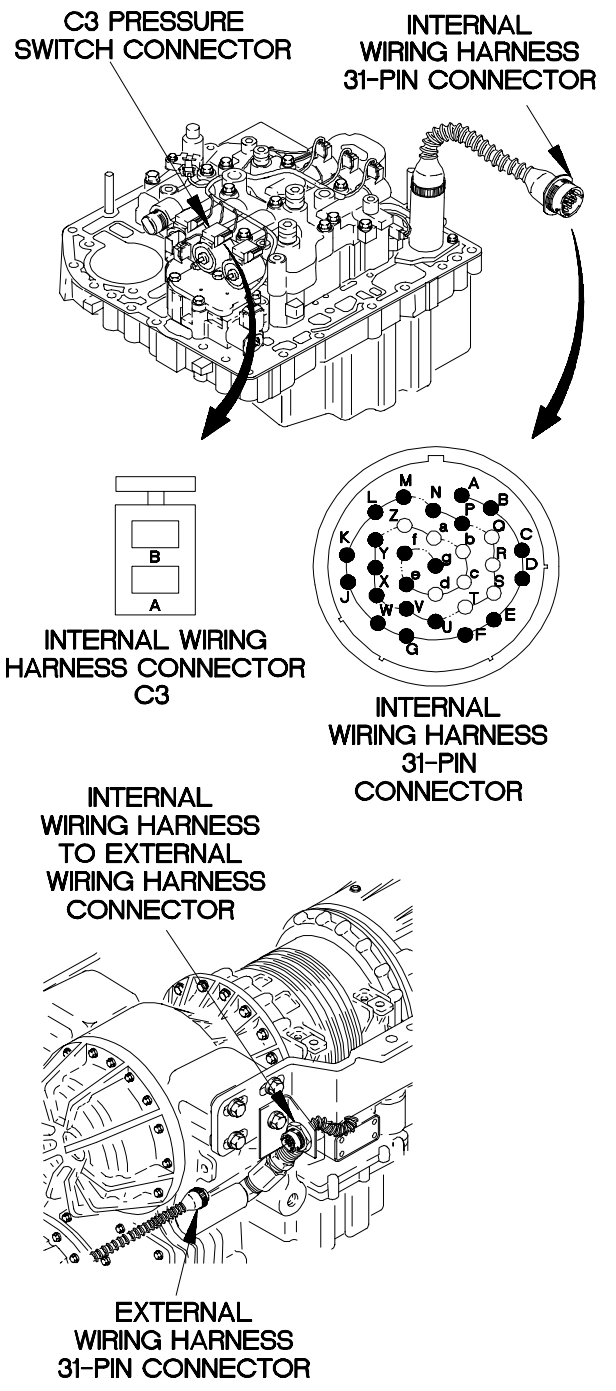


c8. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND/OR 57 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



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).



c9. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND/OR 57 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY)

INITIAL SETUP

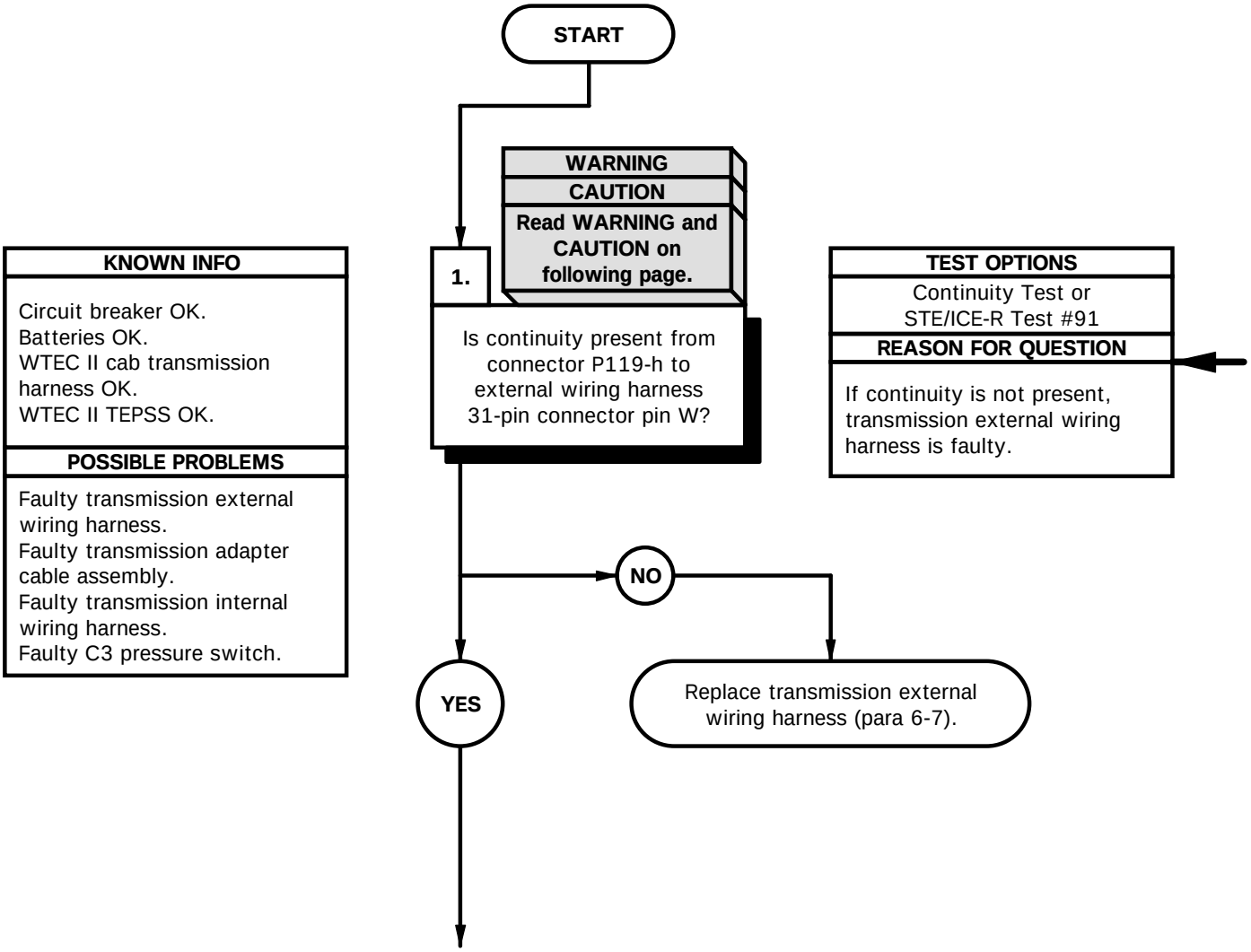
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

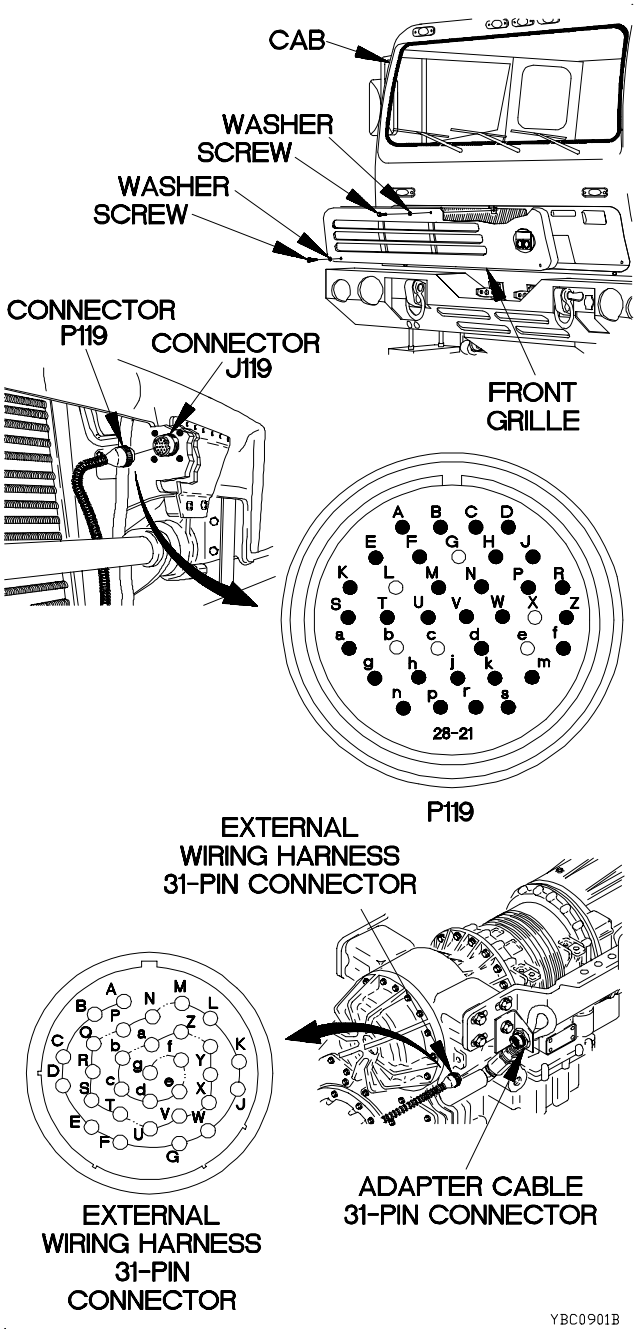
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



c9. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND/OR 57 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.

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.

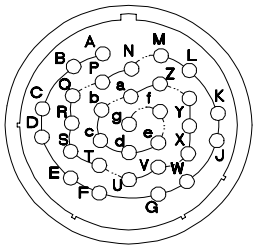
NO

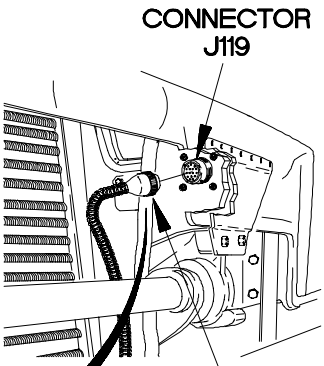
YES

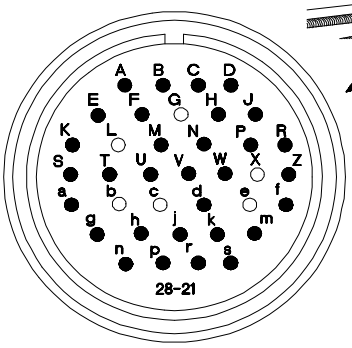
Replace transmission external wiring harness (para 6-7).

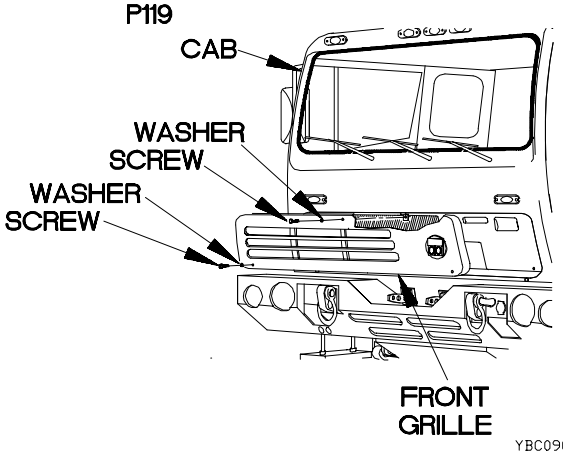
CONTINUITY TEST

(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).

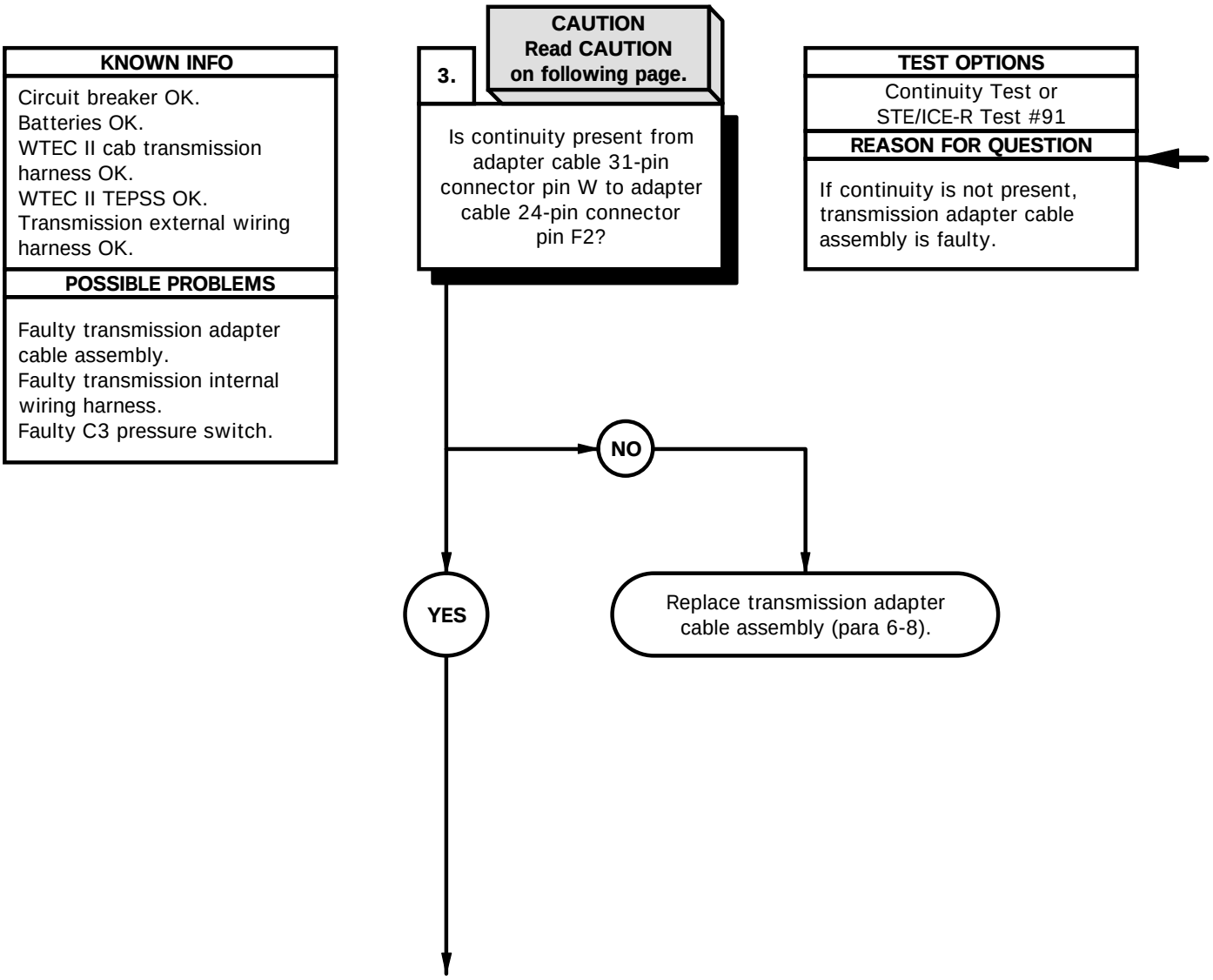








c9. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND/OR 57 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

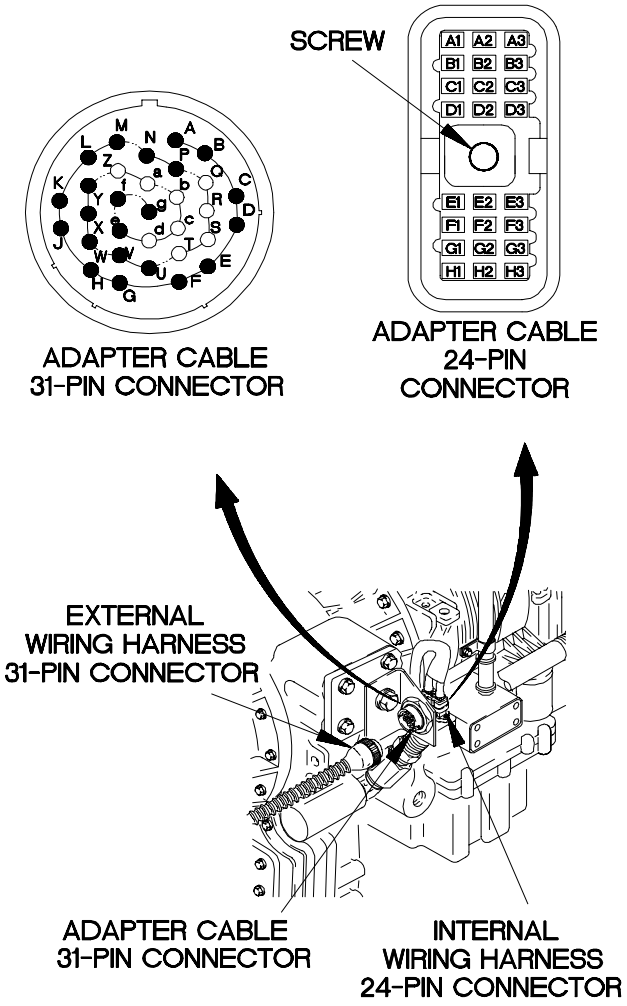


CAUTION

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).



c9. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND/OR 57 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.

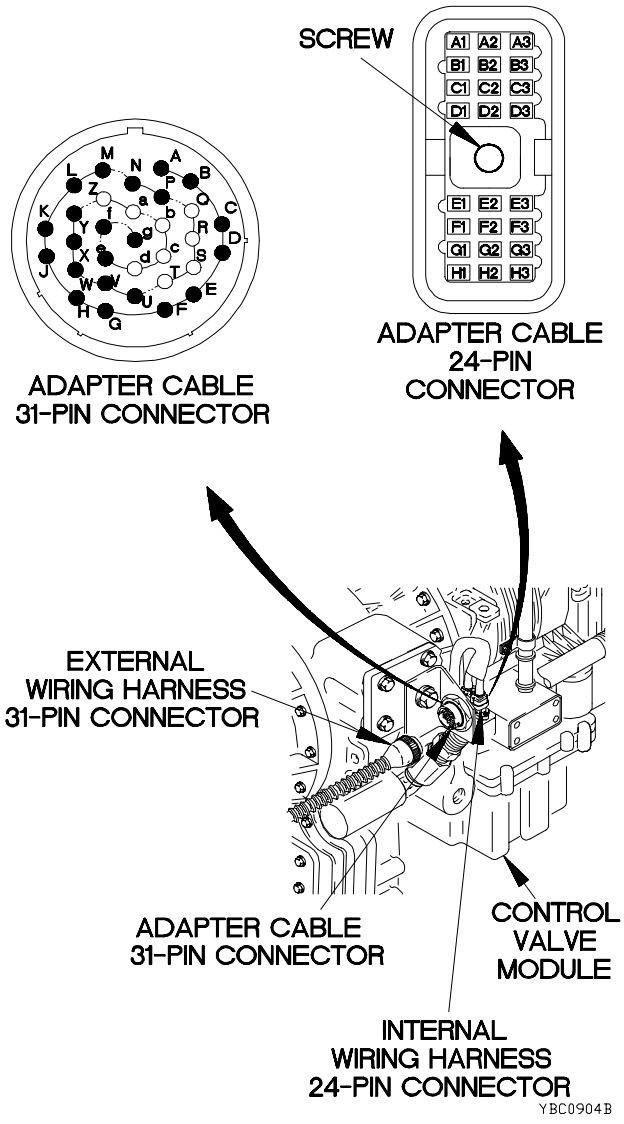
NO

YES

Replace transmission adapter cable assembly (para 6-8).

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).



c9. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND/OR 57 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.

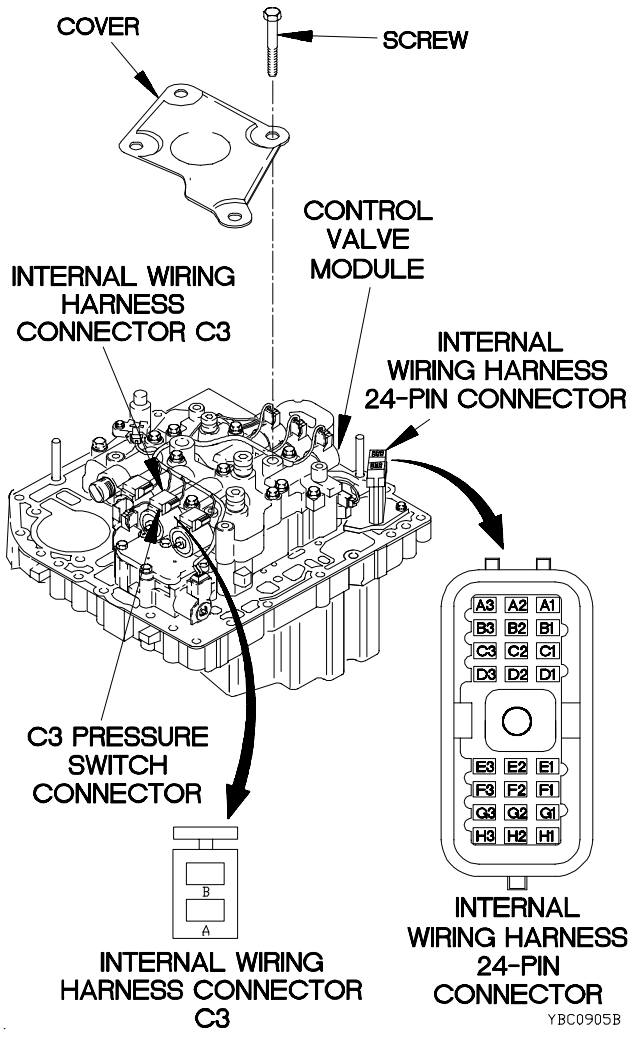
NO

Replace transmission internal wiring harness (para 7-13).

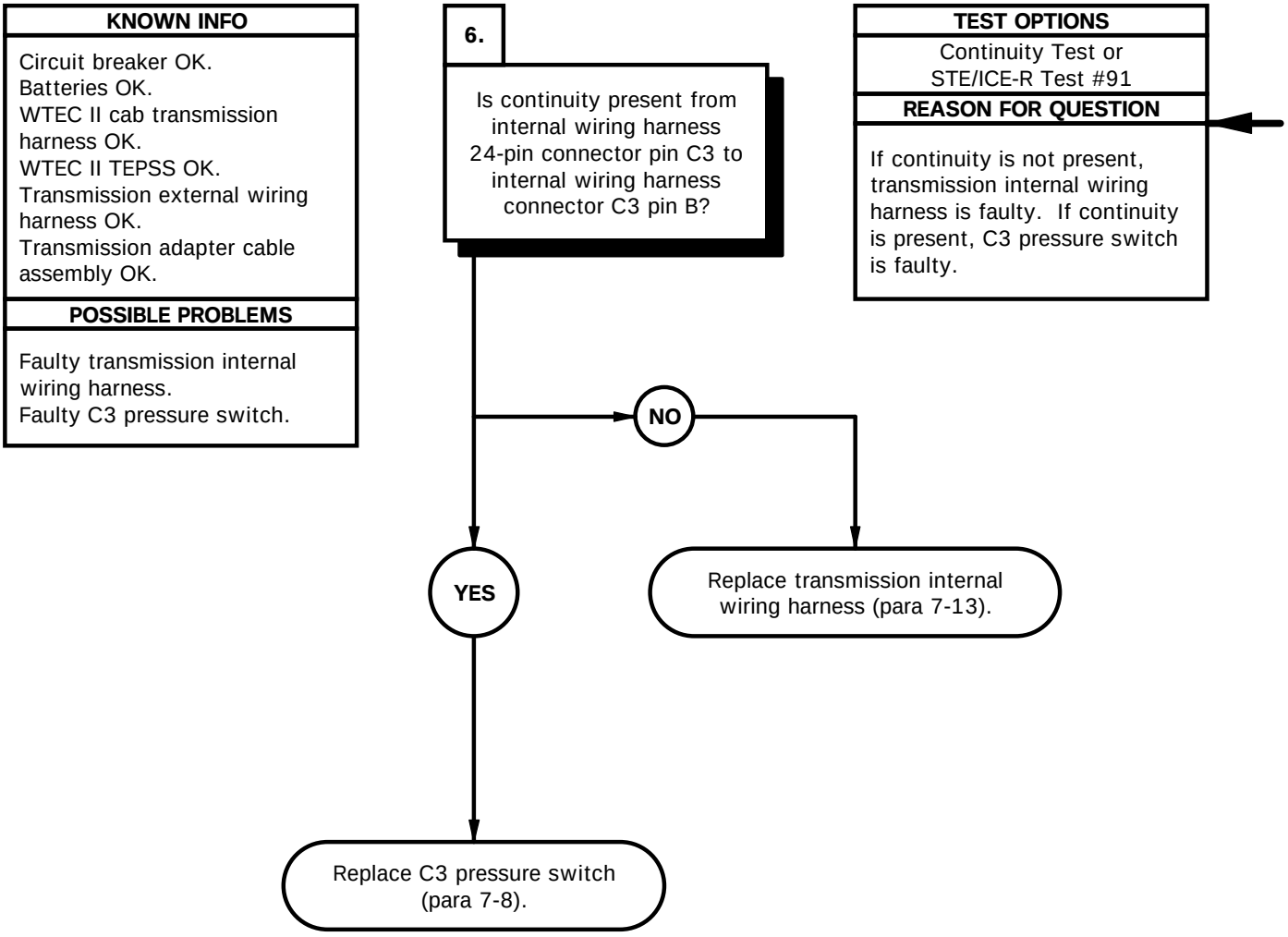
YES

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).

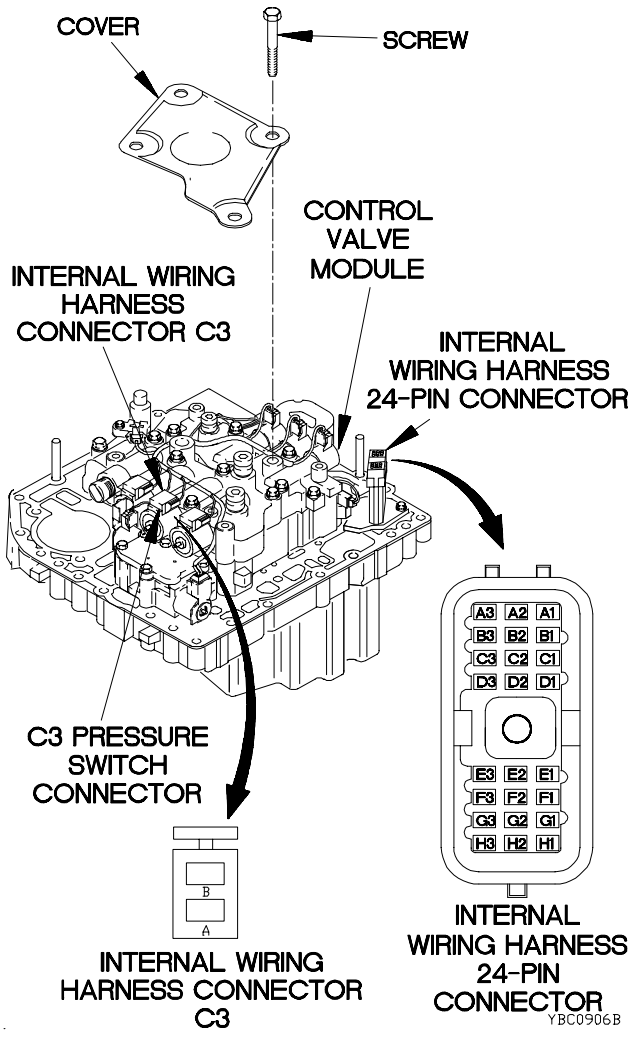


c9. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND/OR 57 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



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/OR 57 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369)

INITIAL SETUP

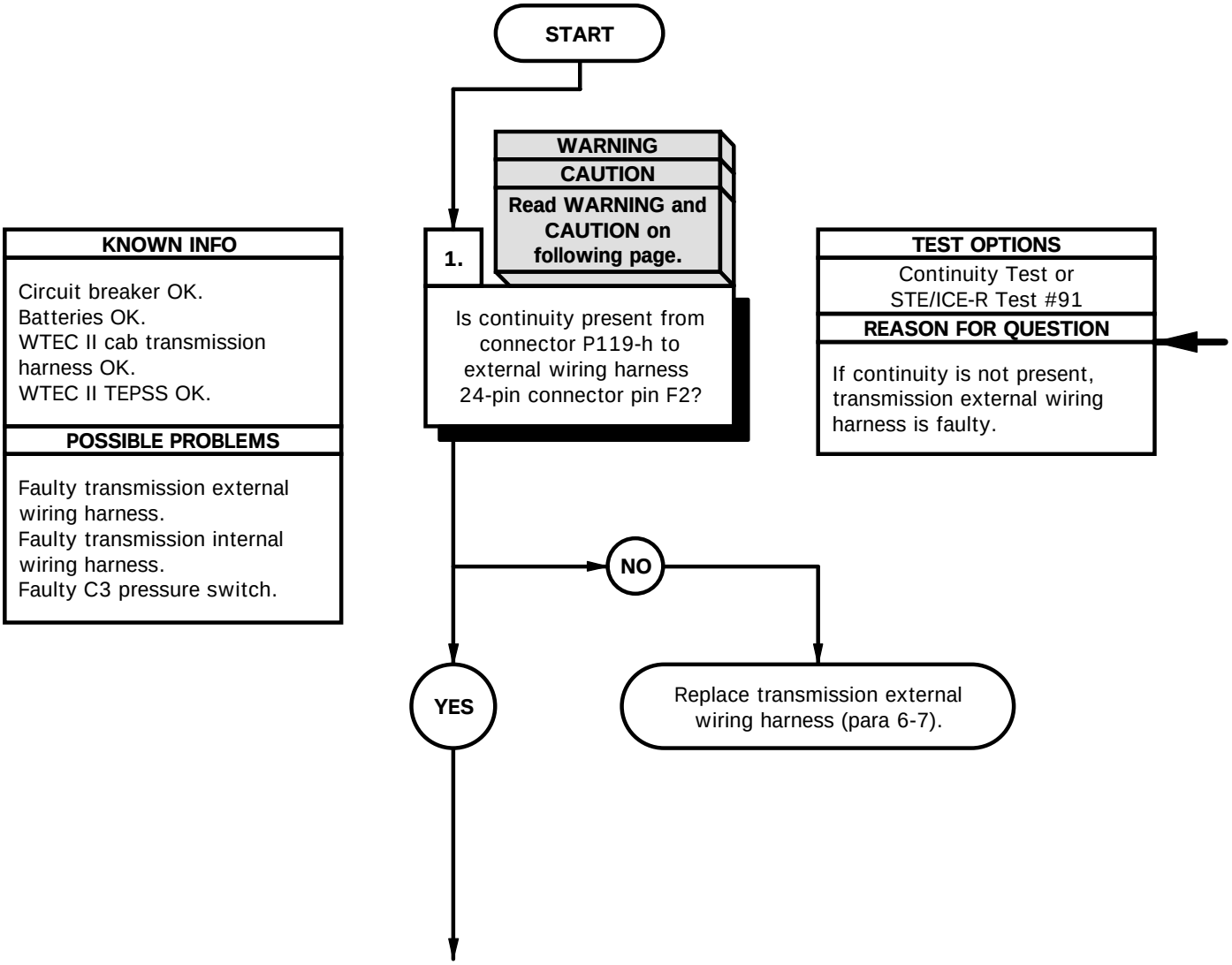
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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 Set, Socket (Item 85, 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

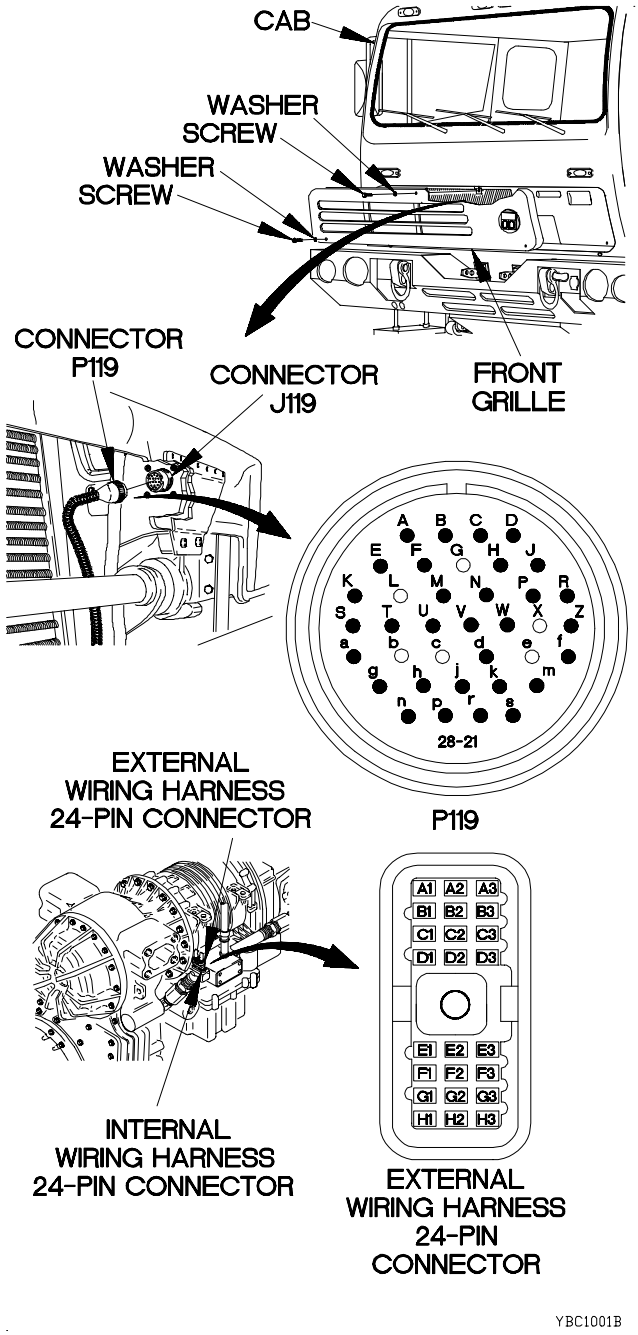
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

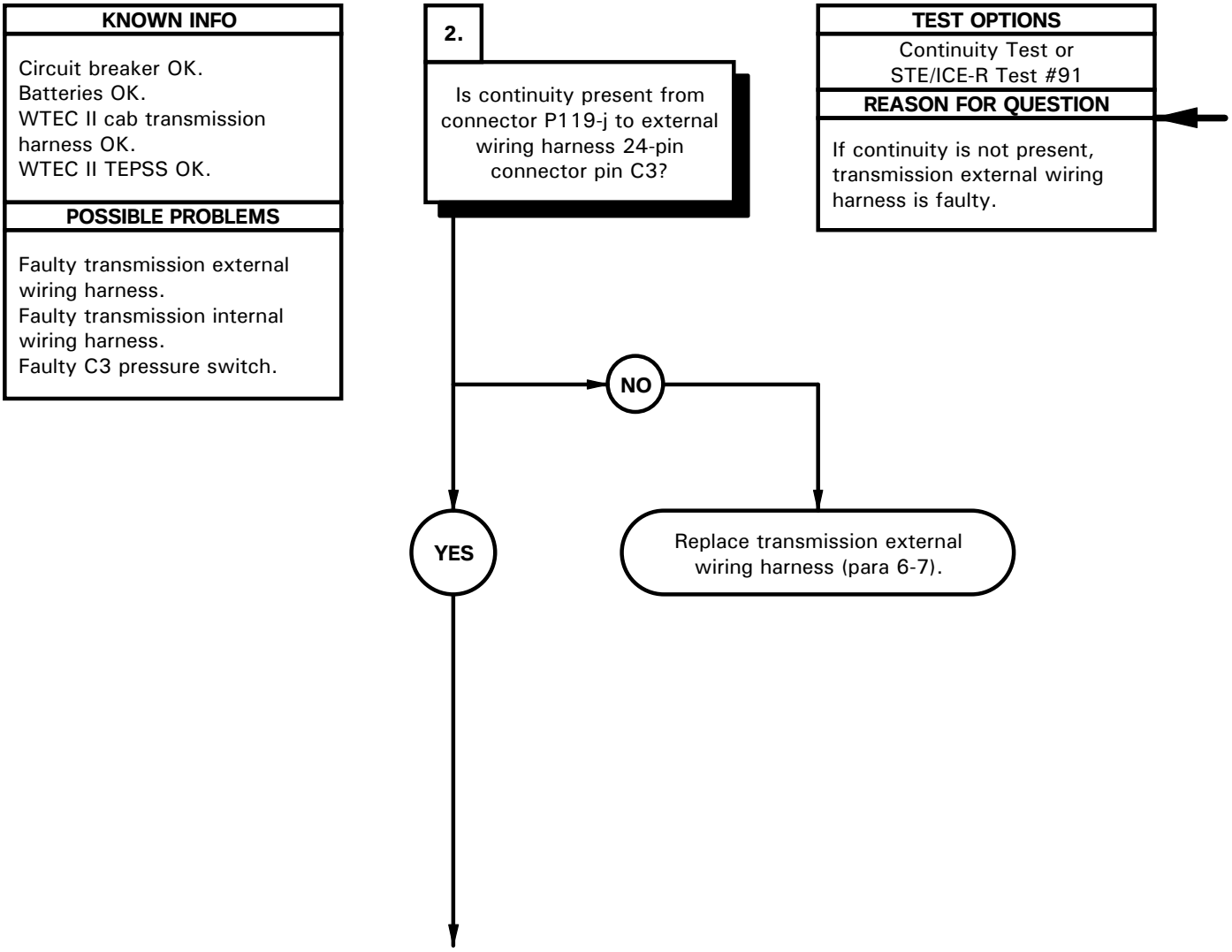
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Loosen screw in external wiring harness 24-pin connector.
(6) Disconnect external wiring harness 24-pin connector 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).

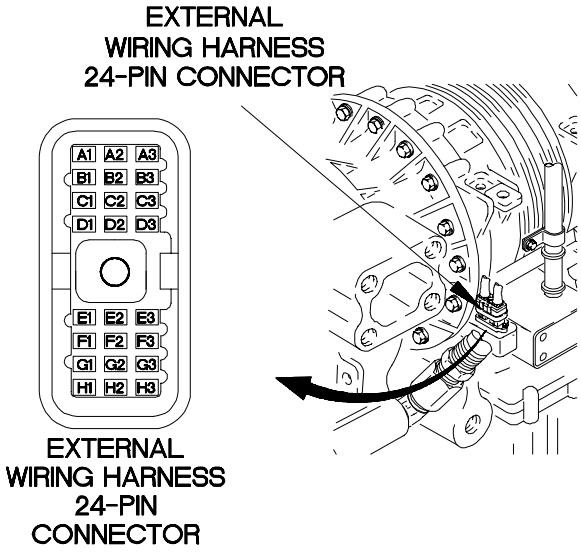


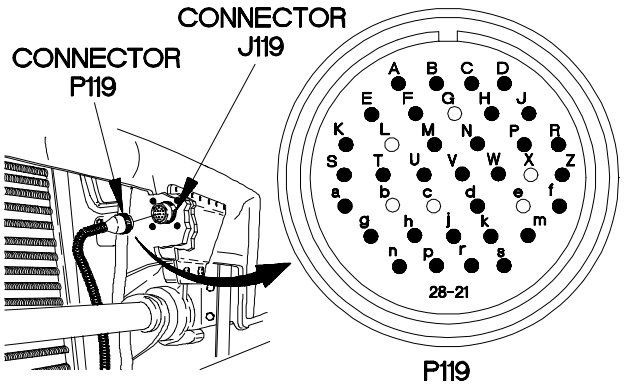
c10. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND/OR 57 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

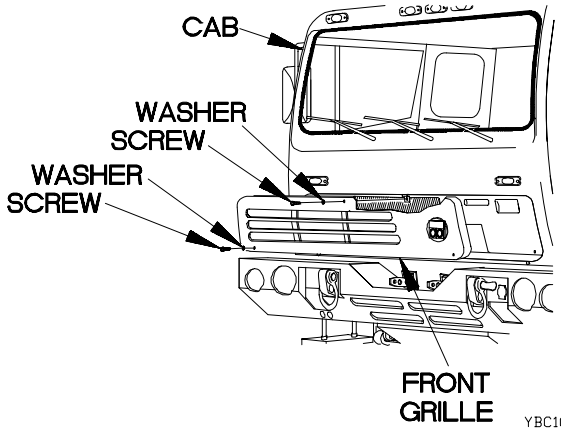


CONTINUITY TEST

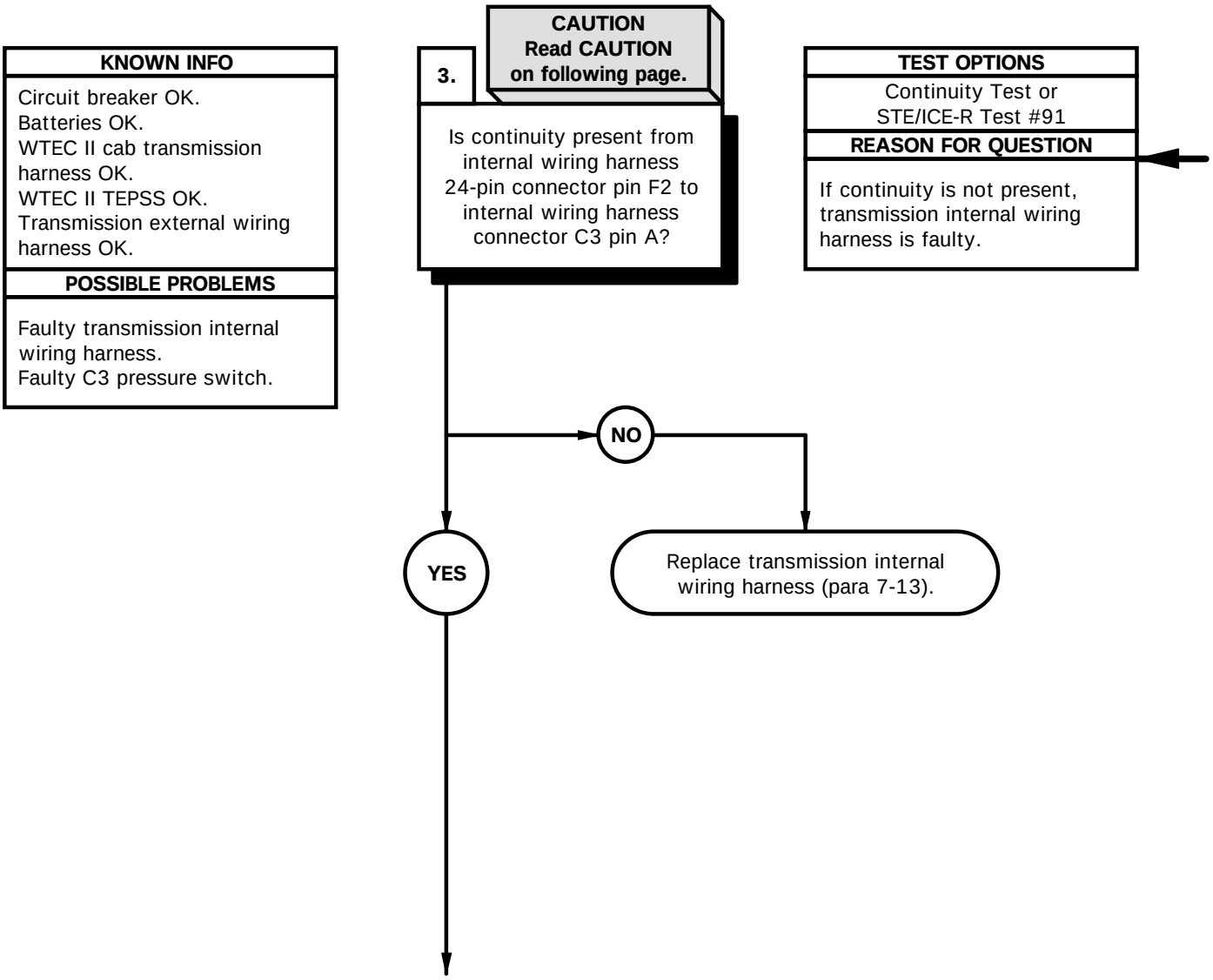
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P119-j.
(3) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin C3 and note reading on multimeter.
(4) If continuity is not present, replace transmission external wiring harness (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).







c10. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND/OR 57 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

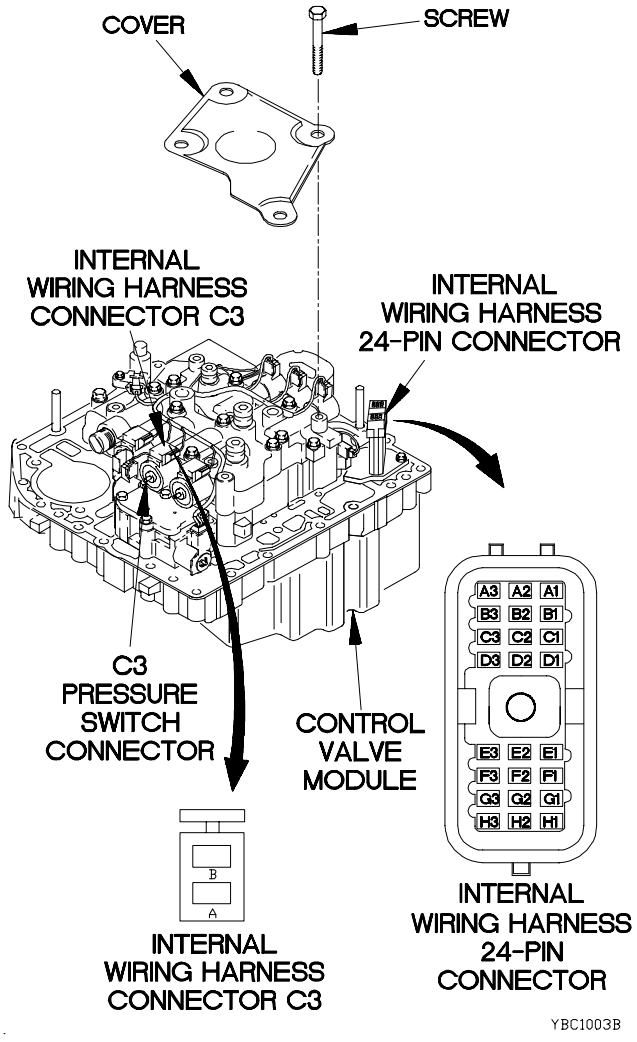


CAUTION

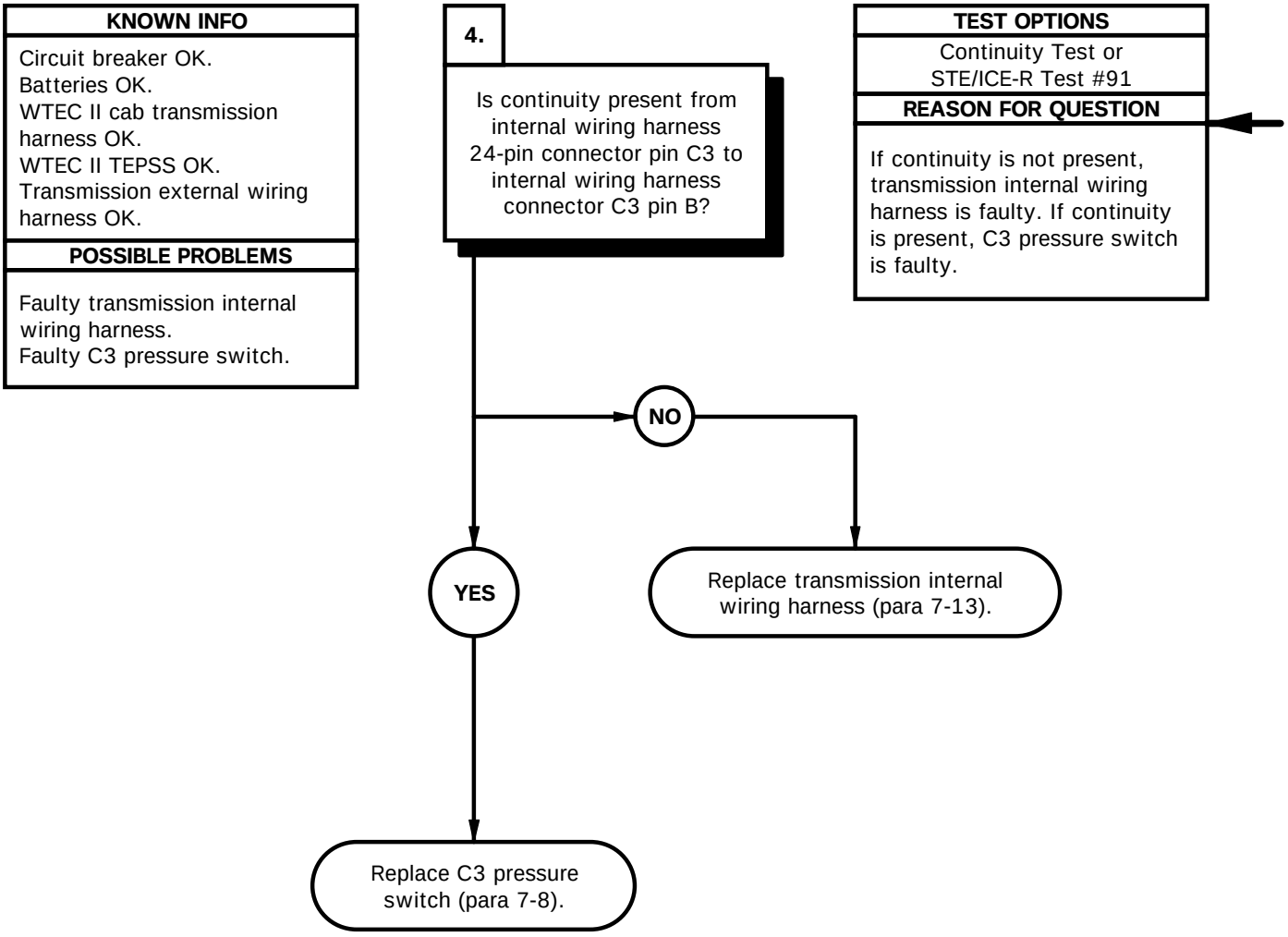
Use care when disconnecting transmission internal wiring harness connectors. Failure to comply may result in damage to equipment.

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).

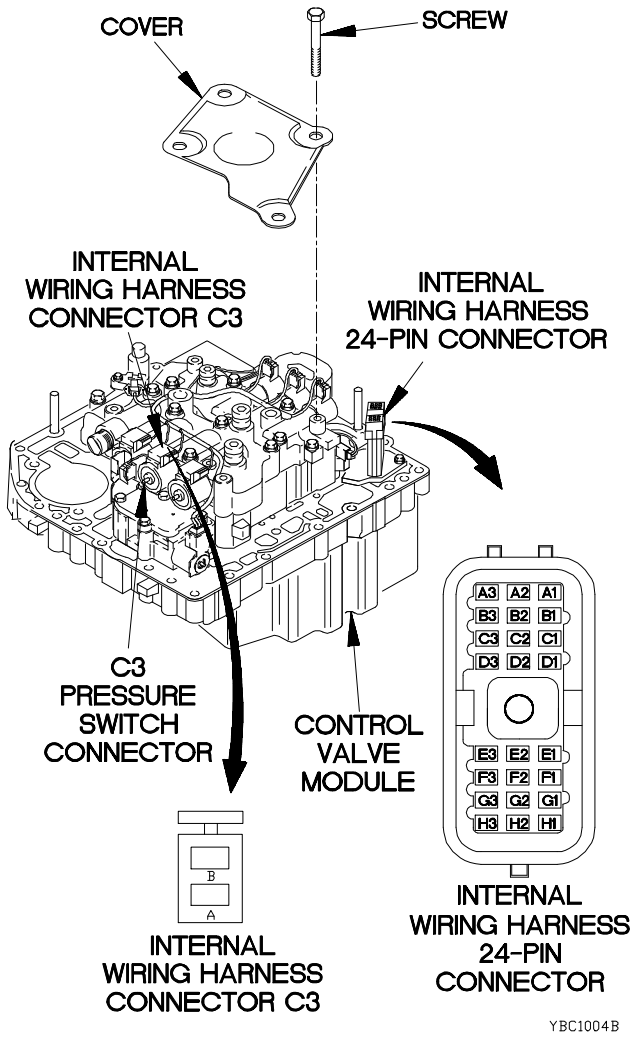


c10. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND/OR 57 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369) (CONT)



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).



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

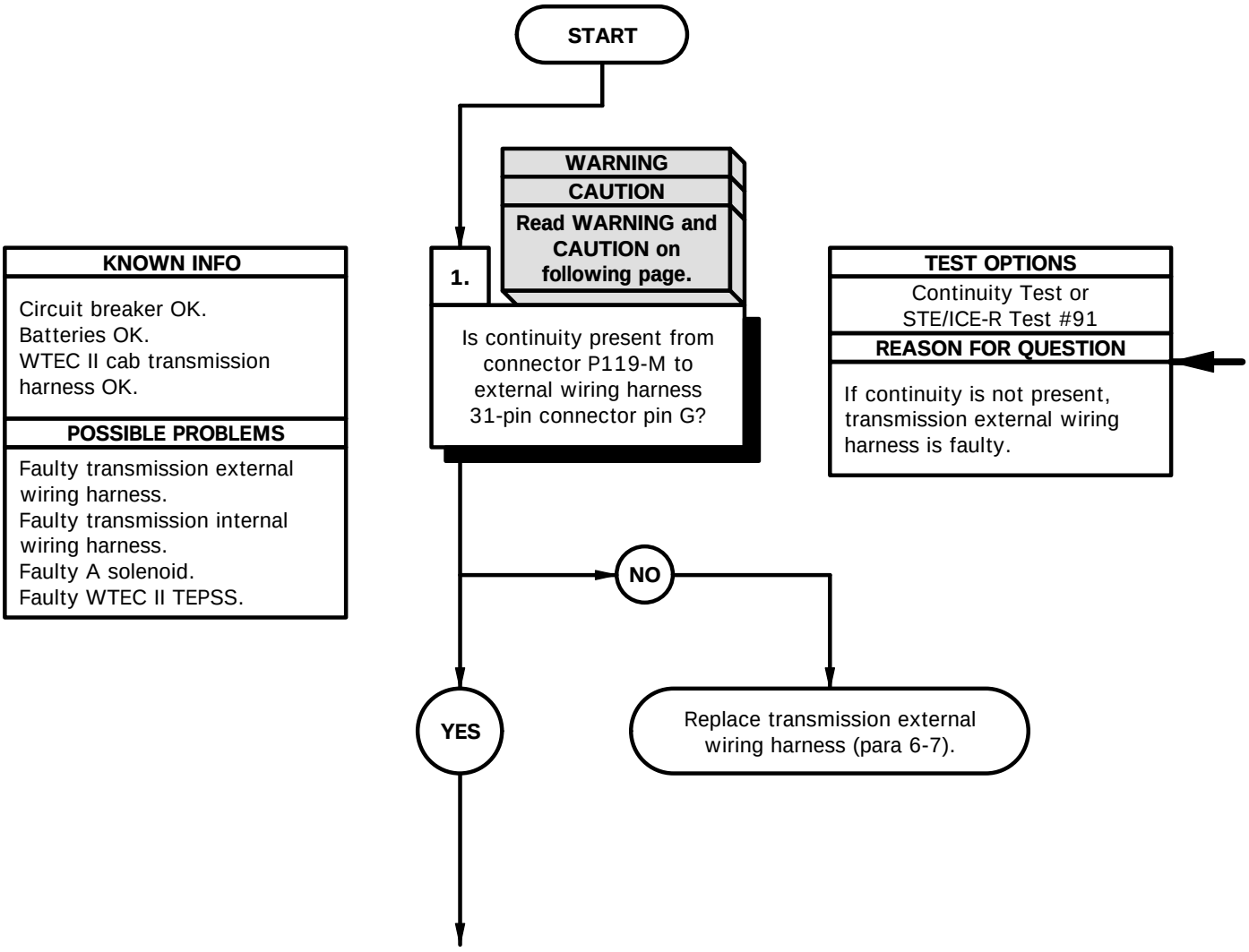
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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)

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

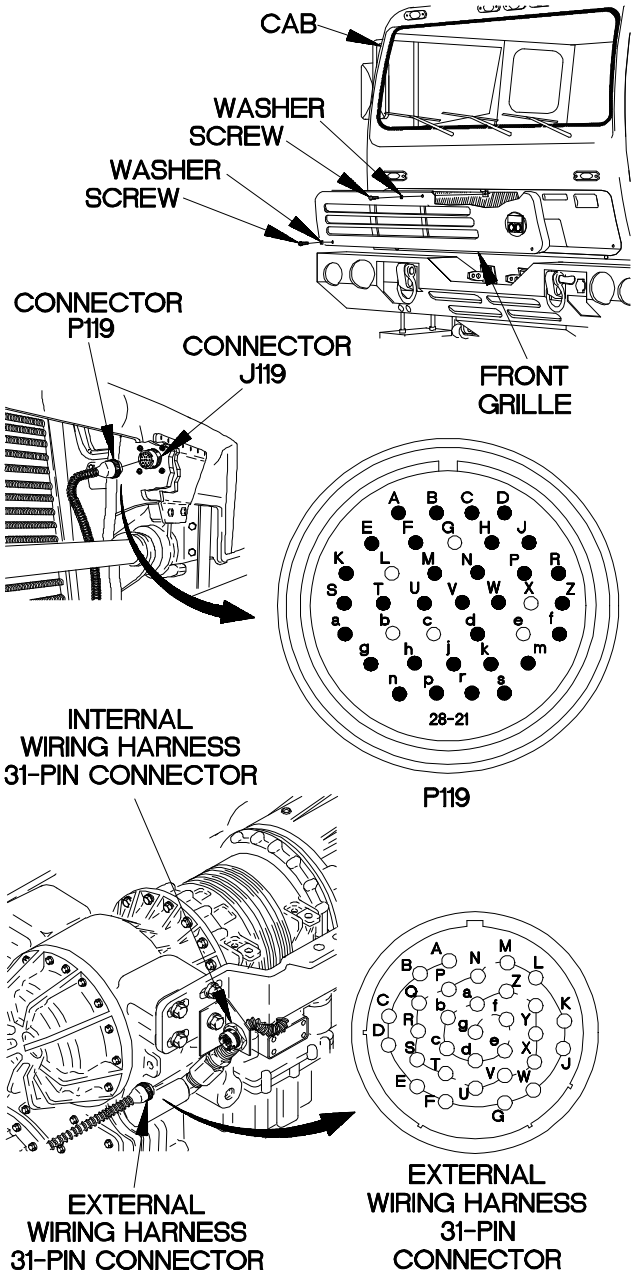
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

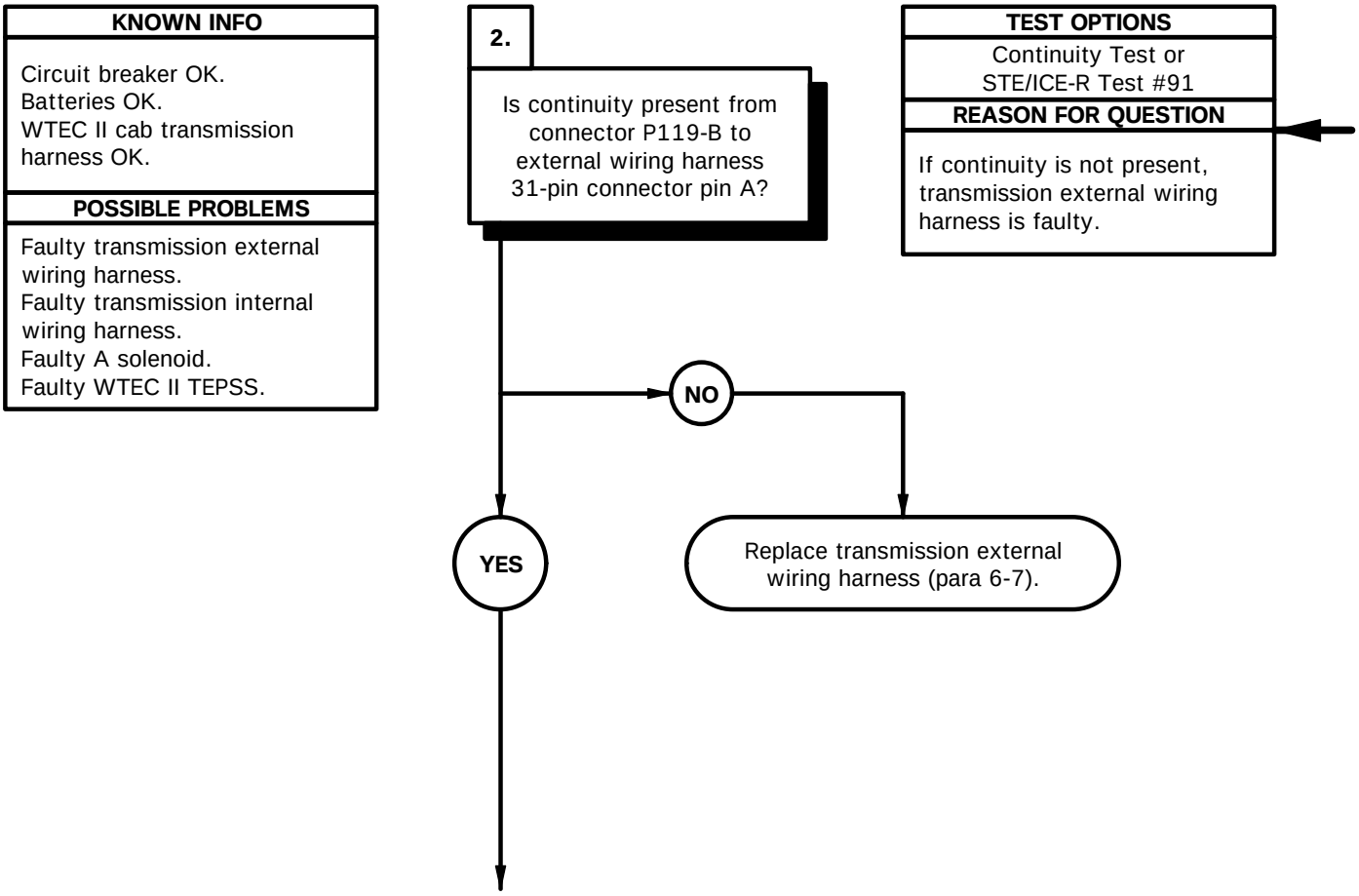
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect positive (+) probe of multimeter to connector P119-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).

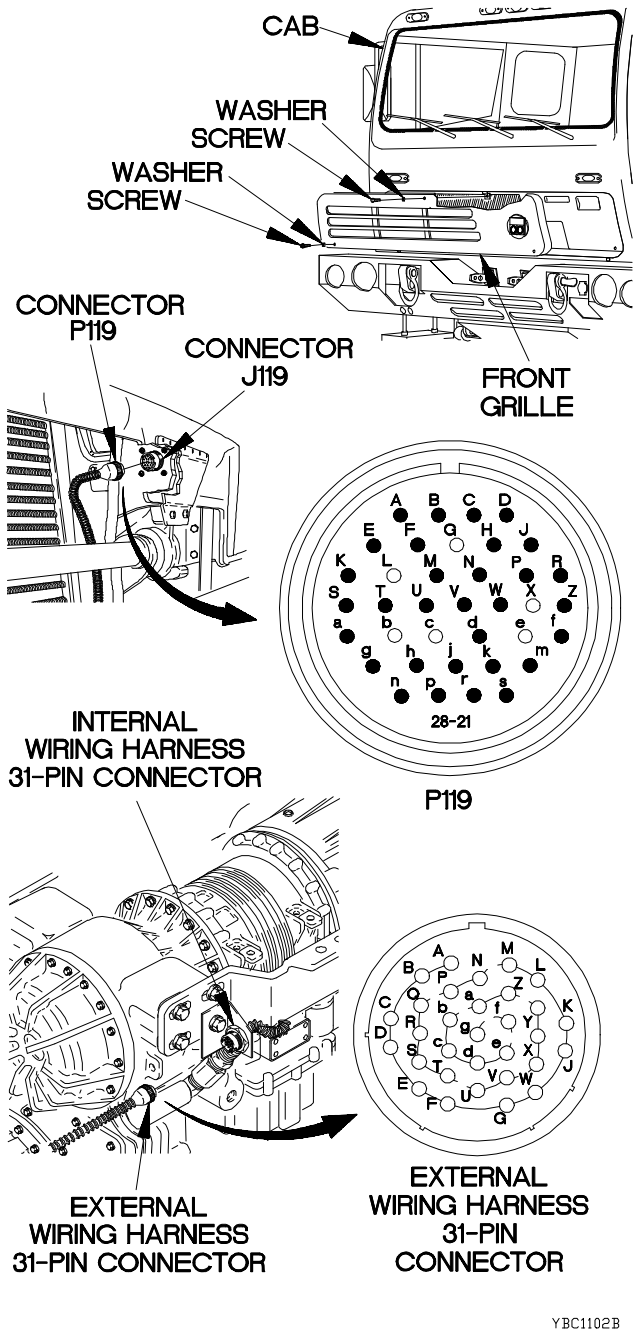


c11. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

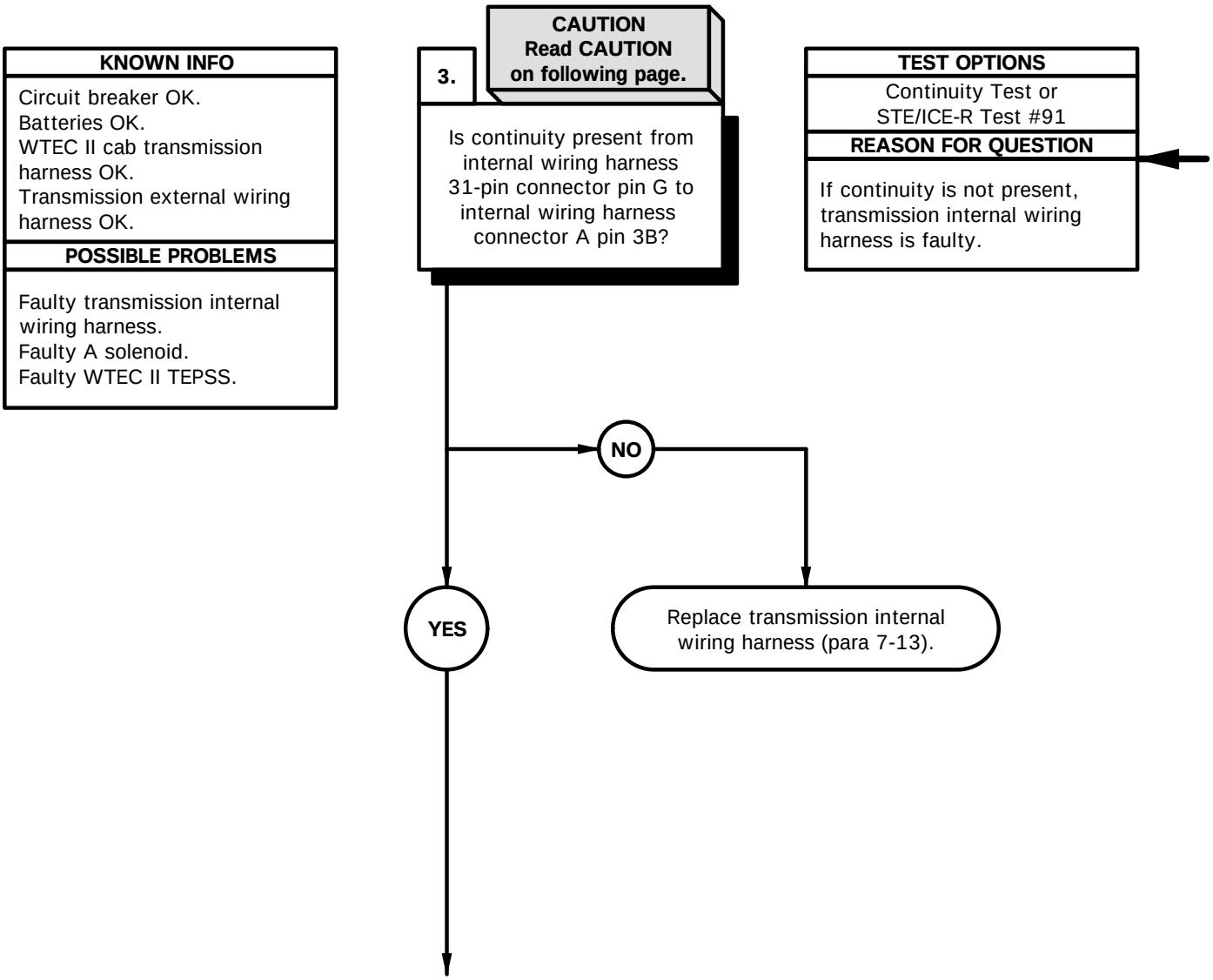


CONTINUITY TEST

(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).



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)

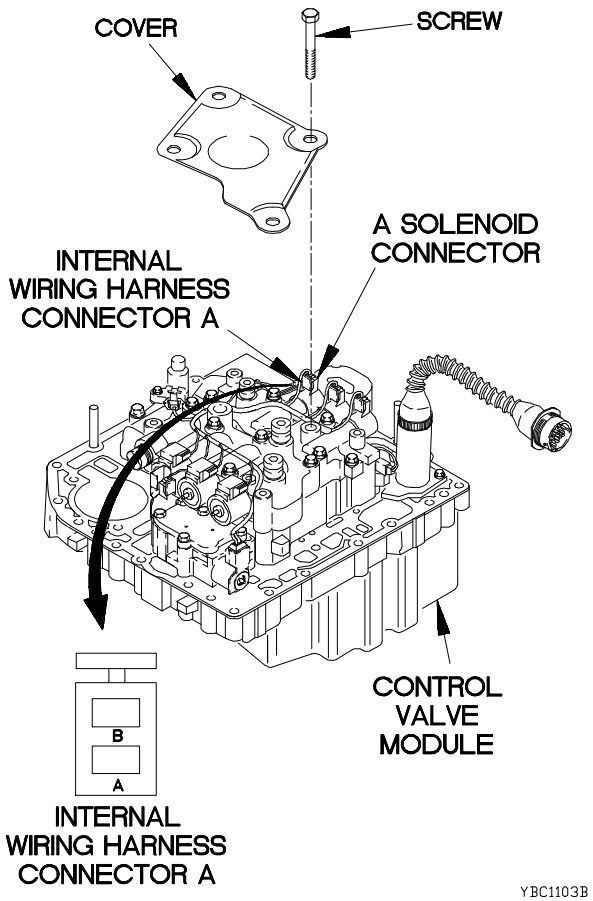


CAUTION

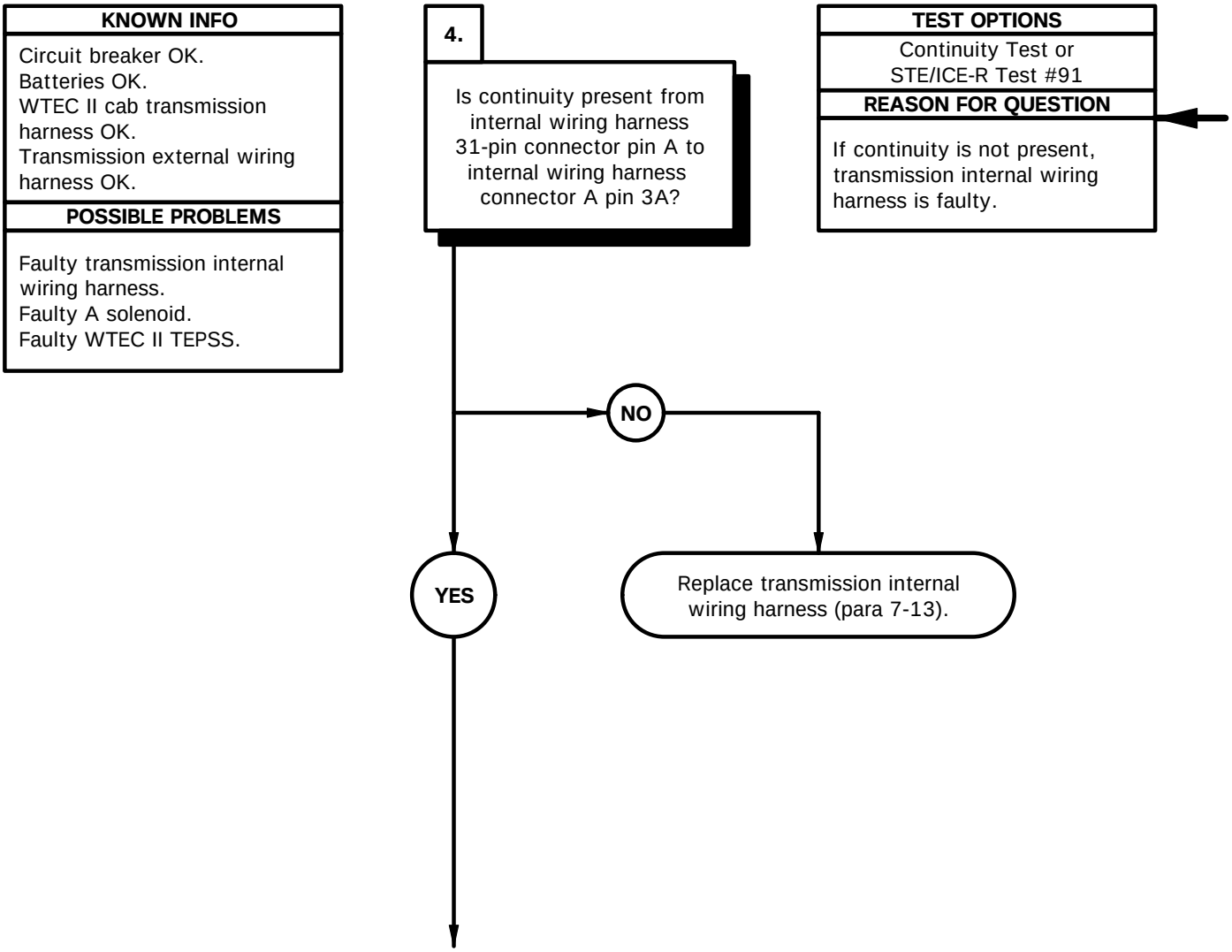
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

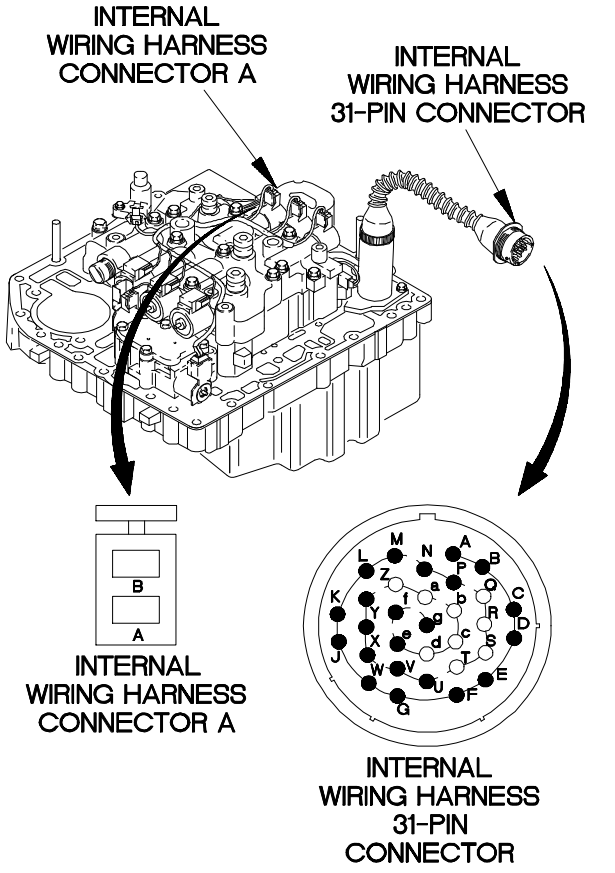


c11. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

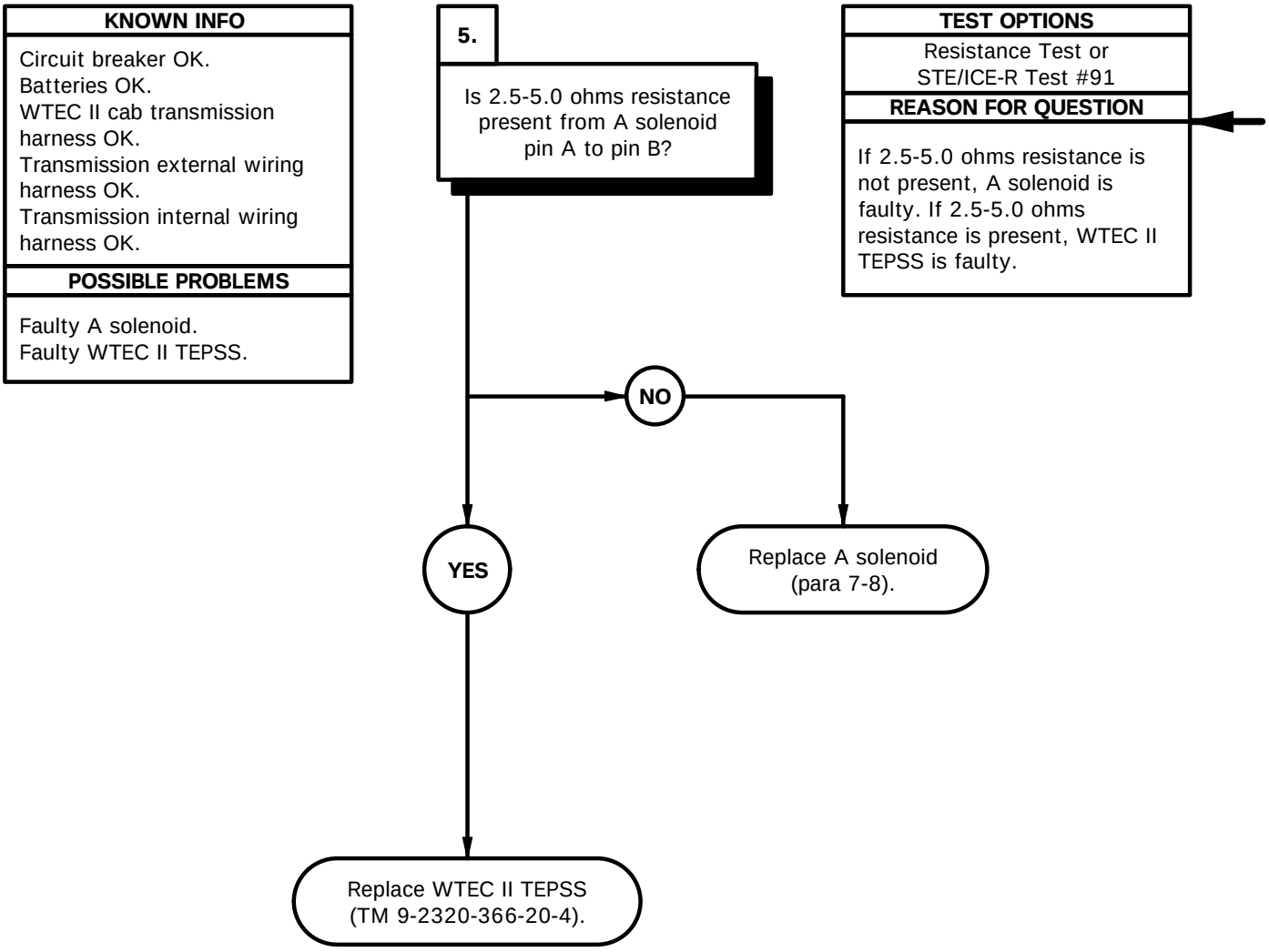


CONTINUITY TEST

(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).

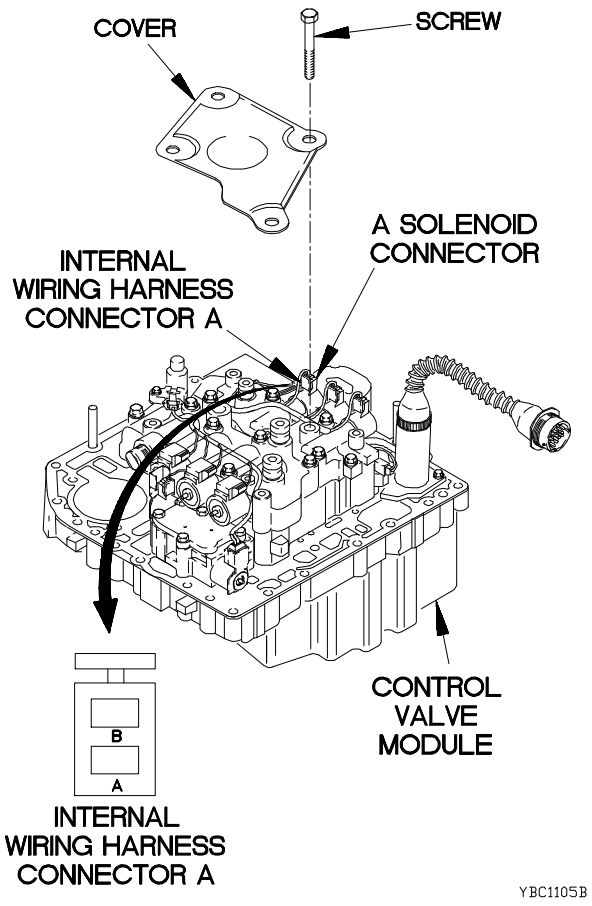


c11. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



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).



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

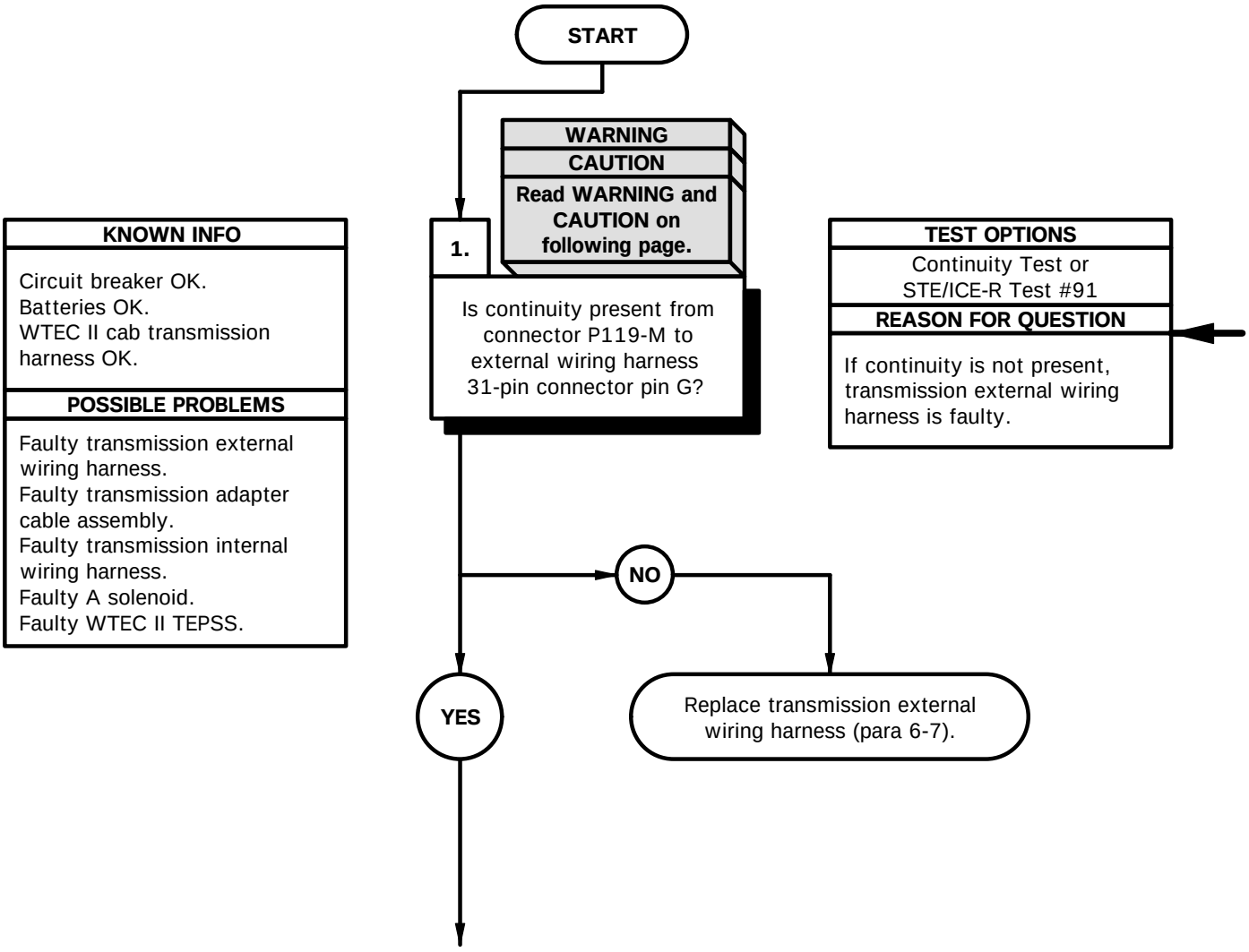
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

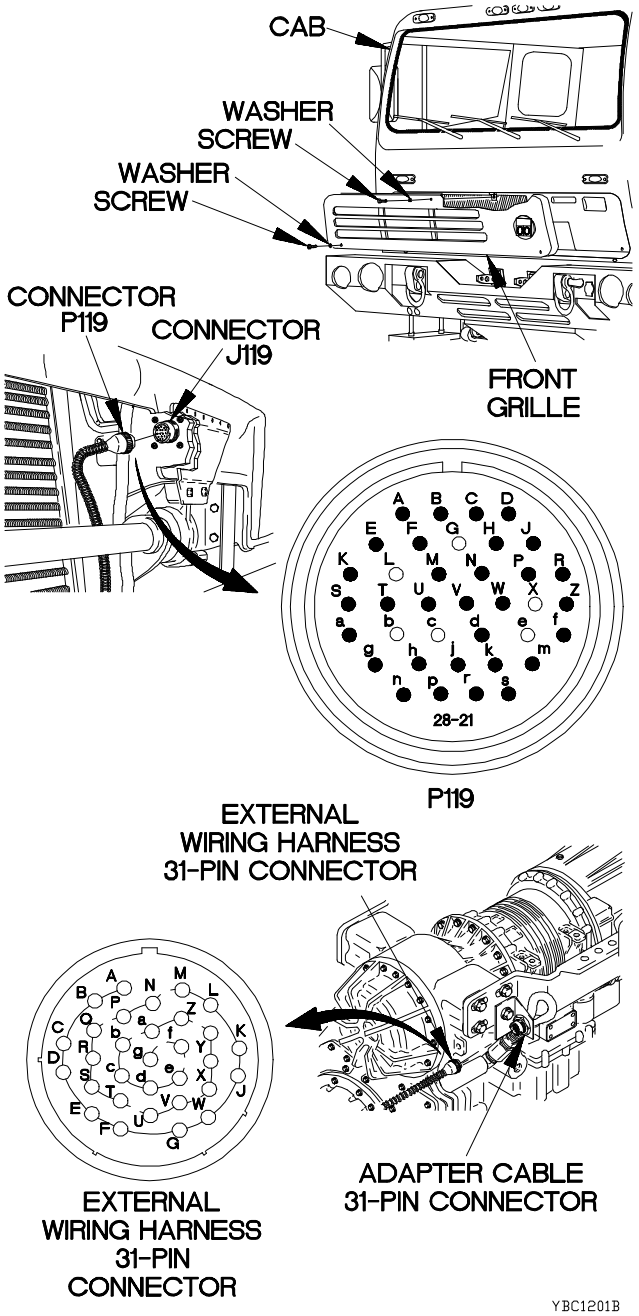
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



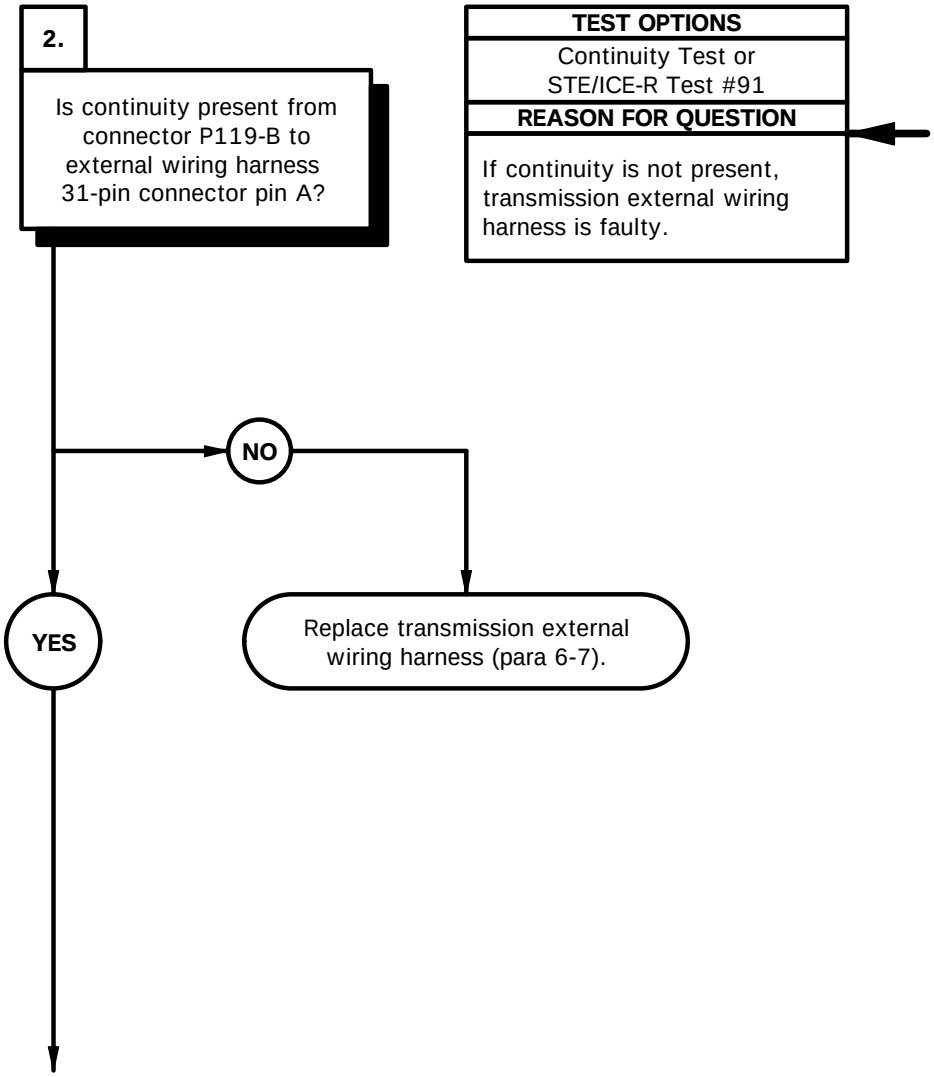
c12. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

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.



TEST OPTIONS

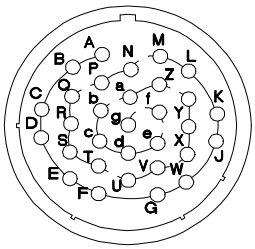
Continuity Test or
STE/ICE-R Test #91

REASON FOR QUESTION

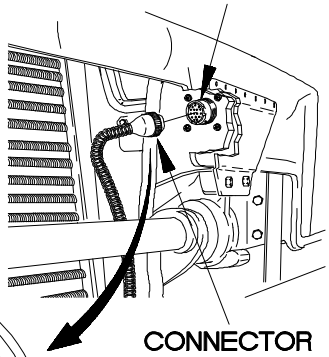
If continuity is not present, transmission external wiring harness is faulty.

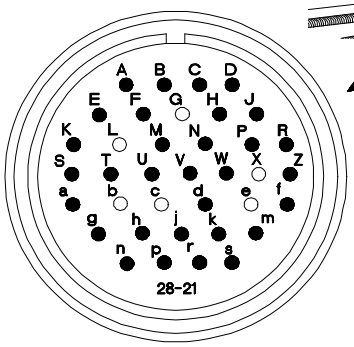
CONTINUITY TEST

(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).

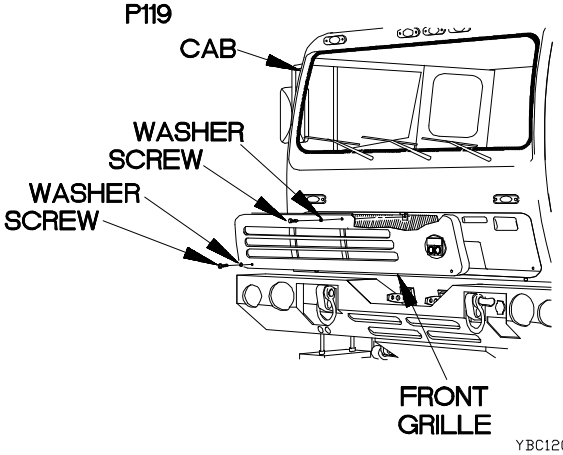


EXTERNAL WIRING HARNESS 31-PIN CONNECTOR

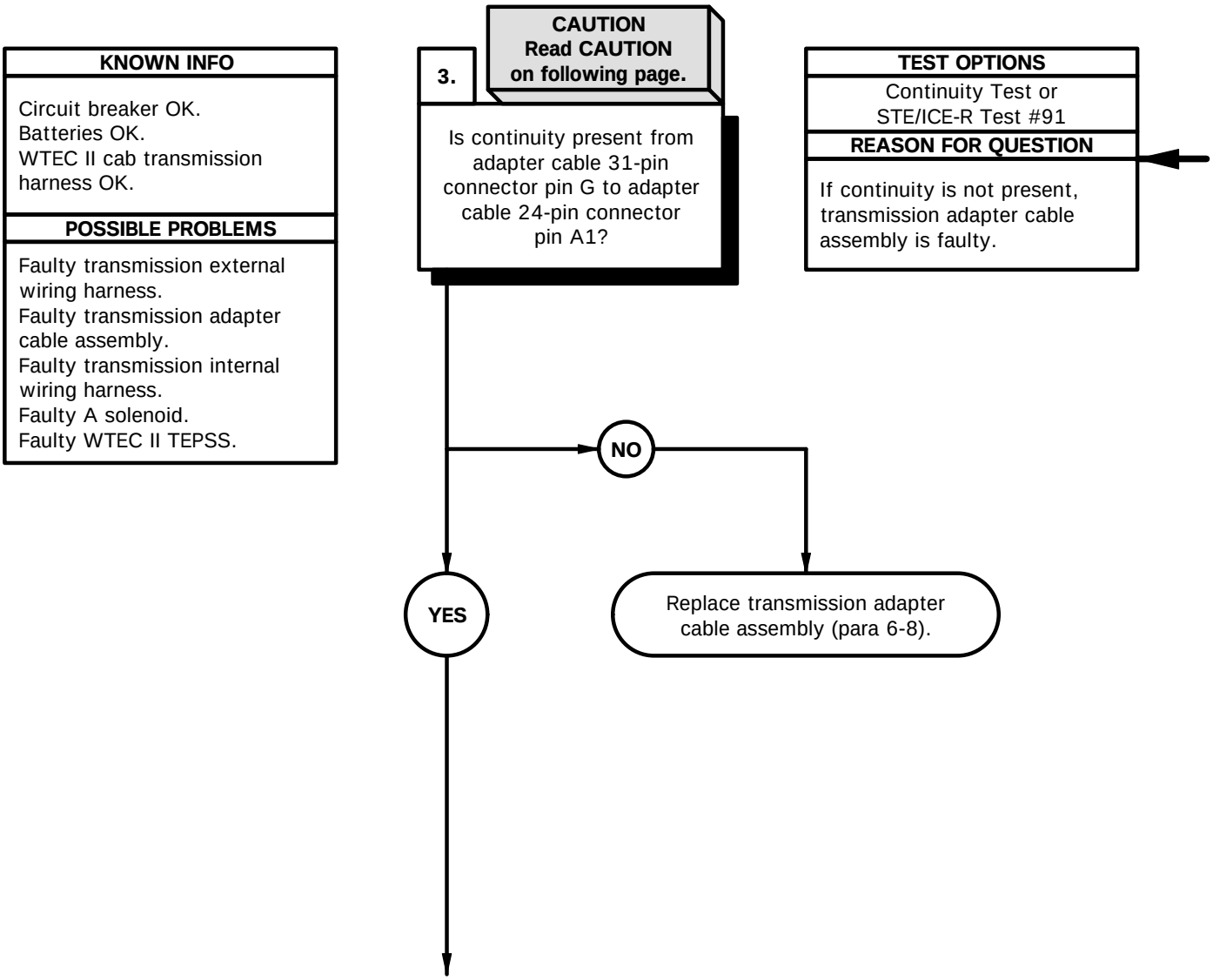




P119



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)

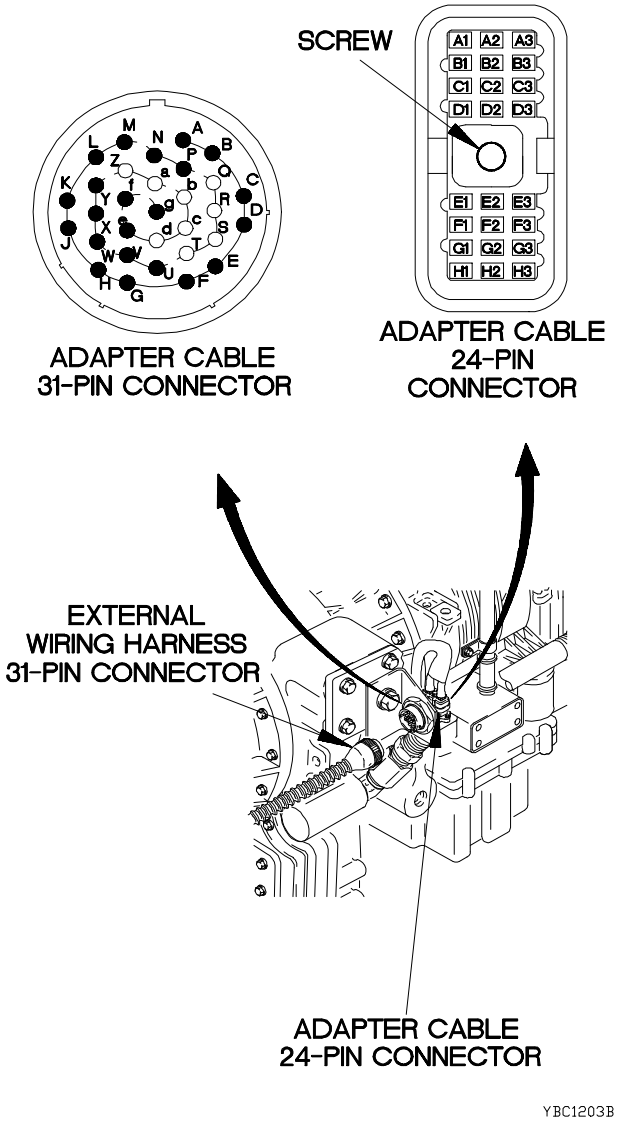


CAUTION

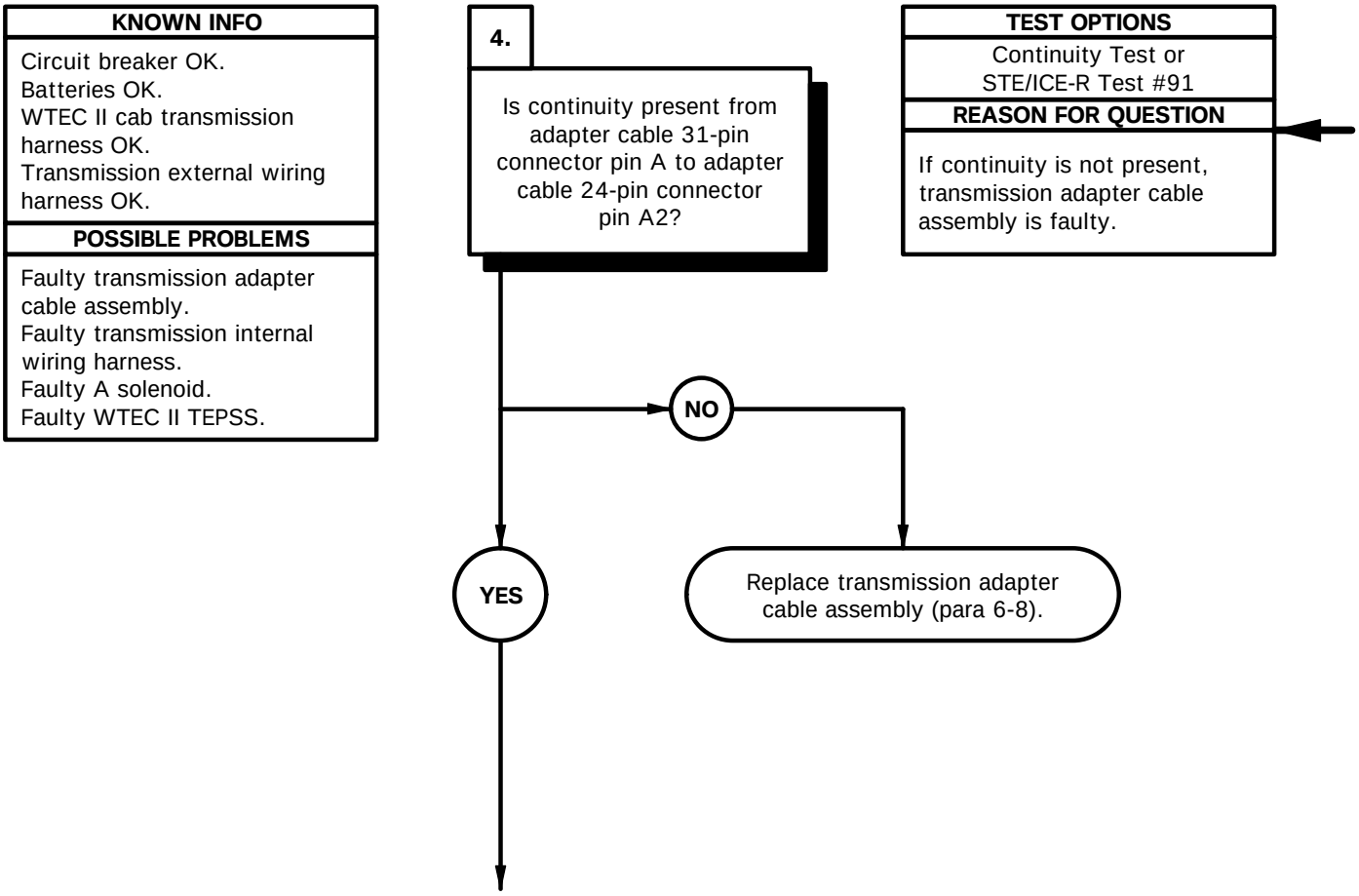
Use care when disconnecting transmission adapter cable connectors. Failure to comply may result in damage to equipment.

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).

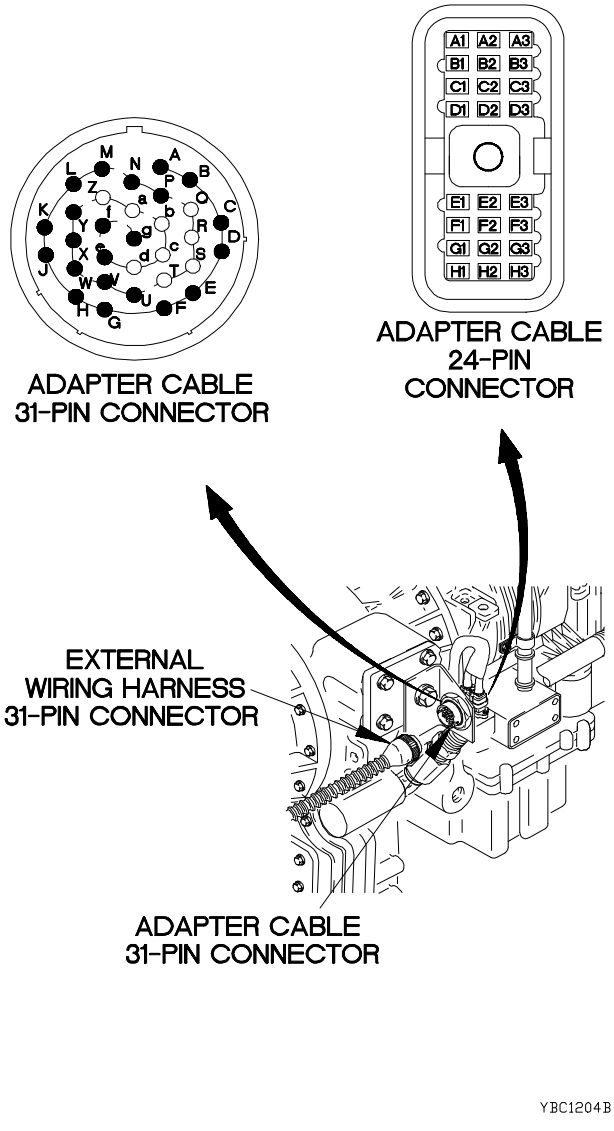


c12. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

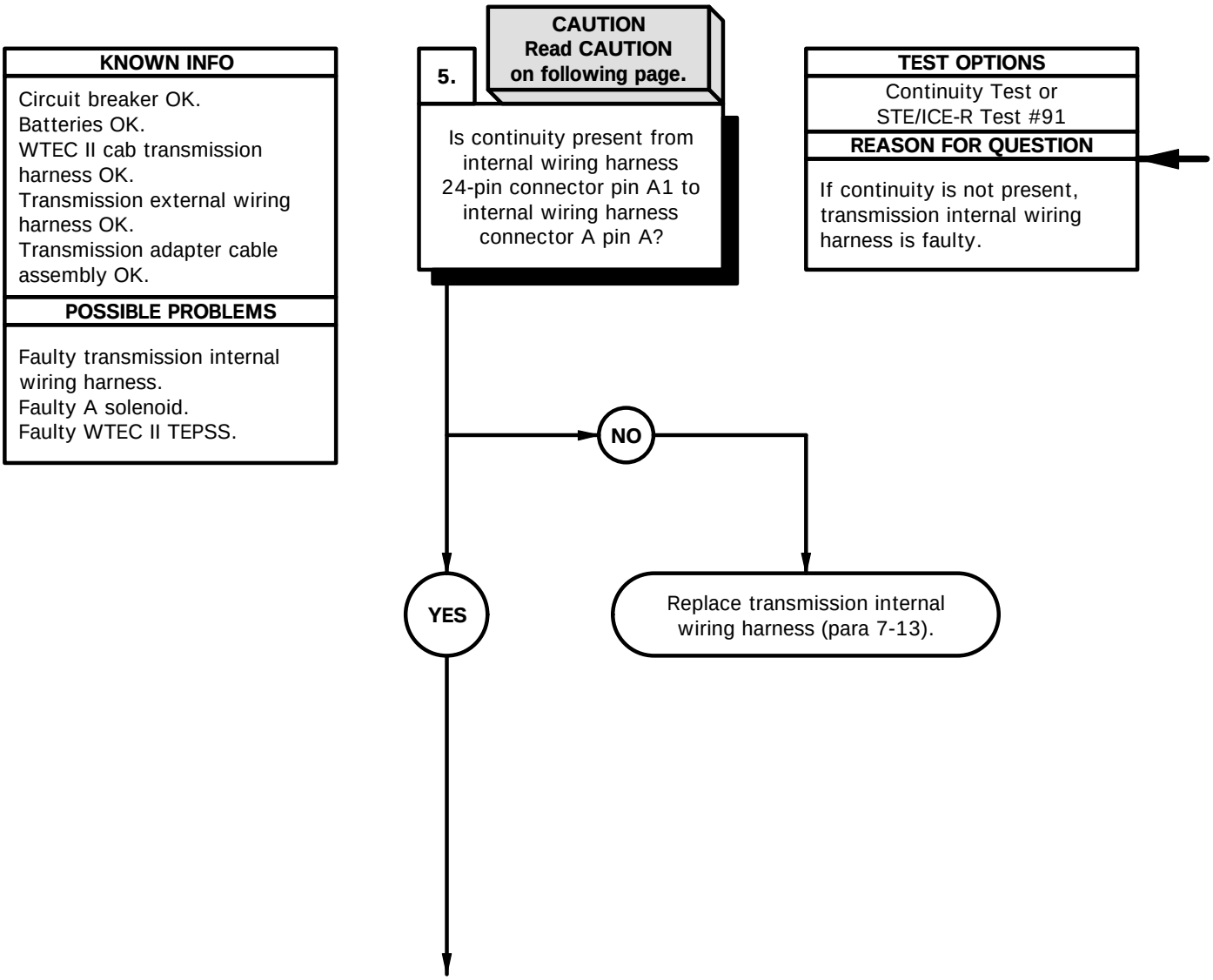


CONTINUITY TEST

(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.



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)

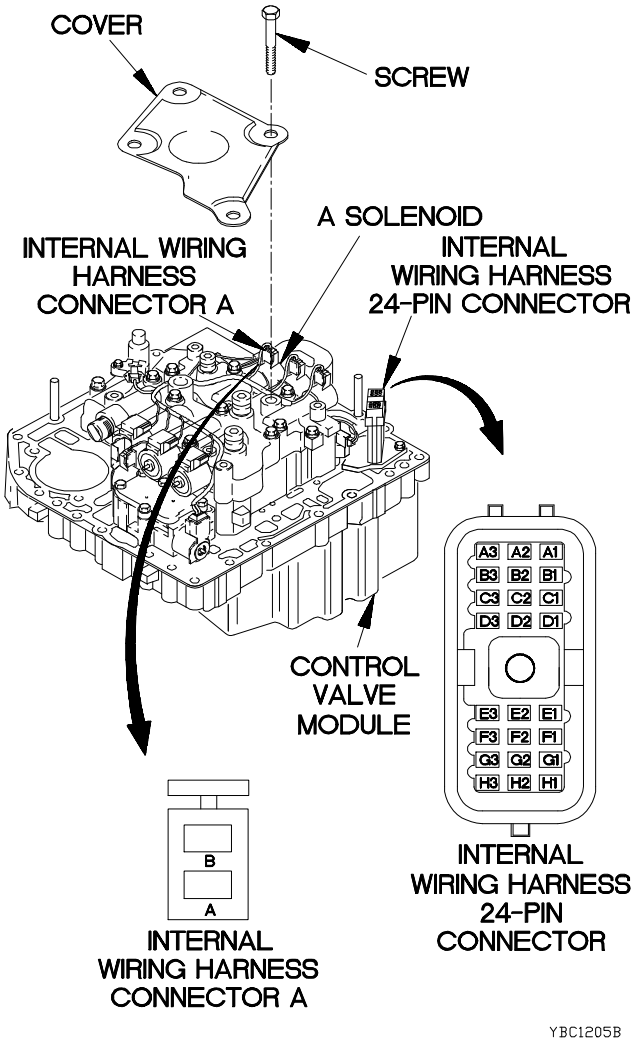


CAUTION

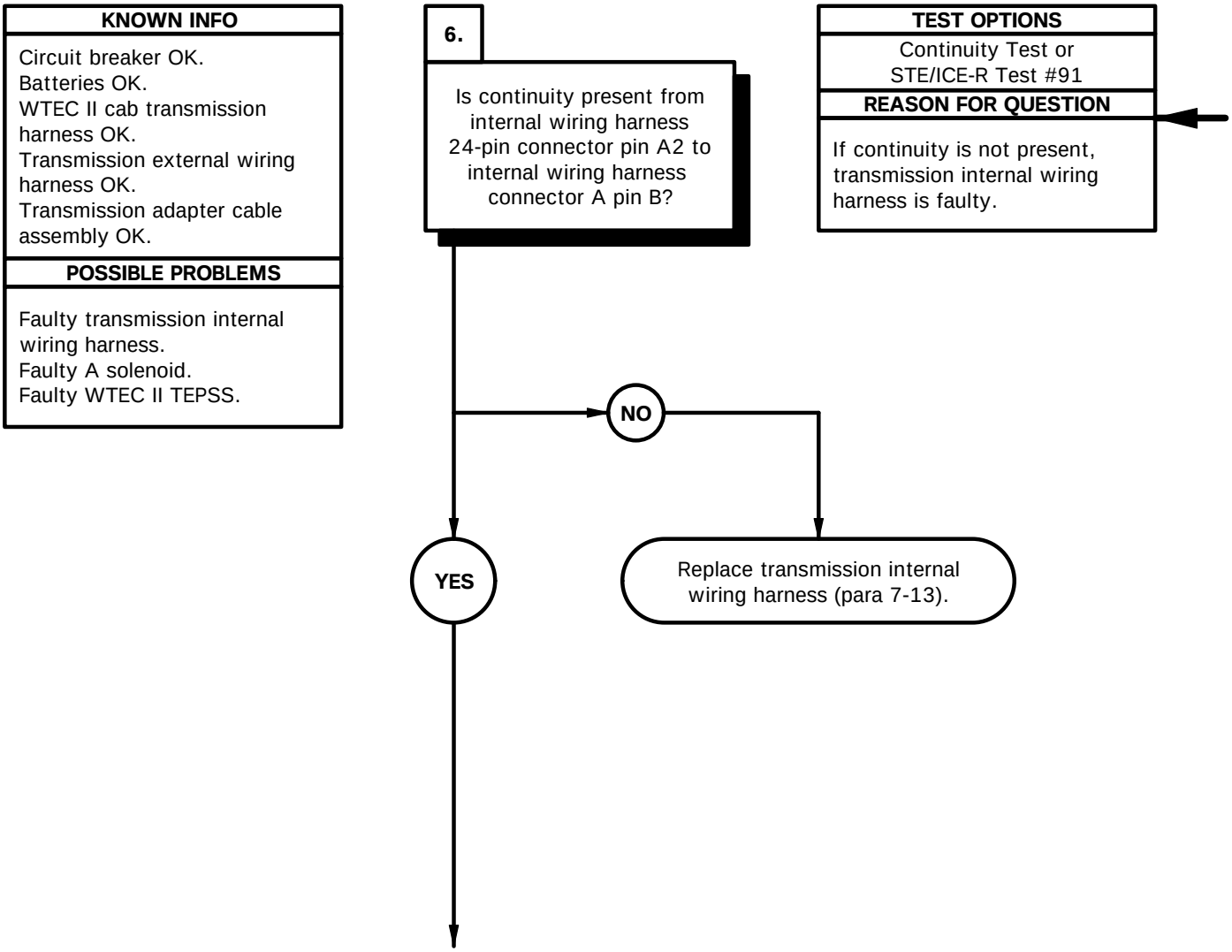
Use care when disconnecting internal wiring harness connectors. Failure to comply may result in damage to equipment.

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).

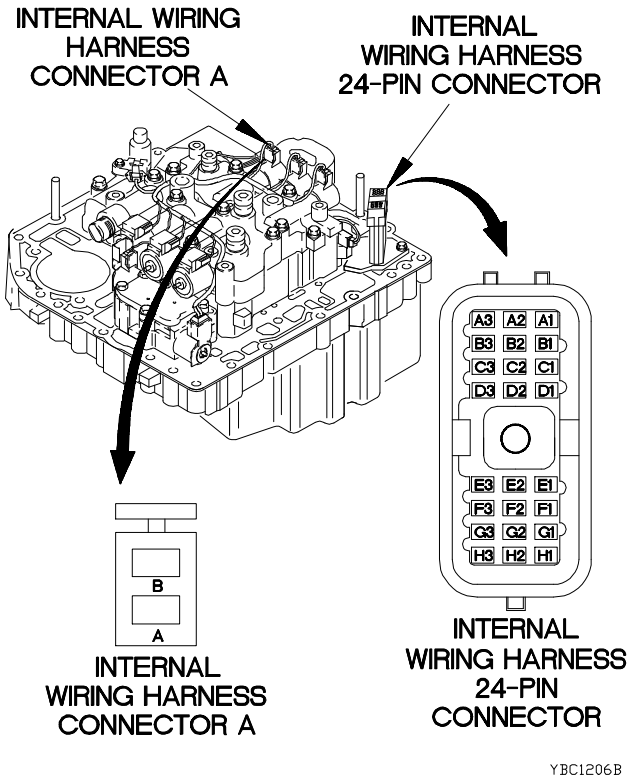


c12. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

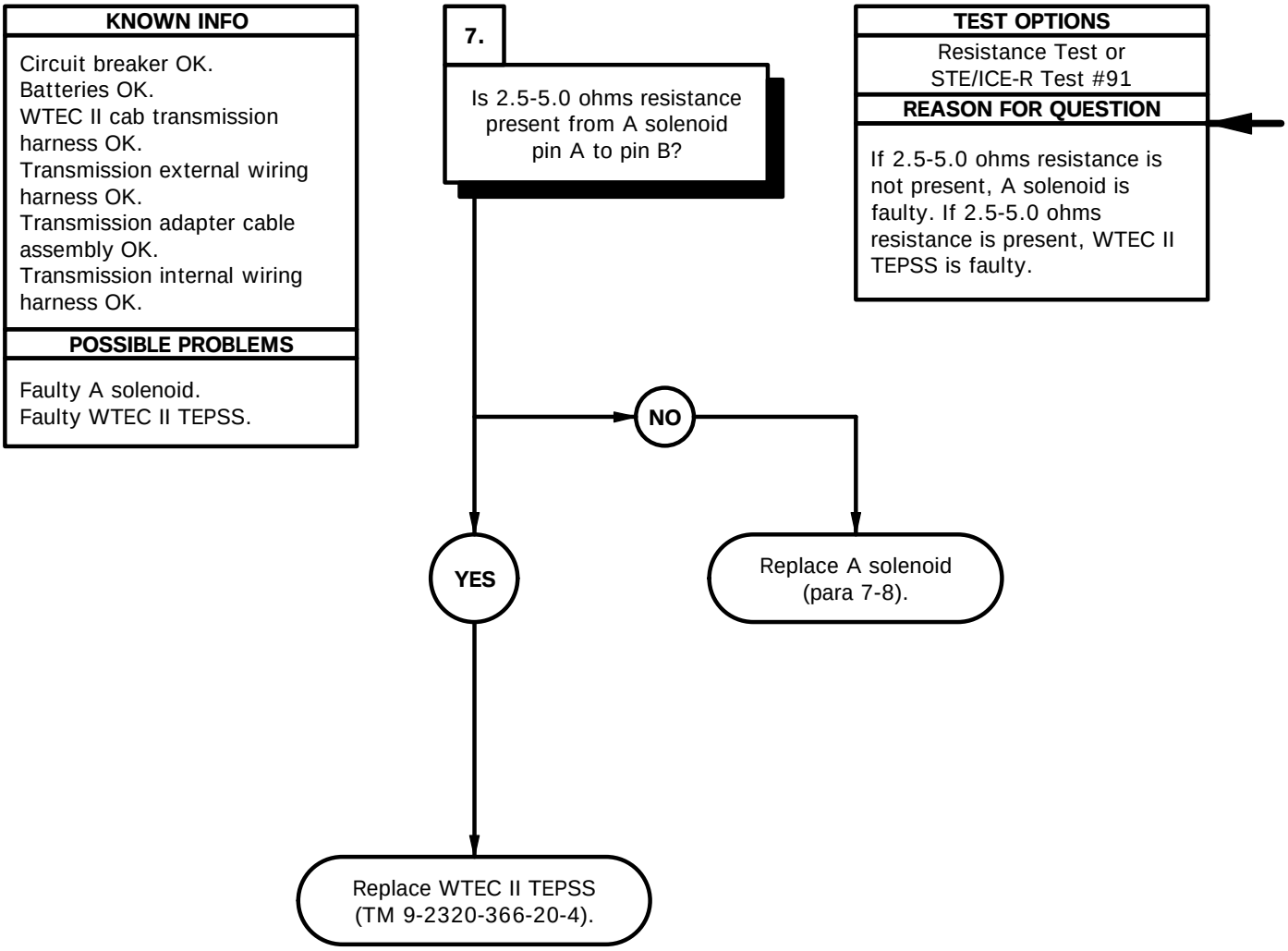


CONTINUITY TEST

(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).

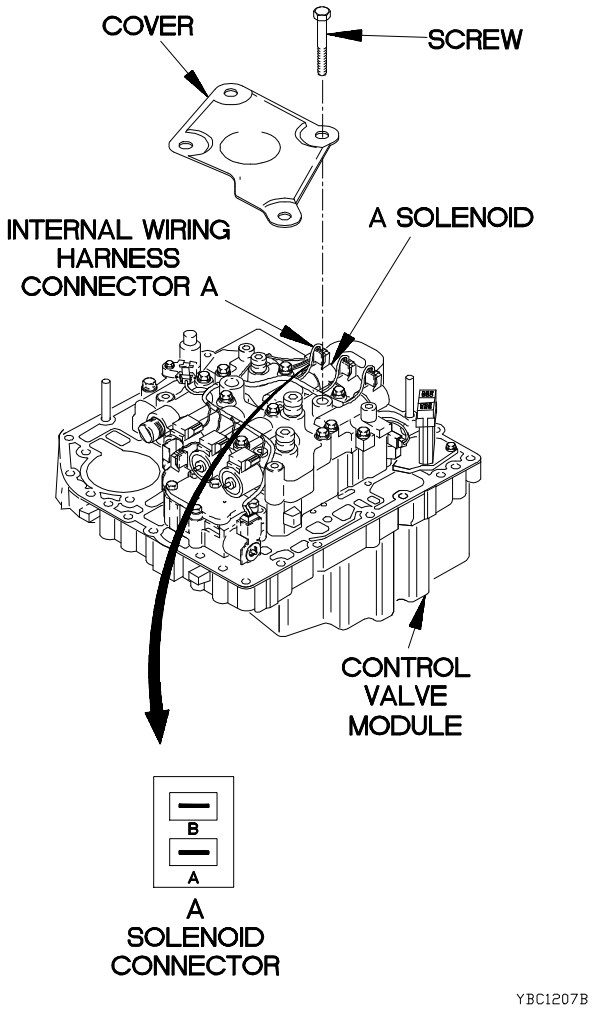


c12. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



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).



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

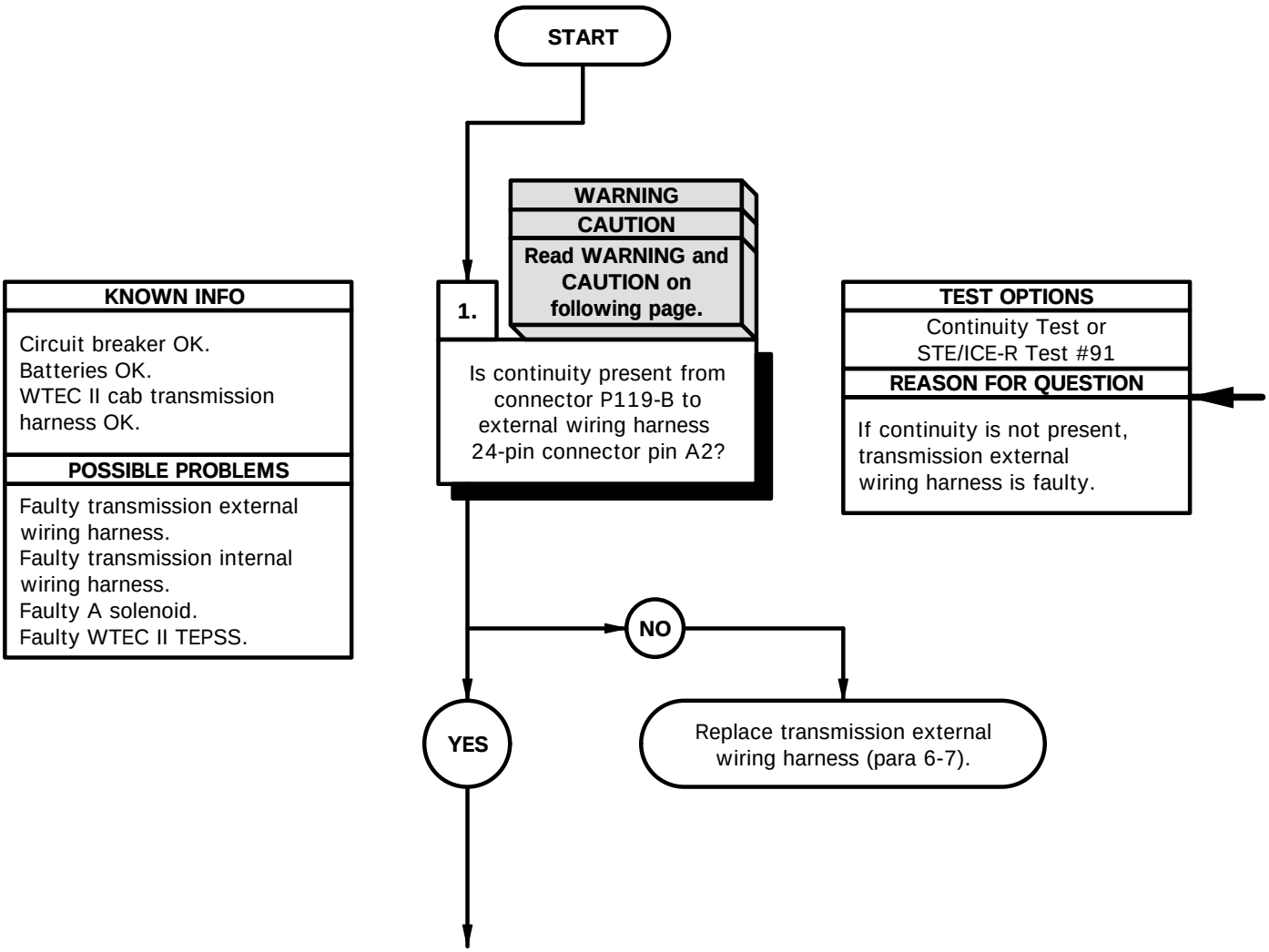
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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)

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

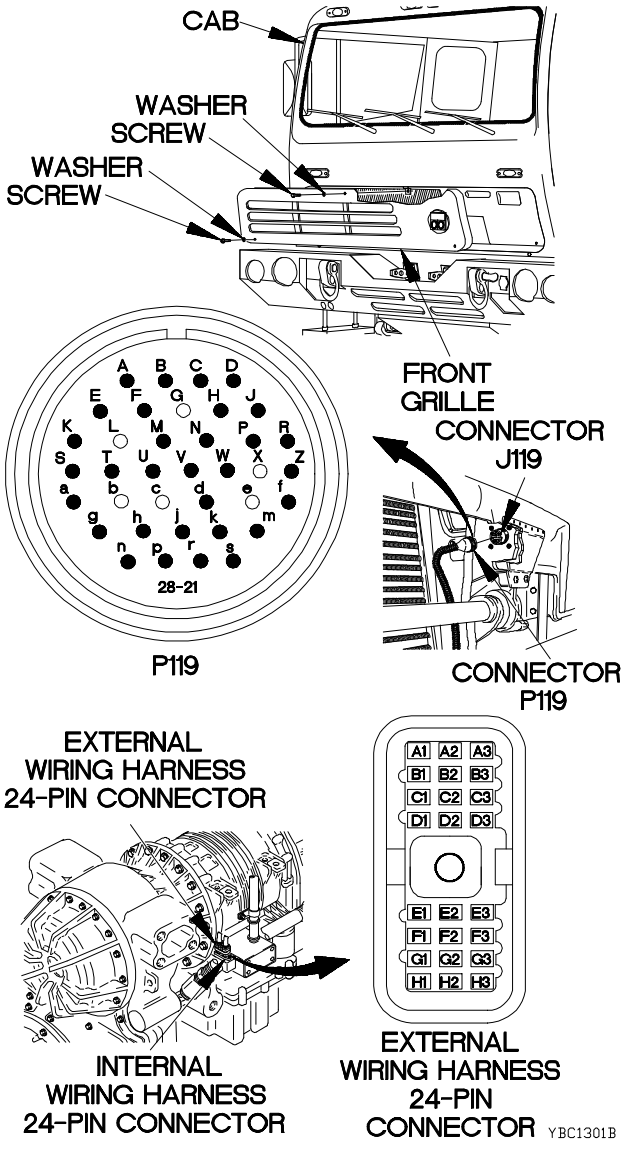
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

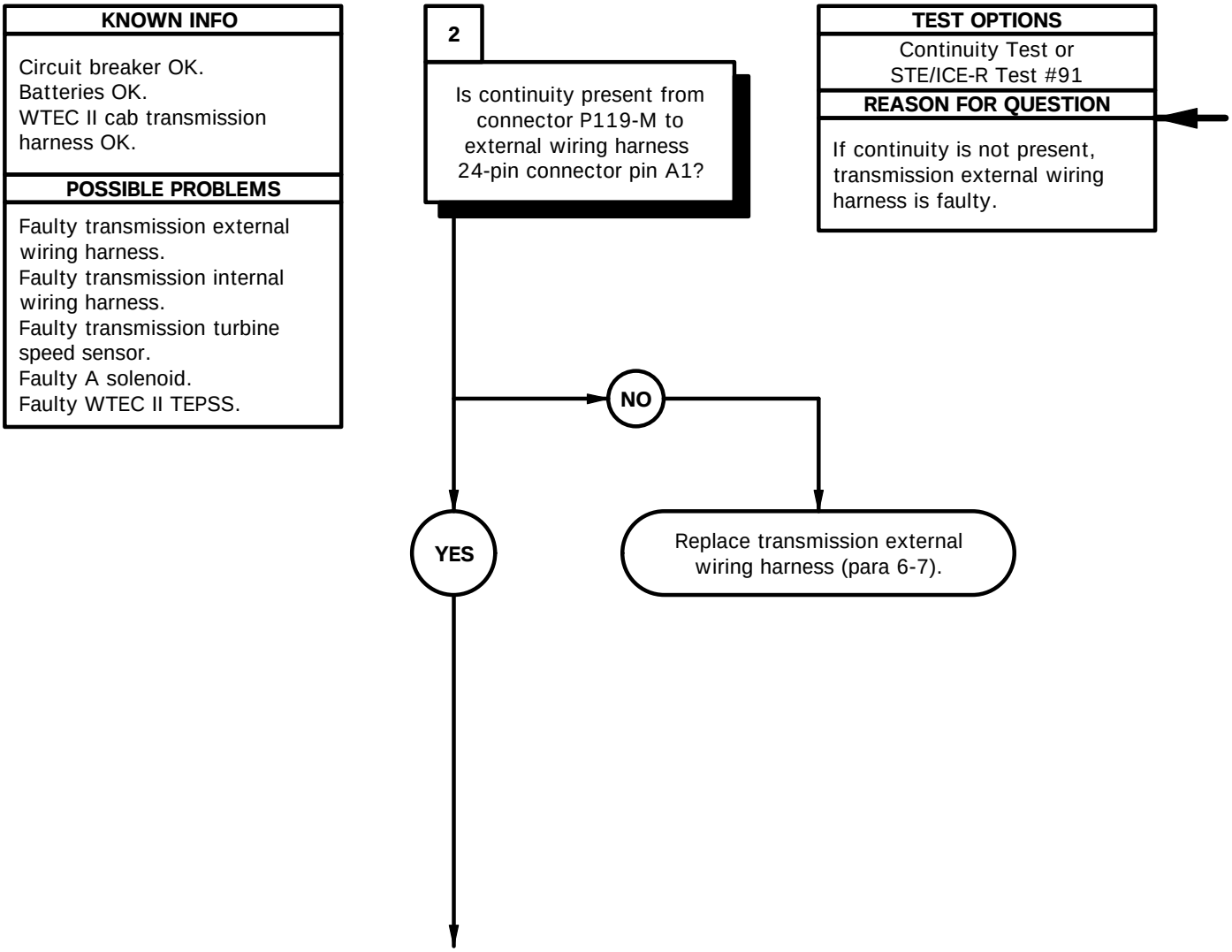
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Loosen screw in external wiring harness 24-pin connector.
(6) Disconnect external wiring harness 24-pin connector from internal wiring harness 24-pin connector.
(7) Set multimeter to ohms.
(8) Connect positive (+) probe of multimeter to connector P119-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).

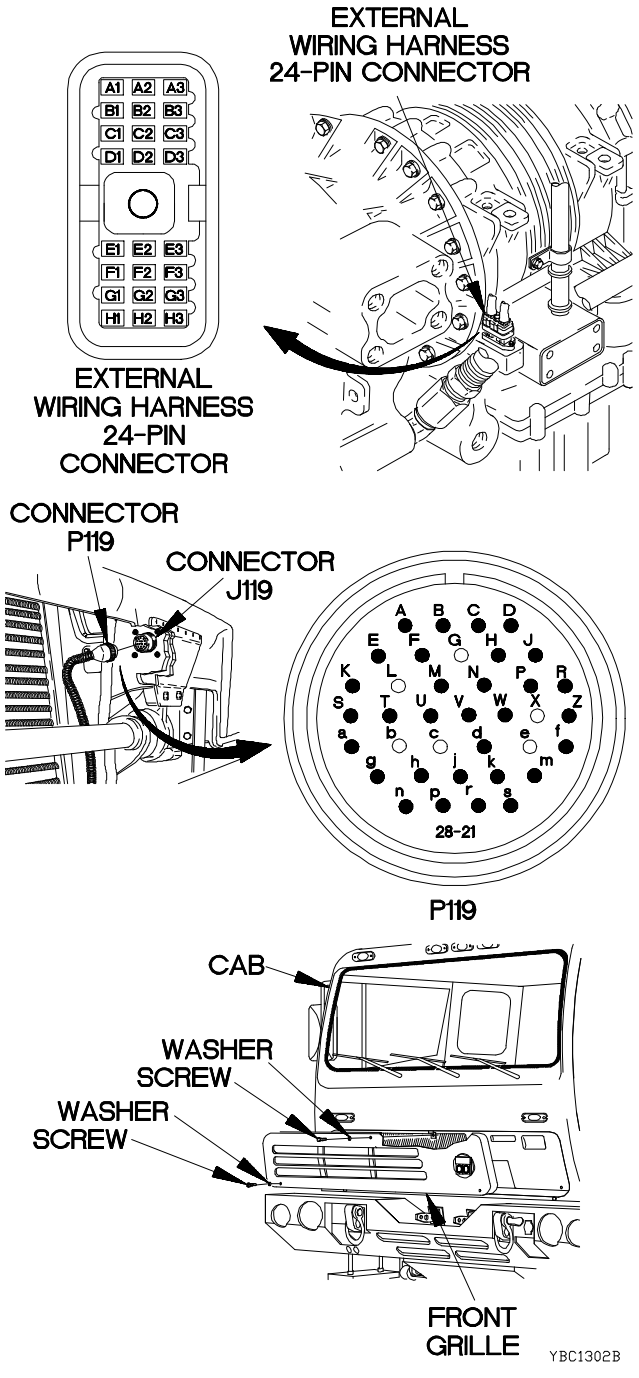


c13. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

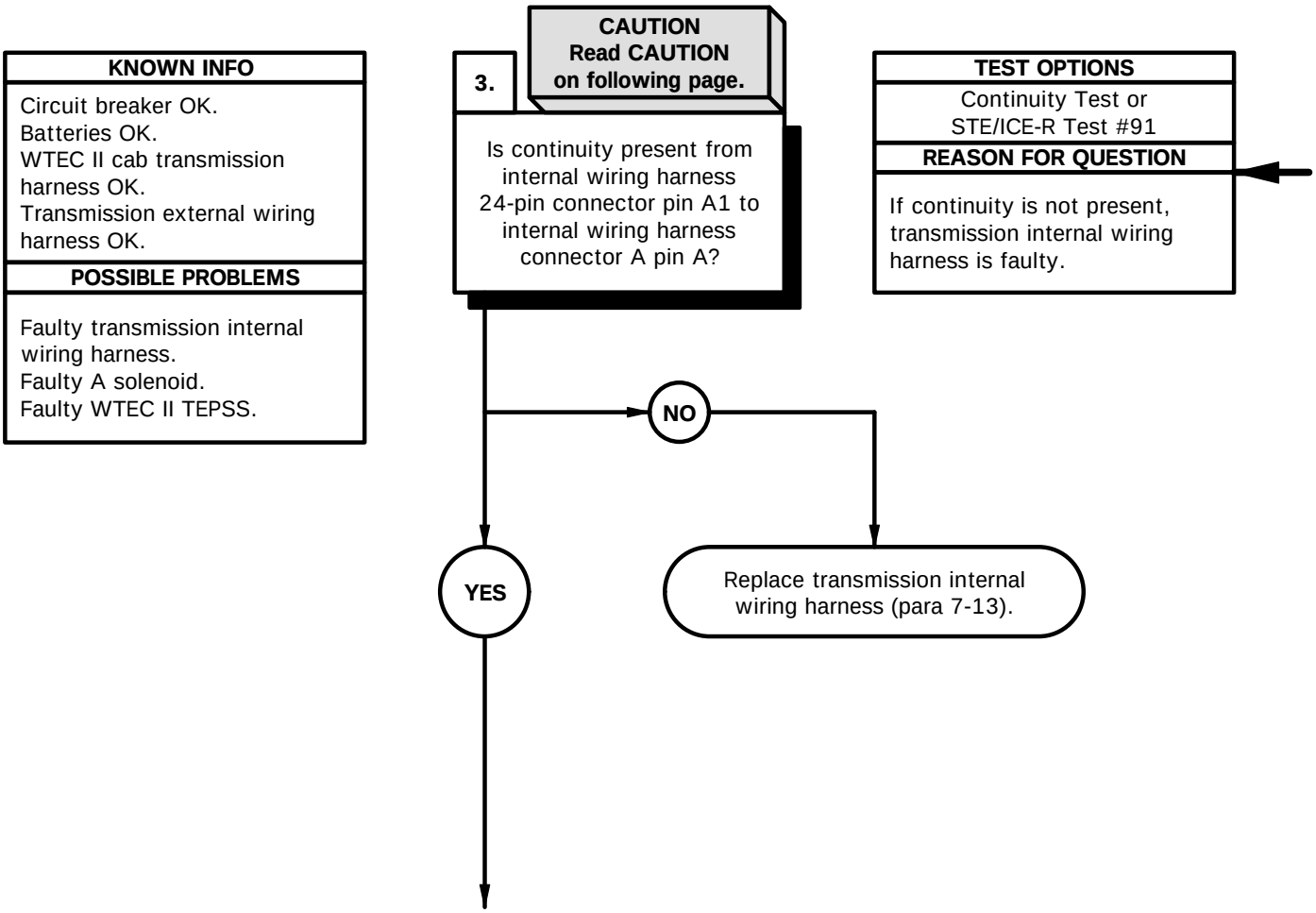


CONTINUITY TEST

(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).



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)

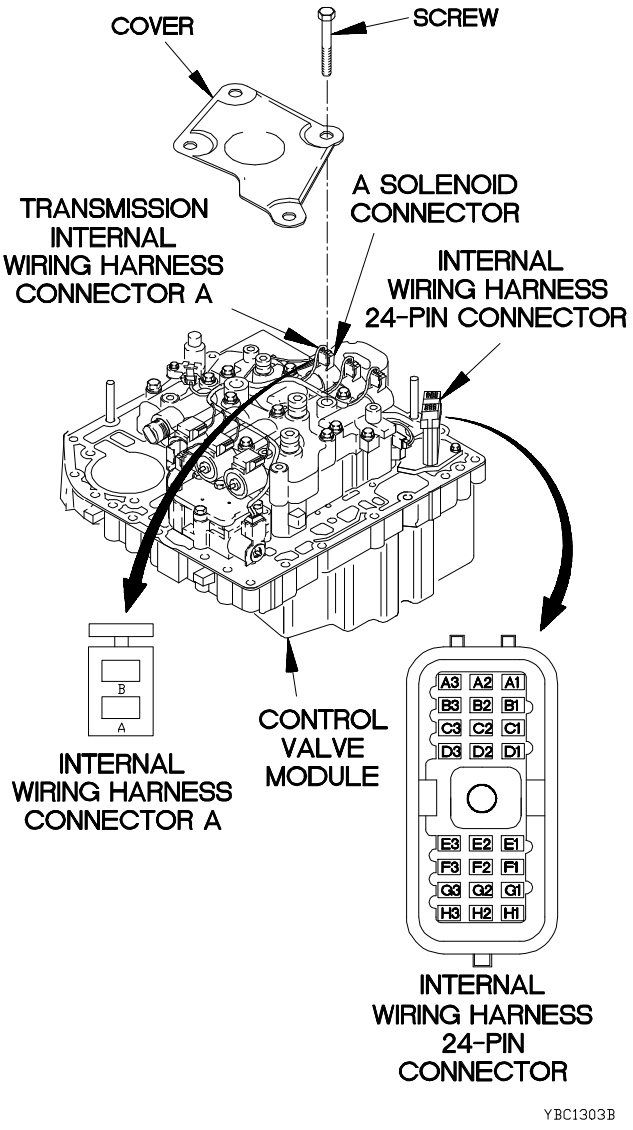


CAUTION

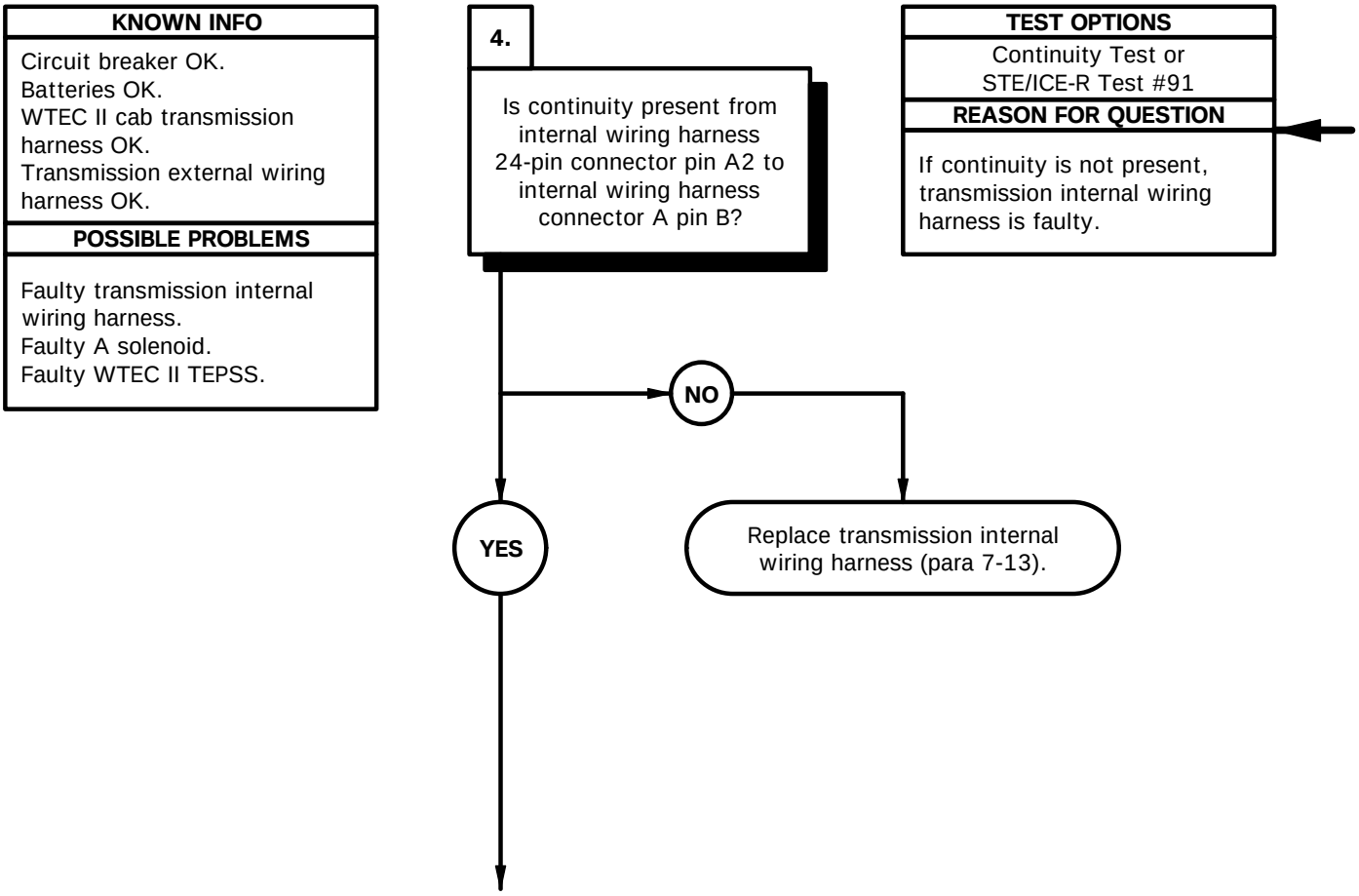
Use care when disconnecting transmission internal wiring harness connectors. Failure to comply may result in damage to equipment.

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).

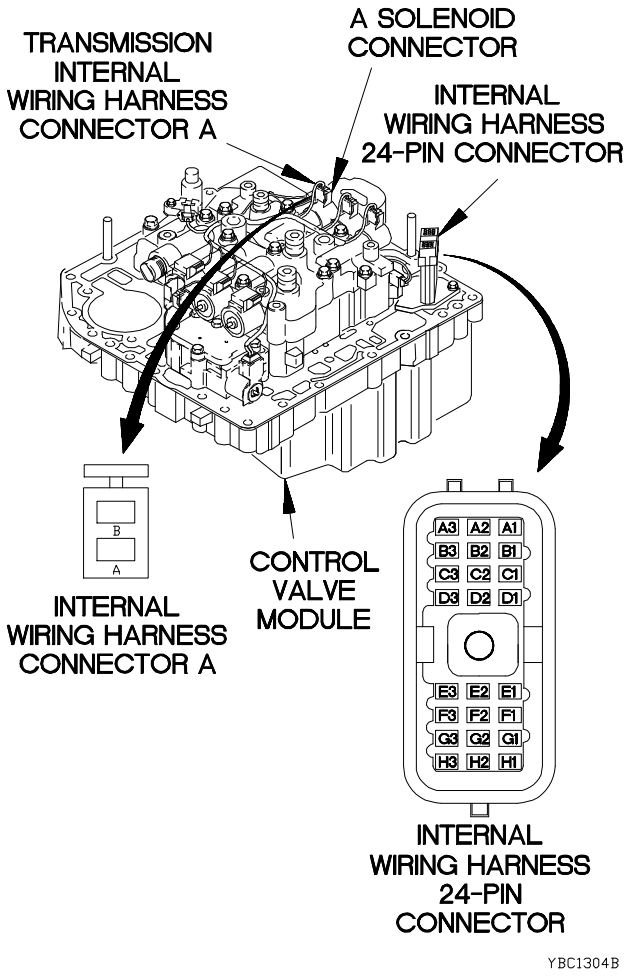


c13. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

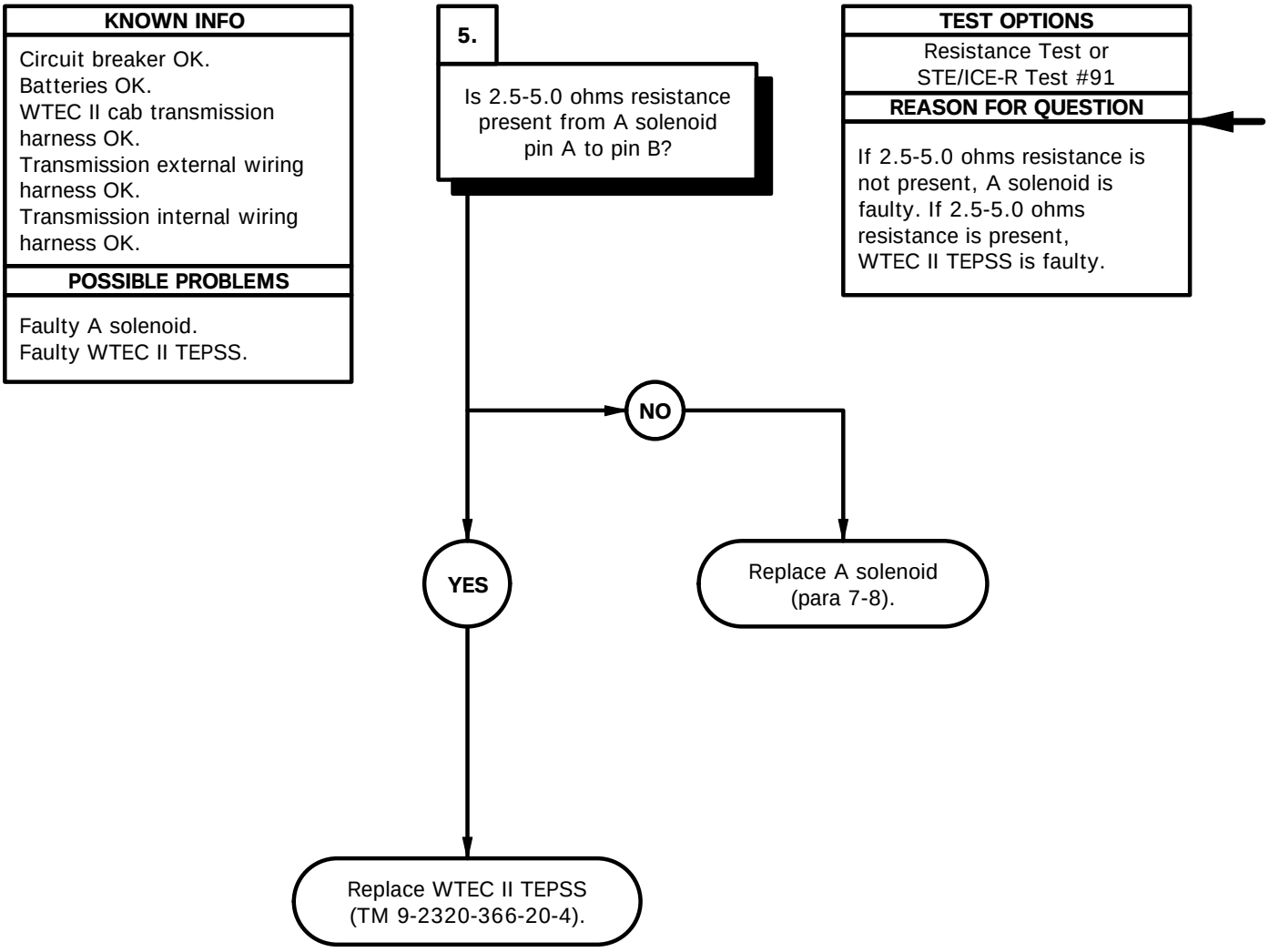


CONTINUITY TEST

(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).

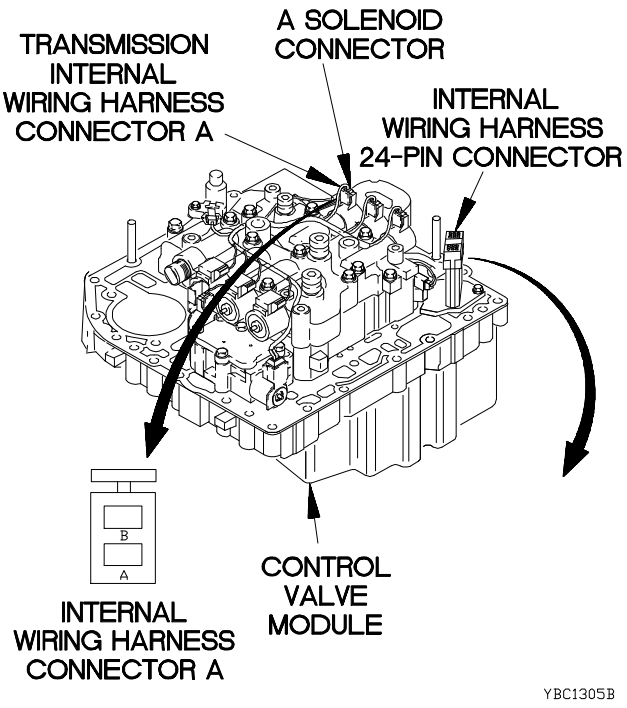


c13. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)



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).



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

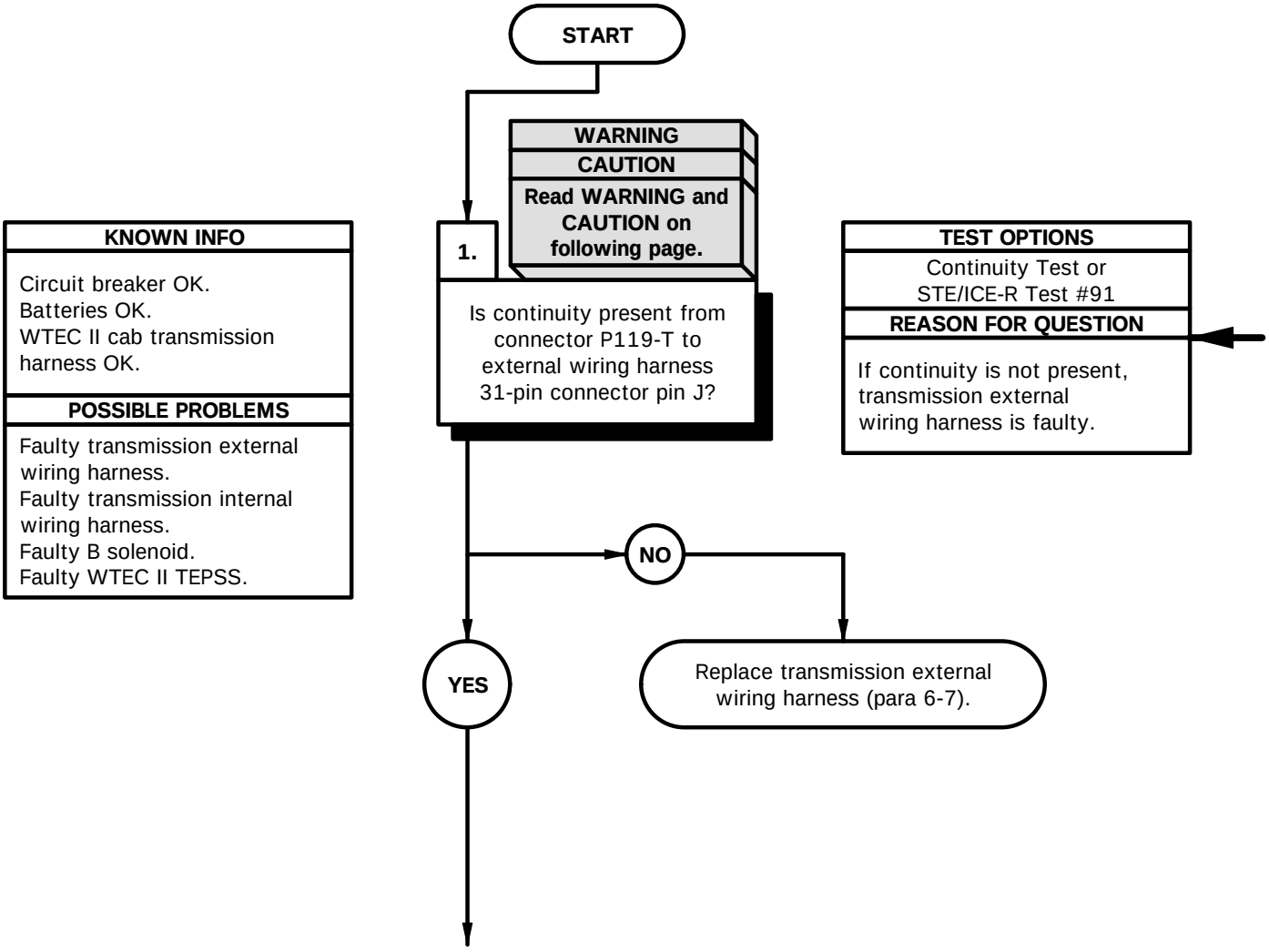
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

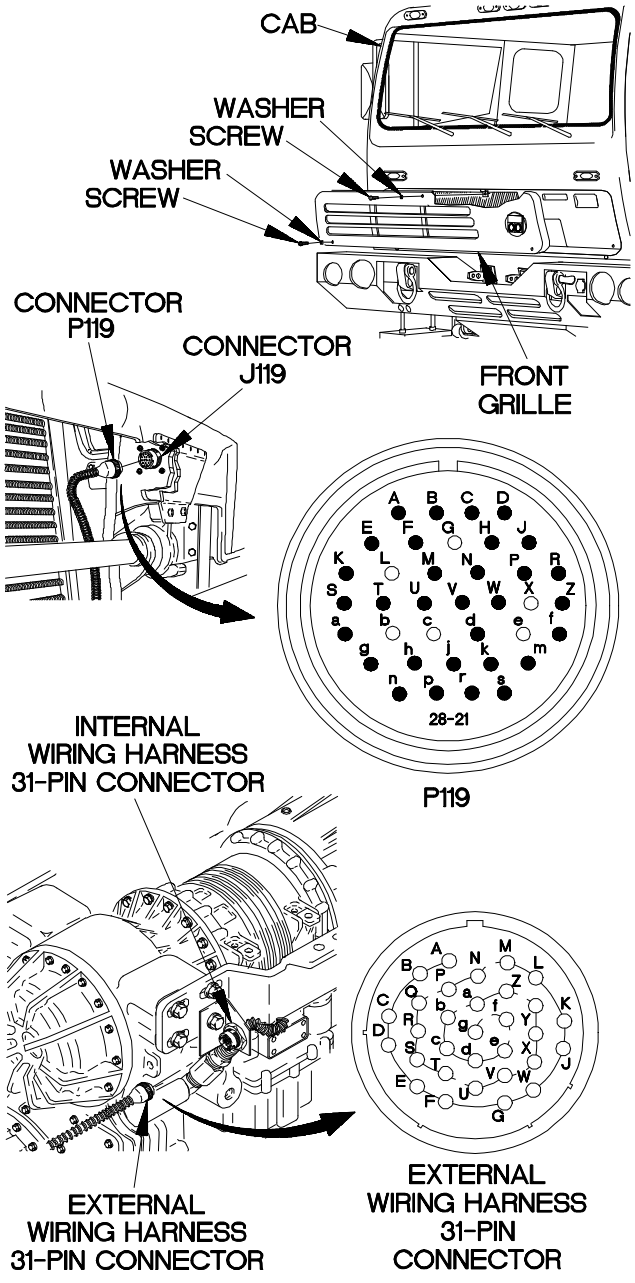
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

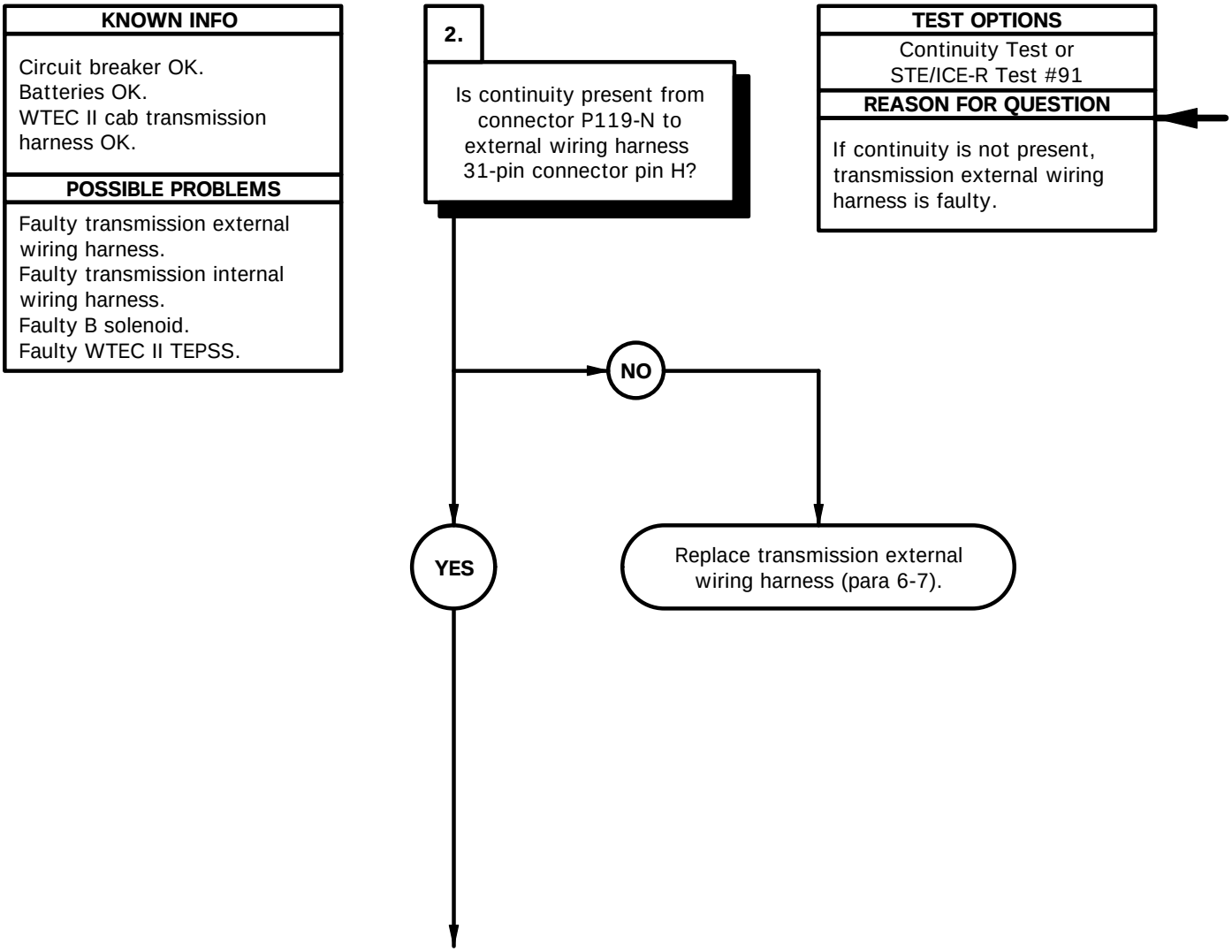
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin from internal wiring harness 31-pin connector.
(6) Set multimeter to ohms.
(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).

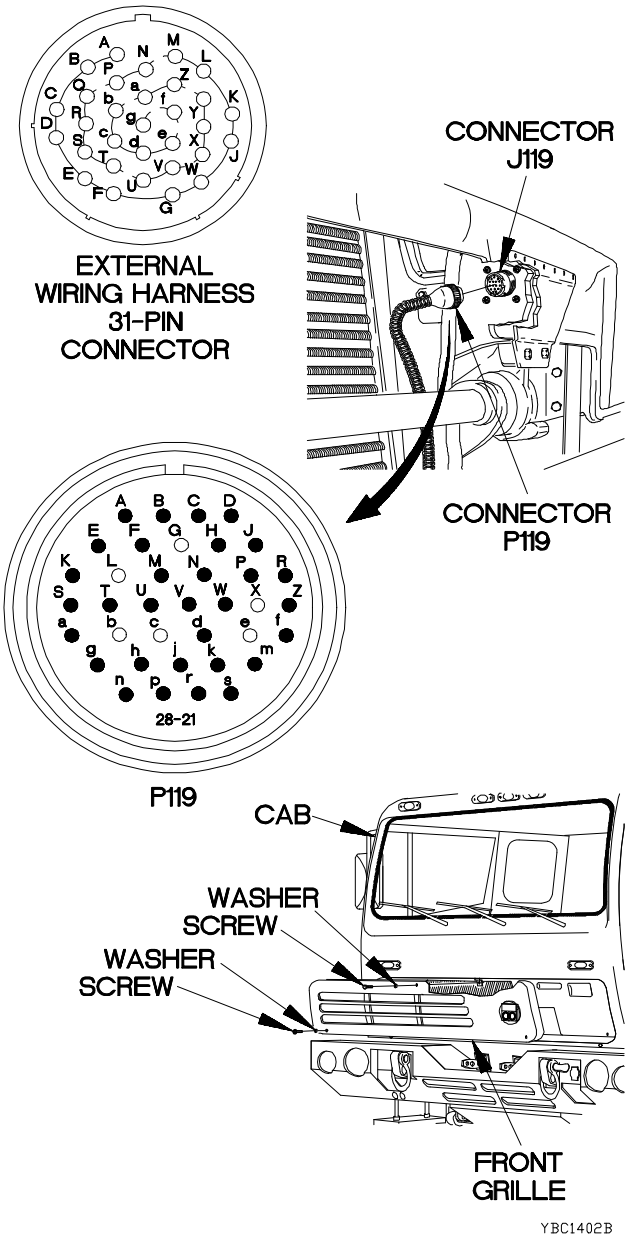


c14. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

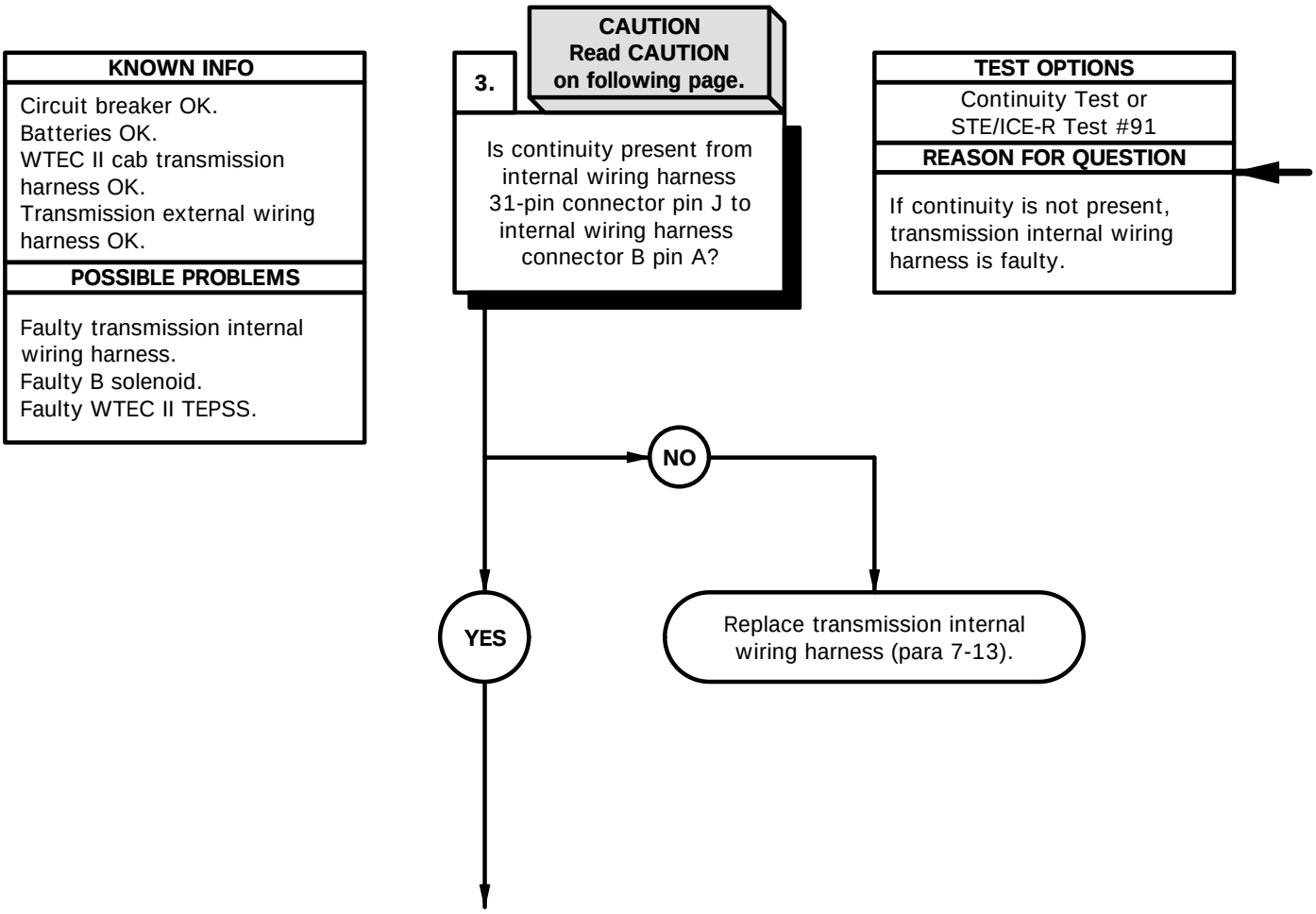


CONTINUITY TEST

(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).



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)

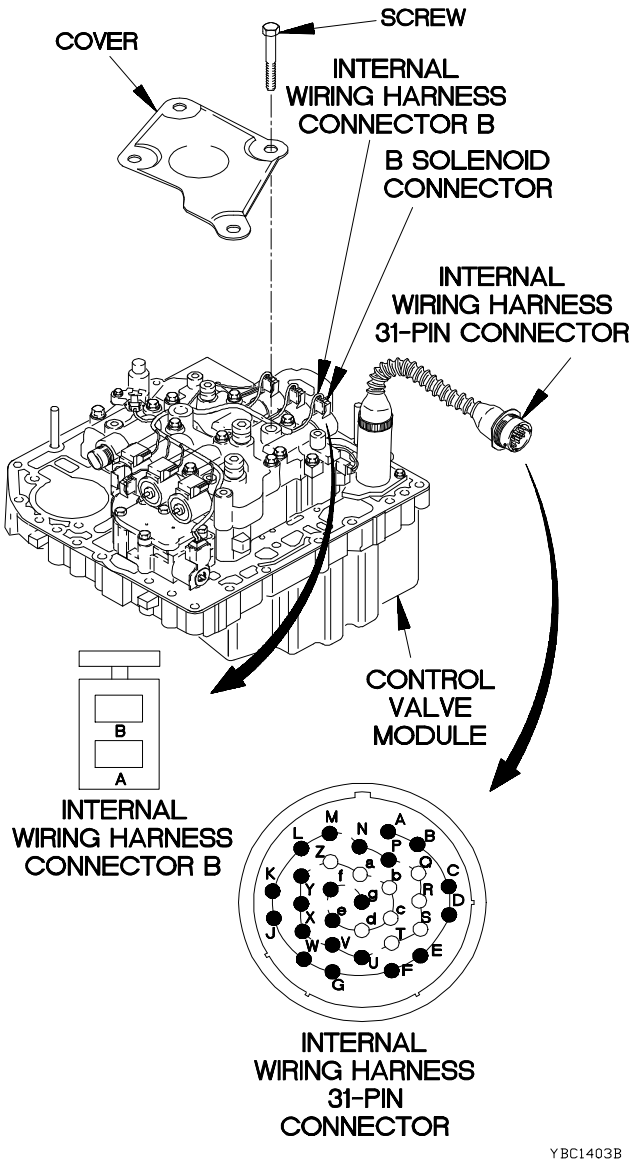


CAUTION

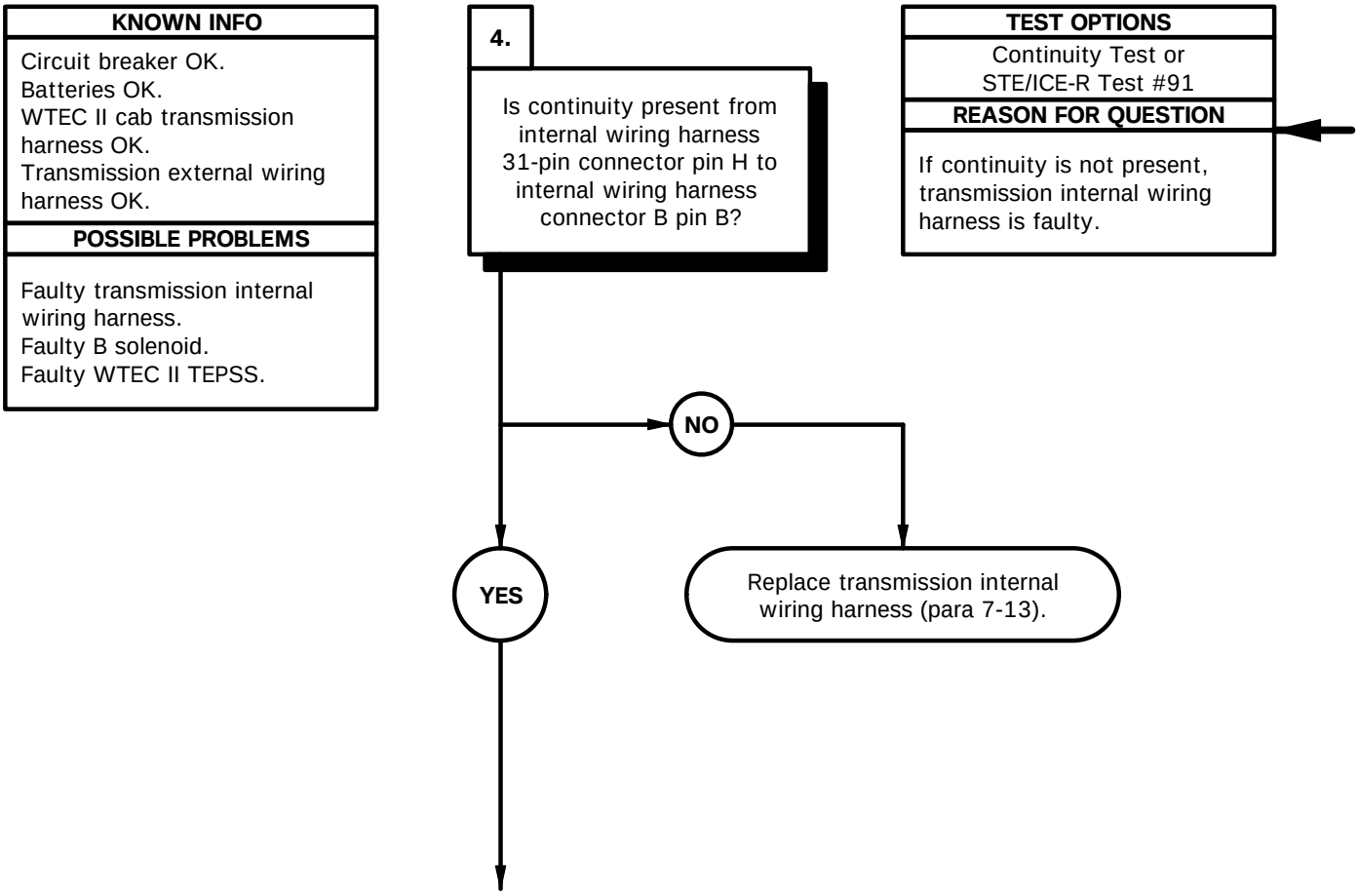
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

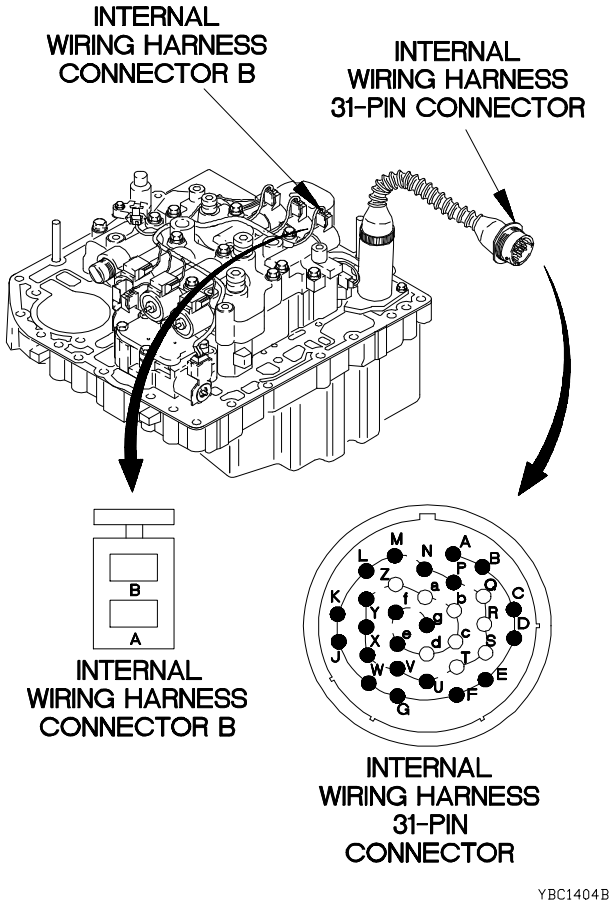


c14. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

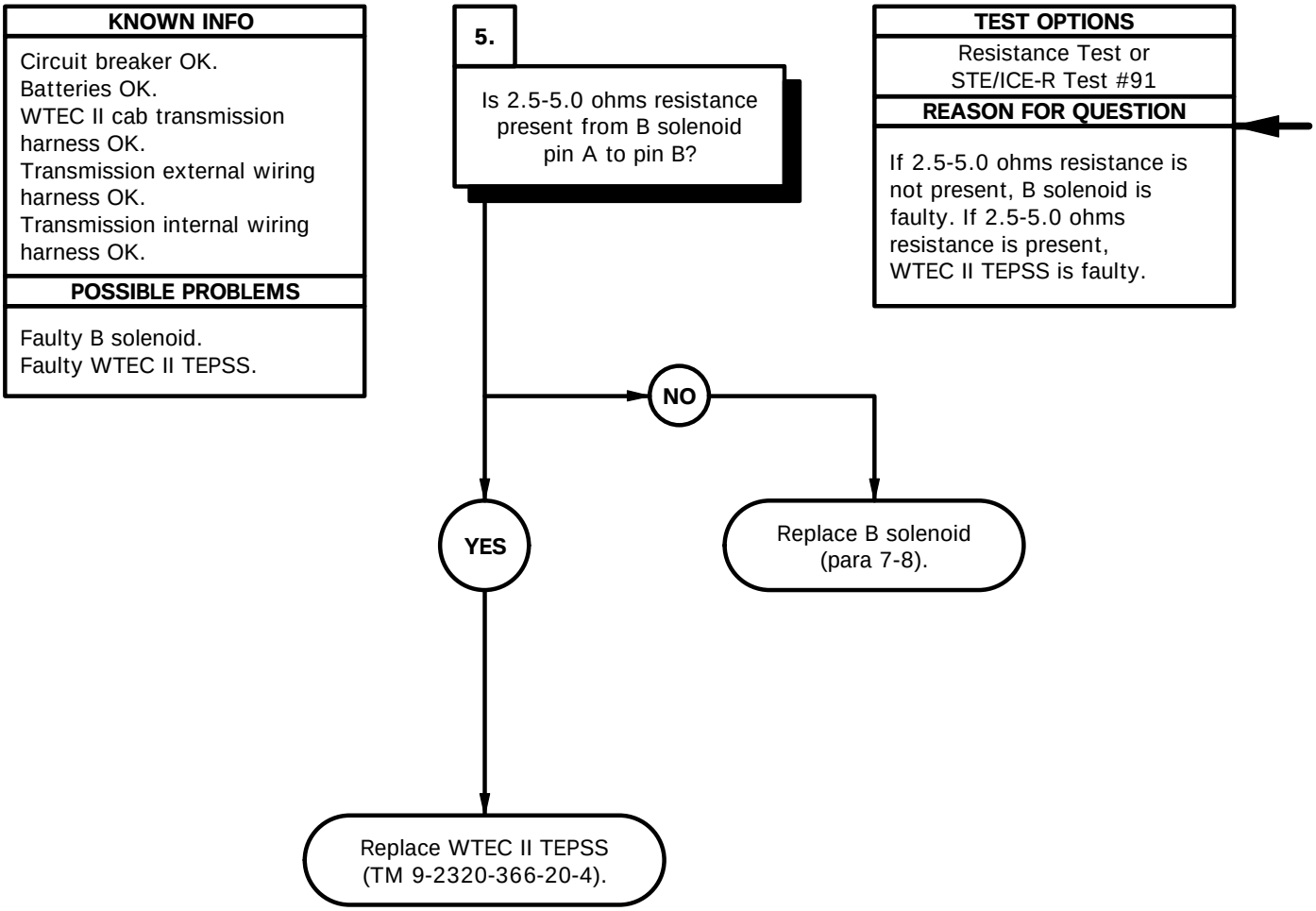


CONTINUITY TEST

(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).

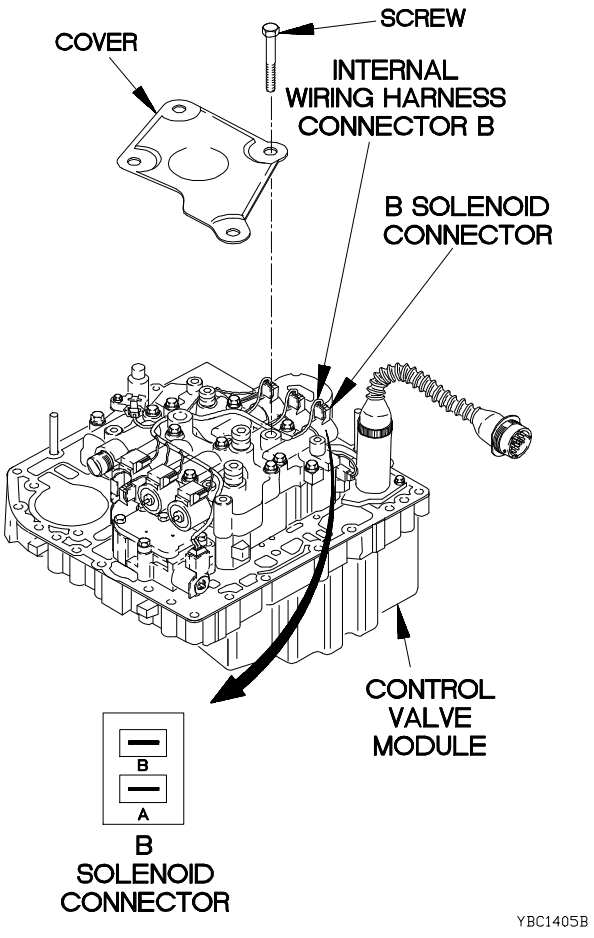


c14. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



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).



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

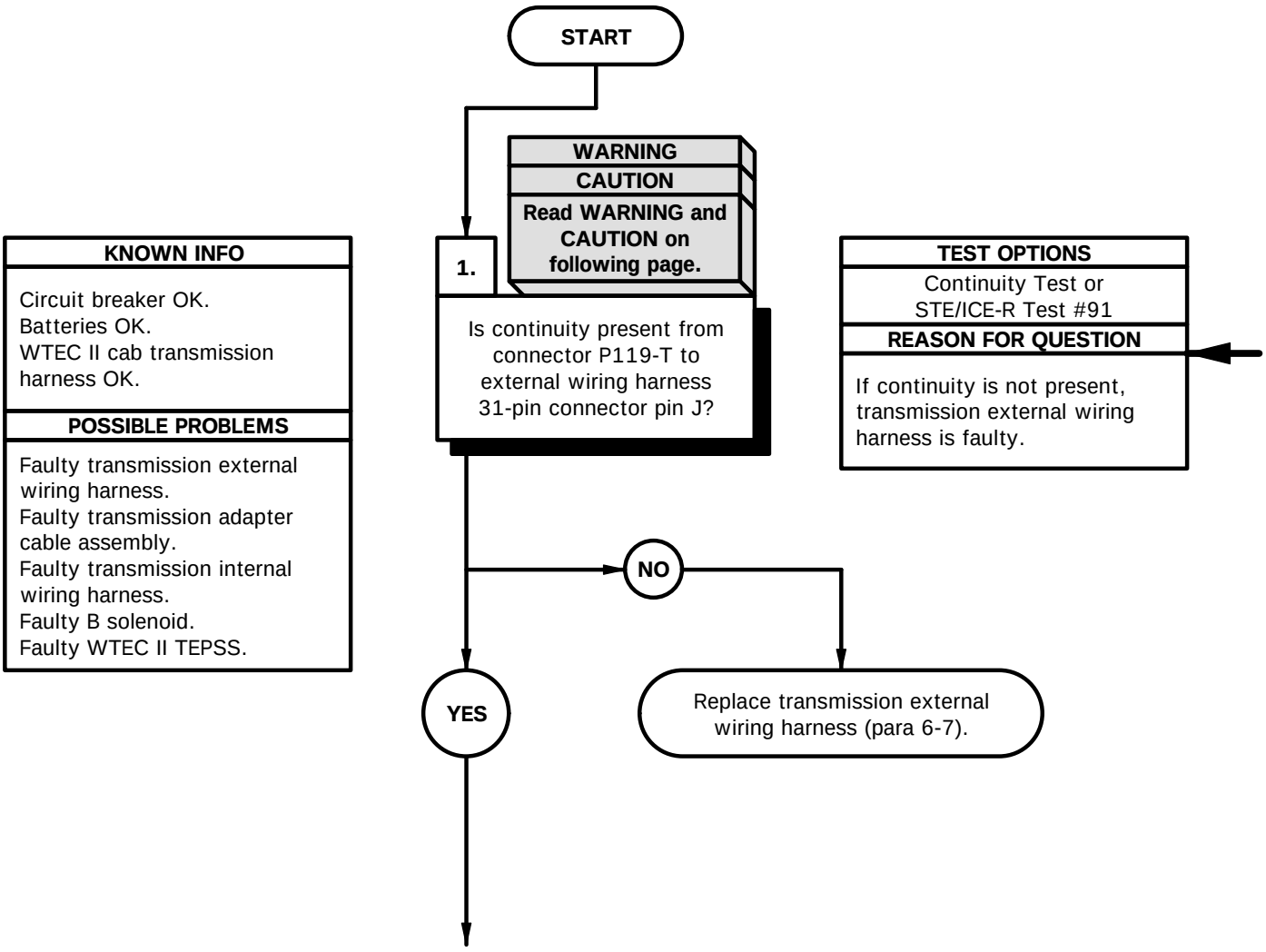
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

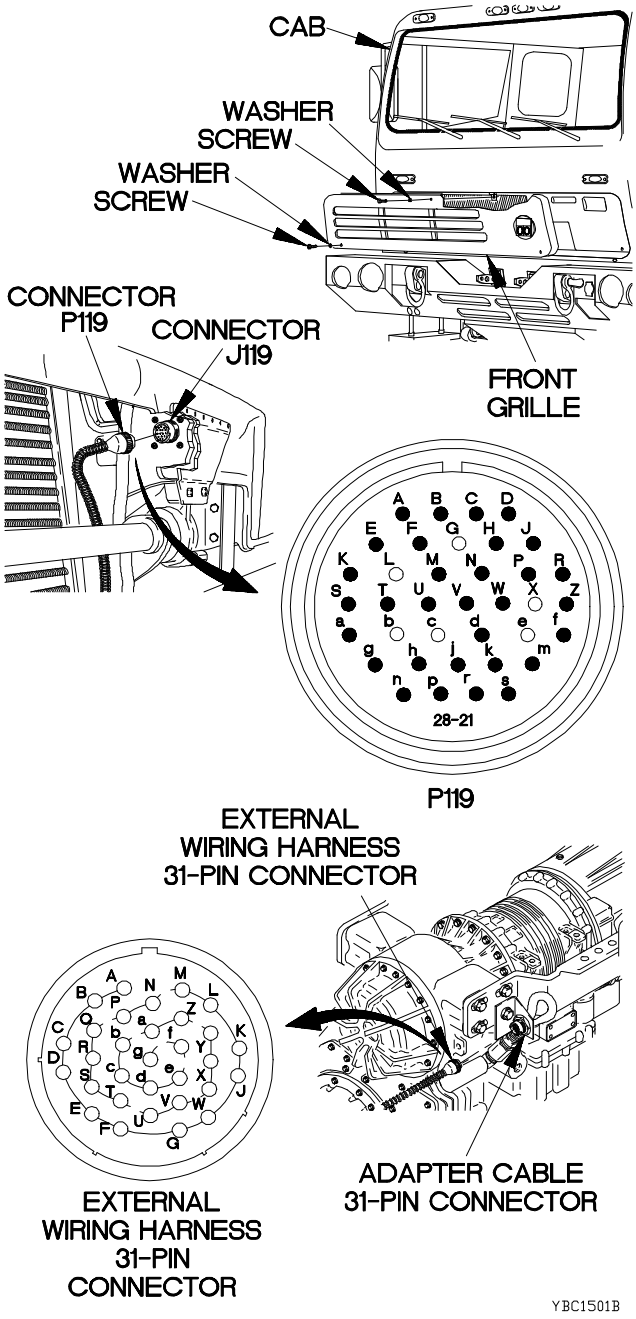
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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-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).



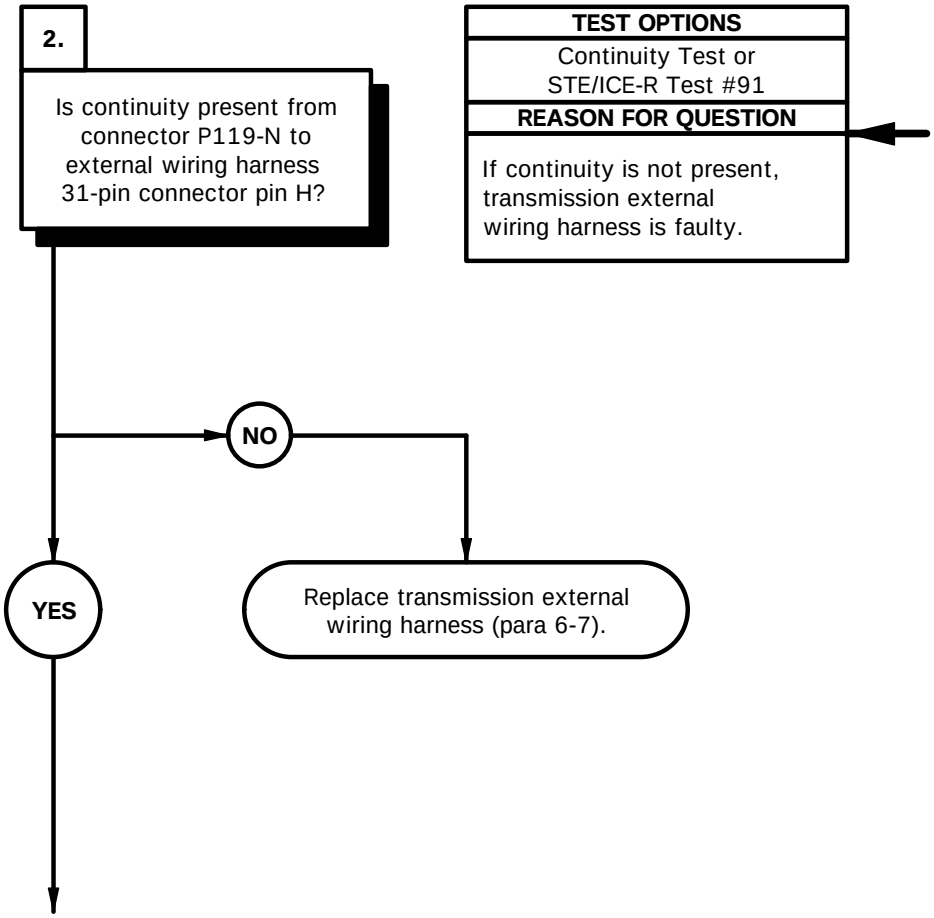
c15. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

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.



TEST OPTIONS

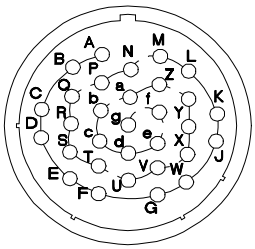
Continuity Test or
STE/ICE-R Test #91

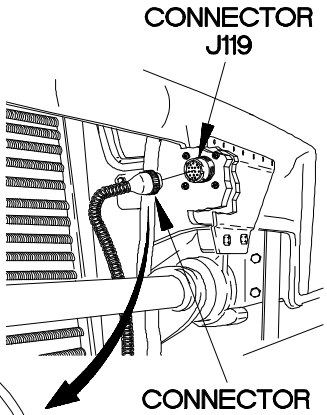
REASON FOR QUESTION

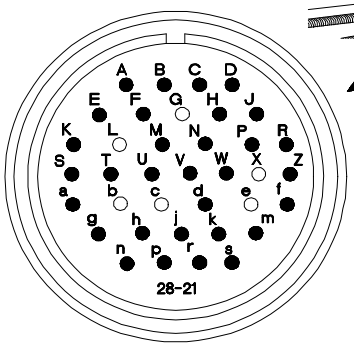
If continuity is not present, transmission external wiring harness is faulty.

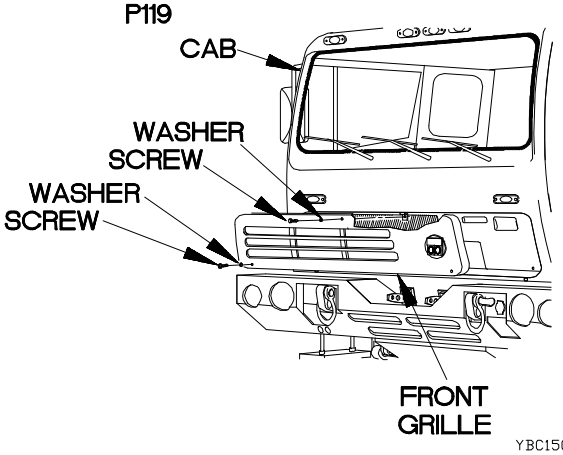
CONTINUITY TEST

(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).

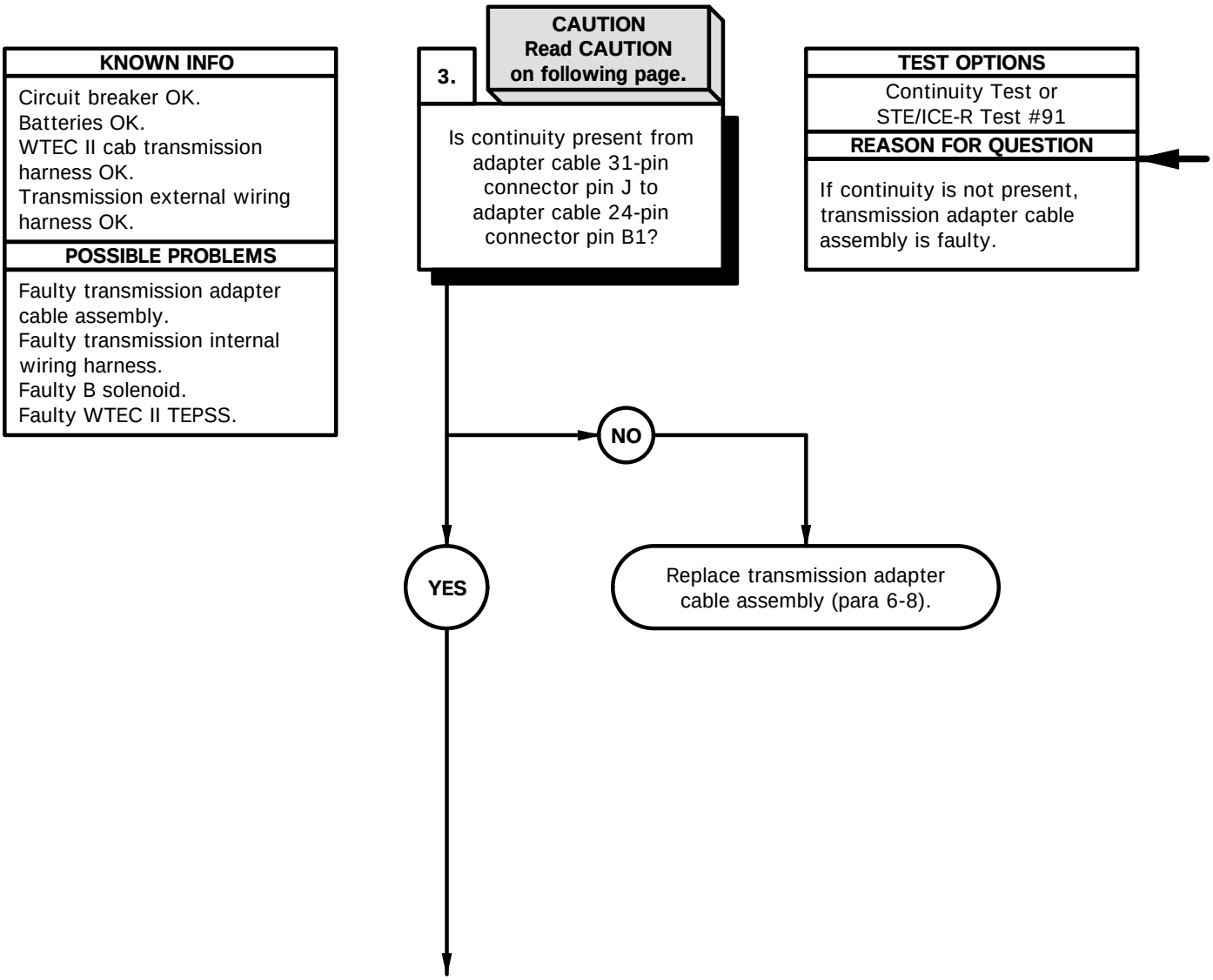








c15. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

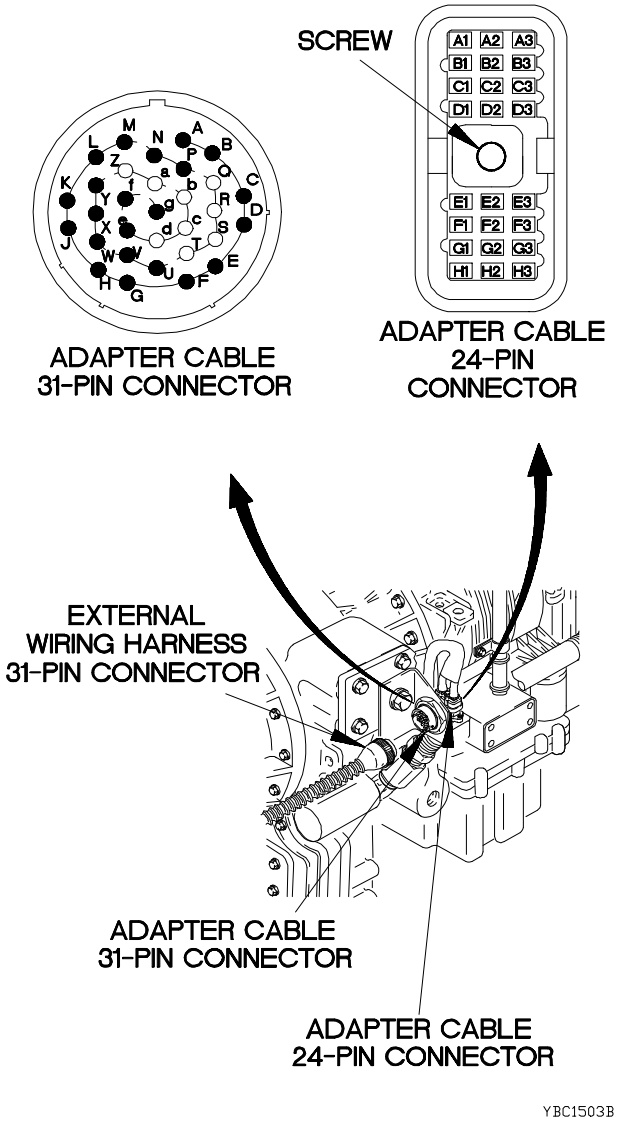


CAUTION

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).



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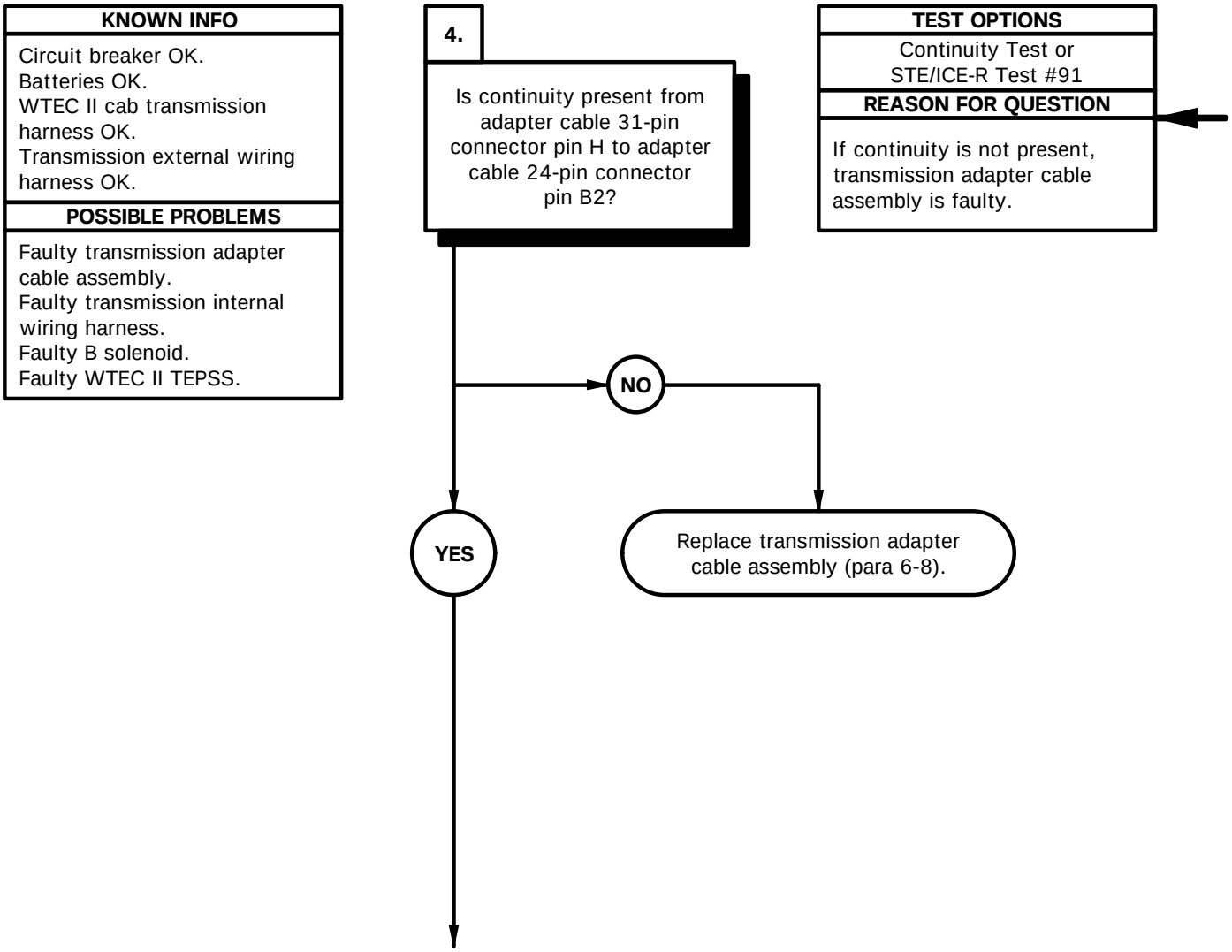
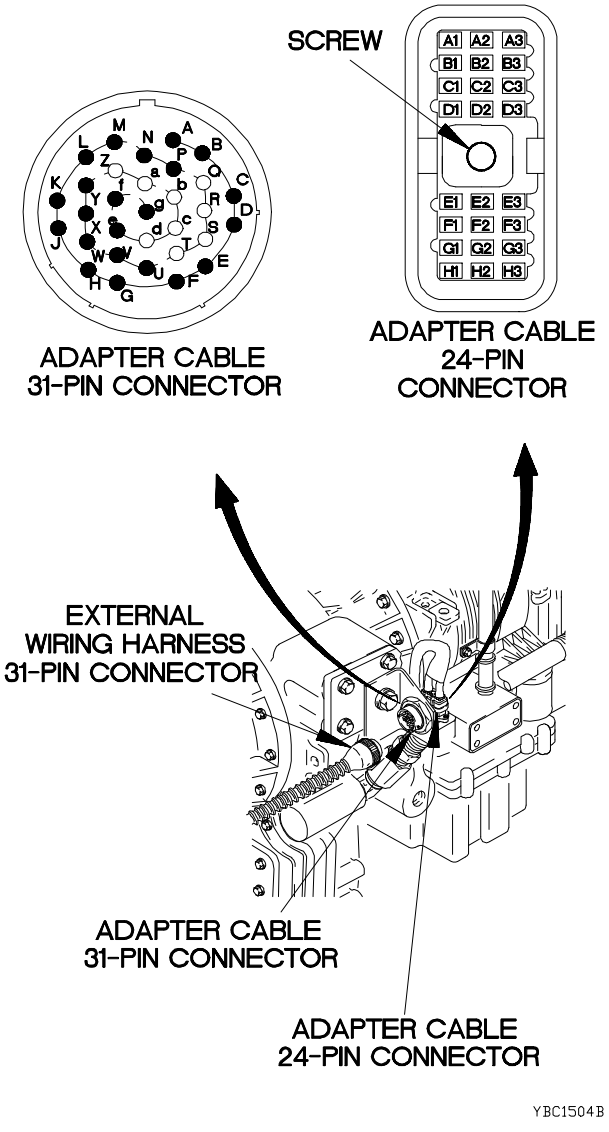
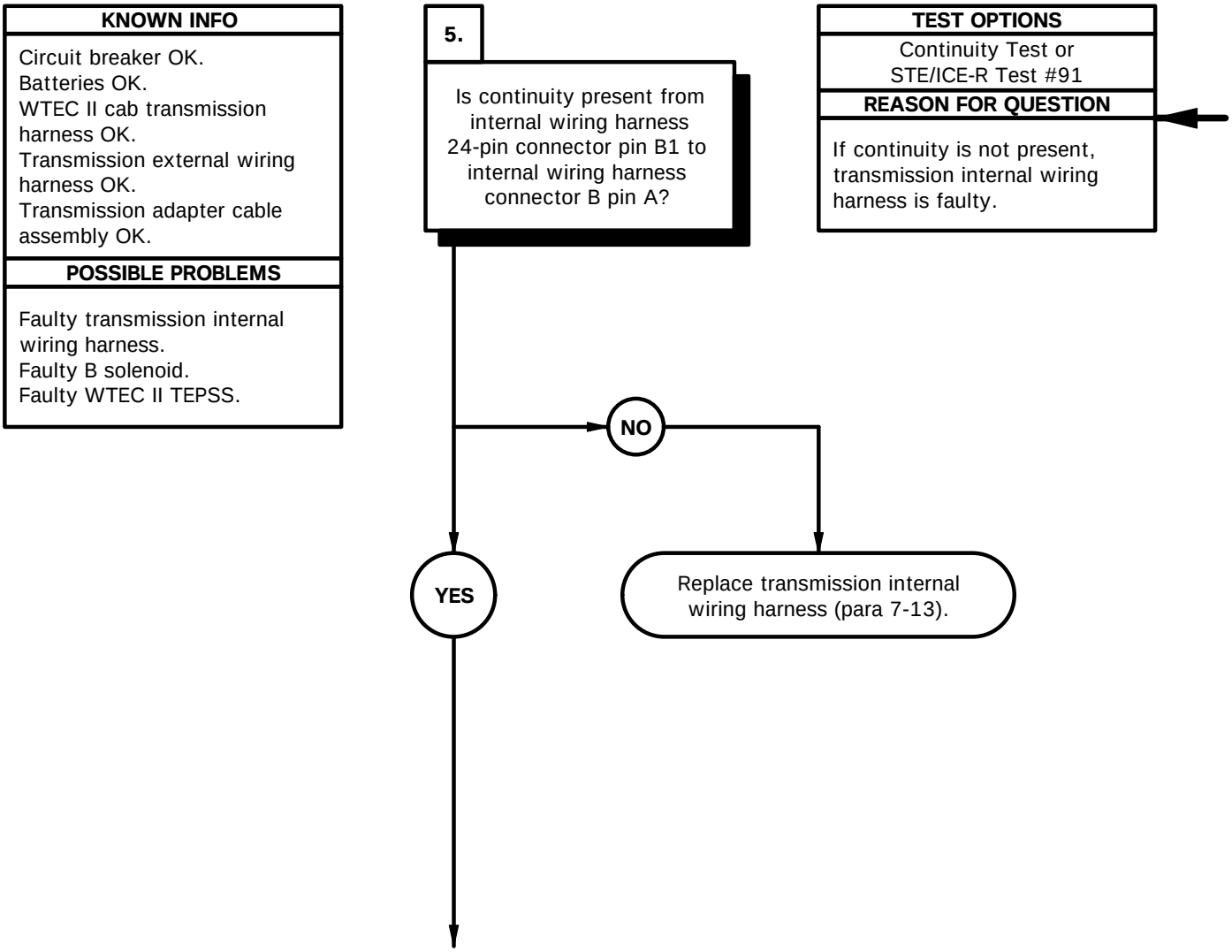


CONTINUITY TEST

(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.

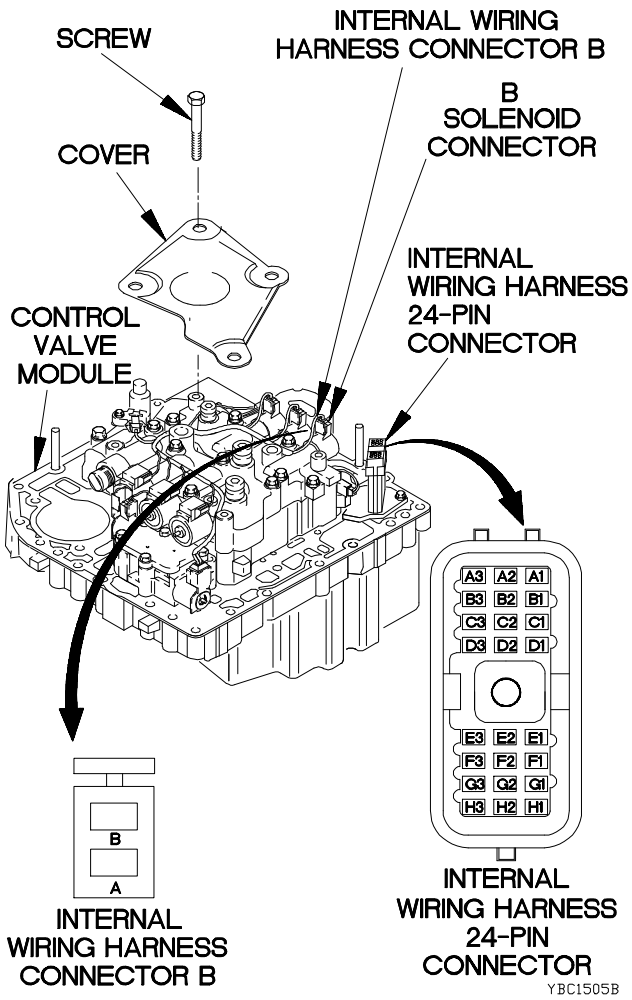


c15. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

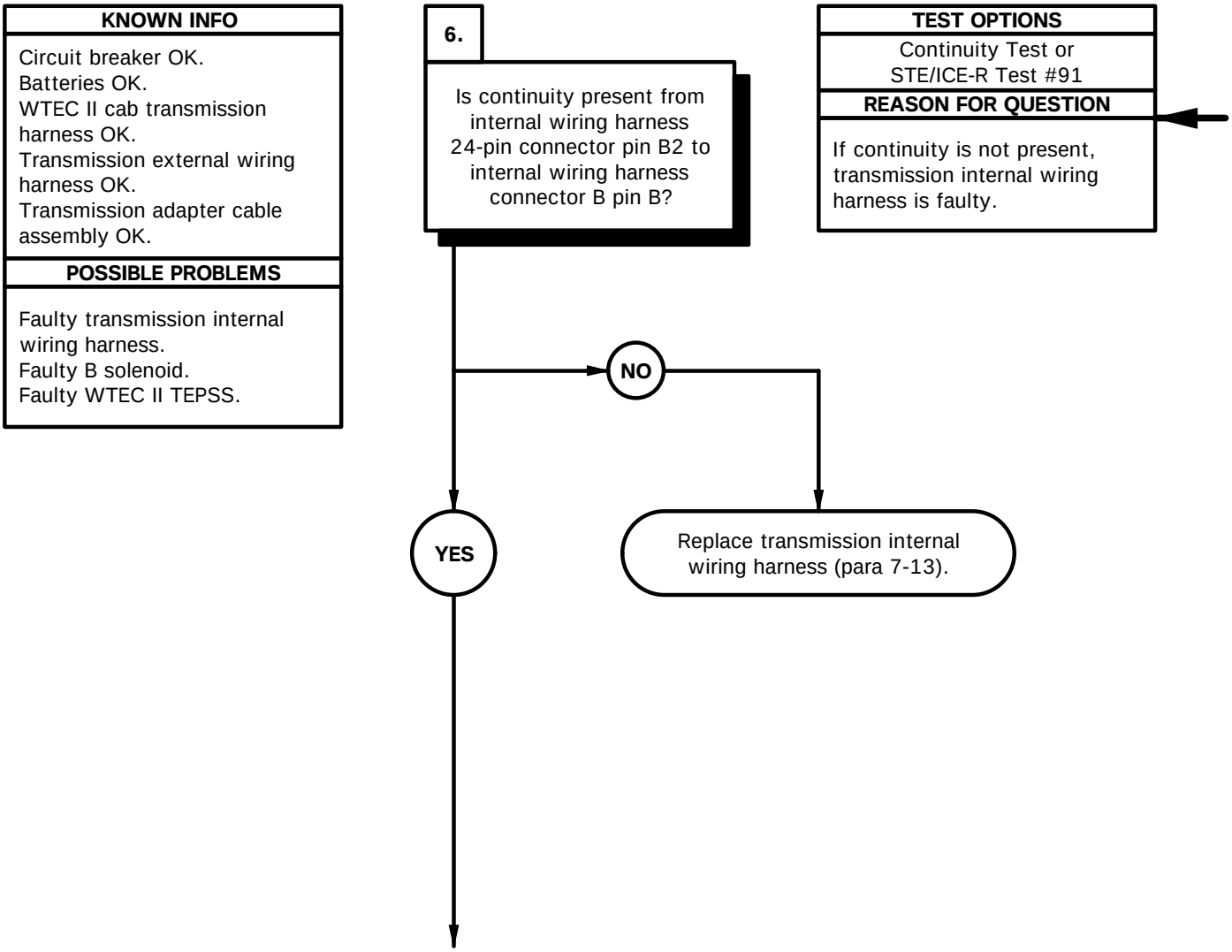


CONTINUITY TEST

(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).

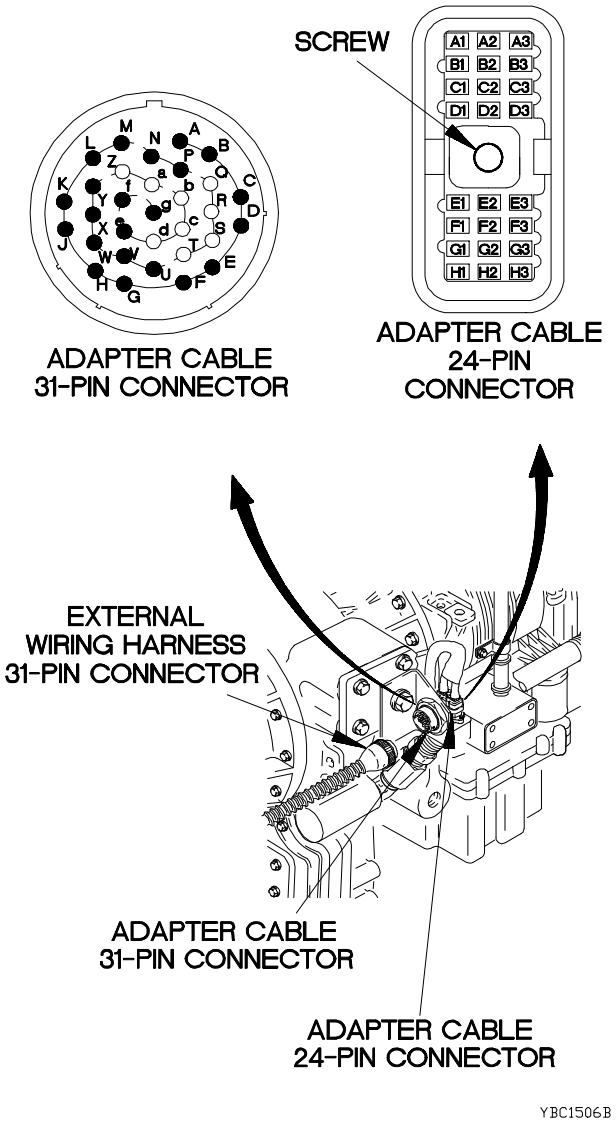


c15. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

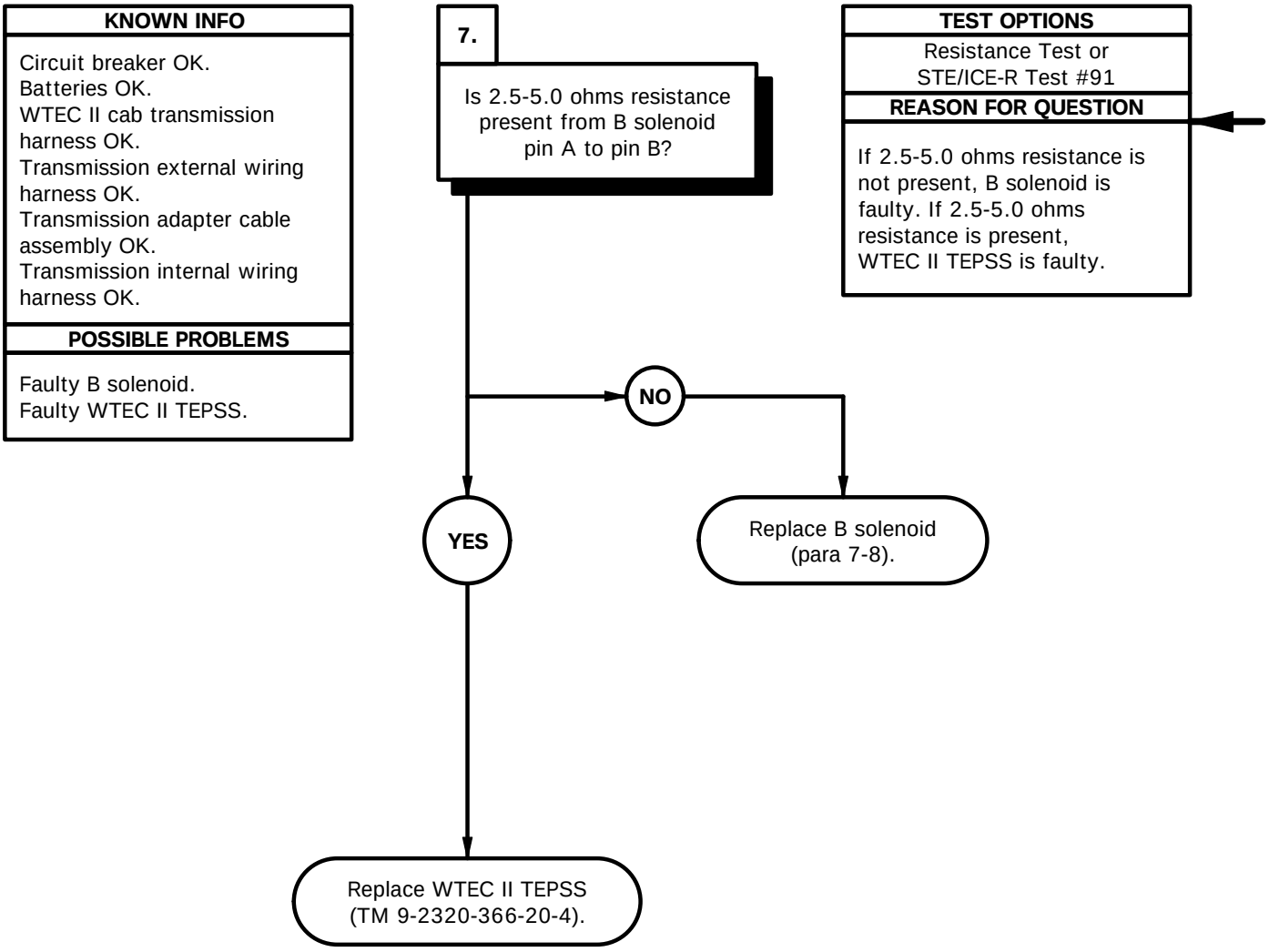


CONTINUITY TEST

(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).

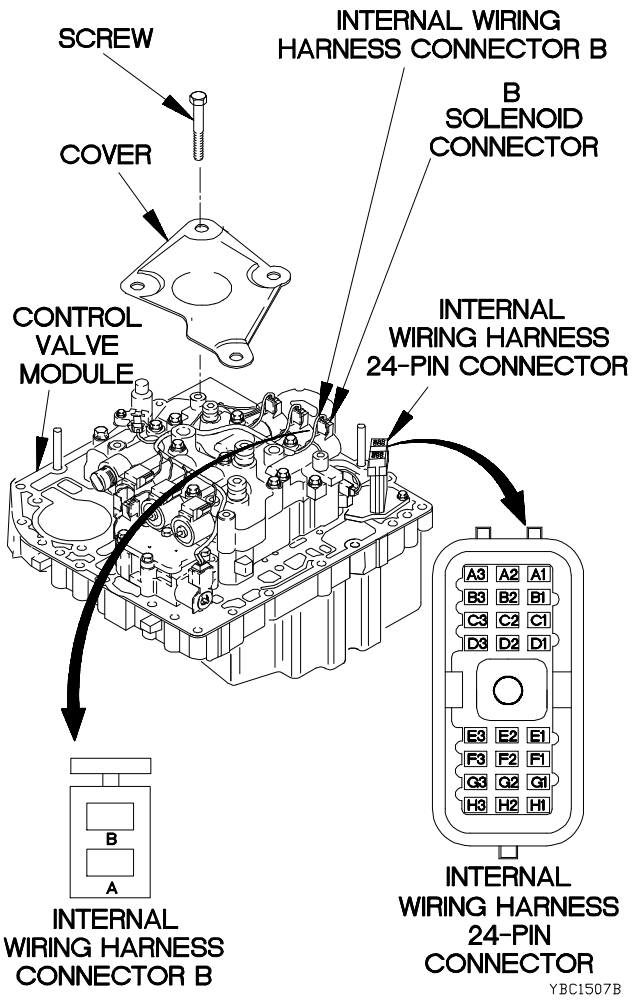


c15. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



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).



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

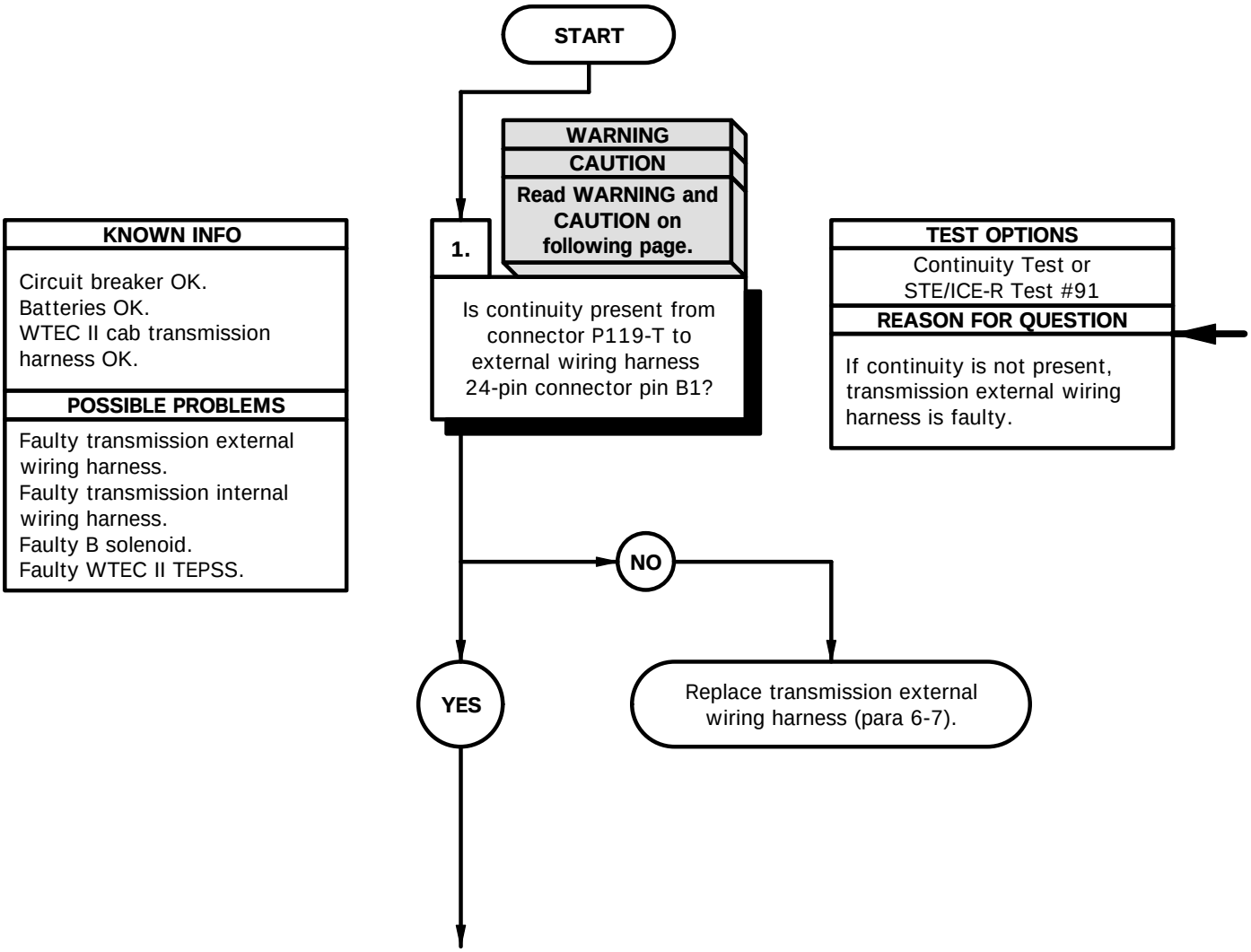
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

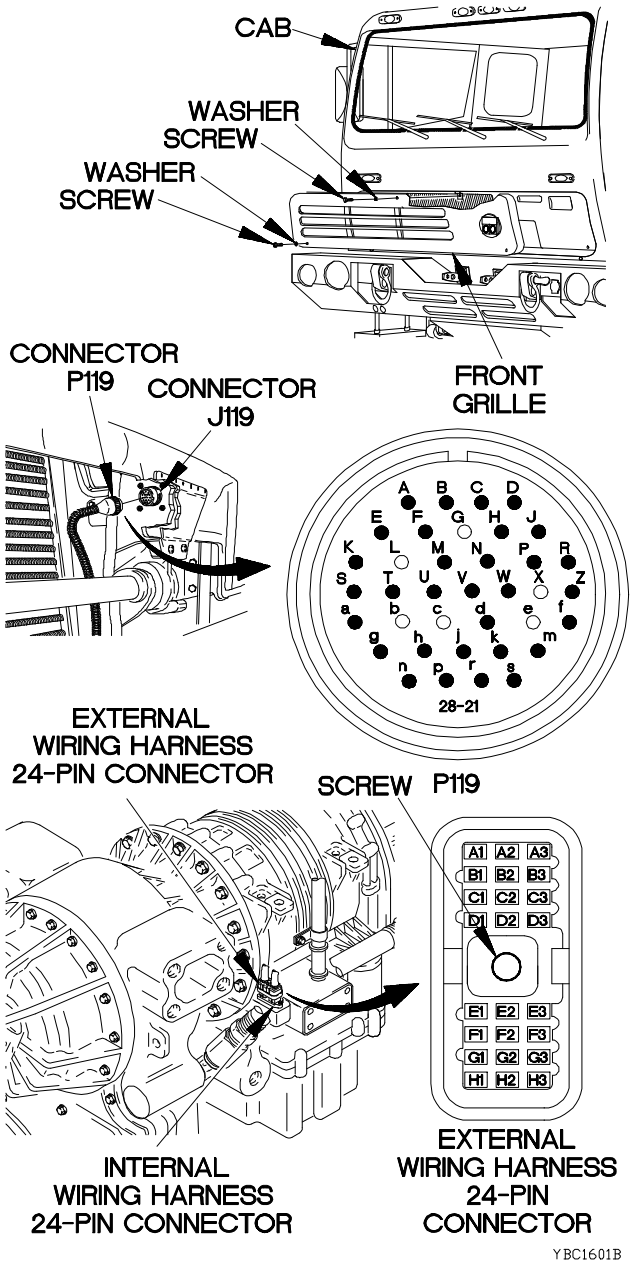
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

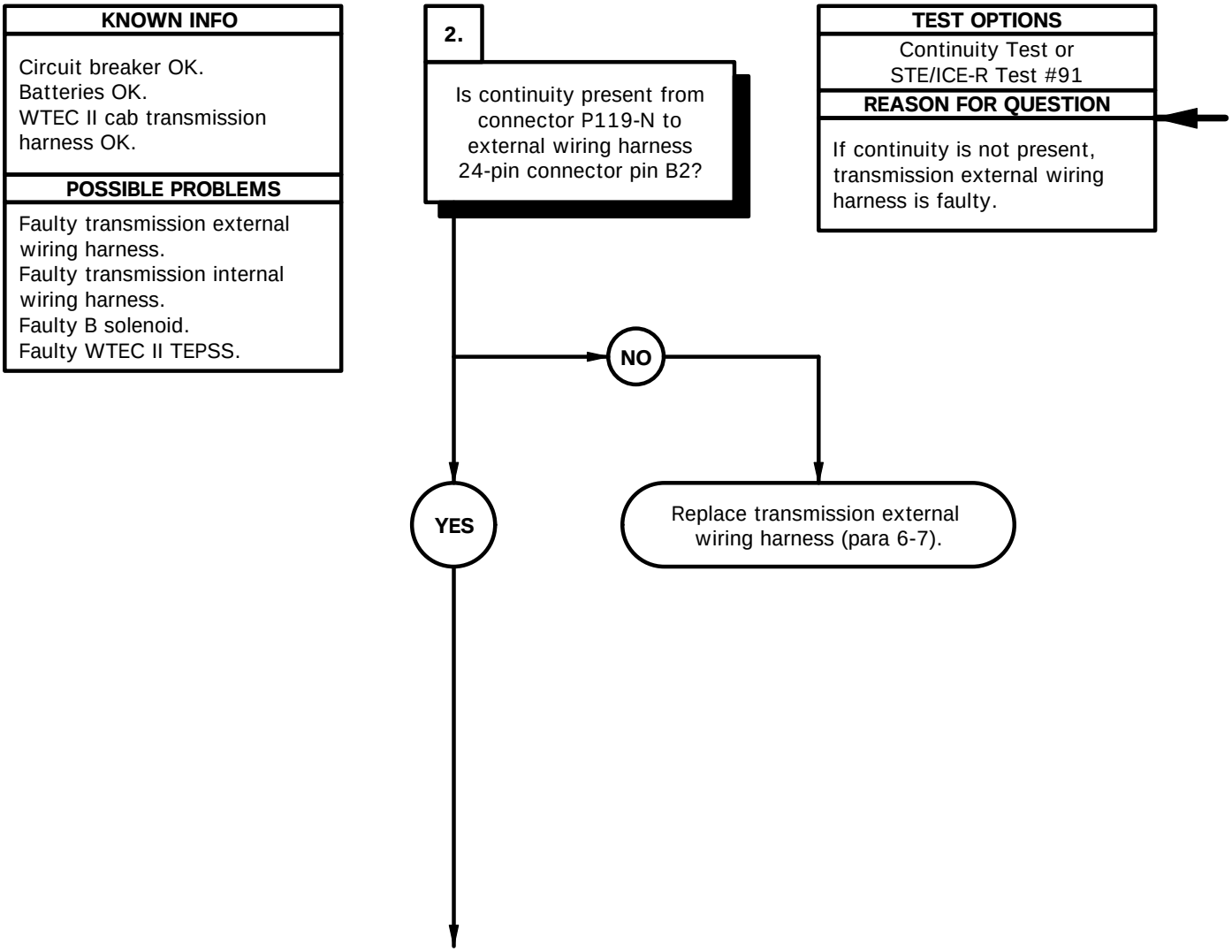
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Loosen screw in external wiring harness 24-pin connector.
(6) Disconnect external wiring harness 24-pin connector 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).

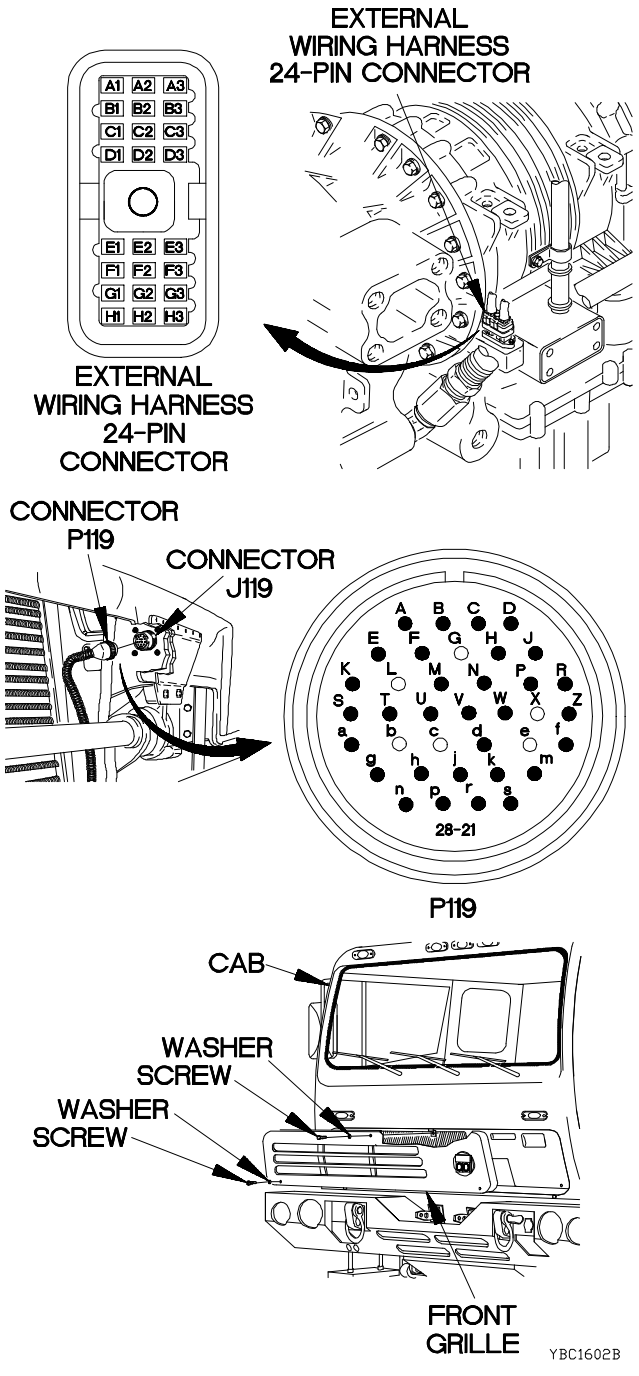


c16. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

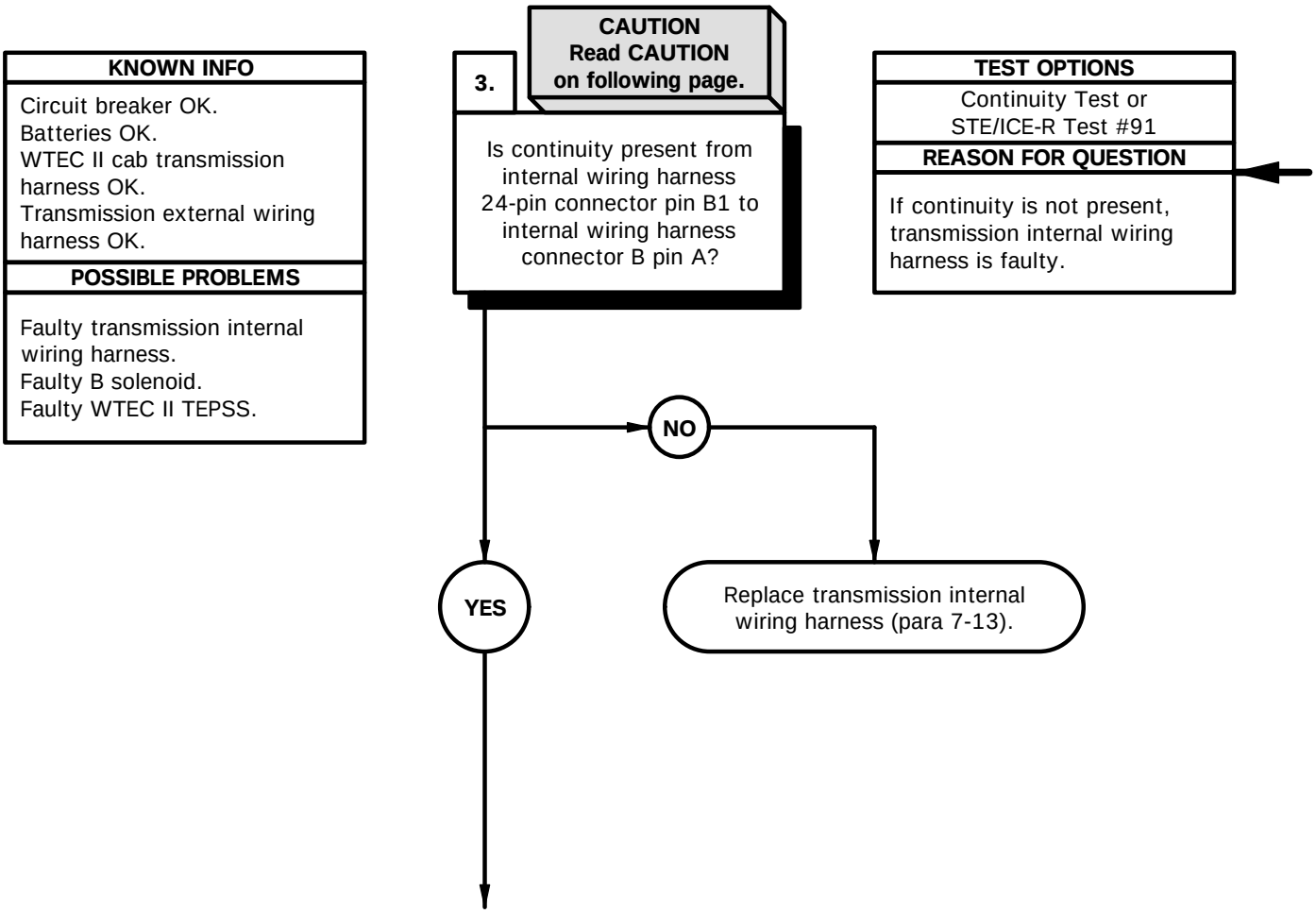


CONTINUITY TEST

(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).



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)

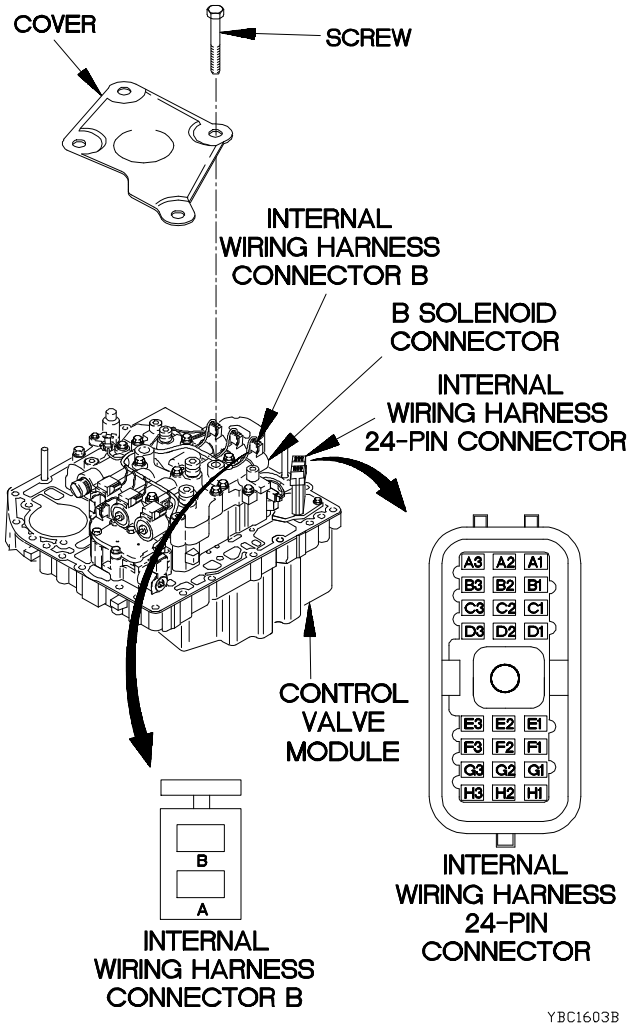


CAUTION

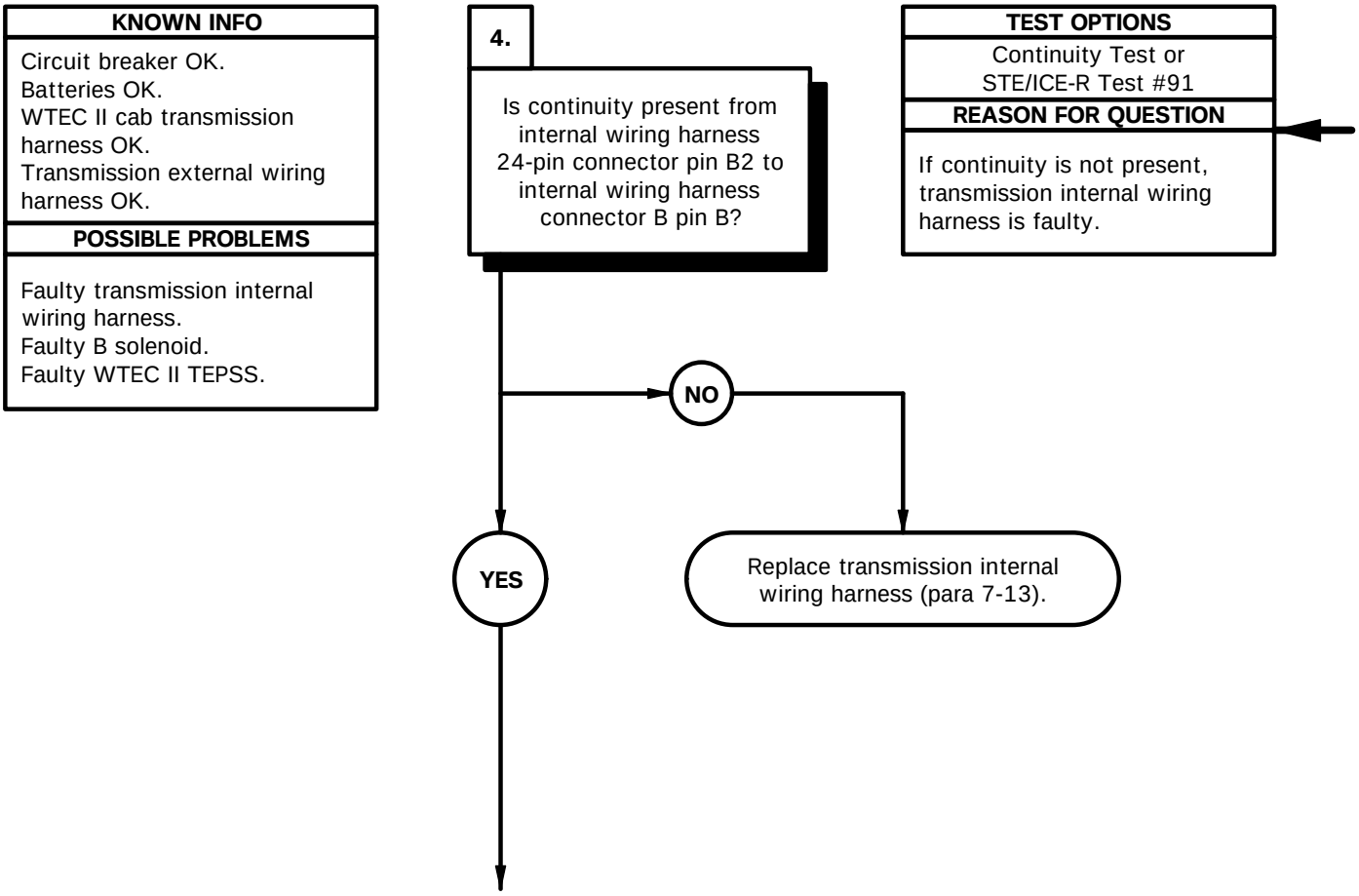
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

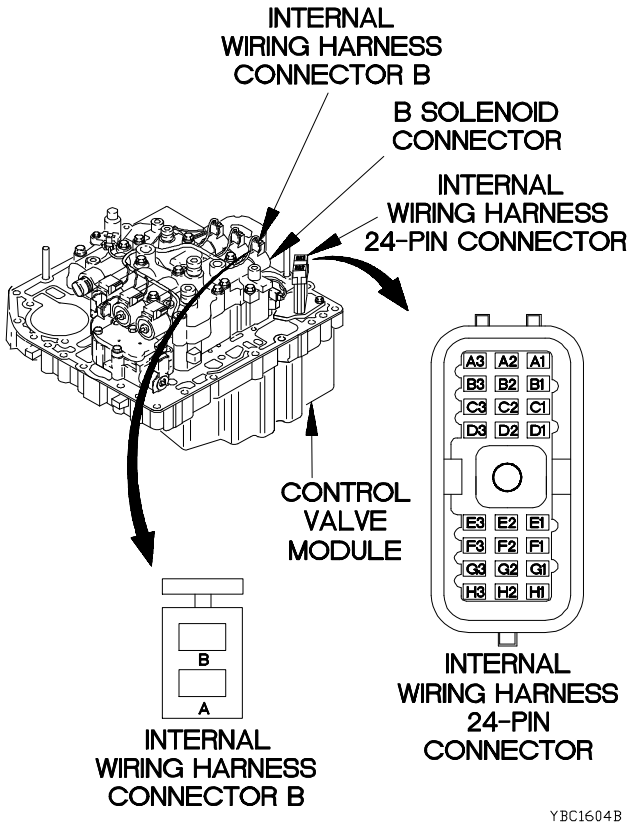


c16. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

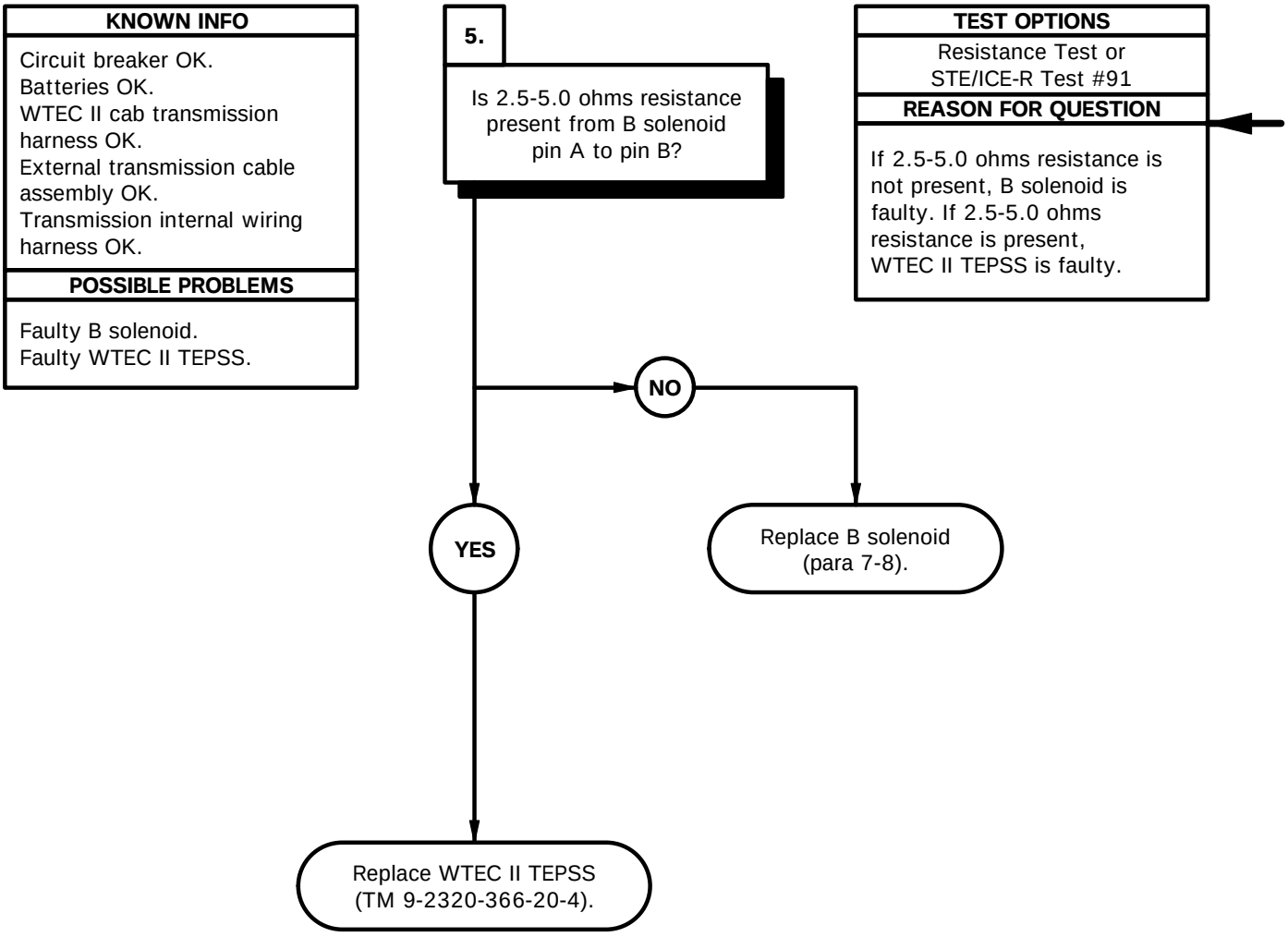


CONTINUITY TEST

(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).

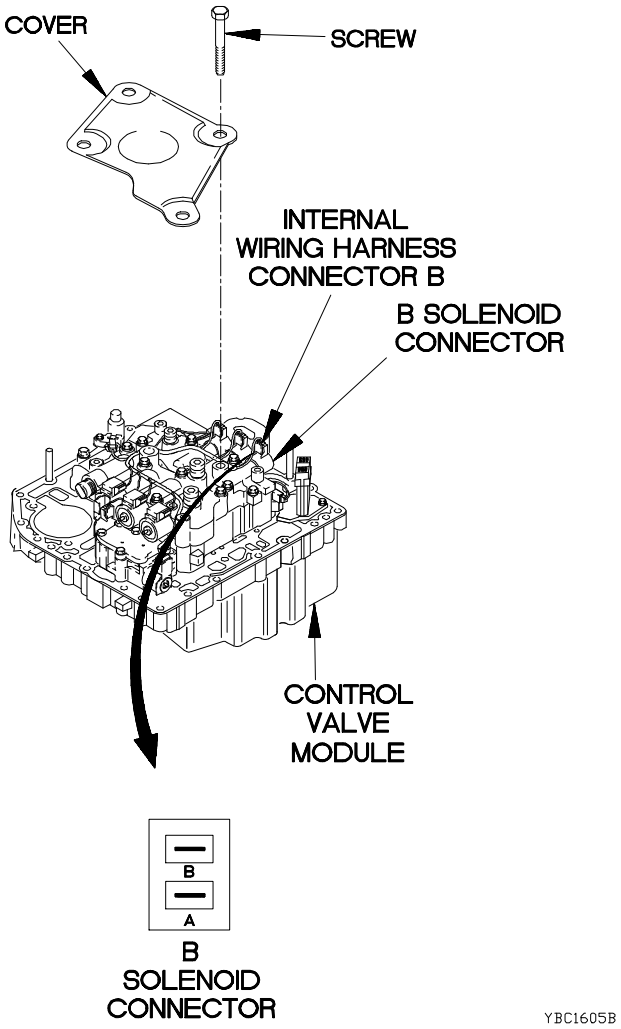


c16. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)



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).



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

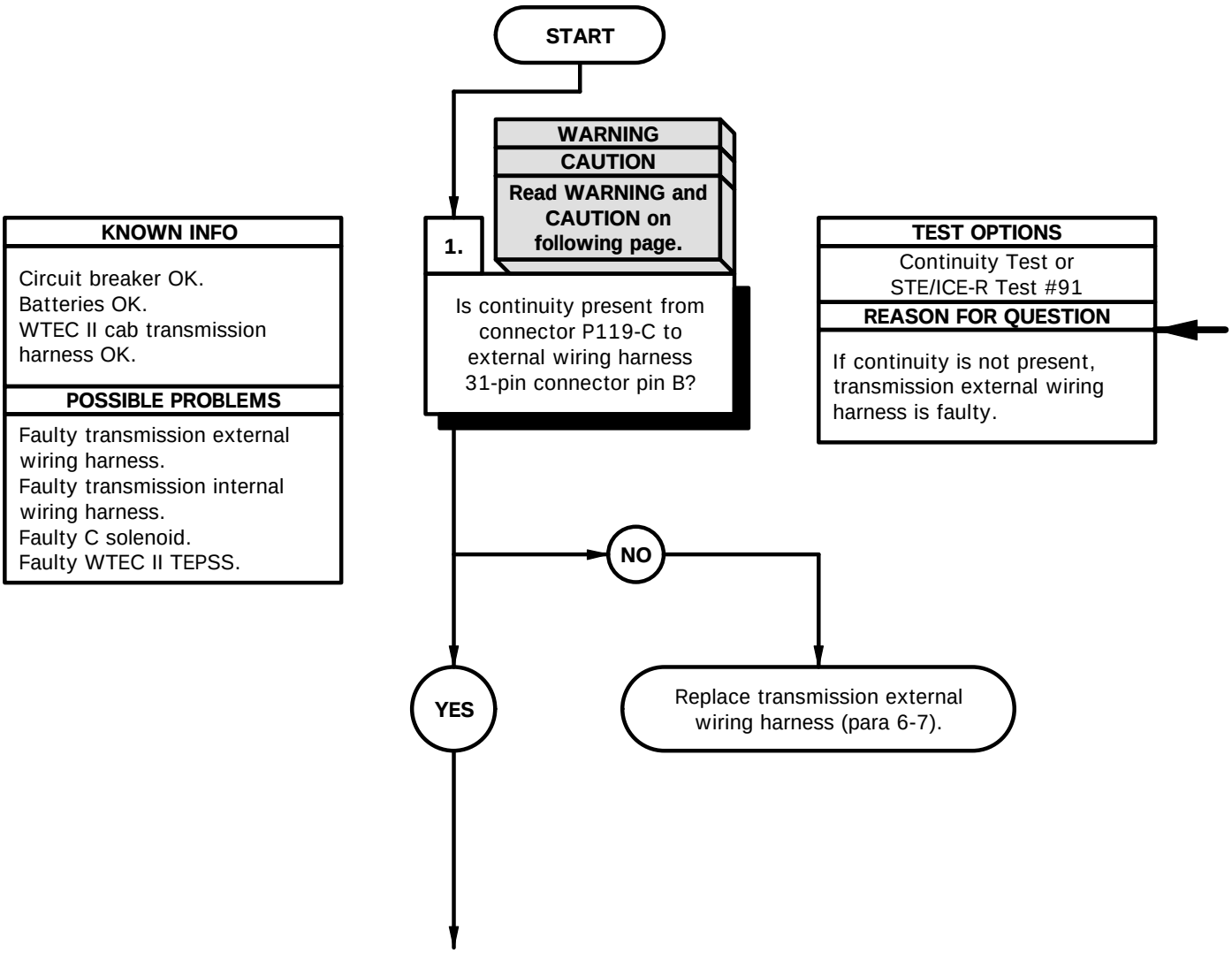
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

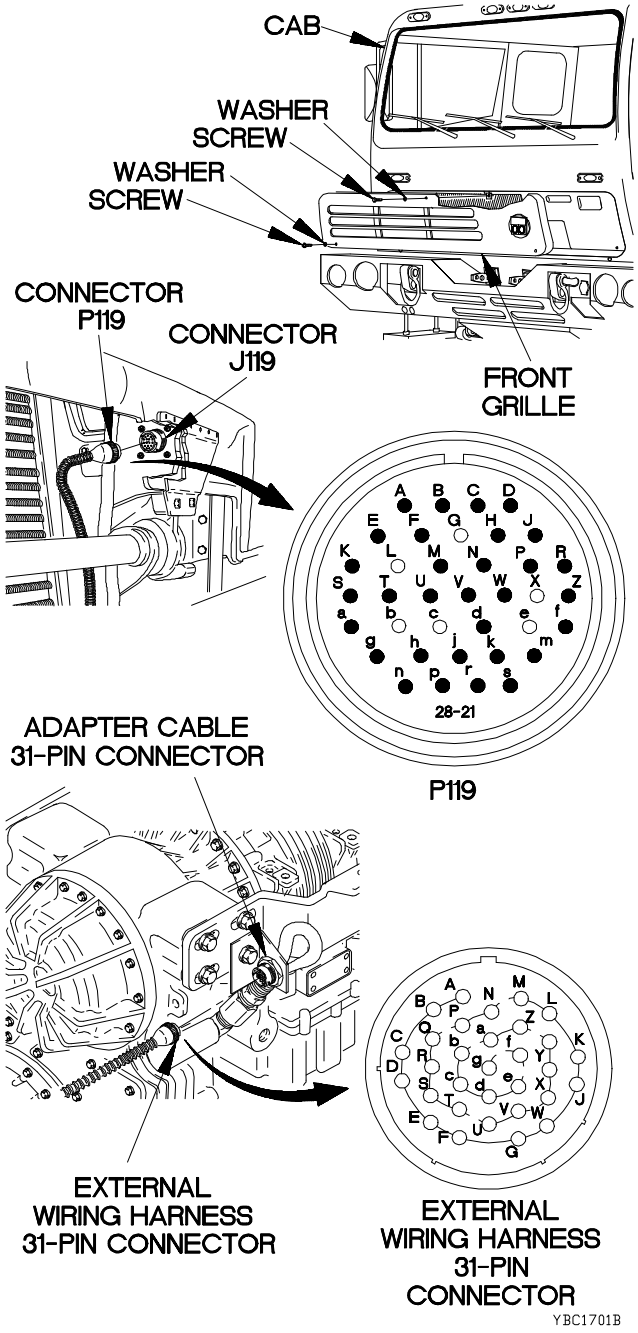
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

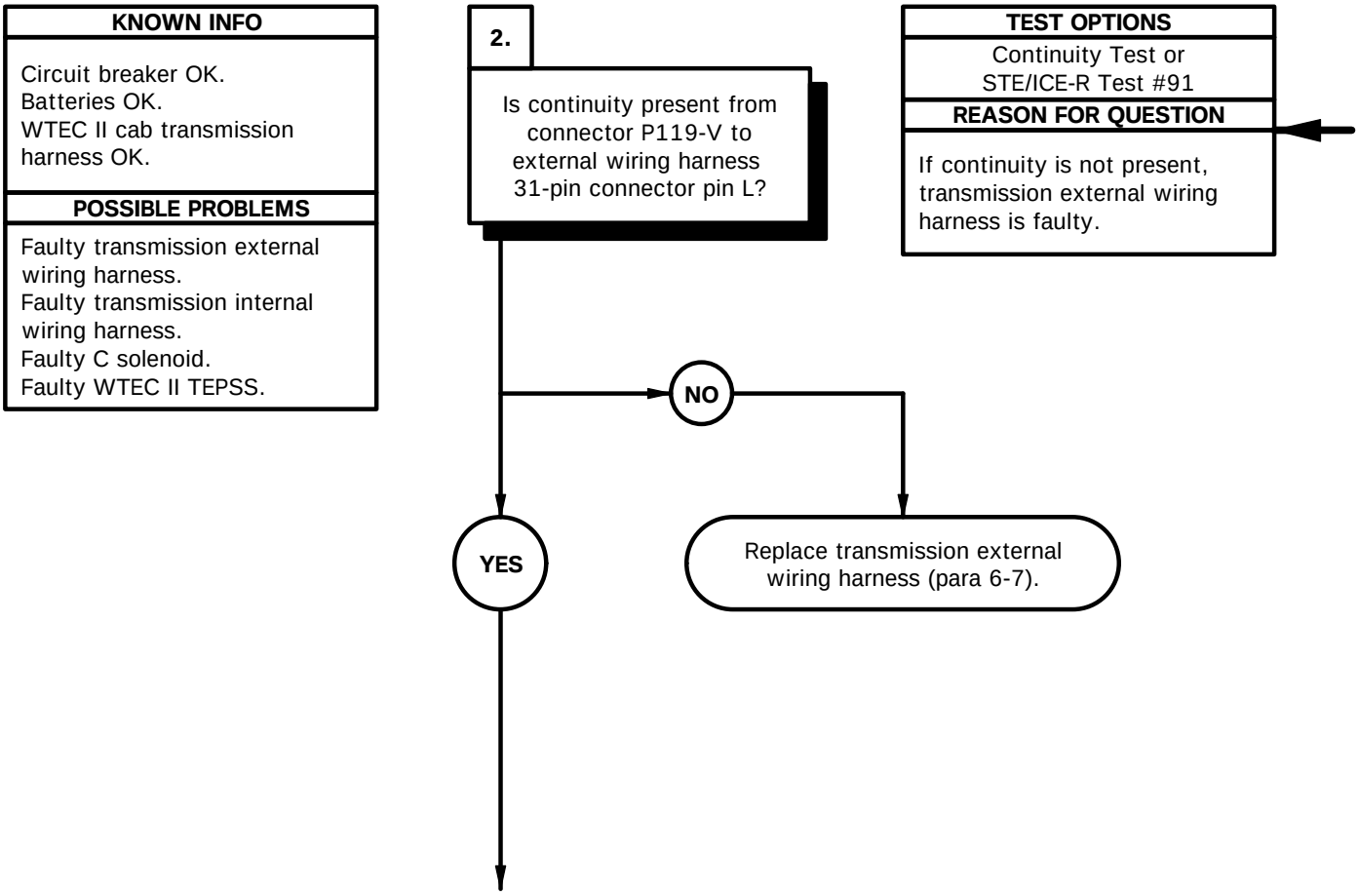
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin connector.
(6) Set multimeter 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).

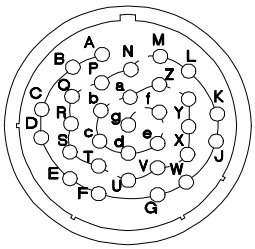


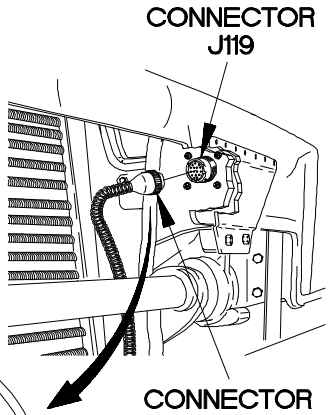
c17. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 14 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

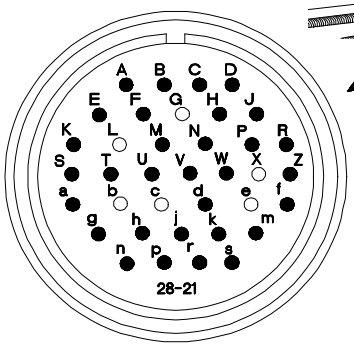


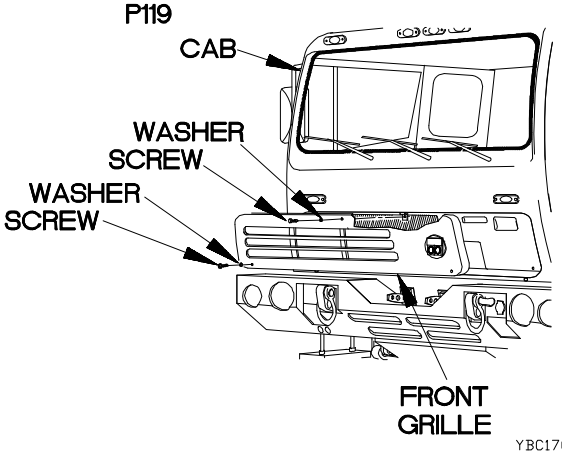
CONTINUITY TEST

(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).

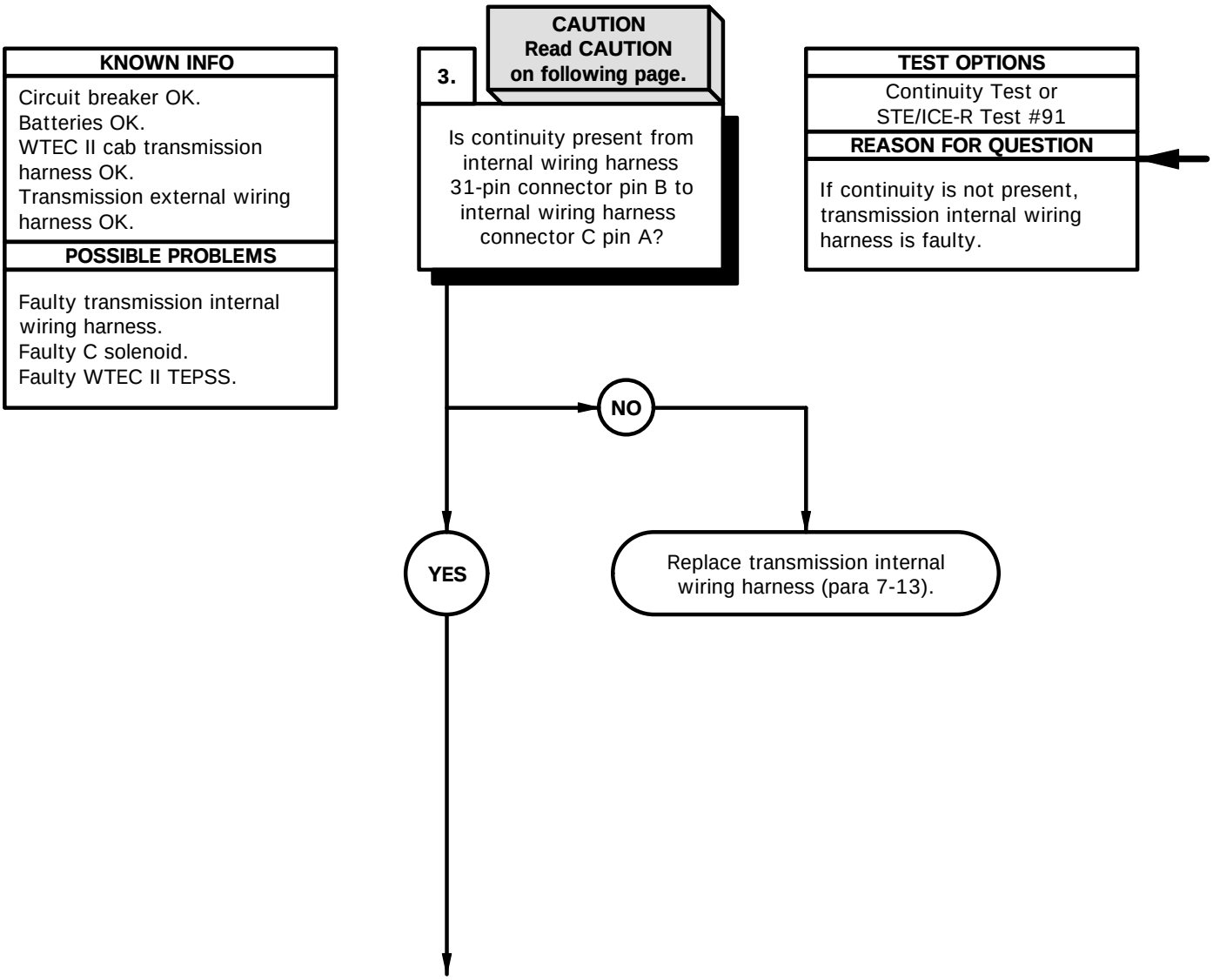








c17. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 14 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

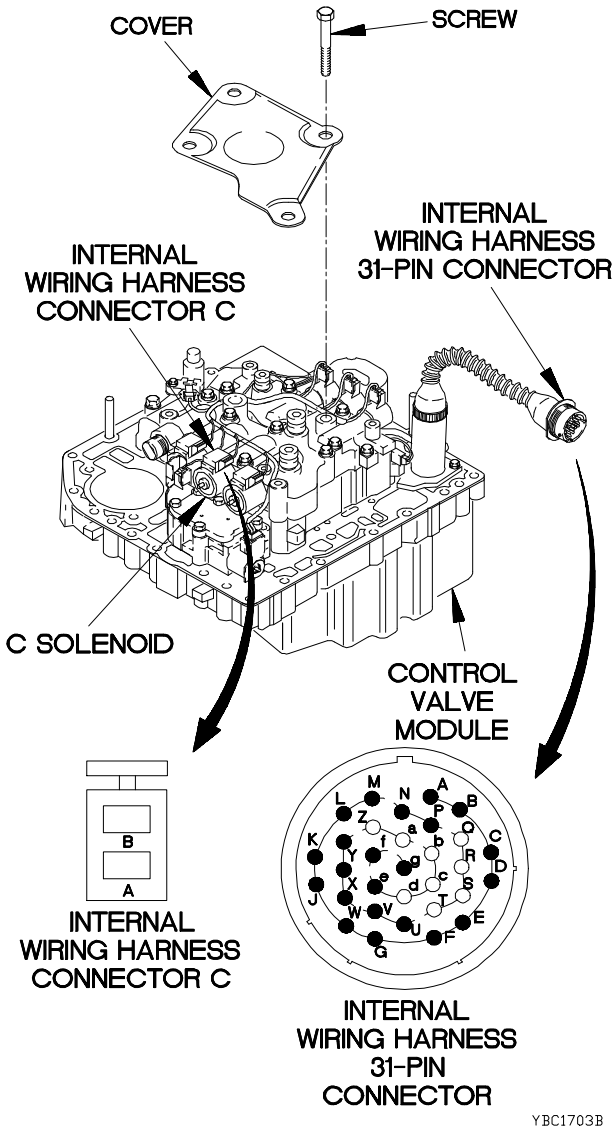


CAUTION

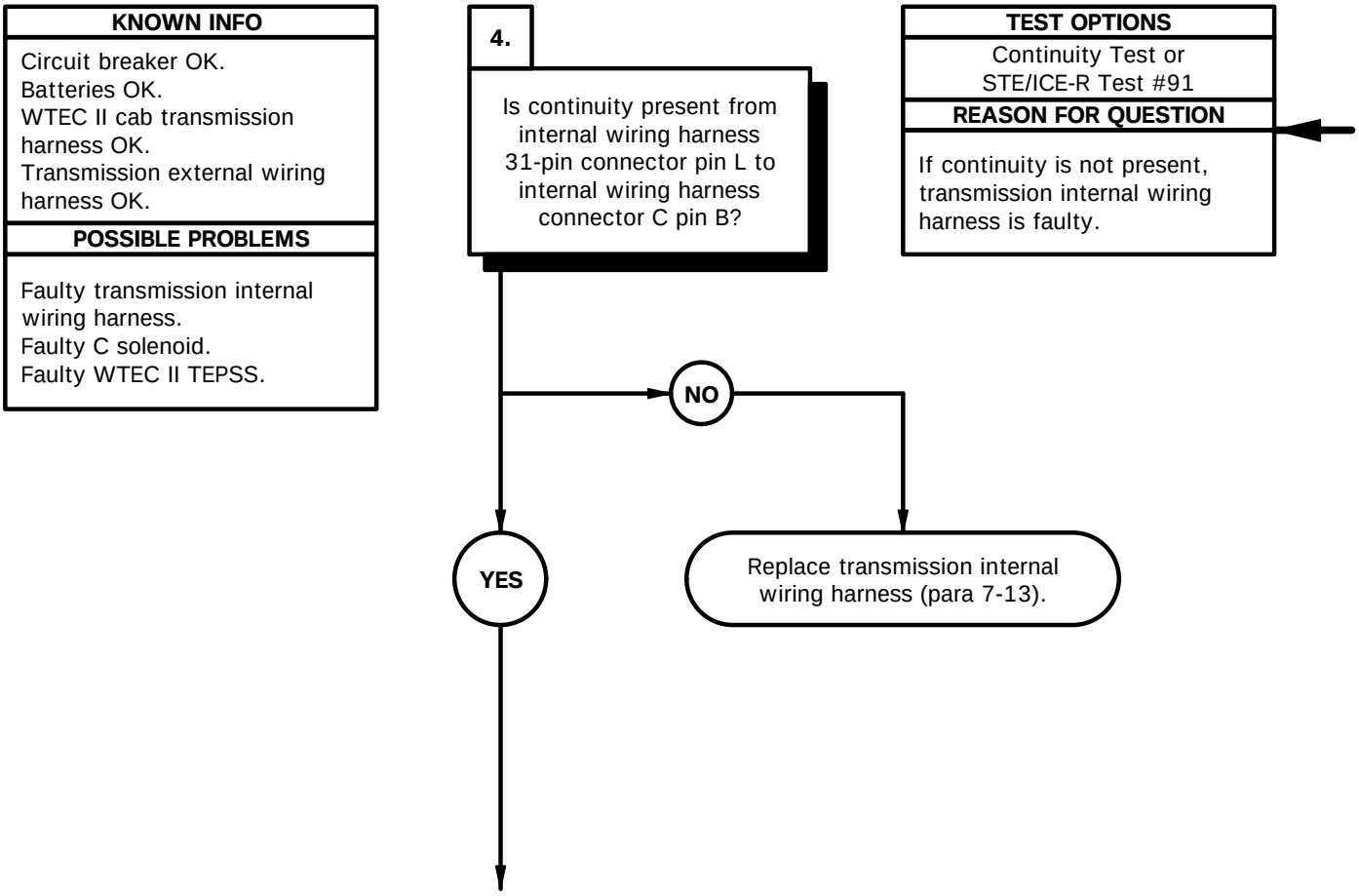
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

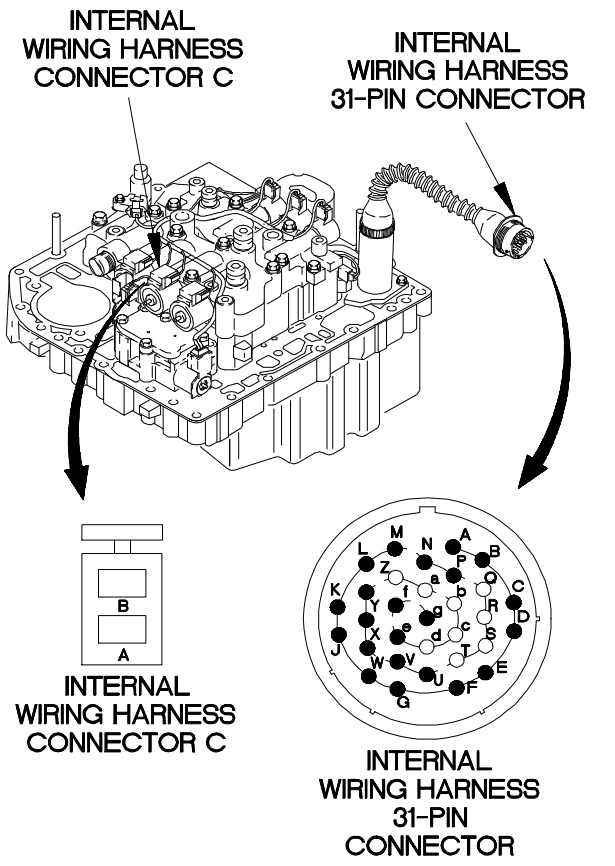


c17. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 14 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

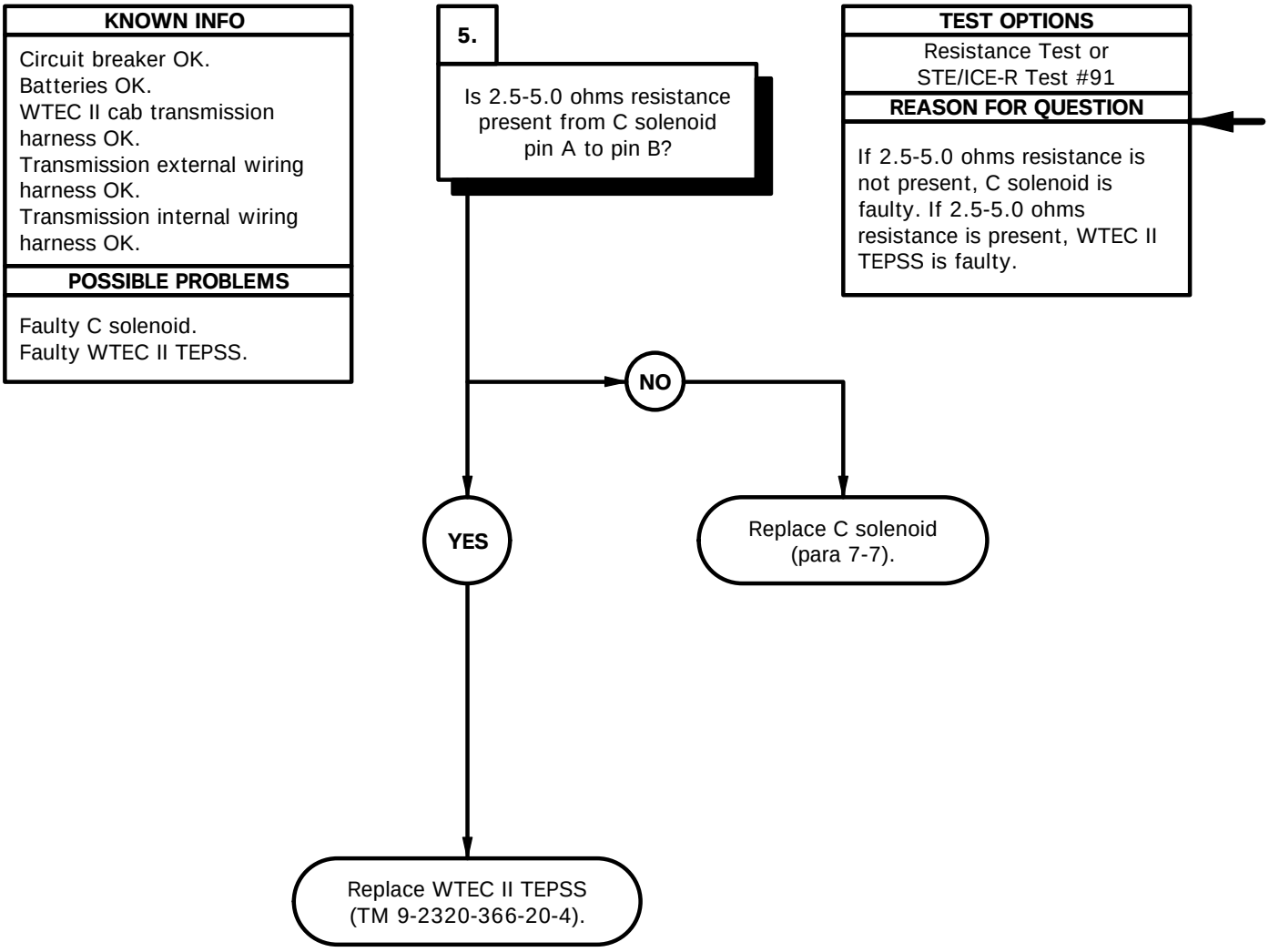


CONTINUITY TEST

(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).

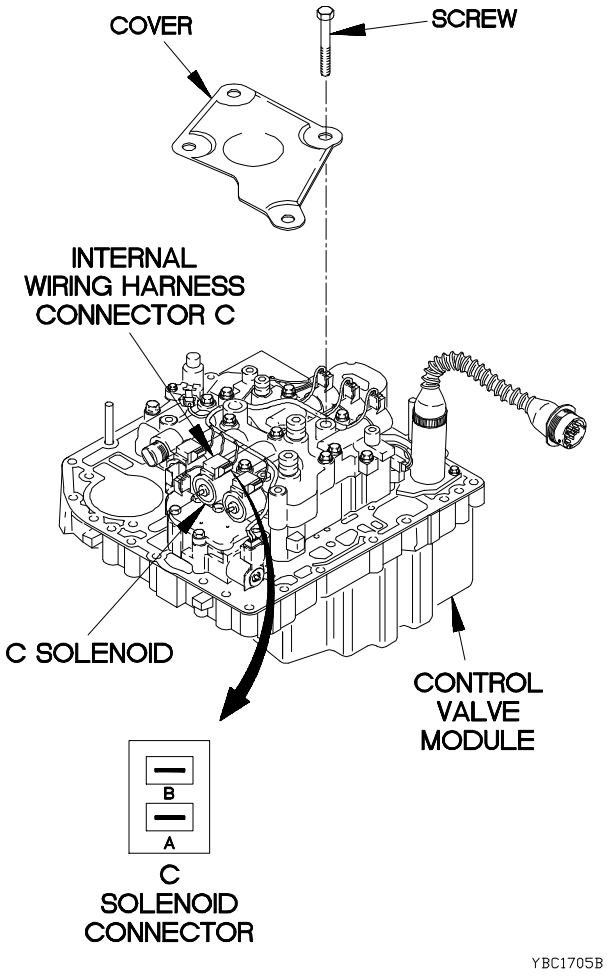


c17. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 14 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



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).



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

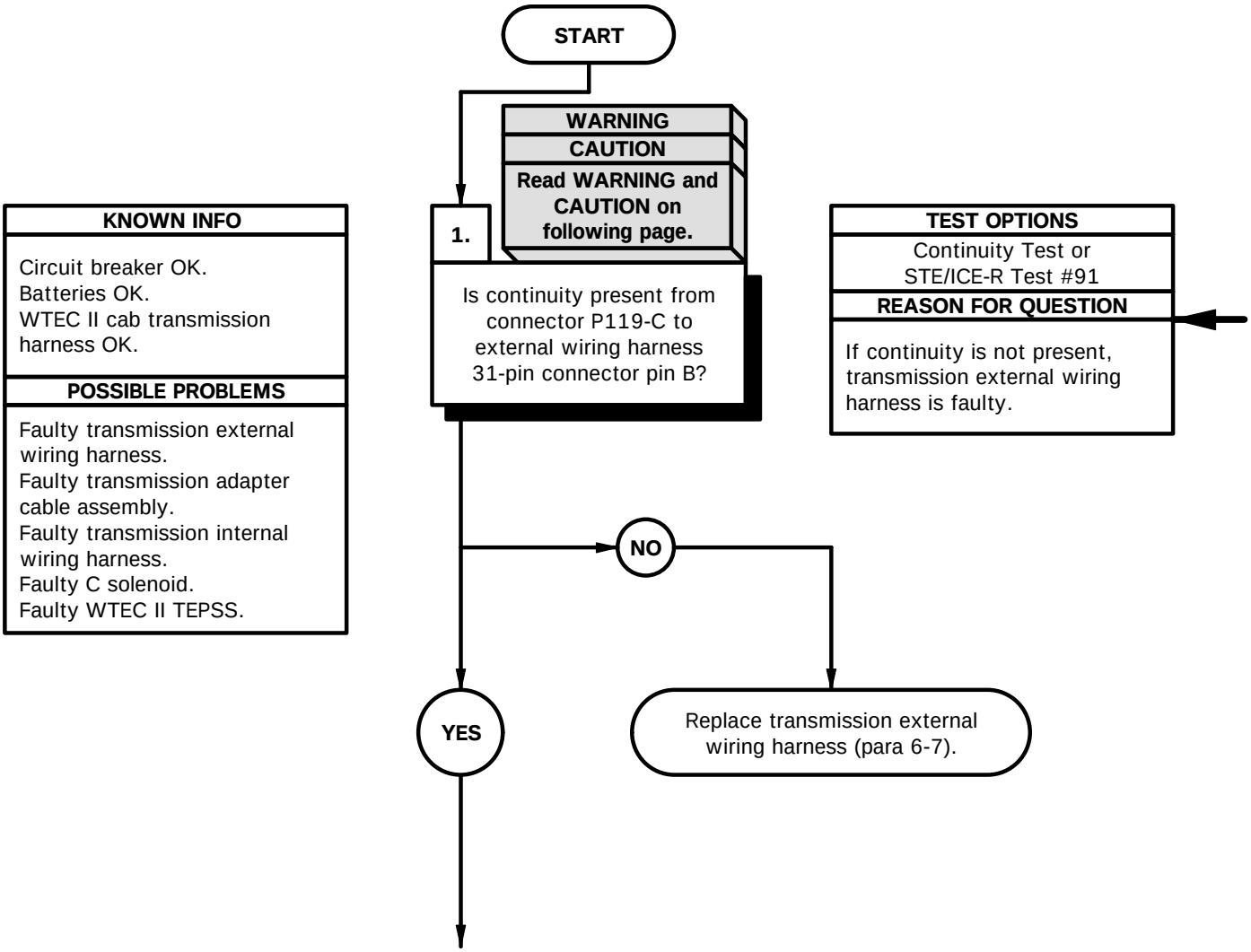
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

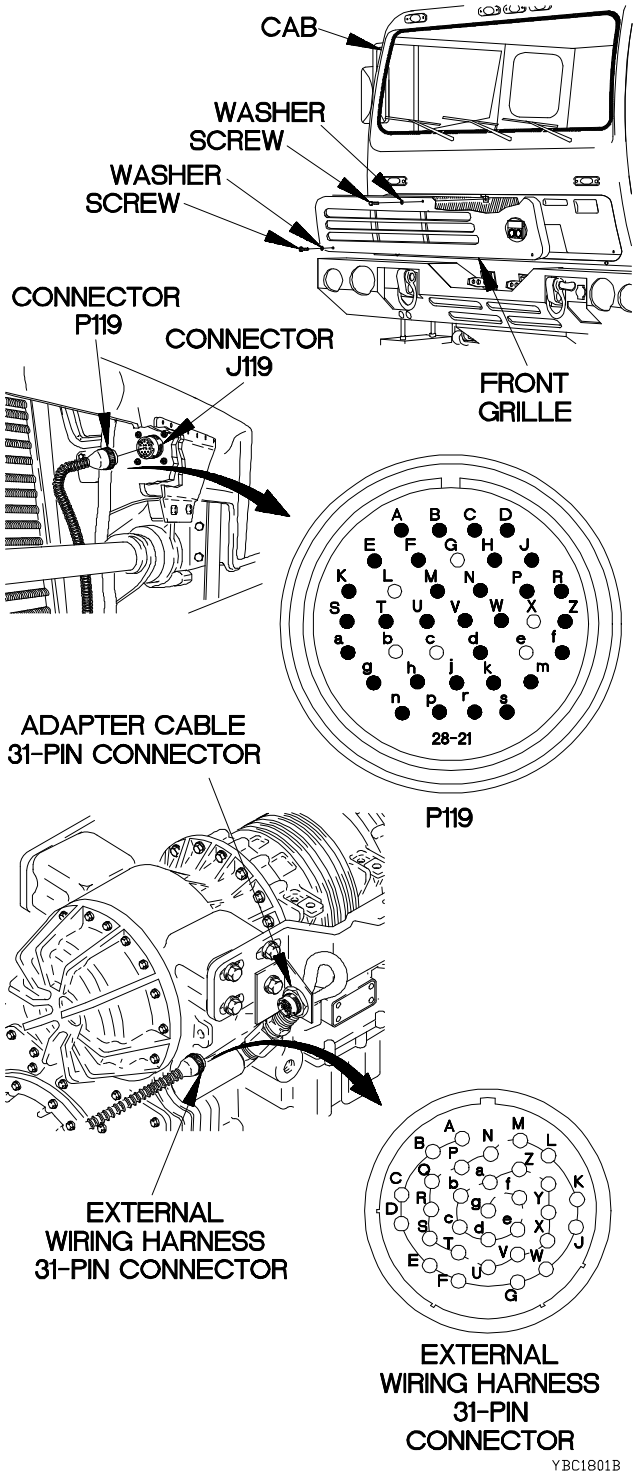
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

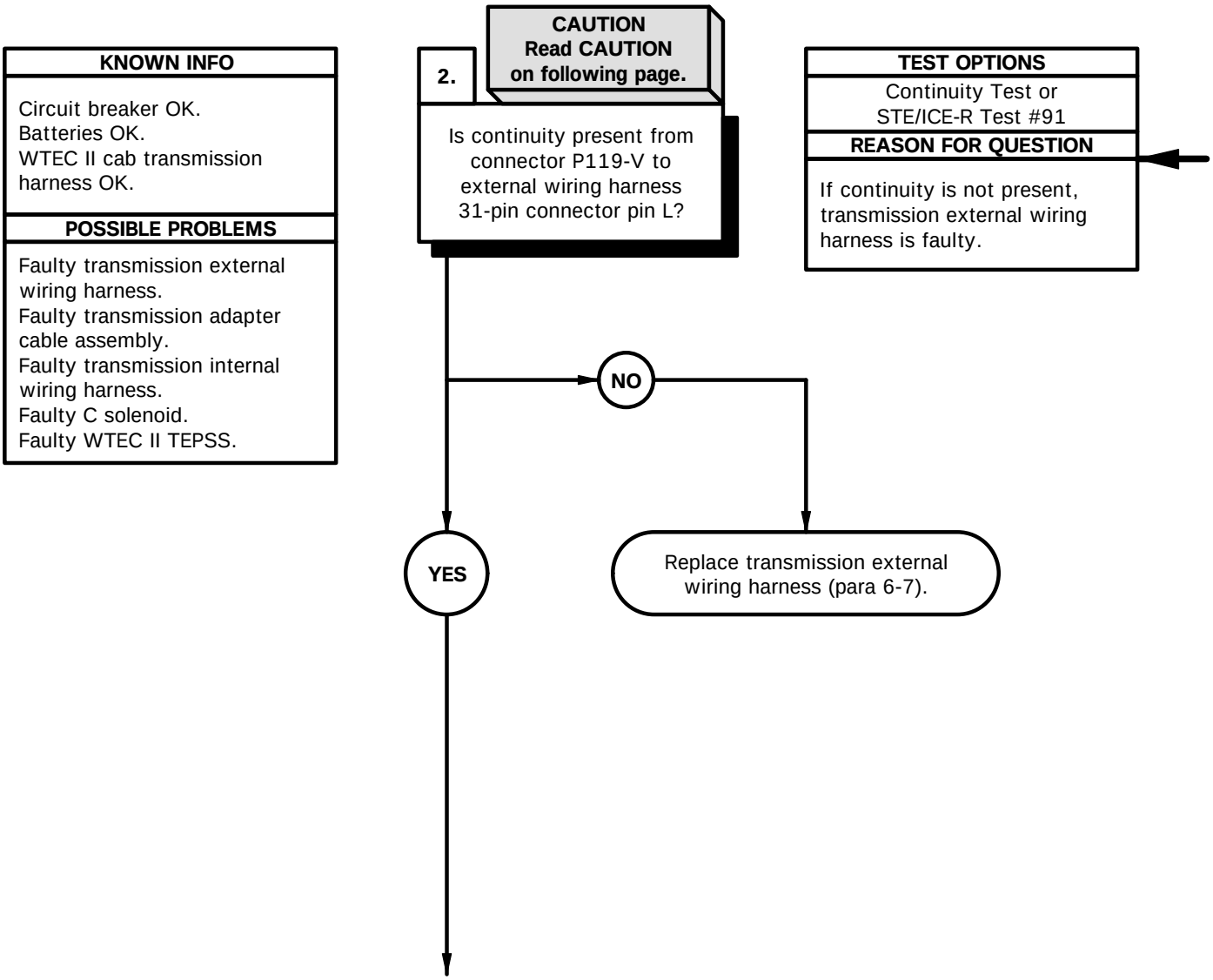
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from adapter cable 31-pin connector.
(6) Set multimeter to ohms.
(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).



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

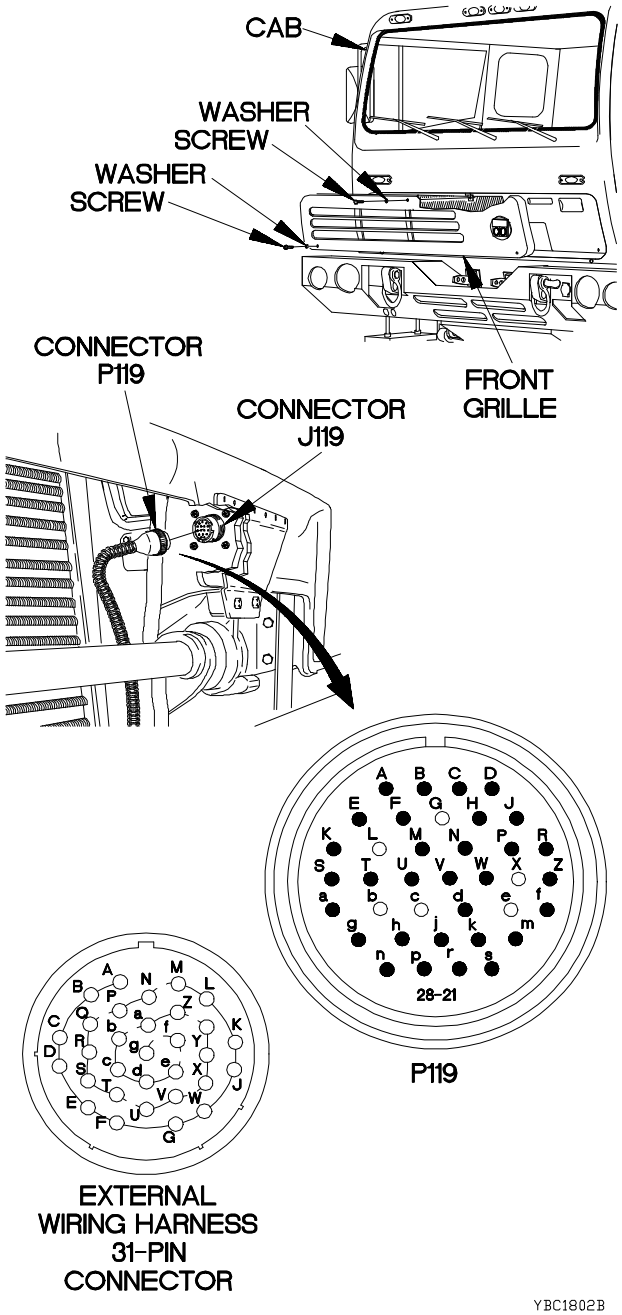
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

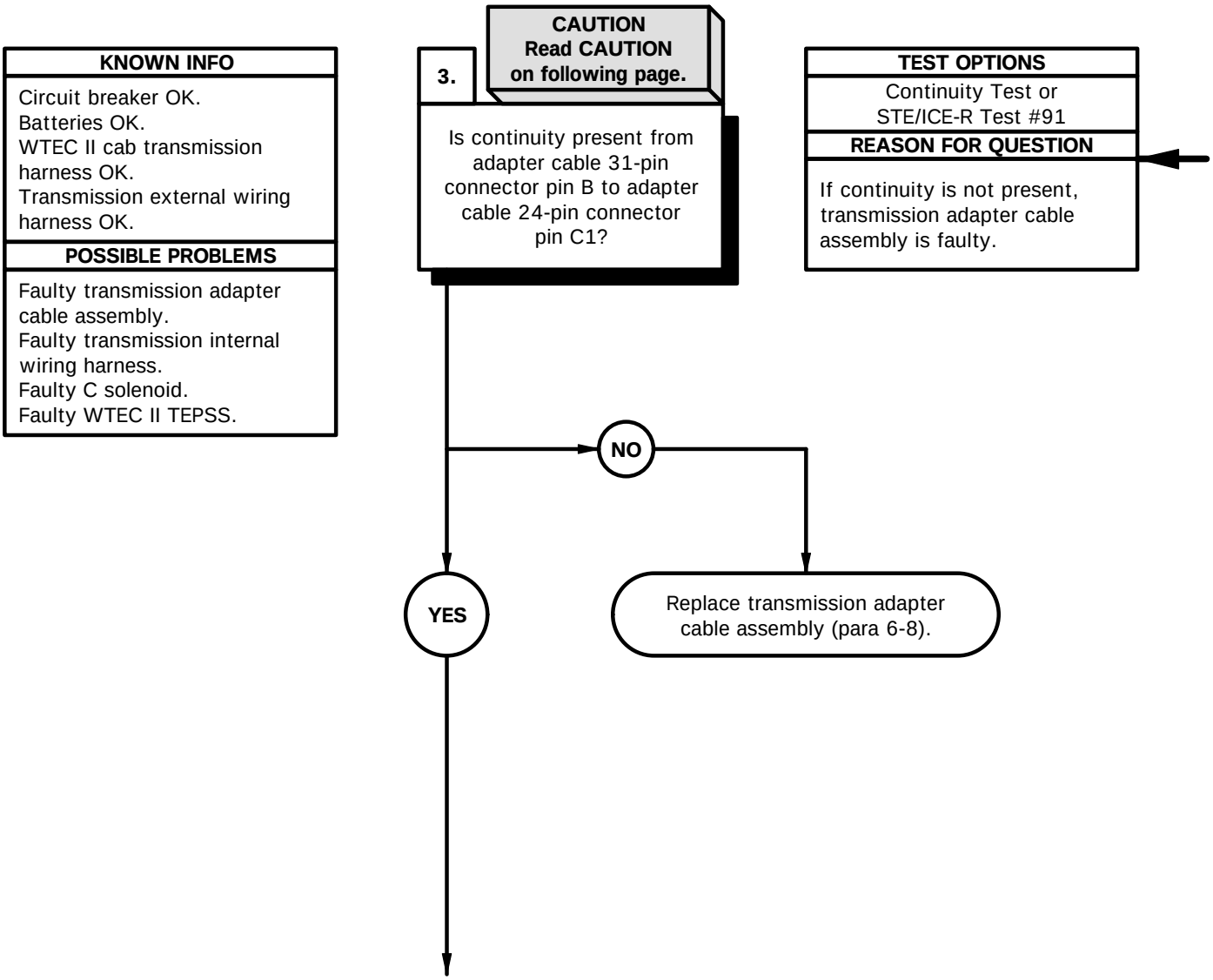
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



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

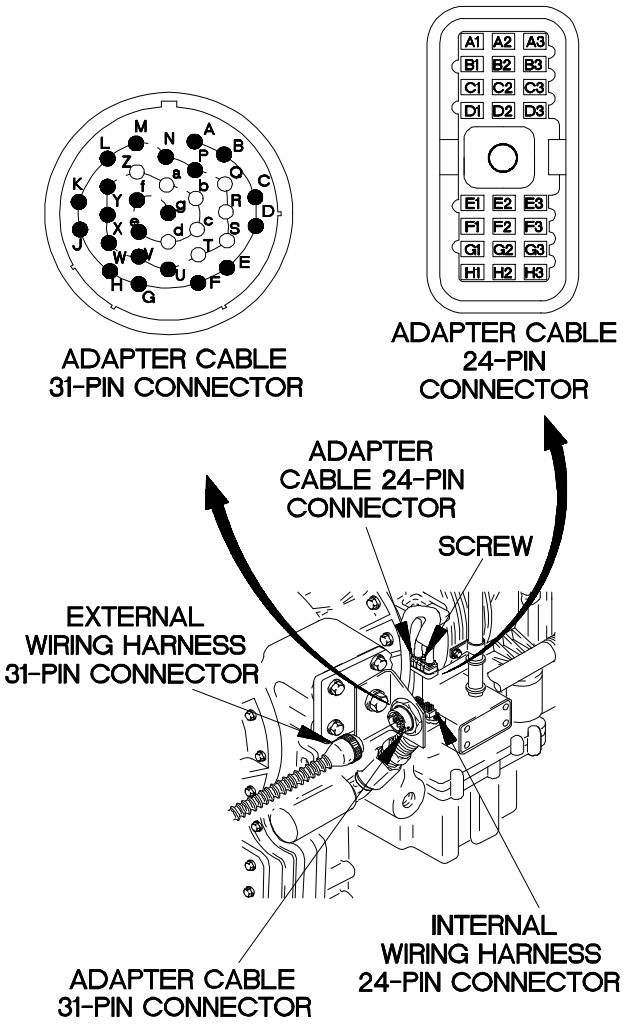
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

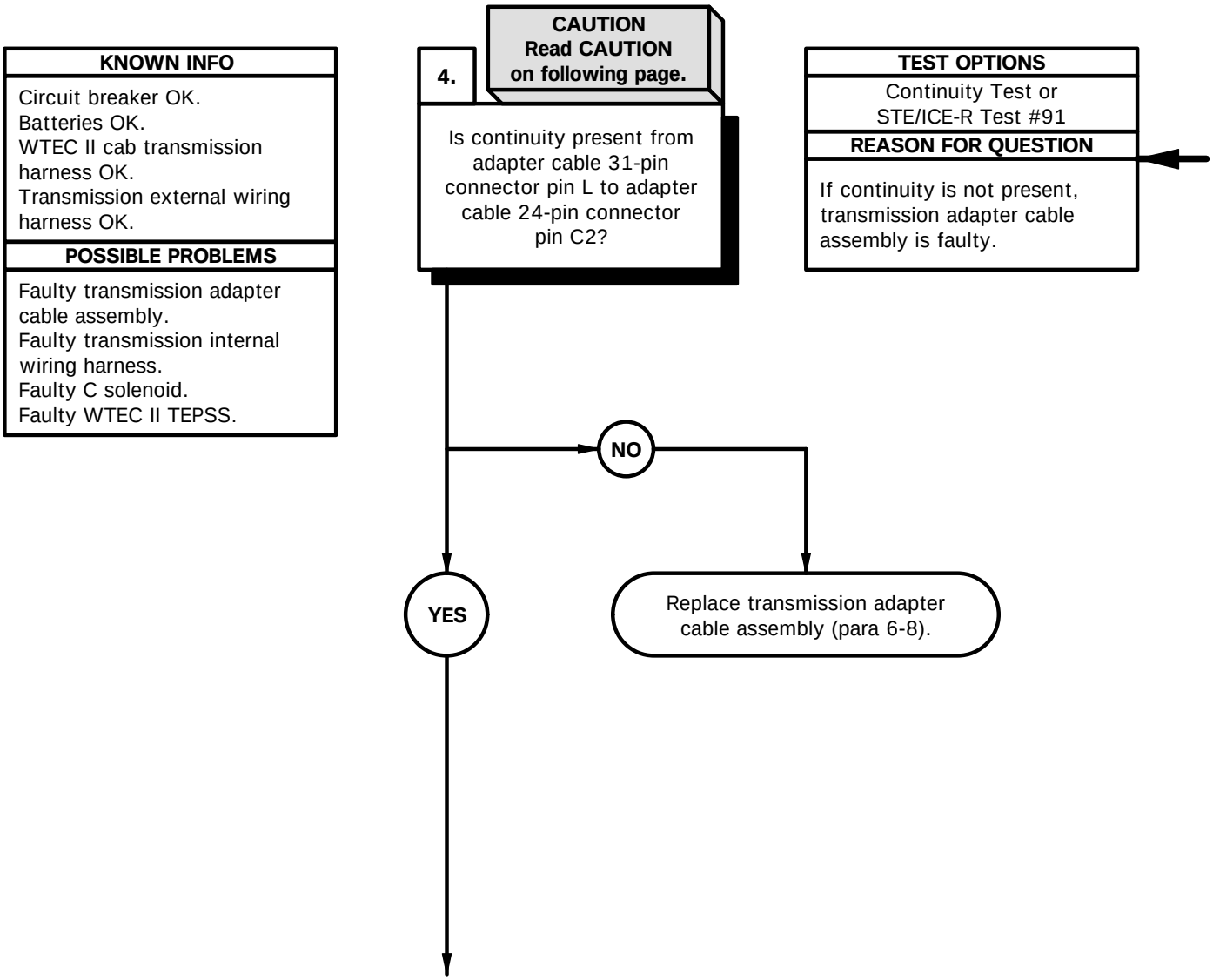
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



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

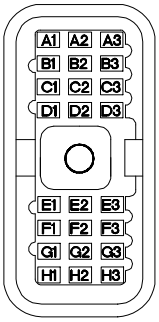
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

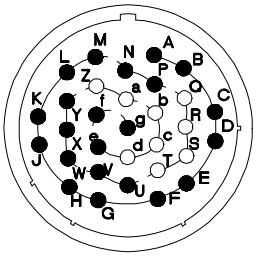
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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.



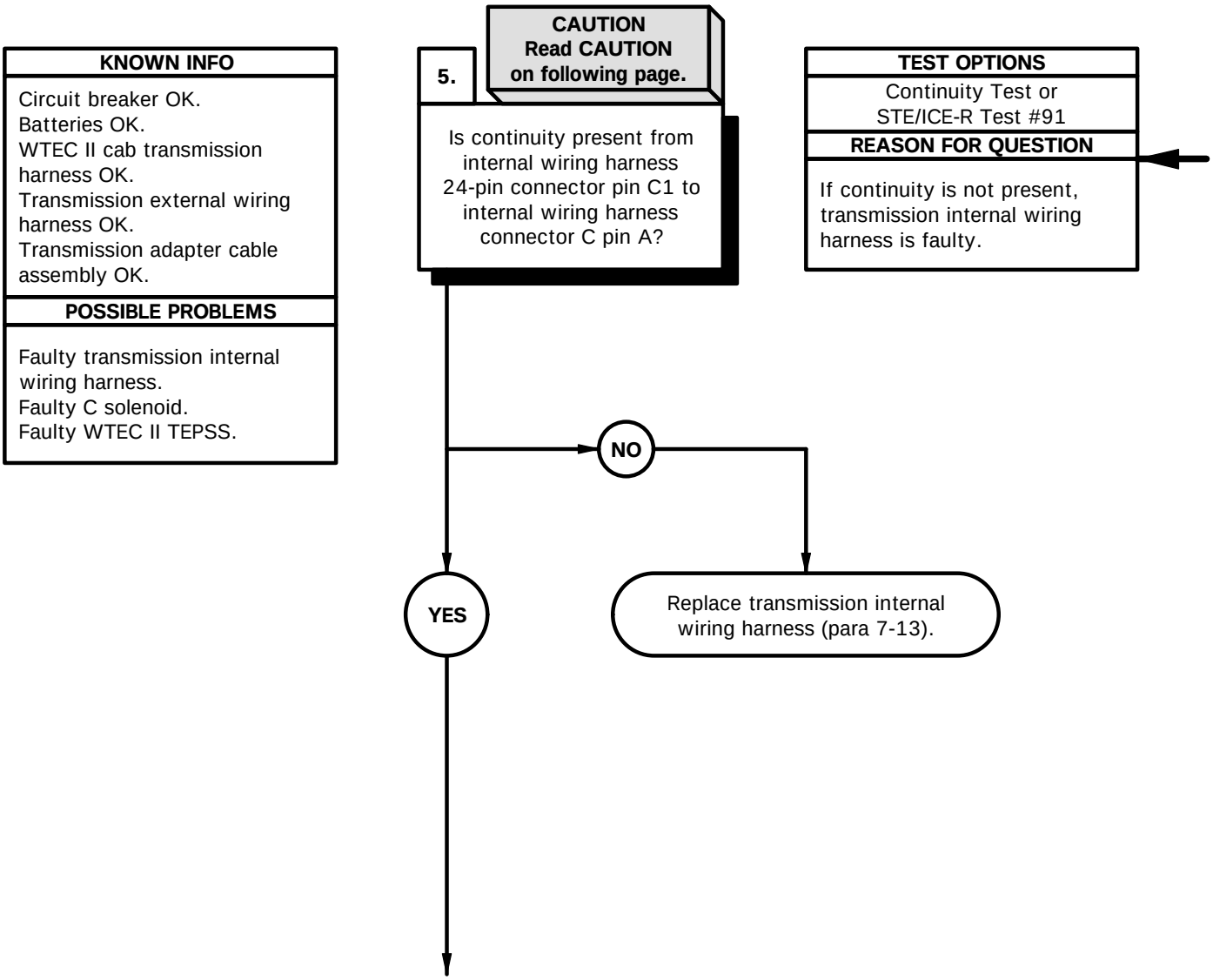
ADAPTER CABLE
24-PIN
CONNECTOR



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)



CAUTION

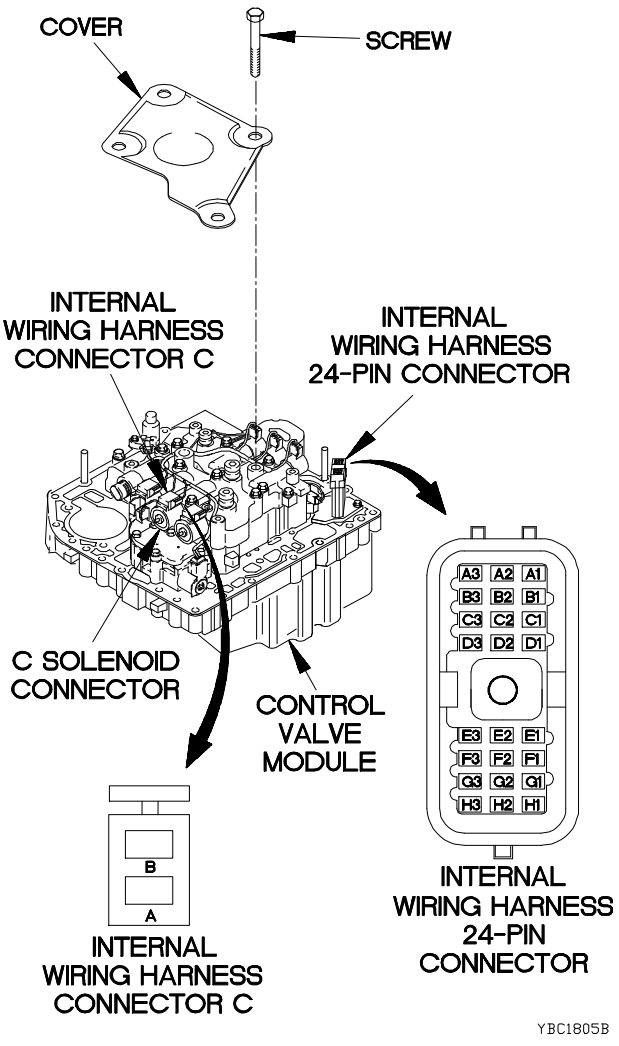
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

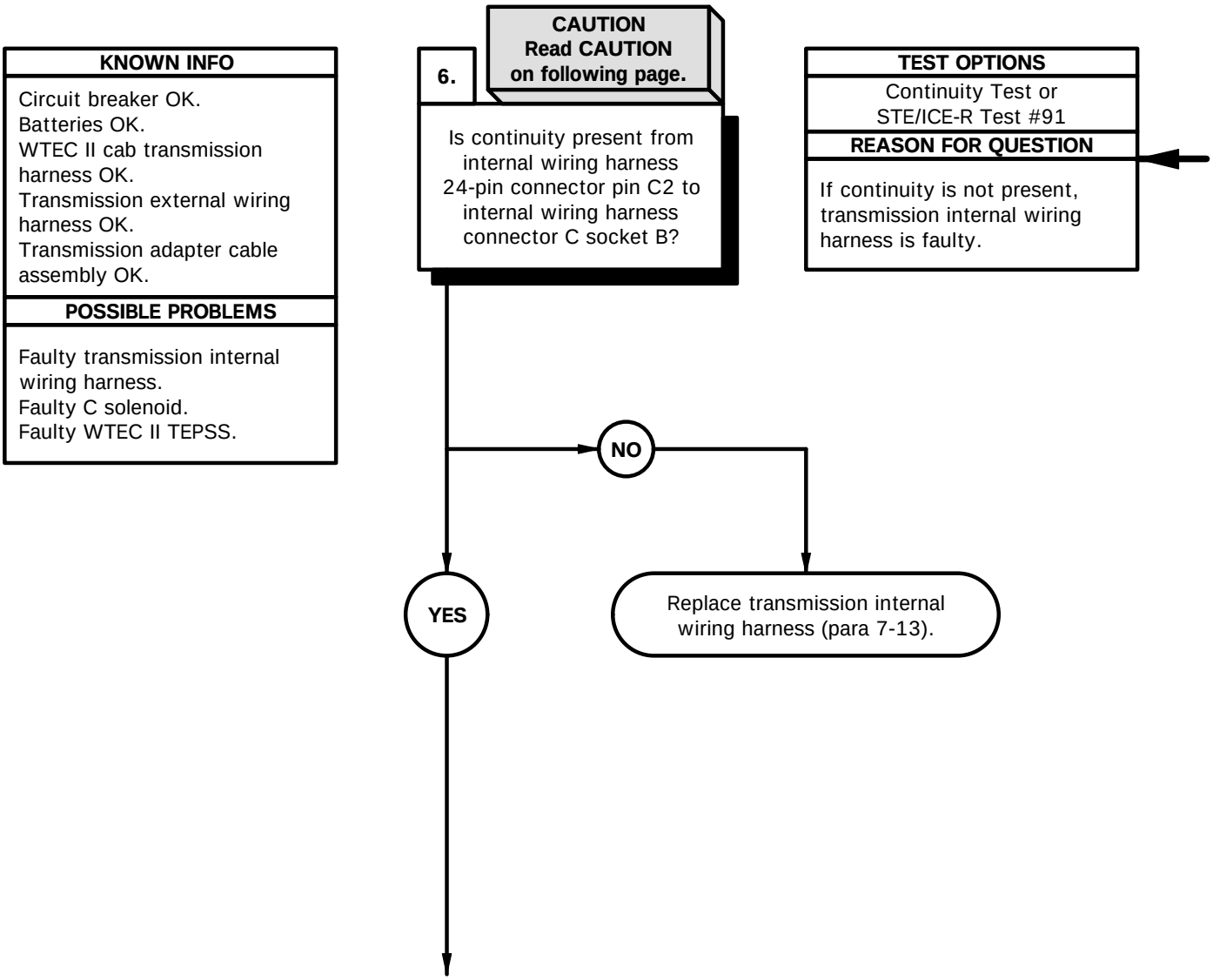
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



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

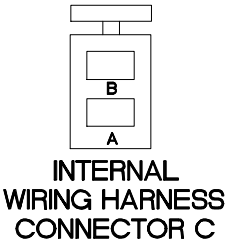
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

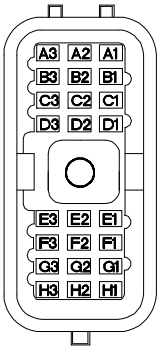
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



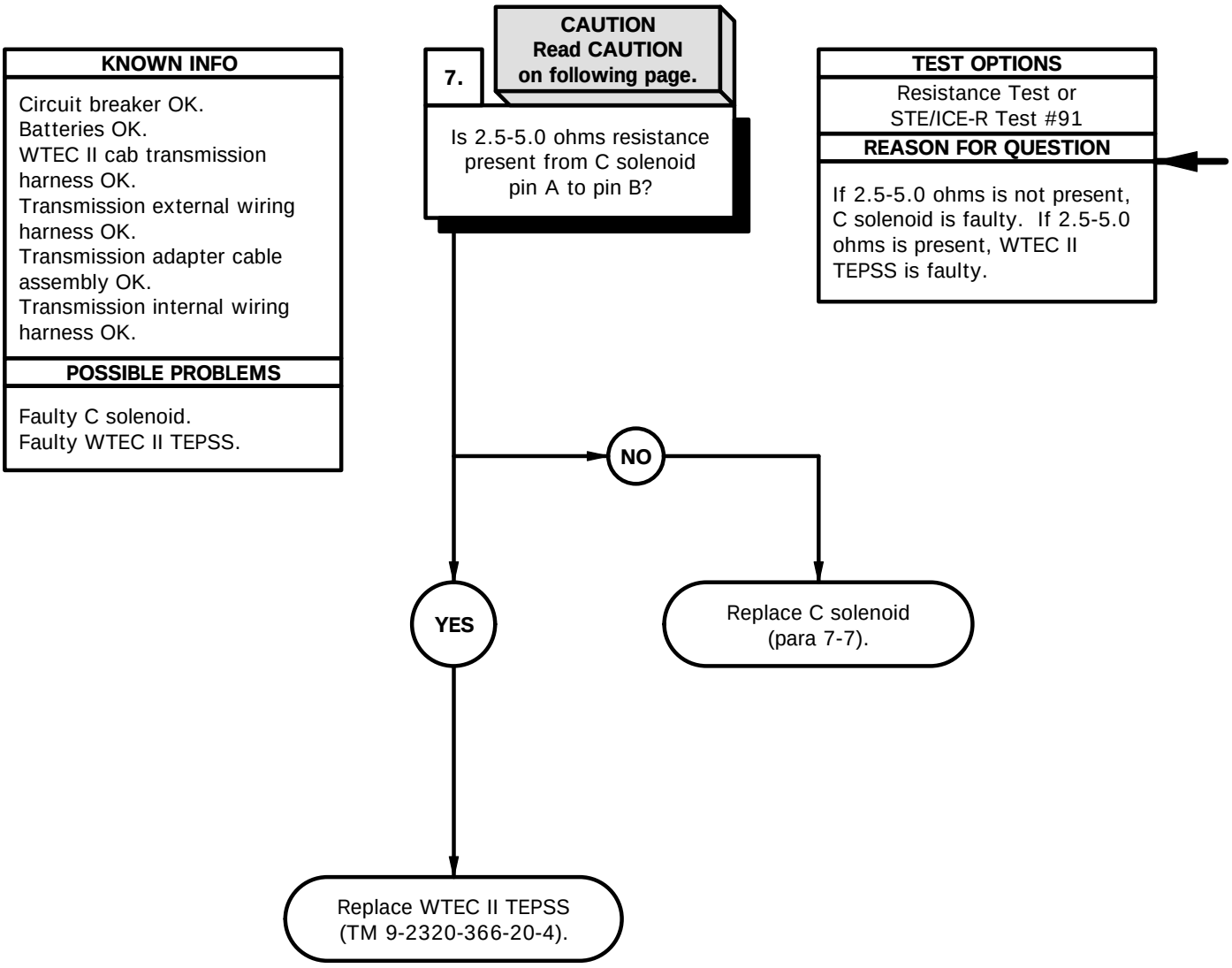
INTERNAL WIRING HARNESS CONNECTOR C



INTERNAL WIRING HARNESS 24-PIN CONNECTOR

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

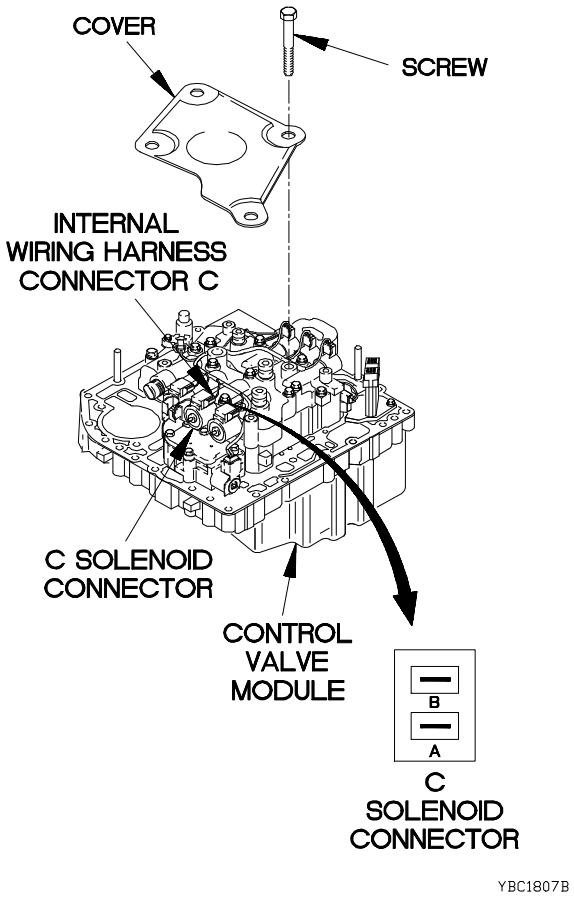
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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).



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

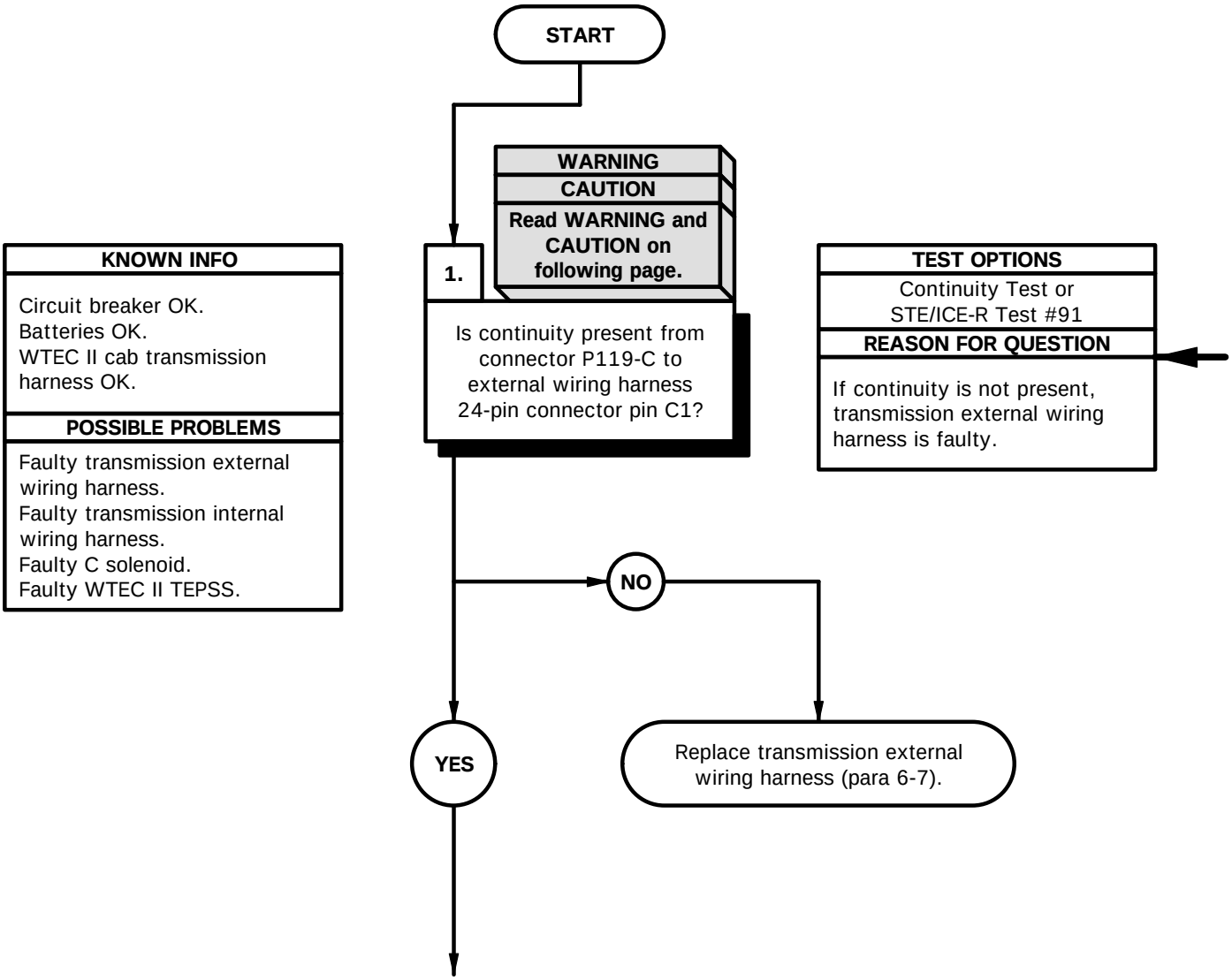
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

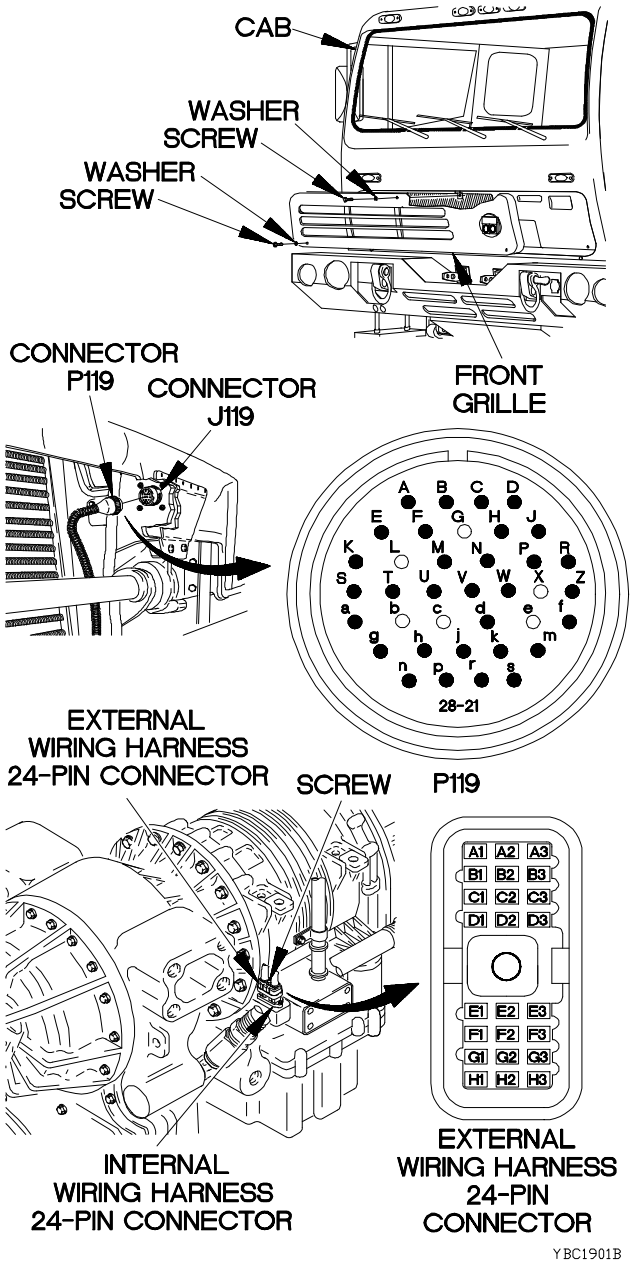
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

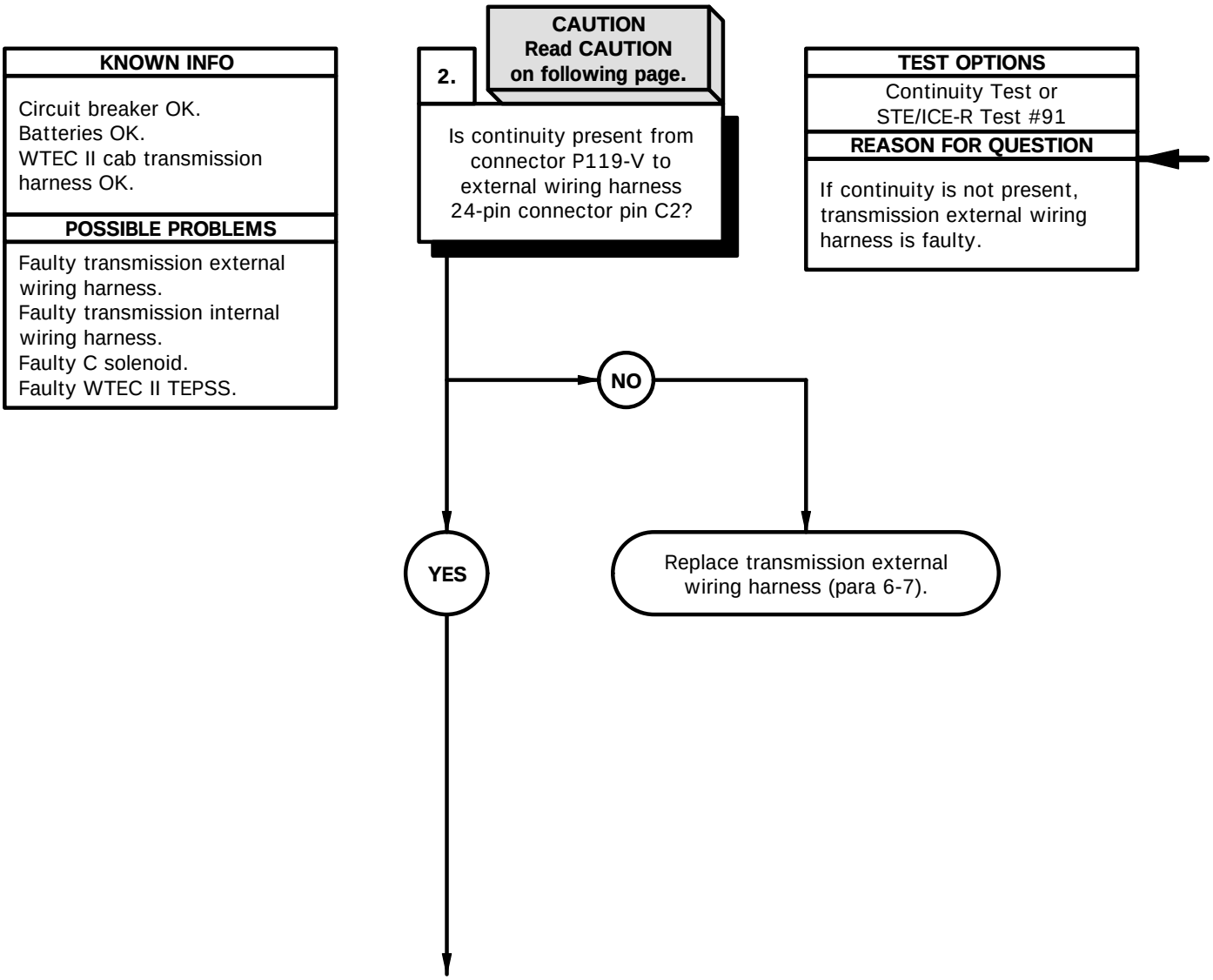
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Loosen screw in external wiring harness 24-pin connector.
(6) Disconnect external wiring harness 24-pin connector 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).



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)



CAUTION

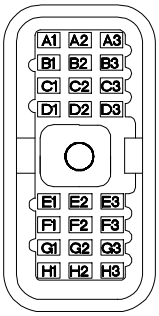
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

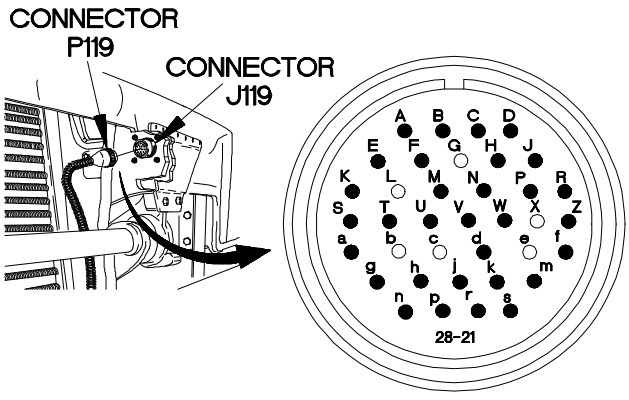
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

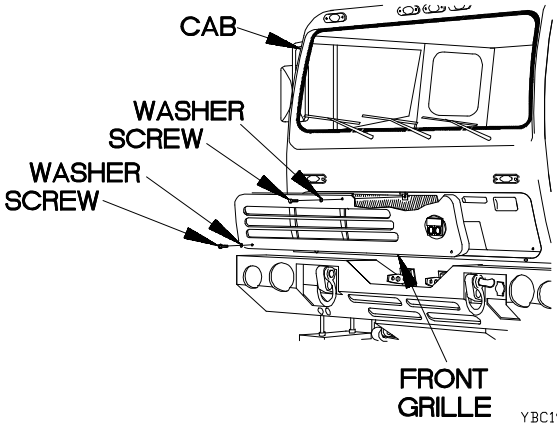
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P119-V.
(3) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin C2 and note reading on multimeter.
(4) If continuity is not present, replace transmission external wiring harness (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).



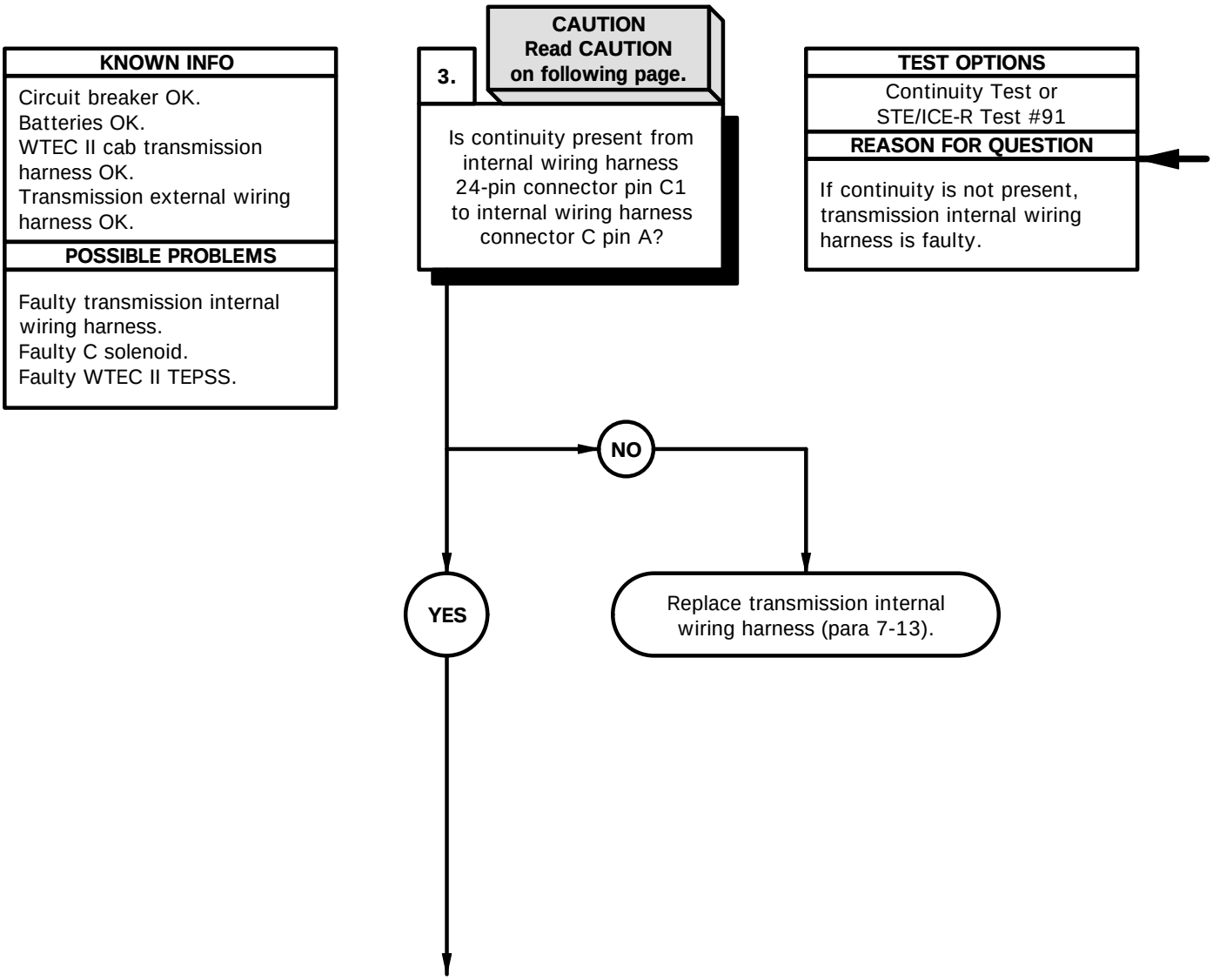
EXTERNAL WIRING HARNESS 24-PIN CONNECTOR



P119



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)



CAUTION

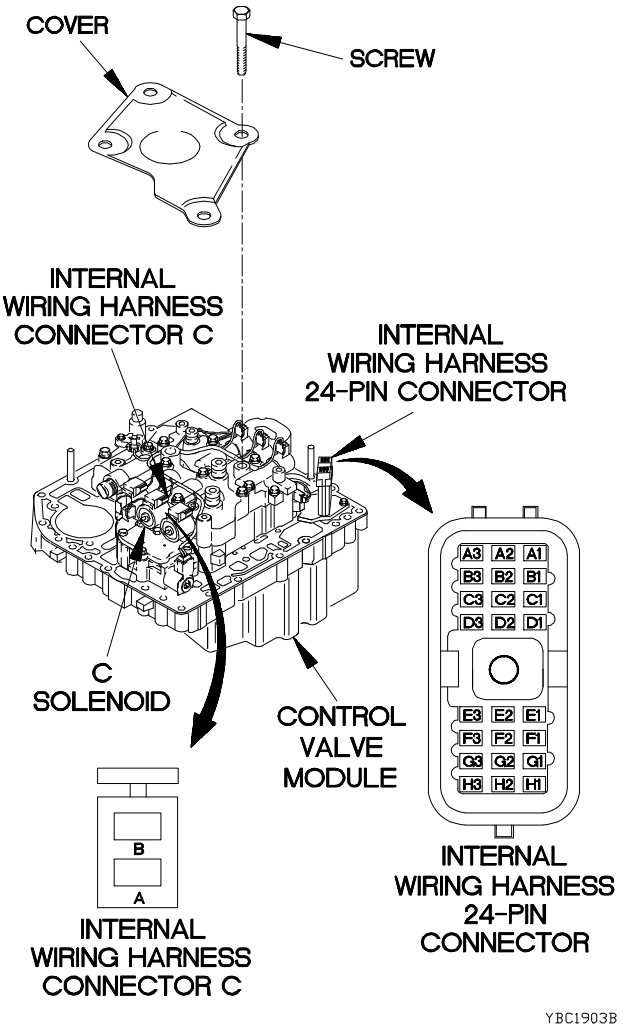
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

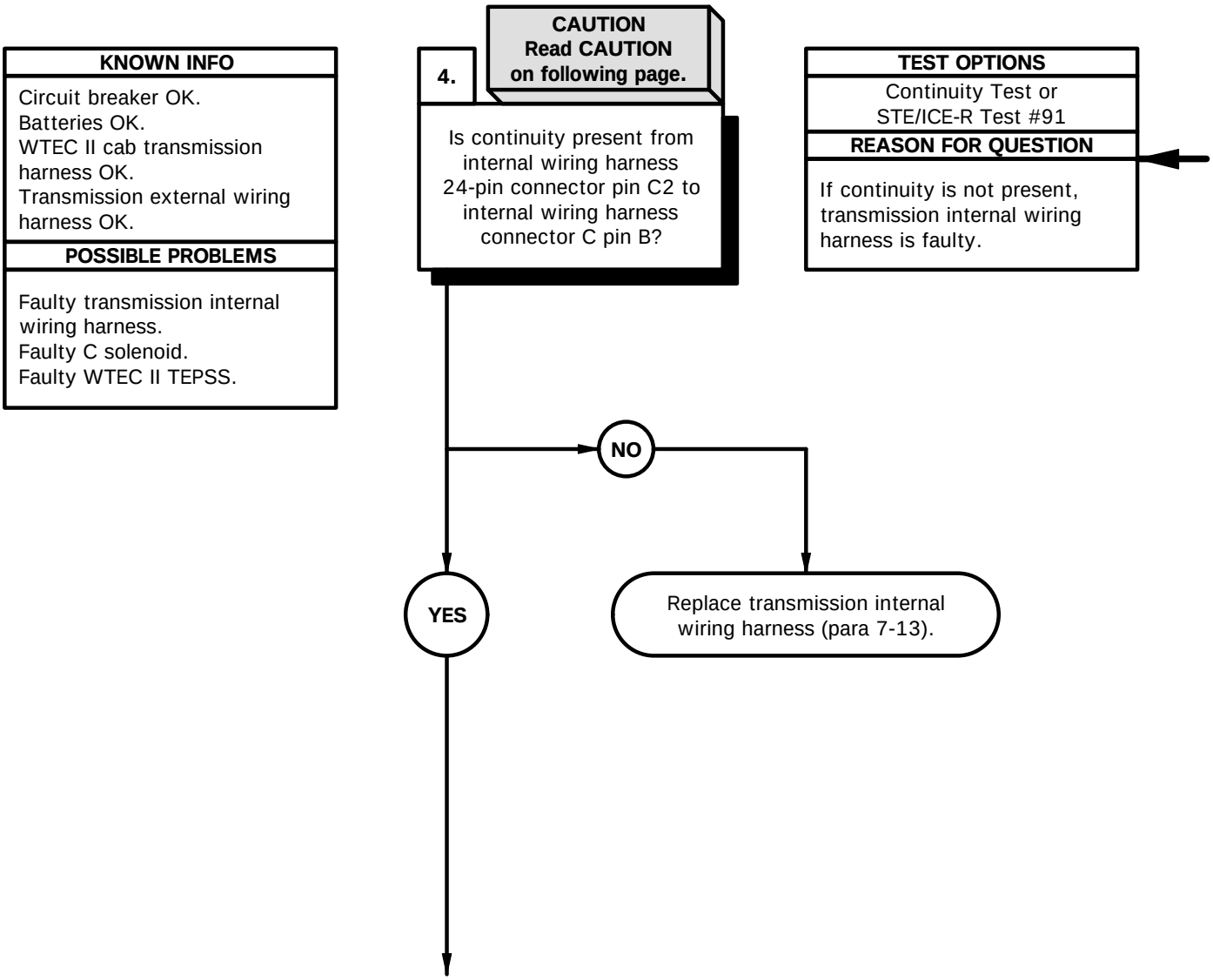
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



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)



CAUTION

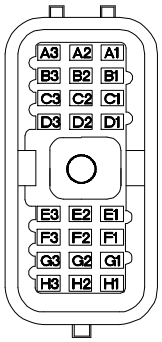
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

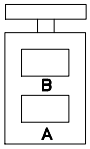
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



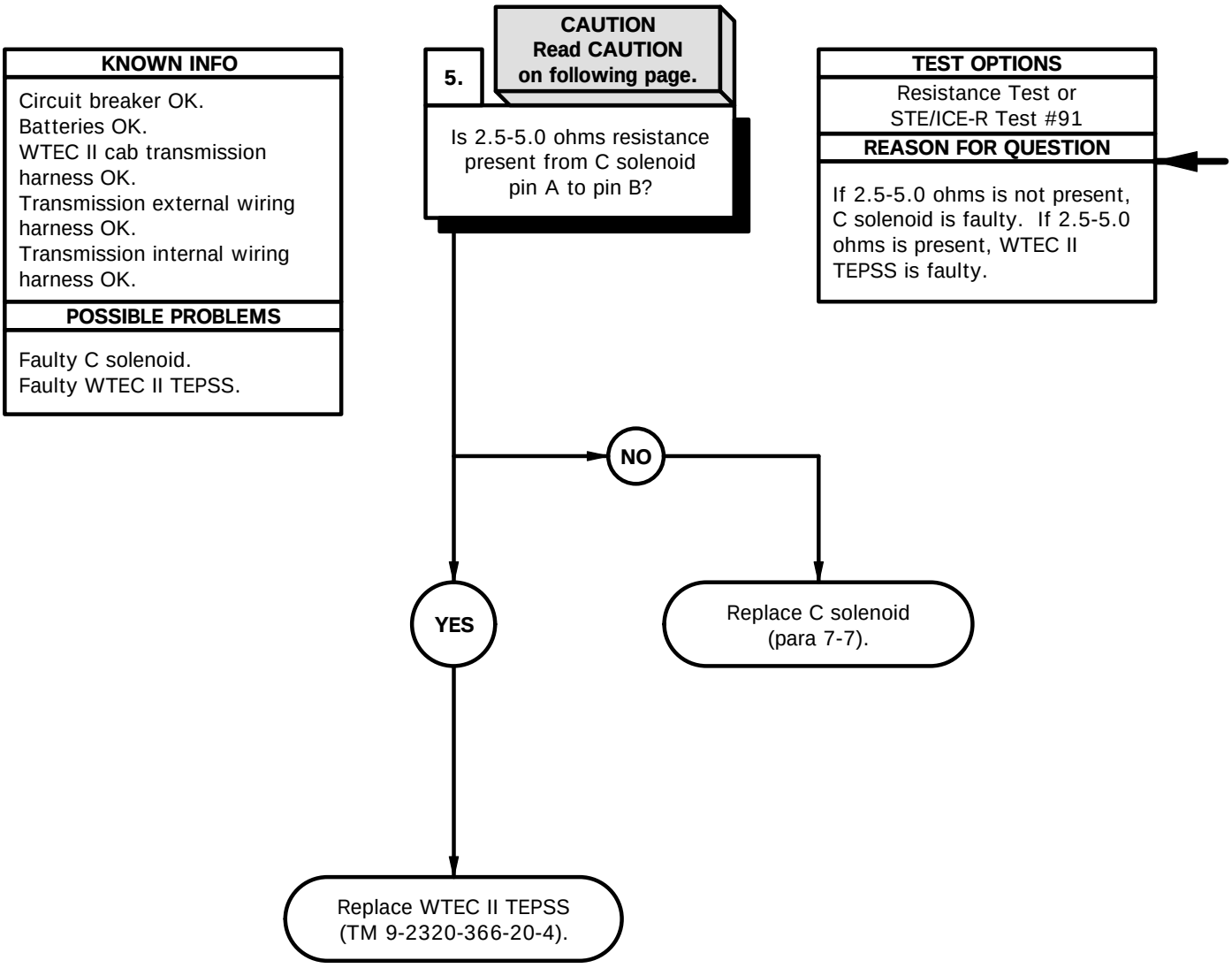
INTERNAL WIRING HARNESS 24-PIN CONNECTOR



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)



CAUTION

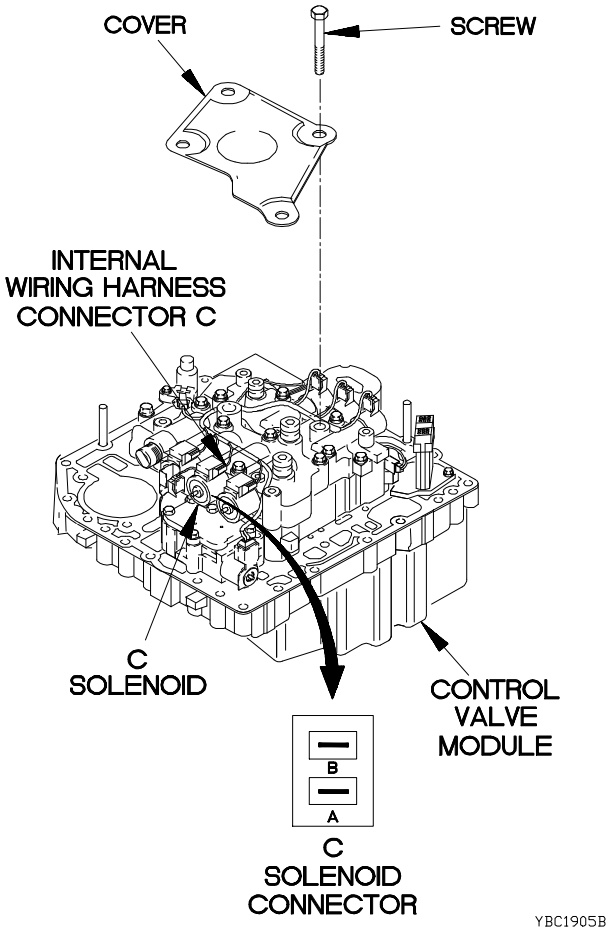
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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).



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

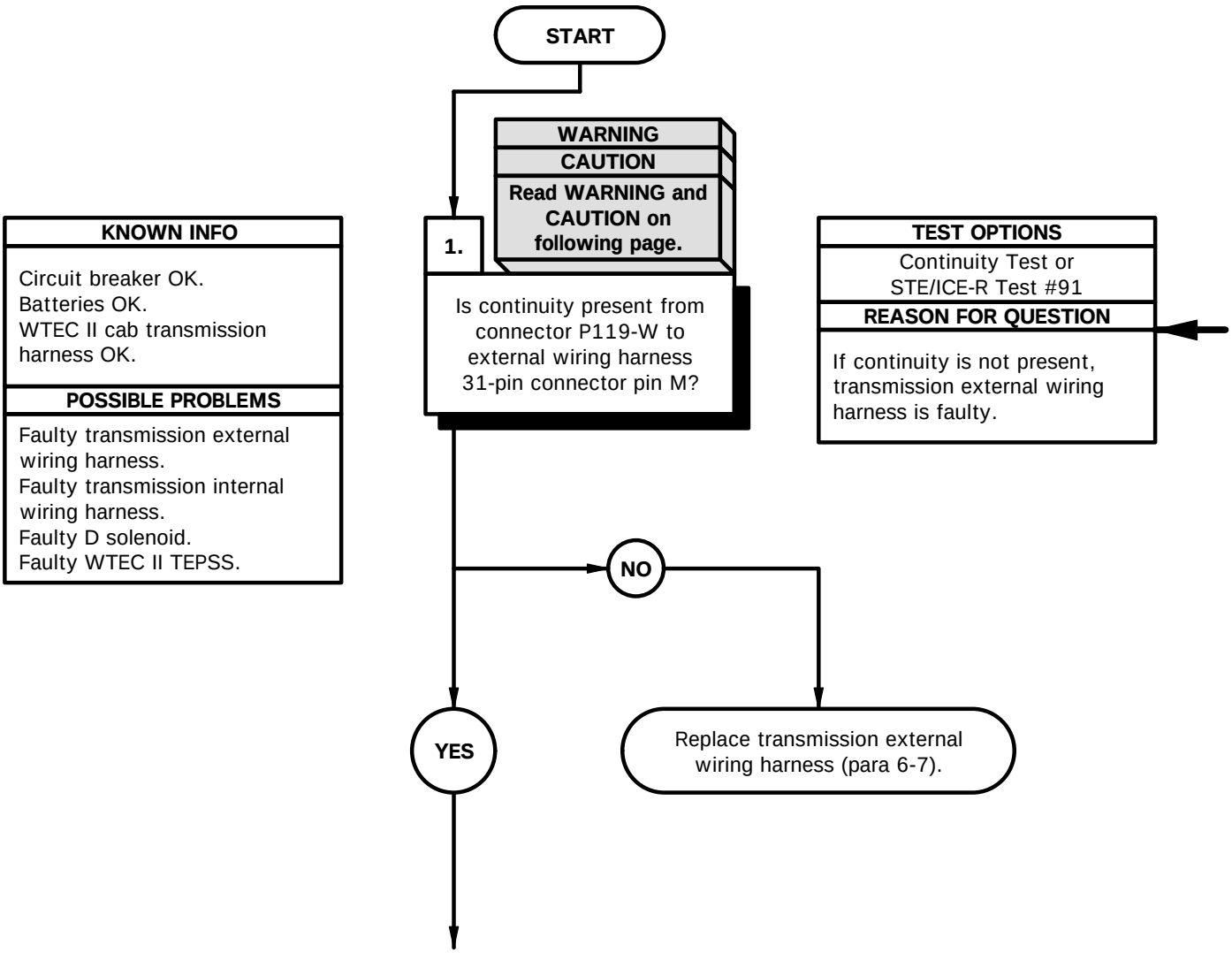
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

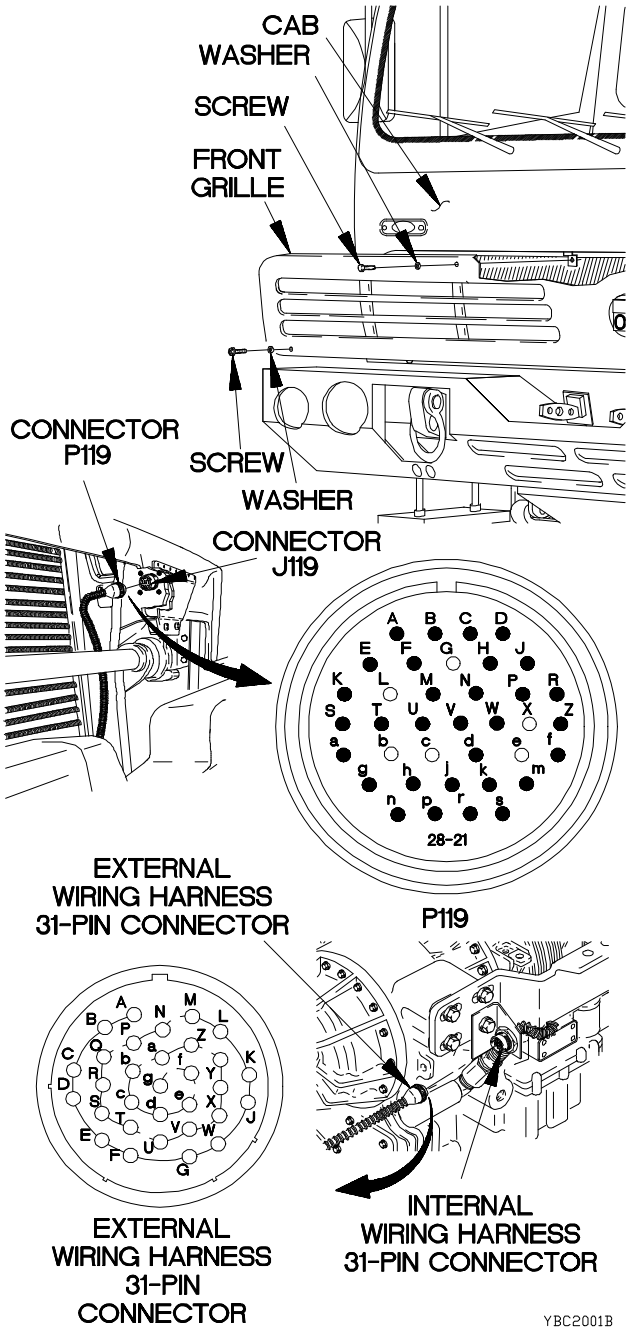
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

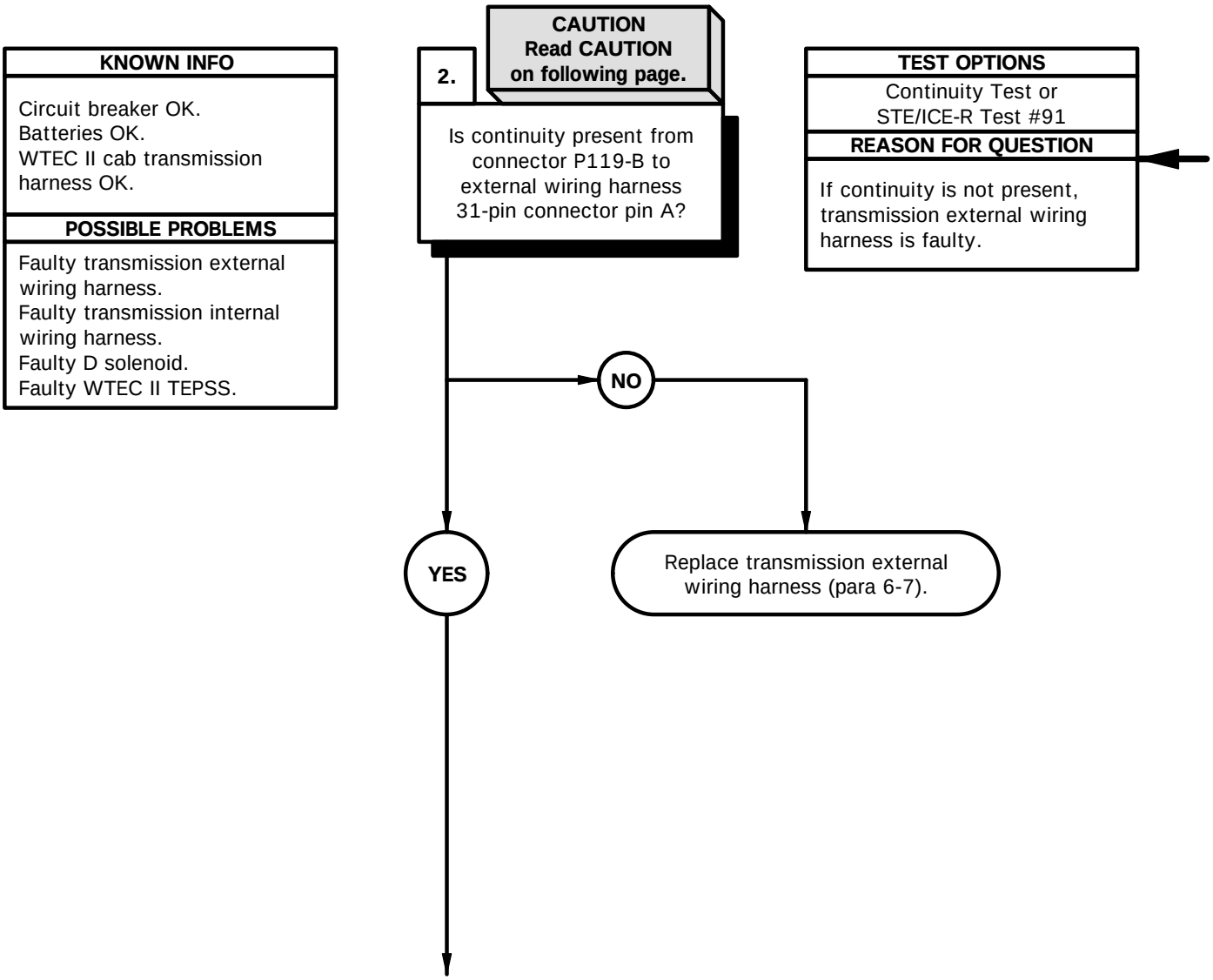
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect positive (+) probe of multimeter to connector P119-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).



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)



CAUTION

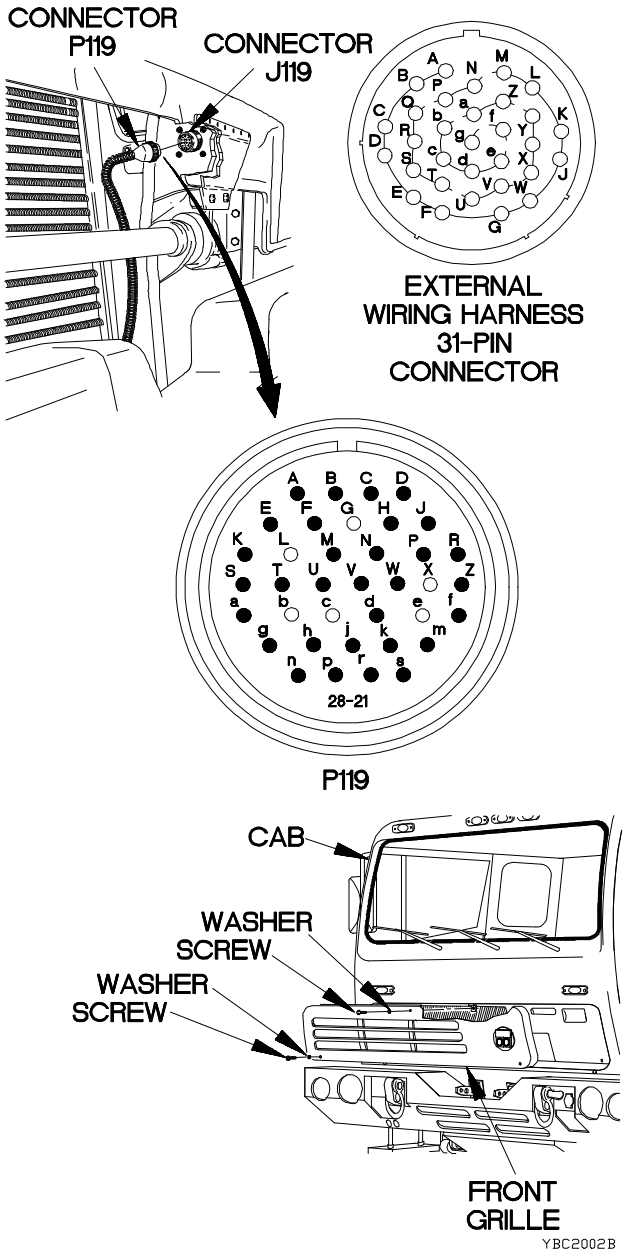
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

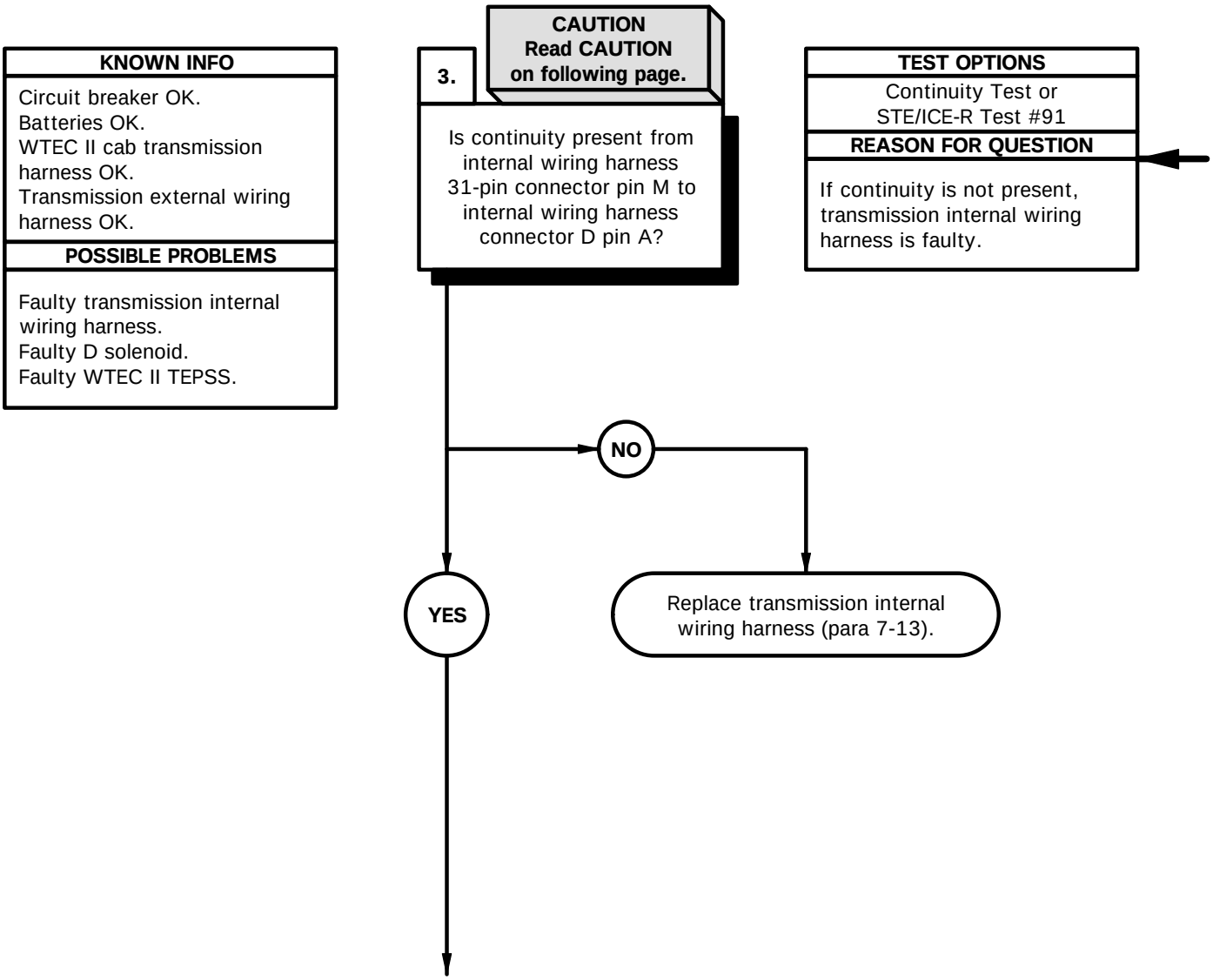
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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)



CAUTION

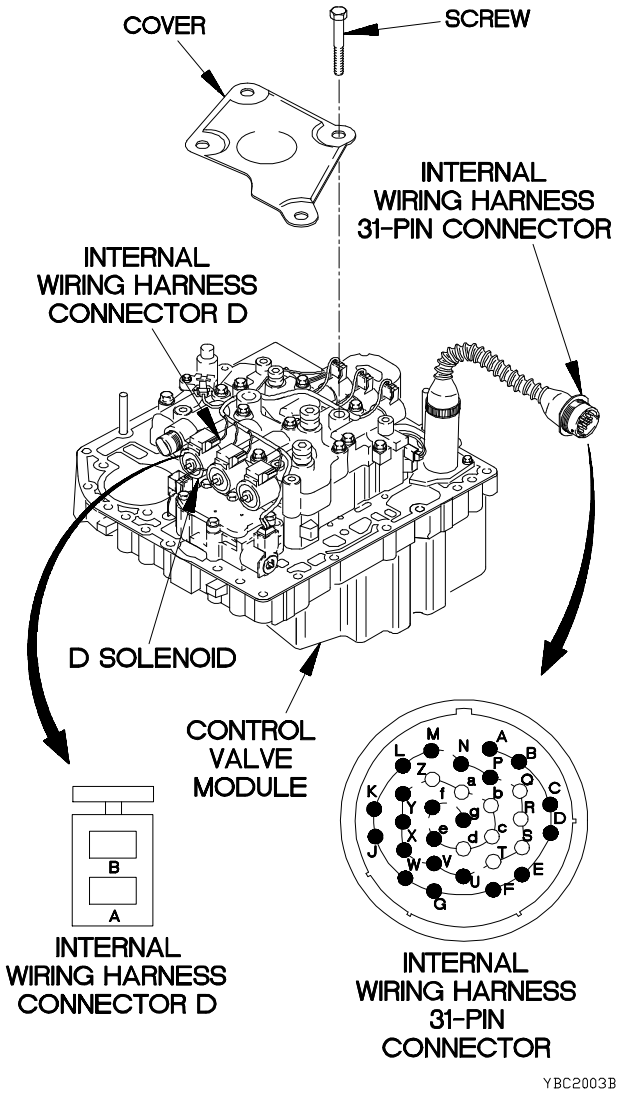
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

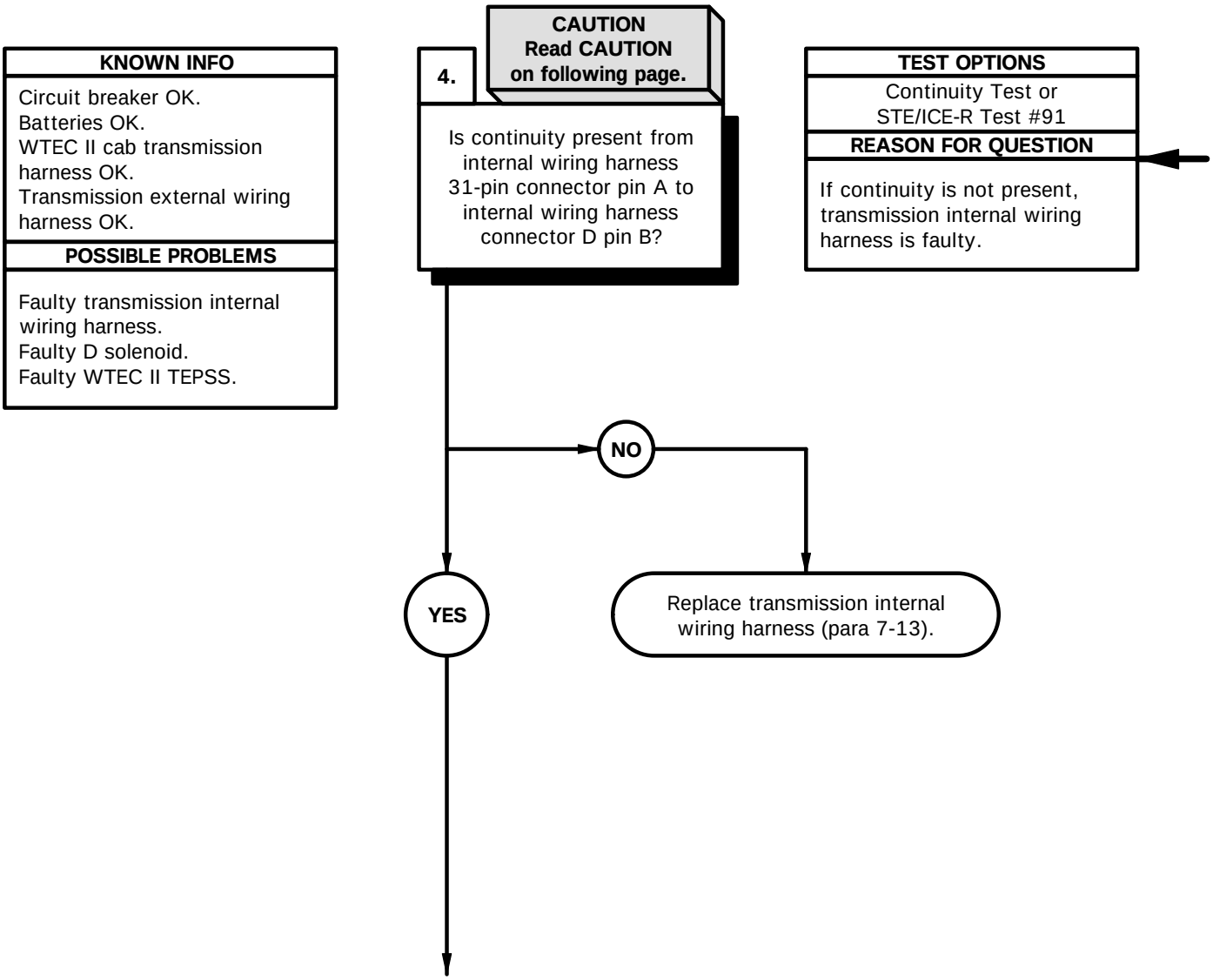
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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 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).



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)



CAUTION

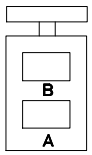
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

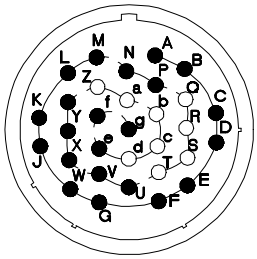
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



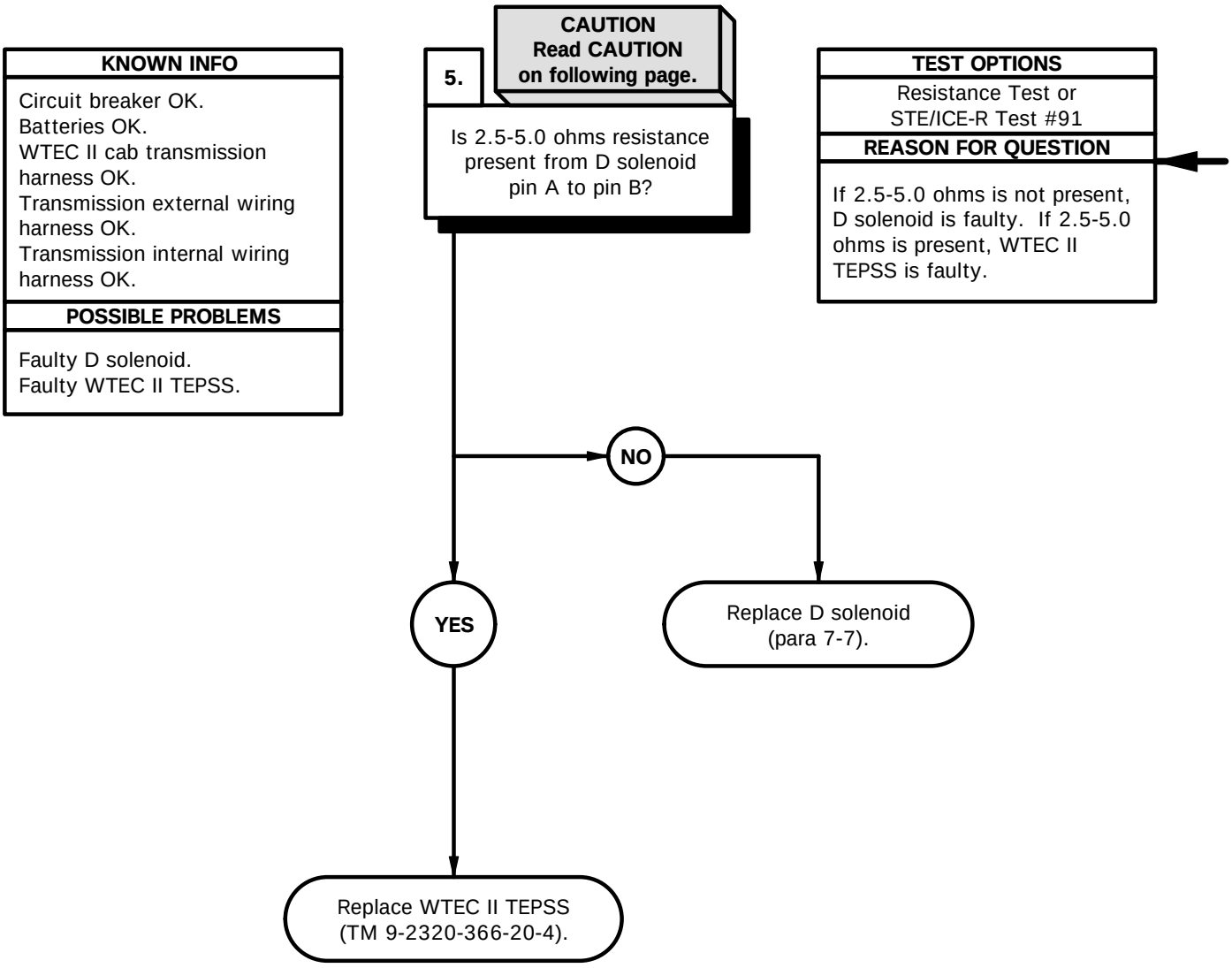
INTERNAL WIRING HARNESS CONNECTOR D



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)



CAUTION

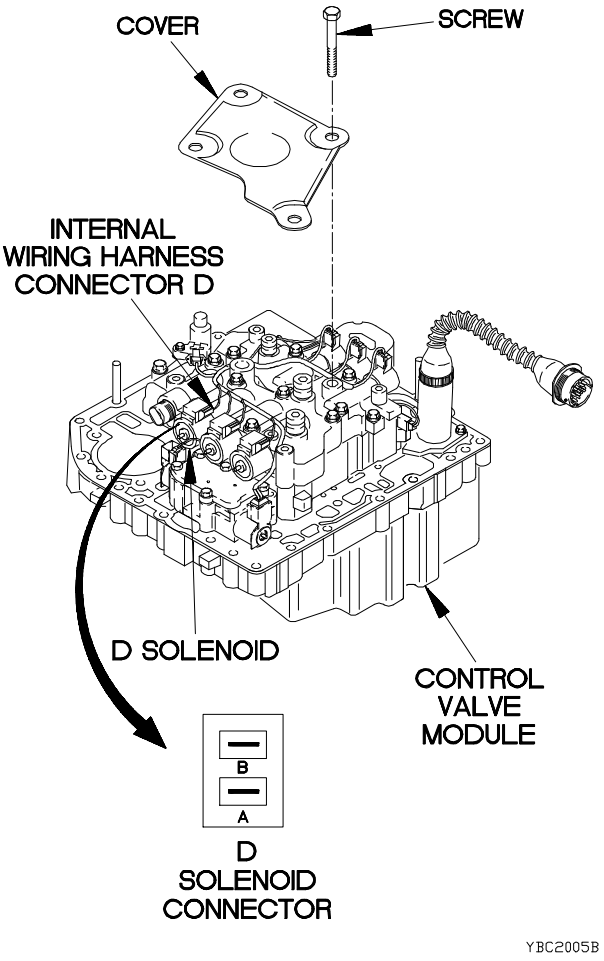
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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).



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

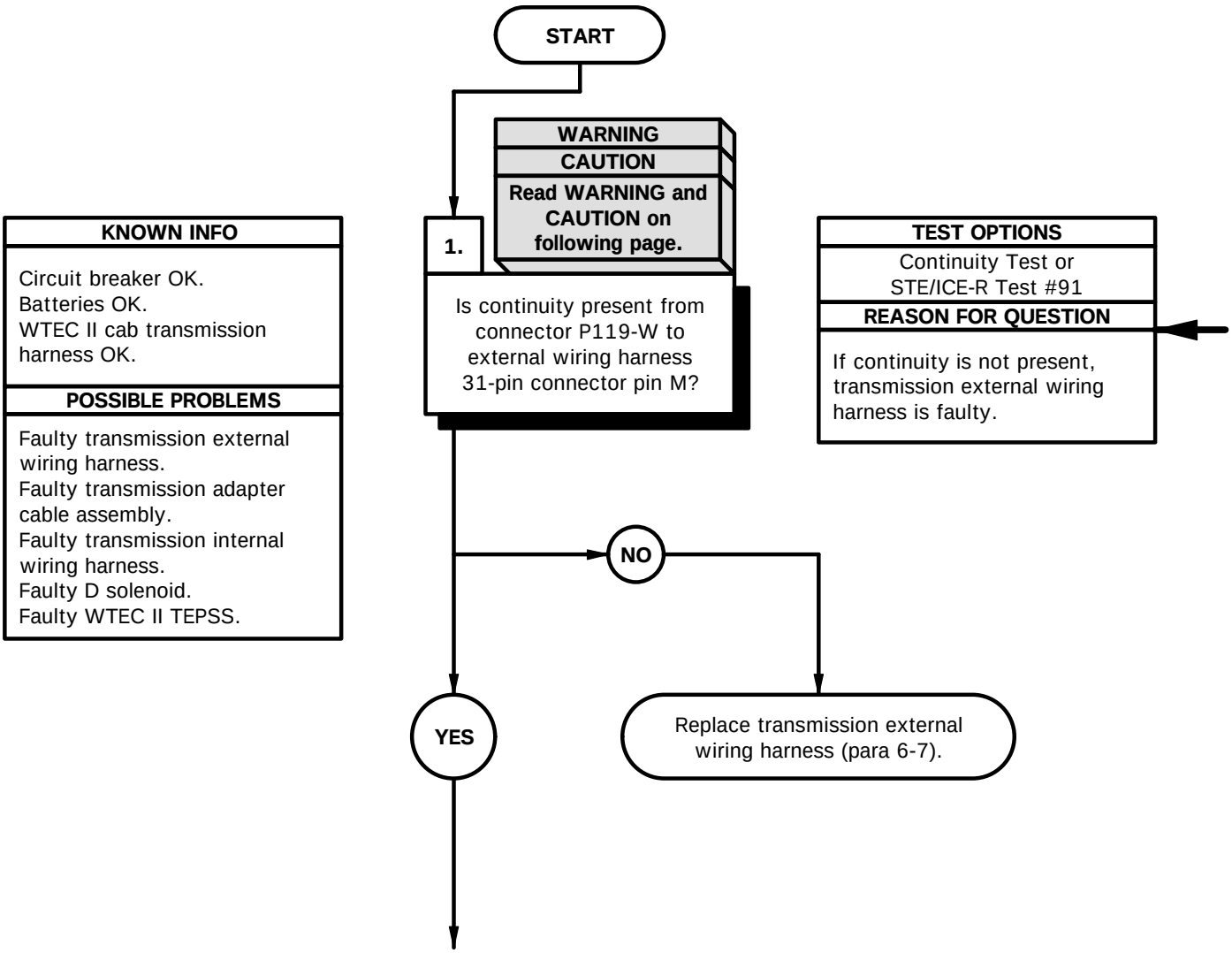
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

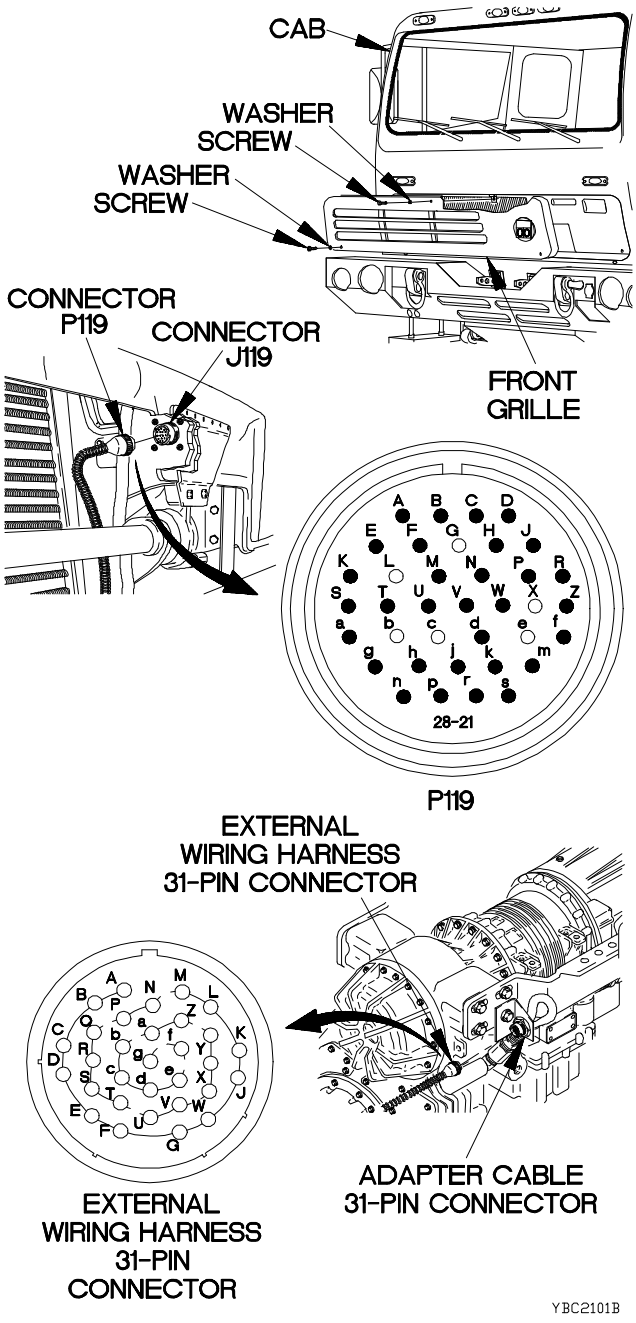
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

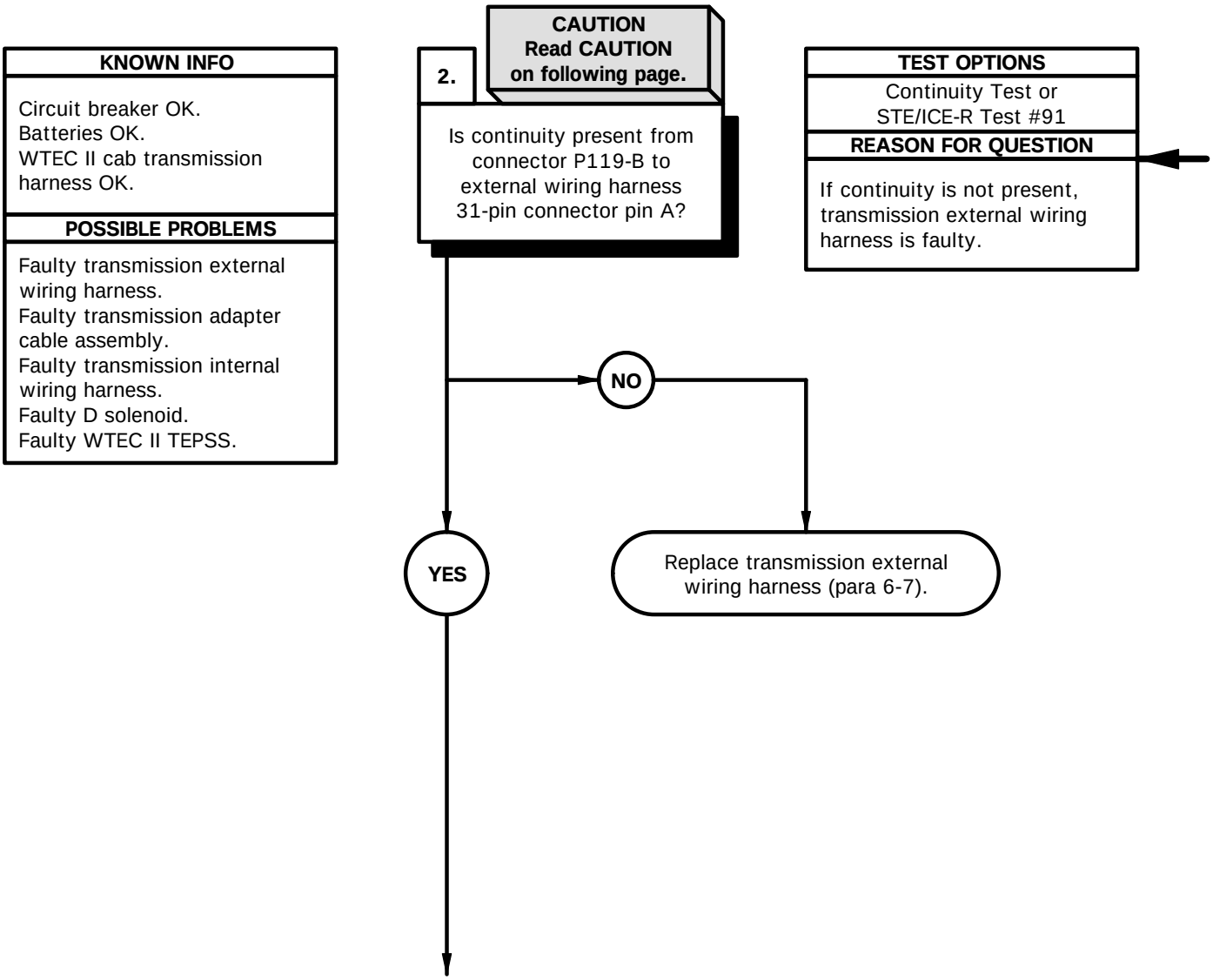
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from adapter cable 31-pin connector.
(6) Set multimeter to ohms.
(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).



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)



CAUTION

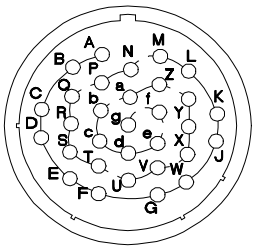
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

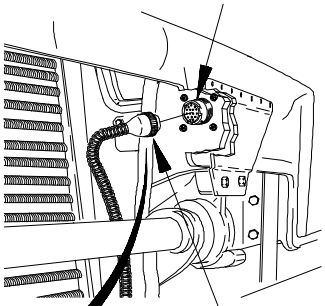
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).

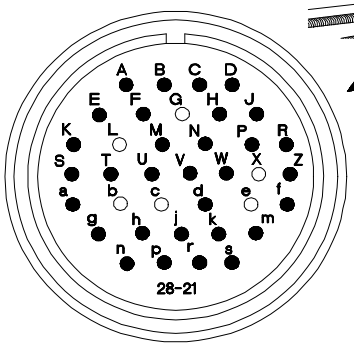


EXTERNAL WIRING HARNESS 31-PIN CONNECTOR

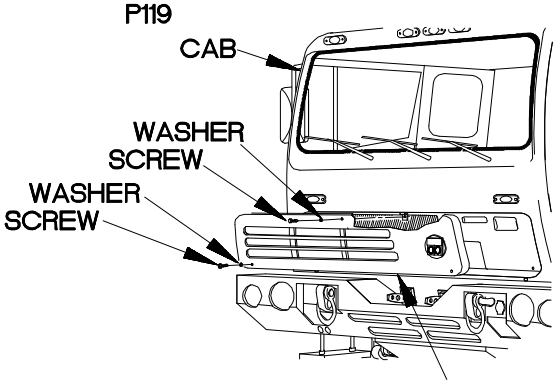


CONNECTOR J119

CONNECTOR P119

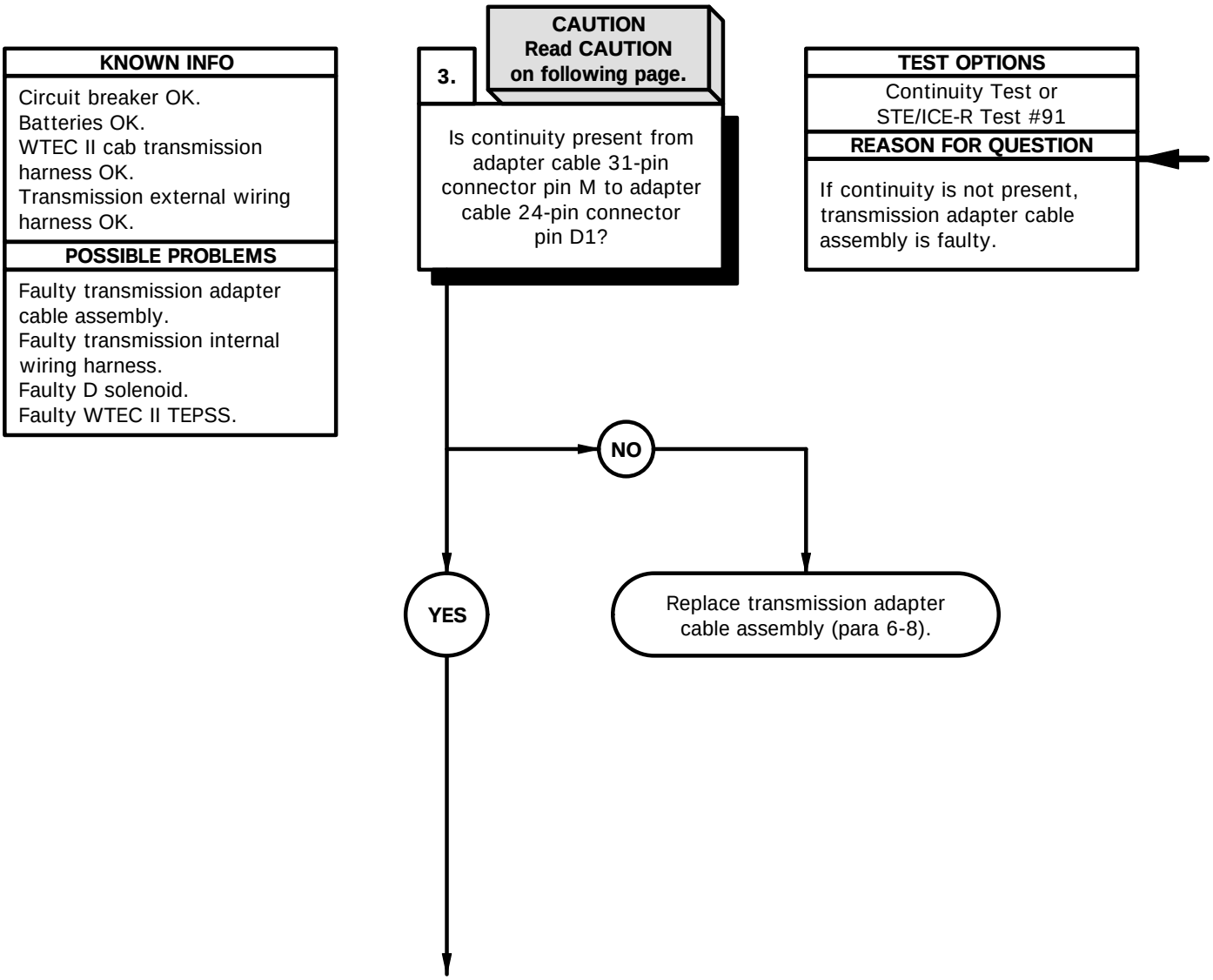


P119



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)

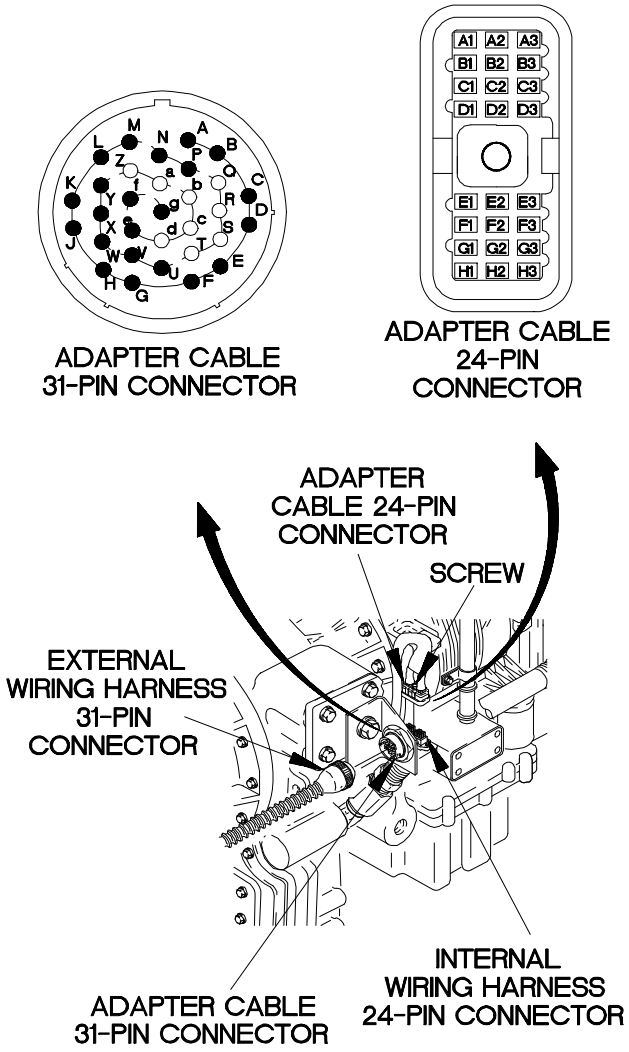


CAUTION

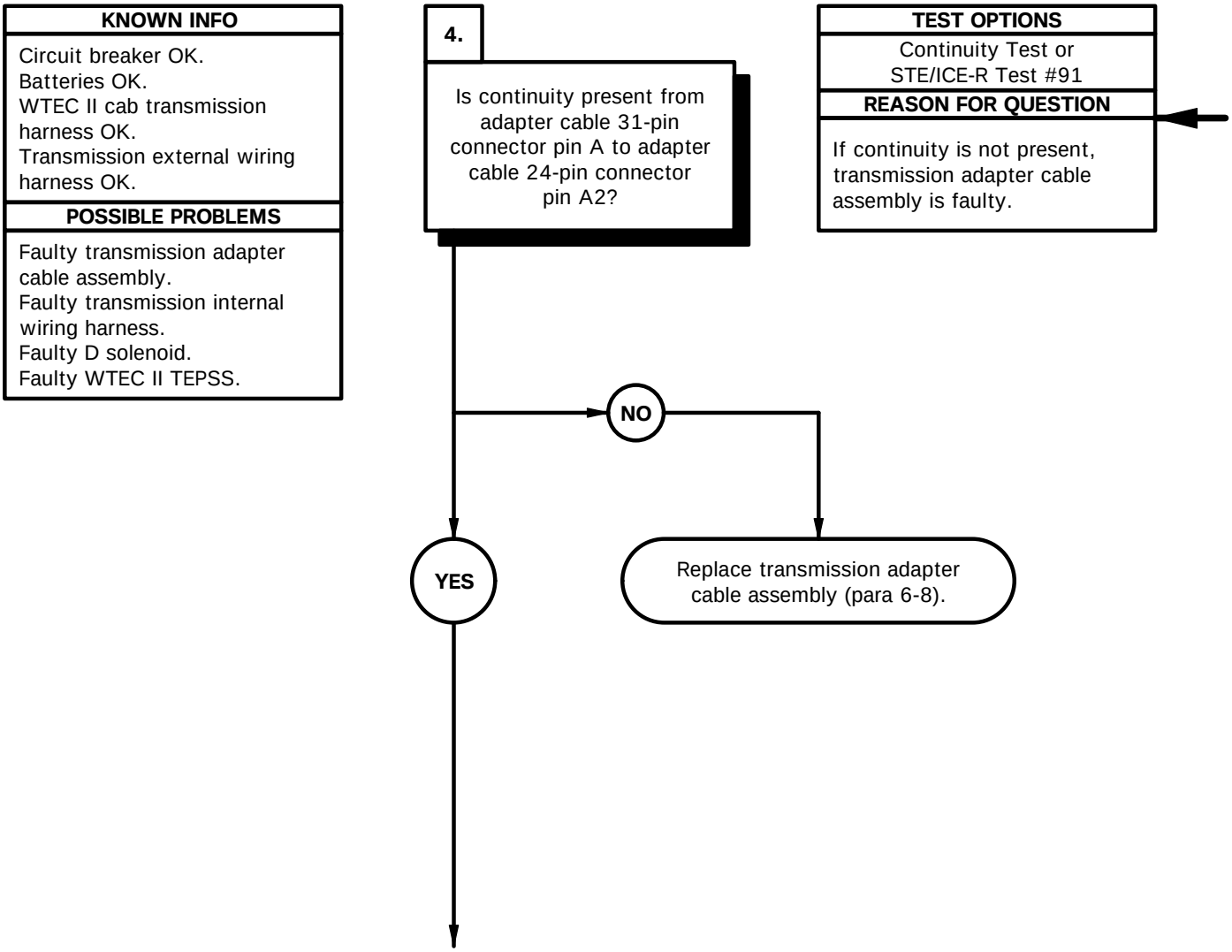
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

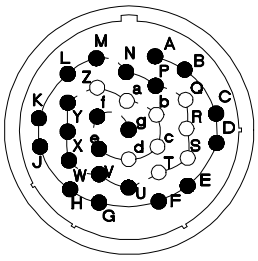


c21. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

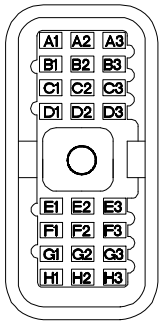


CONTINUITY TEST

(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.



