TECHNICAL MANUAL
MAINTENANCE INSTRUCTIONS
DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
M1078 SERIES, 2 1/2-TON, 4 X 4,
LIGHT MEDIUM TACTICAL VEHICLES (LMTV)

VOLUME NO. 1 OF 2

HOW TO USE THIS MANUAL
PAGE vii

GENERAL INFORMATION
PAGE 1-1

VEHICLE MAINTENANCE
PAGE 2-1

VEHICLE TROUBLESHOOTING
PAGE 2-8

MODEL	NSN	EIC
TRK, CAR., LMTV, M1078		
W/WN	2320-01-360-1898	BHH
W/O WN	2320-01-354-3385	BHD
TRK, VAN, LMTV, M1079		
W/WN	2320-01-360-1891	BHG
W/O WN	2320-01-354-3384	BHE
TRK, CHAS, LMTV, M1080		
W/O WN	2320-01-353-9098	BHC
TRK, CAR., LMTV, AIR DROP, M1081		
W/WN	2320-01-360-1899	BHJ
W/O WN	2320-01-355-3064	BHF

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

HEADQUARTERS, DEPARTMENTS OF THE ARMY AND THE AIR FORCE

17 JUNE 1998

WARNING SUMMARY

WARNING

EXHAUST GASES CAN KILL

1. **DO NOT** operate your vehicle engine in 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.

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.

WARNING SUMMARY (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

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

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 may result in injury to personnel.

WARNING

Use care when installing springs. Springs are under tension and can act as projectiles when being 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

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 SUMMARY (CONT)

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

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 serious 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 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 SUMMARY (CONT)

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

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

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

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

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 SUMMARY (CONT)

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

Wear appropriate eye protection when drilling holes. 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

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

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 SUMMARY (CONT)

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

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

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

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 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

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 SUMMARY (CONT)

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

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 50 lbs (23 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 50 lbs (23 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

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 damage to equipment or injury to personnel.

WARNING

Frame rail 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

Subframe rail 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

Subframe rail 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

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 SUMMARY (CONT)

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 damage to equipment or injury to personnel.

WARNING

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

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

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

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

Standard cab weighs approximately 1400 lbs (636 kgs). M1081 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

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

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

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

WARNING

Cargo bed weighs approximately 2610 lbs (1185 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 2610 lbs (1185 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

11K Self-recovery winch (SRW) 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 SUMMARY (CONT)

WARNING

11K Self-recovery winch (SRW) 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 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

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

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

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

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

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

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

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 SUMMARY (CONT)

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 module 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

Rear 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.

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
M1078 SERIES, 2-1/2-TON, 4x4,
LIGHT MEDIUM TACTICAL VEHICLE
(LMTV)

VOLUME NO. 1 OF 2

TM 9-2320-365-34-1, 17 June 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
c thru f	c thru f
none	g thru r
none	A thru E/(F Blank)
i thru viii	i thru viii
none	ix and x
1-7 thru 1-27/(1-28 Blank)	1-7 thru 1-27/(1-28 Blank)
2-1 and 2-2	2-1 and 2-2
2-5 thru 2-14	2-5 thru 2-14
2-63/(2-64 Blank)	2-63 and 2-64
none	2-64.1 thru 2-64.15/(2-64.16 Blank)
2-65 and 2-66	2-65 and 2-66
2-69 thru 2-71/(2-72 Blank)	2-69 thru 2-72
none	2-72.1/(2-72.2 Blank)
2-73 thru 2-200	2-73 thru 2-200
none	2-200.1 and 2-200.2
2-201 thru 2-416	2-201 thru 2-416
none	2-416.1 and 2-416.2
2-417 thru 2-588	2-417 thru 2-588
none	2-588.1 thru 2-588.4
2-589 thru 2-836	2-589 thru 2-836
none	2-836.1 and 2-836.2
2-837 thru 2-957/(2-958 Blank)	2-837 thru 2-958
none	2-958.1 thru 2-958.3/(2-958.4 Blank)
2-959 and 2-960	2-959 and 2-960
2-963 and 2-964	2-963 and 2-964
2-969 and 2-970	2-969 and 2-970
2-975 and 2-976	2-975 and 2-976
A-1 and A-2	A-1 and A-2
C-1 thru C-8	C-1 thru C-8
D-3 thru D-6	D-3 thru D-6
D-19 thru D-24	D-19 thru D-24
D-31 thru D-40	D-31 thru D-40
D-67/(D-68 Blank)	D-67 and D-68
none	D-69 thru D-71/(D-72 Blank)
F-1 thru F-11/(F-12 Blank)	F-1 thru F-12
G-1/(G-2 Blank)	G-1/(G-2 Blank)
none	H-1 thru H-4
INDEX-1 thru INDEX-19/(INDEX-20 Blank)	INDEX-1 thru INDEX-20
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)	FO-1 FP-1/(FP-2 Blank)
thru FP-19/(FP-20 Blank)	thru FP-19/(FP-20 Blank)
FO-1 FP-23/(FP-24 Blank)	FO-1 FP-23/(FP-24 Blank)
FO-1 FP-27/(FP-28 Blank)	FO-1 FP-27/(FP-28 Blank)
thru FP-61/(FP-62 Blank)	thru FP-61/(FP-62 Blank)
FO-1 FP-65/(FP-66 Blank)	FO-1 FP-65/(FP-66 Blank)
and FP-67/(FP-68 Blank)	and FP-67/(FP-68 Blank)
Back Cover	Back Cover

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
0110107

DISTRIBUTION: To be distributed in accordance with initial distribution number (IDN) 380937 requirements for TM 9-2320-365-34-1.

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 ..... 17 June 1998
Change ..... 1 ..... 31 July 2001

THE TOTAL NUMBER OF PAGES IN THIS PUBLICATION IS 2664, CONSISTING OF THE FOLLOWING:

Page No.	*Change No.
VOLUME 1	
Cover	1
Blank	0
a and b	0
c thru f	1
g thru r Added	1
A thru E Added	1
F Blank Added	1
i	1
ii and iii	0
iv thru viii	1
ix and x Added	1
1-1 thru 1-6	0
1-7 thru 1-27	1
1-28 Blank	0
2-1	1
2-2 thru 2-5	0
2-6	1
2-7	0
2-8 thru 2-13	1
2-14 thru 2-62	0
2-63 and 2-64	1
2-64.1 thru 2-64.7 Added	1
2-64.8 Blank Added	1
2-64.9 thru 2-64.15 Added	1
2-64.16 Blank Added	1
2-65	1
2-66 thru 2-69	0
2-70 thru 2-72	1
2-72.1 Added	1
2-72.2 Blank Added	1
2-73 thru 2-200	1
2-200.1 and 2-200.2 Added	1
2-201 thru 2-416	1
2-416.1 and 2-416.2 Added	1
2-417 thru 2-588	1
2-588.1 thru 2-588.4 Added	1
2-589 thru 2-836	1
2-836.1 and 2-836.2 Added	1
2-837 thru 2-958	1
2-958.1 thru 2-958.3 Added	1
2-958.4 Blank Added	1
2-959	1
2-960 and 2-961	0
2-962 Blank	0
2-963	1
2-964 thru 2-967	0
2-968 Blank	0
2-969	1
2-970 thru 2-973	0
2-974 Blank	0
2-975	1
2-976 thru 2-981	0
2-982 Blank	0
2-983 thru 2-991	0
2-992 Blank	0
A-1	0
A-2	1
A-3 and A-4	0
B-1 thru B-5	0
B-6 Blank	0
C-1 thru C-8	1
D-1 thru D-3	0
D-4 and D-5	1
D-6 thru D-19	0
D-20 thru D-23	1
D-24 thru D-31	0
D-32	1
D-33	0
D-34 thru D-39	1
D-40 thru D-66	0
D-67 and D-68	1
D-69 thru D-71 Added	1
D-72 Blank Added	1
E-1 thru E-8	0
F-1	0
F-2 thru F-12	1
G-1	1
G-2 Blank	0
H-1 thru H-4 Added	1
INDEX-1 thru INDEX-20	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	0
FO-1 FP-22 Blank	0
FO-1 FP-23	1
FO-1 FP-24 Blank	0
FO-1 FP-25	0
FO-1 FP-26 Blank	0
FO-1 FP-27	1
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
FO-1 FP-37	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.
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	0
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-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-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 and b	0
c thru f	1
g thru r Added	1
A thru D Added	1
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 and 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 thru 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 and 3-88	1
3-88.1 Added	1
3-88.2 Blank Added	1
3-89 thru 3-135	0
3-136 Blank	0
4-1 thru 4-46	0
5-1	1
5-2	0
5-3 and 5-4	1
5-4.1 and 5-4.2 Added	1
5-5 thru 5-7	1
5-8 Blank	0
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 thru 7-3	1
7-4 thru 7-16	0
7-16.1 Added	1
7-16.2 Blank Added	1
7-17 and 7-18	1
7-19 and 7-20	0
7-21	1
7-22 thru 7-24	0
7-25 thru 7-28	1
7-28.1 thru 7-28.14 Added	1
7-29 thru 7-42	1
7-42.1 Added	1
7-42.2 Blank Added	1
7-43 and 7-44	1
7-45	0
7-46	1
7-47 thru 7-51	0
7-52	1
7-53 thru 7-66	0
7-67	1
7-68 thru 7-70	0
7-71 and 7-72	1
7-73 thru 7-87	0
7-88 thru 7-91	1
7-92 thru 7-98	0
7-99 thru 7-127 Added	1
7-128 Blank Added	1
8-1	0
8-2 and 8-3	1
8-4	0
8-5 thru 8-10	1
9-1	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.
9-2	1
9-3	0
9-4 and 9-5	1
9-6	0
9-7 and 9-8	1
9-8.1 Added	1
9-8.2 Blank Added	1
9-9 and 9-10	1
9-11 thru 9-14	0
9-15 and 9-16	1
9-16.1 Added	1
9-16.2 Blank Added	1
9-17 thru 9-20	1
9-20.1 Added	1
9-20.2 Blank Added	1
9-21	1
9-22 thru 9-30	0
10-1	0
10-2 thru 10-4	1
10-4.1 Added	1
10-4.2 Blank Added	1
10-5 thru 10-8	1
10-8.1 Added	1
10-8.2 Blank Added	1
10-9 thru 10-18	1
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 12-14	0
12-15	1
12-16 Blank	1
12-17 and 12-18 Deleted	1
13-1	1
13-2 thru 13-8	0
13-9 thru 13-11	1
13-12	0
13-13	1
13-14	0
13-15	1
13-16	0
13-17	1
13-18 and 13-19	0
13-20	1
13-21 thru 13-24	0
13-25	1
13-26 thru 13-41	0
13-42	1
13-43	0
13-44 and 13-45	1
13-46 thru 13-49	0
13-50	1
13-51	0
13-52 thru 13-56	1
13-57 and 13-58	0
13-59	1
13-60 thru 13-62	0
13-63 and 13-64	1
13-65 and 13-66	0
13-67	1
13-68 and 13-69	0
13-70 thru 13-74	1
13-75	0
13-76 thru 13-78	1
13-79 thru 13-90	0
13-91 thru 13-95 Added	1
13-96 Blank Added	1
14-1	0
14-2 thru 14-10	1
14-11	0
14-12 thru 14-20	1
14-21 thru 14-25	0
14-26	1
14-27 thru 14-31	0
14-32	1
14-33 thru 14-37	0
14-38 Blank	0
15-1	0
15-2 thru 15-5	1
15-6 thru 15-11	0
15-12	1
15-12.1 Added	1
15-12.2 Blank Added	1
15-13	1
15-14	0
15-15 thru 15-19	1
15-20	0
15-21 and 15-22	1
15-23 and 15-24	0
15-25 and 15-26	1
15-27 and 15-28	0
15-29 and 15-30	1
15-31 and 15-32	0
15-33 and 15-34	1
15-35	0
15-36 thru 15-45	1
15-46	0
15-47 and 15-48	1
15-48.1 Added	1
15-48.2 Blank Added	1
15-49 and 15-50	0
15-51 and 15-52	1
15-52.1 Added	1
15-52.2 Blank Added	1
15-53	1
15-54	0
15-55	1
15-56	0
15-57	1
15-58 thru 15-62	0
15-63	1
15-64 thru 15-67	0
15-68	1
15-69 and 15-70	0
15-70.1 Added	1
15-70.2 Blank Added	1
15-71 and 15-72	0
15-72.1 Added	1
15-72.2 Blank Added	1
15-73	1
15-74 and 15-75	0
15-76	1
15-77 thru 15-79	0
15-80	1
15-80.1 Added	1
15-80.2 Blank Added	1
15-81	1
15-82 and 15-83	0
15-84	1
15-85 thru 15-101	0
15-102 and 15-103	1
15-104 thru 15-115	0
15-116	1
15-116.1 thru 15-116.5 Added	1
15-116.6 Blank Added	1
15-117 and 15-122	1
15-122.1 Added	1
15-122.2 Blank Added	1
15-123	1
15-124	0
15-124.1 and 15-124.2 Added	1
15-125 thru 15-129	1
15-130 Blank	0
16-1 thru 16-18	0
16-19 thru 16-21	1
16-22	0
16-23	1
16-24 thru 16-26	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.
16-27 and 16-28	1
16-28.1 and 16-28.2 Added	1
16-29 and 16-30	1
16-31	0
16-32	1
16-32.1 Added	1
16-32.2 Blank Added	1
16-33 and 16-34	0
16-35 and 16-36	1
16-36.1 Added	1
16-36.2 Blank Added	1
16-37 and 16-38	0
16-39 and 16-40	1
16-40.1 thru 16-40.3 Added	1
16-40.4 Blank Added	1
16-41 and 16-42	1
17-1 thru 17-7	1
17-8 Blank	1
17-9 thru 17-11 Deleted	1
17-12 Blank Deleted	1
18-1 thru 18-27	1
18-28 Blank	1
18-29 thru 18-123 Deleted	1
18-124 Blank Deleted	1
19-1 and 19-2	1
19-3	0
19-4 thru 19-6	1
19-7	0
19-8 thru 19-15	1
19-16	0
19-17	1
19-18 Blank	0
20-1 and 20-2	1
20-3 and 20-4	0
20-5 and 20-6	1
20-7 thru 20-10	0
20-11	1
20-12 thru 20-39	0
20-40	1
20-41 thru 20-49	0
20-50	1
20-51 thru 20-57	0
20-58	1
20-59 and 20-60	0
21-1 thru 21-9	0
21-10 and 21-11	1
21-12 thru 21-77	0
21-78 Blank	0
22-1	0
22-2 thru 22-9	1
22-10 thru 22-22	0
23-1	0
23-2 and 23-3	1
23-4 thru 23-6	0
23-7	1
23-8 thru 23-12	0
23-13 thru 23-15	1
23-16	0
23-17 thru 23-19	1
23-20 Blank	0
24-1	0
24-2 and 24-3	1
24-4 thru 24-6	0
24-7	1
24-8 thru 24-12	0
24-13 thru 24-15	1
24-16	0
24-17 thru 24-19	1
24-20 Blank	0
A-1	0
A-2	1
A-3 and A-4	0
B-1 thru B-5	0
B-6 Blank	0
C-1 thru C-8	1
D-1 thru D-3	0
D-4 and D-5	1
D-6 thru D-19	0
D-20 thru D-23	1
D-24 thru D-31	0
D-32	1
D-33	0
D-34 thru D-39	1
D-40 thru D-66	0
D-67 and D-68	1
D-69 thru D-71 Added	1
D-72 Blank Added	1
E-1 thru E-8	0
F-1	0
F-2 thru F-12	1
G-1	1
G-2 Blank	0
H-1 thru H-4 Added	1
INDEX-1 thru INDEX-10	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	0
FO-1 FP-22 Blank	0
FO-1 FP-23	1
FO-1 FP-24 Blank	0
FO-1 FP-25	0
FO-1 FP-26 Blank	0
FO-1 FP-27	1
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
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

* Zero in this column indicates an original page.

LIST OF EFFECTIVE PAGES (CONT)

Insert latest changed pages. Destroy superseded pages.

Page No.	*Change No.	Page No.	*Change No.	Page No.	*Change No.
FO-1 FP-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	0				
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-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-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				

* Zero in this column indicates an original page.

TECHNICAL MANUAL
NO. 9-2320-365-34-1

TECHNICAL ORDER
NO. 36A12-1B-1095-12-1

HEADQUARTERS
DEPARTMENTS OF THE ARMY
AND THE AIR FORCE

Washington, D.C., 17 June 1998

Direct Support and General Support Maintenance Manual

M1078 SERIES, 2 1/2-TON, 4 x 4, LIGHT MEDIUM TACTICAL VEHICLES (LMTV)

VOLUME NO. 1 OF 2

MODEL	NSN	EIC
TRK, CAR., LMTV, M1078		
W/WN	**2320-01-360-1898**	**BHH**
W/O WN	**2320-01-354-3385**	**BHD**
TRK, VAN, LMTV, M1079		
W/WN	**2320-01-360-1891**	**BHG**
W/O WN	**2320-01-354-3384**	**BHE**
TRK, CHAS, LMTV, M1080		
W/O WN	**2320-01-353-9098**	**BHC**
TRK, CAR., LMTV, AIR DROP, M1081		
W/WN	**2320-01-360-1899**	**BHJ**
W/O WN	**2320-01-355-3064**	**BHF**

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this publication. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Submit your DA Form 2028 (Recommended Changes to Equipment Technical Publications), through the Internet, on the Army Electronic Product Support (AEPS) website. The Internet address is http://aeps.ria.army.mil. If you need a password, scroll down and click on "ACCESS REQUEST FORM". The DA Form 2028 is located in the ONLINE FORMS PROCESSING section of the AEPS. Fill out the form and click on SUBMIT. Using this form on the AEPS will enable us to respond quicker to your comments and better manage the DA Form 2028 program. You may also mail, fax or Email your letter or DA Form 2028 direct to: AMSTA-LC-CI/TECH PUBS, TACOM-RI, 1 Rock Island Arsenal, Rock Island, IL 61299-7630. The email address is TACOM-TECH-PUBS@ria.army.mil. The fax number is DSN 793-0726 or Commercial (309) 782-0726.

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

TABLE OF CONTENTS

Page

HOW TO USE THIS MANUAL vii

CHAPTER 1 INTRODUCTION 1-1
Section I General Information 1-1
Section II Equipment Description and Data 1-6
Section III Principles of Operation 1-7

TABLE OF CONTENTS (CONT)

Page

CHAPTER 2 VEHICLE MAINTENANCE 2-1

Section I Repair Parts, Special Tools and Test, Measurement and Diagnostic Equipment . . 2-1
Section II Service Upon Receipt. 2-2
Section III Troubleshooting Instructions 2-6
Section IV Maintenance Procedures 2-983

CHAPTER 3 ENGINE MAINTENANCE 3-1

Section I Introduction 3-1
Section II Maintenance Procedures 3-2

CHAPTER 4 FUEL SYSTEM MAINTENANCE 4-1

Section I Introduction 4-1
Section II Maintenance Procedures 4-2

CHAPTER 5 COOLING SYSTEM MAINTENANCE 5-1
Section I Introduction 5-1
Section II Maintenance Procedures 5-2

CHAPTER 6 ELECTRICAL SYSTEM MAINTENANCE 6-1
Section I Introduction 6-1
Section II Maintenance Procedures 6-2

CHAPTER 7 TRANSMISSION MAINTENANCE 7-1

Section I Introduction 7-1
Section II Maintenance Procedures 7-2

CHAPTER 8 POWER TRANSFER AND FINAL DRIVE ASSEMBLY MAINTENANCE 8-1
Section I Introduction 8-1
Section II Maintenance Procedures 8-2

CHAPTER 9 FRONT AXLE MAINTENANCE 9-1

Section I Introduction 9-1
Section II Maintenance Procedures 9-2

CHAPTER 10 REAR AXLE MAINTENANCE 10-1

Section I Introduction 10-1
Section II Maintenance Procedures 10-2

Page

CHAPTER 11 BRAKE SYSTEM MAINTENANCE 11-1
Section I Introduction 11-1
Section II Maintenance Procedures 11-2

CHAPTER 12 STEERING SYSTEM MAINTENANCE 12-1
Section I Introduction 12-1
Section II Maintenance Procedures 12-2

CHAPTER 13 FRAME MAINTENANCE 13-1
Section I Introduction 13-1
Section II Maintenance Procedures 13-2

CHAPTER 14 SUSPENSION MAINTENANCE 14-1
Section I Introduction 14-1
Section II Maintenance Procedures 14-2

CHAPTER 15 BODY AND CAB MAINTENANCE 15-1
Section I Introduction 15-1
Section II Maintenance Procedures 15-2

CHAPTER 16 11K SELF-RECOVERY WINCH (SRW) MAINTENANCE 16-1
Section I Introduction 16-1
Section II Maintenance Procedures 16-2

CHAPTER 17 HYDRAULIC SYSTEM MAINTENANCE 17-1
Section I Introduction 17-1
Section II Maintenance Procedures 17-2

CHAPTER 18 KIT MAINTENANCE 18-1
Section I Introduction 18-1
Section II Maintenance Procedures 18-2

CHAPTER 19 ARMAMENT/SIGHTING AND FIRE CONTROL MATERIAL MAINTENANCE 19-1
Section I Introduction 19-1
Section II Maintenance Procedures 19-2

CHAPTER 20 ENGINE MAINTENANCE 20-1
Section I Introduction 20-1
Section II Maintenance Procedures 20-2

CHAPTER 21 TRANSMISSION MAINTENANCE 21-1
Section I Introduction 21-1
Section II Maintenance Procedures 21-2

TABLE OF CONTENTS (CONT)

Page

CHAPTER 22 POWER TRANSFER AND DRIVE ASSEMBLY MAINTENANCE 22-1

Section I Introduction 22-1
Section II Maintenance Procedures 22-2

CHAPTER 23 FRONT AXLE MAINTENANCE 23-1
Section I Introduction 23-1
Section II Maintenance Procedures 23-2

CHAPTER 24 REAR AXLE MAINTENANCE 24-1
Section I Introduction 24-1
Section II Maintenance Procedures 24-2

APPENDIXES
A. REFERENCES A-1
B. TOOLS AND SPECIAL TOOLS LIST B-1
C. EXPENDABLE AND DURABLE ITEMS LIST C-1
D. ILLUSTRATED LIST OF MANUFACTURED ITEMS D-1
E. TORQUE LIMITS E-1
F. MANDATORY REPLACEMENT PARTS F-1
G. ADDITIONAL AUTHORIZATION LIST (AAL) G-1
H. TRANSMISSION/TRANSMISSION CONTROLS ADAPTABILITY CHART H-1

SUBJECT INDEX Index-1
GLOSSARY Glossary-1

LIST OF ILLUSTRATIONS

Figure	Title	Page
1-1	M1078 Truck, Cargo: 2 1/2-Ton, 4x4, Dropside	1-2
1-2	M1079 Truck, Van: 2 1/2-Ton, 4x4	1-3
1-3	M1080 Truck, Chassis: 2 1/2-Ton, 4x4	1-4
1-4	M1081 Truck, Cargo: 2 1/2-Ton, 4x4, Air Drop	1-5
1-5	Powertrain	1-7
1-6	Engine Air Intake System	1-9
1-7	Fuel System	1-10
1-8	Cooling System	1-12
1-9	Electrical System	1-14
1-10	Engine Starting System	1-15
1-11	Service Lighting System	1-16
1-12	Blackout Lighting System	1-17
1-13	Instrument Panel	1-18
1-14	Troubleshooting Aid	1-19
1-15	Brake System	1-20
1-16	Steering System	1-22
1-17	11K Self-Recovery Winch (SRW)	1-23
1-18	Air Transportability Hydraulic System	1-24
1-19	Air System	1-26
D-1	Brake Adjusting Tool Support	D-5
D-2	Brake Plunger Seal Driver	D-6
D-3	Cab Front Support Spanner Socket	D-7
D-4	Cab Maintenance Stand Angle Brackets and Straight Braces	D-9

LIST OF ILLUSTRATIONS (CONT)

Figure	Title	Page
D-5	Cab Maintenance Stand Base Angle Bracket Locations	D-10
D-6	Cab Maintenance Stand Base Fabrication	D-11
D-7	Cab Maintenance Stand Brace Bracket Locations	D-12
D-8	Cab Maintenance Stand Brace to Base Assembly	D-13
D-9	Cab Maintenance Stand Side Braces Side View	D-14
D-10	Cab Maintenance Stand Assembly	D-15
D-11	Cab Support Tool Strut and Cab Rest	D-16
D-12	Cab Support Tool Seat	D-17
D-13	Cab Support Tool Seat Layout	D-18
D-14	Cab Support Tool Assembly	D-19
D-15	Engine Stand Bracket Assembly	D-20
D-16	Engine Stand Bracket Front Plate	D-21
D-17	Engine Stand Bracket Rear Plate	D-22
D-18	Engine Stand Bracket Side Plates	D-23
D-19	Headlight Adjustment Screen	D-24
D-20	Machine Gun Ring Drill Stop	D-25
D-21	Main Valve Body Spring Compression Tool	D-26
D-22	Spanner Socket Tool	D-27
D-23	Spanner Wrench Tool Assembly	D-28
D-24	Spanner Wrench Jaw	D-29
D-25	Spanner Wrench Handle Piece	D-29
D-26	Spreader Bar Layout	D-30
D-27	Spreader Bar Assembly	D-31
D-28	Steering Stop Shim Gage	D-32
D-29	Transfer Case Lift Bracket Assembly	D-33
D-30	Transfer Case Lift Bracket Main Mounting Bracket	D-34
D-31	Transfer Case Bracket Bolt Mounting Bracket	D-35
D-32	Transfer Case Lift Bracket Lifting Bracket	D-36
D-33	Transfer Case Lift Bracket Center Support Plate	D-37
D-34	Transfer Case Lift Bracket Lifting Plate Braces	D-38
D-35	Transfer Case Lift Bracket Bolt Mounting Bracket Supports	D-39
D-36	Transmission Lift and Mounting Bracket Assembly	D-40
D-37	Transmission Lift and Mounting Bracket Bottom Plate	D-41
D-38	Transmission Lift and Mounting Bracket Side Plates	D-42
D-39	Transmission Lift and Mounting Bracket Top Plate	D-43
D-40	Transmission Lift and Mounting Bracket Top and Bottom Braces	D-44
D-41	Transmission Lift and Mounting Bracket Side Supports	D-45
D-42	Transmission Lift and Mounting Bracket Bolt Mounting Plates	D-46
D-43	Transmission Lift Bracket Assembly	D-47
D-44	Lower Lift Bracket	D-48
D-45	Upper Lift Bracket	D-49
D-46	Battery 12V Cable Assembly	D-51
D-47	Battery Ground Cable Assembly	D-53
D-48	Battery 24V Cable Assembly	D-54
D-49	Lanyard Assembly	D-60
D-50	Wooden Skid	D-61
D-51	CTIS Seal Driver	D-63
D-52	Front Axle Shaft Seal Driver	D-64
D-53	Wheel Hub Grease Seal Driver	D-65
D-54	Differential Pinion Seal Driver	D-66

LIST OF ILLUSTRATIONS (CONT)

Figure	Title	Page
D-55	Front and Rear Differential Yoke Seal Driver	D-67
D-56	Purge Valve Tool	D-69

LIST OF TABLES

Number	Title	Page
2-1	Vehicle Troubleshooting	2-7
2-2	Engine System Fault Index	2-13
2-3	Cooling System Fault Index	2-65
2-4	Transmission System Fault Index	2-73
2-4.1	C3 Pressure Switch	2-565
2-4.2	C3 Pressure Switch	2-579
2-4.3	C3 Pressure Switch	2-588.1
2-4.4	C3 Pressure Switch	2-943
2-4.5	C3 Pressure Switch	2-957
2-5	Wheel Fault Index	2-959
2-6	Hydraulic System Fault Index	2-963
2-7	Steering Fault Index	2-969
2-8	11K Self-Recovery Winch (SRW) Fault Index	2-975
3-1	Crankshaft Positions for Valve Clearance Setting	3-101
3-2	Valve Clearances	3-103
3-3	Valve Clearance Ranges	3-103
4-1	Crankshaft Position	4-20
7-1	Torque Converter Shim Chart	7-14
7-2	Torque Converter End Play Shim Chart	7-16
20-1	Valve Specifications	20-12
20-2	Valve Spring Specifications	20-13
20-3	Valve Seat Insert Specifications	20-14
20-4	Cylinder Head Surface Flatness	20-15
20-5	Crankshaft Main Bearing Journal Diameter	20-33
20-6	Crankshaft Connecting Rod Journal Diameter	20-33
20-7	Piston/Piston Ring Clearances	20-45
20-8	Camshaft Minimum Lobe Lift	20-54
21-1	Selective Spacer Chart	21-12
23-1	Pinion Bearing Preload Chart	23-13
23-2	Pinion Cone Variation Chart	23-16
24-1	Pinion Bearing Preload Chart	24-13
24-2	Pinion Cone Variation Chart	24-16
D-1	Pneumatic Tube Lengths	D-56
D-2	Non-Metallic Electrical Cable Conduit Lengths	D-58
E-1	Dry Torque Limits for SAE and ANSI Screws and Free Spinning Nuts	E-2
E-2	Dry Torque Limits for SAE and ANSI Prevailing Torque Nuts	E-4
E-3	Dry Torque Limits for Metric Screws and Free Spinning Nuts	E-5
E-4	Dry Torque Limits for Metric Prevailing Torque Nuts	E-6
E-5	Wet Torque Limits for SAE and ANSI Screws and Free Spinning Nuts	E-7

HOW TO USE THIS MANUAL

OVERVIEW

This Technical Manual (TM) is provided to help you maintain the LMTV 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 LMTV. Volume 2 contains the DS and 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 LMTV 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 LMTV 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 LMTV.
- **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 the support of the LMTV.
- **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 and Volume 2 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 troubleshooting or maintenance procedure.

OVERVIEW (CONT)

- **TABLE OF CONTENTS.** Lists the chapters, sections, appendixes, and indexes with page numbers in order of appearance.

DIRECT SUPPORT MAINTENANCE

- **MAINTENANCE PROCEDURES.** DS and GS Maintenance procedures to assist you in supporting the LMTV. Chapters 3 through 19 are Direct Support Maintenance procedures. General Support Maintenance procedures are contained in chapters 20 through 24. Become familiar with the entire maintenance procedure before beginning any maintenance task.

- **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, REAR AXLE MAINTENANCE**
- **CHAPTER 11, BRAKE SYSTEM MAINTENANCE**
- **CHAPTER 12, STEERING SYSTEM MAINTENANCE**
- **CHAPTER 13, FRAME MAINTENANCE**
- **CHAPTER 14, SUSPENSION MAINTENANCE**
- **CHAPTER 15, BODY AND CAB MAINTENANCE**
- **CHAPTER 16, 11K SELF-RECOVERY WINCH (SRW) MAINTENANCE**
- **CHAPTER 17, HYDRAULIC SYSTEM MAINTENANCE**
- **CHAPTER 18, KIT MAINTENANCE**
- **CHAPTER 19, ARMAMENT/SIGHTING AND FIRE CONTROL MATERIEL MAINTENANCE**

GENERAL SUPPORT MAINTENANCE

- **CHAPTER 20, ENGINE MAINTENANCE**
- **CHAPTER 21, TRANSMISSION MAINTENANCE**

GENERAL SUPPORT MAINTENANCE (CONT)

- **CHAPTER 22, POWER TRANSFER AND FINAL DRIVE ASSEMBLY MAINTENANCE**
- **CHAPTER 23, FRONT AXLE MAINTENANCE**
- **CHAPTER 24, REAR AXLE MAINTENANCE**
- **APPENDIX A, REFERENCES.** Lists publications used with the LMTV 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 LMTV.
- **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 the support of the LMTV.
- **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.

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 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

Page

Section I. GENERAL INFORMATION 1-1
1-1. SCOPE 1-1
1-2. MAINTENANCE FORMS, RECORDS, AND REPORTS 1-6
1-3. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE 1-6
1-4. OFFICIAL NOMENCLATURE, NAMES AND DESIGNATIONS 1-6
1-5. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR) 1-6
1-6. WARRANTY INFORMATION 1-6

Section II. EQUIPMENT DESCRIPTION AND DATA 1-6
1-7. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES 1-6
1-8. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS 1-7
1-9. DIFFERENCES BETWEEN MODELS 1-7

Section III. PRINCIPLES OF OPERATION 1-7
1-10. POWERTRAIN 1-7
1-11. ENGINE AIR INTAKE SYSTEM 1-9
1-12. FUEL SYSTEM 1-10
1-13. COOLING SYSTEM 1-12
1-14. ELECTRICAL SYSTEM 1-14
1-15. BRAKE SYSTEM 1-20
1-16. STEERING SYSTEM 1-22
1-17. 11K SELF-RECOVERY WINCH (SRW) 1-23
1-18. AIR TRANSPORTABILITY HYDRAULIC SYSTEM 1-24
1-19. AIR SYSTEM 1-26

Section I. GENERAL INFORMATION

1-1. SCOPE

This chapter provides general information, equipment description, and principles of operation for the M1078 series Light Medium Tactical Vehicle (LMTV). The LMTV will herein be referred to as the vehicle.

a. Type of Manual: Direct Support Maintenance and General Support Maintenance Instructions, TM 9-2320-365-34-1.

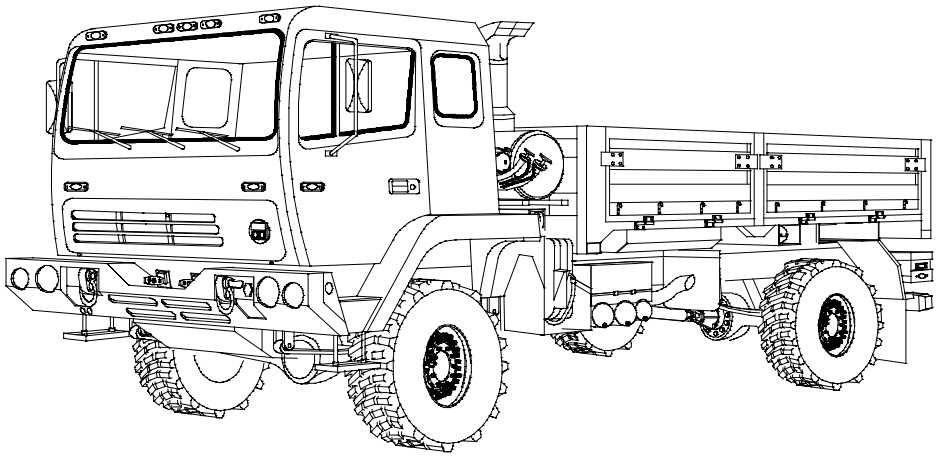
b. Model Numbers and Equipment Names. The vehicle model numbers and names are listed below:

M1078 Truck, Cargo: 2 1/2-Ton, 4x4, Dropside (Figure 1-1).
M1079 Truck, Van: 2 1/2-Ton, 4x4 (Figure 1-2).
M1080 Truck, Chassis: 2 1/2-Ton, 4x4 (Figure 1-3).
M1081 Truck, Cargo: 2 1/2-Ton, 4x4, Dropside, AIR DROP (Figure 1-4).

c. Purpose of Equipment. The LMTV series is a family of 4x4 wheeled vehicles. The purpose of these vehicles is as follows:

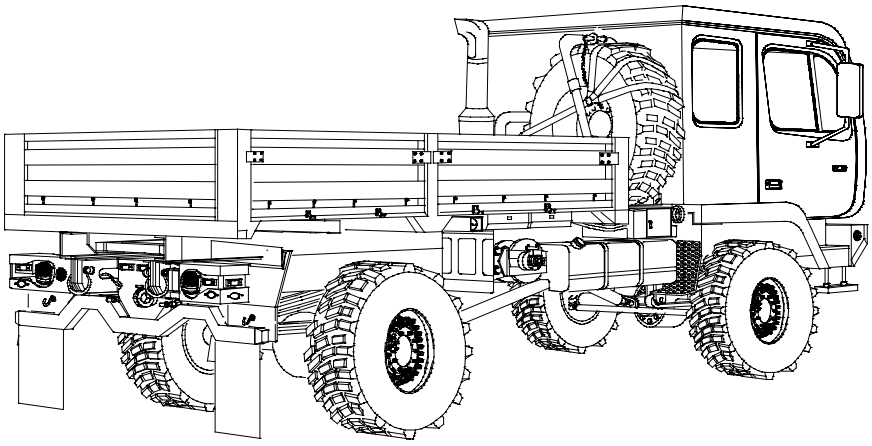
(1) M1078 - Cargo hauling vehicle; can be outfitted for troop transport when equipped with a troopseat kit.
(2) M1079 - Van; can be outfitted with commumications equipment or shop equipment.
(3) M1080 - Vehicle chassis; this chassis will accept a cargo bed or may be modified for special missions.
(4) M1081 - Cargo hauling vehicle; can be airdropped and outfitted for troop transport when equipped with a troopseat kit.

1-1. SCOPE (CONT)



5A010011

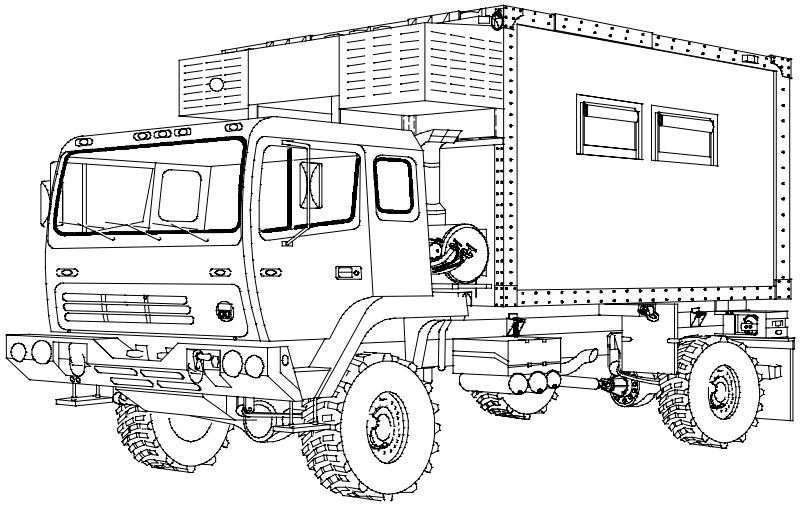
LEFT FRONT VIEW



5A010021

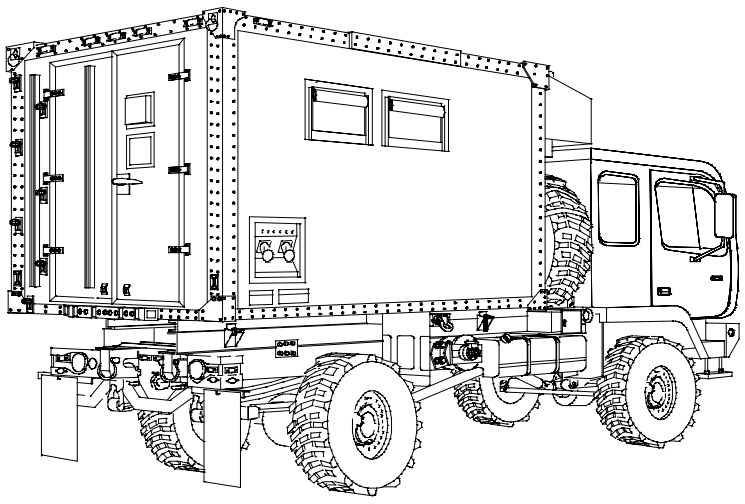
RIGHT REAR VIEW

Figure 1-1. M1078 Truck, Cargo: 2 1/2-Ton, 4x4, Dropside



5A010031

LEFT FRONT VIEW

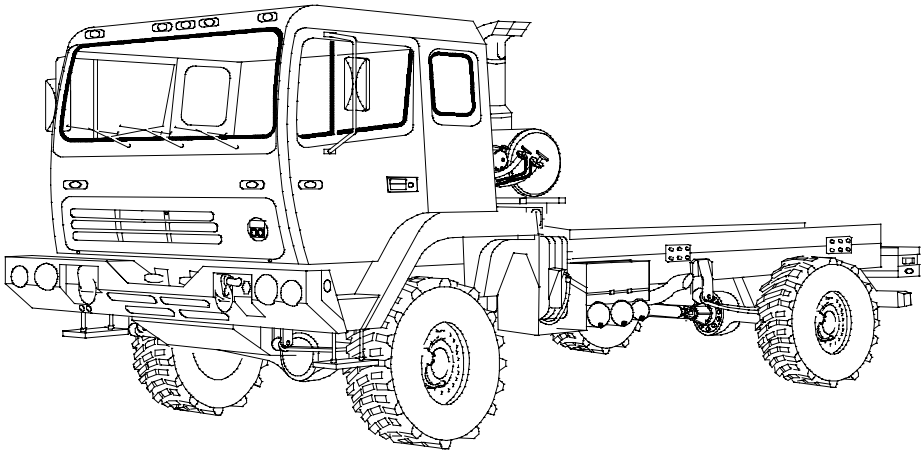


5A010041

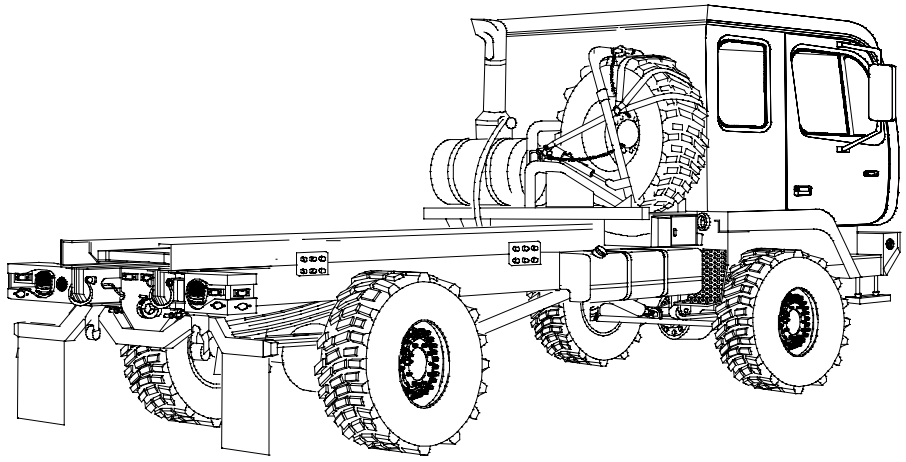
RIGHT REAR VIEW

Figure 1-2. M1079 Truck, Van: 2 1/2 Ton, 4x4

1-1. SCOPE (CONT)

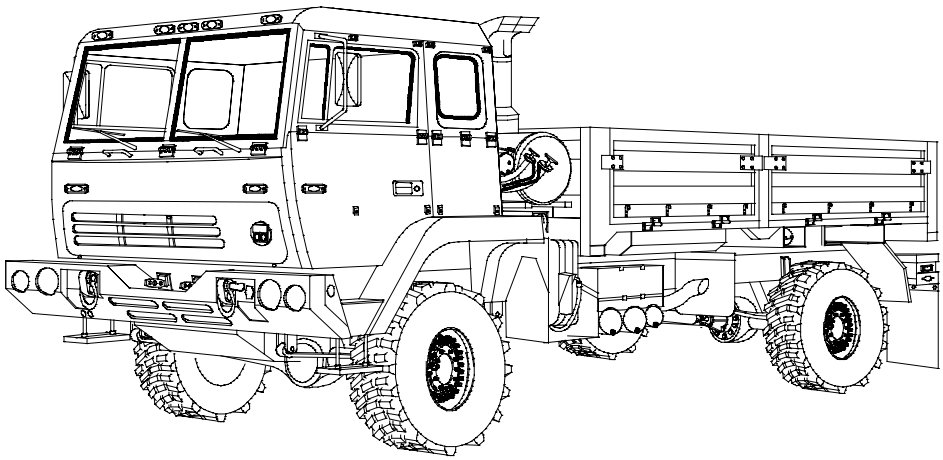


LEFT FRONT VIEW



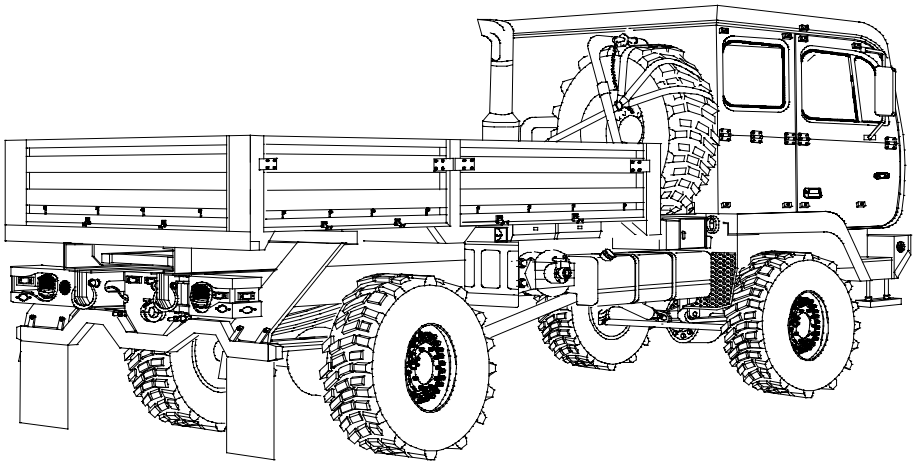
RIGHT REAR VIEW

Figure 1-3. M1080 Truck, Chassis: 2 1/2-Ton, 4x4



5A010071

LEFT FRONT VIEW



5A010091

RIGHT REAR VIEW

Figure 1-4. M1081 Truck, Cargo: 2 1/2-Ton, 4x4, AIR DROP

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 M1078 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	Light Medium Tactical Vehicle (LMTV)

1-5. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your Light Medium Tactical Vehicle (LMTV) 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 M1078 Series Warranty Program Technical Bulletin, TB 9-2300-365-15, 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 9-2320-365-10 for equipment characteristics, capabilities, and features.

1-8. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

Refer to TM 9-2320-365-10 for location and description of major components.

1-9. DIFFERENCES BETWEEN MODELS

Refer to TM 9-2320-365-10 for differences between models.

Section III. PRINCIPLES OF OPERATION

1-10. POWERTRAIN

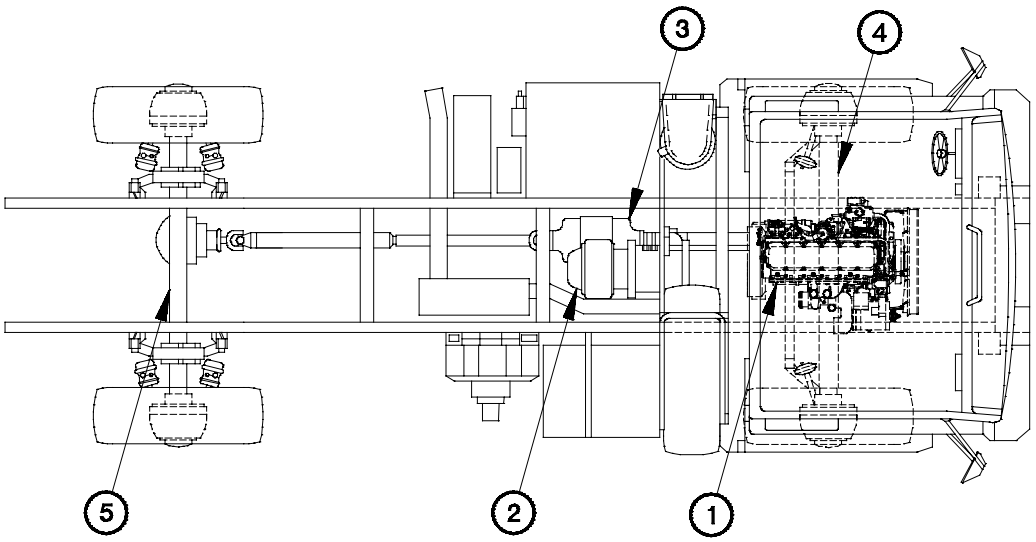


Figure 1-5. Powertrain

Power for the vehicle is provided by a diesel engine (1, Figure 1-5) 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 and 5) 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 a control module located directly beneath the transmission main housing; a Throttle Position Sensor (TPS) which detects the percentage of throttle being used; and engine, turbine, and output speed sensors which, in combination with each other, send information to the transmission ECU to provide the smoothest possible shifting and allow the transmission ECU to monitor overall transmission performance. Transmission shift control is provided by one of two types of pushbutton shift selectors: The WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) which contains an integral transmission ECU or the WTEC III Transmission Pushbutton Shift Selector (TPSS) which is coupled to an external transmission ECU.