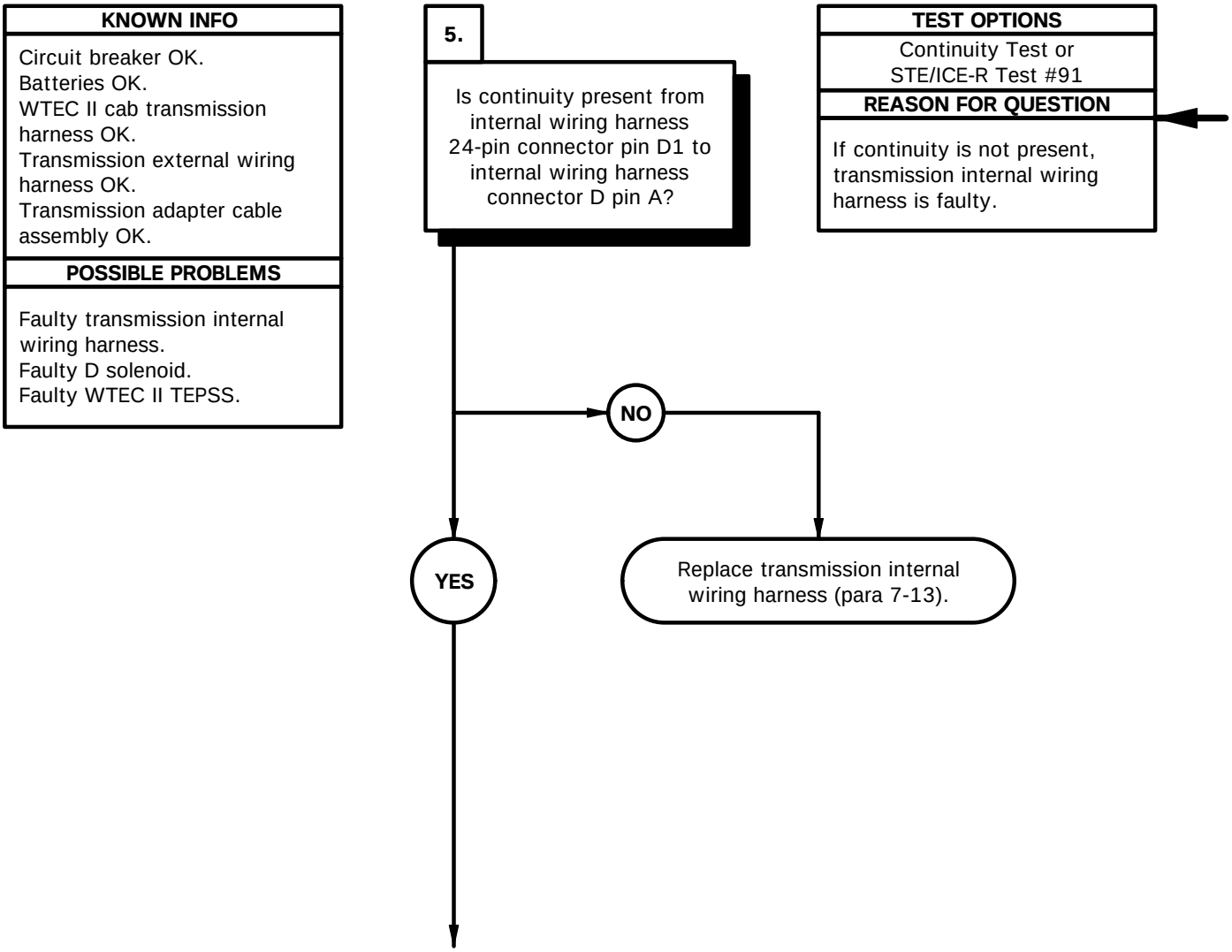
ADAPTER CABLE
31-PIN CONNECTOR



ADAPTER CABLE
24-PIN
CONNECTOR

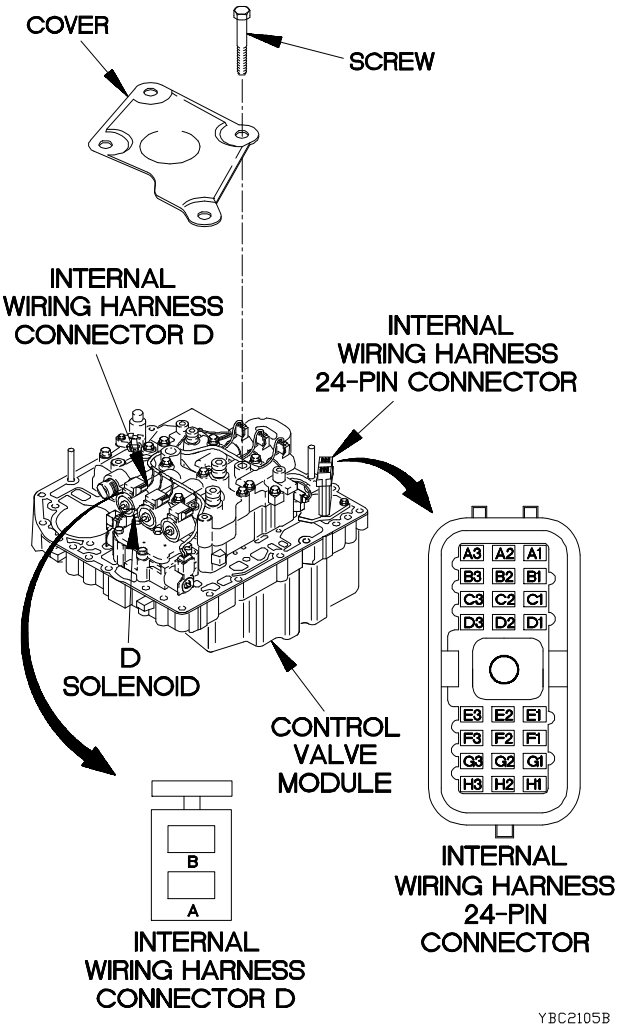
YBC2104B

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)

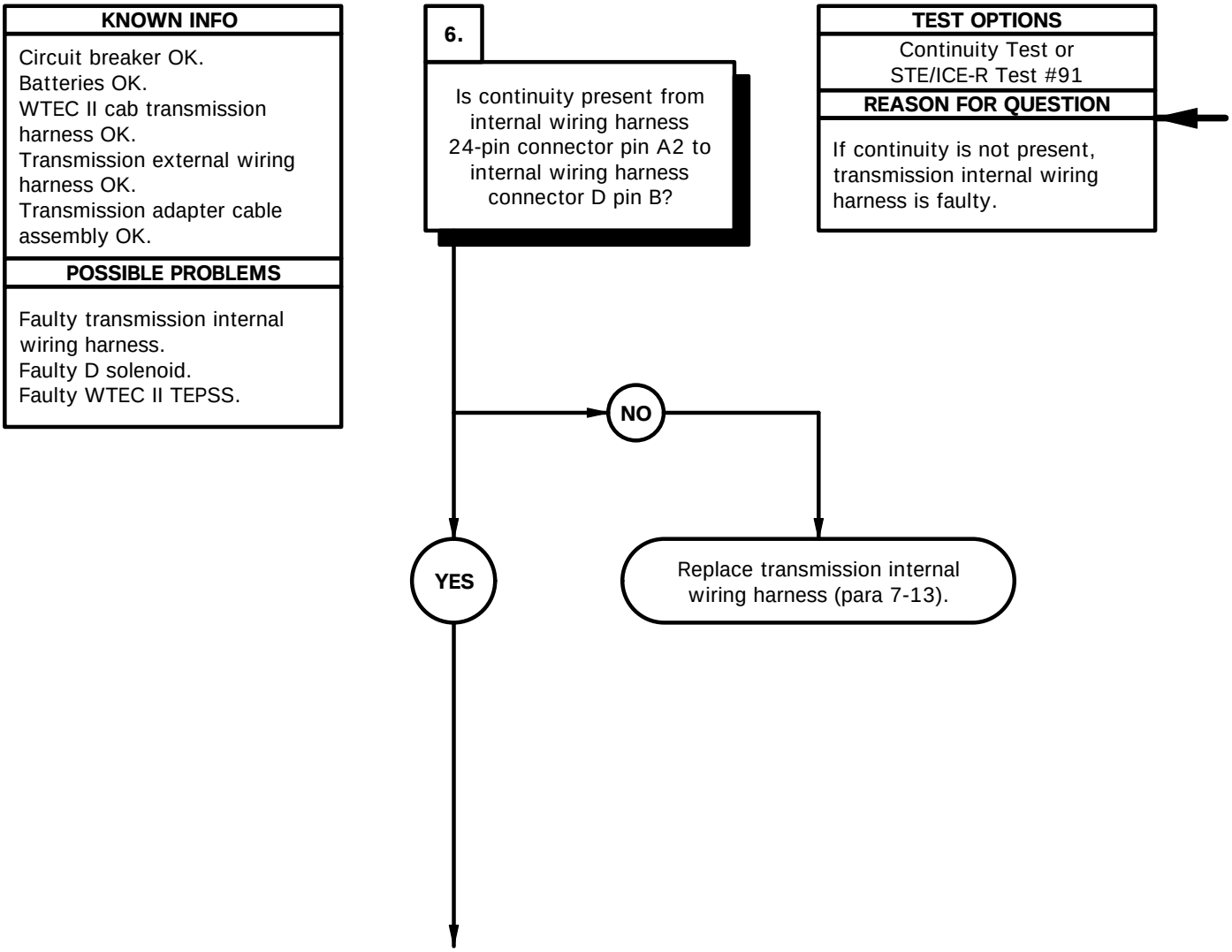


CONTINUITY TEST

(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).

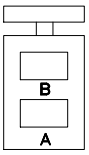


c21. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

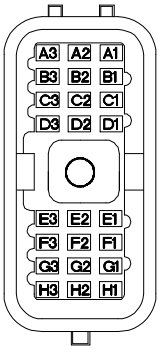


CONTINUITY TEST

(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).



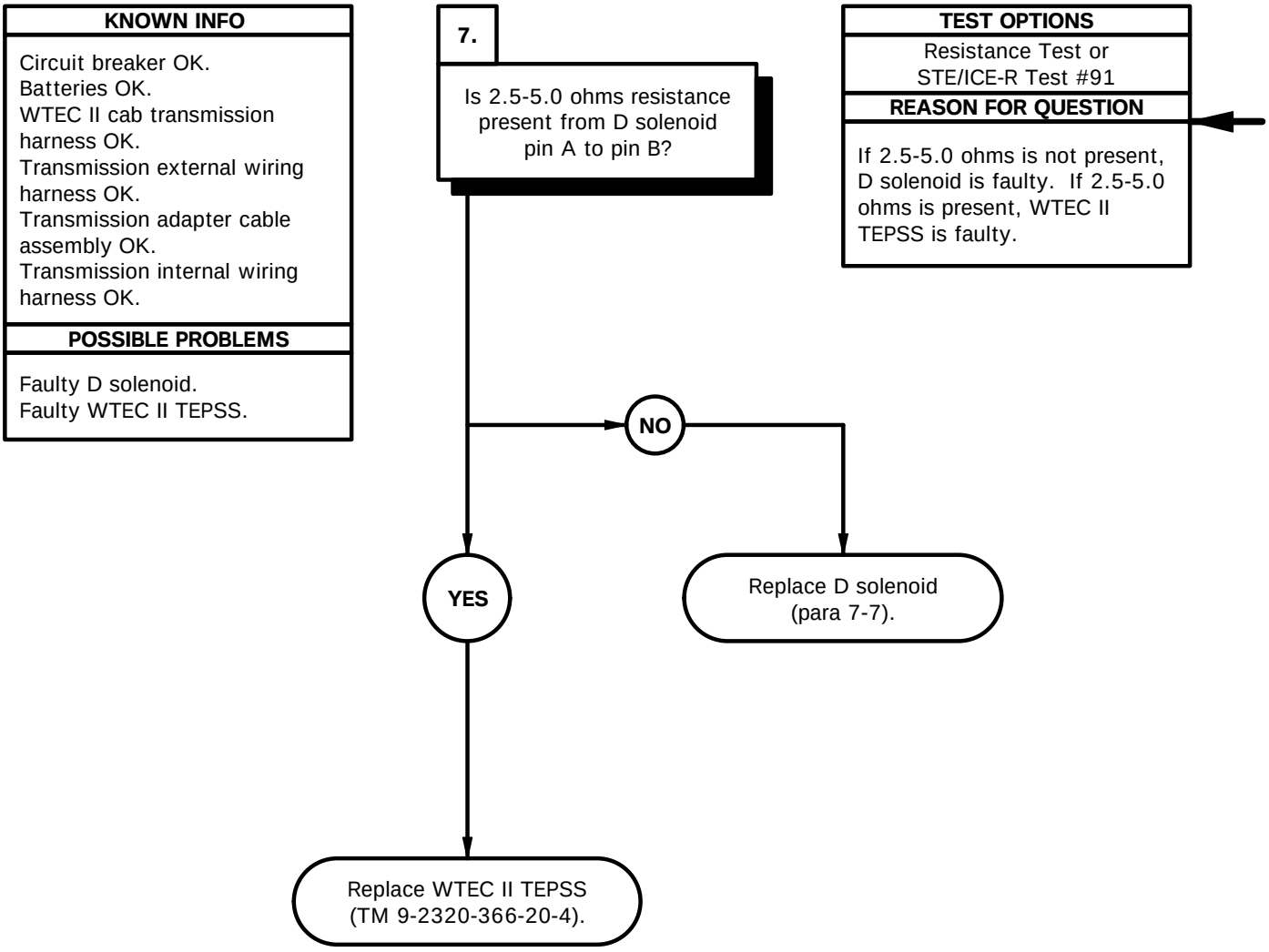
INTERNAL WIRING HARNESS CONNECTOR D



INTERNAL WIRING HARNESS 24-PIN CONNECTOR

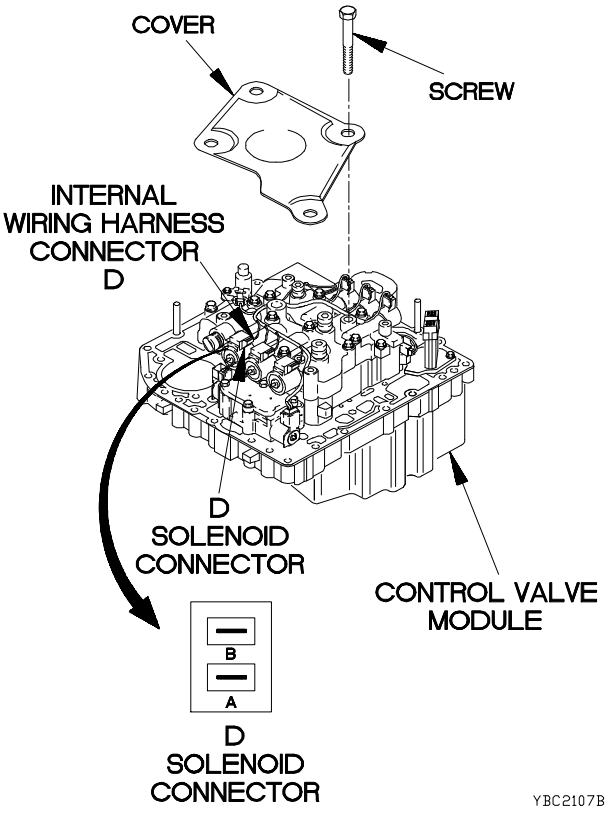
YBC2106B

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)



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).



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).

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)

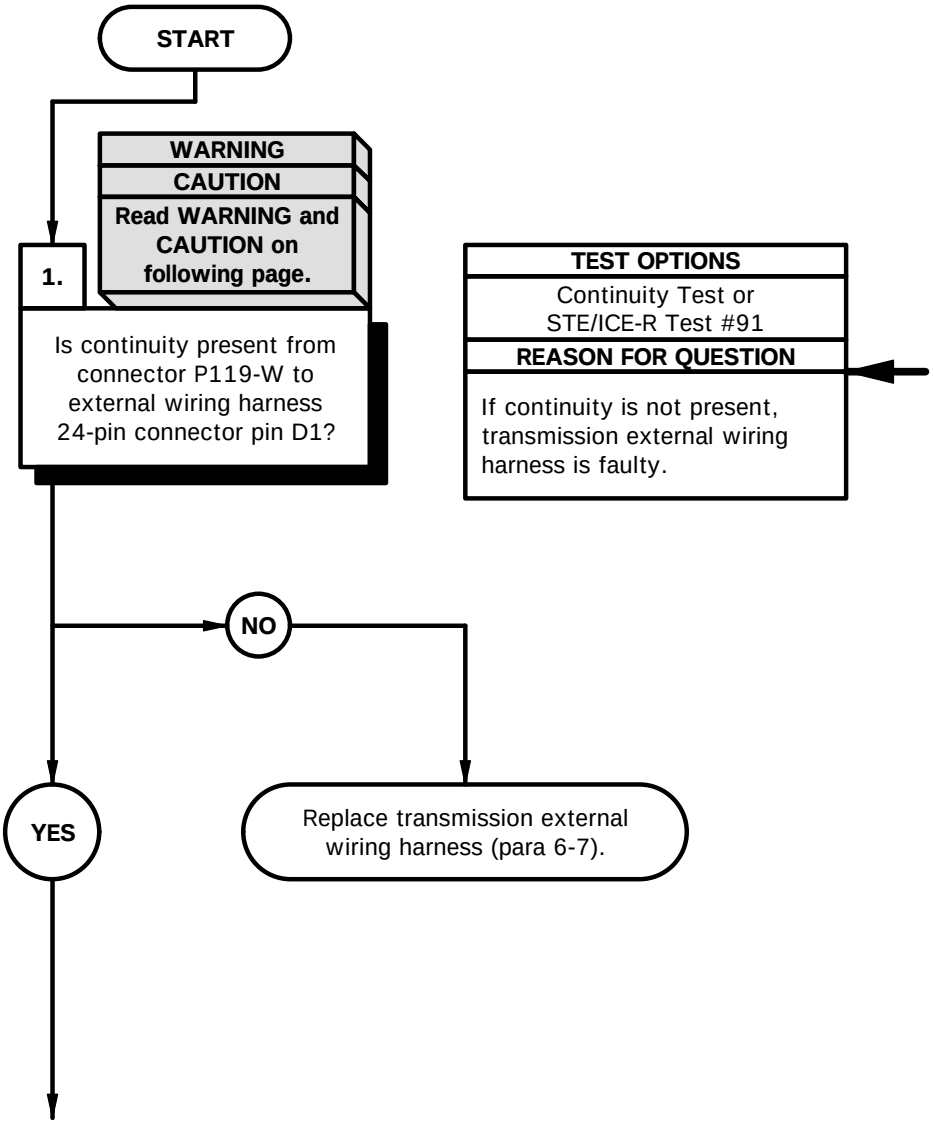
References
TM 9-4910-571-12&P

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.



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

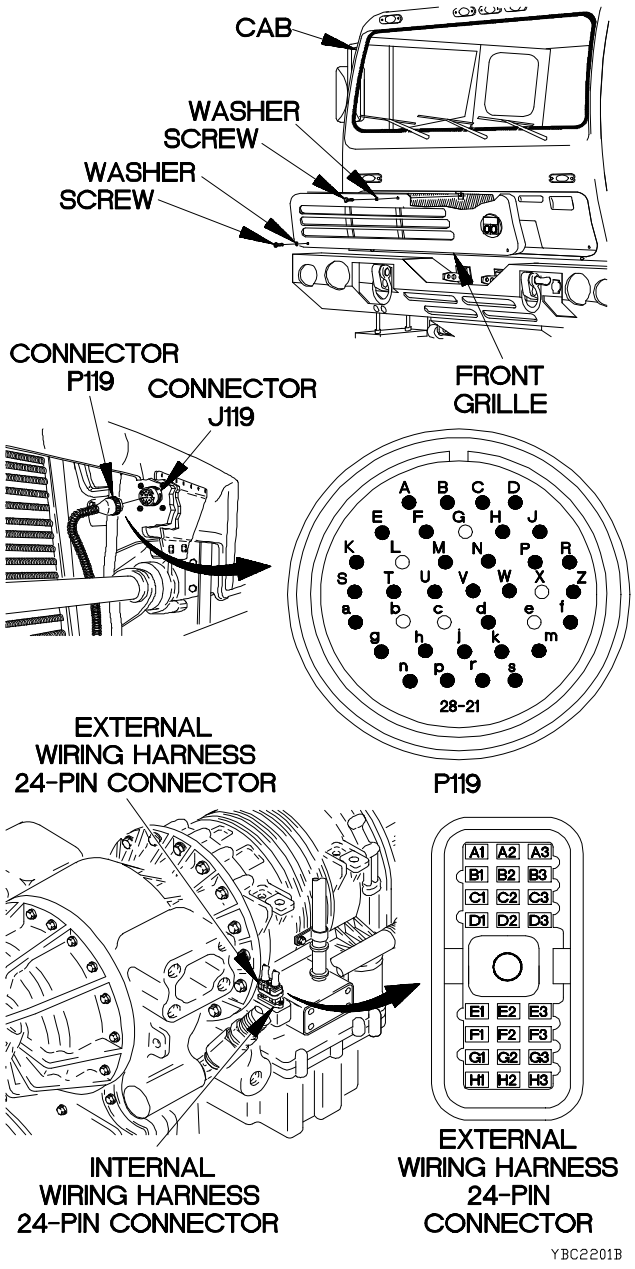
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

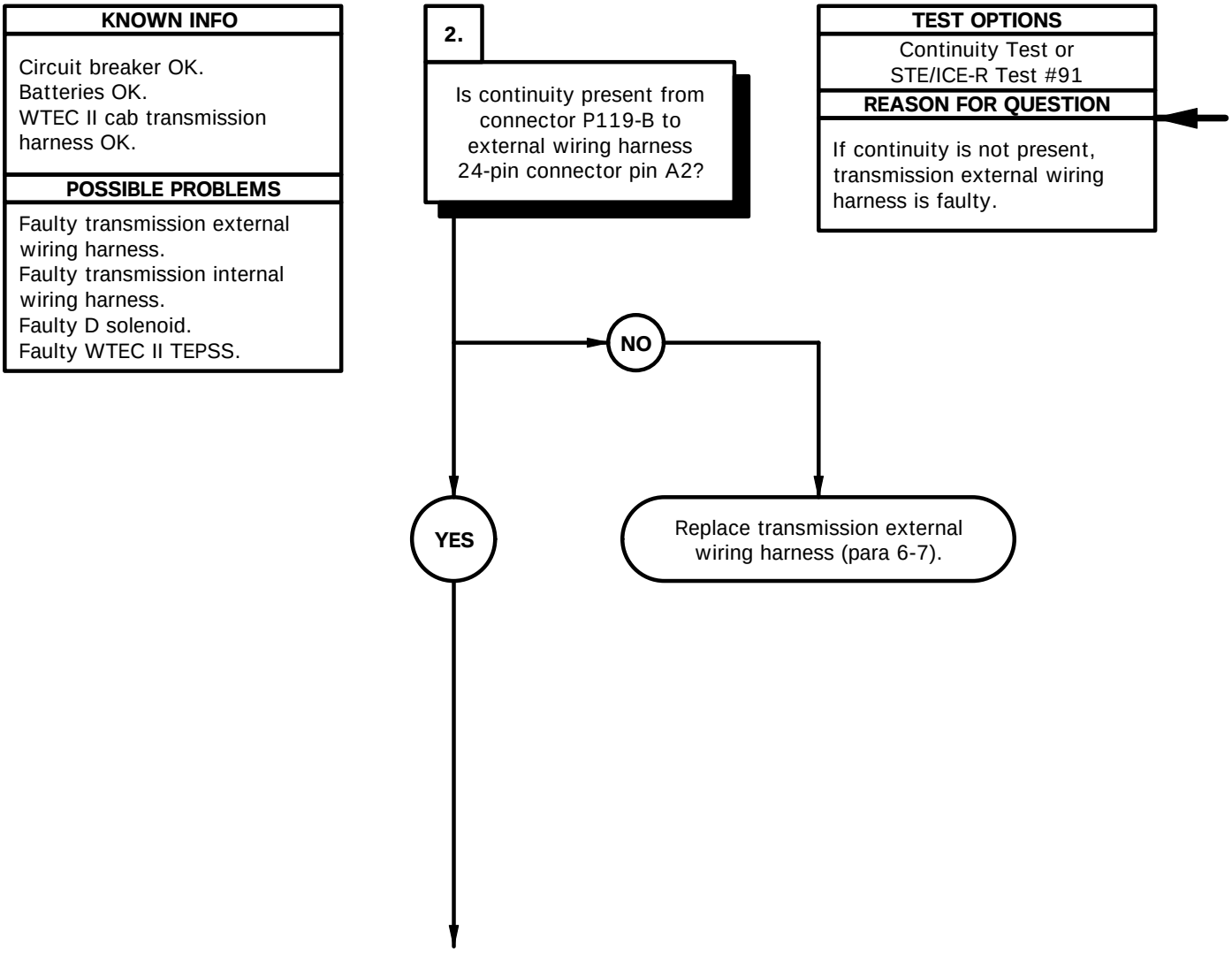
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Loosen screw in external wiring harness 24-pin connector.
(6) Disconnect external wiring harness 24-pin connector 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).

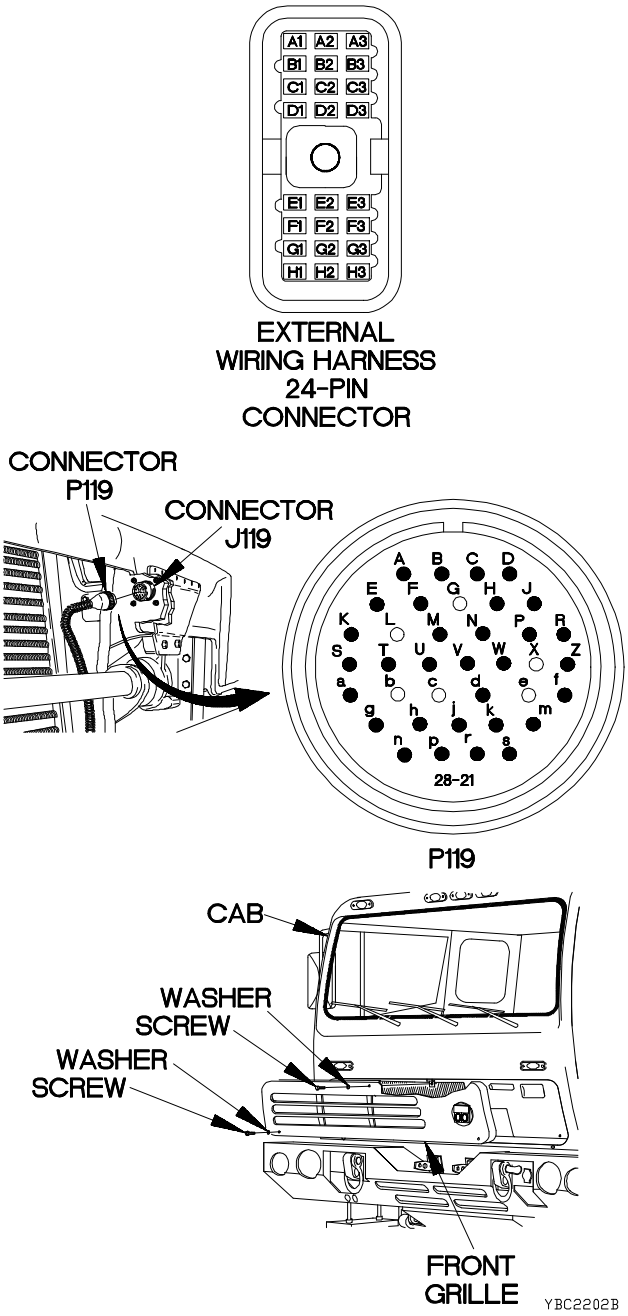


c22. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

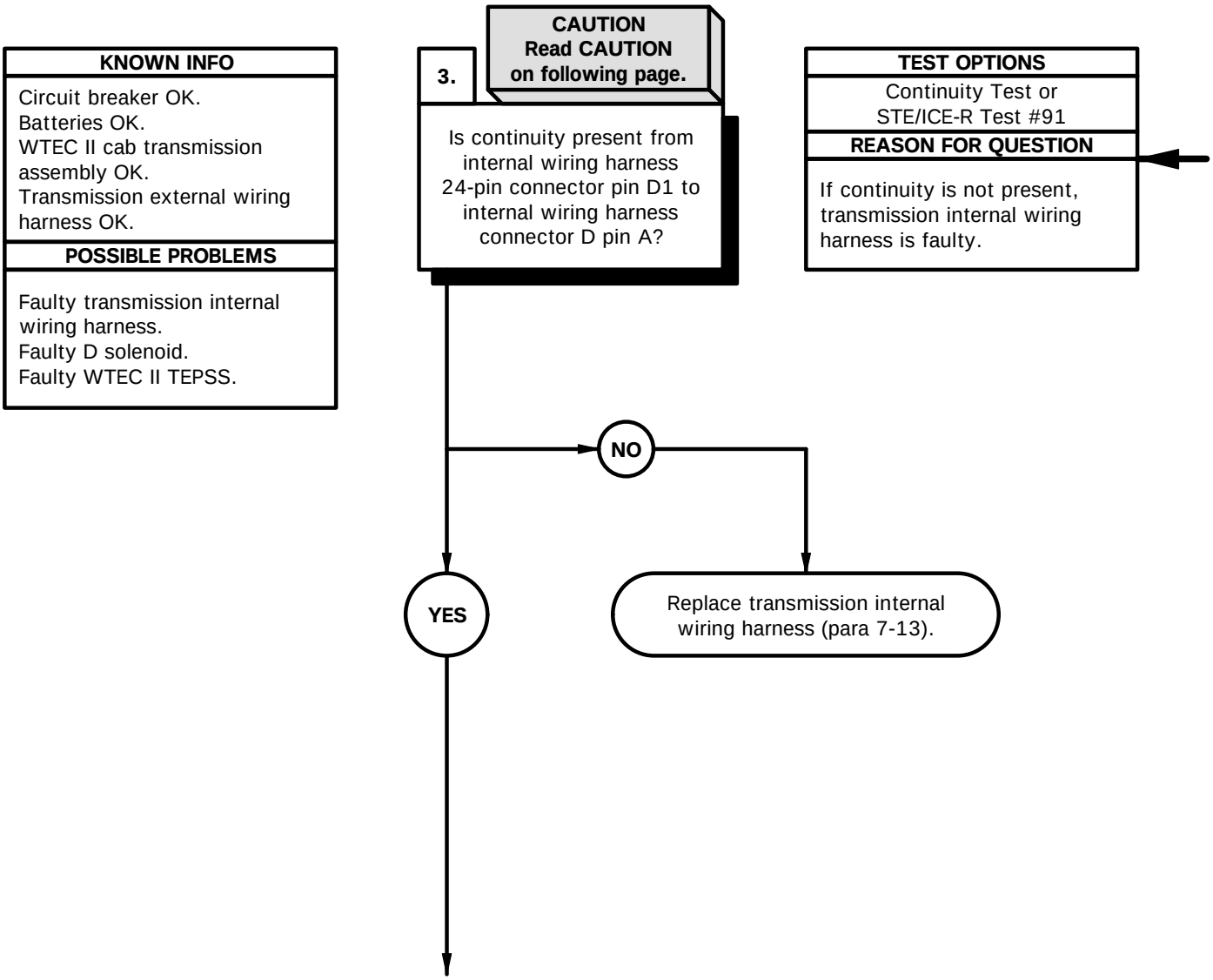


CONTINUITY TEST

(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).



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)



CAUTION

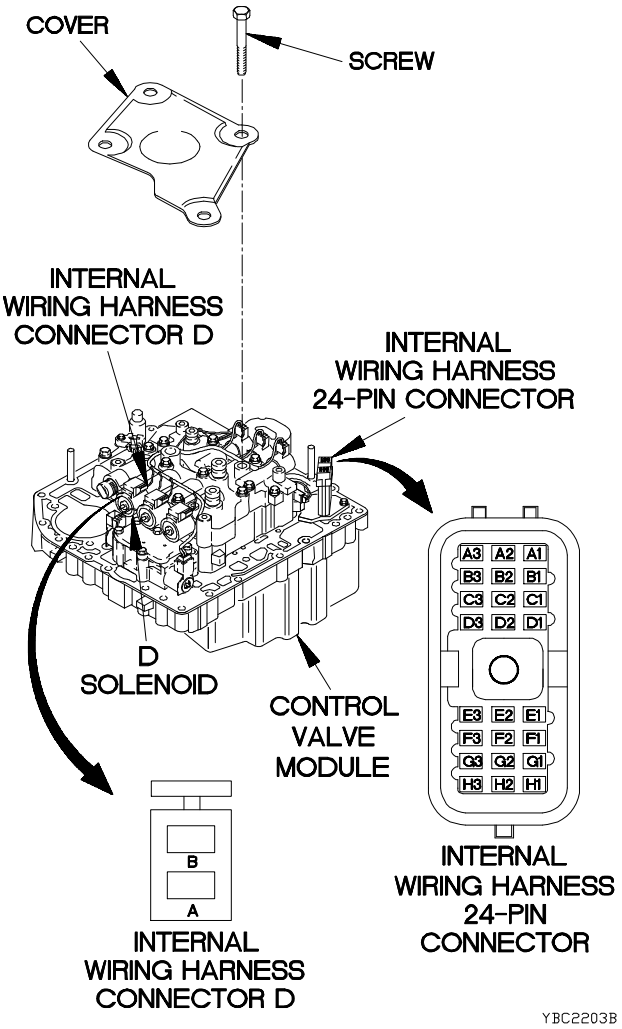
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

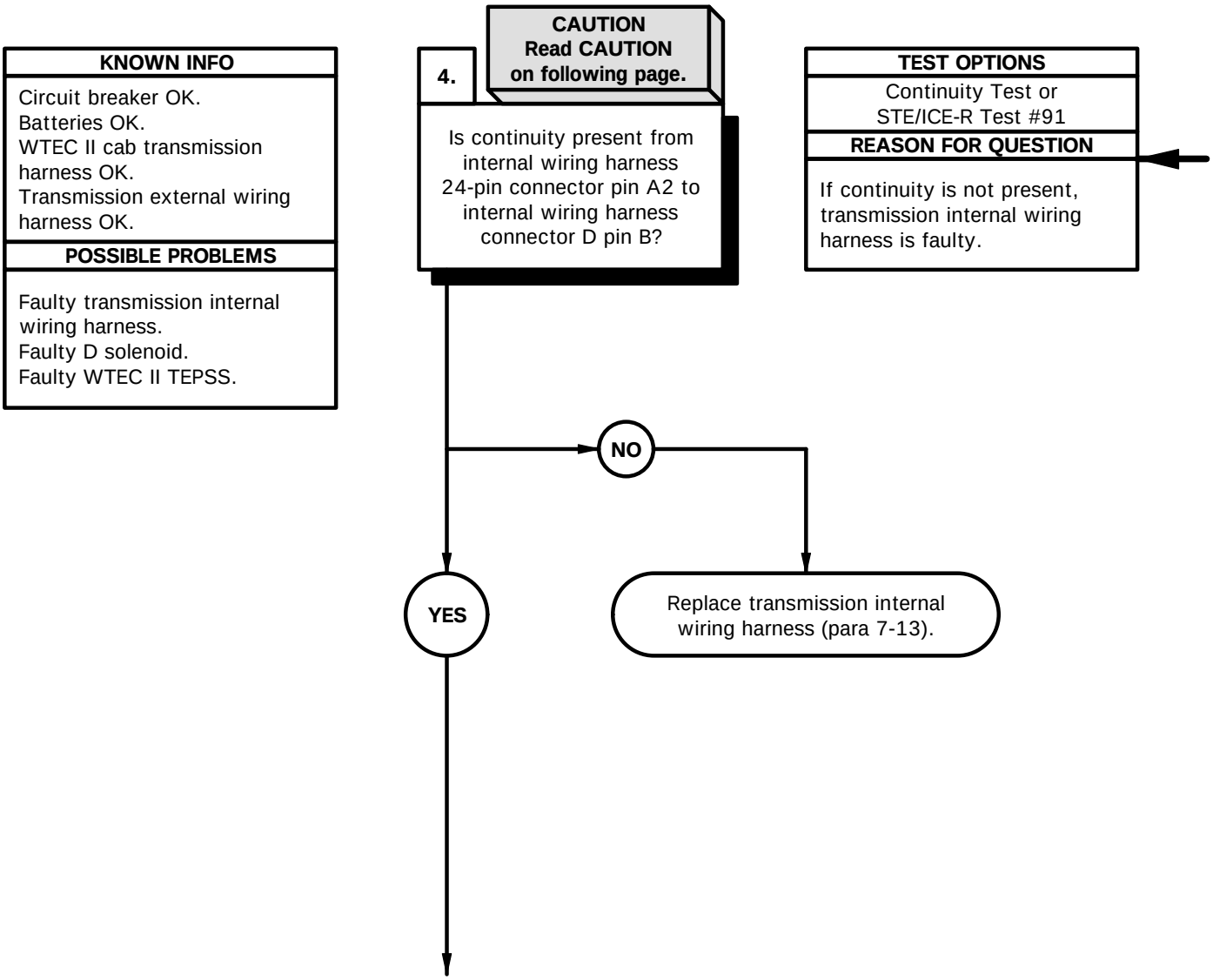
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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 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).



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)



CAUTION

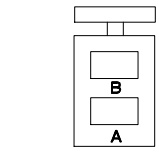
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

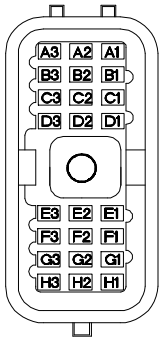
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



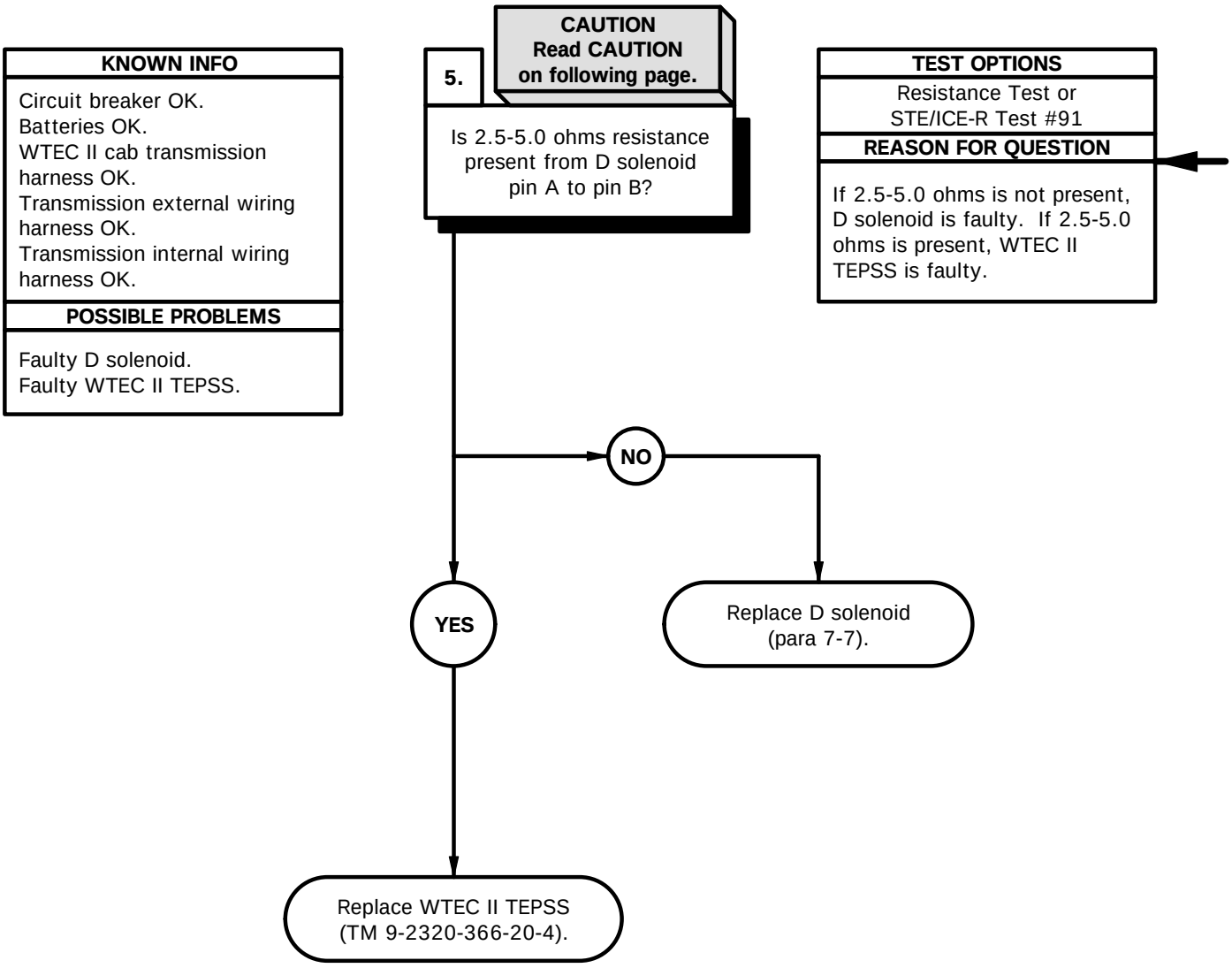
INTERNAL WIRING HARNESS CONNECTOR D



INTERNAL WIRING HARNESS 24-PIN CONNECTOR

YBC2204B

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)



CAUTION

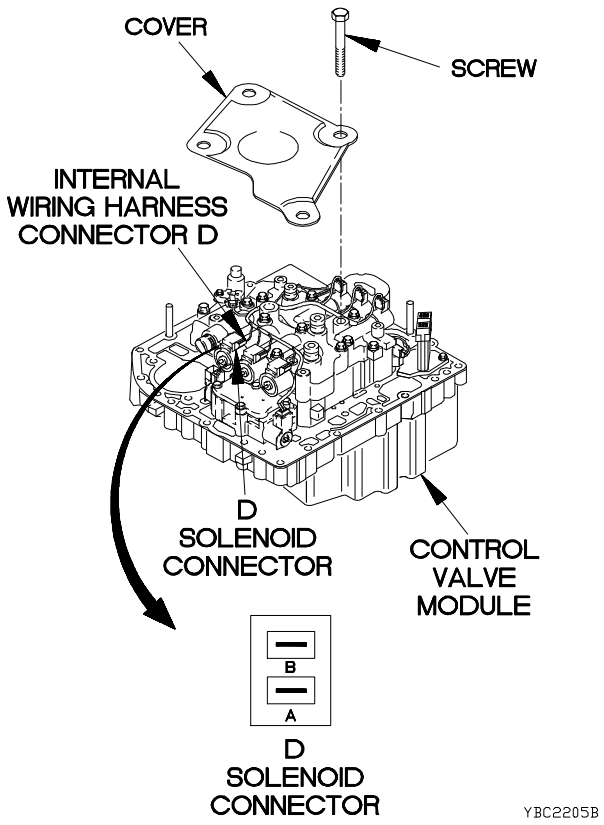
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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).



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

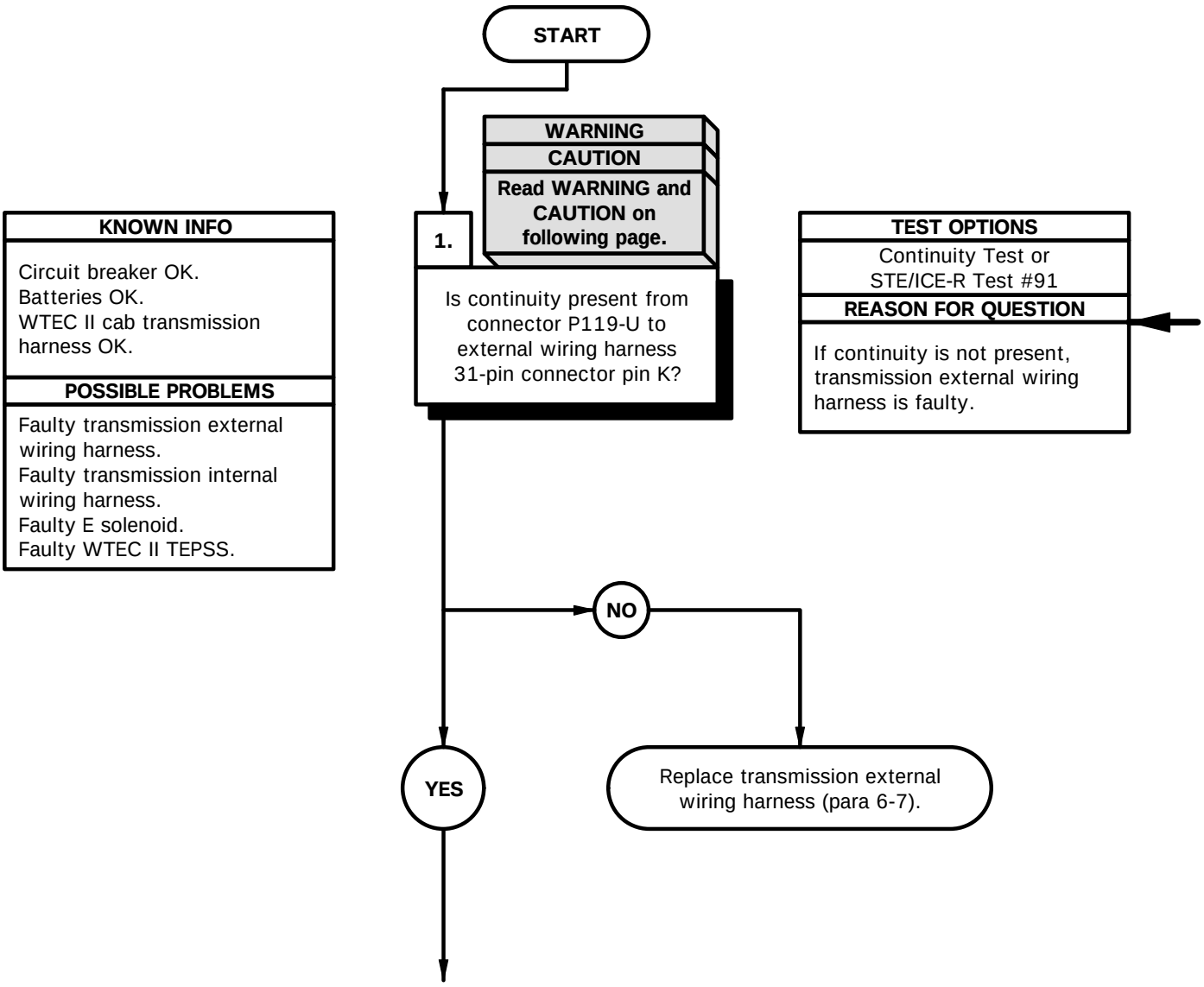
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

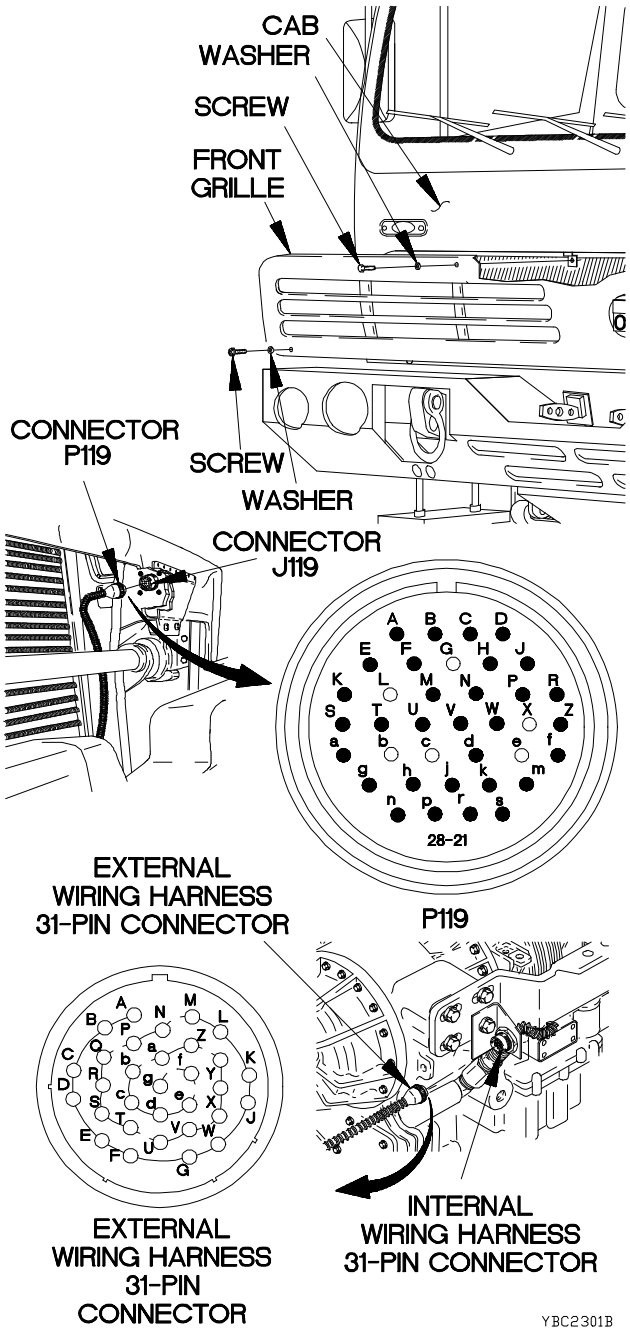
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

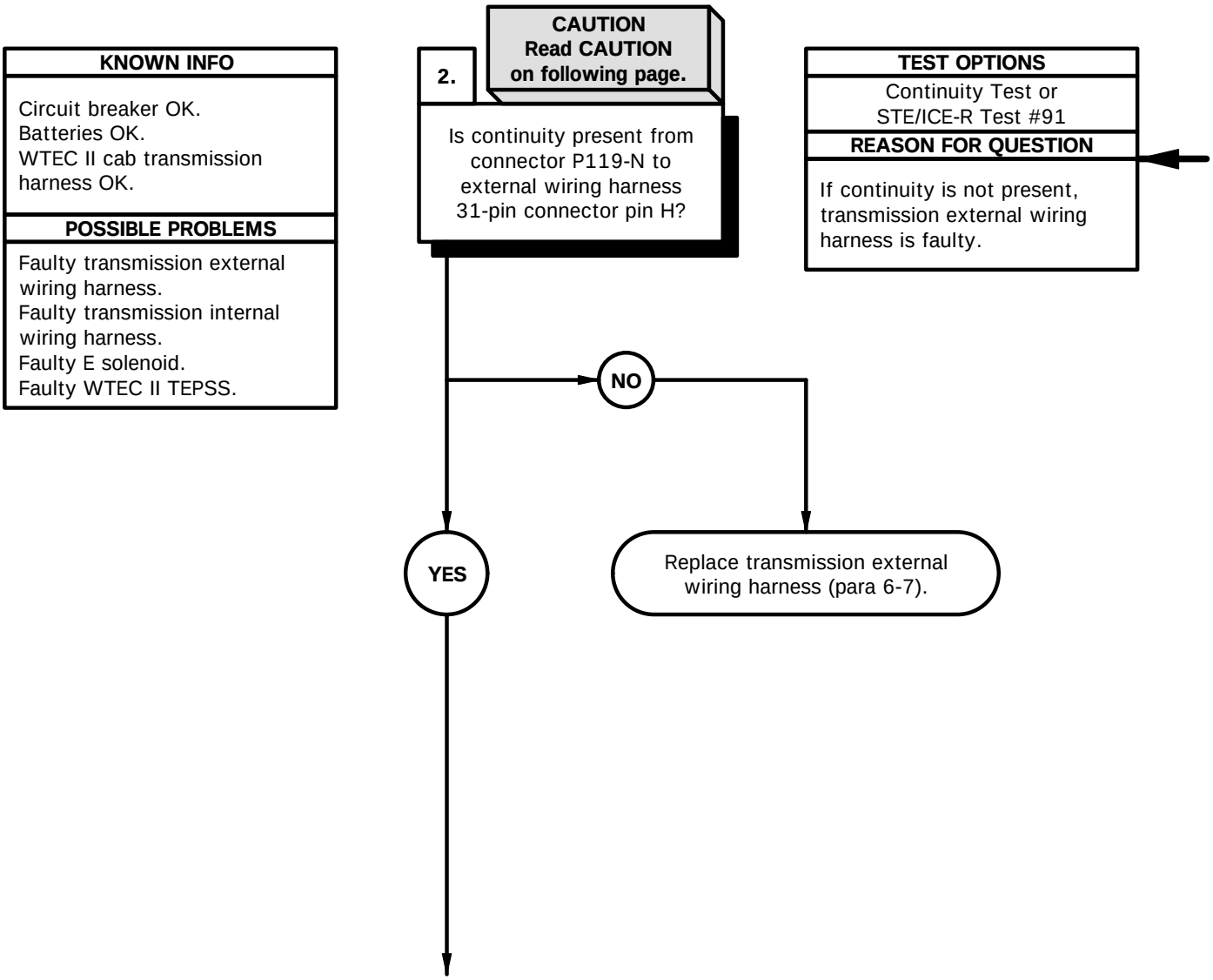
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin connector.
(6) Set multimeter 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).



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)



CAUTION

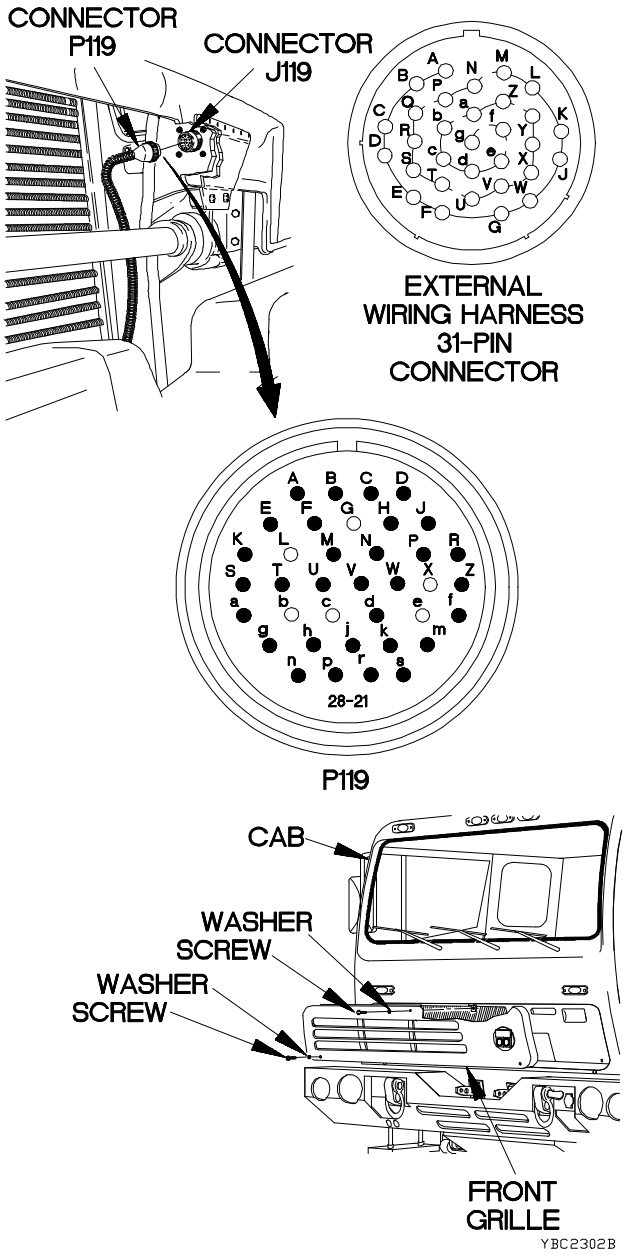
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

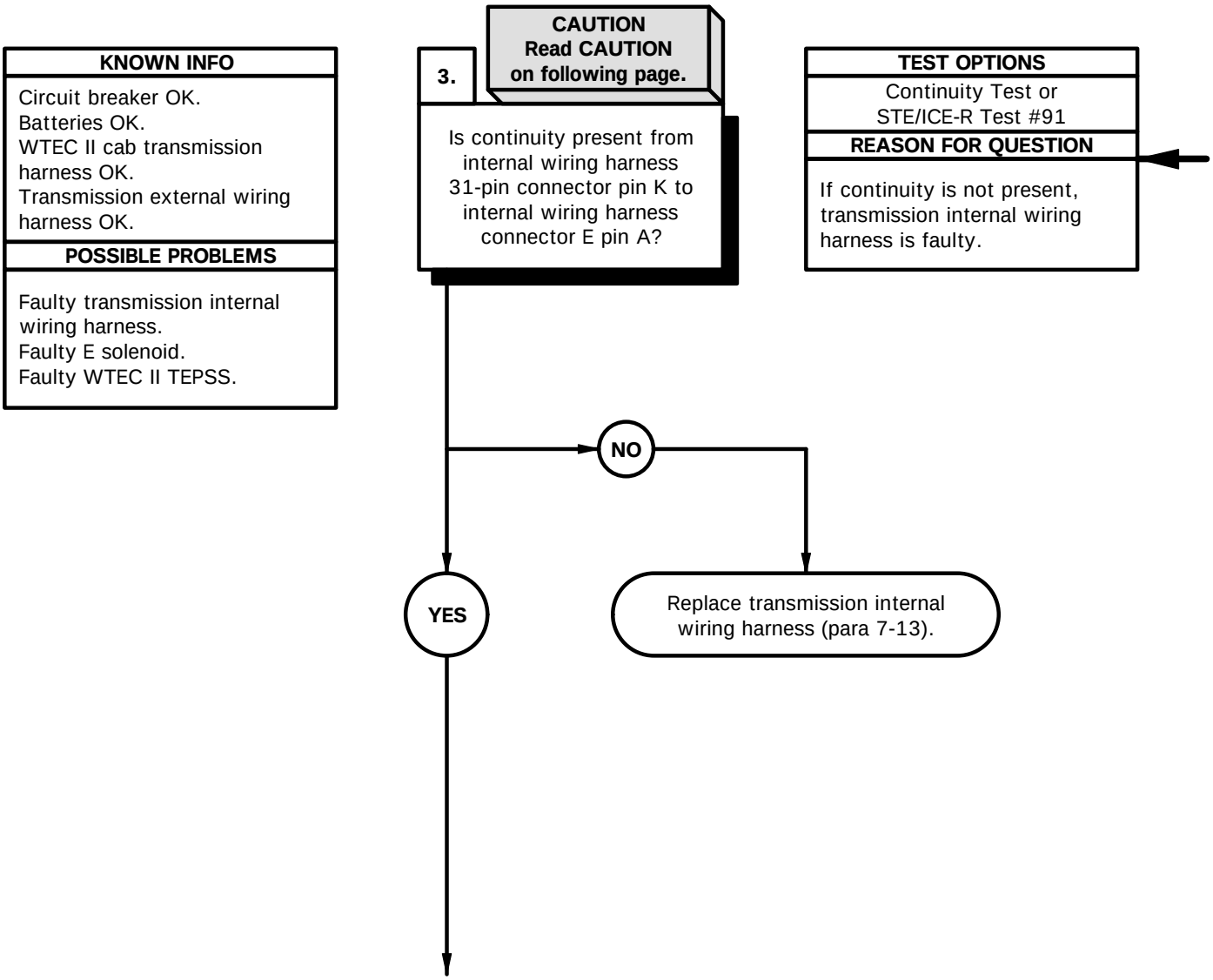
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



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)



CAUTION

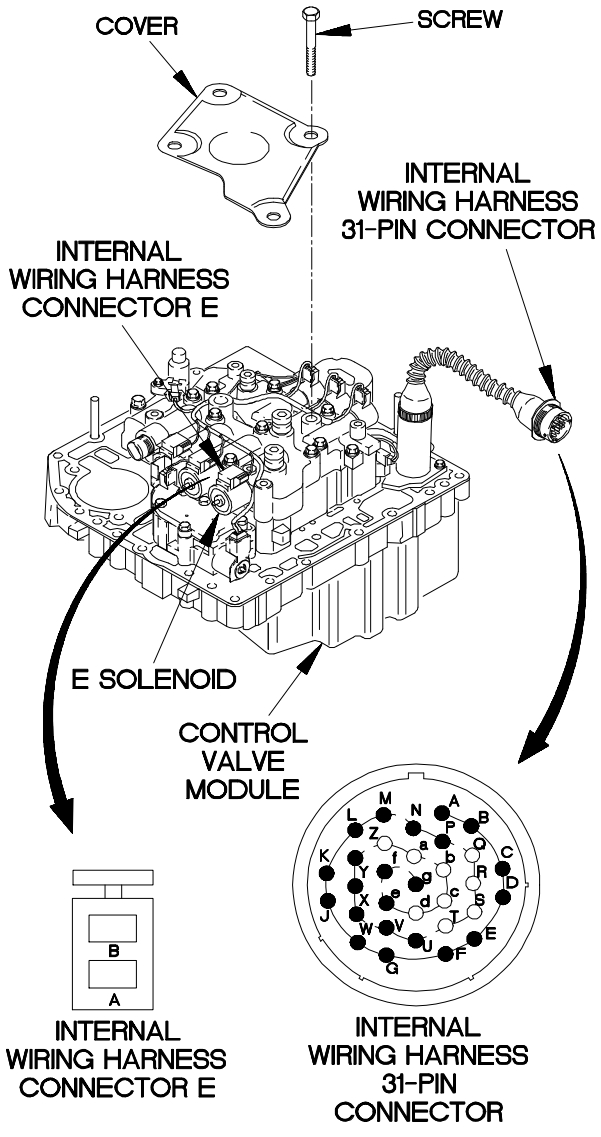
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

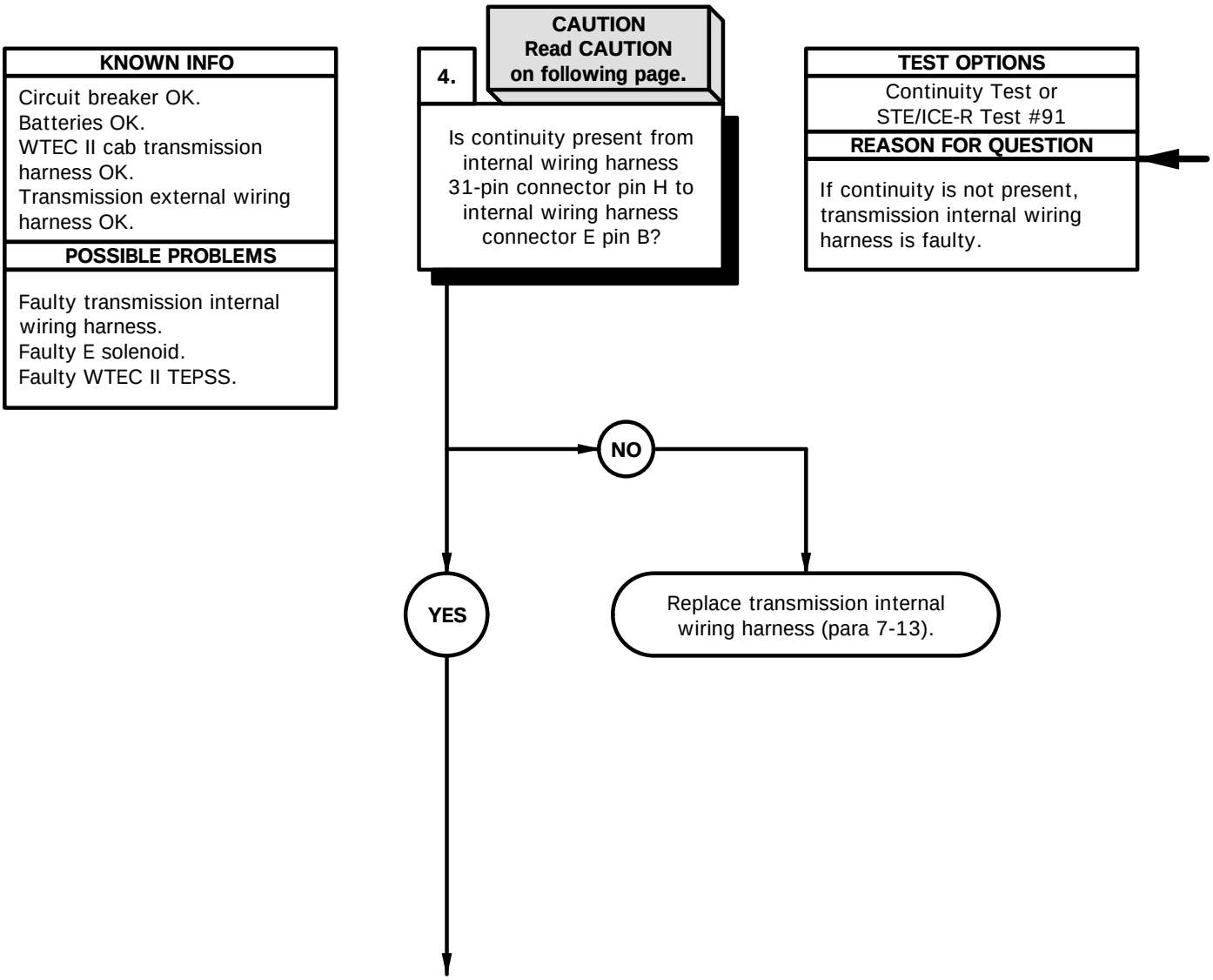
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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 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).



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)



CAUTION

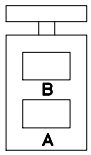
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

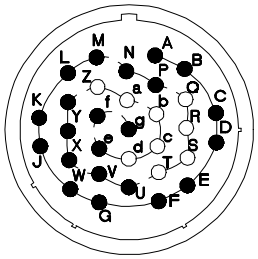
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



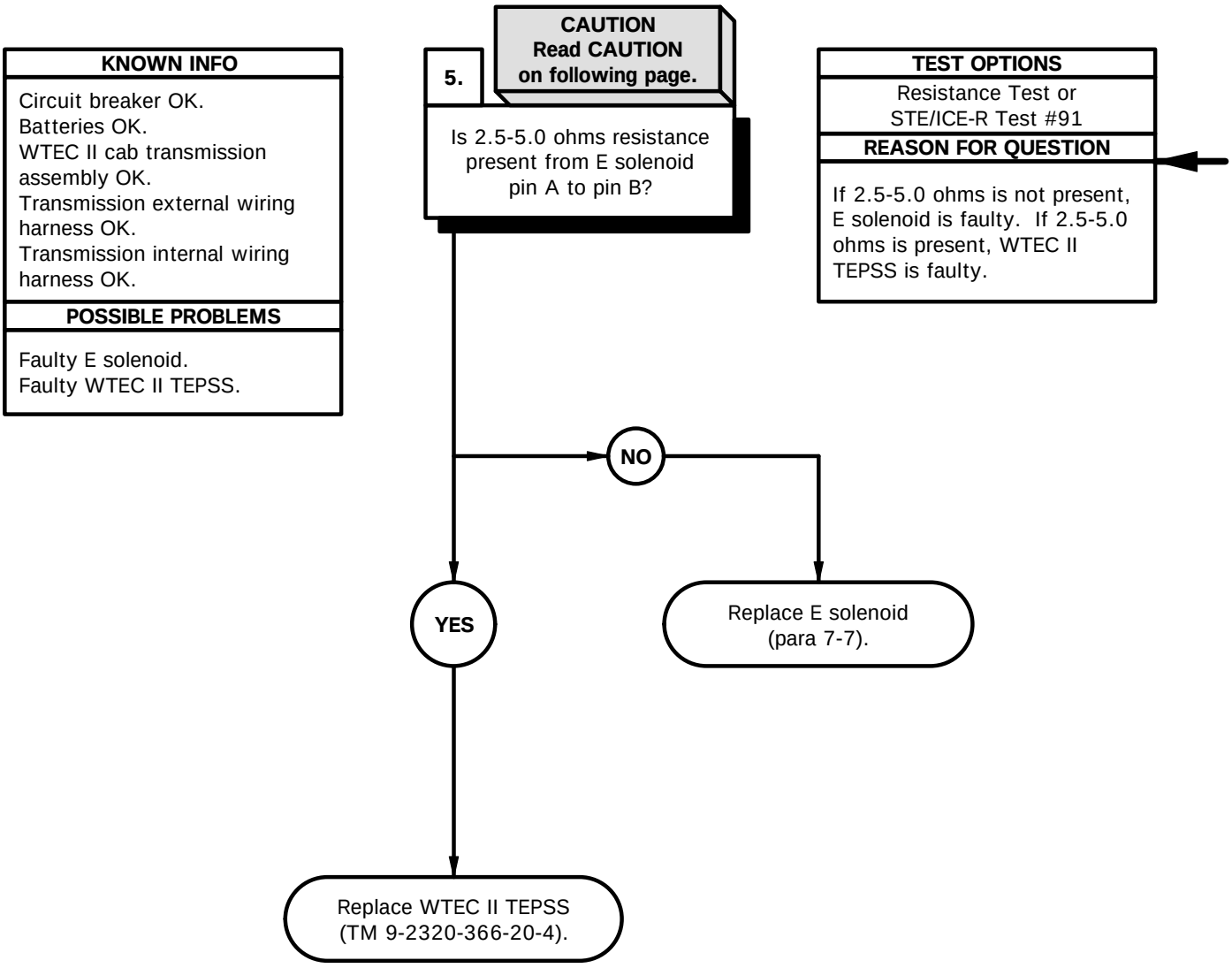
INTERNAL
WIRING HARNESS
CONNECTOR E



INTERNAL
WIRING HARNESS
31-PIN
CONNECTOR

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)



CAUTION

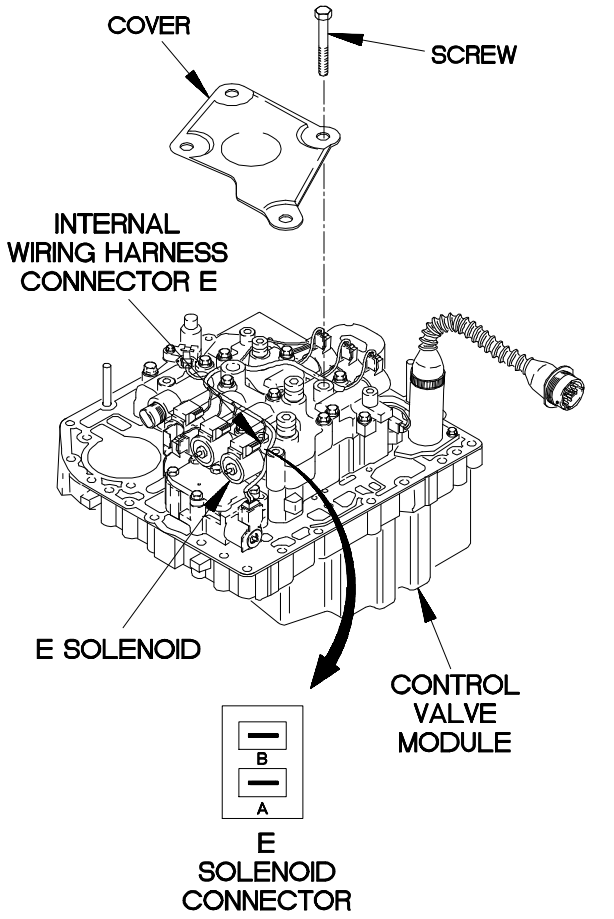
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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).



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

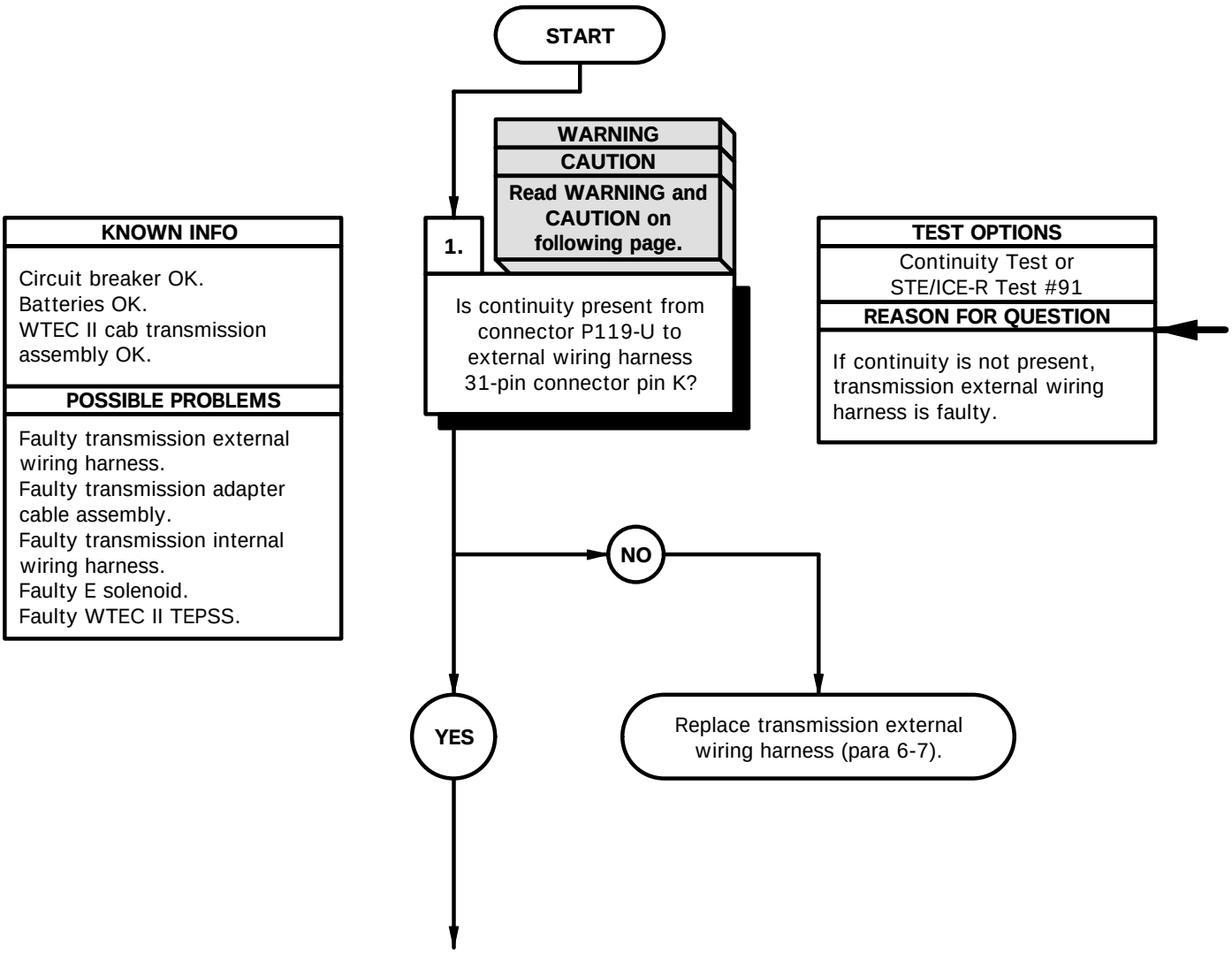
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

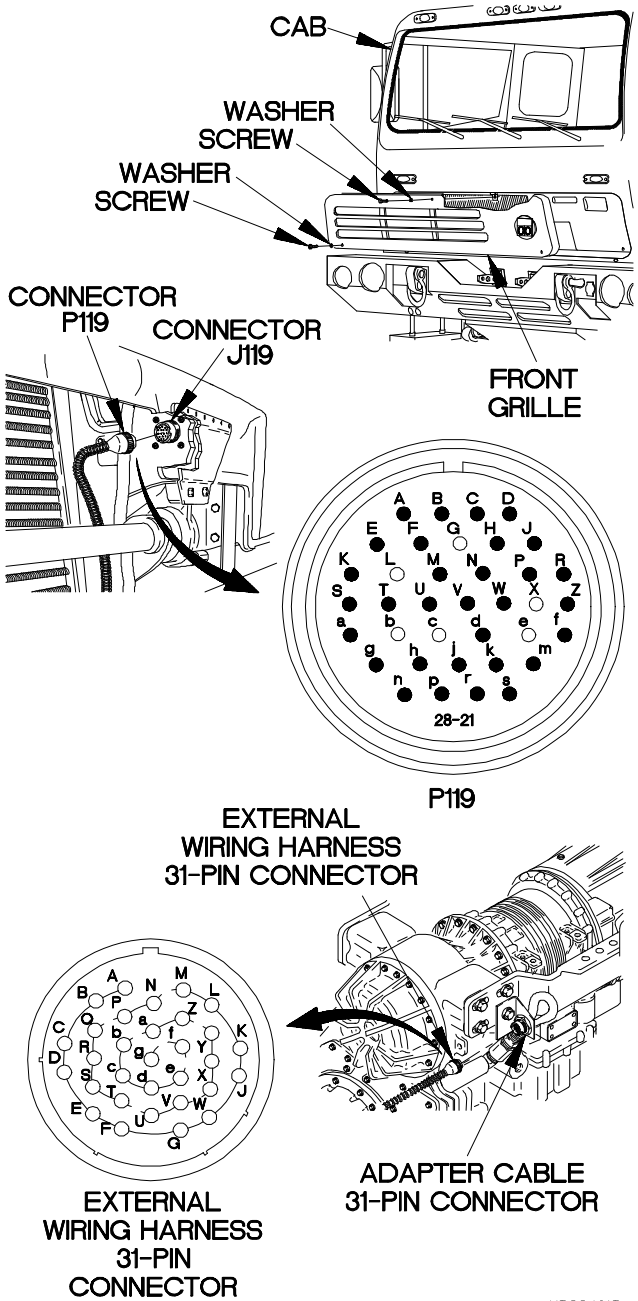
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

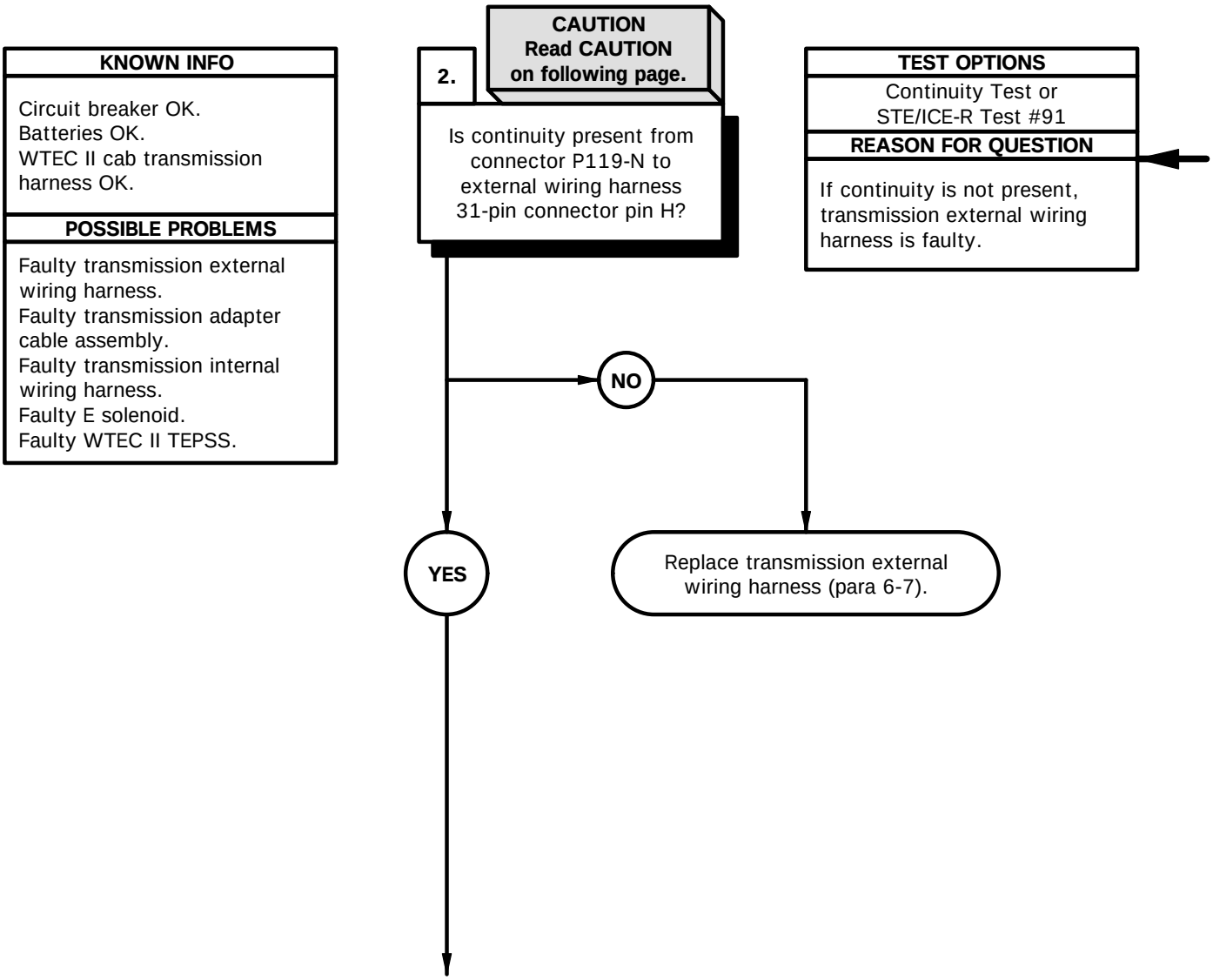
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from adapter cable 31-pin connector.
(6) Set multimeter to ohms.
(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).



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

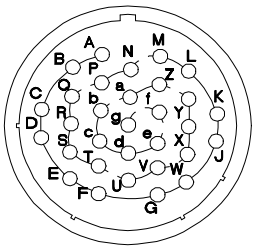
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

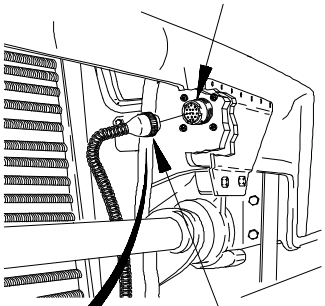
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).

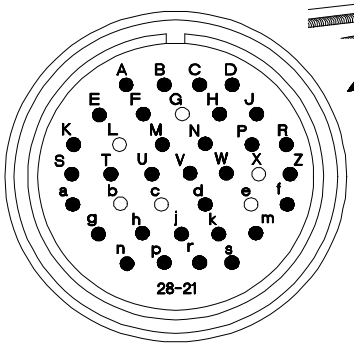


EXTERNAL WIRING HARNESS 31-PIN CONNECTOR

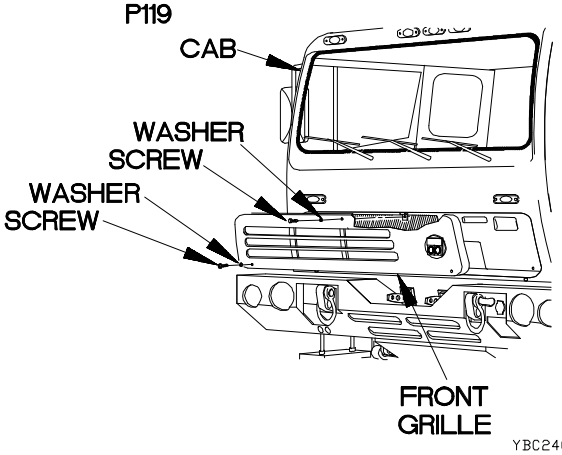


CONNECTOR J119

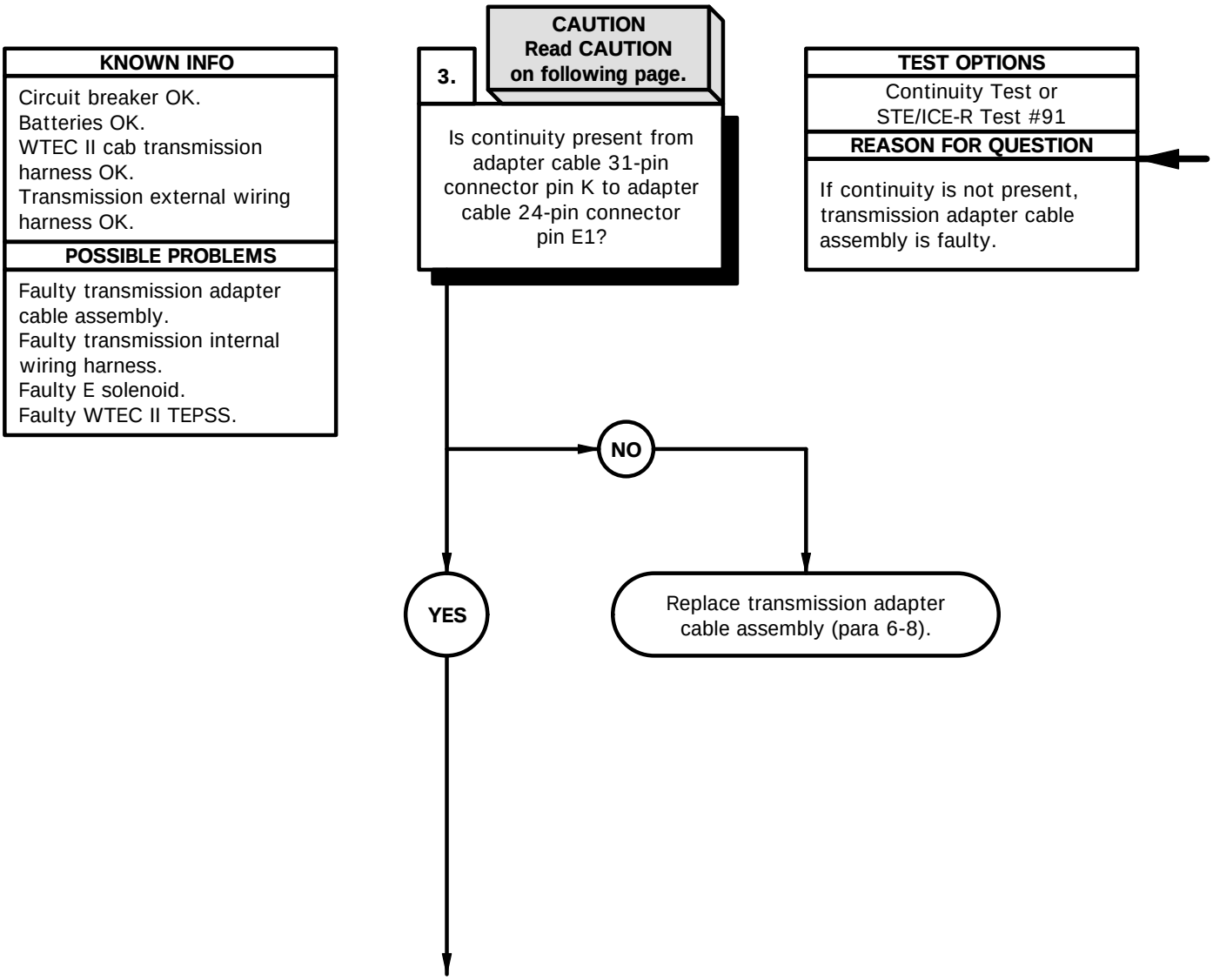
CONNECTOR P119



P119



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

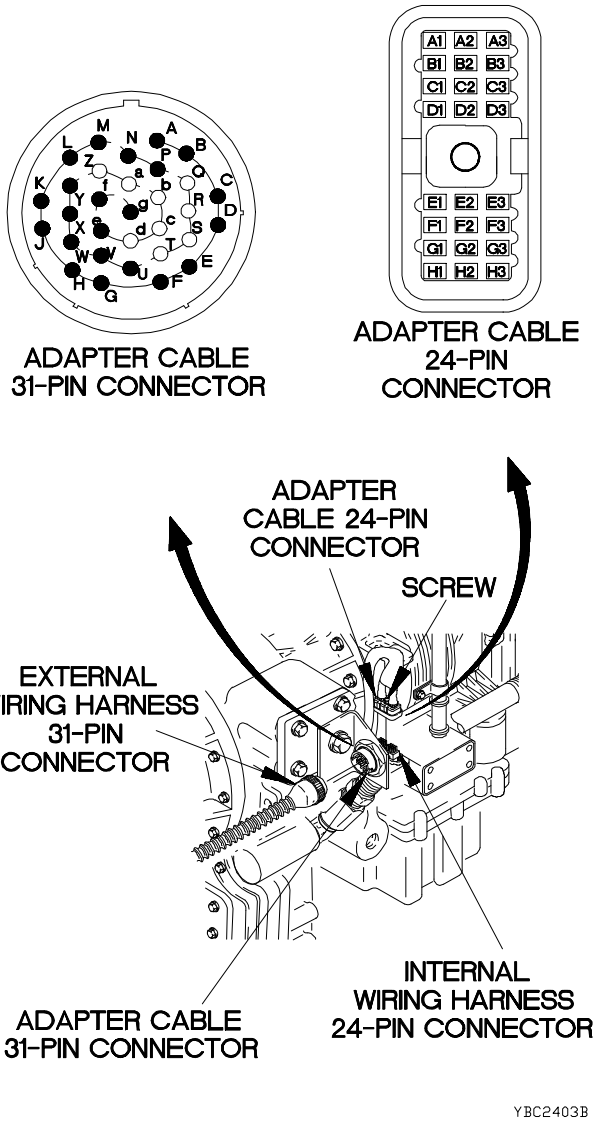
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

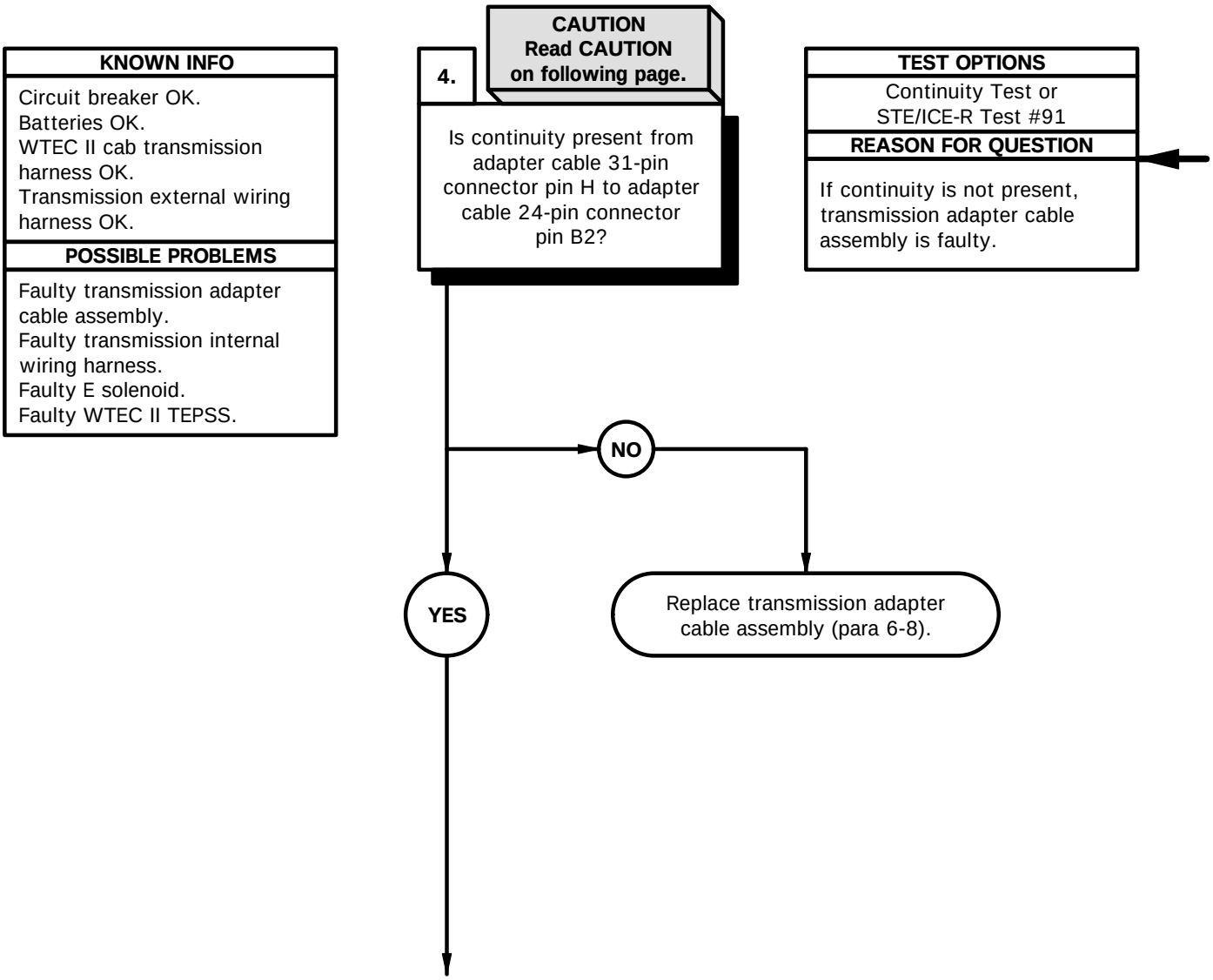
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



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

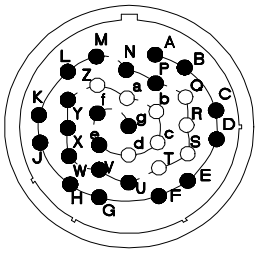
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

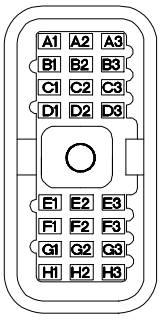
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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.



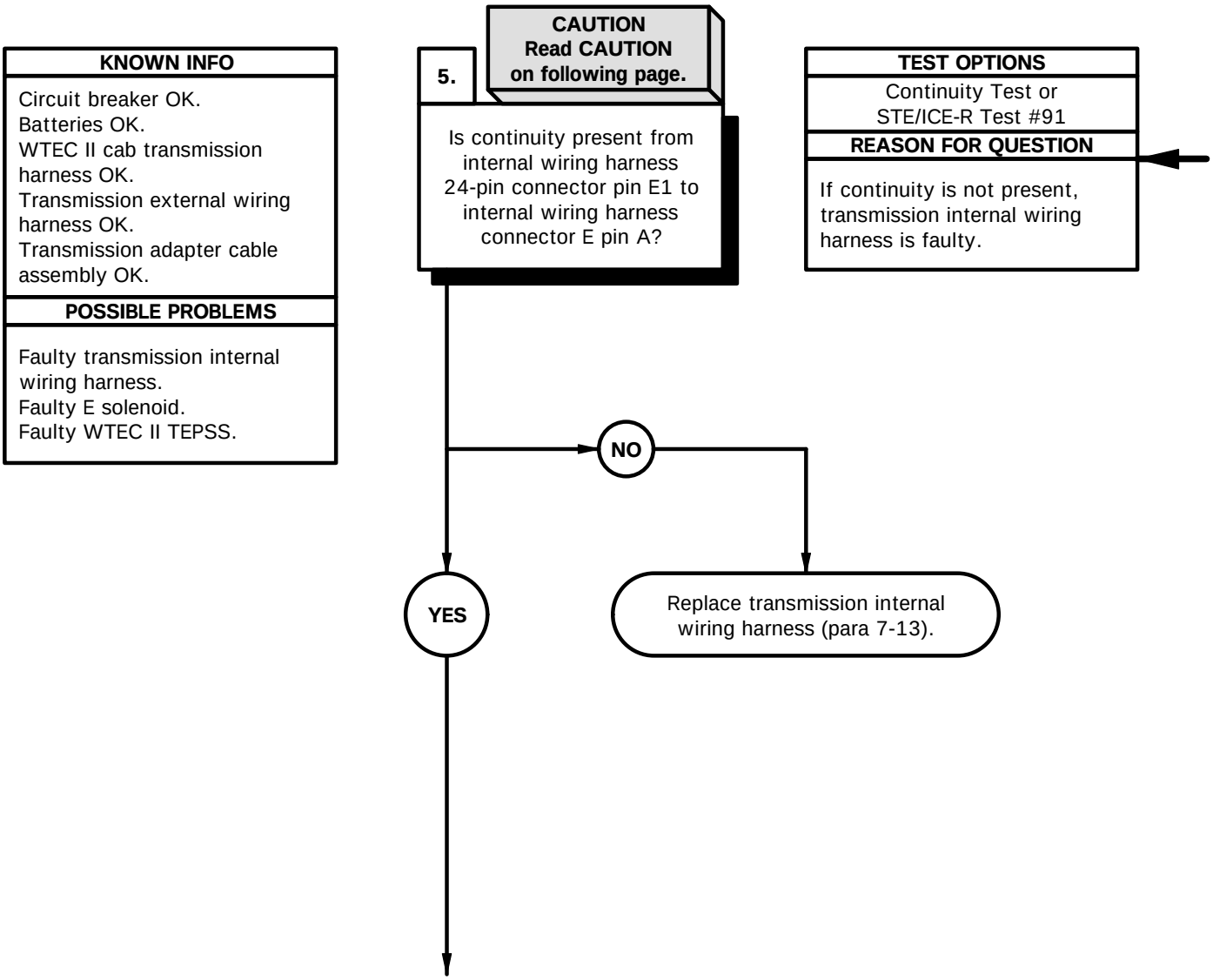
ADAPTER CABLE
31-PIN CONNECTOR



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)



CAUTION

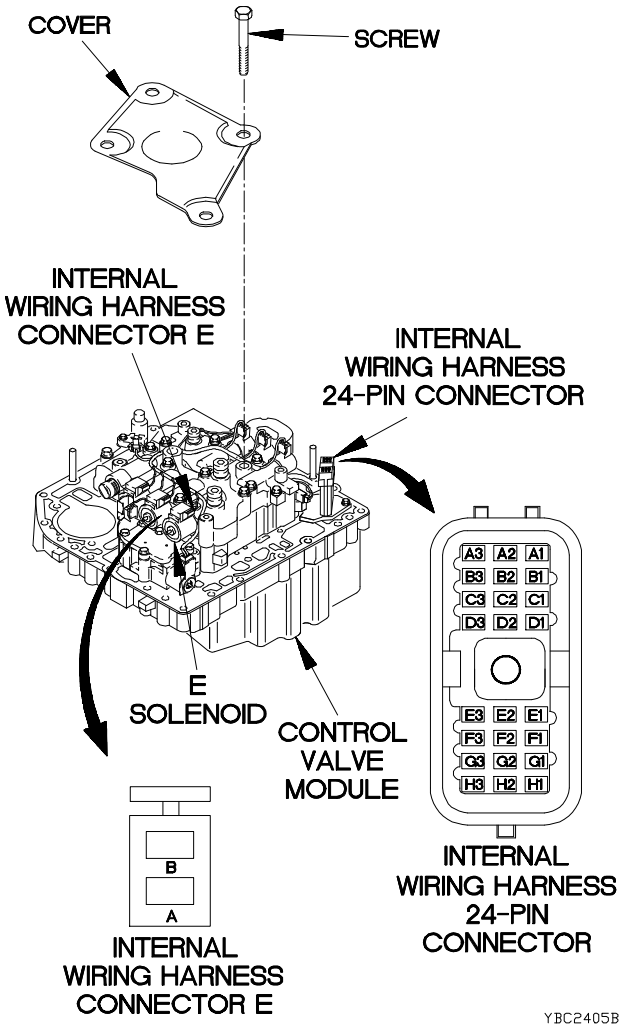
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

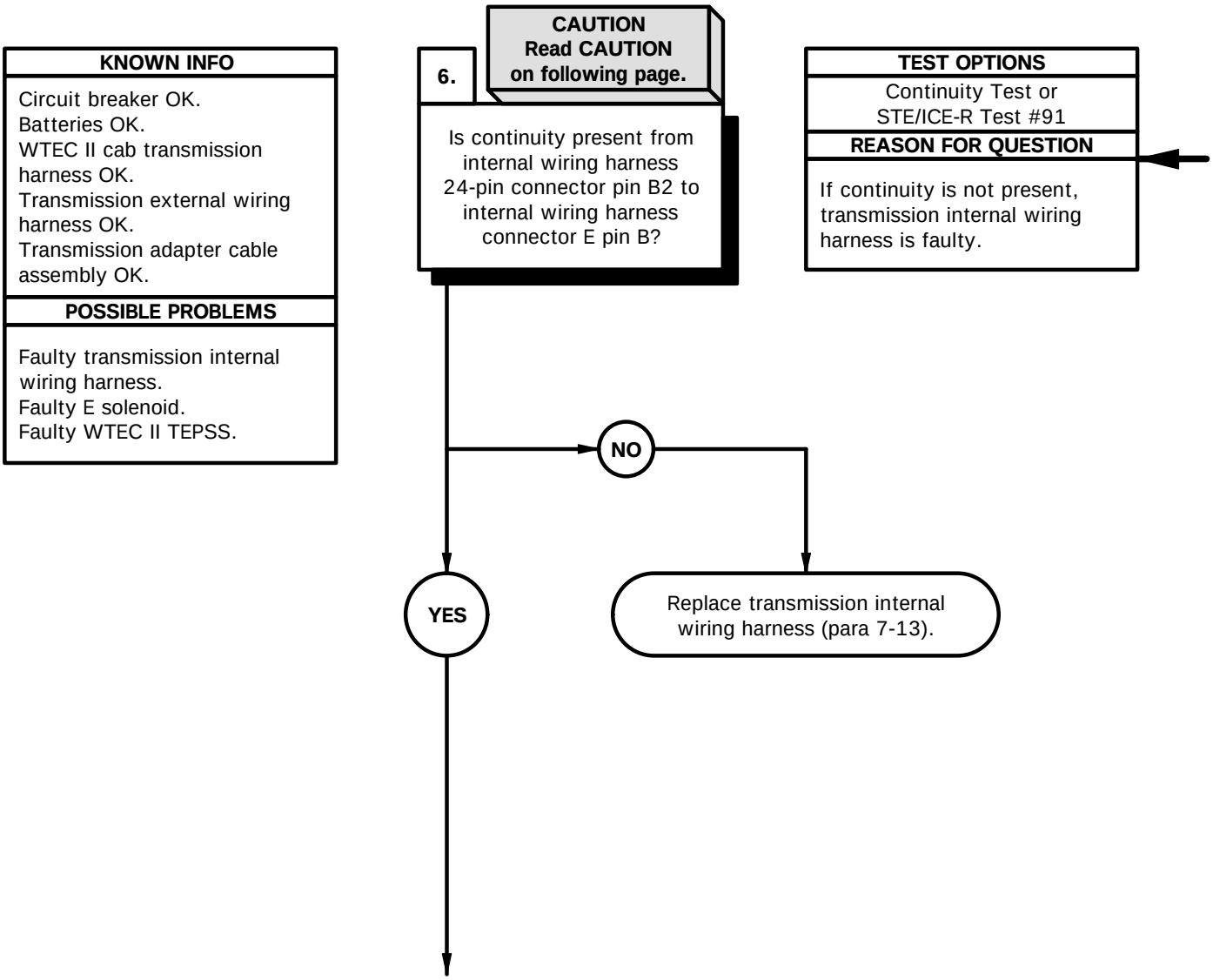
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



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

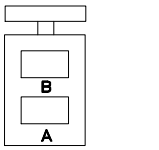
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

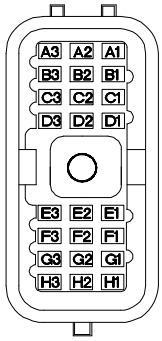
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



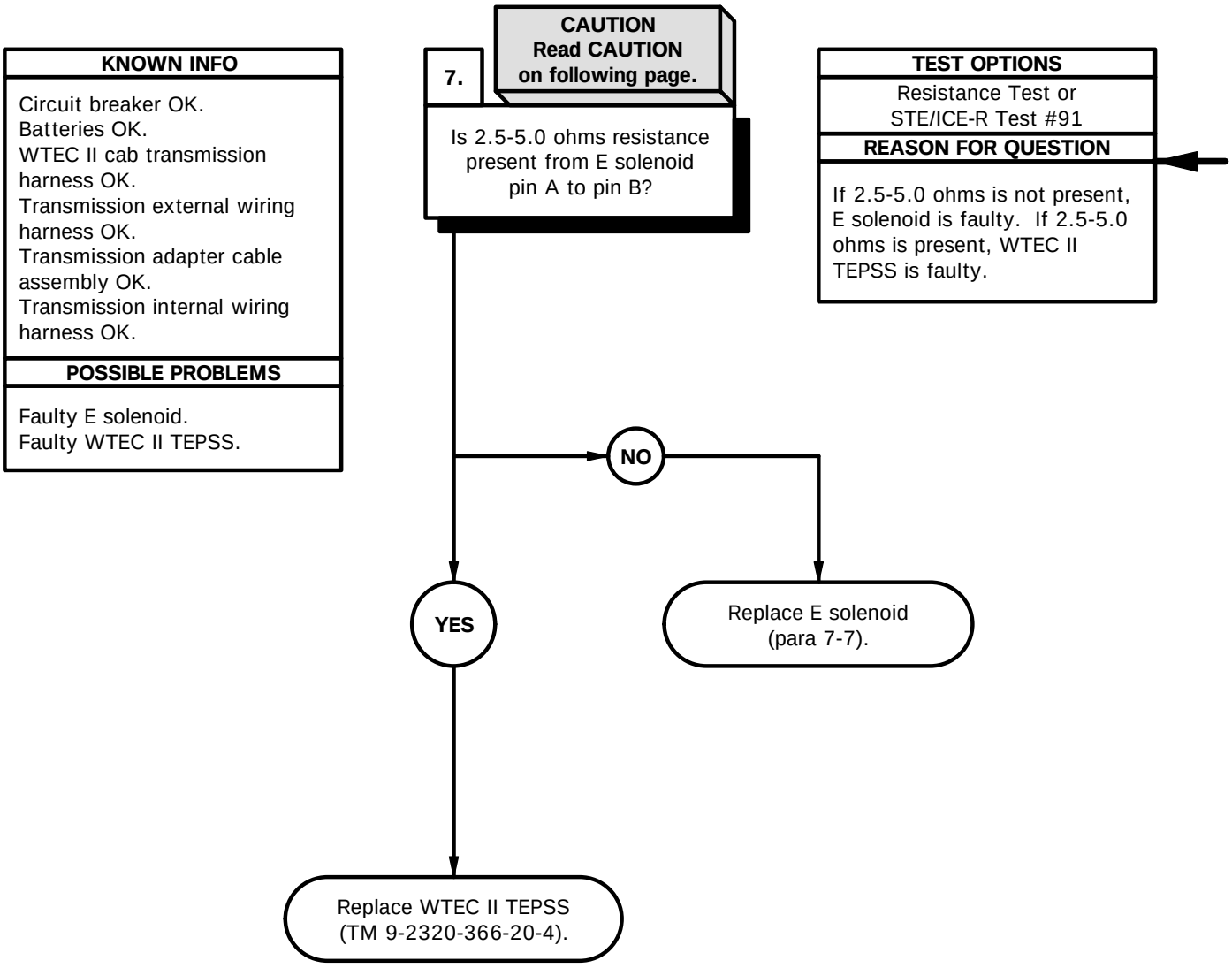
INTERNAL WIRING HARNESS CONNECTOR E



INTERNAL WIRING HARNESS 24-PIN CONNECTOR

YBC2406B

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

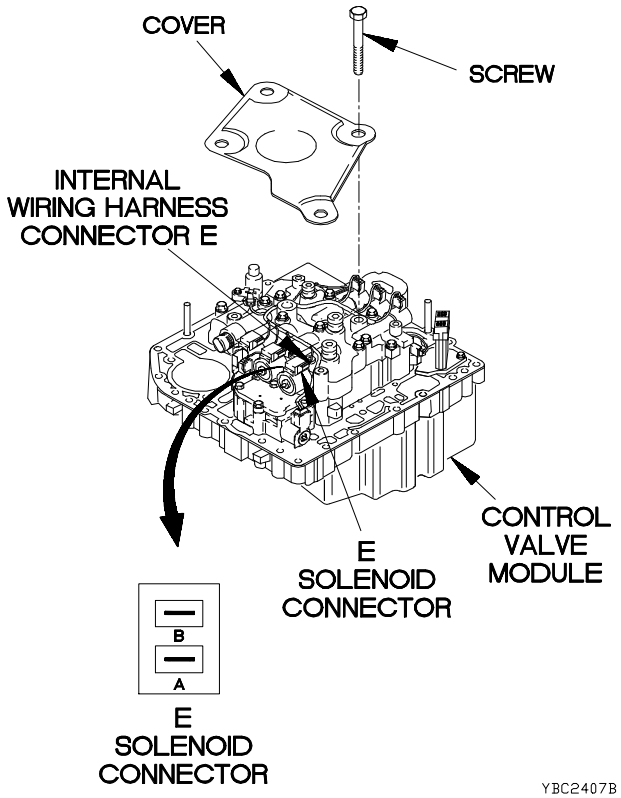
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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).



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

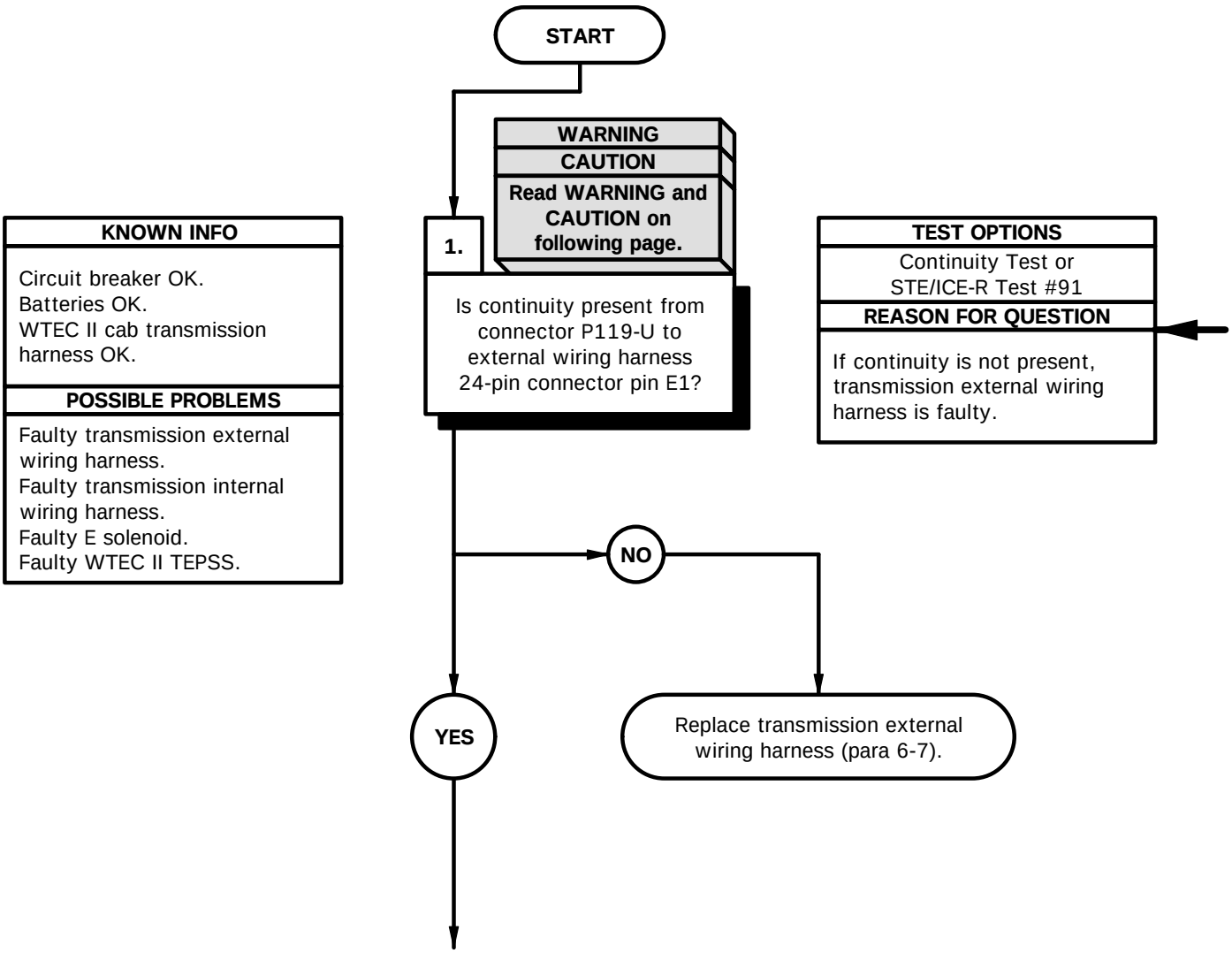
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

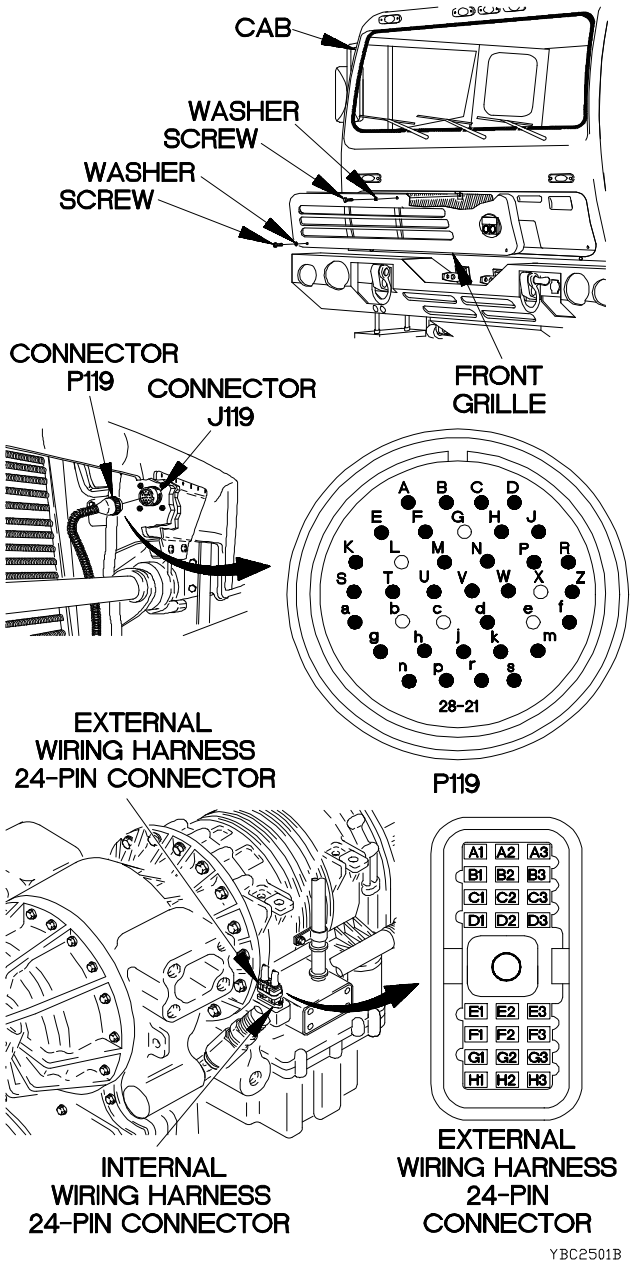
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

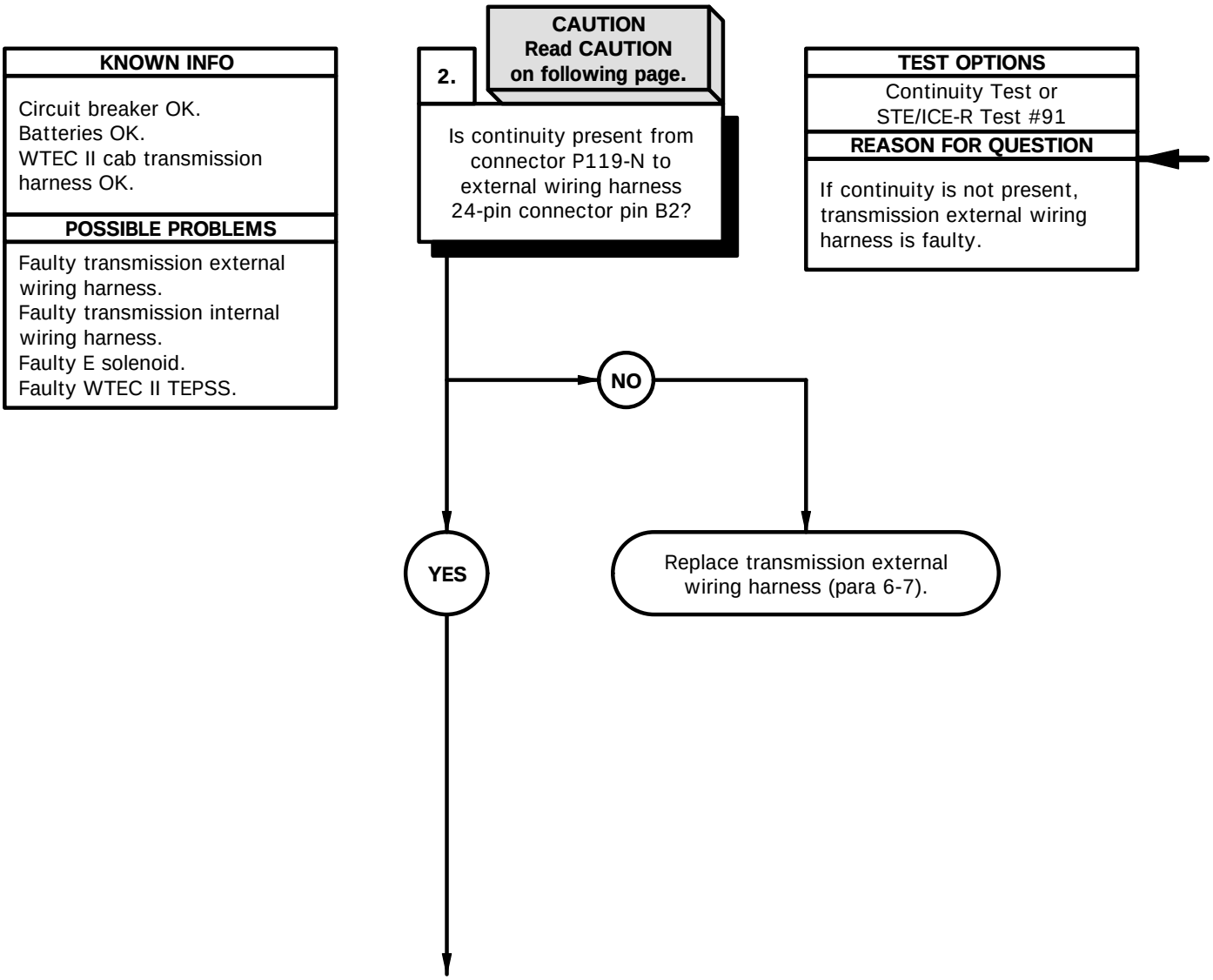
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Loosen screw in external wiring harness 24-pin connector.
(6) Disconnect external wiring harness 24-pin from internal 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).



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

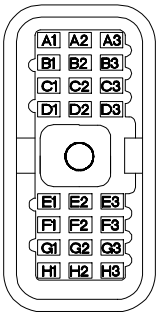
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

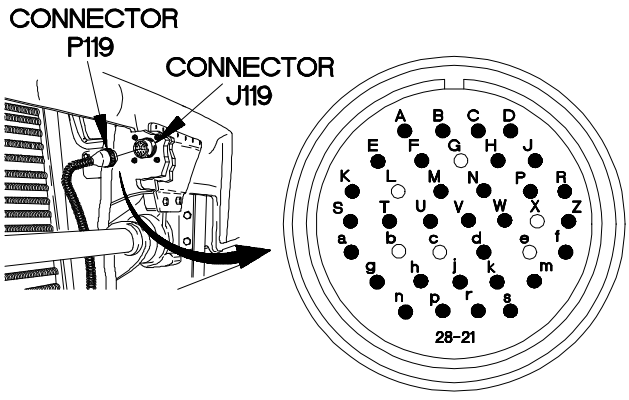
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

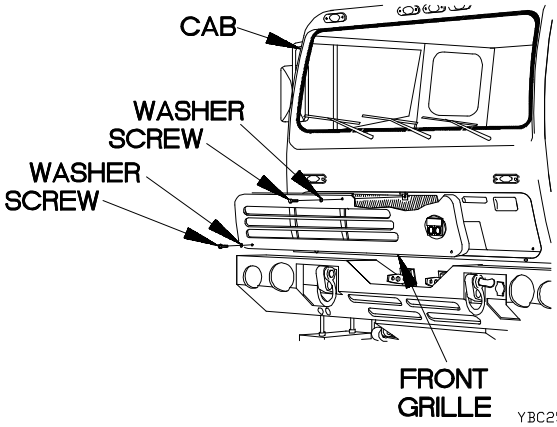
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P119-N.
(3) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin B2 and note reading on multimeter.
(4) If continuity is not present, replace transmission external wiring harness (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).



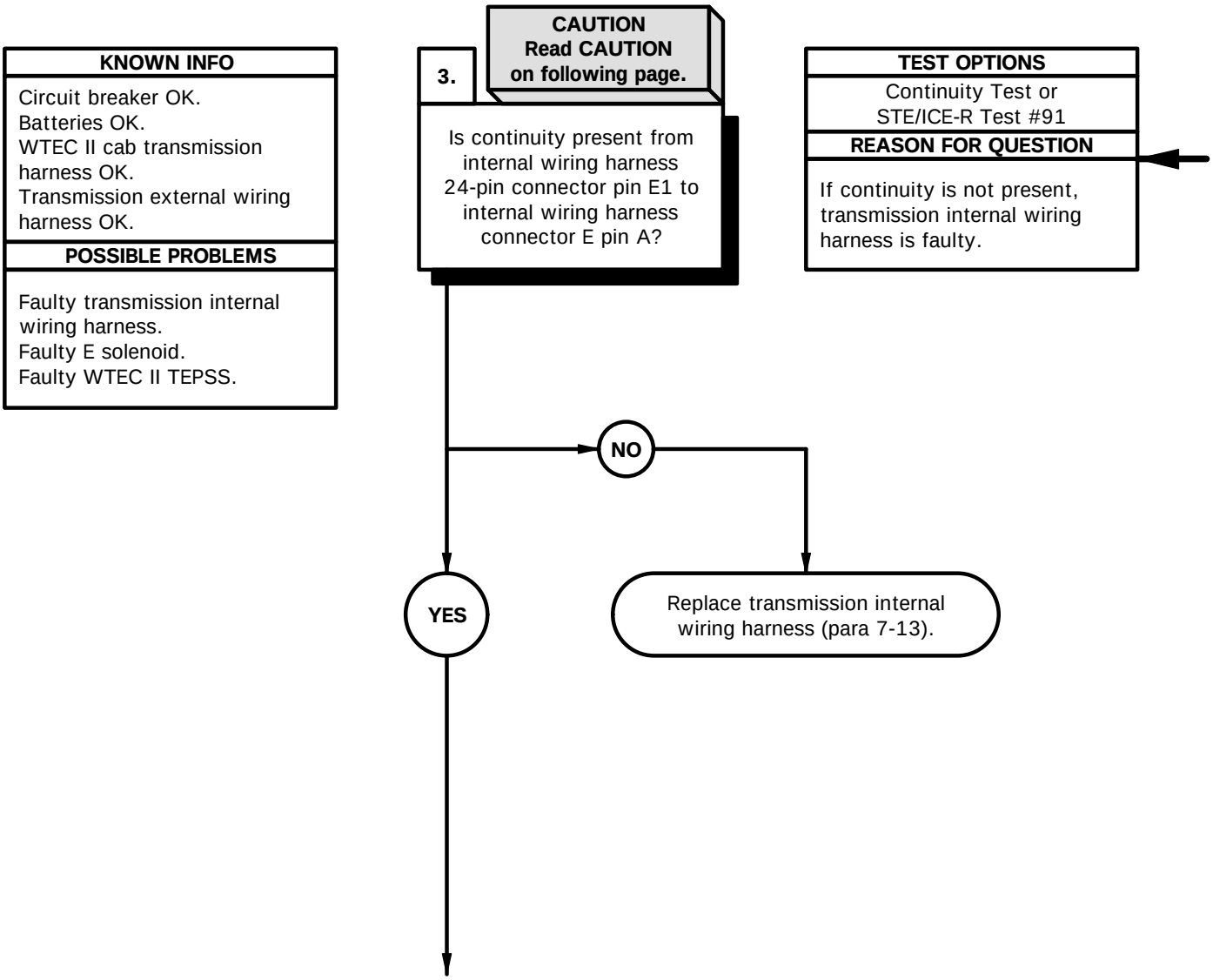
EXTERNAL WIRING HARNESS 24-PIN CONNECTOR



P119



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

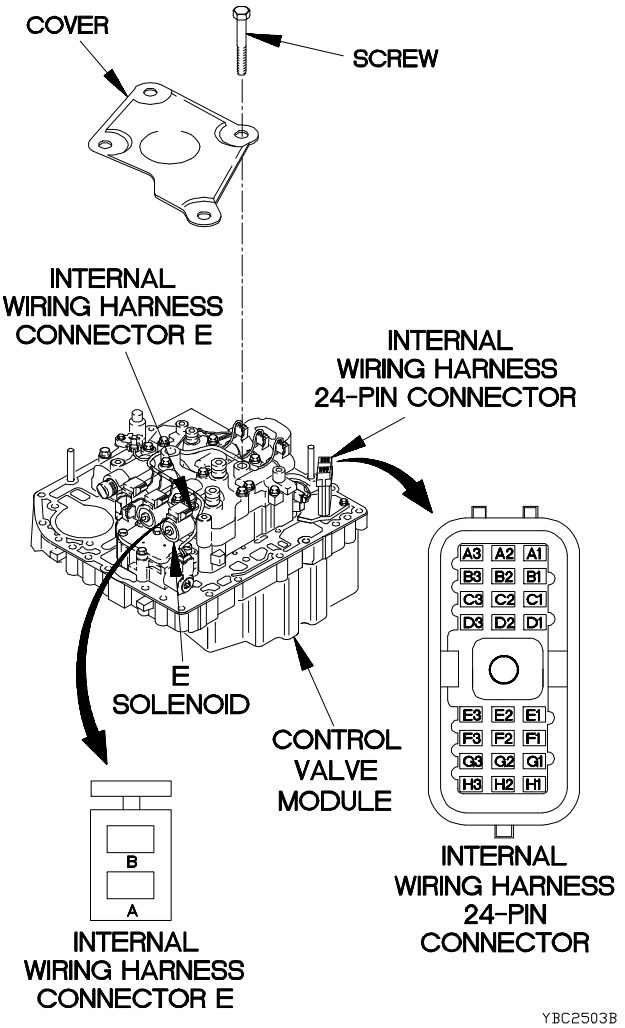
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

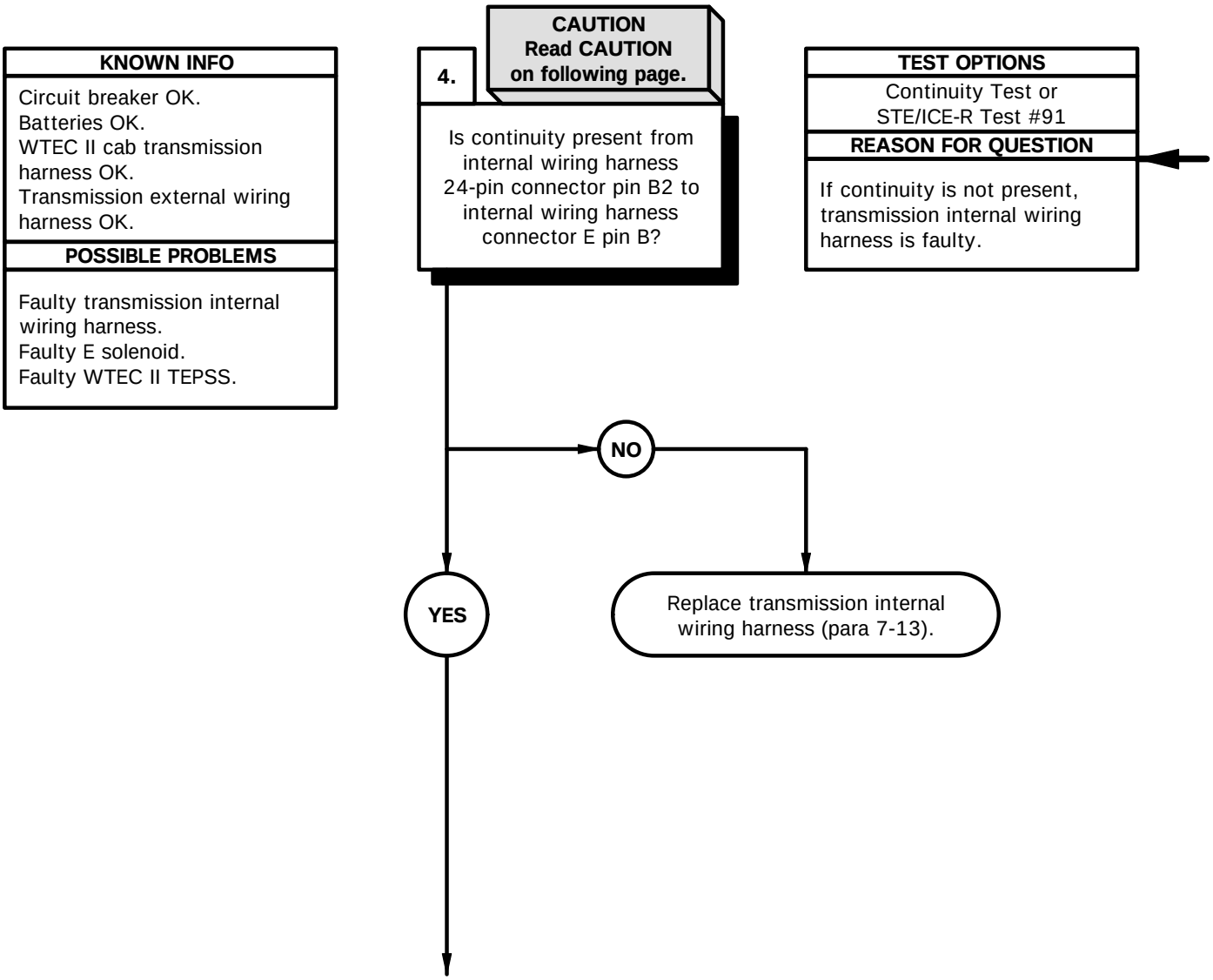
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



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

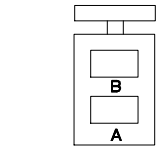
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

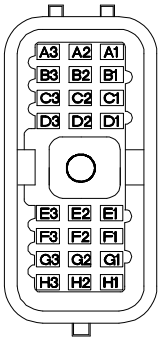
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



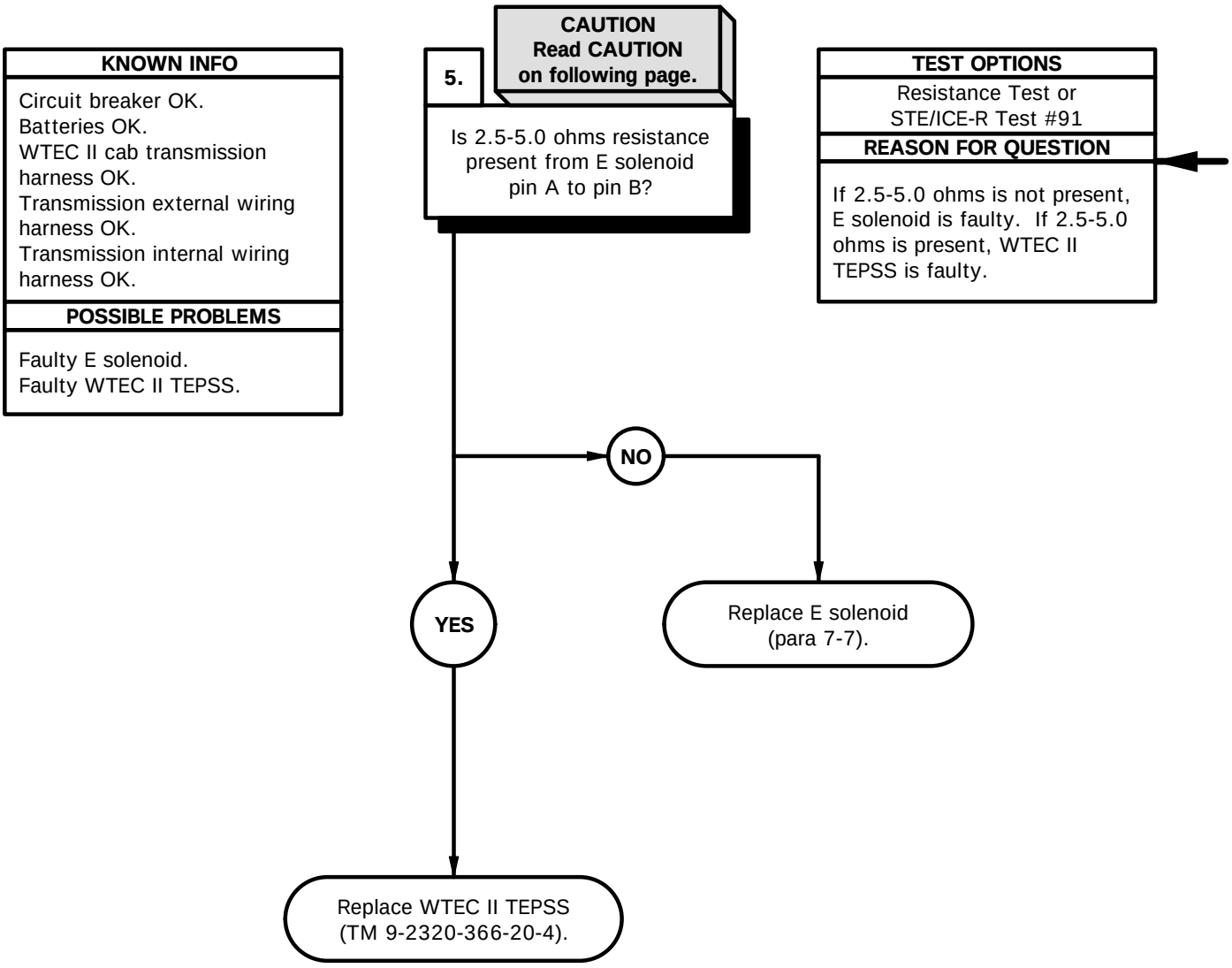
INTERNAL WIRING HARNESS CONNECTOR E



INTERNAL WIRING HARNESS 24-PIN CONNECTOR

YBC2504B

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

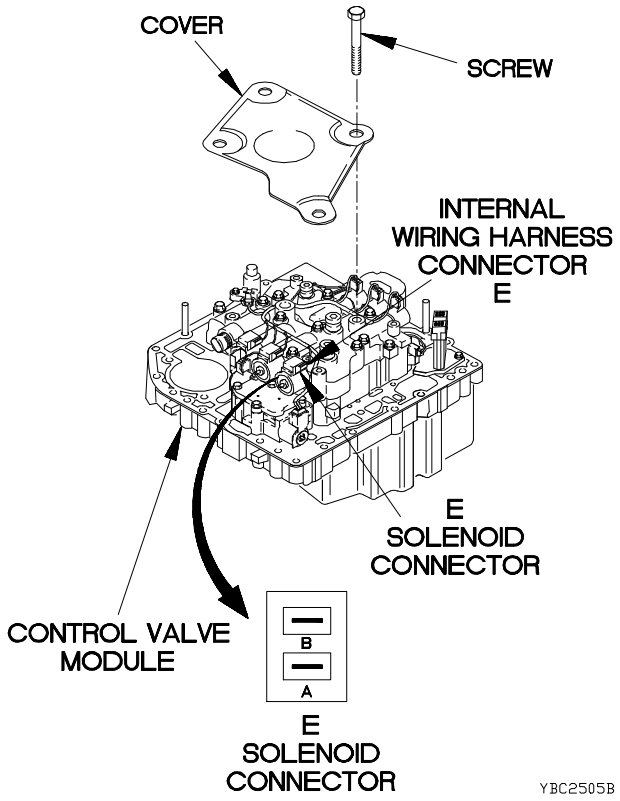
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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).



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

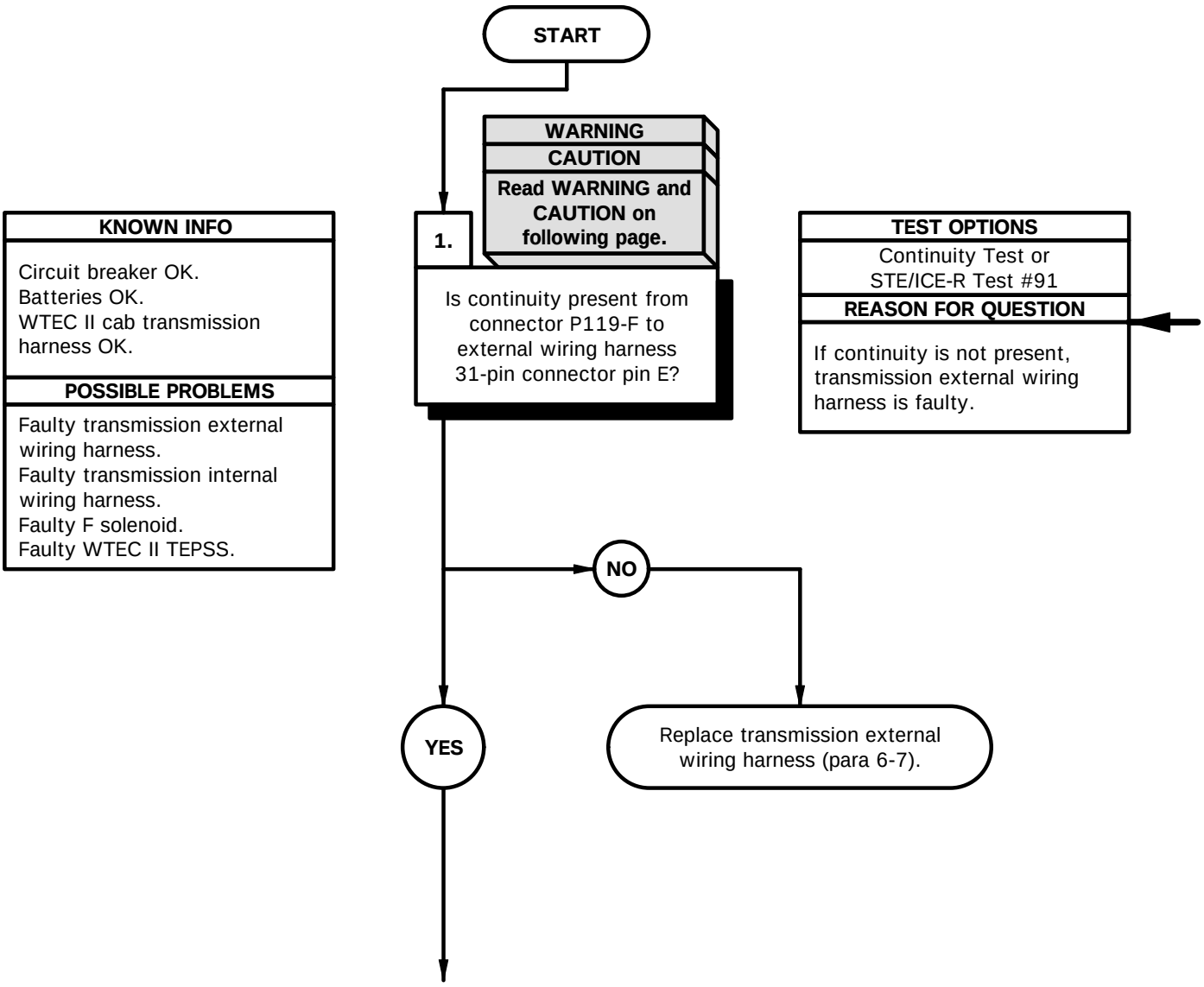
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

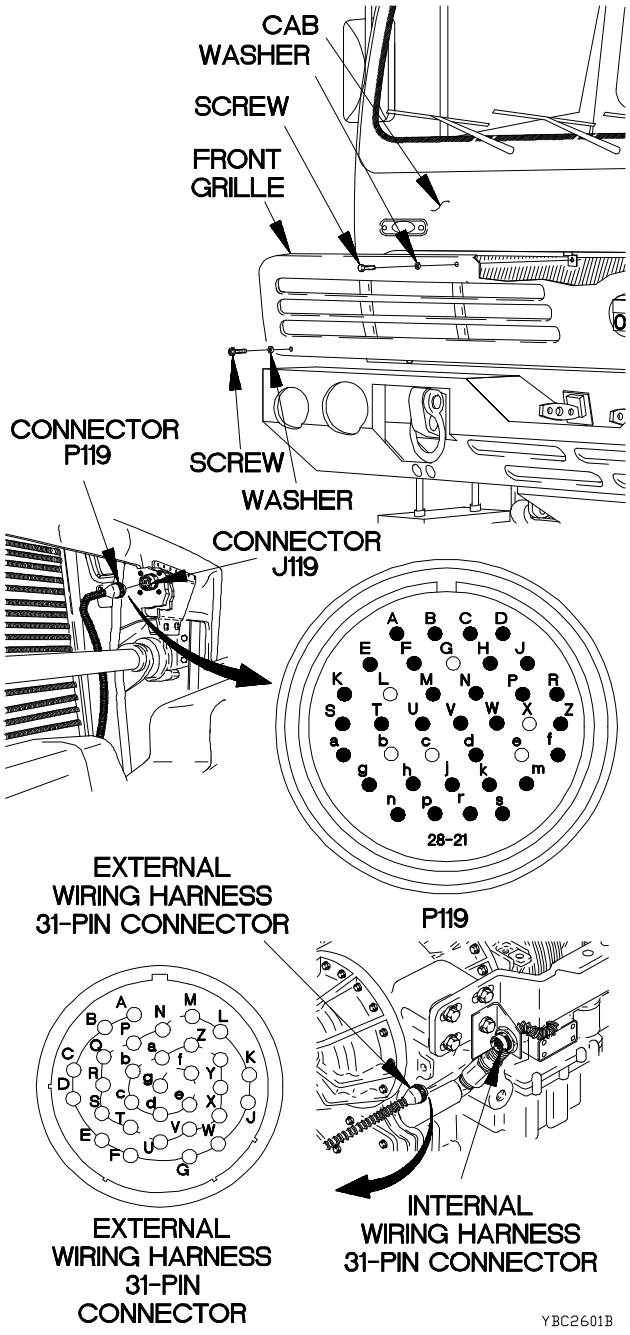
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

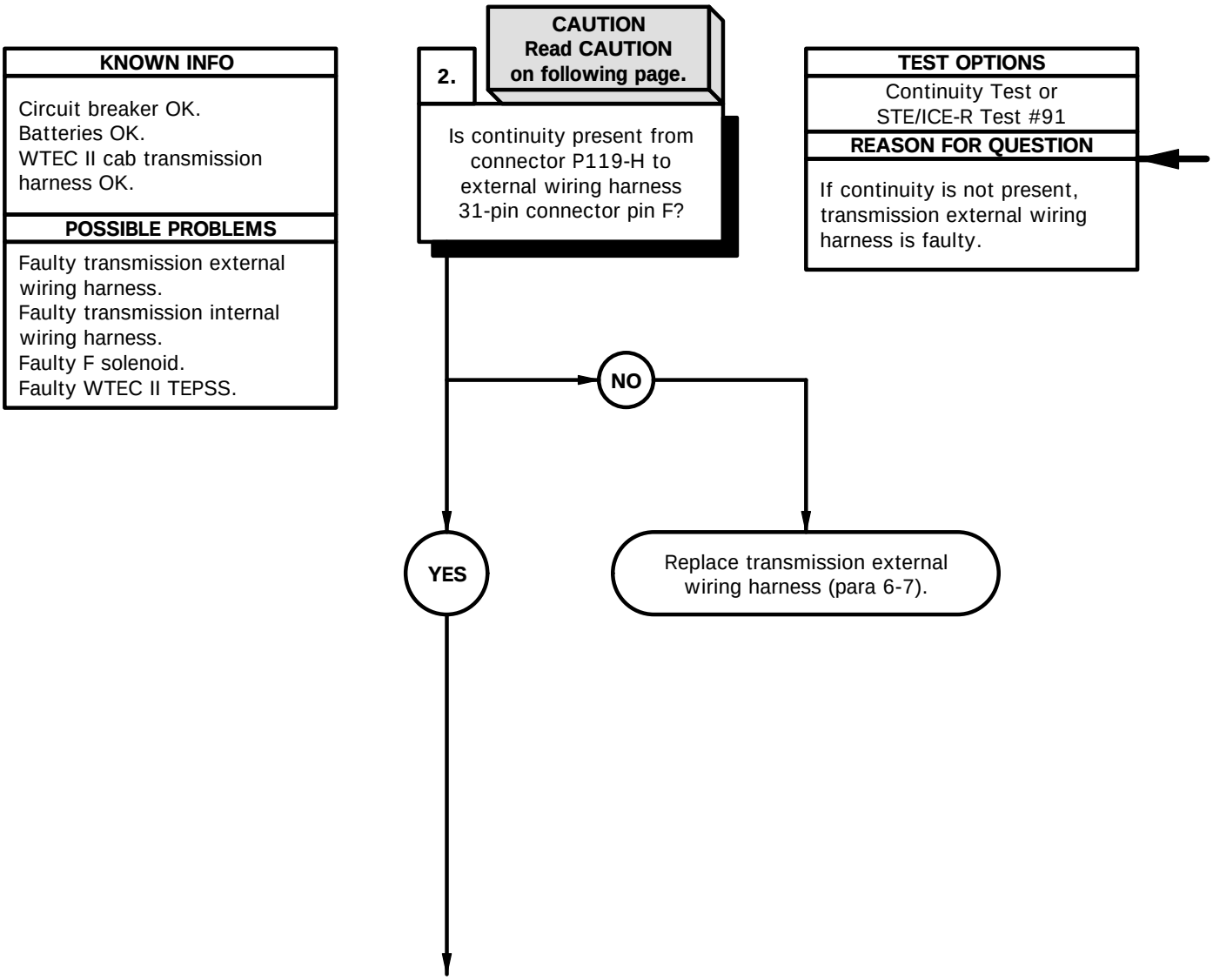
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect positive (+) probe of multimeter to connector P119-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).



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)



CAUTION

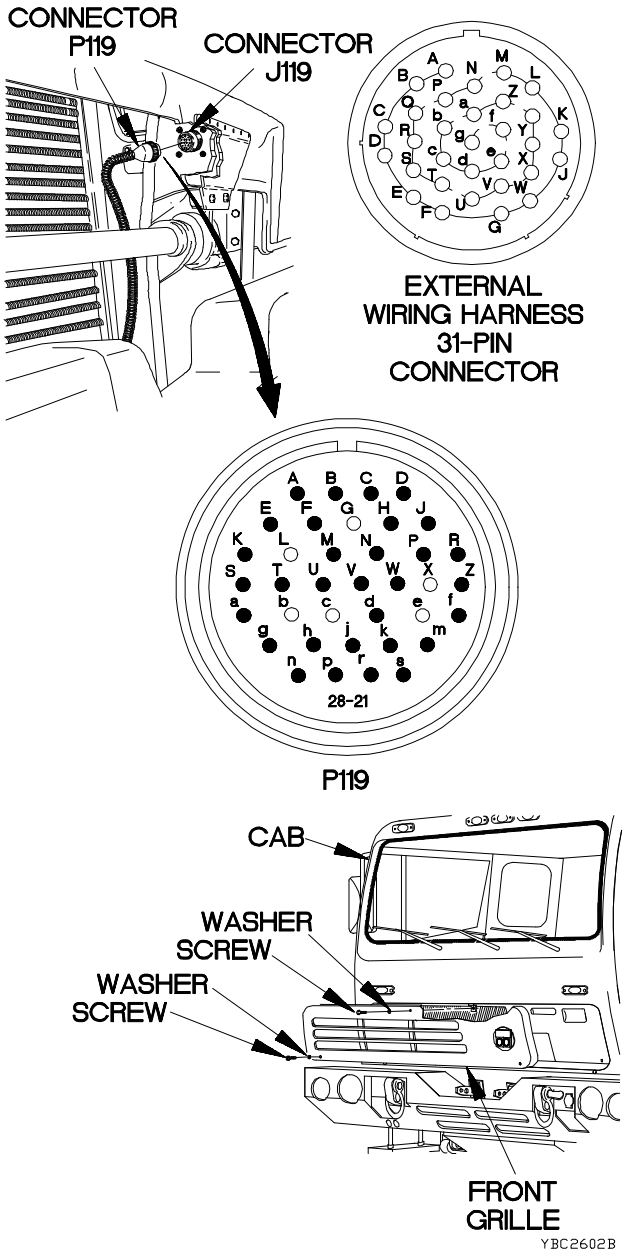
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

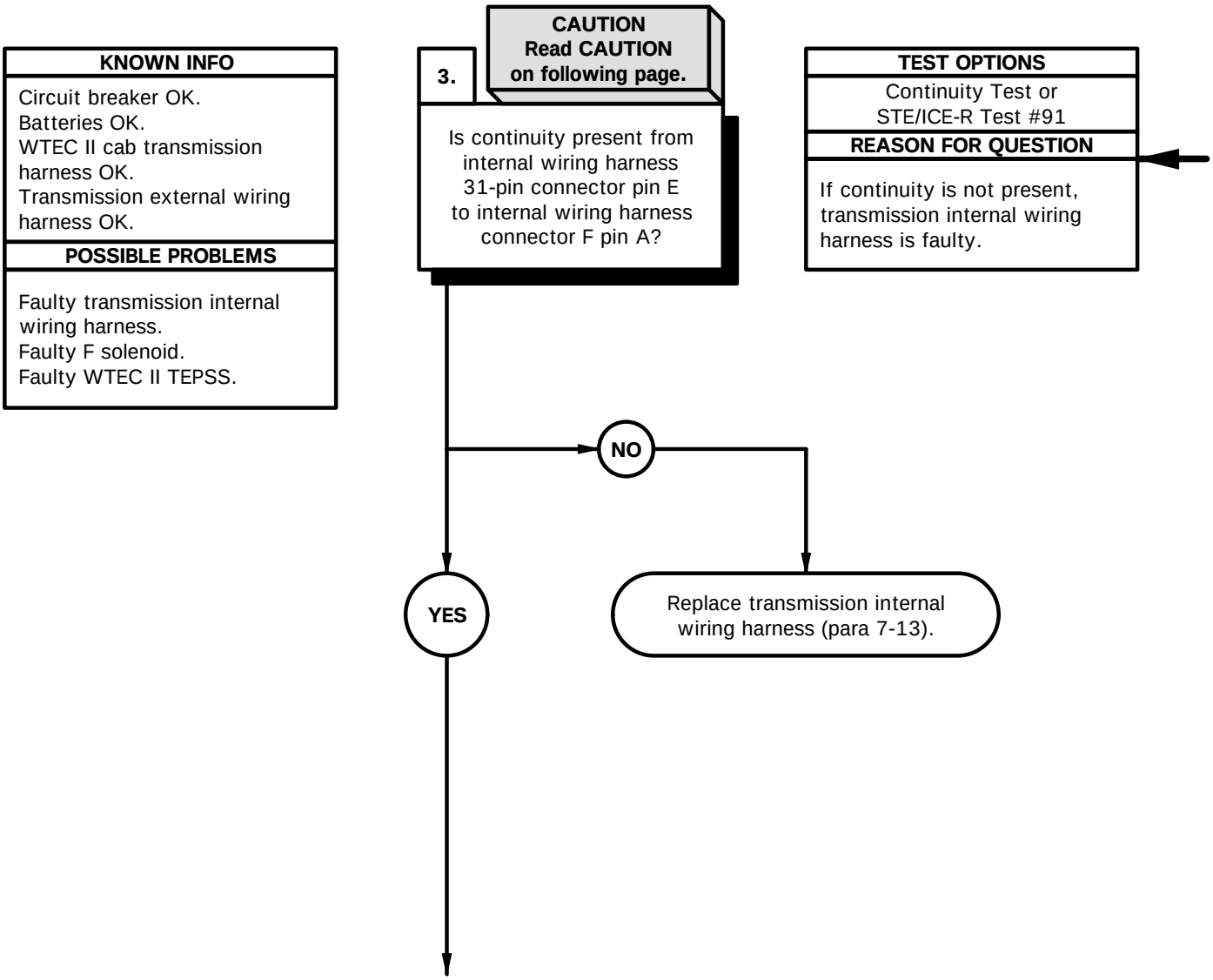
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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)



CAUTION

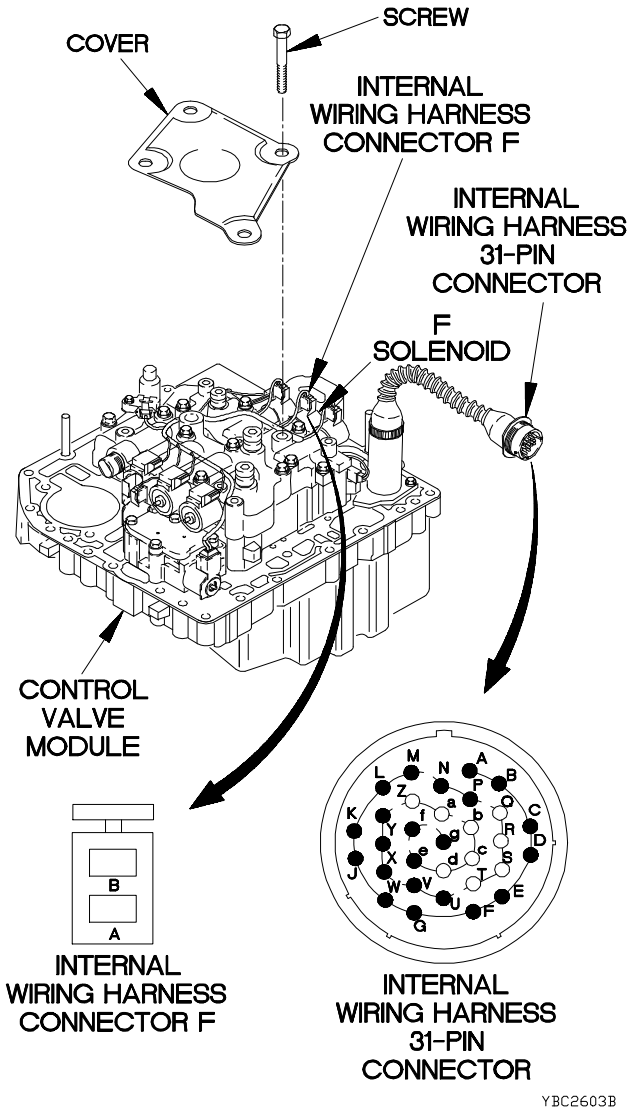
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

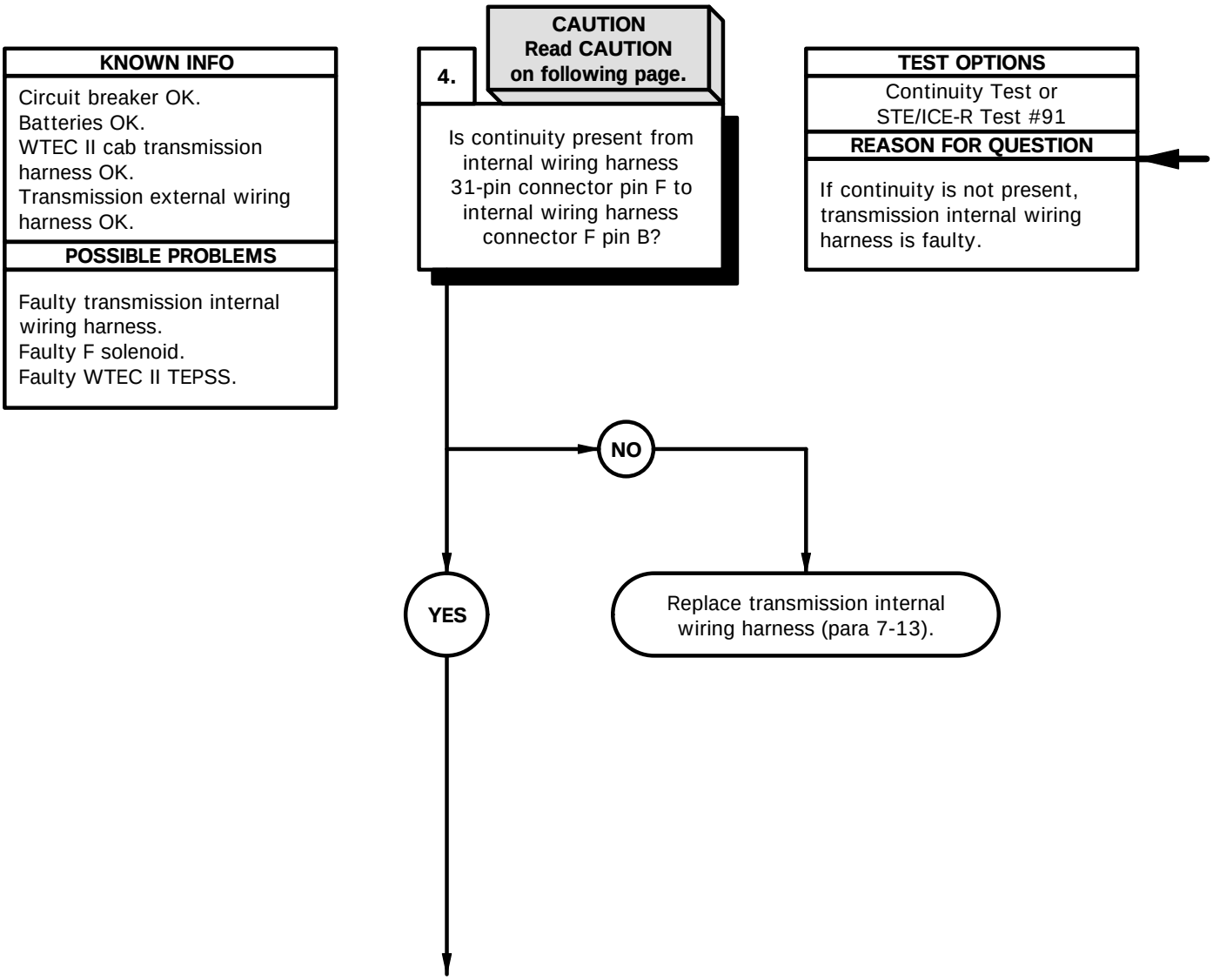
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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 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).



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)



CAUTION

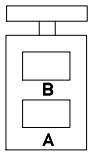
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

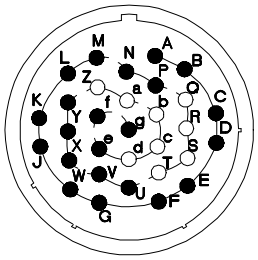
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



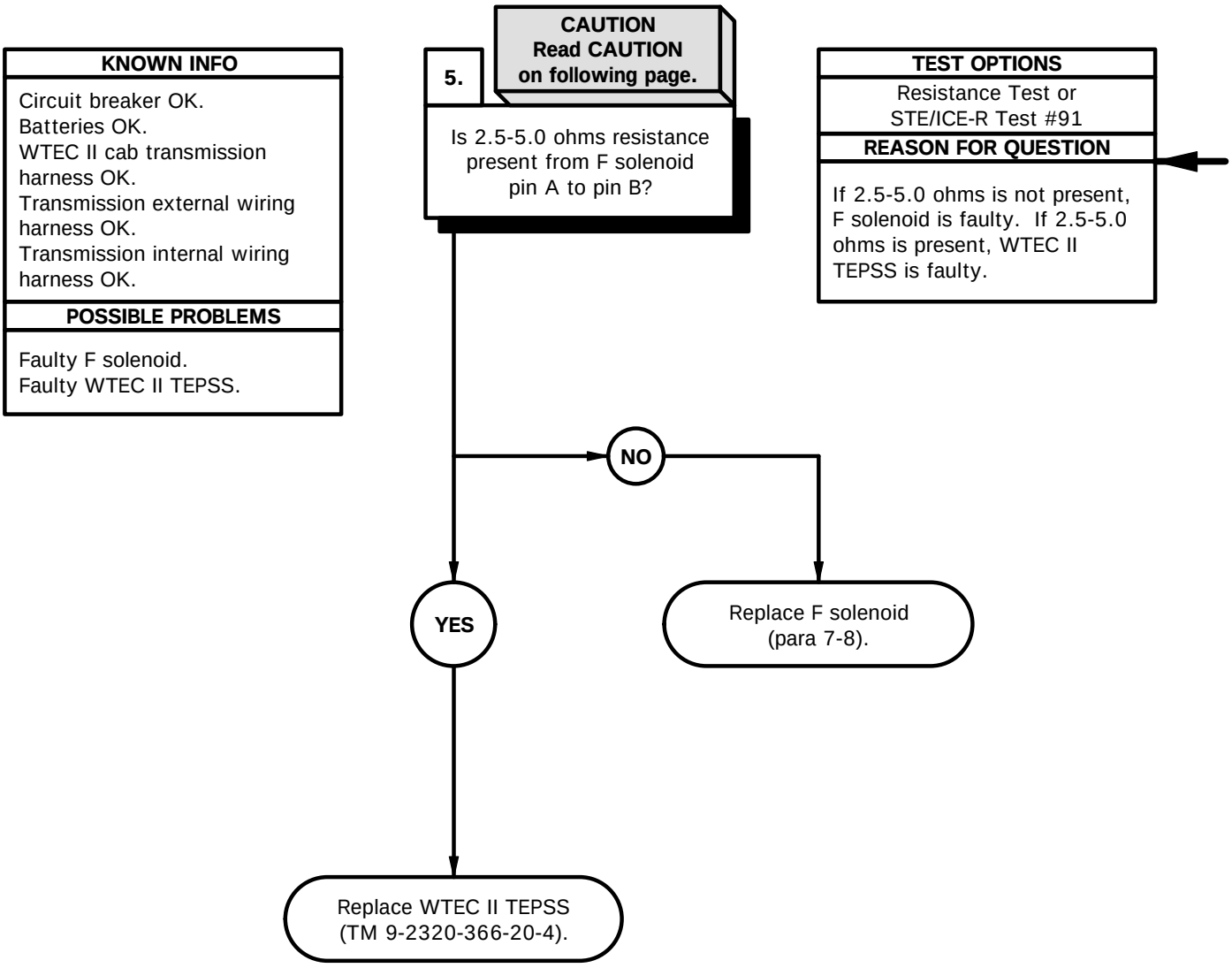
INTERNAL WIRING HARNESS CONNECTOR F



INTERNAL WIRING HARNESS 31-PIN CONNECTOR

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)



CAUTION

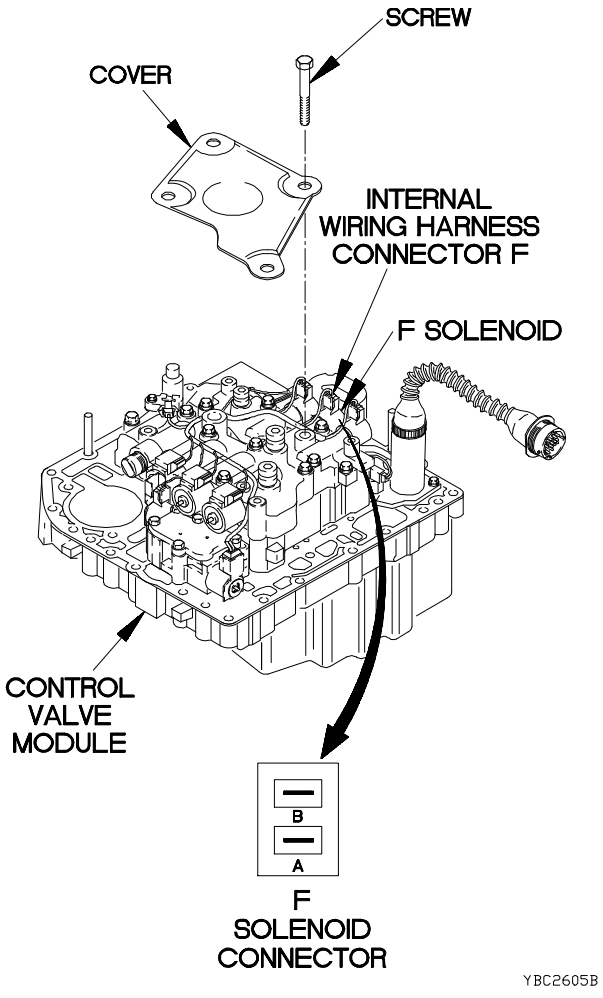
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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).



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

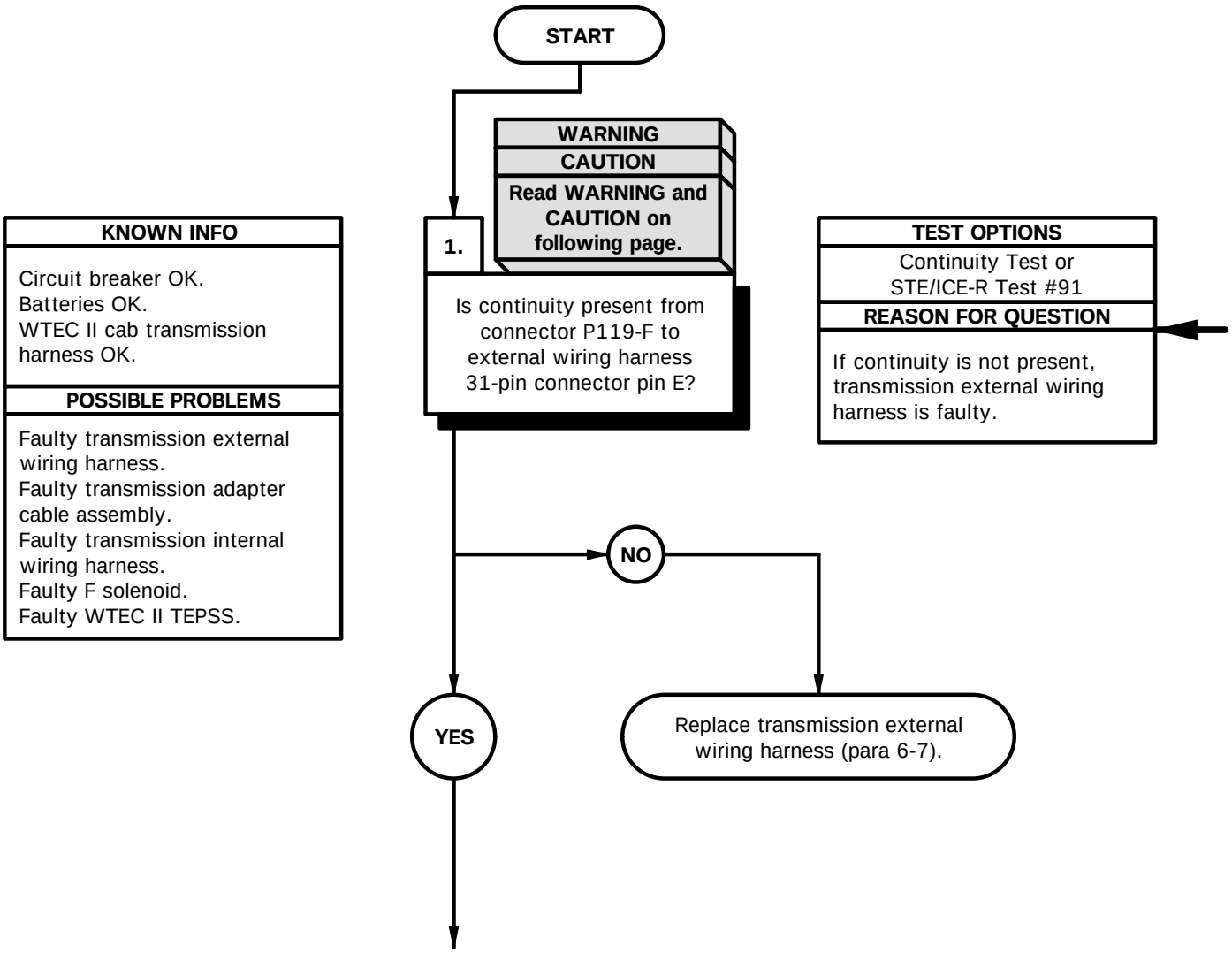
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

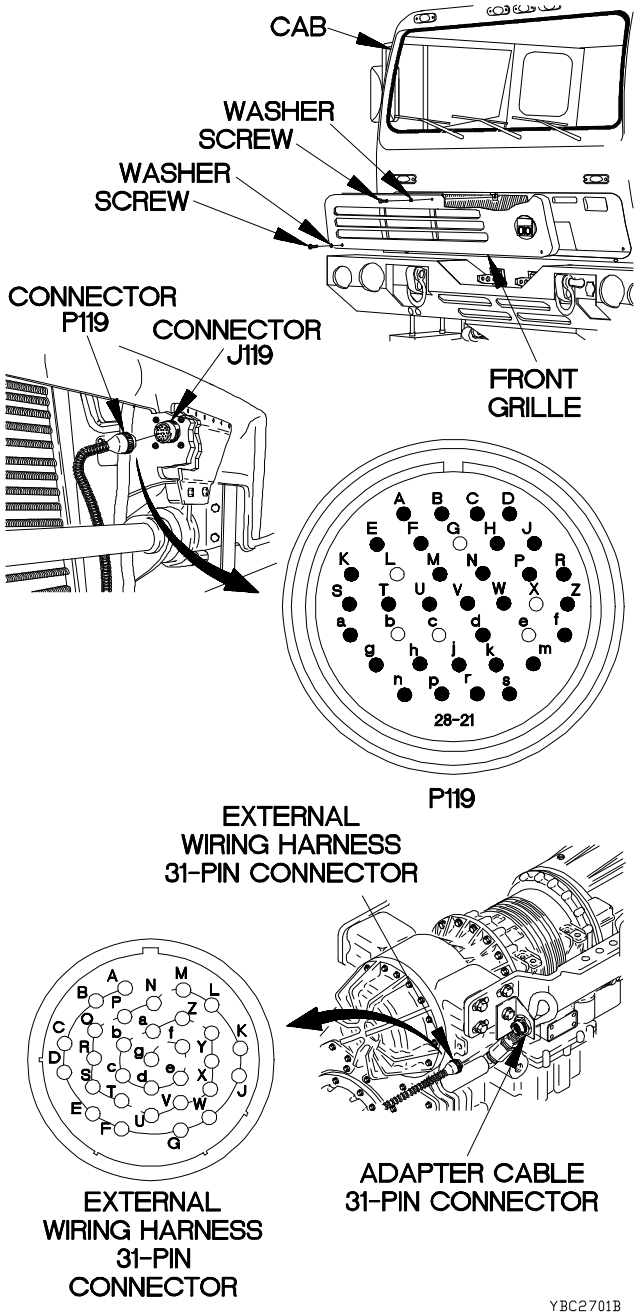
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

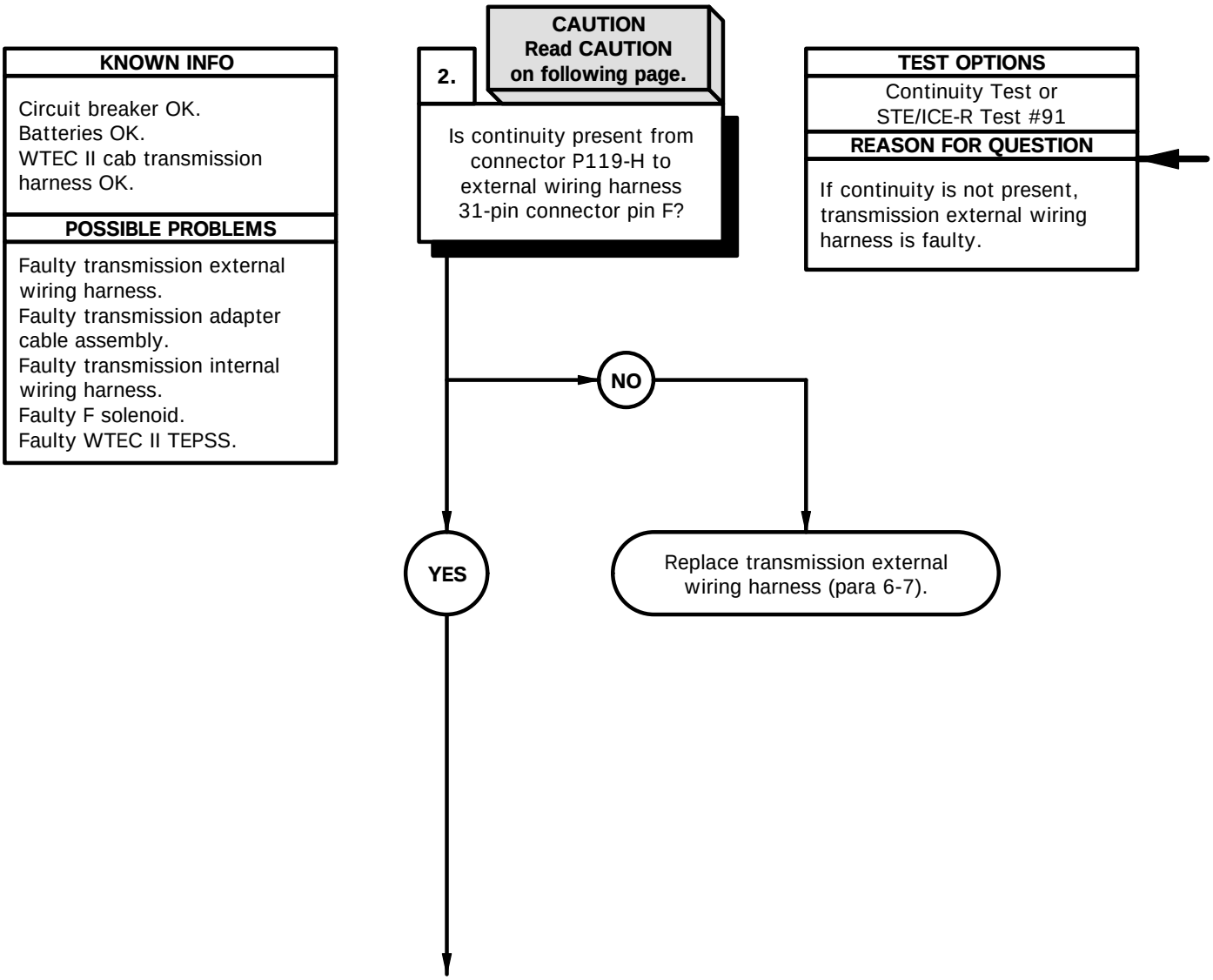
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from adapter cable 31-pin connector.
(6) Set multimeter to ohms.
(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).



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

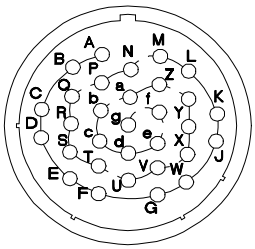
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

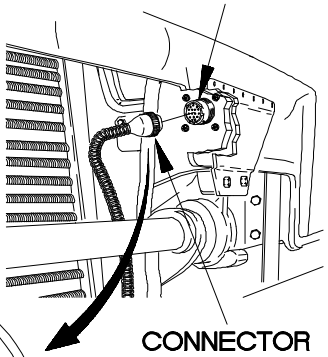
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

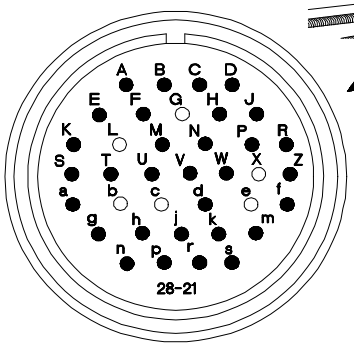
CONTINUITY TEST

(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).

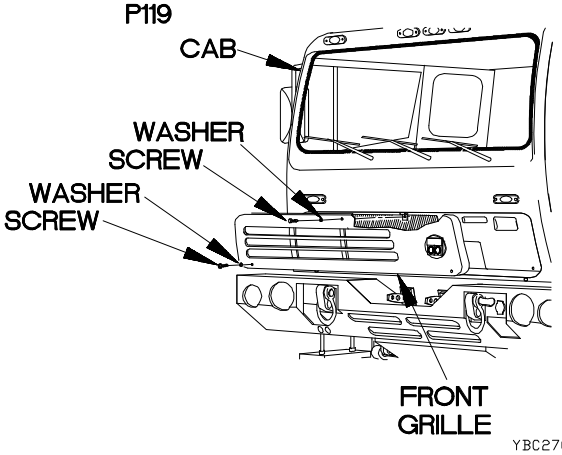


EXTERNAL WIRING HARNESS 31-PIN CONNECTOR

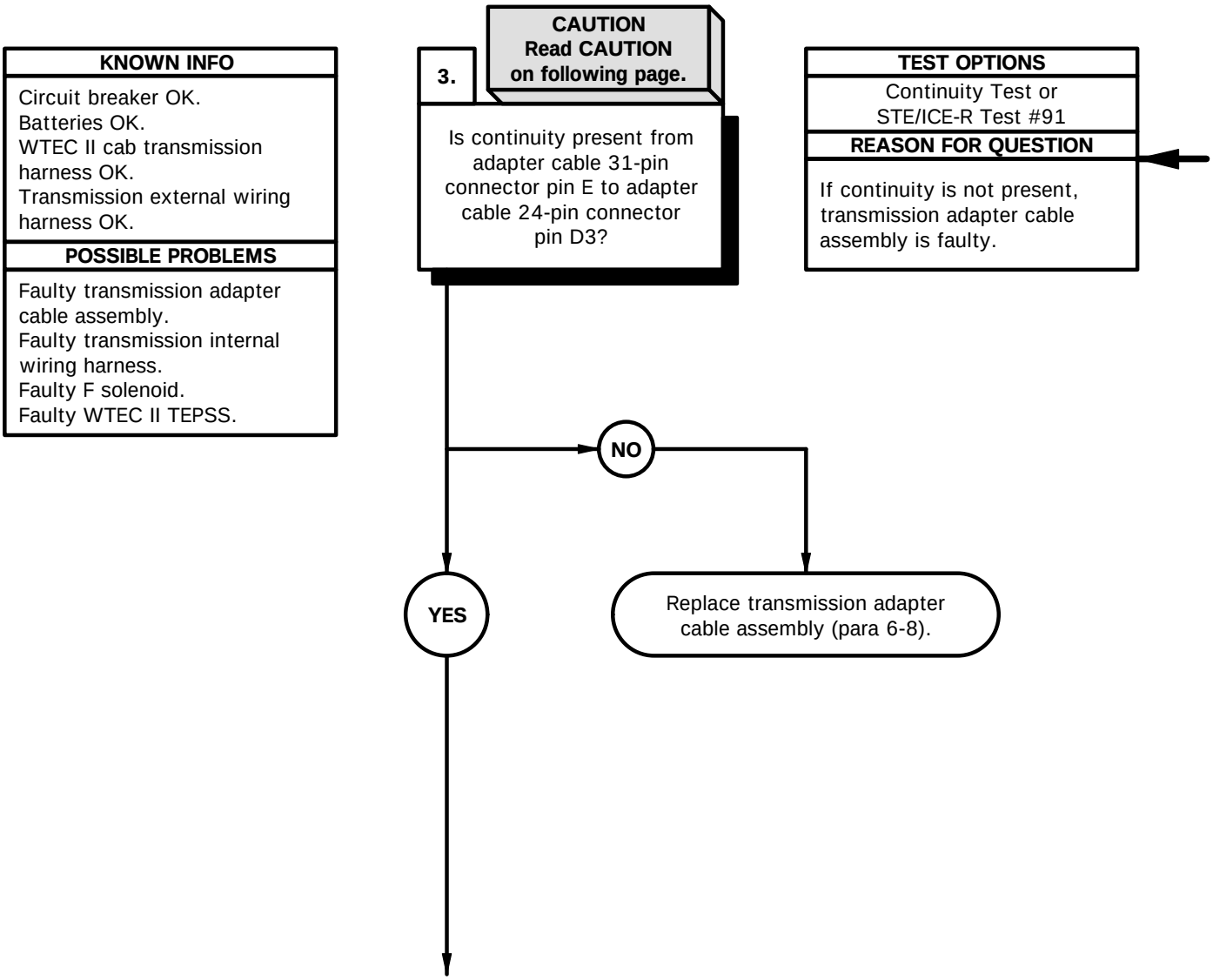




P119



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

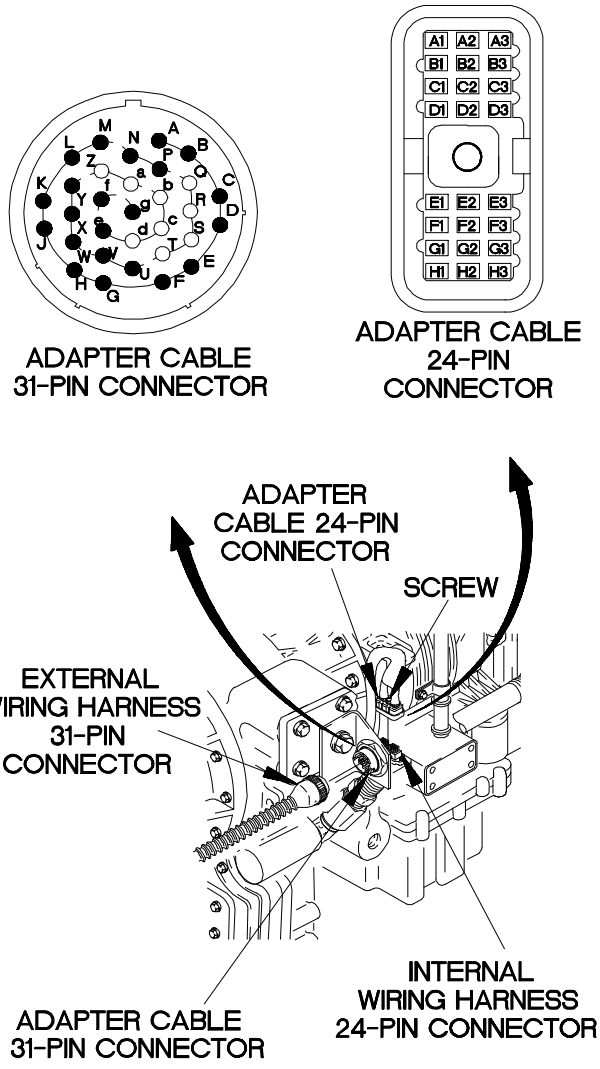
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

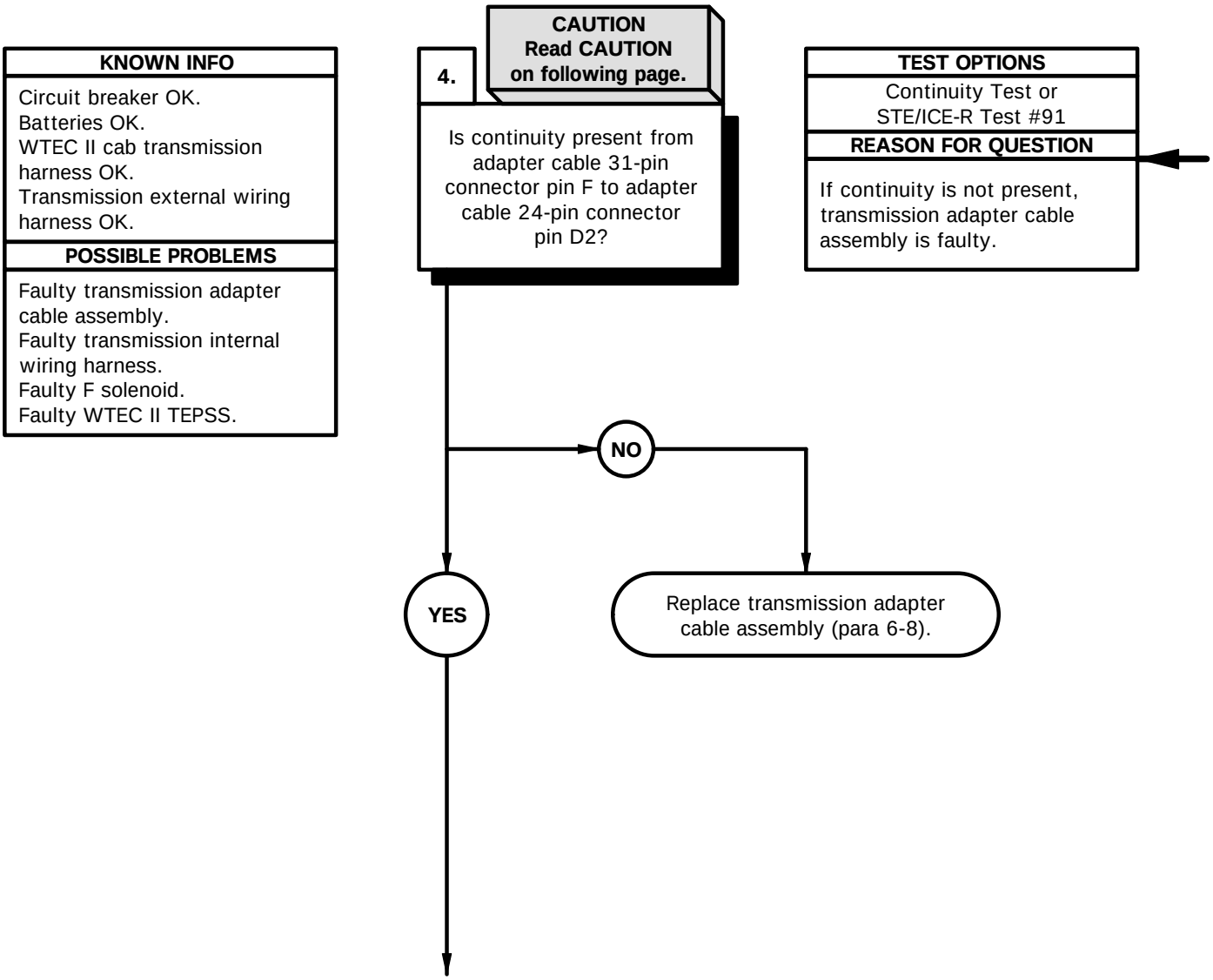
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



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

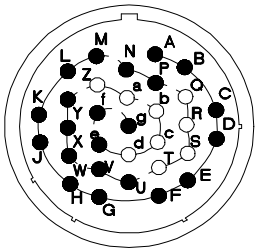
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

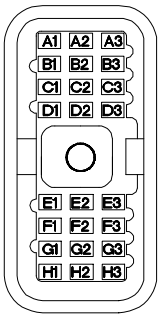
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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.



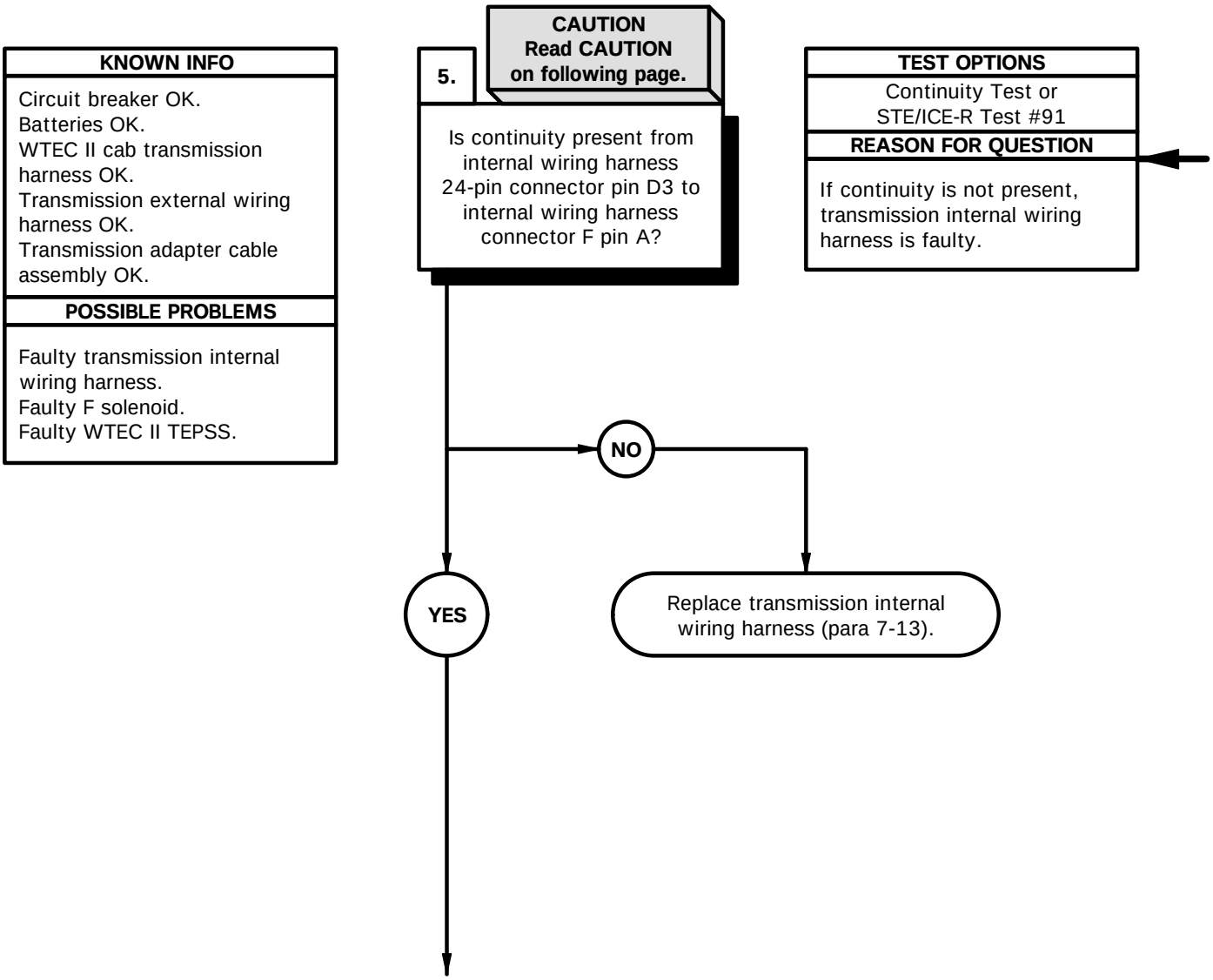
ADAPTER CABLE
31-PIN CONNECTOR



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)



CAUTION

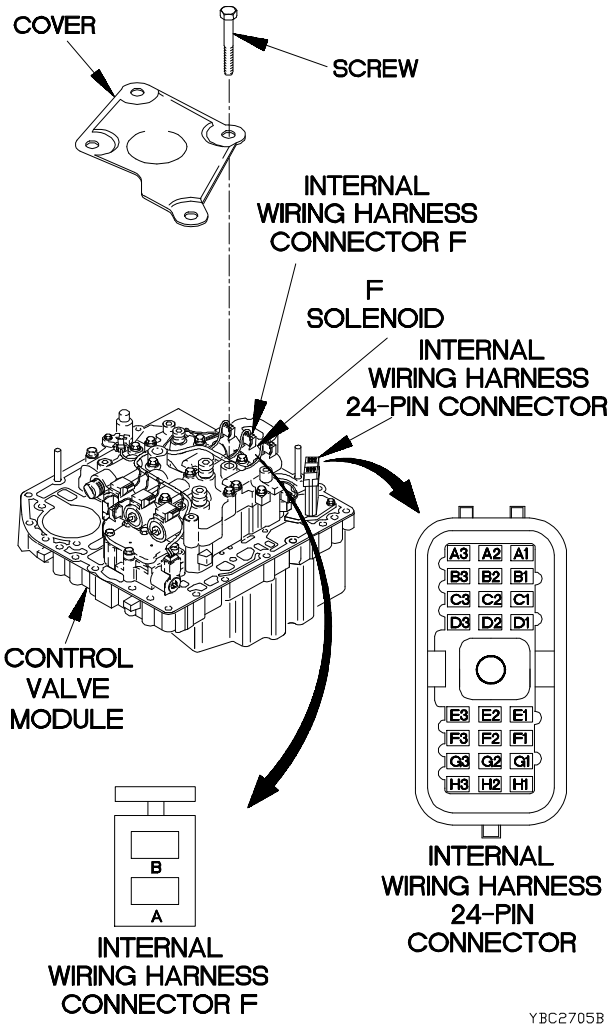
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

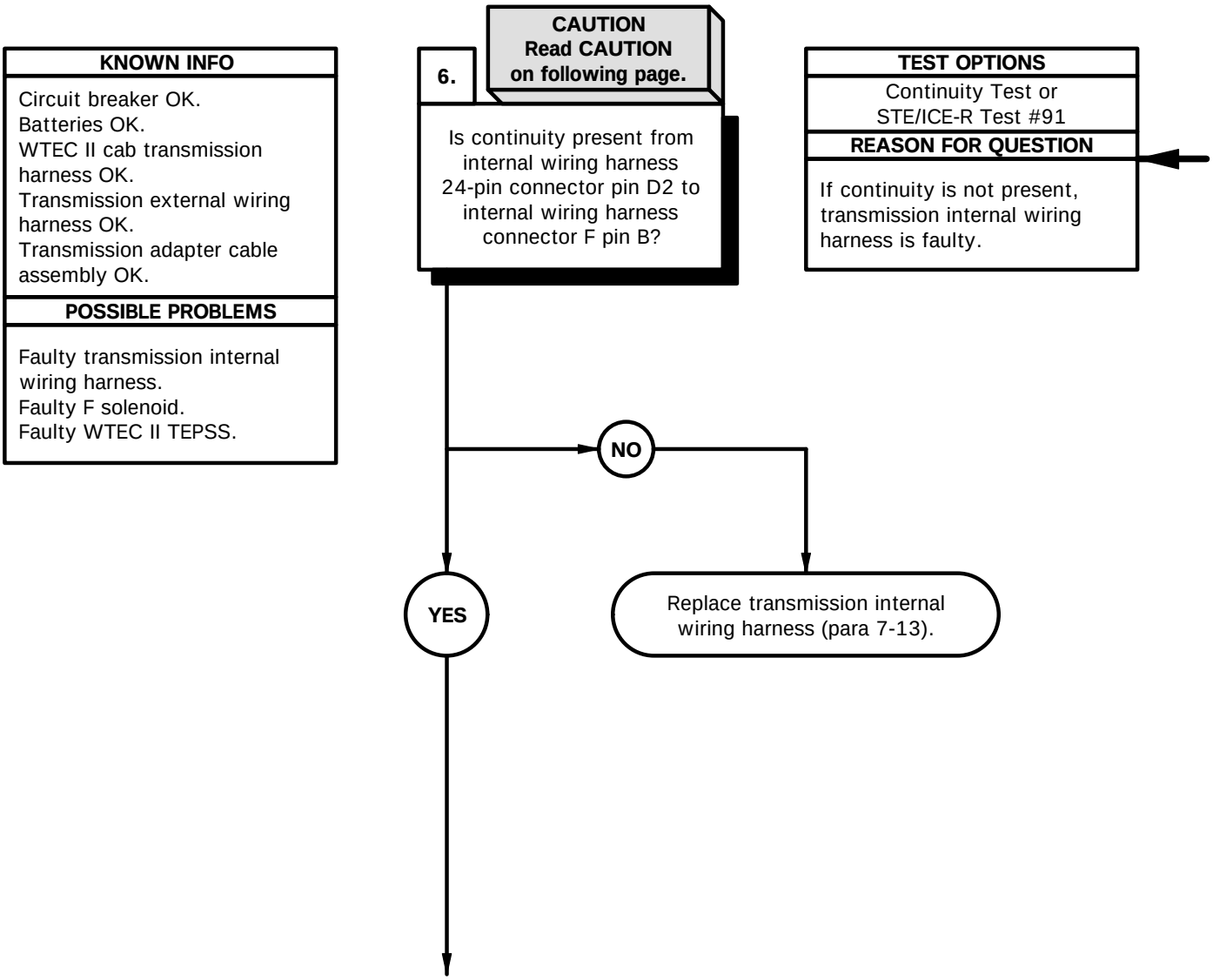
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



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

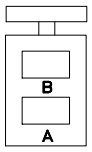
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

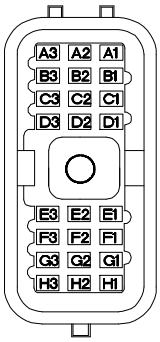
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



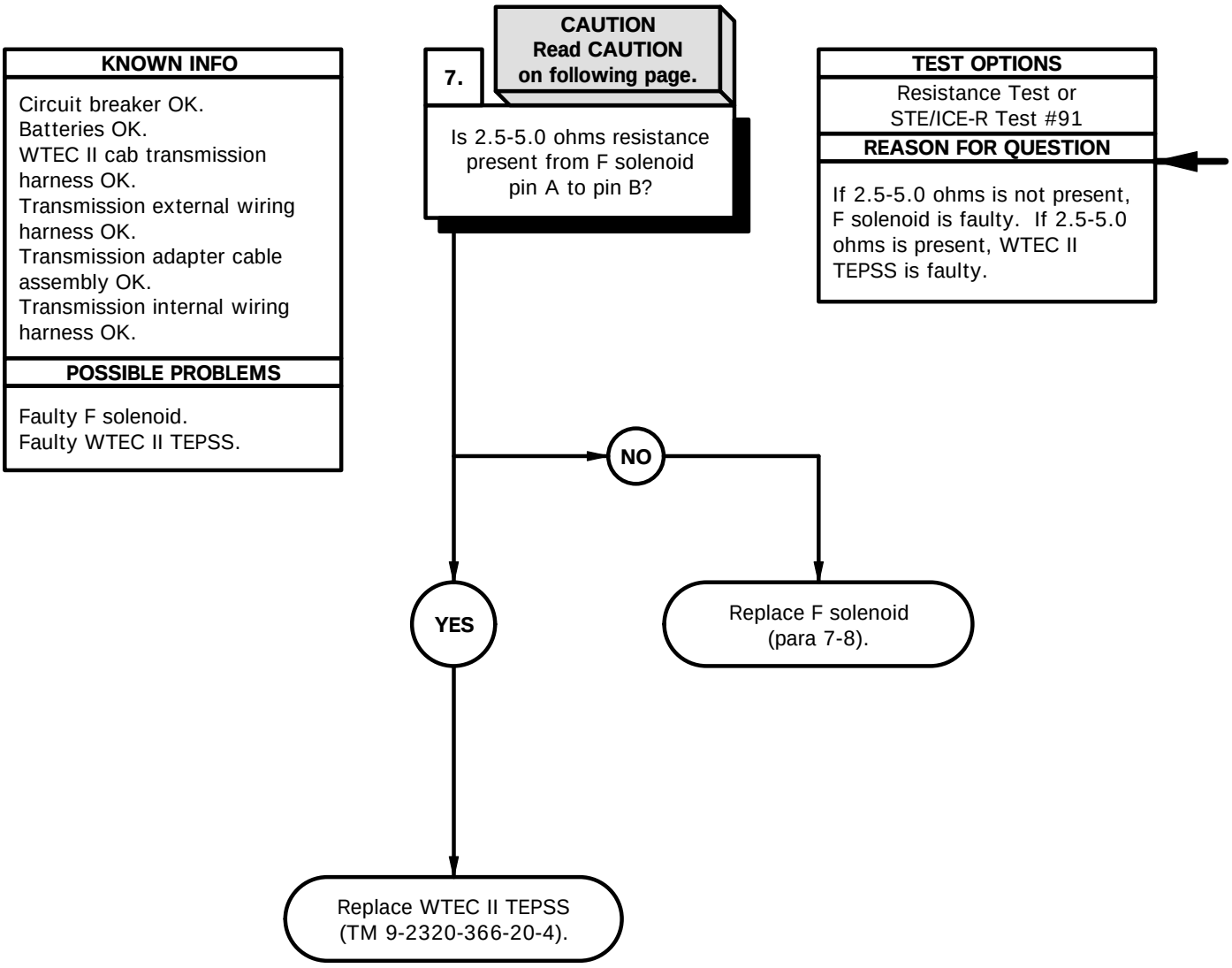
INTERNAL WIRING HARNESS CONNECTOR F



INTERNAL WIRING HARNESS 24-PIN CONNECTOR

YBC2706B

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

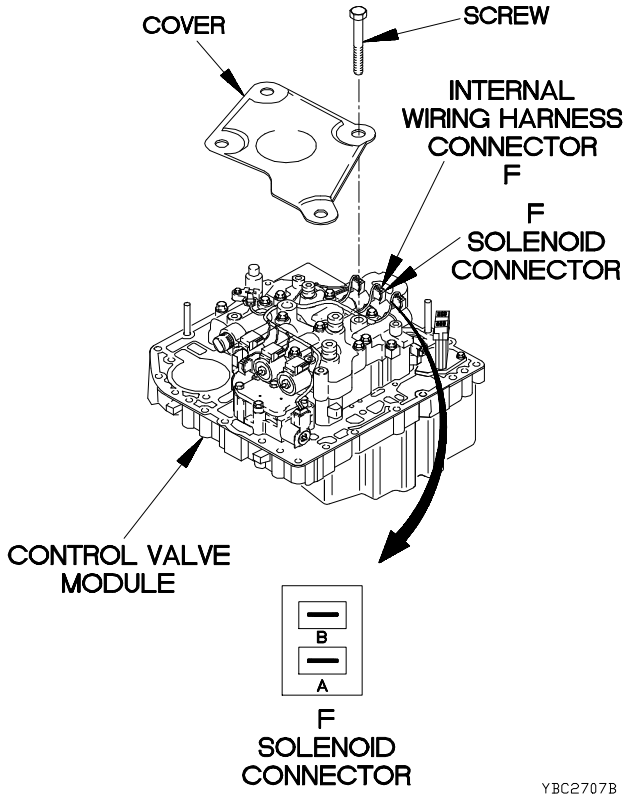
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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).



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

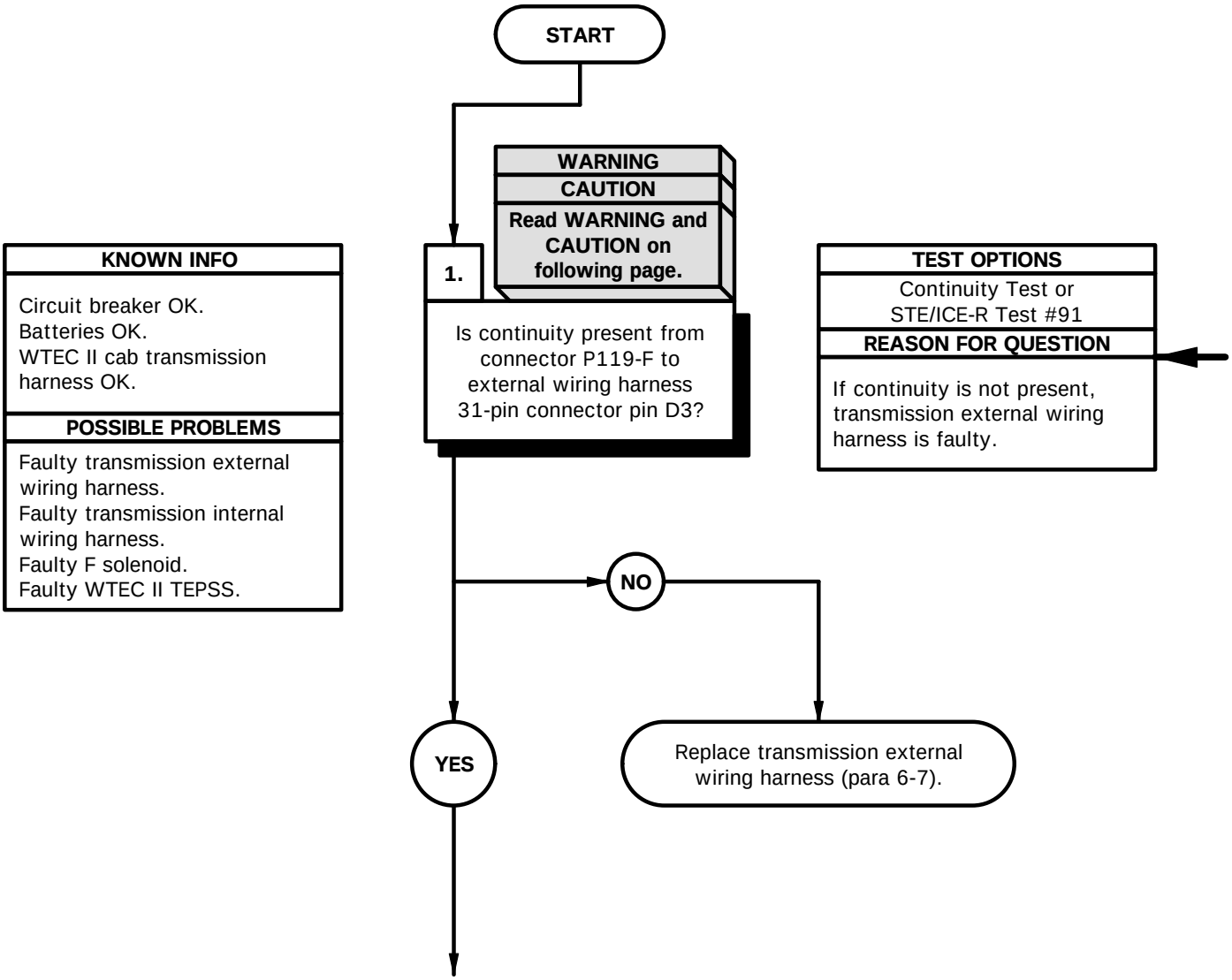
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

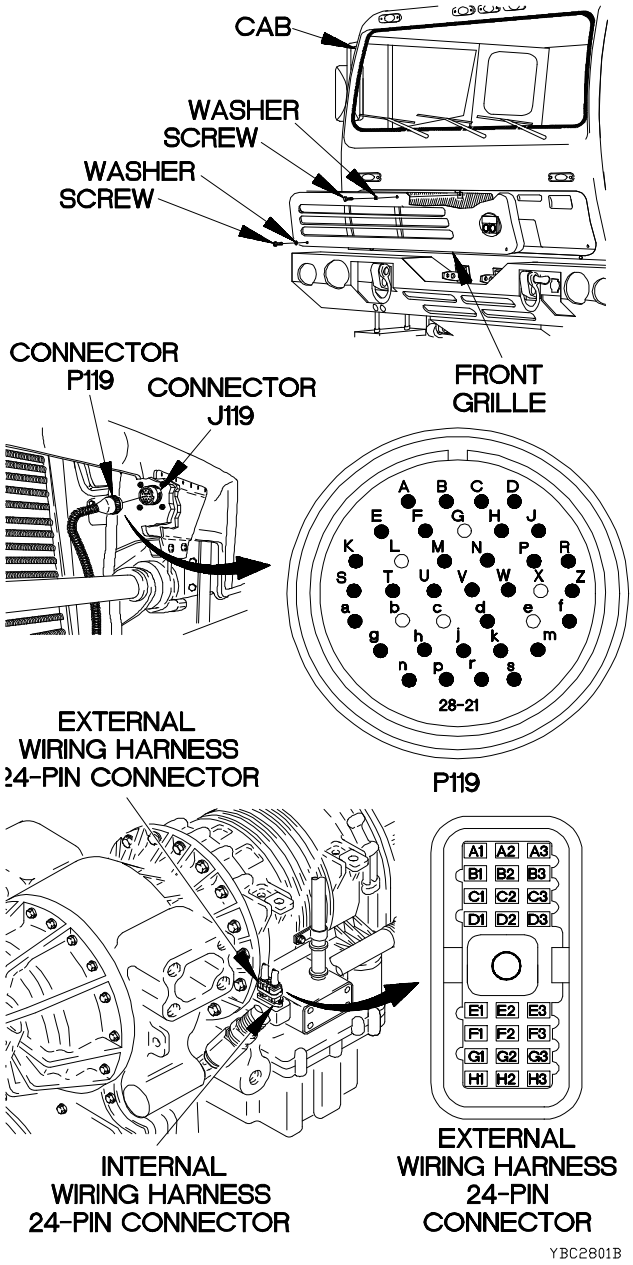
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

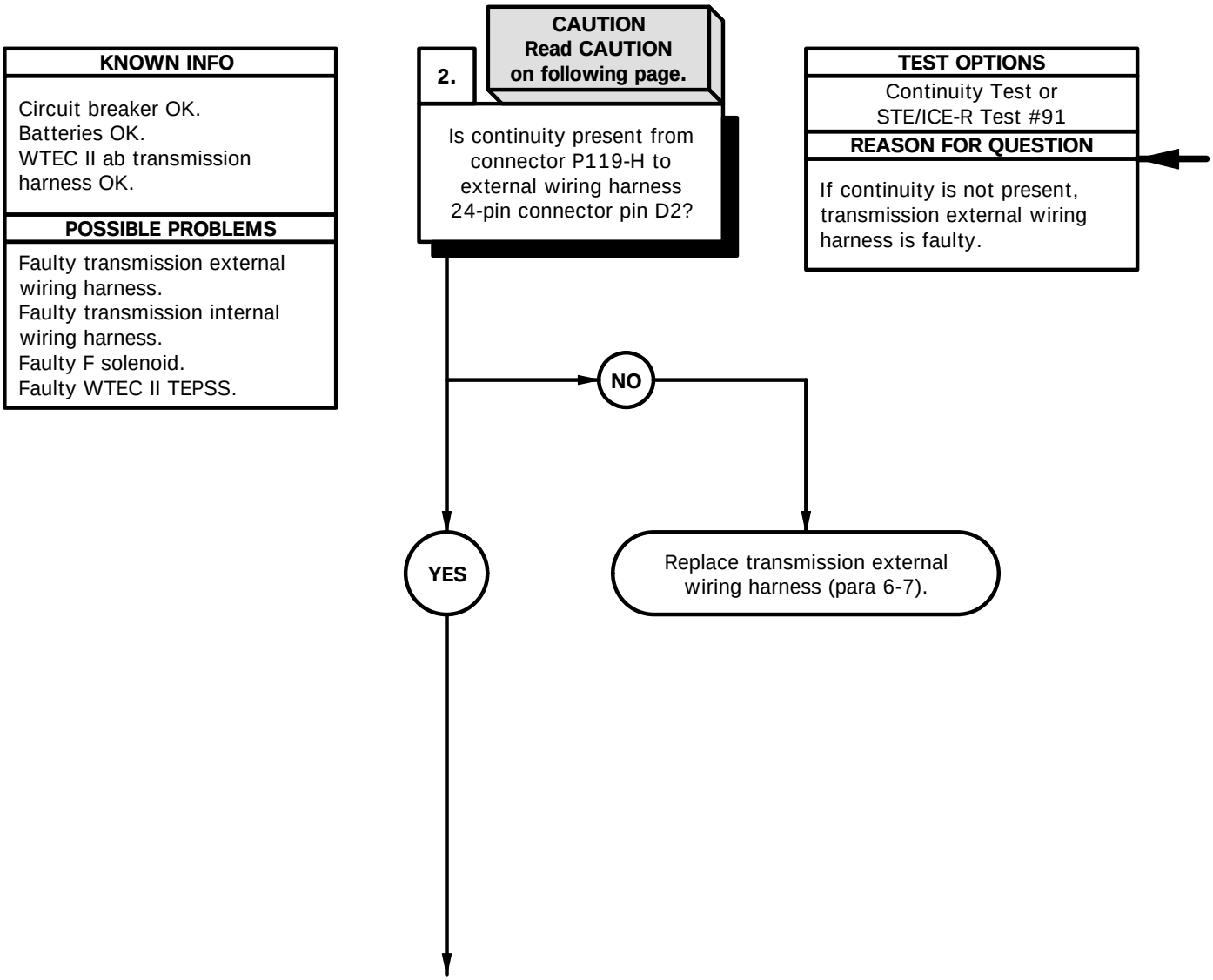
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Loosen screw in external wiring harness 24-pin connector.
(6) Disconnect external wiring harness 24-pin connector 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).



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)



CAUTION

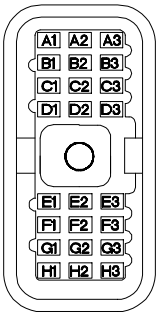
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

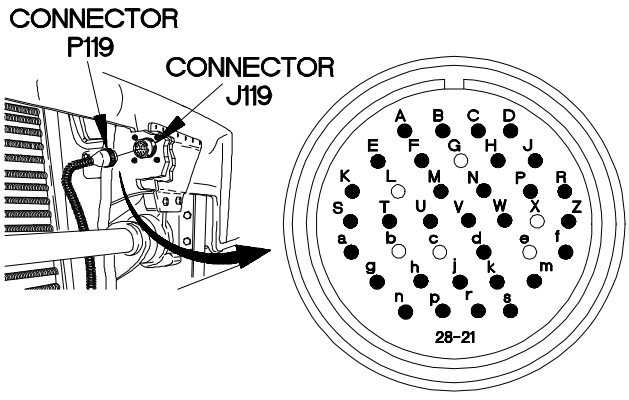
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

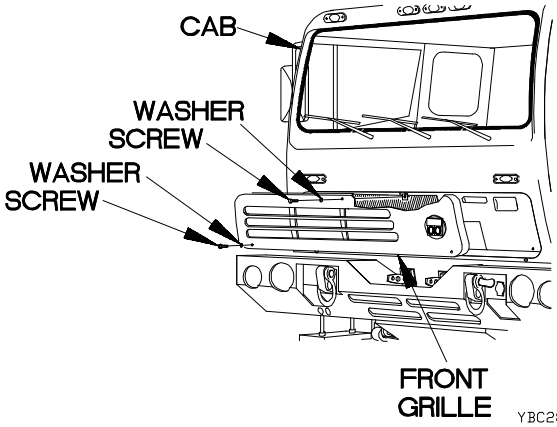
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P119-H.
(3) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin D2 and note reading on multimeter.
(4) If continuity is not present, replace transmission external wiring harness (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).



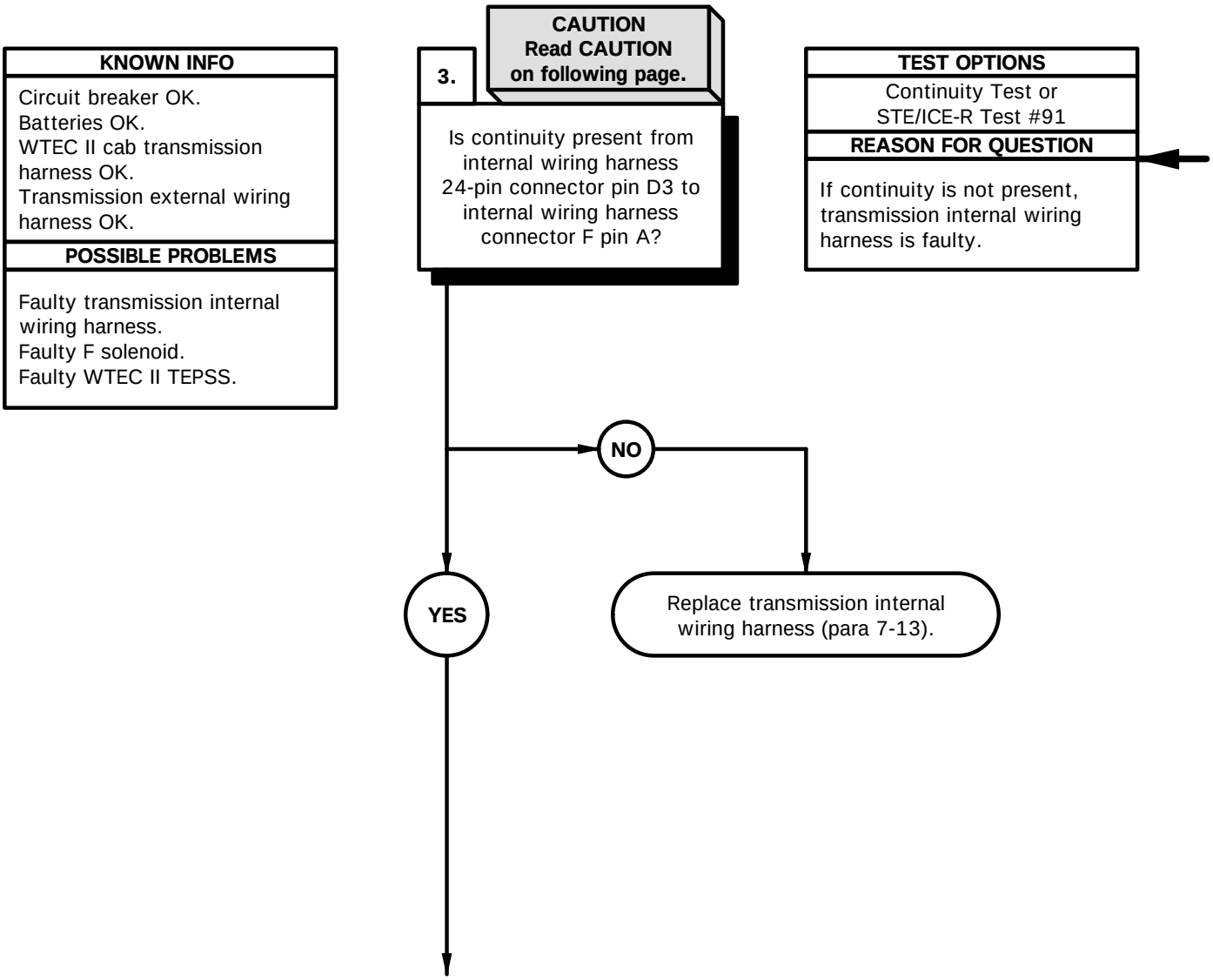
EXTERNAL WIRING HARNESS 24-PIN CONNECTOR



P119



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)



CAUTION

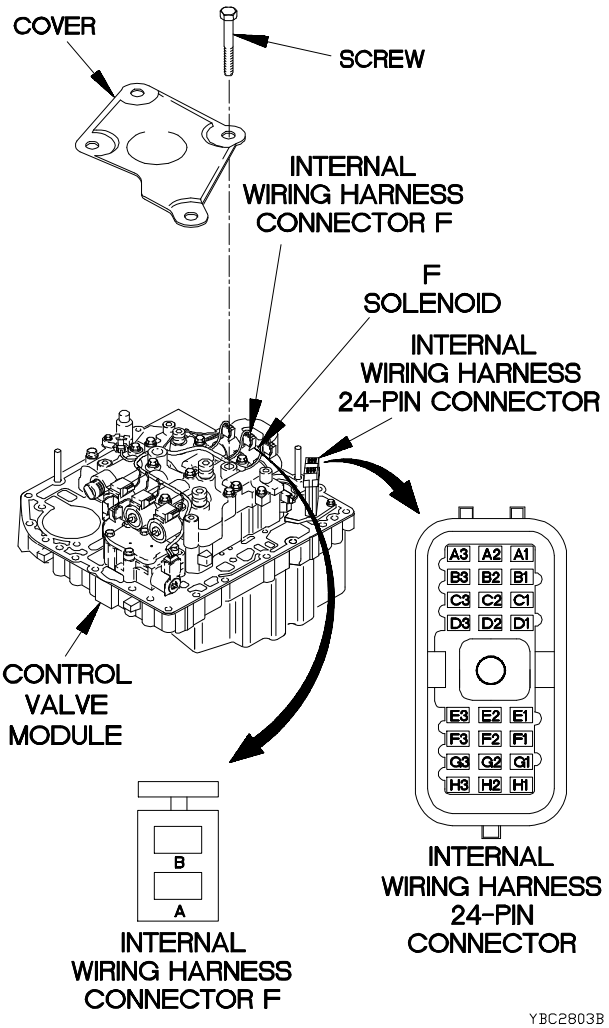
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

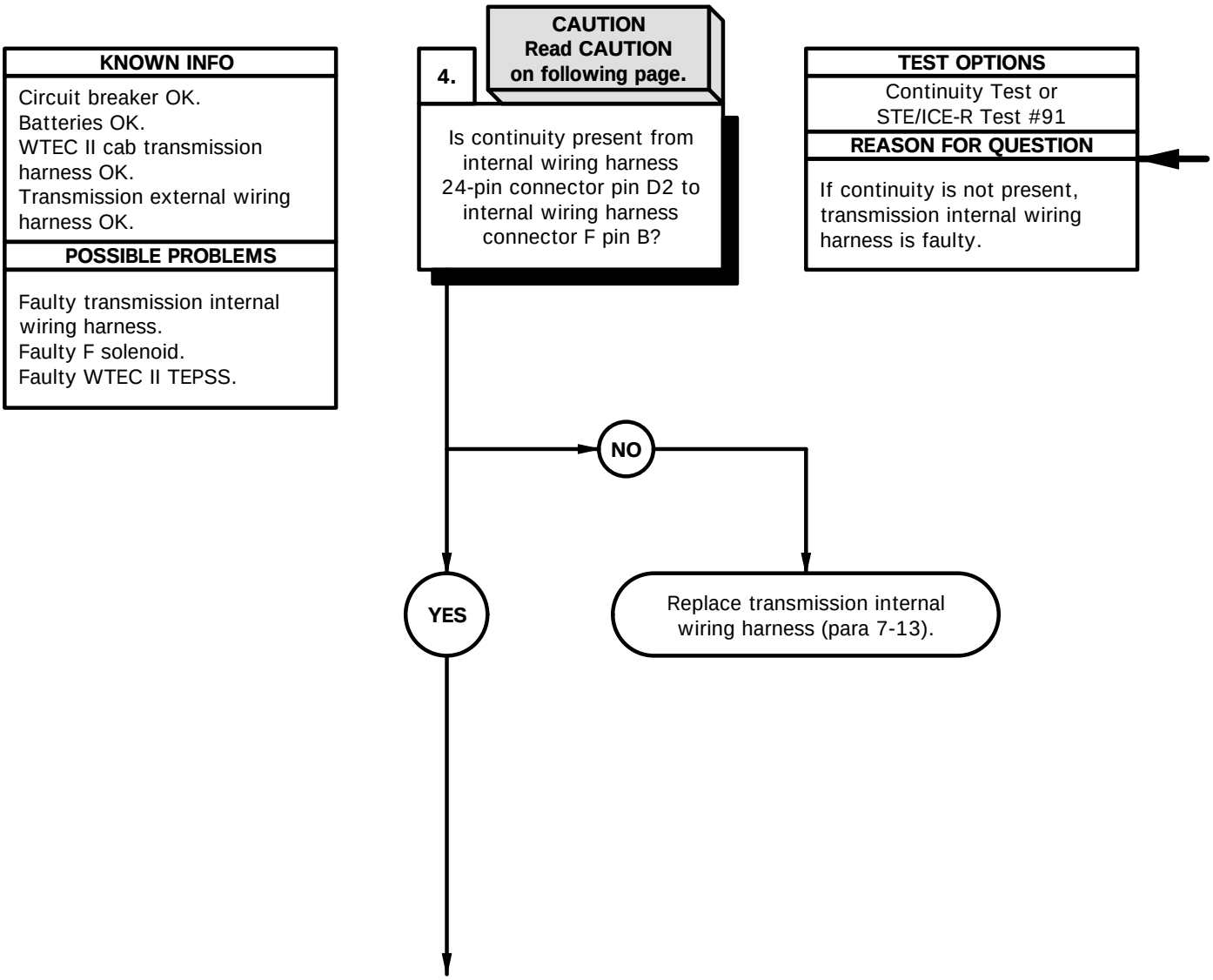
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



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)



CAUTION

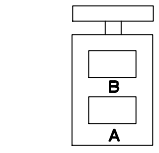
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

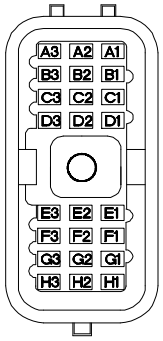
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



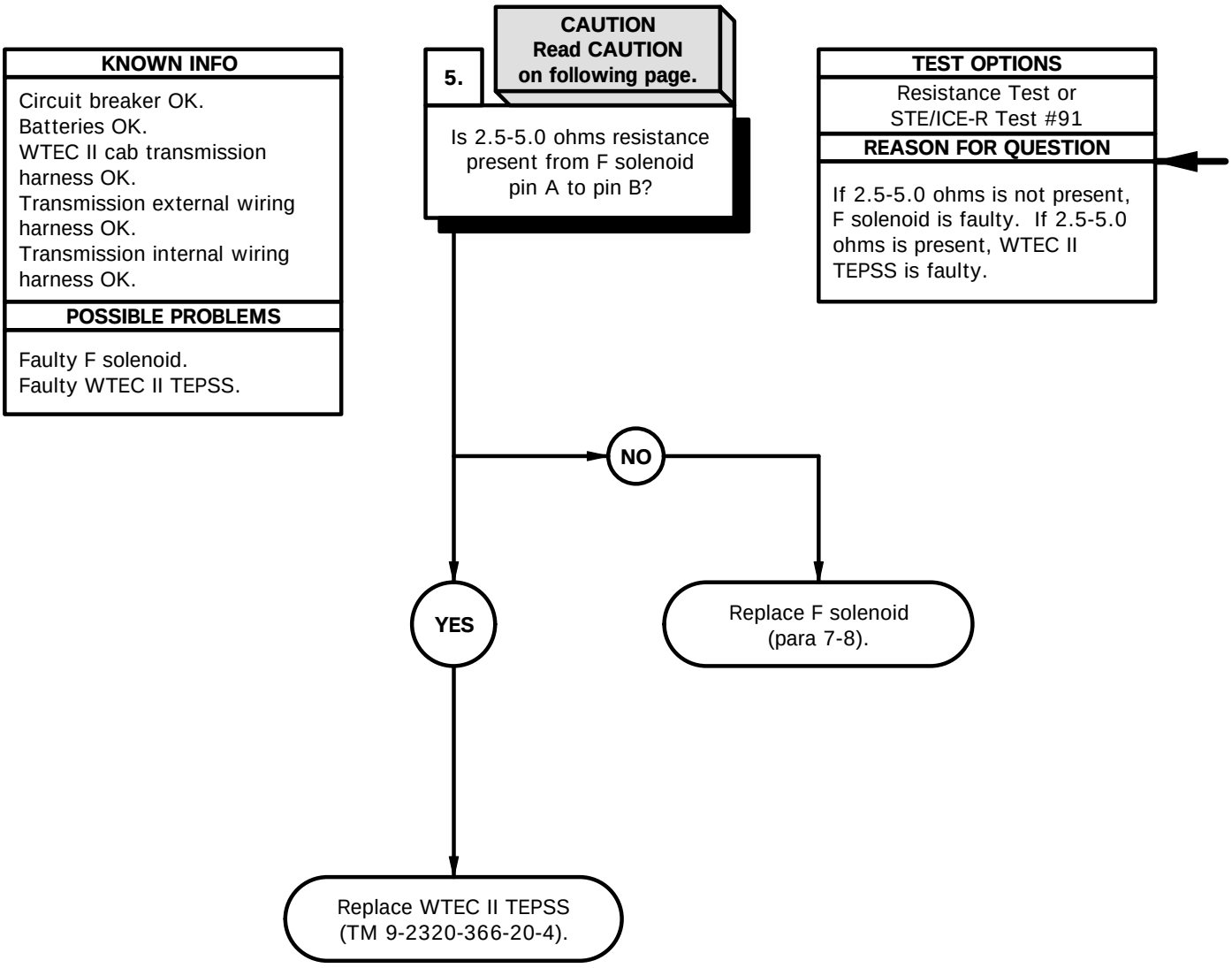
INTERNAL WIRING HARNESS CONNECTOR F



INTERNAL WIRING HARNESS 24-PIN CONNECTOR

YBC2804B

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)



CAUTION

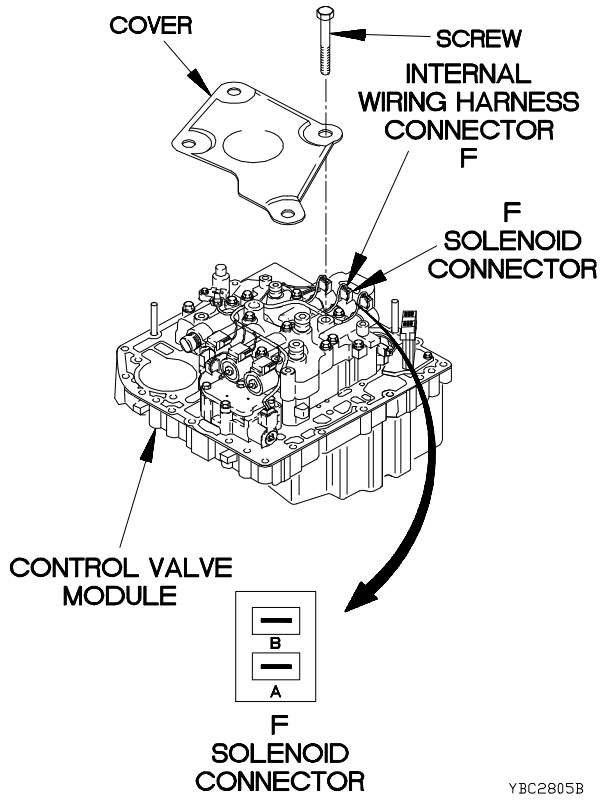
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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).



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

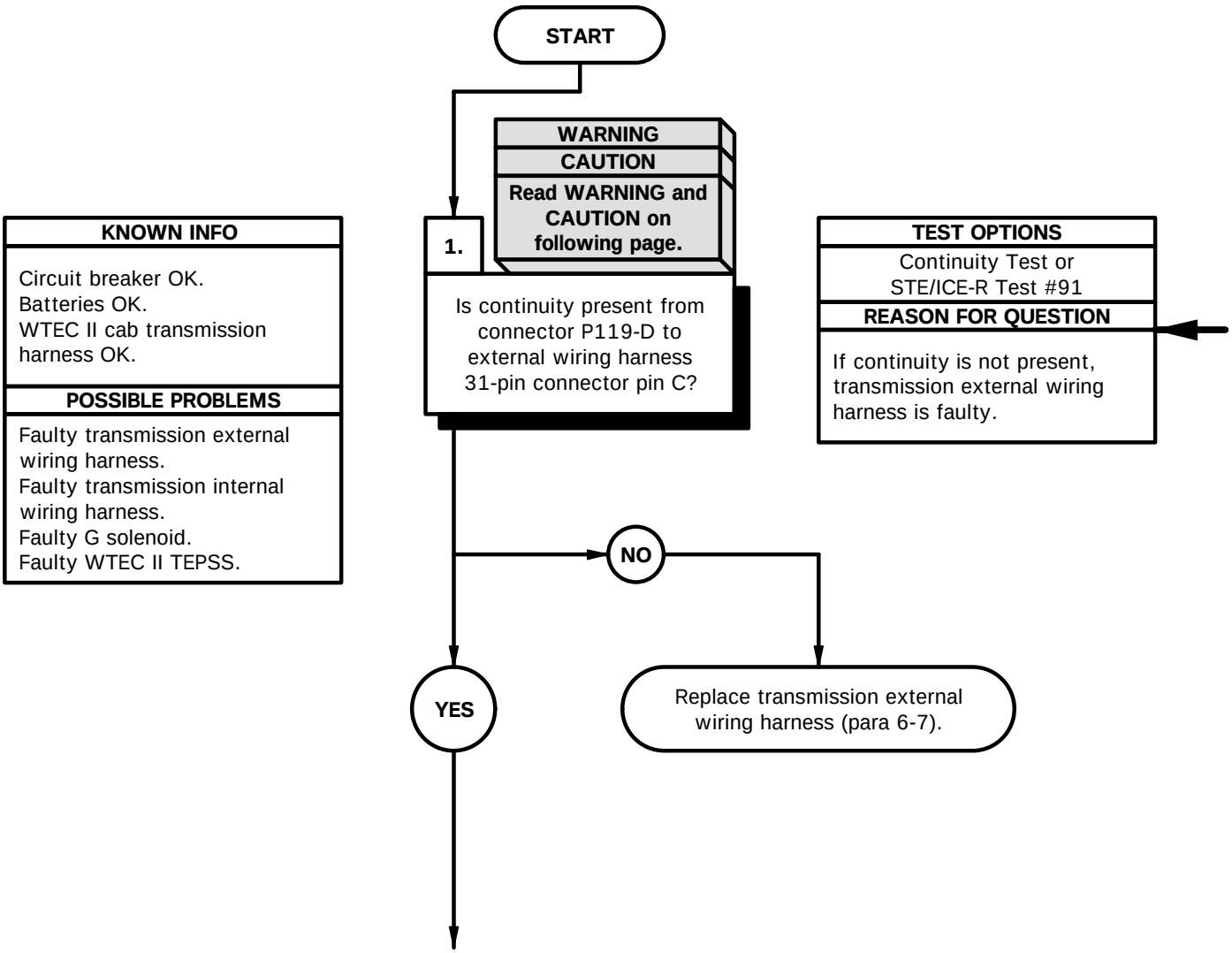
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

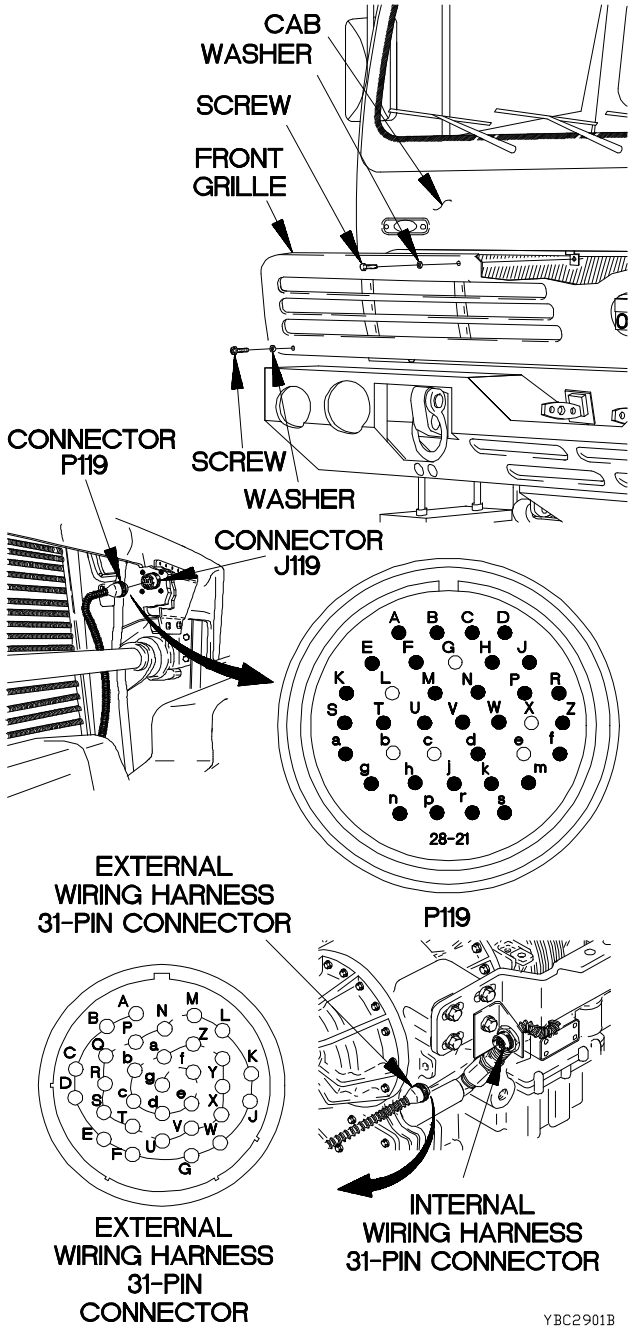
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

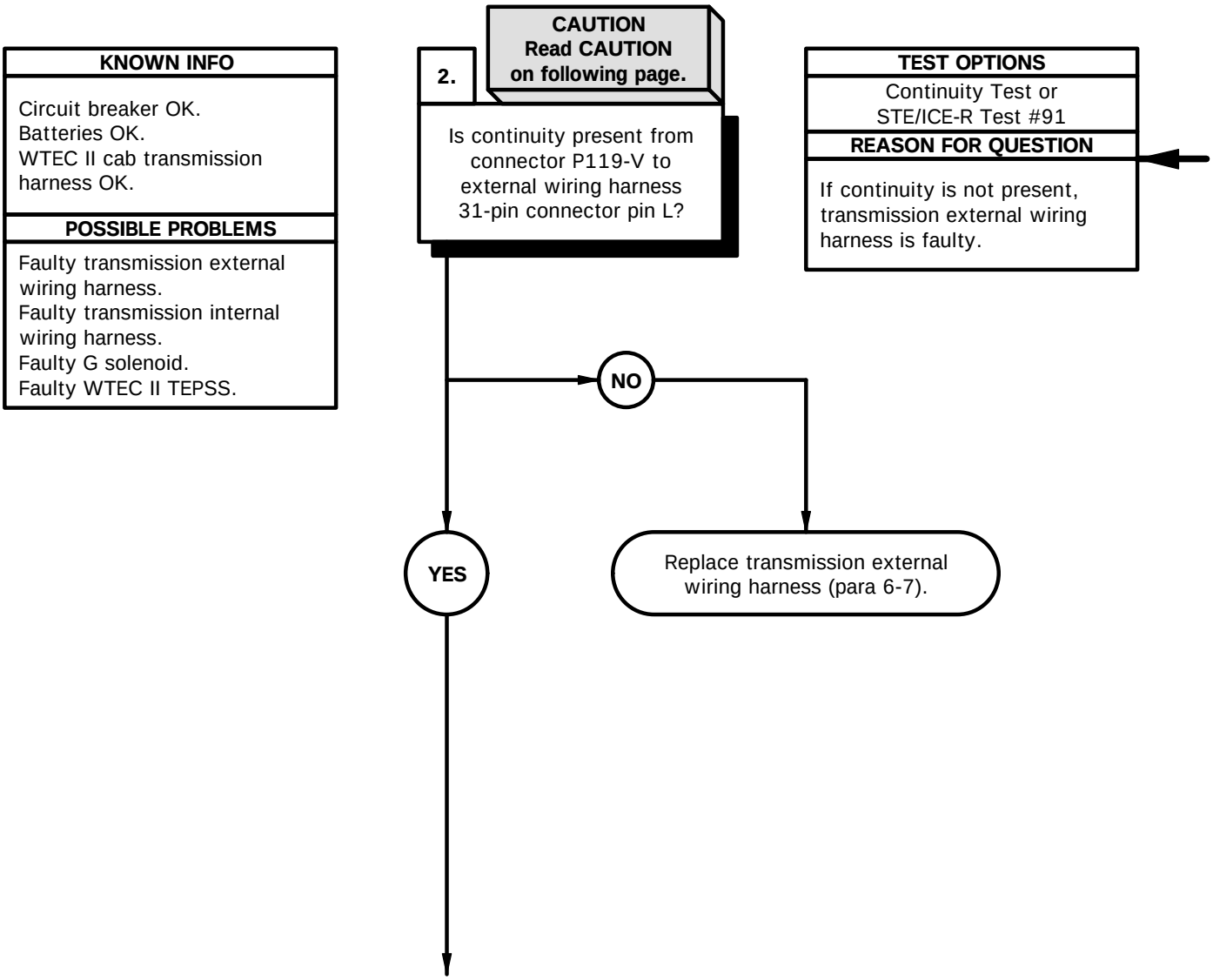
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin harness connector.
(6) Set 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).



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

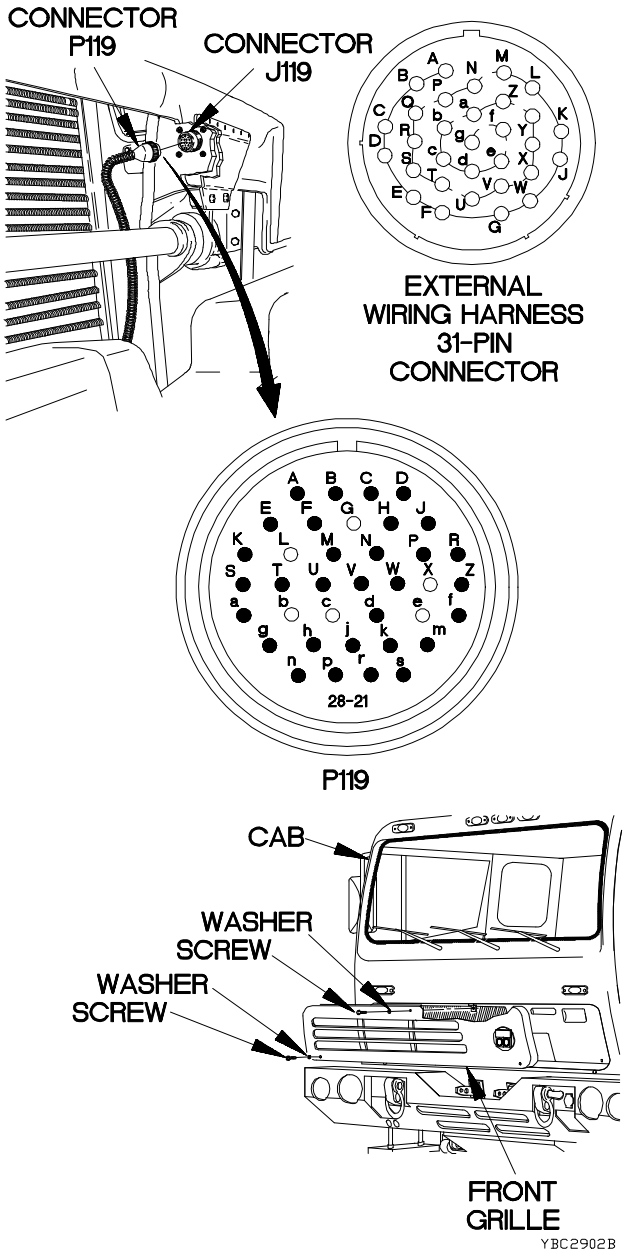
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

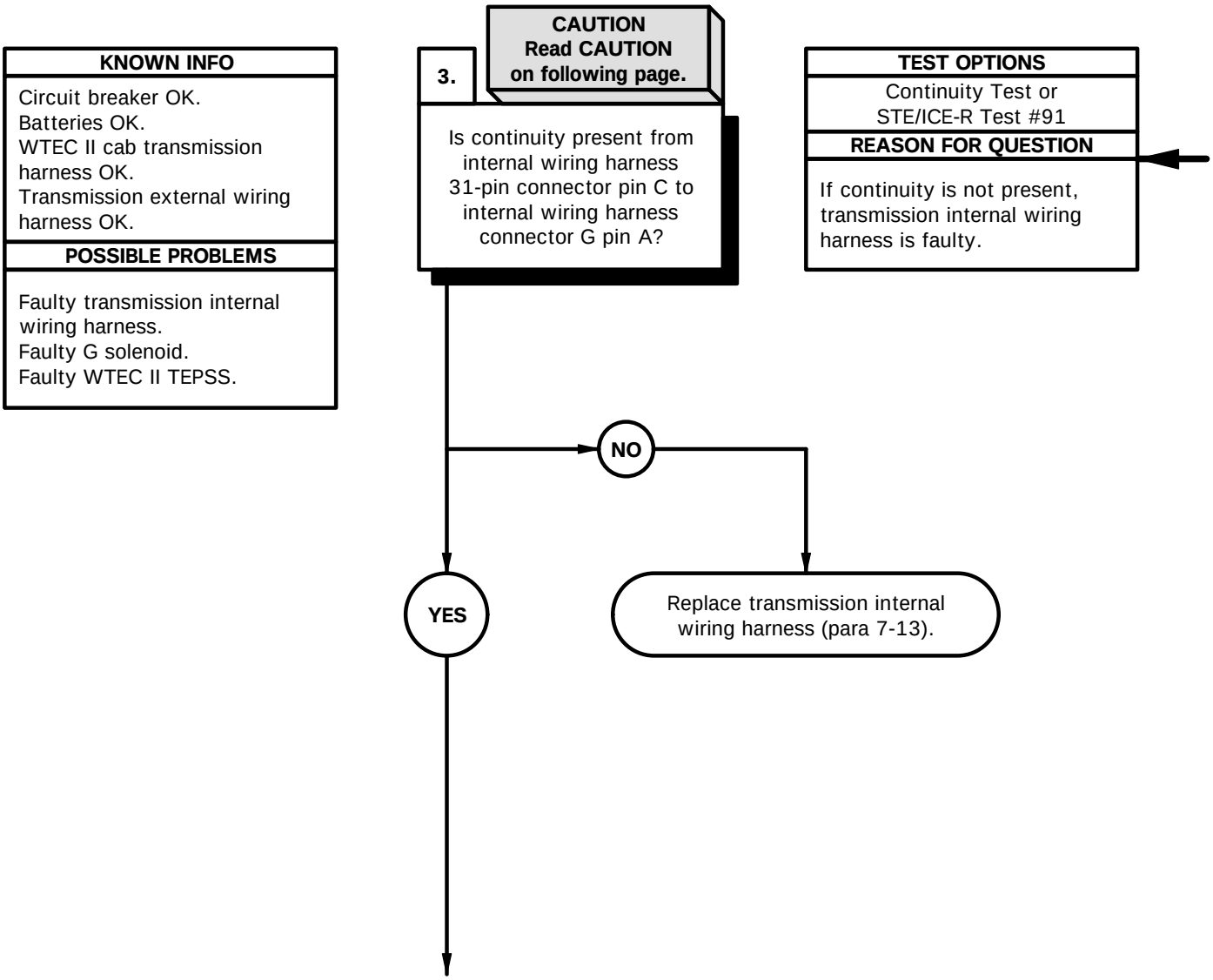
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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)



CAUTION

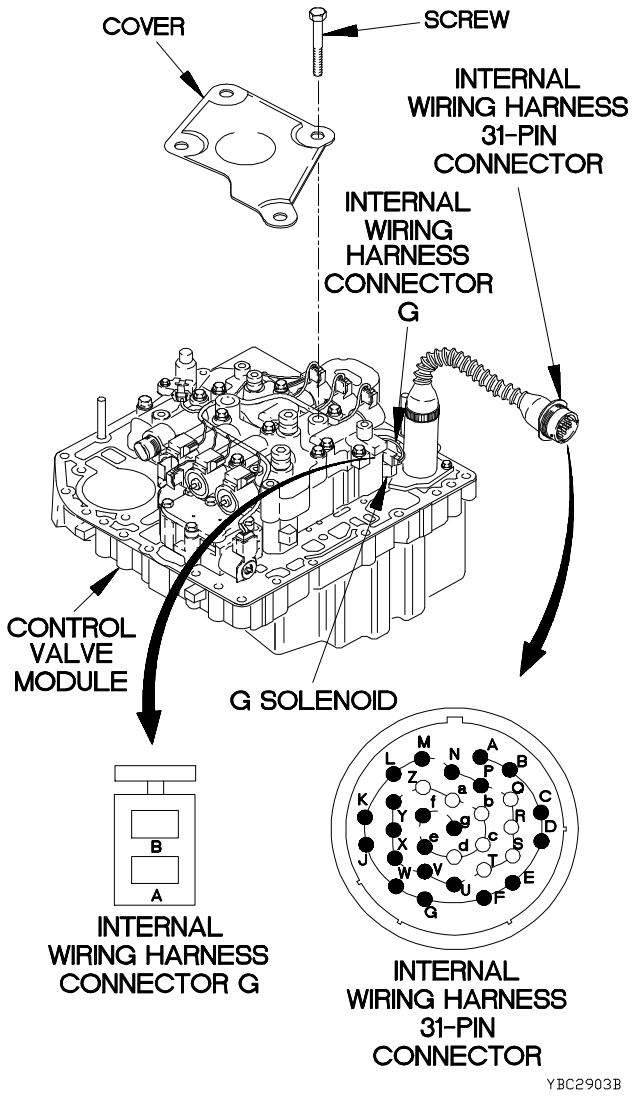
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

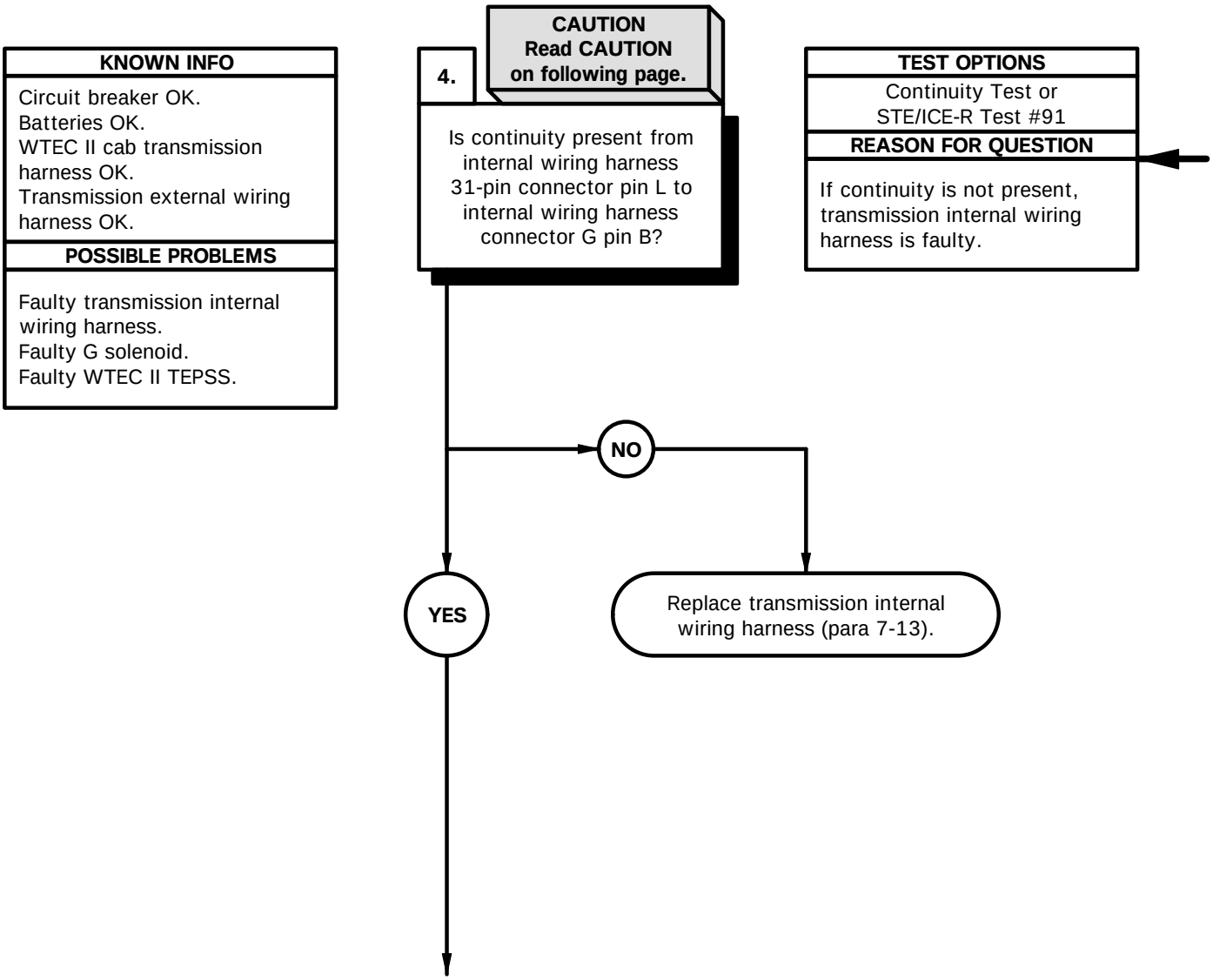
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



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

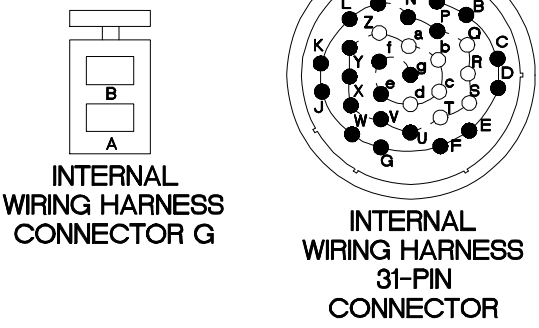
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

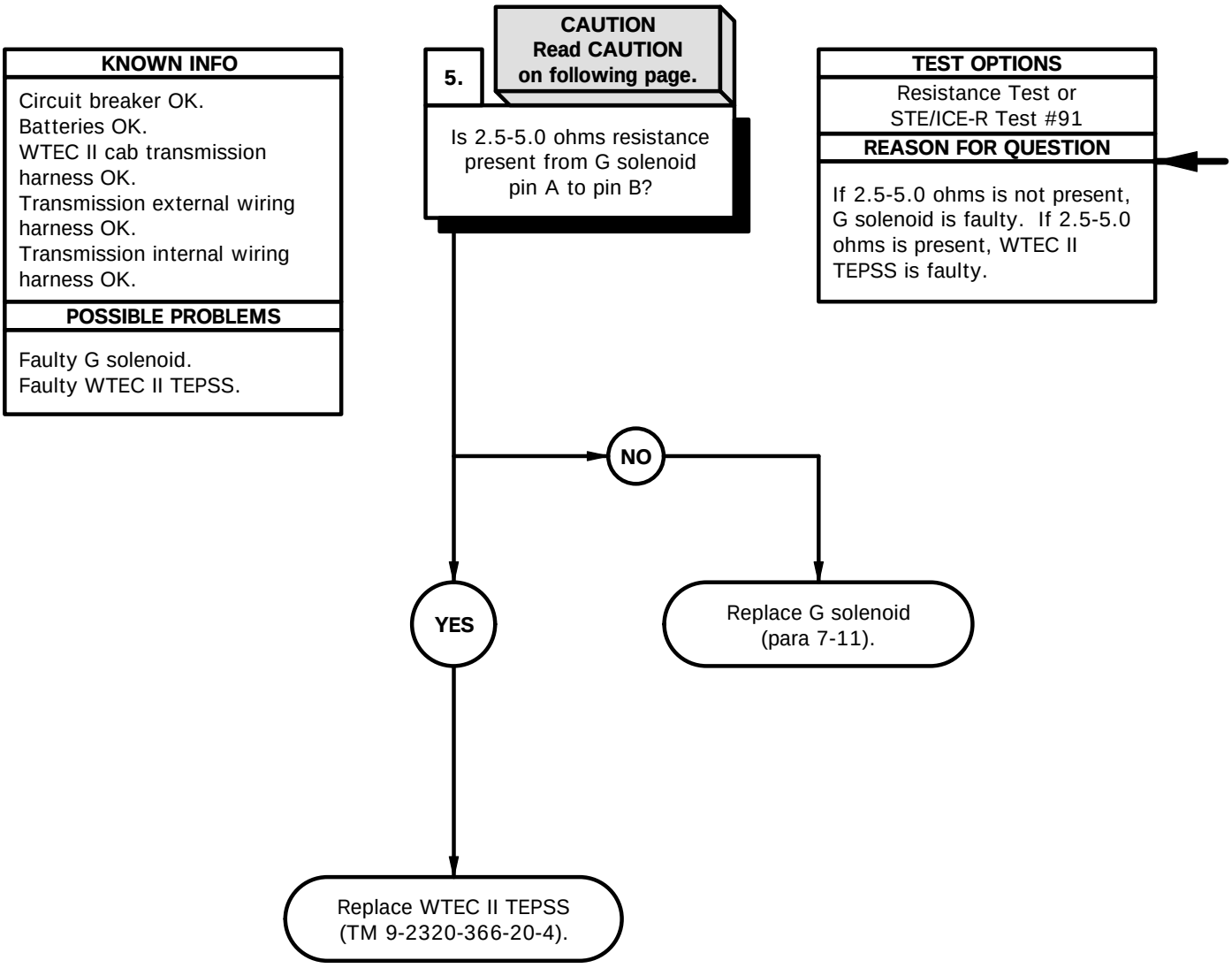
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



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

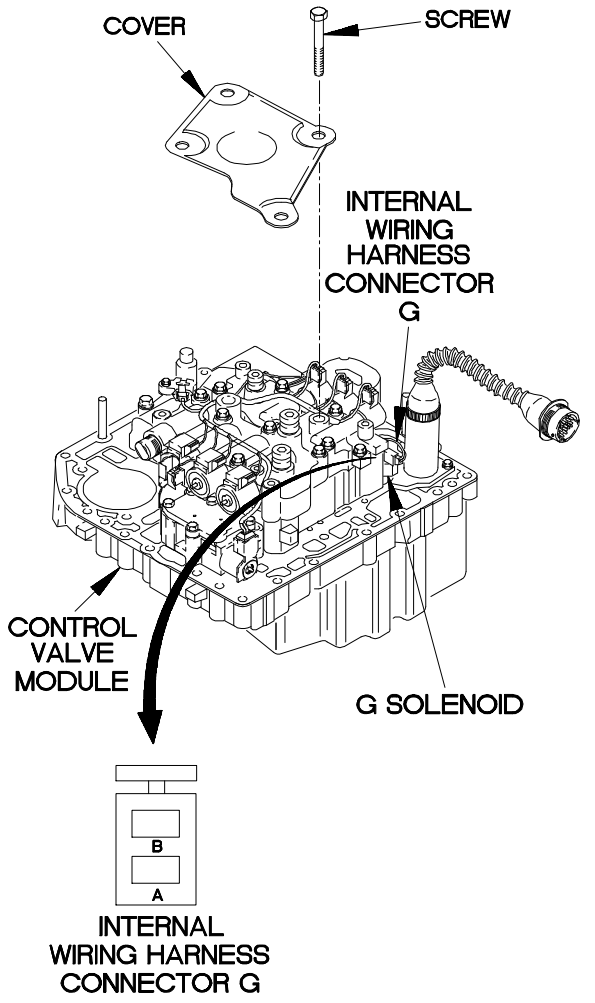
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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).



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

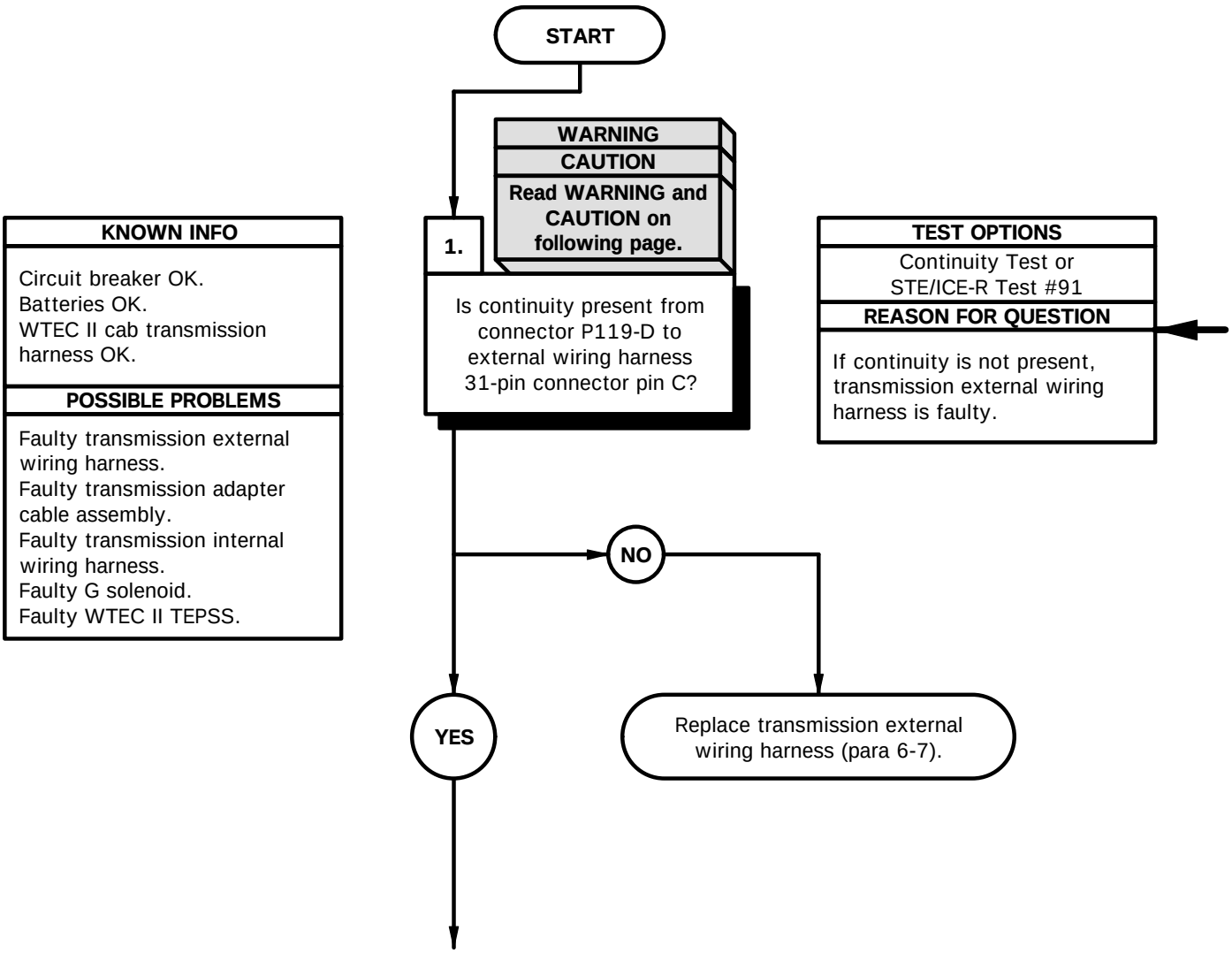
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

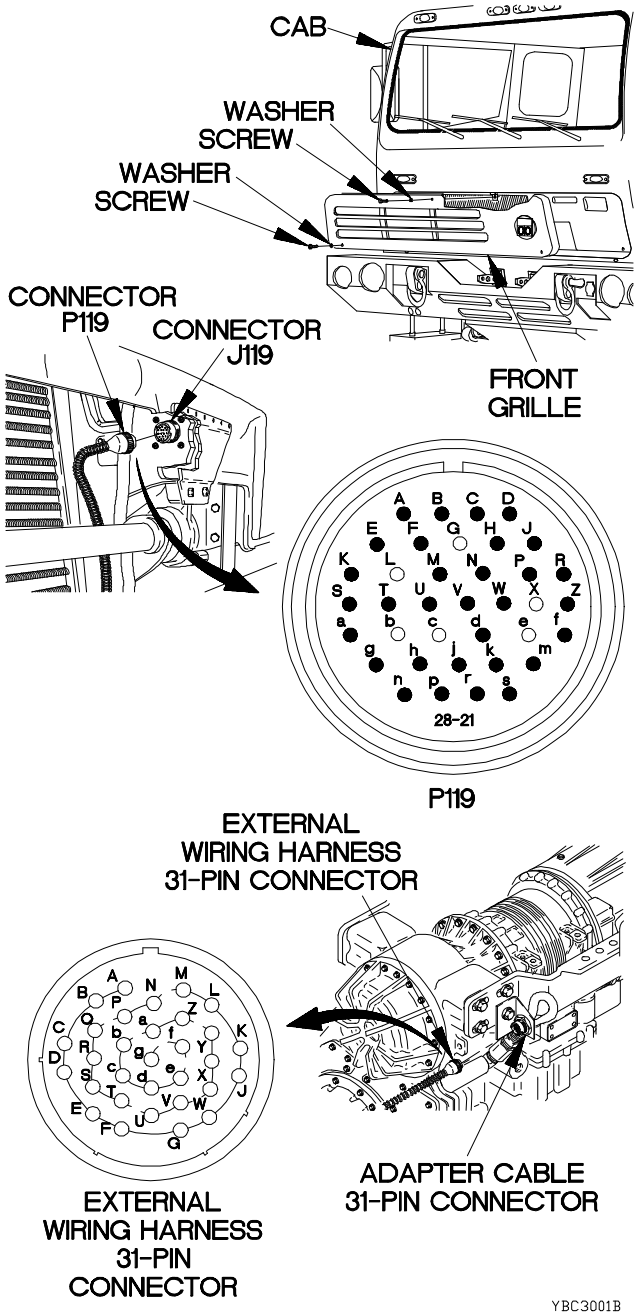
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

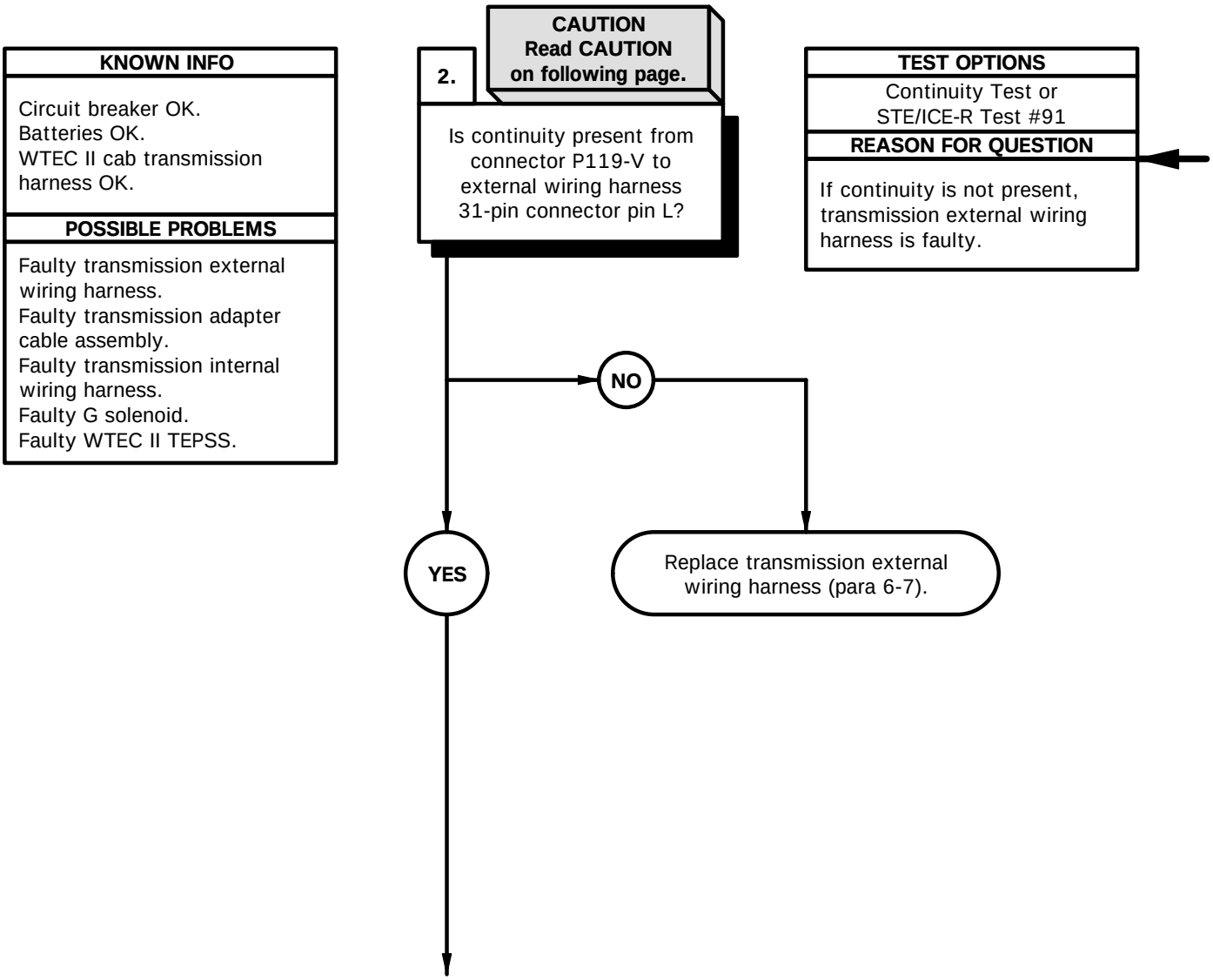
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from adapter cable 31-pin connector.
(6) Set multimeter to ohms.
(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).



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

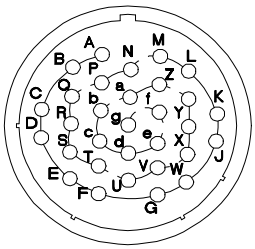
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

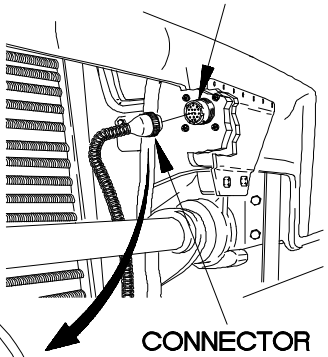
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

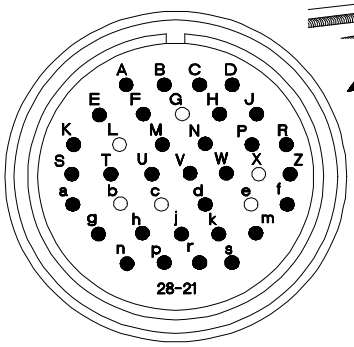
CONTINUITY TEST

(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).

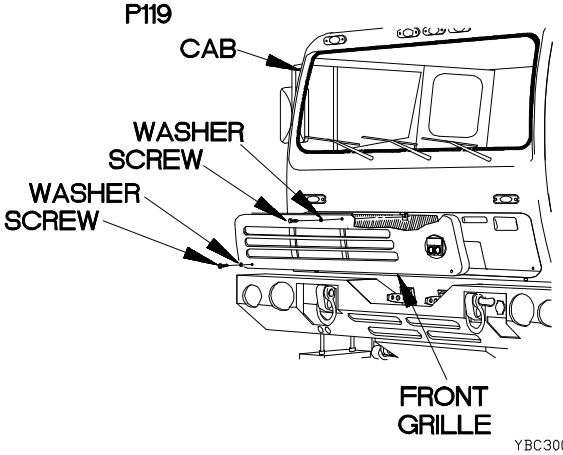


EXTERNAL WIRING HARNESS 31-PIN CONNECTOR

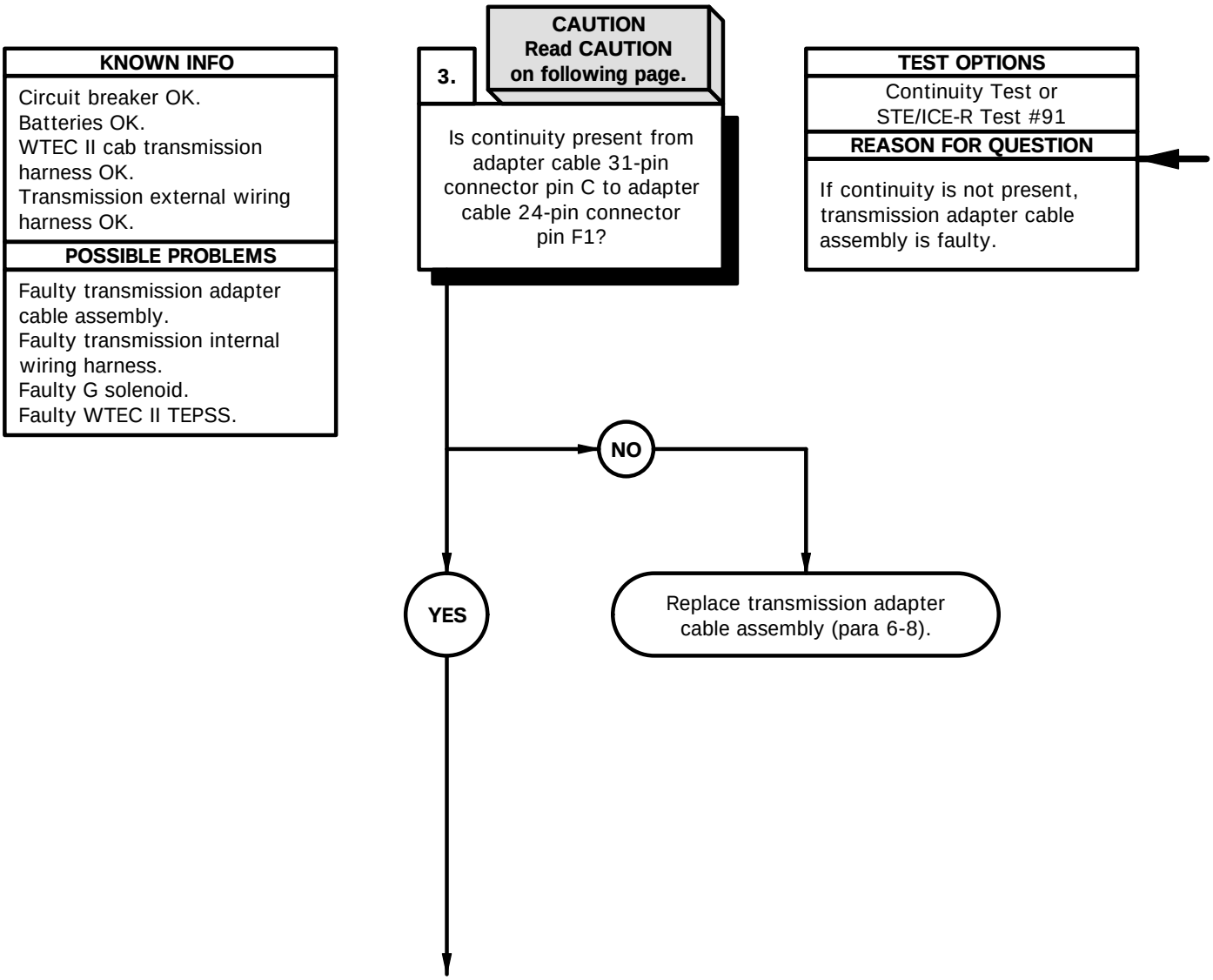




P119



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

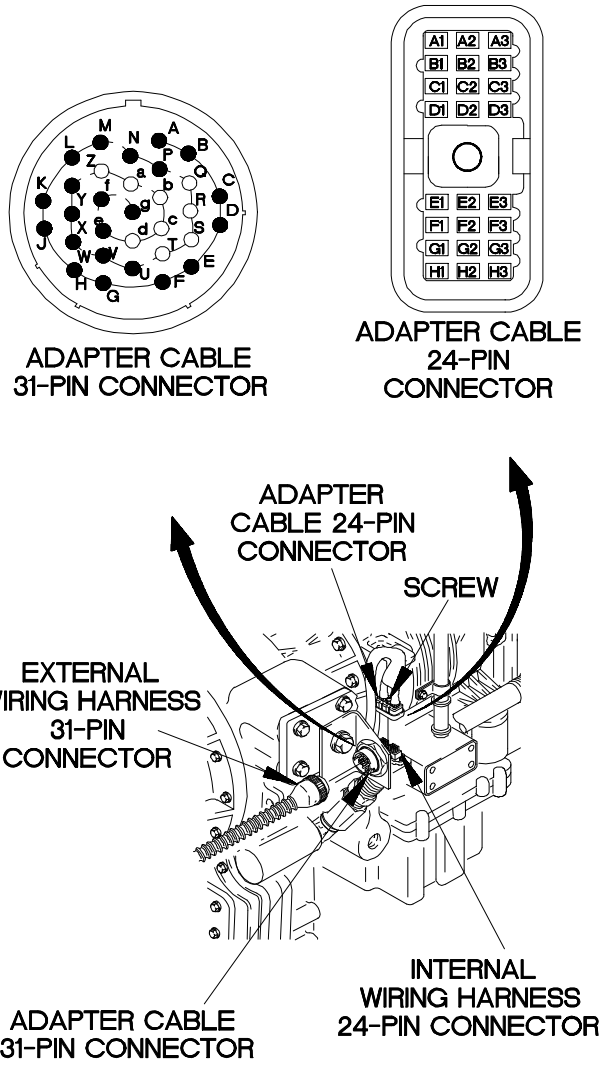
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

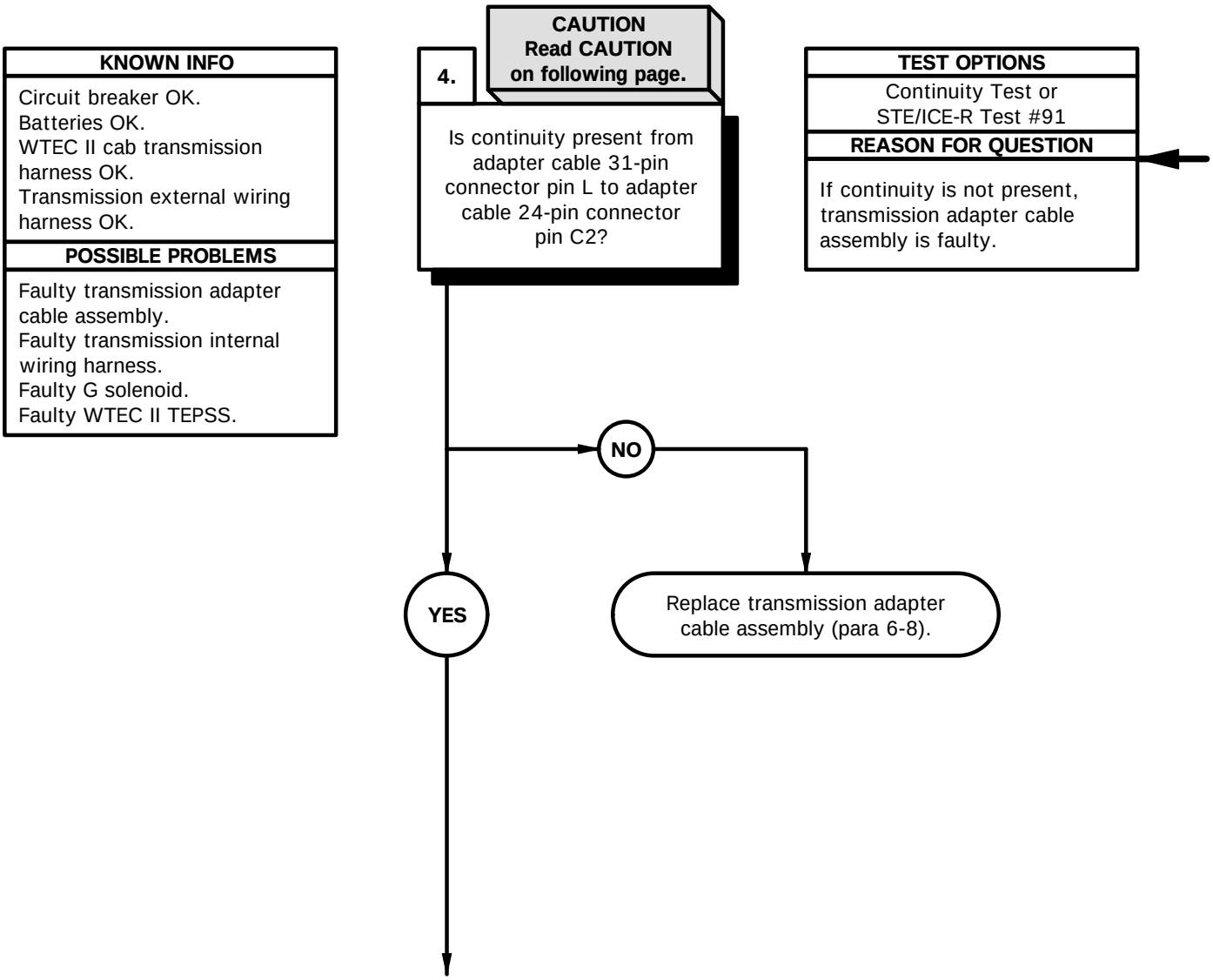
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



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

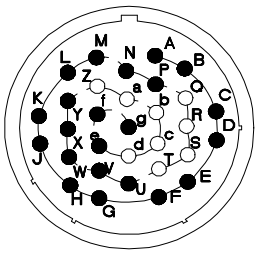
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

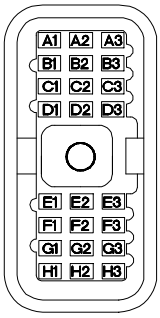
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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.



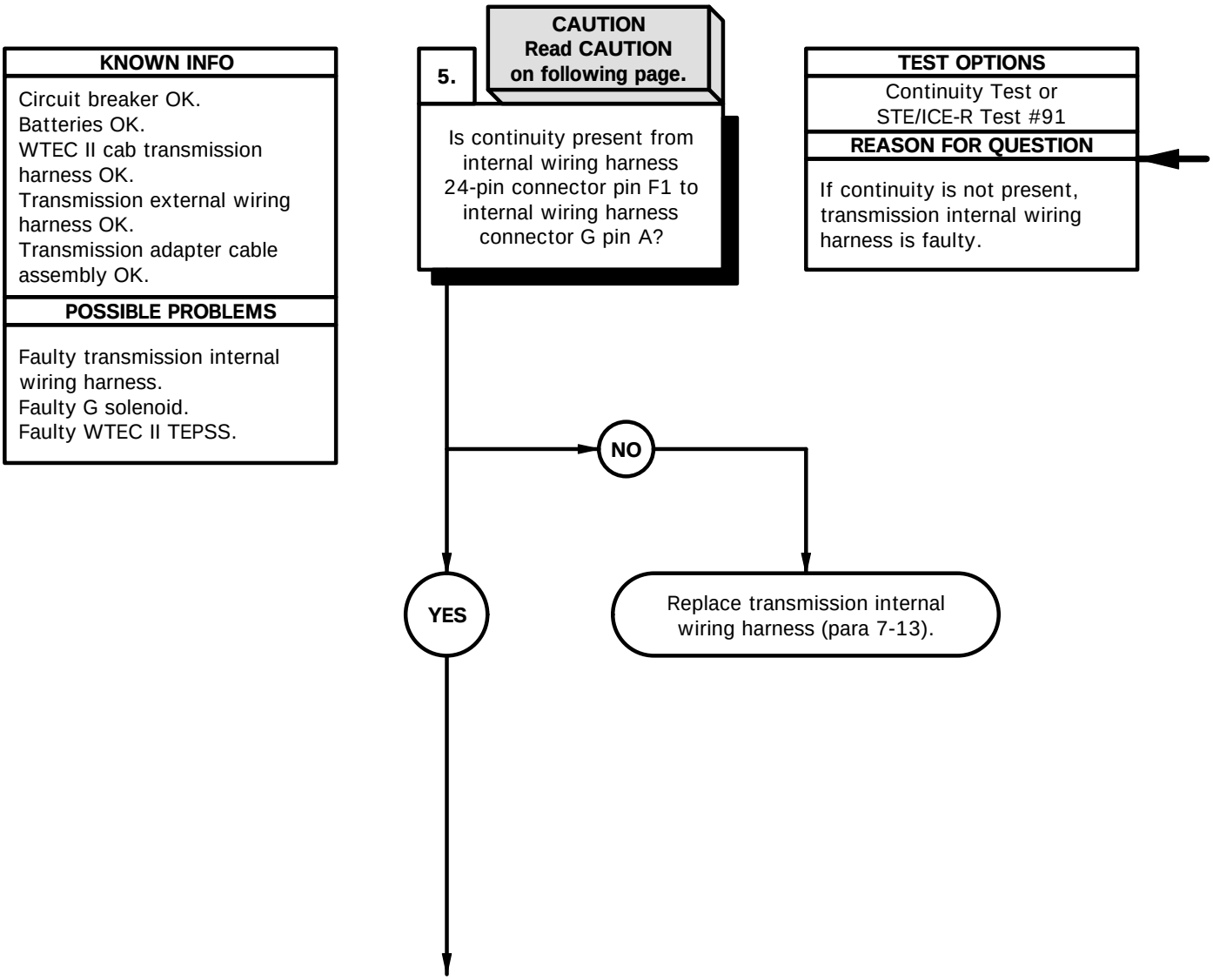
ADAPTER CABLE
31-PIN CONNECTOR



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)



CAUTION

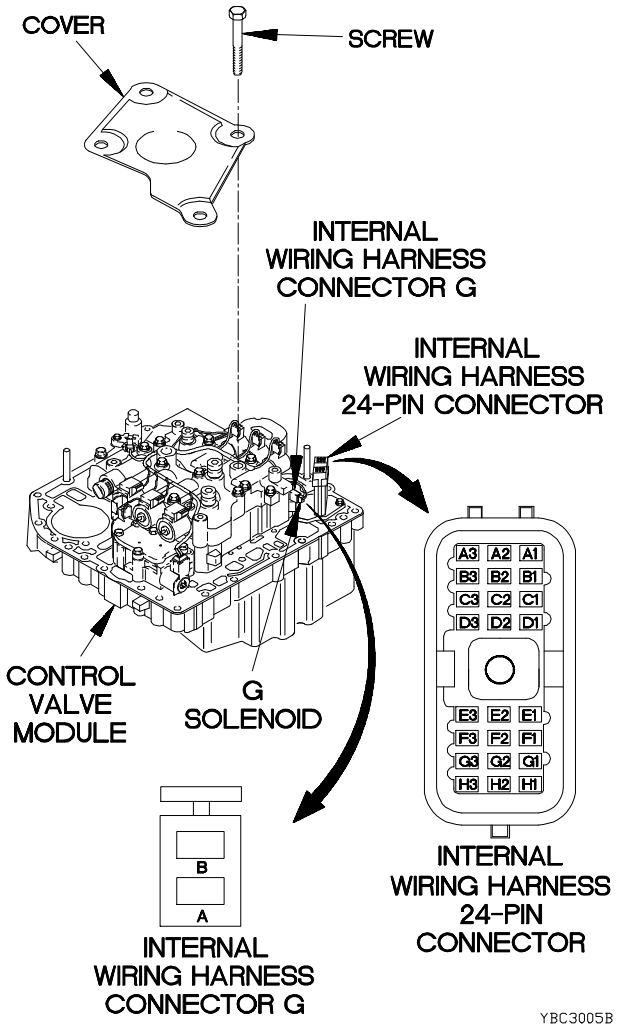
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

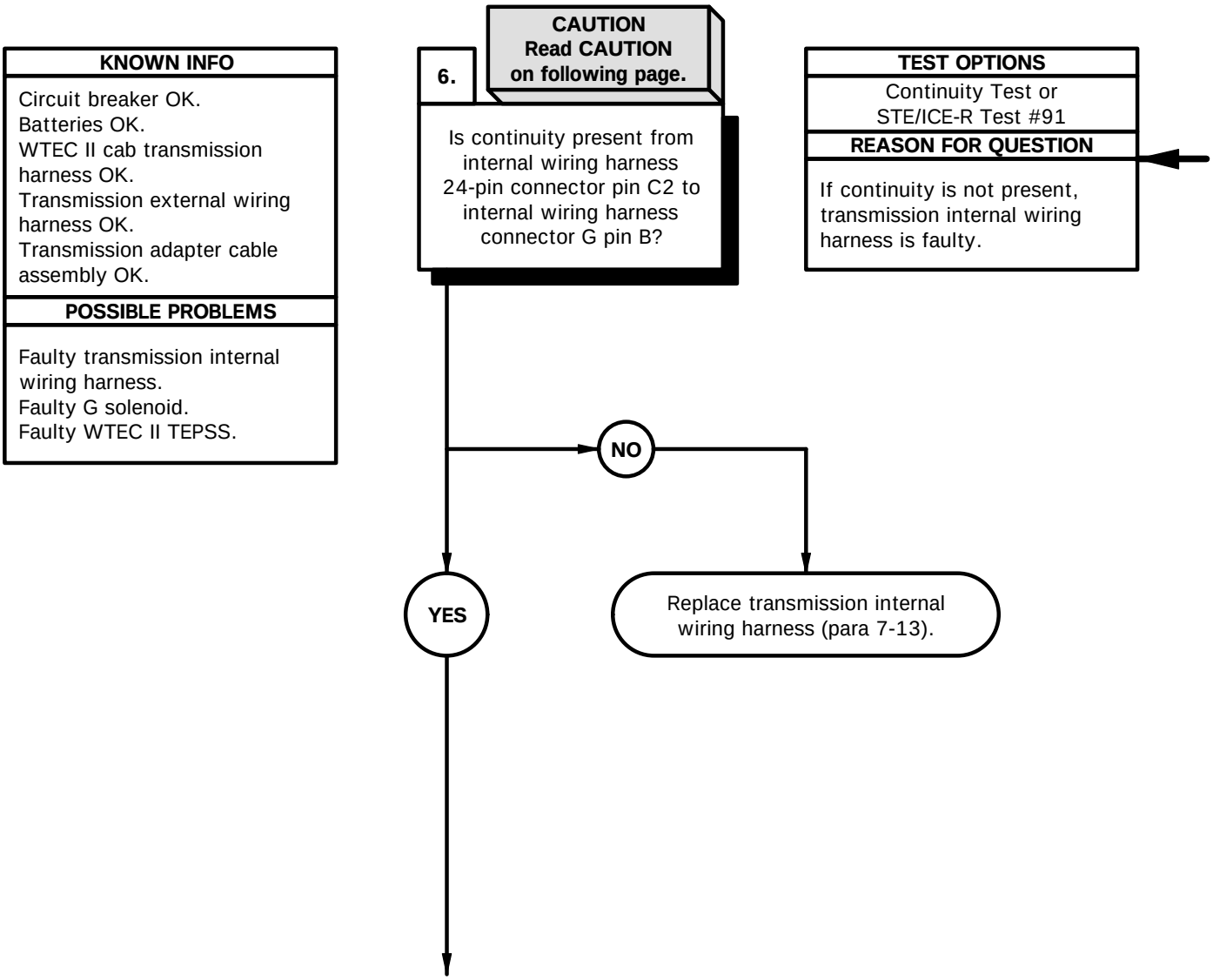
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



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

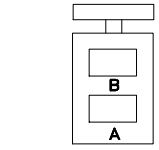
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

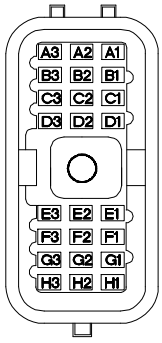
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



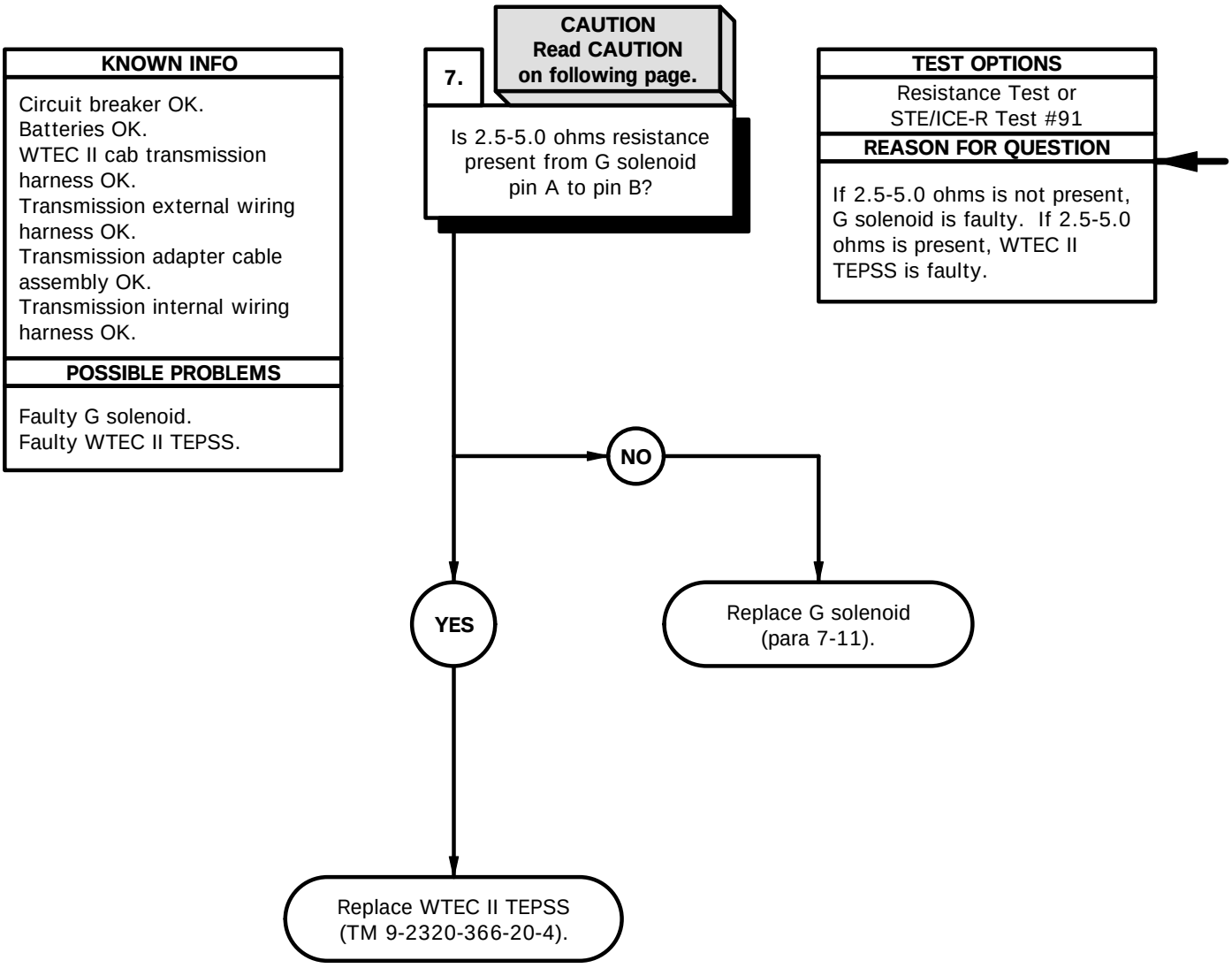
INTERNAL WIRING HARNESS CONNECTOR G



INTERNAL WIRING HARNESS 24-PIN CONNECTOR

YBC3006B

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

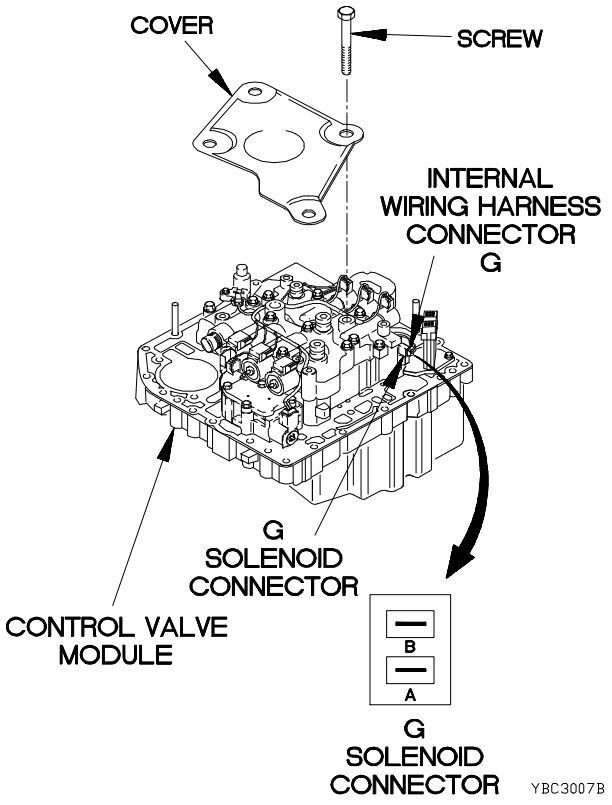
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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).



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

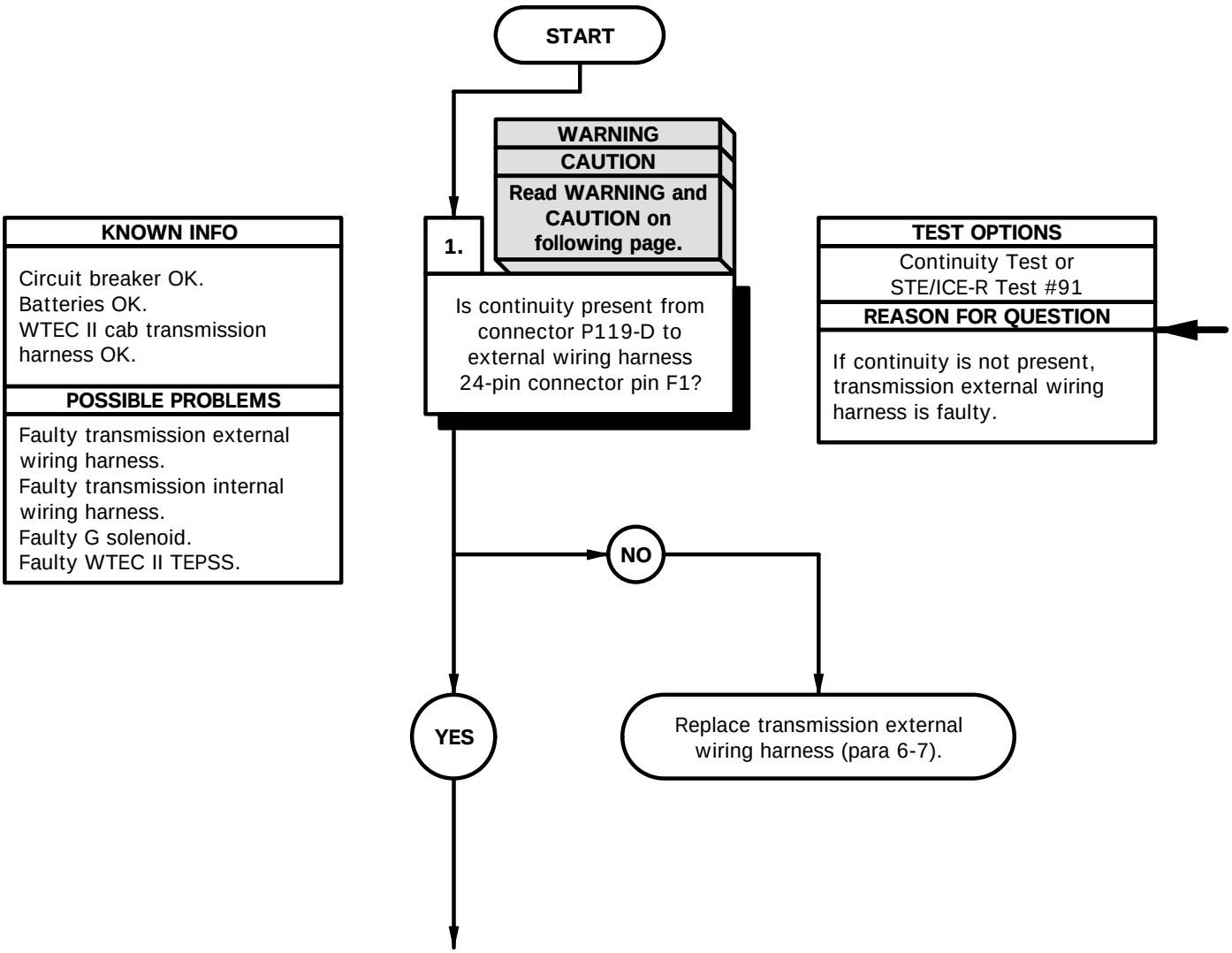
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

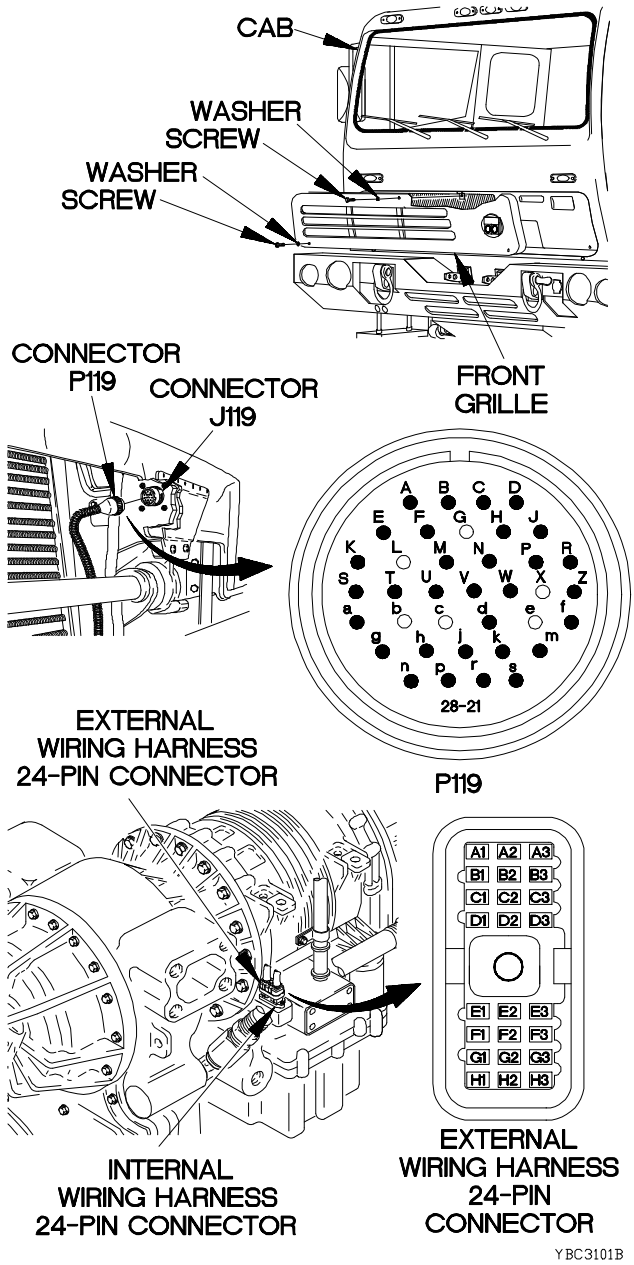
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

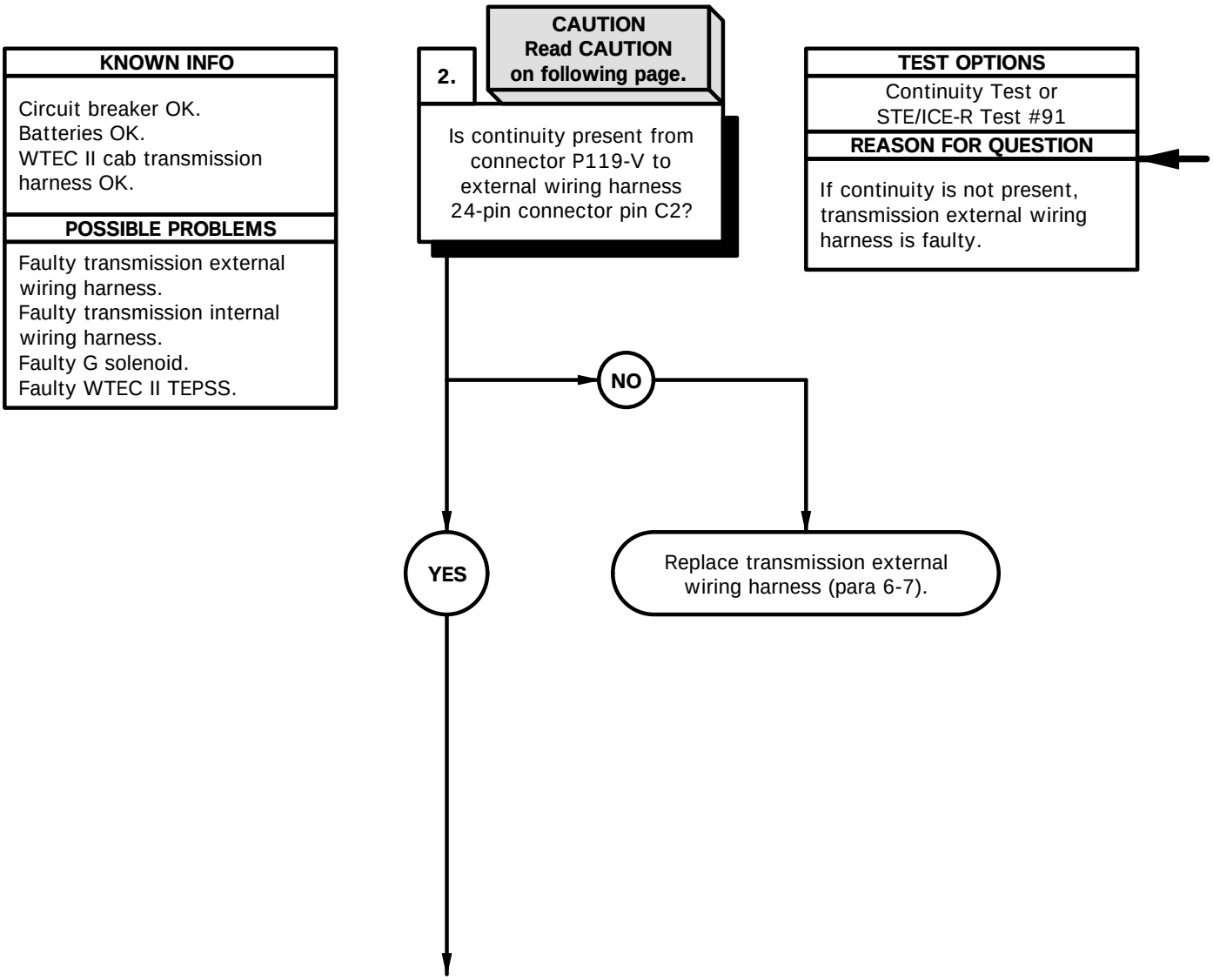
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Loosen screw in external wiring harness 24-pin connector.
(6) Disconnect external wiring harness 24-pin connector 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 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).



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

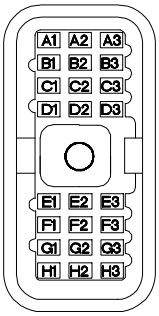
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

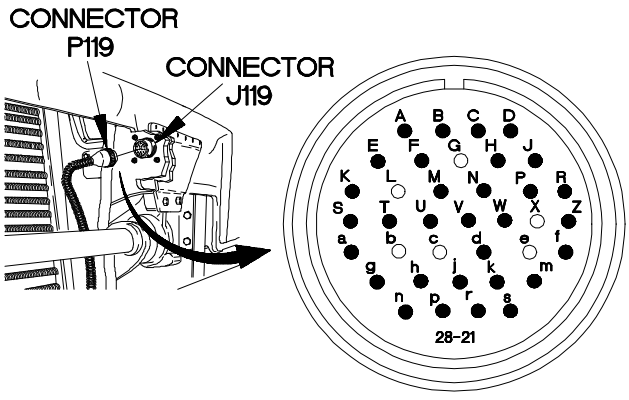
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

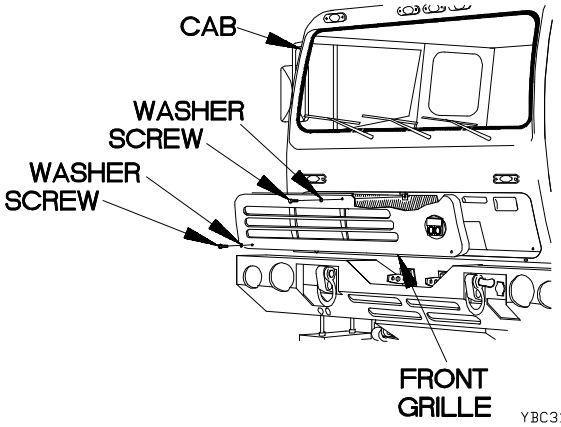
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P119-V.
(3) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin C2 and note reading on multimeter.
(4) If continuity is not present, replace transmission external wiring harness (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).



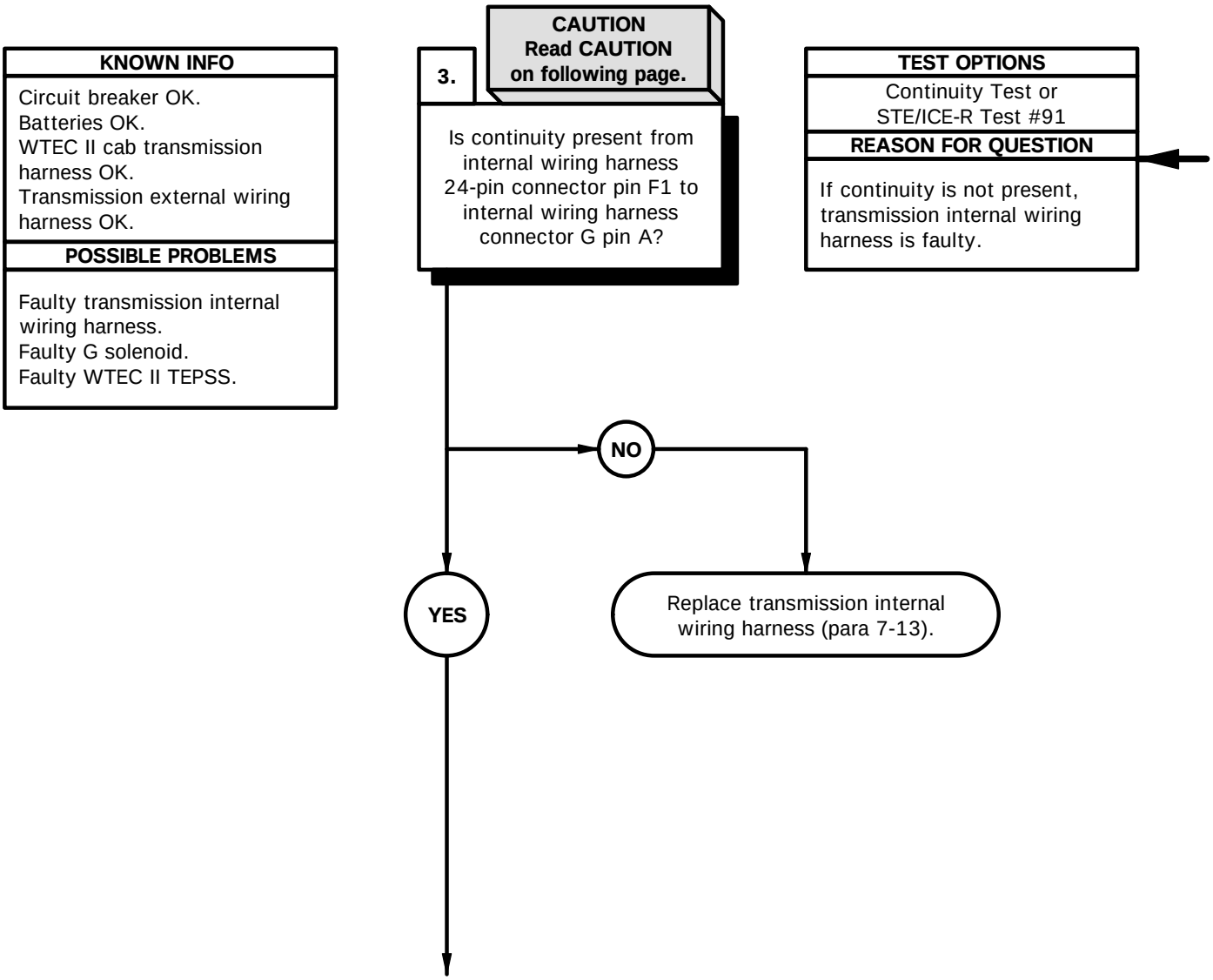
EXTERNAL WIRING HARNESS 24-PIN CONNECTOR



P119



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

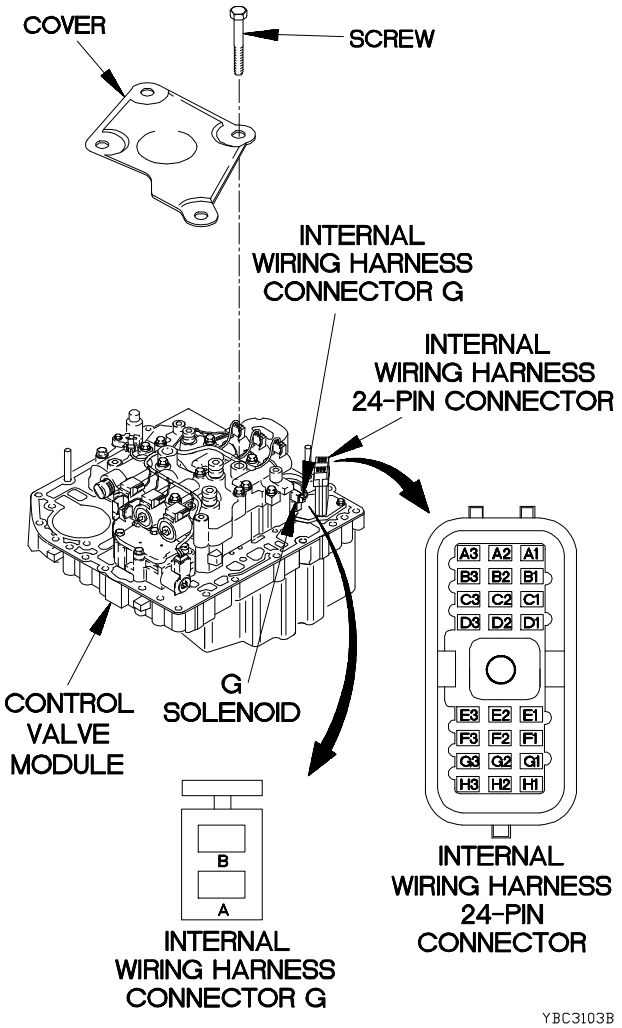
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

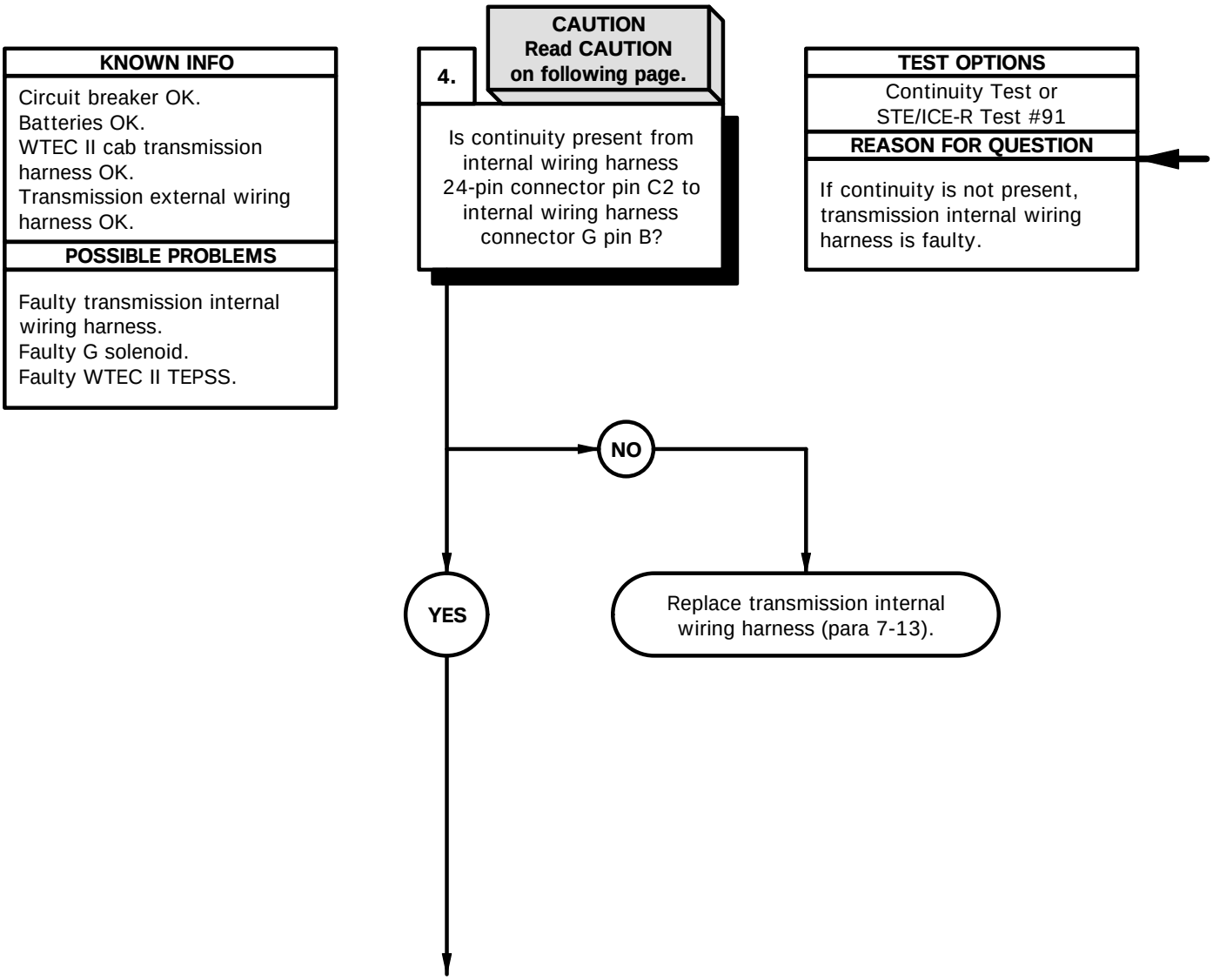
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



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

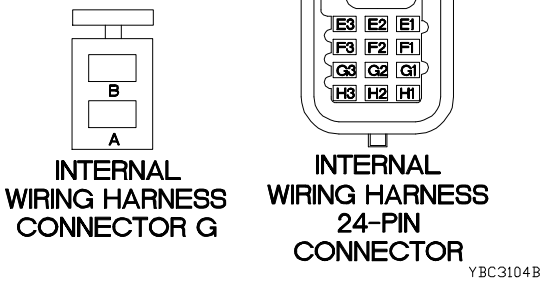
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

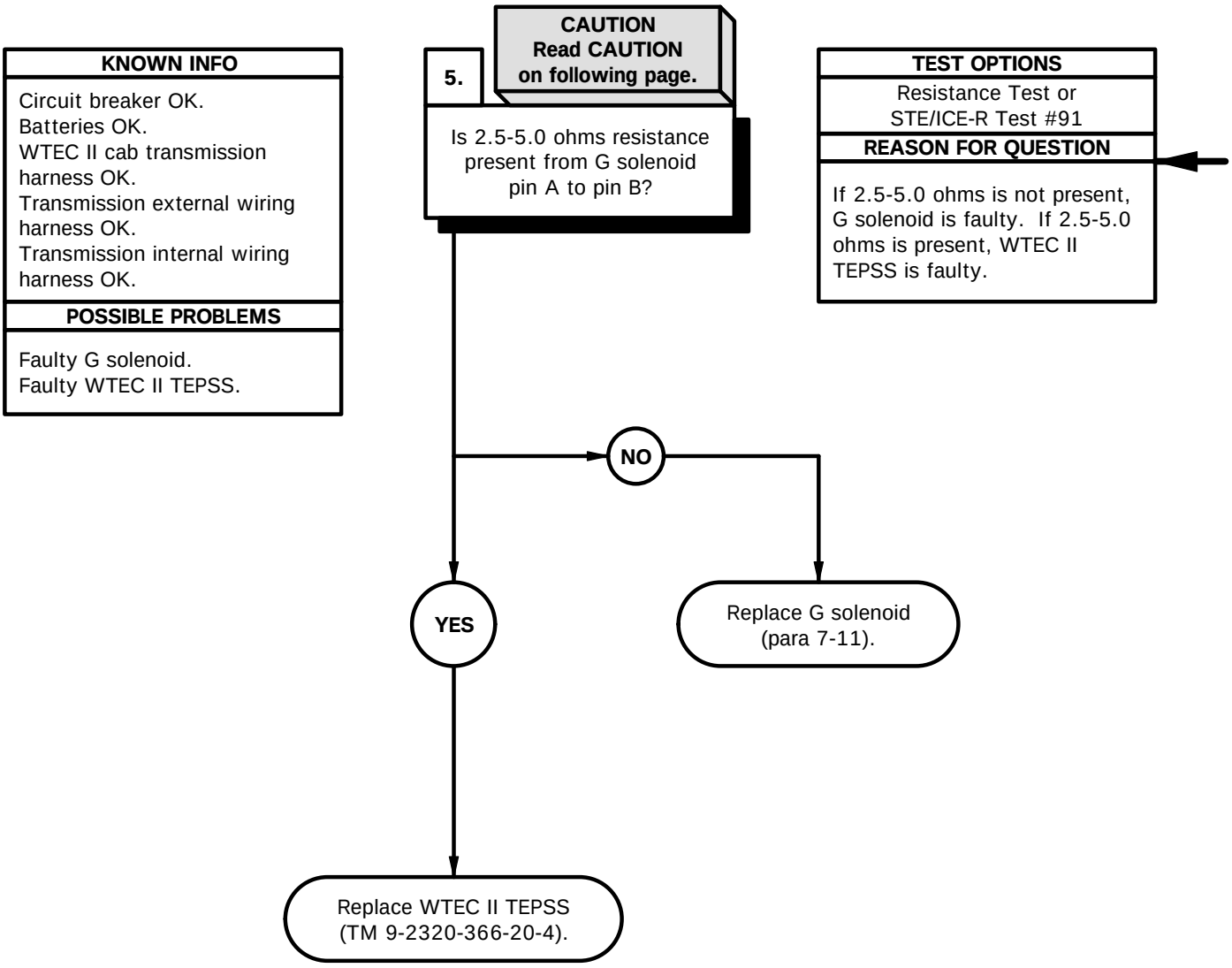
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

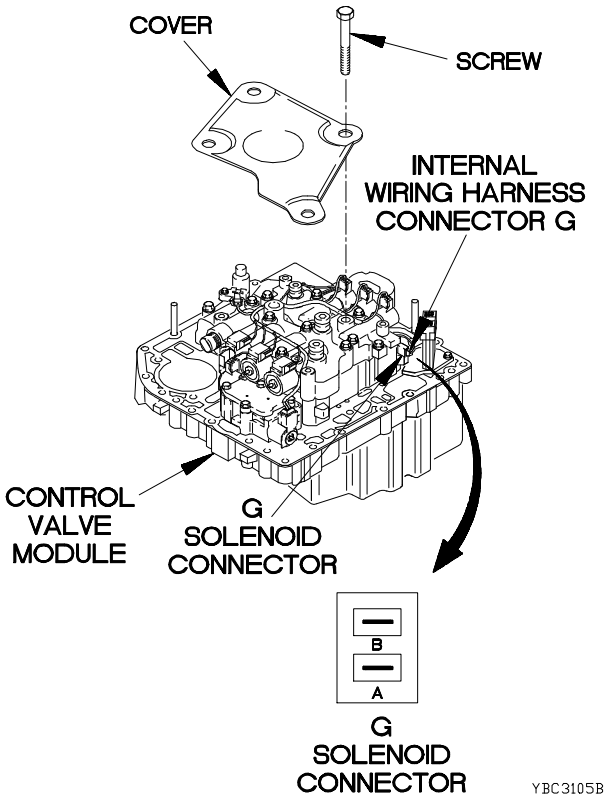
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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).



c32. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45 AND/OR 69 SUB CODE 23

INITIAL SETUP

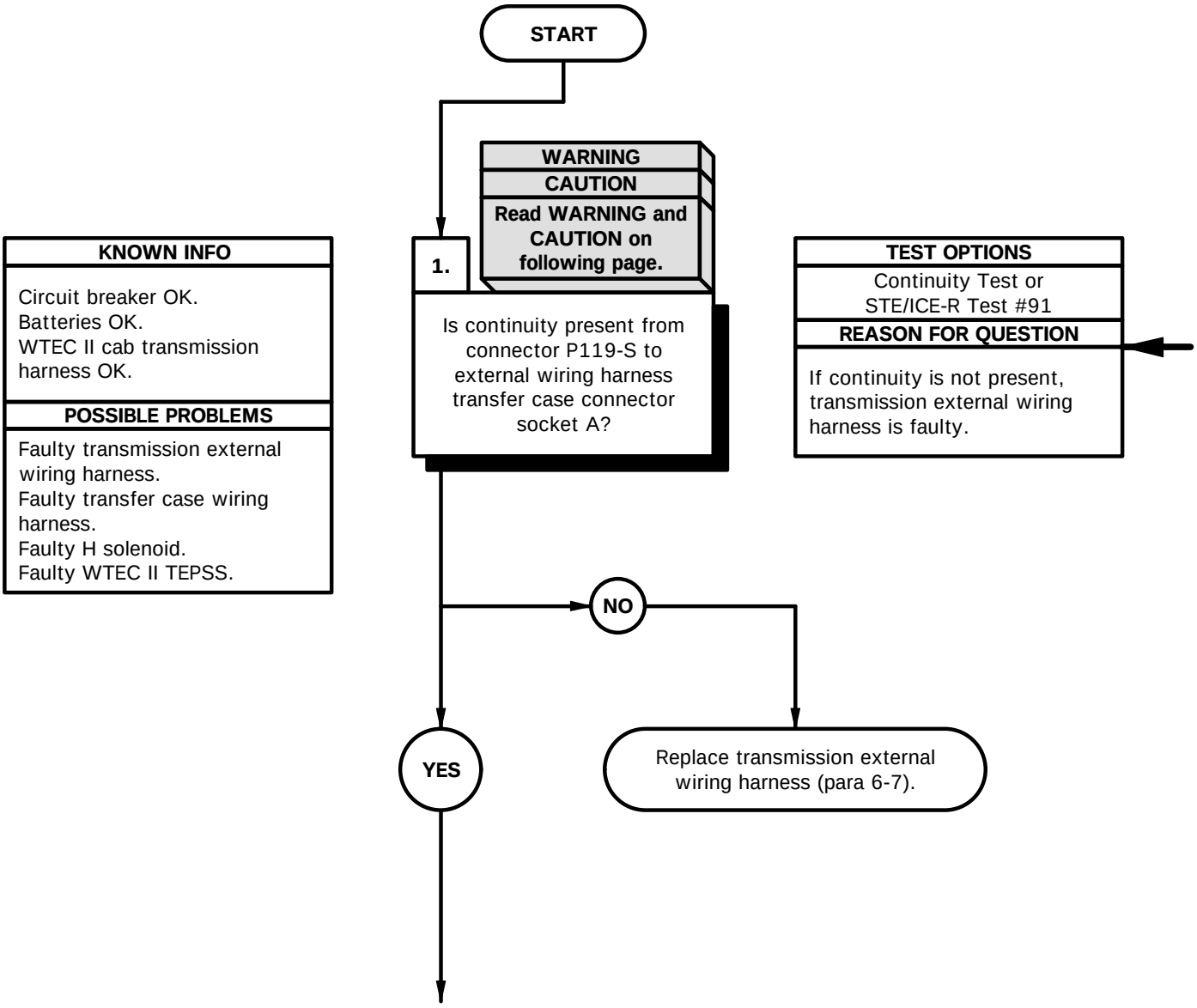
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

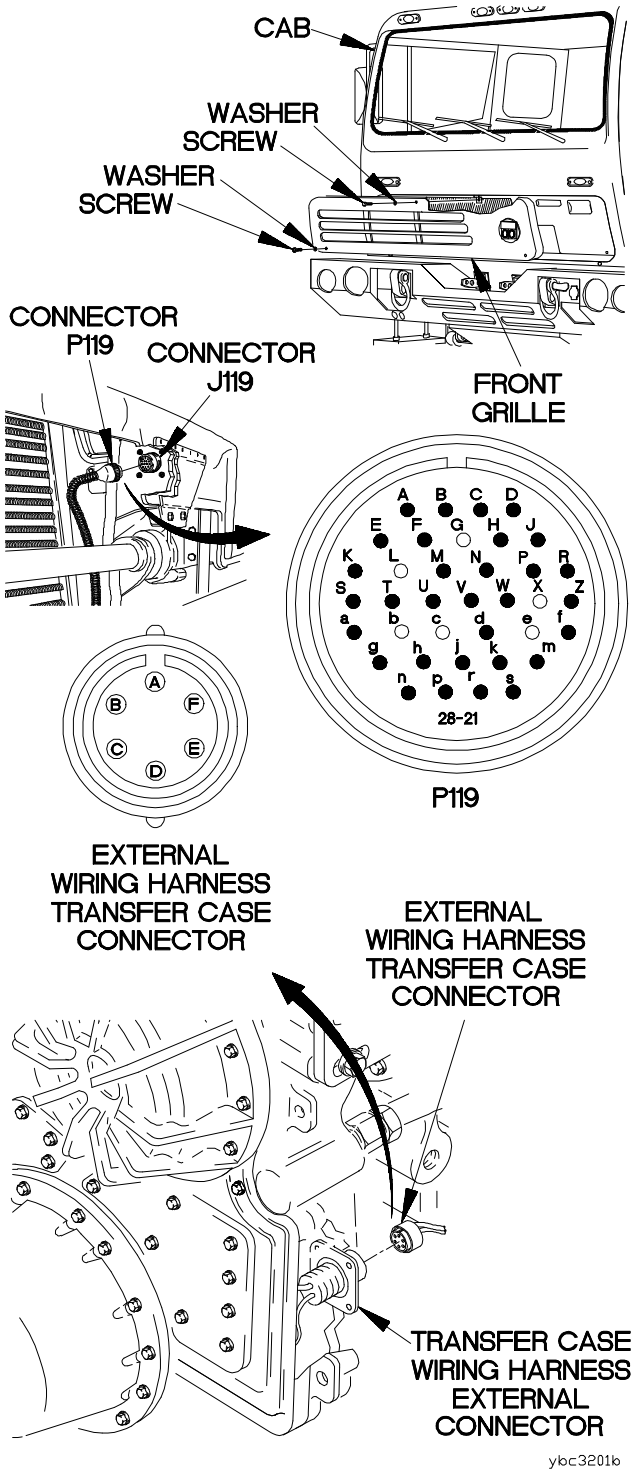
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

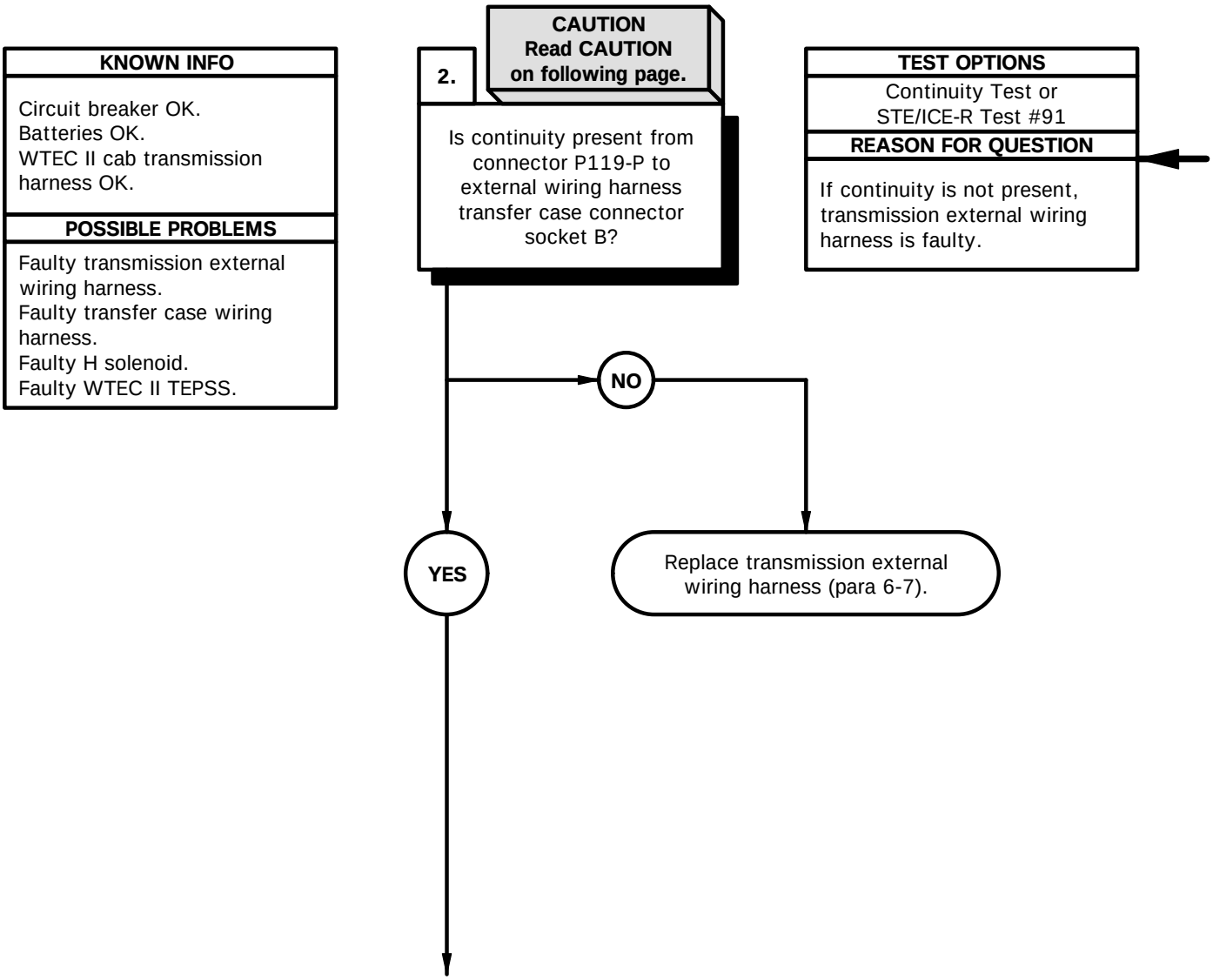
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness transfer case connector from transfer case wiring harness external connector.
(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.

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).



c32. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45 AND/OR 69 SUB CODE 23 (CONT)



CAUTION

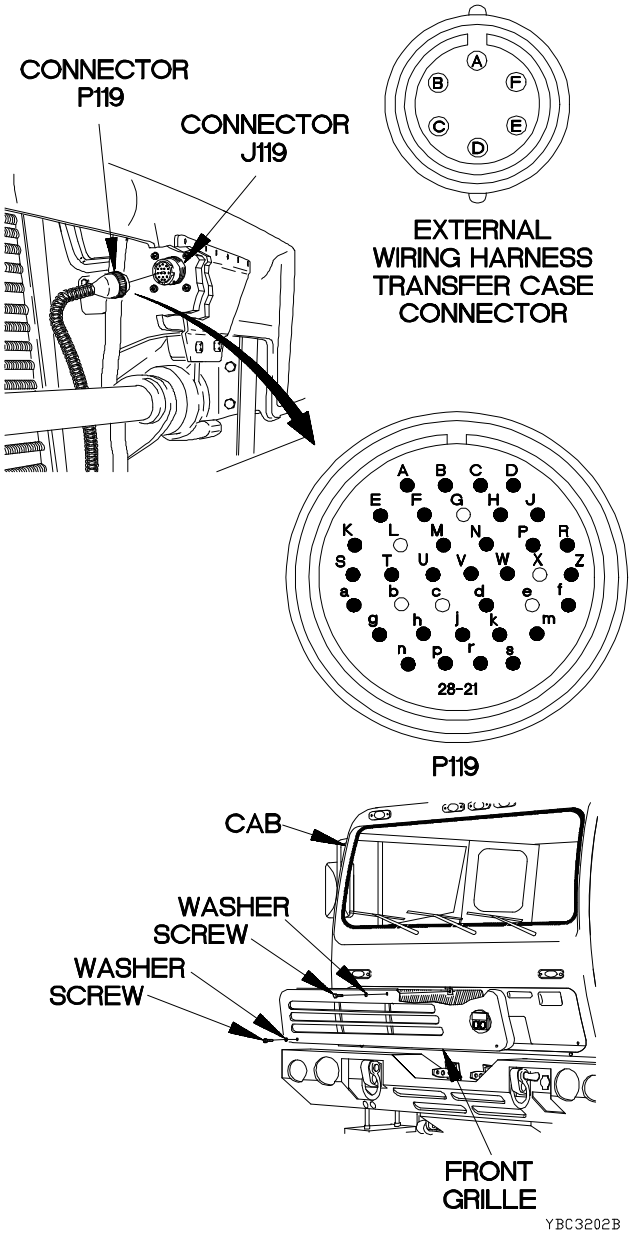
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

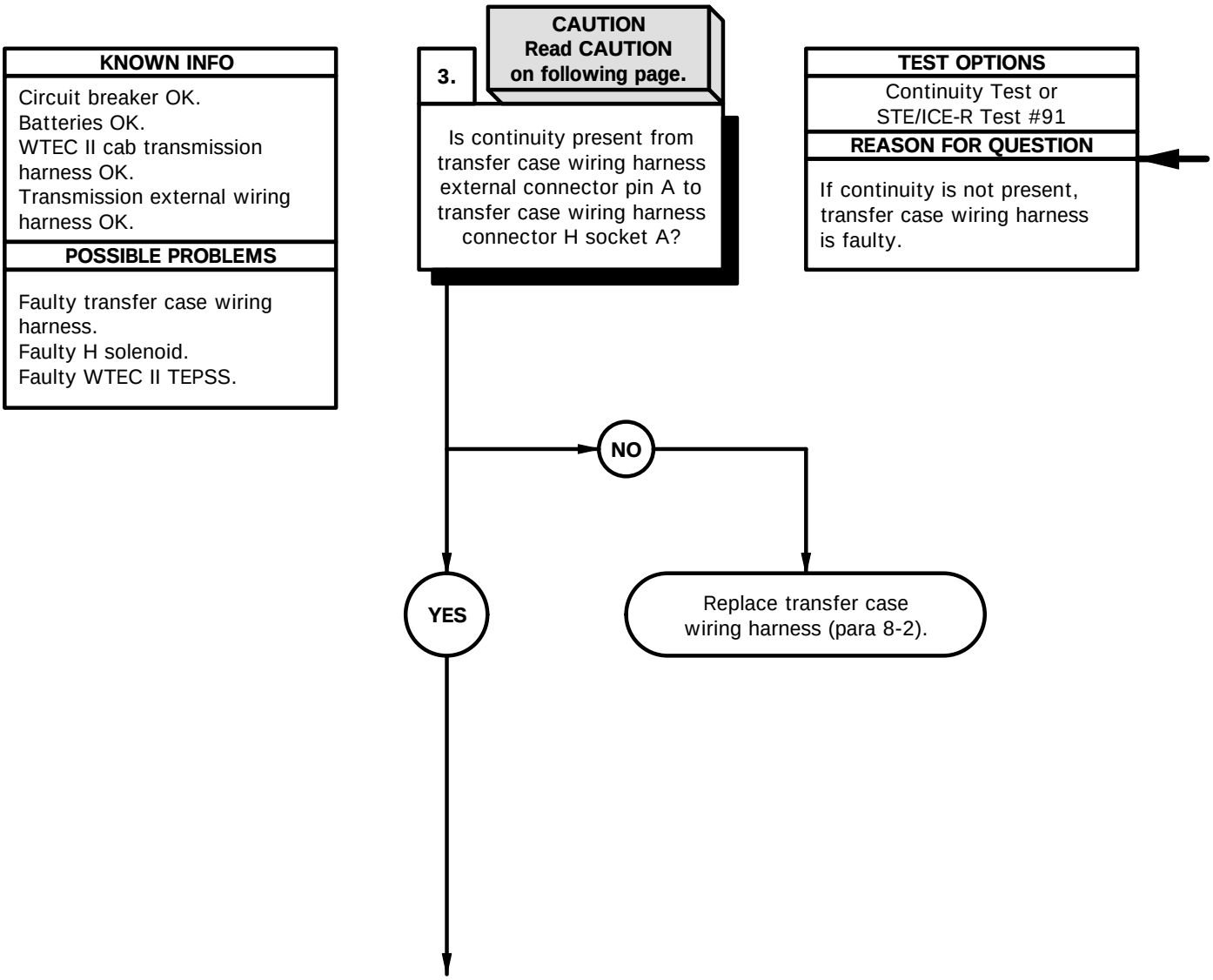
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P119-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).



c32. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45 AND/OR 69 SUB CODE 23 (CONT)



CAUTION

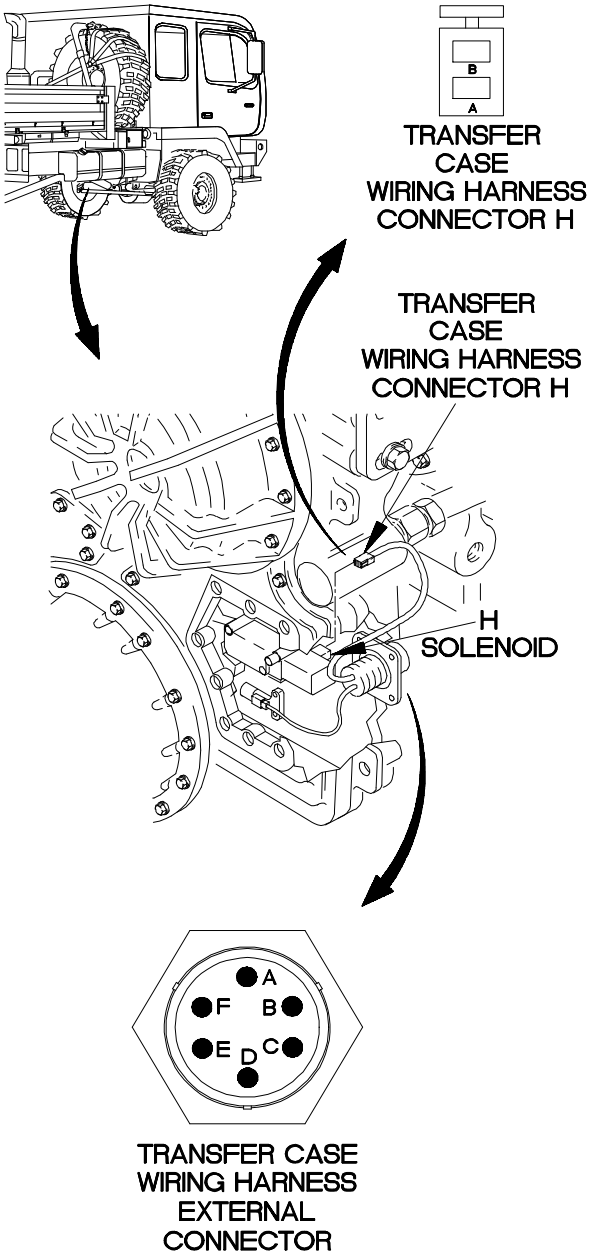
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

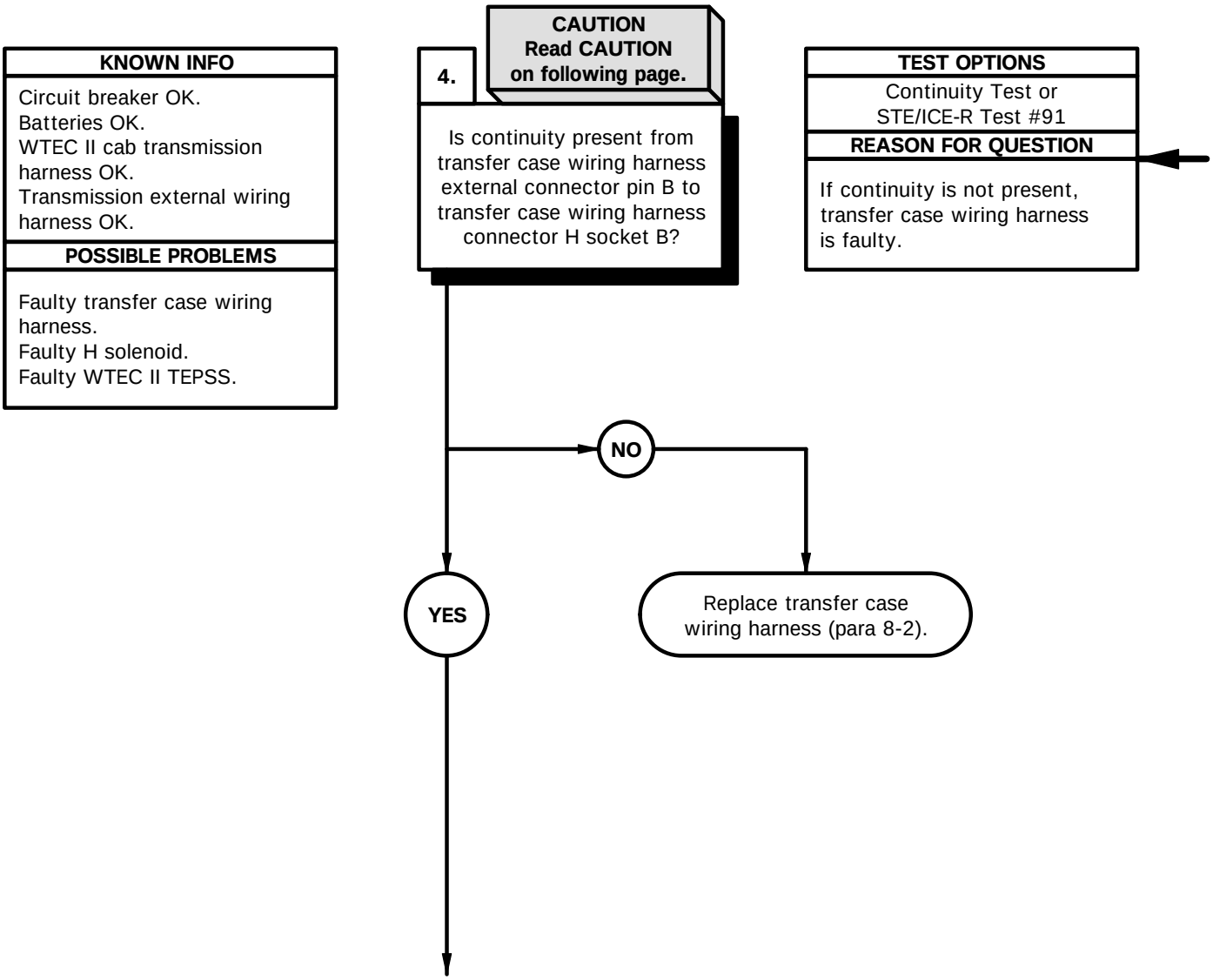
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) 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).



c32. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45 AND/OR 69 SUB CODE 23 (CONT)



CAUTION

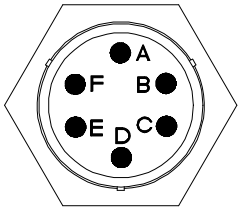
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

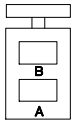
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to 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).



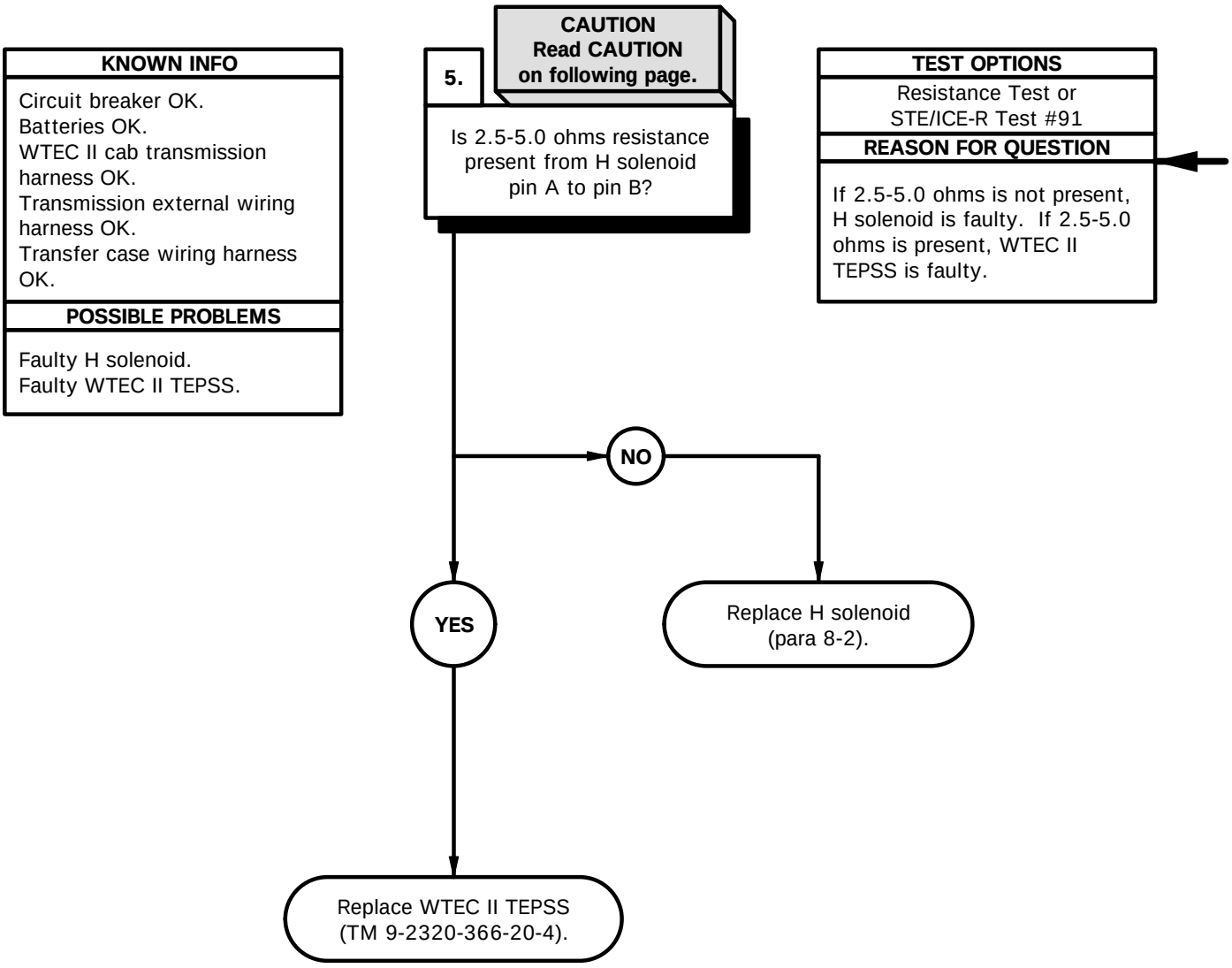
TRANSFER CASE WIRING HARNESS EXTERNAL CONNECTOR



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)



CAUTION

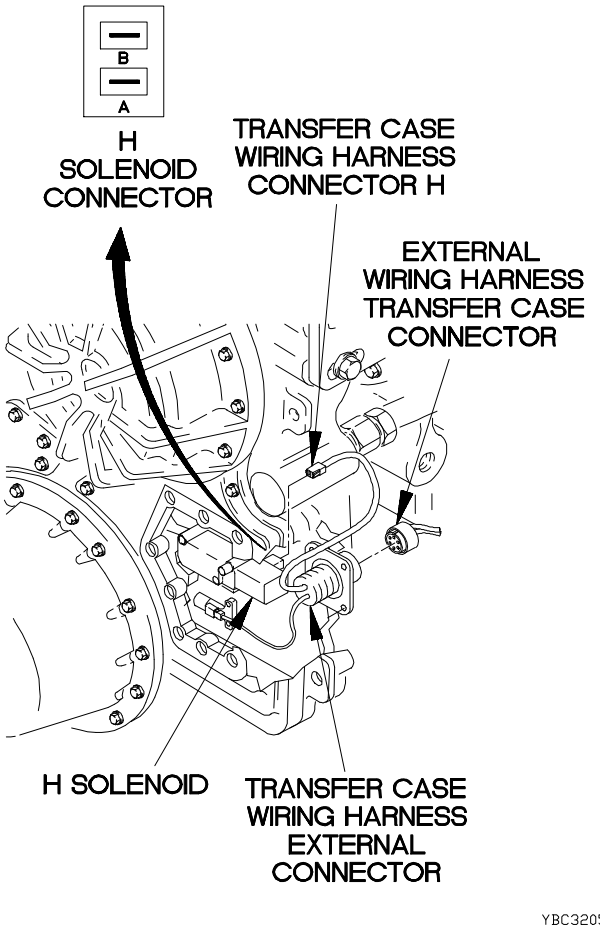
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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).



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

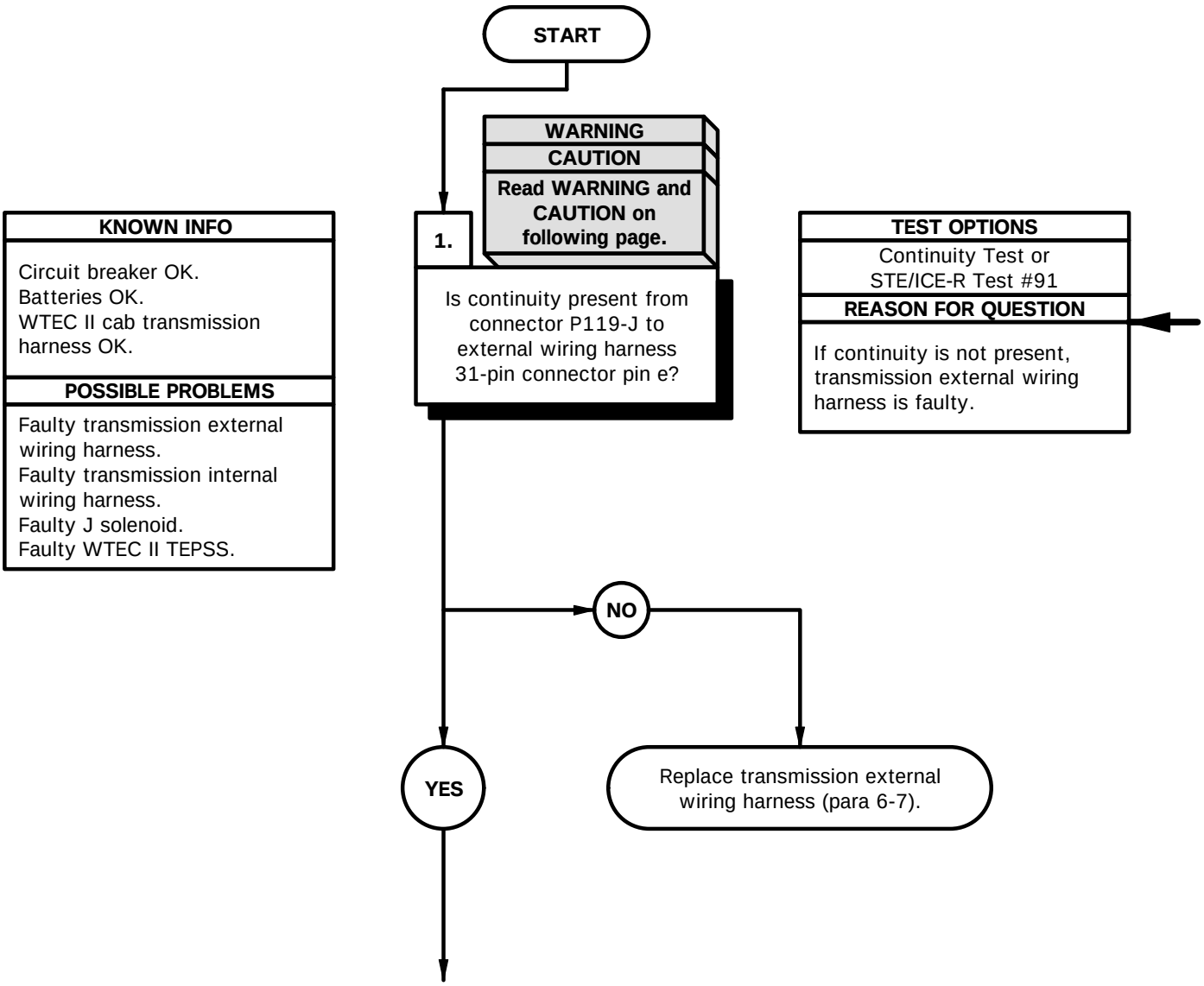
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

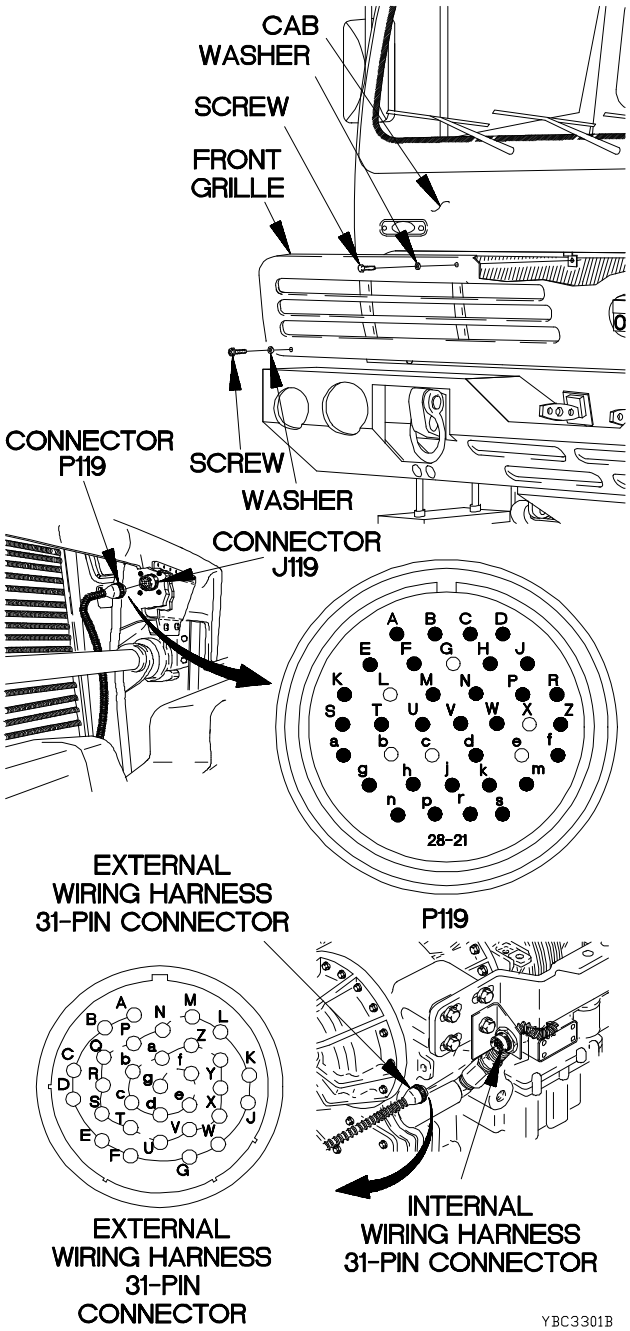
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

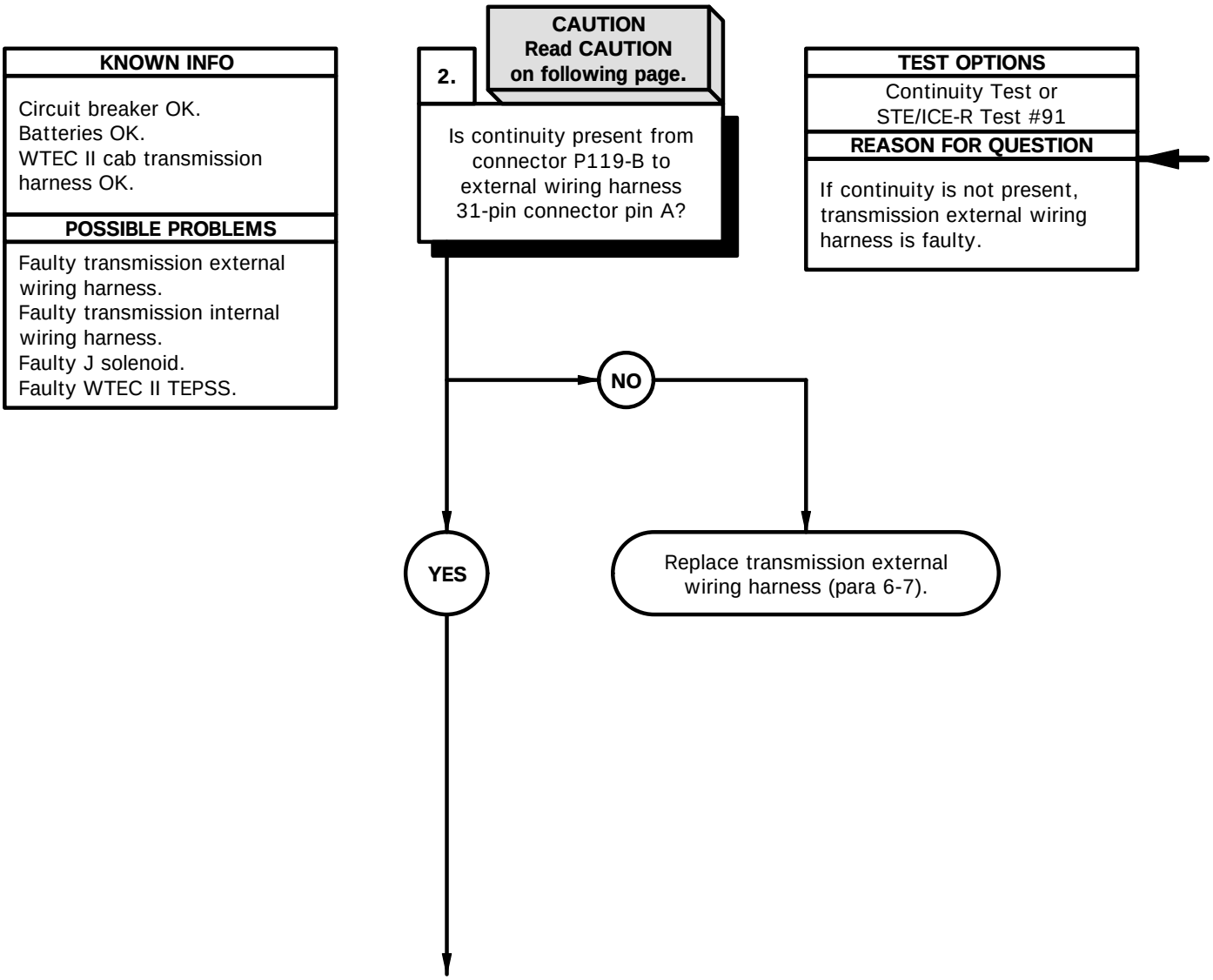
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect positive (+) probe of multimeter to connector P119-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).



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

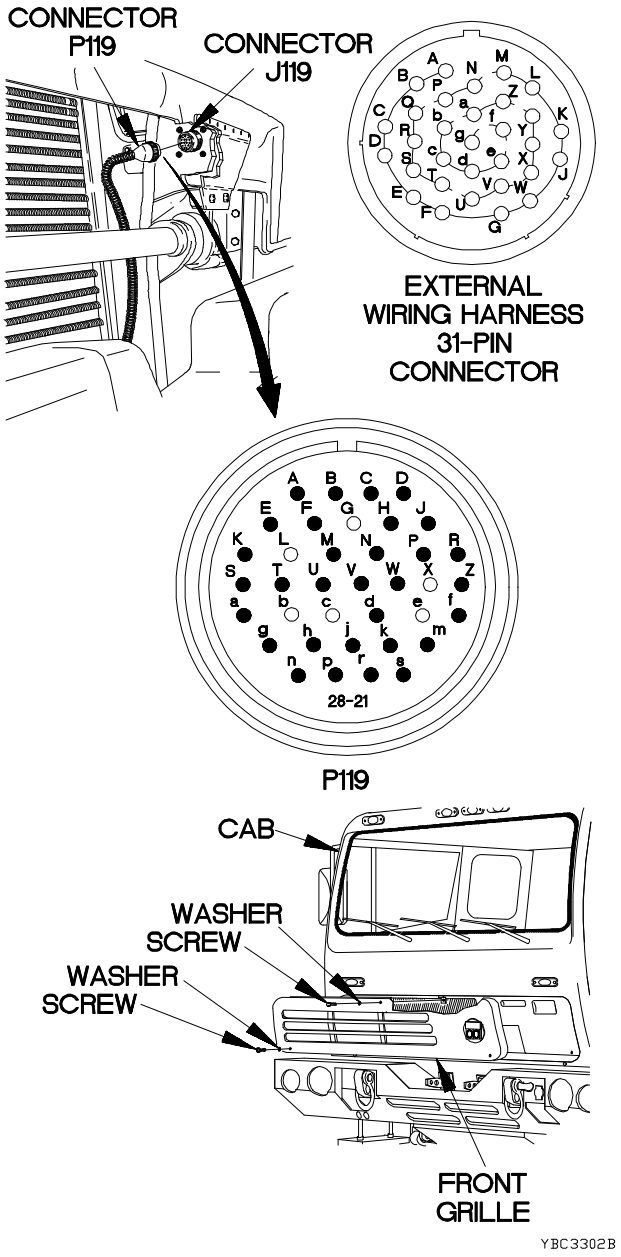
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

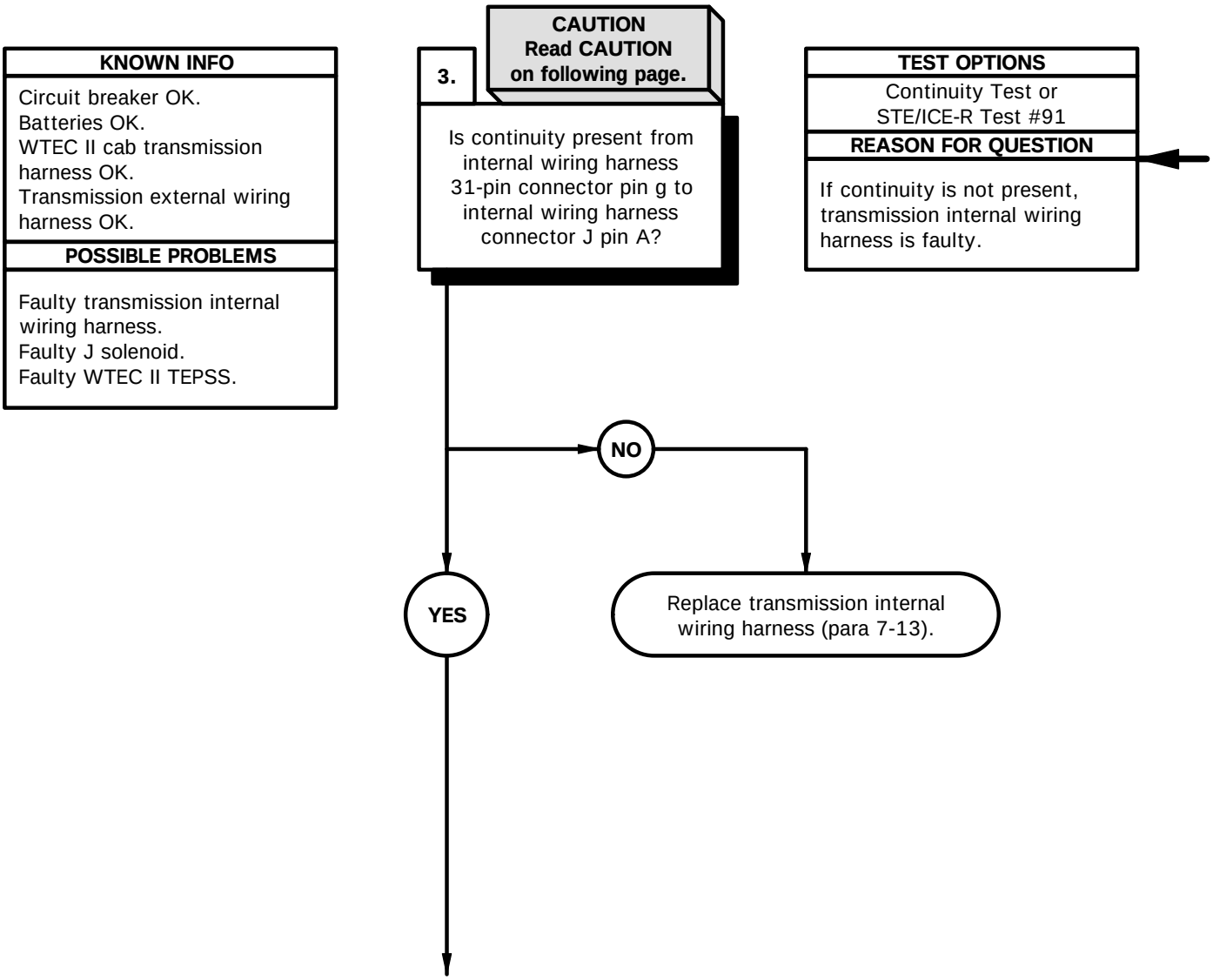
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



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

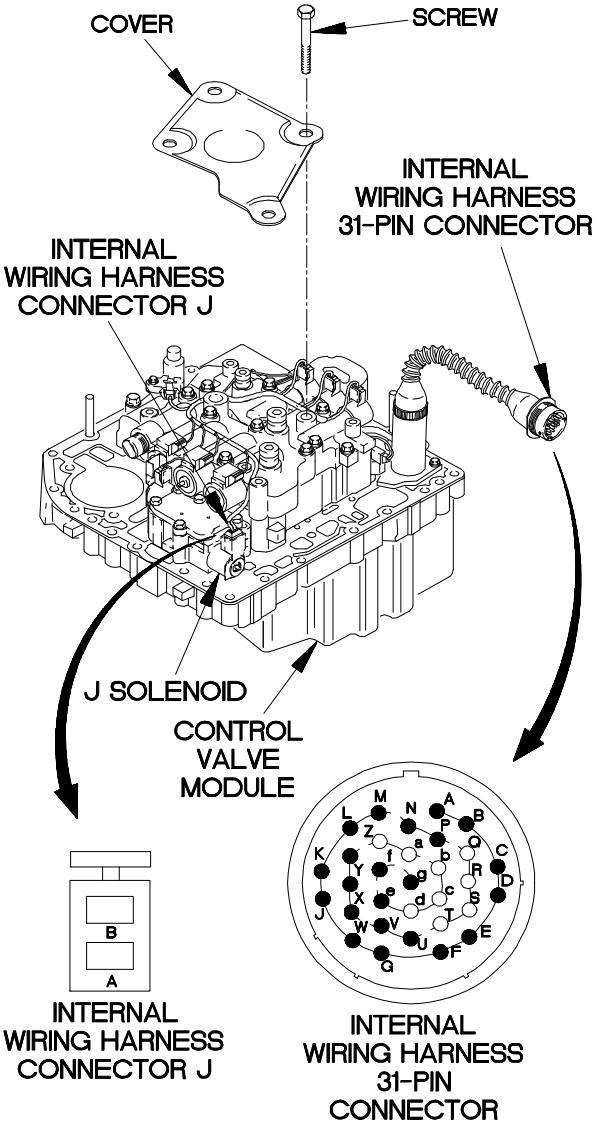
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

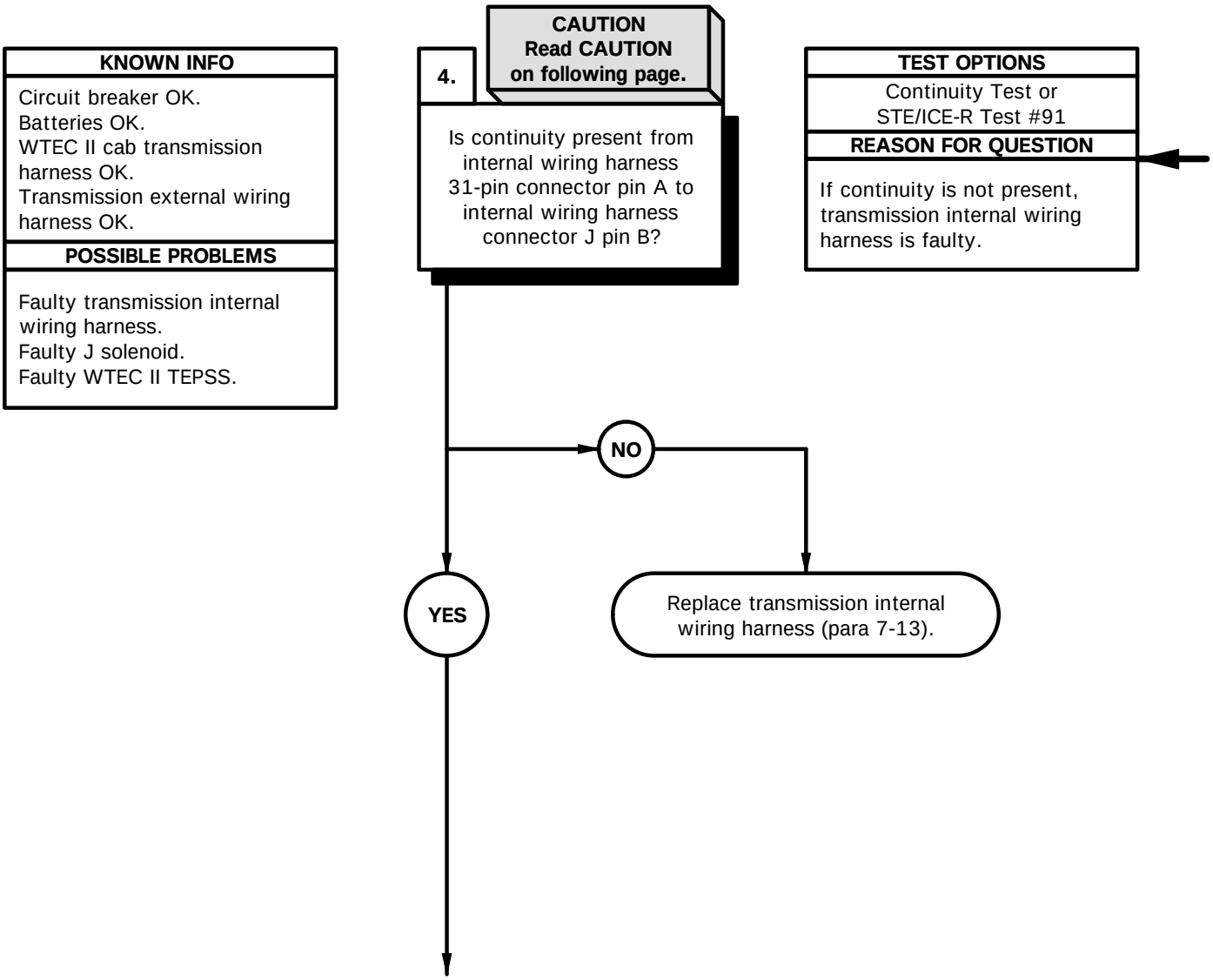
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



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

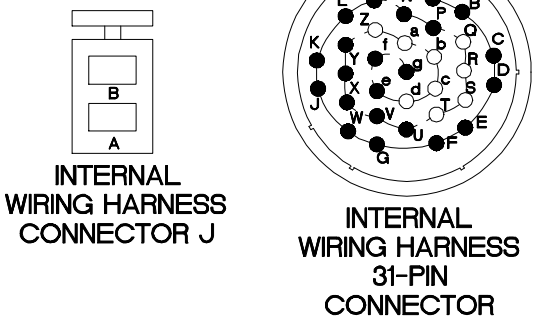
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

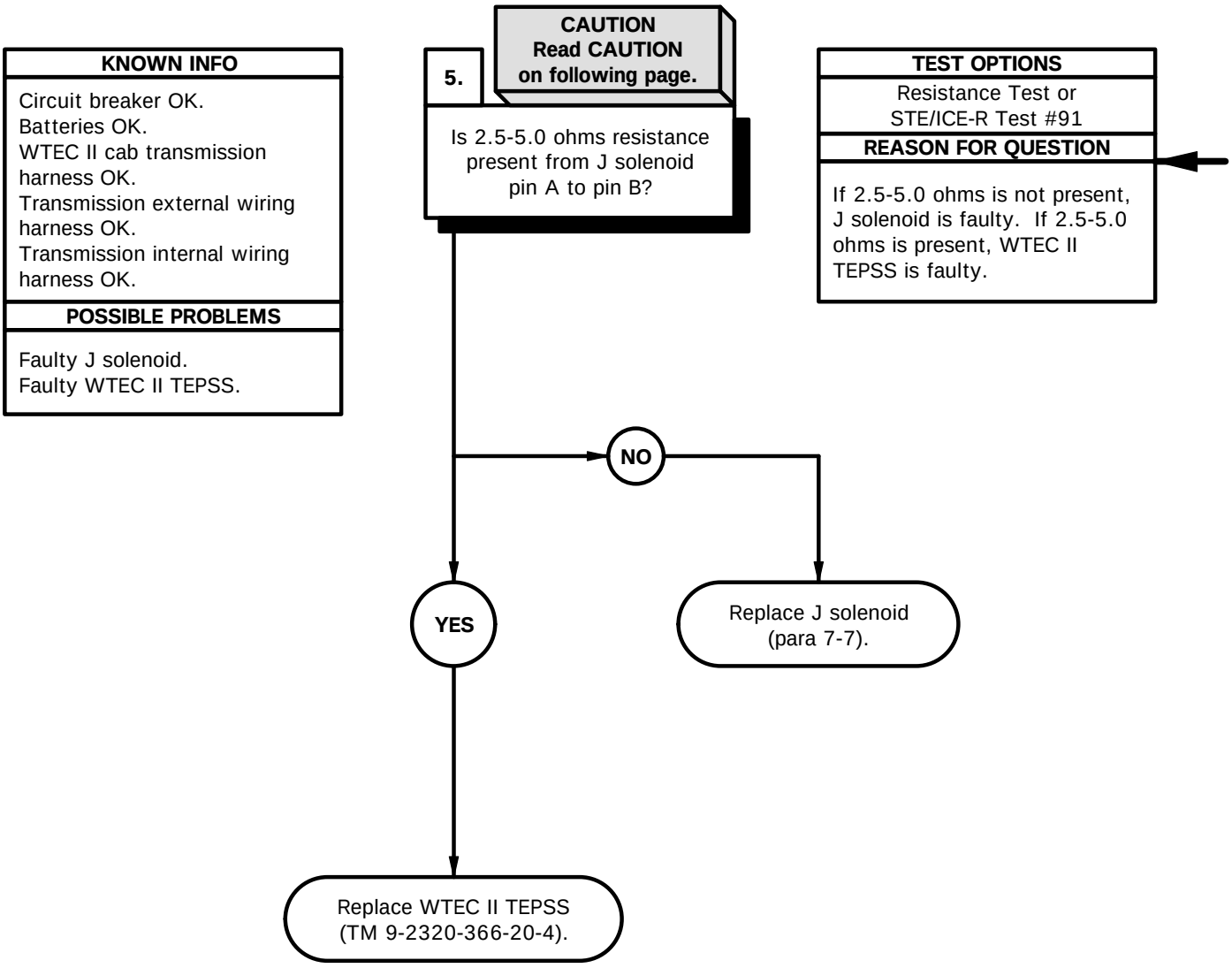
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



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

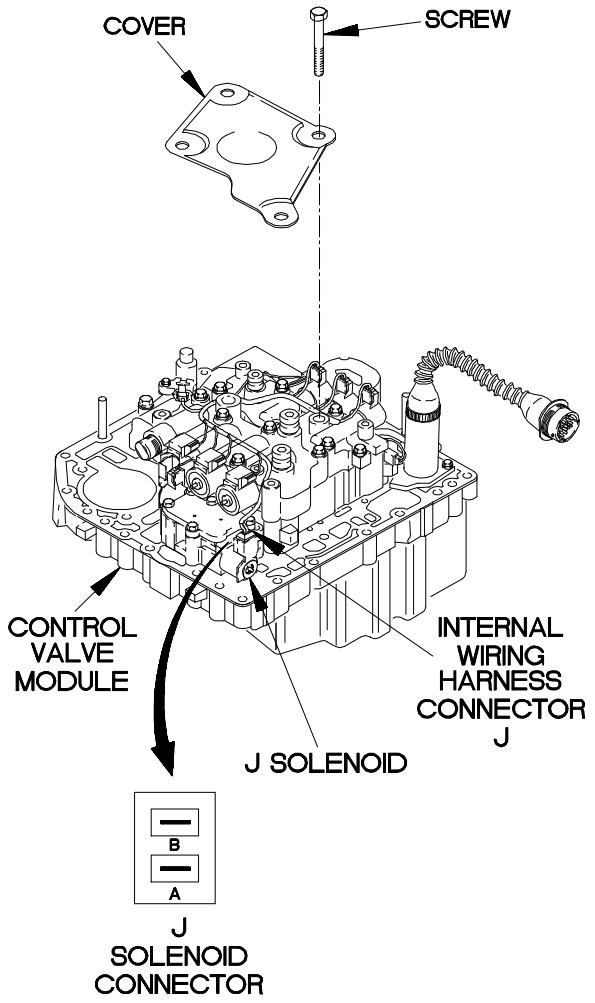
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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).



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

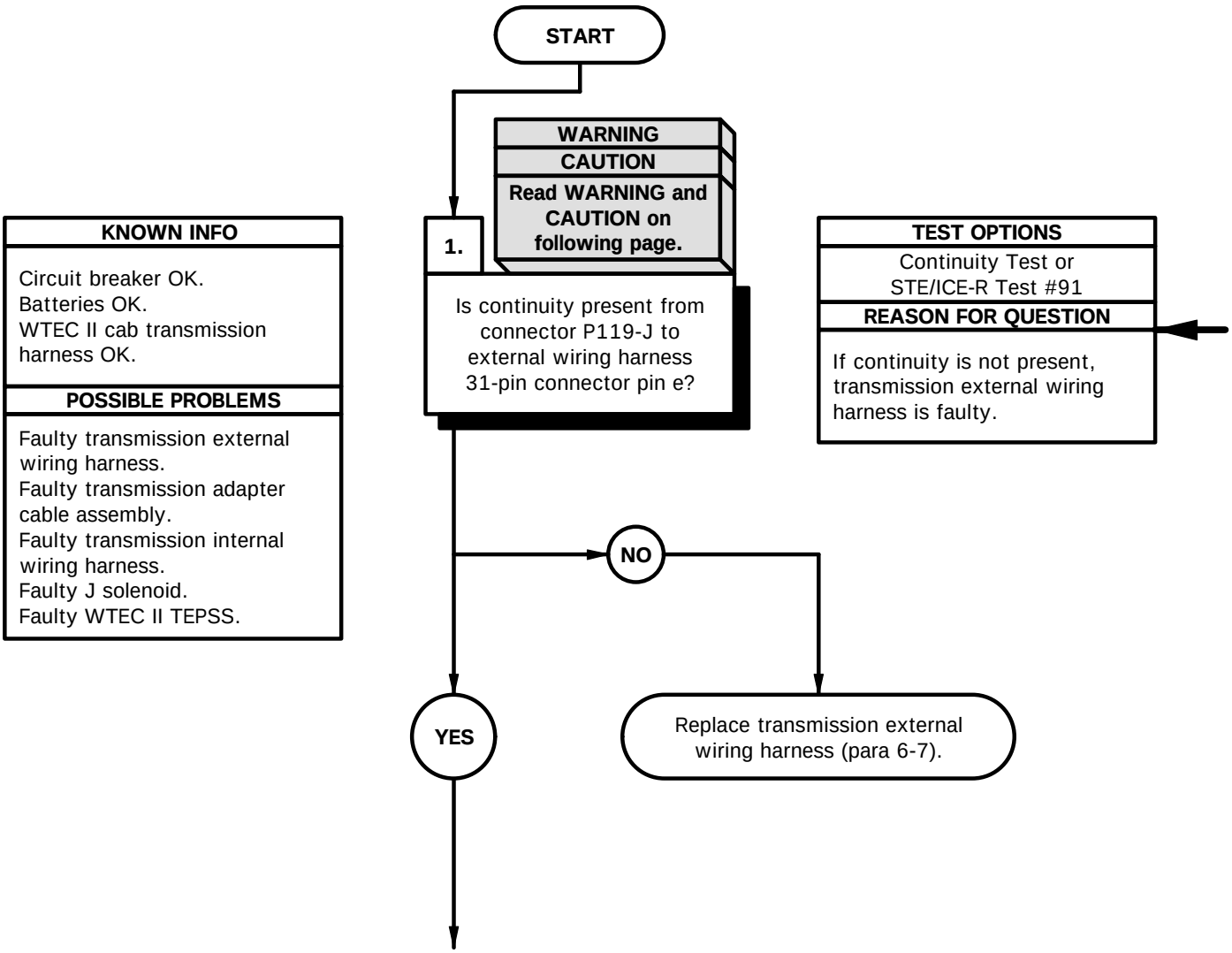
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

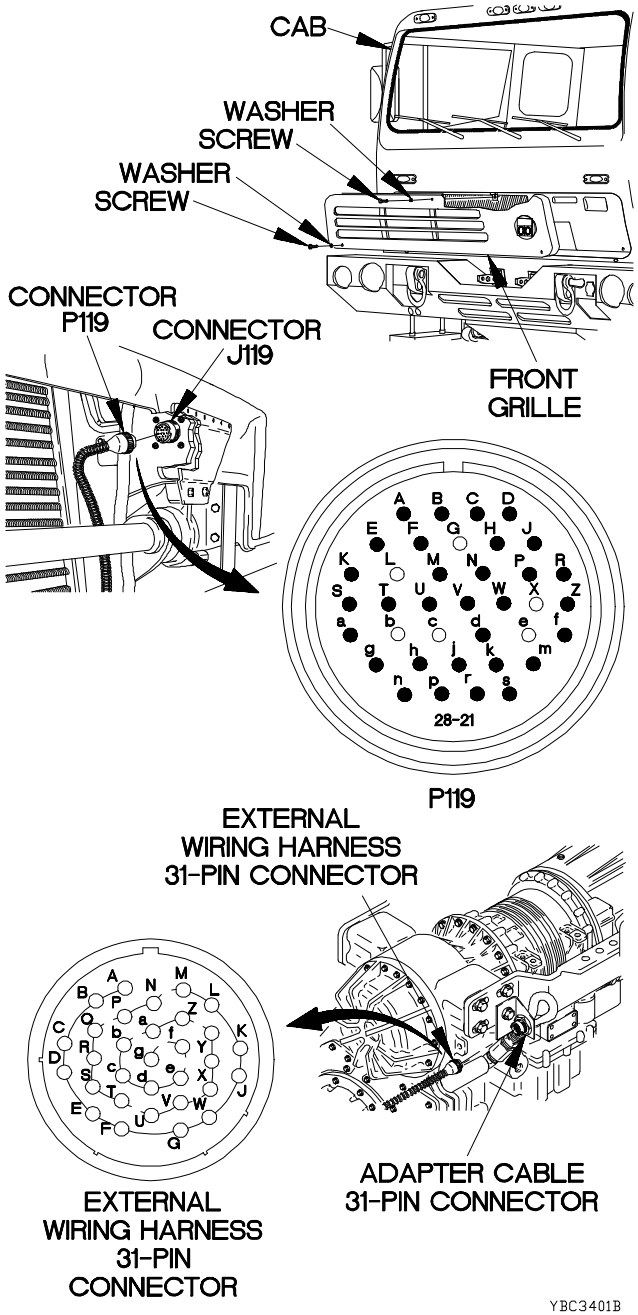
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

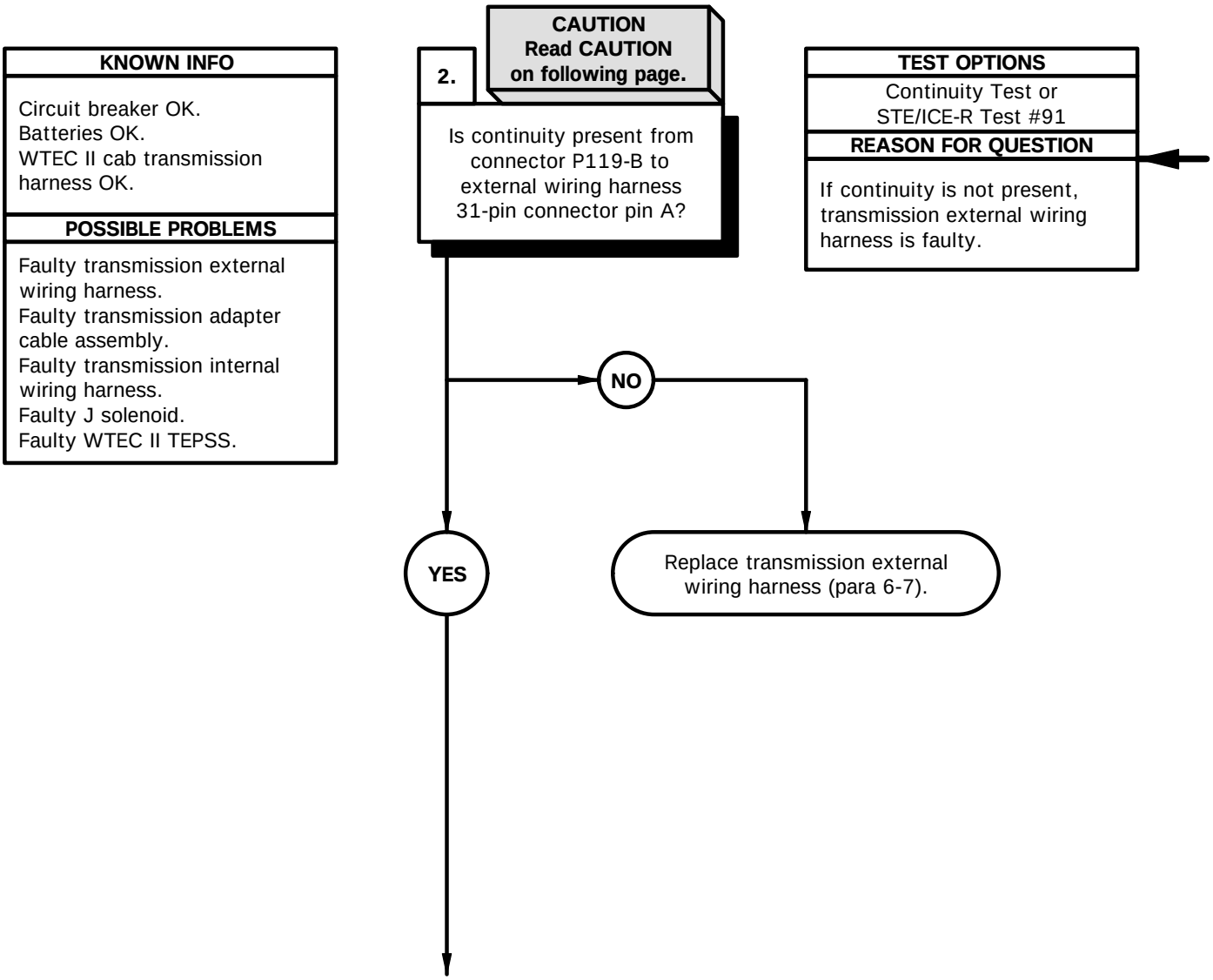
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from adapter cable 31-pin connector.
(6) Set multimeter to ohms.
(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).



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

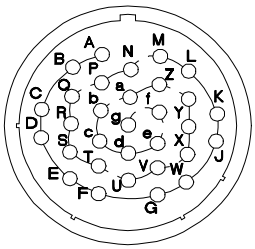
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

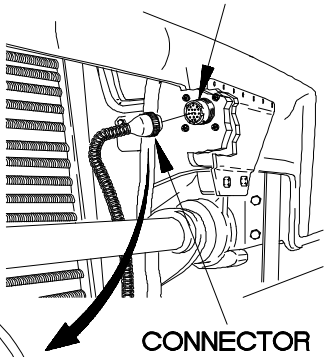
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

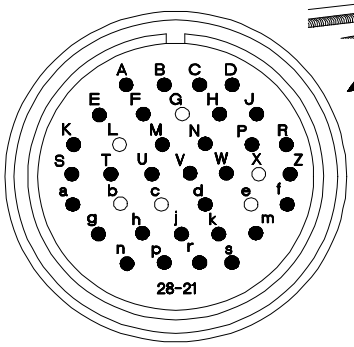
CONTINUITY TEST

(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).