1-10. POWERTRAIN (CONT)

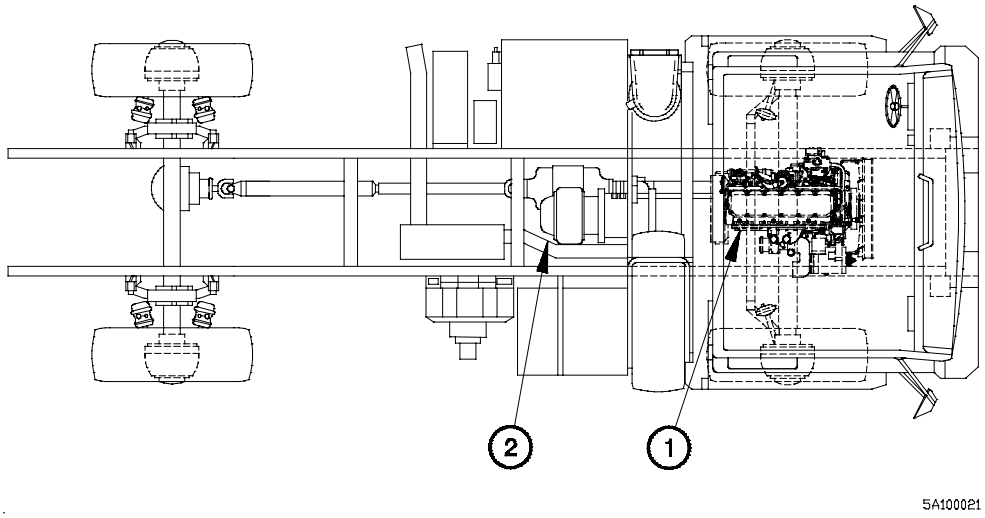


Figure 1-5. Powertrain (Cont)

a. Engine. The vehicle is equipped with a Caterpillar diesel engine, model 3116 ATAAC (Air-to Air After Cooler) (1, Figure 1-5), rated at 225 HP.

b. Transmission. The vehicle is equipped with an Allison automatic transmission, model MD3070PT (2, Figure 1-5). It is a fully automatic electronically controlled seven-speed close-ratio transmission.

(1) The TEPSS contains microprocessor based electronics, and is located in the instrument panel to the driver's left. The TPSS is located in the instrument panel to the driver's left, while the 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 TEPSS and 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 TEPSS and a fault is detected in the transmission controls, the TEPSS will emit an eight second series of beeps. When electrical power is applied to the TPSS and a fault is detected in the transmission controls, "--" will appear in the 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 9-2320-365-10 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 an 11K self-recovery winch (SRW).

c. Transfer Case. The transfer case (3, Figure 1-5) 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 and rear axles (4 and 5, Figure 1-5) 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

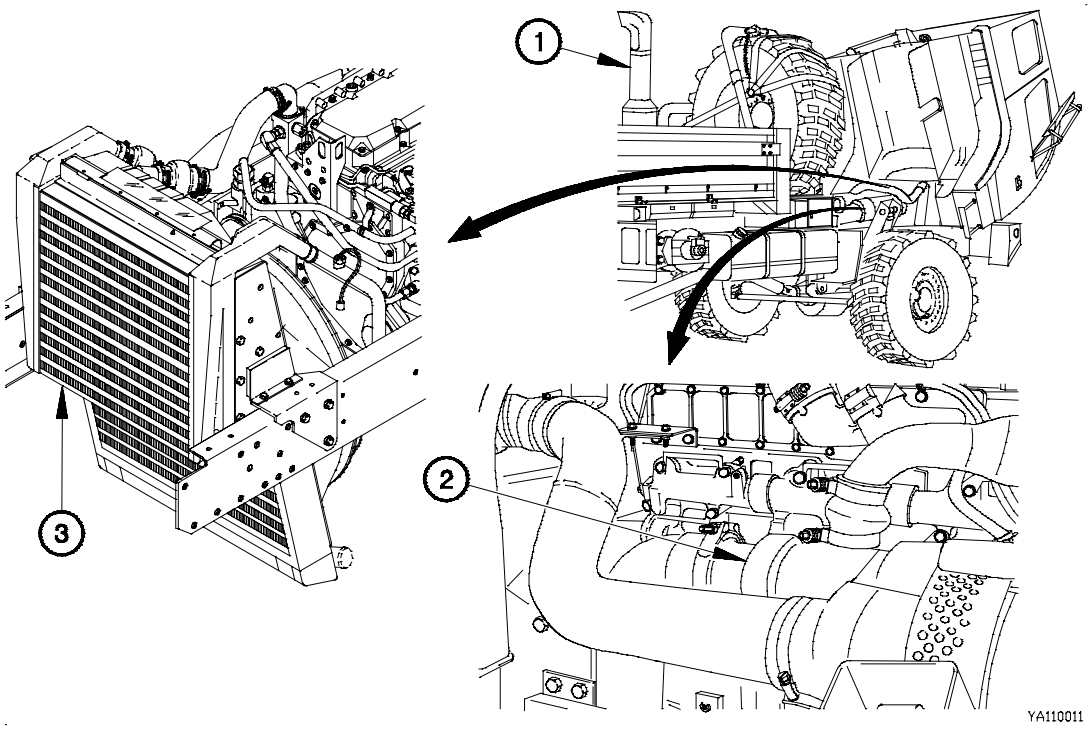


Figure 1-6. Engine Air Intake System

The engine air intake system consists of a dry-type air cleaner (1, Figure 1-6), 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

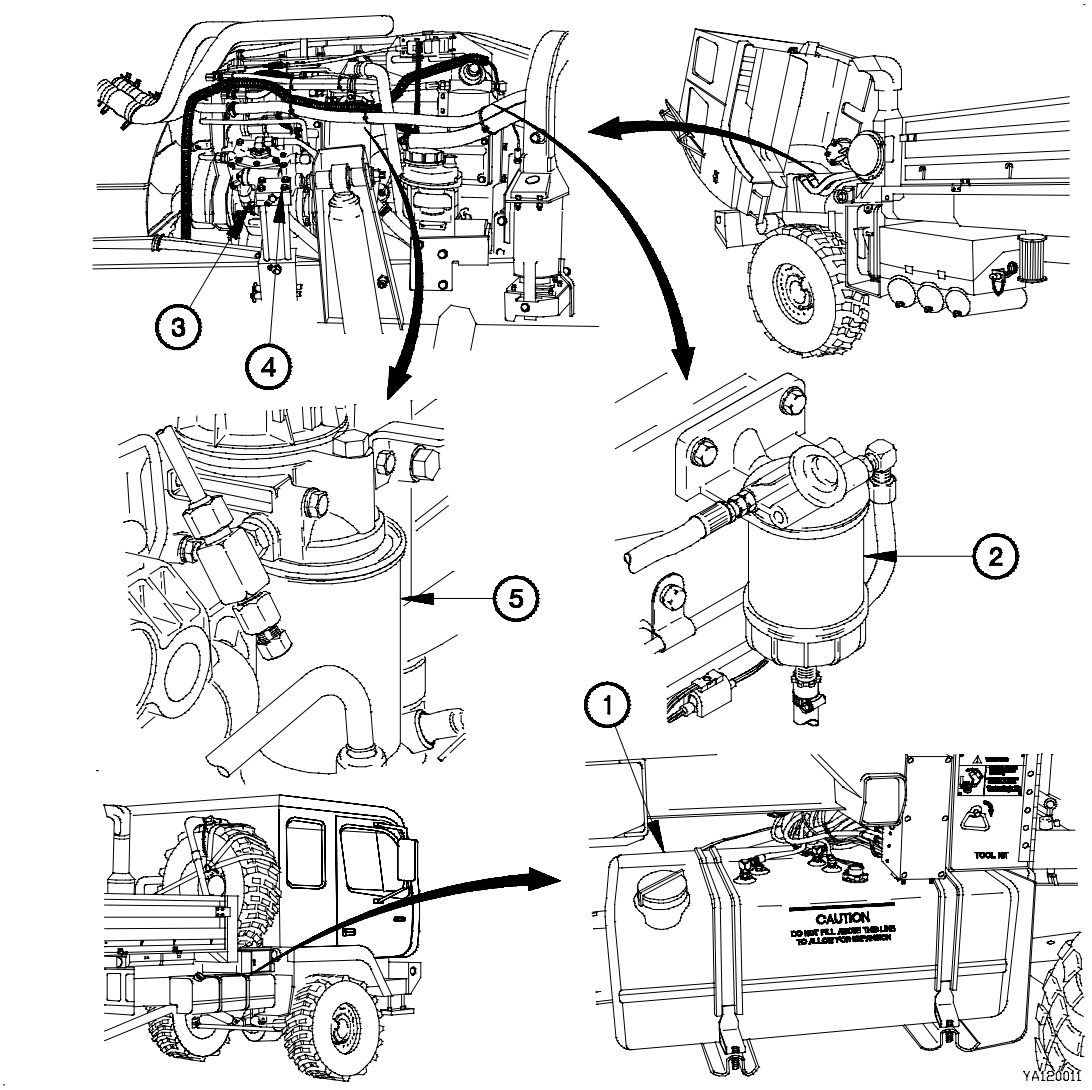


Figure 1-7. Fuel System

The primary components of the fuel system are the fuel tank (1, Figure 1-7), fuel priming pump and fuel/water separator (2), fuel shutoff solenoid (3), engine 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 engine fuel governor. The fuel shutoff solenoid, when energized, frees the governor output shaft to move to the FUEL ON position. When electrical power is removed from the fuel shutoff solenoid, the governor output shaft is locked in the FUEL OFF position. The engine fuel governor contains a mechanical link to the fuel control linkage and fuel transfer pump. The engine 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 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.

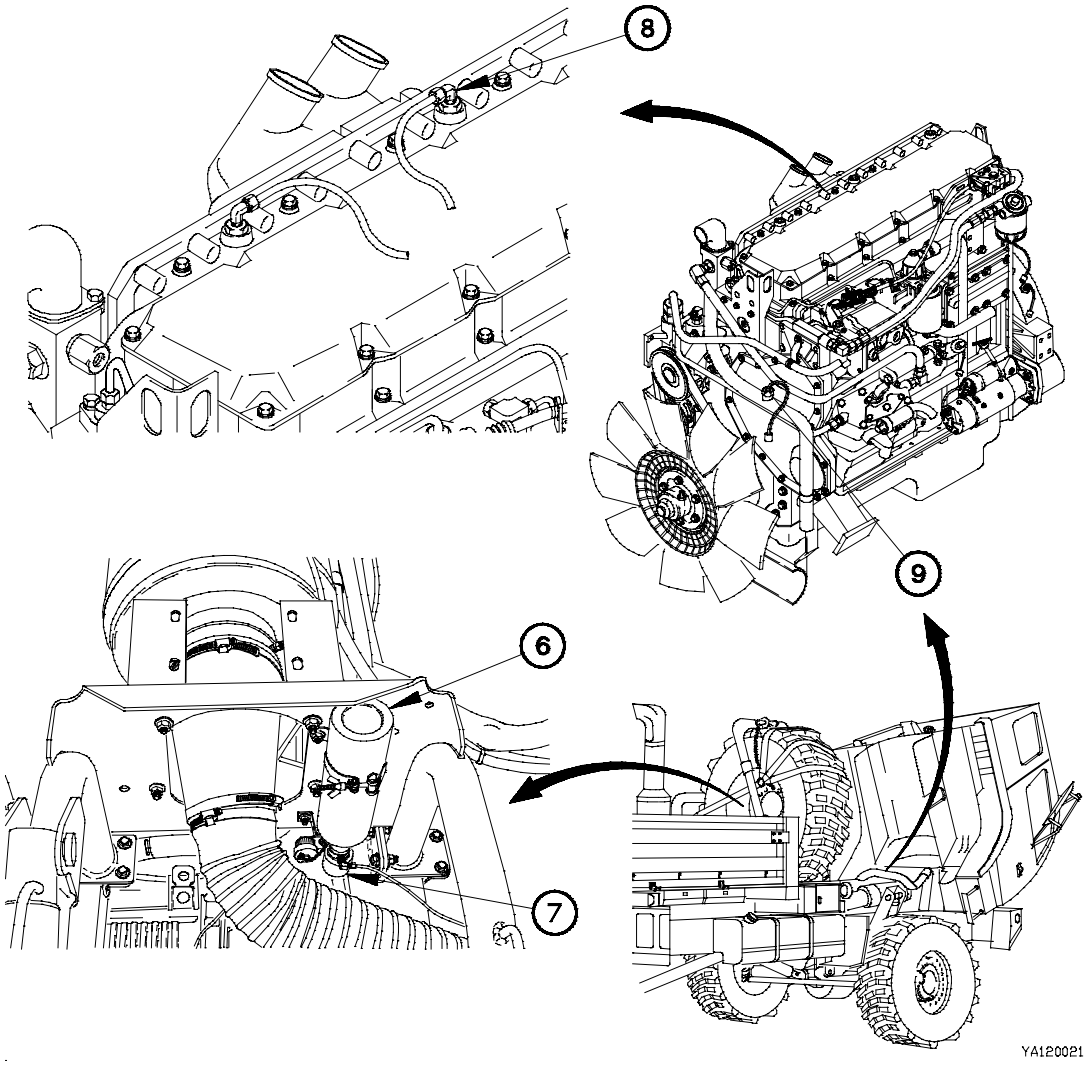


Figure 1-7. Fuel System (Cont)

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

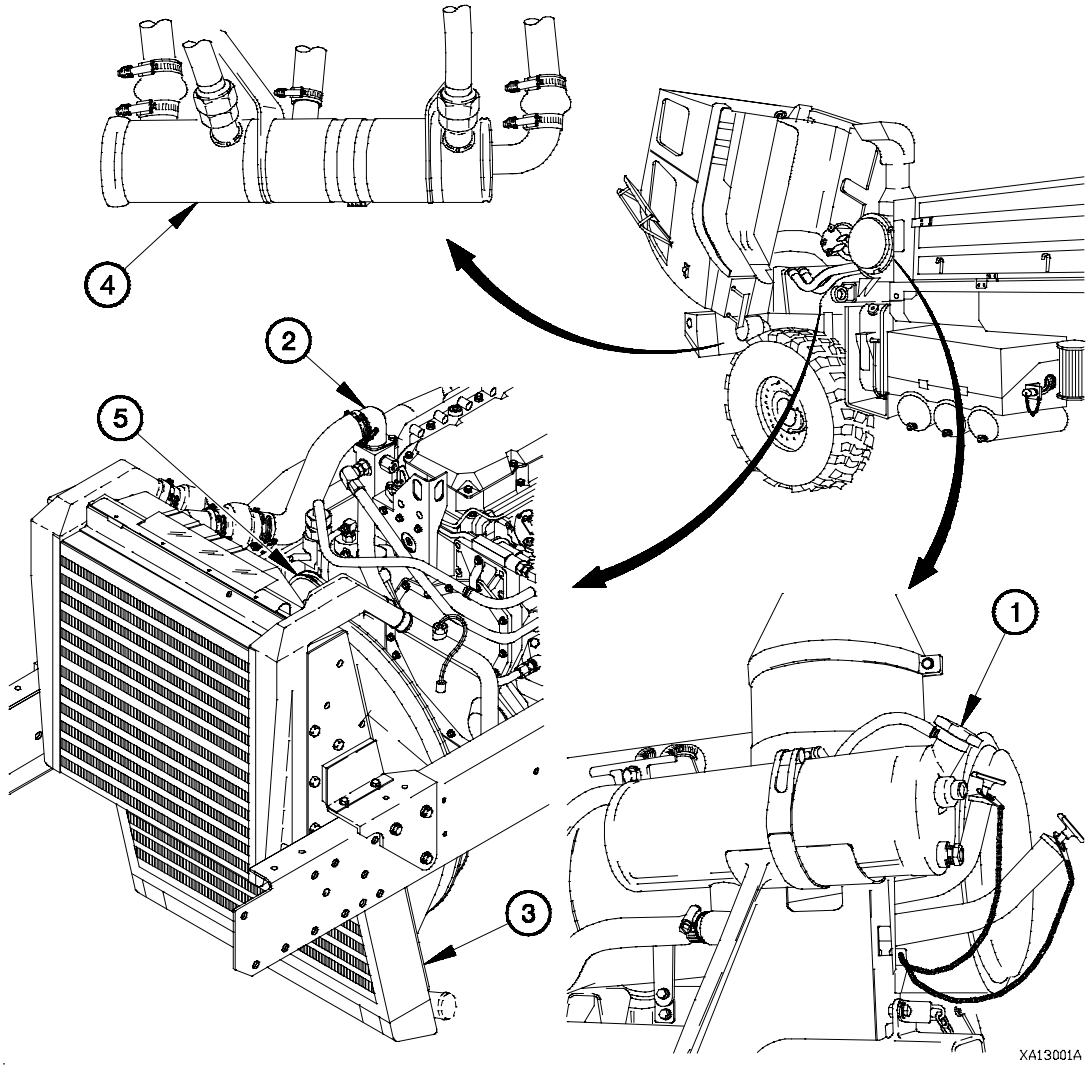


Figure 1-8. Cooling System

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 1-8), 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.

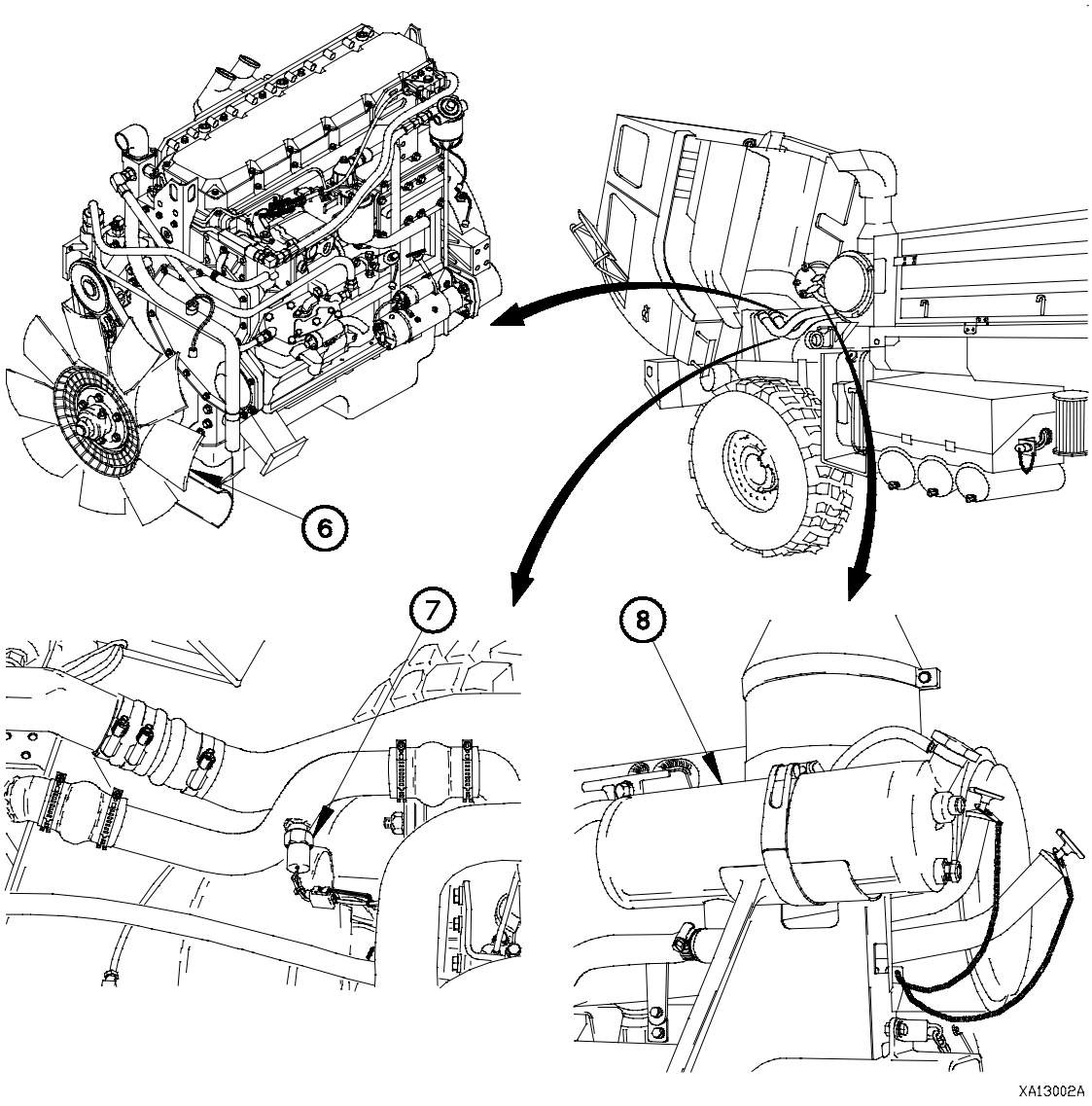


Figure 1-8. Cooling System (Cont)

An engine fan (6) with pneumatic clutch is activated by the water temperature switch (7). When this 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.

1-14. ELECTRICAL SYSTEM

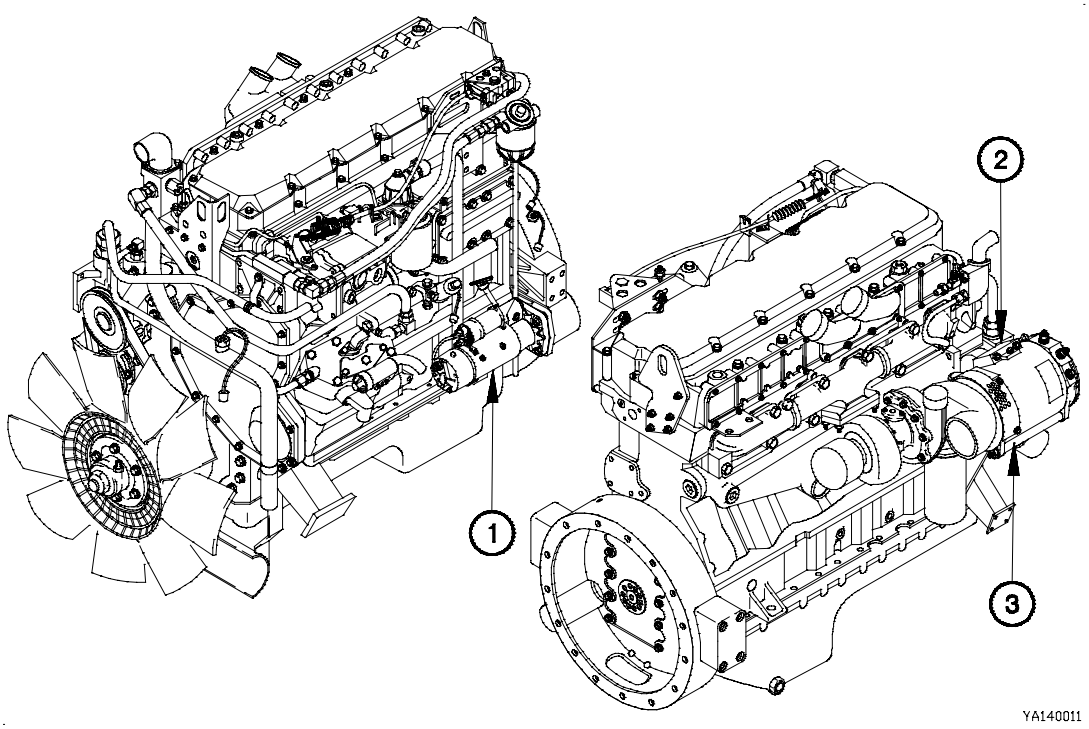


Figure 1-9. Electrical System

In the Electrical System, a heavy duty starting motor (1, Figure 1-9) 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
- Troubleshooting Aid

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.

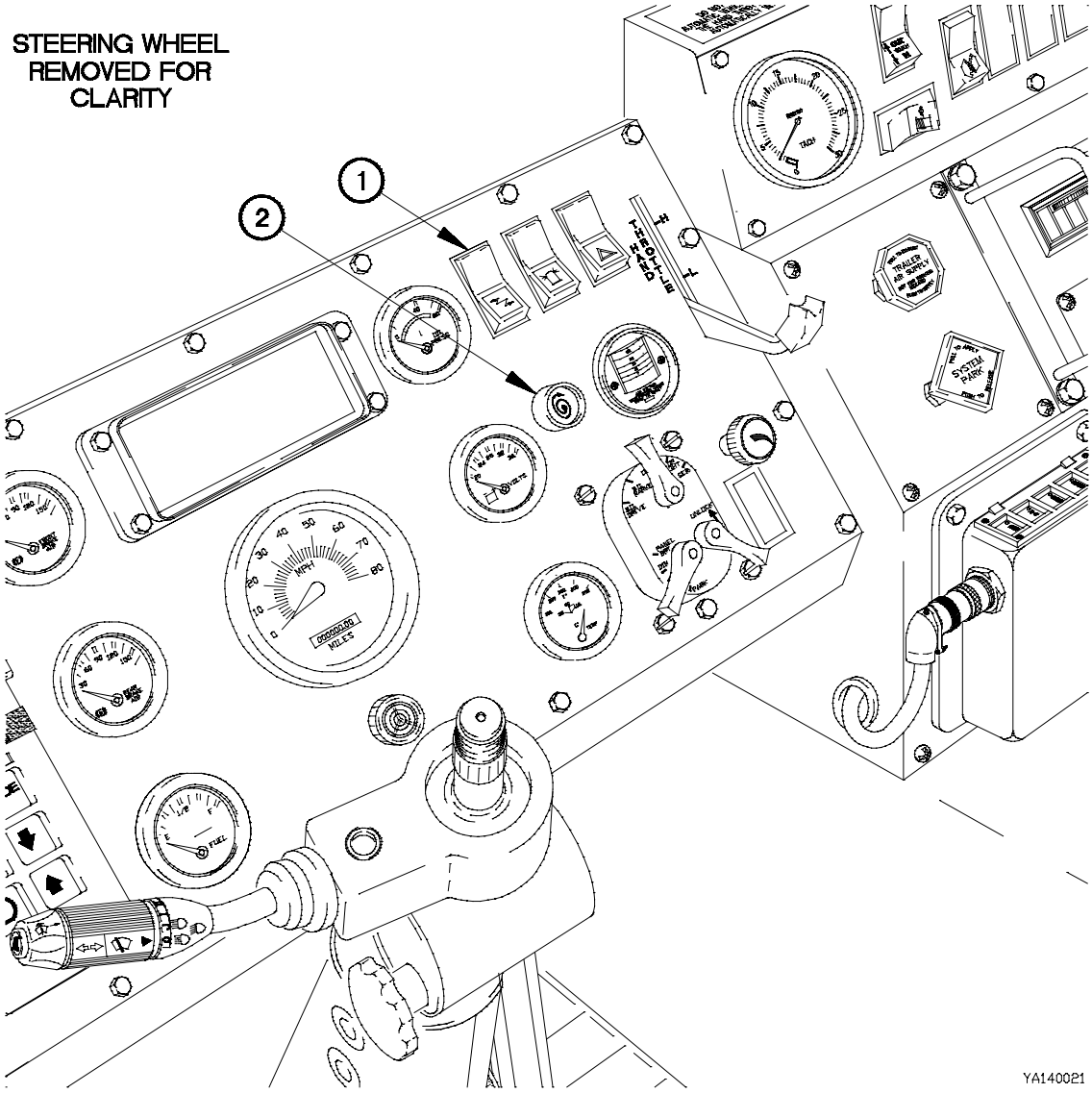


Figure 1-10. Engine Starting System.

b. Engine Starting and Stopping. The Engine Starting System uses the stored electrical energy of the batteries to turn the starting motor. When the master power switch (1, Figure 1-10) is positioned to on and the starter pushbutton (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.

1-14. ELECTRICAL SYSTEM (CONT)

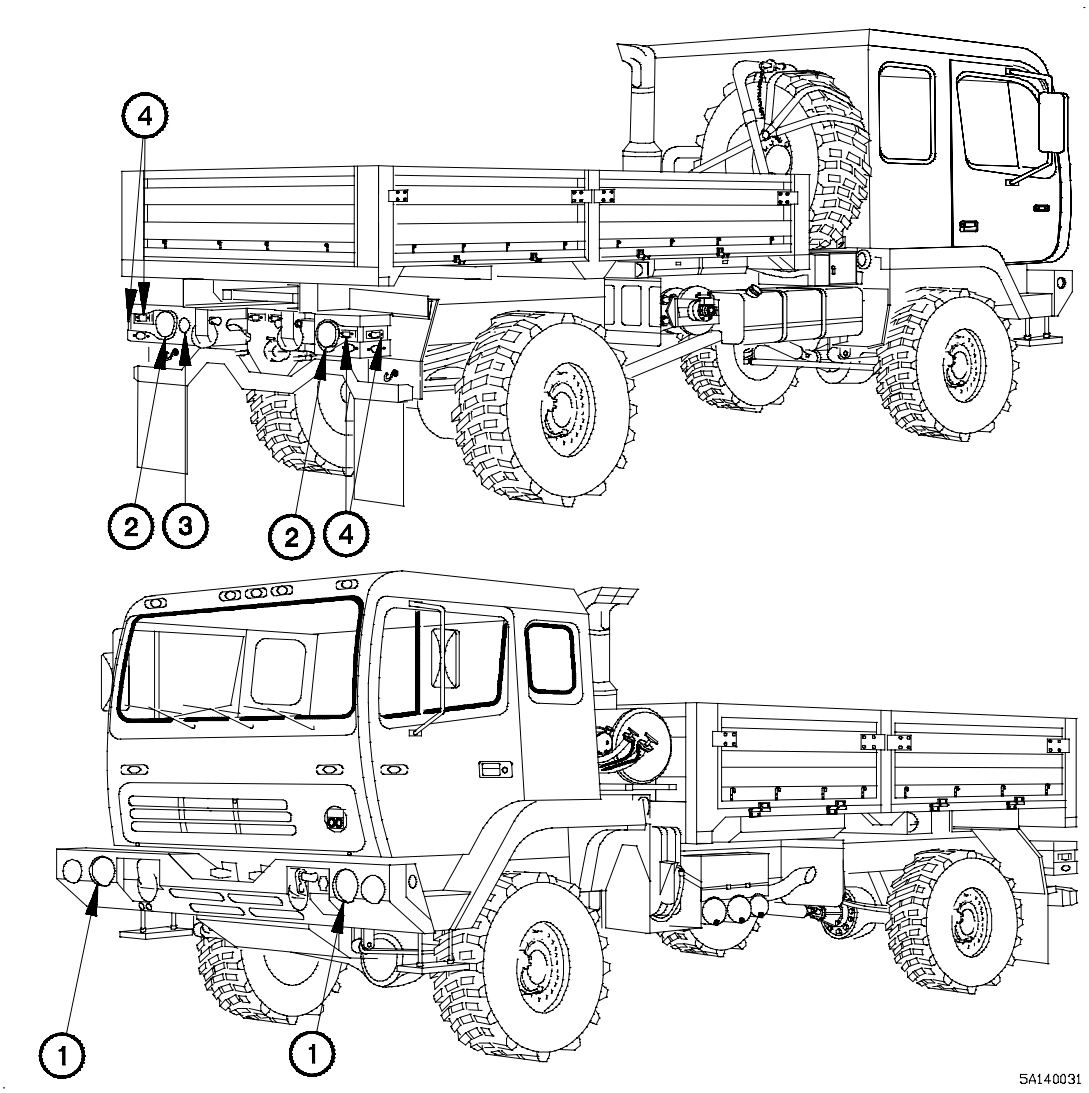


Figure 1-11. Service Lighting System

c. Service Lighting. The Service Lighting System includes the headlights (1, Figure 1-11), 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 9-2320-365-10).

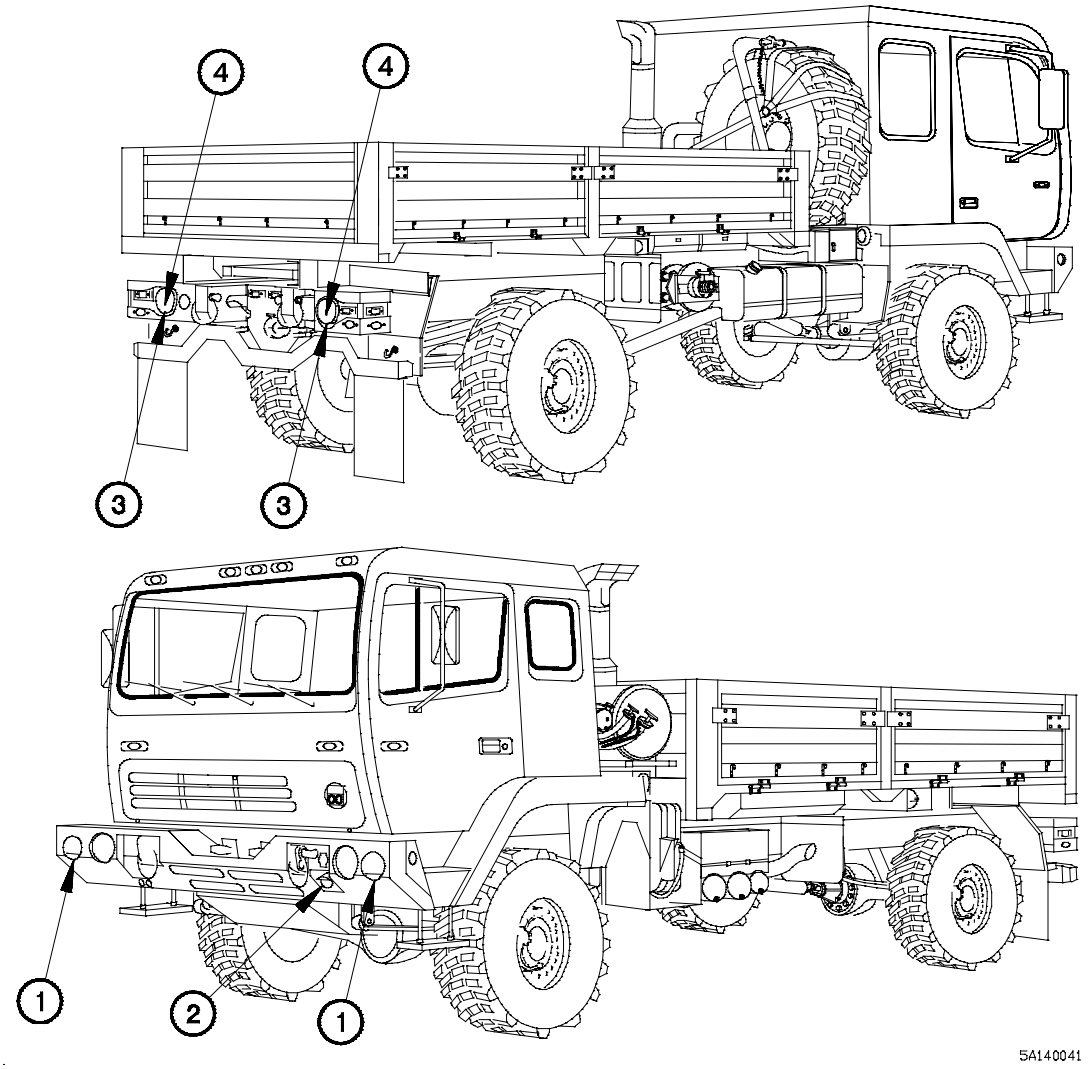


Figure 1-12. Blackout Lighting System

d. Blackout Lighting. The Blackout Lighting System includes the front blackout marker lights (1, Figure 1-12), 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 9-2320-365-10).

e. Accessory Lighting. The accessory lighting on the vehicle is the warning light. This circuit is energized by positioning the appropriate switch (TM 9-2320-365-10) to on.

1-14. ELECTRICAL SYSTEM (CONT)

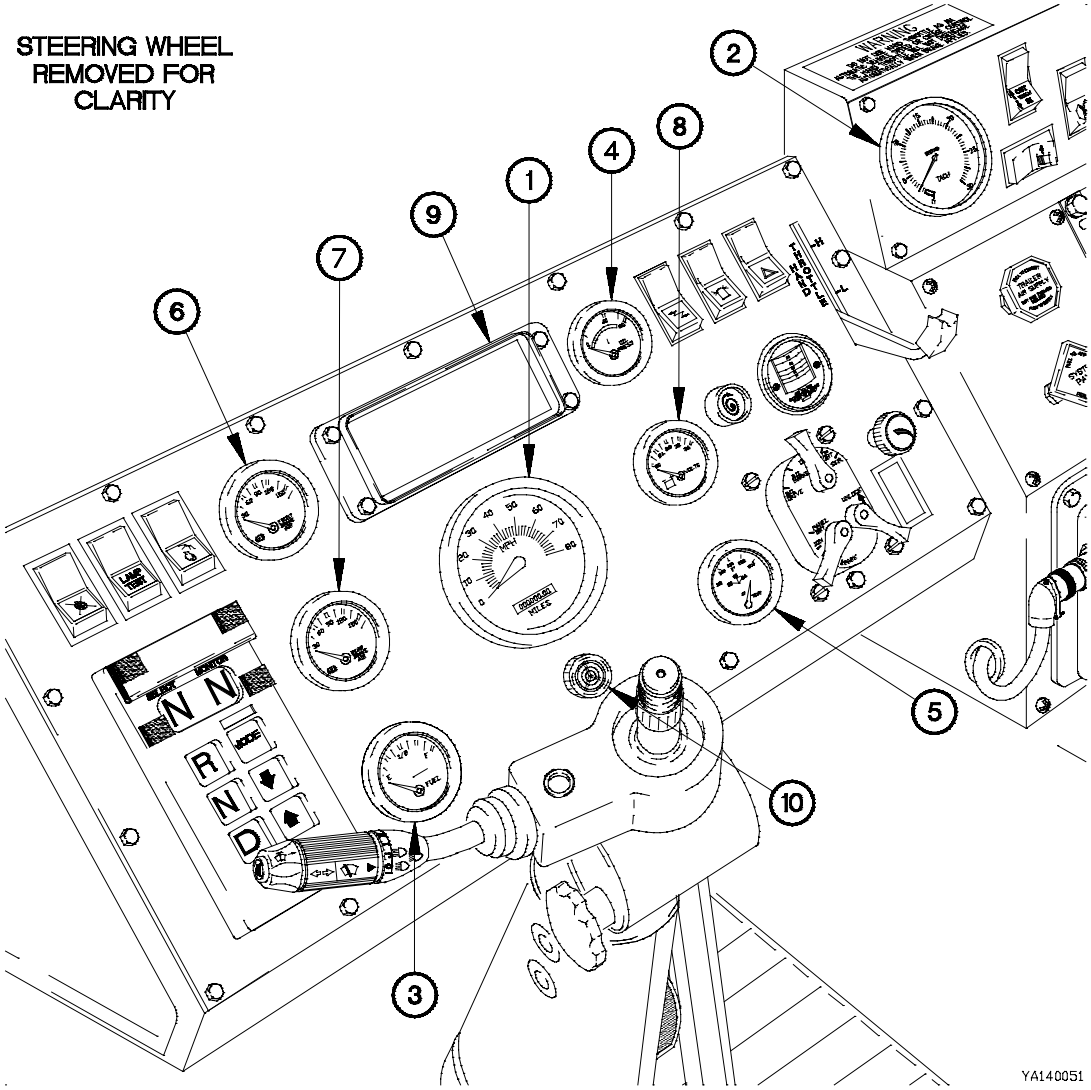


Figure 1-13. Instrument Panel

f. Instruments. The Instrument Panel includes all gages that provide the operator with information about vehicle condition and operating status. The speedometer (1, Figure 1-13) 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 current 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, engine 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.

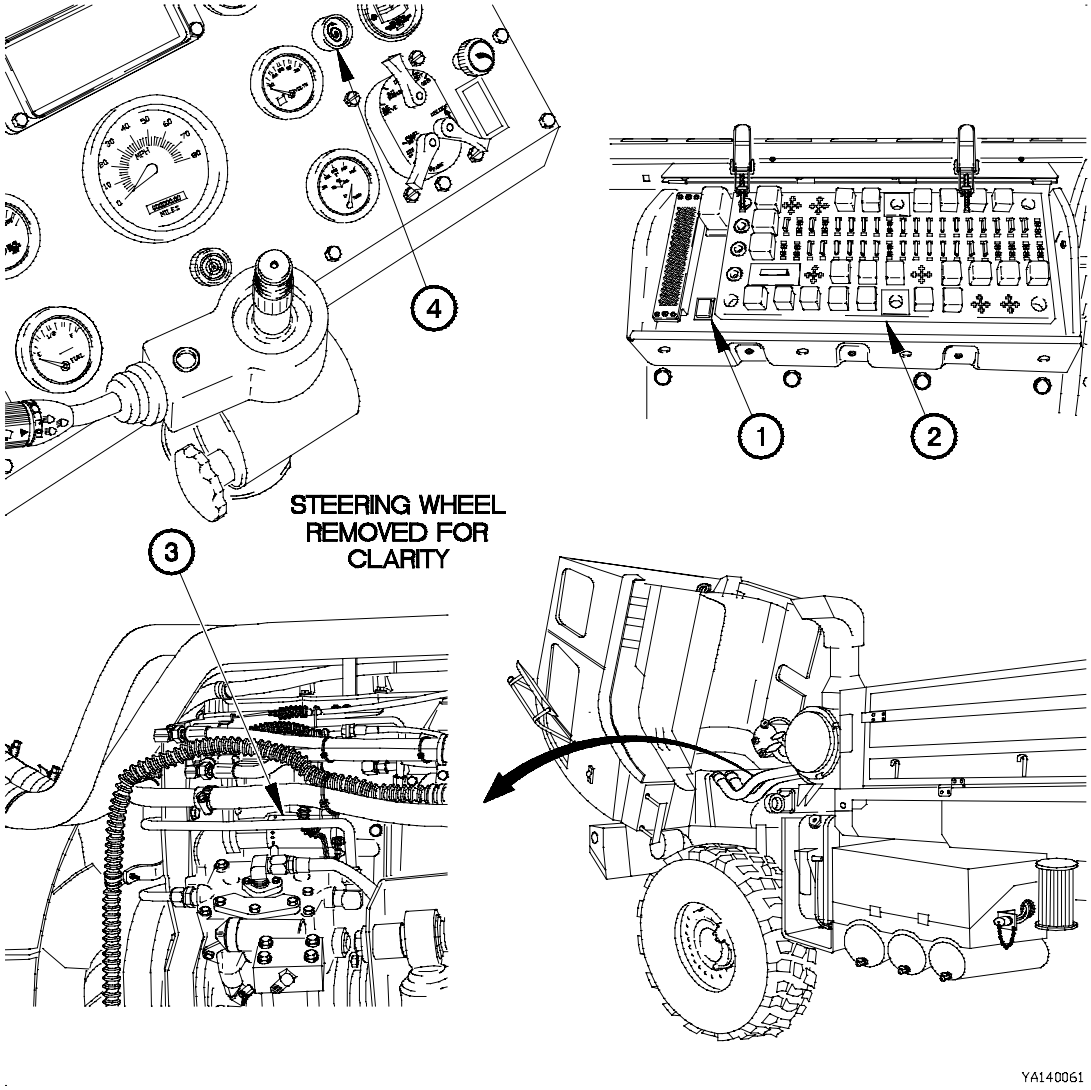


Figure 1-14. Troubleshooting Aid

h. Troubleshooting Aid. A start inhibit switch (1, Figure 1-14), 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.

1-15. BRAKE SYSTEM

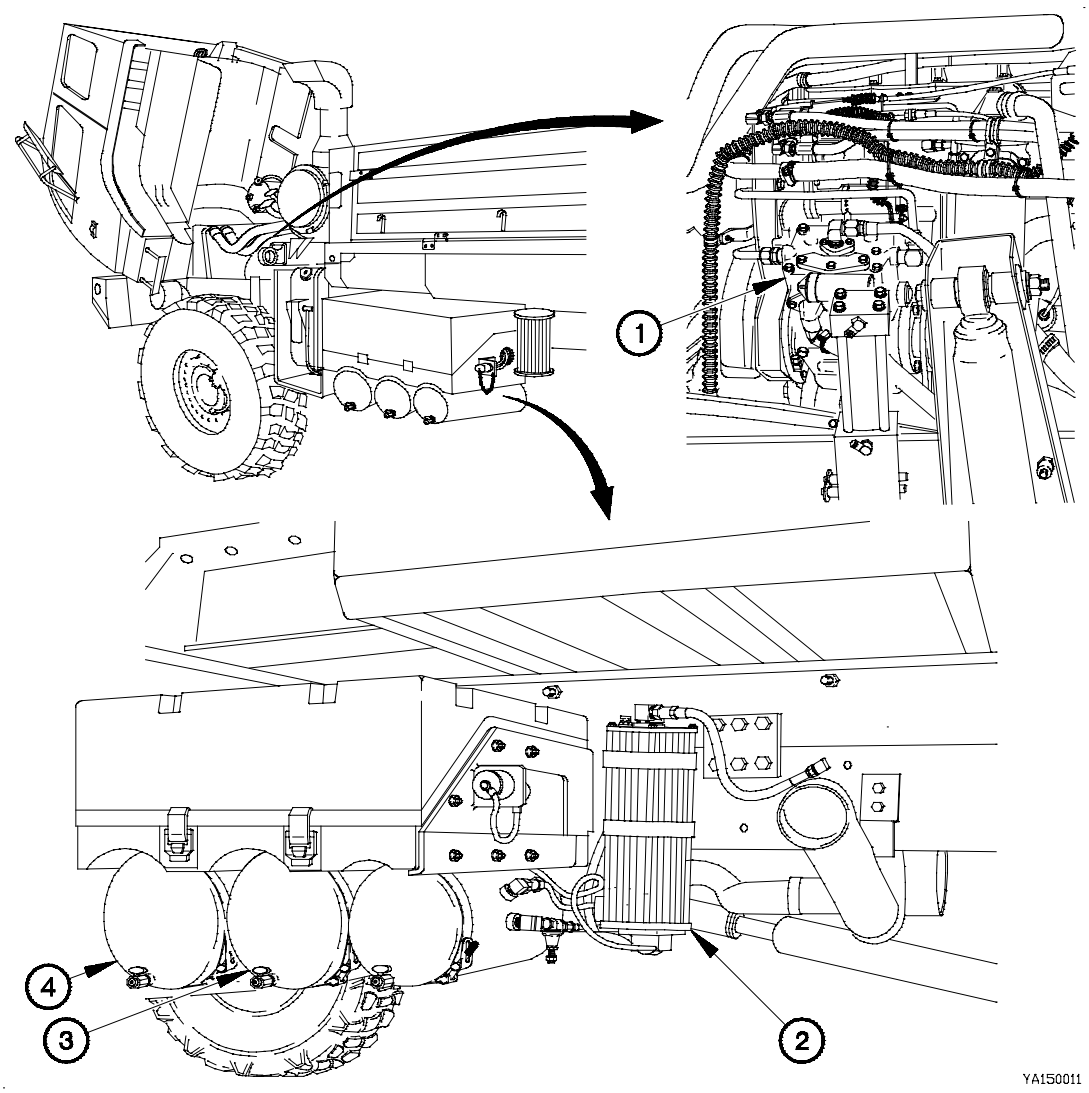


Figure 1-15. Brake System

The vehicle is equipped with an air 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 1-15) 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).

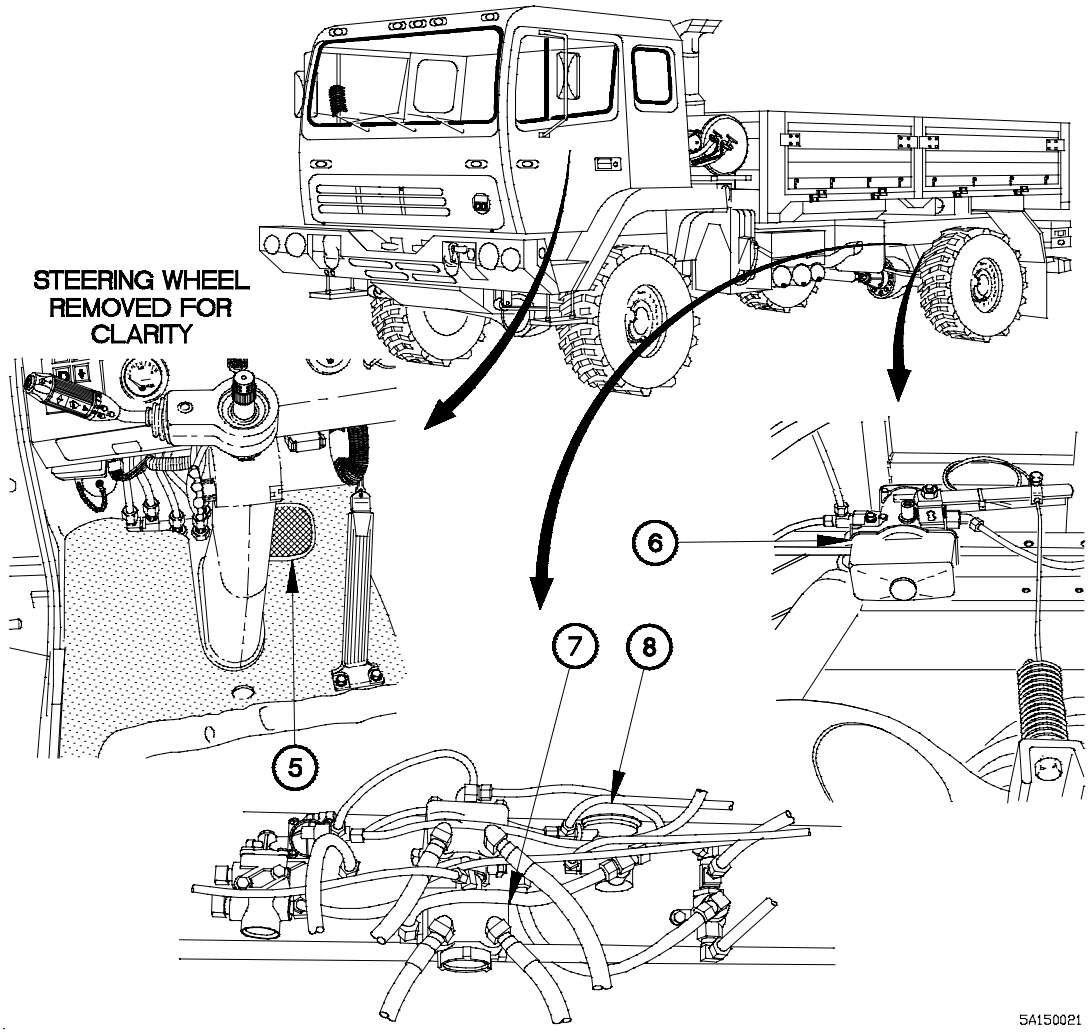


Figure 1-15. Brake System (Cont)

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. Air from the foot control valve is supplied to the load sensing valve (6) which, in turn, controls air delivery to the relay valve (7). The load sensing valve is mounted on a crossmember and connected, by a spring and cable, to the rear axle. The arrangement of the load sensing valve 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 (8) 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

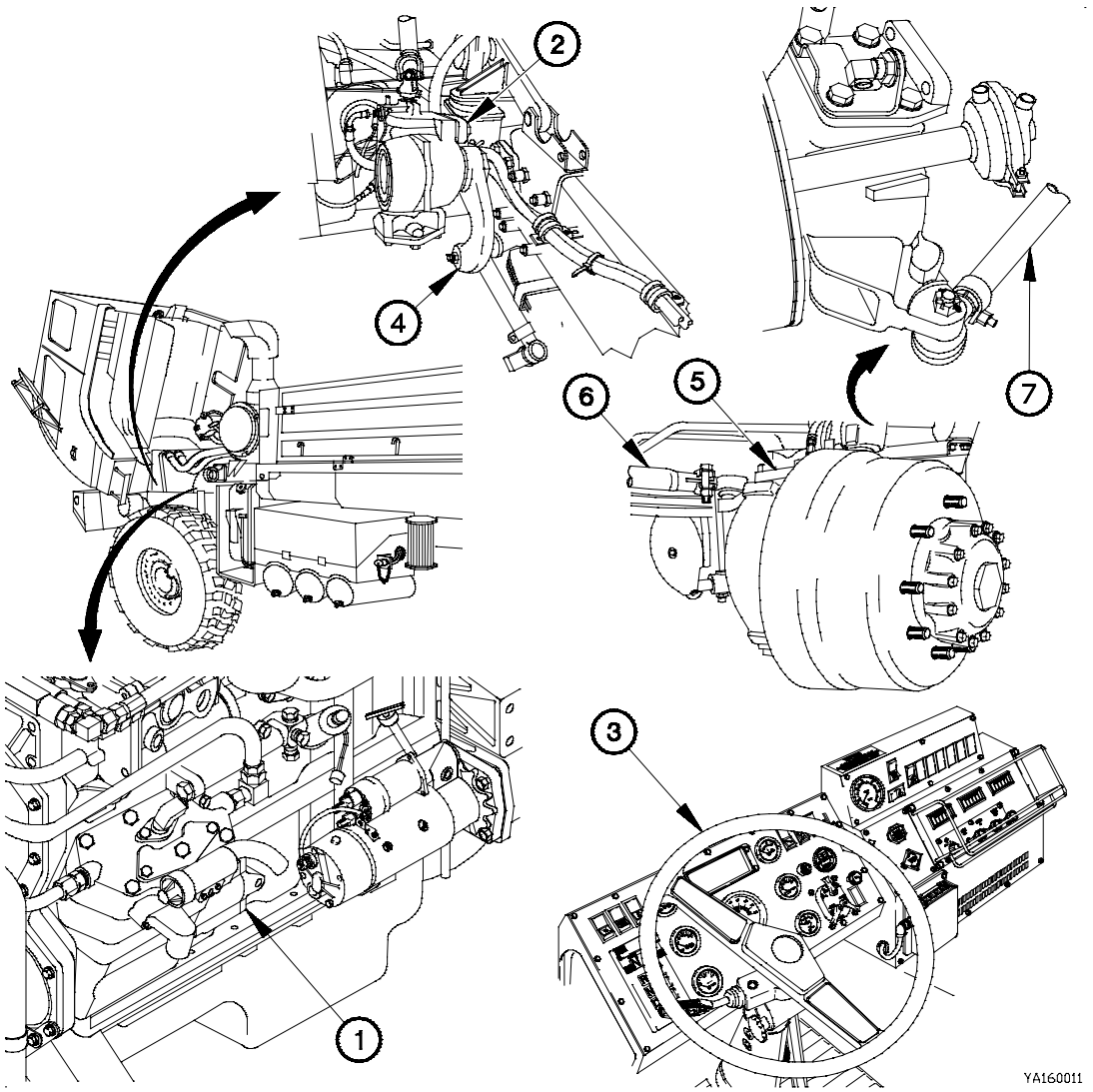


Figure 1-16. Steering System

The vehicle is equipped with hydraulically-assisted power steering. The power steering pump (1, Figure 1-16) 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. 11K SELF-RECOVERY WINCH (SRW)

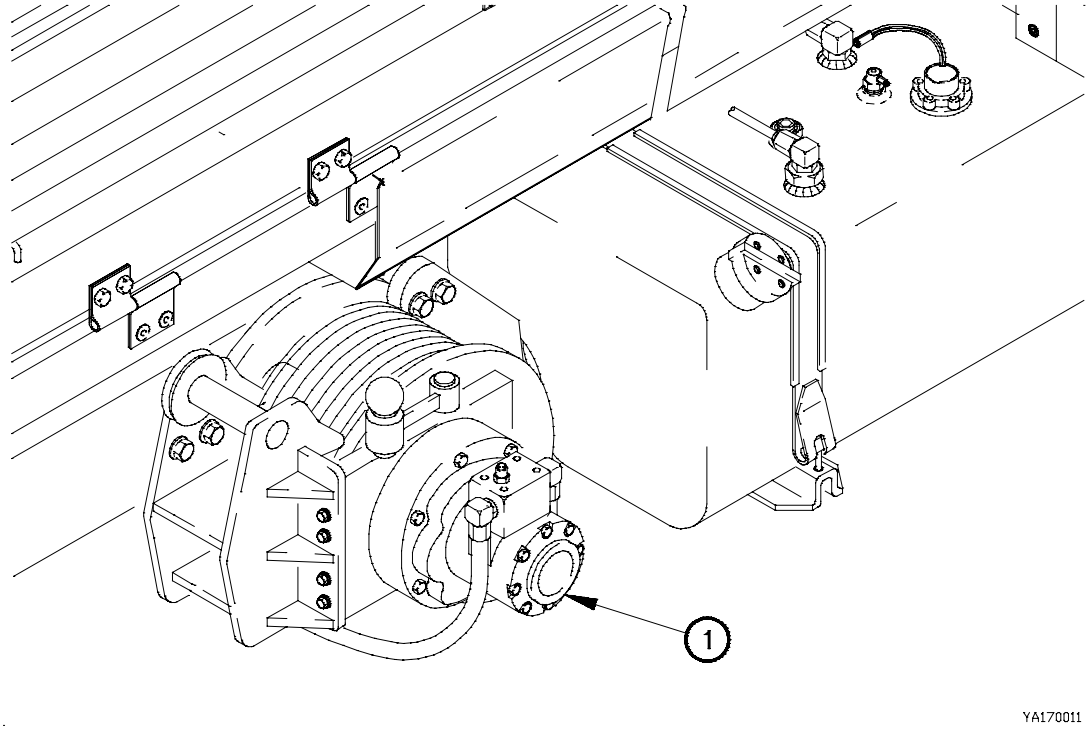


Figure 1-17. 11K Self-Recovery Winch (SRW)

When specified, the vehicle is equipped with an 11K Self-Recovery Winch (SRW) (1, Figure 1-17) mounted on the right frame rail. The 11K SRW is rated for 11,000 lbs (48,924 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 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 6,780 lbs (30,157 N). The 11K SRW cable may be routed to the front or rear of the vehicle for recovery operations. The 11K 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. AIR TRANSPORTABILITY HYDRAULIC SYSTEM

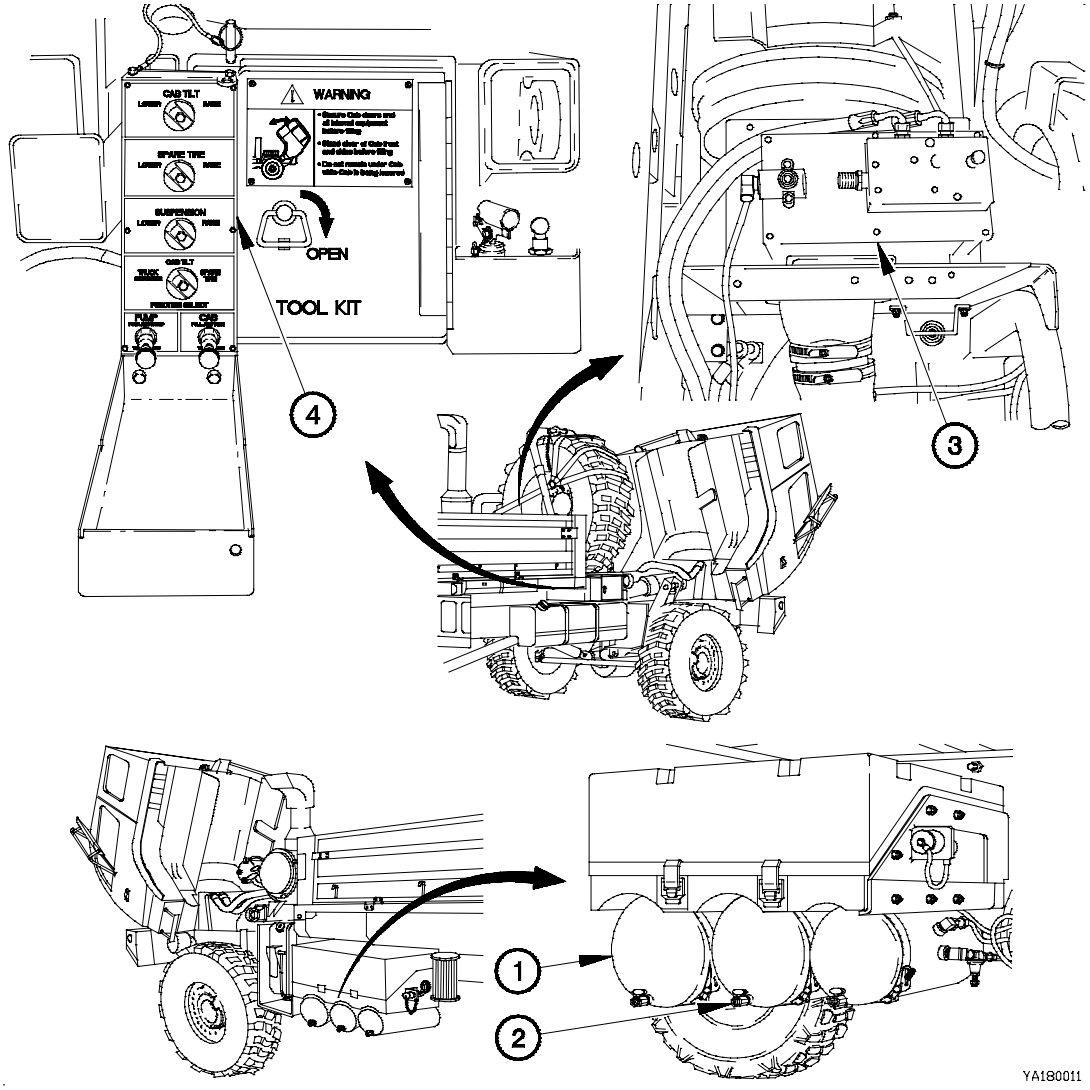


Figure 1-18. Air Transportability Hydraulic System

The entire series of M1078 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 primary and secondary air tanks (1 and 2, Figure 1-18) 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).

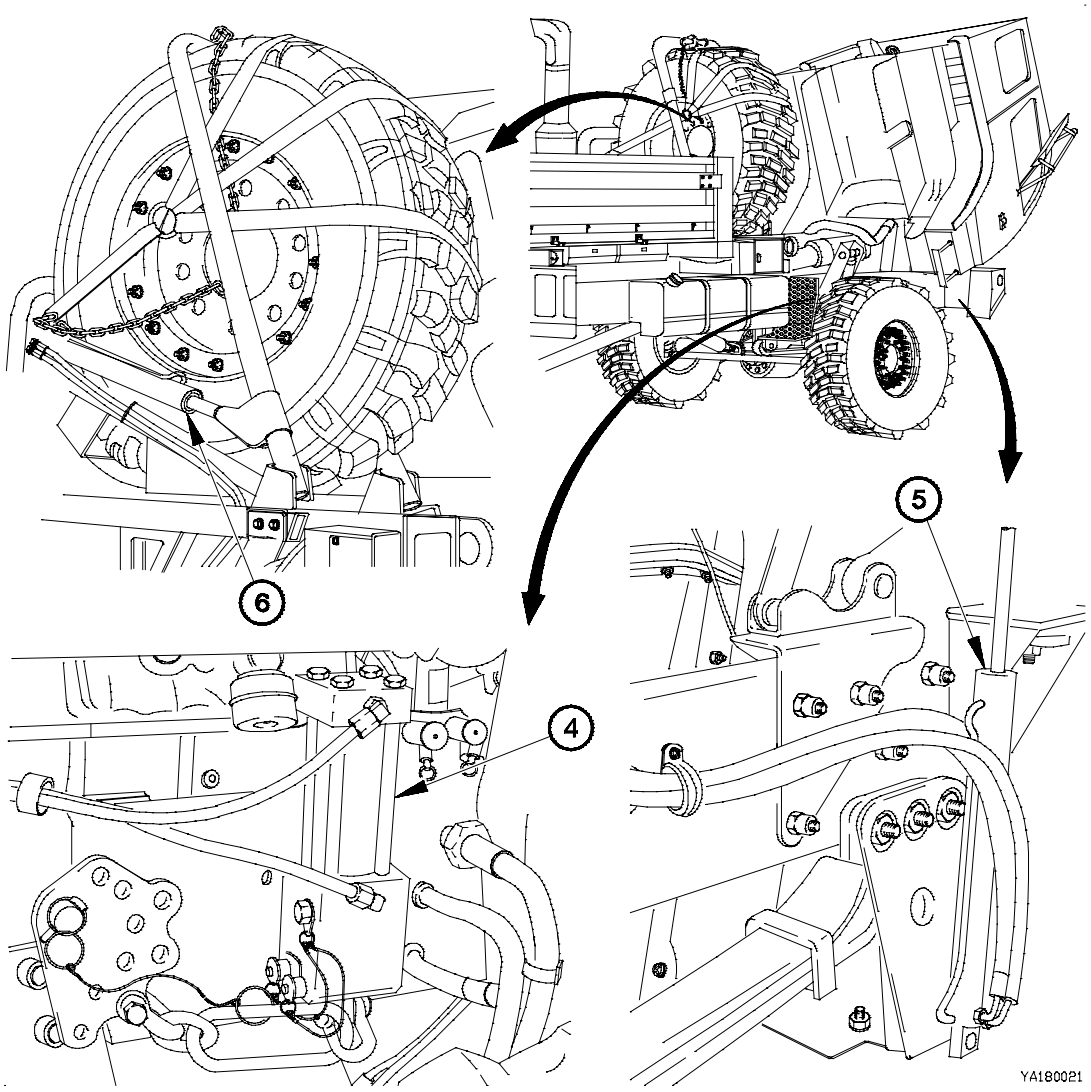


Figure 1-18. Air Transportability Hydraulic System (Cont)

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.

1-19. AIR SYSTEM

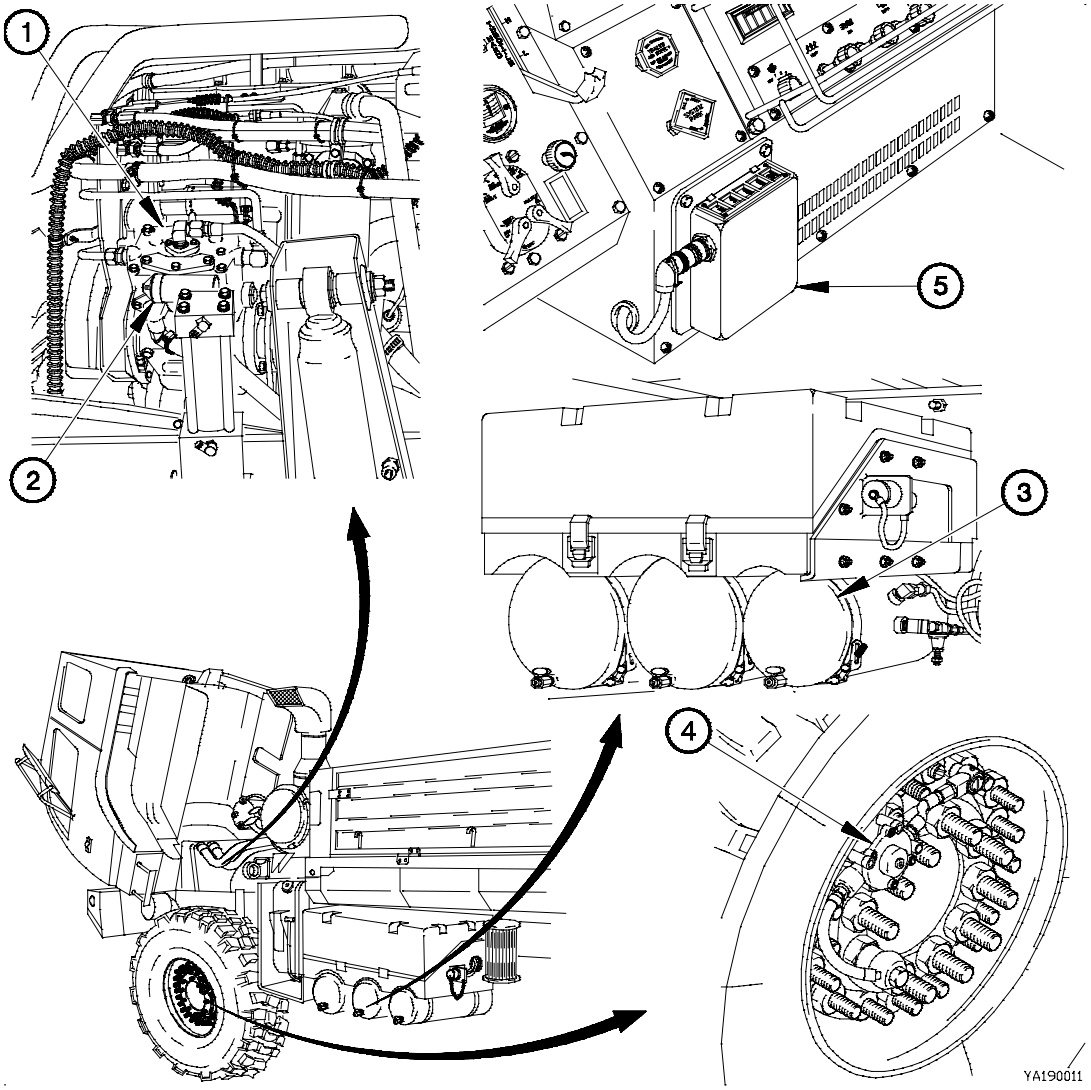


Figure 1-19. Air System

The air system provides clean, dry air for use in the air brake system and the Central Tire Inflation System (CTIS). The air system is pressurized by an engine driven air compressor (1, Figure 1-19) 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.

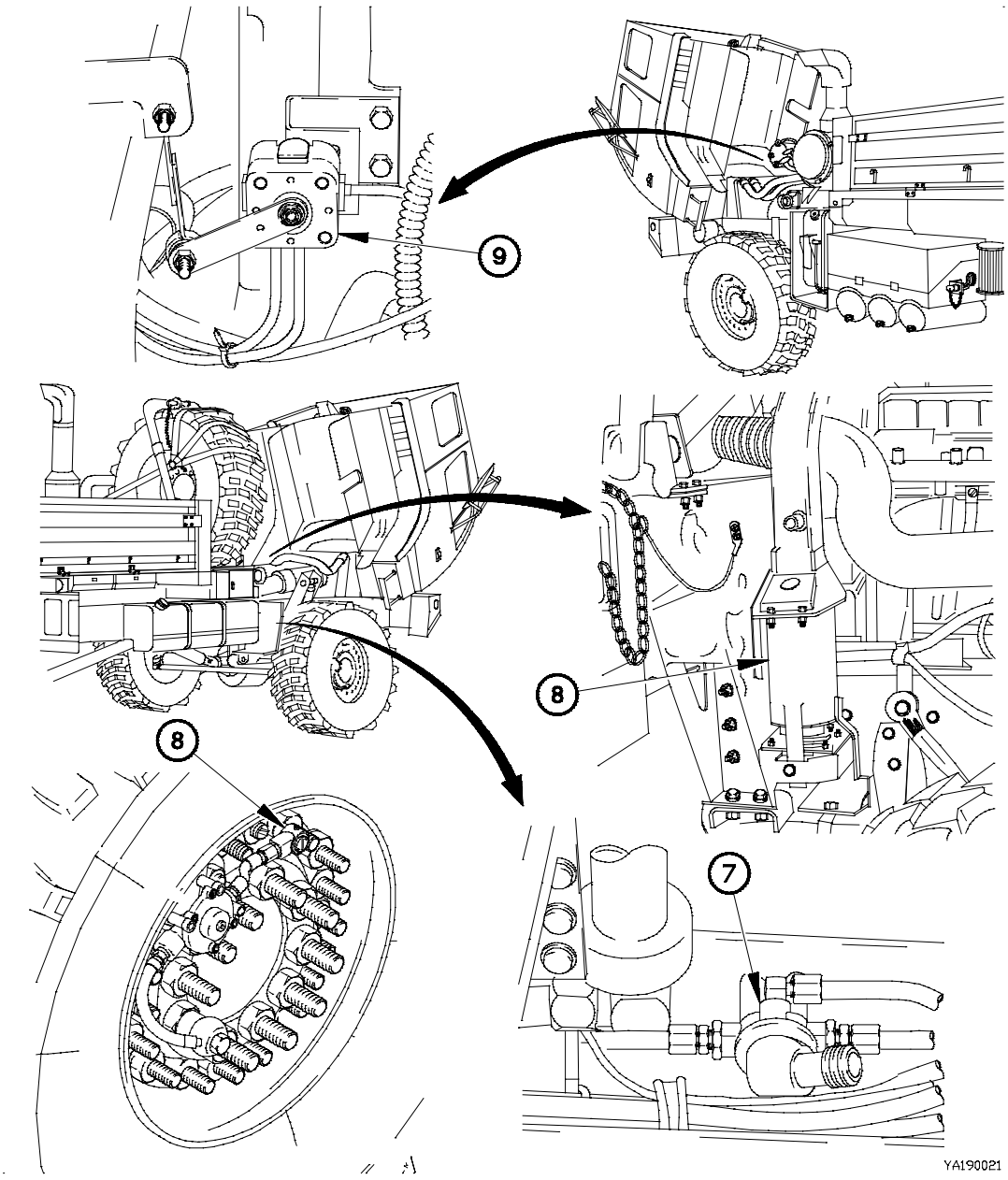


Figure 1-19. Air System (Cont)

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

CHAPTER 2
VEHICLE MAINTENANCE

Section I. REPAIR PARTS, TOOLS, SPECIAL TOOLS, TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE), AND SUPPORT EQUIPMENT 2-1
2-1. COMMON TOOLS AND EQUIPMENT 2-1
2-2. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT 2-1
2-3. REPAIR PARTS 2-2

Section II. SERVICE UPON RECEIPT 2-2
2-4. UNPACKING AND DEPROCESSING 2-2
2-5. HAND RECEIPT MANUAL AND INVENTORY OF EQUIPMENT 2-2
2-6. SERVICE BEFORE OPERATION 2-2

Section III. TROUBLESHOOTING 2-5
2-7. INTRODUCTION TO LOGIC TREE TROUBLESHOOTING 2-6
2-8. TROUBLESHOOTING INSTRUCTIONS 2-6
2-9. ENGINE SYSTEM TROUBLESHOOTING 2-13
2-9A. FUEL SYSTEM TROUBLESHOOTING 2-64.1
2-10. COOLING SYSTEM TROUBLESHOOTING 2-65
2-11. TRANSMISSION SYSTEM TROUBLESHOOTING 2-73
2-12. WHEEL TROUBLESHOOTING 2-959
2-13. HYDRAULIC SYSTEM TROUBLESHOOTING 2-963
2-14. STEERING TROUBLESHOOTING 2-969
2-15. 11K SELF-RECOVERY WINCH (SRW) TROUBLESHOOTING 2-975

Section IV. MAINTENANCE PROCEDURES 2-983
2-16. MAINTENANCE INTRODUCTION 2-983
2-17. GROUND HANDLING 2-983
2-18. GENERAL REMOVAL INSTRUCTIONS 2-983
2-19. GENERAL DISASSEMBLY INSTRUCTIONS 2-983
2-20. GENERAL CLEANING INSTRUCTIONS 2-984
2-21. GENERAL INSPECTION INSTRUCTIONS 2-987
2-22. GENERAL REPAIR INSTRUCTIONS 2-988
2-23. GENERAL ASSEMBLY INSTRUCTIONS 2-988
2-24. GENERAL INSTALLATION INSTRUCTIONS 2-989
2-25. PREPARATION FOR STORAGE OR SHIPMENT INTRODUCTION 2-990
2-26. PREPARATION FOR STORAGE OR SHIPMENT 2-990
2-27. STORAGE MAINTENANCE PROCEDURE 2-990

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 9-2320-365-20, and to the Repair Parts and Special Tools List (RPSTL), TM 9-2320-365-24P.

2-3. REPAIR PARTS

Mandatory replacement parts are listed in Appendix F. Repair parts are listed and illustrated in the RPSTL, TM 9-2320-365-24P, 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

WARNING

- **Heavy objects/loads, such as tool boxes and heavy parts, must always be carried on the floor with the weight distributed as equally as possible between left and right sides of M1079 van. Failure to comply decreases the stability of the M1079 van and will increase the likelihood of a rollover.**

- **Heavy cabinets must always be mounted as low as possible with the weight distributed as equally as possible between left and right sides of M1079 van. Remember to consider the weight of the items that will be stored in the cabinets. Failure to comply decreases the stability of the M1079 van and will increase the likelihood of a rollover.**

- **Always keep in mind, when placing items inside the M1079 van, that heavier items must always be positioned as low as possible and the weight distributed as equally as possible between left and right sides of M1079 van. Failure to comply decreases the stability of the M1079 van and will increase the likelihood of a rollover.**

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 9-2320-365-10). Secure, clean, and correctly adjust and/or lubricate as needed (TM 9-2320-365-20). Check all tools and equipment to be sure every item is accounted for (TM 9-2320-365-10-HR) in good condition, clean and properly mounted or stowed (TM 9-2320-365-10).

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 9-2320-365-10-HR.

2-6. SERVICE BEFORE OPERATION

a. General.

(1) Refer to TM 9-2320-365-10 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 9-2320-365-10). Inspect all assemblies, subassemblies, and accessories to be sure they are in proper working order. Secure, clean, correctly adjust, and/or lubricate (TM 9-2320-365-10 and TM 9-2320-365-20) as needed. Check all tools and equipment to be sure every item is there (TM 9-2320-365-10-HR), in good condition, clean and properly mounted or stowed (TM 9-2320-365-10).

(3) Follow general procedures for all services and inspections given in TM 9-2320-365-10.

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 9-2320-365-10-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 80, Appendix C).

(3) Perform the Semiannual Preventive Maintenance Checks and Services (PMCS), Table 2-1, TM 9-2320-365-20-1.

(4) Lubricate all points shown in TM 9-2320-365-20 (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.

2-6. SERVICE BEFORE OPERATION (CONT)

(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 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.

c. Special Service Instructions.

(1) Vehicle Body and Sheet Metal Inspection (TM 9-2320-365-10).

(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 9-2320-365-10).

(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 for proper operation.

(3) Engine Inspection (TM 9-2320-365-10).

(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 9-2320-365-10).

(a) Check fluid level with dipstick.

(b) Check external tubes and hoses for evidence of leakage.

(5) Transfer Case Inspection (TM 9-2320-365-10).

(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 9-2320-365-10).

(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 9-2320-365-10).

(a) Drain any water from reservoirs.

(b) Inspect all accessible air hose and tubing connections for leakage.

(8) Steering System Inspection (TM 9-2320-365-10).

(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 and Rear Axle Inspection (TM 9-2320-365-10).

(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 9-2320-365-10).

(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 9-2320-365-10).

(c) Check all wheel mounting nuts for proper torque (TM 9-2320-365-20).

(11) Fuel System Inspection (TM 9-2320-365-10).

(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 d1. Wheel wobbles or shimmies, the question is asked "Is the steering knuckle free from damage?". If the question was answered NO, the damaged steering knuckle was replaced. After replacing the damaged steering knuckle, 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.

Table 2-1. Vehicle Troubleshooting

Malfunction		Troubleshooting Procedure (Page)
a. ENGINE SYSTEM TROUBLESHOOTING		
a1.	Low Engine Oil Pressure	2-14
a2.	Engine Stalls at Low RPM	2-18
a3.	Engine Speed is Not Stable	2-24
a4.	Engine Overspeeds on Start	2-28
a5.	Too Much Vibration in Engine	2-30
a6.	Coolant in Engine Oil	2-32
a7.	Excessive Engine Oil Consumption	2-34
a8.	Engine Overheats	2-38
a9.	Excessive Black or Gray Exhaust Smoke from Engine	2-42
a10.	White Exhaust Smoke from Engine	2-46
a11.	Engine Starts but Misfires, Runs Rough, or Lacks Power	2-50
a12.	Blue Exhaust Smoke from Engine	2-60
a13.	Engine Cranks But Does Not Start	2-64.2
a14.	Engine Does Not Crank	2-64.6
a.1. FUEL SYSTEM TROUBLESHOOTING		
a.1.1.	Engine Cranks But Does Not Start	2-64.10
b. COOLING SYSTEM TROUBLESHOOTING		
b1.	Engine Overheats	2-66
b2.	Loss of Coolant	2-70
b3.	Oil in Cooling System	2-72
c. TRANSMISSION SYSTEM TROUBLESHOOTING		
c1.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 15 (Serial Number 6510032369 and Higher)	2-78
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)	2-88
c3.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 15 (Prior to Serial Number 6510032369)	2-102
c4.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 16	2-112
c5.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 24 Sub Code 12 or 23 (Serial Number 6510032369 and Higher)	2-120
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)	2-128
c7.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 24 Sub Code 12 or 23 (Prior to Serial Number 6510032369)	2-140
c8.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 32 and Any Sub Code (Serial Number 6510032369 and Higher)	2-148

Table 2-1. Vehicle Troubleshooting (Cont)

Malfunction		Troubleshooting Procedure (Page)
c. TRANSMISSION SYSTEM TROUBLESHOOTING (CONT)		
c9.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 32 and Any Sub Code (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-156
c10.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 32 and Any Sub Code (Prior to Serial Number 6510032369)	2-168
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)	2-176
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)	2-186
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)	2-200
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)	2-208
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)	2-218
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)	2-232
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)	2-242
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)	2-252
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)	2-266
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)	2-276
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)	2-286
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)	2-300
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)	2-310
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)	2-320
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)	2-334
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)	2-344
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)	2-354
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)	2-368
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)	2-378

Table 2-1. Vehicle Troubleshooting (Cont)

Malfunction		Troubleshooting Procedure (Page)
c. TRANSMISSION SYSTEM TROUBLESHOOTING (CONT)		
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)	2-388
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)	2-402
c32.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45 and/or 69 Sub Code 23	2-412
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)	2-420
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)	2-430
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)	2-444
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)	2-454
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)	2-464
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)	2-478
c39.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 43 Sub Code 21 (Serial Number 6510032369 and Higher)	2-488
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)	2-498
c41.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 43 Sub Code 21 (Prior to Serial Number 6510032369)	2-512
c42.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 43 Sub Code 26 (Serial Number 6510032369 and Higher)	2-522
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)	2-532
c44.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 43 Sub Code 26 (Prior to Serial Number 6510032369)	2-546
c45.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 52 and Any Sub Code (Serial Number 6510032369 and Higher)	2-556
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)	2-566
c47.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 52 and Any Sub Code (Prior to Serial Number 6510032369)	2-580
c47A.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 55 and Any Sub Code	2-588.2
c48.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 15 (Serial Number 6510032369 and Higher)	2-590
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)	2-600

Table 2-1. Vehicle Troubleshooting (Cont)

Malfunction		Troubleshooting Procedure (Page)
c. TRANSMISSION SYSTEM TROUBLESHOOTING (CONT)		
c50.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 16	2-614
c51.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 24 Sub Code 12 or 23 (Serial Number 6510032369 and Higher)	2-622
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)	2-630
c53.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 32 and Any Sub Code (Serial Number 6510032369 and Higher)	2-642
c54.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 32 and Any Sub Code (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-650
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)	2-662
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)	2-672
c57.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 13 (Serial Number 6510032369 and Higher)	2-686
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)	2-696
c59.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 14 (Serial Number 6510032369 and Higher)	2-710
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)	2-720
c61.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 15 (Serial Number 6510032369 and Higher)	2-734
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)	2-744
c63.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 16 (Serial Number 6510032369 and Higher)	2-758
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)	2-768
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)	2-782
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)	2-792
c67.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 22 (Serial Number 6510032369 and Higher)	2-806
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)	2-816

Table 2-1. Vehicle Troubleshooting (Cont)

Malfunction		Troubleshooting Procedure (Page)
c. TRANSMISSION SYSTEM TROUBLESHOOTING (CONT)		
c69.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, 45, 46 and/or 69 Sub Code 23	2-830
c70.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 24 (Serial Number 6510032369 and Higher)	2-838
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)	2-848
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)	2-862
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)	2-872
c74.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 43 Sub Code 21 (Serial Number 6510032369 and Higher)	2-886
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)	2-896
c76.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 43 Sub Code 26 (Serial Number 6510032369 and Higher)	2-910
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)	2-920
c78.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 52 and Any Sub Code (Serial Number 6510032369 and Higher)	2-934
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)	2-944
c80.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 55 and Any Sub Code	2-958
d. WHEEL TROUBLESHOOTING		
d1.	Wheel Wobbles or Shimmies	2-960
e. HYDRAULIC SYSTEM TROUBLESHOOTING		
e1.	Loss of Hydraulic Pressure (Single Stage Pump)	2-964
f. STEERING TROUBLESHOOTING		
f1.	Hard to Steer	2-970
g. 11K SELF-RECOVERY WINCH (SRW) SYSTEM TROUBLESHOOTING		
g1.	11K Self-Recovery Winch (SRW) Does Not Operate	2-976

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

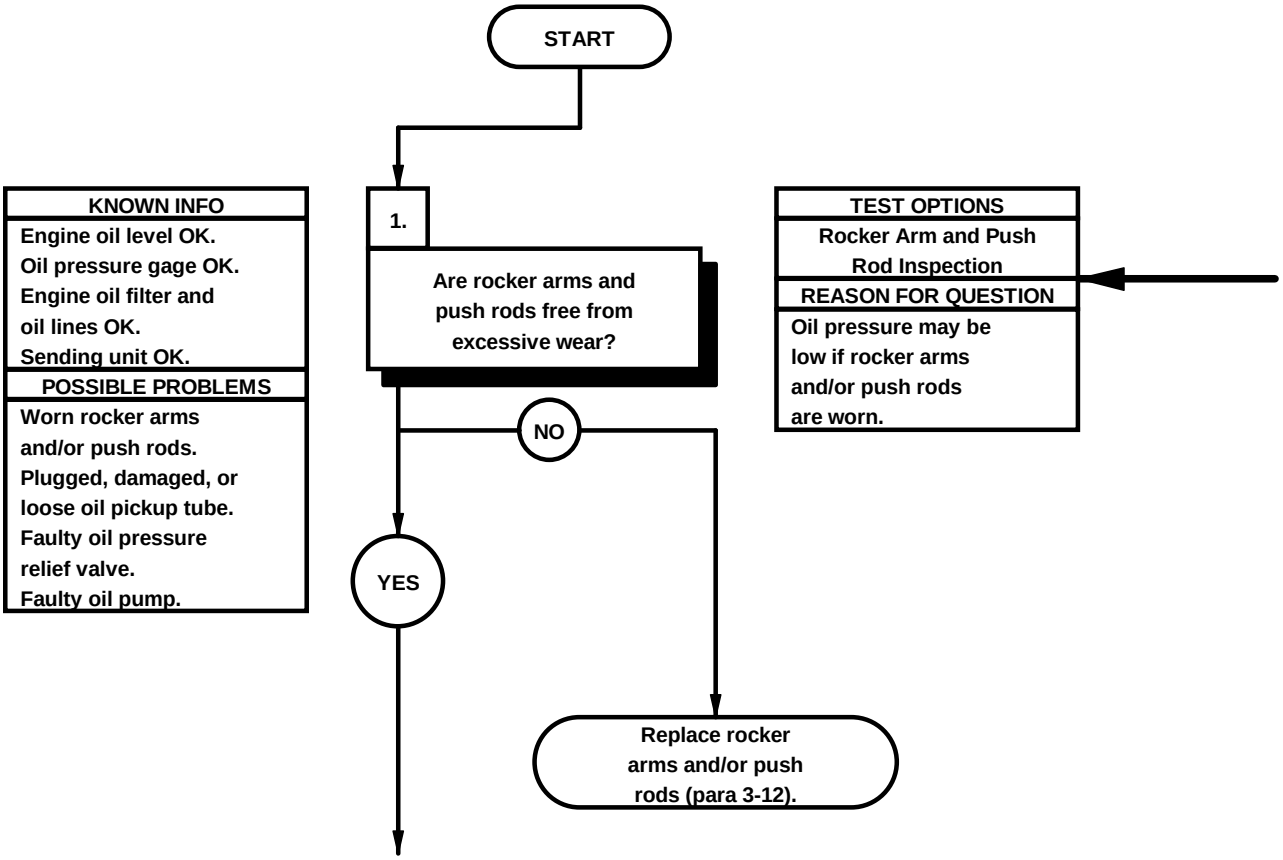
Fault No.	Description	Page
a1.	Low Engine Oil Pressure	2-14
a2.	Engine Stalls at Low RPM	2-18
a3.	Engine Speed Is Not Stable	2-24
a4.	Engine Overspeeds on Start	2-28
a5.	Too Much Vibration in Engine	2-30
a6.	Coolant in Engine Oil	2-32
a7.	Excessive Engine Oil Consumption	2-34
a8.	Engine Overheats	2-38
a9.	Excessive Black or Gray Exhaust Smoke From Engine	2-42
a10.	White Exhaust Smoke From Engine	2-46
a11.	Engine Starts but Misfires, Runs Rough, or Lacks Power	2-50
a12.	Blue Exhaust Smoke From Engine	2-60
a13.	Engine Cranks but Does Not Start	2-64.2
a14.	Engine Does Not Crank	2-64.6

a1. LOW ENGINE OIL PRESSURE

INITIAL SETUP

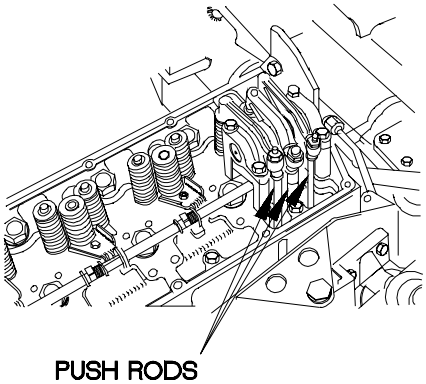
Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
Goggles, Industrial (Item 25, Appendix B)



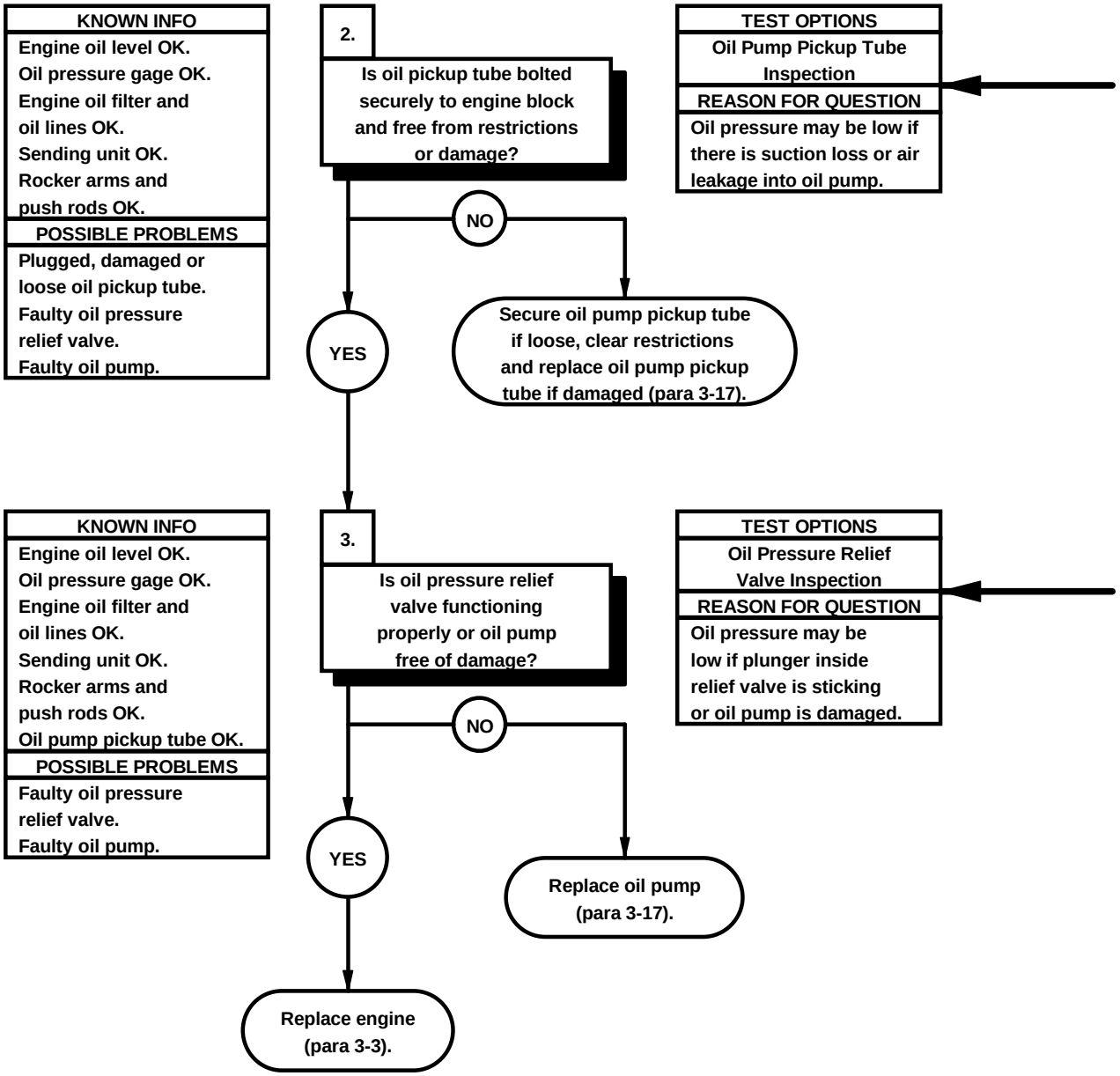
ROCKER ARM AND PUSH ROD INSPECTION

(1) Raise cab (TM 9-2320-365-10).
(2) Remove valve cover (TM 9-2320-365-20-2).
(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 9-2320-365-20-2).
(8) Lower cab (TM 9-2320-365-10).



YBA01011

a1. LOW ENGINE OIL PRESSURE (CONT)

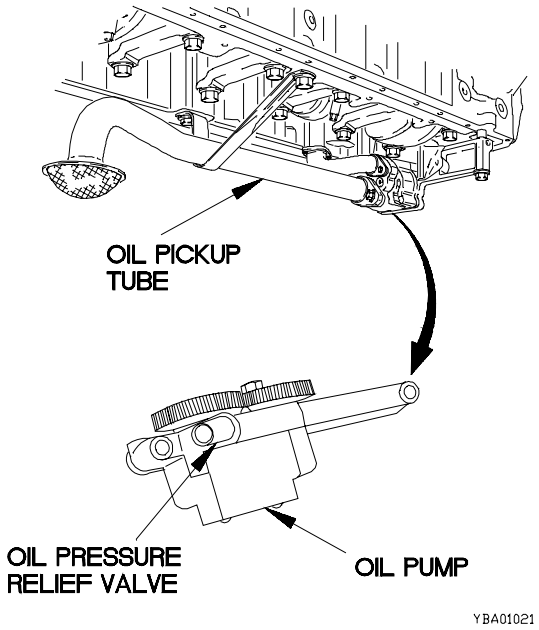


OIL PUMP PICKUP TUBE INSPECTION

(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

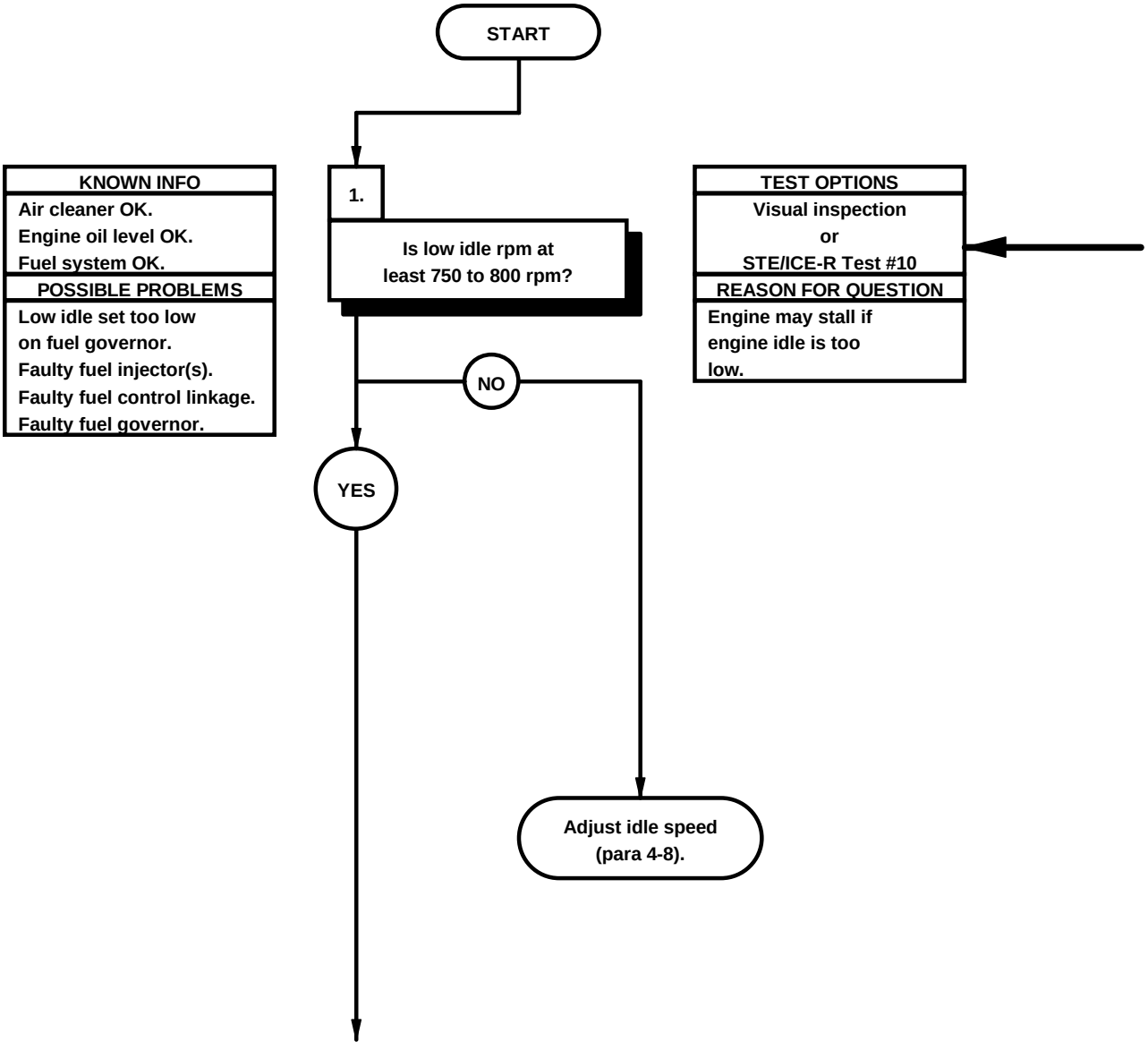
INITIAL SETUP

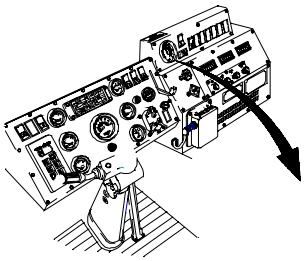
Equipment Conditions
Engine shut down (TM 9-2320-365-10).