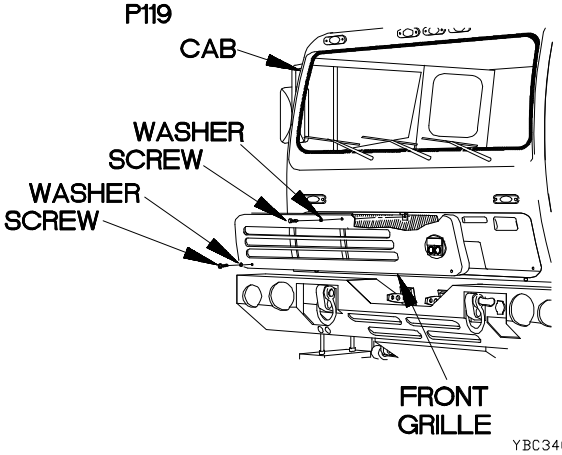


EXTERNAL WIRING HARNESS 31-PIN CONNECTOR

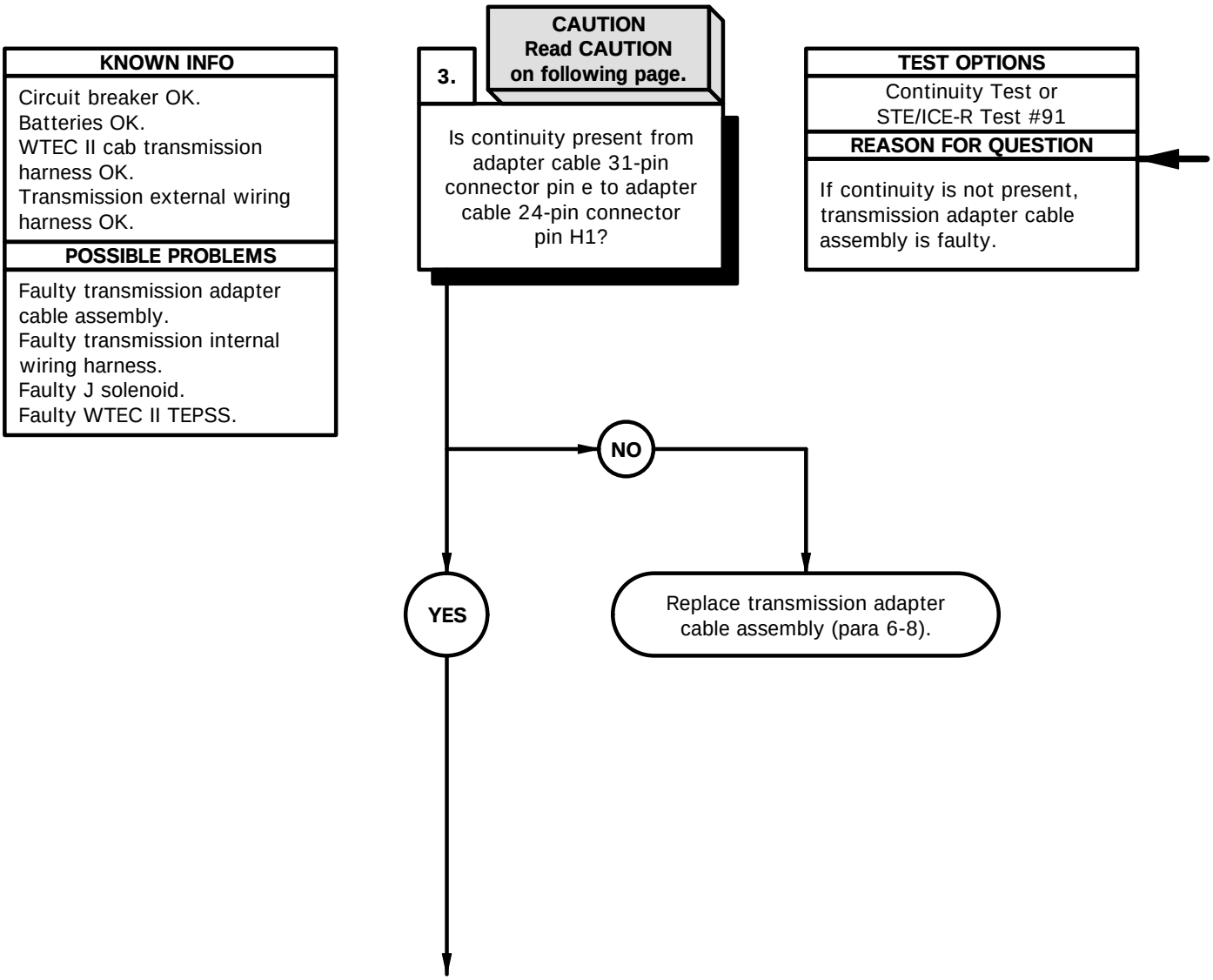




P119



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

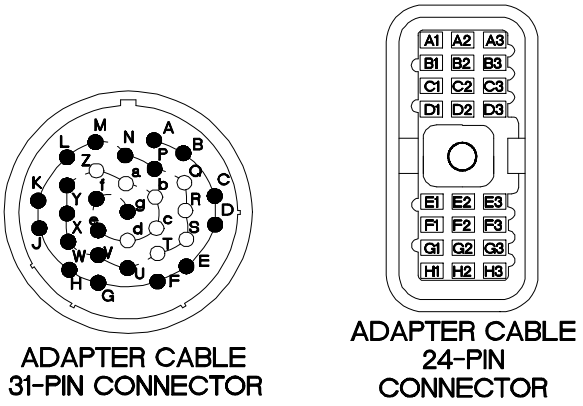
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

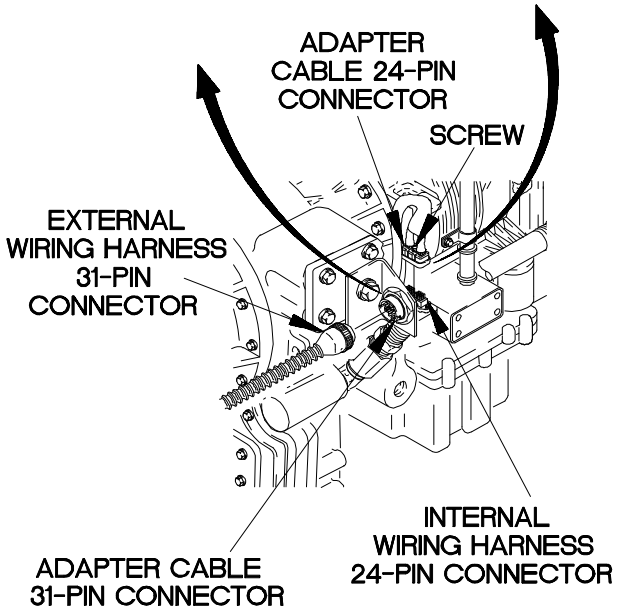
NOTE

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

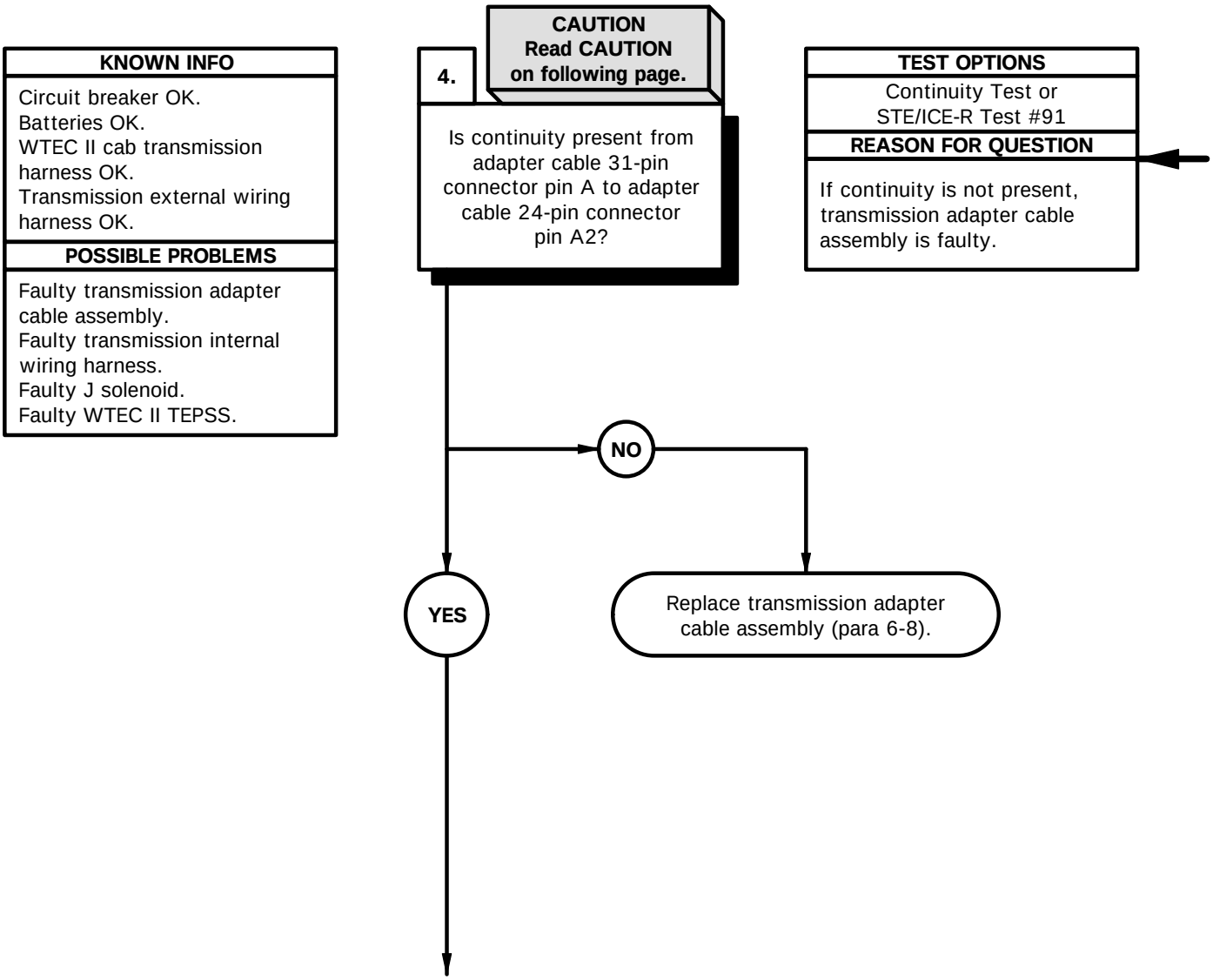
CONTINUITY TEST

(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).





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

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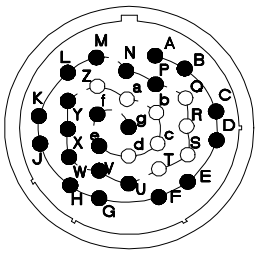
NOTE

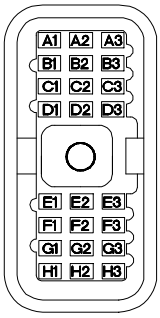
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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.



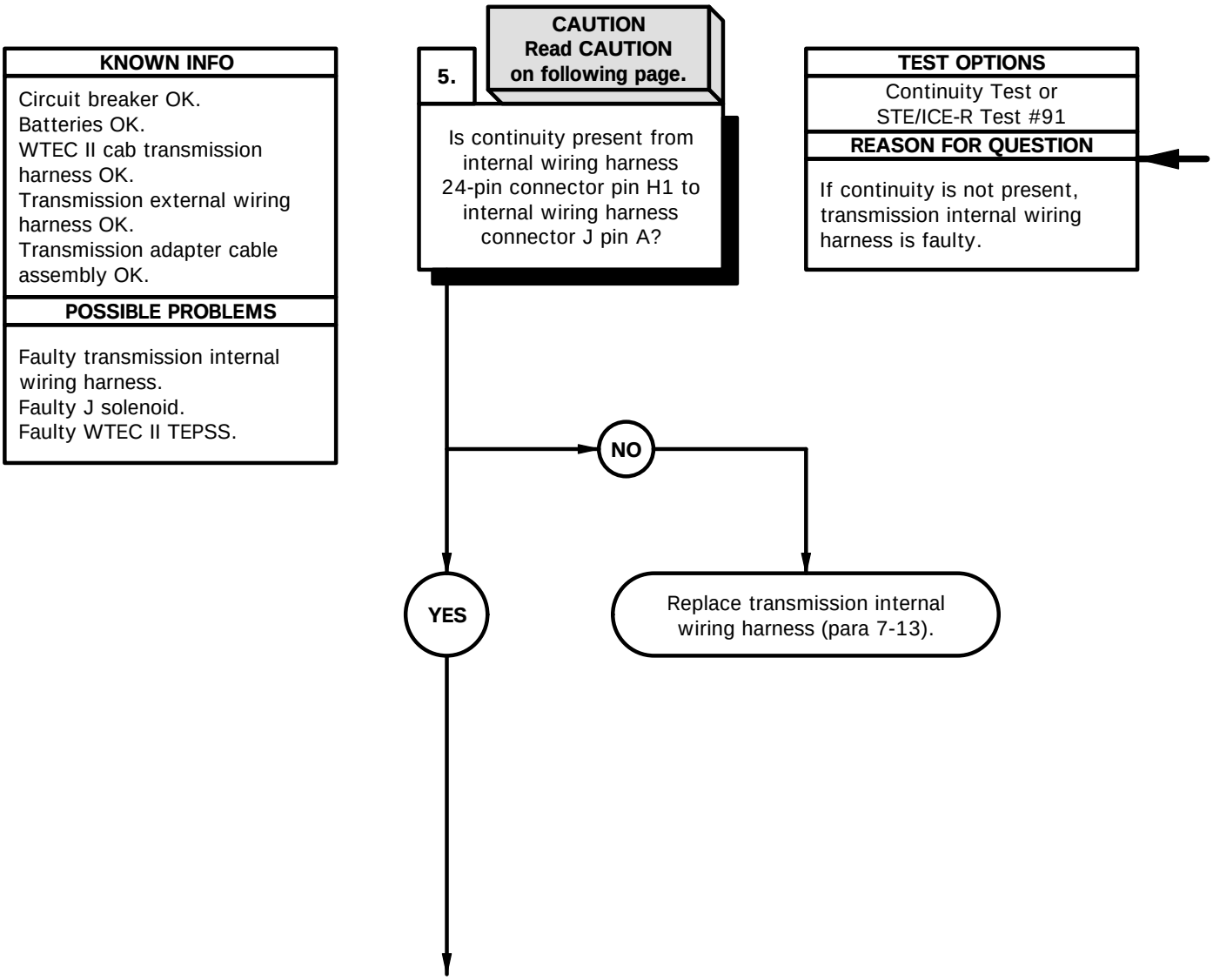
ADAPTER CABLE
31-PIN CONNECTOR



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)



CAUTION

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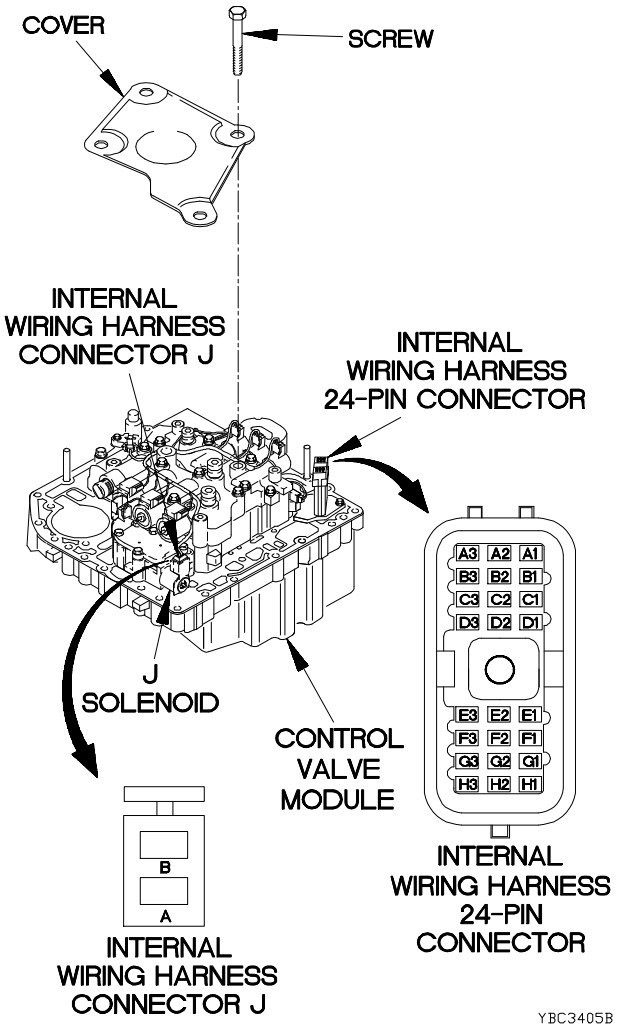
NOTE

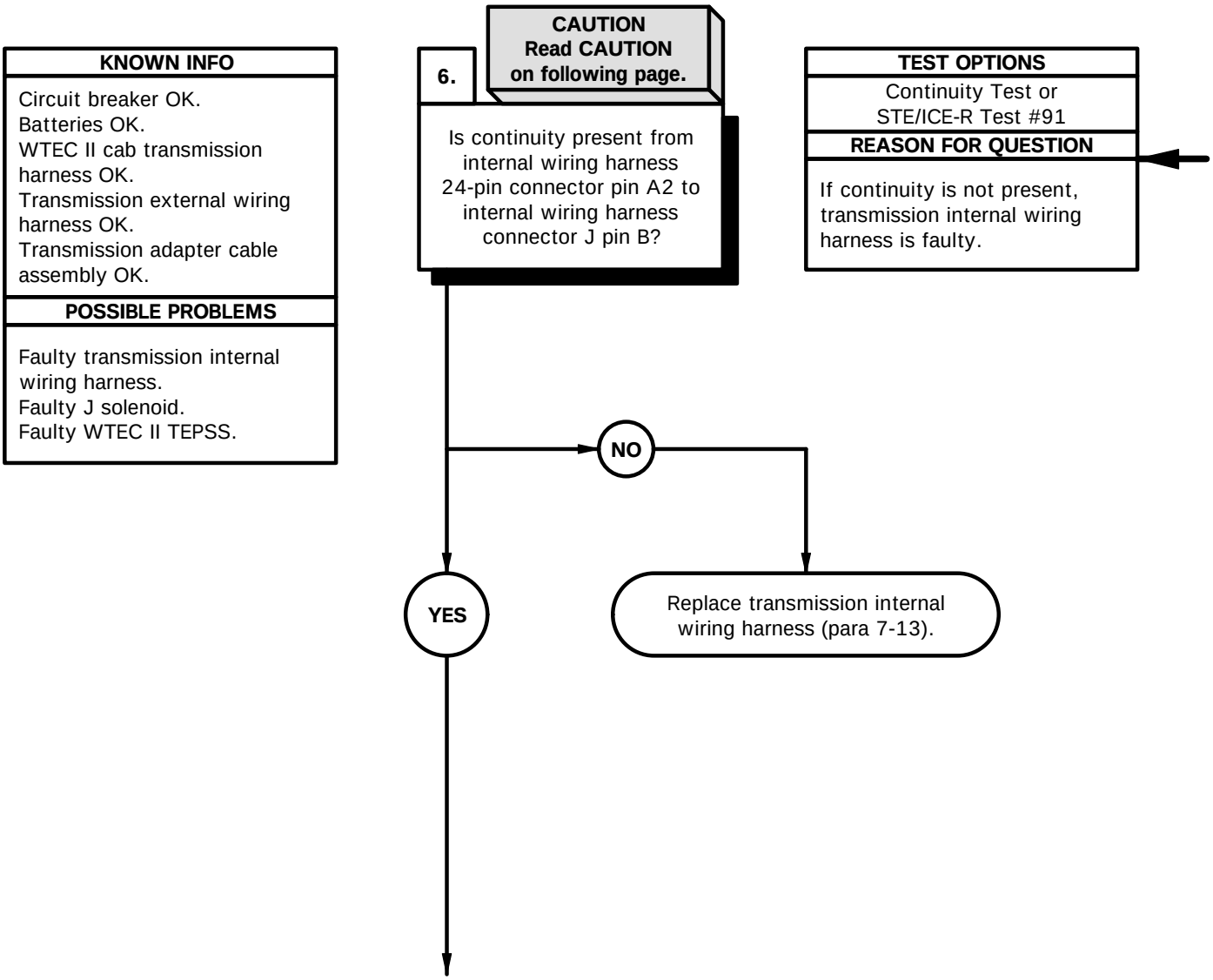
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



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

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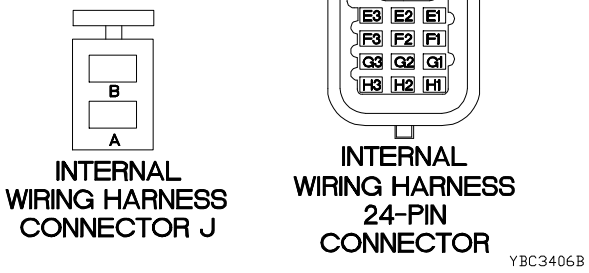
NOTE

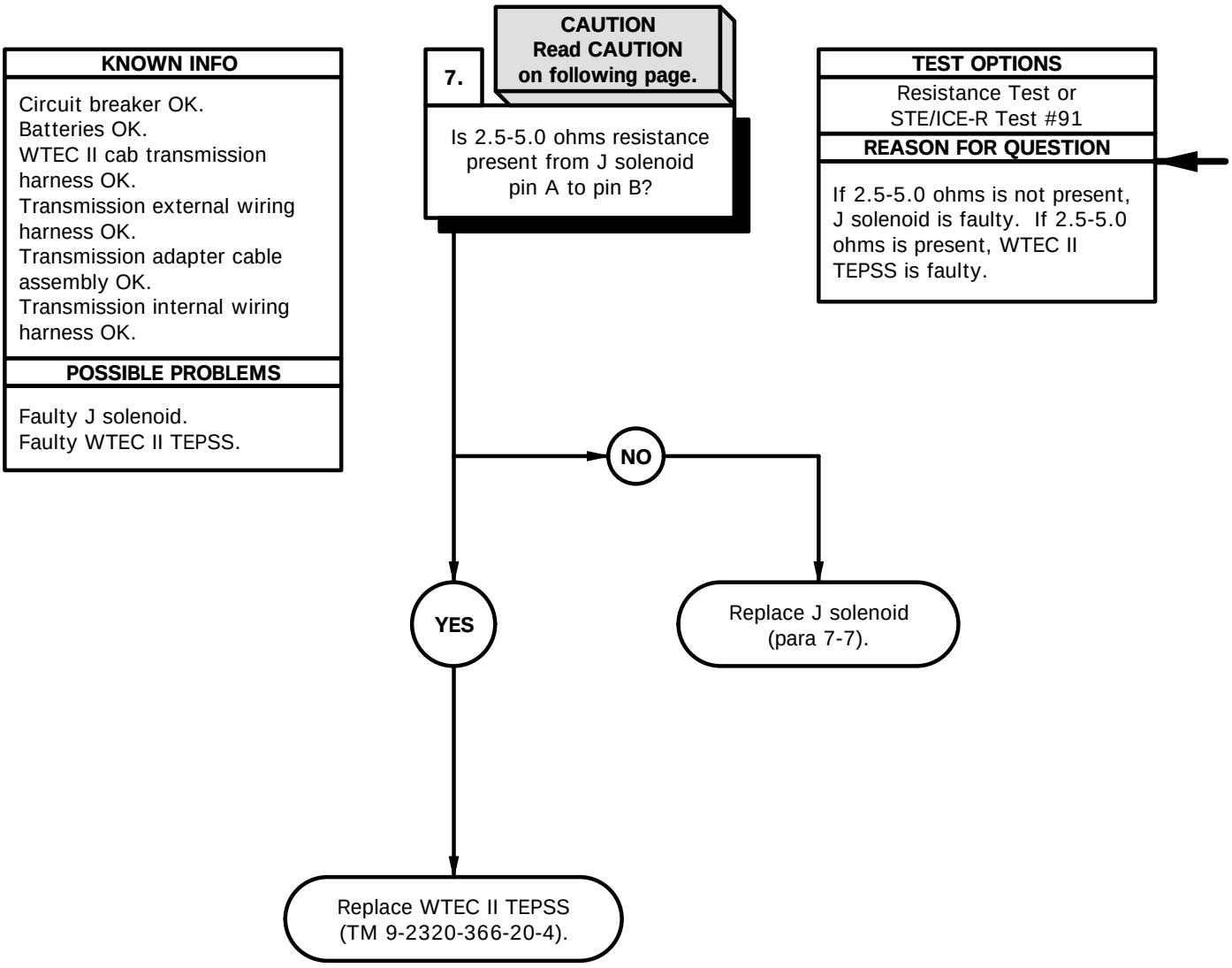
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



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

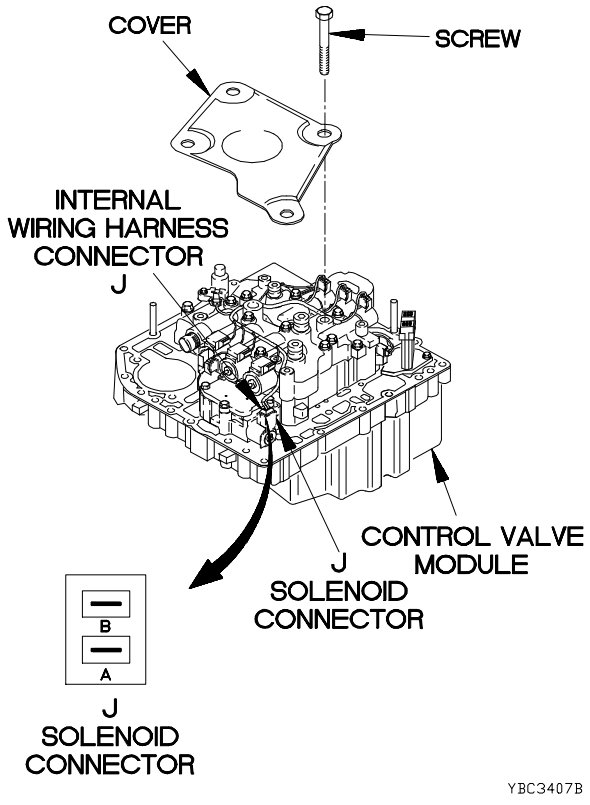
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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).



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

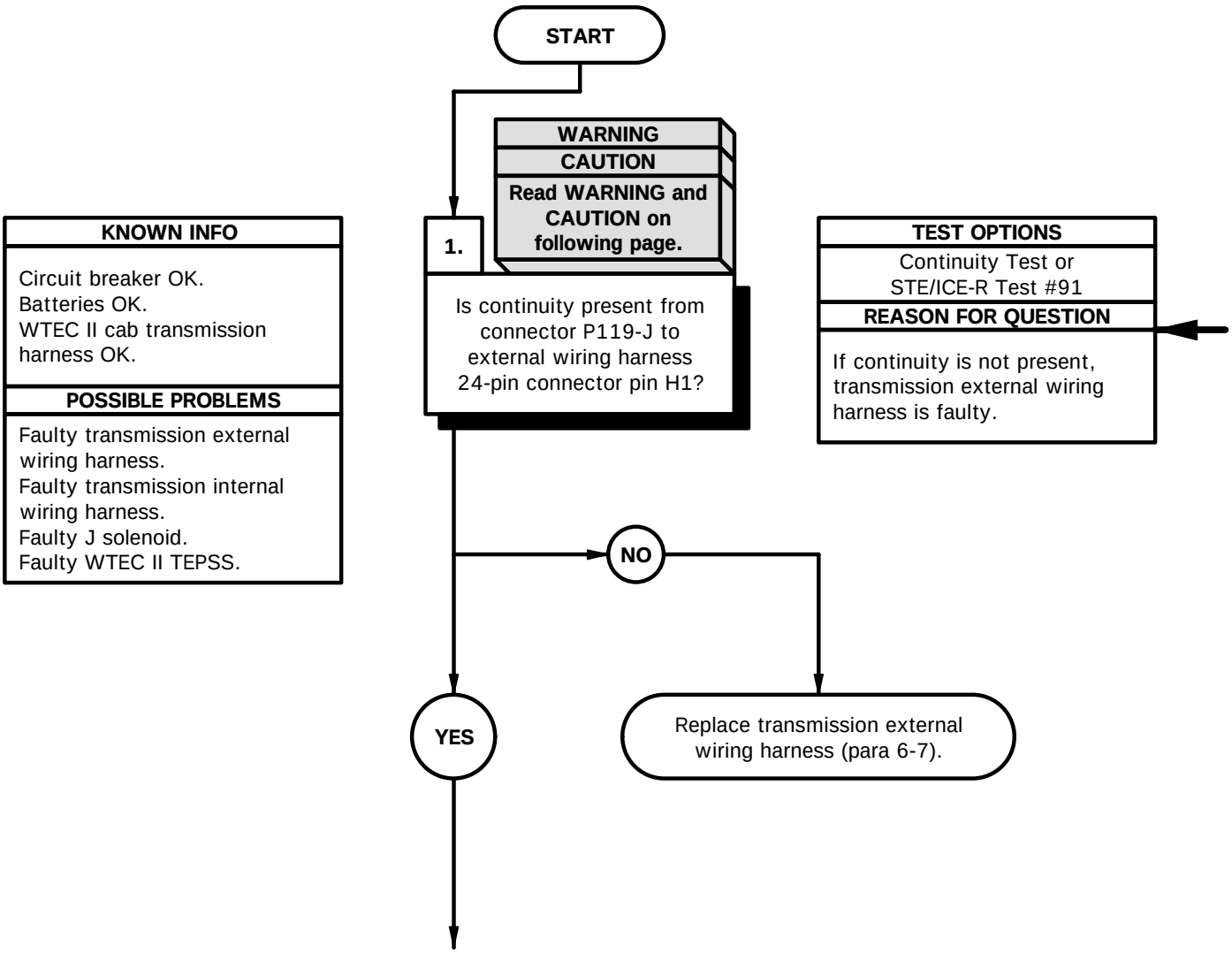
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

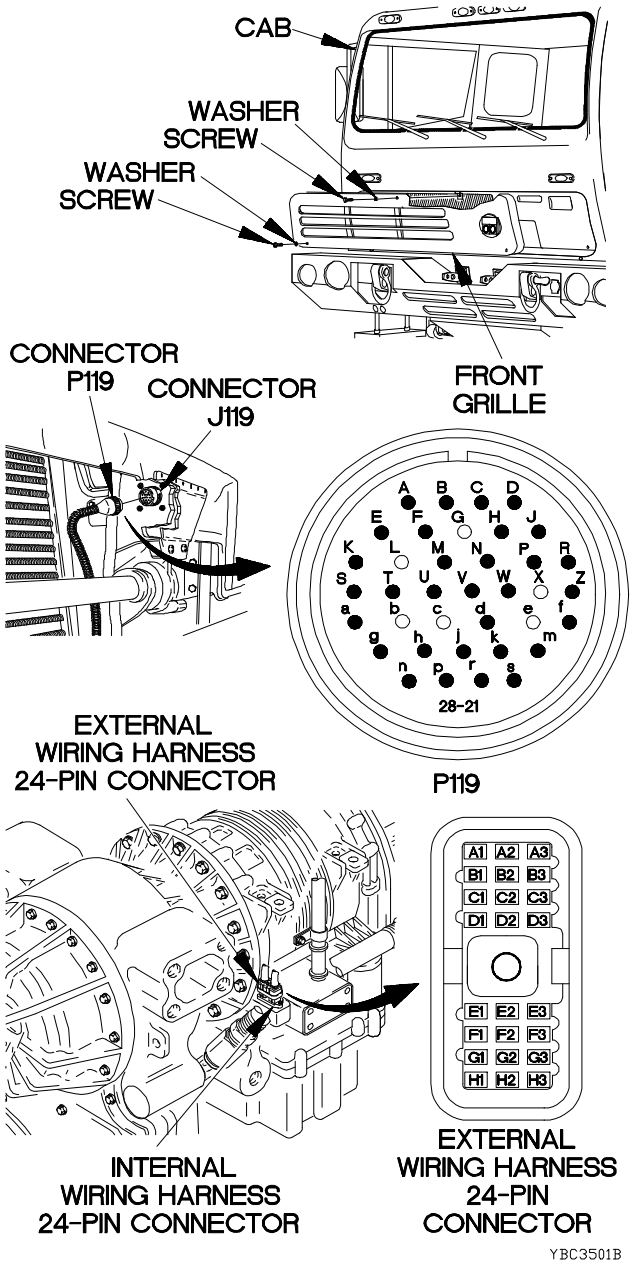
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

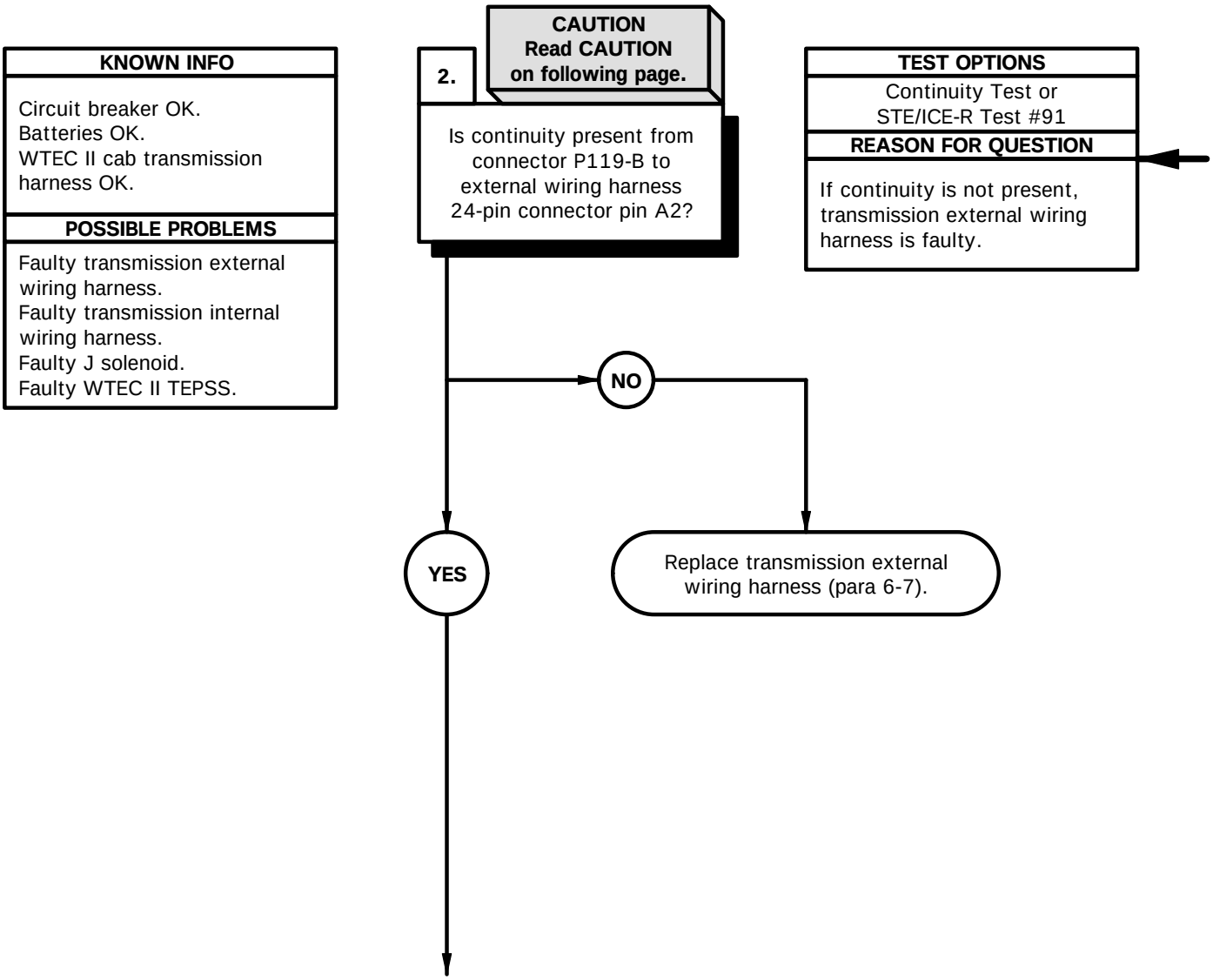
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Loosen screw in external wiring harness 24-pin connector.
(6) Disconnect external wiring harness 24-pin connector 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).



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)



CAUTION

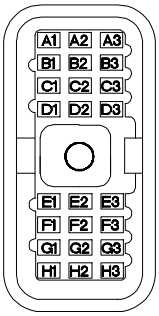
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

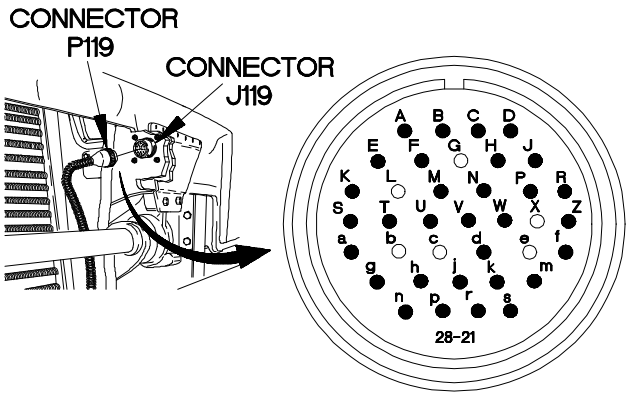
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

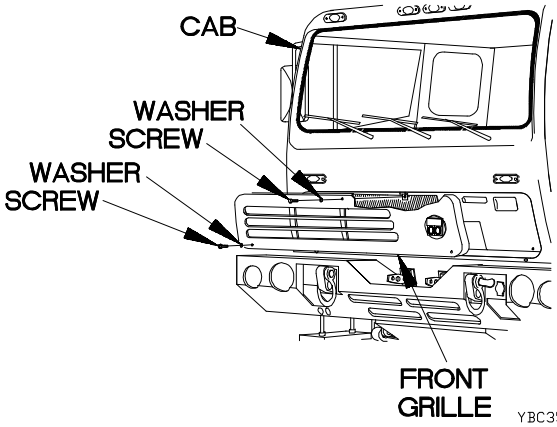
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P119 pin B.
(3) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin A2 and note reading on multimeter.
(4) If continuity is not present, replace transmission external wiring harness (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).



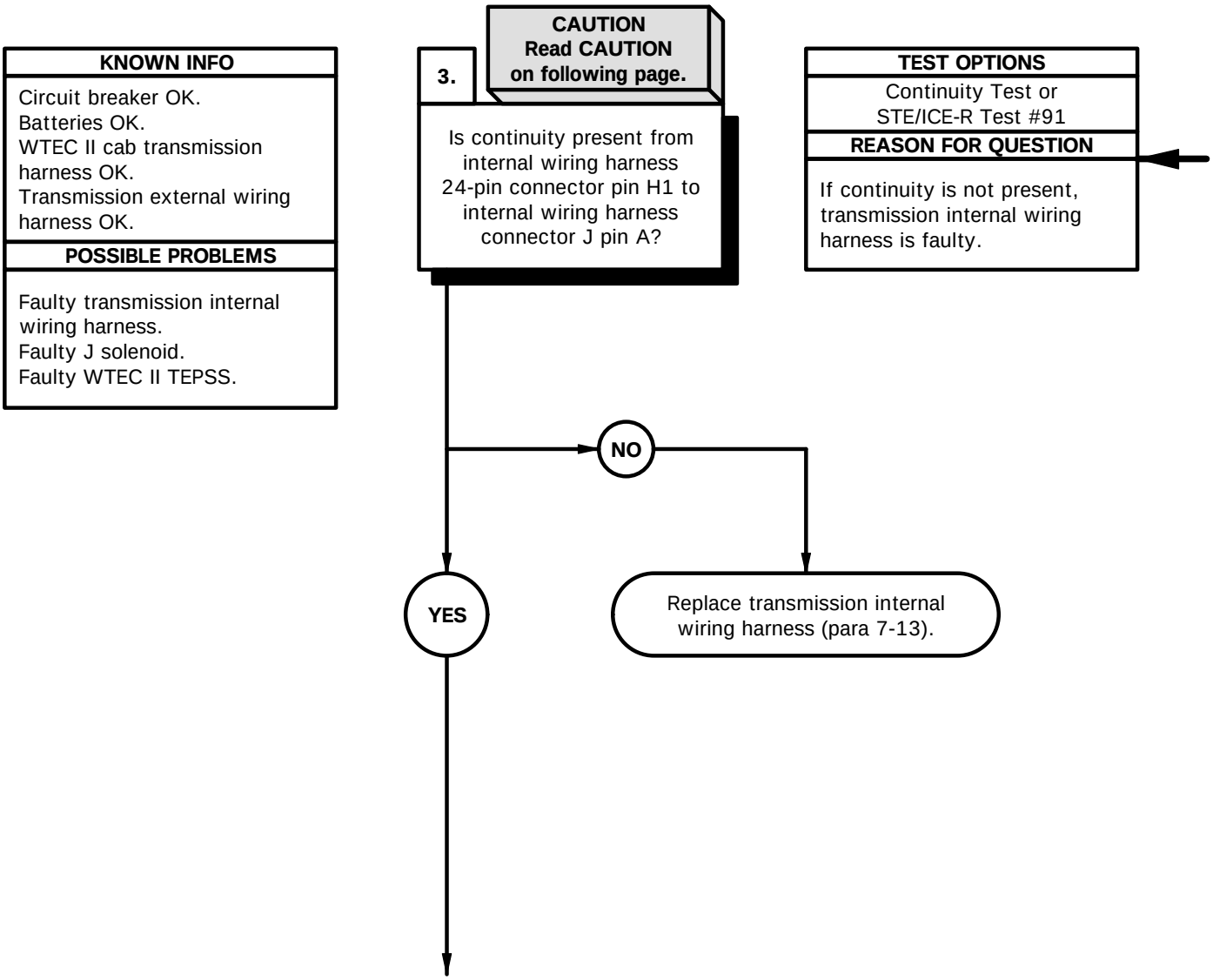
EXTERNAL WIRING HARNESS 24-PIN CONNECTOR



P119



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)



CAUTION

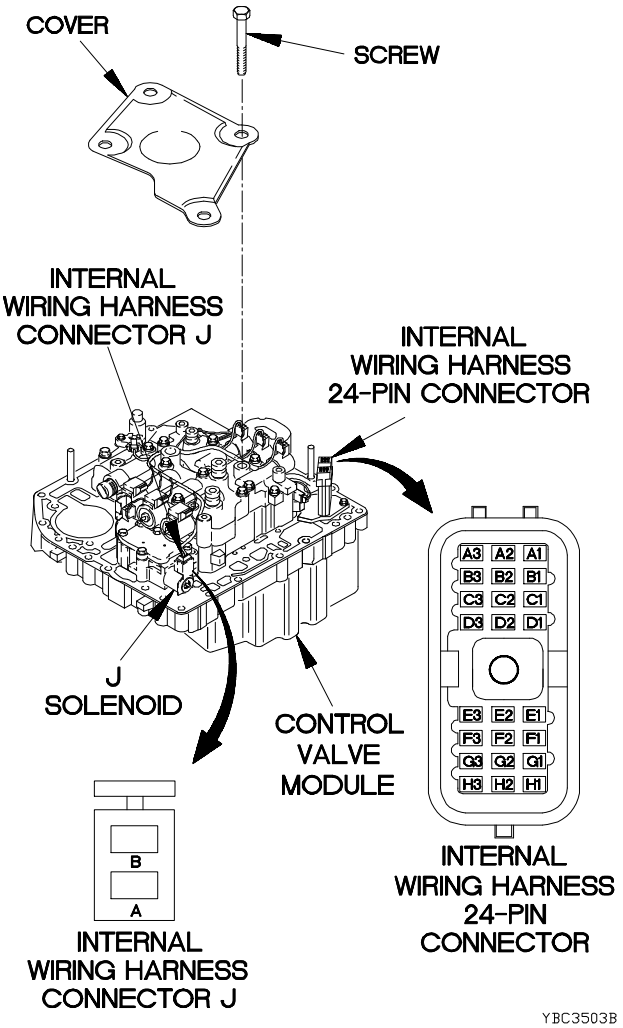
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

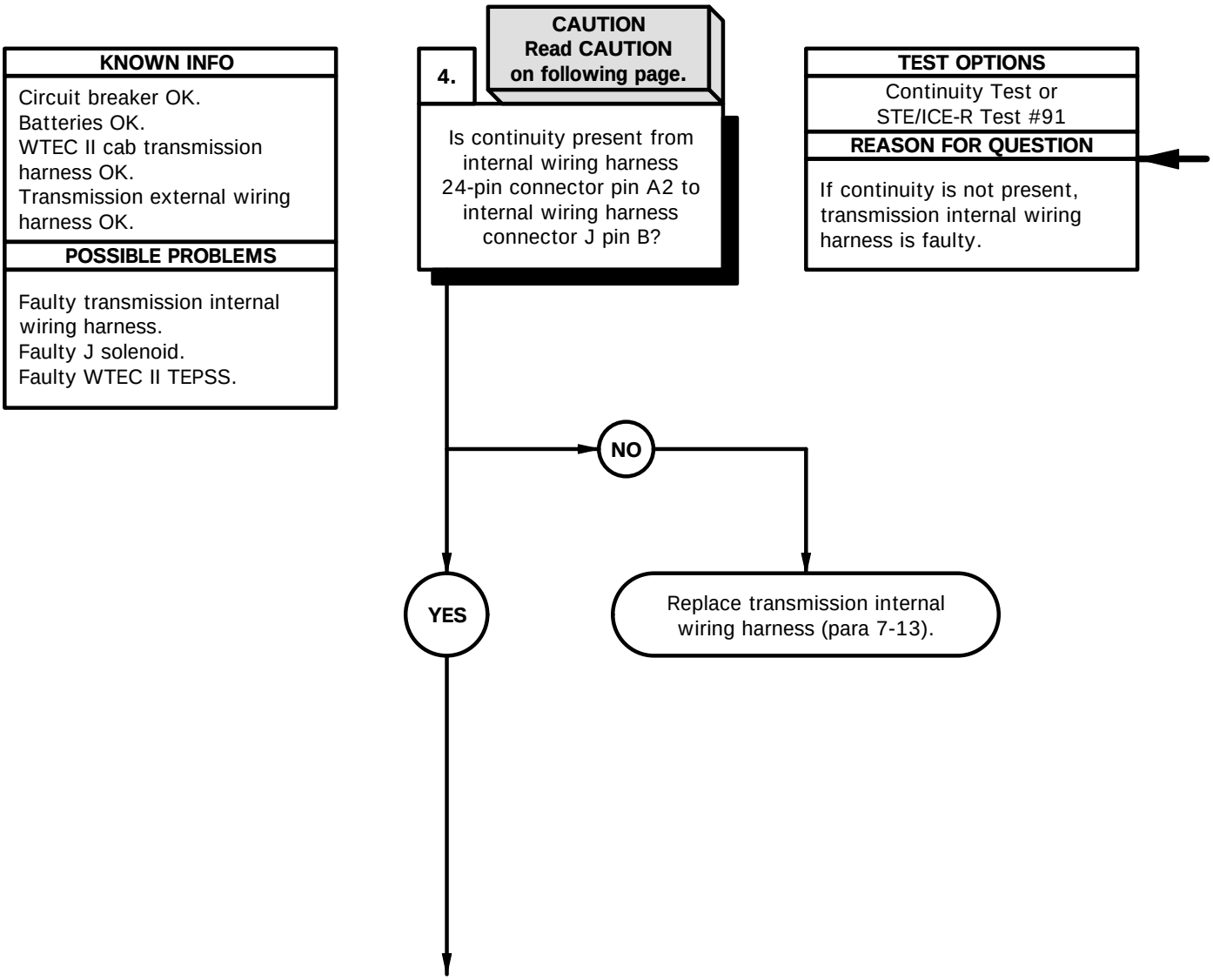
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



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)



CAUTION

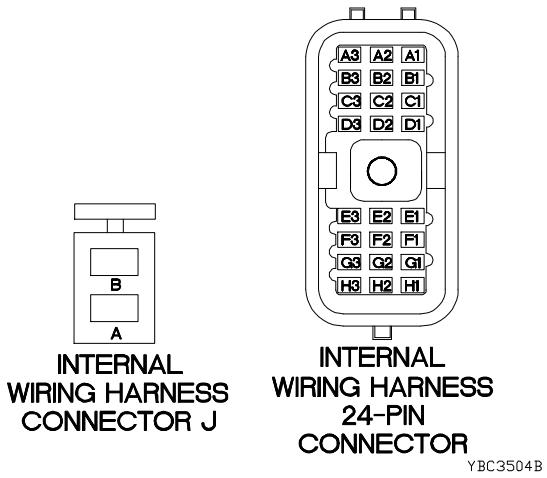
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

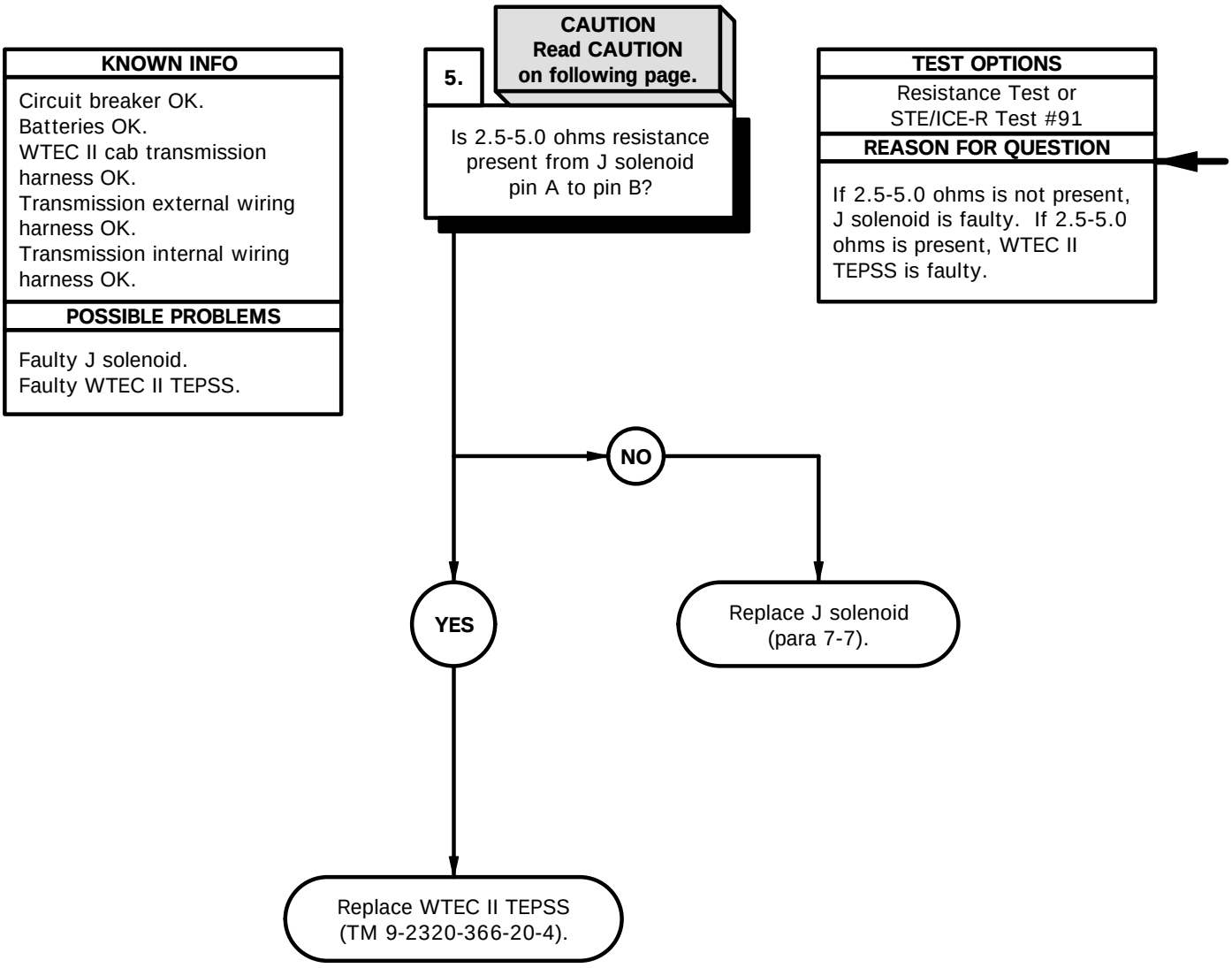
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



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)



CAUTION

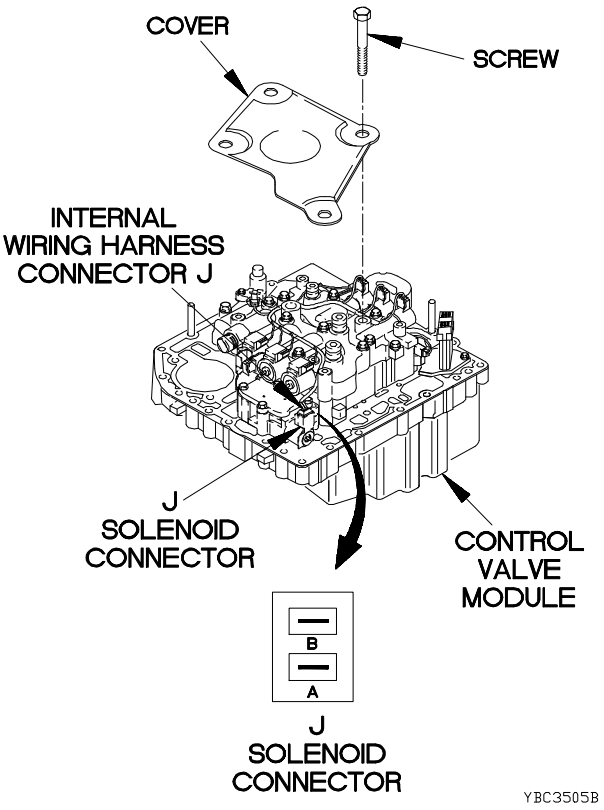
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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).



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

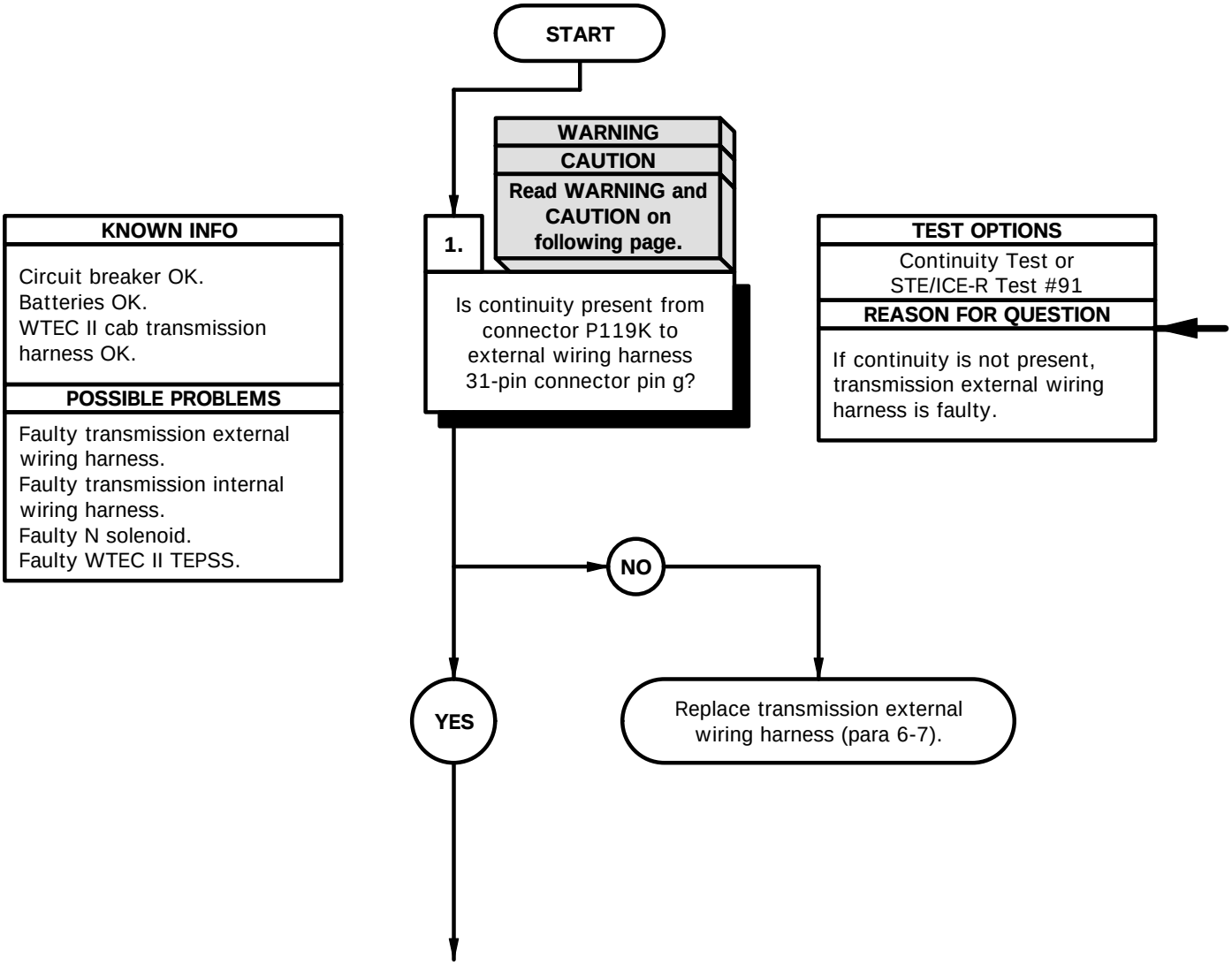
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

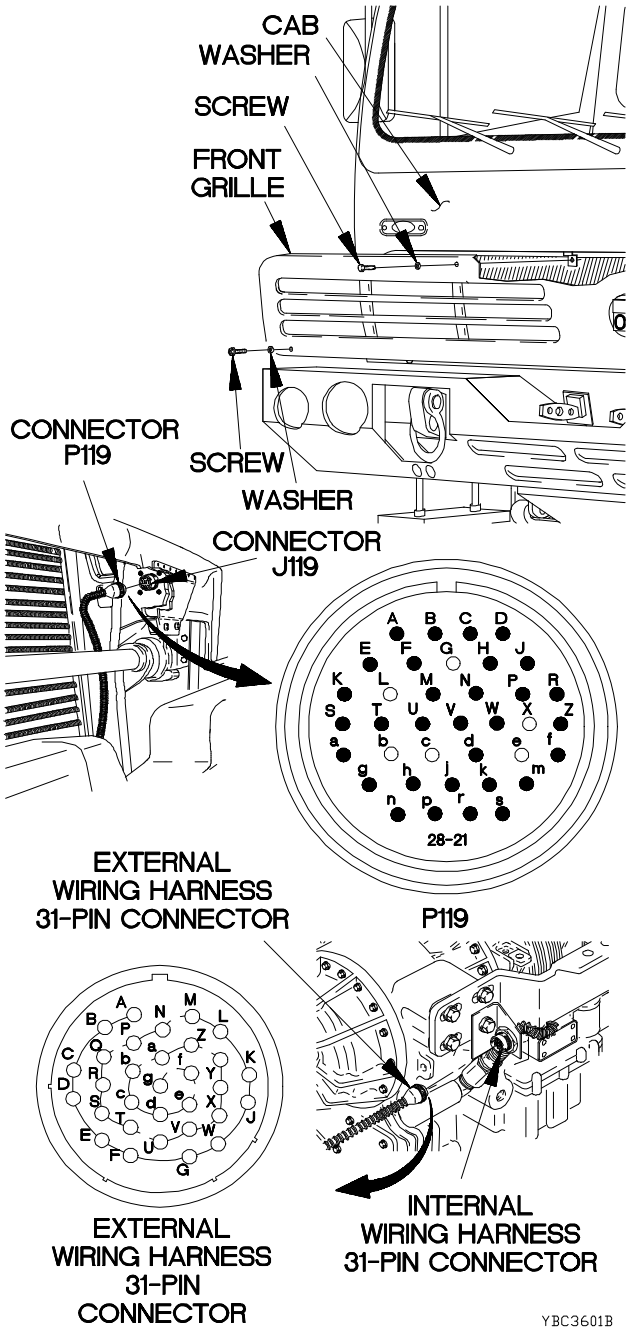
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

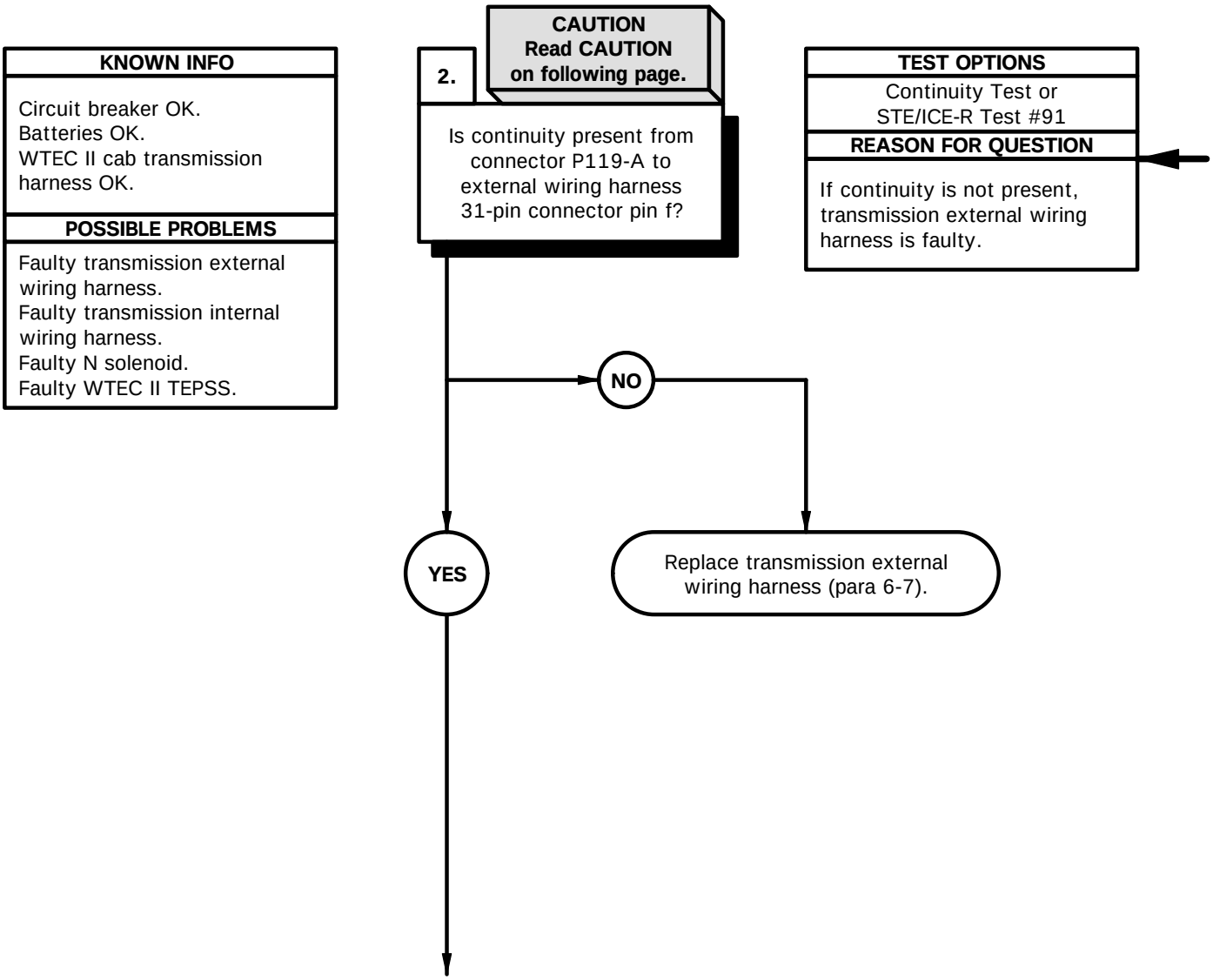
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from internal wiring 31-pin connector.
(6) Set multimeter to 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).



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

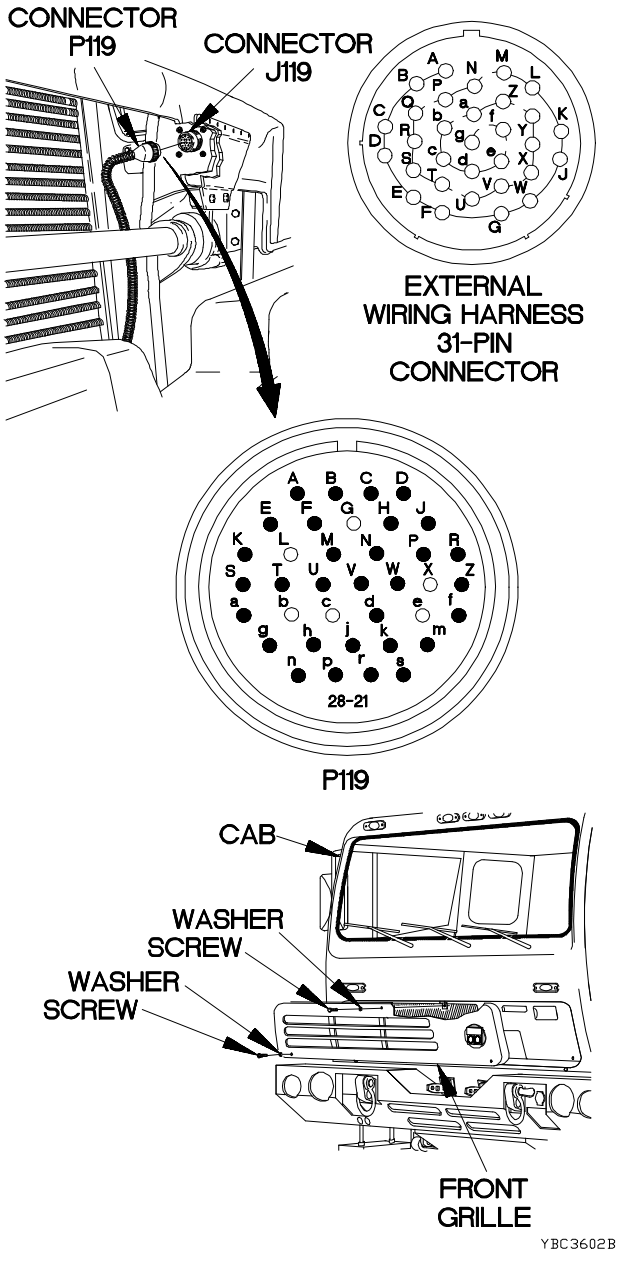
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

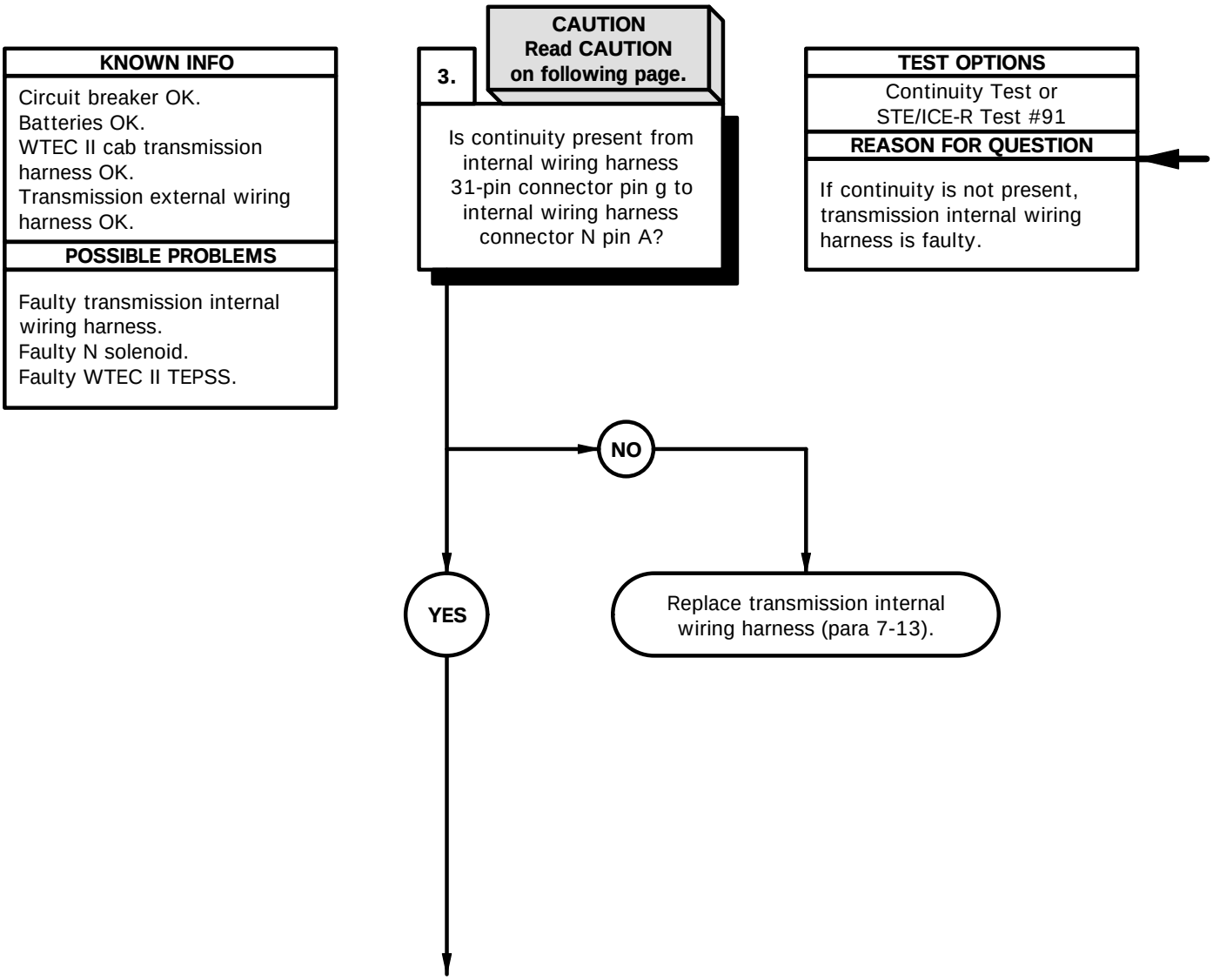
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



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

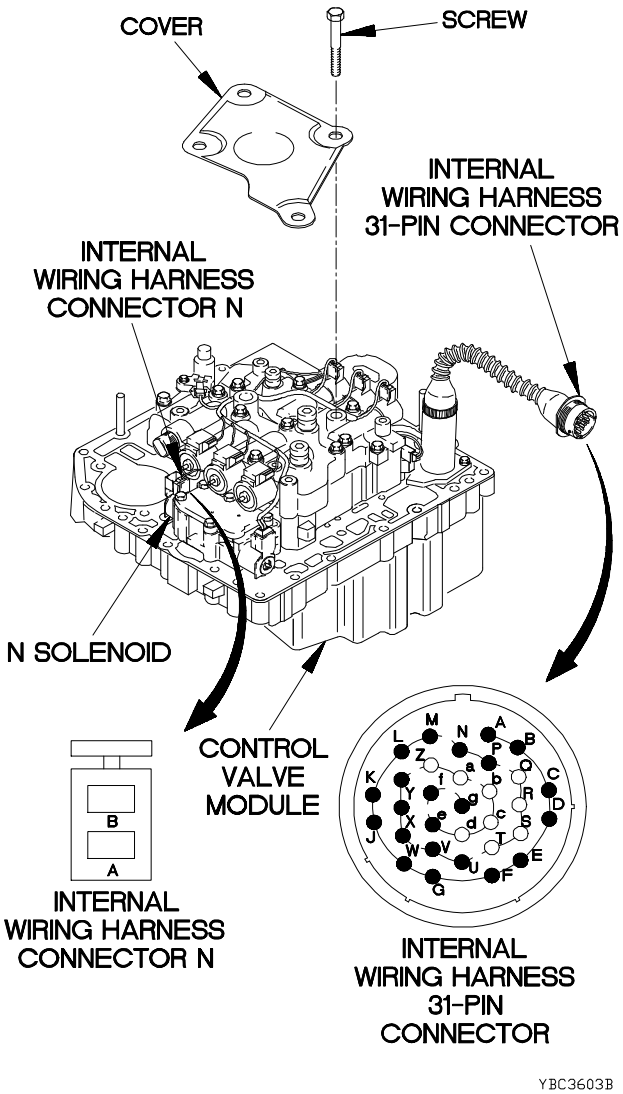
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

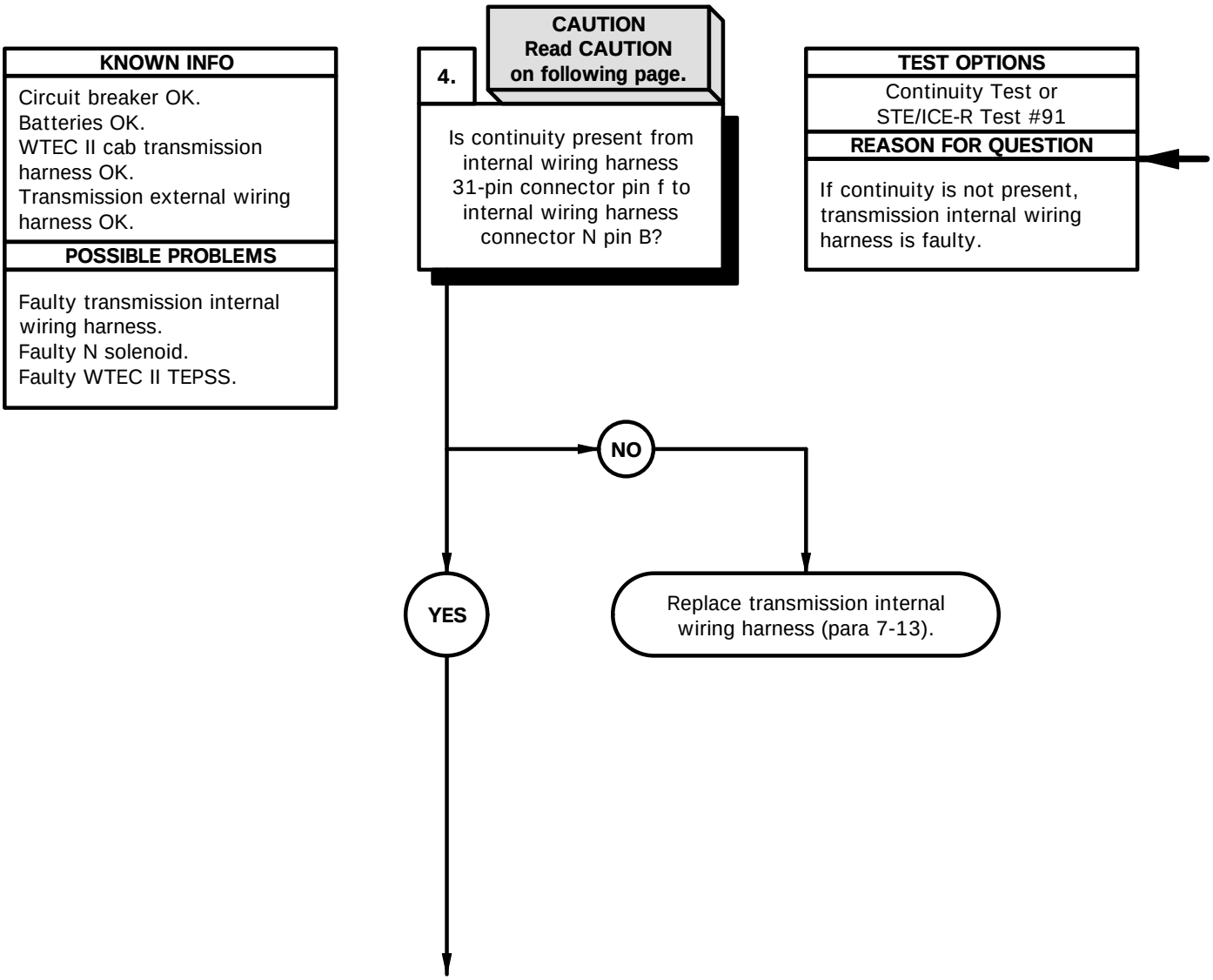
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



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

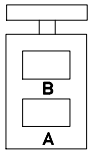
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

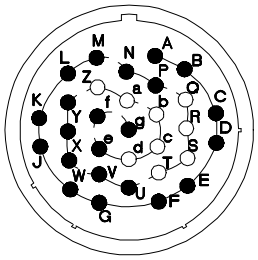
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



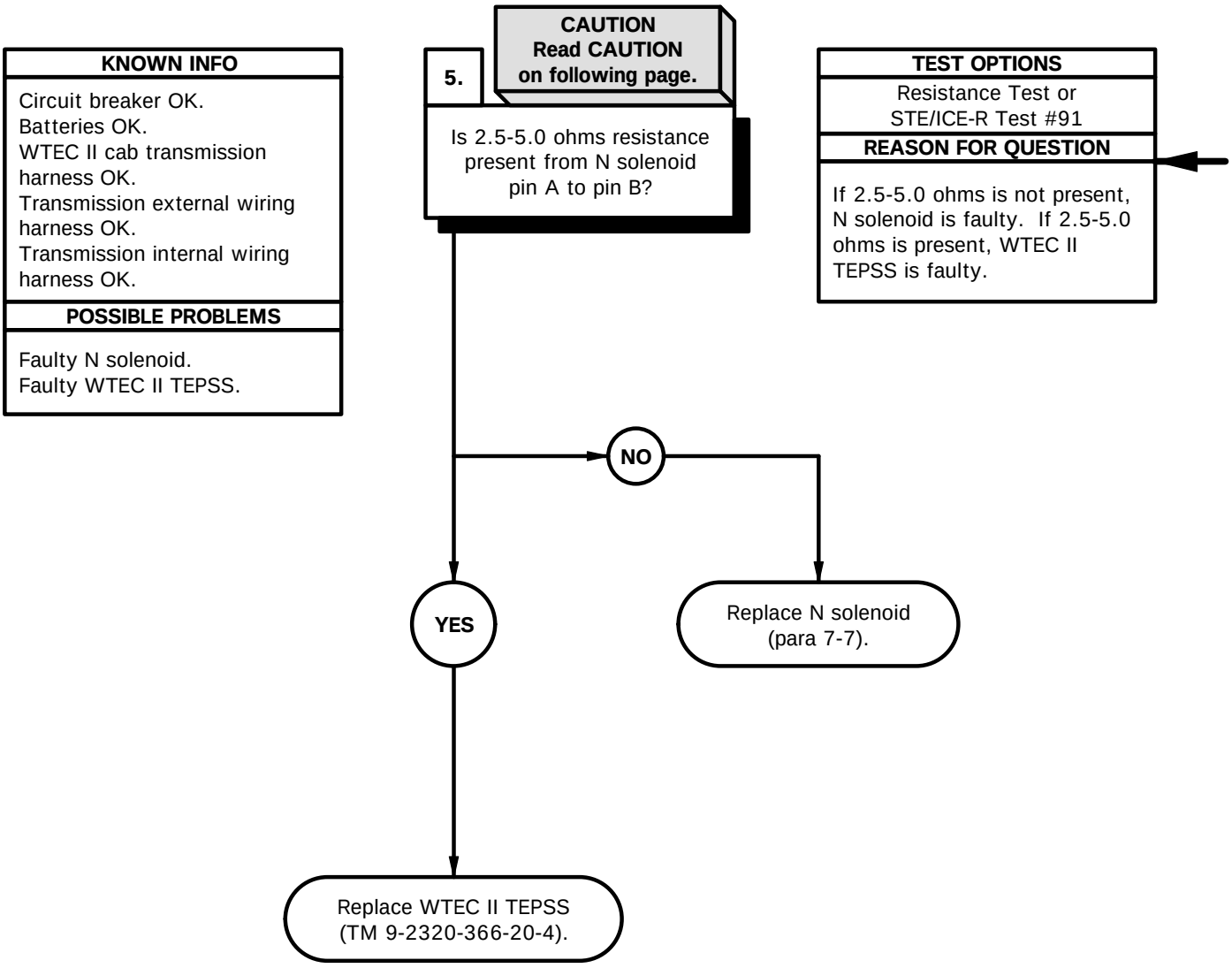
INTERNAL WIRING HARNESS CONNECTOR N



INTERNAL WIRING HARNESS 31-PIN CONNECTOR

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

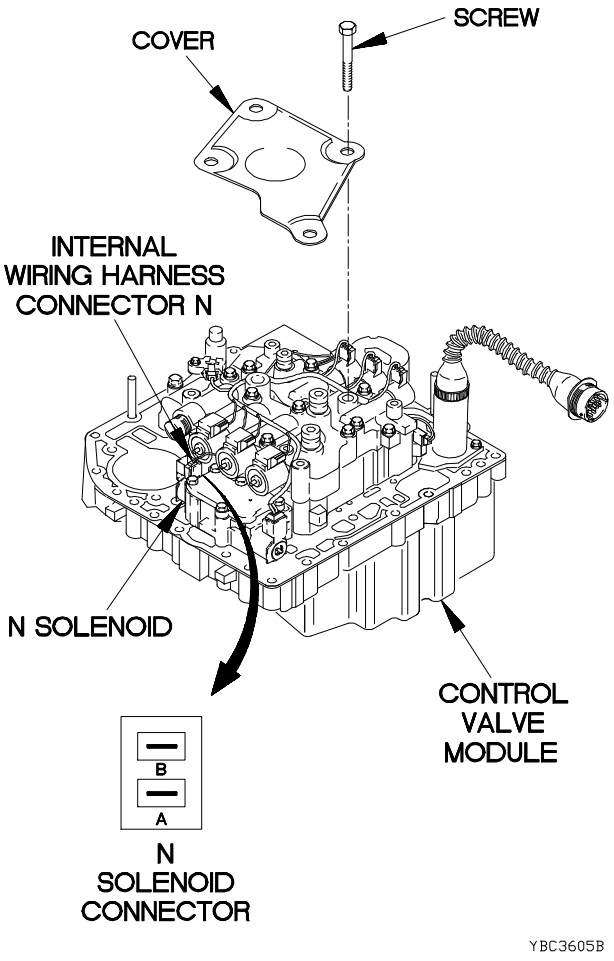
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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).



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

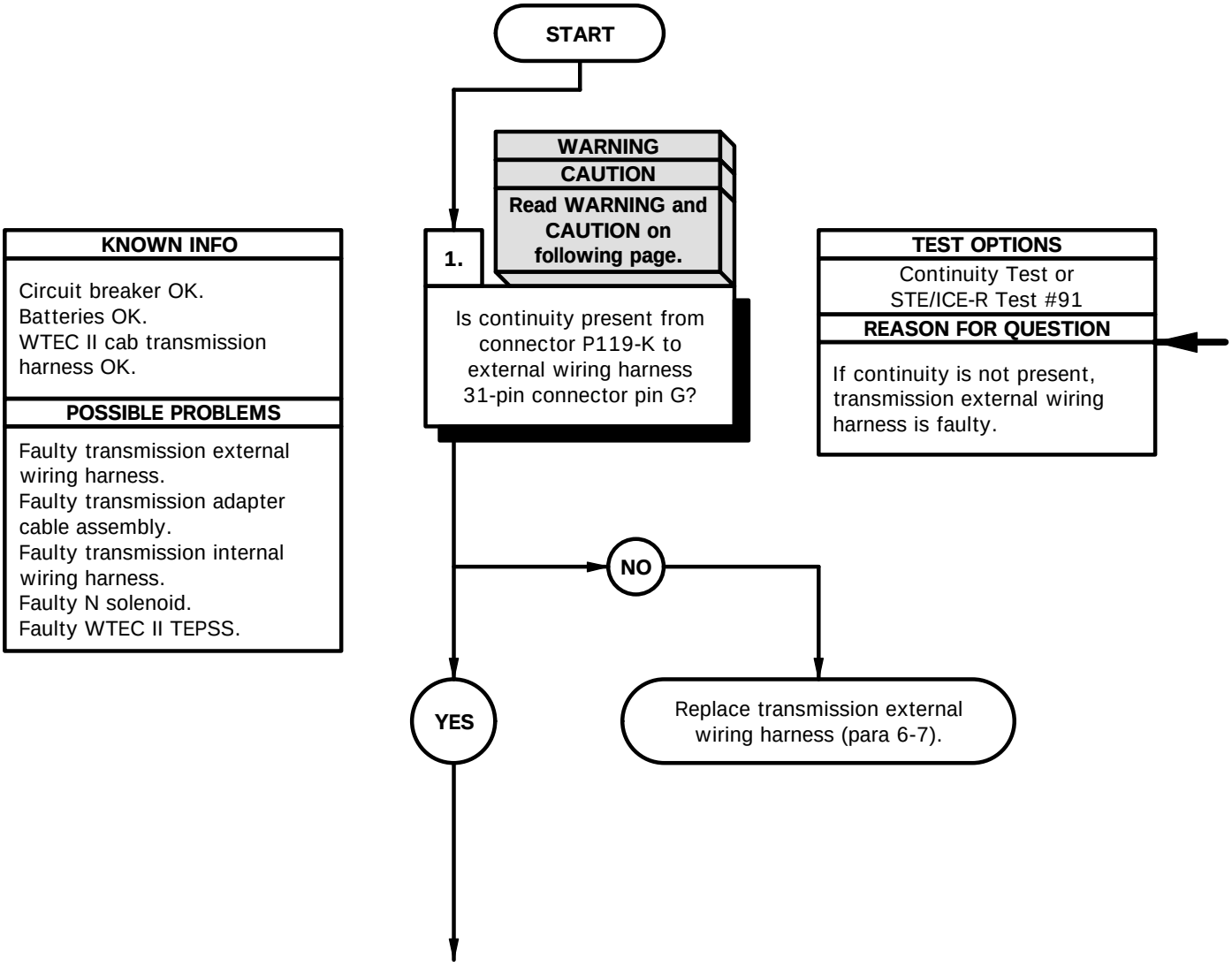
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

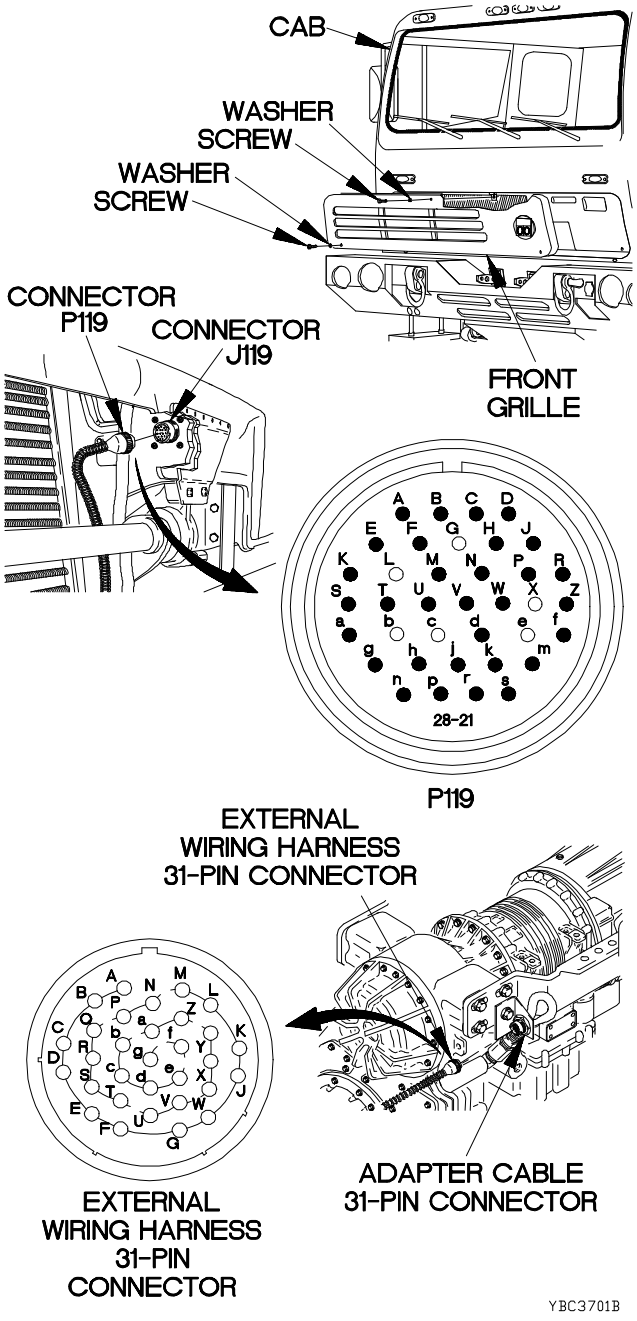
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

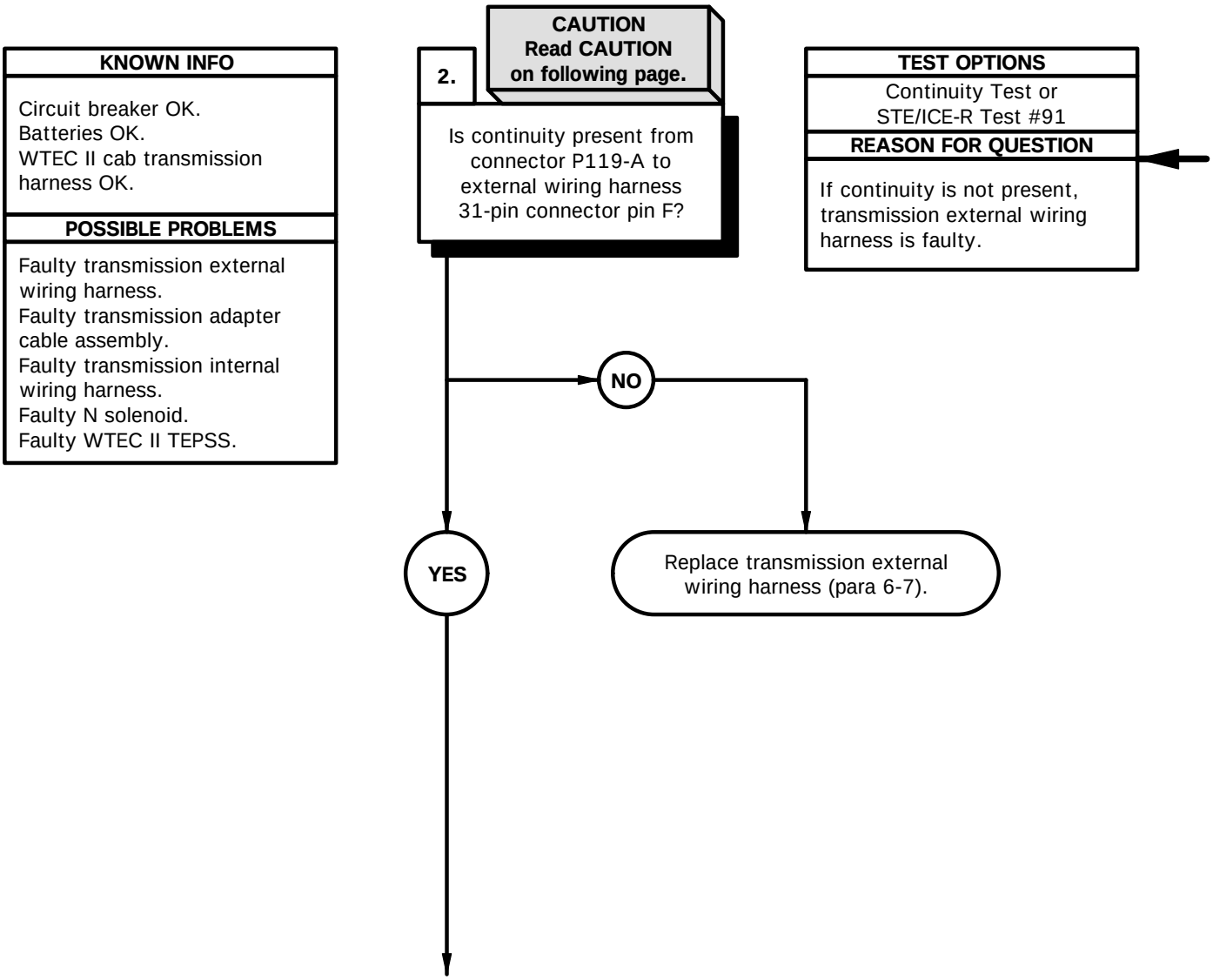
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from adapter cable 31-pin connector.
(6) Set multimeter to ohms.
(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).



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

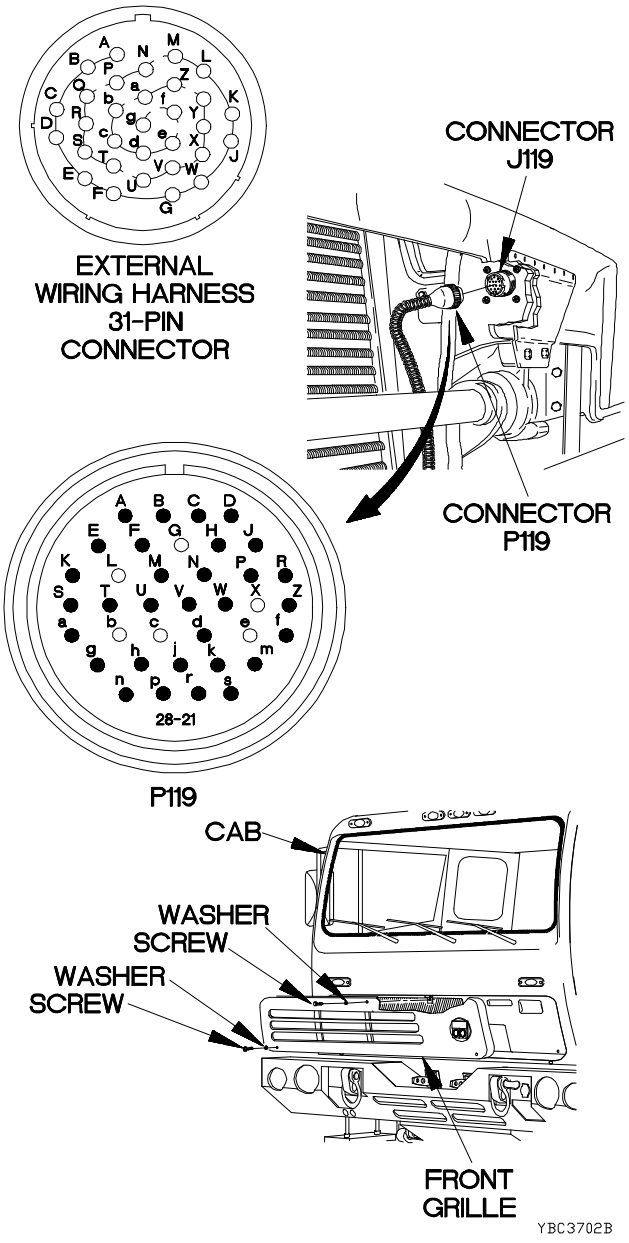
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

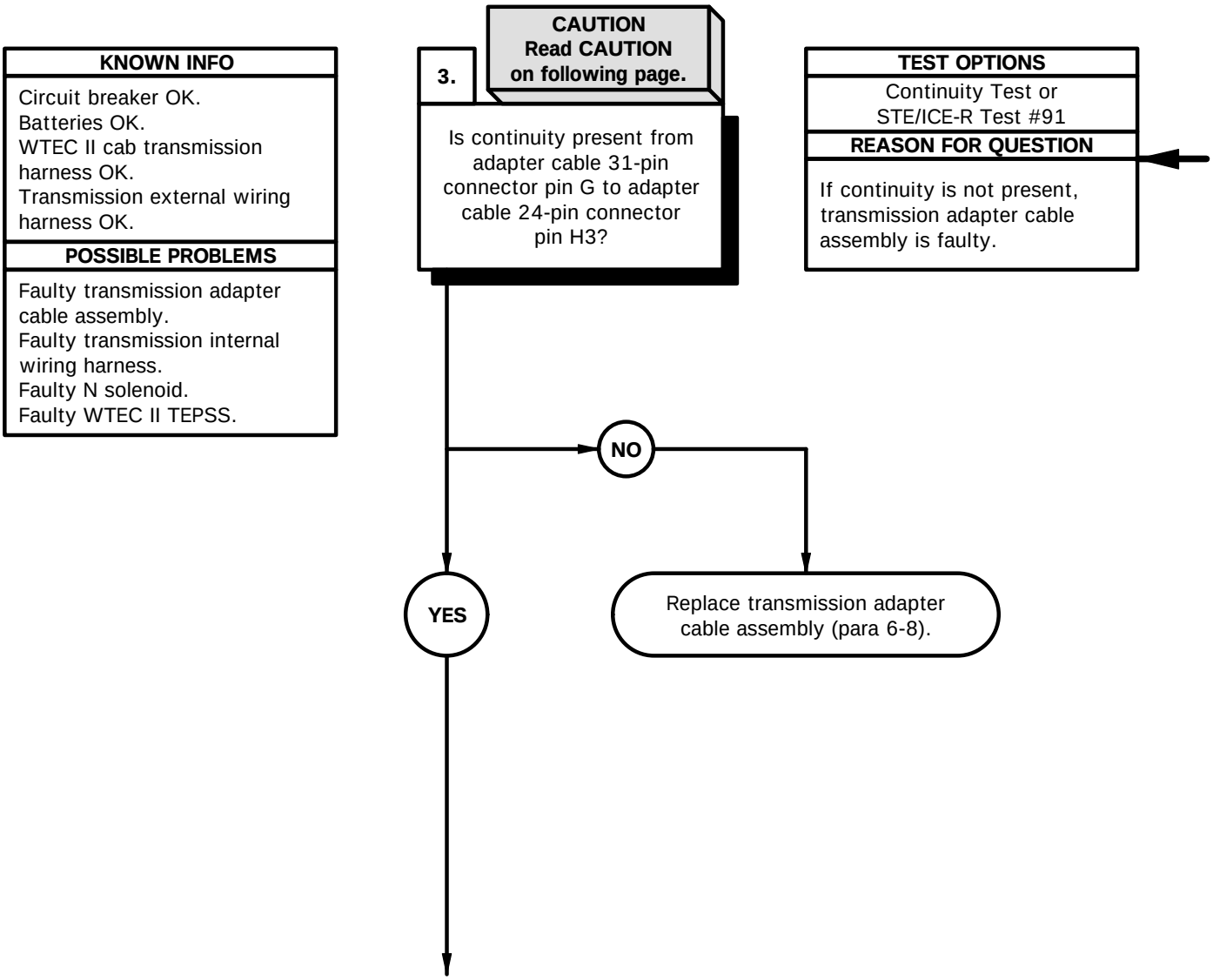
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



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

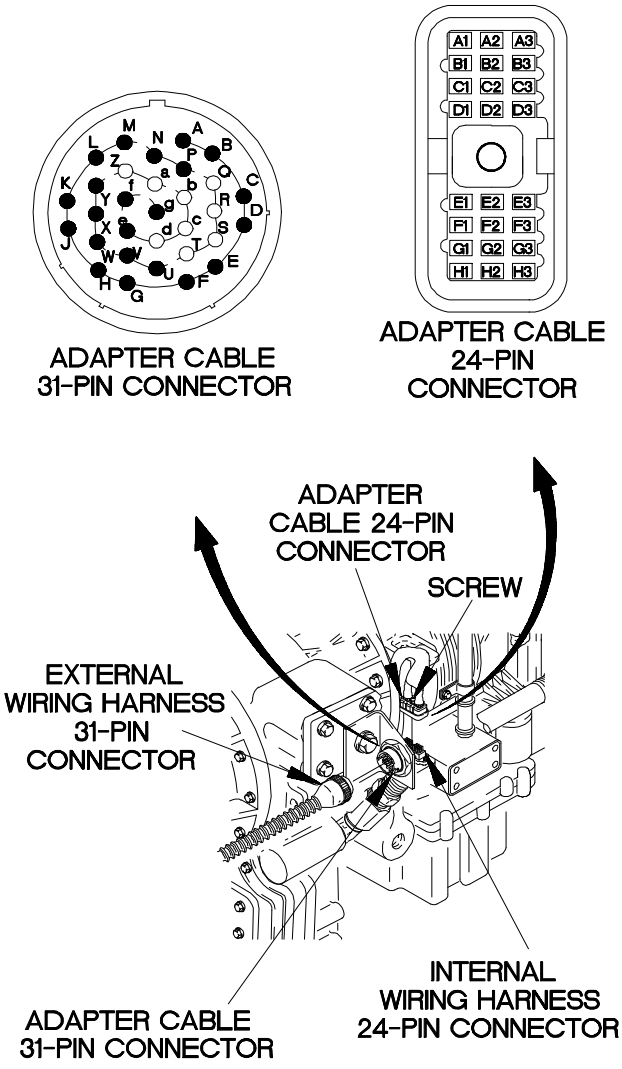
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

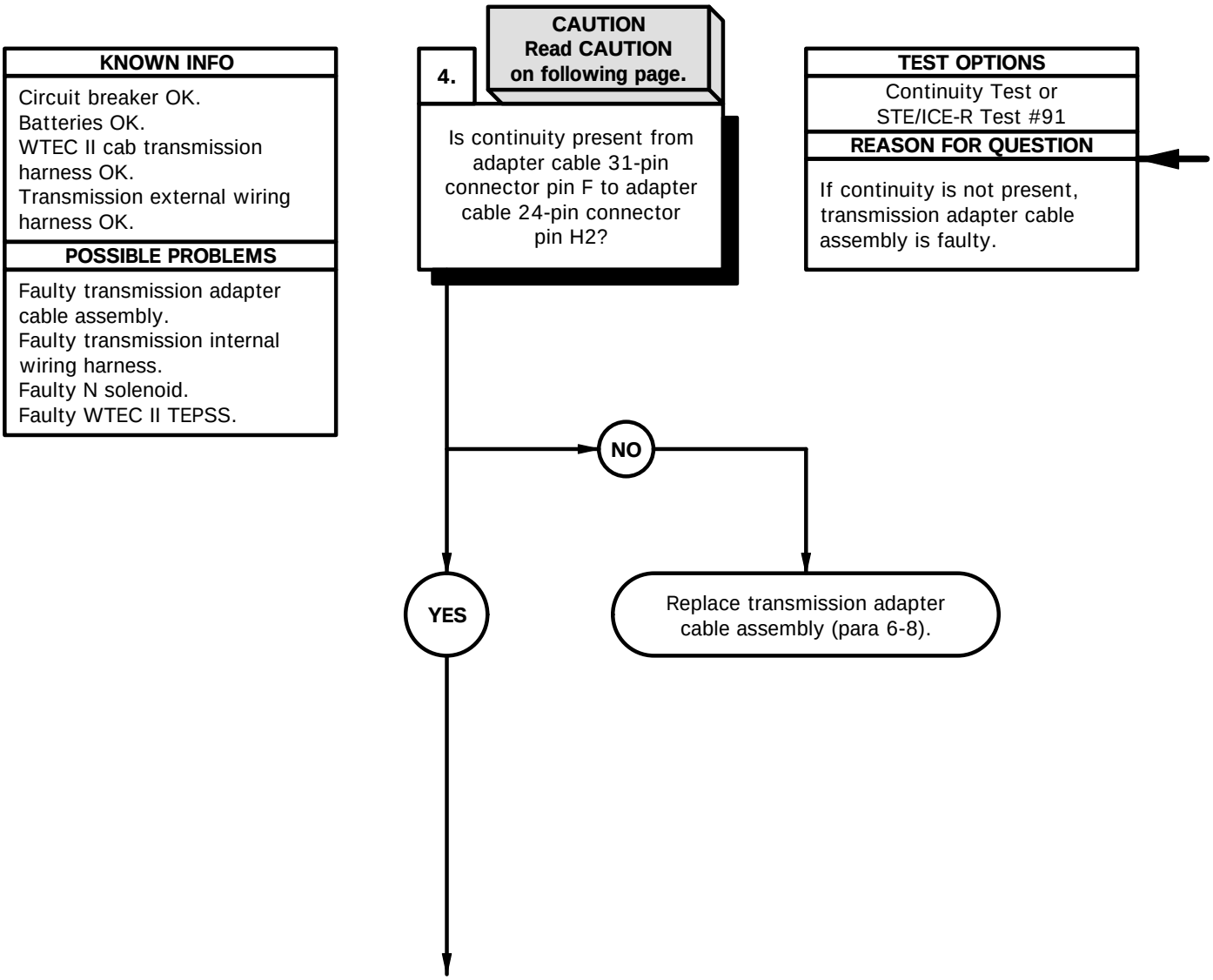
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) 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).



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

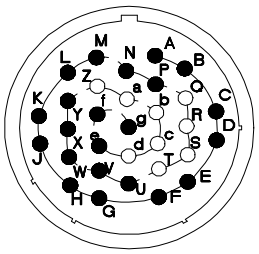
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

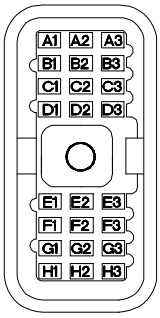
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to 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.



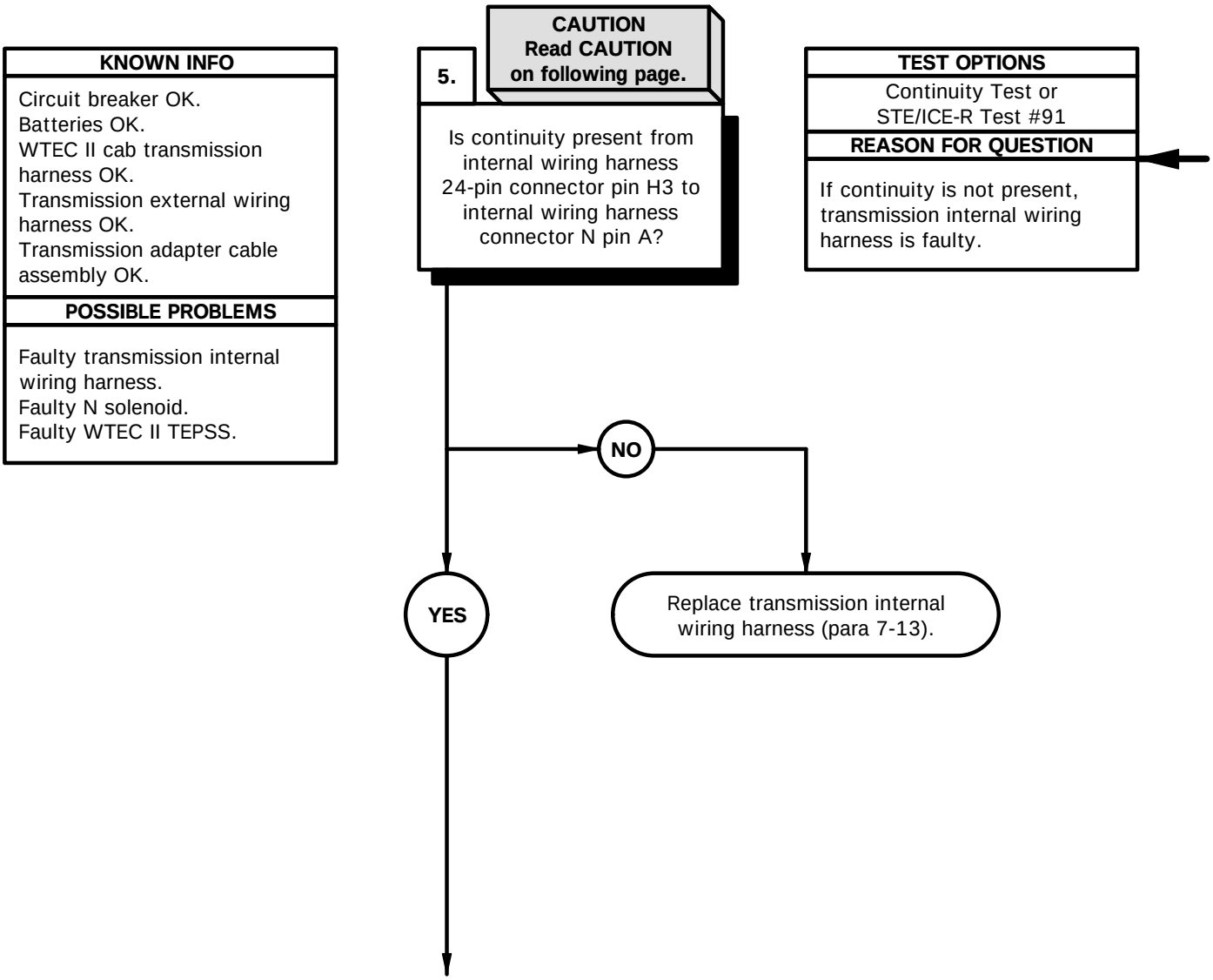
ADAPTER CABLE
31-PIN CONNECTOR



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)



CAUTION

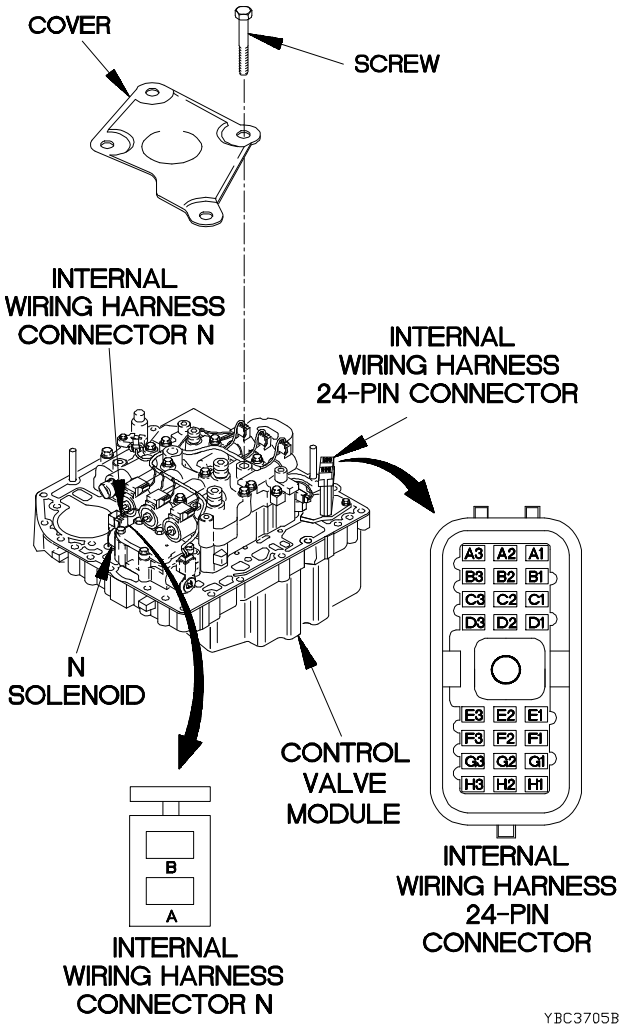
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

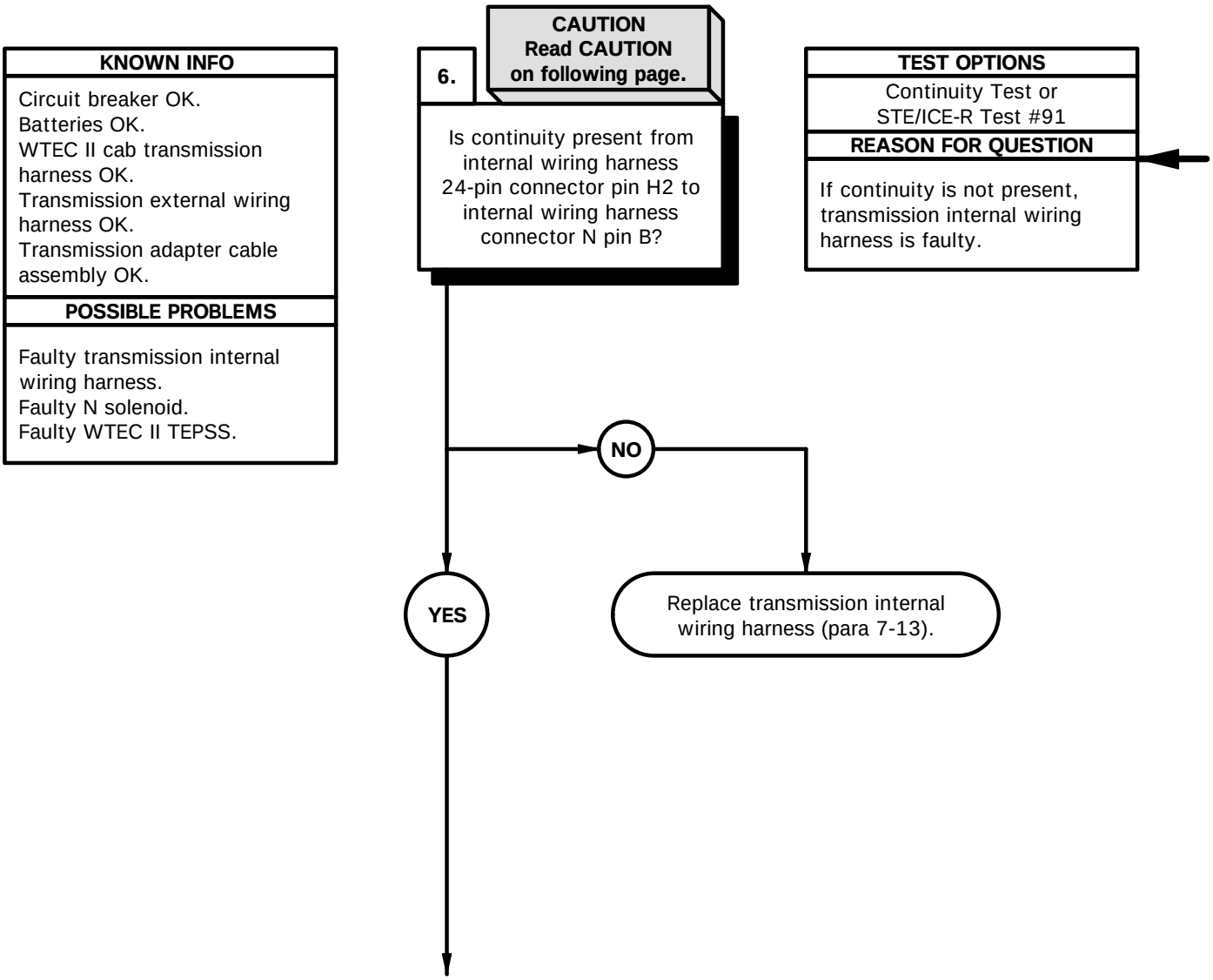
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



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

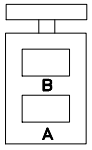
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

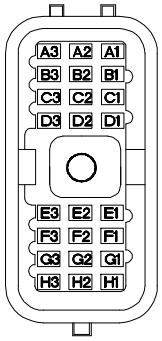
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to 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).



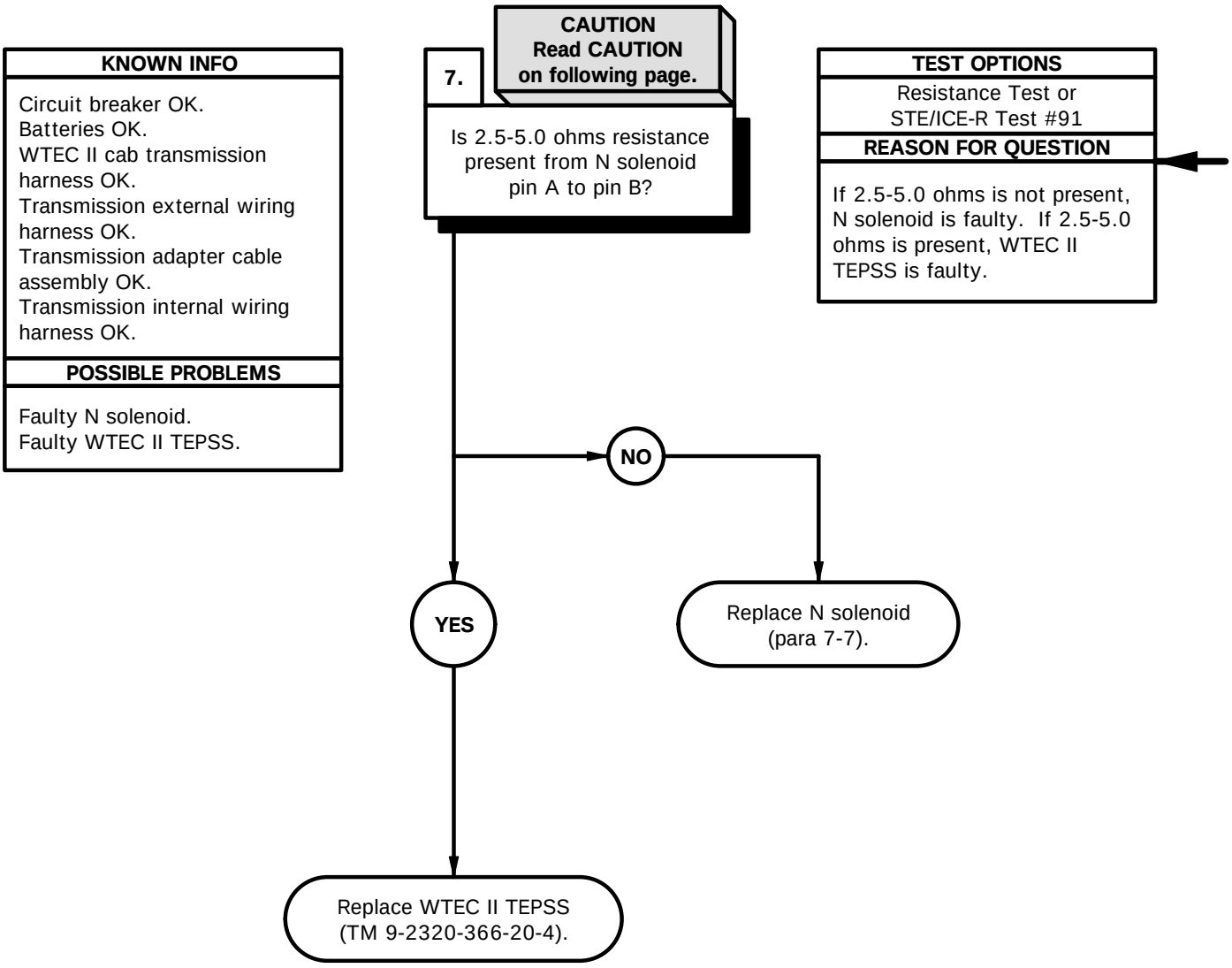
INTERNAL WIRING HARNESS CONNECTOR N



INTERNAL WIRING HARNESS 24-PIN CONNECTOR

YBC3706B

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

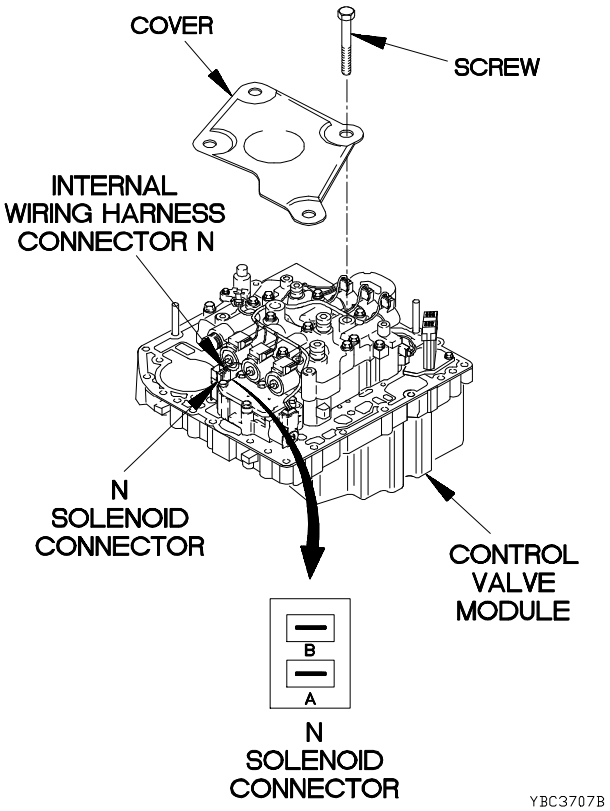
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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).



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

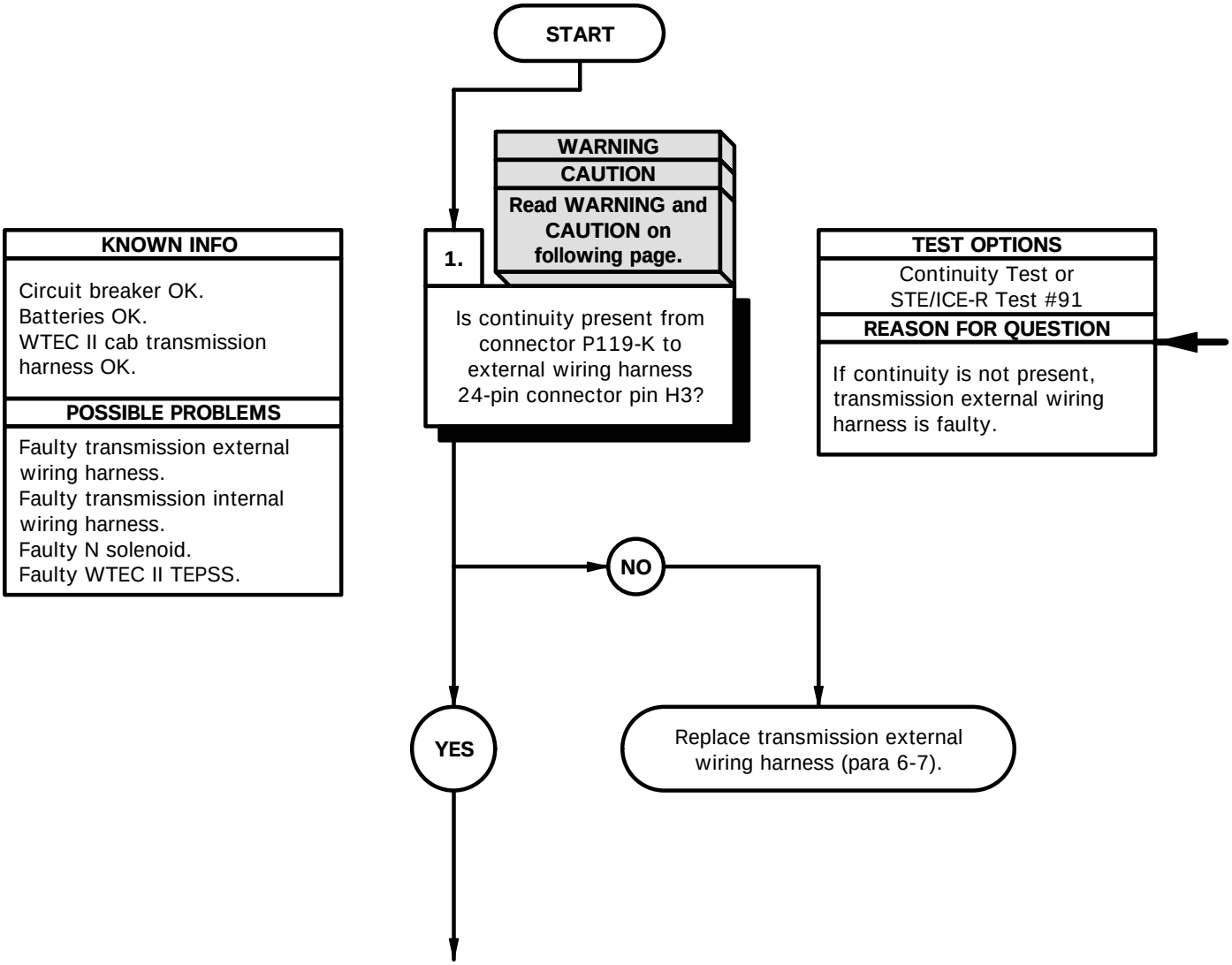
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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 preforming 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

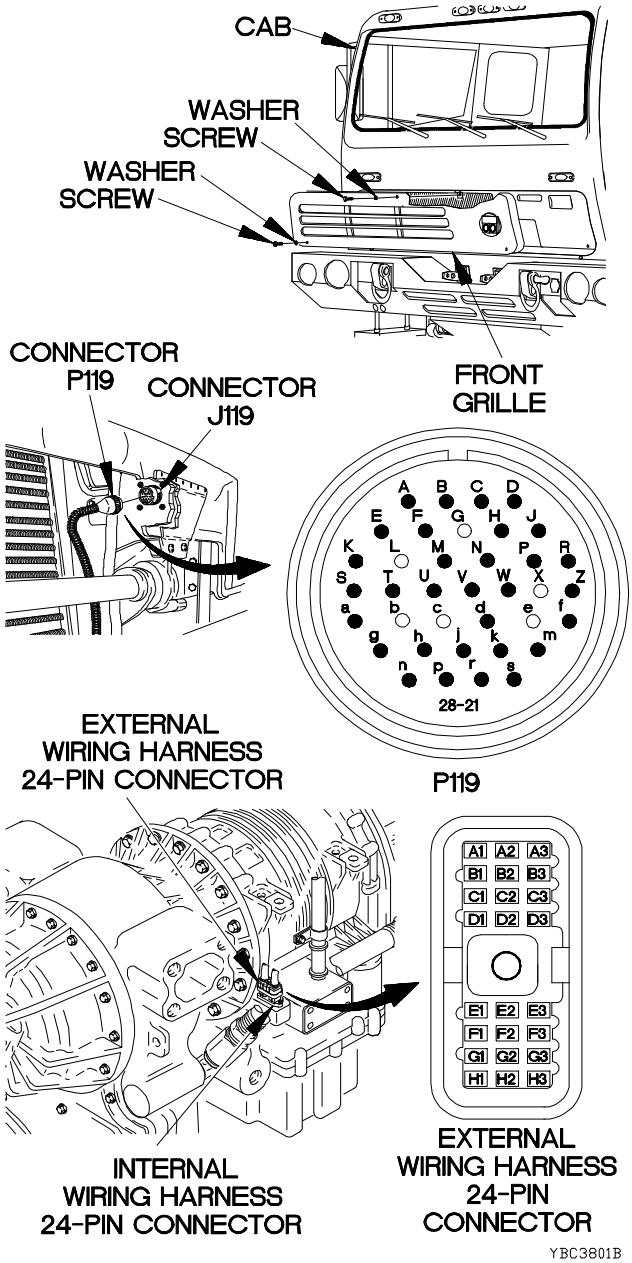
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

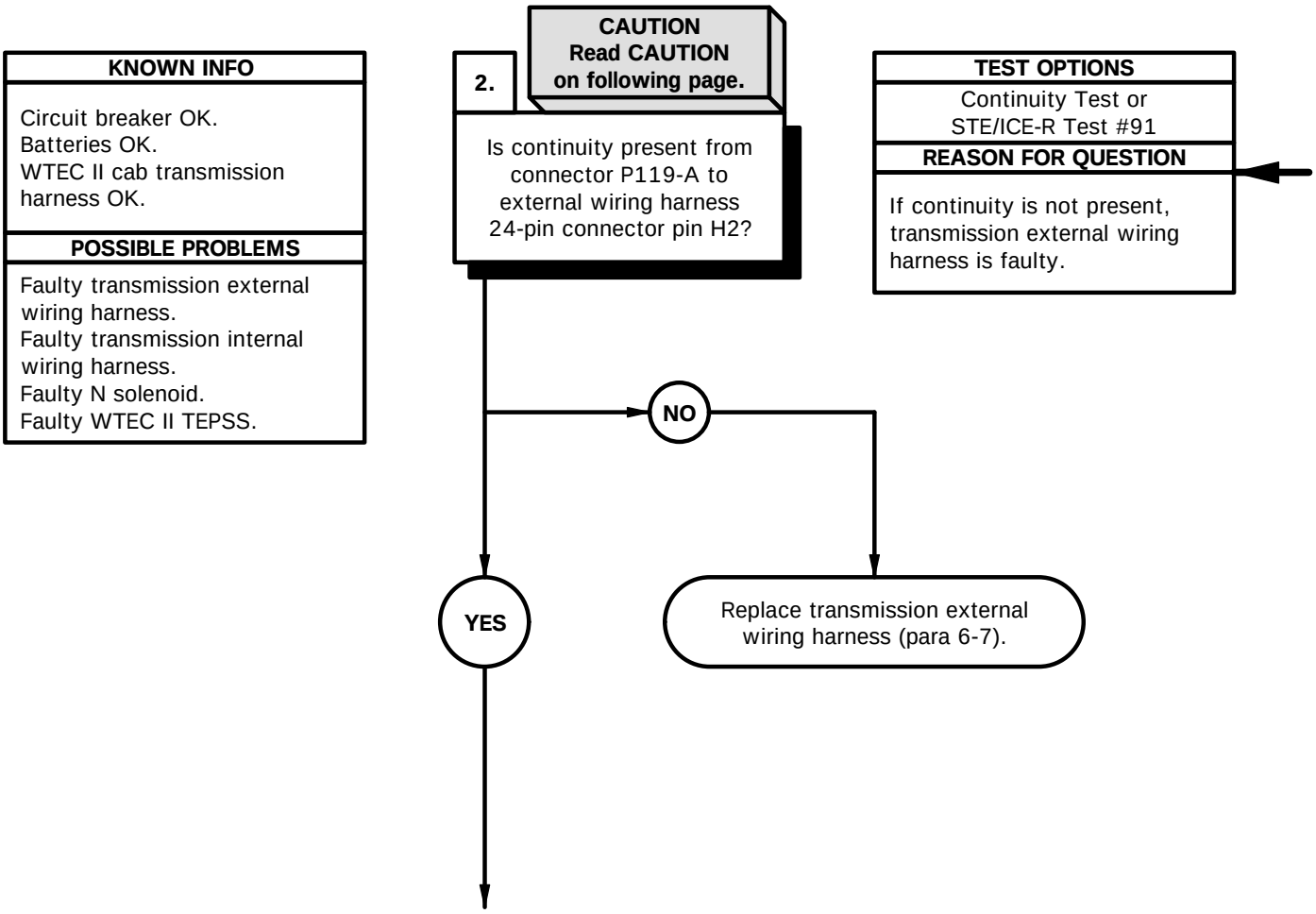
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Loosen screw in external wiring harness 24-pin connector.
(6) Disconnect external wiring harness 24-pin from internal 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).



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)



CAUTION

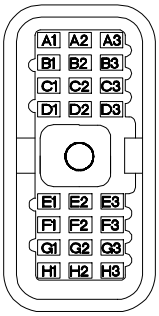
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

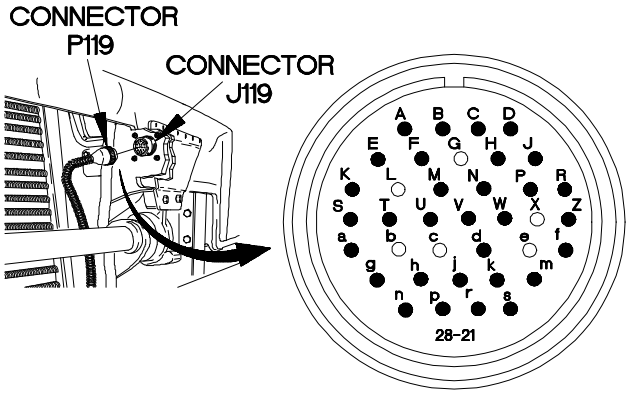
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

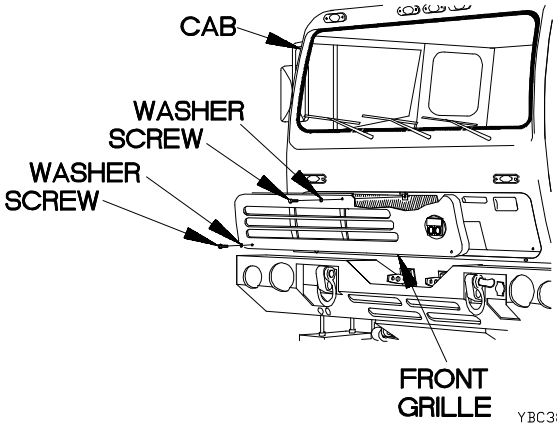
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P119-A.
(3) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin H2 and note reading on multimeter.
(4) If continuity is not present, replace transmission external wiring harness (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).



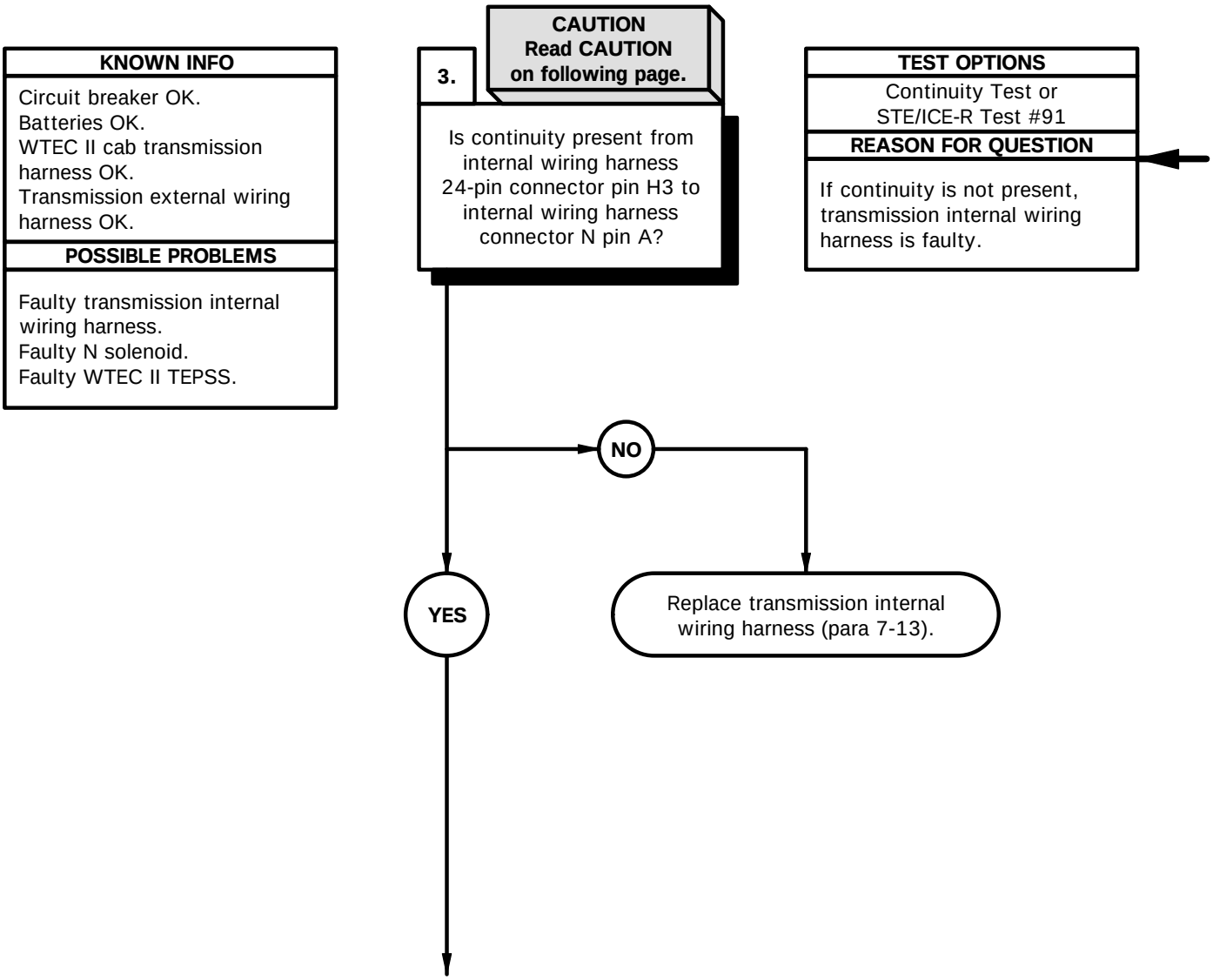
EXTERNAL WIRING HARNESS 24-PIN CONNECTOR



P119



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)



CAUTION

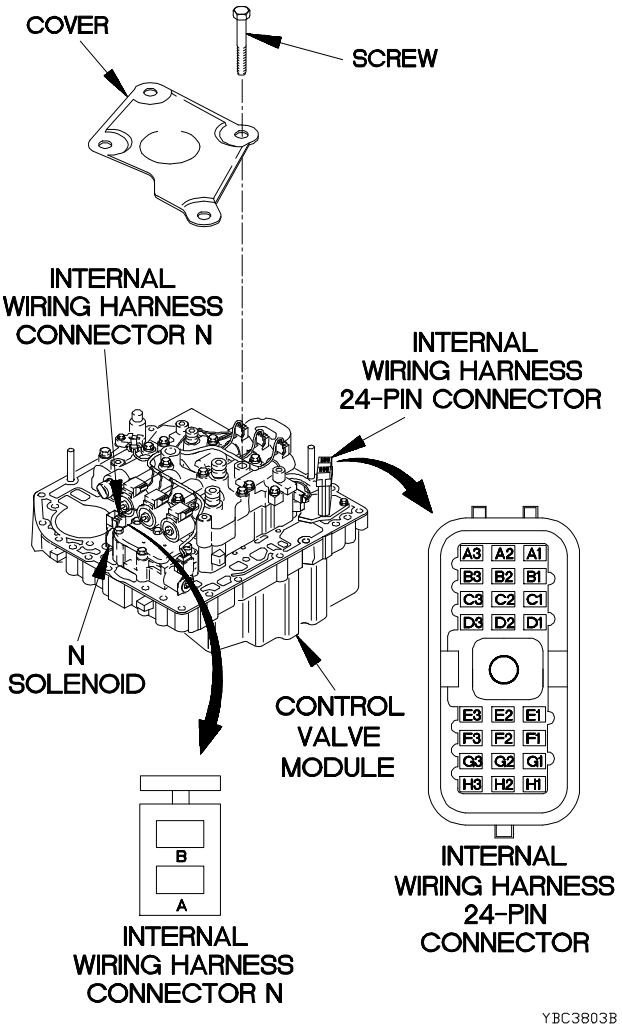
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

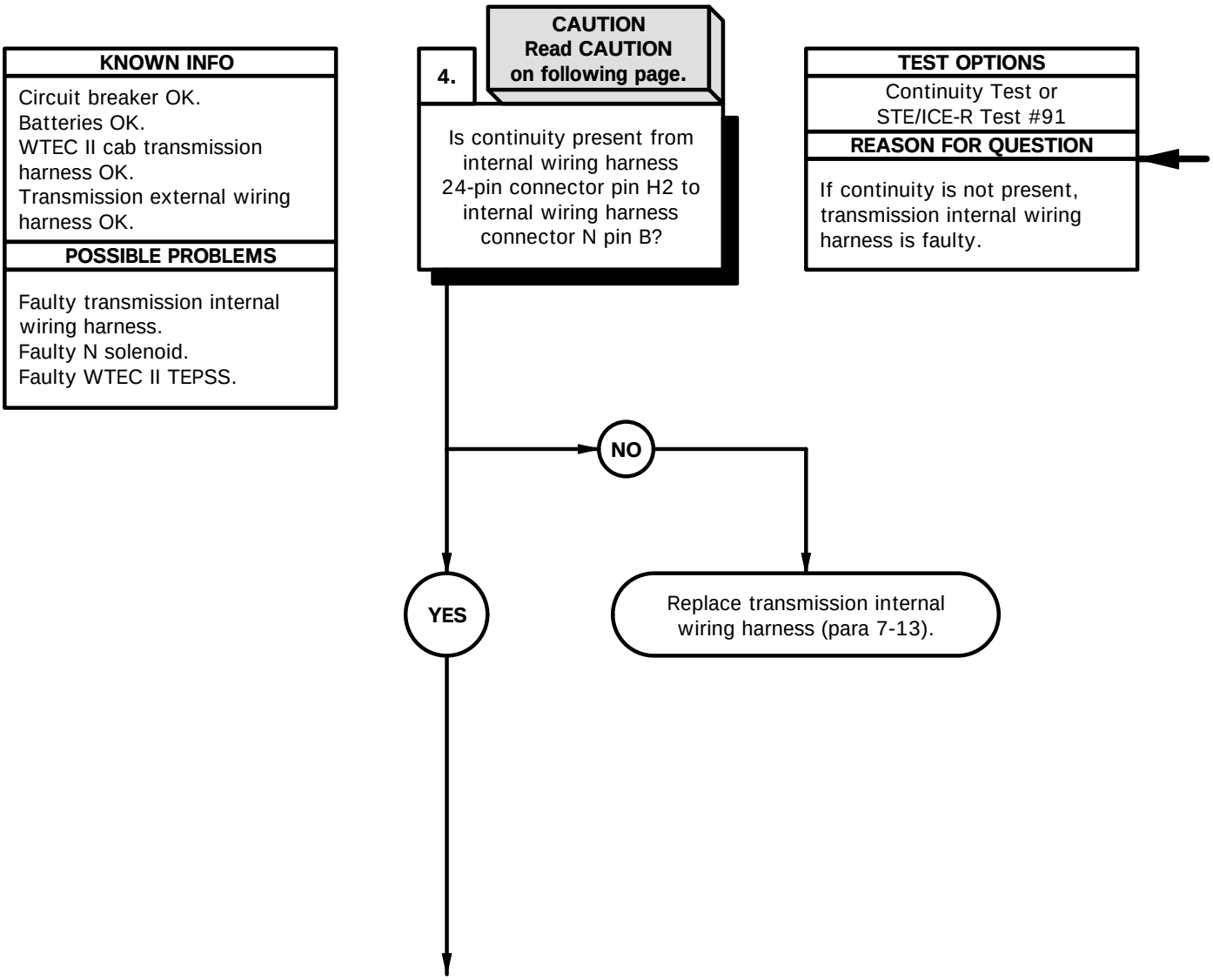
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



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)



CAUTION

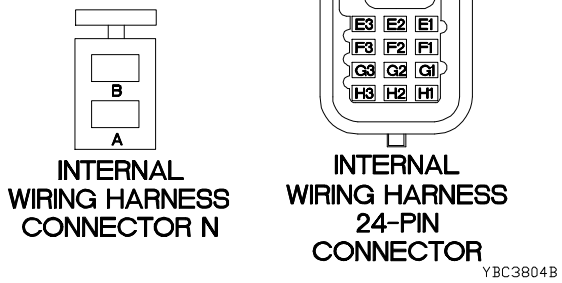
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

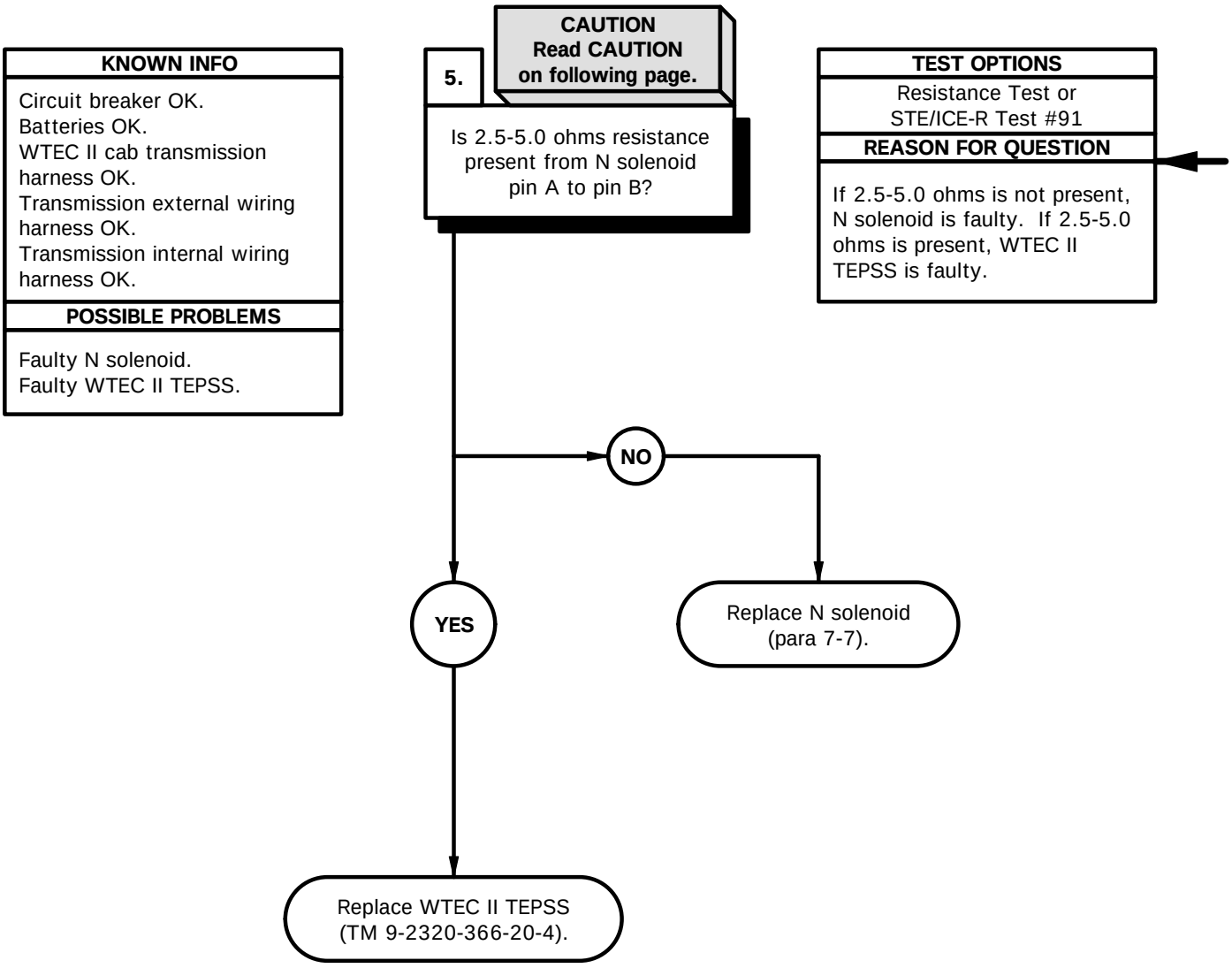
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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)



CAUTION

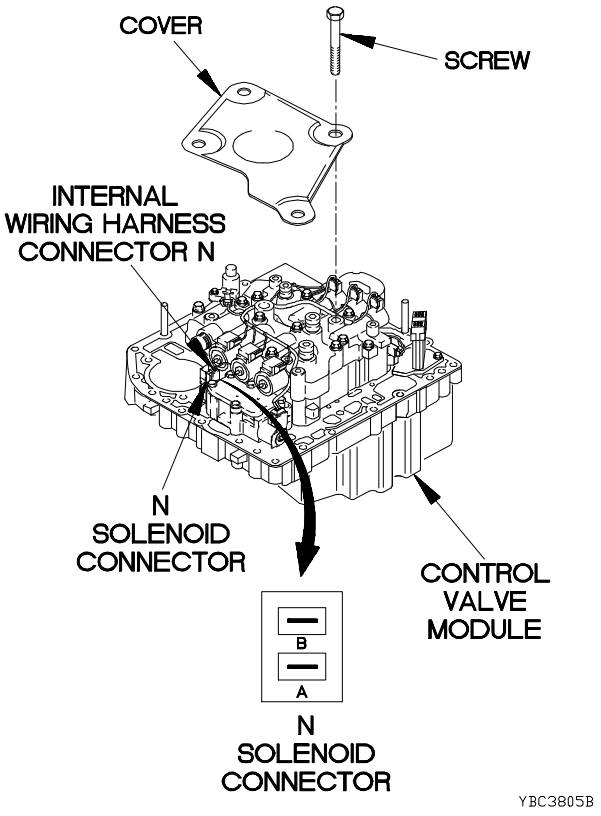
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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).



c39. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

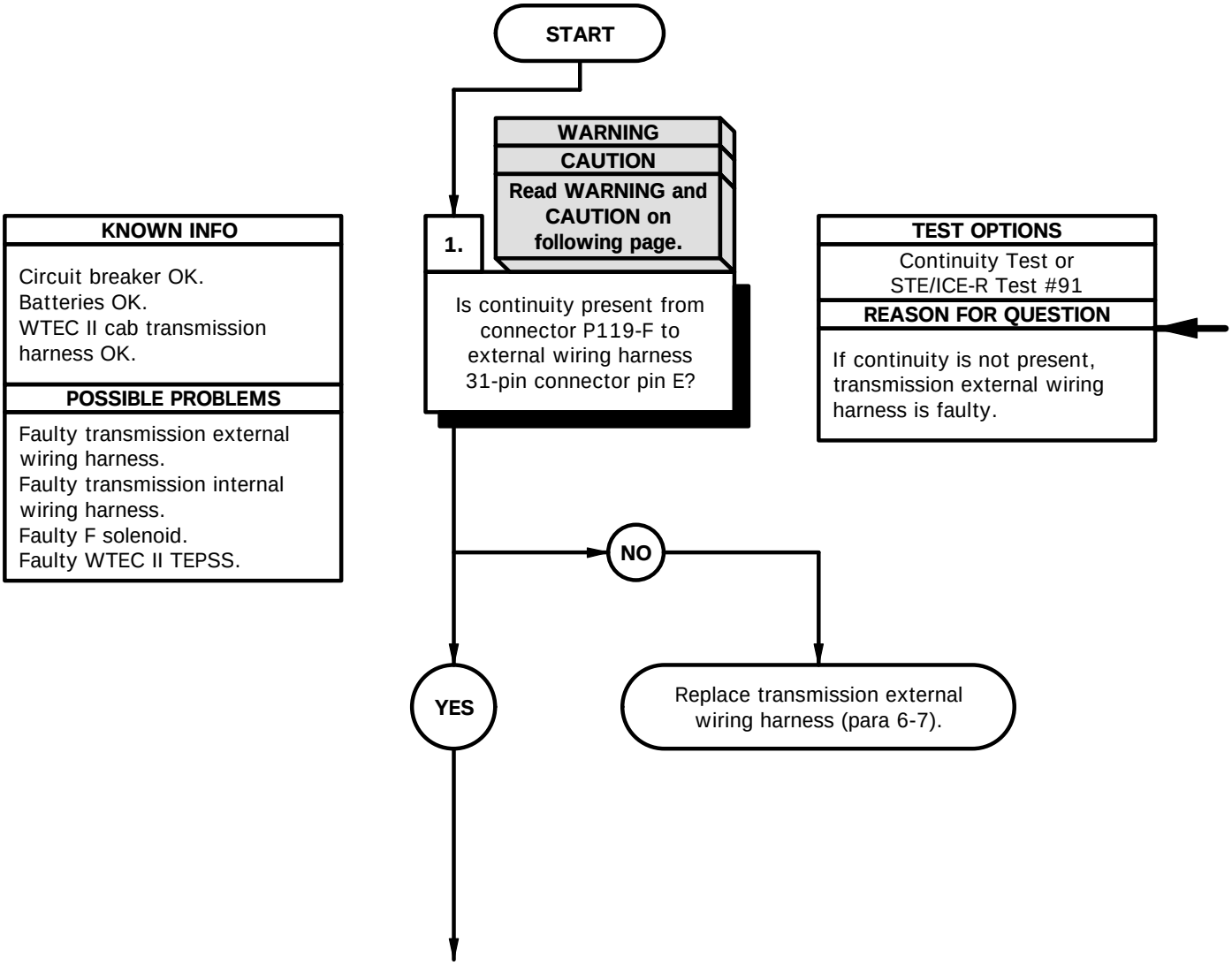
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

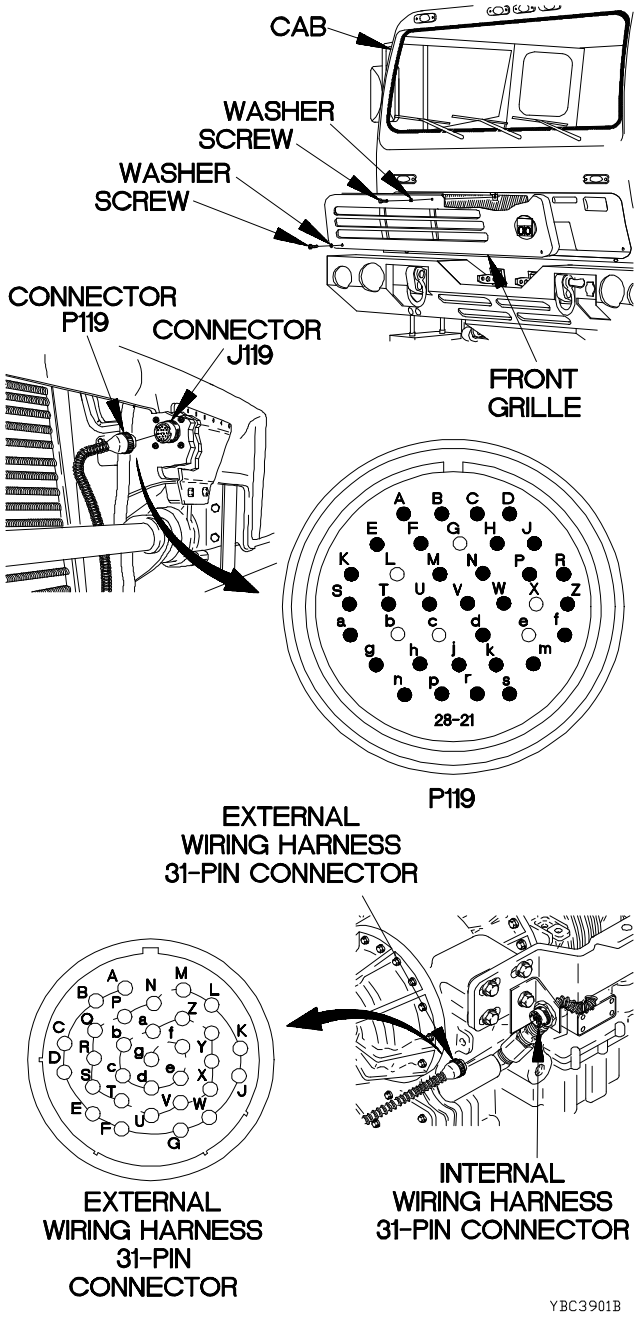
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

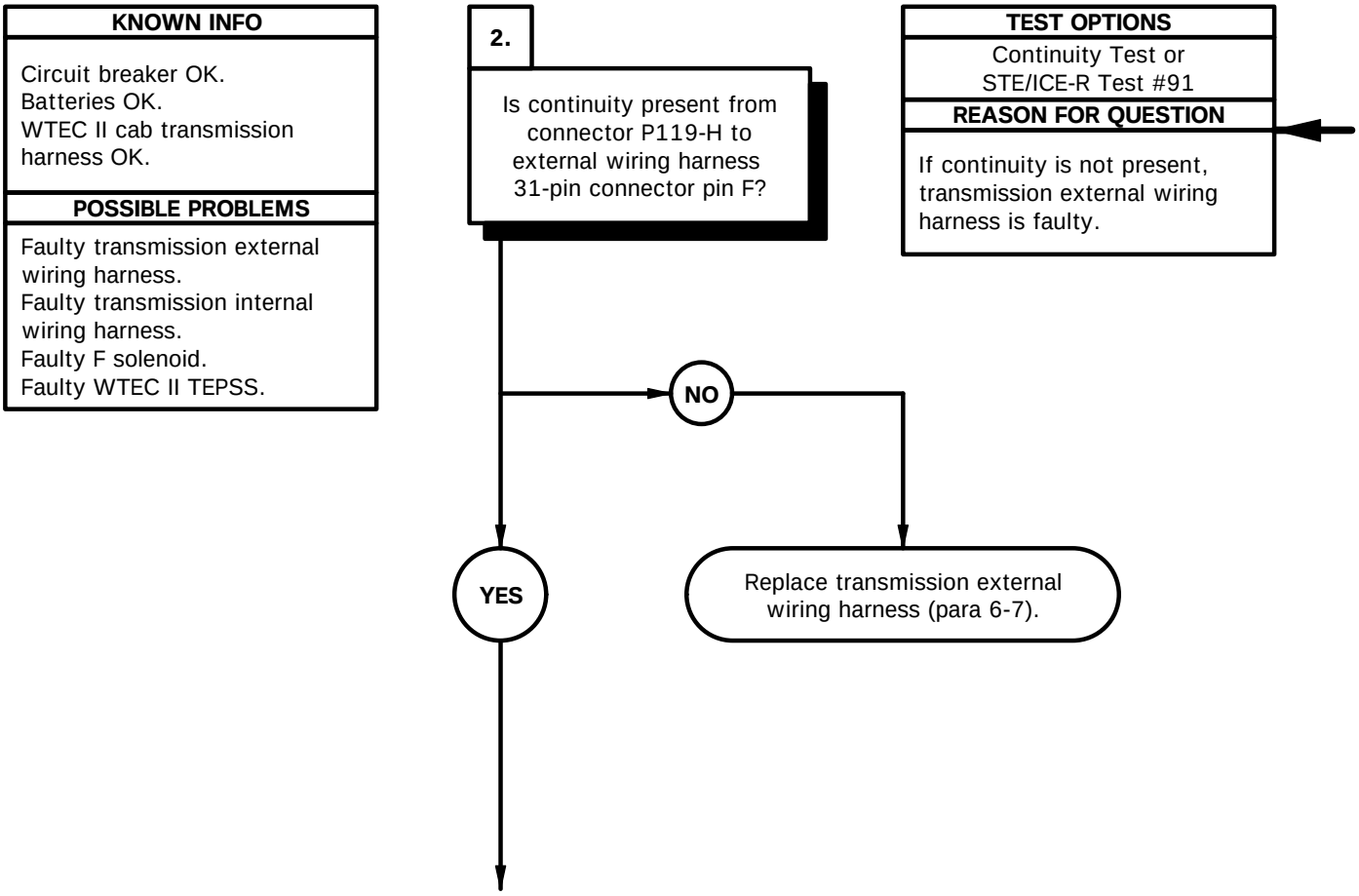
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin connector.
(6) Set multimeter 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).

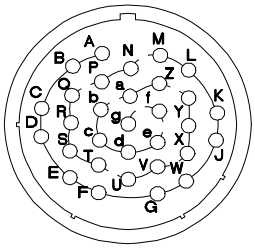


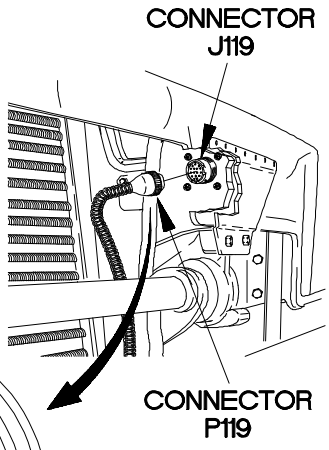
c39. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

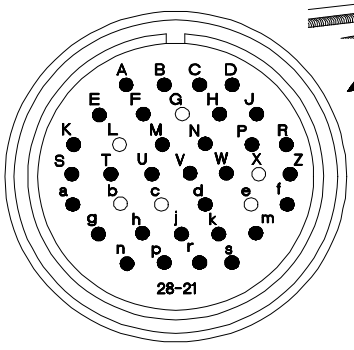


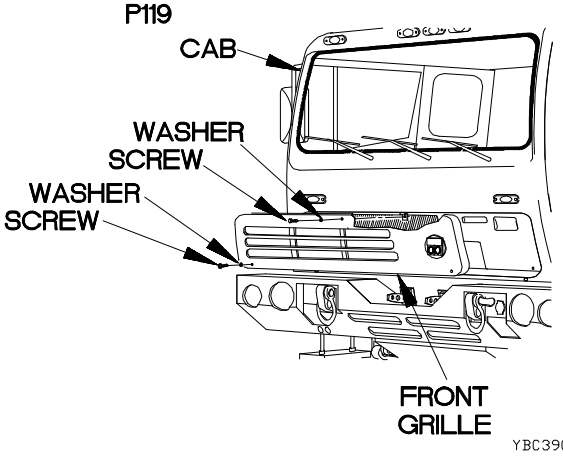
CONTINUITY TEST

(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).

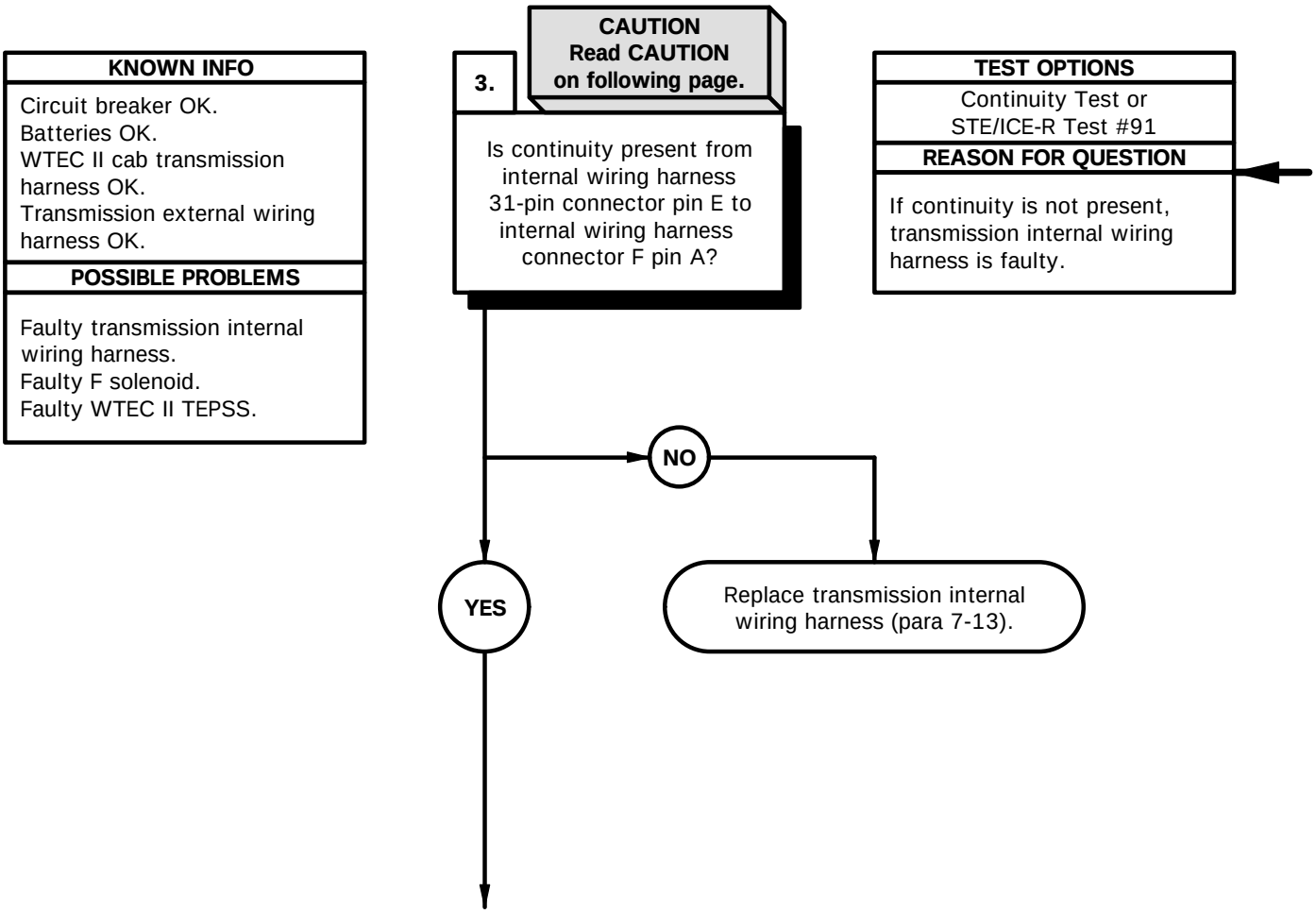








c39. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

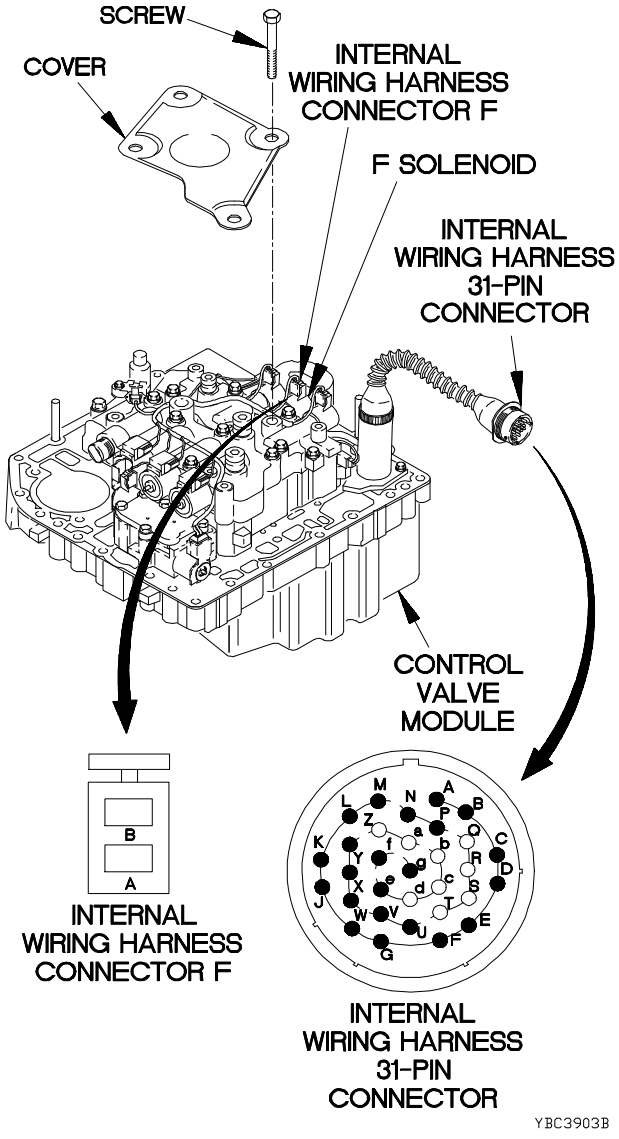


CAUTION

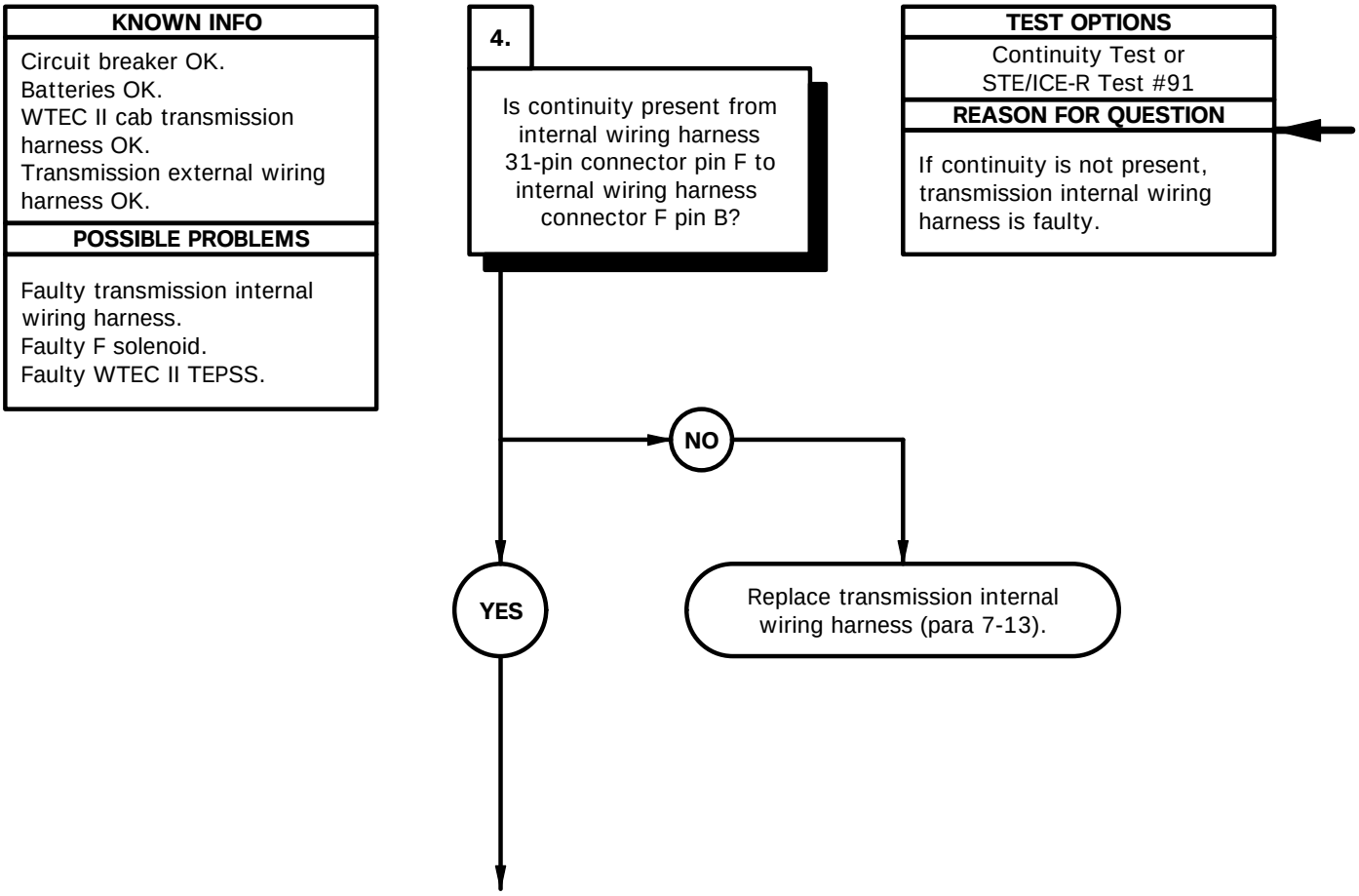
Use care when disconnecting wire harness connectors. Failure to comply may result in damage to equipment.

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).

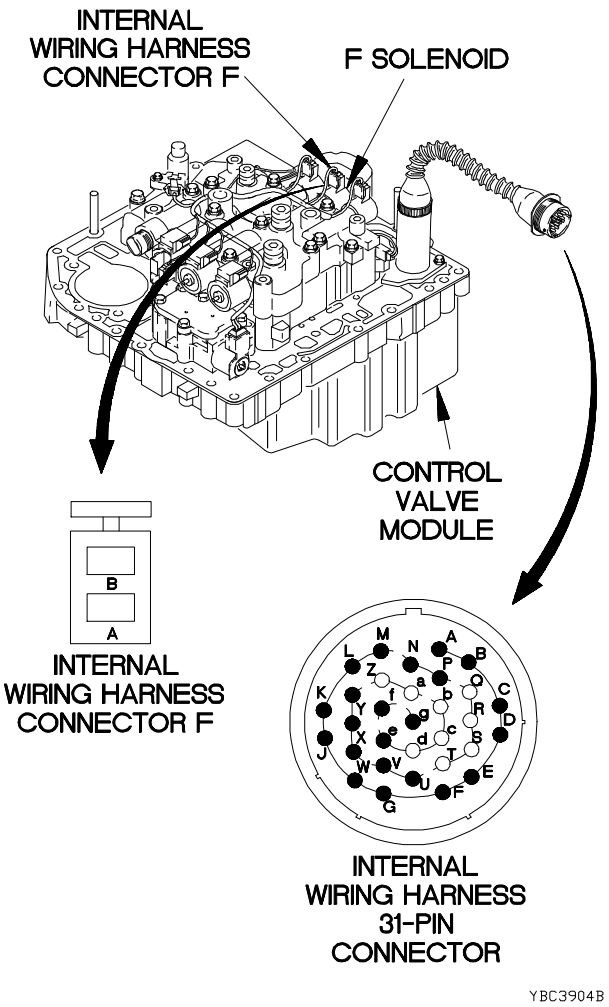


c39. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

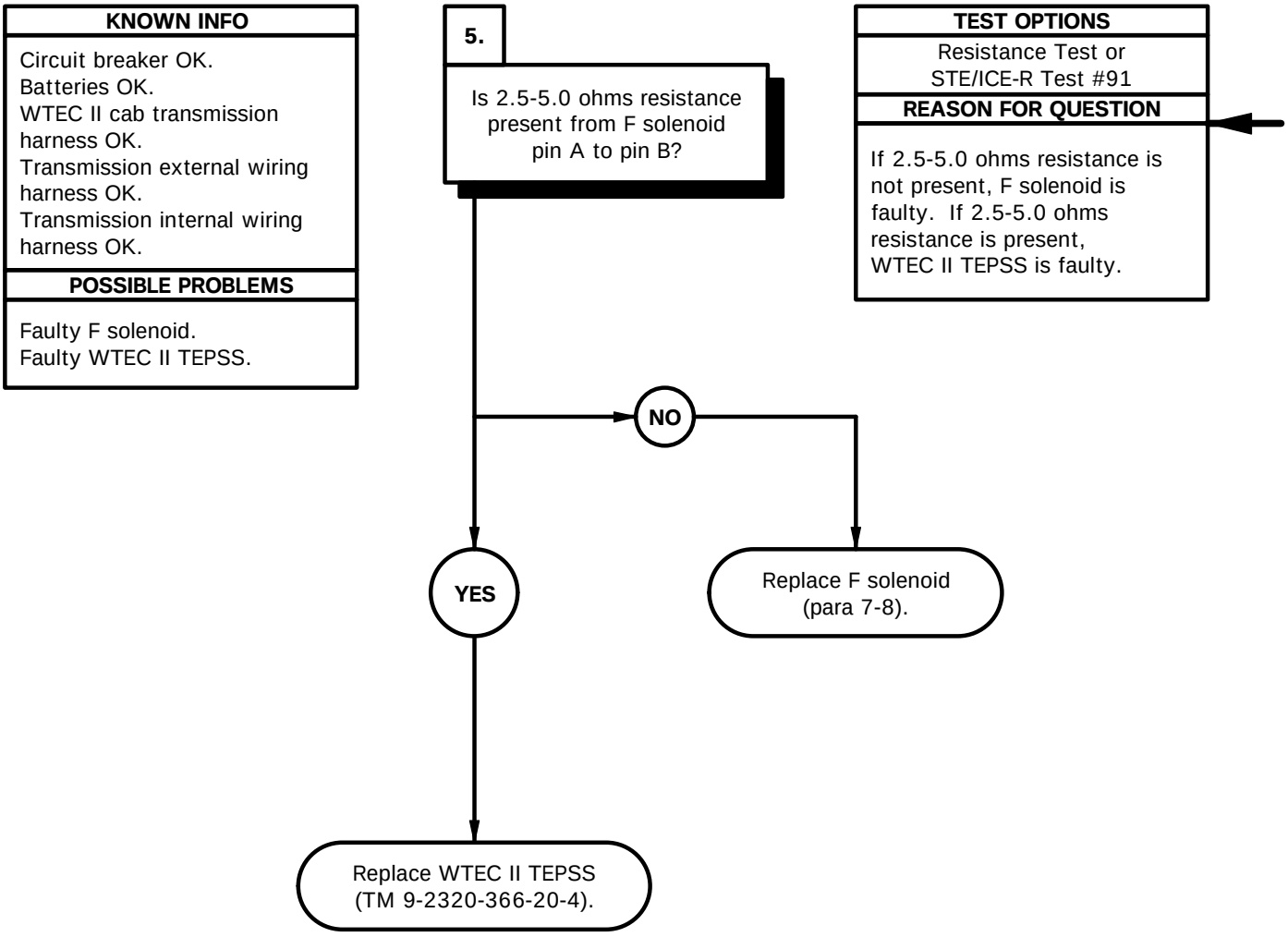


CONTINUITY TEST

(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).

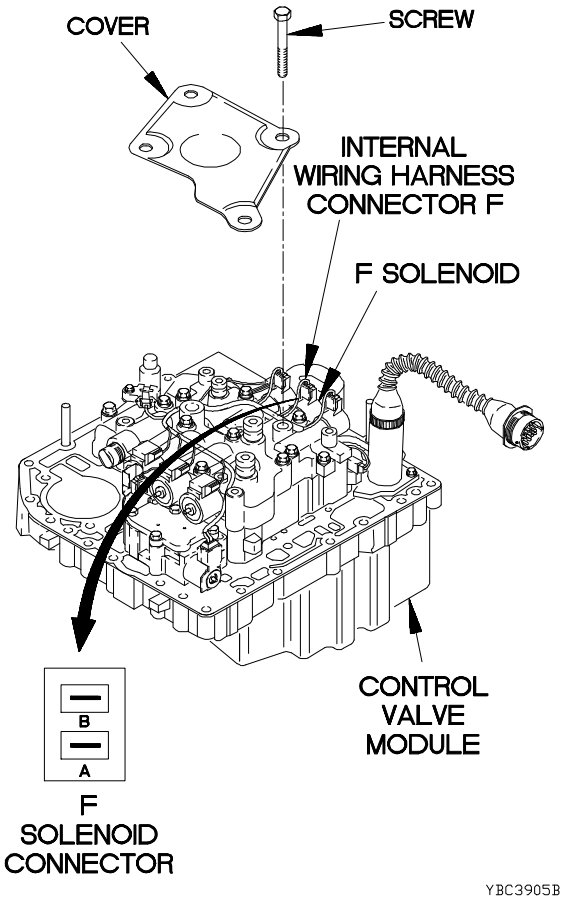


c39. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



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).



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

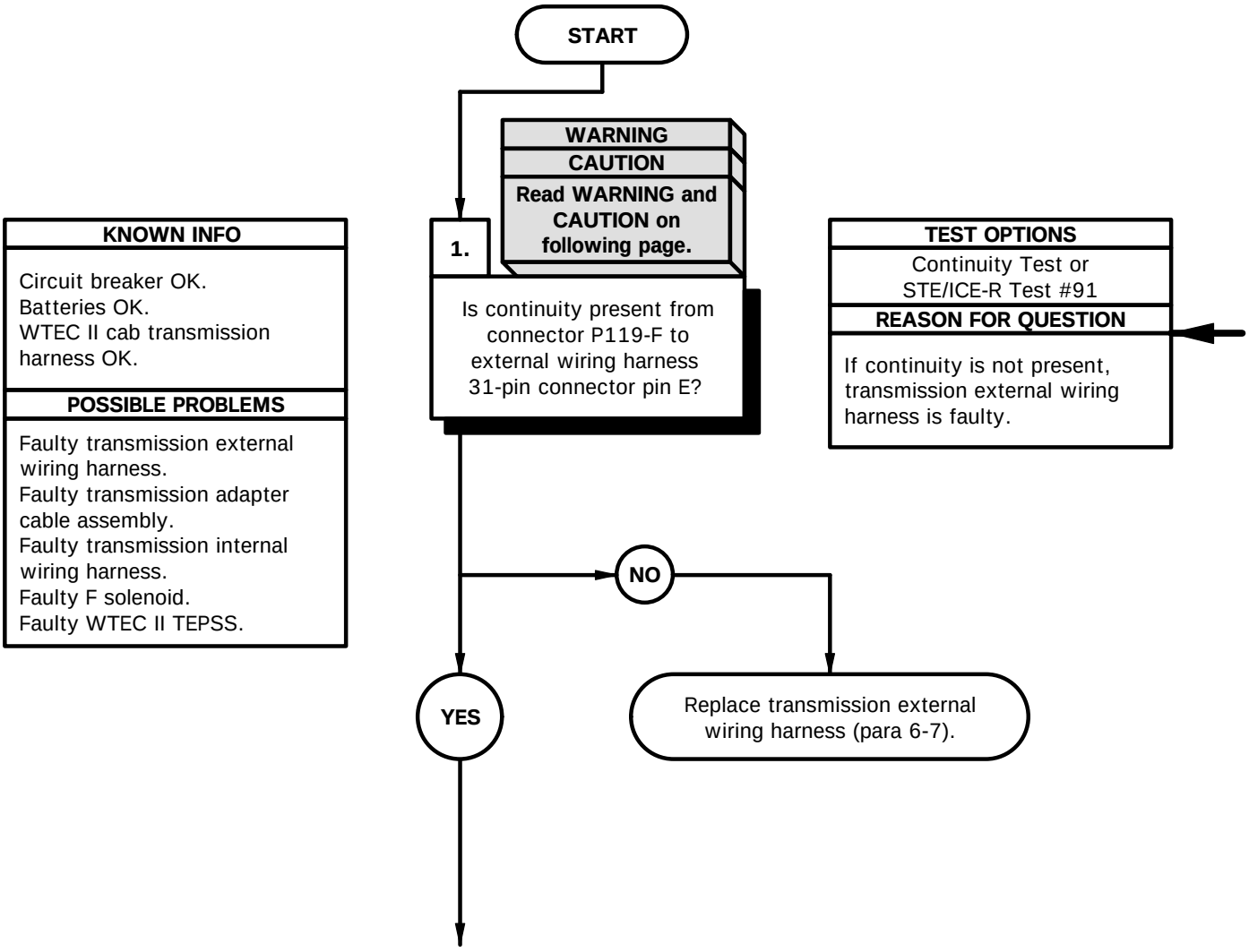
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

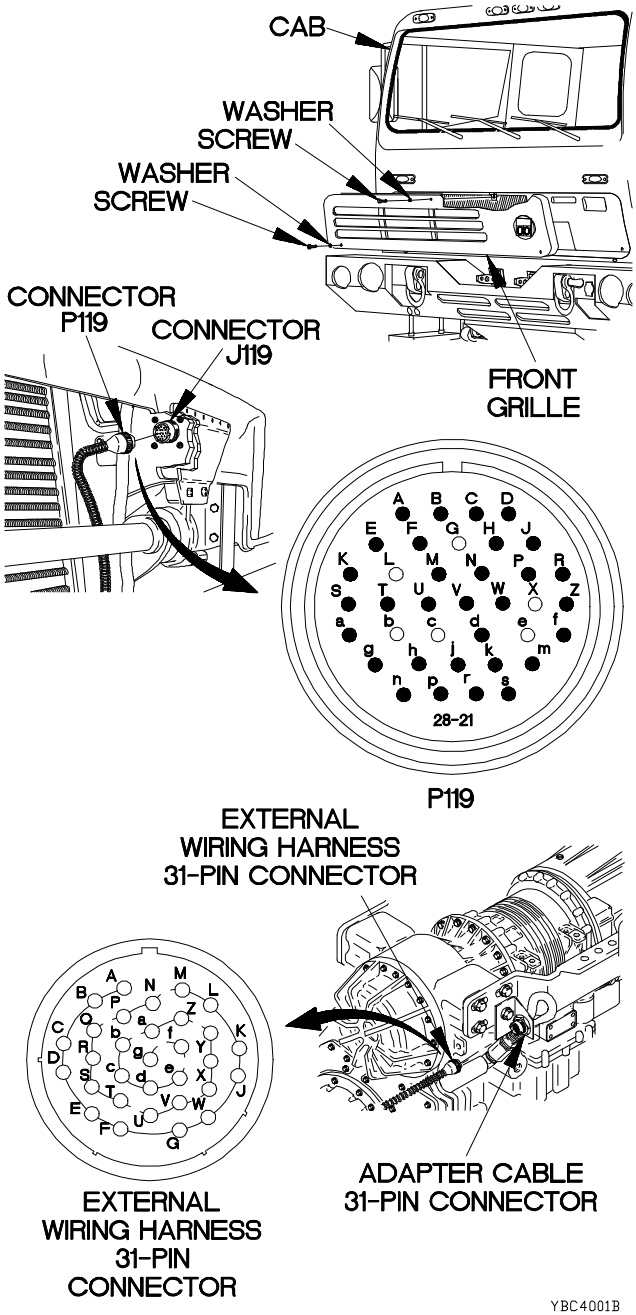
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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-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).



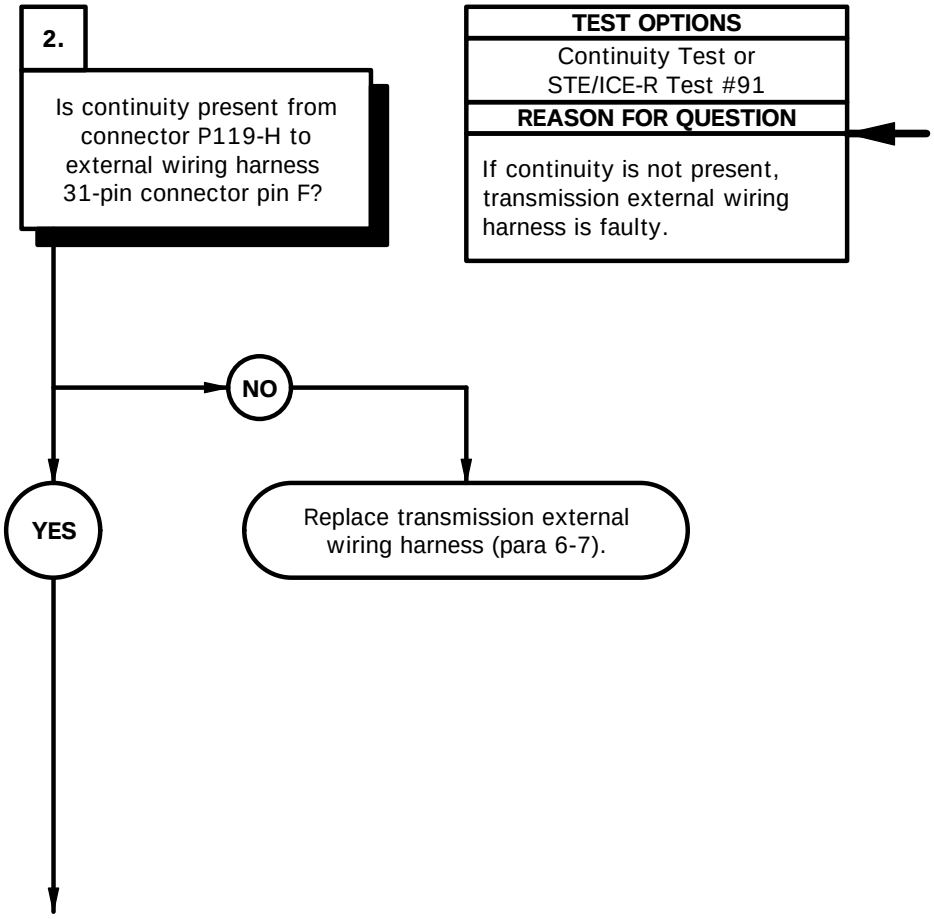
c40. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

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.



TEST OPTIONS

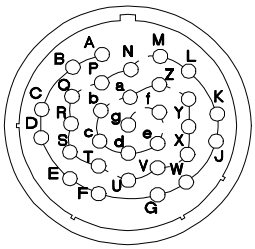
Continuity Test or
STE/ICE-R Test #91

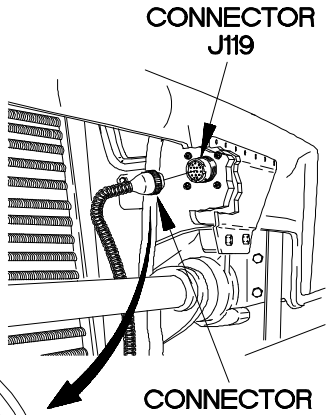
REASON FOR QUESTION

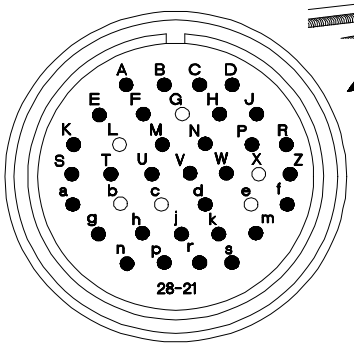
If continuity is not present, transmission external wiring harness is faulty.

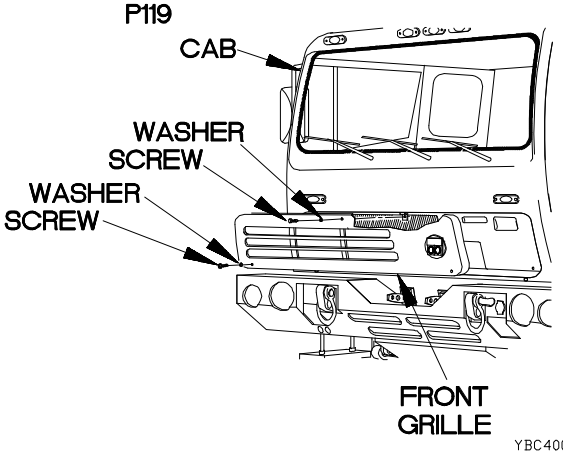
CONTINUITY TEST

(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).

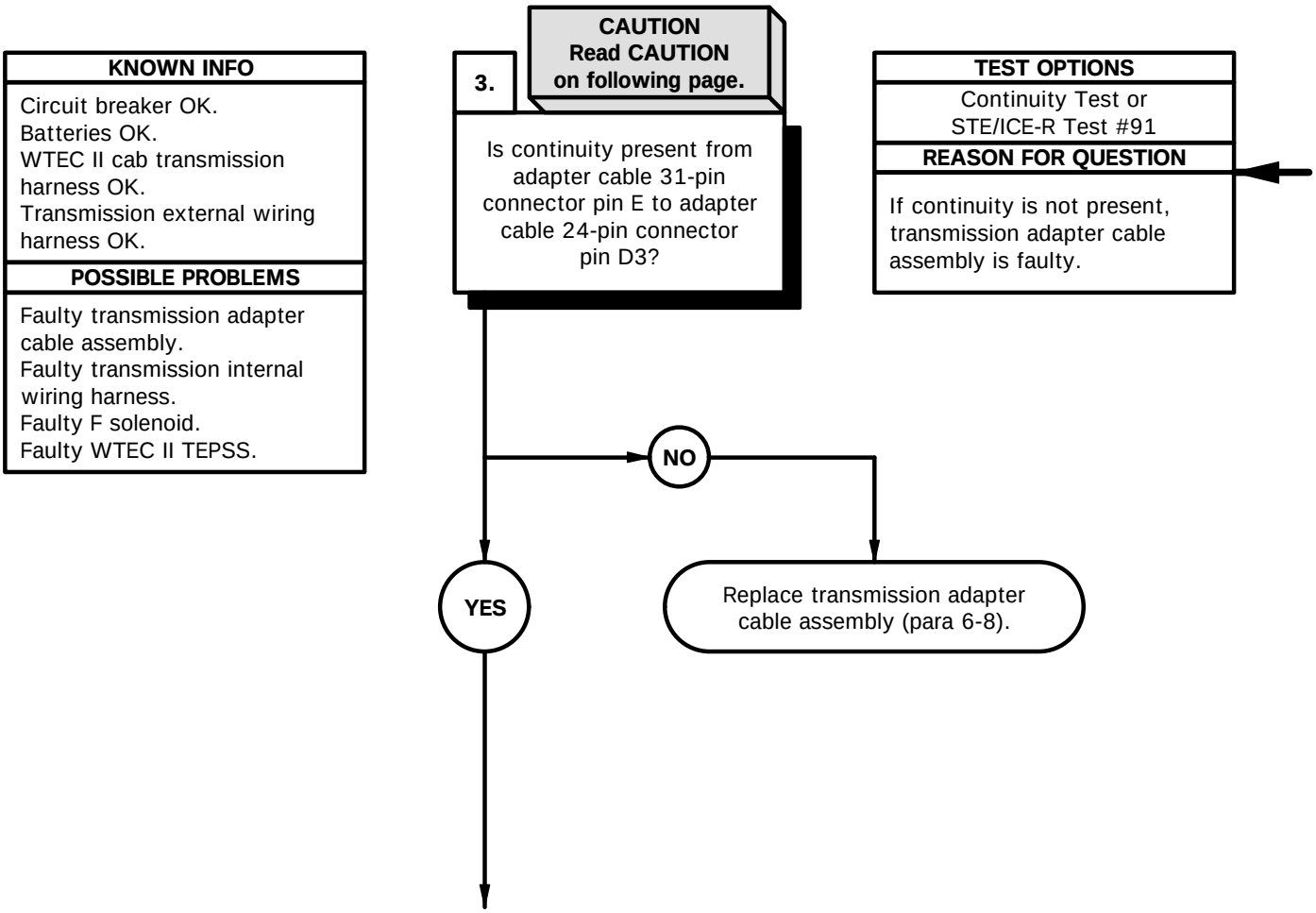








c40. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

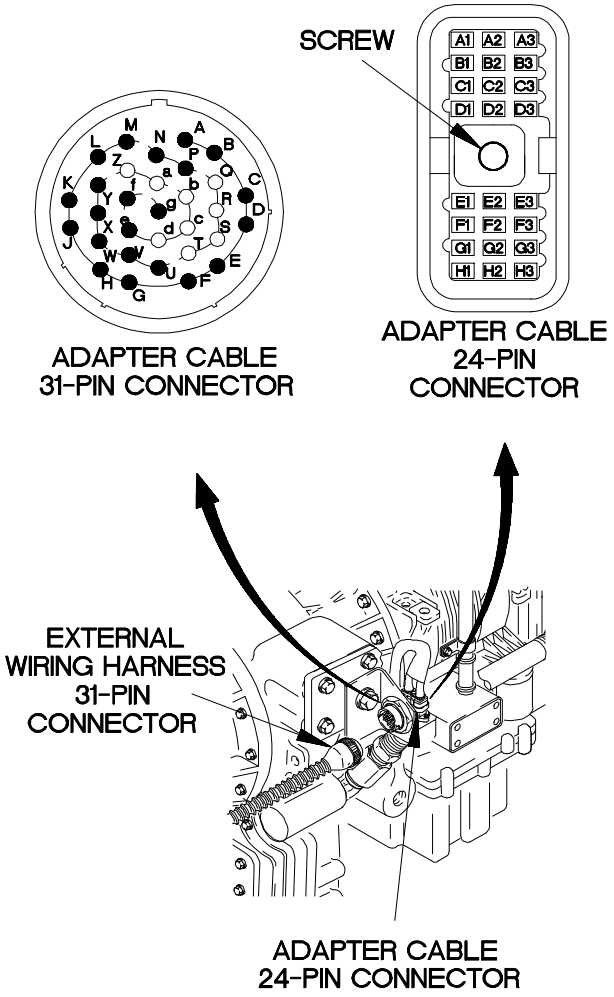


CAUTION

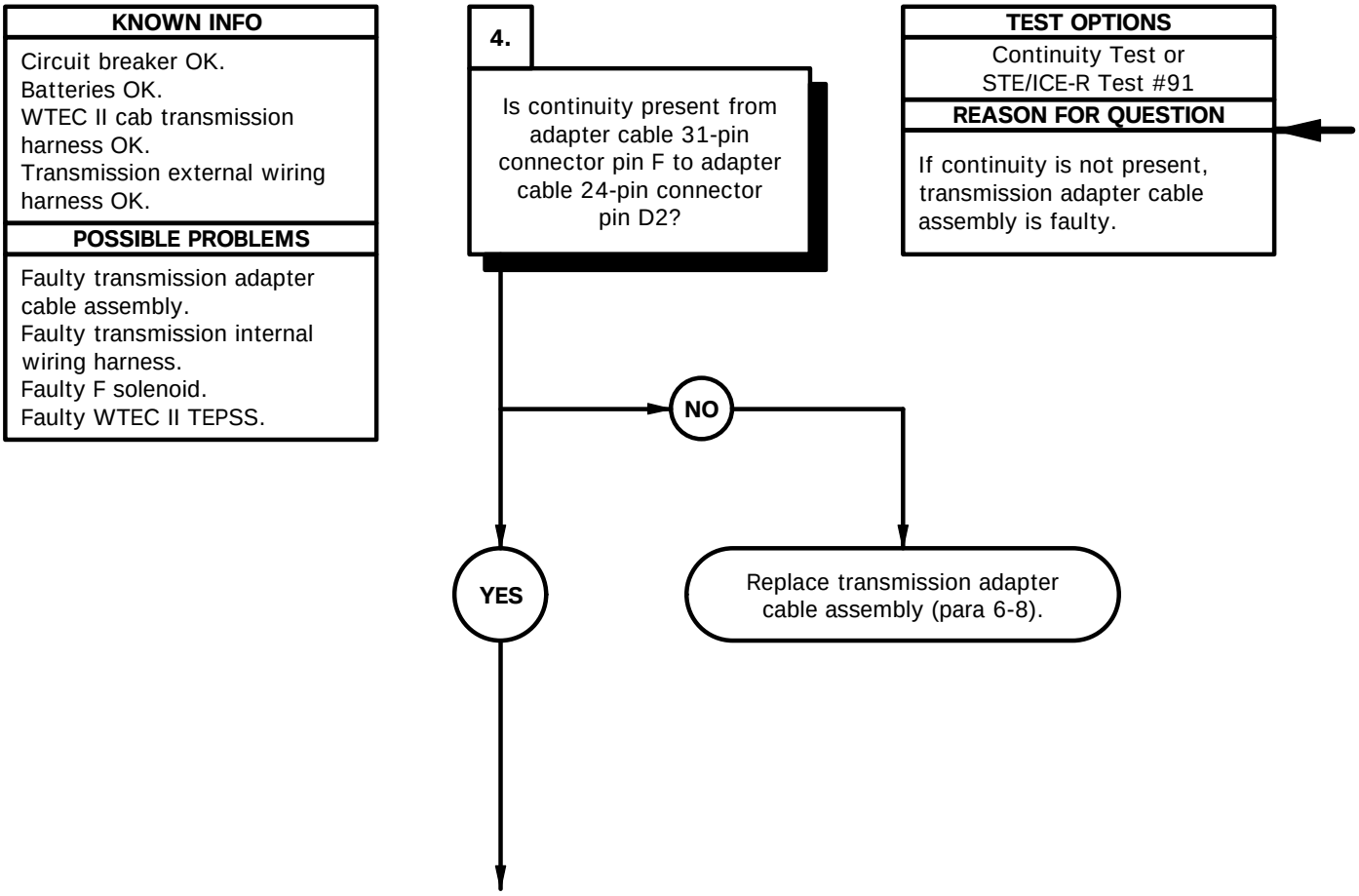
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

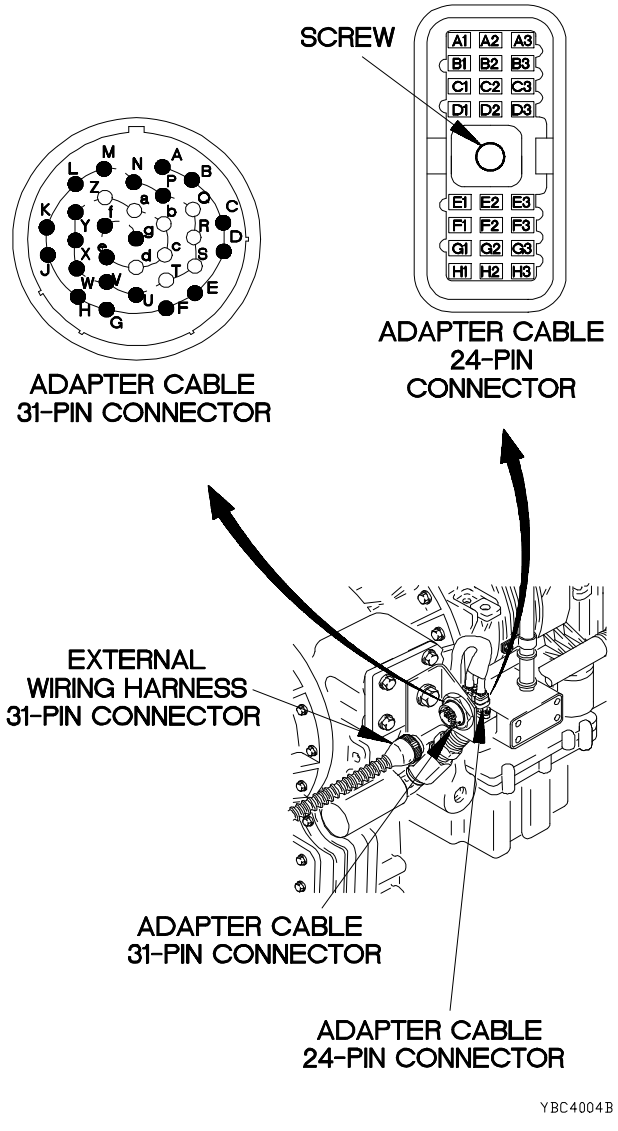


c40. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

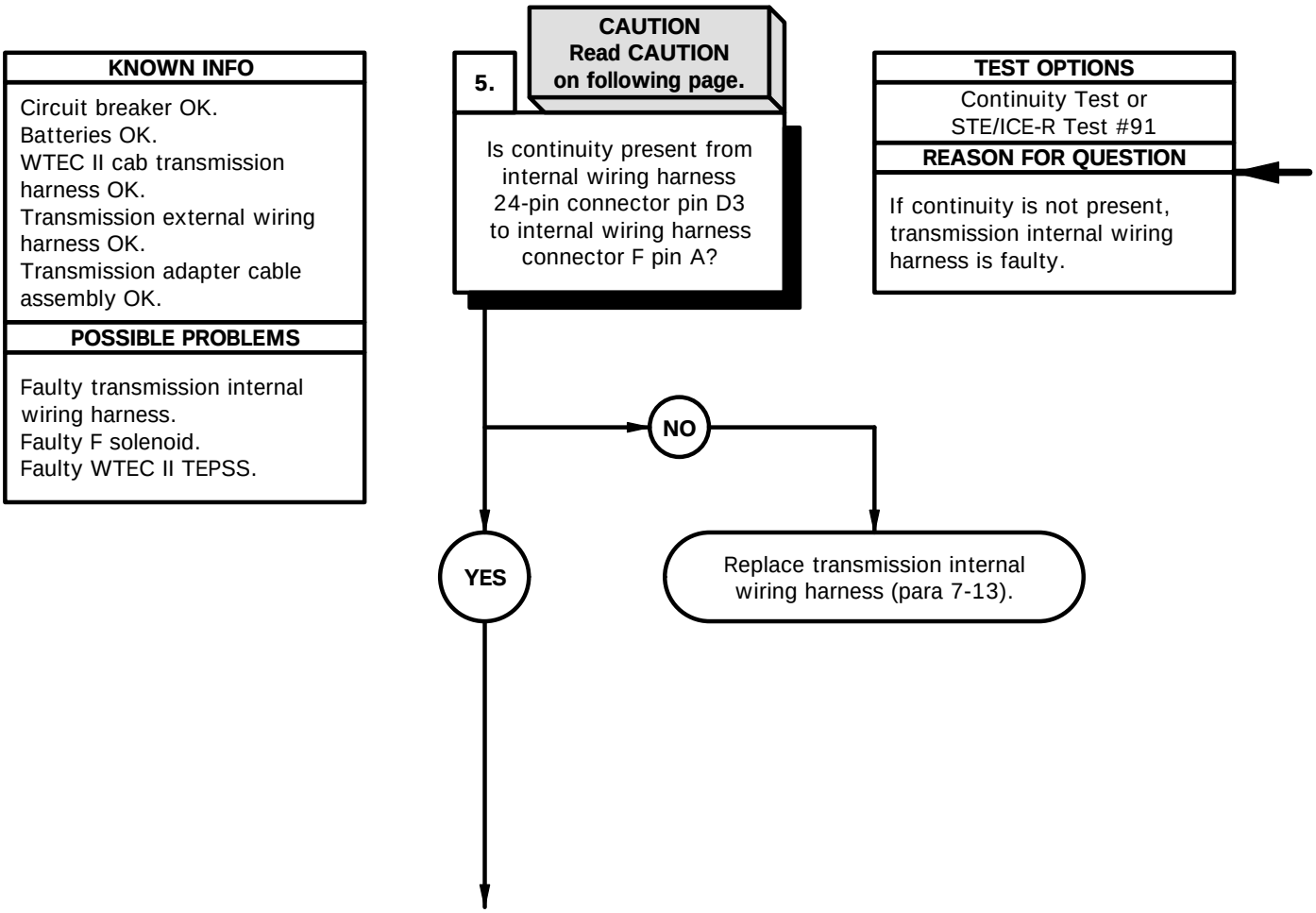


CONTINUITY TEST

(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.



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)

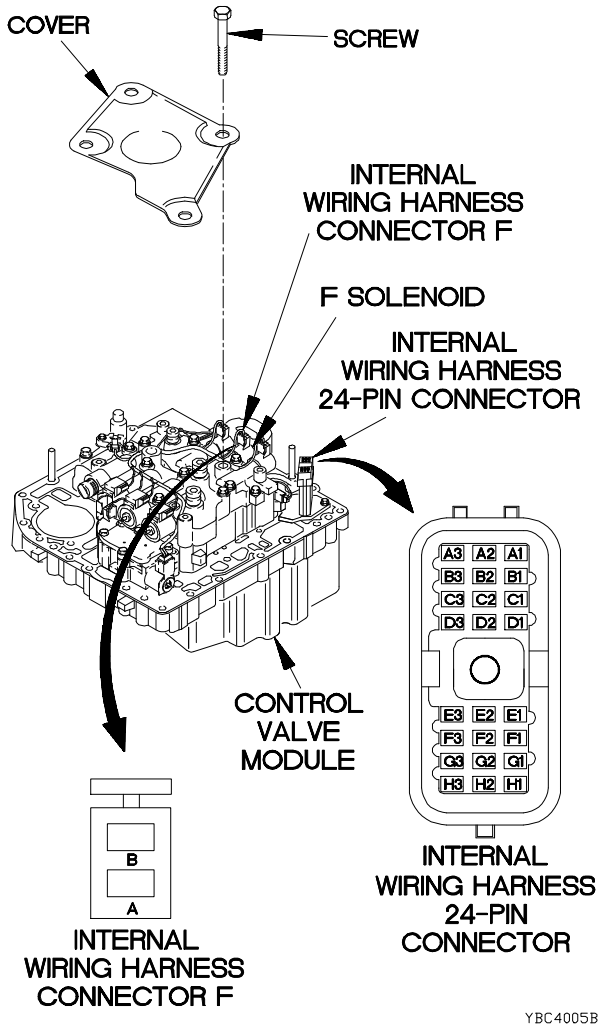


CAUTION

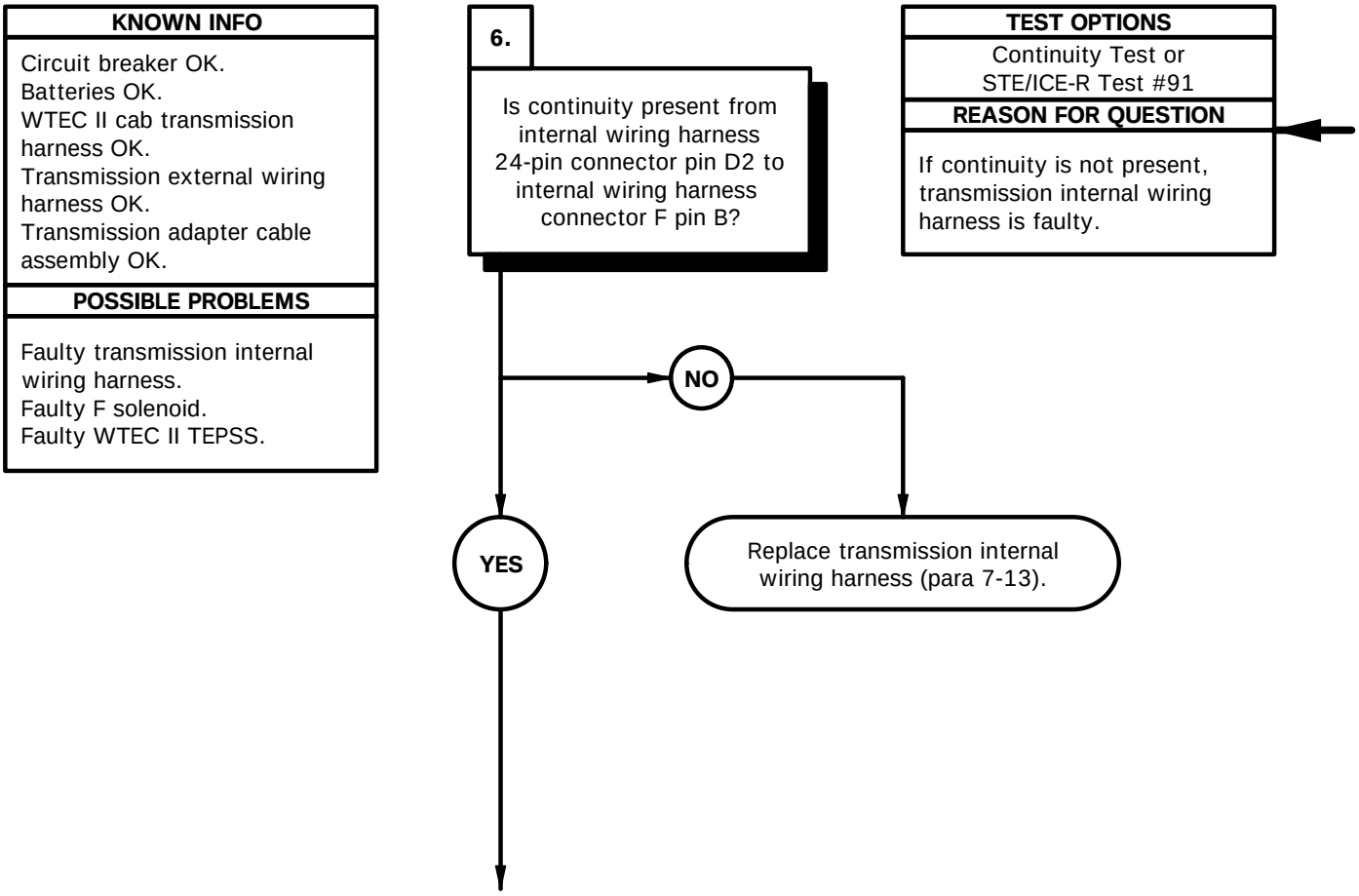
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

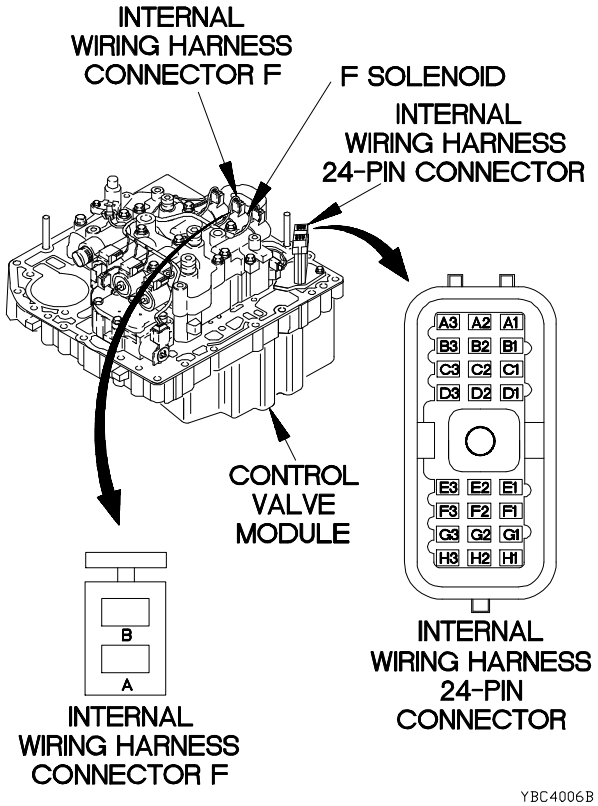


c40. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

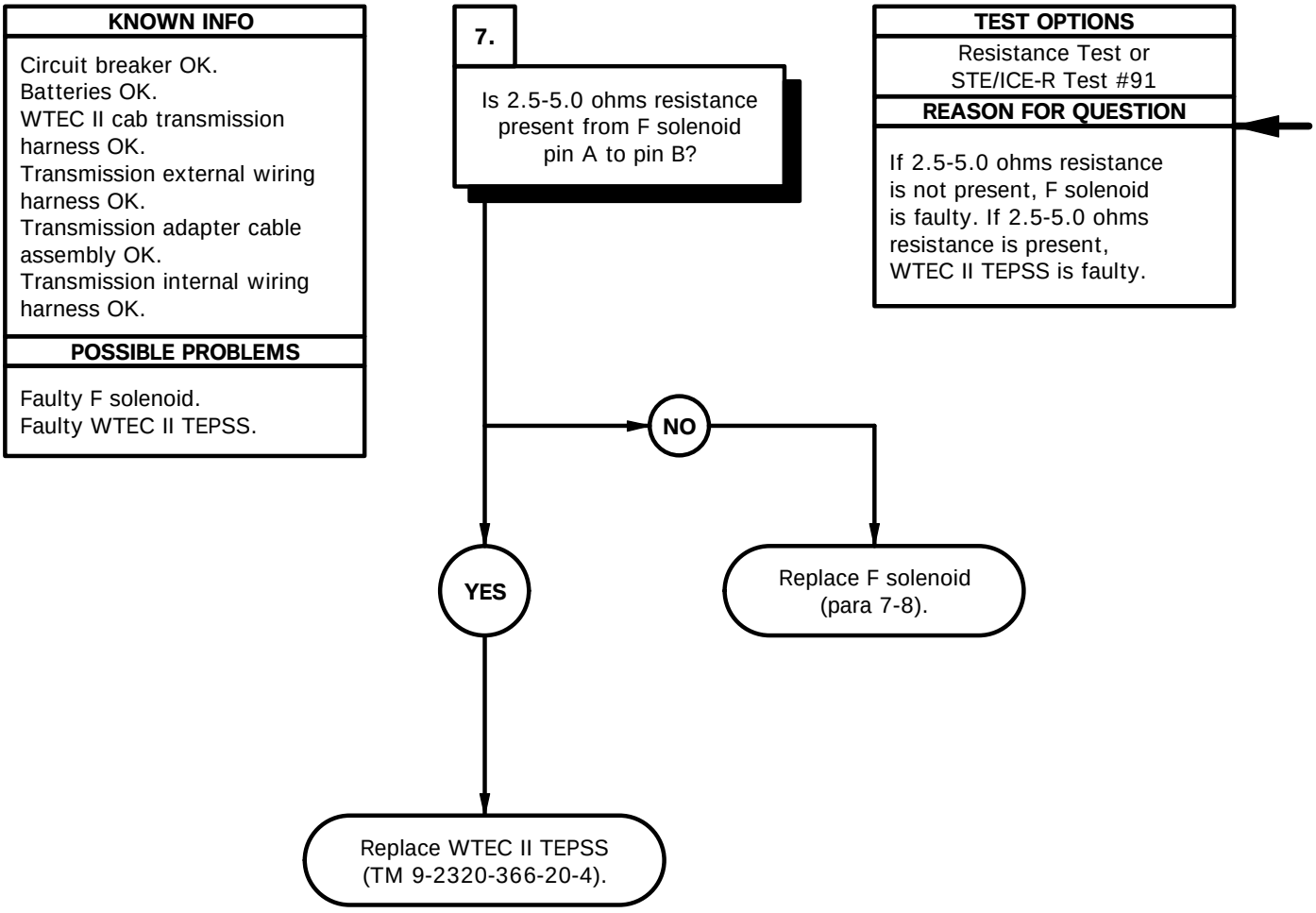


CONTINUITY TEST

(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).

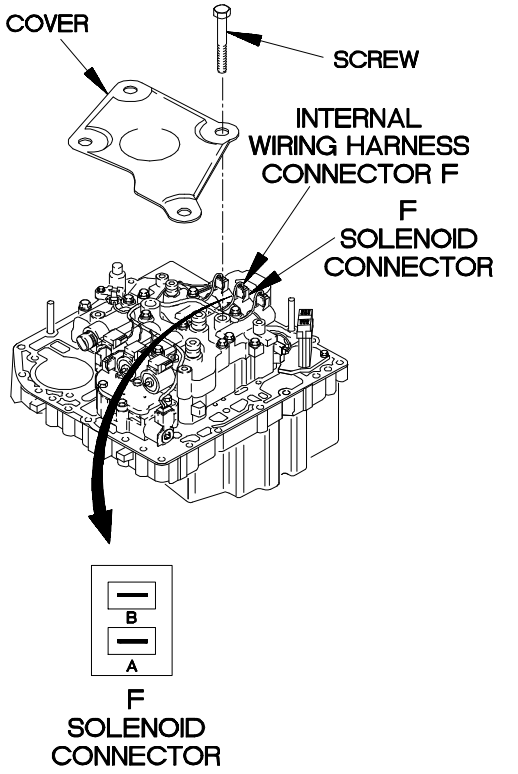


c40. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



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).



c41. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369)

INITIAL SETUP

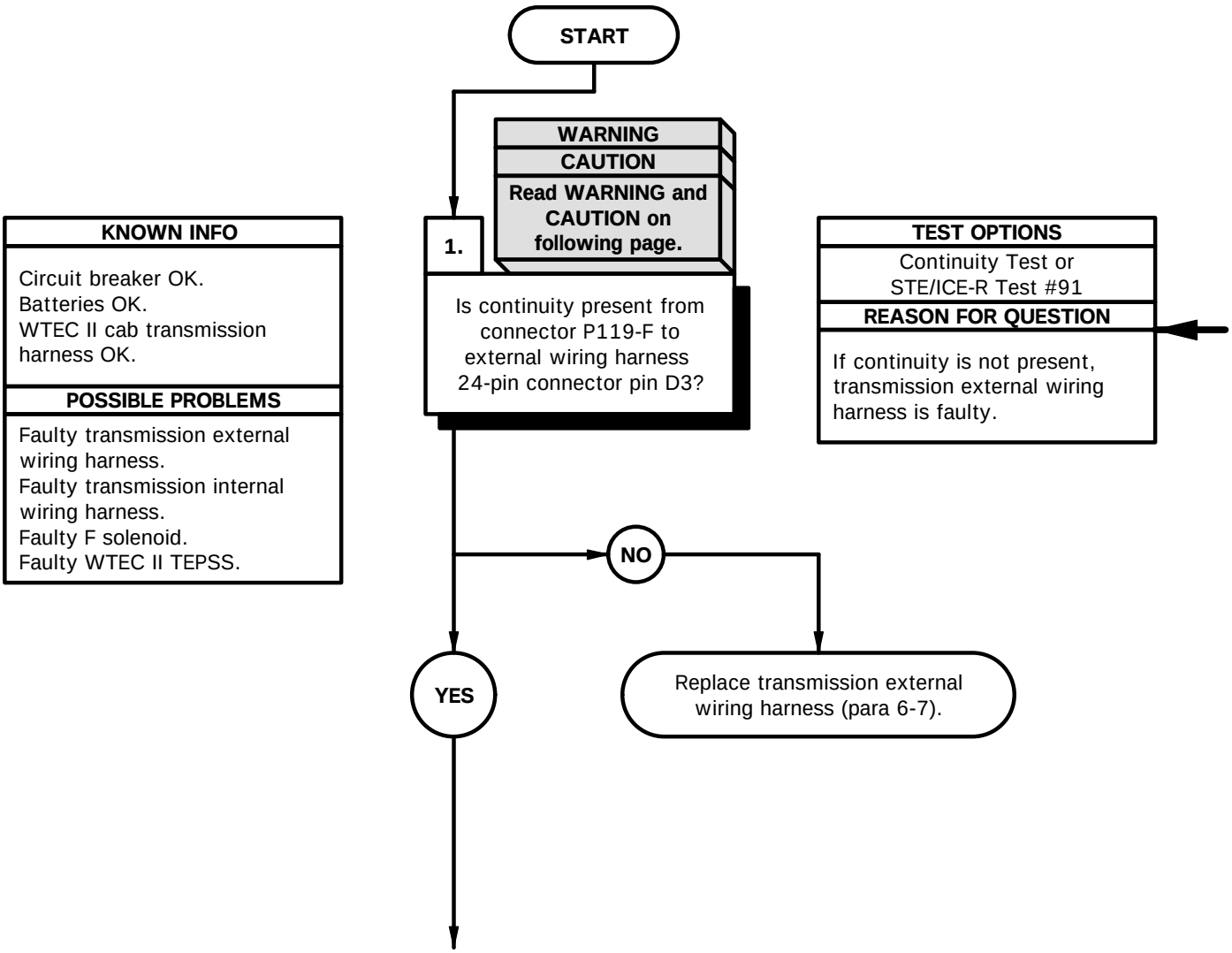
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

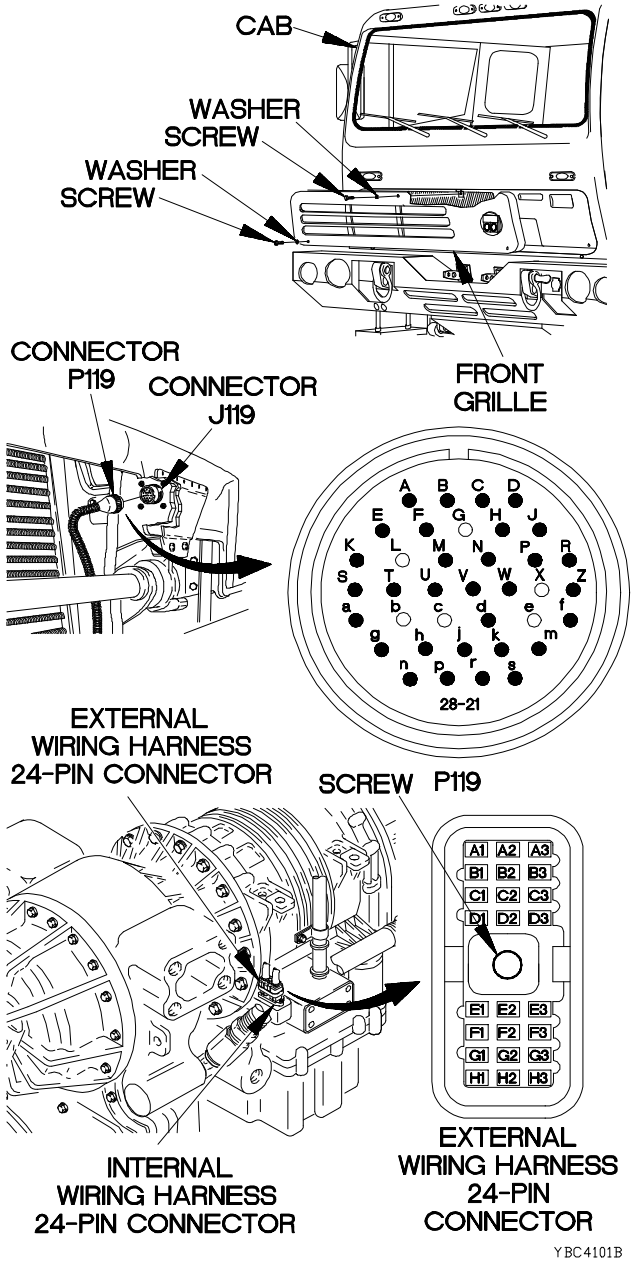
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



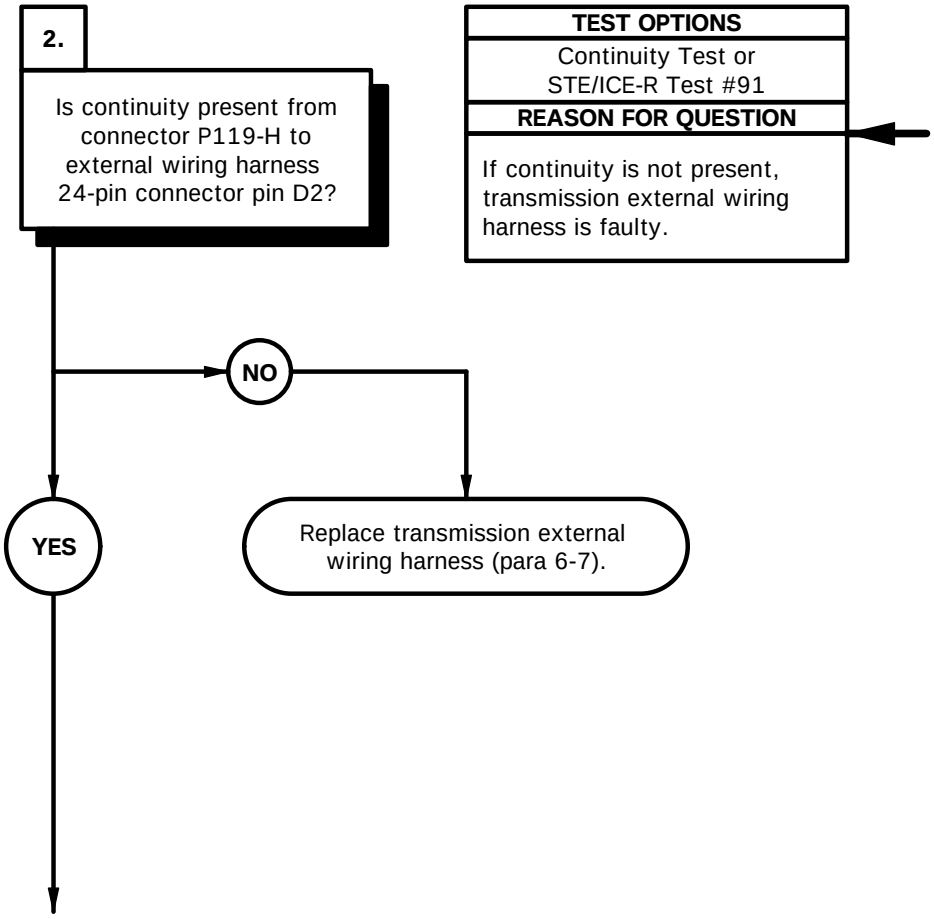
c41. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

KNOWN INFO

Circuit breaker OK.
Batteries OK.
WTEC II cab transmission harness OK.

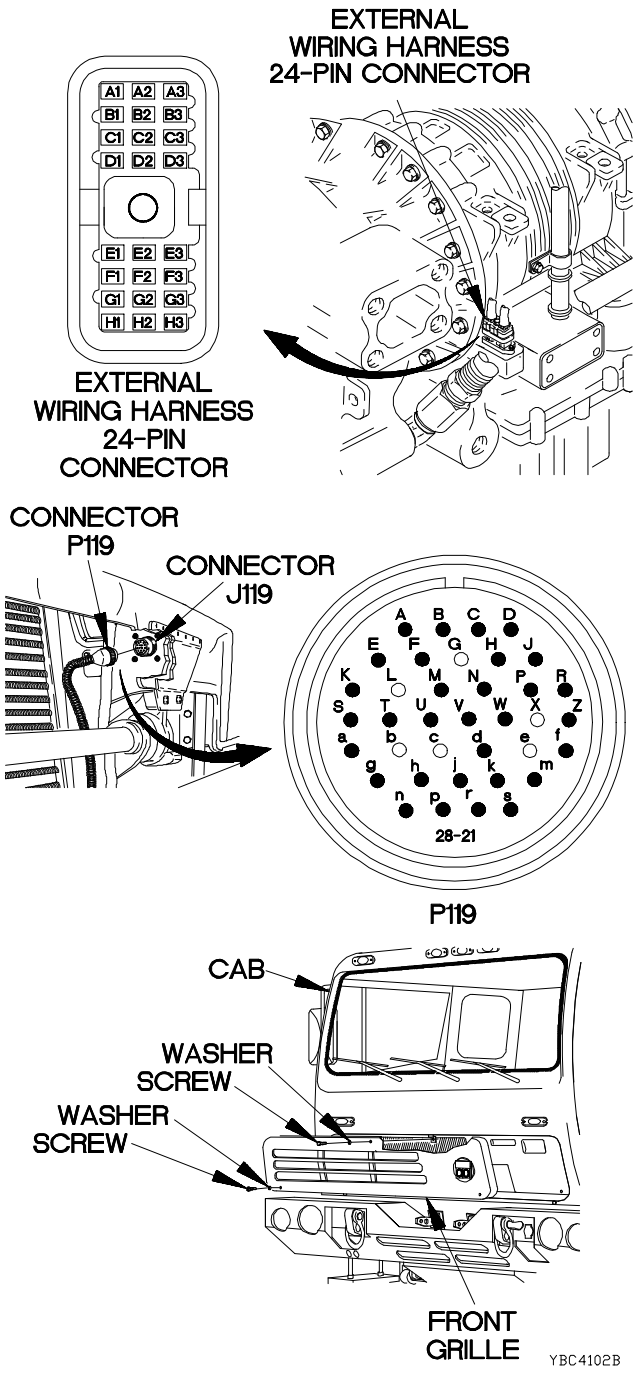
POSSIBLE PROBLEMS

Faulty transmission external wiring harness.
Faulty transmission internal wiring harness.
Faulty F solenoid.
Faulty WTEC II TEPSS.

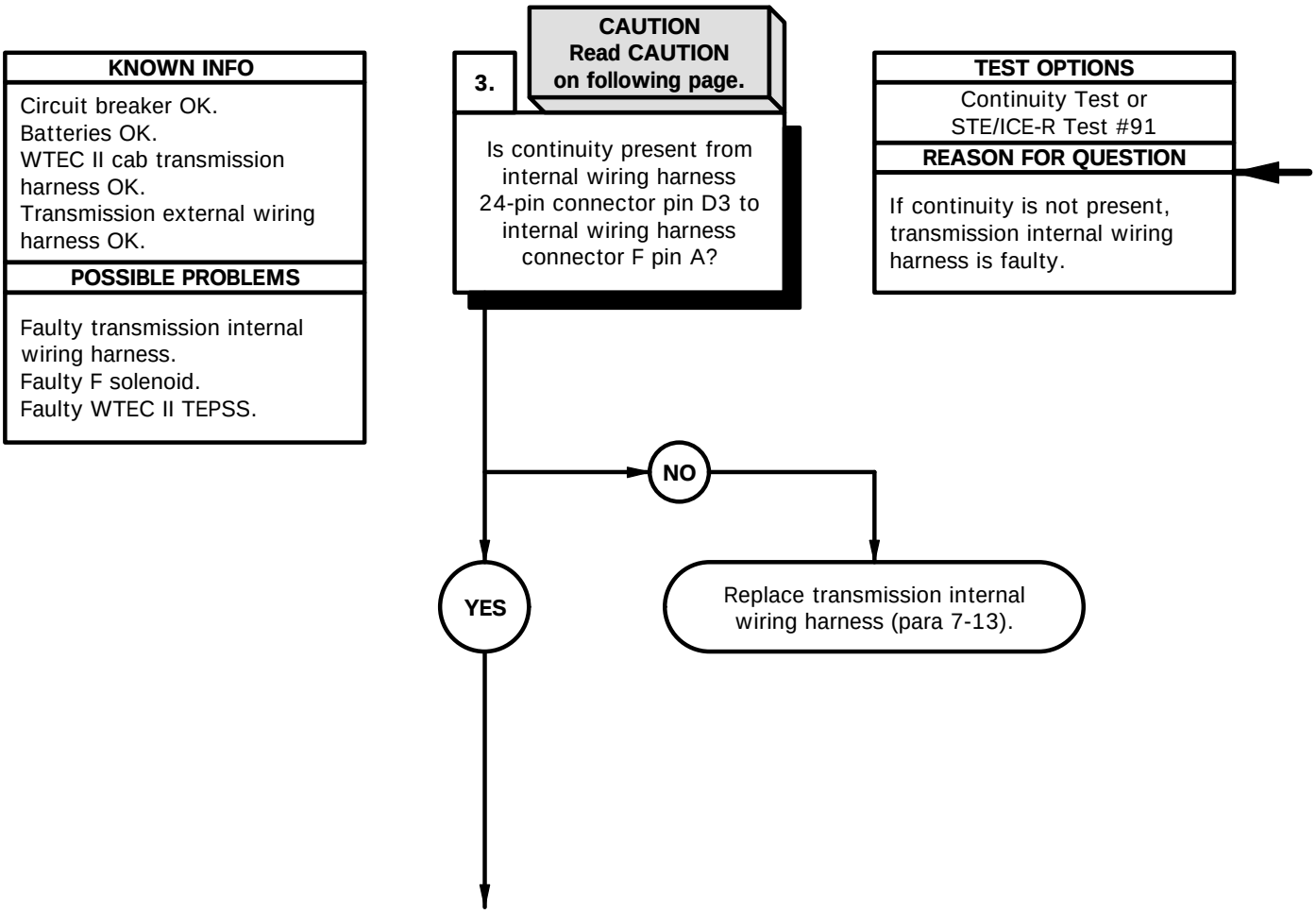


CONTINUITY TEST

(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).



c41. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

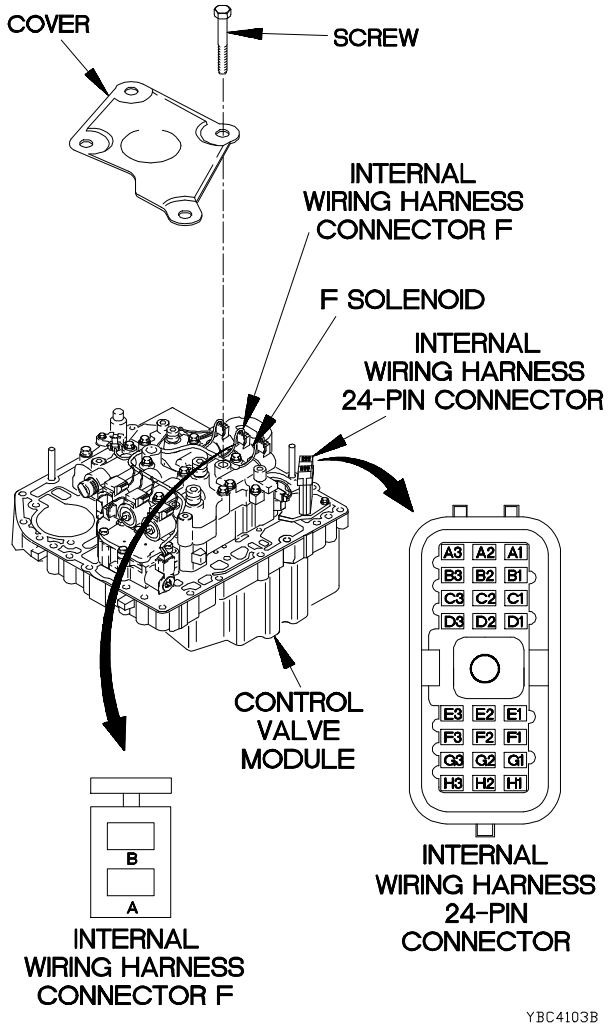


CAUTION

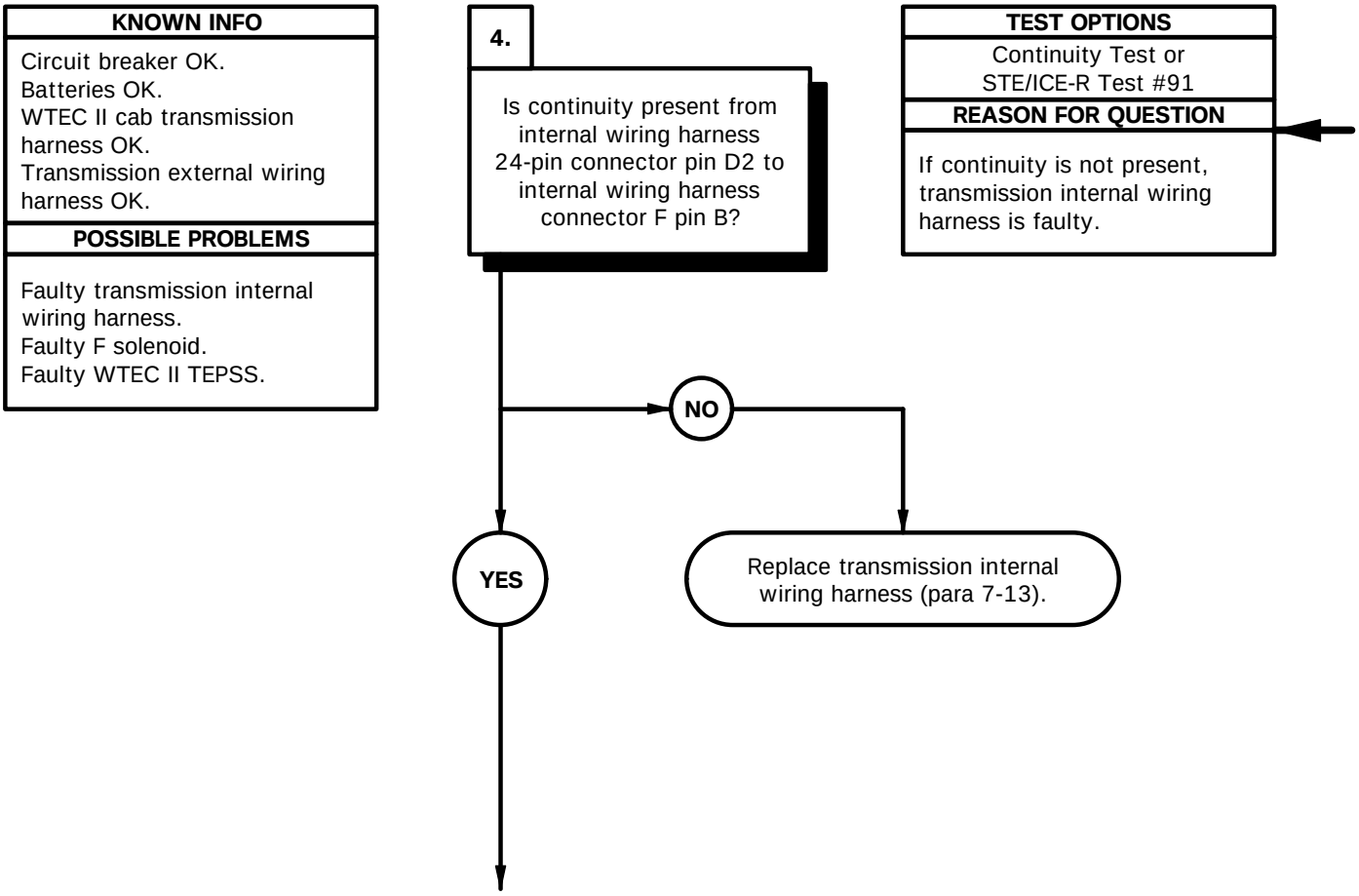
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

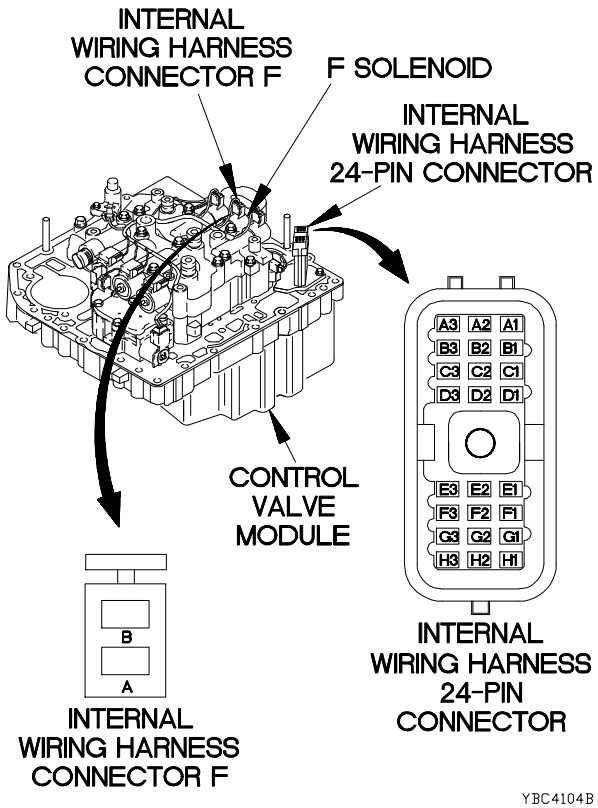


c41. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

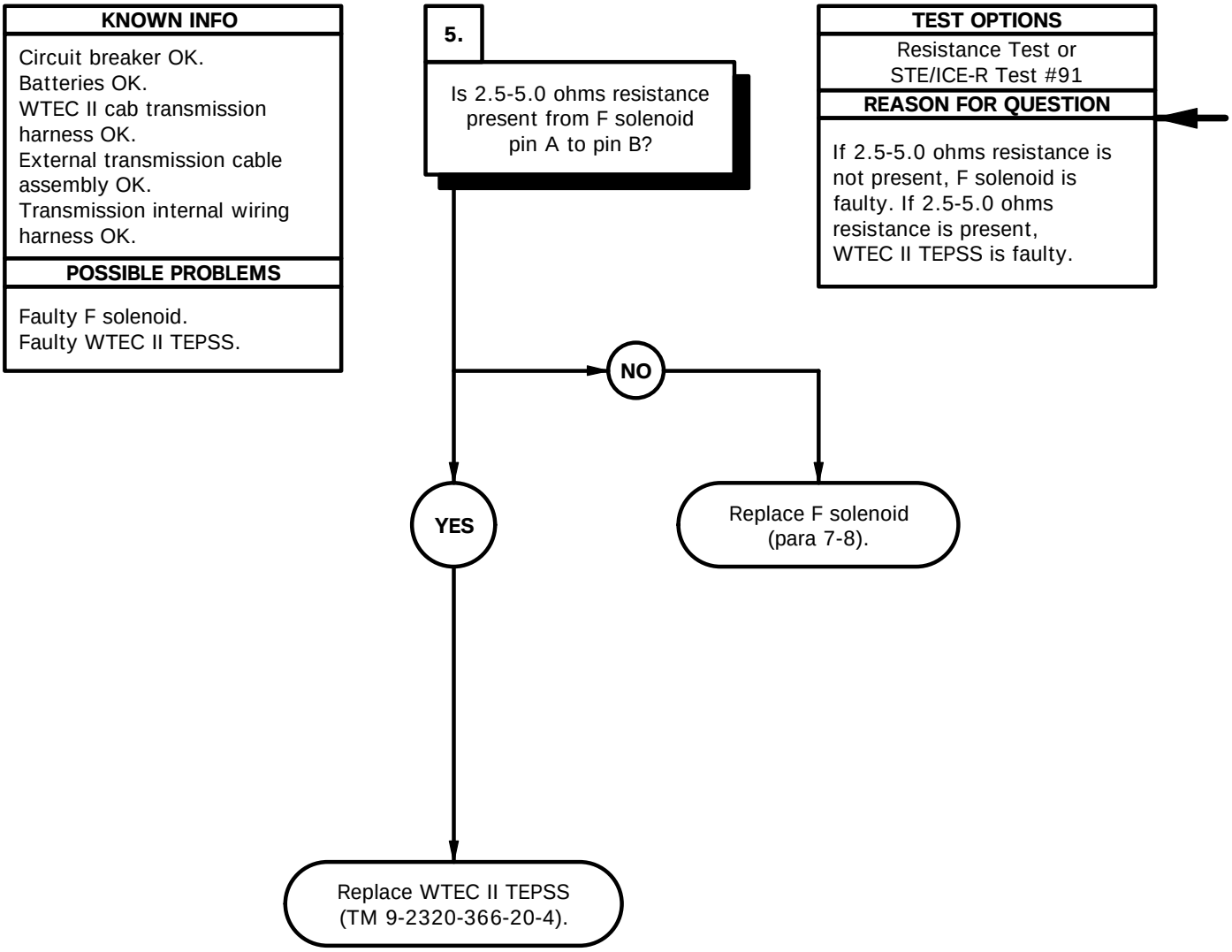


CONTINUITY TEST

(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).

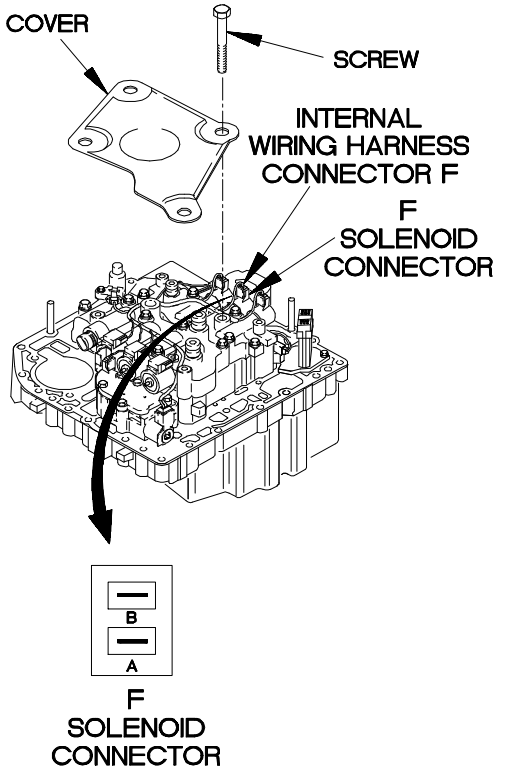


c41. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)



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).



c42. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

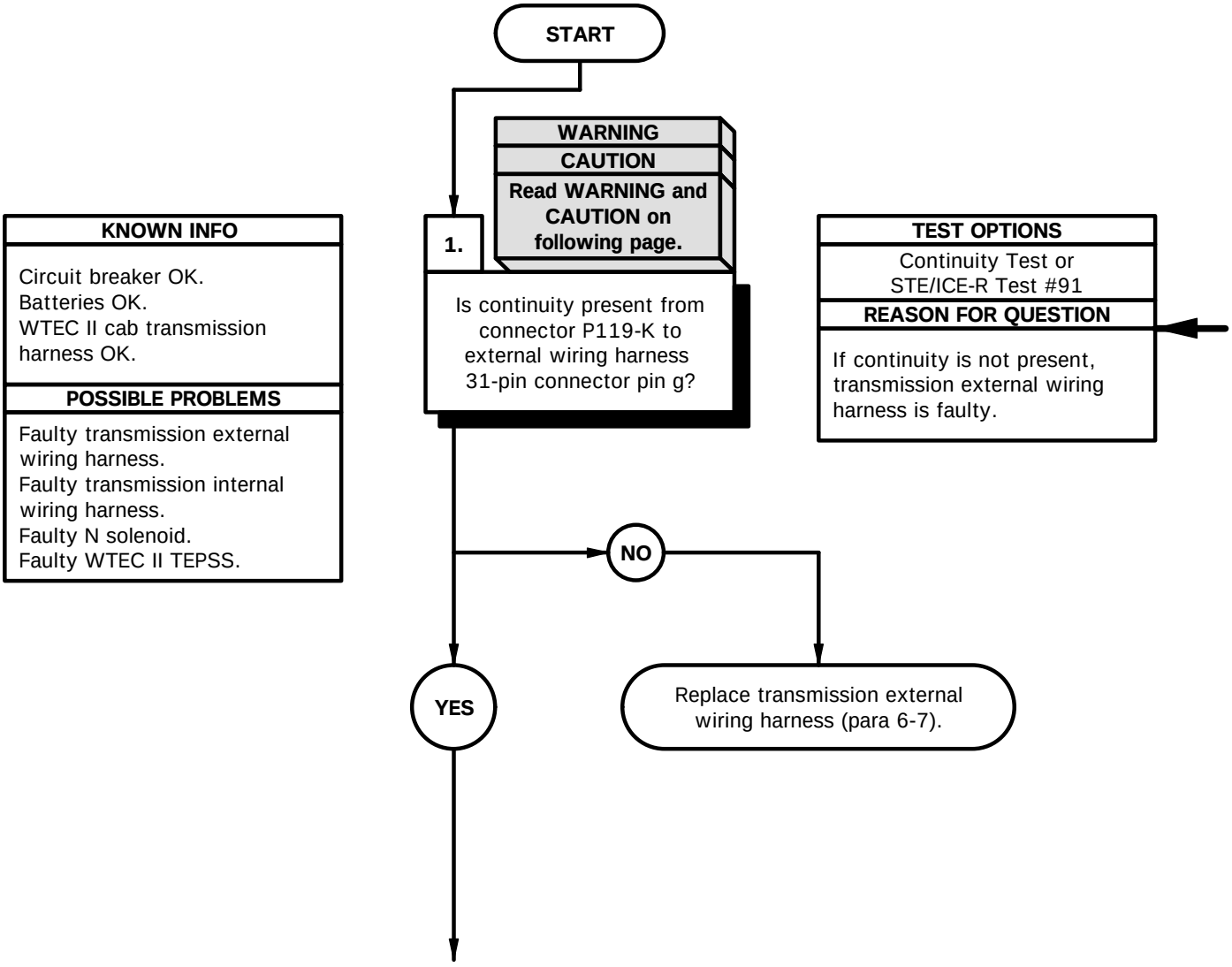
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

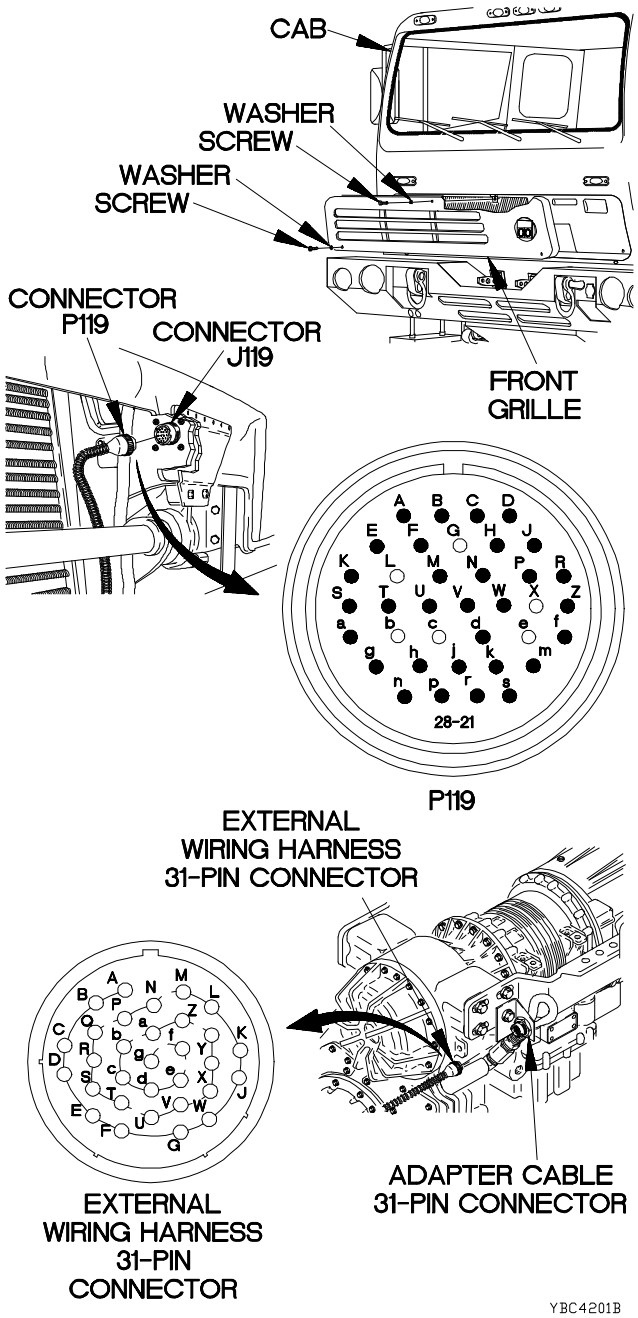
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

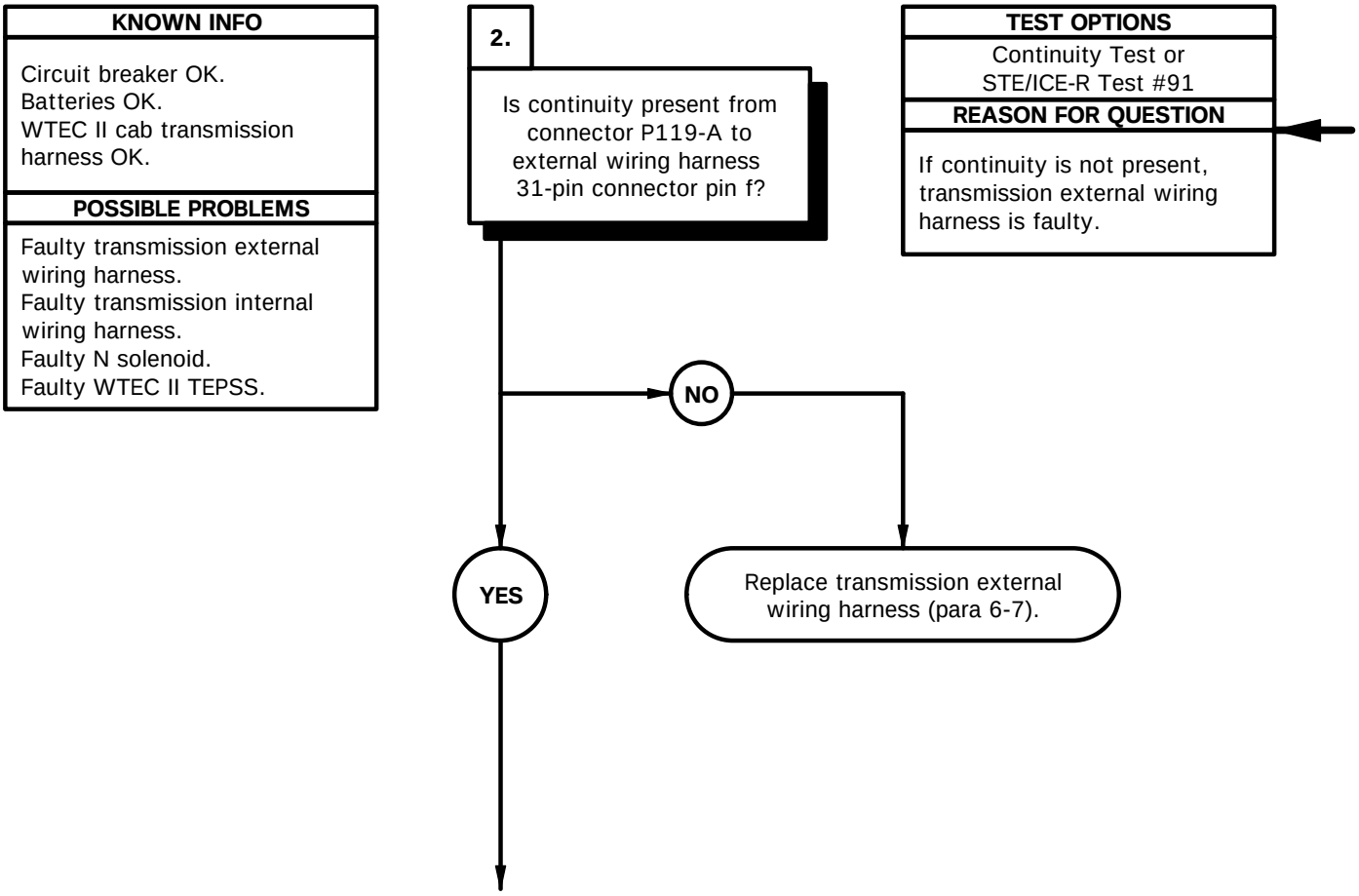
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin connector.
(6) Set multimeter 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).

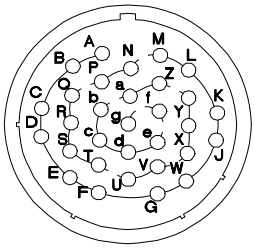


c42. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

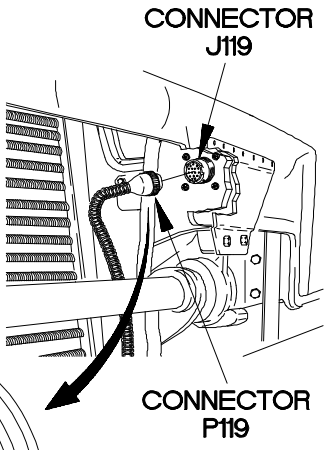


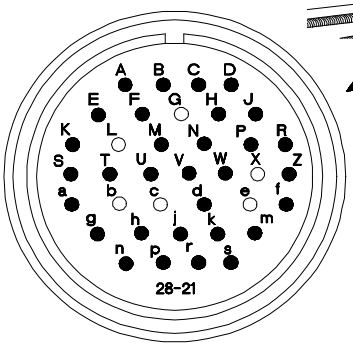
CONTINUITY TEST

(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 mulitmeter 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).

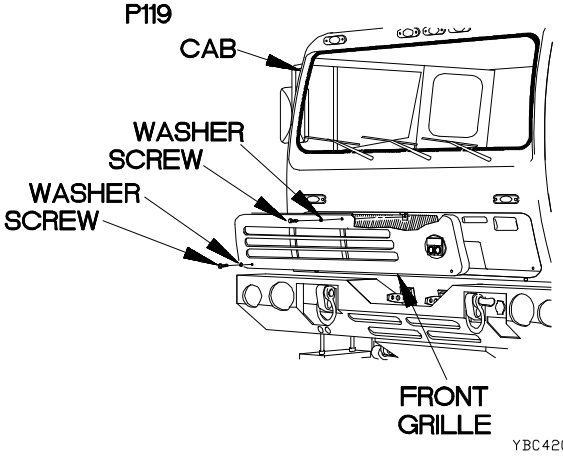


EXTERNAL WIRING HARNESS 31-PIN CONNECTOR

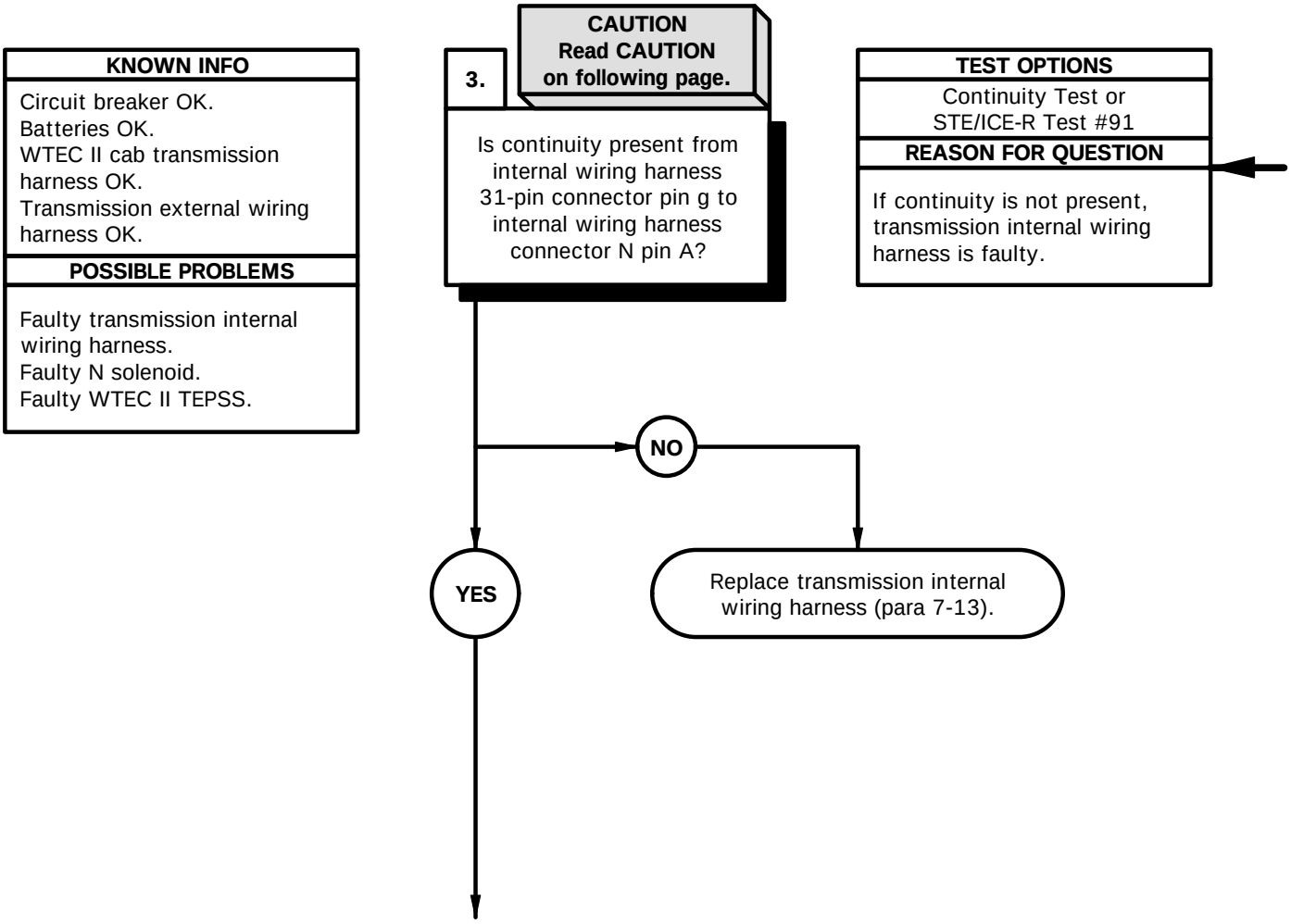




P119



c42. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

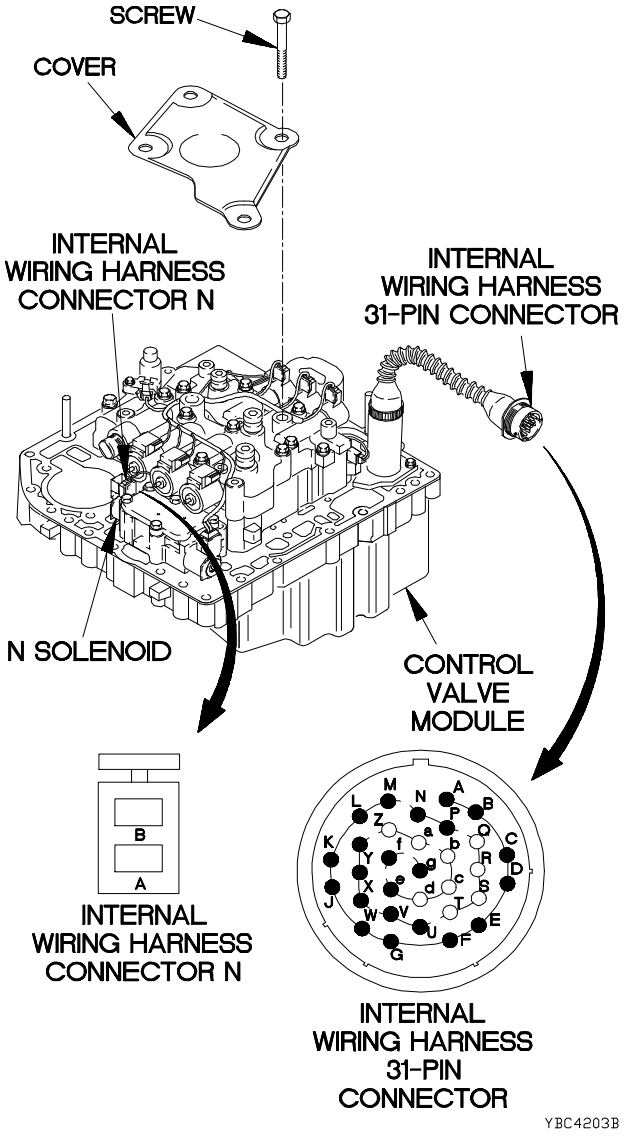


CAUTION

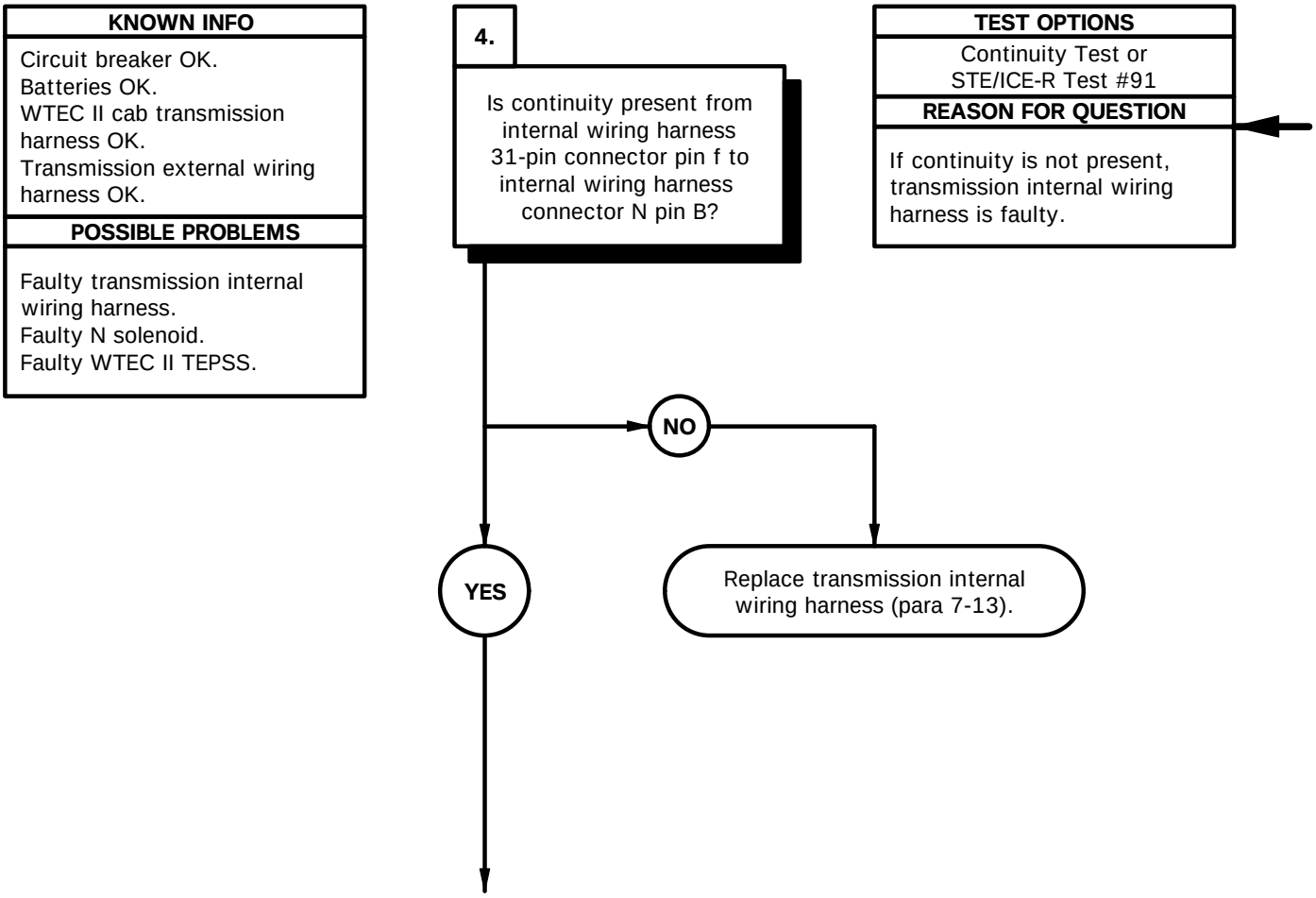
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

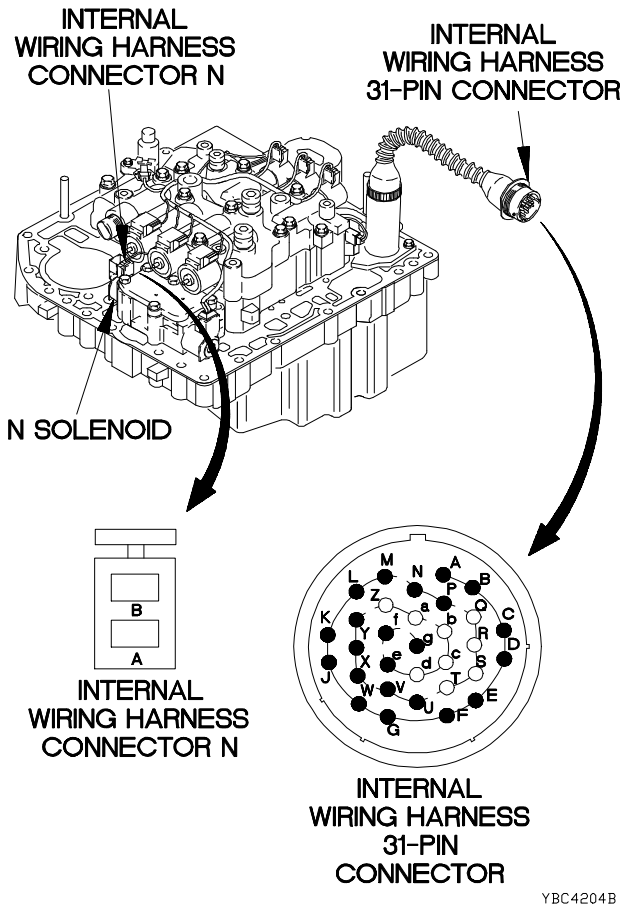


c42. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

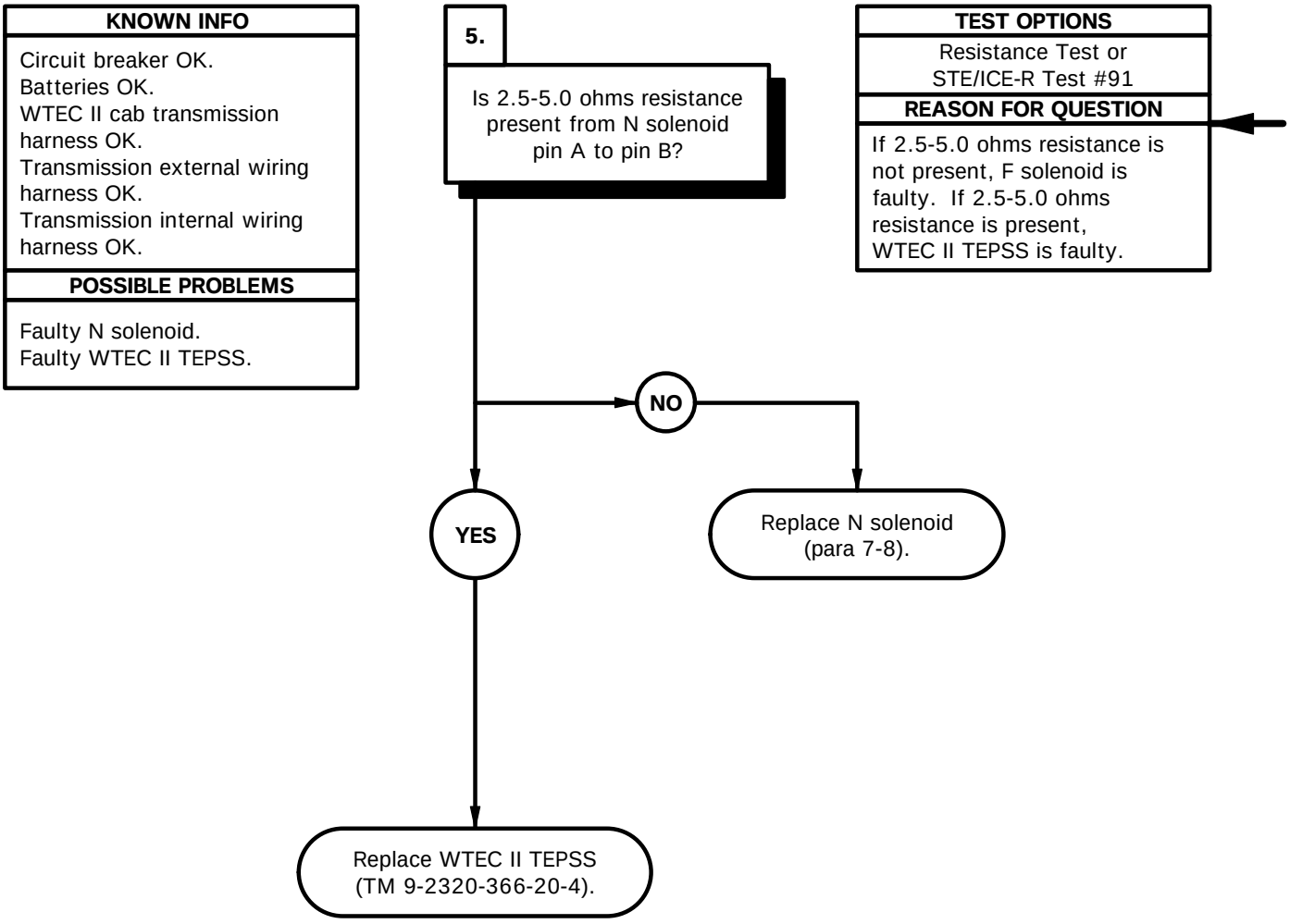


CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to internal wiring harness 31-pin connector 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).

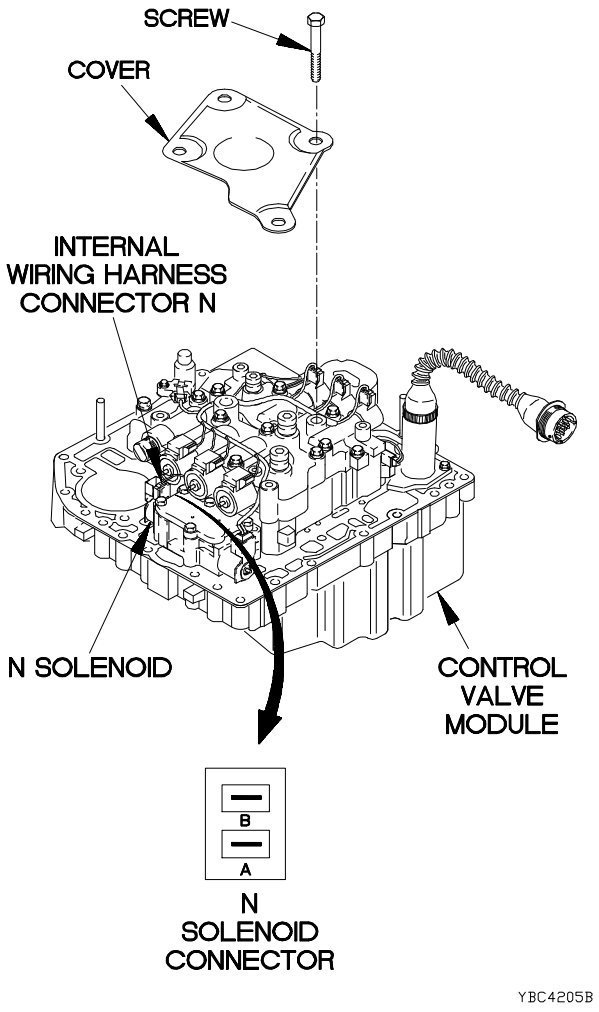


c42. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



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).



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

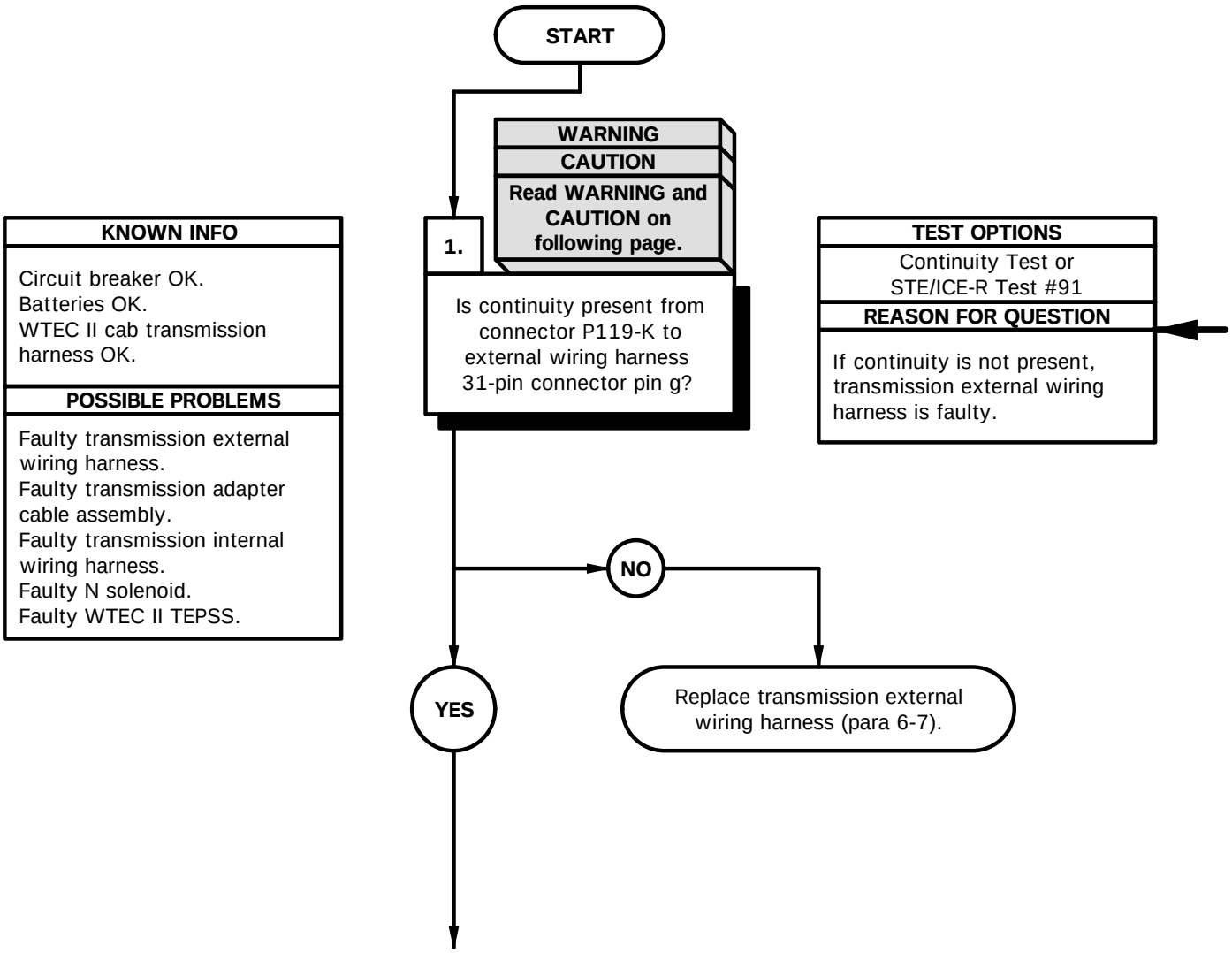
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

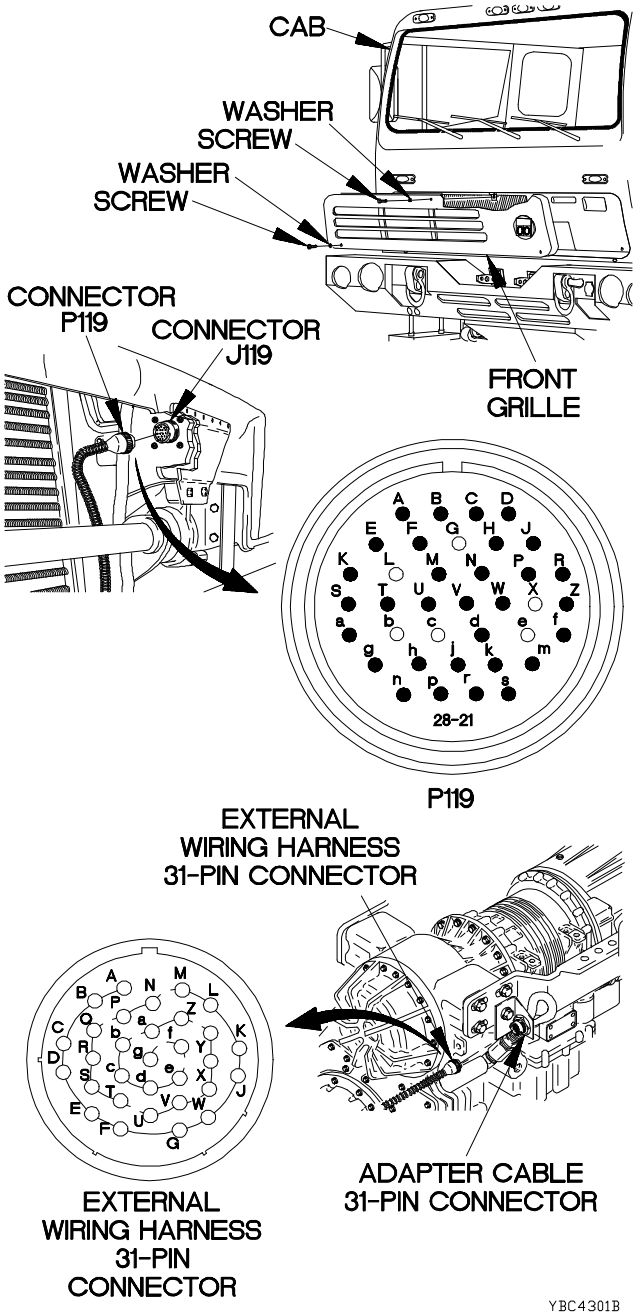
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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-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).



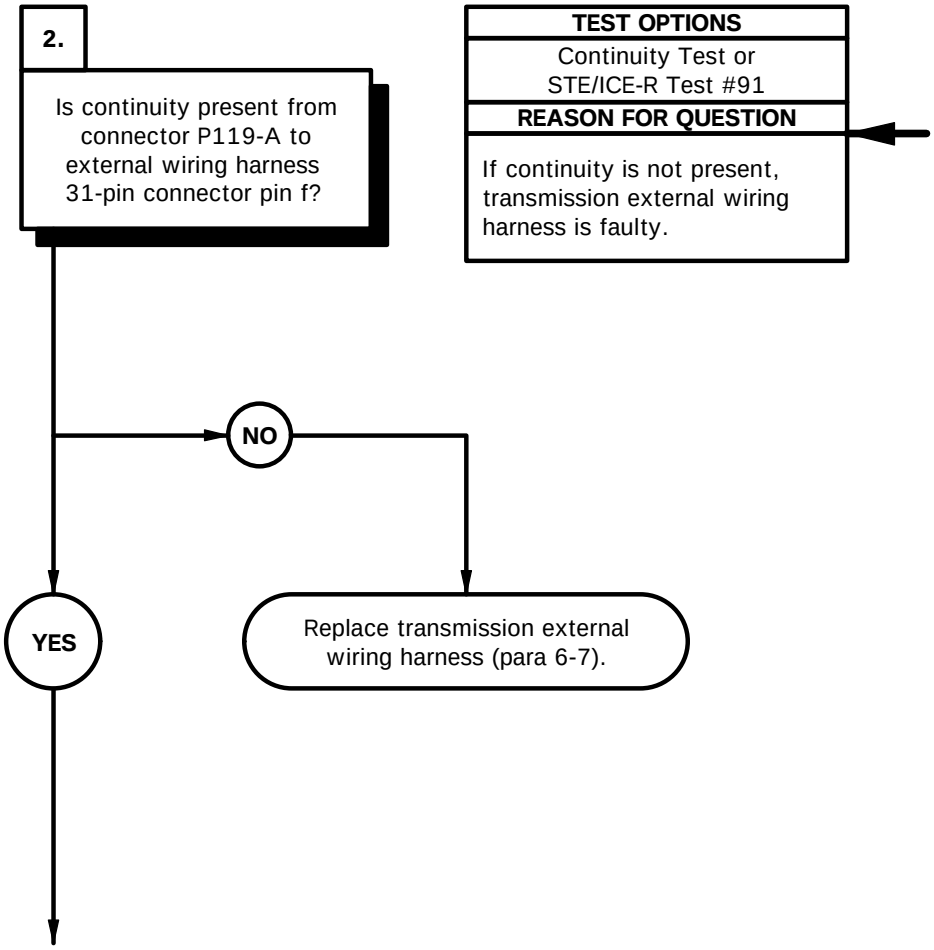
c43. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

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.



TEST OPTIONS

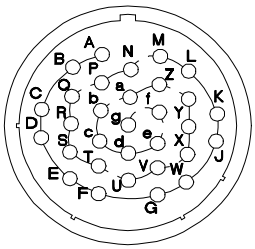
Continuity Test or
STE/ICE-R Test #91

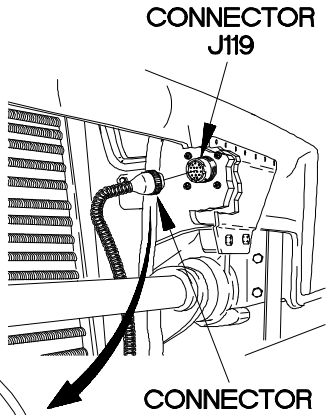
REASON FOR QUESTION

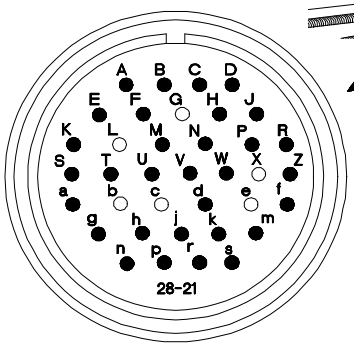
If continuity is not present, transmission external wiring harness is faulty.

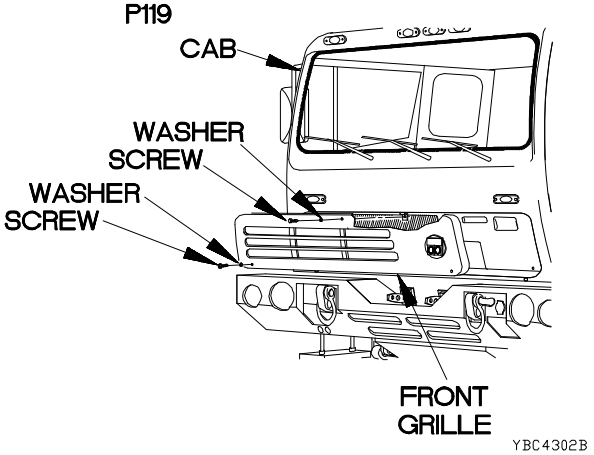
CONTINUITY TEST

(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).

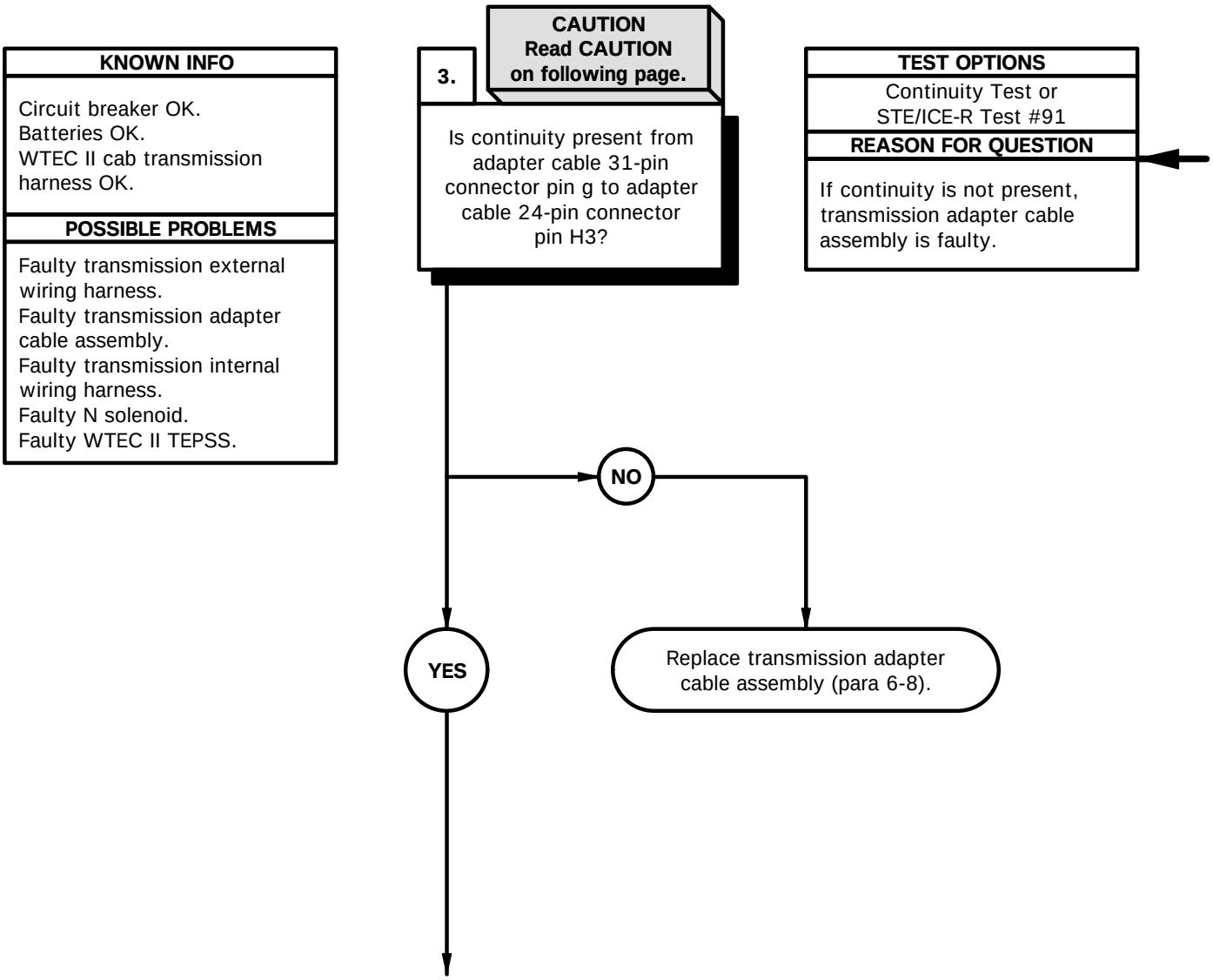








c43. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

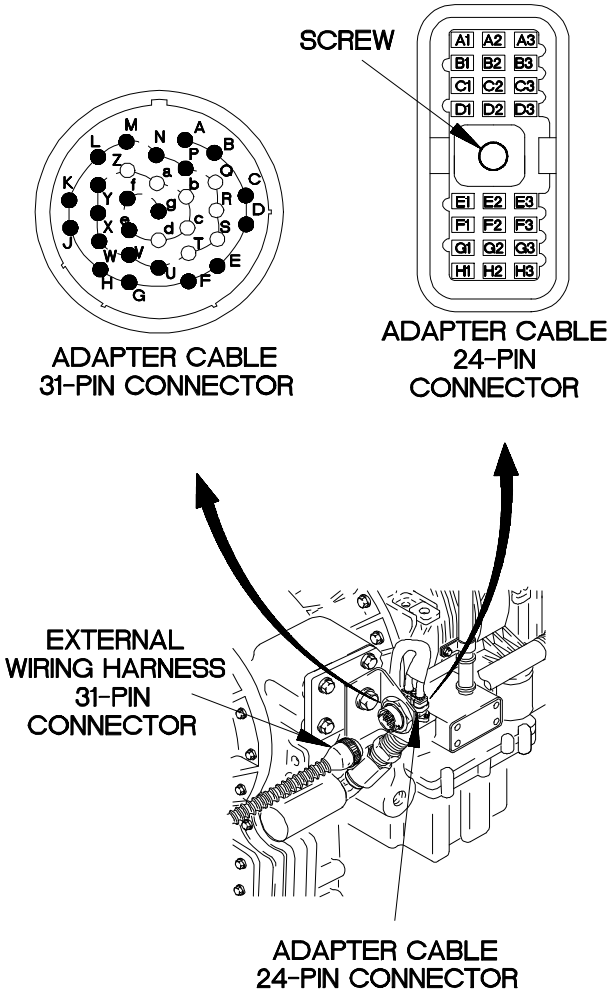


CAUTION

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).



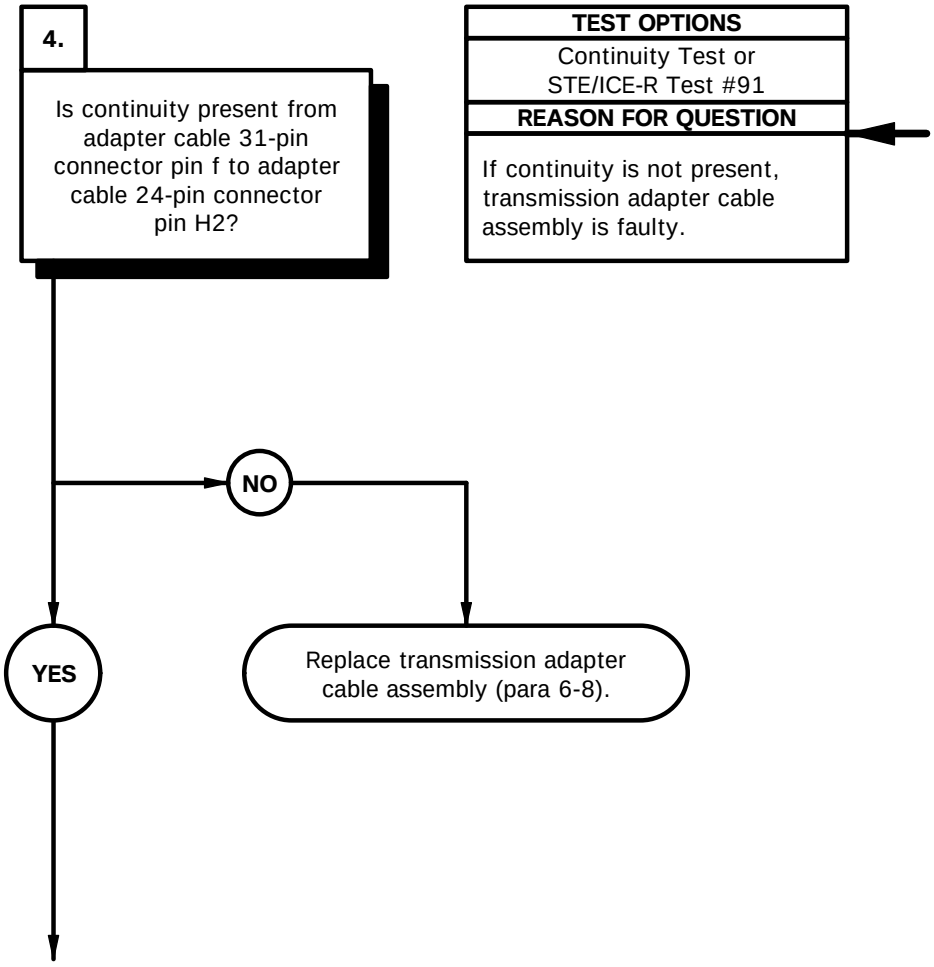
c43. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO

Circuit breaker OK.
Batteries OK.
WTEC II cab transmission harness OK.
Transmission external wiring harness OK.

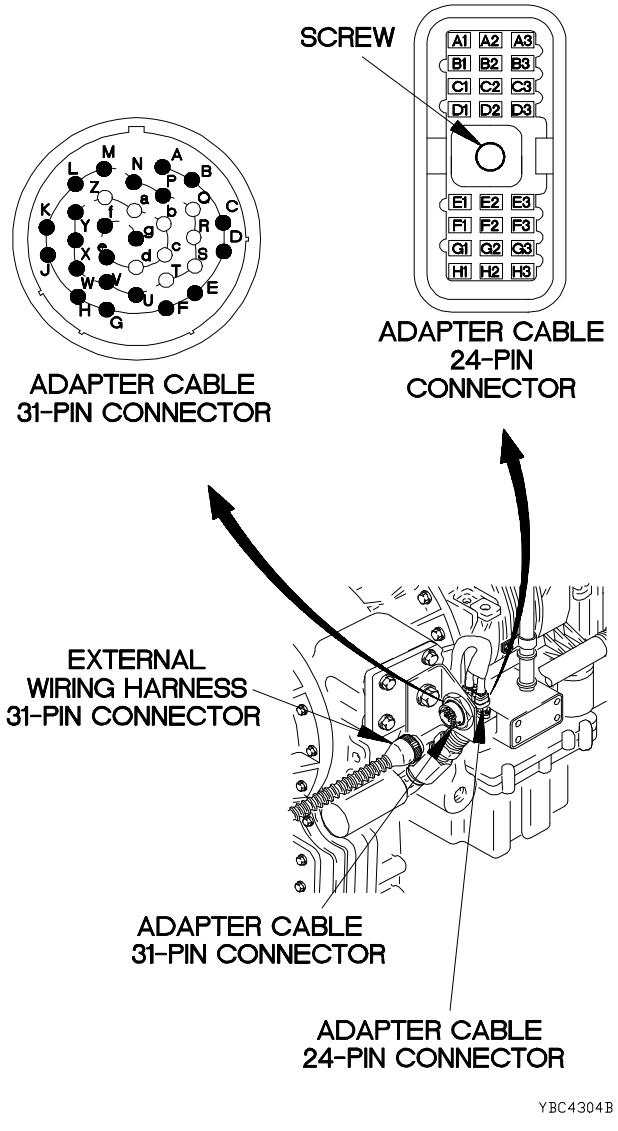
POSSIBLE PROBLEMS

Faulty transmission adapter cable assembly.
Faulty transmission internal wiring harness.
Faulty N solenoid.
Faulty WTEC II TEPSS.

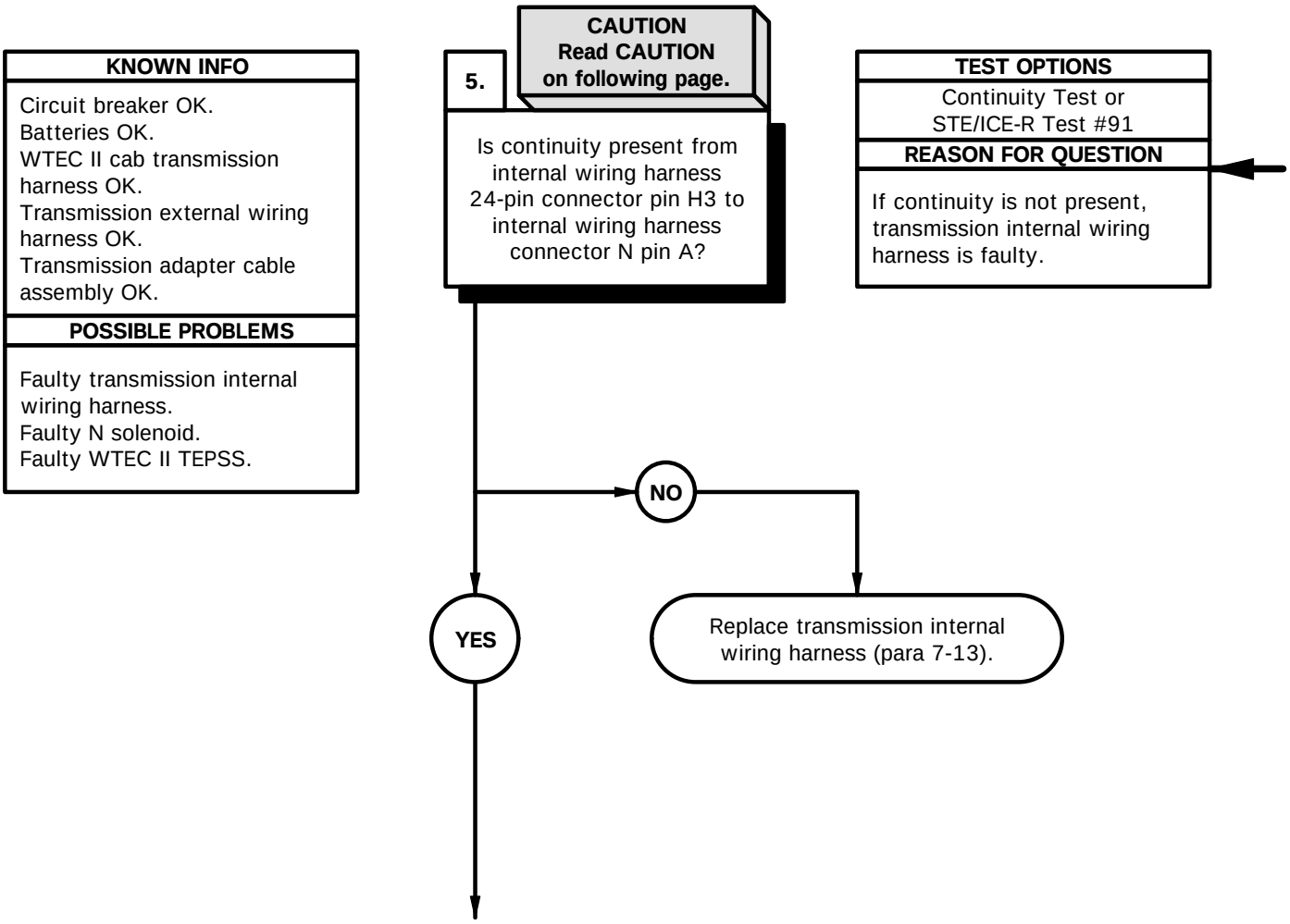


CONTINUITY TEST

(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.



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)

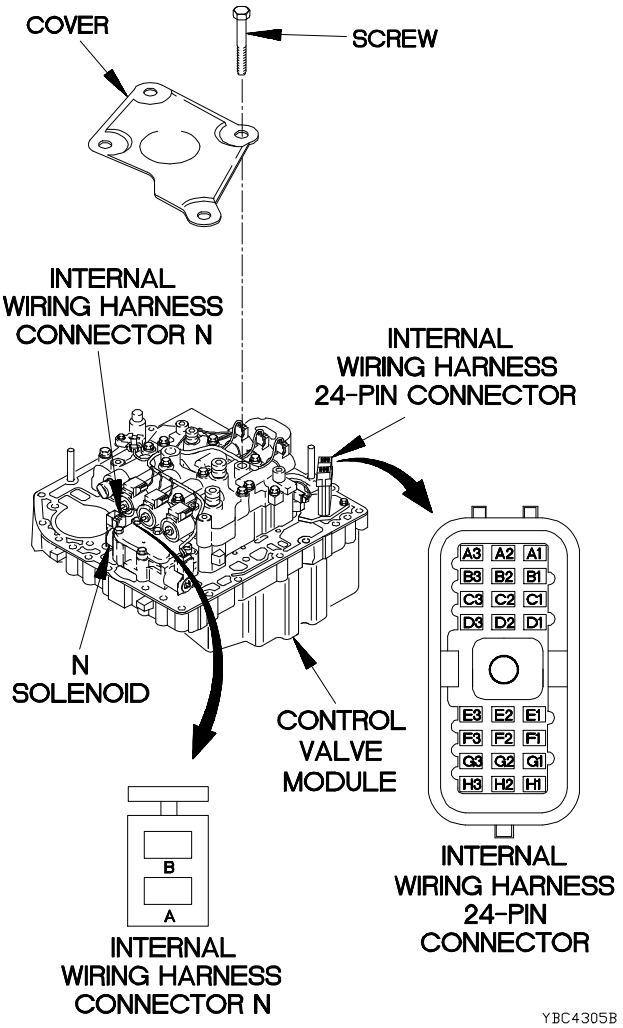


CAUTION

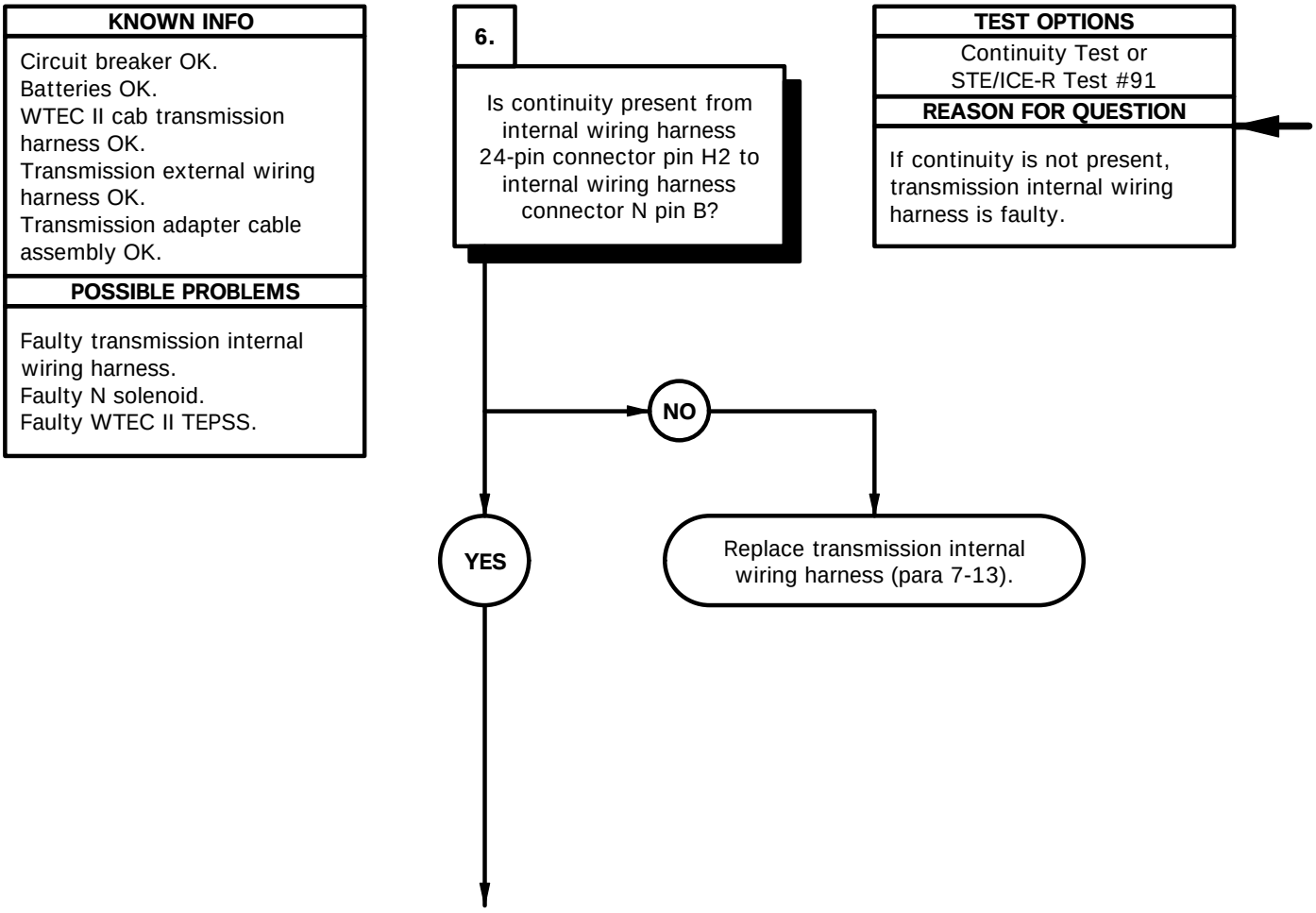
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

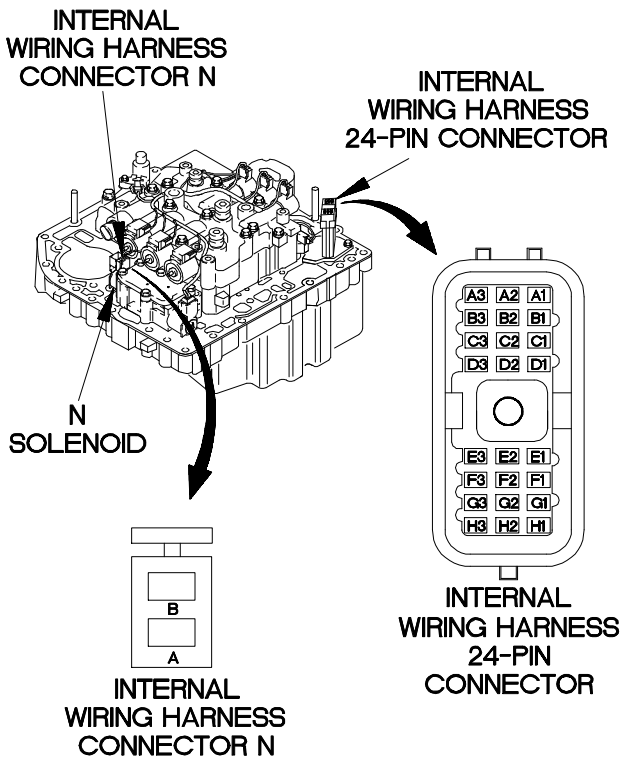


c43. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

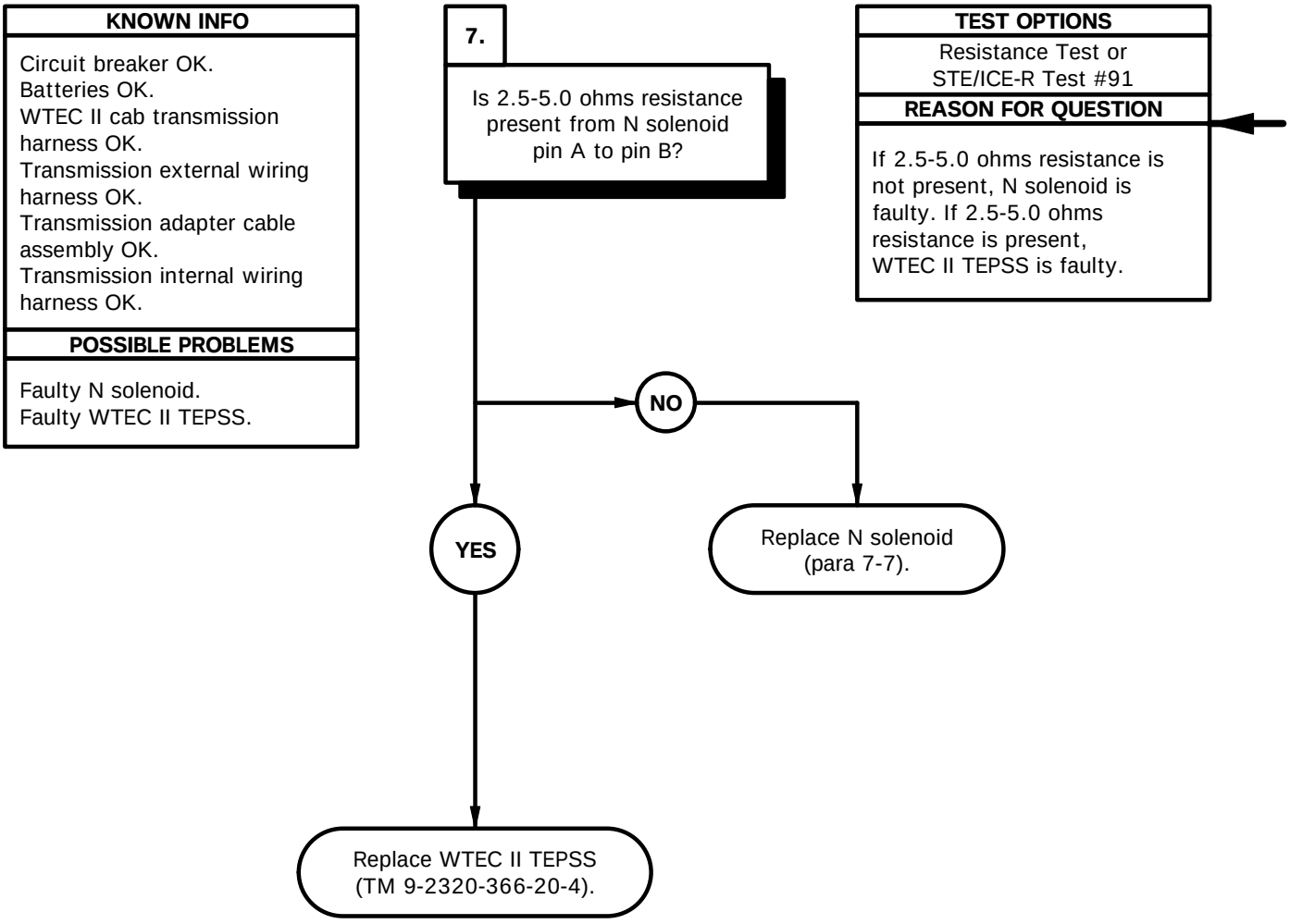


CONTINUITY TEST

(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).

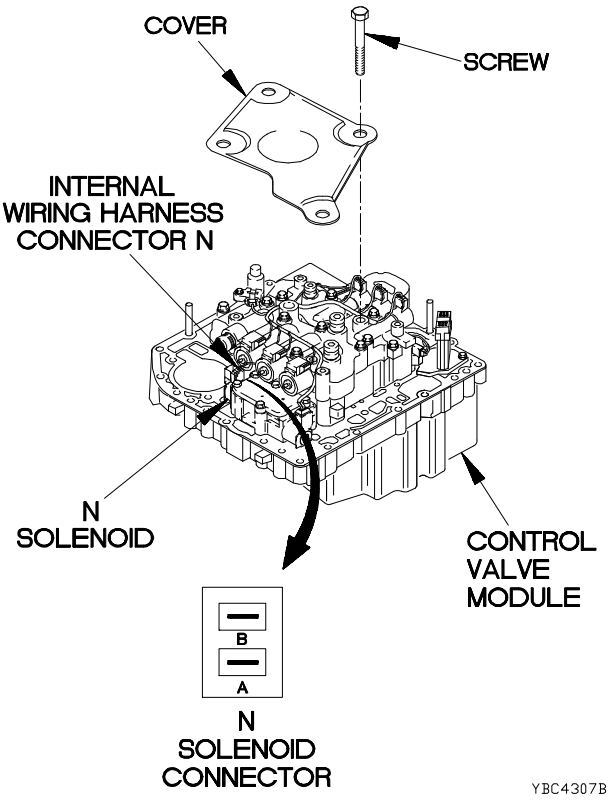


c43. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



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).



c44. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369)

INITIAL SETUP

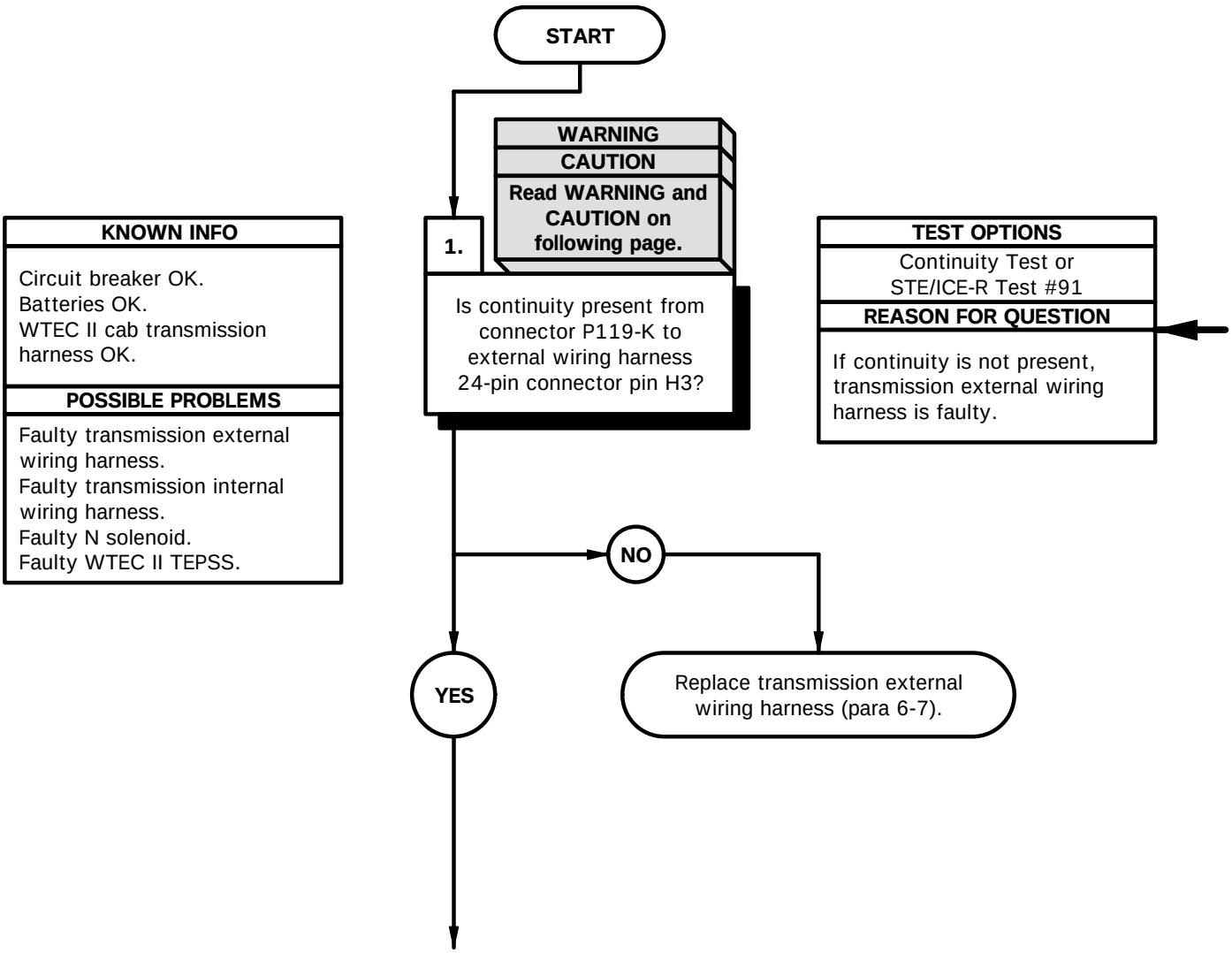
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

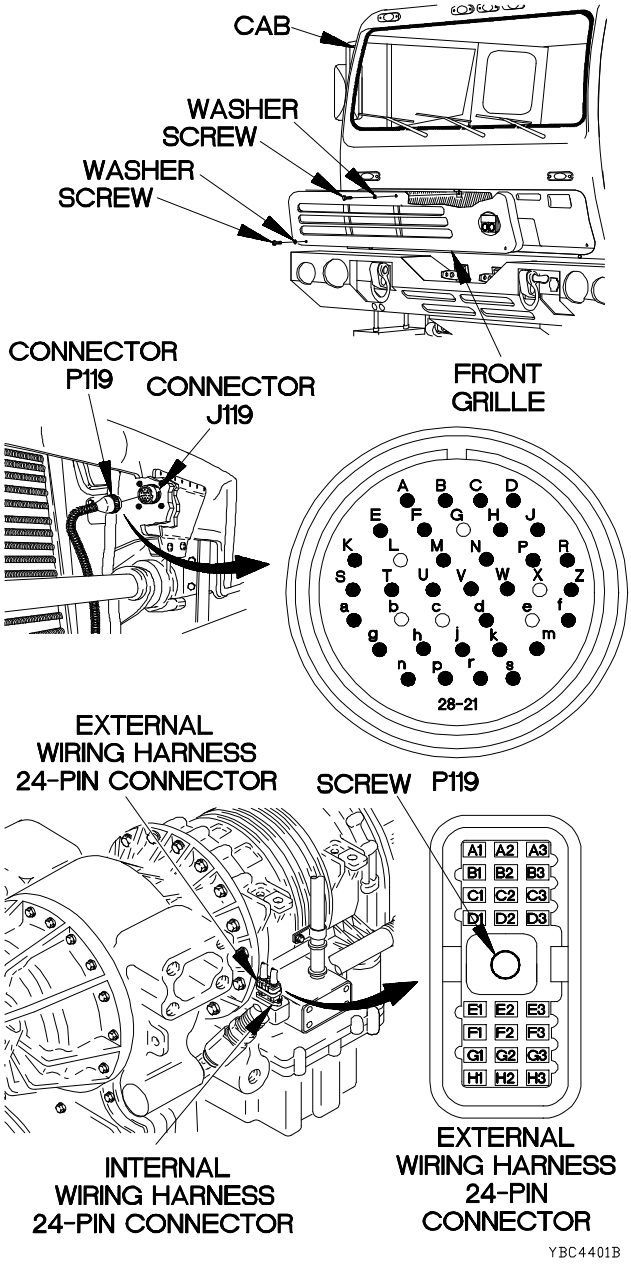
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

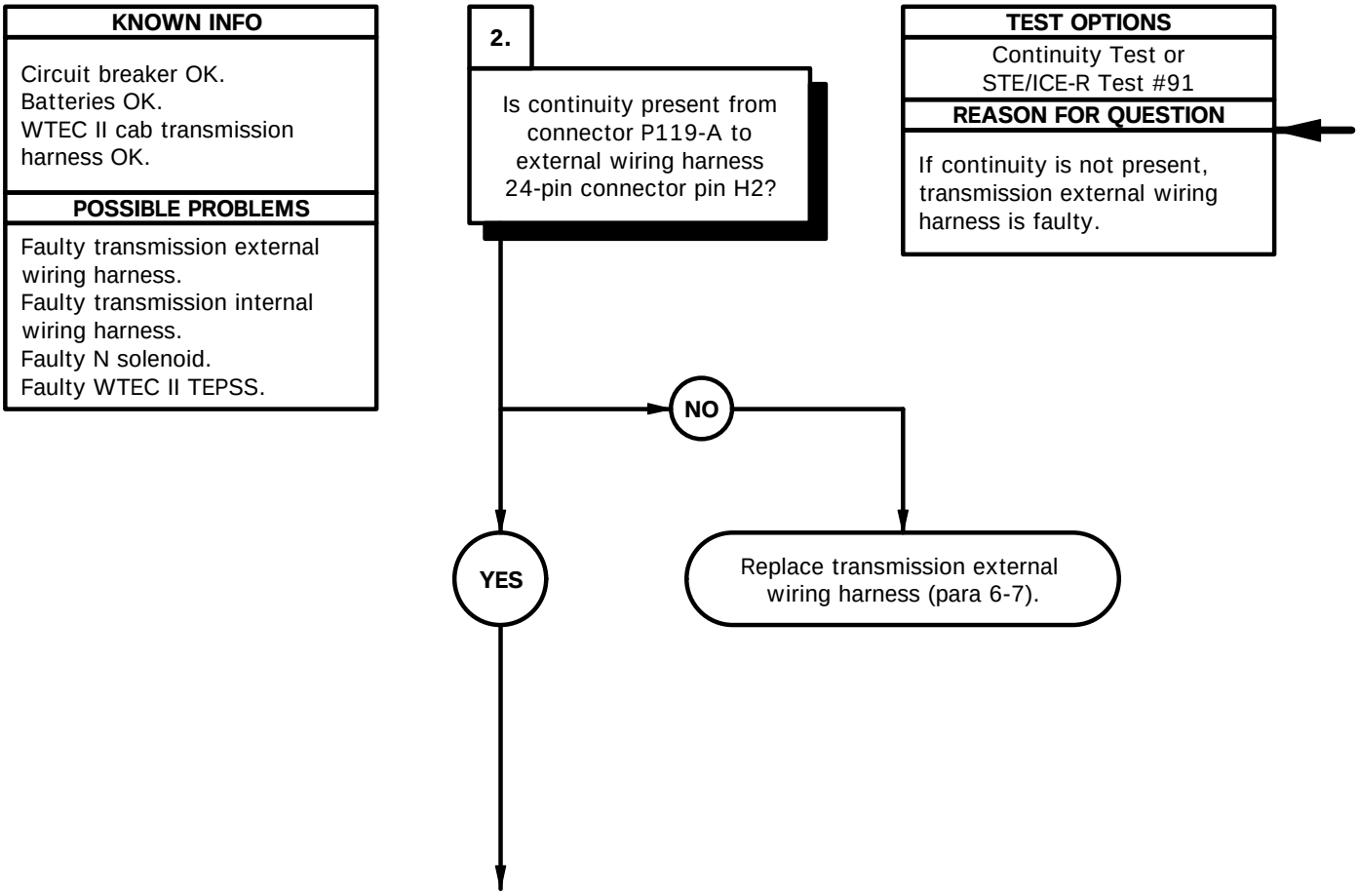
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Loosen screw in external wiring harness 24-pin connector.
(6) Disconnect external wiring harness 24-pin connector from internal wiring harness 24-pin connector.
(7) Set multimeter to ohms.
(8) Connect positive (+) probe of multimeter to connector P119-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).

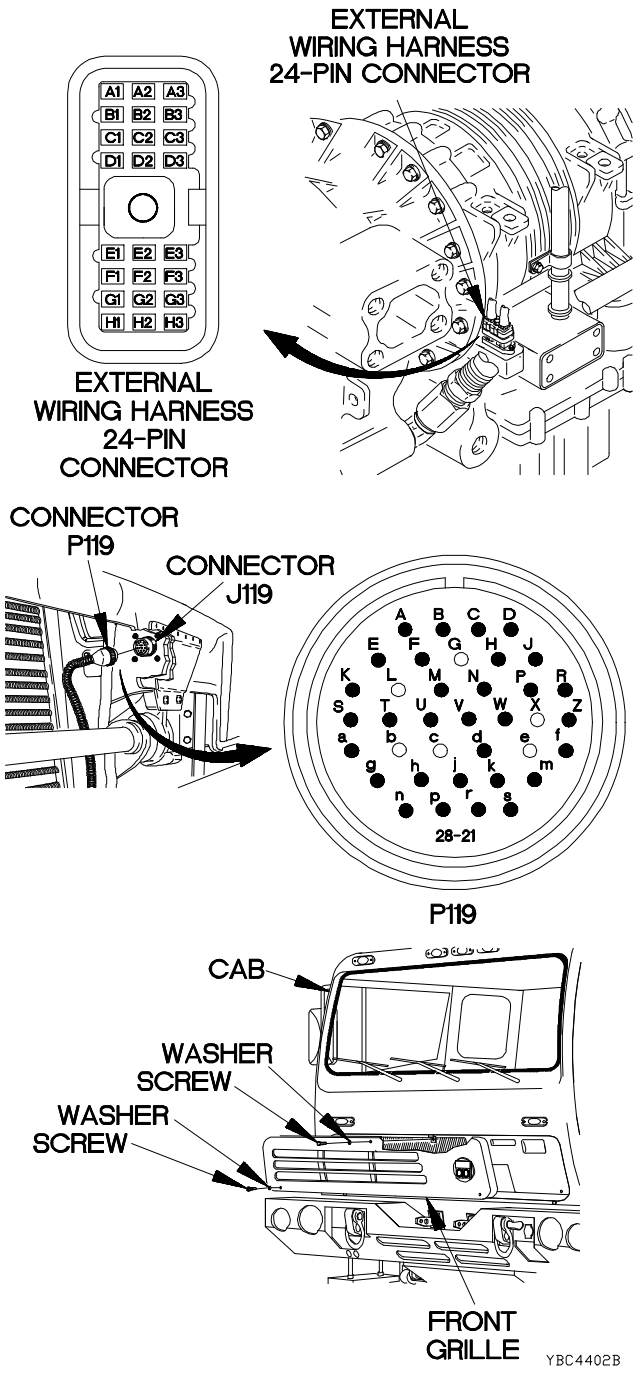


c44. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

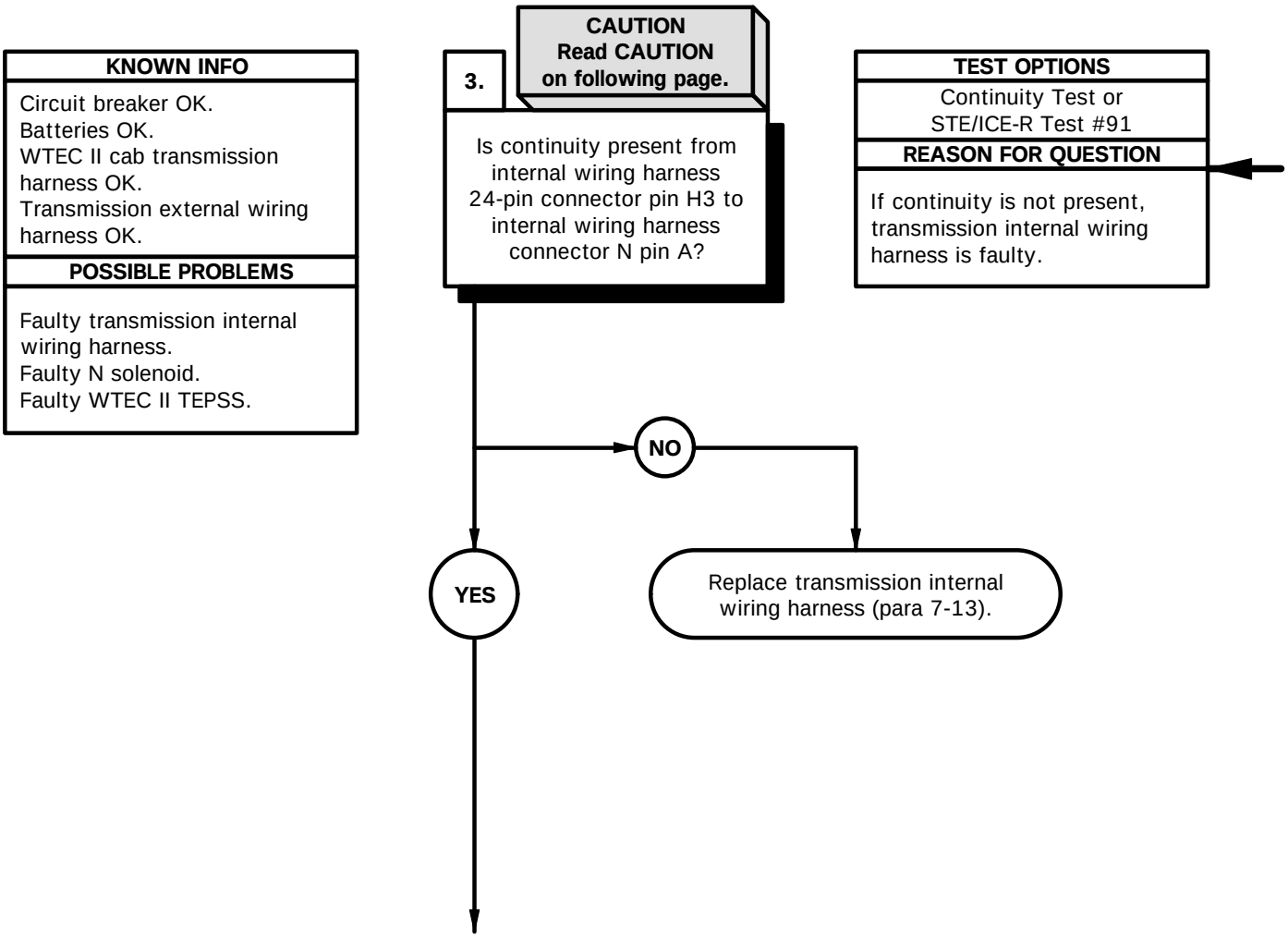


CONTINUITY TEST

(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).



c44. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

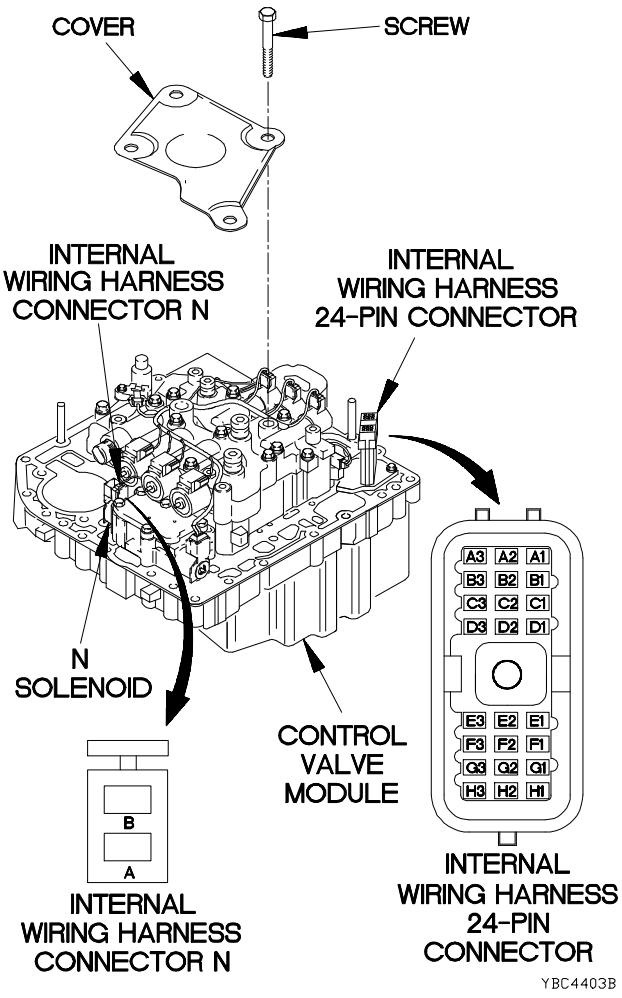


CAUTION

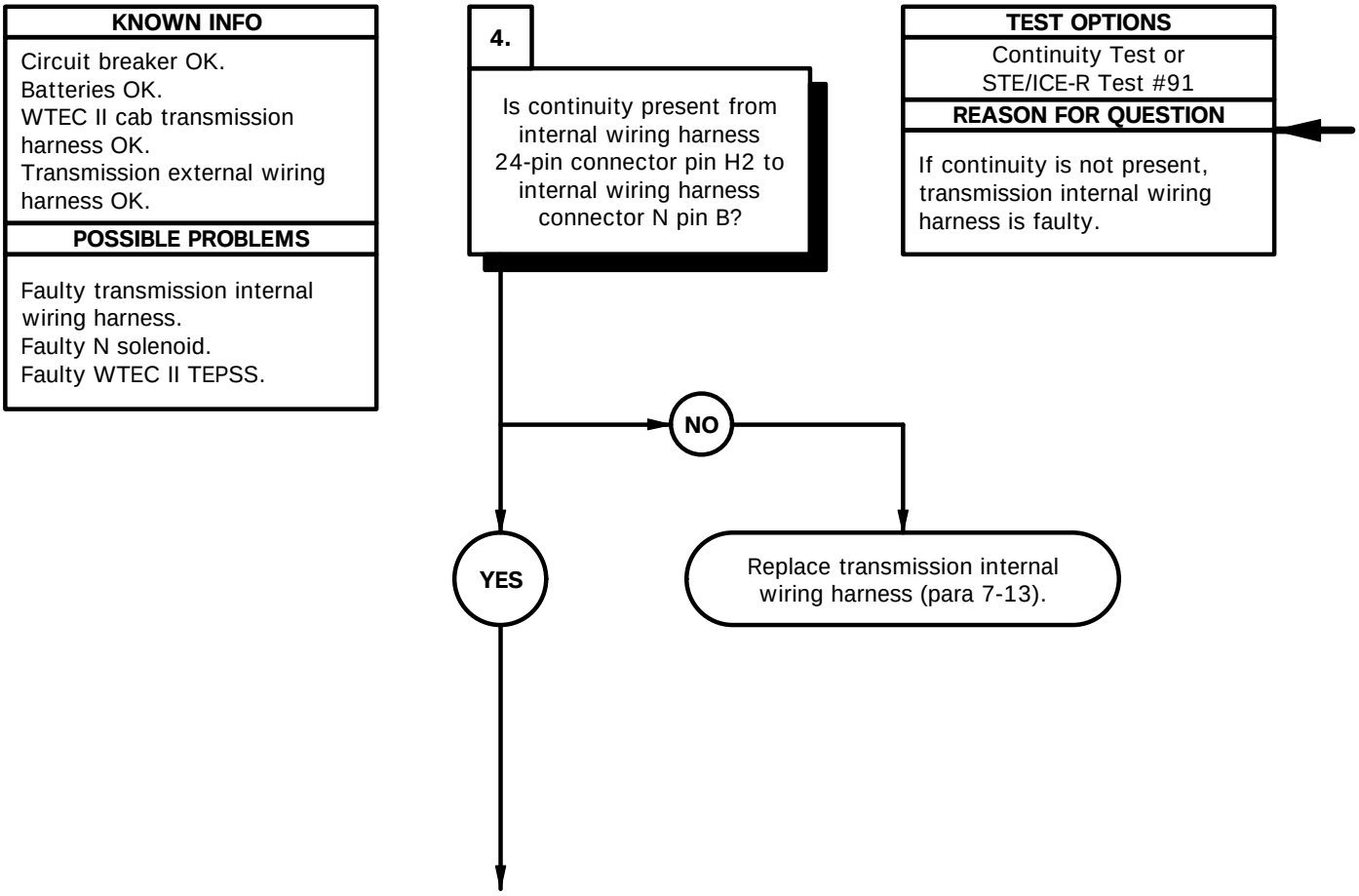
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

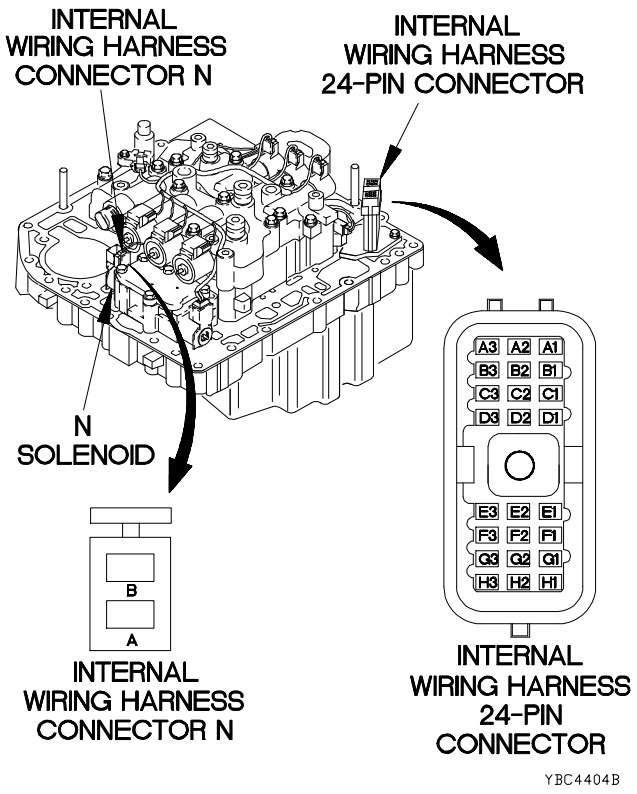


c44. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

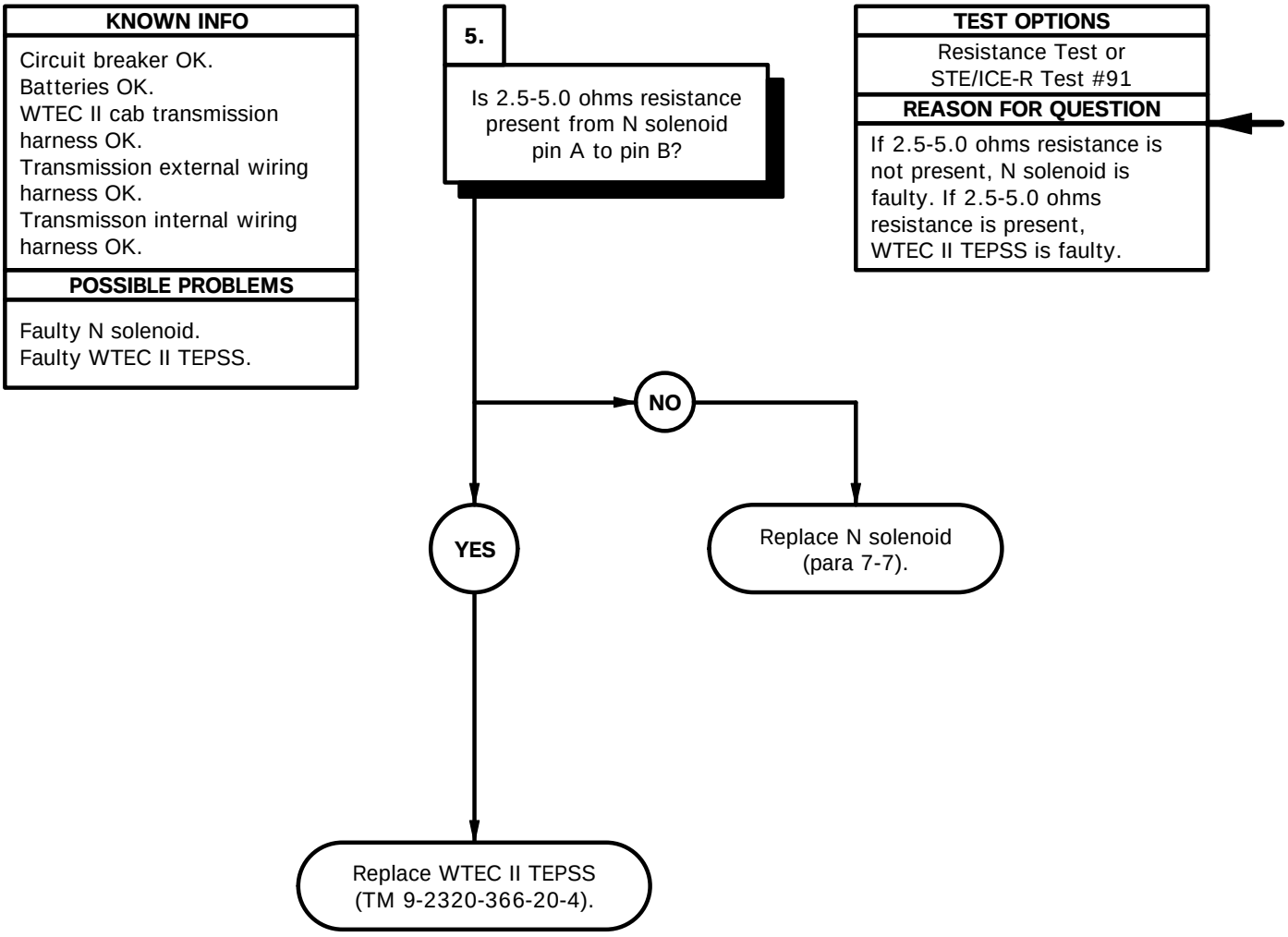


CONTINUITY TEST

(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).

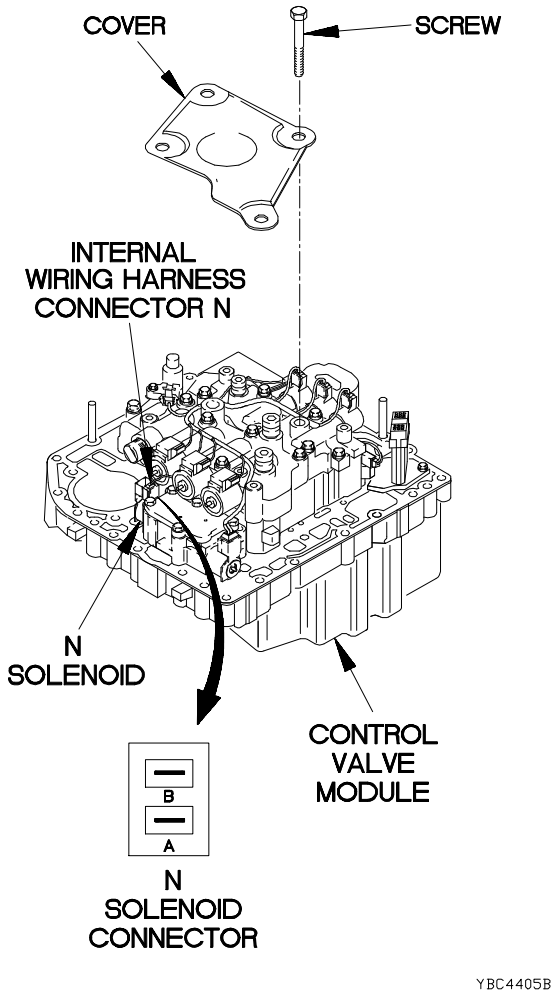


c44. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)



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).



c45. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

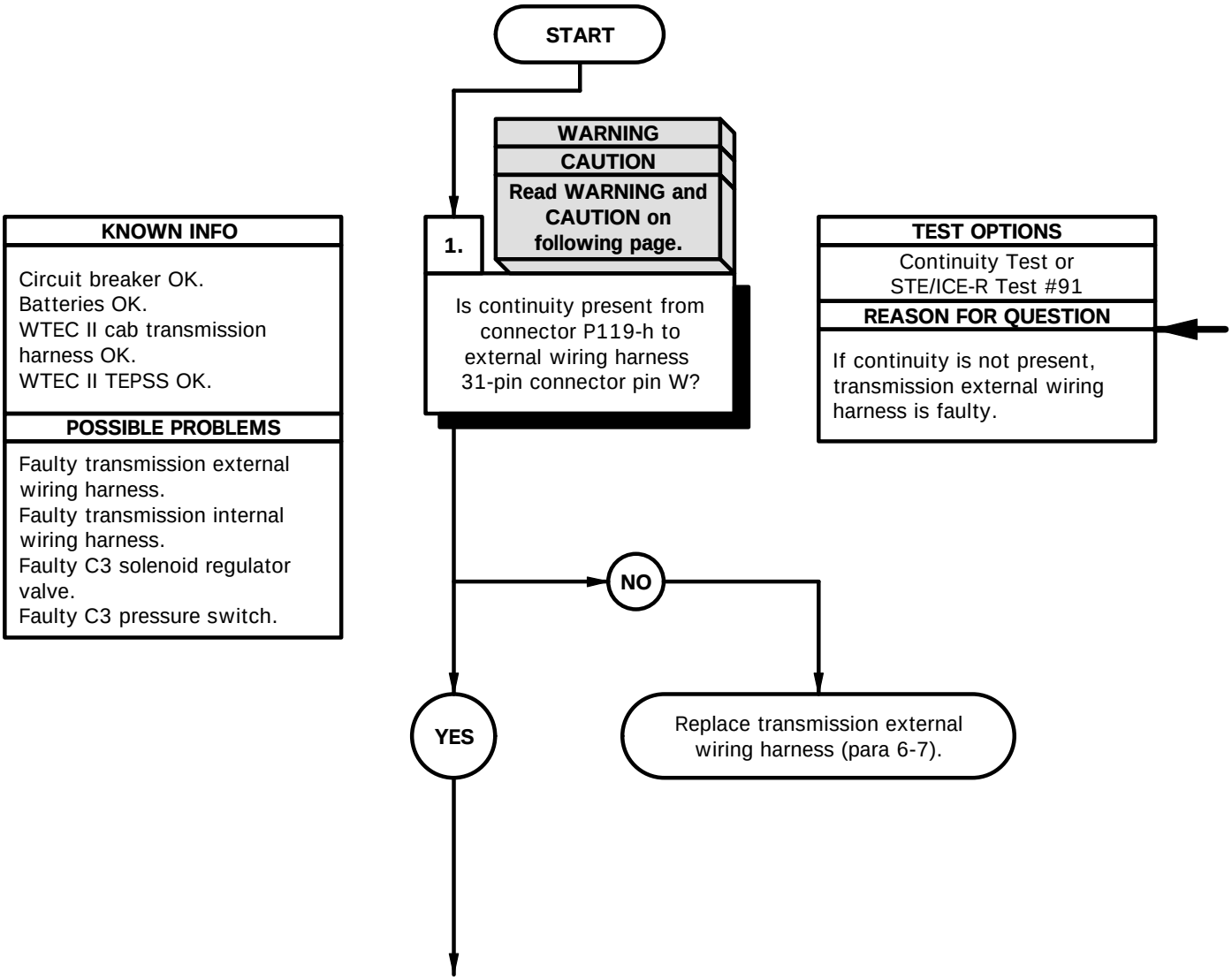
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

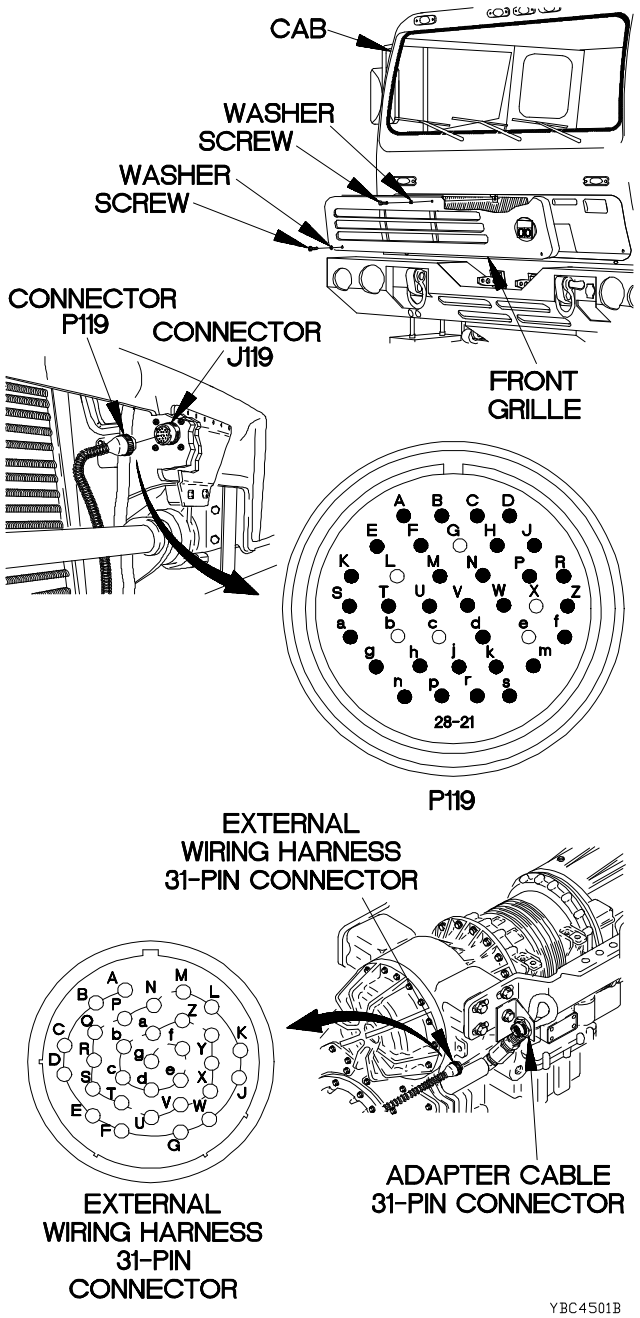
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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 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).



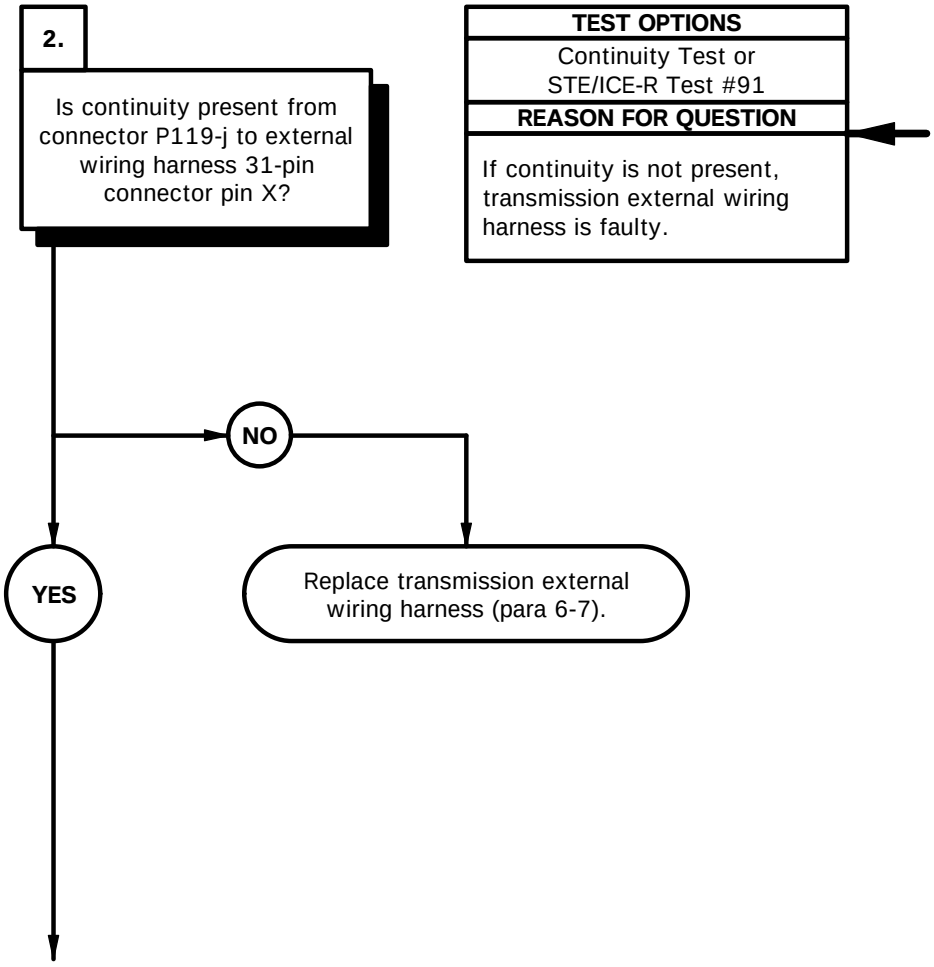
c45. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO

Circuit breaker OK.
Batteries OK.
WTEC II cab transmission harness OK.
WTEC II TEPSS OK.

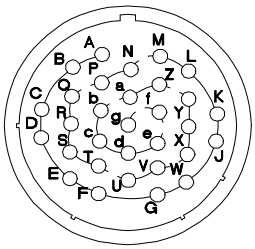
POSSIBLE PROBLEMS

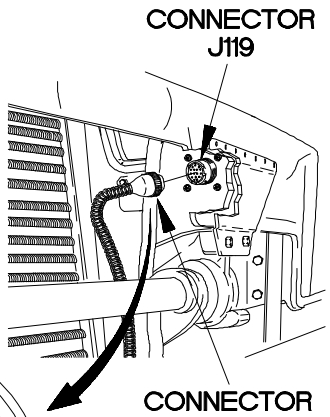
Faulty transmission external wiring harness.
Faulty transmission internal wiring harness.
Faulty C3 solenoid regulator valve.
Faulty C3 pressure switch.

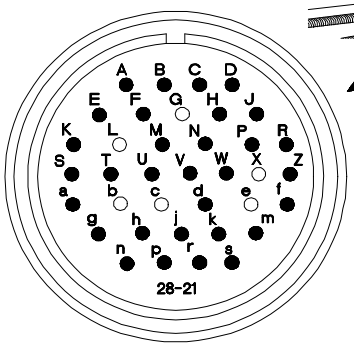


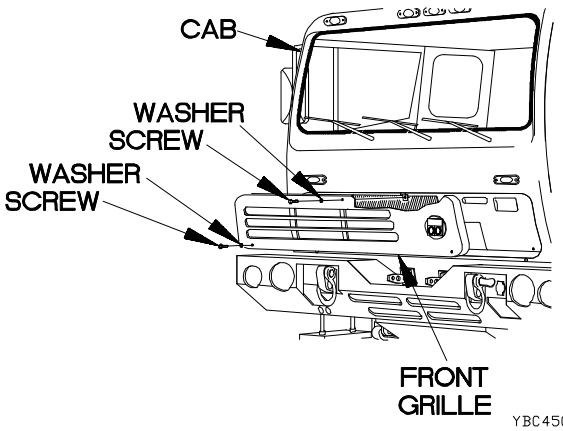
CONTINUITY TEST

(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).

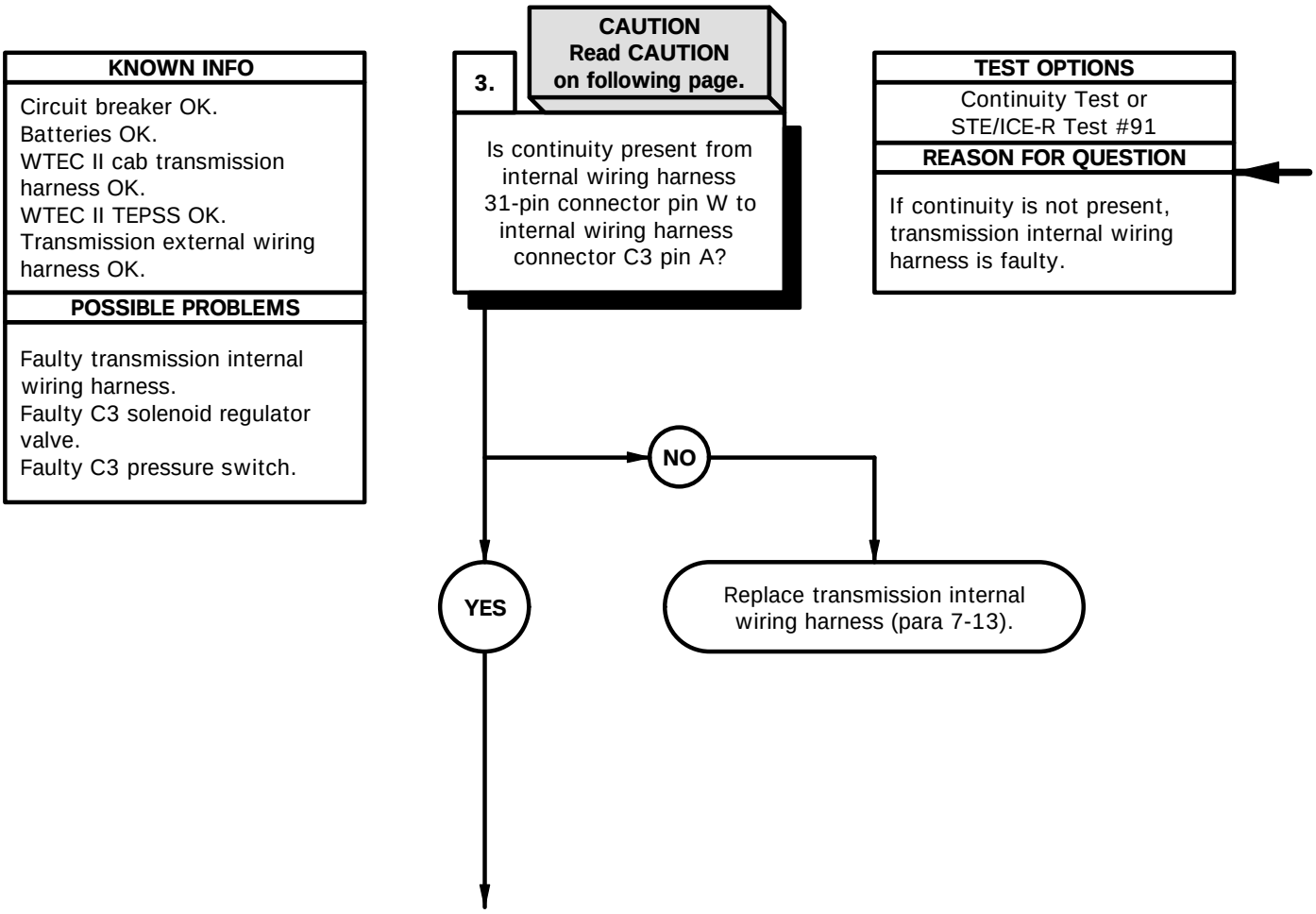








c45. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

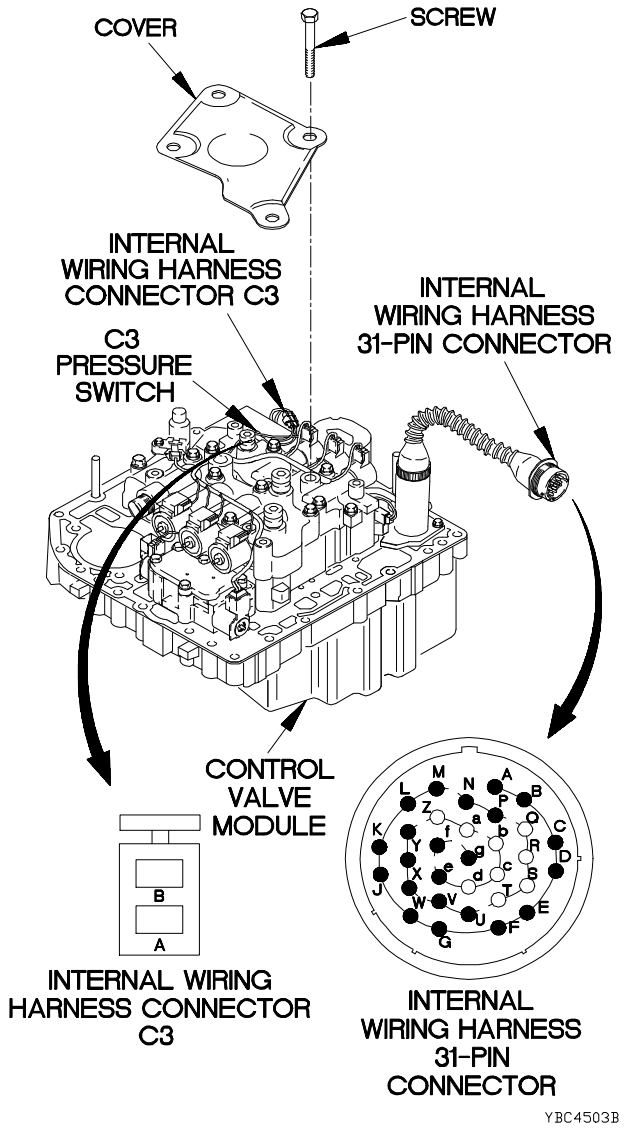


CAUTION

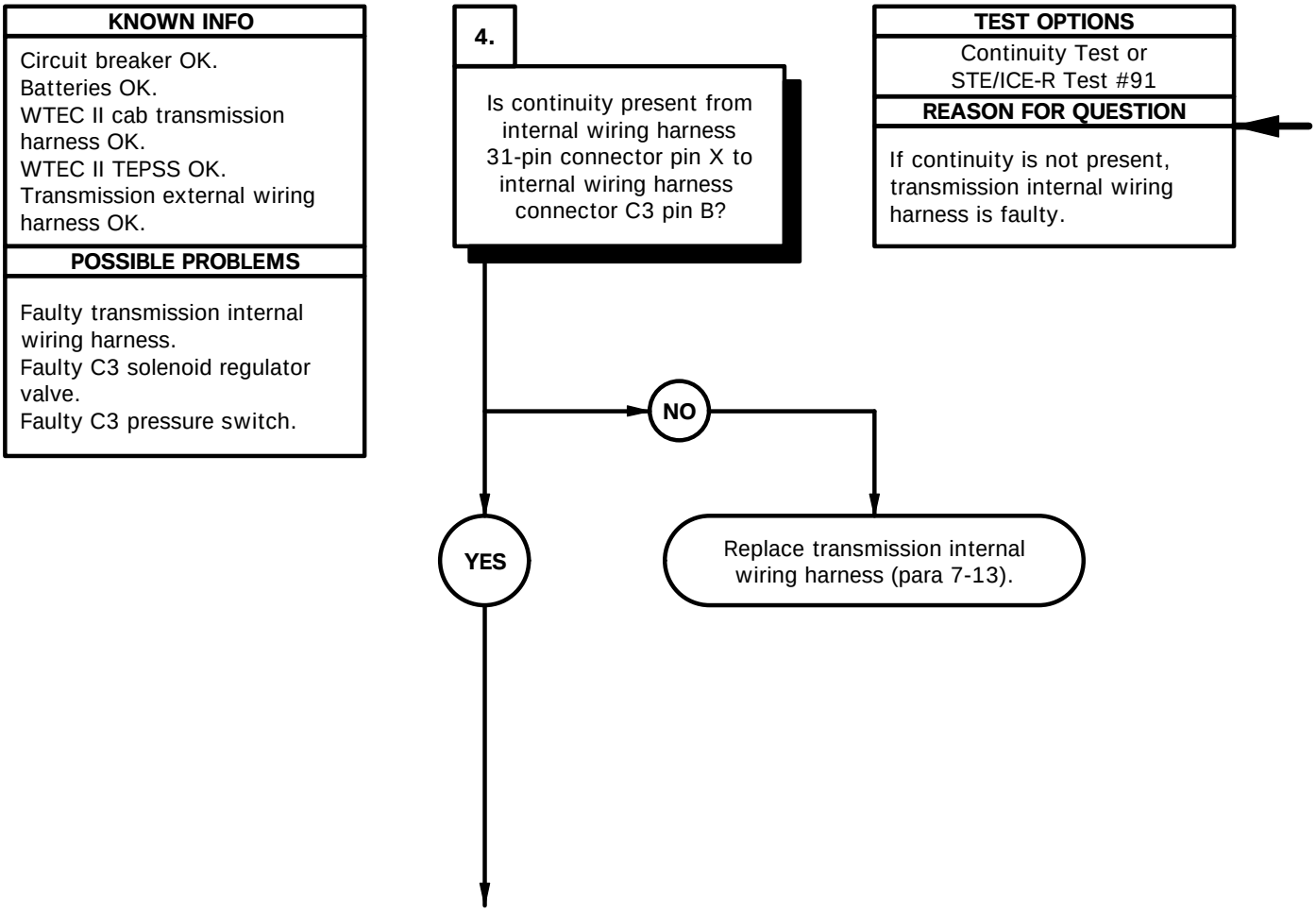
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

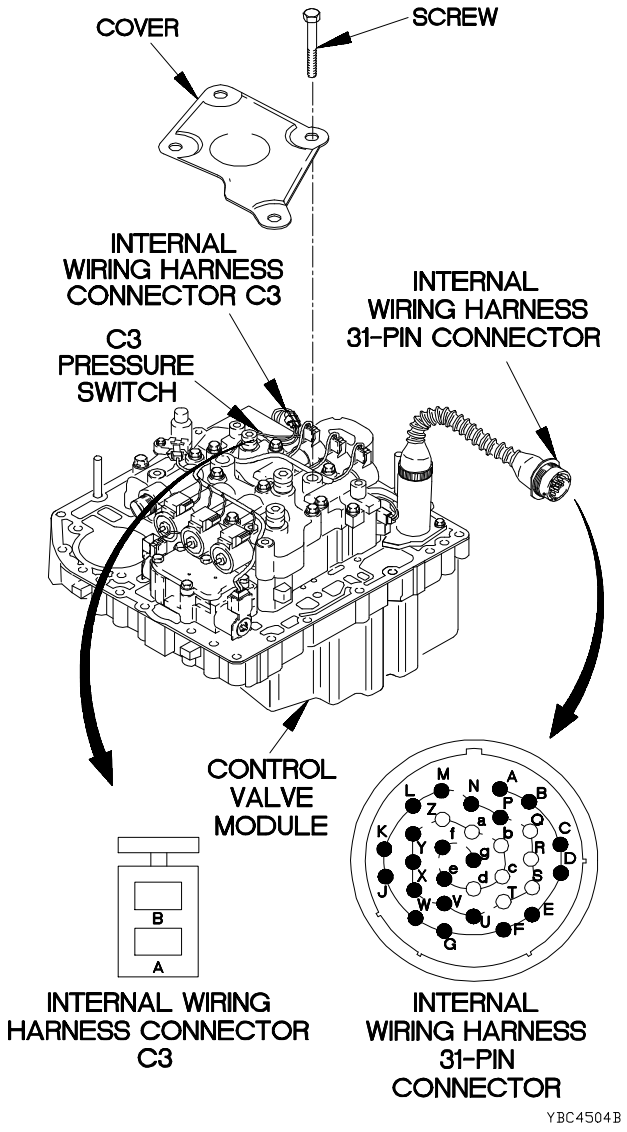


c45. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

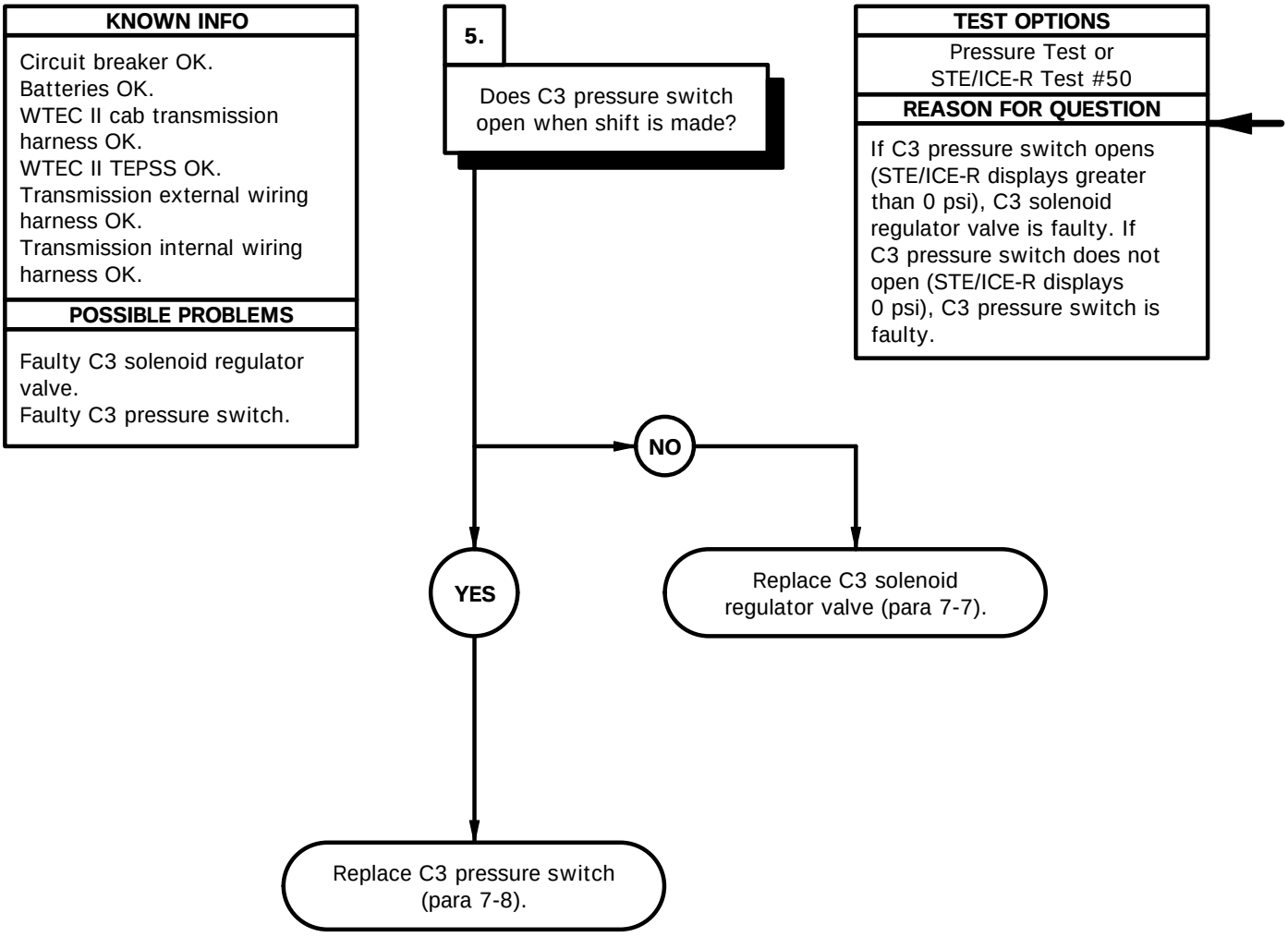


CONTINUITY TEST

(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).



c45. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

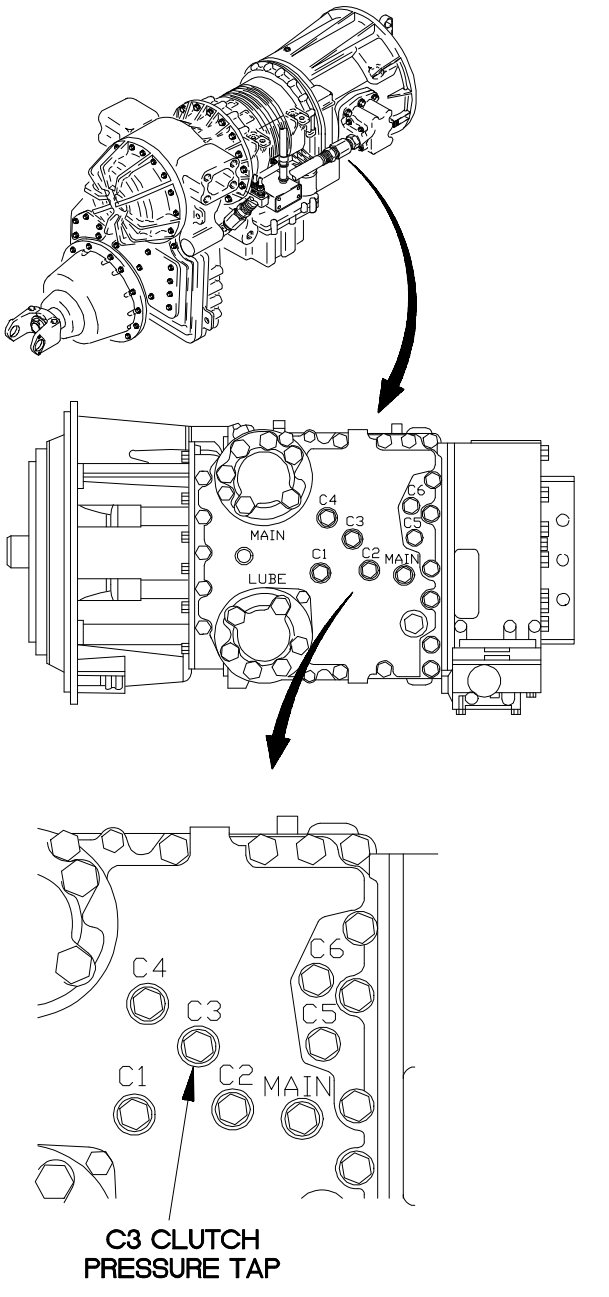


PRESSURE TEST

(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



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

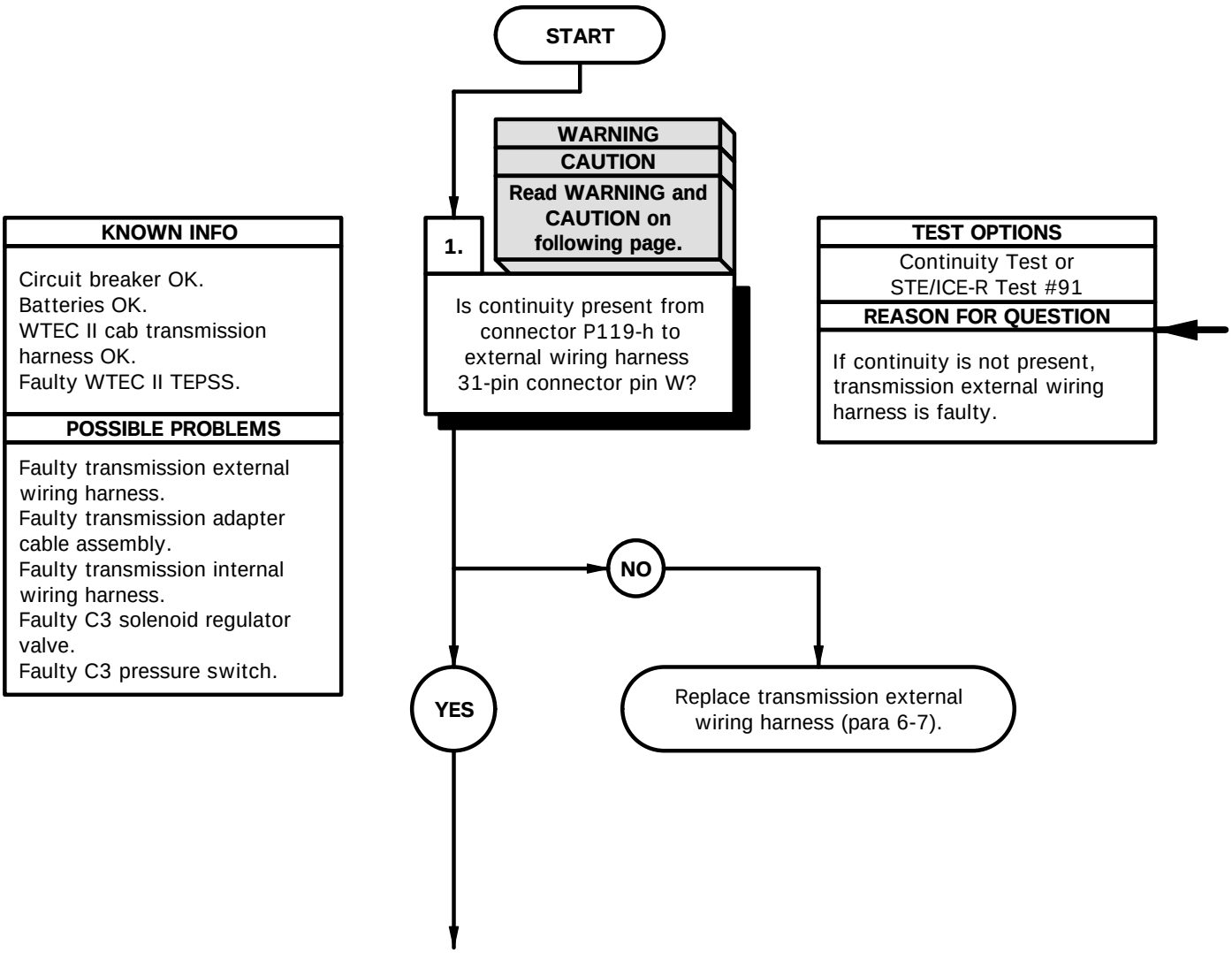
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

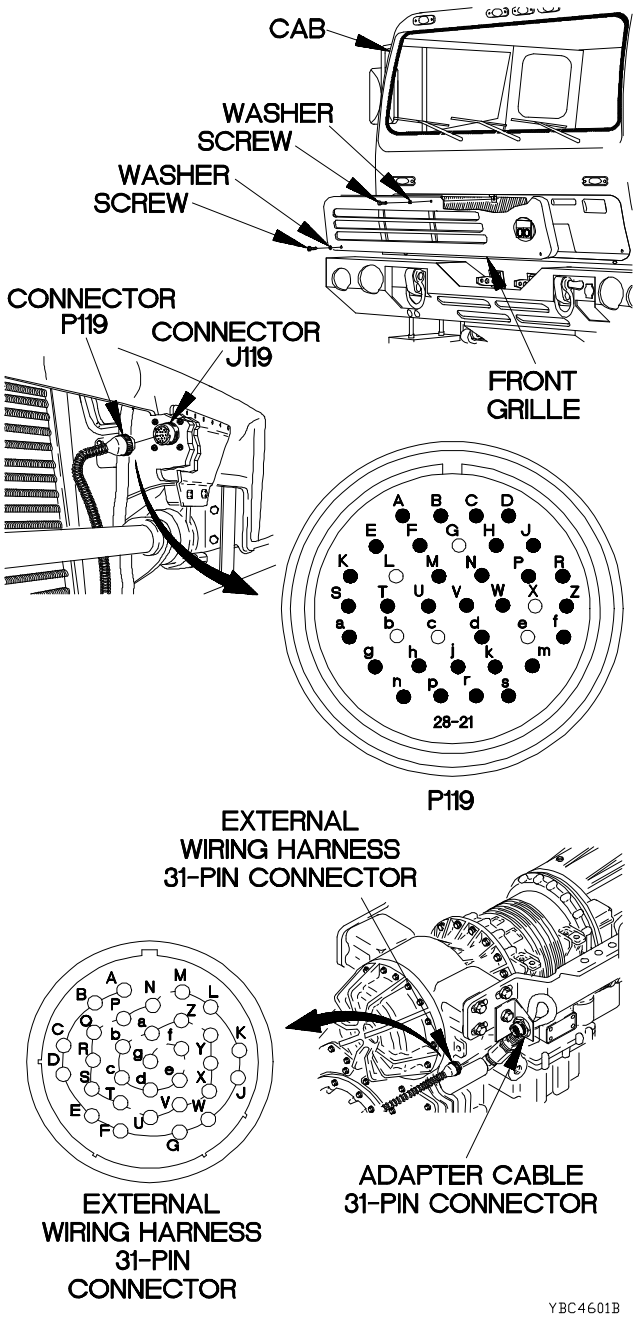
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

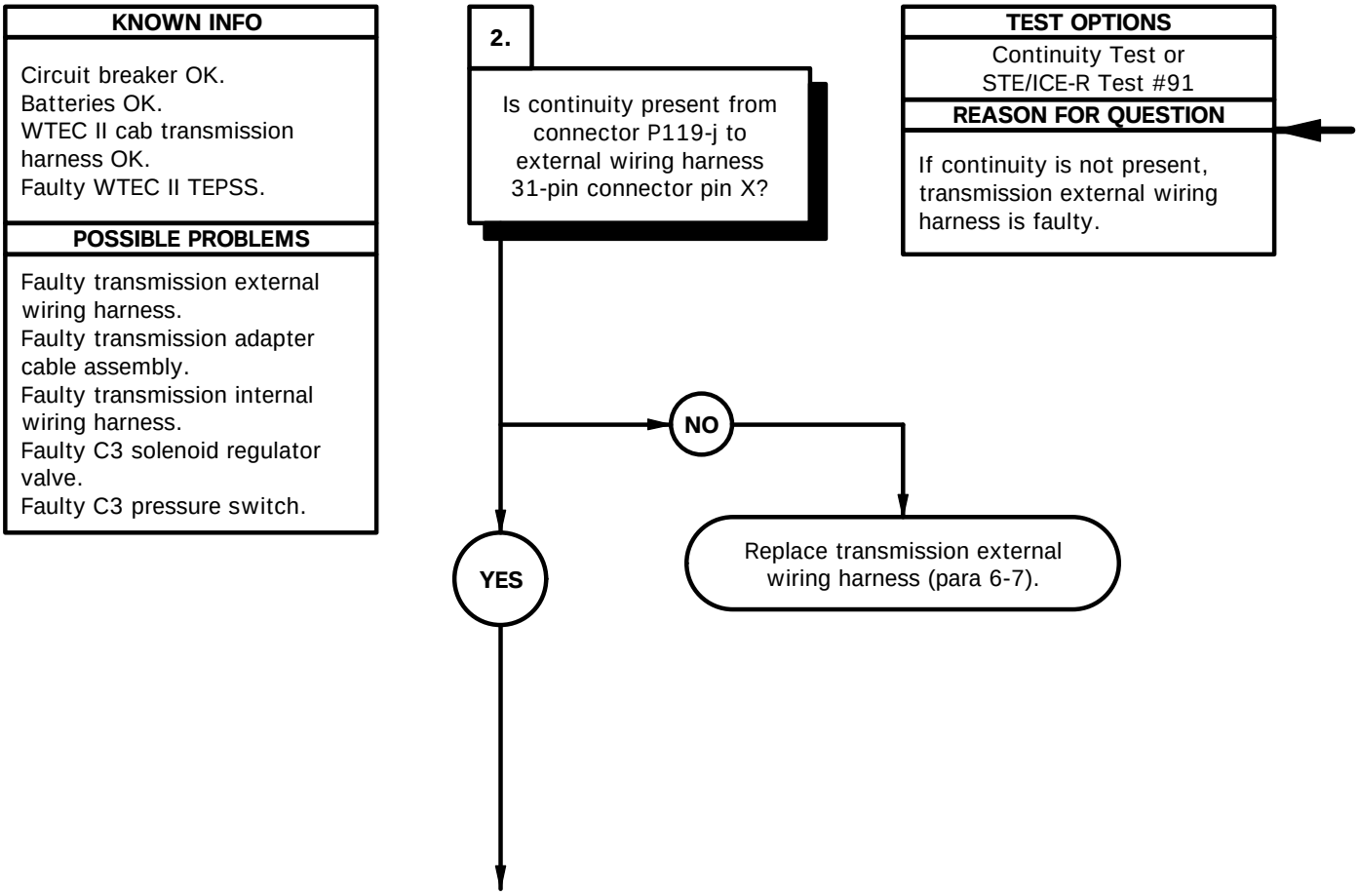
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from adapter cable 31-pin connector.
(6) Set multimeter to ohms.
(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).

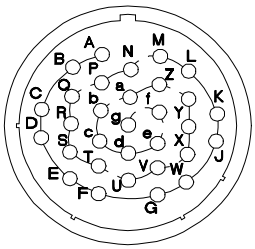


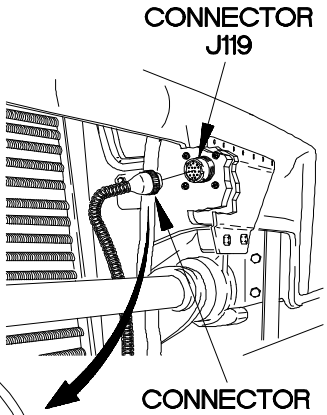
c46. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

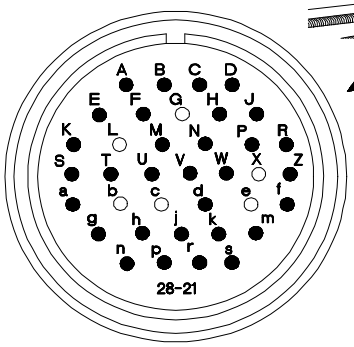


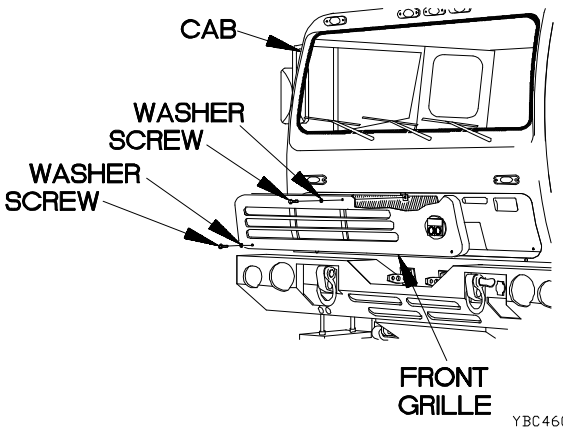
CONTINUITY TEST

(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).

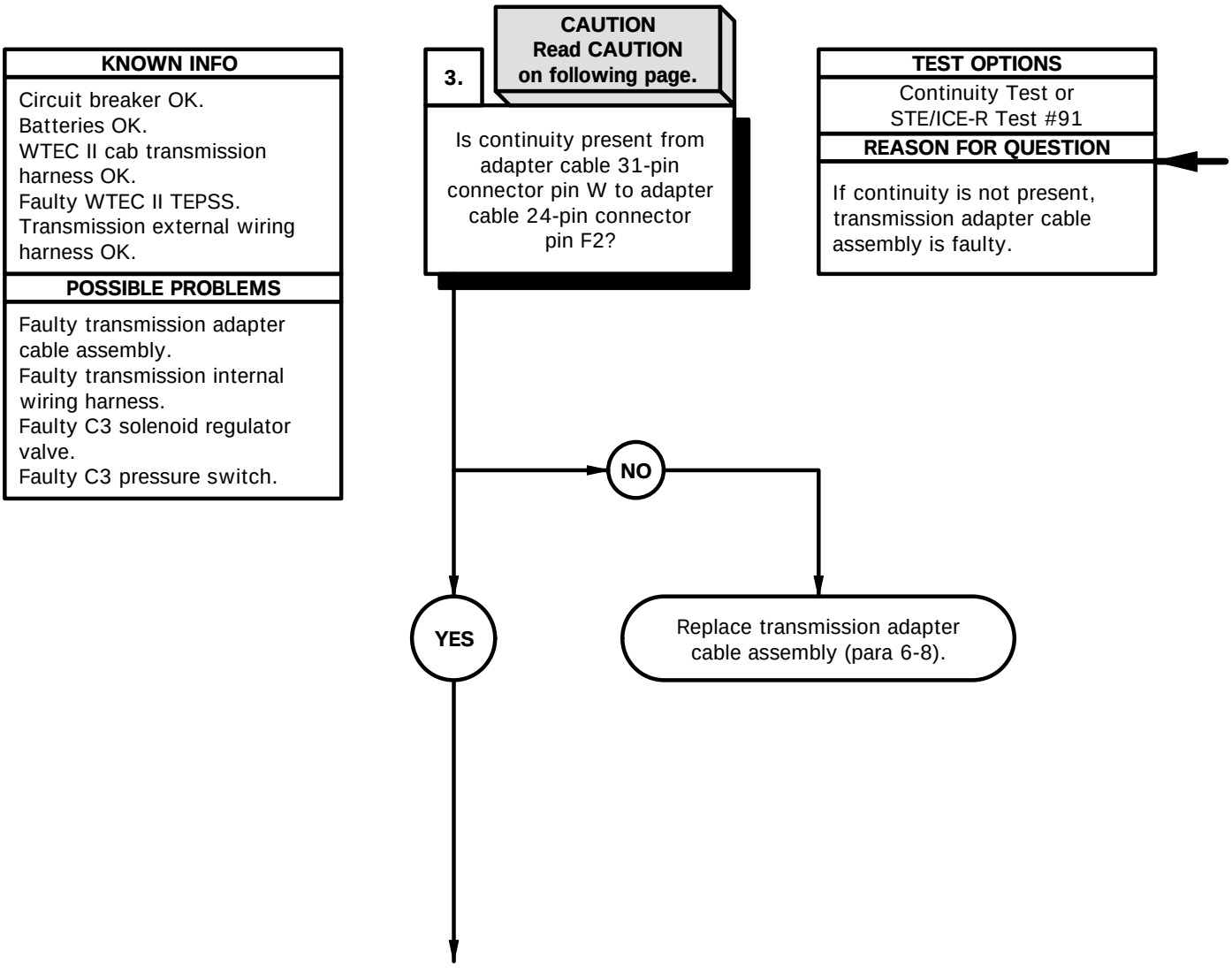








c46. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

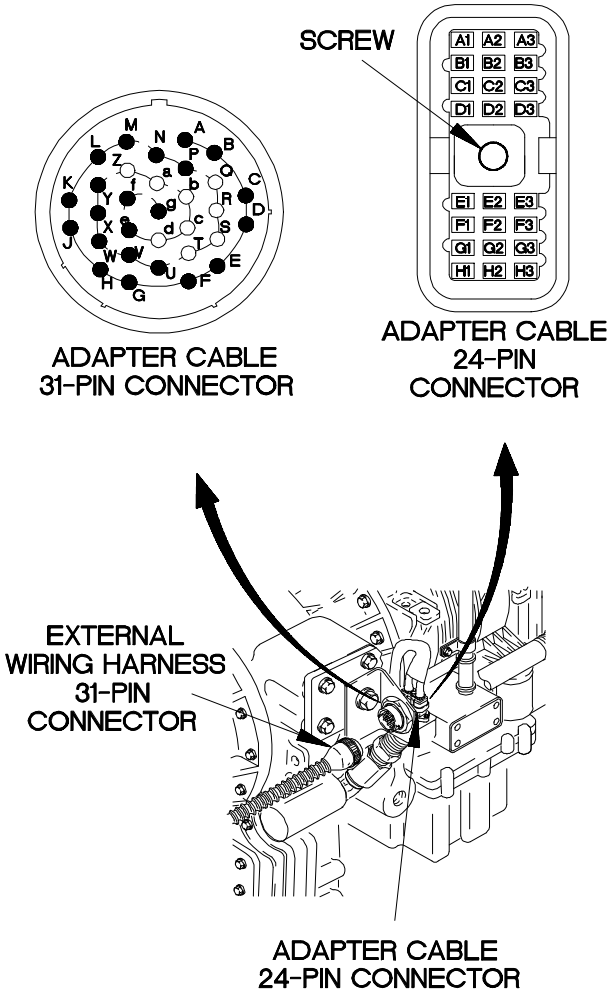


CAUTION

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).



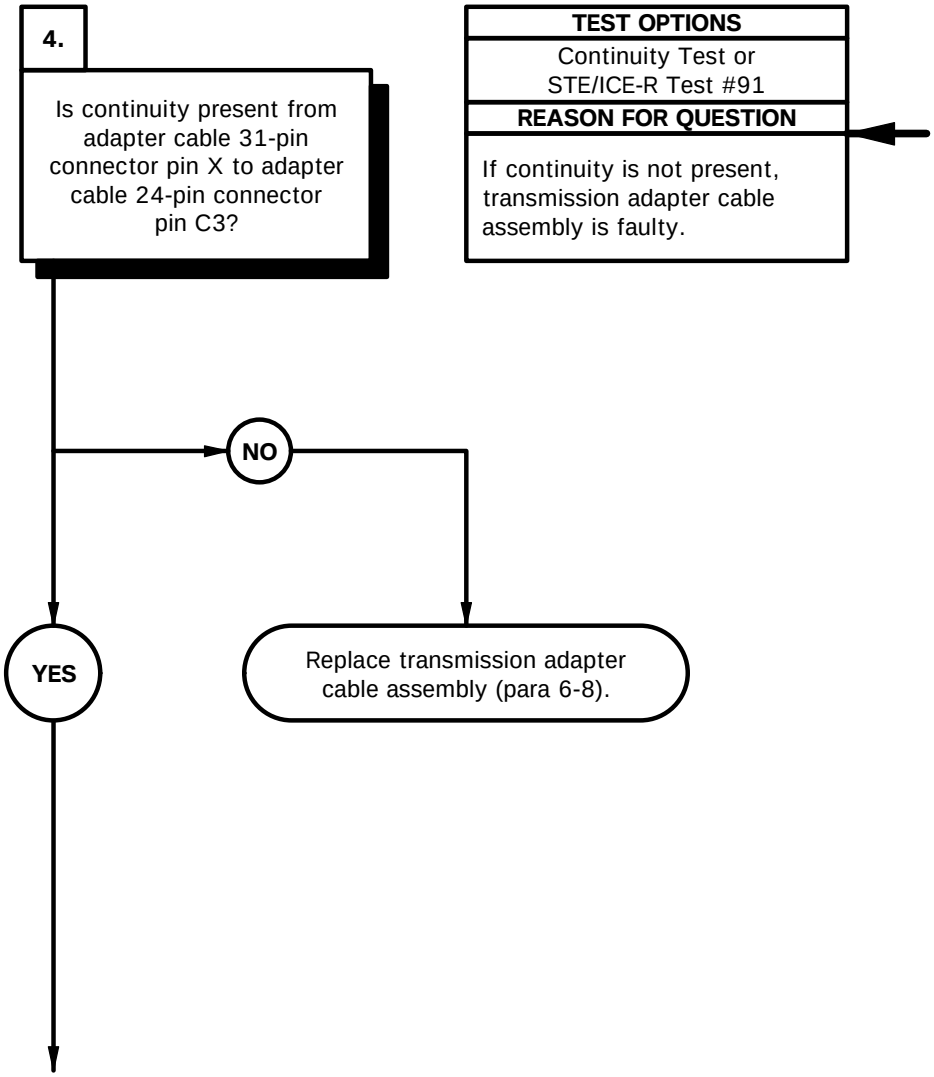
c46. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

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

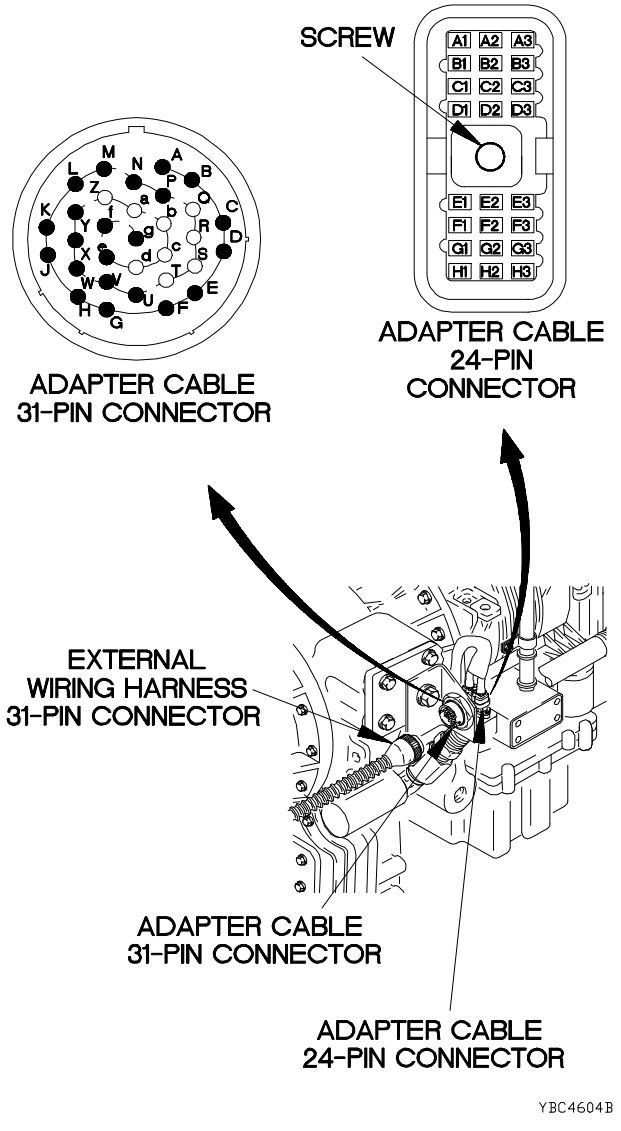
Continuity Test or
STE/ICE-R Test #91

REASON FOR QUESTION

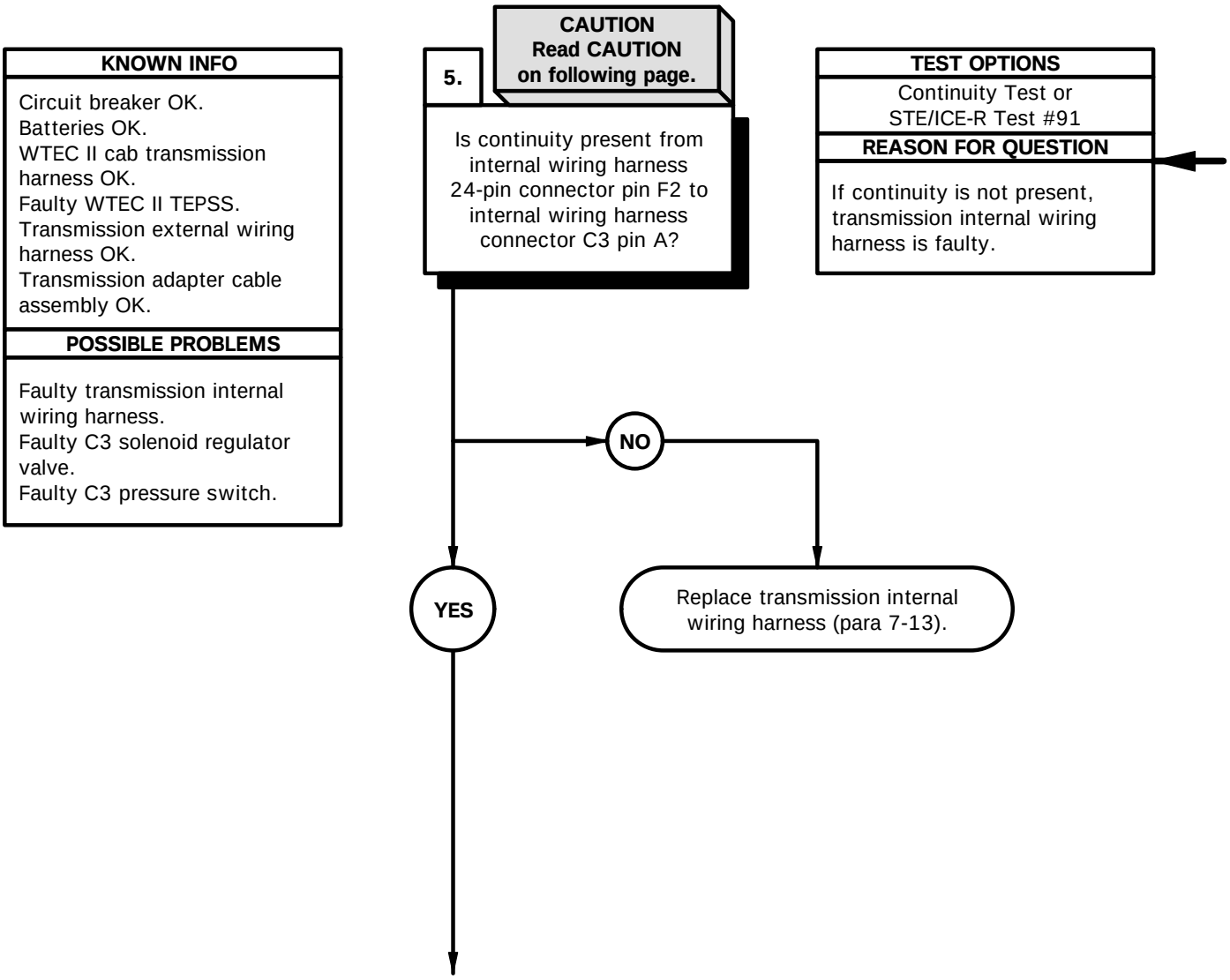
If continuity is not present, transmission adapter cable assembly is faulty.