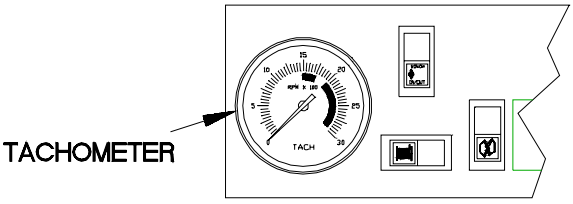
References
TM 9-4910-571-12&P

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Tool Kit, Intl Comb Eng (TM 9-2320-365-20)
Wrench, Torque, 0-60 N·m (Item 84, Appendix B)

Personnel Required
(2)



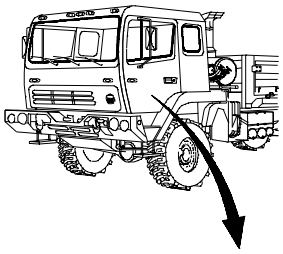




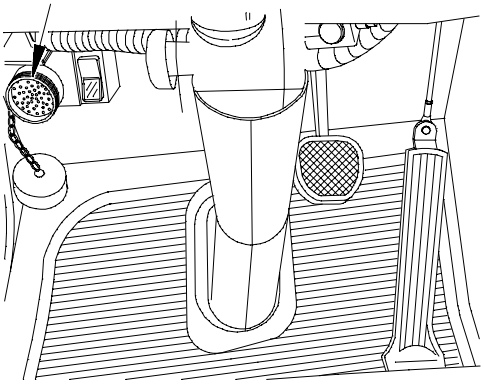
YBA02011

(1) If equipped with tachometer, start engine (TM 9-2320-365-10). 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 9-2320-365-10).

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 9-2320-365-10).
(5) Observe displayed value.
(6) Shut down engine (TM 9-2320-365-10).
(7) Remove STE/ICE-R from DCA.

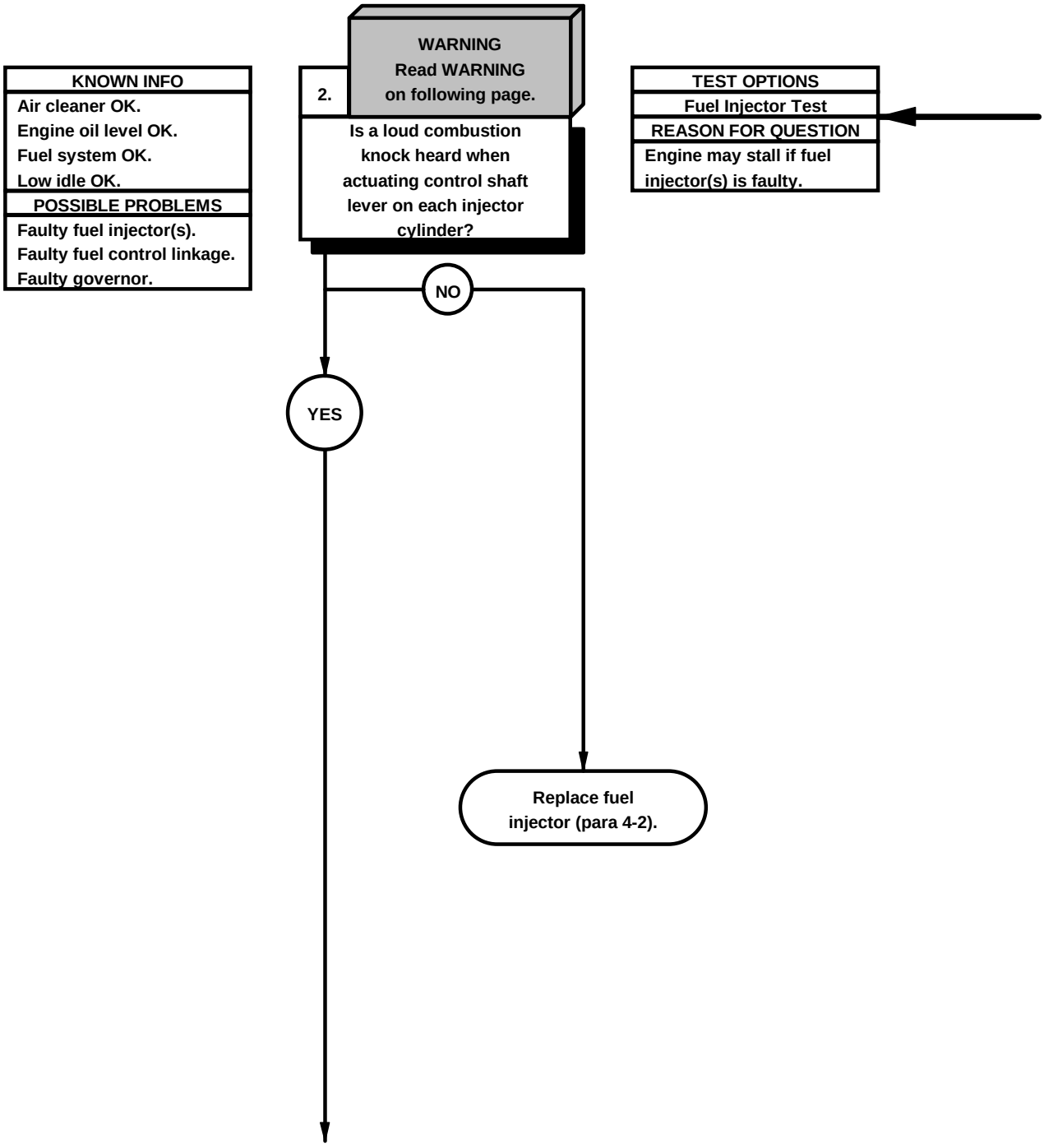


DCA CONNECTOR



YBA02021

a2. ENGINE STALLS AT LOW RPM (CONT)



FUEL INJECTOR TEST

(1) Raise cab (TM 9-2320-365-10).
(2) Remove valve cover (TM 9-2320-365-20-2).

WARNING

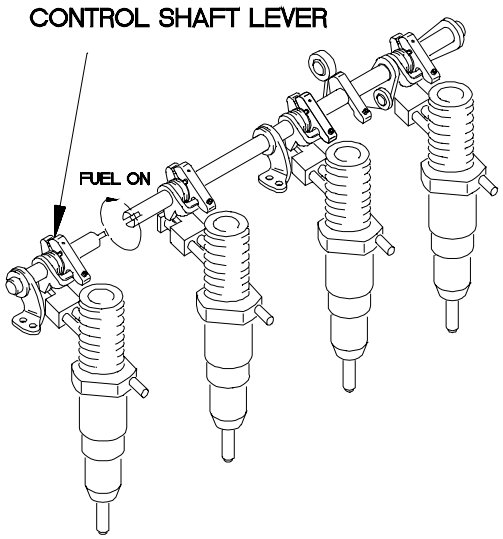
Use extreme care when opening cab door with cab raised. Failure to comply may cause injury to personnel or damage to equipment.

(3) Open cab door.
(4) Start engine (TM 9-2320-365-10).

NOTE

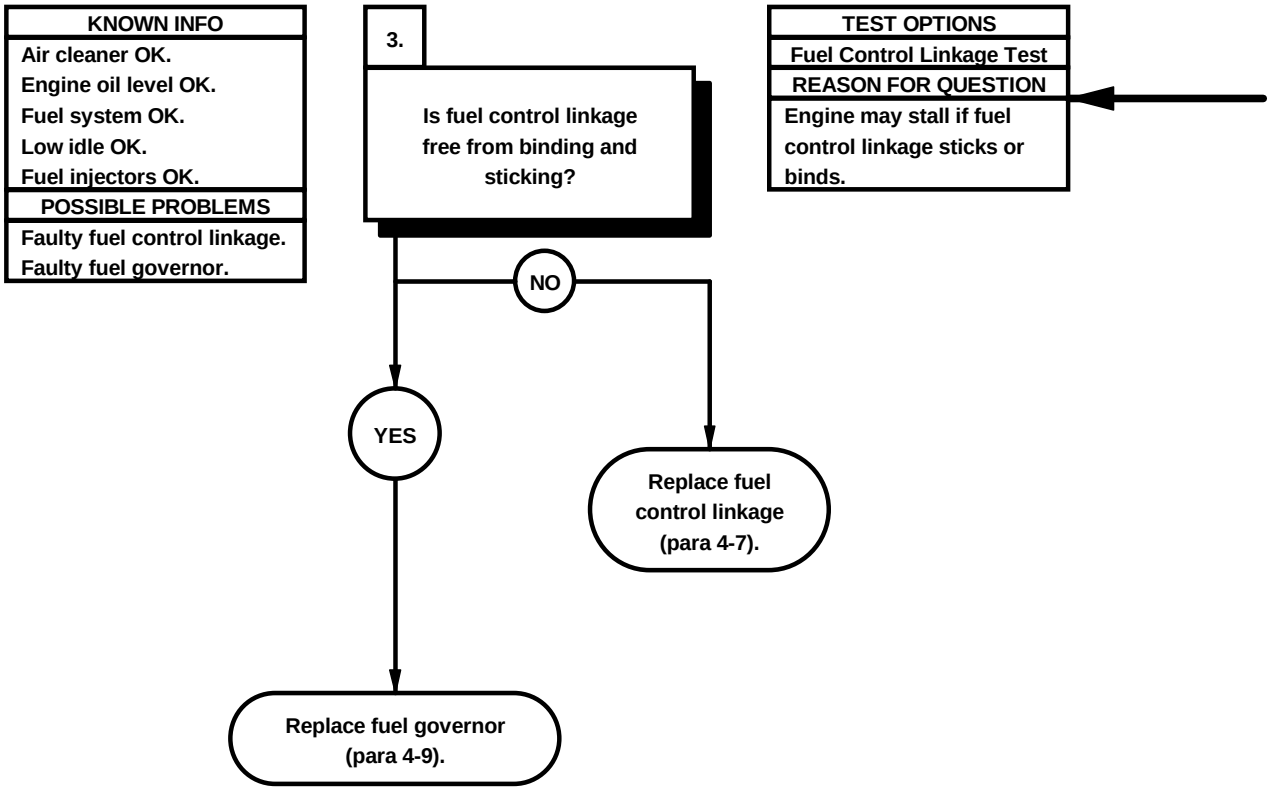
Actuating the control shaft lever places the injector in the Fuel On position for a few seconds. This causes excess fuel to be injected into that particular cylinder, causing a loud combustion knock.

(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 9-2320-365-10).
(9) Close cab door.
(10) Install valve cover (TM 9-2320-365-20-2).
(11) Lower cab (TM 9-2320-365-10).



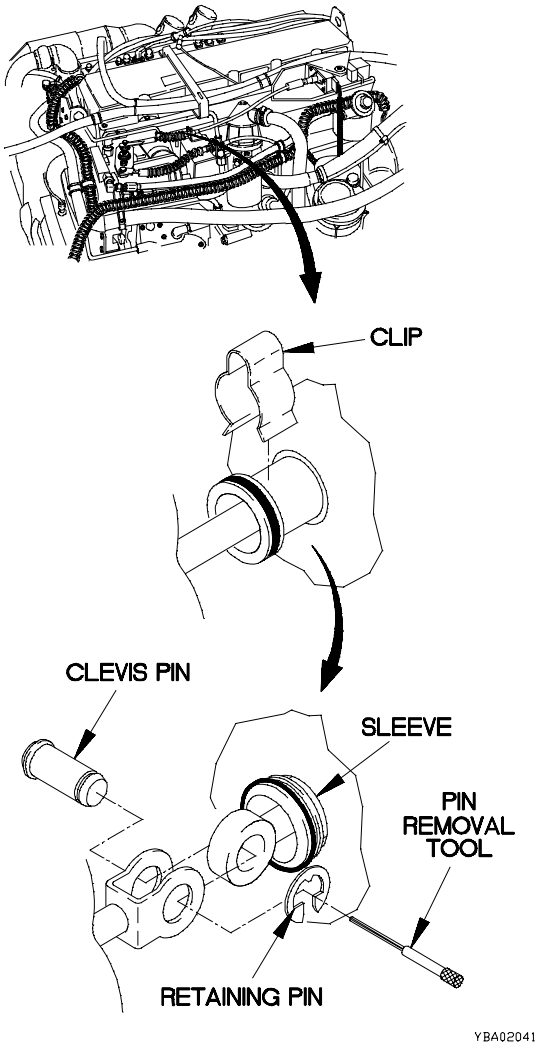
YBA02031

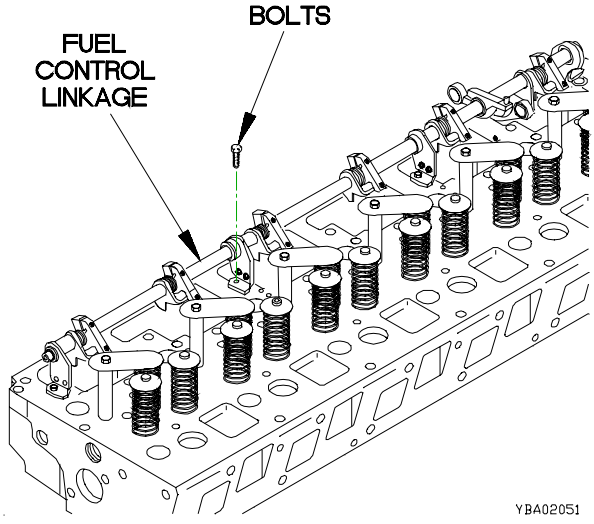
a2. ENGINE STALLS AT LOW RPM (CONT)



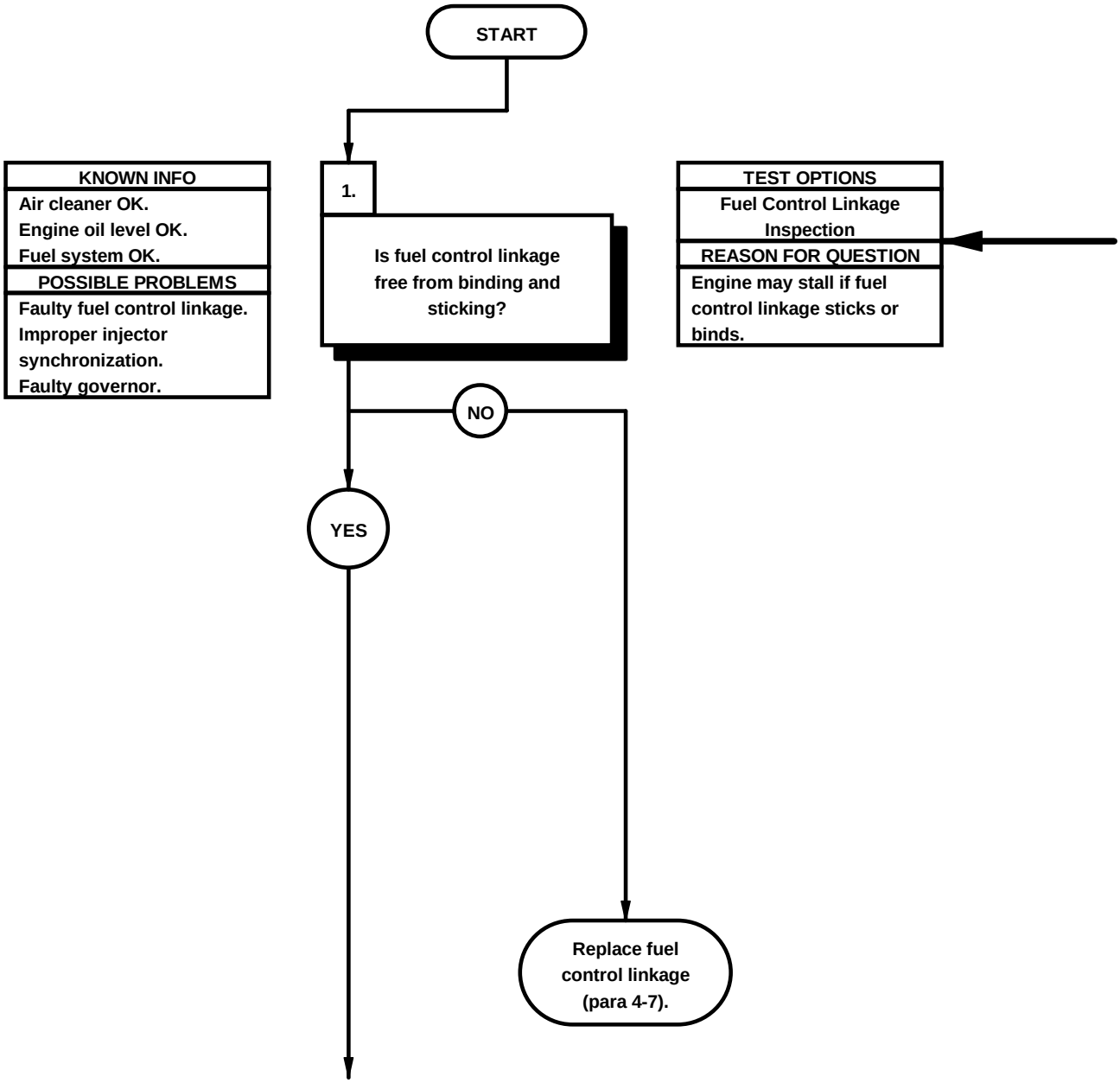
FUEL CONTROL LINKAGE TEST

(1) Raise cab (TM 9-2320-365-10).
(2) Remove valve cover (TM 9-2320-365-20-2).
(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 9-2320-365-20-2).
(21) Lower cab (TM 9-2320-365-10).



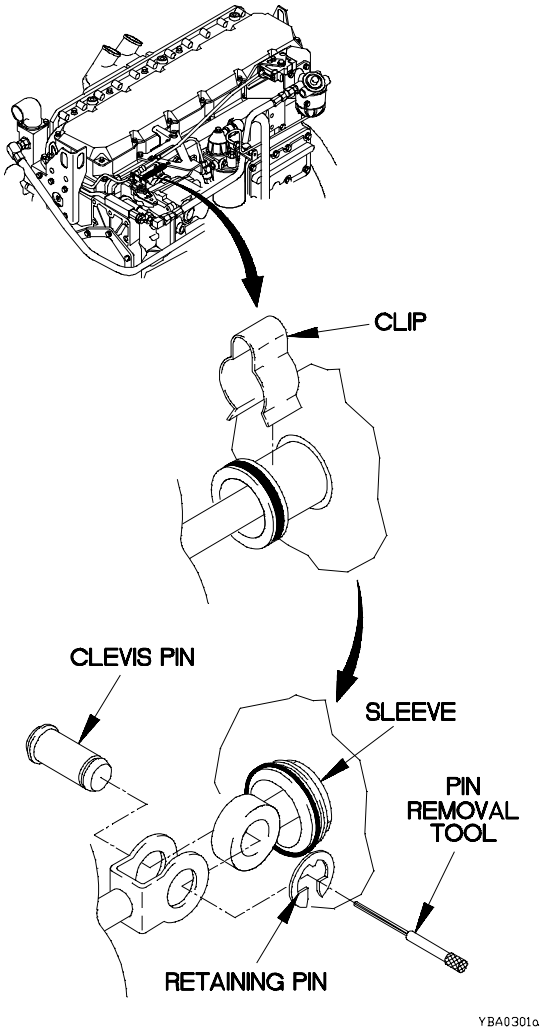


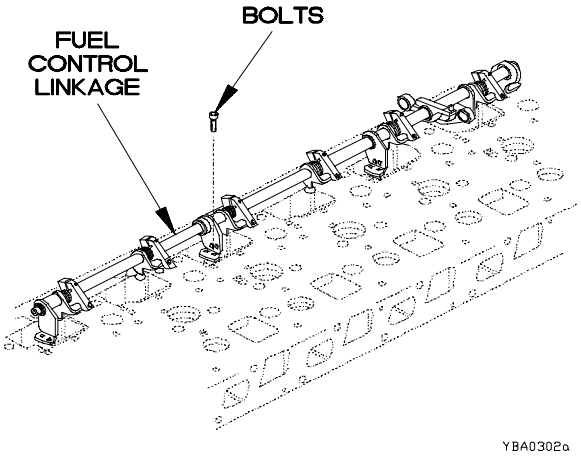
a3. ENGINE SPEED IS NOT STABLE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-365-10).	**Tools and Special Tools** Tool Kit, Genl Mech (Item 131, Appendix B) Tool Kit, Intl Comb Eng (Item 132, Appendix B) Wrench, Torque, 0-60 N·m (Item 153, Appendix B)



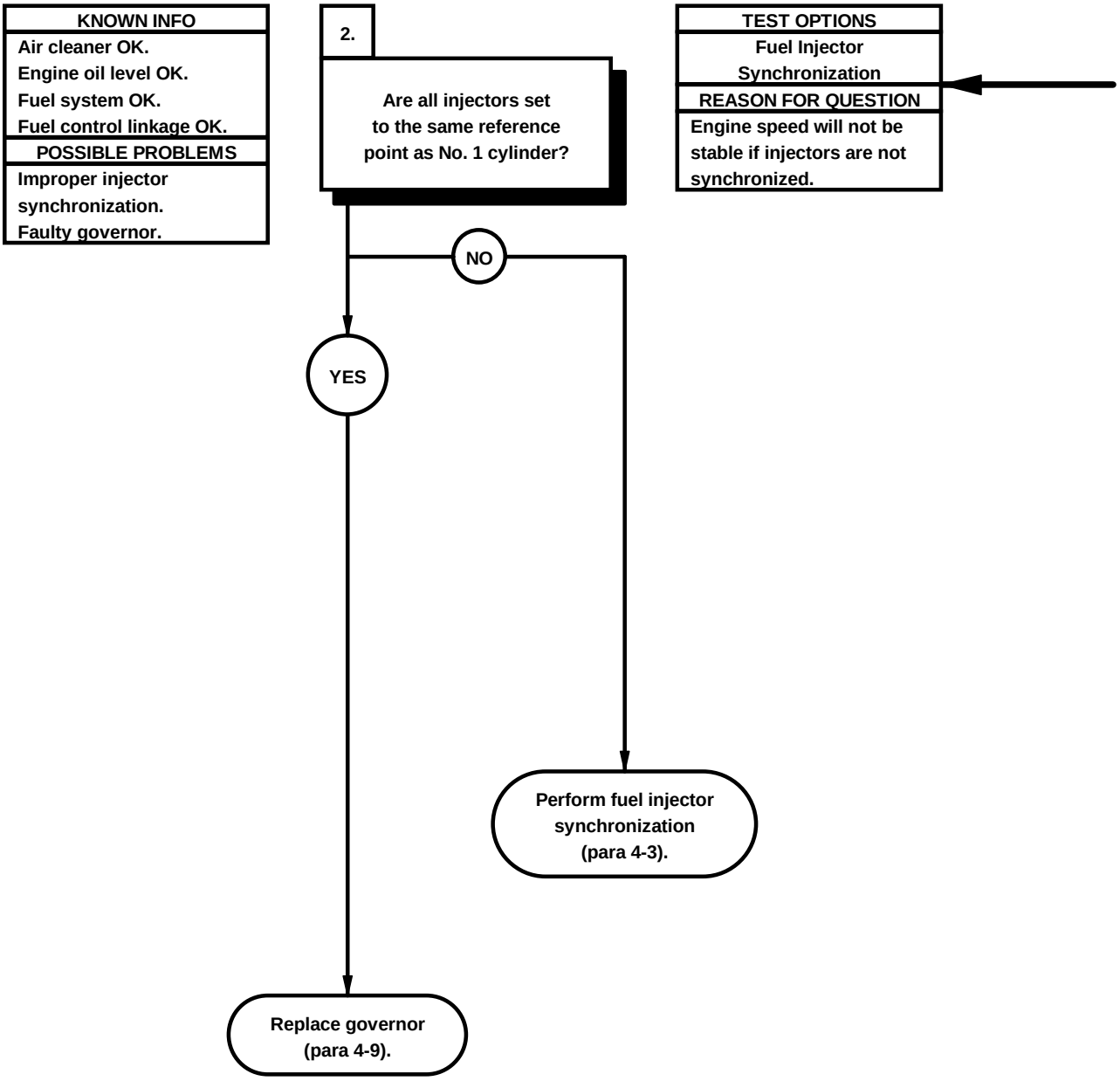
FUEL CONTROL LINKAGE TEST

(1) Raise cab (TM 9-2320-365-10).
(2) Remove valve cover (TM 9-2320-365-20-2).
(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 9-2320-365-20-2).
(21) Lower cab (TM 9-2320-365-10).





a3. ENGINE SPEED IS NOT STABLE (CONT)



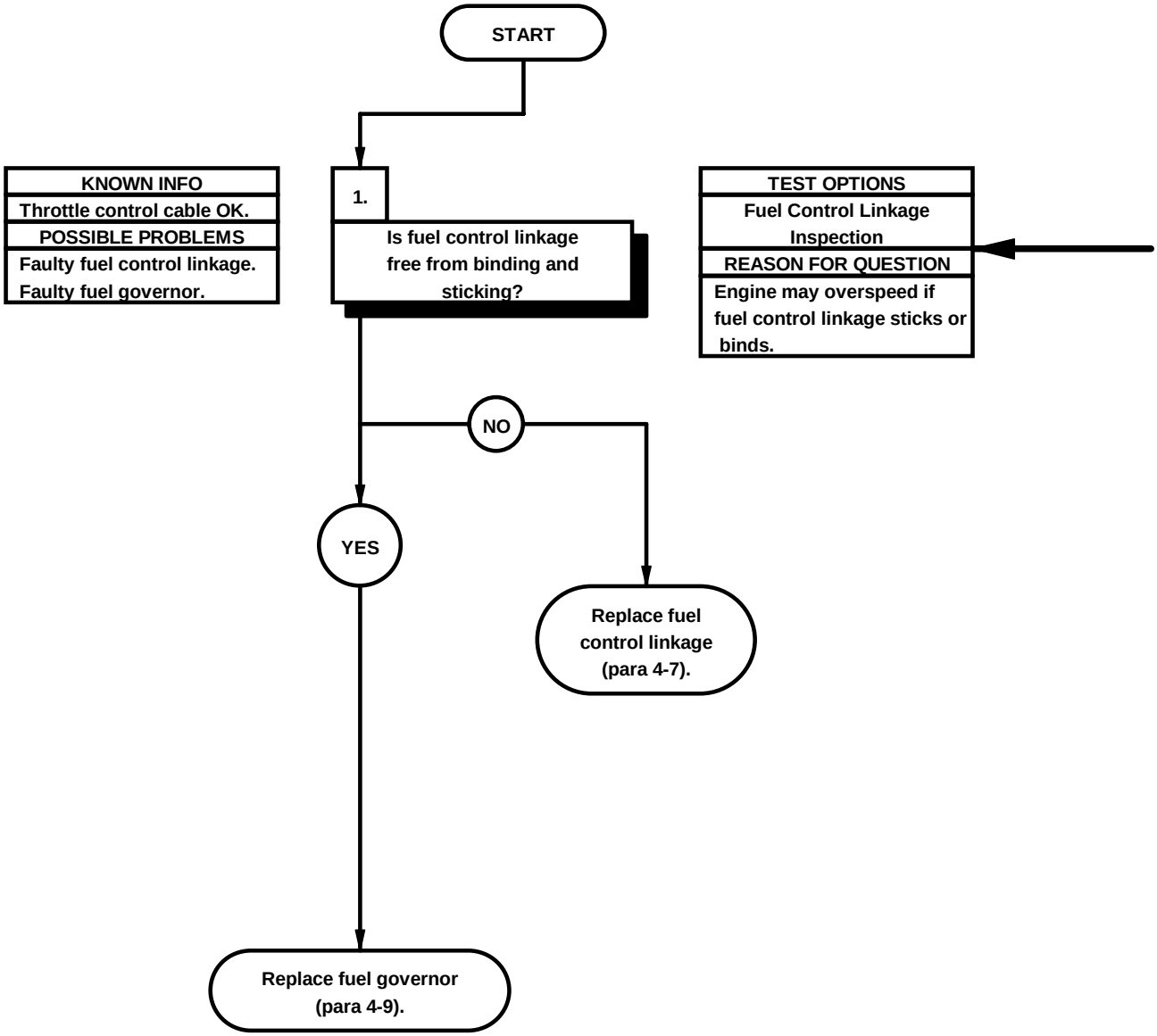
Perform fuel injector sychronization (para 4-3).

a4. ENGINE OVERSPEEDS ON START

INITIAL SETUP

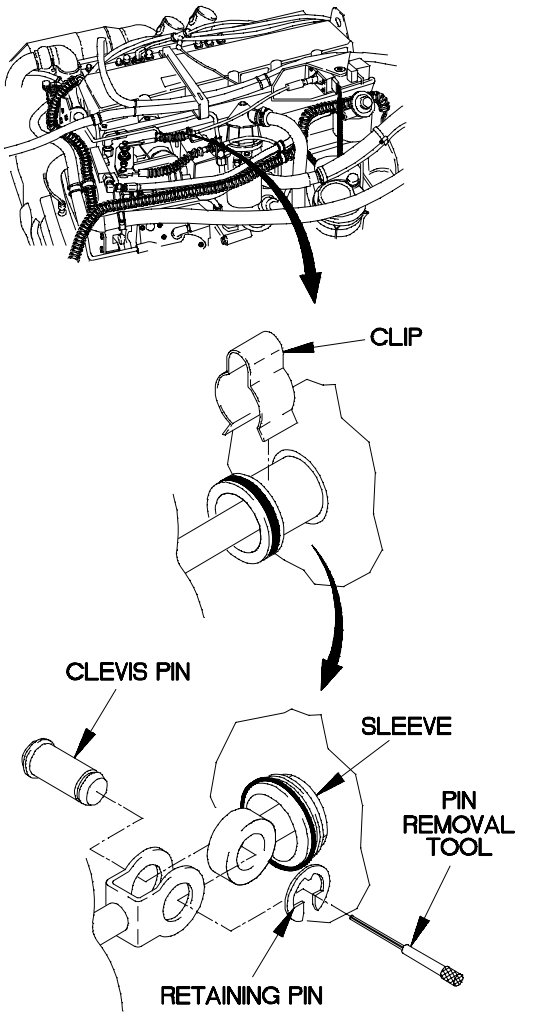
Equipment Conditions
Engine shut down (TM 9-2320-365-10).

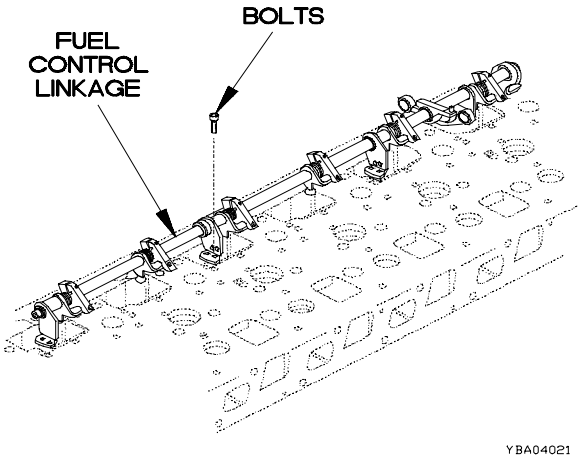
Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
Tool Kit, Intl Comb Eng (TM 9-2320-365-20)
Wrench, Torque, 0-60 N·m (Item 84, Appendix B)



FUEL CONTROL LINKAGE TEST

(1) Raise cab (TM 9-2320-365-10).
(2) Remove valve cover (TM 9-2320-365-20-2).
(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 9-2320-365-20-2).
(21) Lower cab (TM 9-2320-365-10).



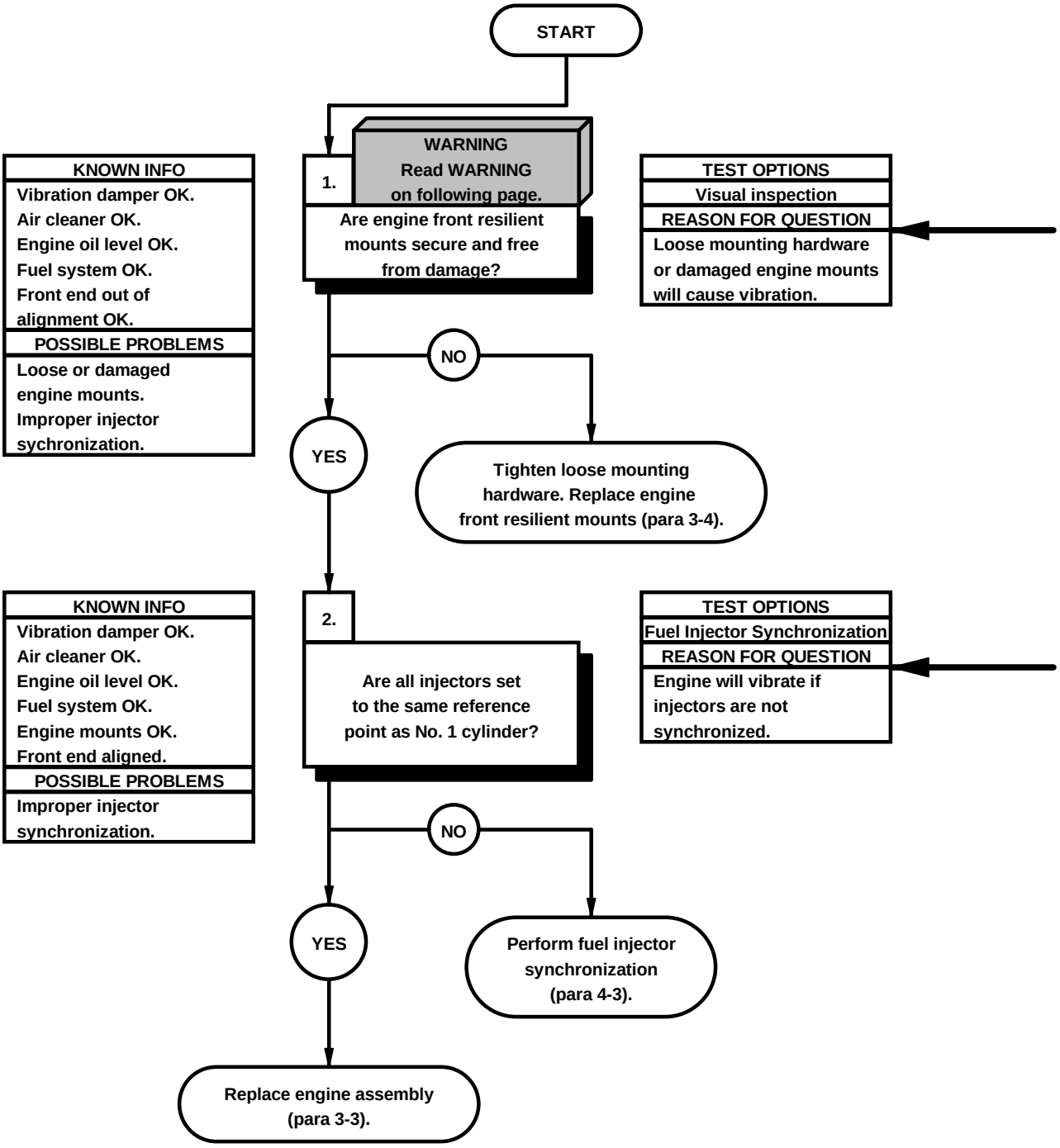


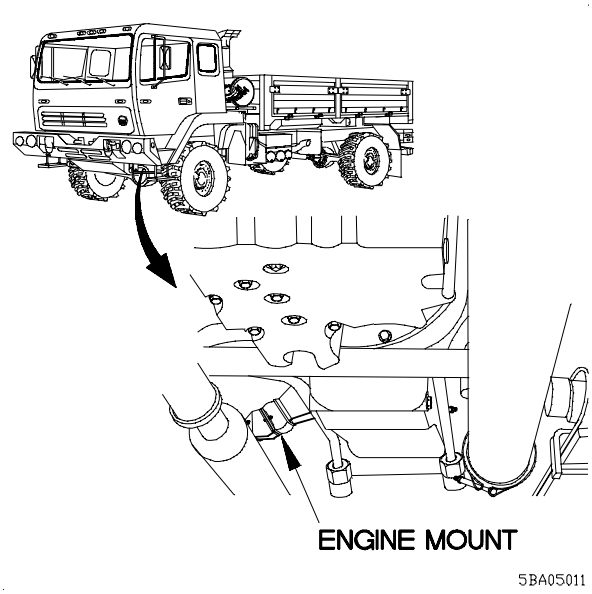
a5. TOO MUCH VIBRATION IN ENGINE

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
Tool Kit, Intl Comb Eng (TM 9-2320-365-20)
Wrench, Torque, 0-60 N·m (Item 84, 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.

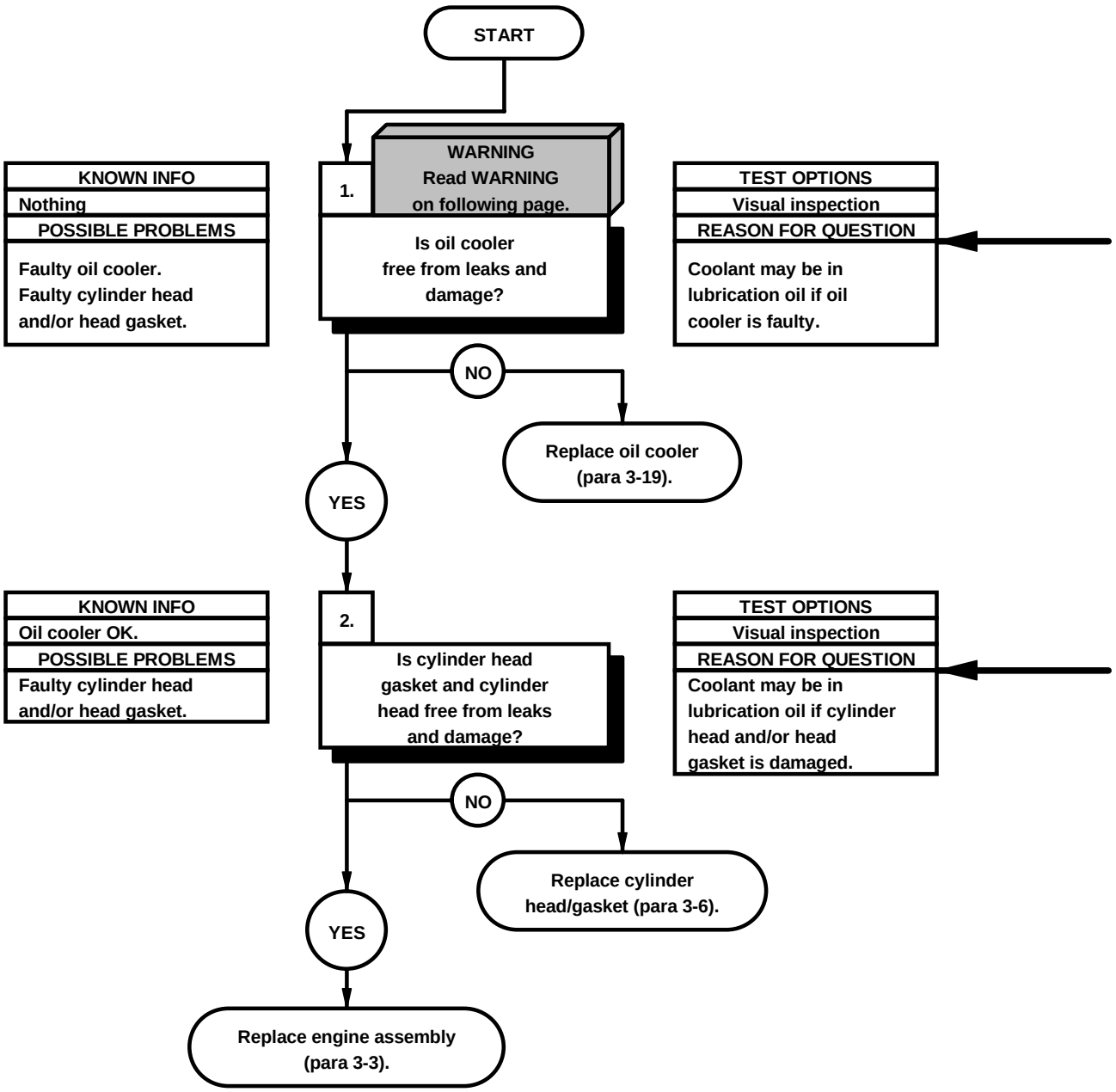
Perform fuel injector sychronization (para 4-3).

a6. COOLANT IN ENGINE OIL

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).

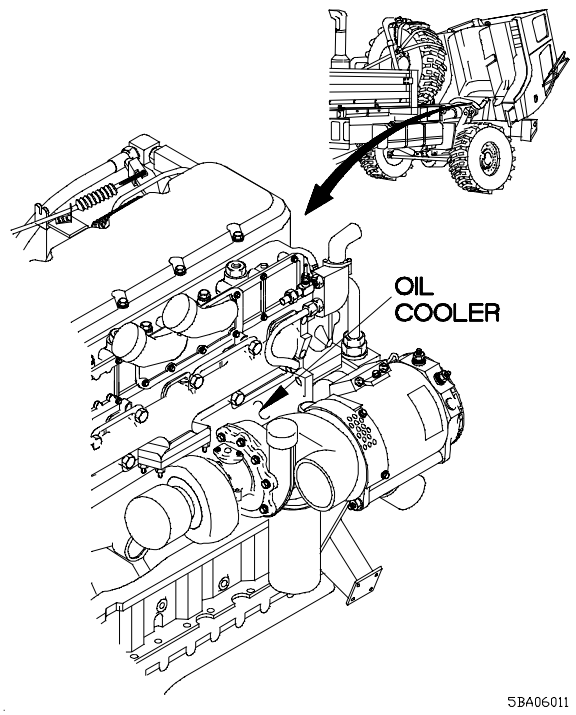
Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
Goggles, Industrial (Item 25, Appendix B)



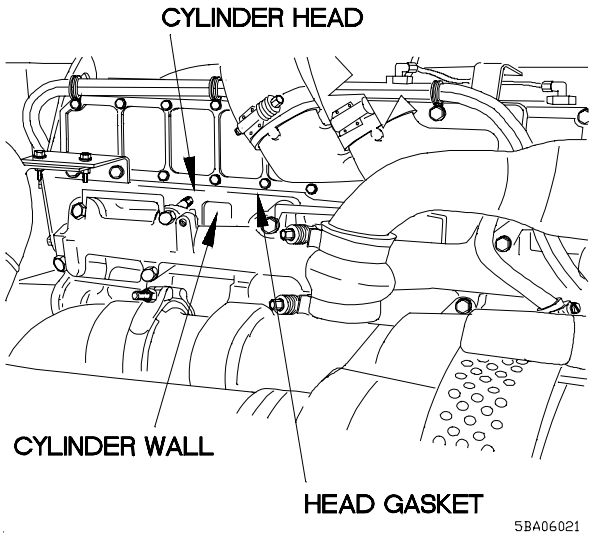
WARNING

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

(1) Raise cab (TM 9-2320-365-10).
(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 9-2320-365-10).



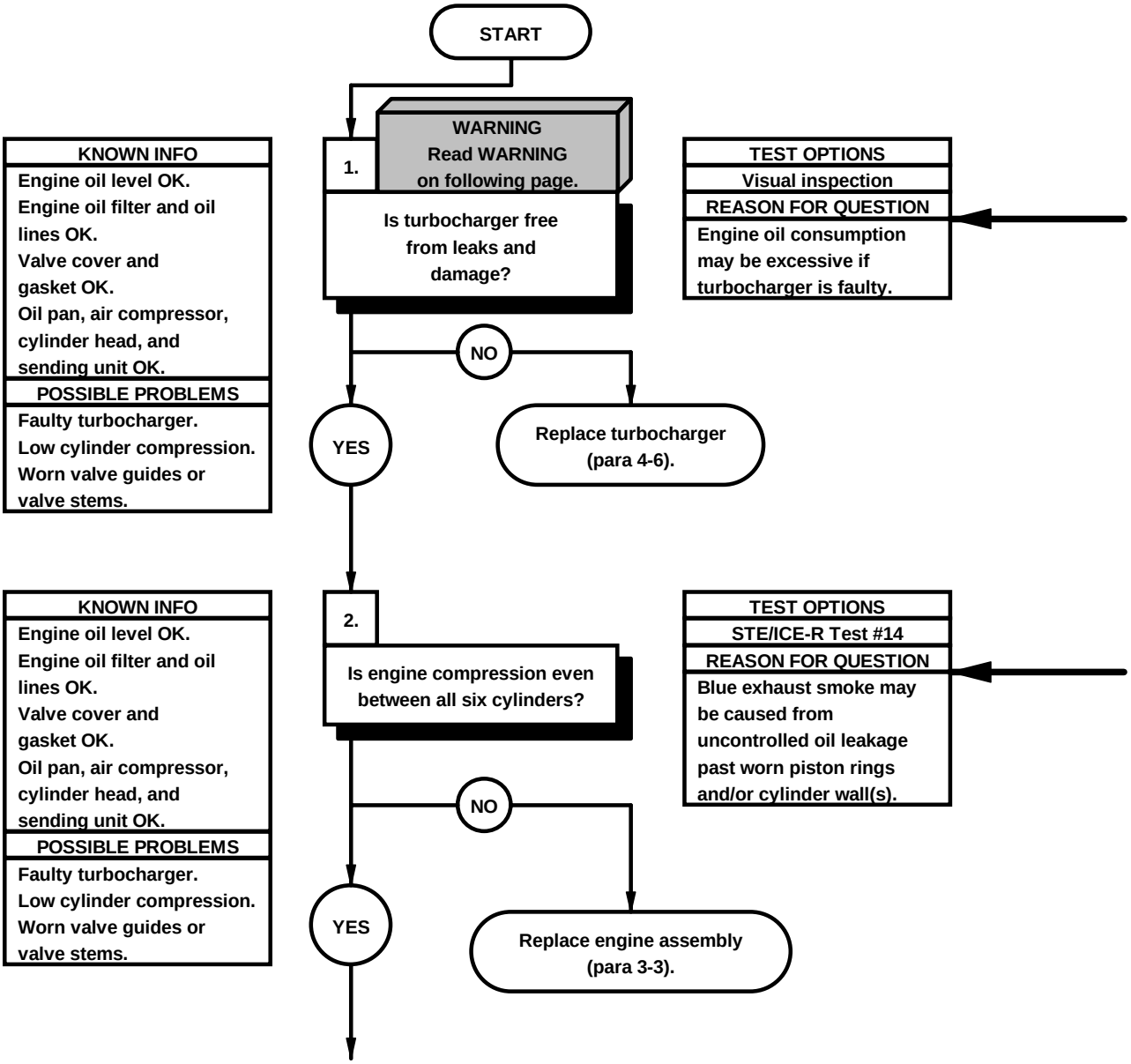
a7. EXCESSIVE ENGINE OIL CONSUMPTION

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).

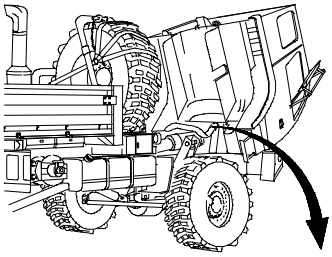
Reference
TM 9-491-571-12&P

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Goggles, Industrial (Item 25, Appendix B)



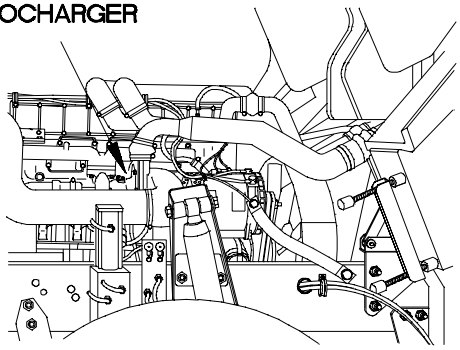
WARNING

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



(1) Raise cab (TM 9-2320-365-10).
(2) Check turbocharger for obvious signs of damage and oil leakage.