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.



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)

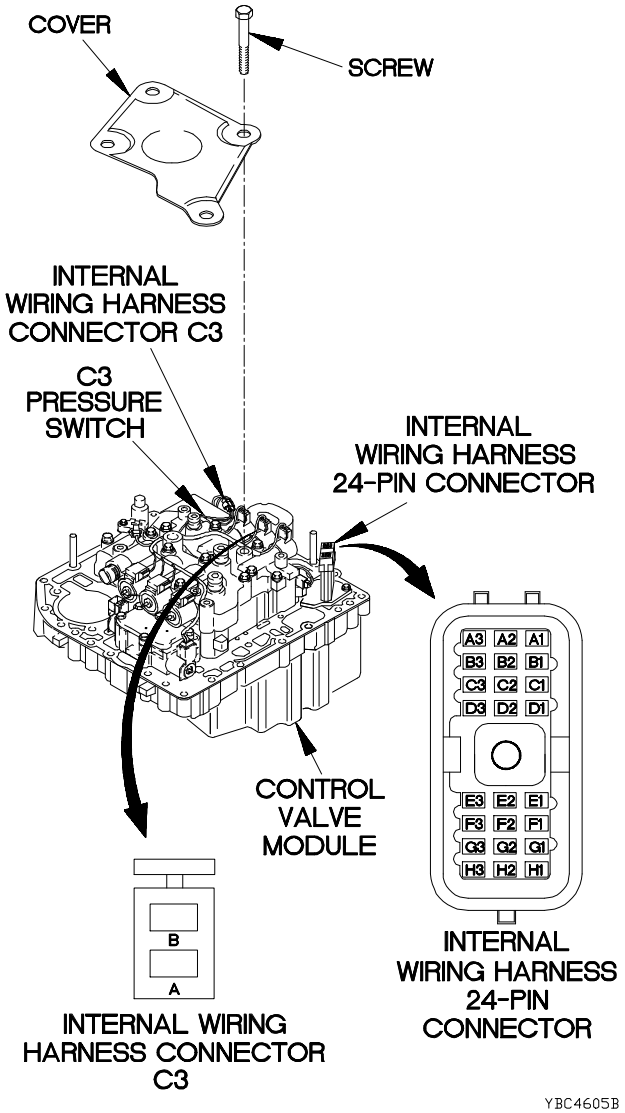


CAUTION

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).



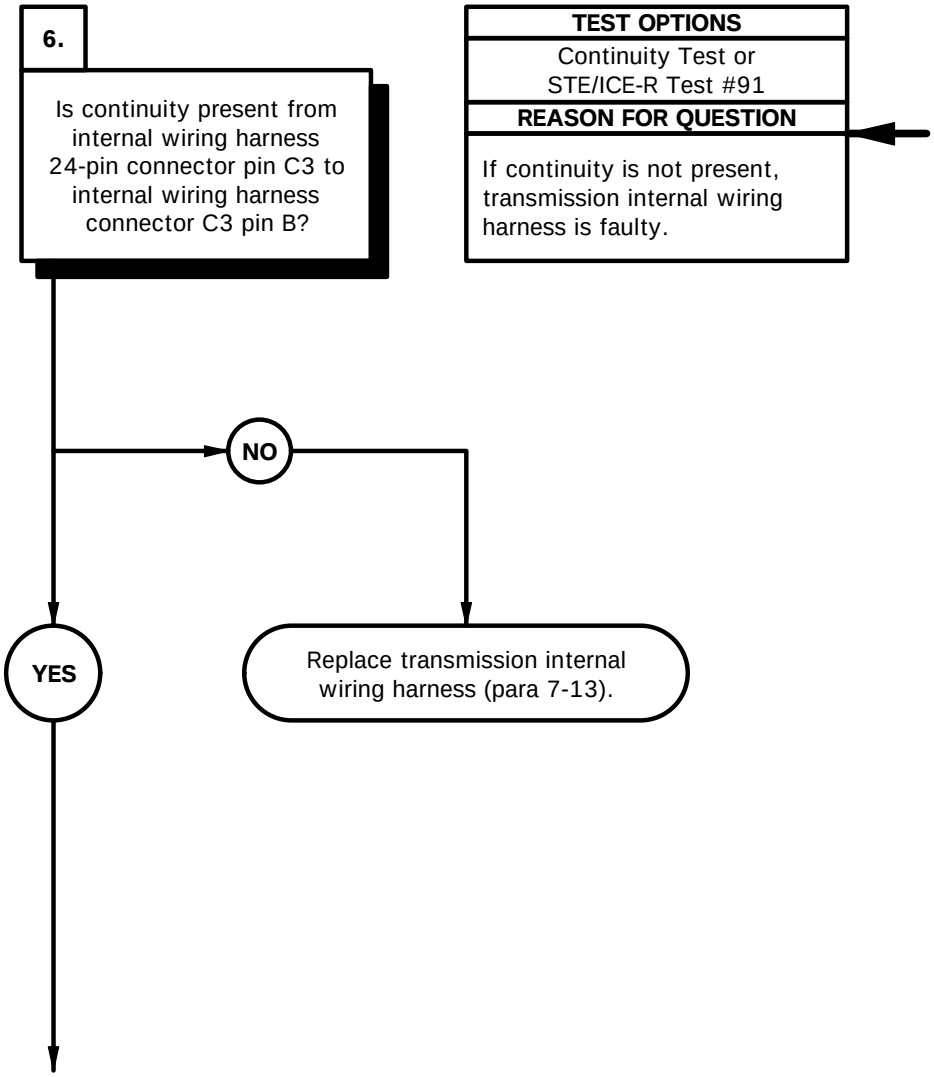
c46. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

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.

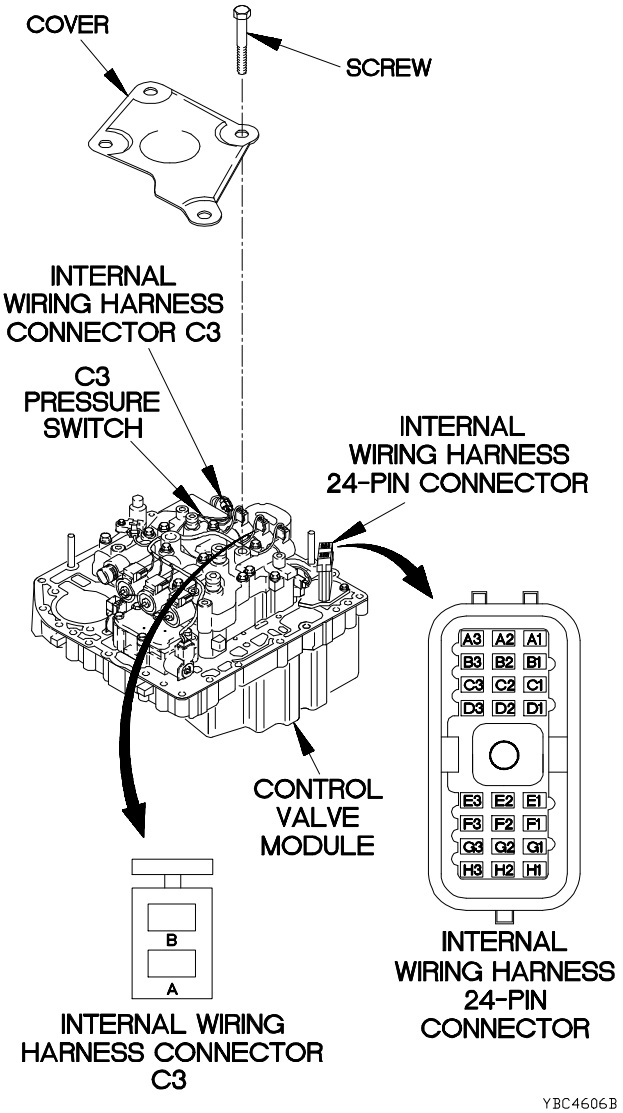
POSSIBLE PROBLEMS

Faulty transmission internal wiring harness.
Faulty C3 solenoid regulator valve.
Faulty C3 pressure switch.

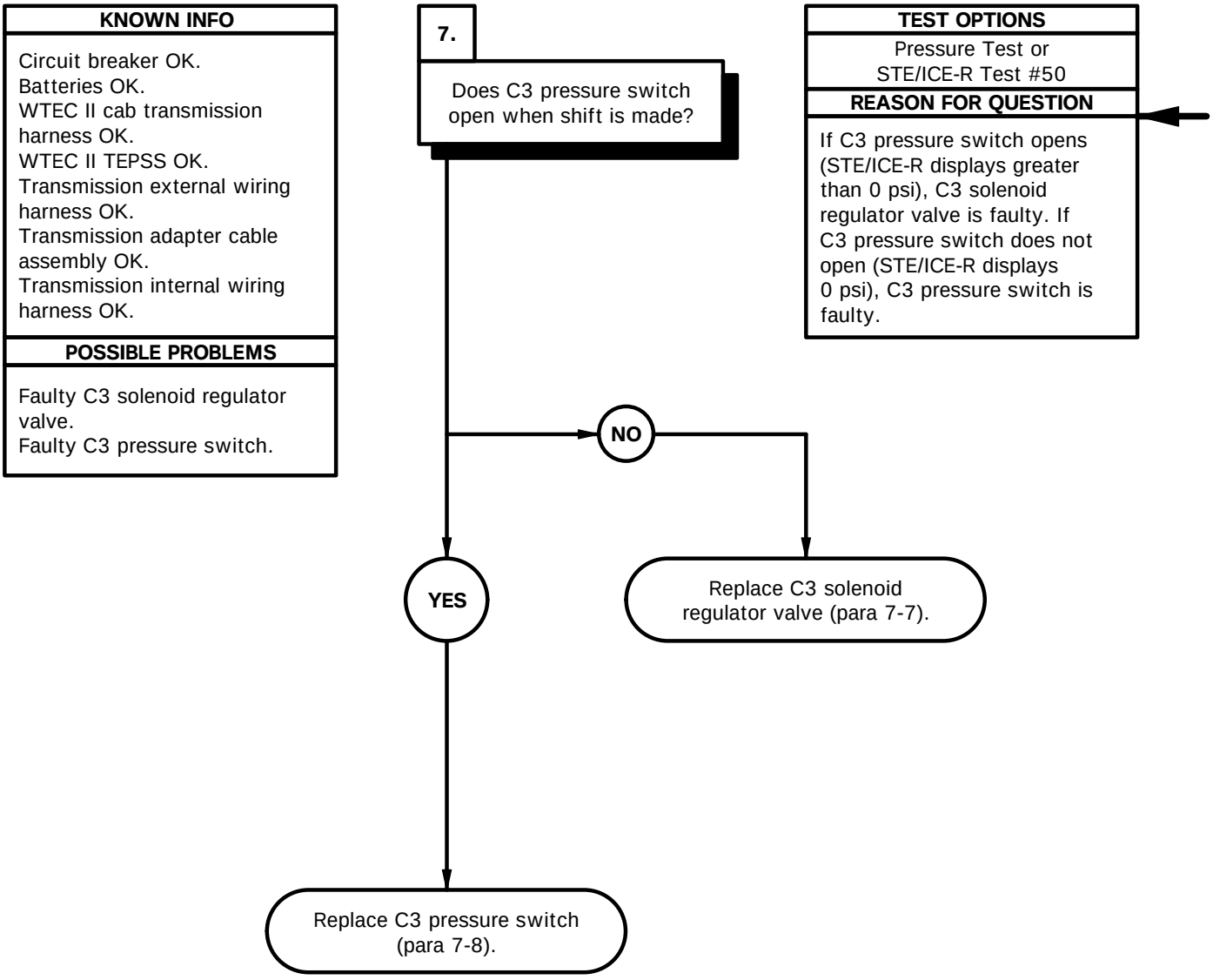


CONTINUITY TEST

(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).



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)

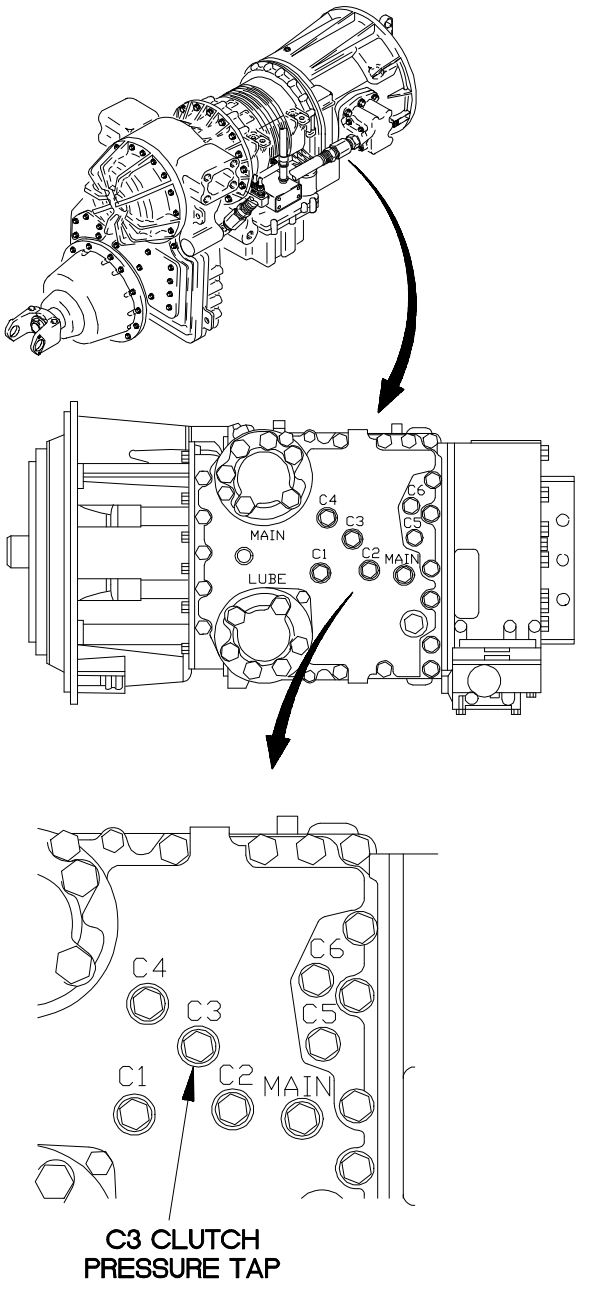


PRESSURE TEST

(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



c47. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369)

INITIAL SETUP

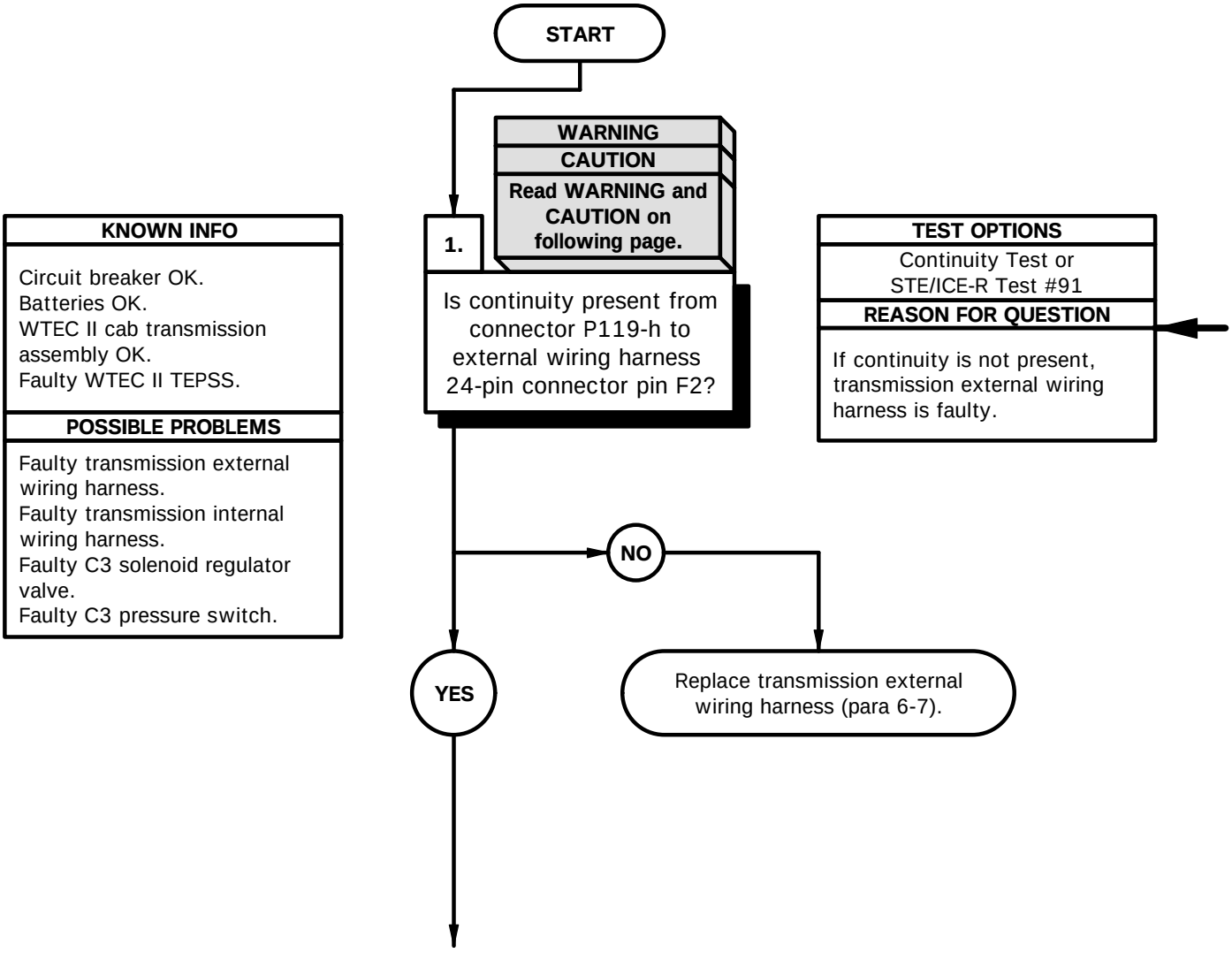
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

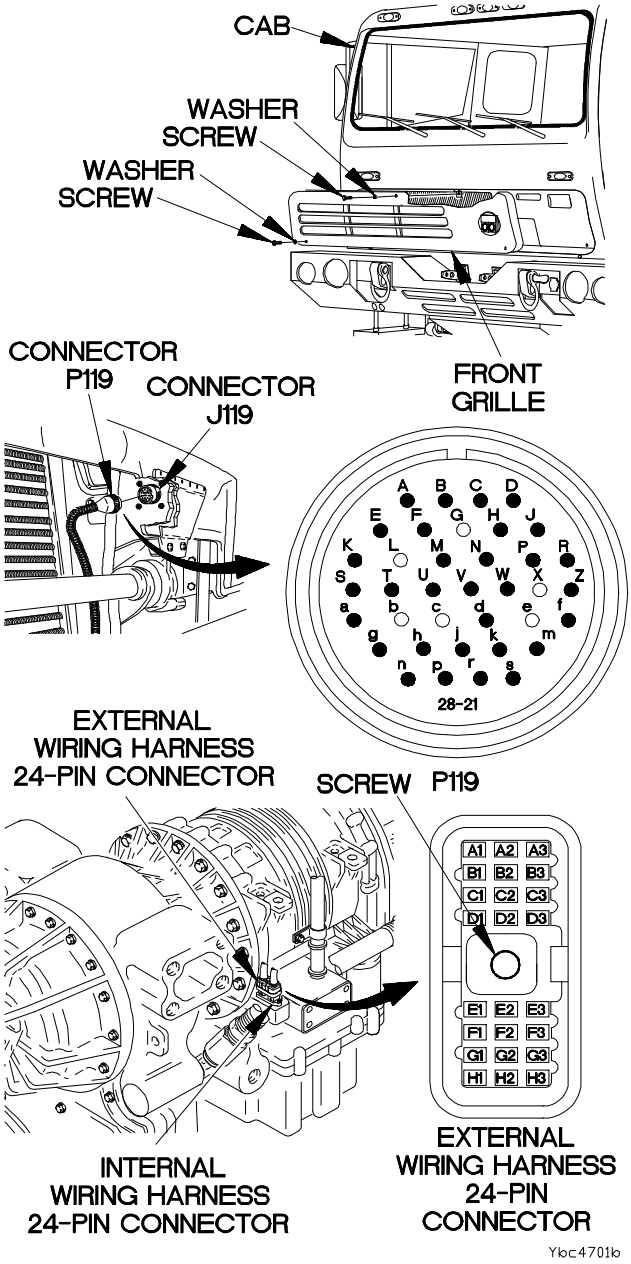
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

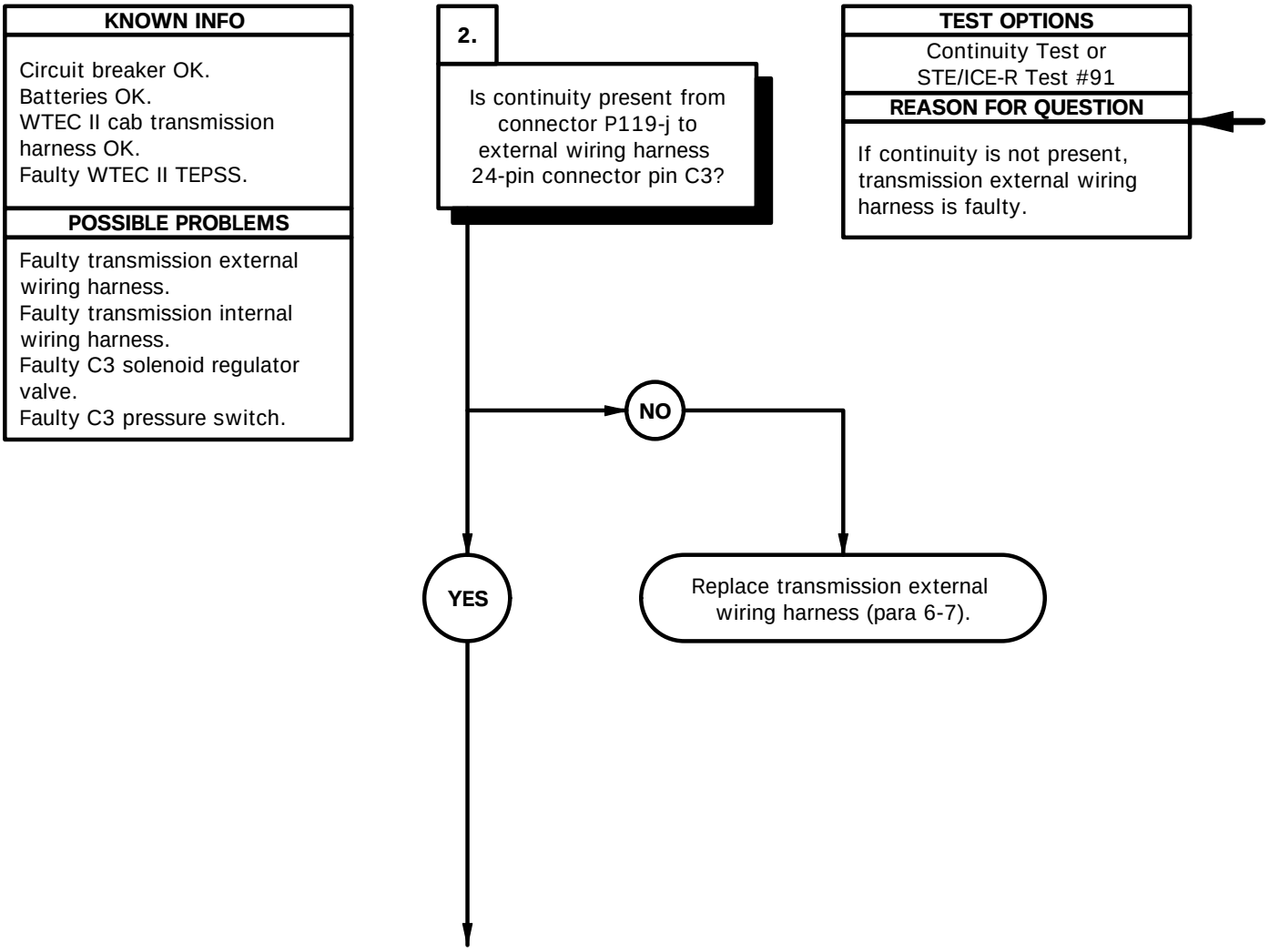
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Loosen screw in external wiring 24-pin connector.
(6) Disconnect external wiring harness 24-pin connector from internal 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).

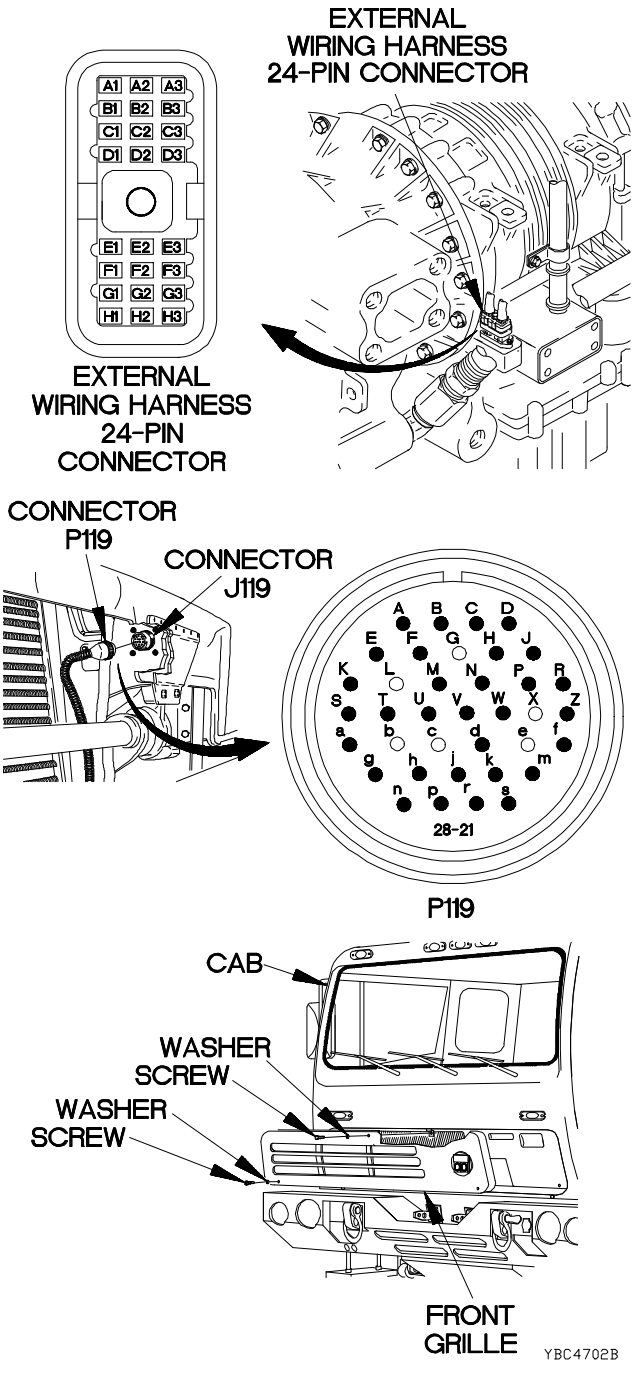


c47. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

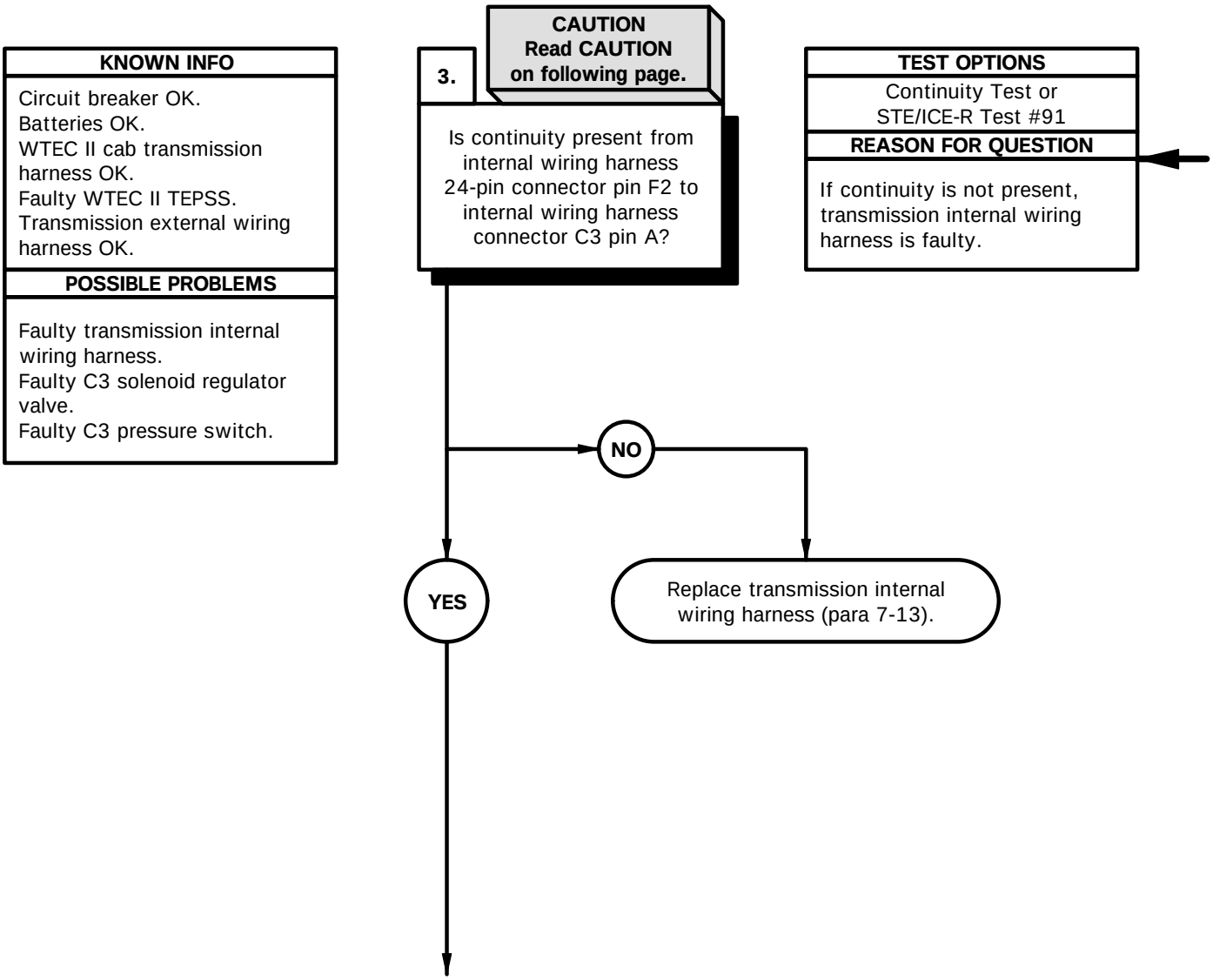


CONTINUITY TEST

(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).



c47. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

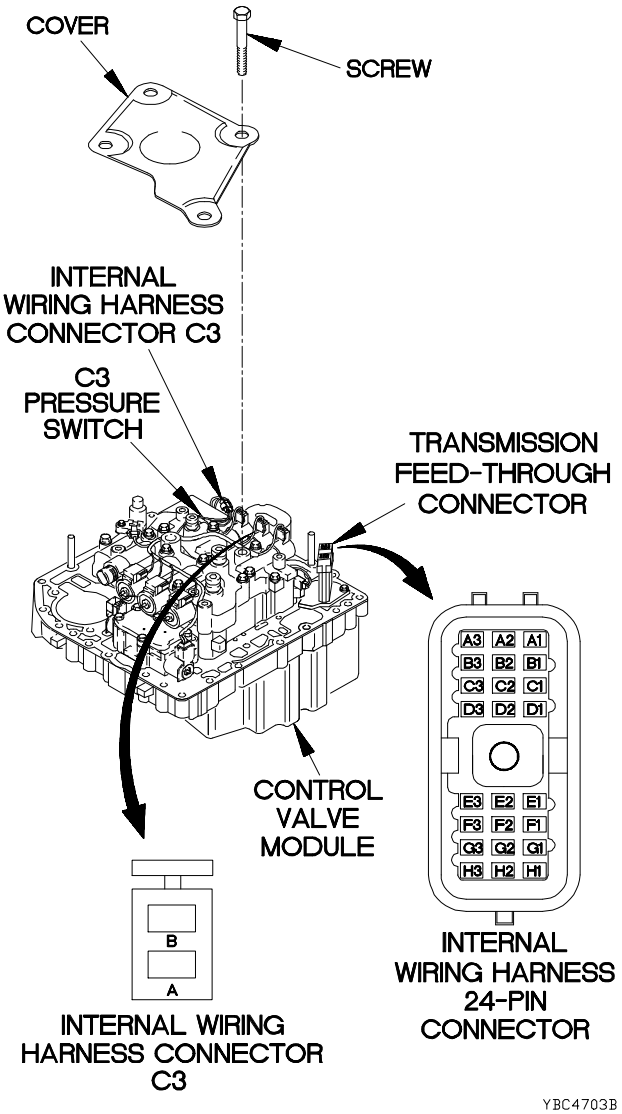


CAUTION

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).



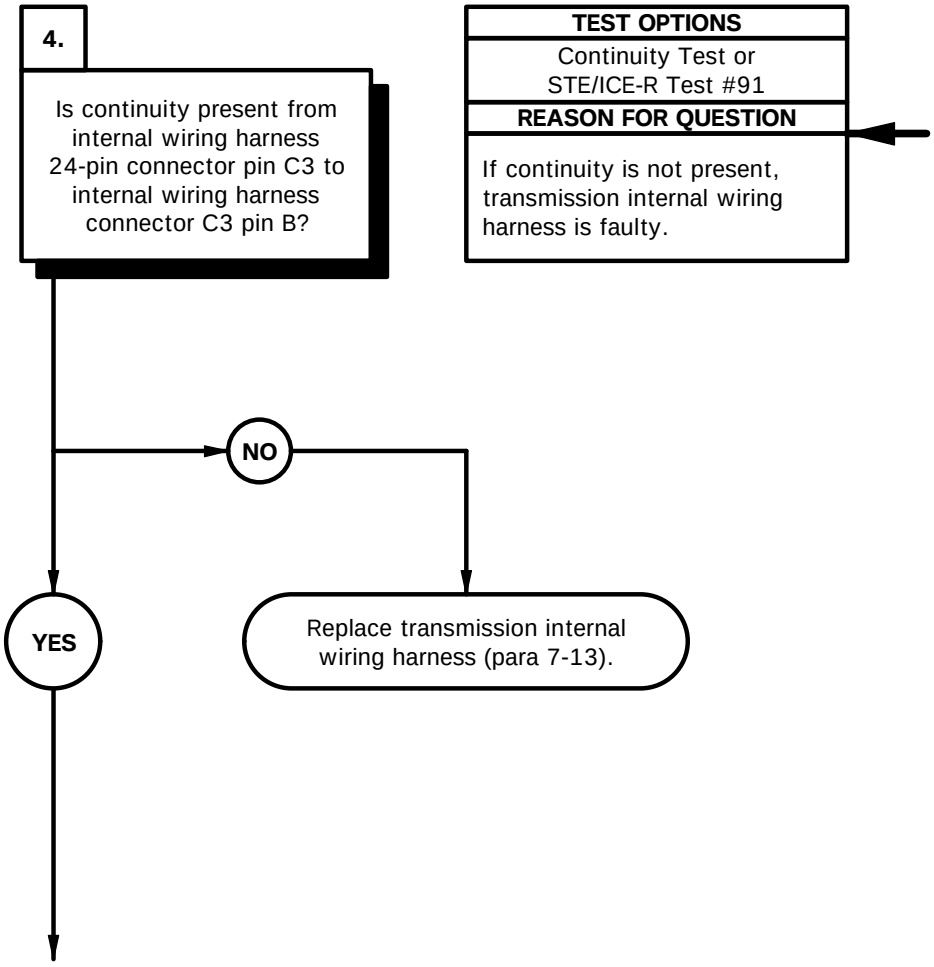
c47. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

KNOWN INFO

Circuit breaker OK.
Batteries OK.
WTEC II cab transmission harness OK.
Faulty WTEC II TEPSS.
Transmission external wiring harness OK.

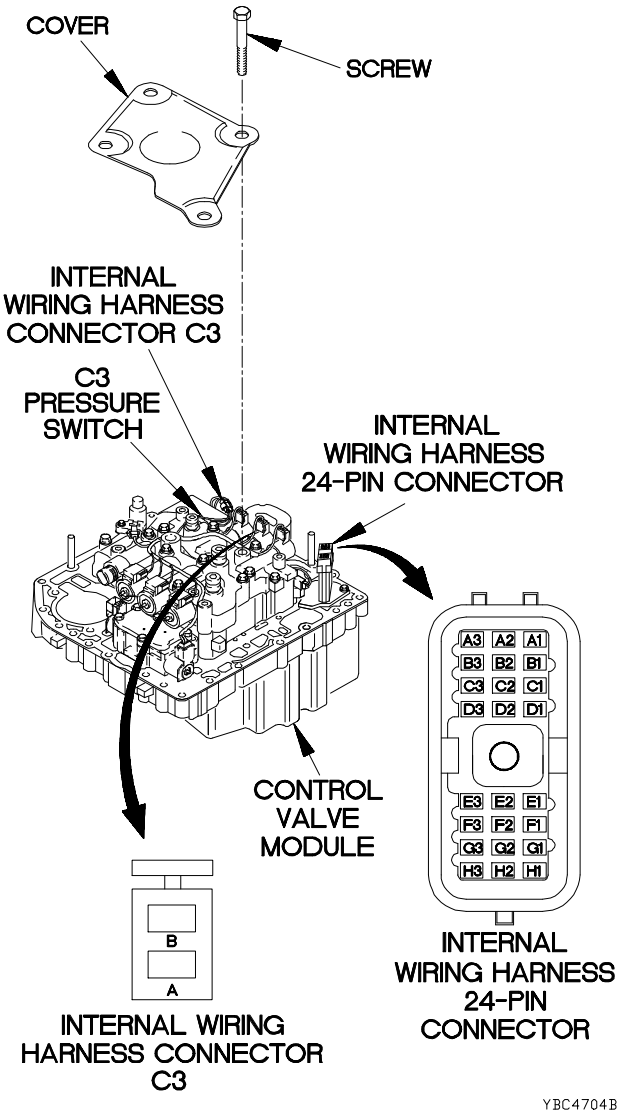
POSSIBLE PROBLEMS

Faulty transmission internal wiring harness.
Faulty C3 solenoid regulator valve.
Faulty C3 pressure switch.

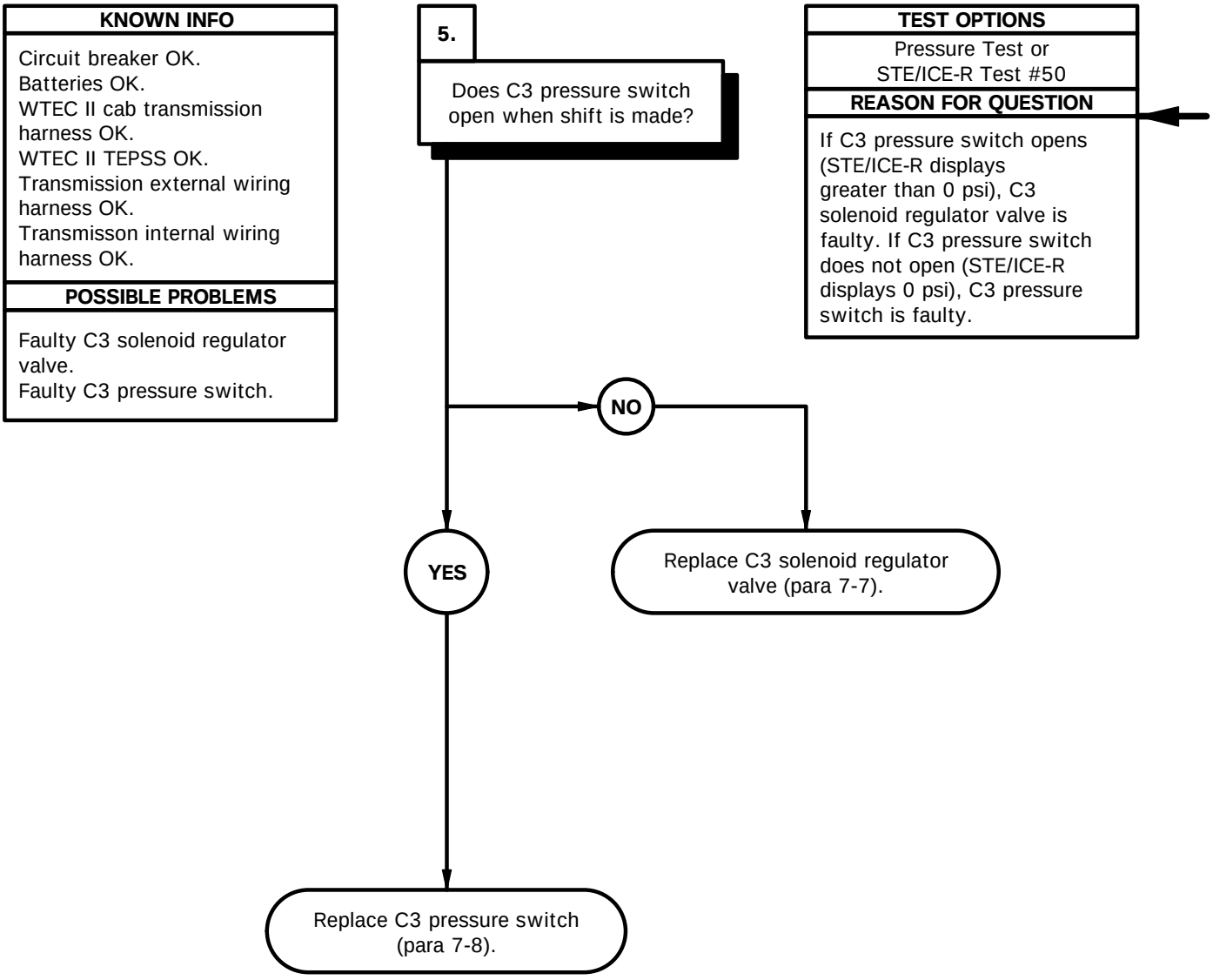


CONTINUITY TEST

(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).



c47. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

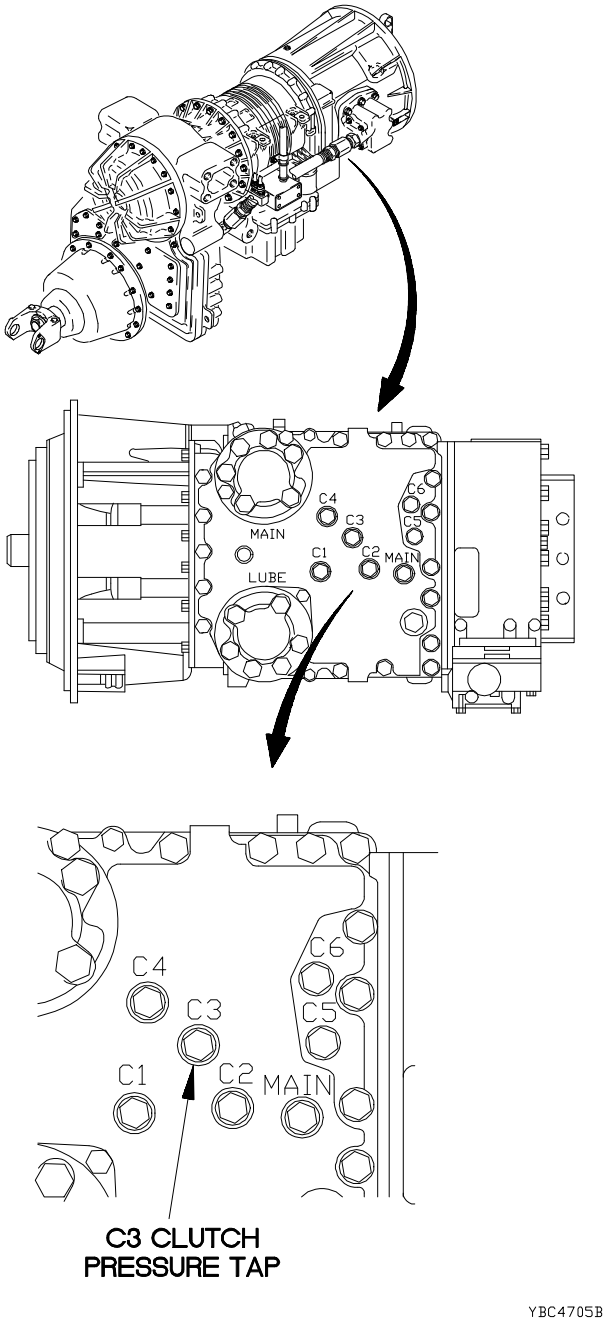


PRESSURE TEST

(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



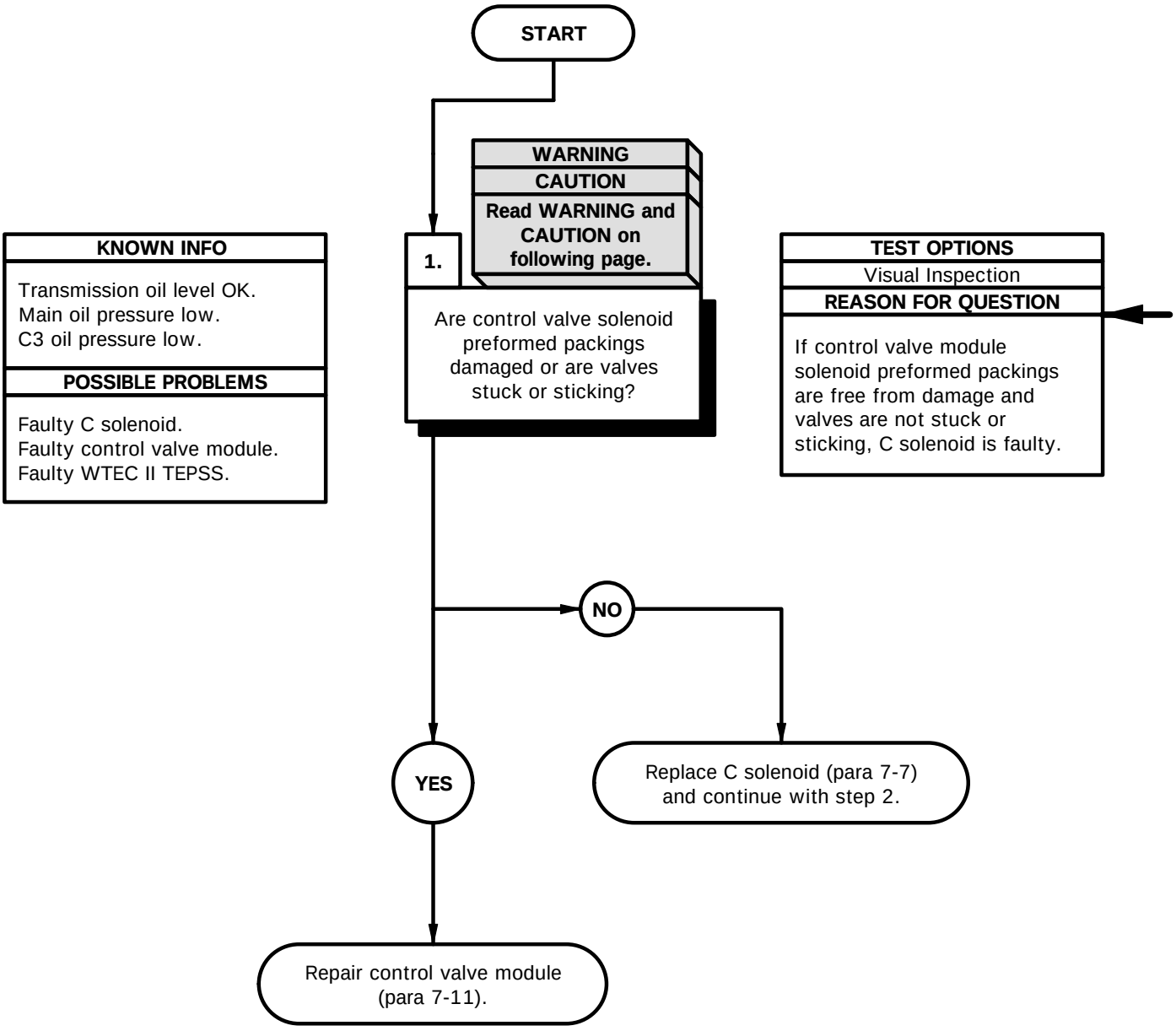
c47A. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 55 AND ANY SUB CODE

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)



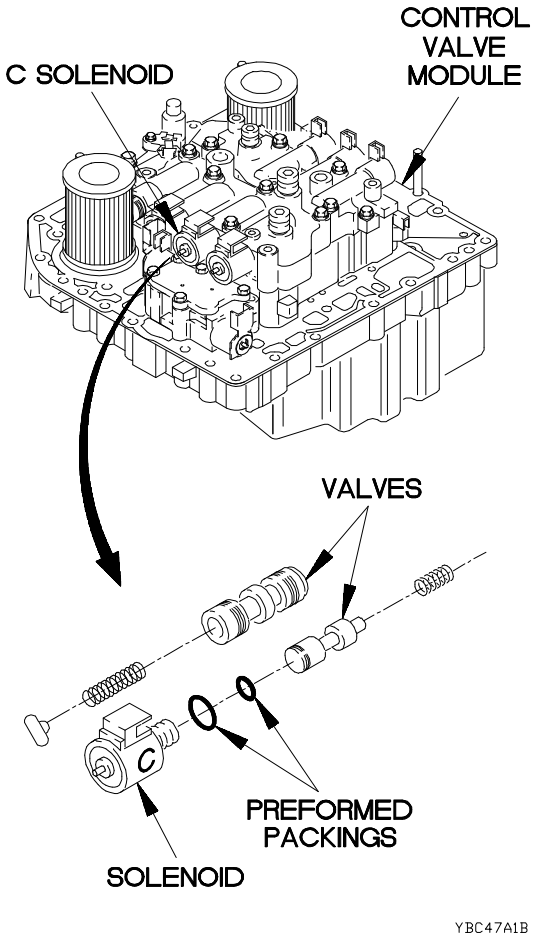
WARNING

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

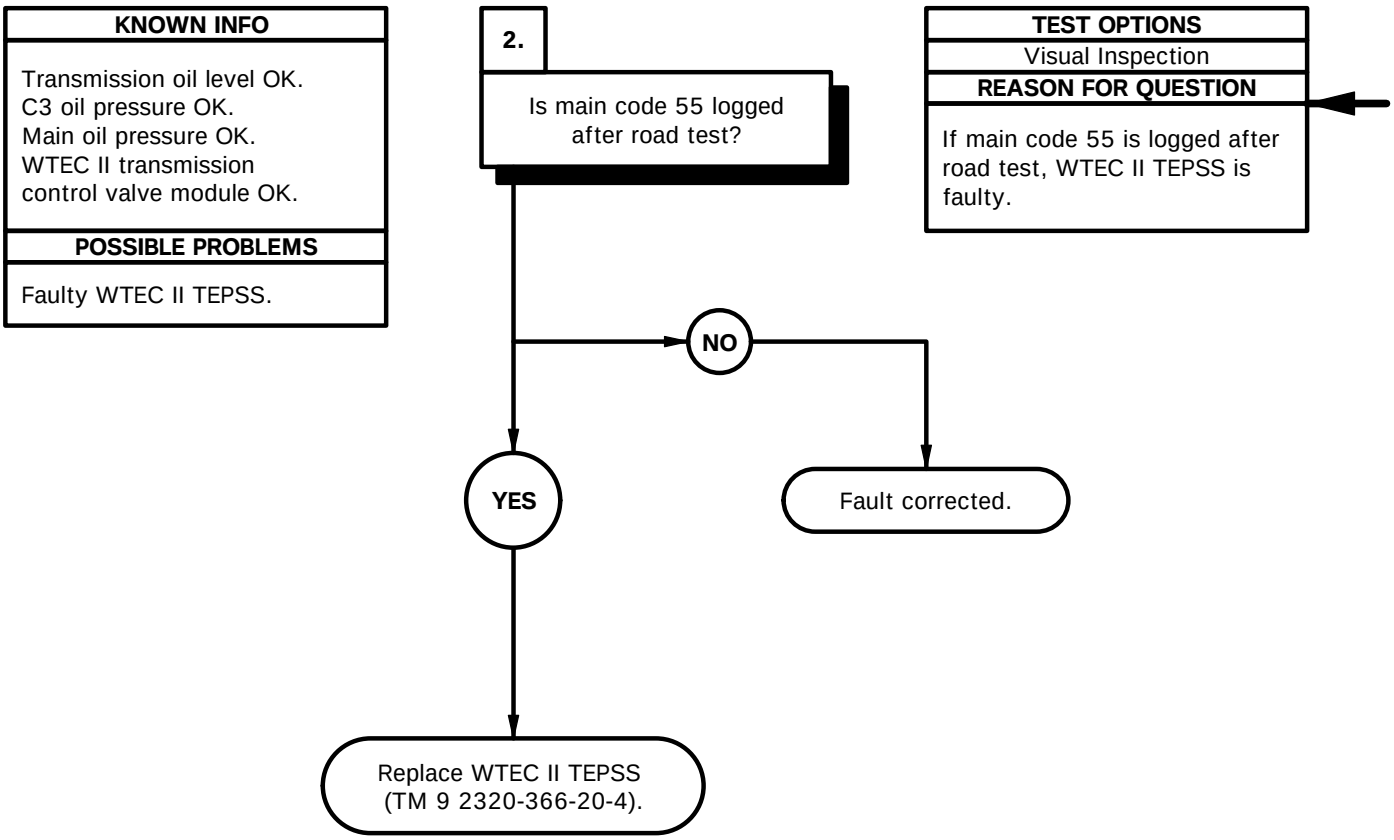
CAUTION

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).



c47A. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 55 AND ANY SUB CODE (CONT)



(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

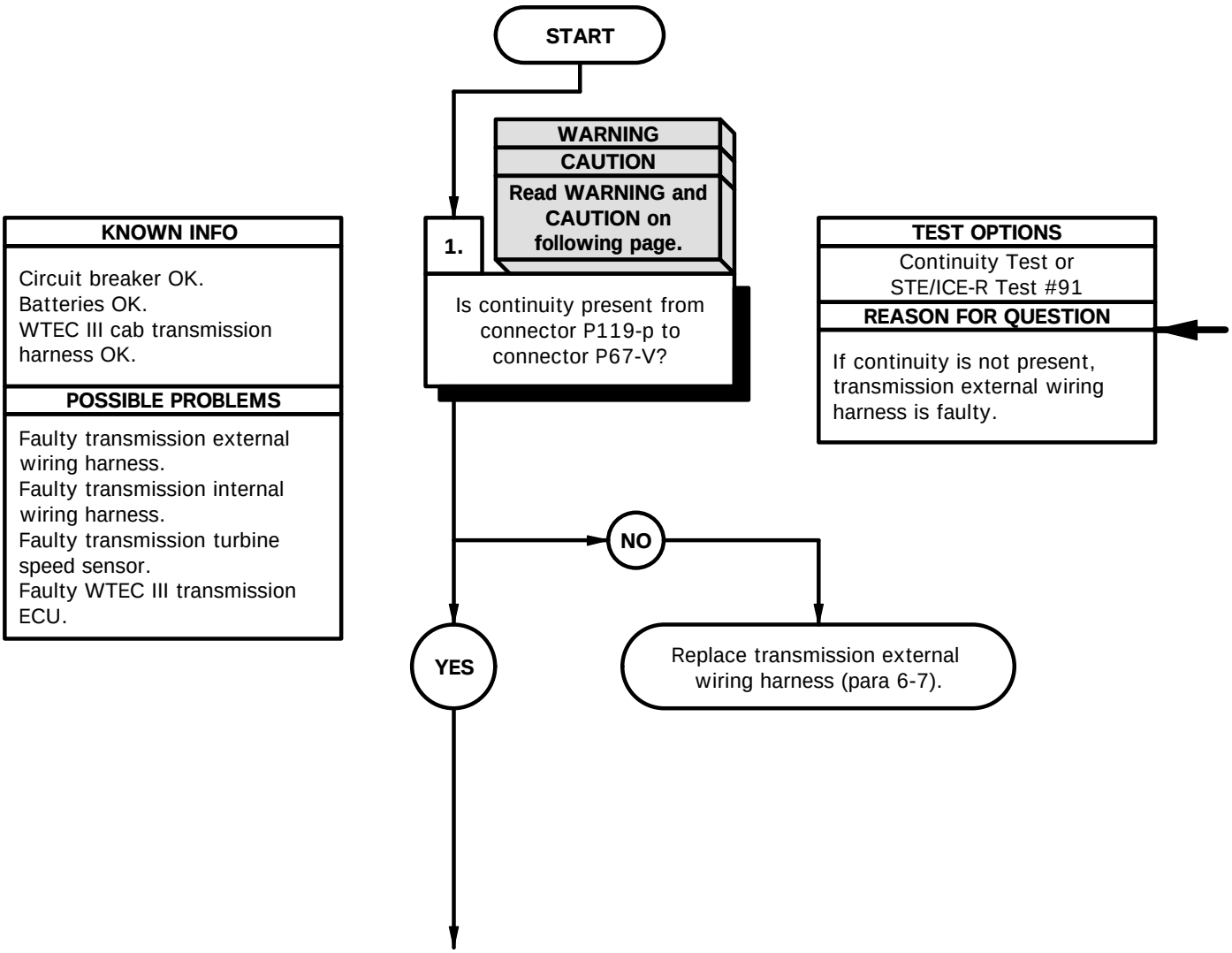
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

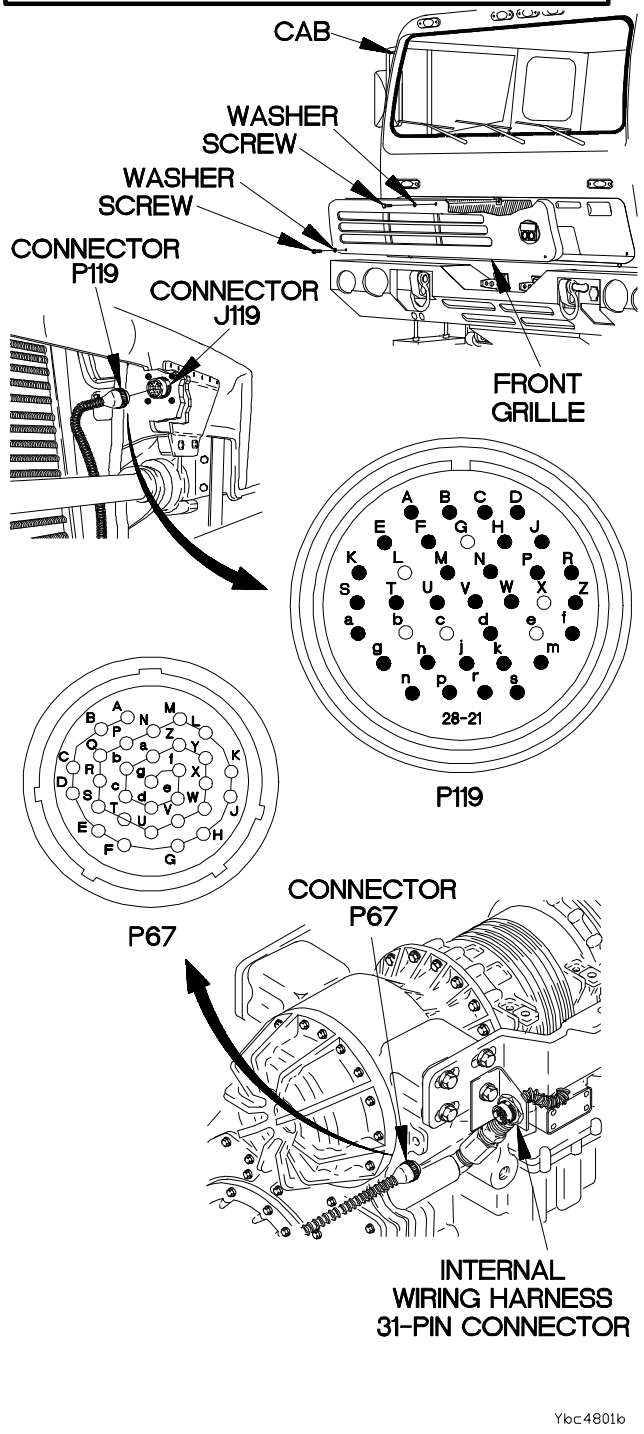
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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 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).



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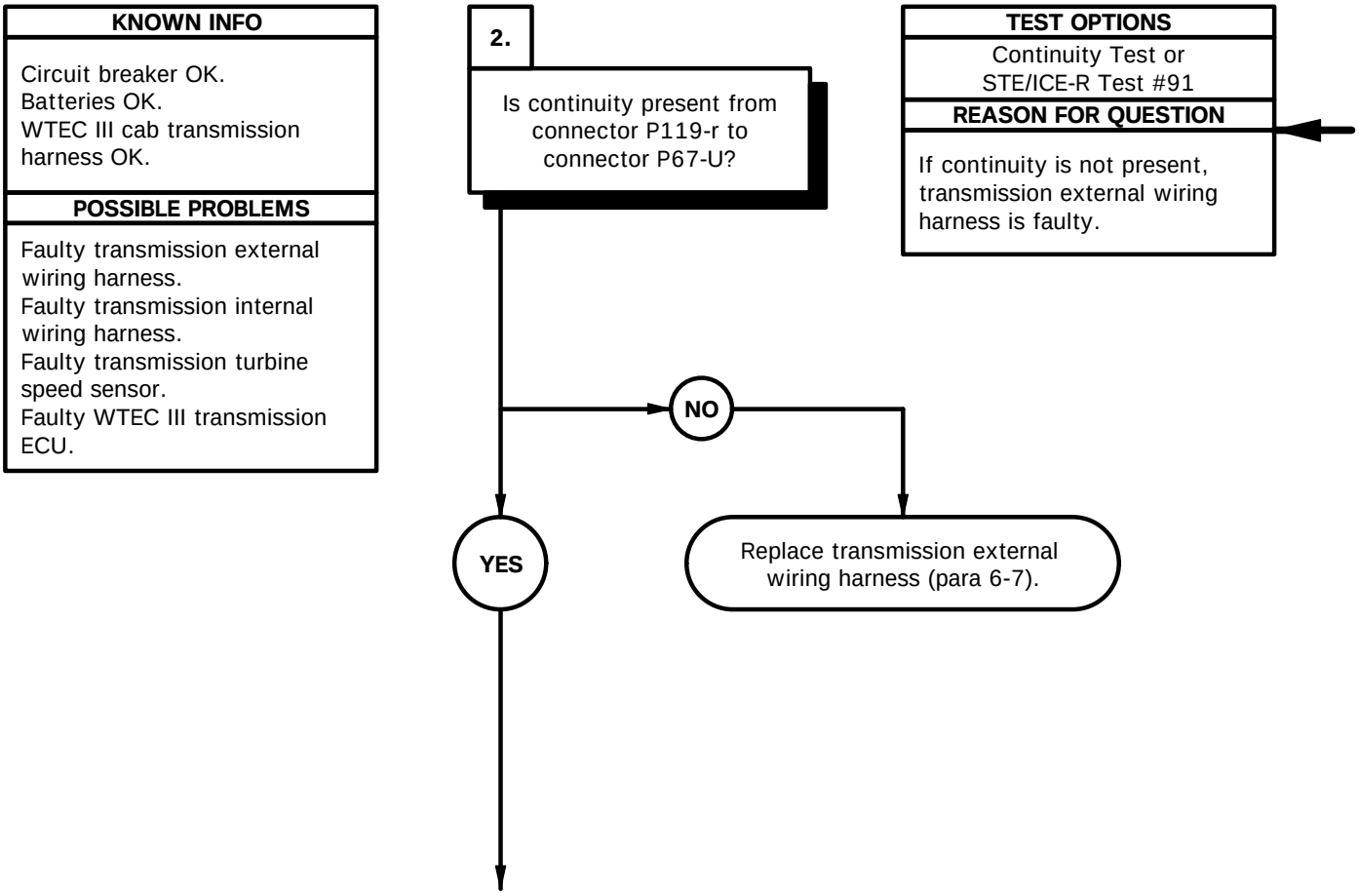
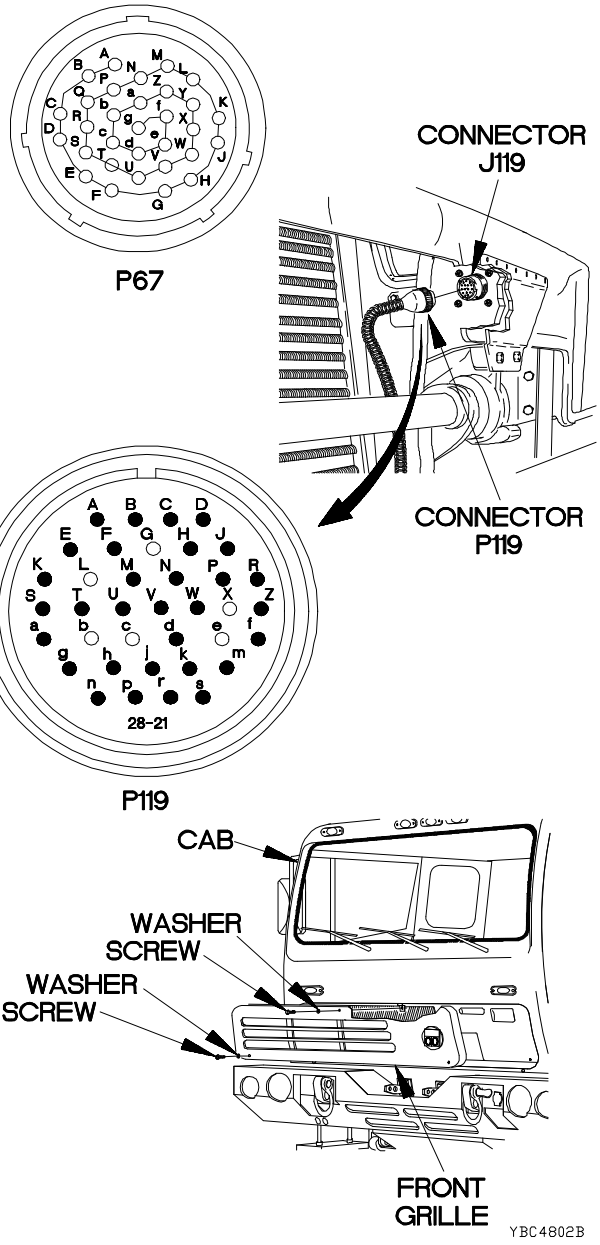
c48. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

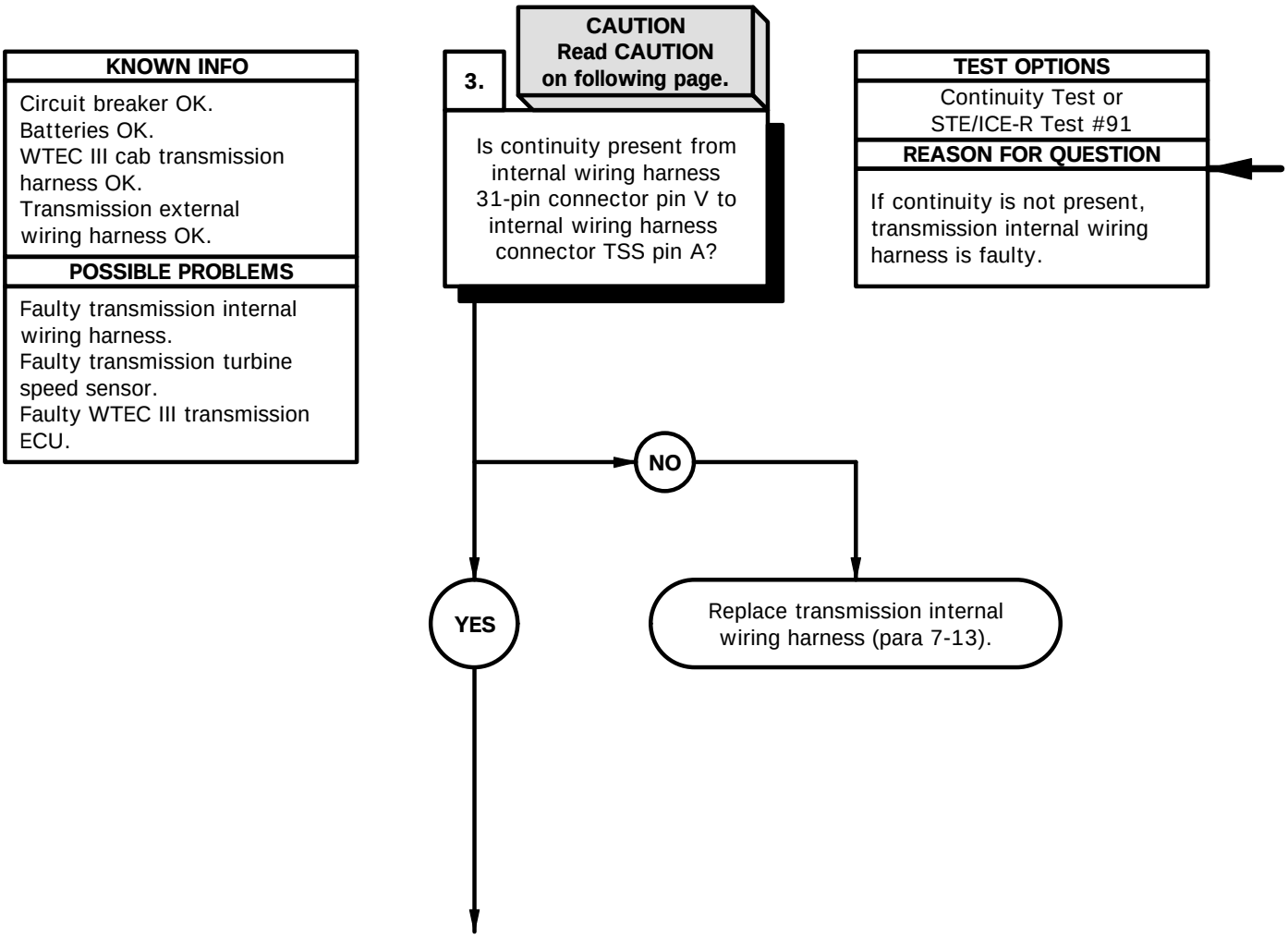


CONTINUITY TEST

(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).



c48. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

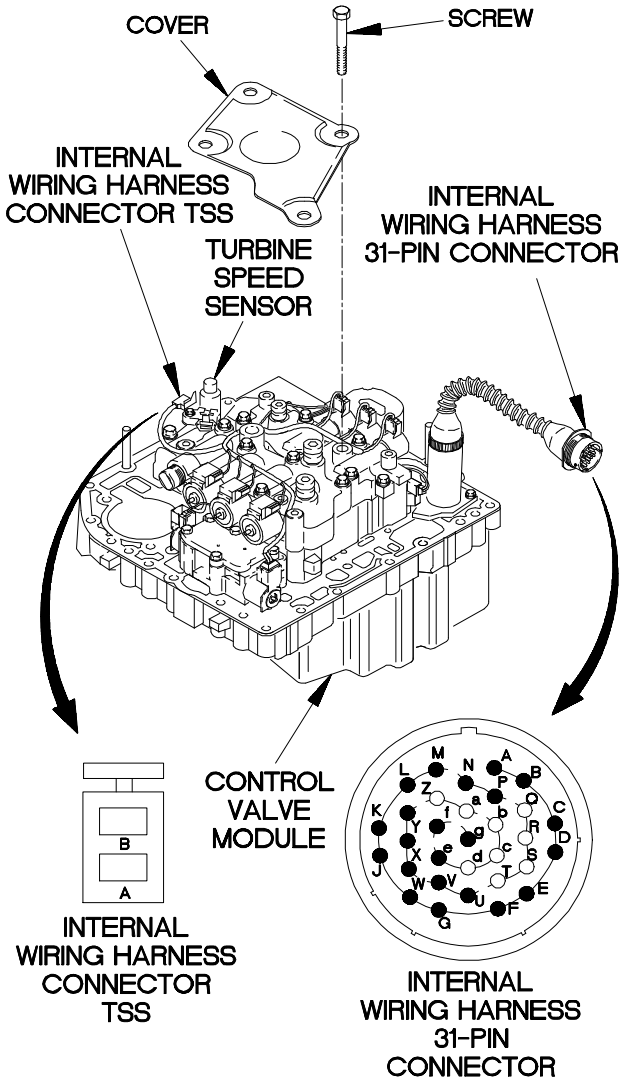


CAUTION

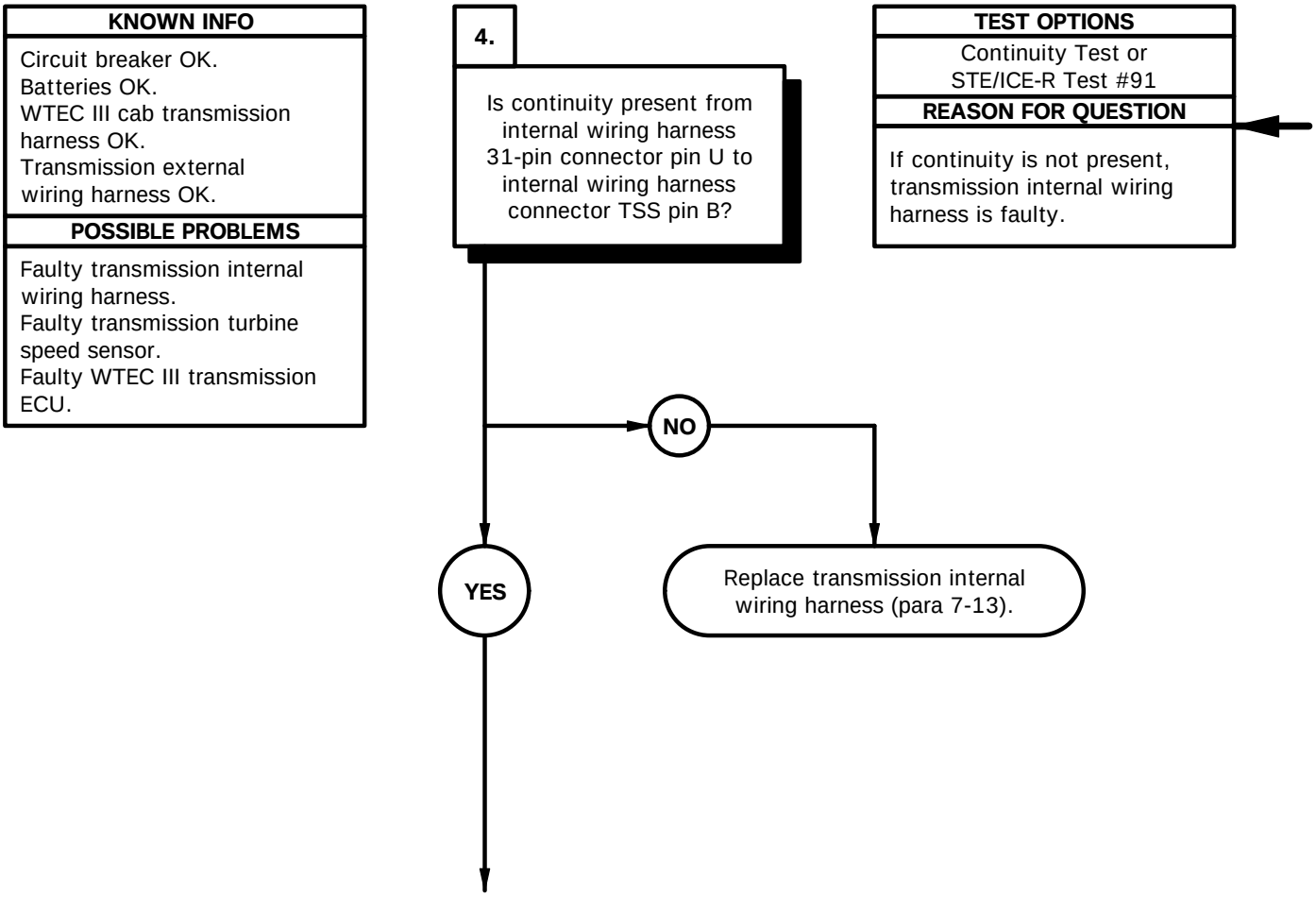
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

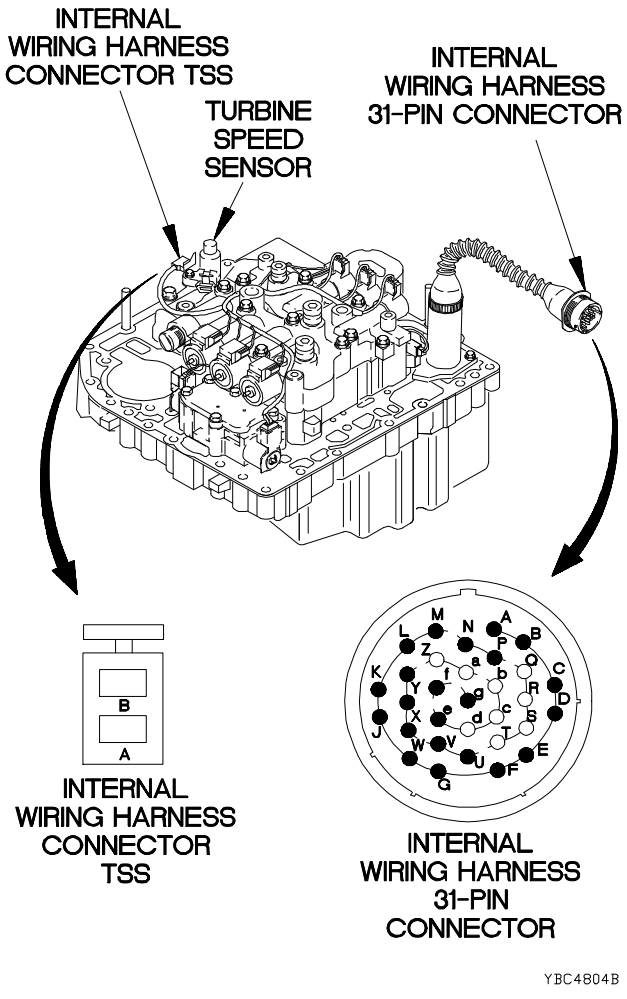


c48. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

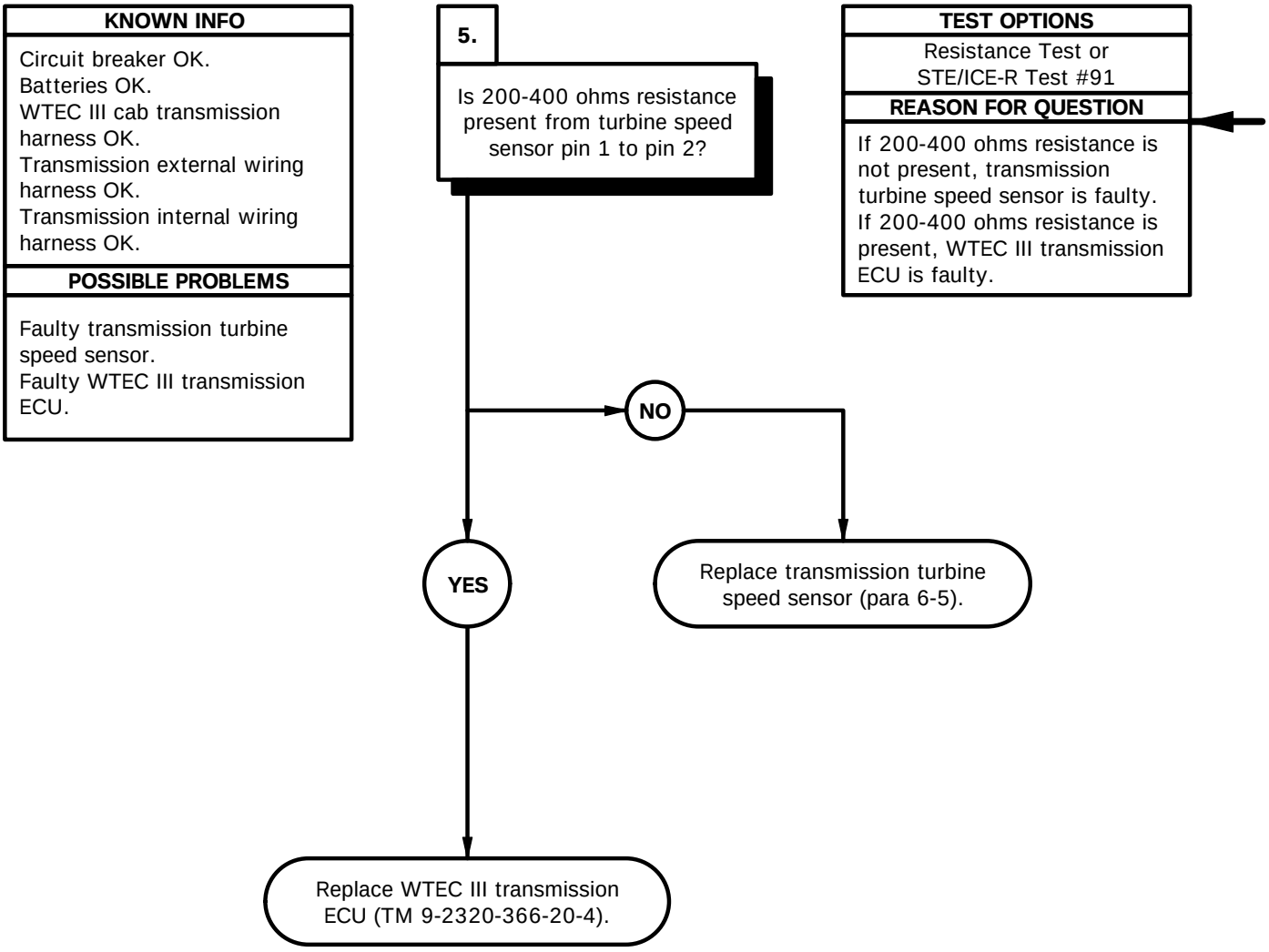


CONTINUITY TEST

(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).

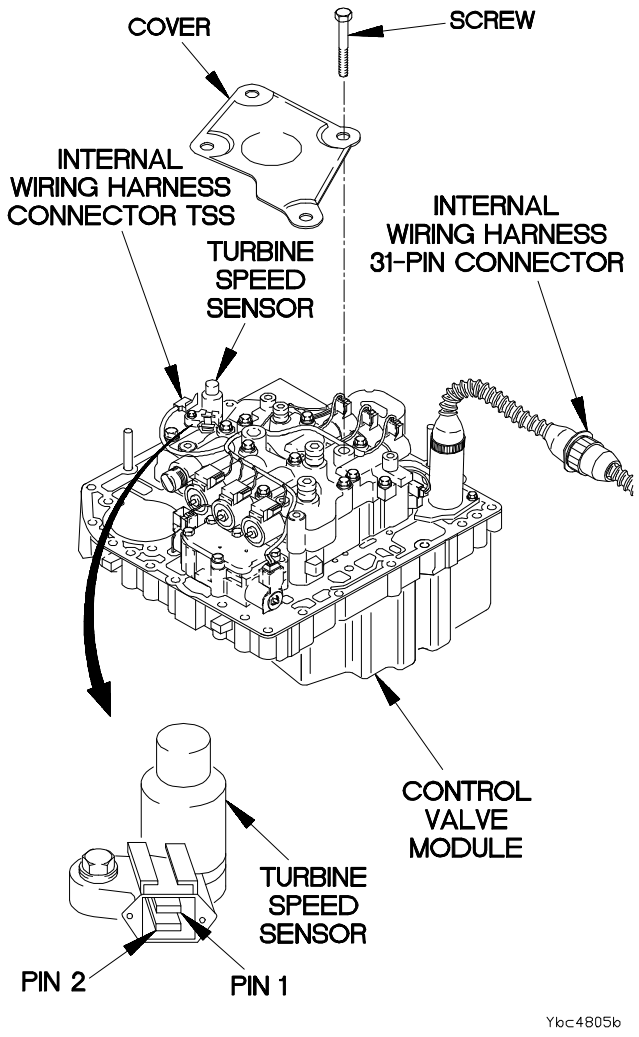


c48. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



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 batteries (TM 9-2320-366-20-3).



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

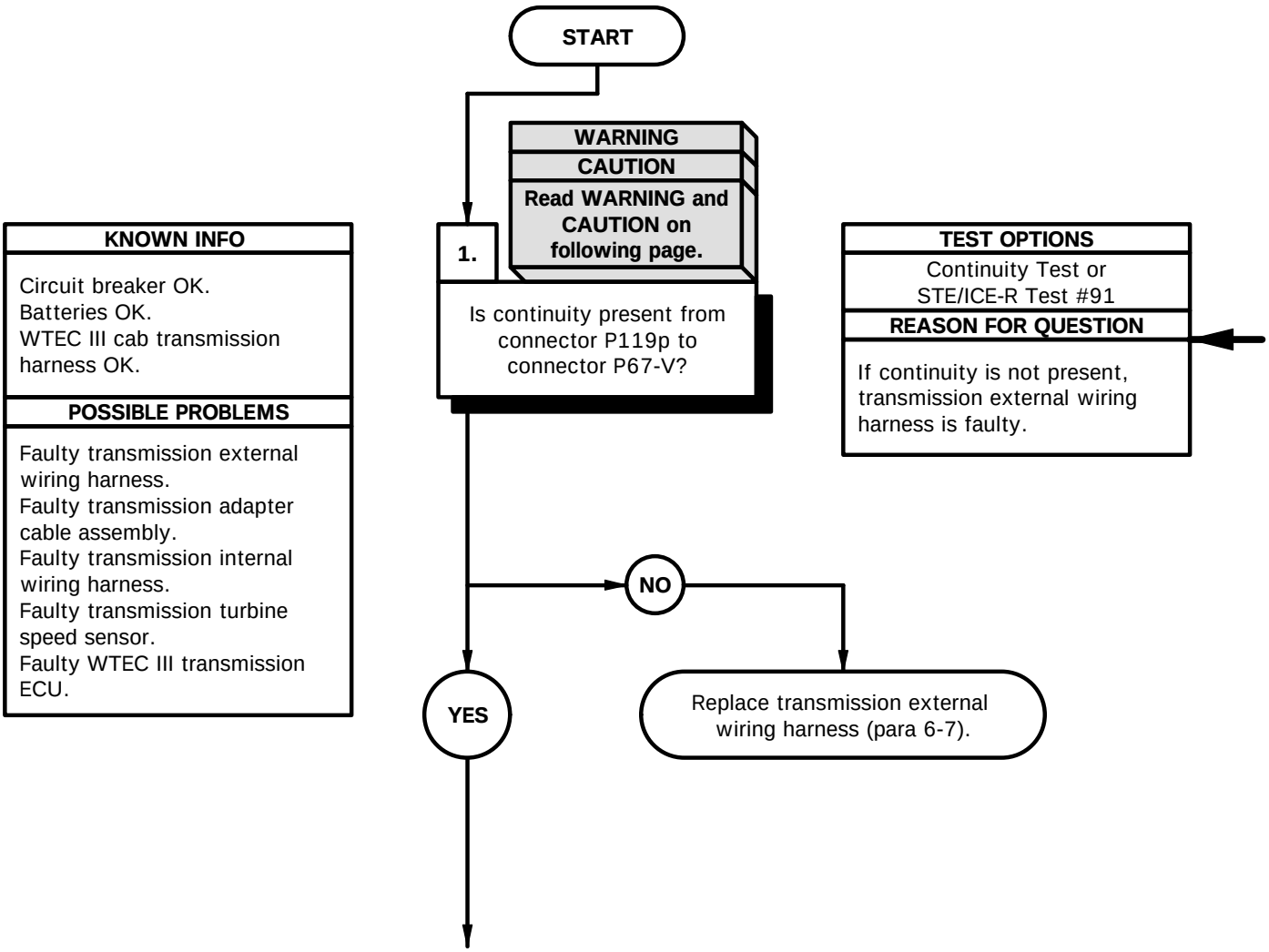
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

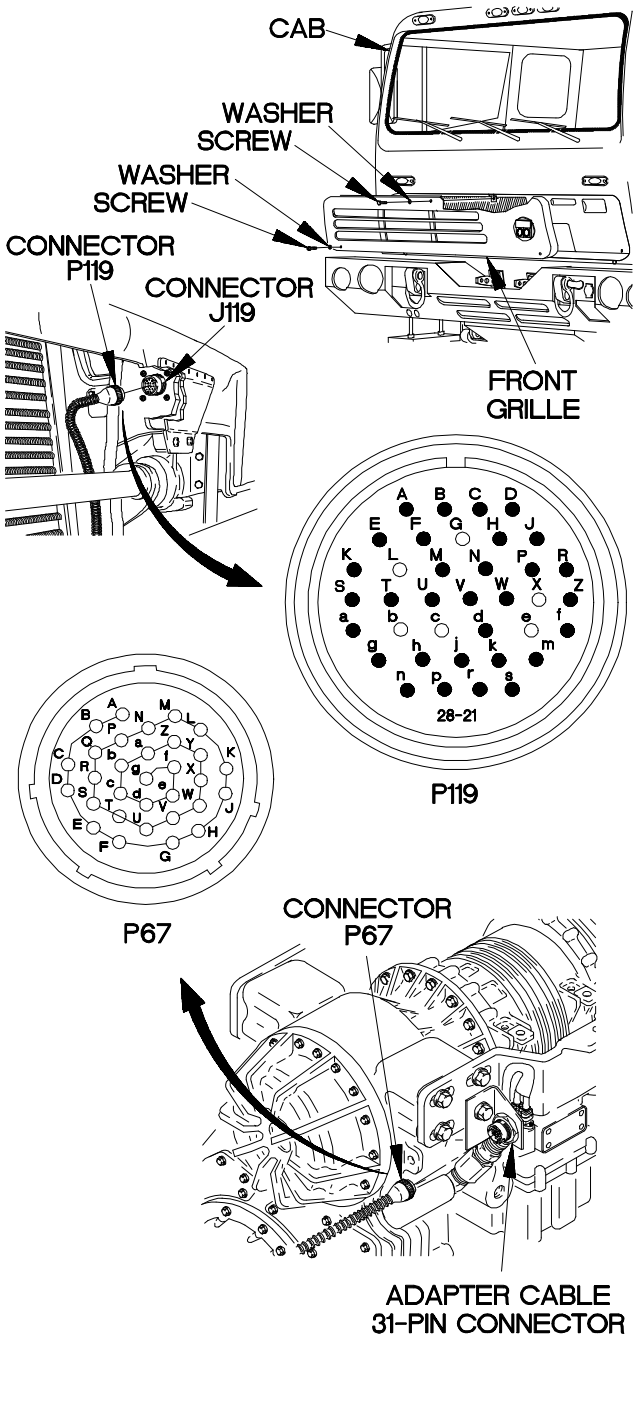
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

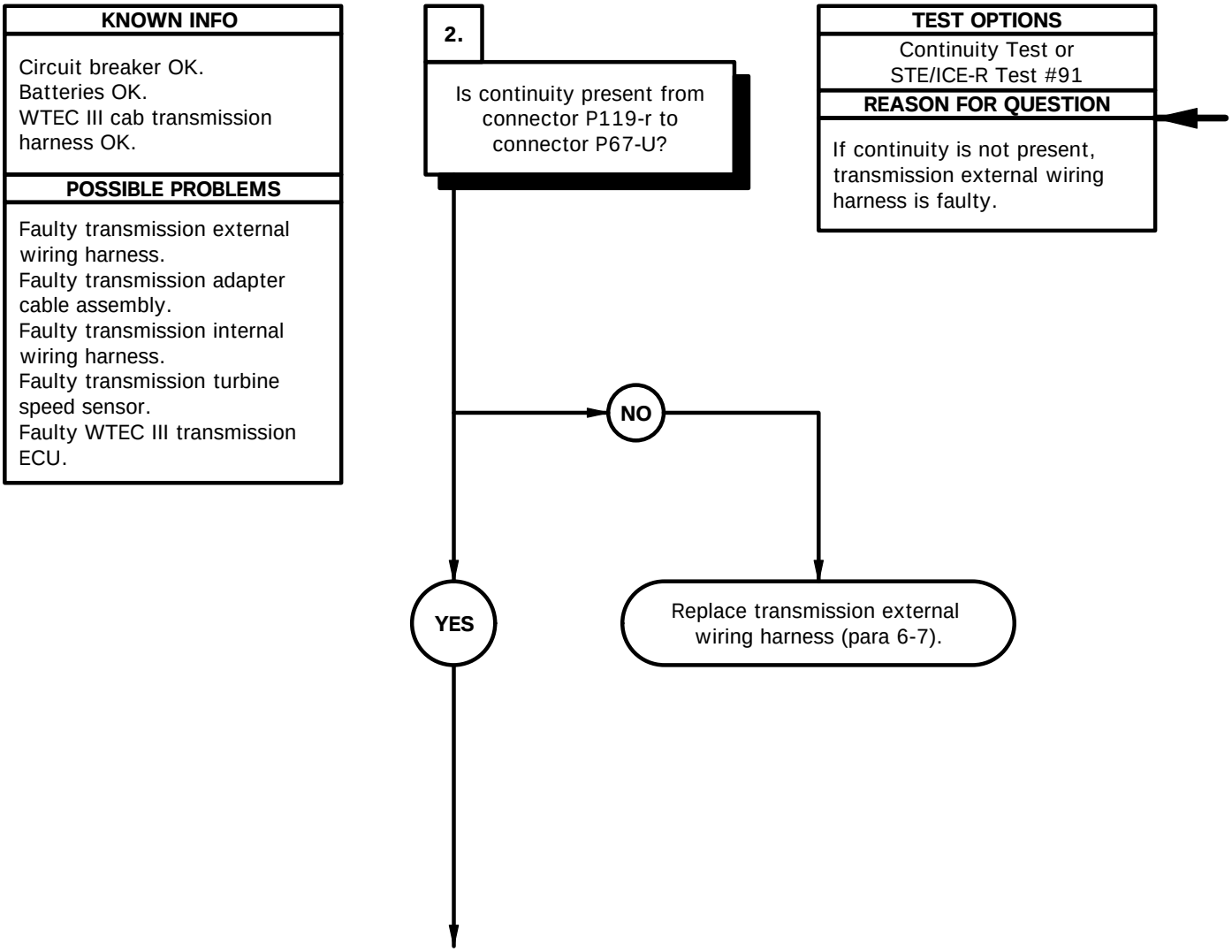
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from adaptor cable 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect positive (+) 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).

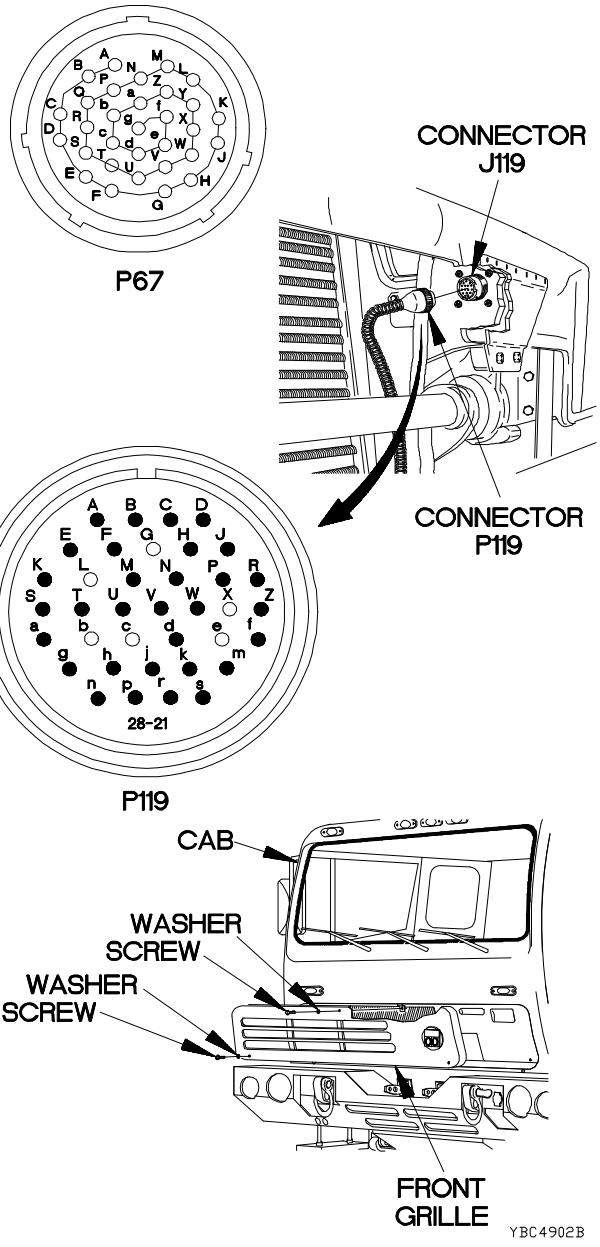


c49. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

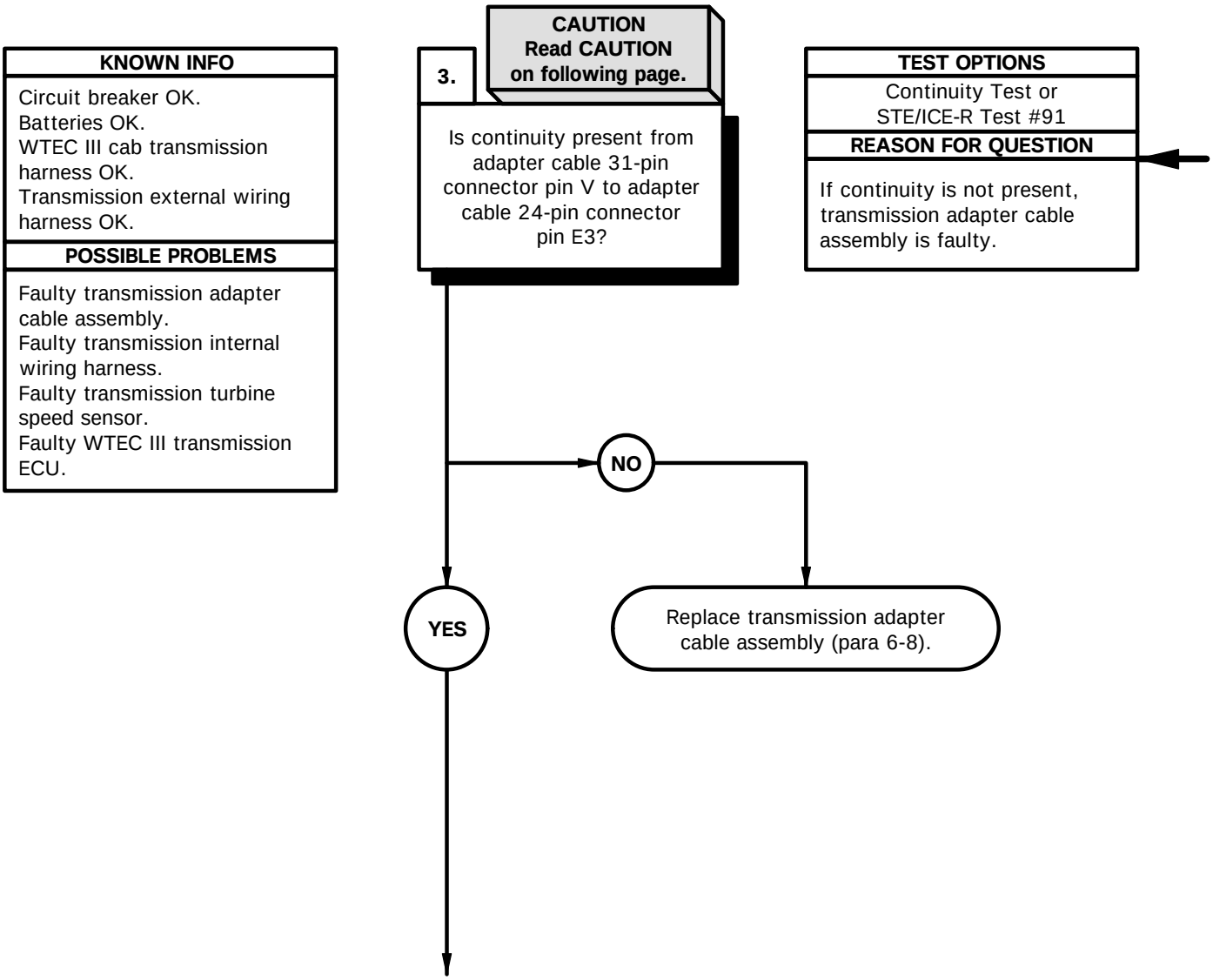


CONTINUITY TEST

(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).



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)

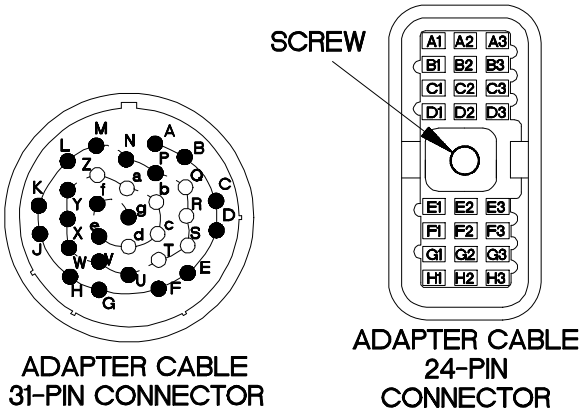


CAUTION

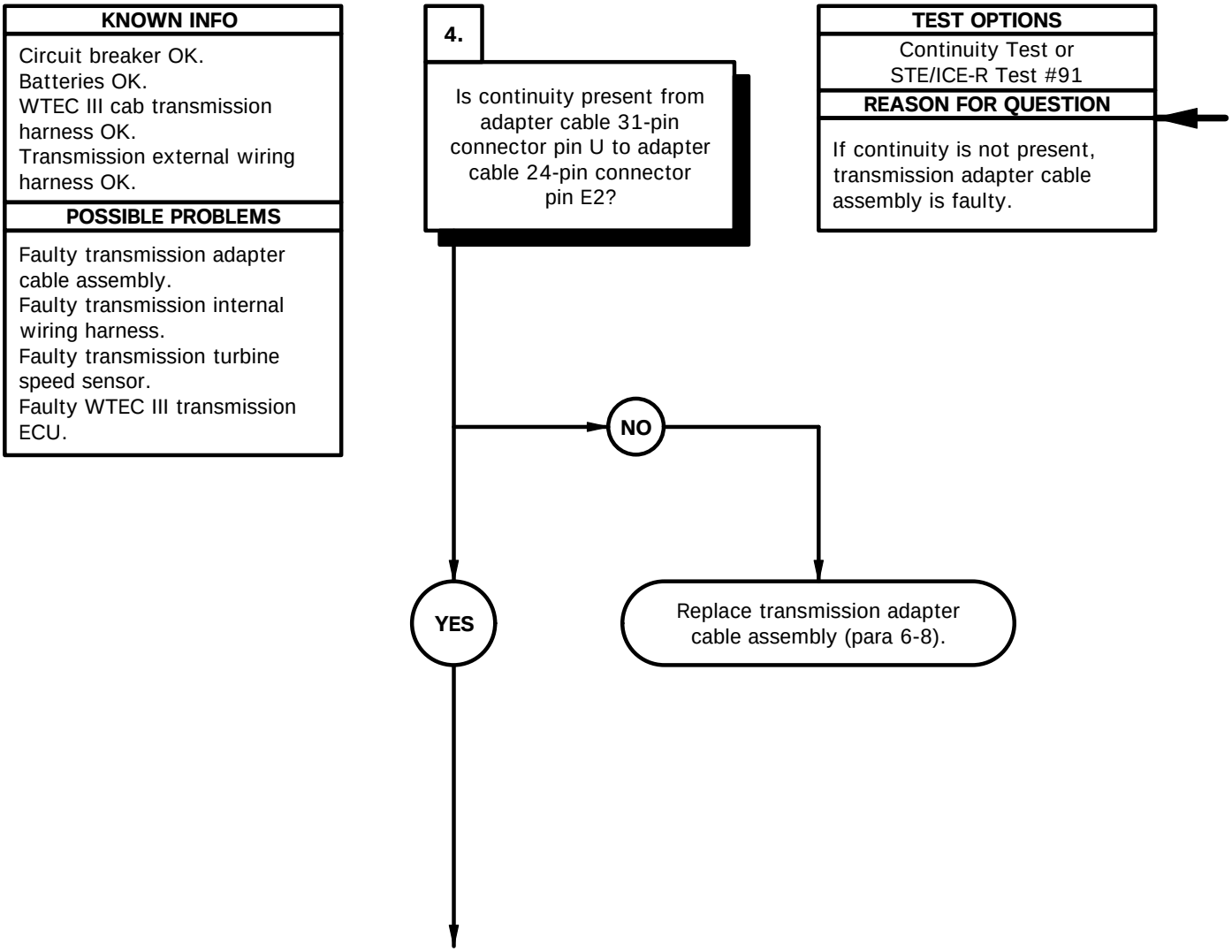
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

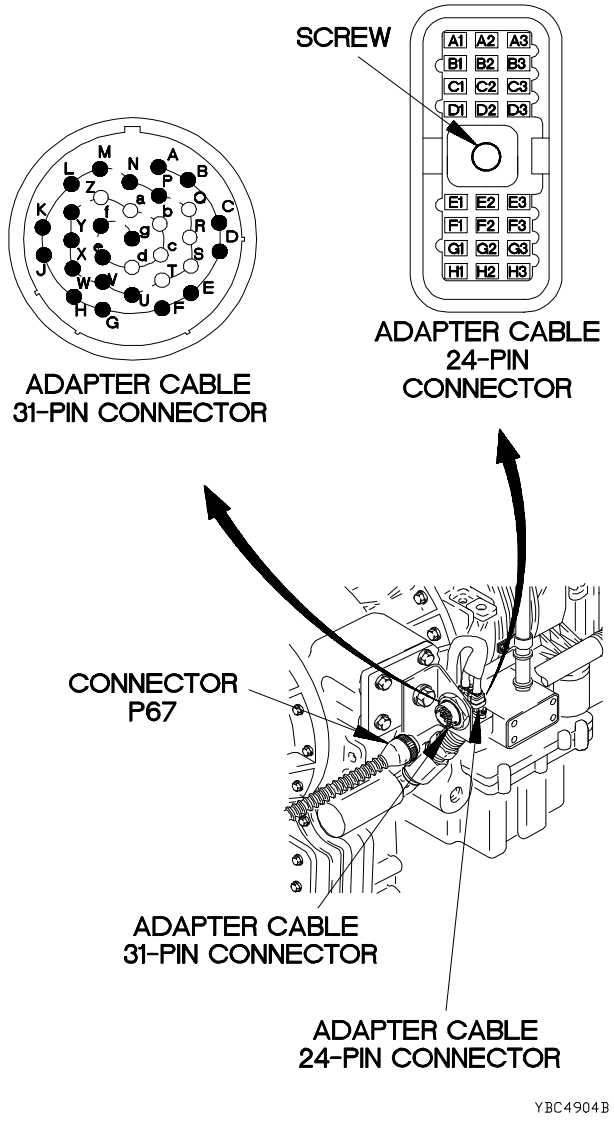


c49. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

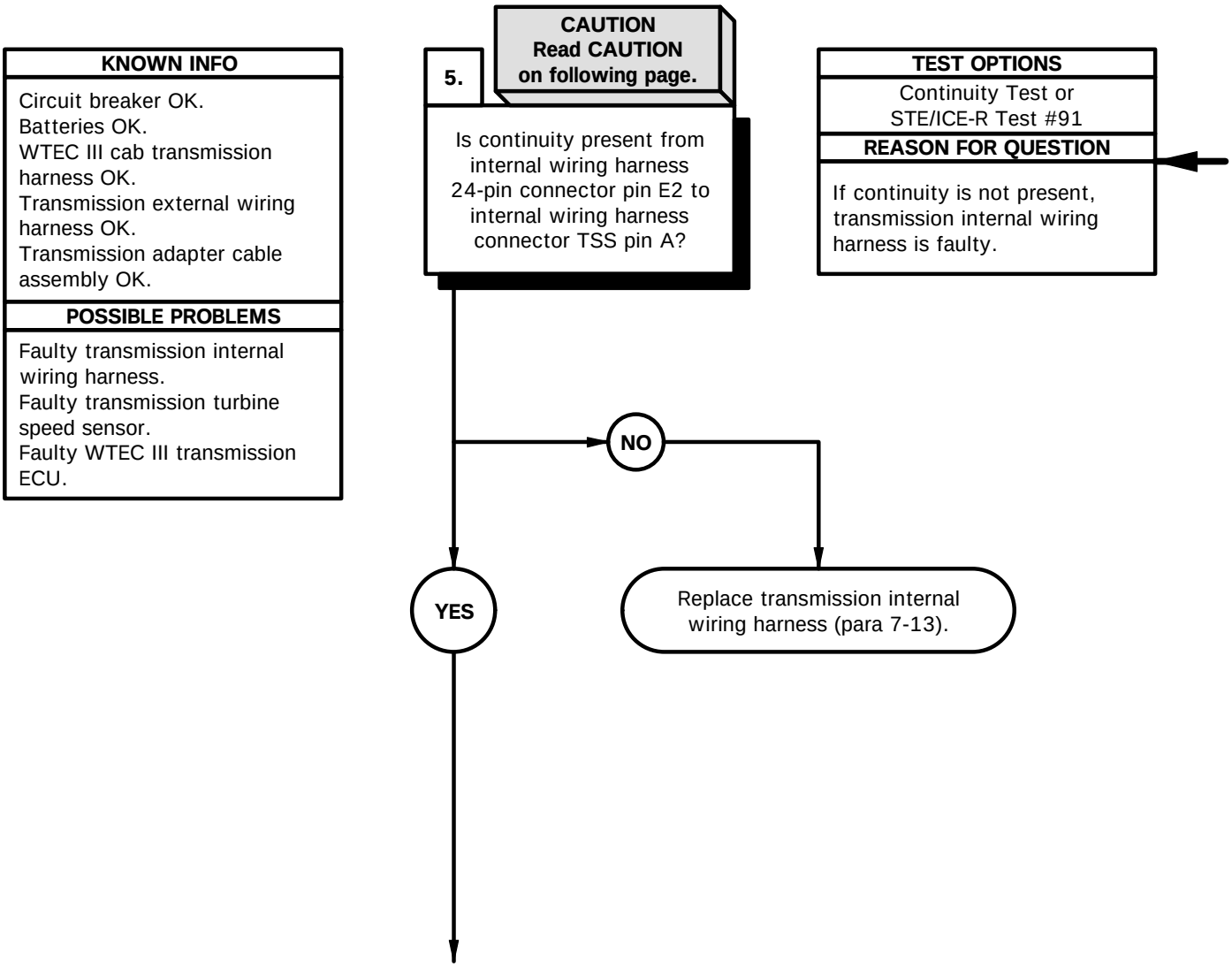


CONTINUITY TEST

(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.



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)

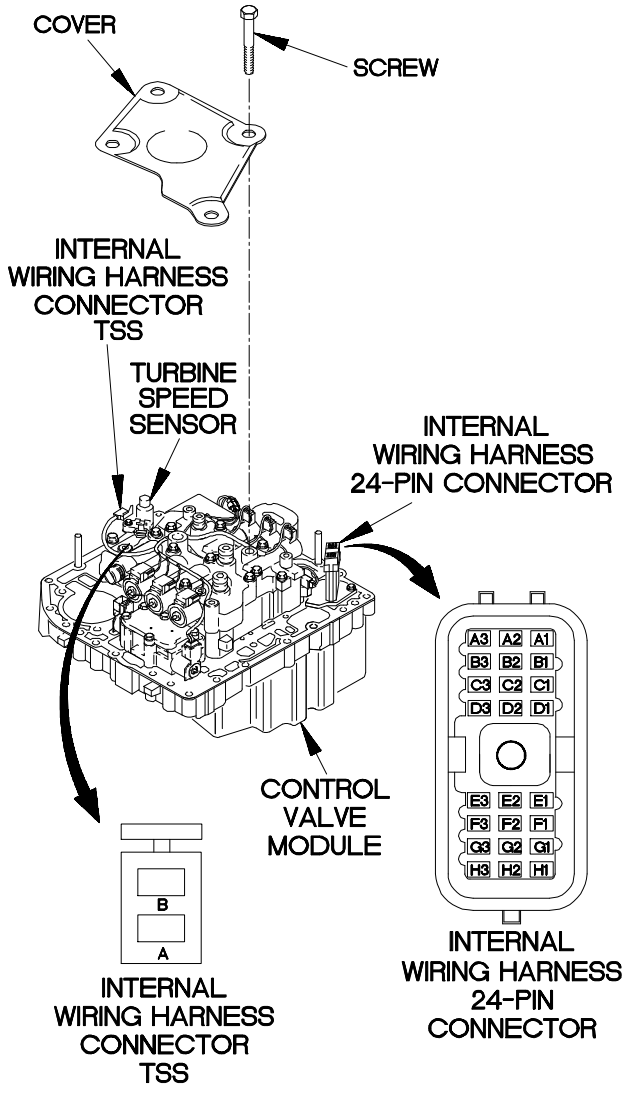


CAUTION

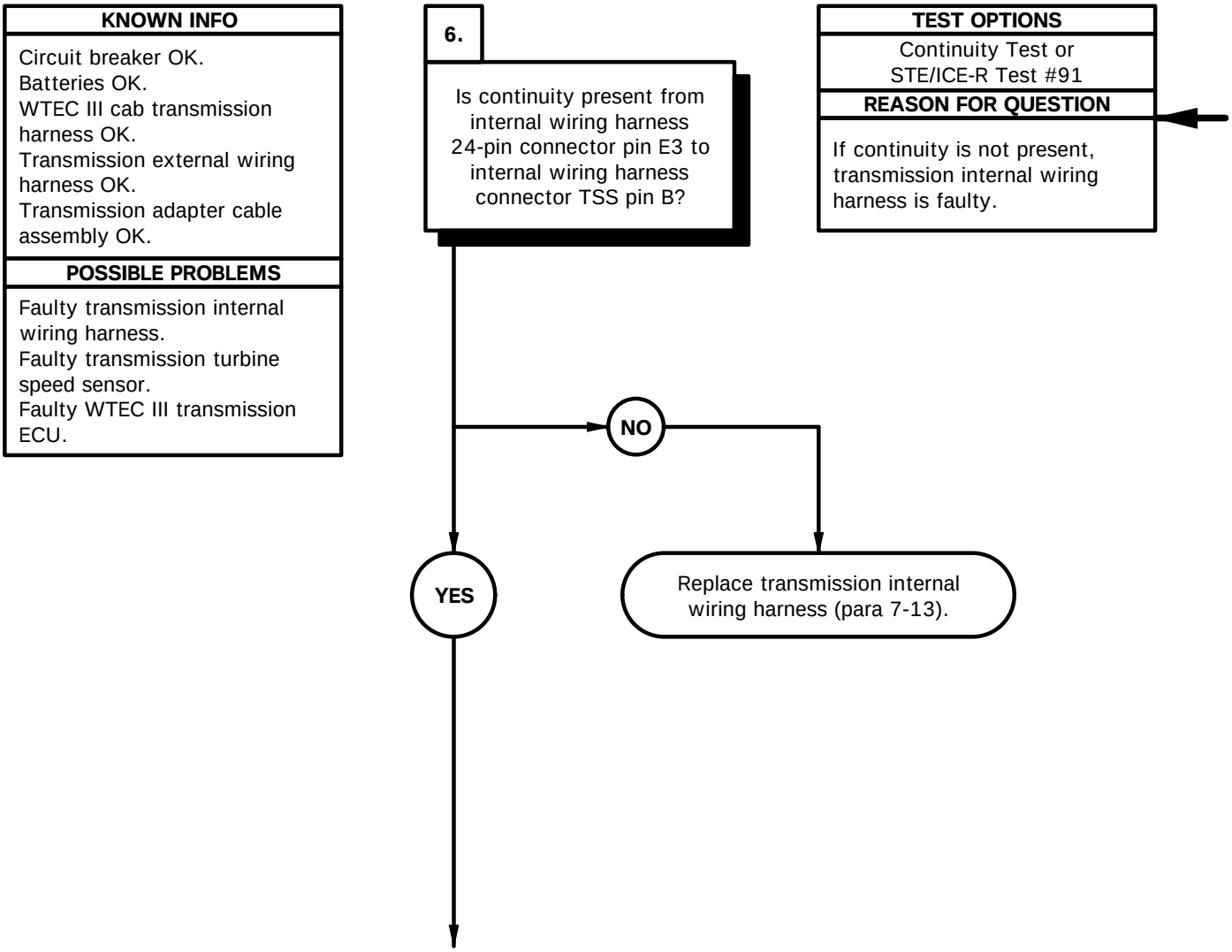
Use care when disconnecting wire harness connectors. Failure to comply may result in damage to equipment.

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).

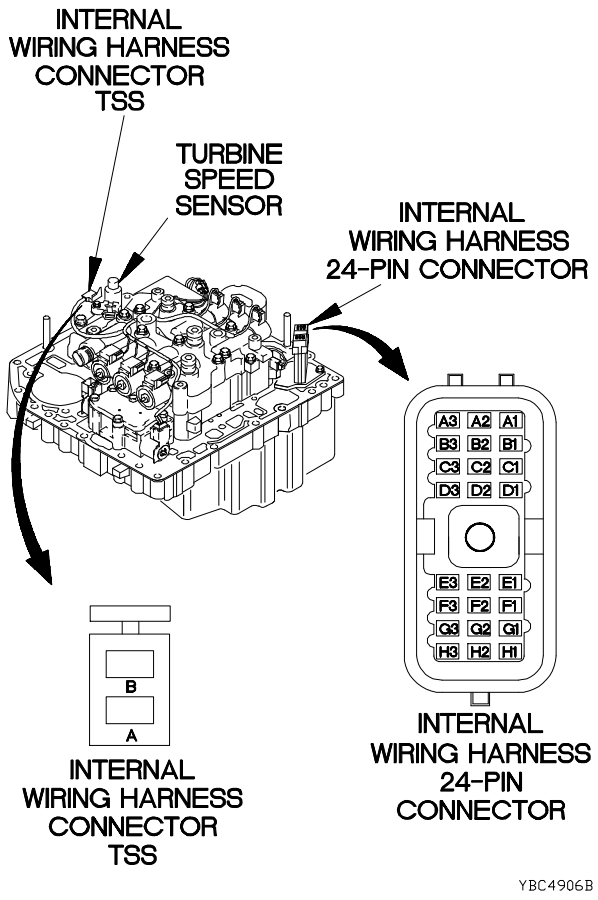


c49. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

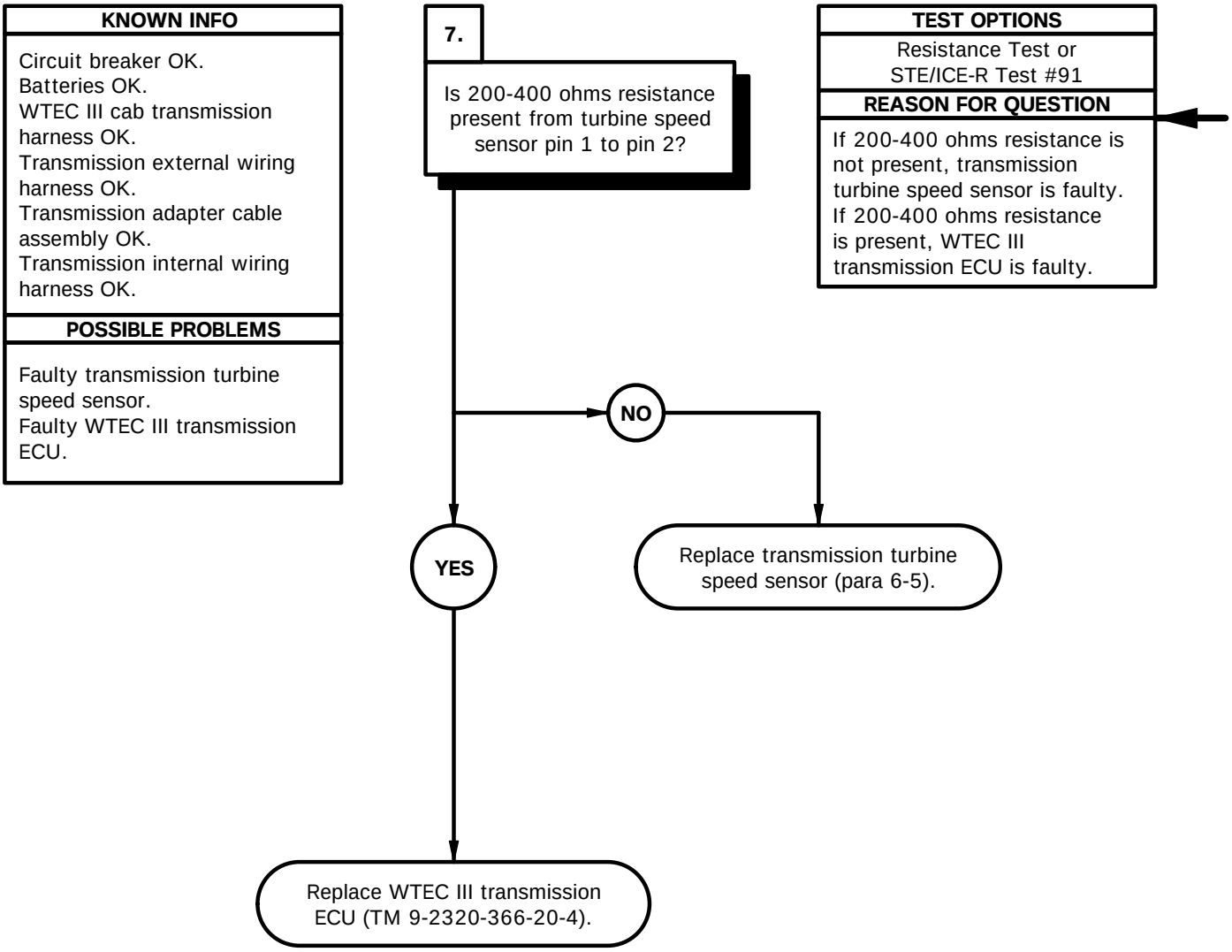


CONTINUITY TEST

(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).

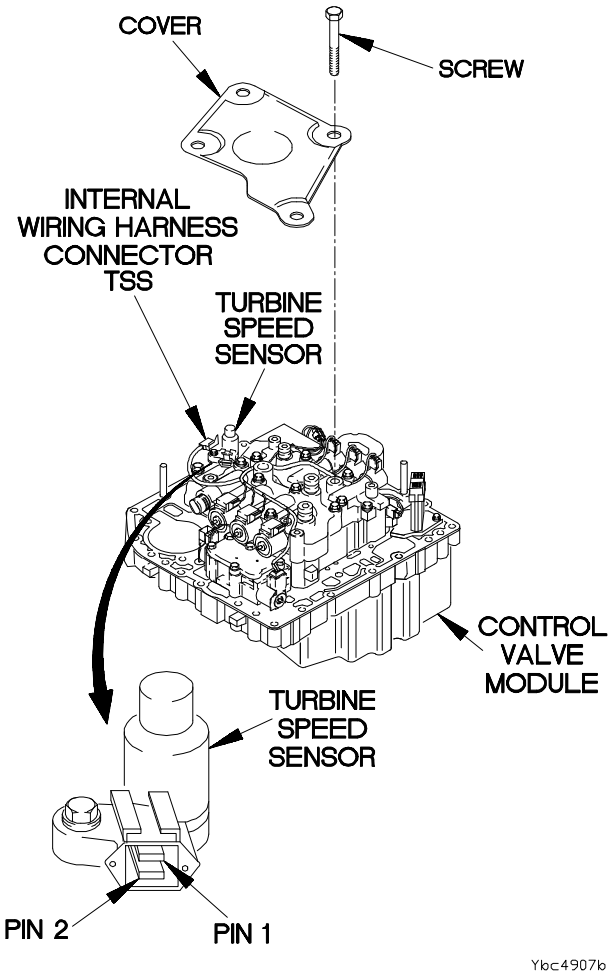


c49. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



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).



c50. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 16 OR MAIN CODE 25 AND/OR 56 AND ANY SUB CODE

INITIAL SETUP

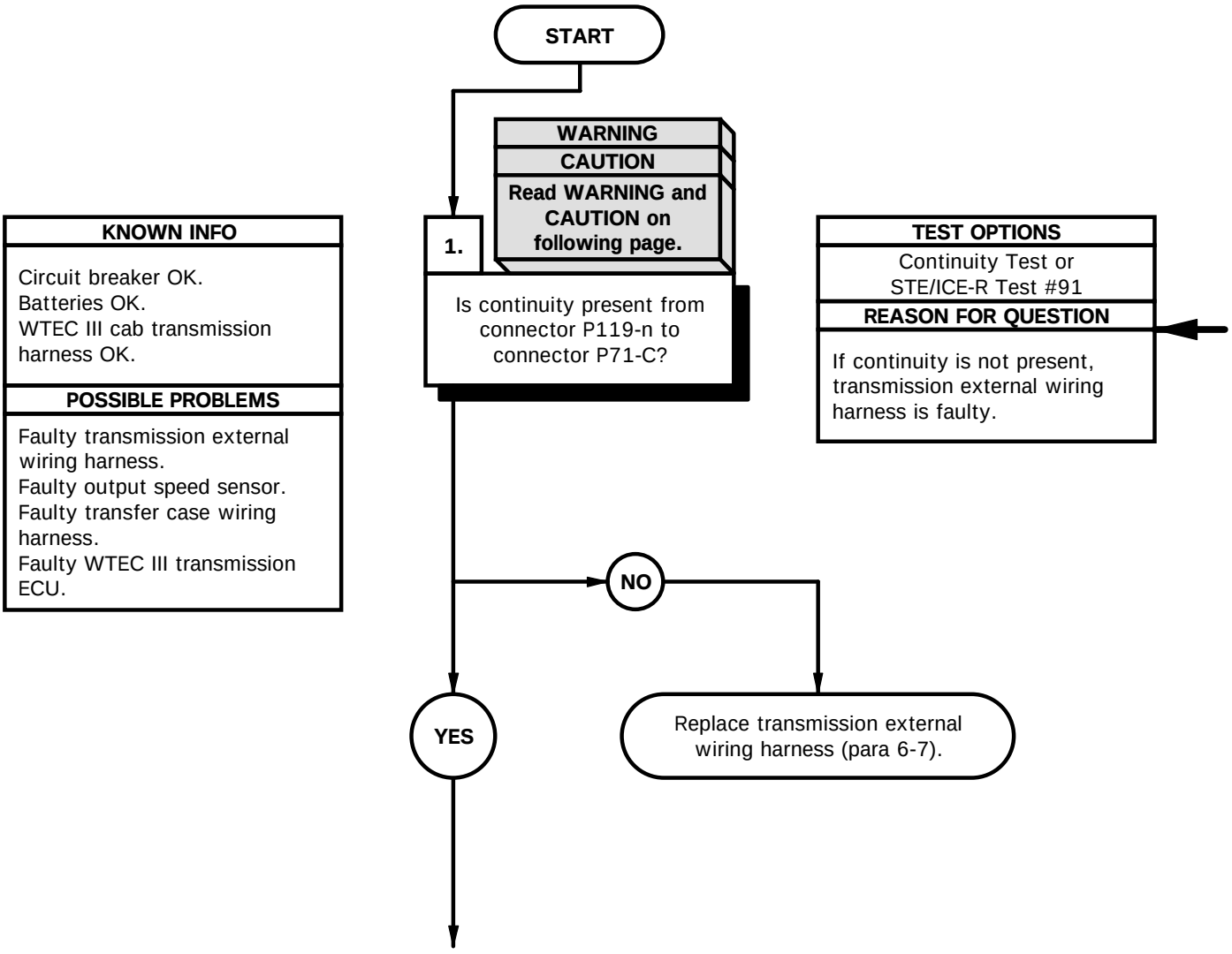
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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)
Pan, Drain (Item 43, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 93, Appendix B)
Wrench Set, Socket (Item 85, Appendix B)

Materials/Parts
Gasket (Item 68, Appendix F)
Oil, Lubricating (Item 46, Appendix C)
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

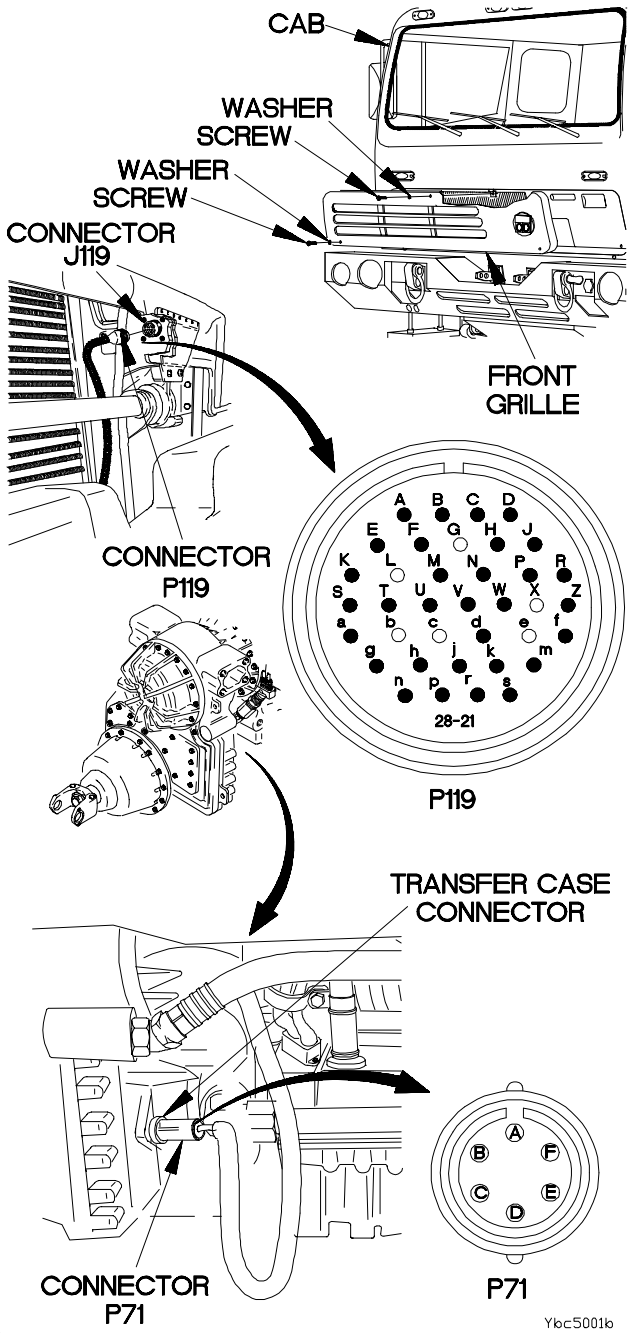
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

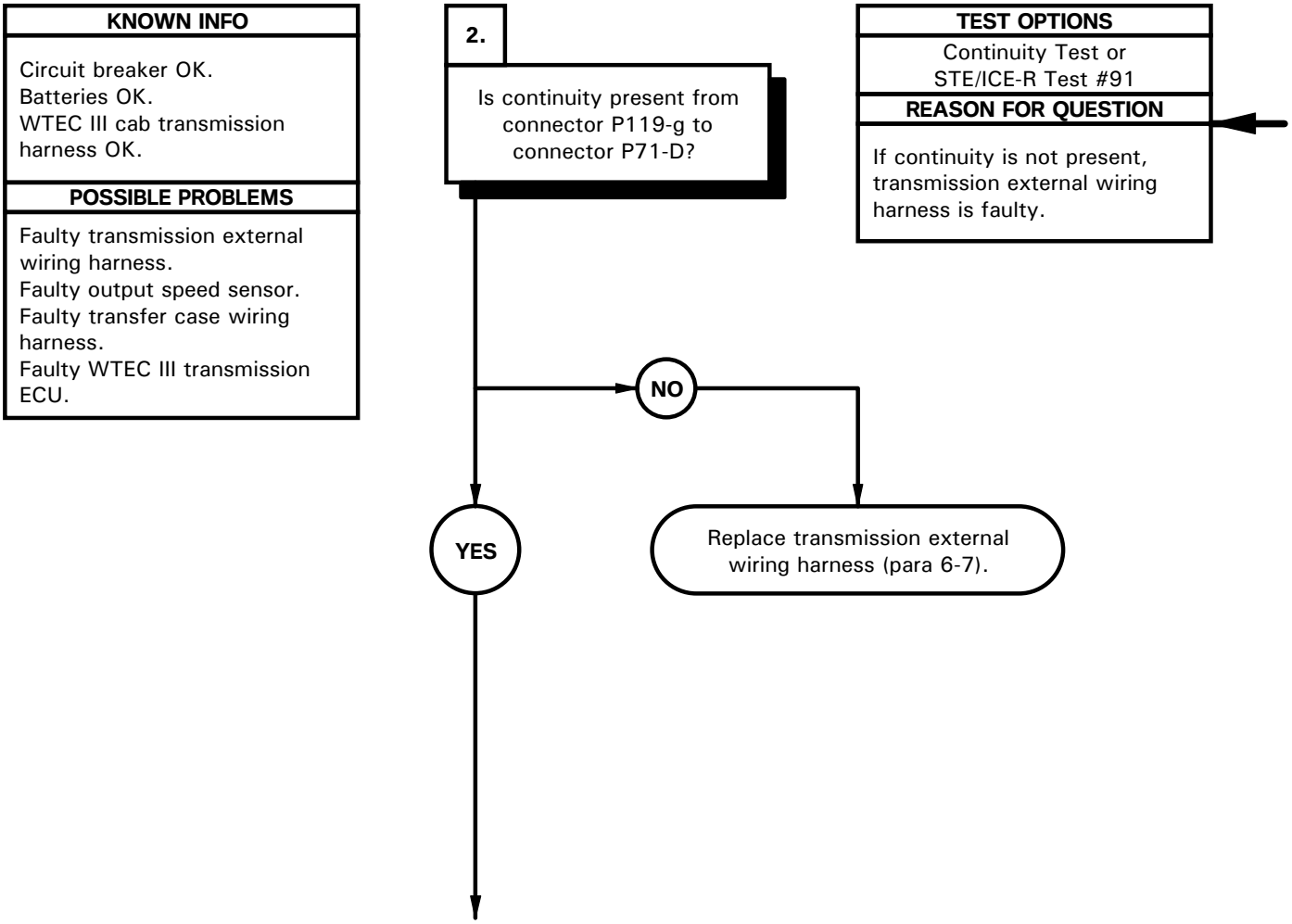
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P71 from transfer case connector.
(6) Set multimeter to ohms.
(7) Connect positive (+) probe 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).

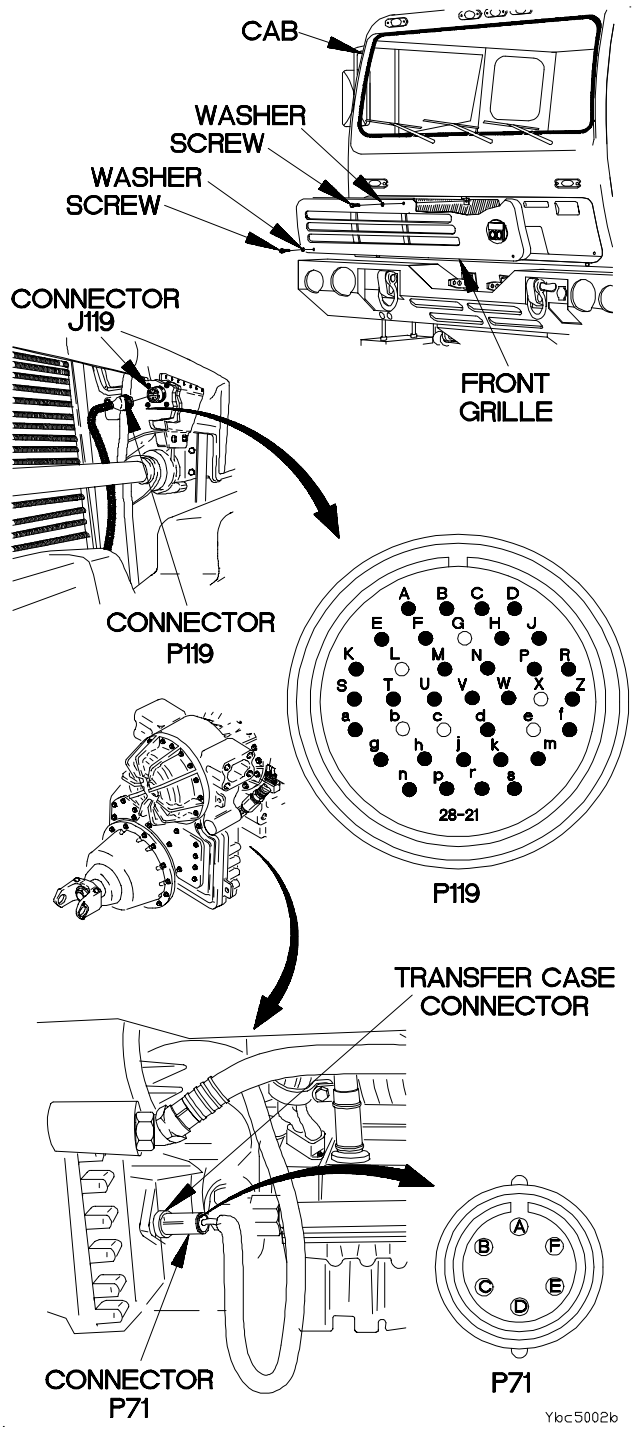


c50. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 16 OR MAIN CODE 25 AND/OR 56 AND ANY SUB CODE (CONT)

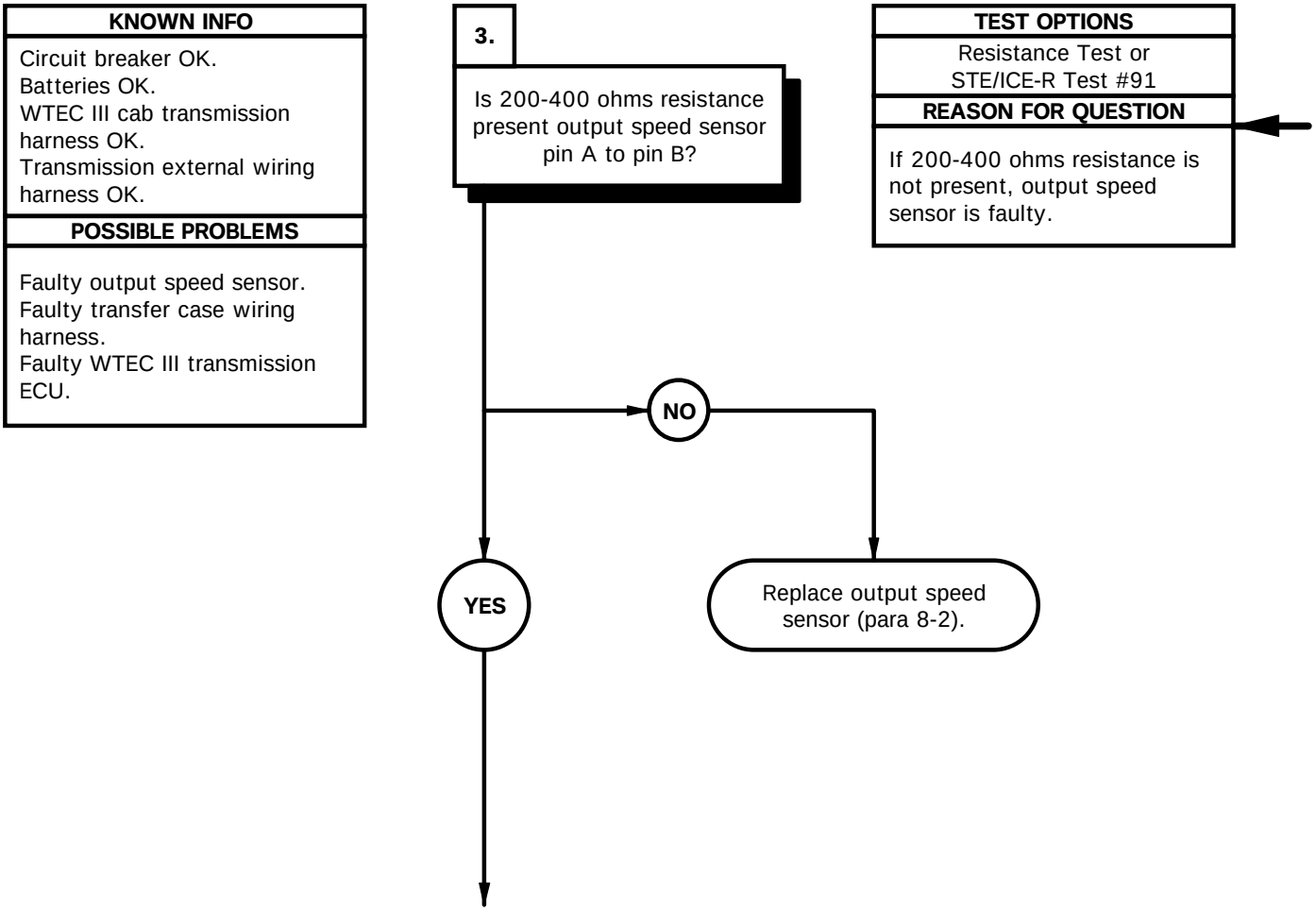


CONTINUITY TEST

(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).

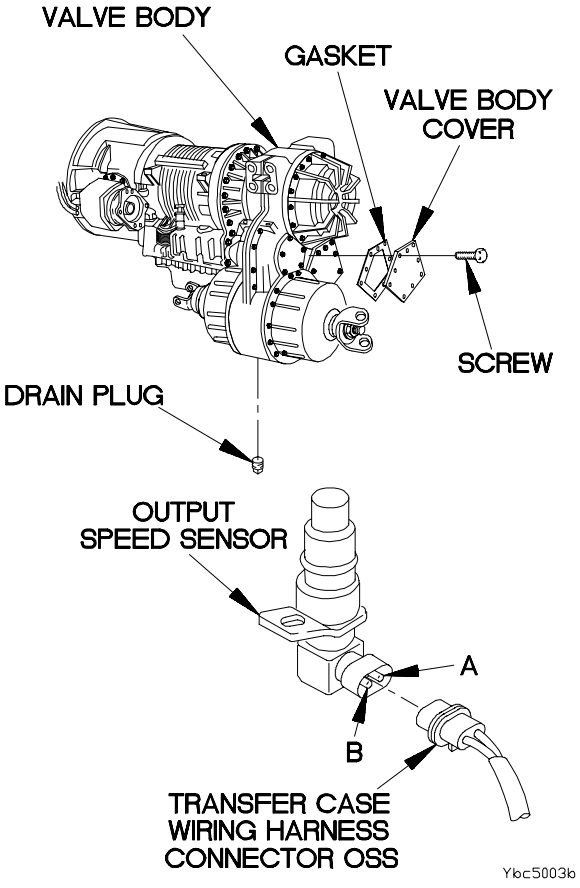


c50. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 16 OR MAIN CODE 25 AND/OR 56 AND ANY SUB CODE (CONT)

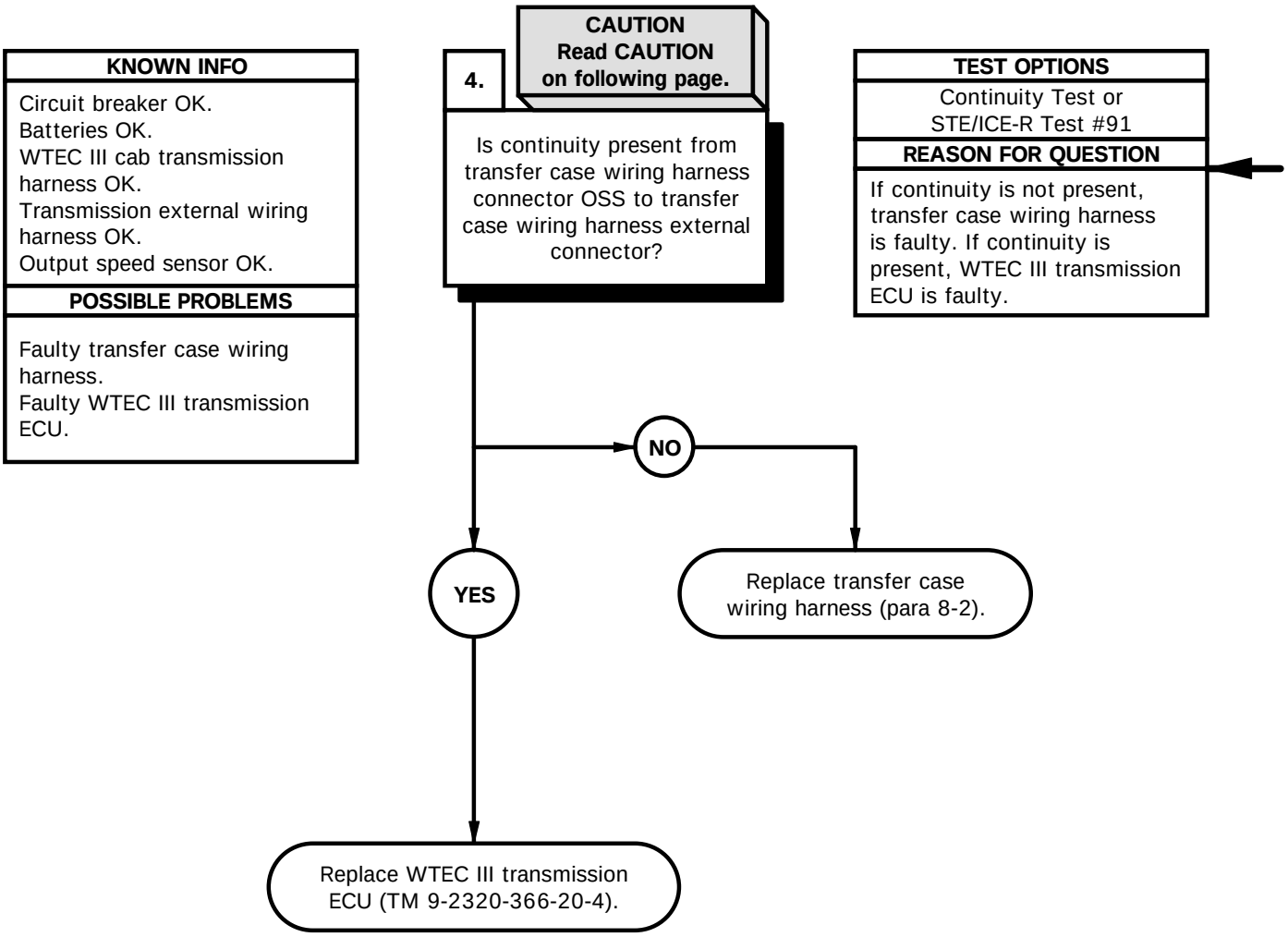


RESISTANCE TEST

(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).



c50. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 16 OR MAIN CODE 25 AND/OR 56 AND ANY SUB CODE (CONT)

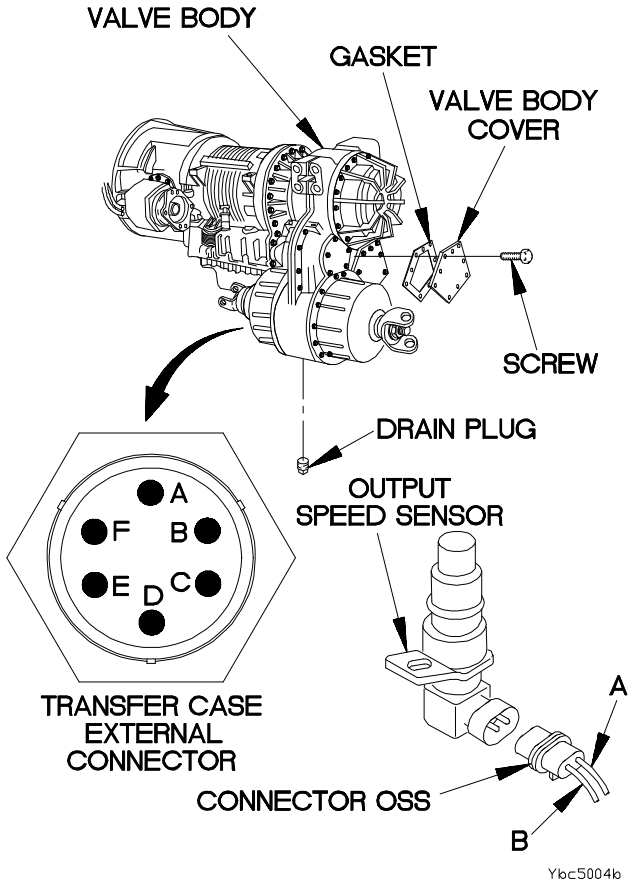


CAUTION

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

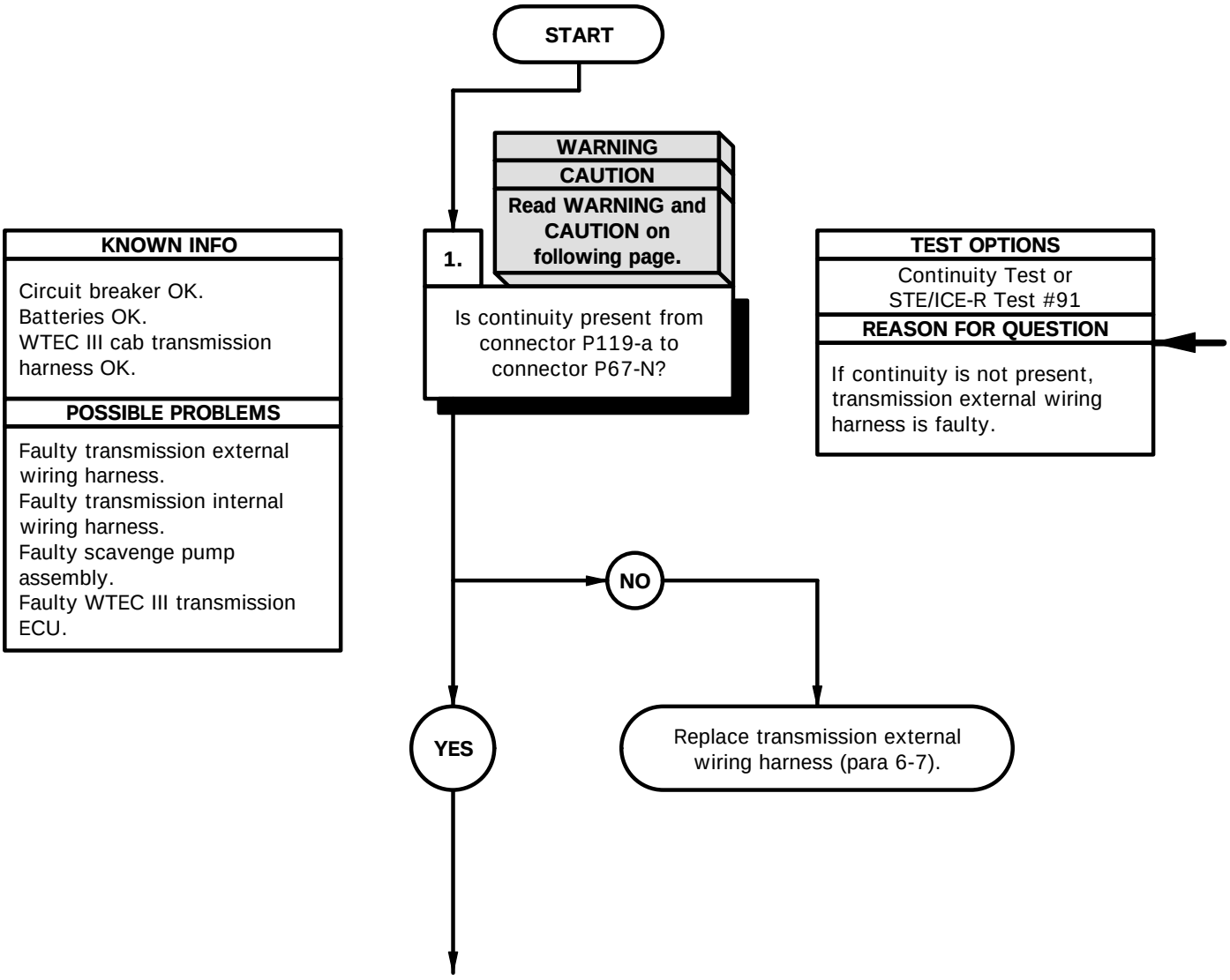
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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, Scoket (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

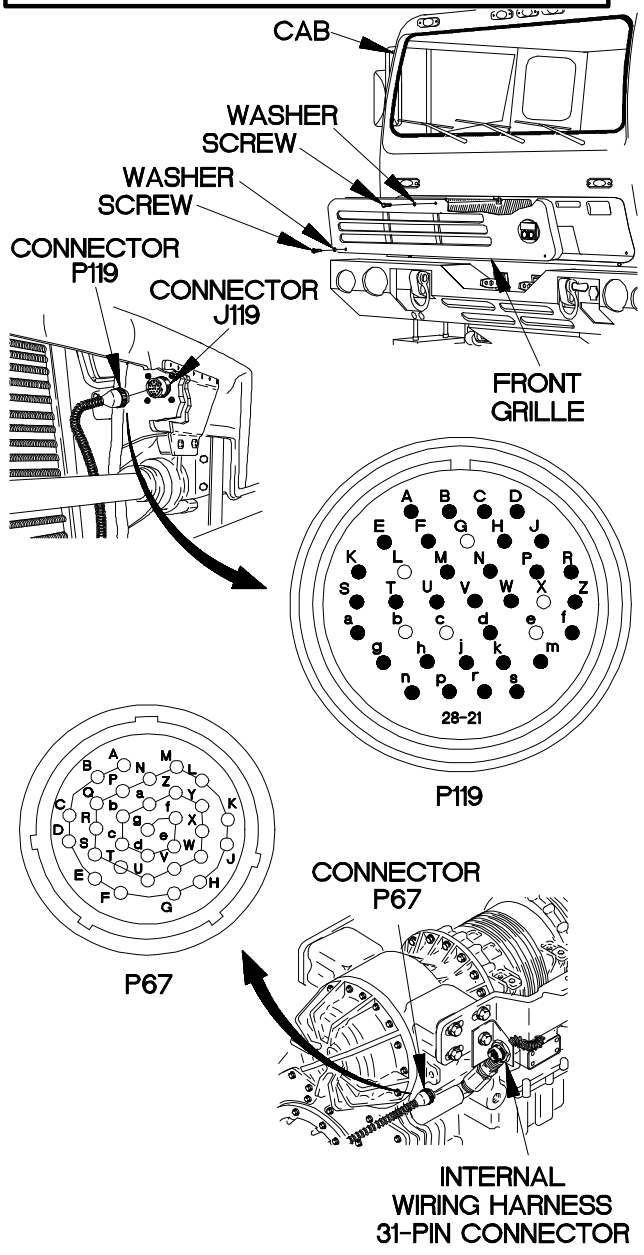
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



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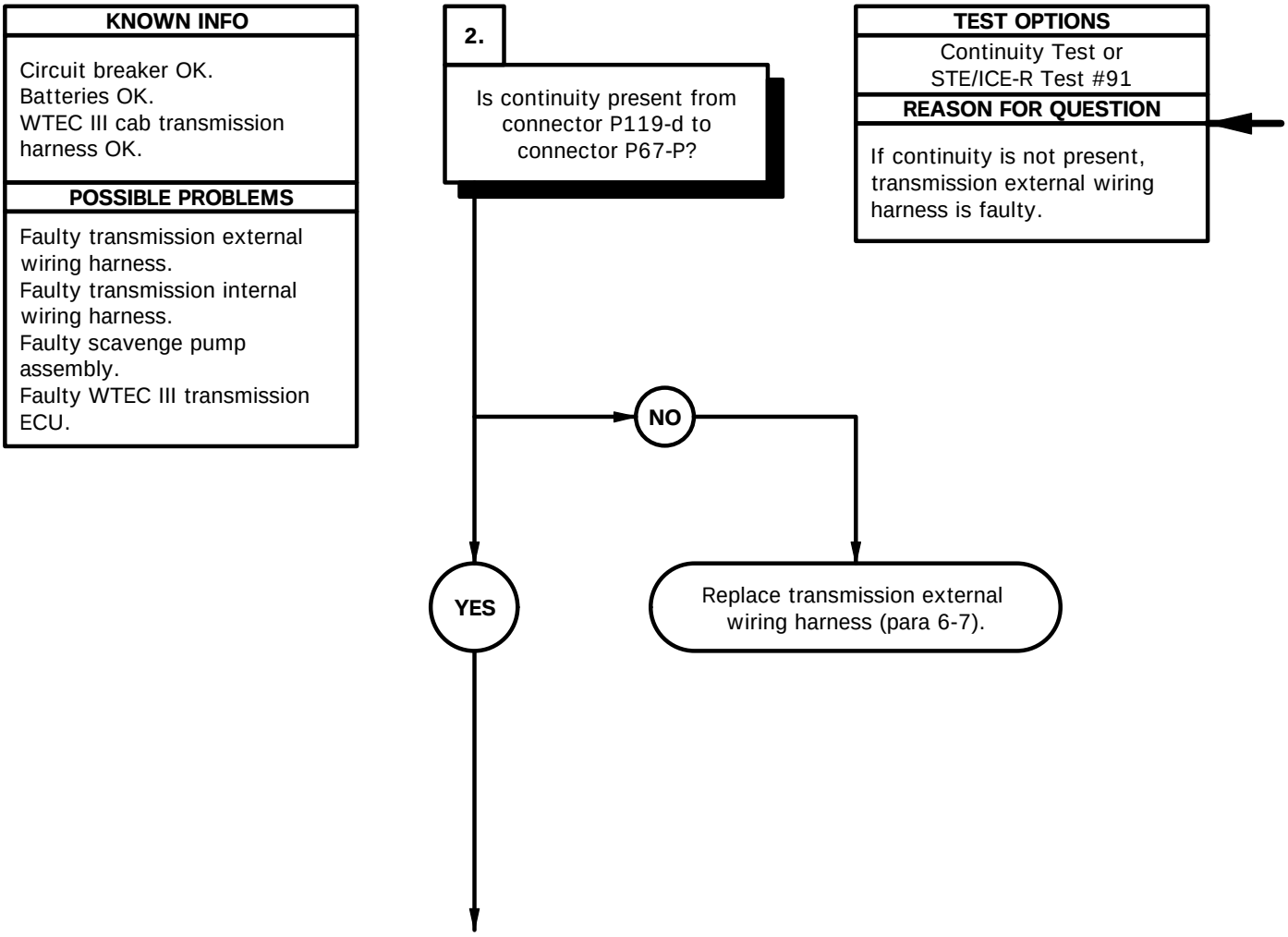
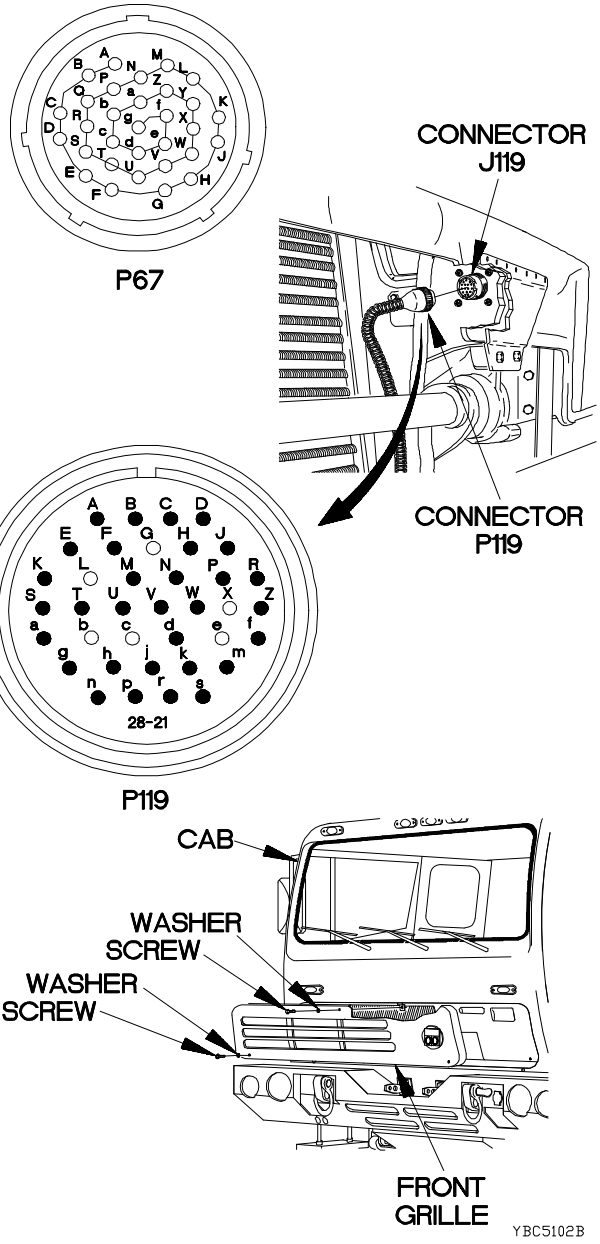
c51. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

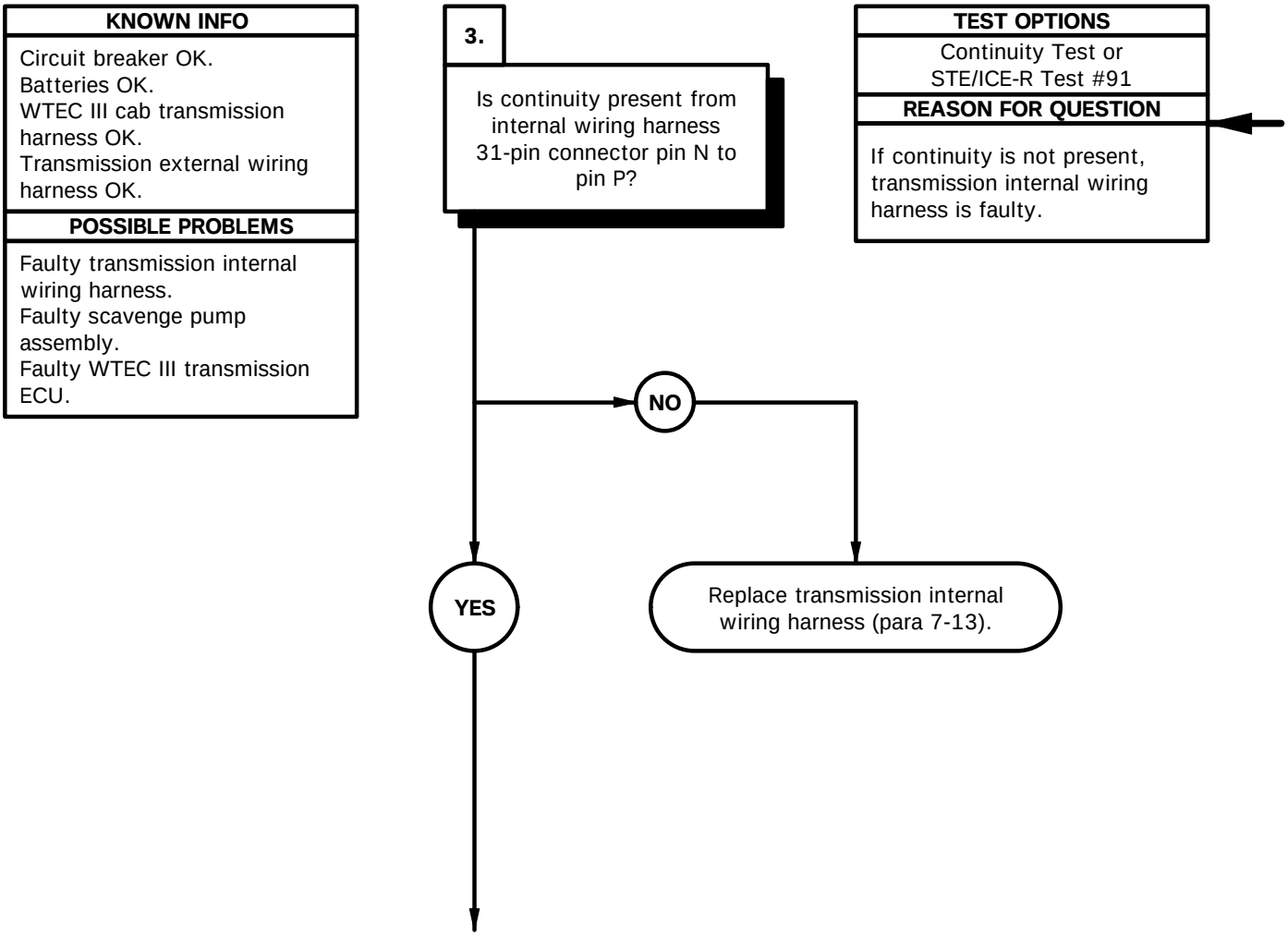


CONTINUITY TEST

(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).

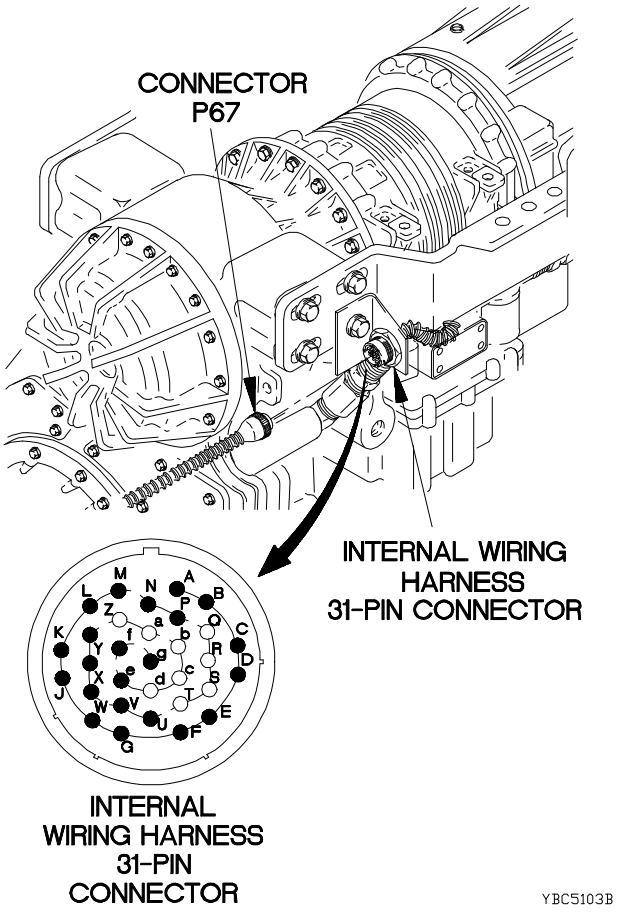


c51. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

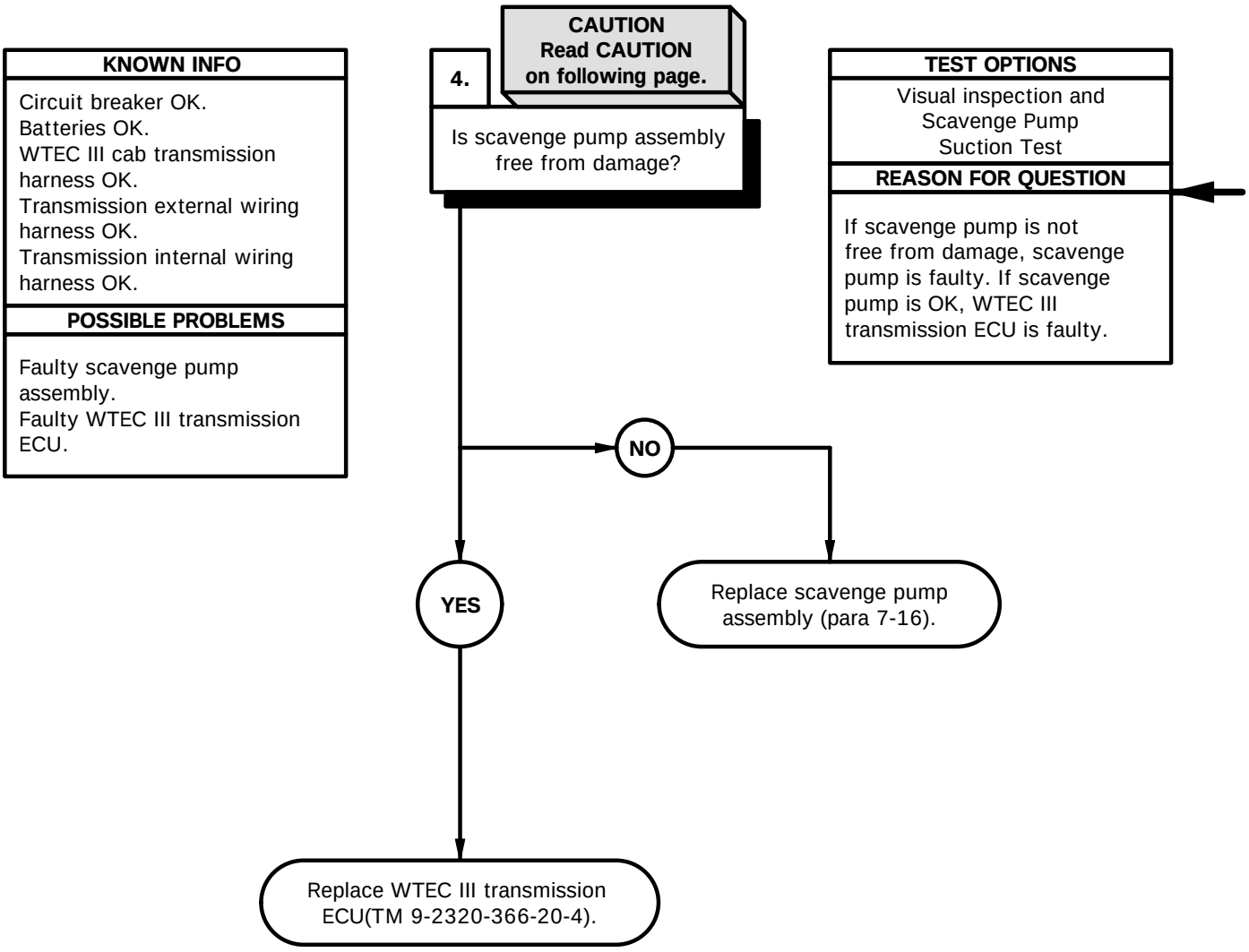


CONTINUITY TEST

(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.



c51. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



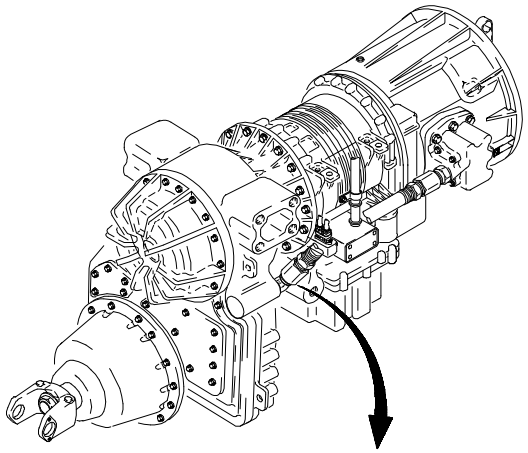
(1) Place drain pan under transfer case.
(2) Disconnect scavenge pump suction hose at transfer case.
(3) Connect batteries (TM 9-2320-366-20-3).
(4) Start engine (TM 9-2320-366-10-1).
(5) If oil drips or runs from fitting on transfer case, replace scavenge pump assembly (para 7-16).
(6) Shut down engine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

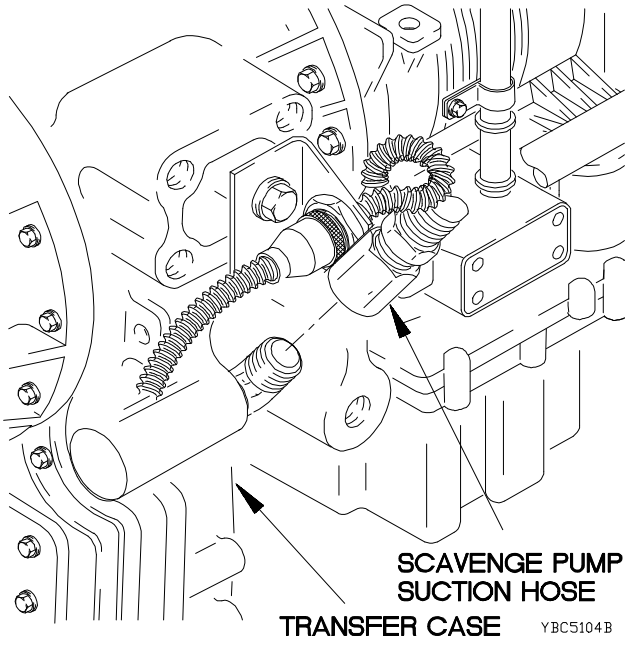
CAUTION

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

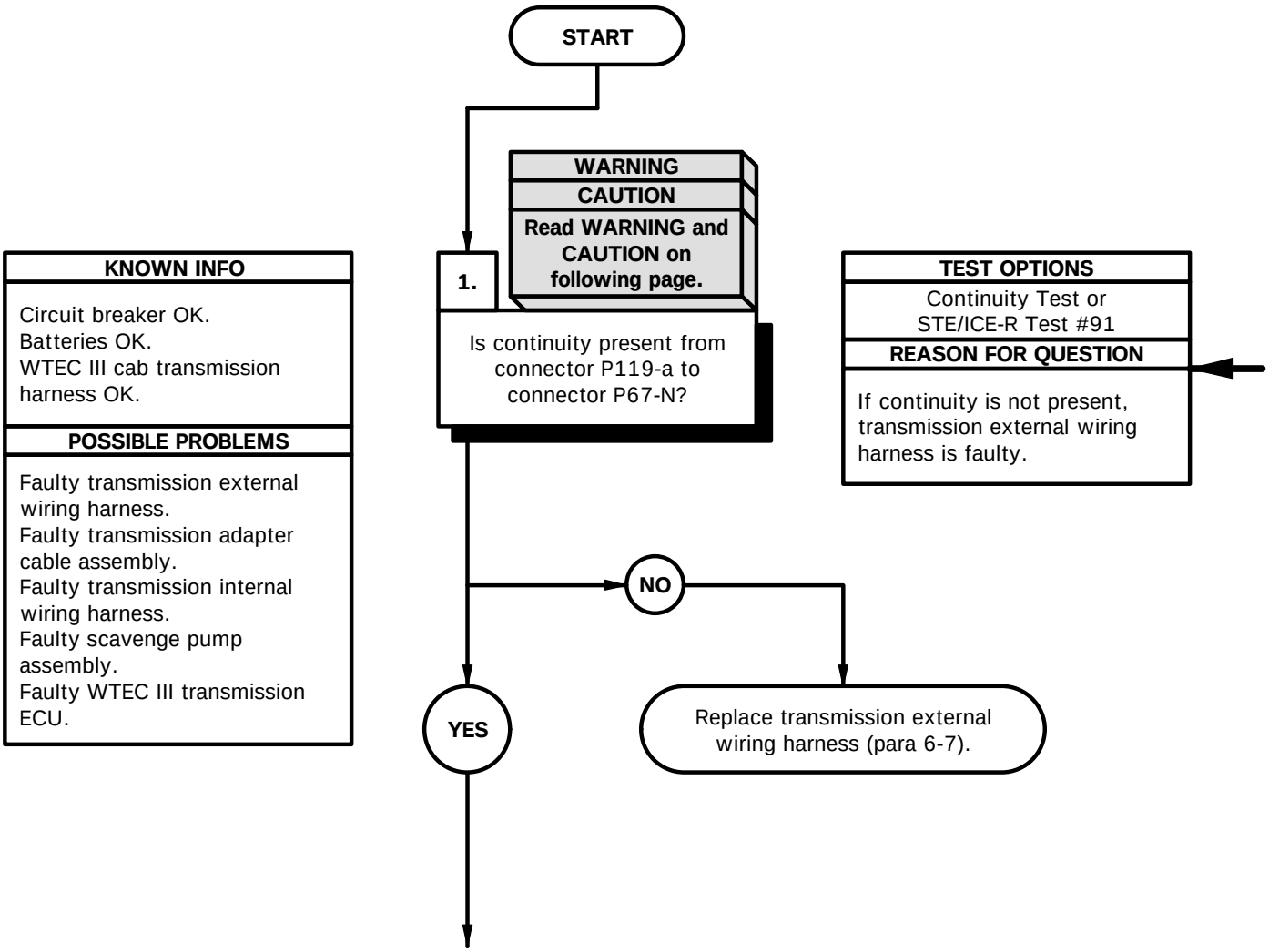
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

Tools and Special Tools
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)

Tools and Special Tools (Cont)
Wrench, Torque, 0-200 lb-in. (Item 93, 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

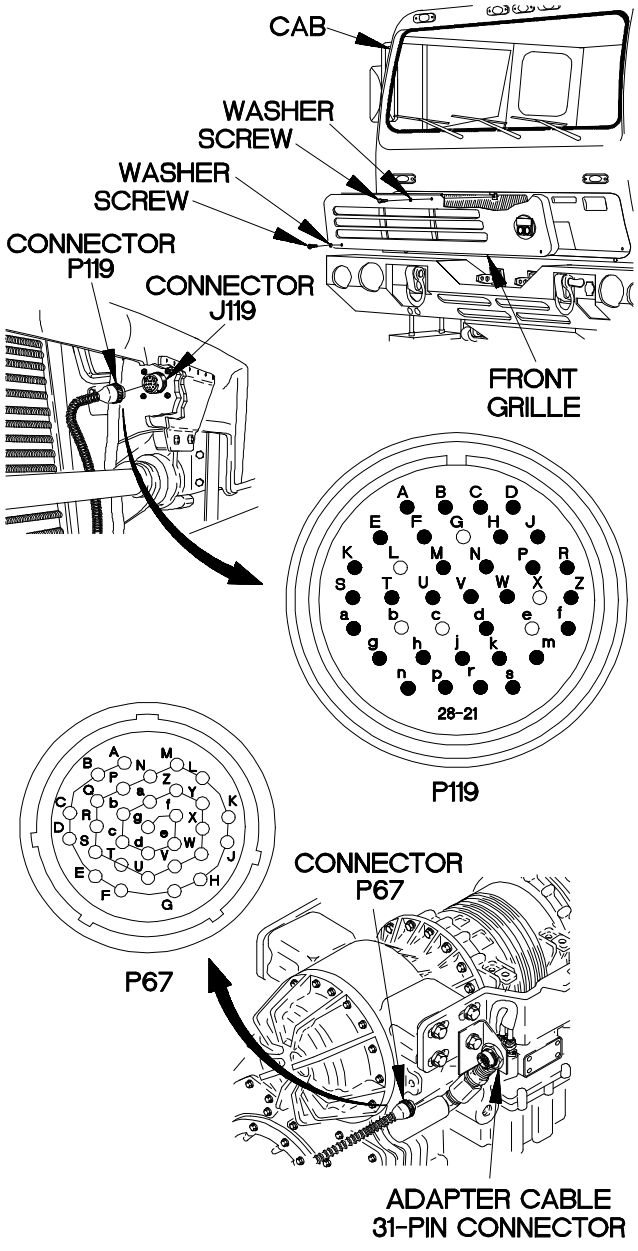
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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 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).



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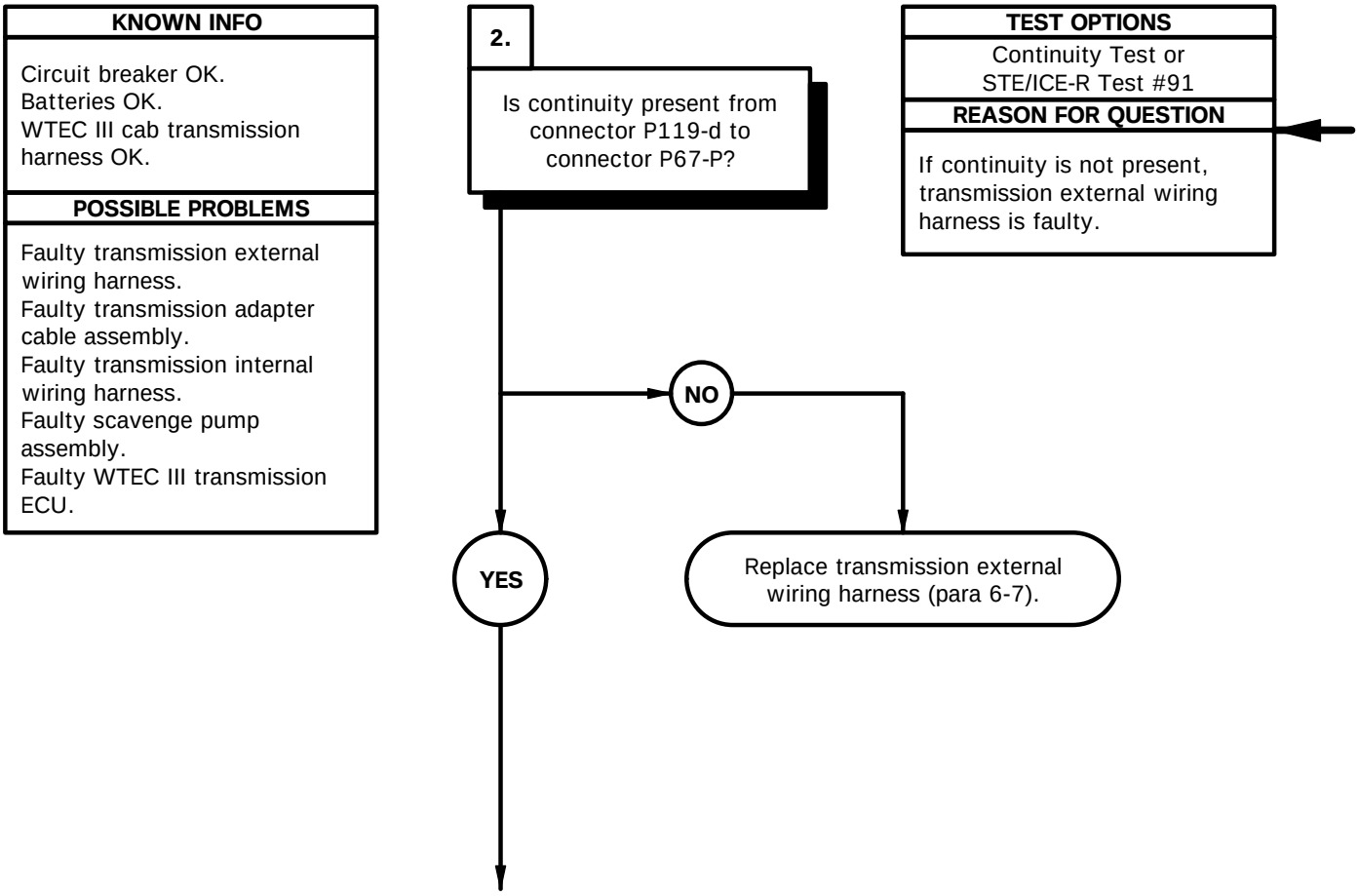
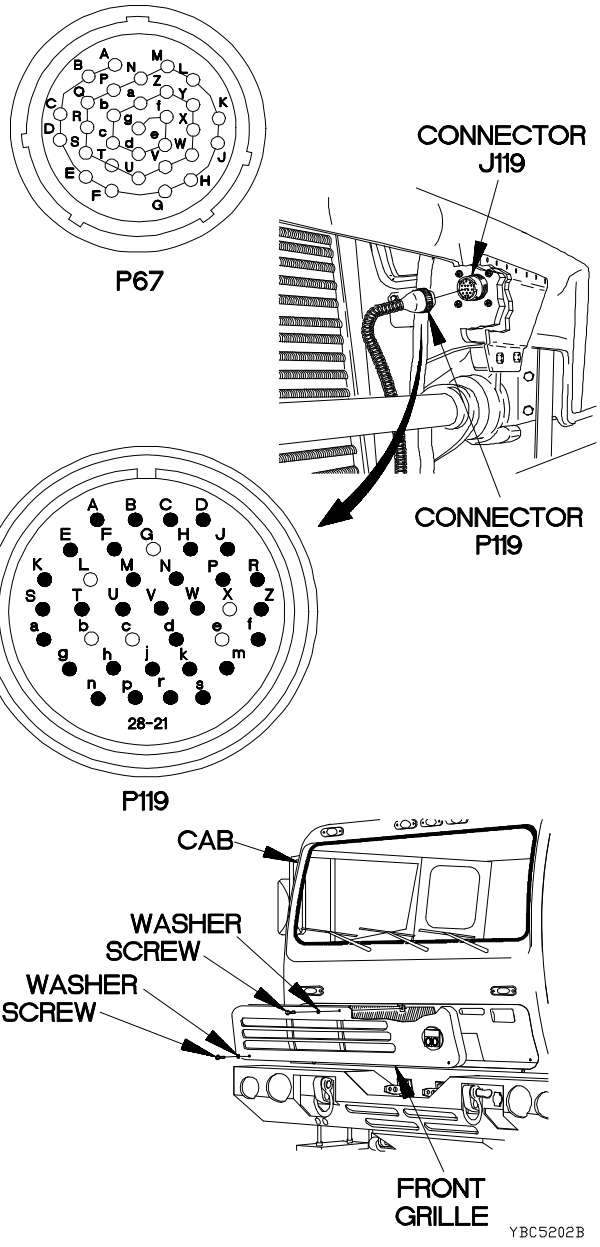
c52. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

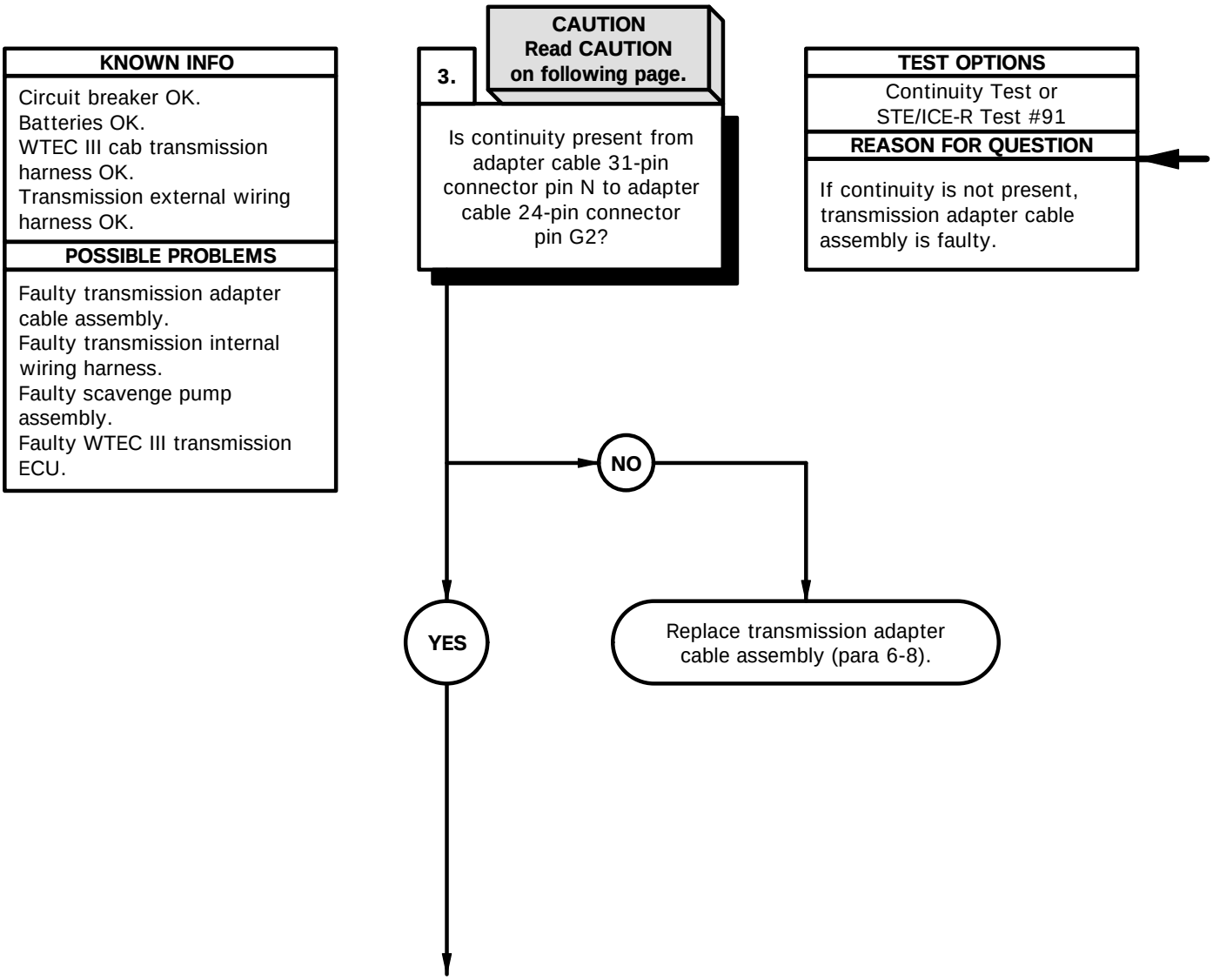


CONTINUITY TEST

(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)

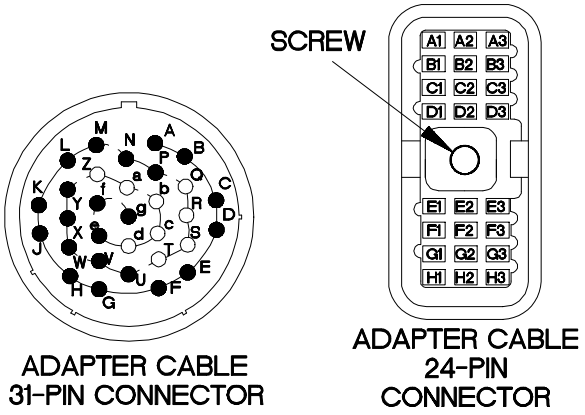


CAUTION

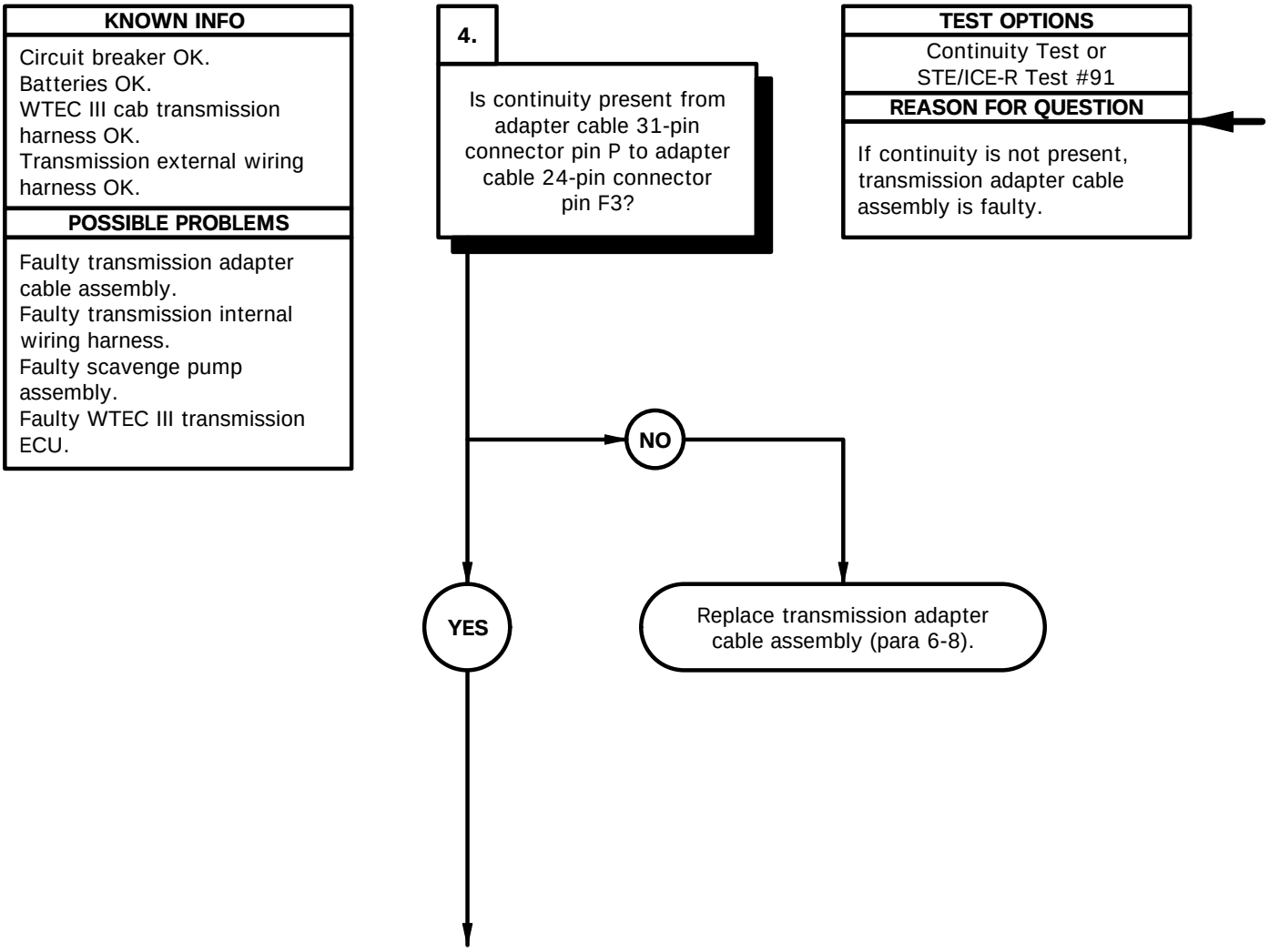
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

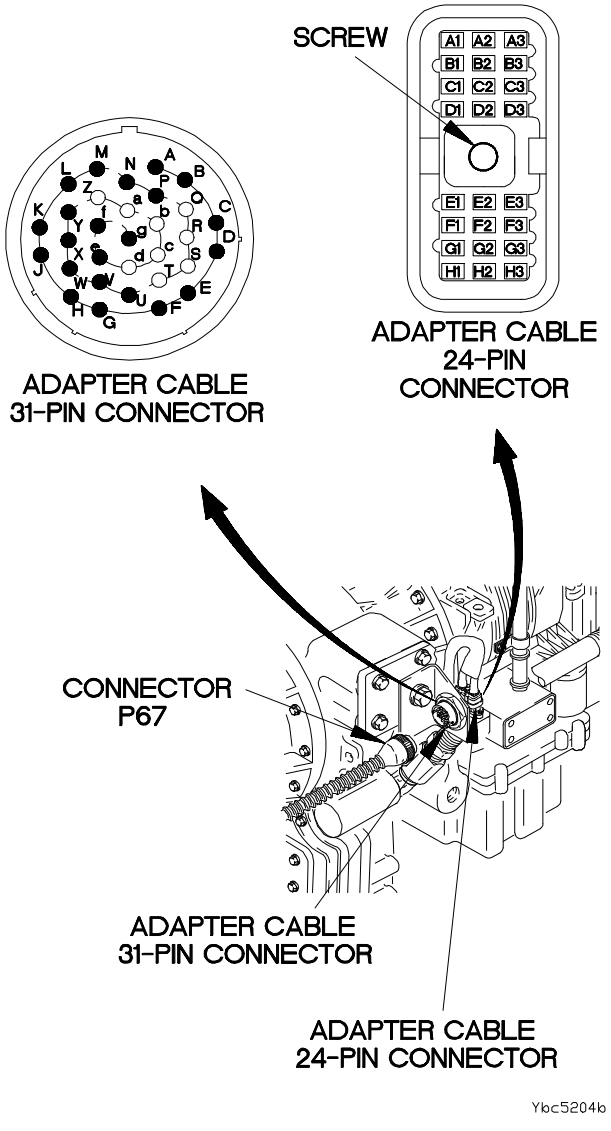


c52. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

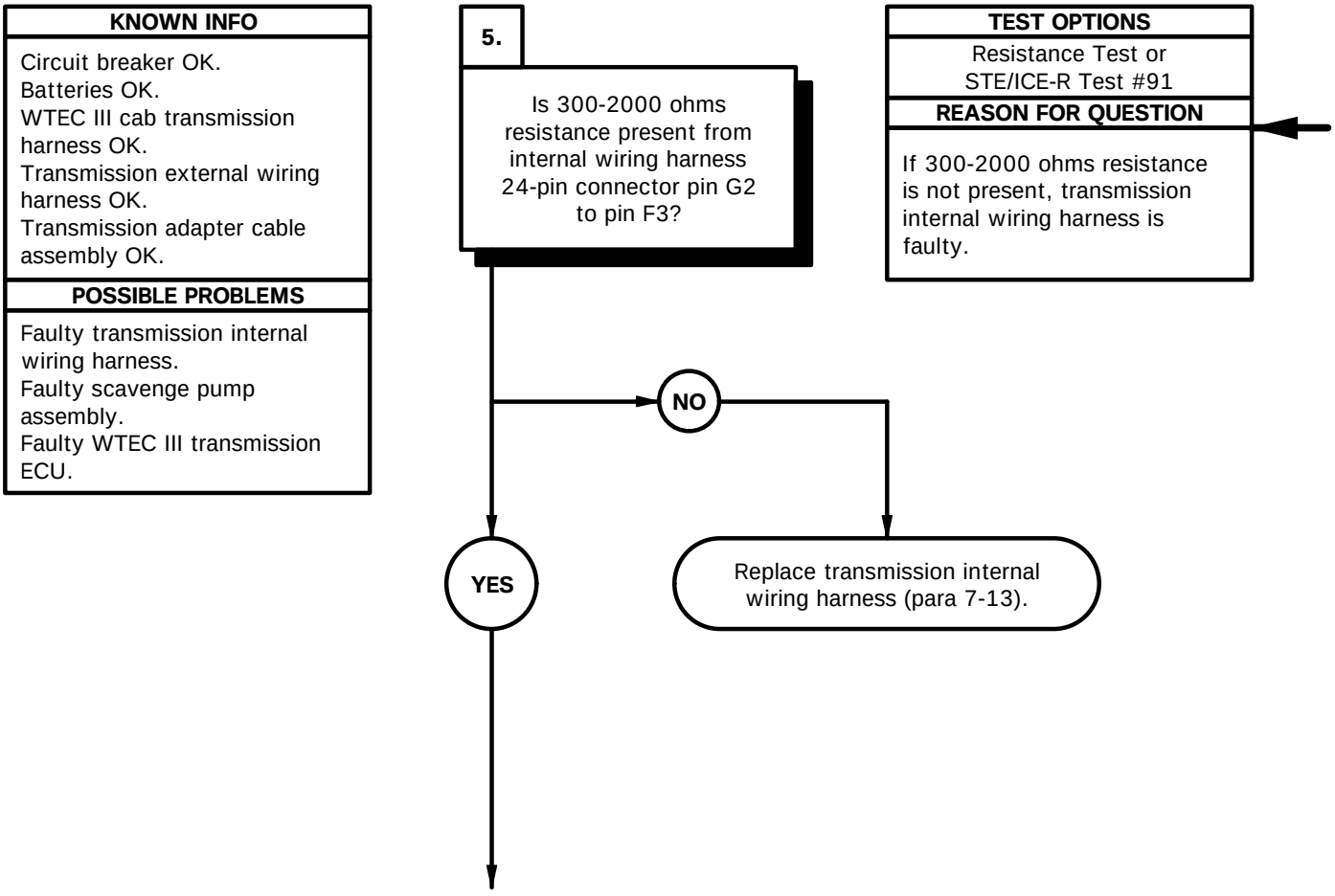


CONTINUITY TEST

(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.

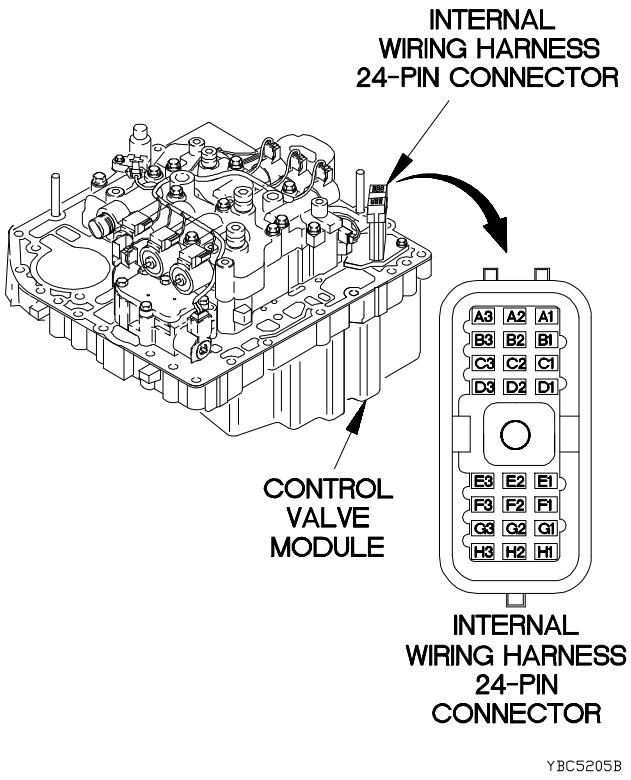


c52. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

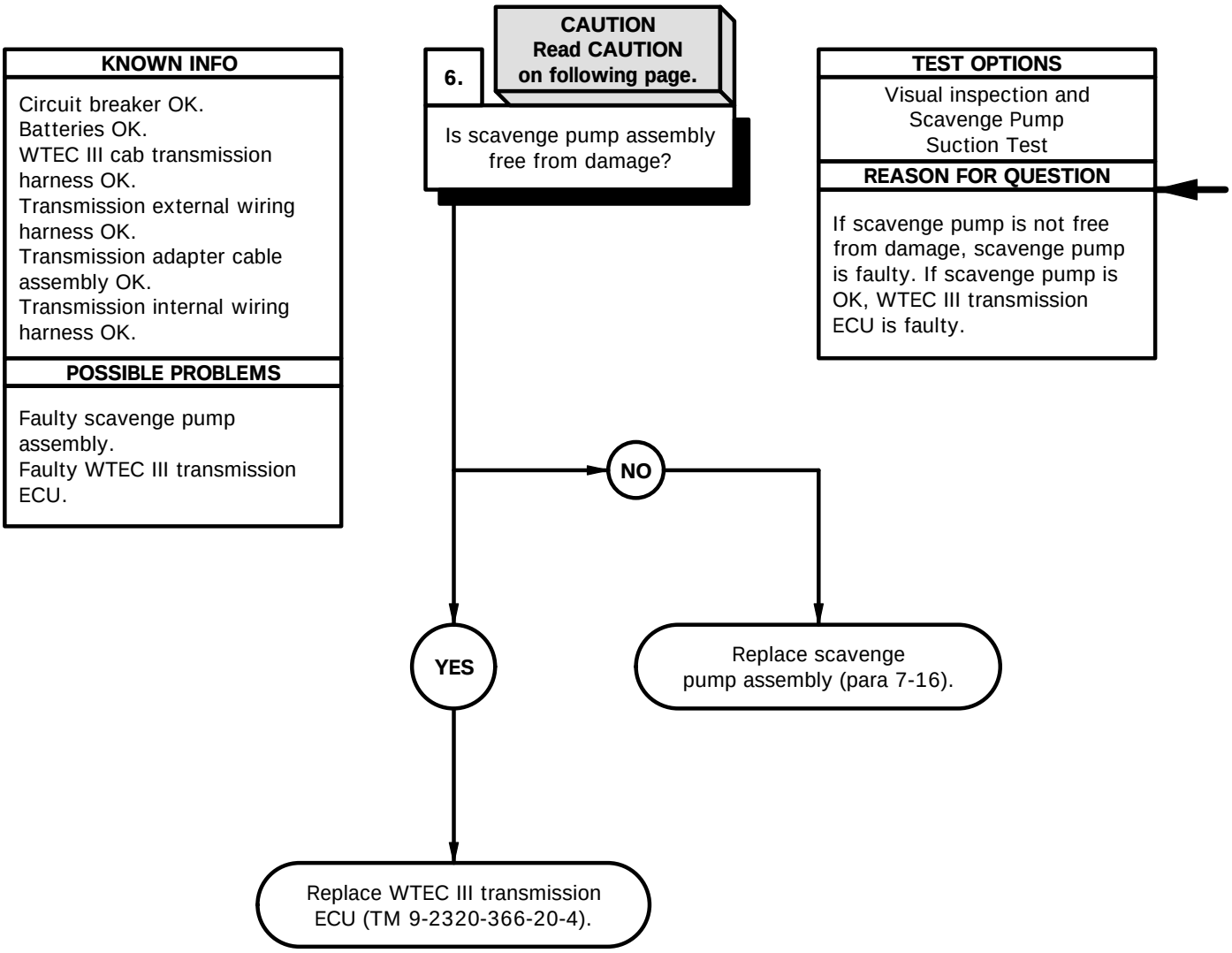


RESISTANCE TEST

(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).



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)



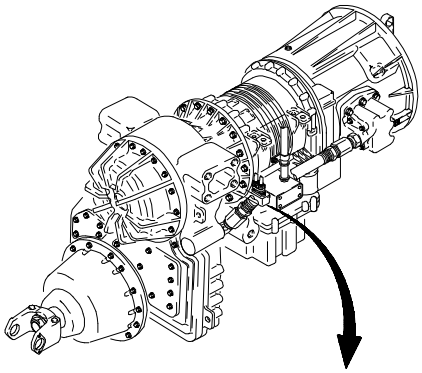
(1) Place drain pan under transfer case.
(2) Disconnect scavenge pump suction hose at transfer case.
(3) Connect batteries (TM 9-2320-366-20-3).
(4) Start engine (TM 9-2320-366-10-1).
(5) If oil drips or runs from fitting on transfer case, replace scavenge pump assembly (para 7-16).
(6) Shut down engine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

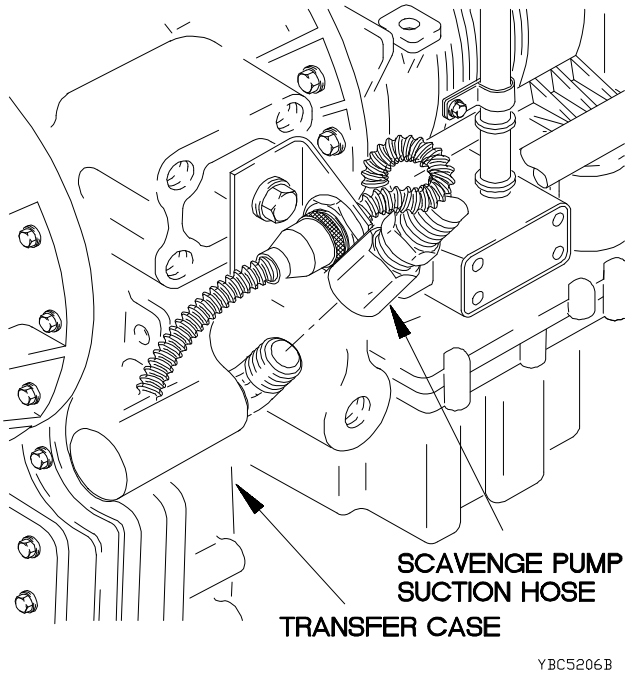
CAUTION

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.





c53. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 32 AND/OR 57 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

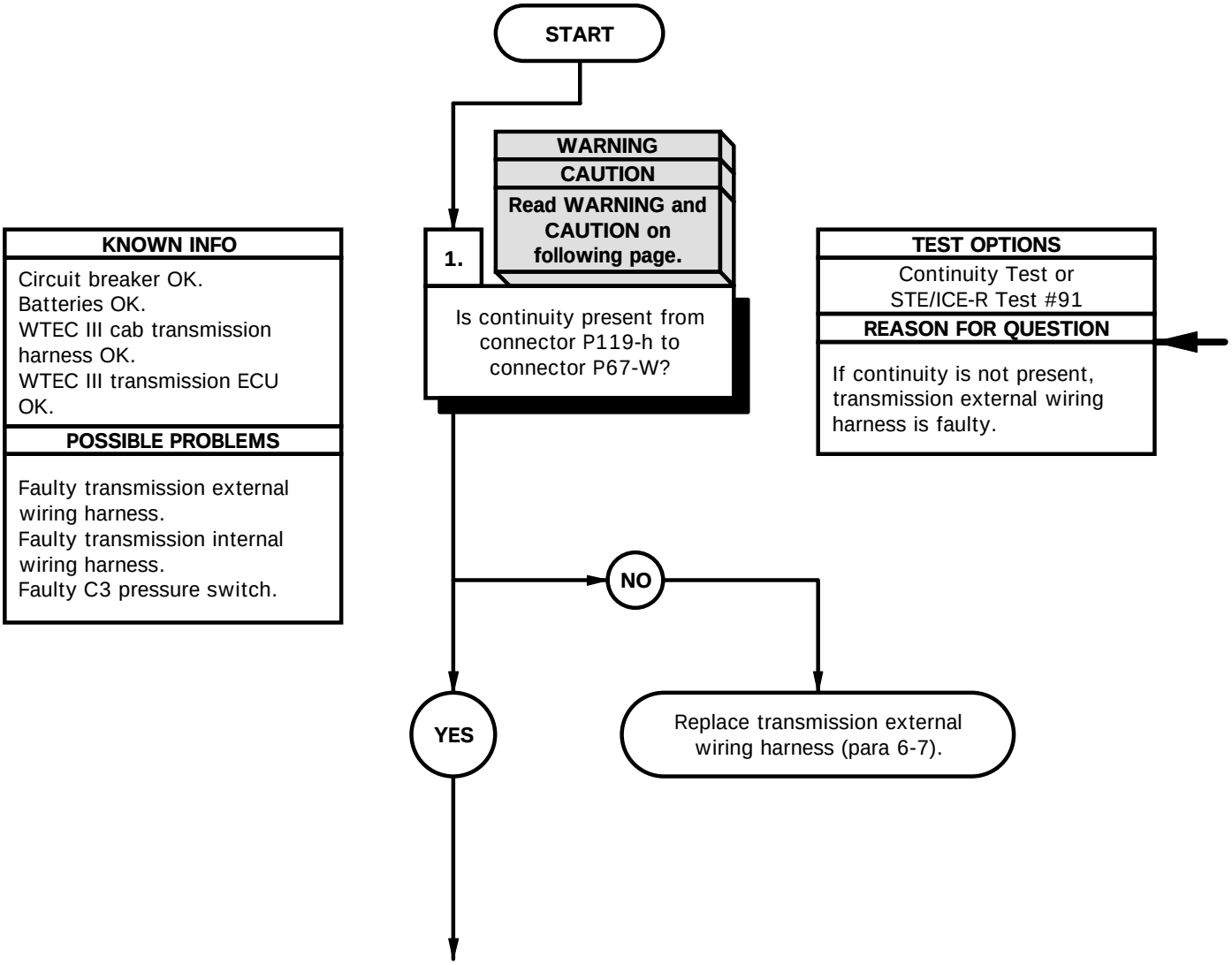
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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)

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

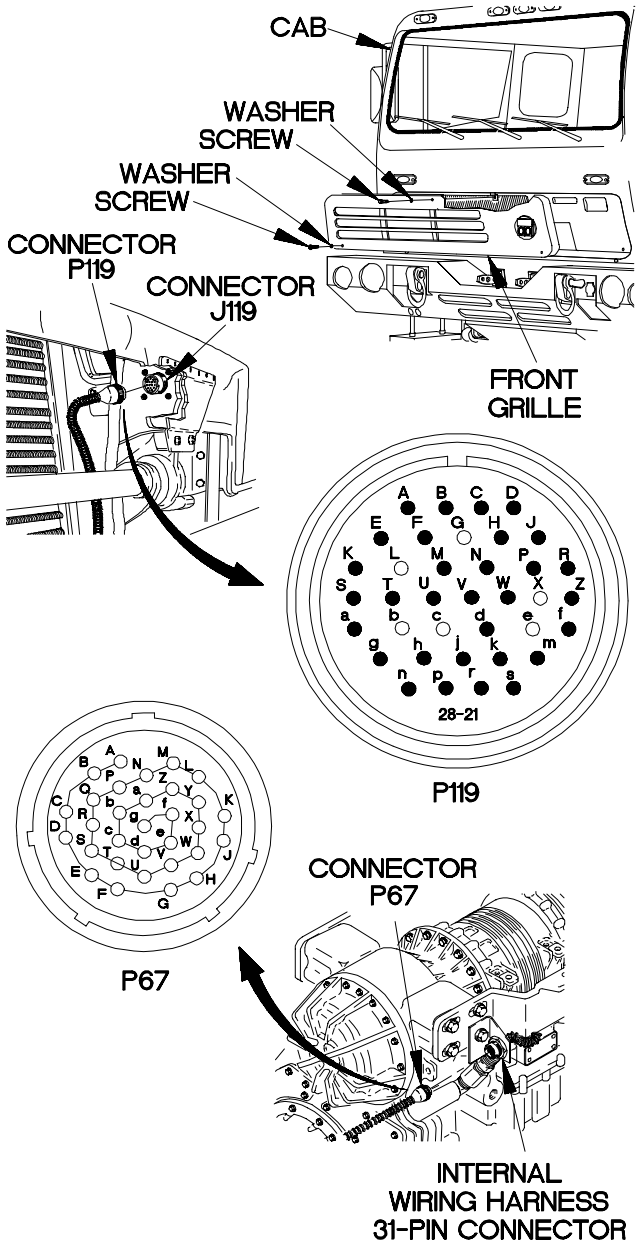
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

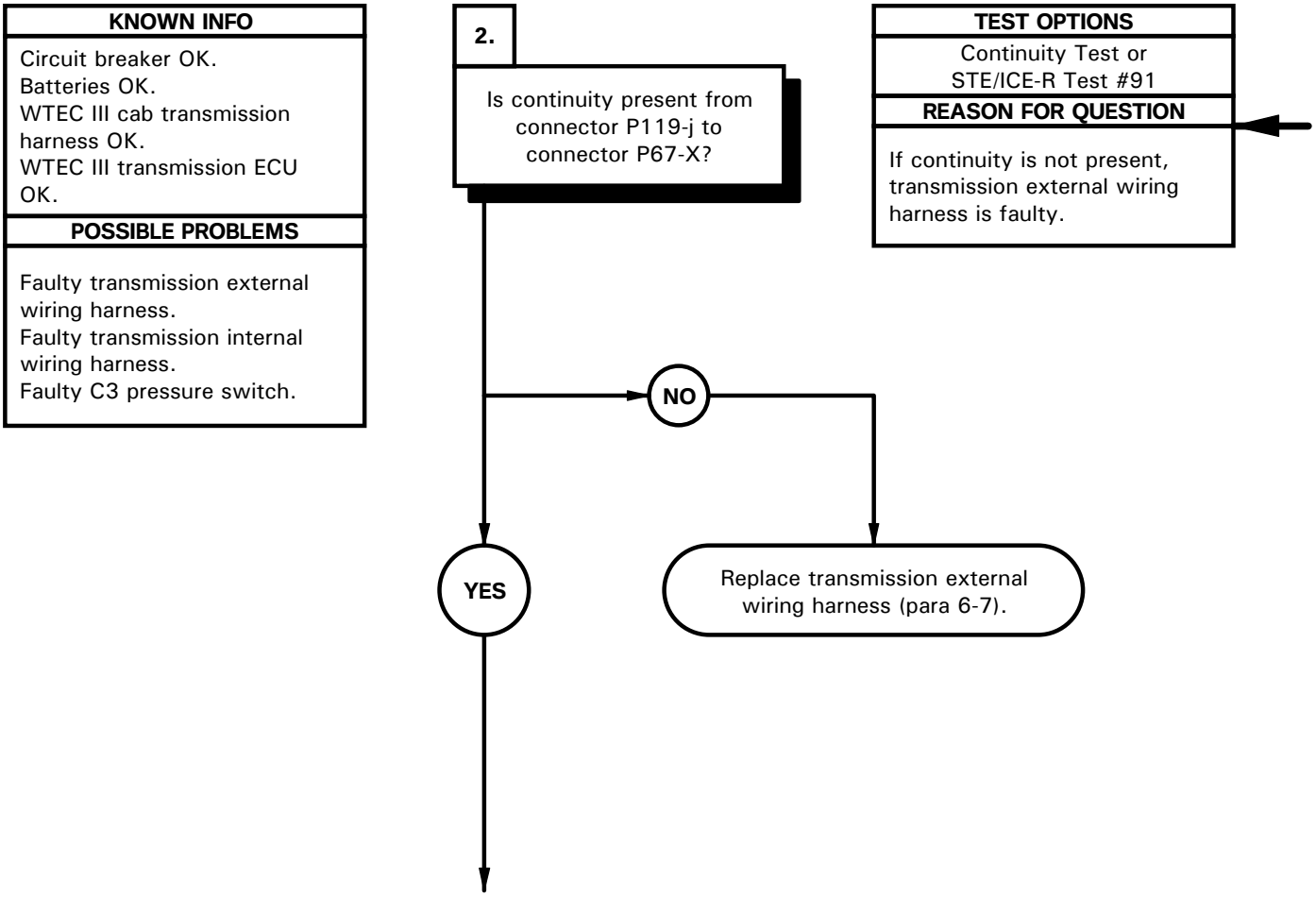
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from internal wiring harness 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect 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).

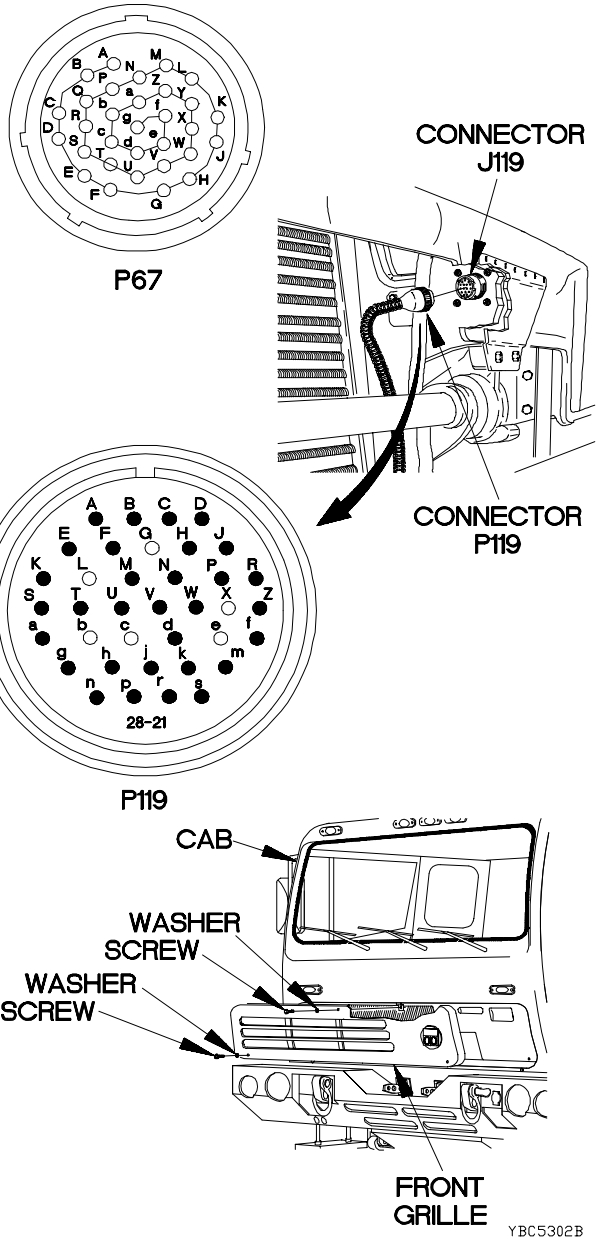


c53. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 32 AND/OR 57 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

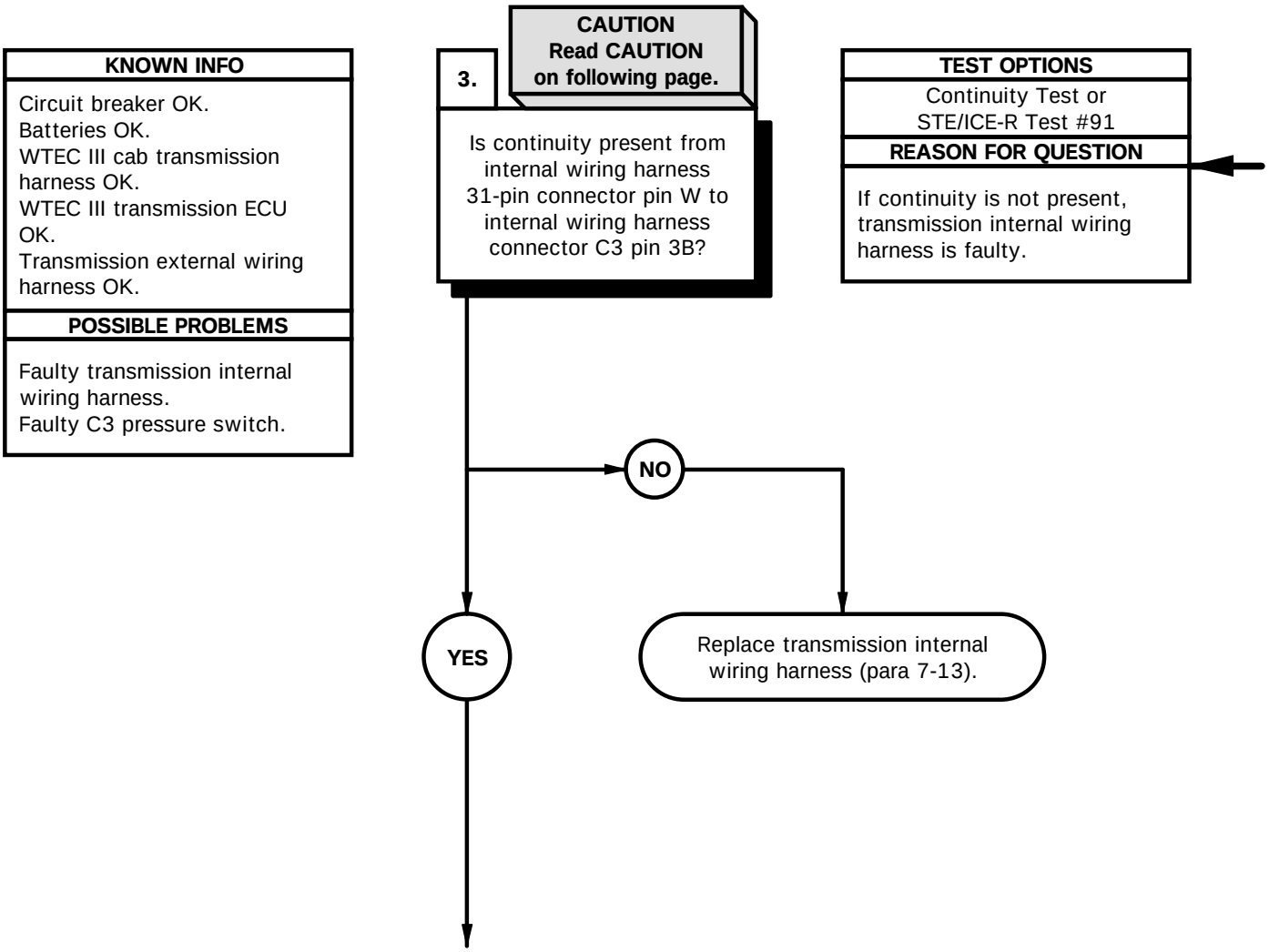


CONTINUITY TEST

(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).



c53. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 32 AND/OR 57 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

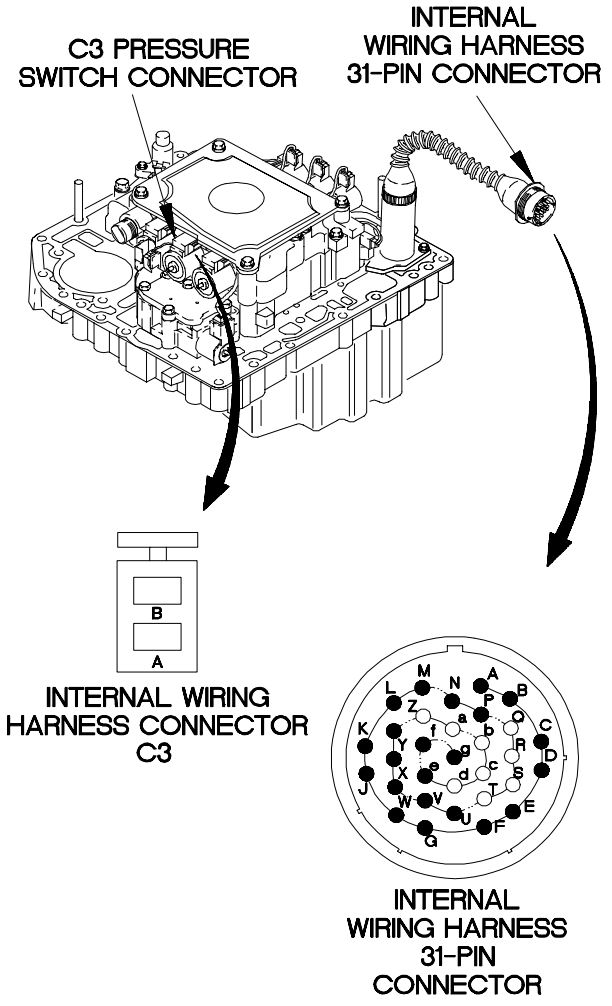


CAUTION

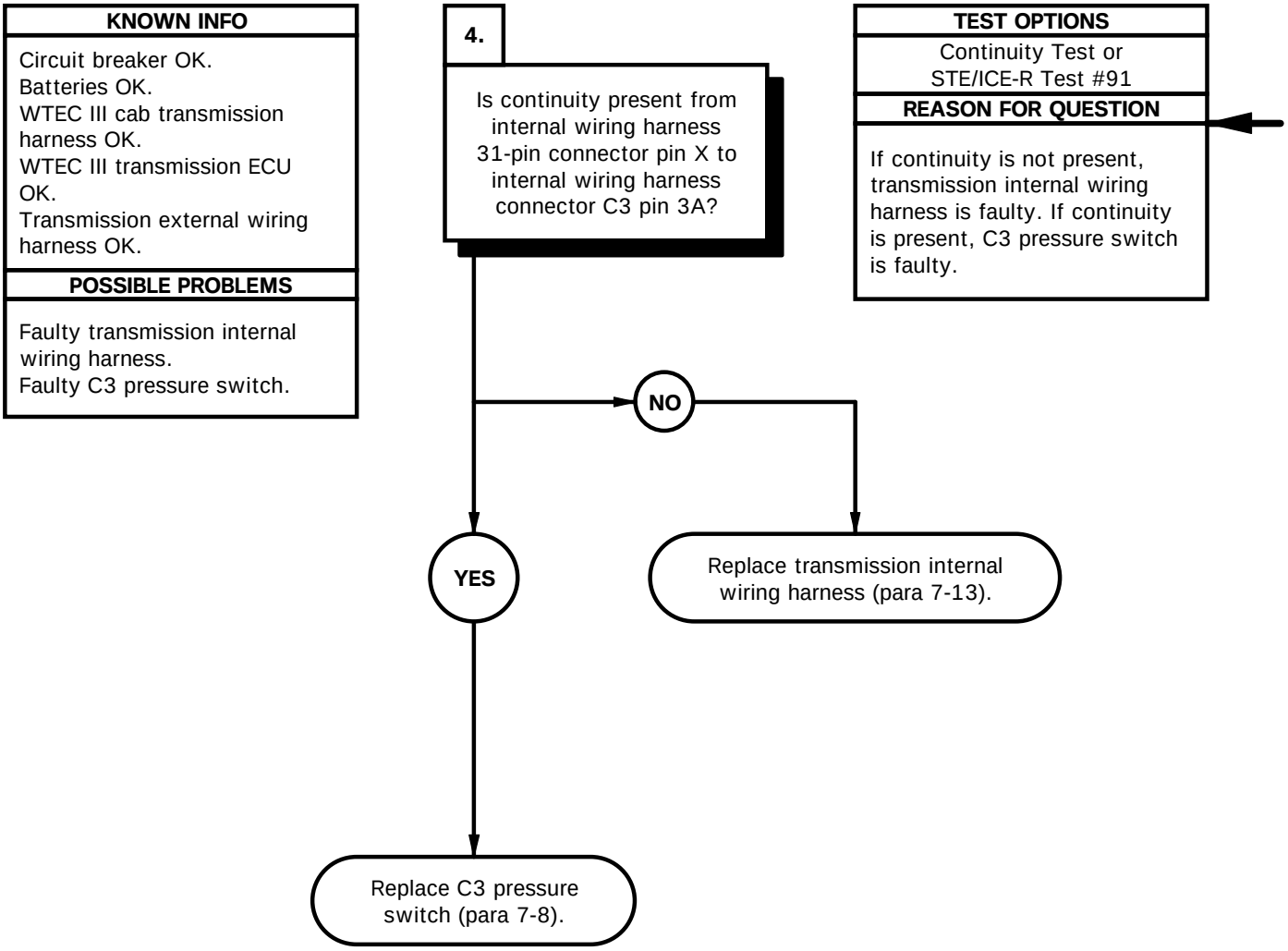
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

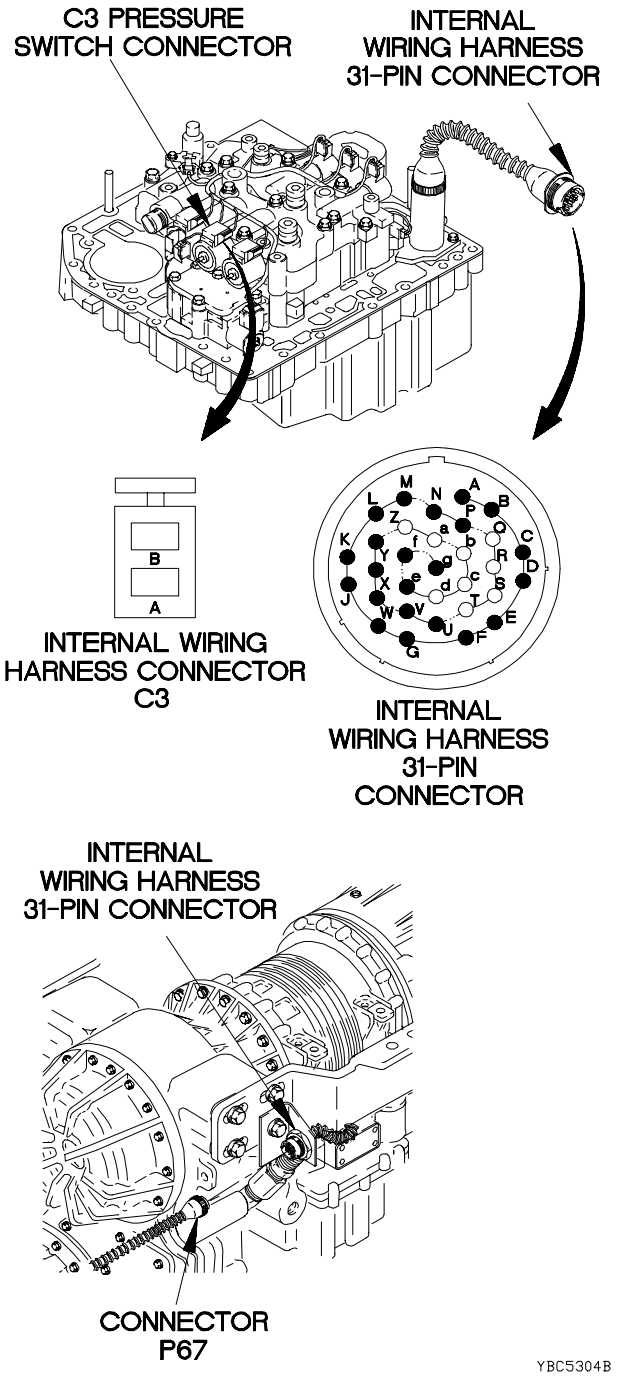


c53. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 32 AND/OR 57 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



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).



c54. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 32 AND/OR 57 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY)

INITIAL SETUP

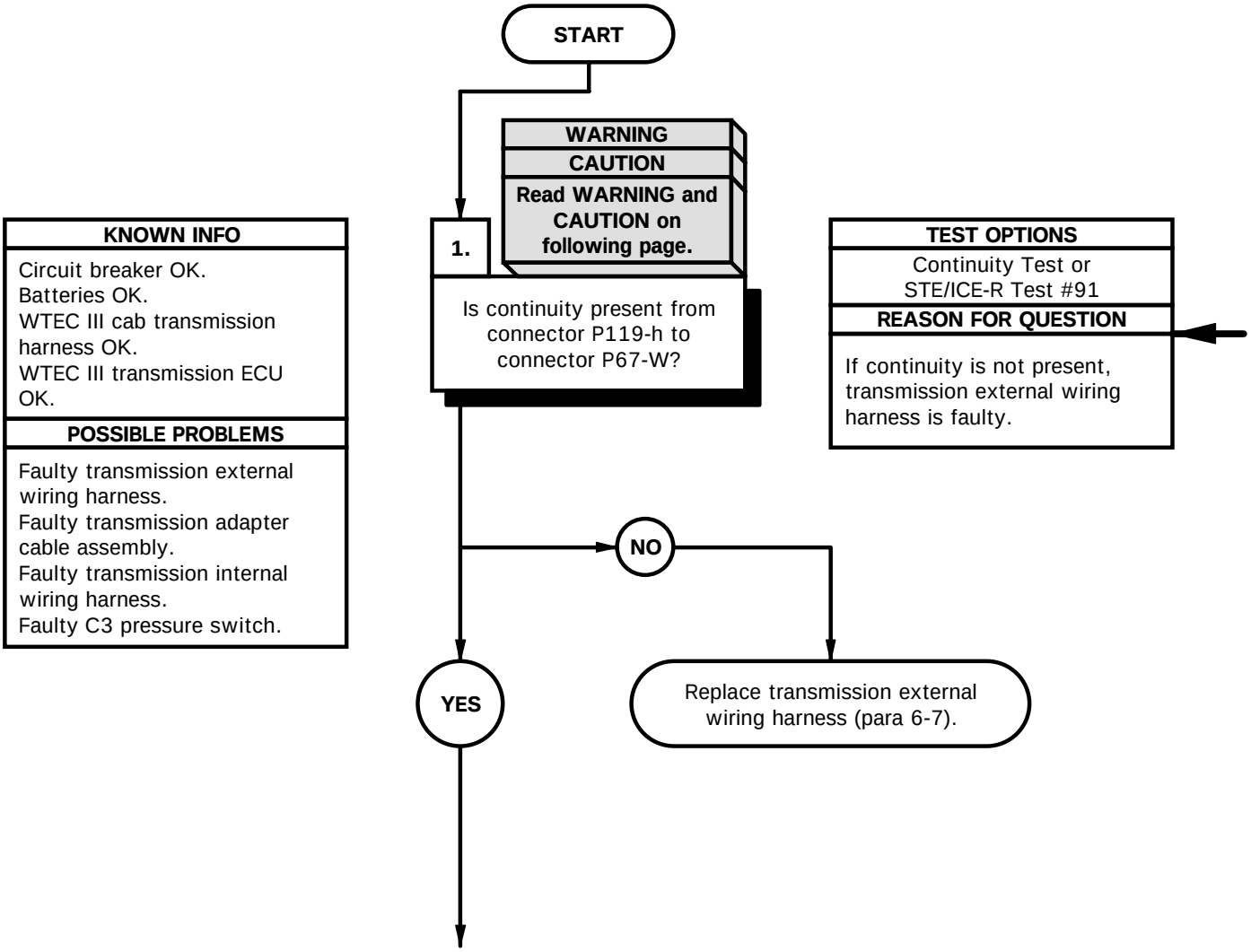
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

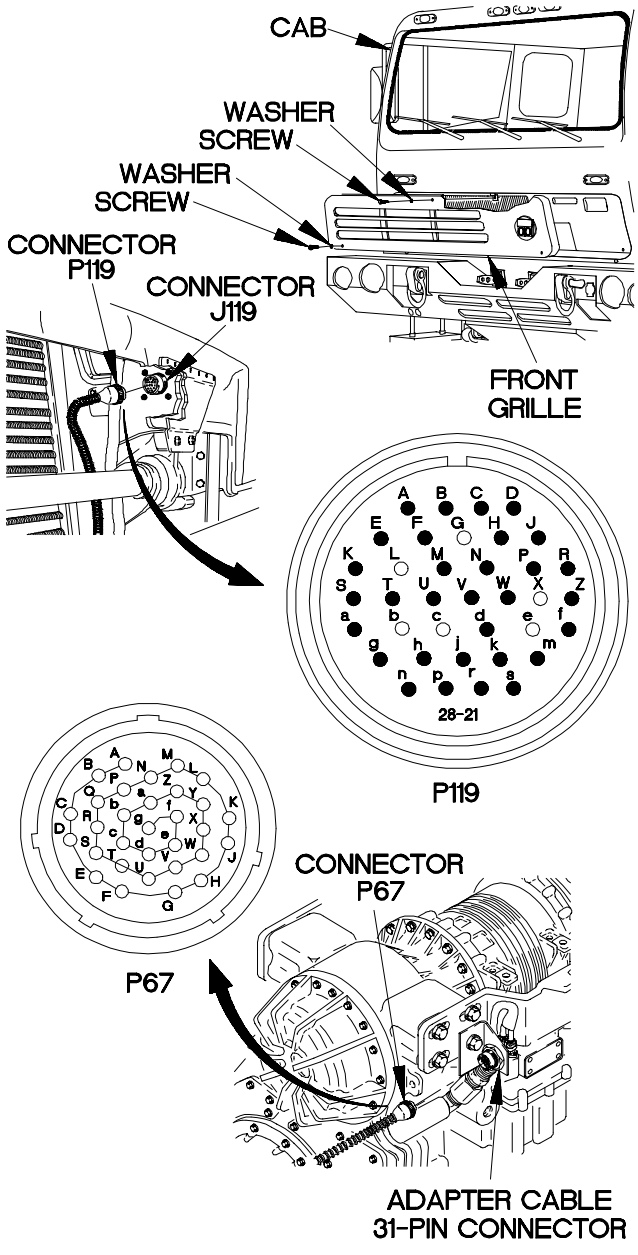
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

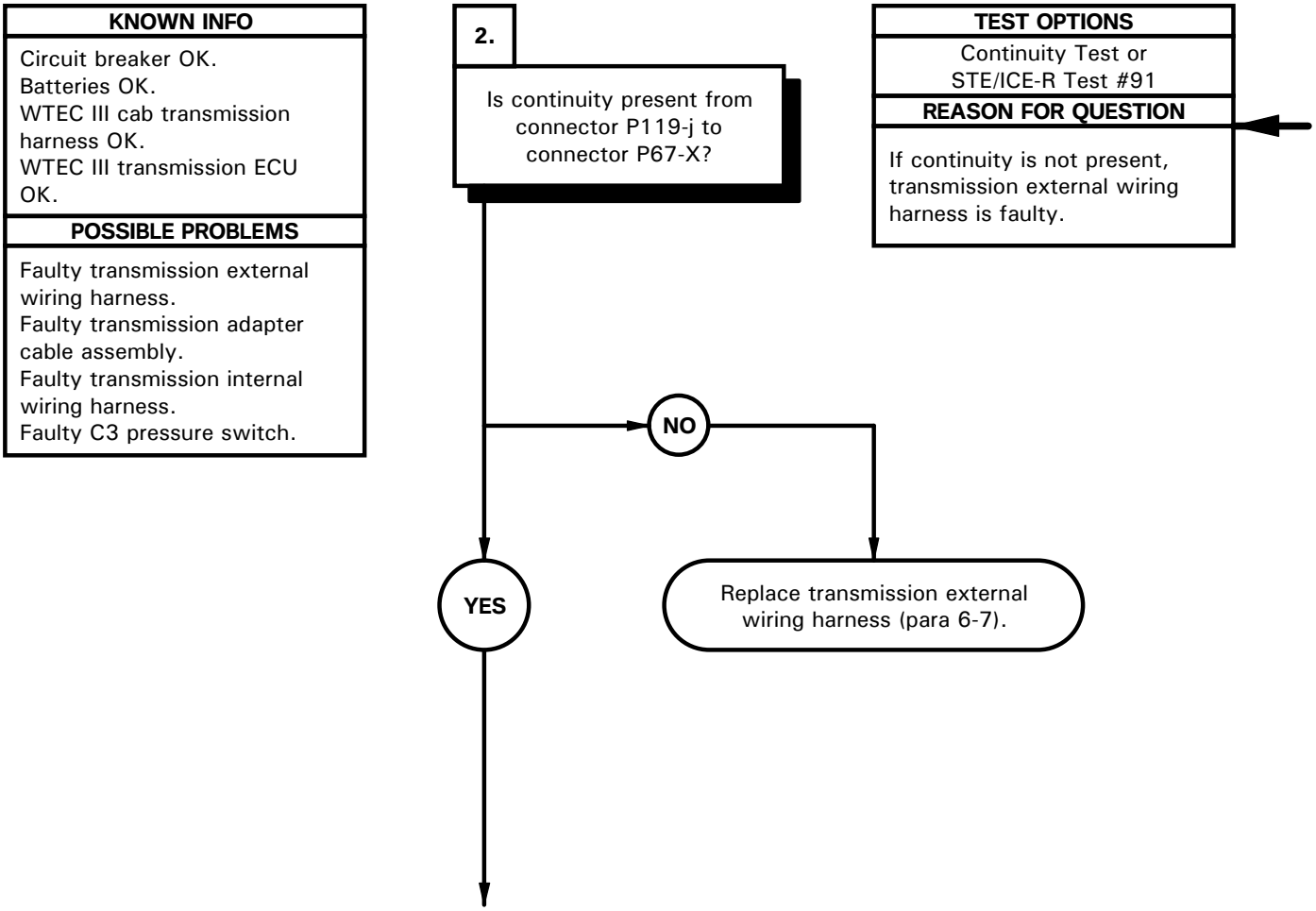
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from adapter cable 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect positive (+) 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).

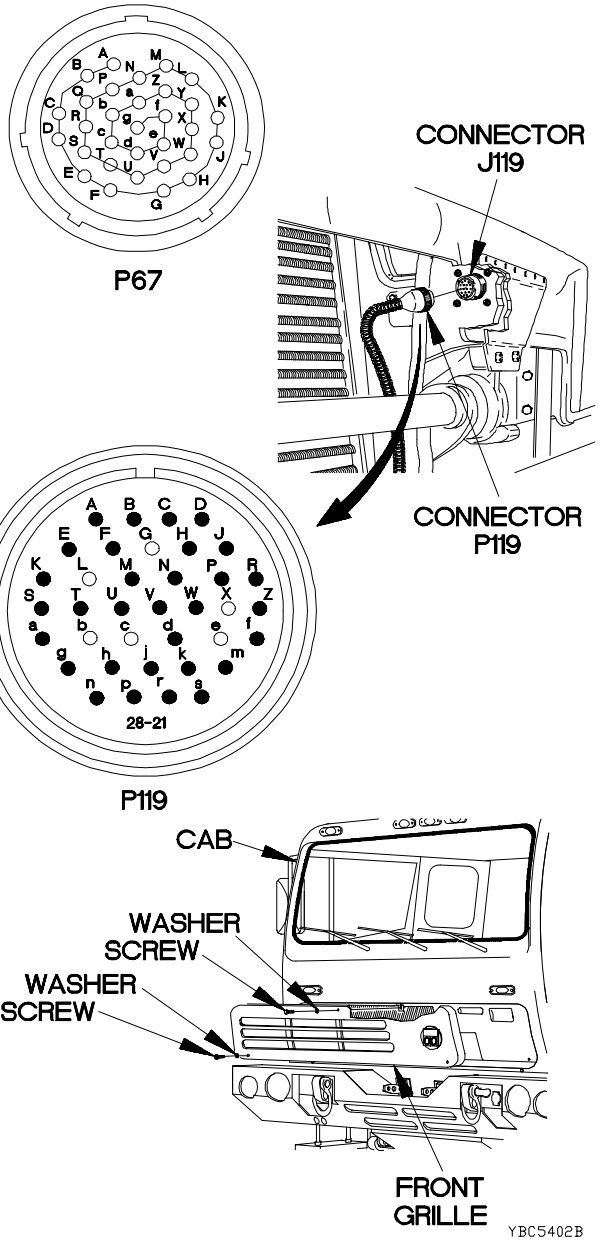


c54. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 32 AND/OR 57 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

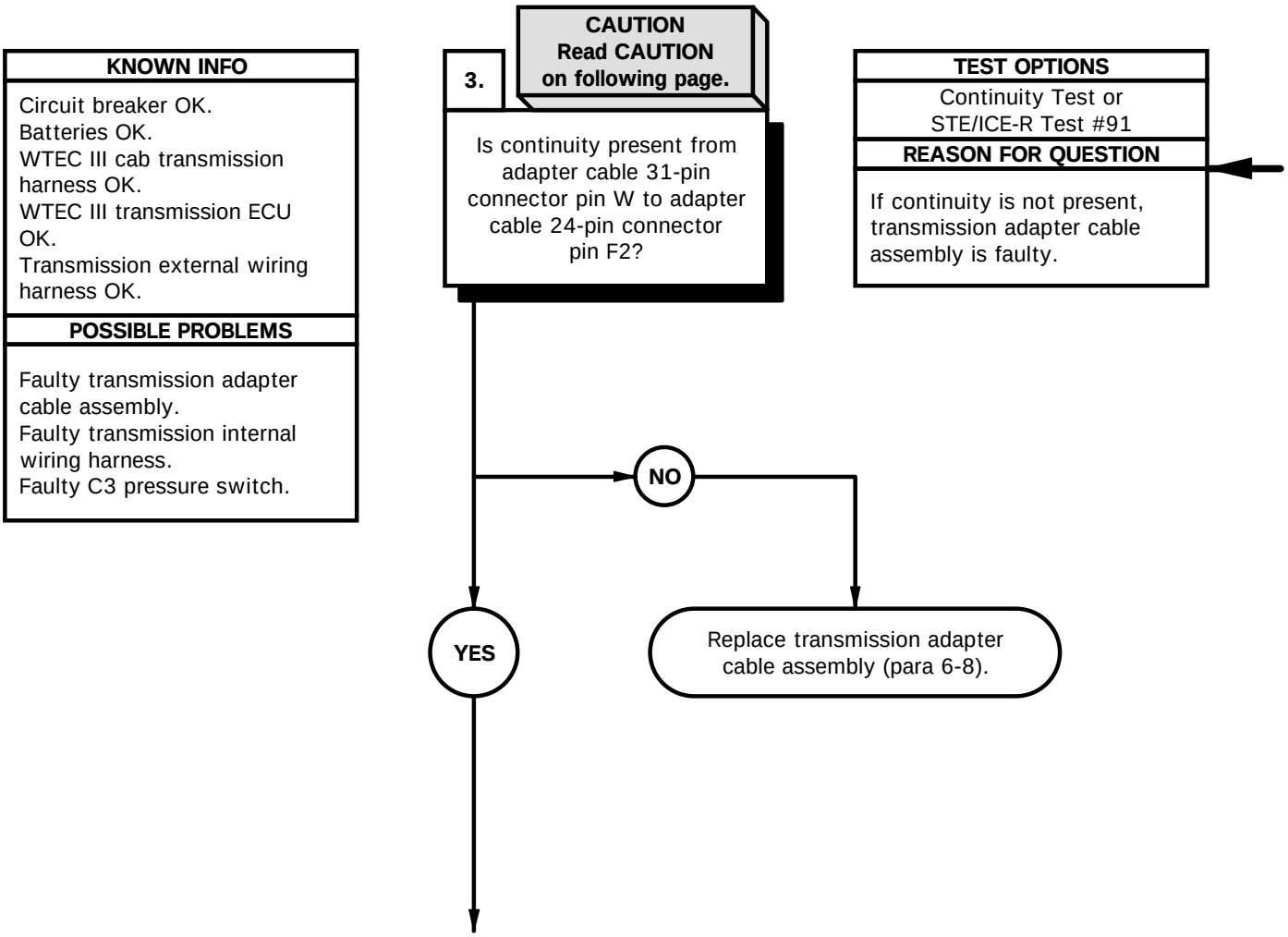


CONTINUITY TEST

(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/OR 57 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

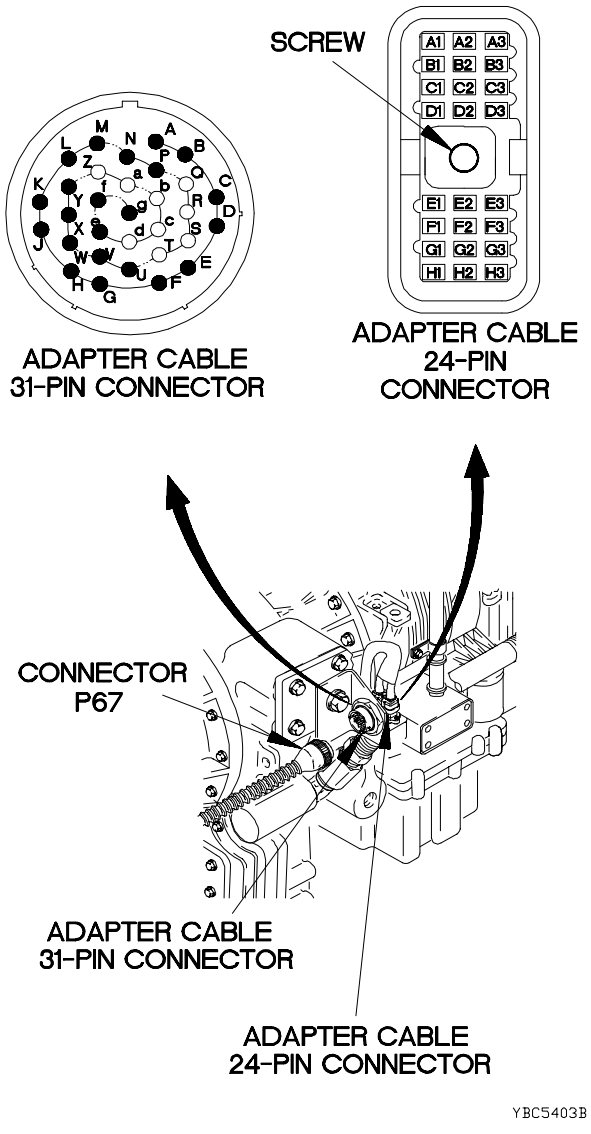


CAUTION

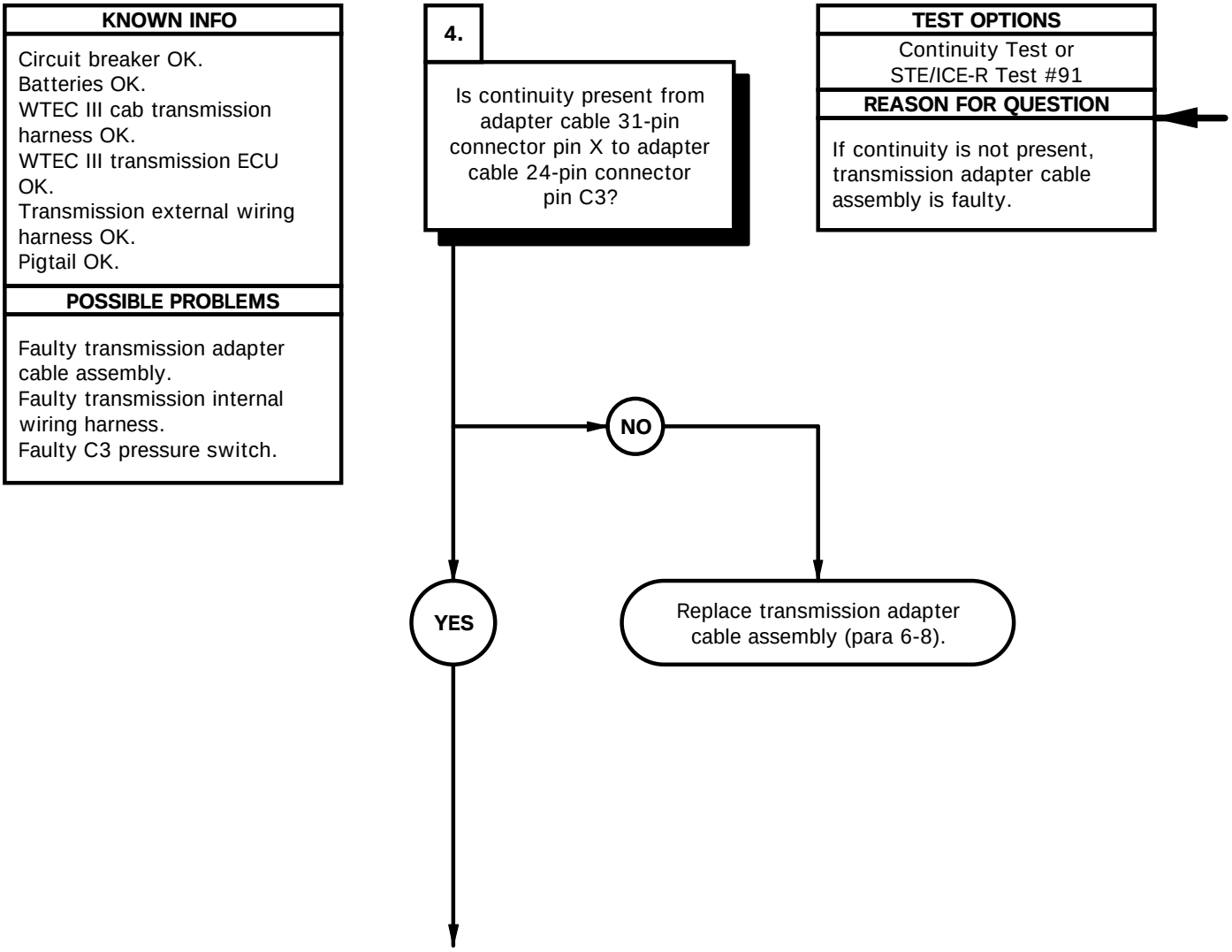
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

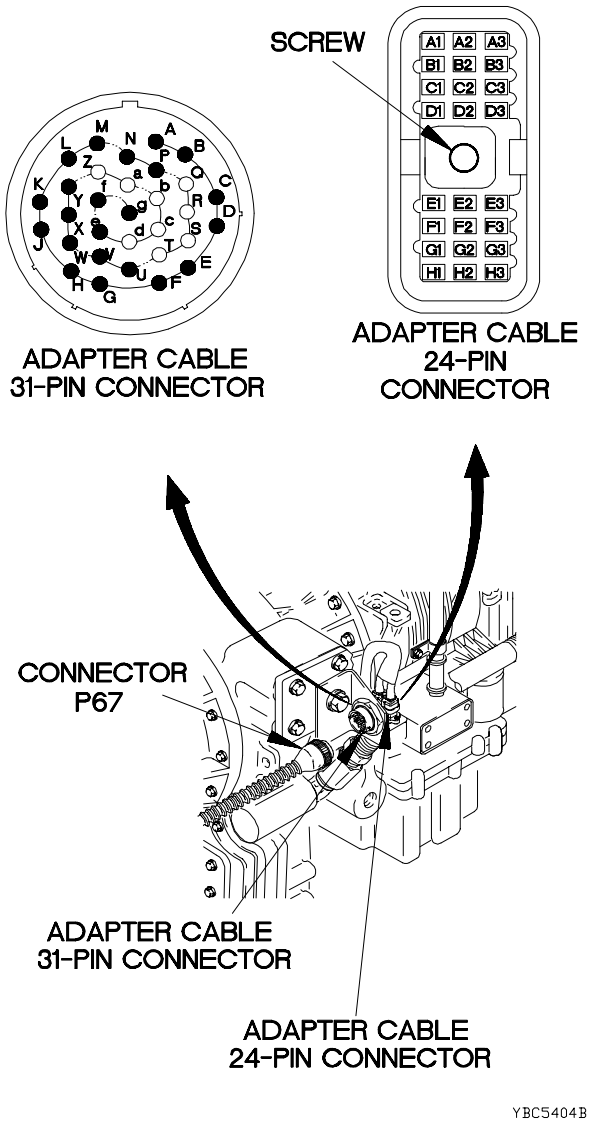


c54. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 32 AND/OR 57 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

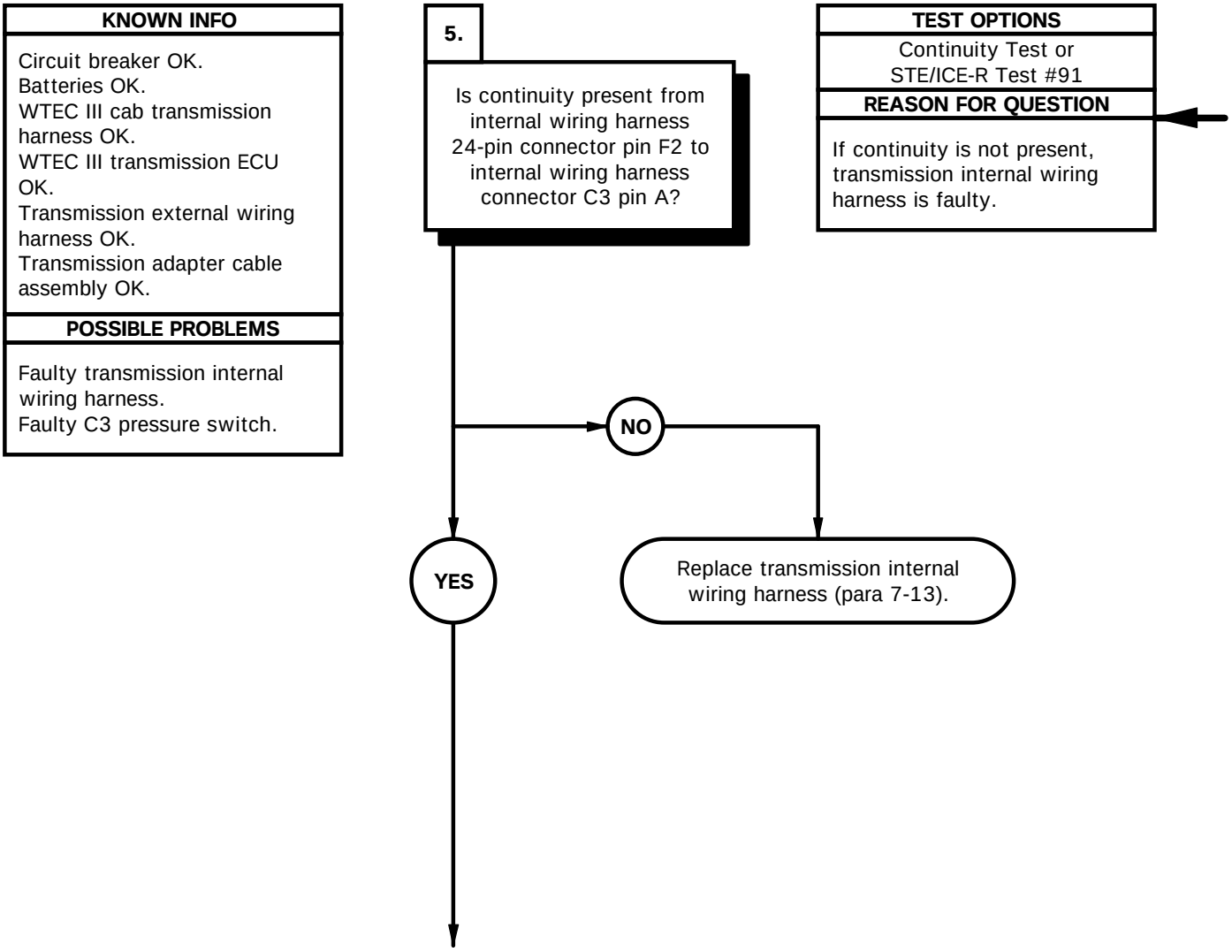


CONTINUITY TEST

(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).

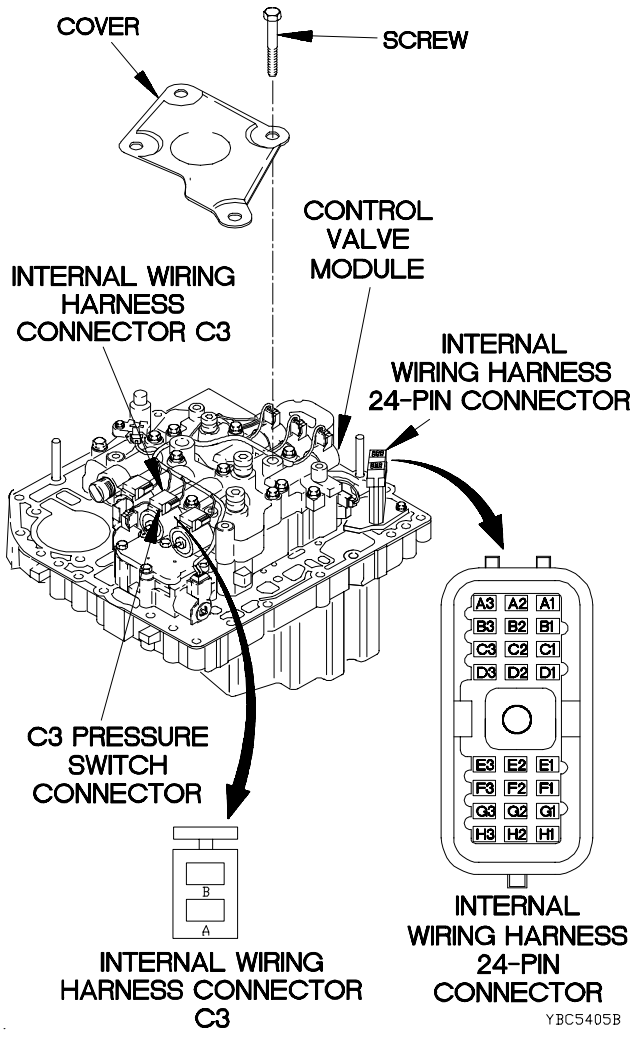


c54. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 32 AND/OR 57 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

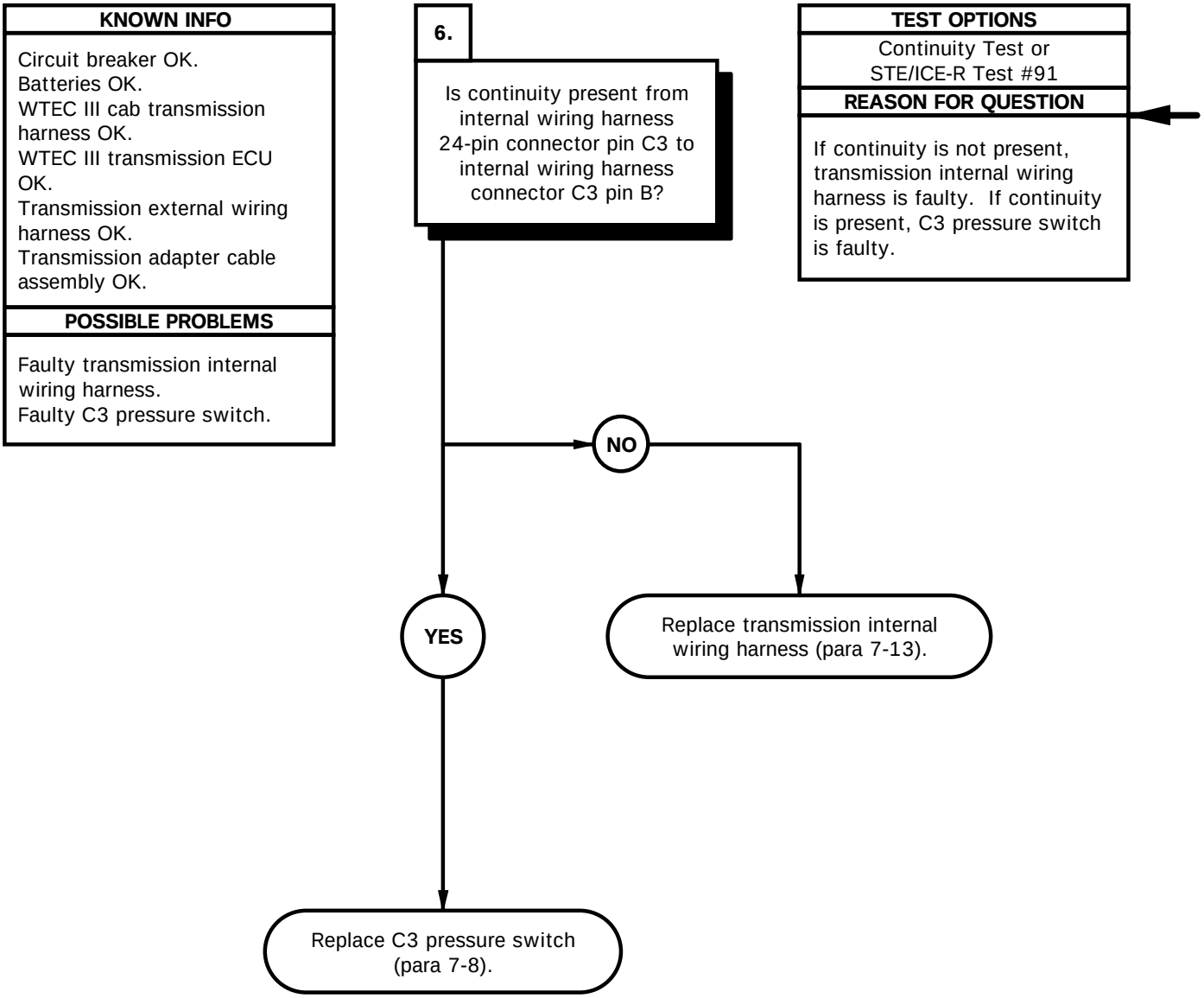


CONTINUITY TEST

(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).

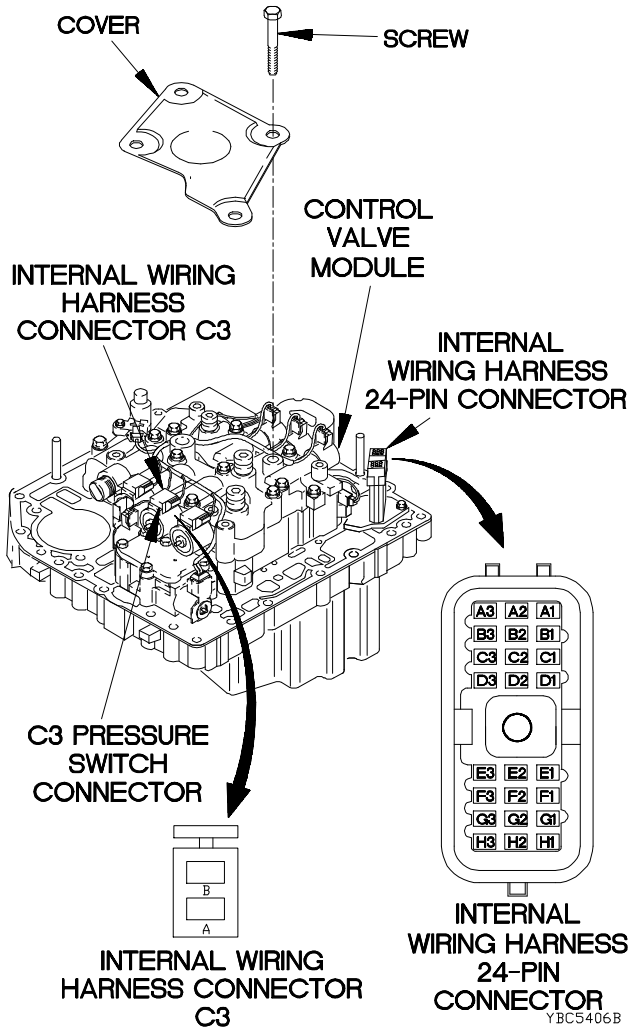


c54. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 32 AND/OR 57 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



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

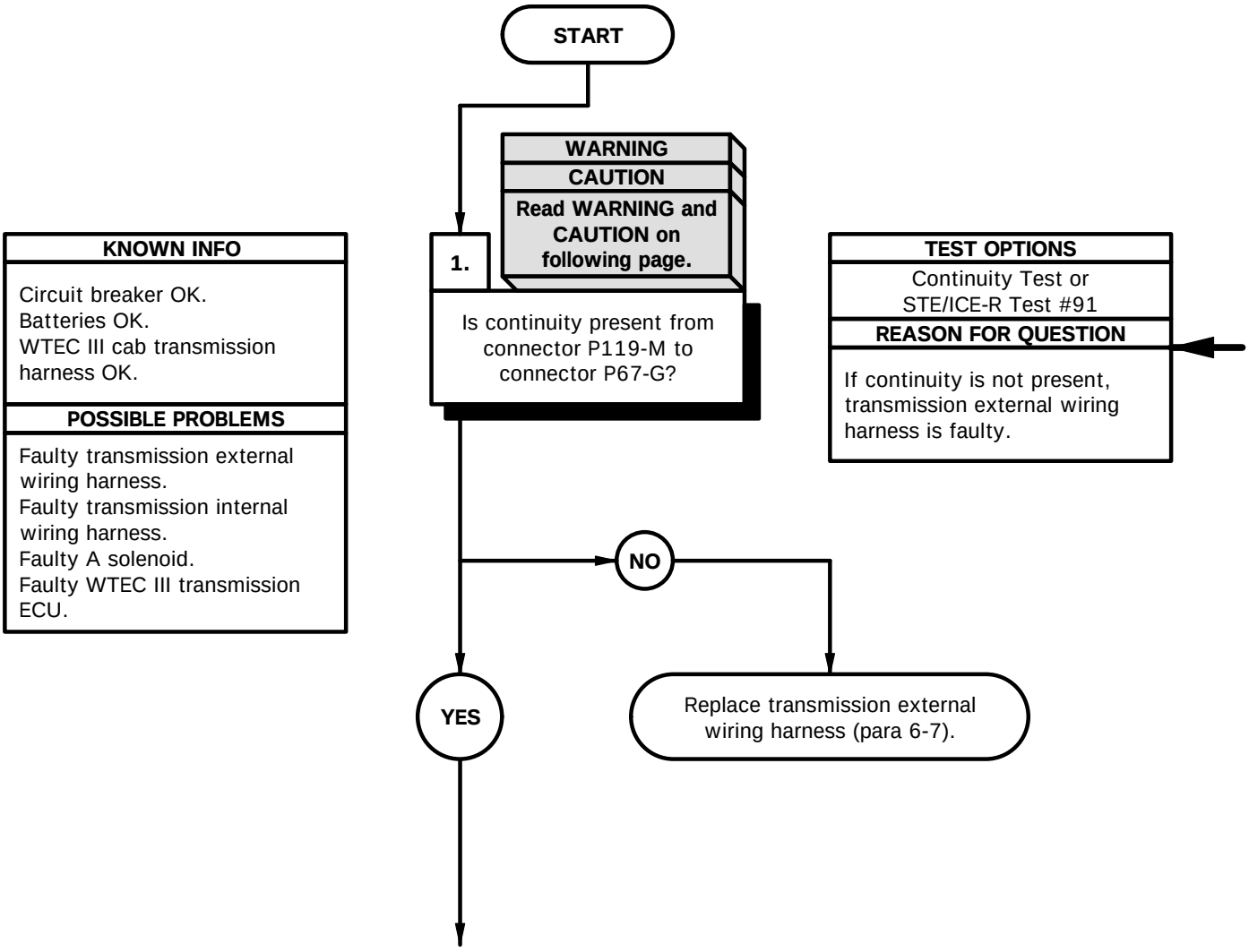
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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)

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

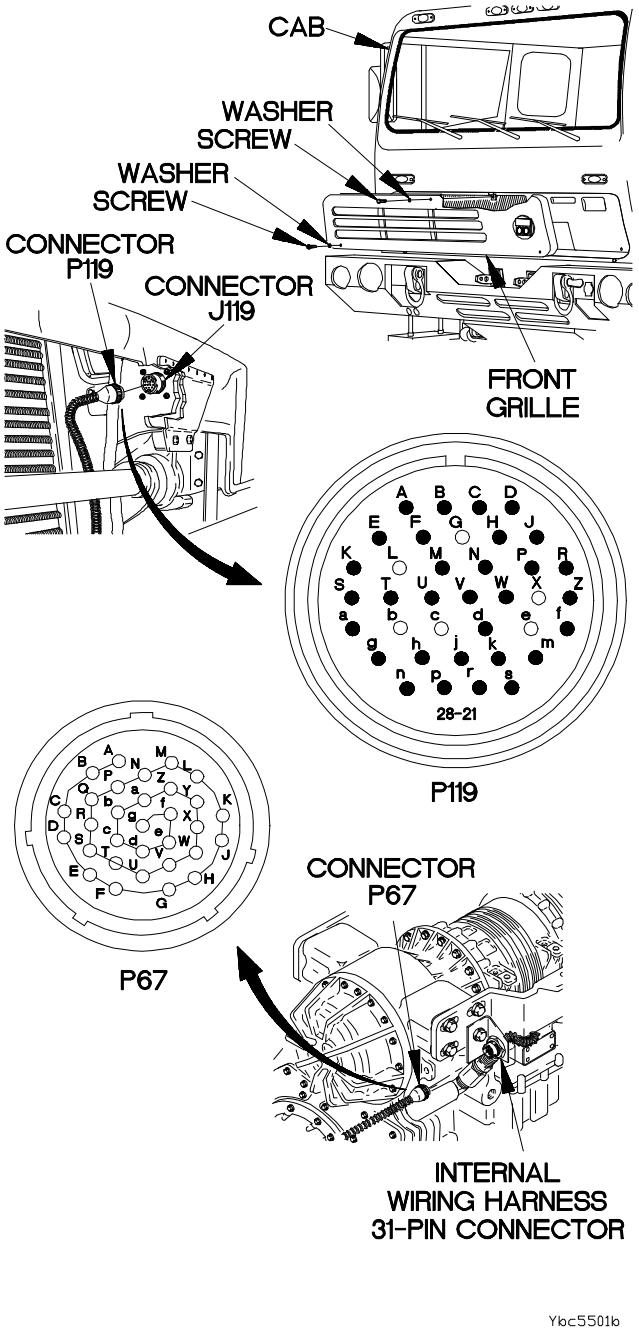
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

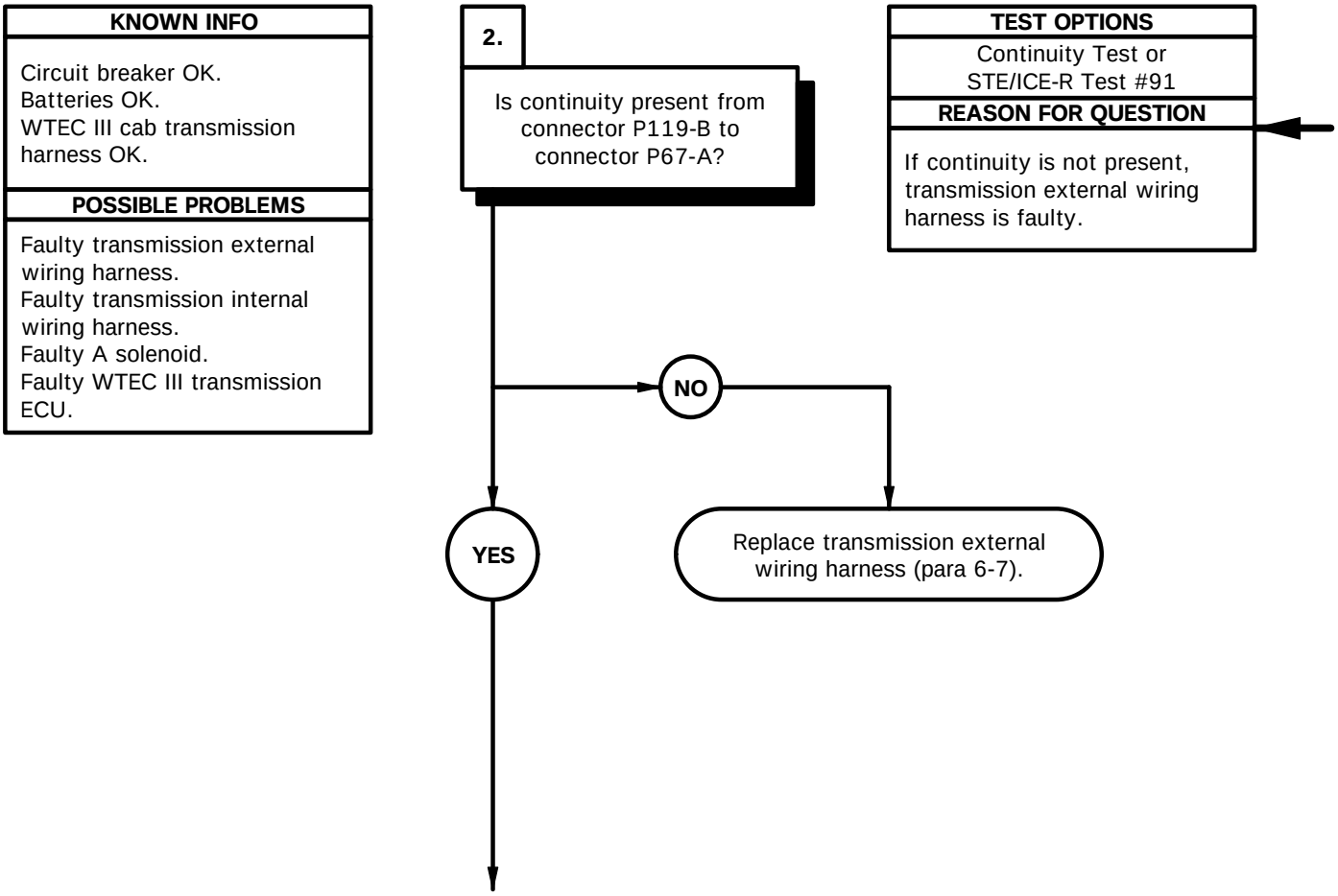
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from internal wiring harness 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect 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).

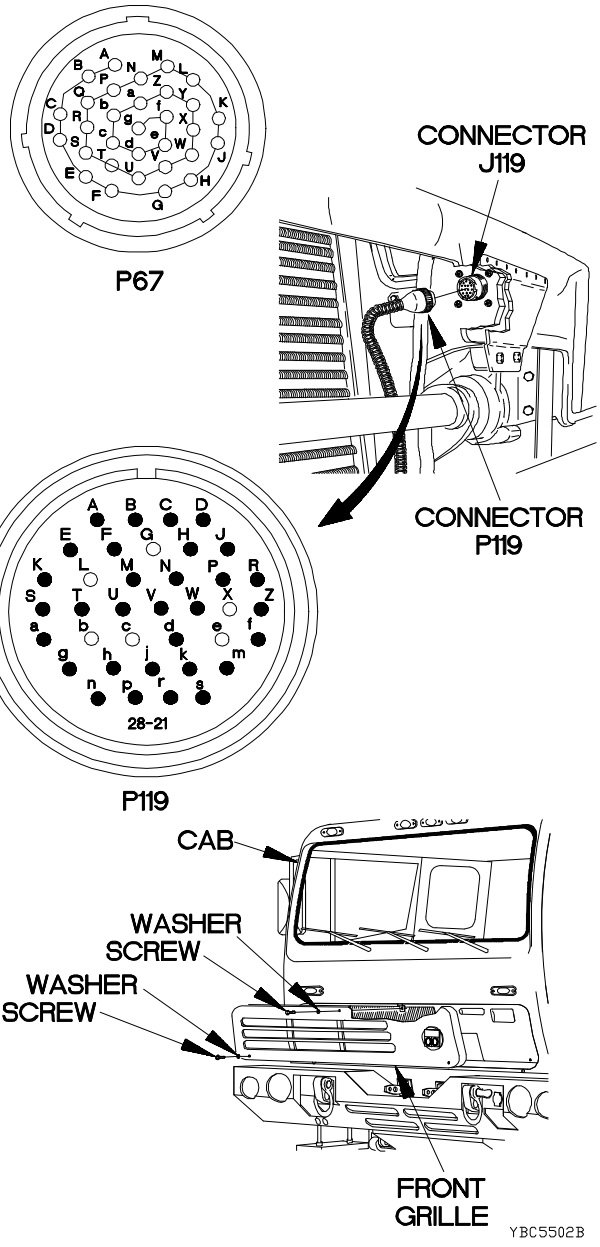


c55. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 12 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

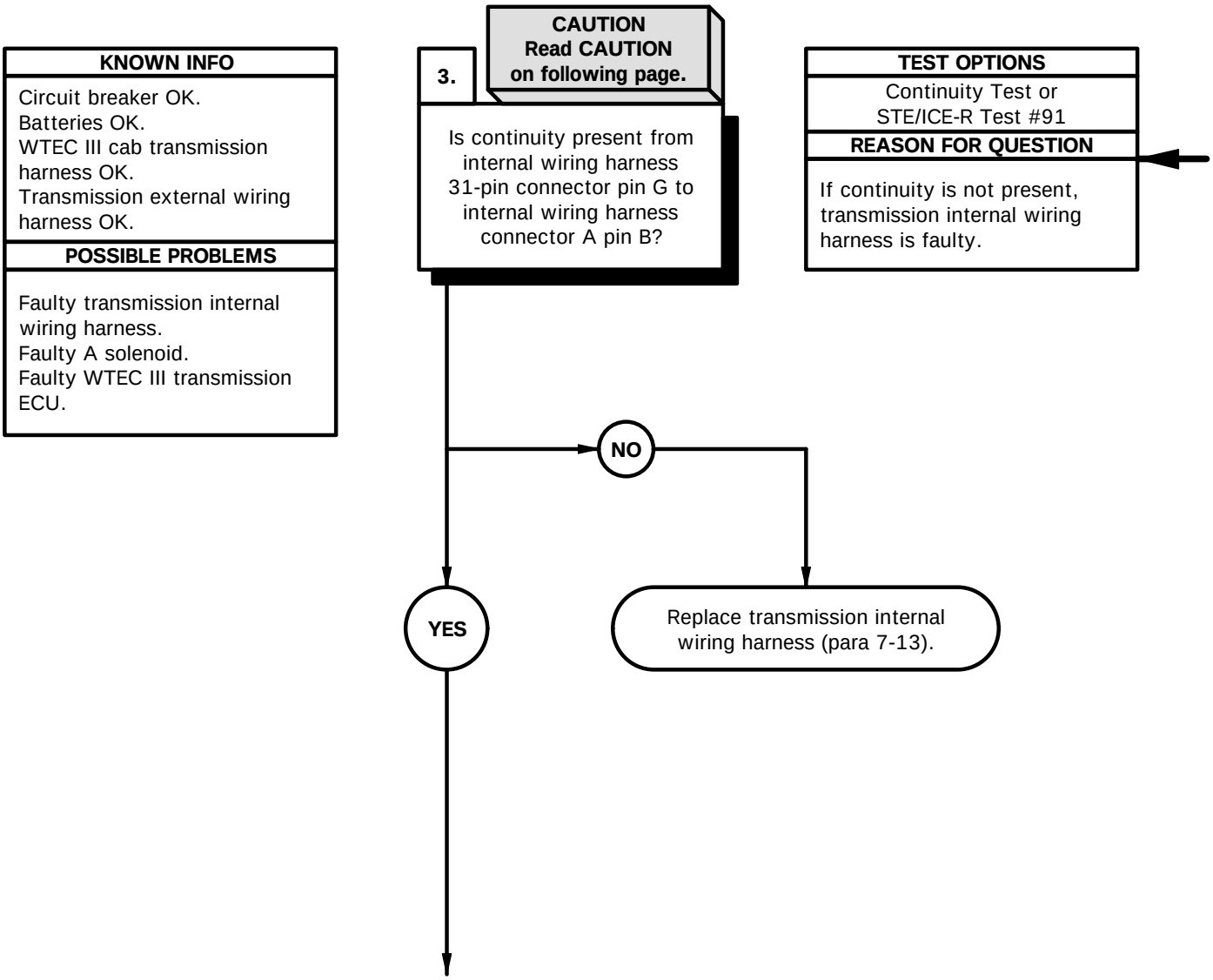


CONTINUITY TEST

(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).



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)

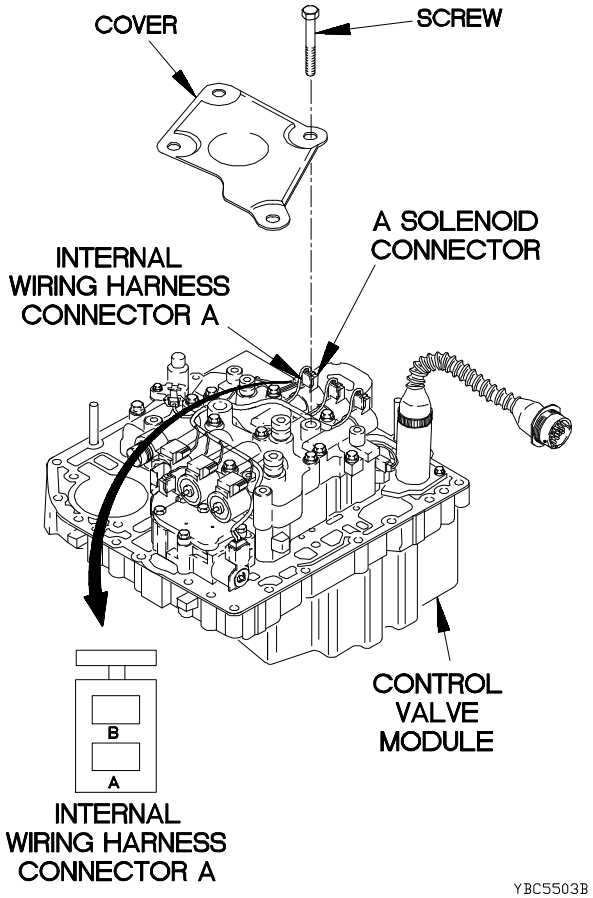


CAUTION

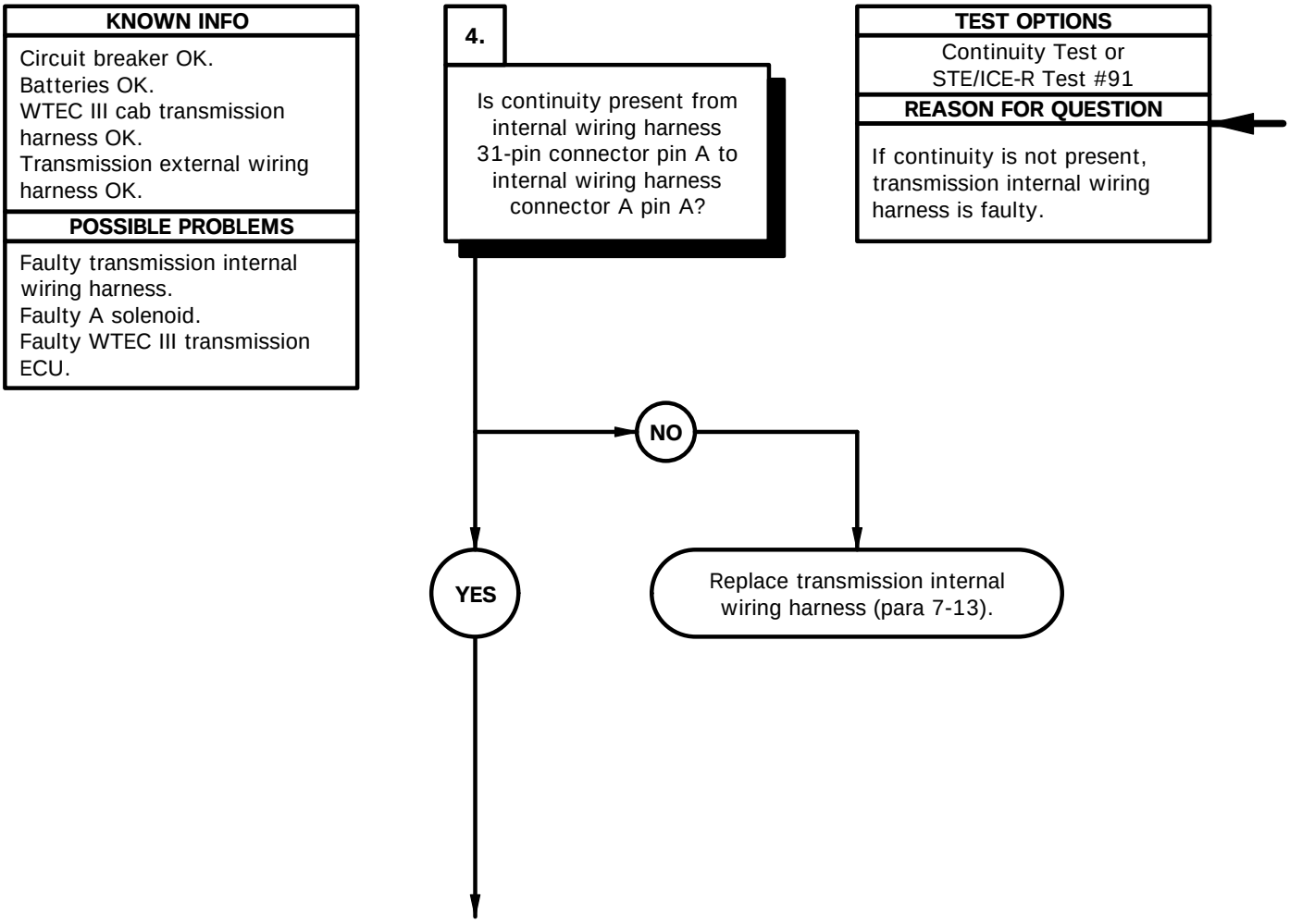
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

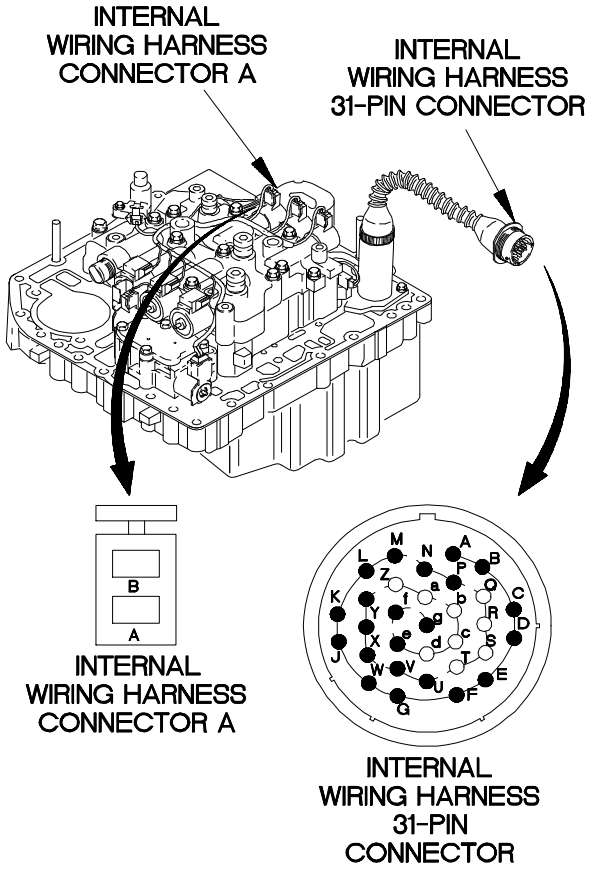


c55. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 12 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

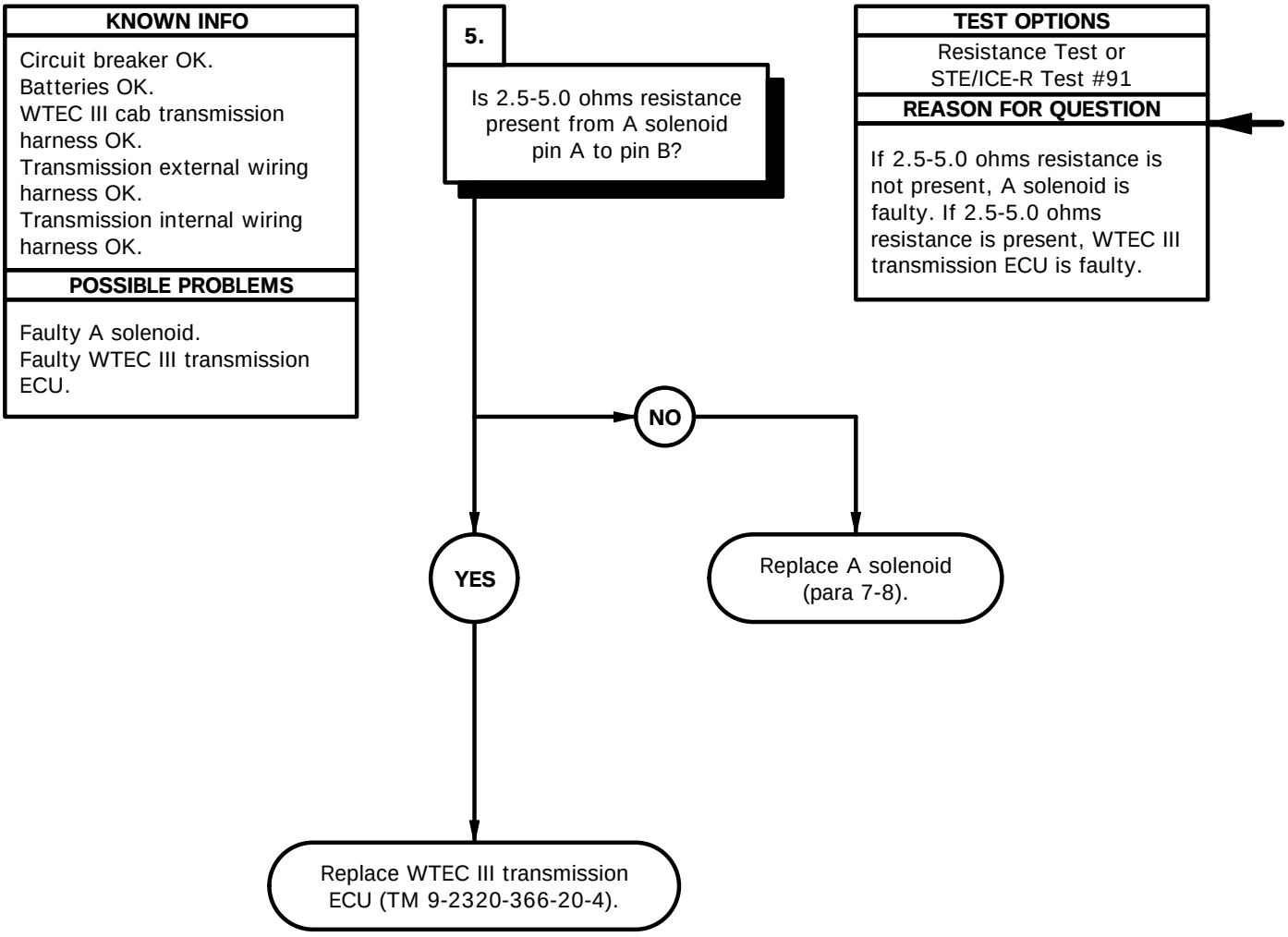


CONTINUITY TEST

(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).

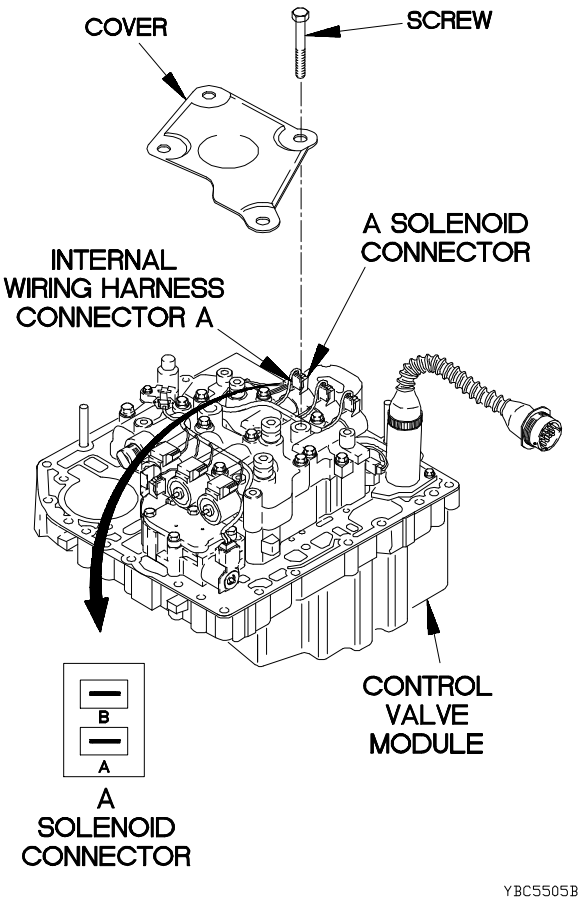


c55. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 12 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



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).



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).

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)

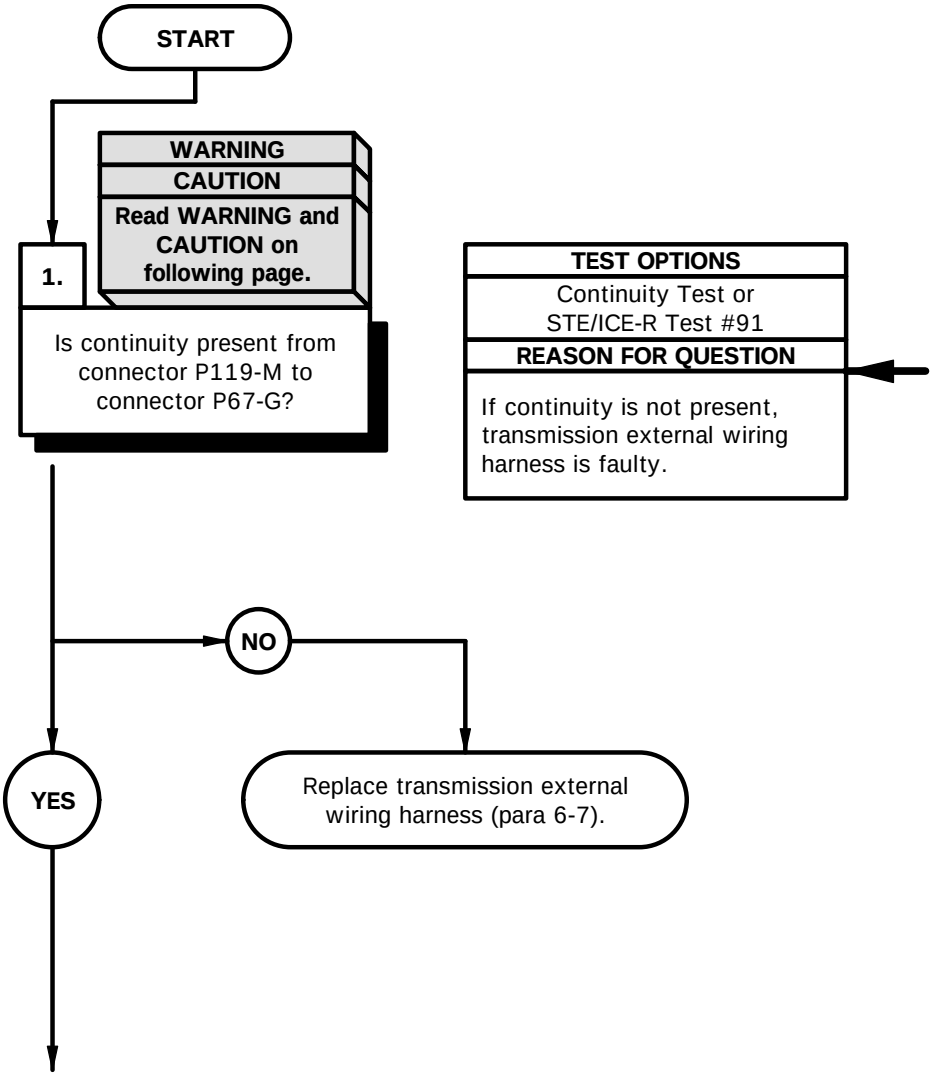
References
TM 9-4910-571-12&P

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.

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

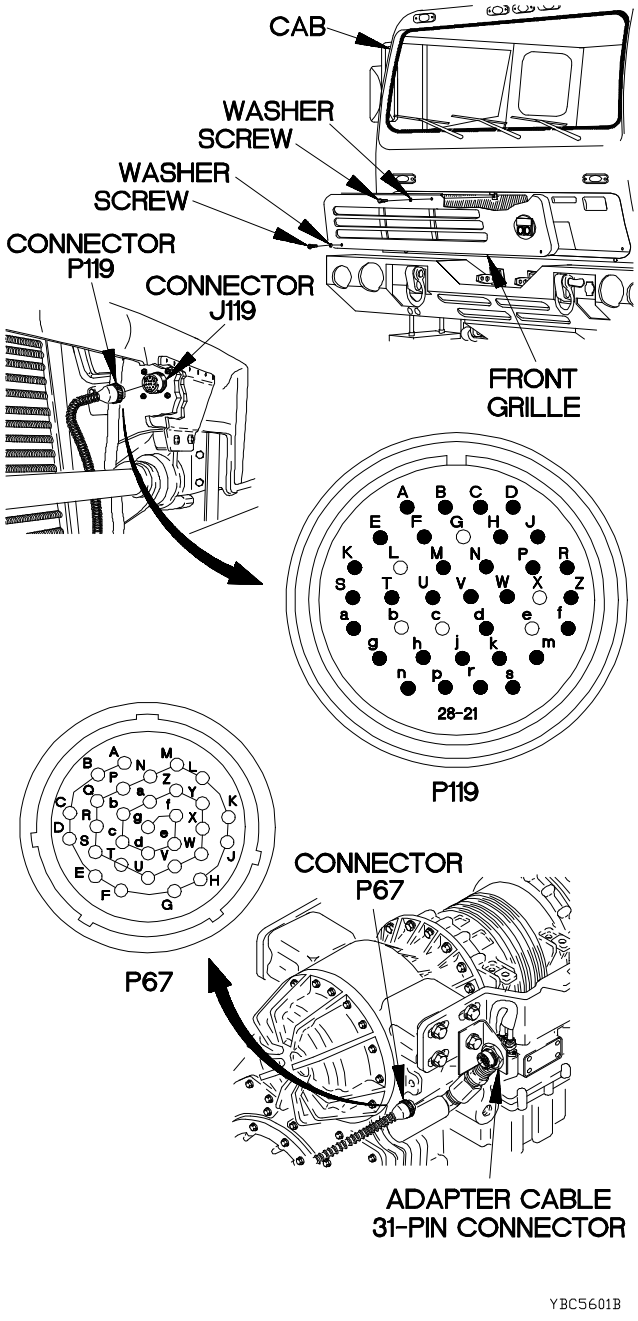
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



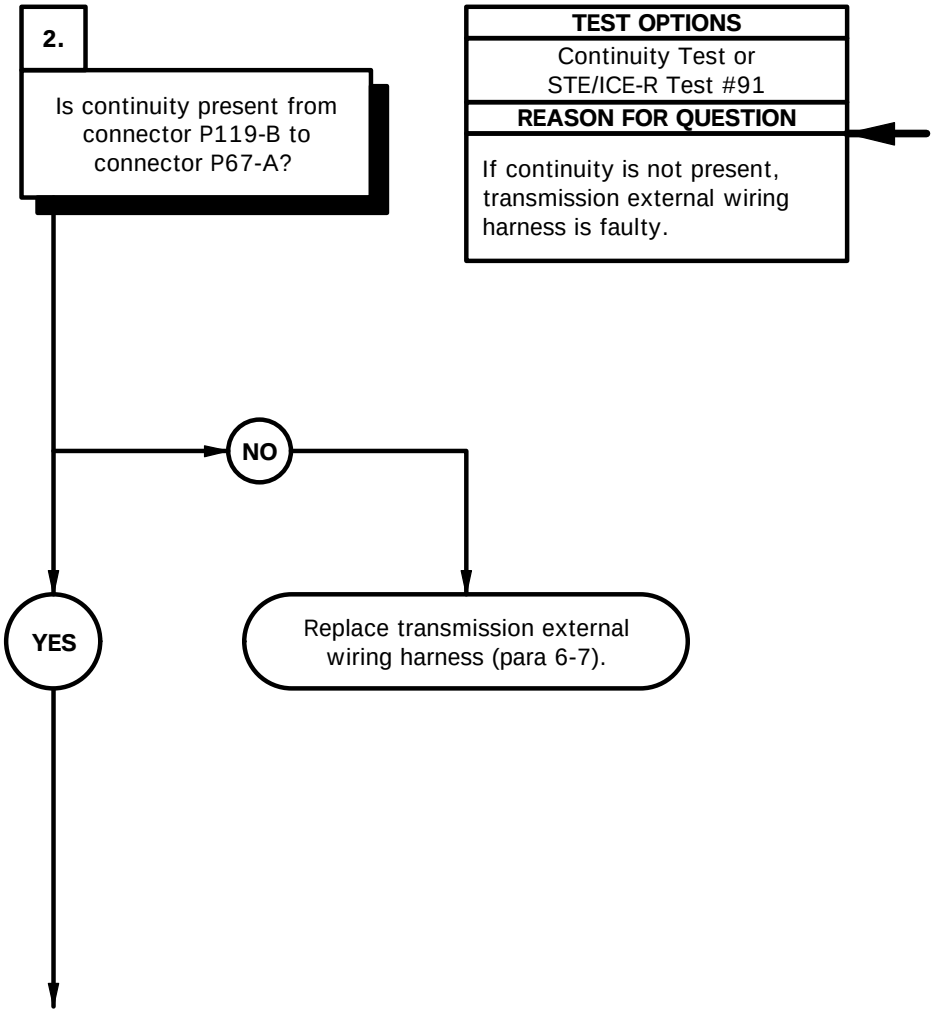
c56. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

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

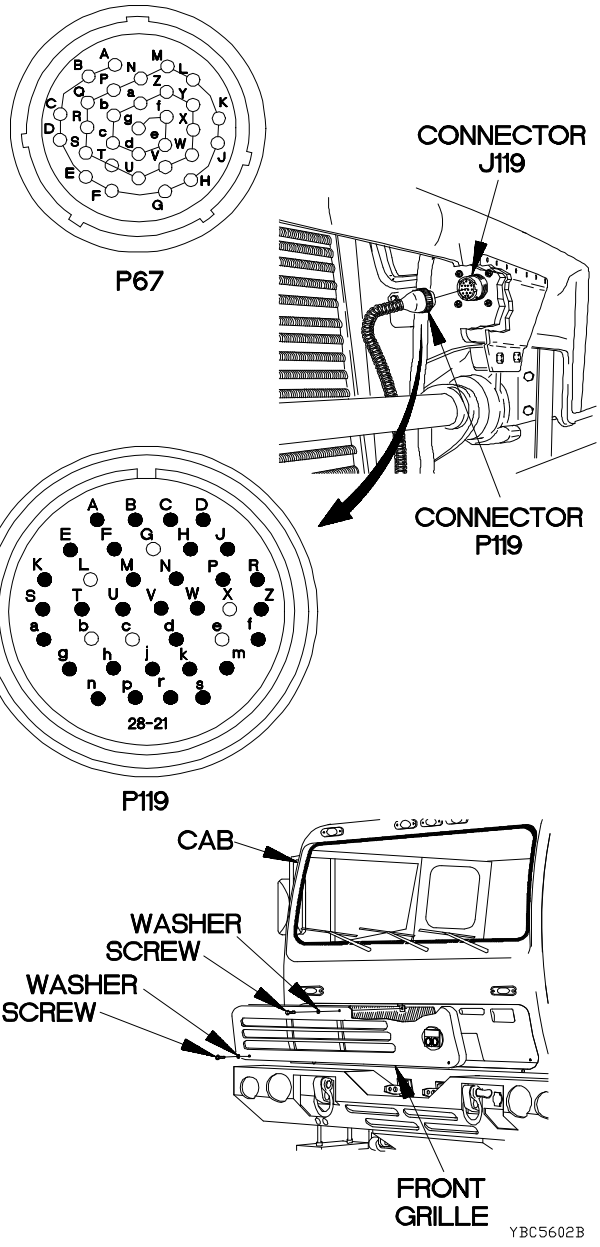
Continuity Test or
STE/ICE-R Test #91

REASON FOR QUESTION

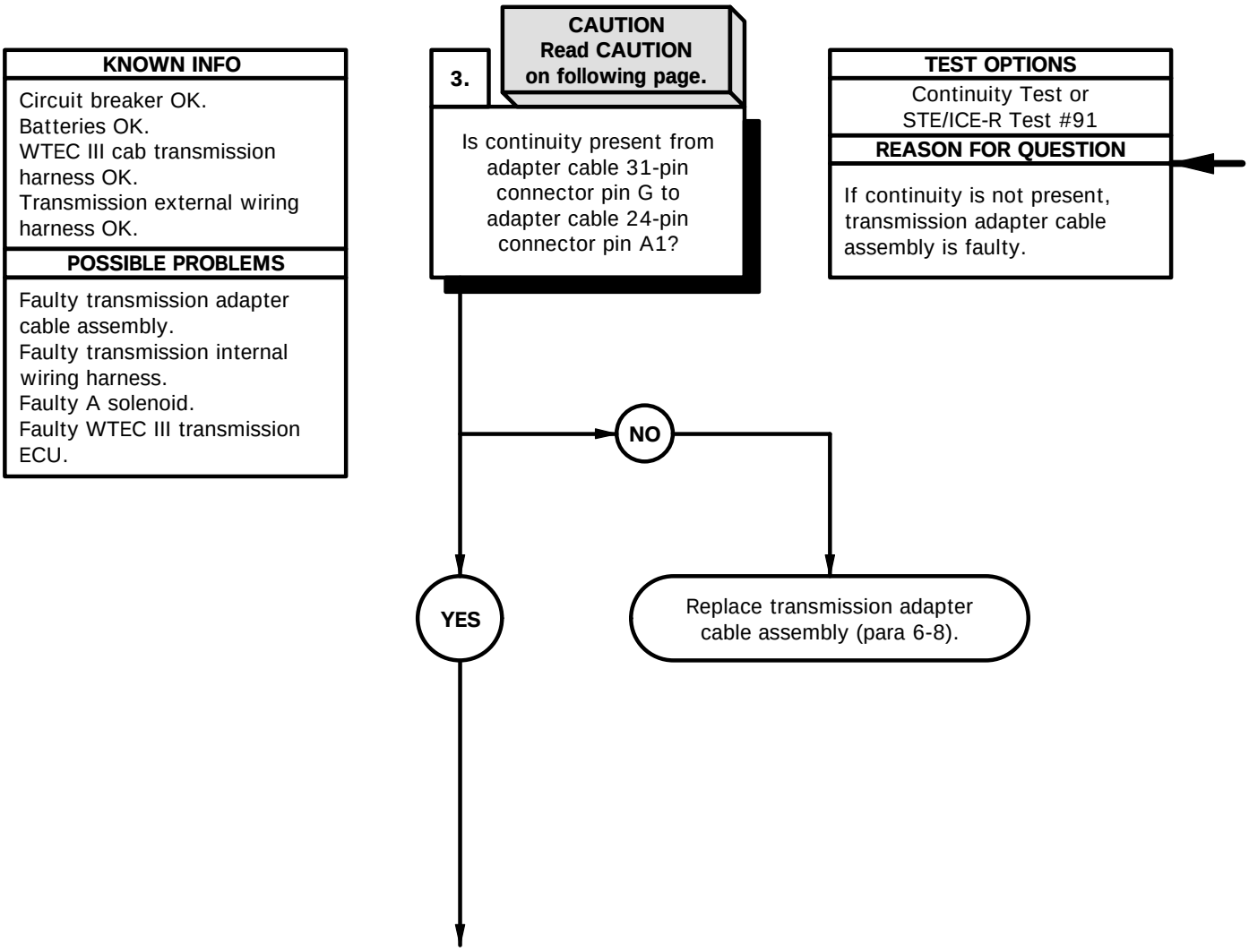
If continuity is not present, transmission external wiring harness is faulty.

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).



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)

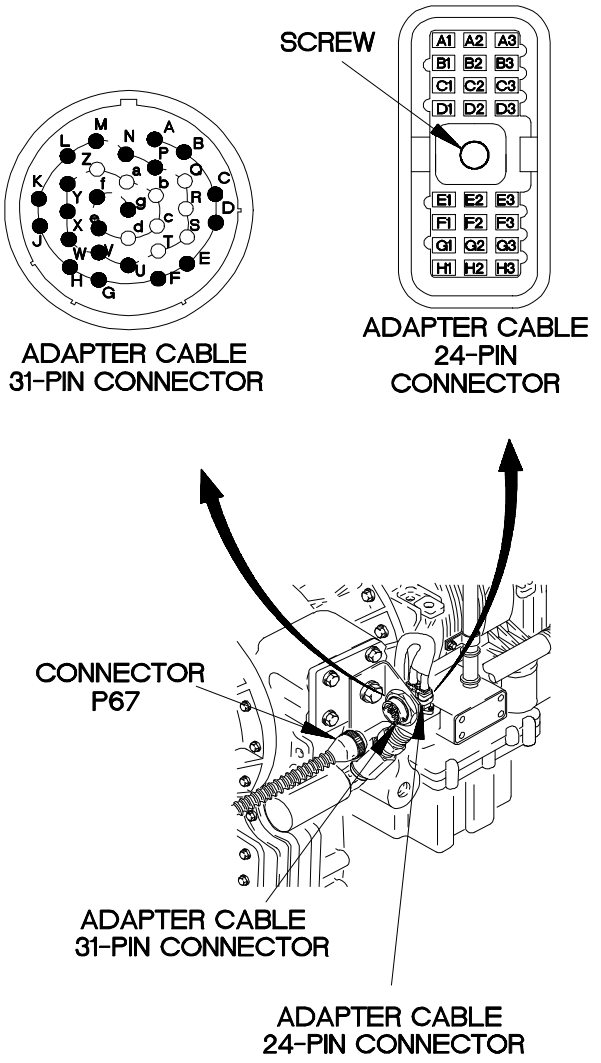


CAUTION

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).



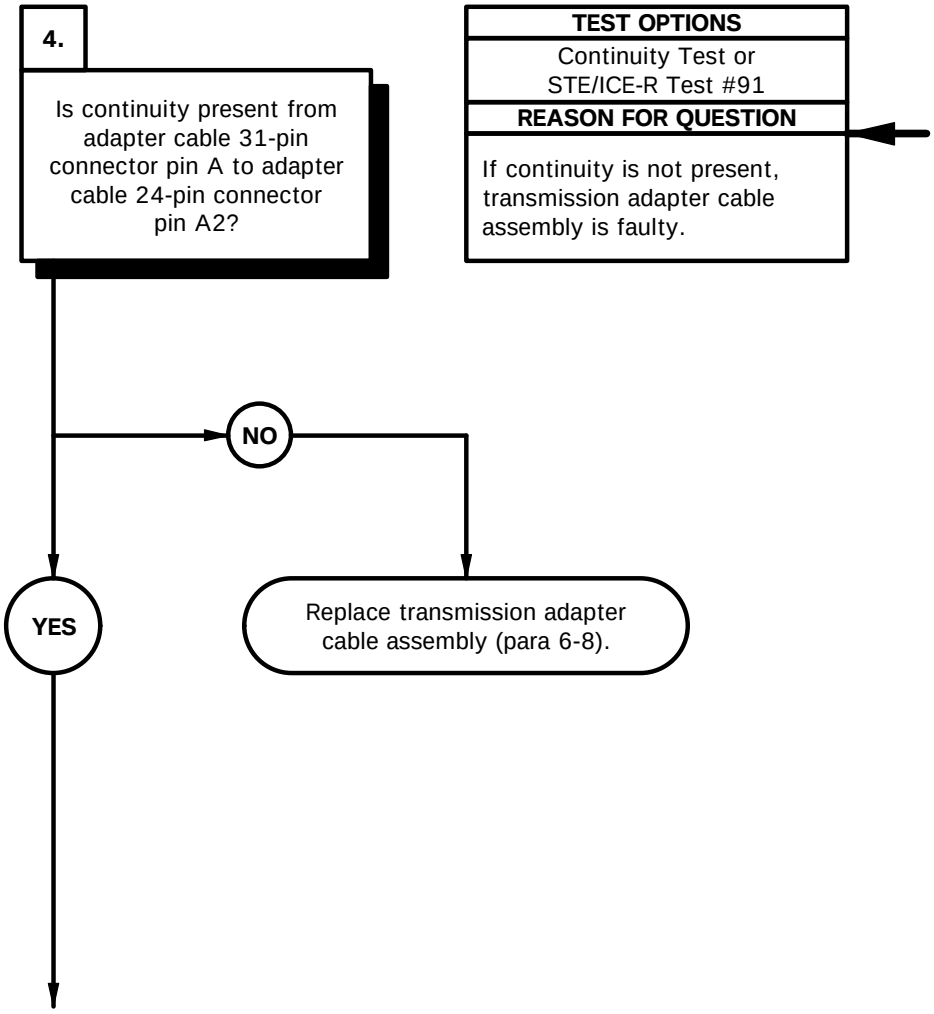
c56. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO

Circuit breaker OK.
Batteries OK.
WTEC III cab transmission harness OK.
Transmission external wiring harness OK.

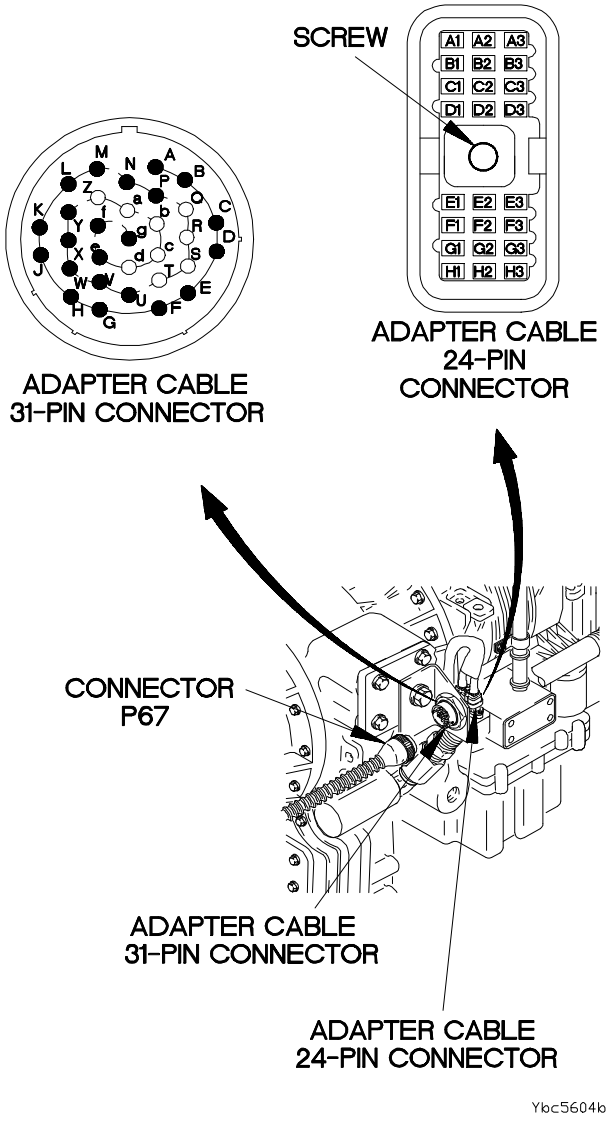
POSSIBLE PROBLEMS

Faulty transmission adapter cable assembly.
Faulty transmission internal wiring harness.
Faulty A solenoid.
Faulty WTEC III transmission ECU.

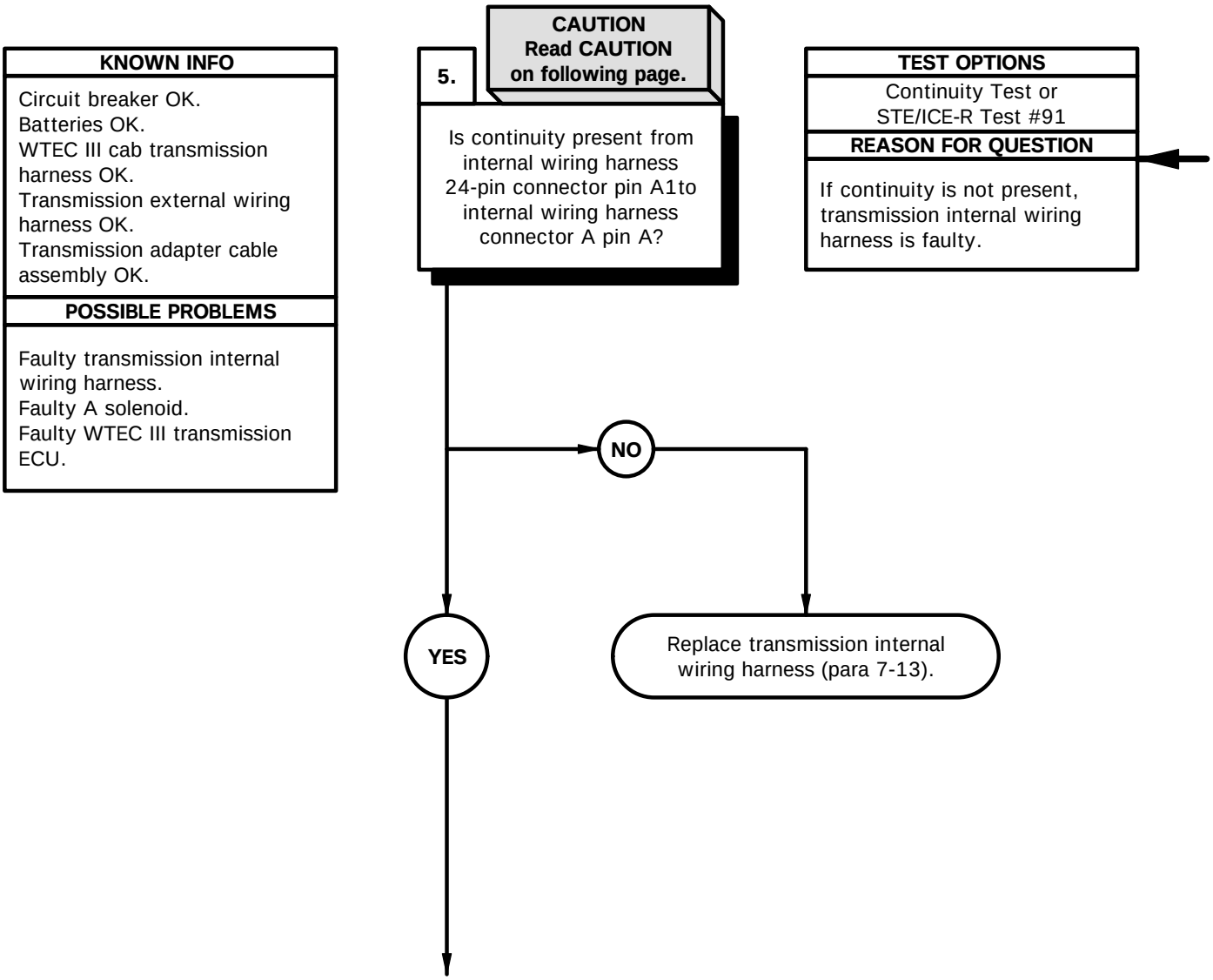


CONTINUITY TEST

(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.



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)

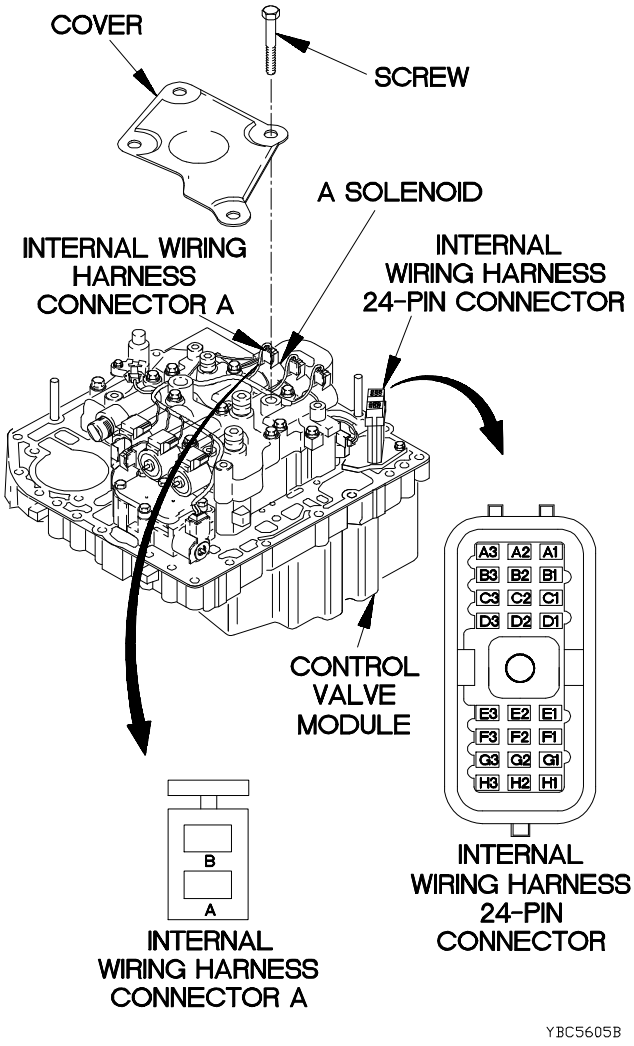


CAUTION

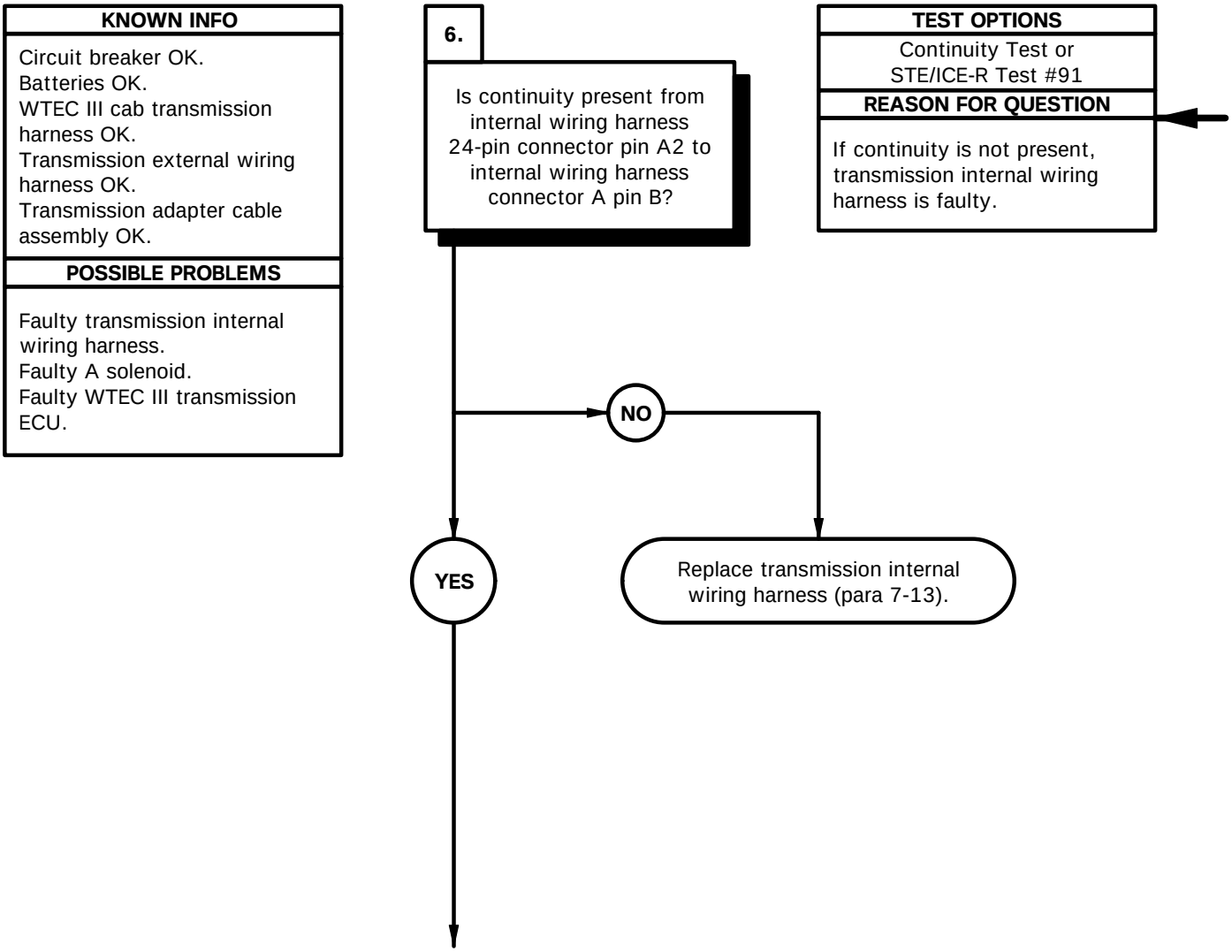
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

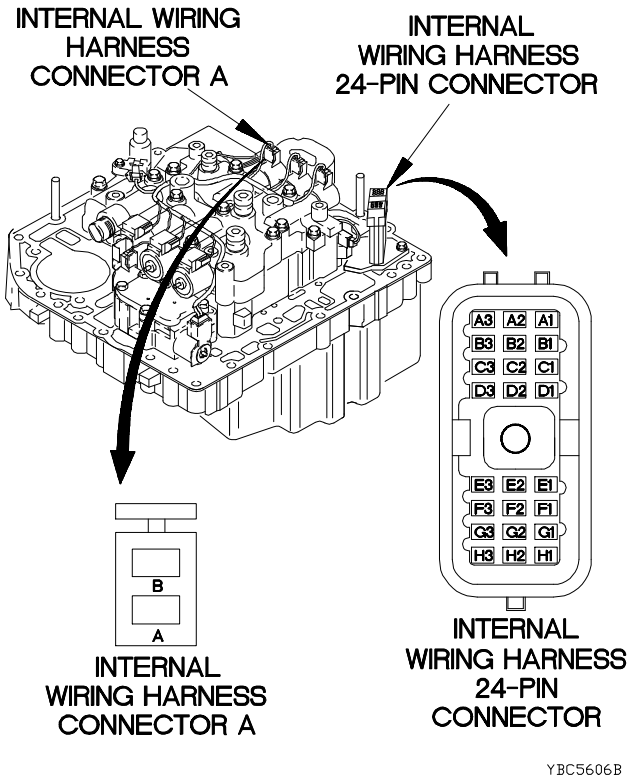


c56. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

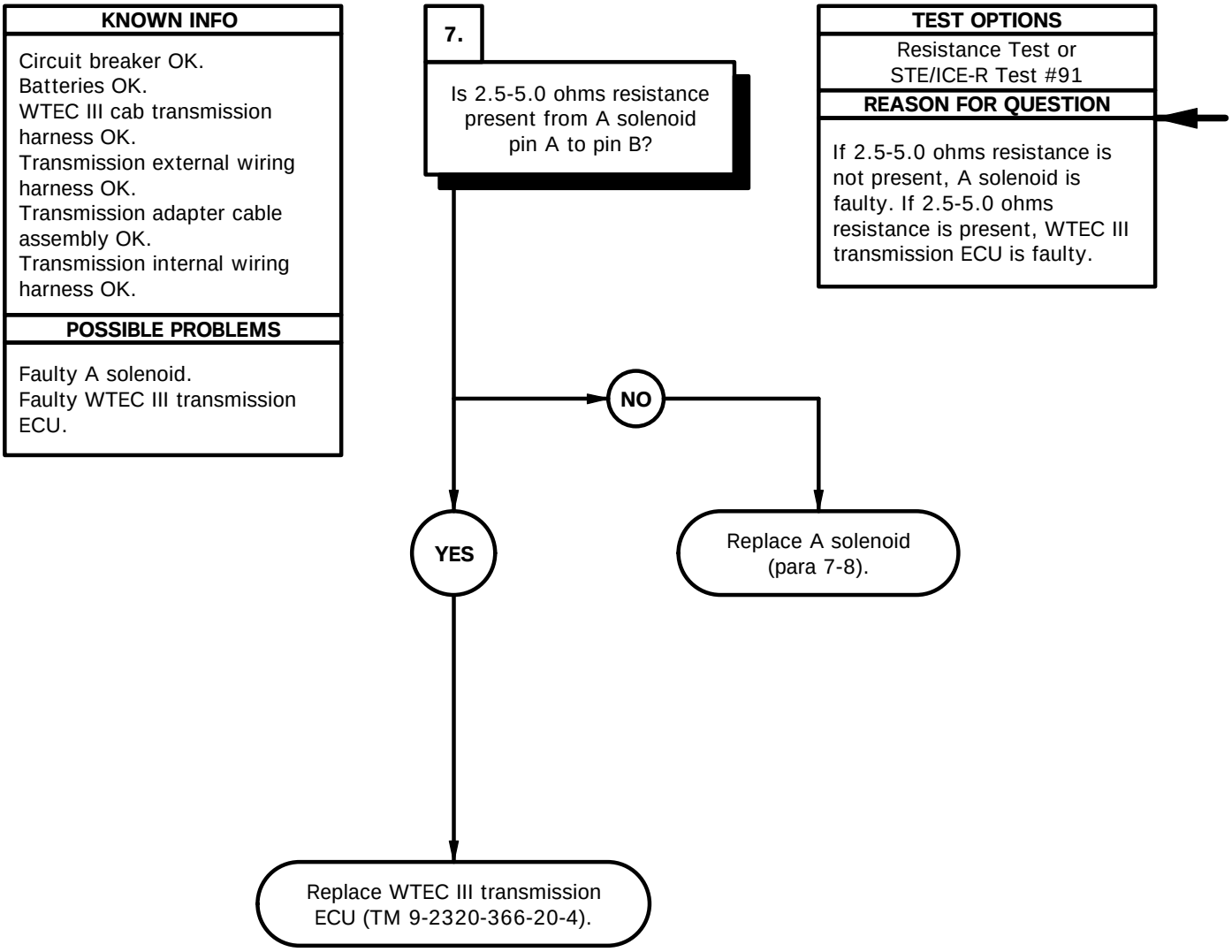


CONTINUITY TEST

(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).

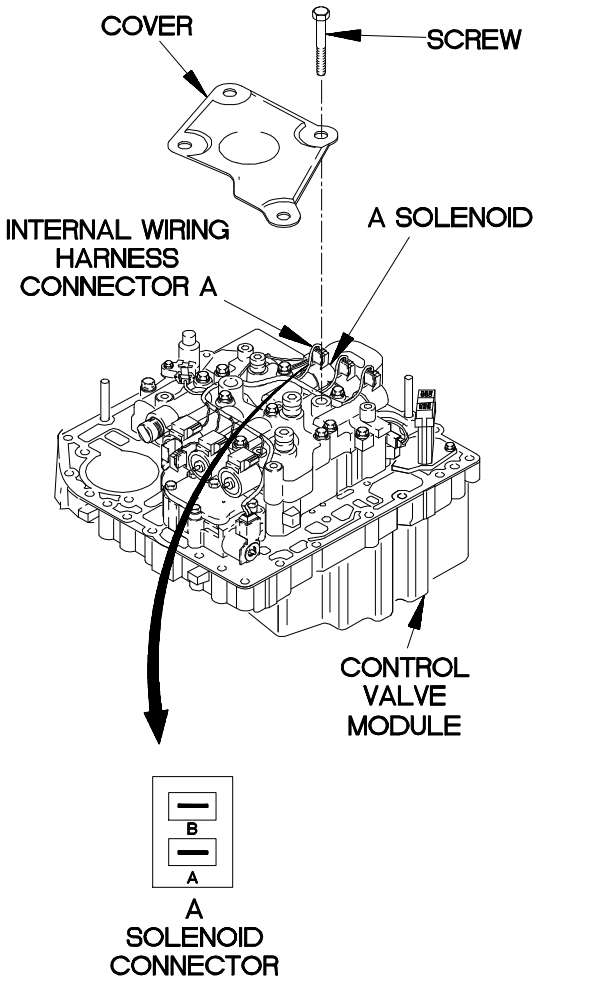


c56. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



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).



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

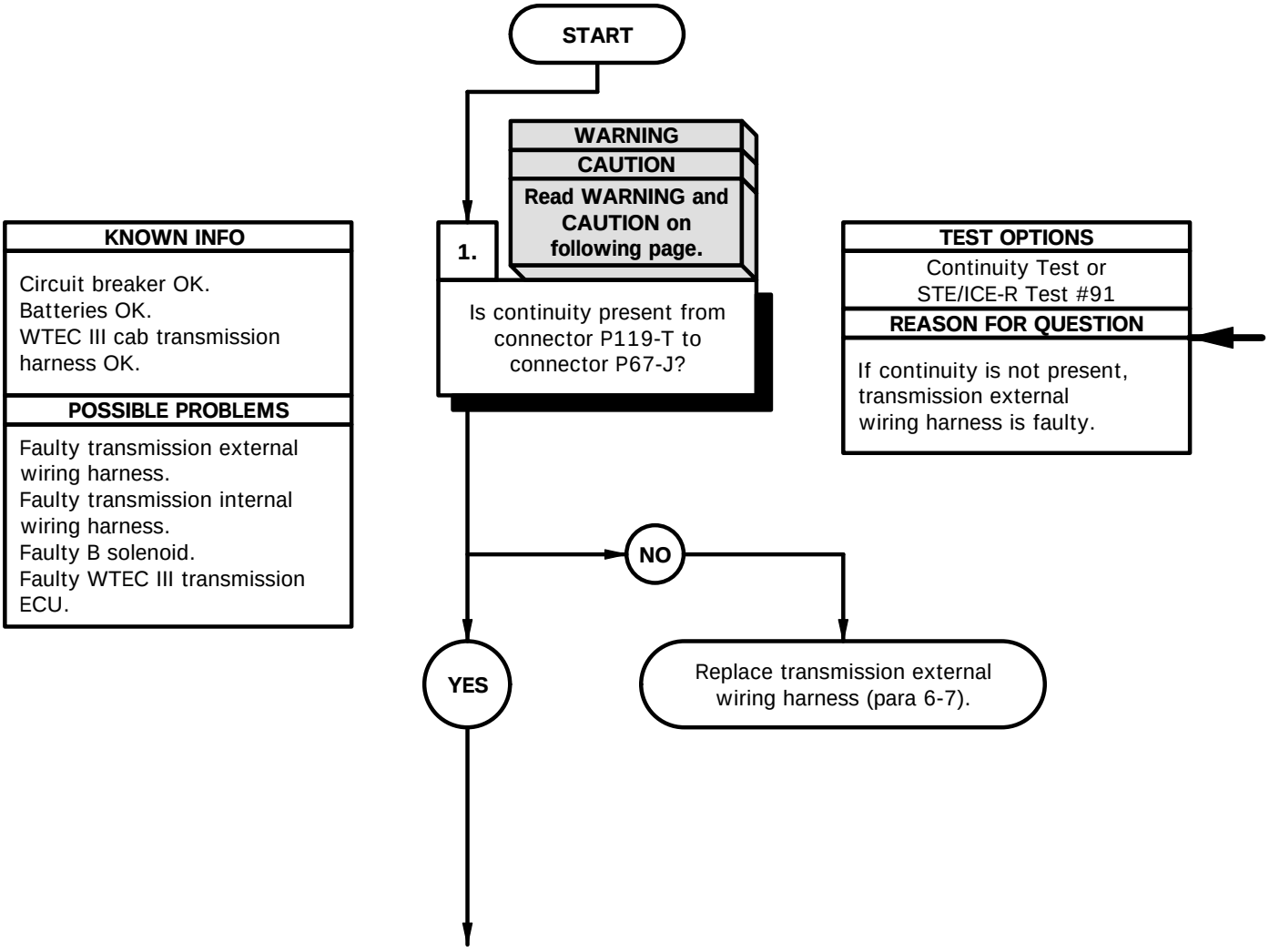
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

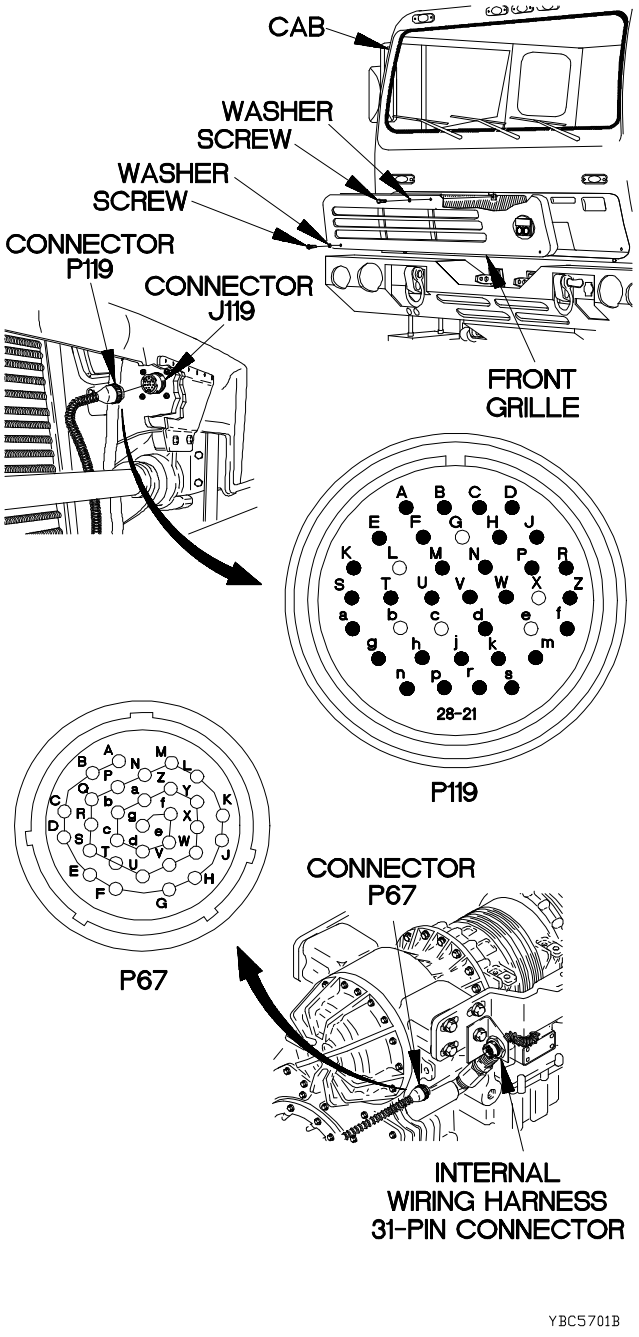
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

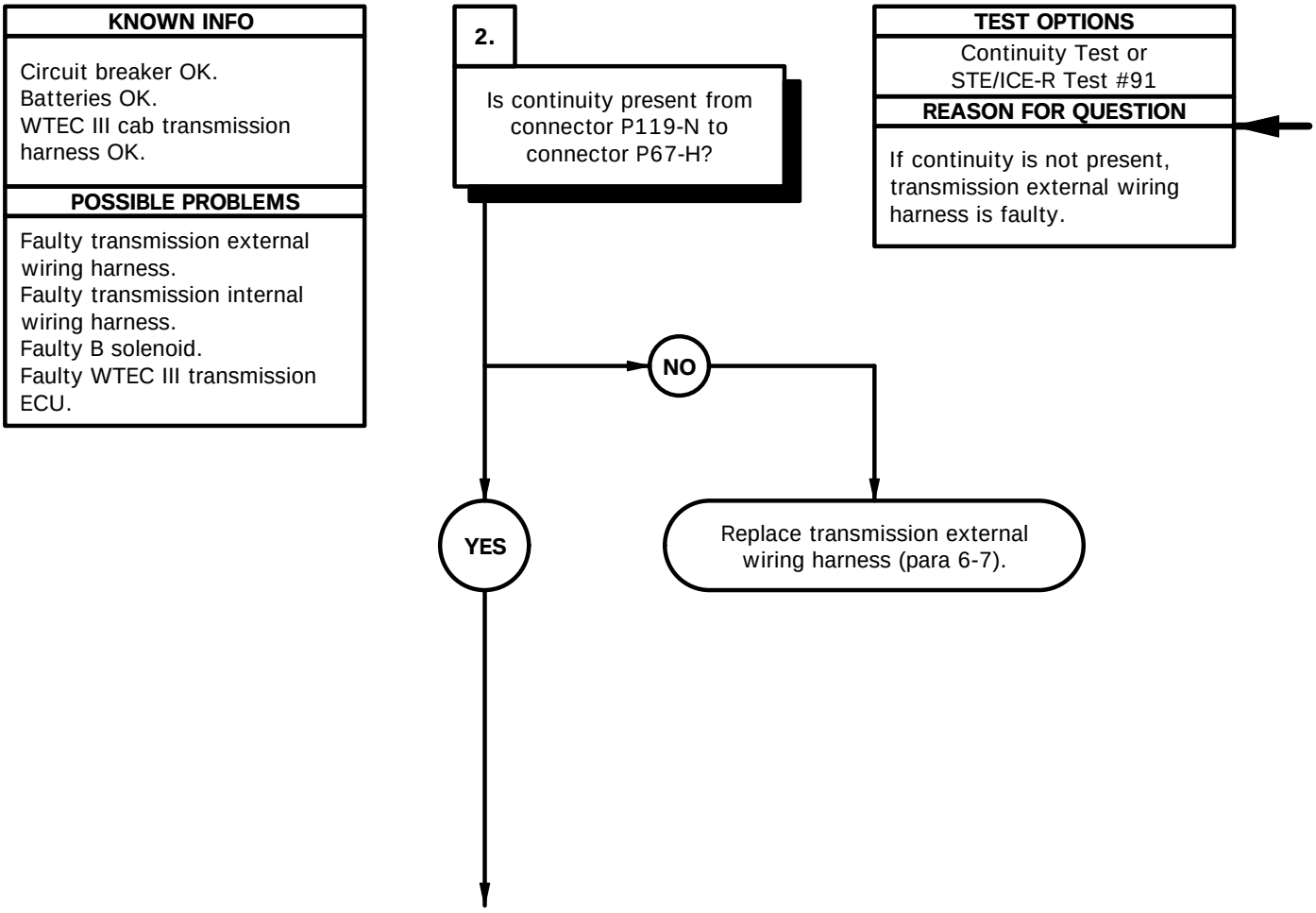
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness connector P67 from internal wiring harness 31-pin connector.
(6) Set multimeter 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).

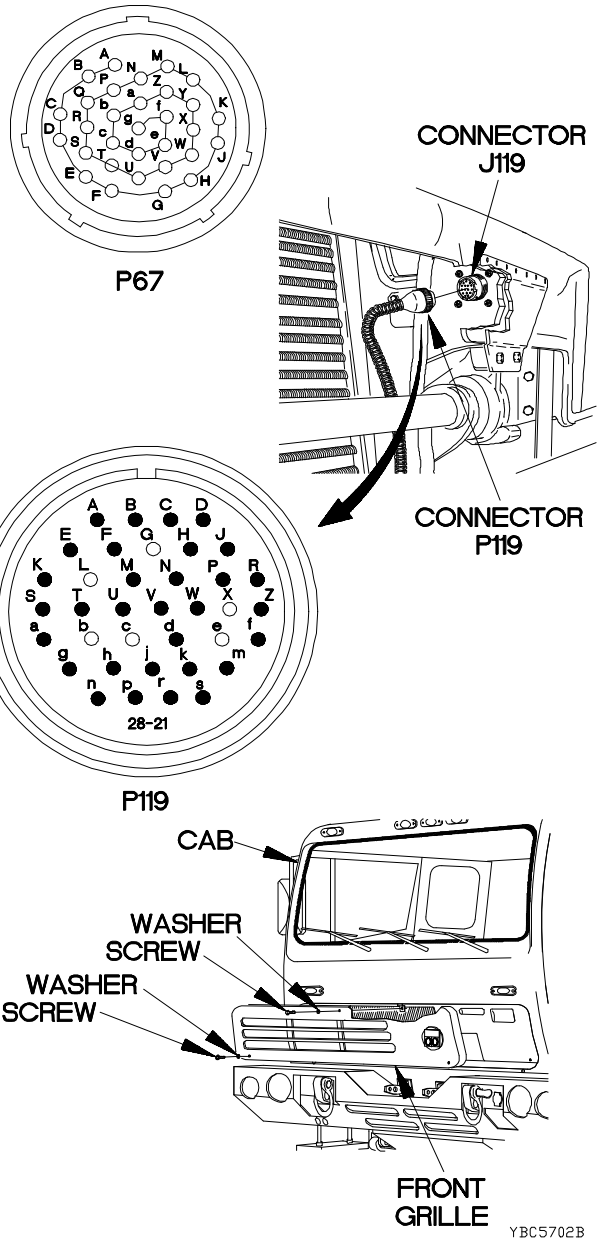


c57. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 13 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

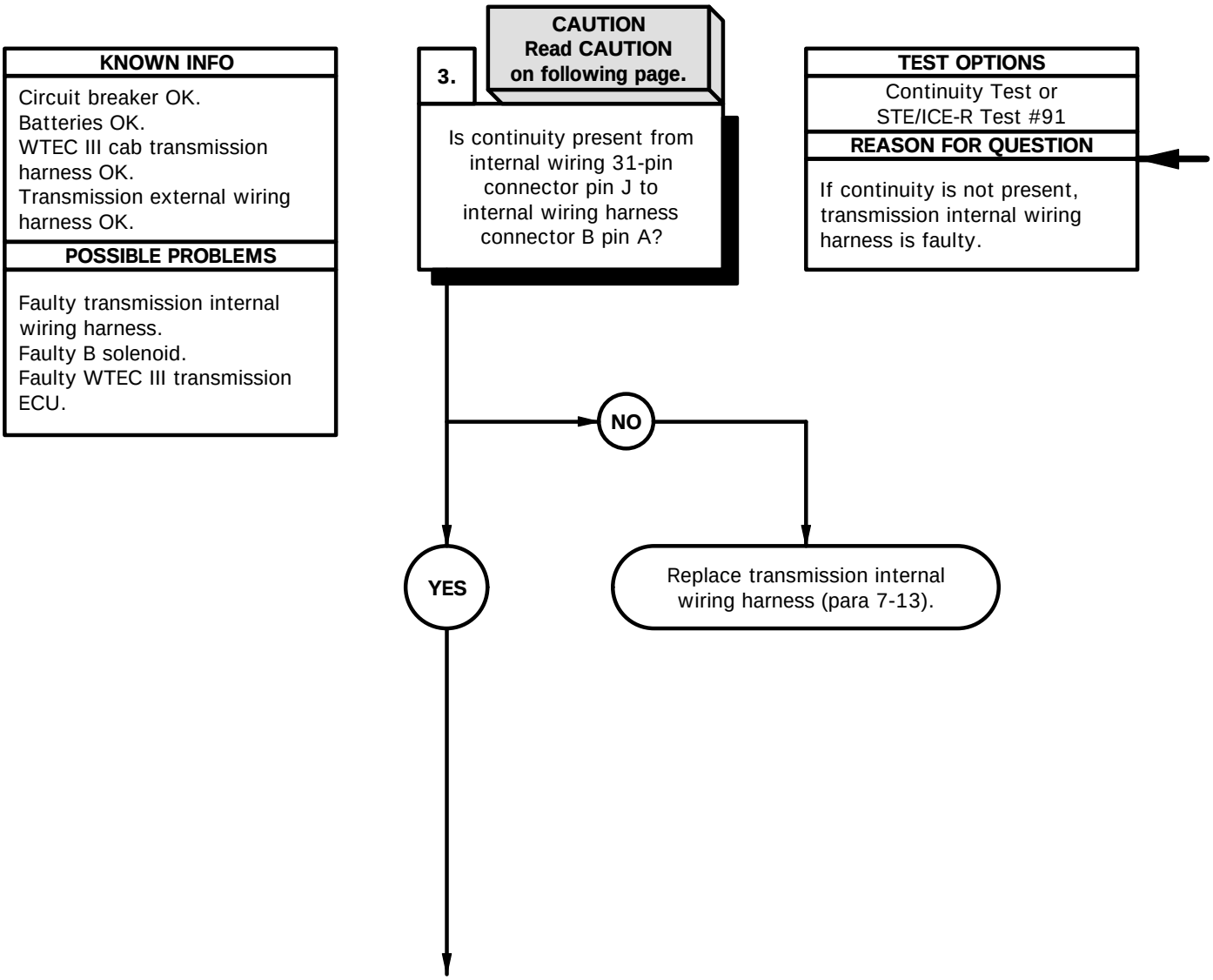


CONTINUITY TEST

(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).



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)

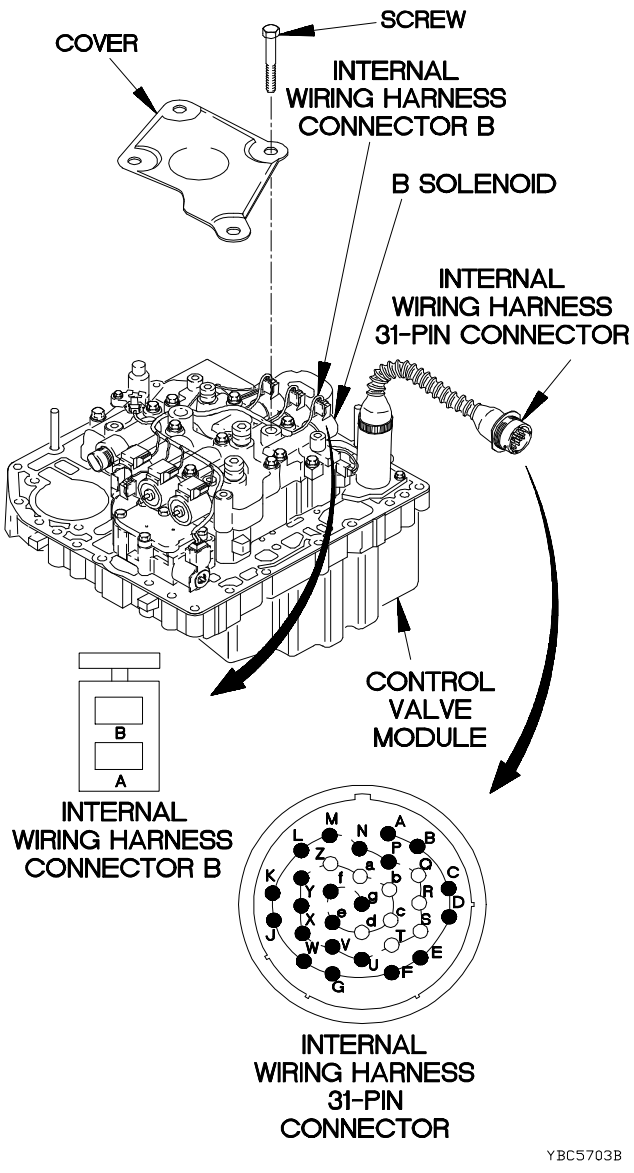


CAUTION

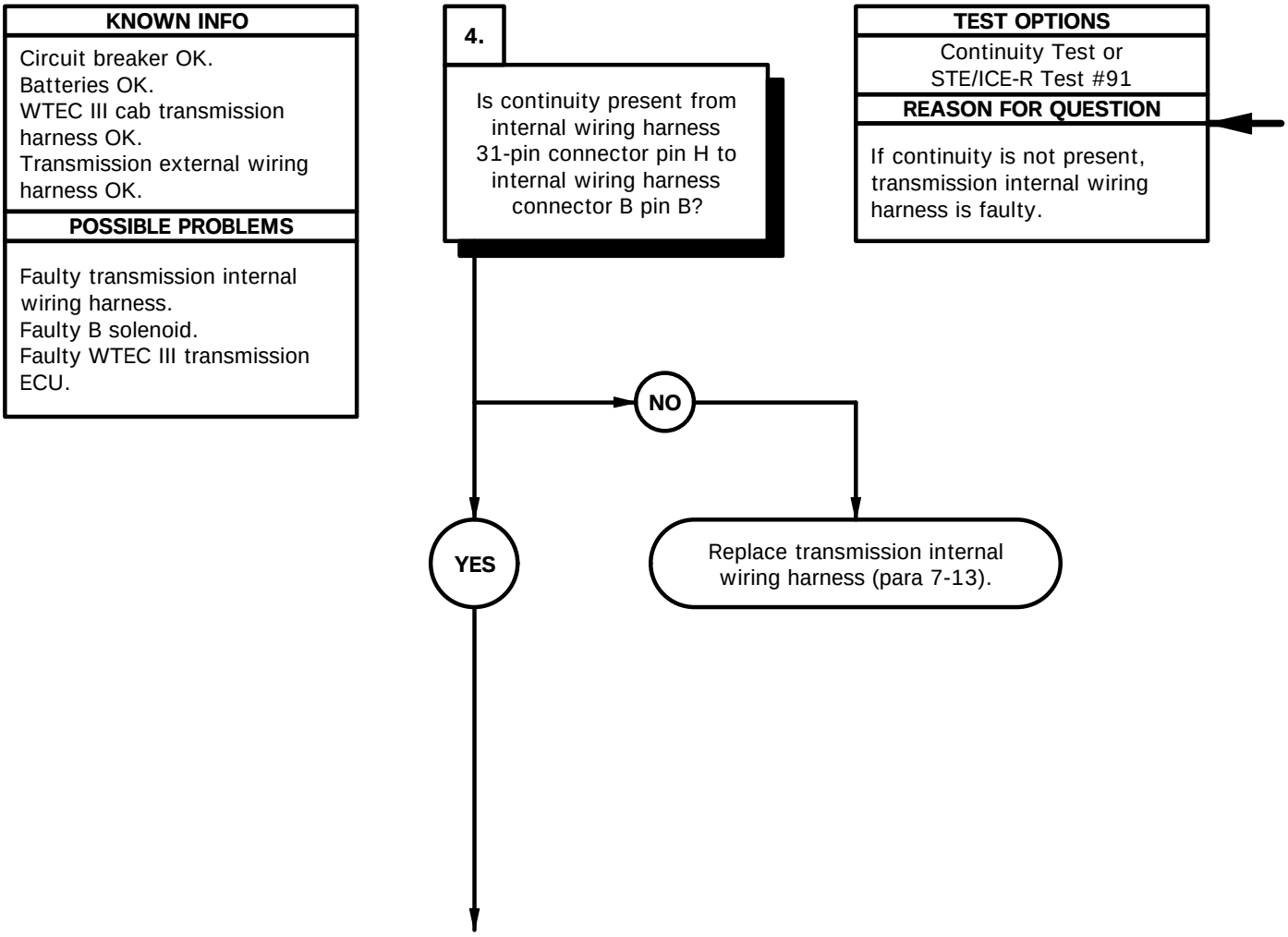
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

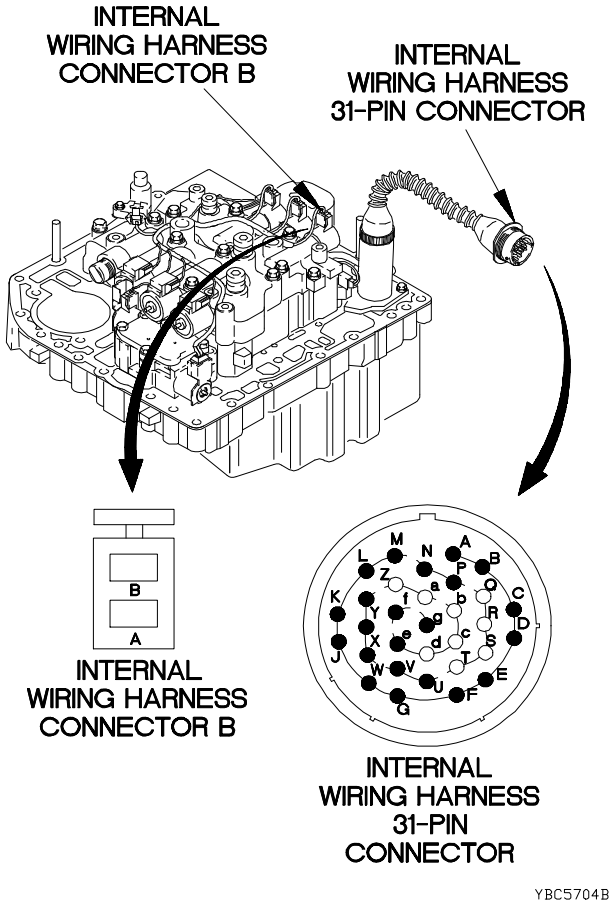


c57. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 13 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

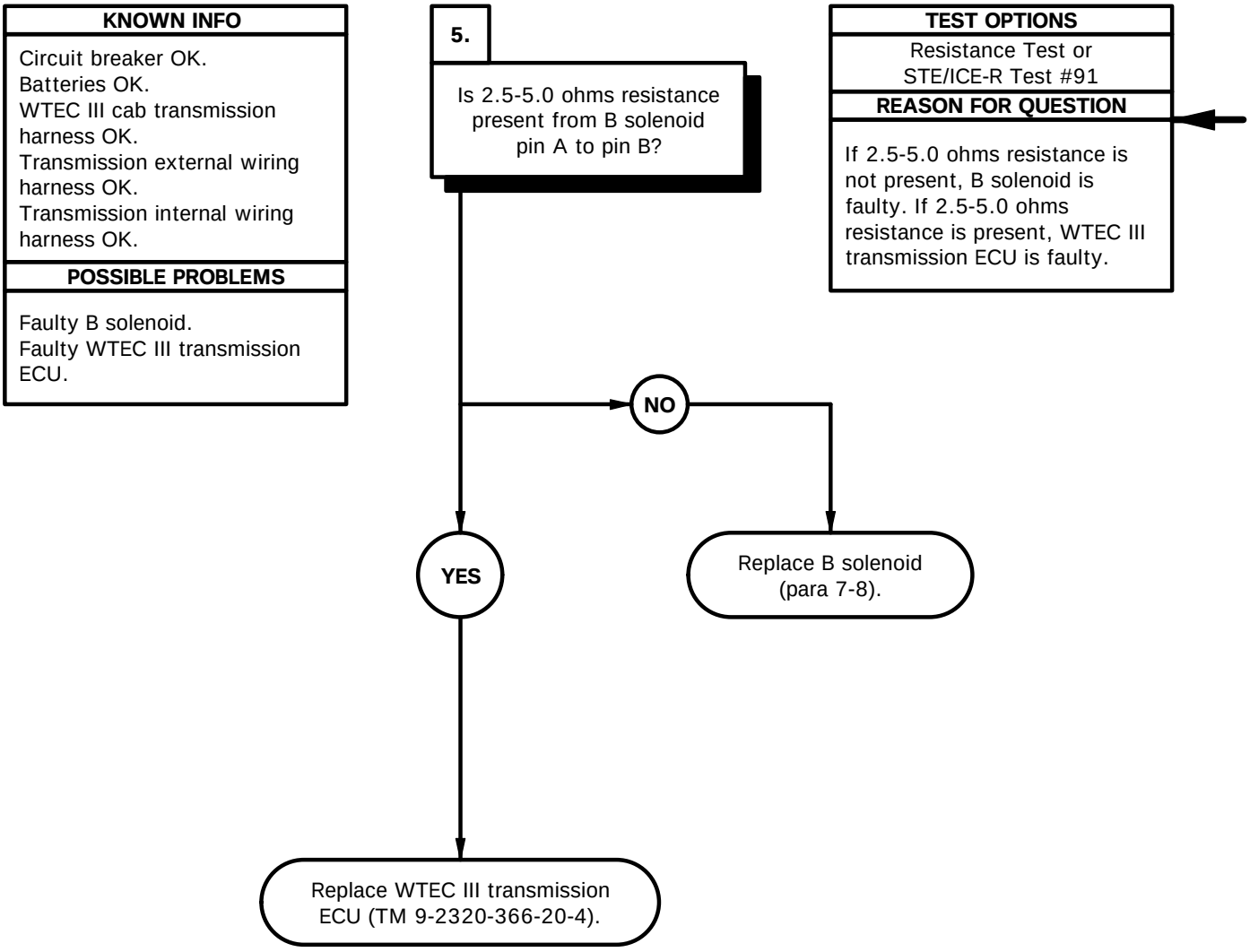


CONTINUITY TEST

(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).

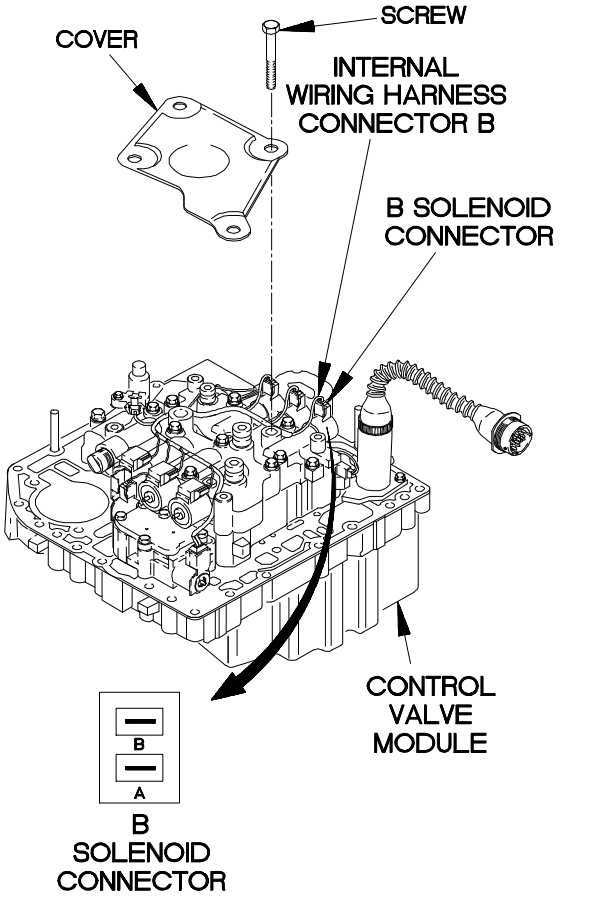


c57. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 13 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



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).



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).

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)

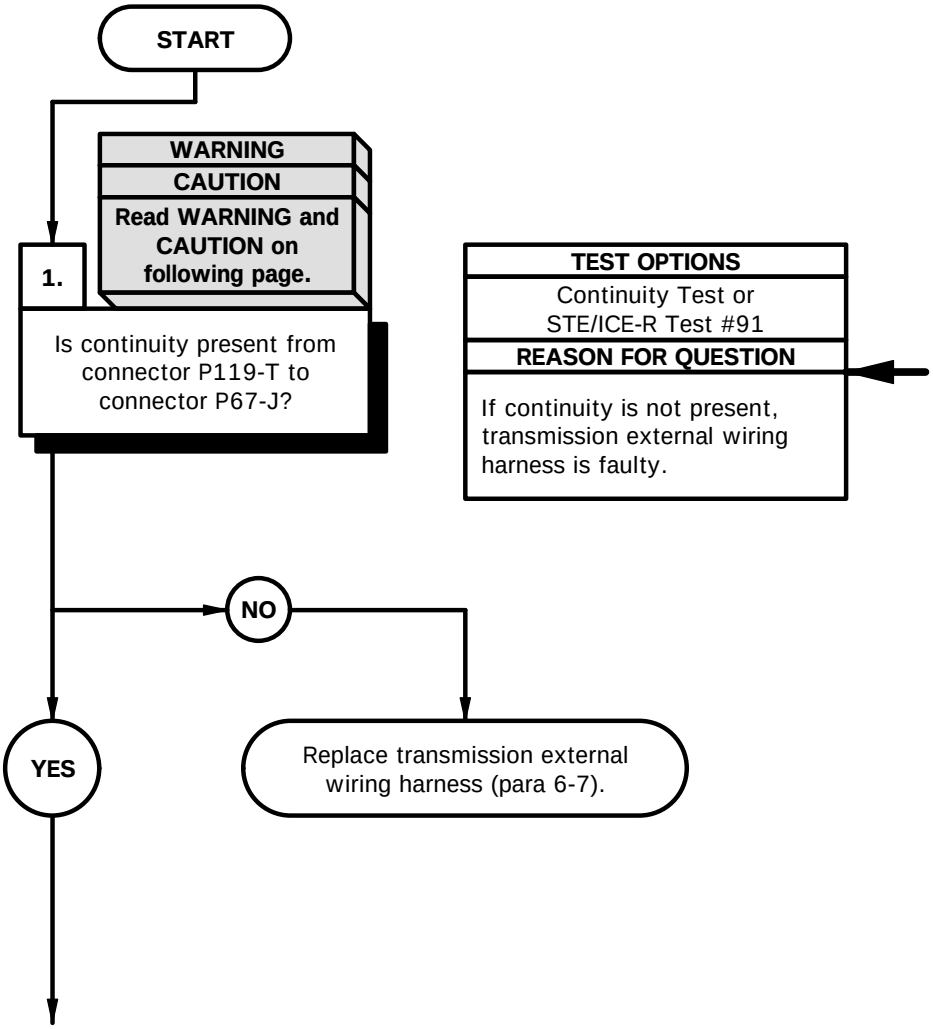
References
TM 9-4910-571-12&P

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.



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

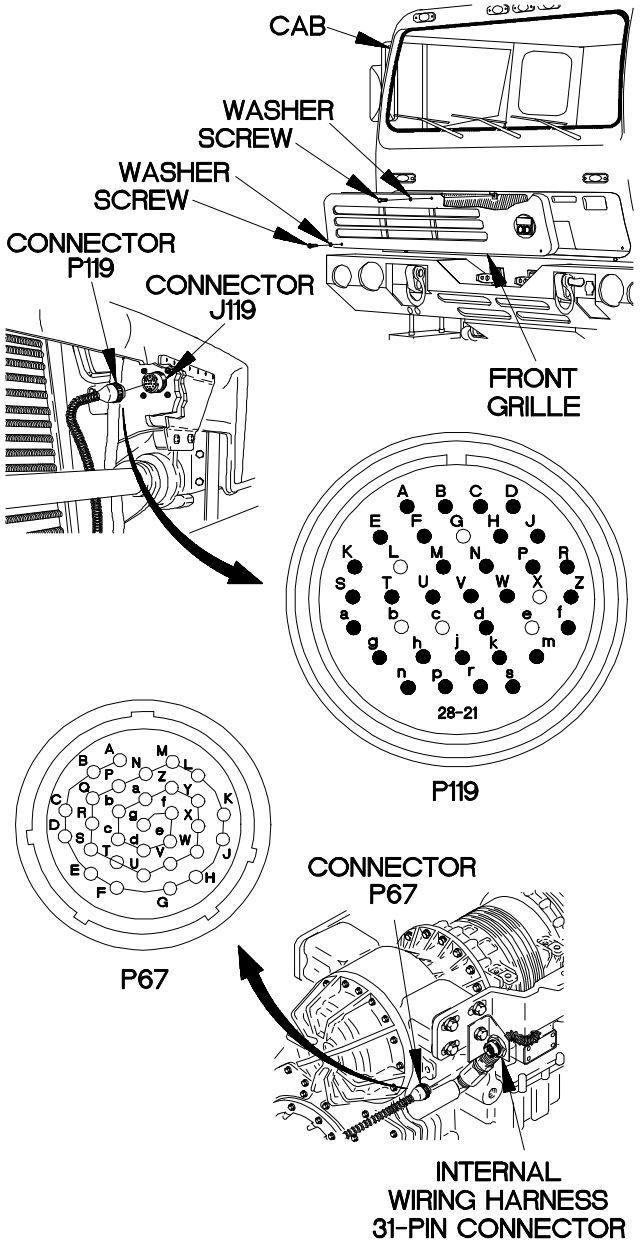
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

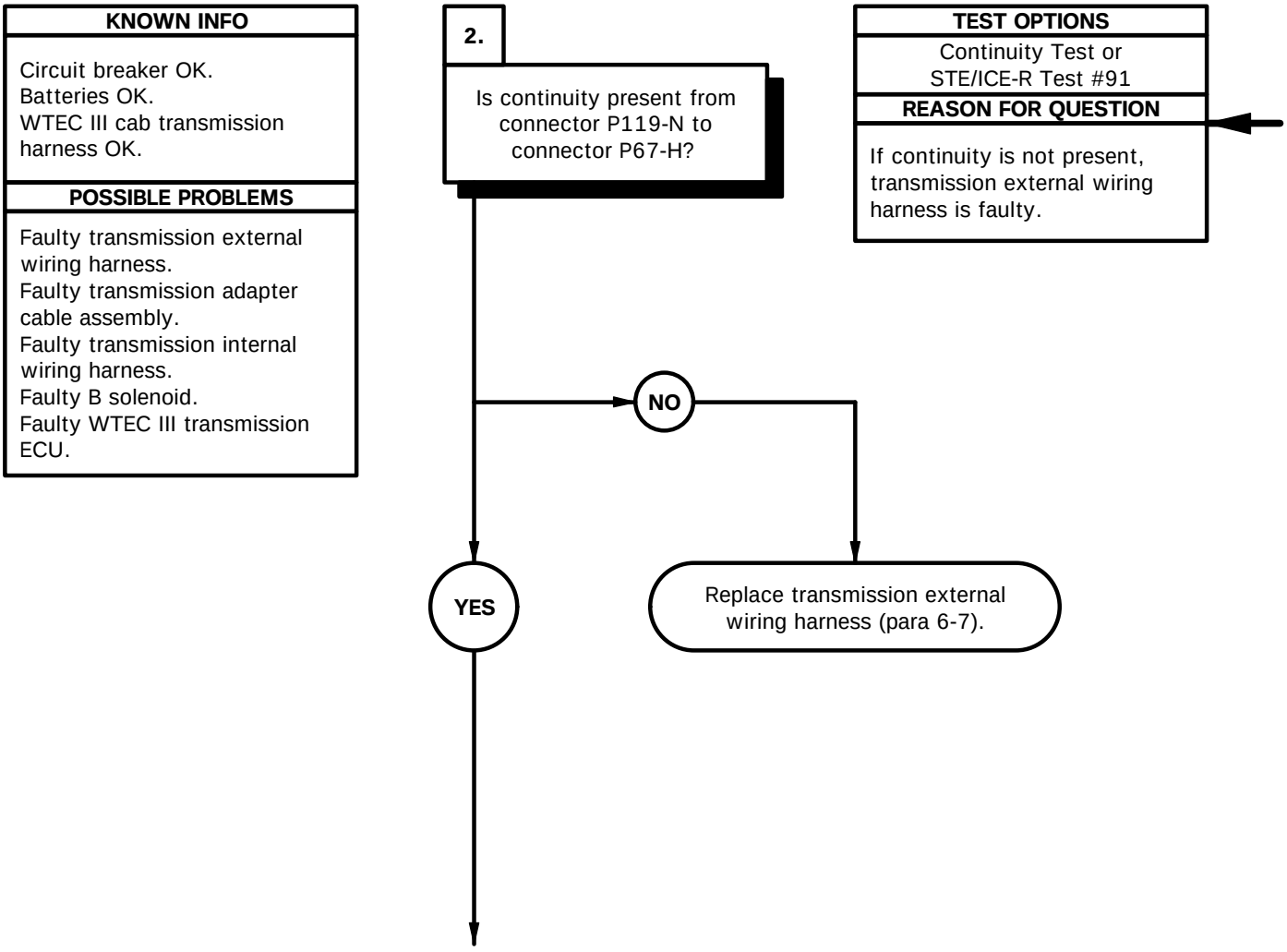
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from adapter cable to 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect positive (+) 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).

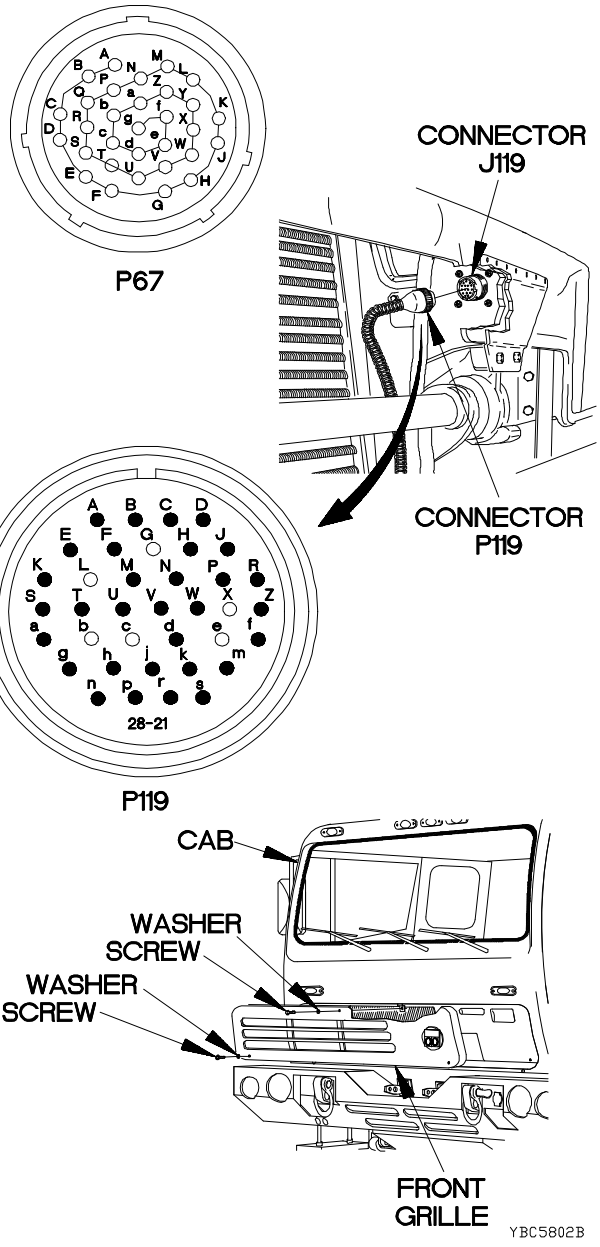


c58. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

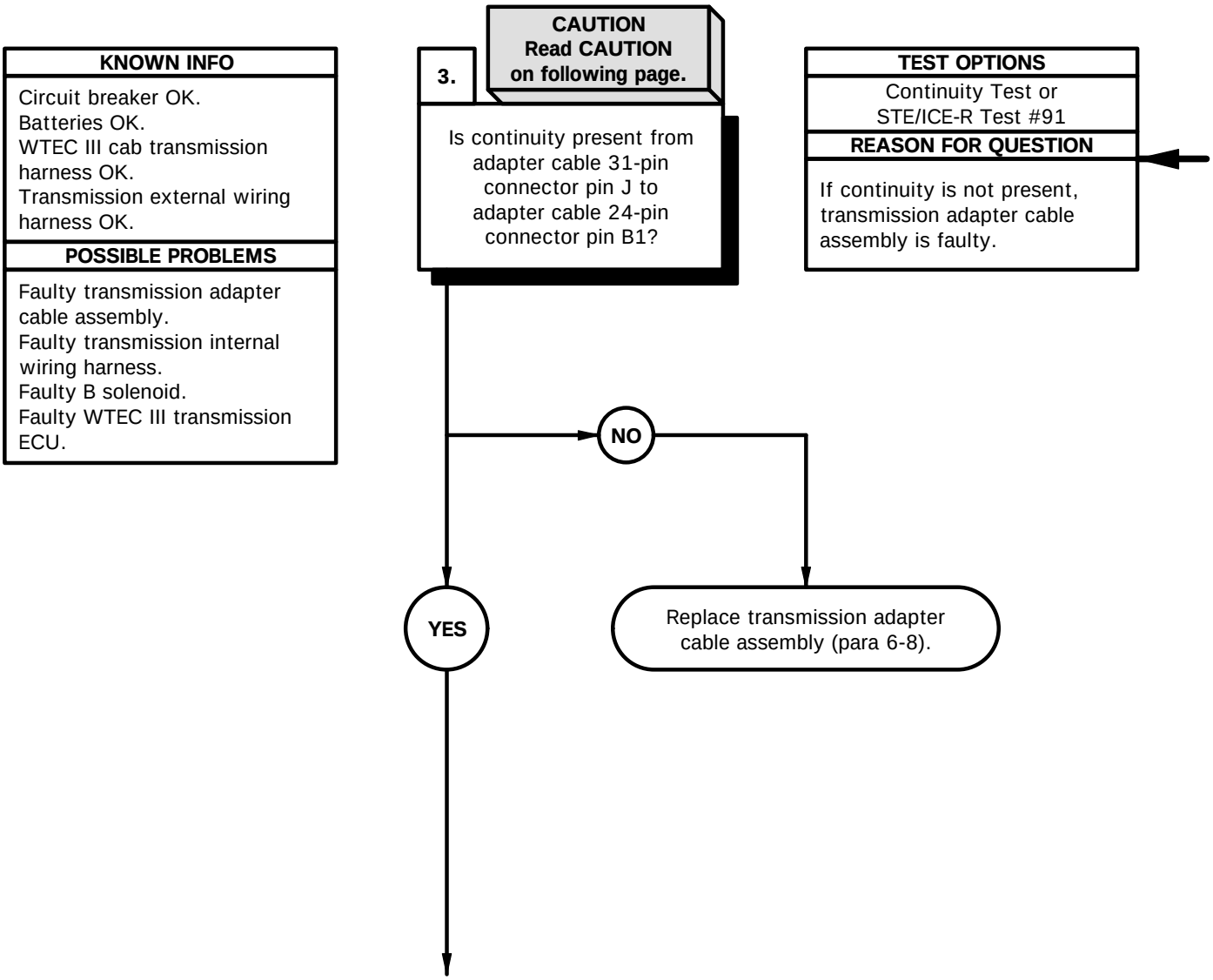


CONTINUITY TEST

(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).



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)

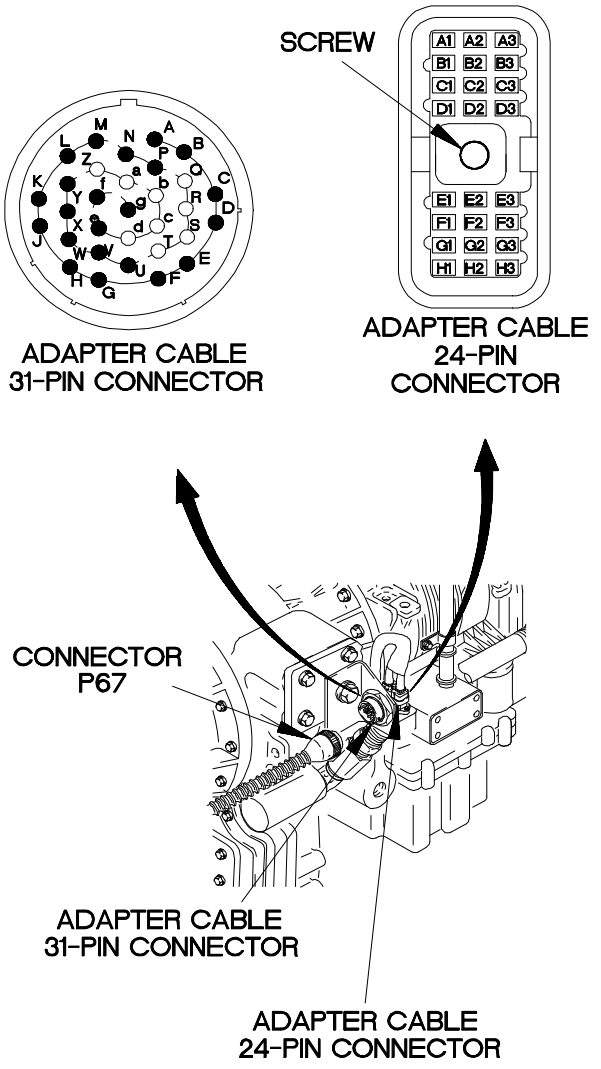


CAUTION

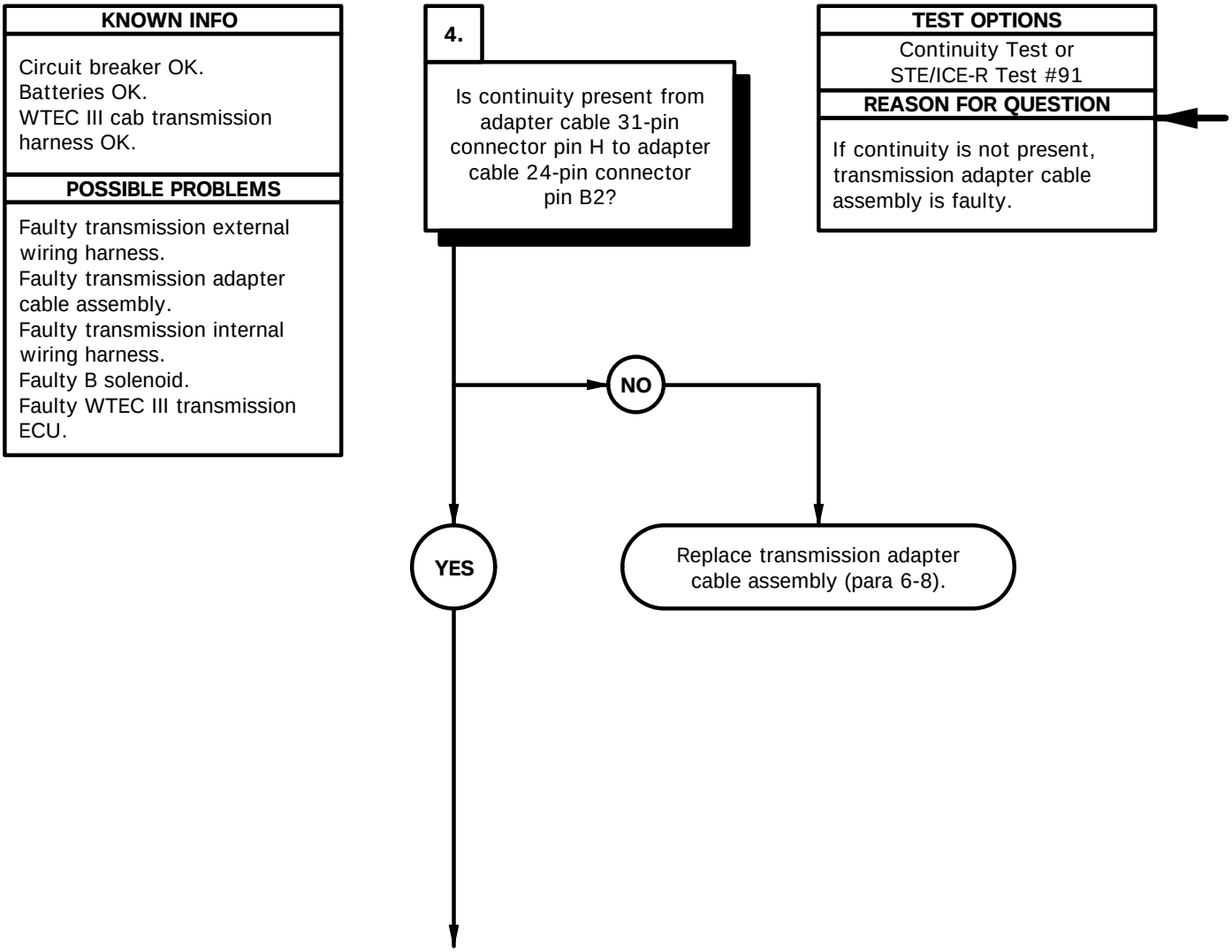
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

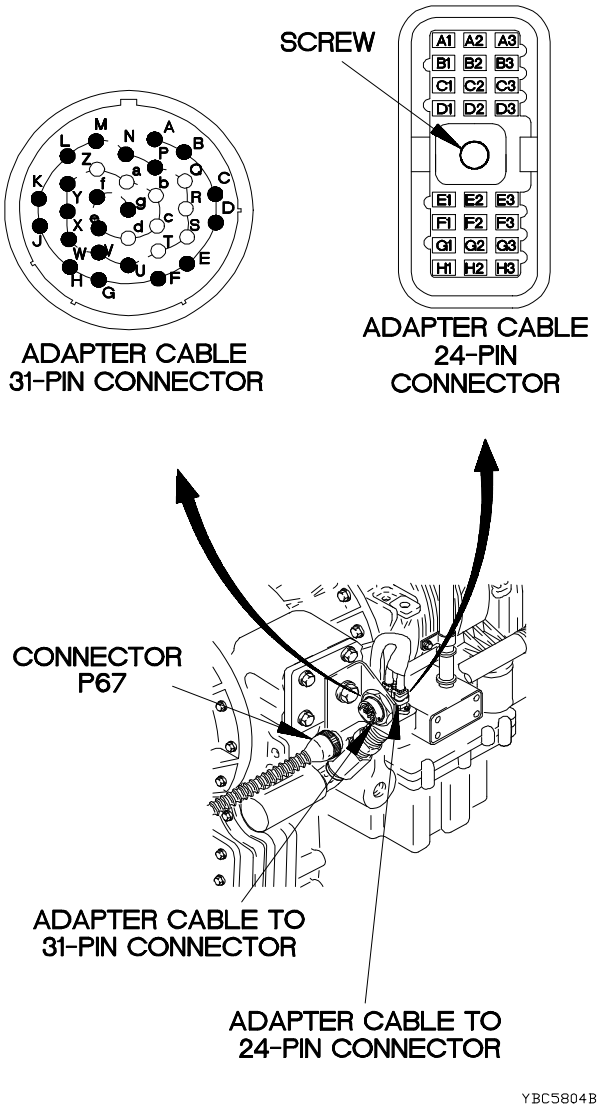


c58. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

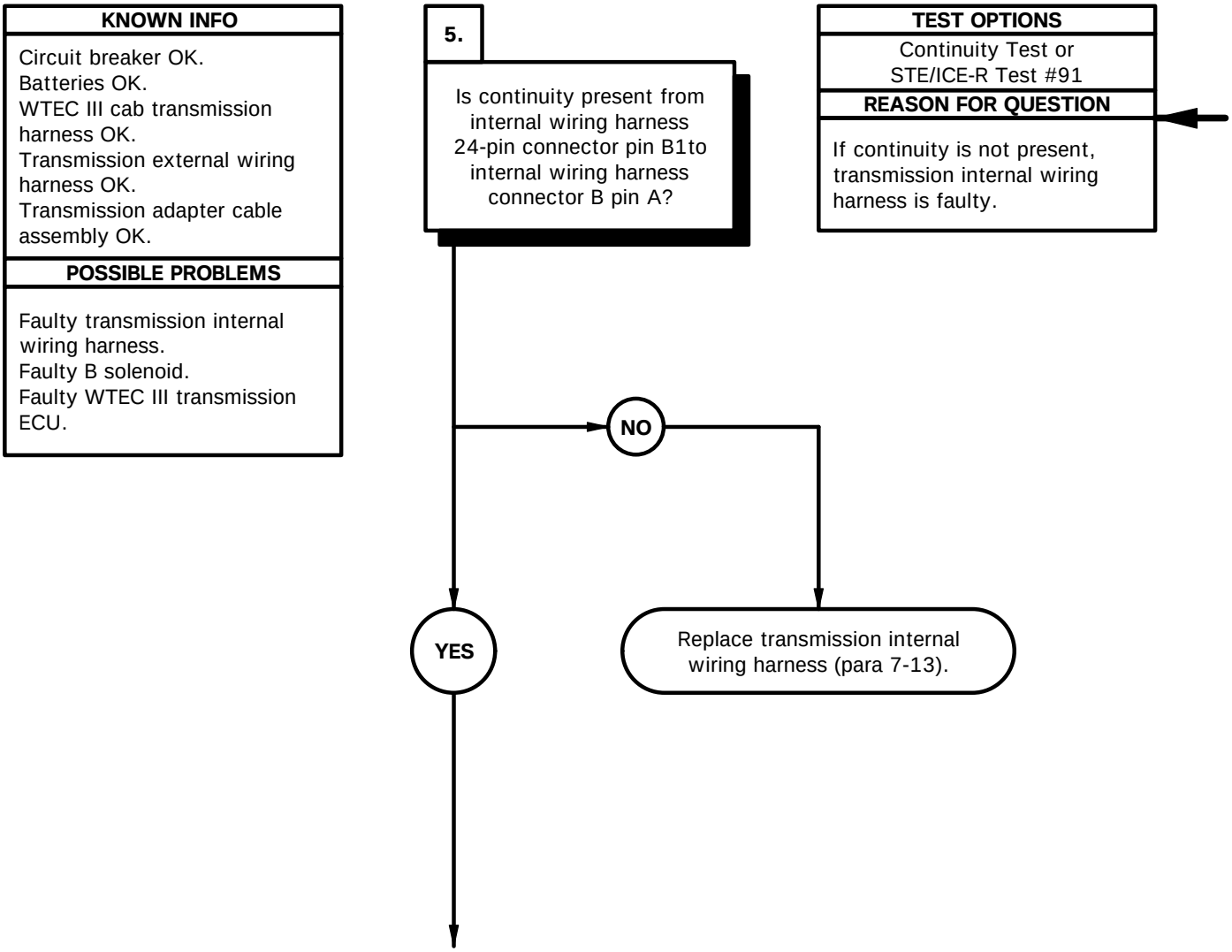


CONTINUITY TEST

(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.