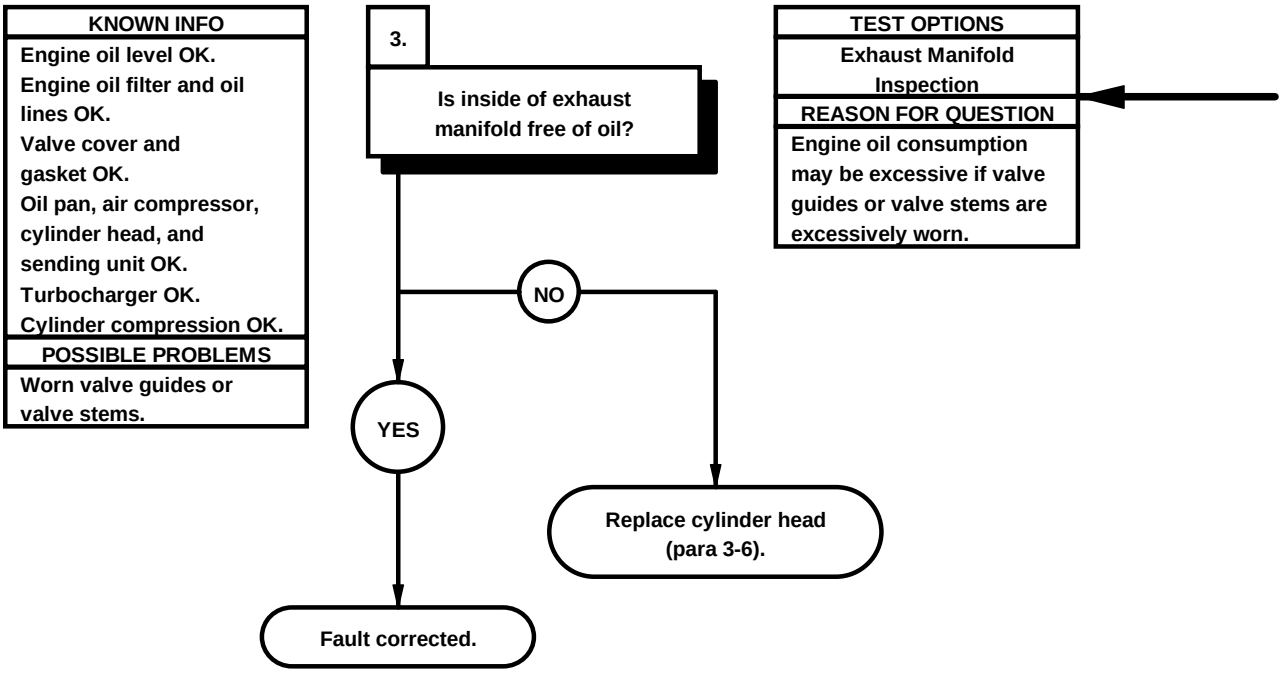
TURBOCHARGER



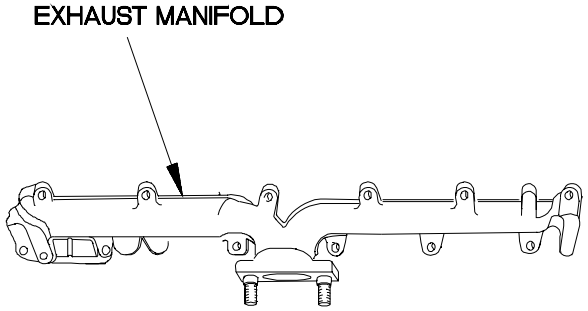
5BA07011

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 9-2320-365-10).

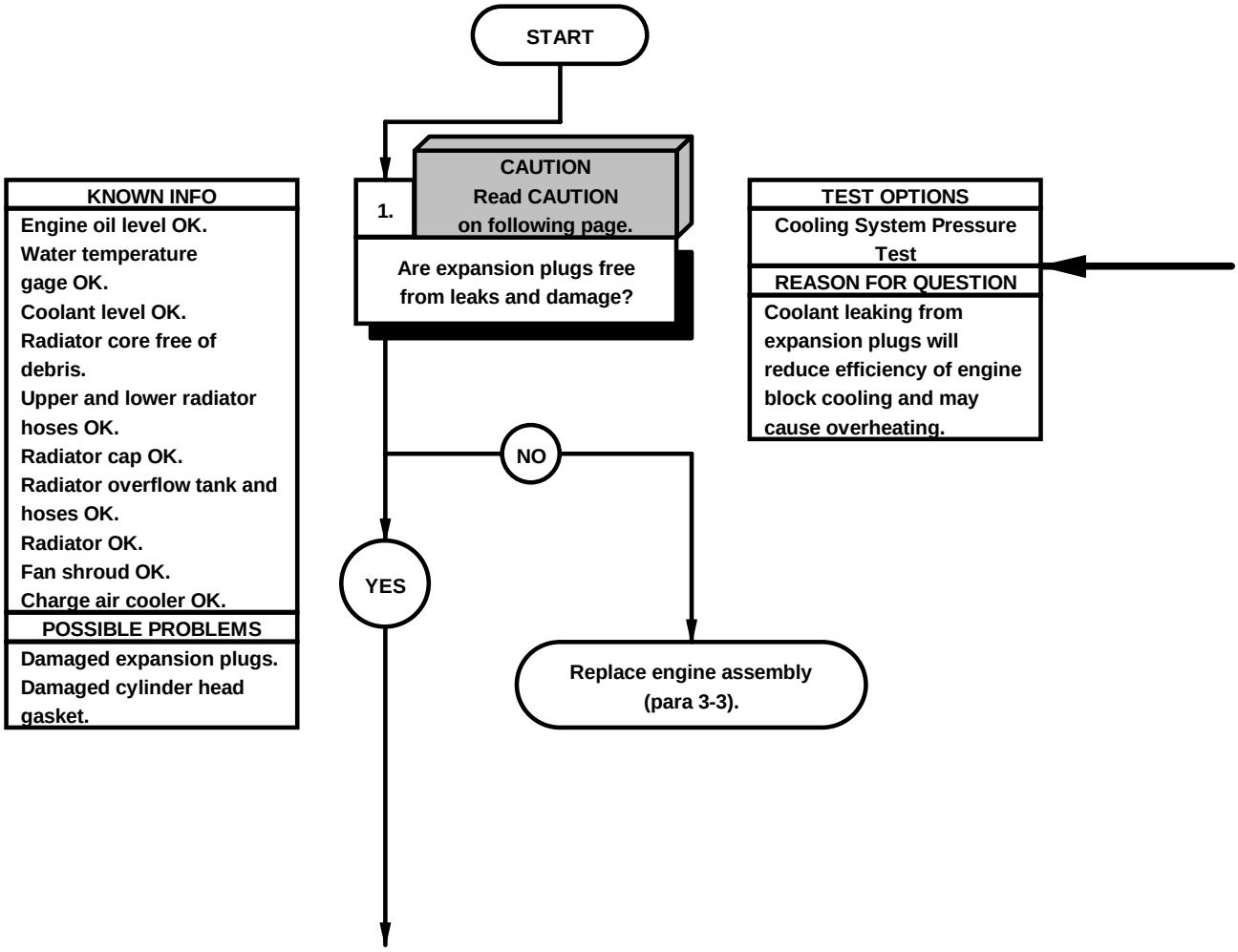


a8. ENGINE OVERHEATS

INITIAL SETUP

Equipment Conditions
- Engine shut down (TM 9-2320-365-10).
- Cab raised (TM 9-2320-365-10).

Tools and Special Tools
- Tool Kit, Genl Mech (Item 68, Appendix B)
- Adapter, Radiator (TM 9-2320-365-20)
- Pressure Tester, Radiator (Item 42, Appendix B)



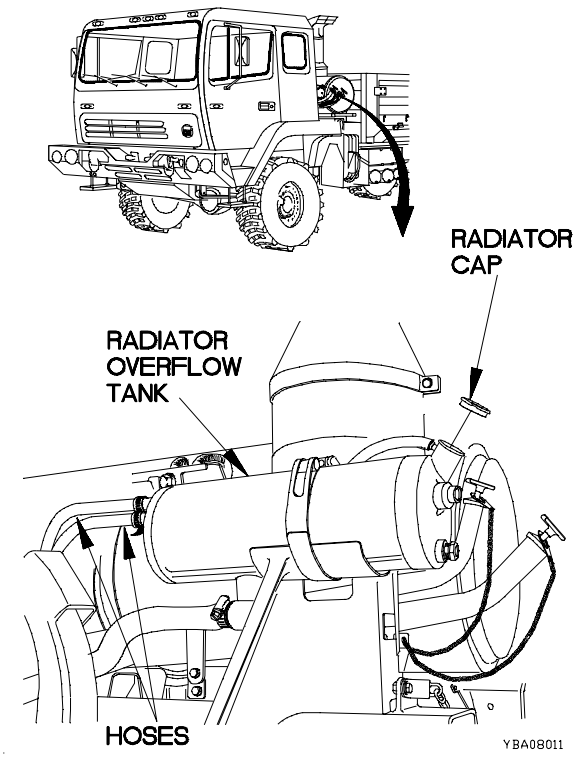
COOLING SYSTEM PRESSURE TEST

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

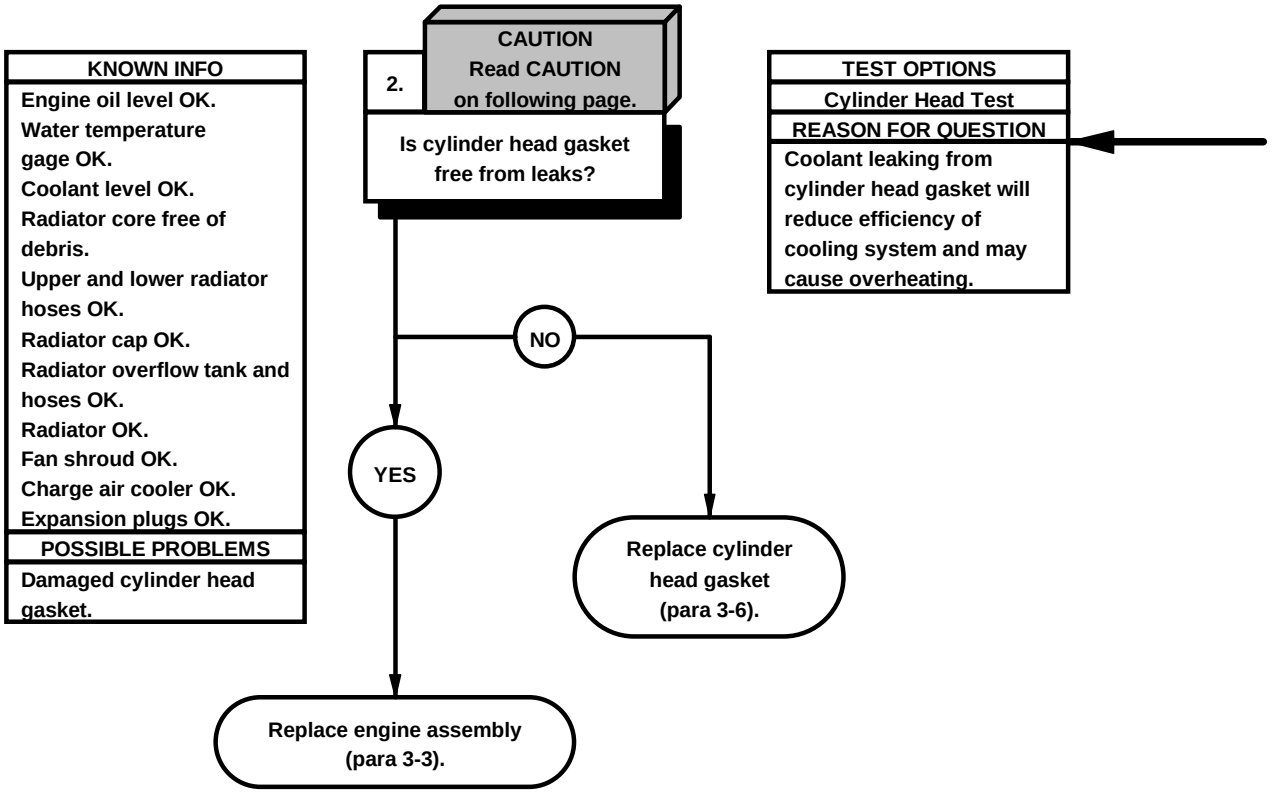
CAUTION

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)



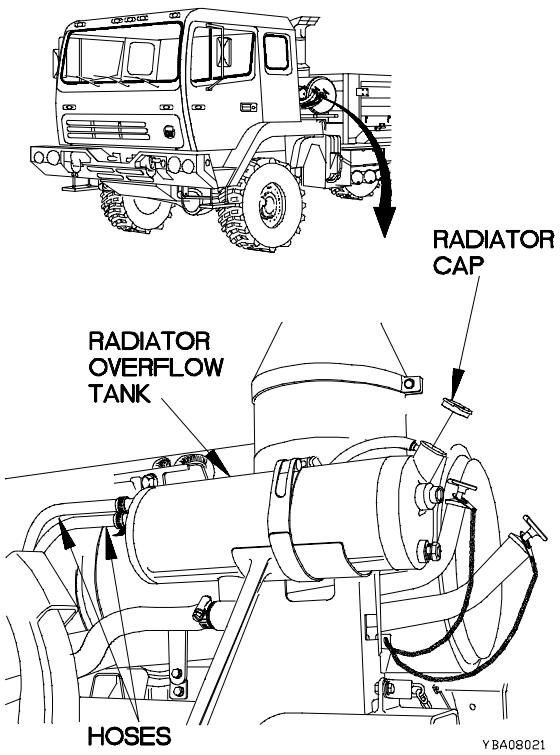
COOLING SYSTEM PRESSURE TEST

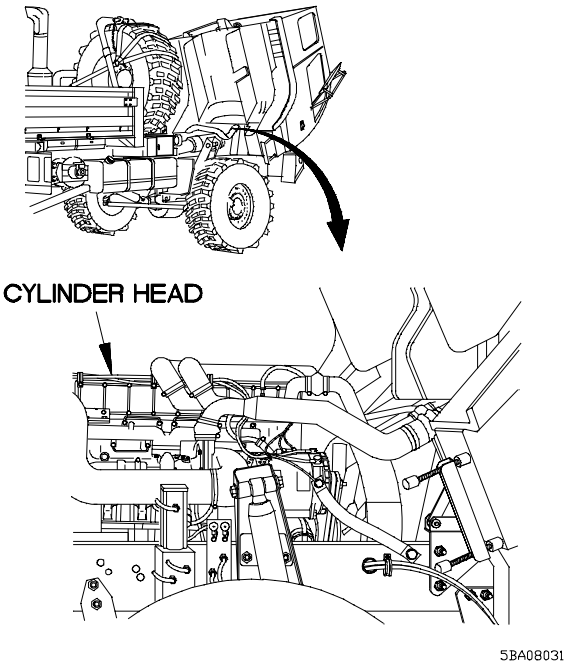
(1) Remove radiator cap from radiator overflow tank.
(2) Install adapter on radiator overflow tank.
(3) Install pressure tester on adapter.

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 9-2320-365-10).





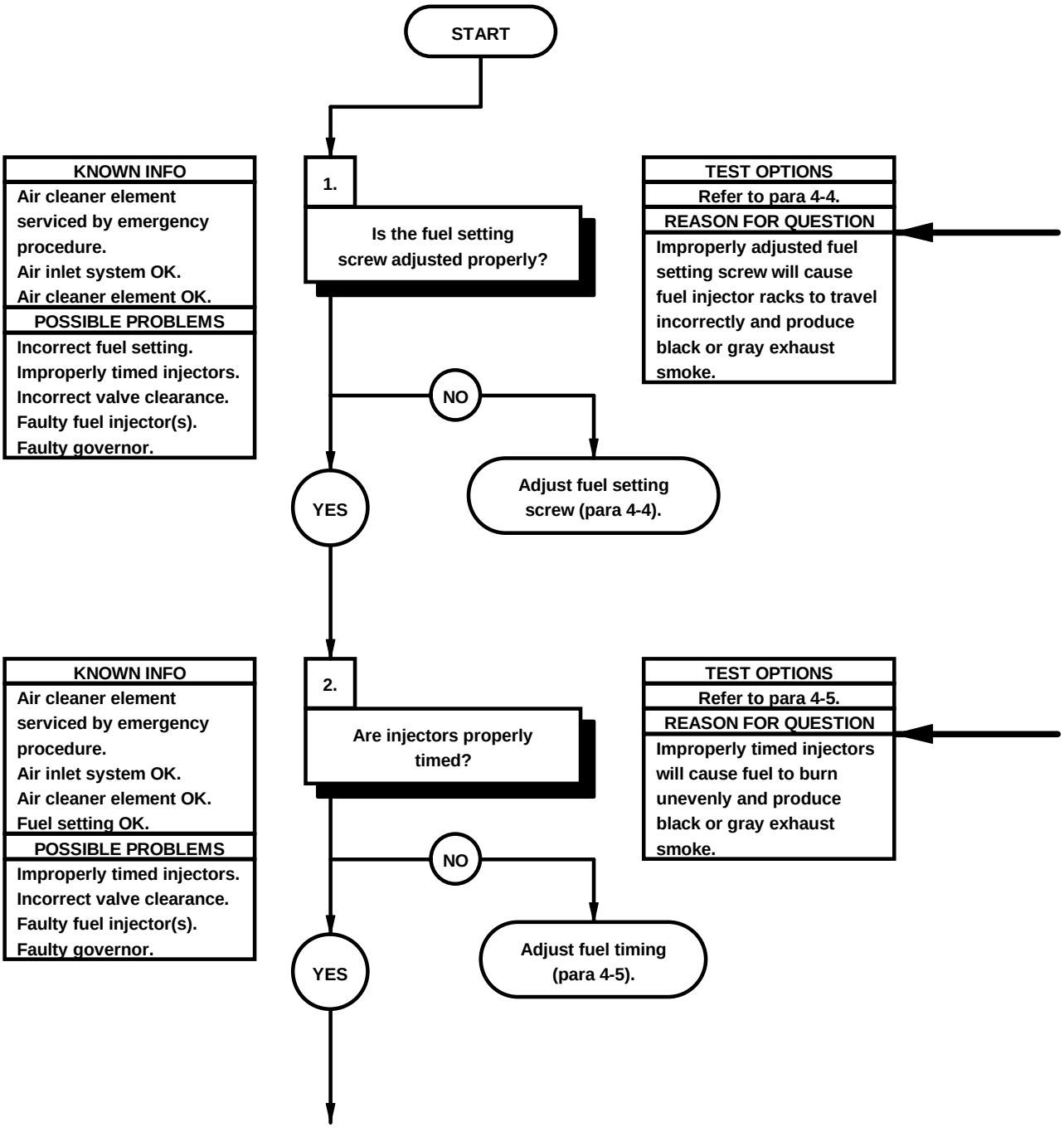
a9. EXCESSIVE BLACK OR GRAY EXHAUST SMOKE FROM ENGINE

INITIAL SETUP

Equipment Conditions
- Engine shut down (TM 9-2320-365-10).
- Cab raised (TM 9-2320-365-10).

Tools and Special Tools
- Tool Kit, Genl Mech (Item 68, Appendix B)
- Tool Kit, Intl Comb Eng (TM 9-2320-365-20)
- Wrench, Torque, 0-60 N·m (Item 84, Appendix B)

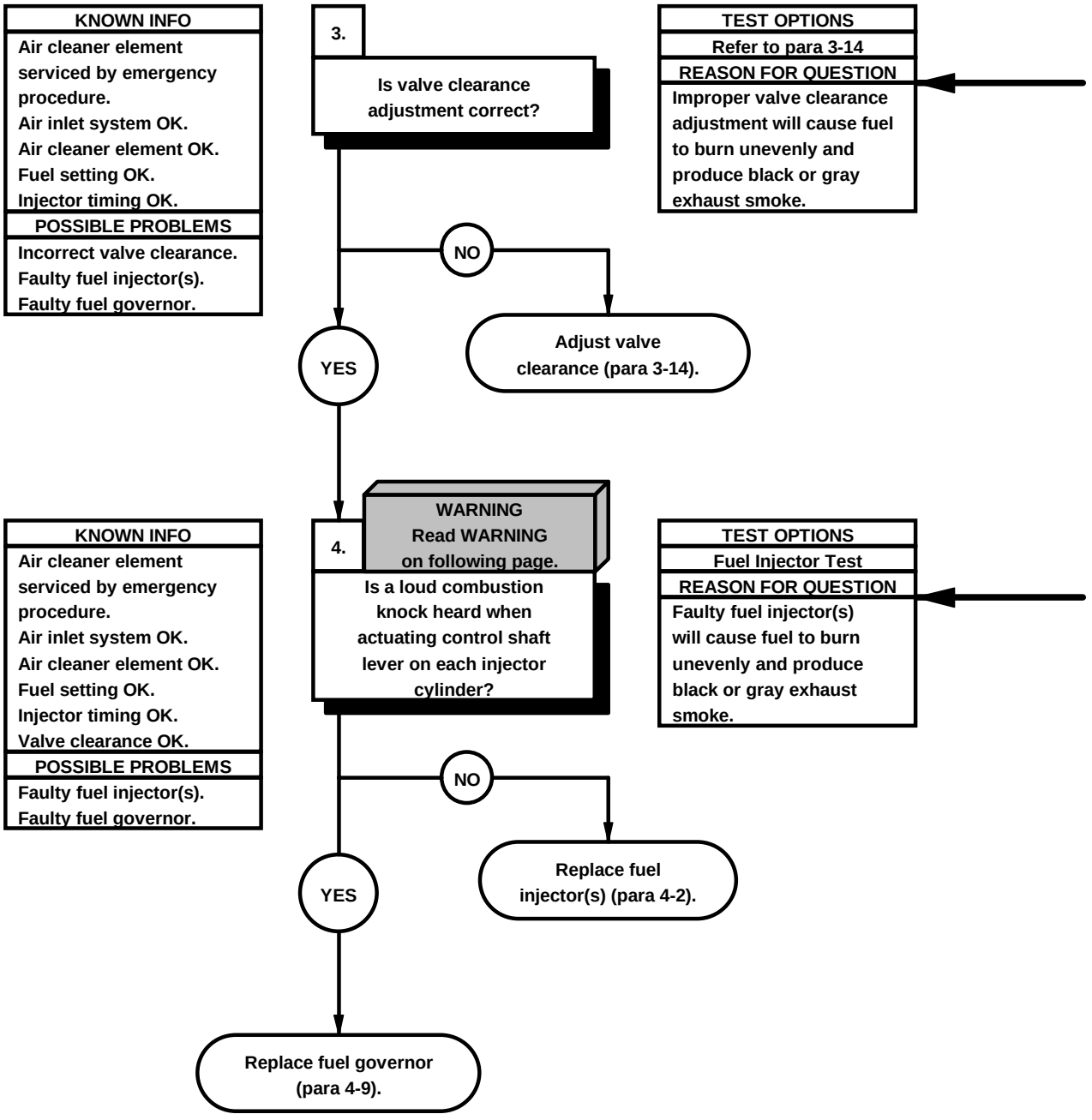
Personnel Required
- (2)



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 9-2320-365-20-2).

WARNING

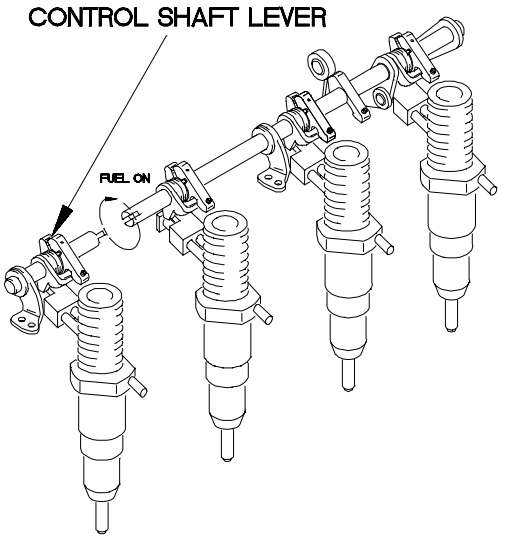
Use extreme care when opening cab door with cab raised. Failure to comply may cause injury to personnel or damage to equipment.

(2) Open cab door.
(3) Start engine (TM 9-2320-365-10).

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 9-2320-365-10).
(8) Close cab door.
(9) Install valve cover (TM 9-2320-365-20-2).
(10) Lower cab (TM 9-2320-365-10).



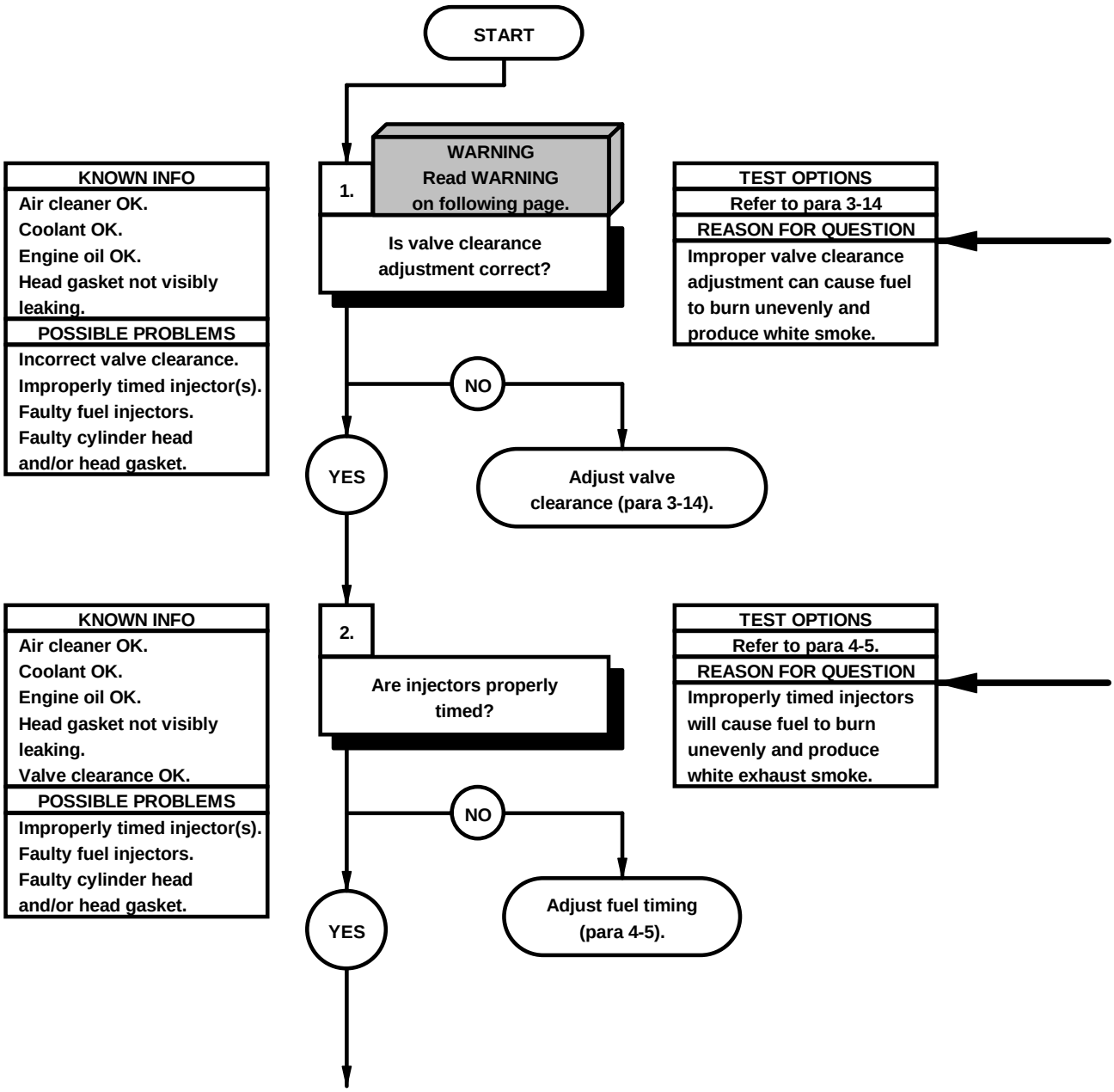
YBA09011

a10. WHITE EXHAUST SMOKE FROM ENGINE

INITIAL SETUP

Equipment Conditions
- Engine shut down (TM 9-2320-365-10).
- Cab raised (TM 9-2320-365-10).

Tools and Special Tools
- Tool Kit, Genl Mech (Item 68, Appendix B)
- Adapter, Radiator (TM 9-2320-365-20)
- Pressure Tester, Radiator (Item 42, Appendix B)
- Tool Kit, Intl Comb Eng (TM 9-2320-365-20)
- Wrench, Torque, 0-60 N·m (Item 84, Appendix B)



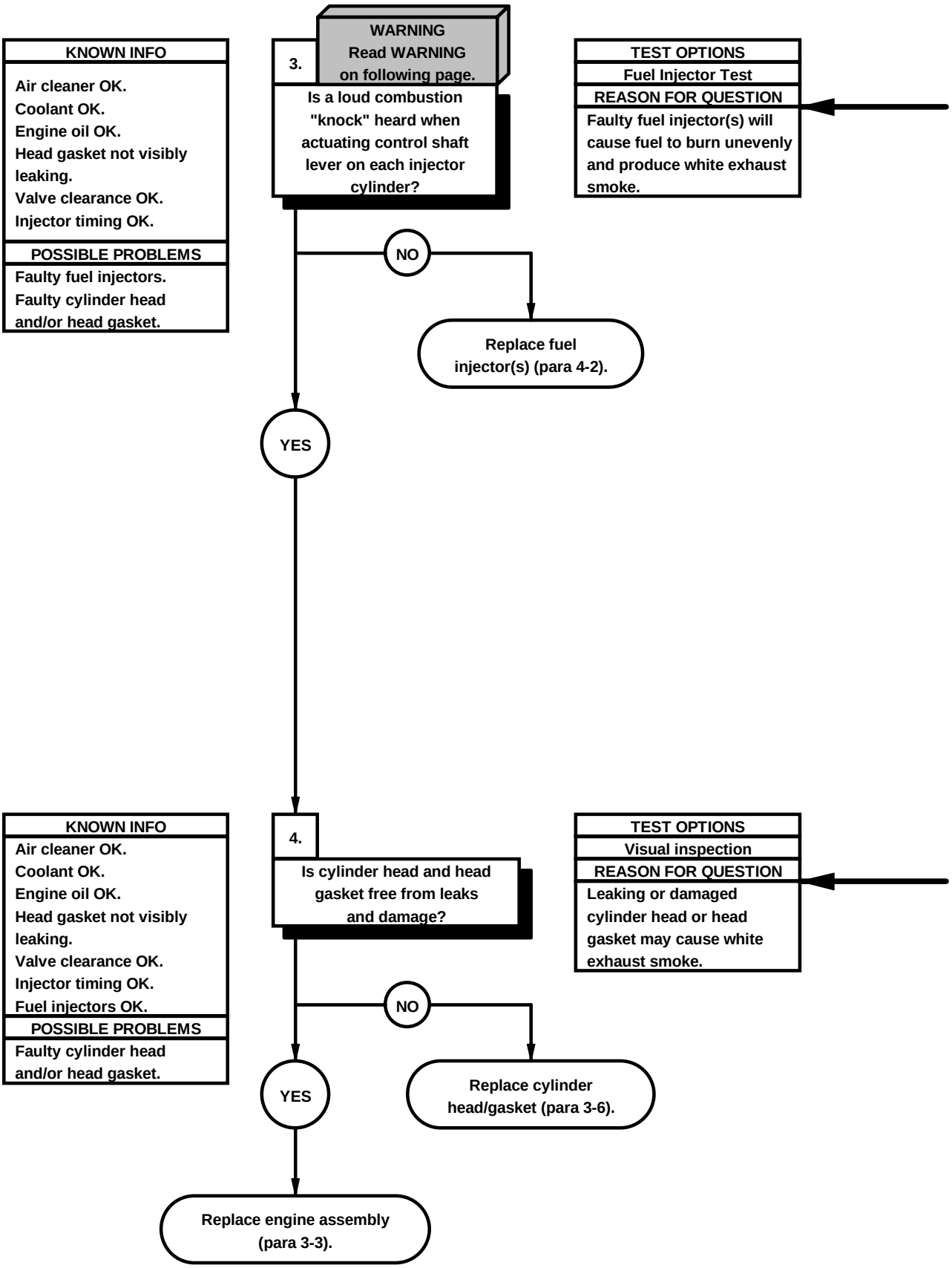
WARNING

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 9-2320-365-20-2).

WARNING

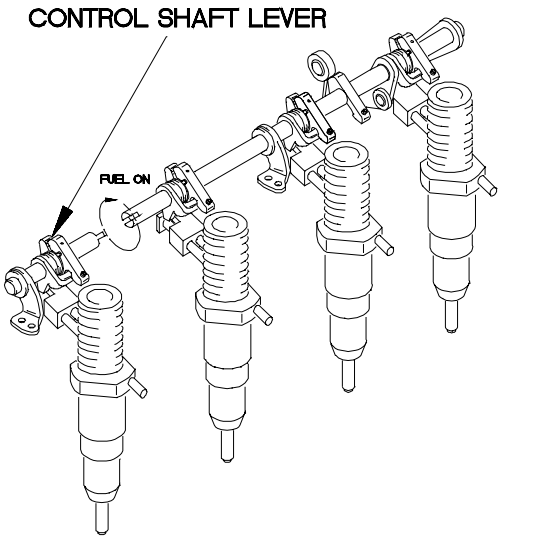
Use extreme care when opening cab door with cab raised. Failure to comply may cause injury to personnel or damage to equipment.

(2) Open cab door.
(3) Start engine (TM 9-2320-365-10).

NOTE

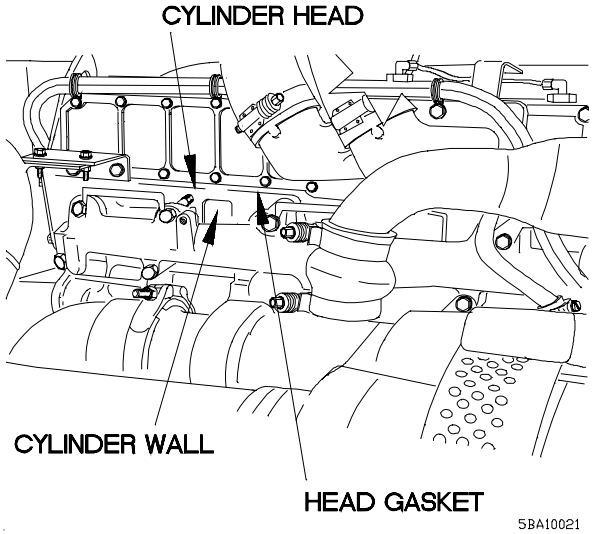
Actuating the control shaft lever places the injector in the Fuel On position for a few seconds. This causes excess fuel to be injected into that particular cylinder, causing a loud combustion knock.

(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 9-2320-365-10).
(8) Close cab door.
(9) Install valve cover (TM 9-2320-365-20-2).
(10) Lower cab (TM 9-2320-365-10).



YBA10011

(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).



5BA10021

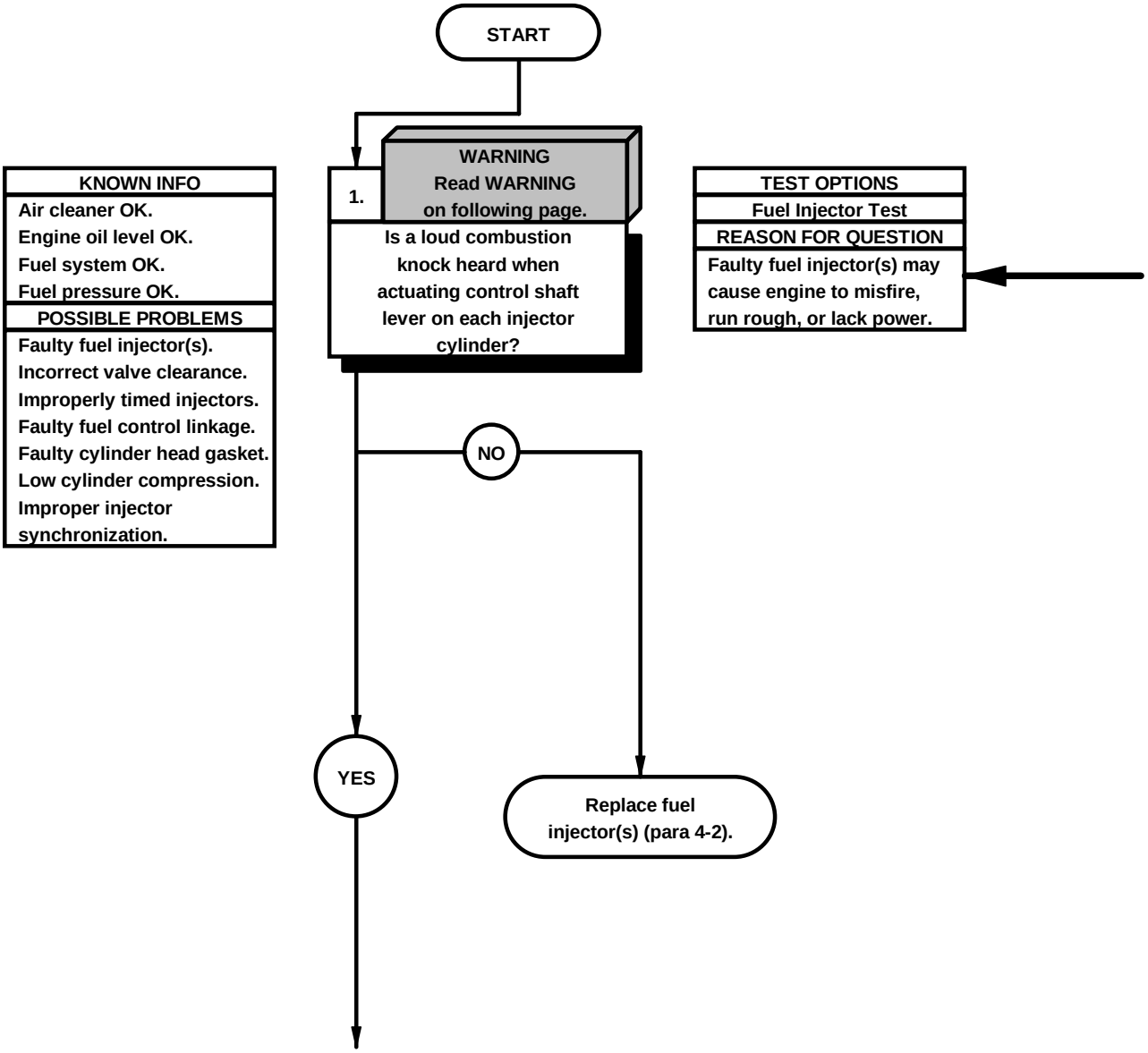
a11. ENGINE STARTS BUT MISFIRES, RUNS ROUGH, OR LACKS POWER

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).

References
TM 9-4910-571-12&P

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
Wrench, Torque, 0-60 N·m (Item 84, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Tool Kit, Intl Comb Eng (TM 9-2320-365-20)
Pressure Tester, Radiator (Item 42, Appendix B)
Adapter, Radiator (TM 9-2320-365-20)



FUEL INJECTOR TEST

(1) Raise cab (TM 9-2320-365-10).
(2) Remove valve cover (TM 9-2320-365-20-2).

WARNING

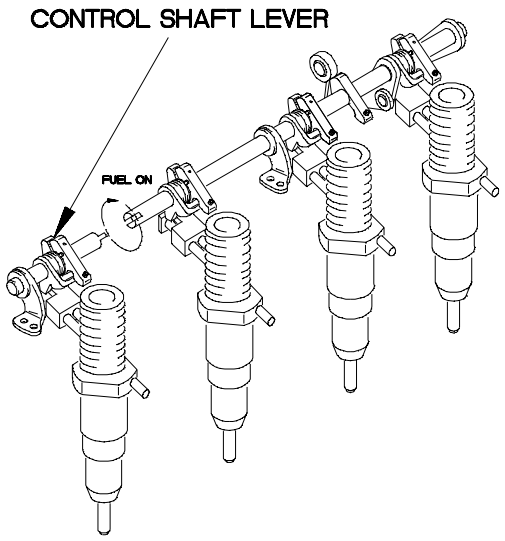
Use extreme care when opening cab door with cab raised. Failure to comply may cause injury to personnel or damage to equipment.

(3) Open cab door.
(4) Start engine (TM 9-2320-365-10).

NOTE

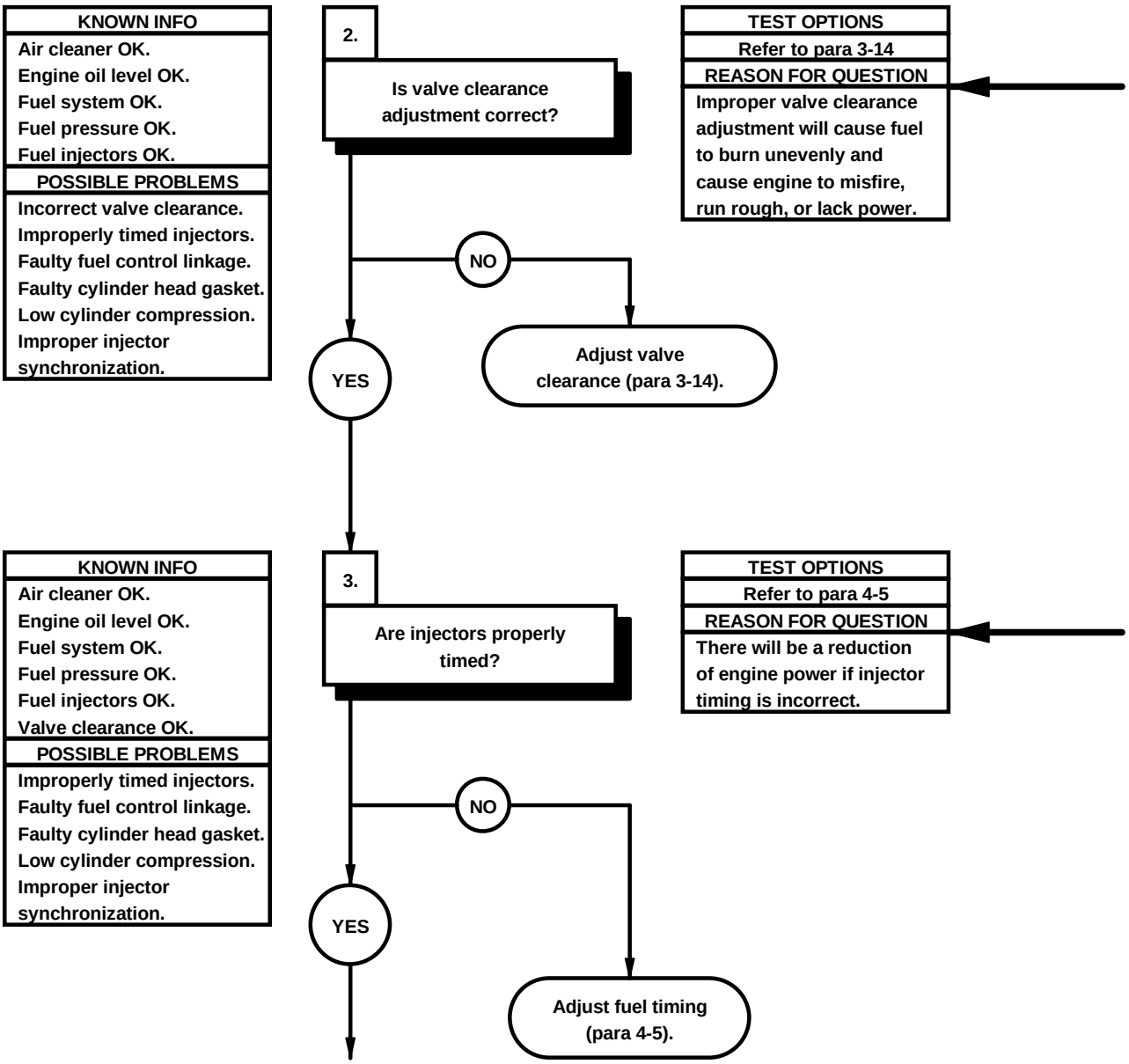
Actuating the control shaft lever places the injector in the Fuel On position for a few seconds. This causes excess fuel to be injected into that particular cylinder, causing a loud combustion knock.

(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 9-2320-365-10).
(9) Close cab door.
(10) Install valve cover (TM 9-2320-365-20-2).
(11) Lower cab (TM 9-2320-365-10).



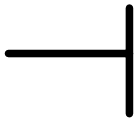
YBA11011

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



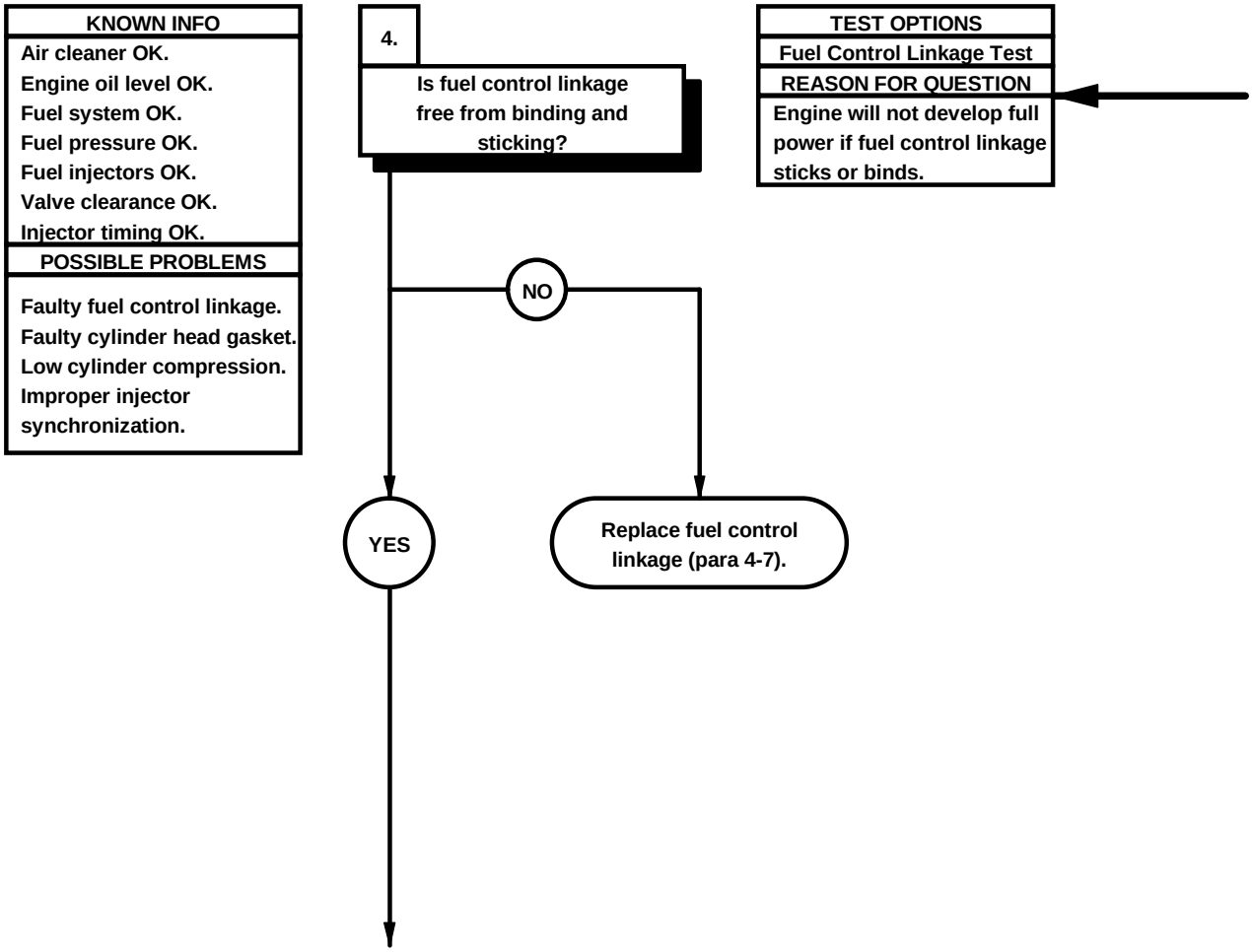


Refer to para 3-14 to adjust valve clearance.



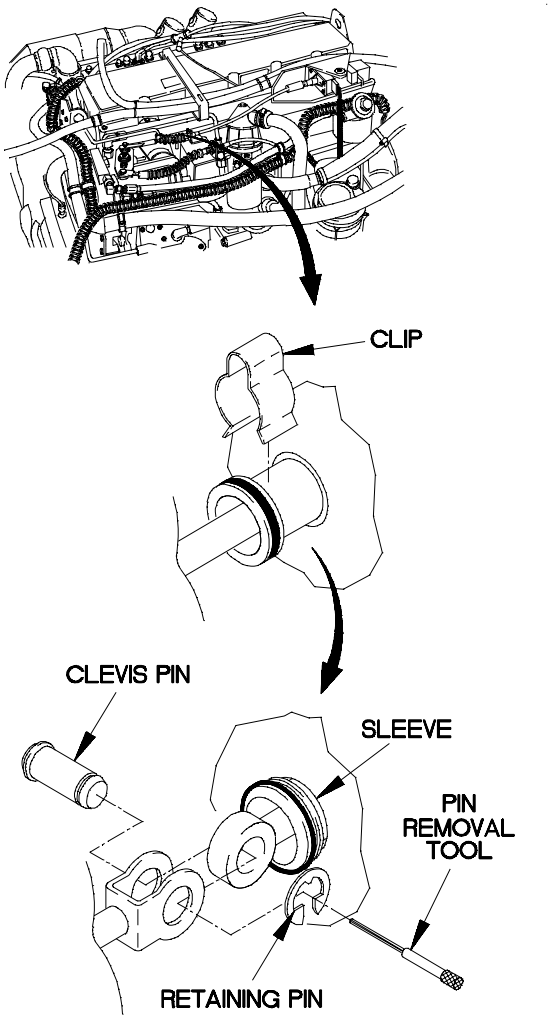
Refer to para 4-5 for fuel timing.