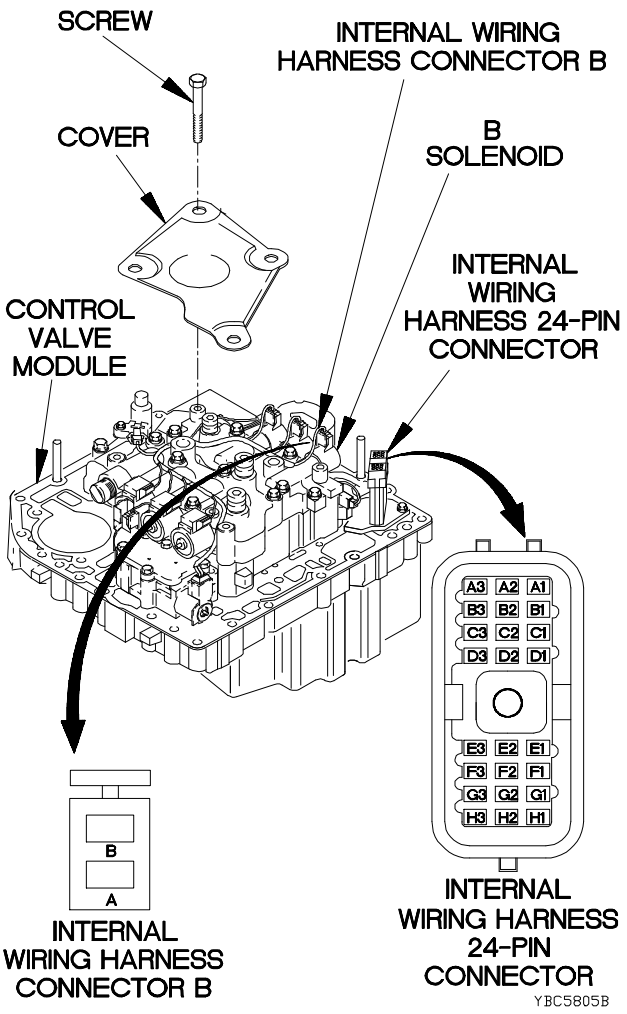


c58. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

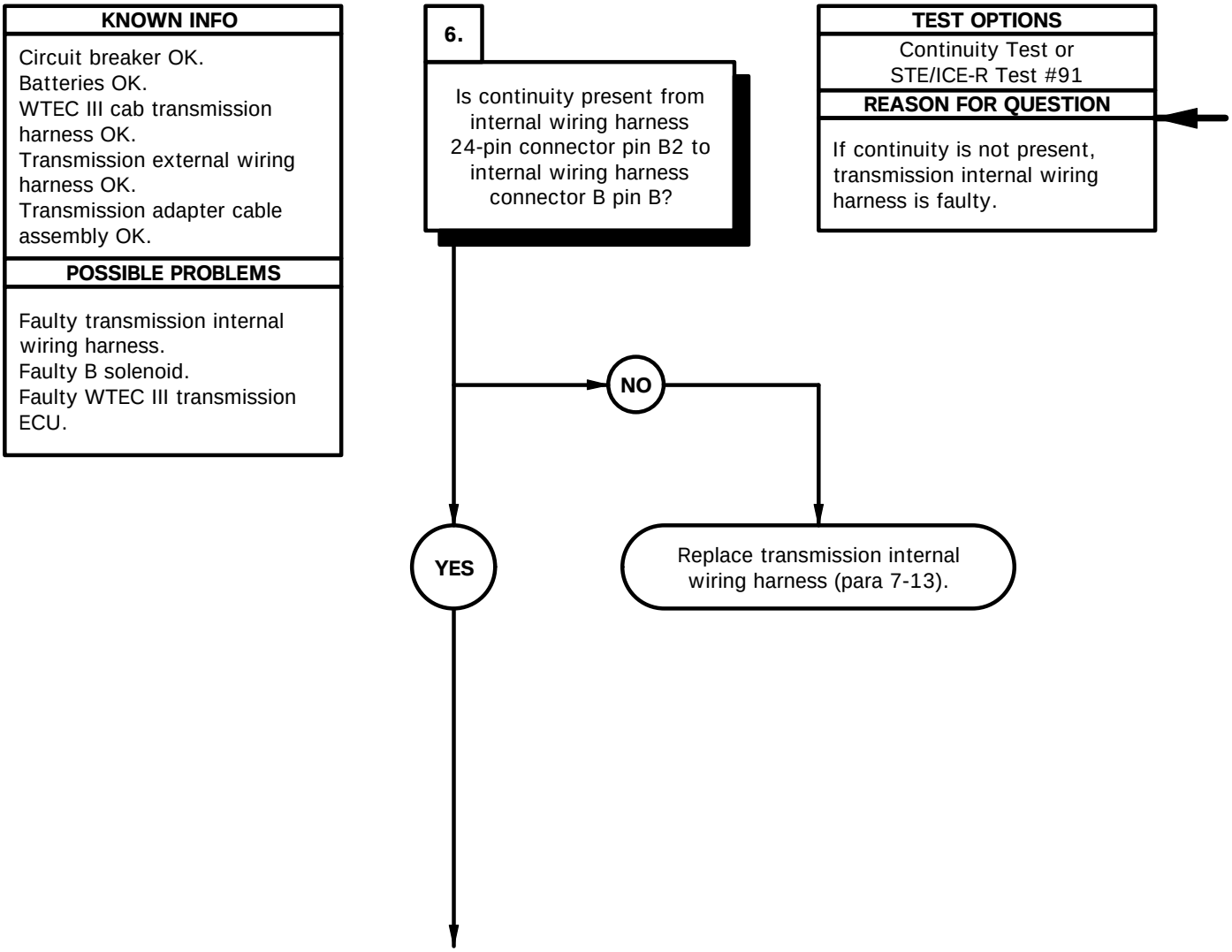


CONTINUITY TEST

(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).

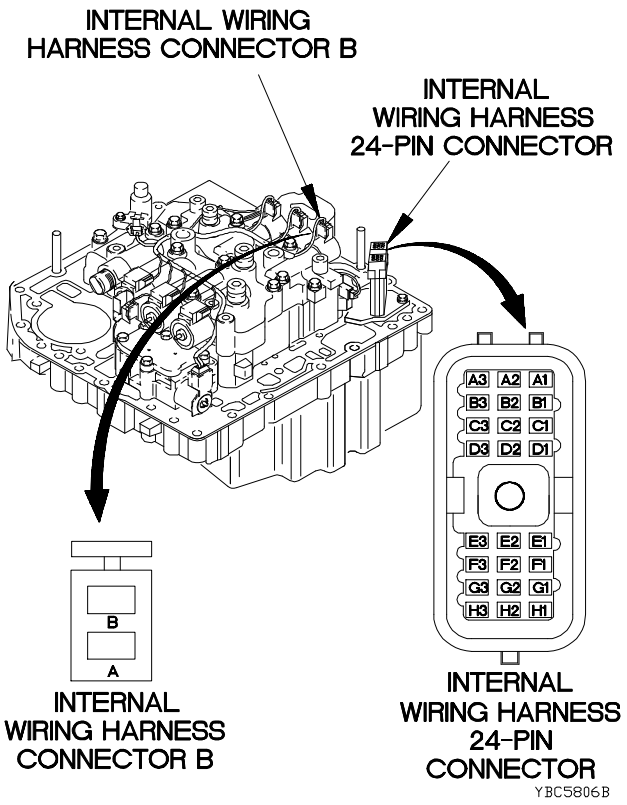


c58. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

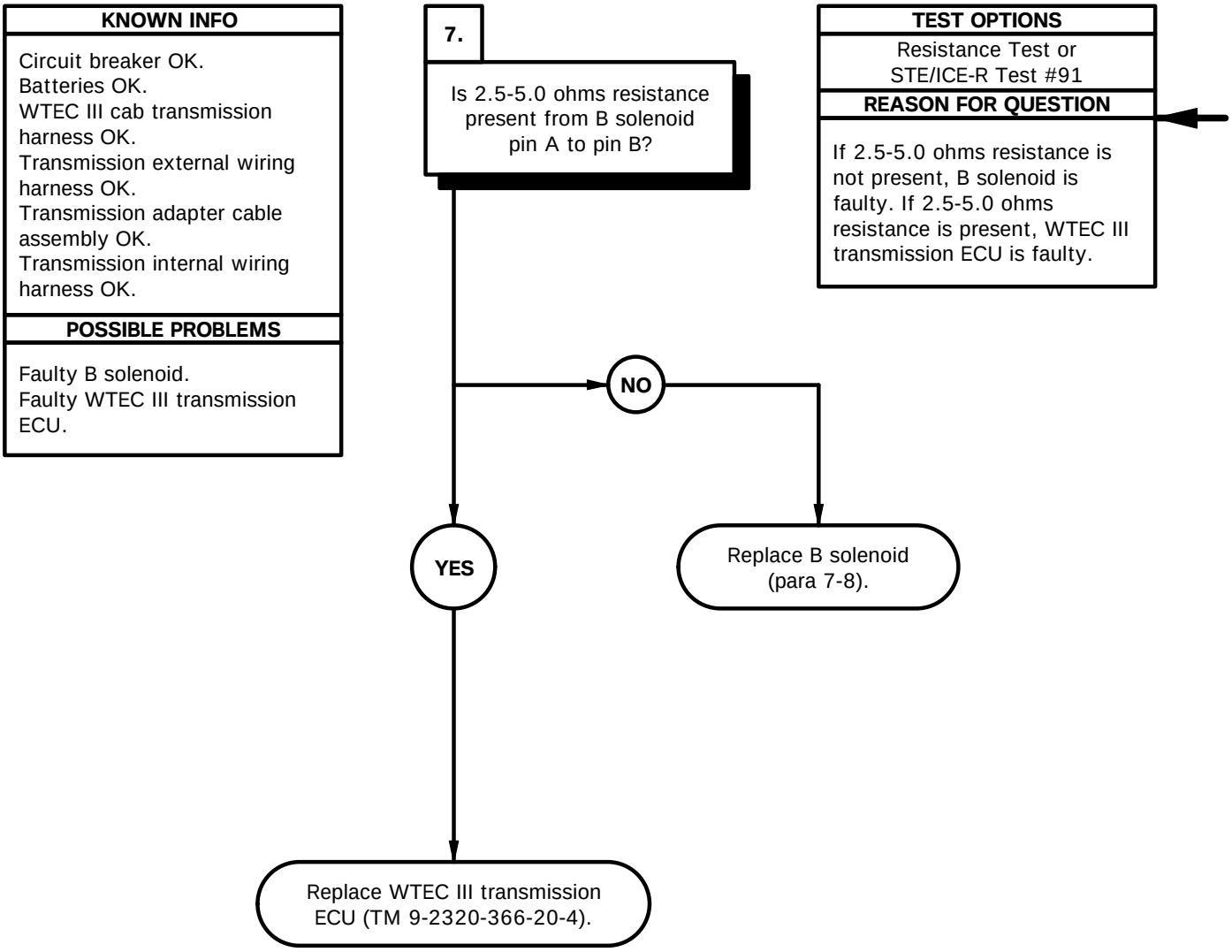


CONTINUITY TEST

(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).

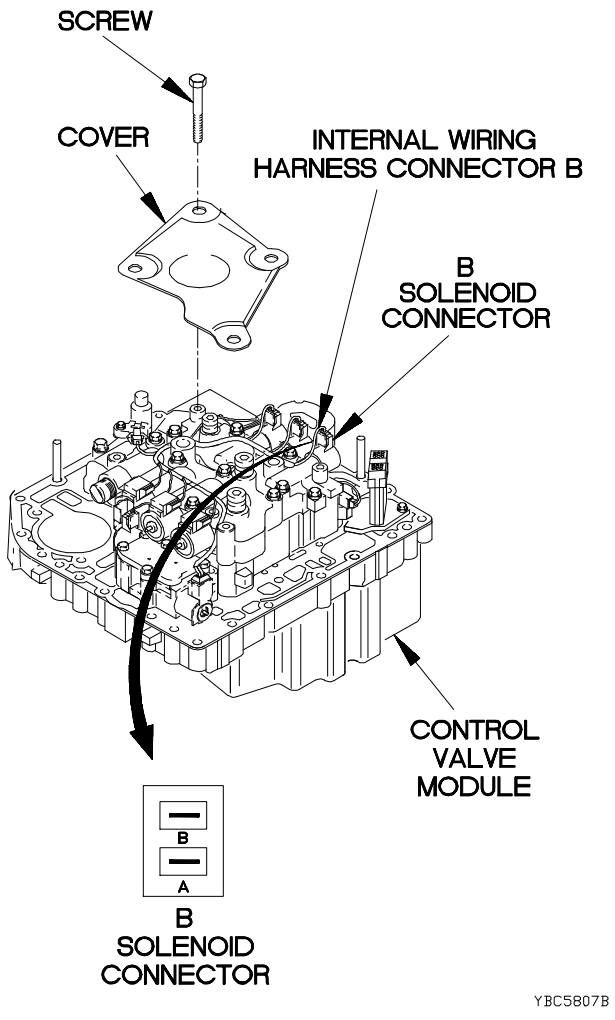


c58. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



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).



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

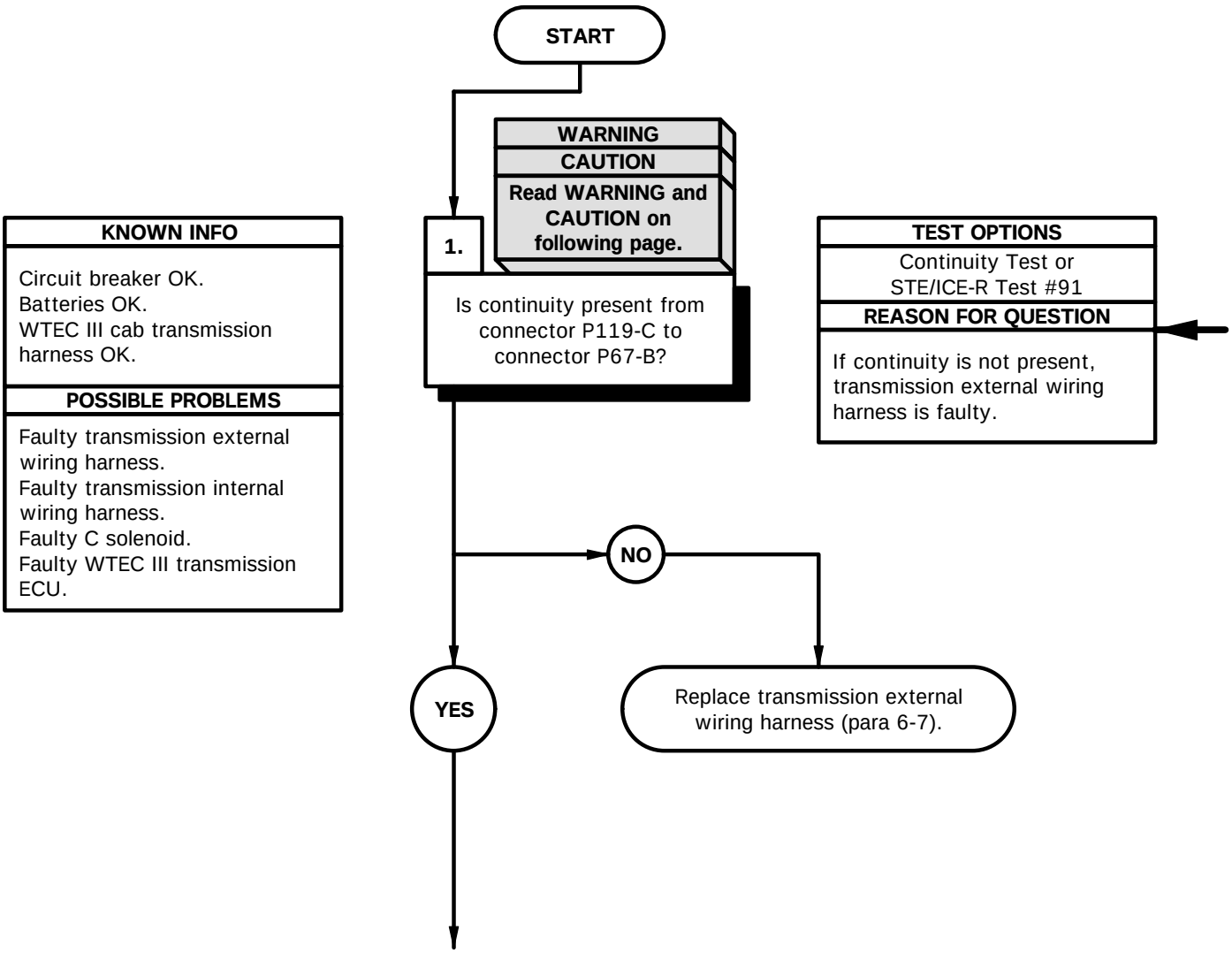
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

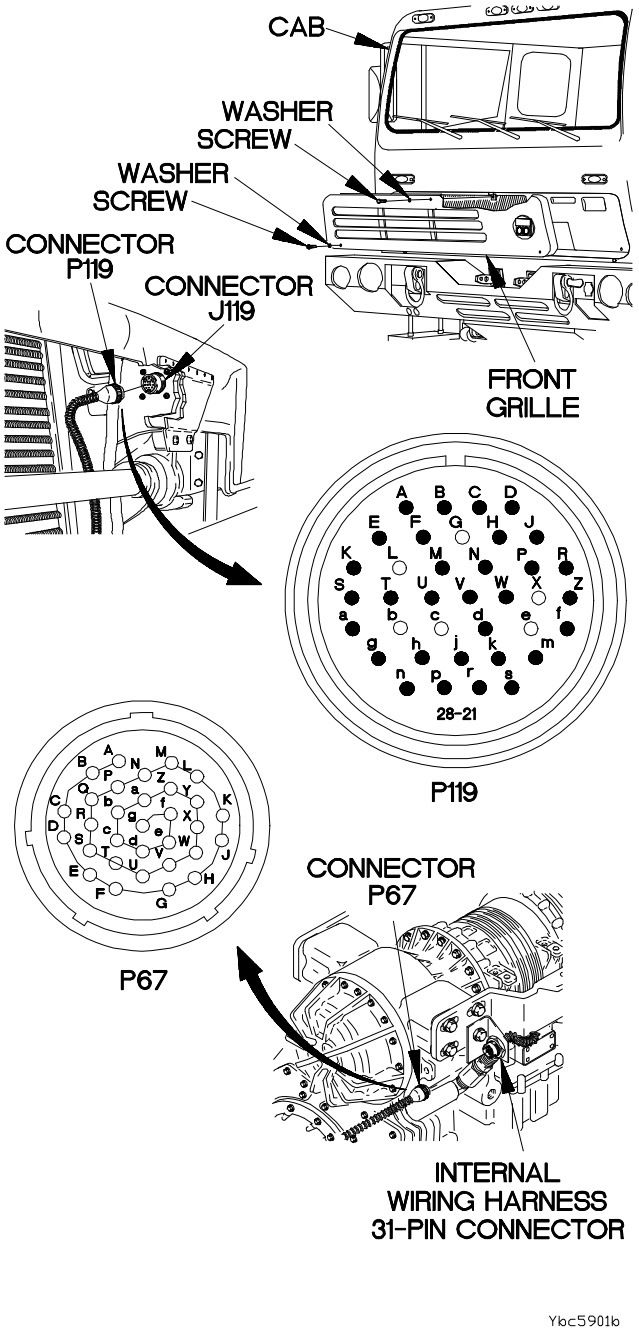
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

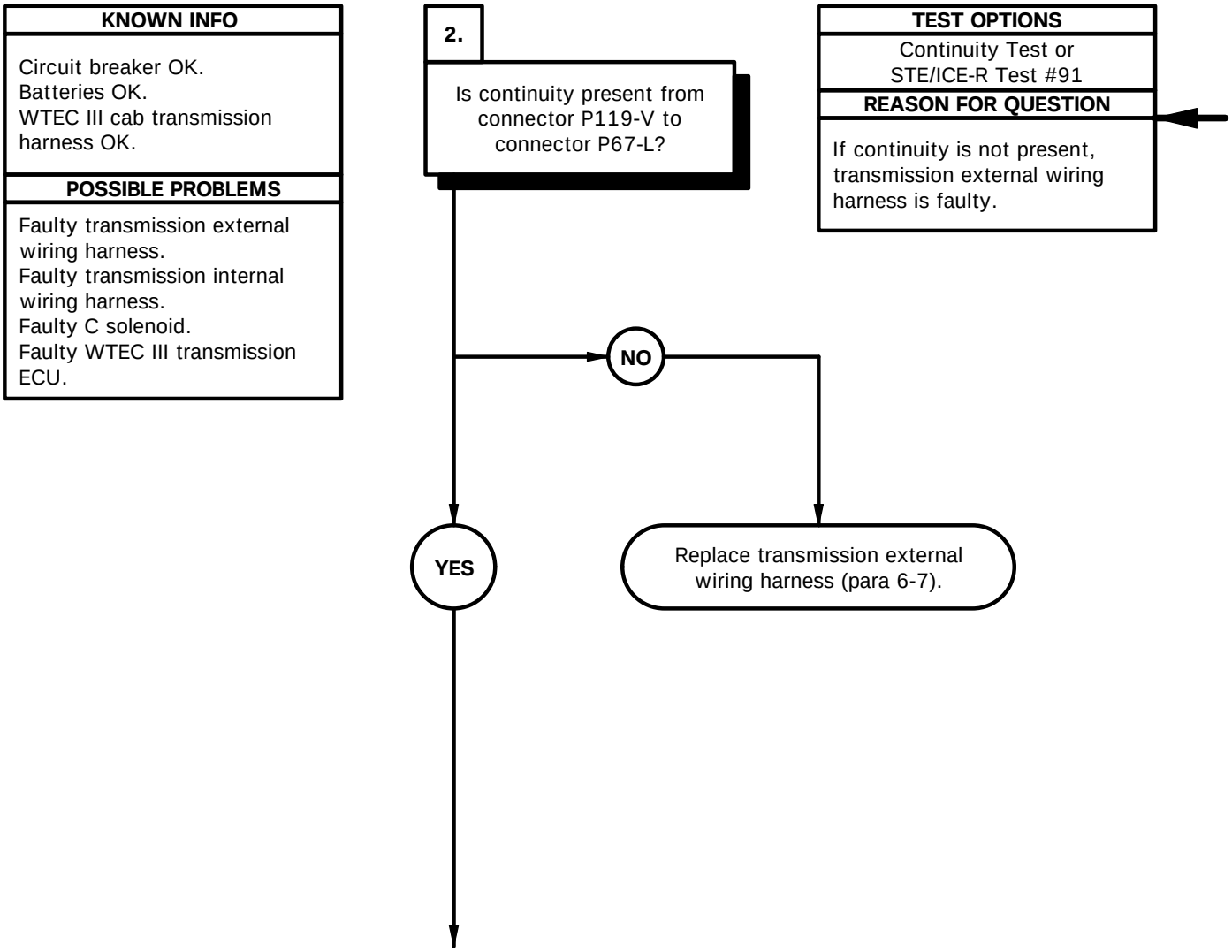
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from internal wiring harness 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect 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).

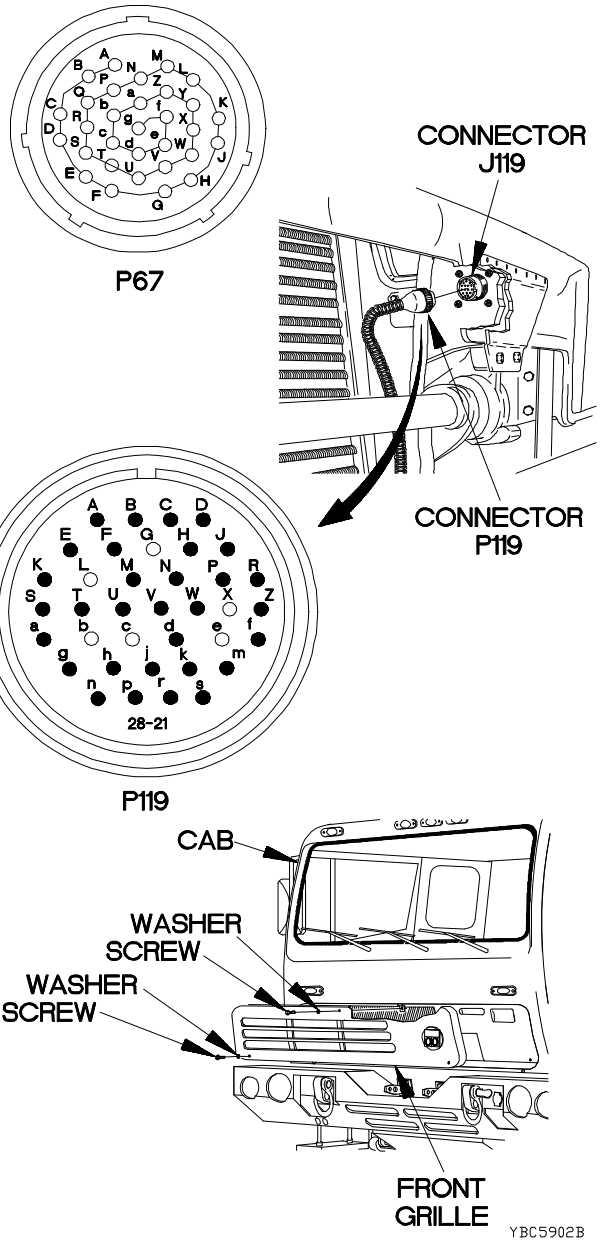


c59. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 14 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

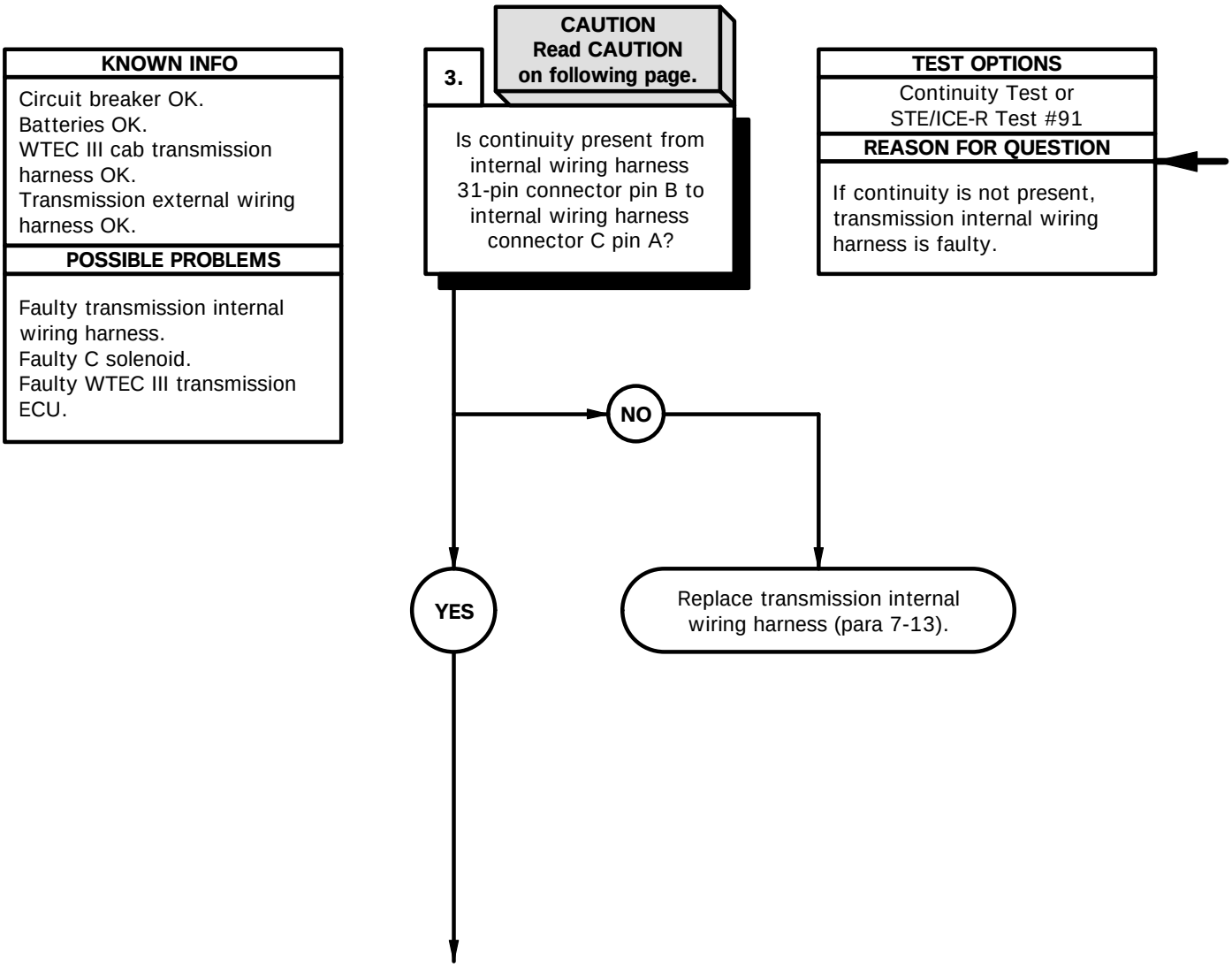


CONTINUITY TEST

(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).



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)

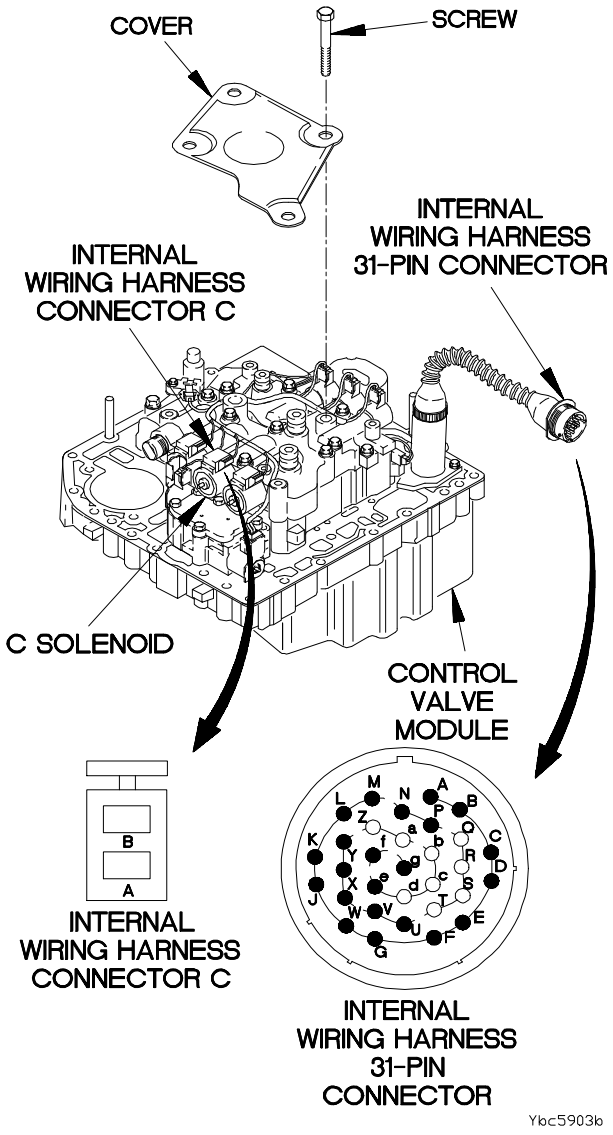


CAUTION

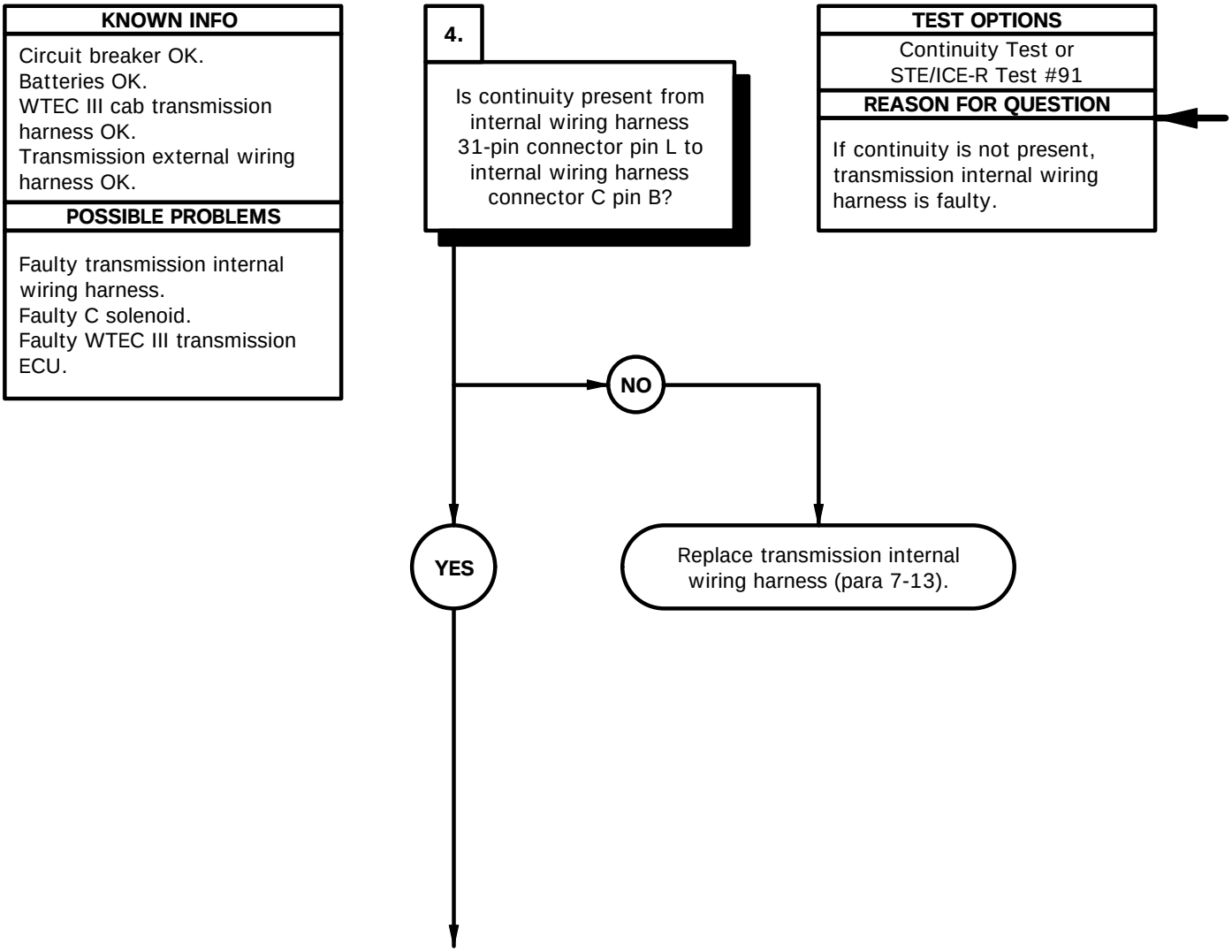
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

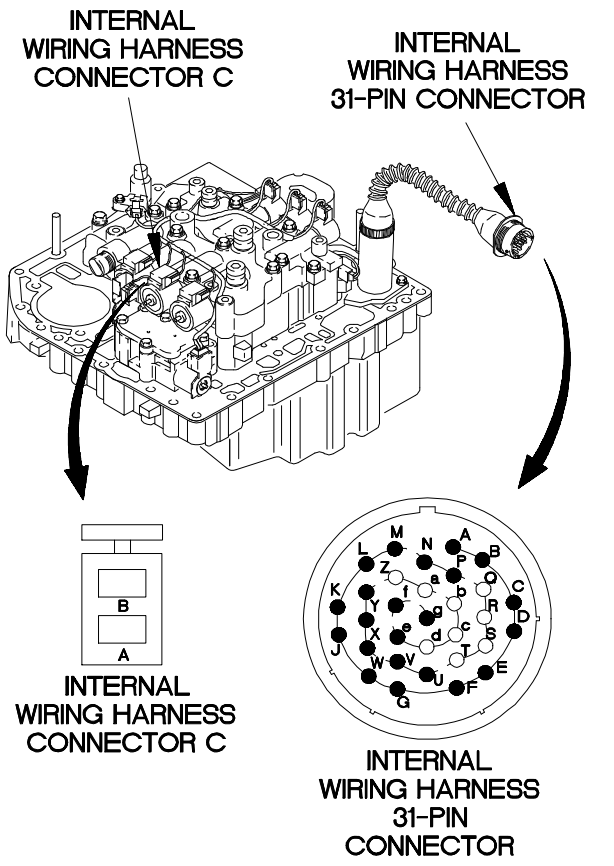


c59. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 14 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

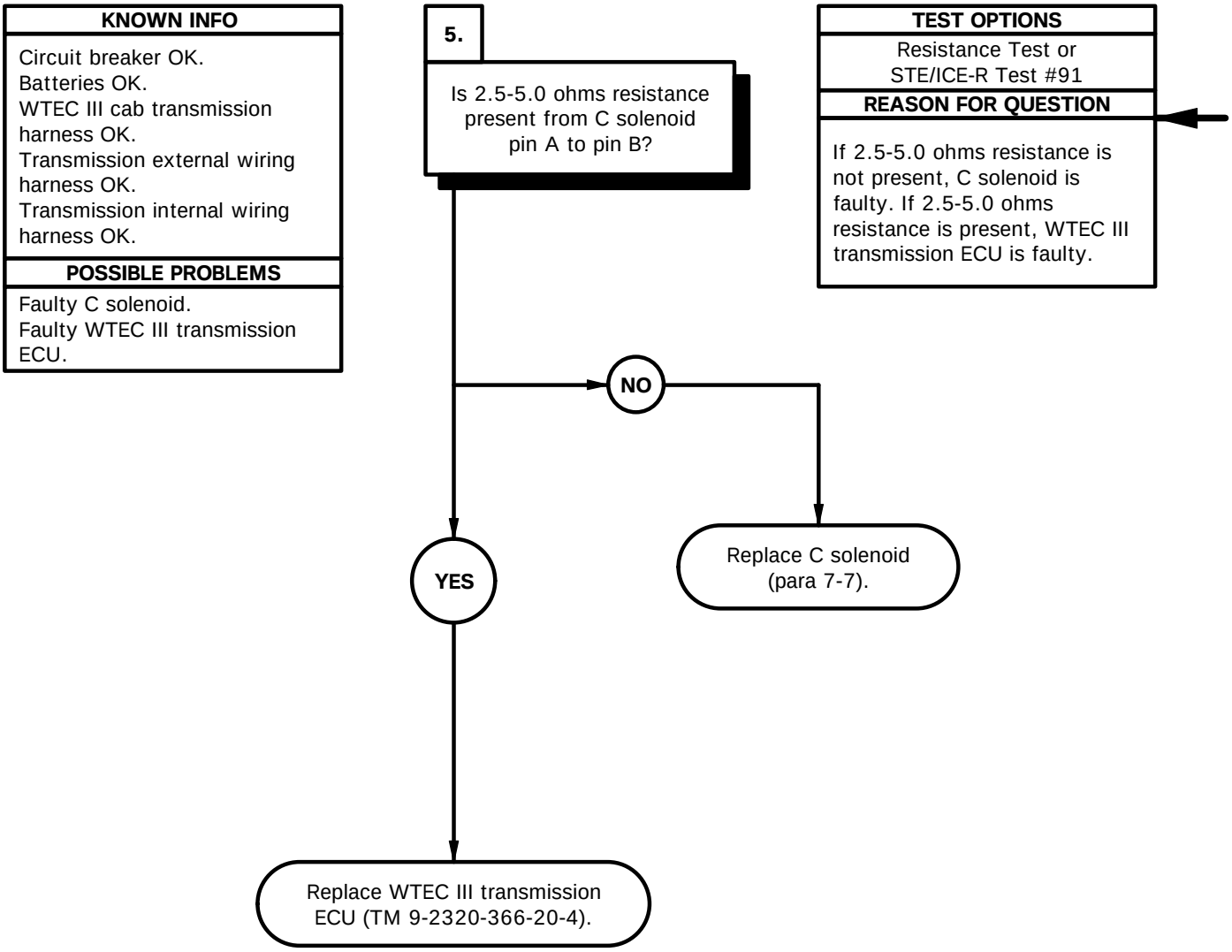


CONTINUITY TEST

(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).

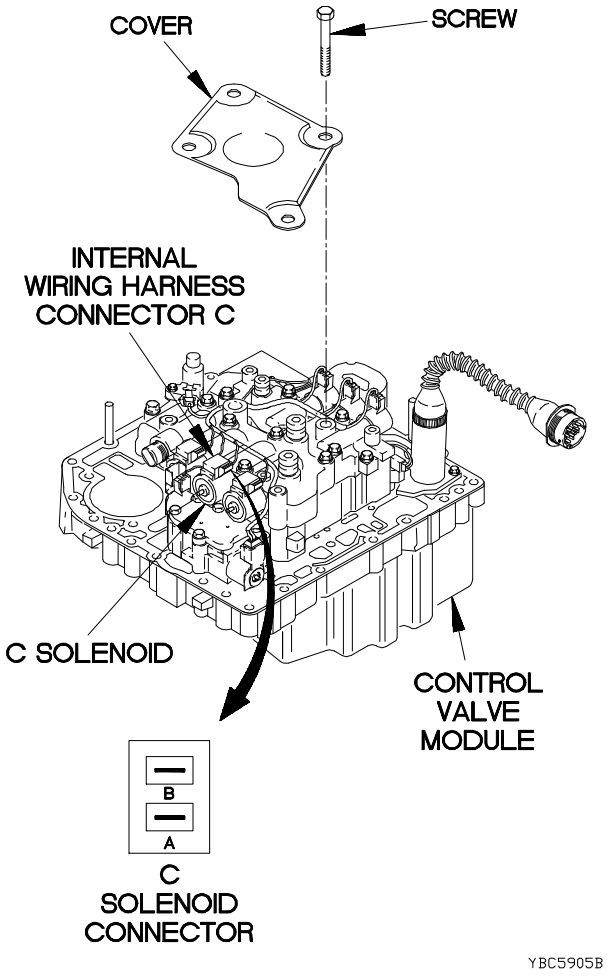


c59. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 14 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



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).



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

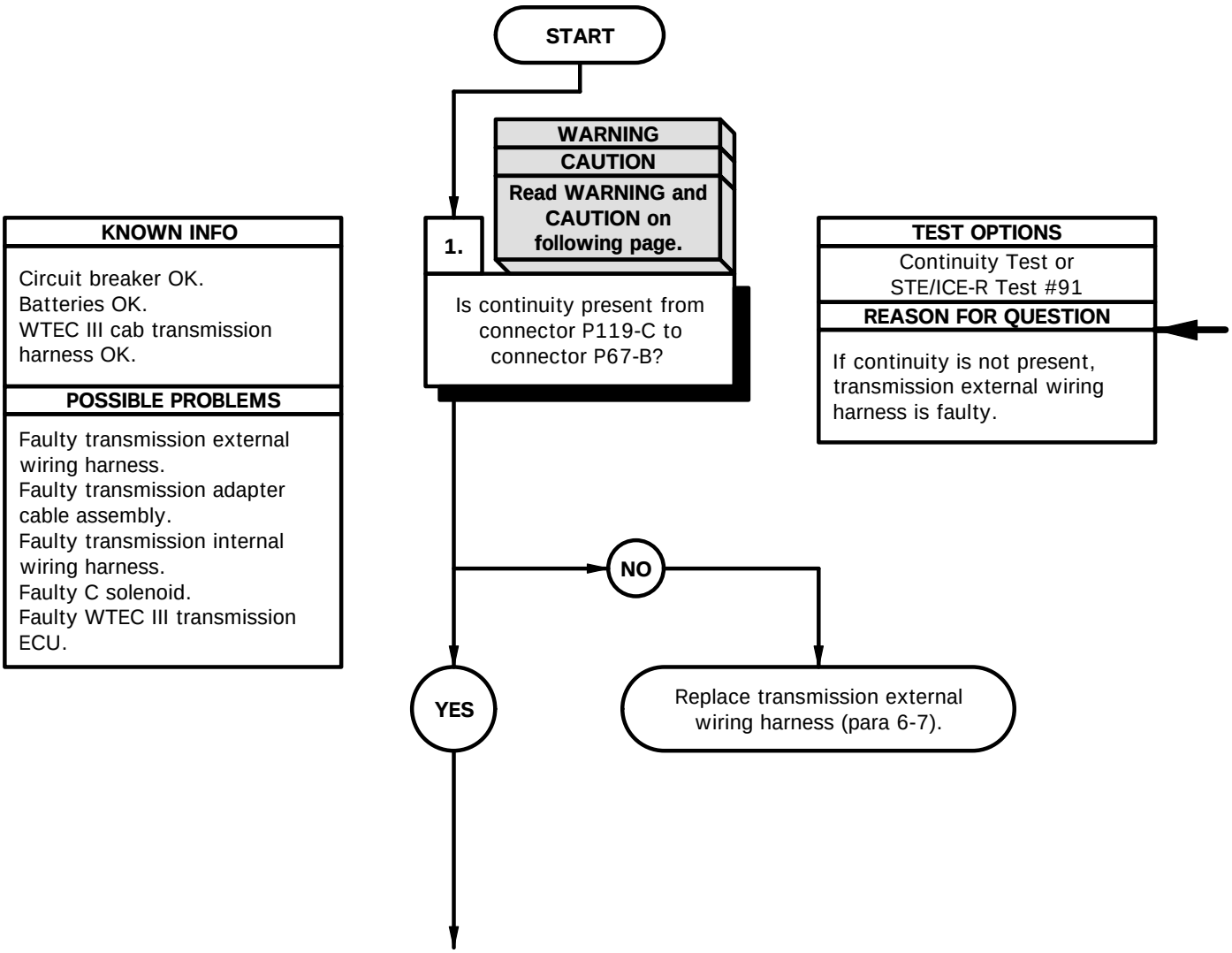
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

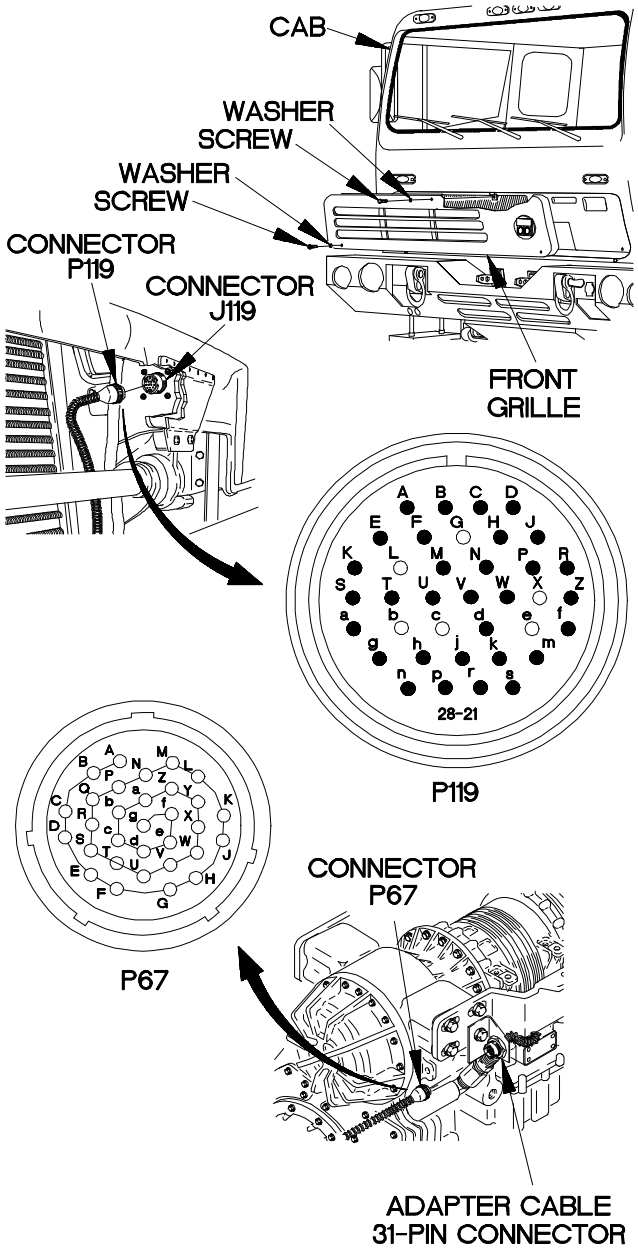
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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-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).



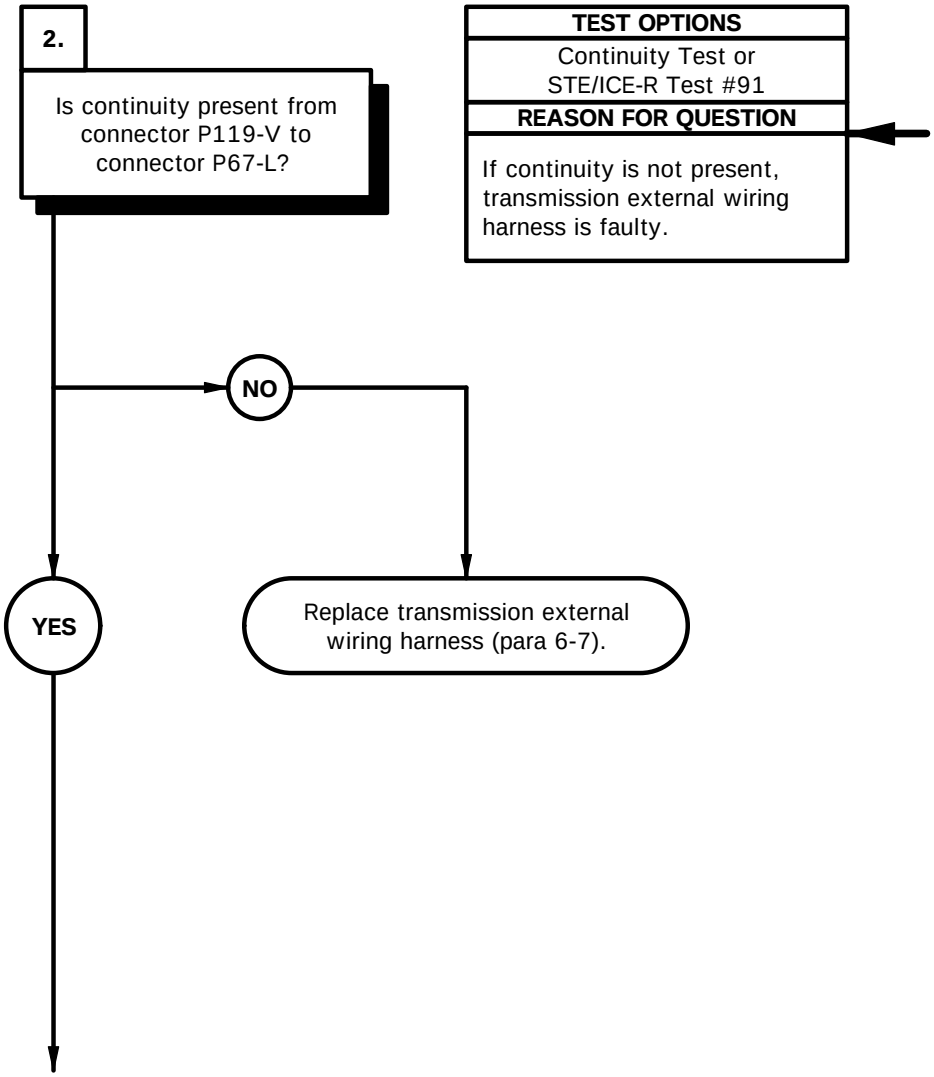
c60. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 14 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO

Circuit breaker OK.
Batteries OK.
WTEC III cab transmission harness OK.

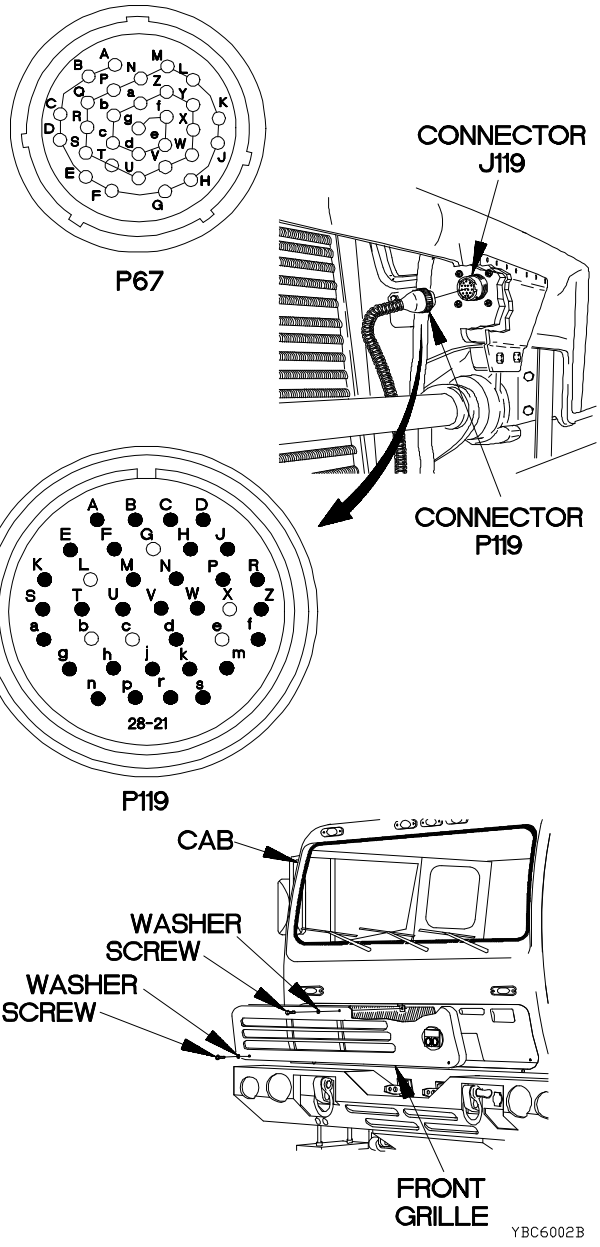
POSSIBLE PROBLEMS

Faulty transmission external wiring harness.
Faulty transmission adapter cable assembly.
Faulty transmission internal wiring harness.
Faulty C solenoid.
Faulty WTEC III transmission ECU.

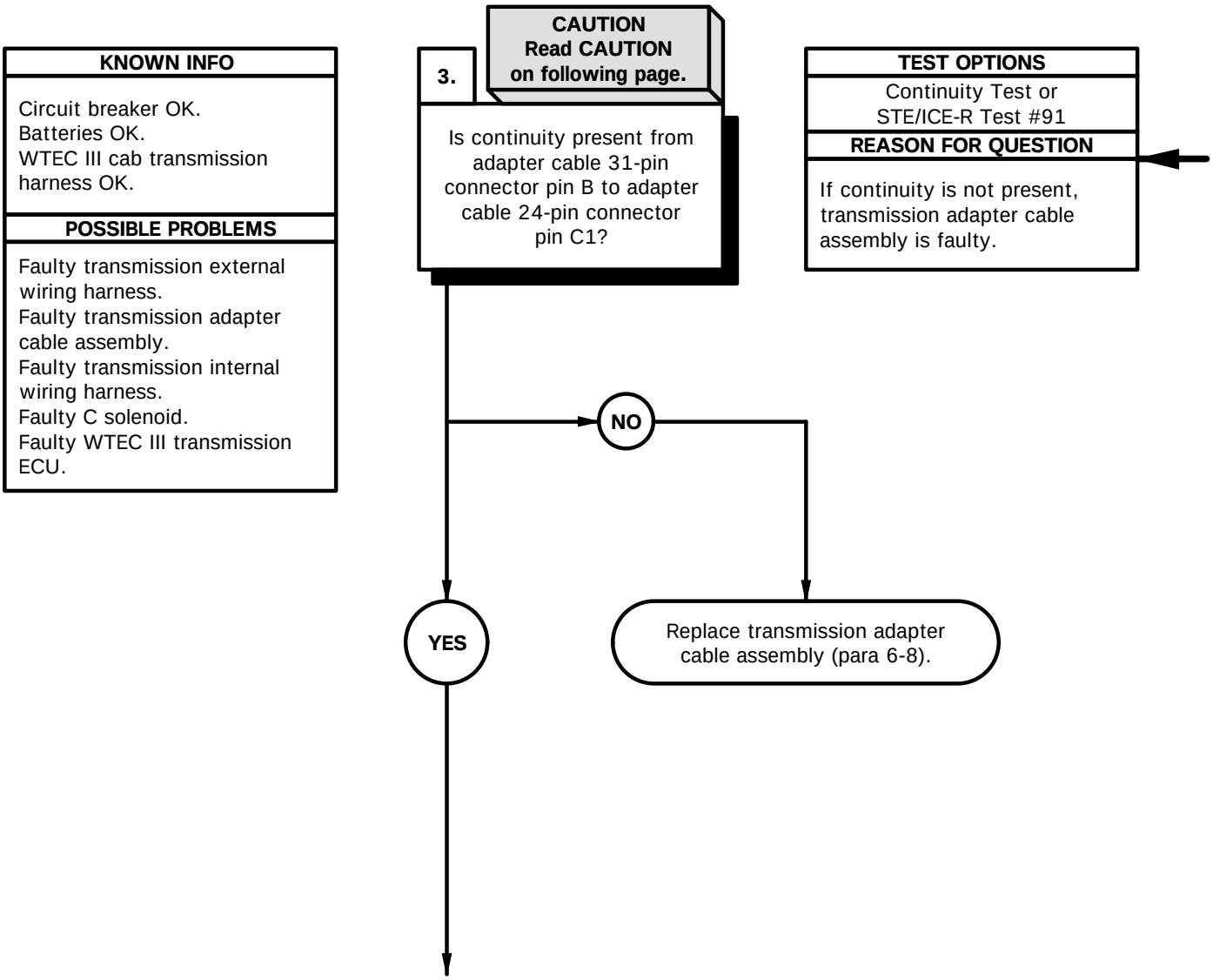


CONTINUITY TEST

(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).



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)

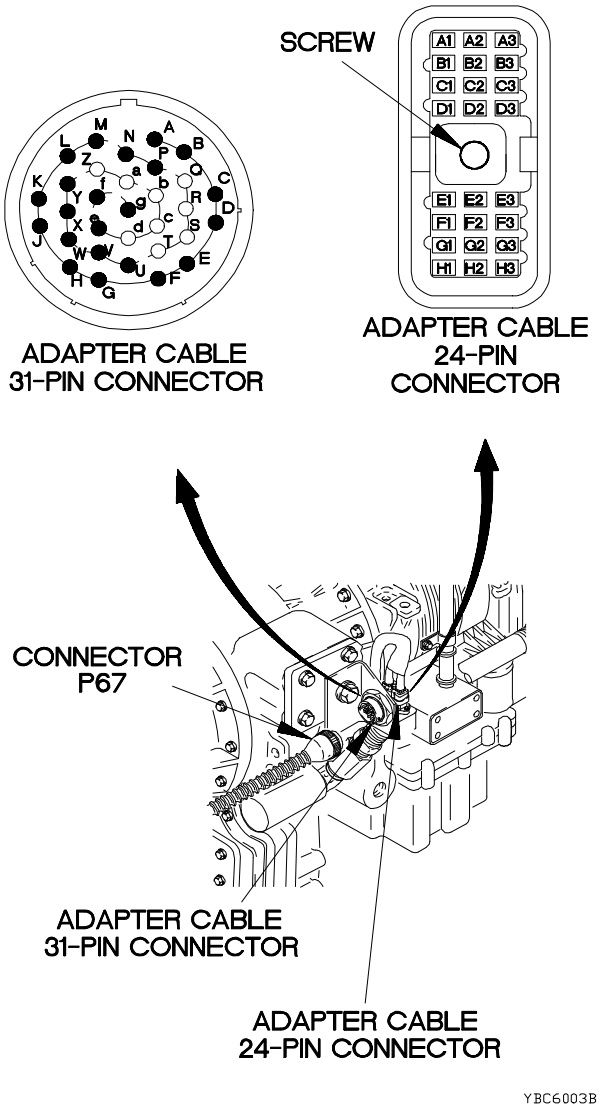


CAUTION

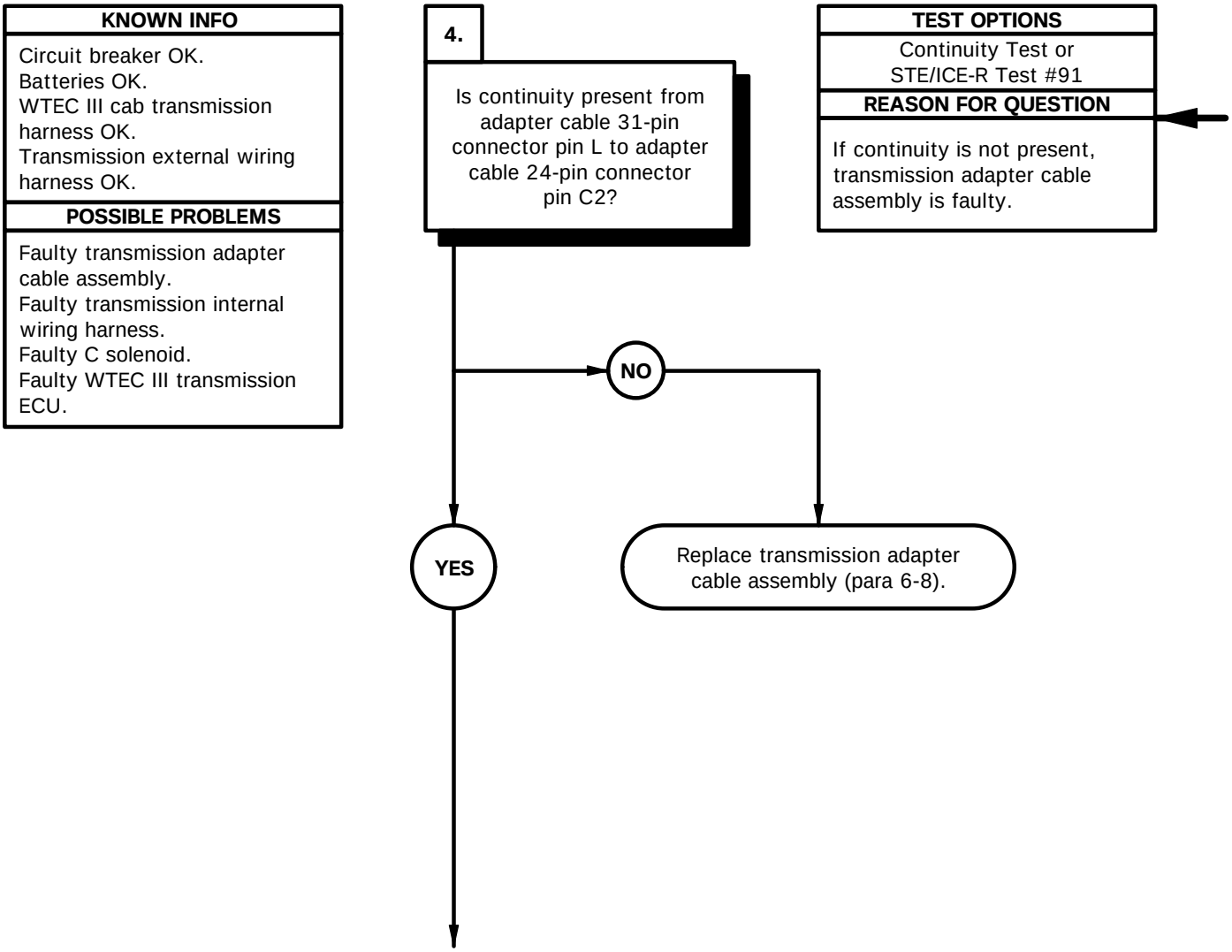
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

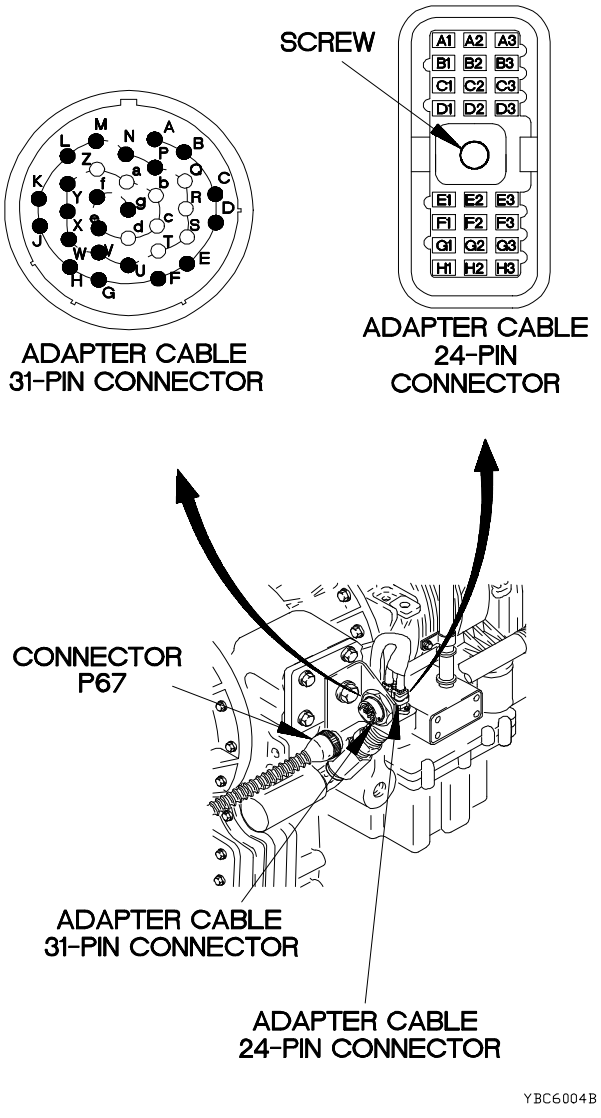


c60. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 14 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

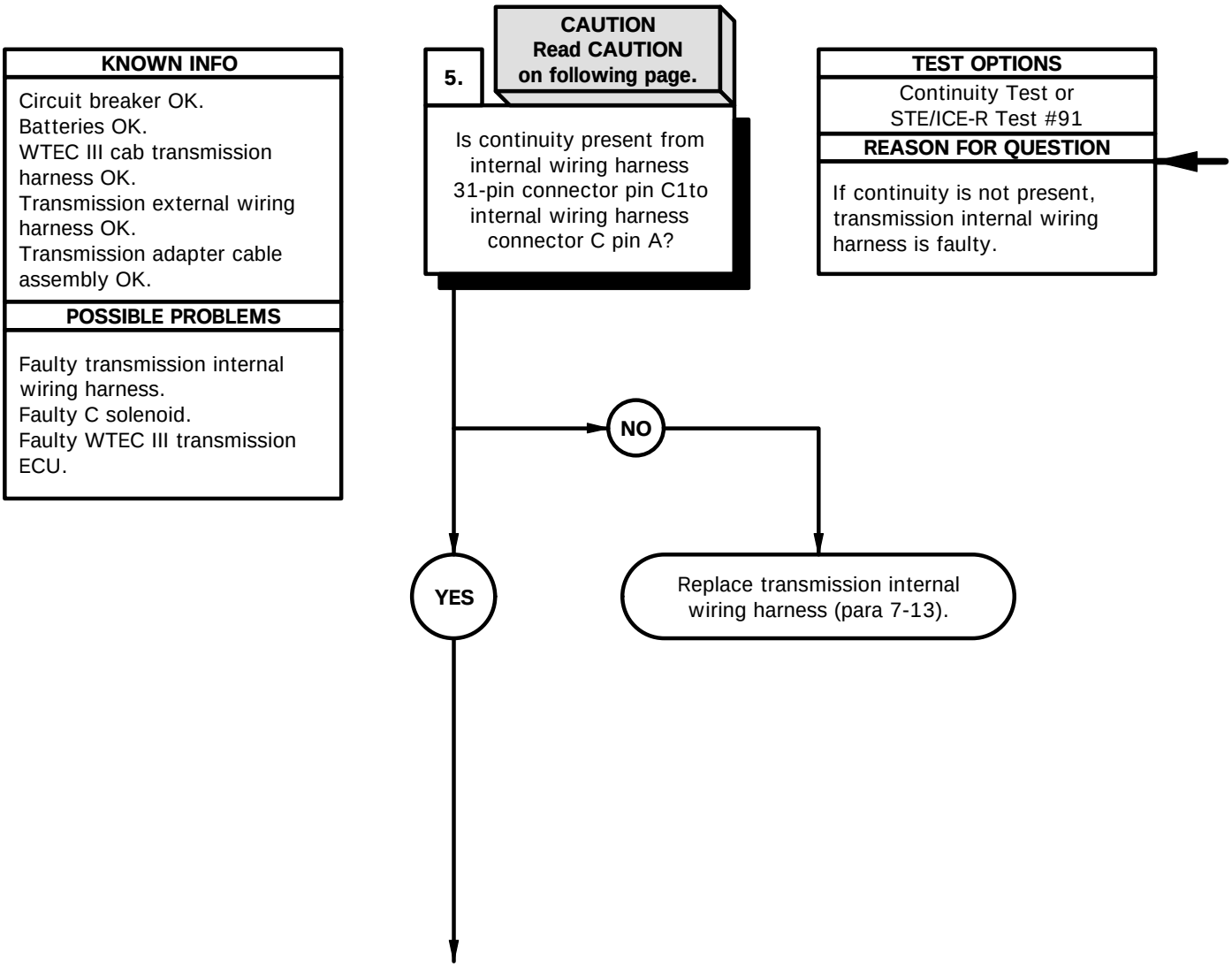


CONTINUITY TEST

(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.



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)

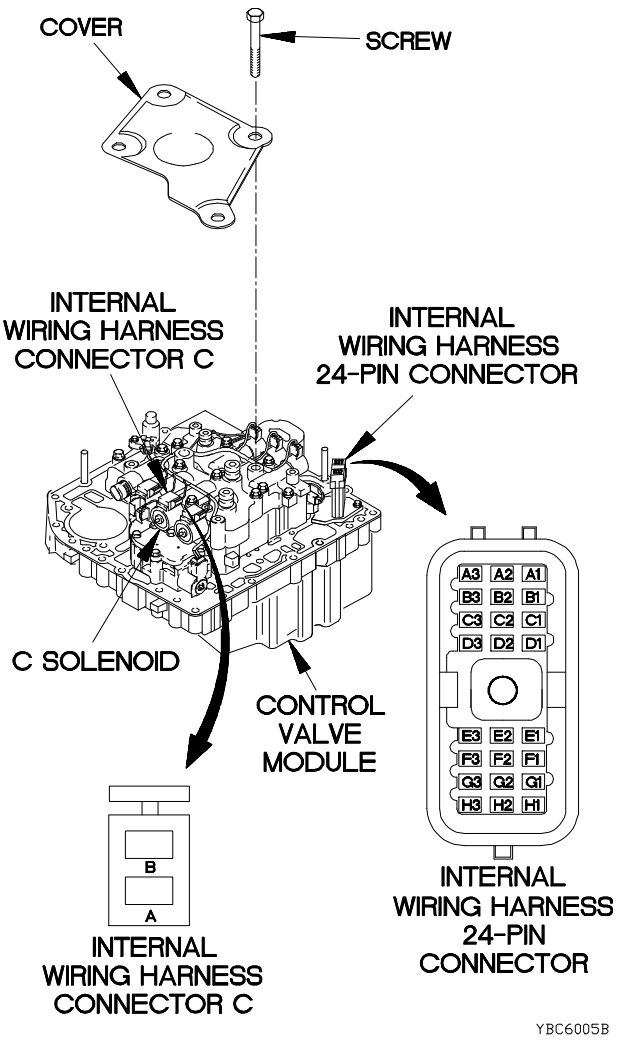


CAUTION

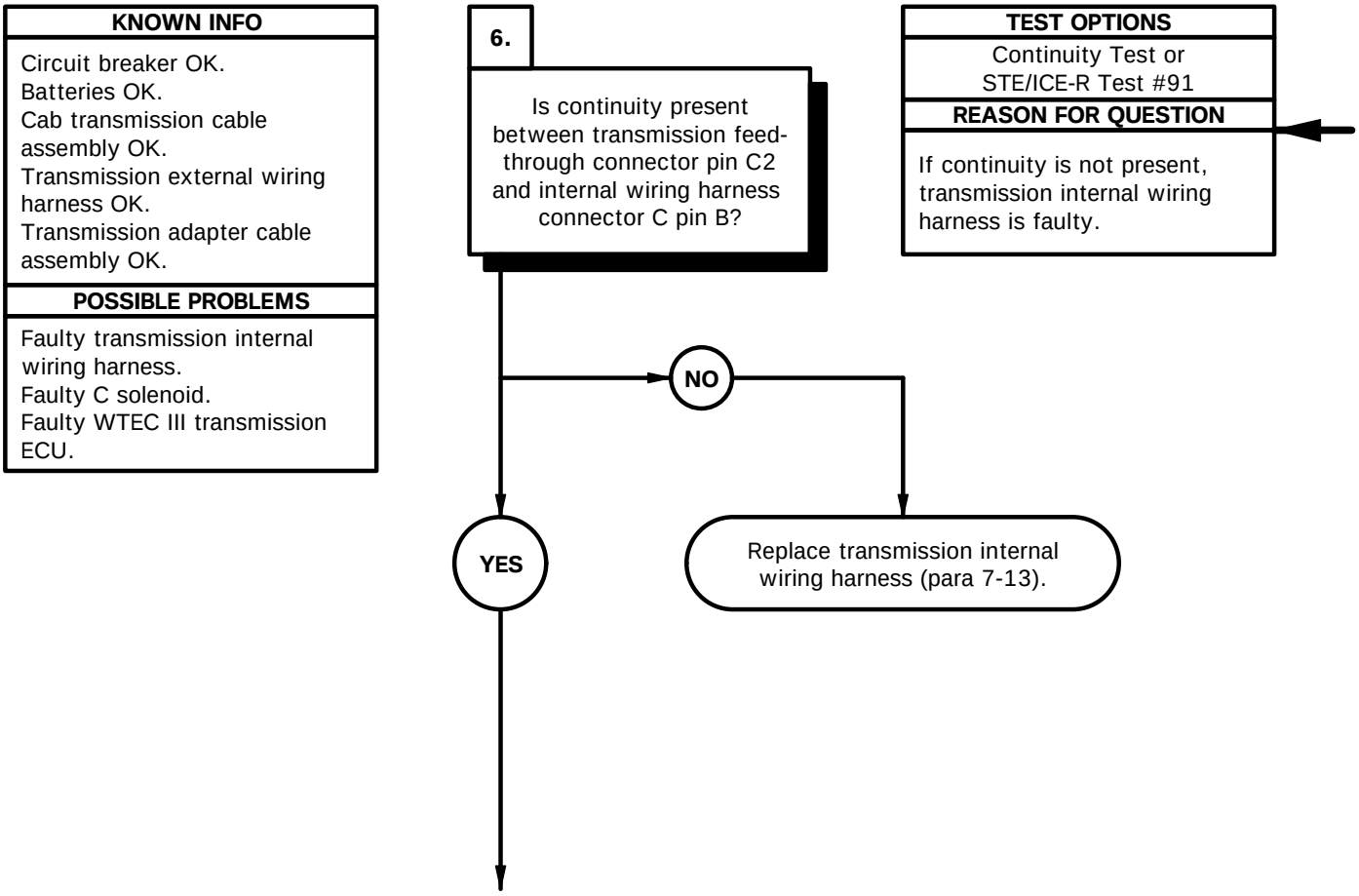
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

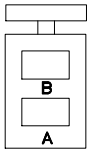


c60. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 14 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

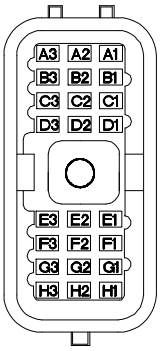


CONTINUITY TEST

(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).



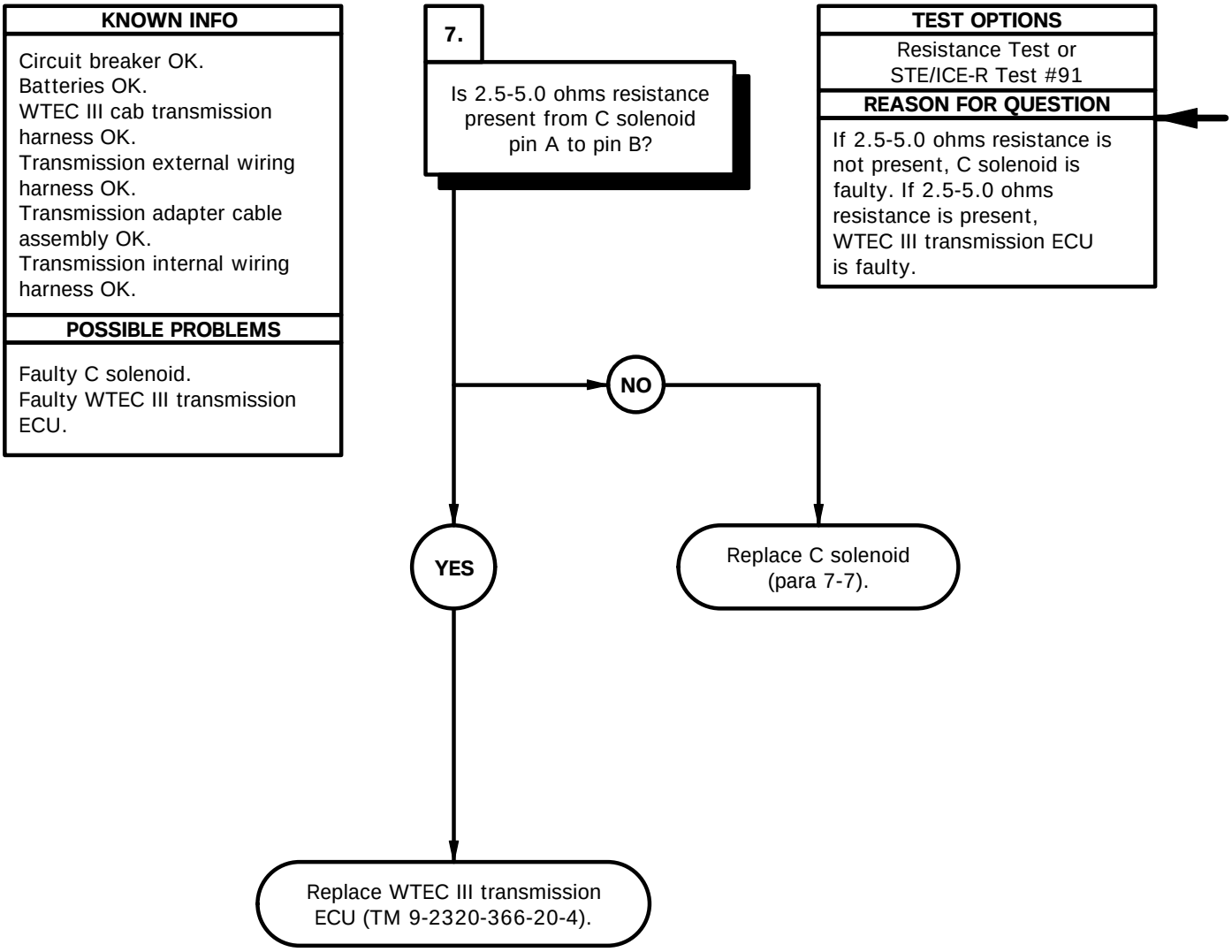
INTERNAL WIRING HARNESS CONNECTOR C



TRANSMISSION FEED-THROUGH CONNECTOR

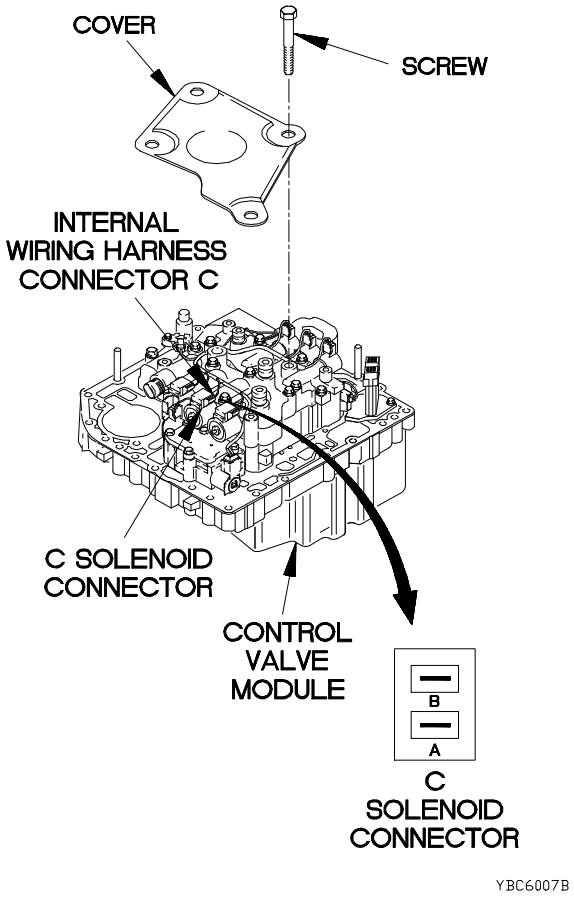
YBC6006B

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)



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).



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

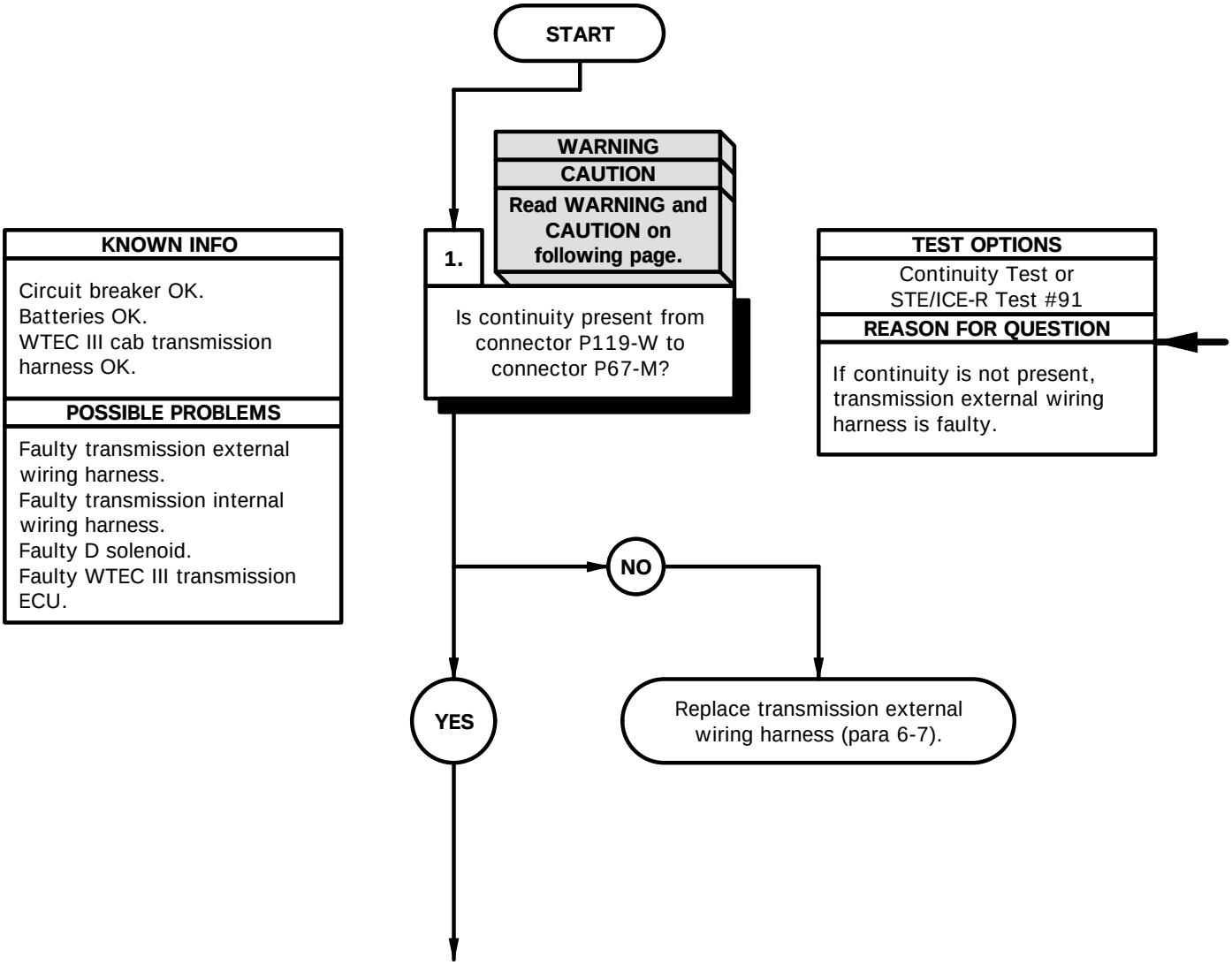
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

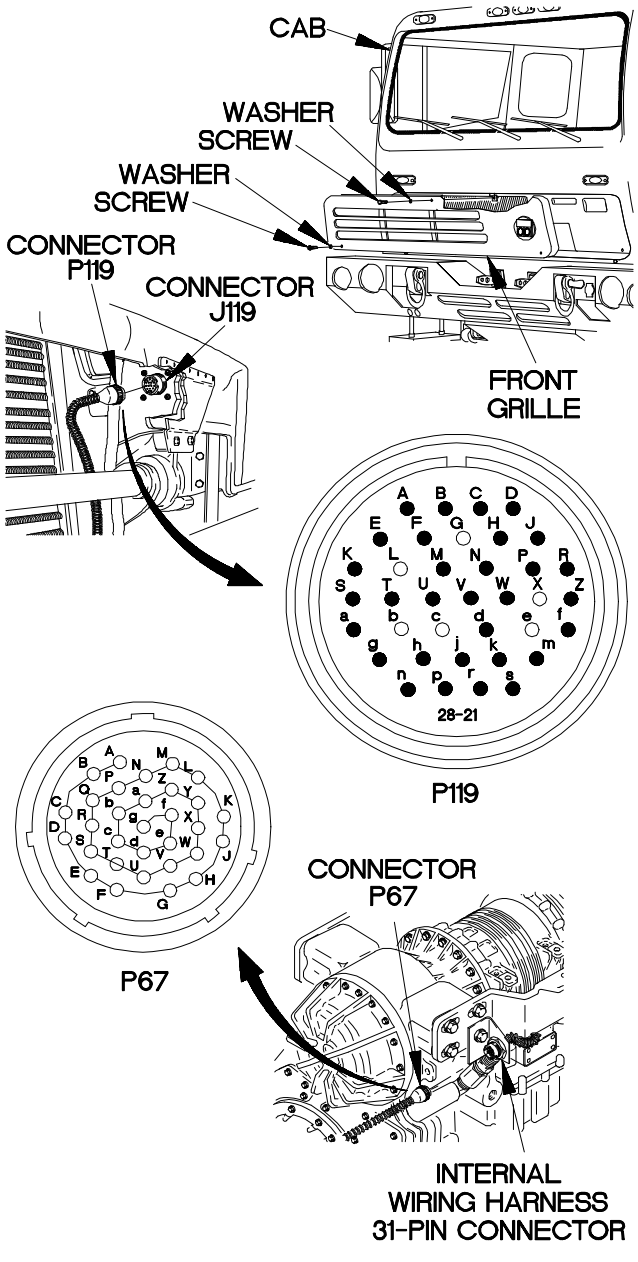
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

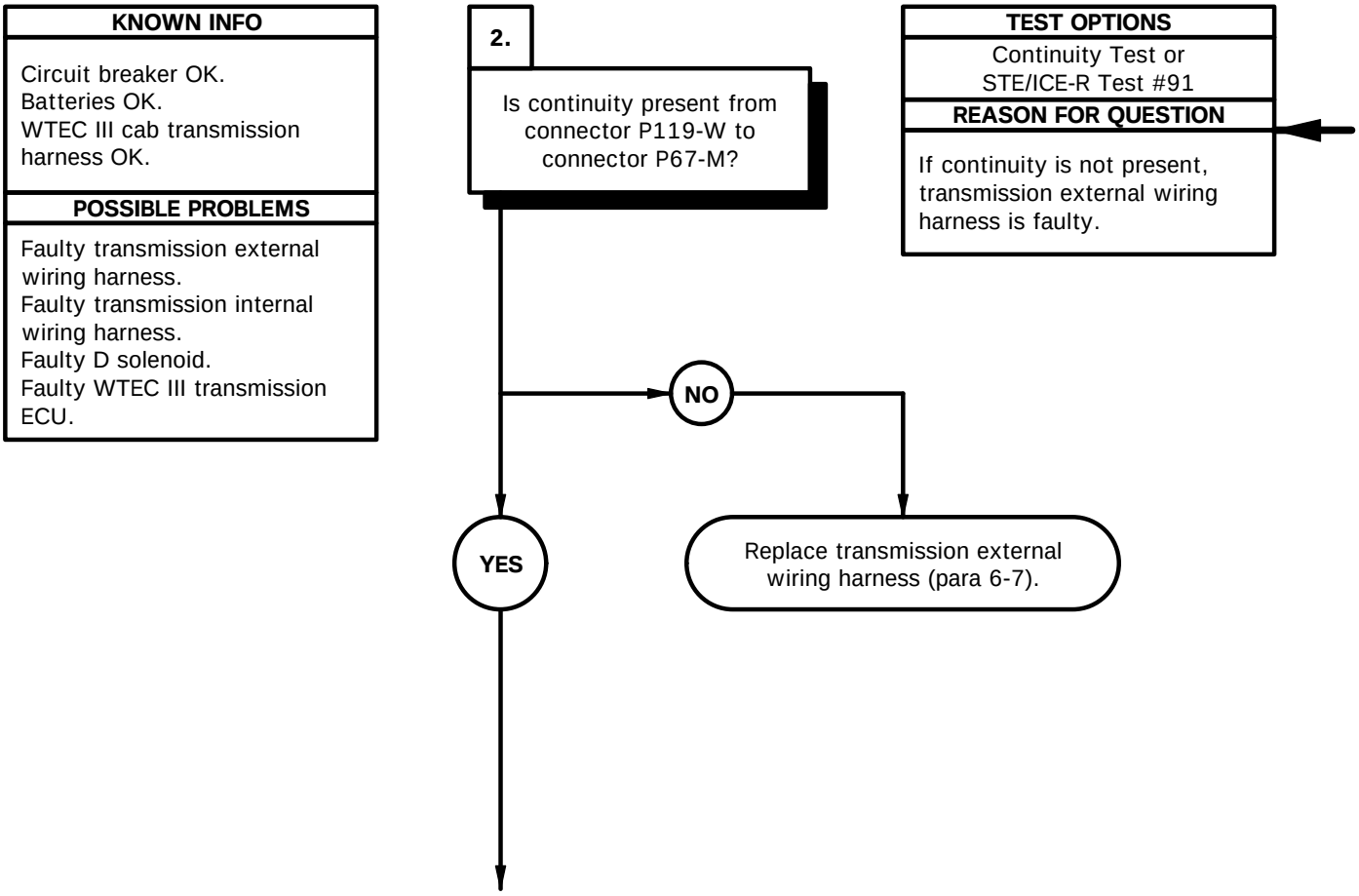
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from internal wiring harness 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect 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).

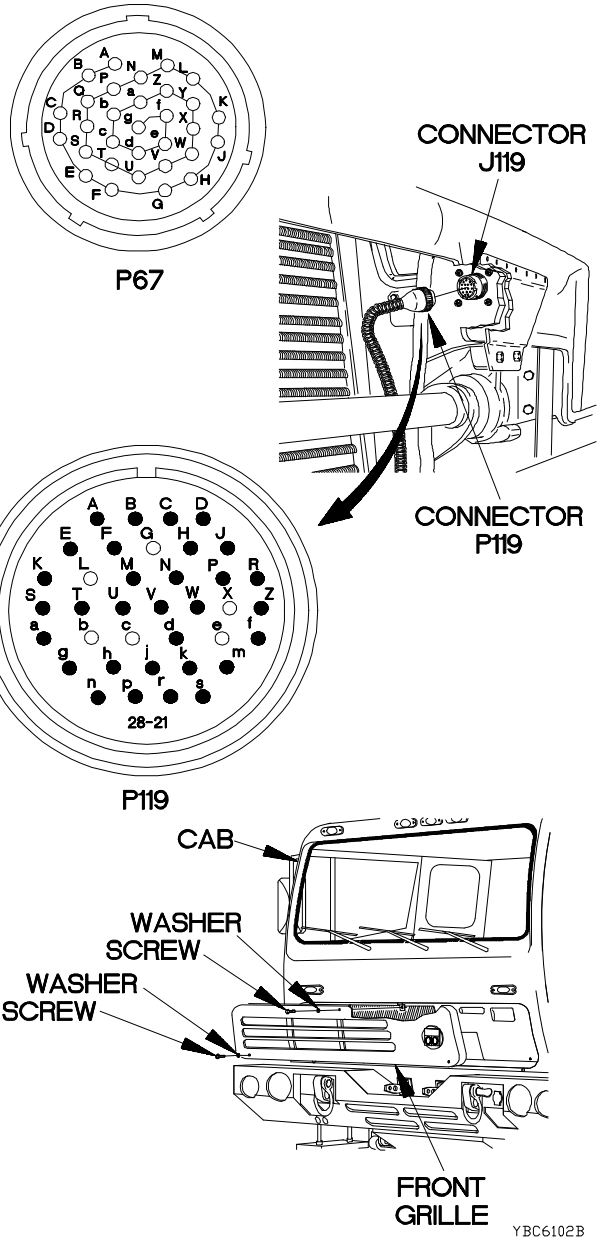


c61. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

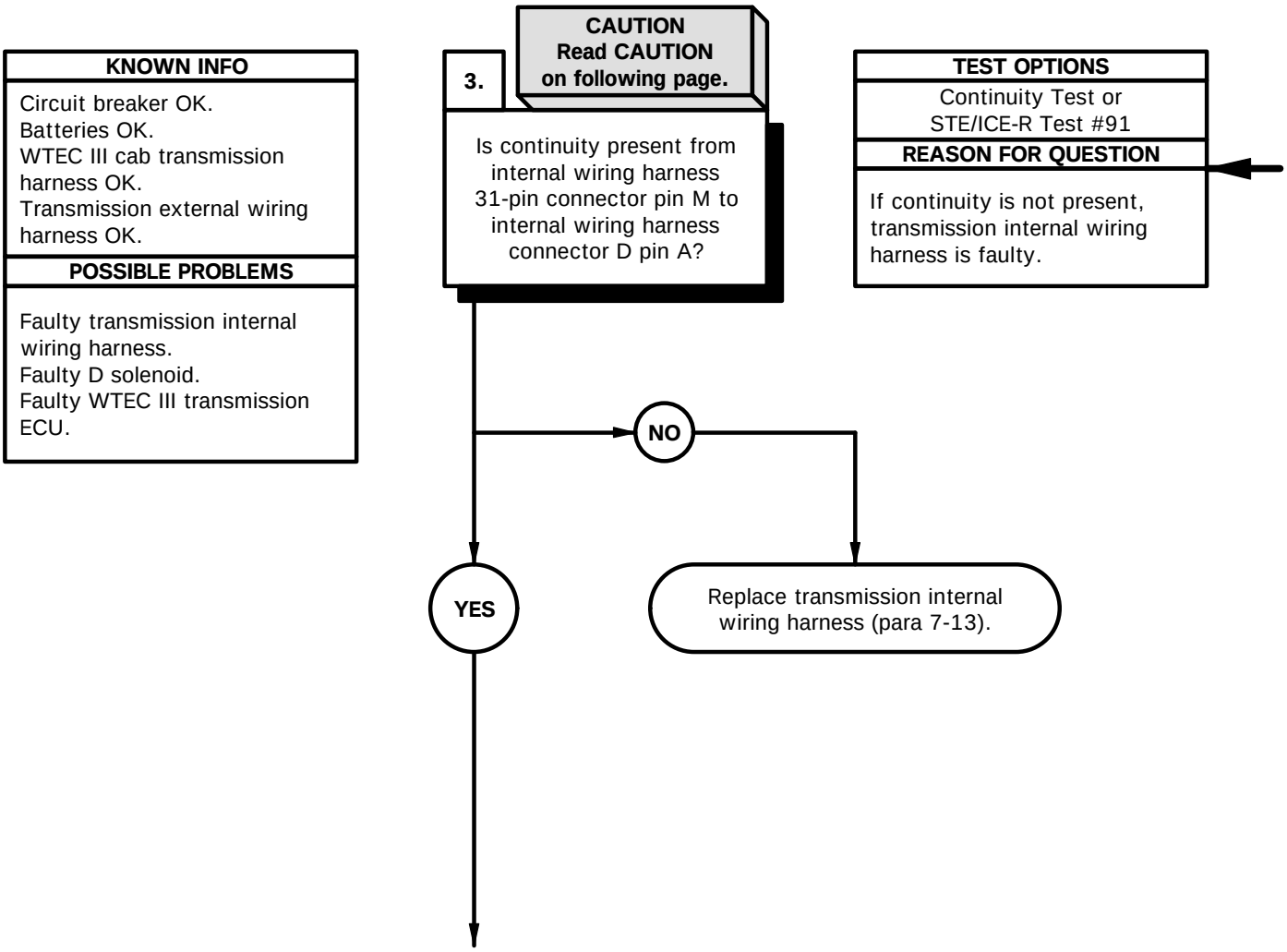


CONTINUITY TEST

(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)

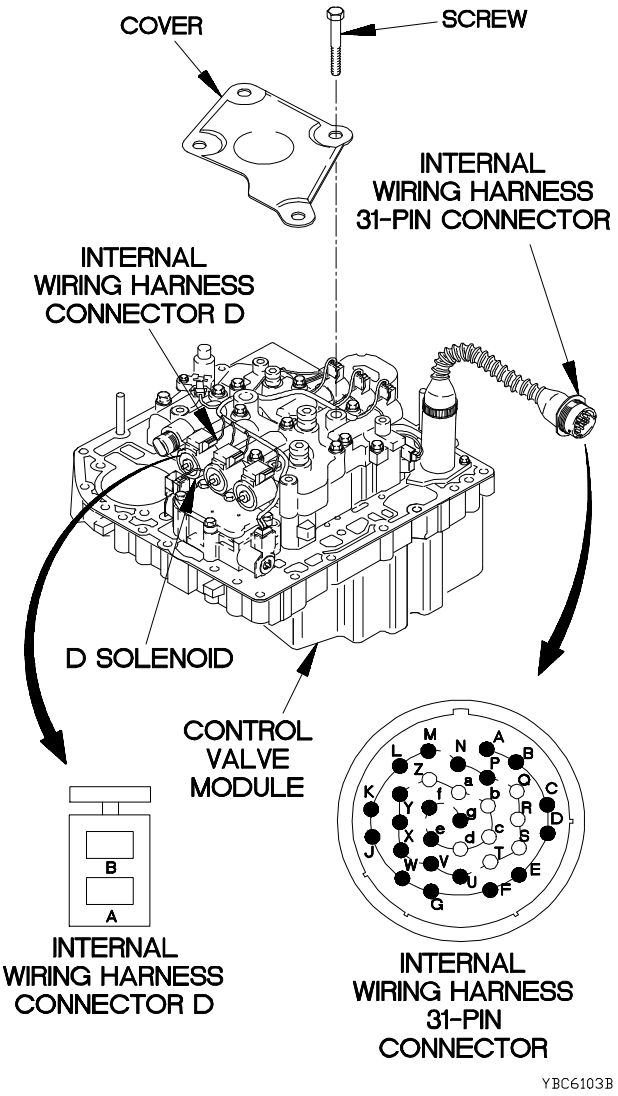


CAUTION

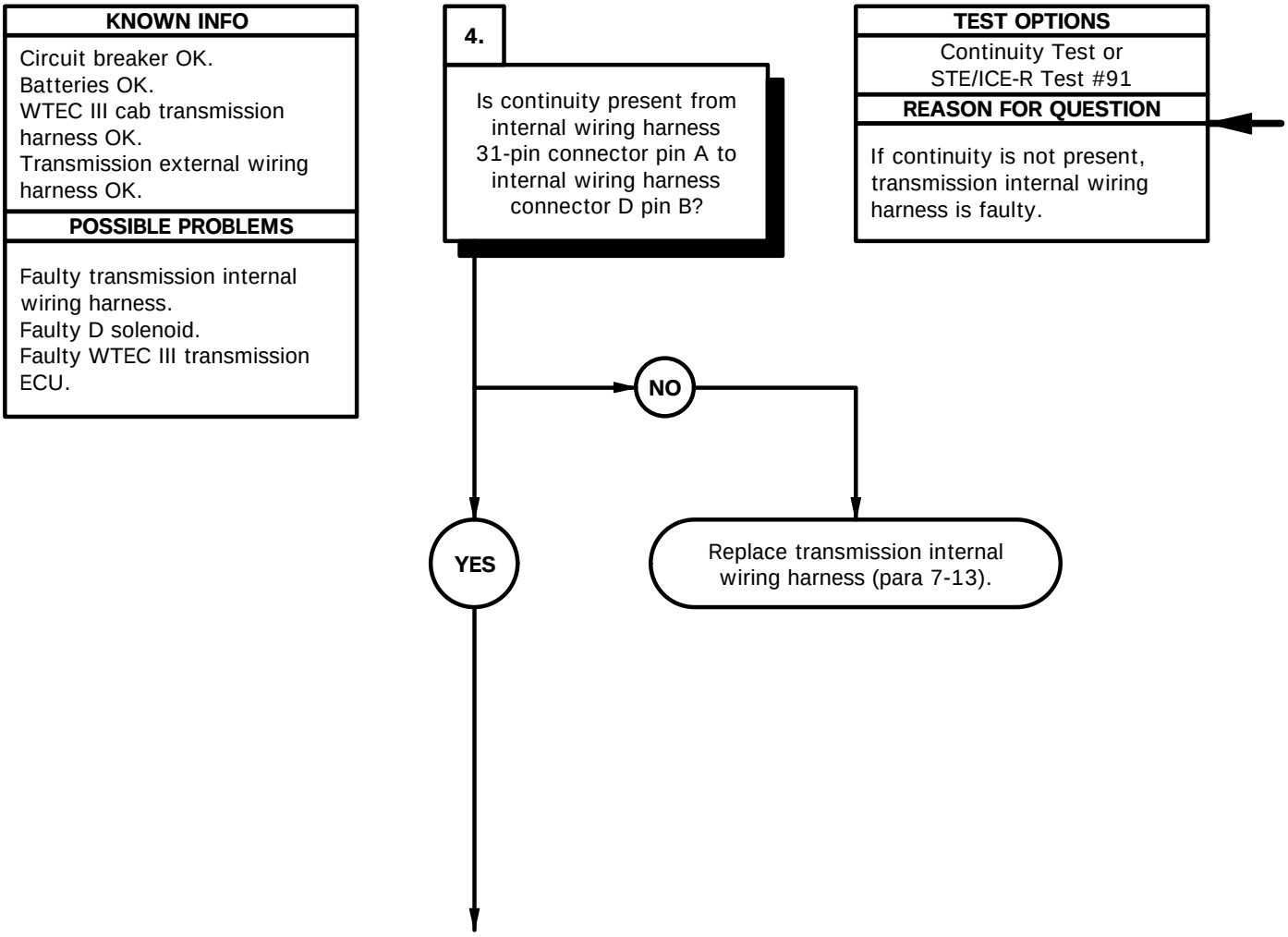
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

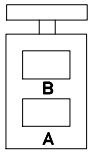


c61. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

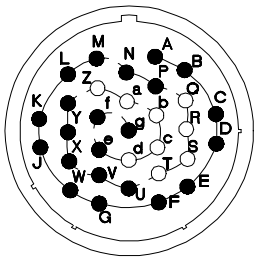


CONTINUITY TEST

(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).



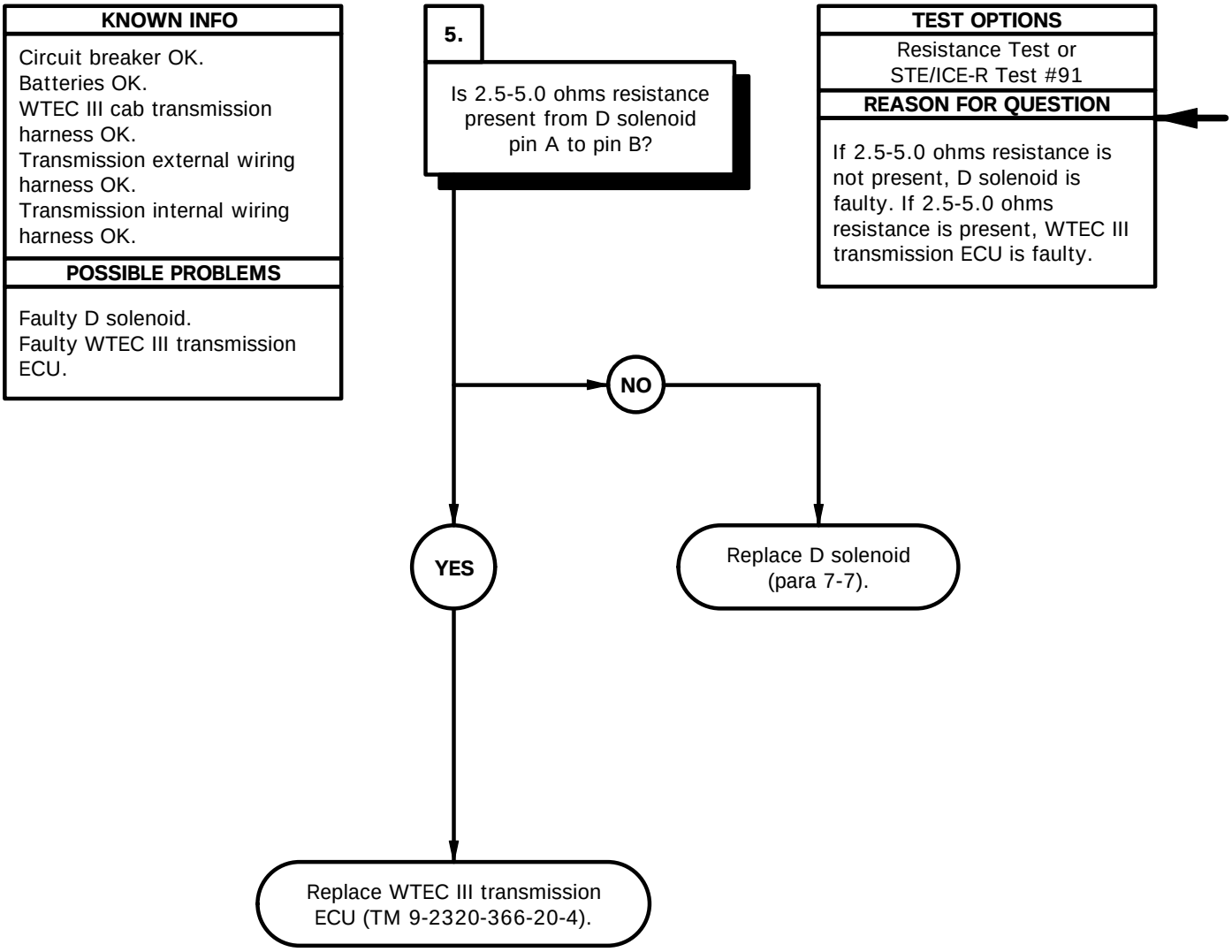
INTERNAL WIRING HARNESS CONNECTOR D



INTERNAL WIRING HARNESS 31-PIN CONNECTOR

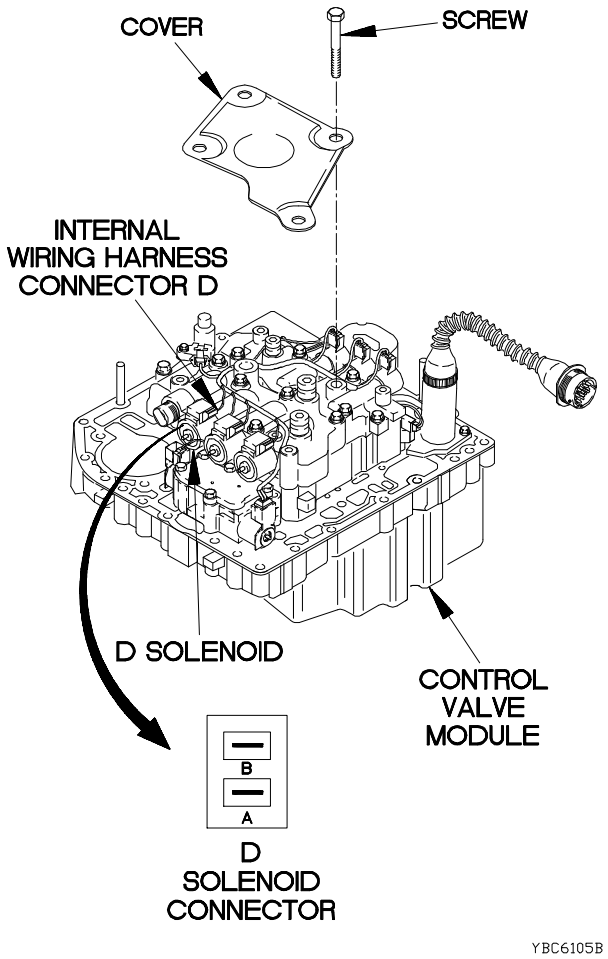
YBC6104B

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)



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).



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).

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)

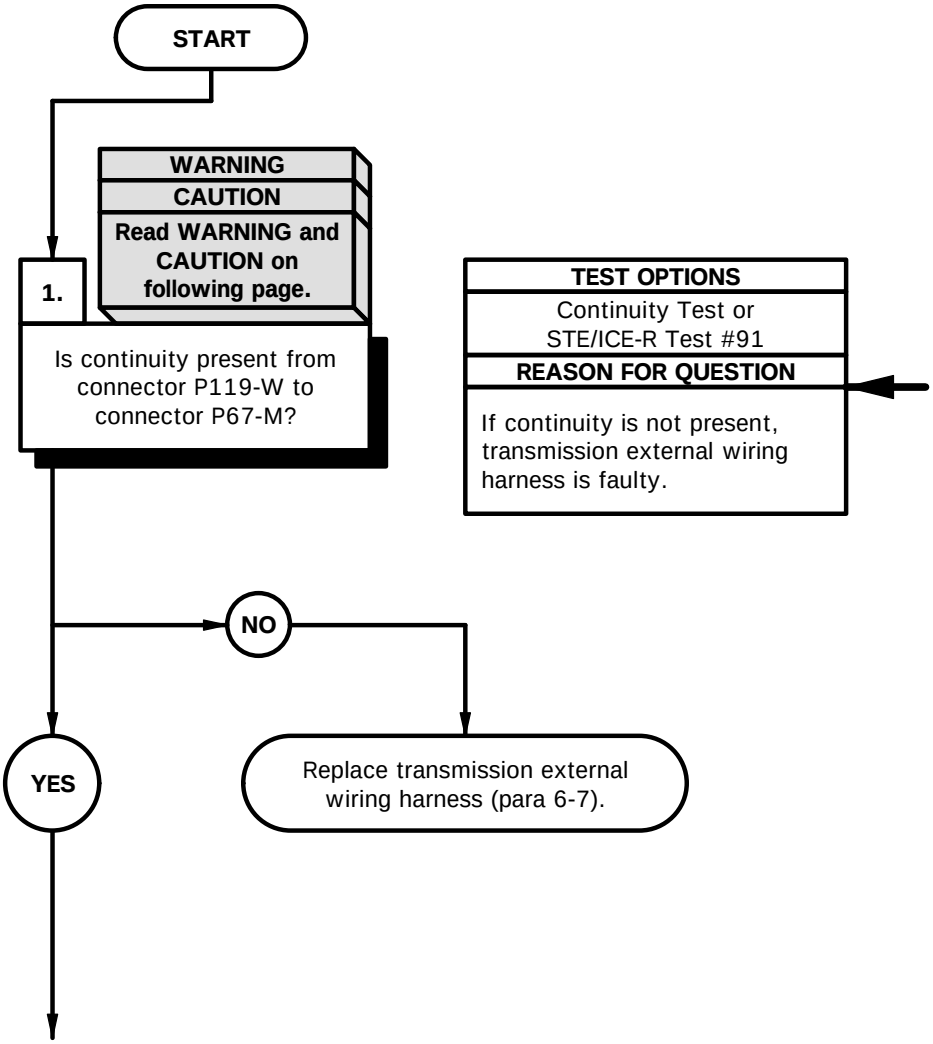
References
TM 9-4910-571-12&P

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.



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

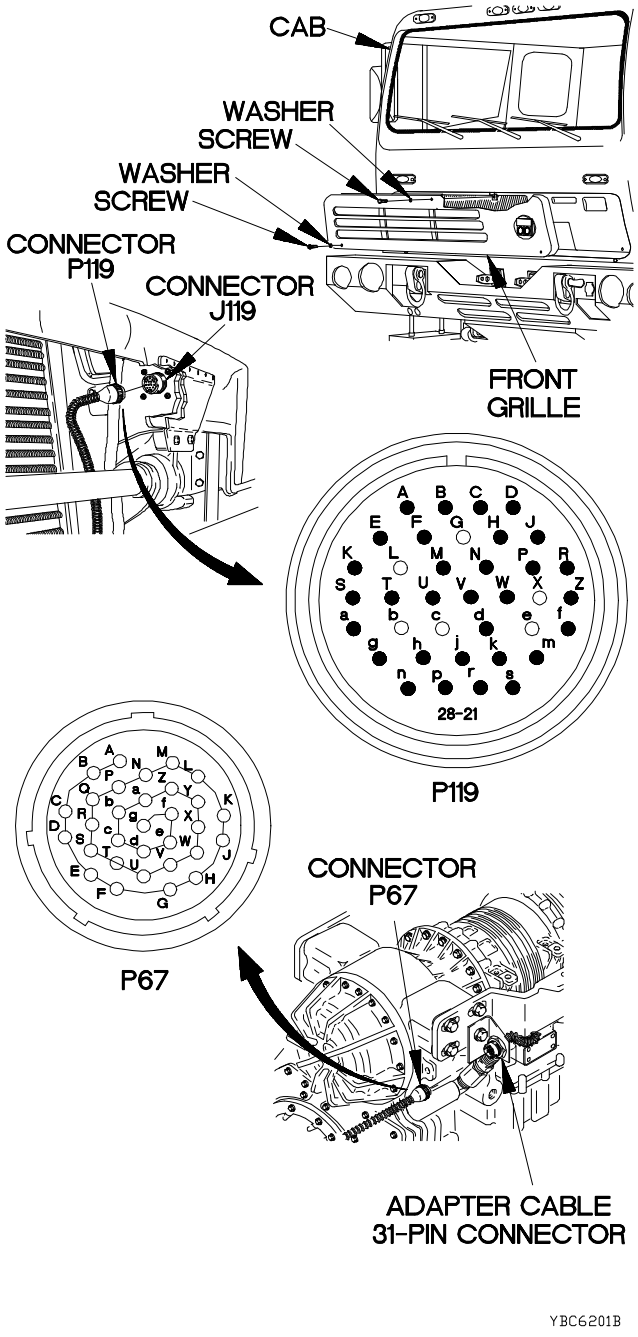
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

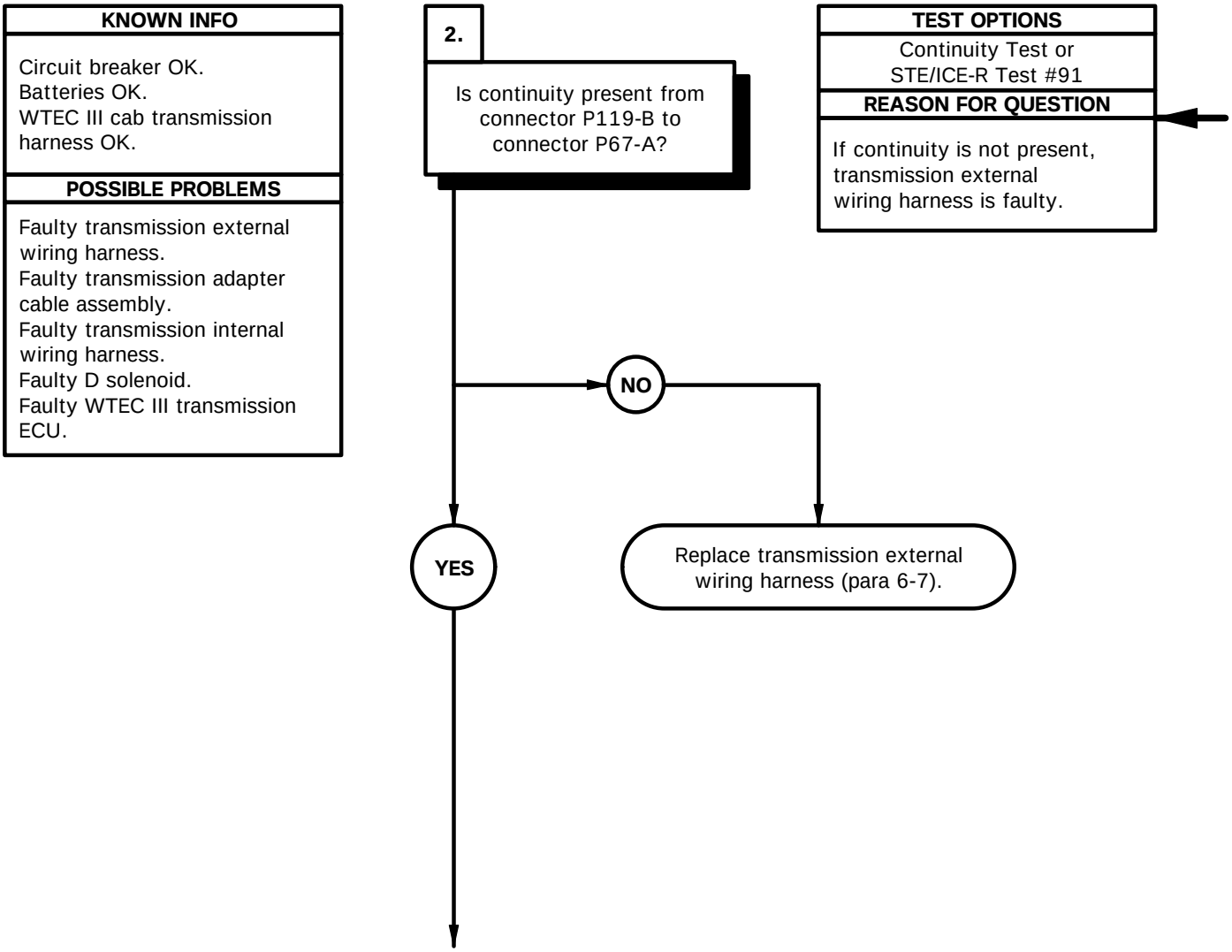
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from adapter cable 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect positive (+) 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).

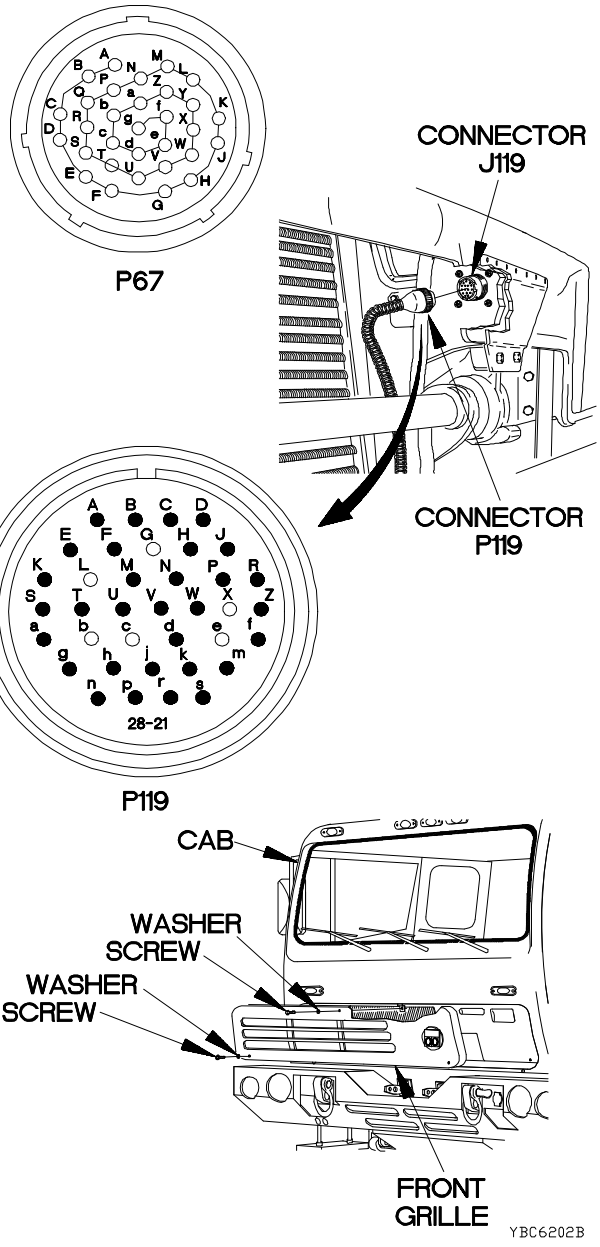


c62. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

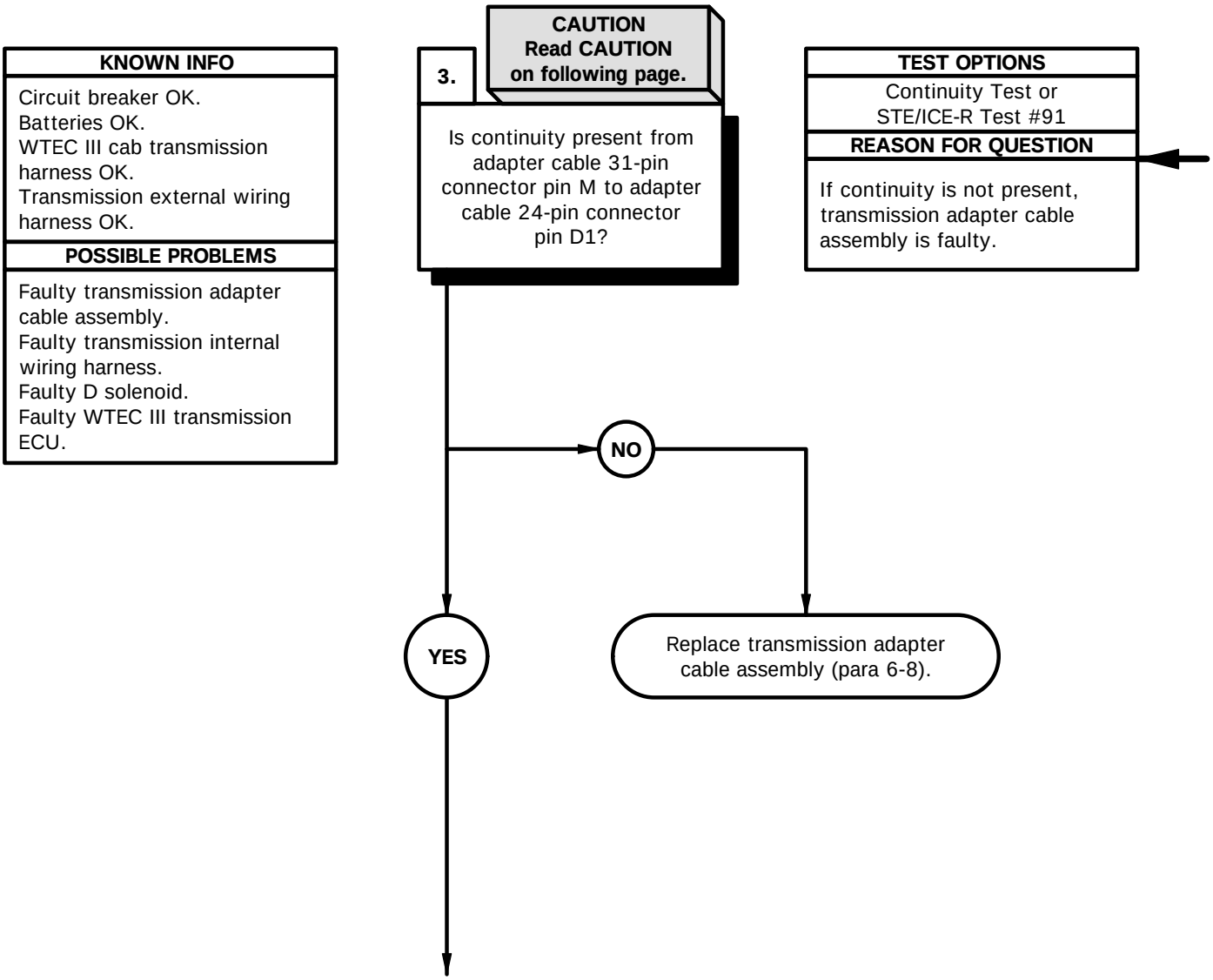


CONTINUITY TEST

(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).



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)

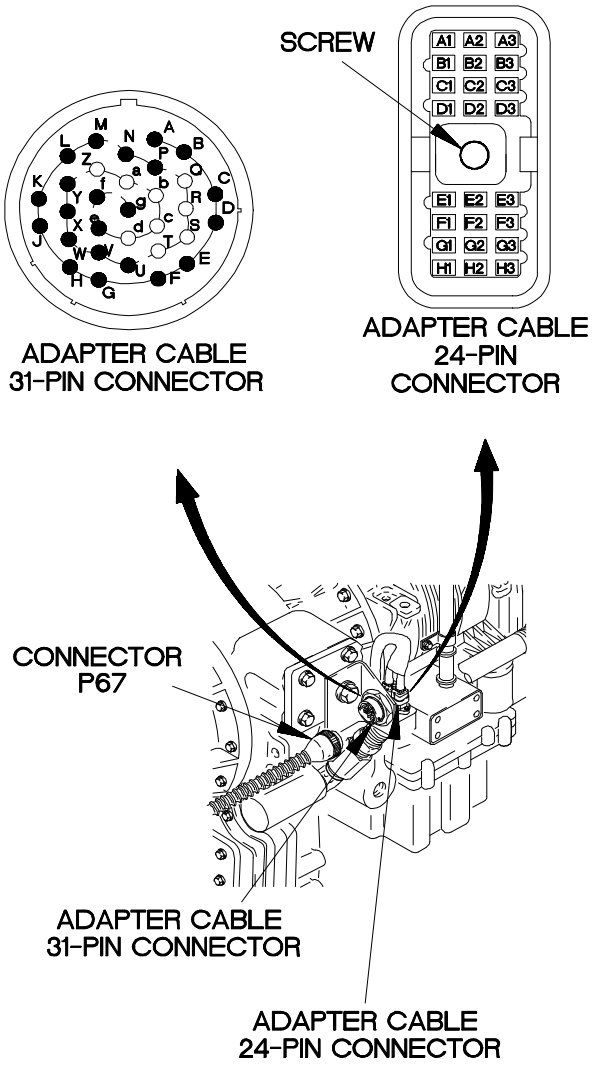


CAUTION

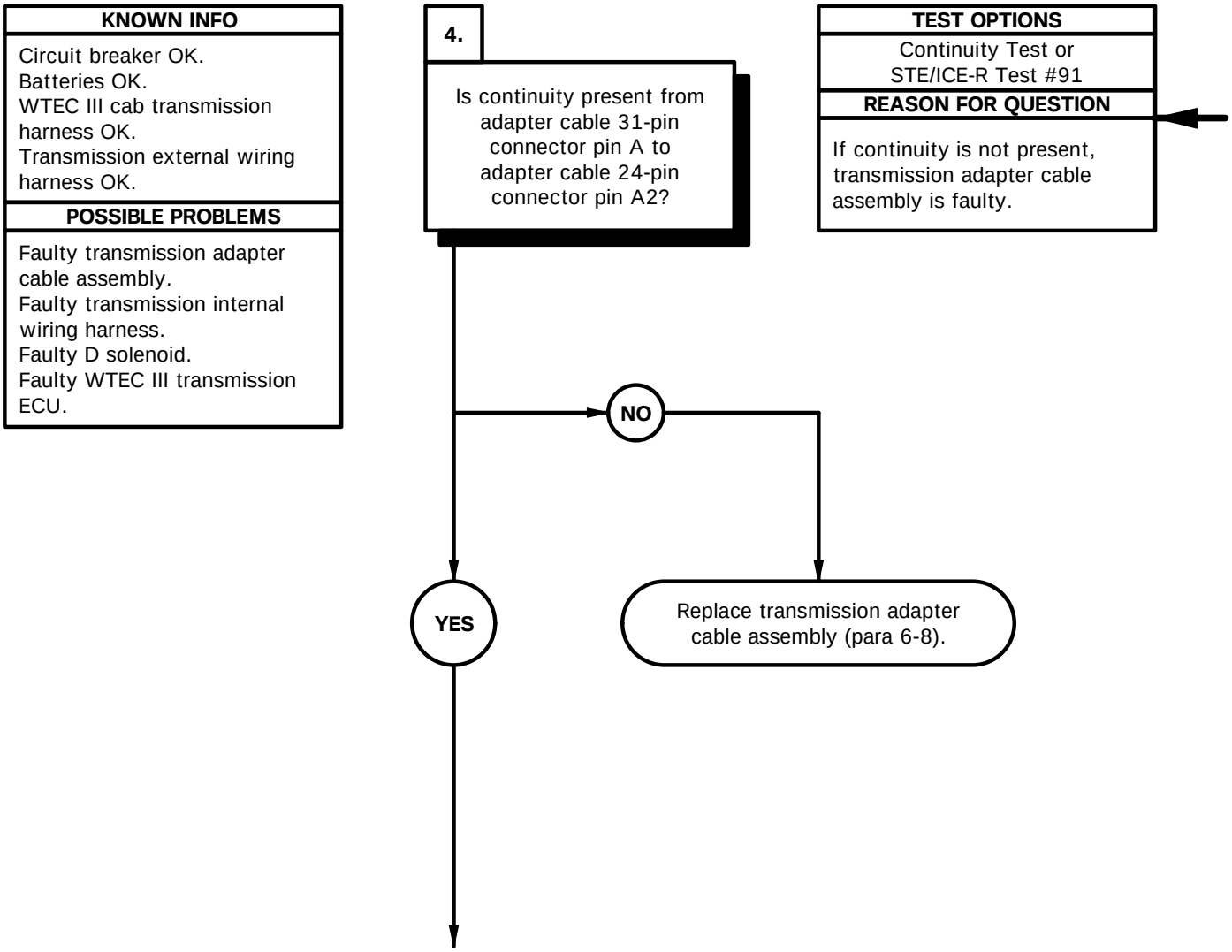
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

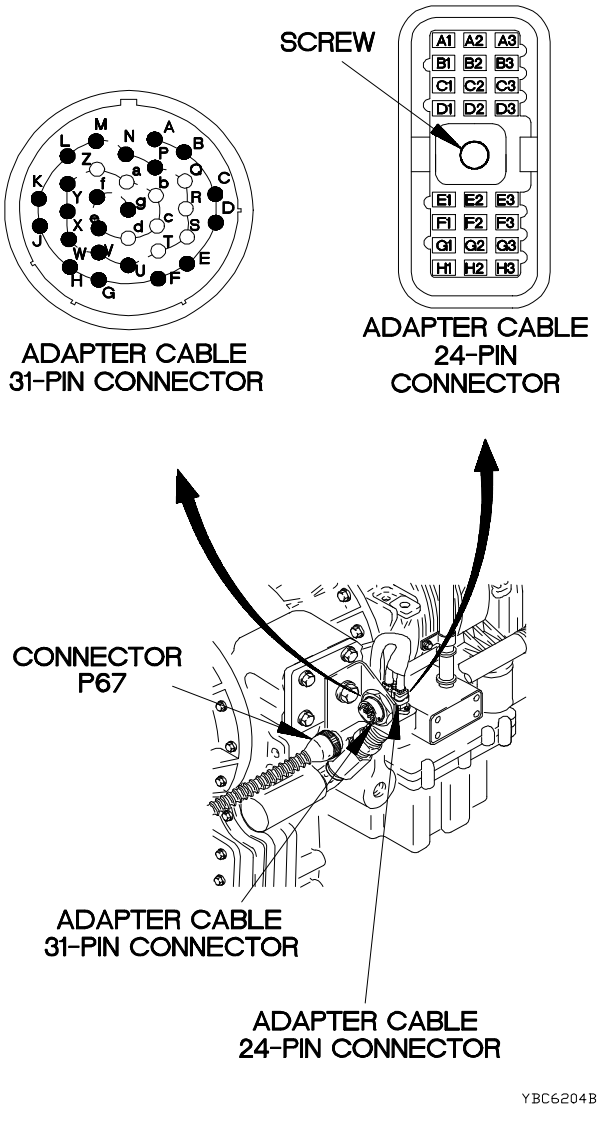


c62. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

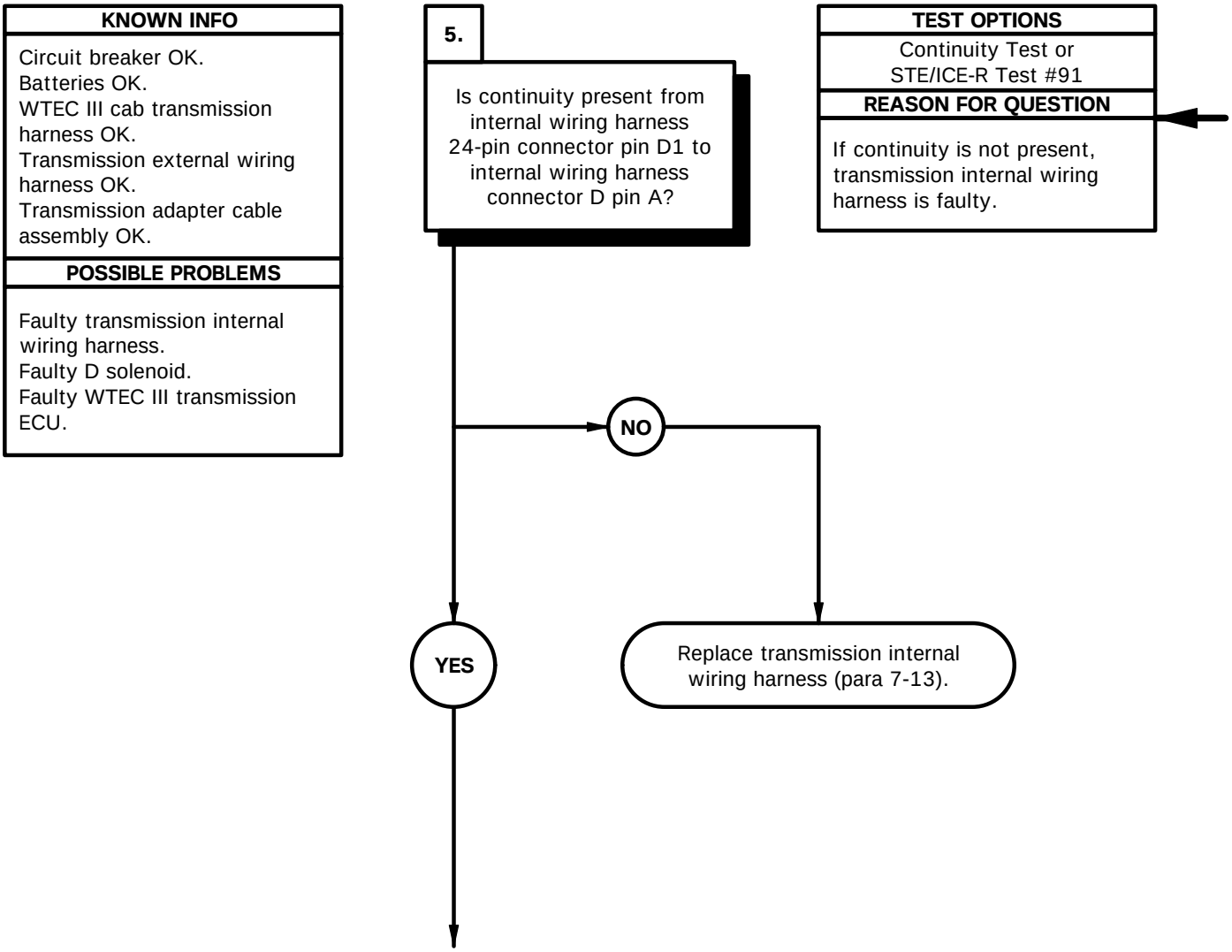


CONTINUITY TEST

(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.

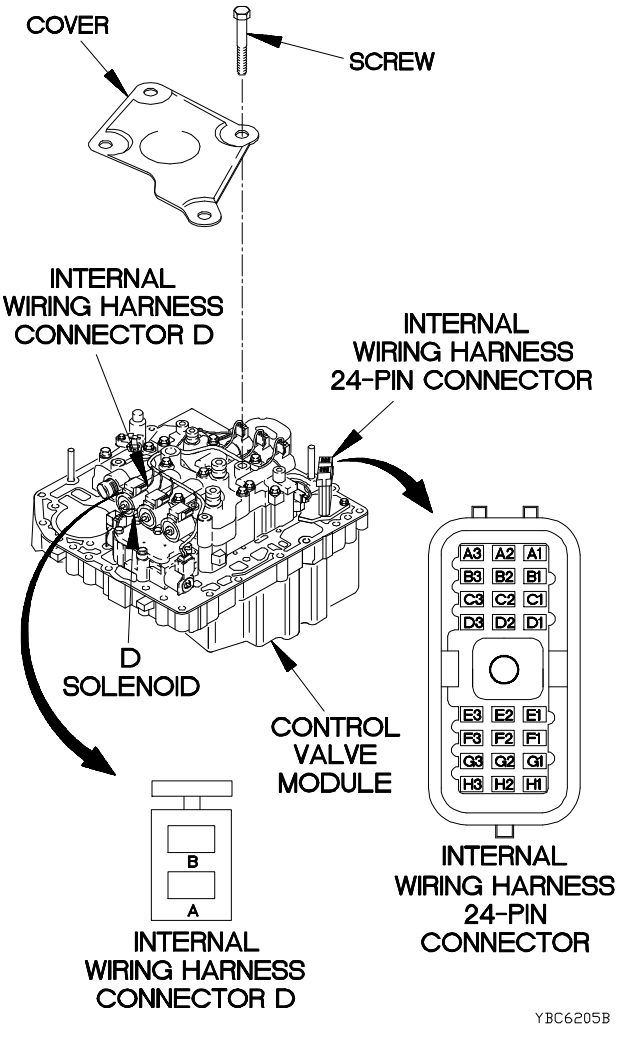


c62. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

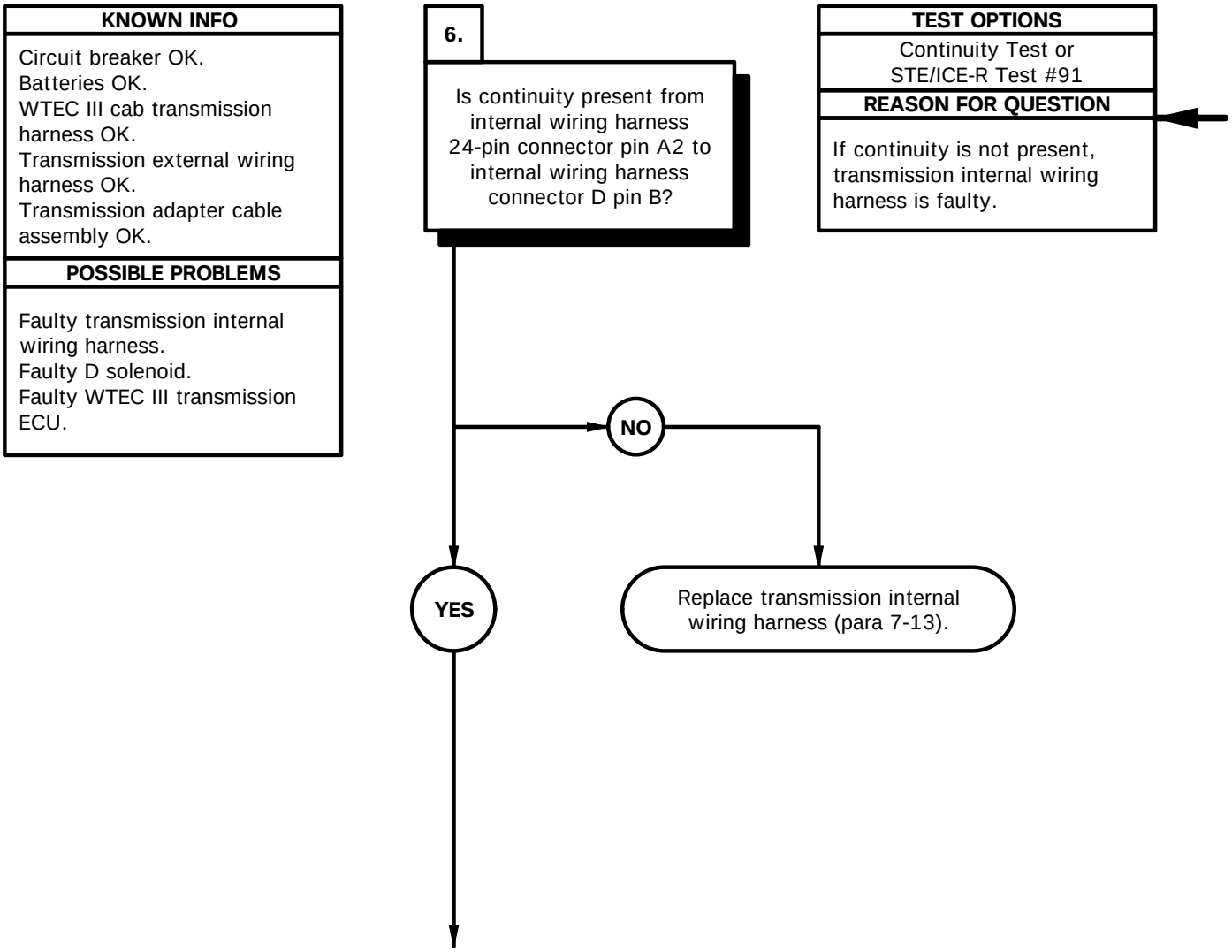


CONTINUITY TEST

(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).

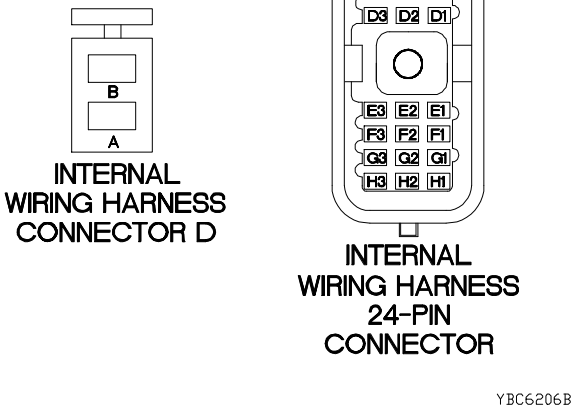


c62. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

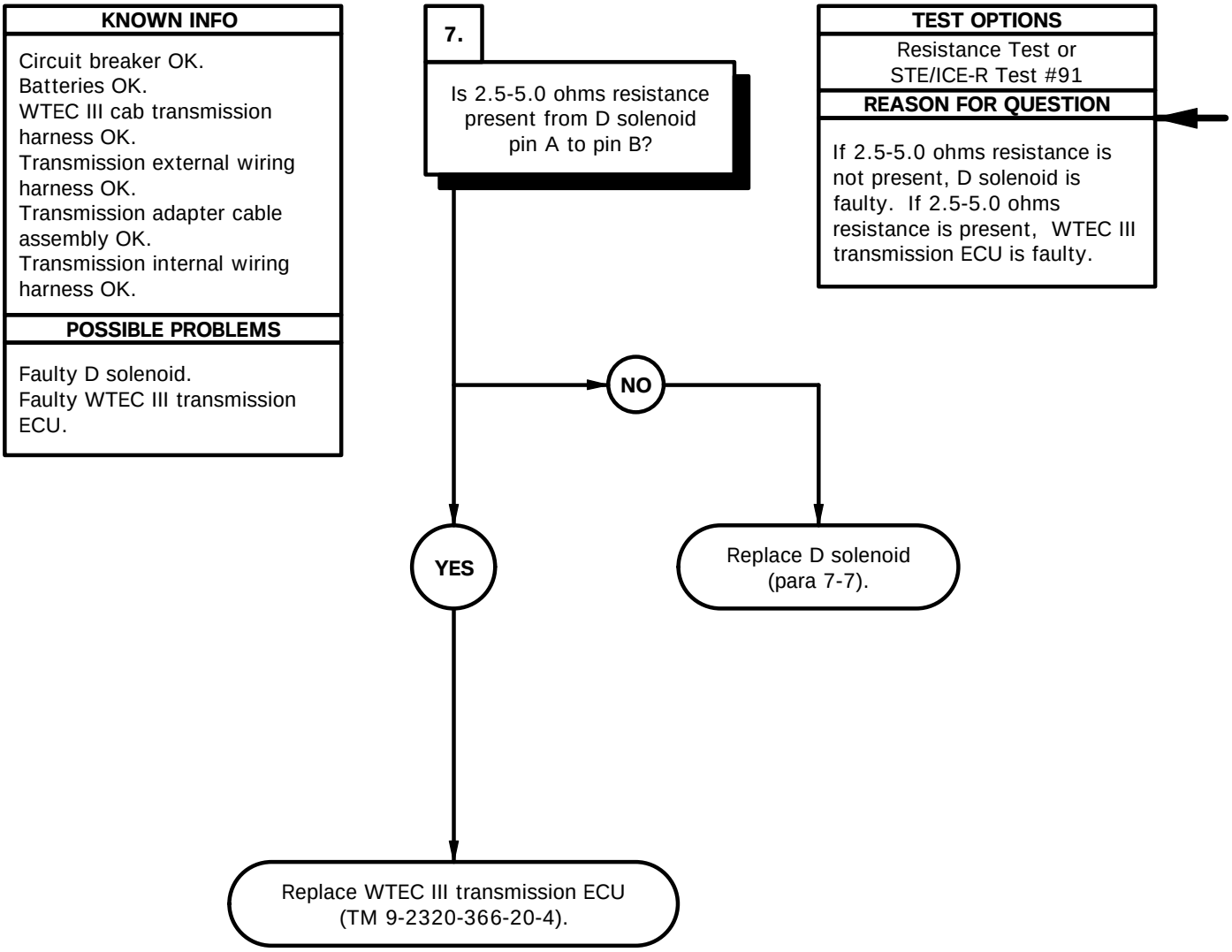


CONTINUITY TEST

(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).

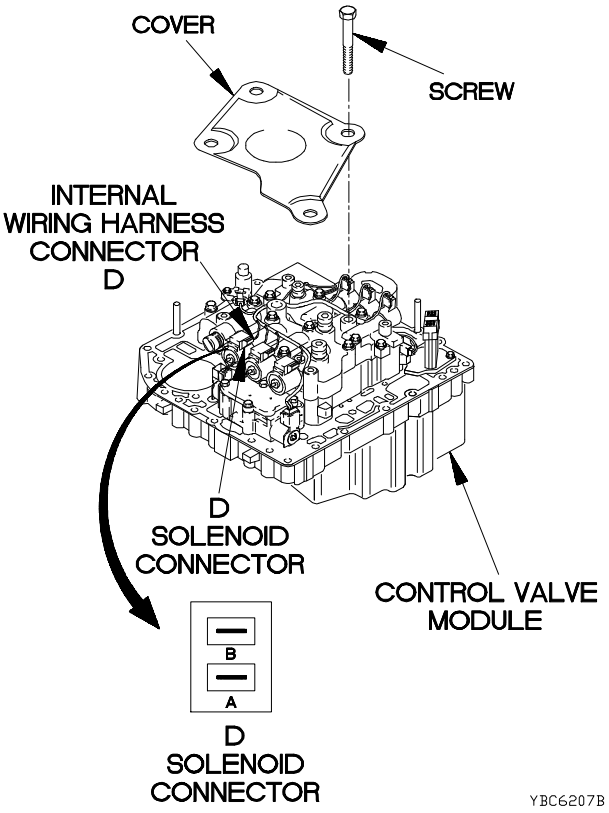


c62. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



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).



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

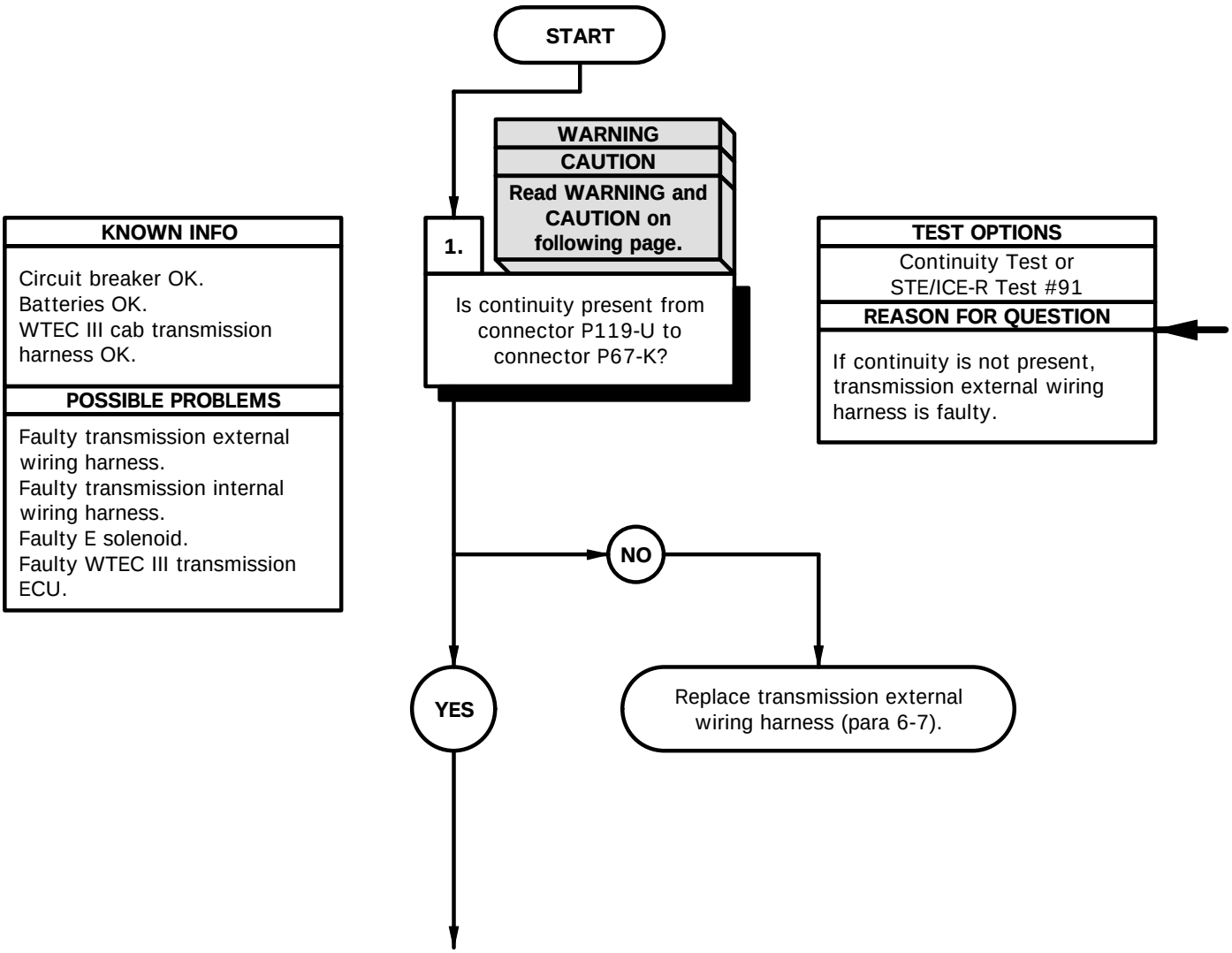
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

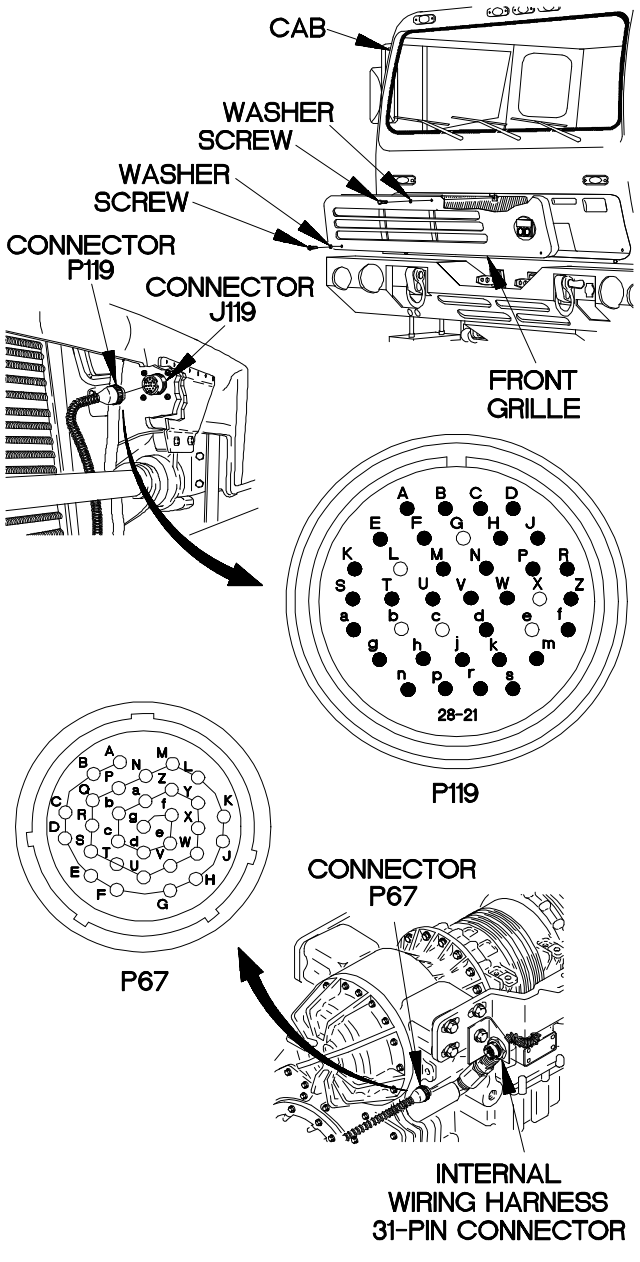
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

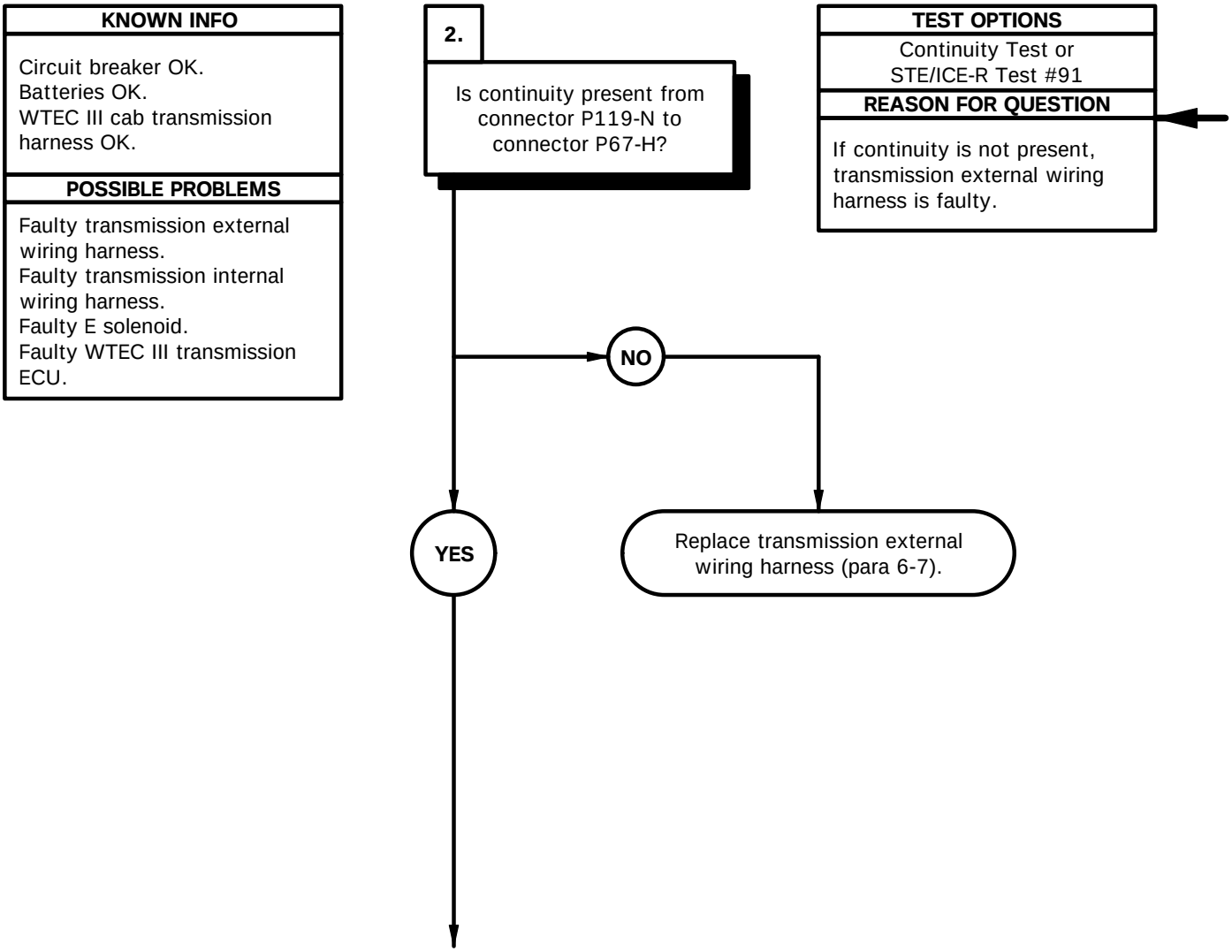
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from internal wiring harness 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect 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).

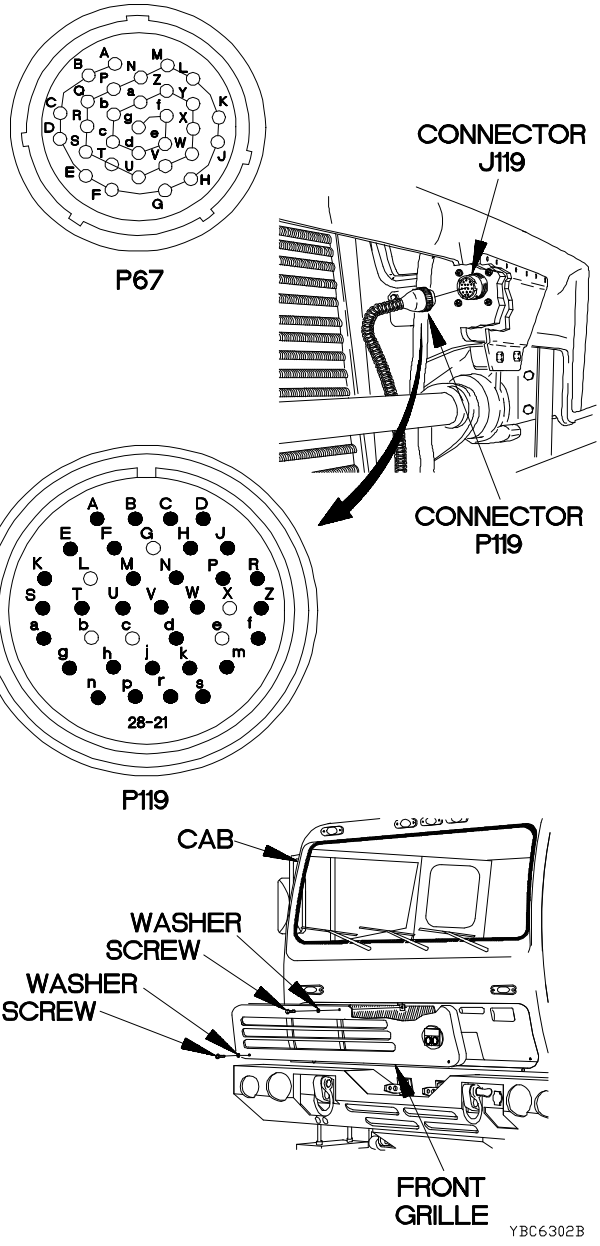


c63. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 16 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

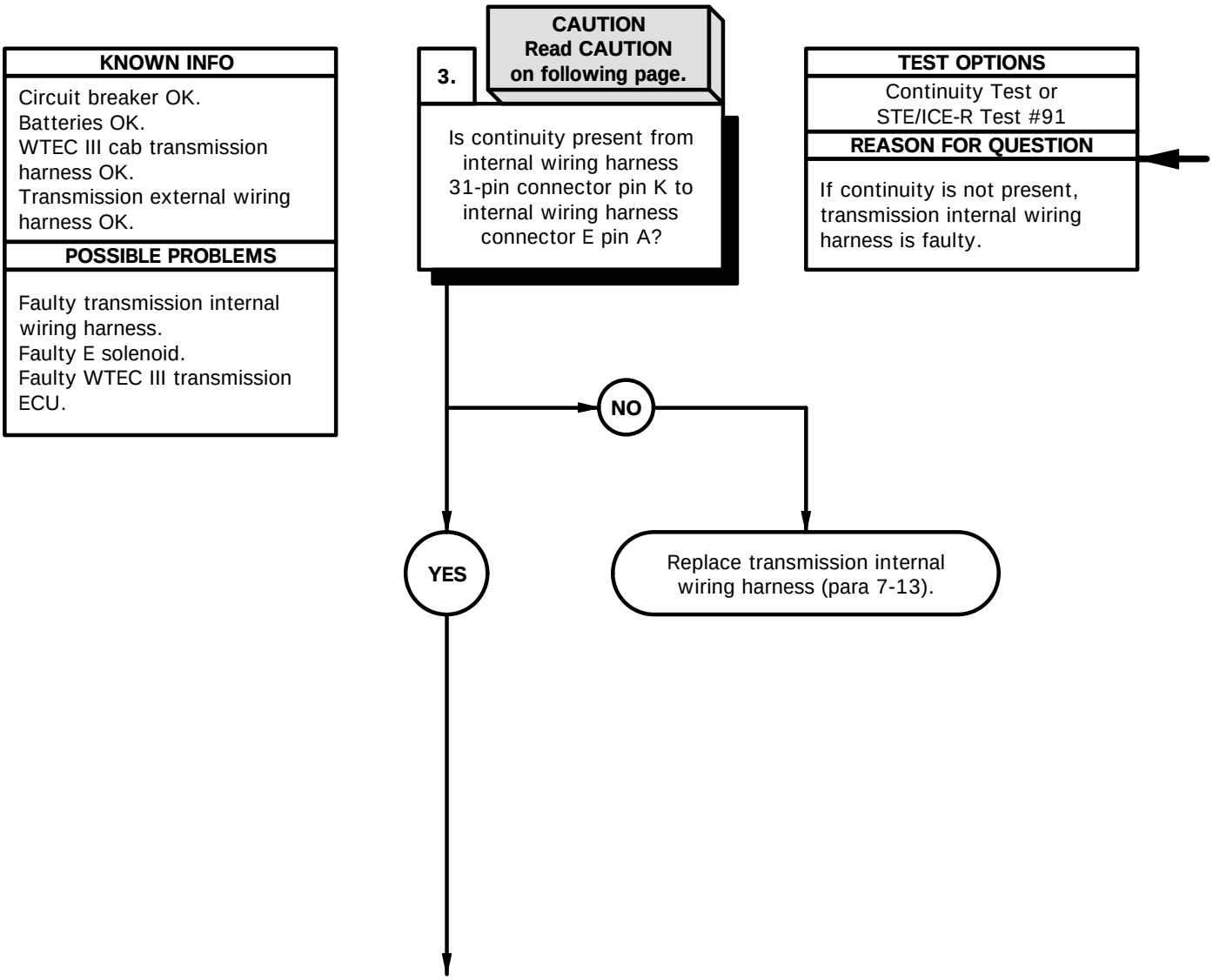


CONTINUITY TEST

(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)

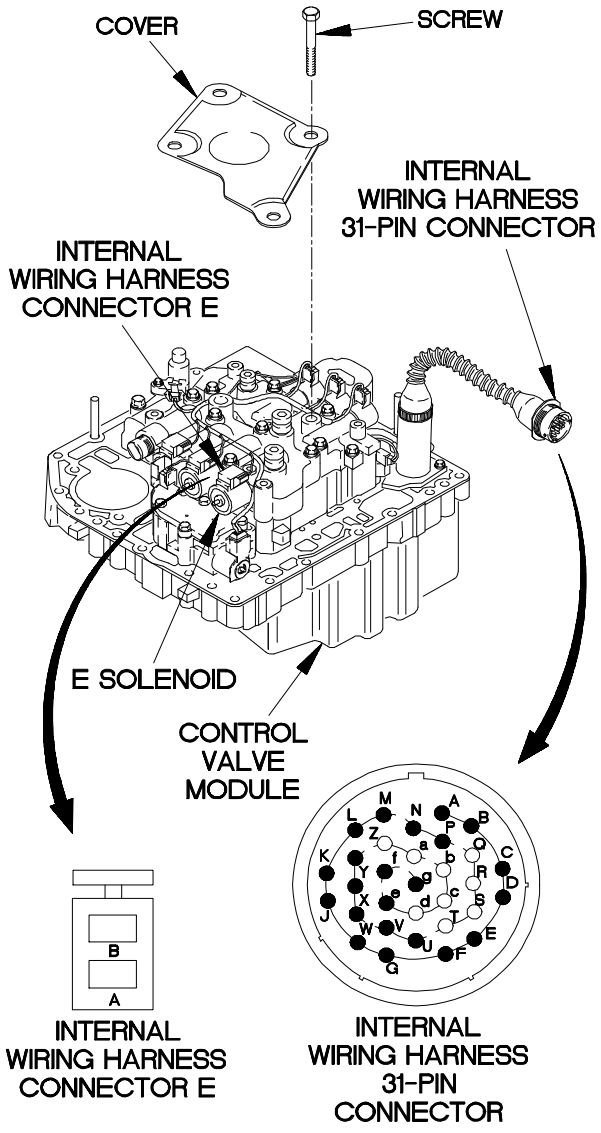


CAUTION

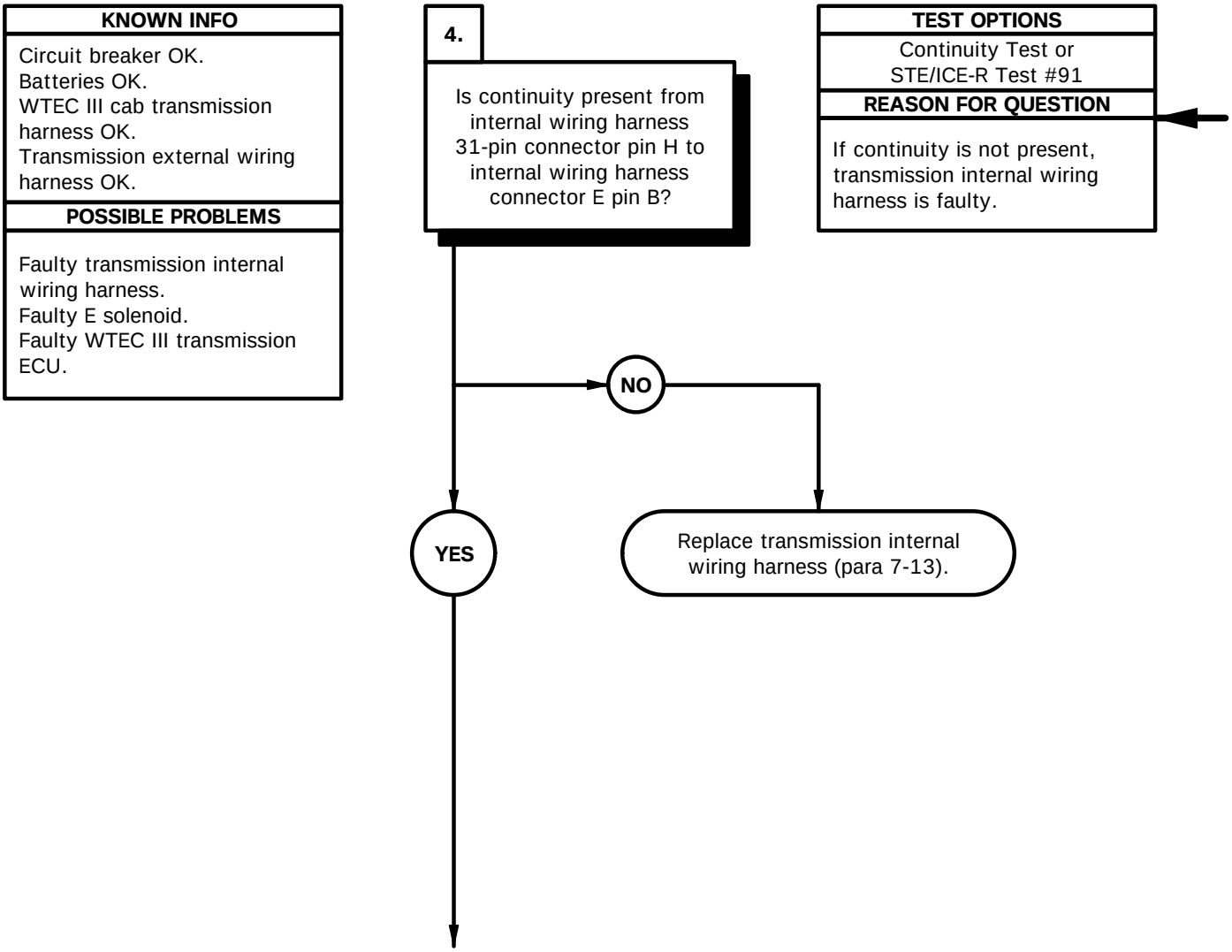
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

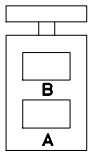


c63. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 16 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

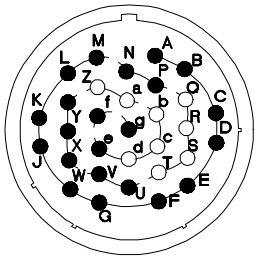


CONTINUITY TEST

(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).



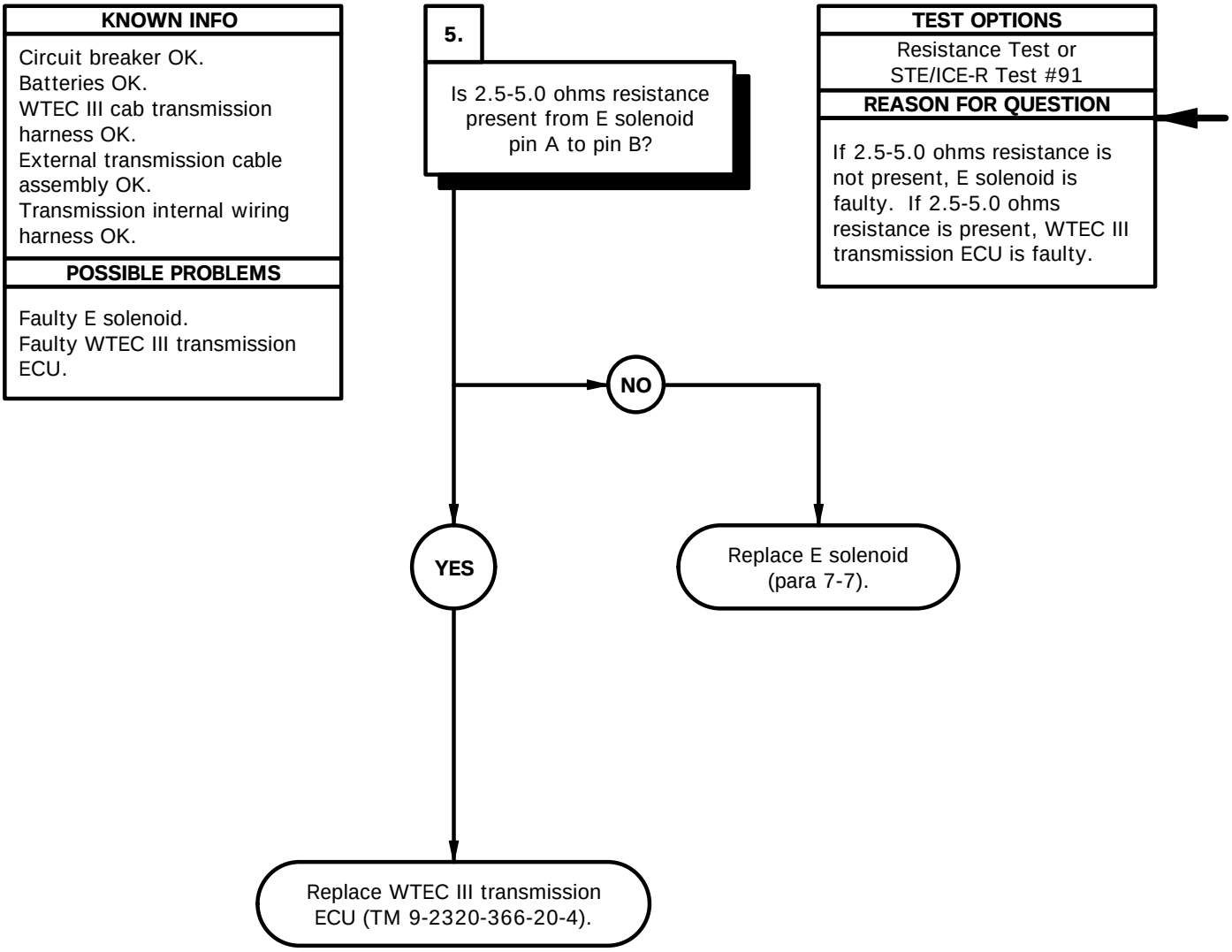
INTERNAL WIRING HARNESS CONNECTOR E



INTERNAL WIRING HARNESS 31-PIN CONNECTOR

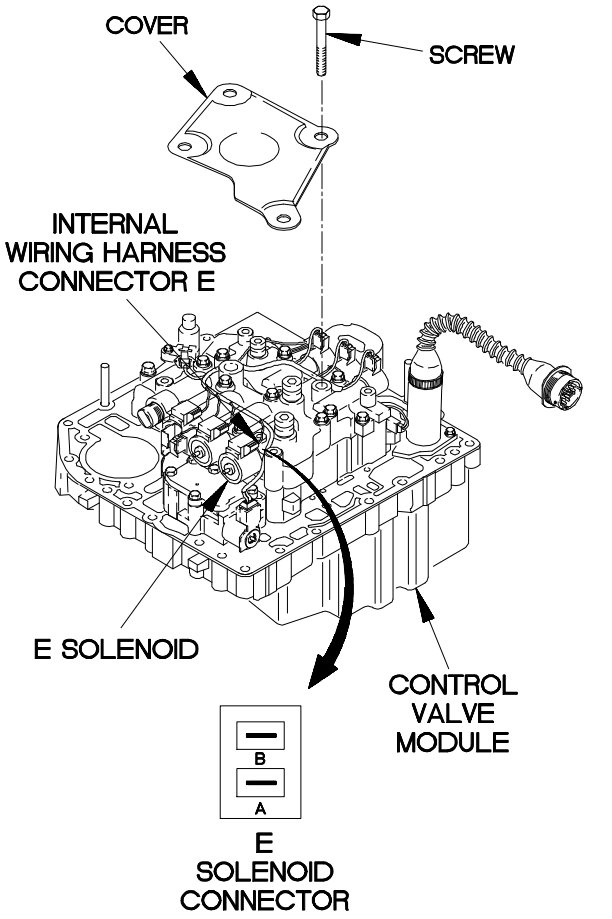
YBC6304B

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)



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).



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).

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)

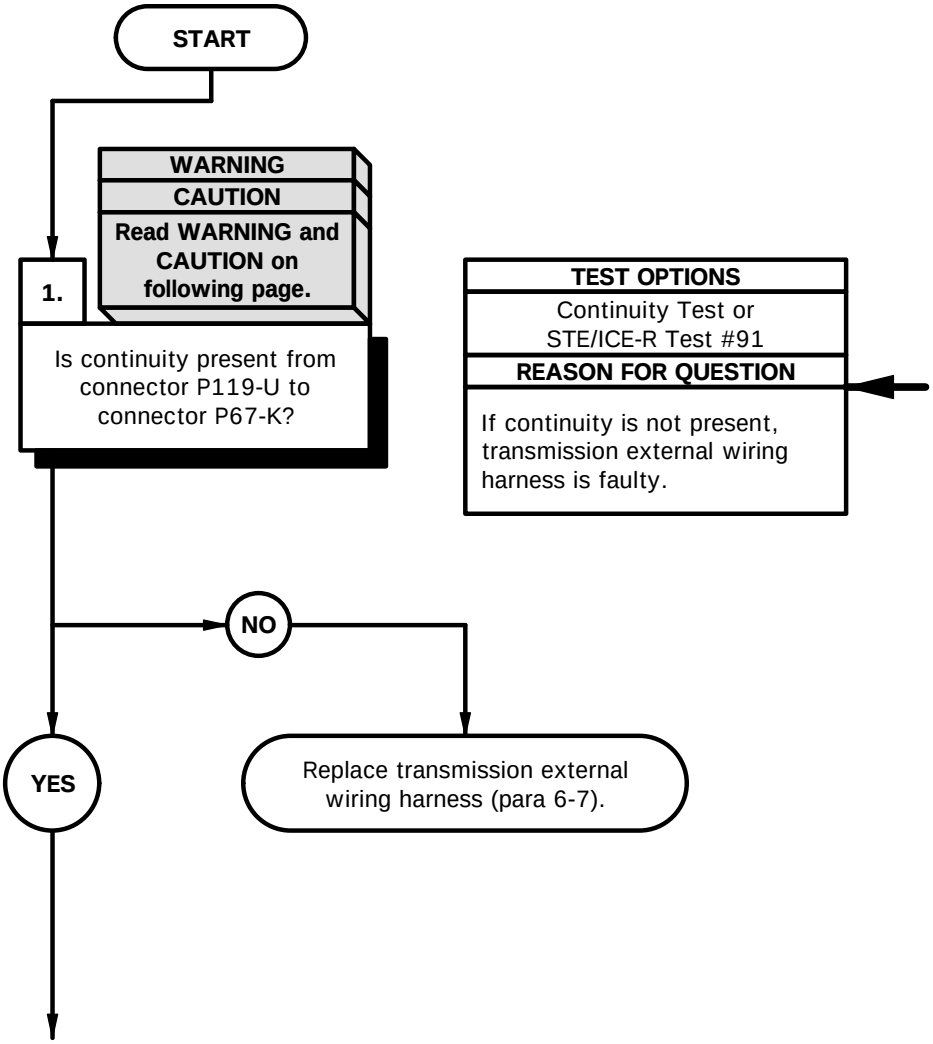
References
TM 9-4910-571-12&P

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.



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

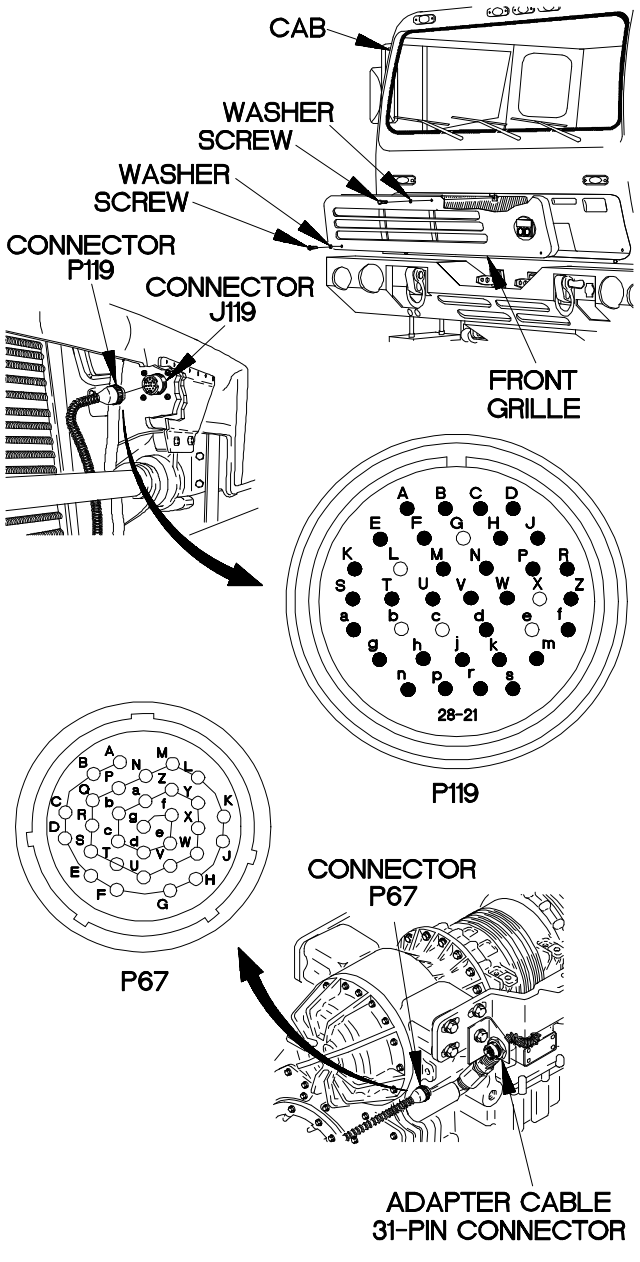
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

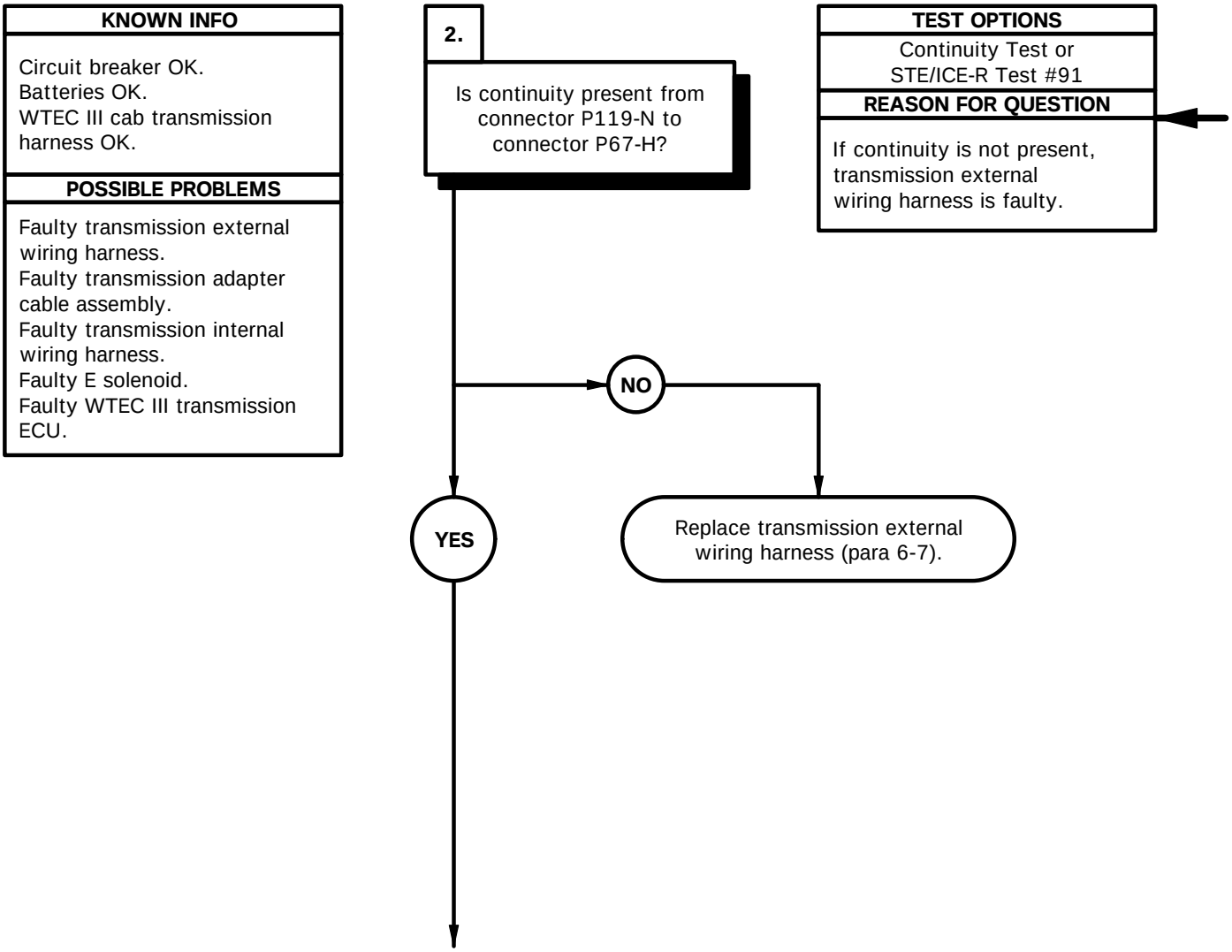
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from adapter cable 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect positive (+) 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).

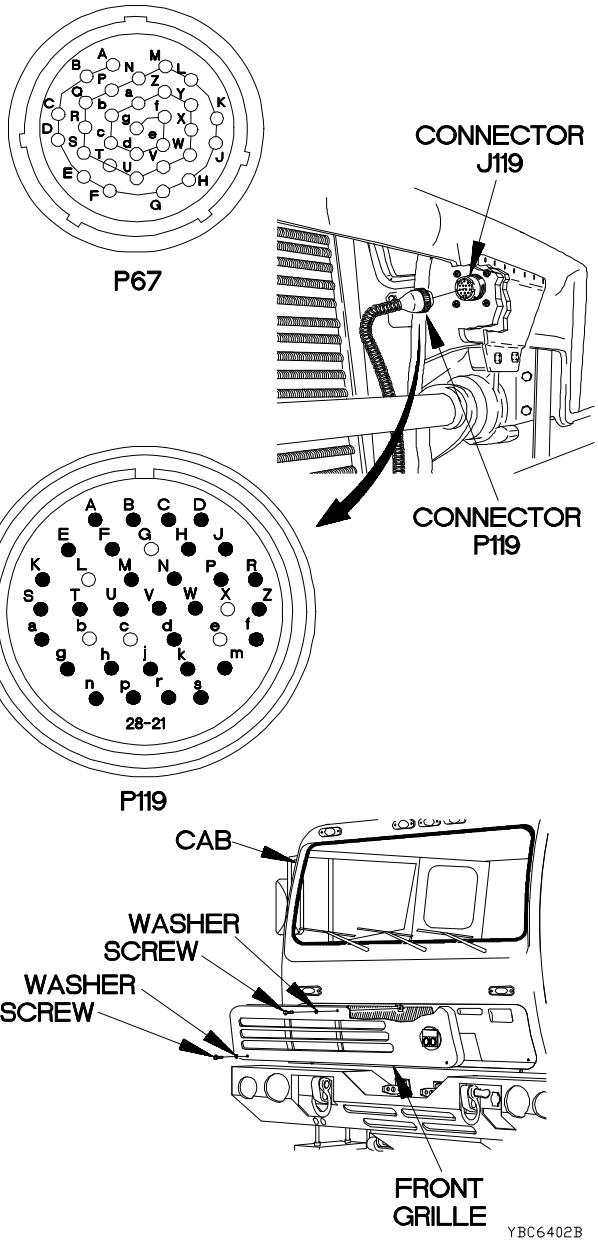


c64. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 16 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

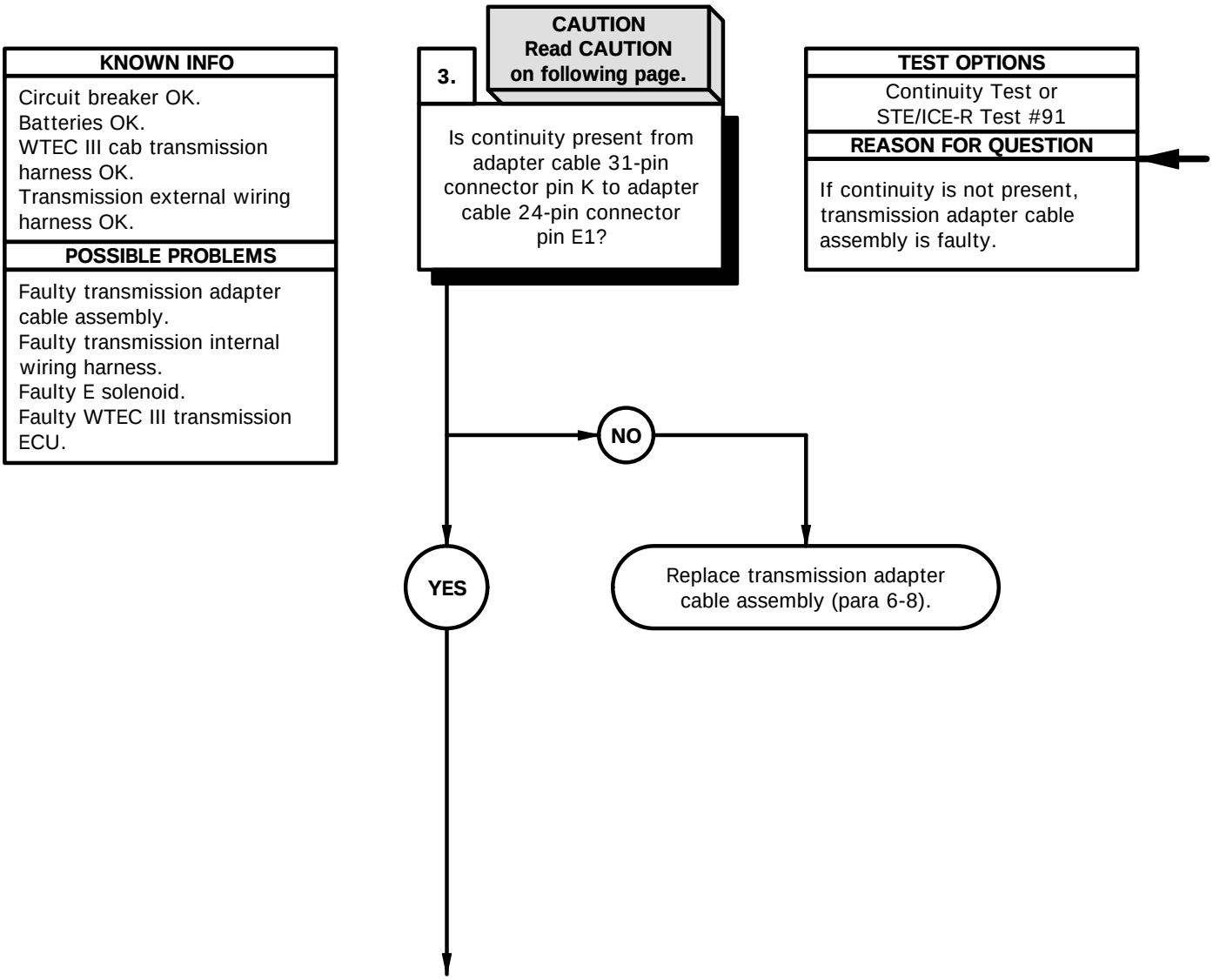


CONTINUITY TEST

(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).



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)

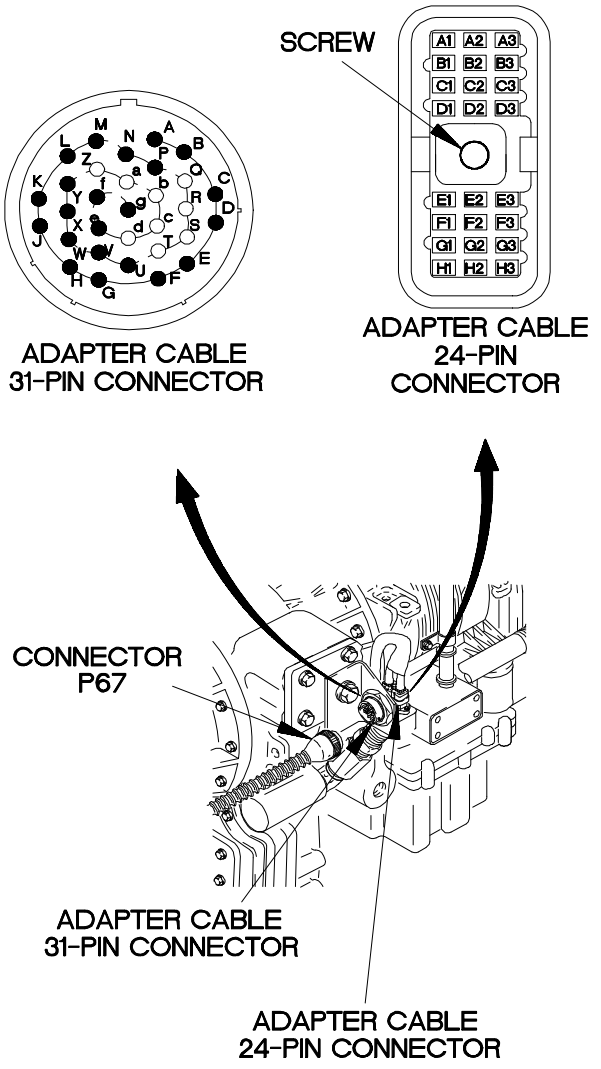


CAUTION

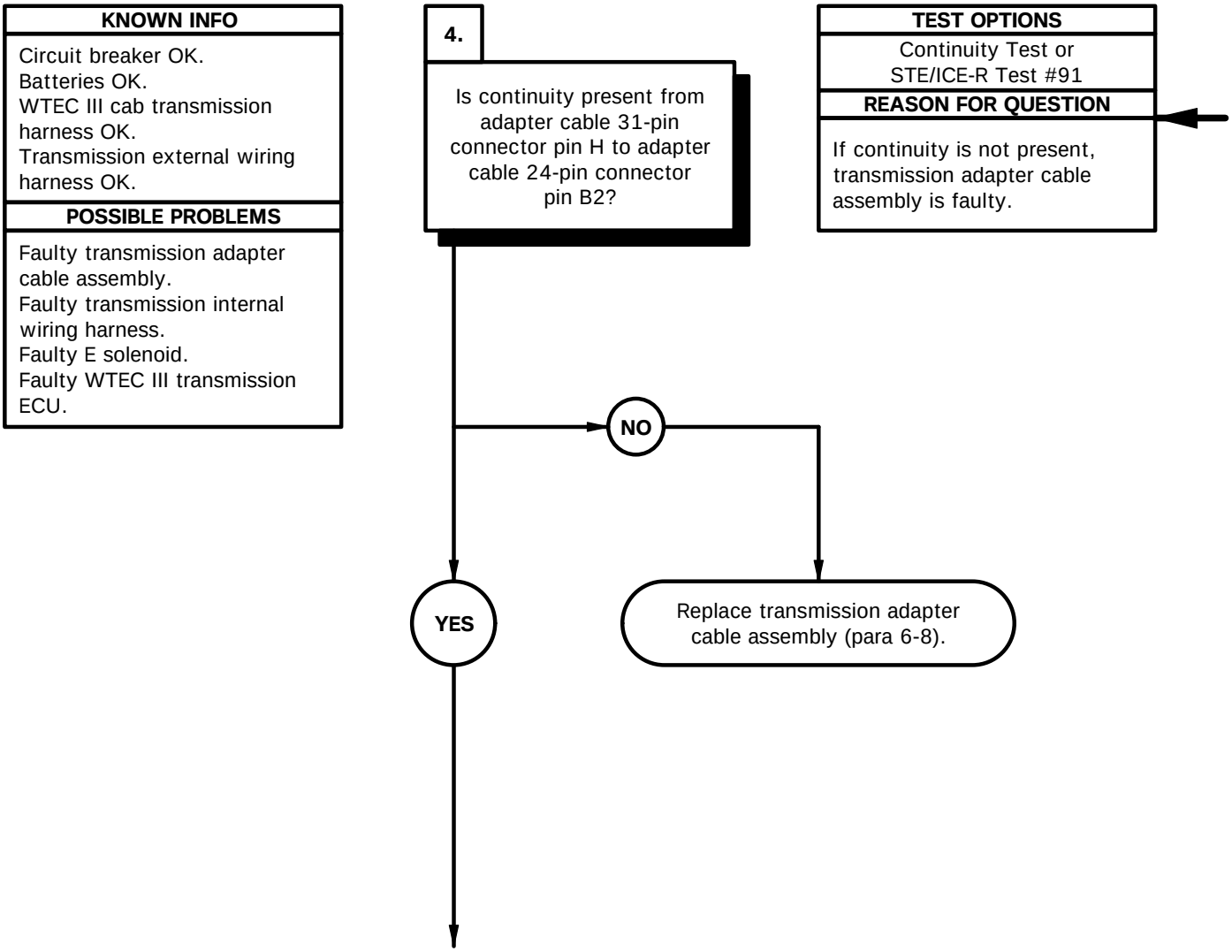
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

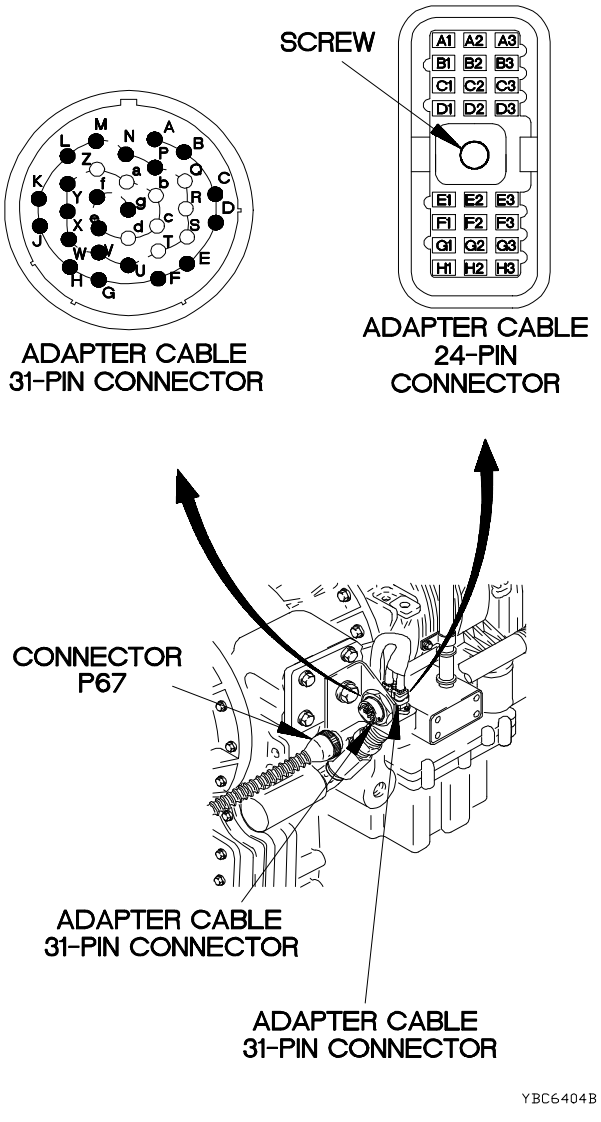


c64. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 16 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

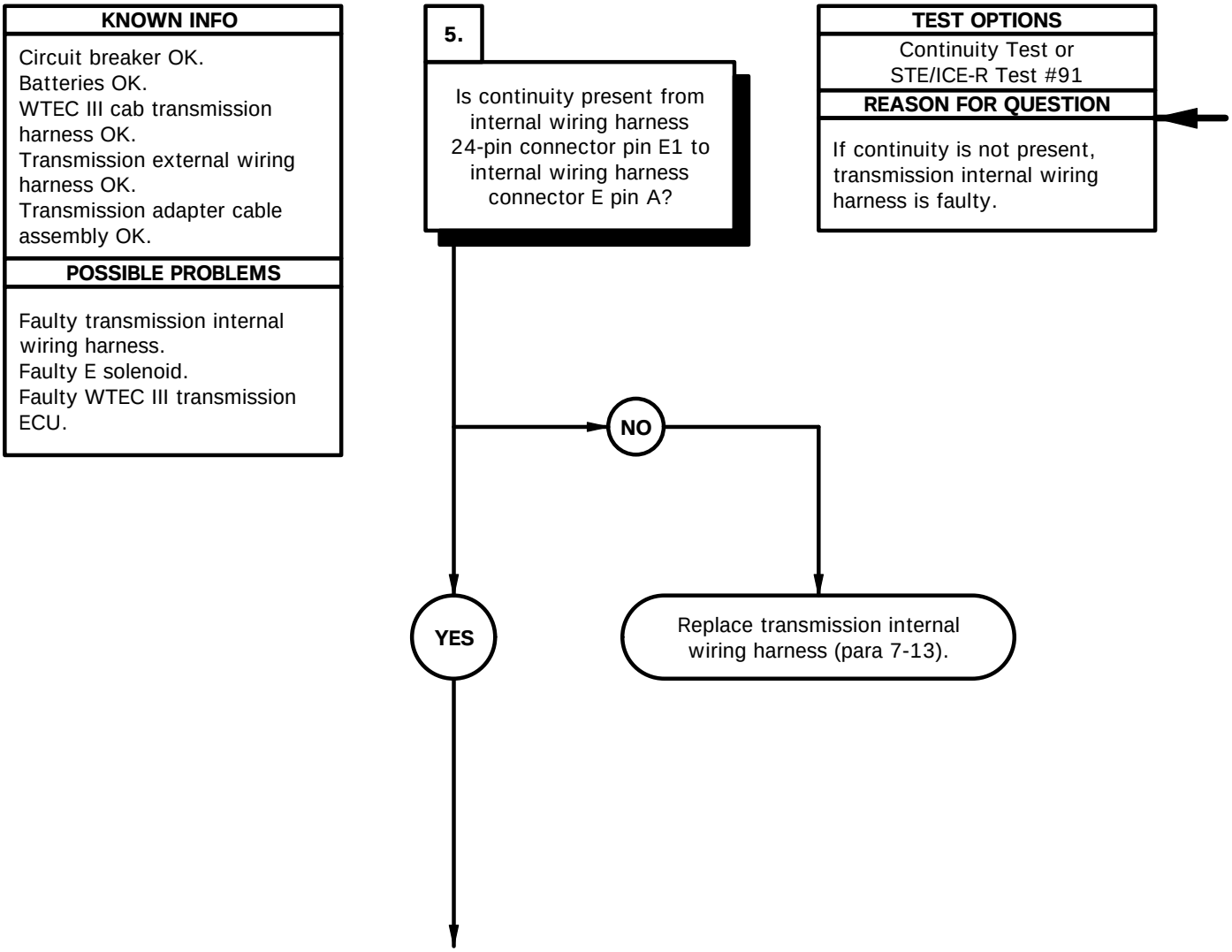


CONTINUITY TEST

(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.

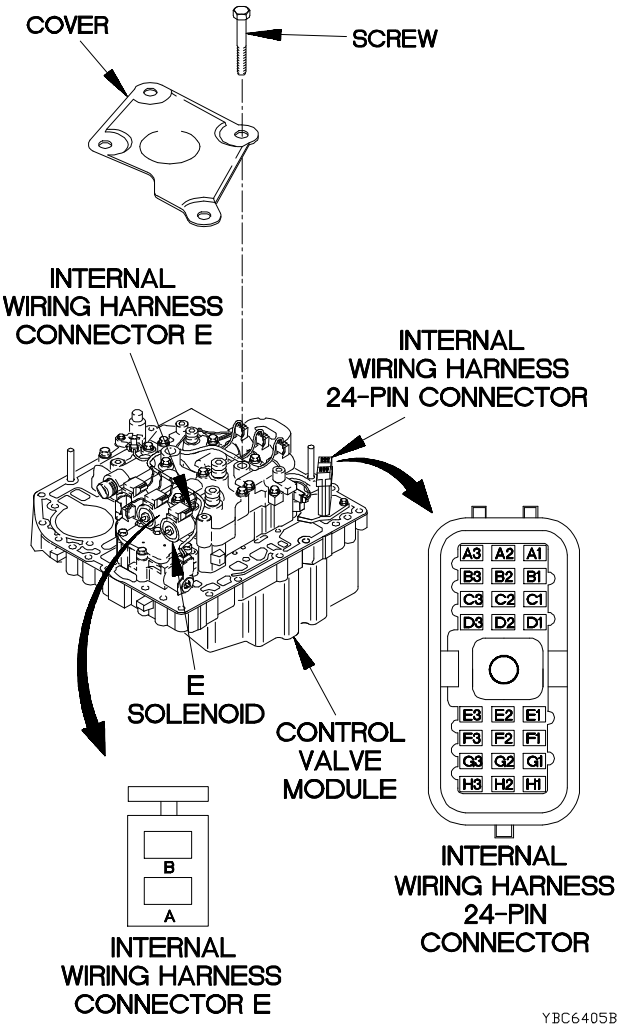


c64. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 16 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

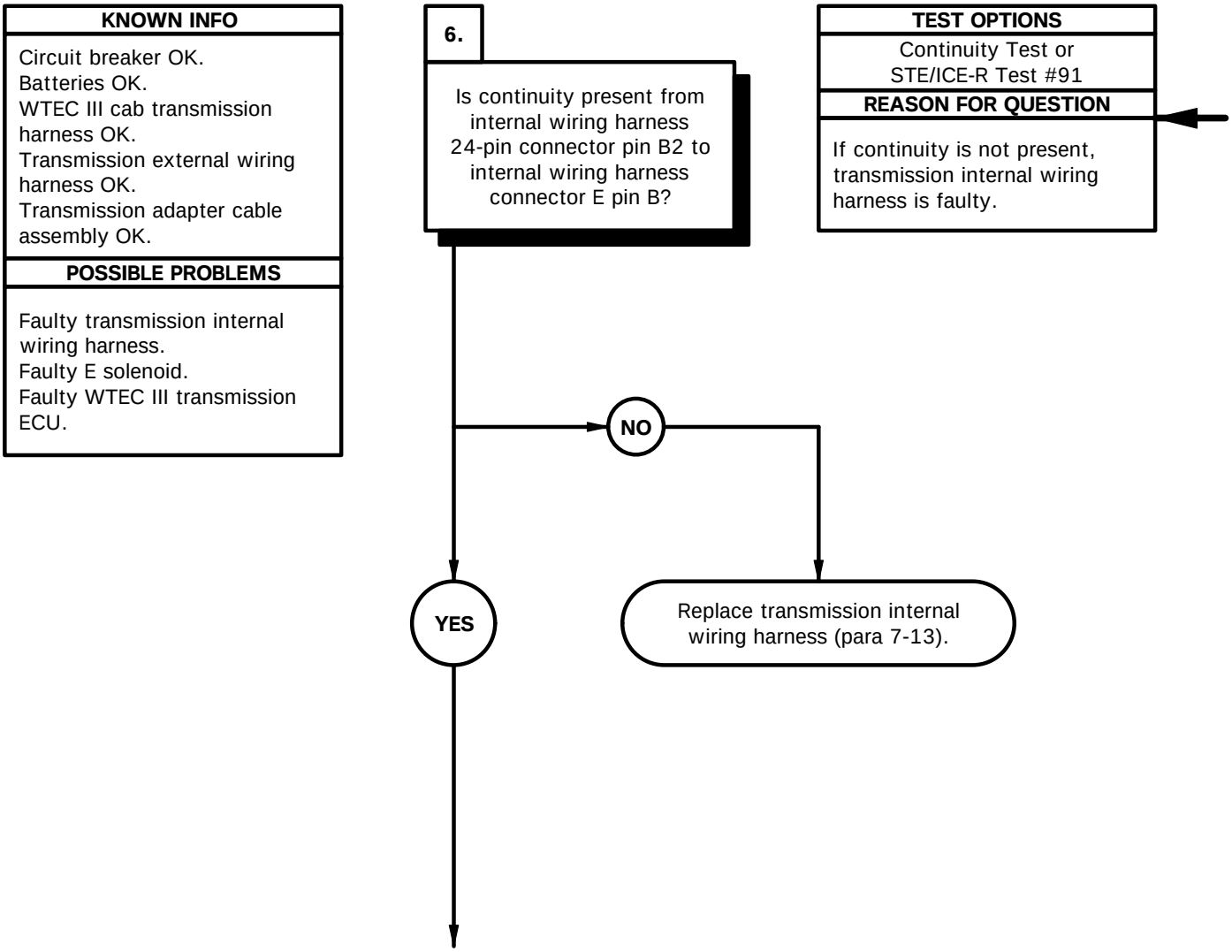


CONTINUITY TEST

(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).

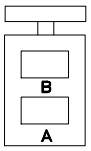


c64. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 16 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

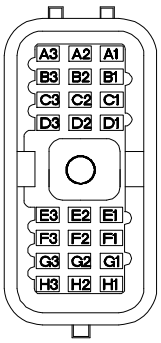


CONTINUITY TEST

(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).



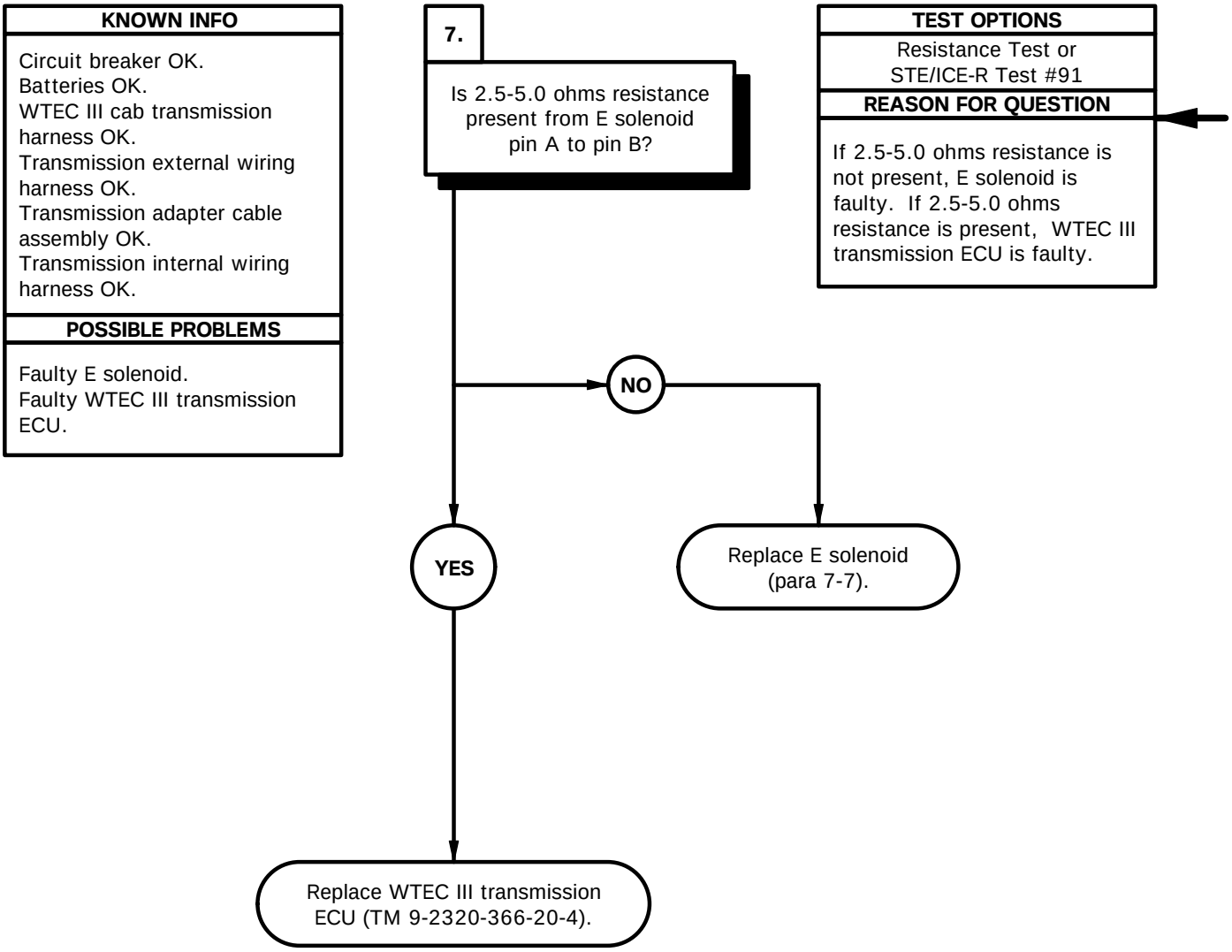
INTERNAL WIRING HARNESS CONNECTOR E



INTERNAL WIRING HARNESS 24-PIN CONNECTOR

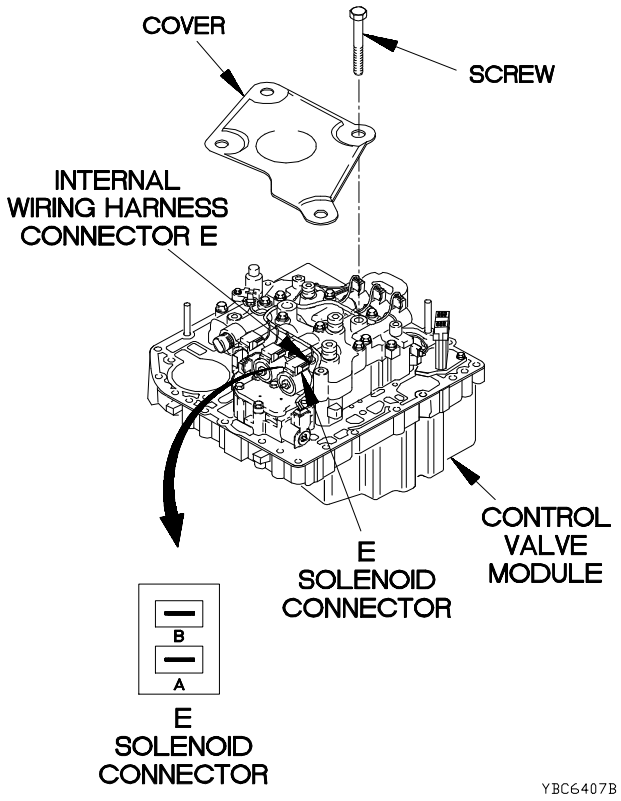
YBC6406B

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)



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).



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

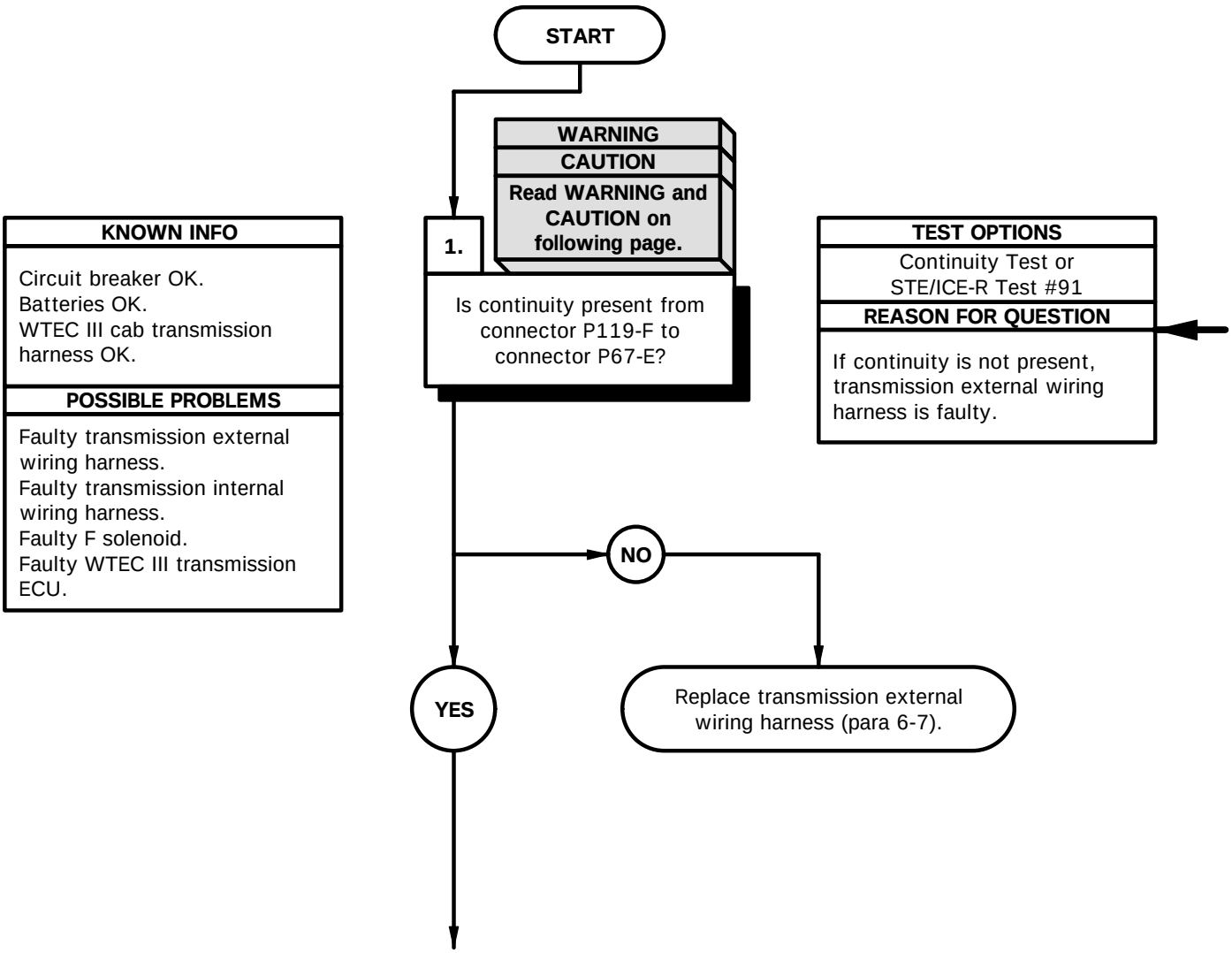
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

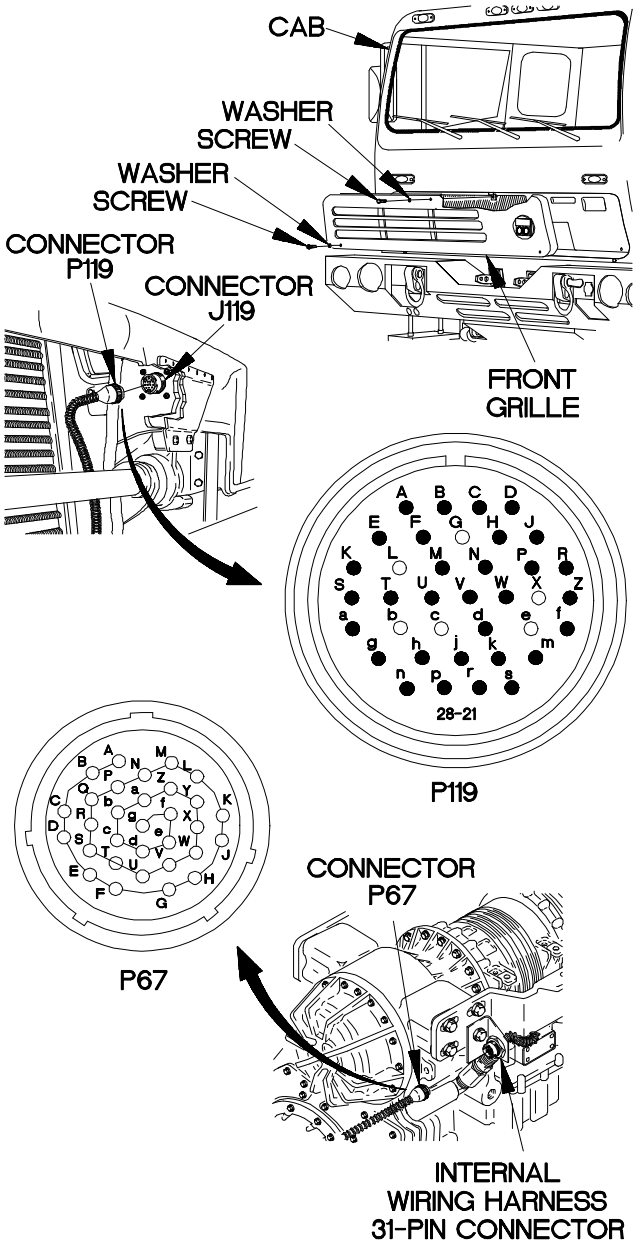
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

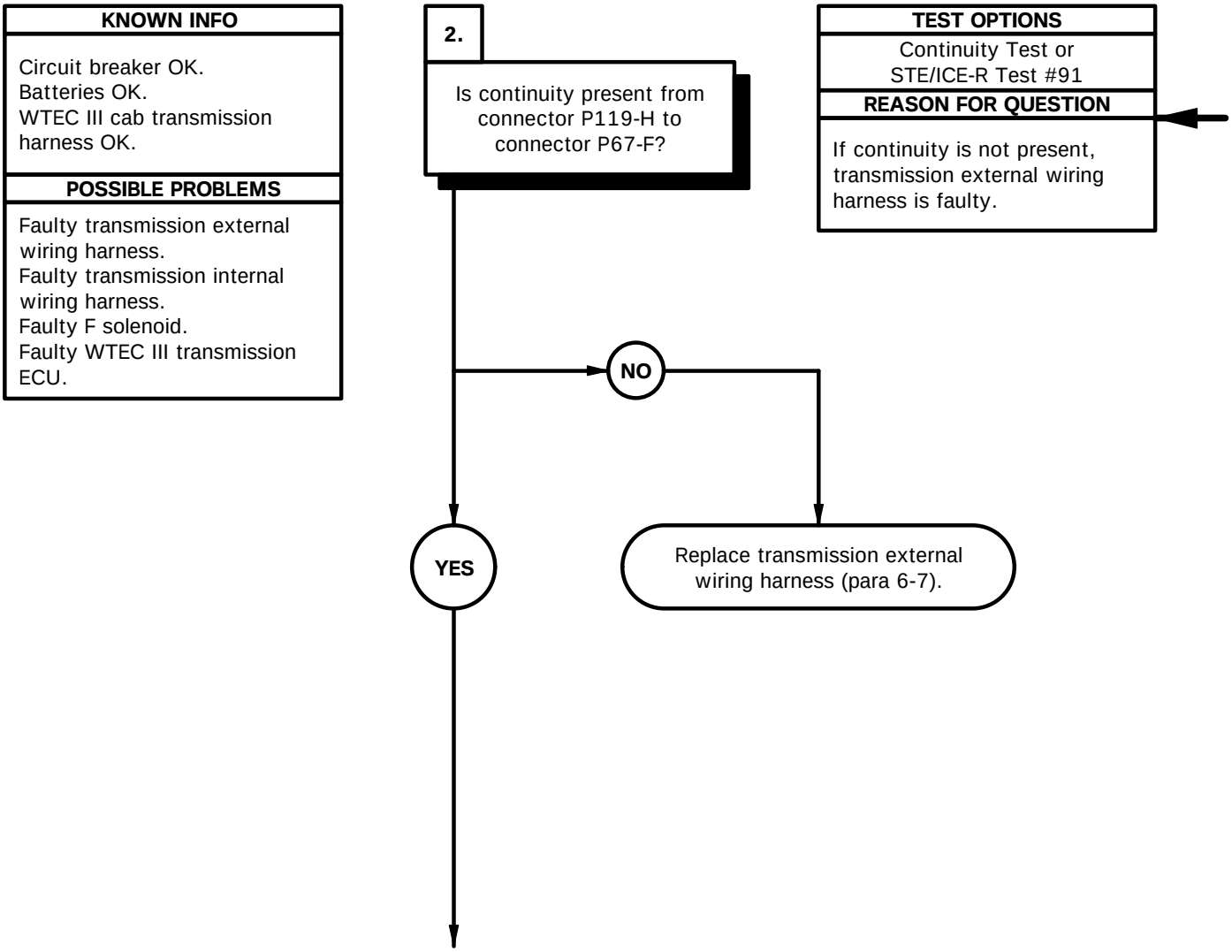
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness connector P67 from internal wiring harness 31-pin connector.
(6) Set multimeter 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).

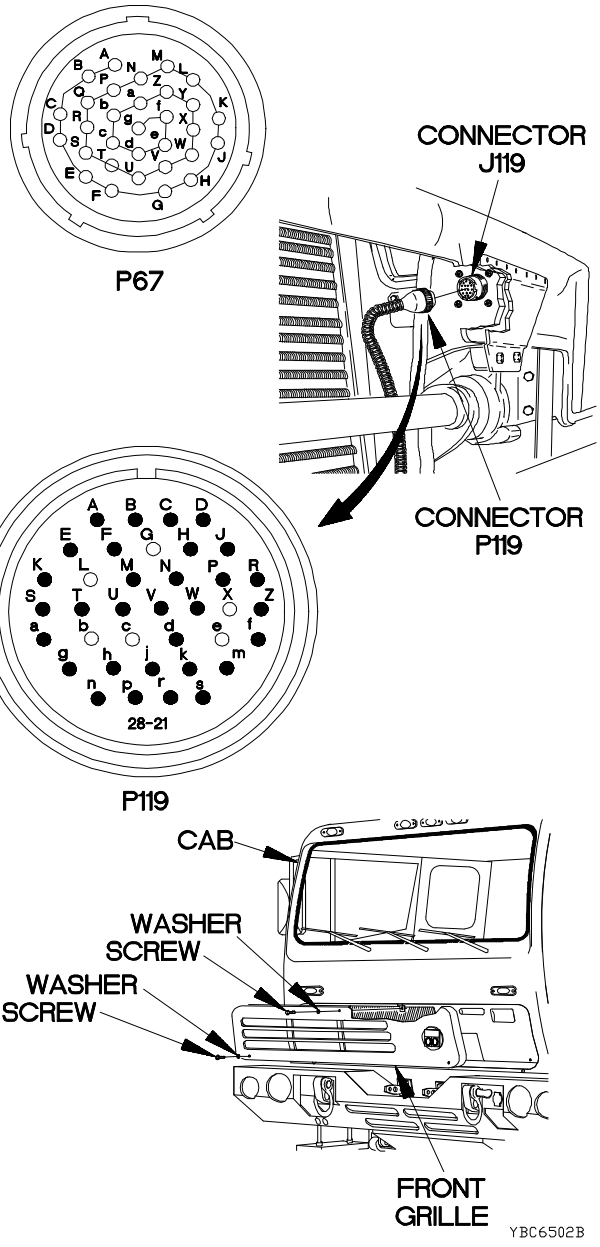


c65. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

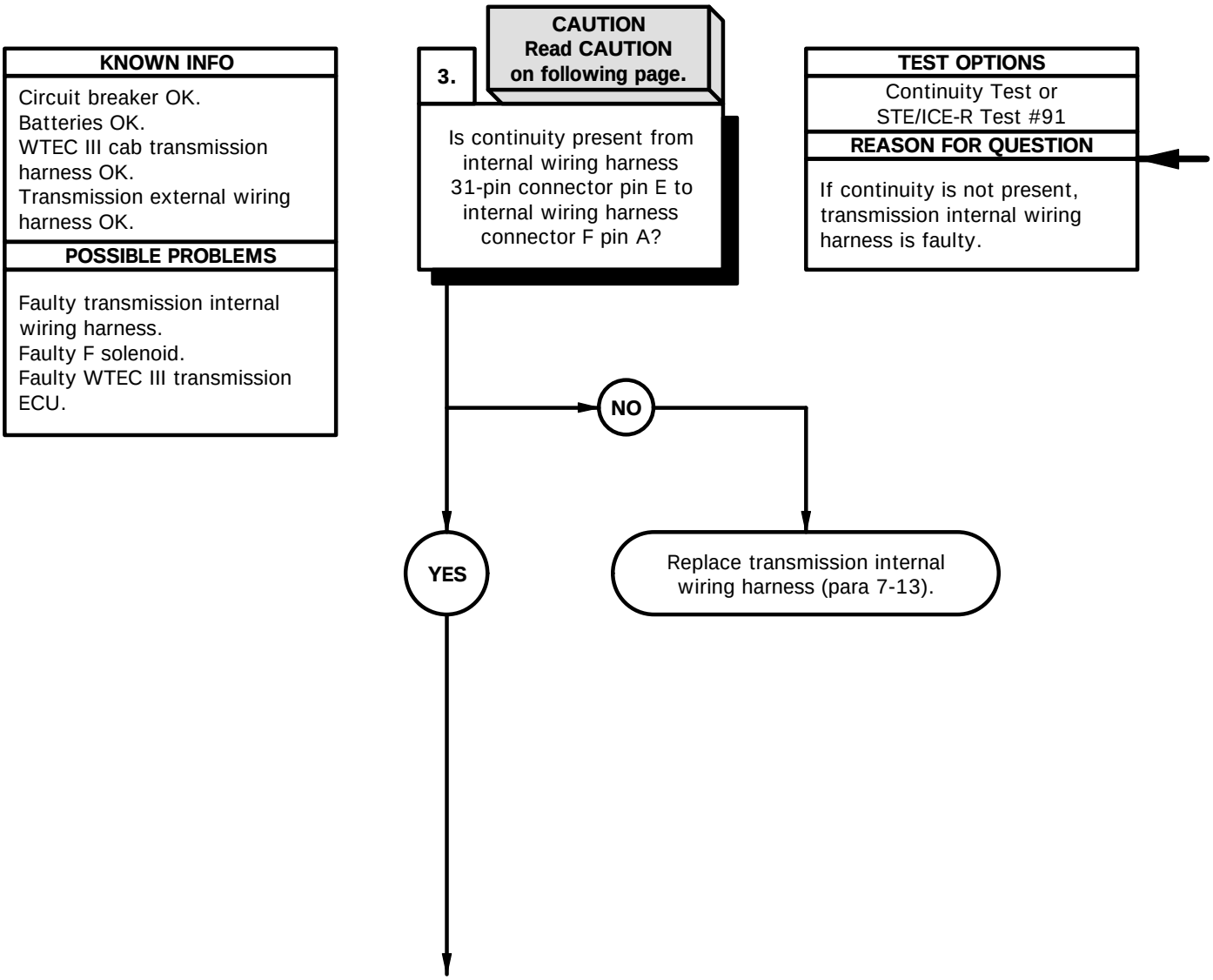


CONTINUITY TEST

(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).



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)

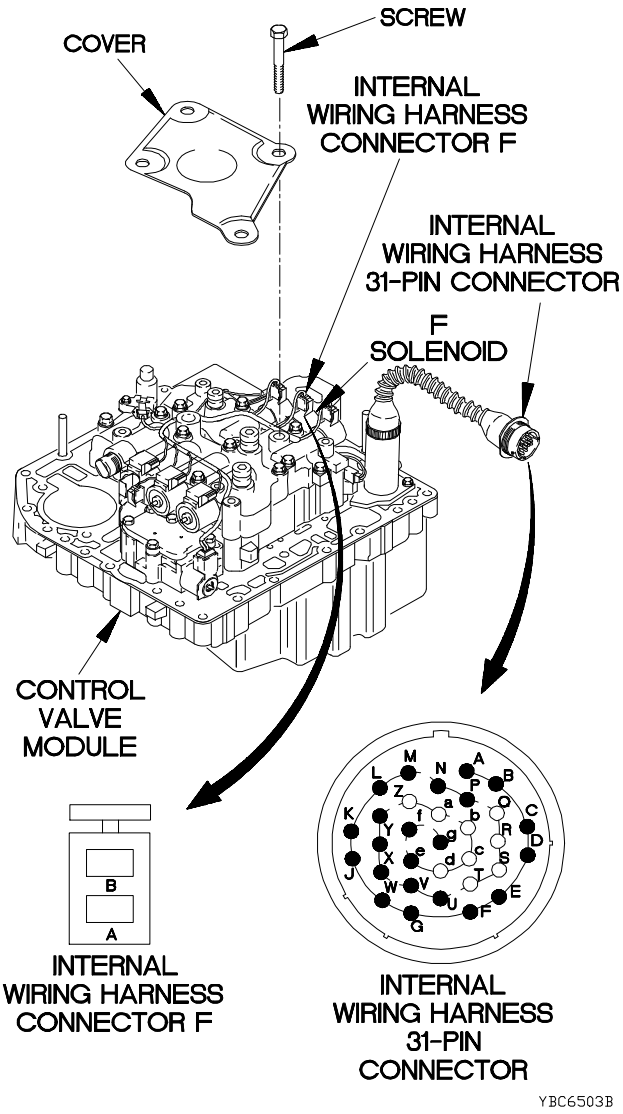


CAUTION

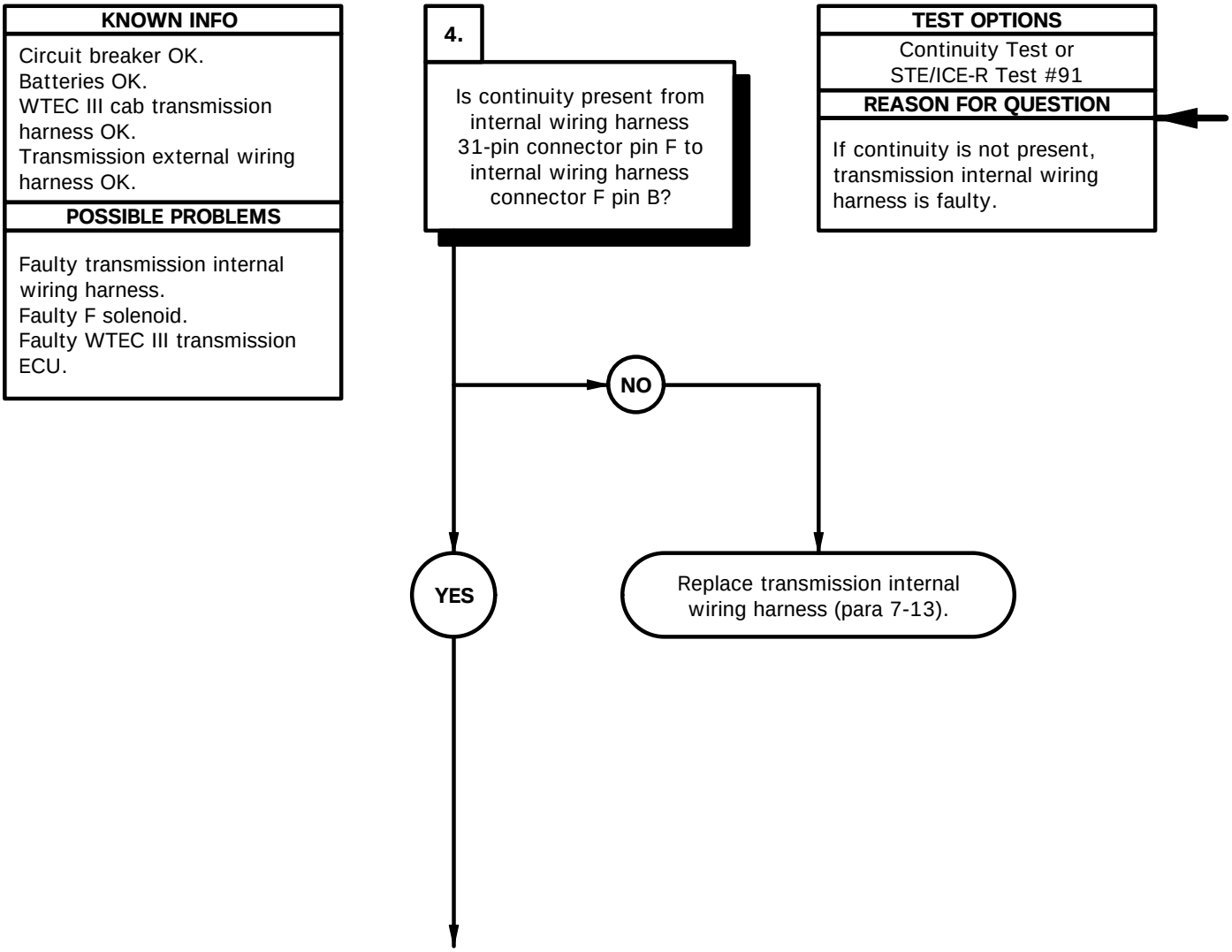
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

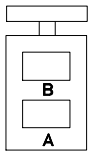


c65. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

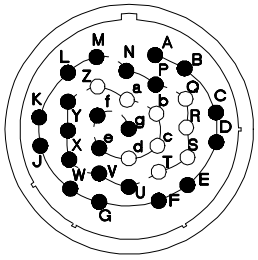


CONTINUITY TEST

(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).



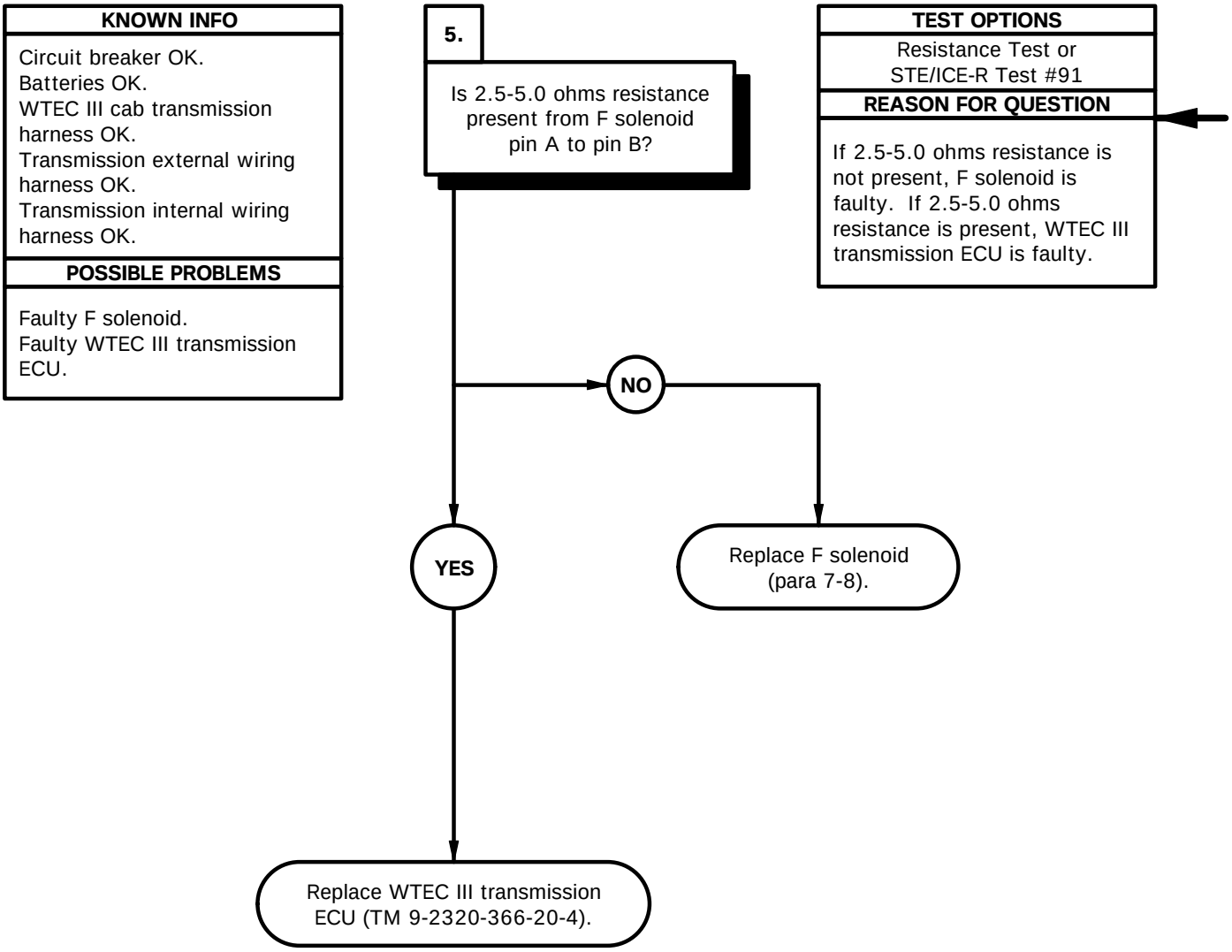
INTERNAL WIRING HARNESS CONNECTOR F



INTERNAL WIRING HARNESS 31-PIN CONNECTOR

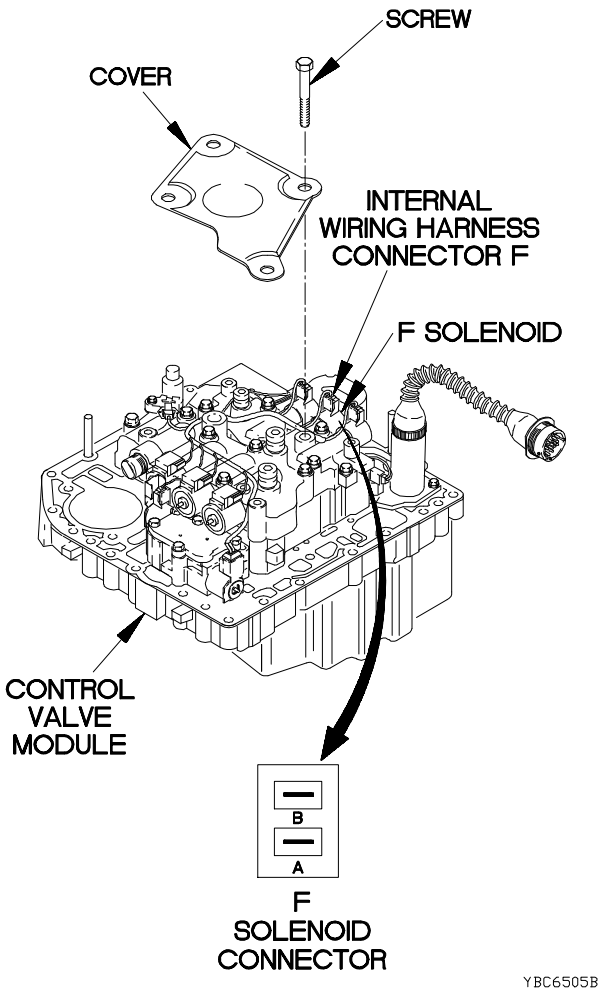
YBC6504B

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)



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).



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

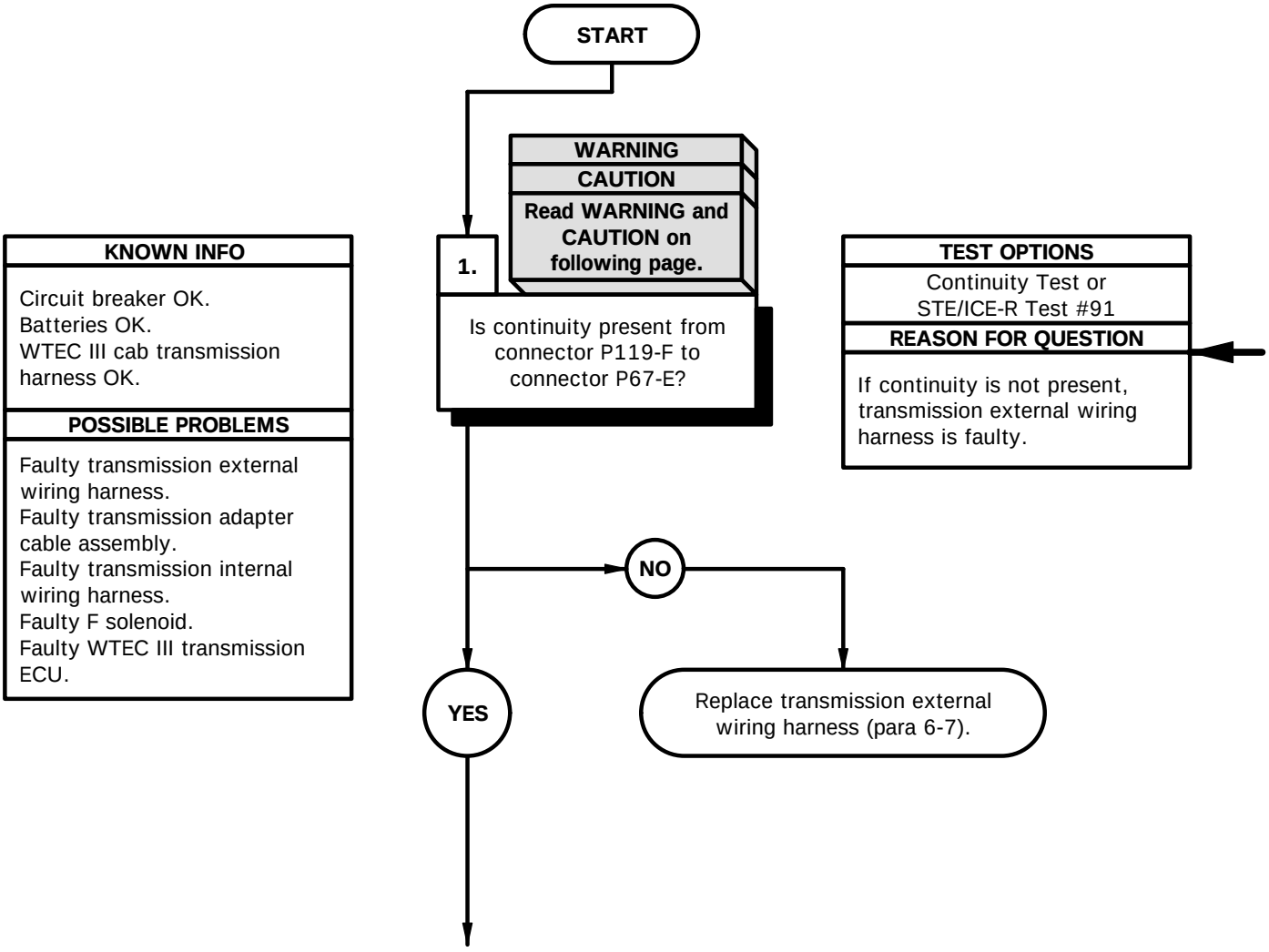
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

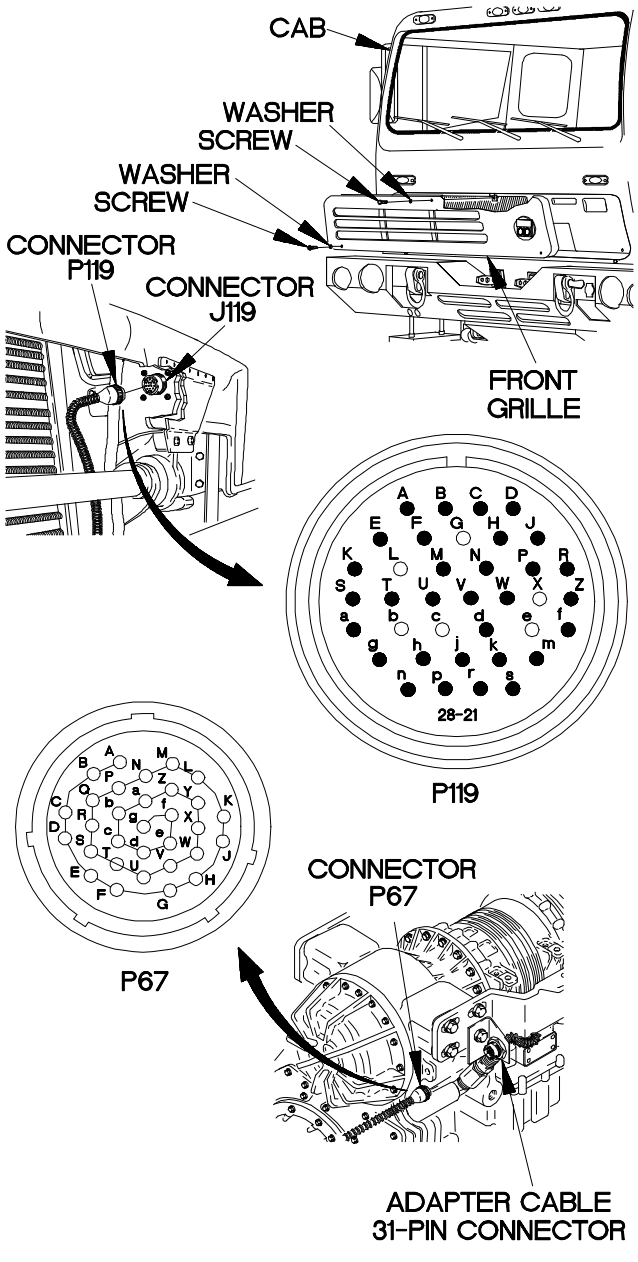
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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-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).



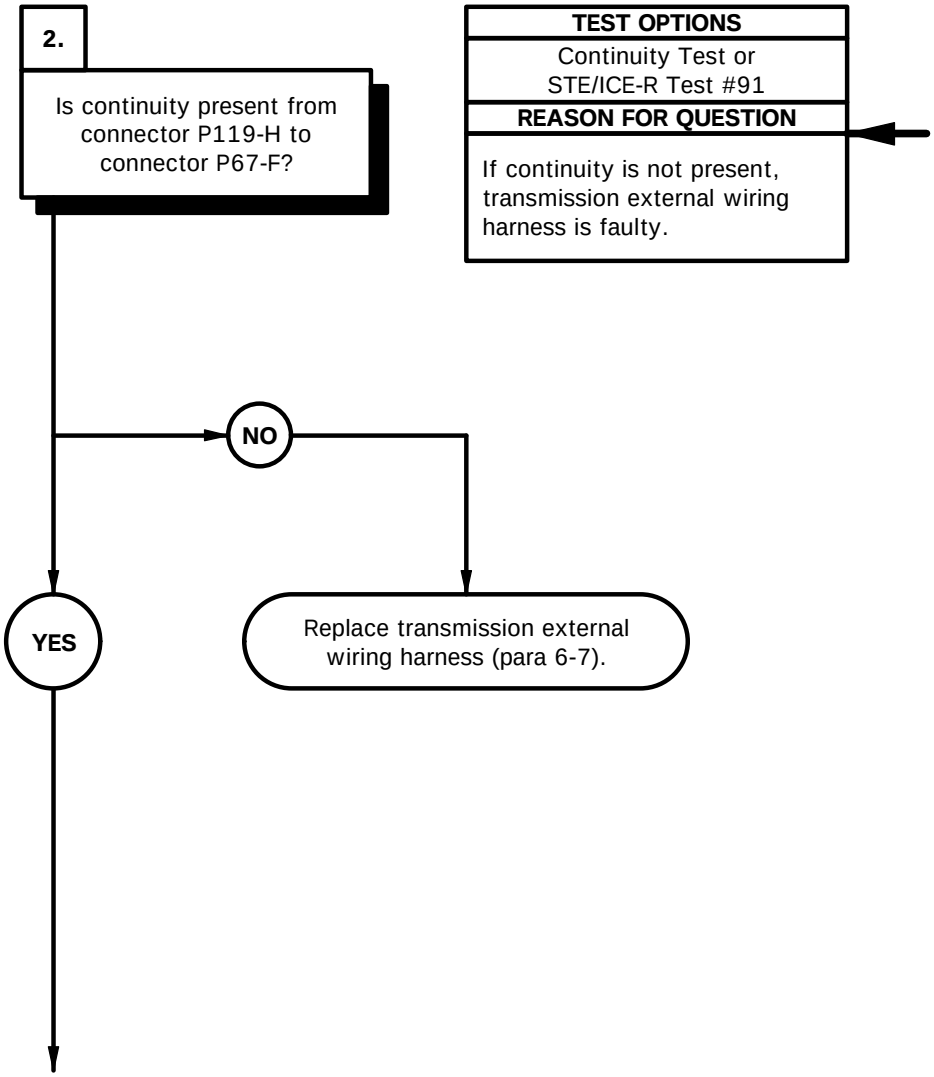
c66. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO

Circuit breaker OK.
Batteries OK.
WTEC III cab transmission harness OK.

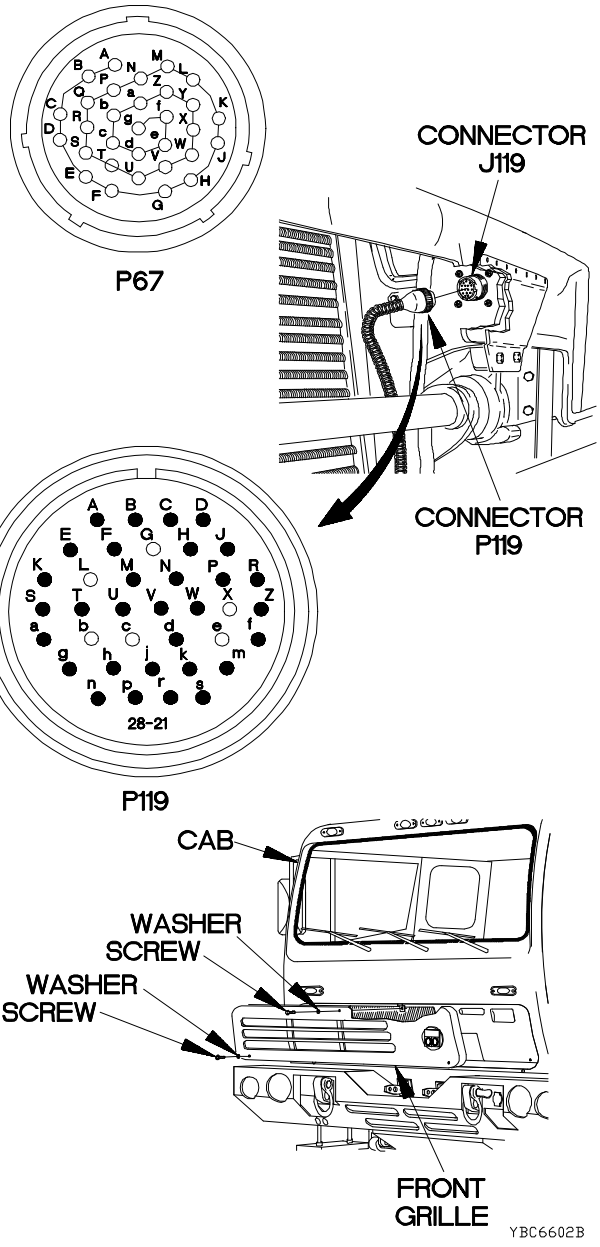
POSSIBLE PROBLEMS

Faulty transmission external wiring harness.
Faulty transmission adapter cable assembly.
Faulty transmission internal wiring harness.
Faulty F solenoid.
Faulty WTEC III transmission ECU.

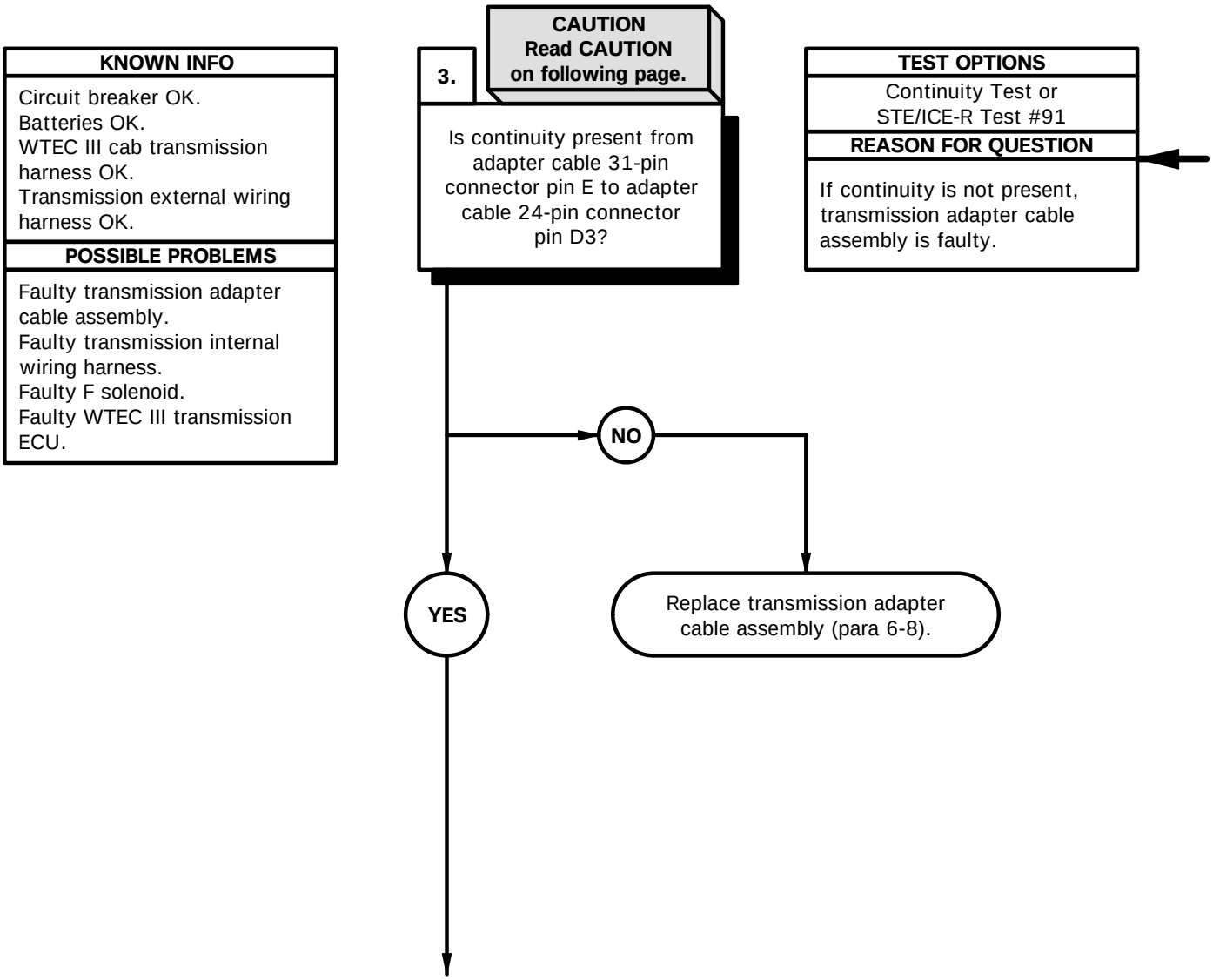


CONTINUITY TEST

(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).



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)

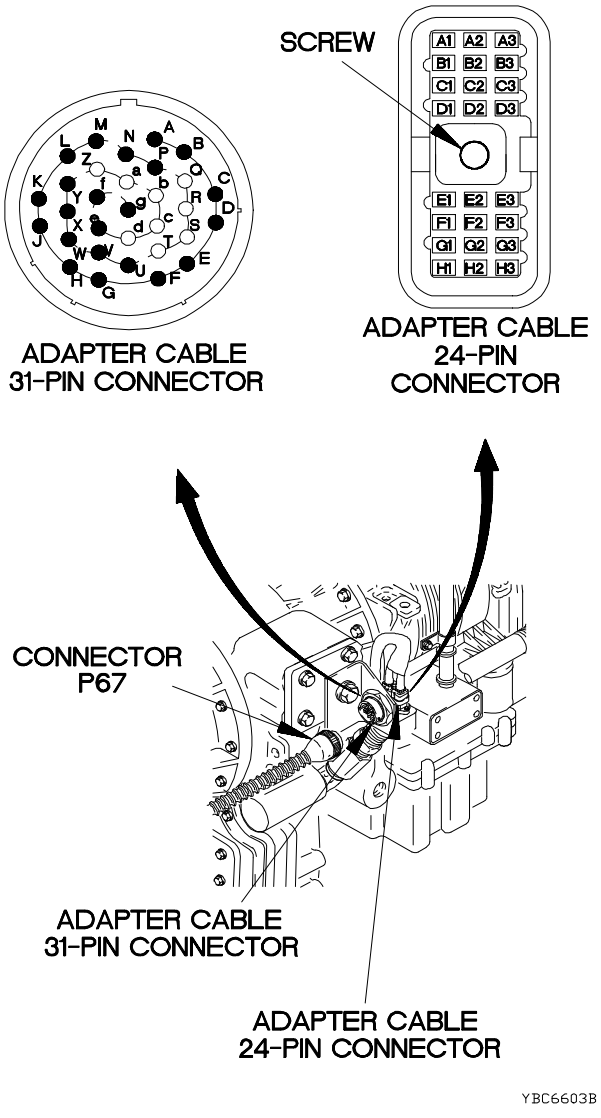


CAUTION

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).



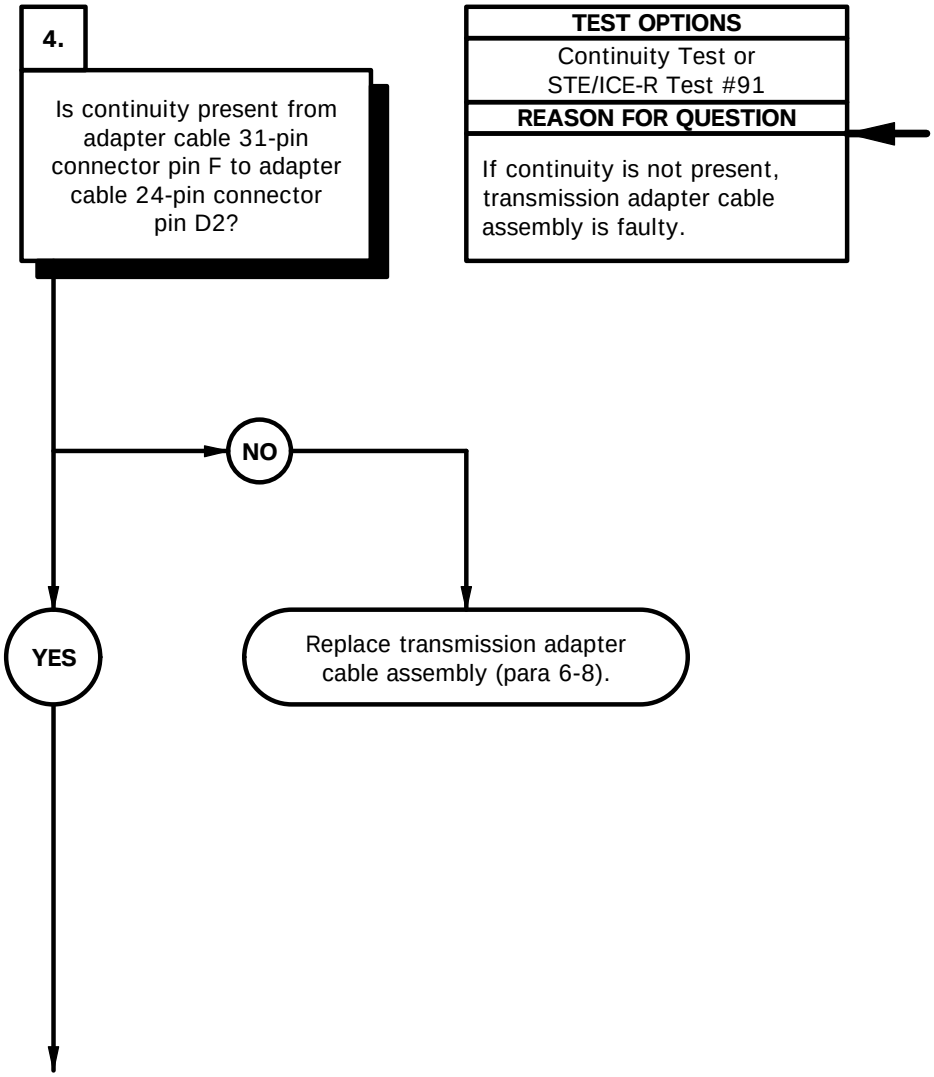
c66. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO

Circuit breaker OK.
Batteries OK.
WTEC III cab transmission harness OK.
Transmission external wiring harness OK.

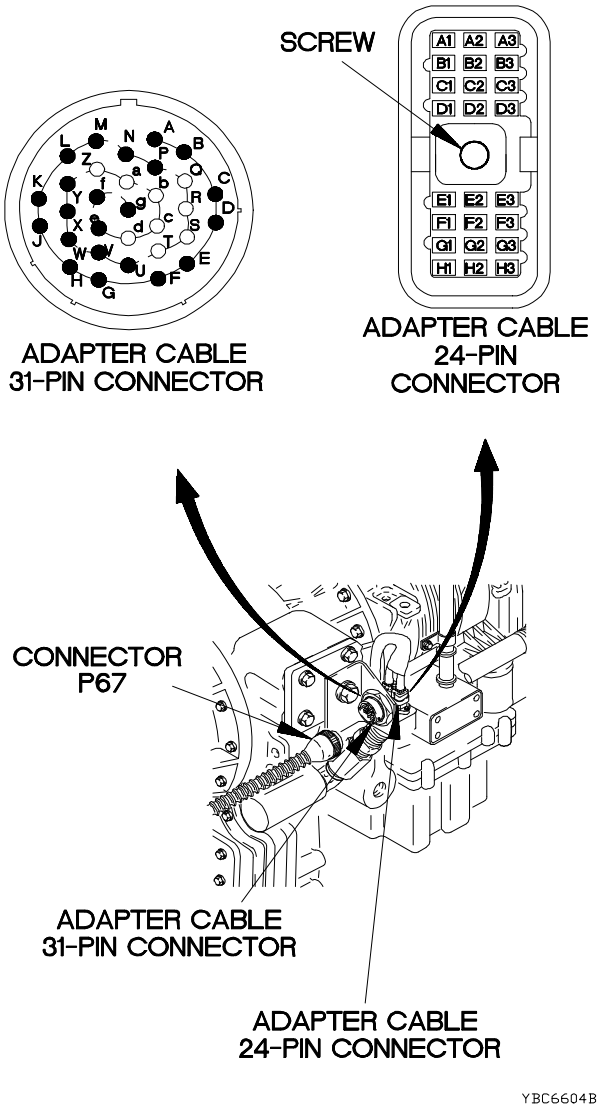
POSSIBLE PROBLEMS

Faulty transmission adapter cable assembly.
Faulty transmission internal wiring harness.
Faulty F solenoid.
Faulty WTEC III transmission ECU.

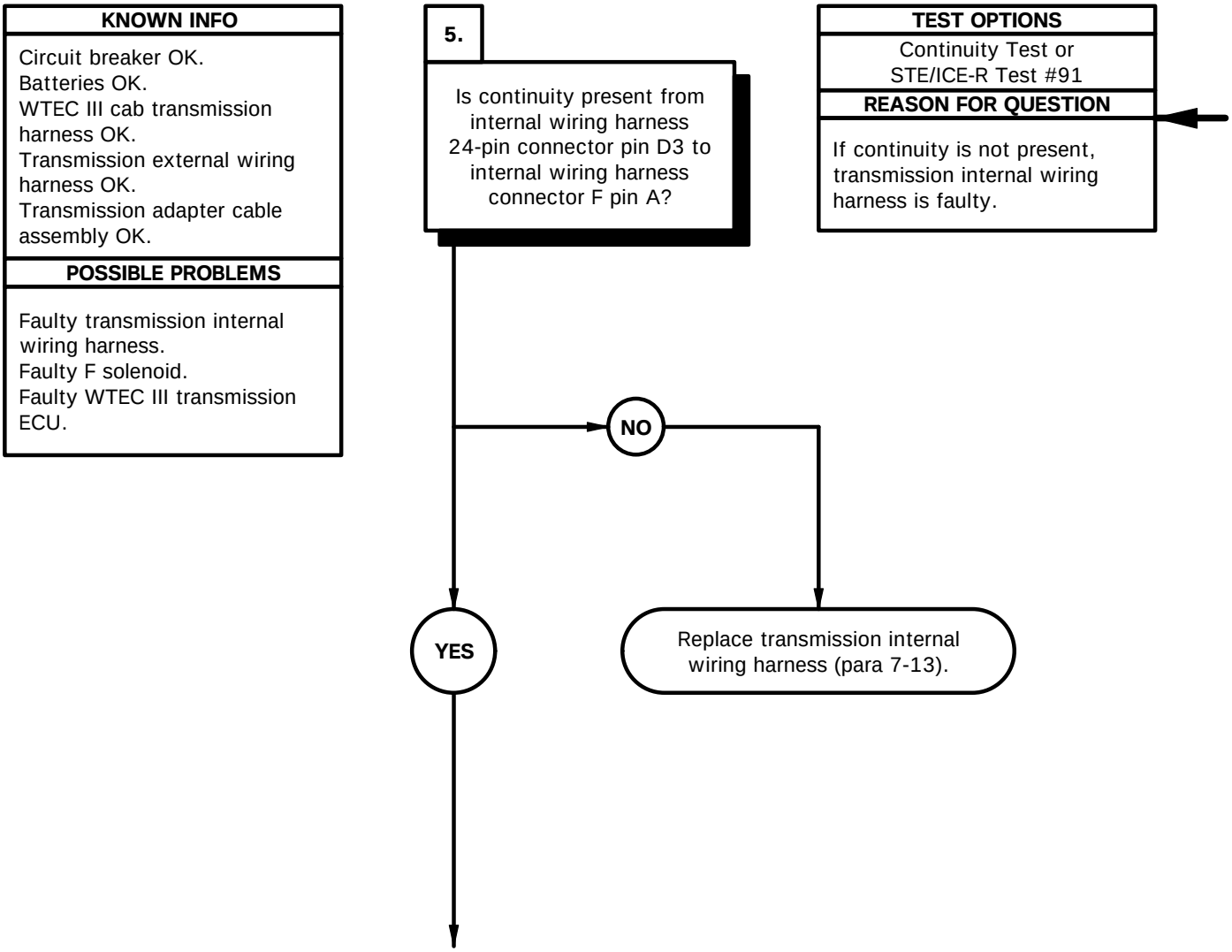


CONTINUITY TEST

(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.

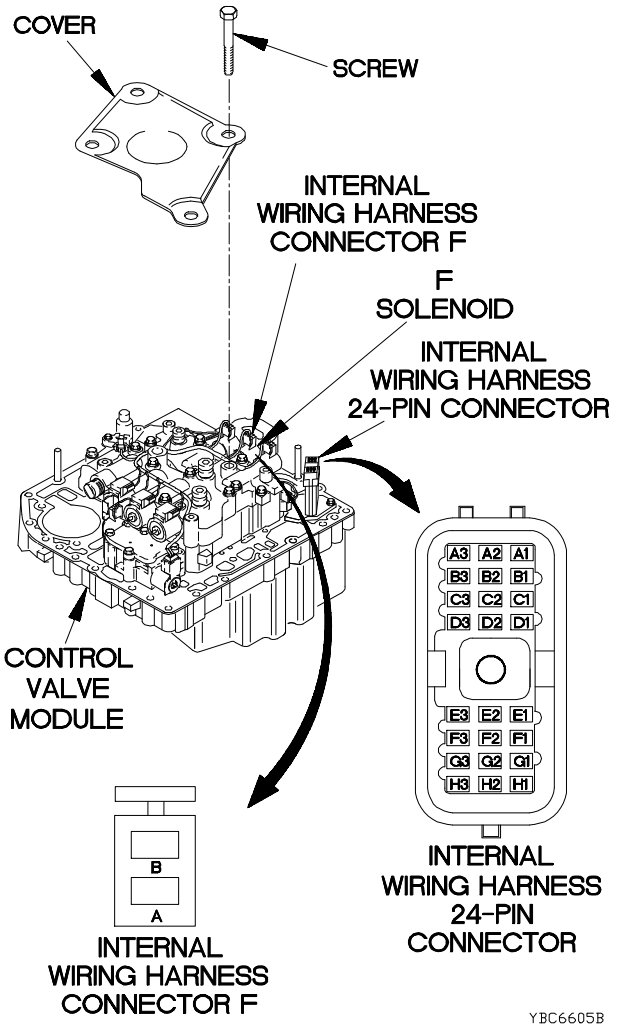


c66. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



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 harness24-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).



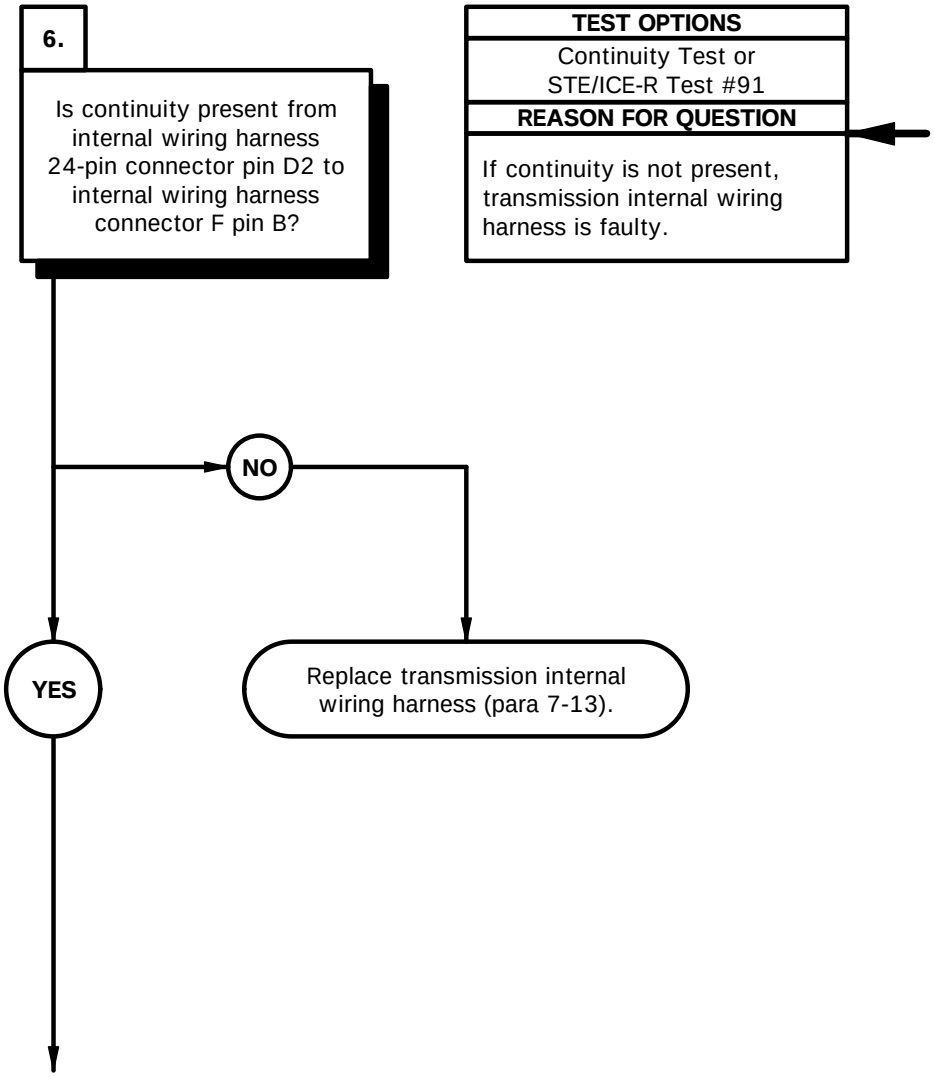
c66. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO

Circuit breaker OK.
Batteries OK.
WTEC III cab transmission harness OK.
Transmission external wiring harness OK.
Transmission adapter cable assembly OK.

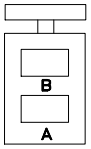
POSSIBLE PROBLEMS

Faulty transmission internal wiring harness.
Faulty F solenoid.
Faulty WTEC III transmission ECU.

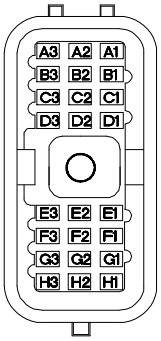


CONTINUITY TEST

(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).



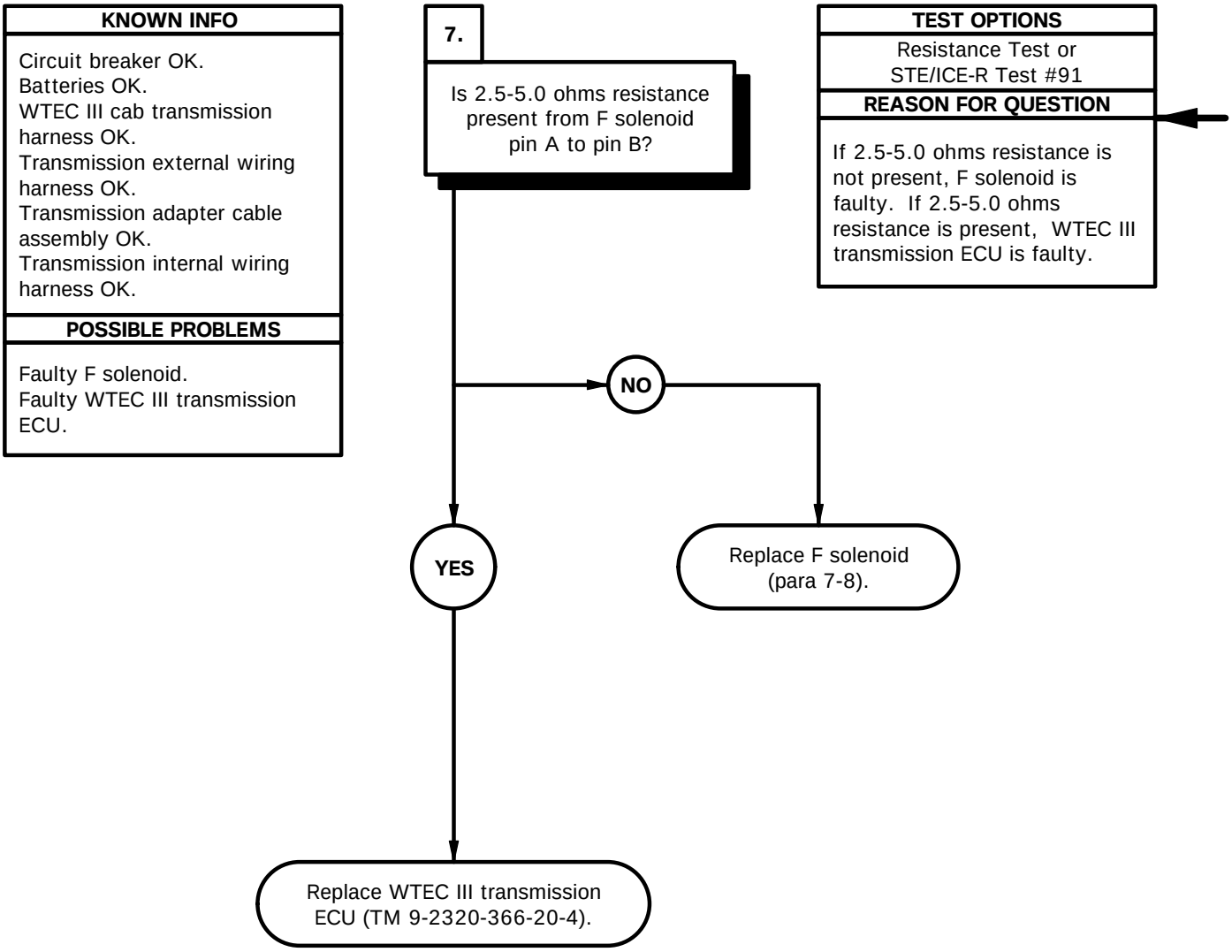
INTERNAL WIRING HARNESS CONNECTOR F



INTERNAL WIRING HARNESS 24-PIN CONNECTOR

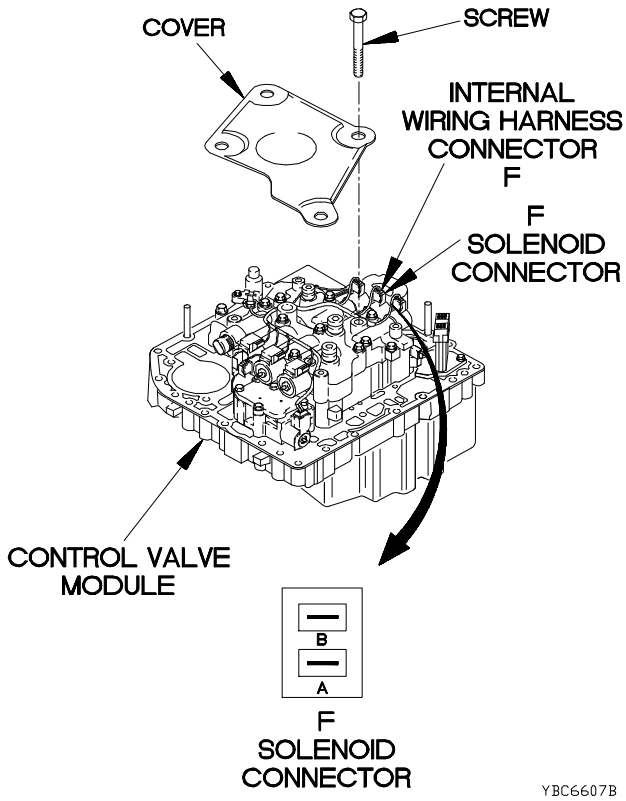
YBC6606B

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)



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).



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).

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)

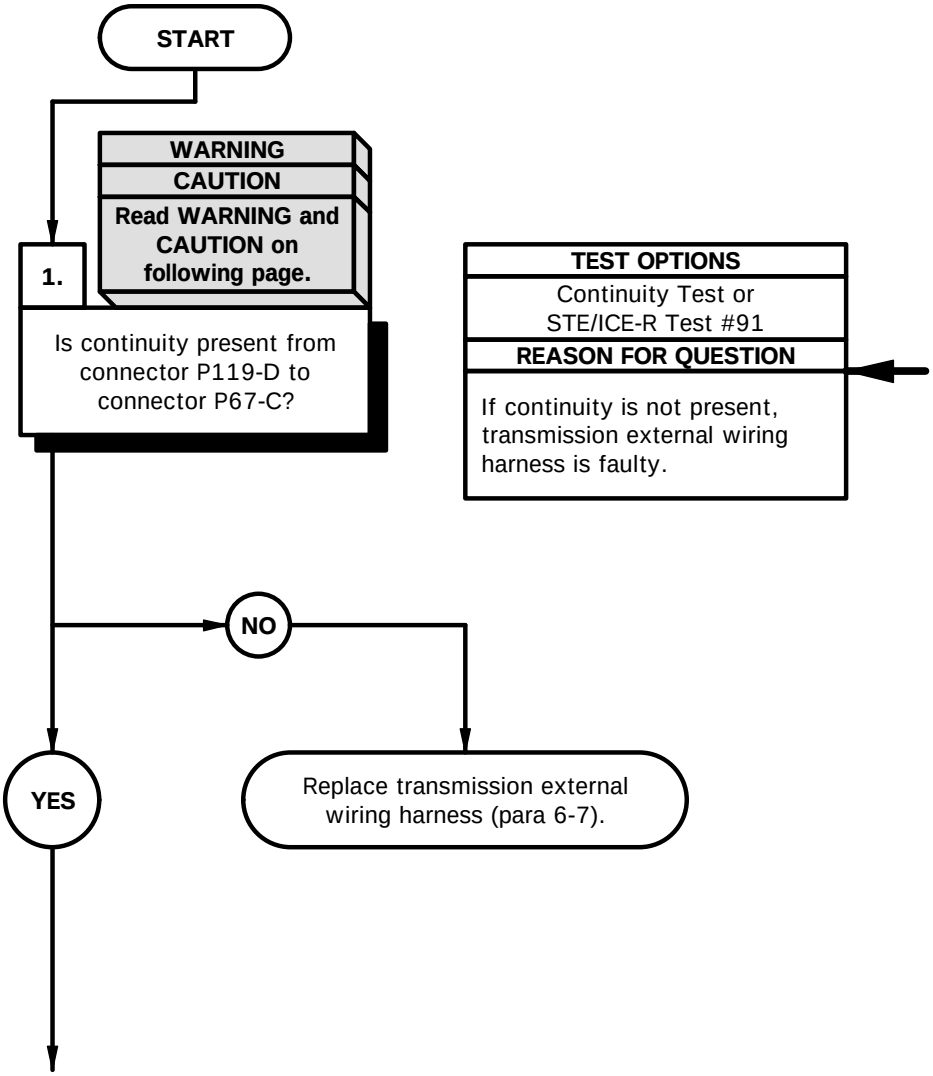
References
TM 9-4910-571-12&P

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.



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

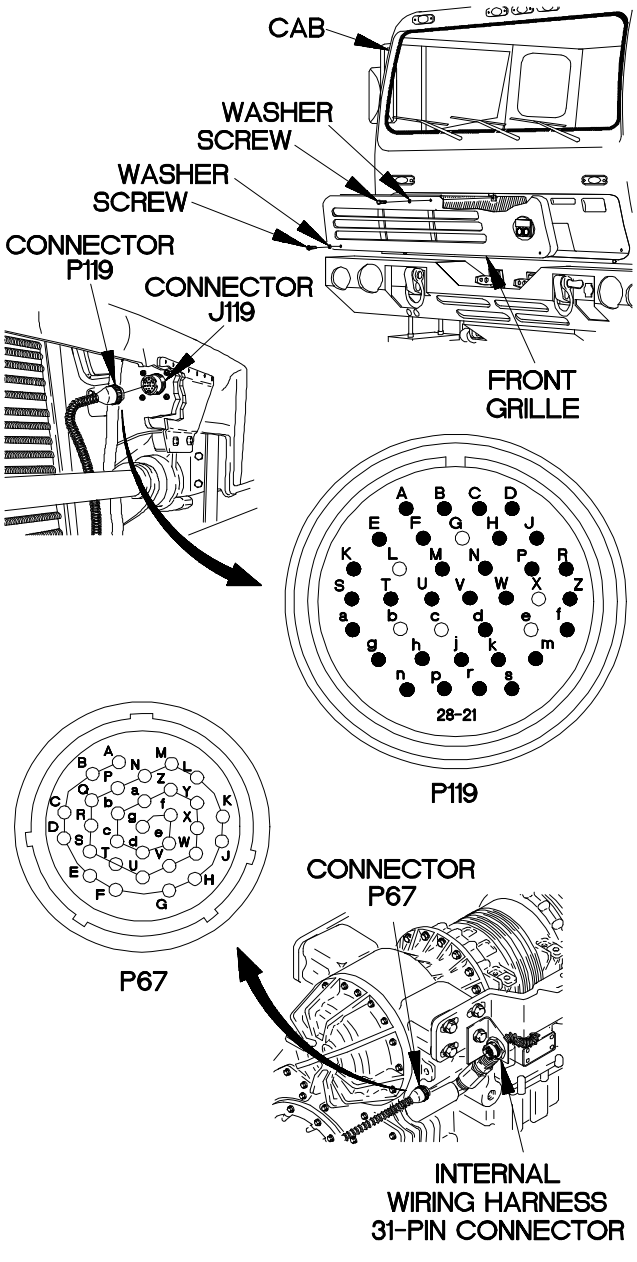
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

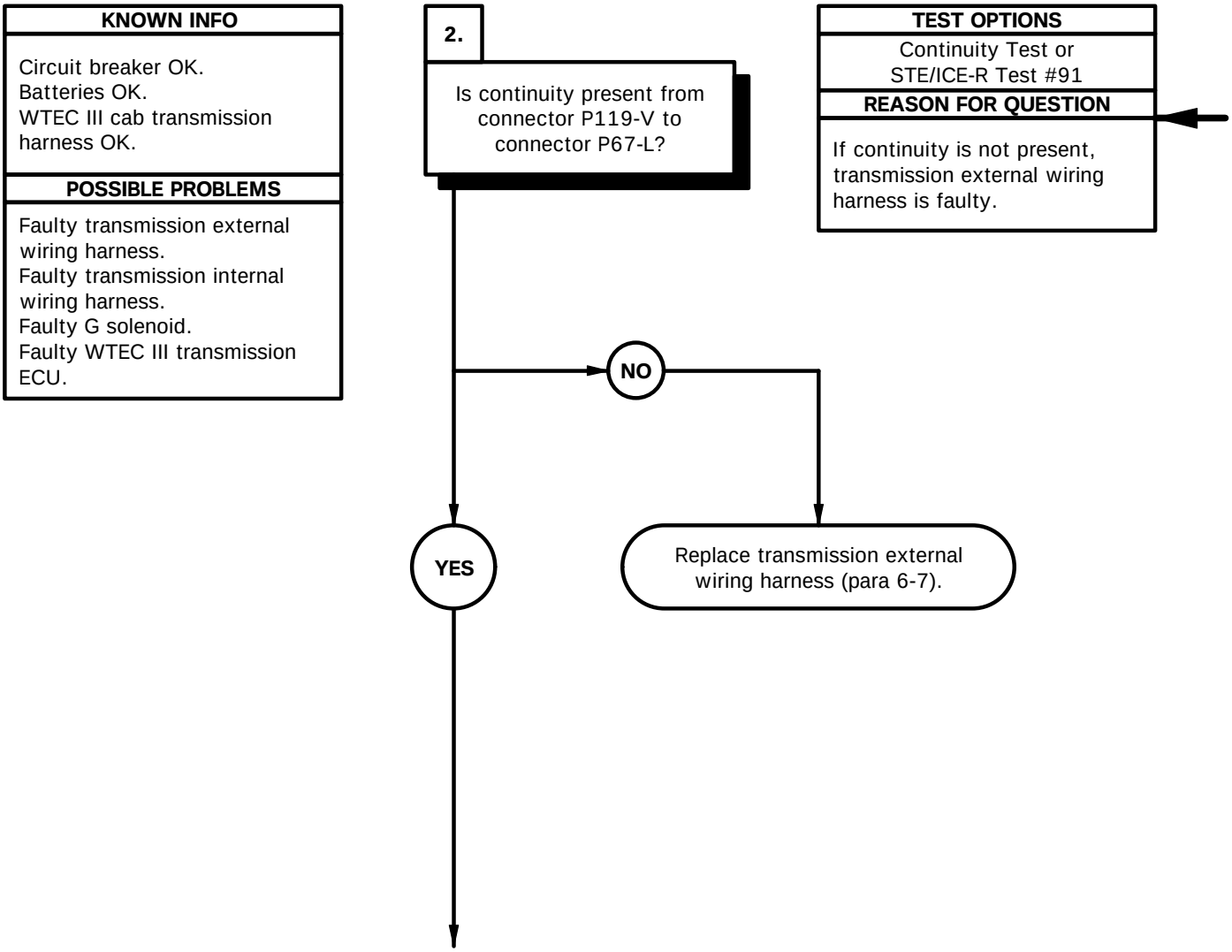
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from internal wiring harness 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect 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).

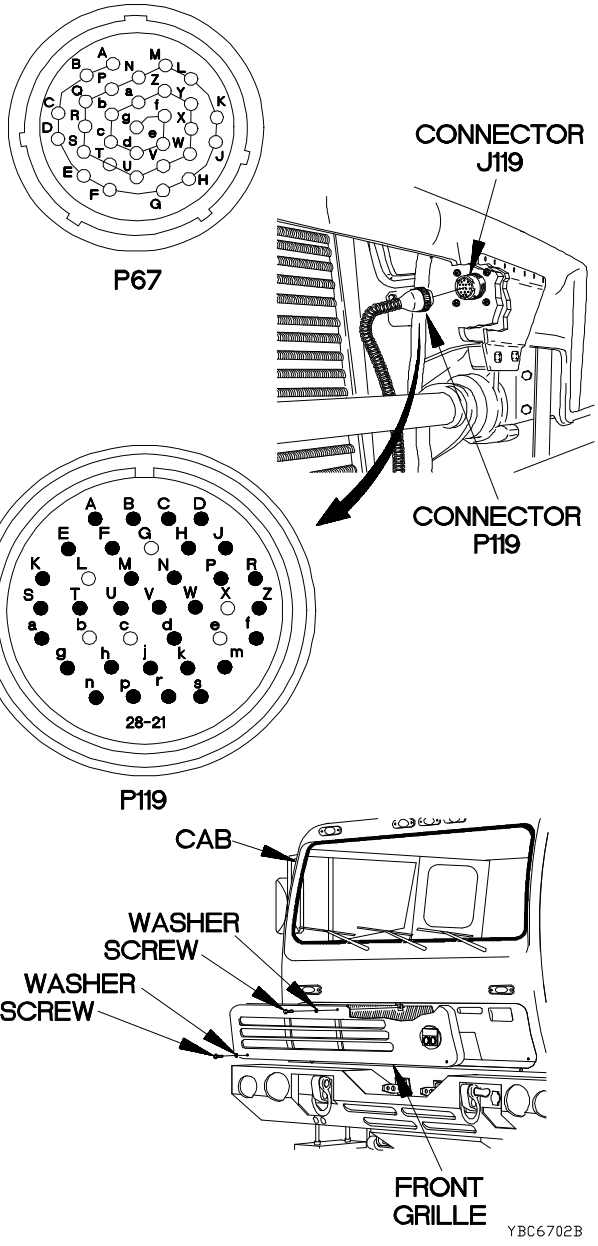


c67. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 22 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

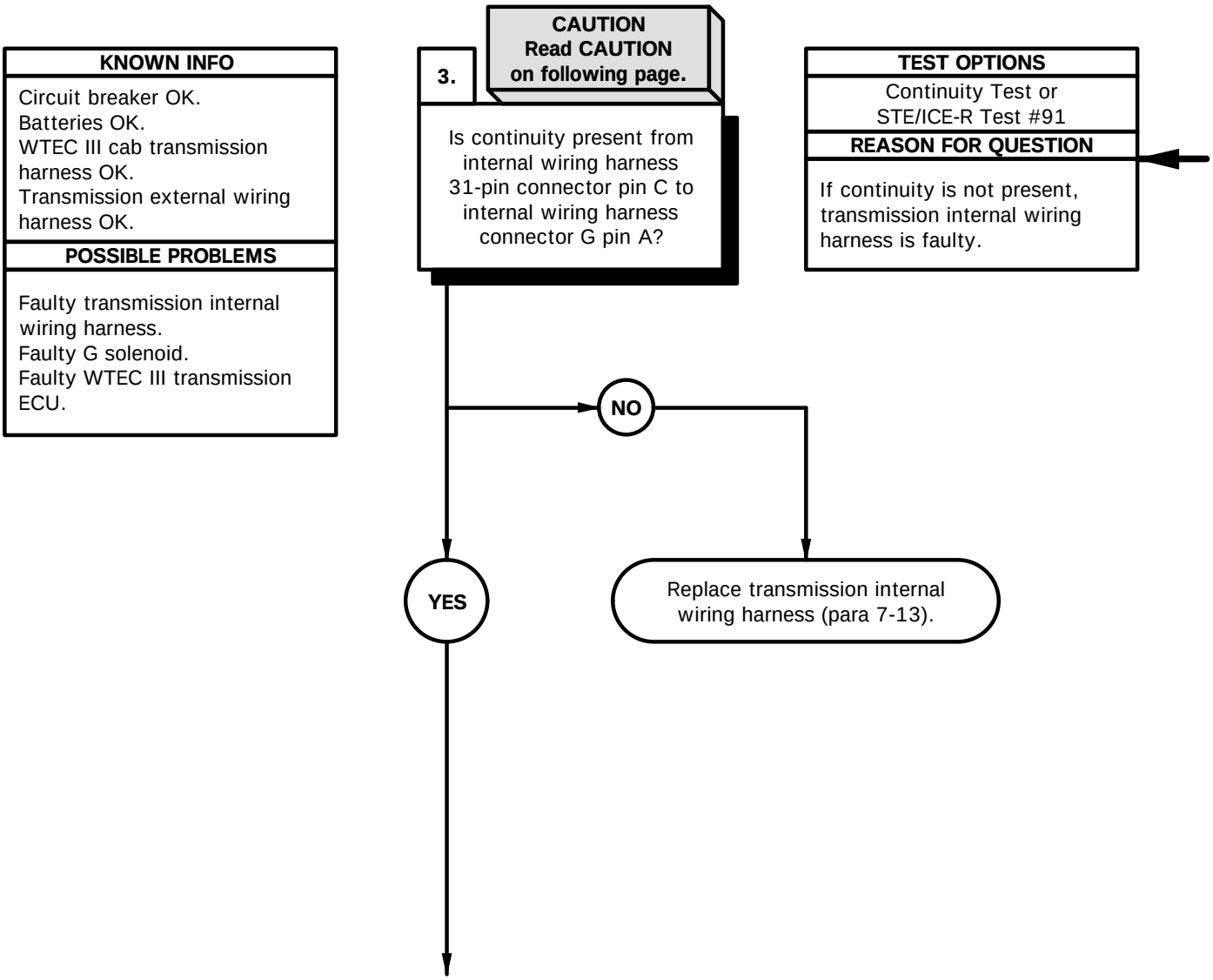


CONTINUITY TEST

(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)

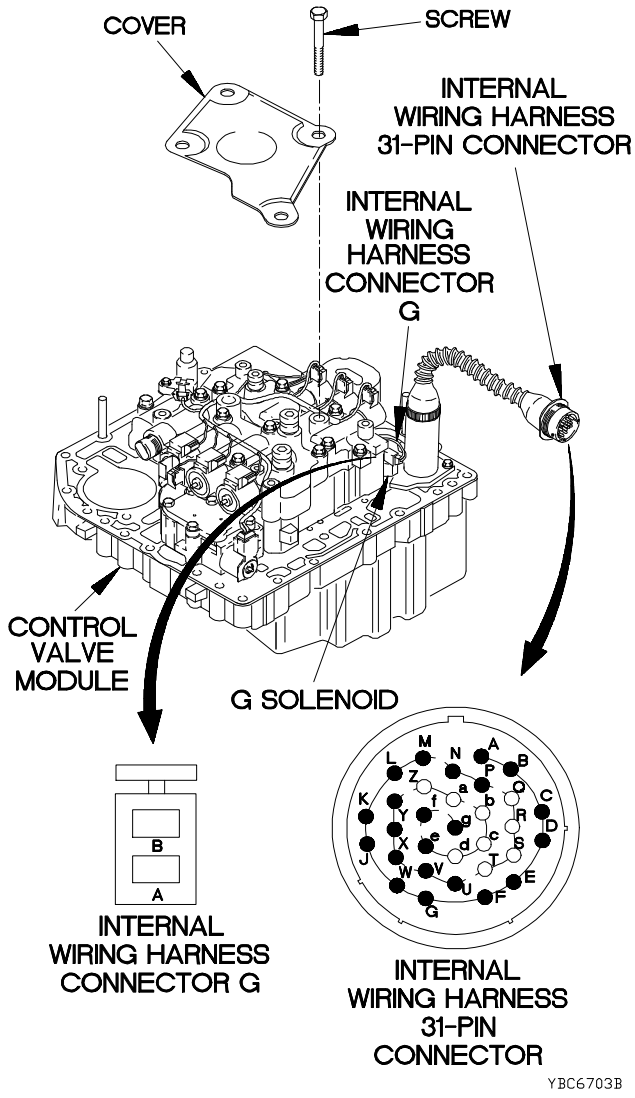


CAUTION

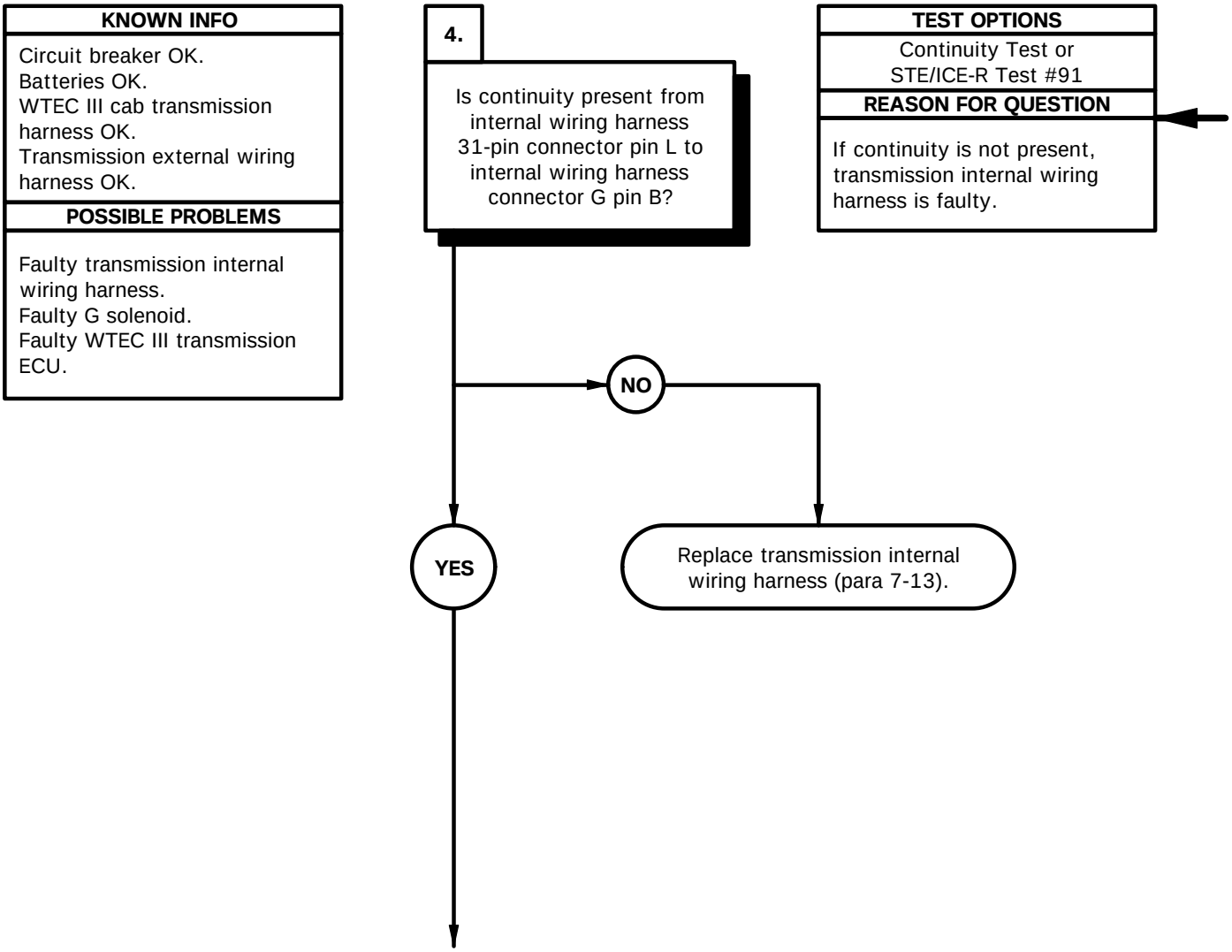
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

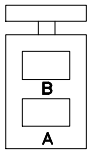


c67. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 22 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

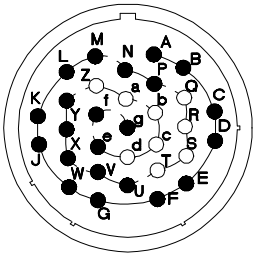


CONTINUITY TEST

(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).



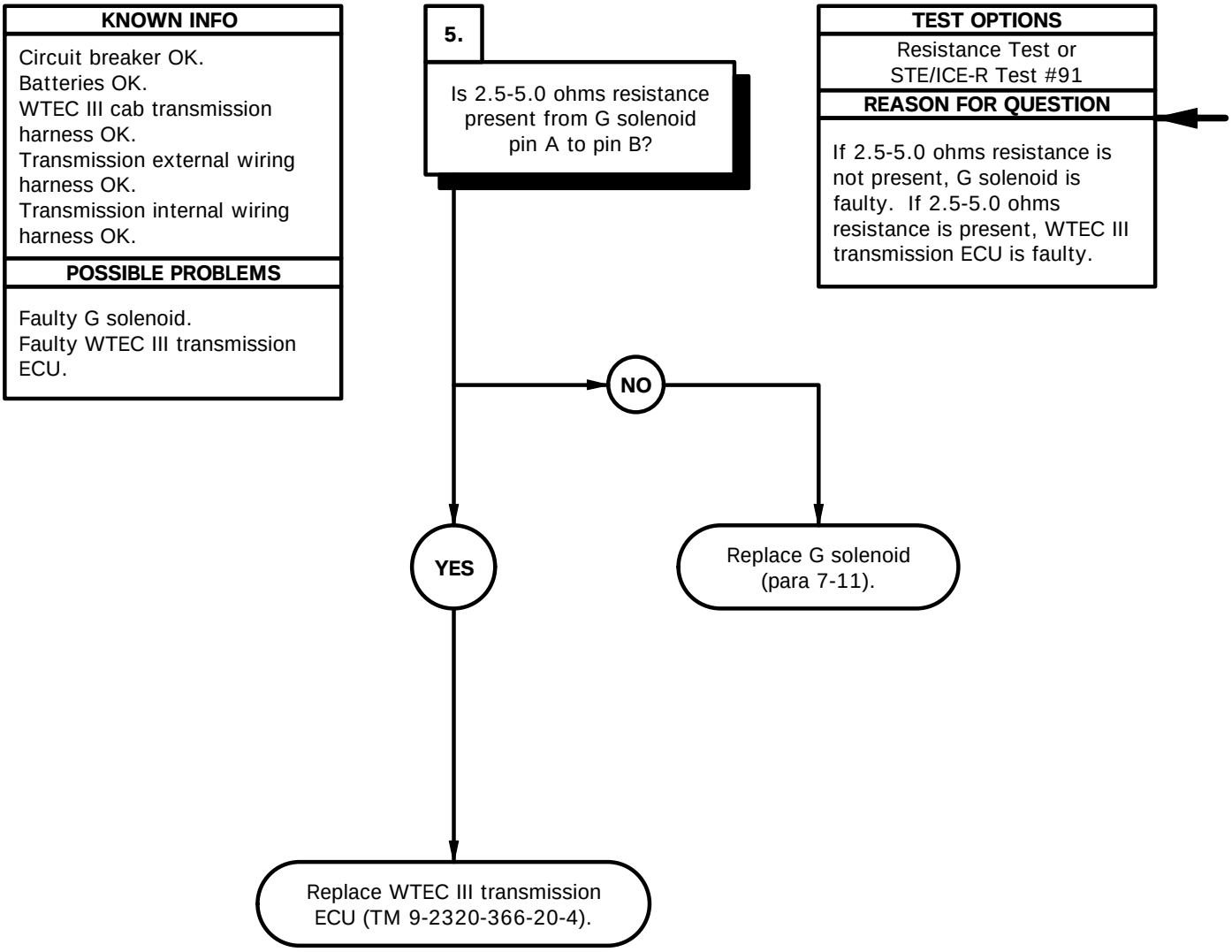
INTERNAL WIRING HARNESS CONNECTOR G



INTERNAL WIRING HARNESS 31-PIN CONNECTOR

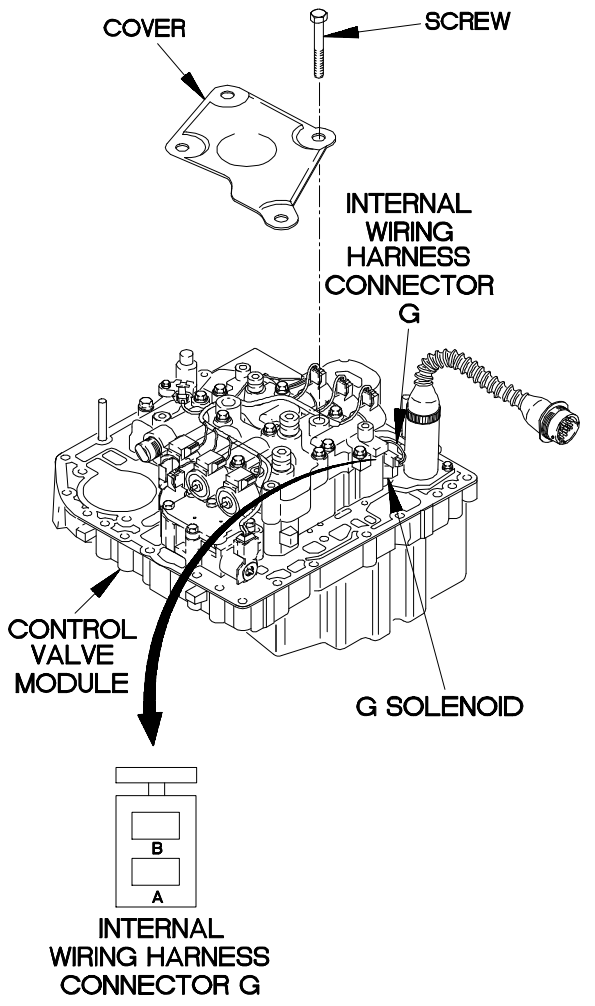
YBC6704B

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)



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).



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).

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)

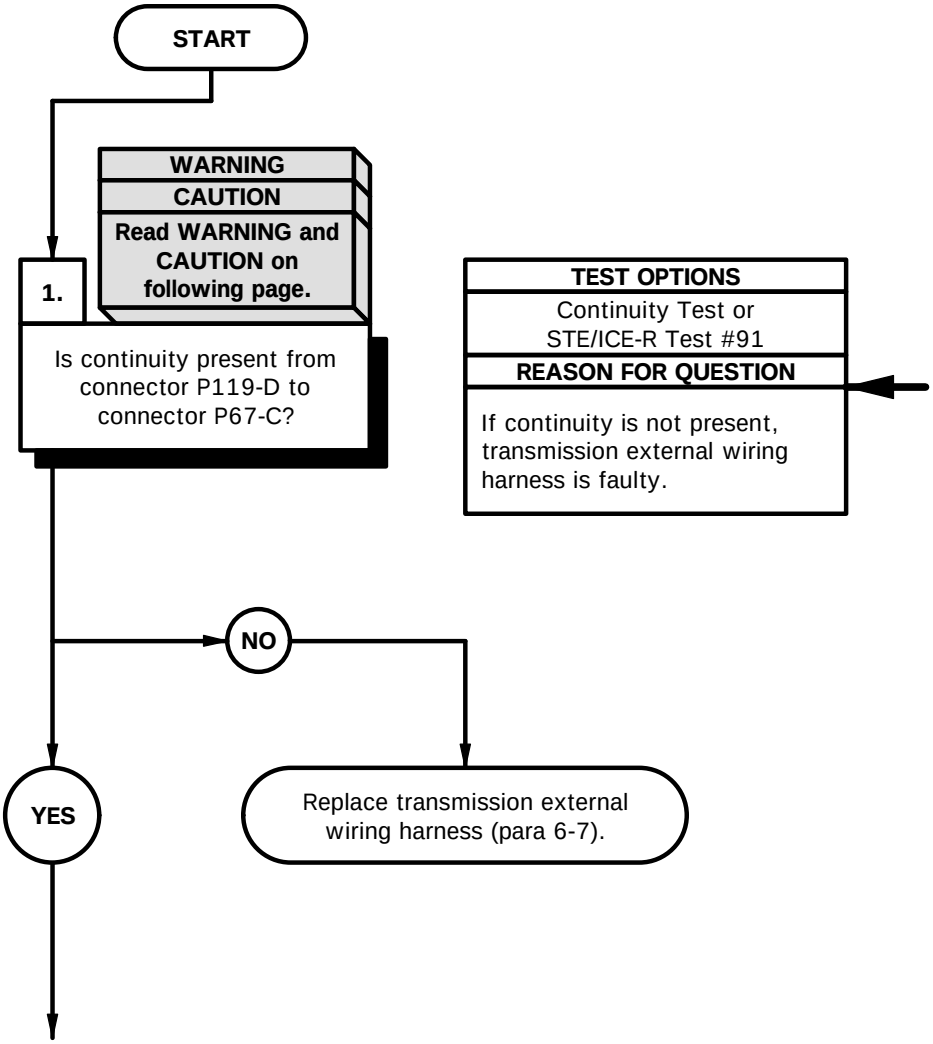
References
TM 9-4910-571-12&P

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.



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

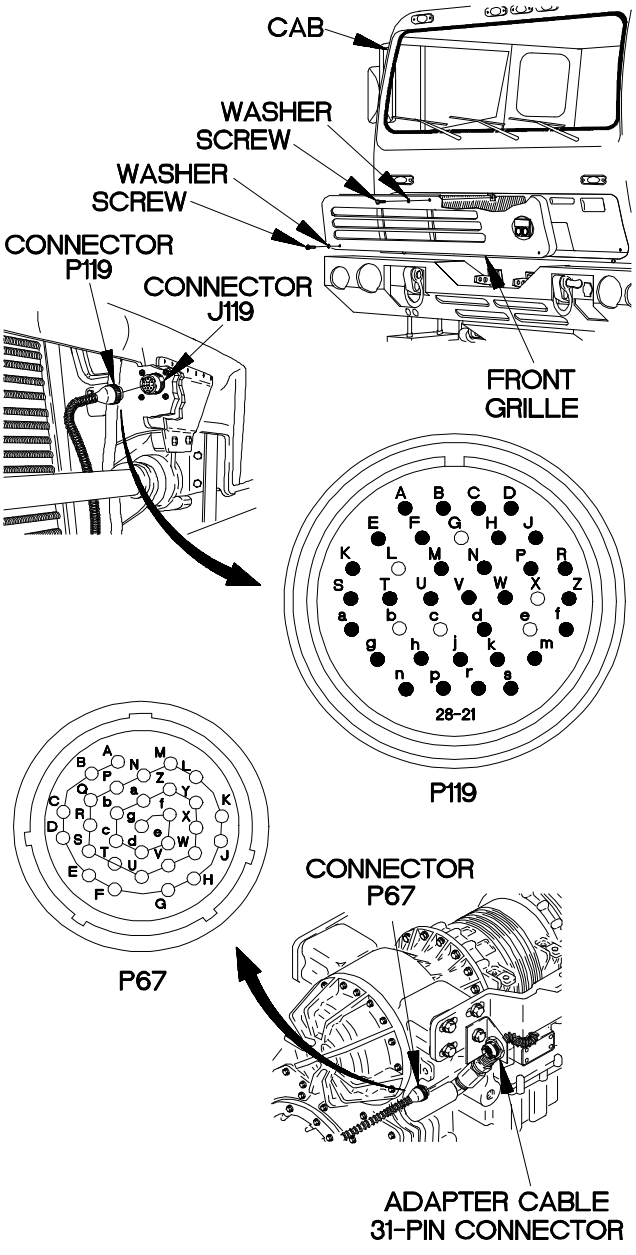
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

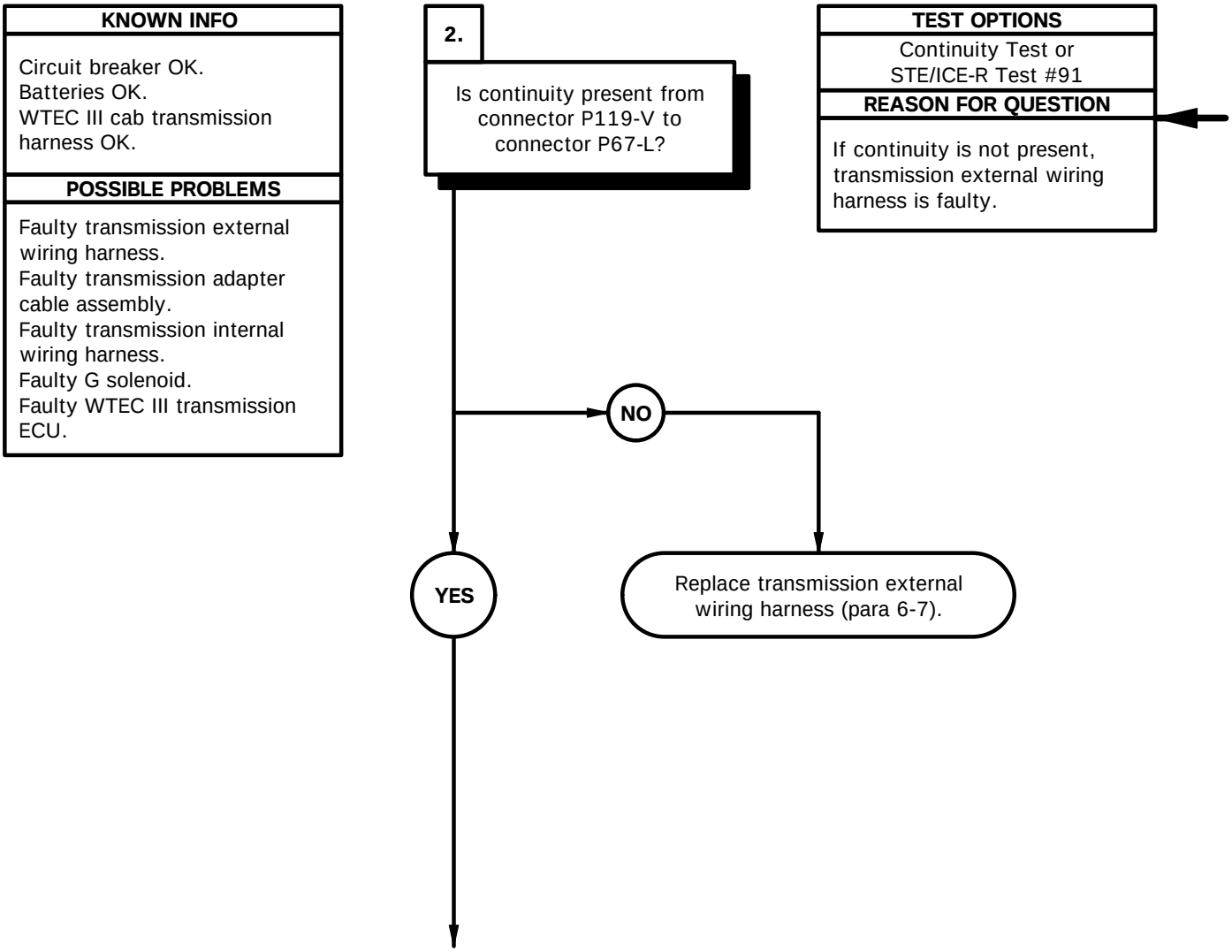
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from adapter cable 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect positive (+) probe of multimeter to connector P119-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).

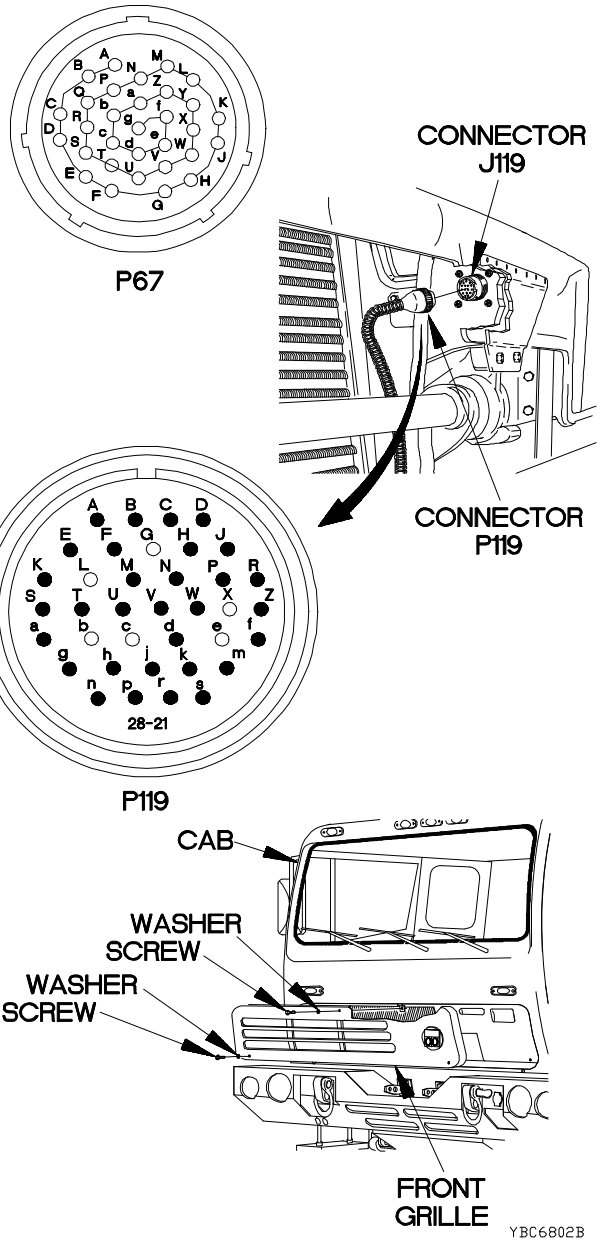


c68. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 22 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

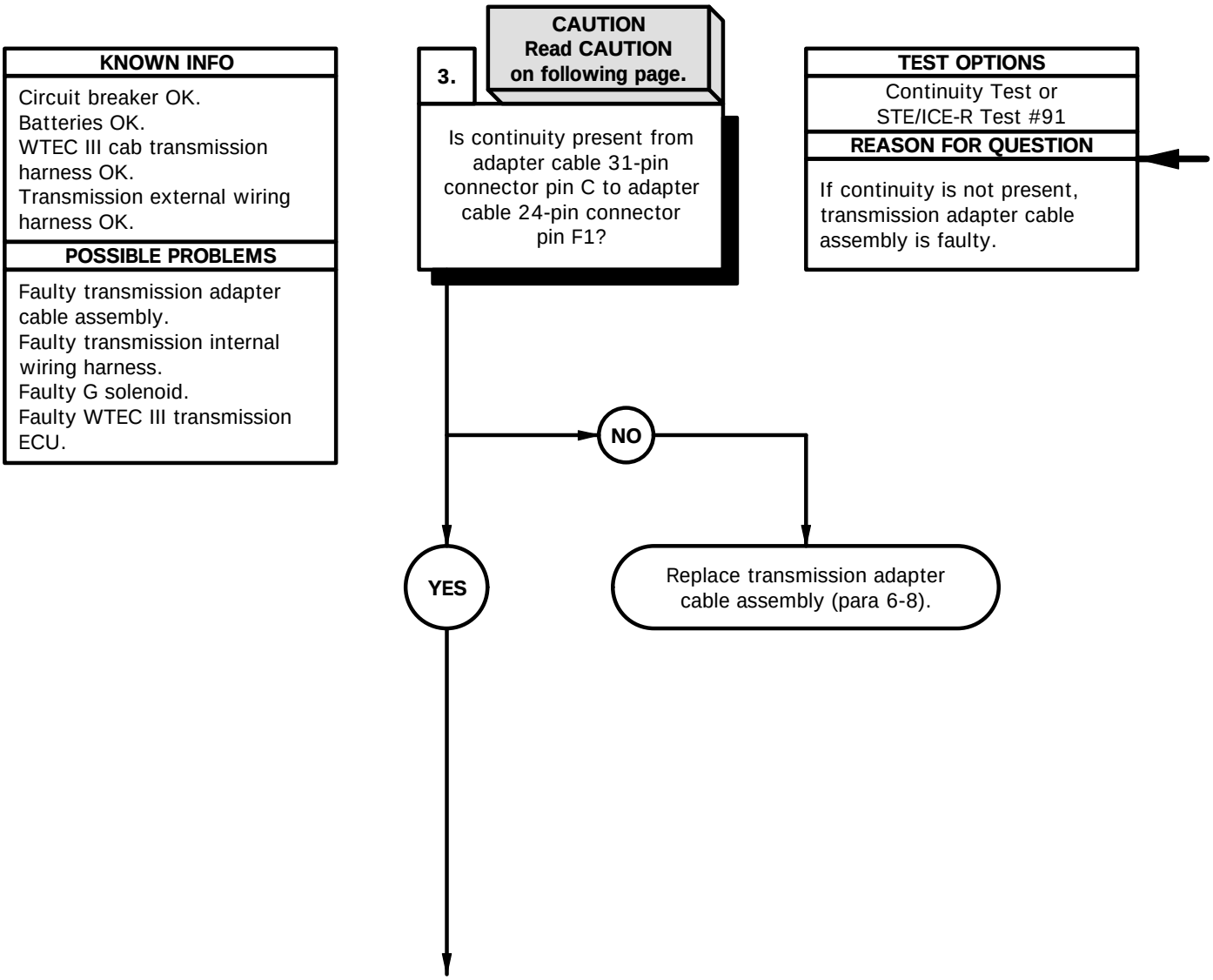


CONTINUITY TEST

(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)

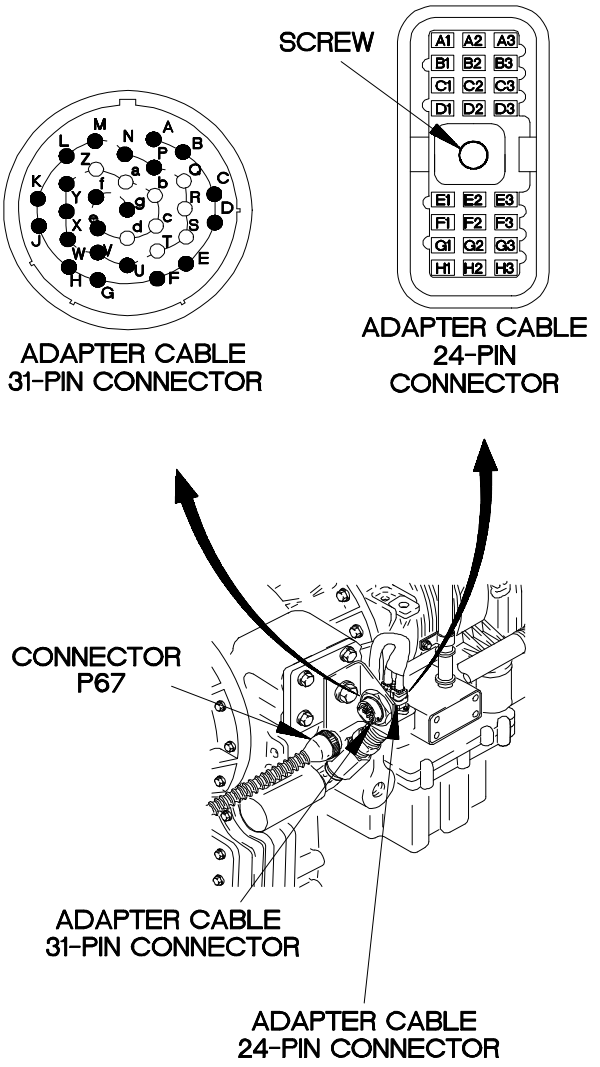


CAUTION

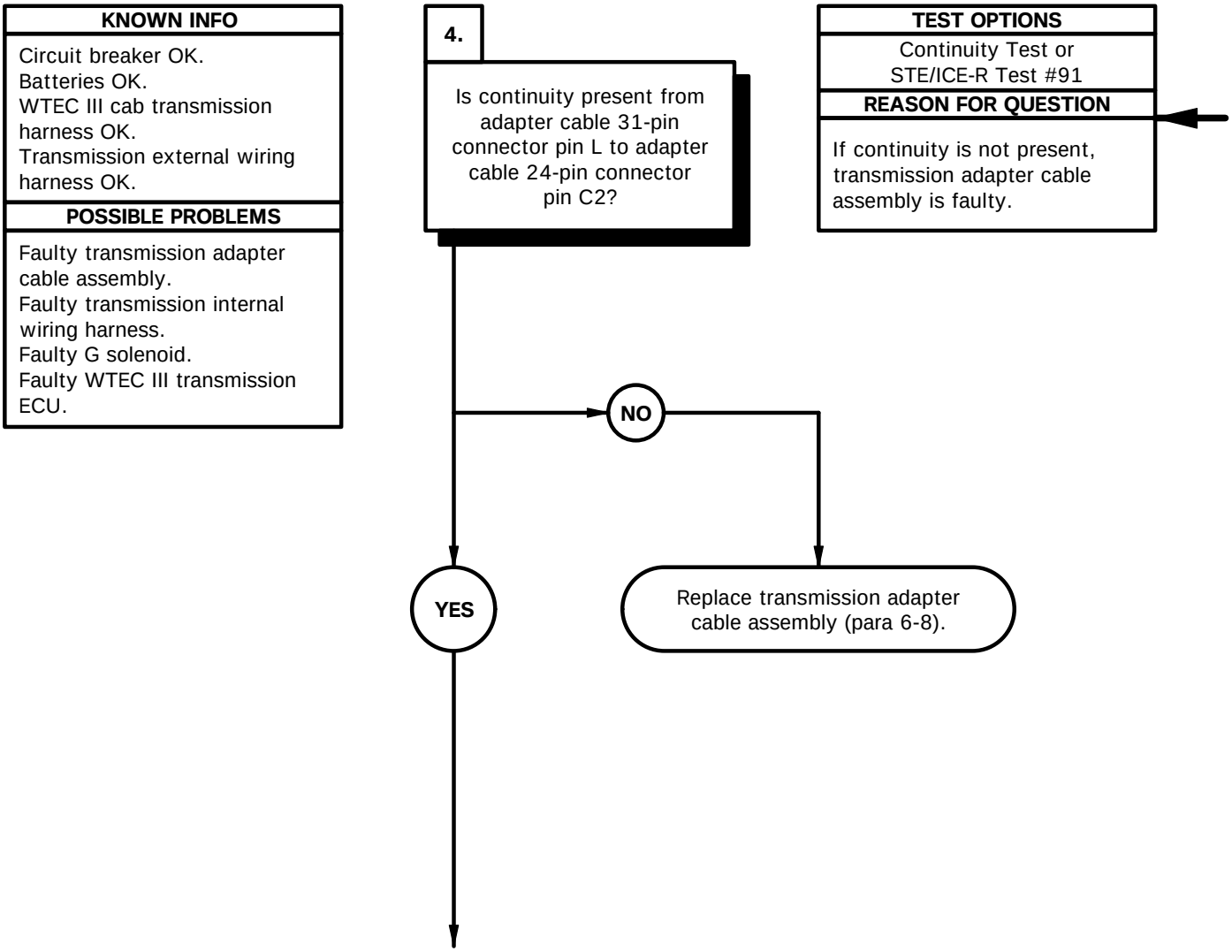
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

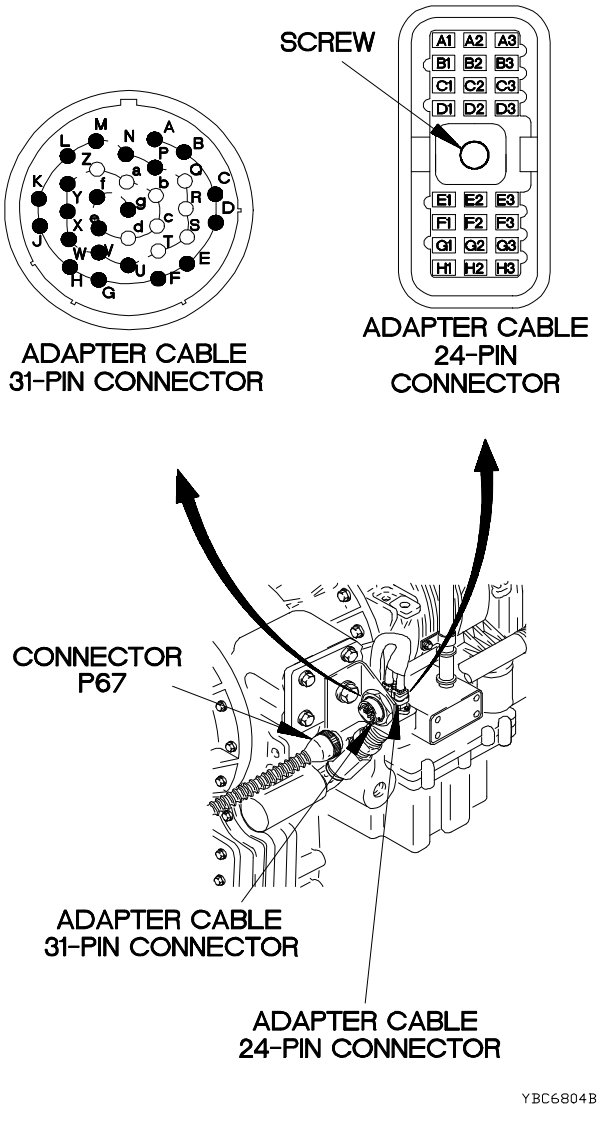


c68. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 22 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

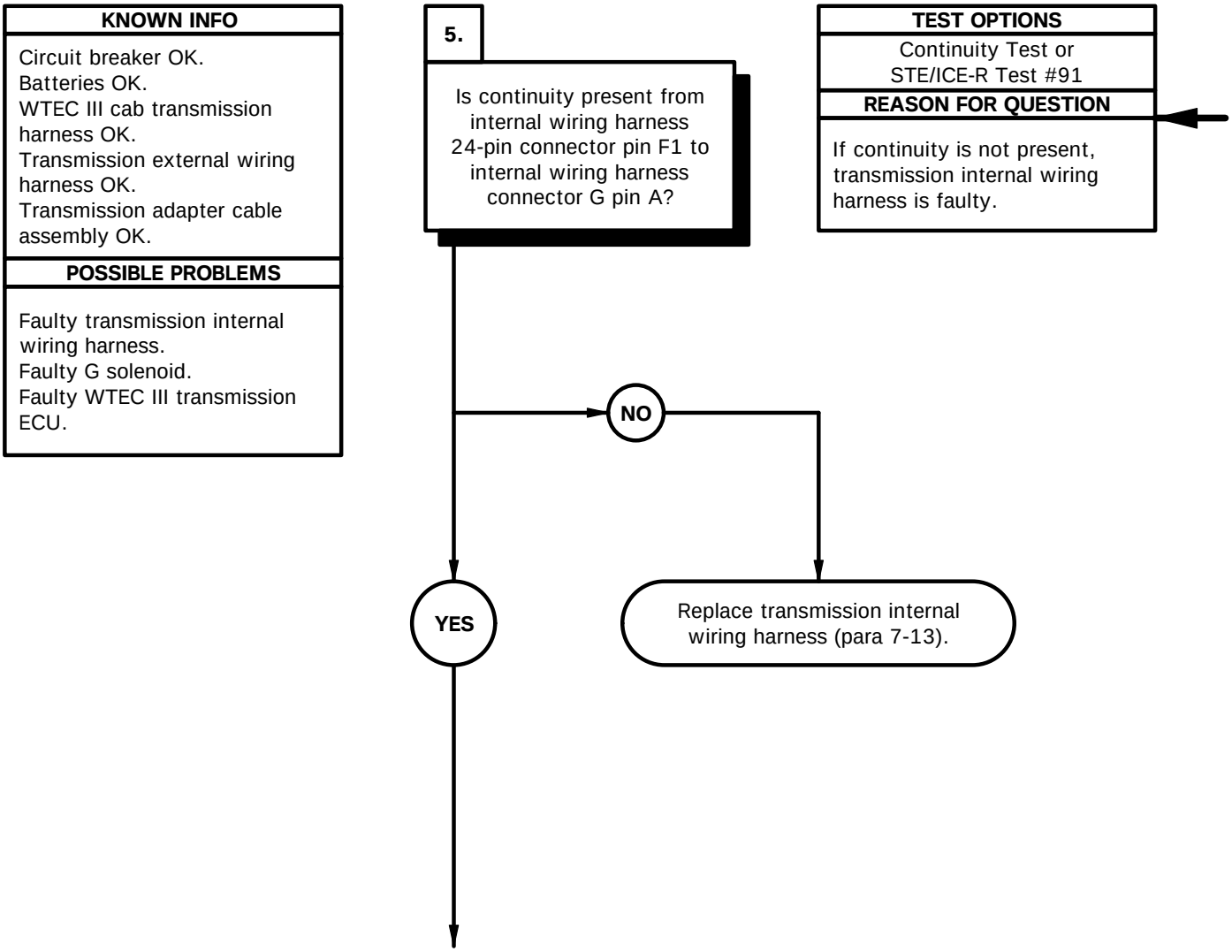


CONTINUITY TEST

(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.

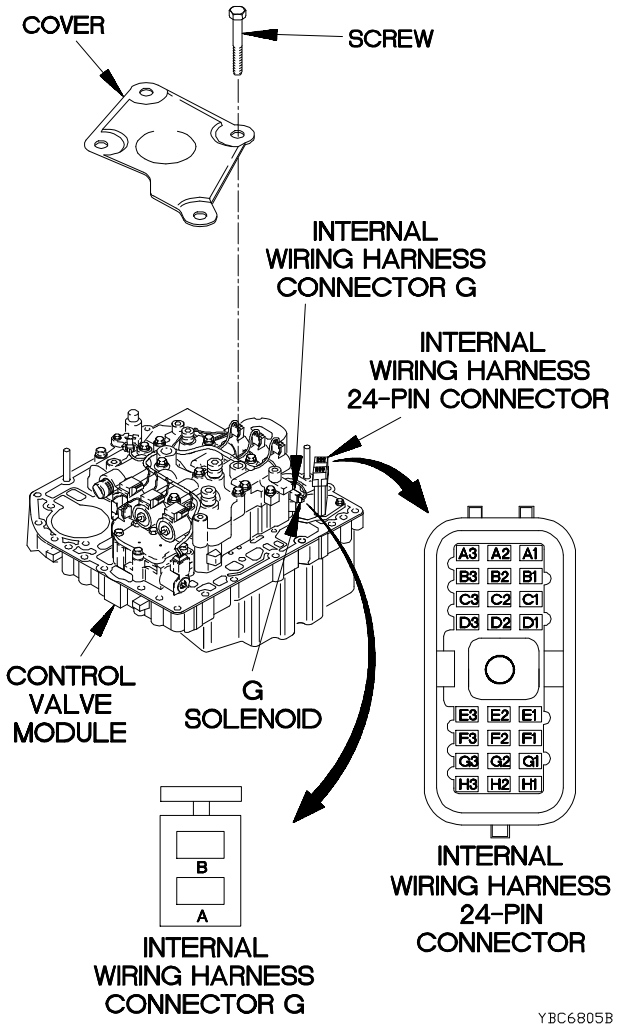


c68. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 22 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

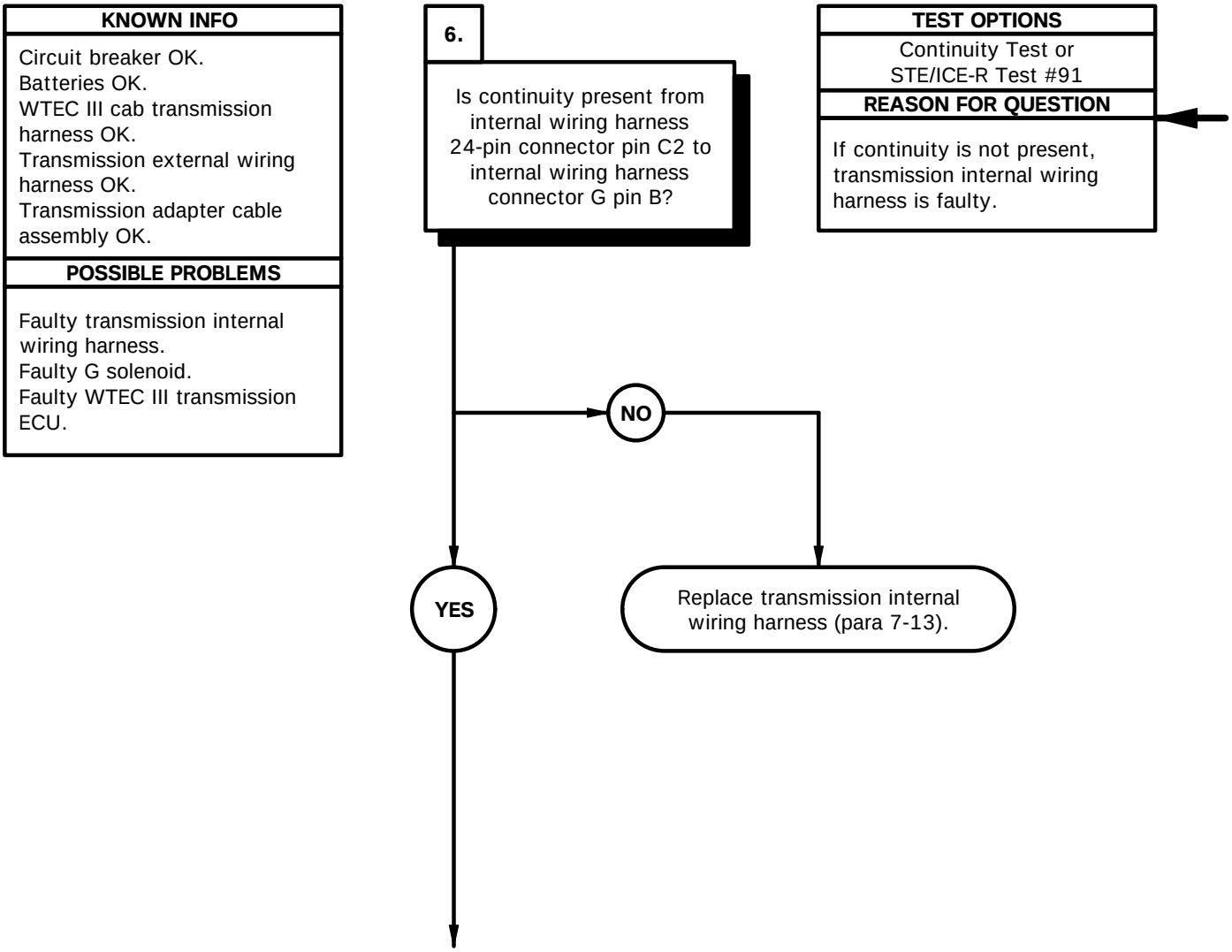


CONTINUITY TEST

(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).

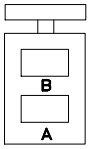


c68. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 22 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

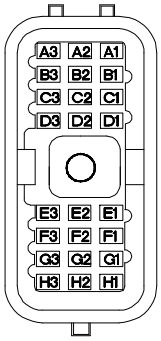


CONTINUITY TEST

(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).



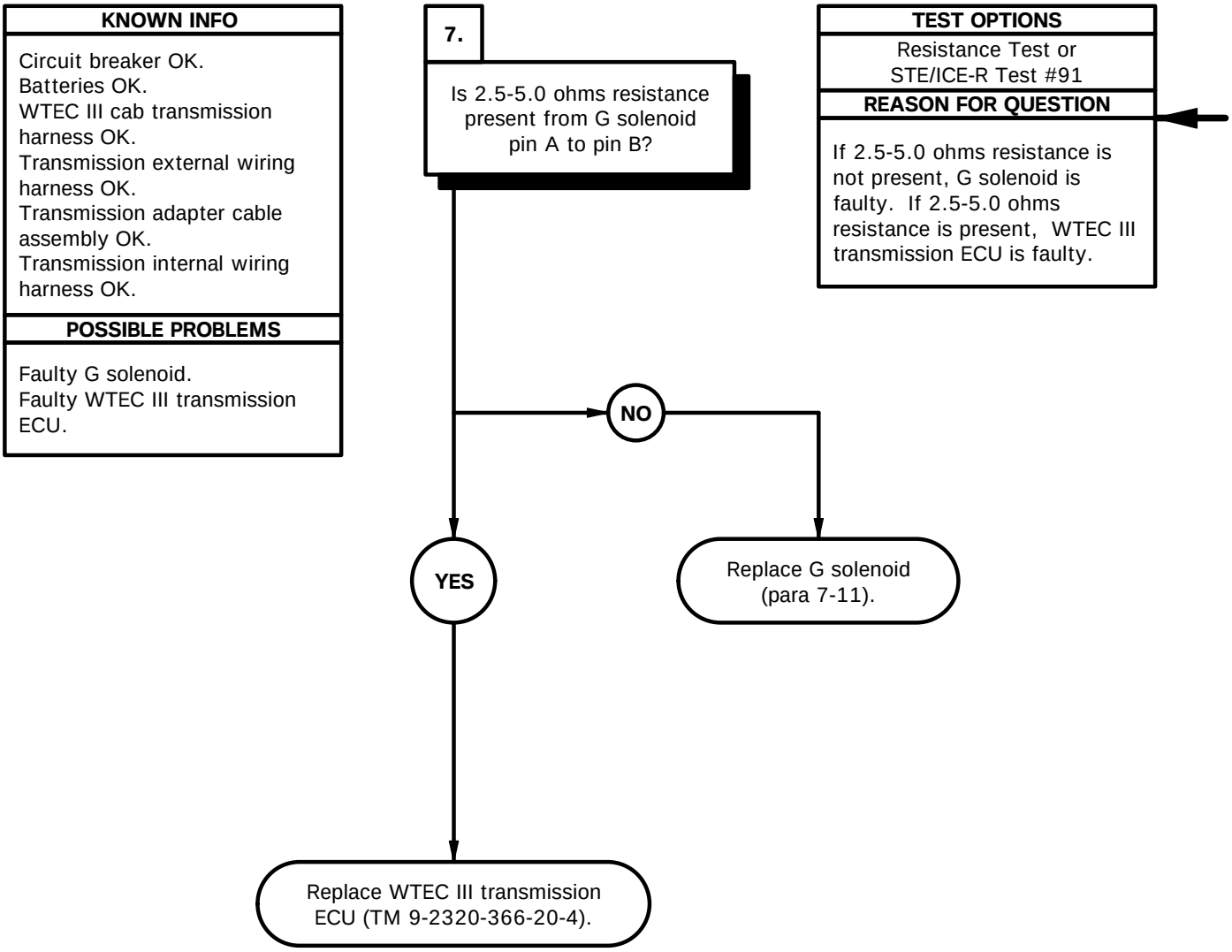
INTERNAL WIRING HARNESS CONNECTOR G



INTERNAL WIRING HARNESS 24-PIN CONNECTOR

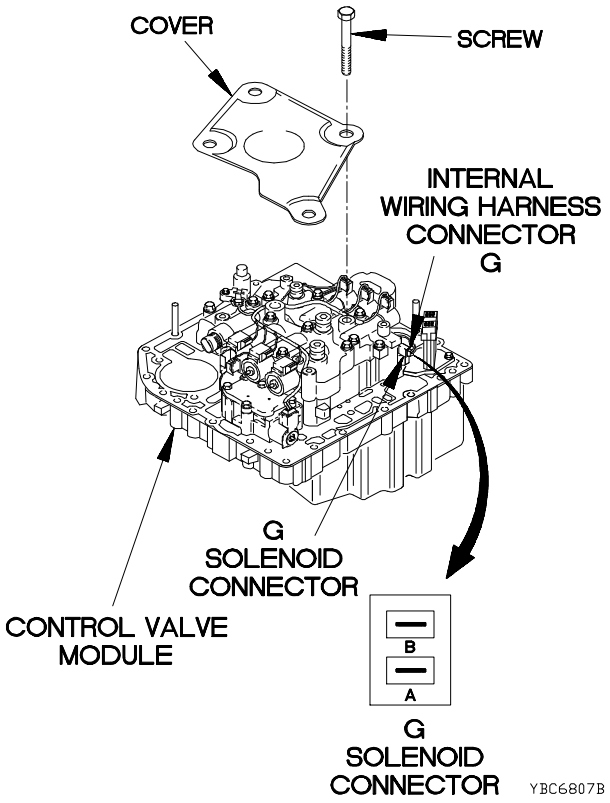
TA248806B

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)



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

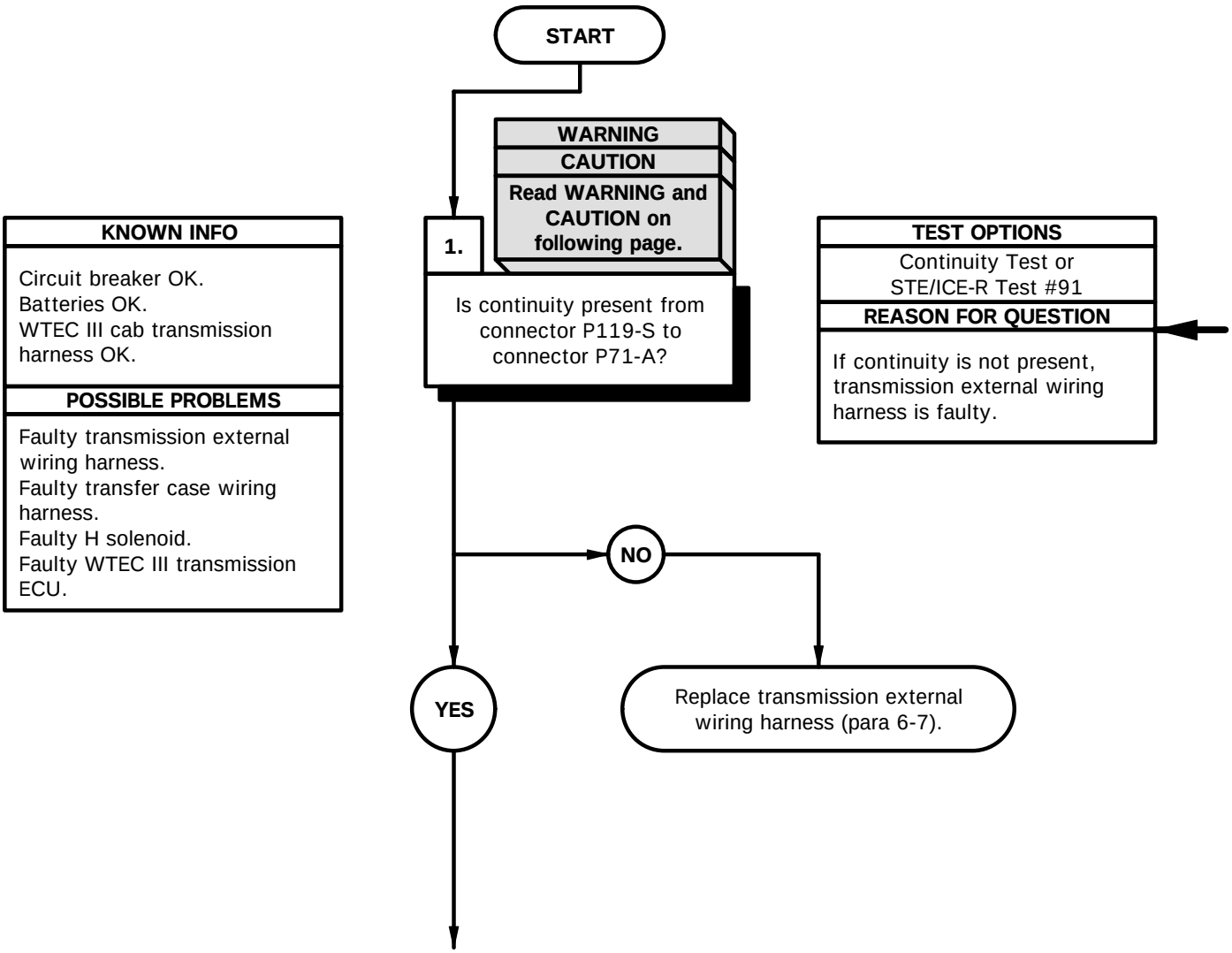
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

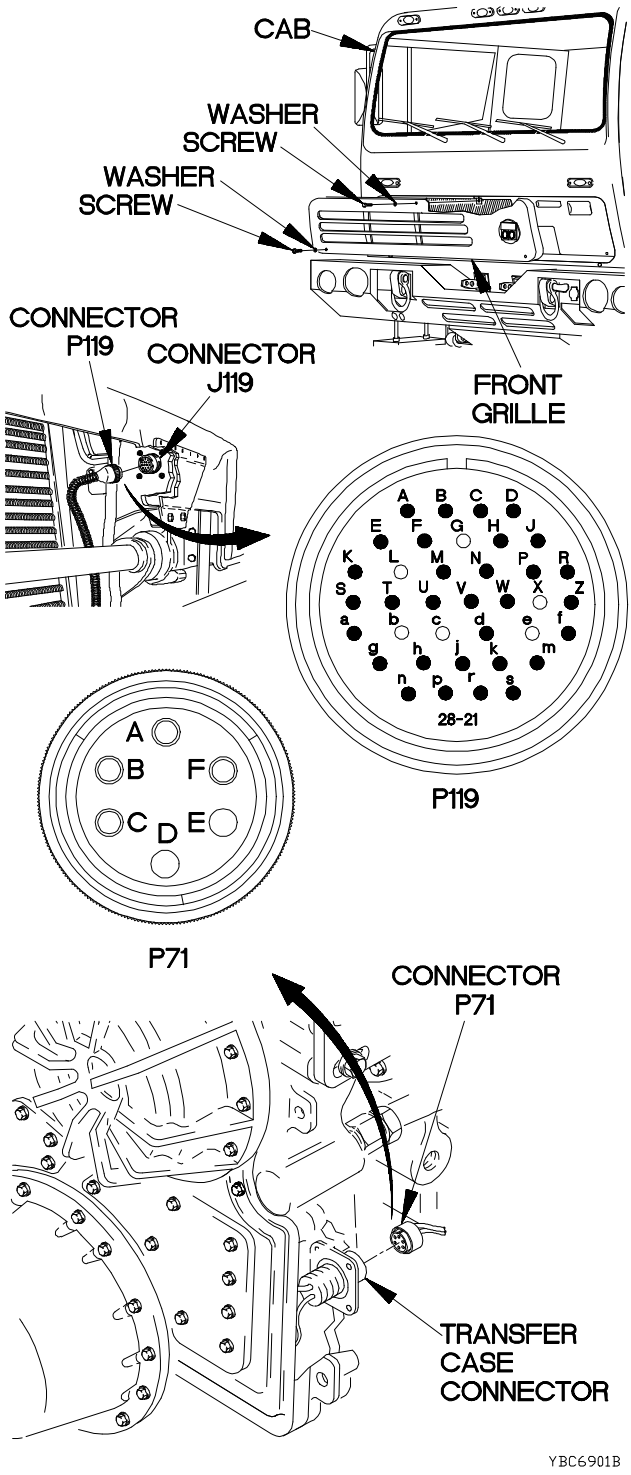
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

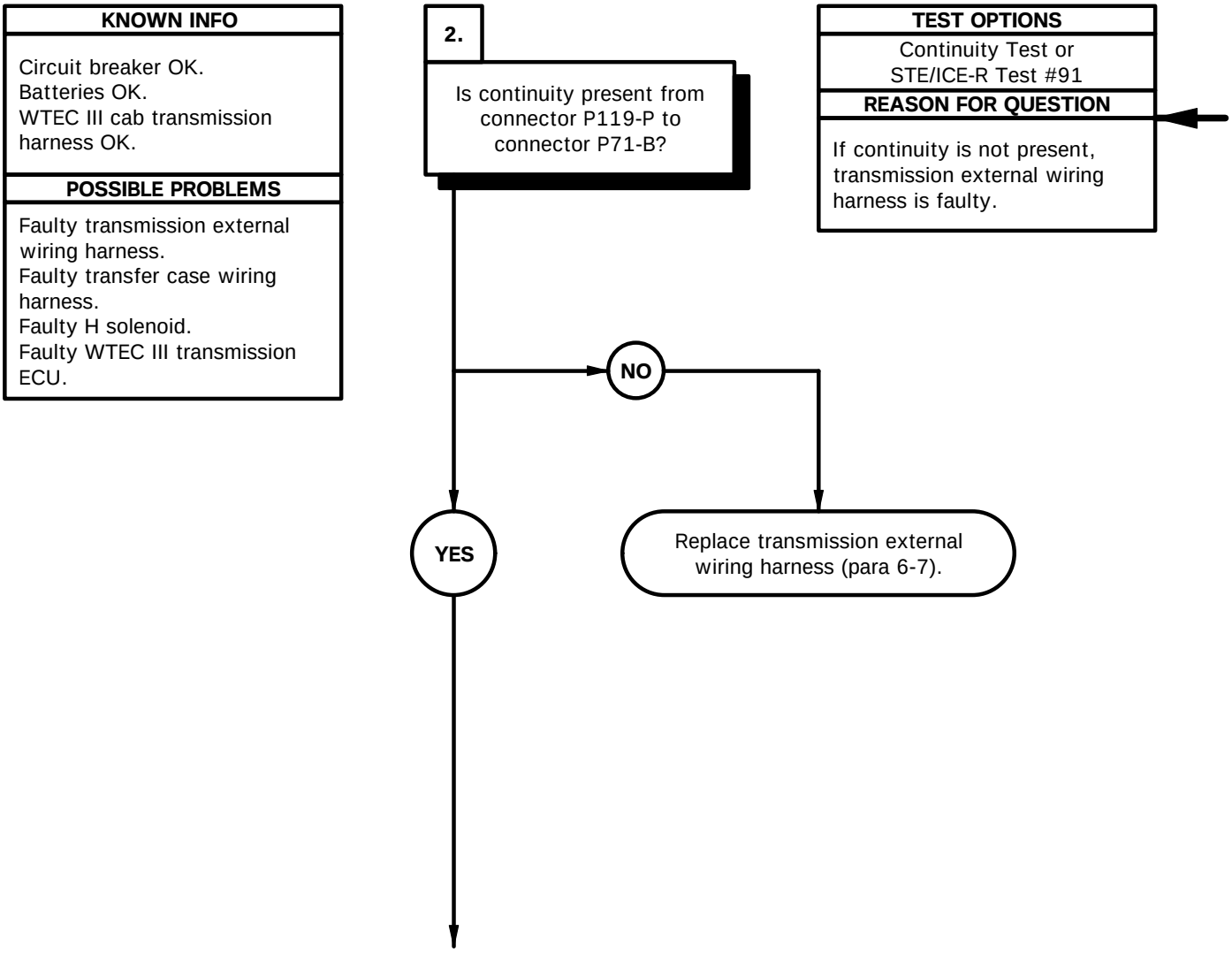
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P71 from transfer case connector.
(6) Set multimeter to ohms.
(7) Connect positive (+) probe 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).

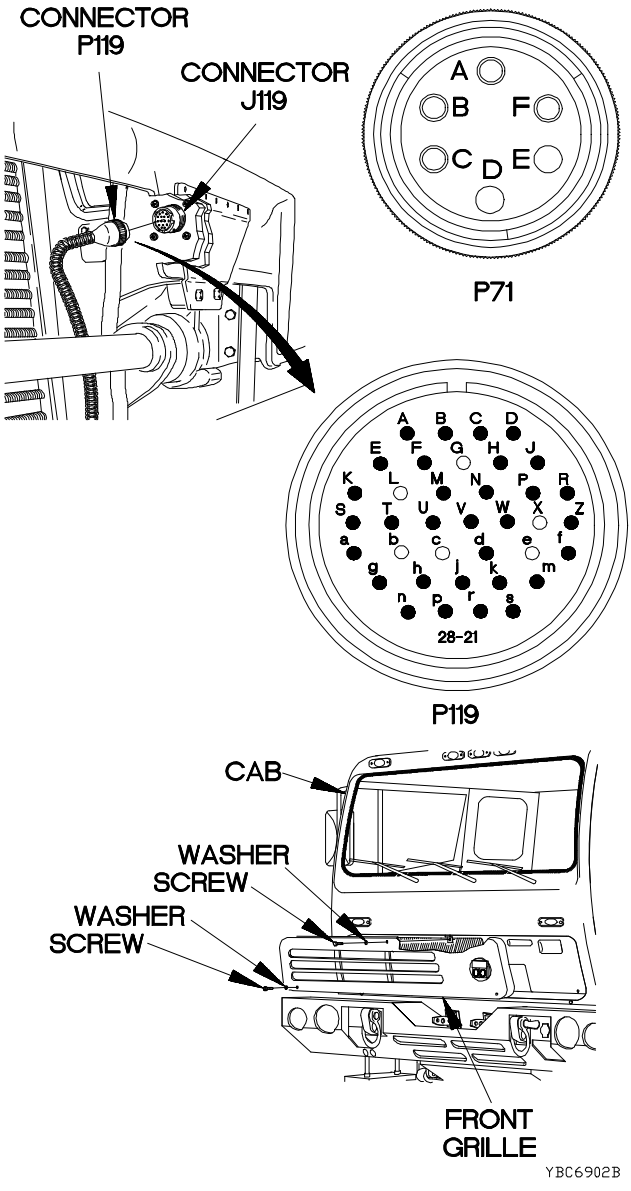


c69. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46 AND/OR 69 SUB CODE 23 (CONT)

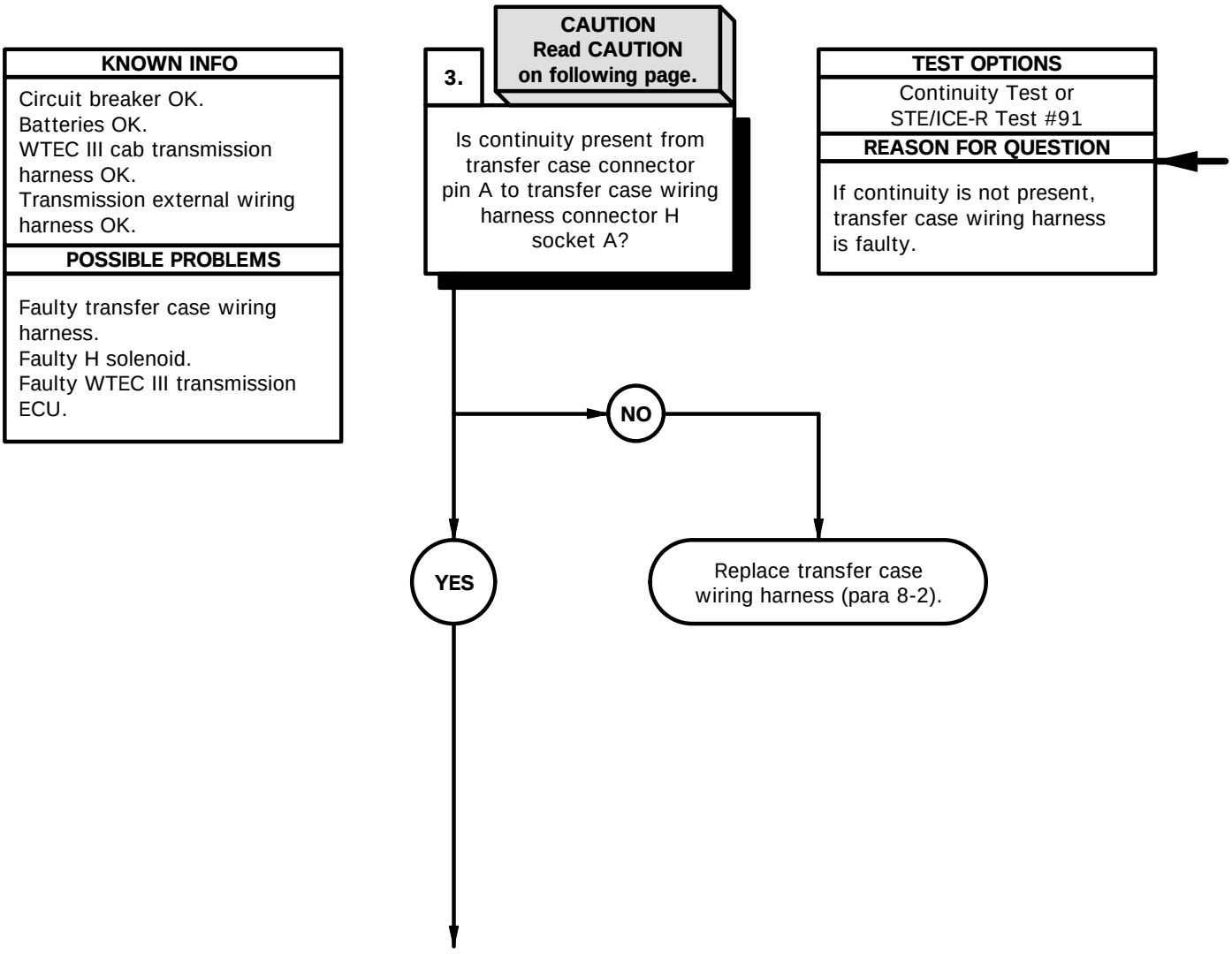


CONTINUITY TEST

(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).



c69. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46 AND/OR 69 SUB CODE 23 (CONT)

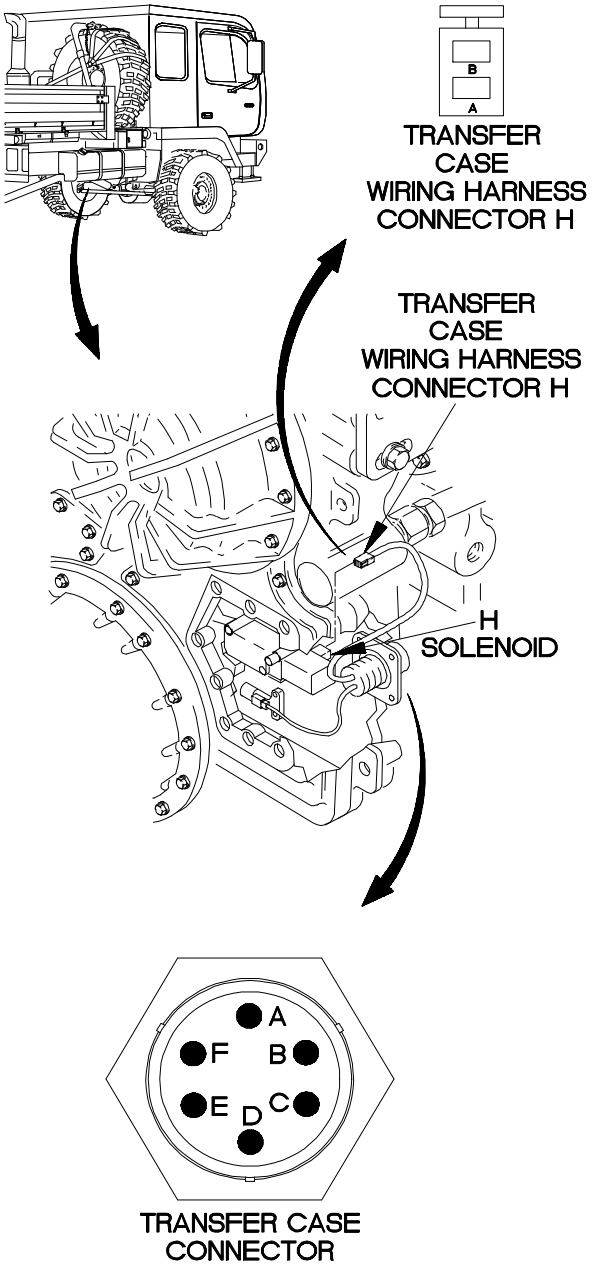


CAUTION

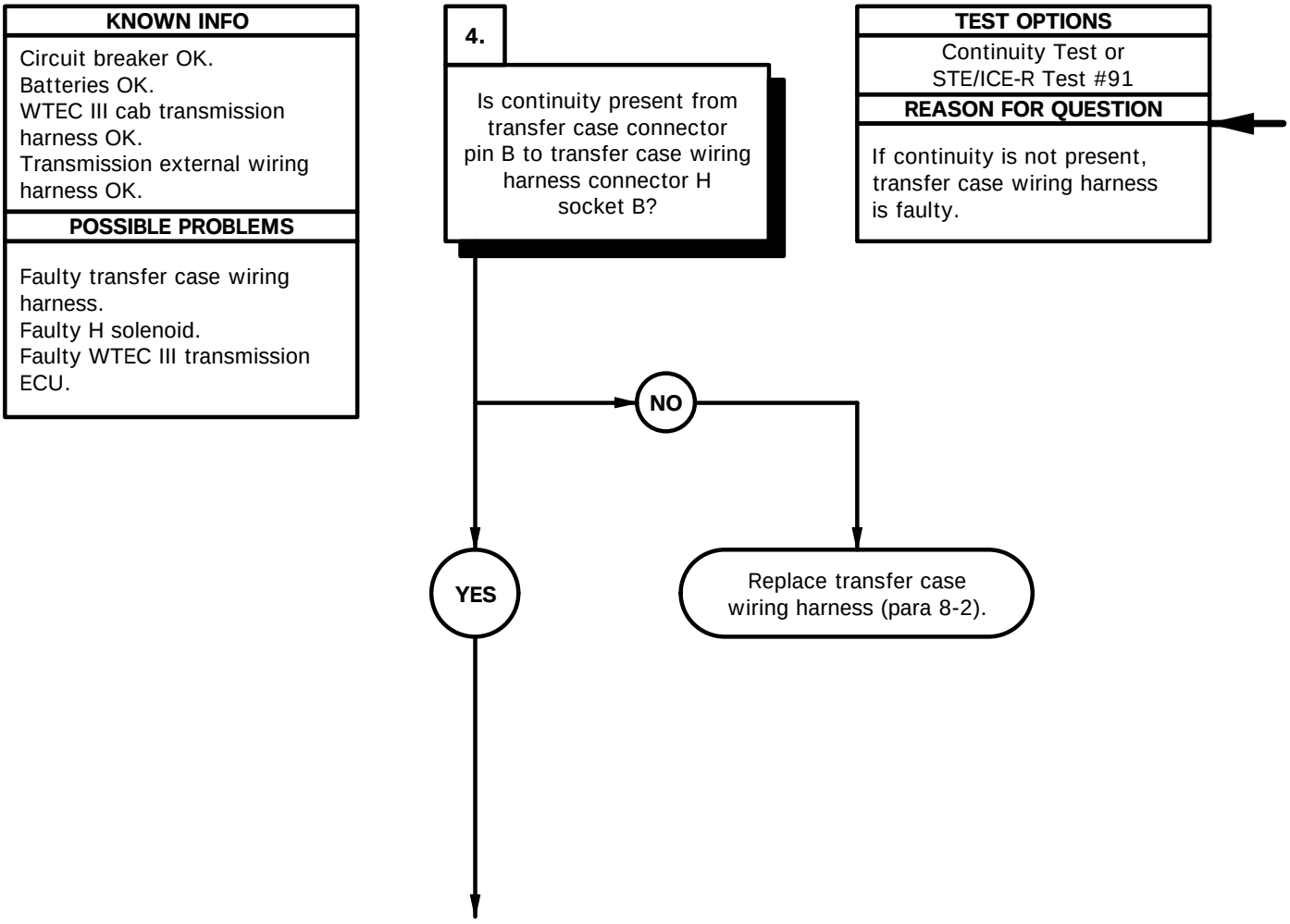
Use care when disconnecting transmission internal wiring harness connectors. Failure to comply may result in damage to equipment.

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).

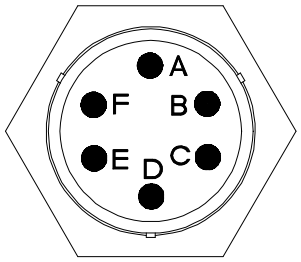


c69. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46 AND/OR 69 SUB CODE 23 (CONT)

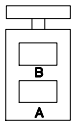


CONTINUITY TEST

(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).



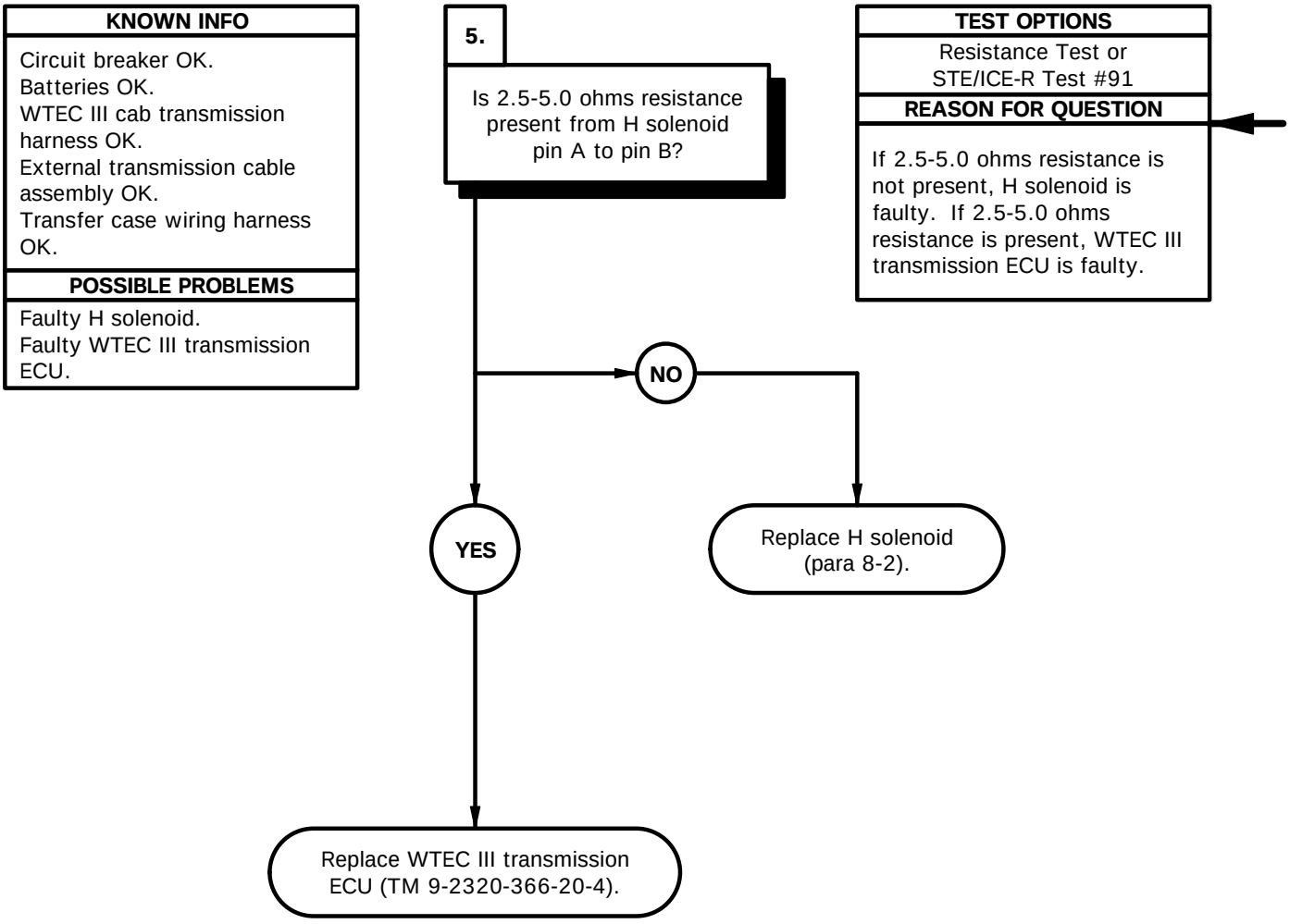
TRANSFER CASE CONNECTOR



TRANSFER CASE WIRING HARNESS CONNECTOR H

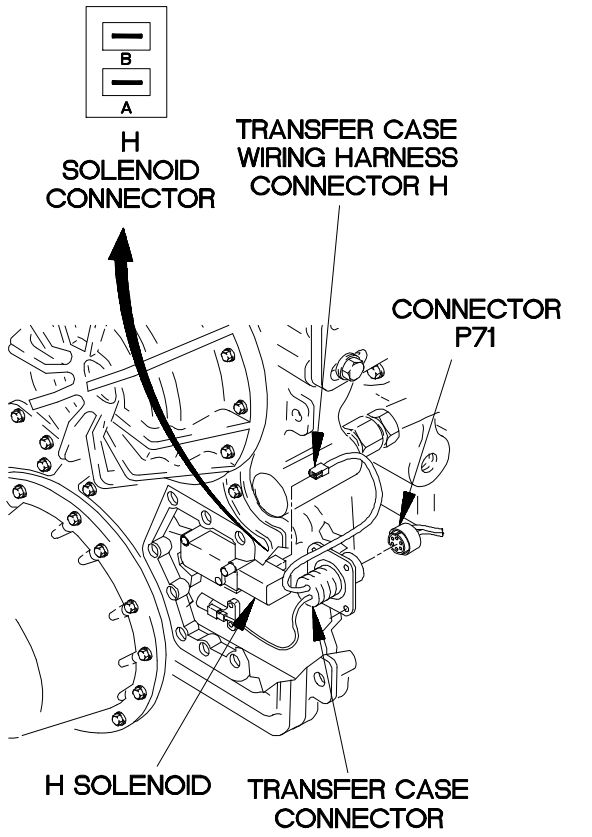
YBC6904B

c69. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46 AND/OR 69 SUB CODE 23 (CONT)



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).



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

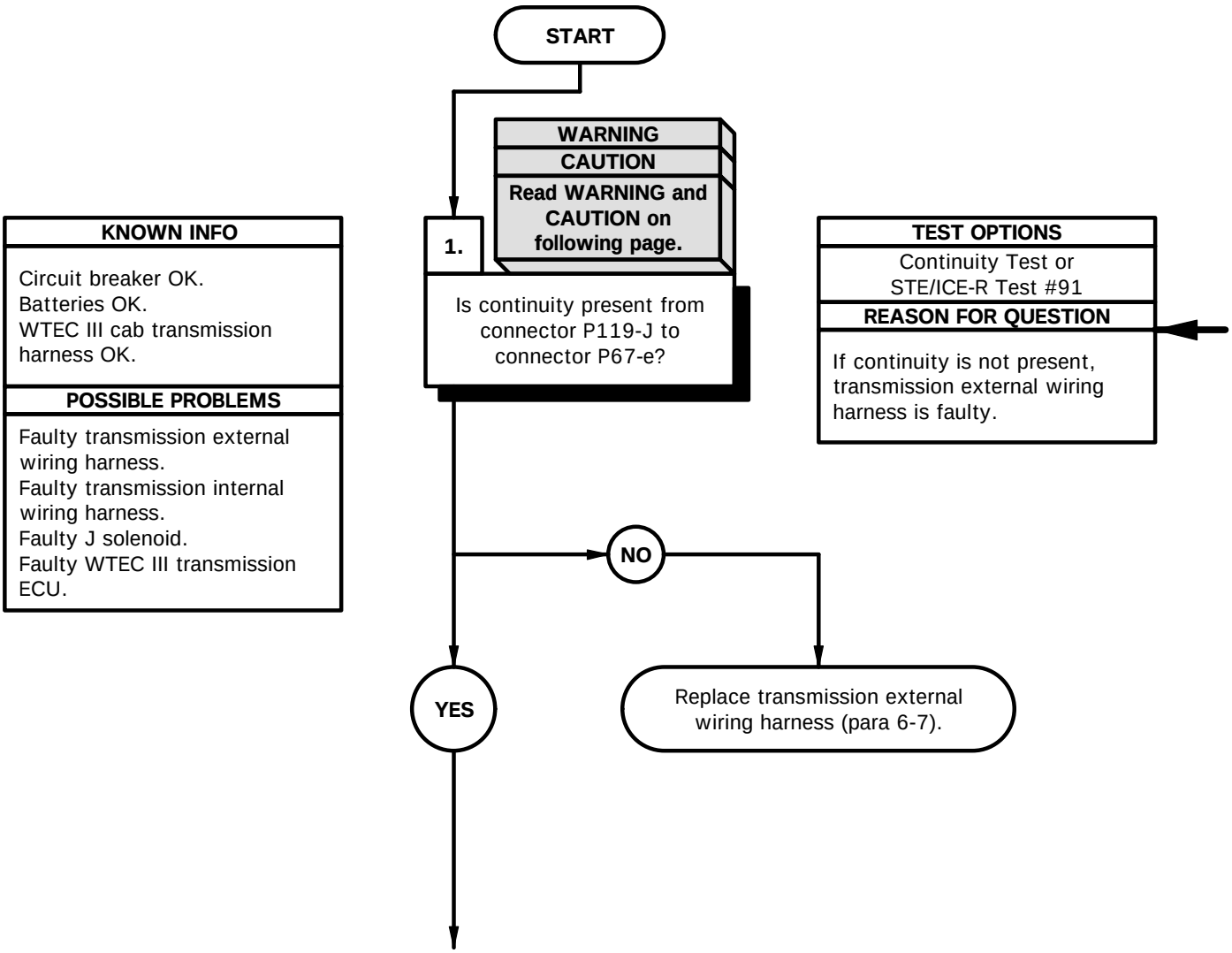
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

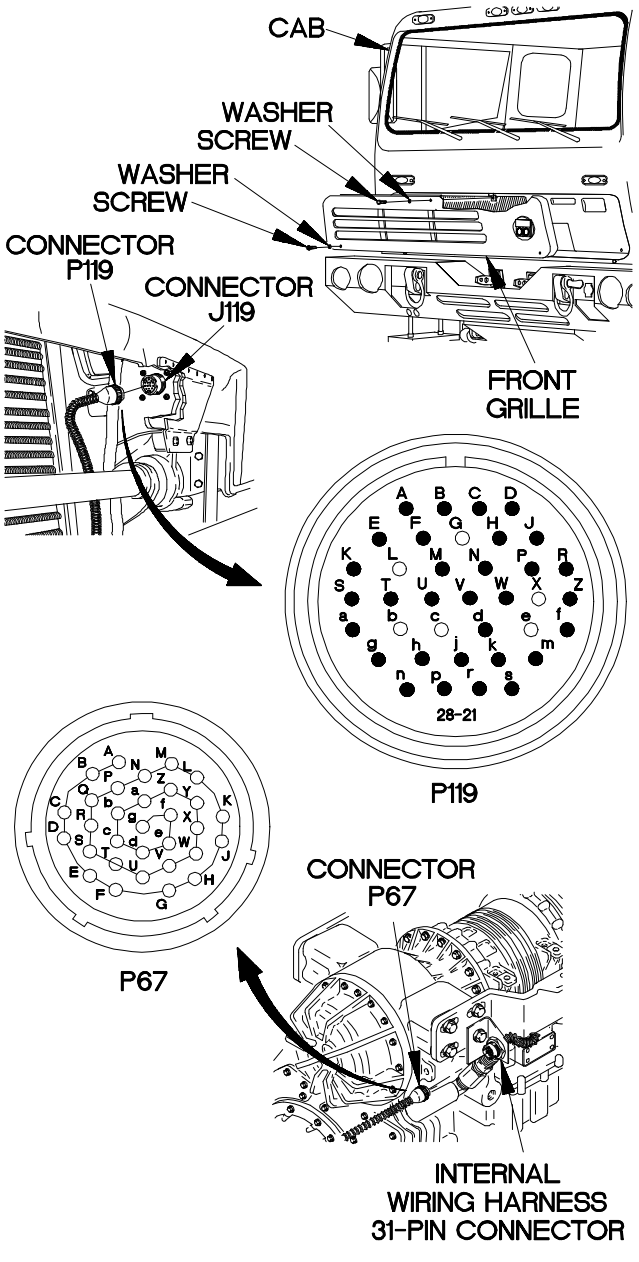
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

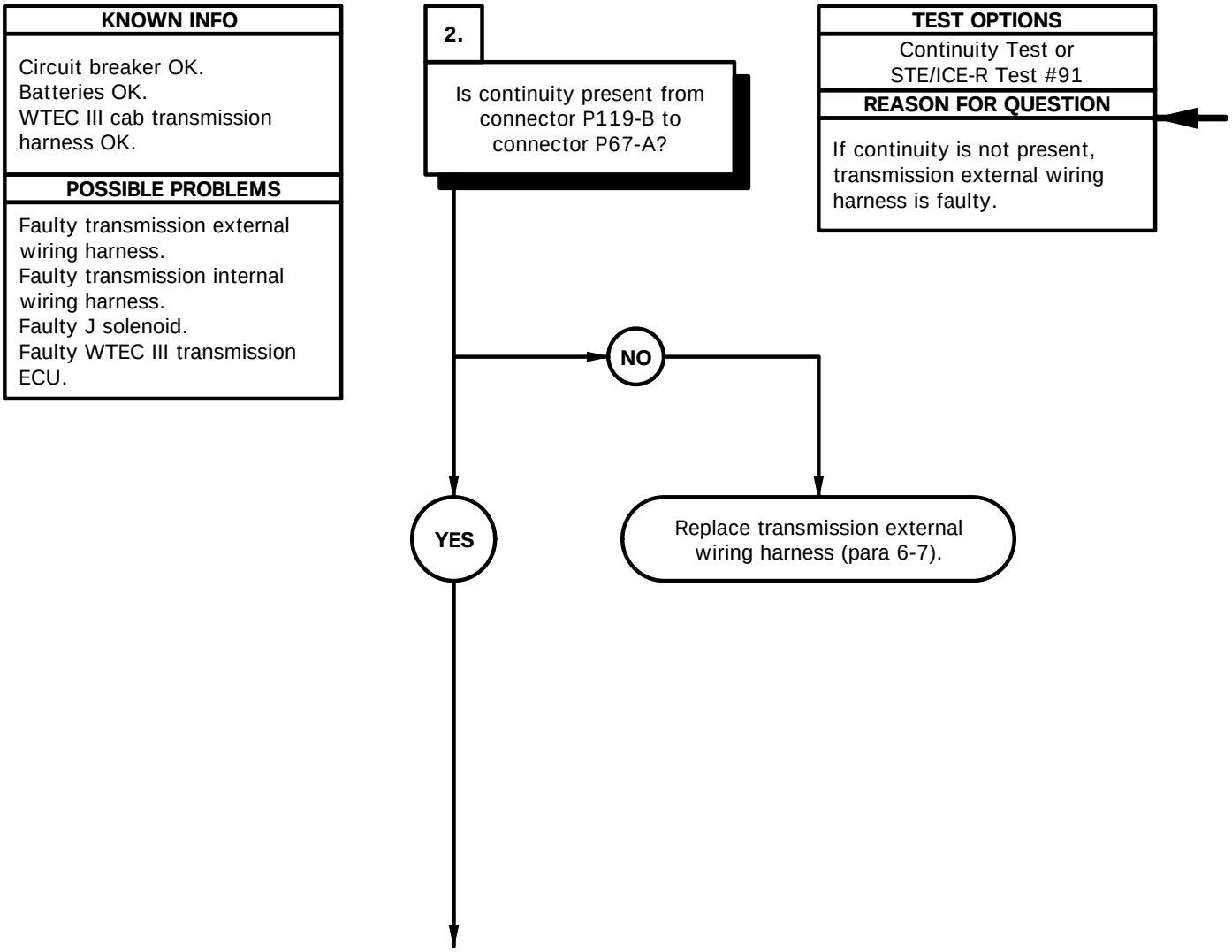
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from internal wiring 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect positive (+) 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).

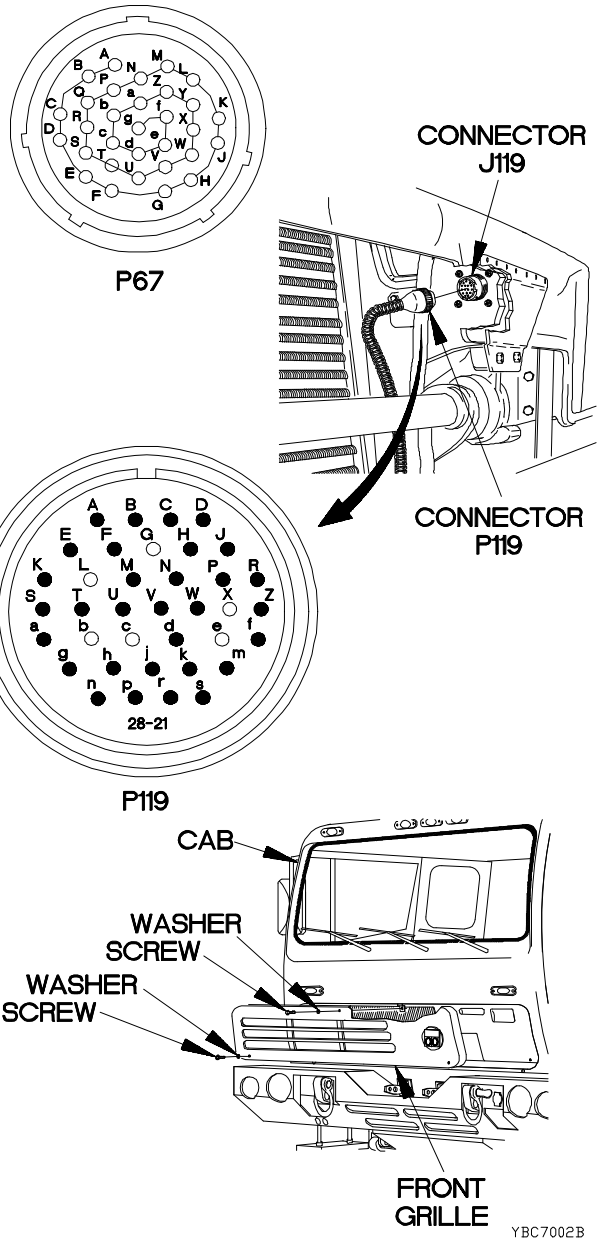


c70. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 24 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

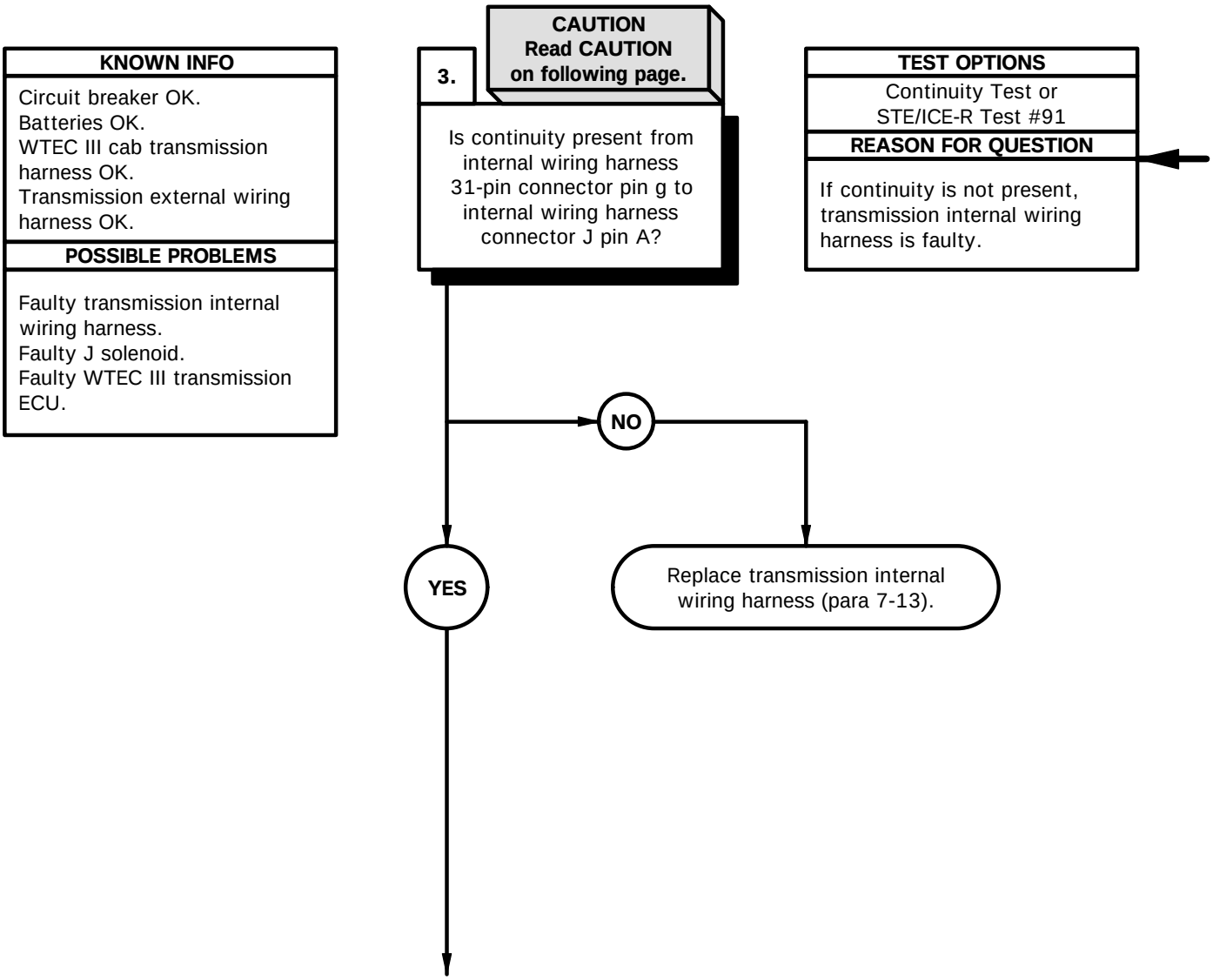


CONTINUITY TEST

(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).



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)

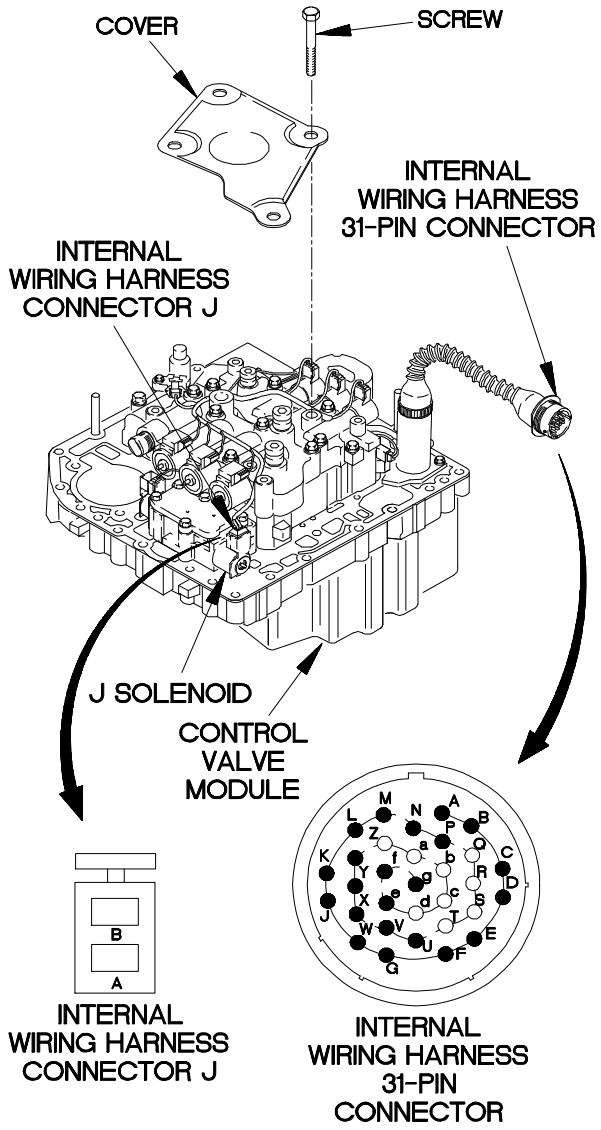


CAUTION

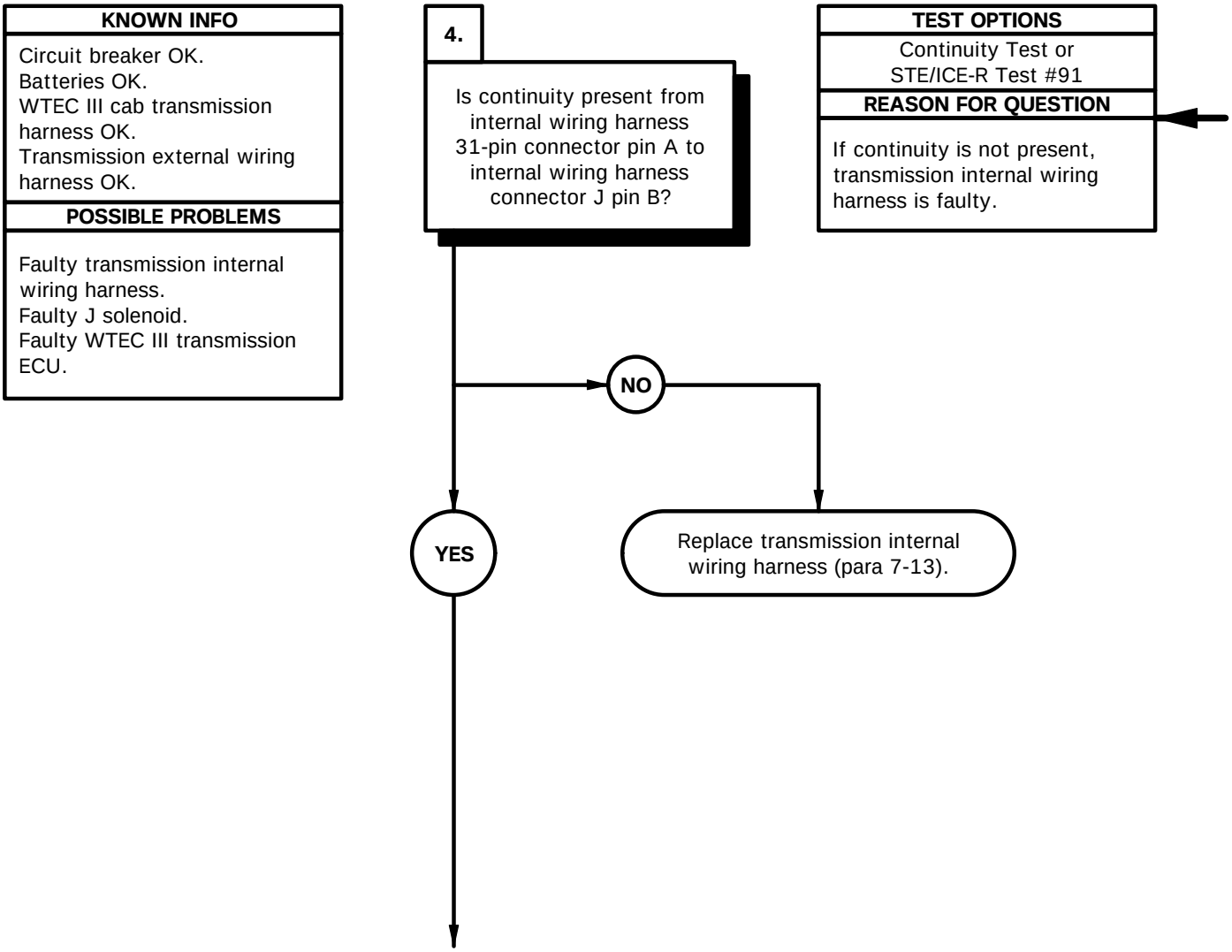
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

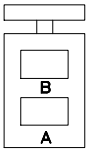


c70. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 24 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

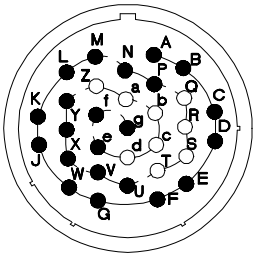


CONTINUITY TEST

(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).