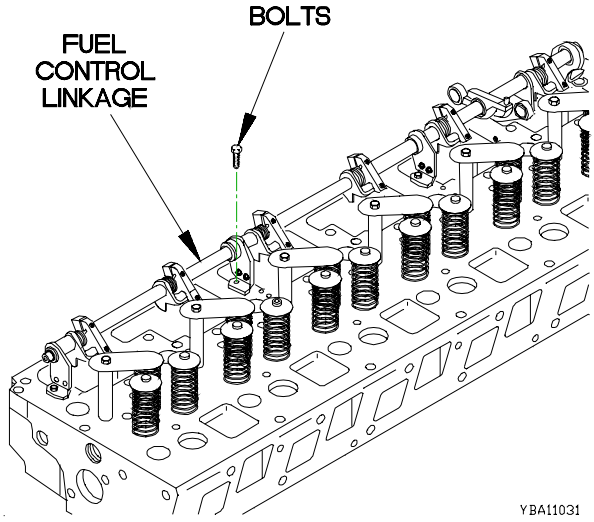
a11. ENGINE STARTS BUT MISFIRES, RUNS ROUGH, OR LACKS POWER (CONT)



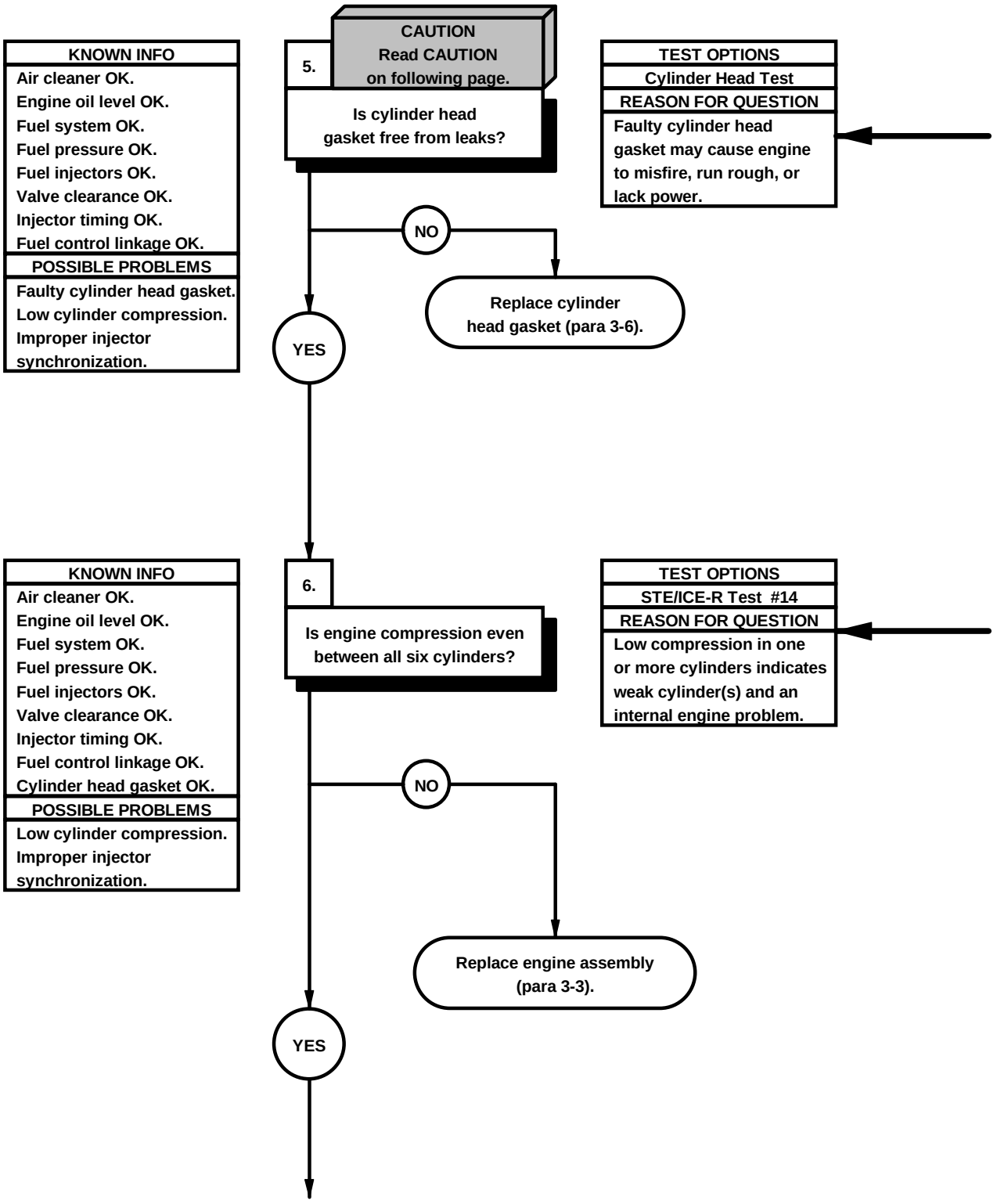
FUEL CONTROL LINKAGE TEST

(1) Raise cab (TM 9-2320-365-10).
(2) Remove valve cover (TM 9-2320-365-20-2).
(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 9-2320-365-20-2).
(21) Lower cab (TM 9-2320-365-10).





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



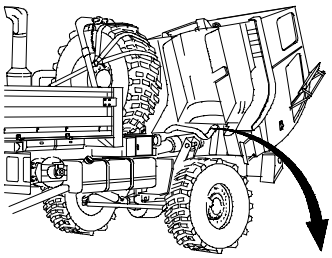
COOLING SYSTEM PRESSURE TEST

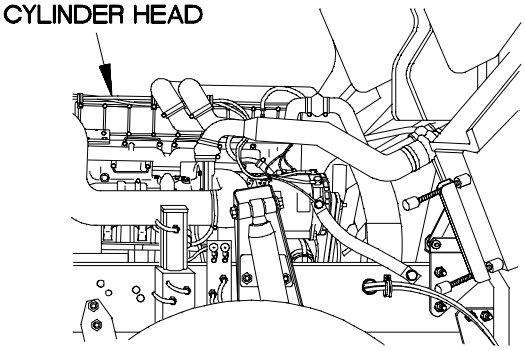
(1) Remove radiator cap from radiator overflow tank.
(2) Install adapter on radiator overflow tank.
(3) Install pressure tester on adapter.
(4) Raise cab (TM 9-2320-365-10).

CAUTION

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

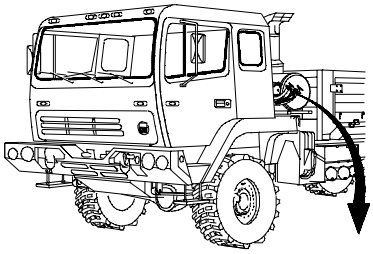
(5) Pressurize cooling system to 10 psi (69 kPa) and check cylinder head for leaks.
(6) Release pressure and remove pressure tester from adapter.
(7) Remove adapter from radiator overflow tank.
(8) Install radiator cap on radiator overflow tank.
(9) Lower cab (TM 9-2320-365-10).

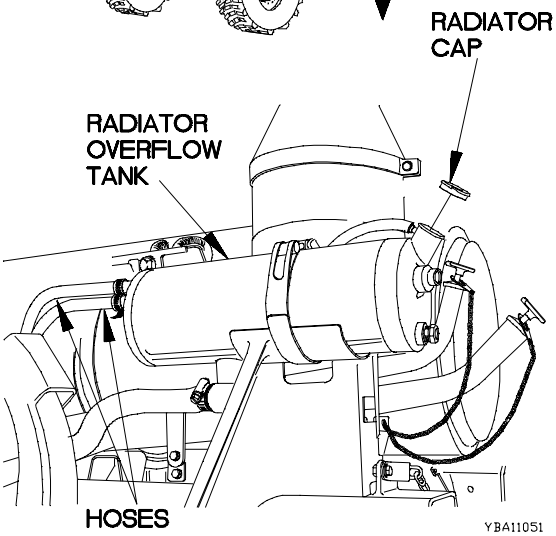




5BA11041

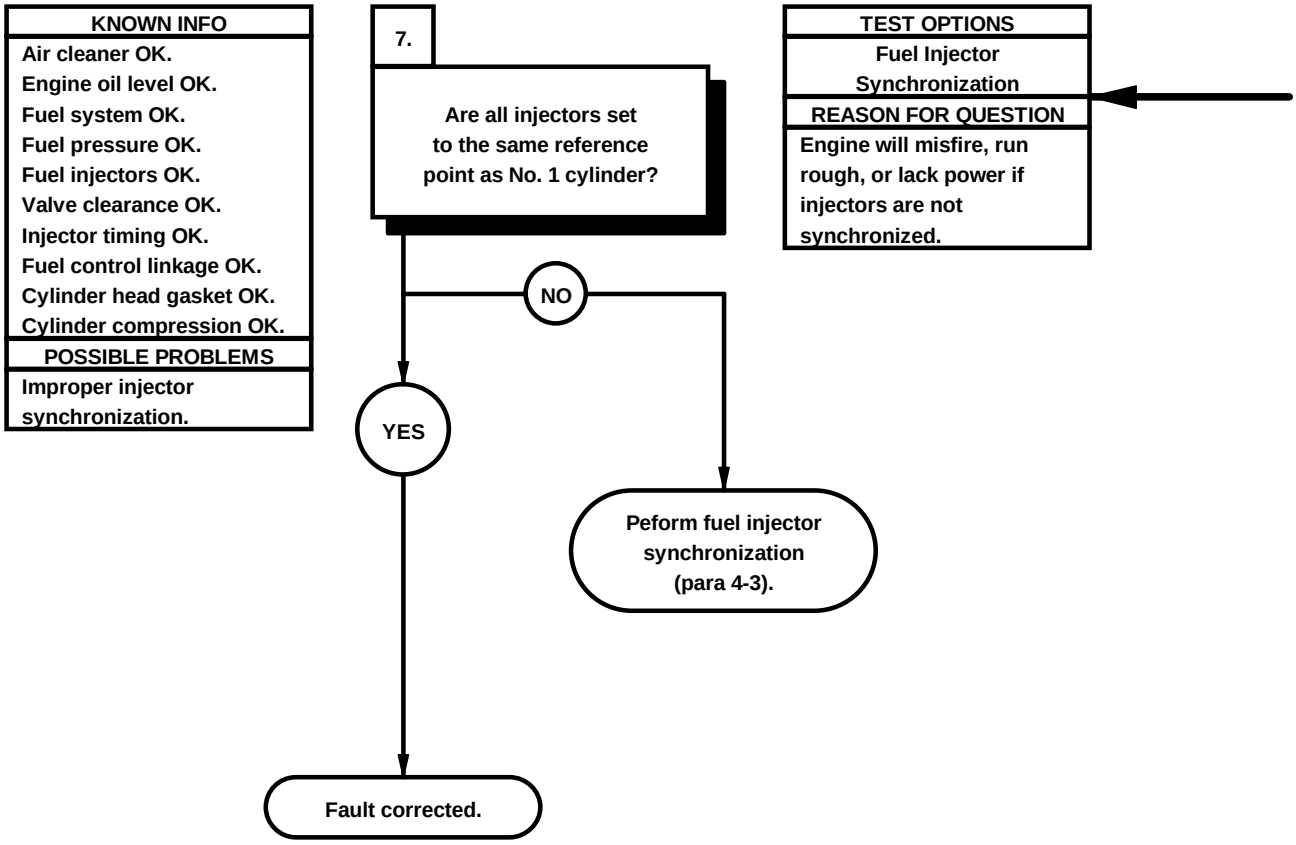
Perform STE/ICE-R test #14.





YBA11051

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



Perform fuel injector sychronization (para 4-3).

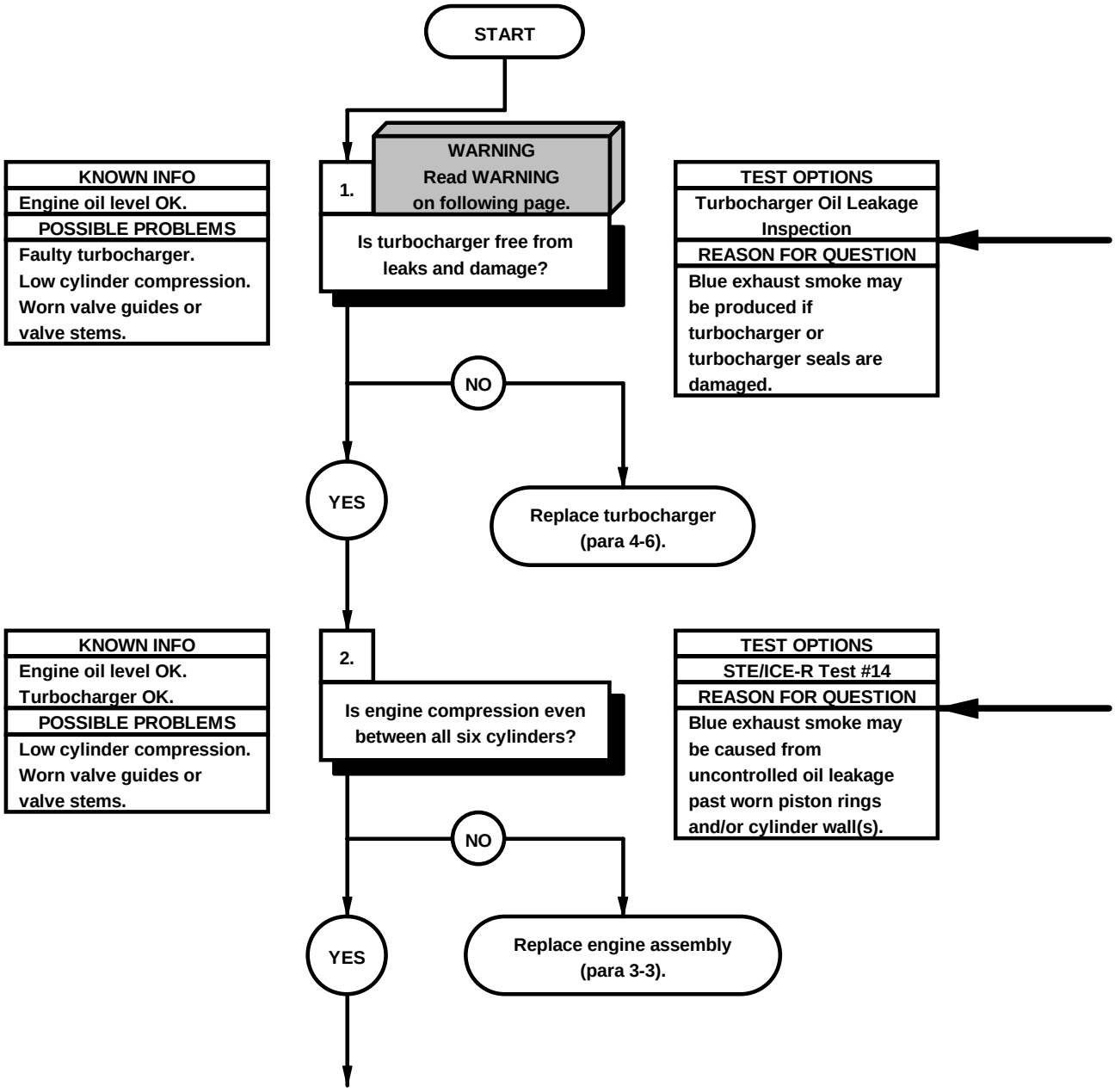
a12. BLUE EXHAUST SMOKE FROM ENGINE

INITIAL SETUP

Equipment Conditions
- Engine shut down (TM 9-2320-365-10).
- Cab raised (TM 9-2320-365-10).

Tools and Special Tools
- Tool Kit, Genl Mech (Item 68, Appendix B)
- STE/ICE-R (Item 60, Appendix B)

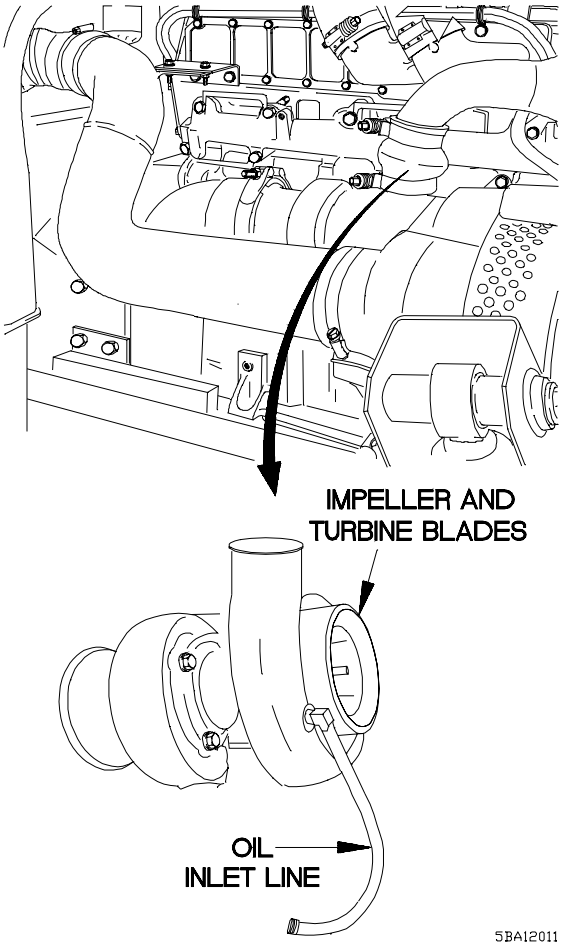
References
- TM 9-4910-571-12&P



WARNING

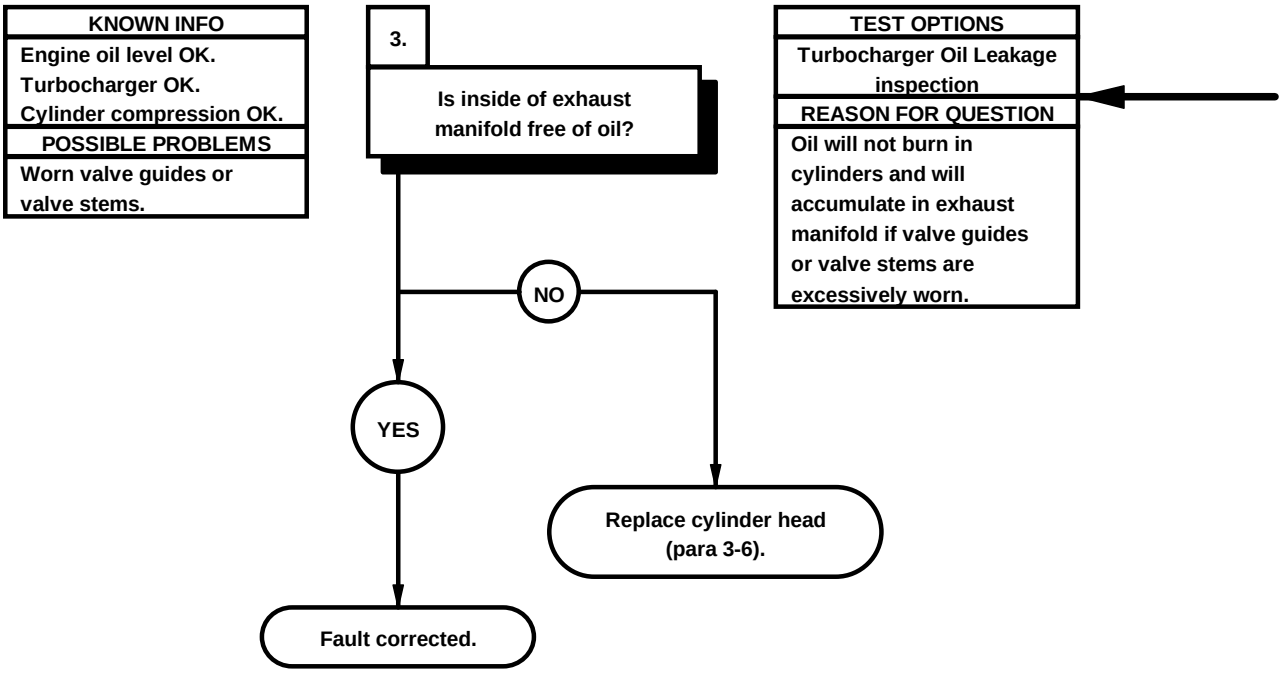
Ensure engine is cool before performing troubleshooting. Failure to comply may result in severe burns.

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.

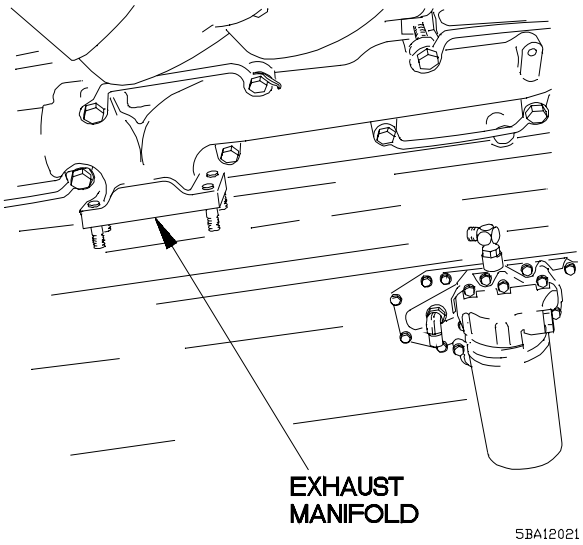


Perform STE/ICE-R test #14.

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 9-2320-365-10).



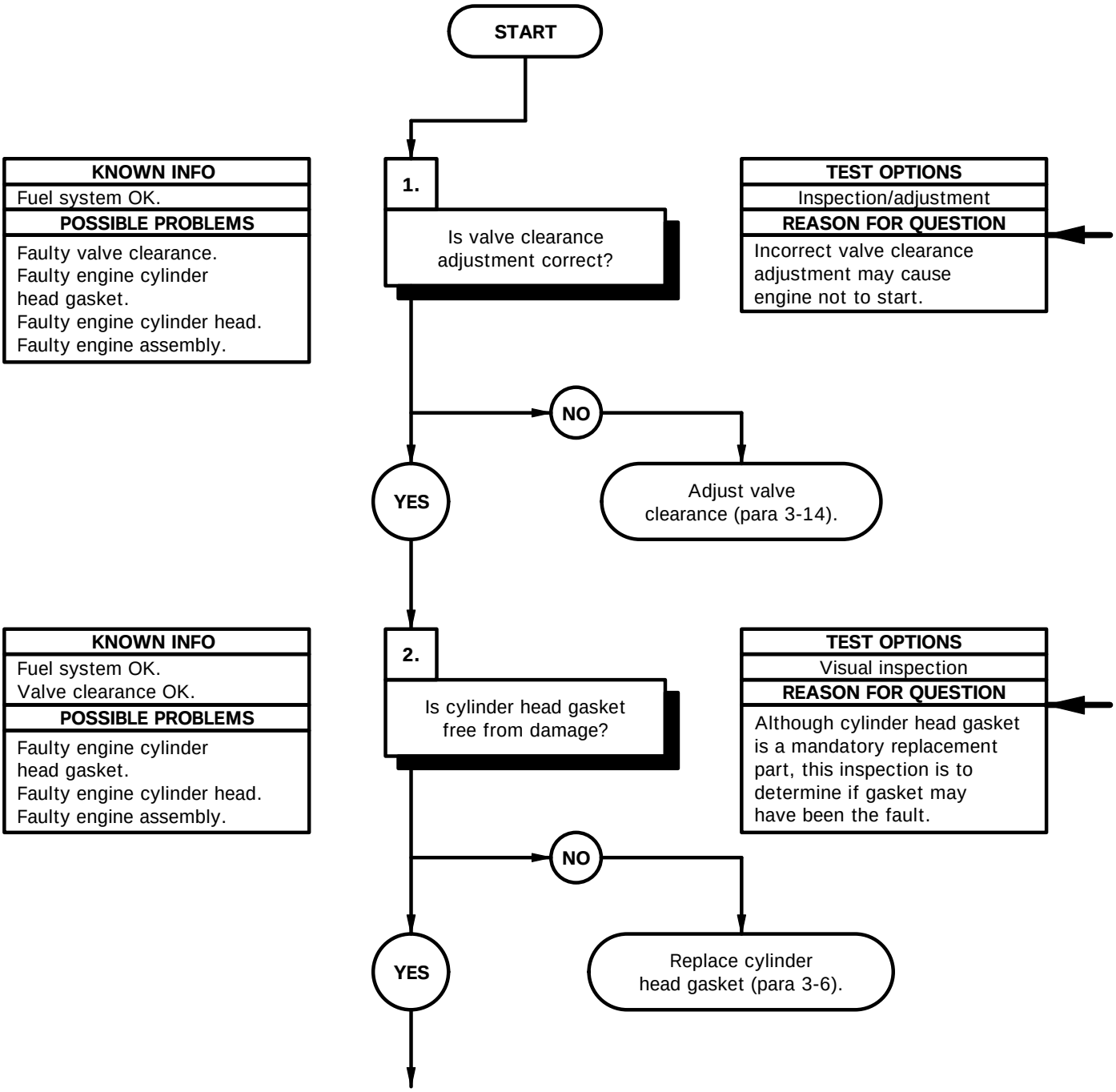
a13. ENGINE CRANKS BUT DOES NOT START

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).

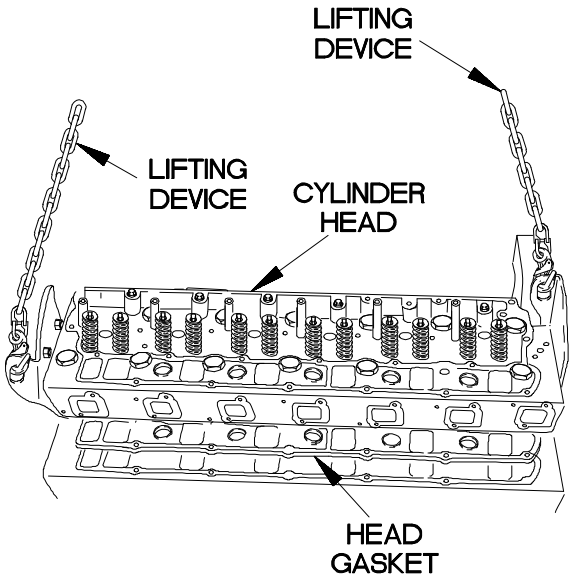
References
TM 9-4910-571-12&P

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)

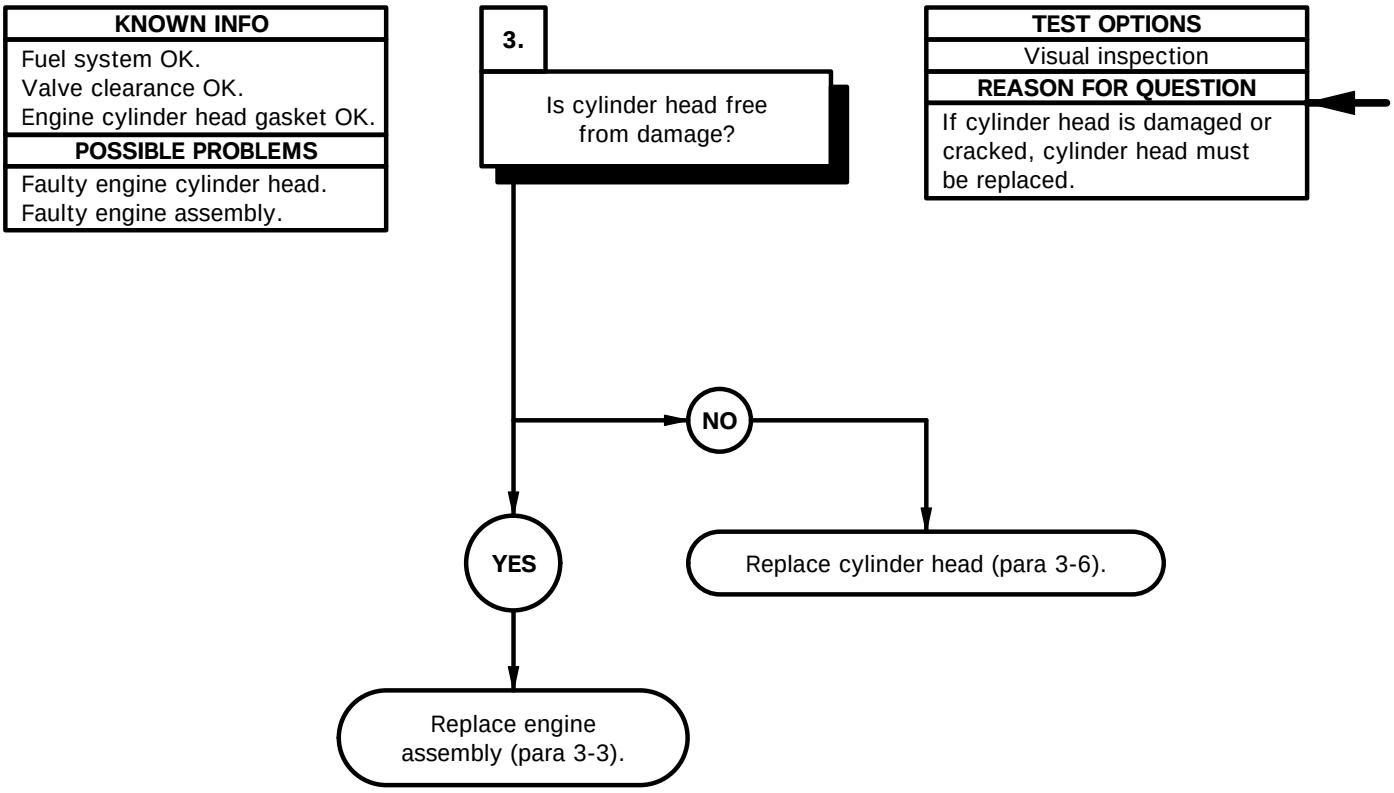


Refer to para 3-14 to adjust valve clearance.

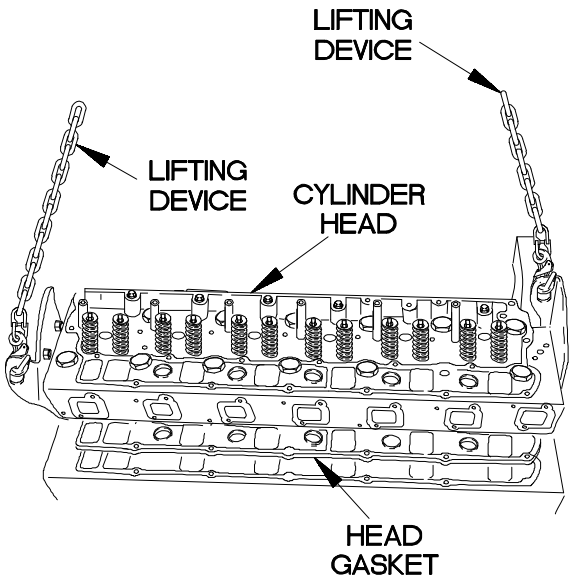
(1) Remove cylinder head from engine block (para 3-6).
(2) Inspect cylinder head gasket for damage.
(3) If cylinder head gasket is damaged, replace cylinder head gasket (para 3-6).



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).



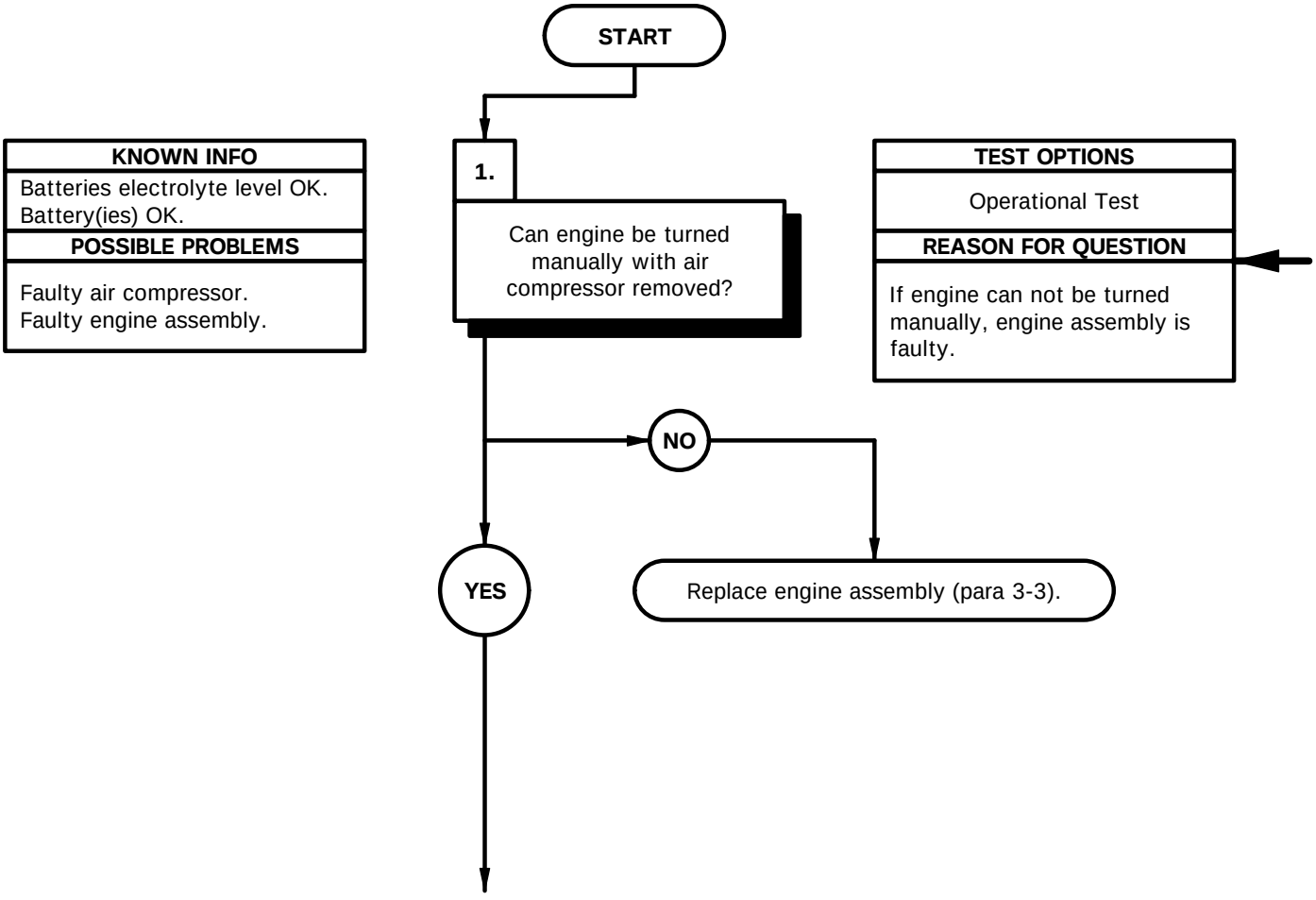
a14. ENGINE DOES NOT CRANK

INITIAL SETUP

Equipment Conditions
Engine shutdown (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).

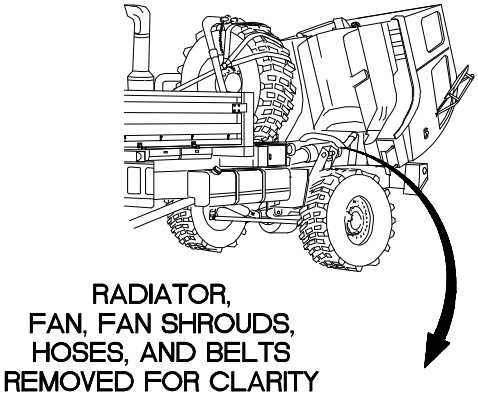
References
TM 9-4910-571-12&P

Personnel Required
(2)

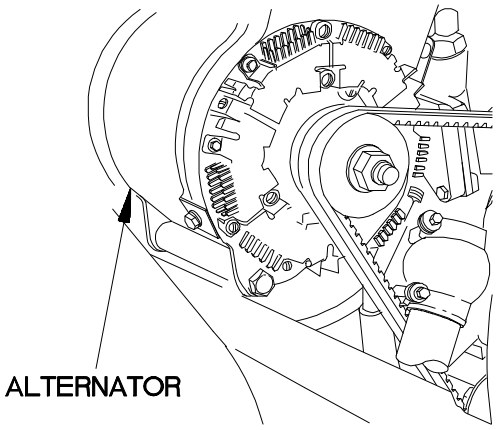


OPERATIONAL TEST

(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).

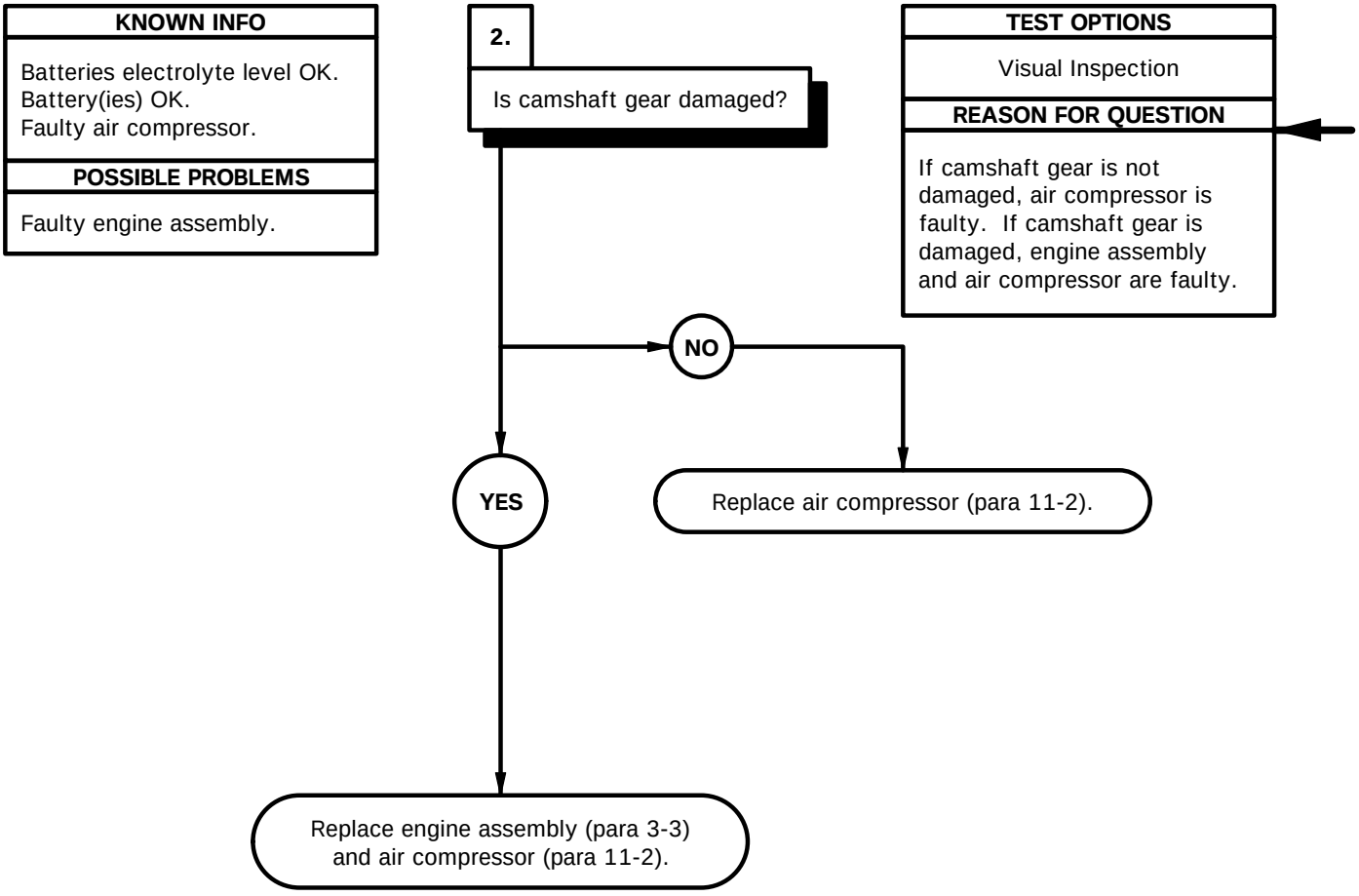


RADIATOR,
FAN, FAN SHROUDS,
HOSES, AND BELTS
REMOVED FOR CLARITY



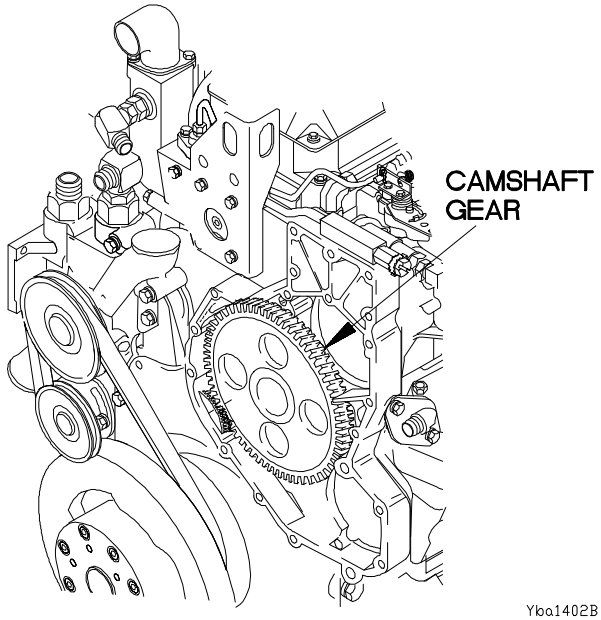
Ybo1401B

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).



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	2-64.10

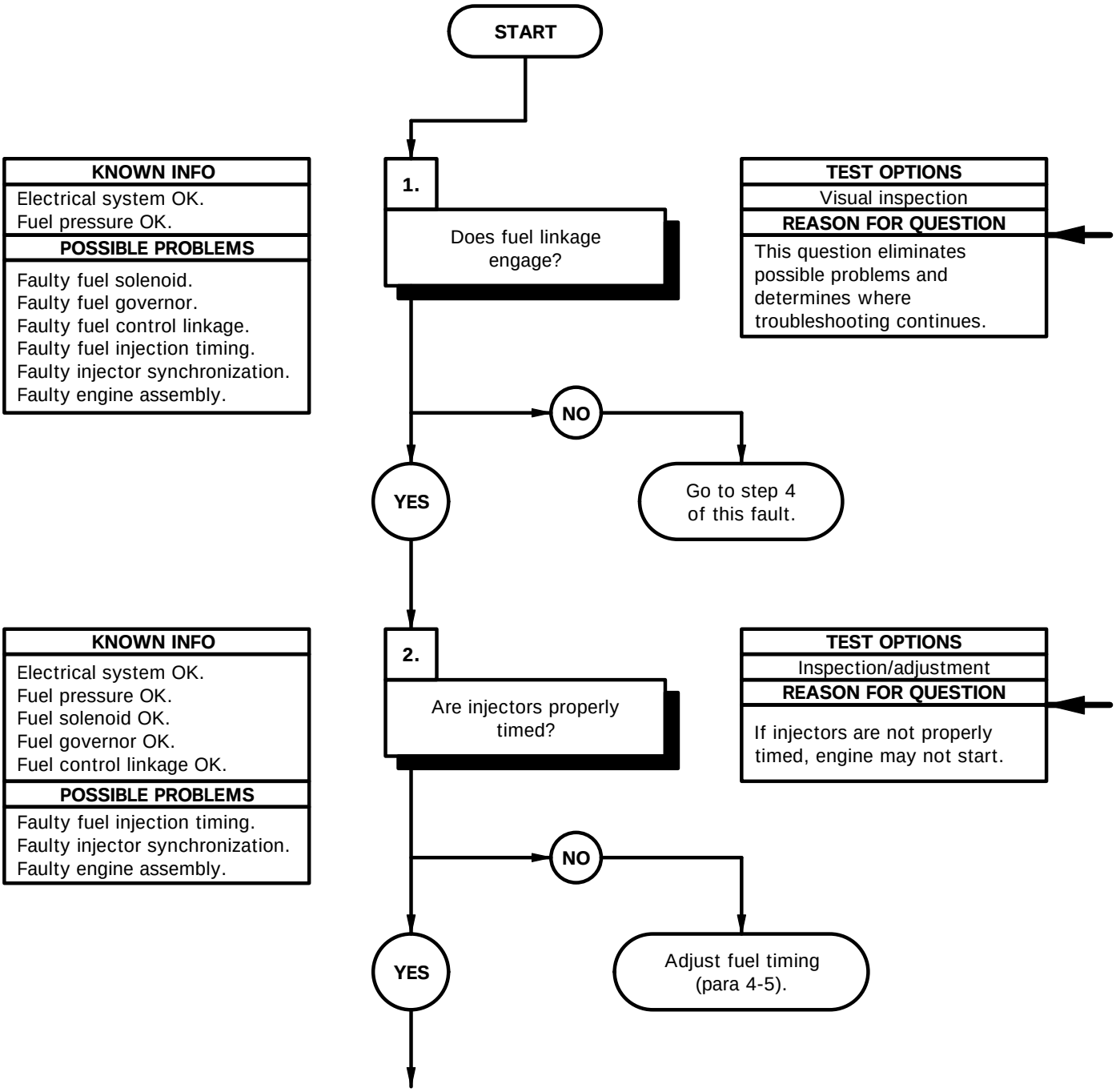
a.1.1. ENGINE CRANKS BUT DOES NOT START

INITIAL SETUP

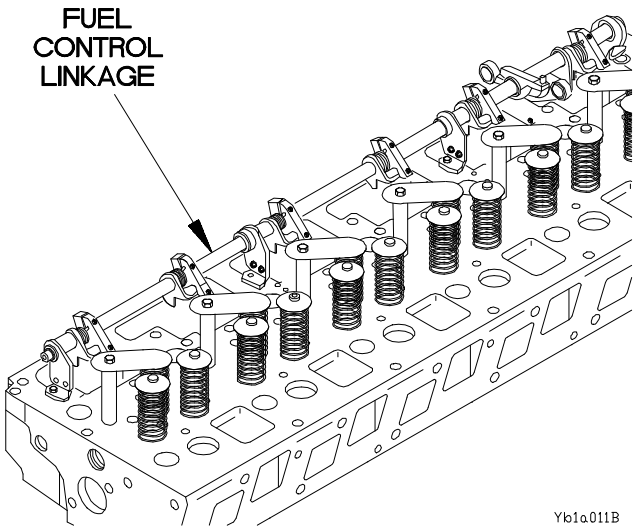
Equipment Conditions
Engine shut down (TM 9-2320-366-10).

References
TM 9-4910-571-12&P

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)

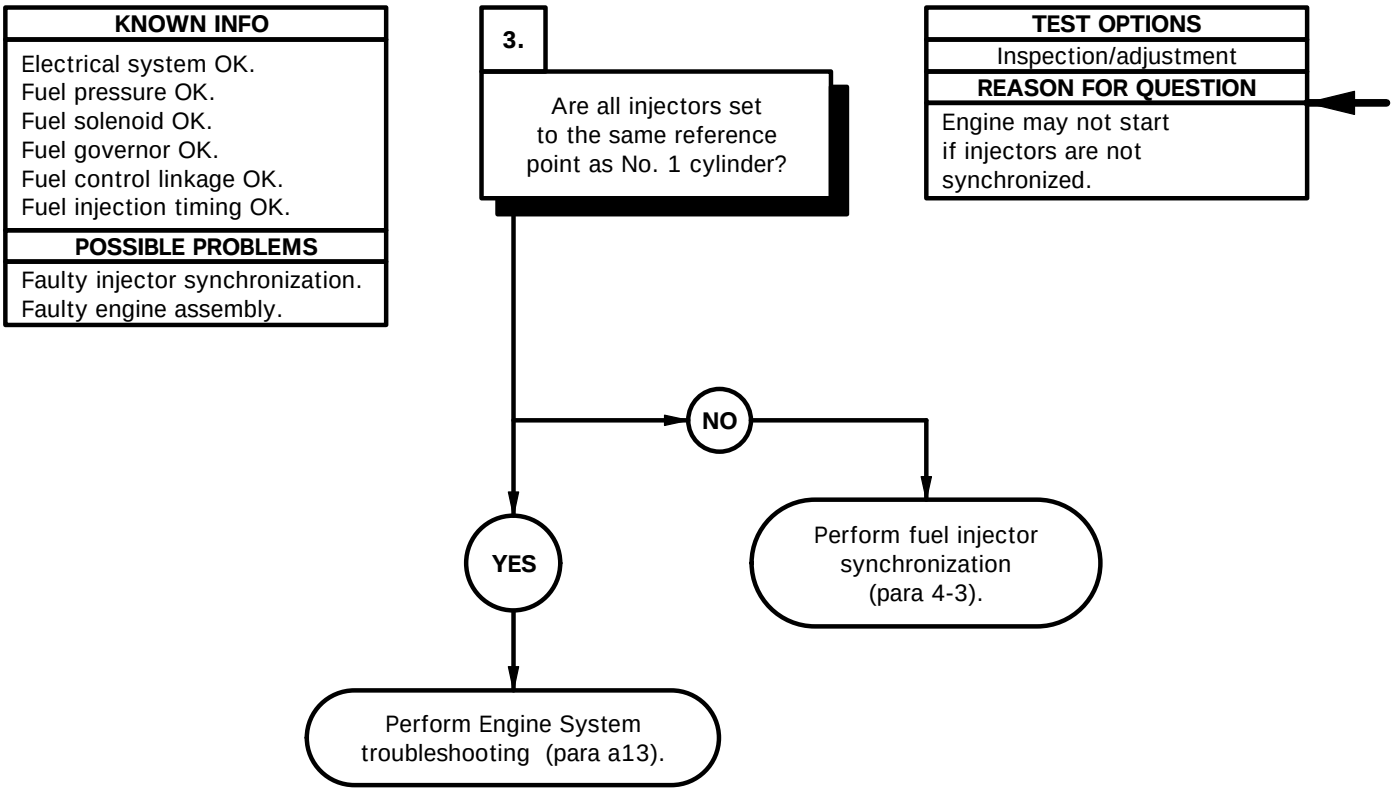


(1) Raise cab (TM 9-2320-366-10).
(2) Remove valve cover (TM 9-2320-365-20-2).
(3) Position master power switch to on (TM 9-2320-366-10).
(4) If fuel linkage does not engage when ignition is turned on, go to step 4 of this fault.
(5) Position master power switch to off (TM 9-2320-366-10).