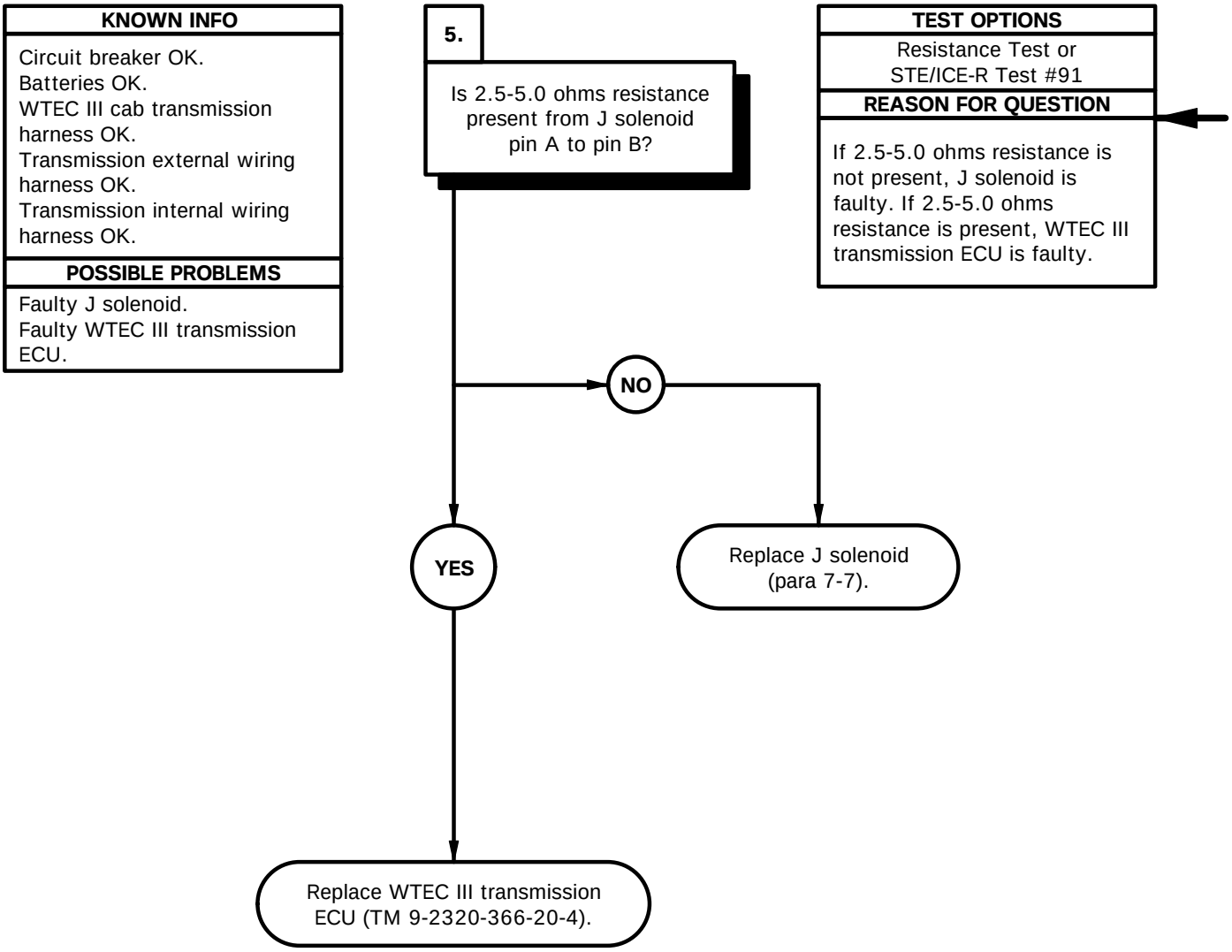
INTERNAL WIRING HARNESS CONNECTOR J



INTERNAL WIRING HARNESS 31-PIN CONNECTOR

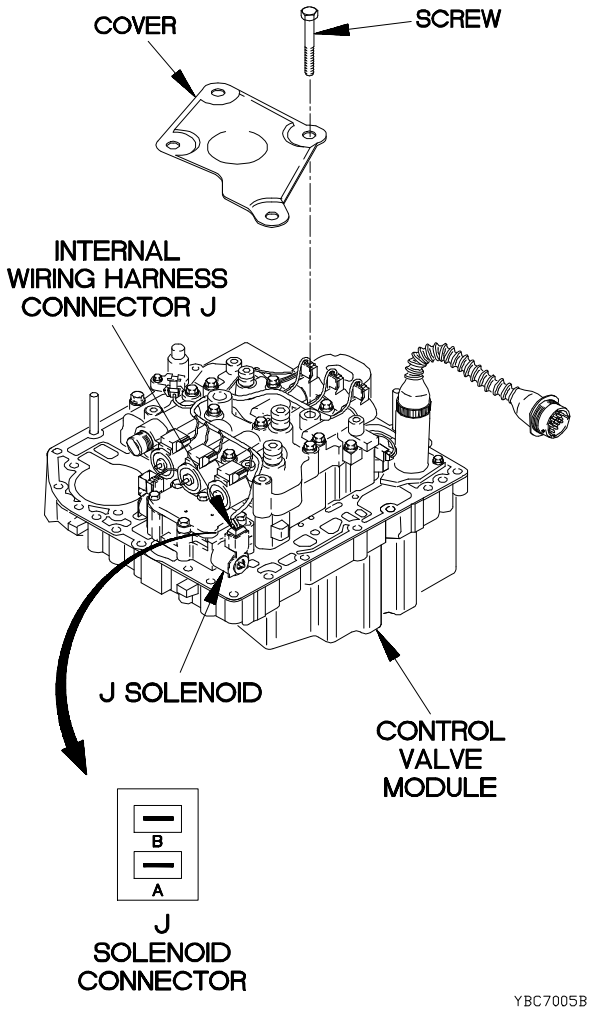
YBC7004B

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)



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).



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

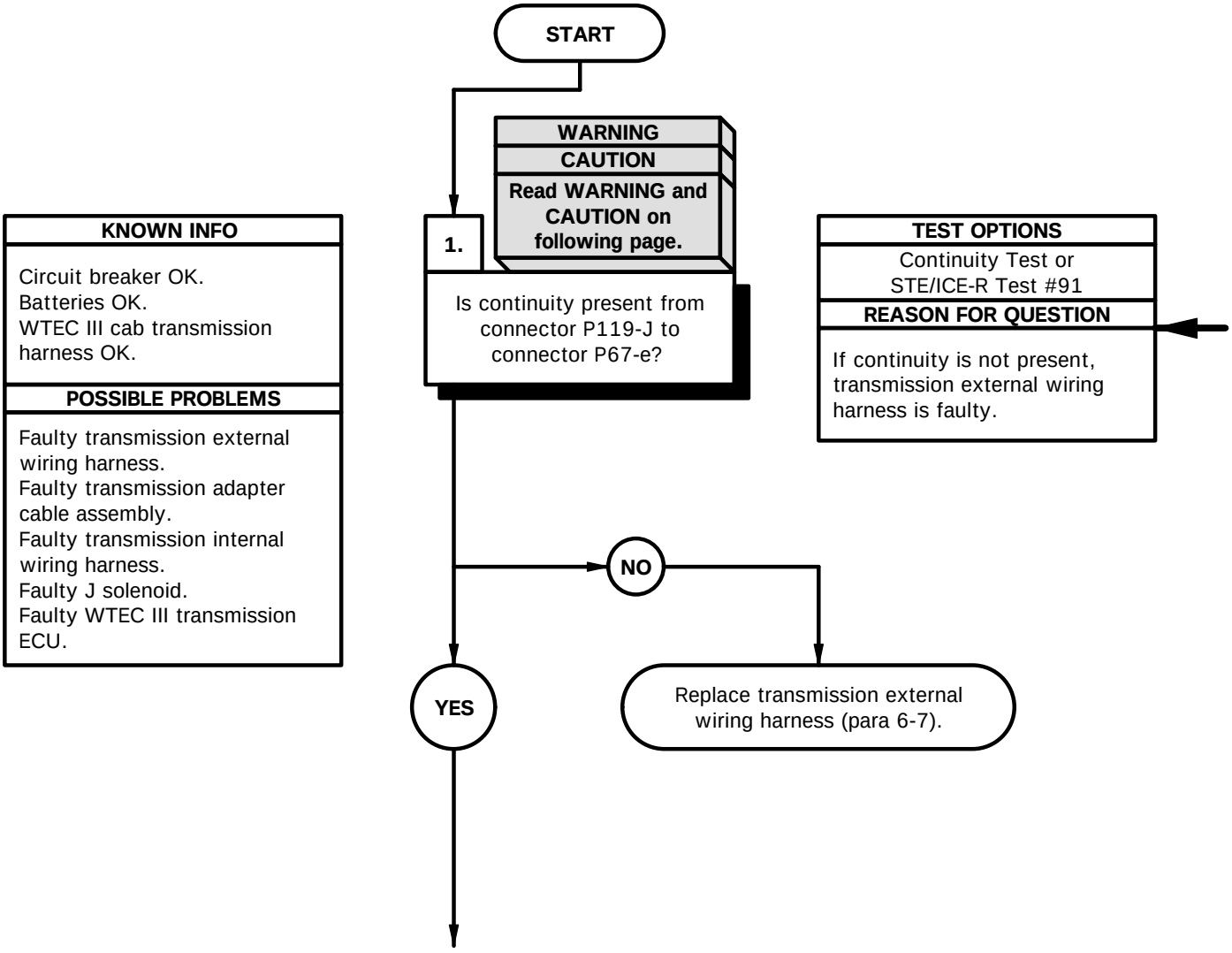
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

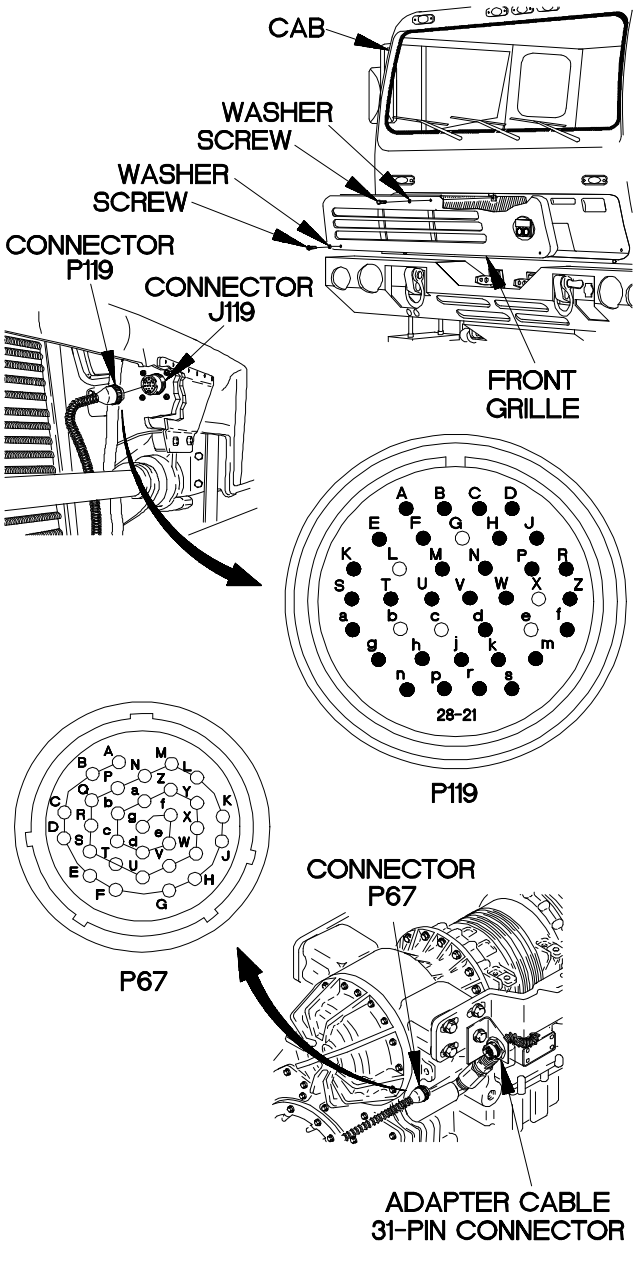
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

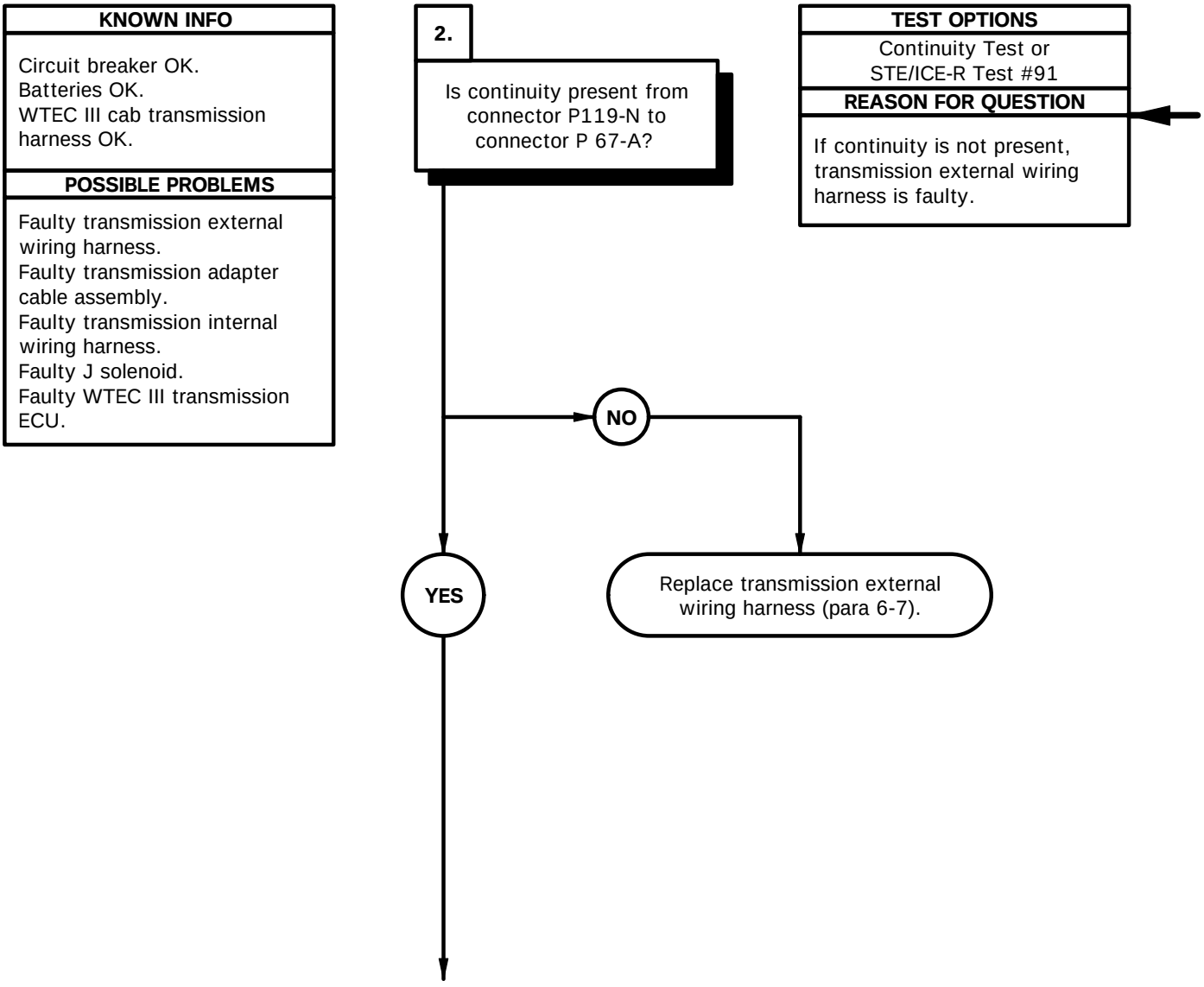
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from adapter cable 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect positive (+) probe of multimeter to connector P119-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).

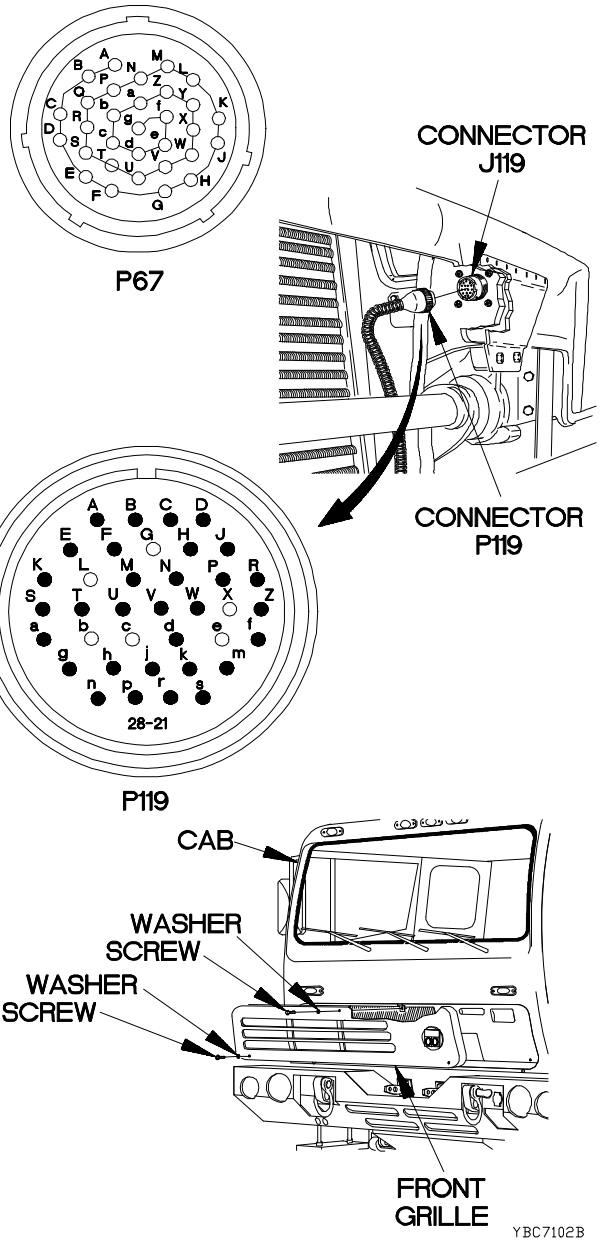


c71. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 24 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

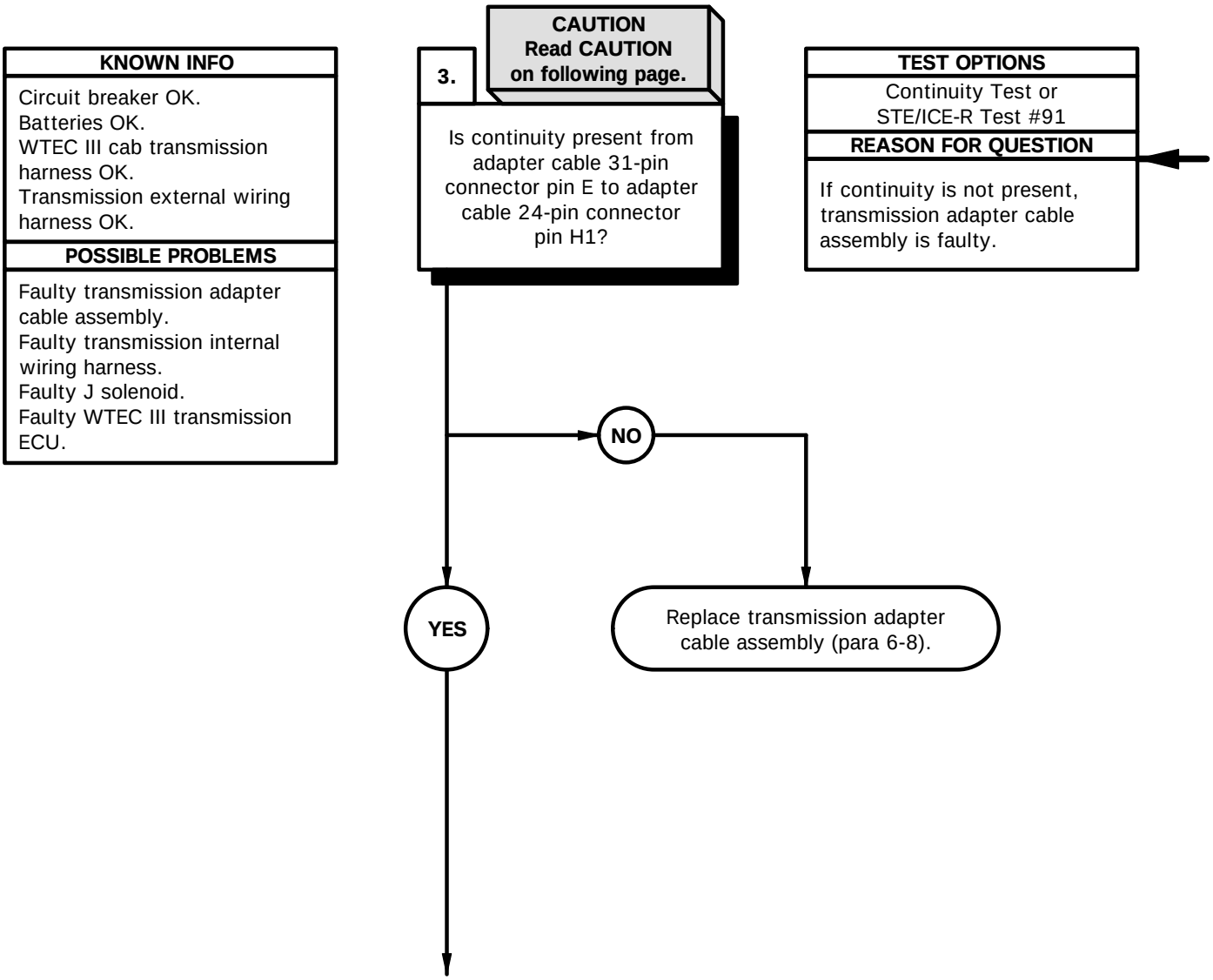


CONTINUITY TEST

(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).



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)

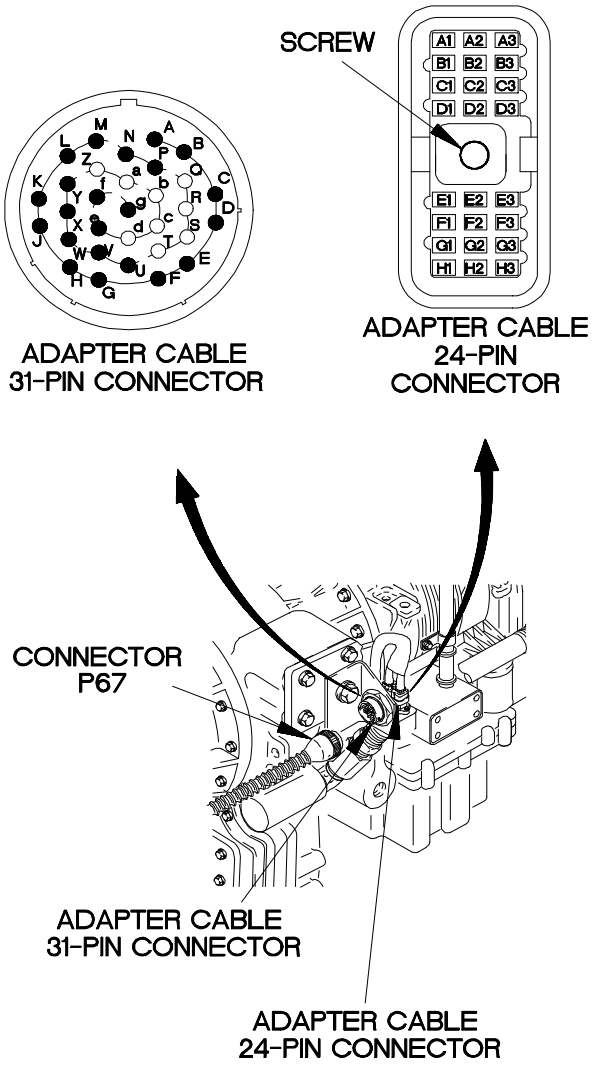


CAUTION

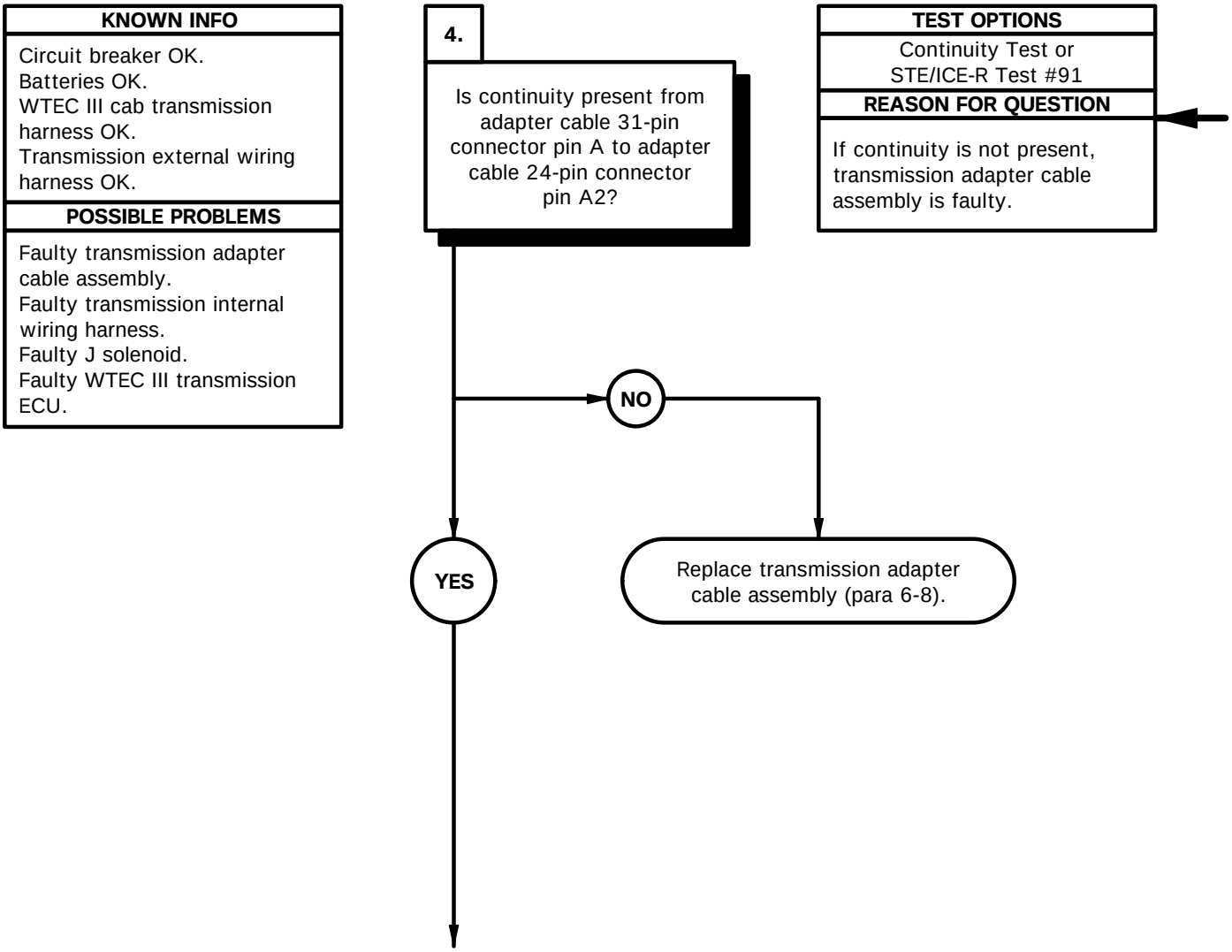
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

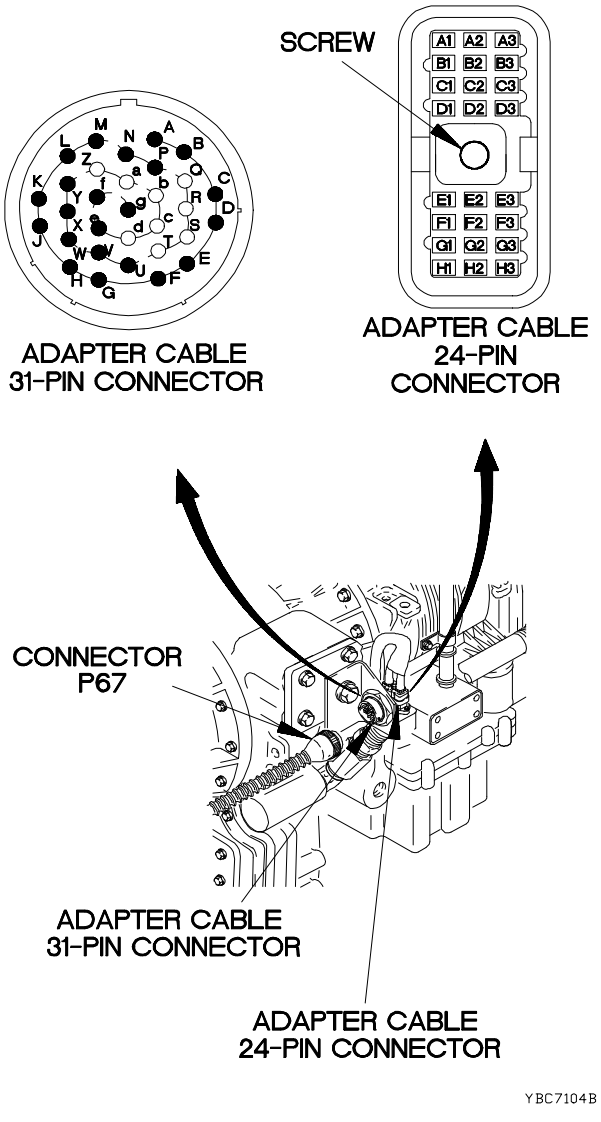


c71. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 24 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

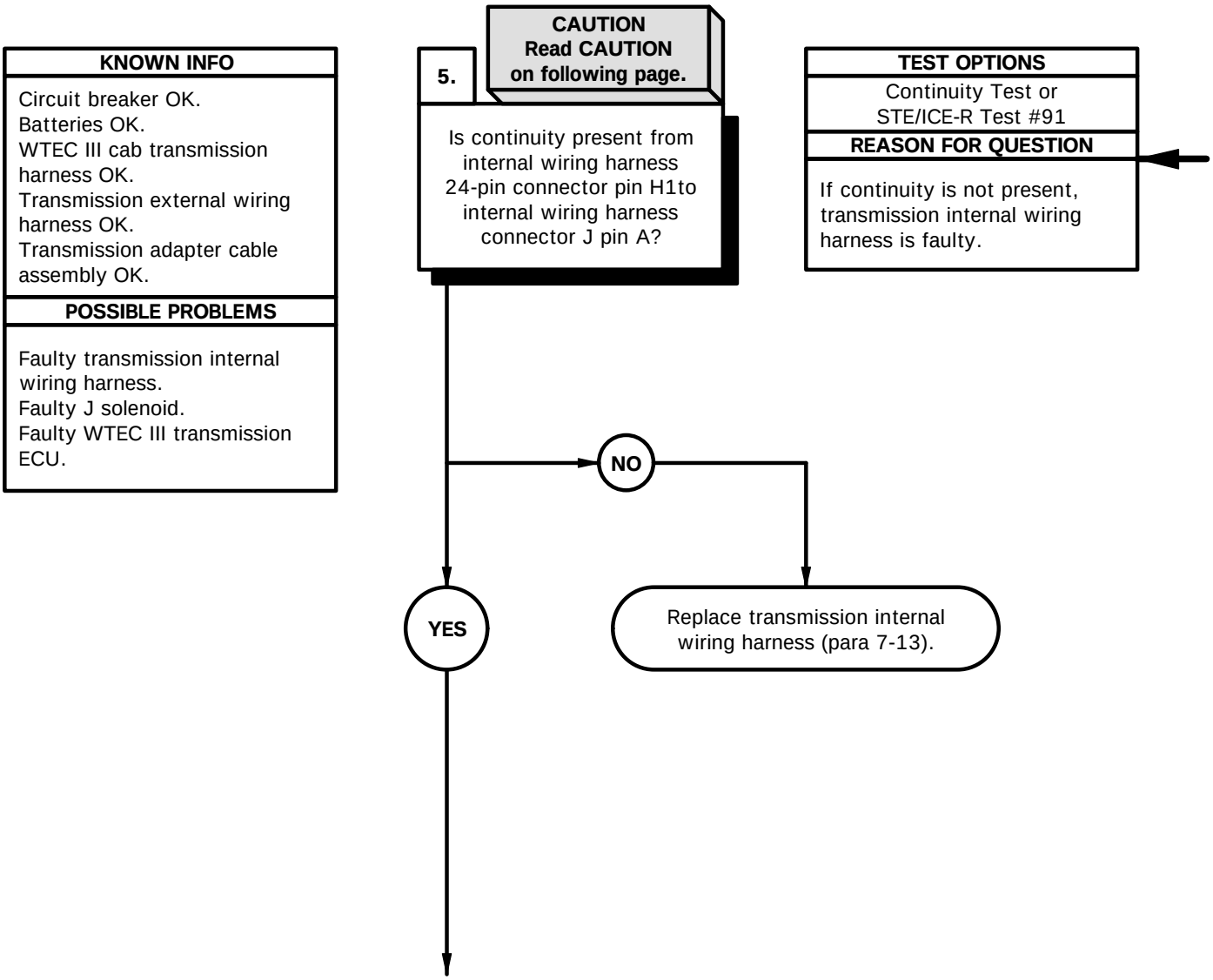


CONTINUITY TEST

(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.



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)

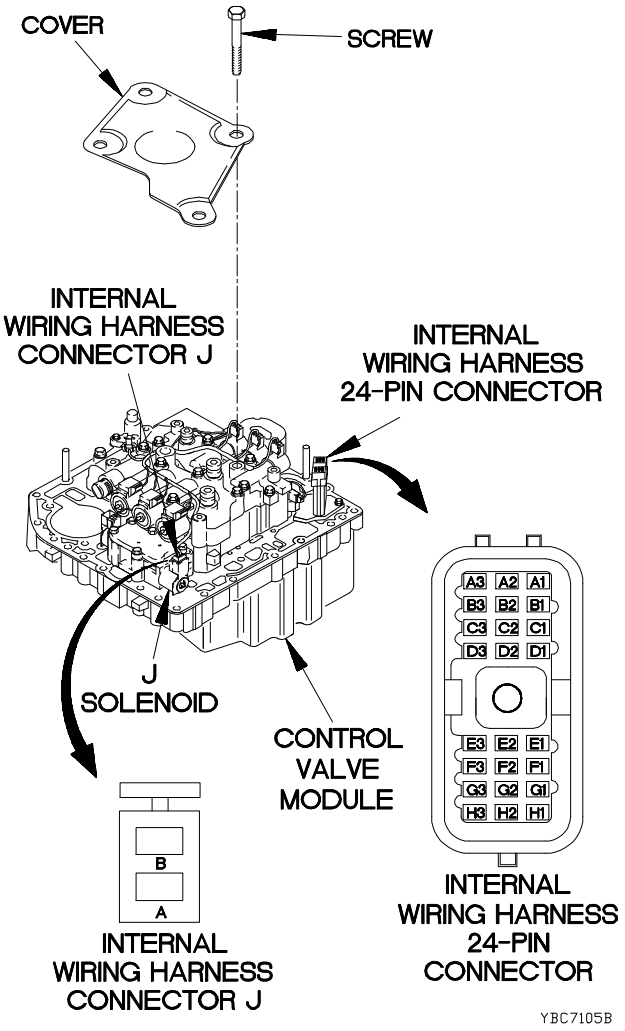


CAUTION

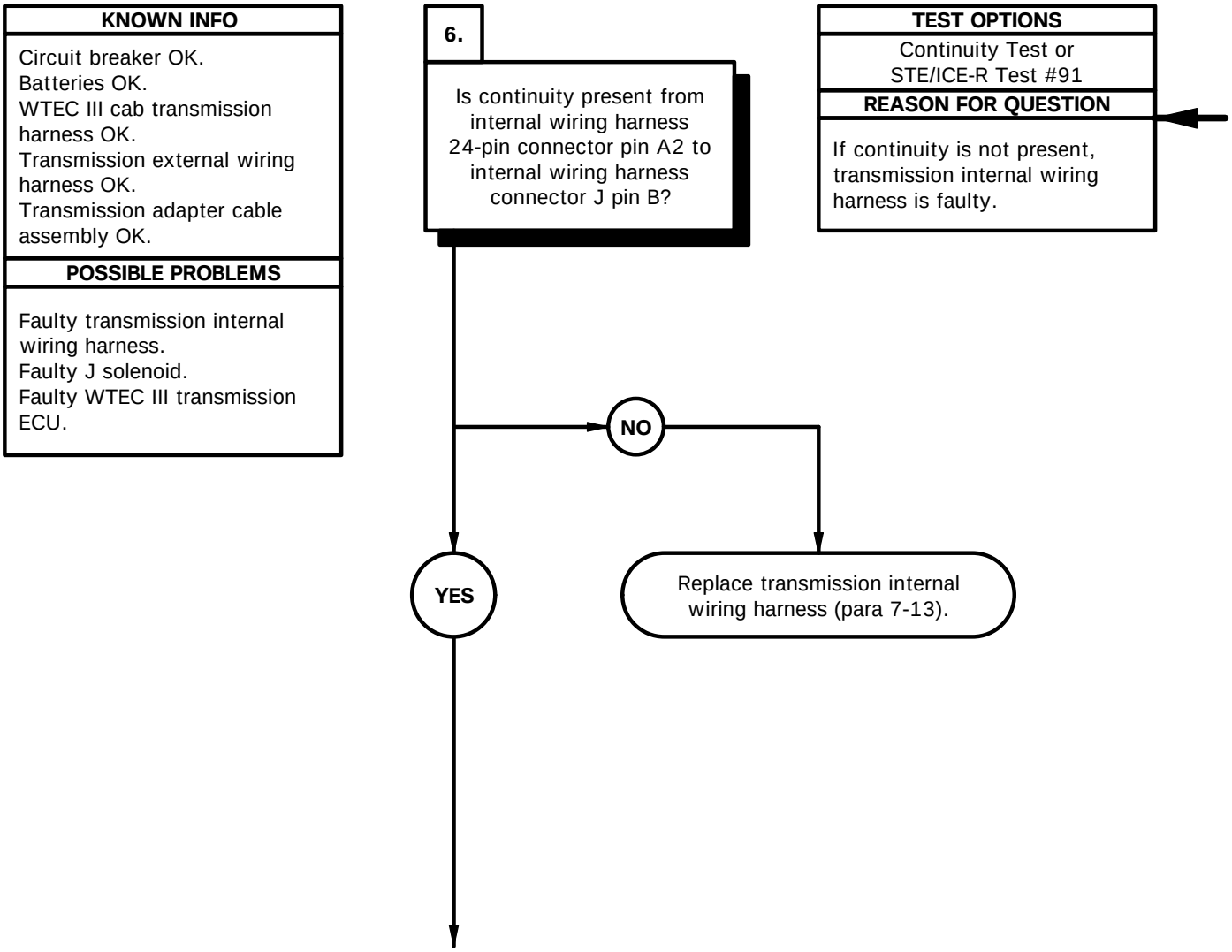
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

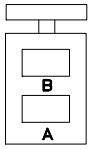


c71. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 24 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

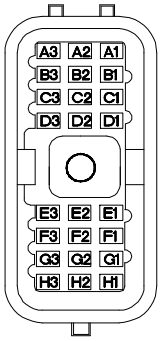


CONTINUITY TEST

(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).



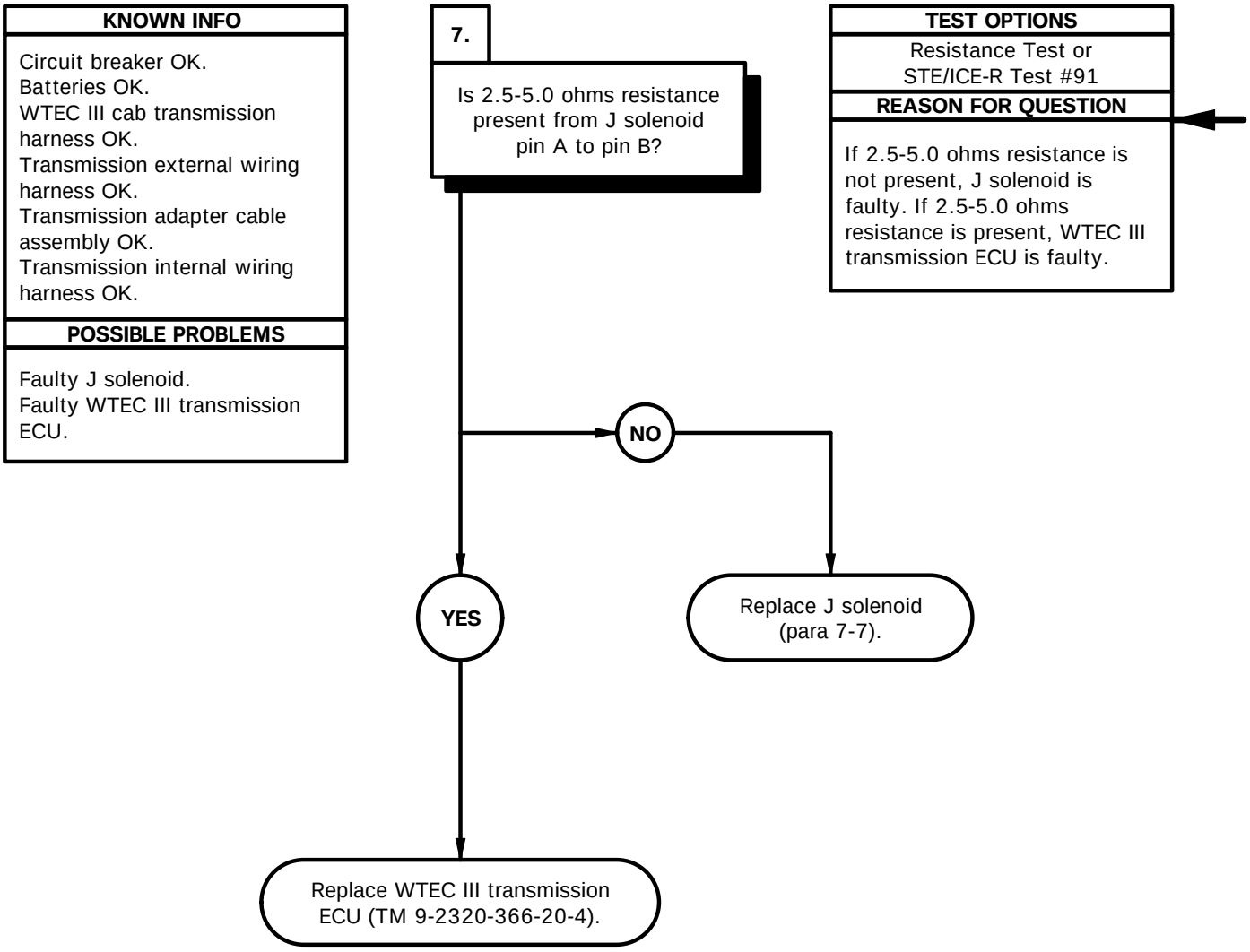
INTERNAL WIRING HARNESS CONNECTOR J



INTERNAL WIRING HARNESS 24-PIN CONNECTOR

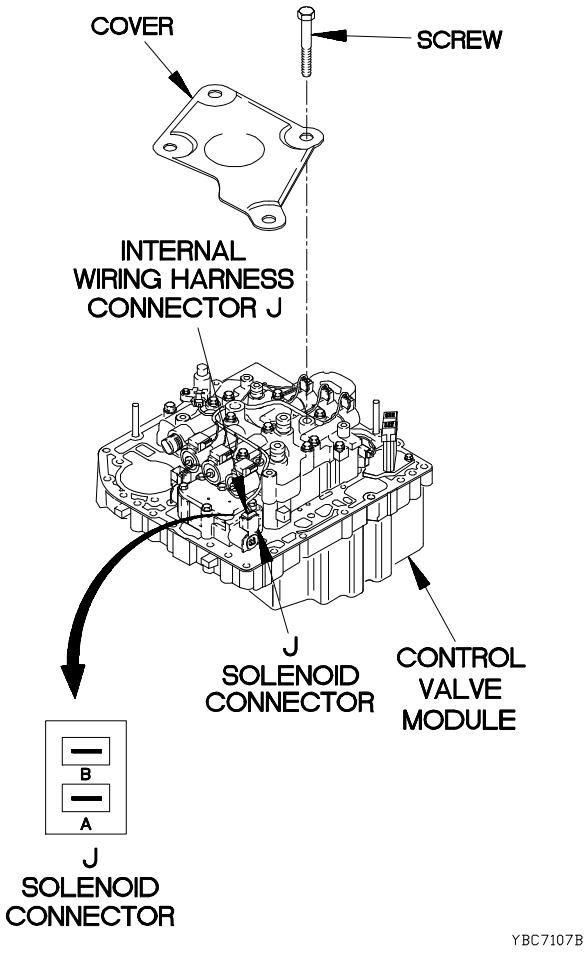
TA271106B

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)



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).



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

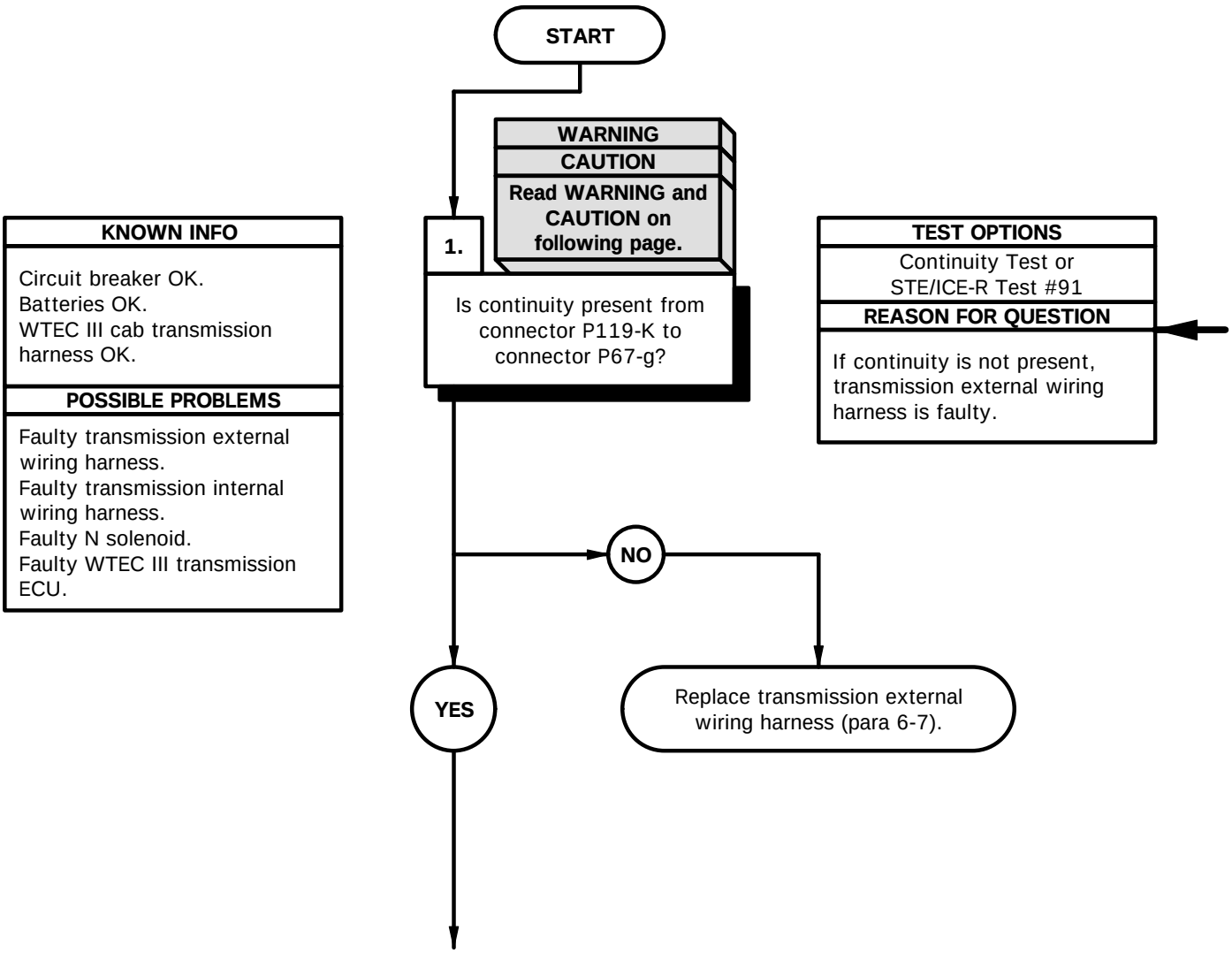
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

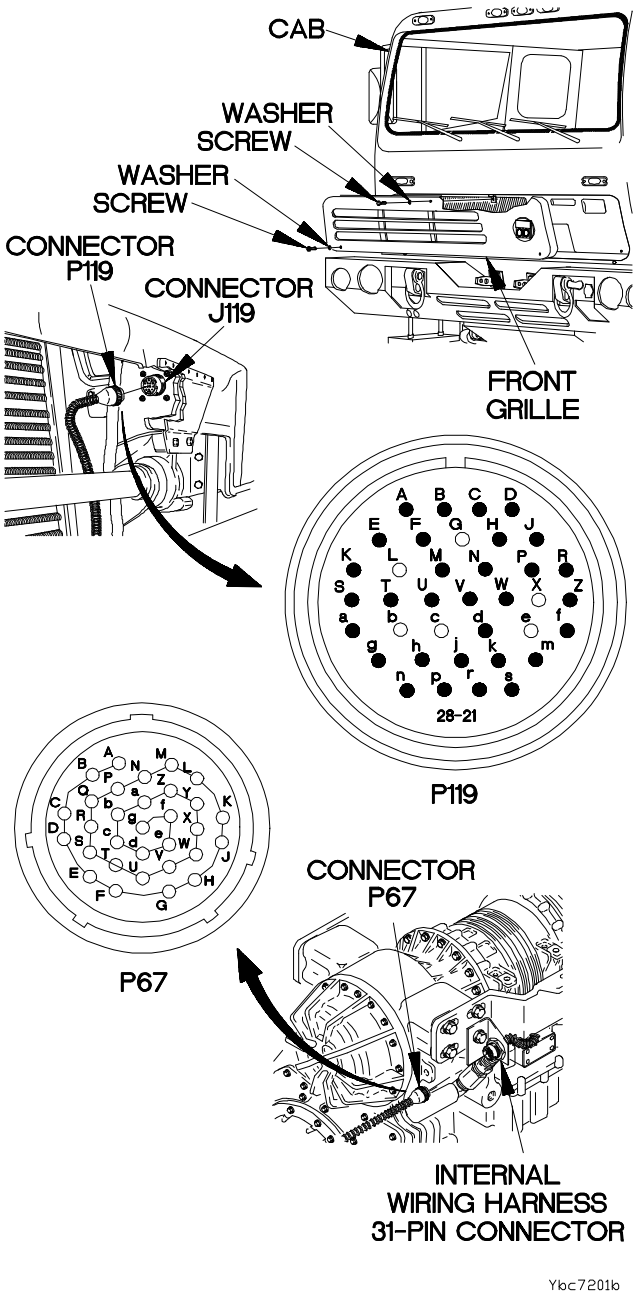
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

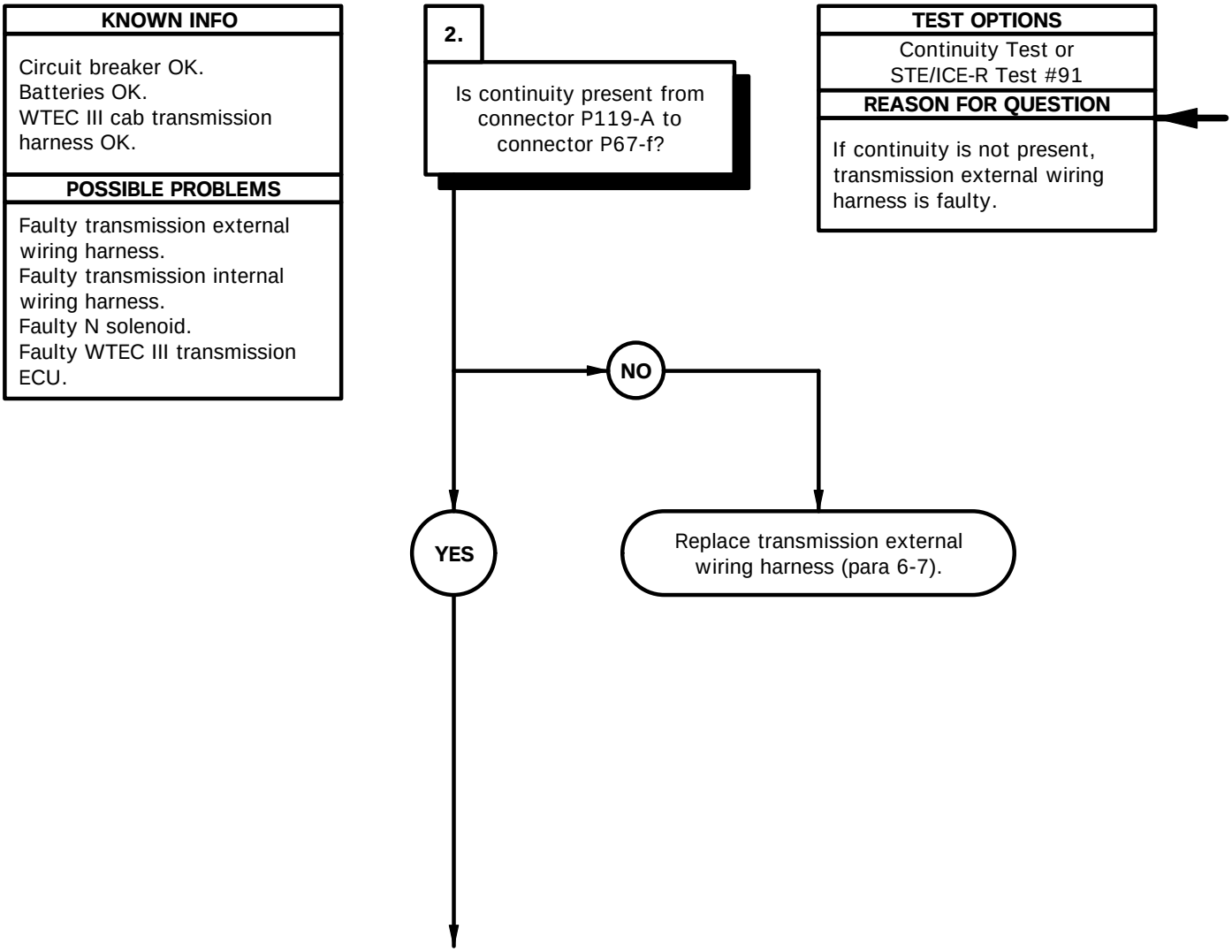
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from internal wiring harness 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect 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).

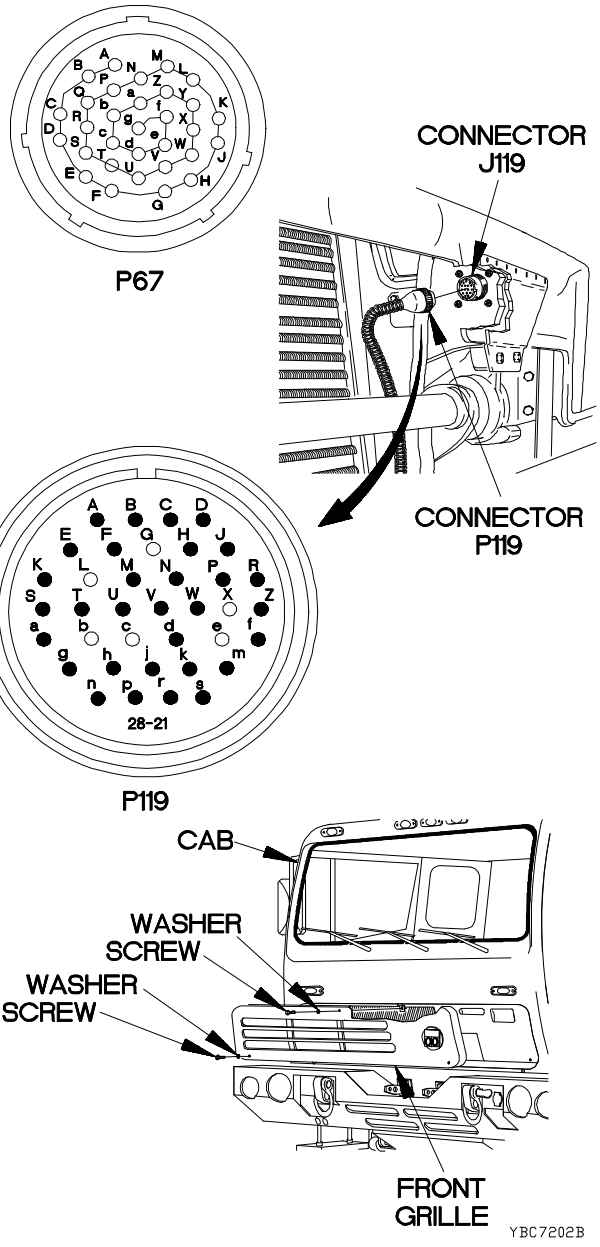


c72. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

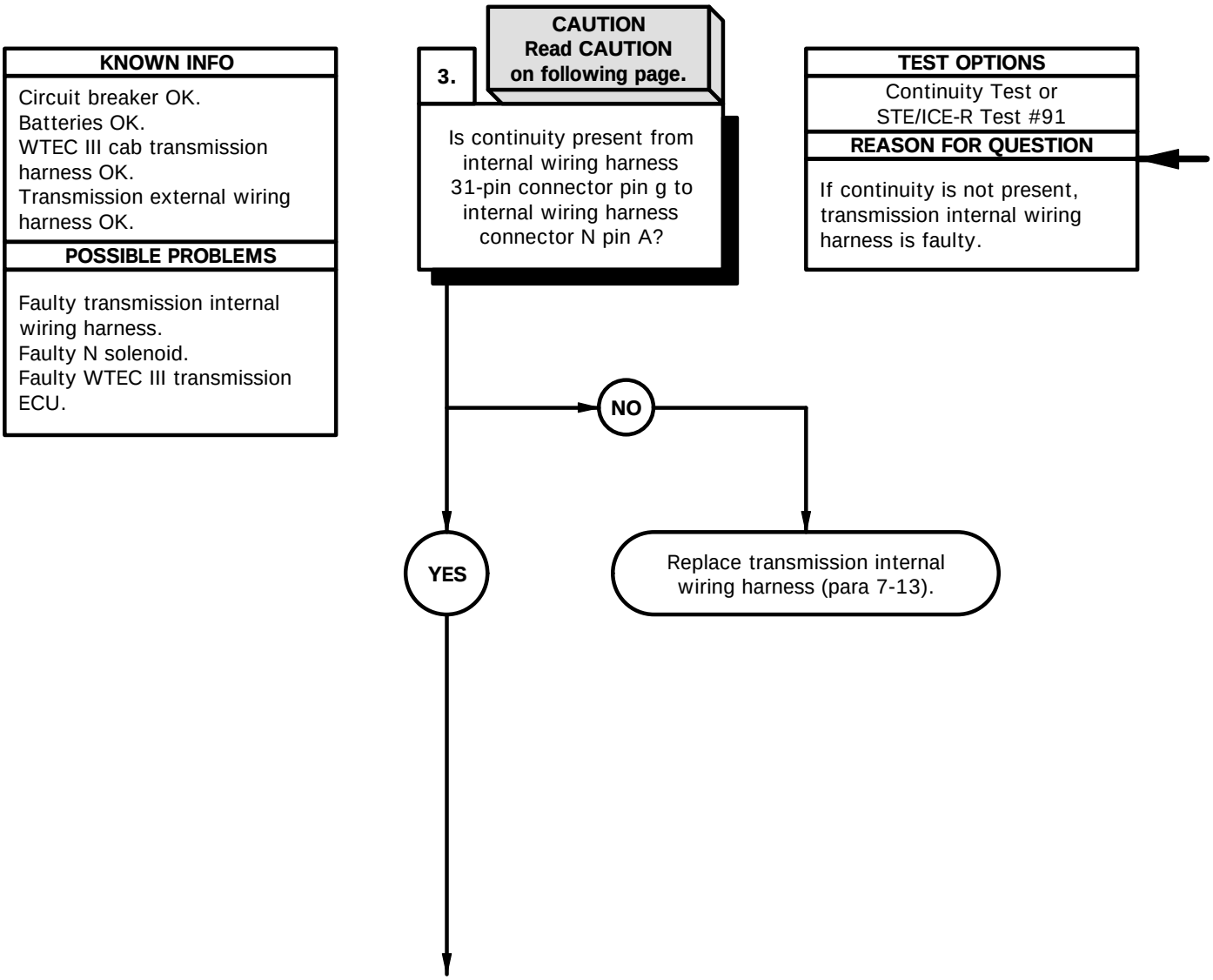


CONTINUITY TEST

(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).



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)

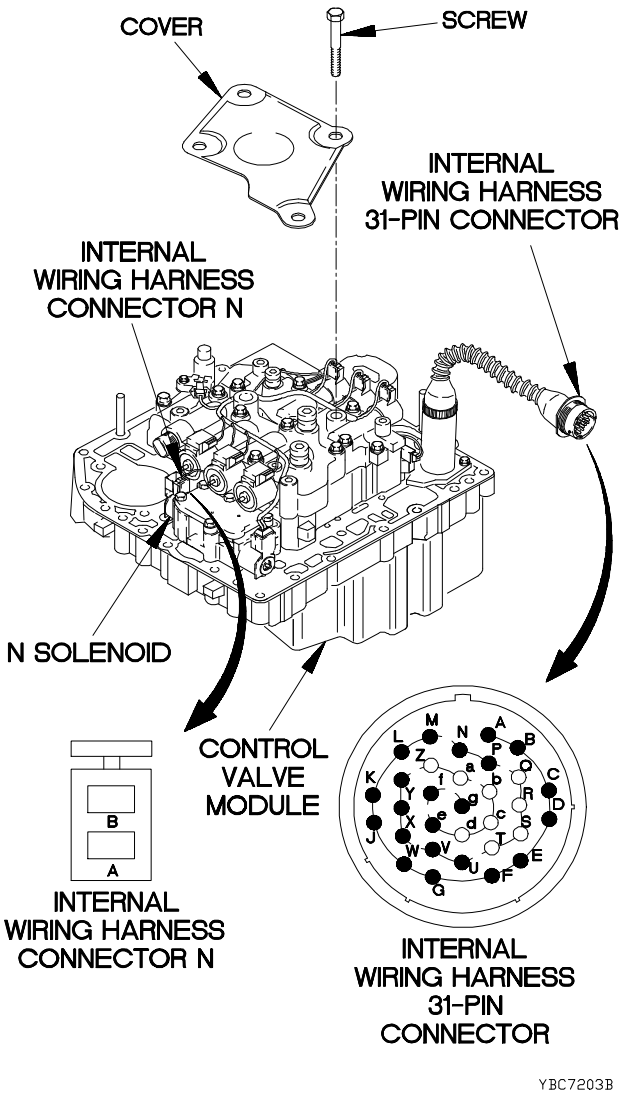


CAUTION

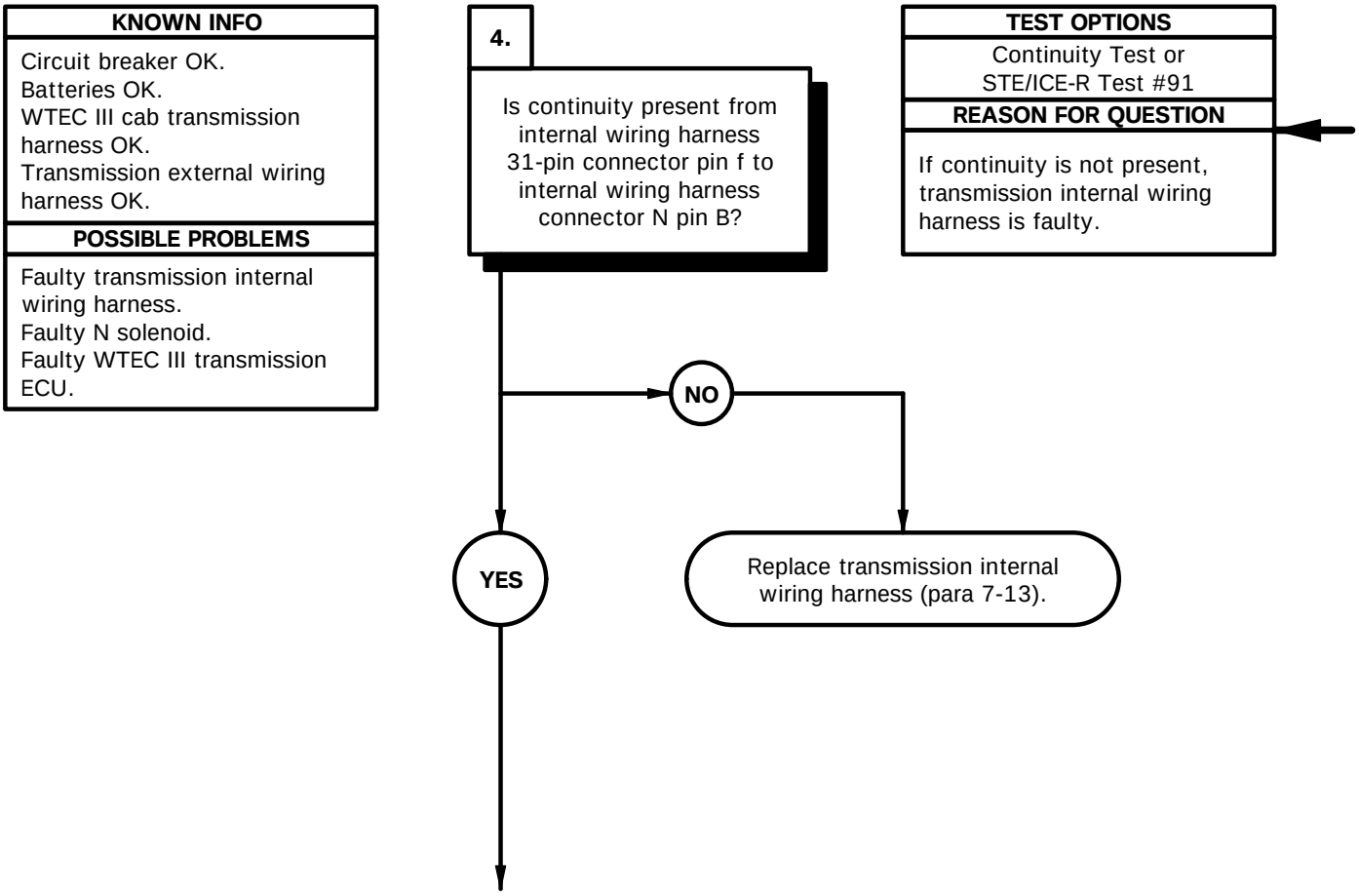
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

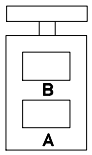


c72. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

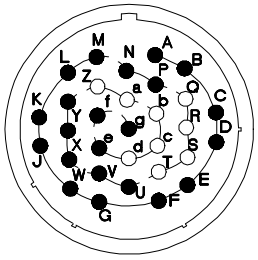


CONTINUITY TEST

(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).



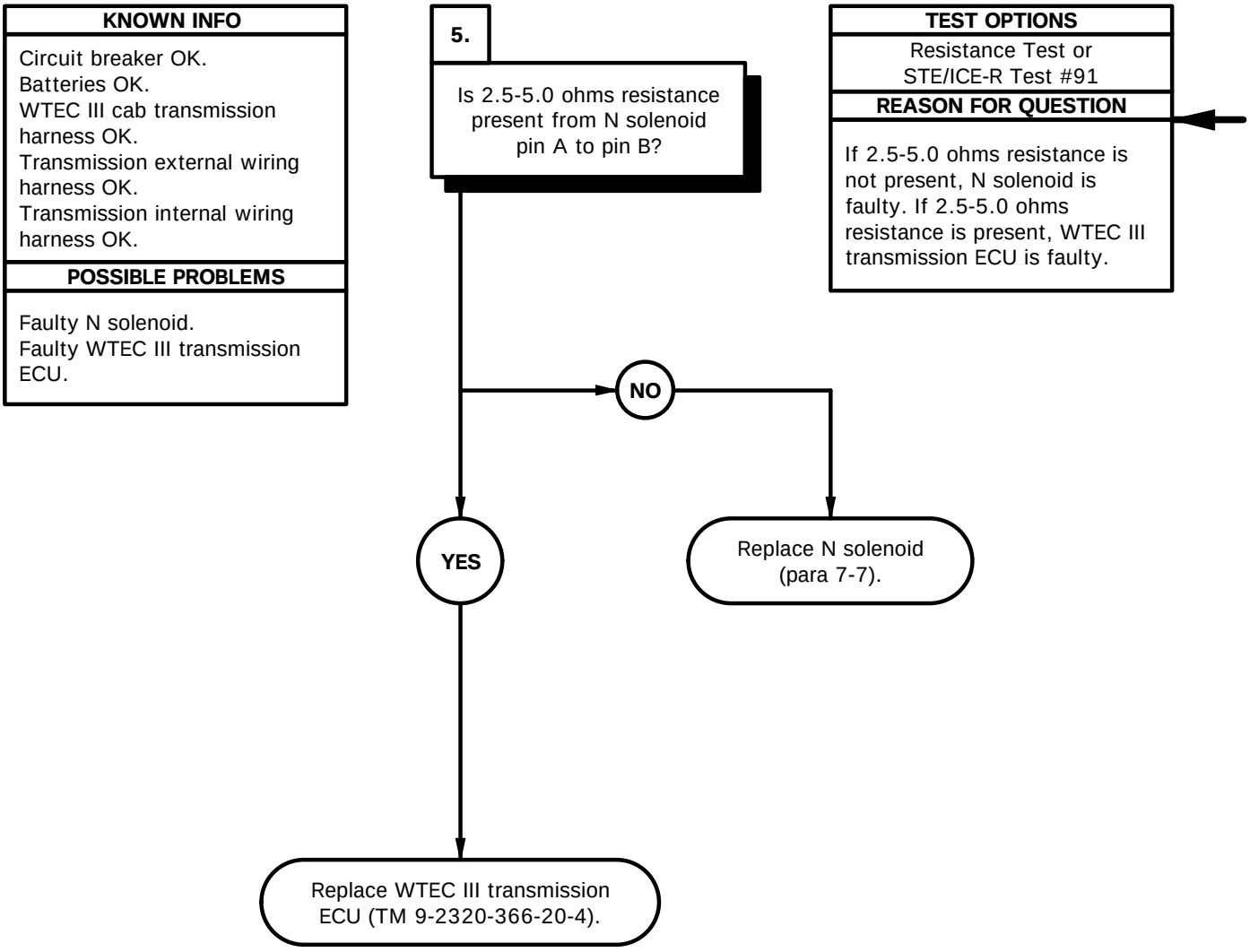
INTERNAL WIRING HARNESS CONNECTOR N



INTERNAL WIRING HARNESS 31-PIN CONNECTOR

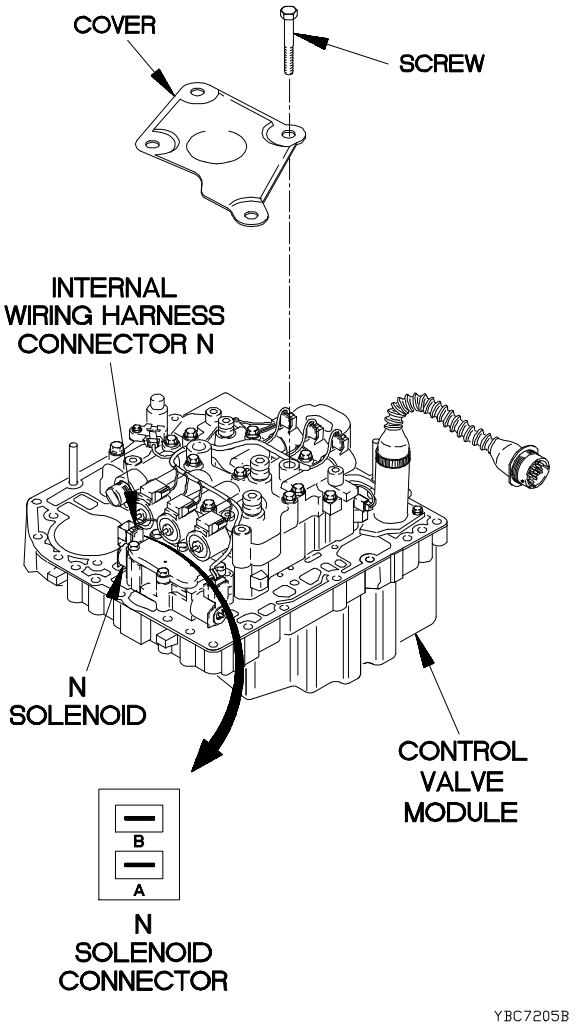
YBC7204B

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)



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).



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).

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)

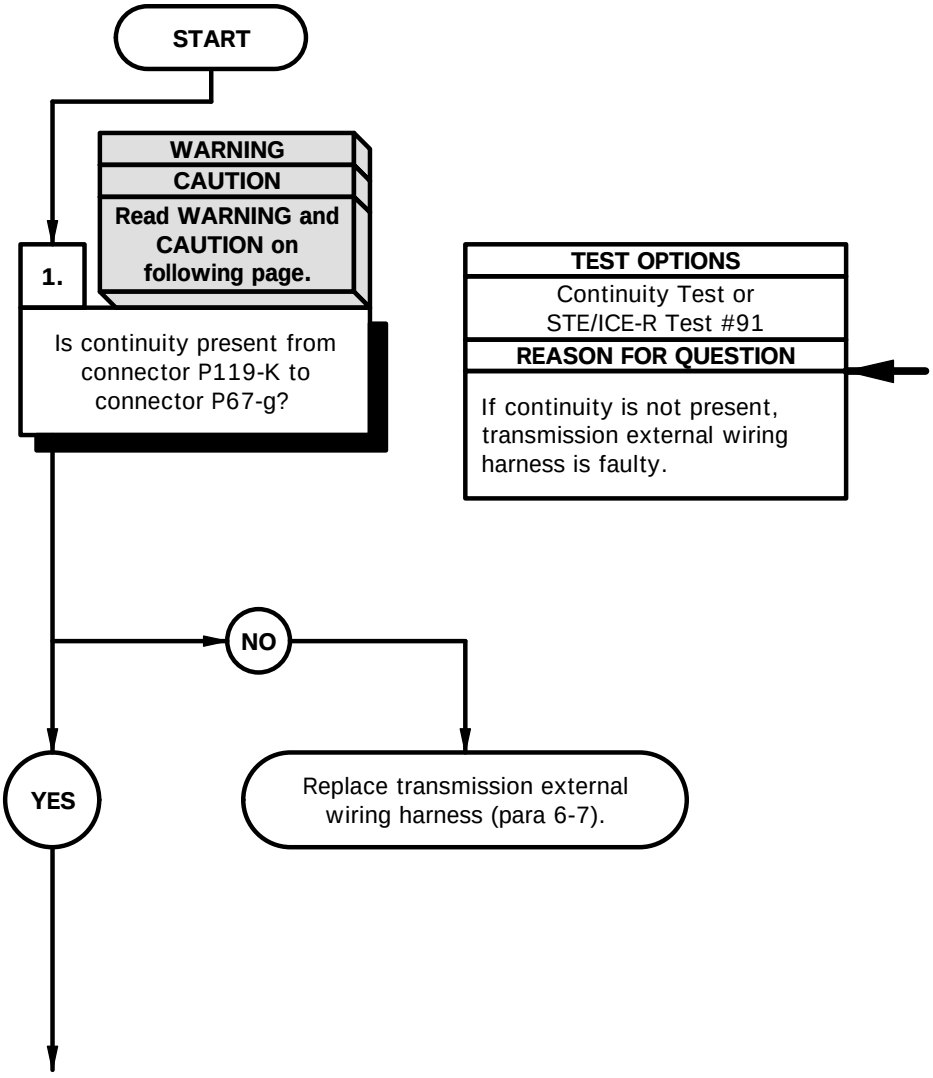
References
TM 9-4910-571-12&P

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.



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

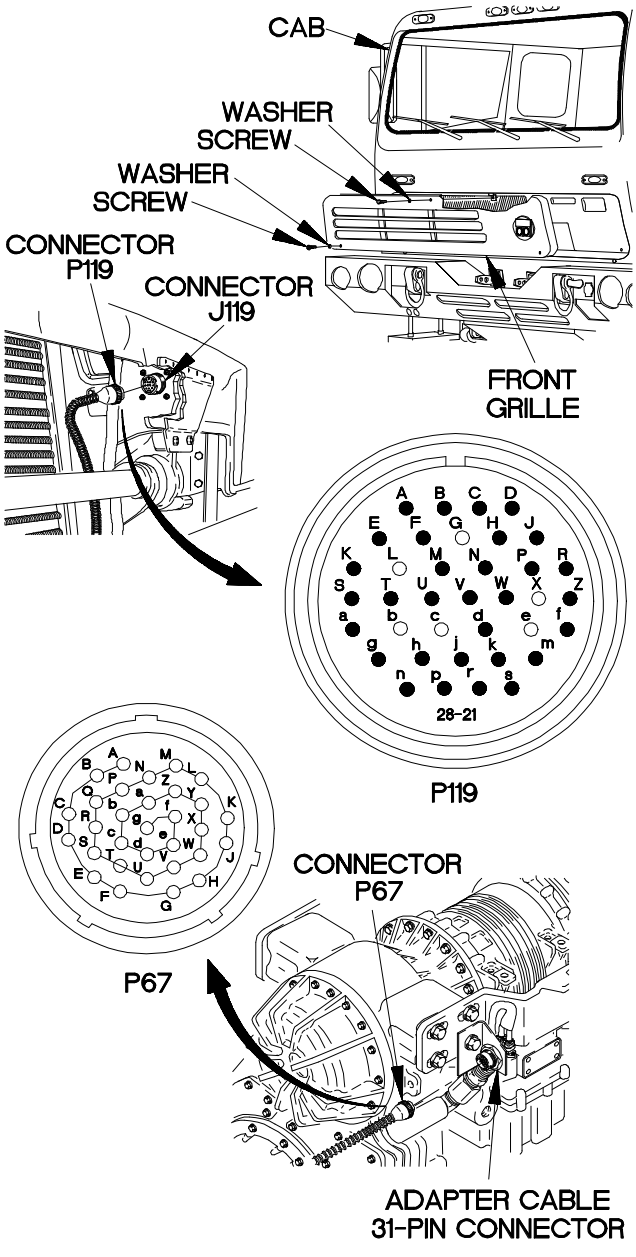
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



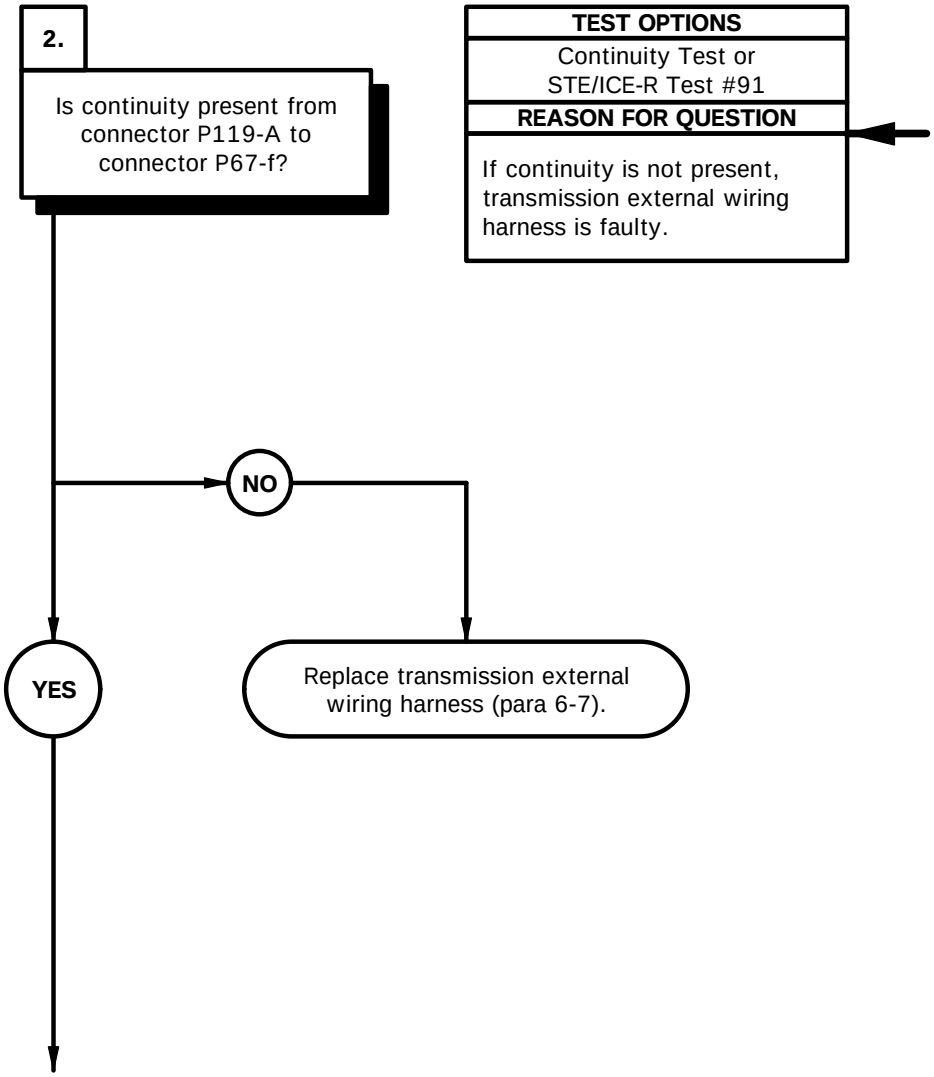
c73. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO

Circuit breaker OK.
Batteries OK.
WTEC III cab transmission harness OK.

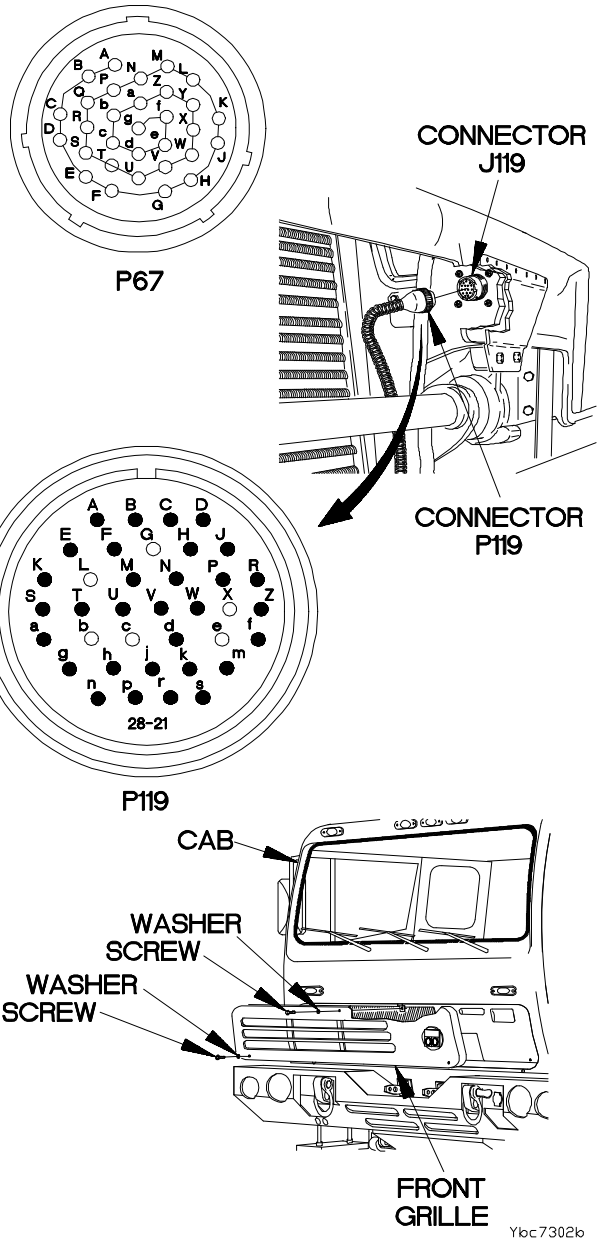
POSSIBLE PROBLEMS

Faulty transmission external wiring harness.
Faulty transmission adapter cable assembly.
Faulty transmission internal wiring harness.
Faulty N solenoid.
Faulty WTEC III transmission ECU.

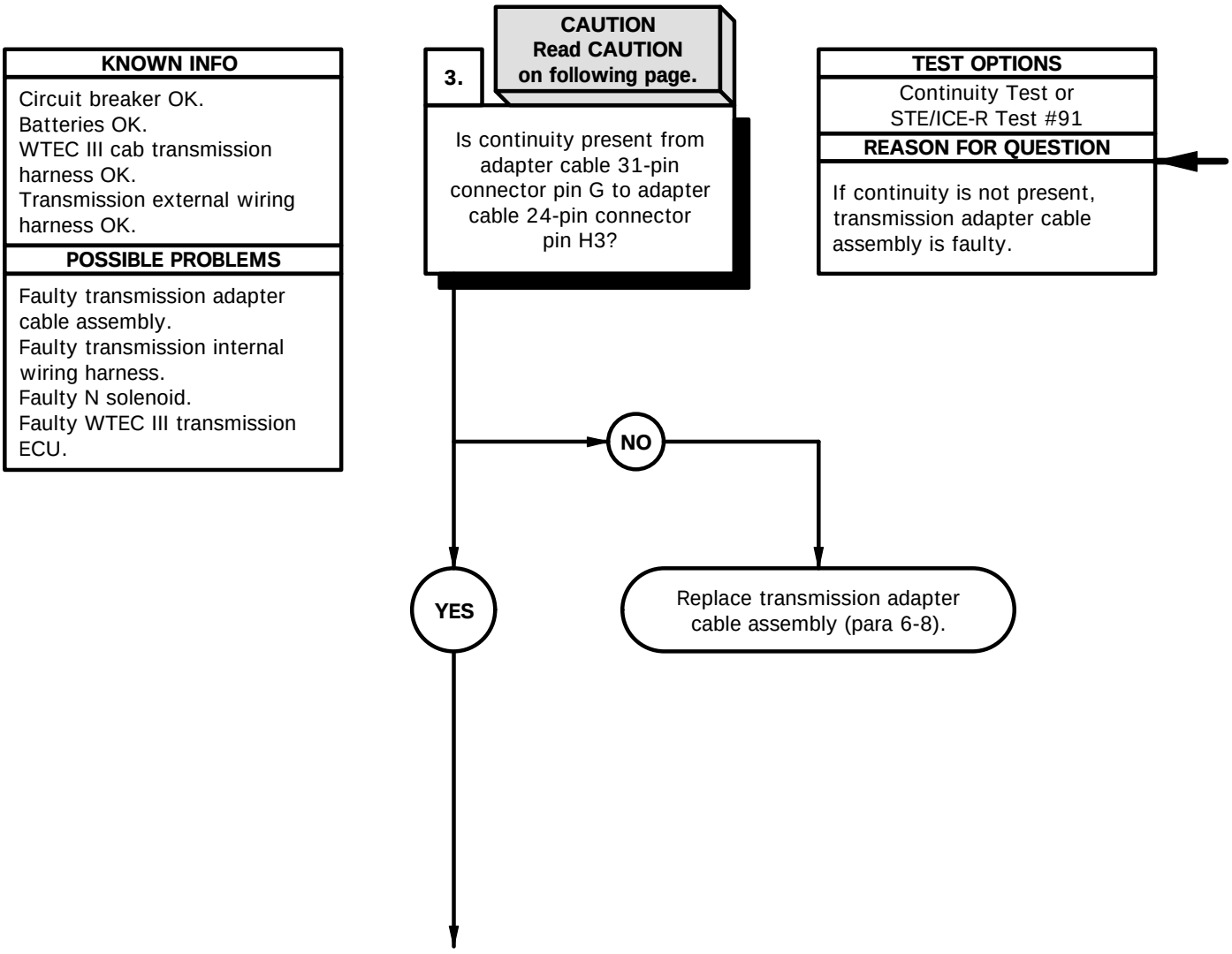


CONTINUITY TEST

(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)

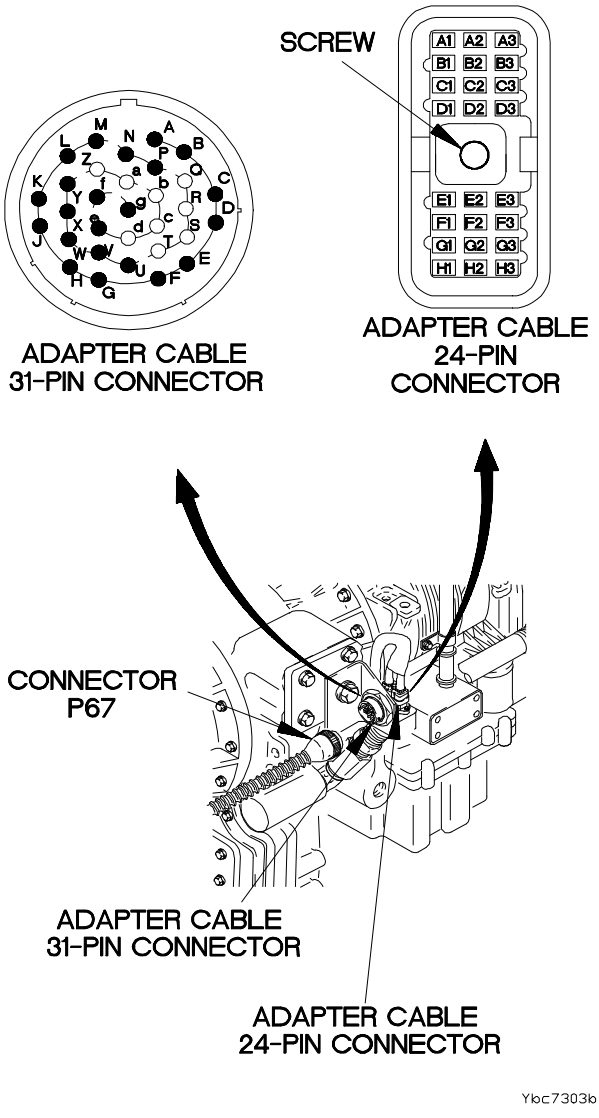


CAUTION

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).



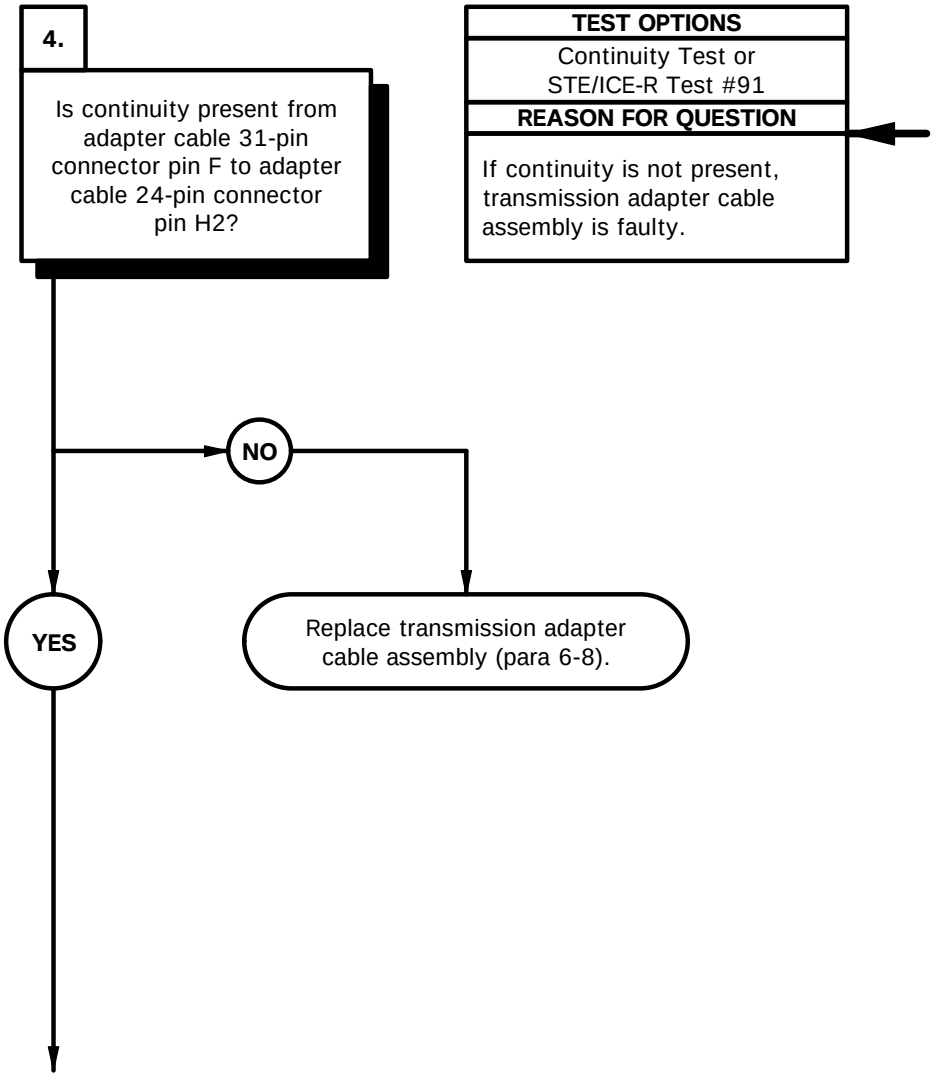
c73. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO

Circuit breaker OK.
Batteries OK.
WTEC III cab transmission harness OK.
Transmission external wiring harness OK.

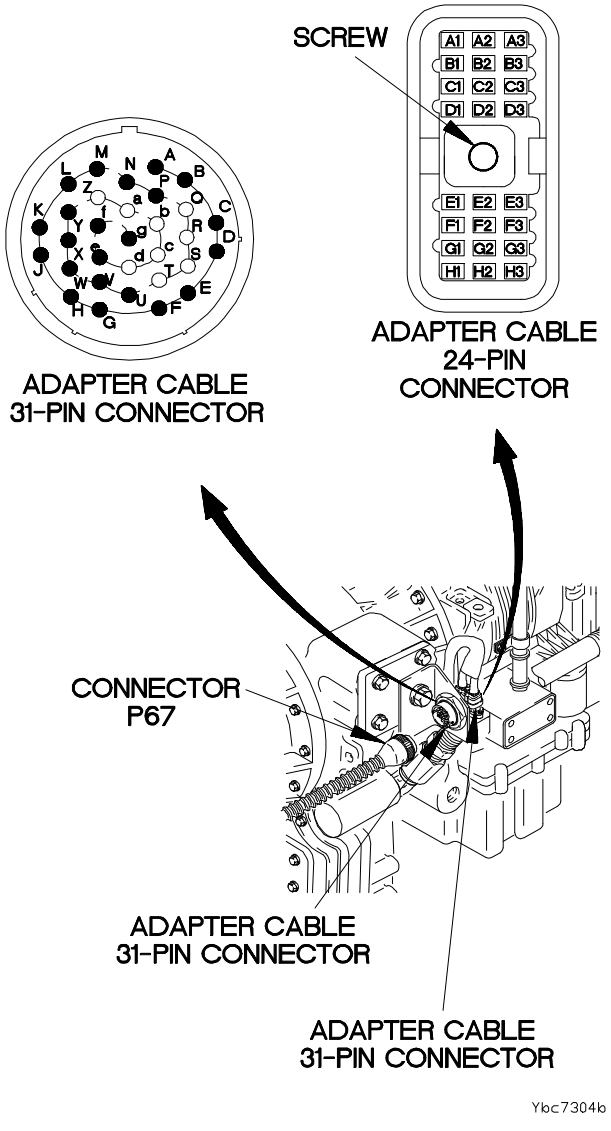
POSSIBLE PROBLEMS

Faulty transmission adapter cable assembly.
Faulty transmission internal wiring harness.
Faulty N solenoid.
Faulty WTEC III transmission ECU.

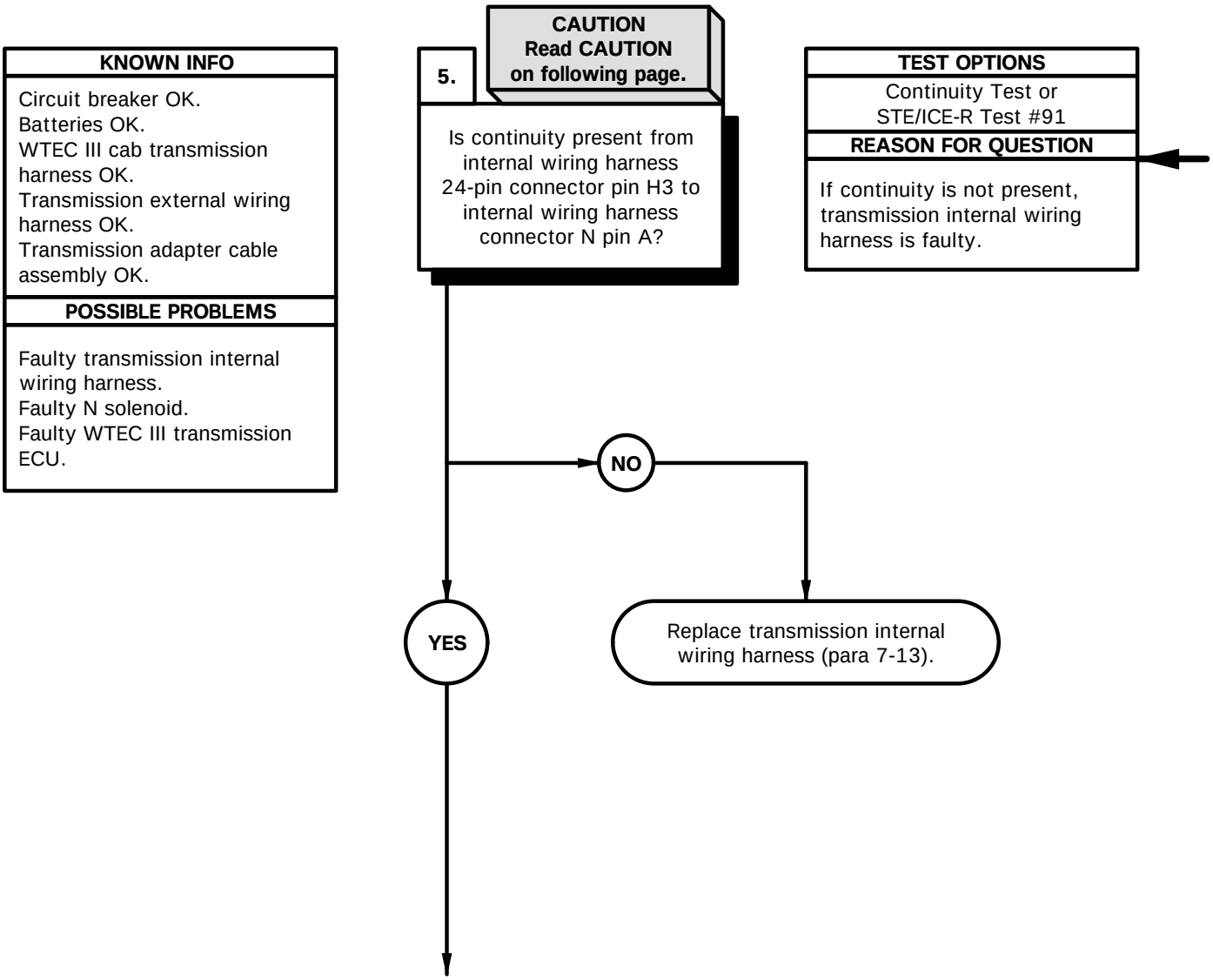


CONTINUITY TEST

(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.



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)

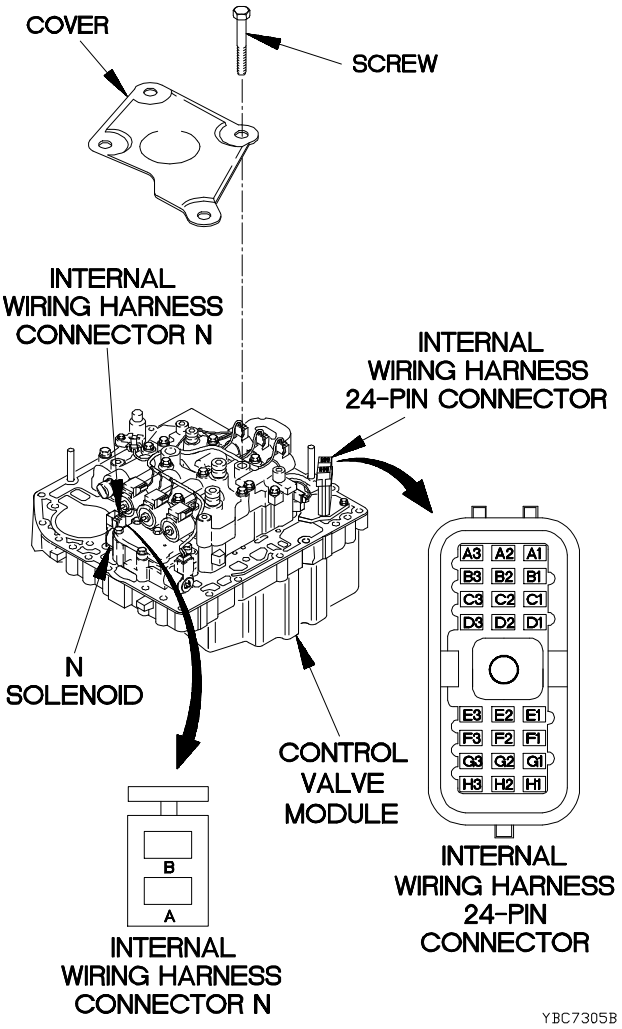


CAUTION

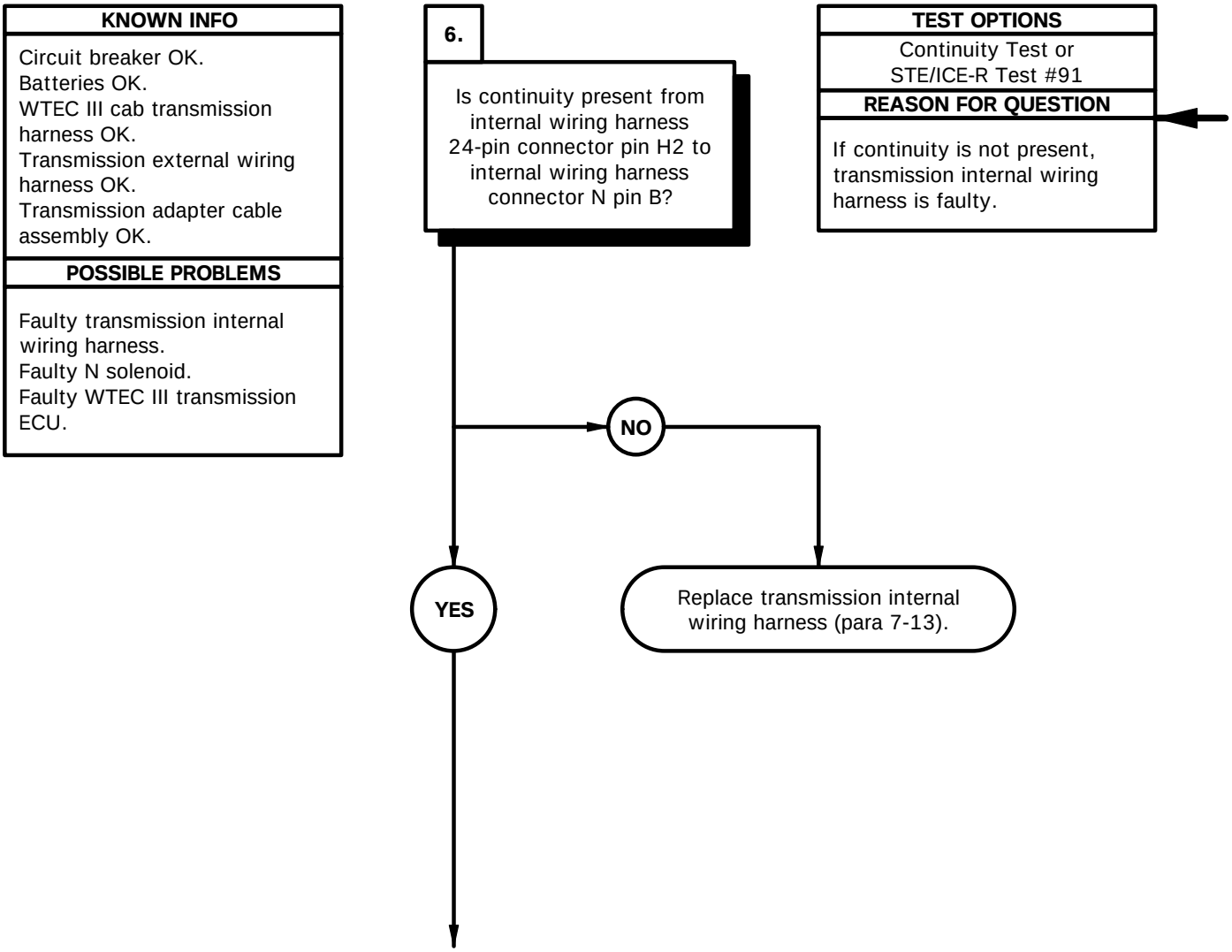
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

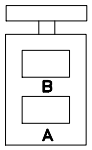


c73. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

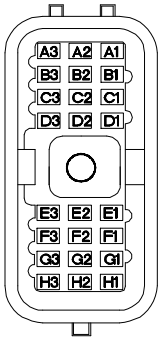


CONTINUITY TEST

(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).

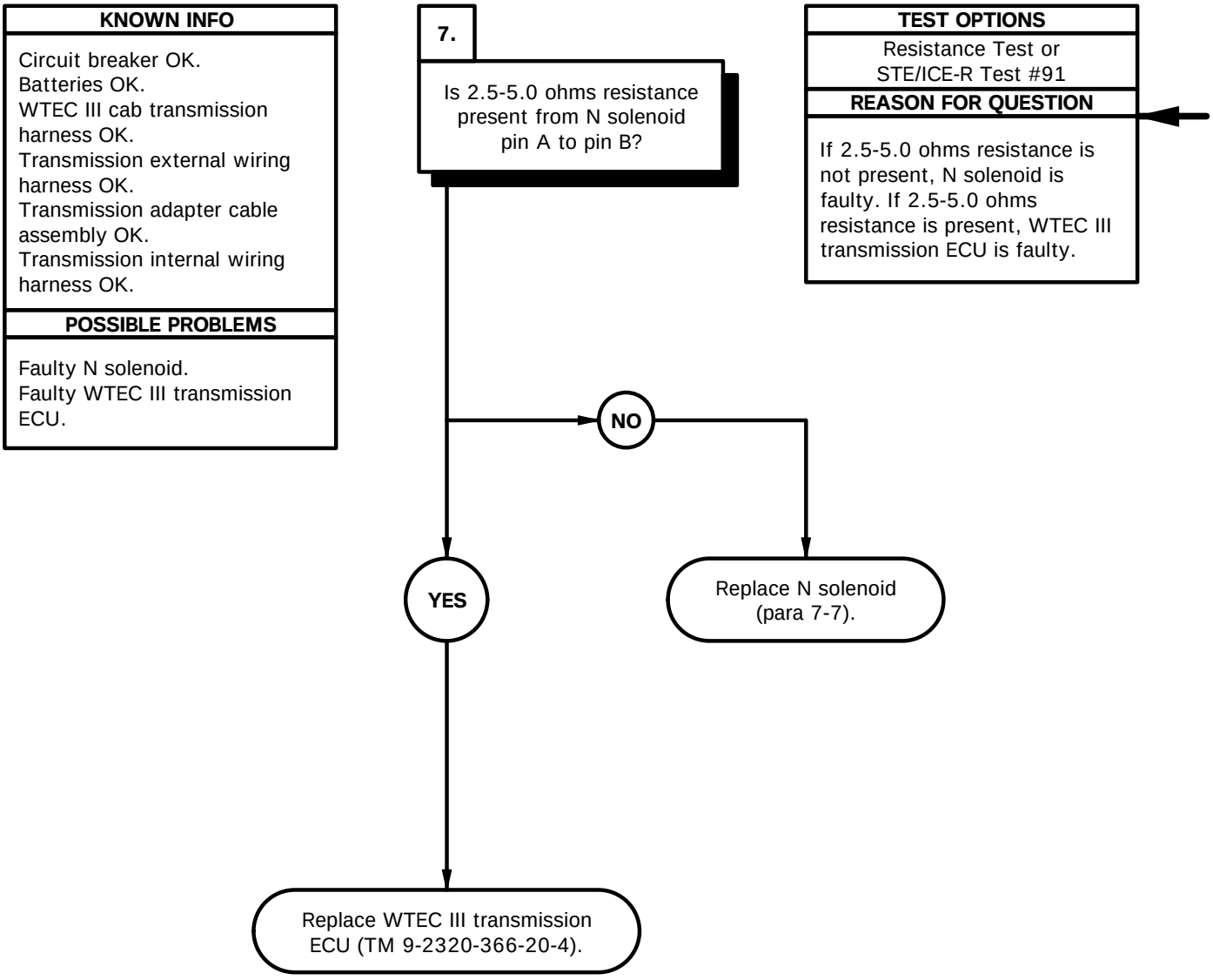


INTERNAL WIRING HARNESS CONNECTOR N



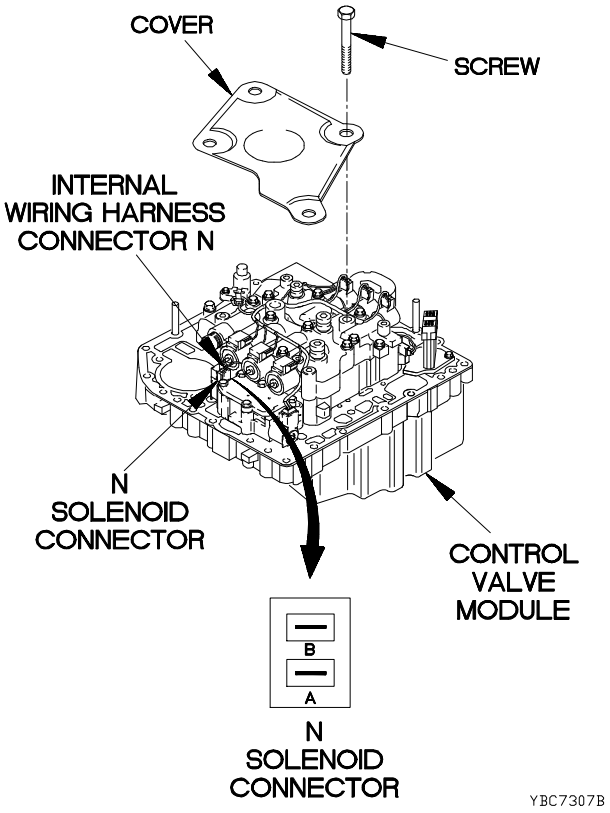
INTERNAL WIRING HARNESS 24-PIN CONNECTOR YBC7306B

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)



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).



c74. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

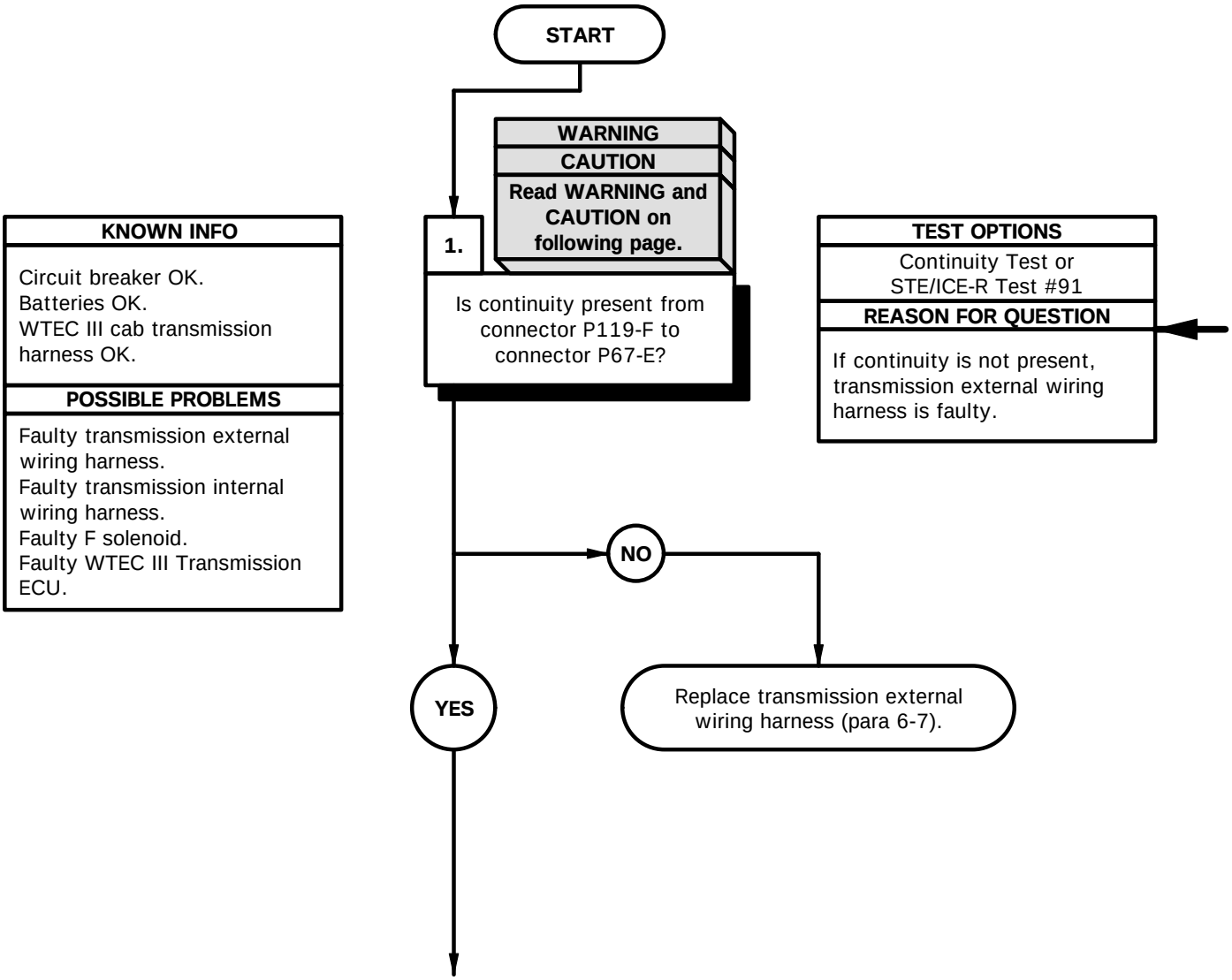
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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)

Material/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

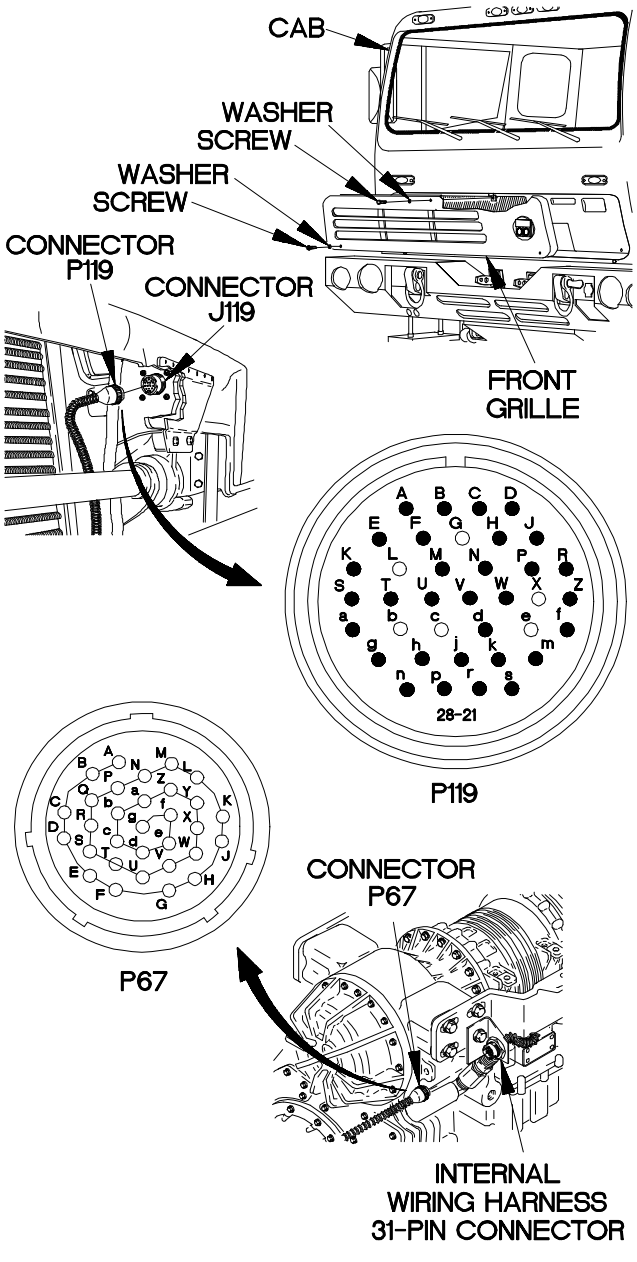
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

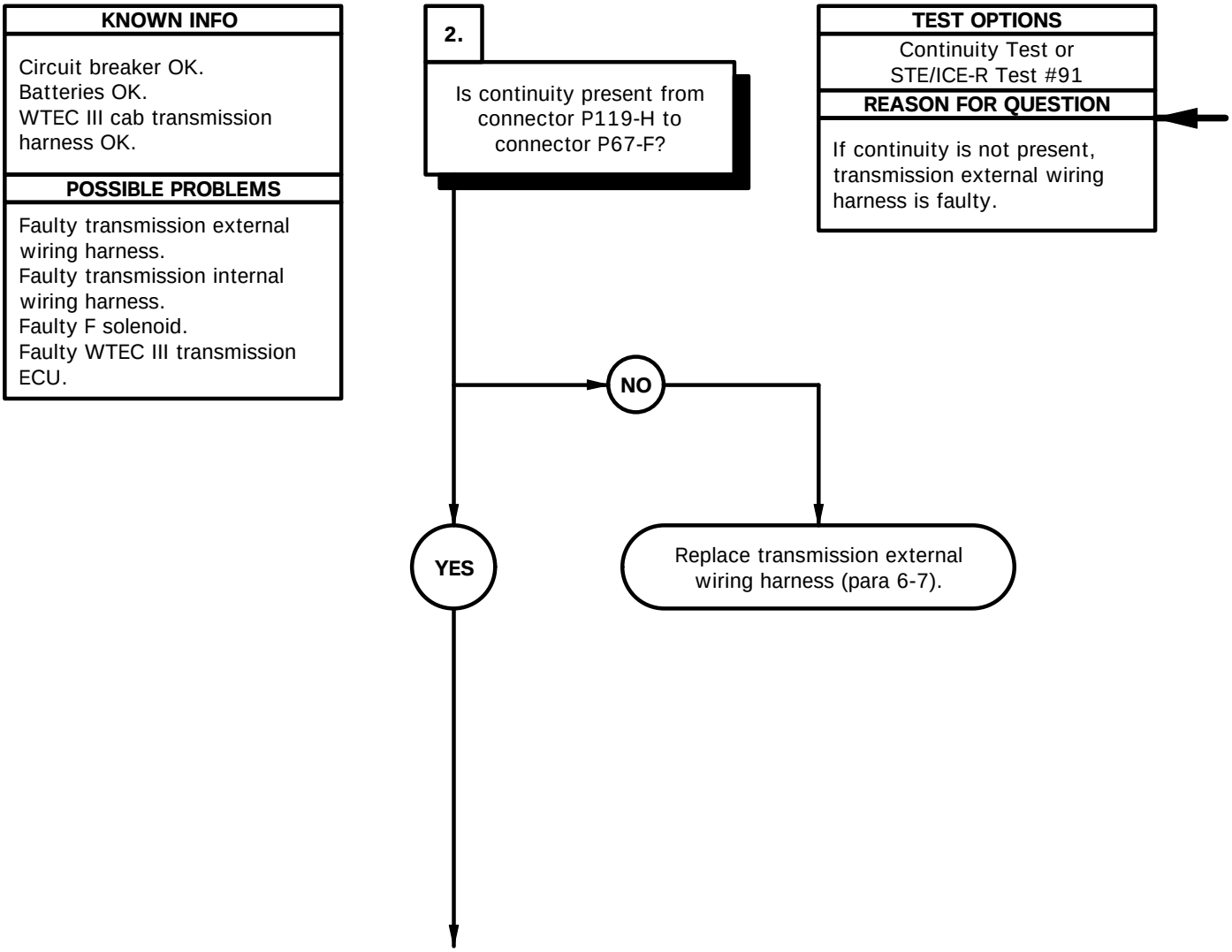
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from internal wiring harness 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect 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).

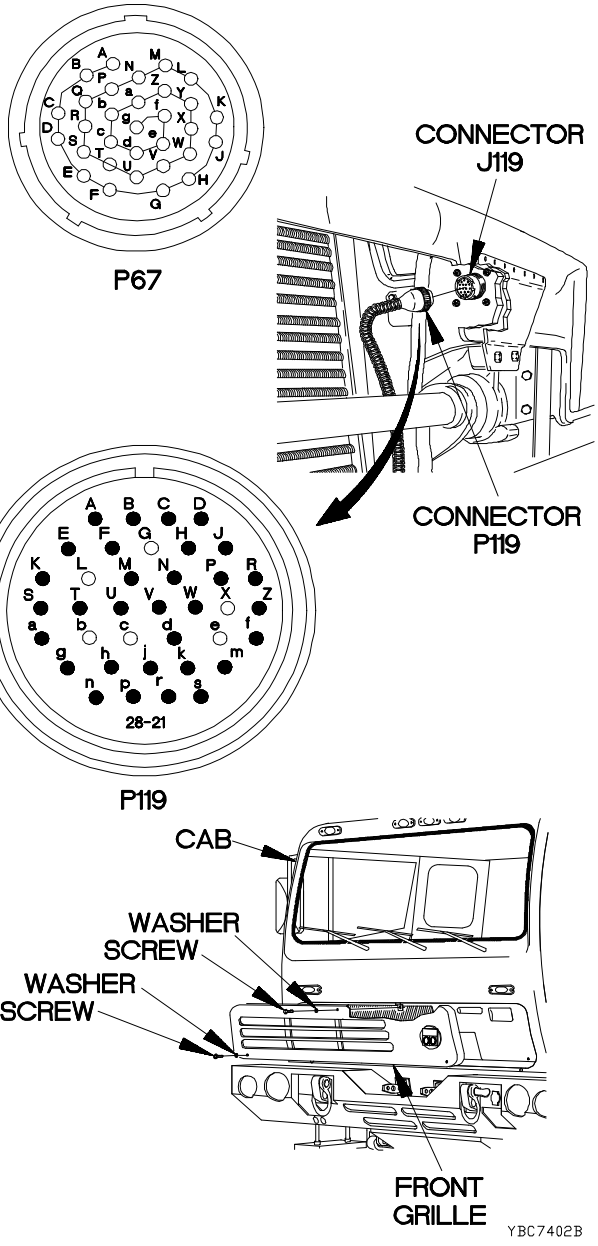


c74. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

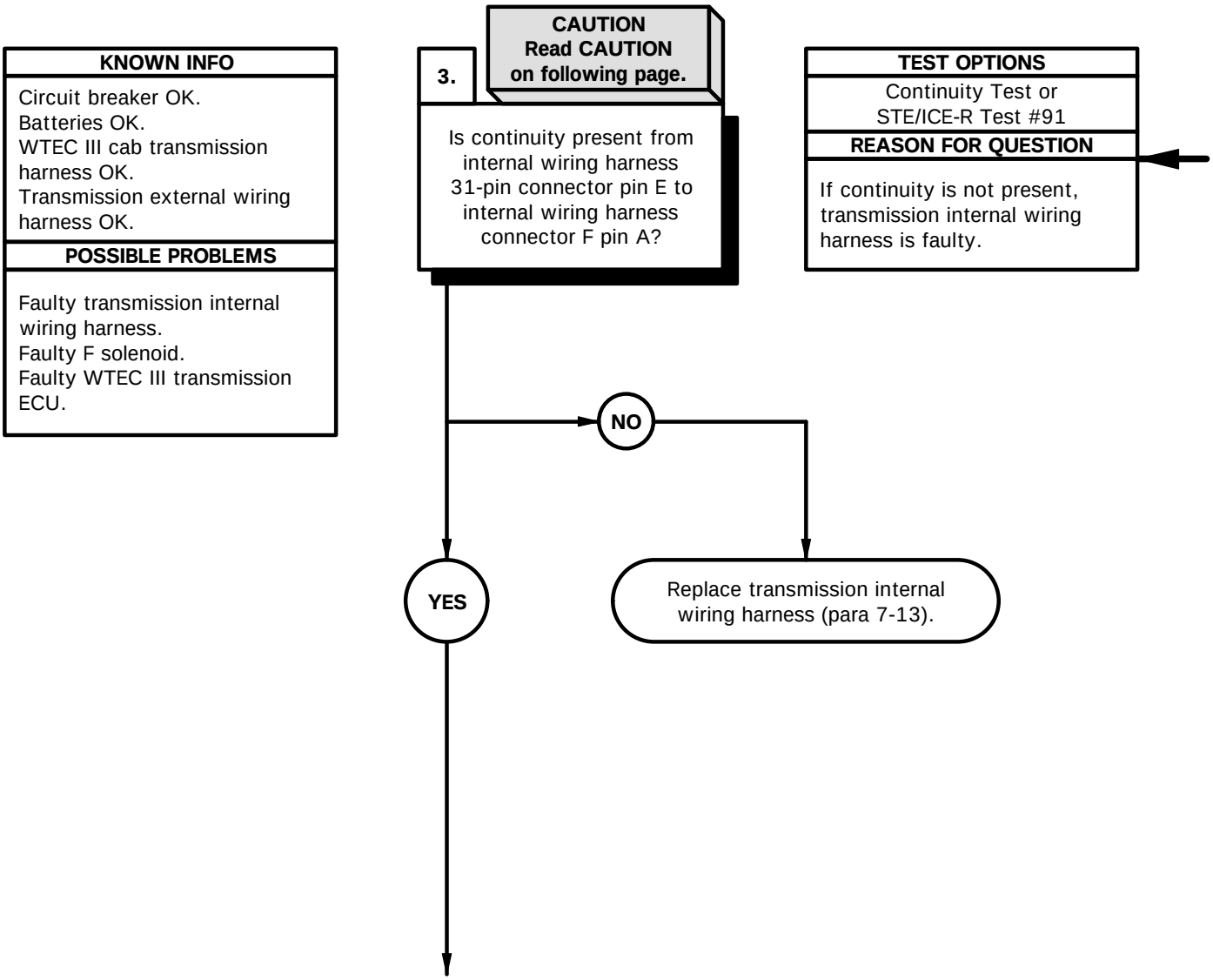


CONTINUITY TEST

(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 mulitmeter 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).



c74. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

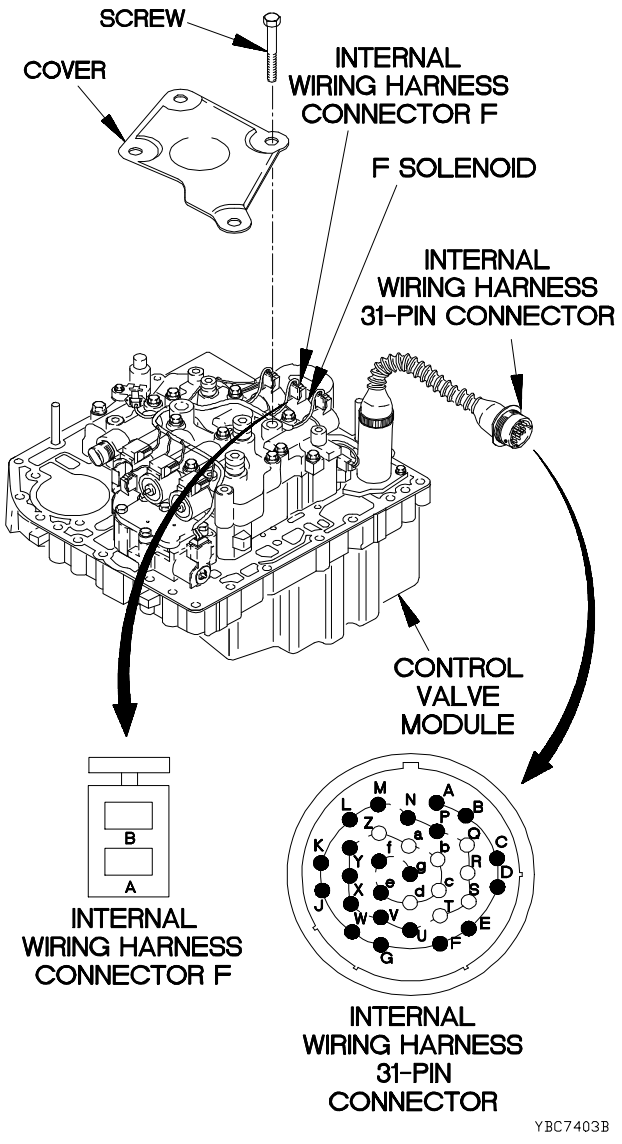


CAUTION

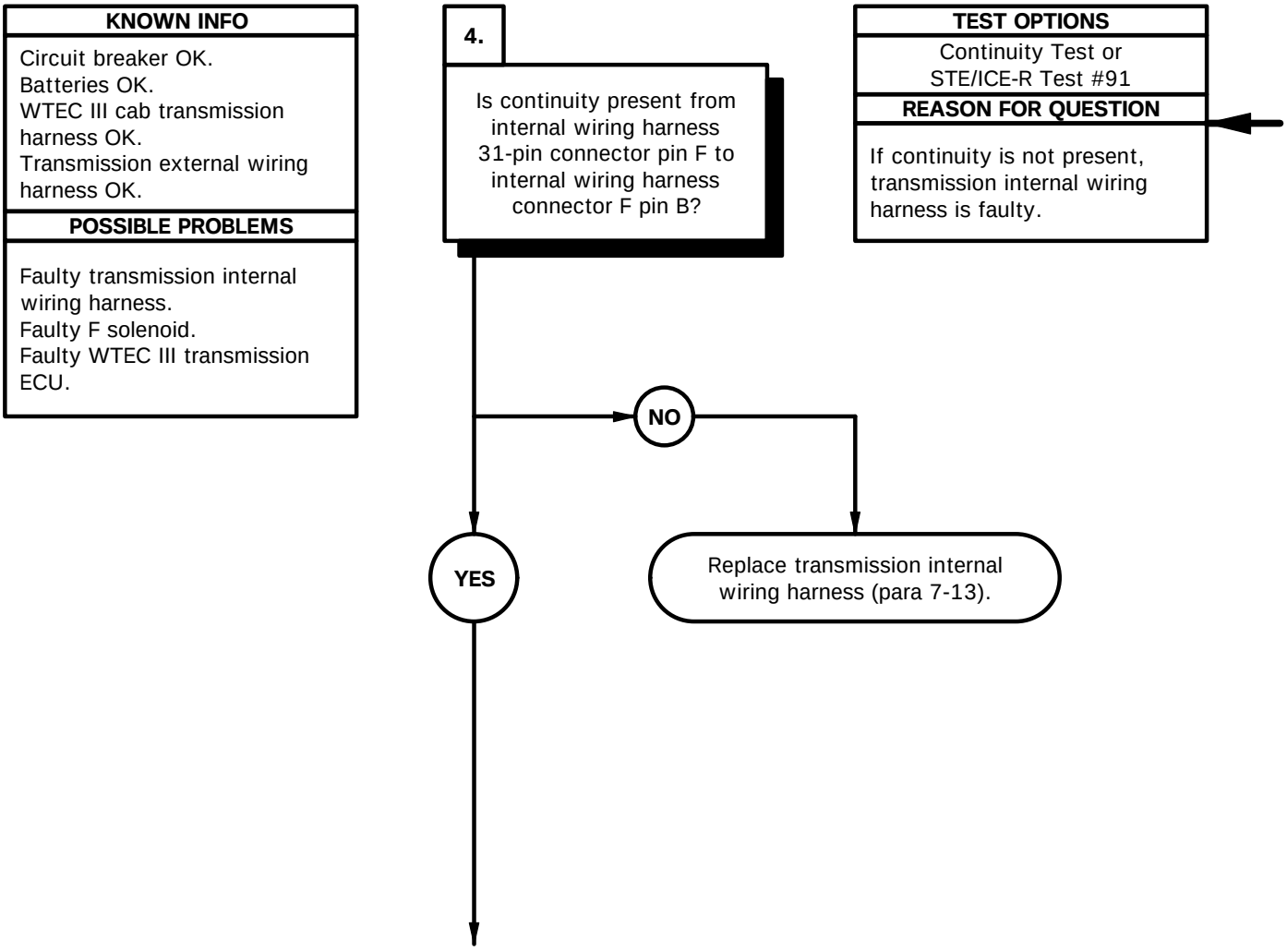
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

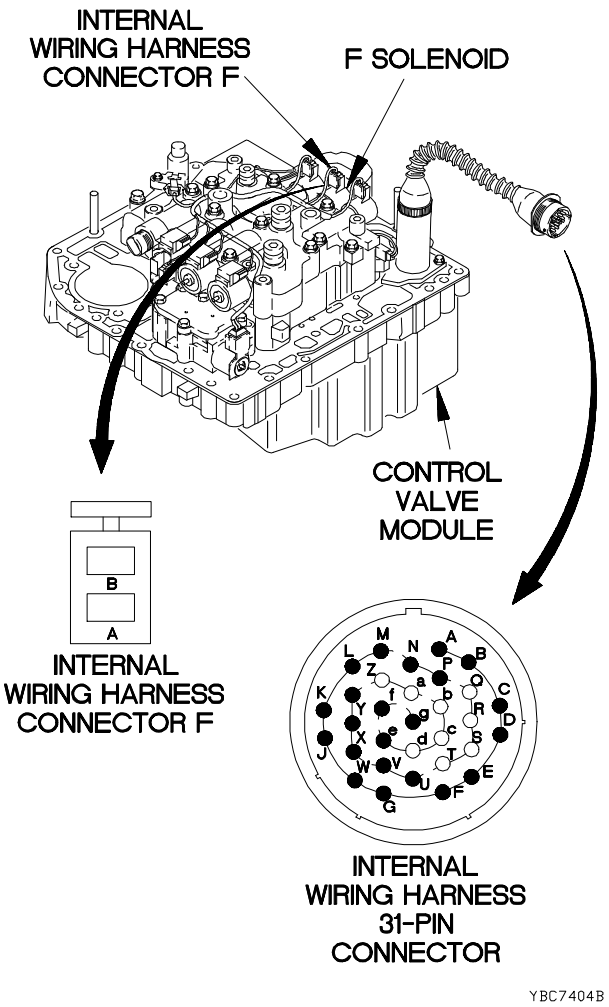


c74. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

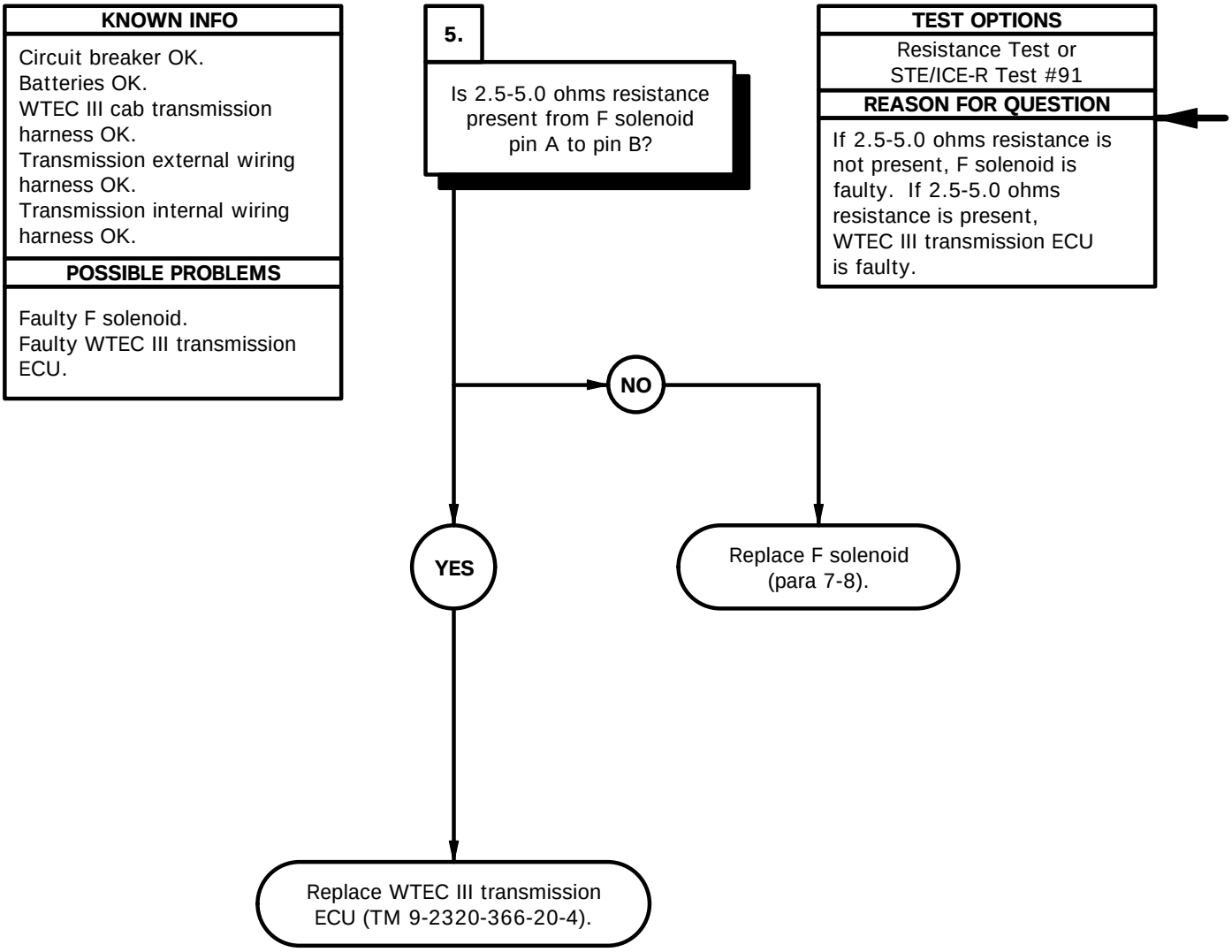


CONTINUITY TEST

(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).

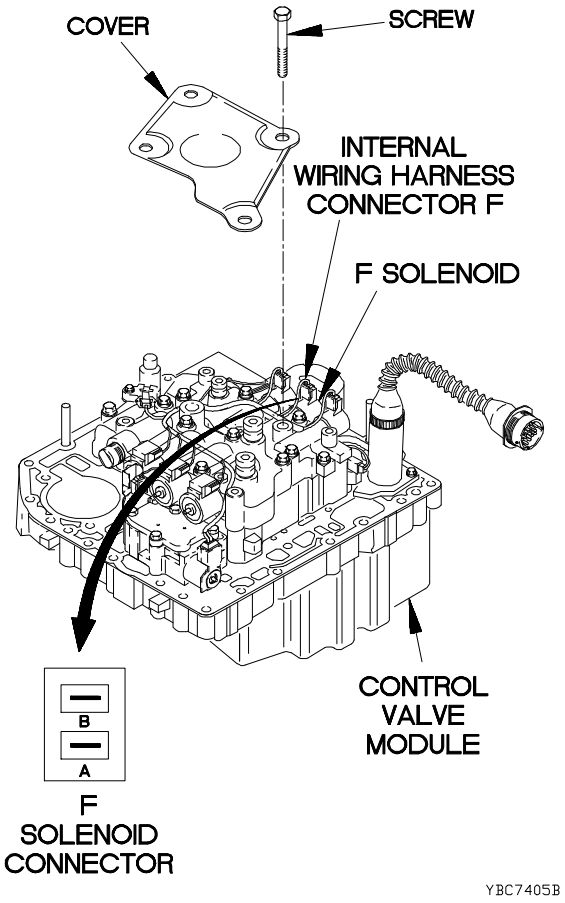


c74. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



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).



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

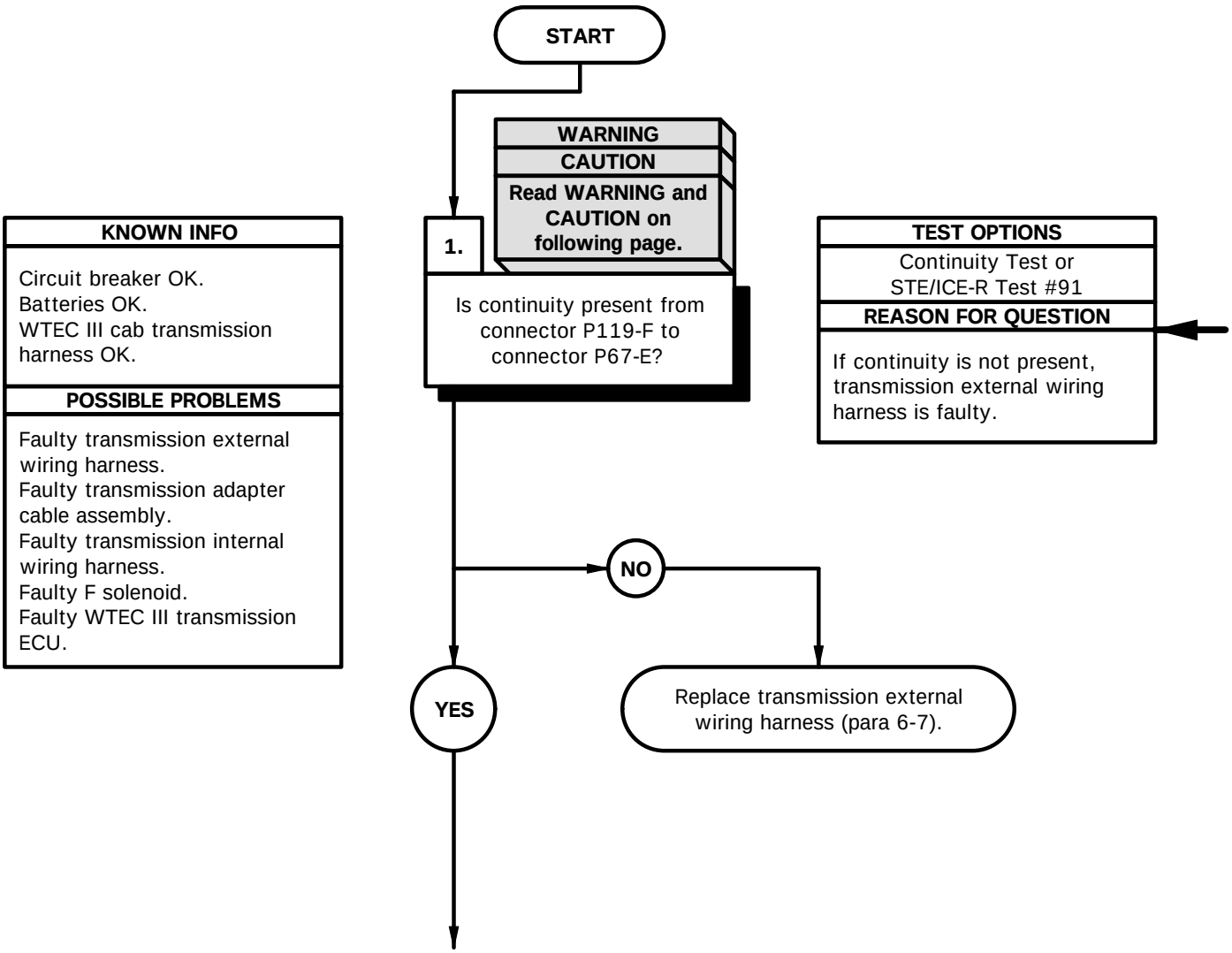
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

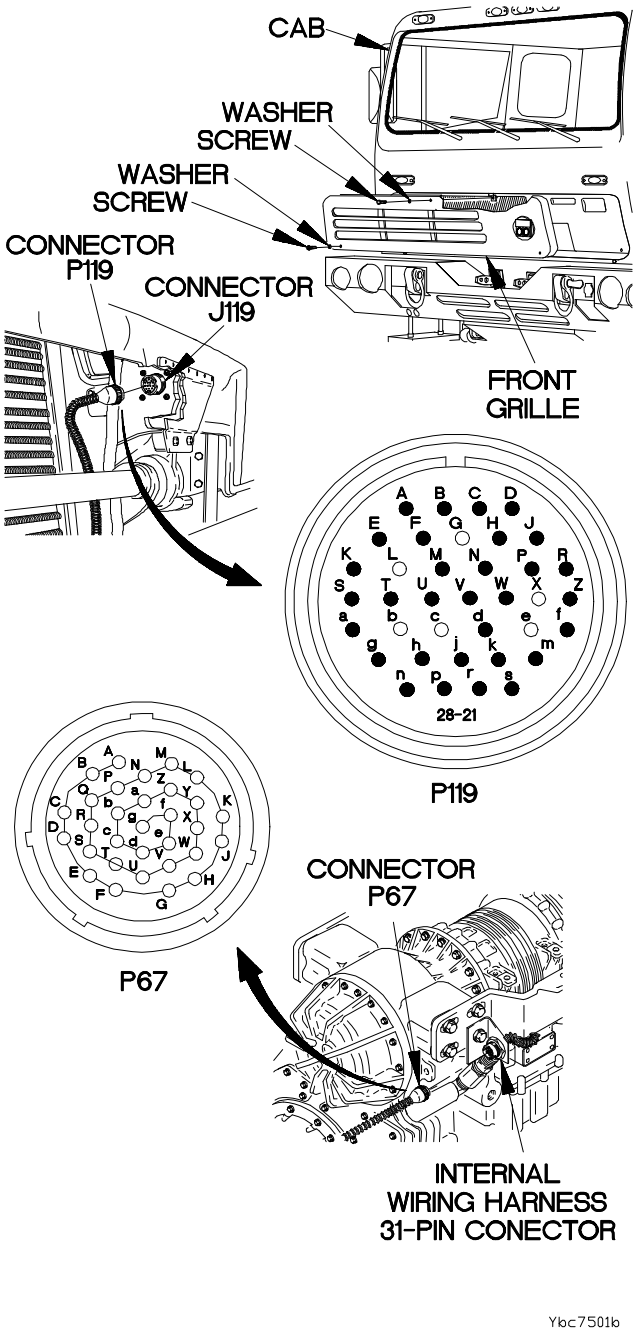
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

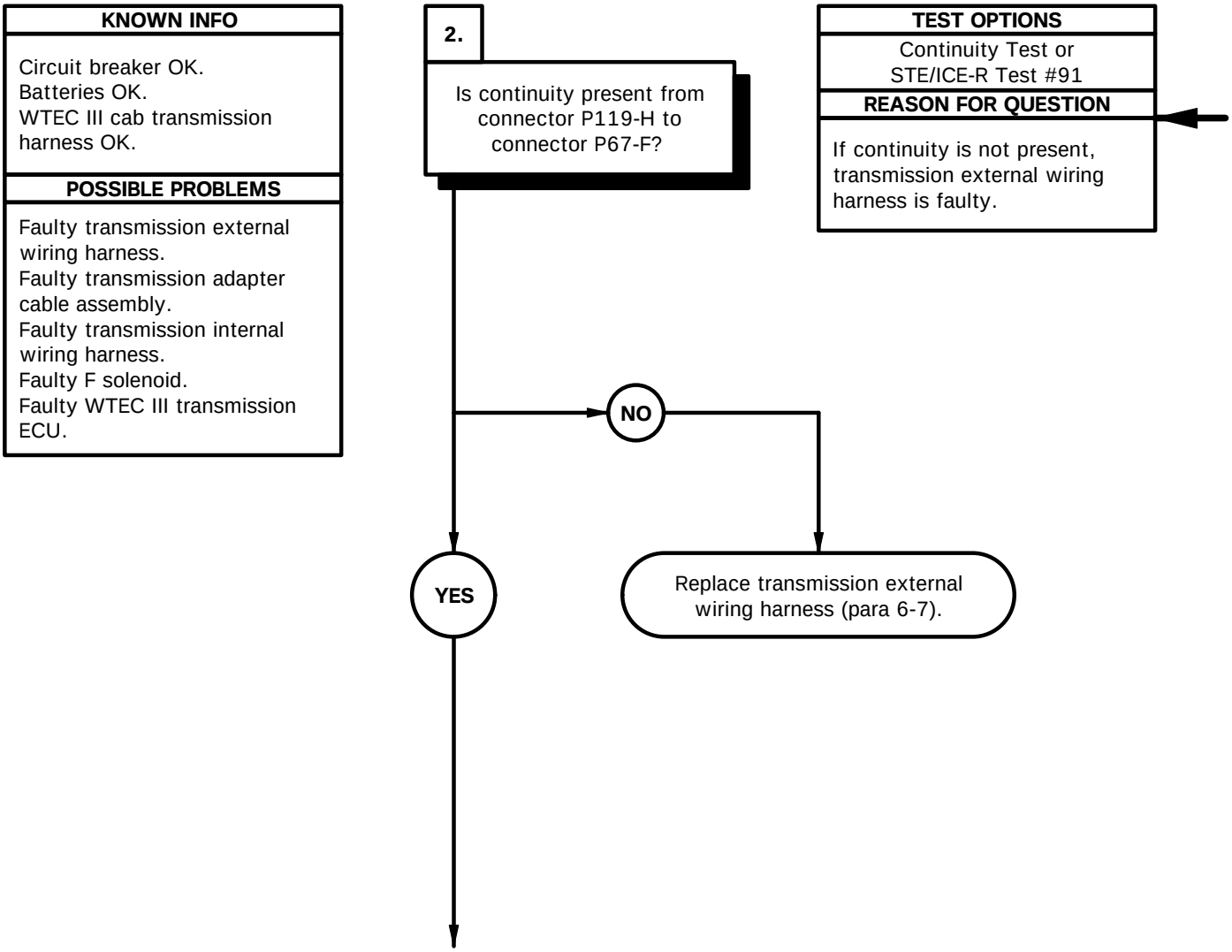
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from adapter cable 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect positive (+) probe of multimeter to connector P119-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).

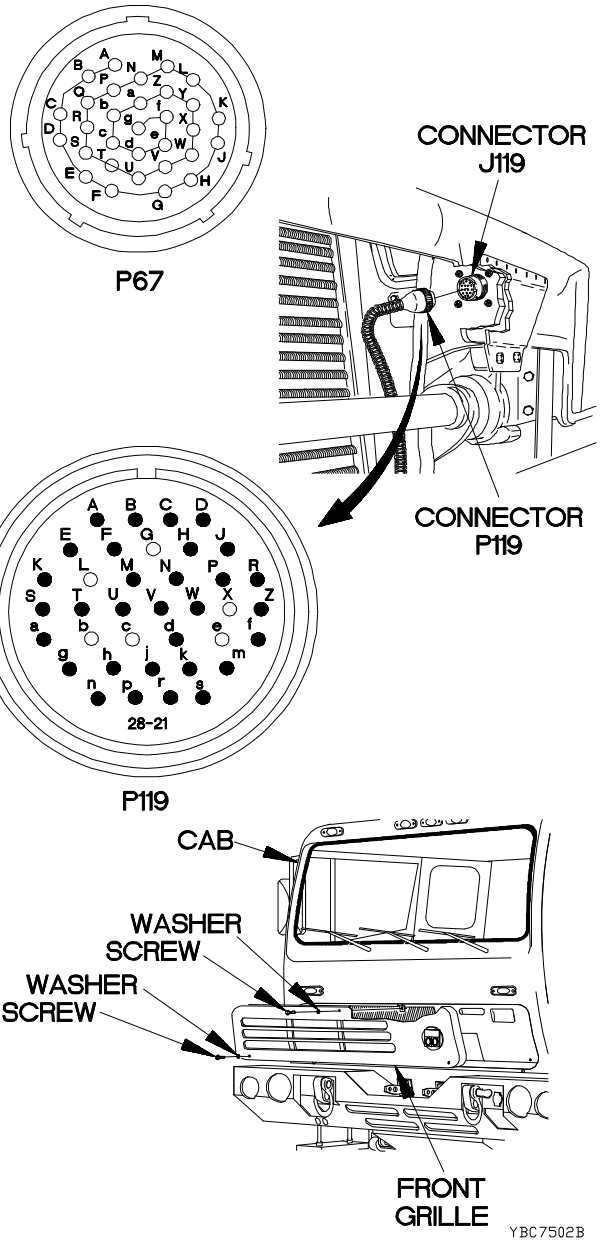


c75. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

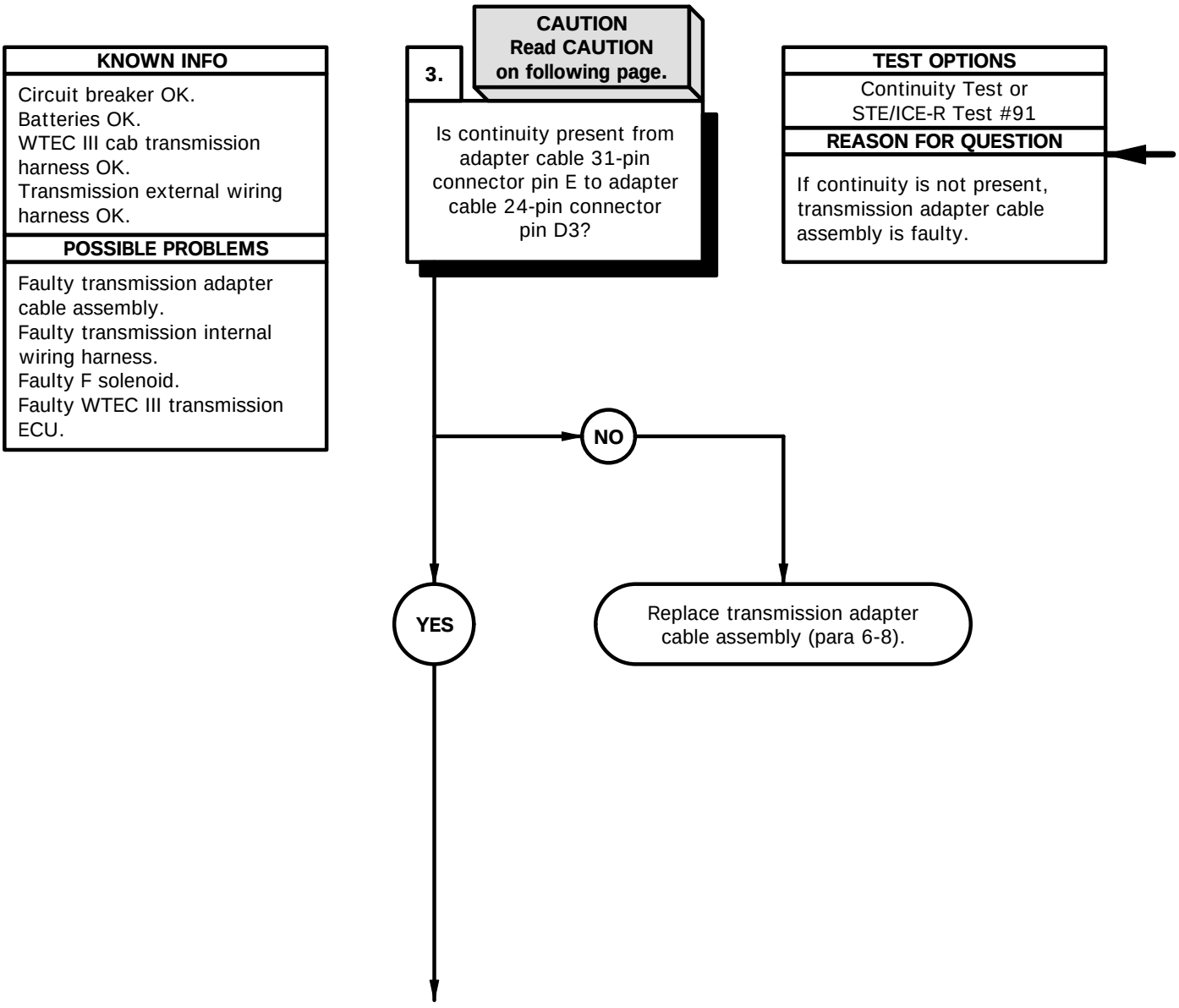


CONTINUITY TEST

(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).



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)

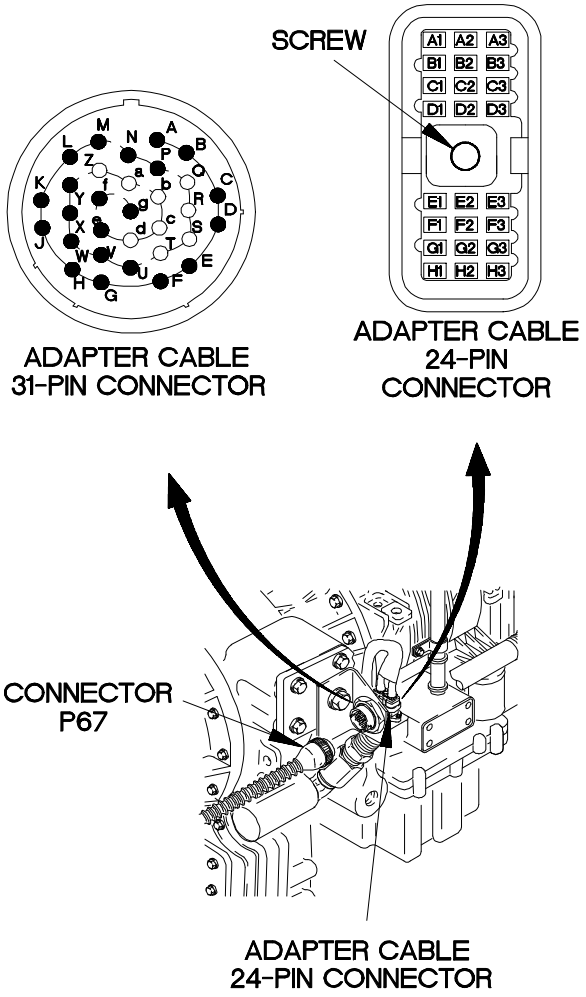


CAUTION

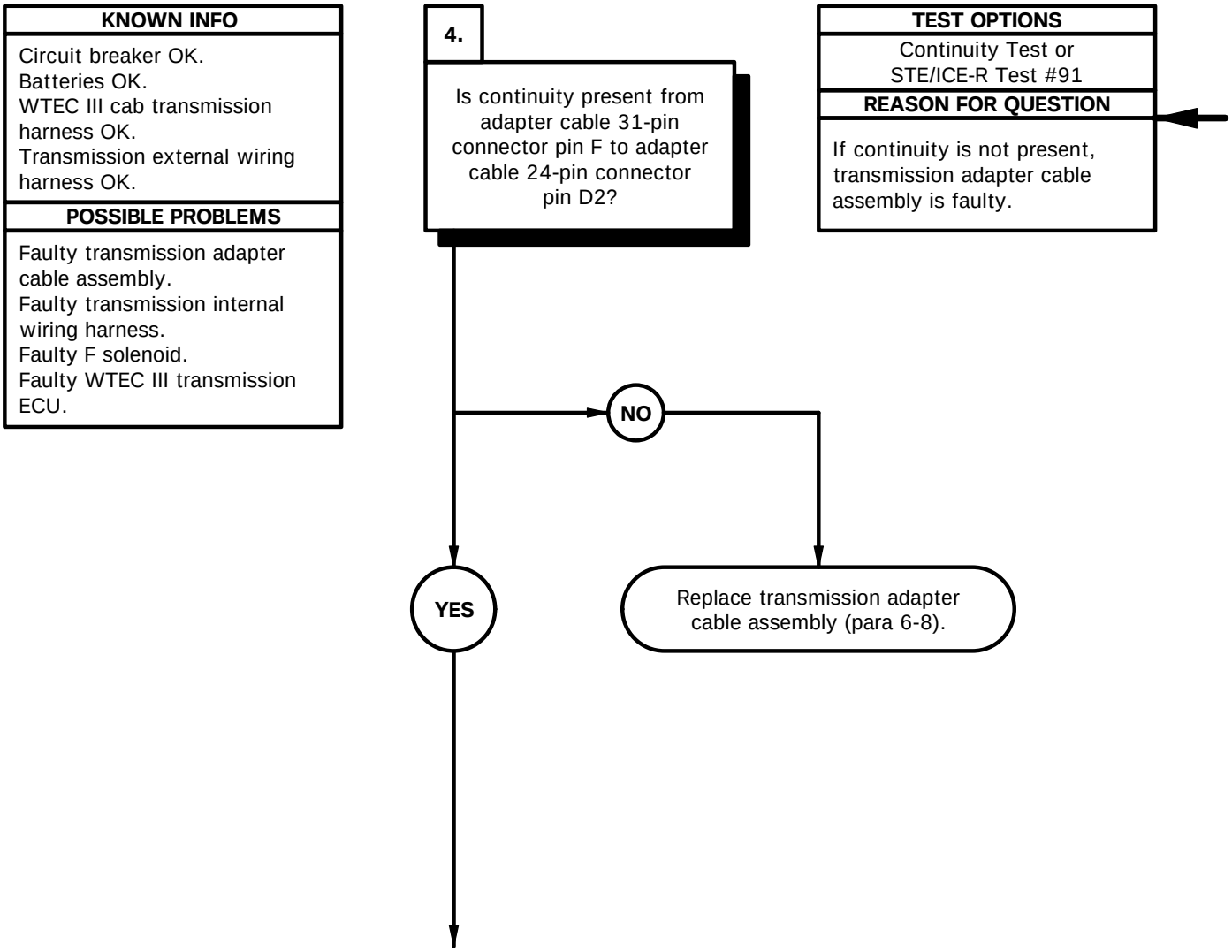
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

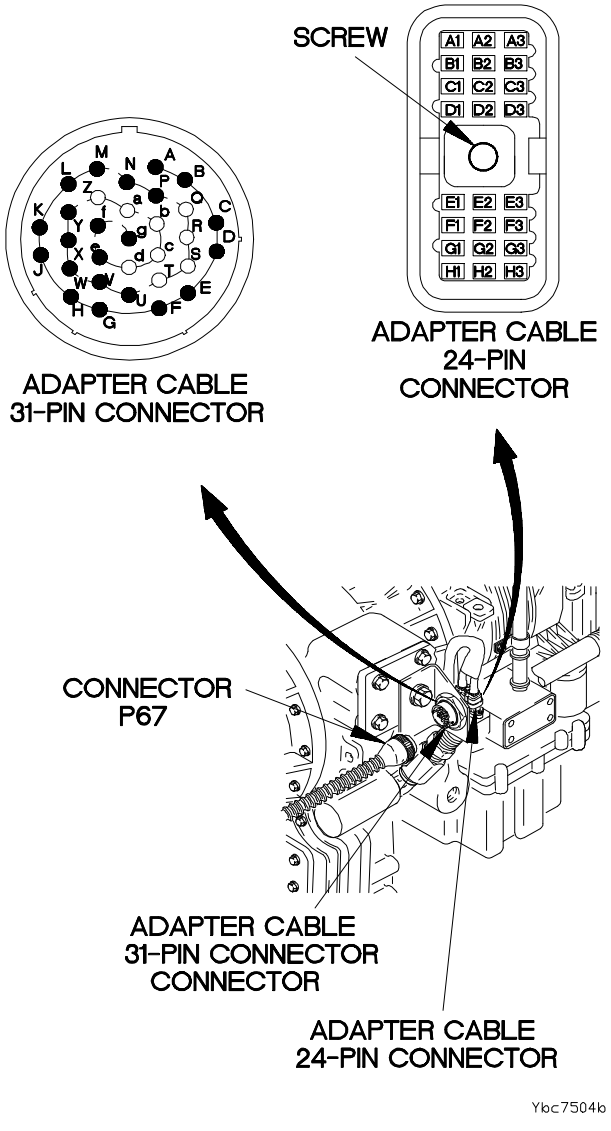


c75. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

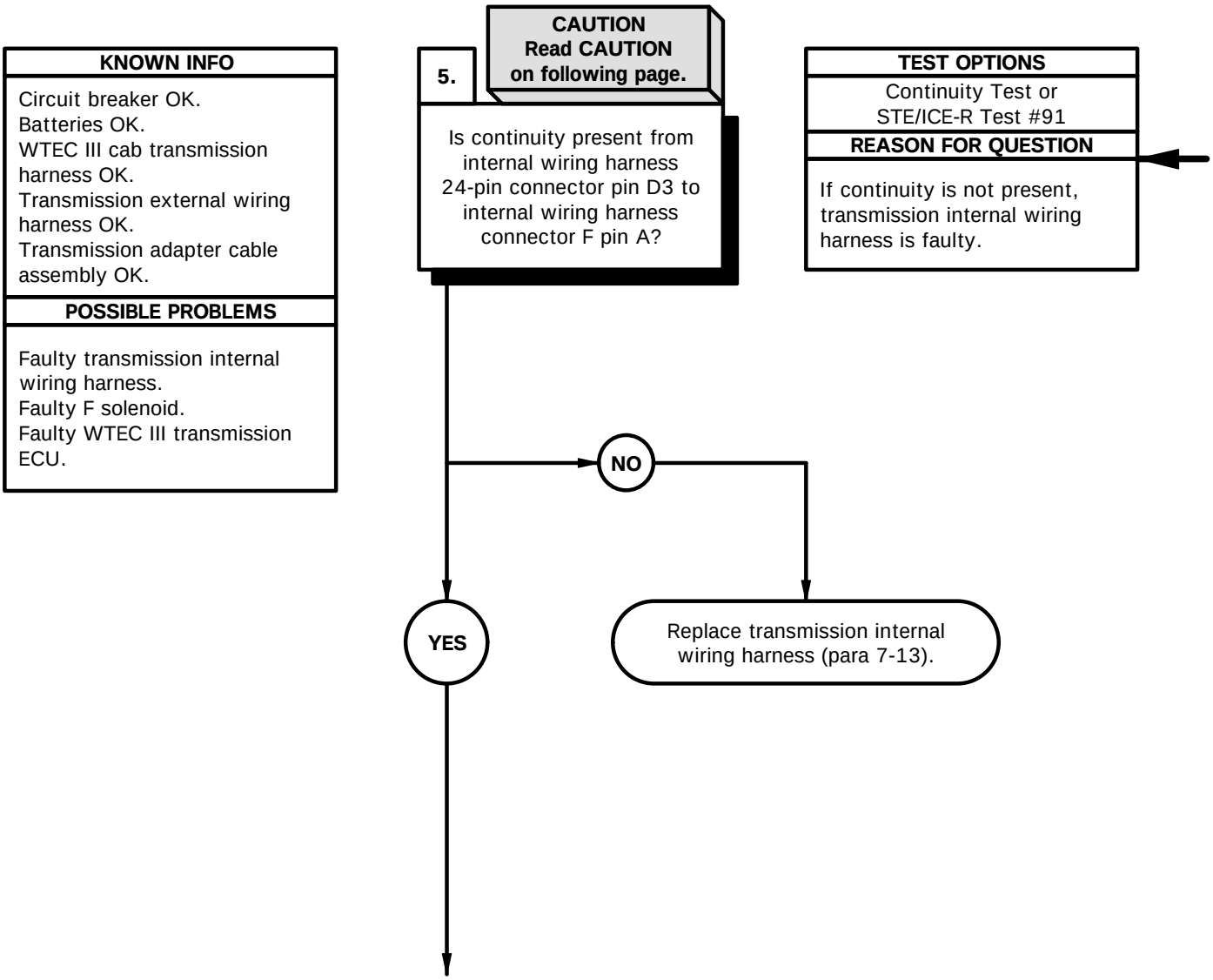


CONTINUITY TEST

(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.



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)

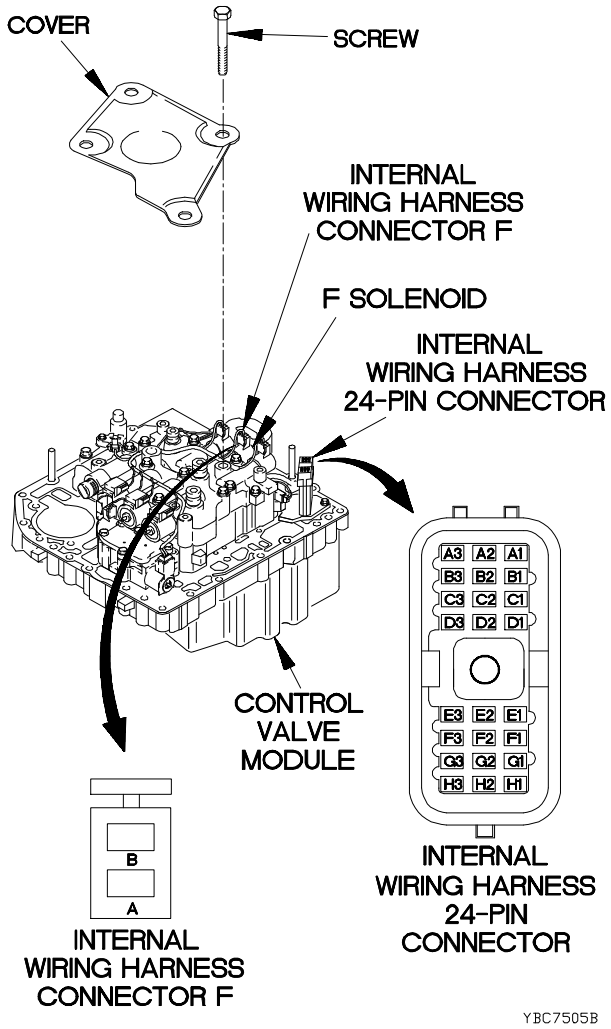


CAUTION

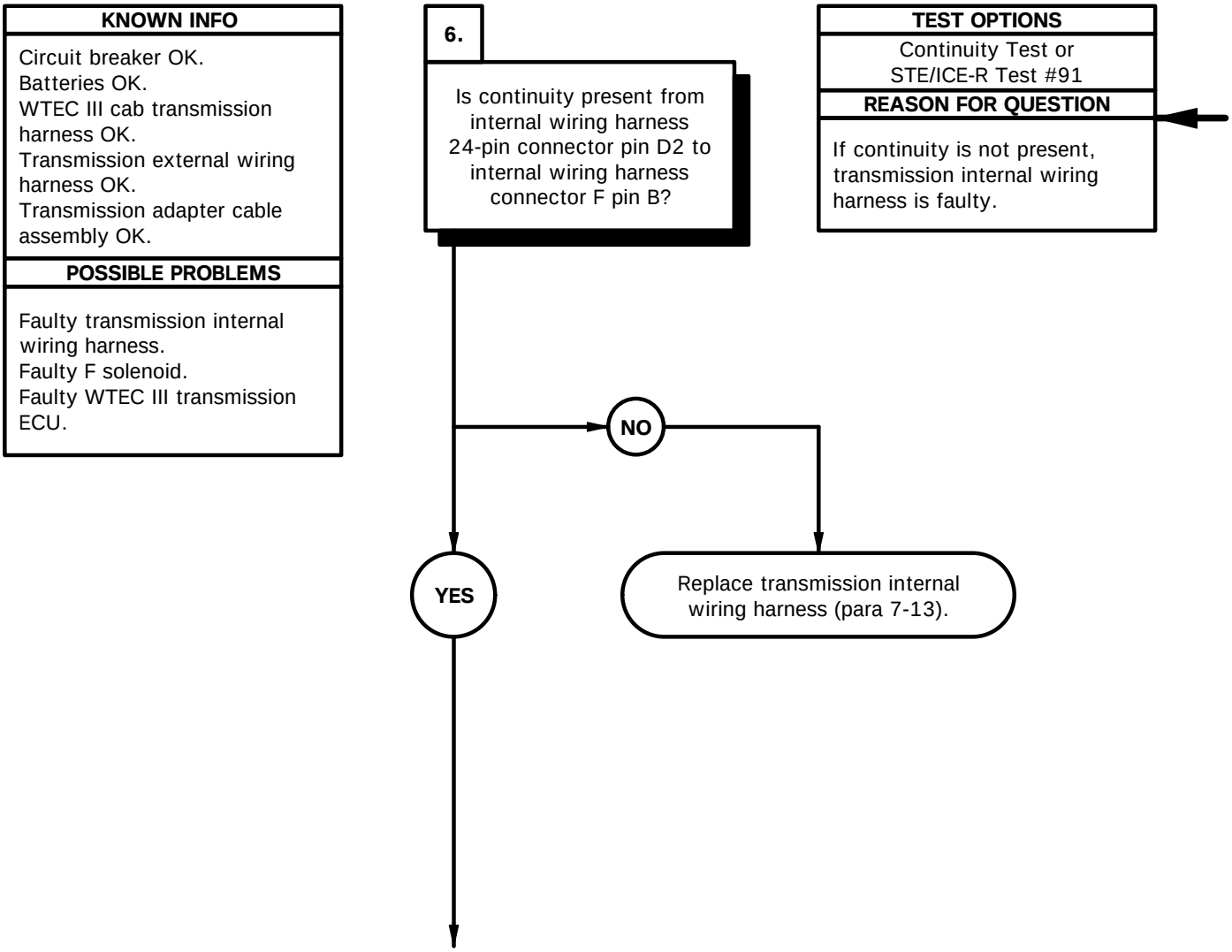
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

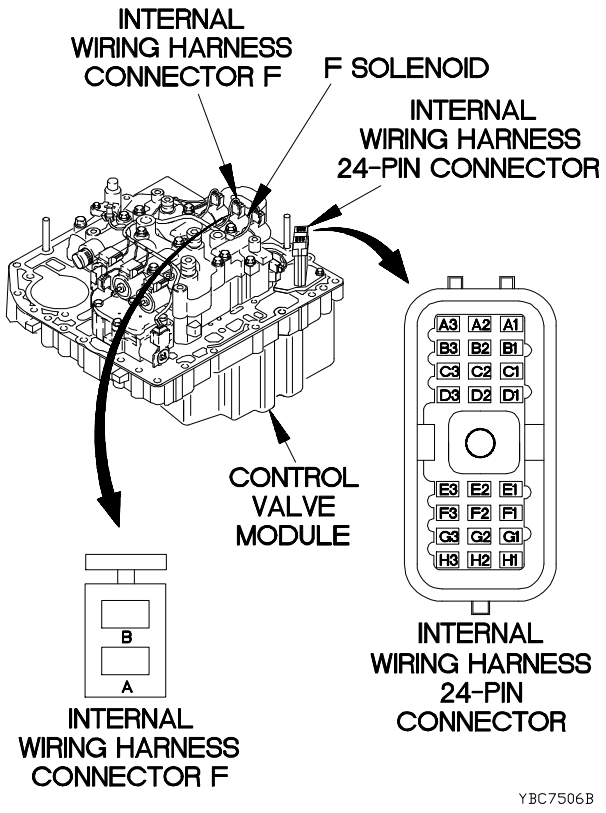


c75. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

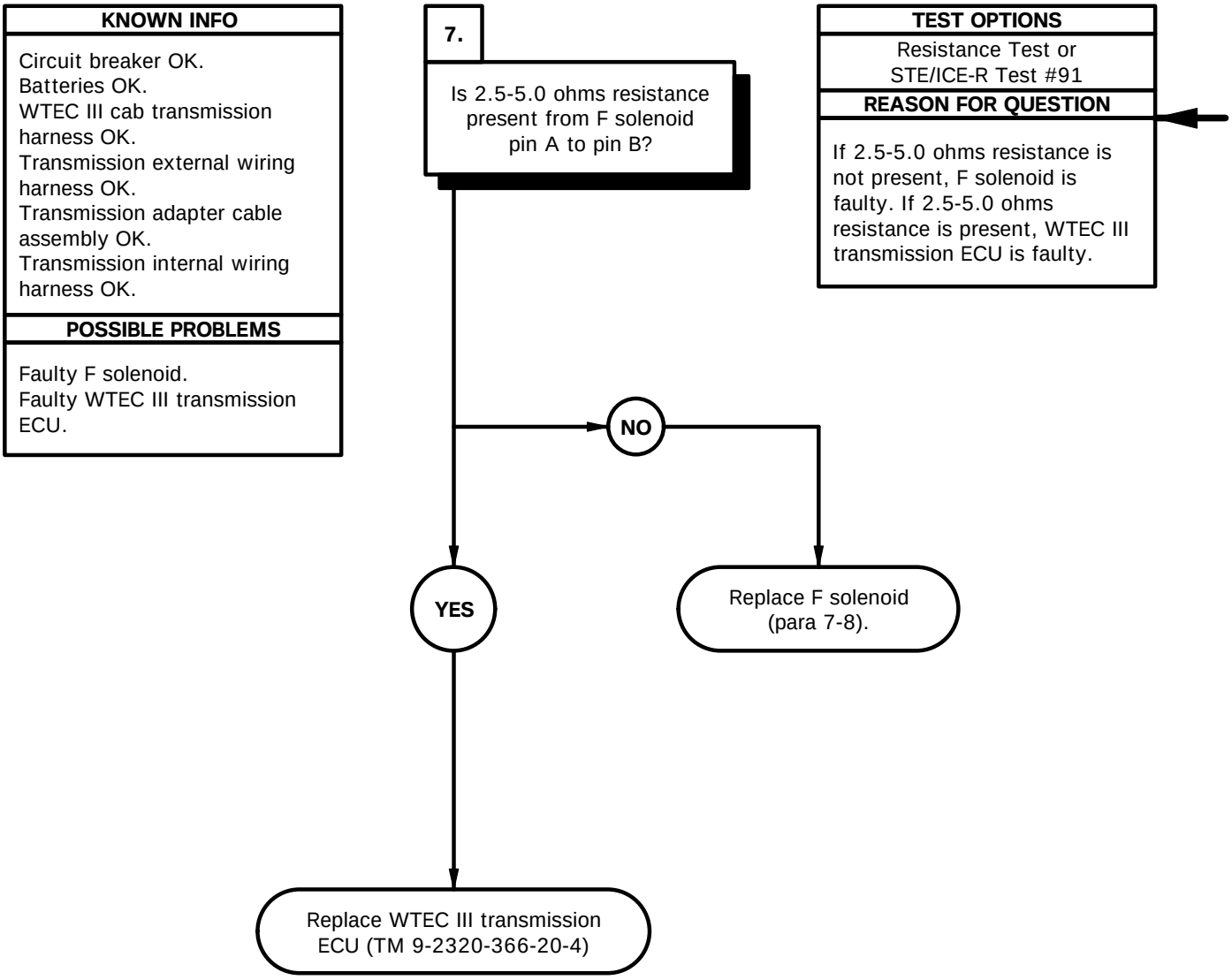


CONTINUITY TEST

(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).

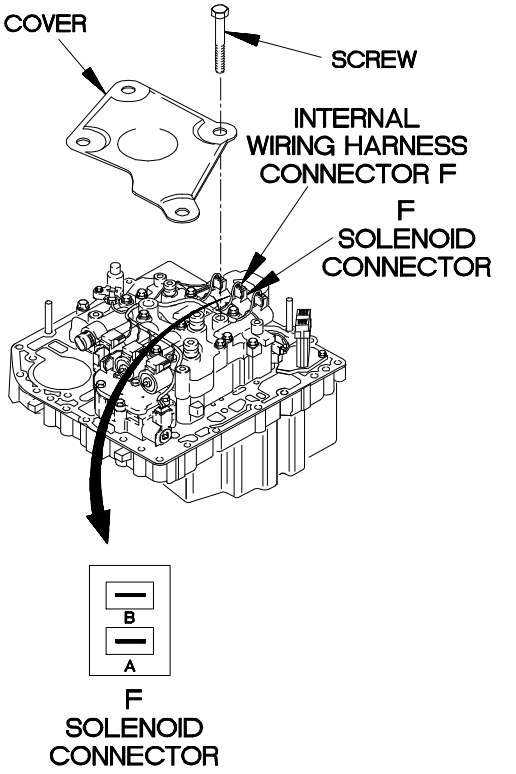


c75. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



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).



c76. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

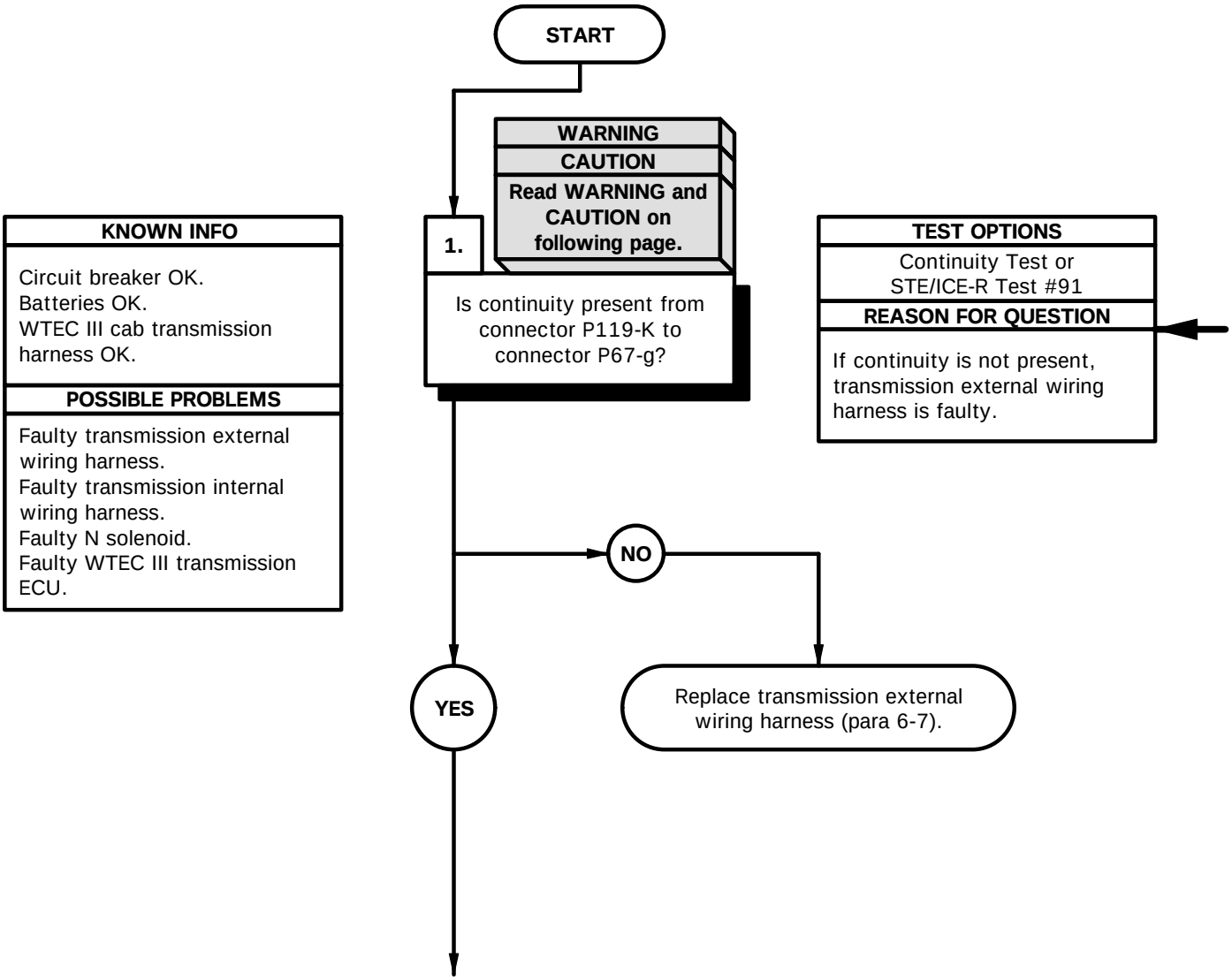
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

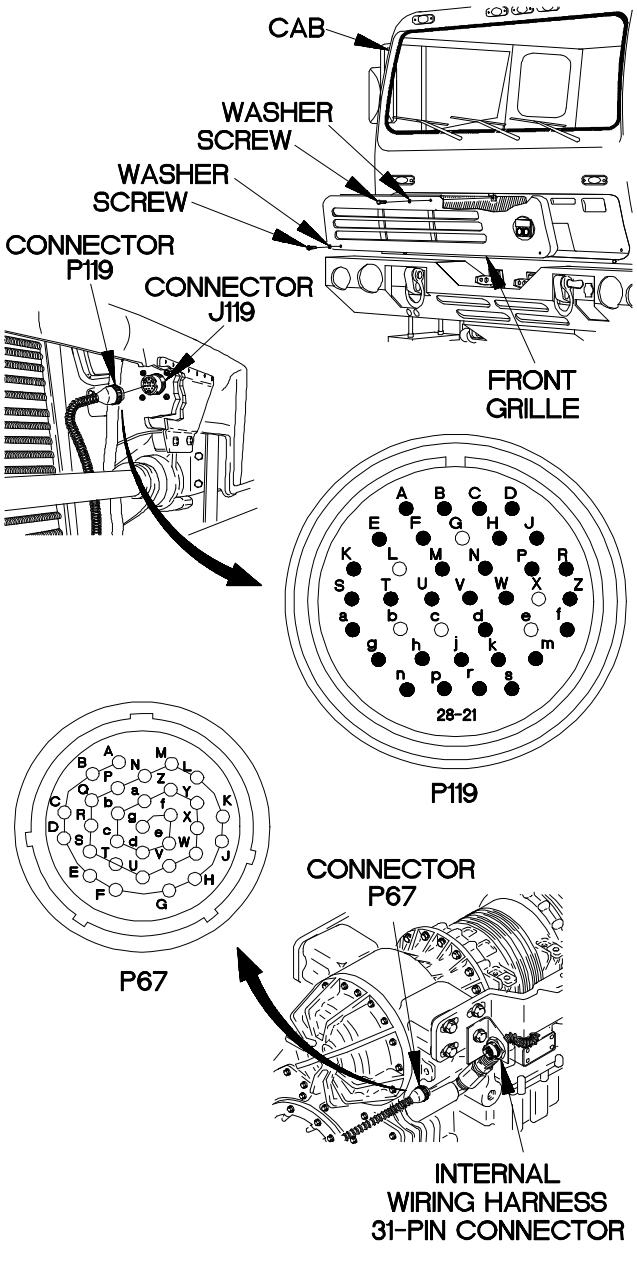
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

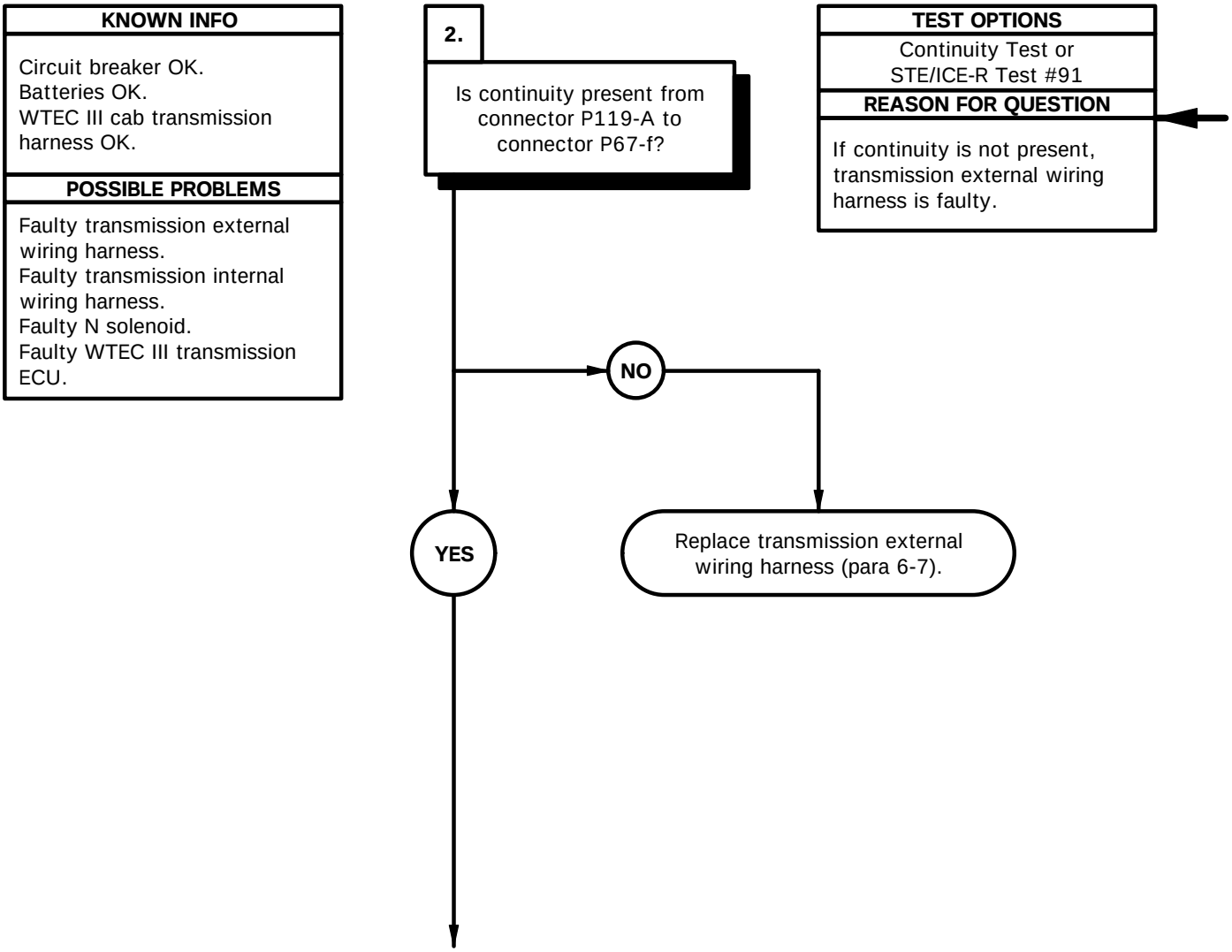
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from internal wiring harness 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect 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).

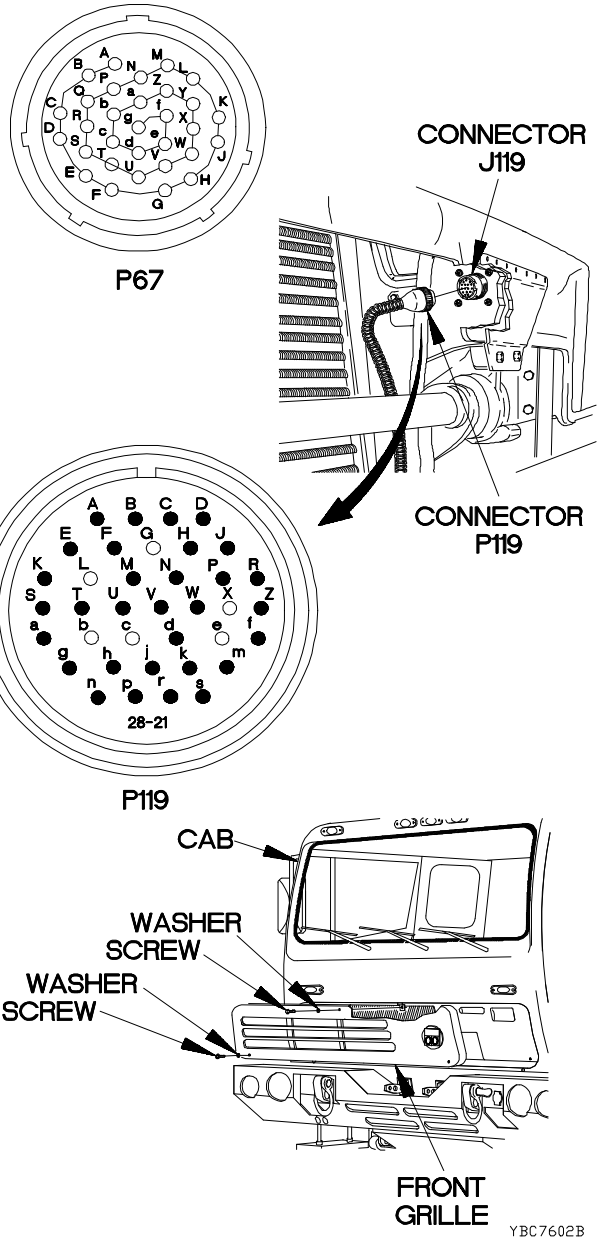


c76. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

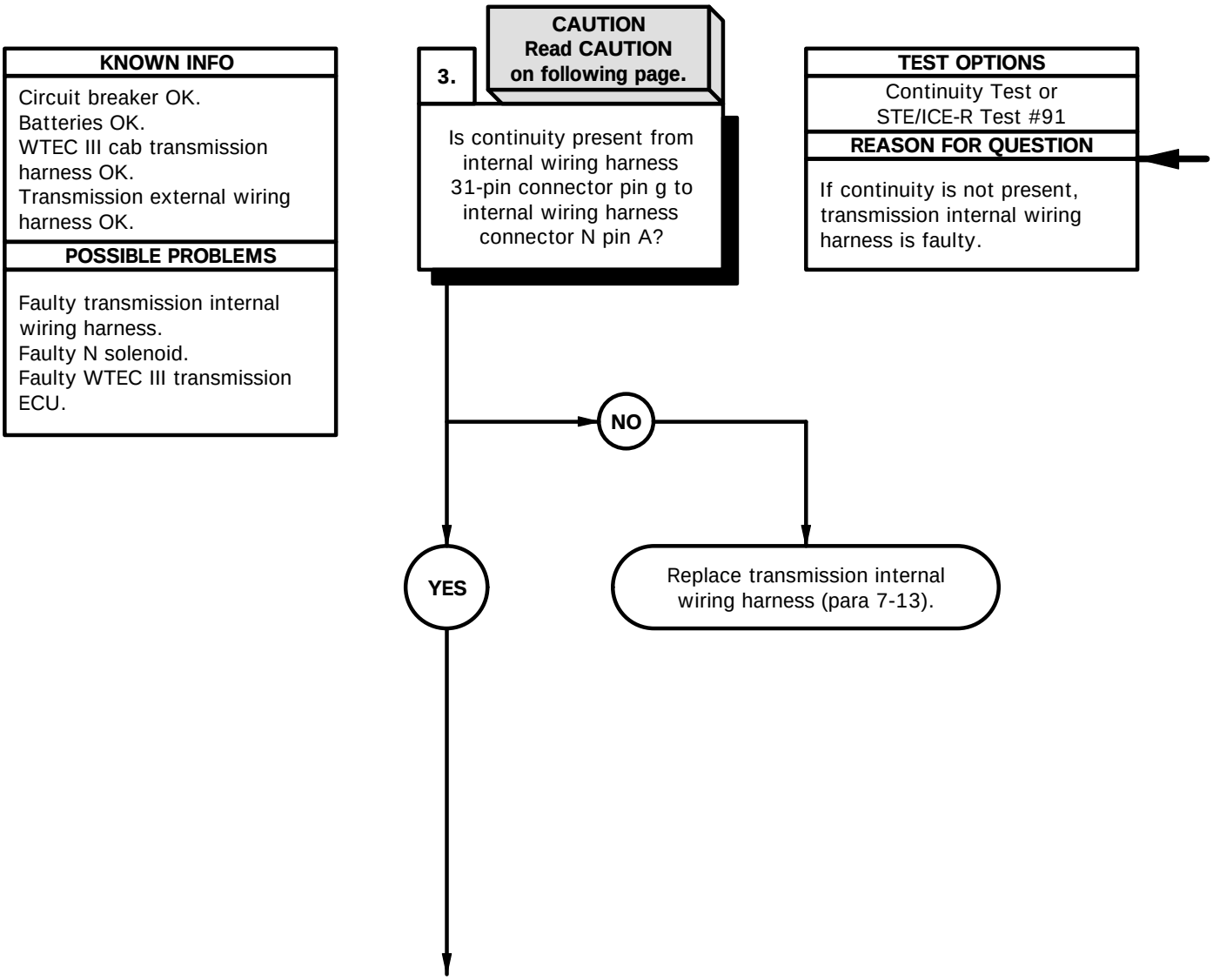


CONTINUITY TEST

(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)

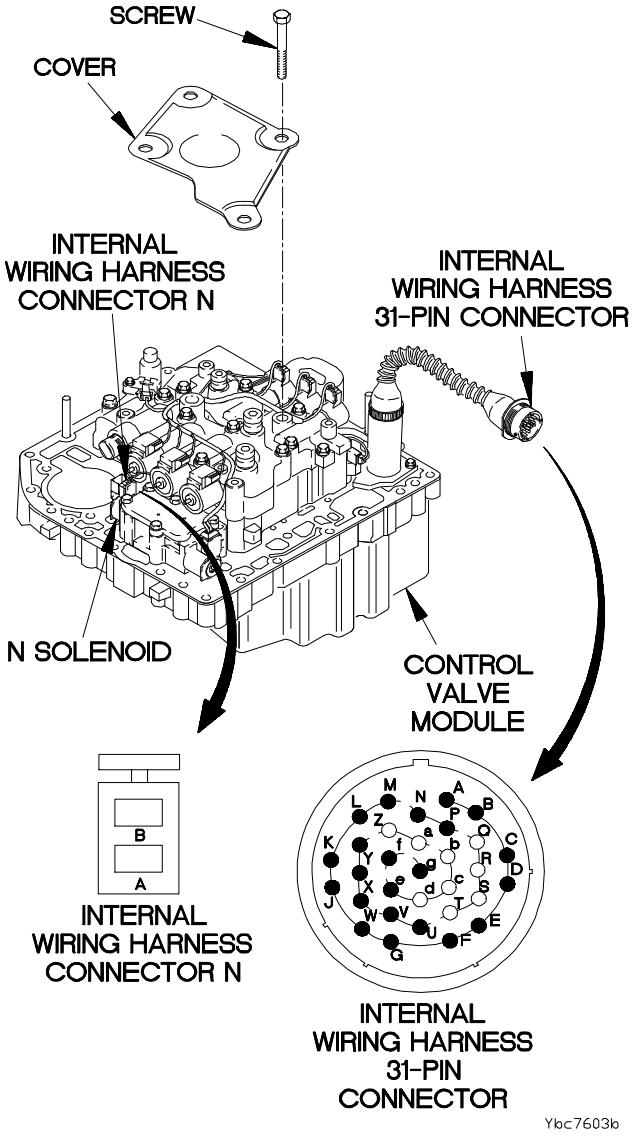


CAUTION

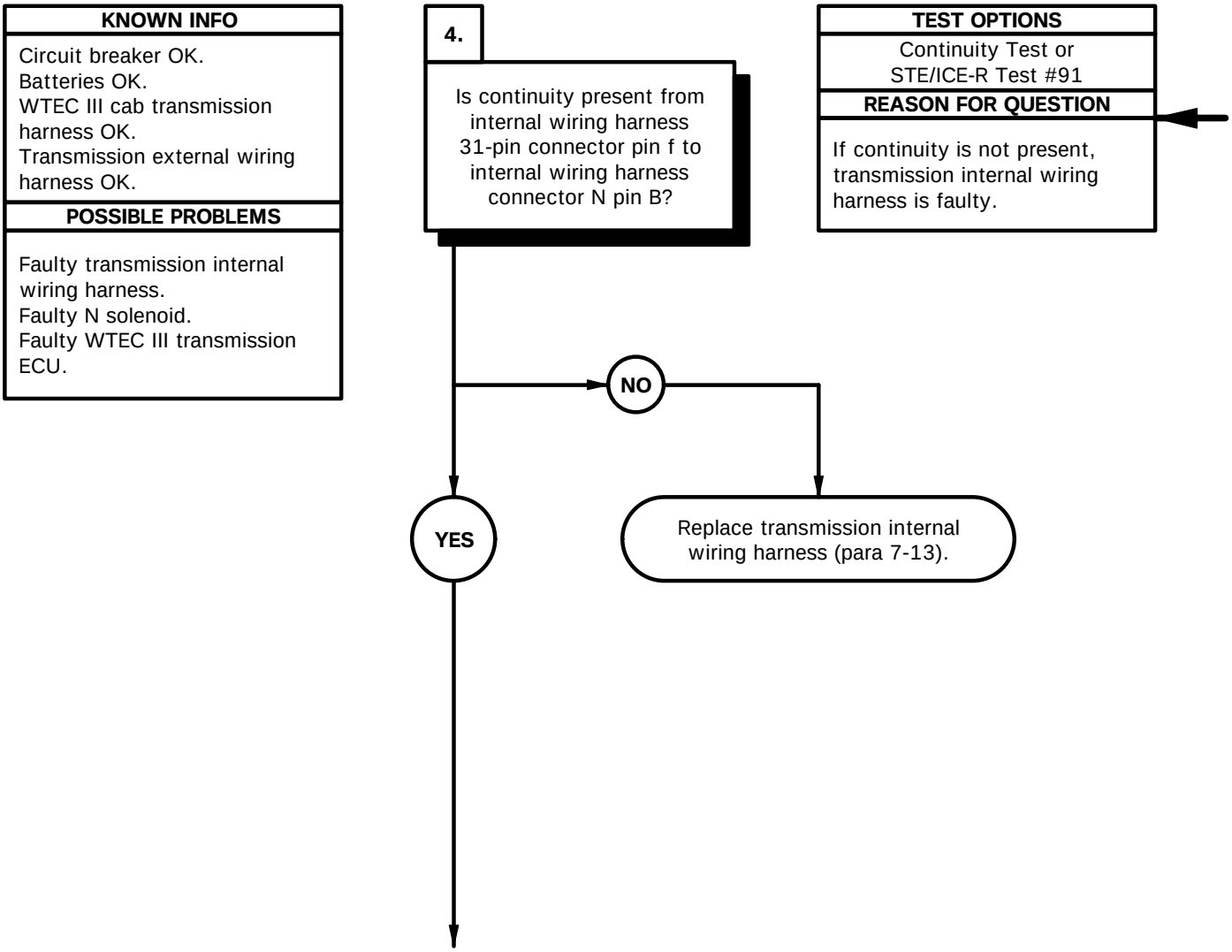
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

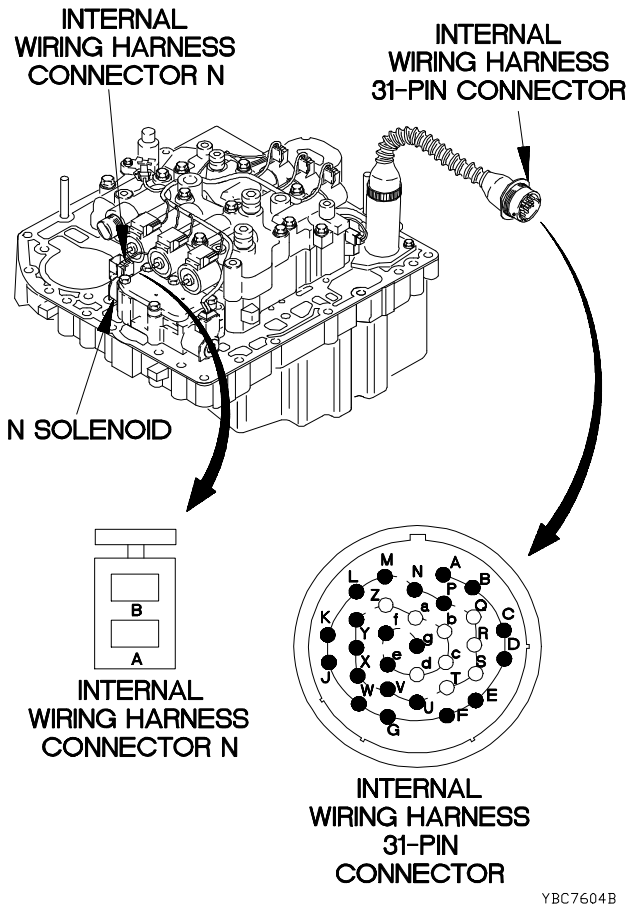


c76. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

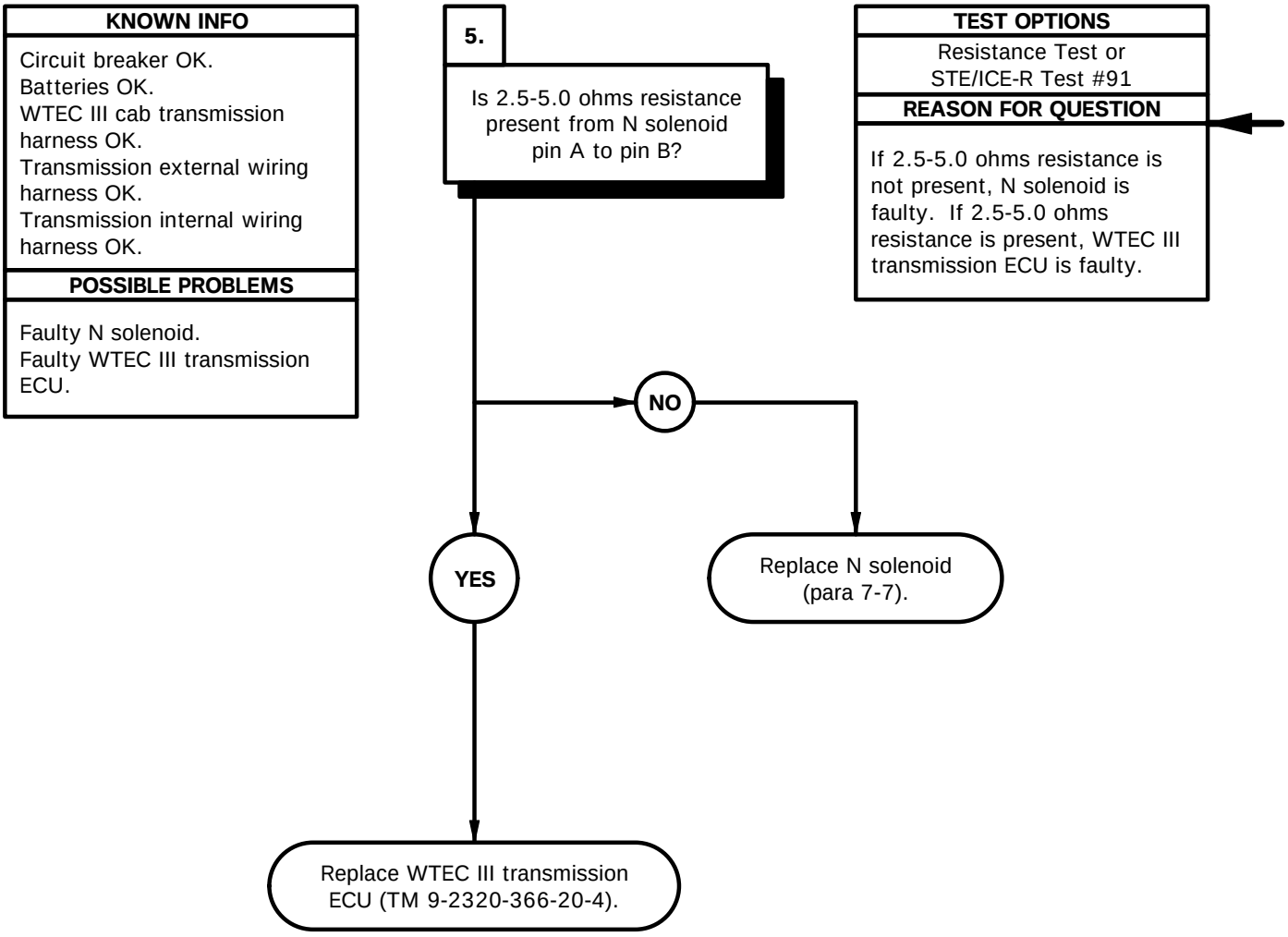


CONTINUITY TEST

(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).

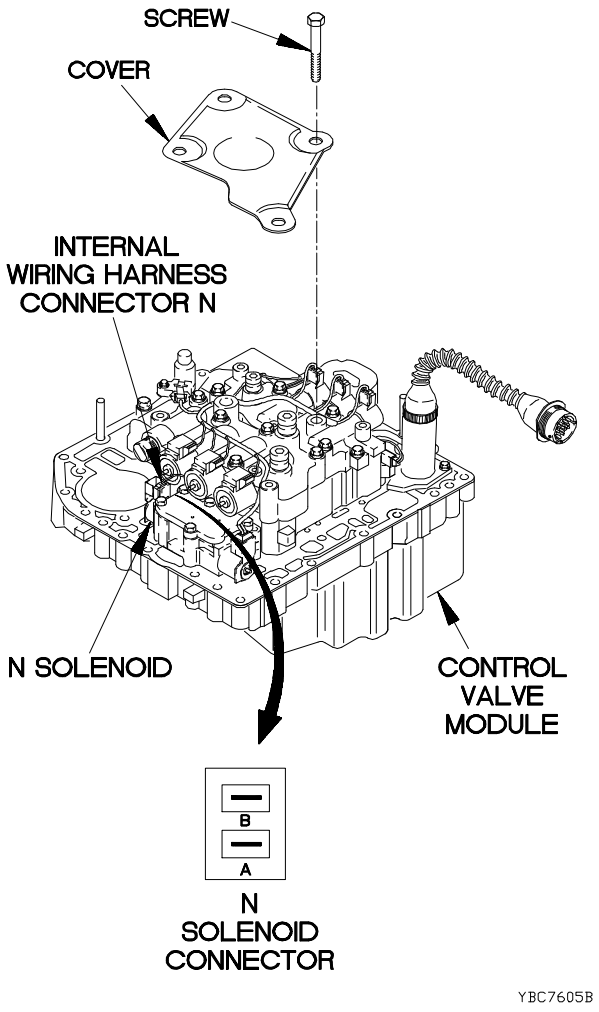


c76. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



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).



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

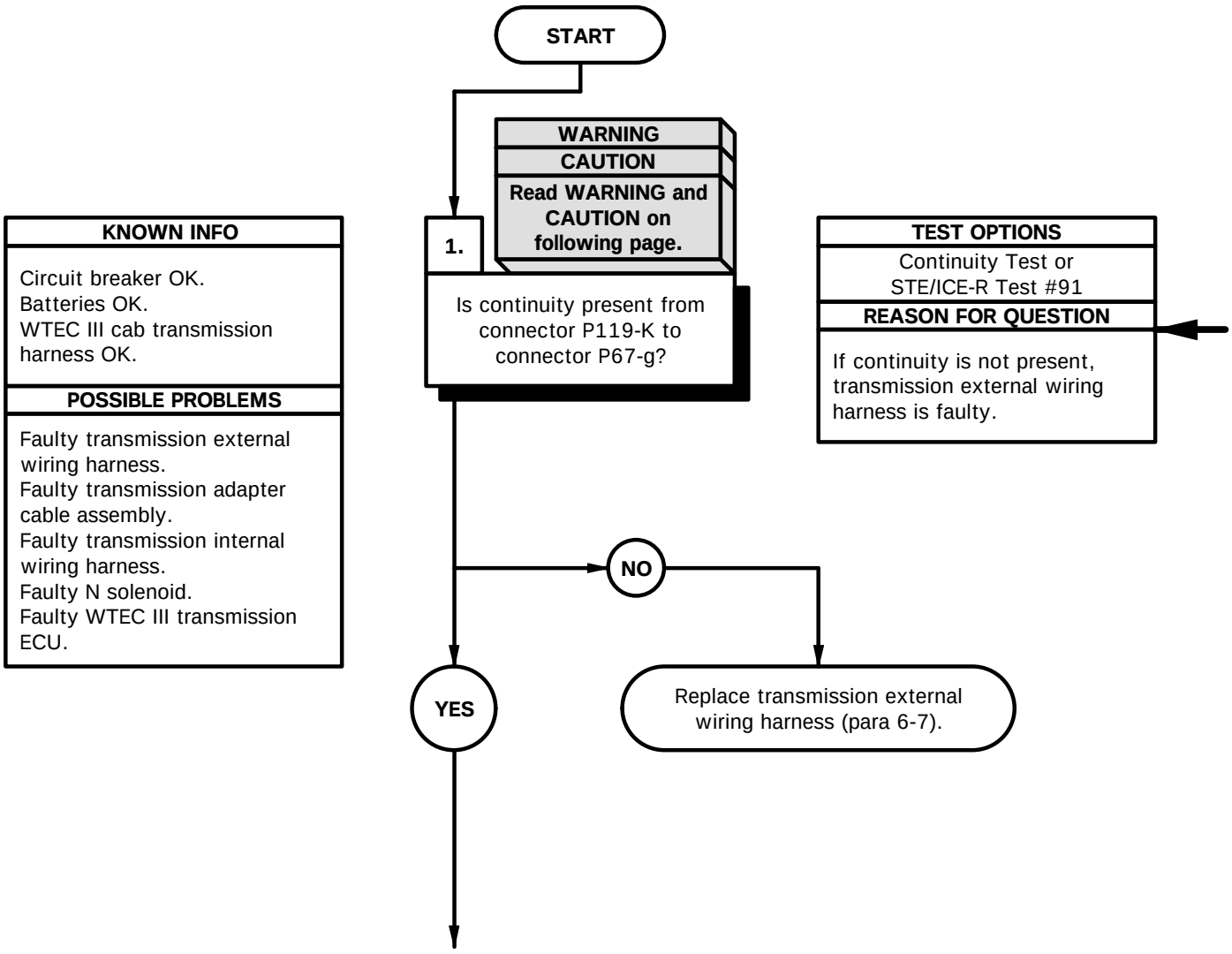
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

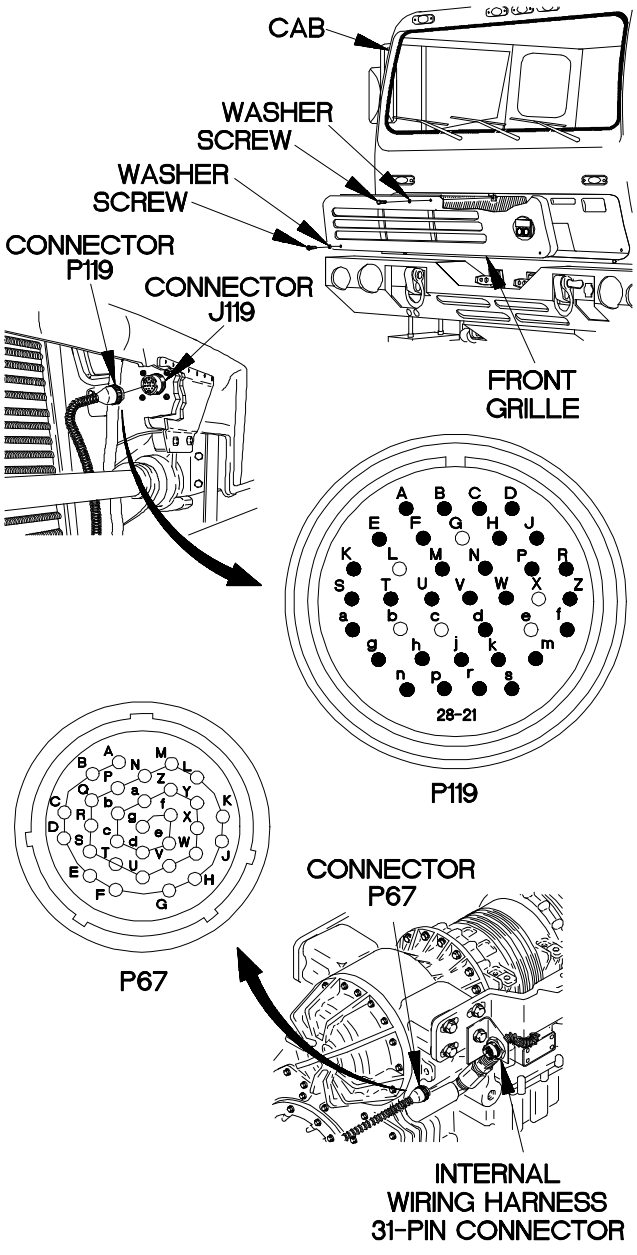
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

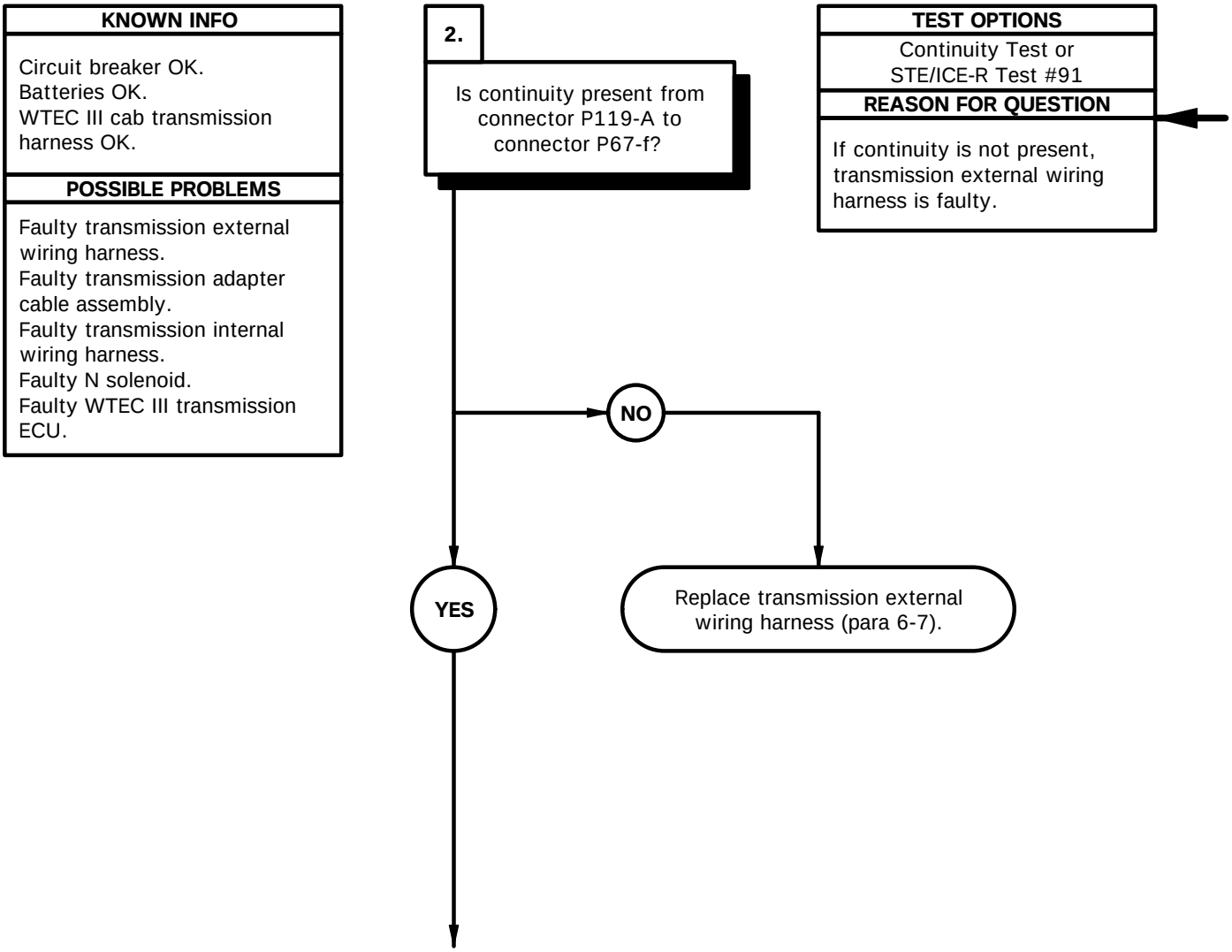
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from adapter cable 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect positive (+) probe of multimeter to connector P119-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).

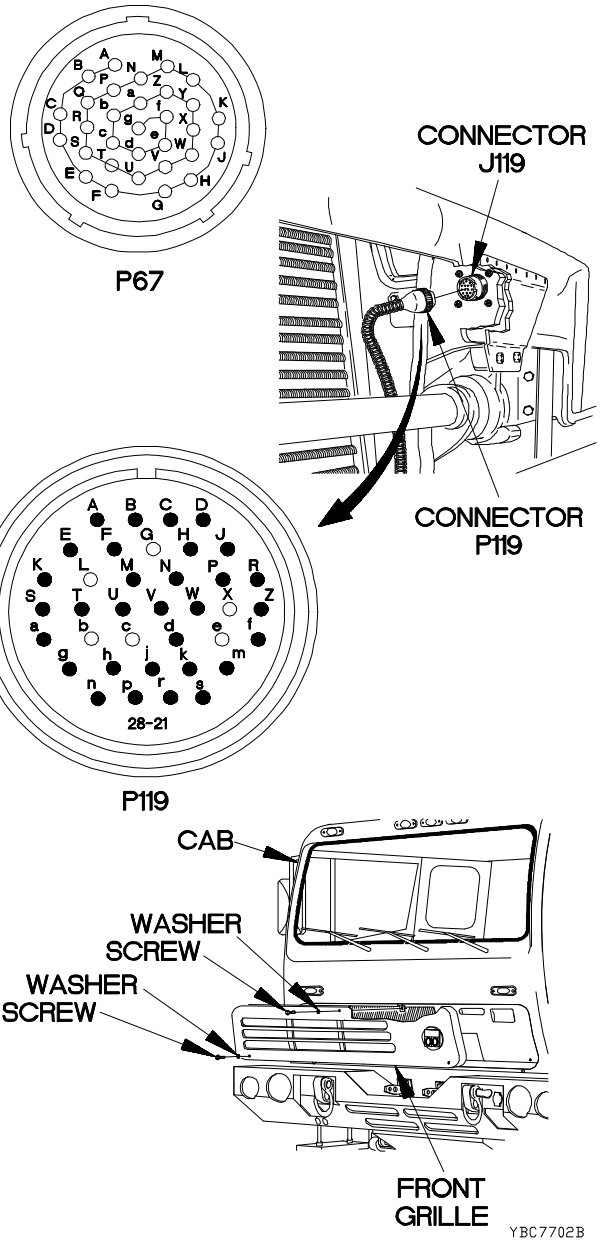


c77. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

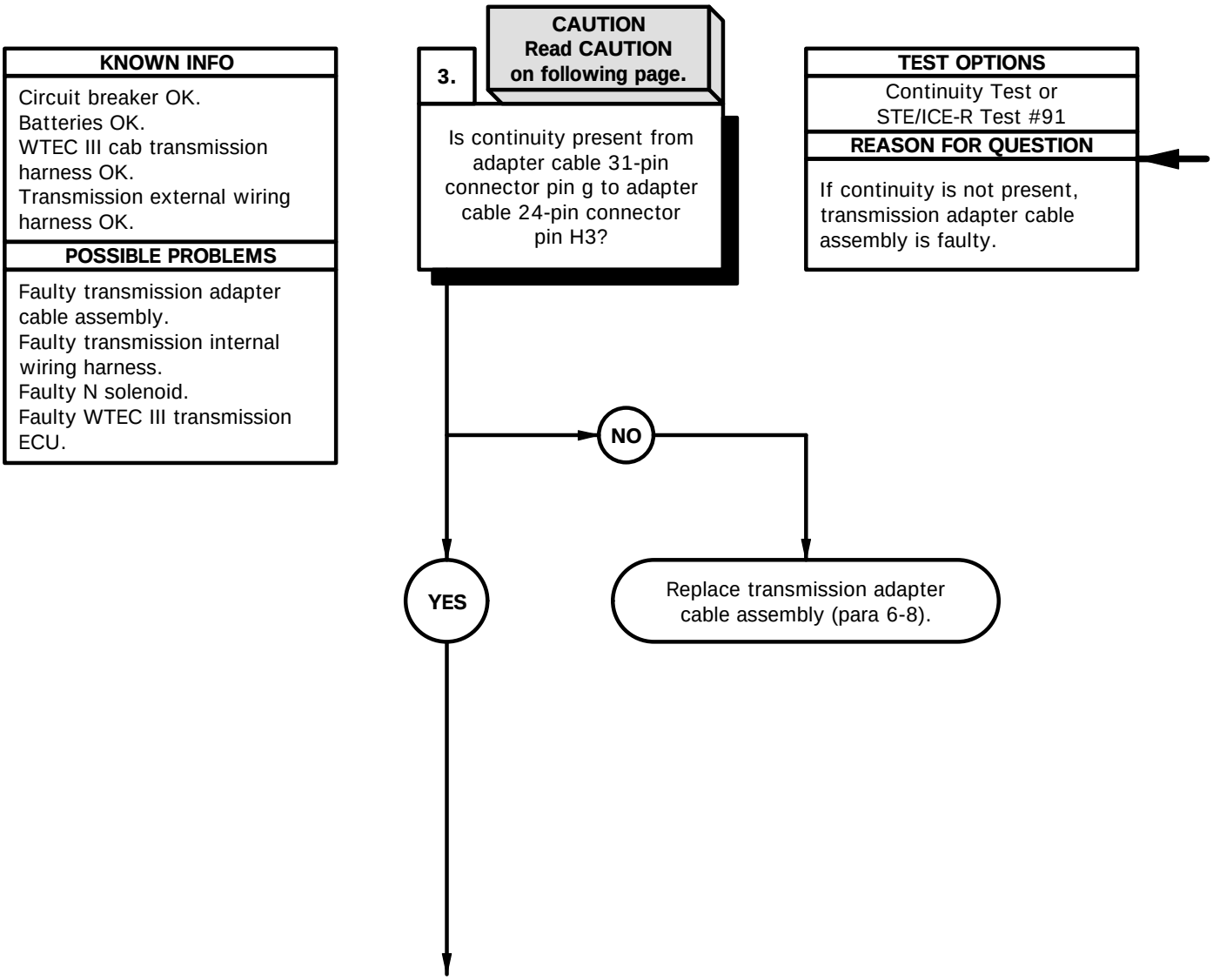


CONTINUITY TEST

(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).



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)

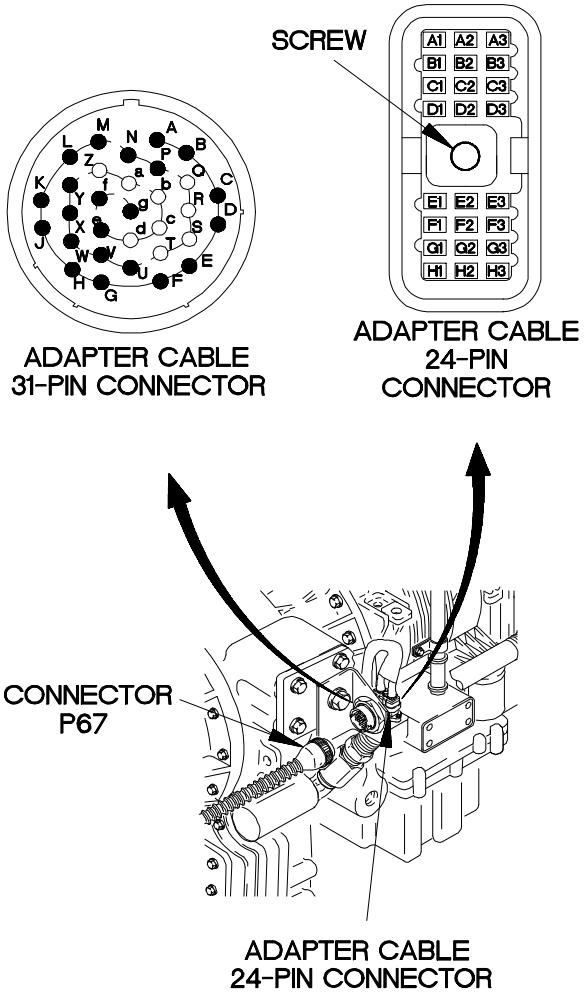


CAUTION

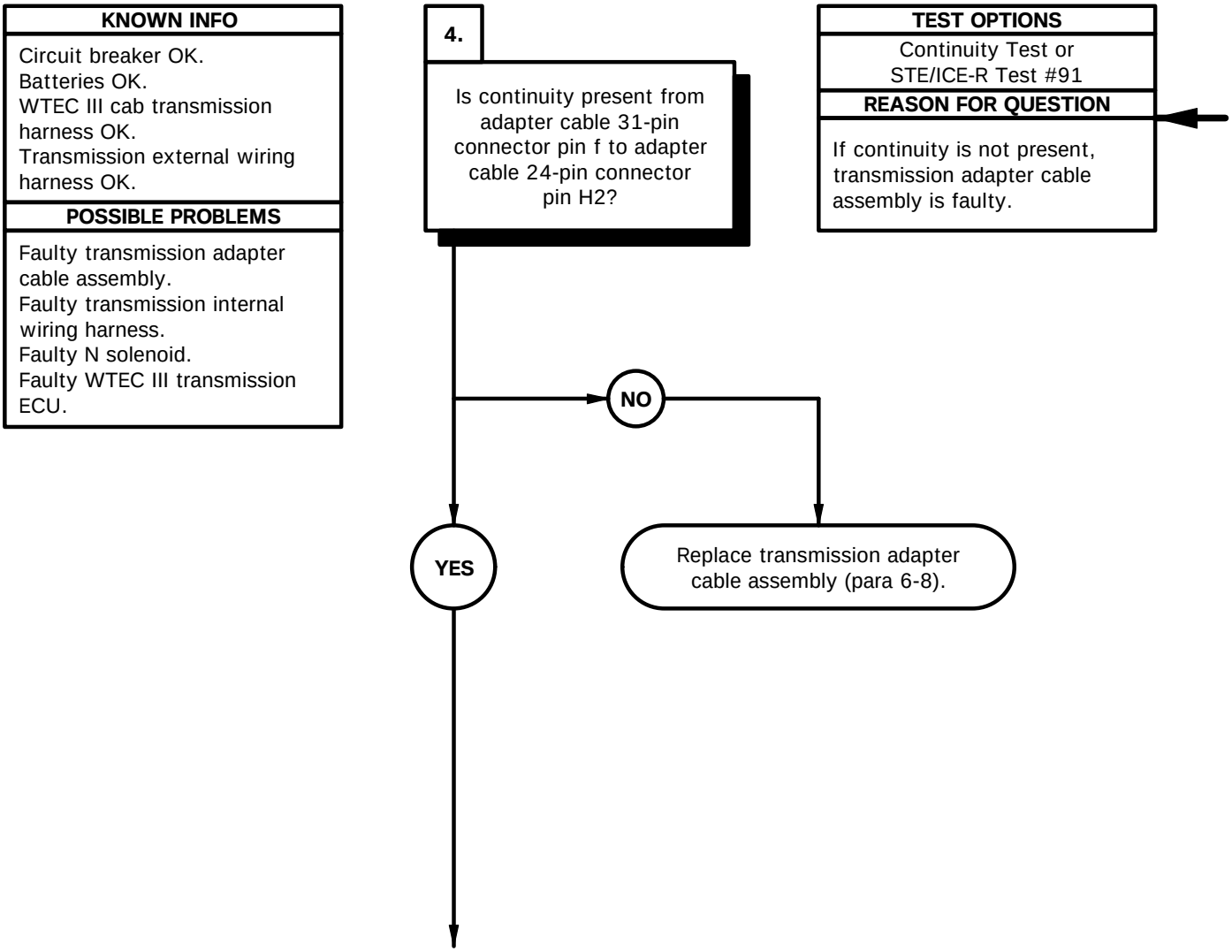
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

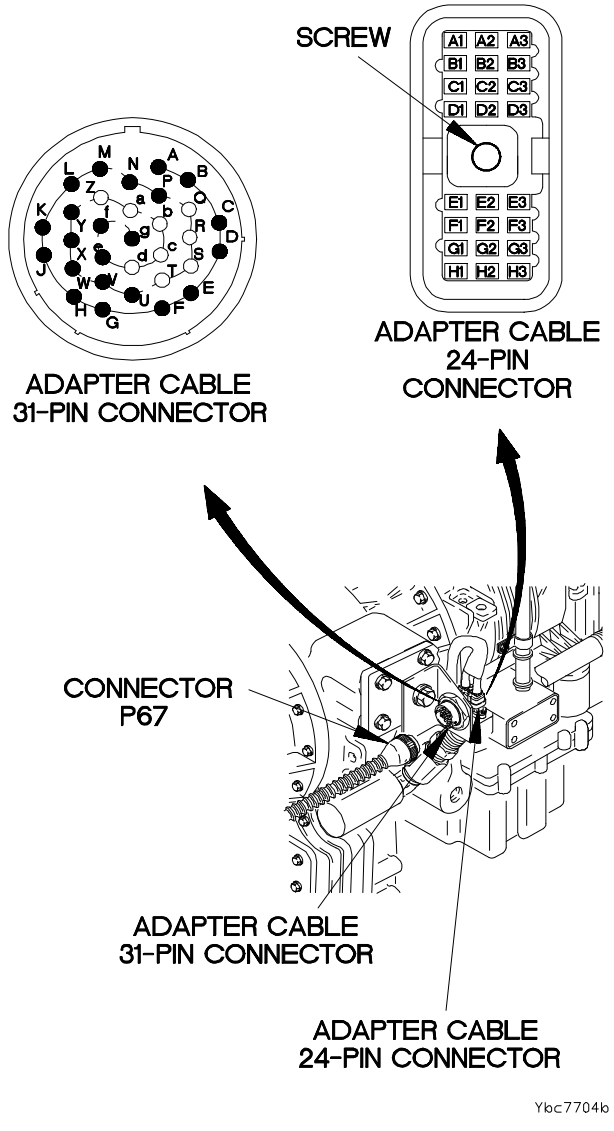


c77. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

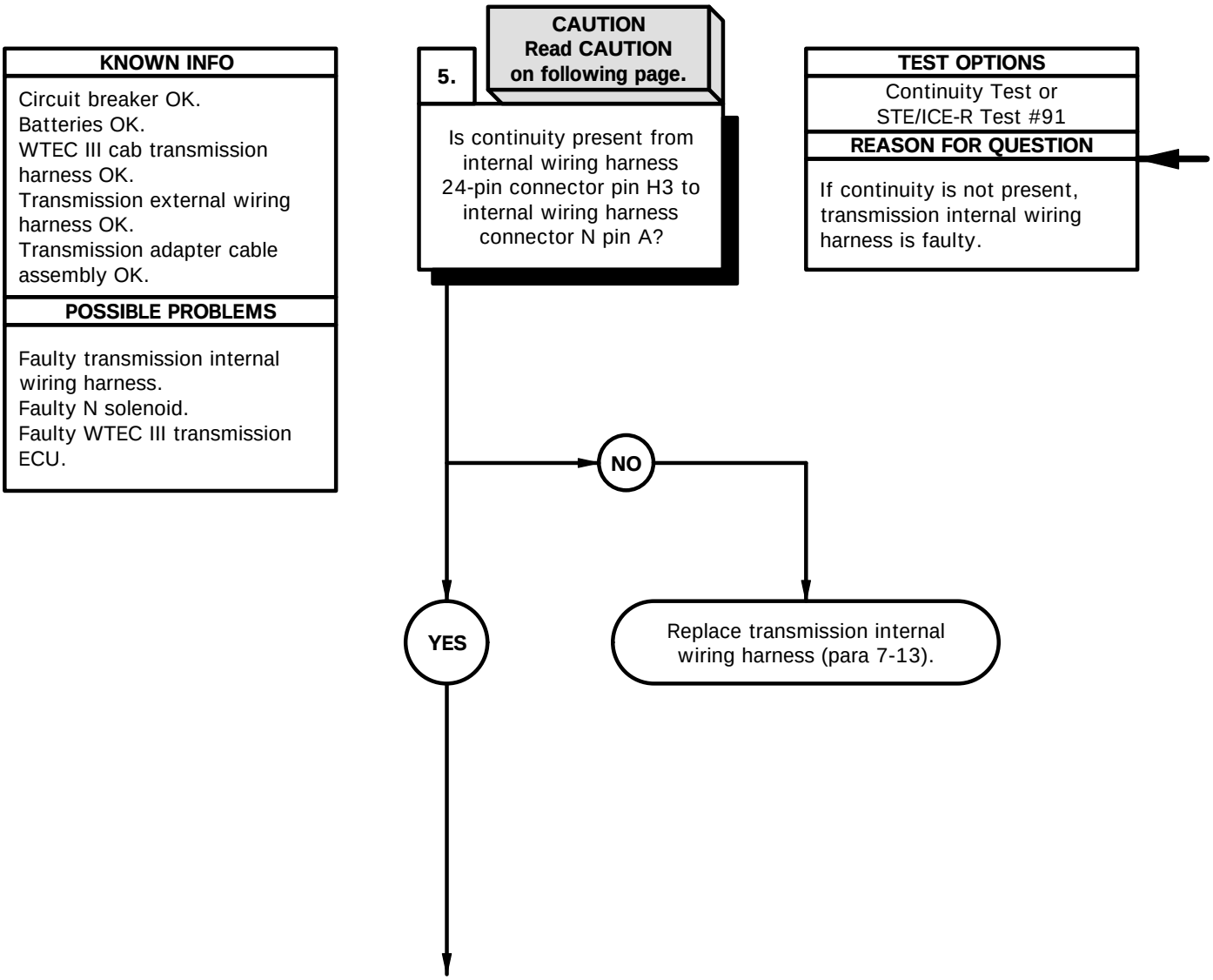


CONTINUITY TEST

(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.



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)

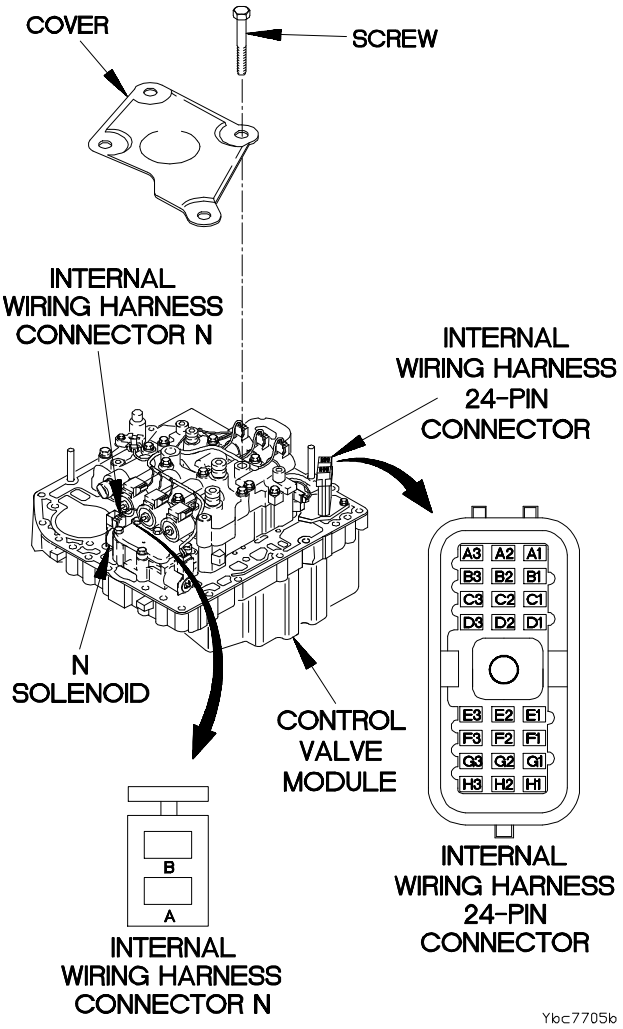


CAUTION

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).



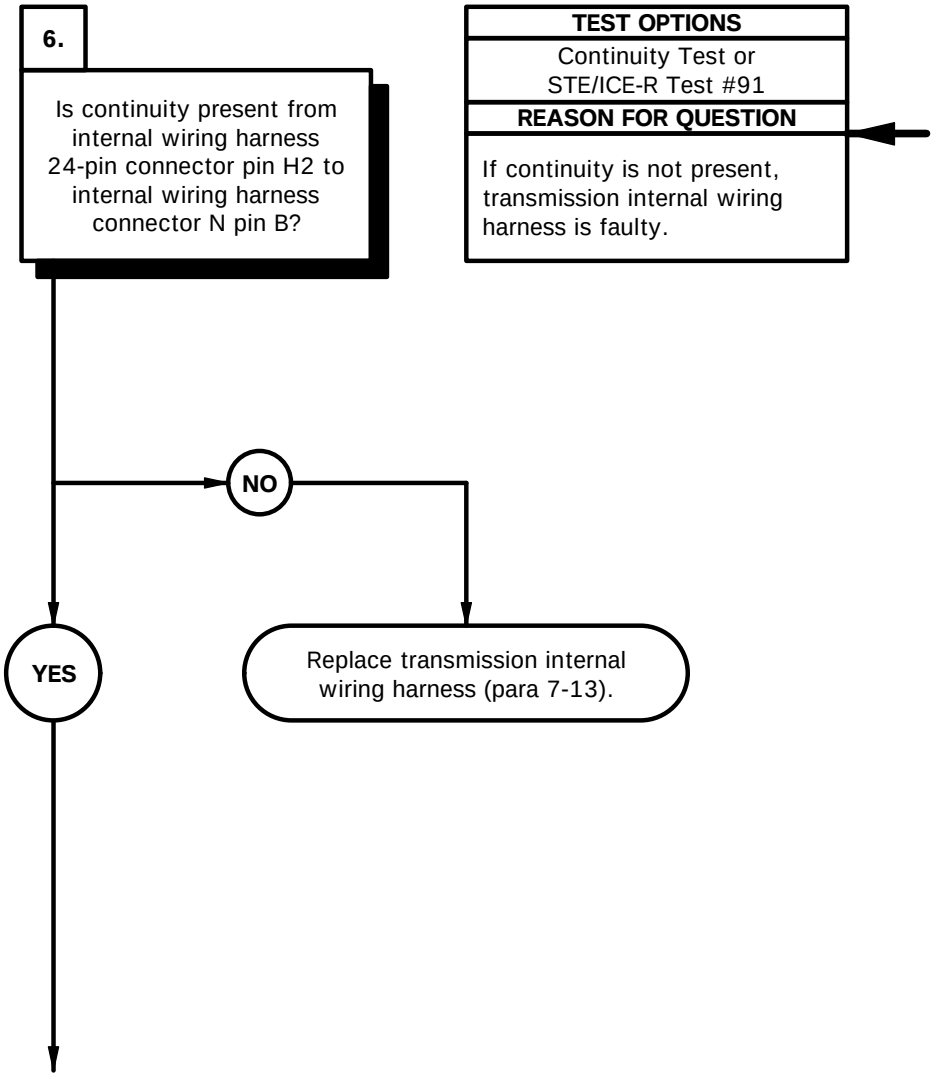
c77. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO

Circuit breaker OK.
Batteries OK.
WTEC III cab transmission harness OK.
Transmission external wiring harness OK.
Transmission adapter cable assembly OK.

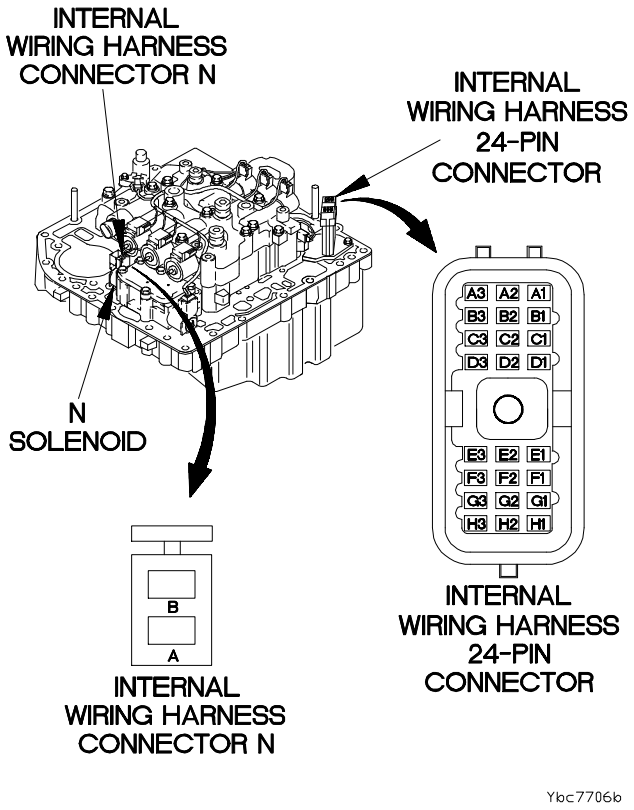
POSSIBLE PROBLEMS

Faulty transmission internal wiring harness.
Faulty N solenoid.
Faulty WTEC III transmission ECU.



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).



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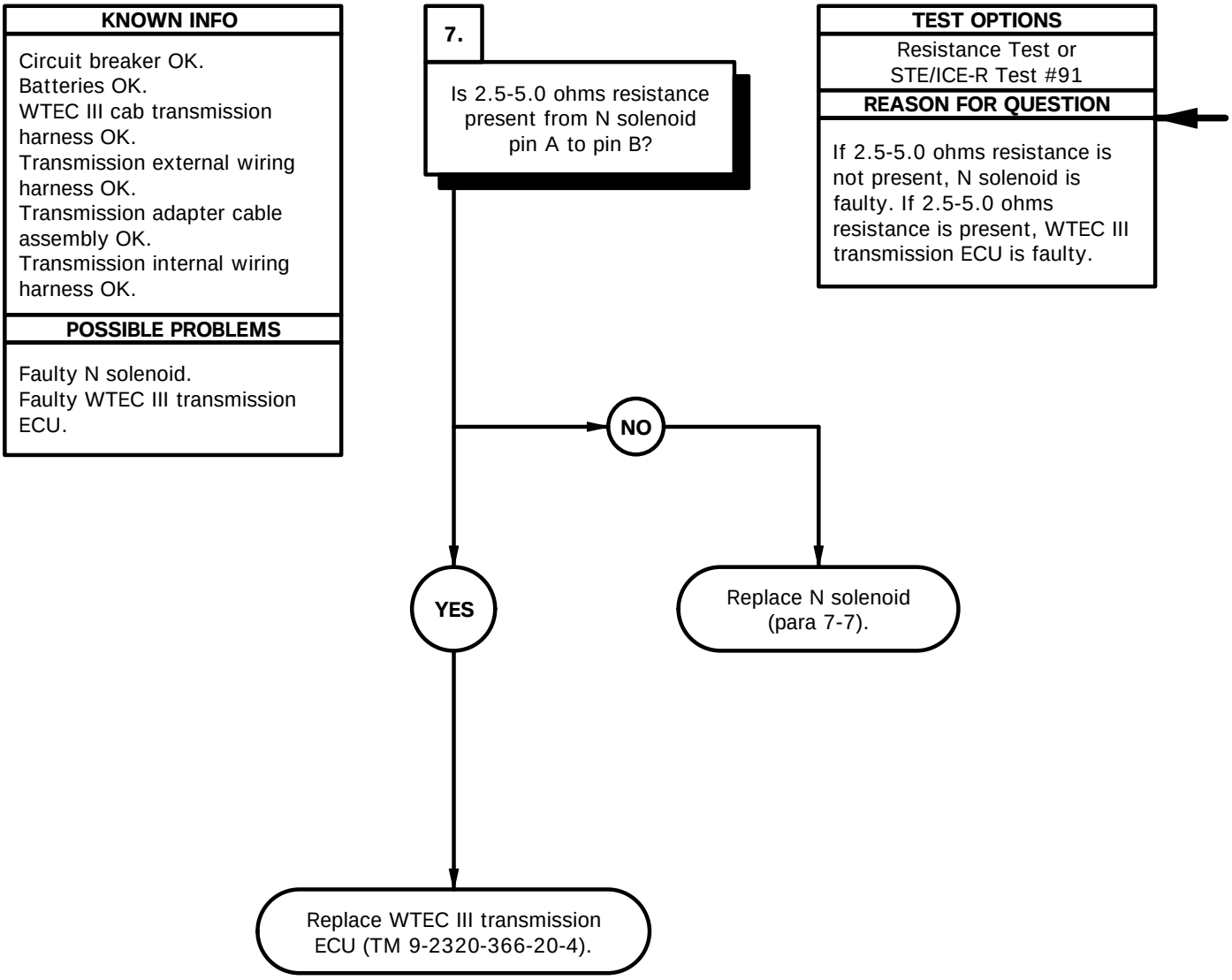
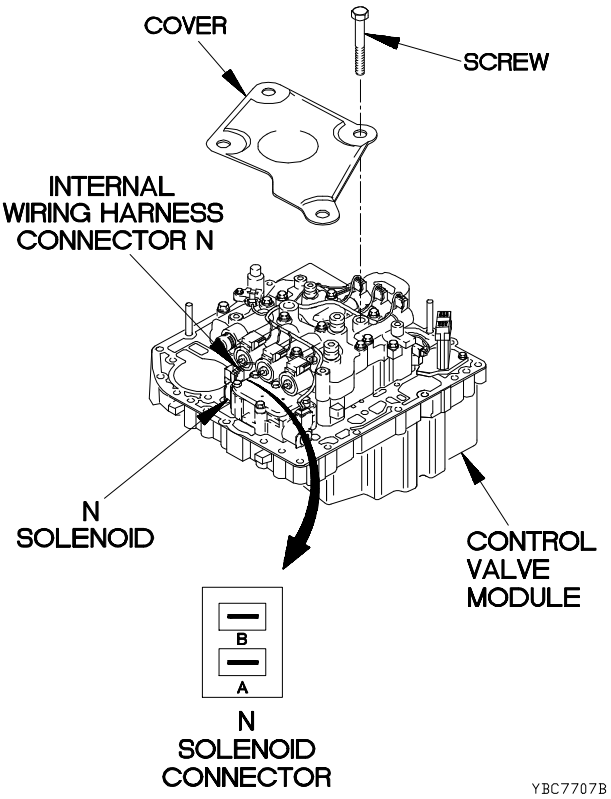
c77. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



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).



c78. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

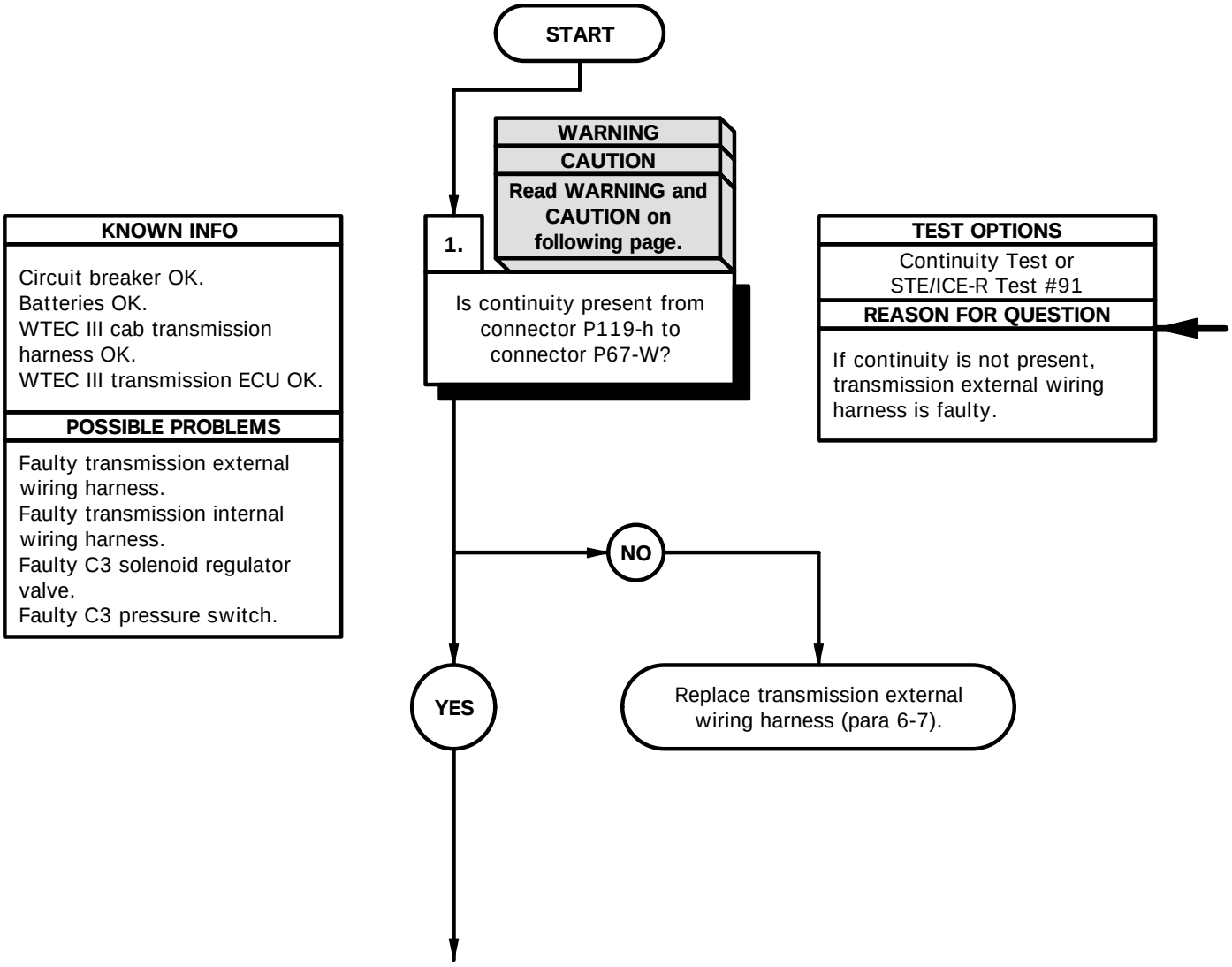
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

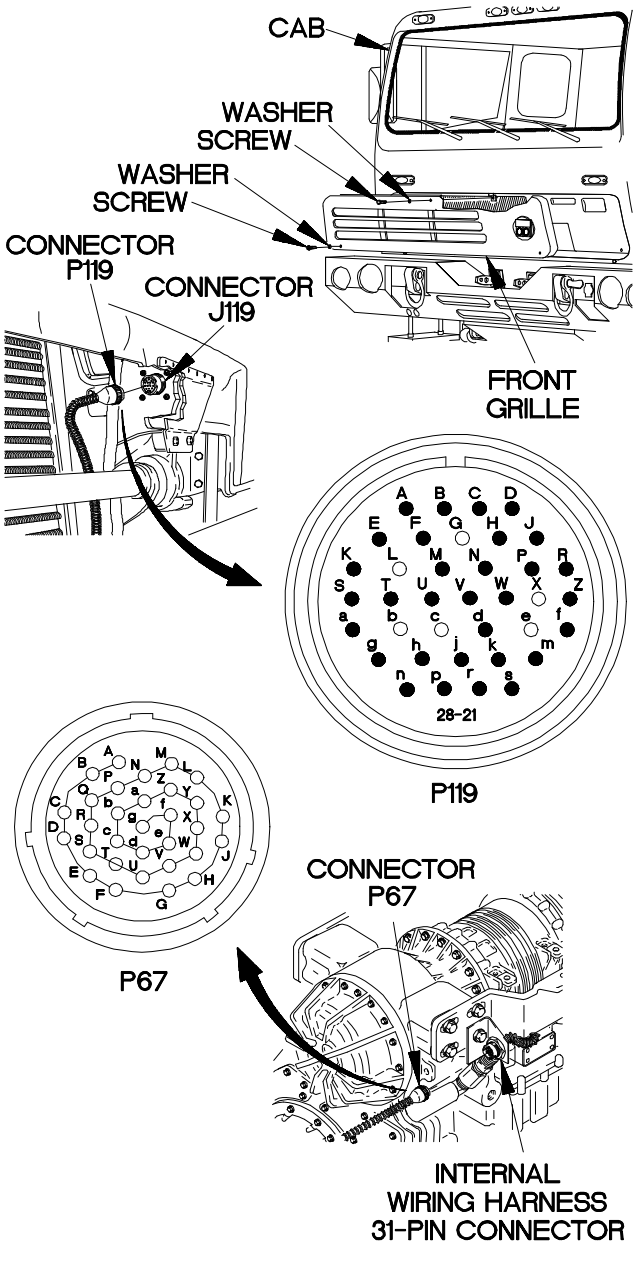
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

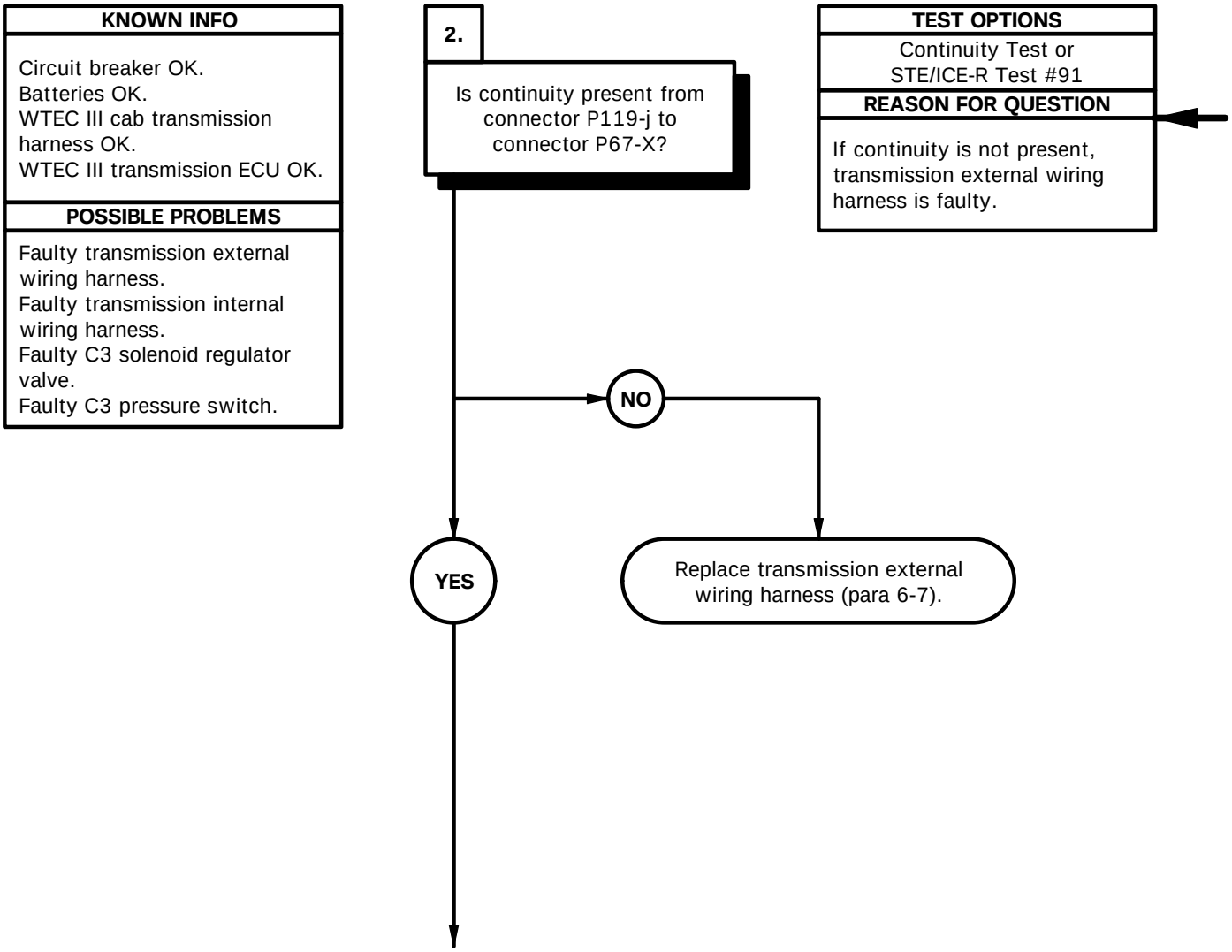
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from internal wiring harness 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect 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).

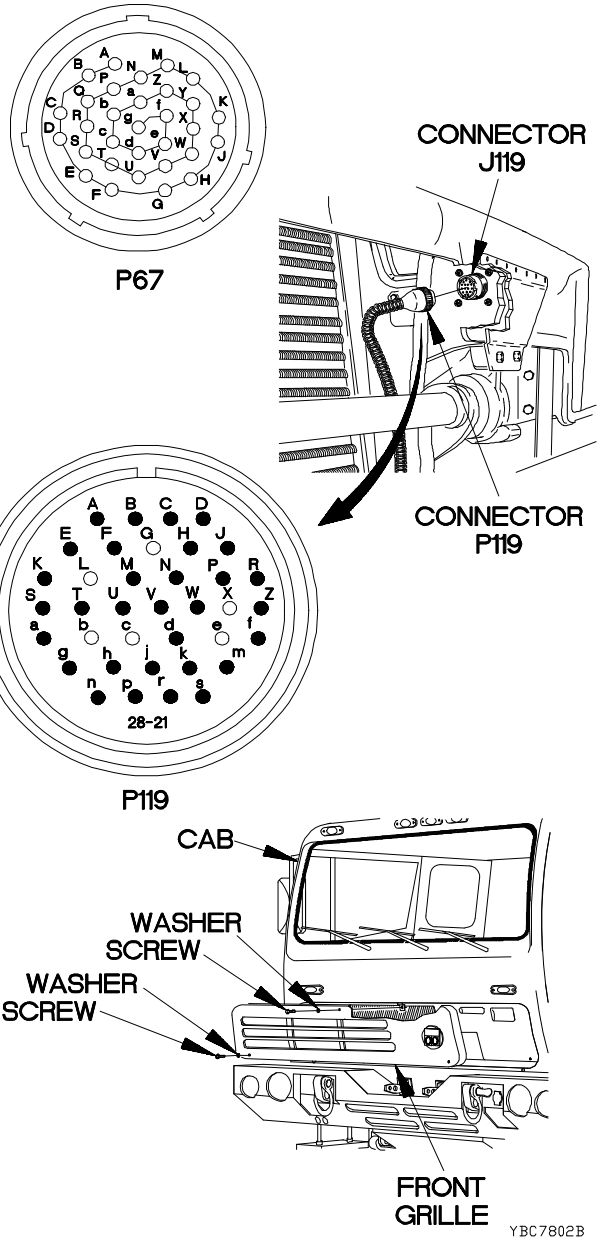


c78. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

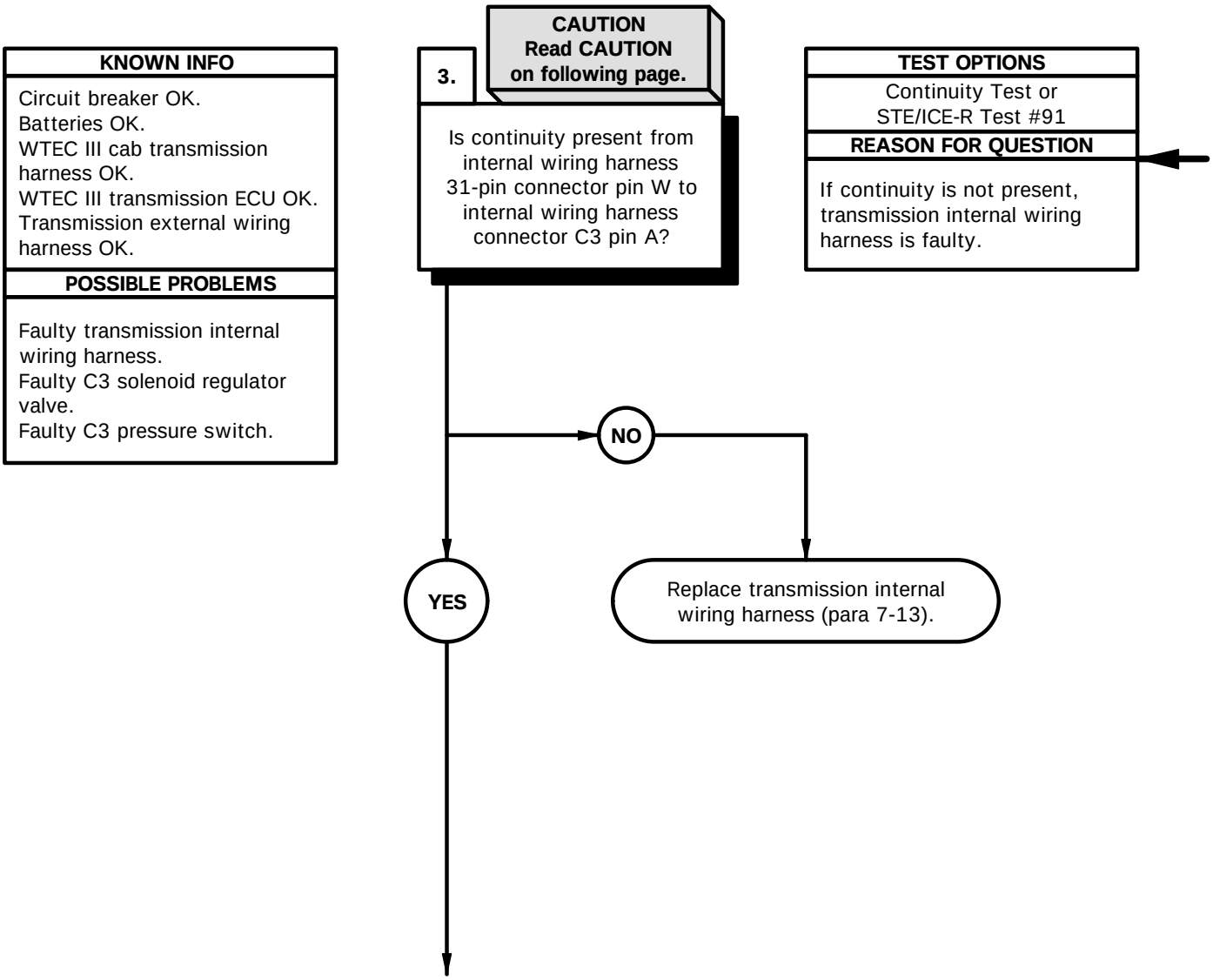


CONTINUITY TEST

(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)

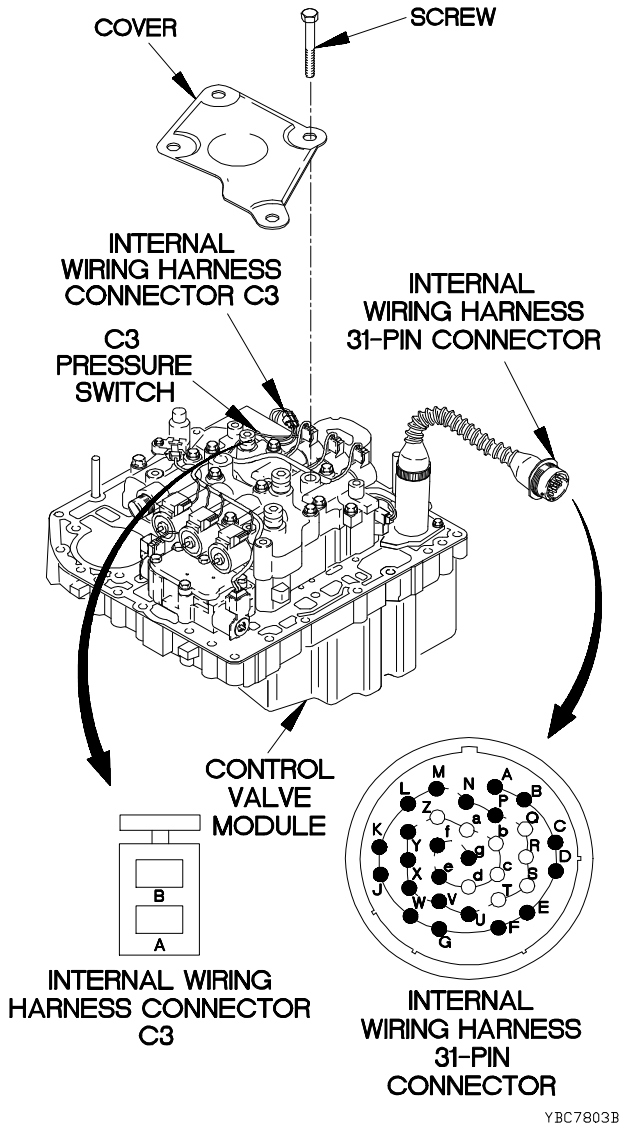


CAUTION

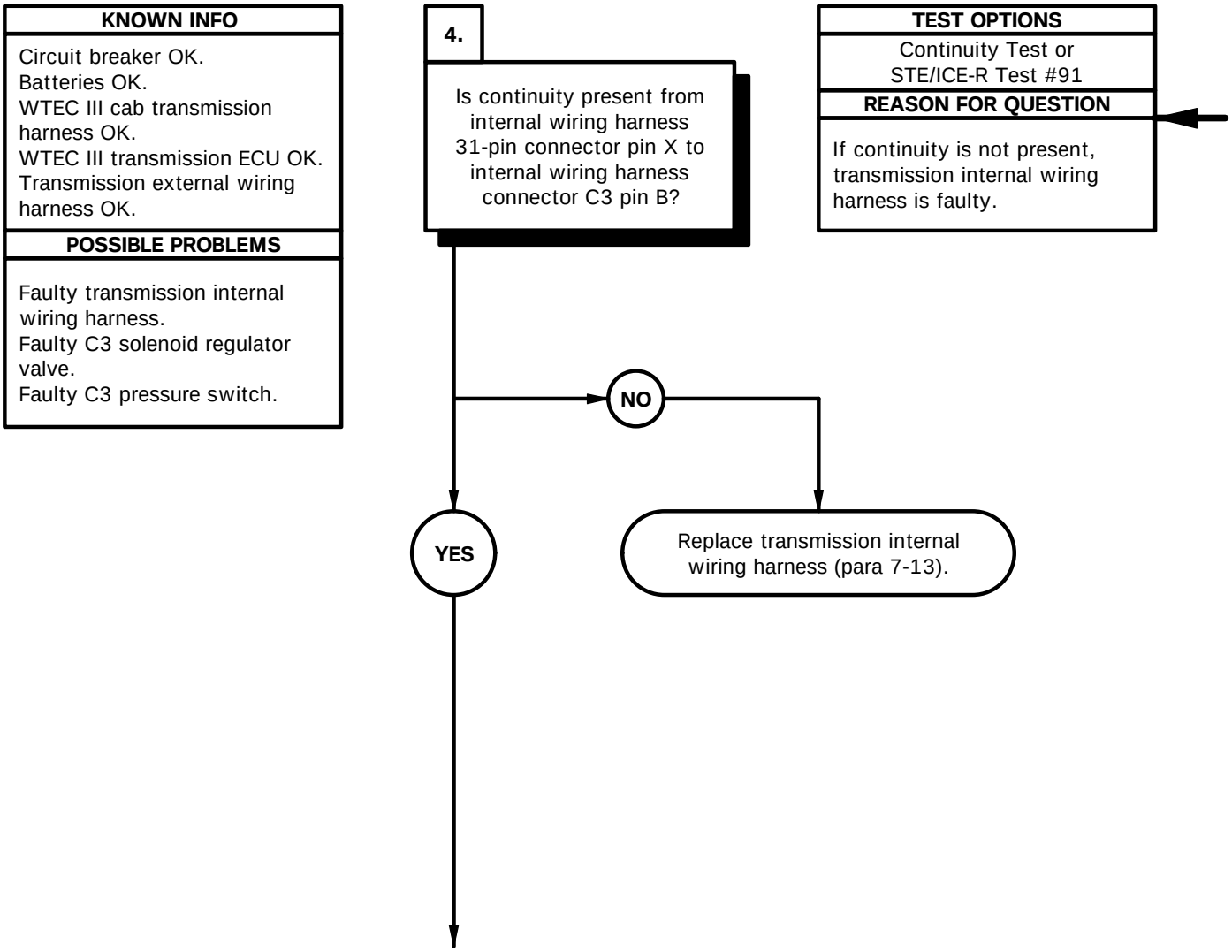
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

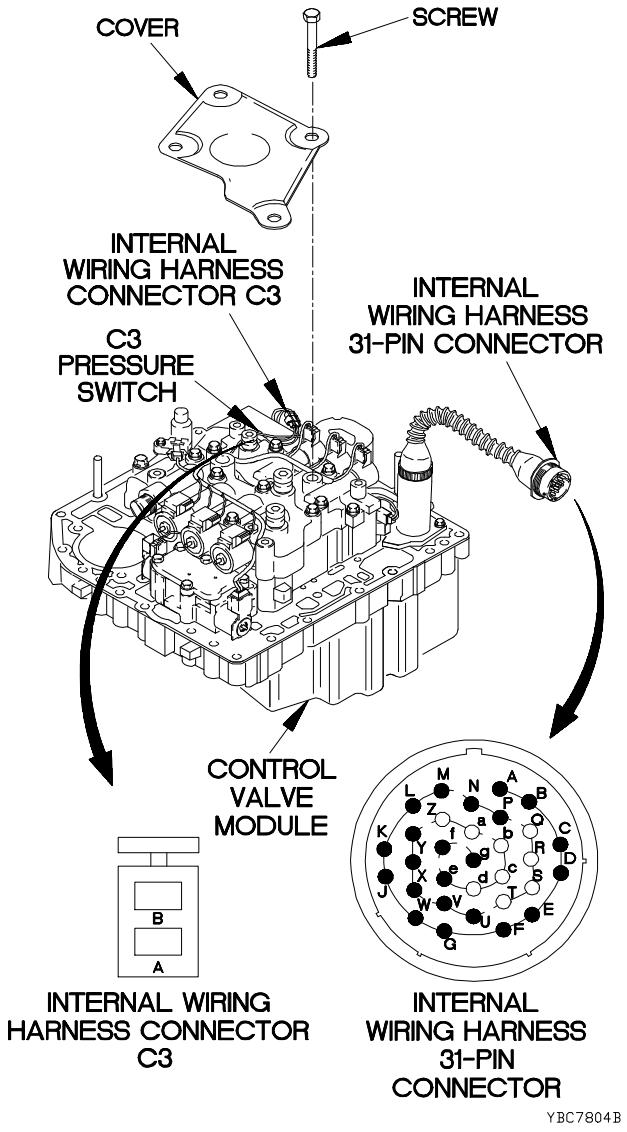


c78. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

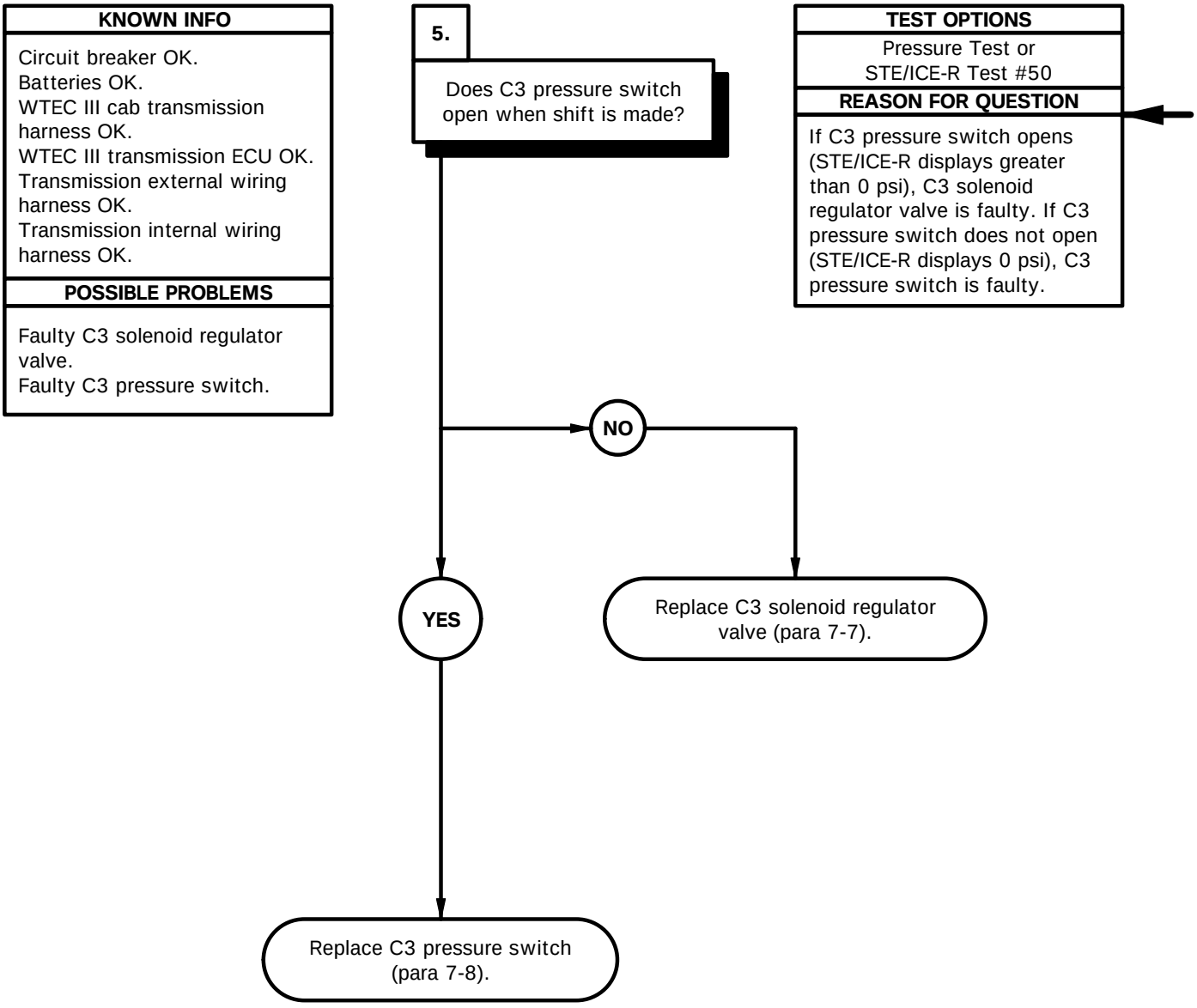


CONTINUITY TEST

(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).



c78. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

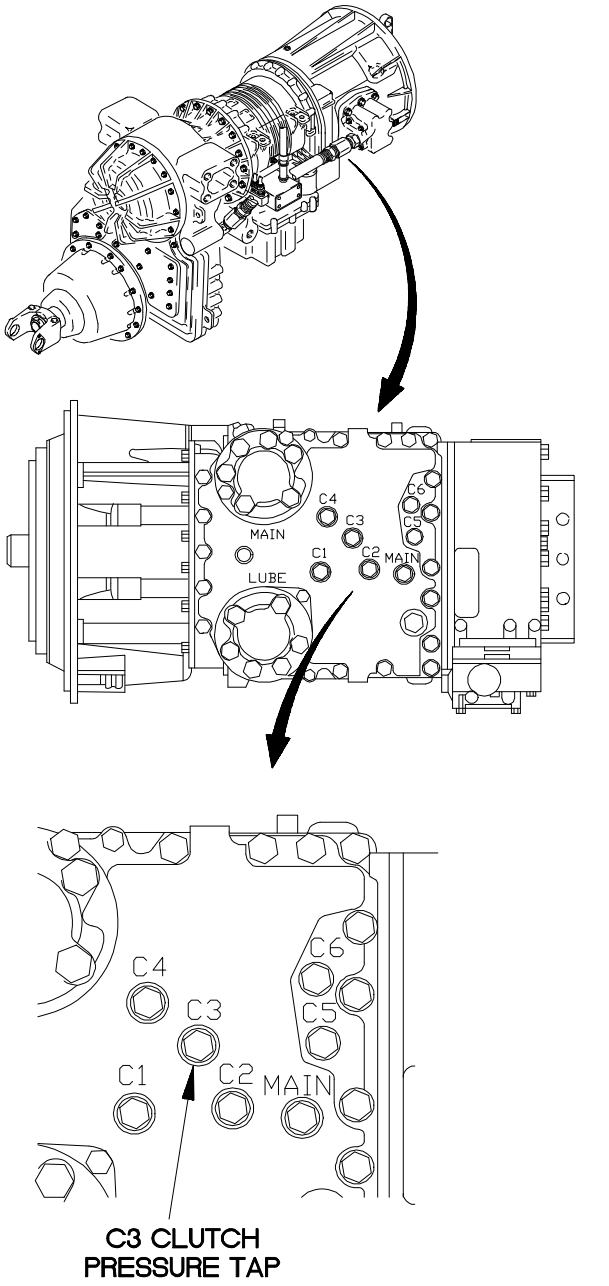


PRESSURE TEST

(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).

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



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

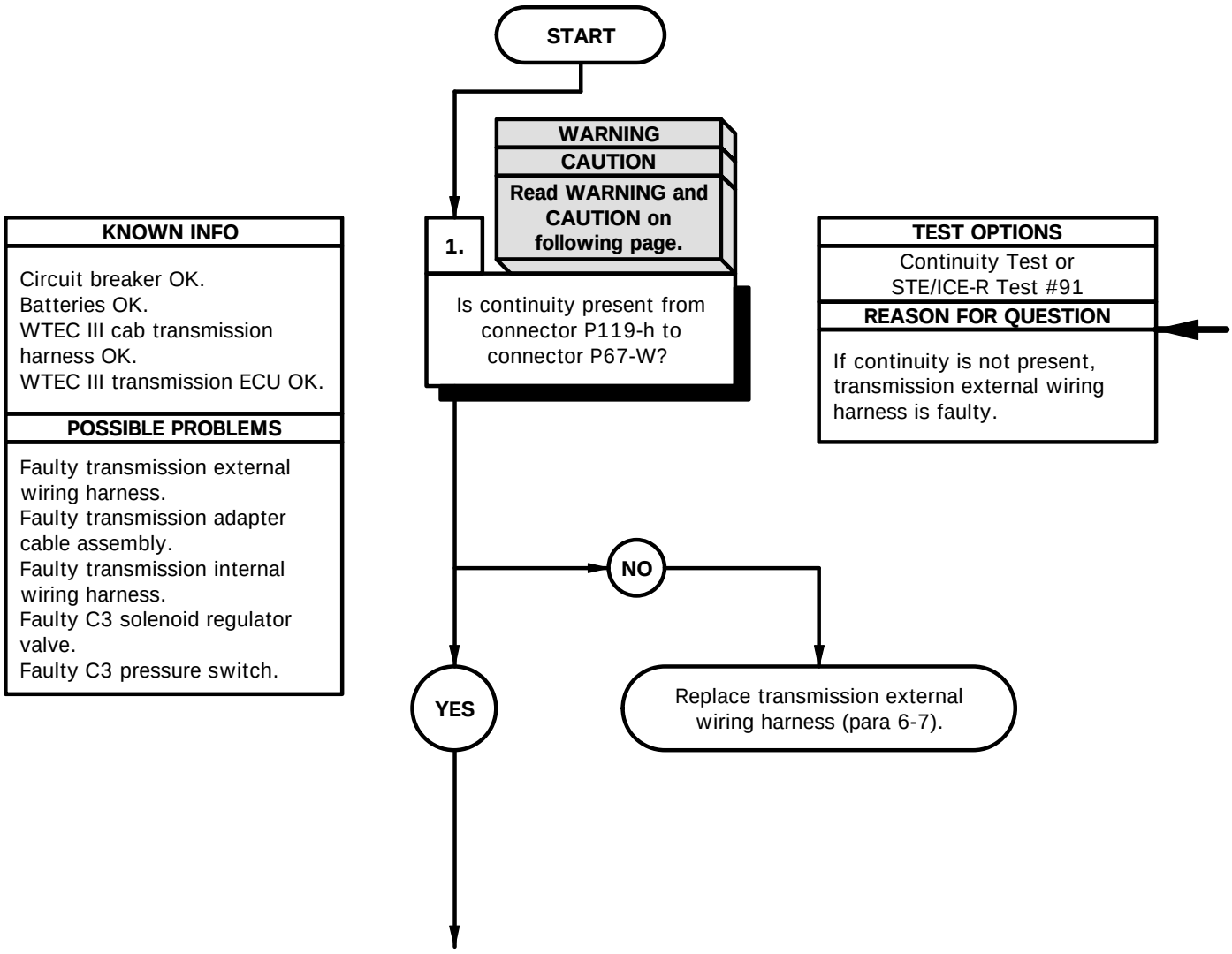
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).
Batteries disconnected (TM 9-2320-366-20-3).

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

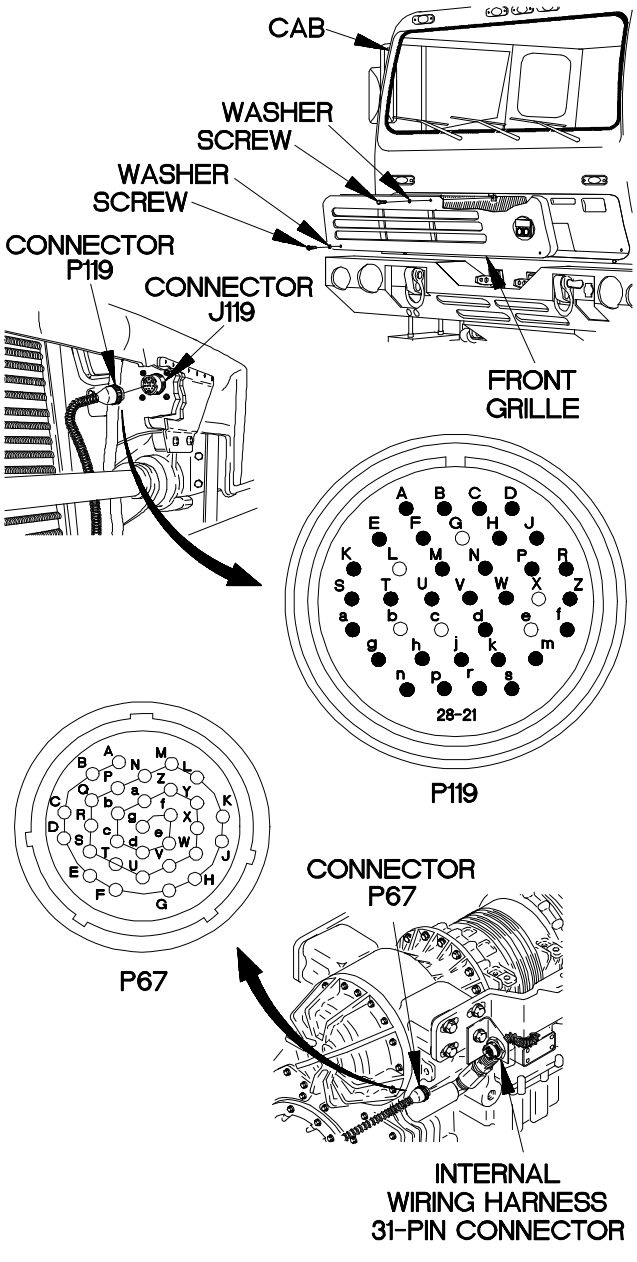
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

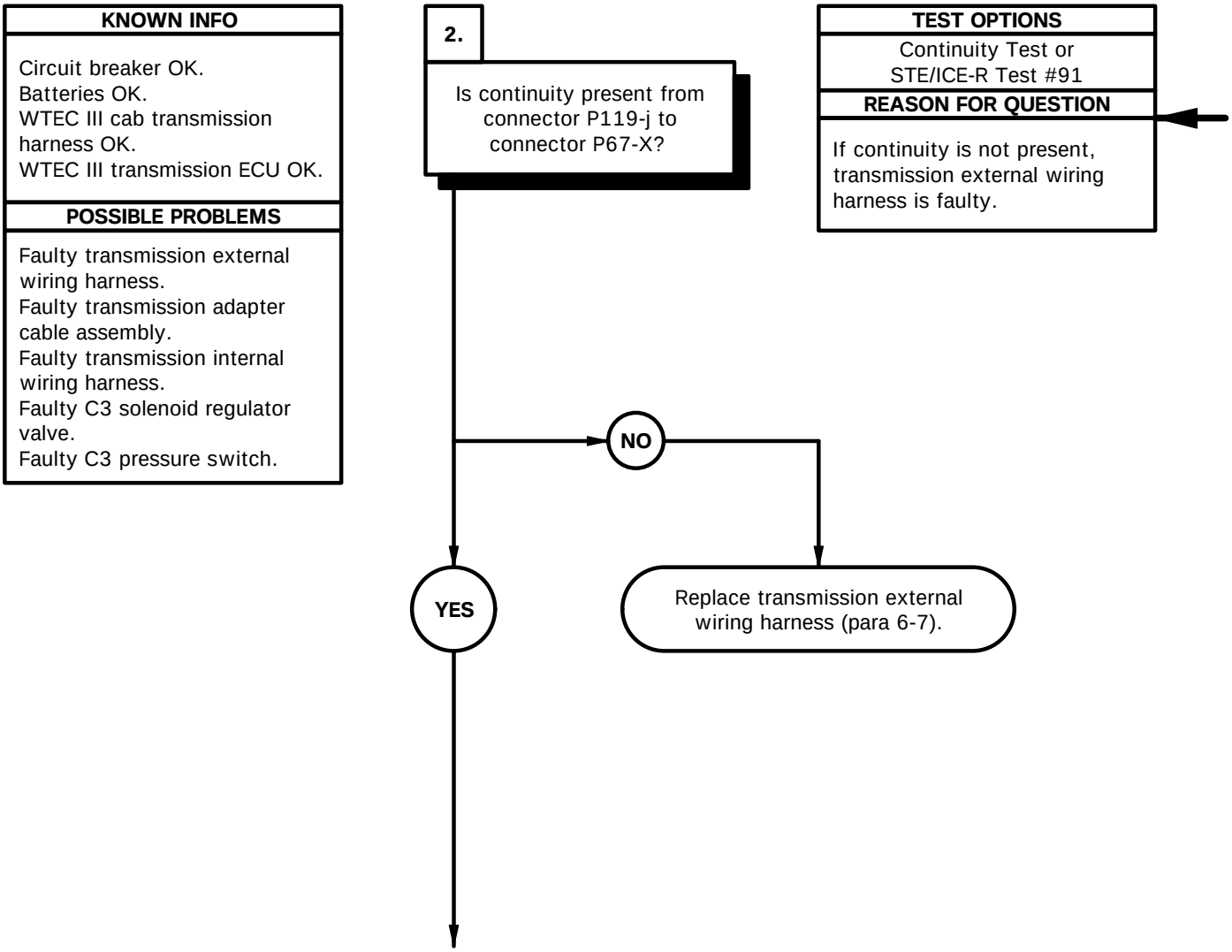
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from adapter cable 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect positive (+) 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).

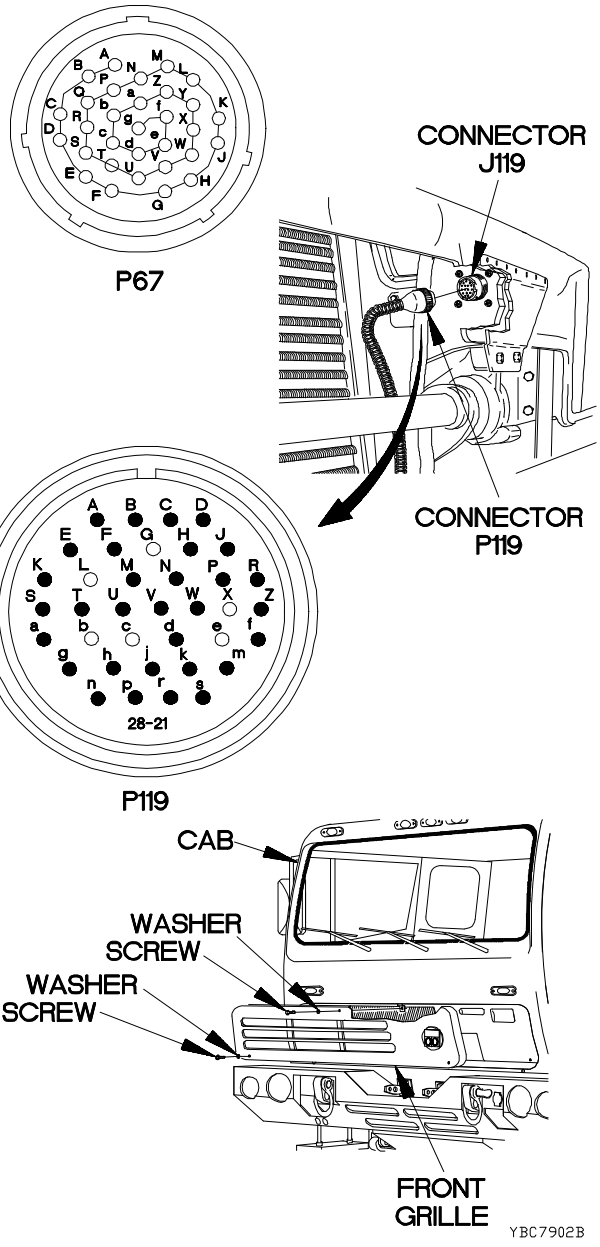


c79. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

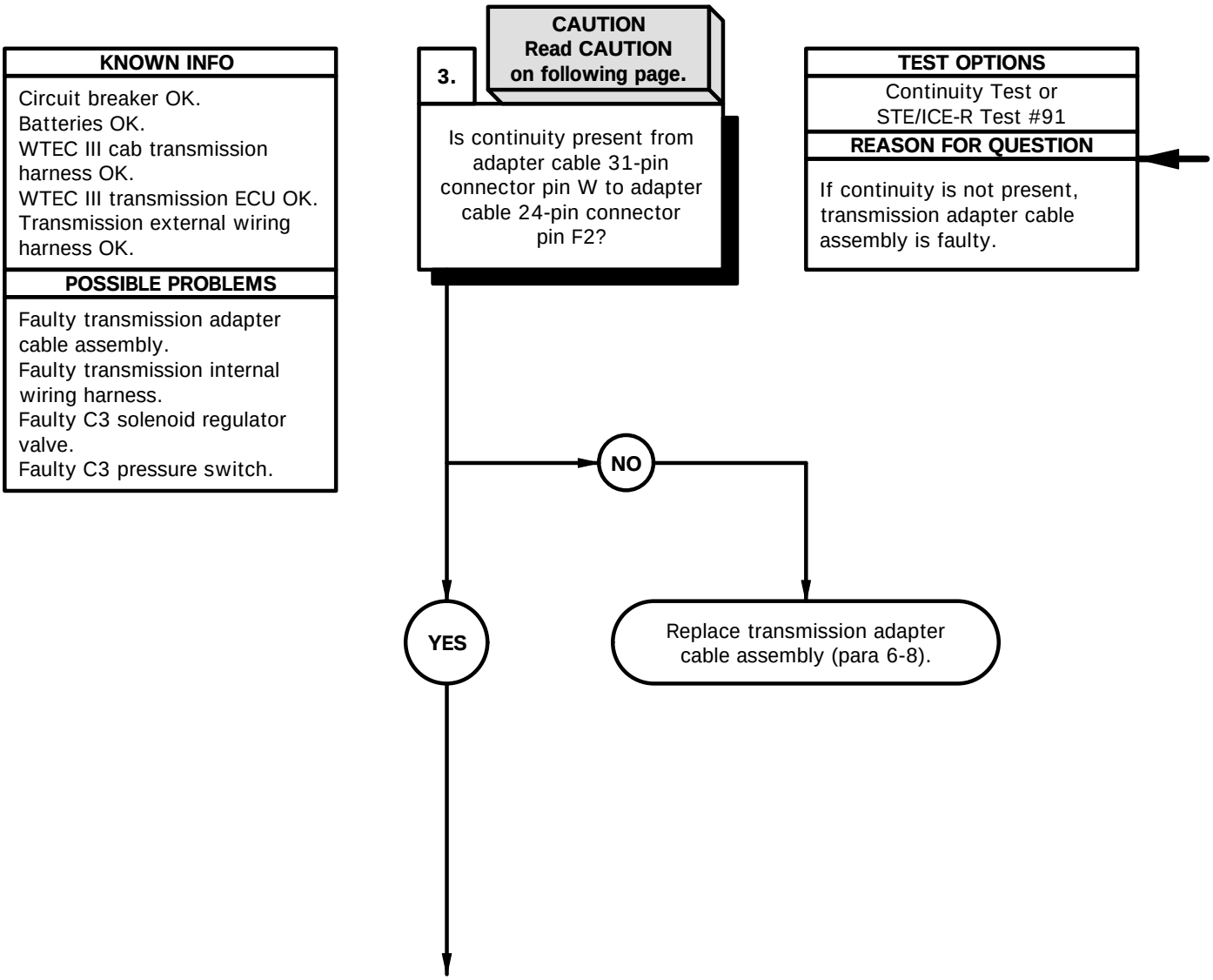


CONTINUITY TEST

(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).



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)

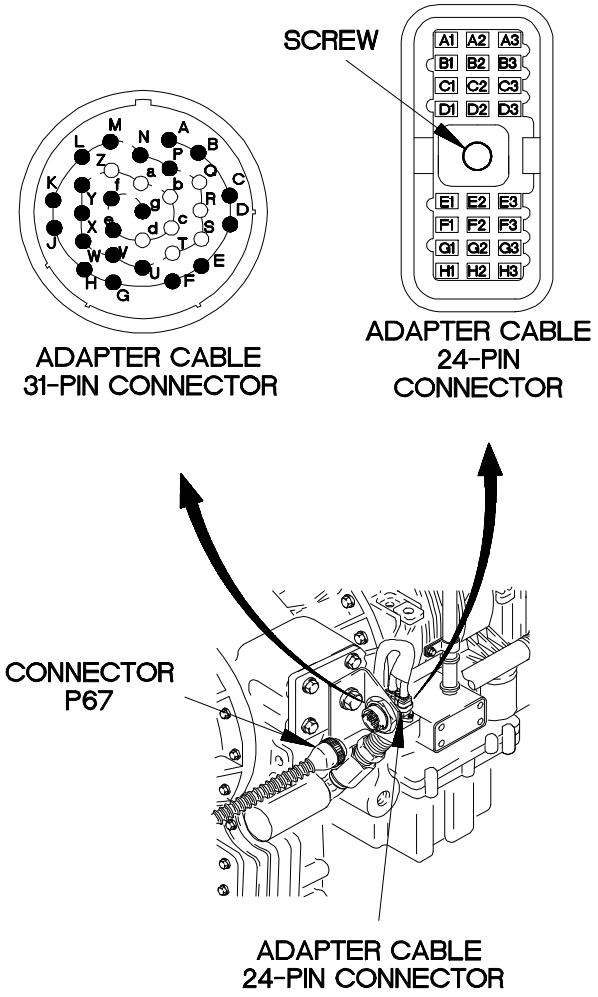


CAUTION

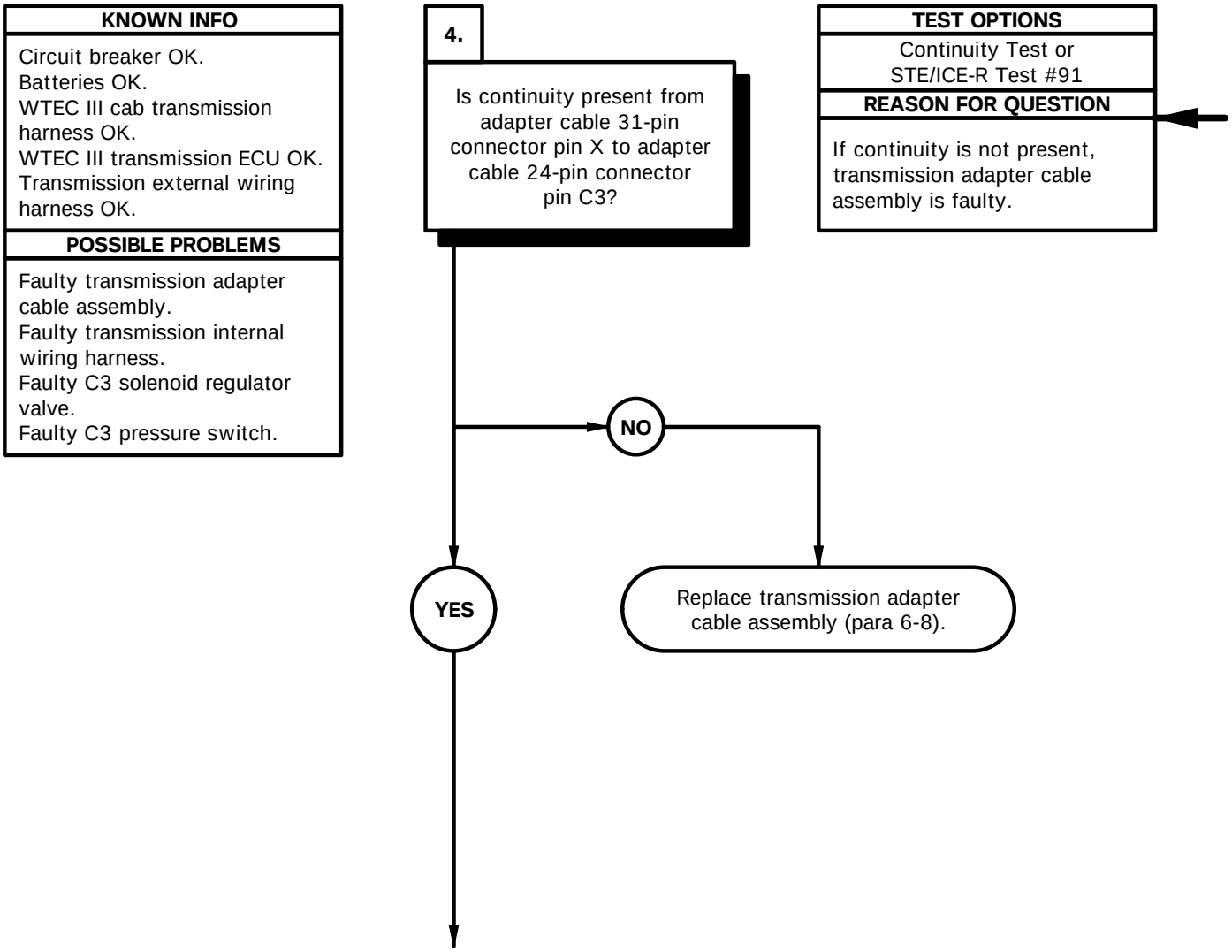
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

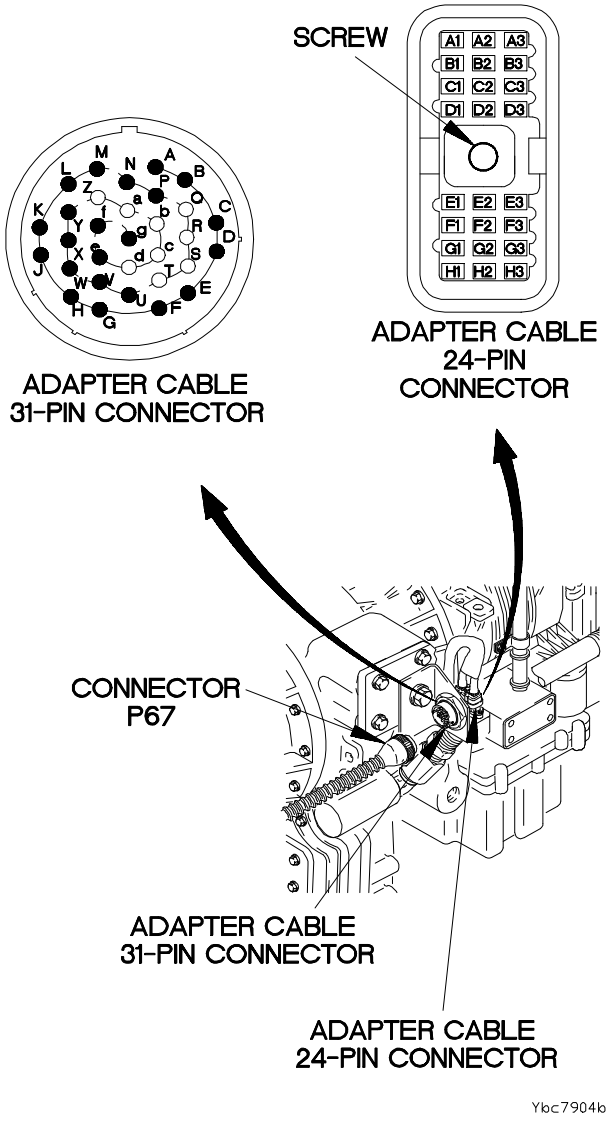


c79. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

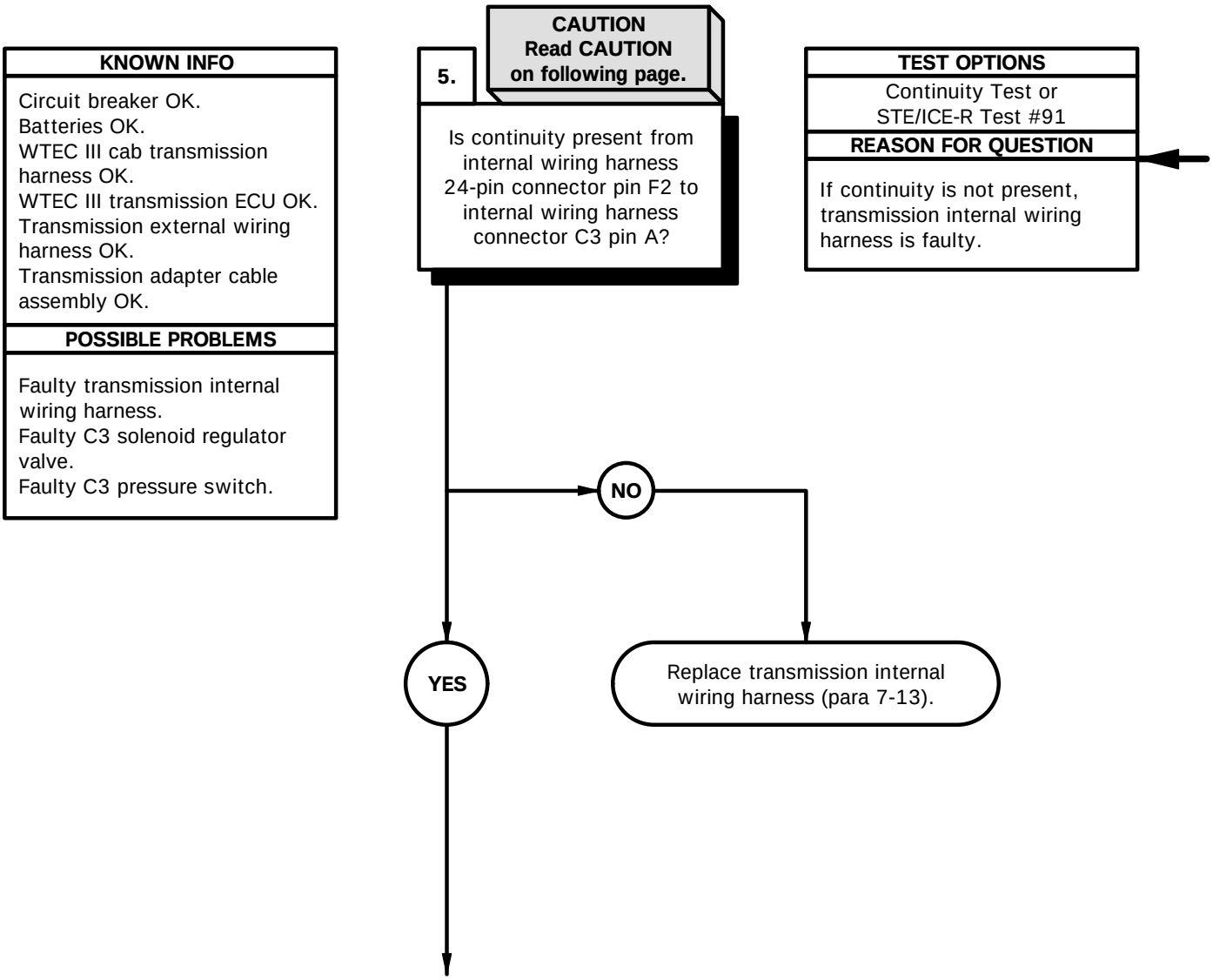


CONTINUITY TEST

(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.



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)

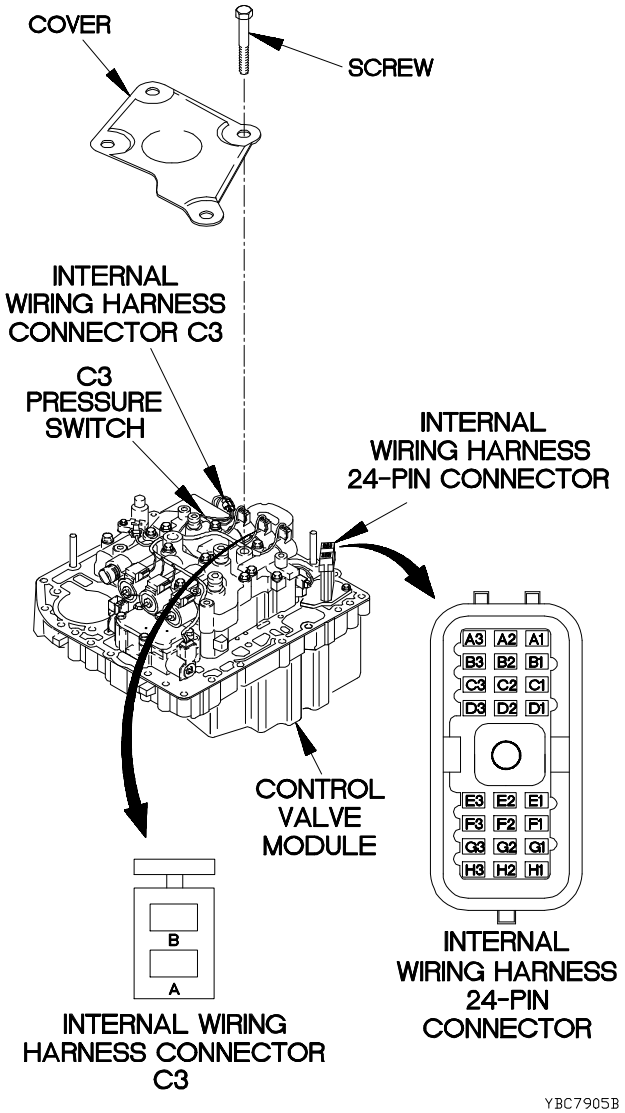


CAUTION

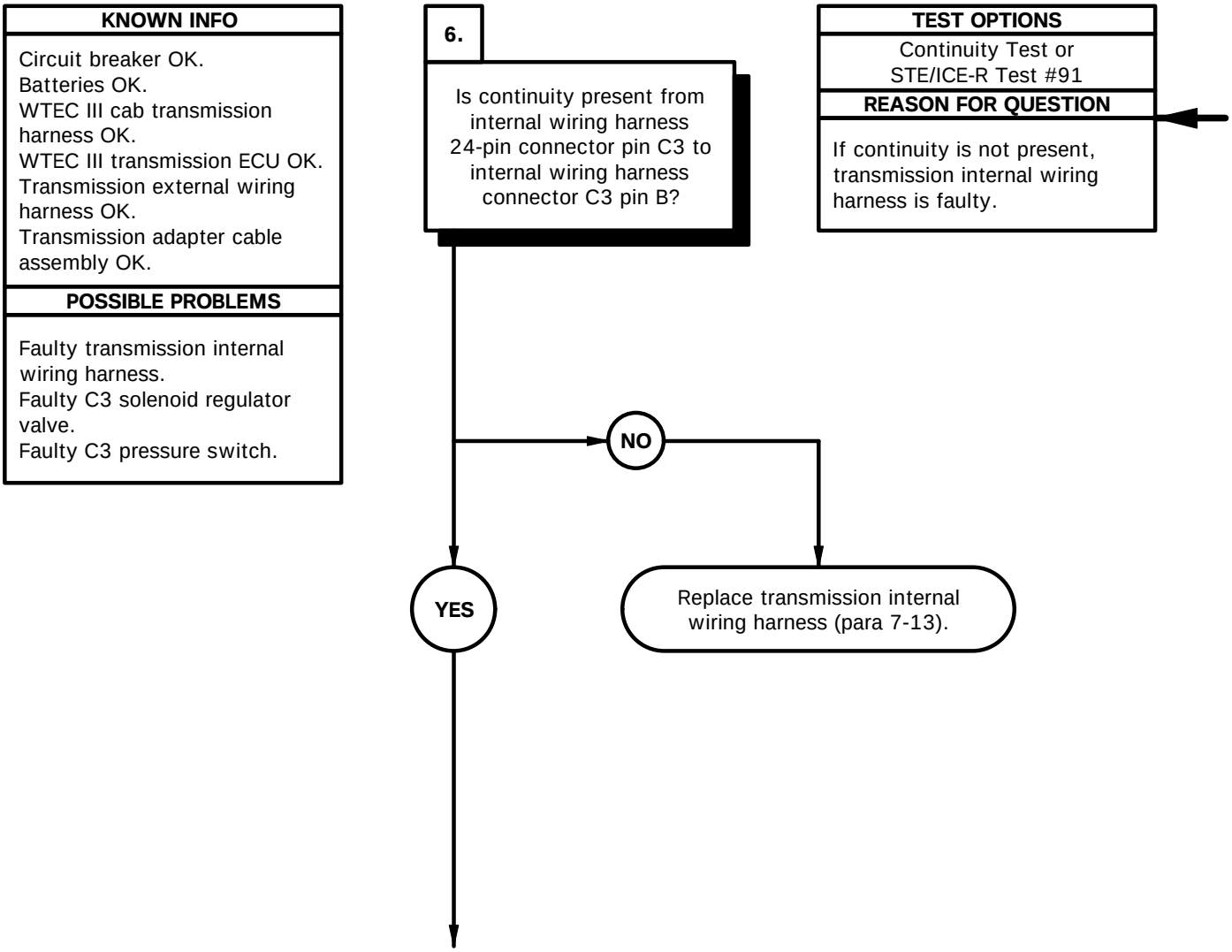
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

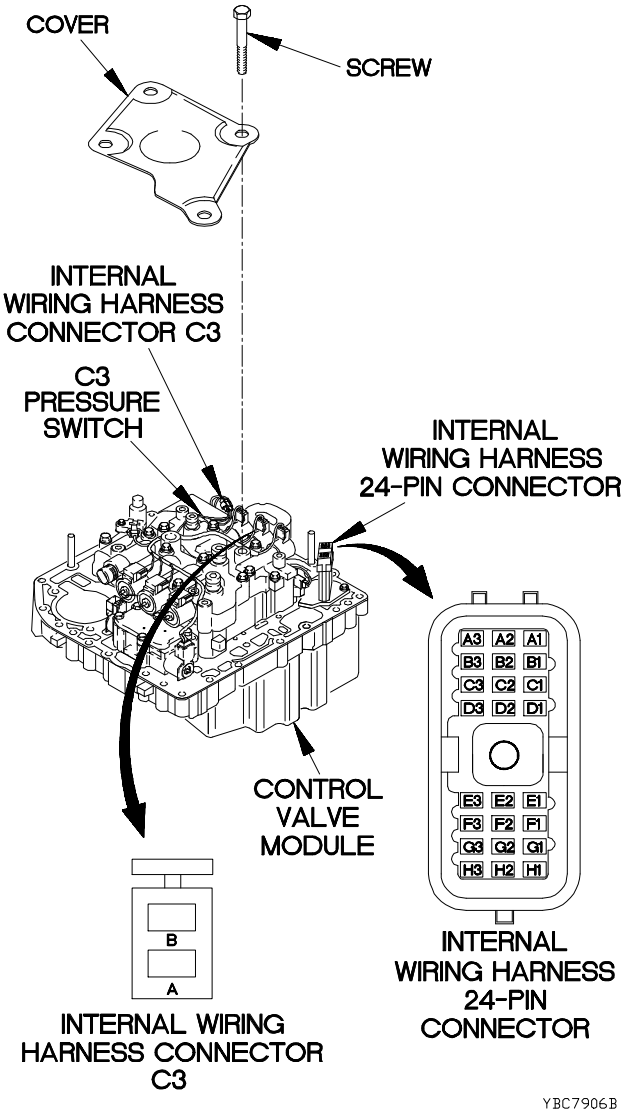


c79. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

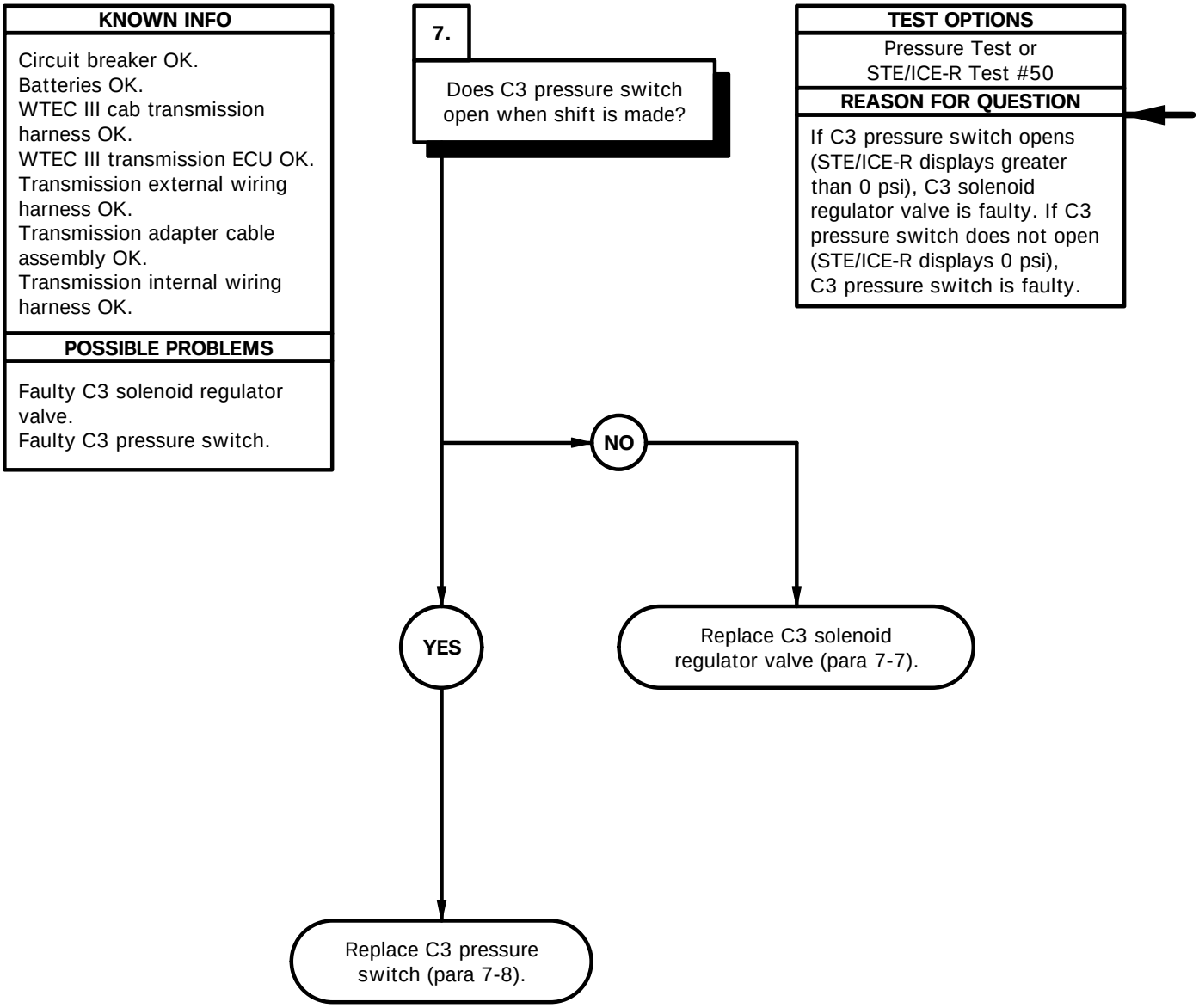


CONTINUITY TEST

(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).



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)

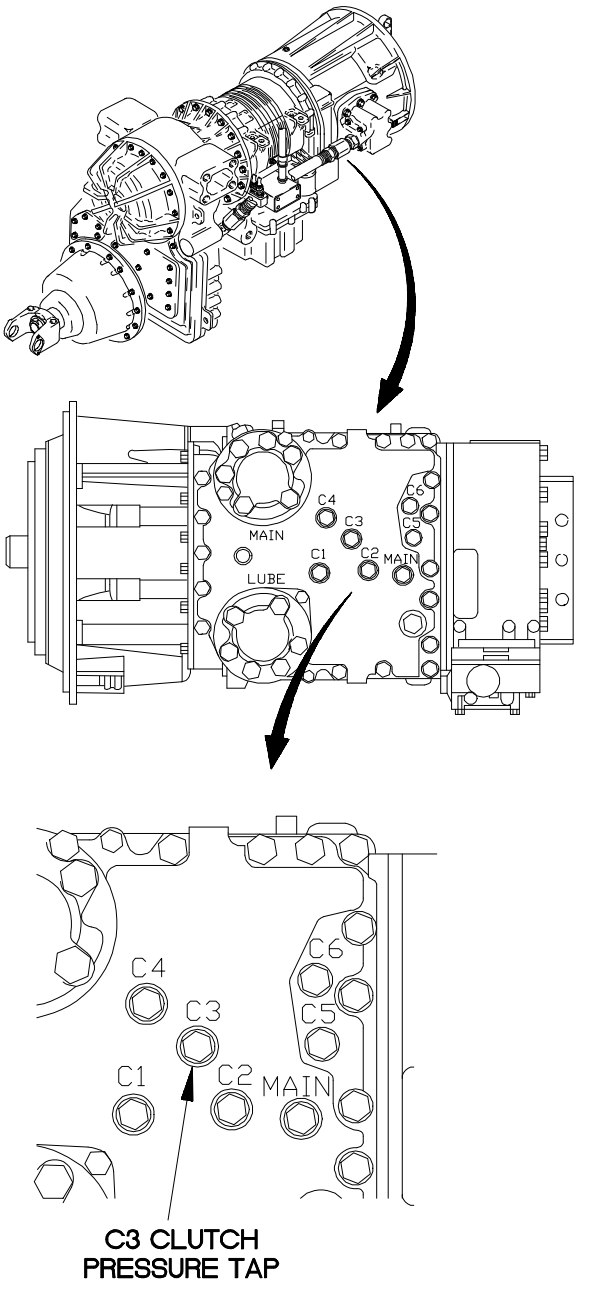


PRESSURE TEST

(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).

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



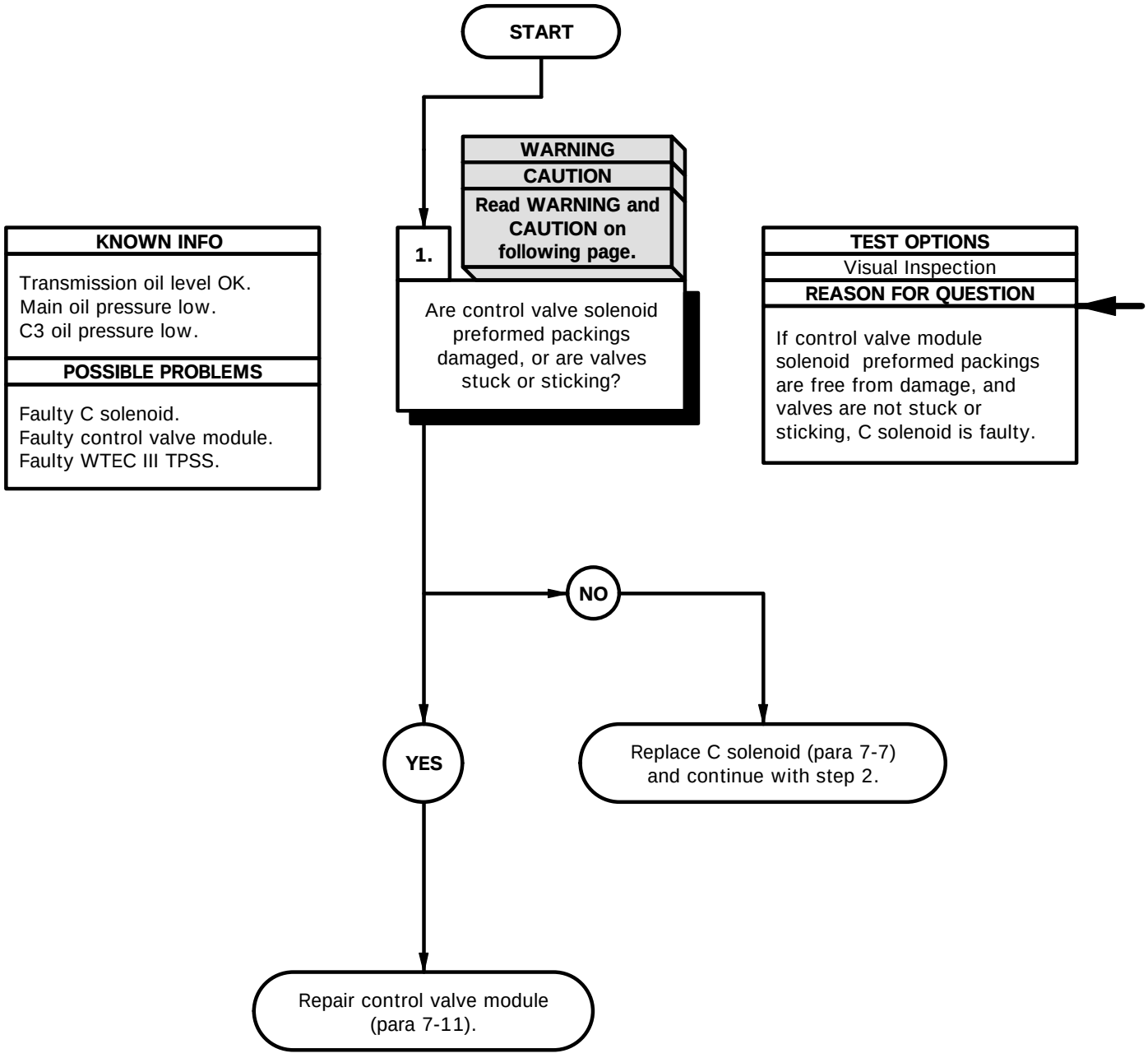
c80. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 55 AND ANY SUB CODE

INITIAL SETUP

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

Personnel Required
(2)

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



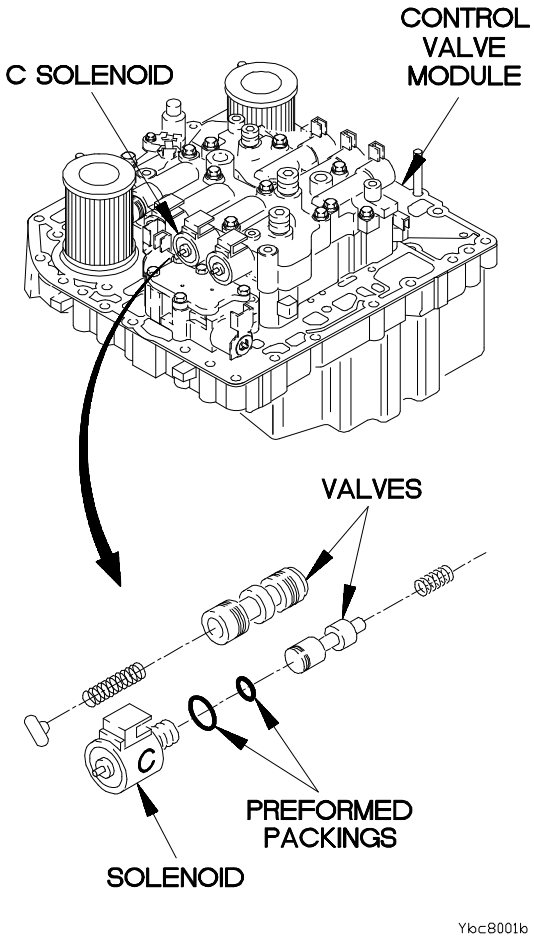
WARNING

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

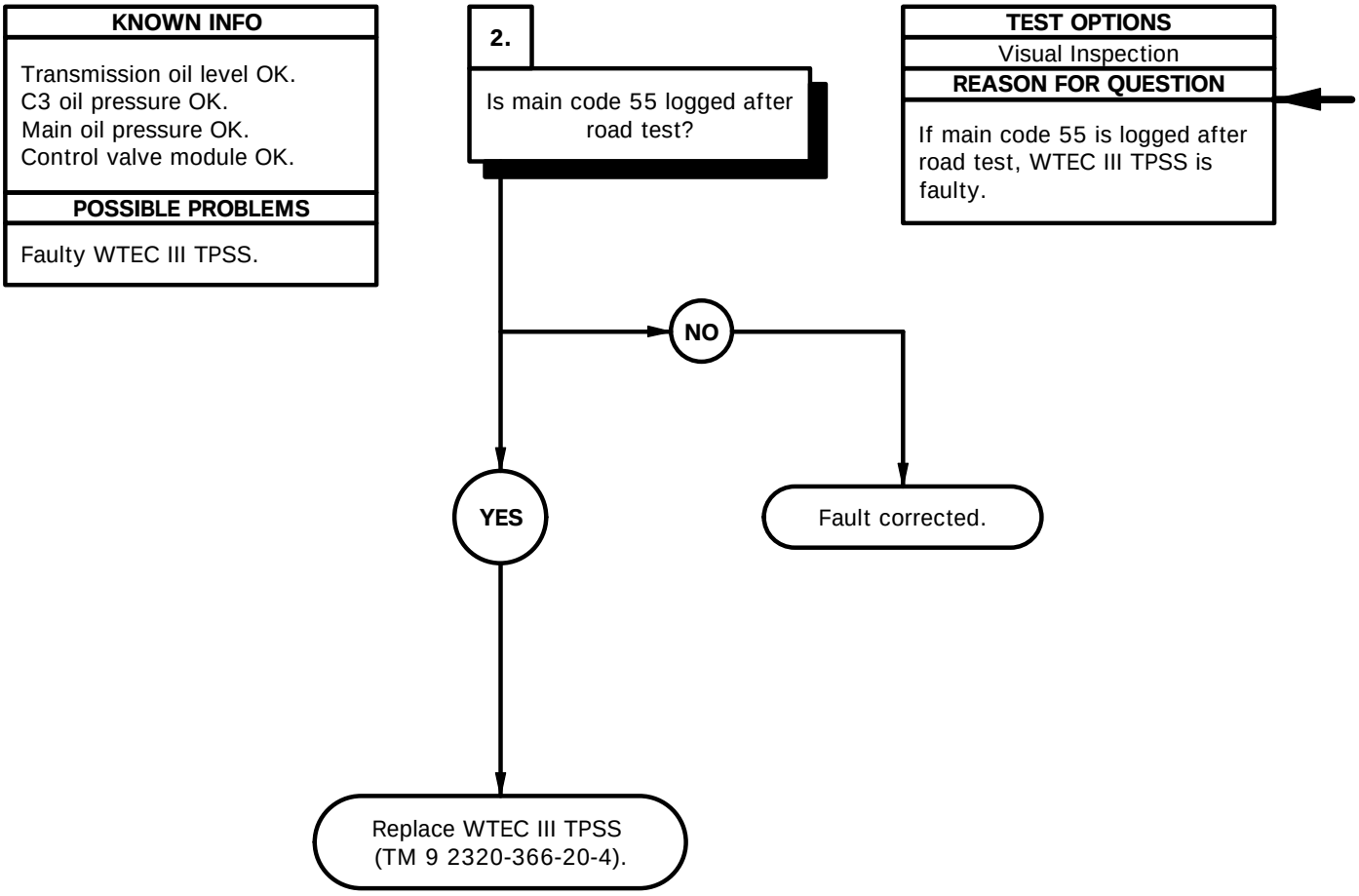
CAUTION

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, 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).



c80. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 55 AND ANY SUB CODE (CONT)



(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 Shimmies	2-962

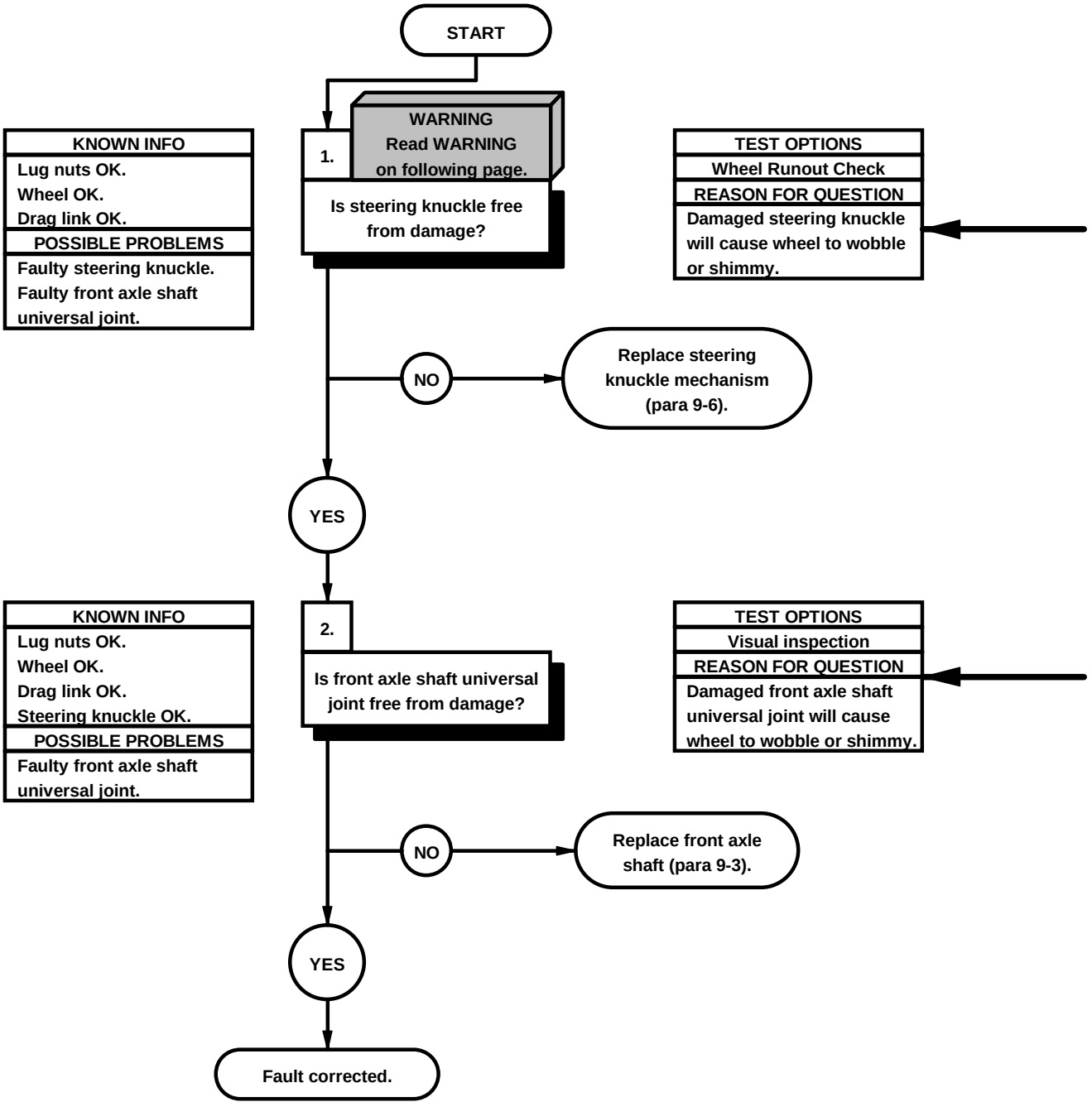
d1. WHEEL WOBBLES OR SHIMMIES

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)
Jack, Dolly-Type, Hydraulic, (Item 37, Appendix B)
Trestle, Motor Vehicle Maintenance (Item 81, Appendix B)

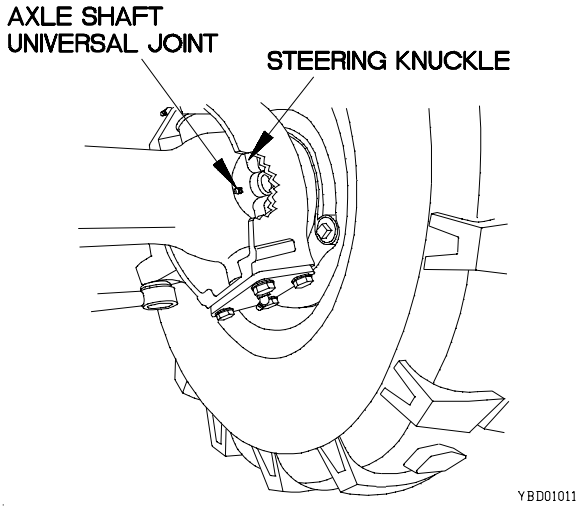


WHEEL RUNOUT CHECK

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).



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

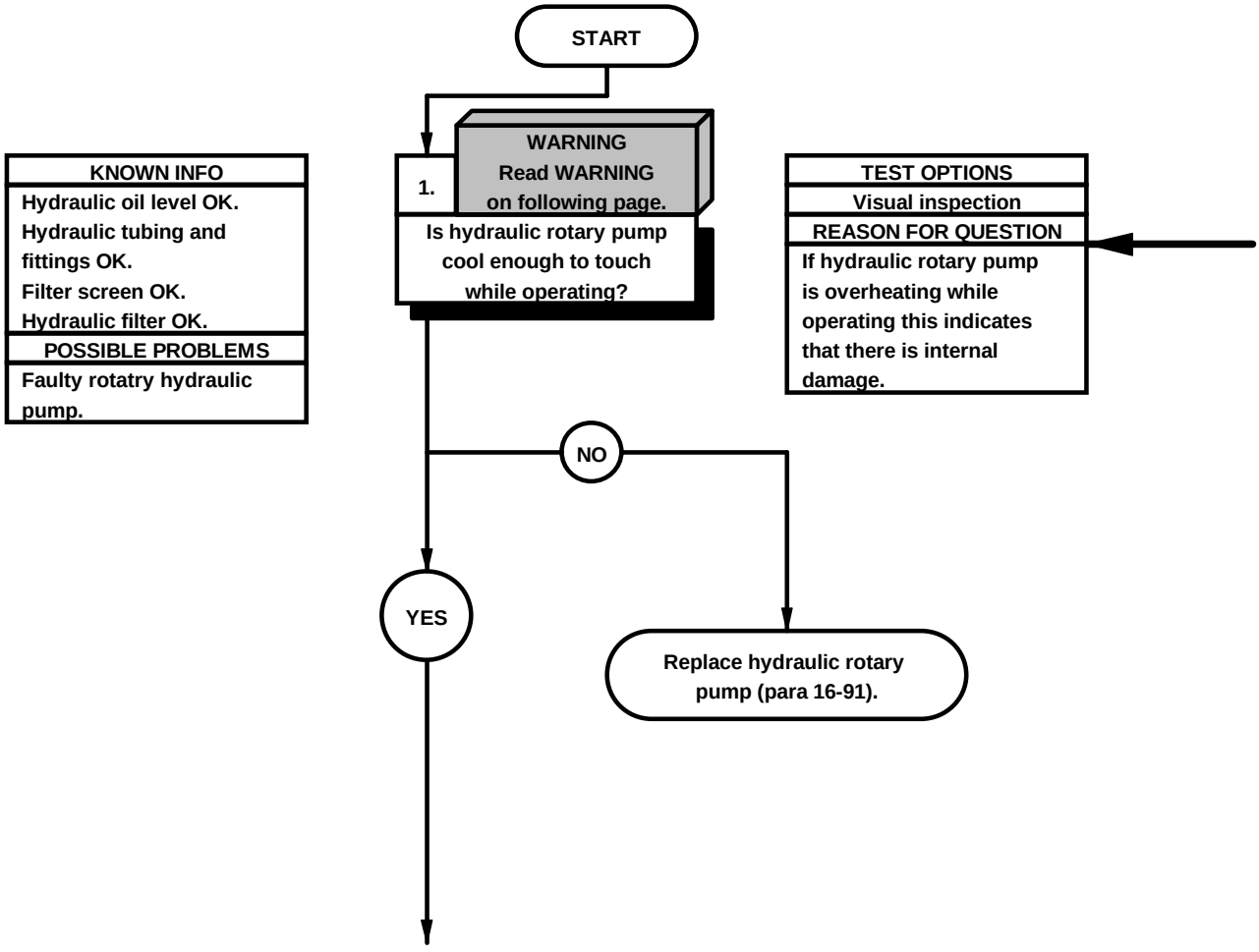
INITIAL SETUP

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

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)

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)

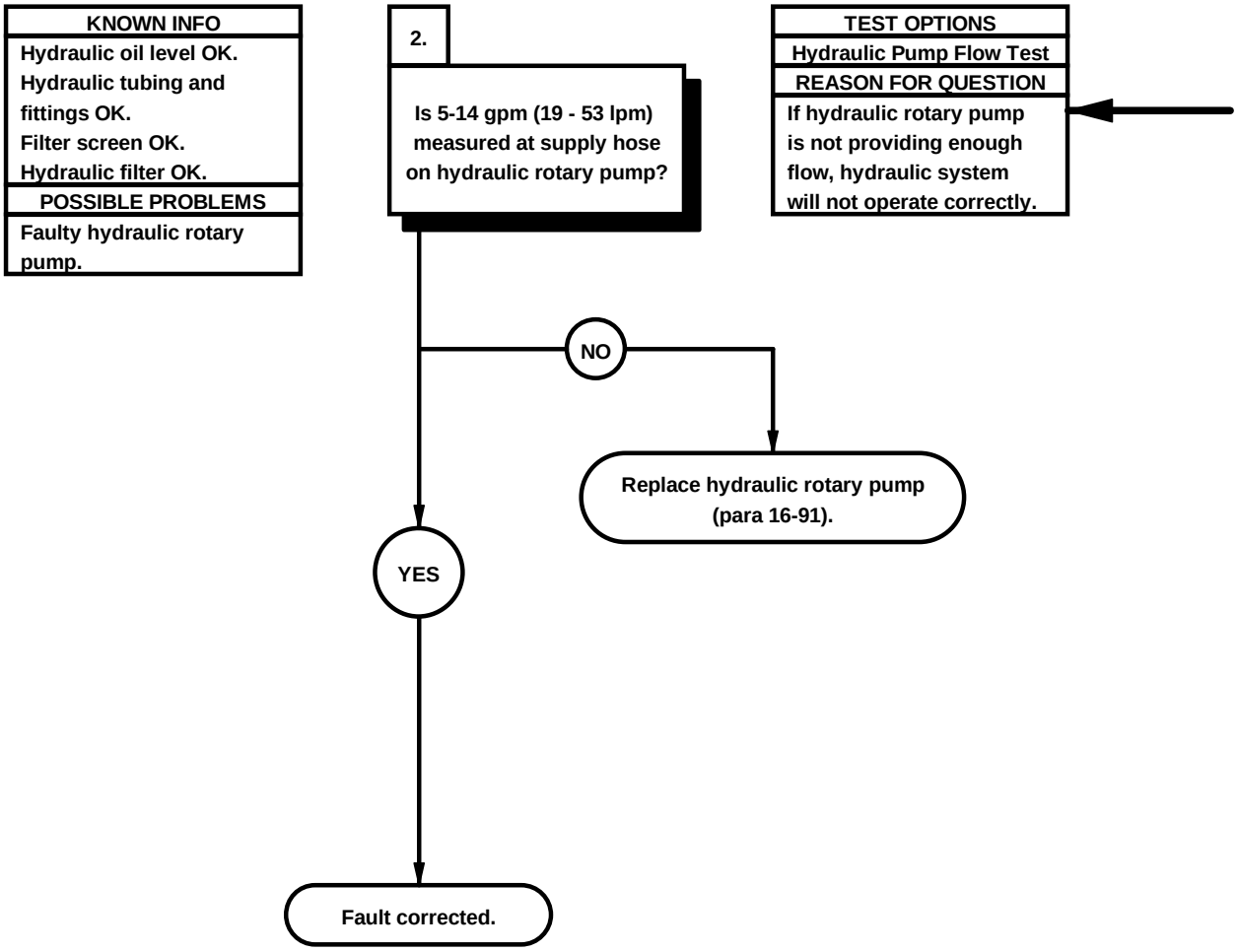


WARNING

- **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.**

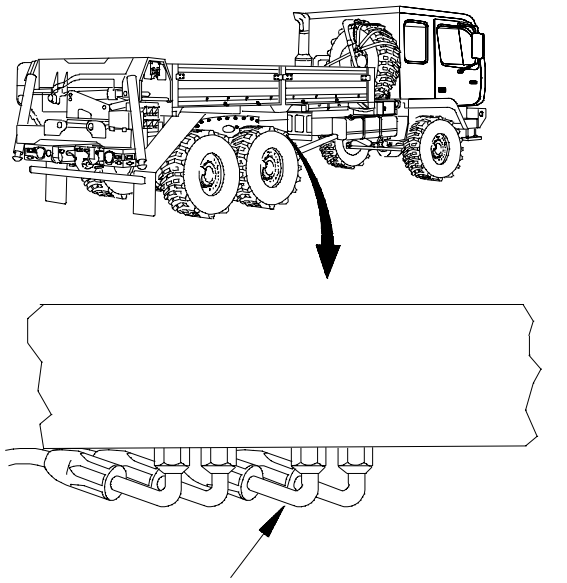
(1) Start engine (TM 9-2320-366-10-1). Allow engine to run until reaching normal operating temperature.
(2) Engage PTO (TM 9-2320-366-10-1).
(3) Increase engine rpm, using hand throttle lever, until 1250-1450 rpm is reached.
(4) Check hydraulic pump for overheating with engine at normal operating temperature.
(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)



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.



e2. LOSS OF HYDRAULIC PRESSURE (Three Stage Pump)

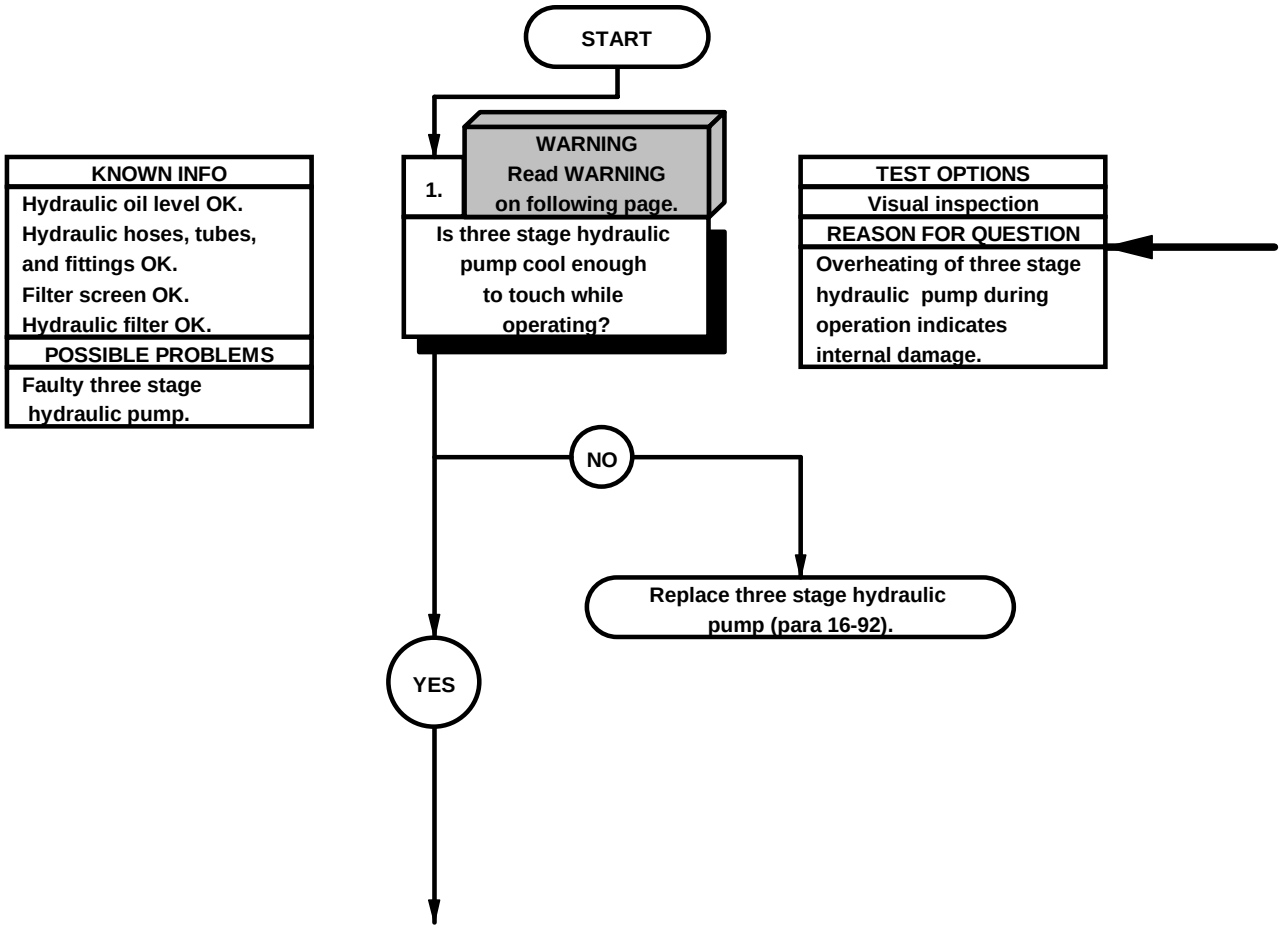
INITIAL SETUP

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

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)

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)

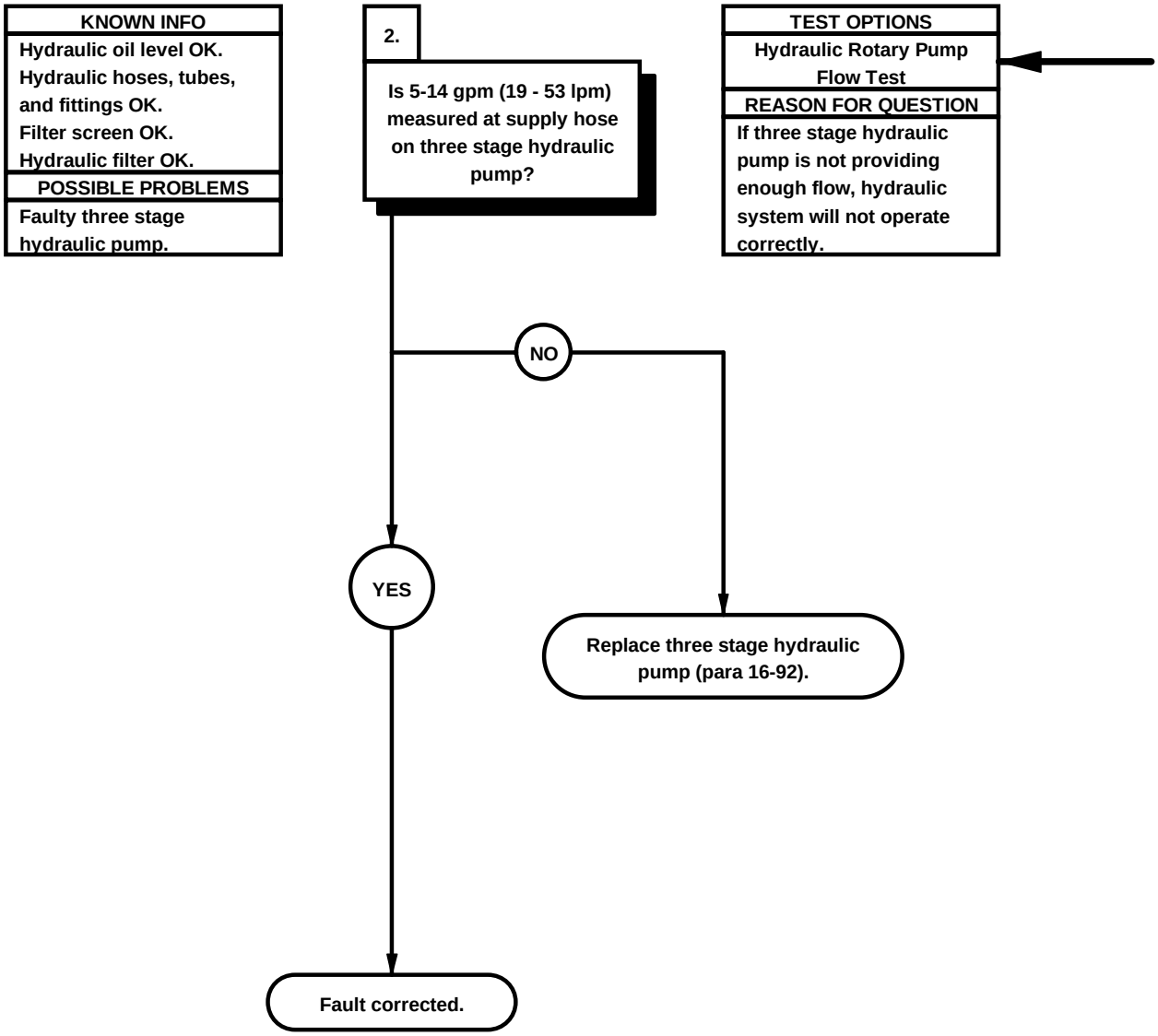


WARNING

- **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.**

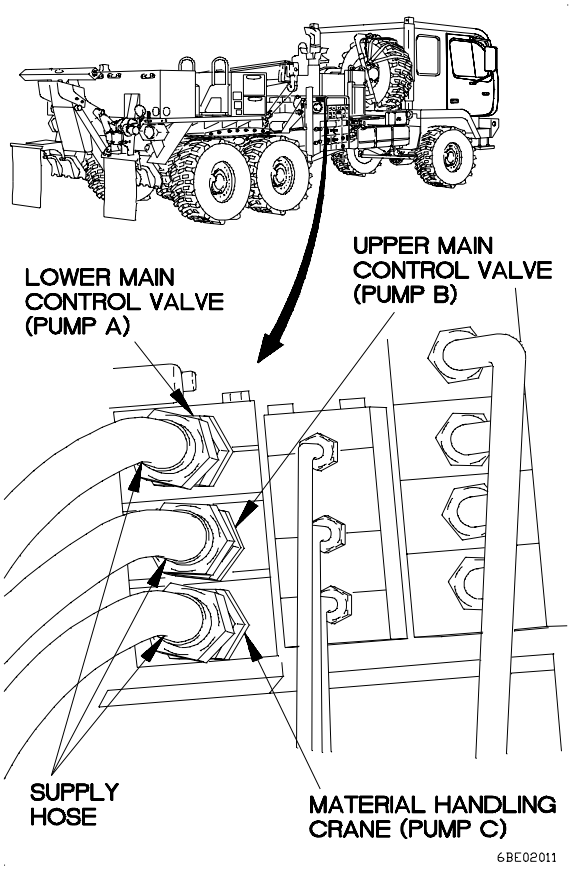
(1) Start engine (TM 9-2320-366-10-1). Allow engine to run until reaching normal operating temperature.
(2) Engage PTO (TM 9-2320-366-10-1).
(3) Increase engine RPM until 1250-1450 RPM is reached (TM 9-2320-366-10-1).
(4) Check three stage hydraulic pump for overheating with engine at normal operating 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)



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.



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

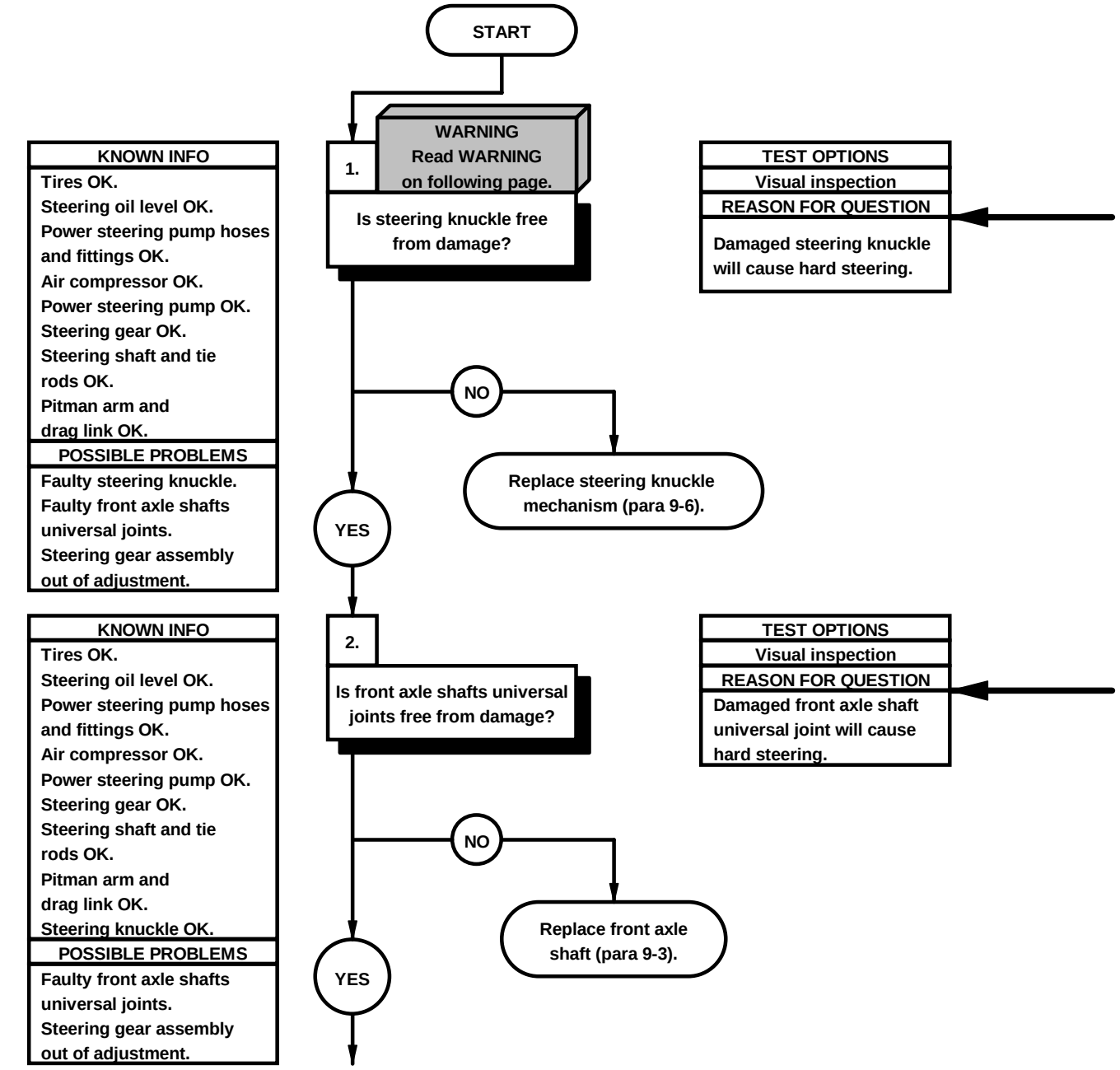
f1. HARD TO STEER

INITIAL SETUP

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

Personnel Required
(2)

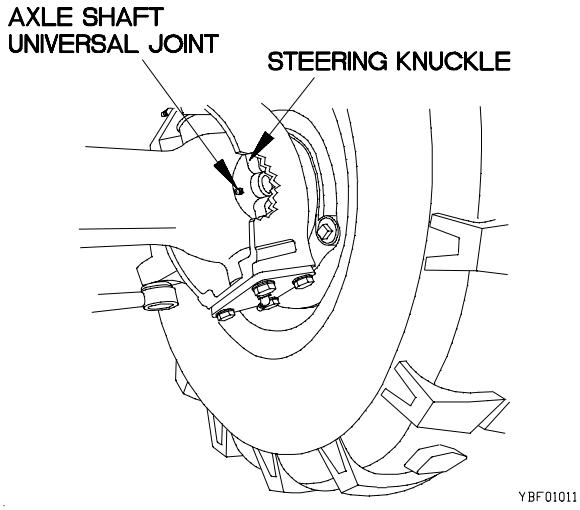
Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Jack, Dolly-Type, Hydraulic (Item 37, Appendix B)
Trestle, Motor Vehicle Maintenance (Item 81, Appendix B)
Goggles, Industrial (Item 28, Appendix B)



WARNING

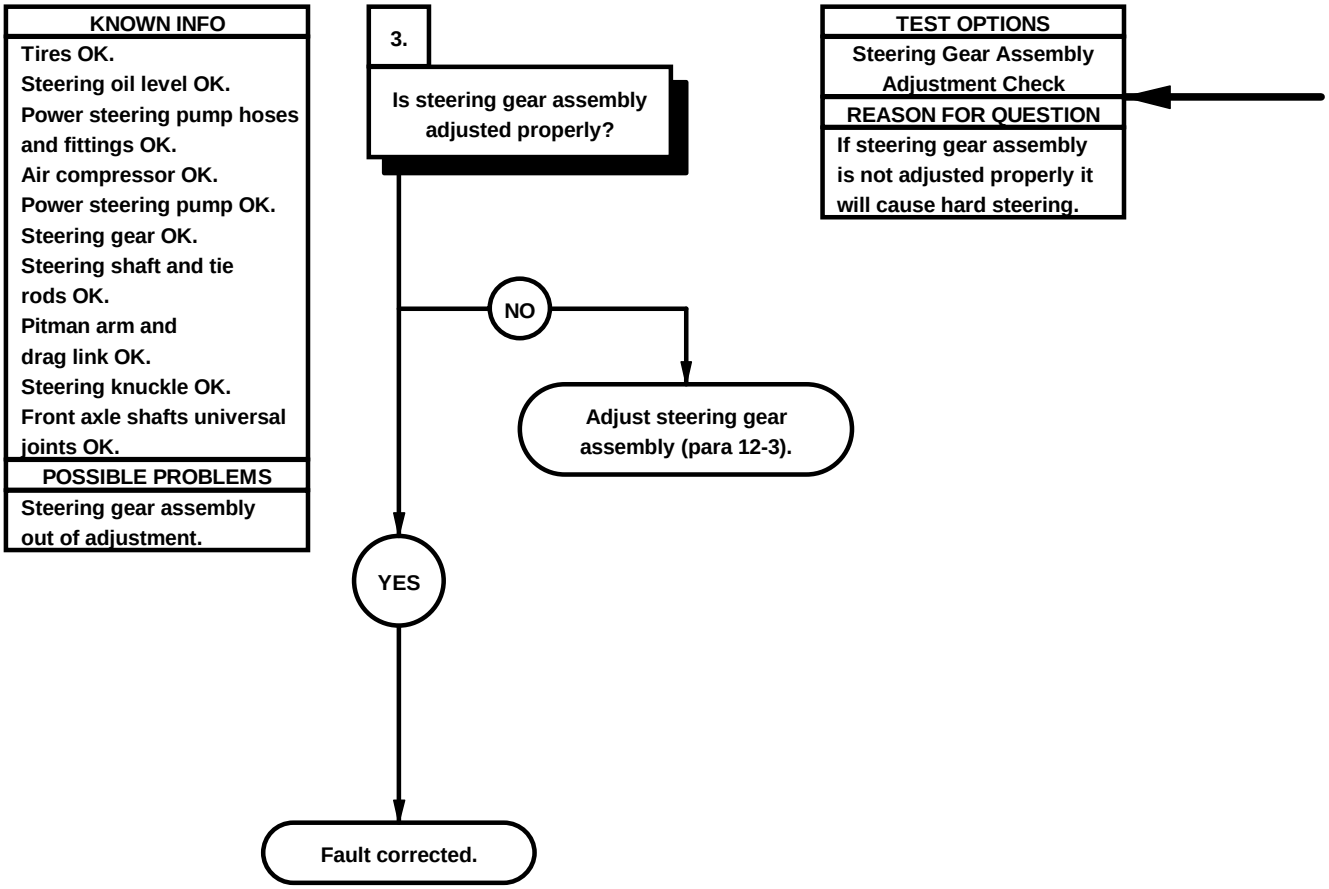
- **Vehicle must be on level ground and wheels must be chocked. Failure to comply may result in injury to personnel.**
- **Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.**

(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.

f1. HARD TO STEER (CONT)



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

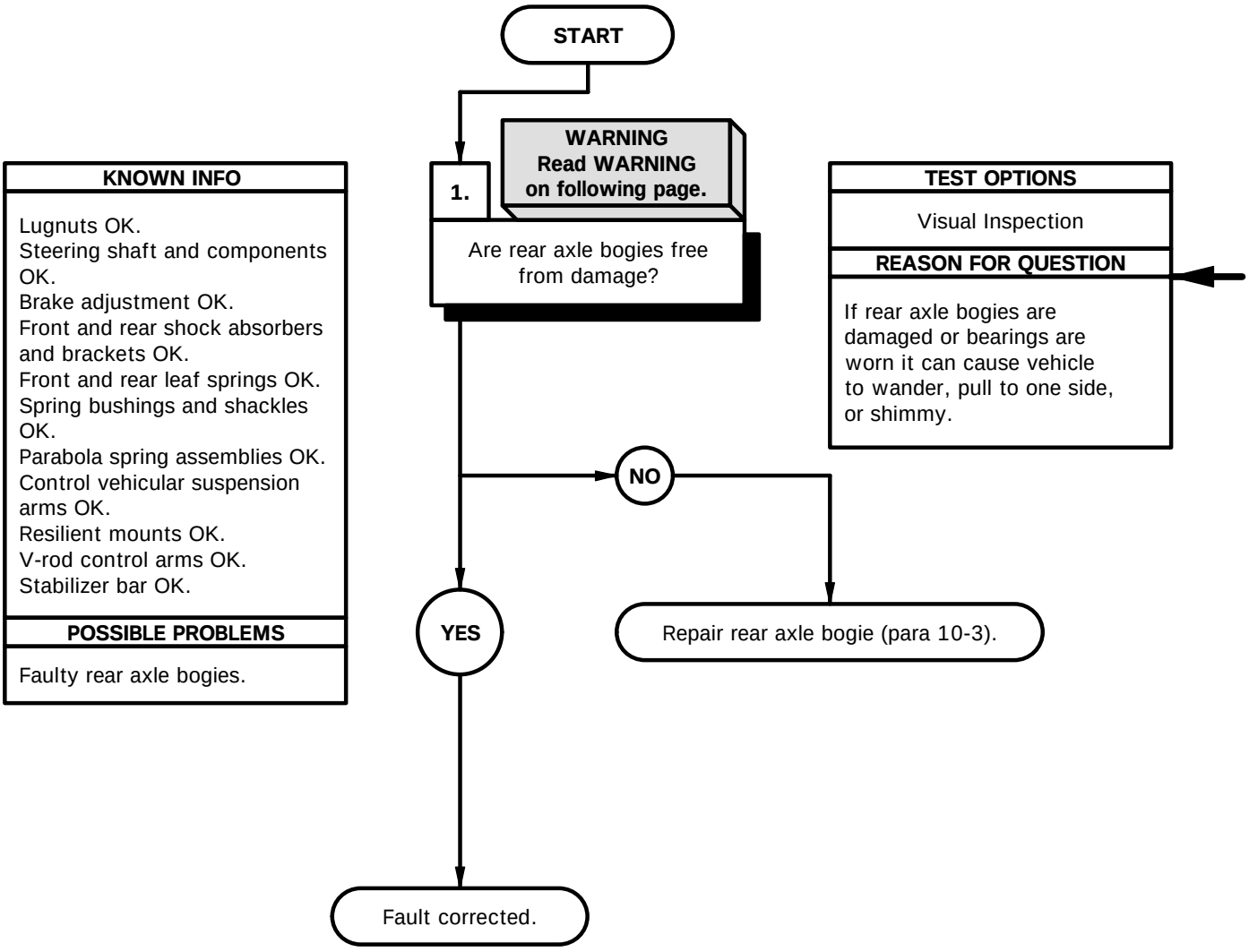
INITIAL SETUP

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

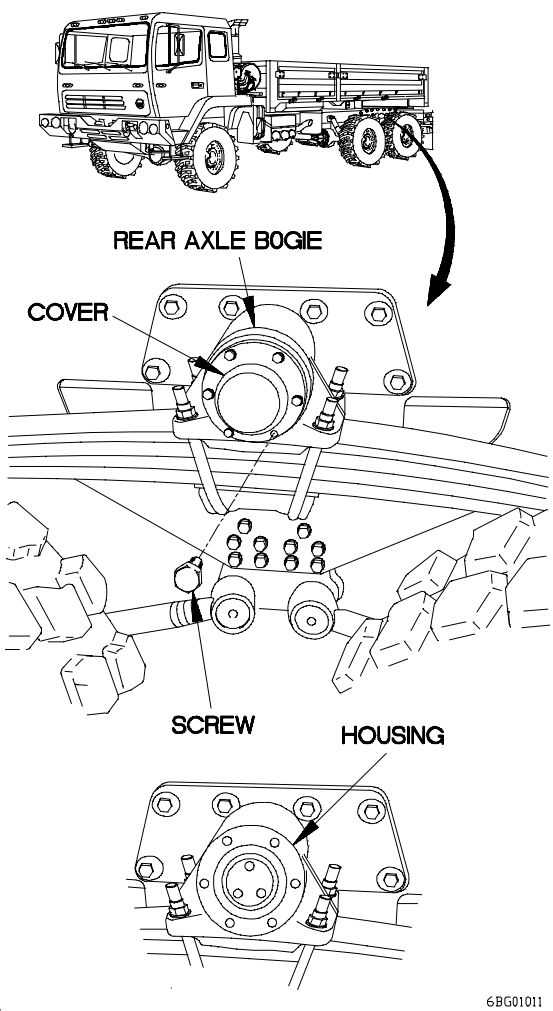
Both left and right rear axle bogies are inspected in the same manner.

(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).



g2. LEANS TO ONE SIDE OR REAR OF VEHICLE SAGS

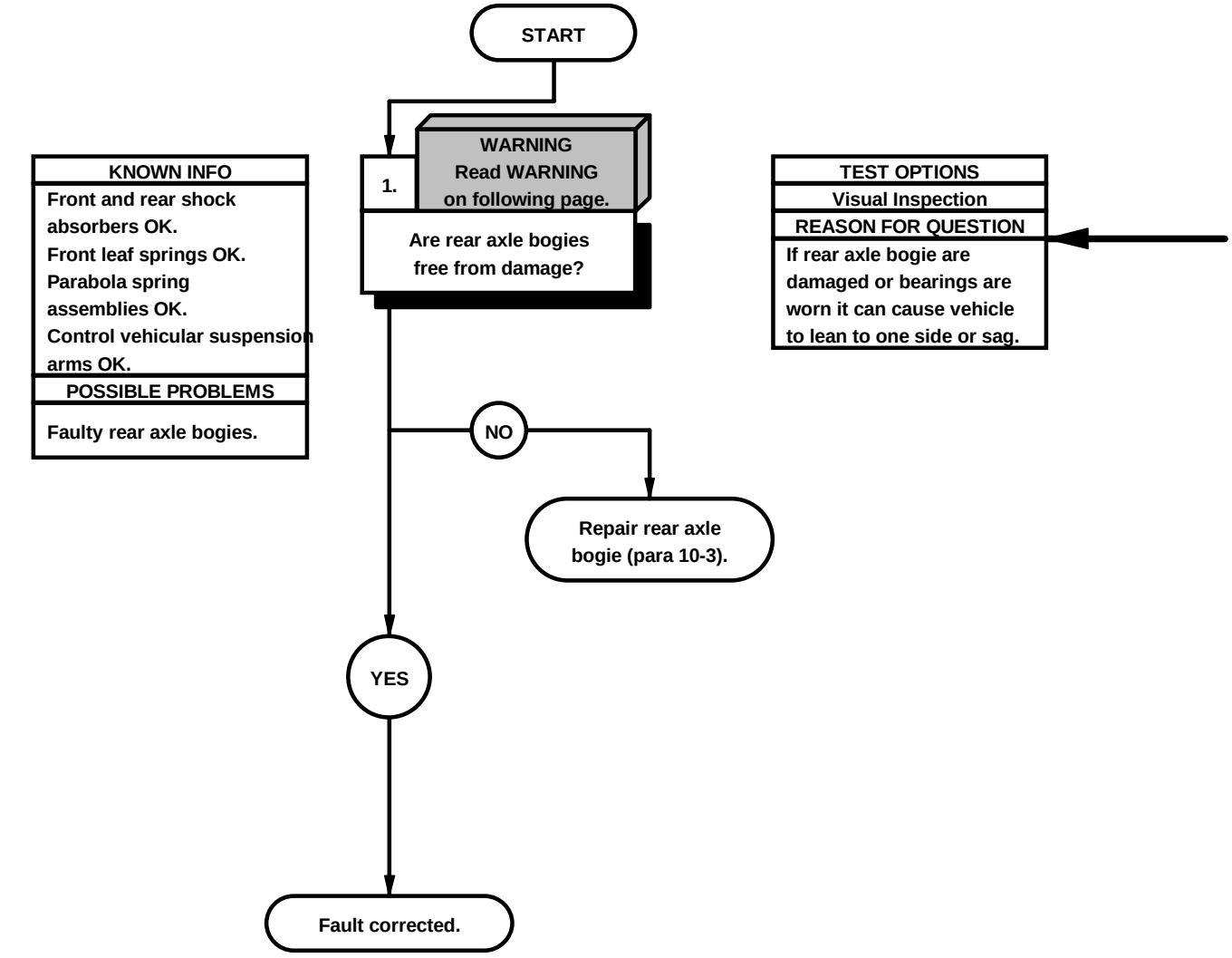
INITIAL SETUP

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

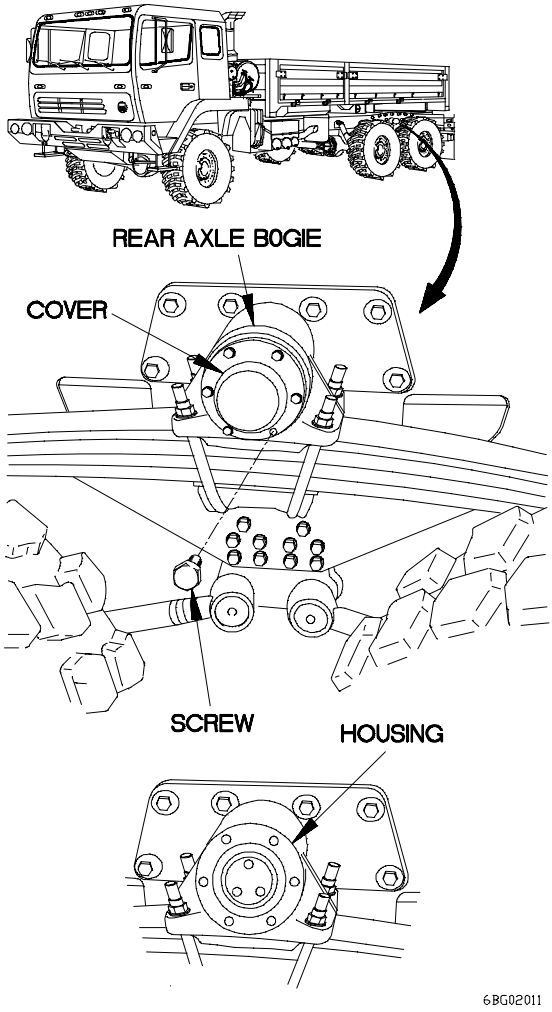
Both left and right rear axle bogies are inspected in the same manner.

(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).



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

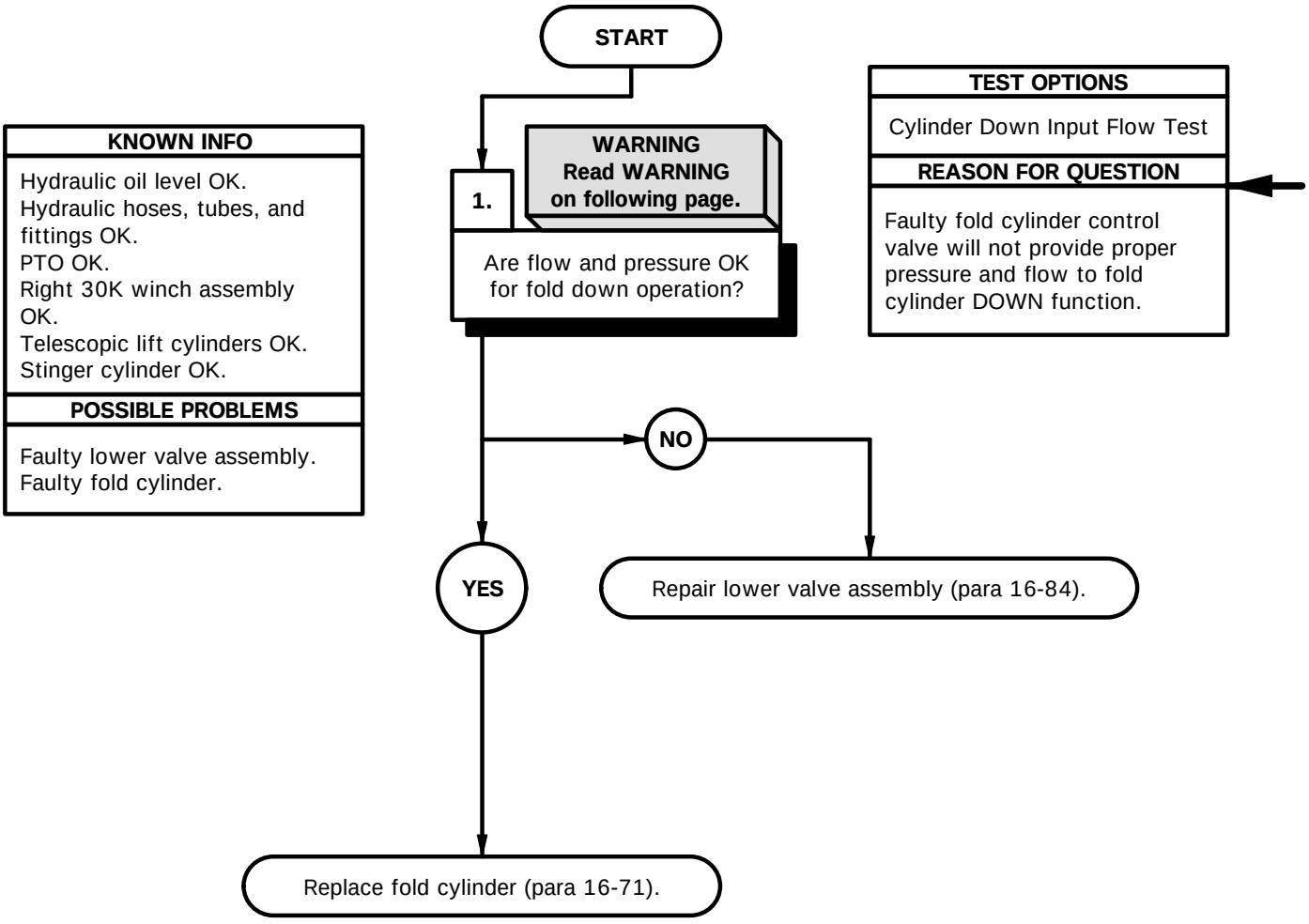
INITIAL SETUP

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)

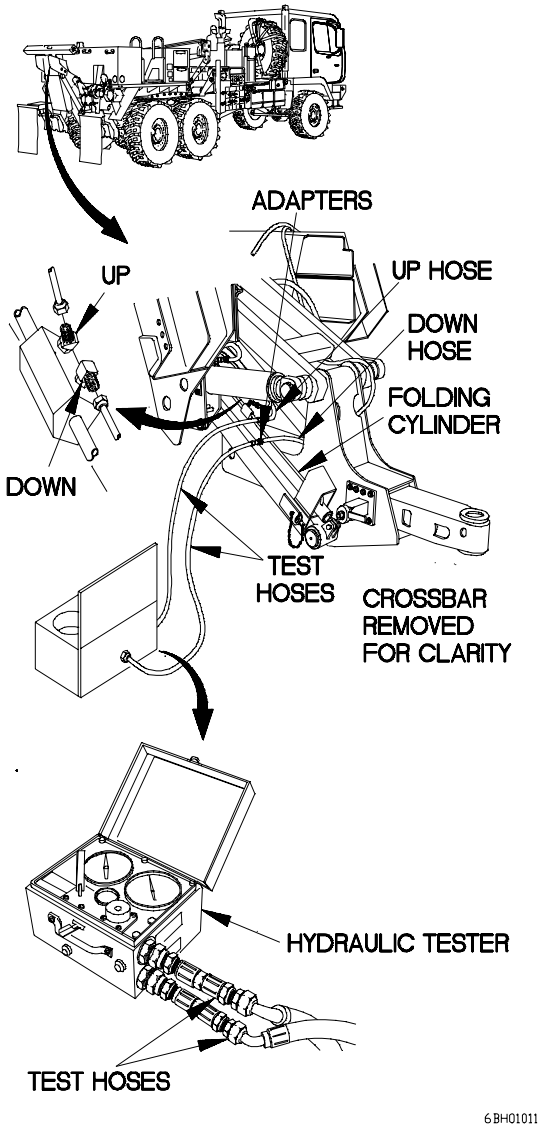


WARNING

- **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.



h2. M1089 LEFT STIFFLEG DRIFTS OR DOES NOT WORK

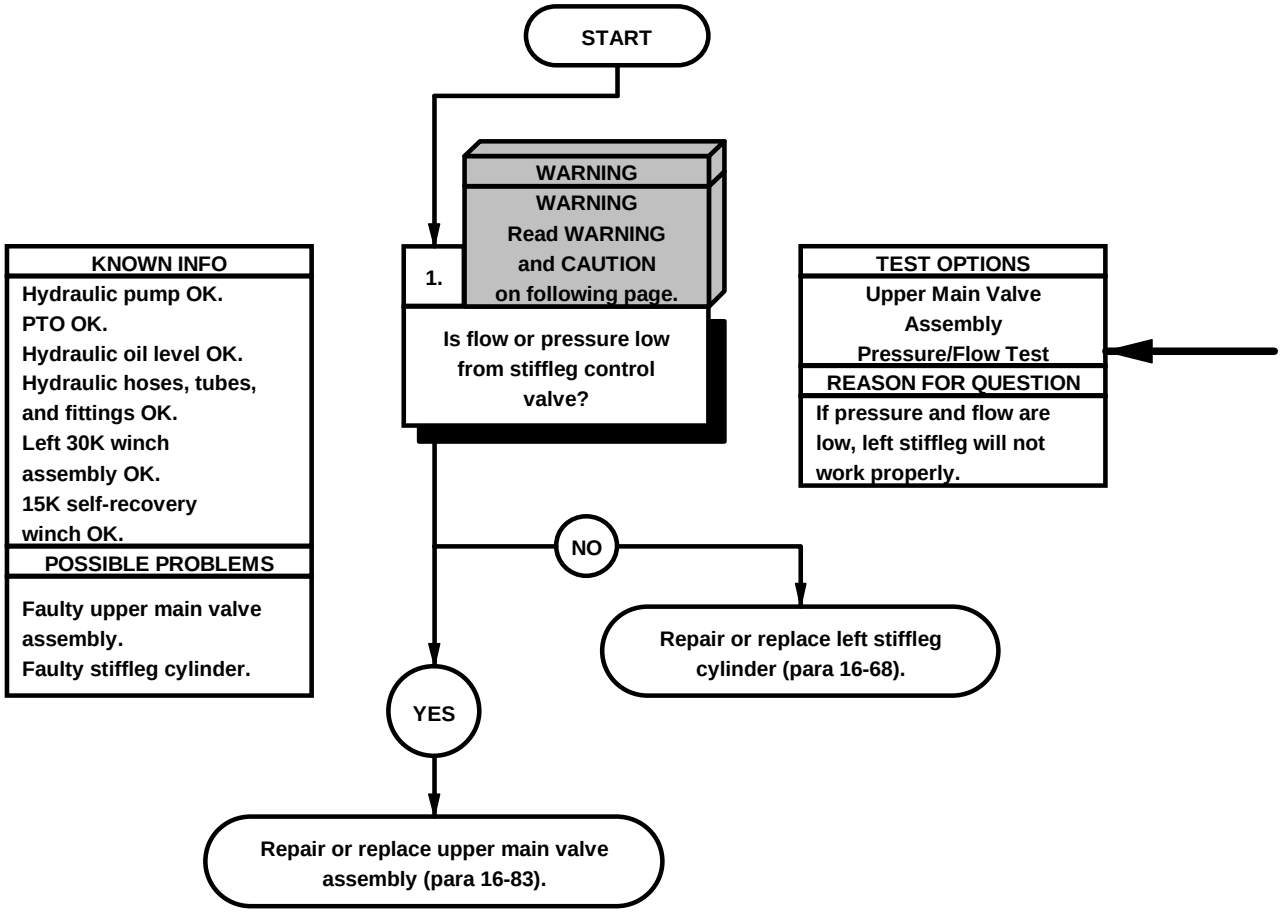
INITIAL SETUP

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 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.

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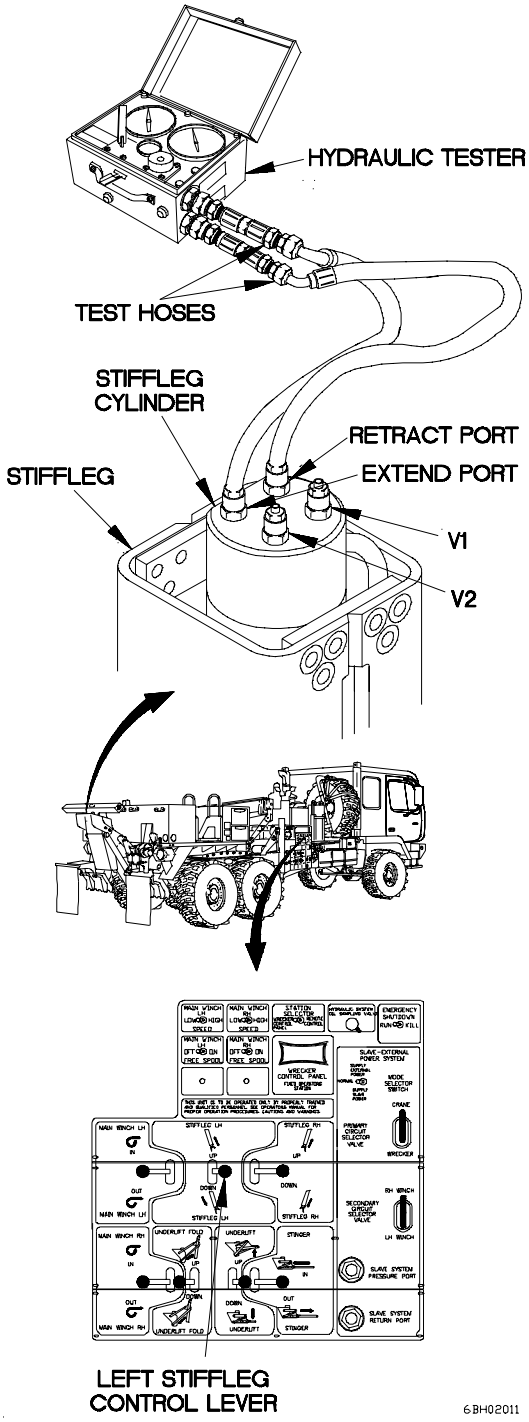

h2. M1089 LEFT STIFFLEG DRIFTS OR DOES NOT WORK (CONT)

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 assisstant.

(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).

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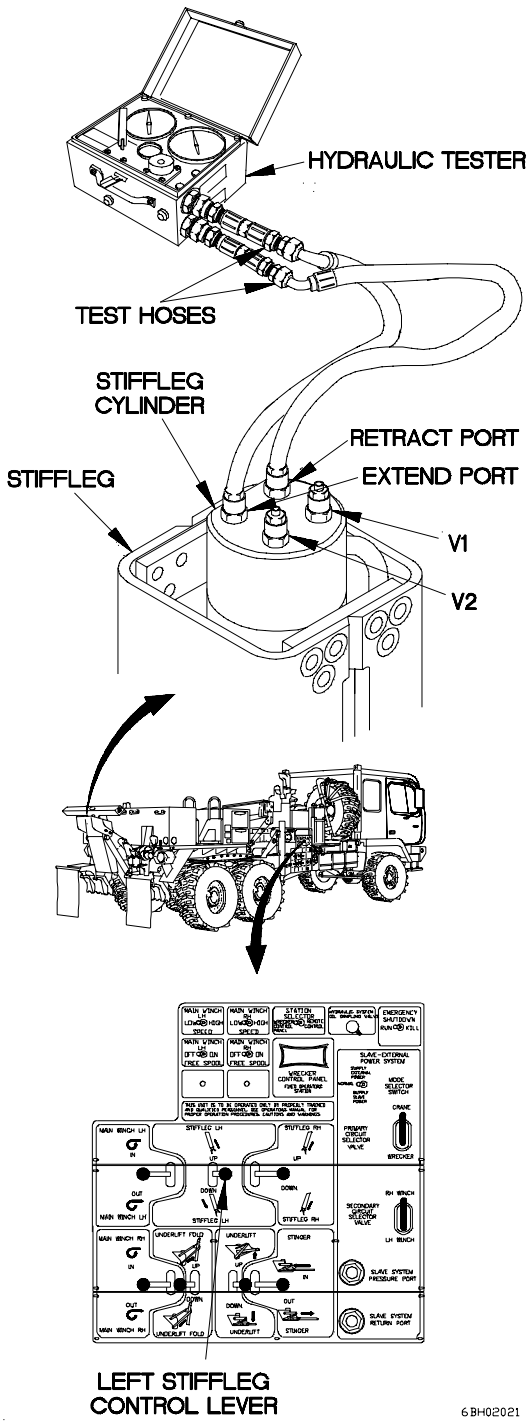


WARNING

- **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

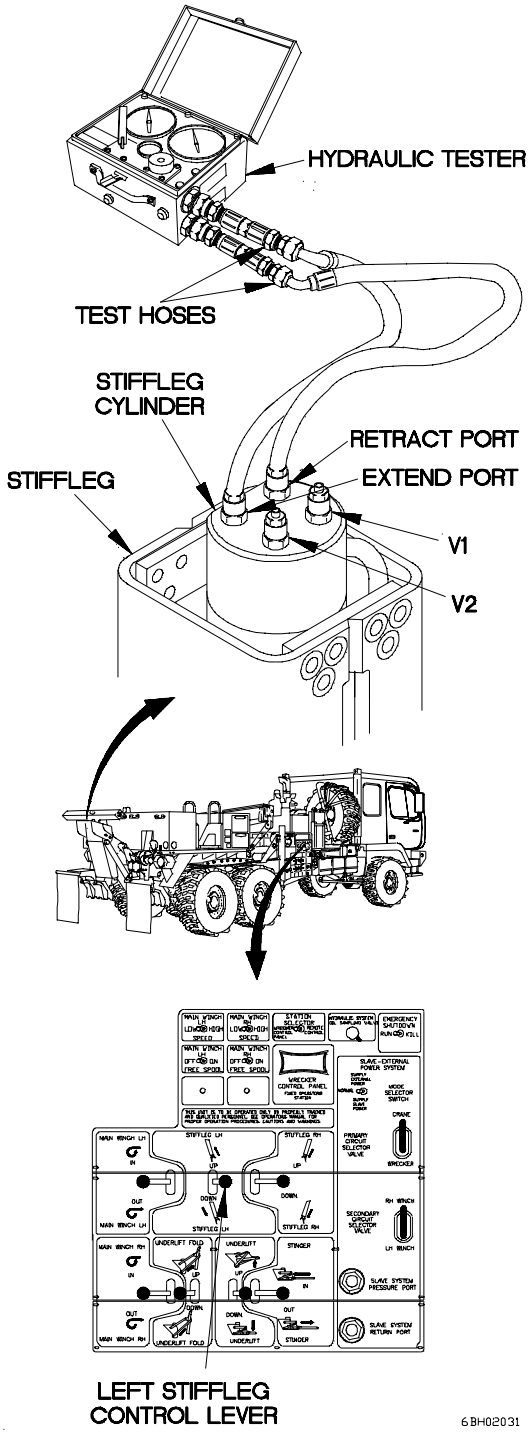
Exercise caution when operating stiffleg. Failure to comply may cause hoses to rub against stiffleg causing damage to equipment.

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.



h3. M1089 RIGHT STIFFLEG DRIFTS OR DOES NOT WORK

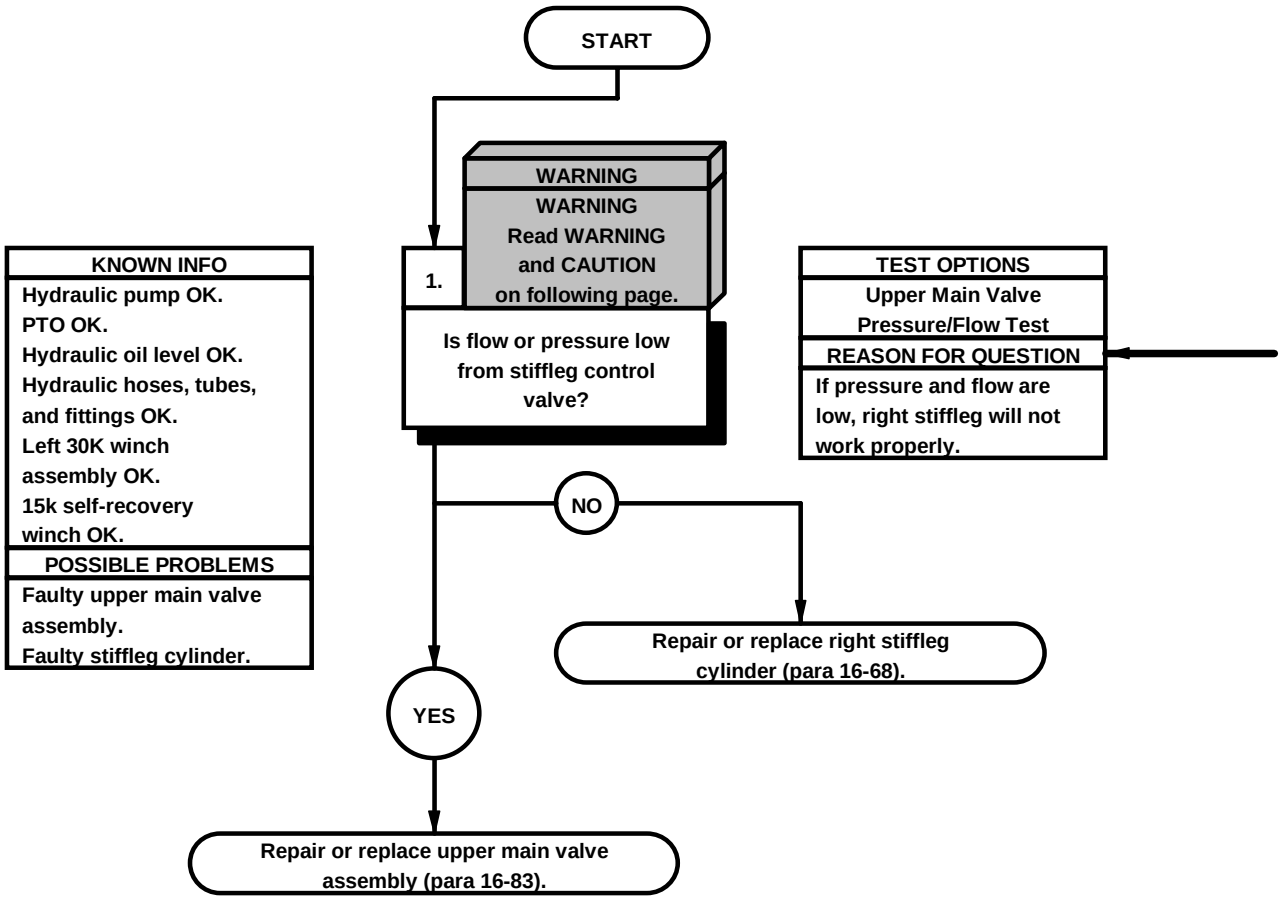
INITIAL SETUP

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.

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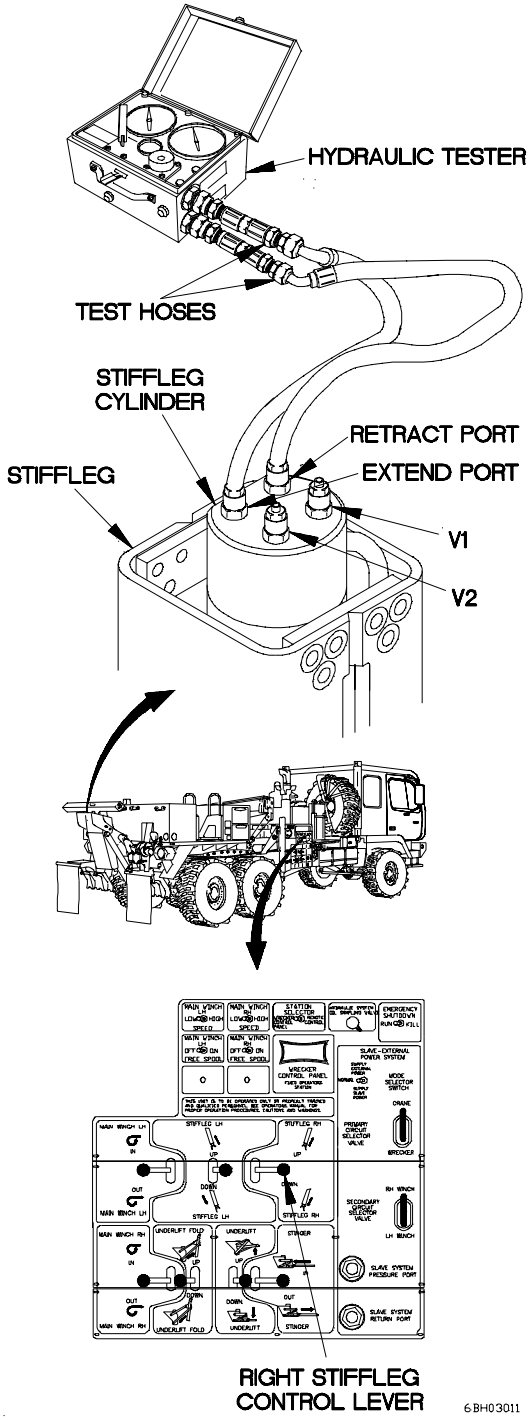

h3. M1089 RIGHT STIFFLEG DRIFTS OR DOES NOT WORK (CONT)

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).

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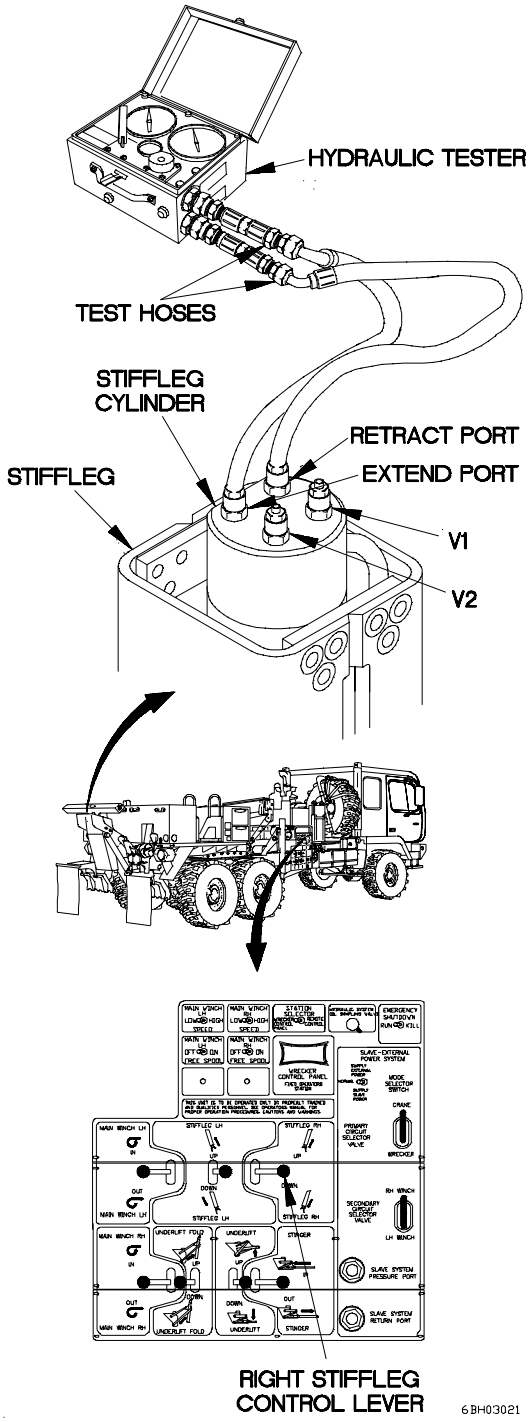


WARNING

- **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

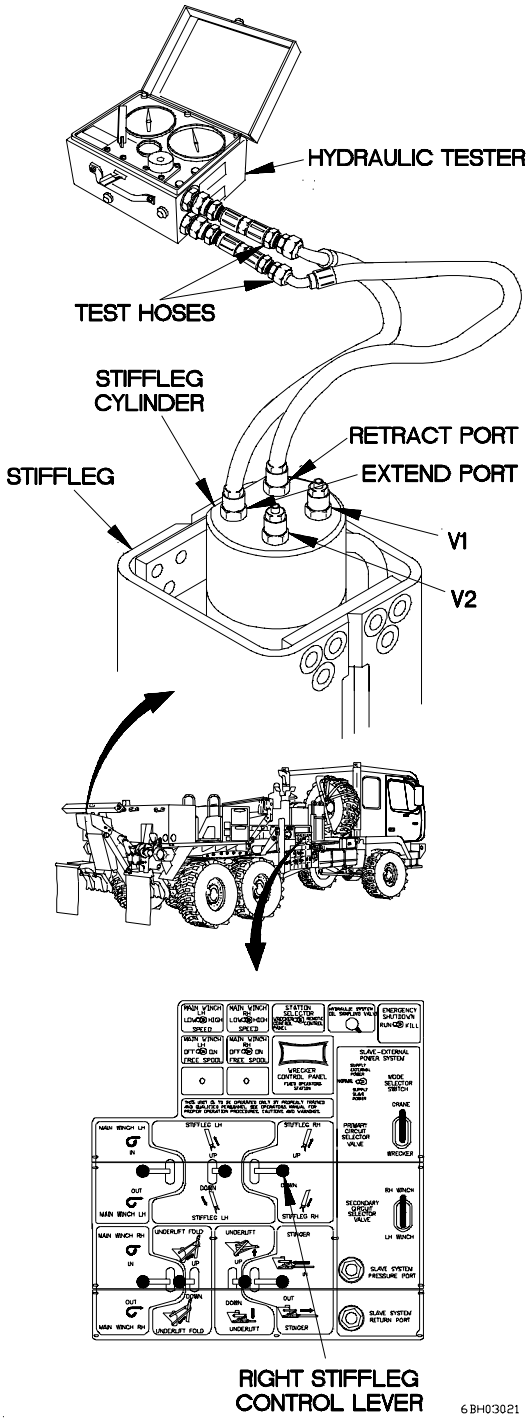
Exercise caution when operating stiffleg. Failure to comply may cause hoses to rub against stiffleg causing damage to equipment.

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.



h4. M1089 STINGER CYLINDER DOES NOT WORK

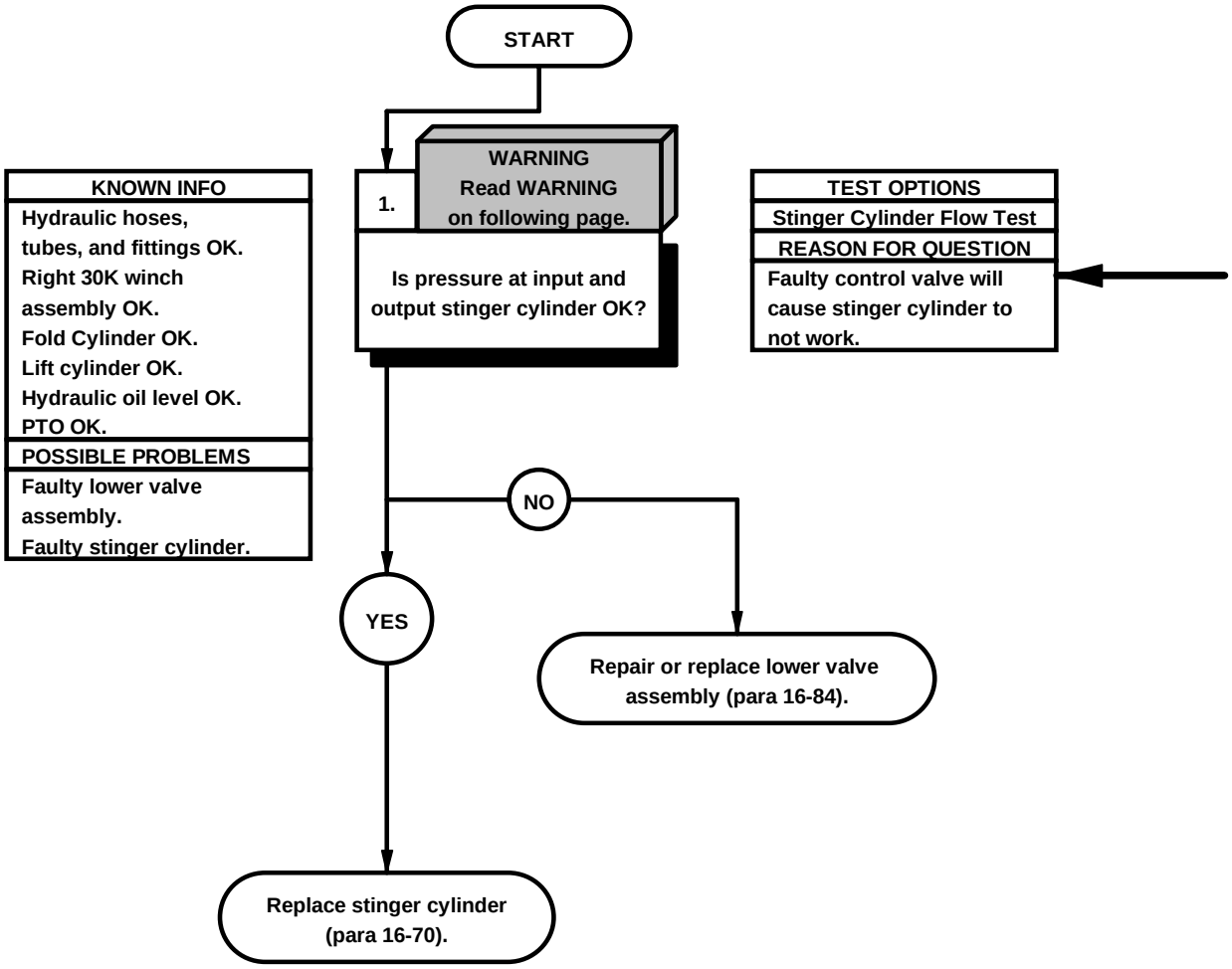
INITIAL SETUP

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)
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)
Fitting (2) (Item 32, Appendix C)
Adapter, Pipe (2) (Item 2, Appendix C)
Adapter,Swivel (2) (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.**

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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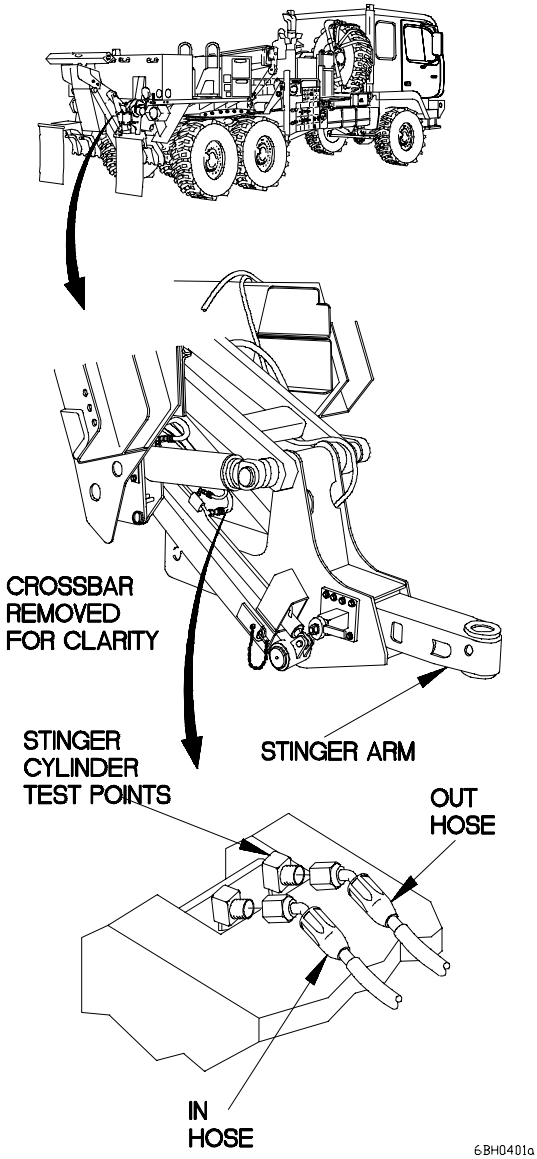
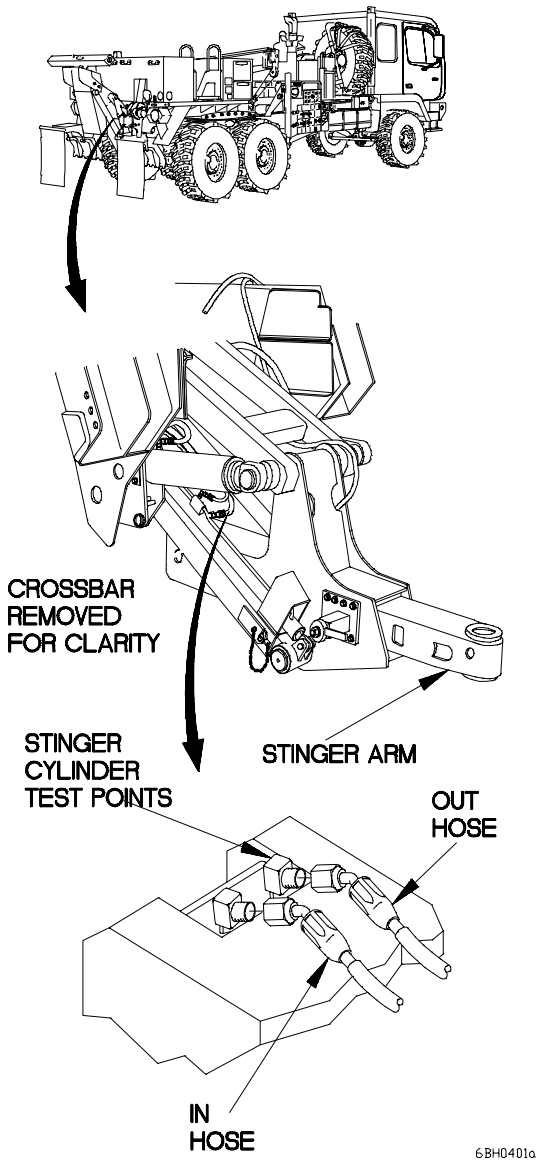


h4. M1089 STINGER CYLINDER DOES NOT WORK (CONT)

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.



h5. M1089 TELESCOPIC LIFT CYLINDER(S) DRIFTS OR DOES NOT WORK

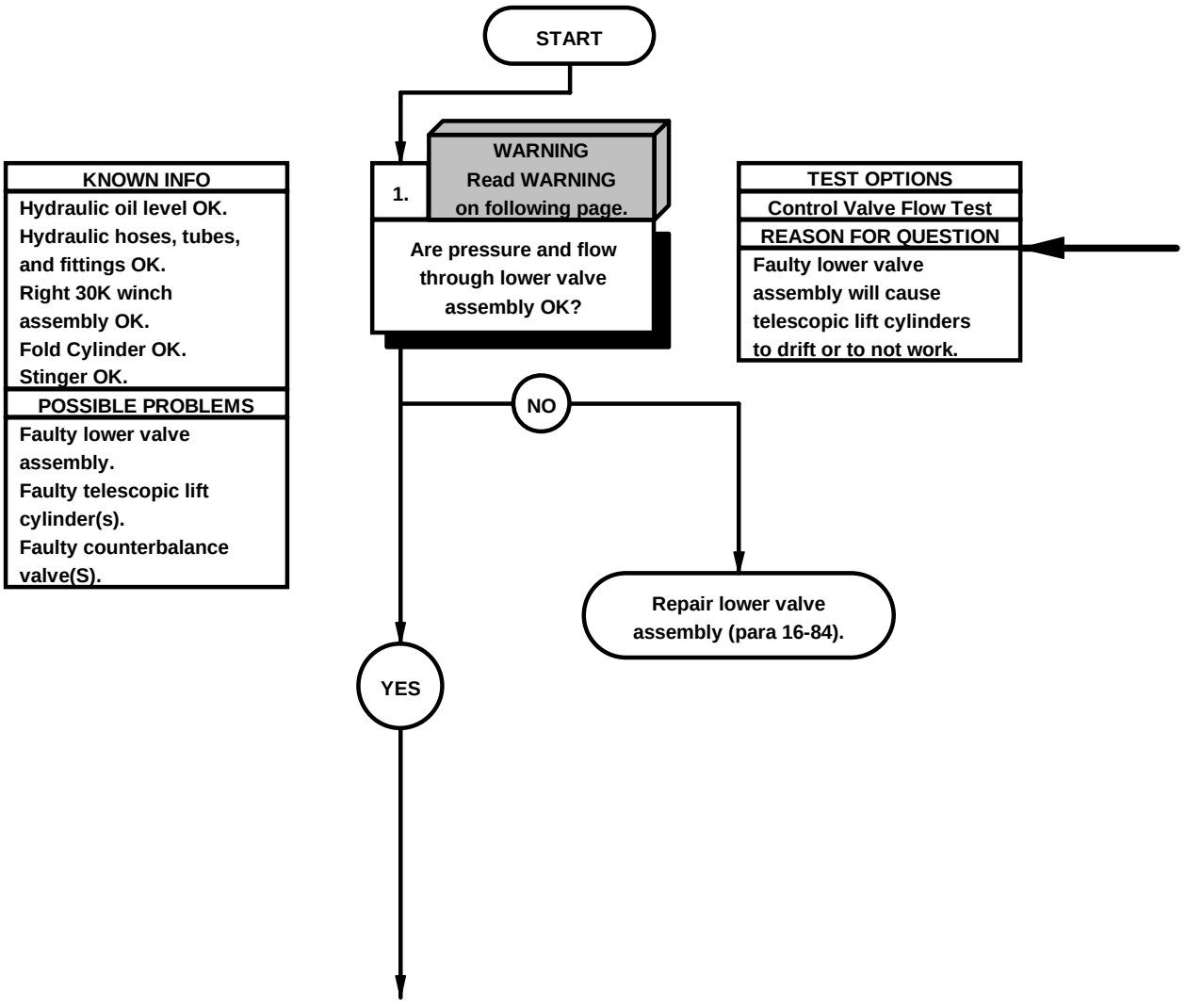
INITIAL SETUP

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)
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)



WARNING

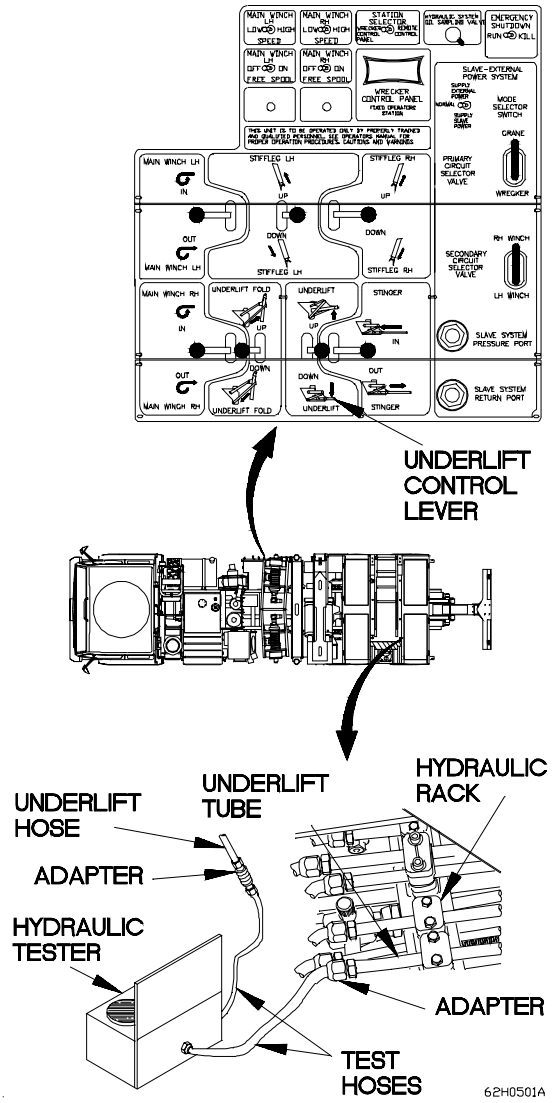
- **Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.**
- **Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical 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

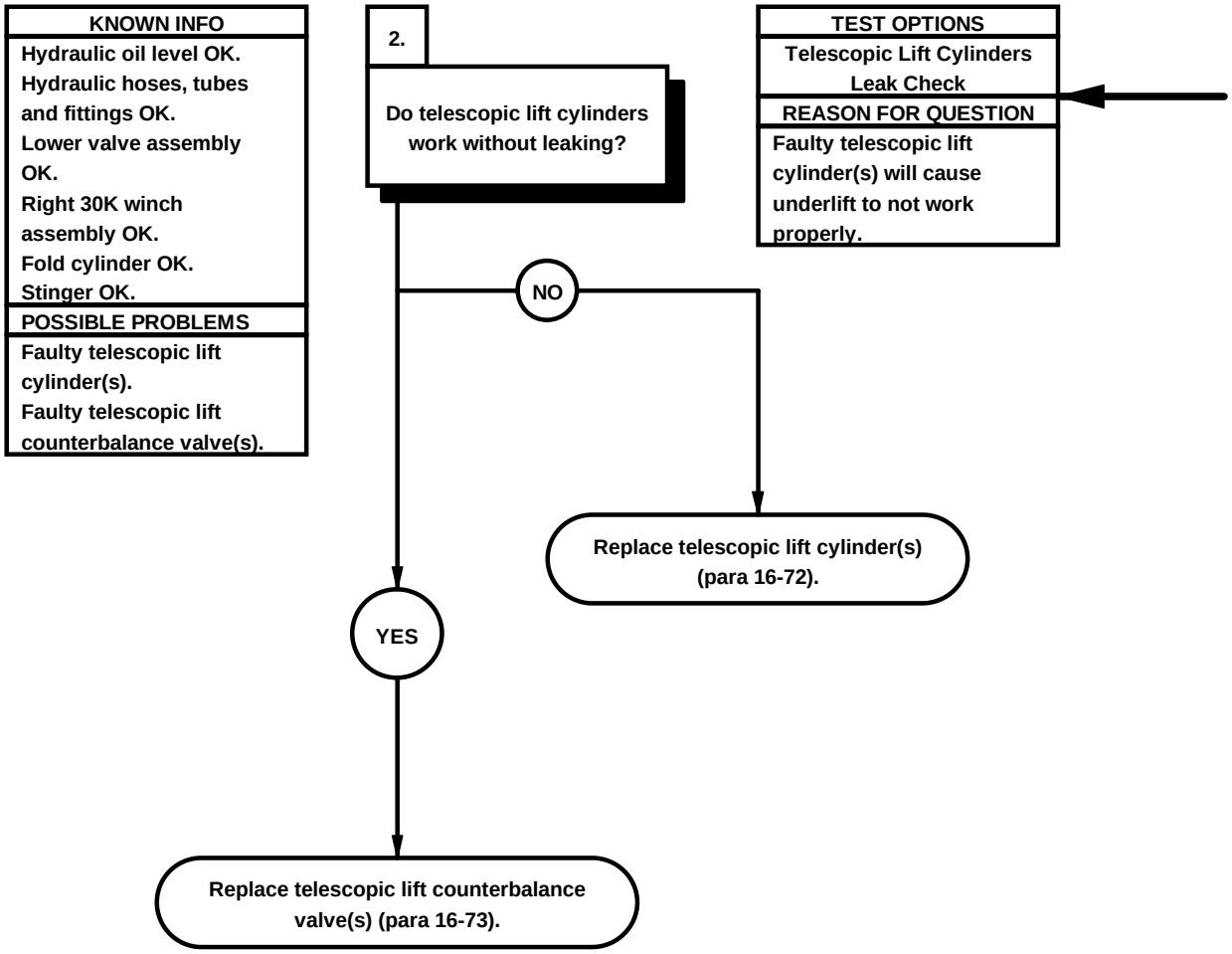
Tag hydraulic hoses, tubes, and fittings prior to disconnecting.

CONTROL VALVE FLOW TEST

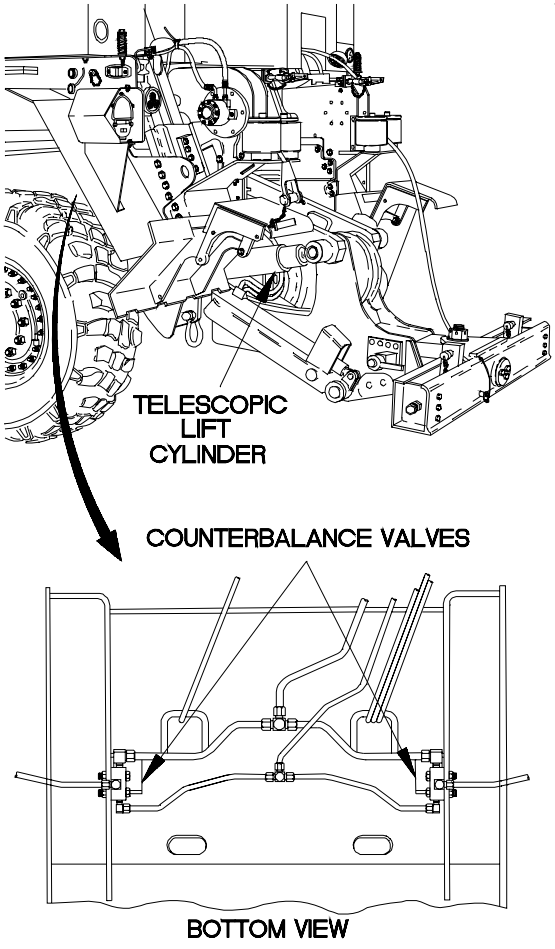
(1) Place drain pan under vehicle.
(2) Disconnect underlift hose from tube at back end of hydraulic rack.
(3) Connect hydraulic tester between hose and tube with test hoses and adapters.
(4) Start engine (TM 9-2320-366-10-1).
(5) Position PTO switch to ON (TM 9-2320-366-10-1).
(6) Increase engine RPM 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.



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.



h6. M1089 RH 30K WINCH DOES NOT OPERATE

INITIAL SETUP

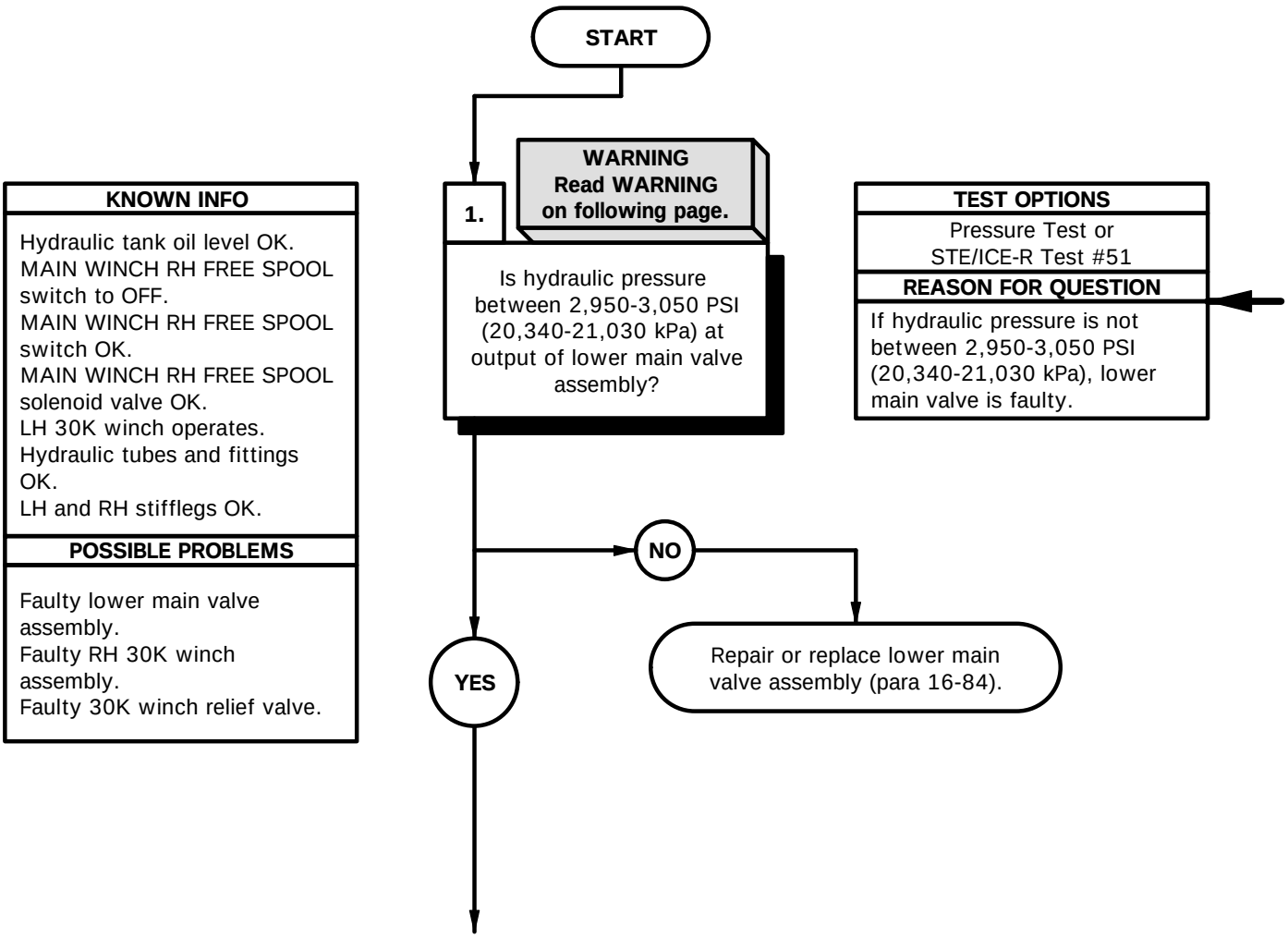
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Control panel assembly covers, removed (TM 9-2320-366-20-5).

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).

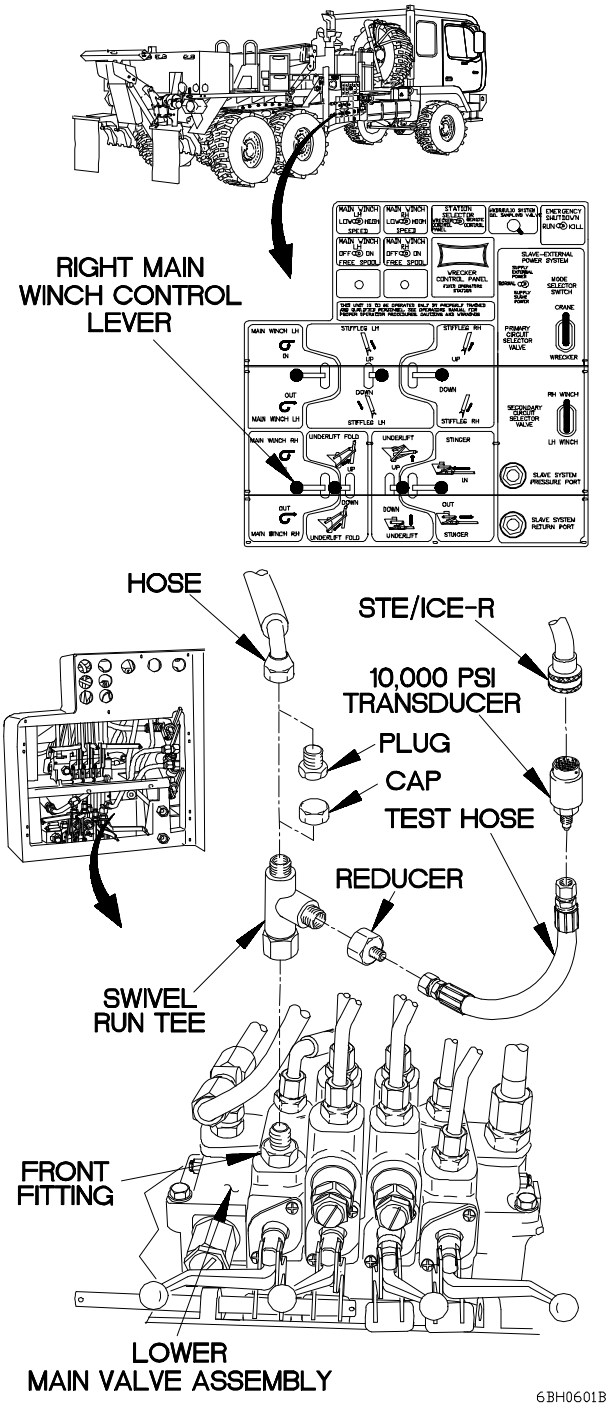
NOTE

In the event of a tachometer failure a HAND THROTTLE lever positioned to L is approximately 1,250-1,450 RPM.

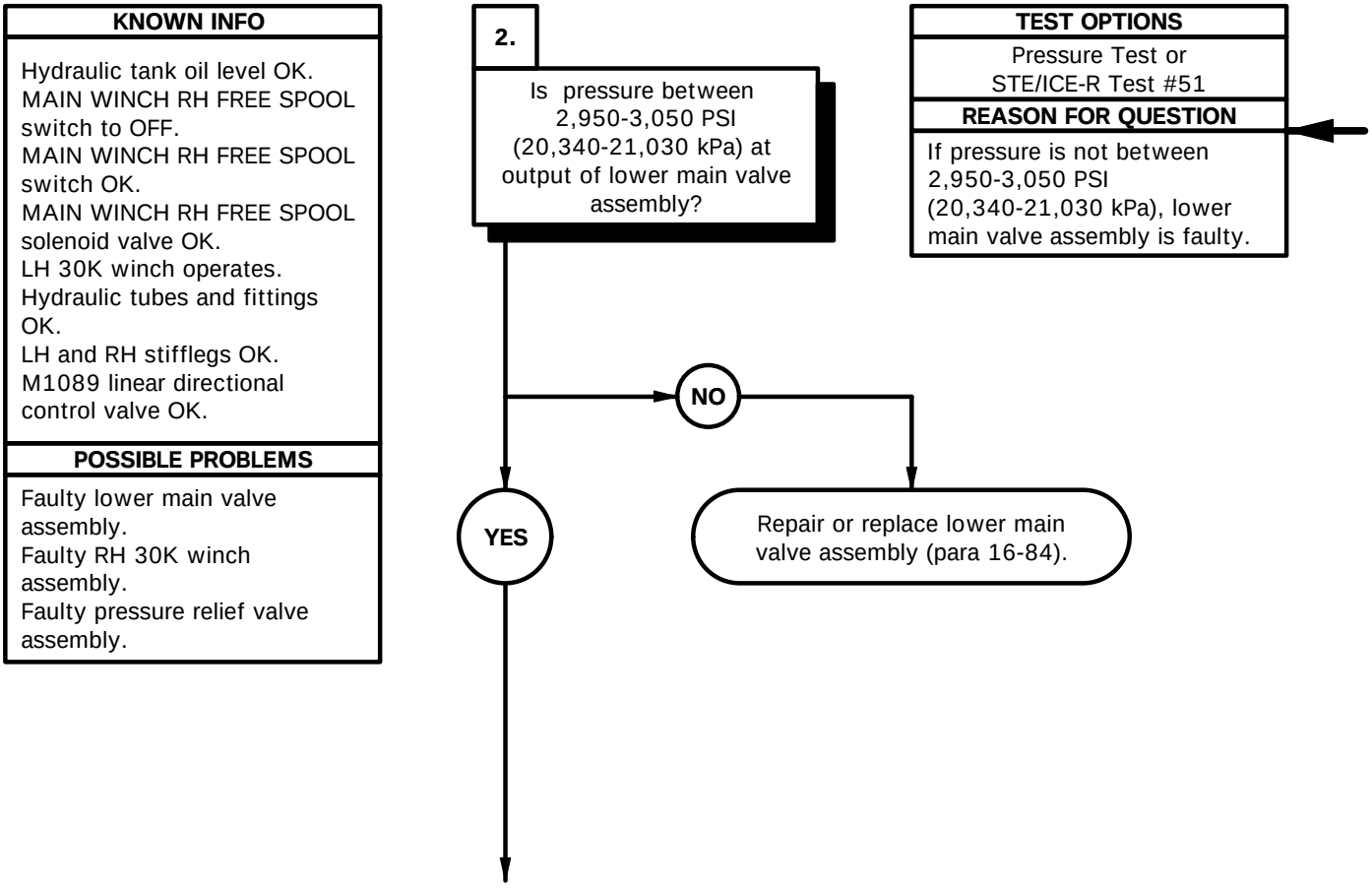
(9) Set engine speed by increasing HAND THROTTLE lever until tachometer reads 1,250-1,450 RPM.
(10) Position STATION SELECTOR switch to WRECKER CONTROL PANEL.
(11) Preform STE/ICE-R test #51 (TM 9-4910-571-12&P).
(12) Position MAIN WINCH RH lever to OUT and note reading.
(13) If pressure is not between 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.



h6. M1089 RH 30K WINCH DOES NOT OPERATE (CONT)



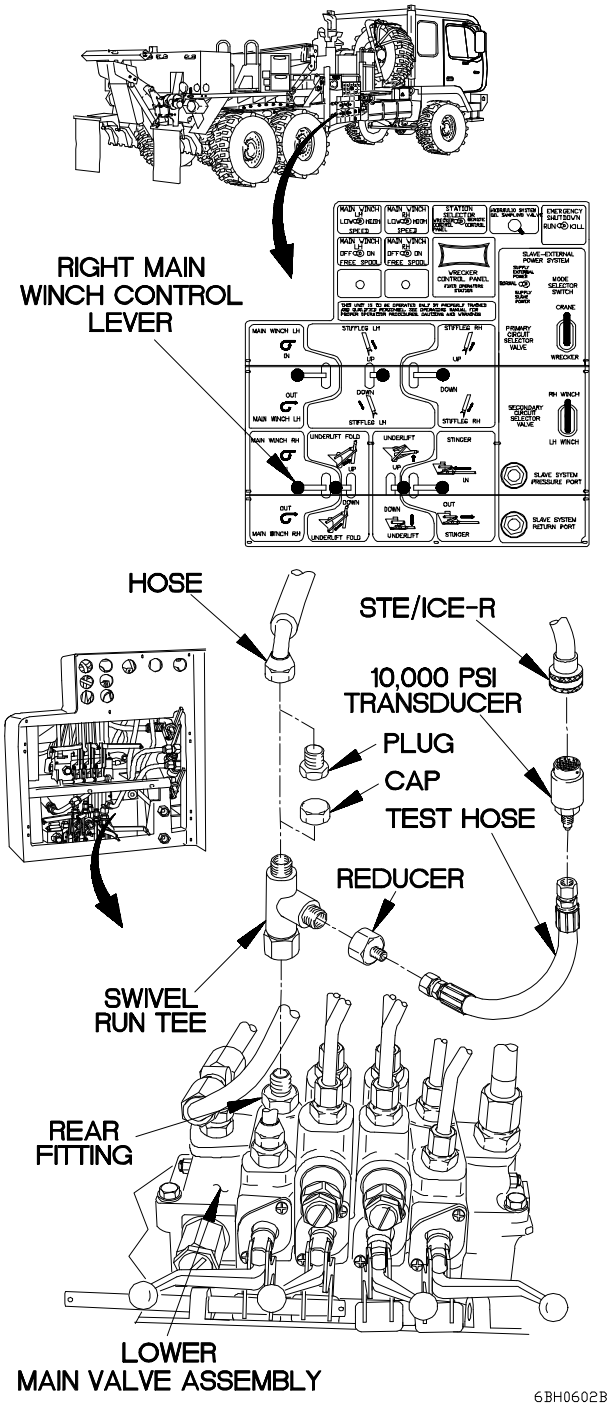
LOWER MAIN VALVE ASSEMBLY PRESSURE TEST

(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).

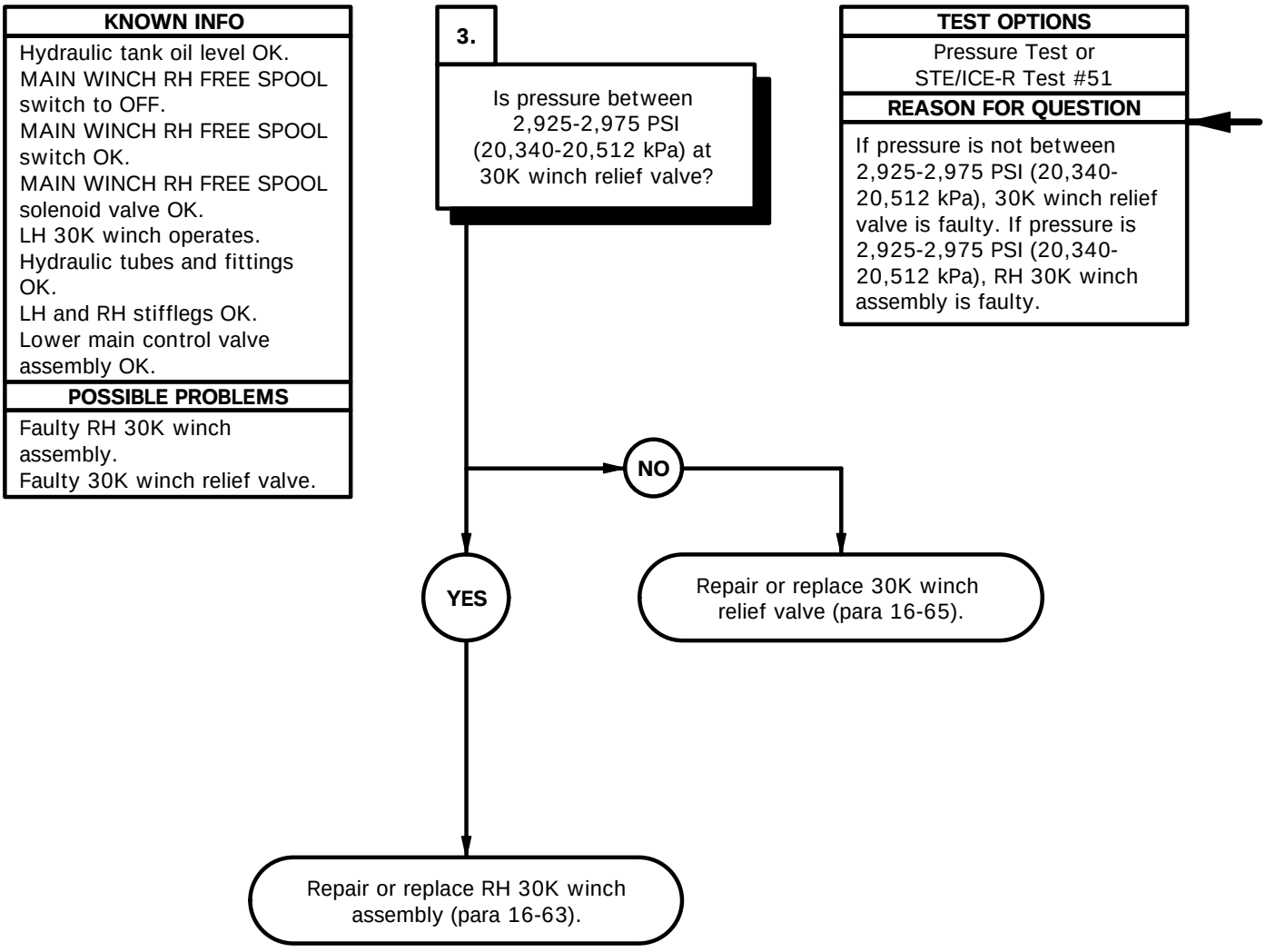
NOTE

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.



h6. M1089 RH 30K WINCH DOES NOT OPERATE (CONT)



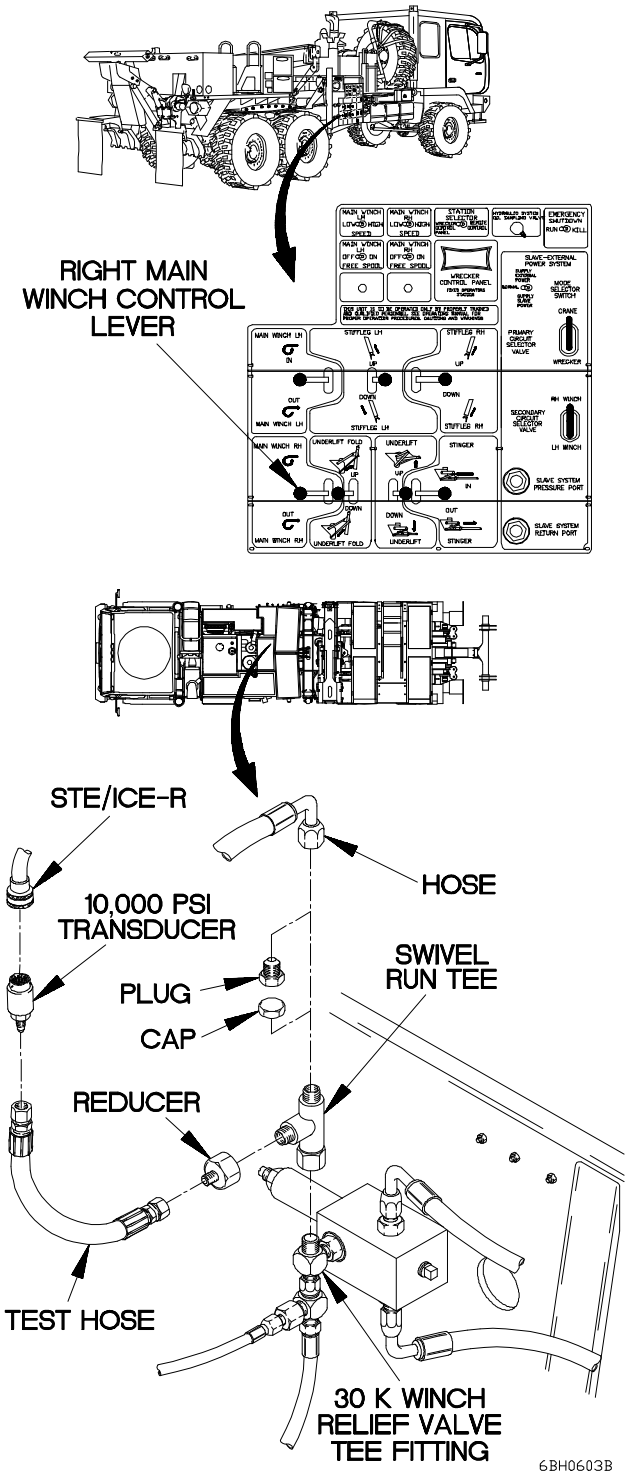
30K WINCH RELIEF VALVE PRESSURE TEST

(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.



h7. M1089 LH 30K WINCH DOES NOT OPERATE

INITIAL SETUP

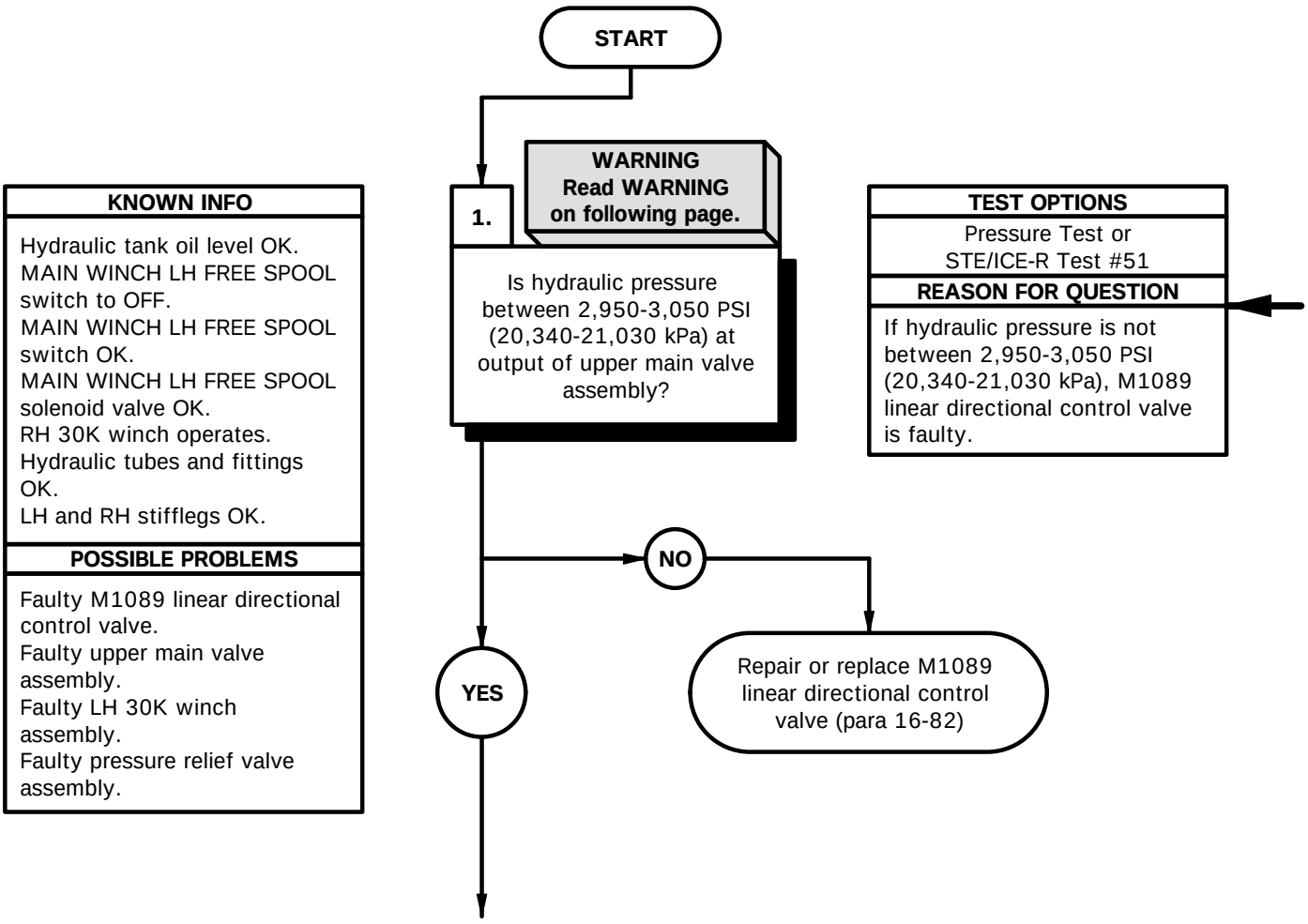
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Control panel assembly covers, removed (TM 9-2320-366-20-5).

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)



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).

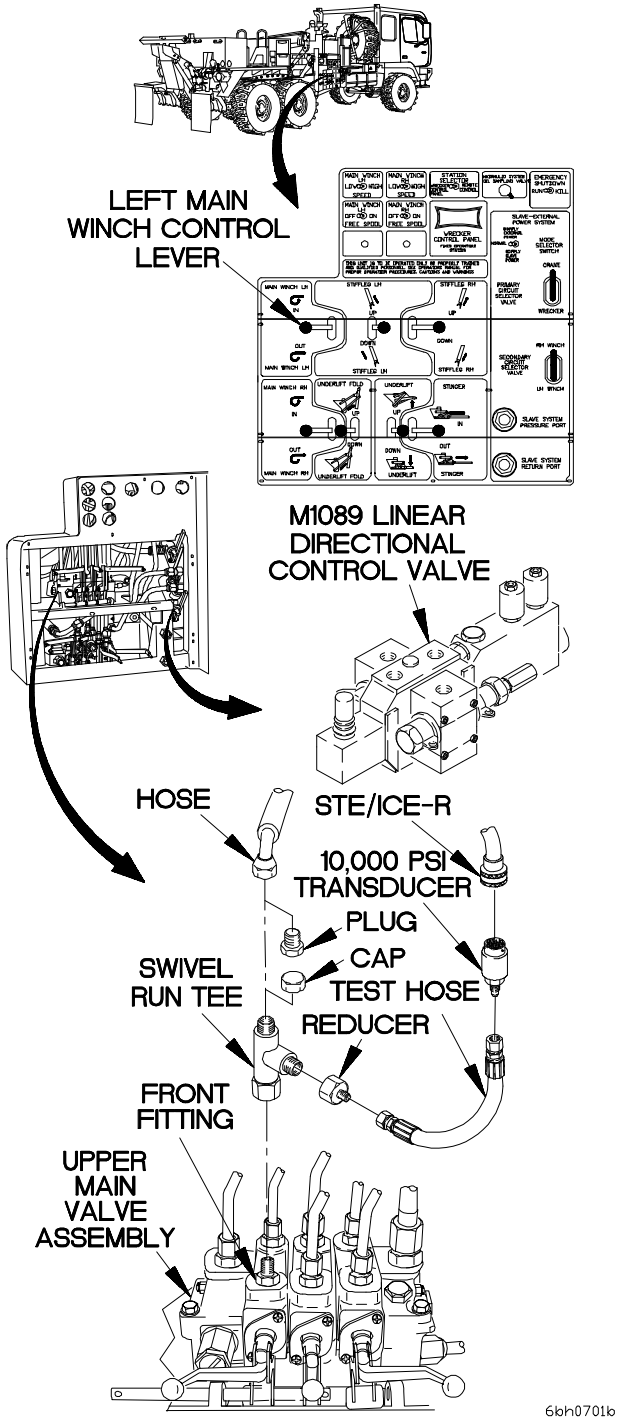
NOTE

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) Preform 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.



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.

2.

Is pressure between 2,950-3,050 PSI (20,340-21,030 kPa) at output of upper main 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.

NO

Repair or replace upper main valve assembly (para 16-83).

YES

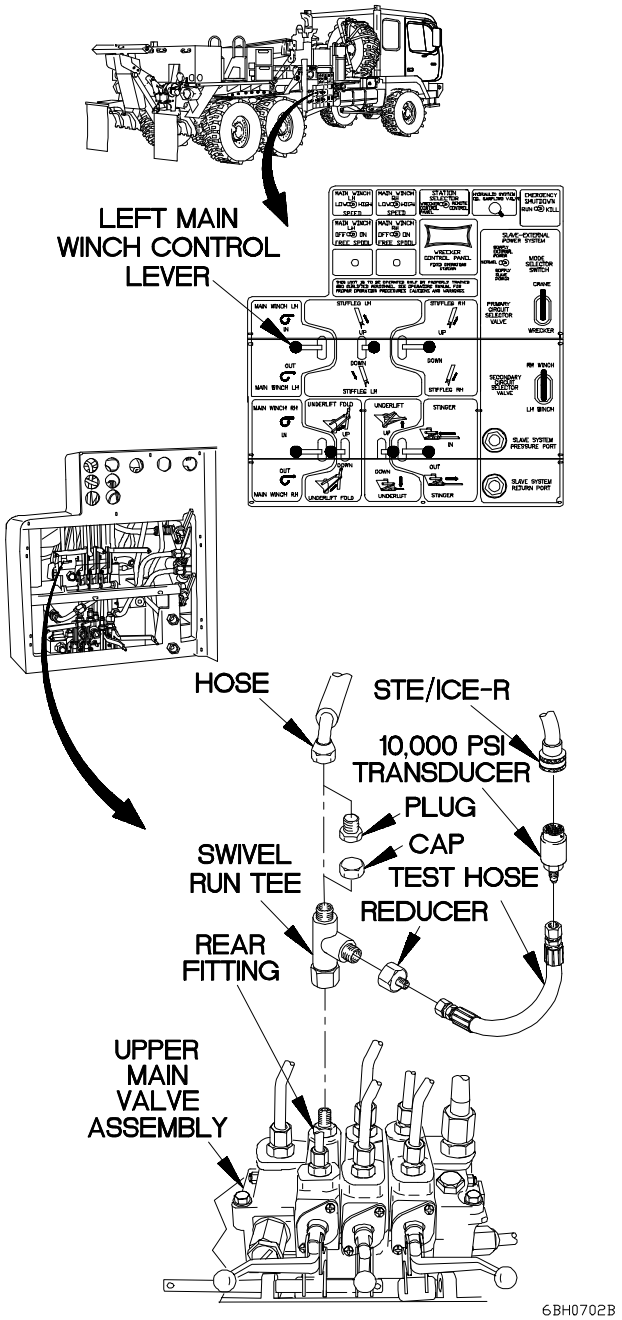
UPPER MAIN VALVE ASSEMBLY PRESSURE TEST

(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).

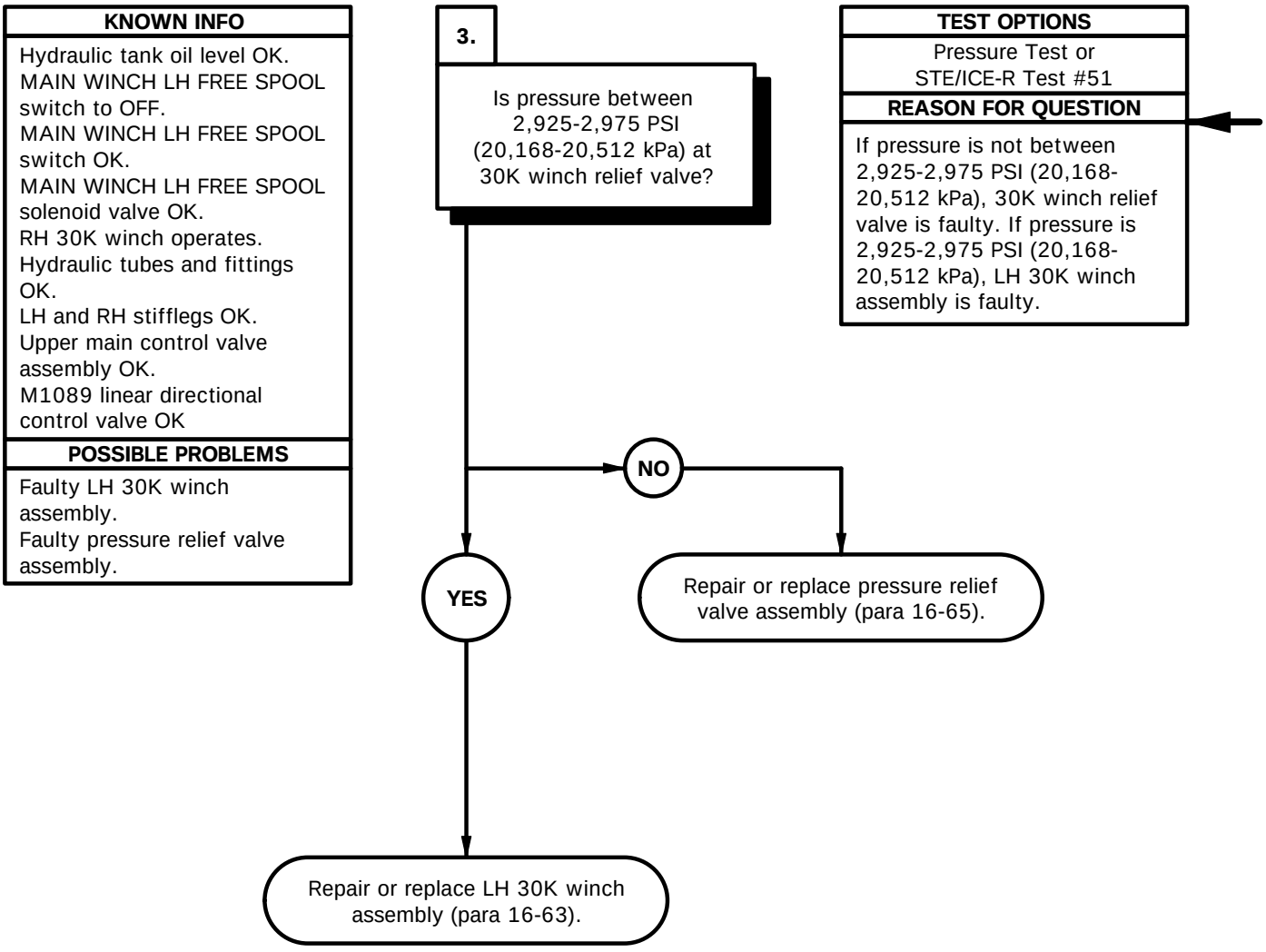
NOTE

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.



h7. M1089 LH 30K WINCH DOES NOT OPERATE (CONT)



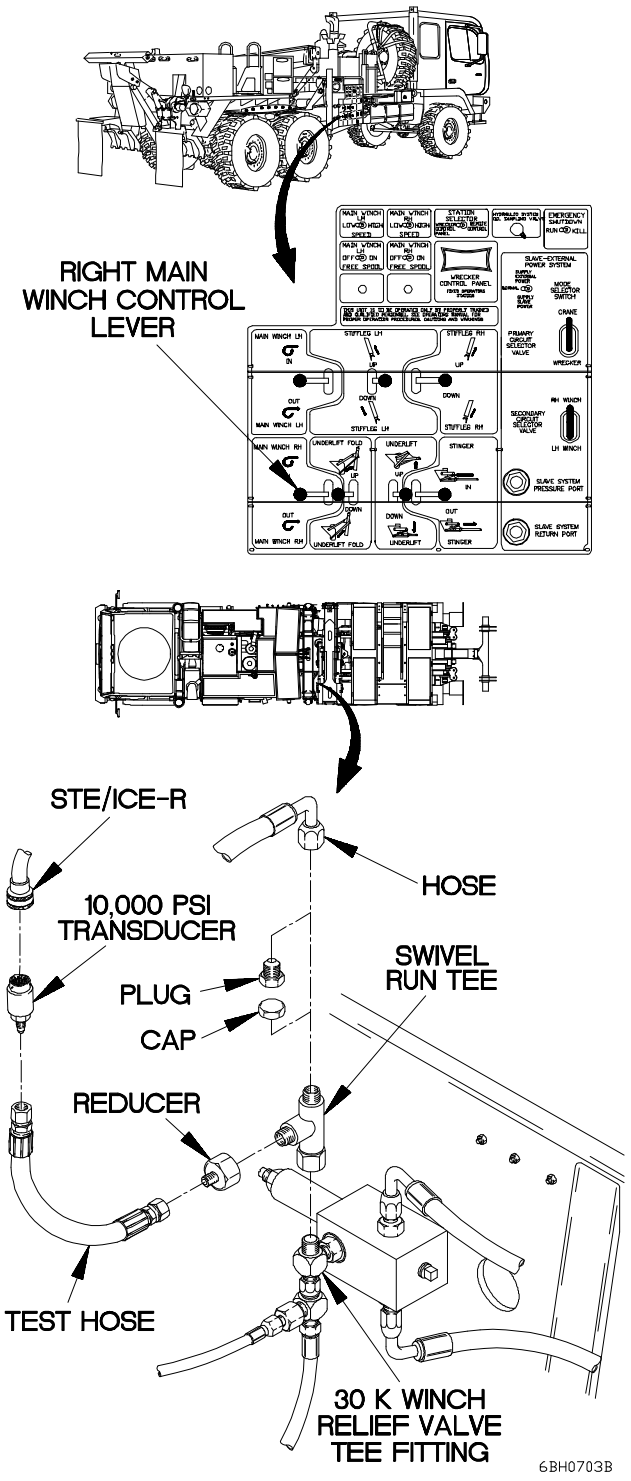
30K WINCH RELIEF VALVE PRESSURE TEST

(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.



h8. PAY-OUT HYDRAULIC MOTOR DOES NOT WORK

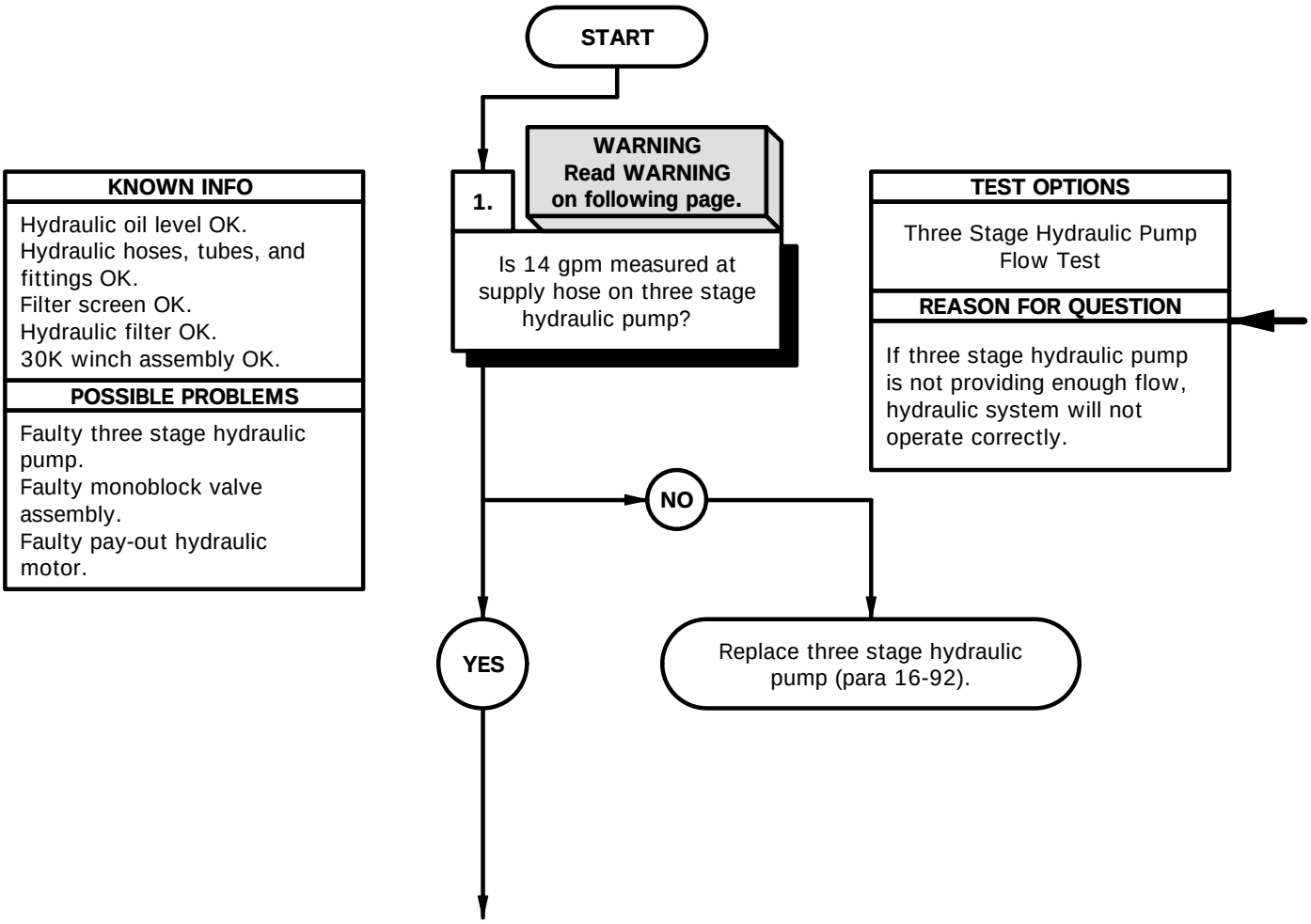
INITIAL SETUP

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

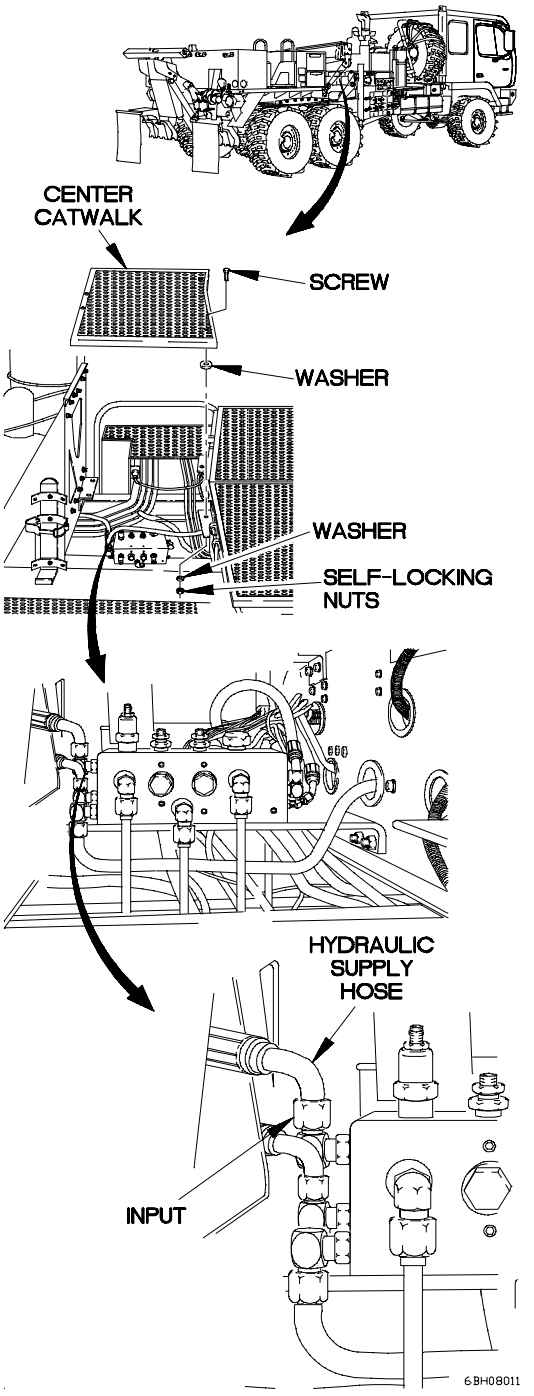
- **Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.**
- **Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical 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

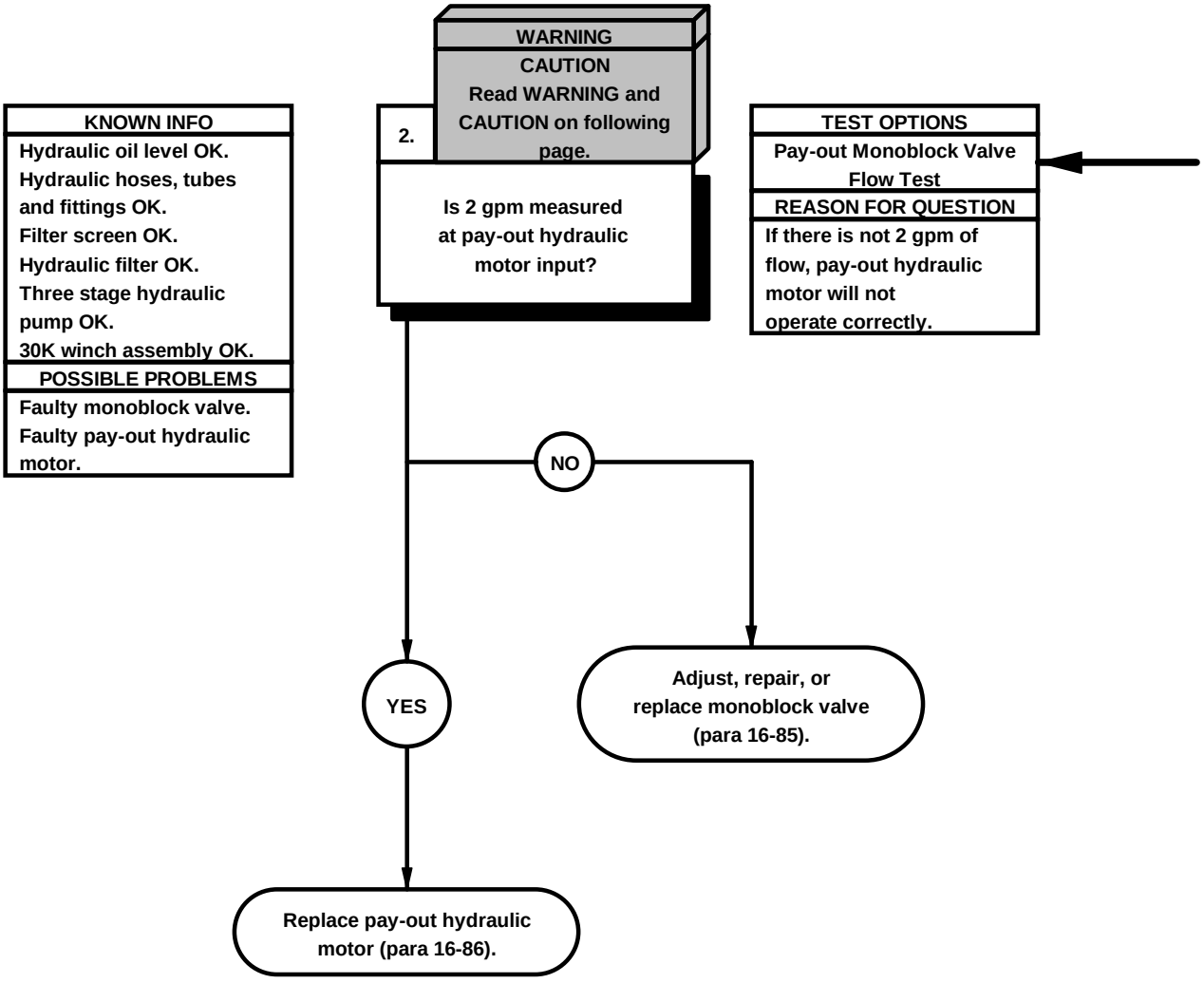
Tag hydraulic hoses, tubes and fittings prior to disconnecting.

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.



h8. M1089 PAY-OUT HYDRAULIC MOTOR DOES NOT WORK (CONT)



WARNING

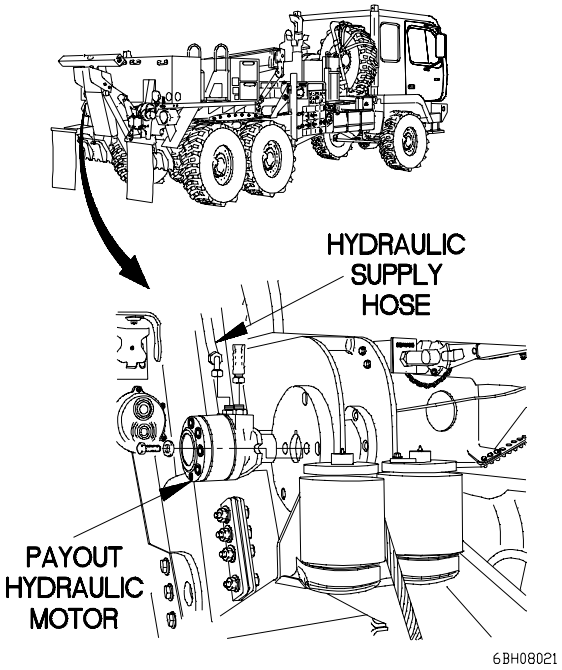
- **Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.**
- **Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical 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.

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

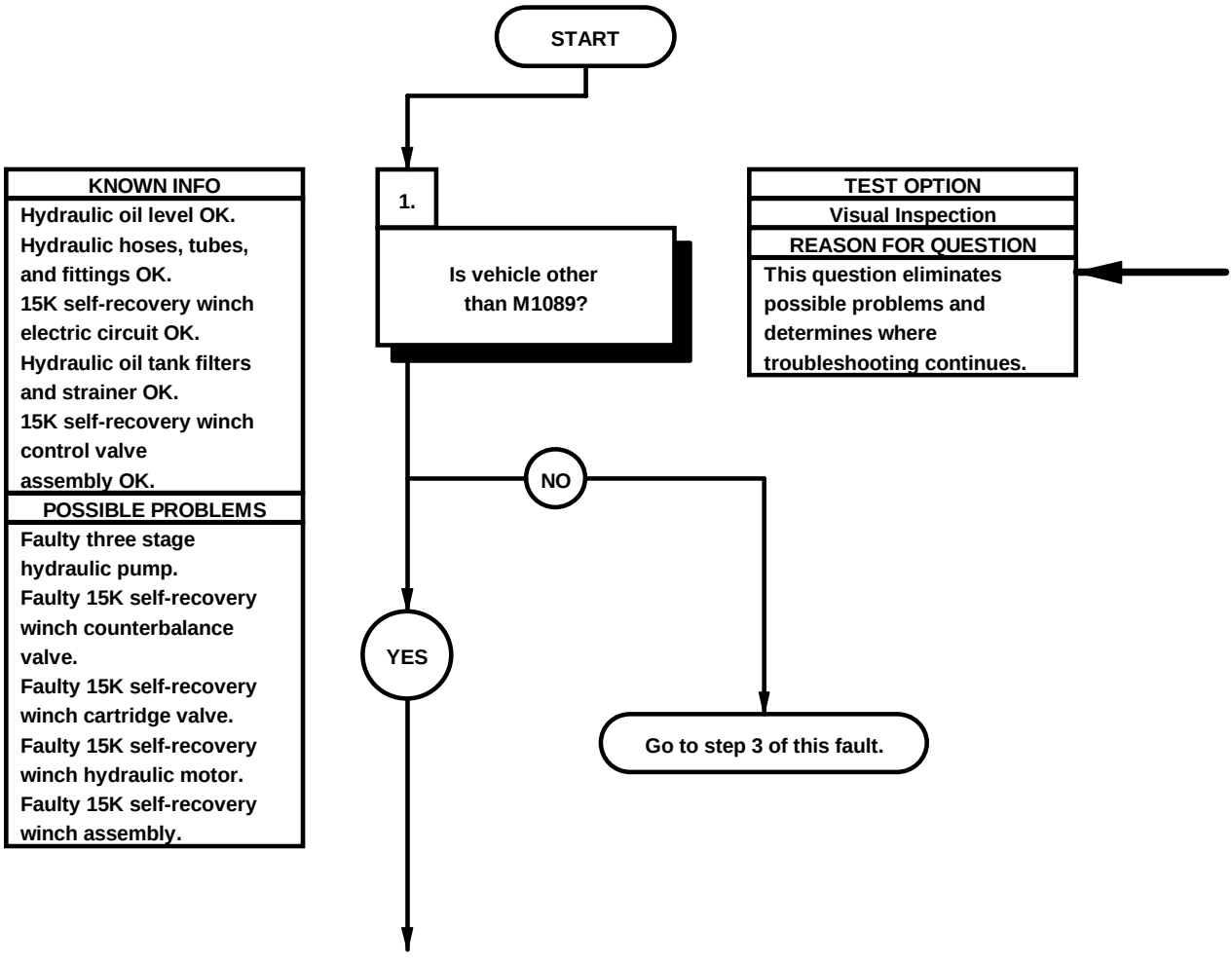
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).

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)

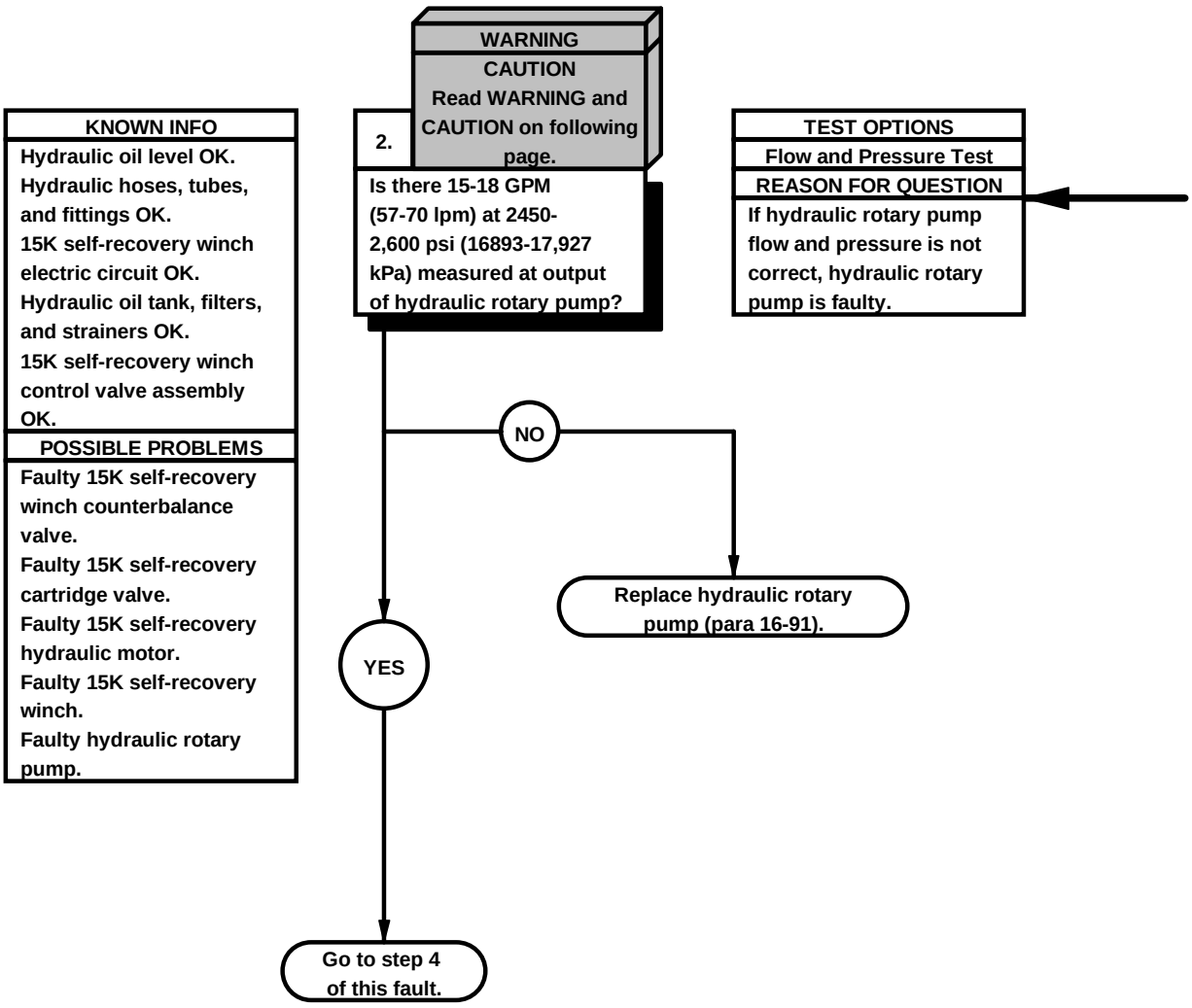


VISUAL

(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

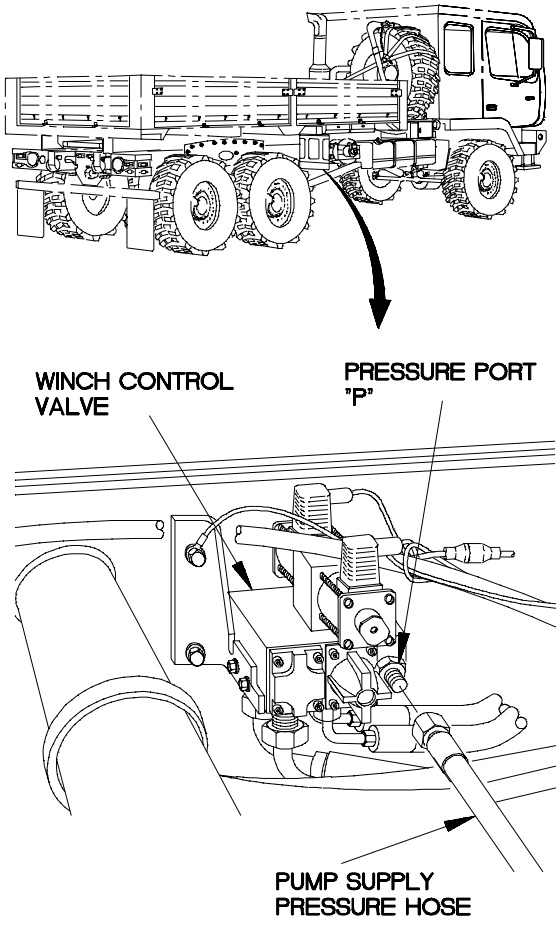
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

CAUTION

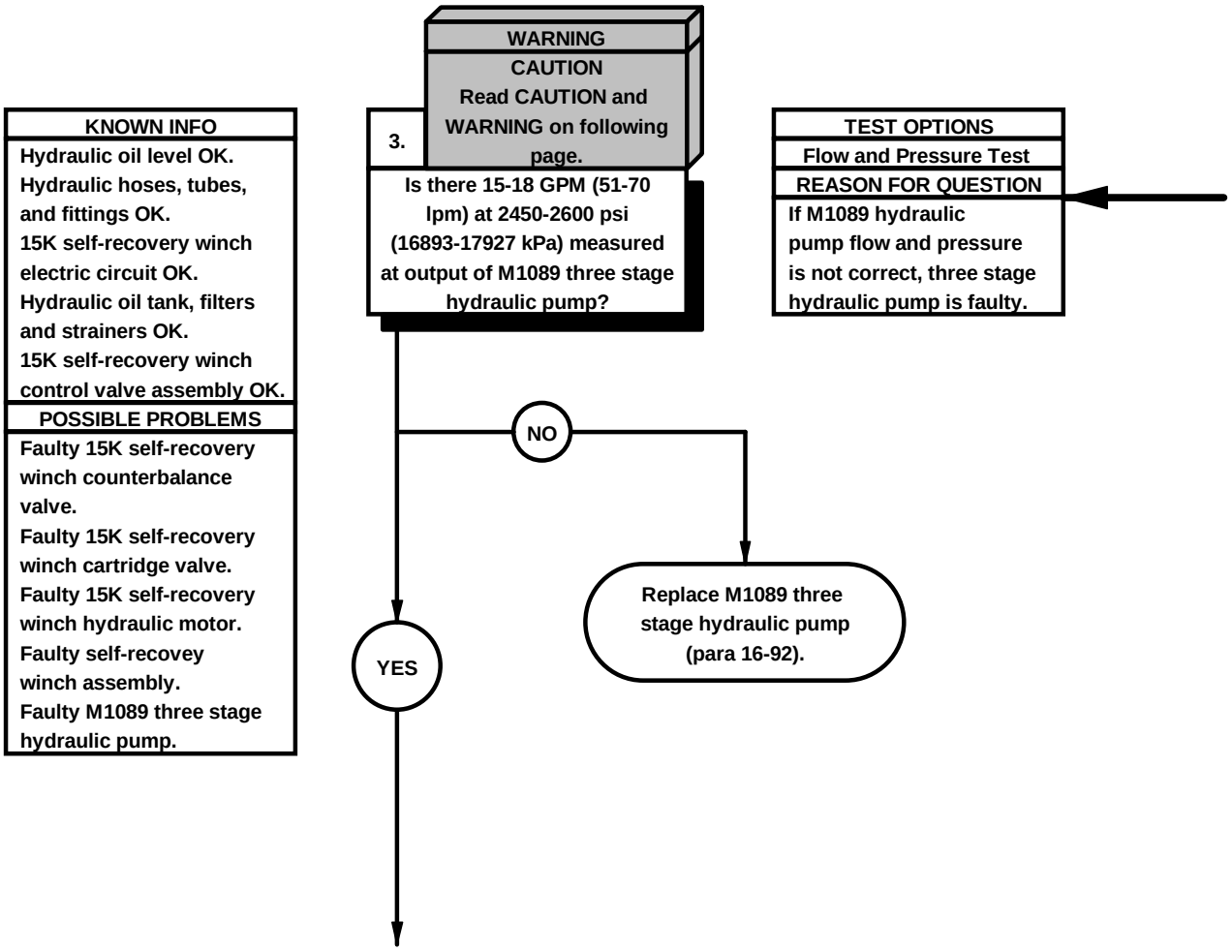
Maintain engine rpm at 1,250-1,450 rpm while performing pressure and flow tests. Failure to comply may result in damage to equipment.

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.



i1. 15K SELF-RECOVERY WINCH DOES NOT WORK (CONT)



WARNING

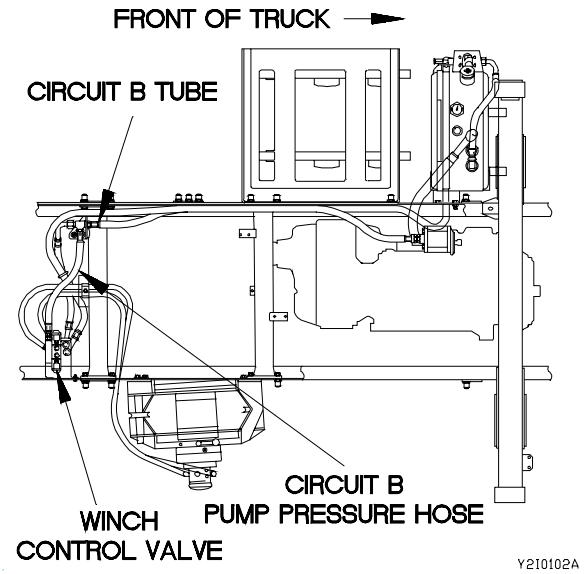
Wear appropriate eye protection when working under vehicle due to the possibity of falling debris. Failure to comply may result in injury to personnel.

CAUTION

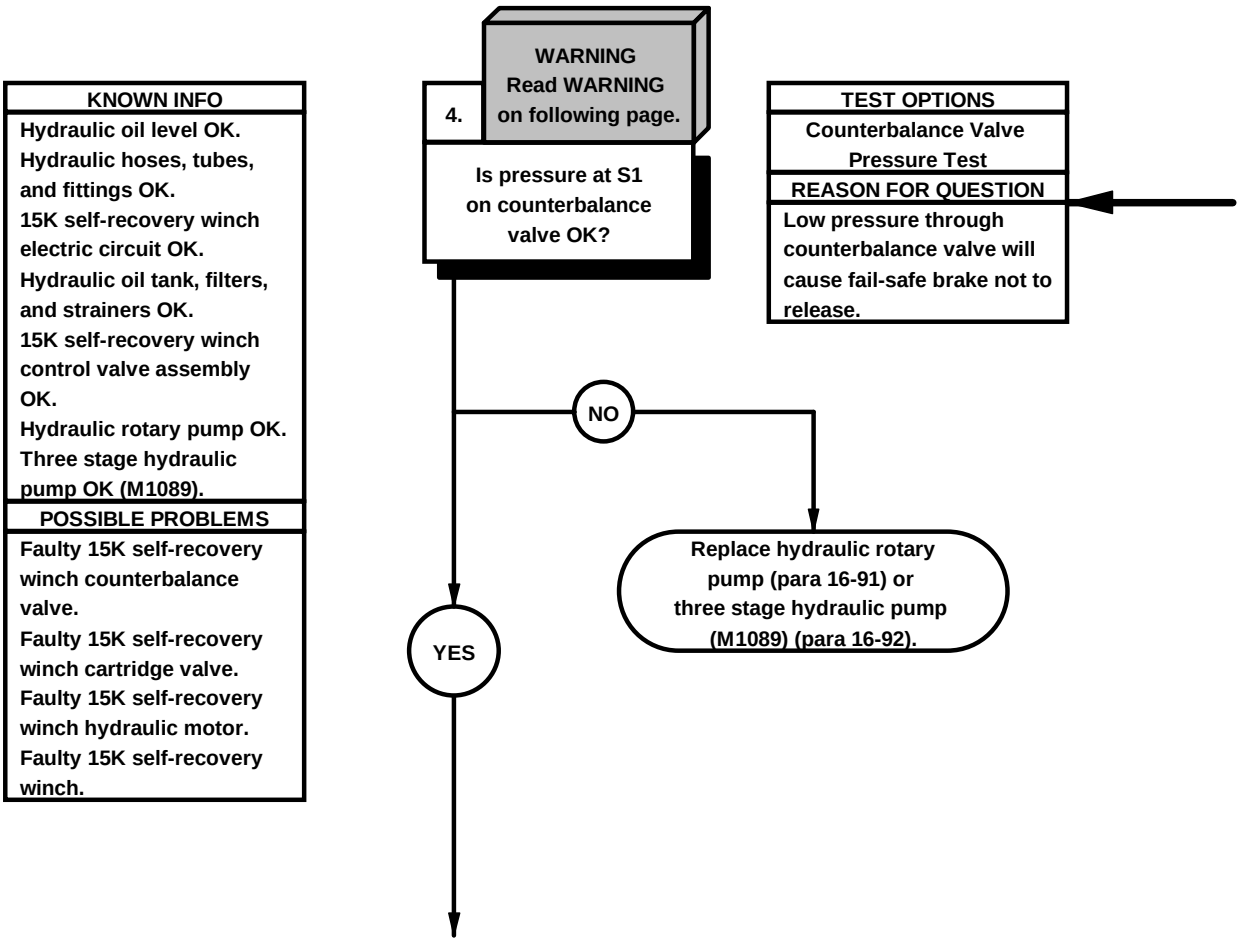
Maintain engine rpm at 1,250-1,450 rpm while perfoming pressure and flow test. Failure to comply may result in damage to equipment.

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.



i1. 15K SELF-RECOVERY WINCH DOES NOT WORK (CONT)



WARNING

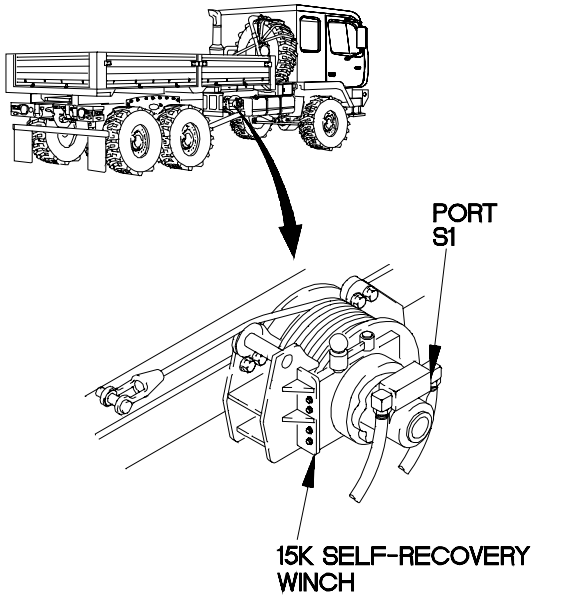
- Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.
- Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention 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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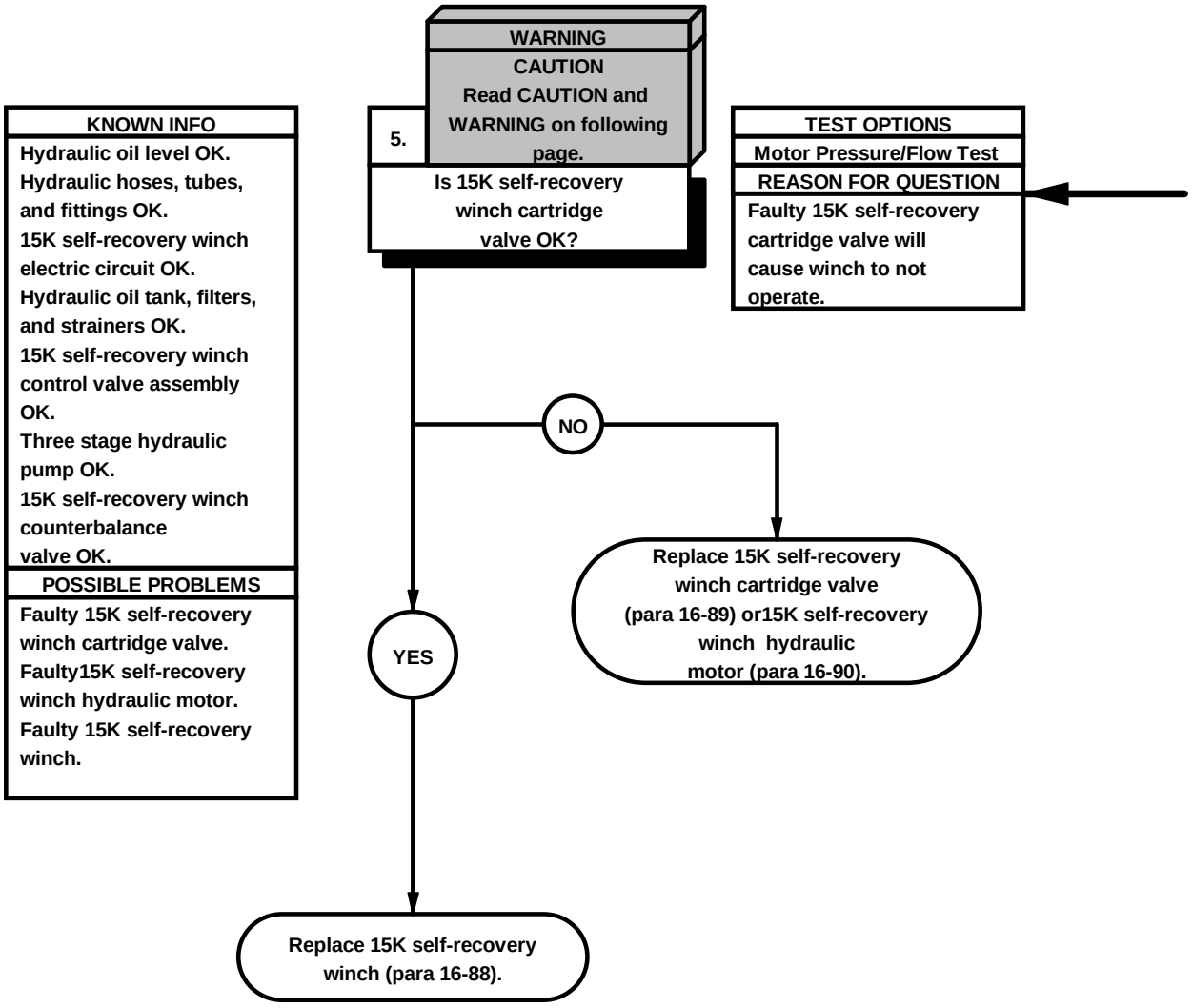
i1. 15K SELF-RECOVERY WINCH DOES NOT WORK (CONT)



WARNING

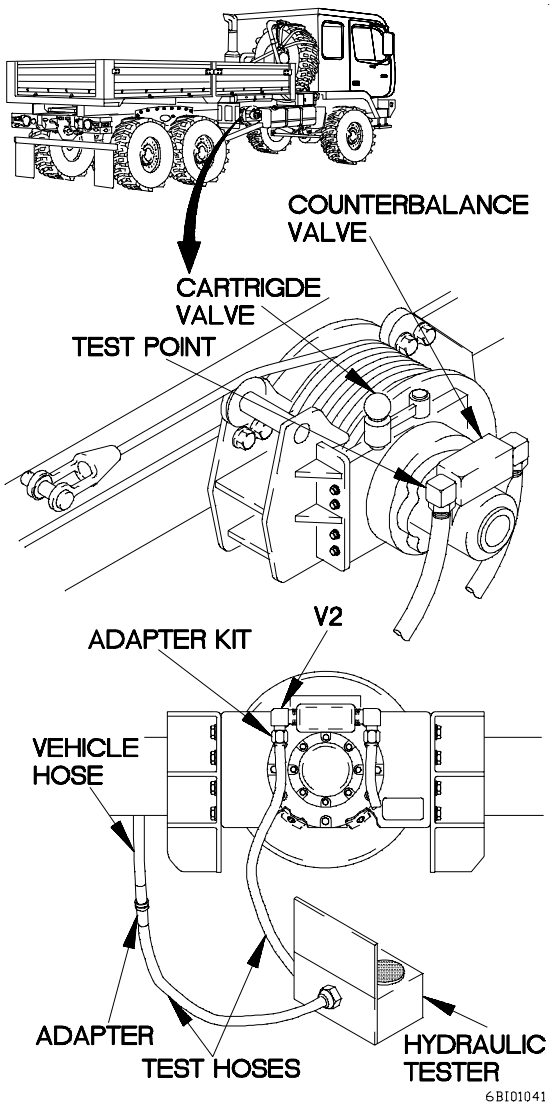
Wear appropriate eye protection when working under vehicle due to the possibity of falling debris. Failure to comply may result in injury to personnel.

CAUTION

Maintain engine rpm at 1,250-1,450 rpm while perfoming 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.



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

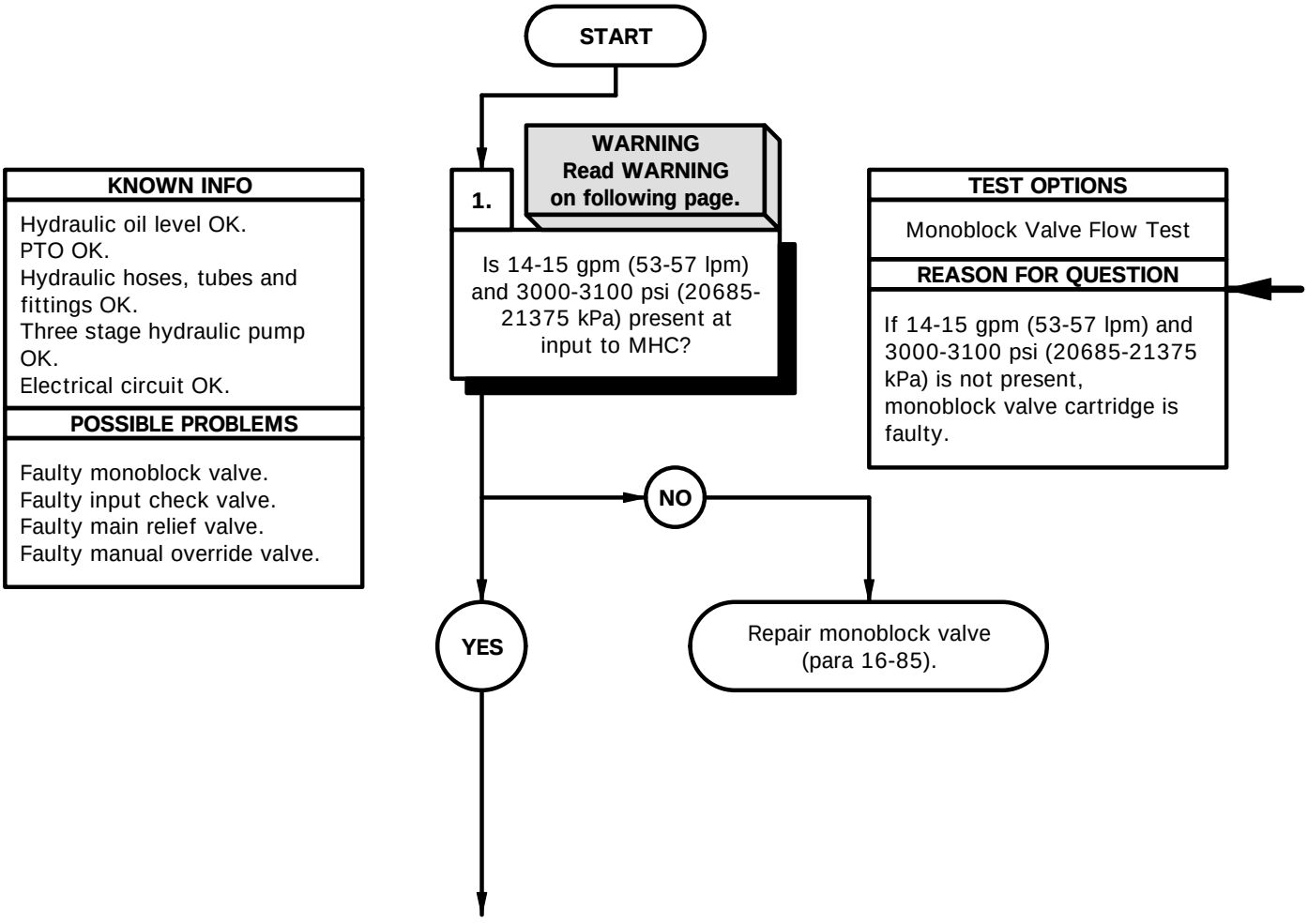
INITIAL SETUP

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.

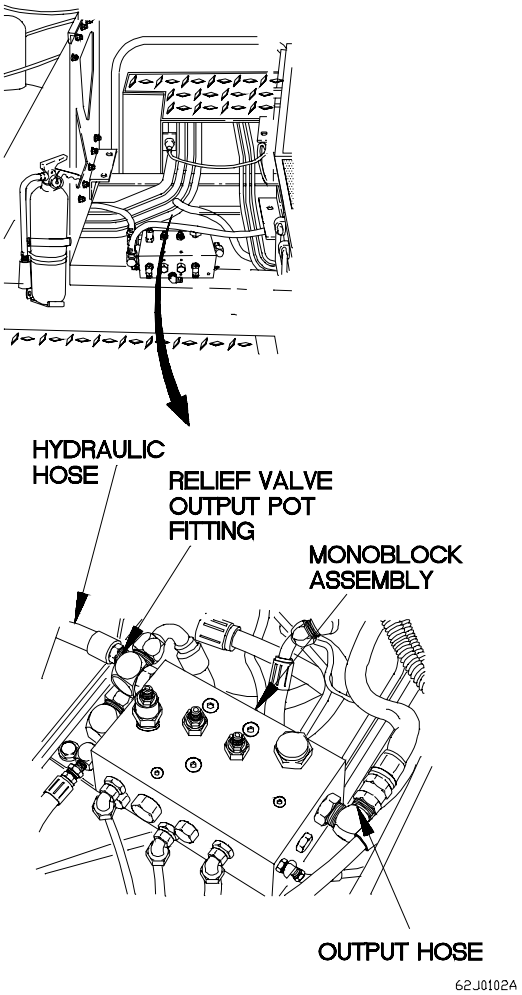
MONOBLOCK VALVE FLOW TEST

(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).

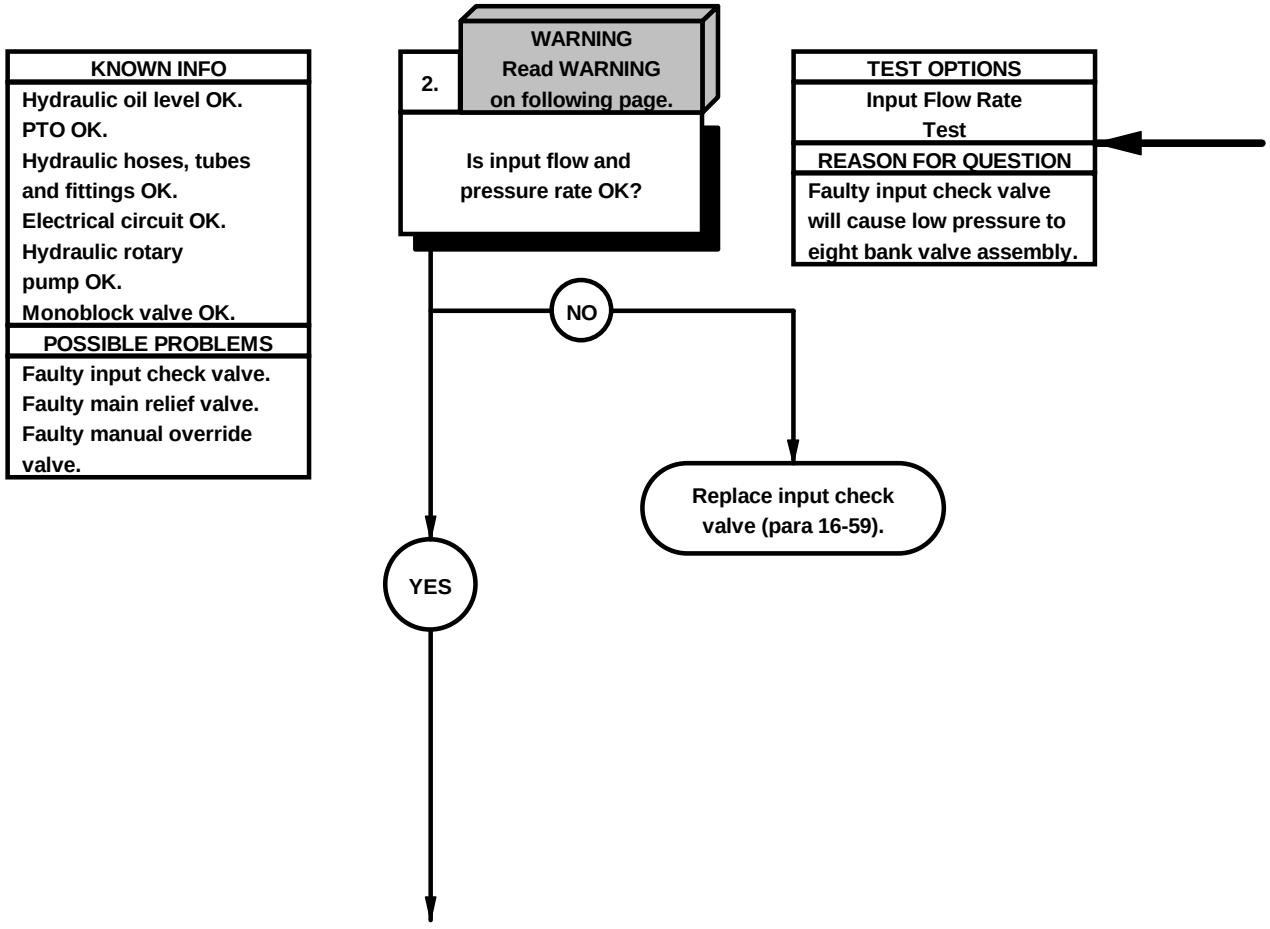
NOTE

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.



j1. M1089 MATERIAL HANDLING CRANE (MHC) DOES NOT OPERATE (CONT)



WARNING

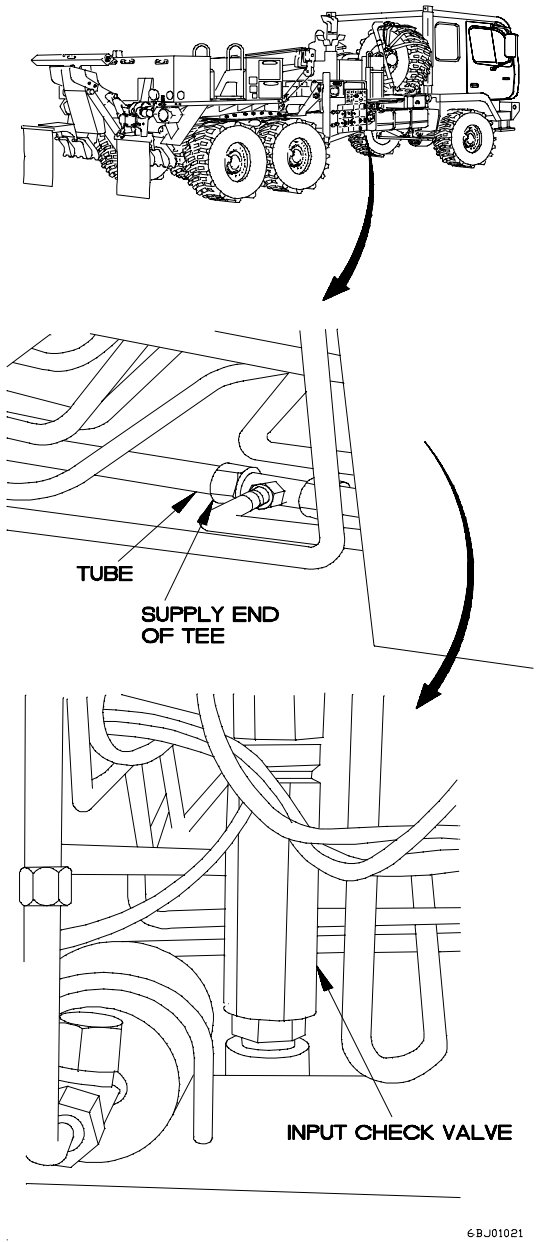
- **Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.**
- **Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical 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

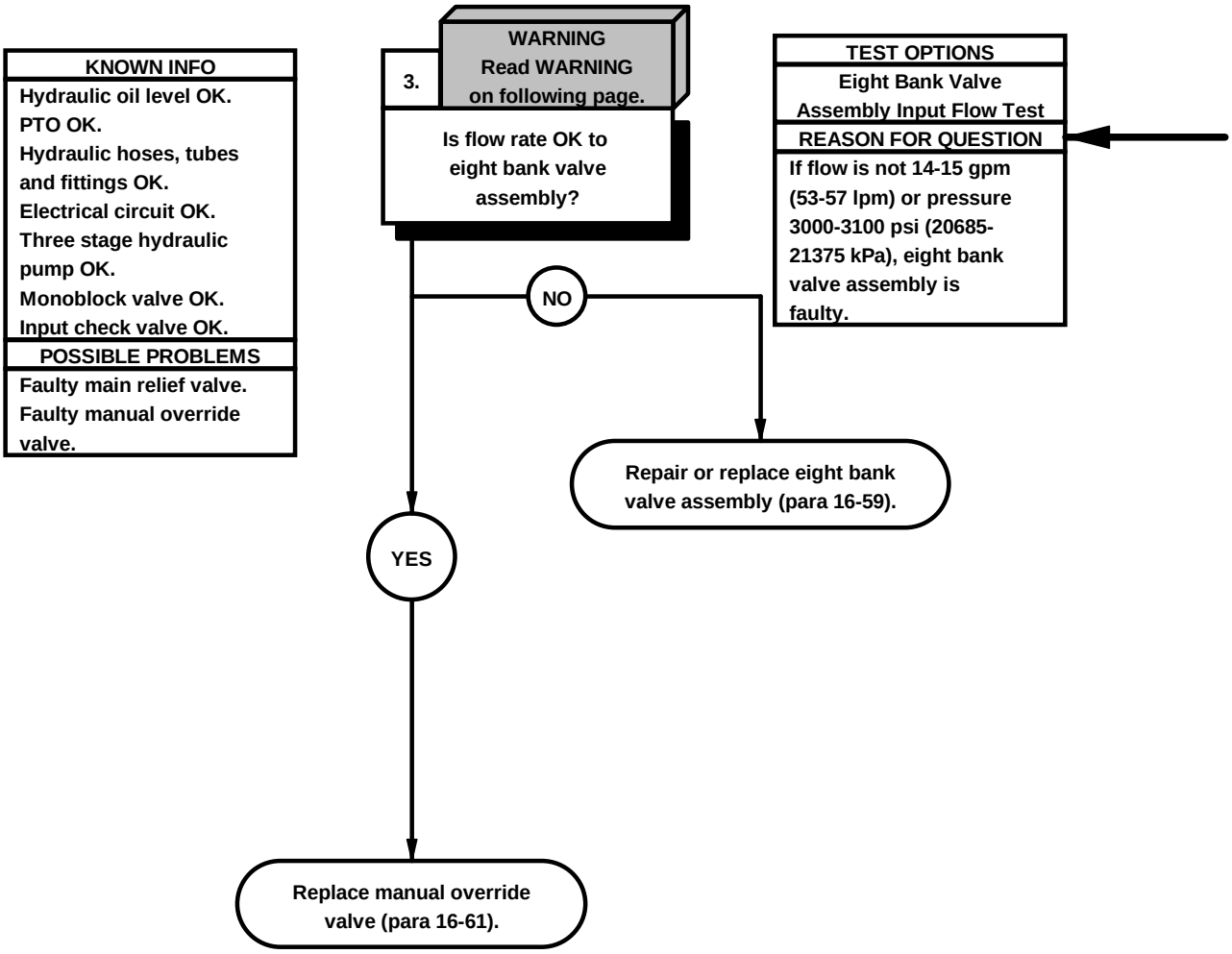
Tag hydraulic hoses, tubes, and fittings prior to removall.

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.



j1. M1089 MATERIAL HANDLING CRANE (MHC) DOES NOT OPERATE (CONT)



WARNING

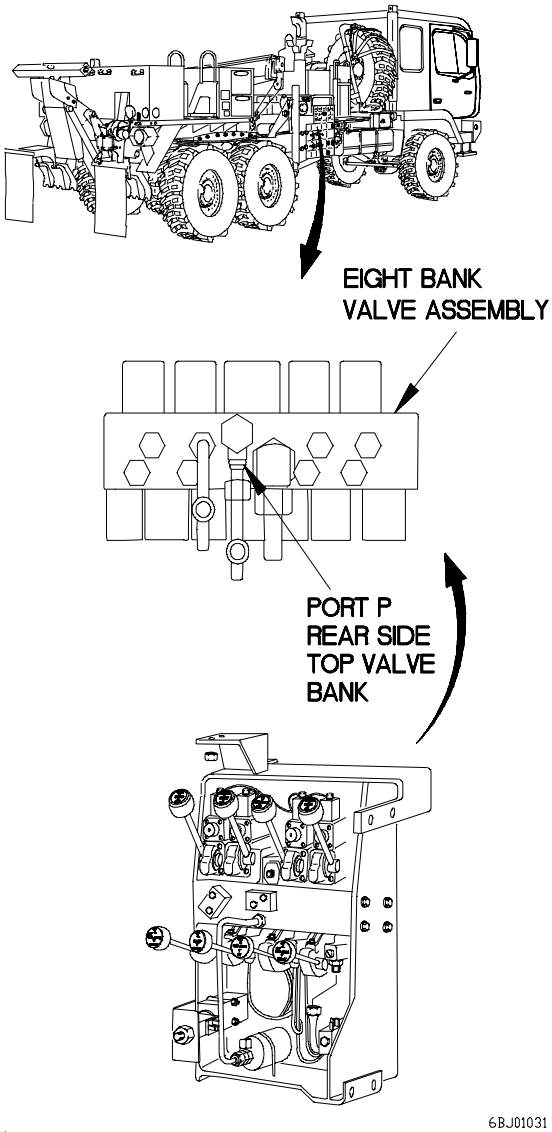
- **Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.**
- **Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical 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 removall.

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).



j2. M1089 MATERIAL HANDLING CRANE (MHC) LEFT OR RIGHT OUTRIGGER DRIFTS OR DOES NOT WORK

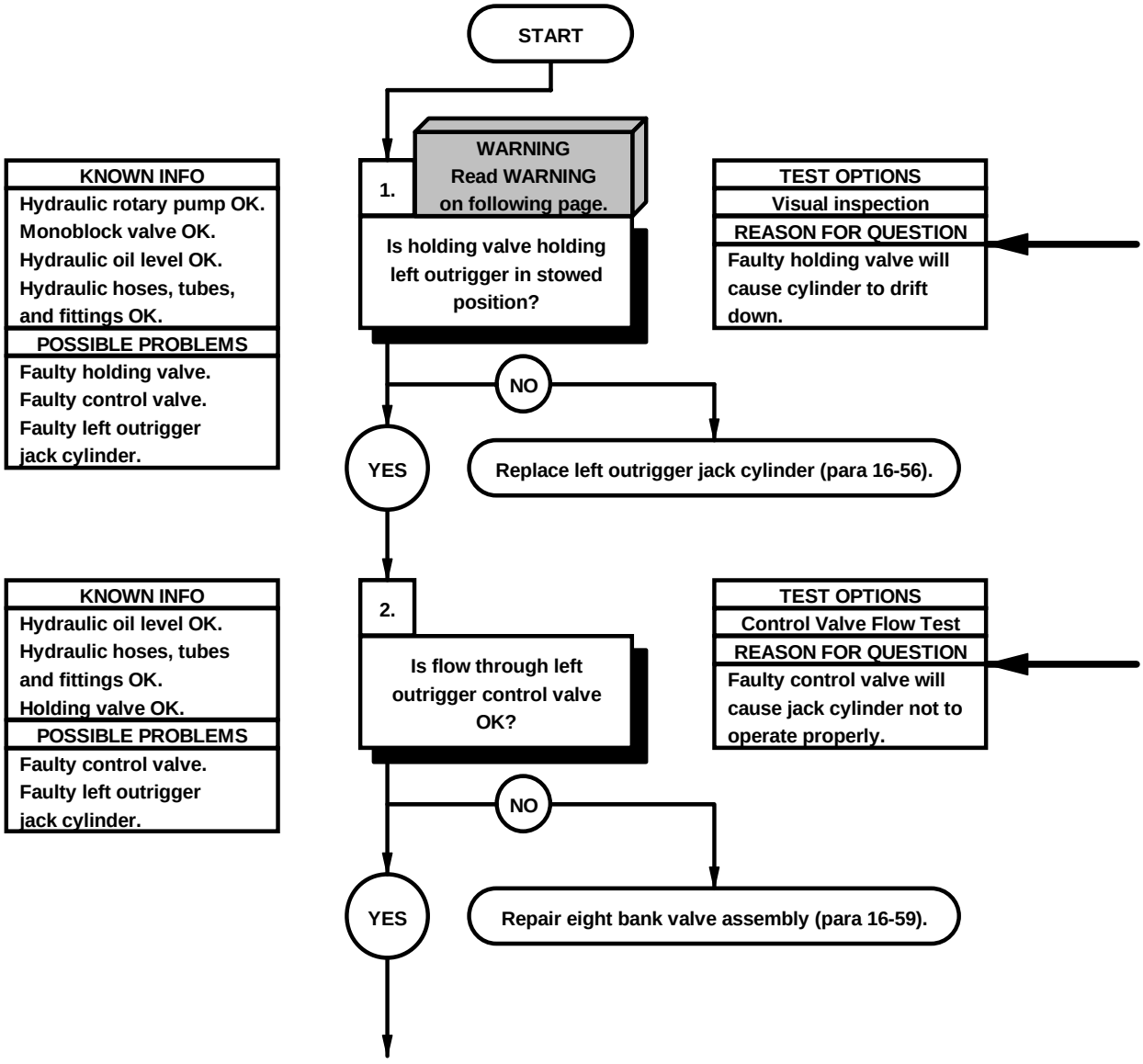
INITIAL SETUP

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

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 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.**

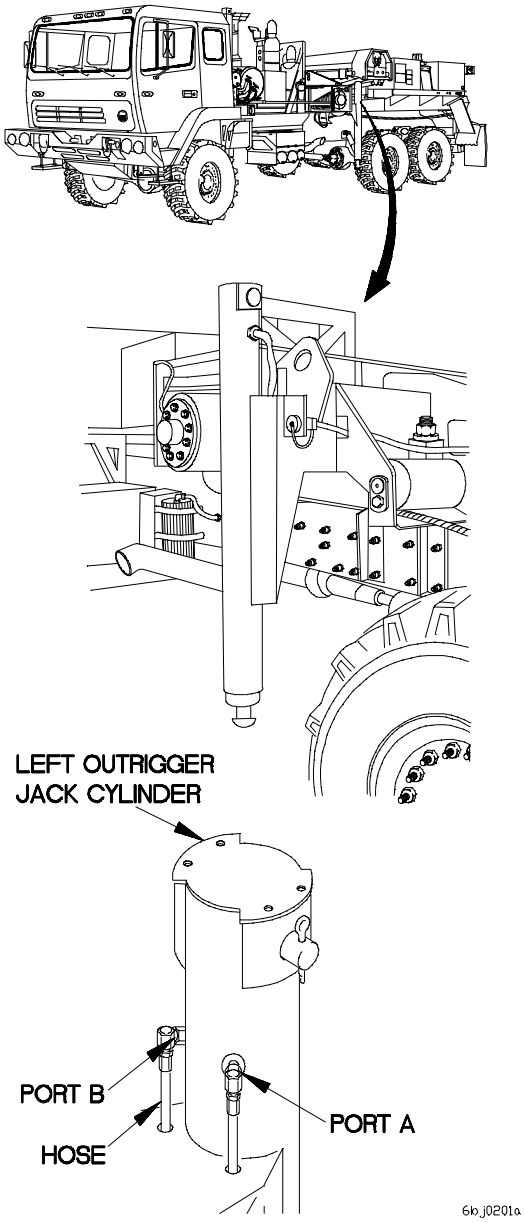
NOTE

Left and right outriggers are tested the same way.
Left outrigger is shown.

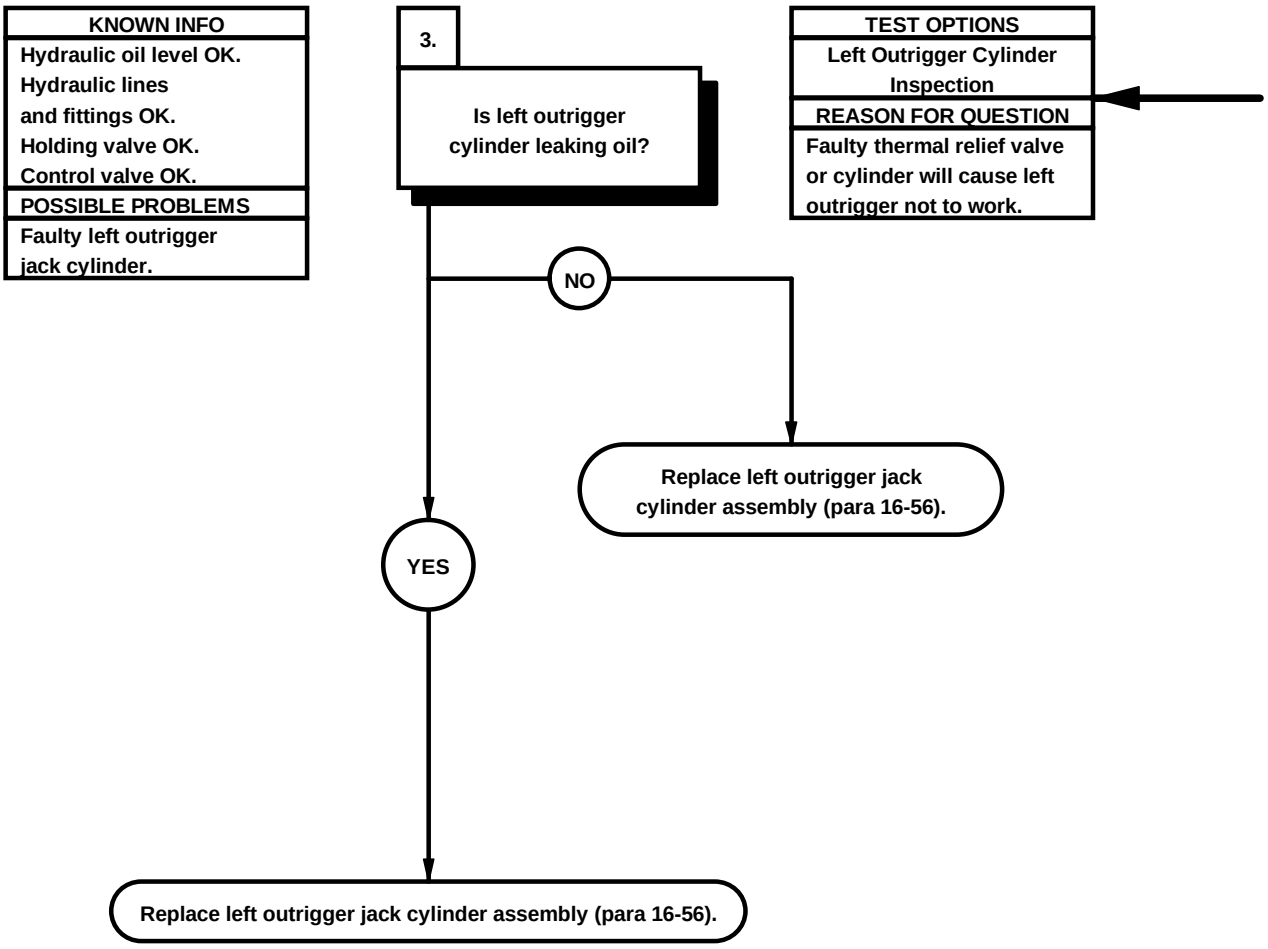
Check position of left outrigger to verify that it is held in the stowed position. If left outrigger will not remain stowed over a period of time, holding valve is faulty.

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.

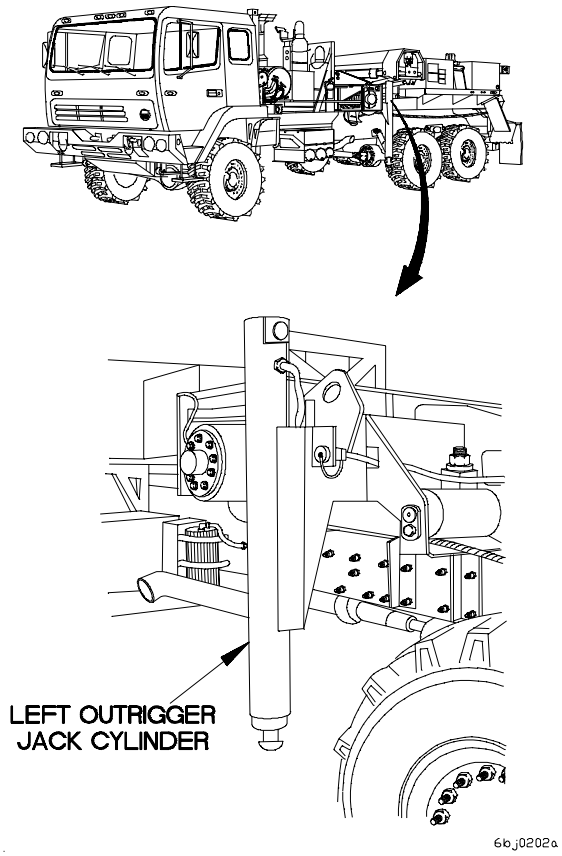


j2. M1089 MATERIAL HANDLING CRANE (MHC) LEFT OR RIGHT OUTRIGGER DRIFTS OR DOES NOT WORK (CONT)



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.



j3. M1089 MATERIAL HANDLING CRANE (MHC) MAST DOES NOT ERECT OR STOW

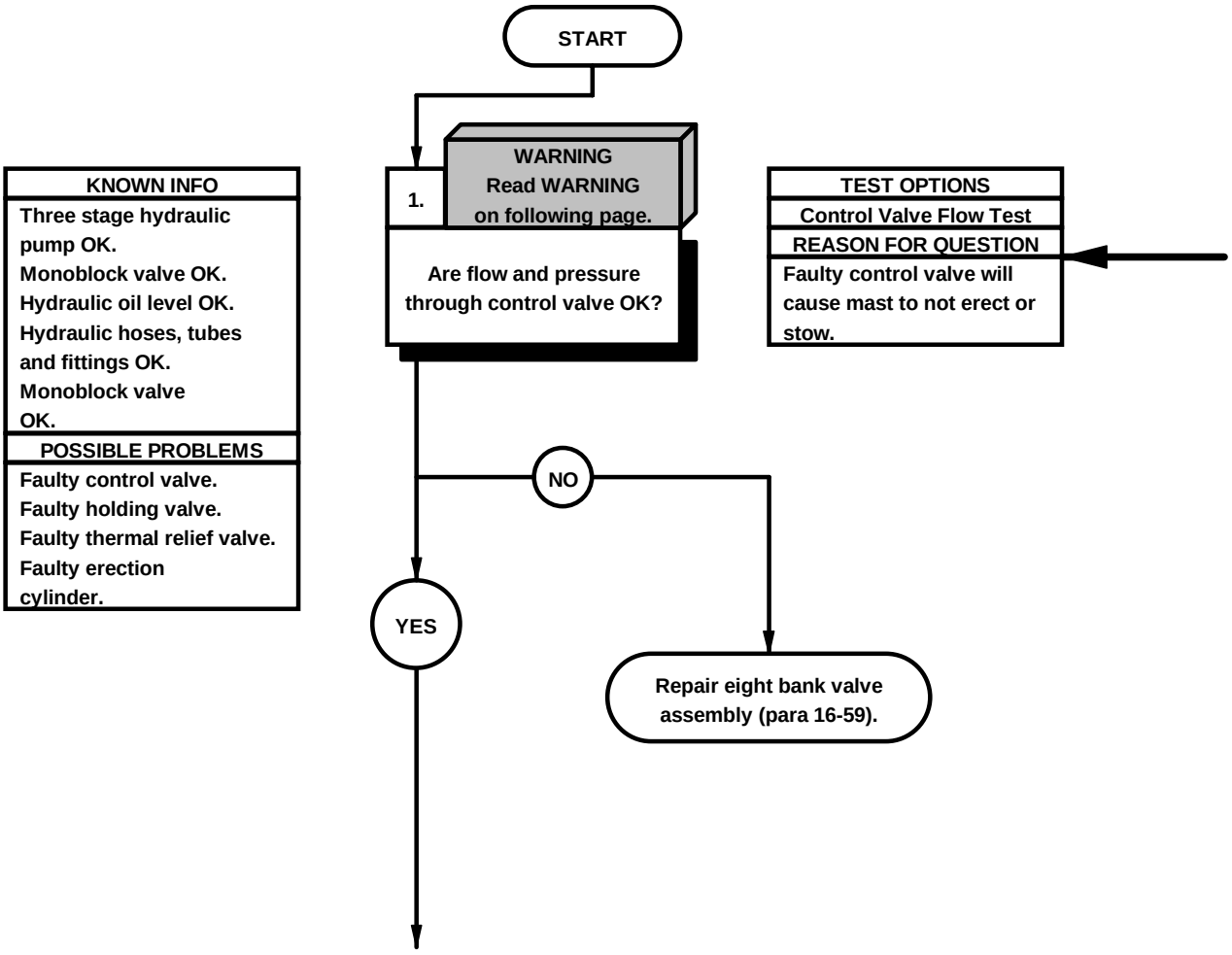
INITIAL SETUP

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

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)

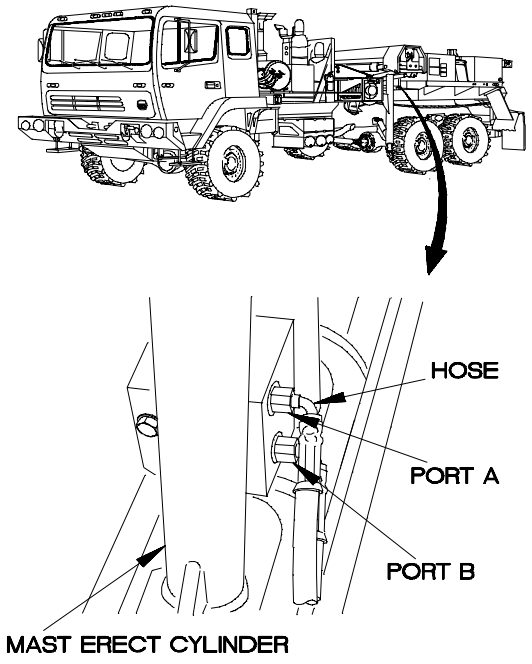


WARNING

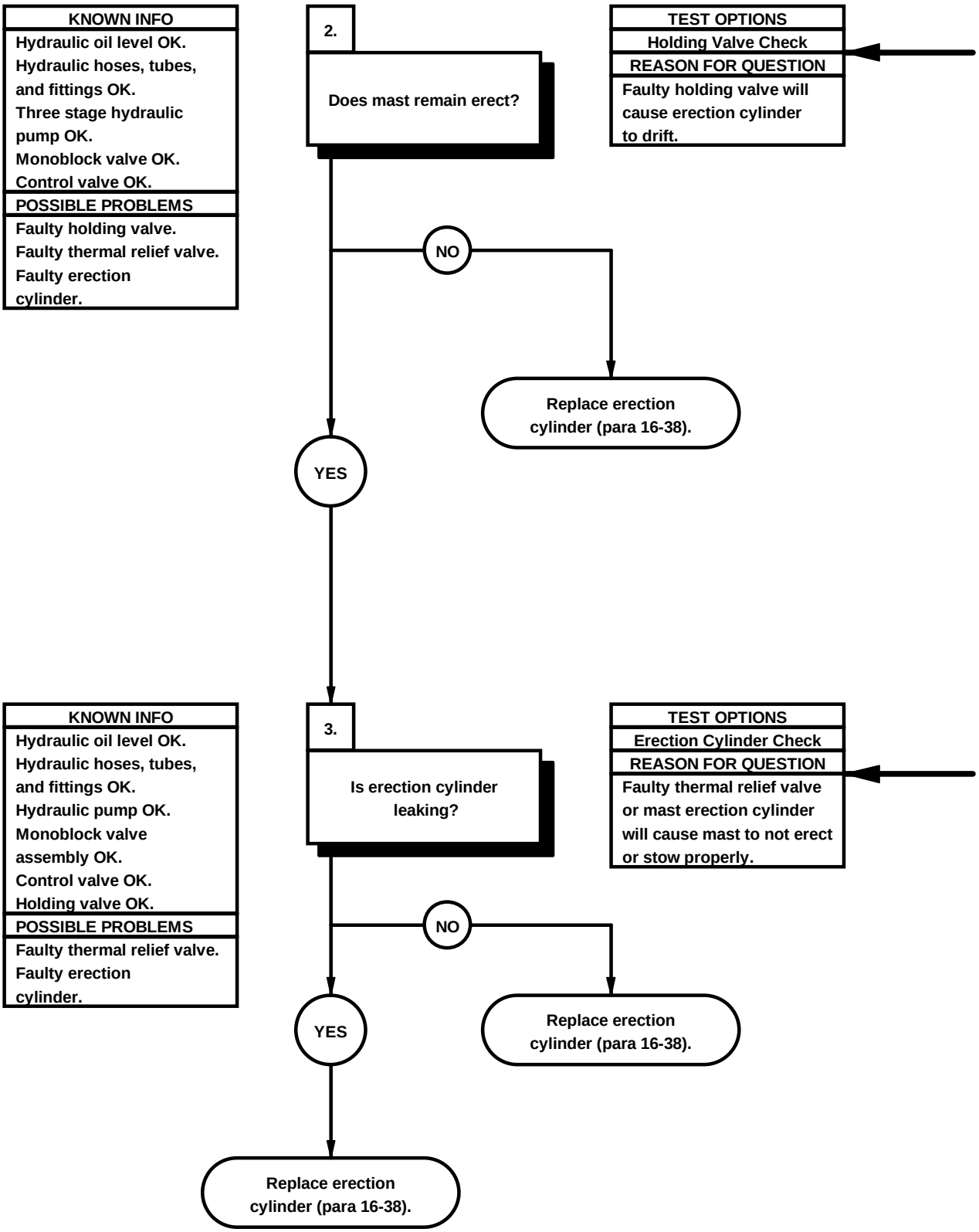
- **Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.**
- **Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical 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.**

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.

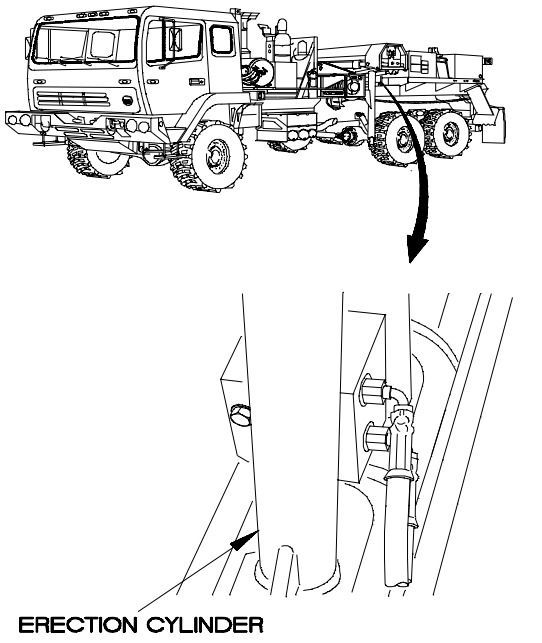


j3. M1089 MATERIAL HANDLING CRANE (MHC) MAST DOES NOT ERECT OR STOW (CONT)



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 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

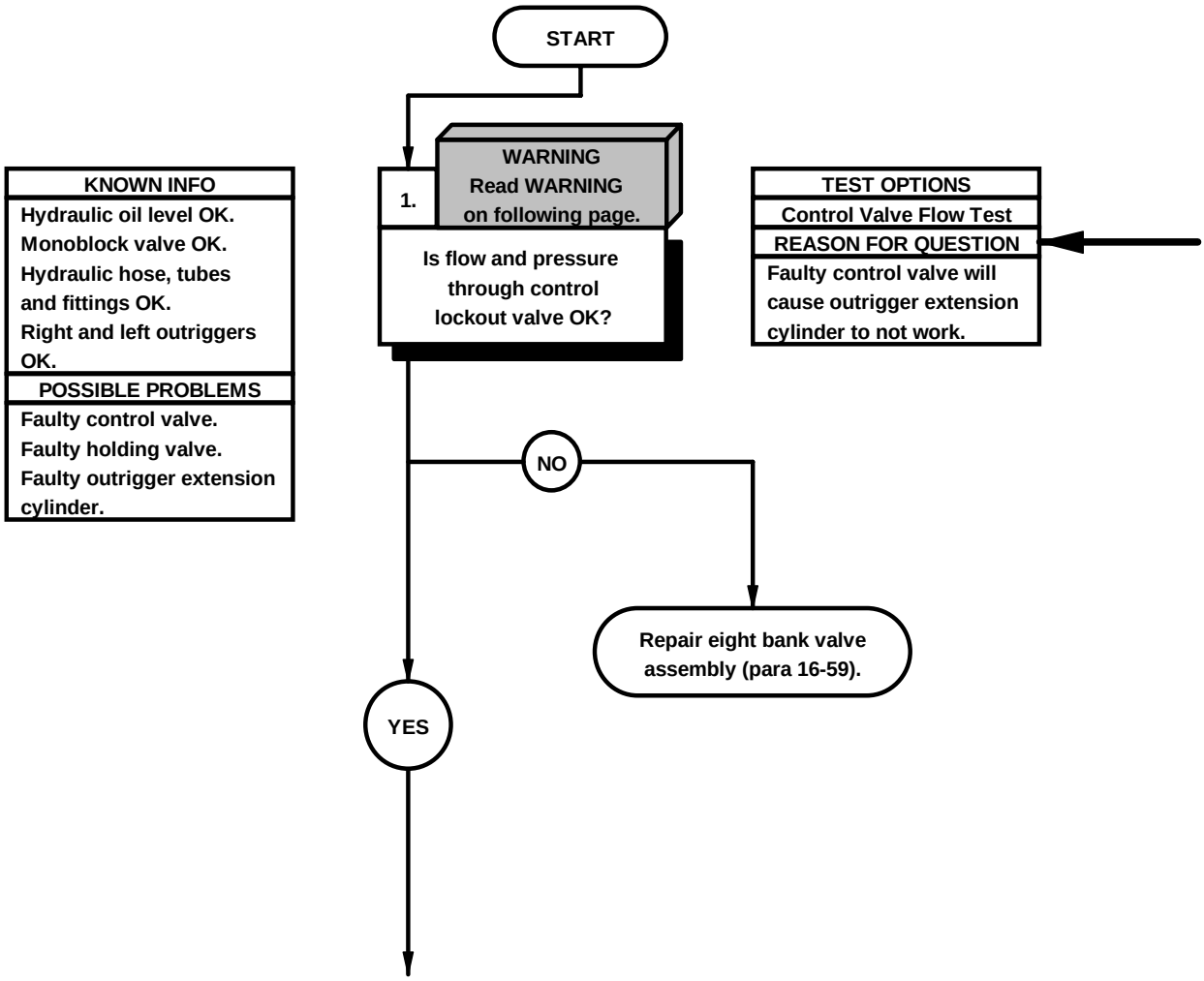
INITIAL SETUP

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

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)

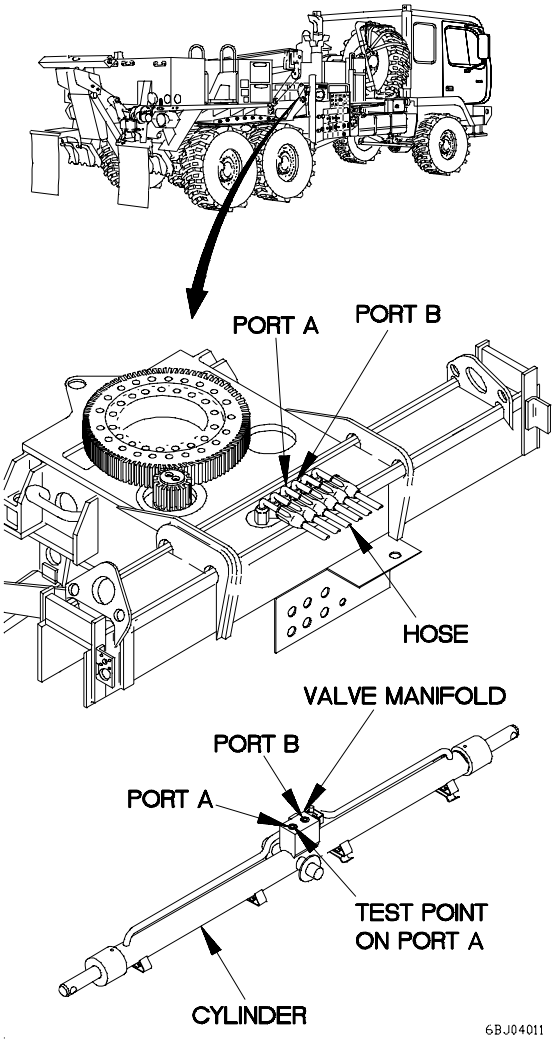


WARNING

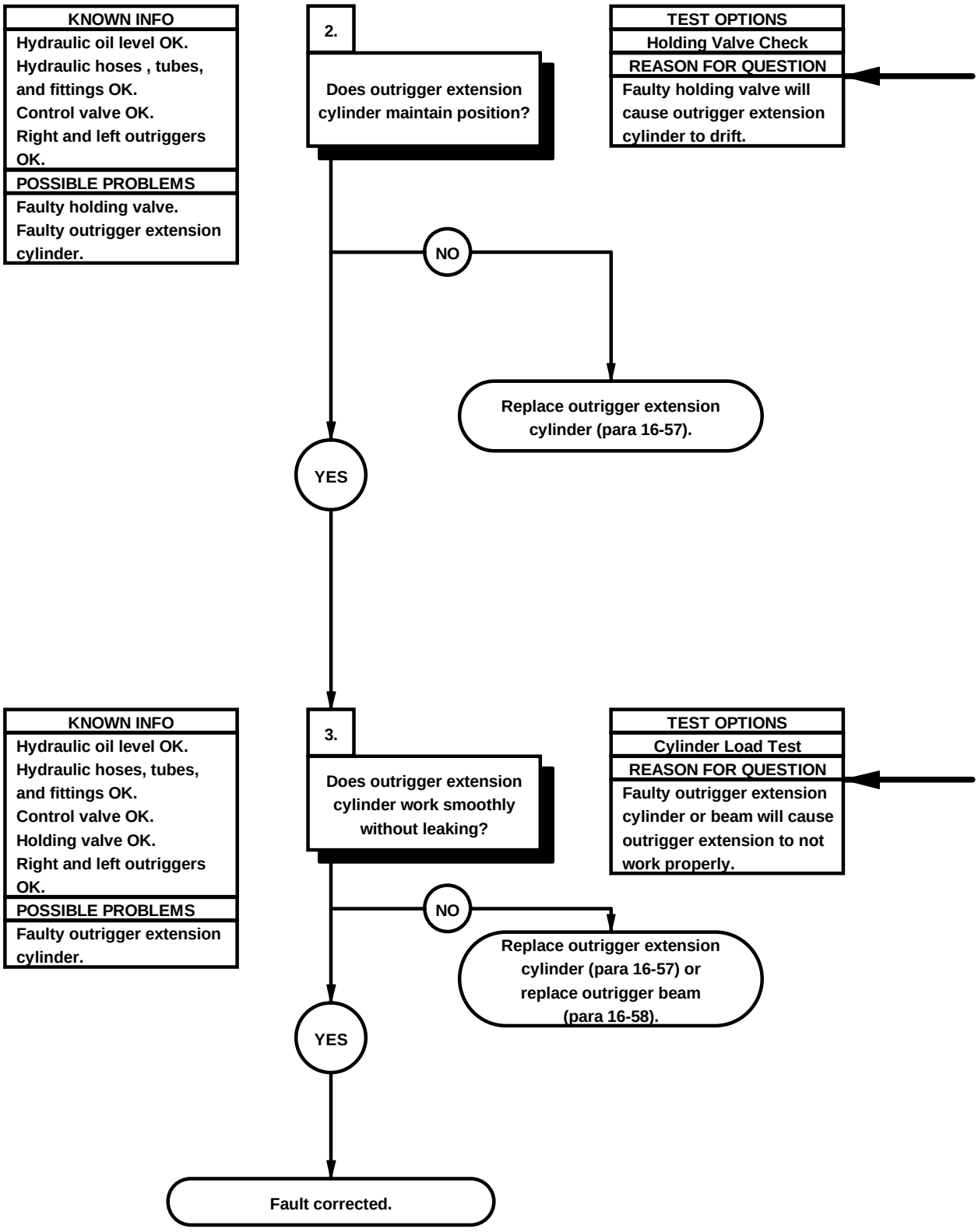
- **Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.**
- **Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical 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.**

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) Postion 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.

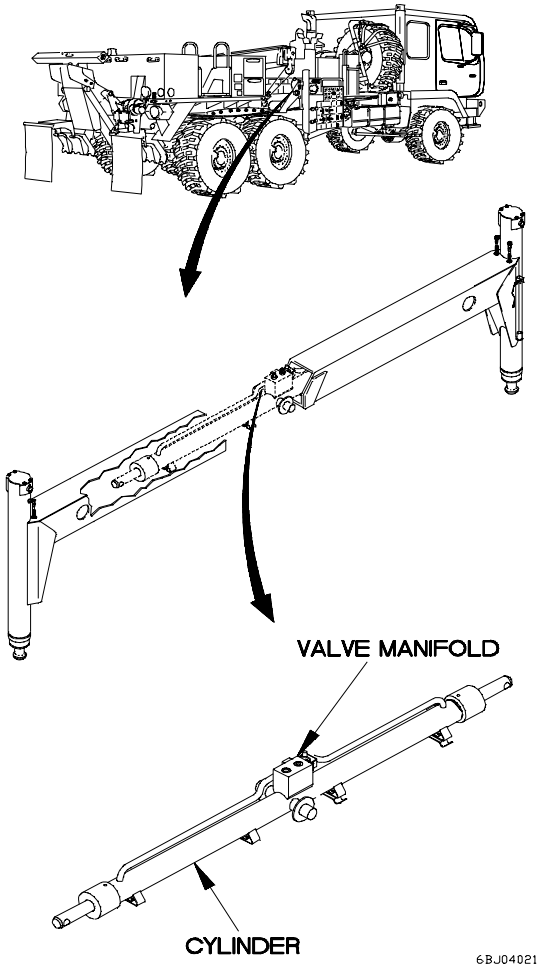


j4. M1089 MATERIAL HANDLING CRANE (MHC) OUTRIGGER EXTENSION CYLINDER DOES NOT WORK (CONT)



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.



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

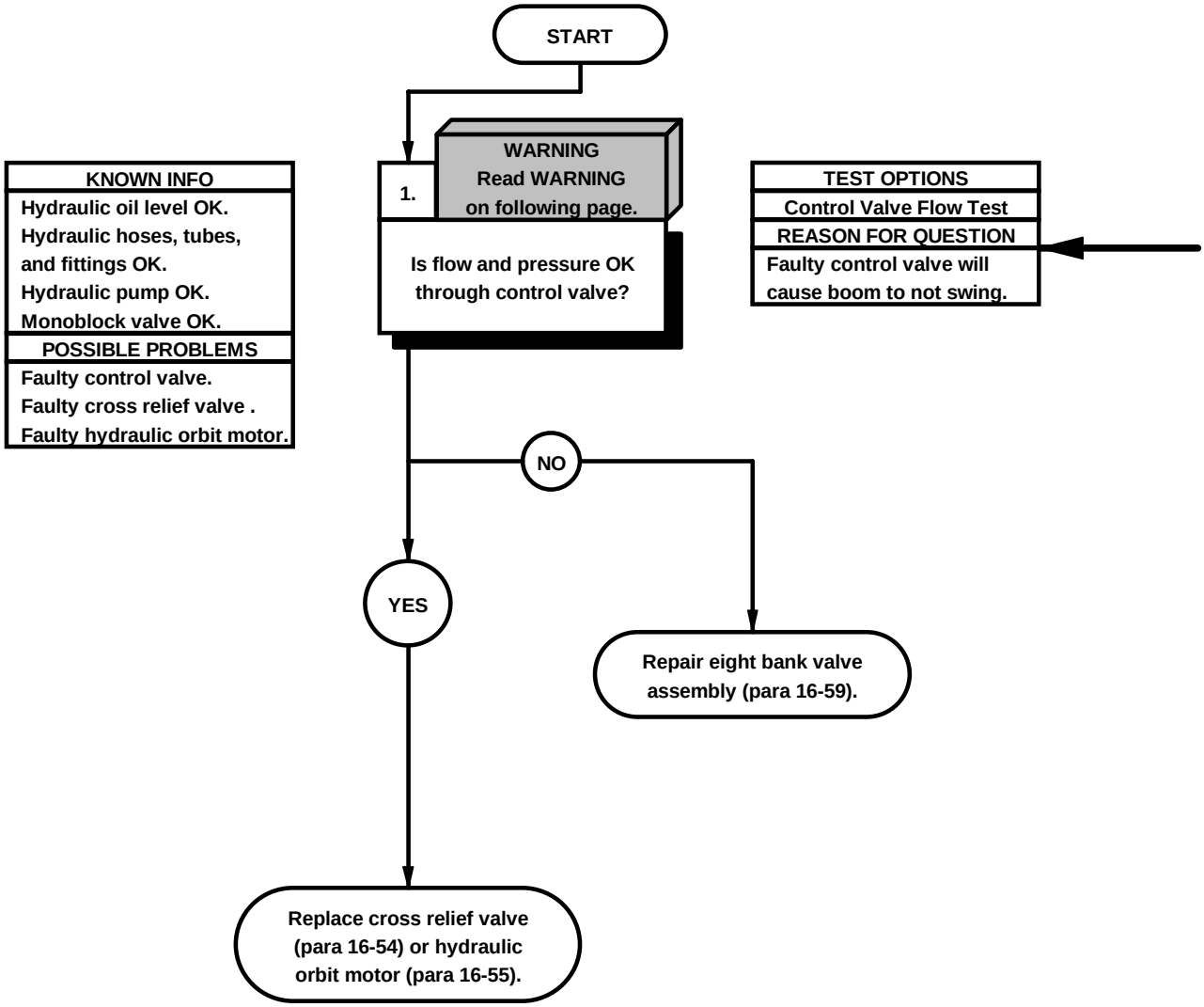
INITIAL SETUP

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

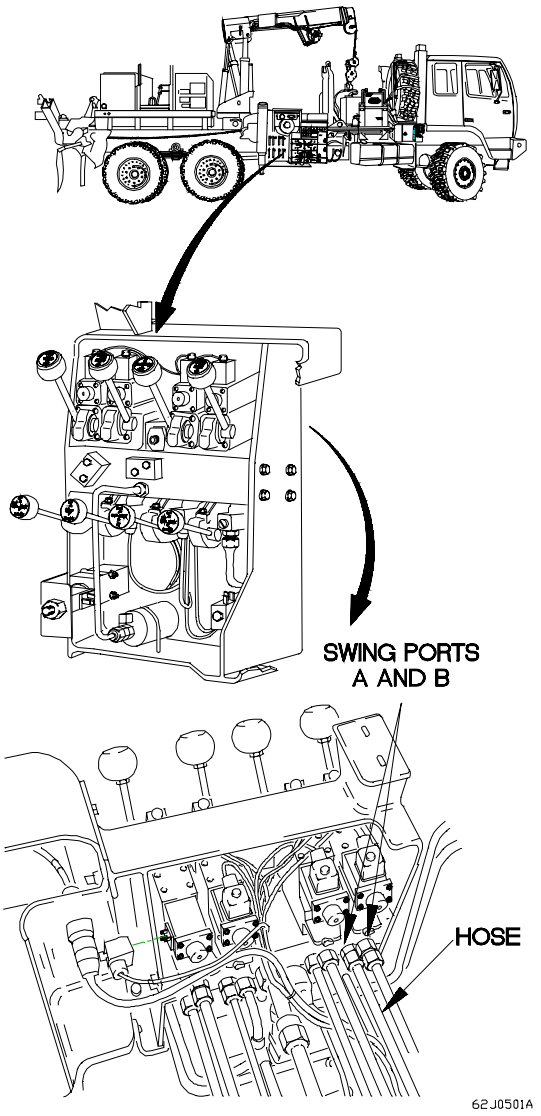
If boom swings right OK but will not swing left: substitute port B for port A, in steps (1), (2), (14), and (15), and operate swing control CCW, in step (9).

(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.



j6. M1089 MATERIAL HANDLING CRANE (MHC) BOOM DOES NOT LIFT UP OR DOWN

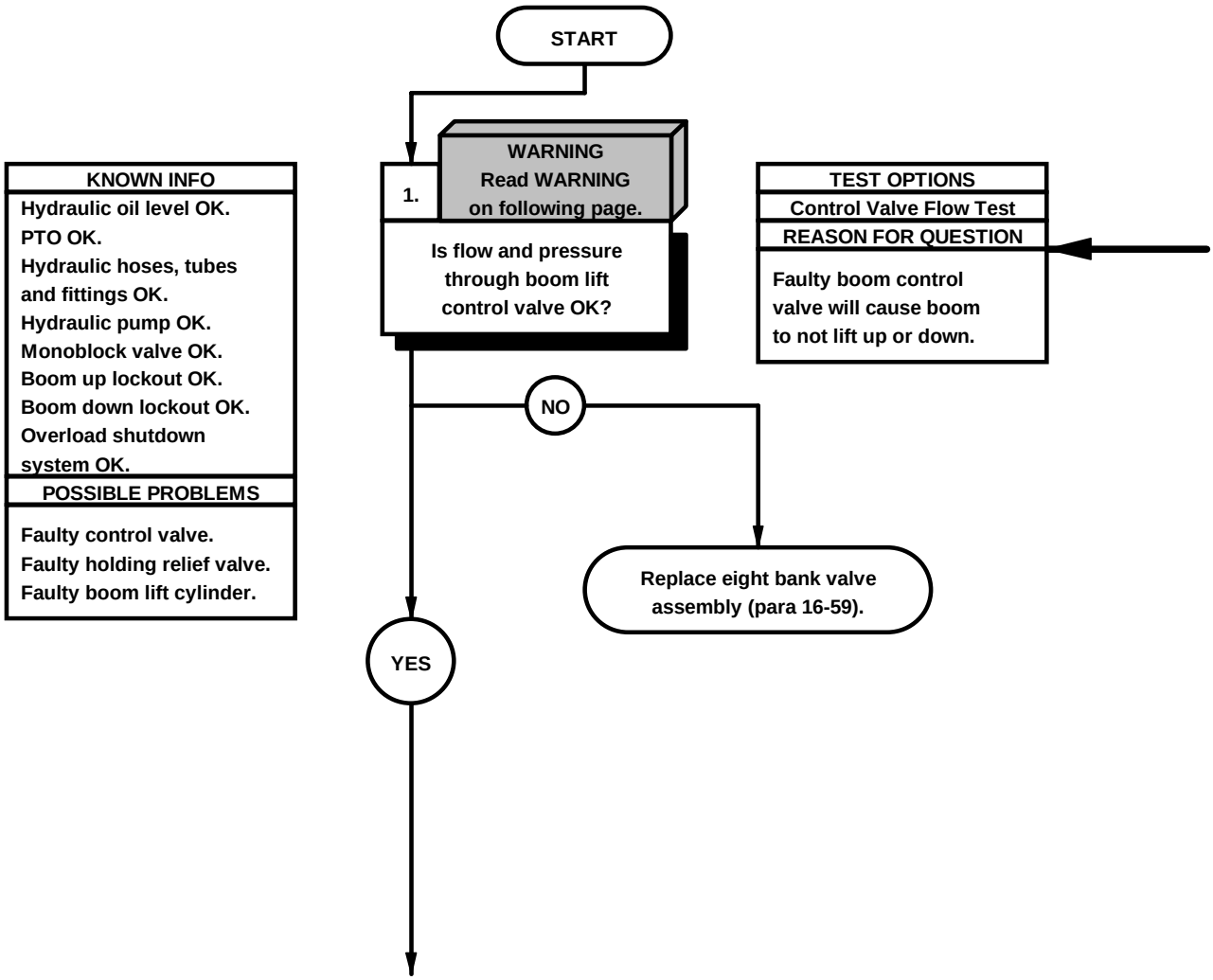
INITIAL SETUP

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

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.**

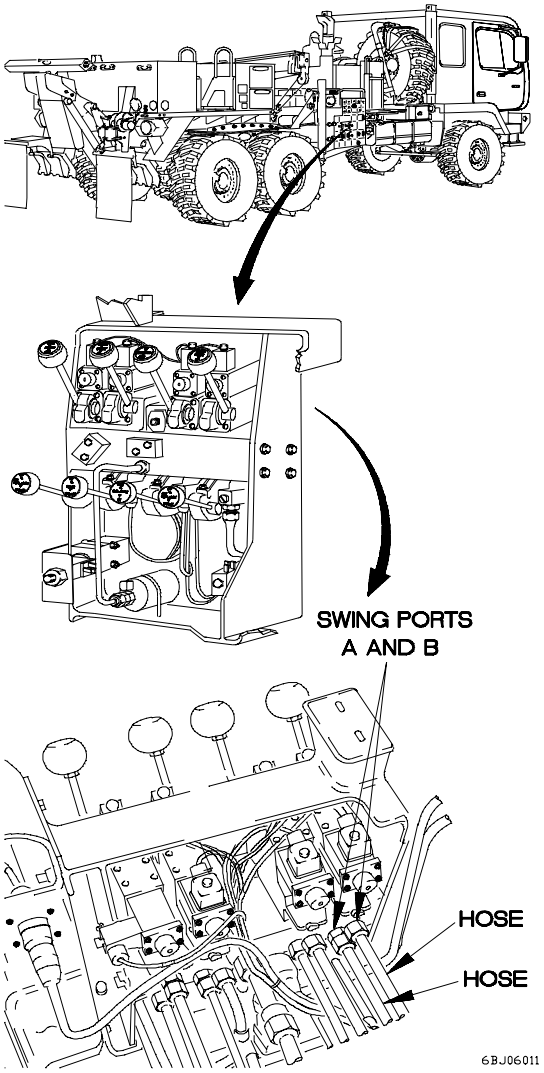
NOTE

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 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)

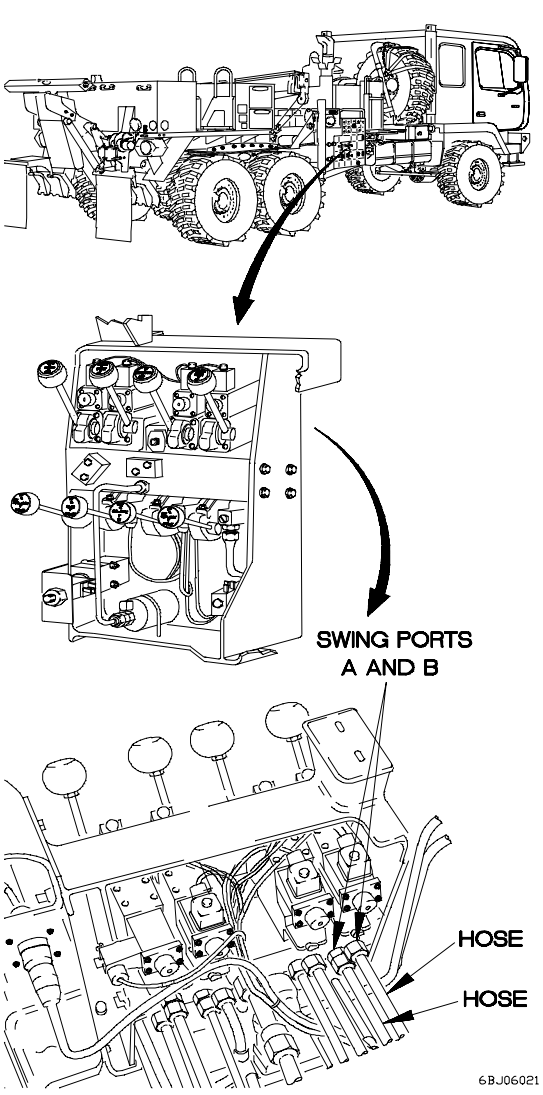


j6. M1089 MATERIAL HANDLING CRANE (MHC) BOOM DOES NOT LIFT UP OR DOWN (CONT)

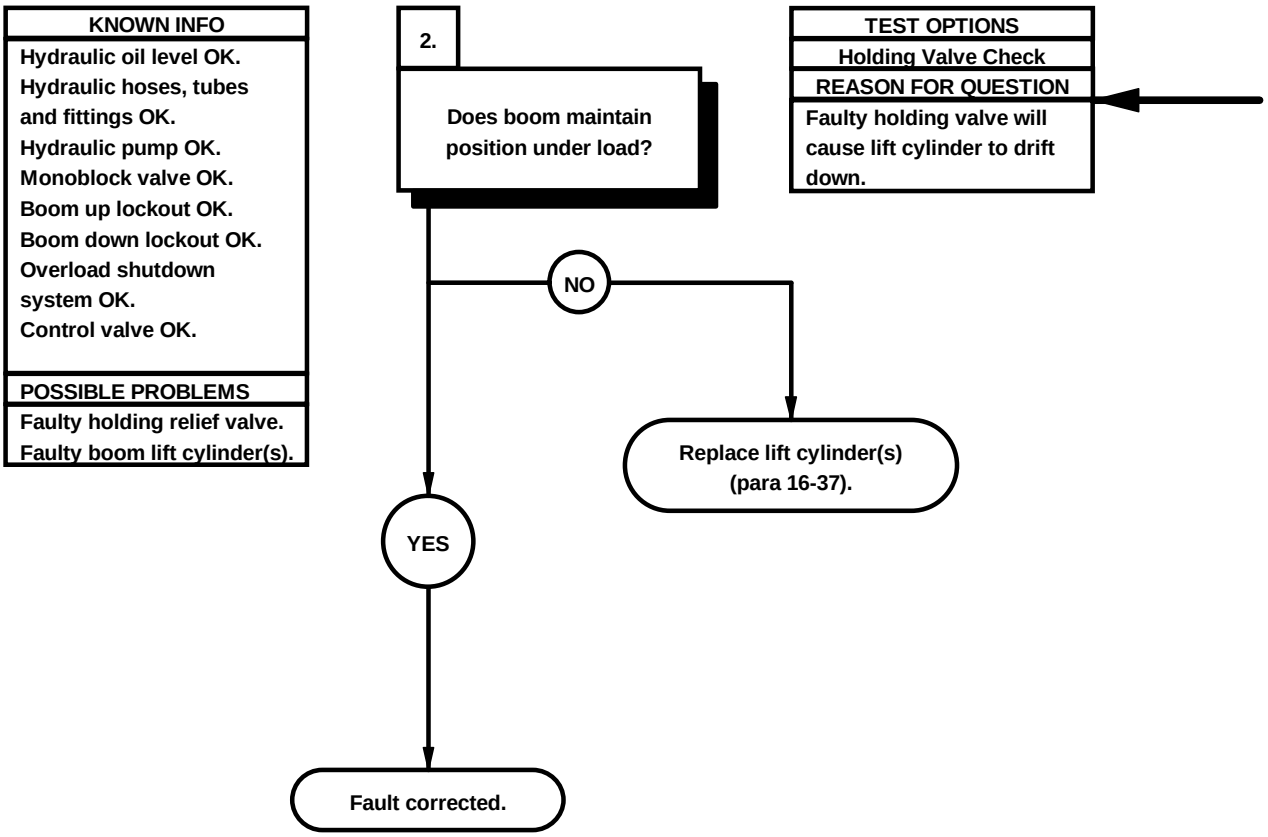
CONTROL VALVE FLOW AND PRESSURE TEST Cont

(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).



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).

j7. M1089 MATERIAL HANDLING CRANE (MHC) BOOM DOES NOT TELESCOPE IN OR OUT

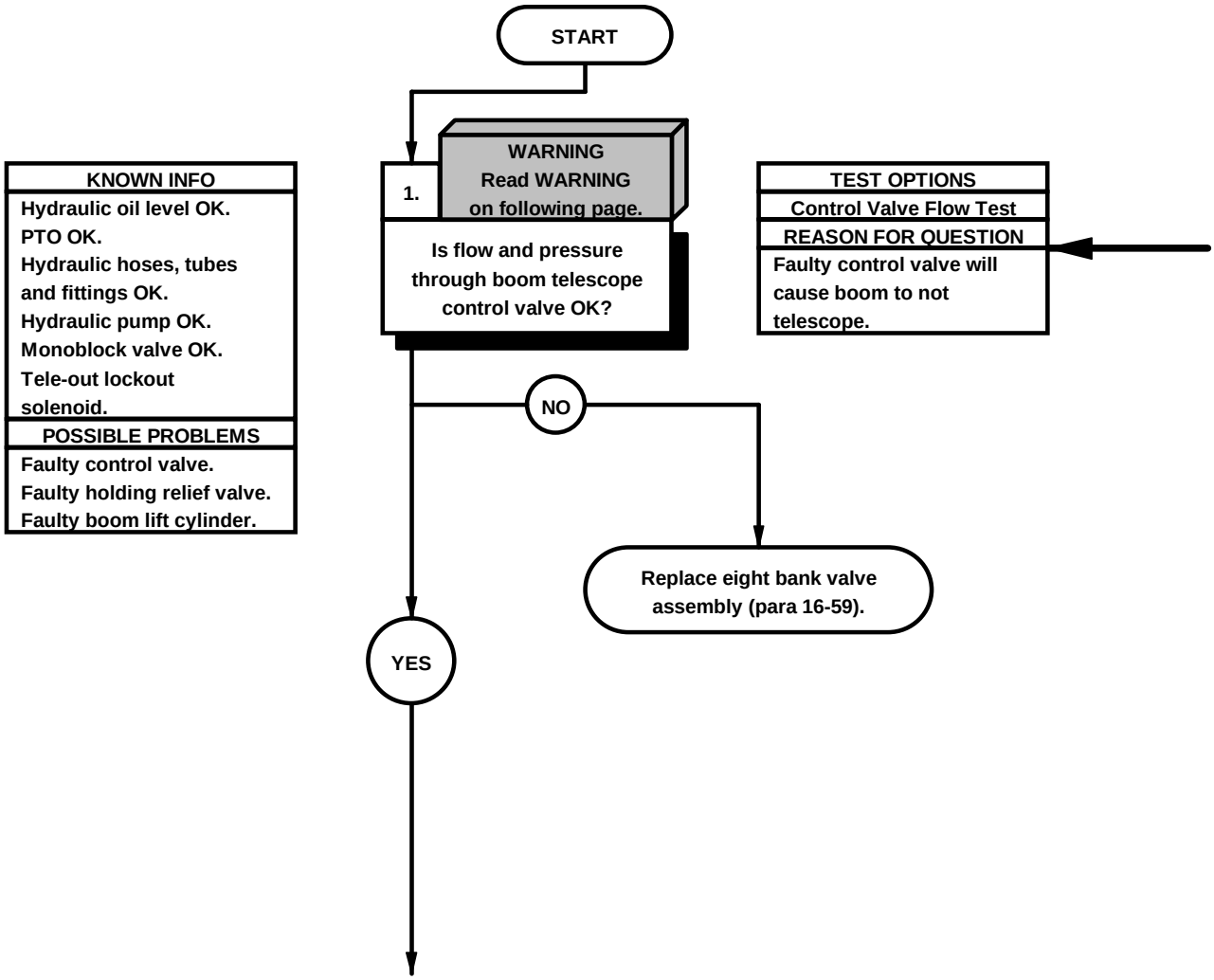
INITIAL SETUP

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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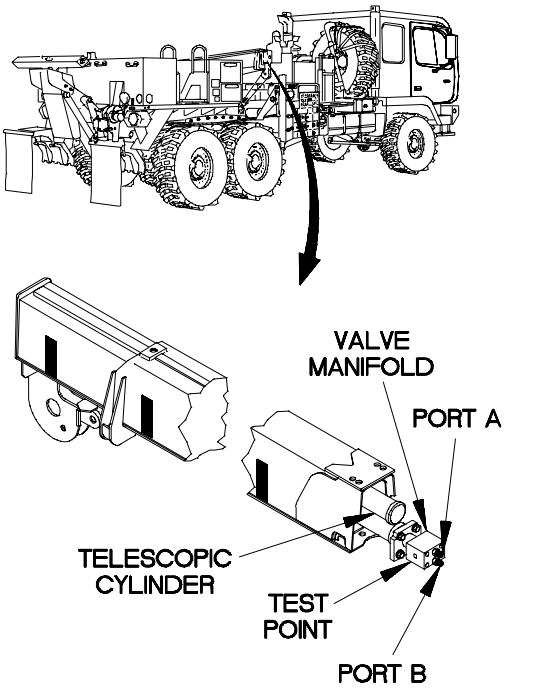
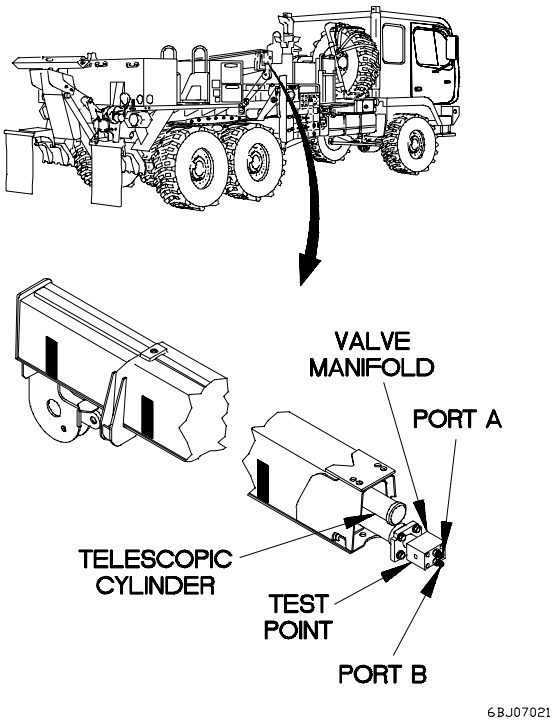


j7. M1089 MATERIAL HANDLING CRANE (MHC) BOOM DOES NOT TELESCOPE IN OR OUT (CONT)

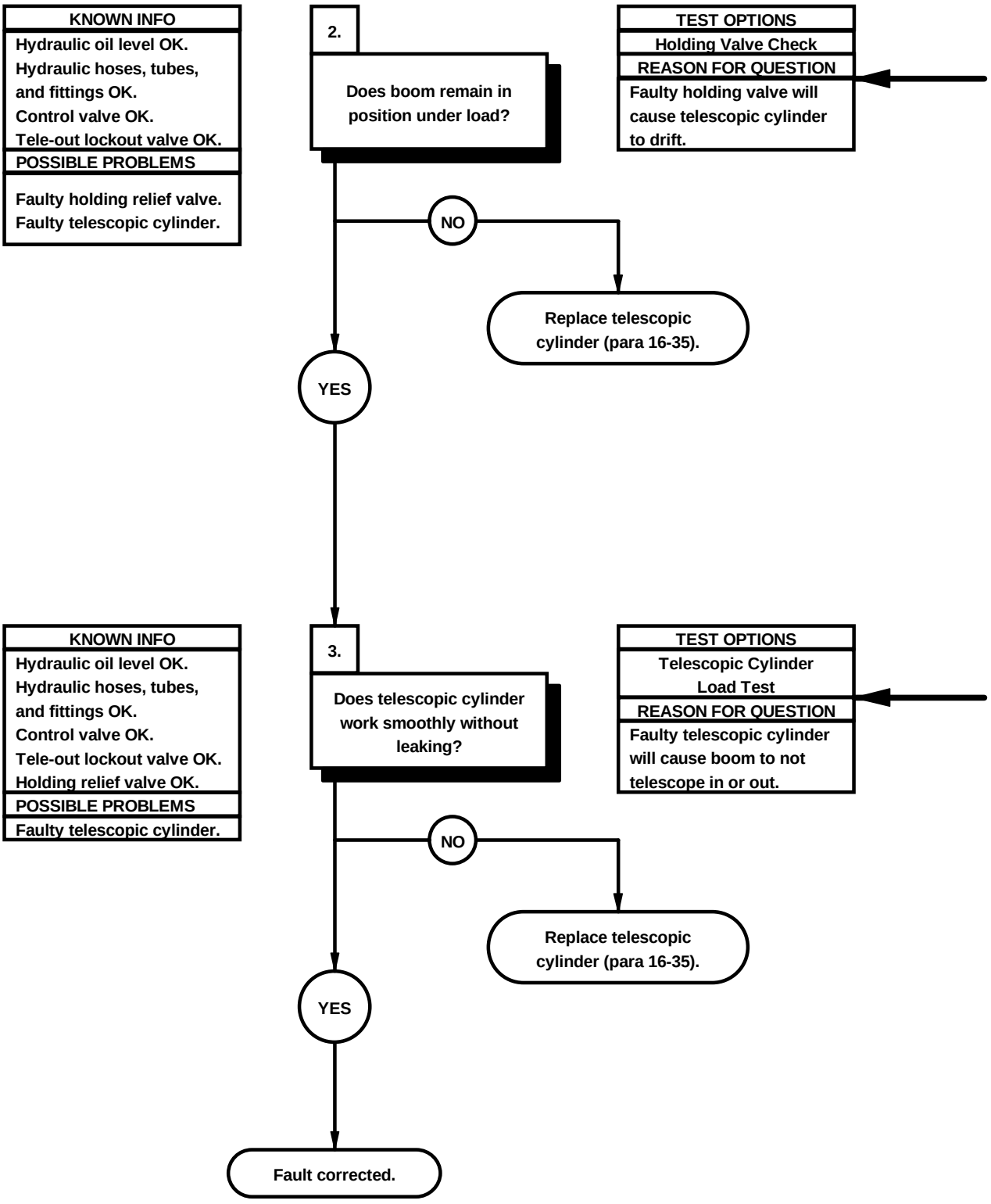
CONTROL VALVE FLOW AND PRESSURE TEST Cont

(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 telescopc cylinder.
(28) Stow crane (TM 9-2320-366-10-1).
(29) Shut down engine (TM 9-2320-366-10-1).

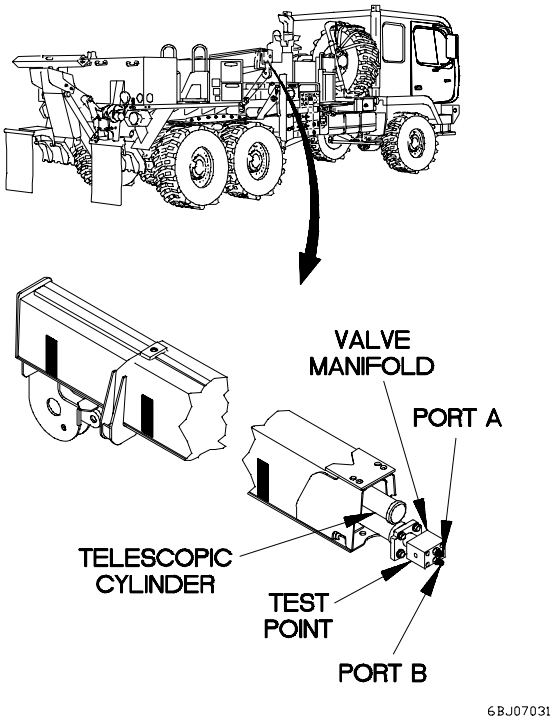


j7. M1089 MATERIAL HANDLING CRANE (MHC) BOOM DOES NOT TELESCOPE IN OR OUT (CONT)



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.



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

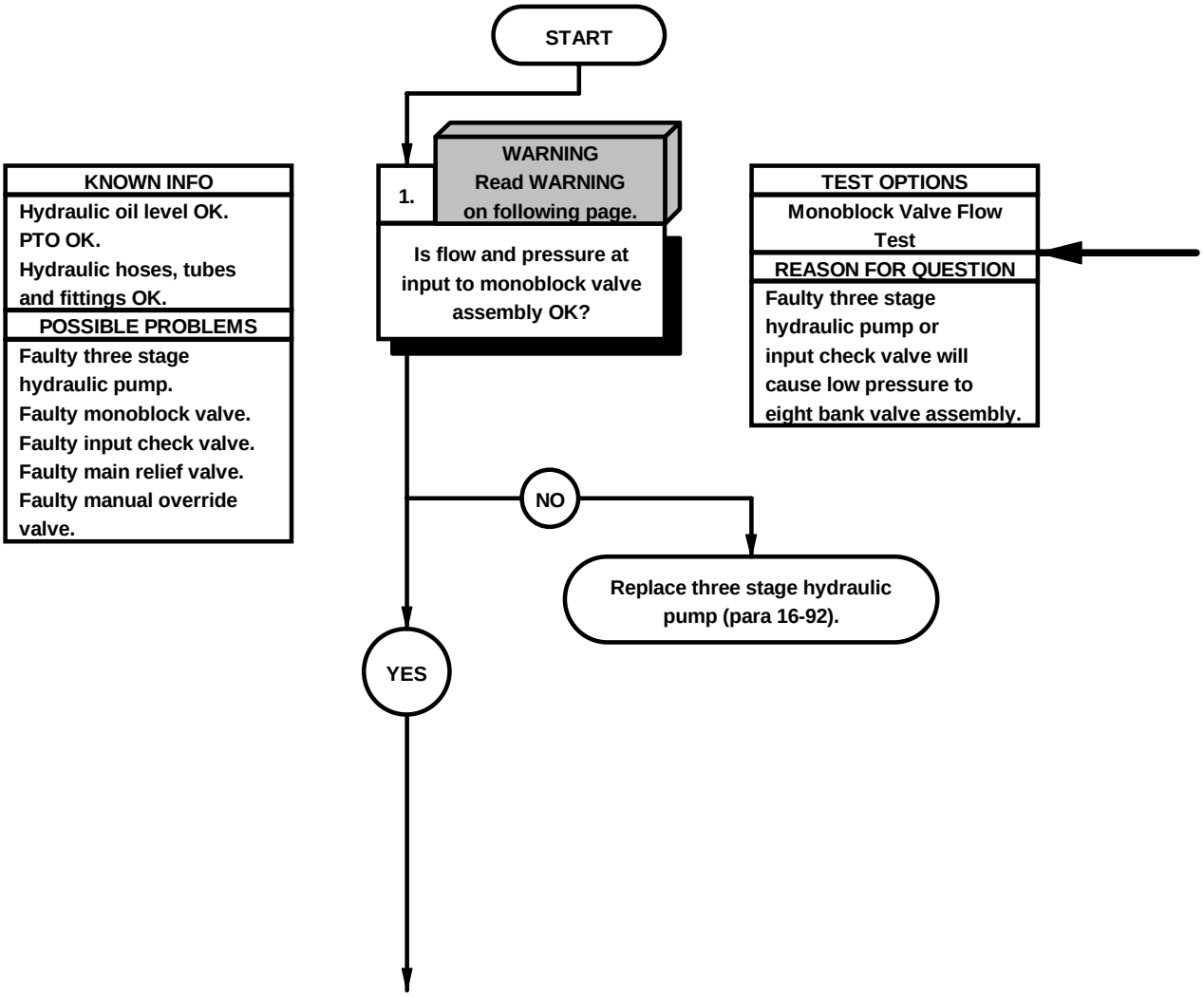
INITIAL SETUP

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

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

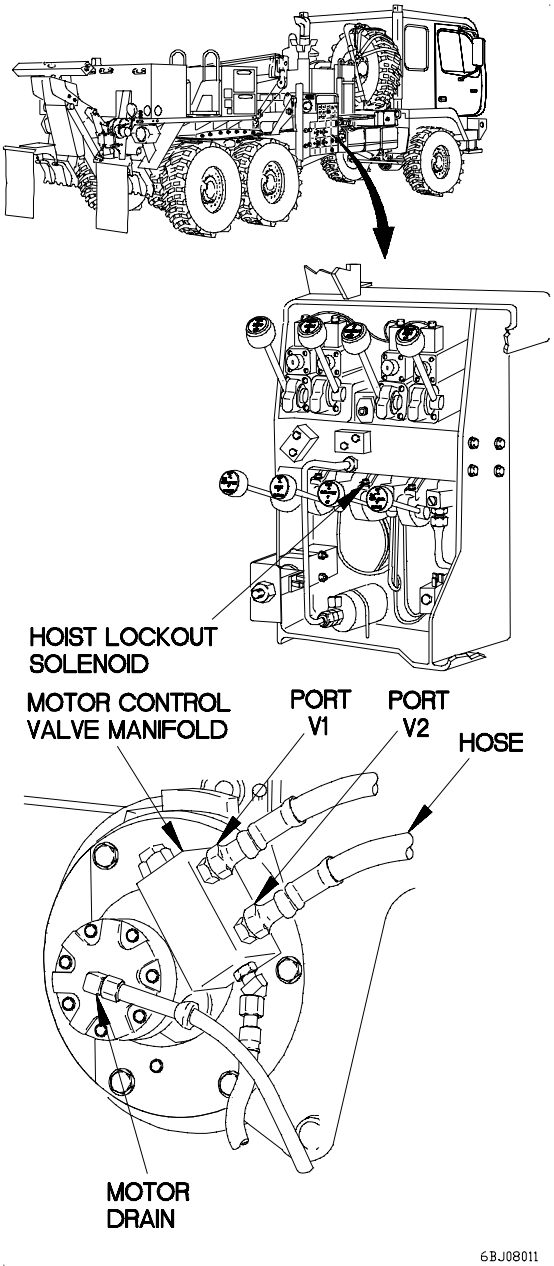
- **Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.**
- **Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical 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

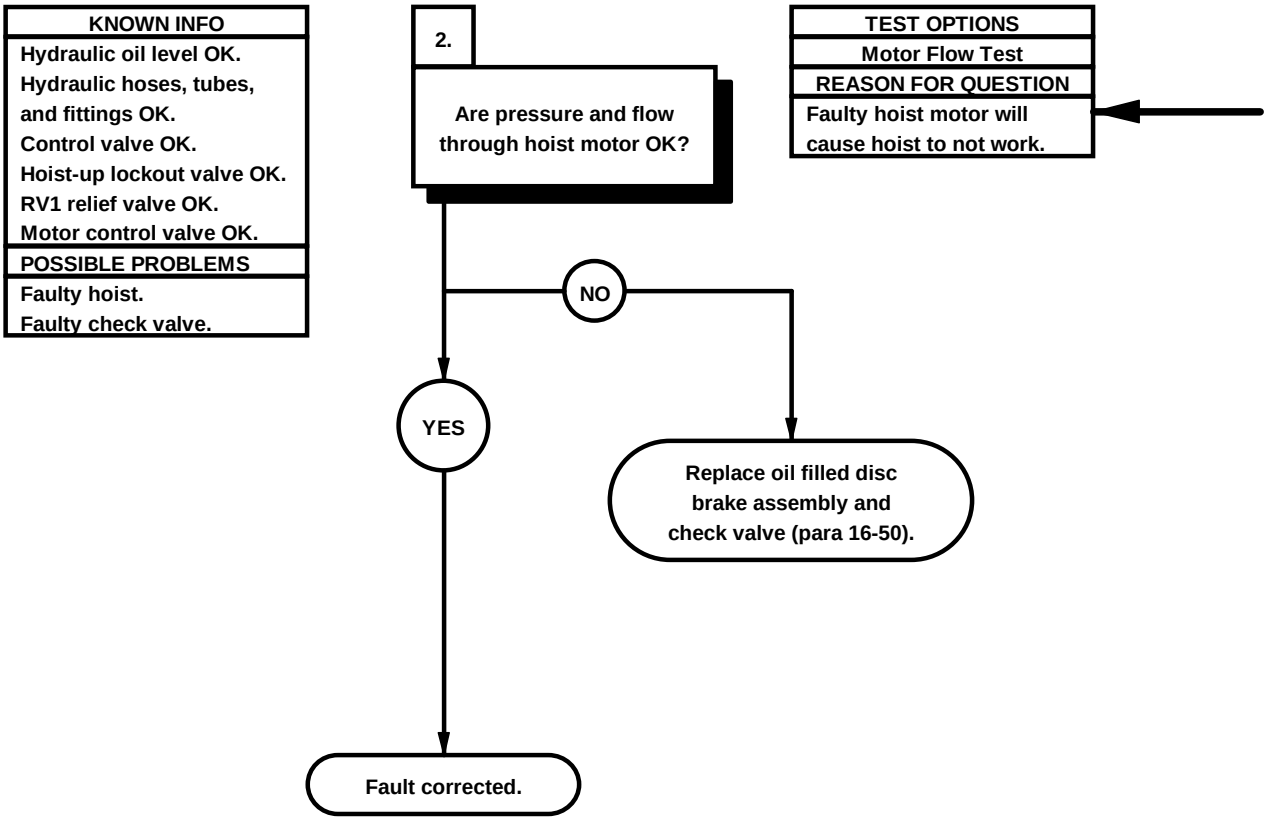
Tag hydraulic hoses, tubes, and fittings prior to disconnecting.

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.

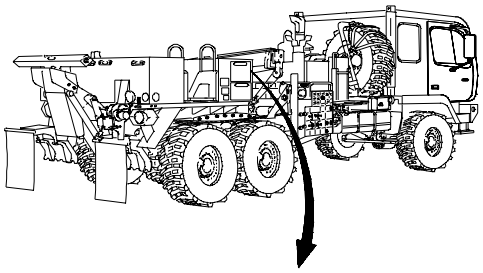


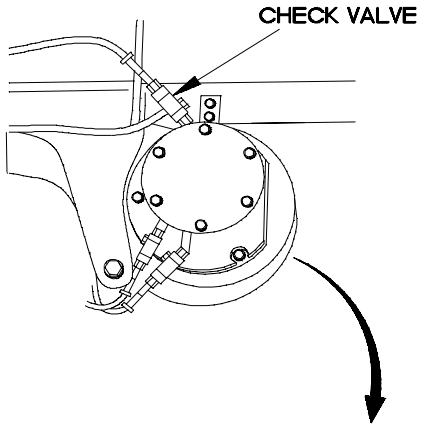
j8. M1089 MATERIAL HANDLING CRANE (MHC) HOIST DOES NOT WORK (CONT)

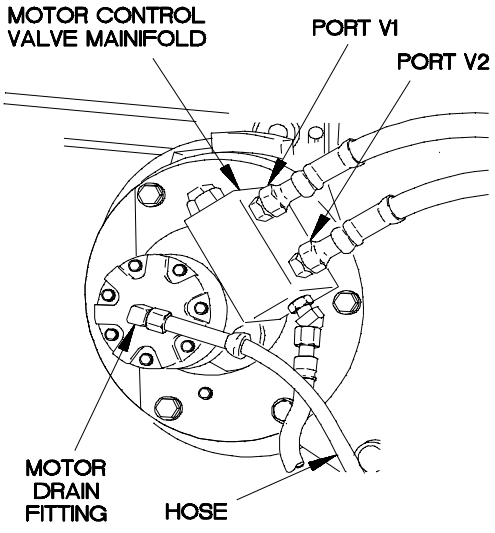


MOTOR FLOW TEST

(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.







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 Drifts Down From Raised Position	2-1072.12

k1. DUMP BODY DOES NOT RAISE

INITIAL SETUP

Equipment Conditions
Engine shutdown (TM 9-2320-366-10-1)

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 (Item 8, Appendix D)
Gloves, Mens (Item 34.2, Appendix C)
STE/ICE-R (Item 70, Appendix B)
Transmitter, Pressure (Item 1, Appendix G)

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)

Personnel Required
(2)

References
TM 9-4910-571-12&P

NOTE

Perform Electrical System Troubleshooting e143. Dump Body Does Not Raise (TM 9-2320-366-20-2) prior to beginning this task.

KNOWN INFO

Hydraulic oil level OK.
PTO OK.
Hydraulic hoses and fittings OK.
Hydraulic oil filter OK.
Dump body electrical system OK.

POSSIBLE PROBLEMS

Faulty hydraulic rotary pump.
Faulty four-way relief valve.
Faulty pressure reducing valve.
Faulty dump body hoist cylinder.

WARNING
CAUTION
Read WARNING and CAUTION on following pages.

1. Is hydraulic rotary pump supplying at least 2,850 PSI (19,650 kPa)?

TEST OPTIONS
Pressure Test or STE/ICE-R Test #51

REASON FOR QUESTION
If hydraulic rotary pump is not supplying at least 2,850 PSI (19,650 kPa), hydraulic rotary is faulty.

NO → Replace hydraulic rotary pump (para 16-91).

YES

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.

Drop hydraulic pressure to zero before disconnecting any hydraulic line.Failure to comply may result in injury to personnel.

PRESSURE TEST

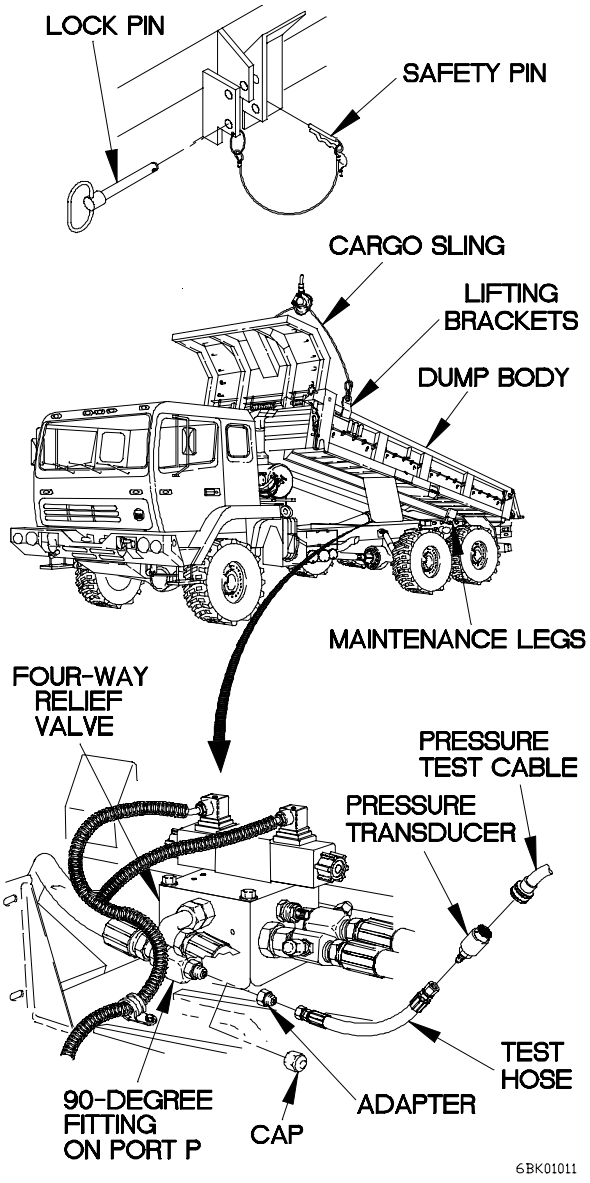
(1) Remove safety pin from two locking pins.
(2) Remove two locking pins from dump body.
(3) Install two dump body lifting brackets in slots in dump body.
(4) Attach cargo sling to dump body lifting brackets.
(5) Lift dump body.
(6) Raise two maintenance legs on frame.
(7) Lower dump body on maintenance legs.
(8) Position drain pan under vehicle.
(9) Remove cap from 90-degree fitting on port P of the four-way relief valve.

NOTE

Route test hose between frame and exit under vehicle.

(10) Install adapter and test hose on 90-degree fitting.
(11) Instal pressure transducer (0-10,000 PSI [0-68,965 kPa]) on test hose.
(12) Connect pressure test cable to pressure transducer and to Test Set.
(13) Start engine (TM 9-2320-366-10-1).
(14) Position PTO switch to on (TM 9-2320-366-10-1).

Test continued on page 2-1070.1.



PRESSURE TEST (CONT)

Test continued from page 2-1069.

CAUTION

Keep tachometer within 1,250-1,450 RPM when PTO is engaged. Failure to comply may result in damage to equipment.

NOTE

In the event of a tachometer failure, a HAND THROTTLE lever positioned to L is approximately 1,250-1,450 RPM.

(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 position (TM9-2320-366-10-1), while assistant checks reading on STE/ICE-R.
(18) If pressure is less than 2,850 PSI (19,650 kPa), replace hydraulic rotary pump (para 16-91).

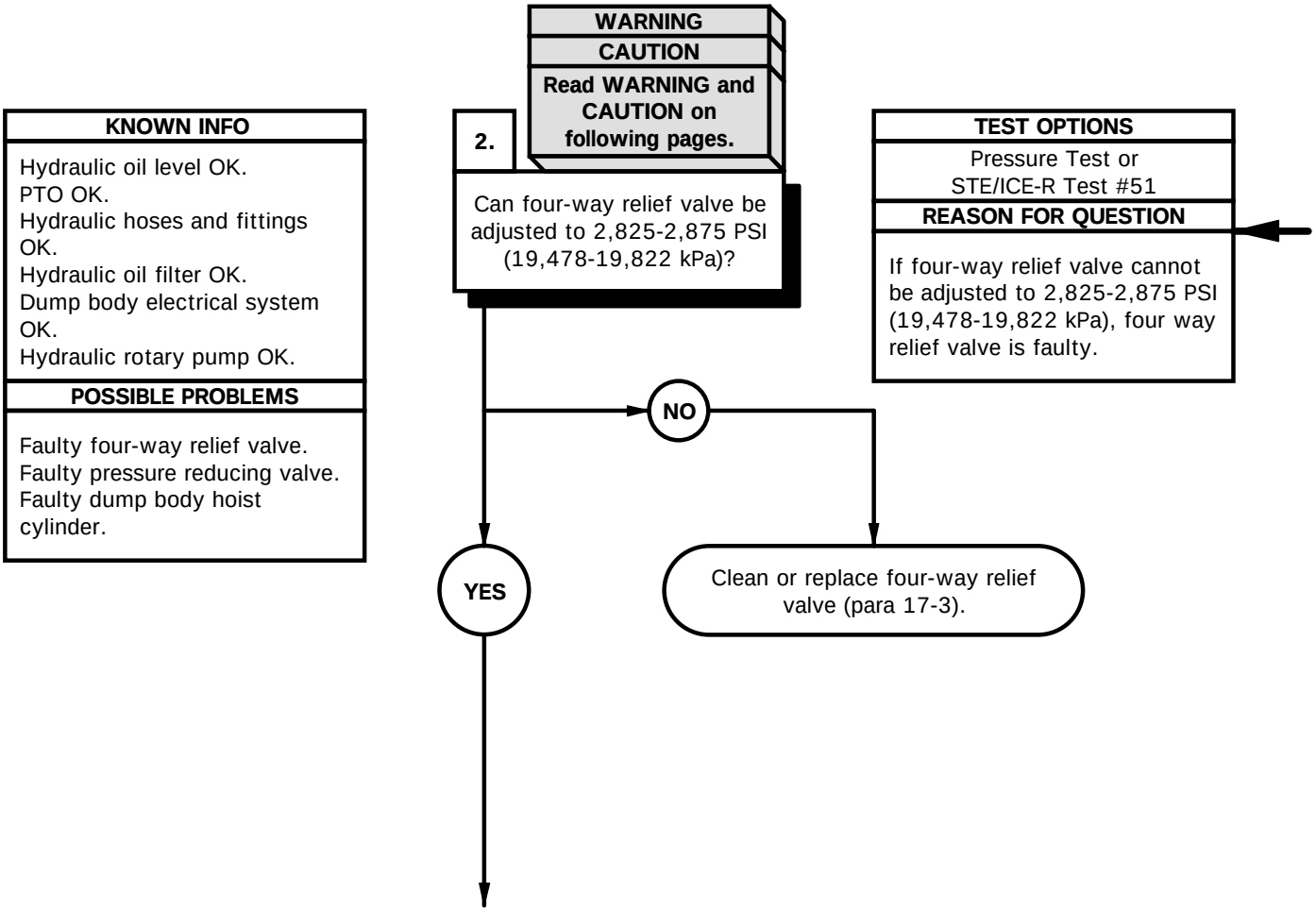
NOTE

In the event of a tachometer failure, a HAND THROTTLE lever positioned to full down position is approximately 750 RPM.

(19) Set engine speed to idle 750 RPM (TM 9-2320-366-101).

(20) Position PTO switch to off (TM 9-2320-366-10-1).
(21) Shut down engine (TM 9-2320-366-10-1).

k1. DUMP BODY DOES NOT RAISE (CONT)



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.

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.

Drop hydraulic pressure to zero before disconnecting any hydraulic line.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.

PRESSURE TEST

(1) Disconnect hose A from tee fitting.
(2) Install cap on tee fitting.
(3) Install plug in hose A.
(4) Start engine (TM 9-2320-366-10-1).
(5) Position PTO switch to on (TM 9-2320-366-10-1).

CAUTION

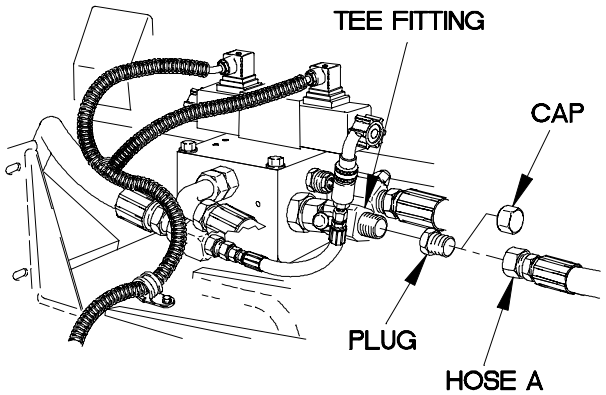
Keep tachometer within 1,250-1,450 RPM when PTO is engaged. Failure to comply may result in damage to equipment.

NOTE

In the event of a tachometer failure, a HAND THROTTLE lever positioned to L is approximately 1,250-1,450 RPM.

(6) Set engine speed to 1250-1450 RPM (TM 9-2320-366-10-1).

Test continued on page 2-1072.1



PRESSURE TEST (CONT)

Test continued from page 2-1071.

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 UP position will force hydraulic oil through relief valve and cause oil temperature to rise.

Measure hydraulic oil temperature near bottom of hydraulic reservoir.

(7) Attach a temperature indicator sticker to hydraulic oil tank.
(8) Press and hold DUMP BED UP/DOWN switch in the UP position (TM 9-2320-366-10-1) 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)

NOTE

Note location of adjusting screw on four-way relief valve before performing step (10).

(10) If pressure is not 2,825-2,875 PSI (19,478-19,822 kPa), loosen lock nut on adjusting screw on four-way relief valve. Turn adjusting screw counter clockwise to lower pressure, clockwise to raise pressure.
(11) If pressure cannot be adjusted, clean or replace four-way relief valve (para 17-3).

NOTE

Hold adjusting screw on four-way relief valve while tightening lock nut.

(12) Tighten locking nut on adjusting screw.

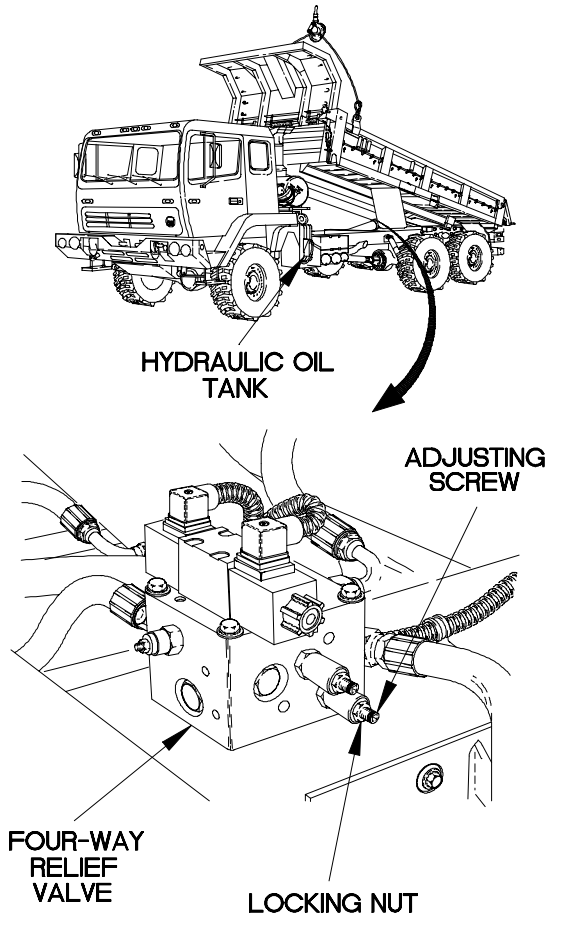
Test continued at top of page.

PRESSURE TEST (CONT)

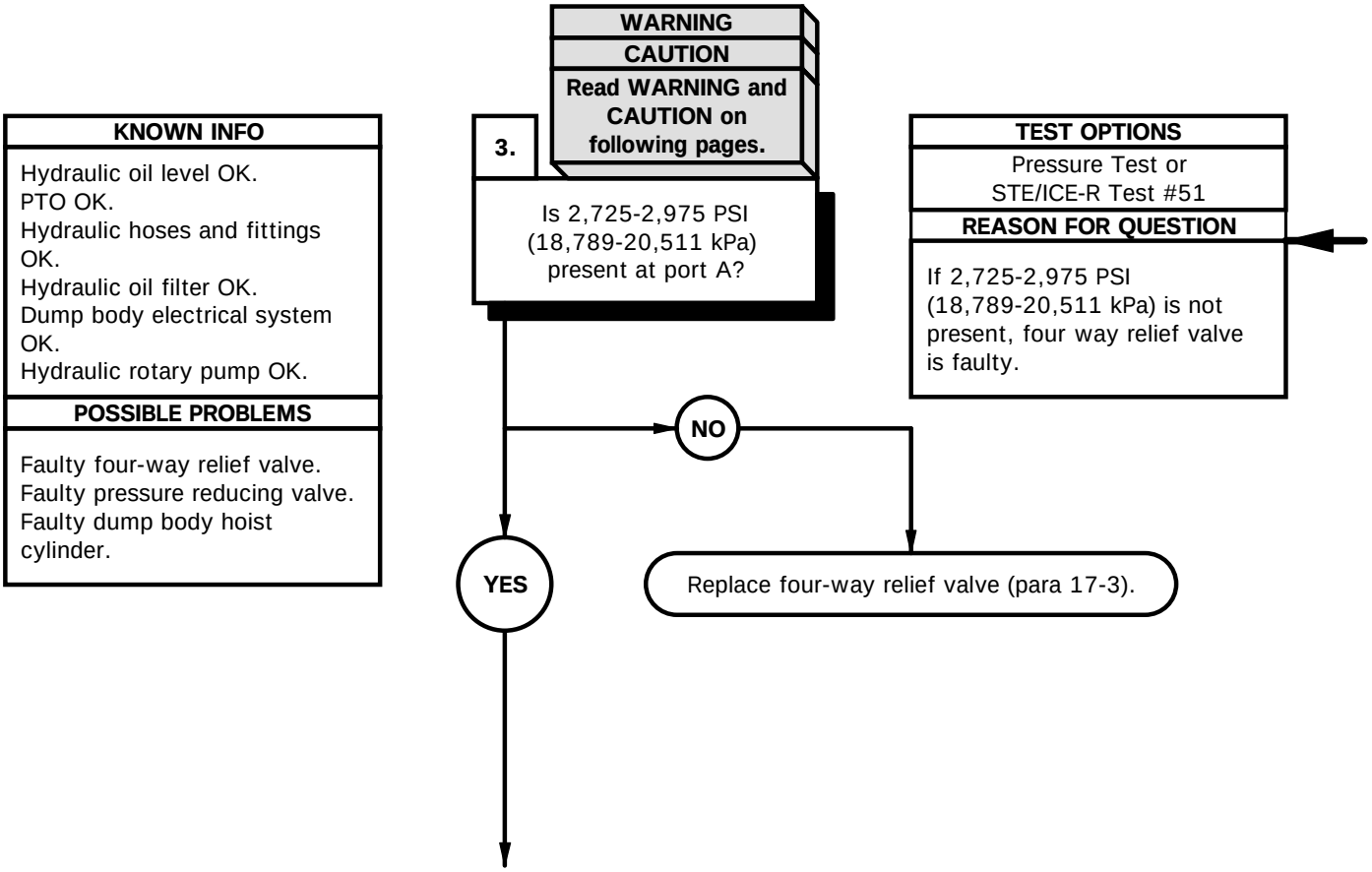
NOTE

In the event of a tachometer failure, a HAND THROTTLE lever positioned to full down is approximately 750 RPM.

(13) Set engine speed to idle 750 RPM (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).



k1. DUMP BODY DOES NOT RAISE (CONT)



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.

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.

Drop hydraulic pressure to zero before disconnecting any hydraulic line.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.

PRESSURE TEST

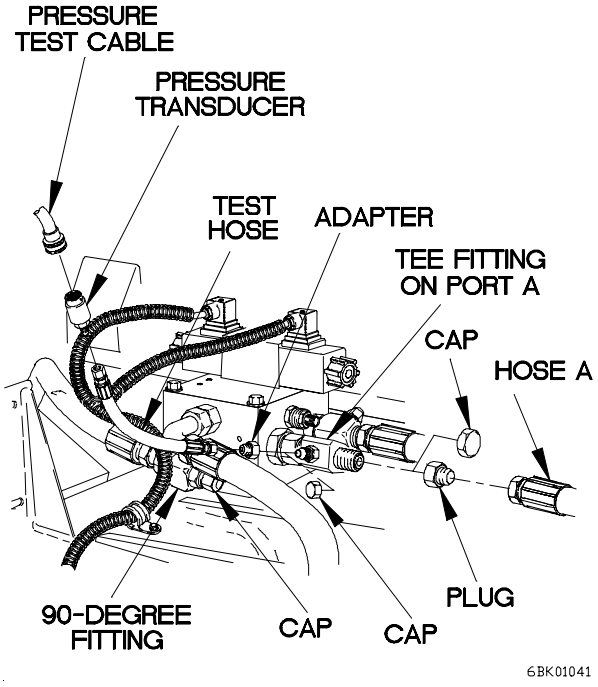
(1) Disconnect pressure test cable from pressure transducer.
(2) Remove plug from hose A.
(3) Remove cap from tee fitting.
(4) Connect hose A to tee fitting.
(5) Tighten hose A to 79-88 lb-ft (107-119 N.m).
(6) Disconnect test hose and adapter from 90-degree fitting.
(7) Install cap on 90-degree fitting.
(8) Remove cap from tee fitting on port A.

NOTE

Route test hose between frame and exit under vehicle.

(9) Install adapter and test hose on tee fitting.
(10) Connect pressure test cable to pressure transducer and to Test Set.
(11) Start engine (TM 9-2320-366-10-1).
(12) Position PTO switch to on (TM 9 -2320-366-10-1).

Test continued on page 2-1072.5.



PRESSURE TEST (CONT)

Test continued from page 2-1072.3.

CAUTION

Keep tachometer within 1,250-1,450 RPM when PTO is engaged. Failure to comply may result in damage to equipment.

NOTE

In the event of a tachometer failure, a HAND THROTTLE lever positioned to L is approximately 1,250-1,450 RPM.

(13) Set engine speed to 1250-1450 RPM (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 UP position will force hydraulic oil through relief valve and cause oil temperature to rise.

Measure hydraulic oil temperature near bottom of hydraulic reservior.

(14) Attach a temperature indicator sticker to hydraulic oil tank.

(15) Press and hold DUMP BED UP/DOWN switch in the UP (TM 9-2320-366-10-1) position until hydraulic oil temperature reaches 145°F-155°F (63°C-68°C).

(16) Perform STE/ICE Test #51 (TM 9-4910-571-12&P).

(17) If 2,726-2,975 PSI (18,789-20,511 kPa) is not present, replace four way relief valve (para 17-3).

Test continued at top of page.

PRESSURE TEST (CONT)

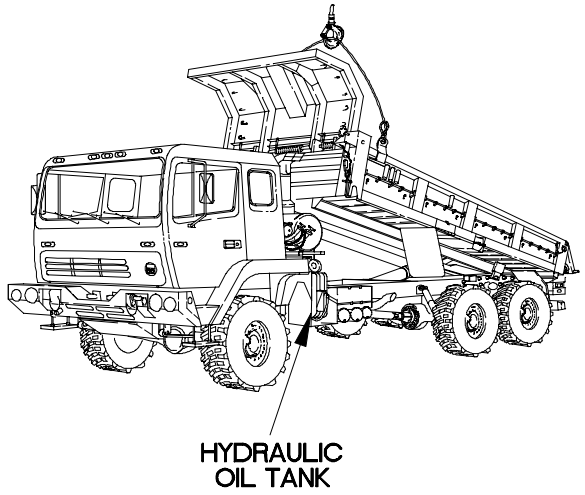
NOTE

In the event of a tachometer failure, a HAND THROTTLE lever positioned to full down is approximately 750 RPM.

(18) Set engine speed to idle 750 RPM (TM 9-2320-366-10-1).

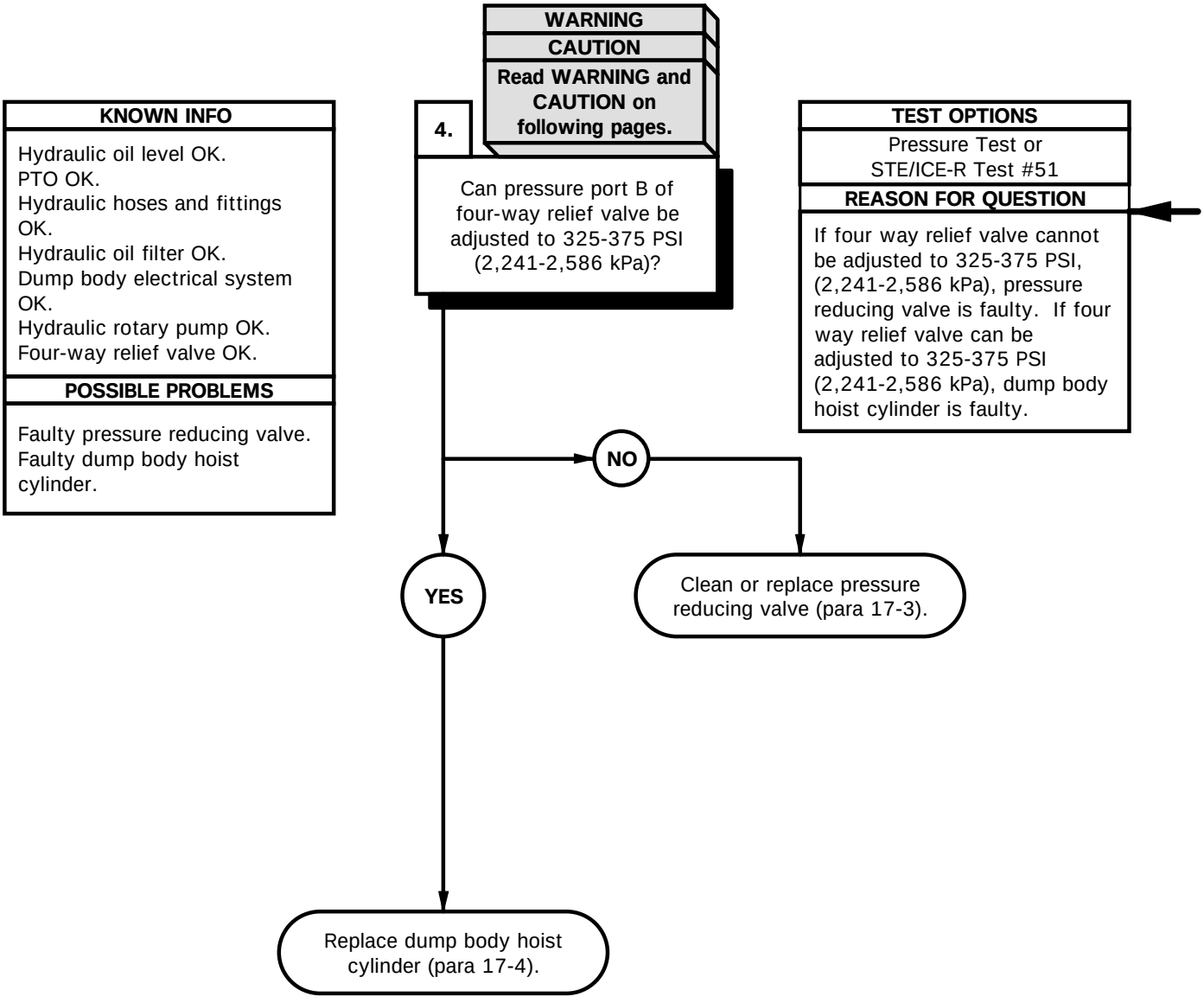
(19) Position PTO switch to off (TM 9-2320-366-10-1).

(20) Shut down engine (TM 9-2320-366-10-1).



6BK01051

k1. DUMP BODY DOES NOT RAISE (CONT)



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.

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.

Drop hydraulic pressure to zero before disconnecting any hydraulic line.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.

PRESSURE TEST

(1) Disconnect pressure test cable from pressure transducer.
(2) Disconnect adapter and test hose from tee fitting.
(3) Install cap on tee fitting at port A.
(4) Remove cap from tee fitting on port B.
(5) Install adapter and test hose on tee fitting at port B.
(6) Connect pressure test cable to transducer and to Test Set.
(7) Start engine (TM 9-2320-366-10-1)
(8) Position PTO switch to on (TM 9 -2320-366-10-1).

CAUTION

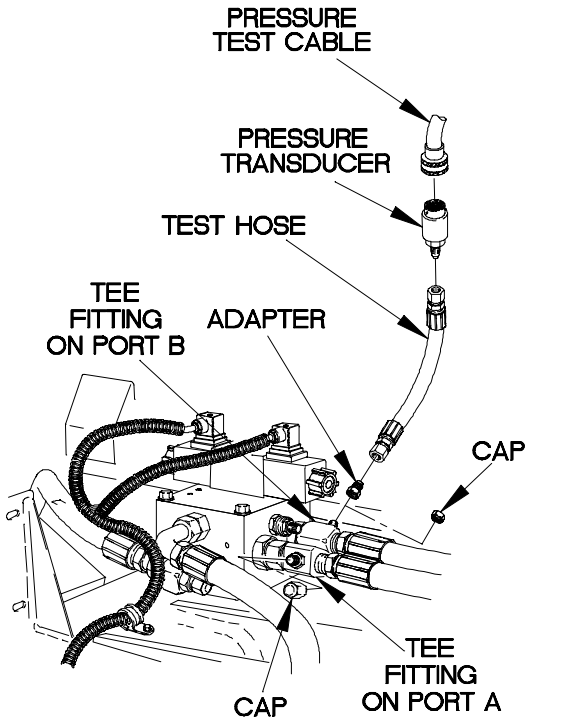
Keep tachometer within 1,250-1,450 RPM when PTO is engaged. Failure to comply may result in damage to equipment.

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 to 1250-1450 RPM (TM 9-2320-366-10-1).

Test continued on page 2-1072.9.



PRESSURE TEST (CONT)

Test continued from page 2-1072.7.

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 UP position will force hydraulic oil through relief valve and cause oil temperature to rise.

Measure hydraulic oil temperature near bottom of hydraulic reservoir.

(10) Attach a temperature indicator sticker to hydraulic oil tank.
(11) Press and hold DUMP BED UP/DOWN switch in the DOWN position (TM 9-2320-366-10-1) until hydraulic oil temperature reaches 145°F-155°F (63°C-68°C).

NOTE

Note location of pressure reducing valve adjusting screw before performing step (12).

(12) If 325-375 PSI (2,241-2,586 kPa) is not present loosen lock nut on pressure reducing adjusting screw. Turn adjusting screw counter clockwise to lower pressure, clockwise to raise pressure.
(13) If pressure cannot be adjusted, clean or replace pressure reducing valve (para 17-3).
(14) If pressure can be adjusted, replace dump body cylinder (para 17-4).

NOTE

Hold pressure reducing valve adjusting screw while tightening lock nut.

(15) Tighten locking nut on adjusting screw.

NOTE

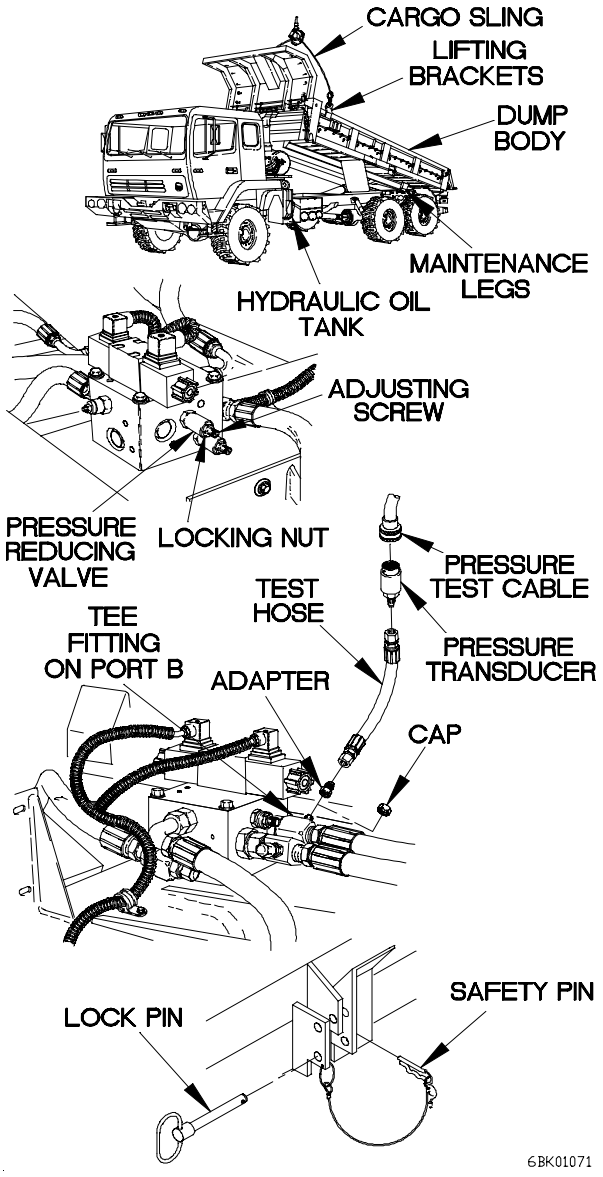
In the event of a tachometer failure, a HAND THROTTLE lever positioned to full down is approximately 750 RPM.

(16) Set engine speed to idle 750 RPM (TM 9-2320-366-10-1).
(17) Position PTO switch to off (TM9-2320-366-10-1).
(18) Shut down engine (TM 9-2320-366-10-1).

Test continued at top of page.

PRESSURE TEST (CONT)

(19) Disconnect pressure test cable from pressure transducer.
(20) Disconnect test hose and adapter from tee fitting.
(21) Install cap on tee fitting.
(22) Raise dump body (TM 9-2320-366-10-1).
(23) Place maintenance legs in stowed position.
(24) Lower dump body (TM 9-2320-366-10-1).
(25) Remove cagro sling from two dump body lifting brackets.
(26) Position two locking pins in dump body.
(27) Install safety pins in two locking pins.



k2. DUMP BODY DOES NOT LOWER

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)
Lifting Bracket, Dump Body (2) (Item 8, Appendix D)
Gloves, Mens (Item 34.2, Appendix C)
STE/ICE-R (Item 70, Appendix B)

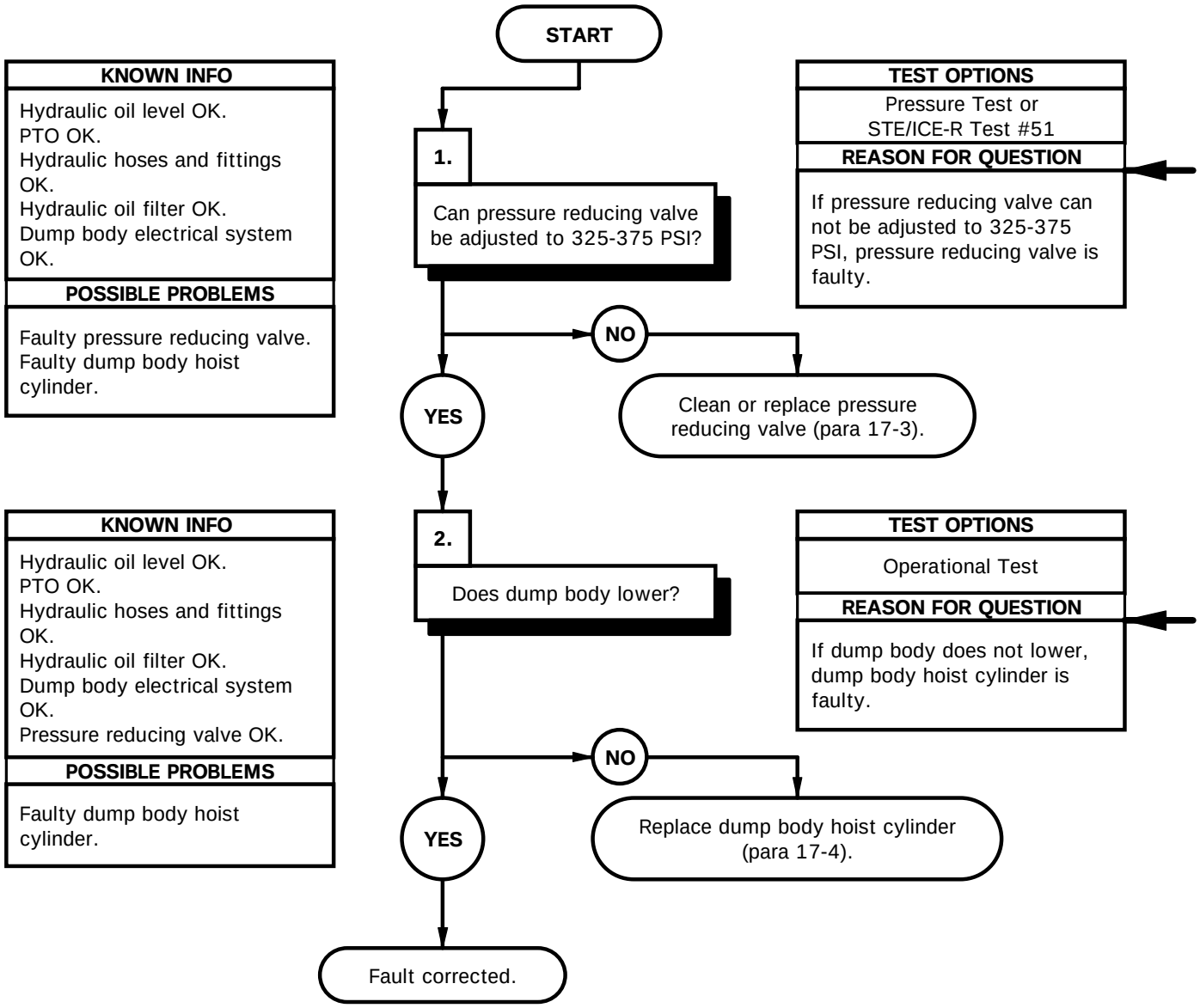
Materials/Parts
Rag, Wiping (Item 60, Appendix C)

Personnel Required
(2)

References
TM 9-4910-571-12&P

NOTE

Perform Electrical System Troubleshooting e144. Dump Body Does Not Lower (TM 9-2320-366-20-2) prior to beginning this task.



PRESSURE TEST
(1) Perform pressure reducing valve adjustment (para 17-3). (2) If pressure reducing valve cannot be adjusted to 325-375 PSI, clean or replace presuure reducing valve (para 17-3).

OPERATIONAL TEST
(1) Attempt to lower dump body (TM 9-2320-366-10-1). (2) If dump body does not lower, replace dump body hoist cylinder (para 17-4). (3) If dump body does lower, fault corrected.

k3. DUMP BODY DRIFTS DOWN FROM RAISED POSITION

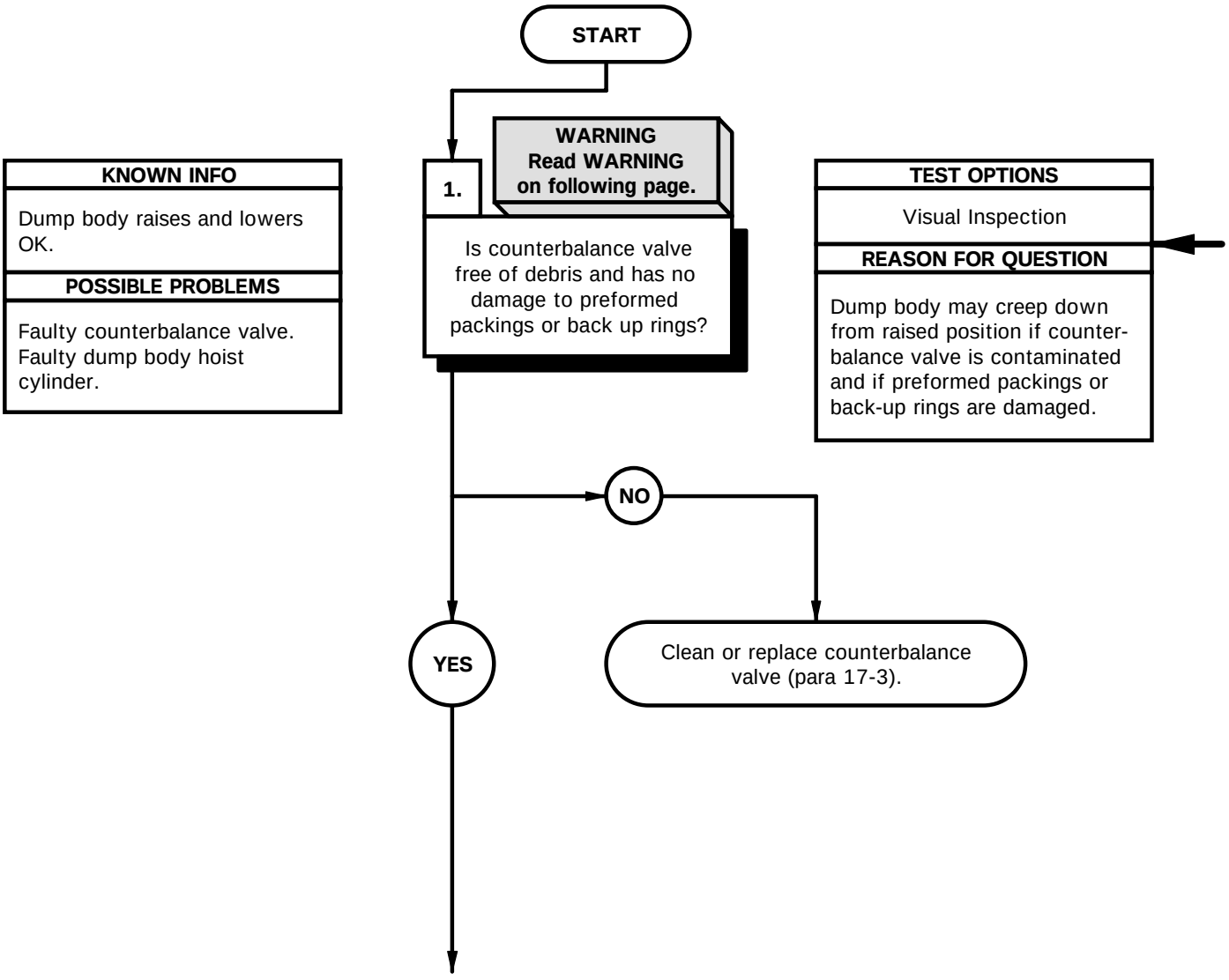
INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 78, Appendix B)
Pan, Drain (Item 42, Appendix B)
Gloves, Mens (Item 40.1, Appendix C)

Materials/Parts
Rag, Wiping (Item 60, Appendix C)

Personnel Required
(2)



WARNING

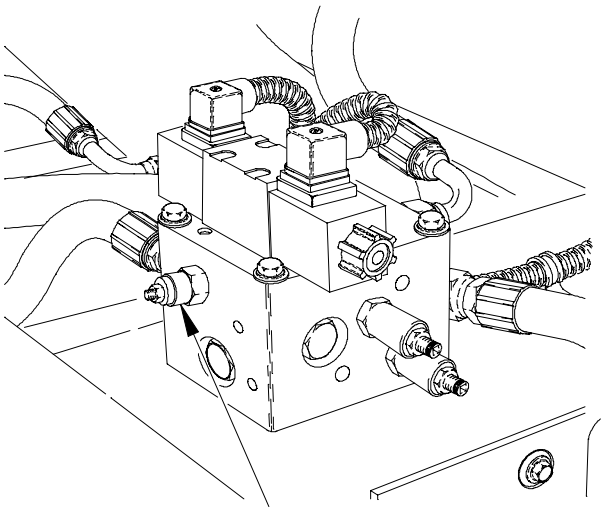
Dump body weighs approximately 3,030 lbs. (1,376 kgs). Use care while performing valve adjustments and pressure checks. Stay clear of dump body while operating. Failure to comply may result in injury to personnel.

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.

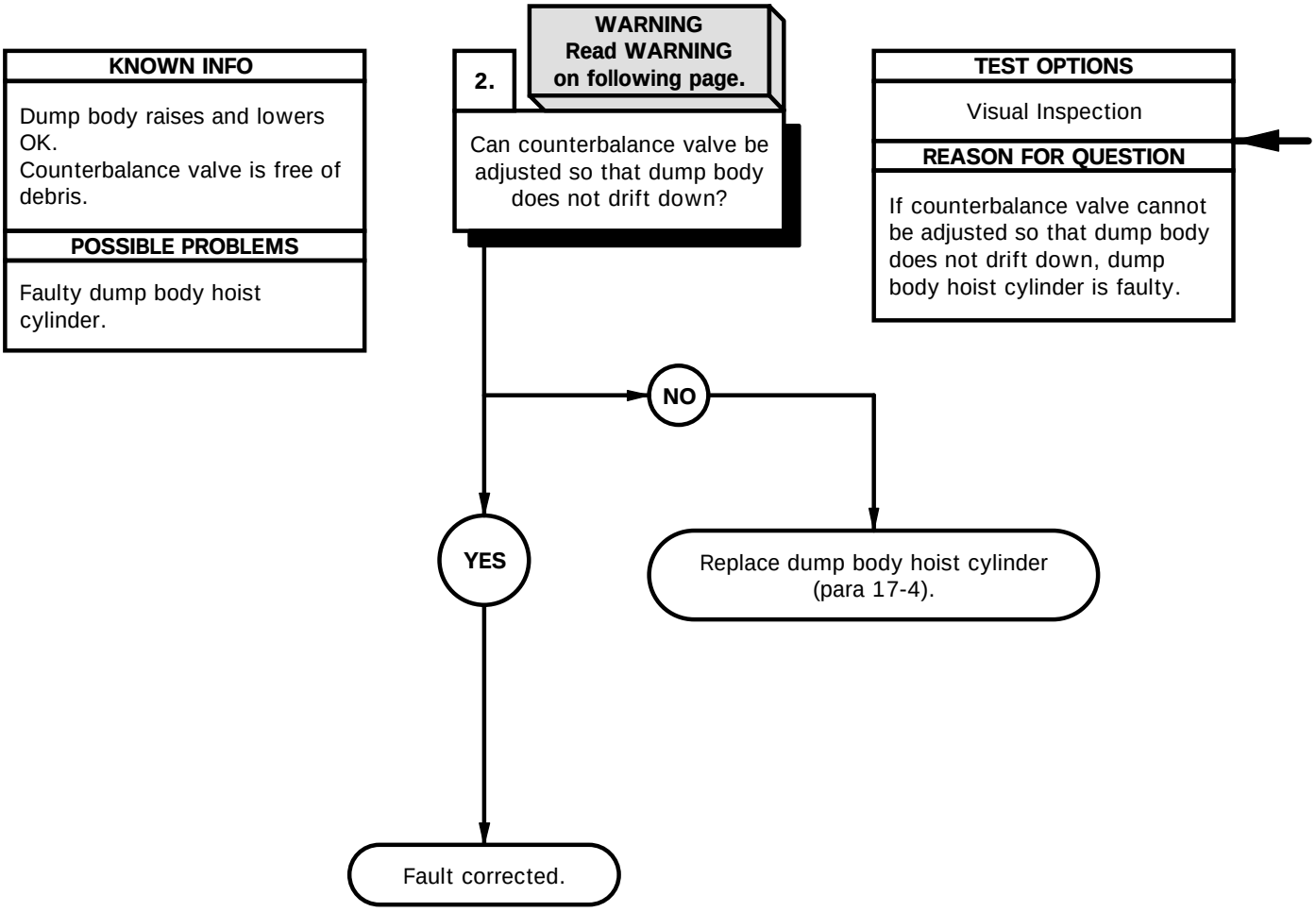
Prolonged contact with lubricating oil (MIL-L-2104) may cause a skin rash. Skin and clothing that come in contact with lubricating oil should be thoroughly washed immediately. Saturated clothing should be removed immediately. Areas in which lubricating oil is used should be well ventilated to keep fumes 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 four-way relief valve (para 17-3).
(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 four-way relief valve (para 17-3).



k3. DUMP BODY DRIFTS DOWN FROM RAISED POSITION (CONT)



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 17-3).
(2) If counterbalance valve cannot be adjusted so that dump body does not drift down, replace dump body hoist cylinder (para 17-4).
(3) If counterbalance valve can be adjusted so that dump body does not drift down, fault corrected.

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
l1.	M1084/M1086 Material Handling Crane (MHC) Hydraulic Functions Operate Slowly	2-1074
l2.	M1084/M1086 Material Handling Crane (MHC) Left Outrigger (Jack) Drifts or Does Not Work	2-1082
l3.	M1084/M1086 Material Handling Crane (MHC) Right Outrigger (Jack) Drifts or Does Not Work	2-1086
l4.	M1084/M1086 Material Handling Crane (MHC) Mast Does Not Erect or Stow	2-1090
l5.	M1084/M1086 Material Handling Crane (MHC) Hoist Does Not Work	2-1094
l6.	M1084/M1086 Material Handling Crane (MHC) Boom Swing Drive Assembly Does Not Work	2-1098
l7.	M1084/M1086 Material Handling Crane (MHC) Boom Does Not Telescope In or Out	2-1100
l8.	M1084/M1086 Material Handling Crane (MHC) Swing, Telescope, Boom, and Hoist Do Not Work	2-1104
l9.	M1084/M1086 Material Handling Crane (MHC) Boom Does Not Lift Up or Down or Hold Under Load	2-1106

I1. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HYDRAULIC FUNCTIONS OPERATE SLOWLY

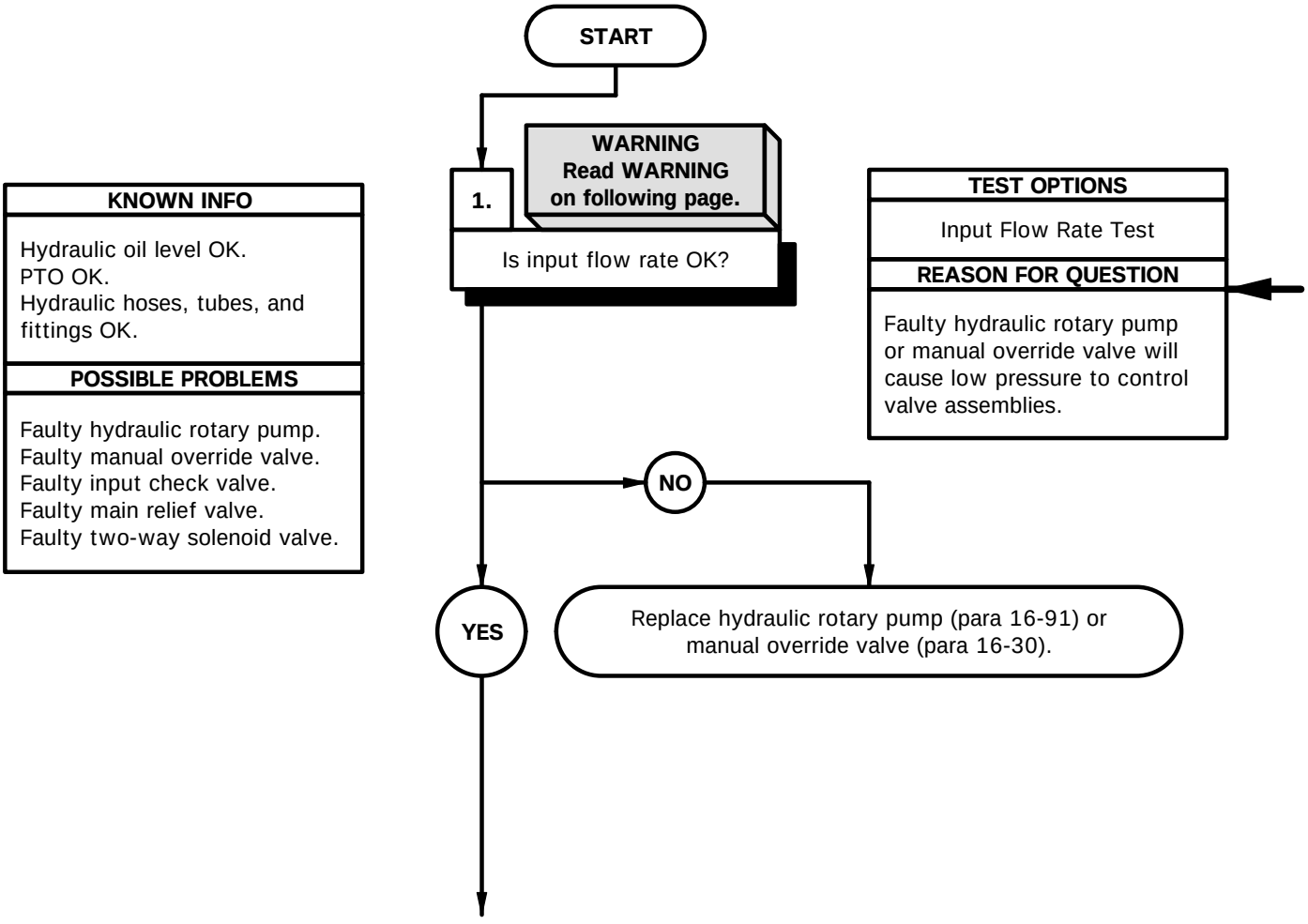
INITIAL SETUP

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

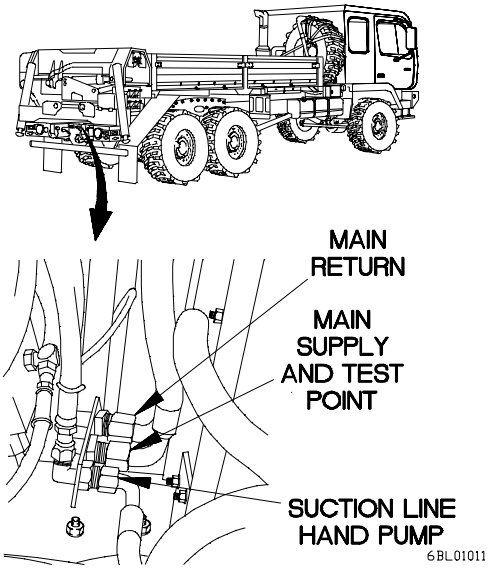
- **Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.**
- **Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical 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

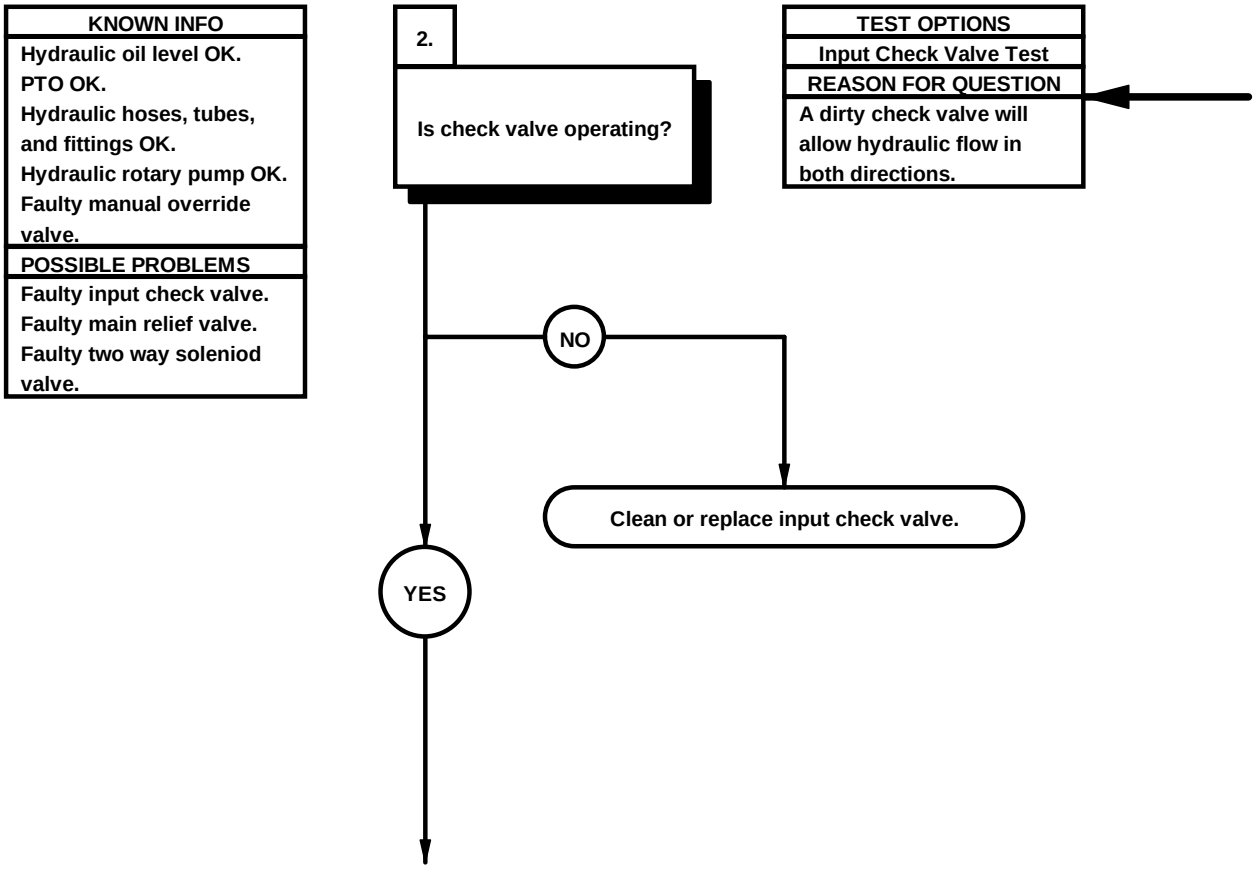
Do not apply crane electrical power, unless step requires crane power.

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.

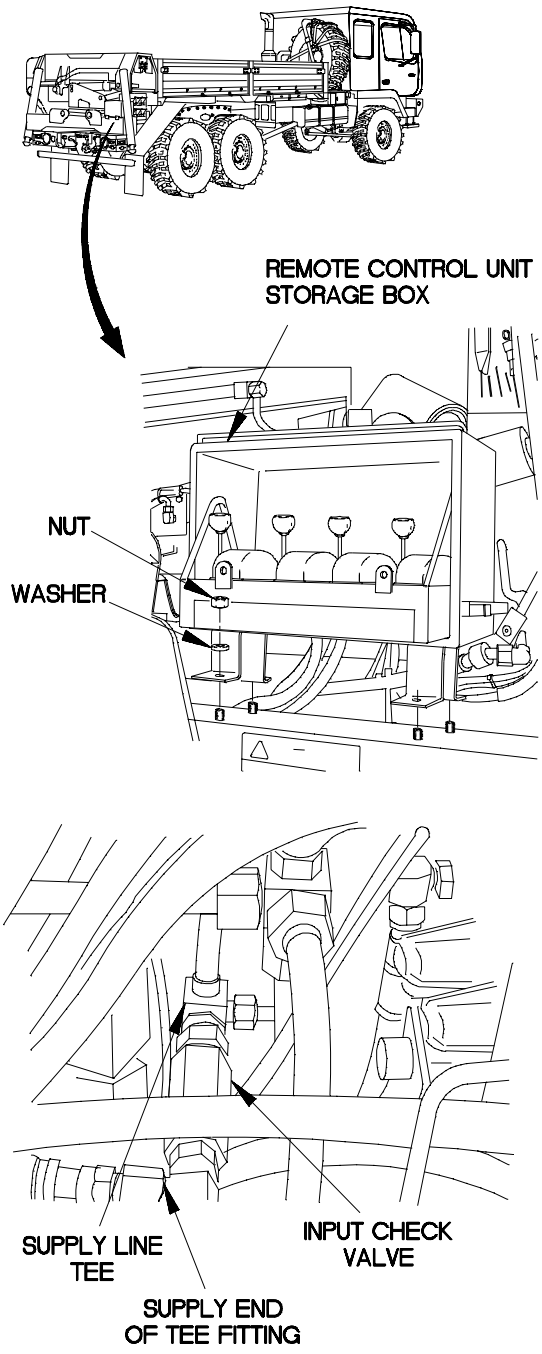


I1. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HYDRAULIC FUNCTIONS OPERATE SLOWLY (CONT)

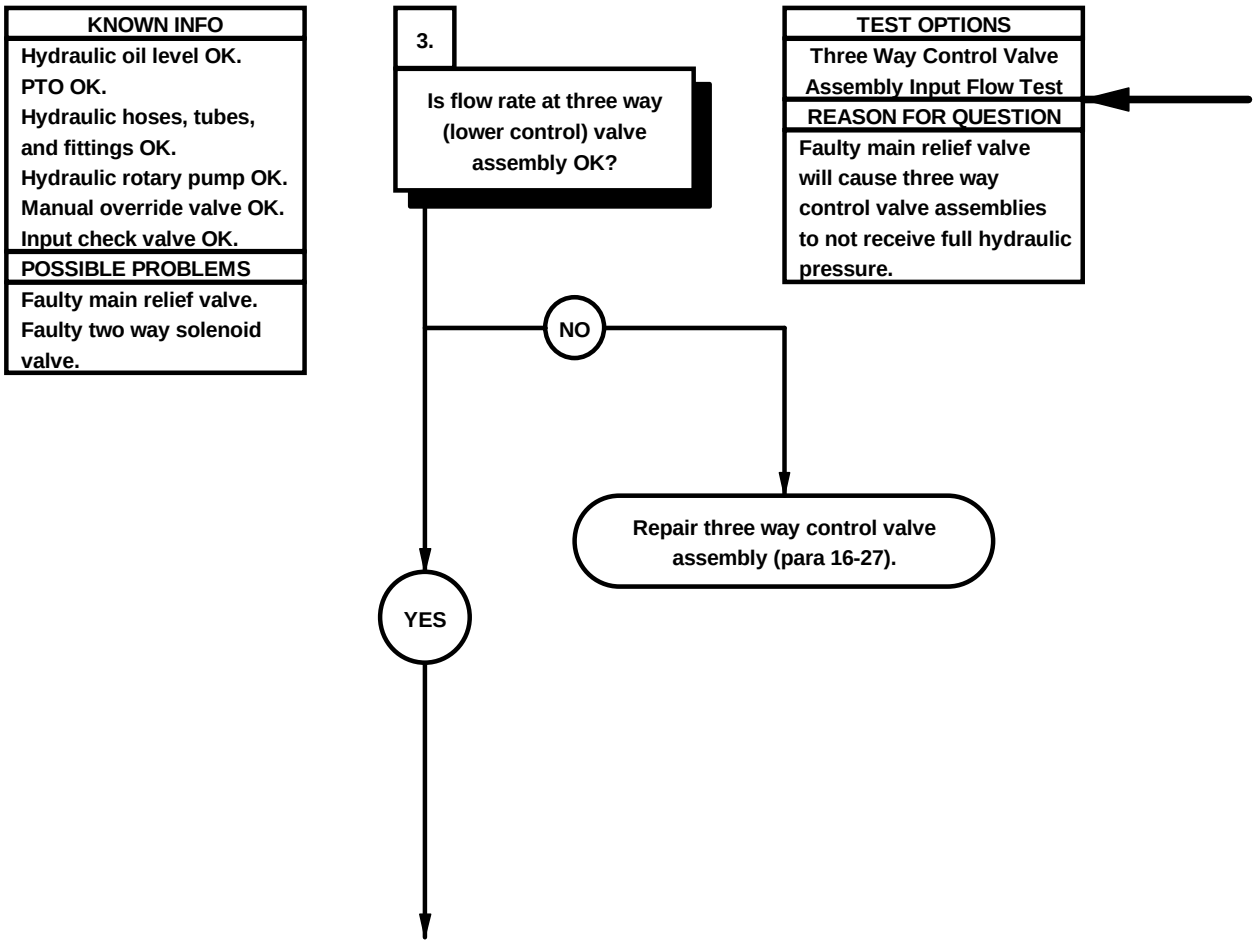


INPUT CHECK VALVE TEST

(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.

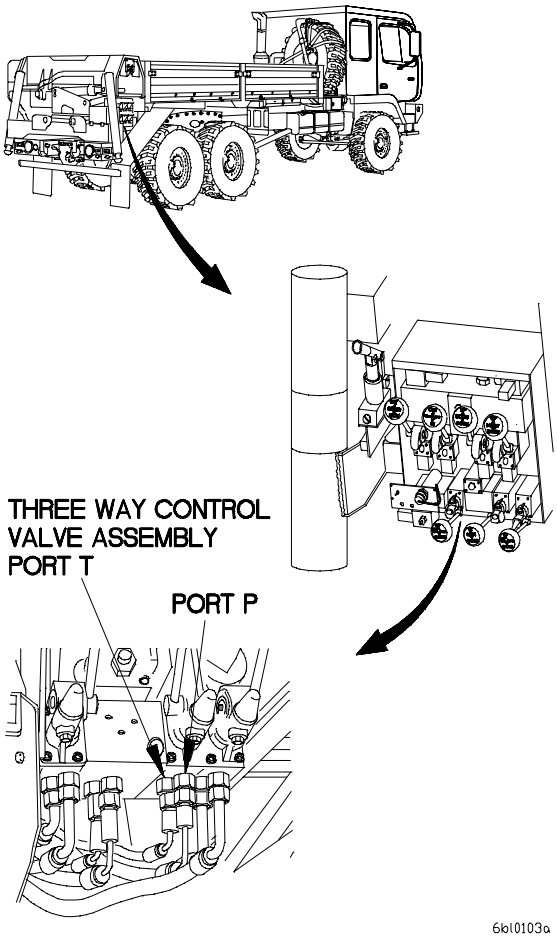


I1. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HYDRAULIC FUNCTIONS OPERATE SLOWLY (CONT)

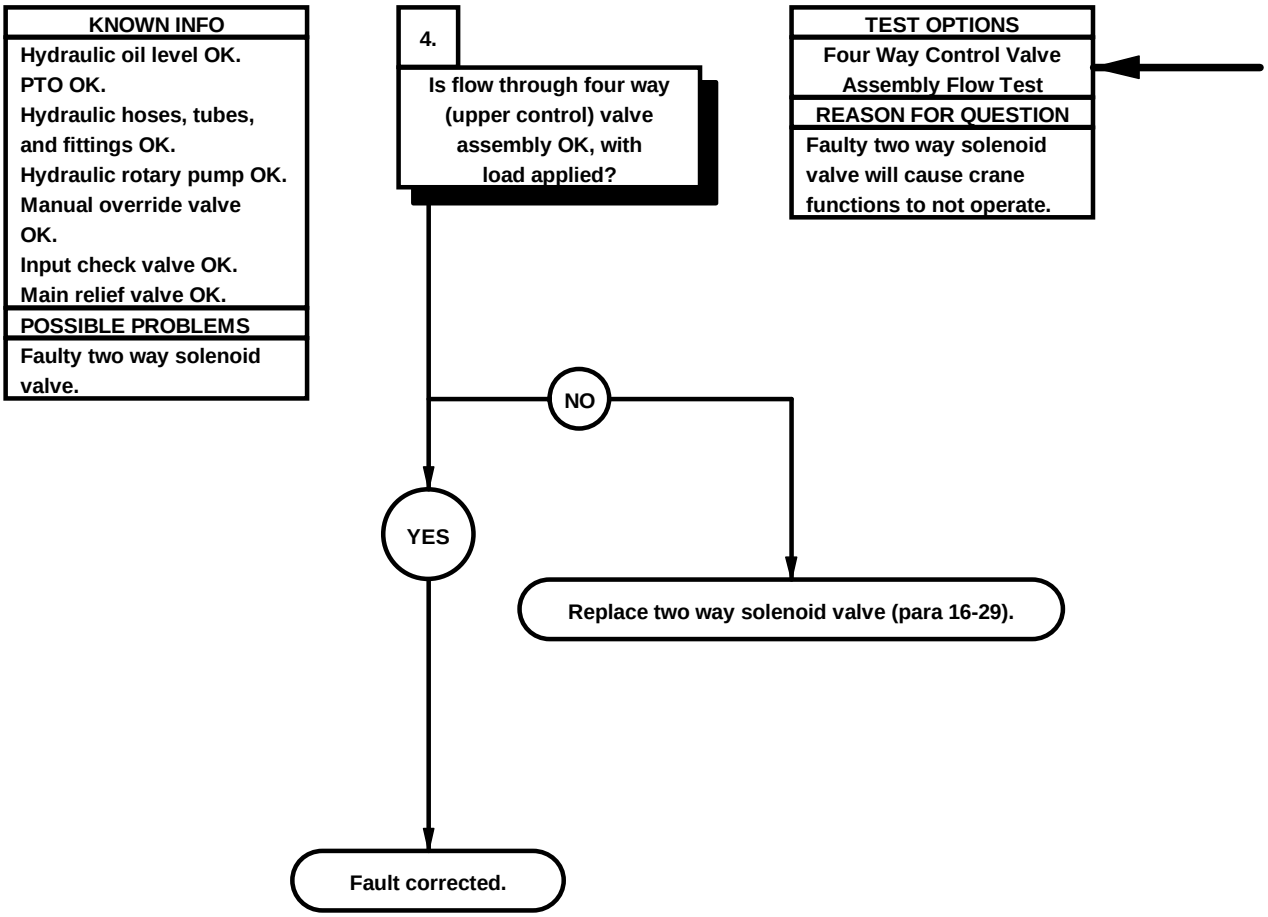


THREE WAY CONTROL VALVE ASSEMBLY INPUT FLOW TEST

(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.

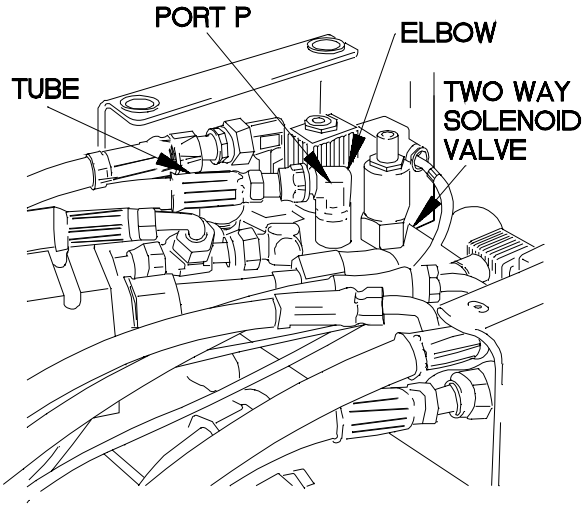


I1. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HYDRAULIC FUNCTIONS OPERATE SLOWLY (CONT)



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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I2. M1084/M1086 MATERIAL HANDLING CRANE (MHC) LEFT OUTRIGGER (JACK) DRIFTS OR DOES NOT WORK

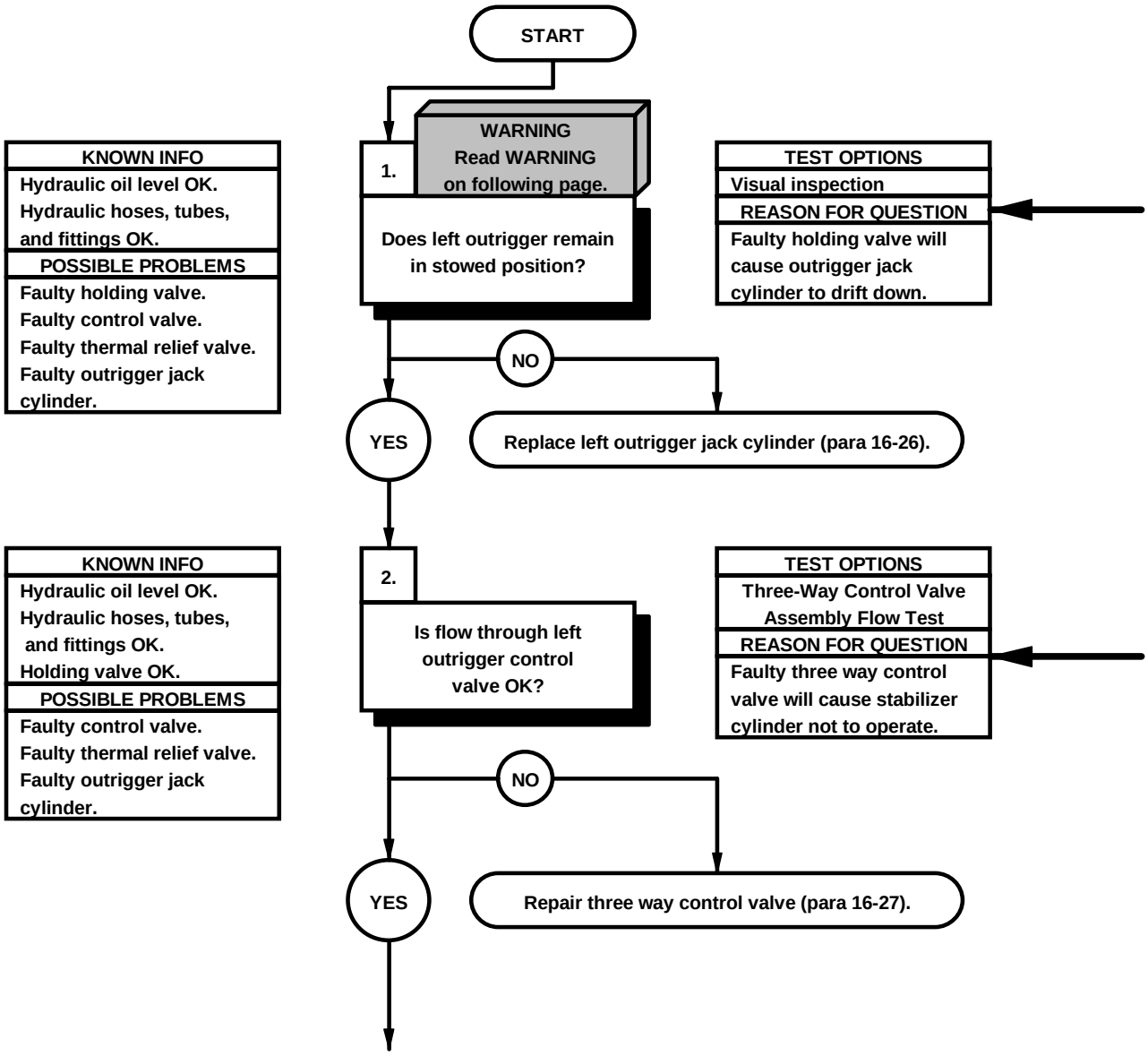
INITIAL SETUP

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

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)
Fitting (Item 32, Appendix C)
Adapter, Pipe (Item 1, Appendix C)
Reducer, Tube (Item 61, Appendix C)



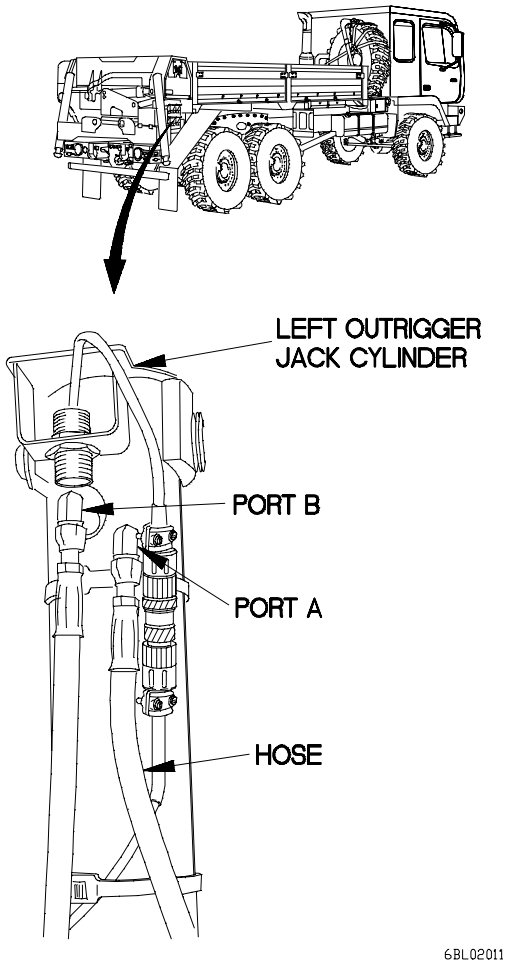
WARNING

- **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.**

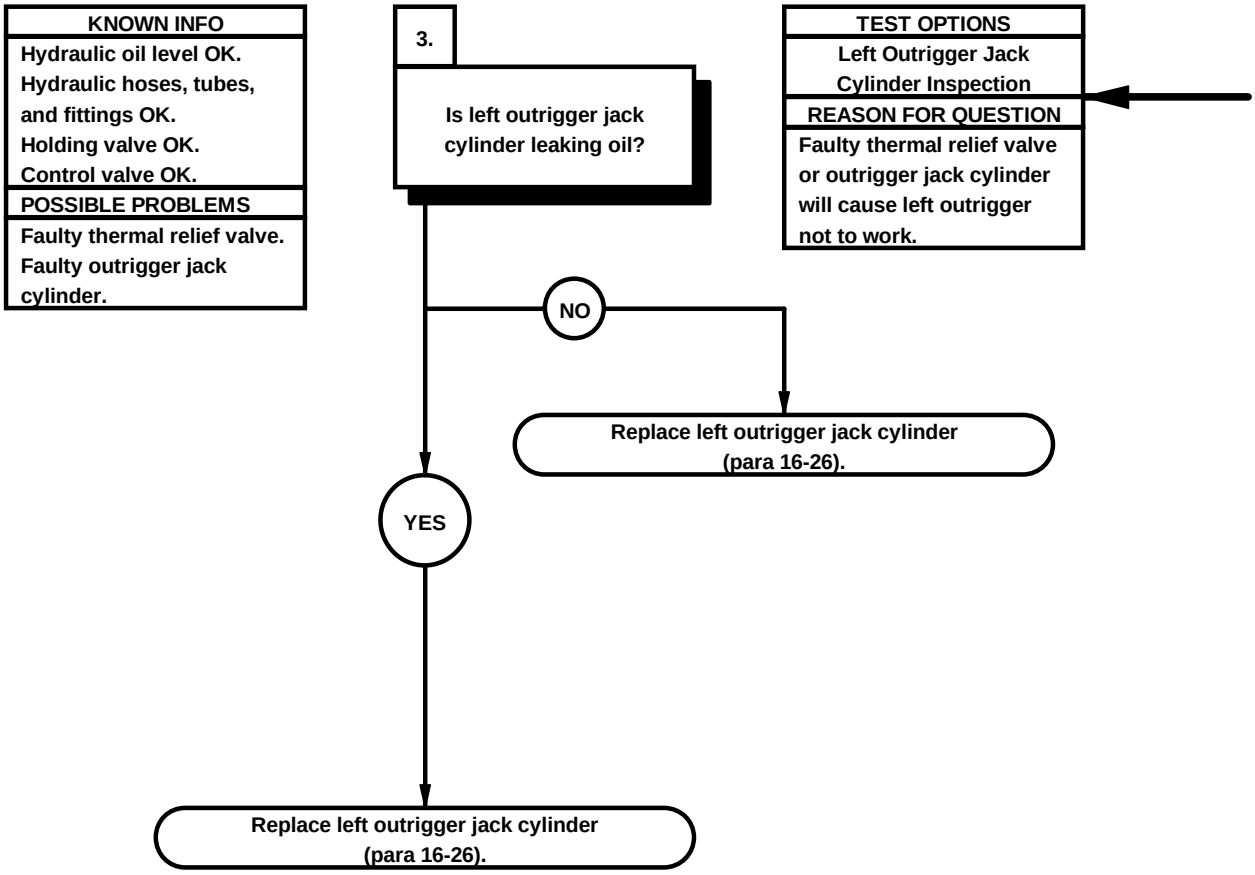
Check position of left outrigger to verify that it is held in the stowed position. If left outrigger will not remain stowed over a period of time, holding valve (in outrigger jack cylinder) is faulty.

THREE-WAY CONTROL VALVE ASSEMBLY FLOW TEST

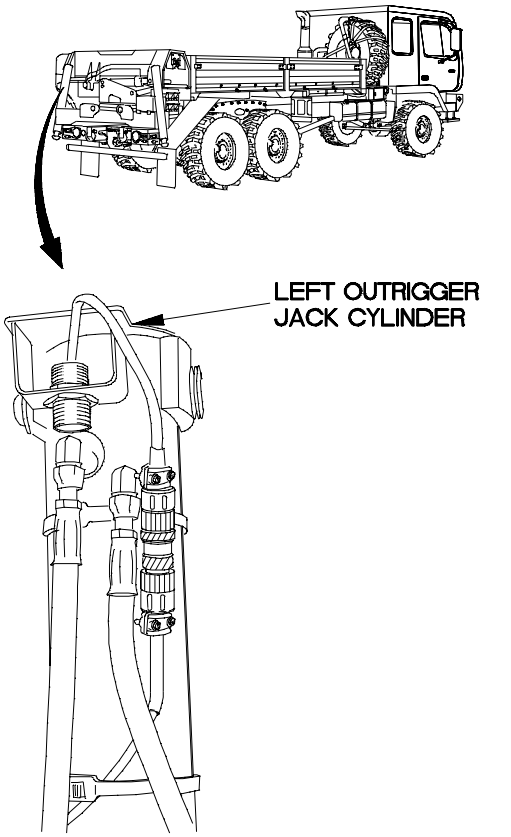
(1) Place drain pan under vehicle.
(2) Disconnect hose from right port (A) on top of left outrigger jack cylinder.
(3) Connect hydraulic tester between hose and port A with test hoses and adapters.
(4) Start engine (TM 9-2320-366-10-1).
(5) Position PTO switch to on (TM 9-2320-366-10-1).
(6) Increase 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.



I2. 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).



I3. M1084/M1086 MATERIAL HANDLING CRANE (MHC) RIGHT OUTRIGGER (JACK) DRIFTS OR DOES NOT WORK

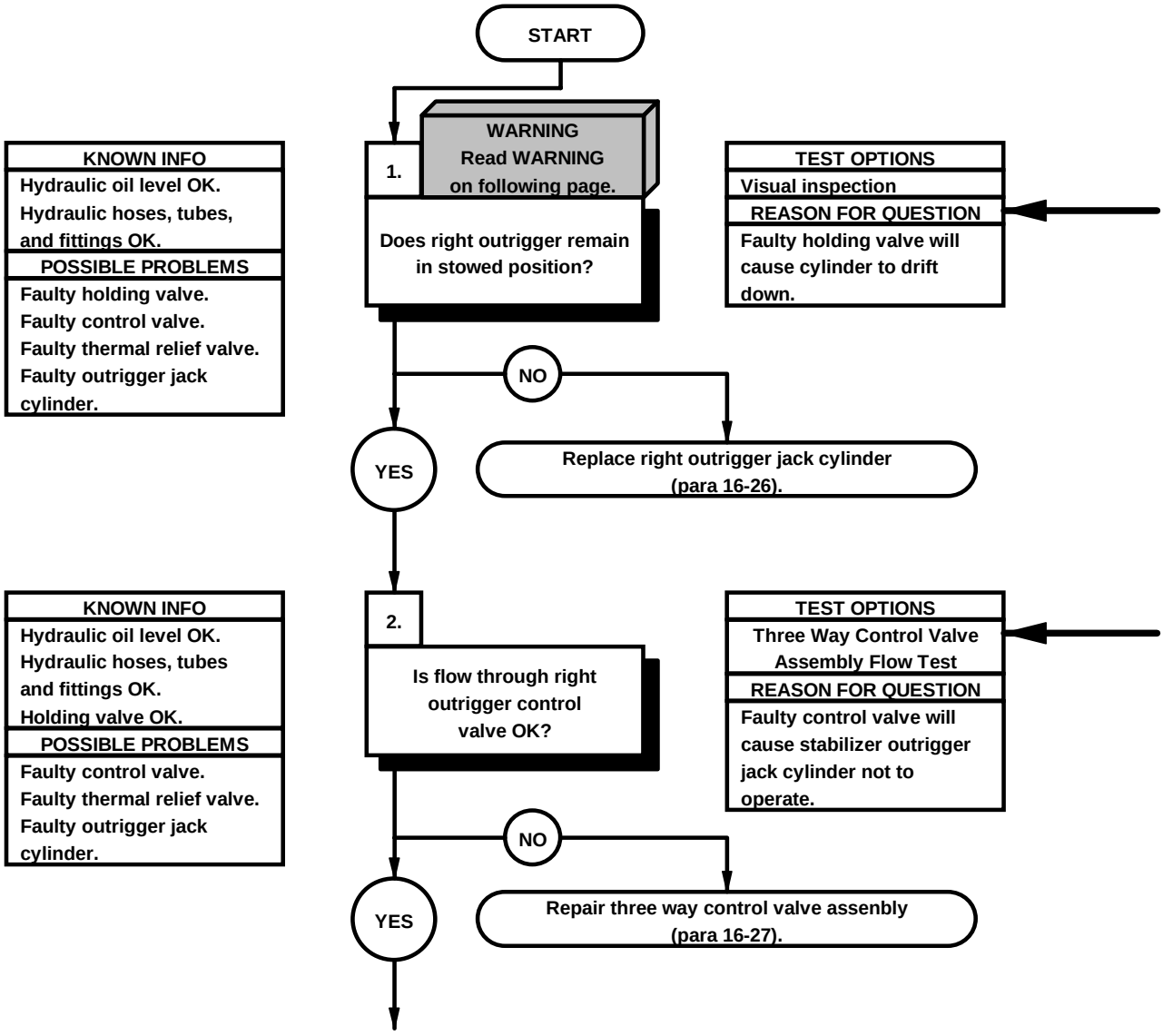
INITIAL SETUP

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

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)
Fitting (Item 32, Appendix C)
Adapter, Pipe (Item 1, Appendix C)
Reducer, Tube (Item 61, Appendix C)



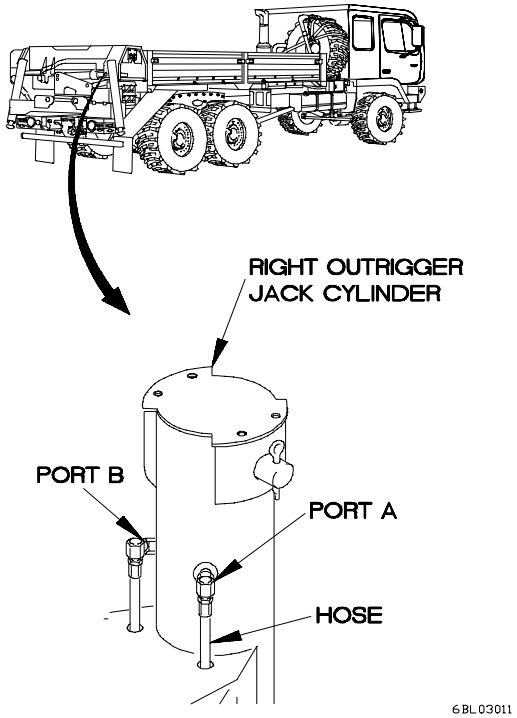
WARNING

- **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.**

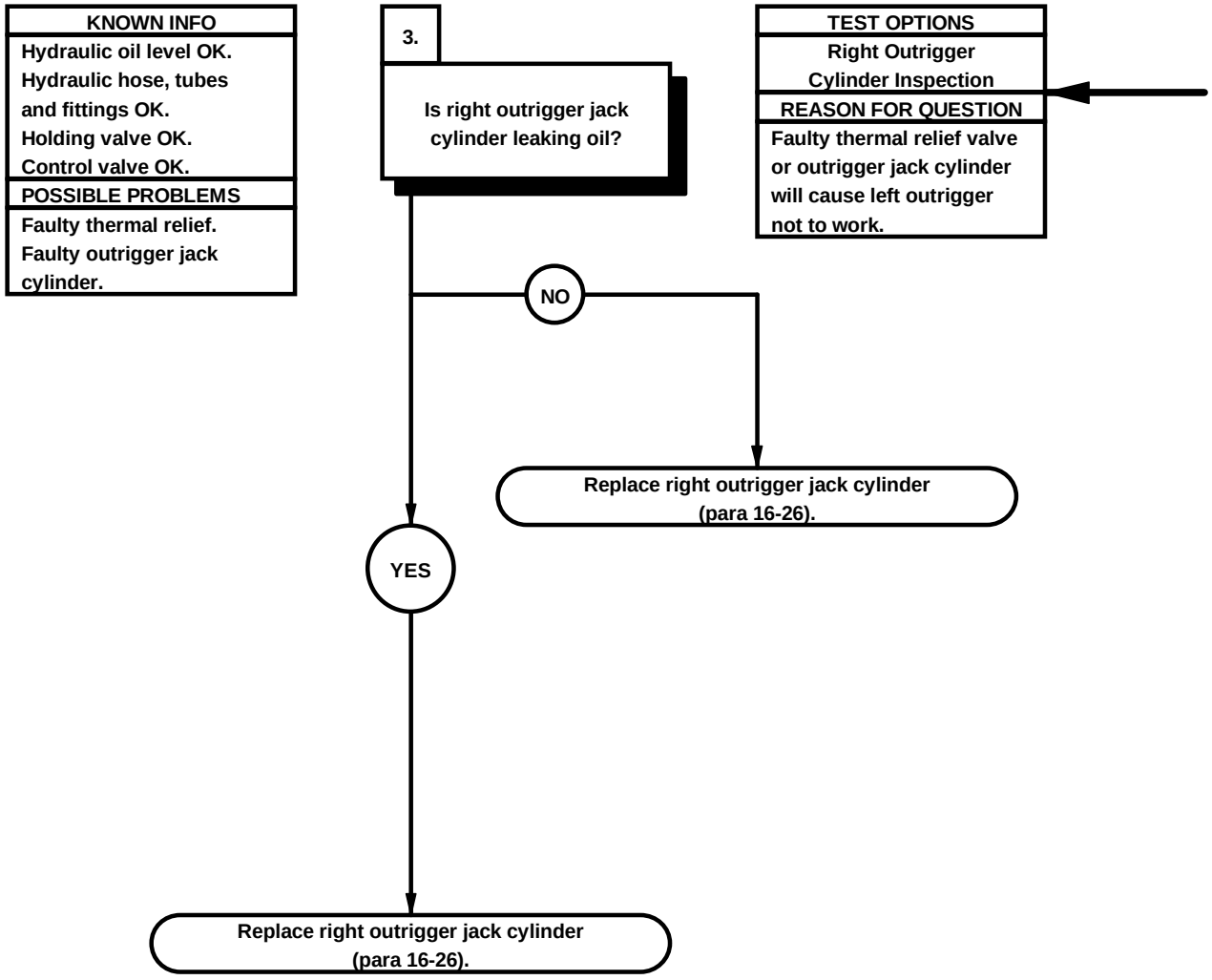
Check position of right outrigger to verify that it is held in the stowed position. If right outrigger will not remain stowed over a period of time, holding valve (in outrigger jack cylinder) is faulty.

THREE WAY CONTROL VALVE ASSEMBLY FLOW TEST

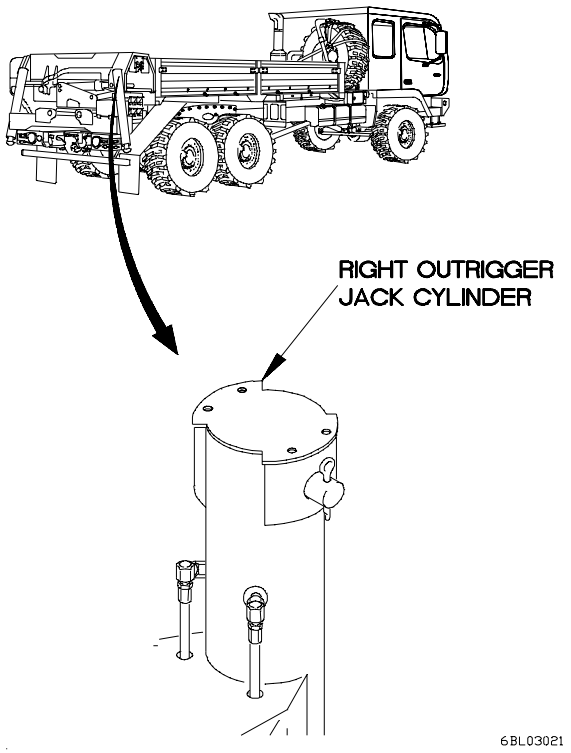
(1) Place drain pan under vehicle.
(2) Disconnect hose from right port A on top of right outrigger jack cylinder.
(3) Connect hydraulic tester between hose and port P with test hoses and adapters.
(4) Start engine (TM 9-2320-366-10-1).
(5) Position PTO switch to on (TM 9-2320-366-10-1).
(6) Increase 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.



I3. M1084/M1086 MATERIAL HANDLING CRANE (MHC) RIGHT OUTRIGGER (JACK) DRIFTS OR DOES NOT WORK (CONT)



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).



I4. M1084/1086 MATERIAL HANDLING CRANE (MHC) MAST DOES NOT ERECT OR STOW

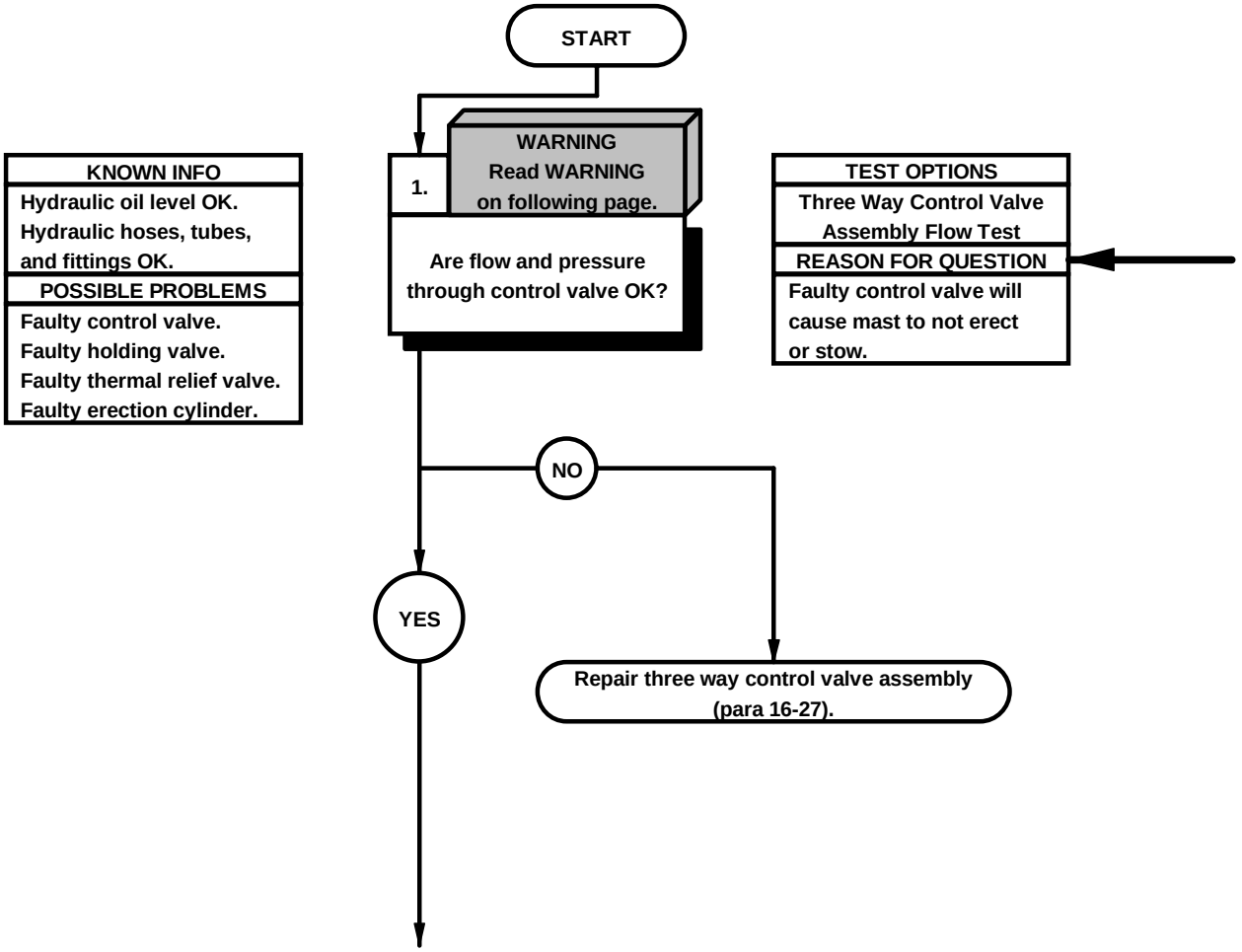
INITIAL SETUP

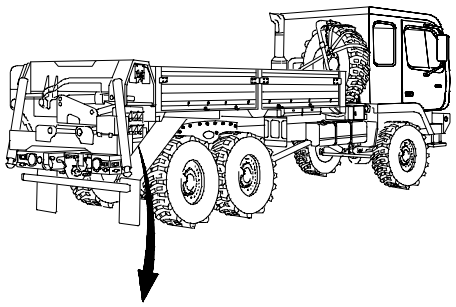
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).

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)

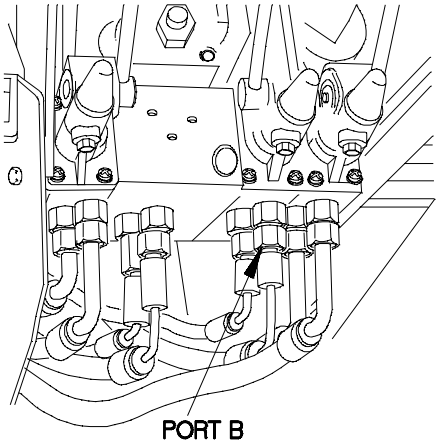
Materials/Parts
Rag, Wiping (Item 60, Appendix C)
Hose (2) (Item 40, Appendix C)
Fitting (2) (Item 31, Appendix C)
Fitting (Item 32, Appendix C)
Adapter, Swivel (Item 3, Appendix C)
Reducer, Tube (Item 61, Appendix C)
Adapter, Pipe (Item 1, Appendix C)
Adapter, Pipe (Item 2, Appendix C)





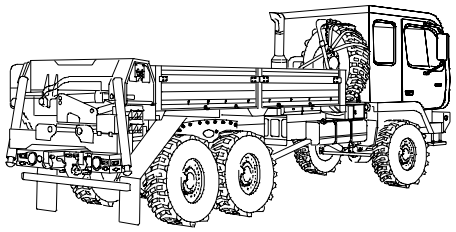
WARNING

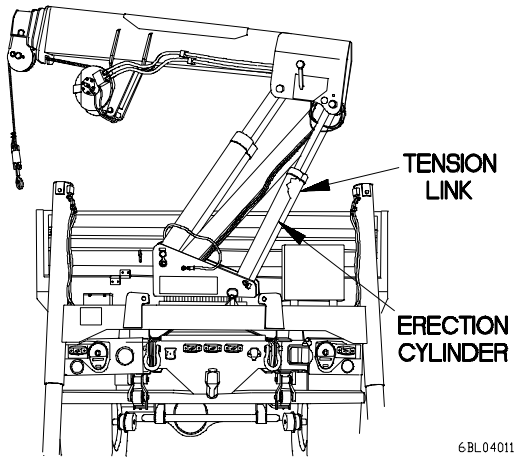
- **Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.**
- **Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical 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.**



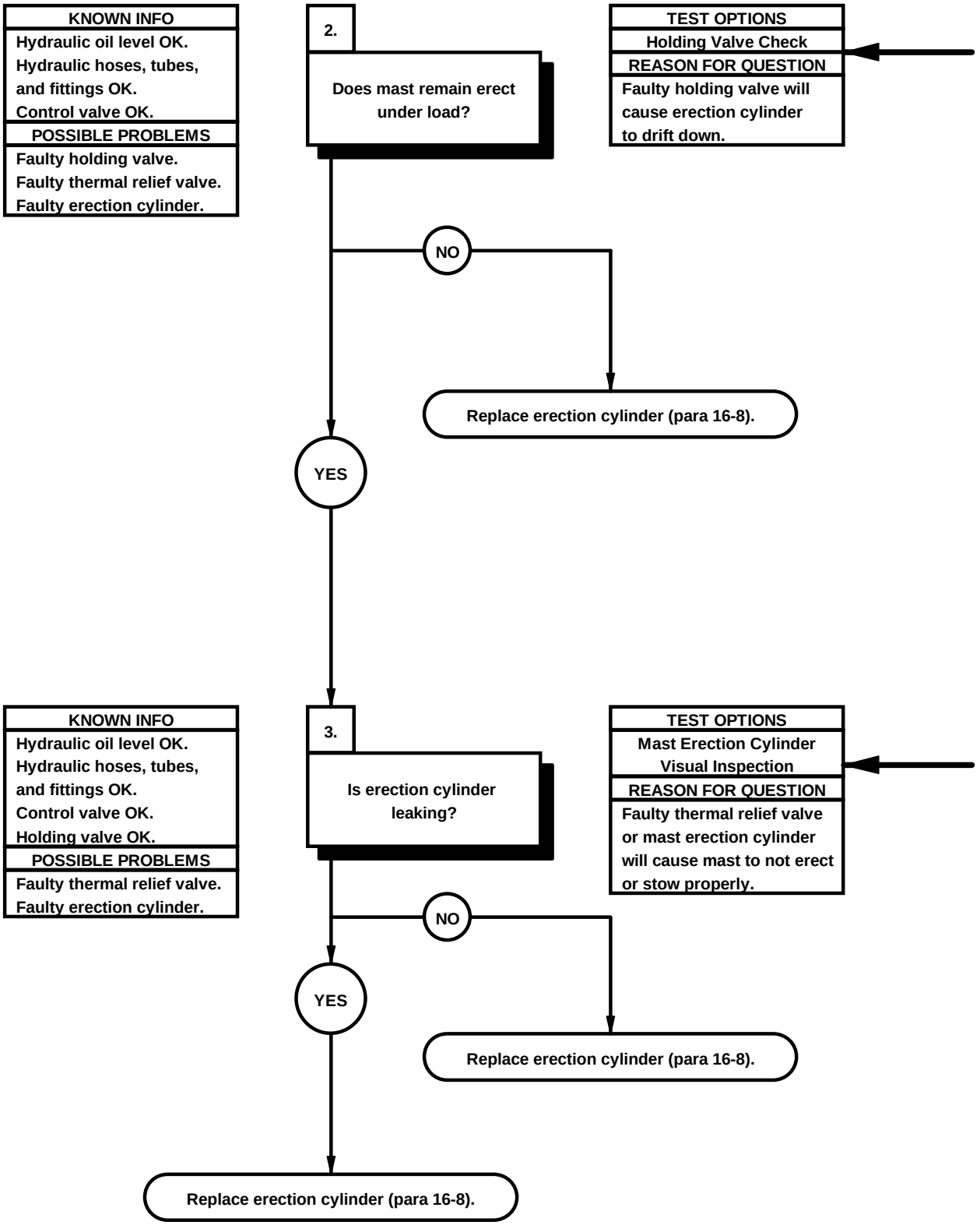
THREE WAY CONTROL VALVE ASSEMBLY FLOW TEST

(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.



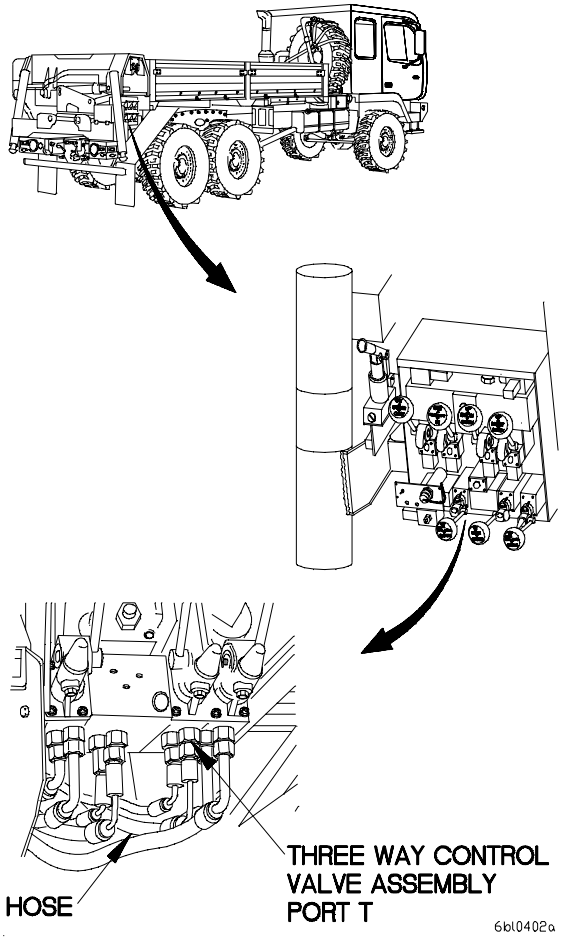


I4. M1084/M1086 MATERIAL HANDLING CRANE (MHC) MAST DOES NOT ERECT OR STOW (CONT)



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.



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.

I5. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HOIST DOES NOT WORK

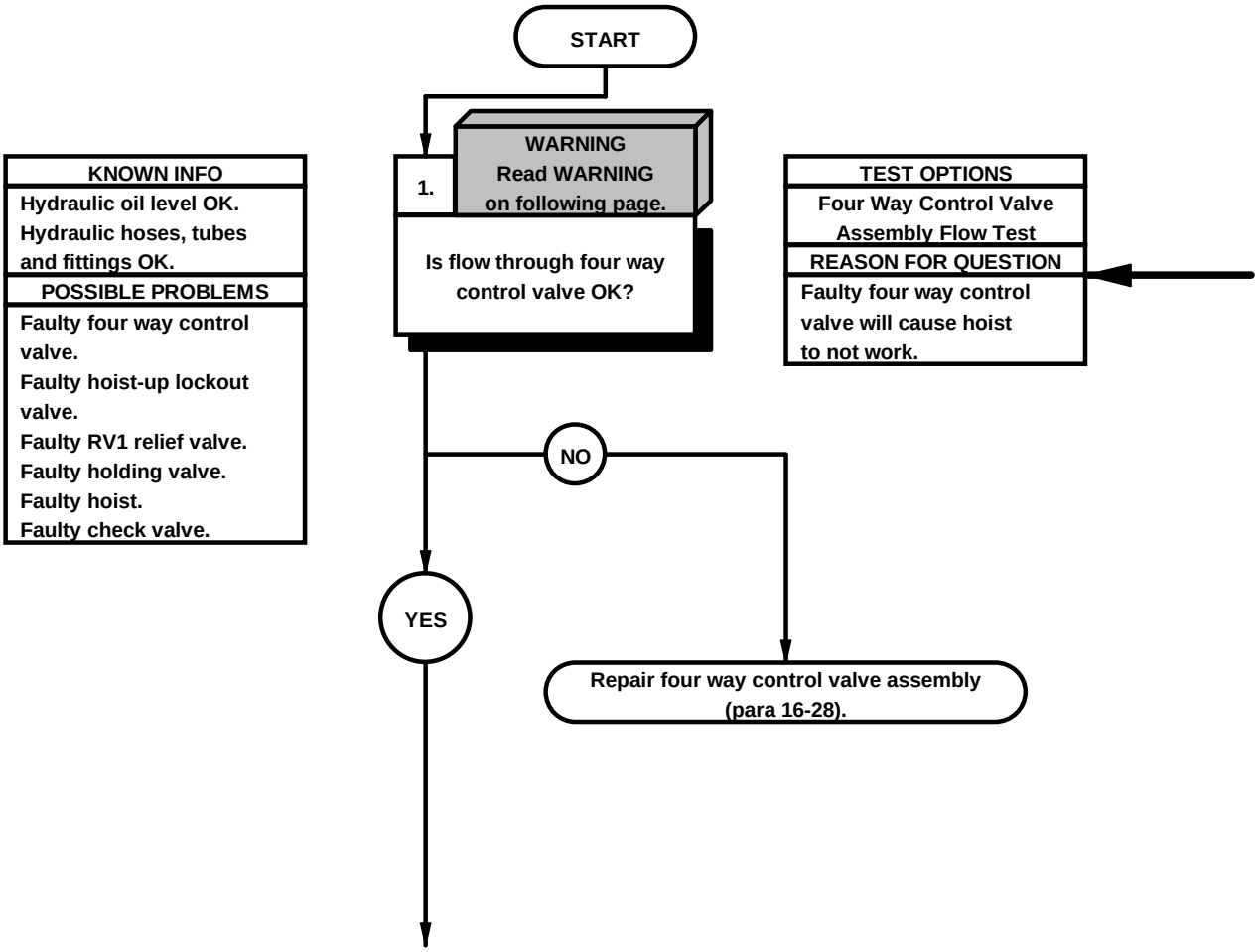
INITIAL SETUP

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)
STE/ICE-R (Item 70, 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)
Fitting (Item 32, Appendix C)
Adapter, Pipe (Item 2, Appendix C)
Adapter, Pipe (Item 1, Appendix C)



WARNING

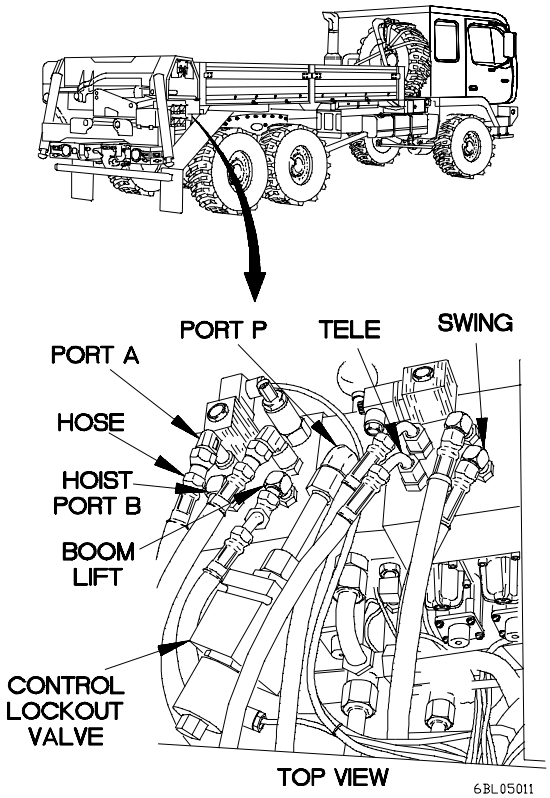
- **Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.**
- **Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical 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.**

FOUR WAY CONTROL VALVE ASSEMBLY FLOW TEST

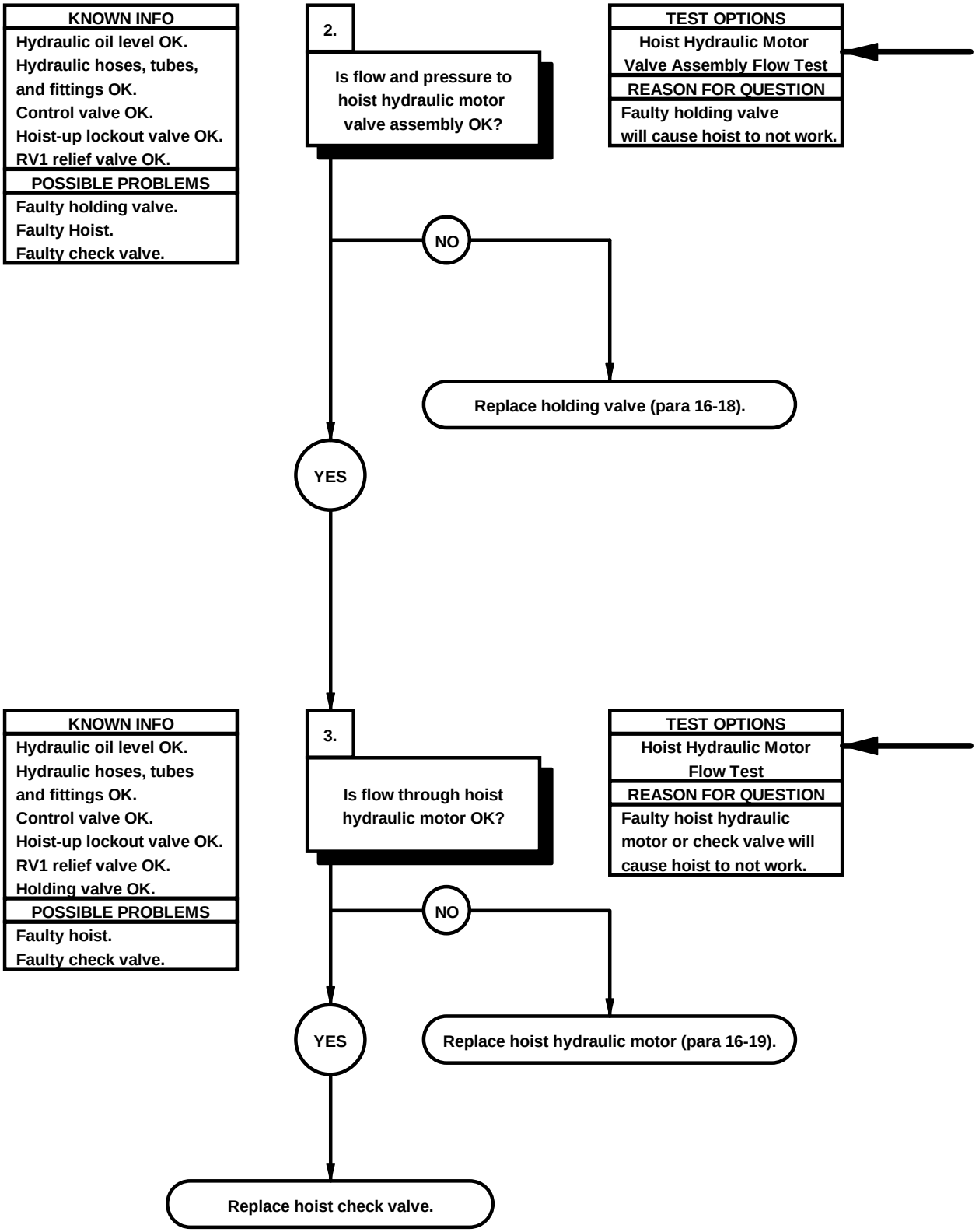
NOTE

- **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.



I5. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HOIST DOES NOT WORK (CONT)

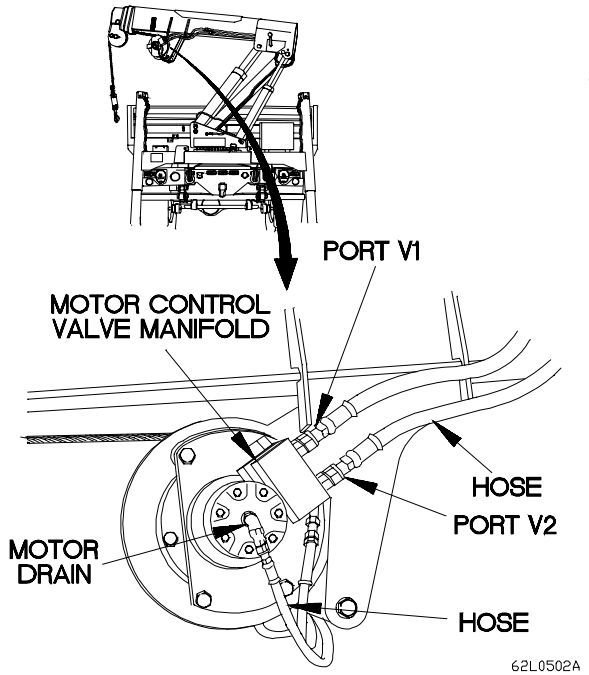


HOIST HYDRAULIC MOTOR VALVE ASSEMBLY FLOW TEST

(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.



I6. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM SWING ASSEMBLY DOES NOT WORK

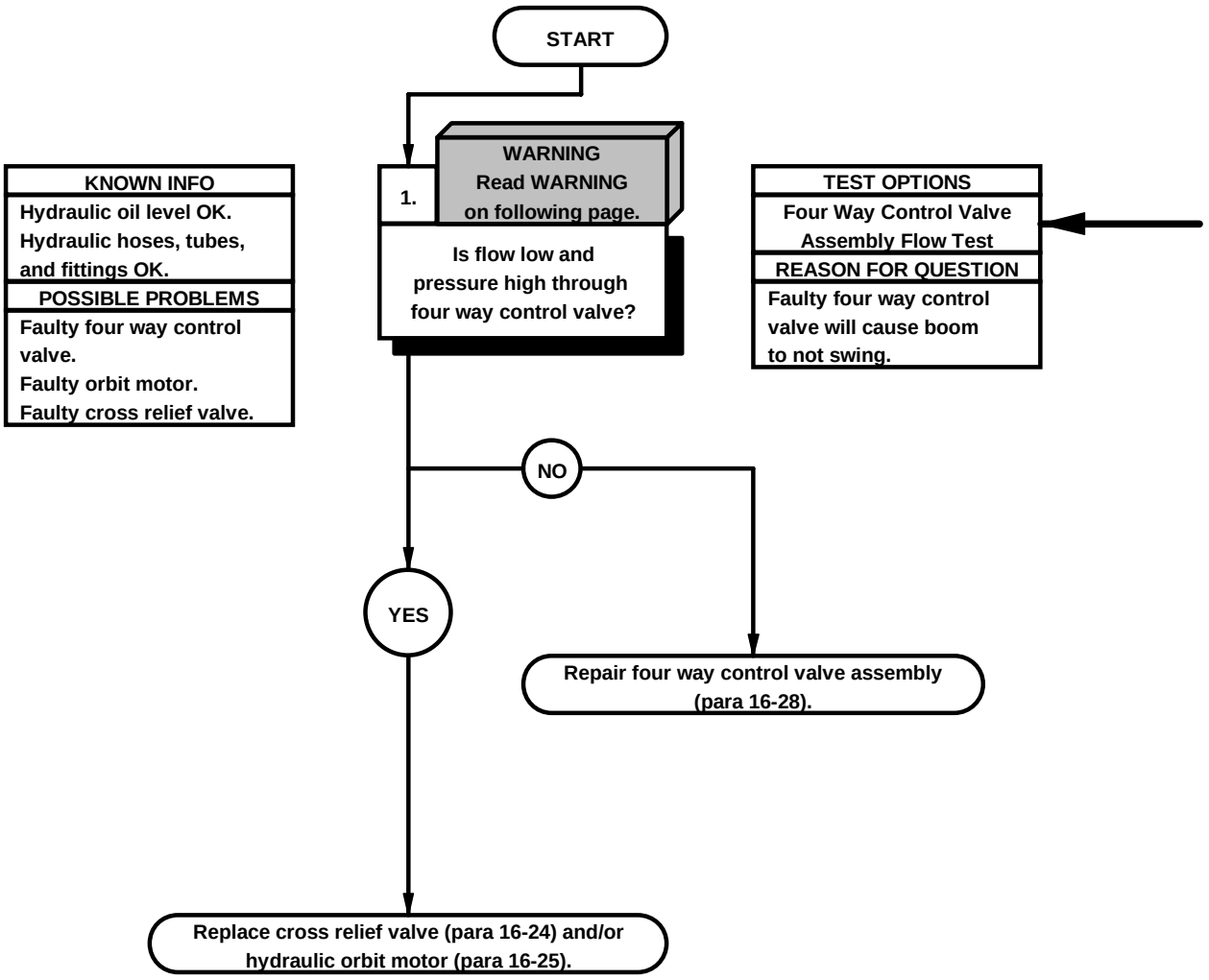
INITIAL SETUP

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

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, Swivel (Item 3, Appendix C)
Adapter, Pipe (Item 2, Appendix C)
Adapter, Pipe (Item 1, Appendix C)
Reducer, Tube (Item 61, Appendix C)



WARNING

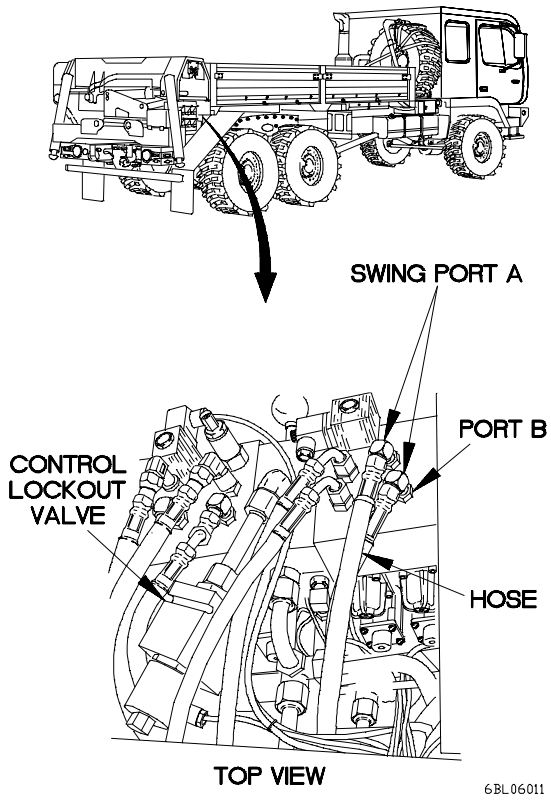
- **Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.**
- **Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical 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.**

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.



I7. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM DOES NOT TELESCOPE IN OR OUT

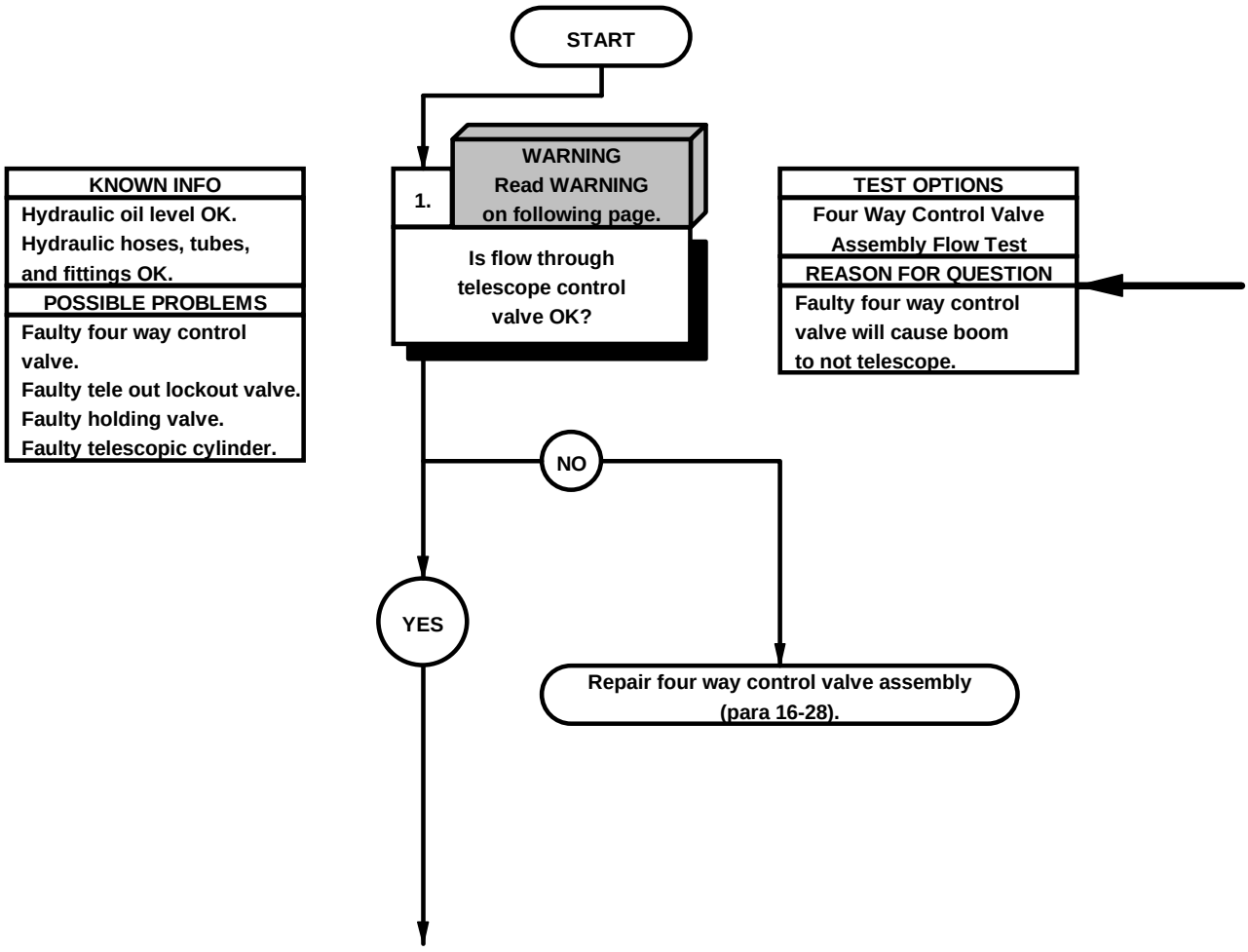
INITIAL SETUP

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

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)



WARNING

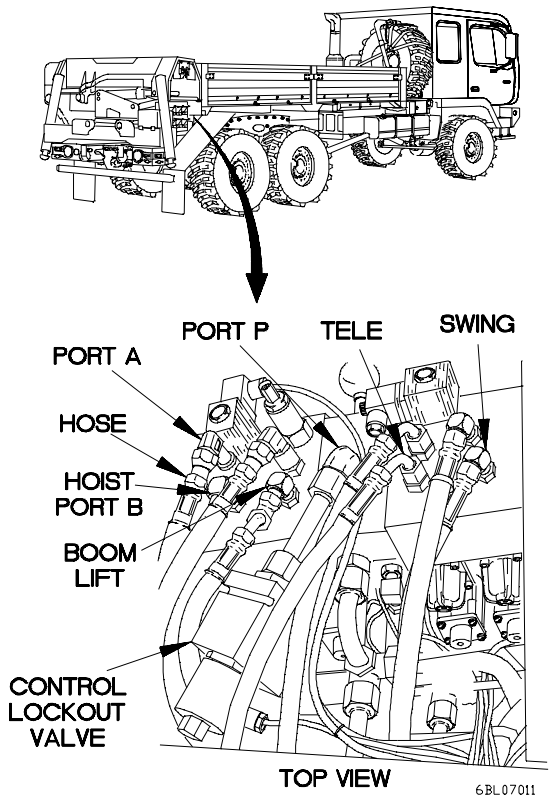
- **Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.**
- **Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical 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

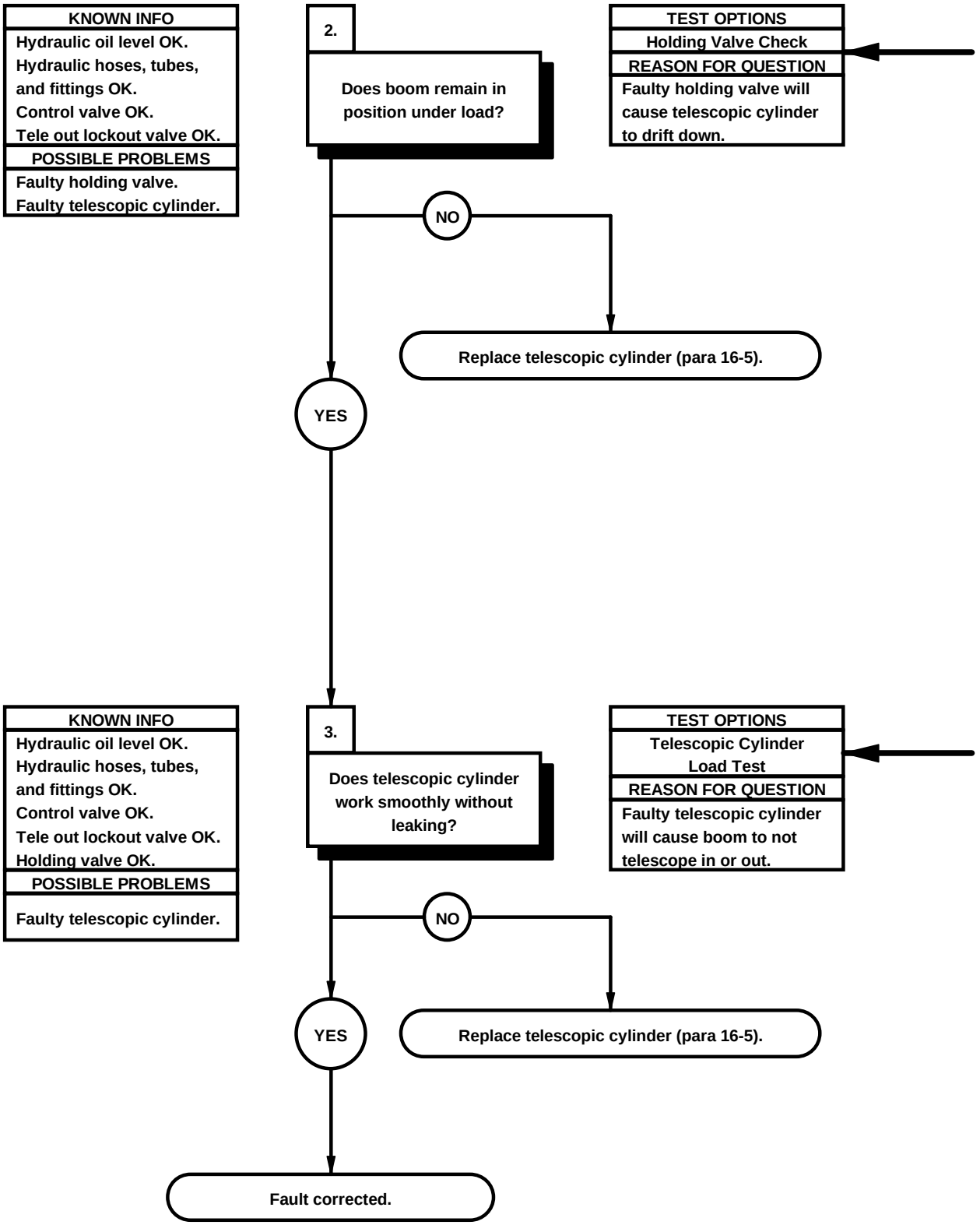
NOTE

- **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).**

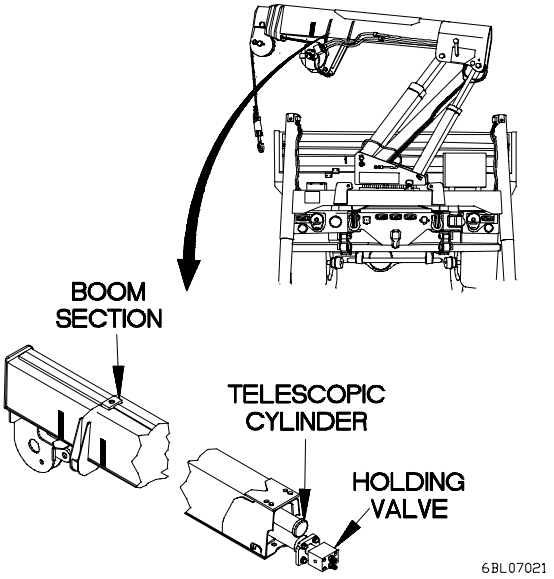
(1) Place drain pan under vehicle.
(2) Disconnect hose from port A of boom telescoping control valve in four way (upper) control valve assembly.
(3) Connect hydraulic tester between hose and port A with test hoses and adapters.
(4) Start engine (TM 9-2320-366-10-1).
(5) Position PTO switch to on (TM 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 telecsope 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.



I7. 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 (tele 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.



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).

I8. M1084/M1086 MATERIAL HANDLING CRANE (MHC) SWING, TELESCOPE, BOOM AND HOIST DOES NOT WORK

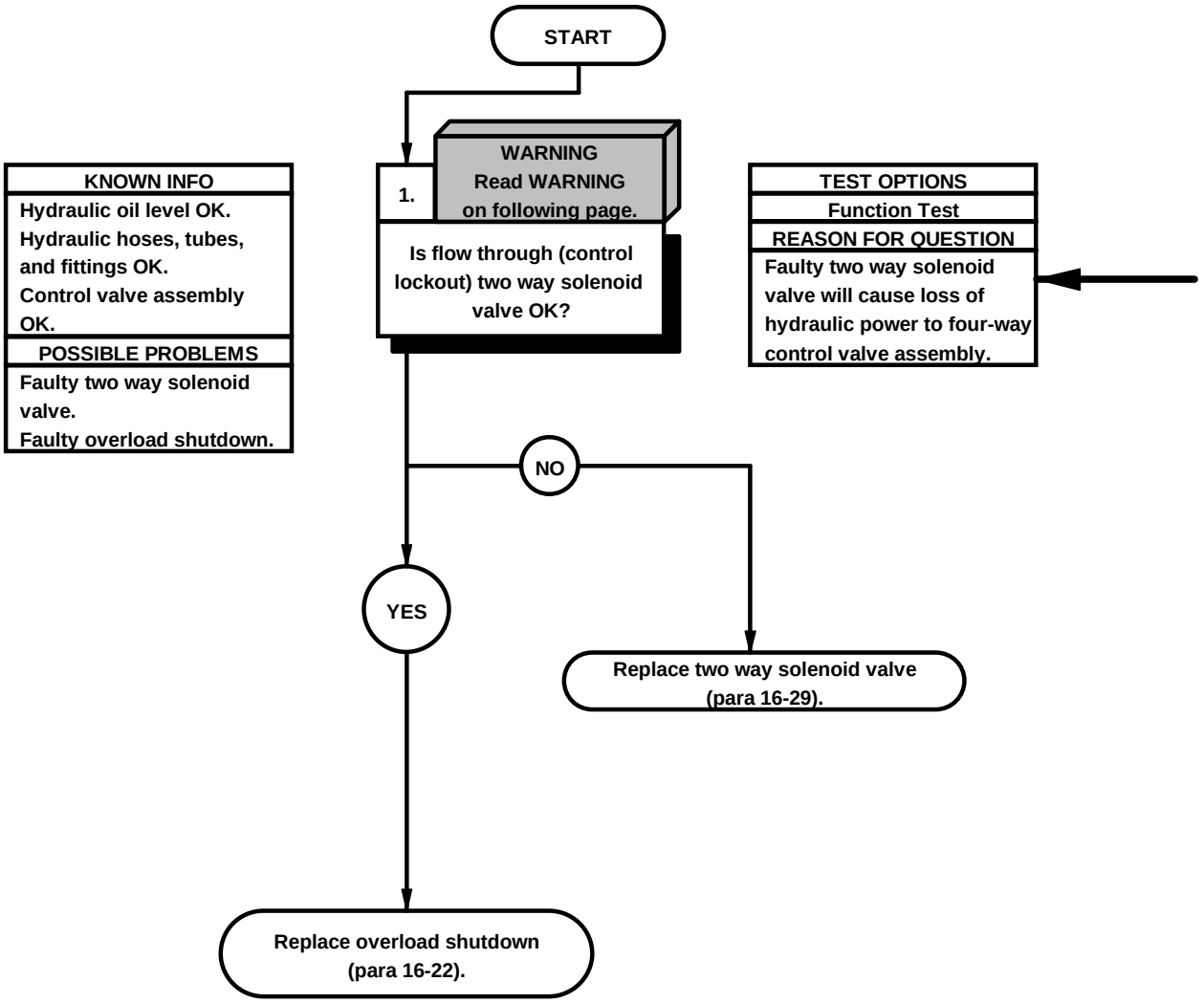
INITIAL SETUP

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

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)

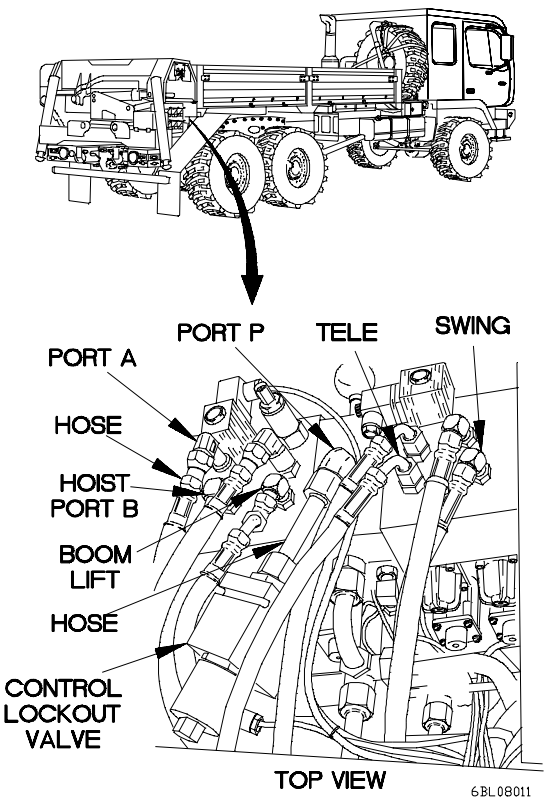


WARNING

- **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.



I9. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM DOES NOT LIFT UP OR DOWN OR HOLD UNDER LOAD

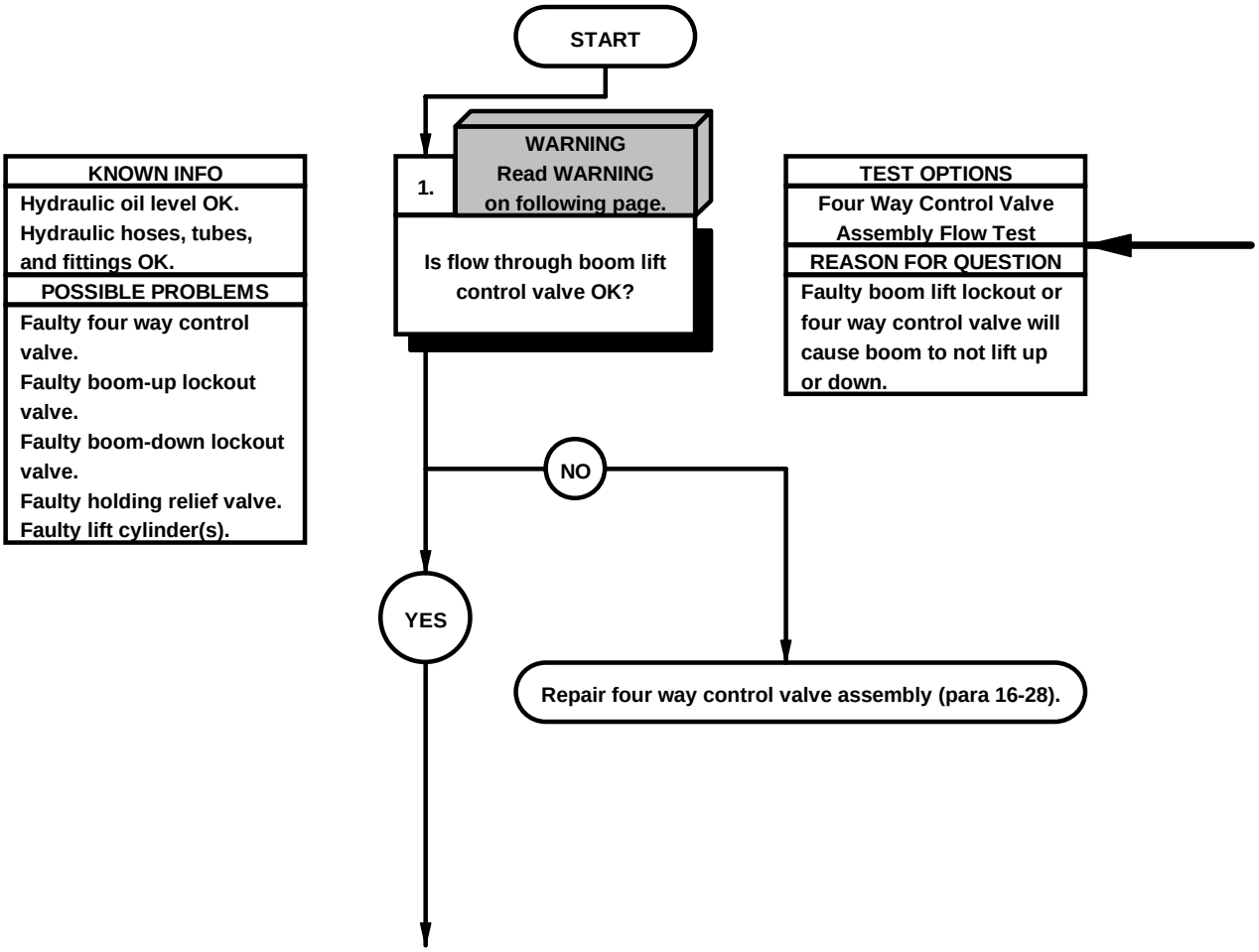
INITIAL SETUP

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

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)



WARNING

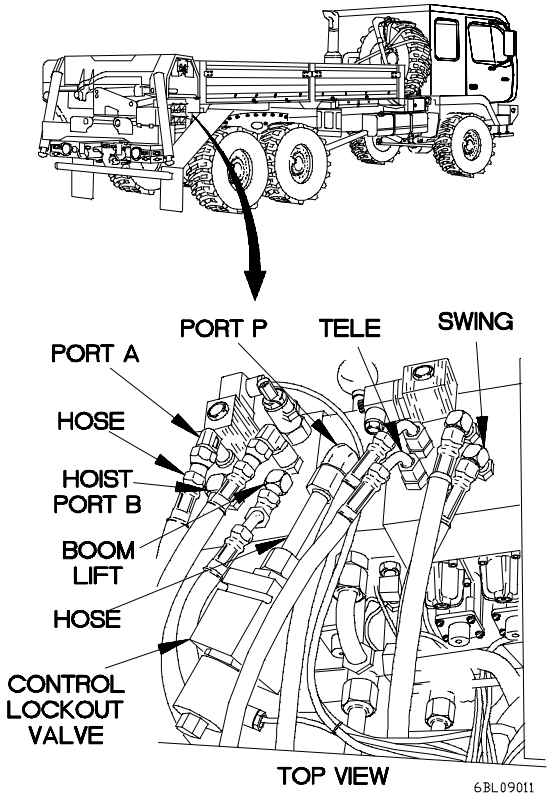
- **Drop hydraulic pressure to zero before disconnecting any hydraulic hose, tube, or fitting. Failure to comply may result in injury to personnel.**
- **Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical 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

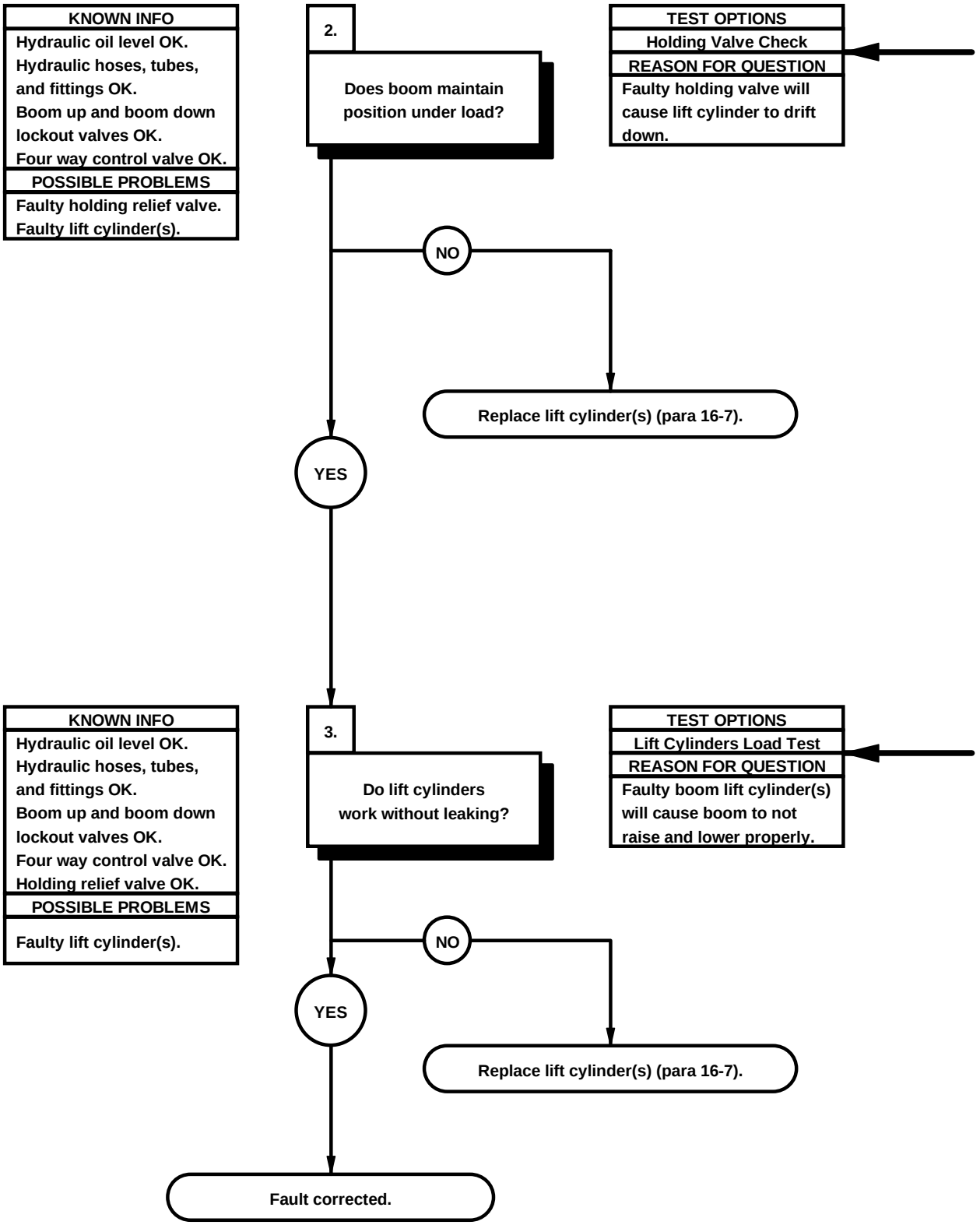
NOTE

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.**

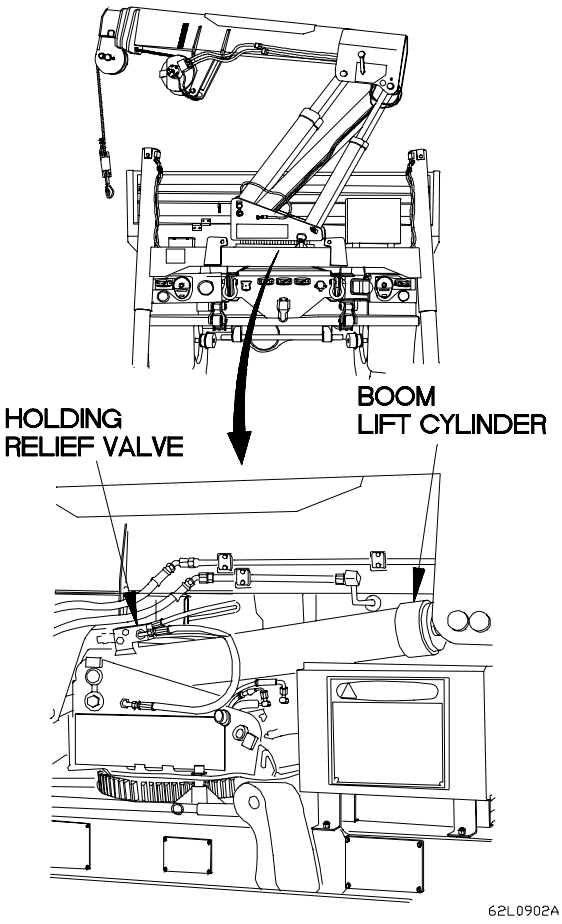


I9. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM DOES NOT LIFT UP OR DOWN OR HOLD UNDER LOAD (CONT)



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.



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 replace, 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 alkalies 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, brinnelling 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 . . . . . TB ORD 650
Description, Use, Bonding Techniques, and Properties of Adhesives . . . . . TB ORD 1032
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	VISE, 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	F3001	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		Adapter, Swivel (81343) 2018-8-8S	ea
4	O/F/H	8040-00-118-2695	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
12.1	O/F/H	8030-00-292-1102	Antiseize 12Z31001-1	tu
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
			Grade 2 - 1 quart can,	qt
		8030-01-149-1731	Grade 3 - 1 pint can,	pt
			Grade 4 - 1 pint can	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 0E/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	O/F	8030-00-728-9665	Sealant (62377) 80017 1 pt can	pt
65.2	F/H	8030-01-255-4144	Sealant (P/N 12297953)	ea
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	8030-01-104-5392 8030-01-025-1692	Sealing Compound (05972) 242 10 cc bottle (box contains 10 bottles) 250 cc bottle	bx 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
76.3	F/H	8030-01-374-3504	Sealing Compound (51831) 50 cc tube	tu

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/OF/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
83.2	F/H		Spindle Compound #2 (ODUG2) #279	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		Turbine Fuel, (MIL-F-16884), (NATO Code No. F75 or F-72)	
		9140-00-255-7764	5 gl can	cn
		9140-00-273-2378	55 gl drum	dr
		9140-00-273-2377	1 gl can	cn
92.3	C		Turbine Fuel, (MIL-F-5624), Grade JP-4 (NATO Code No. F40)	
		9130-00-273-2380	Drum, 16 gage	dr
92.4	C		Turbine Fuel, (MIL-T-5624), Grade JP-5 (NATO Code No. F-44)	
		9130-01-305-5596	Bulk	gl
		9130-01-250-6353	Drum, 16 gage	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.

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Dump Body Lifting Bracket		D-8
Engine Stand Bracket Assembly		D-9
Headlight Adjustment Screen		D-10
Left Front Leaf Spring U-Bolt Socket		D-11
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3256-L-1052	Intermediate Differential Output Pinion Seal Driver	D-50
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3256-Q-1057	Intermediate Input Yoke Seal Driver	D-52
3256-R-1058	Intermediate Output Yoke Seal Driver	D-53
3256-S-1059	Front and Rear Differential Yoke Seal Driver	D-54

Section II. MANUFACTURED ITEMS INDEX (CONT)

ITEM NAME/PART NUMBER	ITEM DESCRIPTION	PARA NO.
Dimmer Switch Test Wire		D-55
Purge Valve Tool		D-56
M1089 30K Winch Air Hoses		D-57
M1089 30K Winch Pneumatic Test Adapters		D-58
Block Seal 12420489 Fabrication		D-59

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

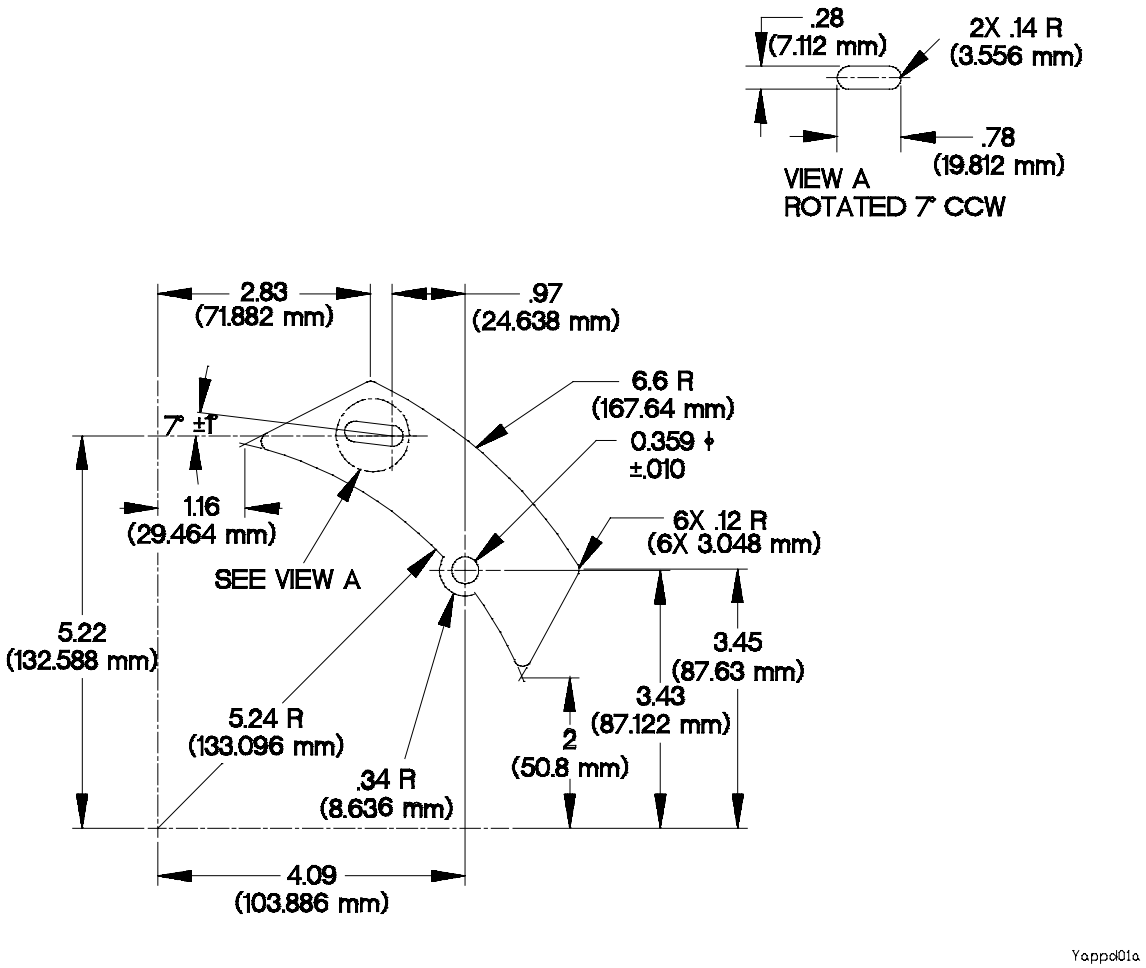


Figure D-1. Brake Adjusting Tool Support

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

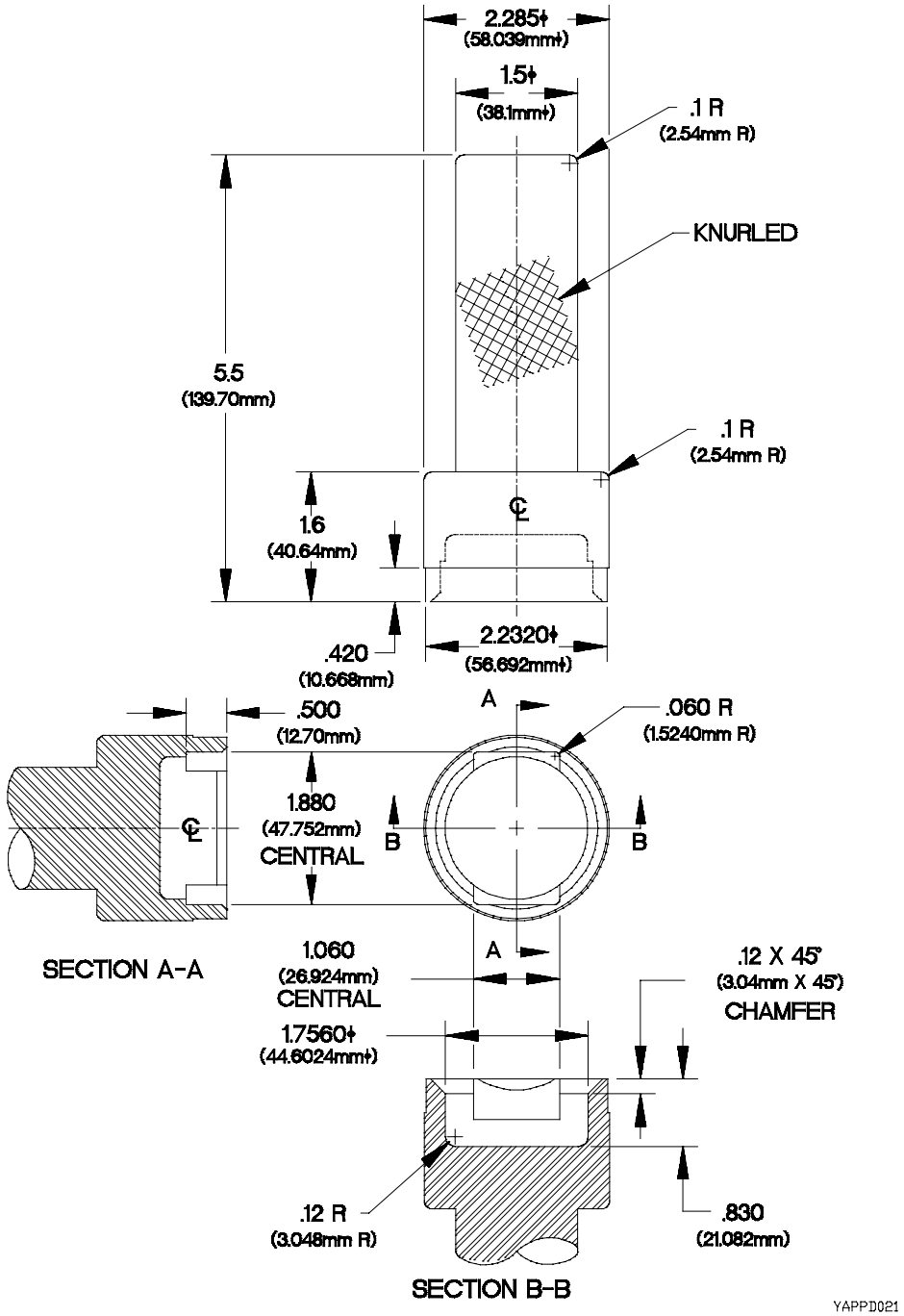


Figure D-2. Brake Plunger Seal Driver

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

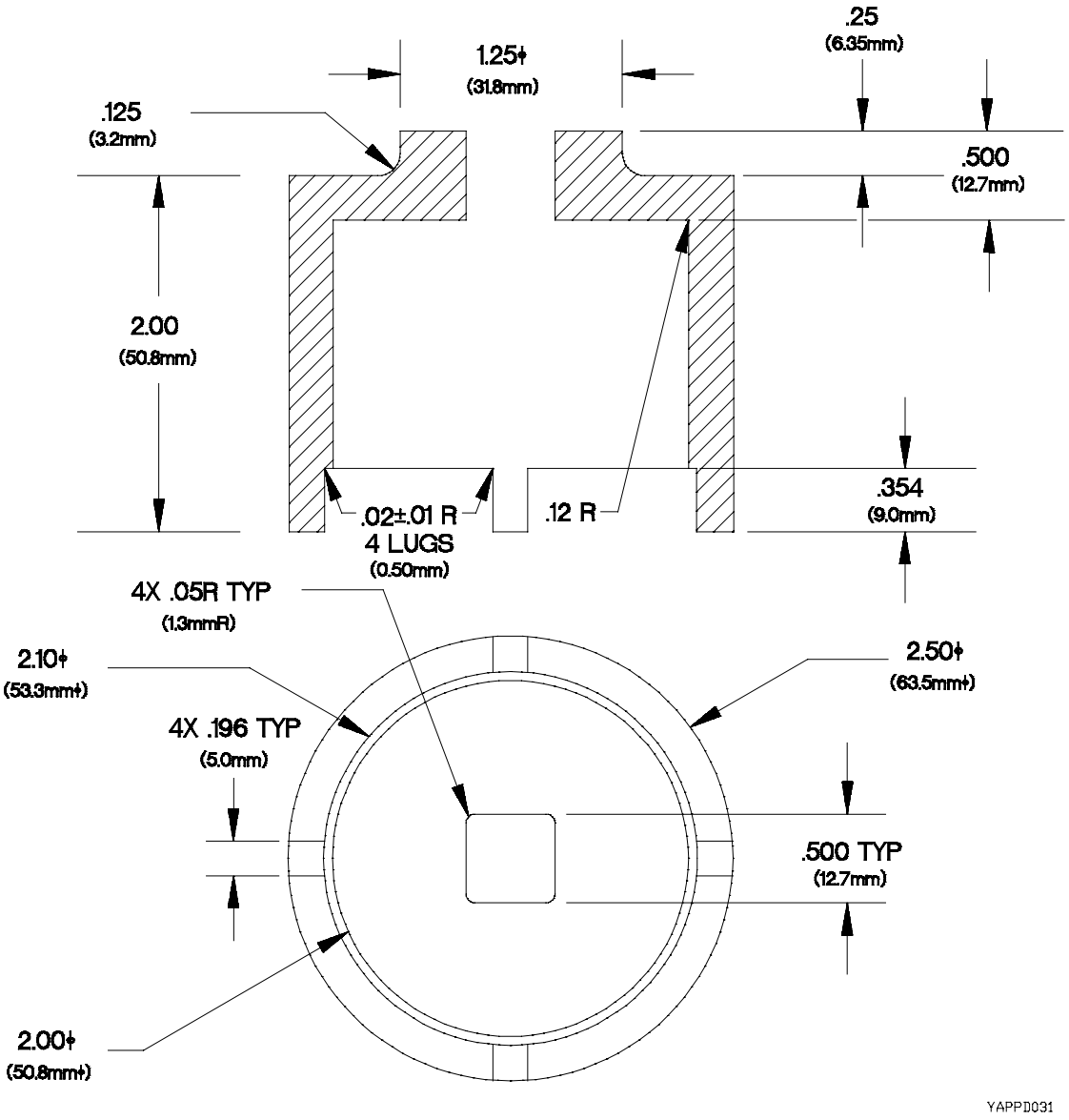


Figure D-3. Cab Front Support Spanner Socket

a. All dimensions are in inches (millimeters).
b. 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).
c. Tolerance:
   1 place +/- .06
   2 place +/- .03
   3 place +/- .005
   angles +/- 2° unless otherwise specified.
d. Surface texture: 125 $\sqrt{.}$ 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)

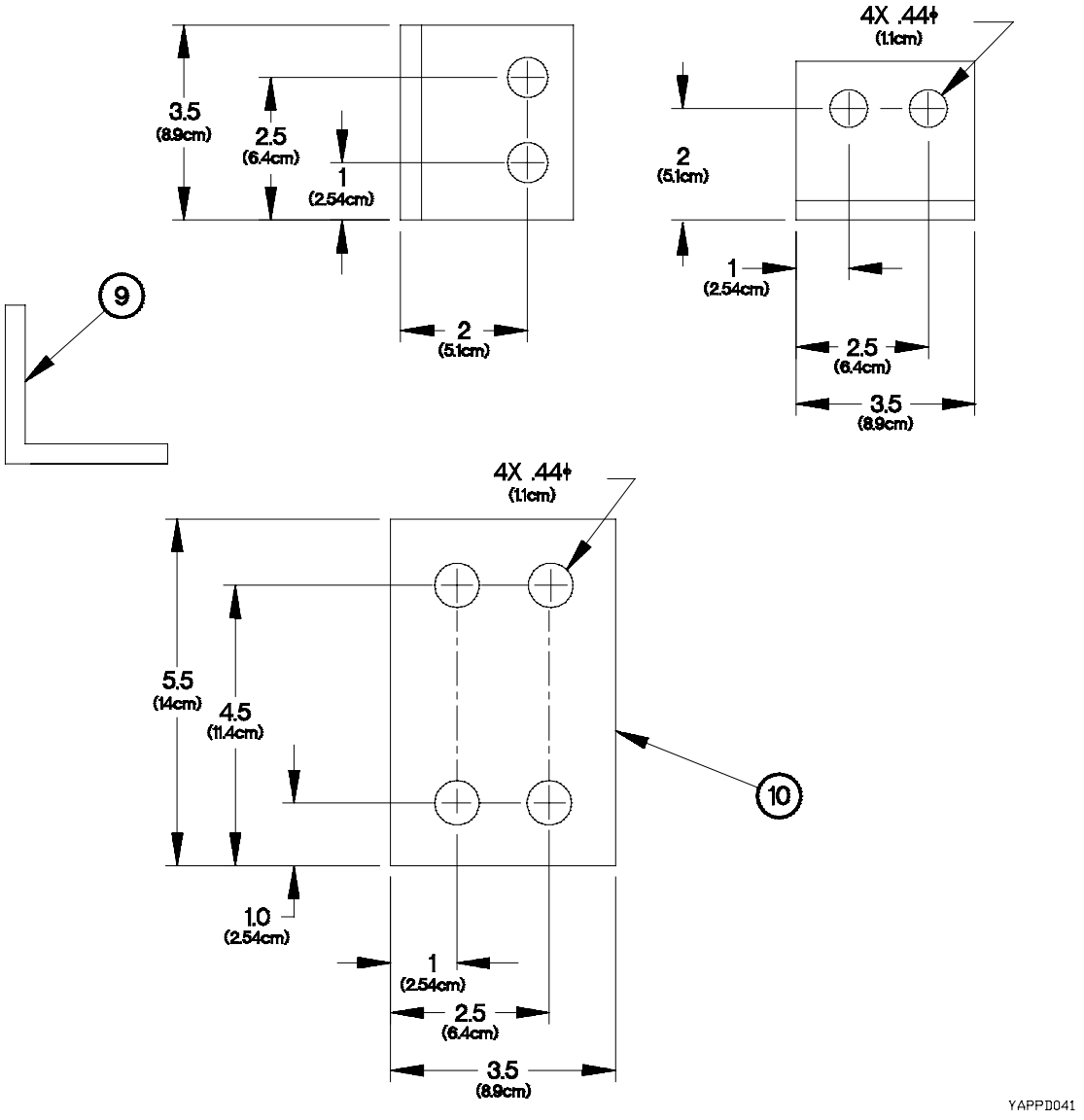


Figure D-4. Cab Maintenance Stand Angle Brackets and Straight Brackets

a. All dimensions are in inches (centimeters).
b. Cut 6 pieces of angle steel stock for angle brackets (9) and 6 pieces of steel plate stock for straight brackets (10).
c. 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**.
d. De-burr and remove sharp edges.

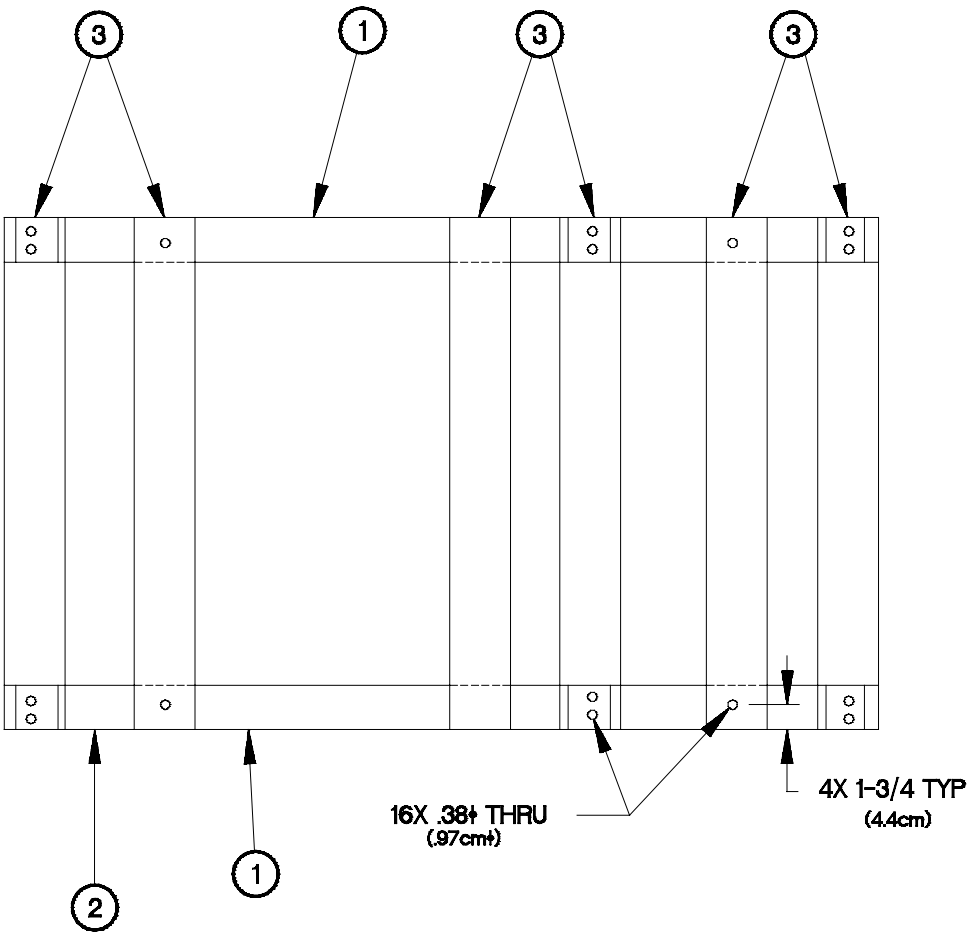


Figure D-5. Cab Maintenance Stand Base Angle Bracket Locations

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)

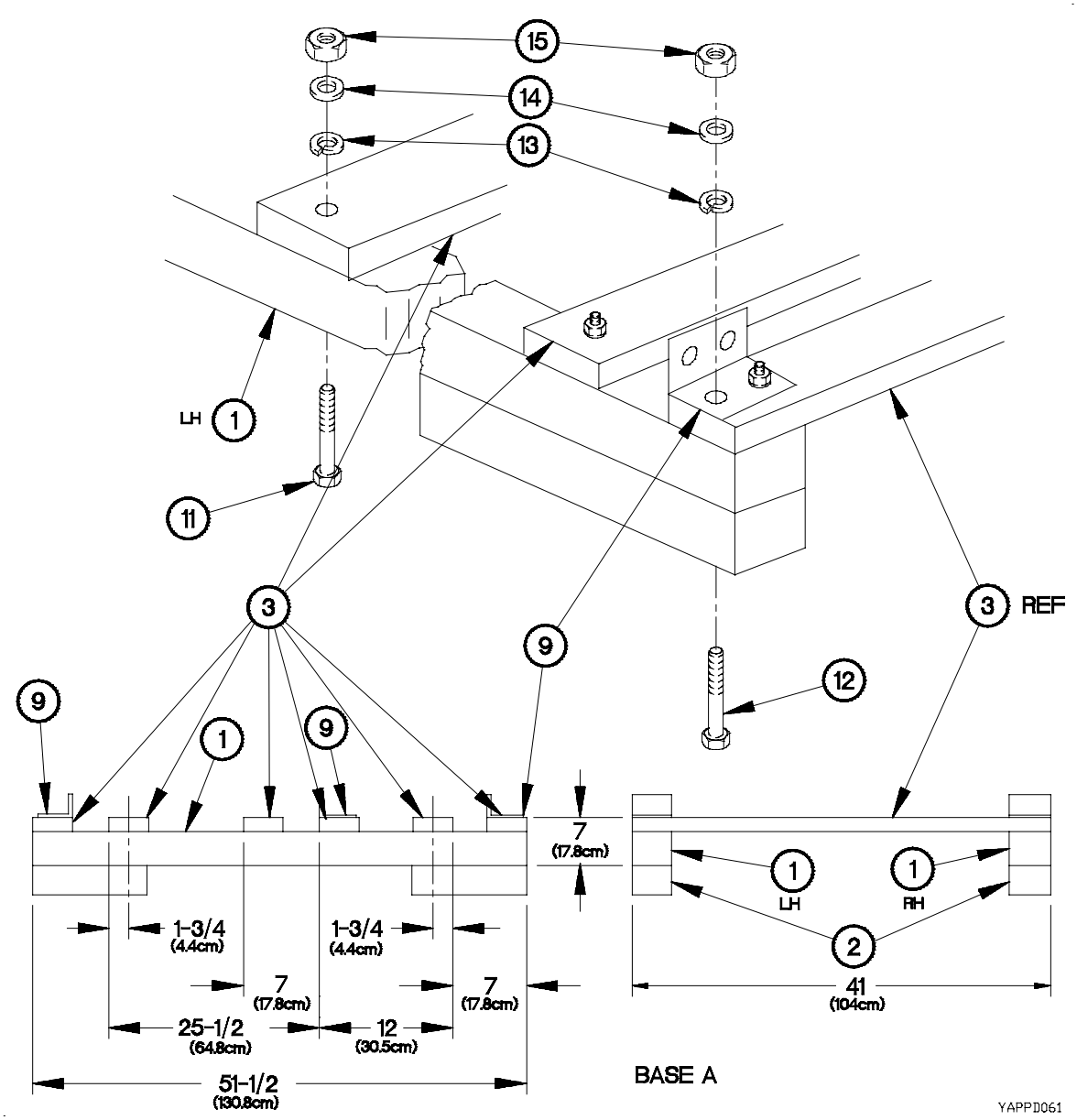


Figure D-6. Cab Maintenance Stand Base Fabrication

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**.

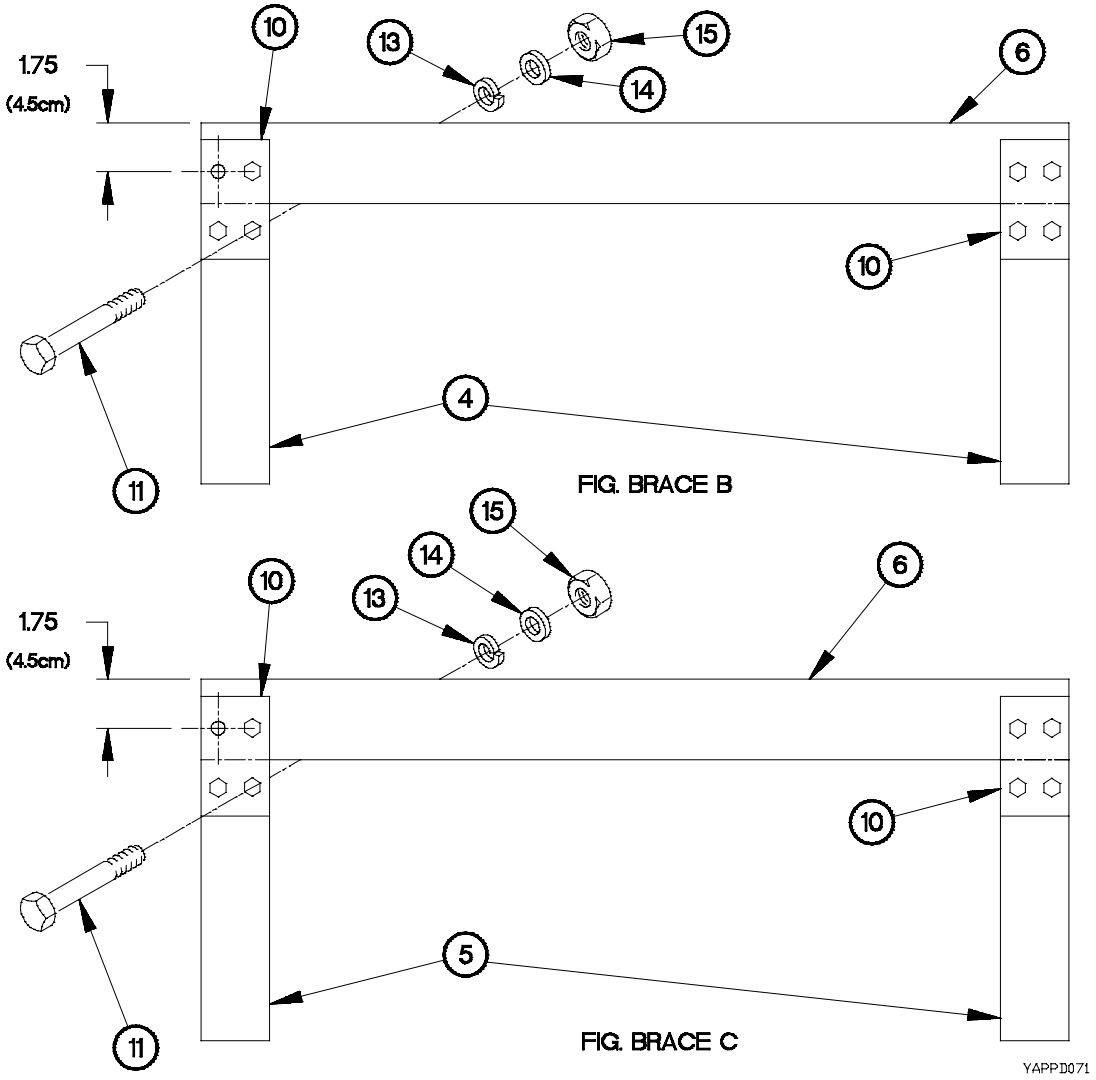


Figure D-7. Cab Maintenance Stand Brace Bracket Locations

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)

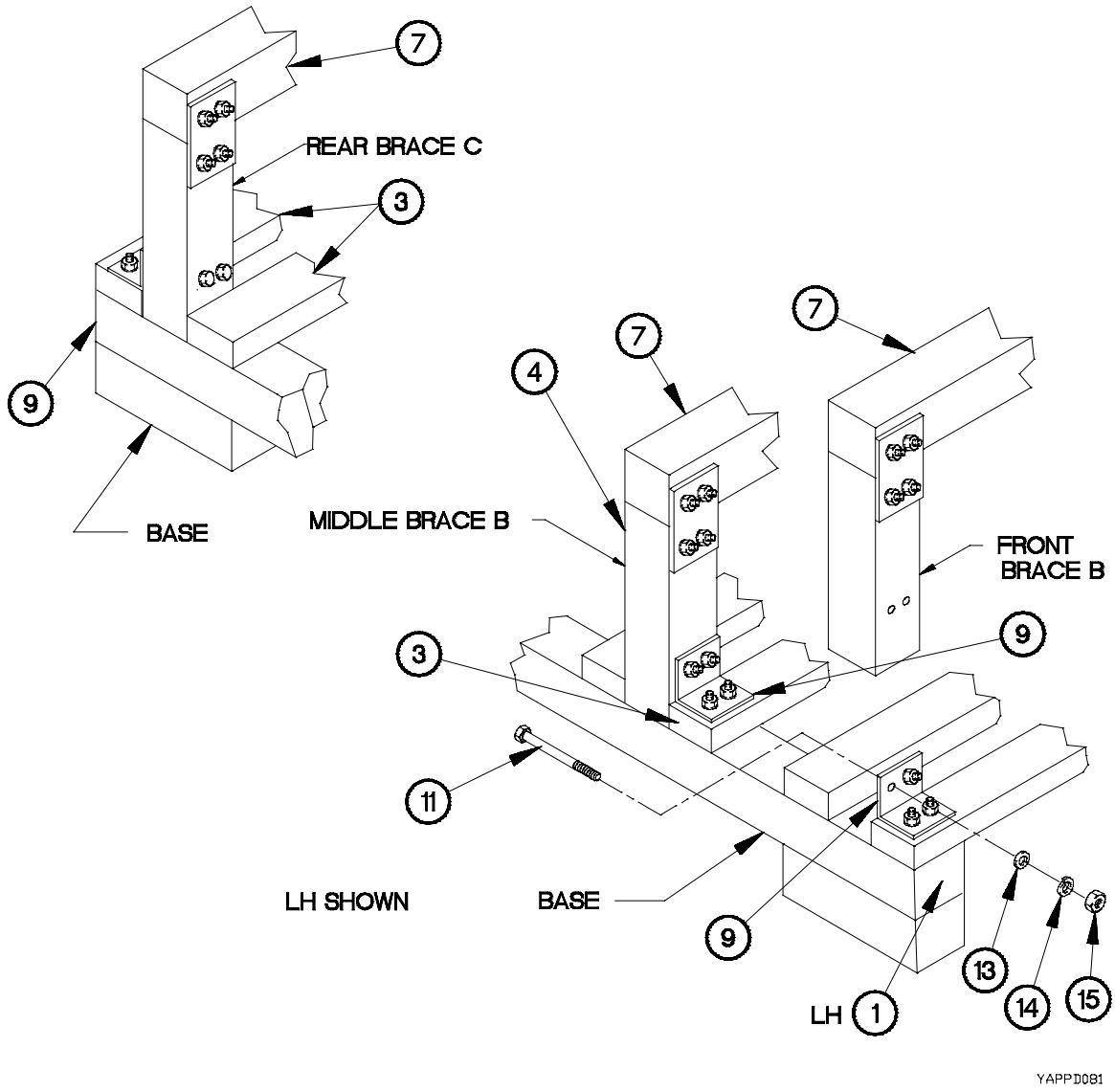


Figure D-8. Cab Maintenance Stand Brace to Base Assembly

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.

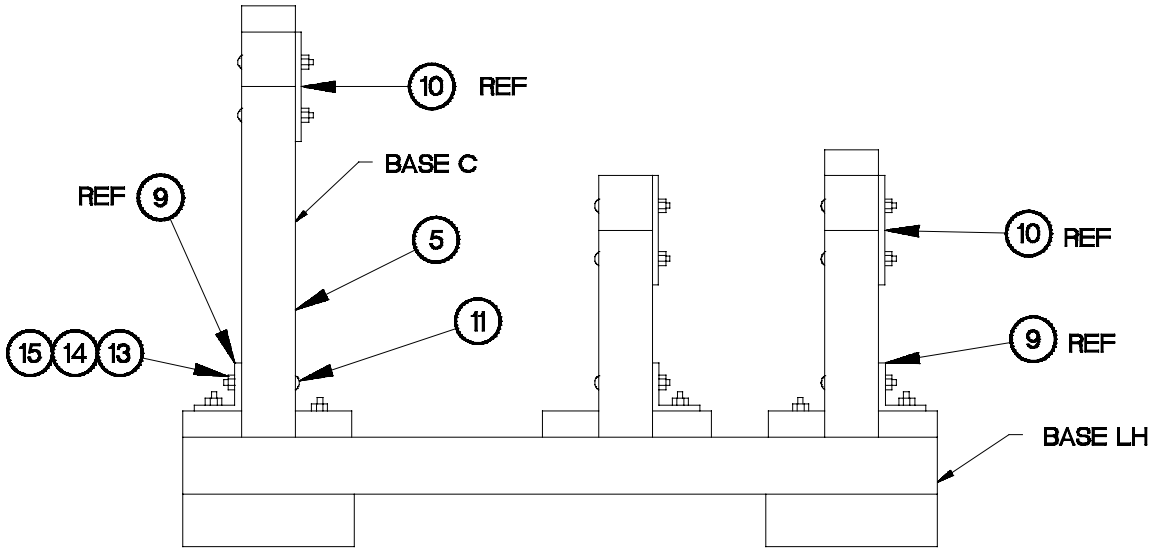


Figure D-9. Cab Maintenance Stand Side Braces Side View

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)

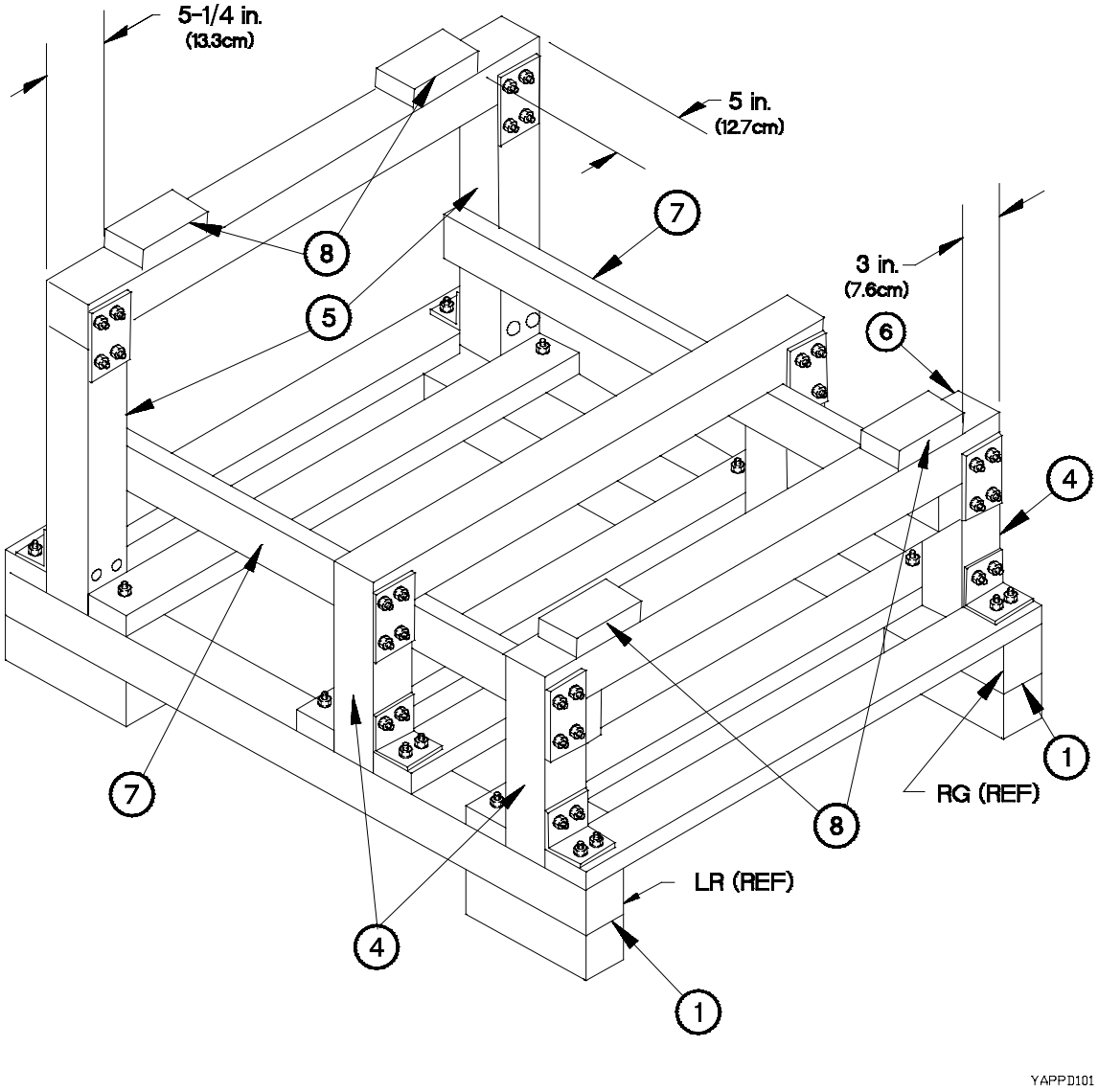


Figure D-10. Cab Maintenance Stand Assembly

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

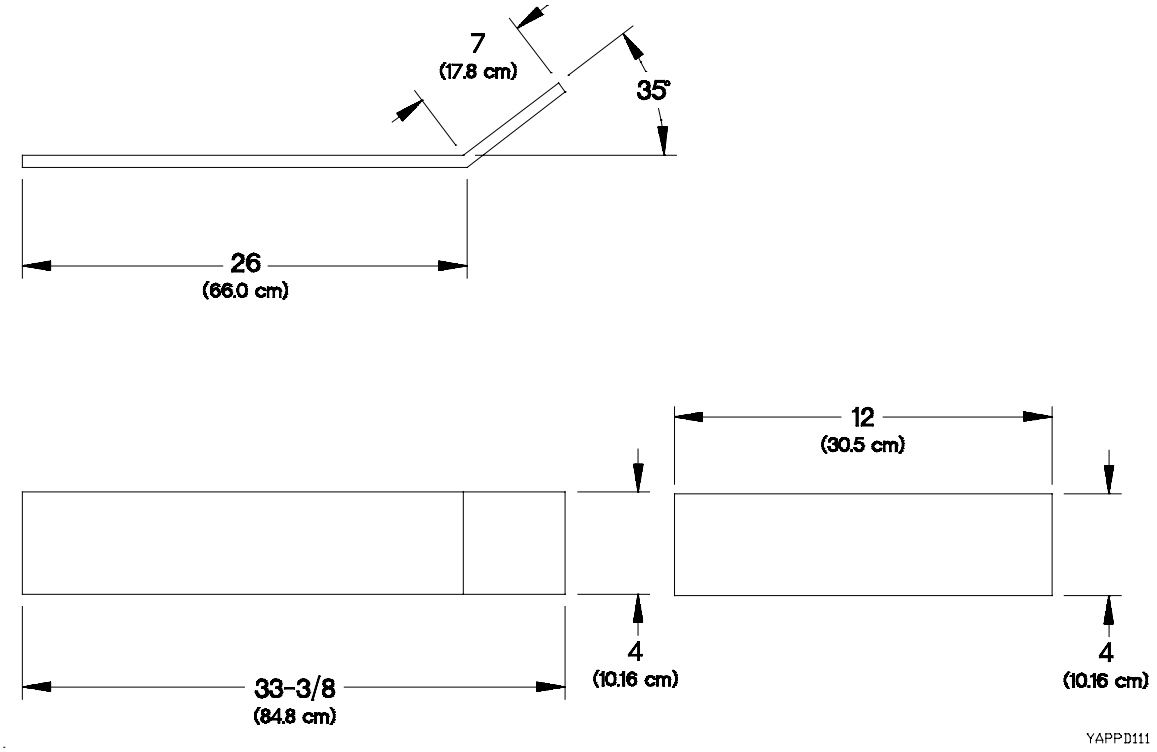


Figure D-11. Cab Support Tool Strut and Cab Rest

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)

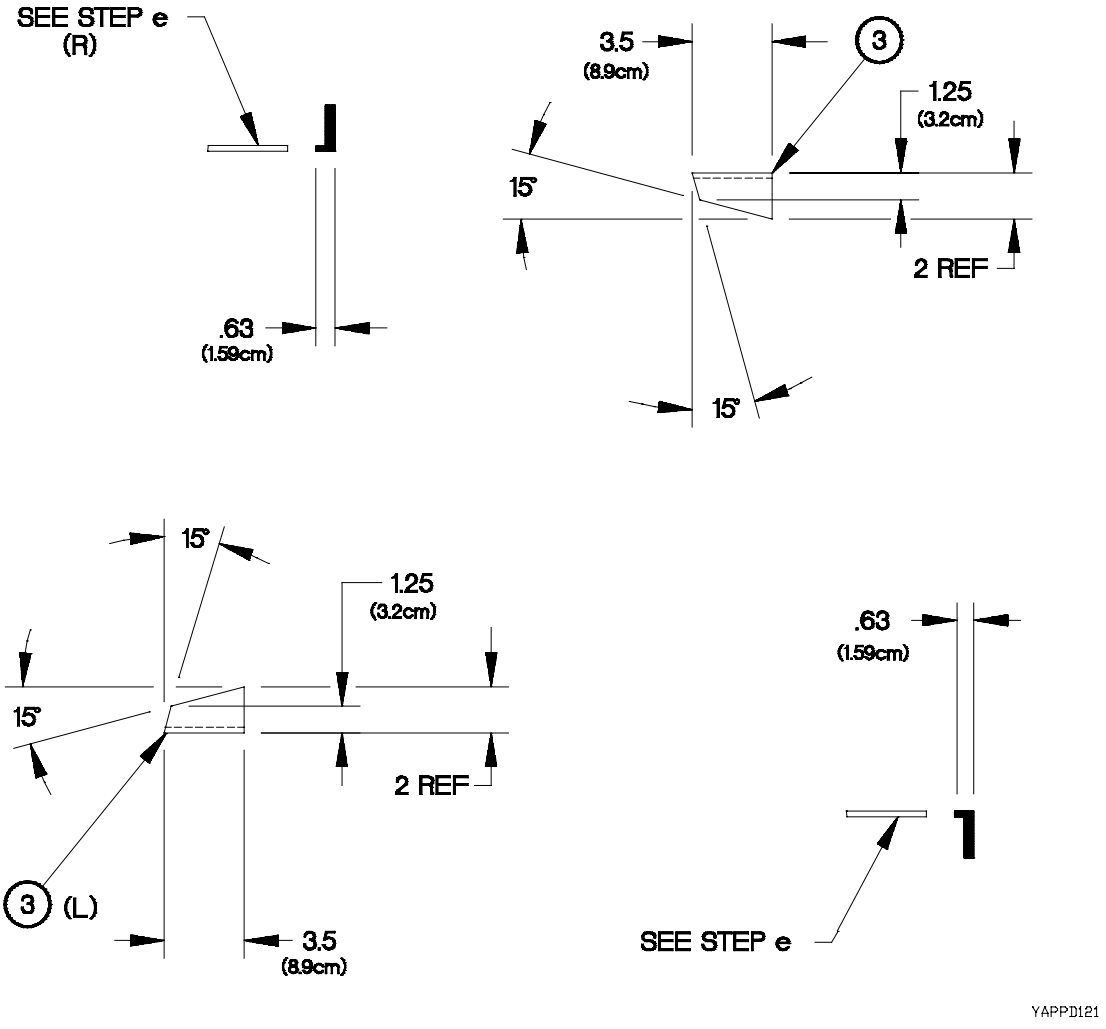


Figure D-12. Cab Support Tool Seat

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.