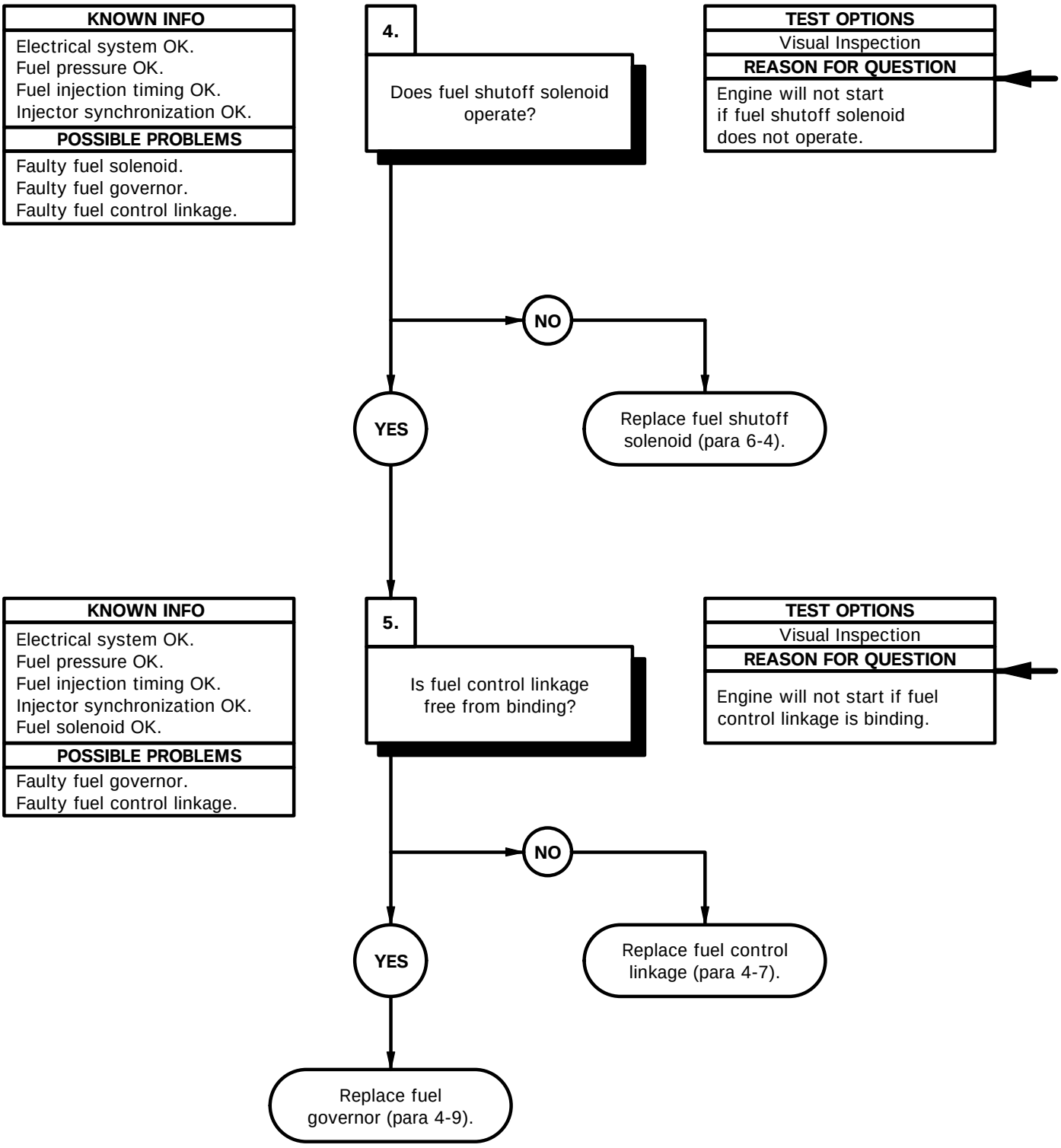
Refer to para 4-5 for fuel timing.

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)

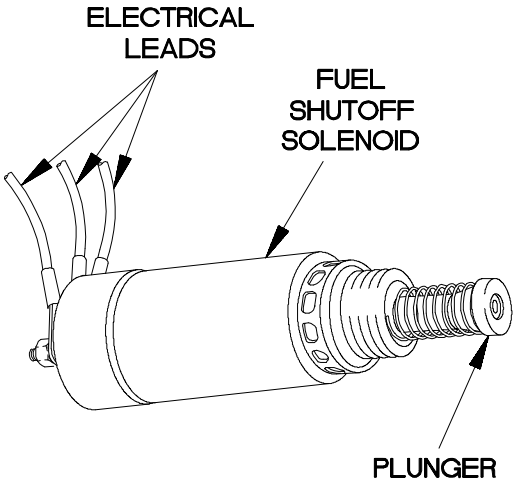


(1) Remove fuel shutoff solenoid (para 6-4).
(2) Reconnect electrical leads to fuel shutoff solenoid (para 6-4).
(3) Position master power switch to on (TM 9-2320-366-10-1).
(4) If plunger in fuel shutoff solenoid does not fully contract, replace fuel shutoff solenoid (para 6-4).
(5) Install valve cover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

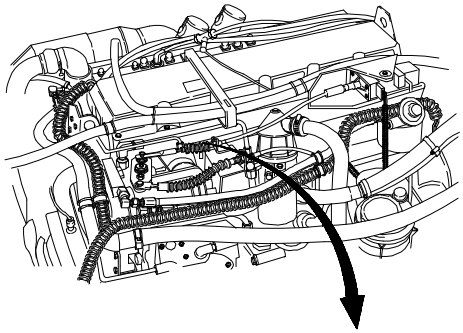
NOTE

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

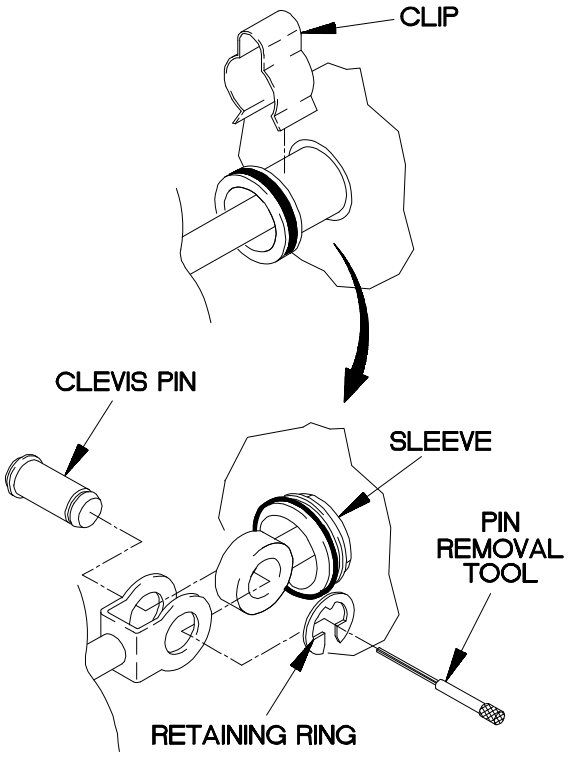
(6) Position master power switch to off (TM 9-2320-366-10-1).
(7) Remove electrical leads from fuel shutoff solenoid (para 6-4).
(8) Install fuel shutoff solenoid (para 6-4).



YB1A012B



(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 9-2320-366-20-2).



YB1A013B

2-10. COOLING SYSTEM TROUBLESHOOTING

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

Table 2-3. Cooling System Fault Index

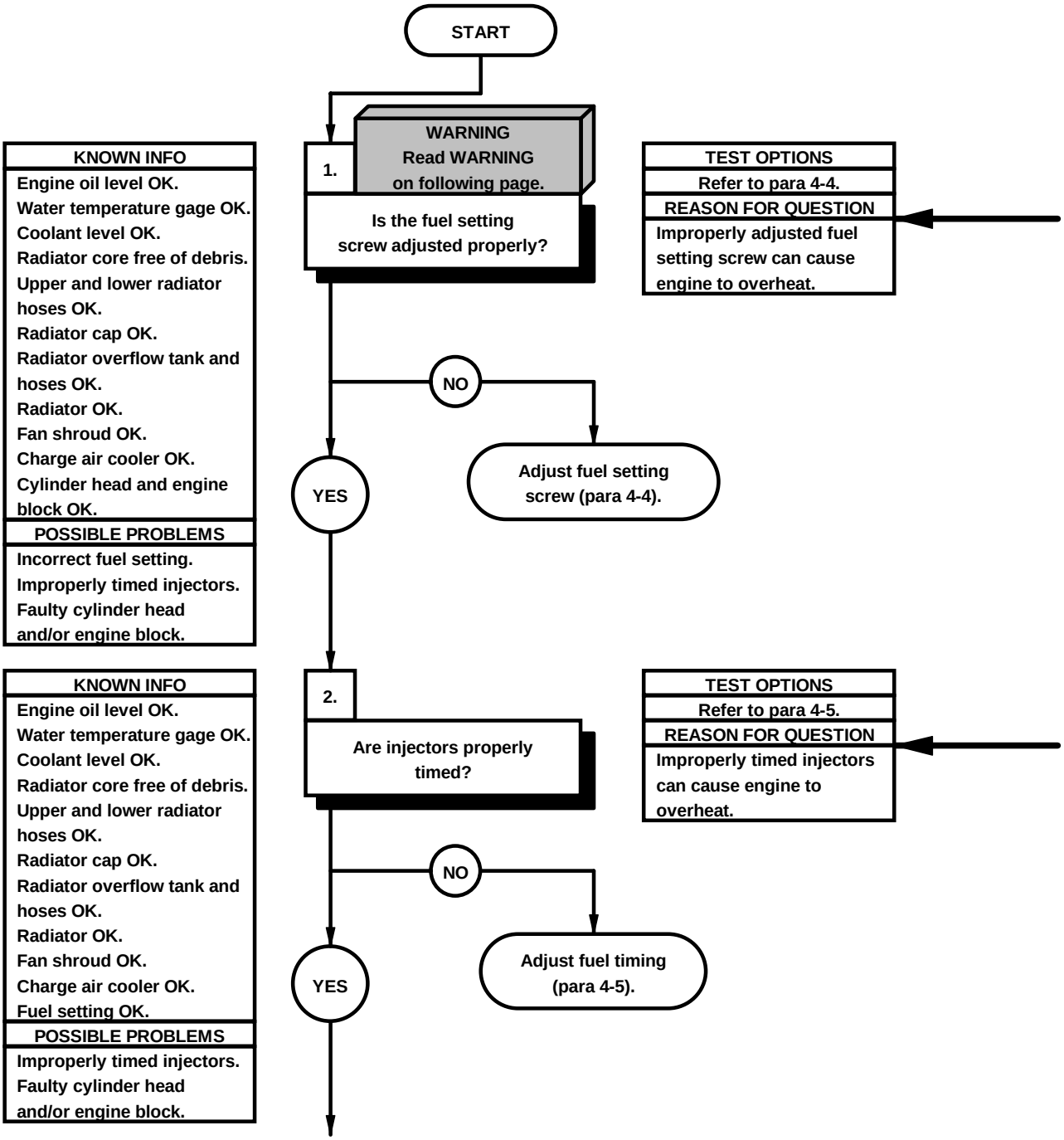
Fault No.	Description	Page
b1.	Engine Overheats	2-66
b2.	Loss of Coolant	2-70
b3.	Oil in Cooling System	2-72

b1. ENGINE OVERHEATS

INITIAL SETUP

Equipment Conditions
- Engine shut down (TM 9-2320-365-10).
- Cab raised (TM 9-2320-365-10).

Tools and Special Tools
- Tool Kit, Genl Mech (Item 68, Appendix B)
- Tool Kit, Intl Comb Eng (TM 9-2320-365-20)
- Wrench, Torque, 0-60 N·m (Item 84, Appendix B)



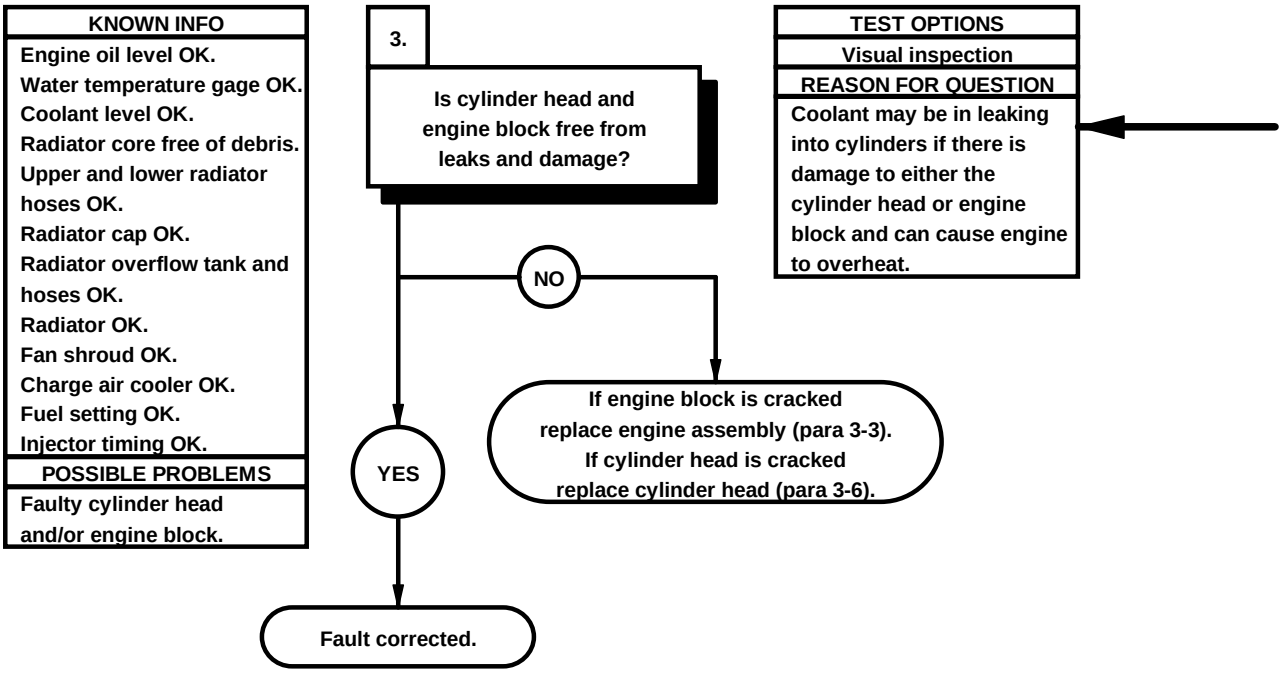
WARNING

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

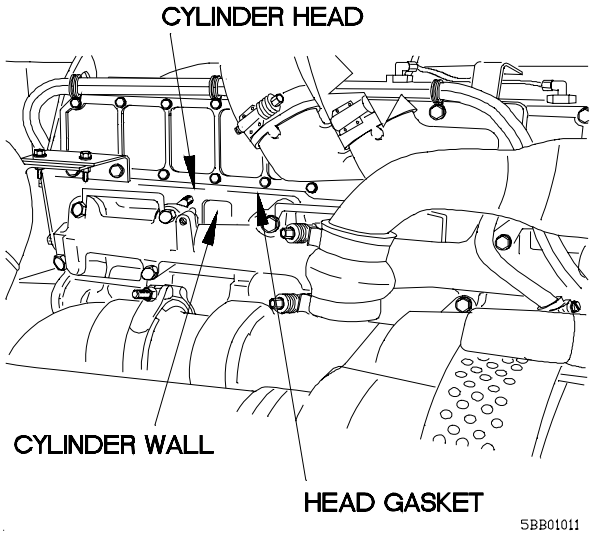
Refer to para 4-4 to adjust fuel setting screw.

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 9-2320-365-10).

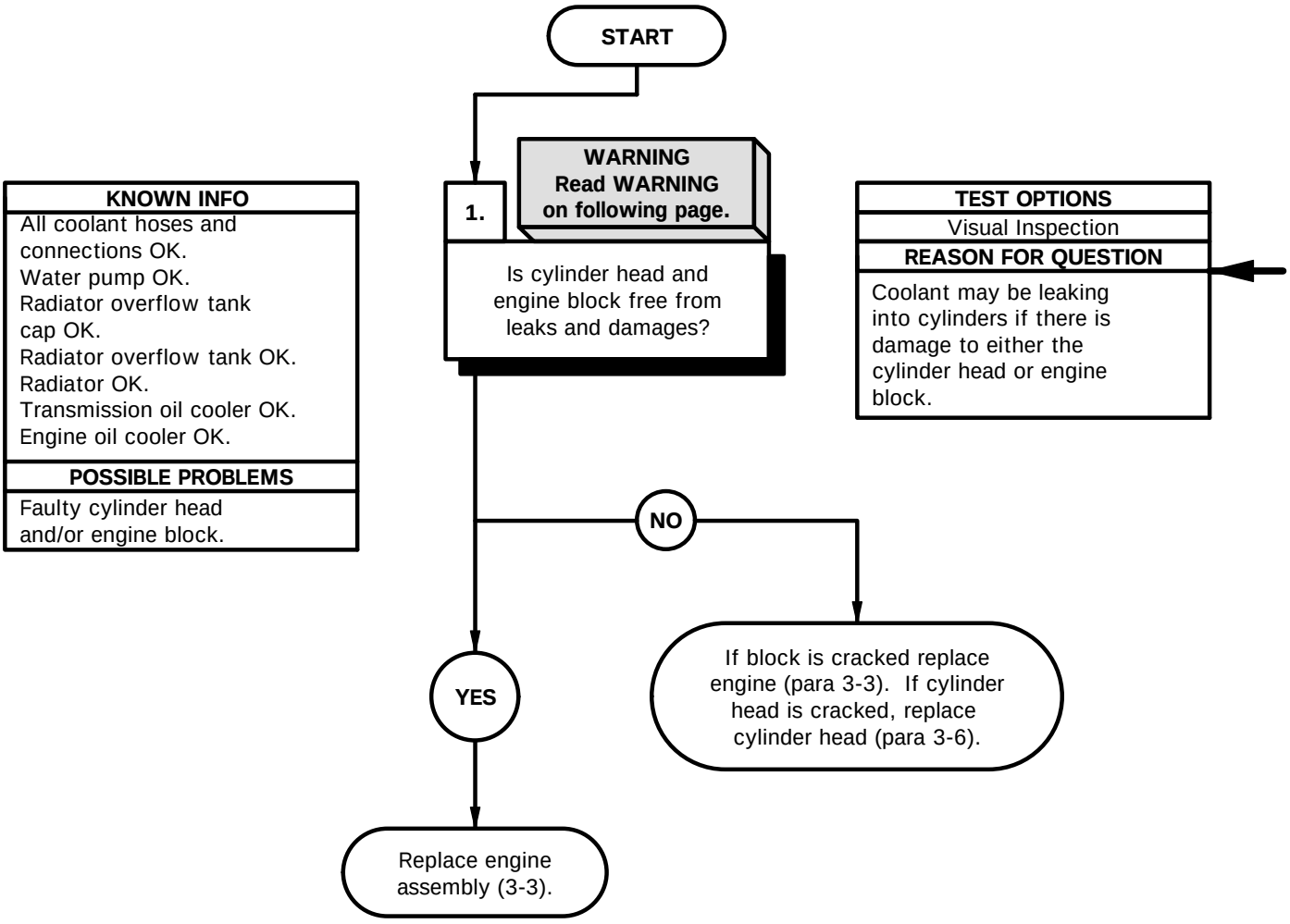


b2. LOSS OF COOLANT

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).

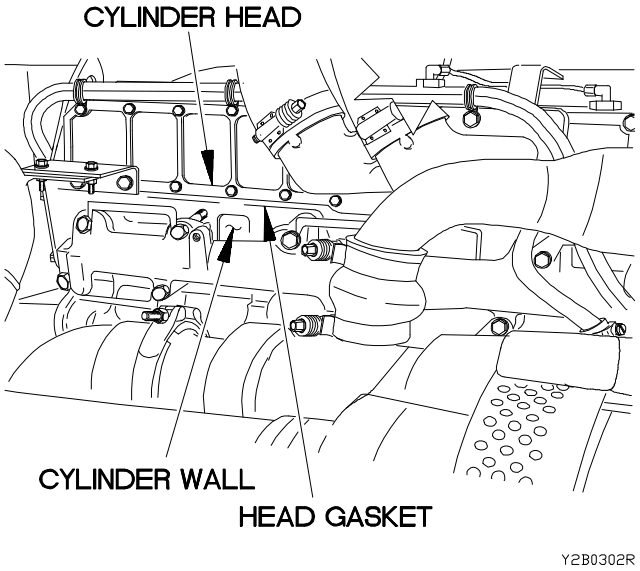
Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)



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 9-2320-365-10).

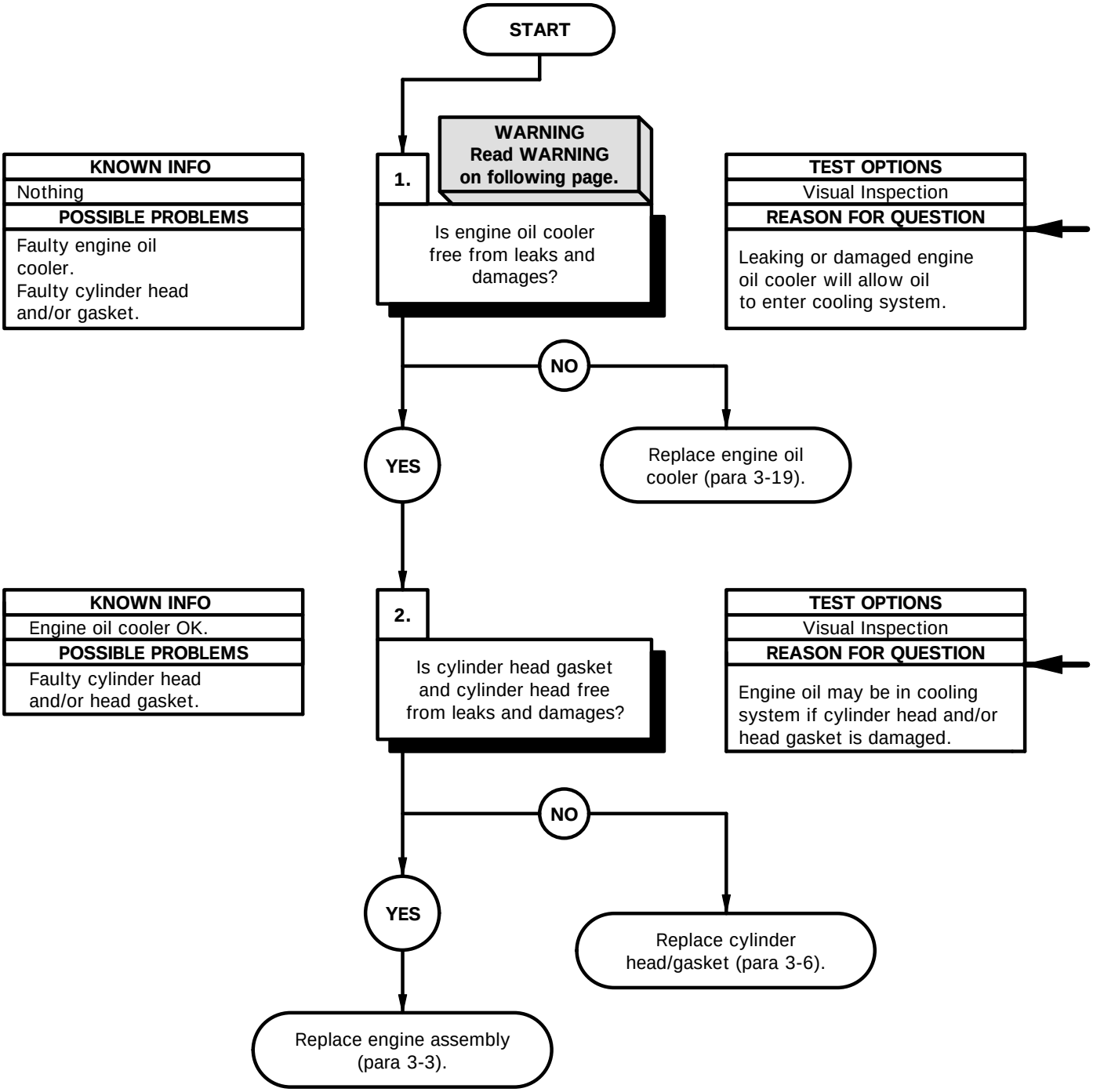


b3. OIL IN COOLING SYSTEM

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).

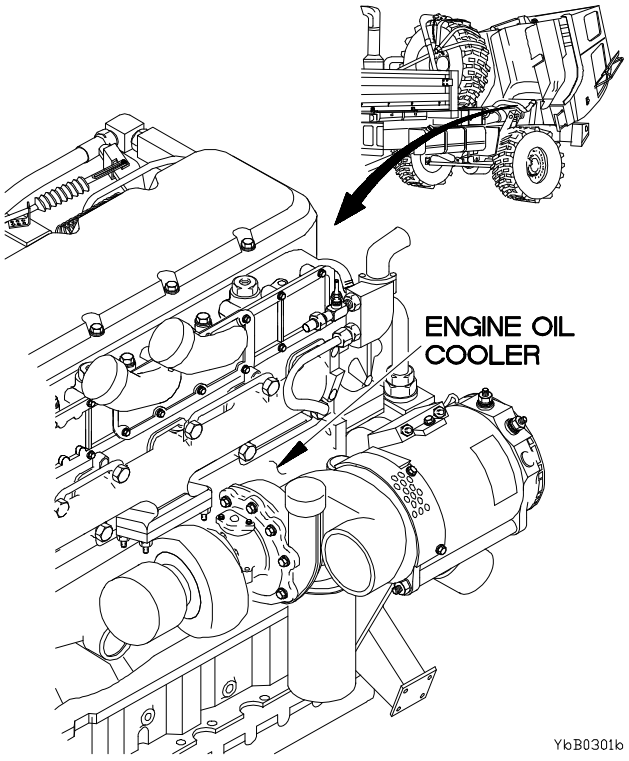
Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
Goggles, Industrial (Item 25, Appendix B)



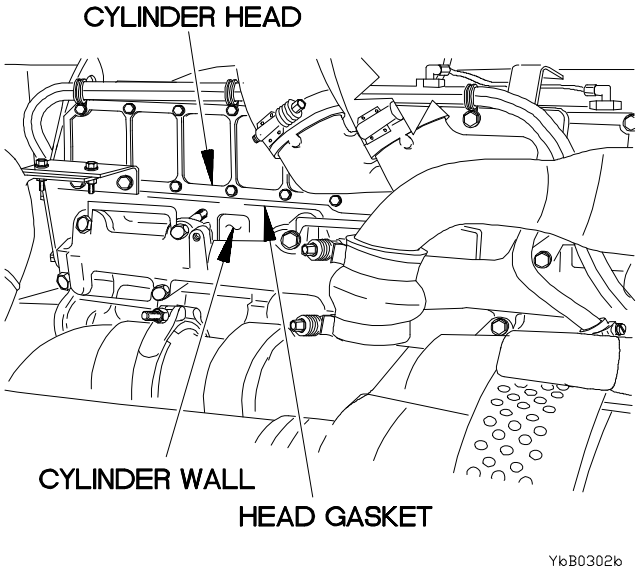
WARNING

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

(1) Raise cab (TM 9-2320-365-10).
(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 9-2320-365-10).



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)	2-78
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)	2-88
c3.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 15 (Prior to Serial Number 6510032369)	2-102
c4.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 16	2-112
c5.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 24 Sub Code 12 or 23 (Serial Number 6510032369 and Higher)	2-120
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)	2-128
c7.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 24 Sub Code 12 or 23 (Prior to Serial Number 6510032369)	2-140
c8.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 32 and Any Sub Code (Serial Number 6510032369 and Higher)	2-148
c9.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 32 and Any Sub Code (Prior to serial number 6510032369 With Transmission Adapter Cable Assembly)	2-156
c10.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 32 and Any Sub Code (Prior to Serial Number 6510032369)	2-168
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)	2-176
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)	2-186
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)	2-200
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)	2-208
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)	2-218
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)	2-232
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)	2-242
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)	2-252
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)	2-266

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)	2-276
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)	2-286
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)	2-300
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)	2-310
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)	2-320
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)	2-334
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)	2-344
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)	2-354
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)	2-368
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)	2-378
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)	2-388
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)	2-402
c32.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 23	2-412
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)	2-420
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)	2-430
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)	2-444
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)	2-454
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)	2-464
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)	2-478
c39.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 43 Sub Code 21 (Serial Number 6510032369 and Higher)	2-488

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)	2-498
c41.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 43 Sub Code 21 (Prior to Serial Number 6510032369)	2-512
c42.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 43 Sub Code 26 (Serial Number 6510032369 and Higher)	2-522
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)	2-532
c44.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 43 Sub Code 26 (Prior to Serial Number 6510032369)	2-546
c45.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 52 and Any Sub Code (Serial Number 6510032369 and Higher)	2-556
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)	2-566
c47.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 52 and Any Sub Code (Prior to Serial Number 6510032369)	2-580
c47A.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 55 and Any Sub Code	2-588.2
c48.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 15 (Serial Number 6510032369 and Higher)	2-590
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)	2-600
c50.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 16	2-614
c51.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 24 Sub Code 12 or 23 (Serial Number 6510032369 and Higher)	2-622
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)	2-630
c53.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 32 and Any Sub Code (Serial Number 6510032369 and Higher)	2-642
c54.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 32 and Any Sub Code (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly)	2-650
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)	2-662
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)	2-672
c57.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 13 (Serial Number 6510032369 and Higher)	2-686
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)	2-696
c59.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 14 (Serial Number 6510032369 and Higher)	2-710

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)	2-720
c61.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 15 (Serial Number 6510032369 and Higher)	2-734
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)	2-744
c63.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 16 (Serial Number 6510032369 and Higher)	2-758
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)	2-768
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)	2-782
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)	2-792
c67.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 22 (Serial Number 6510032369 and Higher)	2-806
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)	2-816
c69.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, 45, 46 and/or 69 Sub Code 23	2-830
c70.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 24 (Serial Number 6510032369 and Higher)	2-838
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)	2-848
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)	2-862
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)	2-872
c74.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 43 Sub Code 21 (Serial Number 6510032369 and Higher)	2-886
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)	2-896
c76.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 43 Sub Code 26 (Serial Number 6510032369 and Higher)	2-910
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)	2-920
c78.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 52 and Any Sub Code (Serial Number 6510032369 and Higher)	2-934

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

Fault No.	Description	Page
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)	2-944
c80.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Display Main Code 55 and Any Sub Code	2-958

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 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)

Materials/Parts
Wire, Elect, 50 ft (Item 94, Appendix C)

Personnel Required
(2)

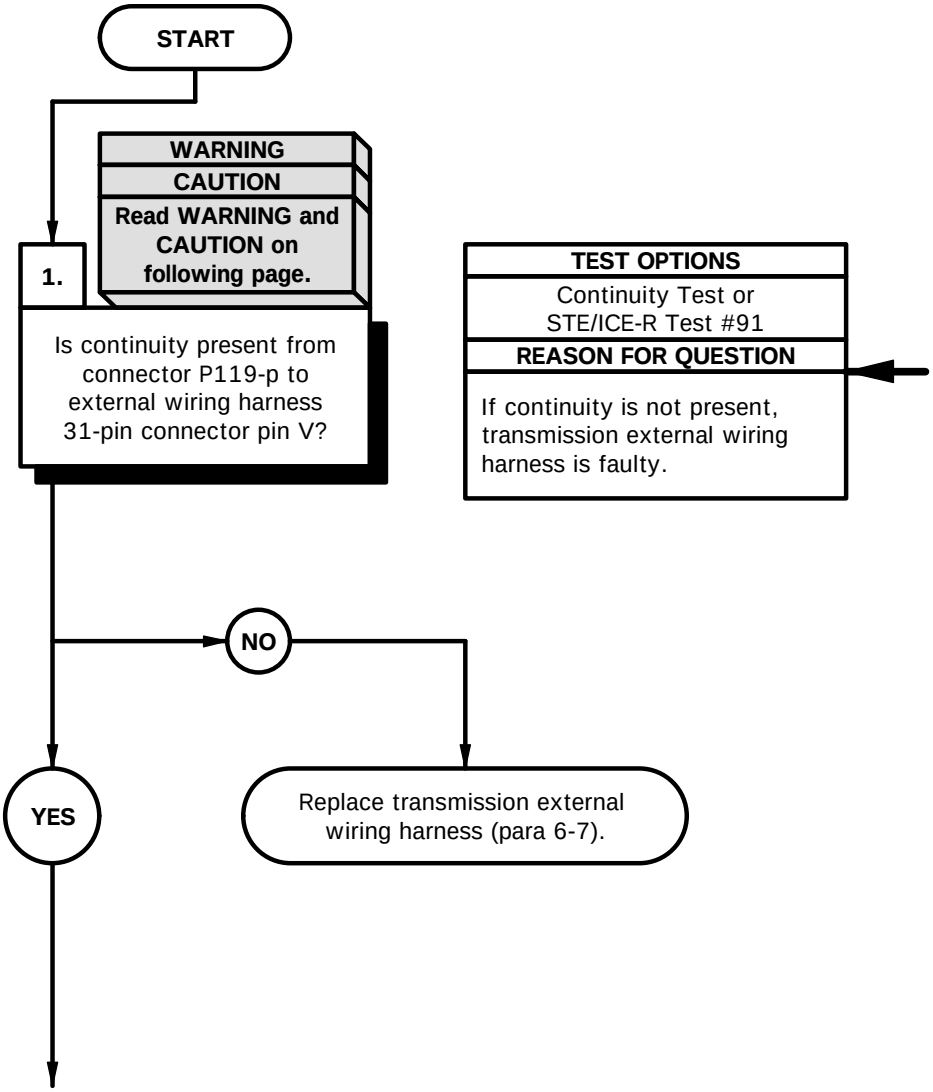
References
TM 9-4910-571-12&P

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 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

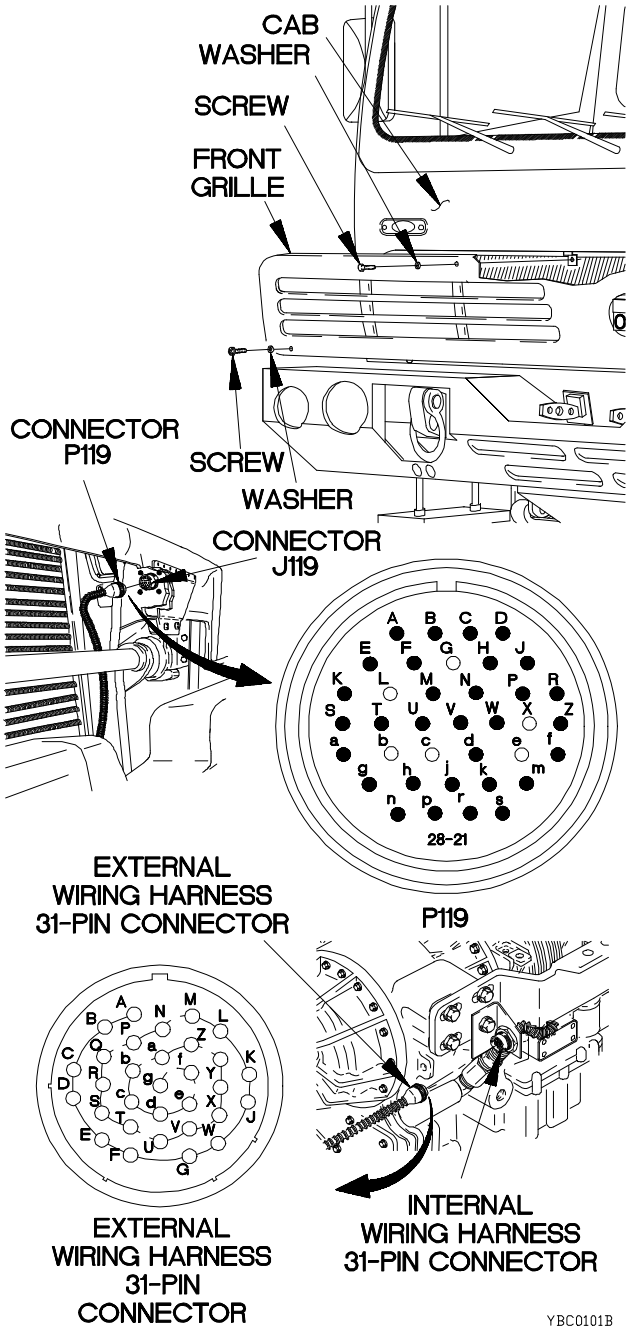
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

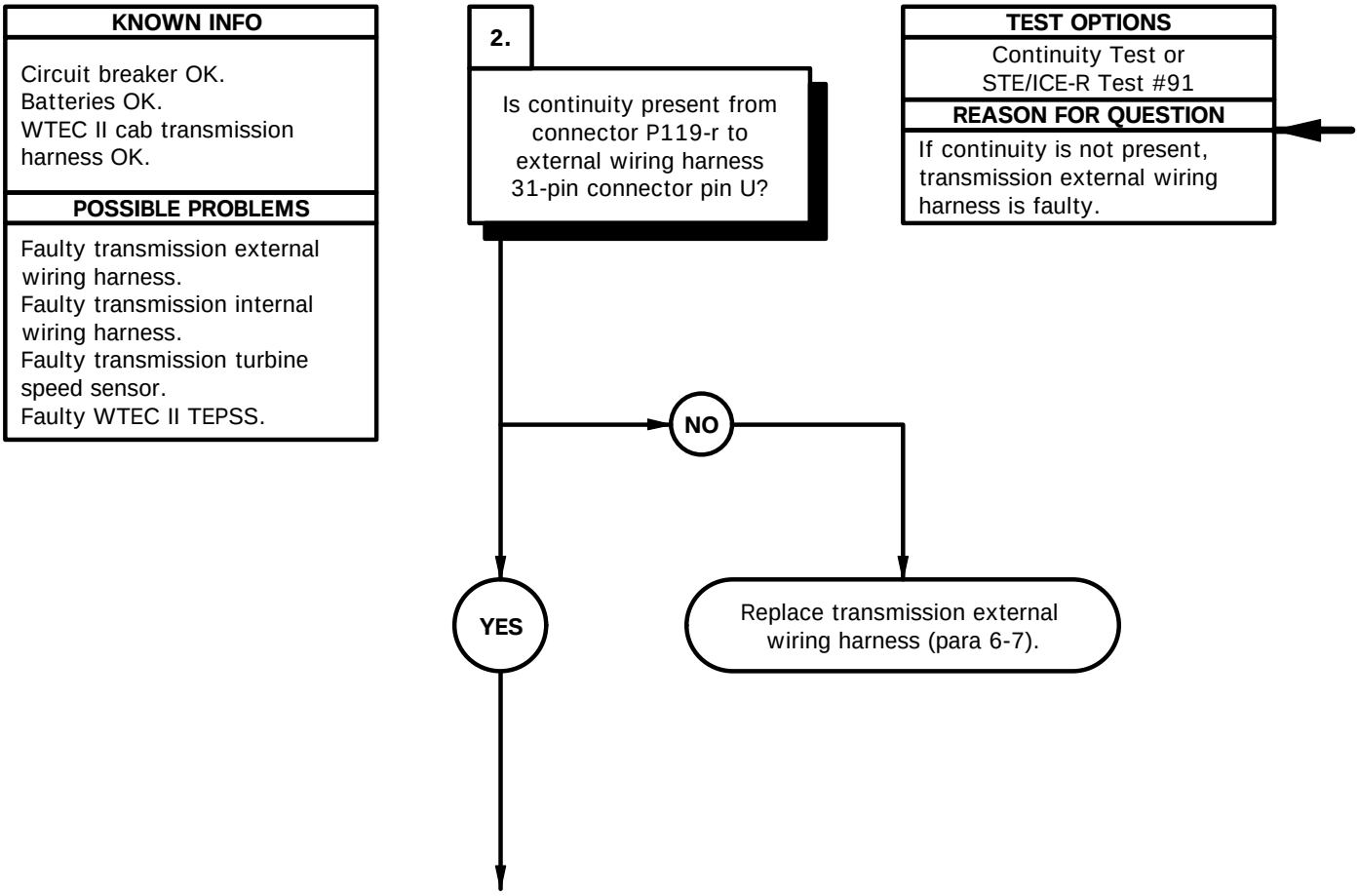
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin connector.
(6) Set multimeter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

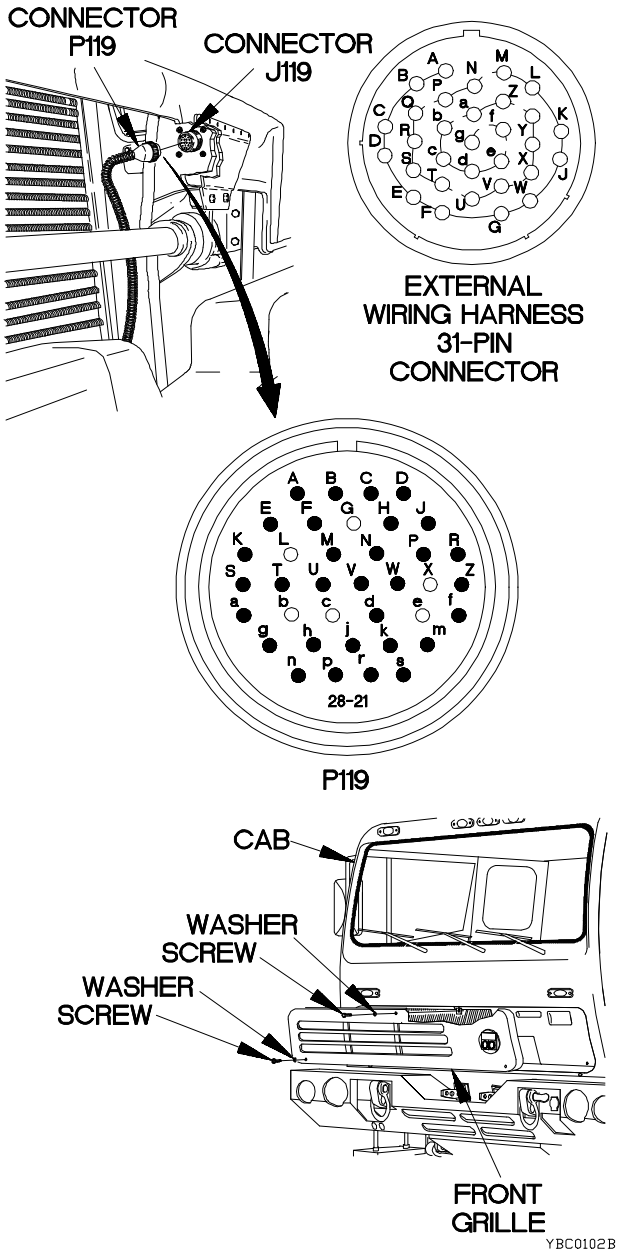


c1. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

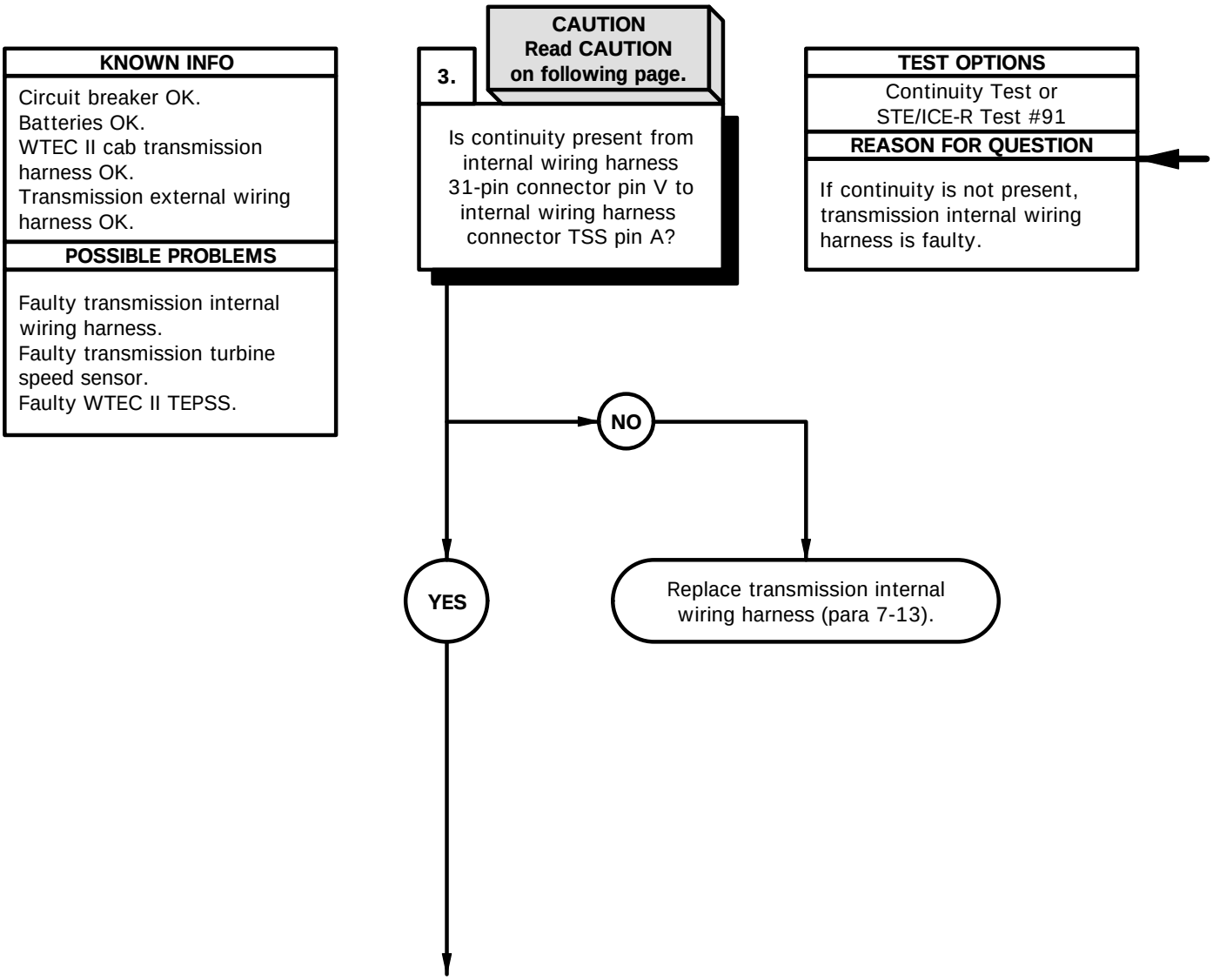


CONTINUITY TEST

(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)