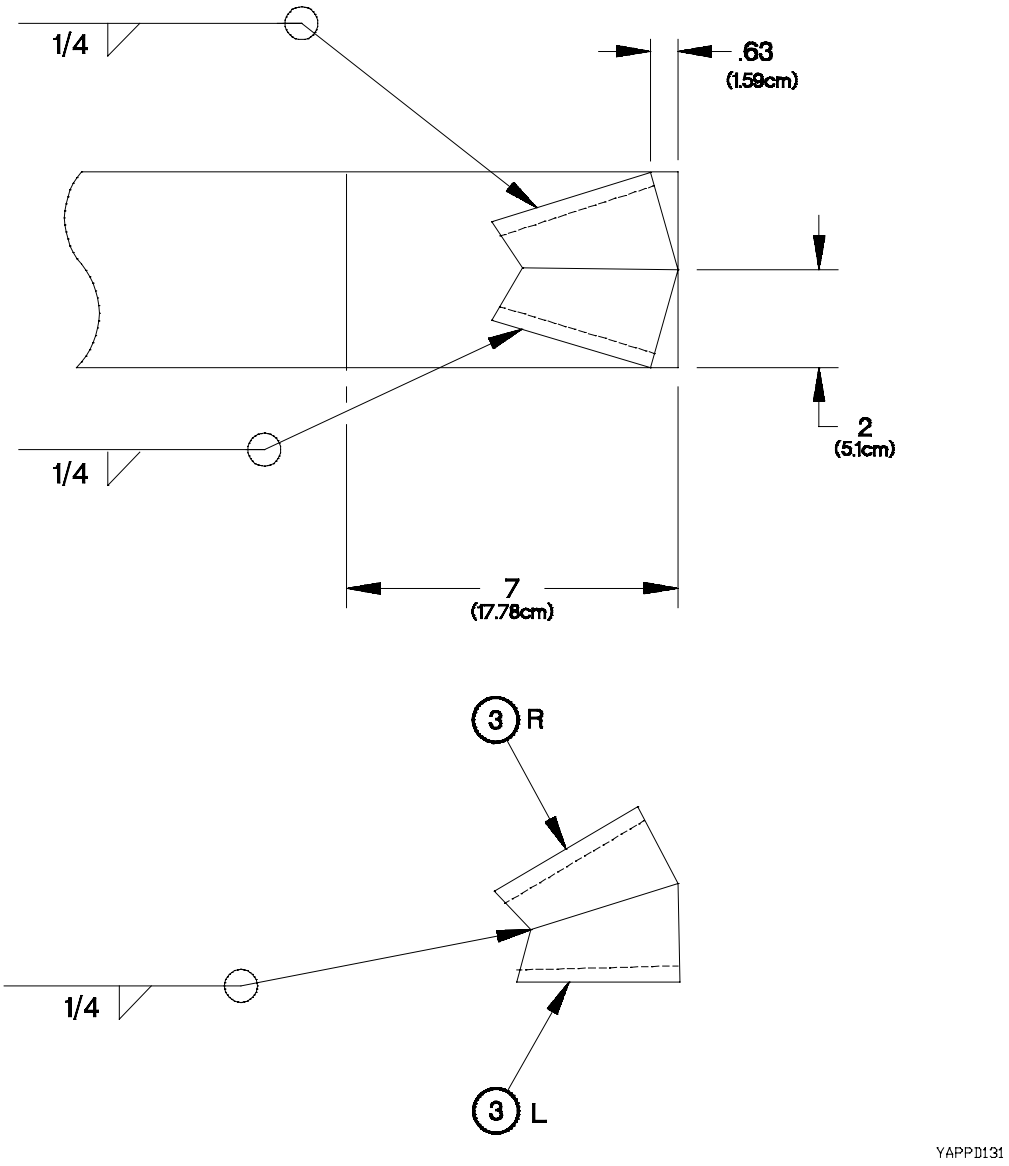


Figure D-13. Cab Support Tool Seat Layout

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)

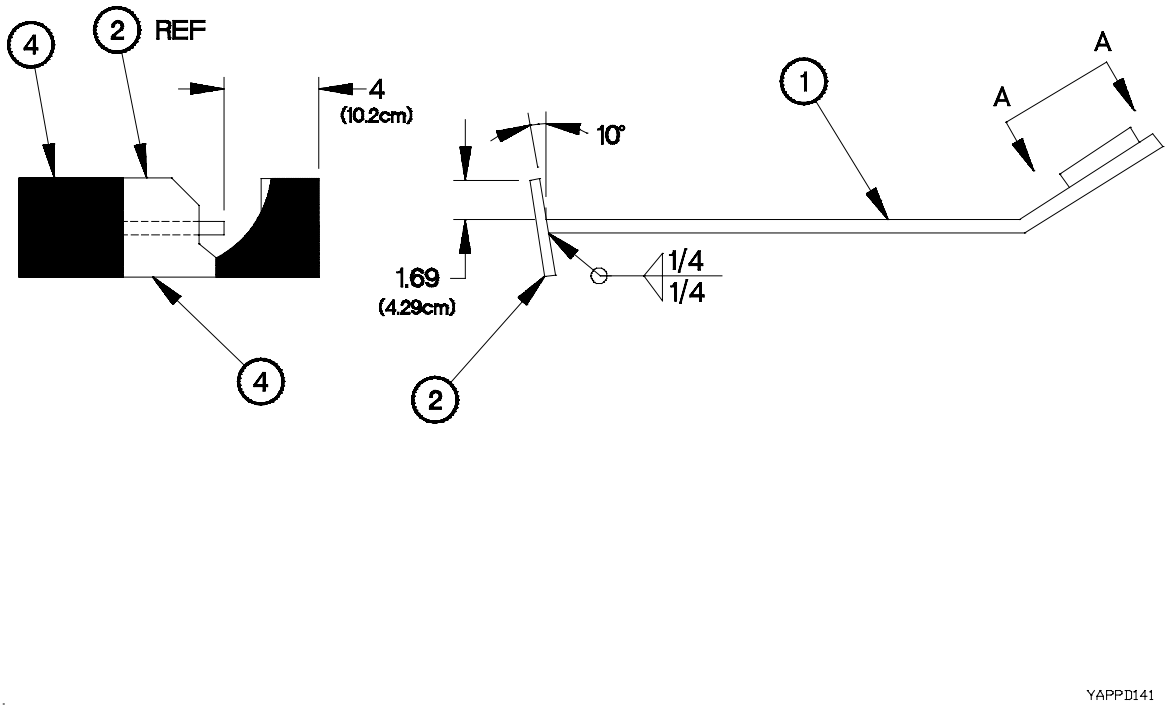


Figure D-14. Cab Support Tool Assembly

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

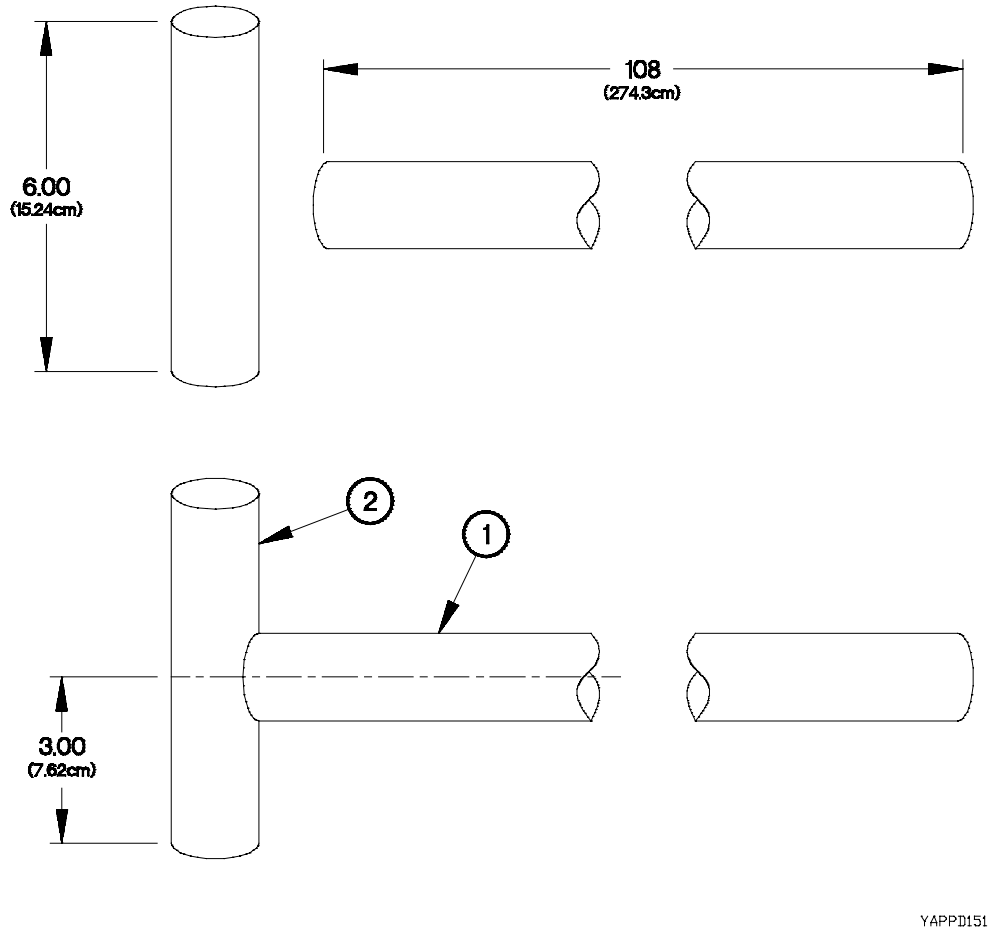


Figure D-15. Dump Body Cab Protector Pivot Pin Removal Tool Assembly

a. All dimensions are in inches (centimeters).
b. 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**.
c. Weld (1) to (2) as identified on assembly table and shown in **Figure D-15. Dump Body Cab Protector Pivot Pin Removal Tool Assembly**.
d. Weld both sides indicated in **Figure D-15. Dump Body Cab Protector Pivot Pin Removal Tool Assembly**.
e. 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	Front Plate	1
4	N/A	Guide Brace	1
5	N/A	Plate, Mounting	1

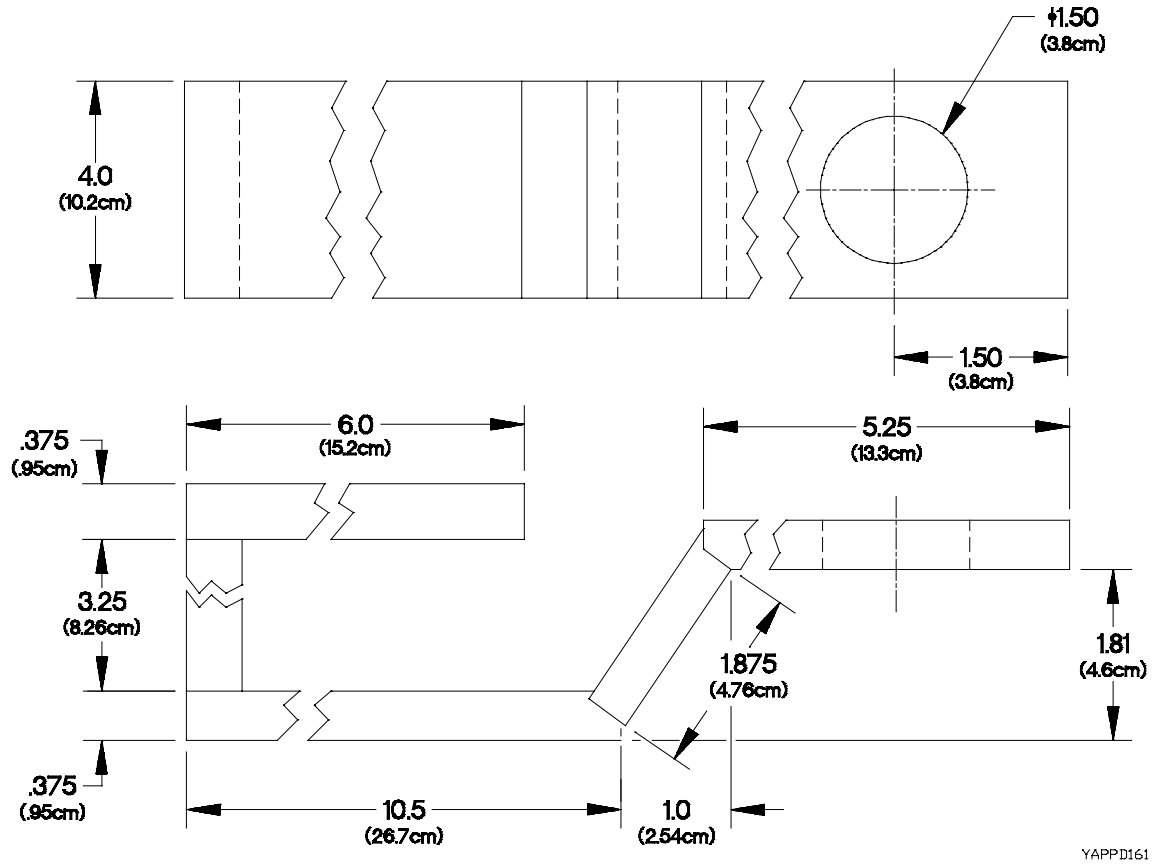


Figure D-16 Dump Body Lifting Bracket

a. All dimensions are in inches (centimeters).
b. Position and clamp pieces (1 through 5) together as shown by dimensions in Figure Dump Body Lifting Bracket.
c. Weld pieces together as shown in **Figure D-16. Dump Body Lifting Bracket**.
d. Coat all surfaces with Plastisol (6).
e. 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. (10.2 cm) X 4.0 in. (10.2 cm) X 0.375 in. (0.95 cm)	1

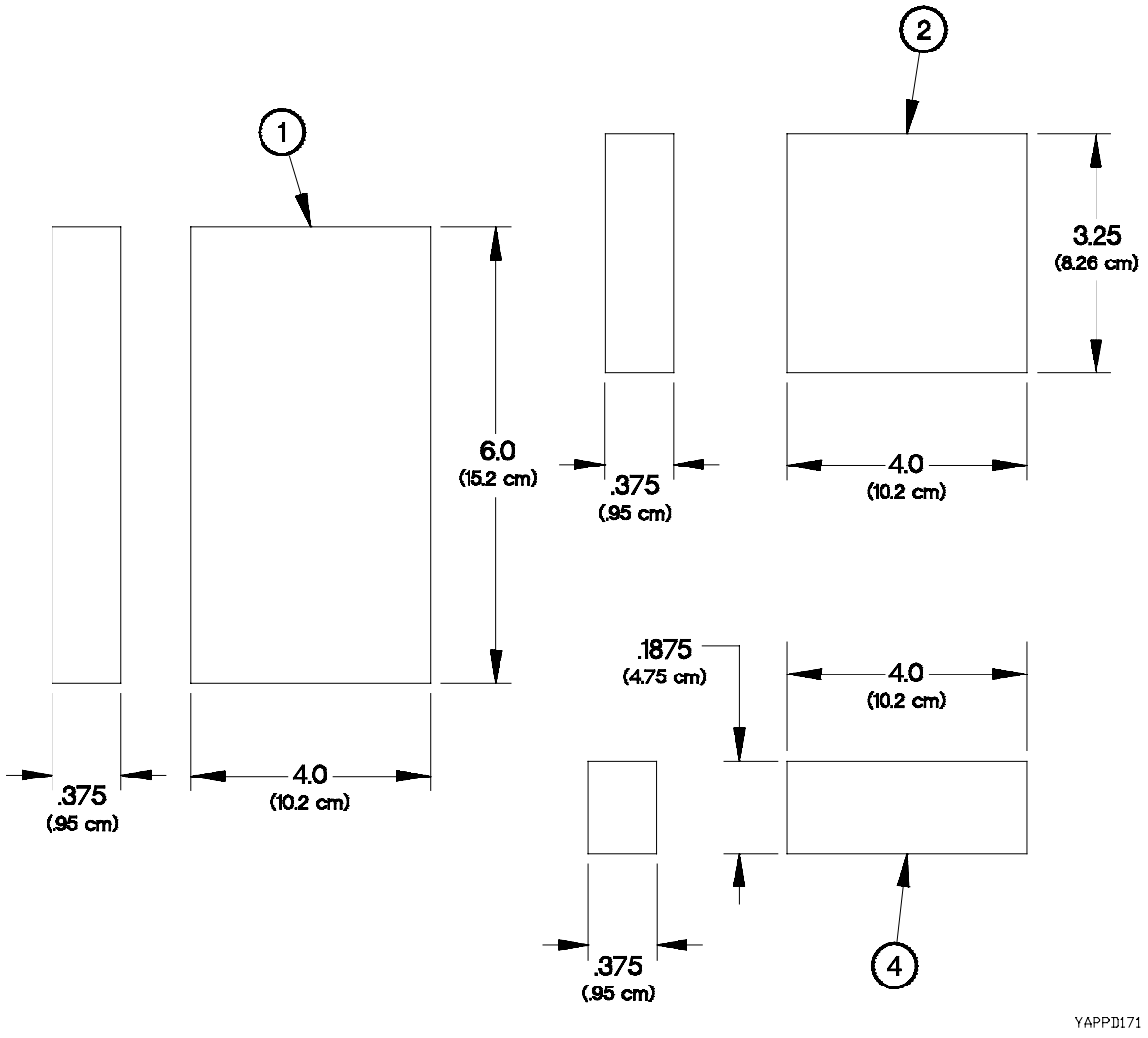


Figure D-17. Rear, Top, and Guide Plate

a. All dimensions are in inches (centimeters).
b. Fabricate (1),(2), and (4) from ASTM A-36 steel plate as shown in **Figure D-17. Rear, Top, and Guide Plate**.
c. 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

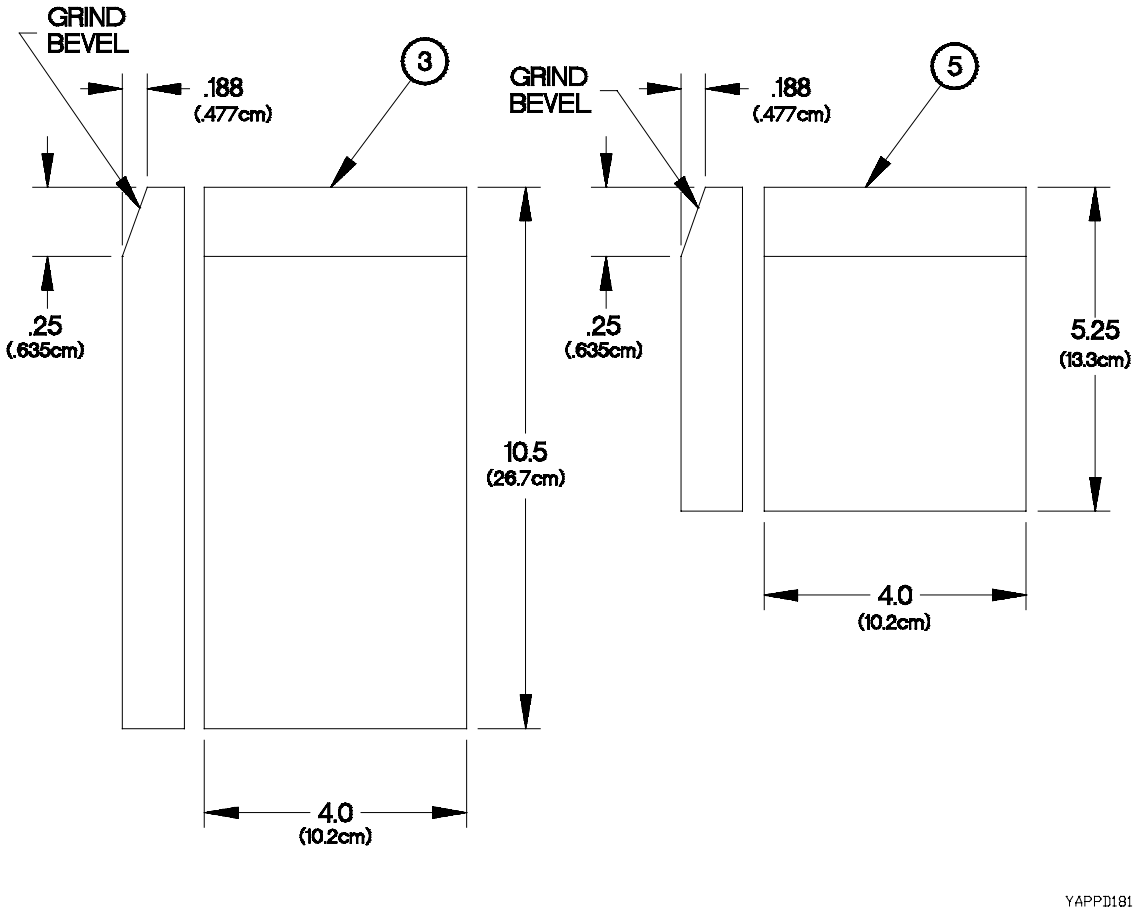


Figure D-18. Front and Mounting Plate

a. All dimensions are in inches (centimeters).
b. Fabricate (3) and (5) from ASTM A-36 steel plate.
c. Drill 1-1/2 inch (3.84 cm) diameter hole in plate (5) as shown in **Figure D-18. Front and Mounting Plate**.
d. Grind bevel on edge of each plate for weld surface as shown in **Figure D-18. Front and Mounting Plate**.
e. 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

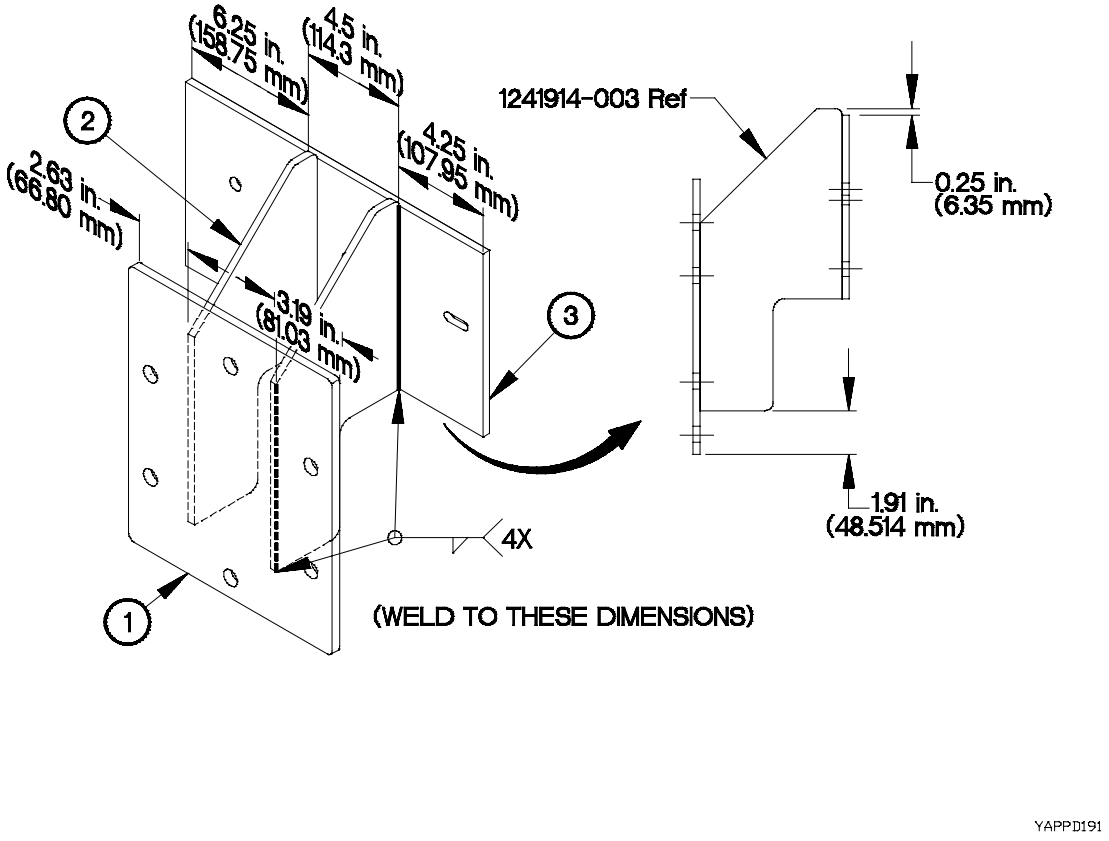


Figure D-19. Engine Stand Bracket Assembly

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

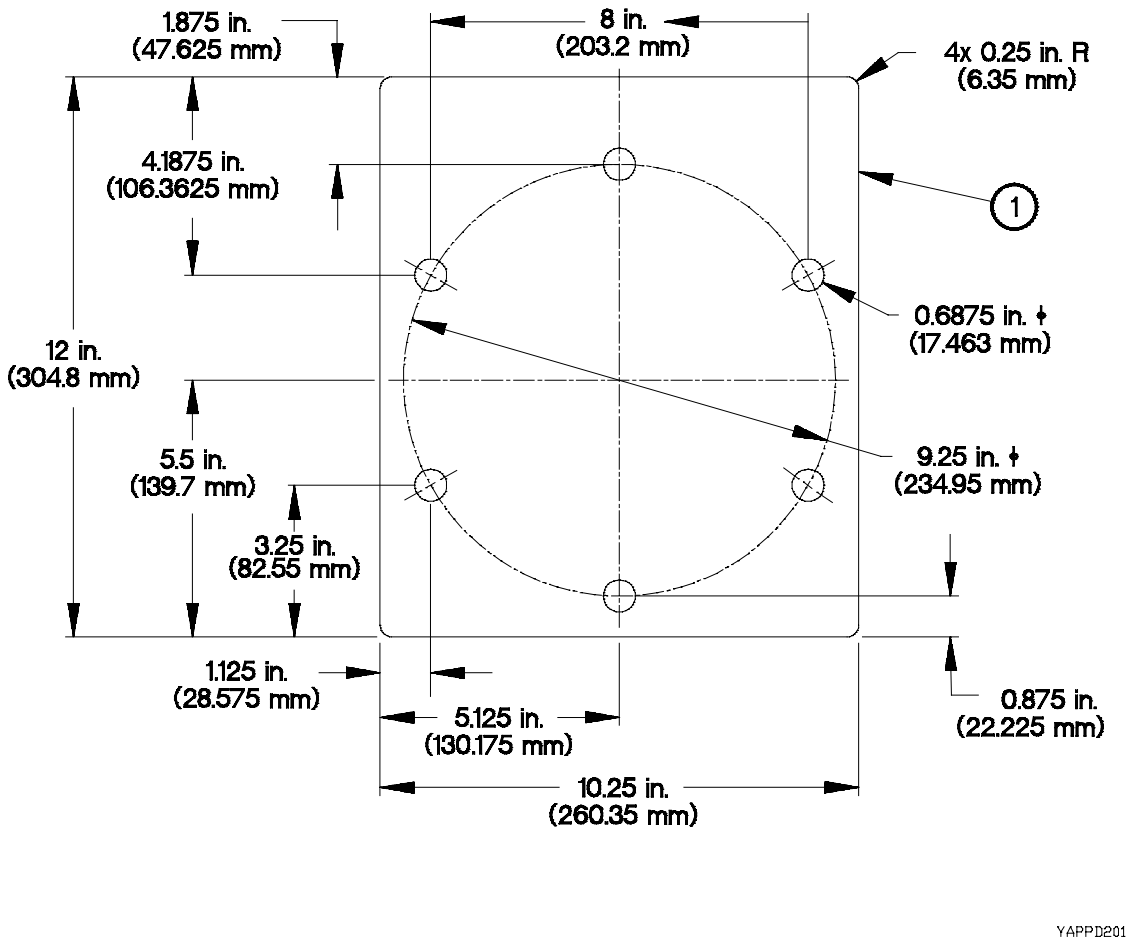


Figure D-20. Engine Stand Bracket Front Plate

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

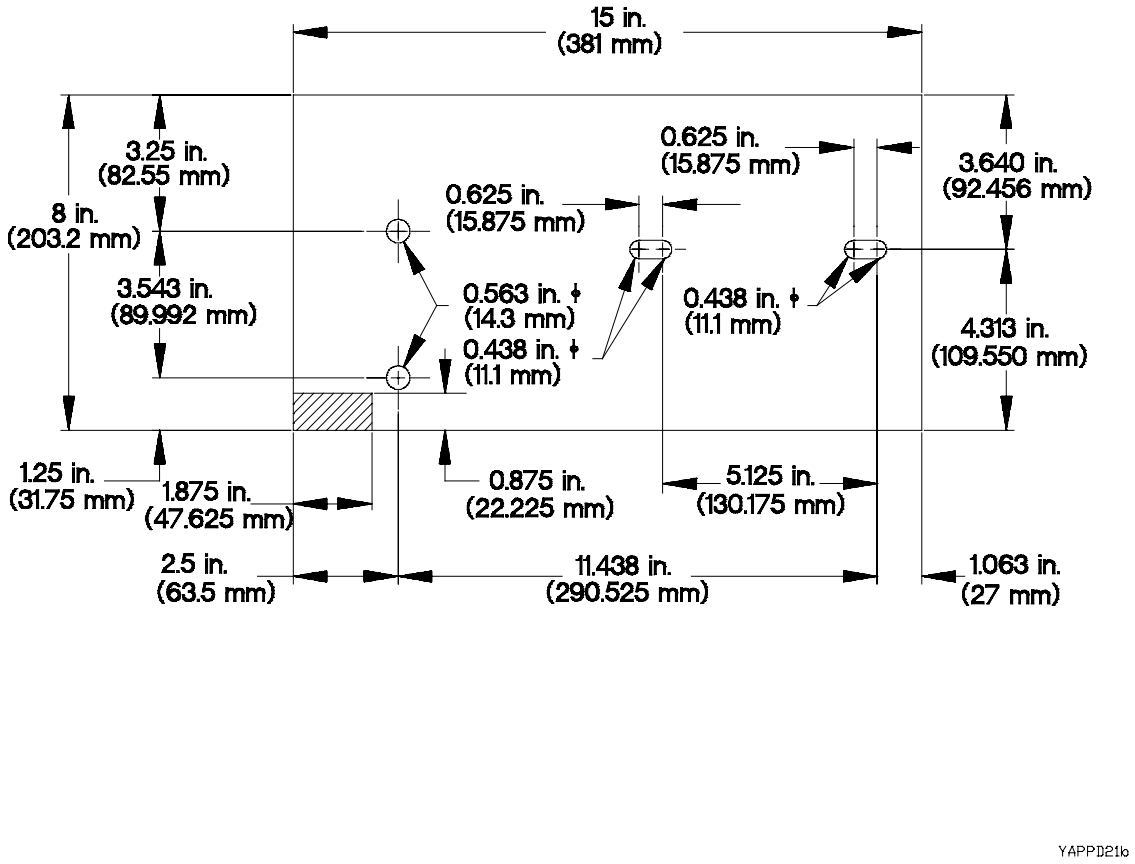


Figure D-21. Engine Stand Bracket Rear Plate

a. All dimensions are in inches (millimeters).
b. Fabricate (2) from ASTM A-36 steel plate.
c. 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**.
d. 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**.
e. Cut or mill between 0.438 in. (11.1 mm) diameter holes as shown in **Figure D-21. Engine Stand Bracket Rear Plate**.
f. 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

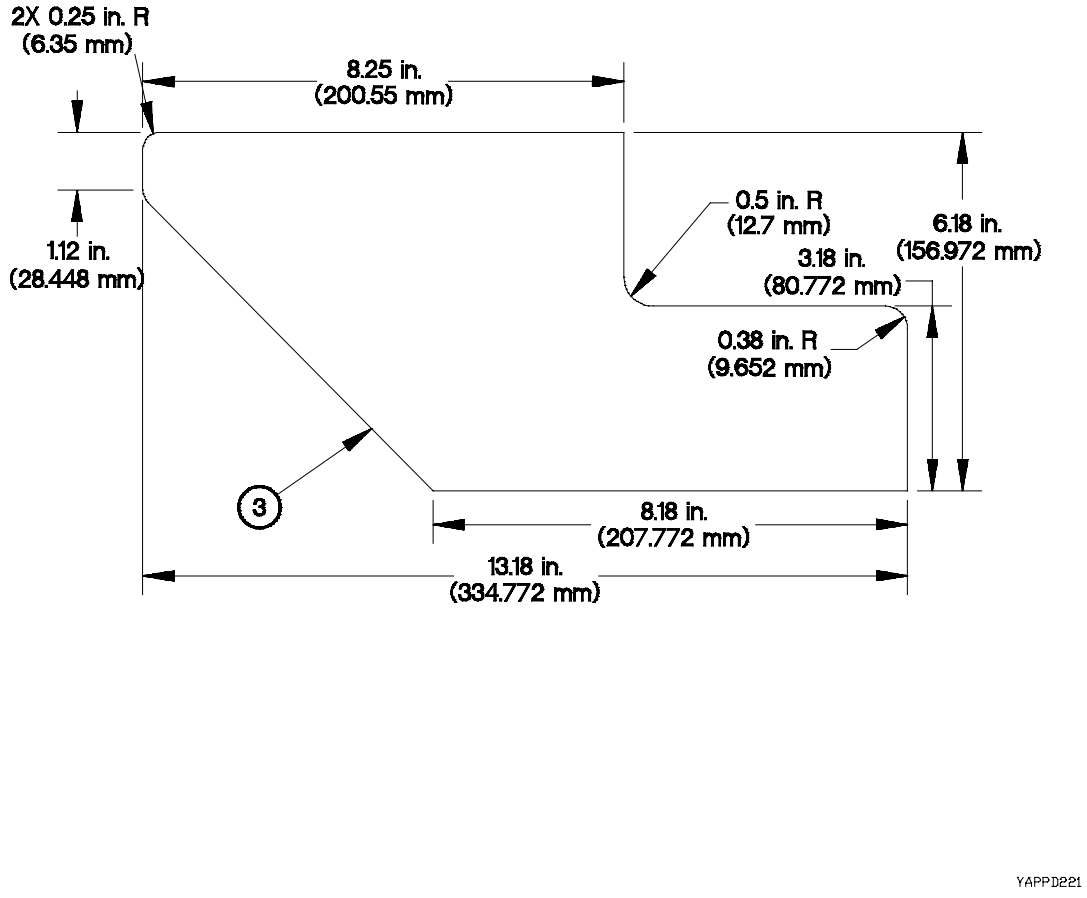


Figure D-22. Engine Stand Bracket Side Plates

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).

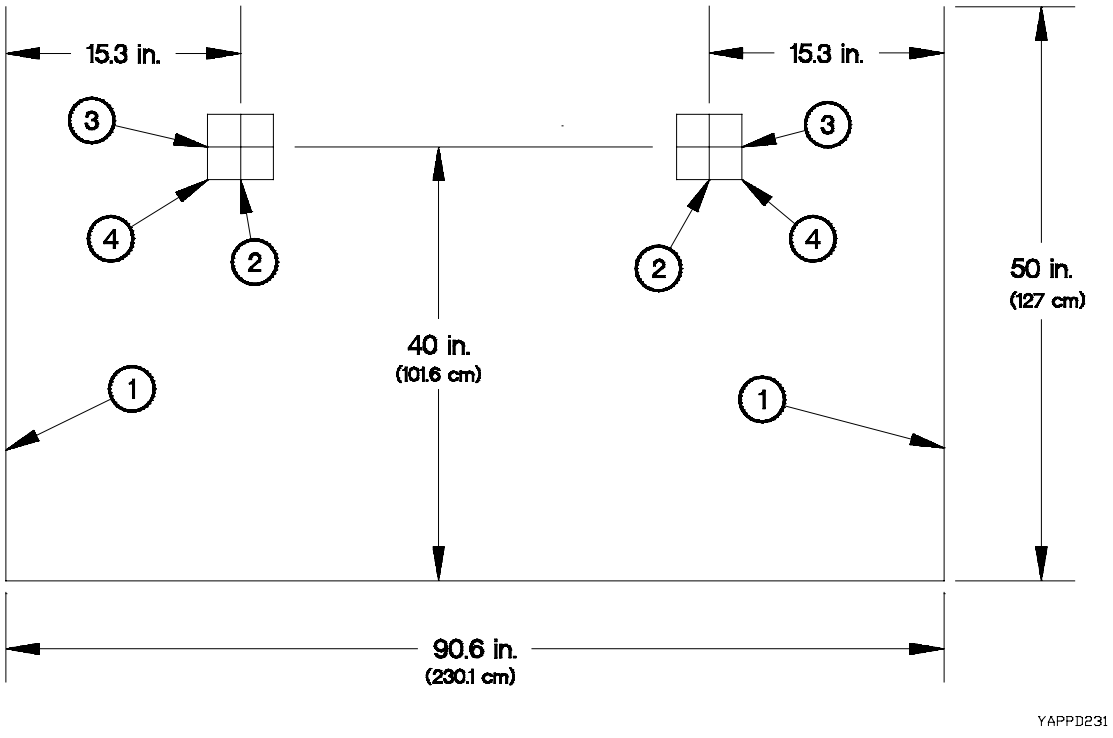


Figure D-23. Headlight Adjustment Screen

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

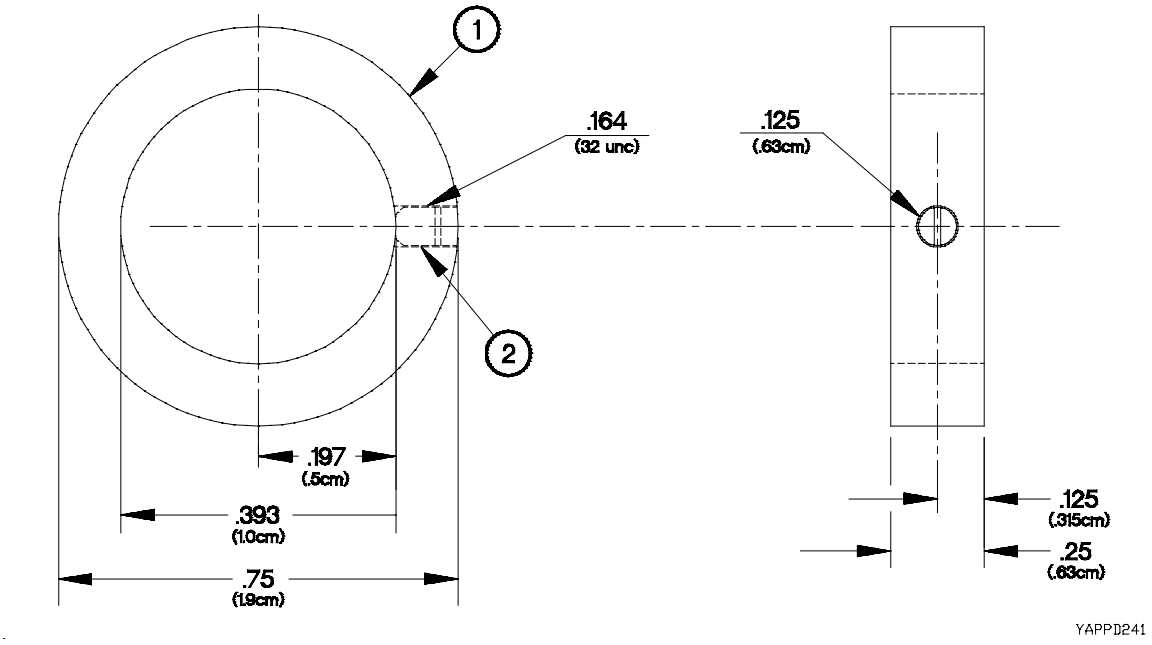


Figure D-24. Machine Gun Ring Drill Stop

a. All dimensions are in inches (centimeters).
b. Drill 0.393 in. (1.0 cm) diameter hole through as shown in **Figure D-24. Machine Gun Ring Drill Stop**.
c. Drill 0.125 in (0.32 cm) diameter hole through for setscrew as shown in **Figure D-24. Machine Gun Ring Drill Stop**.
d. Thread setscrew hole 0.164-32 UNC.
e. De-burr and remove sharp edges.
f. 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

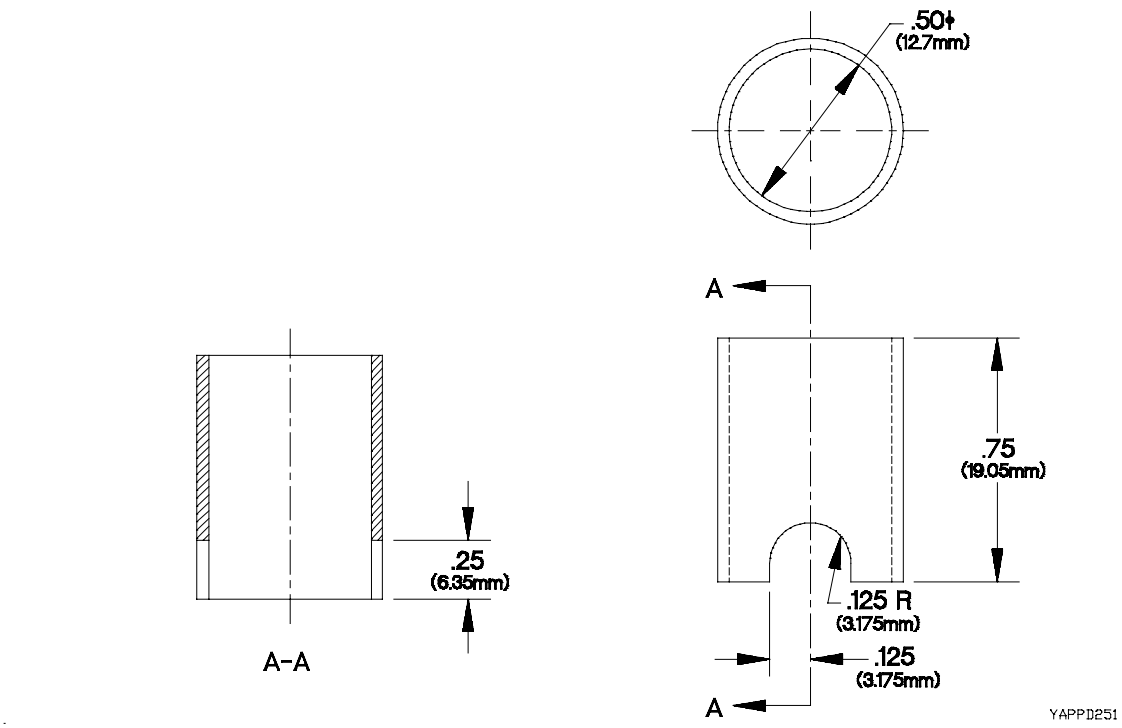


Figure D-25. Main Valve Body Spring Compression Tool

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 $\sqrt{\ }$ 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

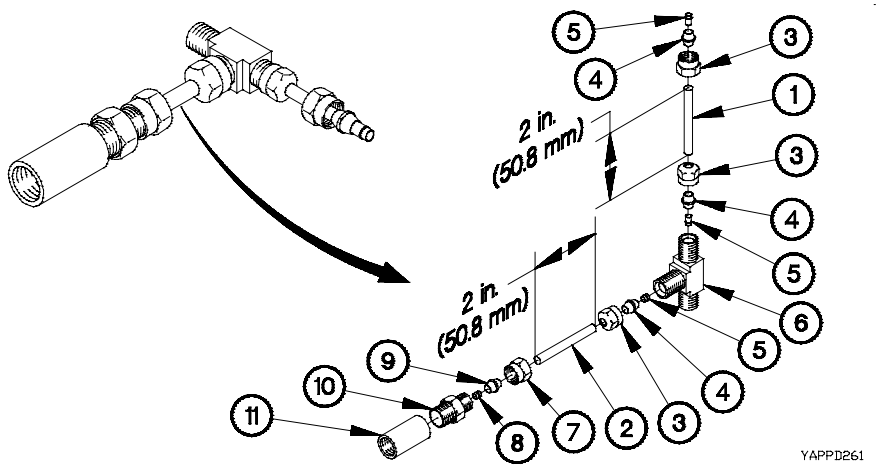


Figure D-26. M1089 30K Winch Test Adapter

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.

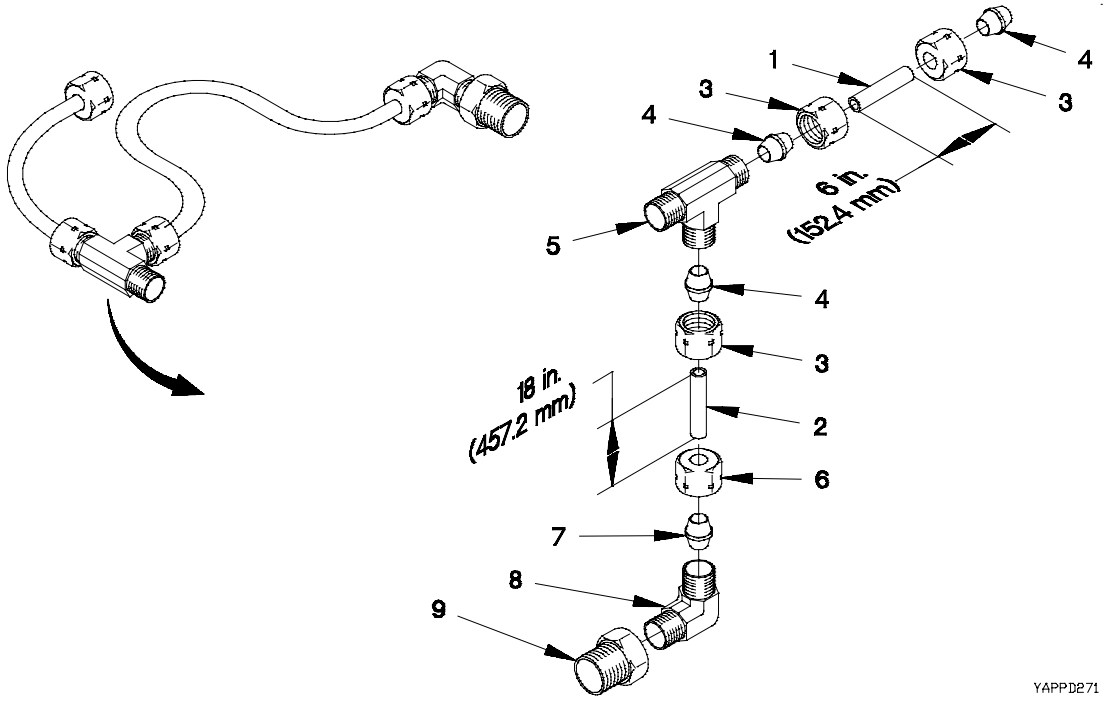


Figure D-27. M1089 Solenoid Test Adapter

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

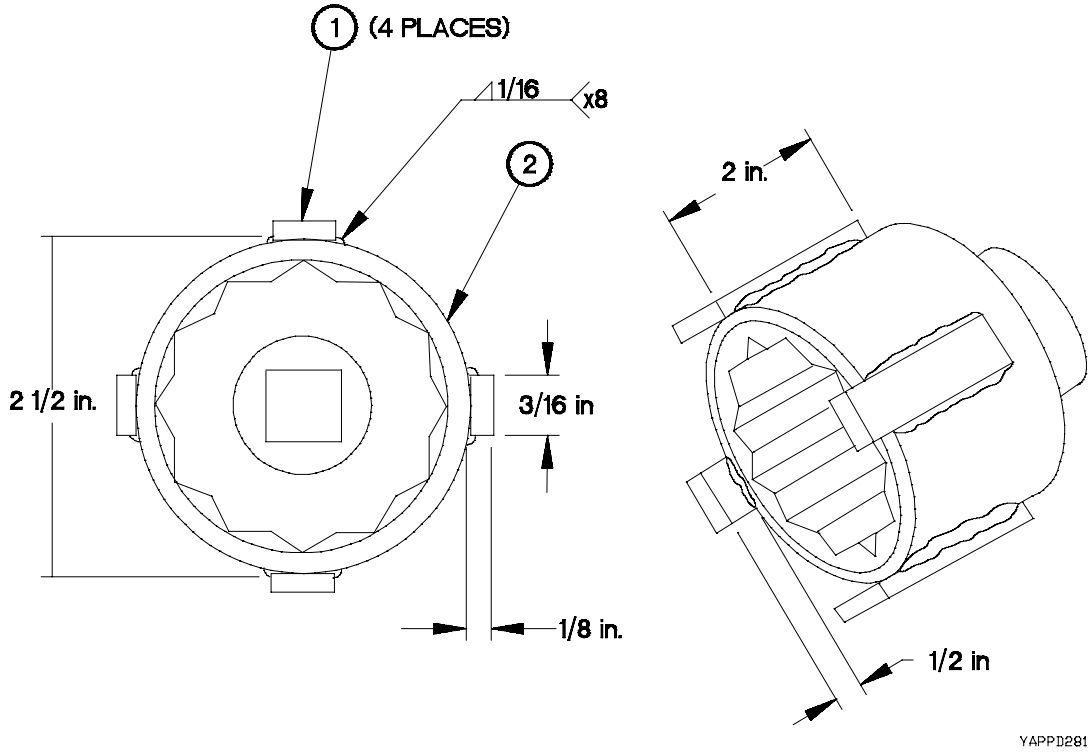


Figure D-28. Spanner Socket Tool

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

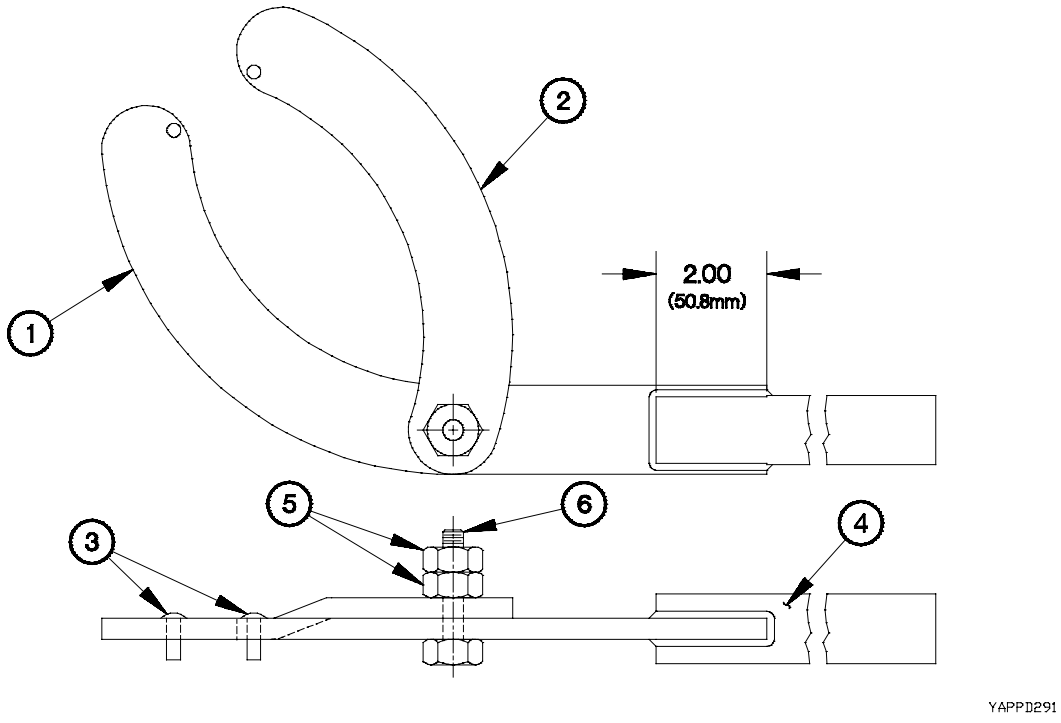


Figure D-29. Spanner Wrench Tool Assembly

a. Weld pins (3) in spanner handle (1) and spanner jaw (2) as shown in **Figure D-29. Spanner Wrench Tool Assembly**.
b. Position and clamp handle (4) to spanner handle piece (1) as shown in **Figure D-29. Spanner Wrench Tool Assembly**.
c. Weld handle to spanner handle on both sides of spanner handle.
d. Assemble spanner jaw (2) and spanner handle using bolt (6) and 2 hex nuts (5).

D-20. SPANNER WRENCH TOOL (CONT)

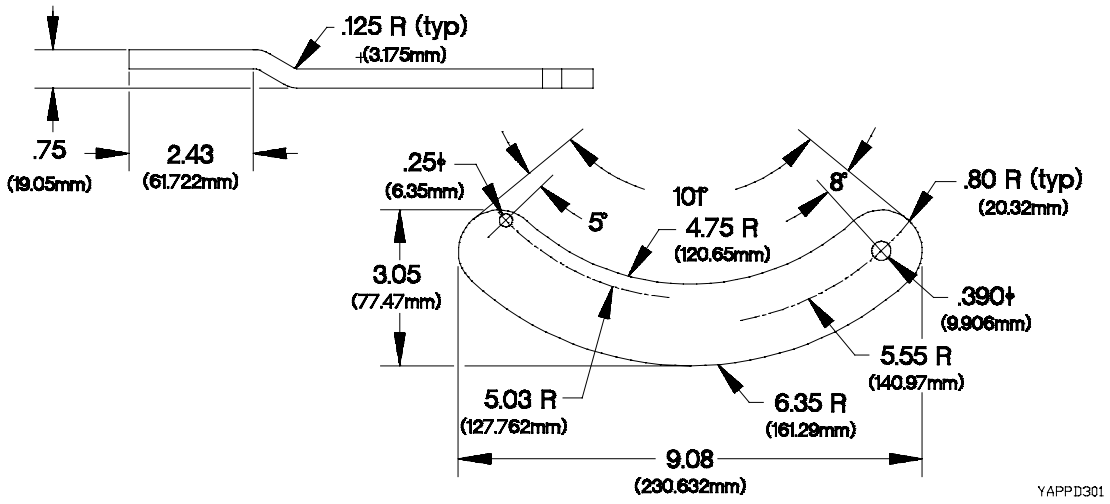


Figure D-30. Spanner Wrench Jaw

a. Shape spanner jaw (2) as shown in **Figure D-30. Spanner Wrench Jaw**.
b. 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**.
c. De-burr and remove sharp edges.

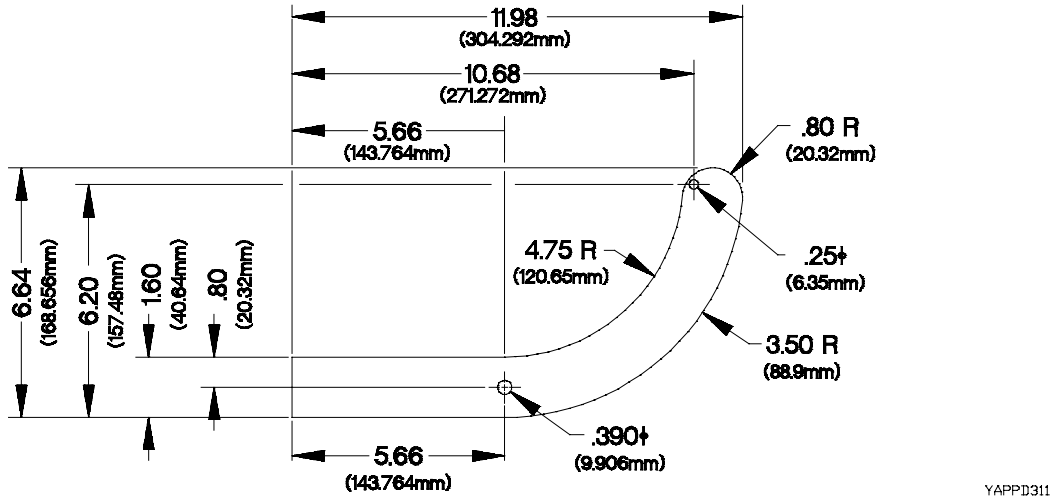


Figure D-31. Spanner Wrench Handle Piece

a. Shape spanner handle piece (1) the same as (2) except as shown in **Figure D-31. Spanner Wrench Handle Piece**.
b. 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**.
c. Cut slot in handle (4) as shown in **Figure D-31 Spanner Wrench Handle Piece**.
d. 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

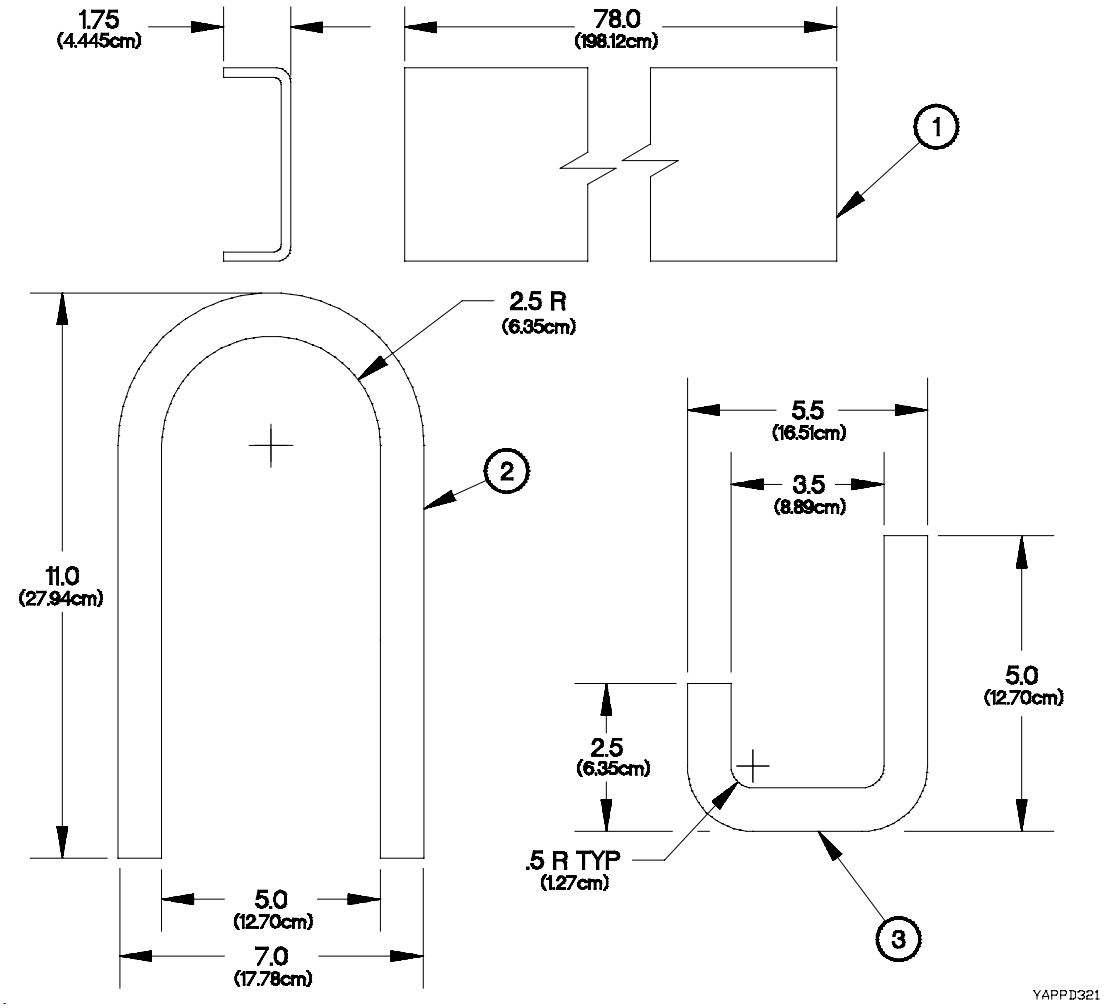


Figure D-32. Spreader Bar Layout

a. All dimensions are in inches (centimeters).
b. Heat and bend lift rod (2) to dimensions shown in **Figure D-32. Spreader Bar Layout**.
c. Heat and bend two guide rods (3) to dimensions shown in **Figure D-32. Spreader Bar Layout**.
d. Cut lift rod (2) and guide rods (3) to final dimensions shown in **Figure D-32 Spreader Bar Layout**.
e. De-burr and remove sharp edges.

D-21. SPREADER BAR (CONT)

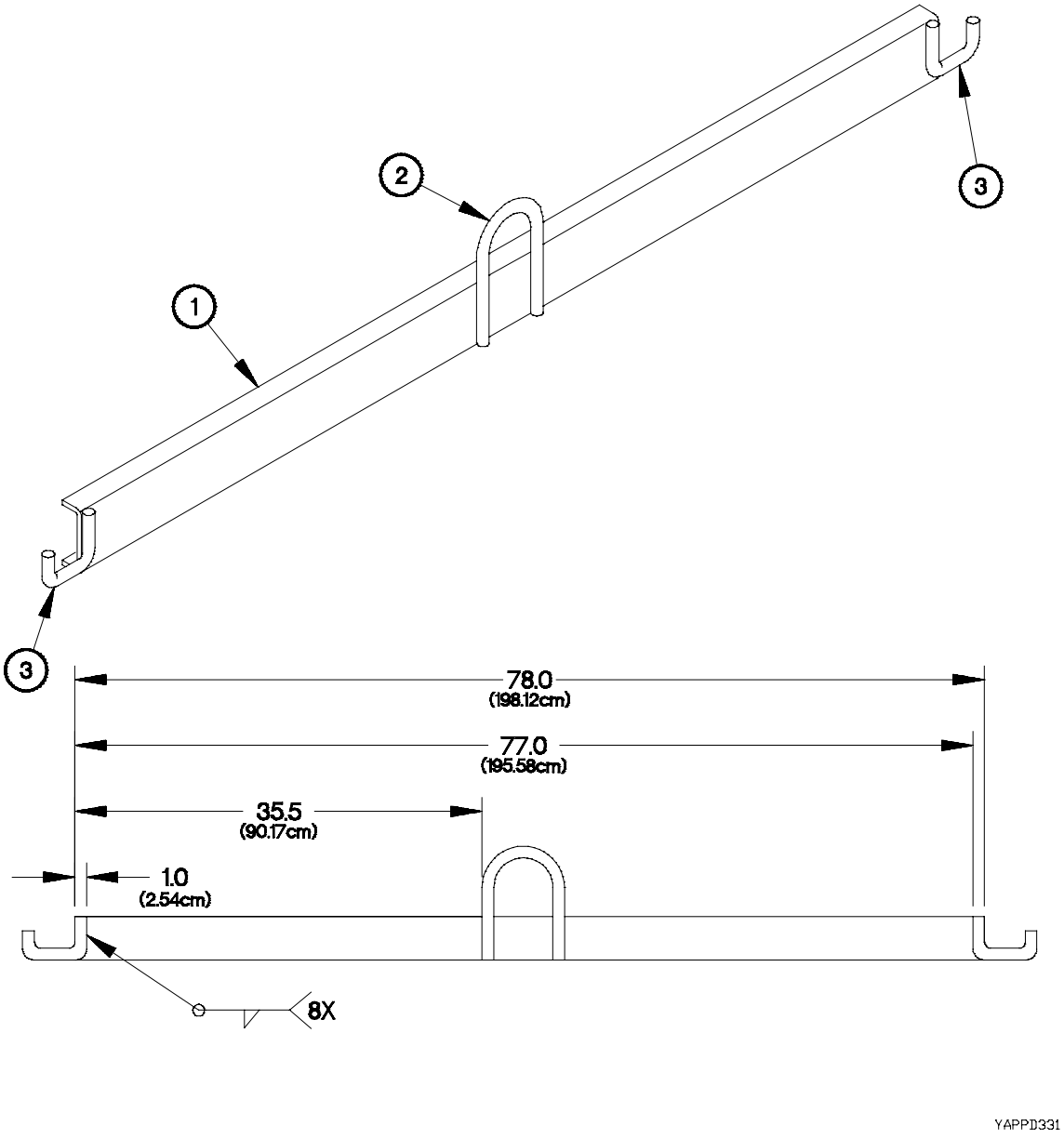


Figure D-33. Spreader Bar Assembly

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

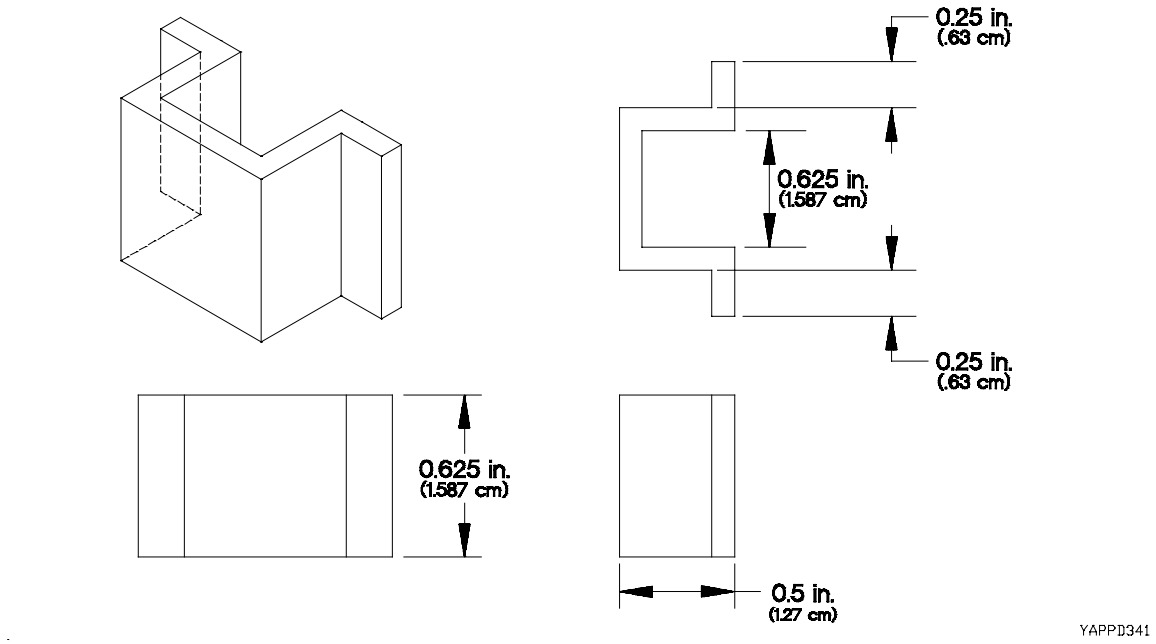


Figure D-34. Steering Stop Shim Gage

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

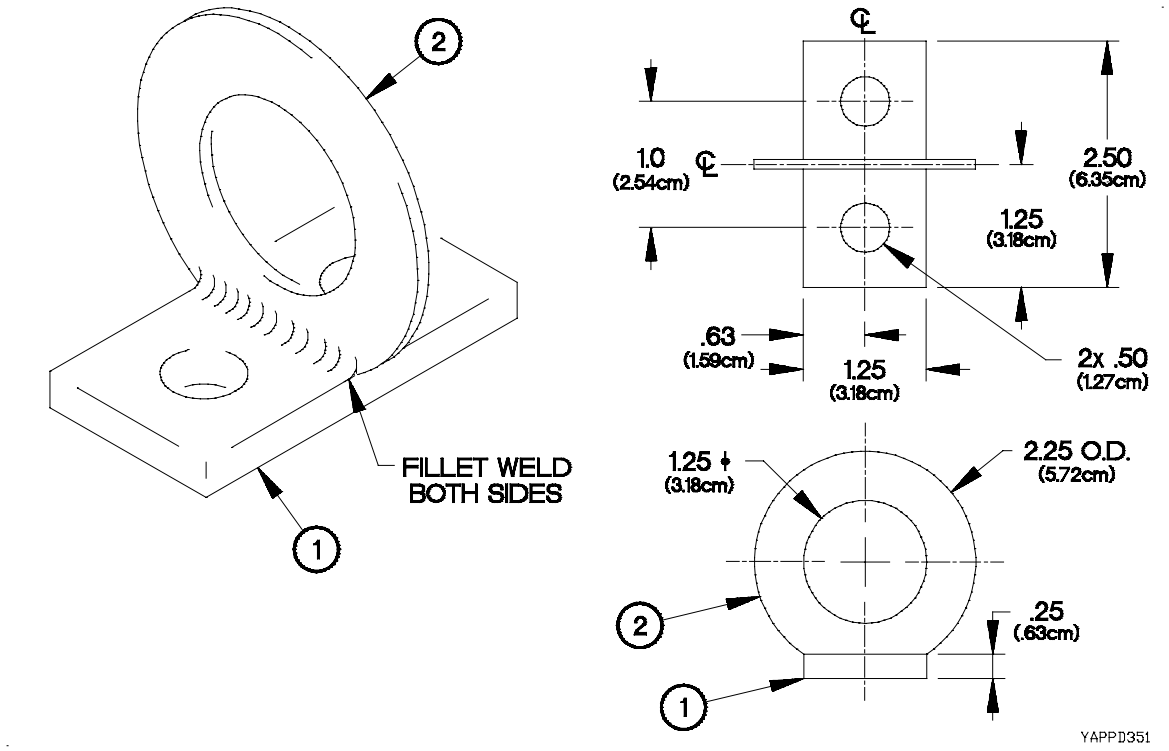


Figure D-35 Swingdrive Assembly Bracket

a. All dimensions are in inches (centimeters).
b. Fabricate (1) from flat steel bar and flat washer (2) as identified in table.
c. Hold tolerances of dimensions given to two decimal places at ±0.01 in. (±0.02 cm).
d. Drill 0.50 in. (1.3 cm) diameter hole 2 places as shown in **Figure D-35. Swingdrive Assembly Bracket**.
e. Grind side of flat washer (2) and weld to flat bar (1) as shown in **Figure D-35. Swingdrive Assembly Bracket**.
f. Dimensions shown in **Figure D-35. Swingdrive Assembly Bracket** are for machining and positioning pieces.
g. 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

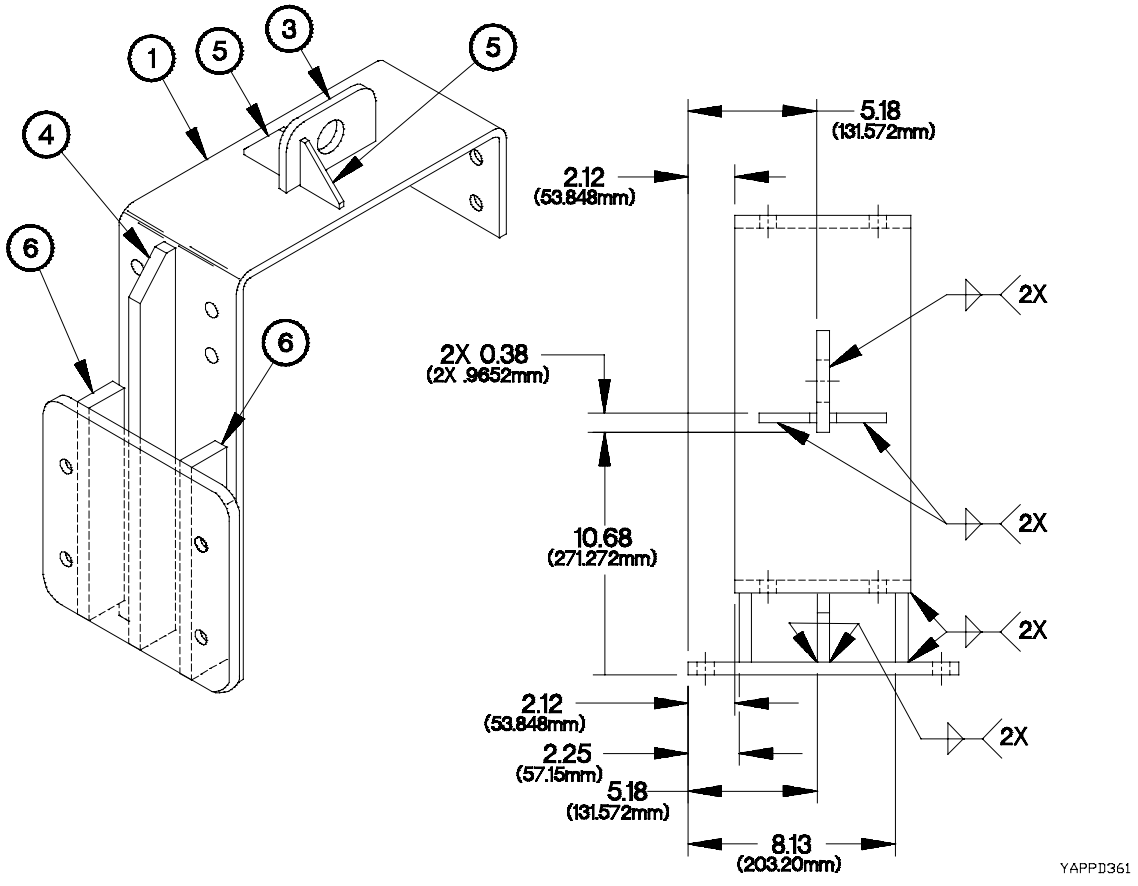


Figure D-36. Transfer Case Lift Bracket Assembly

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

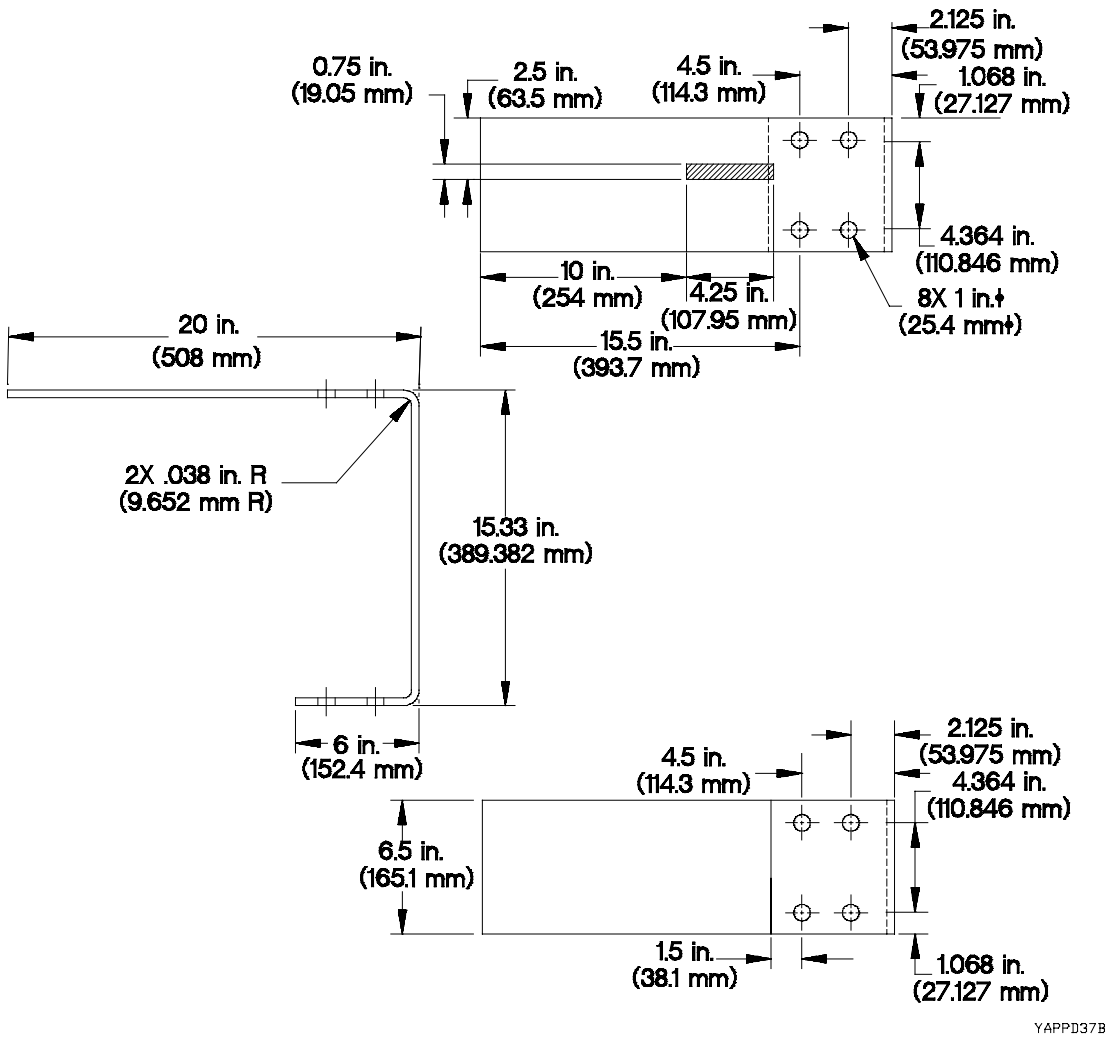


Figure D-37. Transfer Case Lift Bracket Main Mounting Bracket

a. All dimensions are in inches (millimeters).
b. Fabricate main mounting bracket (1) from ASTM A-36 steel plate.
c. 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**.
d. All dimensions are after bends are made.
e. Drill 1 in. (25.4 mm) diameter hole through 8 places as shown in **Figure D-37. Transfer Case Lift Bracket Main Mounting Bracket**.
f. 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

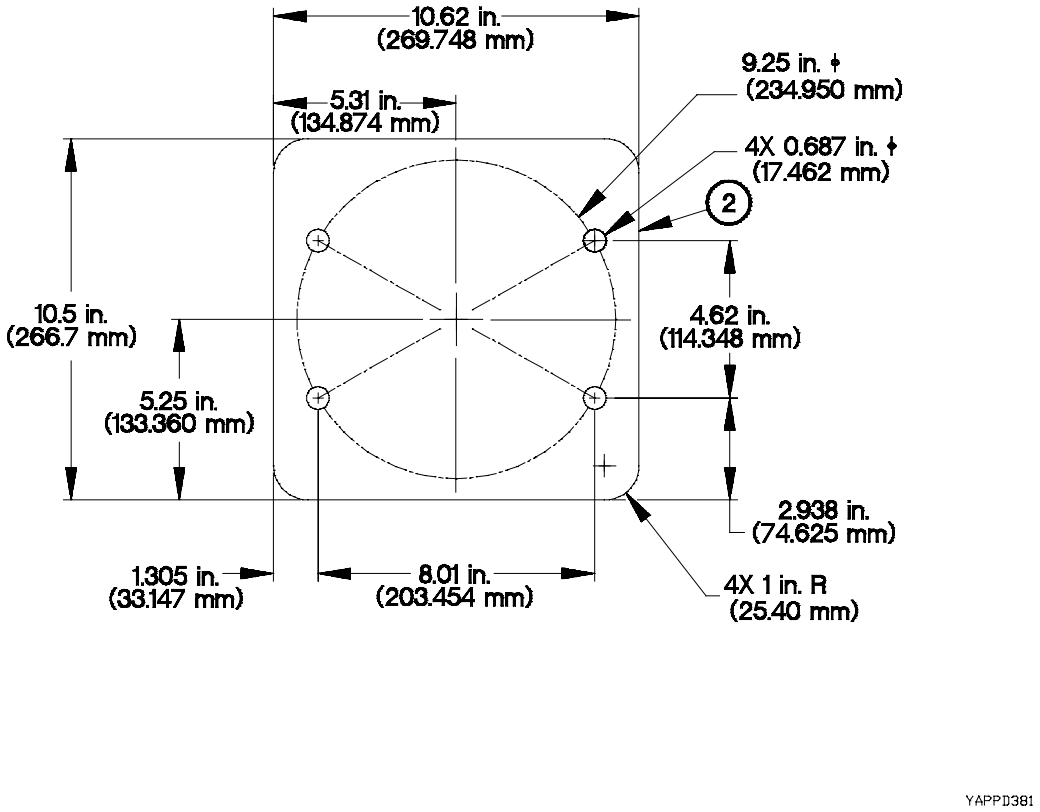


Figure D-38. Transfer Case Lift Bracket Bolt Mounting Bracket

a. All dimensions are in inches (millimeters).
b. Fabricate bolt mounting bracket (2) from ASTM A-36 steel plate.
c. 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**.
d. Round four corners to 1.0 in. (25.4 mm) radius as shown in **Figure D-38. Transfer Case Lift Bracket Bolt Mounting Bracket**.
e. 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

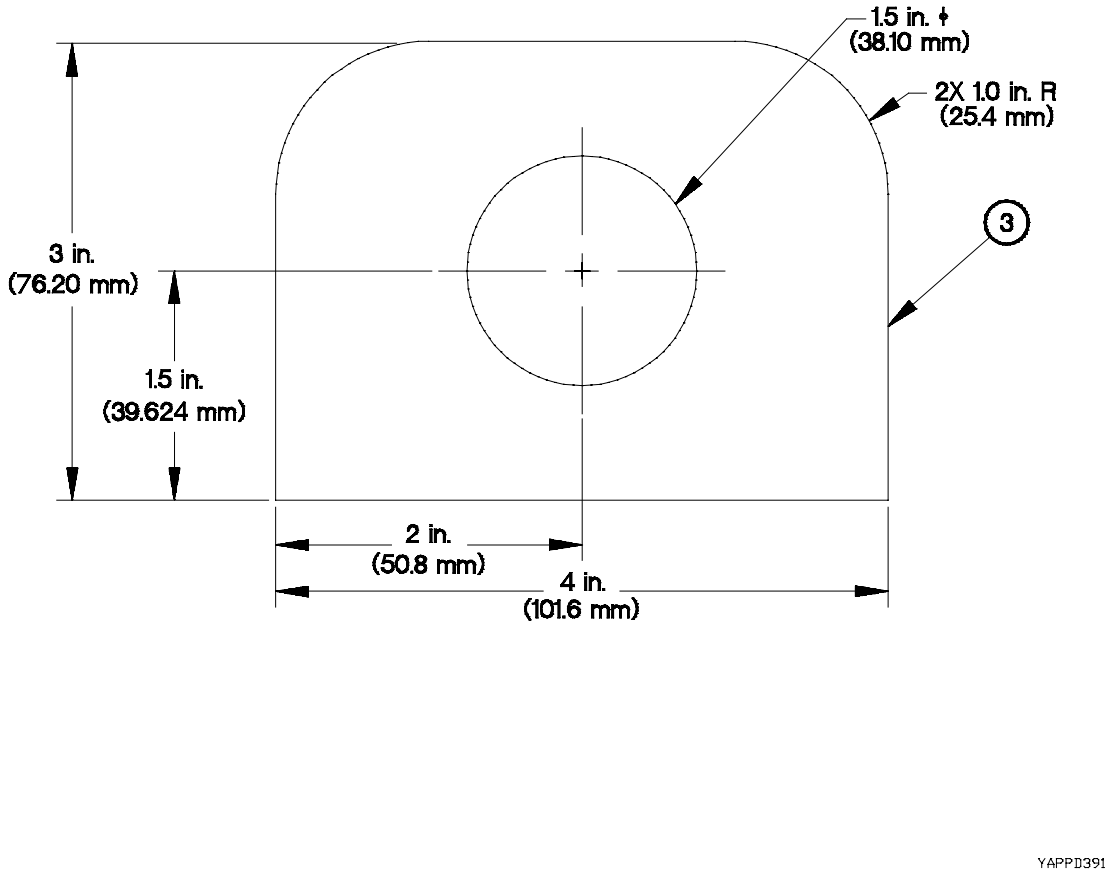


Figure D-39. Transfer Case Lift Bracket Lifting Plate

a. All dimensions are in inches (millimeters).
b. Fabricate lifting plate (3) from ASTM A-36 steel plate.
c. Drill 1.50 in. (38.1 mm) diameter hole through 1 place as shown in **Figure D-39. Transfer Case Lift Bracket Lifting Plate**.
d. Round two corners to 1.0 in. (25.4 mm) radius as shown in **Figure D-39. Transfer Case Lift Bracket Lifting Plate**.
e. 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

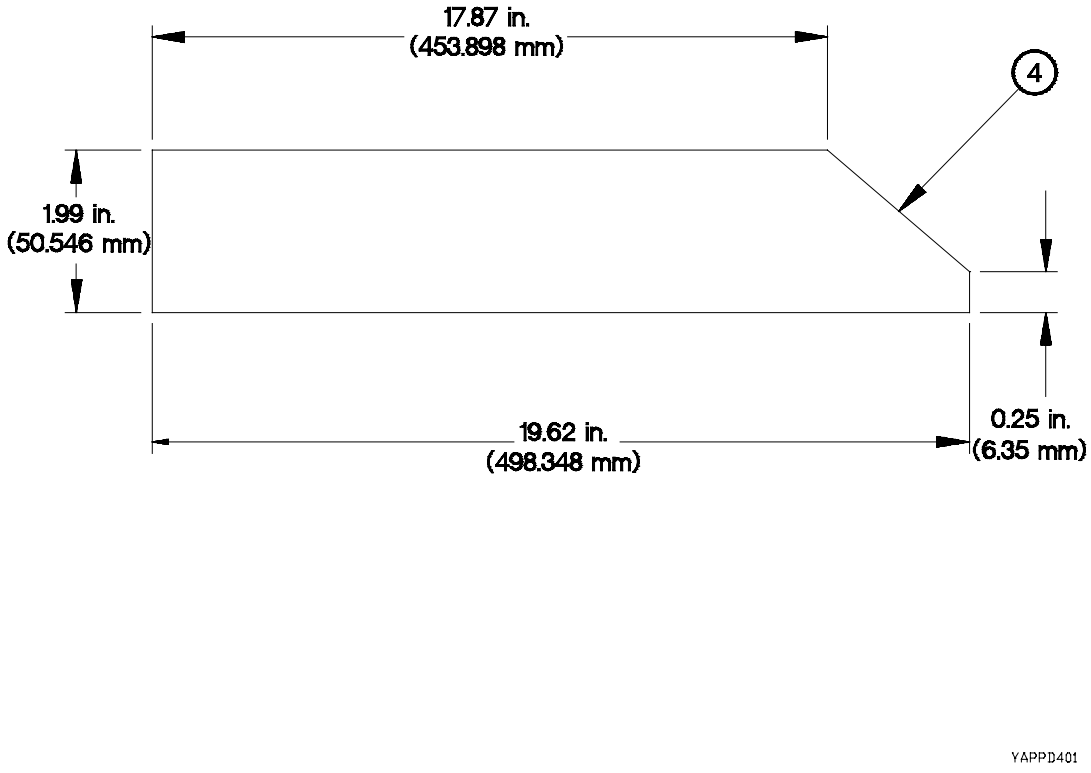


Figure D-40. Transfer Case Lift Bracket Center Support Plate

a. All dimensions are in inches (millimeters).
b. Fabricate center support plate (4) from ASTM A-36 steel plate.
c. 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

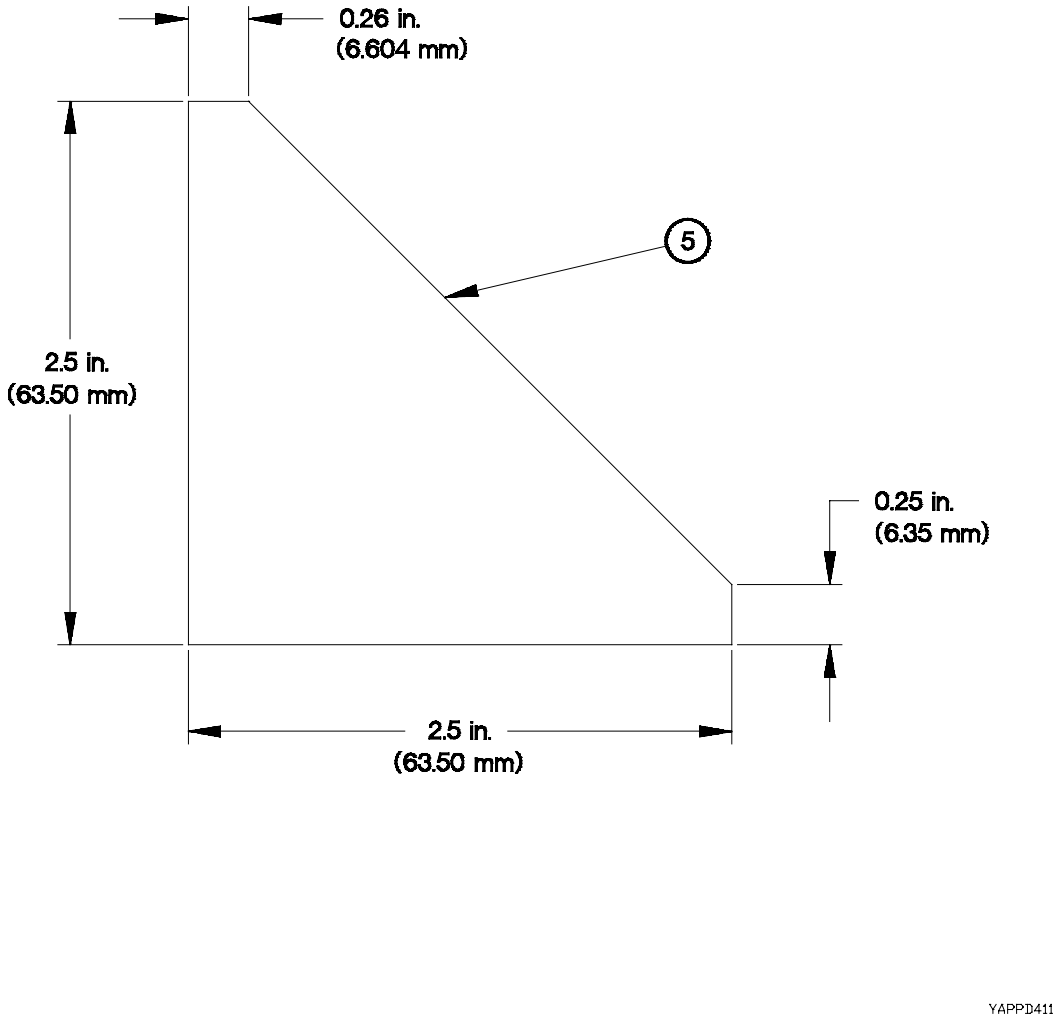


Figure D-41. Transfer Case Lift Bracket Lifting Plate Braces

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

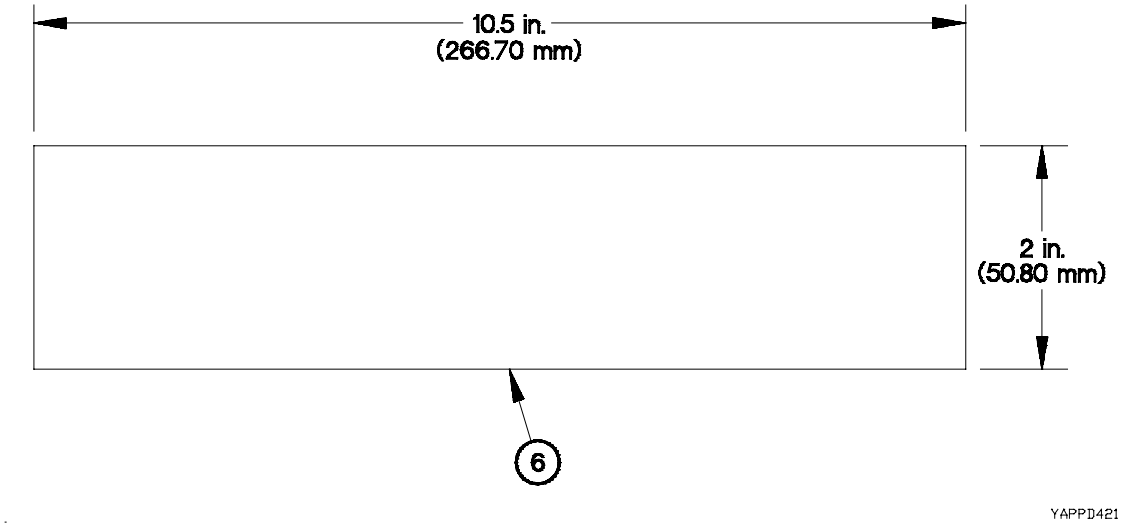


Figure D-42. Transfer Case Lift Bracket Bolt Mounting Bracket Supports

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

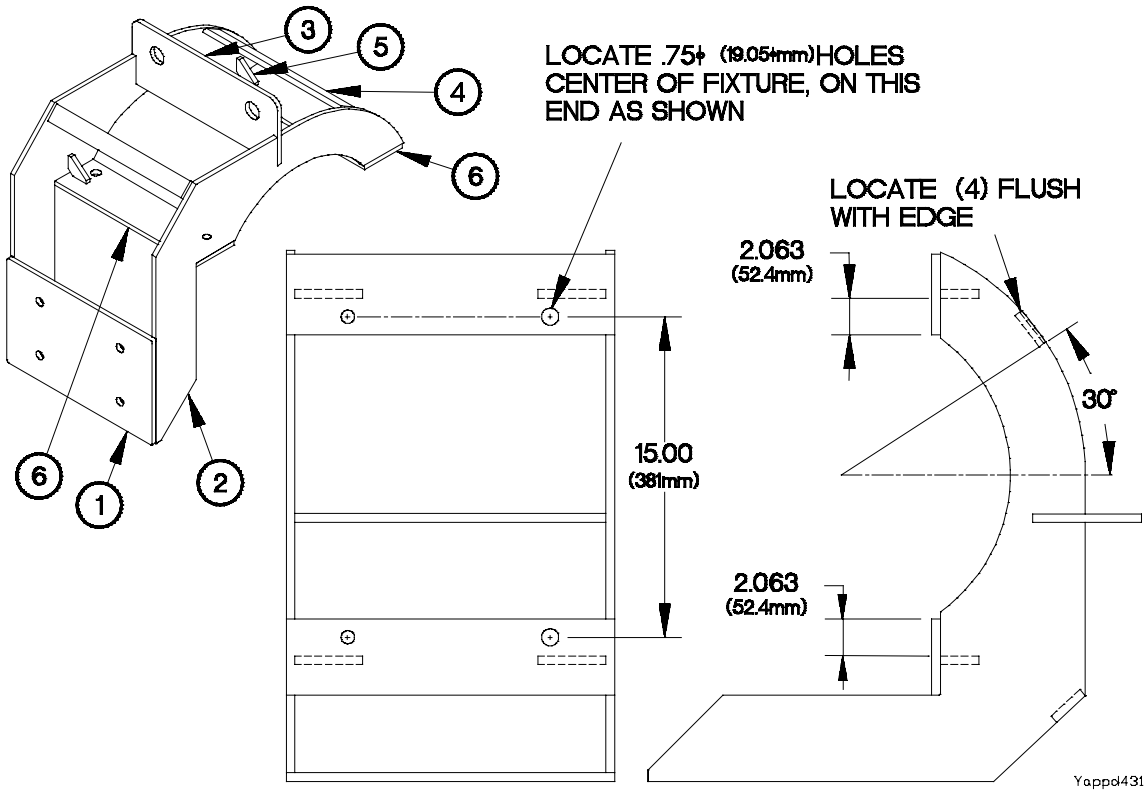


Figure D-43. Transmission Lift and Mounting Bracket Assembly

a. All dimensions are in inches (millimeters).
b. Position items (1 through 6) together as shown by dimensions in **Figure D-43. Transmission Lift and Mounting Bracket Assembly**.
c. Weld items (1 through 6) together as shown by Section A - A in **Figure D-43. Transmission Lift and Mounting Bracket Assembly**.
d. Tolerance on dimensions given to two decimal places will be held to ±0.03 in. (±0.76 mm).
e. 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**.
f. 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

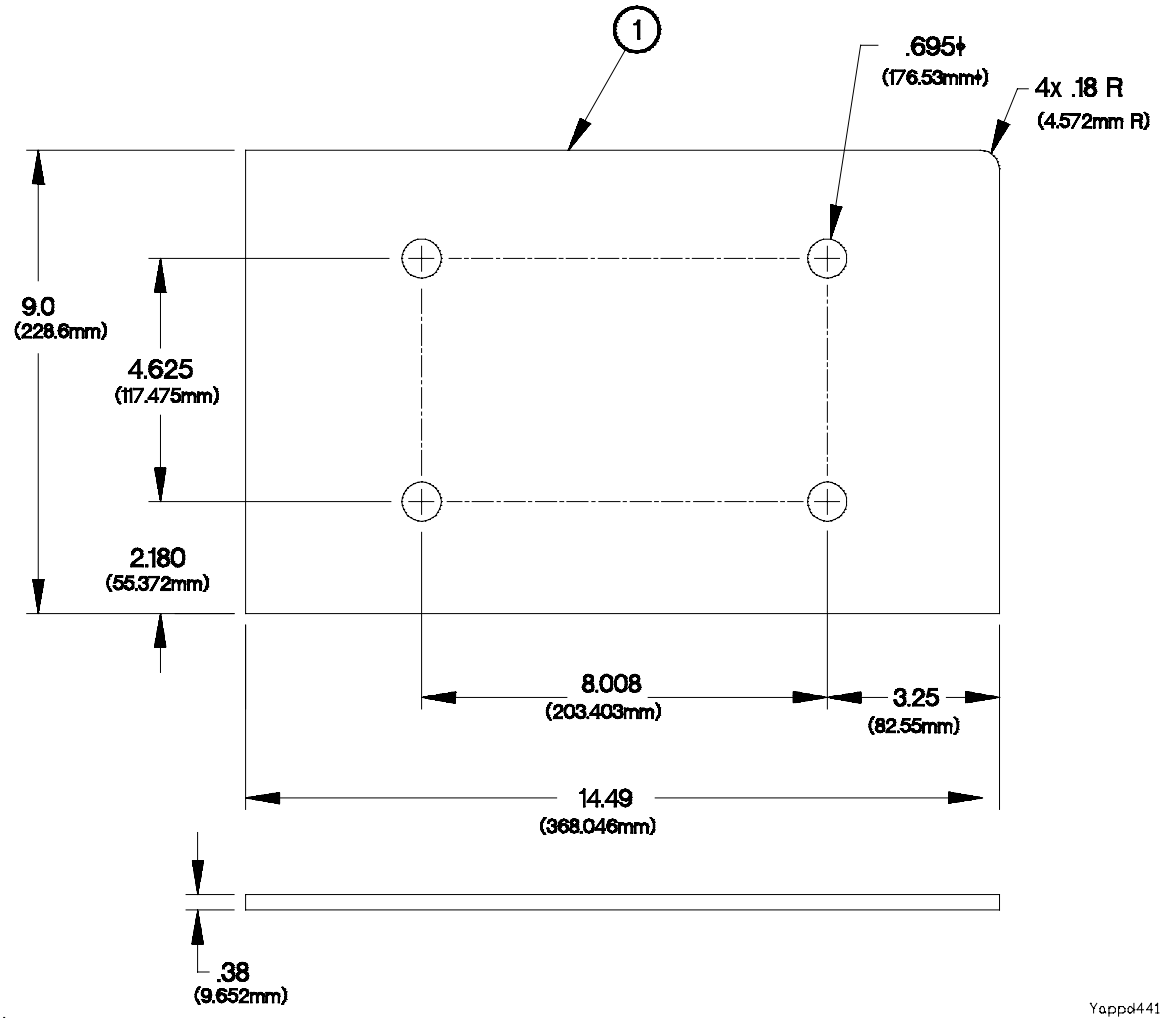


Figure D-44. Transmission Lift and Mounting Bracket Bottom Plate

a. All dimensions are in inches (millimeters).
b. Fabricate bottom plate (1) from ASTM A-36 steel plate.
c. 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**.
d. Round four corners to 0.18 in. (4.6 mm) radius as shown in **Figure D-44. Transmission Lift and Mounting Bracket Bottom Plate**.
e. 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

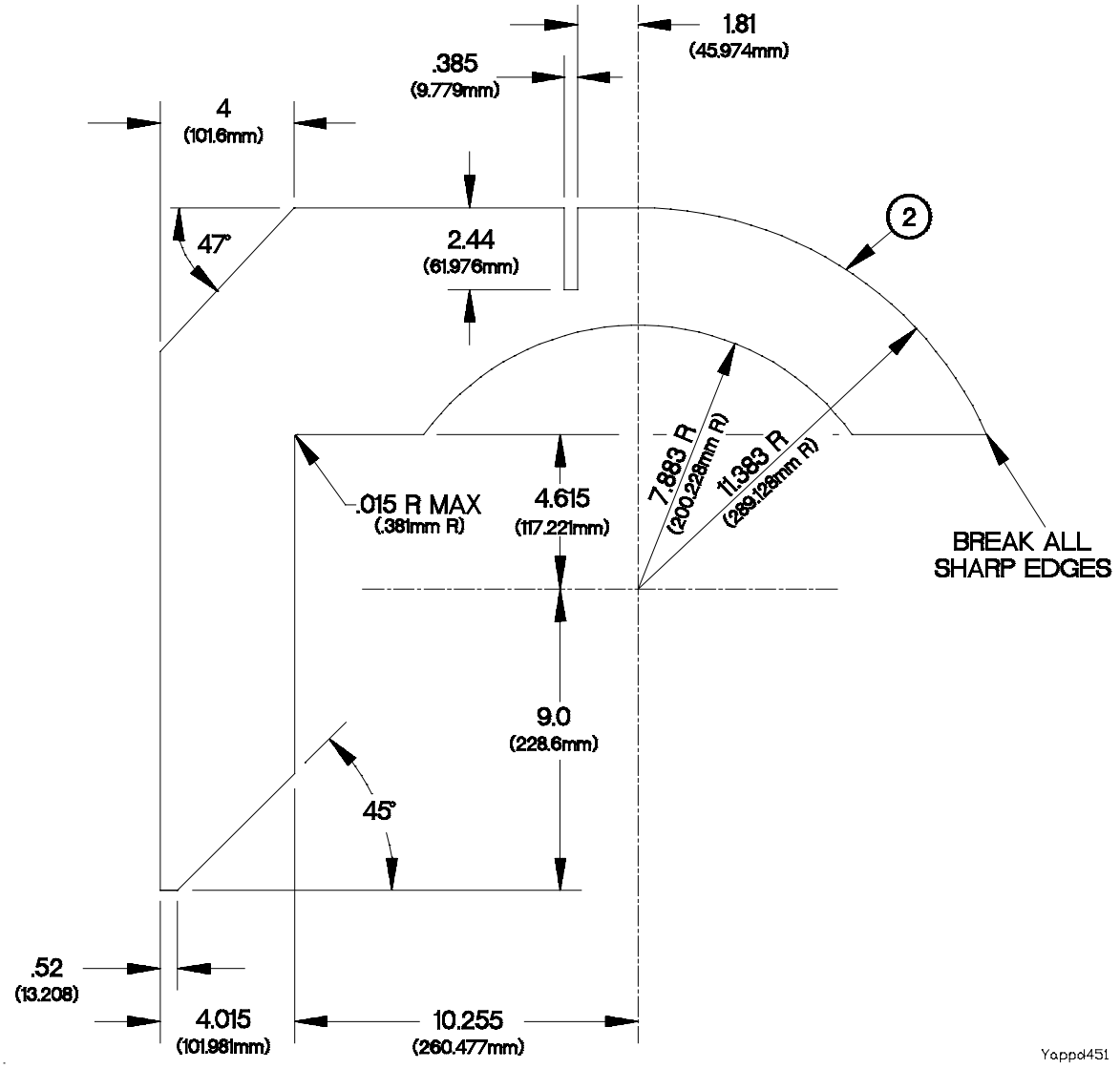


Figure D-45. Tansmission Lift and Mounting Bracket Side Plates

a. All dimensions are in inches (millimeters).
b. Fabricate two side plates (2) from ASTM A-36 steel plate.
c. 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. Tansmission Lift and Mounting Bracket Side Plates**.
d. 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

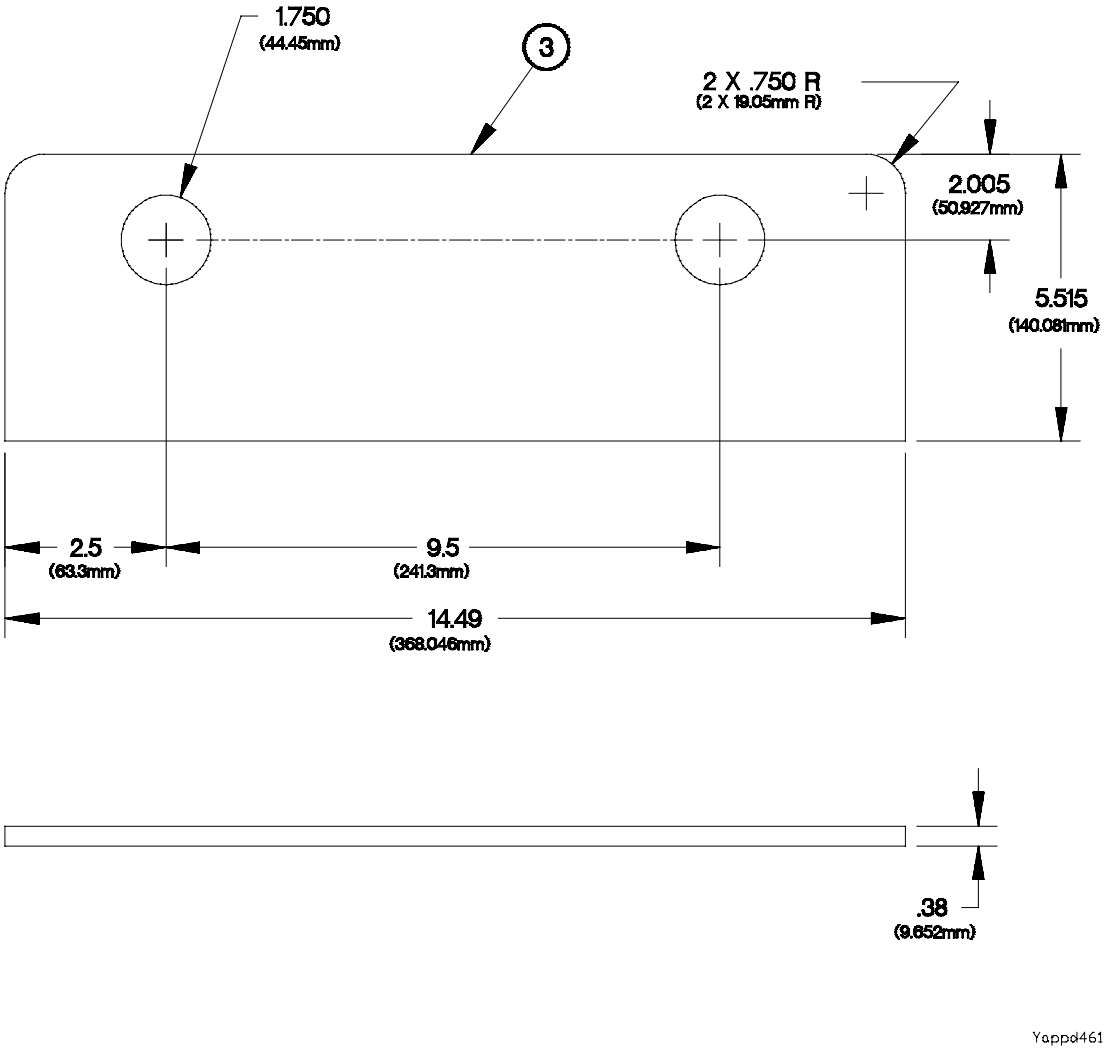


Figure D-46. Transmission Lift and Mounting Bracket Top Plate

a. All dimensions are in inches (millimeters).
b. Fabricate top plate (3) from ASTM A-36 steel plate.
c. Drill 1-3/4 in. (44.4 mm) diameter hole through 2 places as shown in **Figure D-46. Tansmission Lift and Mounting Bracket Top Plate**.
d. Round two corners to 0.750 in (19 mm) radius as shown in **Figure D-46. Tansmission Lift and Mounting Bracket Top Plate**.
e. 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

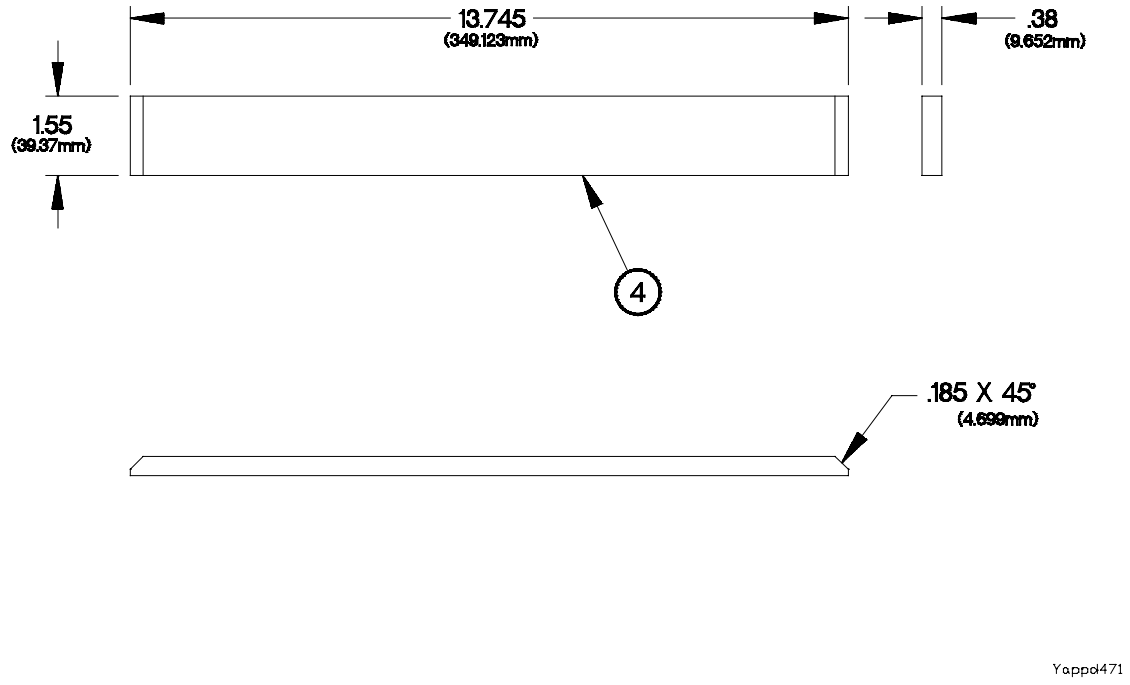


Figure D-47. Tansmission Lift and Mounting Bracket Top and Bottom Braces

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

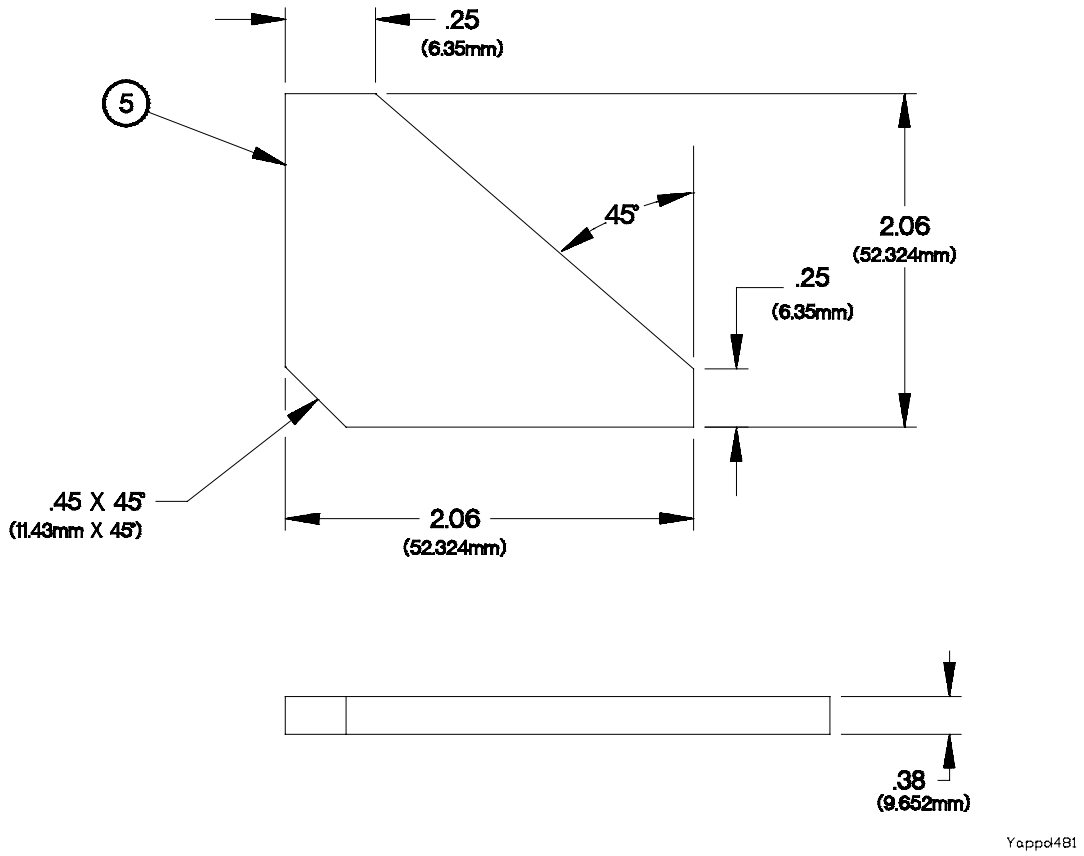


Figure D-48. Transmission Lift and Mounting Bracket Side Supports

a. All dimensions are in inches (millimeters).
b. Fabricate four side supports (5) from ASTM A-36 steel plate.
c. 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

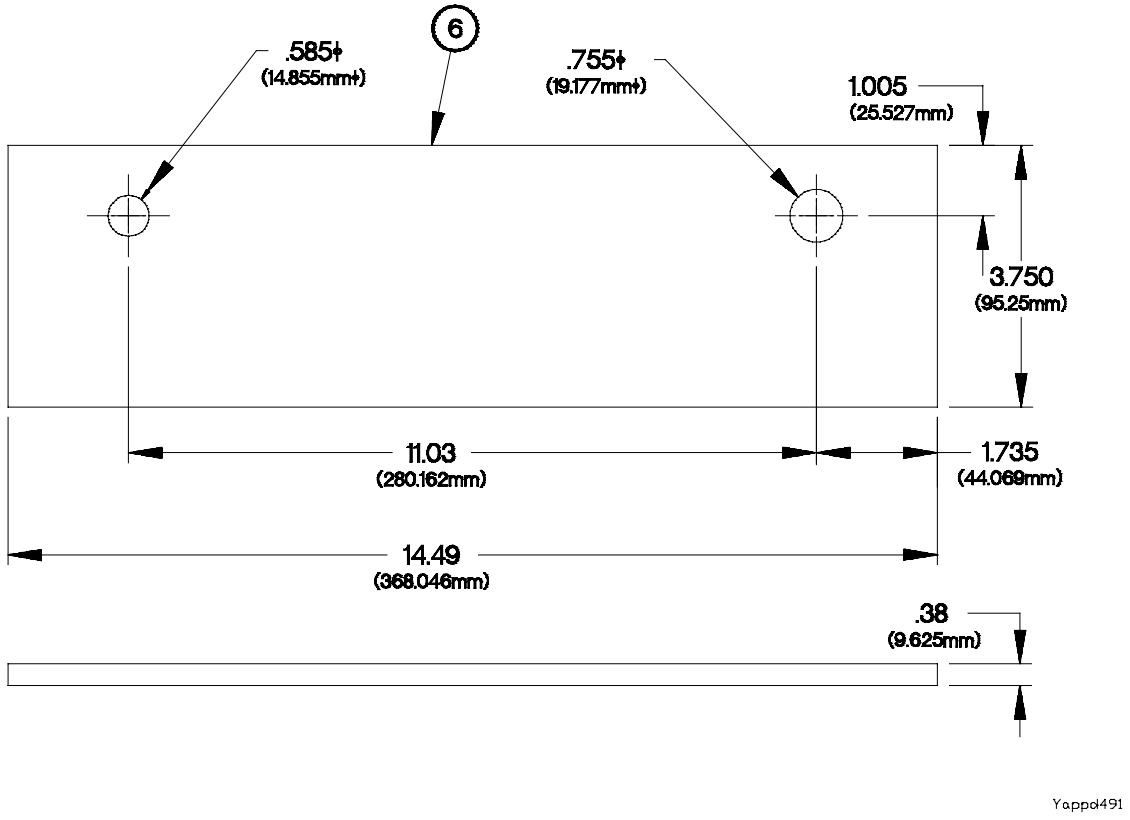


Figure D-49. Transmission Lift and Mounting Bracket Bolt Mounting Plates

a. All dimensions are in inches (millimeters).
b. Fabricate two bolt mounting plates (6) from ASTM A-36 steel plate.
c. Drill 0.755 in. (19.2 mm) diameter hole through as shown in **Figure D-49. Transmission Lift and Mounting Bracket Bolt Mounting Plates**.
d. Drill 0.585 in. (14.8 mm) diameter hole through as shown in **Figure D-49. Transmission Lift and Mounting Bracket Bolt Mounting Plates**.
e. 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

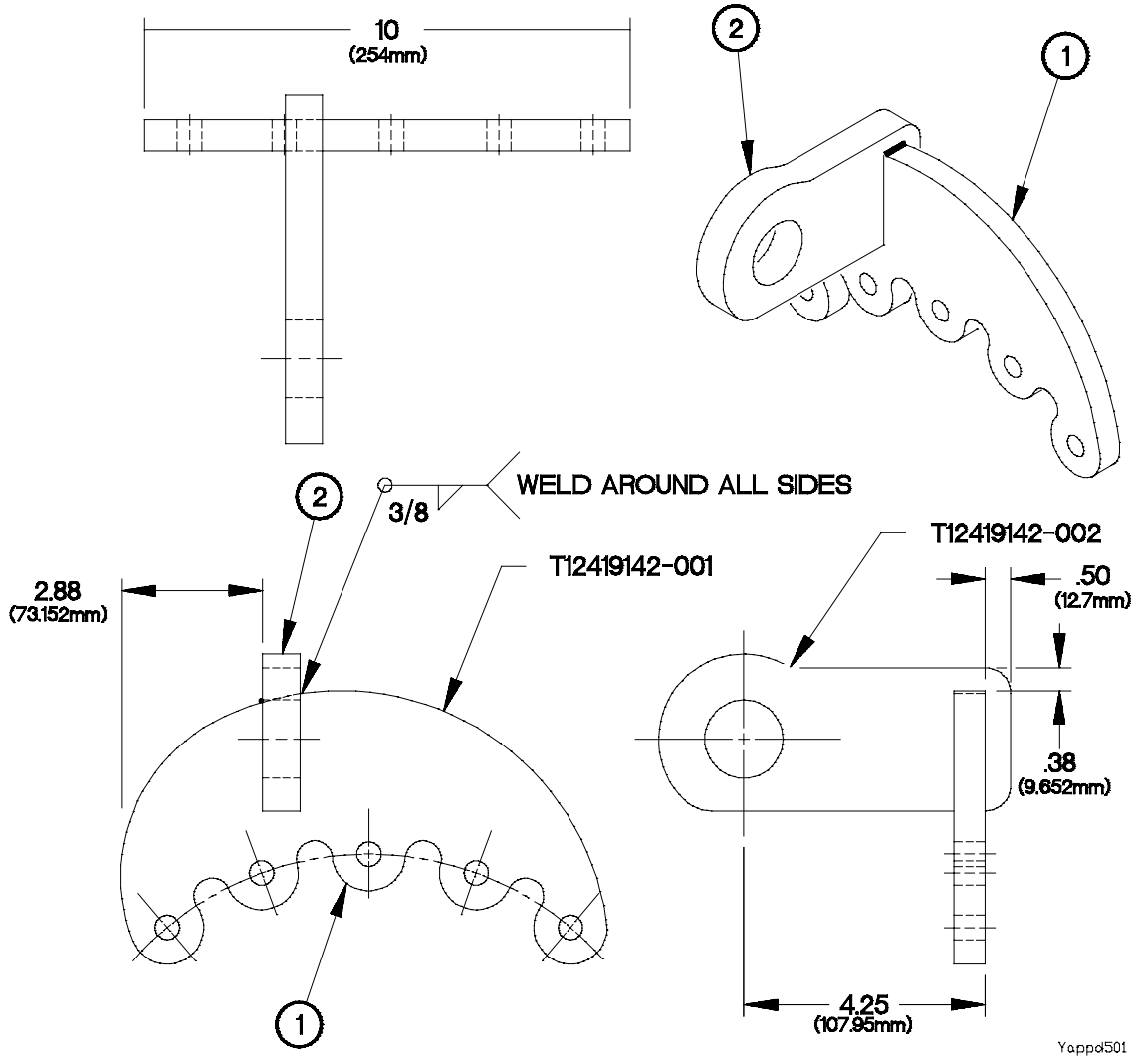


Figure D-50. Transmission Lift Bracket Assembly

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

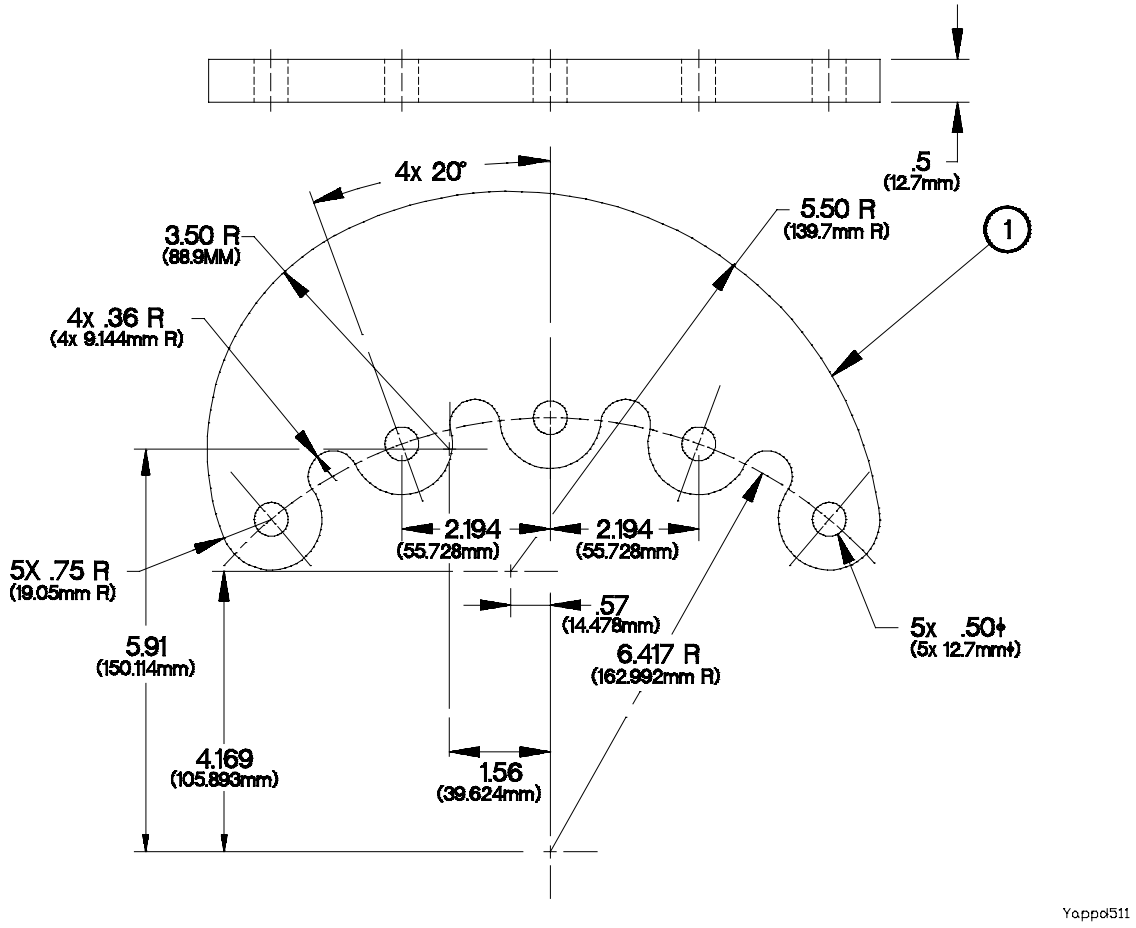


Figure D-51. Lower Lift Bracket

a. All dimensions are in inches (millimeters).
b. Fabricate (1) from ASTM A829, Grade 4130, Hardness Rockwell C28-32 steel plate.
c. 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).
d. Tolerance on dimensions shown to three decimal places in **Figure D-51. Lower Lift Bracket** are held to ±0.005 in. (±0.13 mm).
e. 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**.
f. Round piece to 5.50 in. (139.7 mm) radius as shown in **Figure D-51. Lower Lift Bracket**.
g. 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**.
h. 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

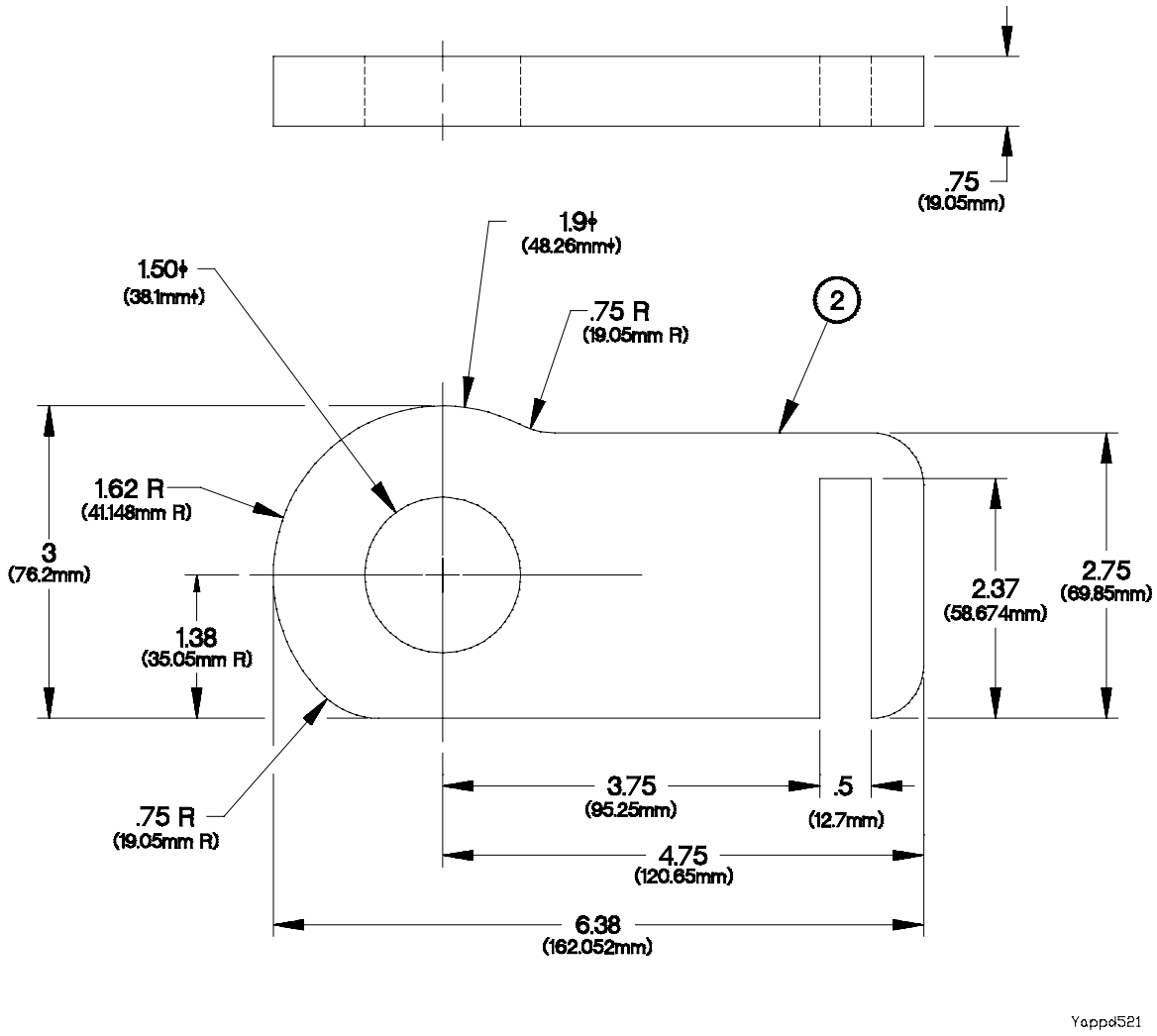


Figure D-52. Upper Lift Bracket

a. All dimensions are in inches (millimeters).
b. Fabricate (2) from ASTM A829, Grade 4130, Hardness Rockwell C28-32 steel plate.
c. 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).
d. Drill 1.50 inch (38.1 mm) diameter hole through 1 place as shown in **Figure D-52. Upper Lift Bracket**.
e. 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**.
f. De-burr and remove all sharp edges.
g. 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

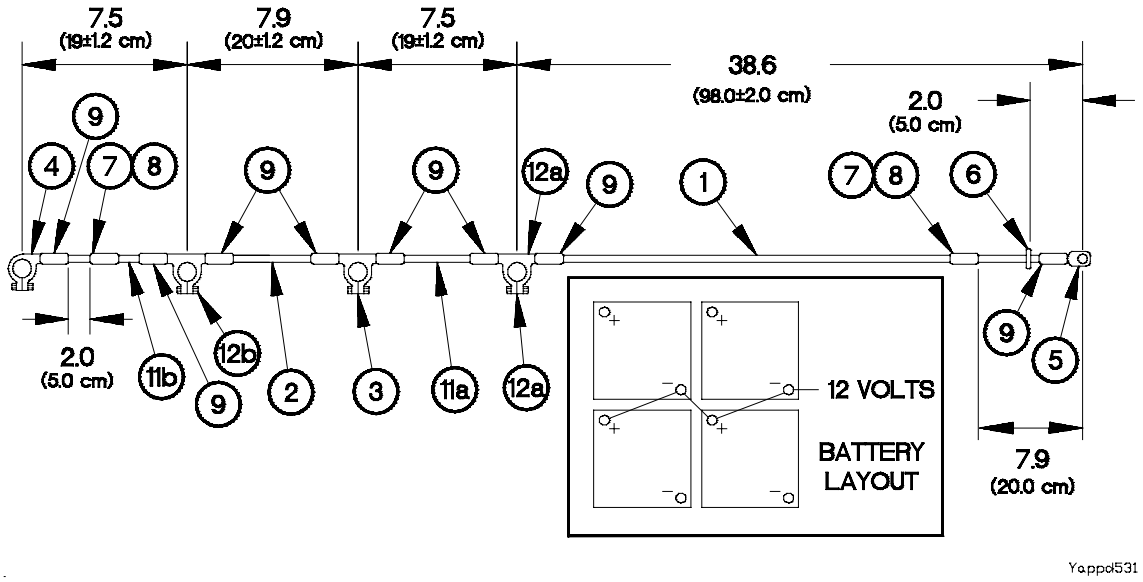


Figure D-53. Battery 12V Cable Assembly

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 sleevings (9).
zd. Seal terminals sleevings (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

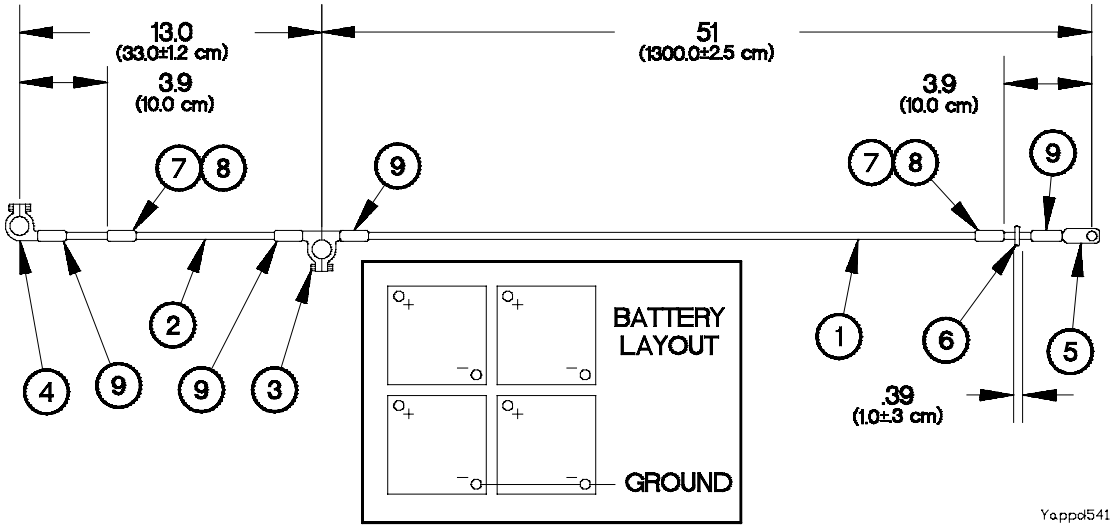


Figure D-54. Battery Ground Cable Assembly

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 sleevings (9).
t. Seal four sleevings (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

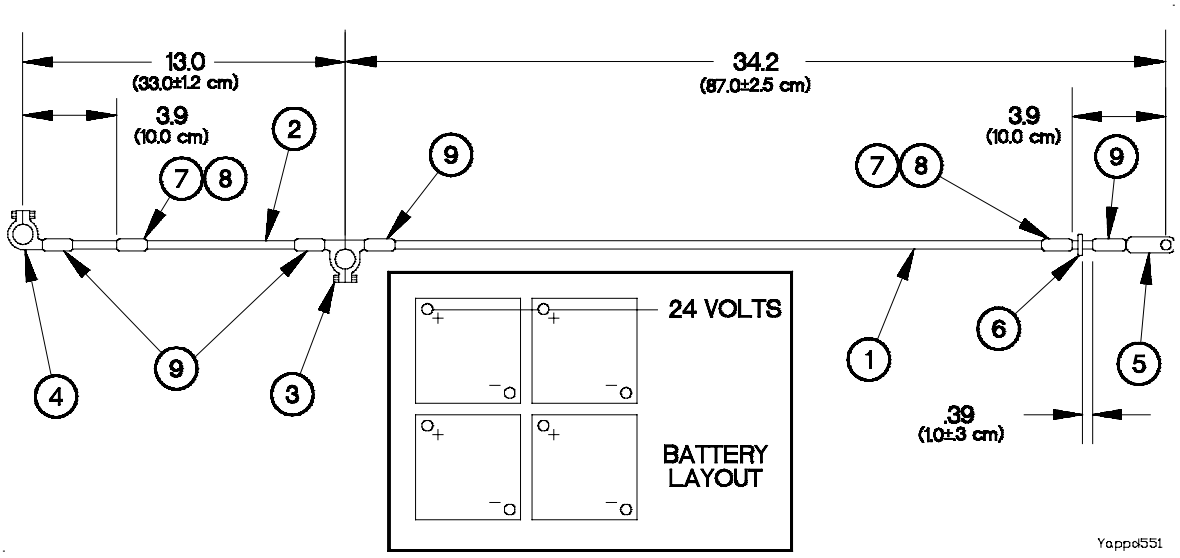


Figure D-55. Battery 24V Cable Assembly

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 in **Figure D-55. Battery 24V 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-55. Battery 24V Cable Assembly**.
f. Install marker sleeve (7) on cable (2) at position shown in **Figure D-55. Battery 24V 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 **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 sleevings (9).
t. Seal four sleevings (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

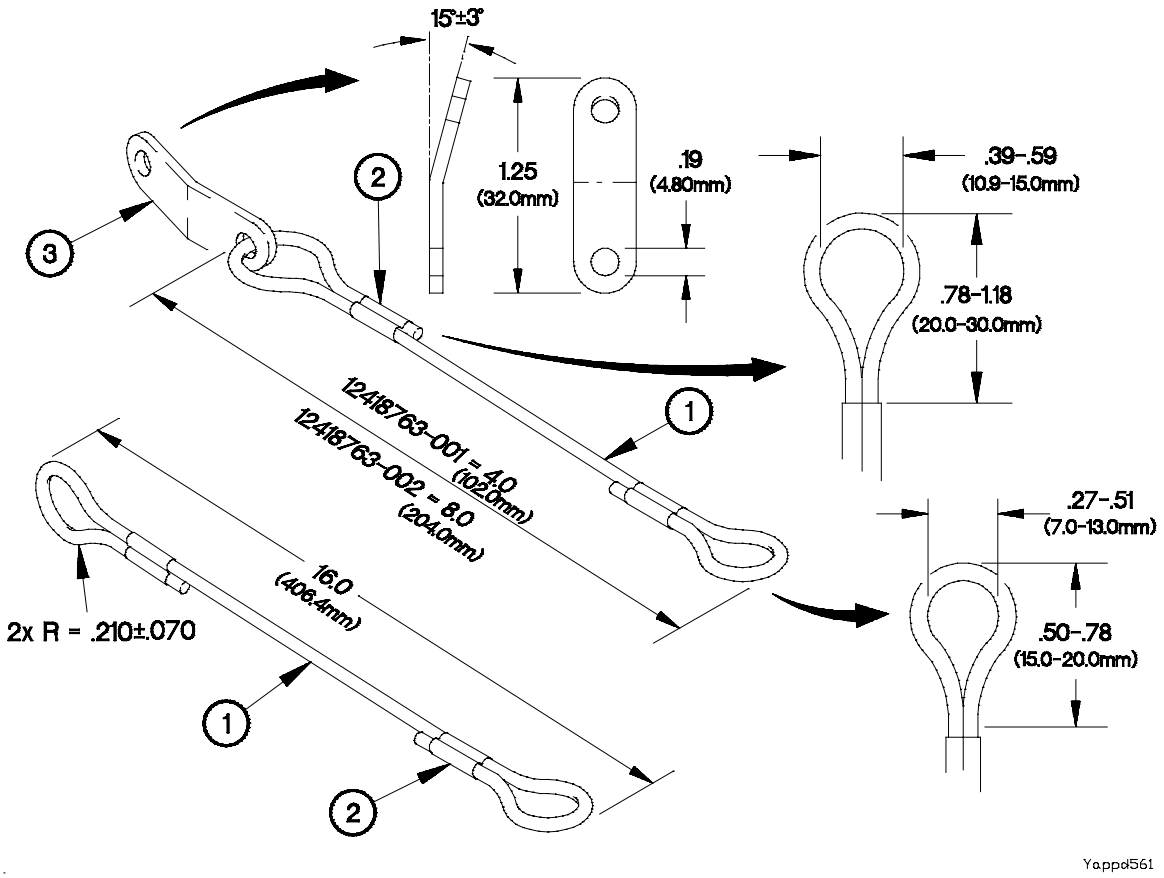


Figure D-56. Lanyard Assembly

a. All dimensions are in inches (millimeters).
b. Make from bulk cable and flat steel material as identified in parts list.
c. Drill two 0.19 in. (4.8 mm) diameter holes through tab material as shown in **Figure D-56 Lanyard Assembly**.
d. De-burr and remove sharp edges.
e. Bend tab as shown in **Figure D-56 Lanyard Assembly**.
f. 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**.
g. 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.

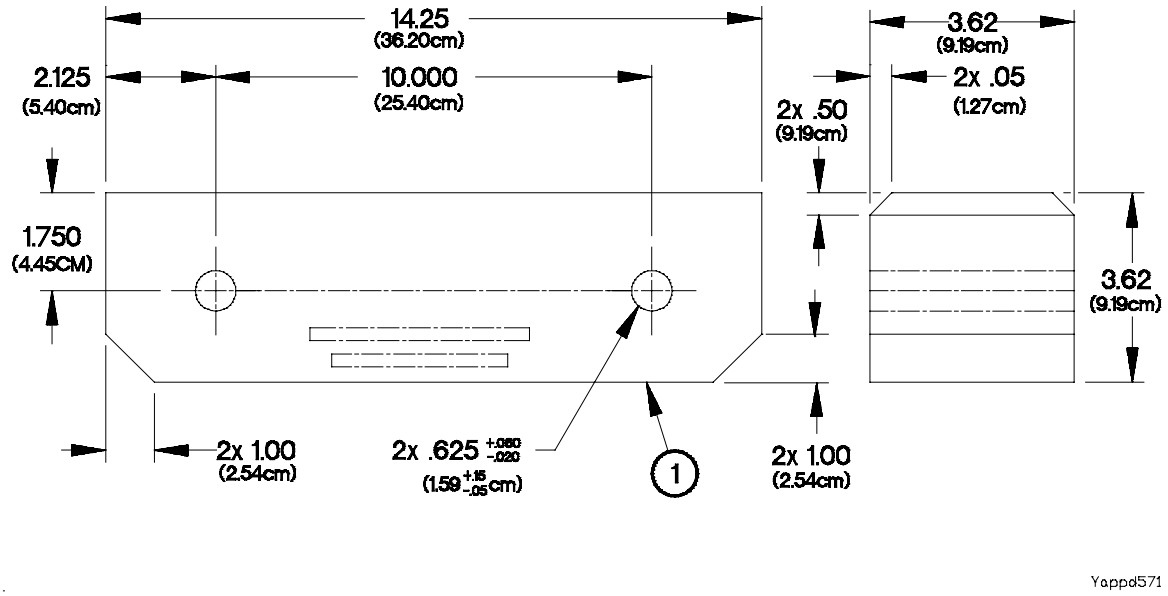


Figure D-57. Wooden Skid

a. All dimensions are in inches (centimeters).
b. Fabricate (1) from MIL-STD 736 Group IV untreated bulk wood stock as illustrated in **Figure D-57. Wooden Skid**.
c. Drill 0.625 inch (1.58 cm) diameter hole 2 places as shown in **Figure D-57. Wooden Skid**.
d. Sand and remove sharp edges.
e. 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-47. CTIS SEAL DRIVER (3256-H-1048)

Used on Front, Intermediate, and Rear Axle CTIS Seals.

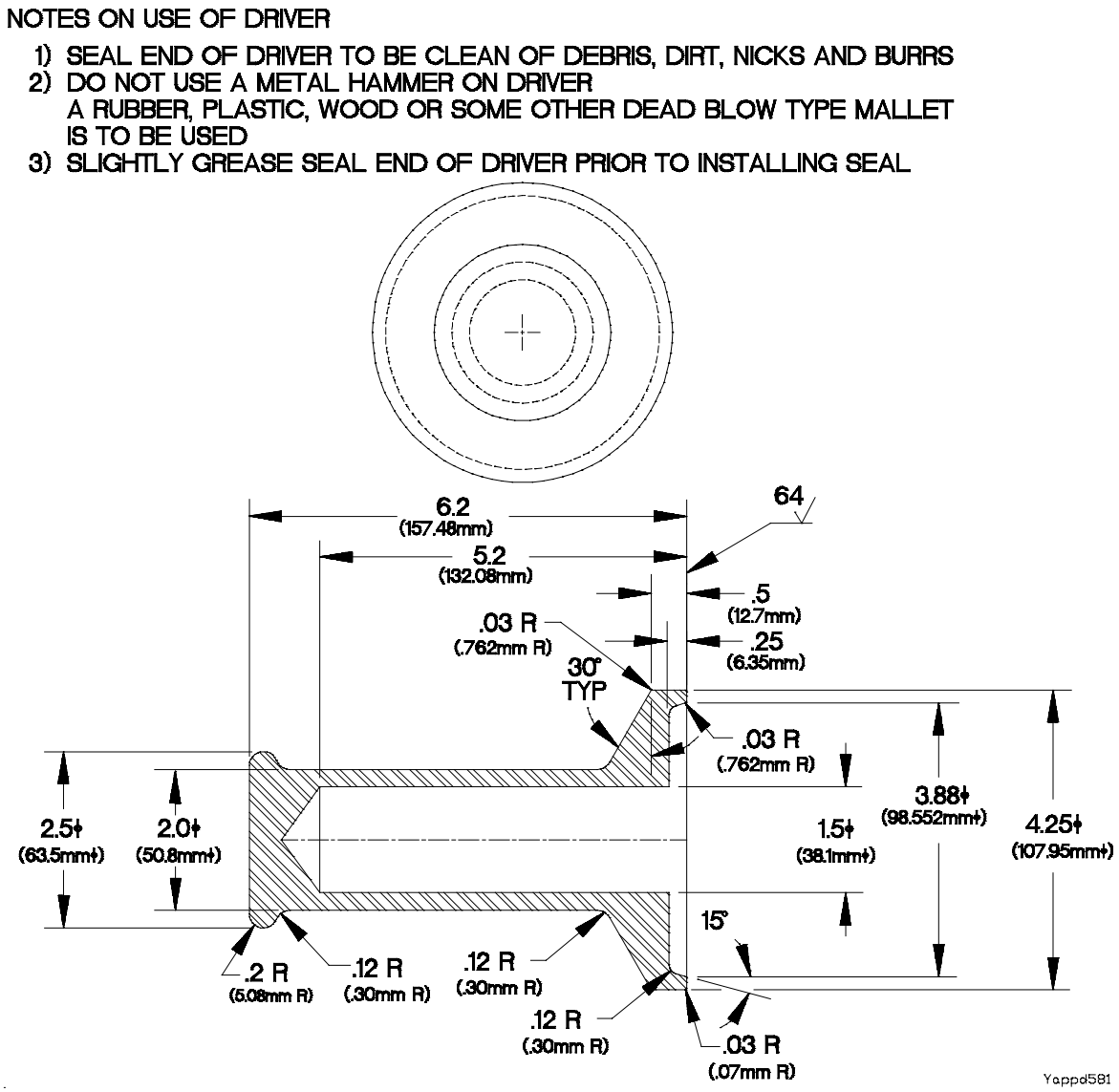


Figure D-58 CTIS Seal Driver

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-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

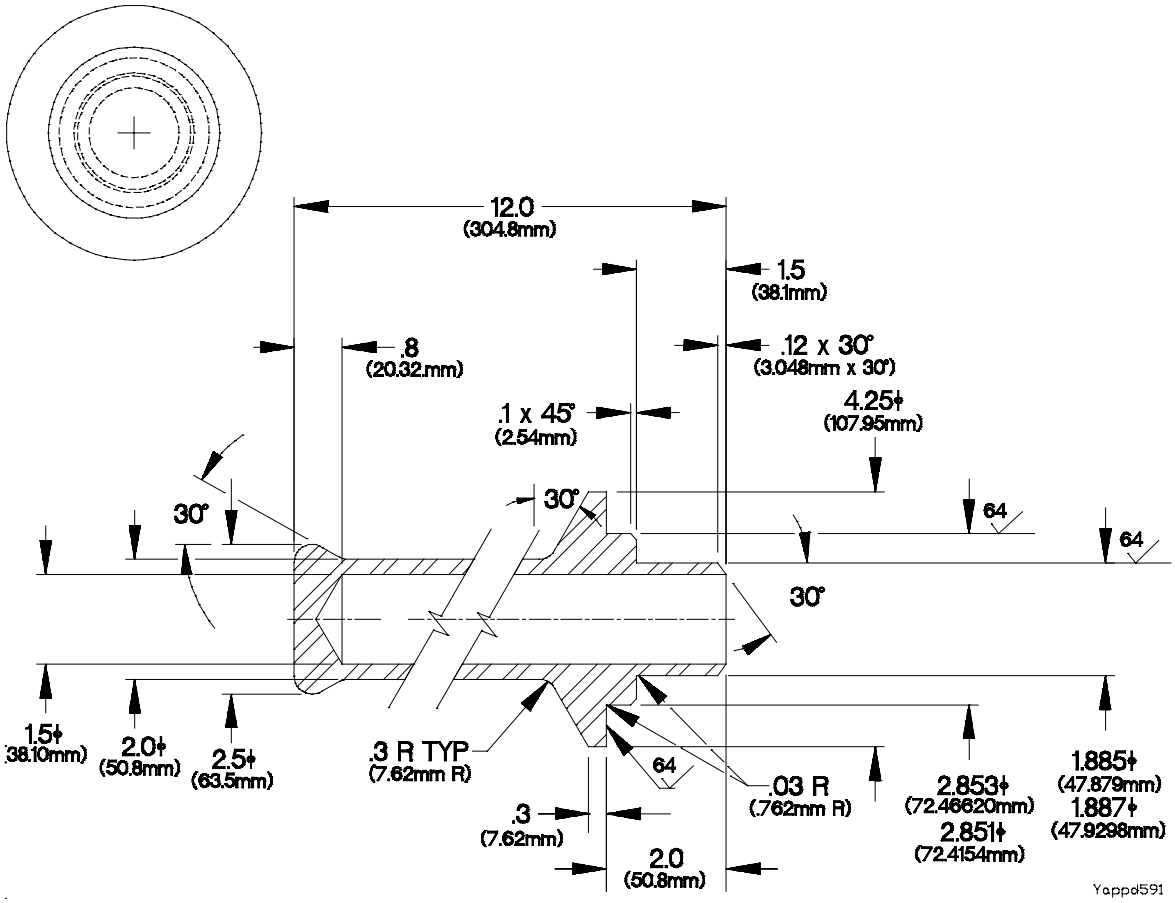


Figure D-59. Front Axle Shaft Seal Driver

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 $\sqrt{.}$ 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

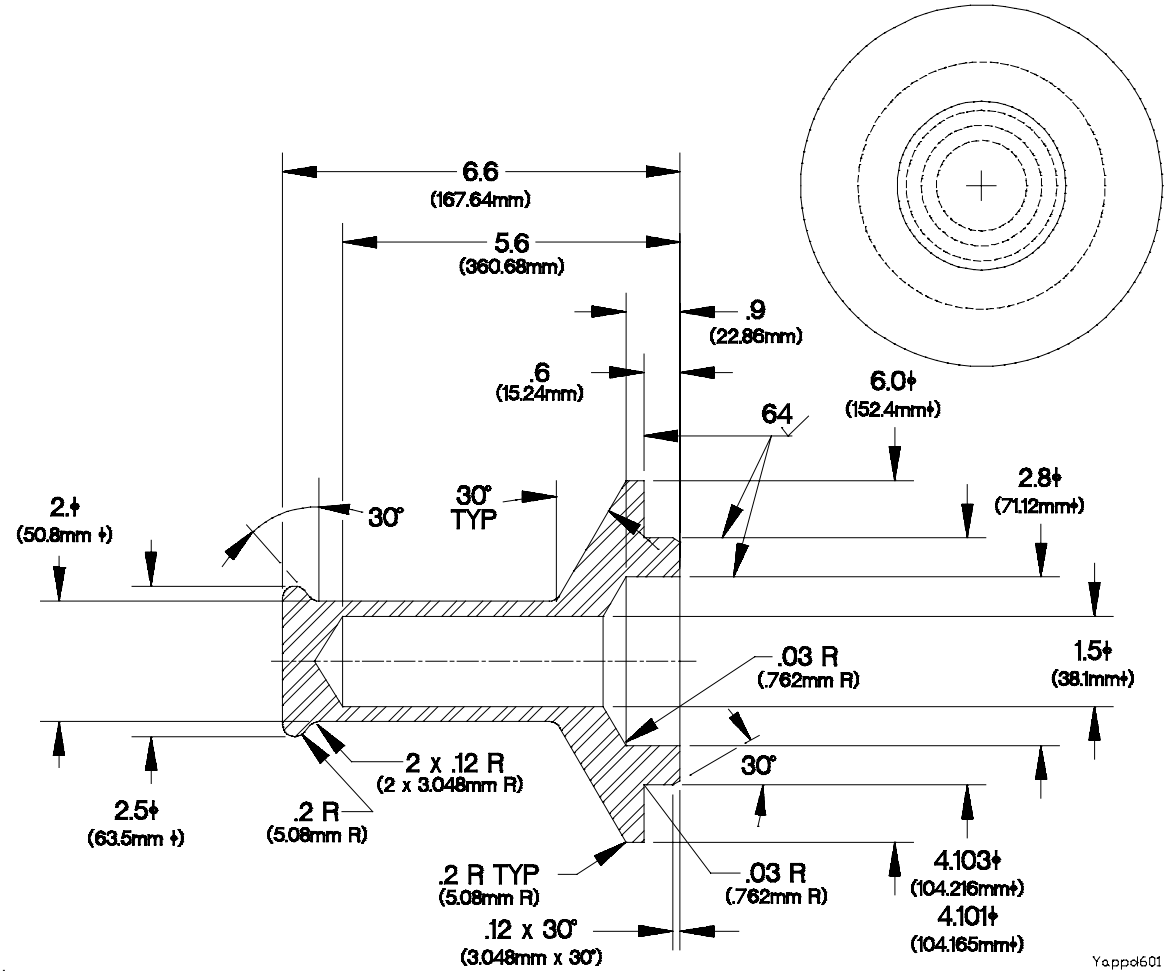


Figure D-60. Wheel Hub Grease Seal Driver

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

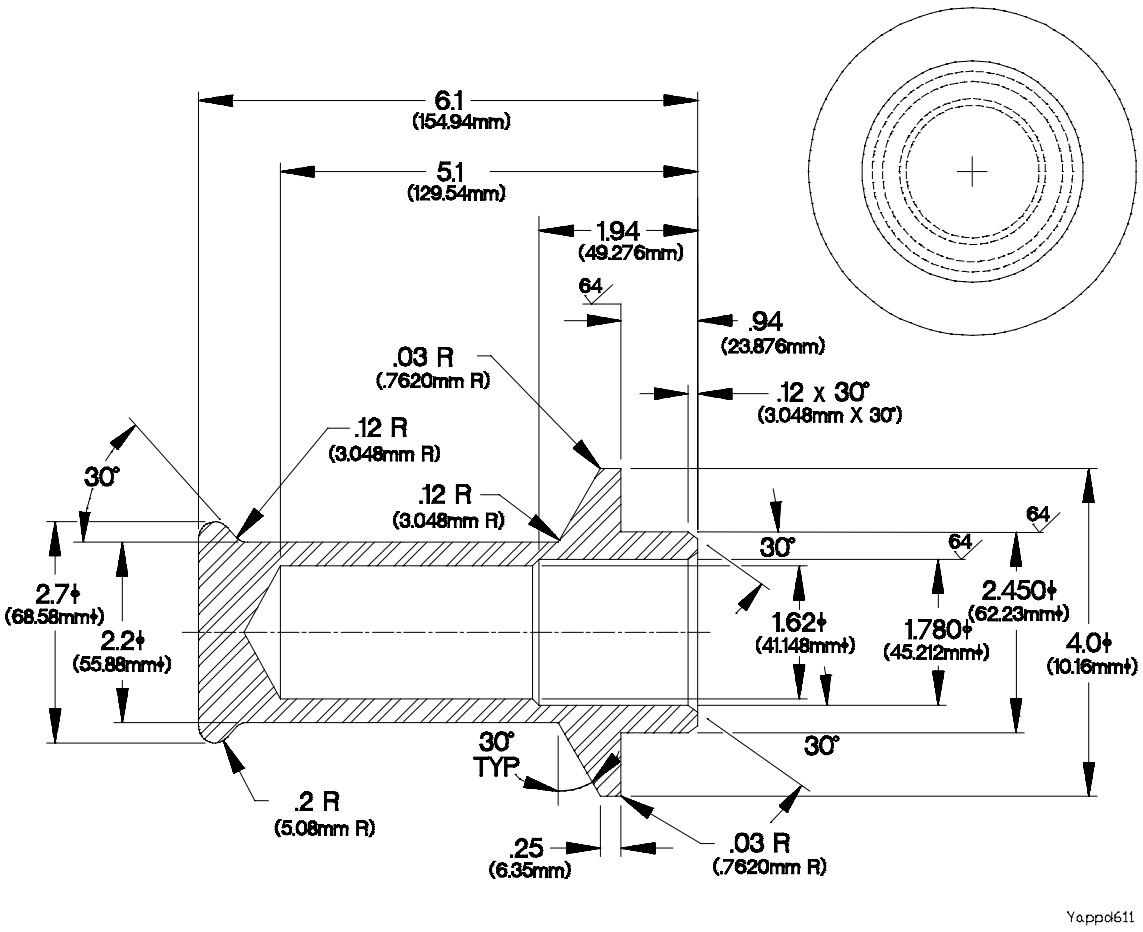


Figure D-61. Intermediate Differential Output (Rear) Seal Driver

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 $\sqrt{\ }$ unless otherwise specified.

D-51. DIFFERENTIAL PINION SEAL DRIVER (3256-M-1053)

Used on Front, Intermediate, and Rear Differential Pinion Seals.

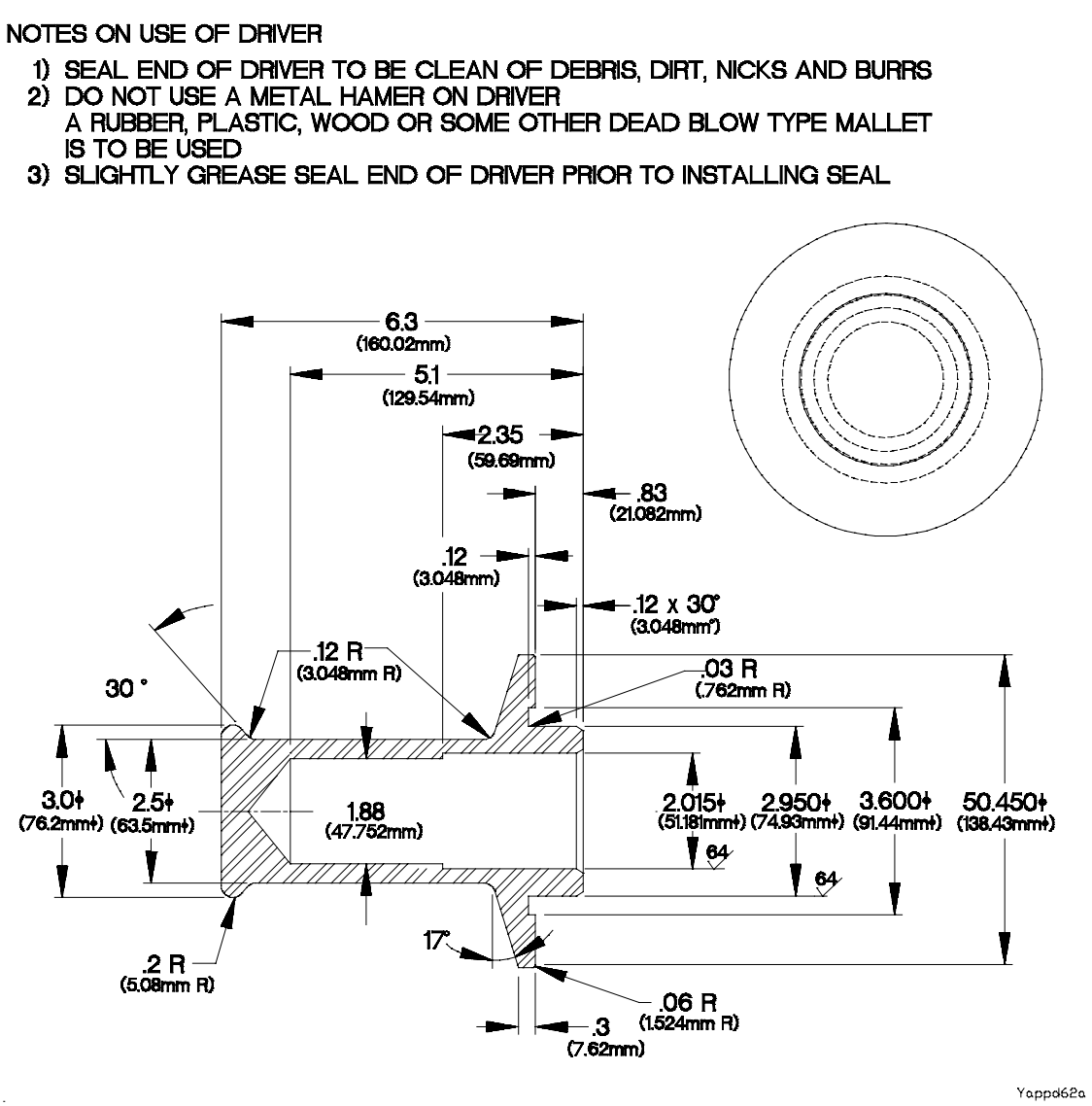


Figure D-62. Differential Pinion Seal Driver

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 $\sqrt{.}$ unless otherwise specified.

D-52. INTERMEDIATE INPUT (FRONT) YOKE SEAL DRIVER (3256-Q-1057)

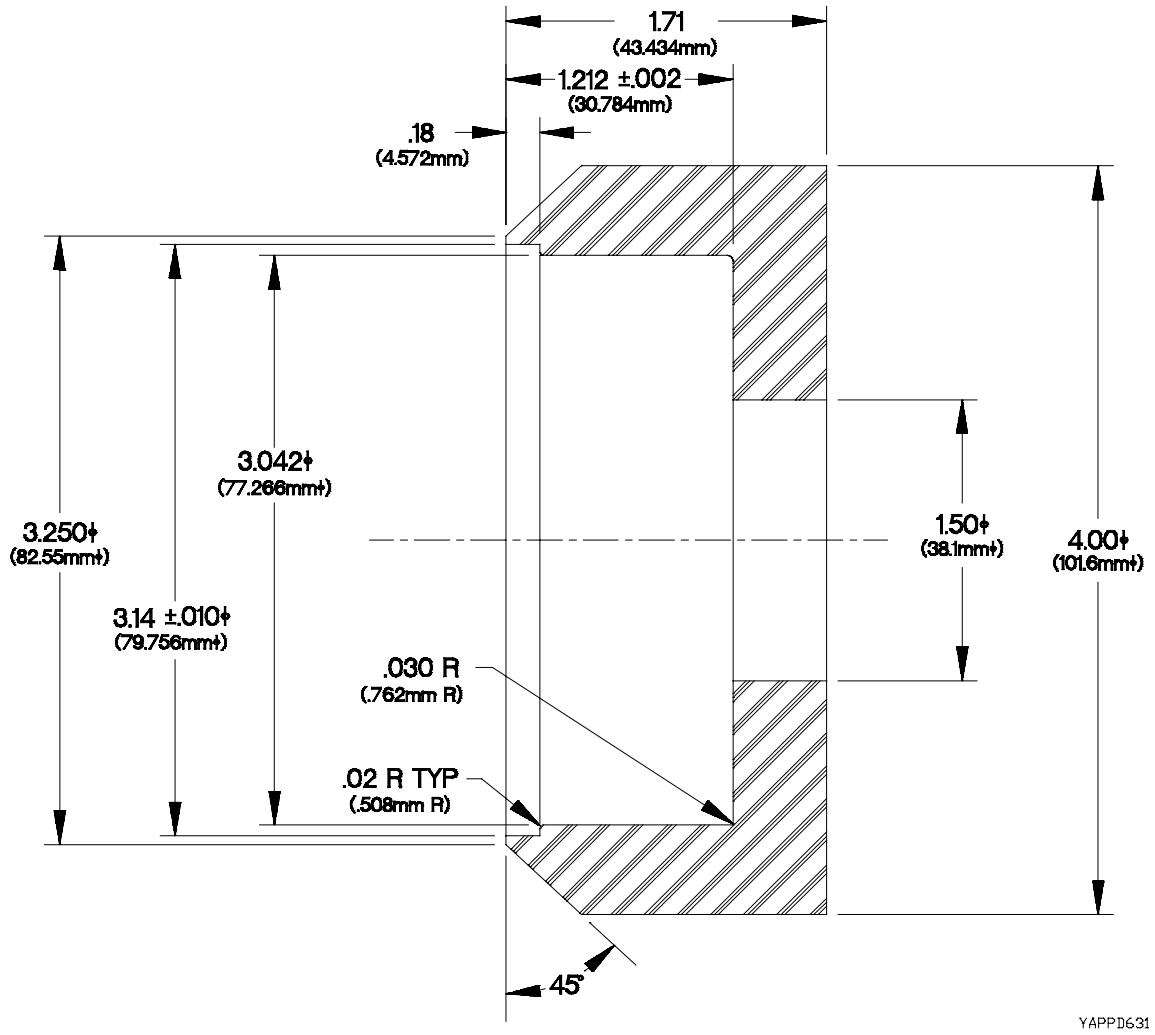


Figure D-63. Intermediate Input Yoke Seal Driver

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 $\sqrt{.}$ unless otherwise specified.

D-53. INTERMEDIATE OUTPUT (REAR) YOKE SEAL DRIVER (3256-R-1058)

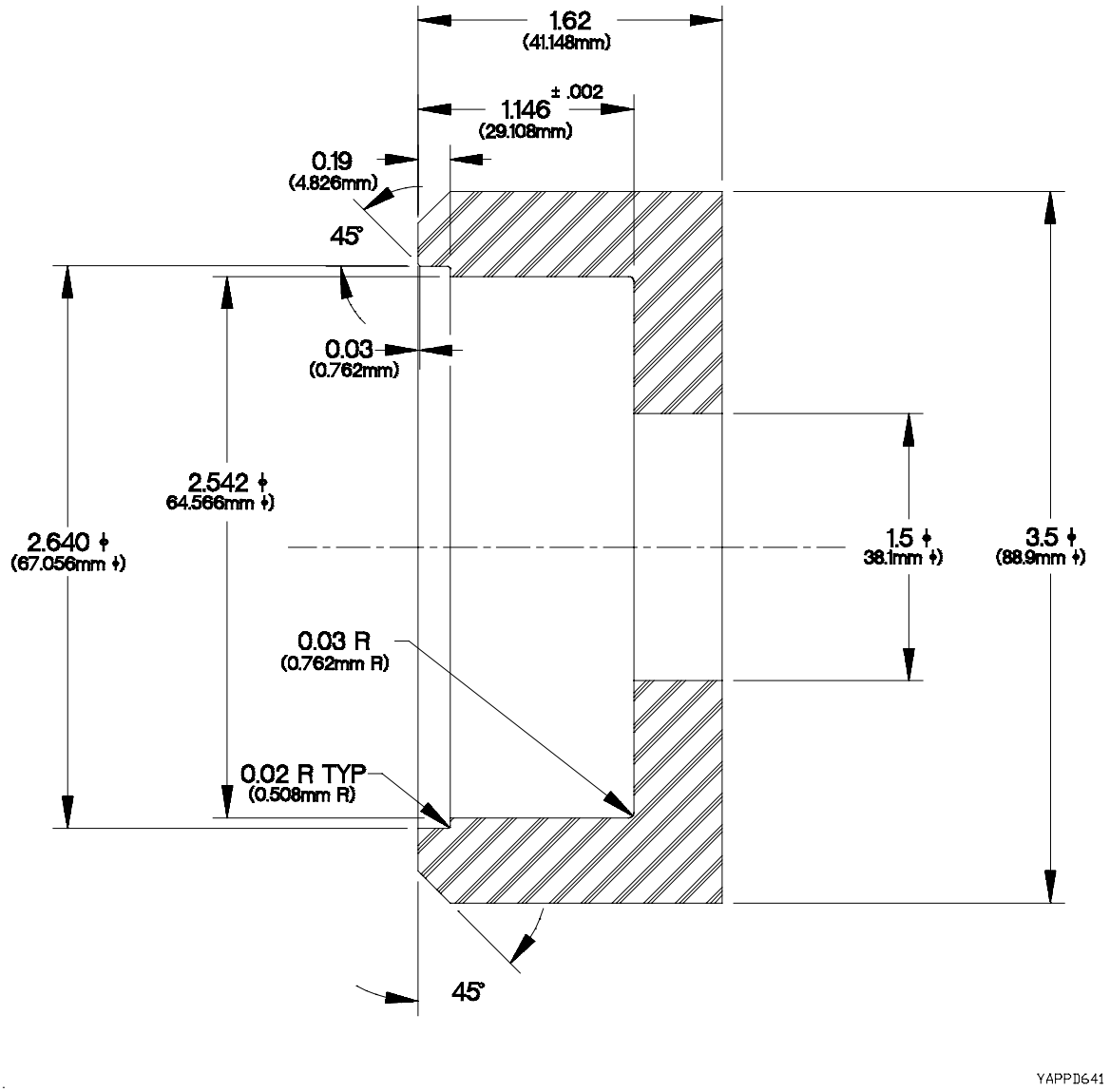


Figure D-64. Intermediate Output Yoke Seal Driver

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 $\sqrt{.}$ unless otherwise specified.

D-54. FRONT AND REAR DIFFERENTIAL YOKE SEAL DRIVER (3256-S-1059)

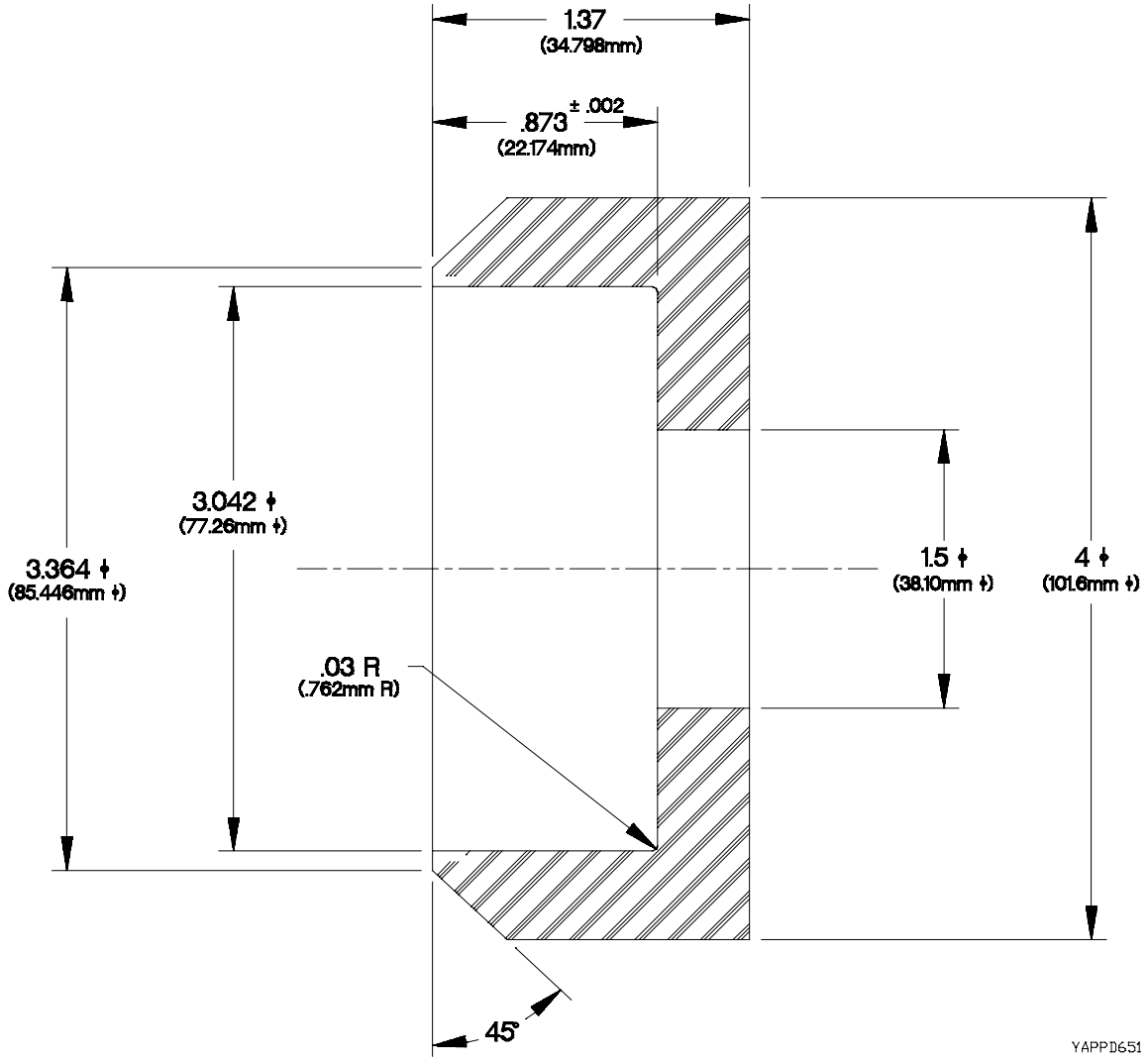


Figure D-65. Front and Rear Differential Yoke Seal Driver

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 $\sqrt{.}$ 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

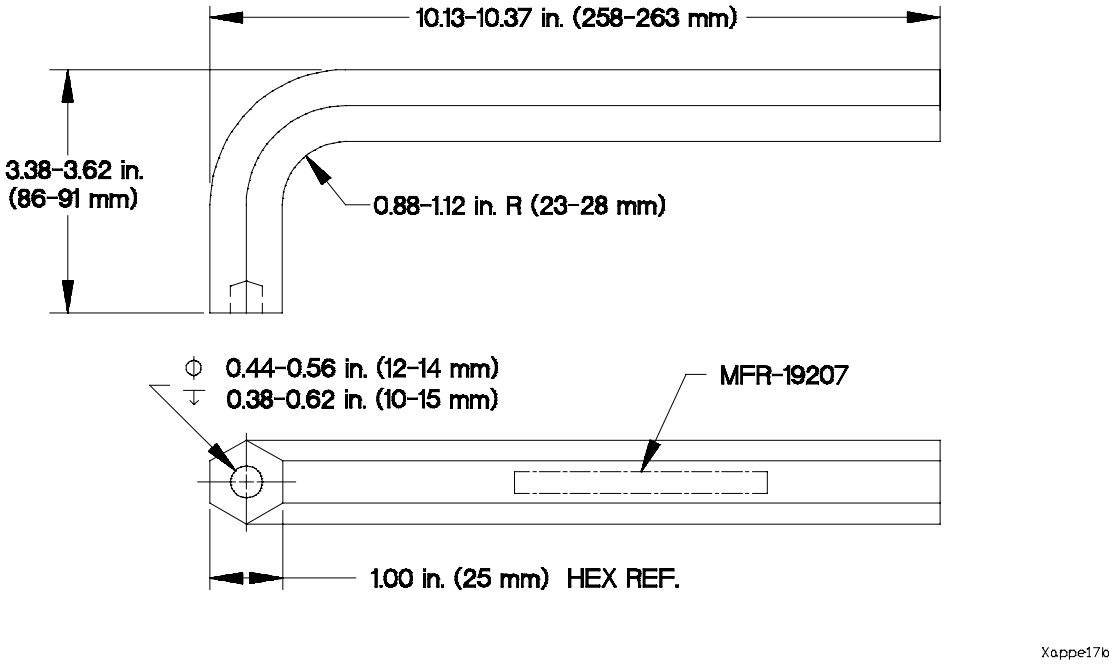


Figure D-66. Purge Valve Tool

a. All dimensions are in inches (cm).
b. Cut steel bar (1) and bend to shape as shown in Figure D-66.
c. Dimensional limits apply after coating.
d. All edges shall be broken and free from burrs.
e. 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

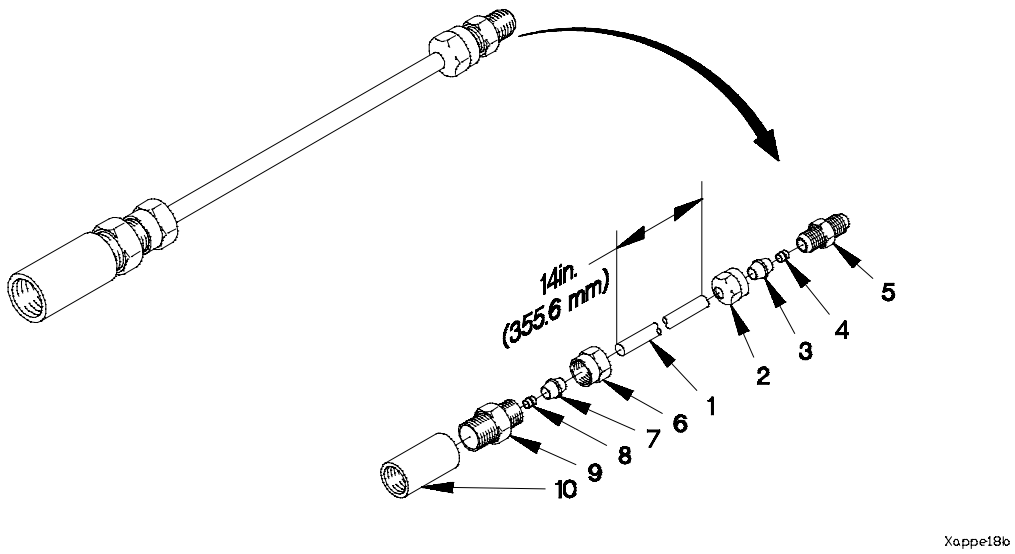


Figure D-67. M1089 30K Winch Pneumatic Test Adapter

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 FABRICATIONy

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.

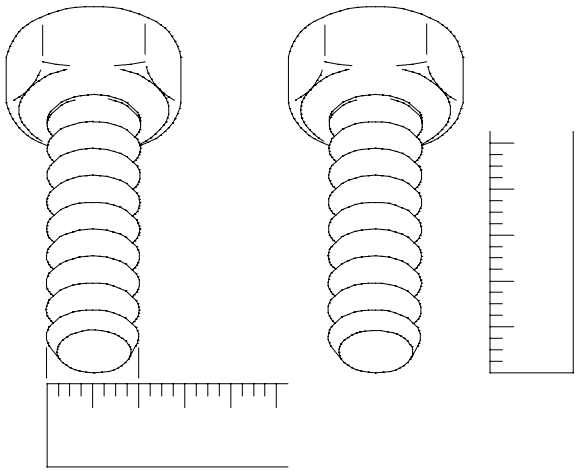
(2) Count the number of threads per inch.

(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.



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APPENDIX E
TORQUE LIMITS

Table E-1. Dry Torque Limits for SAE and ANSI Screws and Free Spinning Nuts

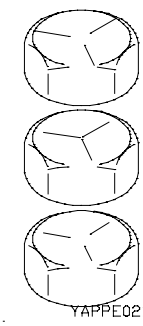
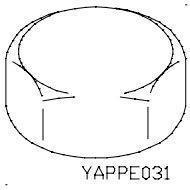
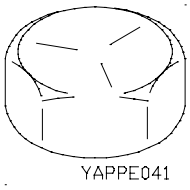
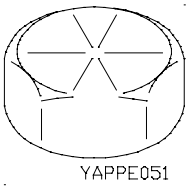
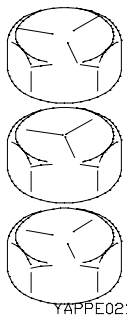
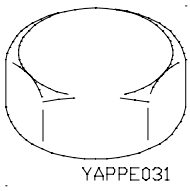
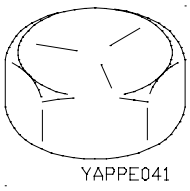
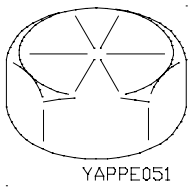
 YAPPE021 **NOTE Manufacturer's marks may vary. These are all SAE Grade 5.**		**Material Grade Markings**					
		 YAPPE031 **SAE Grade 2**		 YAPPE041 **SAE Grade 5**		 YAPPE051 **SAE Grade 8**	
Diameter	**Threads per inch**	**Torque**					
inch		**lb-ft**	**N·m**	**lb-ft**	**N·m**	**lb-ft**	**N·m**
1/4	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)

 YAPPE021 Manufacturer's marks may vary. These are all SAE Grade 5		Material Grade Markings					
		 YAPPE031 SAE Grade 2		 YAPPE041 SAE Grade 5		 YAPPE051 SAE Grade 8	
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

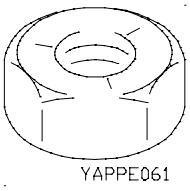
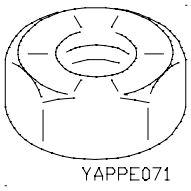
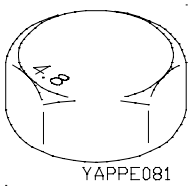
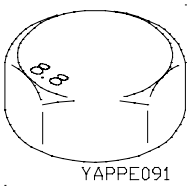
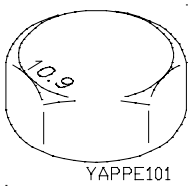
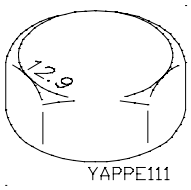
		Material Grade Markings			
		 YAPPE061		 YAPPE071	
		SAE Grade 5		SAE Grade 8	
Hole Diameter	Threads per inch	Torque			
inch		lb-ft	N·m	lb-ft	N·m
1/4	20	10-12	14-16	15-17	20-24
1/4	28	12-14	16-18	14-18	21-25
5/16	18	20-24	27-33	26-32	36-44
5/16	24	22-26	30-36	29-35	40-48
3/8	16	35-41	47-55	48-58	65-77
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							
		 Metric Grade 4.8		 Metric Grade 8.8		 Metric Grade 10.9		 Metric Grade 12.9	
Diameter	Thread Pitch	Torque							
mm		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

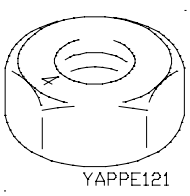
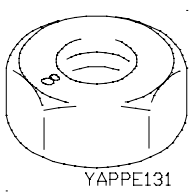
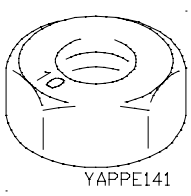
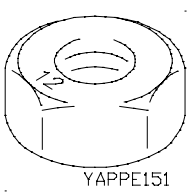
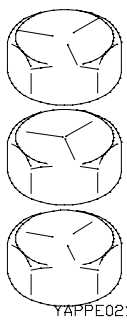
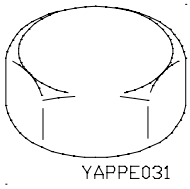
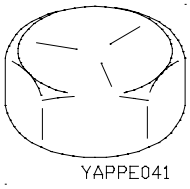
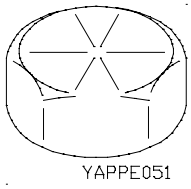
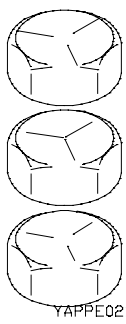
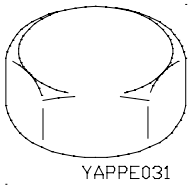
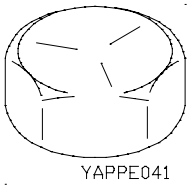
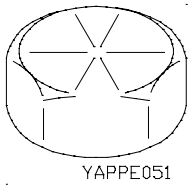
		Material Grade Markings							
		 Metric Grade 4.8		 Metric Grade 8.8		 Metric Grade 10.9		 Metric Grade 12.9	
Diameter	Thread Pitch	Torque							
mm		lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m
6	1	5-6	7-8	7-9	10-12	10-12	14-17	11-14	15-19
8	1.25	12-14	16-18	18-22	24-30	24-30	32-40	27-33	36-46
8	1	12-14	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

 YAPPE021 **NOTE Manufacturer's marks may vary. These are all SAE Grade 5.**		**Material Grade Markings**					
		 YAPPE031 **SAE Grade 2**		 YAPPE041 **SAE Grade 5**		 YAPPE051 **SAE Grade 8**	
Diameter	**Threads per inch**	**Torque**					
inch		**lb-ft**	**N·m**	**lb-ft**	**N·m**	**lb-ft**	**N·m**
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)

 YAPPE021 Manufacturer's marks may vary. These are all SAE Grade 5		Material Grade Markings					
		 YAPPE031 SAE Grade 2		 YAPPE041 SAE Grade 5		 YAPPE051 SAE Grade 8	
Diameter	**Threads per inch**	**Torque**					
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
163.1	LOCKWASHER	12414560-019	5330-01-369-6074
164	LOCKWASHER	12414560-017	5310-01-395-0820
165	LOCKWASHER	12414560-018	5310-01-381-3281
166	LOCKWASHER	12414560-029	5310-01-395-0817
166.1	LOCKWASHER	12414570-019	5310-01-470-2362
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

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(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
365.1	RIVET, COMPRESSION	12418469	5320-01-376-0699
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
423.1	SPLICE, CONDUCTOR	M83519/1-9	5940-01-136-2540
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
428.1	TERMINAL, LUG	12420344	5940-01-082-3321
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
435.1	WASHER, SEAL	12422577	5310-01-493-6806
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 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 October 1999) [3]	PRE-ID w/ 31-pin connector (transmission serial number 6510032369 to 6510090785)	Install ID harness.
WTEC III (with ECU manufactured after 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 October 1999) [3]	TID 2 (transmission serial number 6510142172 to 6510262116)	No modification required.
WTEC III (with ECU manufactured after October 1999) [3]	TID 3 (transmission serial number 6510262117 and subsequent)	No modification required.

Section III.

MODIFICATION PARTS IDENTIFICATION

Identification	Part Number/NSN	Description
31-pin connector	300130 5935-21-921-1813	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 6150-01-481-8088	Converts a TID 2 transmission to a TID 1 configuration to allow WTEC II controls to communicate with the transmission.
Gasket	29503283 5330-01-360-9035	Required when replacing transmission internal wiring harness.
ID harness	200100 6150-21-921-1191	Allows WTEC III controls to communicate with a PRE-ID transmission.
Adapter cable assembly	29519210 6150-01-420-5987	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)

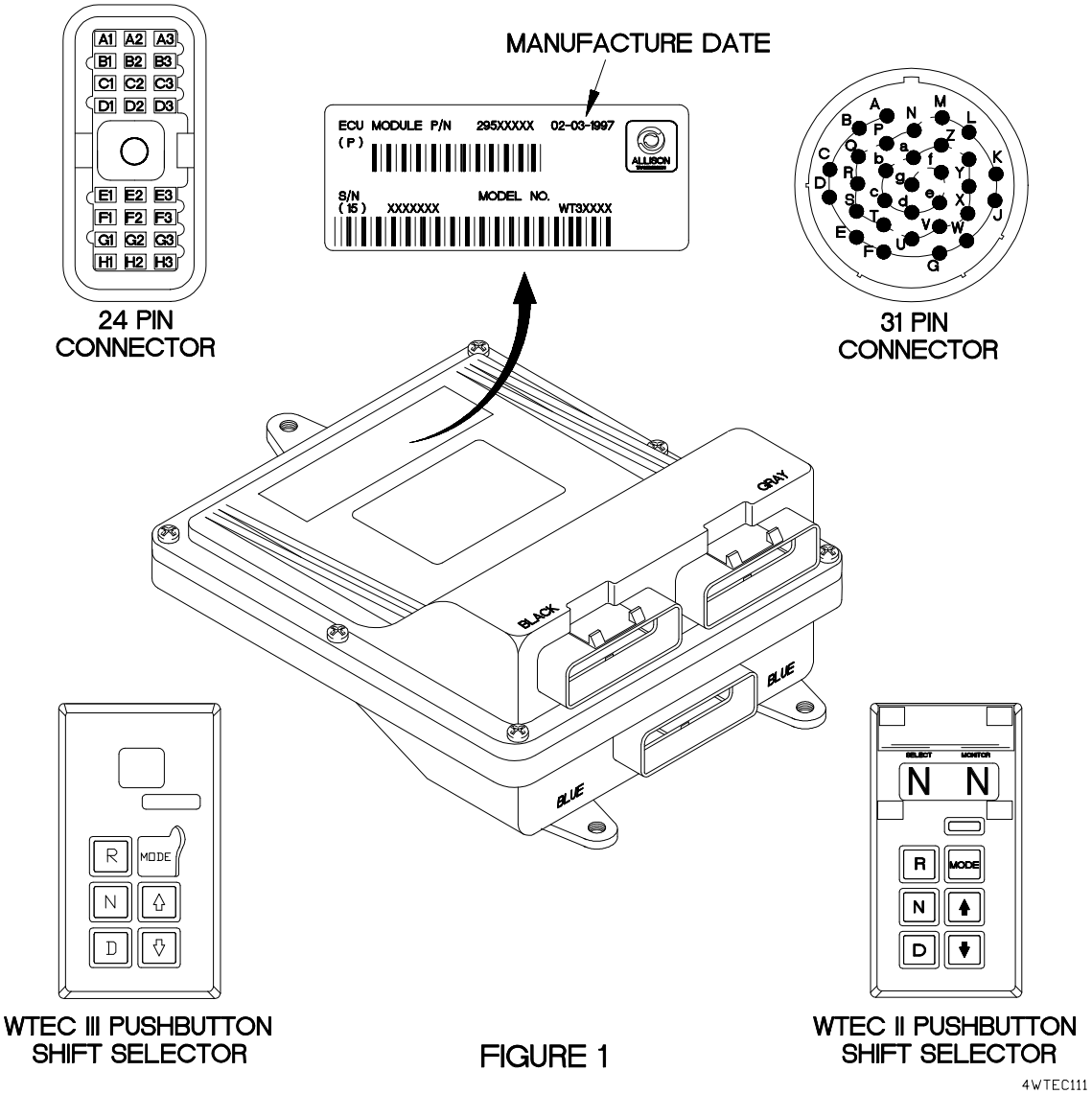

FIGURE 1

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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)

By Order of the Secretary of the Army:

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ITEM	PAGE	PARA-GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON

** Reference to line numbers within the paragraph or subparagraph.*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

TO: *(Forward direct to addressee listed in publication)*	**FROM:** *(Activity and location) (Include ZIP Code)*	**DATE**

PART II - REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION NUMBER	DATE	TITLE

PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

PART III - REMARKS *(Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is OAASA	Use Part II *(reverse)* for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
TO: *(Forward to proponent of publication or form) (Include ZIP Code)*	**FROM:** *(Activity and location) (Include ZIP Code)*	

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

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TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

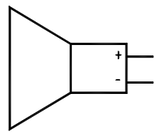
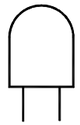
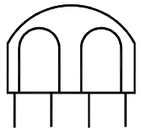
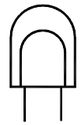
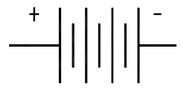
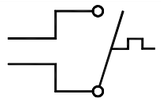
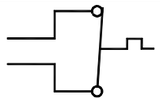
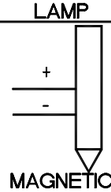
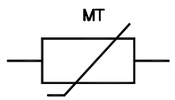
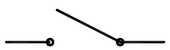
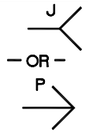
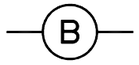
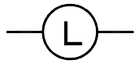
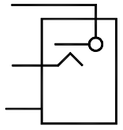
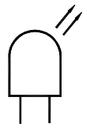
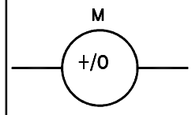
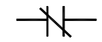
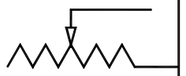
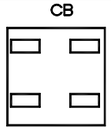
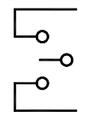
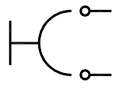
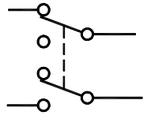
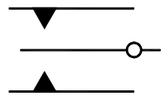
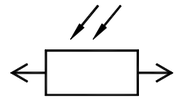
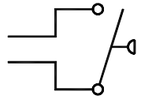
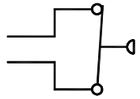
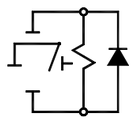
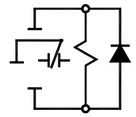
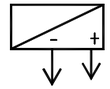
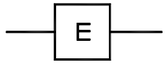
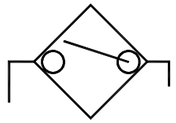
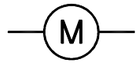
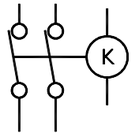
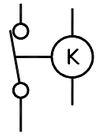
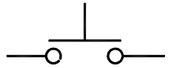
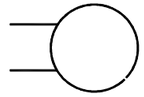
 HORN	BLACKOUT LAMP	 LAMP	 DUALBEAM LAMP	GROUND	 POWER LAMP	OPEN CONTACT	 BATTERY
 TEMPERATURE SWITCH OPEN	 TEMPERATURE SWITCH CLOSED	 MAGNETIC PICKUP	 SENSOR	 NORMALLY OPEN	NORMALLY CLOSED	CONNECTOR	 RECEPTACLE
 MOTOR	 SOLENOID	 LEVEL SENSOR	FILTER	 LED	 METER OR GAGE	 CLOSED CONTACT	 DIMMER MODULE
 CIRCUIT BREAKER	 TWO WAY SWITCH	BRIDGE RECTIFIER	 POWER SWITCH BREAKER	 DPDT SWITCH	 DPST SWITCH	 PHOTOCELL	FUSE
 PRESSURE SWITCH OPEN	 PRESSURE SWITCH CLOSED	 NORMALLY OPEN	 NORMALLY CLOSED	ALTERNATOR	RESISTOR	TERMINAL LUG	 ELECTRONIC IGNITION UNIT
DIODE	 SPLICE	 SENSING SWITCH	 MOTOR	 GROUND RELAY	 RELAY	 PUSHBUTTON	 CIRCULATING PUMP

FIGURE FO-1 ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 1 OF 40

SIZE	ILL. NO.	
B	6WD01IL1B	FP-1/ (FP-2 BLANK)

CONNECTORS			
NUMBER	ZONE	SH	DESCRIPTION
CABLE A	G315	35	OVERLOAD SHUTDOWN SYSTEM
CABLE A	D317	36	WRECKER MATERIAL HANDLING CRANE
CABLE A	F324	36	OVERLOAD SHUTDOWN SYSTEM
CABLE A	D340	38	WRECKER CONTROLS
CABLE B	A307	35	CARGO MATERIAL HANDLING CRANE
CABLE C	G308	35	CARGO MATERIAL HANDLING CRANE
CABLE F	B308	36	INTERNAL REMOTE CONNECTOR
CABLE G	F299	35	CARGO MATERIAL HANDLING CRANE
CABLE G	A324	36	INTERNAL REMOTE CONTROL CONNECTOR
CABLE H	F304	35	CRANE CONTROL PANEL
CABLE H	E313	36	CRANE CONTROL PANEL
CABLE I	G313	35	CRANE CONTROL PANEL
CABLE I	F322	36	CRANE CONTROL PANEL
CABLE J	G313	35	CRANE CONTROL PANEL
CABLE J	F322	36	CRANE CONTROL PANEL
CABLE K	G304	35	CRANE CONTROL PANEL
CABLE K	F322	36	CRANE CONTROL PANEL
CABLE L	D304	35	CRANE CONTROL PANEL
CABLE L	C322	36	CRANE CONTROL PANEL
CABLE M	D313	35	CRANE CONTROL PANEL
CABLE M	C322	36	CRANE CONTROL PANEL
CABLE N	D313	35	CRANE CONTROL PANEL
CABLE N	D322	36	CRANE CONTROL PANEL
CABLE O	C313	35	CRANE CONTROL PANEL
CABLE O	G322	36	CRANE CONTROL PANEL
CABLE P	C313	35	CRANE CONTROL PANEL
CABLE P	C322	36	CRANE CONTROL PANEL
CABLE Q	E313	35	CRANE CONTROL PANEL
CABLE Q	E322	36	CRANE CONTROL PANEL
CABLE R	E313	35	CRANE CONTROL PANEL
CABLE R	D322	36	CRANE CONTROL PANEL
CABLE S	F313	35	CRANE CONTROL PANEL
CABLE S	E322	36	CRANE CONTROL PANEL
CABLE T	F313	35	CRANE CONTROL PANEL
CABLE T	E322	36	CRANE CONTROL PANEL
CABLE U	A314	35	CRANE REMOTE CONNECTOR
CABLE V	E313	35	CRANE CONTROL PANEL
CONN F	C335	38	WRECKER REMOTE
CONN G	C340	38	WRECKER REMOTE
J2	A194	22	EMI FILTER
J3	D241	27	AIRDROP ONLY
J4	E340	38	WRECKER CONTROLS
J5	A47	6	VEHICLE HORN
J6	A47	6	VEHICLE HORN
J7	A197	22	WTEC II TRANSMISSION PUSHBUTTON SHIFT SELECTOR DIMMER MODULE
J8	B47	6	BLACKOUT MARKER RIGHT FRONT
J9	C47	6	FRONT RIGHT TURN SIGNAL
J10	B47	6	PARKING LIGHT FRONT RIGHT
J12	D47	6	RIGHT HEADLIGHT
J13	C47	6	RIGHT HEADLIGHT
J14	C47	6	RIGHT HEADLIGHT
J17	H47	6	BLACKOUT DRIVE LIGHT
J18	D47	6	LEFT HEADLIGHT
J19	E47	6	LEFT HEADLIGHT
J19	C186	21	CAB - DASH - LEFT - UNDERDASH
J20	D47	6	LEFT HEADLIGHT
J22	G47	6	PARKING LIGHT FRONT LEFT
J23	F47	6	FRONT LEFT TURN SIGNAL
J24	H47	6	BLACKOUT MARKER LEFT FRONT
J25	G94	11	WINDSHIELD WASHER ROTARY PUMP (B3)
J27	A52	6	CHASSIS - FRONT
J31	E65	8	ENGINE
J31X	F184	21	CAB - DASH - LEFT - UNDERDASH
J39	G70	8	ENGINE
J43	G51	6	CHASSIS - FRONT
J43X	F51	6	CHASSIS - FRONT
J43X	G184	21	CAB - DASH - LEFT - UNDERDASH
J44	B238	27	ROTARY WARNING LIGHT CONNECTOR
J45	C238	27	ROTARY WARNING LIGHT CONNECTOR
J50	E94	11	CAB MARKER LIGHT FRONT UPPER LEFT
J51	D51	6	CHASSIS - FRONT
J52	E47	6	CHASSIS - FRONT BUMPER

CONNECTORS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
J52	B239	27	CHASSIS - FRONT
J53	F236	27	AIRDROP ONLY
J55	C94	11	CAB MARKER LIGHT FRONT UPPER RIGHT
J57	D94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT
J59	C94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT
J60	D94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE
J62	E97	11	ROTARY WARNING LIGHT CONNECTOR
J65	E195	22	ROTARY WARNING LIGHT CONNECTOR
J78	F194	22	CAB RADIO CONNECTOR
J80	A299	34	AIR DRYER CONNECTOR
J80	D87	10	AIR DRYER (EXCEPT DUMP)
J93	B59	7	CHASSIS - SPARE TIRE
J95	E47	6	12V INTERVEHICULAR
J95	B242	27	ENGINE
J99	E196	22	CHEMICAL ALARM CONNECTOR
J106	F59	7	CHEMICAL DETECTOR RECEPTACLE
J108	B258	29	CAB - DASH - CENTER - OPTIONS PANEL
J111	E131	15	CTIS ELECTRONIC CONTROL UNIT
J113	G195	22	CTIS PRESSURE TRANSDUCER
J114	B173	20	CAB - DASH - LEFT - TRANSMISSION HARNESS - WTEC II
J114	C353	40	WTEC III CAB TRANSMISSION HARNESS (TIDI) CONNECTOR
J114	C357	40	WTEC III CAB TRANSMISSION HARNESS (TID2) CONNECTOR
J115	C163	19	CAB - DASH - LEFT - WTEC III TRANSMISSION HARNESS
J115	C346	39	WTEC III TRANSMISSION ECU CONNECTOR
J116	C168	19	CAB - DASH - LEFT - WTEC III TRANSMISSION HARNESS
J116	E346	39	WTEC III TRANSMISSION ECU CONNECTOR
J117	F170	19	CAB - DASH - LEFT - WTEC III TRANSMISSION HARNESS
J117	B343	39	WTEC III DIAGNOSTIC CONNECTOR
J118	D170	19	CAB - DASH - LEFT - WTEC III TRANSMISSION HARNESS
J119	B178	20	CAB - DASH - LEFT - TRANSMISSION HARNESS
J119	C355	40	WTEC III CAB TRANSMISSION HARNESS (TIDI)
J119	C359	40	WTEC III CAB TRANSMISSION HARNESS (TID2)
J129	F94	11	CAB MARKER LIGHT FRONT LOWER LEFT
J130	F94	11	CAB MARKER LIGHT LEFT DOOR
J130	F238	27	12 PIN CONNECTOR
J131	B94	11	CAB MARKER LIGHT RIGHT DOOR
J132	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT
J172	A300	34	DUMP BODY CONNECTOR
J209	F265	30	ALL MTV W/O PTO
J209	G265	30	DUMP, CARGO LWB, CARGO W/MHC, CARGO LWB W/MHC
J209A	G267	30	TRACTOR W/O WINCH
J209A	C266	30	PTO EQUIPPED
J209B	F267	30	TRANSMISSION AUXILIARY OIL COOLER FAN
J209B	D266	30	PTO EQUIPPED
J210	F258	29	CAB - DASH - CENTER - OPTIONS PANEL
J215	E266	30	PTO EQUIPPED
J912	B133	15	CAB - DASH - CENTER - HEATER/CTIS ECU
J912	D245	28	CAB - DASH - CENTER - OPTIONS PANEL
J912	G264	30	ALL MTV W/O PTO
J912	F265	30	TRACTOR W/O WINCH
J913	B131	15	CAB - DASH - CENTER - HEATER/CTIS ECU
J921	G70	8	TROOP TRANSPORT ALARM
L4	E268	30	WINCH IN SOLENOID
L5	D268	30	WINCH OUT SOLENOID
L7	B301	34	TAILGATE RELEASE CONNECTOR
L8	B301	34	DUMP BED UP CONNECTOR
L9	A301	34	DUMP BED DOWN CONNECTOR
P2	A194	22	EMI FILTER
P3	D240	27	AIRDROP ONLY
P5	A47	6	VEHICLE HORN
P6	A47	6	VEHICLE HORN

CONNECTORS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
P8	B47	6	BLACKOUT MARKER RIGHT FRONT
P9	C47	6	FRONT RIGHT TURN SIGNAL
P10	B47	6	PARKING LIGHT FRONT RIGHT
P12	D47	6	RIGHT HEADLIGHT
P13	C47	6	RIGHT HEADLIGHT
P14	C47	6	RIGHT HEADLIGHT
P17	H47	6	BLACKOUT DRIVE LIGHT
P18	D47	6	LEFT HEADLIGHT
P18	A186	21	CAB - DASH - LEFT - UNDERDASH
P19	E47	6	LEFT HEADLIGHT
P20	D47	6	LEFT HEADLIGHT
P22	G47	6	PARKING LIGHT FRONT LEFT
P23	F47	6	FRONT LEFT TURN SIGNAL
P24	H47	6	BLACKOUT MARKER LEFT FRONT
P25	G94	11	WINDSHIELD WASHER ROTARY PUMP (B3)
P25	B300	34	DUMP BED SWITCH CONNECTOR
P27	A52	6	CHASSIS - FRONT
P31	E65	8	ENGINE
P31X	D65	8	ENGINE
P32	F68	8	ENGINE OIL PRESSURE SENSOR
P33	H68	8	FUEL/WATER SEPARATOR
P34	E68	8	OIL PRESSURE WARNING LIGHT SWITCH
P36	A66	8	WATER COOLER TEMPERATURE
P37	C66	8	WATER TEMPERATURE SWITCH
P38	F70	8	ENGINE SPEED MAGNETIC PICKUP
P39	G70	8	ENGINE
P41	B66	8	WATER TEMPERATURE SENSOR
P42	F66	8	ETHER SENSOR SWITCH
P43	G51	6	CHASSIS - FRONT
P43X	F51	6	CHASSIS - FRONT
P50	E94	11	CAB MARKER LIGHT FRONT UPPER LEFT
P50	F242	27	LH FRONT TOP CAB MARKER LIGHT
P51	D199	23	CAB - DASH - RIGHT - POWER DISTRIBUTION PANEL
P51	D208	24	REAR LIGHTS TRACTOR
P51	D217	25	LONG WHEEL BASE
P51	D226	26	CAB - DASH - RIGHT - POWER DISTRIBUTION PANEL
P52F	E47	6	CHASSIS - FRONT
P52M	G208	24	REAR LIGHTS TRACTOR
P52R	E205	23	WRECKER REAR LIGHTS
P52R	G214	24	REAR LIGHTS TRACTOR
P52R	E223	25	LONG WHEEL BASE
P52R	E232	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
P53M	F208	24	REAR LIGHTS TRACTOR
P53R	D205	23	WRECKER REAR LIGHTS
P53R	F214	24	REAR LIGHTS TRACTOR
P53R	D223	25	LONG WHEEL BASE
P53R	D232	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
P54	D206	23	LEFT REAR MARKER
P54	F215	24	LEFT REAR MARKER
P54	D224	25	LEFT REAR MARKER
P54	D233	26	LEFT REAR MARKER
P55	C94	11	CAB MARKER LIGHT FRONT UPPER RIGHT
P55	D242	27	RH FRONT TOP CAB MARKER LIGHT
P56	D206	23	MIDDLE REAR MARKER
P56	E224	25	MIDDLE REAR MARKER
P56	F215	24	MIDDLE REAR MARKER
P56	E233	26	MIDDLE REAR MARKER
P57	D94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT
P57	F242	27	LH FRONT TOP CAB CLEARANCE LIGHT
P58	E206	23	RIGHT REAR MARKER
P58	E215	24	RIGHT REAR MARKER
P58	E224	25	RIGHT REAR MARKER
P58	E233	26	RIGHT REAR MARKER
P59	C94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT
P59	D242	27	RH FRONT TOP CAB CLEARANCE LIGHT
P60	D94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE

CONNECTORS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
P60	E242	27	MIDDLE FRONT TOP CLEARANCE LIGHT
P61	E215	24	RH COMPOSITE LIGHT
P61	F206	23	RH COMPOSITE LIGHT
P61	F224	25	RH COMPOSITE LIGHT
P61	F233	26	RH COMPOSITE LIGHT
P62	D215	24	RH COMPOSITE LIGHT
P62	F206	23	RH COMPOSITE LIGHT
P62	F224	25	RH COMPOSITE LIGHT
P62	F233	26	RH COMPOSITE LIGHT
P62A	B236	27	ROTARY WARNING LIGHT CONNECTOR
P63	F224	25	RH COMPOSITE LIGHT
P63	G206	23	RH COMPOSITE LIGHT
P63	D215	24	RH COMPOSITE LIGHT
P63	G233	26	RH COMPOSITE LIGHT
P64	F206	23	RH COMPOSITE LIGHT
P64	F224	25	RH COMPOSITE LIGHT
P64	D215	24	RH COMPOSITE LIGHT
P64	F233	26	RH COMPOSITE LIGHT
P65	E195	22	ROTARY WARNING LIGHT CONNECTOR
P67	A83	10	PRE-BLOCK SEVEN WITH PIGTAIL TRANSMISSION EXTERNAL WIRING HARNESS TO TRANSMISSION CONNECTOR
P67	B78	9	TIDI, TID2, AND TID3 TRANSMISSION EXTERNAL WIRING HARNESS TO TRANSMISSION CONNECTOR
P69	D68	8	ENGINE
P71	E75	9	PRE-BLOCK SEVEN TRANSMISSION OUTPUT SPEED SENSOR CONNECTOR
P71	E79	9	TIDI, TID2, AND TID3 TRANSMISSION OUTPUT SPEED SENSOR CONNECTOR
P71	E83	10	PRE-BLOCK SEVEN WITH PIGTAIL TRANSMISSION OUTPUT SPEED SENSOR CONNECTOR
P72	E83	10	PRE-BLOCK SEVEN W/PIGTAIL TRANSMISSION ENGINE SPEED SENSOR CONNECTOR
P72	F75	9	PRE-BLOCK SEVEN TRANSMISSION ENGINE SPEED SENSOR CONNECTOR
P72	F79	9	TIDI, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR
P73	F75	9	PRE-BLOCK SEVEN TRANSMISSION THROTTLE POSITION SENSOR CONNECTOR
P73	F79	9	TIDI, TID2, AND TID3 TRANSMISSION THROTTLE POSITION SENSOR CONNECTOR
P73	F83	10	PRE-BLOCK SEVEN WITH PIGTAIL TRANSMISSION THROTTLE POSITION SENSOR CONNECTOR
P74	A215	24	LH COMPOSITE LIGHT
P74	B206	23	LH COMPOSITE LIGHT
P74	B224	25	LH COMPOSITE LIGHT
P74	B233	26	LH COMPOSITE LIGHT
P76	B206	23	LH COMPOSITE LIGHT
P76	B215	24	LH COMPOSITE LIGHT
P76	B224	25	LH COMPOSITE LIGHT
P76	B233	26	LH COMPOSITE LIGHT
P77	C206	23	LH COMPOSITE LIGHT
P77	B215	24	LH COMPOSITE LIGHT
P77	C224	25	LH COMPOSITE LIGHT
P77	C233	26	LH COMPOSITE LIGHT
P78	B206	23	LH COMPOSITE LIGHT
P78	B215	24	LH COMPOSITE LIGHT
P78	B224	25	LH COMPOSITE LIGHT
P78	B234	26	LH COMPOSITE LIGHT
P80	G60	7	CHASSIS - REAR
P80	A298	34	AIR DRYER CONNECTOR (DUMP)
P80B	A298	34	AIR DRYER CONNECTOR (DUMP)
P80B	A299	34	AIR DRYER CONNECTOR (DUMP)
P81	C56	7	CHASSIS - FRONT
P81	D71	8	STARTER THERMO SWITCH
P82	B60	7	FUEL TANK LEVEL SENSOR
P83	B181	21	CAB - DASH - LEFT - UNDERDASH
P84	F60	7	CHASSIS - REAR
P85	A206	23	LH SIDE MARKER LIGHT
P85	A224	25	LH SIDE MARKER LIGHT

CONNECTORS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
P85	A233	26	LH SIDE MARKER LIGHT
P86	A206	23	LH REAR MARKER LIGHT
P86	A215	24	LH REAR MARKER LIGHT
P86	A224	25	LH REAR MARKER LIGHT
P86	A233	26	LH REAR MARKER LIGHT
P87	C206	23	BACKUP LIGHT
P87	B215	24	BACKUP LIGHT
P87	C224	25	BACKUP LIGHT
P87	C233	26	BACKUP LIGHT
P88	G206	23	RH SIDE MARKER LIGHT
P88	H224	25	RH SIDE MARKER LIGHT
P88	H233	26	RH SIDE MARKER LIGHT
P89	G206	23	RH REAR MARKER LIGHT
P89	C215	24	RH REAR MARKER LIGHT
P89	G224	25	RH REAR MARKER LIGHT
P89	G233	26	RH REAR MARKER LIGHT
P107	B199	23	WRECKER REAR LIGHTS
P108	B258	29	CAB - DASH - CENTER - OPTIONS PANEL
P108	F199	23	WRECKER REAR LIGHTS
P110	E128	15	CTIS ELECTRONIC CONTROL UNIT
P111	E131	15	CTIS ELECTRONIC CONTROL UNIT
P112	G132	15	CAB - DASH - CENTER - HEATER/CTIS ECU
P113	F132	15	CTIS ELECTRONIC CONTROL UNIT
P114	C350	39	WTEC III CAB TRANSMISSION HARNESS (TID2)
P115	C346	39	WTEC III CAB - DASH - RIGHT - KICK PANEL
P116	E346	39	WTEC III CAB - DASH - RIGHT - KICK PANEL
P116	C194	22	CAB - DASH - RIGHT - UNDERDASH WTEC II
P118	D170	19	CAB - DASH - LEFT - TRANSMISSION HARNESS
P119	B178	20	CAB - DASH - LEFT - TRANSMISSION HARNESS
P119	D73	9	PRE-BLOCK SEVEN TRANSMISSION CONNECTOR
P119	D78	9	TIDI, TID2, AND TID3 TRANSMISSION CONNECTOR
P119	D82	10	PRE-BLOCK SEVEN WITH PIGTAIL TRANSMISSION CONNECTOR
P125	G93	11	WINDSHIELD WASHER ROTARY PUMP (B3)
P129	F94	11	CAB MARKER LIGHT FRONT LOWER LEFT
P130	F94	11	CAB MARKER LIGHT LEFT DOOR
P131	A94	11	CAB MARKER LIGHT RIGHT DOOR
P132	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT
P133	A199	23	LH WORKLIGHTS
P133	B209	24	LH WORKLIGHTS
P133A	B199	23	LH WORKLIGHTS
P133A	B209	24	LH WORKLIGHTS
P134	G199	23	RH WORKLIGHTS
P134	C209	24	RH WORKLIGHTS
P134A	F199	23	RH WORKLIGHTS
P134A	B209	24	RH WORKLIGHTS
P135	D260	29	CAB - DASH - CENTER - OPTIONS PANEL
P136	C260	29	CAB - DASH - CENTER - OPTIONS PANEL
P171	F308	35	CARGO MATERIAL HANDLING CRANE
P172	A300	34	DUMP BODY CONNECTOR
P201	G70	8	ENGINE
P209A	F268	30	TRANSMISSION AUXILIARY OIL COOLER FAN
P209B	G264	30	DUMP, CARGO LWB, CARGO W/MHC, CARGO LWB W/MHC
P209B	G268	30	TRANSMISSION AUXILIARY OIL COOLER FAN
P210	F258	29	CAB - DASH - CENTER - OPTIONS PANEL
P210	C263	30	PTO EQUIPPED
P215	E266	30	PTO EQUIPPED
P216	E265	30	PTO EQUIPPED
P216	A304	34	PTO PRESSURE SWITCH CONNECTOR
P217	C265	30	PTO EQUIPPED
P217	B304	34	PTO SOLENOID CONNECTOR
P901	A245	28	CAB - DASH - CENTER - OPTIONS PANEL
P902	C250	28	CAB - DASH - CENTER - OPTIONS PANEL
P902A	D250	28	CAB - DASH - CENTER - OPTIONS PANEL
P903	C248	28	CAB - DASH - CENTER - OPTIONS PANEL
P903A	D248	28	CAB - DASH - CENTER - OPTIONS PANEL
P904	C247	28	CAB - DASH - CENTER - OPTIONS PANEL
P904A	D247	28	CAB - DASH - CENTER - OPTIONS PANEL
P905	A247	28	CAB - DASH - CENTER - OPTIONS PANEL

FIGURE FO-1 ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 2 OF 40

SIZE B | ILL. NO. 6WD01L2B | FP-3/ (FP-4 BLANK)

CONNECTORS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
P905A	B247	28	CAB - DASH - CENTER - OPTIONS PANEL
P906	A248	28	CAB - DASH - CENTER - OPTIONS PANEL
P906A	B248	28	CAB - DASH - CENTER - OPTIONS PANEL
P908	A251	28	CAB - DASH - CENTER - OPTIONS PANEL
P908A	B251	28	CAB - DASH - CENTER - OPTIONS PANEL
P909	A256	29	CAB - DASH - CENTER - OPTIONS PANEL
P909A	B256	29	CAB - DASH - CENTER - OPTIONS PANEL
P910	B251	28	CAB - DASH - CENTER - OPTIONS PANEL
P910A	D251	28	CAB - DASH - CENTER - OPTIONS PANEL
P911	B256	29	CAB - DASH - CENTER - OPTIONS PANEL
P911A	D256	29	CAB - DASH - CENTER - OPTIONS PANEL
P912	B133	15	CAB - DASH - CENTER - HEATER/CTIS - ECU
P912A	F134	15	CAB - DASH - CENTER - HEATER/CTIS - ECU
P913	B131	15	CAB - DASH - CENTER - HEATER/CTIS - ECU
P913	F245	28	CAB - DASH - CENTER - OPTIONS PANEL
P914	A250	28	CAB - DASH - CENTER - OPTIONS PANEL
P914A	B250	28	CAB - DASH - CENTER - OPTIONS PANEL
P921	G70	8	TROOP TRANSPORT ALARM
P94	A199	23	LH INTERMEDIATE MARKER
P94	A217	25	LH INTERMEDIATE MARKER
P95	G199	23	RH INTERMEDIATE MARKER
P95	G217	25	RH INTERMEDIATE MARKER
P99	F195	22	CHEMICAL ALARM CONNECTOR
PX1	A101	12	ENGINE FAN OFF SWITCH
PX10	D116	13	CAB - DASH - LEFT - INSTRUMENT PANEL
PX11	G116	13	CAB - DASH - LEFT - INSTRUMENT PANEL
PX12	C121	14	ROTATING WARNING LIGHT SWITCH
PX12A	E121	14	CAB - DASH - LEFT - INSTRUMENT PANEL
PX13	F101	12	ETHER STARTER SWITCH
PX13A	G101	12	CAB - DASH - LEFT - INSTRUMENT PANEL
PX14	F121	14	FULL HAZARD WARNING SWITCH
PX14A	H121	14	CAB - DASH - LEFT - INSTRUMENT PANEL
PX15	C124	14	MAIN LIGHT SWITCH
PX17	A121	14	IGNITION SWITCH
PX17A	C112	14	CAB - DASH - LEFT - INSTRUMENT PANEL
PX1A	B101	12	CAB - DASH - LEFT - INSTRUMENT PANEL
PX2	D101	12	LAMP TEST SWITCH
PX20	C197	22	TURN SIGNAL FLASHER
PX21	A143	16	WIPER DELAY MODULE
PX22	A193	22	EMI FILTER
PX24	G124	14	INSTRUMENT PANEL LIGHTS DIMMER MODULE
PX25	C128	15	CAB - DASH - CENTER - HEATER/CTIS - ECU
PX26	B188	21	CAB - DASH - LEFT - UNDERDASH
PX2A	E101	12	CAB - DASH - LEFT - INSTRUMENT PANEL
PX33	B191	22	CAB - DASH - RIGHT - UNDERDASH
PX33	G346	39	WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR
PX34	E197	22	FRONT AIR PRESSURE METER
PX4	F106	12	FAN SOLENOID
PX5	B106	12	REAR AIR PRESSURE METER
PX50	D197	22	INTER-AXLE DIFFERENTIAL SOLENOID
PX6	B116	13	CAB - DASH - LEFT - INSTRUMENT PANEL
PX7	A113	13	CAB - DASH - LEFT - INSTRUMENT PANEL
PX8	G111	13	CAB - DASH - LEFT - INSTRUMENT PANEL
PX9	D106	12	FUEL LEVEL METER

LIGHTS			
NUMBER	ZONE	SH	DESCRIPTION
DS1	D105	12	CAB - DASH - LEFT - INSTRUMENT PANEL
DS2	G115	12	CAB - DASH - LEFT - INSTRUMENT PANEL
DS3	F105	12	CAB - DASH - LEFT - INSTRUMENT PANEL
DS4	B105	12	CAB - DASH - LEFT - INSTRUMENT PANEL
DS5	B115	13	CAB - DASH - LEFT - INSTRUMENT PANEL
DS6	G110	13	CAB - DASH - LEFT - INSTRUMENT PANEL
DS7	D115	13	CAB - DASH - LEFT - INSTRUMENT PANEL
DS8	C100	12	CAB - DASH - LEFT - INSTRUMENT PANEL
DS9	B110	13	DUMP BODY UP
DS10	E120	14	CAB - DASH - LEFT - INSTRUMENT PANEL
DS11	G100	12	CAB - DASH - LEFT - INSTRUMENT PANEL
DS12	H120	14	CAB - DASH - LEFT - INSTRUMENT PANEL
DS13	C120	14	CAB - DASH - LEFT - INSTRUMENT PANEL
DS14	B110	13	LEFT TURN SIGNAL
DS15	B110	13	RIGHT TURN SIGNAL

LIGHTS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
DS16	E110	13	HIGH BEAM
DS17	D128	15	HEATER CONTROL PANEL ILLUMINATION
DS18	A244	28	CAB - DASH - CENTER - OPTIONS PANEL
DS19	E110	13	RADIATOR FAN OFF
DS21	C110	13	EMERGENCY BRAKE
DS22	D110	13	PARKING BRAKE
DS23	C110	13	PTO ON
DS24	D110	13	OIL PRESSURE
DS25	C110	13	WATER TEMPERATURE
DS27	C110	13	REAR BRAKE AIR
DS28	E110	13	FRONT AIR BRAKE
DS29	D110	13	ENGINE OIL LEVEL
DS30	F110	13	MASTER STOP
DS31	D249	28	CAB - DASH - CENTER - OPTIONS PANEL
DS32	B110	13	CHEMICAL DETECT
DS34	C110	13	CTIS OVERSPEED
DS35	C207	23	WRECKER BLACKOUT STOP LEFT REAR
DS35	B216	24	TRACTOR BLACKOUT STOP LEFT REAR
DS35	C225	25	LONG WHEEL BASE BLACKOUT STOP LEFT REAR
DS35	C234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE BLACKOUT STOP LEFT REAR
DS36	G207	23	WRECKER BLACKOUT STOP RIGHT REAR
DS36	D216	24	TRACTOR BLACKOUT STOP RIGHT REAR
DS36	G225	25	LONG WHEEL BASE BLACKOUT STOP RIGHT REAR
DS36	G234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE BLACKOUT STOP RIGHT REAR
DS37	B207	23	WRECKER REAR LEFT COMPOSITE
DS37	A216	24	TRACTOR REAR LEFT COMPOSITE
DS37	B225	25	LONG WHEEL BASE REAR LEFT COMPOSITE
DS37	B234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE REAR LEFT COMPOSITE
DS38	F207	23	WRECKER REAR RIGHT COMPOSITE
DS38	E216	24	TRACTOR REAR RIGHT COMPOSITE
DS38	F225	25	LONG WHEEL BASE REAR RIGHT COMPOSITE
DS38	F234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE REAR RIGHT COMPOSITE
DS39	F46	6	FRONT LEFT TURN SIGNAL
DS41	D110	13	TRANSMISSION OIL TEMPERATURE
DS42	C47	6	FRONT RIGHT TURN SIGNAL
DS43	D248	28	CAB - DASH - CENTER - OPTIONS PANEL
DS44	D46	6	RIGHT HEADLIGHT
DS45	D207	23	WRECKER BACKUP LIGHT
DS45	C216	24	TRACTOR BACKUP LIGHT
DS45	C225	25	LONG WHEEL BASE BACKUP LIGHT
DS45	C234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE BACKUP LIGHT
DS46	D246	28	CAB - DASH - CENTER - OPTIONS PANEL
DS47	G46	6	PARKING LIGHT FRONT LEFT
DS48	B47	6	PARKING LIGHT FRONT RIGHT
DS49	G46	6	BLACKOUT MARKER LEFT FRONT
DS50	B47	6	BLACKOUT MARKER RIGHT FRONT
DS51	B207	23	WRECKER BLACKOUT MARKER LEFT REAR
DS51	B216	24	TRACTOR BLACKOUT MARKER LEFT REAR
DS51	B225	25	LONG WHEEL BASE BLACKOUT MARKER LEFT REAR
DS51	C234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND WRECKER BLACKOUT MARKER LEFT REAR
DS52	F207	23	WRECKER BLACKOUT MARKER RIGHT REAR
DS52	D216	24	TRACTOR BLACKOUT MARKER RIGHT REAR
DS52	F225	25	LONG WHEEL BASE BLACKOUT MARKER RIGHT REAR
DS52	F234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE BLACKOUT MARKER RIGHT REAR
DS53	H46	6	BLACKOUT DRIVE LIGHT
DS54	D93	11	CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT
DS54	F242	27	LH FRONT TOP CAB CLEARANCE LIGHT
DS52	F234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE BLACKOUT MARKER RIGHT REAR

LIGHTS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
DS53	H46	6	BLACKOUT DRIVE LIGHT
DS54	D93	11	CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT
DS54	F242	27	LH FRONT TOP CAB CLEARANCE LIGHT
DS55	D93	11	CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE
DS55	E242	27	MIDDLE FRONT TOP CLEARANCE LIGHT
DS56	C93	11	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT
DS56	D242	27	RH FRONT TOP CAB CLEARANCE LIGHT
DS57	C93	11	CAB MARKER LIGHT FRONT UPPER RIGHT
DS57	D242	27	RH FRONT TOP CAB MARKER LIGHT
DS58	E93	11	CAB MARKER LIGHT FRONT UPPER LEFT
DS58	F242	27	LH FRONT TOP CAB MARKER LIGHT
DS59	B93	11	CAB MARKER LIGHT RIGHT DOOR
DS60	F93	11	CAB MARKER LIGHT FRONT LOWER LEFT
DS61	A93	11	CAB MARKER LIGHT RIGHT DOOR
DS62	F93	11	CAB MARKER LIGHT LEFT DOOR
DS63	B246	28	CAB - DASH - CENTER - OPTIONS PANEL
DS64	B248	28	CAB - DASH - CENTER - OPTIONS PANEL
DS65	A207	23	WRECKER LH SIDE MARKER LIGHT
DS65	A225	25	LONG WHEEL BASE LH SIDE MARKER LIGHT
DS65	A234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE LH SIDE MARKER LIGHT
DS66	A207	23	WRECKER LH REAR MARKER LIGHT
DS66	A216	24	TRACTOR LH REAR MARKER LIGHT
DS66	A225	25	LONG WHEEL BASE LH REAR MARKER LIGHT
DS66	A234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE LH REAR MARKER LIGHT
DS67	H207	23	WRECKER RH SIDE MARKER LIGHT
DS67	H225	25	LONG WHEEL BASE RH SIDE MARKER LIGHT
DS67	H234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE RH SIDE MARKER LIGHT
DS68	G207	23	WRECKER RH REAR MARKER LIGHT
DS68	C216	24	TRACTOR RH REAR MARKER LIGHT
DS68	G225	25	LONG WHEEL BASE RH REAR MARKER LIGHT
DS68	G234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE RH REAR MARKER LIGHT
DS69	D207	23	WRECKER LEFT REAR MARKER
DS69	G216	24	TRACTOR LEFT REAR MARKER
DS69	D225	25	LONG WHEEL BASE LEFT REAR MARKER
DS69	D234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE LEFT REAR MARKER
DS70	E207	23	WRECKER MIDDLE REAR MARKER
DS70	F216	24	TRACTOR MIDDLE REAR MARKER
DS70	E225	25	LONG WHEEL BASE MIDDLE REAR MARKER
DS70	E234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE MIDDLE REAR MARKER
DS71	E207	23	WRECKER RIGHT REAR MARKER
DS71	E216	24	TRACTOR RIGHT REAR MARKER
DS71	E225	25	LONG WHEEL BASE RIGHT REAR MARKER
DS71	E234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE RIGHT REAR MARKER
DS72	B207	23	WRECKER REAR LEFT COMPOSITE
DS72	B216	24	TRACTOR REAR LEFT COMPOSITE
DS72	B225	25	LONG WHEEL BASE REAR LEFT COMPOSITE
DS72	B234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE REAR LEFT COMPOSITE
DS73	F207	23	WRECKER REAR RIGHT COMPOSITE
DS73	E216	24	TRACTOR REAR RIGHT COMPOSITE
DS73	F225	25	LONG WHEEL BASE REAR RIGHT COMPOSITE
DS73	F234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE REAR RIGHT COMPOSITE
DS74	D46	6	LEFT HEADLIGHT
DS96	B251	28	CAB - DASH - CENTER - OPTIONS PANEL
DS97	B255	29	CAB - DASH - CENTER - OPTIONS PANEL
DS98	D251	28	CAB - DASH - CENTER - OPTIONS PANEL
DS99	D255	29	CAB - DASH - CENTER - OPTIONS PANEL
DS100	B249	28	CAB - DASH - CENTER - OPTIONS PANEL
DS101	D128	15	HEATER CONTROL PANEL ILLUMINATION
DS108	E100	12	CAB - DASH - LEFT - INSTRUMENT PANEL

CIRCUIT BREAKERS			
NUMBER	ZONE	SH	DESCRIPTION
CB20	C149	17	CAB RADIO
CB21	C158	18	WTEC II VIM STE/ICE

CIRCUIT BREAKERS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
CB22	C158	18	FAN/ETHER
CB23	C156	18	HEATER BLOWER
CB30	C148	17	CHEMICAL ALARM
CB35	D158	18	WTEC II VIM POWER
CB36	C156	18	HORN POWER
CB37	C160	18	WINDSHIELD WIPER/WASHER
CB38	D156	18	ROTATING BEACON
CB39	C155	18	TRAILER BLACKOUT STOP
CB40	C159	18	CTIS COOLER
CB41	C151	17	TRAILER REAR LIGHTS POWER
CB42	C151	17	BLACKOUT MARKER LIGHTS POWER
CB43	C152	17	REAR COMPOSITE LIGHTS / WTEC III ECU
CB44	C152	17	REAR COMPOSITE LIGHTS
CB45	C148	17	FUEL PREHEAT
CB48	C149	17	ARCTIC CAB/ENGINE KILL
CB49	C160	18	PTO POWER
CB50	C155	18	SWINGFIRE PUMP POWER
CB53	D149	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB54	D151	17	BLACKOUT HEADLIGHT
CB61	D162	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB62	D162	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB63	D160	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB64	D160	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB65	D149	17	PARKING LIGHTS
CB66	D152	17	BLACKOUT MARKER POWER
CB67	D148	17	MARKER LIGHTS
CB68	C161	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB70	D155	18	IGNITION/MAIN LIGHT SWITCH
CB71	D158	18	HAZARD/FLASHER WORKLIGHTS
CB72	D148	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB73	D159	18	BACK-UP LIGHT POWER
CB74	D159	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB76	D152	17	BLACKOUT STOP RELAY POWER
CB77	C161	18	ENGINE INSTR POWER
CB78	D156	18	HEADLIGHTS
CB79	C159	18	WTEC II VIM POWER / WTEC III REVERSE WARNING RELAY
CB80	D151	17	TAILLIGHTS

TERMINAL LUGS			
NUMBER	ZONE	SH	DESCRIPTION
TL1	B63	7	POLARITY PROTECTION
TL1	E69	8	ALTERNATOR
TL1	F62	7	200 AMP
TL2	D62	7	200 AMP
TL2	B62	7	POLARITY PROTECTION
TL2	D69	8	ALTERNATOR
TL3	C94	11	CAB MARKER LIGHT FRONT UPPER RIGHT
TL3	D242	27	RH FRONT TOP CAB MARKER LIGHT
TL4	C94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT
TL4	D242	27	RH FRONT TOP CAB CLEARANCE LIGHT
TL5	D69	8	ALTERNATOR
TL6	D69	8	ALTERNATOR
TL9	D56	7	24V AUXILIARY STARTER SOLENOID
TL8	D94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE
TL8	E242	27	MIDDLE FRONT TOP CLEARANCE LIGHT
TL10	C61	7	CHASSIS - REAR (REF E1)
TL12	C58	7	BATTERIES
TL12	C71	8	STARTER/STARTER SOLENOID
TL14	E97	11	ROTARY WARNING LIGHT CONNECTOR
TL15	A206	23	WRECKER REAR LIGHTS
TL15	A224	25	LONG WHEEL BASE
TL15	A233	26	LH SIDE MARKER LIGHT
TL16	B206	23	WRECKER REAR LIGHTS
TL16	G215	24	REAR LIGHTS TRACTOR
TL16	B224	25	LONG WHEEL BASE
TL16	A233	26	LH REAR MARKER LIGHT

TERMINAL LUGS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
TL17	C233	26	BACKUP LIGHT
TL17	C206	23	WRECKER REAR LIGHTS
TL17	C215	24	REAR LIGHTS TRACTOR
TL17	C224	25	LONG WHEEL BASE
TL18	C206	23	WRECKER REAR LIGHTS
TL18	H215	24	REAR LIGHTS TRACTOR
TL18	C224	25	LONG WHEEL BASE REAR LIGHTS
TL18	C233	26	LONG WHEEL BASE
TL19	H206	23	WRECKER REAR LIGHTS
TL19	H224	25	LONG WHEEL BASE
TL19	H233	26	RH SIDE MARKER LIGHT
TL20	G233	26	RH REAR MARKER LIGHT
TL20	C215	24	TRACTOR REAR LIGHTS
TL20	G224	25	LONG WHEELBASE REAR LIGHTS
TL20	G206	23	WRECKER REAR LIGHTS
TL21	G206	23	WRECKER REAR LIGHTS
TL21	D215	24	REAR LIGHTS TRACTOR
TL21	G224	25	LONG WHEEL BASE
TL21	G233	26	RH COMPOSITE LIGHT
TL22	D94	11	CAB MARKER LIGHTS
TL22	E242	27	LH FRONT TOP CAB CLEARANCE LIGHT
TL23	D56	7	24V AUXILIARY STARTER SOLENOID
TL24	D56	7	24V AUXILIARY STARTER SOLENOID
TL25	C56	7	CHASSIS - FRONT
TL25	C71	8	STARTER/STARTER SOLENOID
TL26	B56	7	CHASSIS - FRONT
TL26	C71	8	STARTER/STARTER SOLENOID
TL27	E94	11	CAB MARKER LIGHTS
TL27	F242	27	LH FRONT TOP CAB MARKER LIGHT
TL28	G66	8	FUEL SOLENOID
TL29	H66	8	FUEL SOLENOID
TL30	D206	23	WRECKER REAR LIGHTS
TL30	E215	24	REAR LIGHTS TRACTOR
TL30	D224	25	LONG WHEEL BASE
TL30	D233	26	LEFT REAR MARKER
TL31	E206	23	WRECKER REAR LIGHTS
TL31	F215	24	REAR LIGHTS TRACTOR
TL31	E224	25	LONG WHEEL BASE
TL31	E233	26	MIDDLE REAR MARKER
TL32	E206	23	WRECKER REAR LIGHTS
TL32	G215	24	REAR LIGHTS TRACTOR
TL32	E224	25	LONG WHEEL BASE
TL32	E233	26	RIGHT REAR MARKER
TL320	E268	30	PTO EQUIPPED
TL320	C277	31	ARCTIC KIT W/PTO EQUIPPED
TL33	E56	7	24V AUXILIARY STARTER SOLENOID
TL35	D70	8	ALTERNATOR
TL36	B62	7	POLARITY PROTECTION
TL36	F63	7	200 AMP
TL37	F63	7	200 AMP
TL37	B63	7	POLARITY PROTECTION
TL38	D59	7	SHUNT
TL39	C61	7	CHASSIS - REAR (REF E1)
TL41	B62	7	POLARITY PROTECTION
TL42	B62	7	POLARITY PROTECTION
TL44	B62	7	POLARITY PROTECTION
TL44	E63	7	200 AMP
TL45	D59	7	SHUNT
TL46	D58	7	SHUNT
TL46	D71	8	STARTER/STARTER SOLENOID
TL47	F63	7	200 AMP
TL47	C63	7	POLARITY PROTECTION
TL48	E61	7	CHASSIS - REAR (REF E2)
TL49A	D61	7	CHASSIS - REAR (REF E1)
TL49A	F61	7	NATO SLAVE RECEPTACLE
TL50	G130	15	CHASSIS GROUND
TL50A	F61	7	NATO SLAVE RECEPTACLE
TL51	E59	7	SHUNT
TL52	E59	7	SHUNT

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 3 OF 40

SIZE B | ILL NO. 6WD01L3B | FP-5/ (FP-6 BLANK)

28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36

TERMINAL LUGS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
TL53	B56	7	CHASSIS - FRONT
TL53	B71	8	STARTER/STARTER SOLENOID
TL54	C200	23	WRECKER REAR LIGHTS
TL55	B56	7	CHASSIS - FRONT
TL55	C71	8	STARTER/STARTER SOLENOID
TL56	F145	17	X3 GROUND
TL57	F145	17	CAB GROUND
TL58	D69	8	ALTERNATOR
TL59	C70	8	ALTERNATOR
TL60	C62	7	POLARITY PROTECTION
TL60	D69	8	ALTERNATOR
TL61	C62	7	POLARITY PROTECTION
TL61	E69	8	ALTERNATOR
TL61	F62	7	200 AMP
TL62	C56	7	CHASSIS - FRONT
TL63	C56	7	CHASSIS - FRONT
TL63	B71	8	STARTER/STARTER SOLENOID
TL66	H70	8	ENGINE (REF P201)
TL67	F307	35	CARGO MATERIAL HANDLING CRANE
TL68	D260	29	CAB - DASH - CENTER - OPTIONS PANEL
TL69	E260	29	CAB - DASH - CENTER - OPTIONS PANEL
TL70	B47	6	FRONT RH COMPOSITE LIGHT
TL71	A94	11	CAB MARKER LIGHT RIGHT DOOR
TL72	H47	6	BLACKOUT DRIVE LIGHT
TL73	B95	11	CAB MARKER LIGHTS
TL74	D95	11	CAB MARKER LIGHTS
TL74	E240	27	AIRDROP ONLY
TL75	F96	11	CAB MARKER LIGHTS
TL76	D265	30	PTO EQUIPPED
TL77	B299	34	DUMP BODY
TL78	B298	34	DUMP BODY
TL77	B299	34	DUMP BODY
TL78	B298	34	DUMP BODY
TL79	F47	6	FRONT LH COMPOSITE LIGHT
TL80	E63	7	200 AMP
TL80	C62	7	POLARITY PROTECTION
TL81	C48	6	CHASSIS - GROUND
TL82	F47	6	CHASSIS - GROUND
TL83	B61	7	FUEL TANK LEVEL SENSOR
TL84	B58	7	CHASSIS - SPARE TIRE (REF J93)
TL85	G61	7	CHASSIS - REAR
TL86	C95	11	CAB MARKER LIGHTS
TL86	D240	27	AIRDROP ONLY
TL87	F95	11	CAB MARKER LIGHTS
TL88	A199	23	WRECKER REAR LIGHTS
TL88	A217	25	LONG WHEEL BASE
TL89	G199	23	WRECKER REAR LIGHTS
TL89	G217	25	LONG WHEEL BASE
TL90	H199	23	WRECKER REAR LIGHTS
TL90	H217	25	LONG WHEEL BASE
TL92	H200	23	WRECKER REAR LIGHTS
TL92	C215	24	REAR LIGHTS TRACTOR
TL92	G224	25	LONG WHEEL BASE
TL92	F231	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
TL93	H199	23	WRECKER REAR LIGHTS
TL93	G215	24	REAR LIGHTS TRACTOR
TL93	G230	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
TL93M	G208	24	REAR LIGHTS TRACTOR
TL94	G94	11	WINDSHIELD WASHER ROTARY PUMP (B3)
TL97	B97	11	CHEMICAL ALARM CONNECTOR
TL98	B97	11	CHEMICAL ALARM CONNECTOR
TL99	D61	7	CHASSIS - REAR (REF E2)
TL101	G264	30	ALL MTV W/O PTO
TL101	G267	30	TRACTOR W/O WINCH
TL109	C209	24	REAR LIGHTS TRACTOR
TL110	D70	8	ALTERNATOR
TL111	D266	30	PTO EQUIPPED
TL123	E47	6	CHASSIS - FRONT (REF J19)
TL126	E135	15	CHASSIS - GROUND
TL130	F94	11	CAB MARKER LIGHTS
TL131	A94	11	CAB MARKER LIGHTS

TERMINAL LUGS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
TL133	F94	11	CAB MARKER LIGHTS
TL134	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT
TL150	F186	21	SENSOR/FRONT AIR PRESSURE TRANSMITTER
TL151	G186	21	SENSOR/REAR AIR PRESSURE TRANSMITTER
TL152	C188	21	STOPLIGHT SWITCH
TL501	G197	22	CAB - DASH - RIGHT - UNDERDASH
TL502	G197	22	CAB - DASH - RIGHT - UNDERDASH
TL153	C188	21	STOPLIGHT SWITCH
TL154	D188	21	STOPLIGHT SWITCH
TL155	D188	21	STOPLIGHT SWITCH
TL156	F186	21	SWITCH/FRONT AIR PRESSURE TRANSMITTER
TL157	G186	21	SWITCH/REAR AIR PRESSURE TRANSMITTER
TL158	E146	17	START INHIBIT PUSHBUTTON
TL159	E145	17	START INHIBIT PUSHBUTTON
TL162	B123	14	STARTER PUSHBUTTON
TL163	B123	14	STARTER PUSHBUTTON
TL164	G71	8	ENGINE (REF J921)
TL165	G71	8	ENGINE (REF J921)
TL166	F62	7	200 AMP
TL167	E62	7	200 AMP
TL168	D63	7	200 AMP
TL169	D62	7	200 AMP
TL171	F62	7	200 AMP
TL172	F62	7	200 AMP
TL173	E63	7	200 AMP
TL174	D62	7	200 AMP
TL190	D344	39	WTEC III PRESSURE SWITCH GROUND
TL201	E134	15	PARKING BRAKE SWITCH
TL202	E133	15	PARKING BRAKE SWITCH

SWITCHES			
NUMBER	ZONE	SH	DESCRIPTION
S3	A186	21	COLUMN SWITCH
S3	C186	21	COLUMN SWITCH
S4	D123	14	MAIN LIGHT SWITCH
S5/1	B120	14	IGNITION SWITCH
S5/11	A100	12	ENGINE FAN OFF SWITCH
S5/14	C249	28	WINCH ON OFF
S5/15	B248	28	WINCH IN-OUT
S5/16	F100	12	ETHER STARTER SWITCH
S5/2	D100	12	LAMP TEST SWITCH
S5/2	D120	14	ROTATING WARNING LIGHT SWITCH
S5/22	G120	14	FULL HAZARD WARNING SWITCH
S5/25	A255	29	SWINGFIRE PUMP SWITCH
S5/37	C255	29	DUMP UP DOWN SWITCH
S5/5	A247	28	WORKLIGHTS ON/OFF SWITCH
S5/6	B246	28	PTO ON/OFF SWITCH
S5/8	A249	28	BLACKOUT OVERRIDE SWITCH
S5/9	A250	28	FUEL PRE-HEAT SWITCH
S6	A123	14	STARTER PUSHBUTTON
S7	F146	17	START INHIBIT PUSHBUTTON
S10A	C188	21	STOPLIGHT SWITCH
S10B	D188	21	STOPLIGHT SWITCH
S18	D305	34	PTO PRESSURE SWITCH
S20	E186	21	SWITCH/FRONT AIR PRESSURE TRANSMITTER
S23	F61	7	AIR PRESSURE SWITCH FOR CTIS
S24	E134	15	PARKING BRAKE SWITCH
S25	B299	34	DUMP BED POSITION SWITCH
S26	C66	8	WATER TEMPERATURE SENSOR
S27	E68	8	OIL PRESSURE WARNING LIGHT SWITCH
S29	G186	21	SWITCH/REAR AIR PRESSURE TRANSMITTER
S31	A252	28	ARCTIC TROOP HEATER SWITCH
S36	C251	28	TAILGATE RELEASE SWITCH
S40	F67	8	ETHER SENSOR SWITCH
S45	G71	8	TROOP ALARM SWITCH
S56	A66	8	WATER TEMPERATURE SWITCH

GAGES			
NUMBER	ZONE	SH	DESCRIPTION
M2	D115	13	VOLTMETER
M3	B115	13	ENGINE OIL PRESSURE METER
M4	F105	12	FRONT AIR PRESSURE METER
M5	B105	12	REAR AIR PRESSURE METER

GAGES (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
M6	G116	13	WATER TEMPERATURE METER
M7	D105	12	FUEL LEVEL METER
M8	G111	13	SPEEDOMETER
M9	A246	28	TACHOMETER

RELAYS			
NUMBER	ZONE	SH	DESCRIPTION
K1	F158	18	STARTER RELAY
K2	B152	17	CONTROL PANEL RELAY
K6	F153	17	STOPLIGHT RELAY
K7	G162	18	HEADLIGHT RELAY
K8	G160	18	HEADLIGHT LO/HI-BEAM RELAY
K9	A151	17	HAZARD FLASHER BO OVERIDE
K10	F159	18	STARTER RELAY
K11	F155	18	ALTERNATOR EXCITATION RELAY
K12	B148	17	WORKLIGHT RELAY
K13	B158	18	ROTATING BEACON BO OVRD RELAY
K15	B149	17	AUXILIARY COOLER RELAY
K19	B159	18	START INHIBIT RELAY
K20	H147	17	MARKER LIGHTS RELAY
K24	B160	18	CRANKING LOCKOUT RELAY
K25	B346	39	WTEC III REVERSE WARNING RELAY
K26	B344	39	WTEC III NEUTRAL START RELAY
K27	H152	17	BO STOP RELAY
K28	H151	17	TRAILER REAR LIGHTS RELAY
K29	F151	17	BO MARKER RELAY / WTEC III BLACKOUT DRIVE RELAY
K30	H156	18	REAR LEFT COMPOSITE LAMP RELAY
K31	H158	18	REAR RIGHT COMPOSITE LAMP RELAY
K32	B156	18	HORN RELAY
K37	B348	39	WTEC III PTO ENABLE OUTPUT RELAY
K52	H148	17	CTIS OVERSPEED INDICATION RELAY
K53	H149	17	RADIO POWER RELAY

RESISTORS			
NUMBER	ZONE	SH	DESCRIPTION
R1	D88	10	AIR DRYER
R2	E181	21	CAB - DASH - LEFT - UNDERDASH
R4	D184	21	CAB - DASH - LEFT - UNDERDASH
R5	C184	21	CAB - DASH - LEFT - UNDERDASH
R6	F181	21	CAB - DASH - LEFT - UNDERDASH

SOLENOIDS			
NUMBER	ZONE	SH	DESCRIPTION
KS	D56	7	24V AUXILIARY STARTER SOLENOID
L1	E198	22	FAN SOLENOID
L1	H337	38	RIGHT WINCH OUT
L2	H76	8	FUEL SOLENOID
L2	H337	38	RIGHT WINCH IN
L3	B305	34	PTO SOLENOID
L4	E269	30	WINCH IN SOLENOID
L5	D269	30	WINCH OUT SOLENOID
L5	H340	38	LEFT WINCH IN
L6	D198	22	INTER-AXLE DIFFERENTIAL SOLENOID
L6	H339	38	LEFT WINCH OUT
L7	B302	34	TAILGATE RELEASE SOLENOID
L8	B302	34	DUMP BED UP SOLENOID
L9	A302	34	DUMP BED SOLENOID
L11	H338	38	UNDERLIFT DOWN
L13	H339	38	STINGER OUT
L14	H338	38	UNDERLIFT UP
L15	B60	7	CHASSIS - SPARE TIRE
L15	H337	38	UNDERLIFT FOLD DOWN
L16	H339	38	STINGER IN
L18	H338	38	UNDERLIFT FOLD UP

HORNS AND ALARMS			
NUMBER	ZONE	SH	DESCRIPTION
LS1	A46	6	VEHICLE HORN
LS2	H110	13	AUDIBLE ALARM

MOTORS			
NUMBER	ZONE	SH	DESCRIPTION
B2	A192	22	WINDSHIELD WIPER MOTOR
B4	C127	15	FAN MOTOR
B6	F268	30	TRANSMISSION AUXILIARY OIL COOLER FAN
B6A	G268	30	TRANSMISSION AUXILIARY OIL COOLER FAN

BATTERIES			
NUMBER	ZONE	SH	DESCRIPTION
BT1	C61	7	BATTERY
BT2	D61	7	BATTERY
BT3	D61	7	BATTERY
BT4	E61	7	BATTERY

MISCELLANEOUS			
NUMBER	ZONE	SH	DESCRIPTION
10A	C192	22	WTEC II VEHICLE INTERFACE MODULE
10A	E192	22	WTEC II VEHICLE INTERFACE MODULE
A2	F127	15	CTIS ELECTRONIC CONTROL UNIT
A3	G123	14	INSTRUMENT PANEL LIGHTS DIMMER MODULE
A5	A143	16	WIPER DELAY MODULE
A7	B188	21	FREQUENCY DIVIDER
A18	A112	13	LIGHTED INDICATOR DISPLAY
A20	H68	8	FUEL/WATER SEPARATOR
B1	C72	8	STARTER/STARTER SOLENOID
B10	E76	9	WTEC II TRANSFER CASE (SERIAL # 6510032369)
B10	E81	9	WTEC II TRANSFER CASE (SERIAL # 651032369 AND HIGHER)
B10	E75	9	WTEC II TRANSMISSION (SERIAL # 6510032369)
B10	E79	9	WTEC II TRANSMISSION (SERIAL # 6510032369 AND HIGHER)
B10	E85	10	TRANSFER CASE PRIOR (SERIAL # 6510032369 WITH ADAPTER CABLE ASSEMBLY)
B10	E83	10	TRANSMISSION PRIOR TO (SERIAL # 6510032369 WITH ADAPTER CABLE ASSEMBLY)
B3	G92	11	WINDSHIELD WASHER ROTARY PUMP
BJ1	A184	21	JUNCTION BOX
D1A	C147	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D1B	C147	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D2A	D147	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D2B	D147	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D3A	B147	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D3B	A147	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D7	B307	35	DIODE ASSEMBLY
D7	B318	36	DIODE ASSEMBLY
D8	C307	35	DIODE ASSEMBLY
D8	A318	36	DIODE ASSEMBLY
E1	C61	7	BATTERY
E1	D61	7	BATTERY
E1	D61	7	BATTERY
E1	E61	7	BATTERY
E2	C4	6	CHASSIS - FRONT BUMPER (REF J27)
E2	C52	7	BATTERY
E2	D52	7	BATTERY
E2	E52	7	BATTERY
E2	E52	7	BATTERY
E3	H157	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
E4	H159	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
E5	B160	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
E14	E221	25	LONG WHEEL BASE
E14	E230	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E15	E224	25	LONG WHEEL BASE
E15	E233	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E16	A224	25	LONG WHEEL BASE
E16	A233	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E17	G222	25	LONG WHEEL BASE

MISCELLANEOUS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
E17	G222	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E18	G212	25	LONG WHEEL BASE
E18	G221	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E19	F212	25	LONG WHEEL BASE
E19	F221	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E20	E213	25	LONG WHEEL BASE
E20	E221	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E21	D213	25	LONG WHEEL BASE
E21	D222	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E22	B86	11	CAB MARKER LIGHTS
E27	F213	24	REAR LIGHTS TRACTOR
E28	G215	24	REAR LIGHTS TRACTOR
E29	E209	24	REAR LIGHTS TRACTOR
E30	D214	24	REAR LIGHTS TRACTOR
E31	D213	24	REAR LIGHTS TRACTOR
E32	G212	24	REAR LIGHTS TRACTOR
E33	C209	24	REAR LIGHTS TRACTOR
E34	B210	24	REAR LIGHTS TRACTOR
E35	F209	24	REAR LIGHTS TRACTOR
E36	E210	24	REAR LIGHTS TRACTOR
E37	E211	24	REAR LIGHTS TRACTOR
E38	F209	24	REAR LIGHTS TRACTOR
E39	E210	24	REAR LIGHTS TRACTOR
E40	F210	24	REAR LIGHTS TRACTOR
E41	D211	24	REAR LIGHTS TRACTOR
E42	D210	24	REAR LIGHTS TRACTOR
E43	D210	24	REAR LIGHTS TRACTOR
E44	H213	24	REAR LIGHTS TRACTOR
E45	G209	24	REAR LIGHTS TRACTOR
E46	G203	23	WRECKER REAR LIGHTS
E47	F203	23	WRECKER REAR LIGHTS
E48	E204	23	WRECKER REAR LIGHTS
E49	D203	23	WRECKER REAR LIGHTS
E50	E206	23	WRECKER REAR LIGHTS
E51	A206	23	WRECKER REAR LIGHTS
E52	G204	23	WRECKER REAR LIGHTS
E53	D200	23	WRECKER REAR LIGHTS
E54	B200	23	WRECKER REAR LIGHTS
E55	F200	23	WRECKER REAR LIGHTS
E56	E211	24	REAR LIGHTS TRACTOR
E57	E203	23	WRECKER REAR LIGHTS
E58	D204	23	WRECKER REAR LIGHTS
E59	G204	23	WRECKER REAR LIGHTS
E64	D221	25	LONG WHEEL BASE
E65	B50	6	CHASSIS - FRONT
E66	C50	6	CHASSIS - FRONT
E66	D354	40	WTEC III CAB TRANSMISSION HARNESS (TID1)
E66	D358	40	WTEC III CAB TRANSMISSION HARNESS (TID2)
E67	D47	6	CHASSIS - FRONT
E68	D49	6	CHASSIS - FRONT
E69	D260	29	CAB - DASH - CENTER - OPTIONS PANEL
E70	C265	30	PTO EQUIPPED
E70	F266	30	TRACTOR W/O WINCH
E71	F182	21	CAB - DASH - LEFT - UNDERDASH
E72	G222	25	LONG WHEEL BASE
E74	G266	30	TRACTOR W/O WINCH
E78	A290	34	DUMP BODY
E79	B227	27	ROTARY WARNING LIGHT CONNECTOR
E80	C227	27	ROTARY WARNING LIGHT CONNECTOR
E81	B228	27	ROTARY WARNING LIGHT CONNECTOR
E82	C228	27	ROTARY WARNING LIGHT CONNECTOR
E83	B228	27	ROTARY WARNING LIGHT CONNECTOR
E84	B228	27	ROTARY WARNING LIGHT CONNECTOR
E88	B106	13	CAB - DASH - LEFT - INSTRUMENT PANEL

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 4 OF 40

SIZE B | ILL. NO. 6WD01L4B | FP-7/ (FP-8 BLANK)

MISCELLANEOUS (CONTINUED)			
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
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
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

TRANSMISSION			
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
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
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
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

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 5 OF 40

SIZE B | ILL. NO. 6WD01IL5B | FP-9/ (FP-10 BLANK)

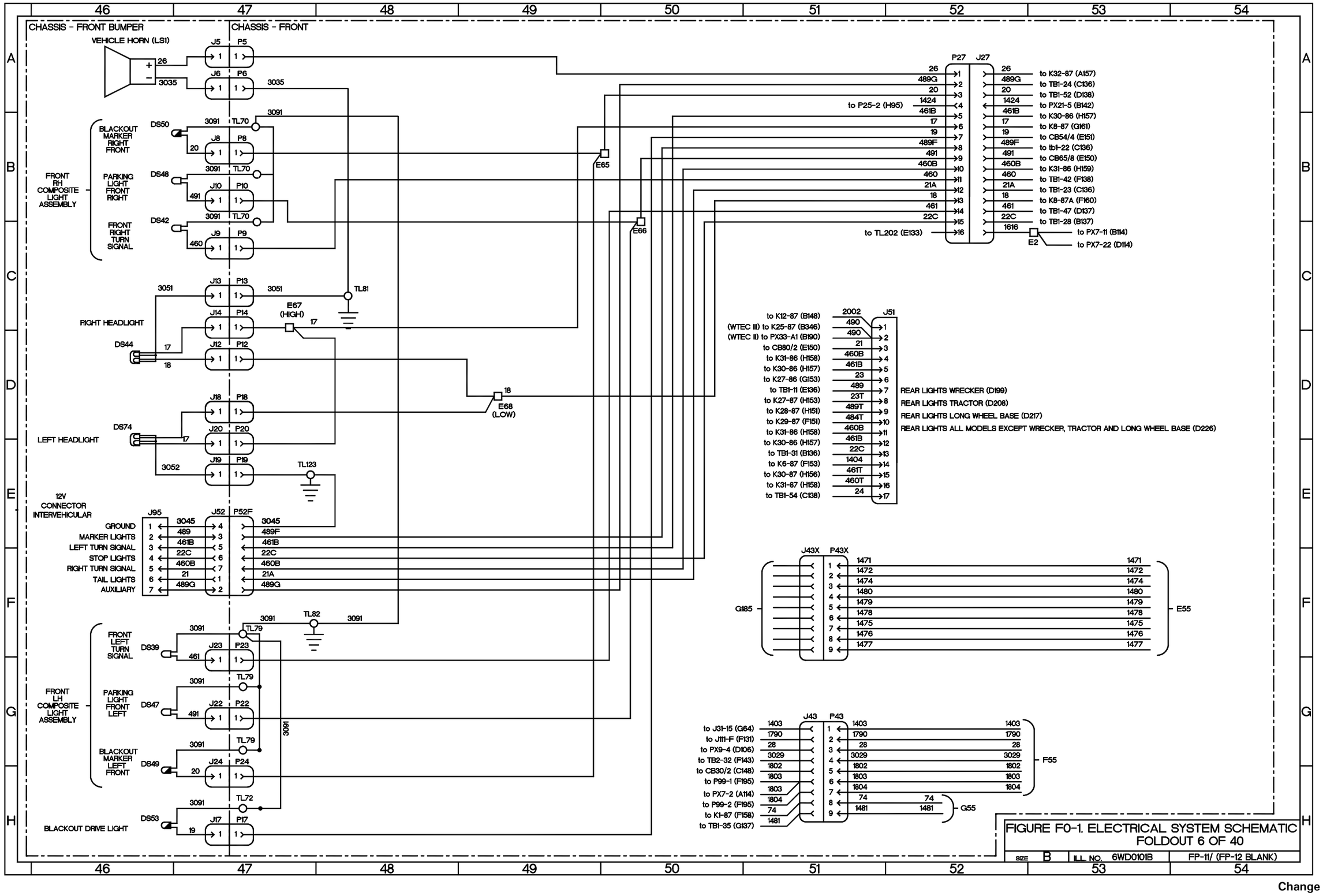


FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 6 OF 40

SIZE	ILL. NO.	
B	6WD0101B	FP-11/ (FP-12 BLANK)

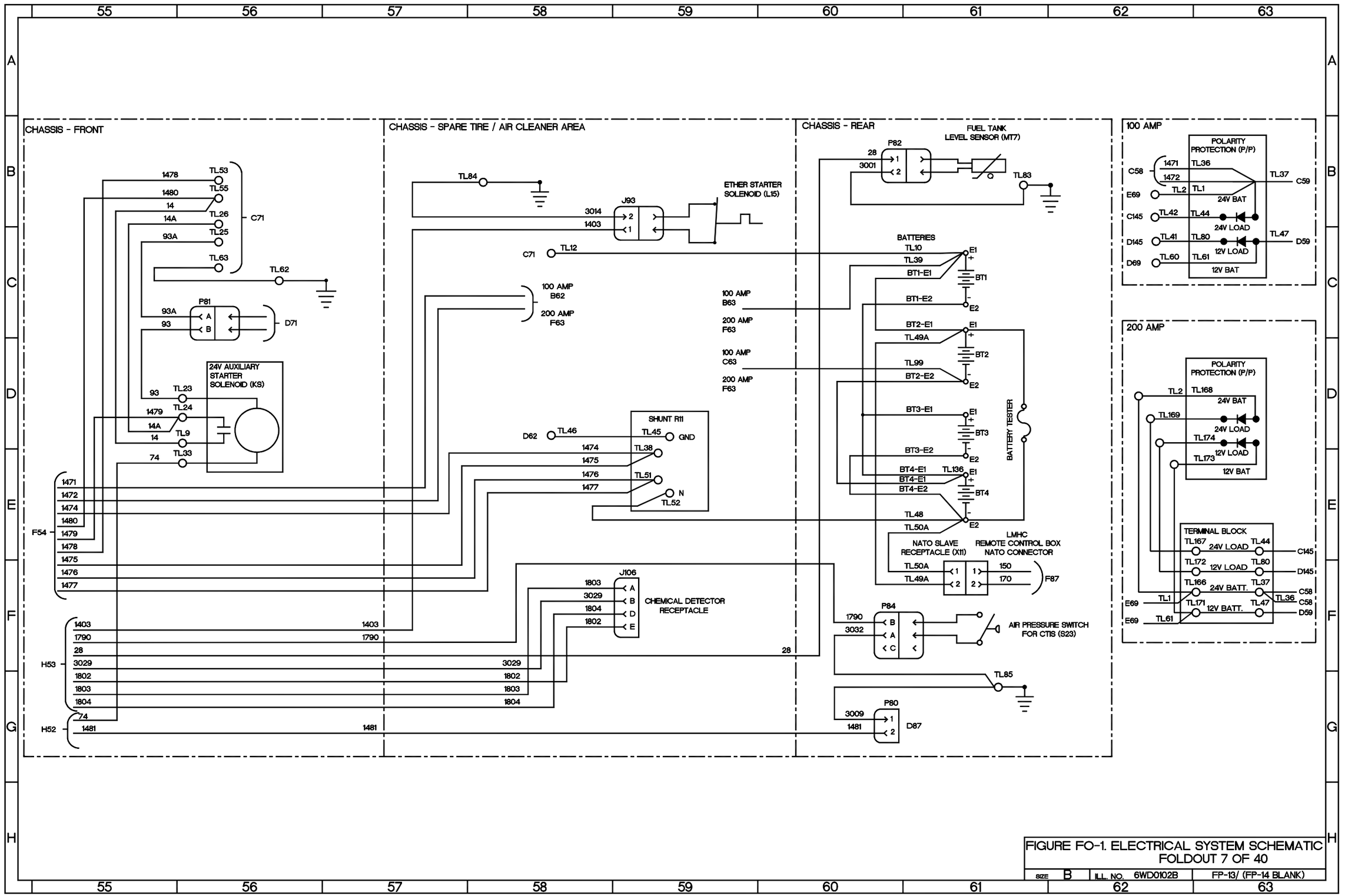


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 7 OF 40

SIZE	ILL. NO.	
B	6WD0102B	FP-13/ (FP-14 BLANK)

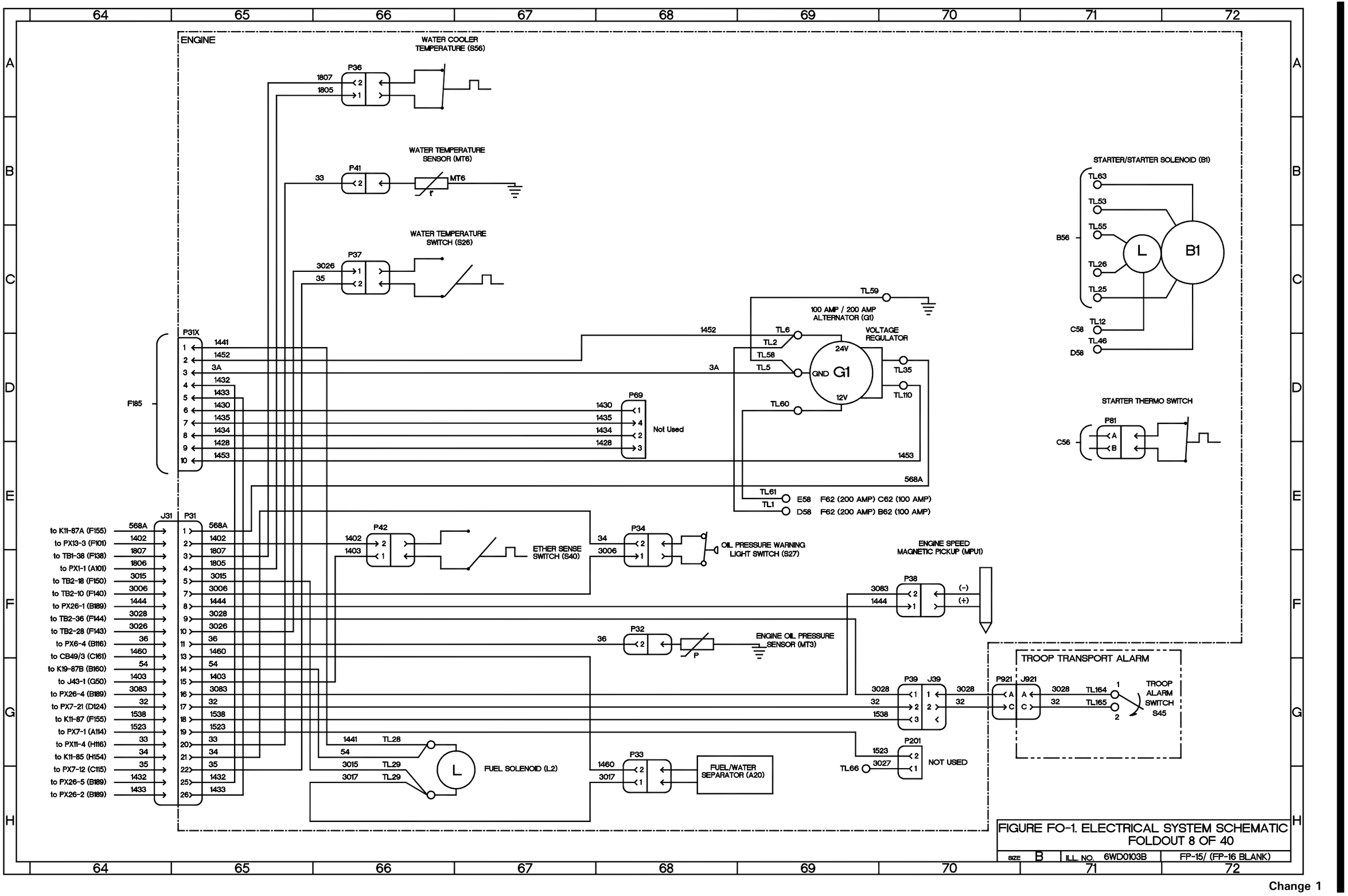


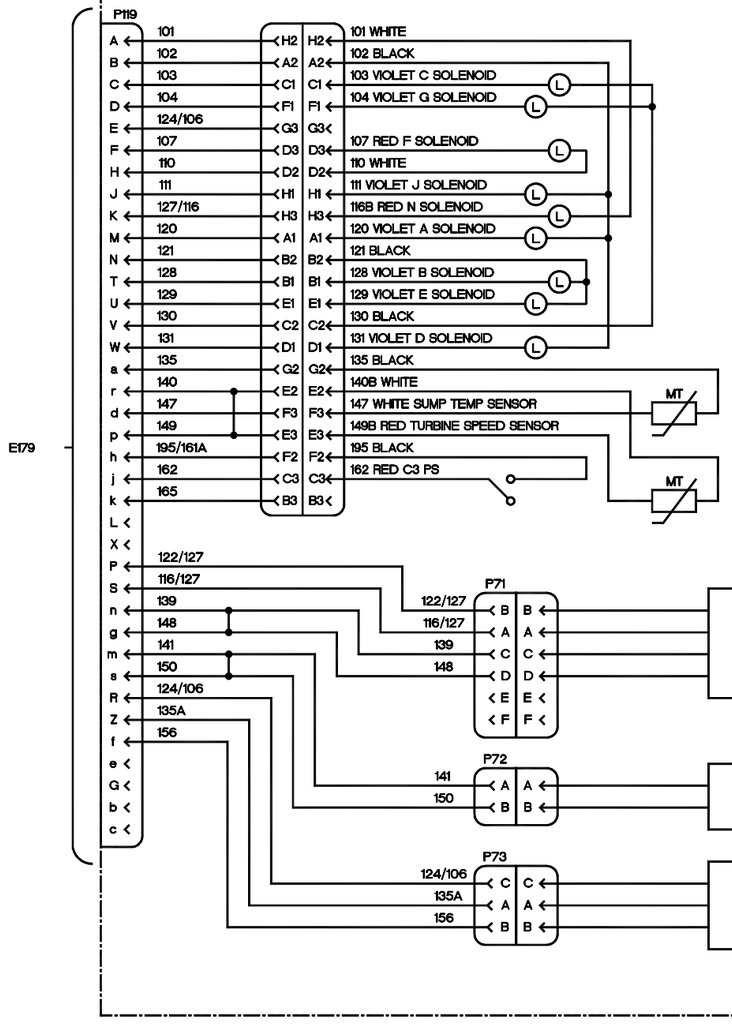
FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 8 OF 40

SIZE B | ILL. NO. 6WD0103B | FP-15/ (FP-16 BLANK)

PRIOR TO SERIAL NUMBER 6510032369

PRE-BLOCK SEVEN TRANSMISSION

EXTERNAL WIRING HARNESS TO TRANSMISSION CONNECTOR



SERIAL NUMBER 6510032369 AND HIGHER

TID1, TID2, AND TID3 TRANSMISSIONS

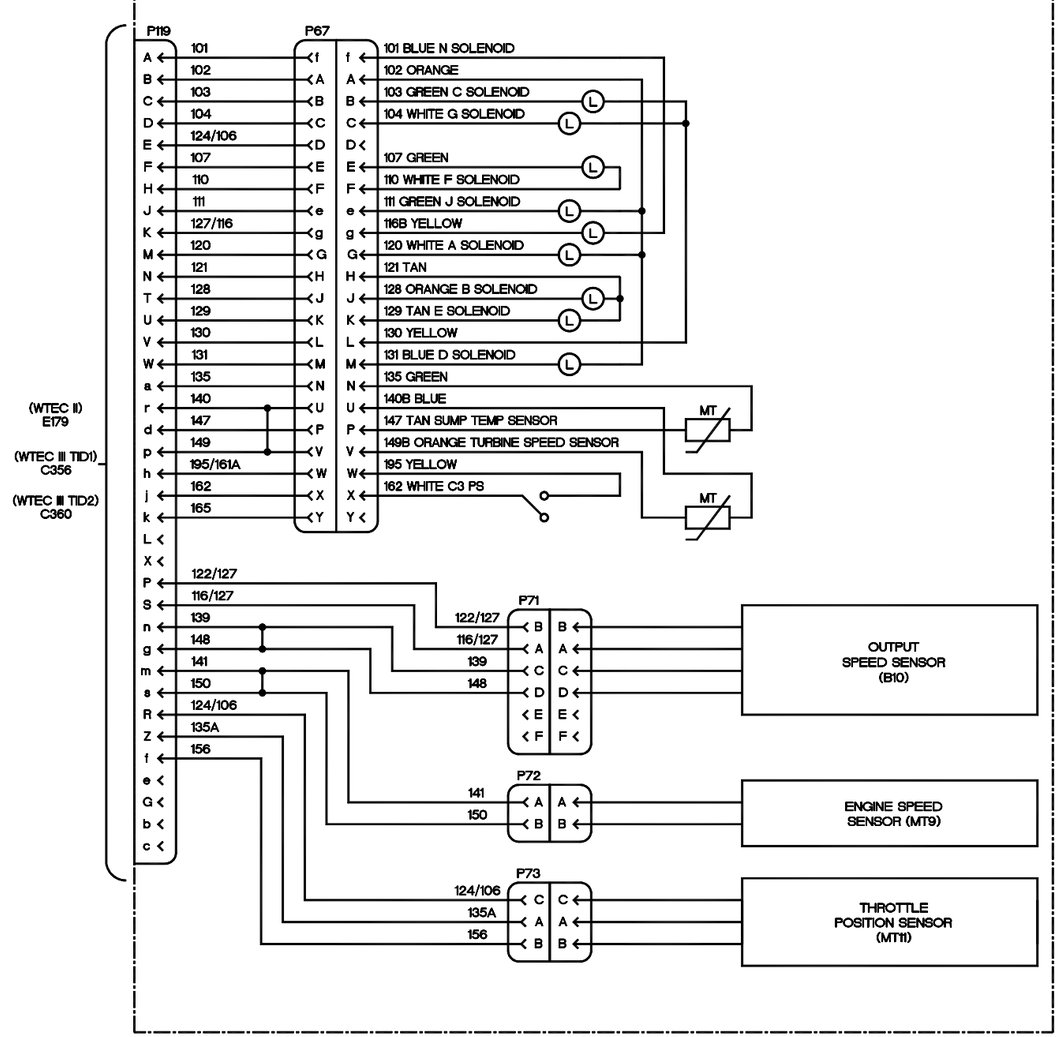
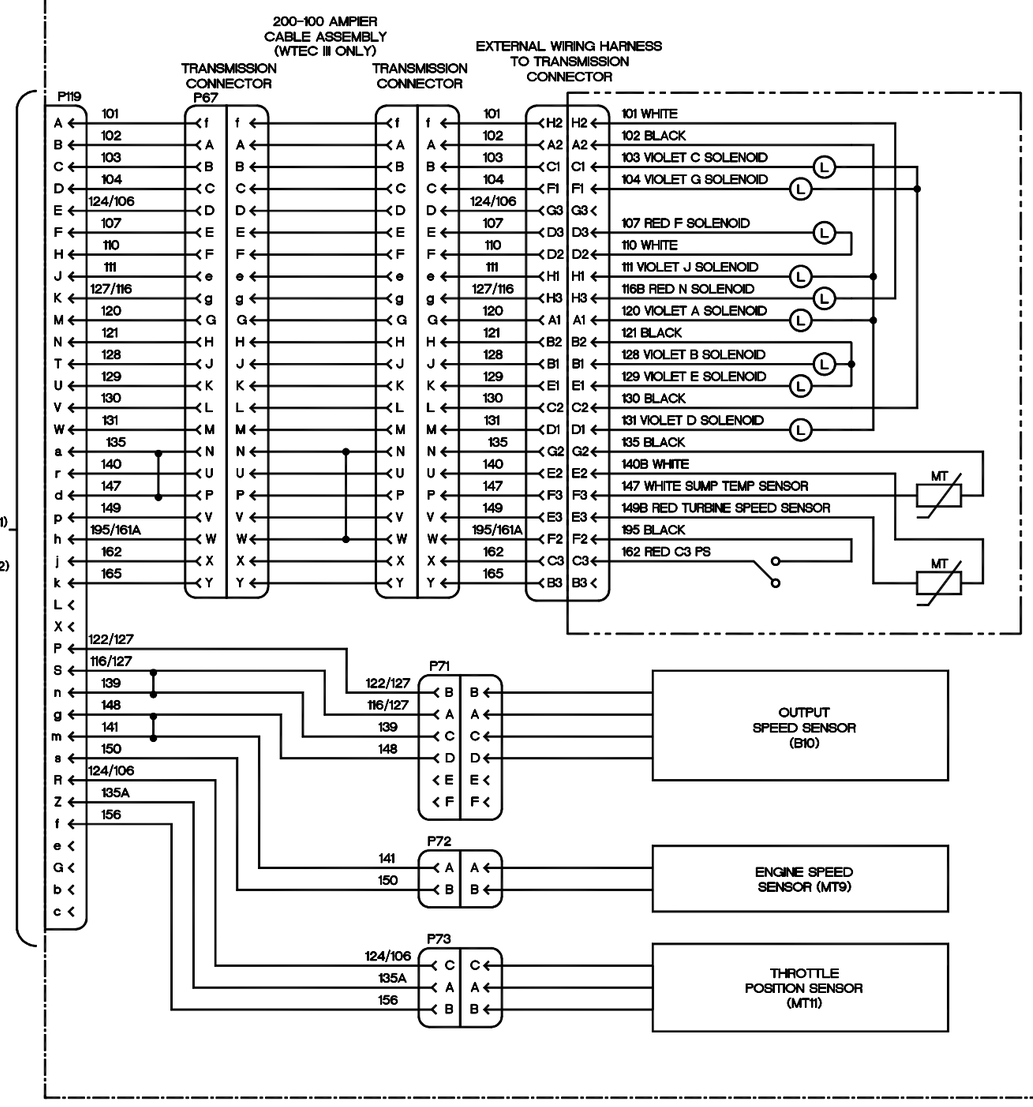


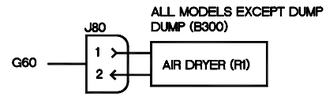
FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 9 OF 40

SIZE	ILL. NO.	
B	6WD0104B	FP-17/ (FP-18 BLANK)

PRIOR TO SERIAL NUMBER 6510032369 WITH ADAPTER CABLE ASSEMBLY

PRE-BLOCK SEVEN WITH PIGTAIL TRANSMISSION





LIGHT MATERIAL HANDLING CRANE (LMHC)

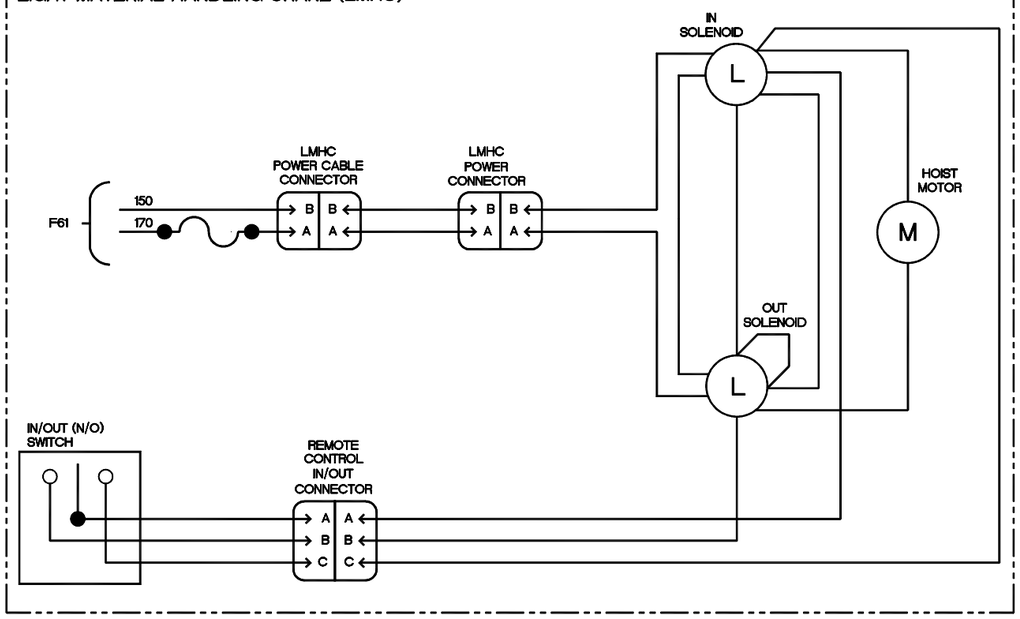


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 10 OF 40

SIZE B | ILL. NO. 6WD0105B | FP-19/ (FP-20 BLANK)

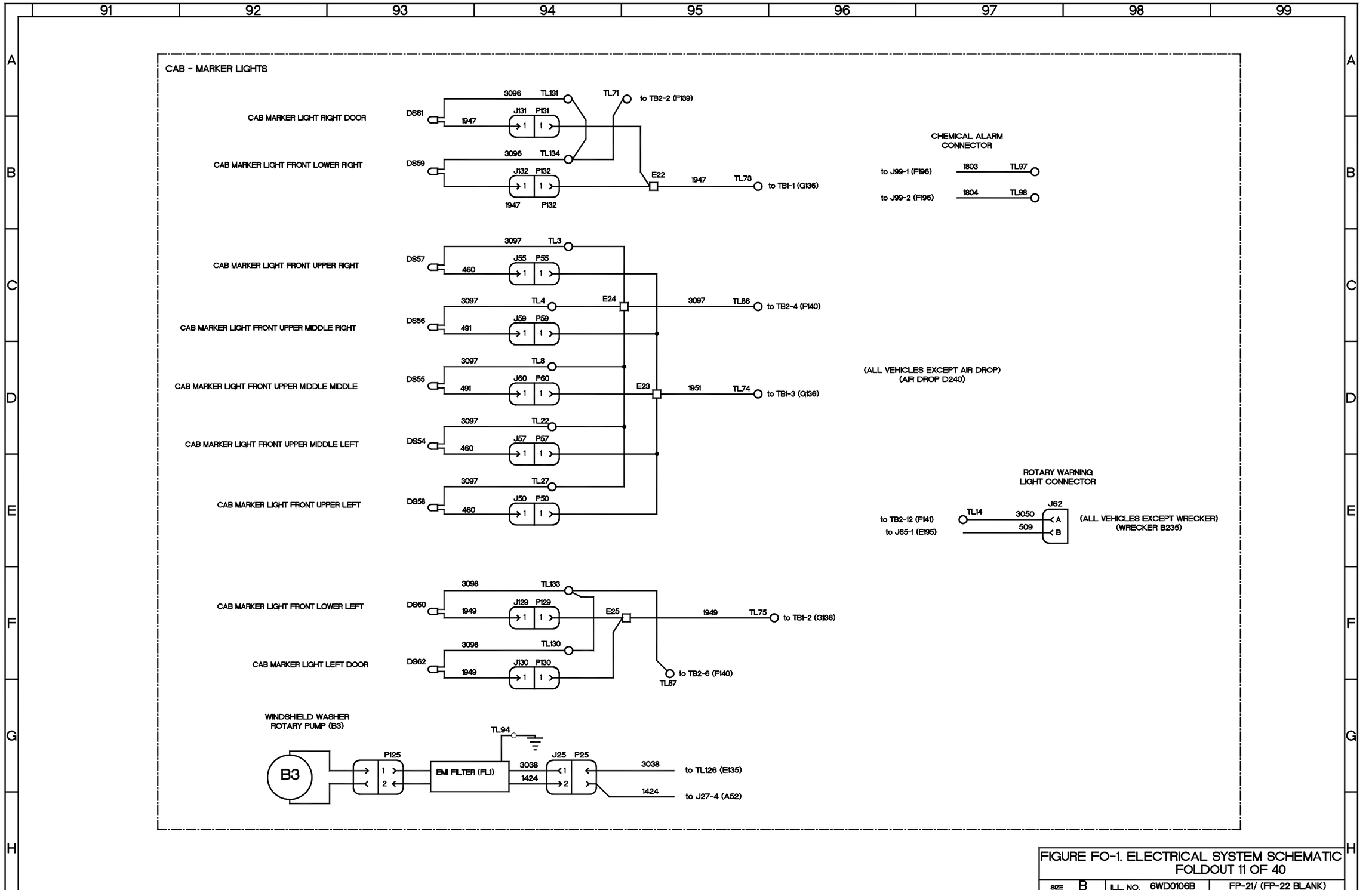


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 11 OF 40

SIZE	ILL. NO.	
B	6WD0106B	FP-21/ (FP-22 BLANK)

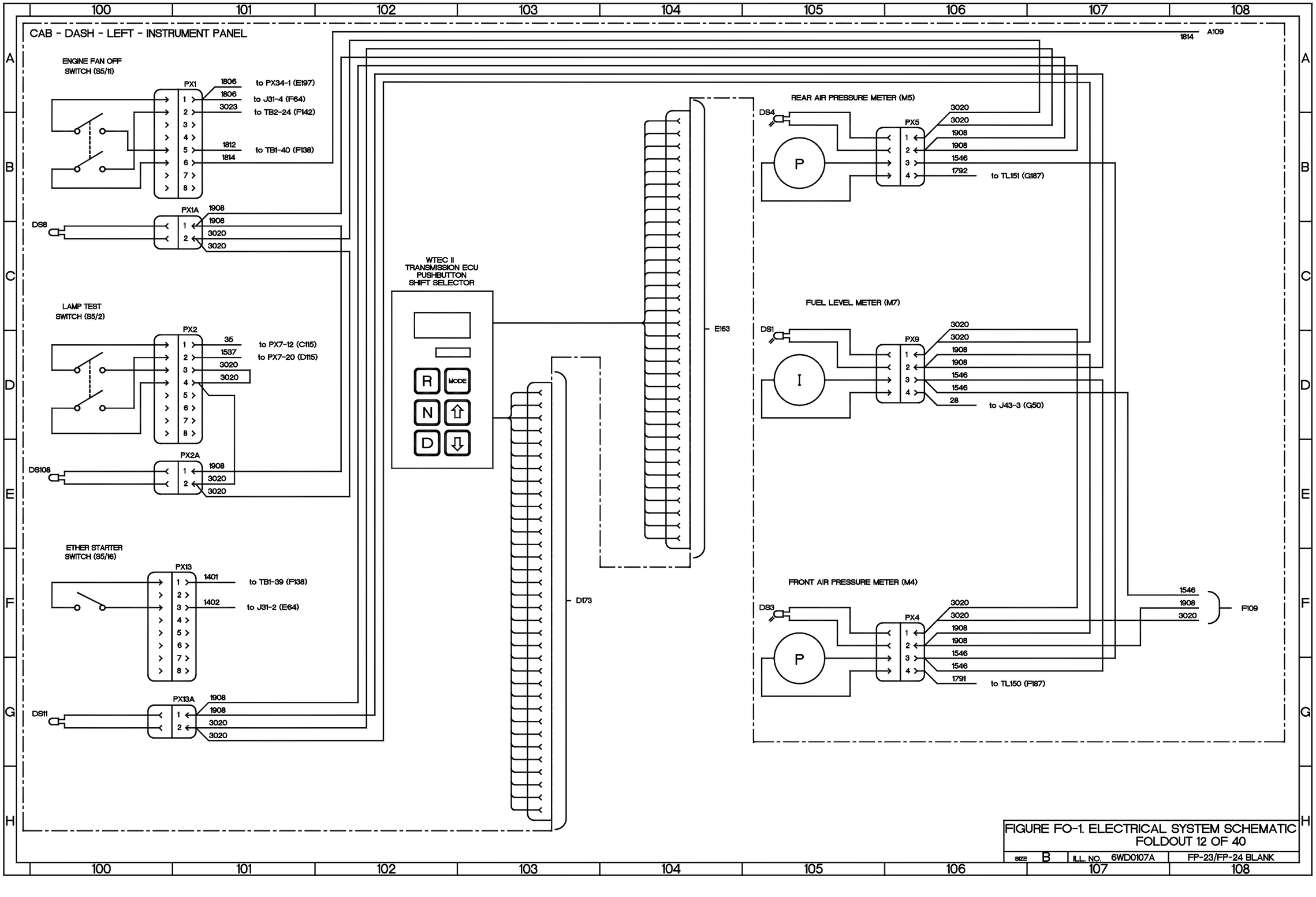


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 12 OF 40

SIZE	ILL. NO.	
B	6WD0107A	FP-23/FP-24 BLANK

CAB - DASH - LEFT - INSTRUMENT PANEL

A108 1814

LIGHTED INDICATOR DISPLAY (A18)

CHEM DETECT DS32
RIGHT TURN SIGNAL DS15
LEFT TURN SIGNAL DS14
DUMP BODY UP DS9
CTIS OVRSPD DS34
PTO ON DS23
EMER BRAKE DS21
WATER TEMPERATURE DS25
REAR BRAKE AIR DS27
TRANS OIL TEMP DS41
ENGINE OIL LEVEL DS29
PARK BRAKE DS22
OIL PRESSURE DS24
HIGH BEAM DS16
FRONT AIR BRAKE DS28
RADIATOR FAN OFF DS19
MASTER STOP DS30

PX7
1 1523 to J31-19 (G64)
2 1803 to J43-6 (H51)
3
4 1580 to TB1-41 (E138)
5
6 1570 to TB1-47 (F138)
7 3021 to TB2-25 (G142)
8 2034 to P912-9 (C133)
9 1528 to J111-D (F131)
10 2021 to J913-13 (C130)
11 1616 to J27-16 (C52)
12 35
13 1525 to TL157 (H187)
14
15
16 1532
17 3030 to TB2-33 (F143)
18
19 1536
20 1537
21
22 1616 to J27-16 (C52)
23 34A to D3B-4 (A147)
24 1681 to K8-87 (F160)
25 1530 to TL156 (F187)
26 1814
27 1658 to TB1-61 (B138)
28 2010 to P912-7 (B133)

ENGINE OIL PRESSURE METER (M3)
DS5
OP
PX6
1 3020
2 3020
3 1908
4 1908
1546
1546
36 to J31-11 (F64)
B118

E88 35 to PX2-1 (D101)
35 to J31-22 (H64)

E89 1537 to PX2-2 (D101)
1537 to J118-1 (D171) (WTEC II)
105 to P115-19 (D344) (WTEC III)

VOLTMETER (M2)
DS7
V
PX10
1 3020
2 3020
3 1908
4 1908
1546
1546 to J913-9 (C130)
3004 to TB2-9 (G140)
D118
E118

F108 1546
1908
3020

3020 F118
1908

SPEEDOMETER (M8)
DS6
KM
PX8
1 3020
2 3020
3 1908
4 1908
1546
1546
1793 to PX33-H2 (E190) (WTEC II)
1793 to J111-B (F131) (WTEC II)
157 to P116-30 (F345) (WTEC III)
157 to J111-B (F131) (WTEC III)

32 TL178 to J31-17 (G64)
1536 TL160
1532 TL161
AUDIBLE ALARM (LS2)

WATER TEMPERATURE METER (M6)
DS2
t°
PX11
1 3020
2 3020
3 1908
4 1908
1546
1546
33 to J31-20 (G64)
G118

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 13 OF 40

SIZE B | ILL. NO. 6WD0108B | FP-25/ (FP-26 BLANK)

CAB - DASH - LEFT - INSTRUMENT PANEL

IGNITION SWITCH (S5/1)

PX17

B117: 3020, 3020, 1908, 1908, 1546, 1546

1548 to K2-86 (A152)

1586 to CB70/4 (E155)

PX17A

DS13: 1908, 1908, 3020, 3020

STARTER PUSHBUTTON (S6)

TL163 — TL162 — 1405 to K24-87 (A161); 3007 to TB2-11 (G140)

ROTATING WARNING LIGHT SWITCH (S5/2)

PX12

1559 to K13-86 (A158)

1575, 1575 to K20-86 (G147)

PX12A

DS10: 1908, 1908, 3020, 3020

MAIN LIGHT SWITCH (S4)

PX15

D117: 3020, 3020, 1908, 1908

E117: 1546

1542

22 to D1A-2 (C147)

19 to CB54/3 (D151)

1572 to CB66/1 (D152)

1586 to CB70/4 (D155)

1575

1577 to CB74/5 (D159)

1404 to K6-87 (F152)

491 to CB65/7 (D150)

16 to P18-3 (B187)

23 to K27-86 (G152)

F117: 3020, 1908

FULL HAZARD WARNING SWITCH (S5/22)

PX14

G117: 3020, 3020, 1908, 1908, 1546

1565 to K9-87 (B151)

1566 to J19-5 (D186)

1566 to K10-87A (F159)

1567 to PX20-B (C197)

1568 to J19-12 (E186)

1568 to PX20-A (C197)

1514 to CB74/6 (E159)

PX14A

DS12: 1908, 1908, 3020, 3020

1908 to J913-11 (C130)

3020 to J913-10 (C130)

INSTRUMENT PANEL LIGHTS DIMMER MODULE (A3)

PX24

1908, 1908, 1542

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 14 OF 40

SIZE B | ILL. NO. 6WD0109A | FP-27/FP-28 BLANK

CAB - DASH - CENTER - HEATER / CTIS ECU

PERSONNEL HEATER

FAN MOTOR
B4
FL3
3 HIGH
2 MED
1 LOW
OFF

PX25
1 1601 to CB23/7 (C166)
2 1908
3 3003
4 3003 to TB2-8 (F149)

HEATER CONTROL PANEL ILLUMINATION
DS17
DS101

J913 P913
1 1673 to K12-86 (A148)
2 1674 to CB72/2 (D148)
3 1672 to D2B-3 (D147)
4 1670 to CB45/4 (C148)
5 1925 to CB49/3 (C161)
6 1954 to J118-9 (E171)
7 161 (WTEC II) to PX33-A3 (C190)
8 153 (WTEC II) to P115-12 (C344)
9 1546 to PX10-3 (E116)
10 3020 to TB2-31 (G143)
11 1908 to PX14A-2 (H121)
12 1550 to PX26-1 (B188)
13 2021 to PX7-10 (B114)
14 2019 (WTEC III) to K37-87 (B348)
15 1904 (WTEC III) to K37-30 (A348)
G244

161 (WTEC II) to J118-13 (E171)
161/1952 (WTEC III) to P115-31 (D344)
153 (WTEC II) to J118-8 (D171)
1908 to PX14A-1 (H121)
2021 to PX7-10 (B114)
2019 (WTEC III) to K37-87 (B348)
2019 (WTEC II) to PX33-E2 (D190)
1904 (WTEC II) to PX33-E3 (D190)
1904 (WTEC III) to K37-30 (A348)

P912 J912
1 1 2006 to CB50/2 (C154)
2 2 2069 to CB48/8 (C150)
3 3
4 4 2004 to K12-87 (B148)
5 5 1328 to CB63/1 (D160)
6 6
7 7 2010 to PX7-28 (D114)
8 8 2033 to CB53/6 (E149)
9 9 2034 to PX7-8 (B114)
10 10 2040 to TB1-20 (D136)
11 11 2041 to TB1-50 (D138)
12 12 1650 to X1 (C145)
13 13 1653 to X1 (C145)
14 14 2037 to K19-87 (B159)
15 15 1811 to K15-87A (A149)
E244

2006
2006
2069
2069
2012
2004
1328
2010
2033
2033
2034
2040
2041
1650
1653
2037
1811

PARKING BRAKE SWITCH

C51 TL202 1616 S24 3024 TL201 TL126
3038 to P25-1 (Q95)

CTIS
ELECTRONIC
CONTROL UNIT (A2)

P110
H 01
F 02
Z 01 01 (ALL VEHICLES EXCEPT M1089 AND M1088)
M
U 03
S 04
E 05
T 06
P 07
b 08
c 09
j 10
R 11
B 12
C 13

P111 J111
01 E 1911 to CB40/7 (C159)
02 A 3031 to TB2-35 (G144)
03 B 1793 to PX8-4 (G112) (WTEC II)
04 G 157 to PX8-4 (G112) (WTEC III)
05 D 1911 to K52-87A (G148)
06 F 1528 to PX7-9 (B114)
1790 to J43-2 (G51)

P113
B
C
A

P112
D
F
E
A
B
G195

TL50
CHASSIS GROUND

P912A
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
M1088 W/O PTO (F265)
M1083/M1085/M1092/M1093/M1096 W/O PTO (F264)
to K15-87A (A150) 1811A

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 15 OF 40

SIZE B ILL. NO. 6WD0110B FP-29/ (FP-30 BLANK)

CAB - DASH - RIGHT - POWER DISTRIBUTION PANEL

PX21

to P18-9 (B187) 1599
to CB37/1 (C161) 1569
to J2-4 (B194) 1916
to TB2-37 (G144) 3034
to P18-8 (B187) 1424
to J27-4 (A52) 1424
to P18-7 (B187) 1597

WIPER DELAY MODULE (A5)

22C J51-13 (E51)
1940 K10-87 (F159)
1940 K10-86 (F159)
22 D1A-1 (C147)
22C J27-15 (C52)
1912 CB67-4 (D148)
21A J27-12 (B52)
489G J27-2 (A52)
489F J27-8 (B52)
2040 P912-10 (C133)
489 J51-7 (D51)
1426 J7-1 (A197)
1955 K28-86 (H151)
1951 TL74 (D95)
1947 TL73 (B95)
1949 TL75 (F95)

1930 K11-86 (F155)
1929 CB77/5 (C161)
1658 K11-30 (F155)
1546 J913-9 (C131)
1658 PX7-27 (D114)
1690 CB79/5 (C159) (WTEC II)
1462 K19-30 (A159)
1460 PX33-C1 (C190) (WTEC III)
146 K25-86 (B246) (WTEC III)
1463 TL159 (E145)
146 J117-C (C343) (WTEC III)
1572 CB66/2 (E152)
1408 K29-86 (F151)
24 J51-17 (F51)
1329 K52-86 (H148)
20 J27-3 (A52)
2041 P912-11 (C133)
461 J27-14 (B52)
1570 PX7-6 (B114)
1581 J19-1 (C186)
1524 J19-4 (D187)
1580 PX7-4 (B114)
460 J27-11 (B52)
1401 PX13-1 (F101)
1812 PX1-5 (B101)
1935 CB22/3 (C158)
1807 J31-3 (F64)
1481 J43-9 (H51)
1692 CB21/1 (C158)
1692 PX26-3 (B188)
(WTEC II) 1692 PX33-E1 (D190)
(WTEC III) 1692 K34-30 (B347)
1692 PX33-F1 (D190) (WTEC II)
1692 K26-30 (B344) (WTEC III)

TB1

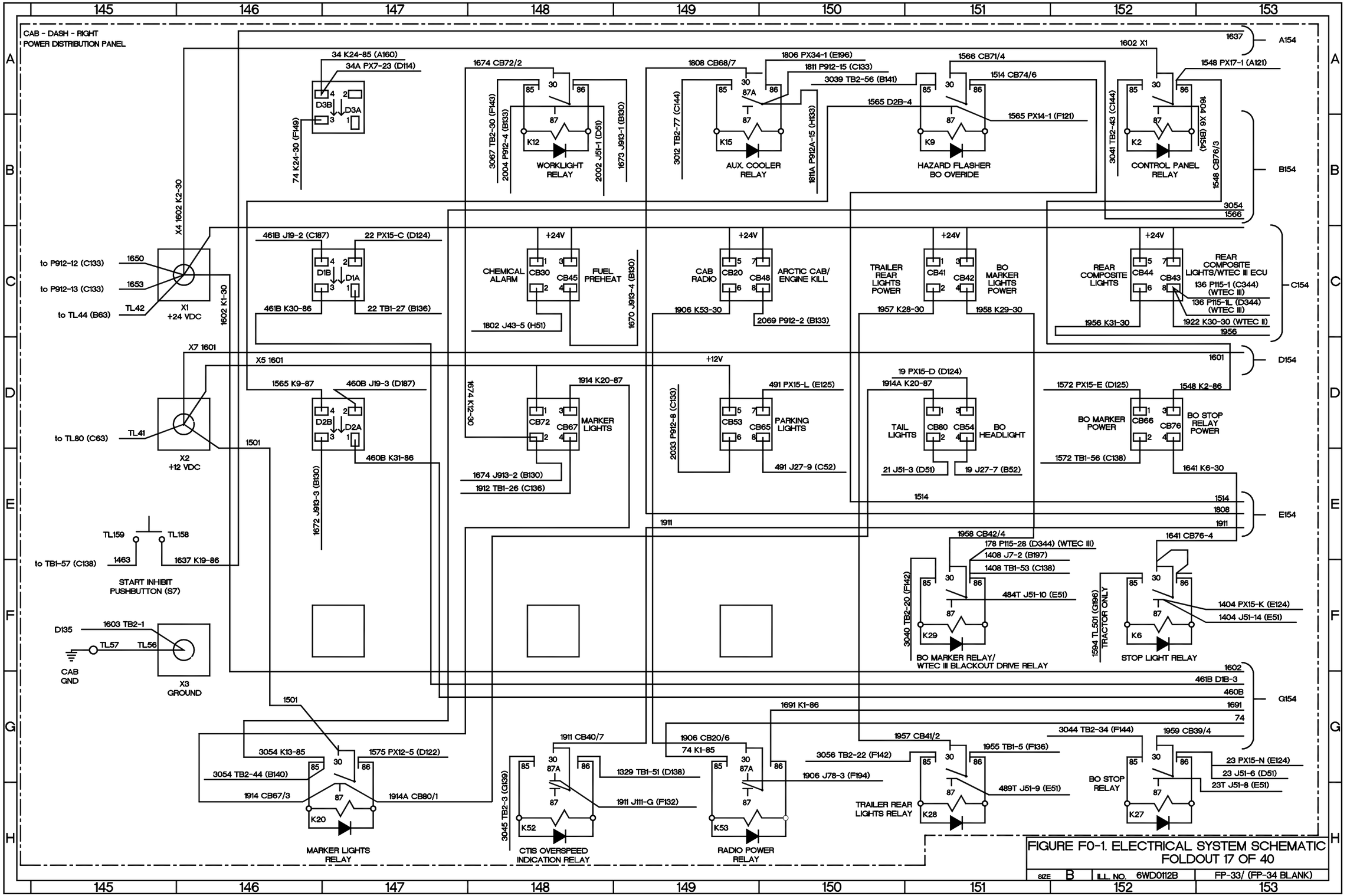
3101 K37-85 (B348) (WTEC III)
3054 K20-85 (H147)
3036 K32-85 (A156)
3047 K30-85 (H156)
3039 K9-85 (A151)
3099 J7-3 (B197)
3046 K10-85 (F160)
3016 K19-85 (A159)
3053 K8-85 (F161)
3002 K7-85 (F162)
3041 K2-85 (A152)
3042 TL502 (G196)
3043 TL153 (C189)
3048 K31-85 (G158)
3049 PX20-C (C198)
3012 K15-85 (A150)
3011 PX34-2 (E198)

1603 TB2-1 — F145

1603 X3
TB2
3096 TL71 (A94)
3097 TL86 (C95)
3098 TL87 (F95)
3003 PX25-3 (C129)
3006 J31-7 (F64)
3050 TL14 (E97)
3008 PX50-1 (D197)
3101 PX33-K1 (F190) (WTEC II)
143 P115-32 (D344) (WTEC III)
3015 J31-5 (F64)
3040 K29-85 (F151)
3056 K28-85 (G151)
3023 PX1-2 (B101)
3083 PX26-6 (B188)
3026 J31-10 (F64)
3067 K12-85 (A148)
3029 J43-4 (H52)
3044 K27-85 (A152)
3028 J31-9 (F64)
3045 K52-85 (H148)
3004 PX10-4 (E117)
3007 TL163 (B124)
(WTEC II) 188 PX33-V (H346)
(WTEC II) 188 PX33-7 (H346)
(WTEC II) 3102 PX33-K2 (F190)
(WTEC III) 3102 K26-85 (B344)
3018 J78-2 (F194)
3019 J78-4 (F194)
3021 PX7-7 (B114)
(WTEC III) 143 P115-17 (D344)
(WTEC III) 143 J117-E (C343)
2120 J913-10 (C130)
3030 PX7-17 (C114)
3031 J111-A (F131)
3034 PX21-4 (A142)
3037 J2-3 (A194)

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 16 OF 40

SIZE	ILL. NO.	
B	6WD0111B	FP-31/ (FP-32 BLANK)


CAB - DASH - RIGHT
POWER DISTRIBUTION PANEL
34 K24-85 (A160)
34A PX7-23 (D114)
74 K24-30 (F149)
1674 CB72/2
3067 TB2-30 (F143)
2004 P912-4 (B133)
WORKLIGHT RELAY
2002 J51-1 (D51)
1673 J913-1 (B130)
1808 CB68/7
1806 PX34-1 (E196)
1811 P912-15 (C133)
3039 TB2-56 (B141)
3012 TB2-77 (C144)
AUX. COOLER RELAY
181IA P912A-15 (H133)
1566 CB71/4
1514 CB74/6
1565 D2B-4
1565 PX14-1 (F121)
HAZARD FLASHER BO OVERIDE
1602 X1
1637
A154
1548 PX17-1 (A121)
3041 TB2-43 (C144)
CONTROL PANEL RELAY
1604 X6 (B154)
1548 CB76/3
B154
3054
1566
X4 1602 K2-30
to P912-12 (C133)
1650
to P912-13 (C133)
1653
to TL44 (B63)
TL42
X1
+24 VDC
1602 K1-30
461B J19-2 (C187)
22 PX15-C (D124)
461B K30-86
22 TB1-27 (B136)
+24V
CHEMICAL ALARM
CB30
CB45
FUEL PREHEAT
1802 J43-5 (H51)
1670 J913-4 (B130)
CAB RADIO
CB20
CB48
ARCTIC CAB/ ENGINE KILL
1906 K53-30
2069 P912-2 (B133)
TRAILER REAR LIGHTS POWER
CB41
CB42
BO MARKER LIGHTS POWER
1957 K28-30
1958 K29-30
REAR COMPOSITE LIGHTS
CB44
CB43
REAR COMPOSITE LIGHTS/WTEC III ECU
136 P115-1 (C344) (WTEC III)
136 P115-1L (D344) (WTEC III)
1922 K30-30 (WTEC II)
1956 K31-30
1956
C154
X7 1601
X5 1601
1601
D154
to TL80 (C63)
TL41
X2
+12 VDC
1501
1565 K9-87
460B J19-3 (D187)
460B K31-86
1672 J913-3 (B130)
1674 K12-30
1914 K20-87
CB72
CB67
MARKER LIGHTS
1674 J913-2 (B130)
1912 TB1-26 (C136)
+12V
2033 P912-8 (C133)
491 PX15-L (E125)
CB53
CB65
PARKING LIGHTS
491 J27-9 (C52)
19 PX15-D (D124)
1914A K20-87
TAIL LIGHTS
CB80
CB54
BO HEADLIGHT
21 J51-3 (D51)
19 J27-7 (B52)
1572 PX15-E (D125)
1548 K2-86
BO MARKER POWER
CB66
CB76
BO STOP RELAY POWER
1572 TB1-56 (C138)
1641 K6-30
1514
1808
1911
E154
TL159
TL158
to TB1-57 (C138)
1463
1637 K19-86
START INHIBIT PUSHBUTTON (S7)
1911
1958 CB42/4
178 P115-28 (D344) (WTEC III)
1408 J7-2 (B197)
1408 TB1-53 (C138)
3040 TB2-20 (F142)
484T J51-10 (E51)
K29
BO MARKER RELAY/ WTEC III BLACKOUT DRIVE RELAY
1641 CB76-4
1404 PX15-K (E124)
1404 J51-14 (E51)
1594 TL501 (G196) TRACTOR ONLY
K6
STOP LIGHT RELAY
D135
1603 TB2-1
TL57
TL56
CAB GND
X3
GROUND
1602
461B D1B-3
460B
1691
74
G154
1501
1691 K1-86
3054 K13-85
1575 PX12-5 (D122)
3054 TB2-44 (B140)
1914 CB67/3
1914A CB80/1
K20
MARKER LIGHTS RELAY
1911 CB40/7
1906 CB20/6
74 K1-85
1329 TB1-51 (D138)
1911 J111-G (F132)
3045 TB2-3 (G139)
K52
CTIS OVERSPEED INDICATION RELAY
K53
RADIO POWER RELAY
1957 CB41/2
3056 TB2-22 (F142)
1906 J78-3 (F194)
TRAILER REAR LIGHTS RELAY
1955 TB1-5 (F136)
489T J51-9 (E51)
K28
3044 TB2-34 (F144)
1959 CB39/4
23 PX15-N (E124)
23 J51-6 (D51)
23T J51-8 (E51)
BO STOP RELAY
K27
FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 17 OF 40
SIZE B
ILL. NO. 6WD0112B
FP-33/ (FP-34 BLANK)

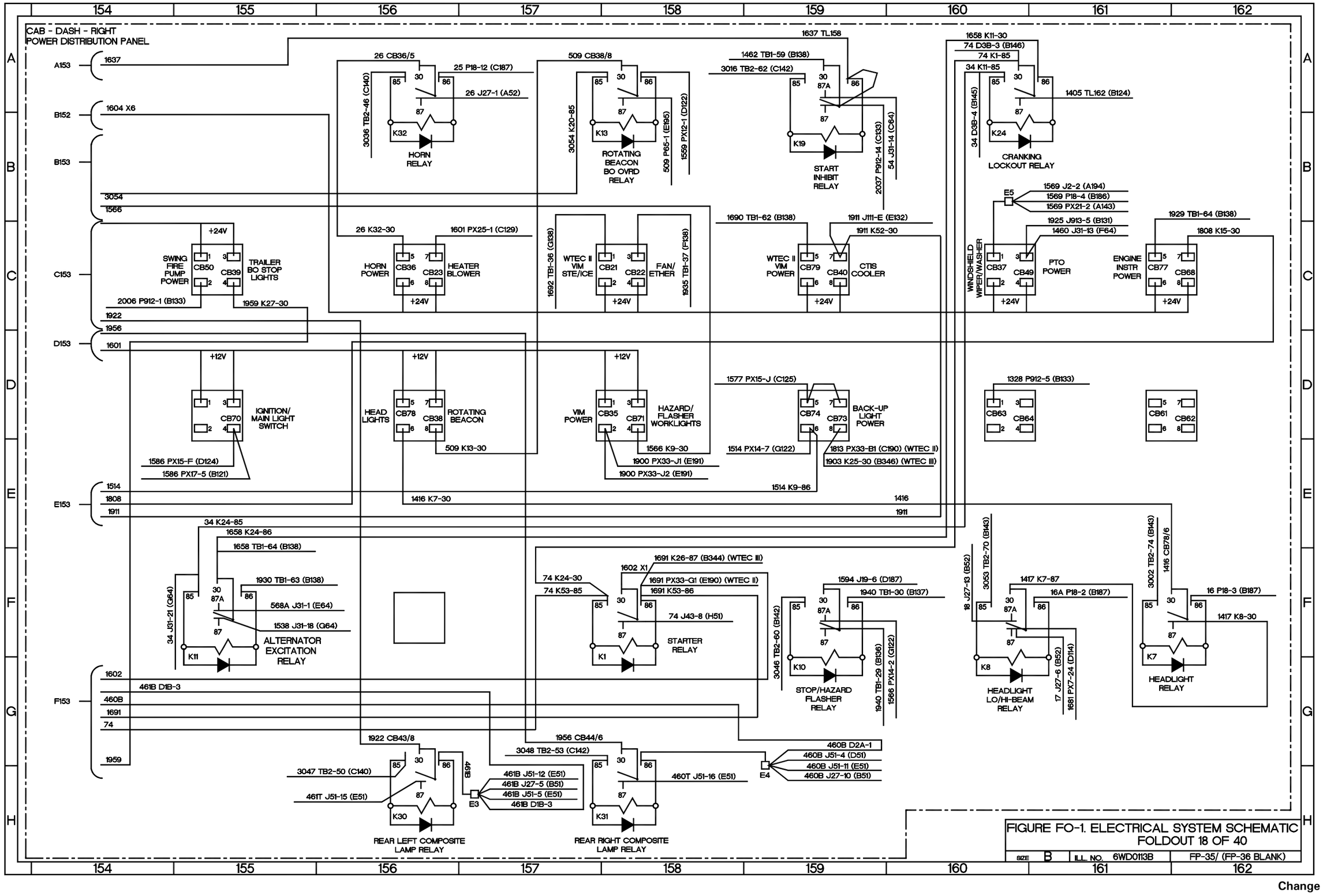


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 18 OF 40

SIZE B | ILL. NO. 6WD0113B | FP-35/ (FP-36 BLANK)

CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS

G175: 123 118 115 113 105 / 125 119 117 114 112

H177: 135A/B 156 147 149 161A/B / 162 148 150 165

G176 G176 G176 G176

G174

J115

1	135A/B
2	136A/D
3	137
4	
5	139
6	140
7	141
8	142A/B
9	143A/D
10	144
11	136C/D
12	146
13	147
14	148
15	149
16	150
17	151A/B
18	143C/D
19	153
20	154
21	155
22	156
23	157
24	158
25	
26	
27	161A/B
28	162
29	163
30	
31	165
32	
33	
34	

C104

J116

143A	A1
132	B1
	C1
123	D1
136A	E1
146	F1
143C	A2
157	B2
125	C2
112	D2
136C	E2
113	F2
115	A3
	B3
158	C3
	D3
	E3
114	F3

D194

P118 J118

105	1	1537 PX7-20 (C115)
118	2	
119	3	
	4	
137	5	
142B	6	
151B	7	
153	8	153 J913-8 (B130)
155	9	1954 J913-6 (B130)
	10	
	11	
154	12	
161B	13	161 J913-7 (B130)
163	14	163 PX33-A2 (C190)
	15	
117	16	

J117

143D	A
	B
	C
	D
	E
	F
	G
136D	H
142A	J
151A	K
	L
	M

WTEC II DIAGNOSTIC CONNECTOR

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 19 OF 40

SIZE B | ILL. NO. 6WD0114B | FP-37/ (FP-38 BLANK)

CAB-DASH-LEFT-WTECII TRANSMISSION HARNESS

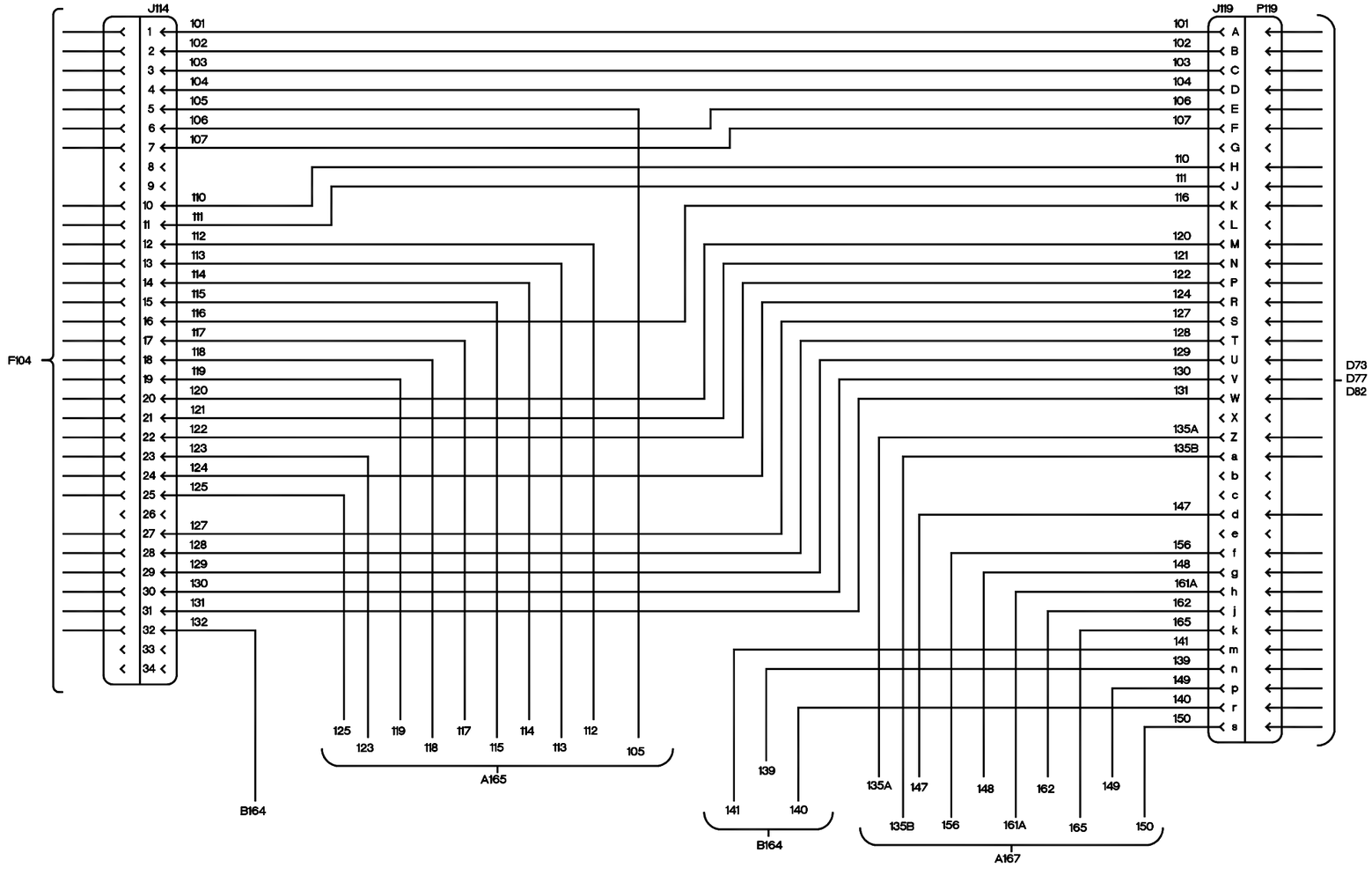


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 20 OF 40

SIZE	ILL. NO.	
B	6WD0115B	FP-39/ (FP-40 BLANK)

CAB - DASH - LEFT - UNDERDASH

JUNCTION BOX (BJ1)

P83

STE / ICE RECEPTACLE

f 1610 — 1610
AB 1437 — 1430
AD 1431
z 1446
x 1427
p 1423
m 1438
AA 1436
g 1612 — 1437
k 1439 — 1431
n 1421 — 1446
w 1425 — 1427
y 1447 — 1423
AC 1429 — 1438
R 1441
N 1452 — 1436
P 3A — 1612
d 1432 — 1434
c 1433
v 1435 — 1439
u 1428 — 1421
O 1453 — 1425
E 1471 — 1447
V 1472 — 1429
Y 1474
T 1480
S 1479
M 1478
F 1475
X 1476
W 1477
h — R2
j
s — R6
U 1482
Z 1482 — E71
a 1482
b 1482

R5
R4

BLUE
BROWN
GREEN
RED
YELLOW
BLACK
WHITE

J31X
1441 1
1452 2
3A 3
1432 4
1433 5
1430 6
1435 7
1434 8
1428 9
1453 10
D64

J43X
1471 1
1472 2
1474 3
1480 4
1479 5
1478 6
1475 7
1476 8
1477 9
F50

COLUMN SWITCH (S3)

P18
1 16A — to K8-86 (F160)
2 16 — to K7-86 (F162)
3 16 — to PX15-M (E125)
4 1569 — to CB37/1 (B161)
5 1527 — to J2-5 (B195)
6 1590 — to J2-1 (A195)
7 1597 — to PX21-6 (B142)
8 1424 — to PX21-5 (B142)
9 1599 — to PX21-1 (A142)
10
11
12 25 — to K32-86 (B156)

HORN PUSHBUTTON SWITCH

COLUMN SWITCH (S3)

J19
1 1581 — to TB1-46 (E138)
2 461B — to D1B-4 (C146)
3 460B — to D2A-2 (D147)
4 1524 — to TB1-43 (E137)
5 1566 — to PX14-2 (G122)
6 1594 — to K10-30 (F159)
7
8
9
10
11
12 1568 — to PX14-6 (G122)

FREQUENCY DIVIDER (A7)

PX26
INPUT (+) 1 1550 — to J913-12 (C130)
OUTPUT (+) 2 1444 — to J31-8 (F64)
+24V POWER 3 1433 — to J31-26 (H64)
INPUT (-) 4 1692 — to TB1-36 (G138)
OUTPUT (-) 5 3083 — to J31-16 (G64)
GROUND 6 1432 — to J31-25 (G64)
3083 — to TB2-26 (F142)

STOP LIGHT SWITCH (S10A)

TL152 — TL153 3043 — 3043 — to TB2/47 (C140)
1594 — 1594 — to TL501 (G197) (TRACTOR ONLY)

STOP LIGHT SWITCH (S10B)

TL154 — TL155 3043
1594

FRONT AIR PRESSURE TRANSMITTER

SENSOR (MT4) / SWITCH (S20)

TL150 1791 — to PX4-4 (G106)
P
TL156 1530 — to PX7-25 (D114)

REAR AIR PRESSURE TRANSMITTER

SENSOR (MT5) / SWITCH (S29)

TL151 1792 — to PX5-4 (B106)
P
TL157 1525 — to PX7-13 (C114)

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 21 OF 40

SIZE B | ILL. NO. 6WD0116B | FP-41/ (FP-42 BLANK)

CAB - DASH - RIGHT - UNDERDASH

WINDSHIELD WIPER MOTOR (B2)

B2

PX22

EMI FILTER (FL2)

P2 J2

1590 to P18-6 (B187)
1569 to CB37/1 (B160)
3037 to TB2-39 (G144)
1916 to PX21-3 (A142)
1527 to P18-5 (B187)

TRANSMISSION DIMMER MODULE

J7

1426 to TB1-9 (F139)
1408 to K29-86 (F150)
3099 to TB2-58 (B144)
158

WTEC II VEHICLE INTERFACE MODULE (A10)

PX33

to J51-2 (D51)
to J118-14 (E171)
to J913-7 (B130)
to CB73/8 (E159)
to TB1-60 (B138)
to TB1-33 (G137)
to J913-14 (D130)
to J913-15 (D130)
to TB1-34 (G138)
to K1-86 (F158)
to PX8-4 (G112)
to CB35/2 (E158)
to CB35/2 (E158)
to TB2-16 (F141)
to TB2-17 (G141)

REV
PTO ENABLE OUTPUT RELAY SF02
DIFFERENTIAL LOCK RELAY SF04
REVERSE WARNING RELAY RW
INDICATOR OUTPUT RELAY SF01
10A
SF01
SF4
SF02
NS
FL
10A
NEUTRAL START RELAY NS
NOT USED SF3
S02
S03

P116

D168

TURN SIGNAL FLASHER (A1)

OUTPUT
INPUT
GROUND

PX20

1568 to PX14-6 (G122)
1567 to PX14-5 (G122)
3049 to TB2-55 (C141)

INTER-AXLE DIFFERENTIAL SOLENOID (L6)

PX50

to TB2-14 (F141)
(WTEC III) 1692 K34-97A (B347)

ROTARY WARNING LIGHTS CONNECTION

P65 J65

to K13-87 (B158)
509 to J62-B (E97)

FAN SOLENOID (L1)

to K15-86 (A149)
to PX1-1 (A101)
to TB2-79 (C144)

PX34

CHEMICAL ALARM CONNECTION

P99 J99

to J43-6 (H51)
to J43-7 (H51)
1803 to TL88 (B97)
1804 to TL98 (B97)

CAB RADIO CONNECTION

J78

to TB2-21 (G142)
to K53-87A (H150)
to TB2-23 (G142)
3018
1906
3019

J113

G132

CTIS PRESSURE TRANSDUCER

CTIS PNEUMATIC CONTROLLER

C180
to K6-85 (F152)
1594
1594
TL501
TL502
3042 to TB2-45 (D140)

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 22 OF 40

SIZE B | ILL. NO. 6WD0117B | FP-43/ (FP-44 BLANK)

WRECKER REAR LIGHTS

LH INTERMEDIATE MAKER — P94 1 — 489 — TL88 — 3089

LH WORK LIGHTS — P133 A 3063, B 2002; P133A 1 3064, 2 2002 — E54

E341 — P107 a 3088, b 3087, d 2037, e 2033, f 2069, g 2006, z 2033 — TL54

CAB-DASH-RIGHT-POWER DISTRIBUTION PANEL

D52 — P51 1 2002, 2 490, 3 21, 4 460B, 5 461B, 6 23, 7 489, 8 23T, 9 489T, 10 484T, 11 460B, 12 461B, 13 22C, 14 1404, 15 461T, 16 460T, 17 24 — E53

B258 — P108 9 2033, 13 2037, 14 2033, 15 2069, 16 2006

RH WORK LIGHTS — P134A 1 3062, 2 2002 — E55; P134 A 3061, B 2002

RH INTERMEDIATE MARKER — P95 1 489 — TL89 3089 — T90 3089

TL93 3094; TL92 3094 3094

E49 — E57 — E48 — E47 — E46 — E59 — E52

E58 — P53R 1 3094, 2 489T, 3 3094, 4 1404, 5 460T, 6 23T, 7 484T, 8 461T, 9 484T, 10 484T — F236

P52R 1 21, 2, 3 489, 4 3045, 5 461B, 6 22C, 7 460B — B239

E51 — P85 489 — DS65 LH SIDE MARKER LIGHT — TL15 3094

P86 489 — DS66 LH REAR MARKER LIGHT — TL16 3094

P74 461B — DS37 LH TURN AND STOPLIGHT

P78 21 — DS72 LH TAILLIGHT

P76 24 — DS51 BLACKOUT MARKER LH REAR

P77 23 — DS35 BLACKOUT STOP LH REAR

LH REAR COMPOSITE LIGHT

3094 3094 TL86 — TL18 — DS45

P87 490 — BACKUP LIGHT — TL17 3094

E50 — P54 489 — DS69 LEFT REAR MARKER — TL30 3094

P56 489 — DS70 MIDDLE REAR MARKER — TL31 3094

P58 489 — DS71 RIGHT REAR MARKER — TL32 3094

P61 460B — DS38 RH TURN AND STOPLIGHT

P64 21 — DS73 RH TAILLIGHT

P62 24 — DS52 BLACKOUT MARKER RH REAR

P63 23 — DS36 BLACKOUT STOP RH REAR

RH REAR COMPOSITE LIGHT

3095 3095 TL21

P89 489 3095 — DS68 RH REAR MARKER LIGHT — TL20 3095

P88 489 — DS67 RH SIDE MARKER LIGHT — TL19 3095

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 23 OF 40

SIZE B | ILL. NO. 6WD0118B | FP-45/ (FP-46 BLANK)

REAR LIGHTS TRACTOR

LH WORKLIGHTS — P133A (1, 2) / P133 (A, B)
RH WORKLIGHTS — P134A (1, 2) / P134 (A, B)
E33, E34, TL109

D52 — P51
1 2002
2 490
3 21
4 460B
5 461B
6 23
7 489
8 23T
9 489T
10 484T
11 460B
12 461B
13 22C
14 1404
15 461T
16 460T
17 24

F236 — P53M
1 3033
2 489T
3 3089
4 1404
5 460T
6 23T
7 484T
8 461T
9 484T
10 484T
TL93M

B239 — P52M
1 21
2
3 489
4 3045
5 461B
6 22C
7 460B

E29, E35, E36, E38, E39, E40, E41, E42, E43, E45, E56, E37, E26, E32, E31, E30, E27, E28

F236 — P53R
3094 1
489T 2
3094 3
1404 4
460T 5
23T 6
484T 7
461T 8
484T 9
484T 10

B239 — P52R
21 1
2
489 3
3045 4
461B 5
22C 6
460B 7
E44

LH REAR COMPOSITE LIGHT
- P86 1 — DS66 LH REAR MARKER LIGHT
- P74 461B 1 — DS37 LH TURN AND STOPLIGHT
- P78 21 1 — DS72 LH TAILLIGHT
- P76 24 1 — DS51 LH BLACKOUT MARKER LIGHT
- P77 23 1 — DS35 LH BLACKOUT STOPLIGHT
- P87 490 1 — DS45 BACKUP LIGHT

TL17, TL20, TL92, 3095

RH REAR MARKER LIGHT
- P89 489 1 — DS68

TL21

RH REAR COMPOSITE LIGHT
- P63 23 1 — DS36 RH BLACKOUT STOPLIGHT
- P62 24 1 — DS52 RH BLACKOUT MARKER LIGHT
- P64 21 1 — DS73 RH TAILLIGHT
- P61 460B 1 — DS38 RH TURN AND STOPLIGHT
- P58 489 1 — DS71 RIGHT REAR MARKER
- P56 489 1 — DS70 REAR MIDDLE MARKER
- P54 489 1 — DS69 LEFT REAR MARKER

3094 TL30, TL31, TL32
TL93, TL16, TL18

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 24 OF 40

SIZE B | ILL. NO. 6WD0119B | FP-47/ (FP-48 BLANK)

LONG WHEEL BASE REAR LIGHTS

LH INTERMEDIATE MAKER — P94 — 1 — 489 — TL88 3089

RH INTERMEDIATE MARKER — P95 — 1 — 489 — TL89 3090 — TL90 3089

D52 — P51: 1 490, 2 21, 3 460B, 4 461B, 5 23, 6 489, 7 23T, 8 489T, 9 484T, 10 460B, 11 461B, 12 22C, 13 1404, 14 461T, 15 460T, 16 24, 17

E64, E14, E20, E19, E18, E72, E17, E21, E16, E15

P53R — F236: 3094, 489T, 3094, 1404, 460T, 23T, 484T, 461T, 484T, 484T

P52R — B239: 21, 489, 3045, 461B, 22C, 460B

LH COMPOSITE LIGHT
- P85 — 489 — DS65 LH SIDE MARKER LIGHT — TL15
- P86 — 489 — DS66 LH REAR MARKER LIGHT — 3094 — TL16
- 3094 — P74 — 461B — DS37 LH TURN AND STOPLIGHT
- P78 — 21 — DS72 LH TAILLIGHT
- P76 — 24 — DS51 LH BLACKOUT MARKER LIGHT
- P77 — 23 — DS35 LH BLACKOUT STOPLIGHT — TL86 — TL18

P87 — 490 — DS45 BACKUP LIGHT — 3094 — TL17

P54 — 489 — DS69 LEFT REAR MARKER — 3094 — TL30

P56 — 489 — DS70 MIDDLE REAR MARKER — 3094 — TL31

P58 — 489 — DS71 RIGHT REAR MARKER — 3094 — TL32

RH COMPOSITE LIGHT
- P61 — 460B — DS38 RH TURN AND STOPLIGHT
- P64 — 21 — DS73 RH TAILLIGHT
- P62 — DS52 RH BLACKOUT MARKER LIGHT
- P63 — DS36 RH BLACKOUT STOPLIGHT — 3095 — TL21

P89 — 3050 — DS68 RH REAR MARKER LIGHT — 3095 — TL20

TL92

P88 — 489 — DS67 RH SIDE MARKER LIGHT — 3095 — TL19

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 25 OF 40

SIZE B | ILL. NO. 6WD0120B | FP-49/ (FP-50 BLANK)

REAR LIGHTS ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE

CAB-DASH-RIGHT-POWER DISTRIBUTION PANEL

D52 — P51

1	490
2	21
3	460B
4	461B
5	23
6	489
7	23T
8	489T
9	484T
10	460B
11	461B
12	22C
13	1404
14	461T
15	460T
16	24
17	

E21 — P53R — F236

3094	1
489T	2
3094	3
1404	4
460T	5
23T	6
484T	7
461T	8
484T	9
484T	10

E14 — E20 — P52R — B239

21	1
489	2
3045	3
461B	4
22C	5
460B	6
3045	7
3095	TL92

E19

E18

TL93

E16

E15

E17

LH COMPOSITE LIGHT

P85	489	DS65 LH SIDE MARKER LIGHT
	3094	TL15
P86	489	DS66 LH REAR MARKER LIGHT
	3094	TL16
P74	461B	DS37 LH TURN AND STOPLIGHT
P78	21	DS72 LH TAILLIGHT
P76	24	DS51 LH BLACKOUT MARKER LIGHT
P77	23	DS35 LH BLACKOUT STOPLIGHT
	3094	TL18
	3094	TL86
P87	490	DS45 BACKUP LIGHT
	3094	TL17

P54	489	DS69 LEFT REAR MARKER
	3094	TL30
P56	489	DS70 MIDDLE REAR MARKER
	3094	TL31
P58	489	DS71 RIGHT REAR MARKER
	3094	TL32

RH COMPOSITE LIGHT

P61	460B	DS38 RH TURN AND STOPLIGHT
P64	21	DS73 RH TAILLIGHT
P62	24	DS52 RH BLACKOUT MARKER LIGHT
P63	23	DS36 RH BLACKOUT STOPLIGHT
	3095	TL21
	3095	
P89	489	DS68 RH REAR MARKER LIGHT
	3095	TL20
P88	489	DS67 RH SIDE MARKER LIGHT
	3095	TL19

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 26 OF 40

SIZE B | ILL. NO. 6WD0121B | FP-51/ (FP-52 BLANK)

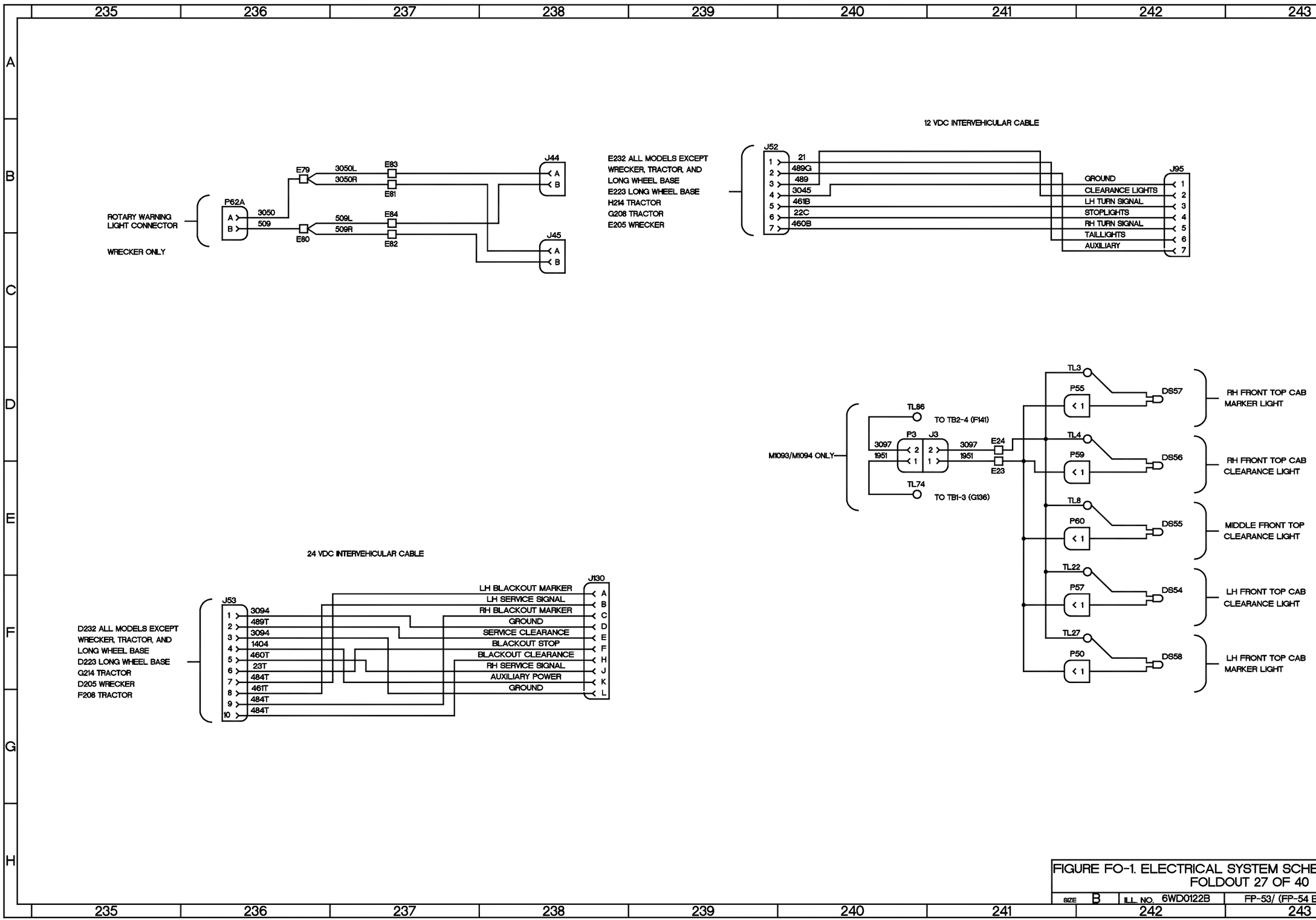


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 27 OF 40

SIZE	ILL. NO.	
B	6WD0122B	FP-53/ (FP-54 BLANK)

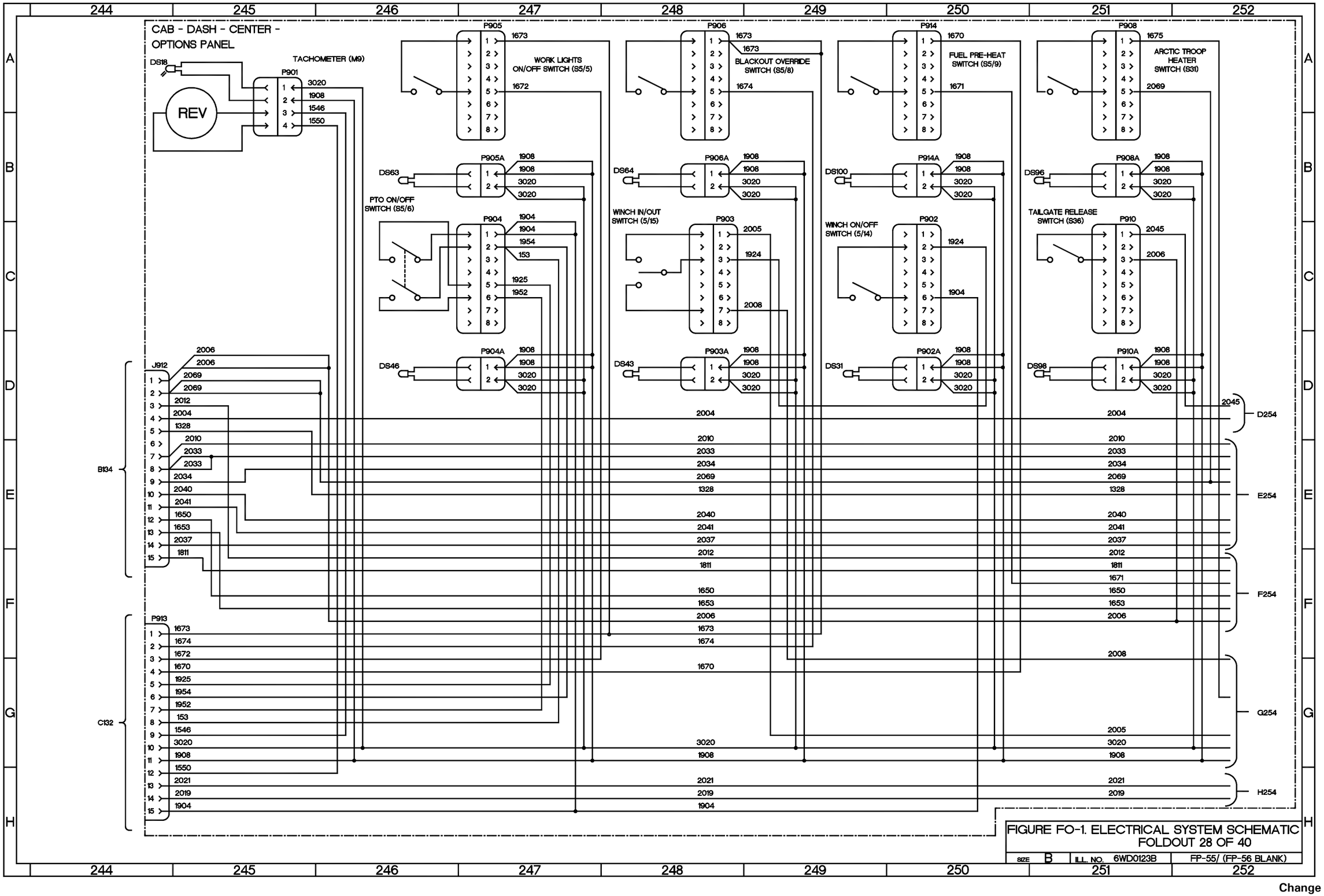


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 28 OF 40

SIZE B | ILL. NO. 6WD0123B | FP-55/ (FP-56 BLANK)

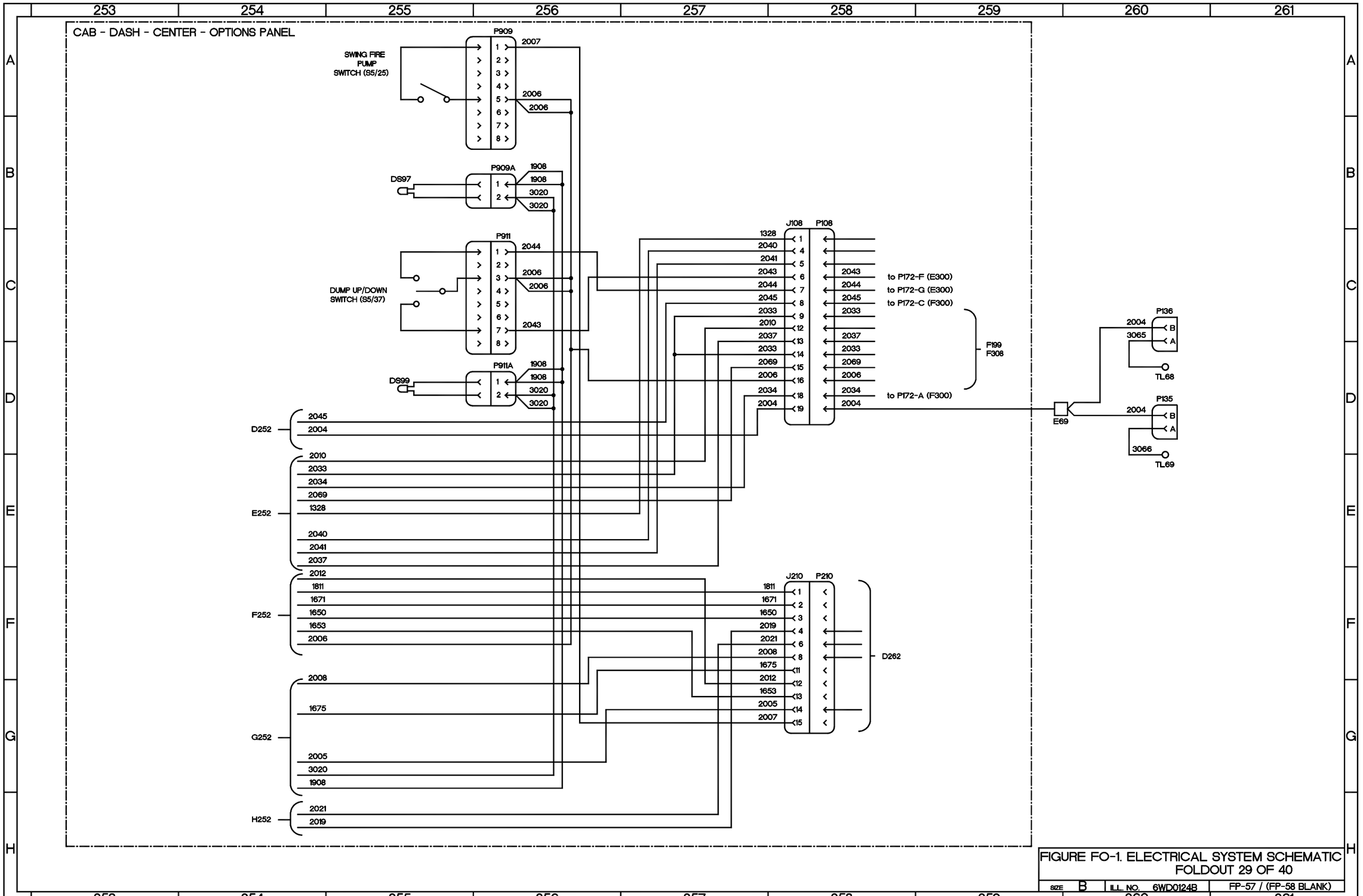


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 29 OF 40

SIZE	ILL. NO.	
B	6WD0124B	FP-57 / (FP-58 BLANK)

PTO EQUIPPED

P210 G258: 1 1811, 4 2019, 6 2021, 8 2008, 14 2005

E70

P217 E304: 3068 A, 2019 B

P216 D304: 3025 A, 2021 B

TL76

J209A F268: 1811 1, 3013 2

TL111: 3013

J209B: 1811 1, 3013 2

M1084/M1085/M1086/M1090 G264
M1083/M1088/M1089/M1090/M1093/M1094 G268

WINCH OUT SOLENOID (L5)

L5: 3070 1, 2

P215 J215: 2008 1, 2005 2 — 2008 1, 2005 2

TL320

WINCH IN SOLENOID (L4)

L4: 3069 1, 2

J912 G134: 15

J209 F268: 1811 1, 3013 2

TL101: 3013

M1083/M1085/M1093 WITHOUT PTO

P209B G268: 1 1811, 2 3013

J209 D266: 1811 1, 3013 2

M1084/M1086/M1090 M1083/M1085 WITH PTO

J912 G134: 15 1811 E70

J209B G268: 1811 1, 3013 2

E74: 3013

TL101: 3013

J209A F268: 1811 1, 3013 2

M1088 WITHOUT PTO

P209A B6: C266 1, F265 2

TRANSMISSION AUXILIARY OIL COOLER FAN

P209B B6A: D266 1, G264 2

TRANSMISSION AUXILIARY OIL COOLER FAN

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 30 OF 40

SIZE B | ILL. NO. 6WD0125B | FP-59/ (FP-60 BLANK)

271 | 272 | 273 | 274 | 275 | 276 | 277 | 278 | 279

A B C D E F G H

DELETED

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 31 OF 40

SIZE B | ILL. NO. 6WD0126B | FP-61/ (FP-62 BLANK)

DELETED

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 32 OF 40

SIZE	ILL. NO.	
B	6WD0127B	FP-63/ (FP-64 BLANK)

289 290 291 292 293 294 295 296 297

A B C D E F G H

DELETED

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 33 OF 40

SIZE B | ILL. NO. 6WD0128B | FP-65/ (FP-66 BLANK)

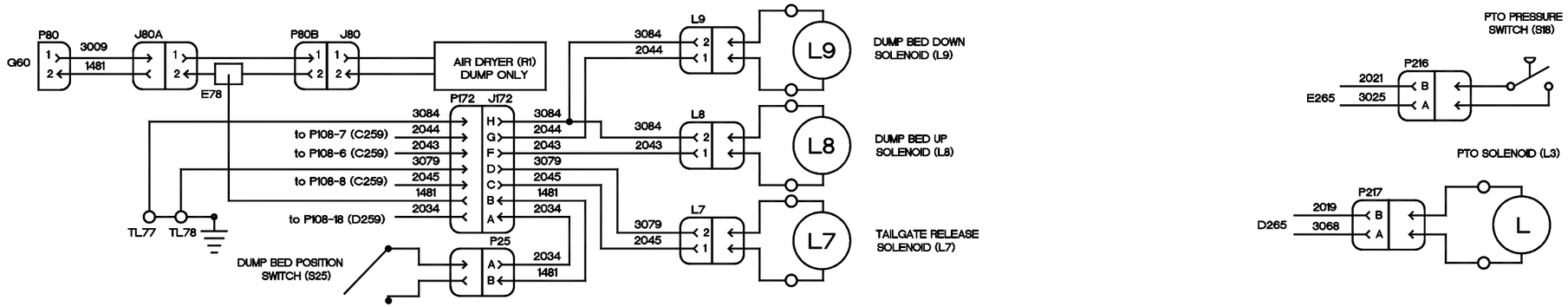


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 34 OF 40

SIZE B | ILL. NO. 6WD0129B | FP-67/ (FP-68 BLANK)

CARGO MATERIAL HANDLING CRANE

PROXIMITY SENSOR
CABLE B
JUNCTION BOX
CONTROL LOCKOUT RELAY
HYDRAULIC SYSTEM SHUTDOWN RELAY
DIODE ASSEMBLY
D7
D8
10A
POWER SWITCH/BREAKER
TB
GROUNDING STRIP
CRANE REMOTE CONNECTOR CABLE U
CRANE CONTROL PANEL
CABLE O — SYSTEM SHUTDOWN
CABLE P — BOOM UP L/O
CABLE N — CONTROL L/O
CABLE L — TELESCOPE OUT L/O
CABLE M
CABLE V — BOOM DOWN L/O
CABLE R — HOIST UP L/O
CABLE Q — HOIST UP
CABLE T — BOOM DOWN
CABLE S — BOOM UP
CABLE H — TELESCOPE IN
CABLE I — TELESCOPE OUT
CABLE K — SWING CW
CABLE J — SWING CCW
OVERLOAD SHUTDOWN SYSTEM
HOIST
TENSION LOAD CELL
HOIST LAYER SENSING SWITCH
OVERLOAD SHUTDOWN BOX
CABLE A
P171 CABLE G
to P108-15 (C259)
to P108-9 (C259)
TL67
CABLE C
PROXIMITY SENSOR

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 35 OF 40

SIZE B | ILL. NO. 6WD0130A | FP-69/FP-70 BLANK

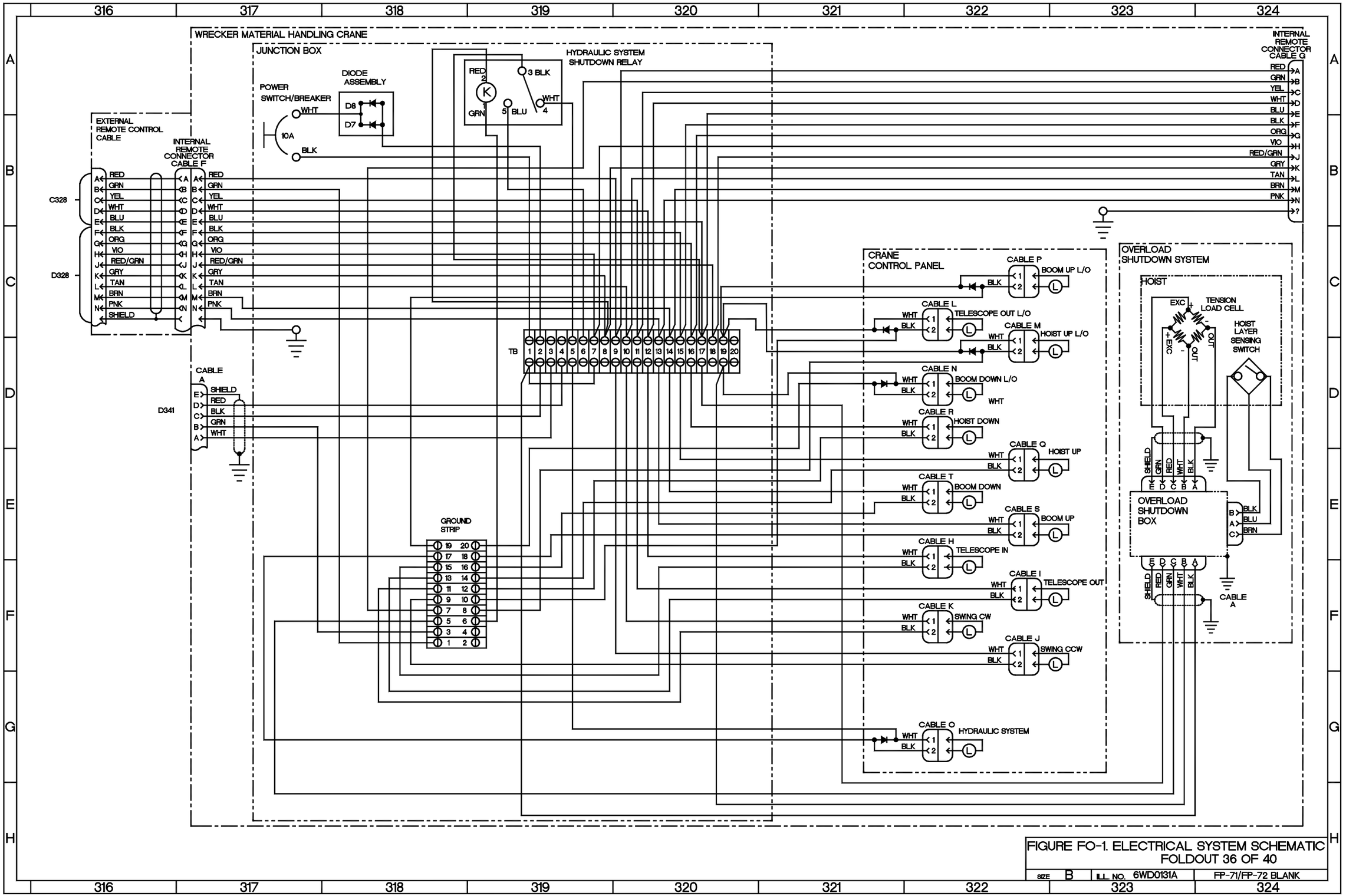


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 36 OF 40

SIZE	ILL. NO.	
B	6WD0131A	FP-71/FP-72 BLANK

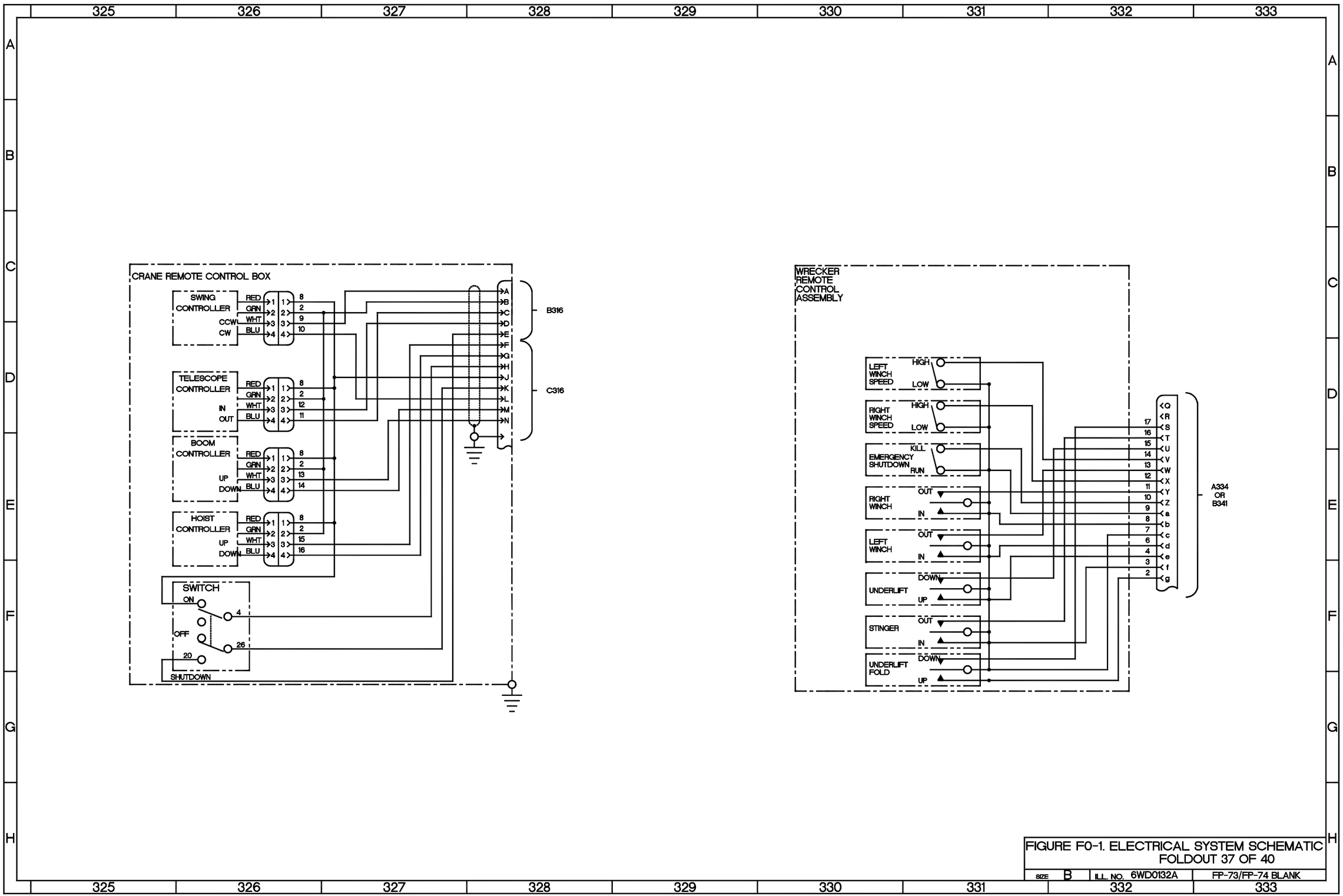


FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 37 OF 40

SIZE	ILL. NO.	
B	6WD0132A	FP-73/FP-74 BLANK

334 335 336 337 338 339 340 341 342

WRECKER CONTROLS

E333

WRECKER REMOTE CONNECTOR F

WRECKER REMOTE CONNECTOR G

E333

MAIN CONTROL PANEL

LEFT WINCH FREE SPOOL — ON / OFF

RIGHT WINCH FREE SPOOL — ON / OFF

LEFT WINCH SPEED — HIGH / LOW

RIGHT WINCH SPEED — HIGH / LOW

EMERGENCY SHUTDOWN — KILL / RUN

HYDRAULIC POWER — EXTERNAL / SLAVE

STATION SELECTOR — CONTROL PANEL / REMOTE CONTROL

TB 2 3 3A 4 4A 5A 6 6A 7 7A 8 9 9 10 11 12 13 14 15 16 17 18 19 C C C C C

RIGHT WINCH SPEED

LEFT WINCH SPEED

RIGHT WINCH FREE SPOOL — YEL / BLK

LEFT WINCH FREE SPOOL — YEL / BLK

EXTERNAL POWER — BLU / BLK

SLAVE POWER — BLU / RED

CABLE A

BLU

BLK

GRN

D317

J4

C199

L1 RIGHT WINCH OUT

L2 RIGHT WINCH IN

L15 UNDERLIFT FOLD DOWN

L18 UNDERLIFT FOLD UP

L11 UNDERLIFT DOWN

L14 UNDERLIFT UP

L13 STINGER OUT

L16 STINGER IN

L6 LEFT WINCH OUT

L5 LEFT WINCH IN

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 38 OF 40

SIZE B | ILL. NO. 6WD0133B | FP-75/ (FP-76 BLANK)

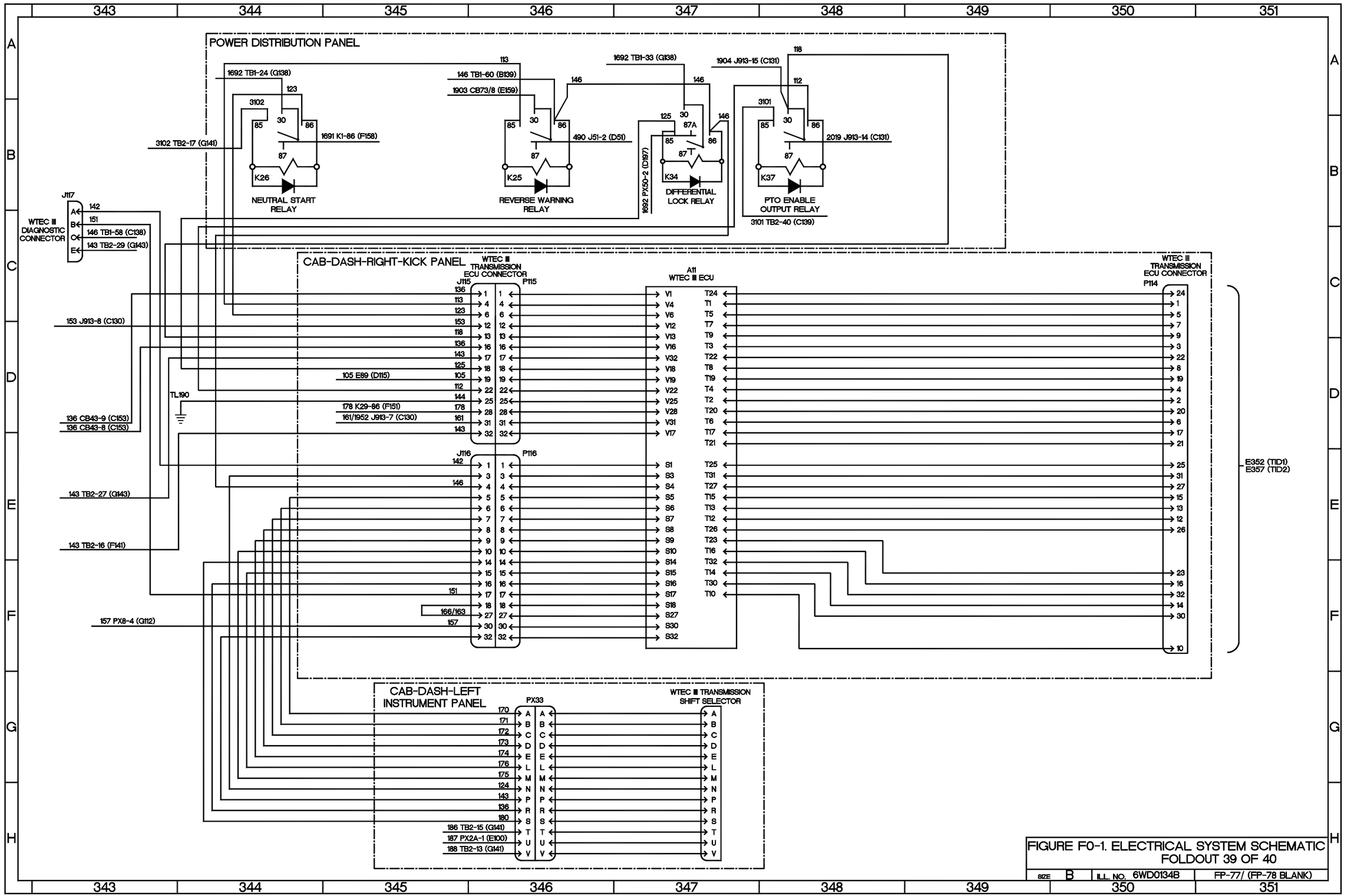


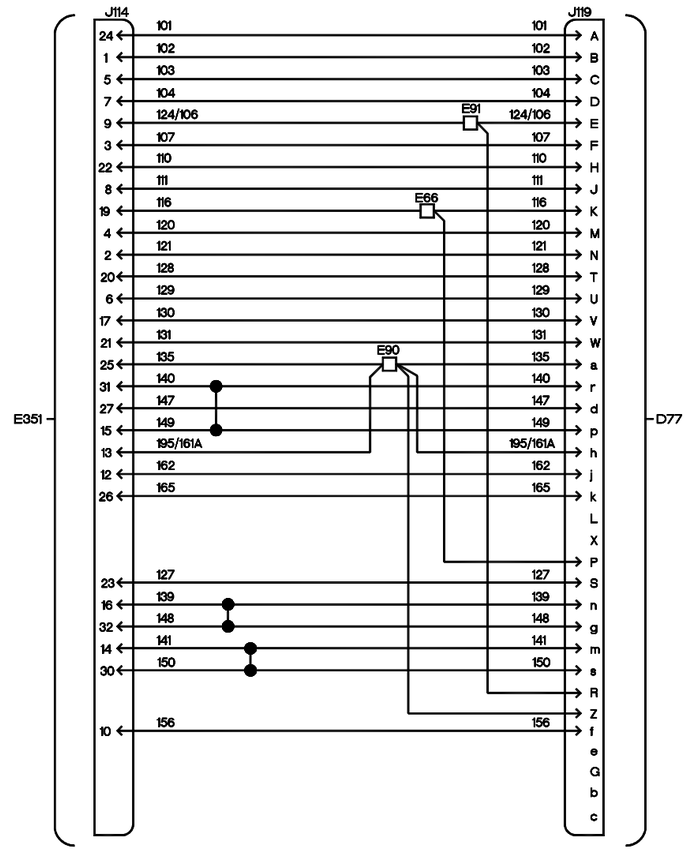
FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 39 OF 40

SIZE	ILL. NO.	
B	6WD0134B	FP-77/ (FP-78 BLANK)

352 353 354 355 356 357 358 359 360

TRANSMISSION SERIAL #: 6510090785 AND LOWER

WTEC III CAB TRANSMISSION HARNESS (TID1)



TRANSMISSION SERIAL #: 6510090786 AND HIGHER

WTEC III CAB TRANSMISSION HARNESS (TID2)

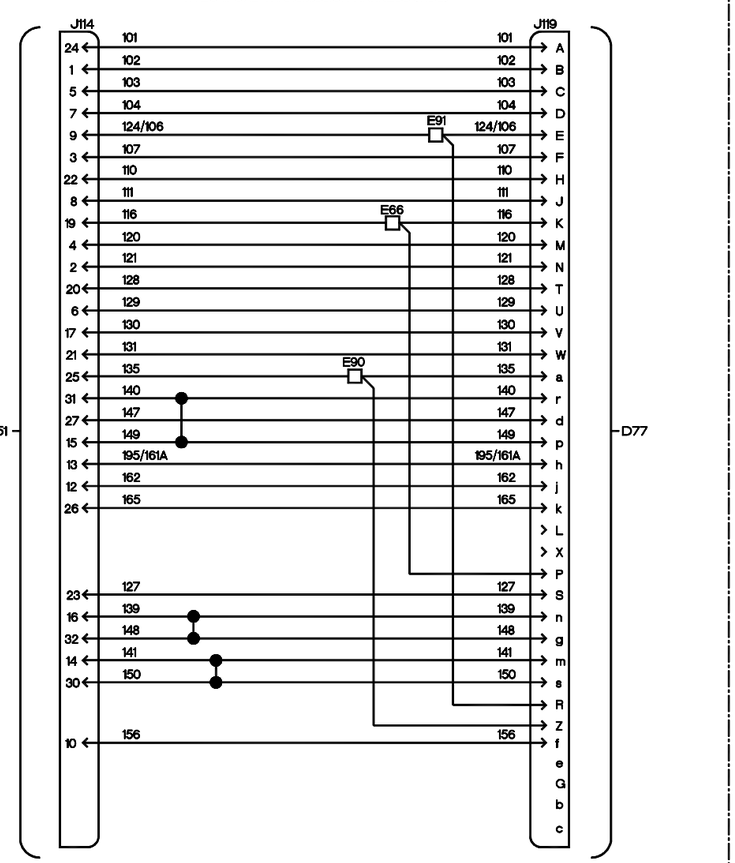


FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 40 OF 40

SIZE B | ILL NO. 6WD0135B | FP-79/ (FP-80 BLANK)

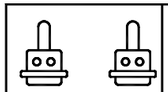
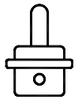
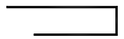
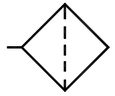
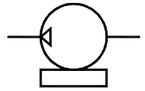
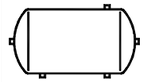
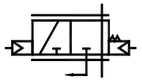
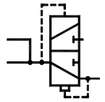
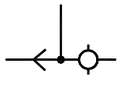
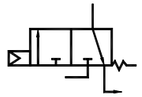
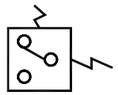
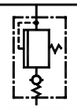
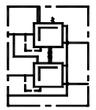
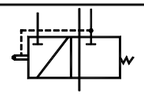
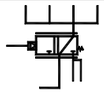
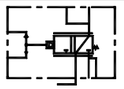
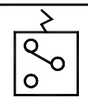
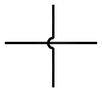
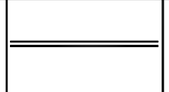
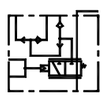
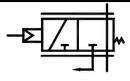
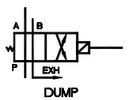
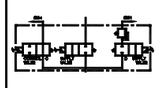
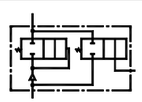
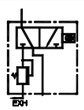
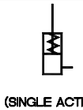
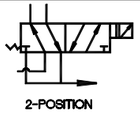
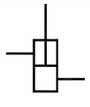
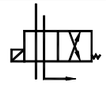
 REAR AXLE BRAKE CHAMBER	 FRONT AXLE BRAKE CHAMBER	 COUPLER AIR BRAKE	AIR DRYER	 AIR CLEANER INTAKE	 AIR COMPRESSOR WITH GOVERNOR	 AIR TANK	DASH GAUGE
MANUAL VALVE	ONE WAY CHECK VALVE	FAN CLUTCH	 MODULATED CONTROL VALVE	 QUICK RELEASE VALVE	 TWO WAY CHECK VALVE	 3/2 WAY SOLENOID VALVE	 PRESSURE SWITCH
 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
CONNECTION	SUPPLY AIR HOSE	 NO CONNECTION	 DELIVERY AIR HOSE	PARK/EMERGENCY AIR HOSE	 AIR BRAKE PROTECTING VALVE	INTERMEDIATE DIFFERENTIAL	AIR BRAKE PRESSURE TRANSMITTER
BOOSTER VALVE	 AIR/HYDRAULIC INVERSION VALVE	DELIVERY AIR HOSE NO CONNECTION	 DUMP TAILGATE SOLENOID	BLEED VALVE	TAILGATE CYLINDER	 CTIS MANIFOLD VALVE	 WHEEL VALVE
 KNEELING VALVE	TIRE	 (SINGLE ACTING) CYLINDER RETURN SPRING	 2-POSITION SPRING OFFSET SOLENOID VALVE	(DOUBLE ACTING) CYLINDER	 MANIFOLD VALVE	 2-POSITION SOLENOID VALVE	

FIGURE F0-2 PNEUMATIC SYSTEM SCHEMATIC
FOLDOUT 1 OF 4

SIZE	ILL. NO.	
B	6PD01AL1	FP-1/FP-2 BLANK

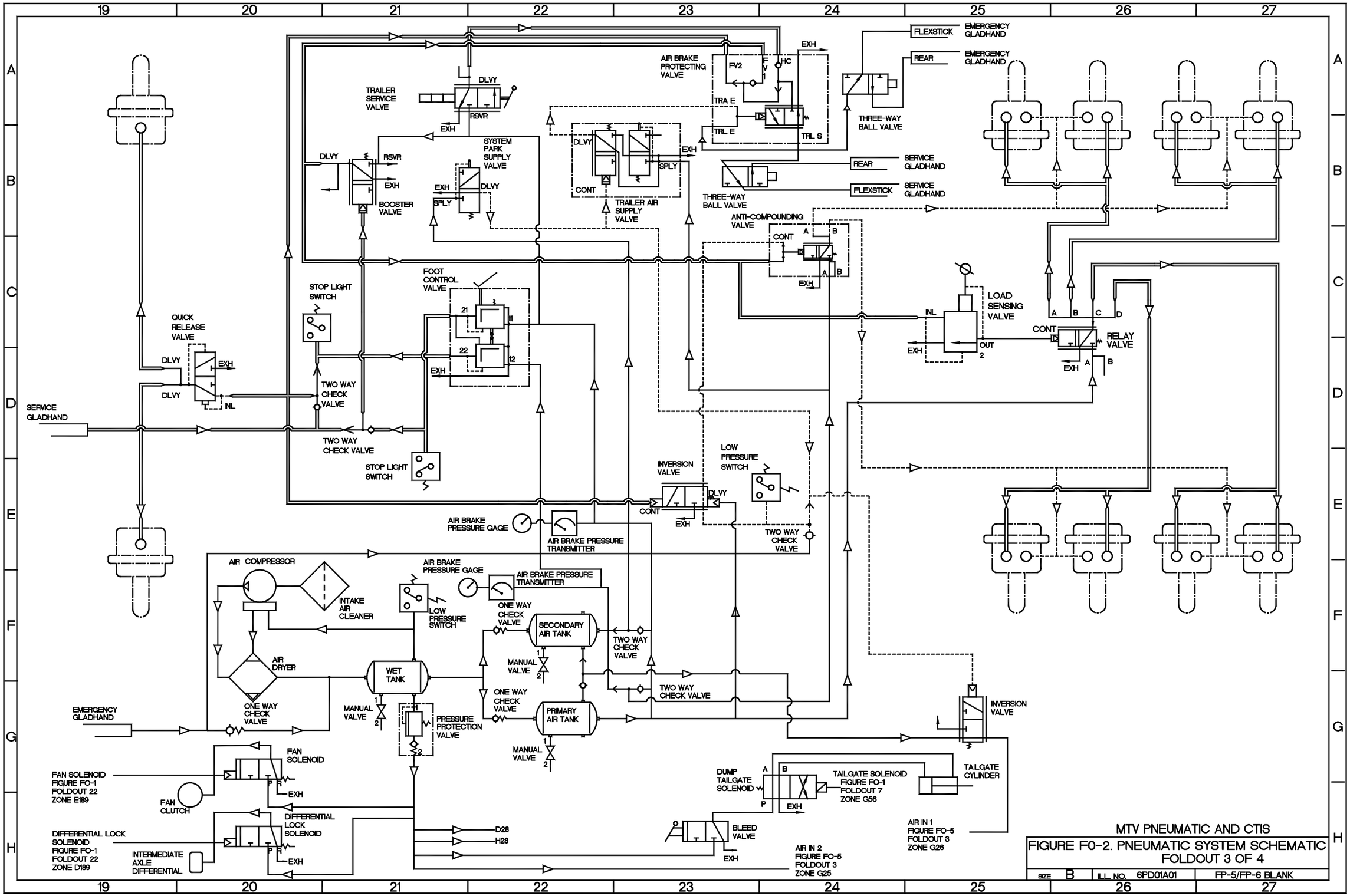
SH	ZONE	DESCRIPTION
3	E22	AIR BRAKE PRESSURE TRANSMITTER
3	F21	AIR BRAKE PRESSURE TRANSMITTER
3	A23	AIR BRAKE PROTECTING VALVE
3	F20	AIR COMPRESSOR
3	F20	AIR DRYER
3	B24	ANTI-COMPOUNDING VALVE
3	H23	BLEED VALVE
3	B21	BOOSTER VALVE
4	D30	CONTROL VALVE
4	C30	CTIS MANIFOLD VALVE
4	D31	DEFLATE VALVE
3	H20	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 F0-2. PNEUMATIC SYSTEM SCHEMATIC FOLDOUT 2 OF 4

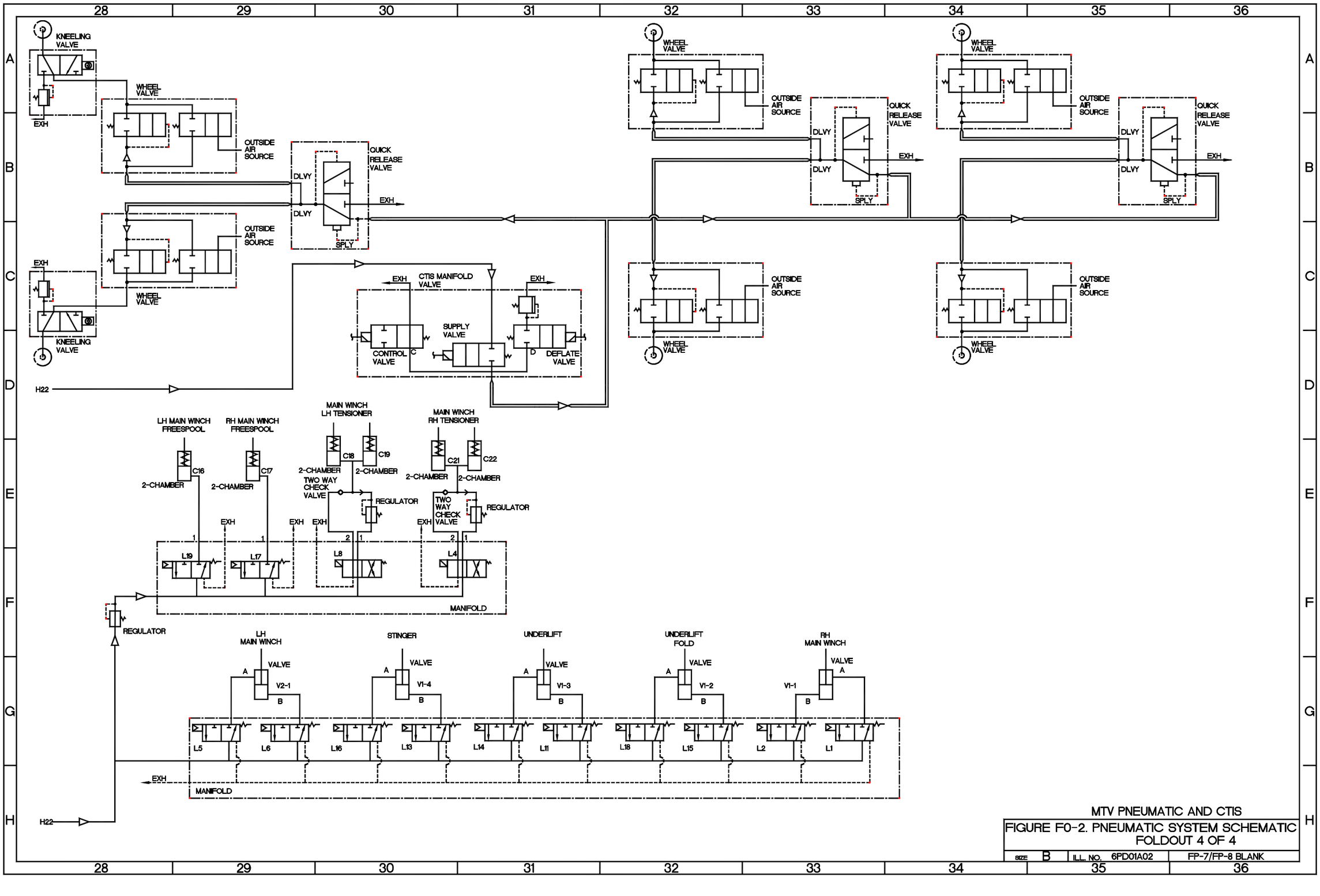
SIZE	ILL. NO.	
B	6PD01AL2	FP-3/FP-4 BLANK



MTV PNEUMATIC AND CTIS

FIGURE FO-2. PNEUMATIC SYSTEM SCHEMATIC FOLDOUT 3 OF 4

SIZE	ILL. NO.	
B	6PD01A01	FP-5/FP-6 BLANK



MTV PNEUMATIC AND CTIS

FIGURE F0-2. PNEUMATIC SYSTEM SCHEMATIC FOLDOUT 4 OF 4

SIZE B | ILL. NO. 6PD01A02 | FP-7/FP-8 BLANK

CHECK VALVE	BYPASS VALVE	CHECK VALVE	AIR OR OIL FILTER	MOTOR	PUMP	PTO	HOIST CYLINDER
AIR LINE LUBRICATOR	CYLINDER	HYDRAULIC ACCUMULATOR	FLOW CONTROL VALVE	CLOSED 2 WAY VALVE	2 WAY SOLENOID VALVE	VALVE	SWING MOTOR
DIRECTIONAL CONTROL VALVE	PRESSURE CONTROL VALVE	CHECK VALVE	HOLDING VALVE	NORMALLY CLOSED 2 WAY VALVE	PRESSURE RELIEF VALVE	SWING DRIVE	RESERVOIR
VALVE	HYDRAULIC CYLINDER	MANUAL SHUT OFF	SUCTION LINE	CROSS OVER RELIEF VALVE	HAND PUMP	MOTOR CONTROL VALVE	

FIGURE FO-3. HYDRAULIC SYSTEM SCHEMATIC

FOLDOUT 1 OF 8

SIZE	ILL. NO.	
B	6HD01AL1	FP-1/FP-2 BLANK

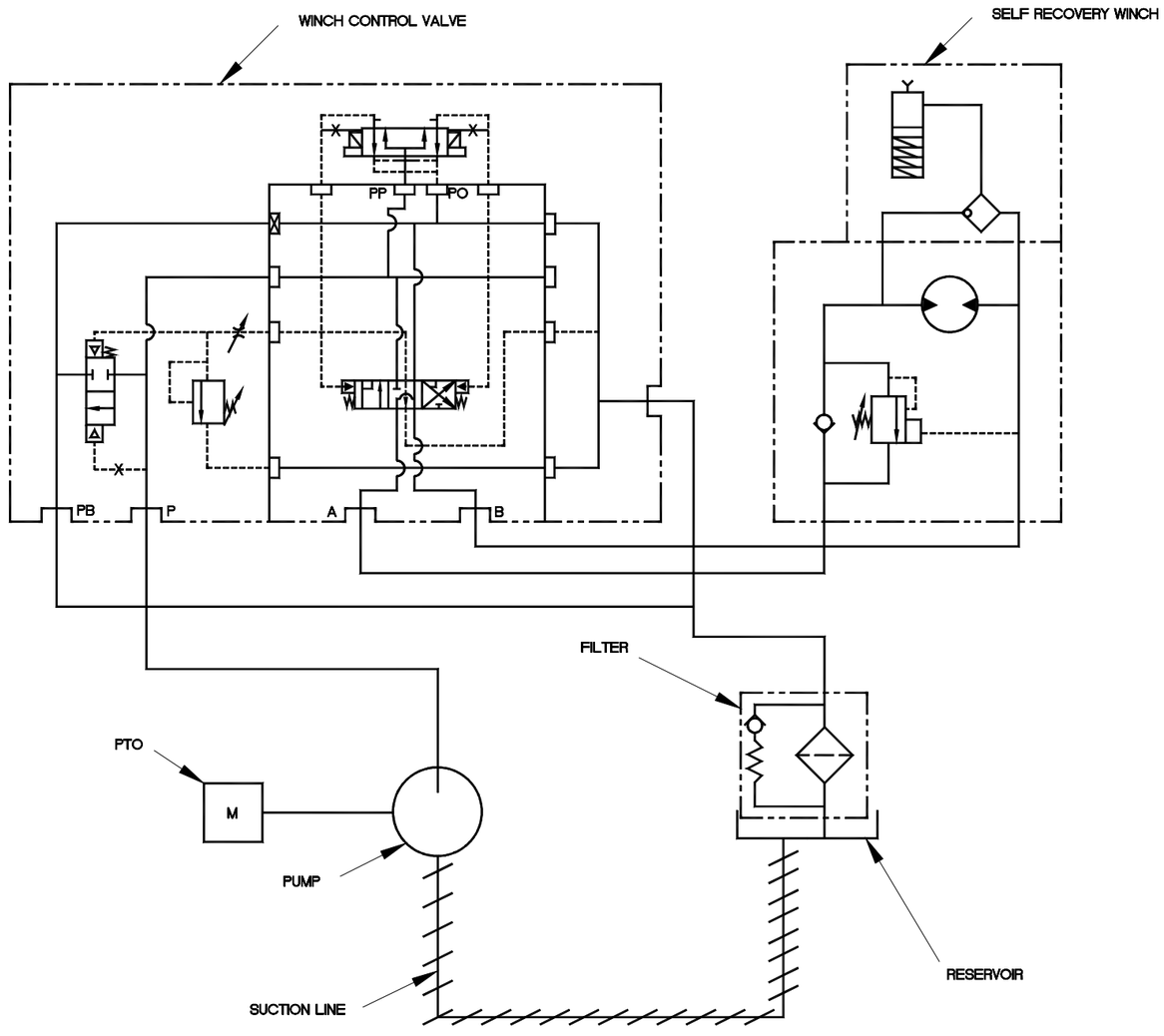
SH	ZONE	DESCRIPTION
6	D46	2 WAY SOLENOID VALVE
7	D60	2 WAY SOLENOID VALVE
7	D55	2 WAY SOLENOID VALVE, OPERATING PRESS
7	F60	3 BANK VALVE ASSEMBLY
7	C61	4 BANK VALVE ASSEMBLY
6	B52	BOOM
7	F55	BULKHEAD PLATE (SUBFRAME)
7	F57	CHECK VALVE
7	G62	CHECK VALVE
7	D55	CHECK VALVE
5	E37	CHECK VALVE CK1
5	E37	CHECK 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

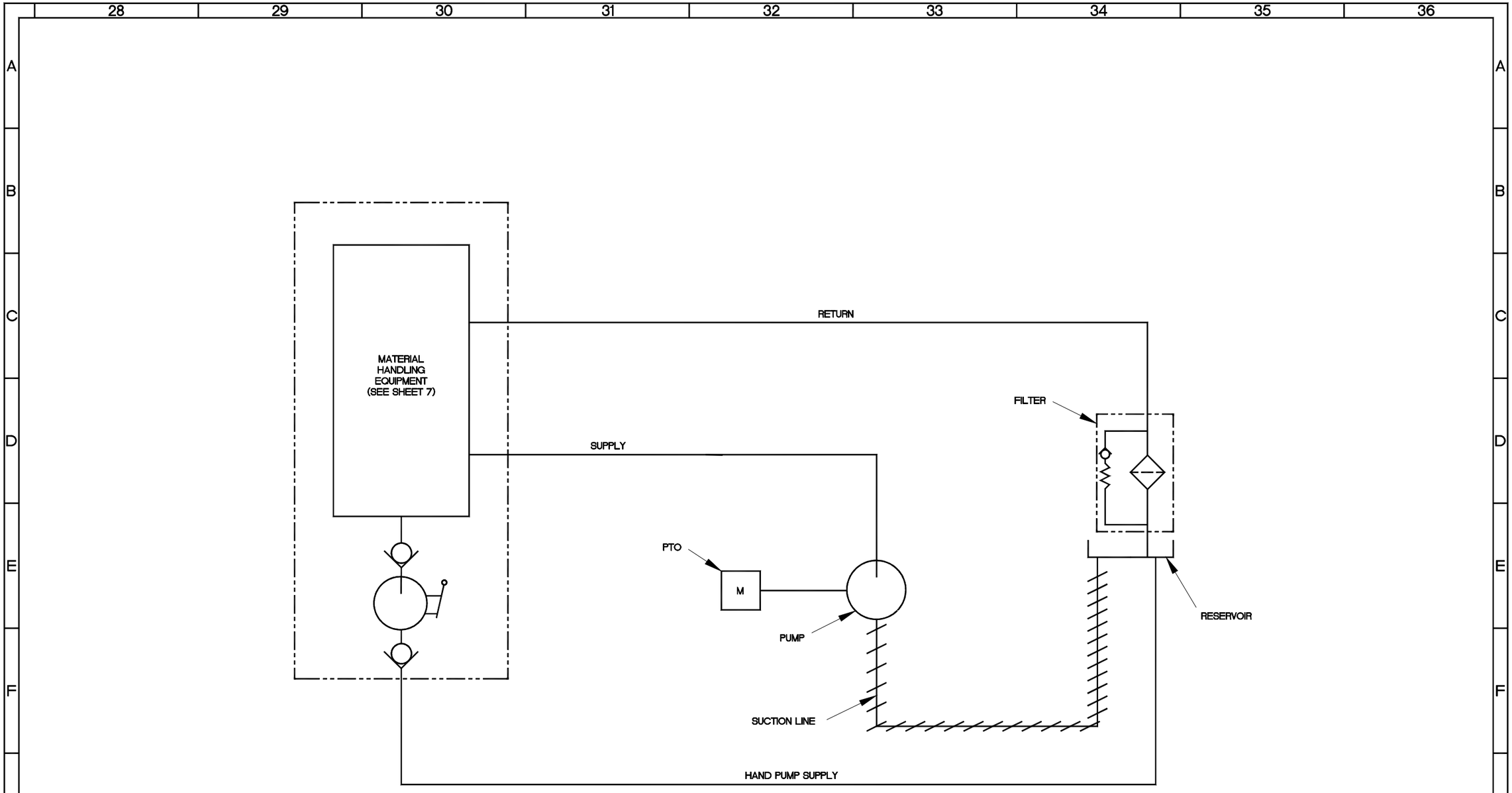
SIZE B | ILL. NO. 6HD01AL2 | FP-3/FP-4 BLANK



MTV TRUCK W/WINCH

FIGURE FO-3. HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 3 OF 8

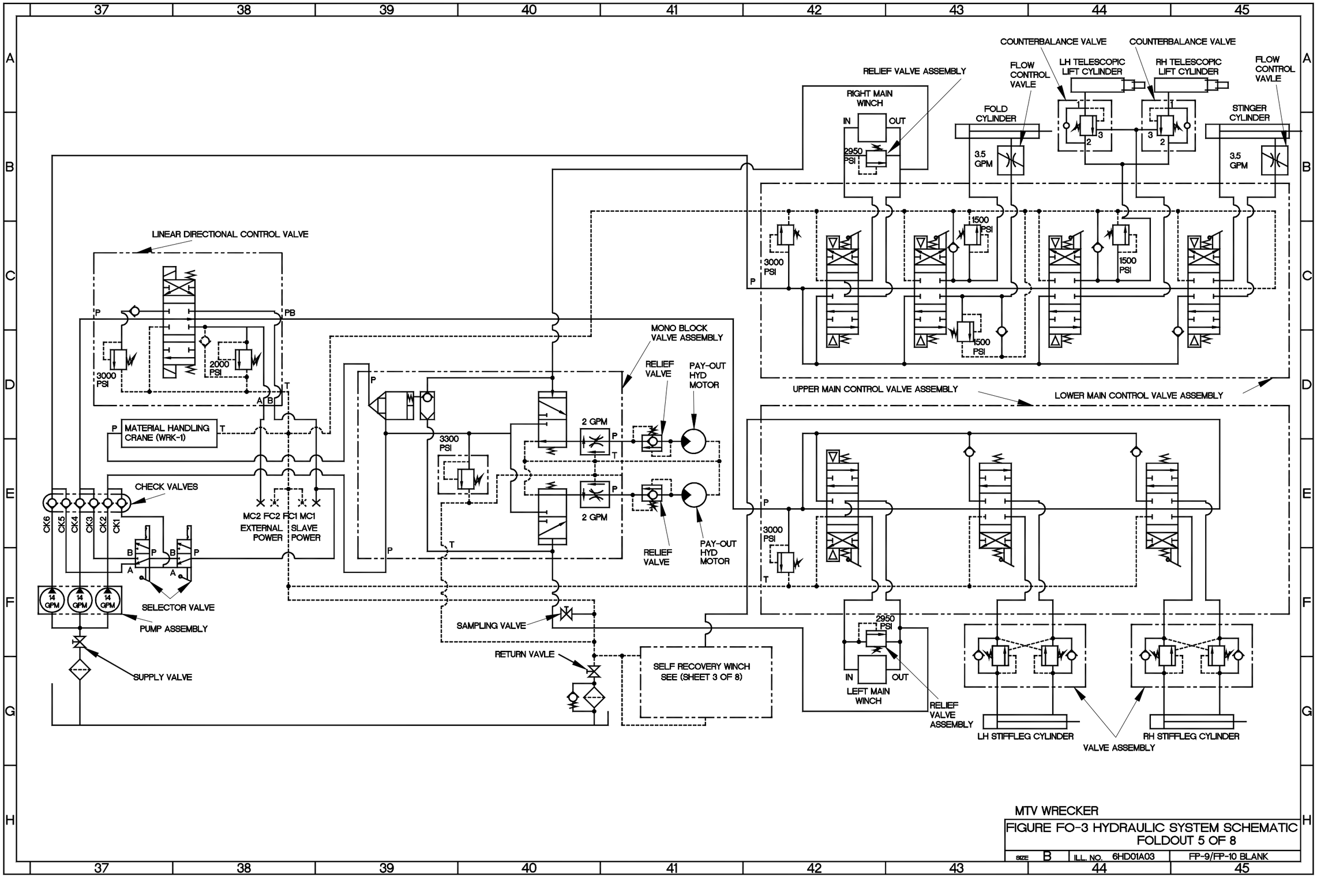
SIZE	ILL. NO.	
B	6HD01A01	FP-5/FP-6 BLANK



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	ILL. NO.	
B	6HD01A03	FP-9/FP-10 BLANK

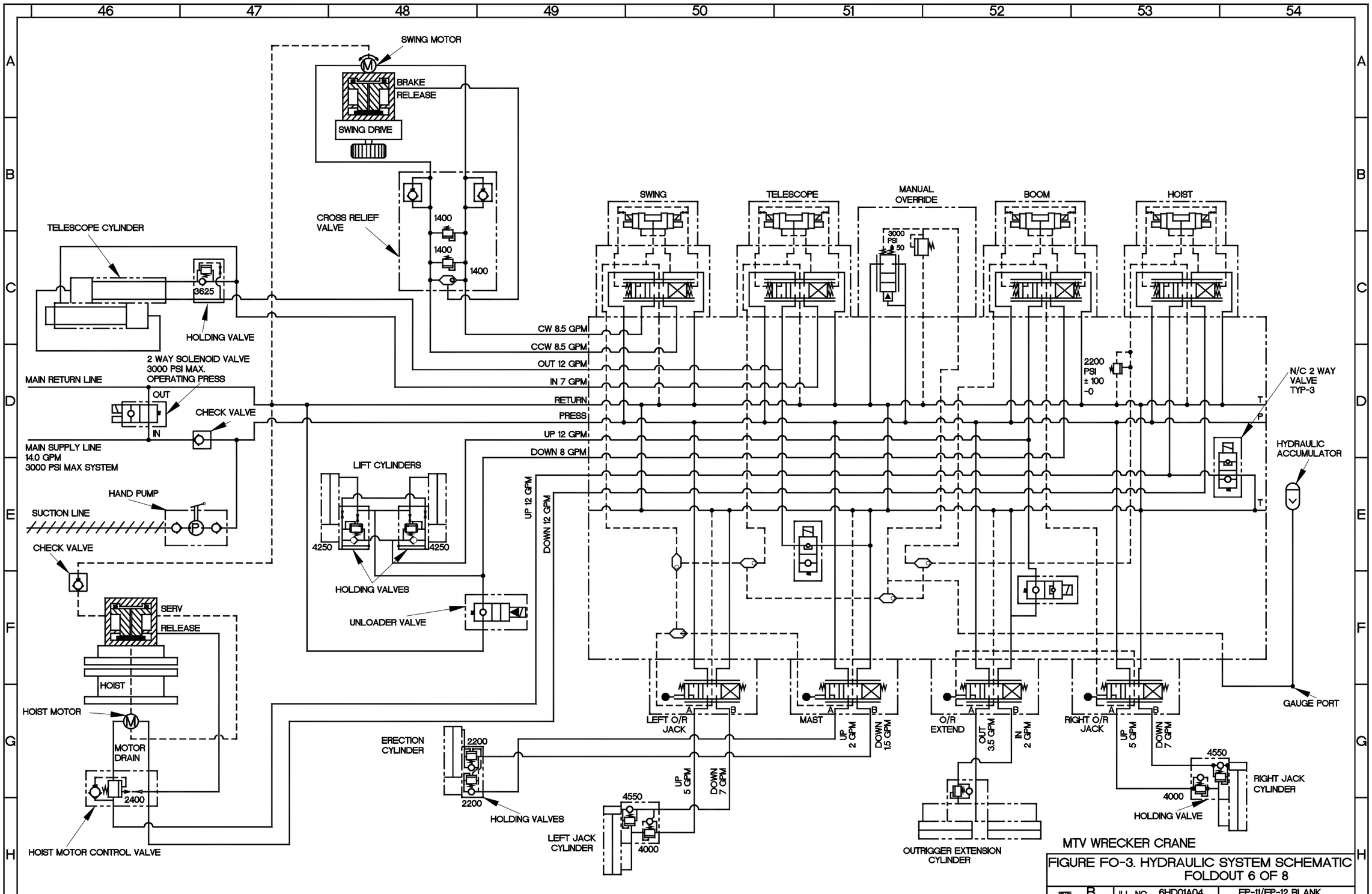
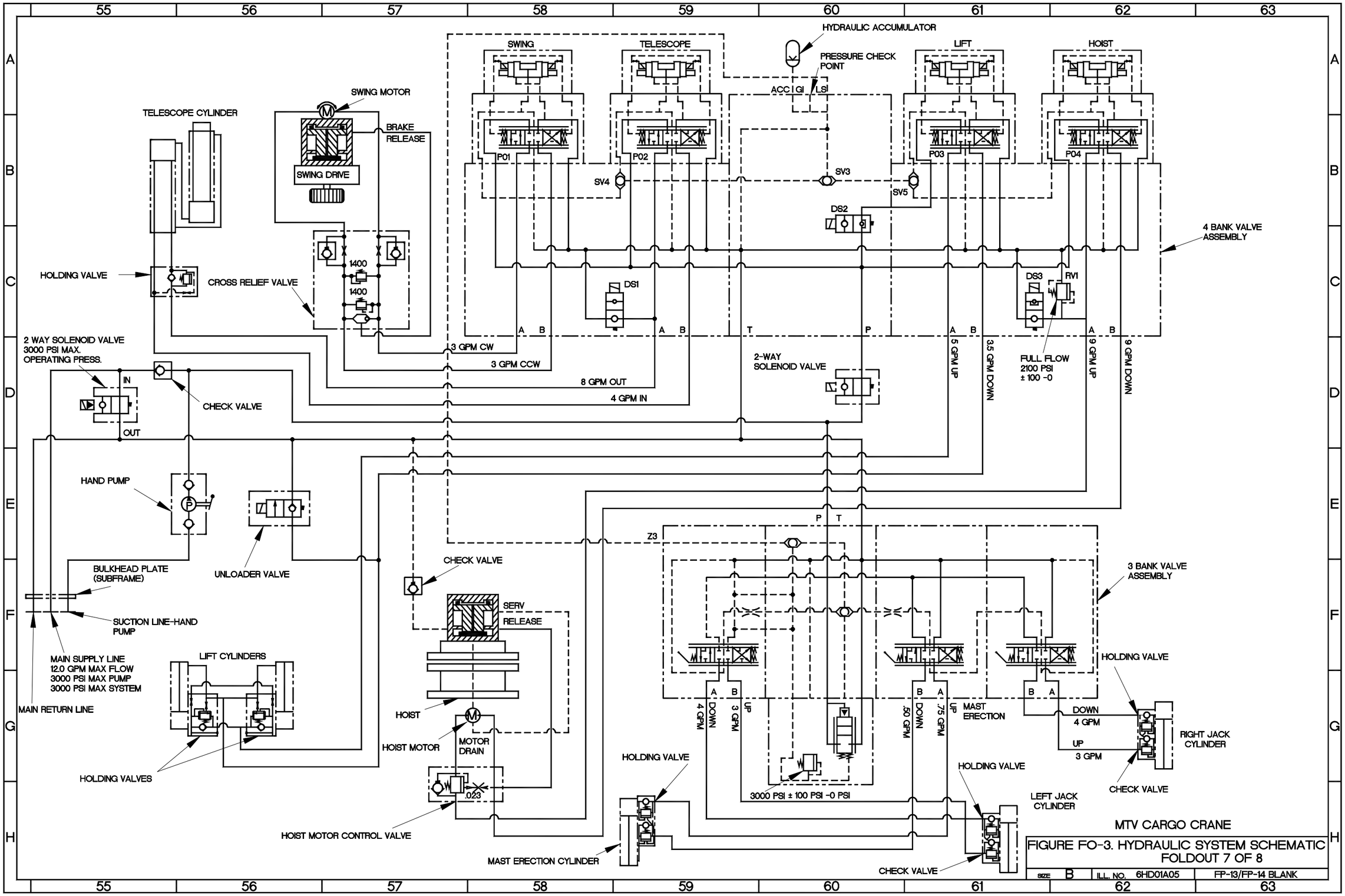


FIGURE FO-3. HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 6 OF 8

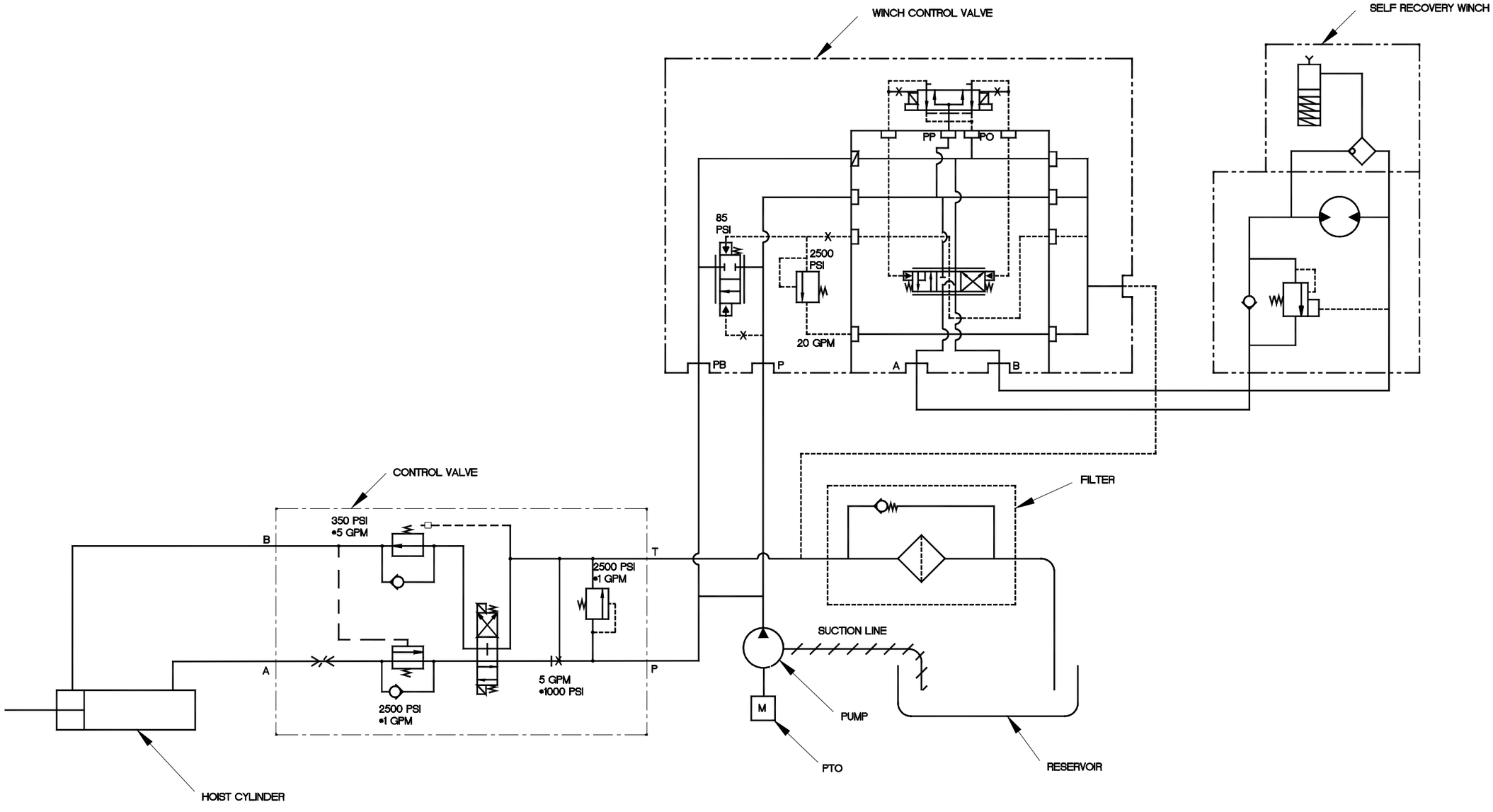
SIZE	ILL. NO.	
B	6HD01A04	FP-11/FP-12 BLANK



MTV CARGO CRANE

FIGURE FO-3. HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 7 OF 8

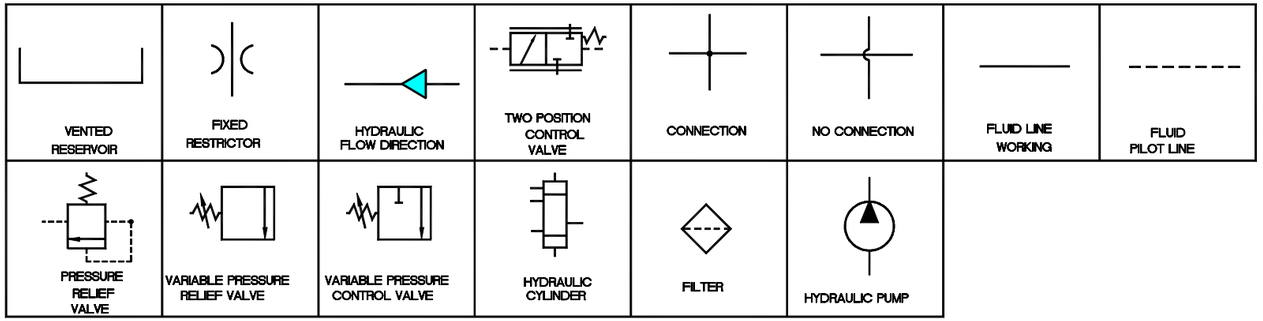
SIZE	ILL. NO.	
B	6HD01A05	FP-13/FP-14 BLANK



MTV DUMP W/ WINCH
MTV DUMP W/O WINCH

FIGURE FO-3. HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 8 OF 8

SIZE	ILL. NO.	
B	6HD01A06	FP-15/FP-16 BLANK



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

SIZE B | ILL. NO. YSD01AL1 | FP-1/FP-2 BLANK

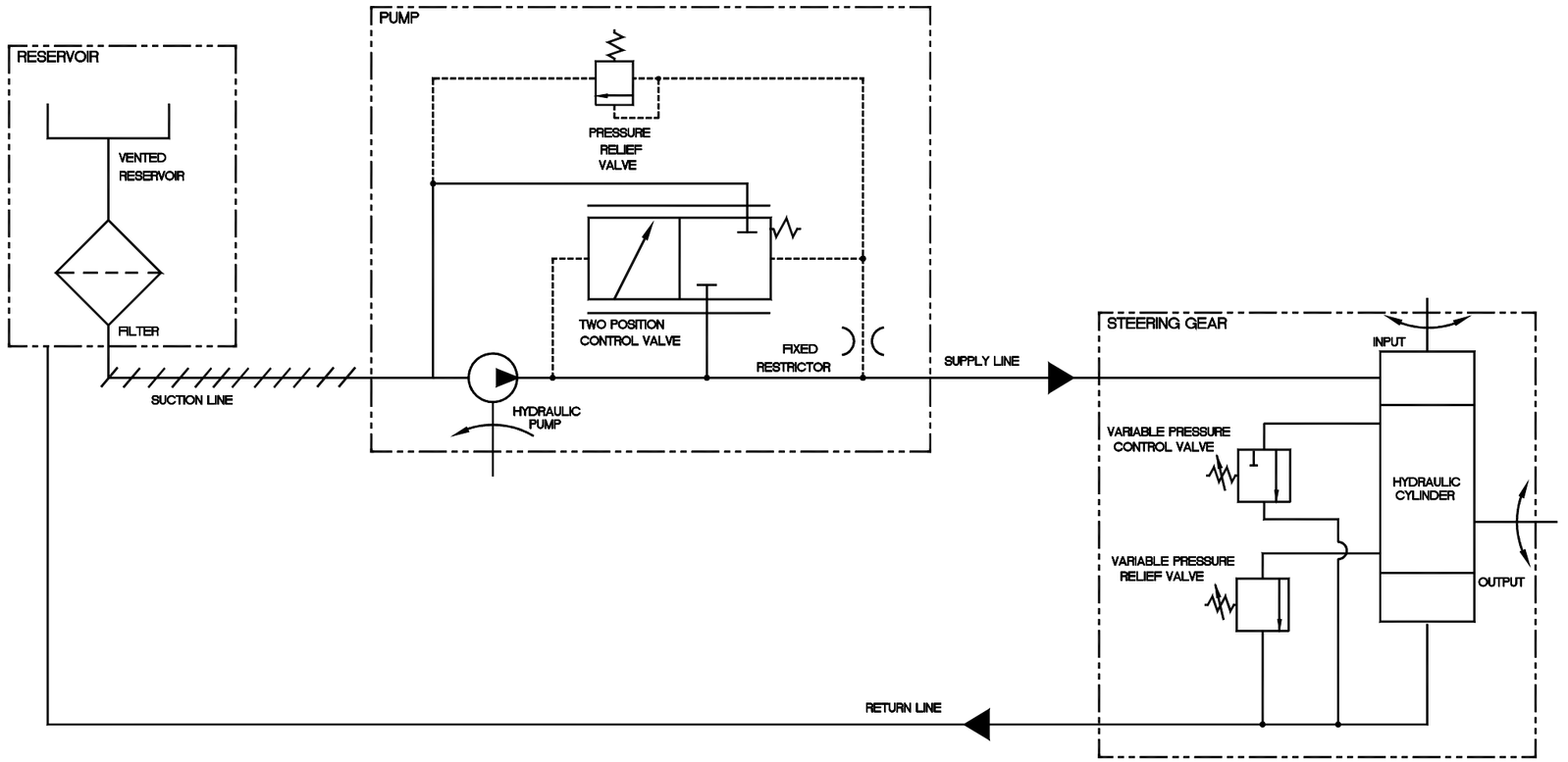


FIGURE FO-4 HYDRAULIC STEERING SYSTEM

FOLDOUT 2 OF 2

SIZE	ILL. NO.	
B	YSD01A01	FP-3/FP-4 BLANK

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 F0-5 AIR TRANSPORTABILITY
HYDRAULIC/PNEUMATIC SYSTEM SCHEMATIC

FOLDOUT 1 OF 3

SIZE B | ILL. NO. YAD01AL1 | FP-1/FP-2 BLANK

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

FIGURE F0-5 AIR TRANSPORTABILITY
HYDRAULIC/PNEUMATIC SYSTEM SCHEMATIC
FOLDOUT 2 OF 3

SIZE B | ILL NO. YAD01AL2 | FP-3/FP-4 BLANK

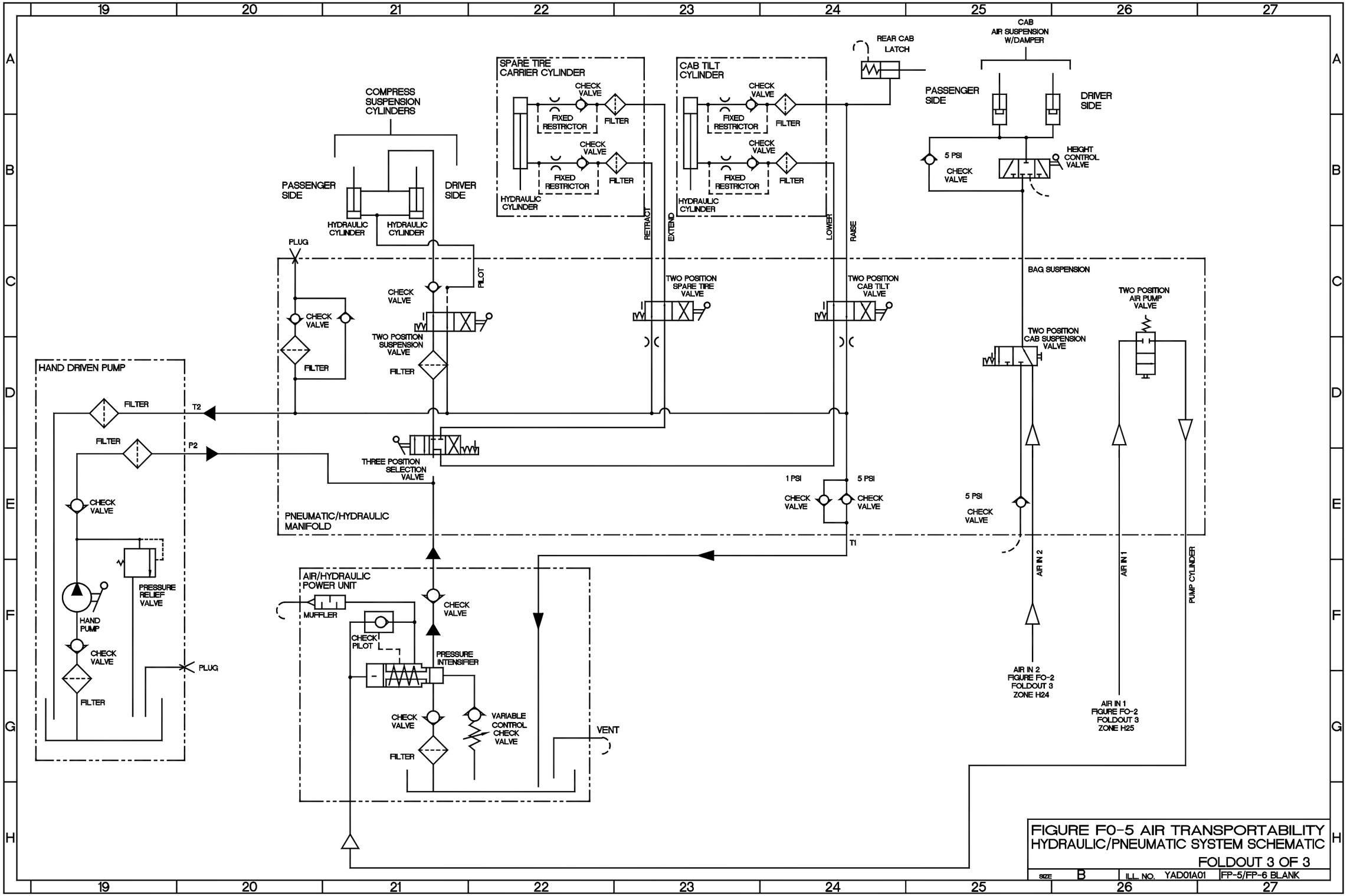


FIGURE FO-5 AIR TRANSPORTABILITY HYDRAULIC/PNEUMATIC SYSTEM SCHEMATIC
FOLDOUT 3 OF 3

SIZE B | ILL NO. YAD01A01 | FP-5/FP-6 BLANK

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

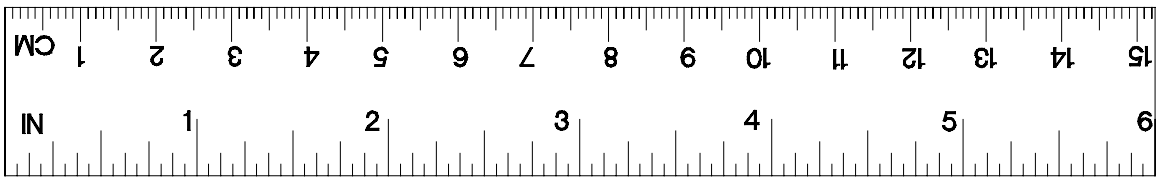
LIQUID MEASURE
1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

TEMPERATURE
5/9 (°F - 32) = °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 C° + 32 = F°

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Inches	Millimeters	25.4
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.57
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.35
Pounds	Kilograms	0.454
Pounds (force)	Newtons	4.448
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds/Sq Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Millimeters	Inches	0.0394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Sq Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Sq Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Newtons	Pounds (force)	0.2248
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds per Sq Inch	0.145
Km per Liter	Miles per Gallon	2.354
Km per Hour	Miles per Hour	0.621



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