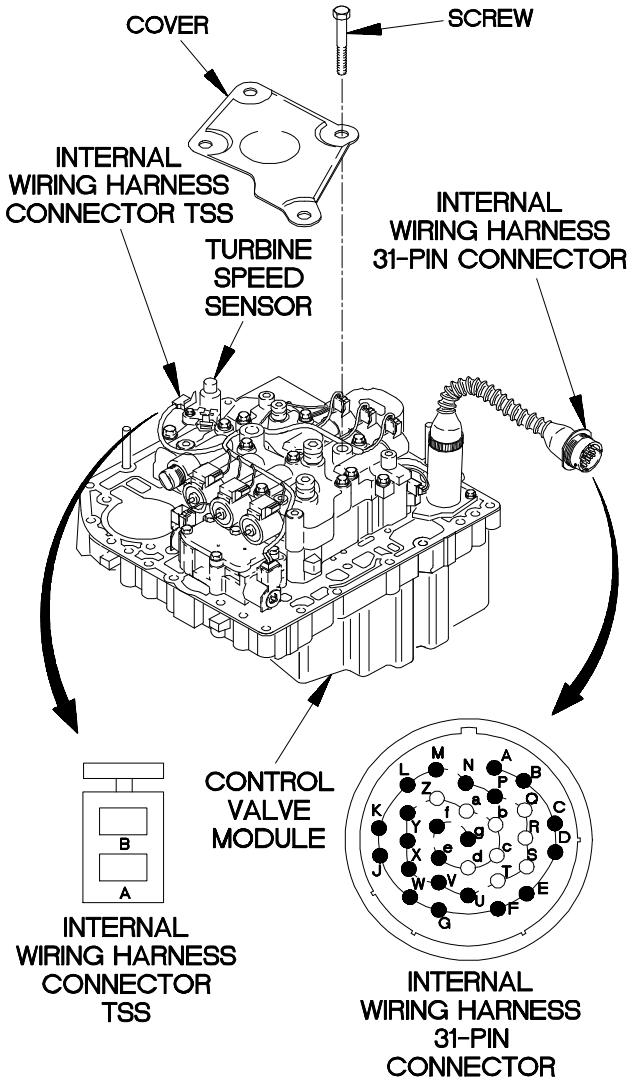


CAUTION

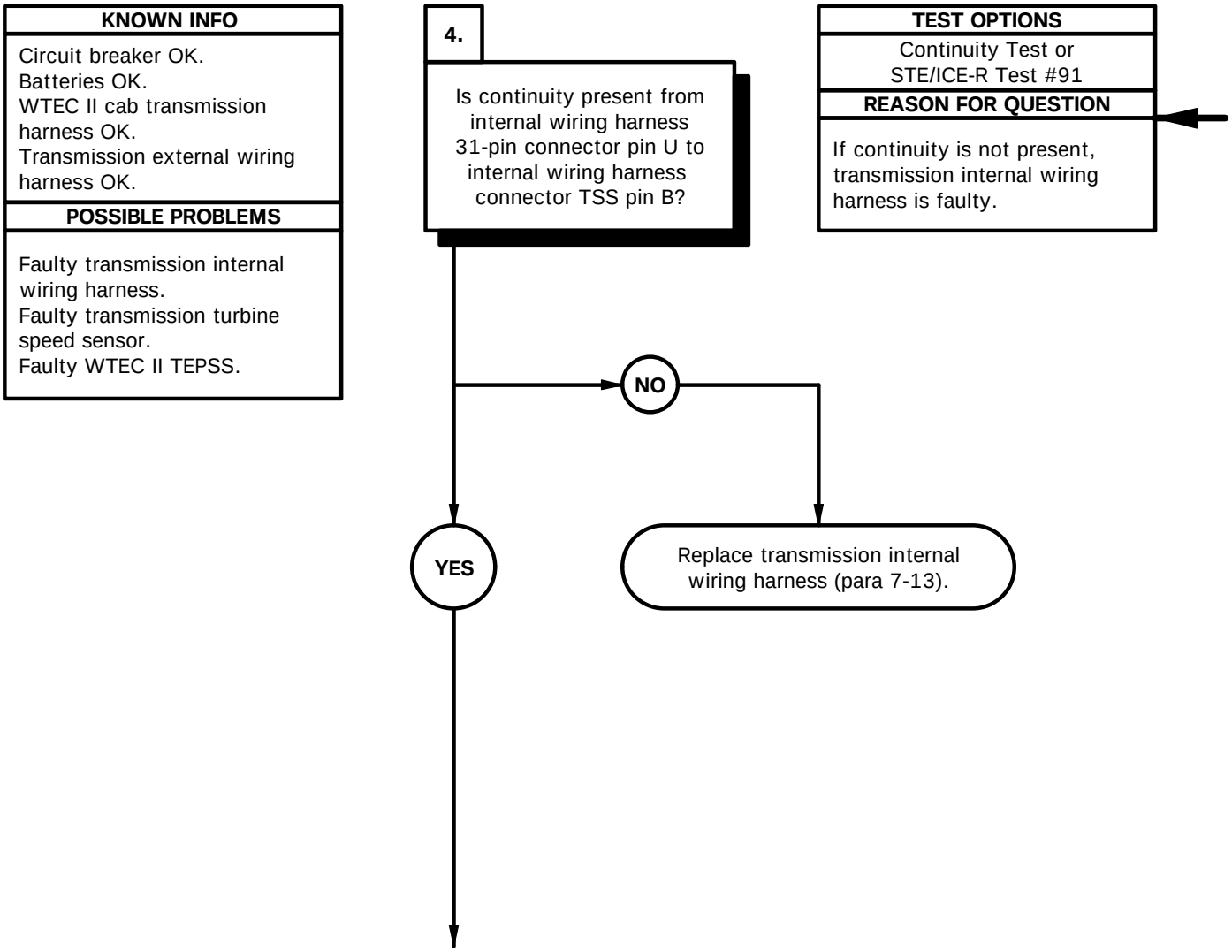
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

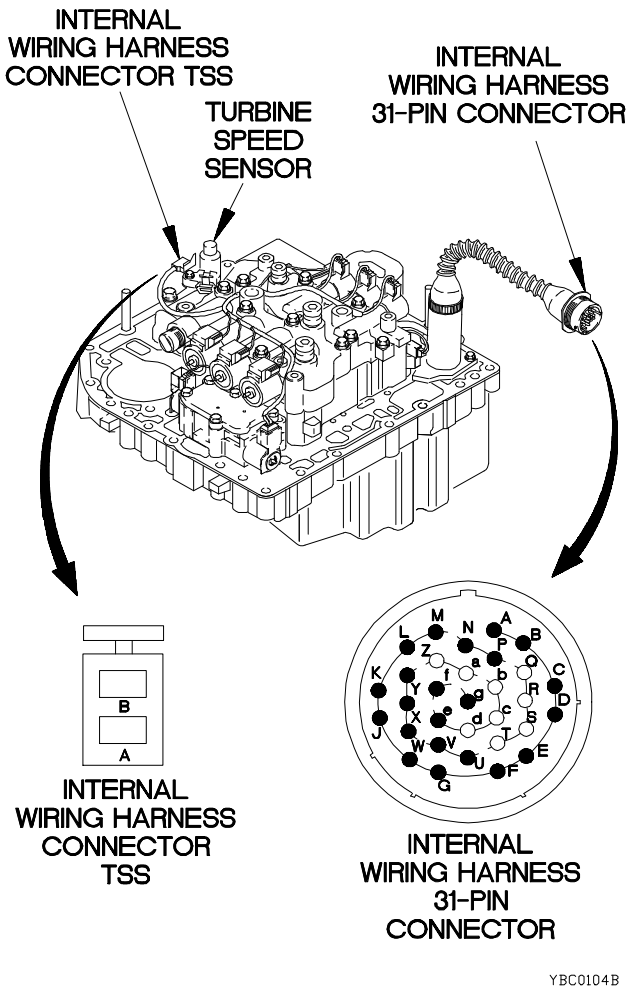


c1. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

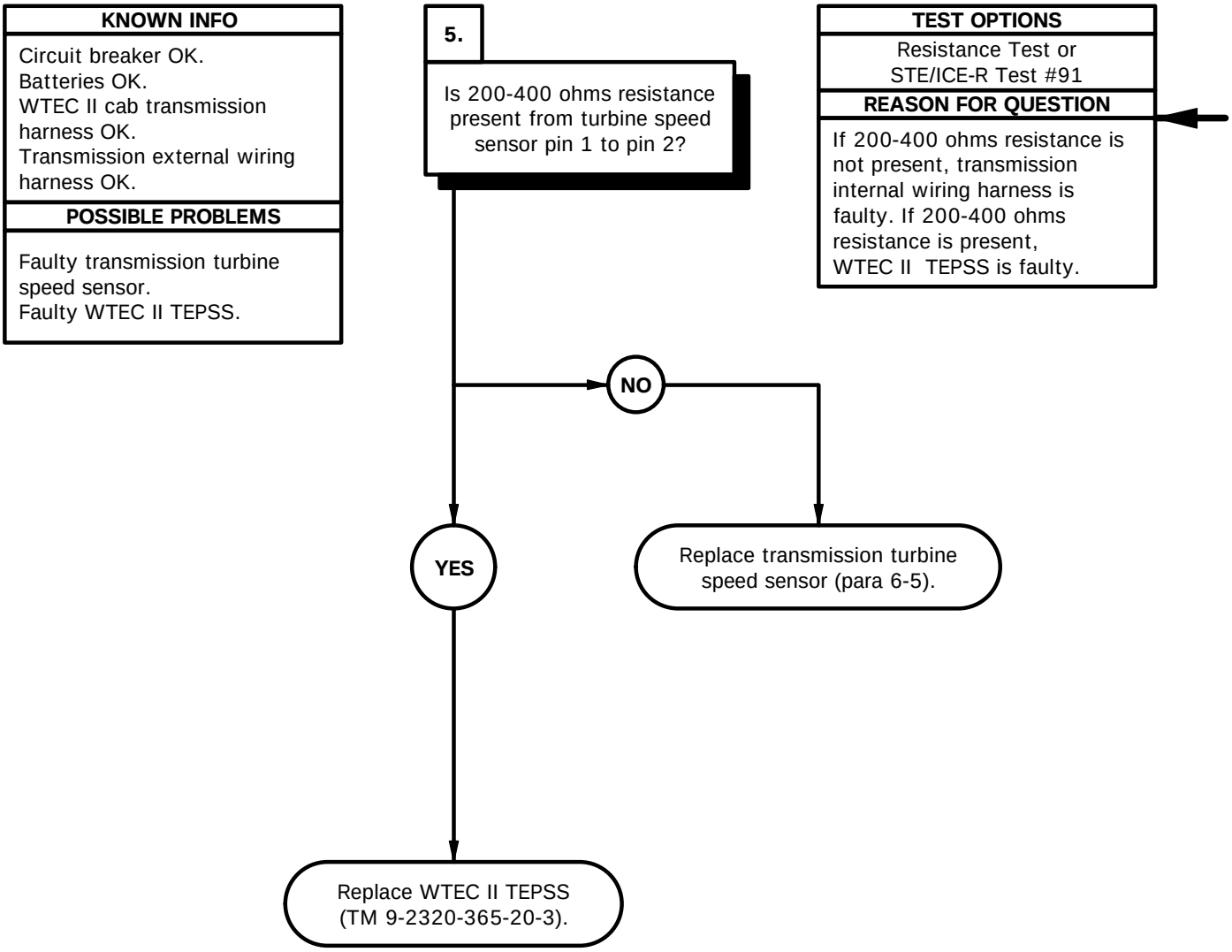


CONTINUITY TEST

(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).

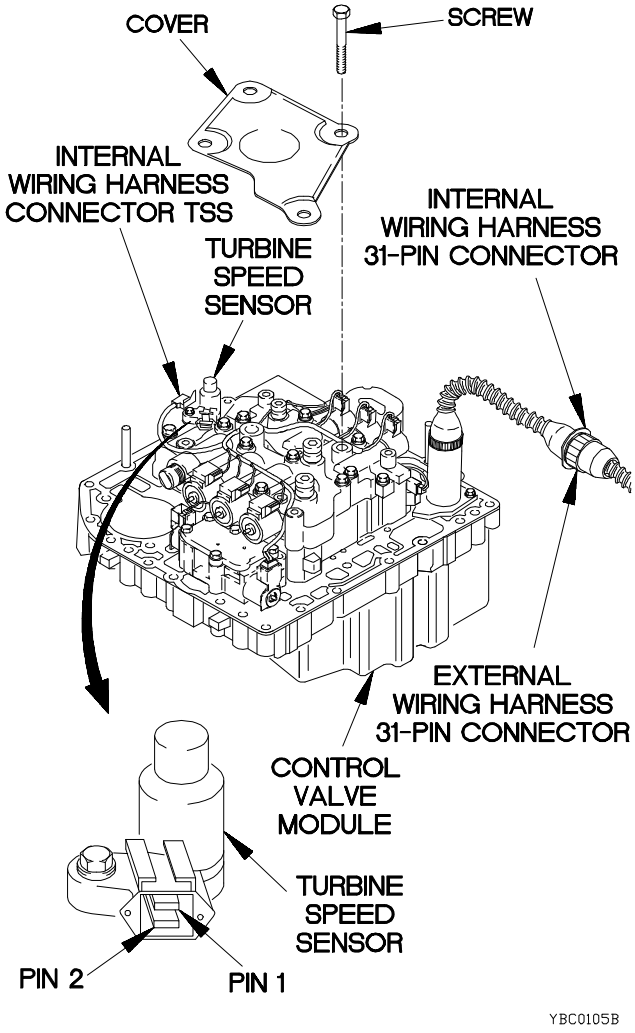


c1. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)

Materials/Parts
Wire, Elect, 50 ft (Item 94, Appendix C)

Personnel Required
(2)

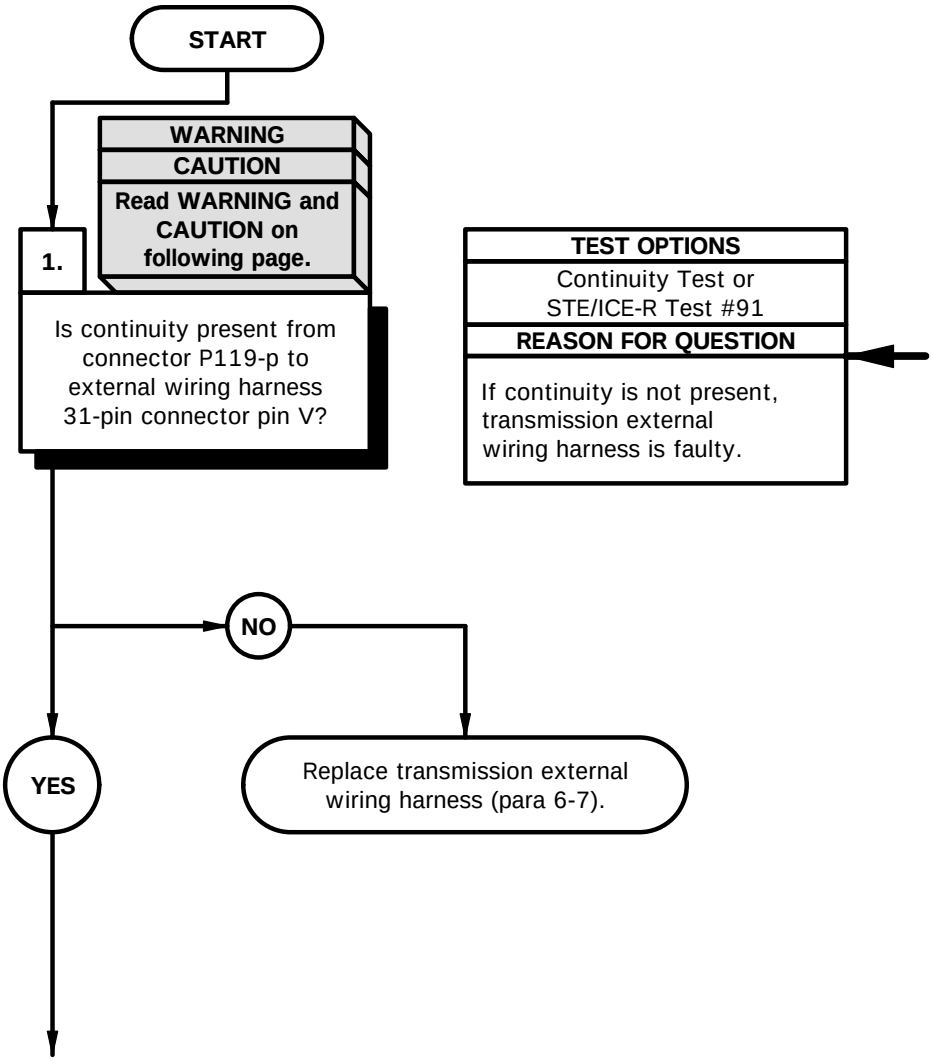
References
TM 9-4910-571-12&P

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

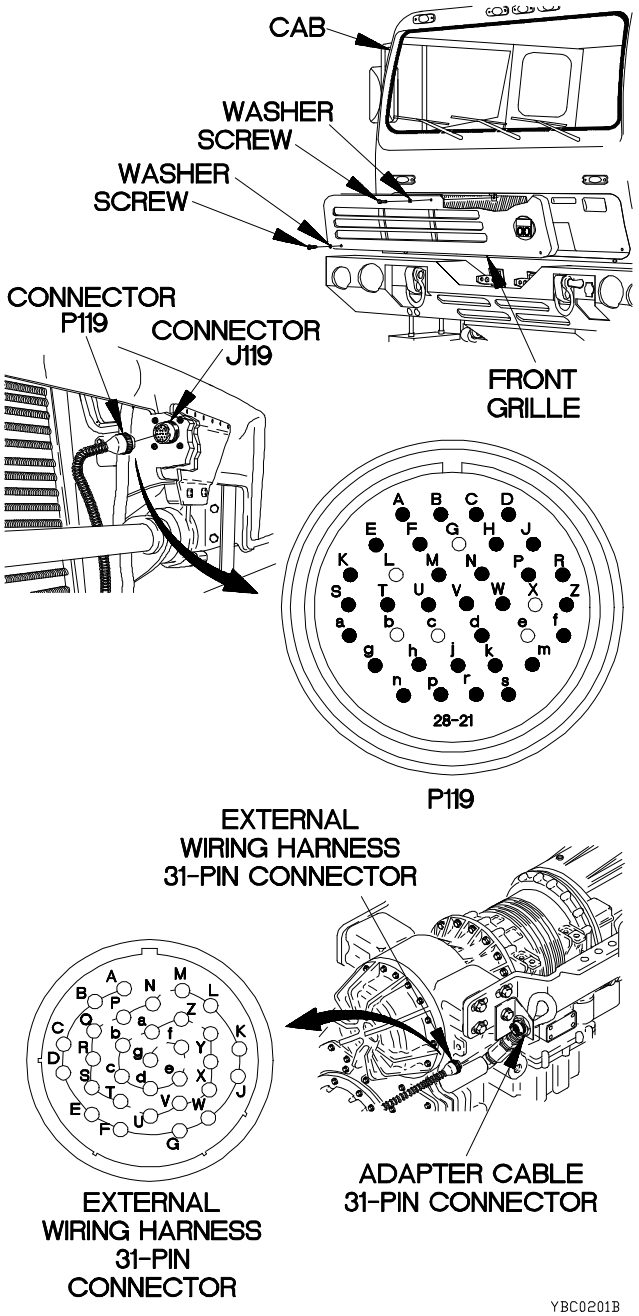
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



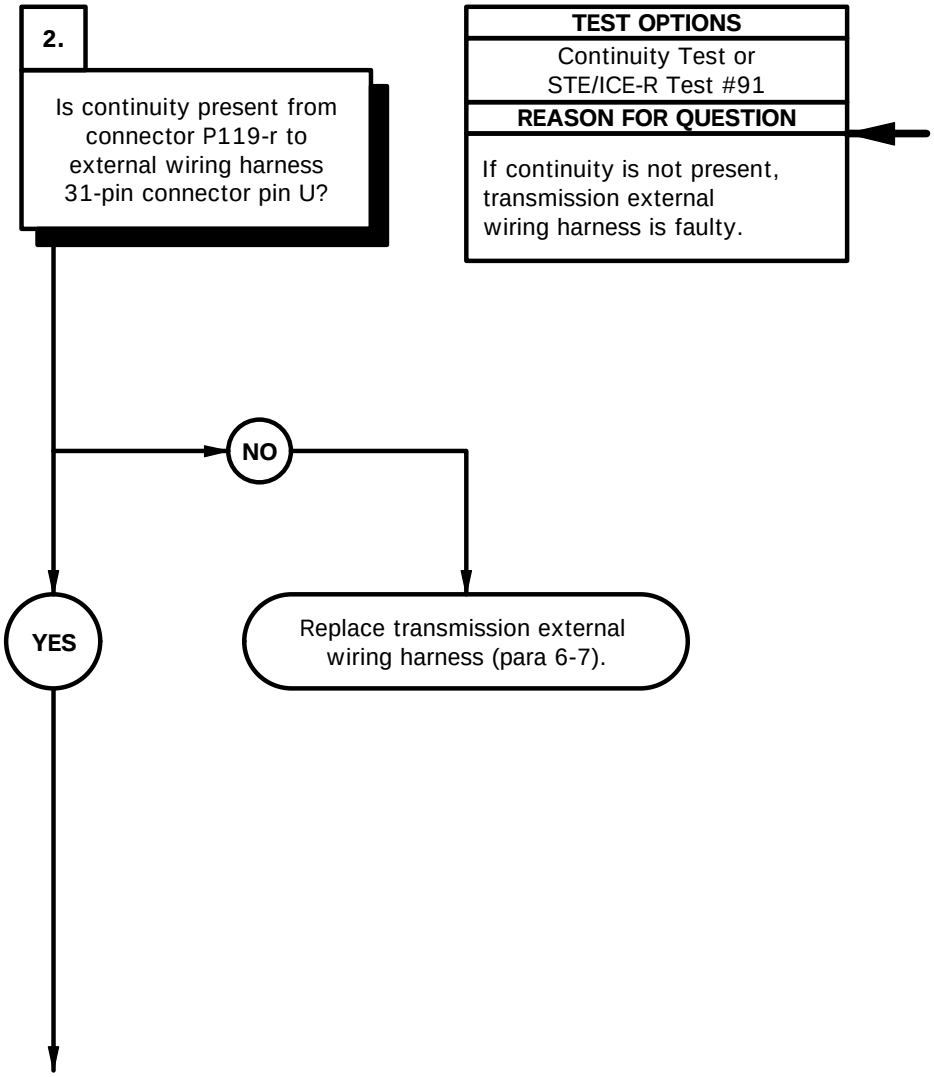
c2. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO

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

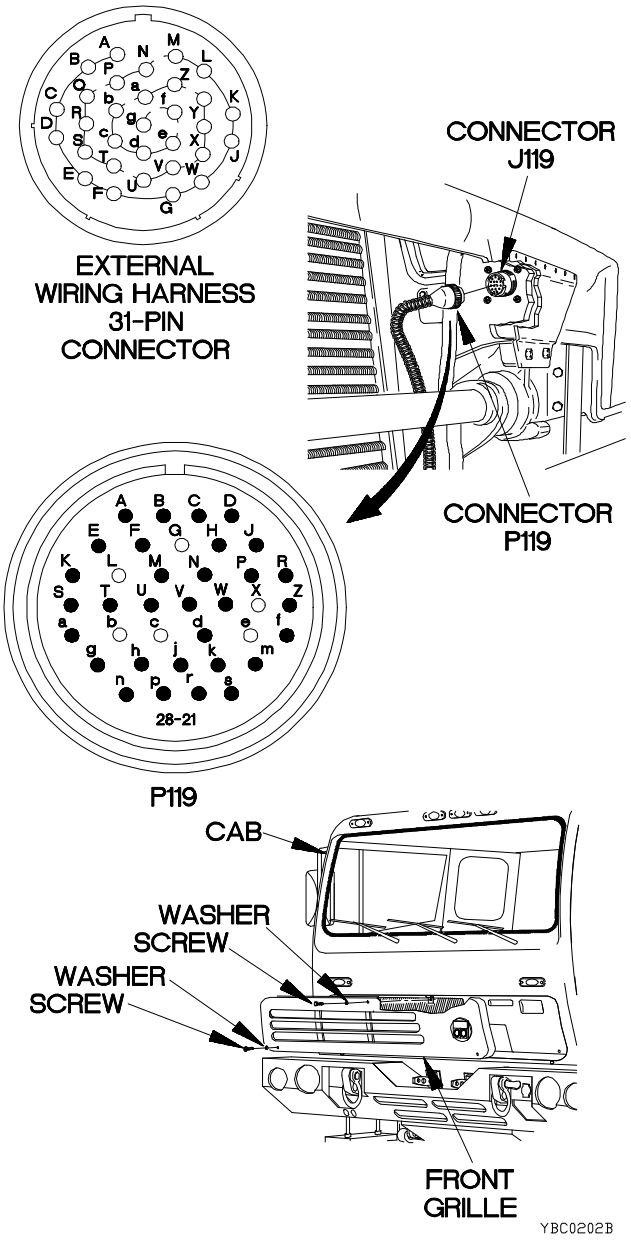
POSSIBLE PROBLEMS

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

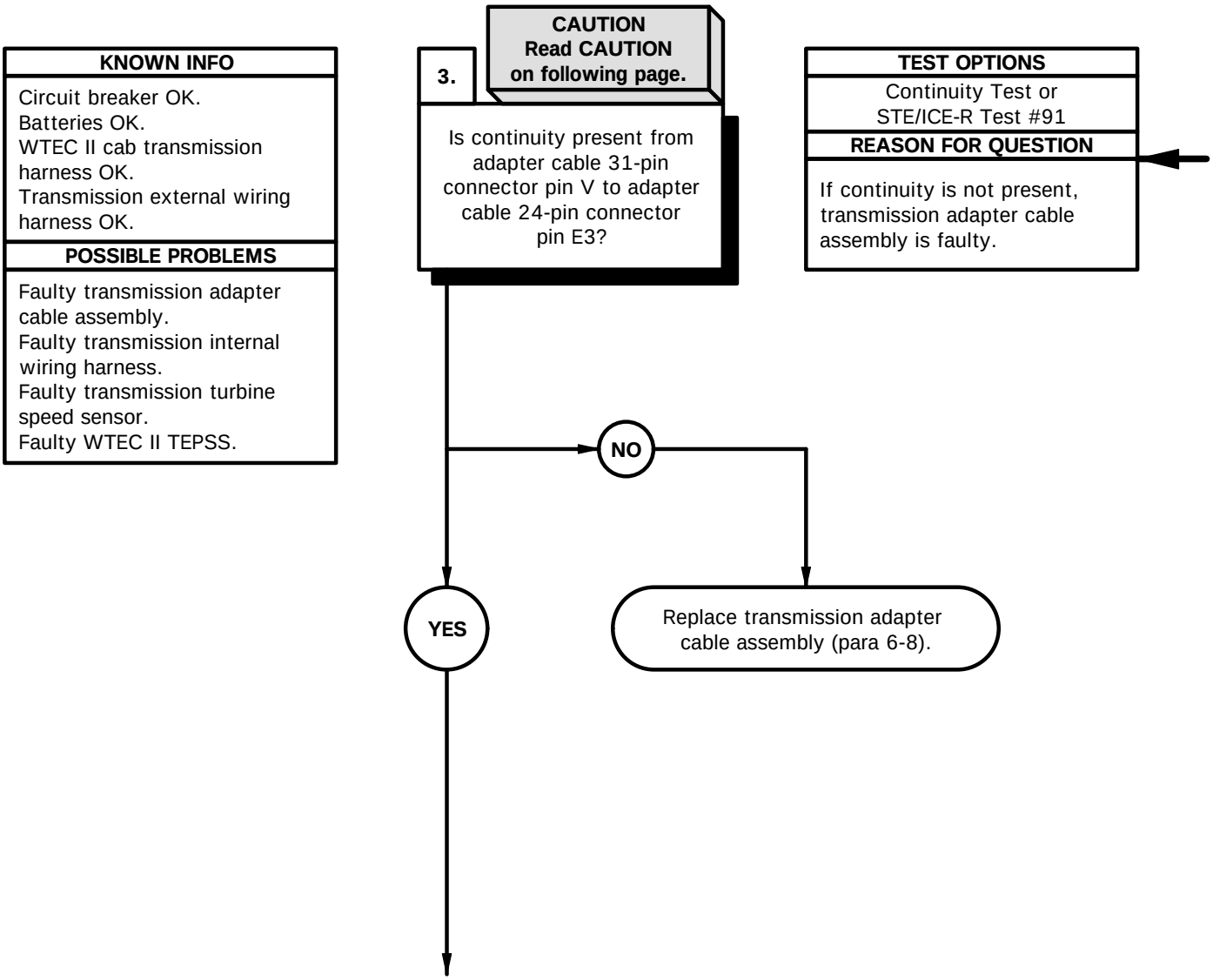


CONTINUITY TEST

(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)

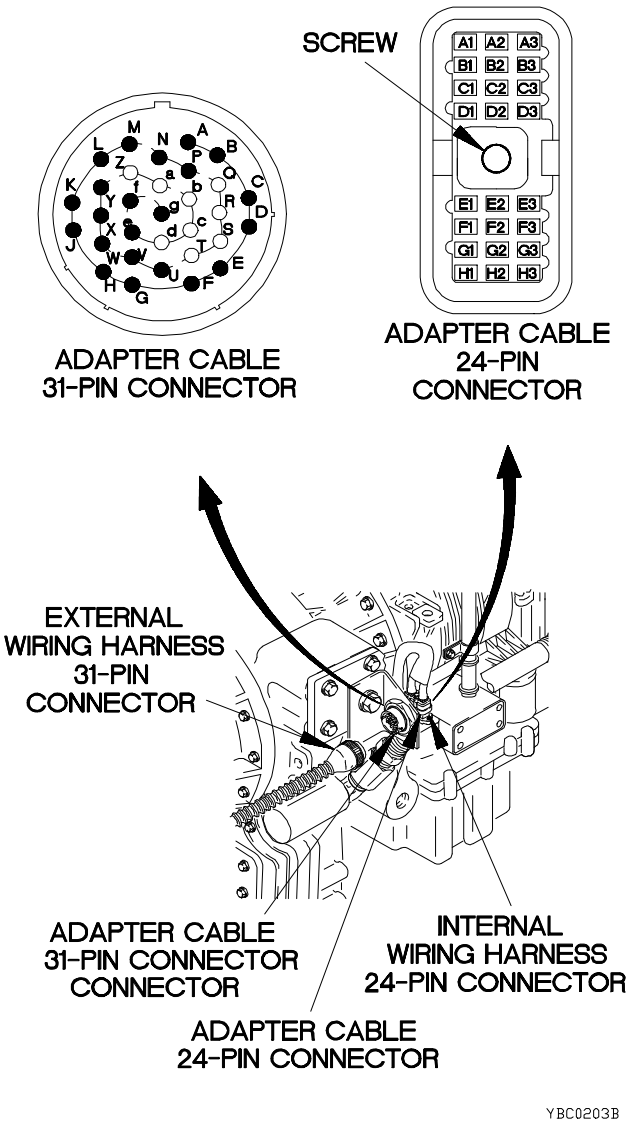


CAUTION

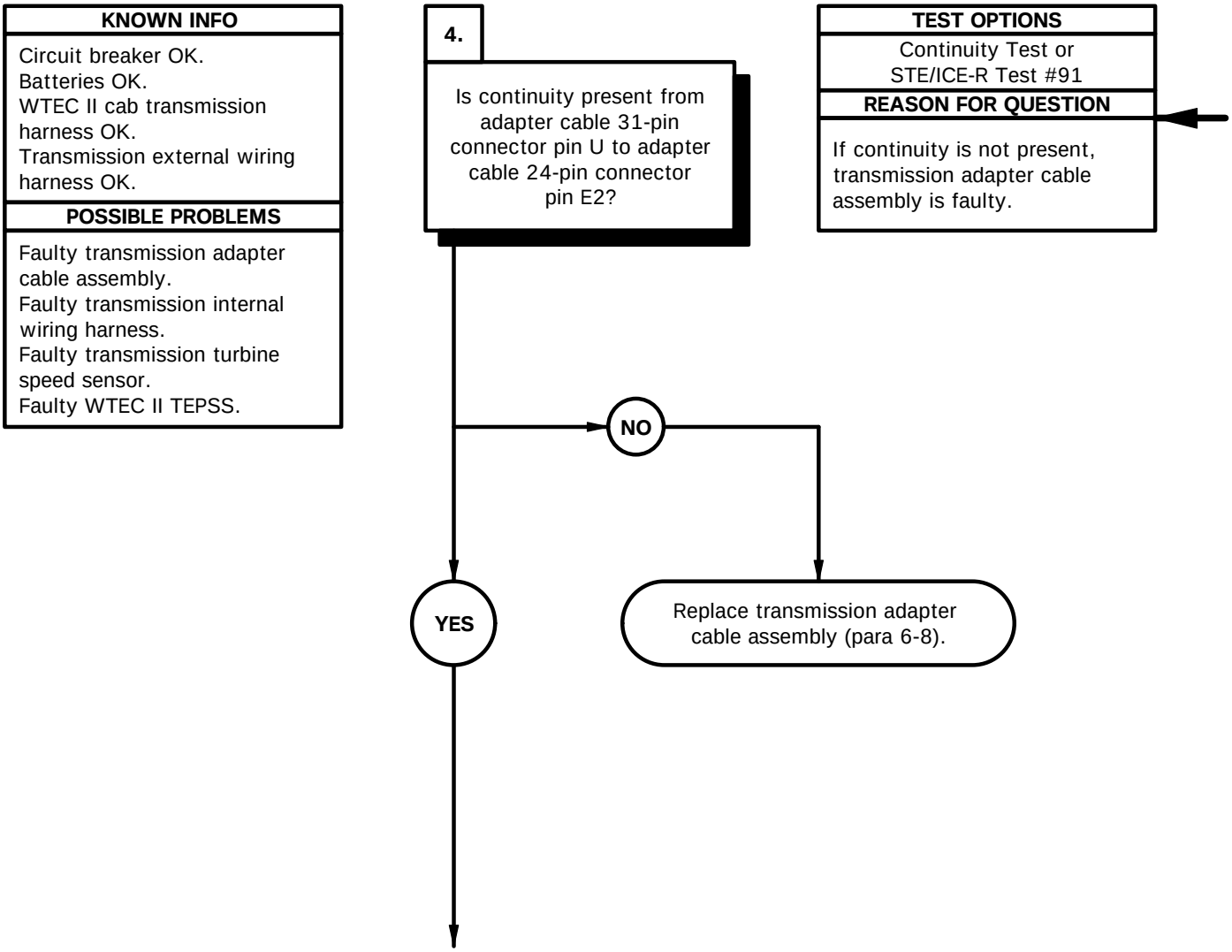
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

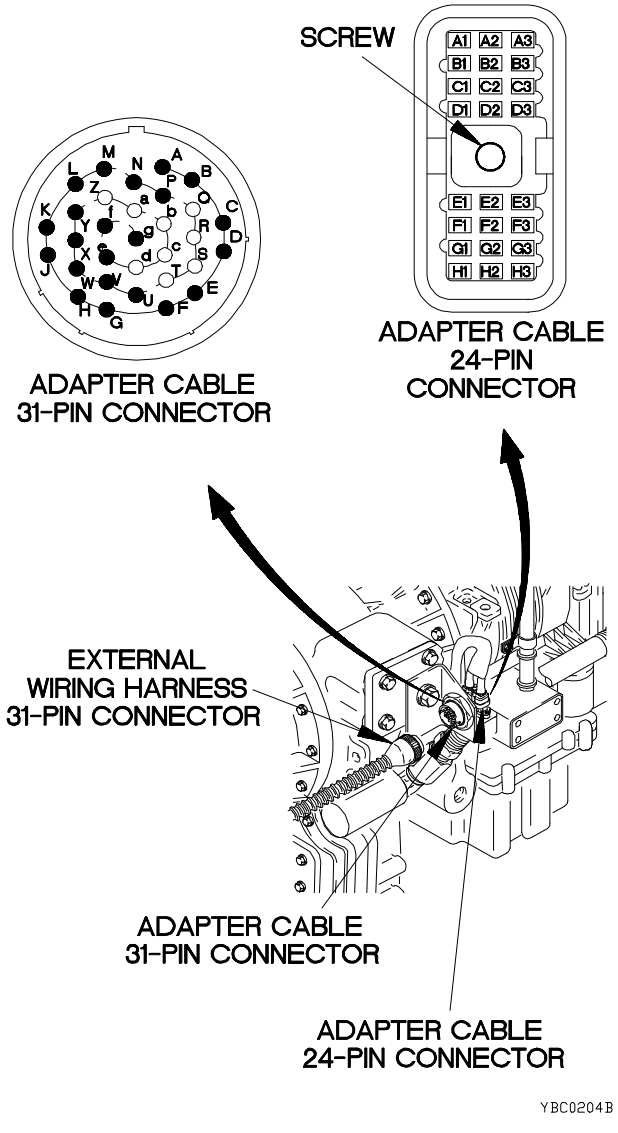


c2. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



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

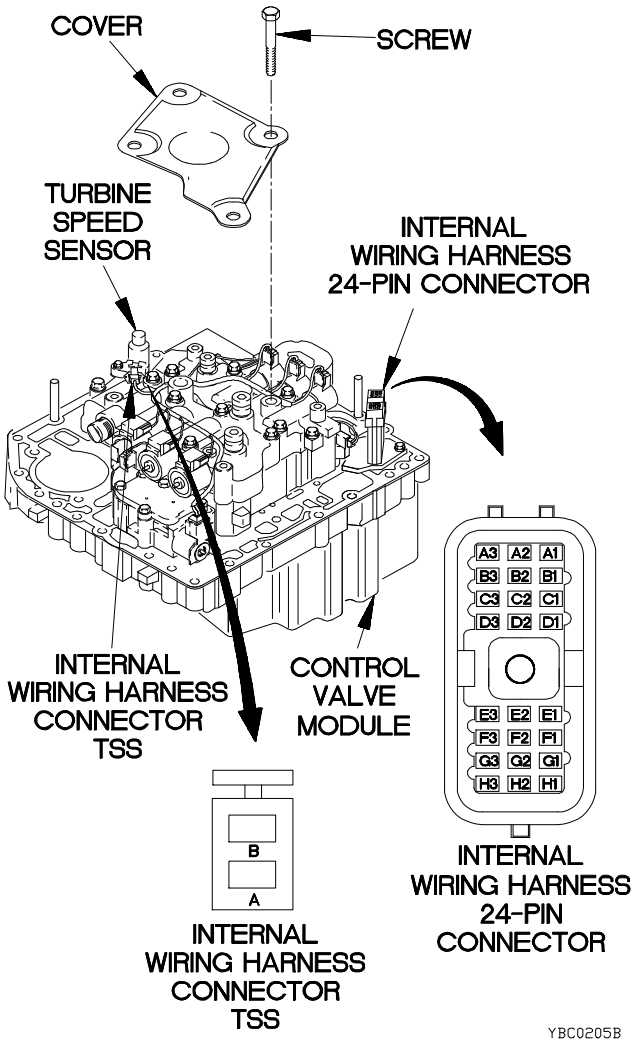
If continuity is not present, transmission internal wiring harness is faulty.

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.

6.

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

TEST OPTIONS

Continuity Test or
STE/ICE-R Test #91

REASON FOR QUESTION

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

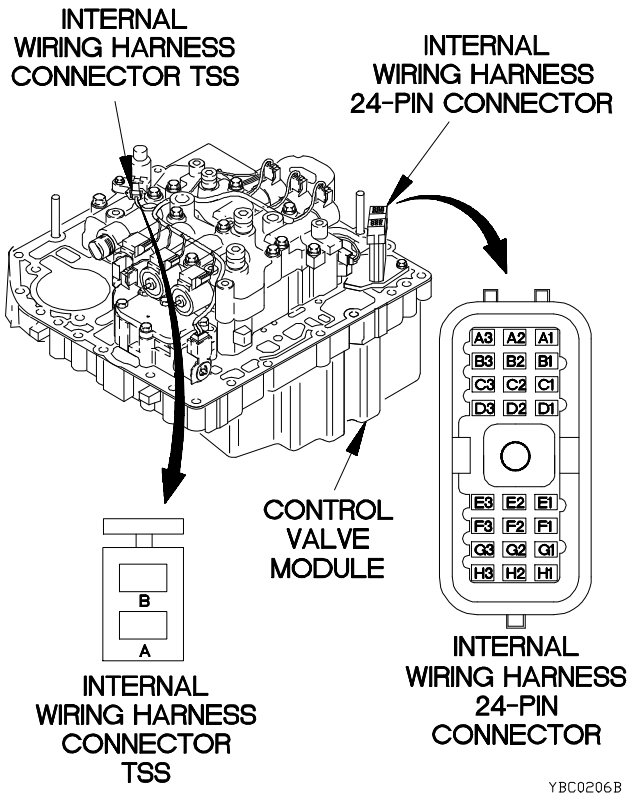
NO

YES

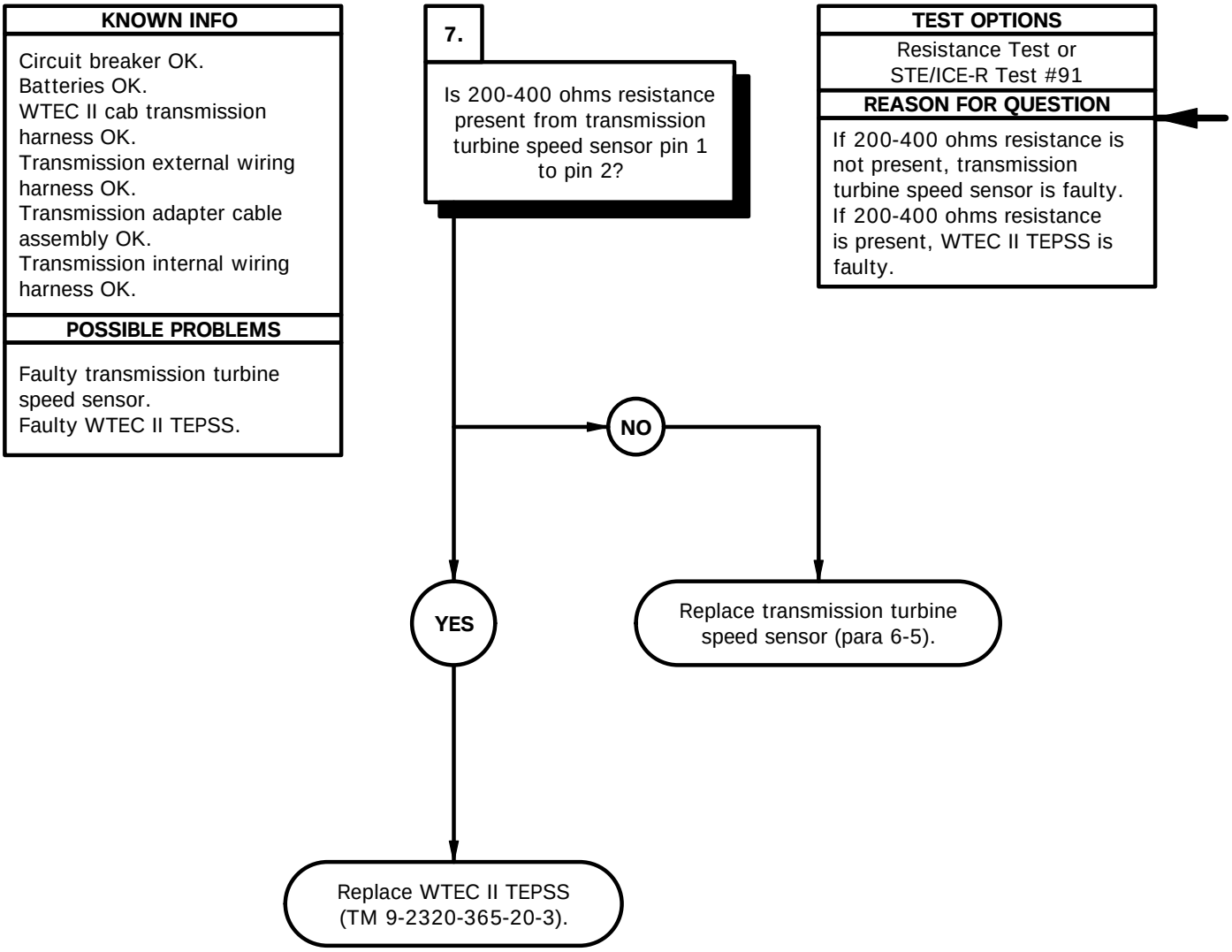
Replace transmission internal wiring harness (para 7-13).

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).

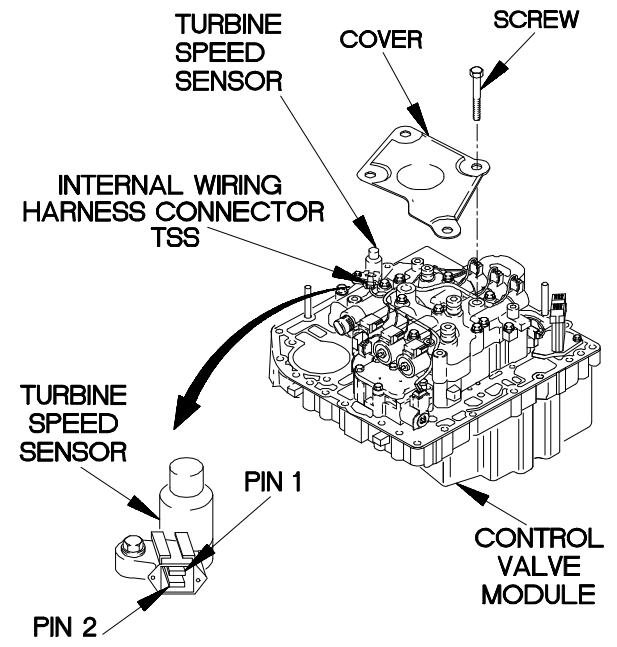


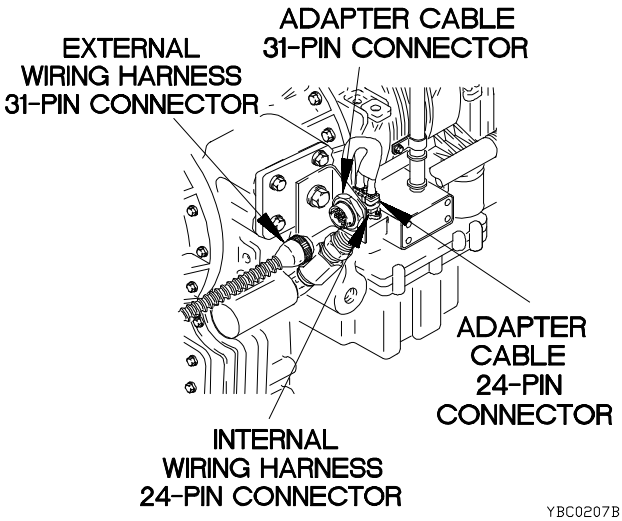
c2. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



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 9-2320-365-20-3).
(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 9-2320-365-20-3).





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 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75 Appendix B)

Personnel Required
(2)

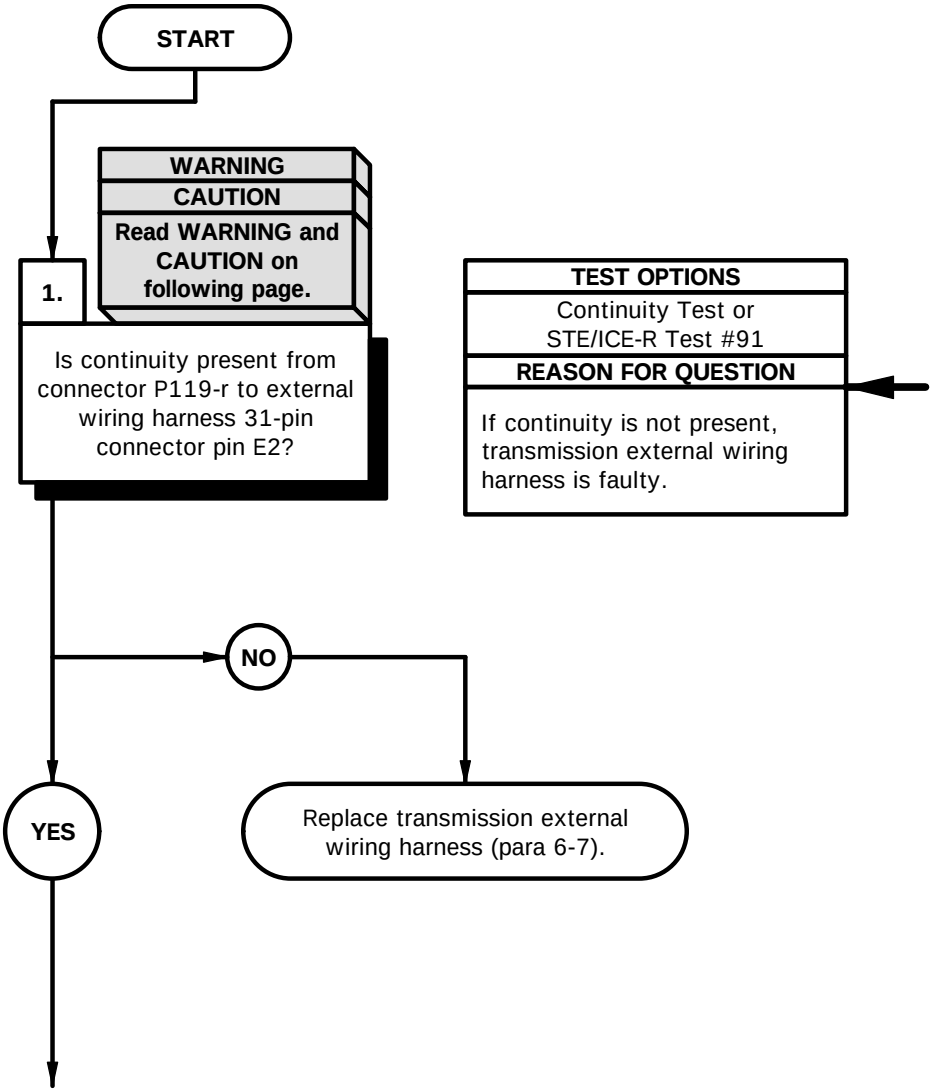
References
TM 9-4910-571-12&P

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 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 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

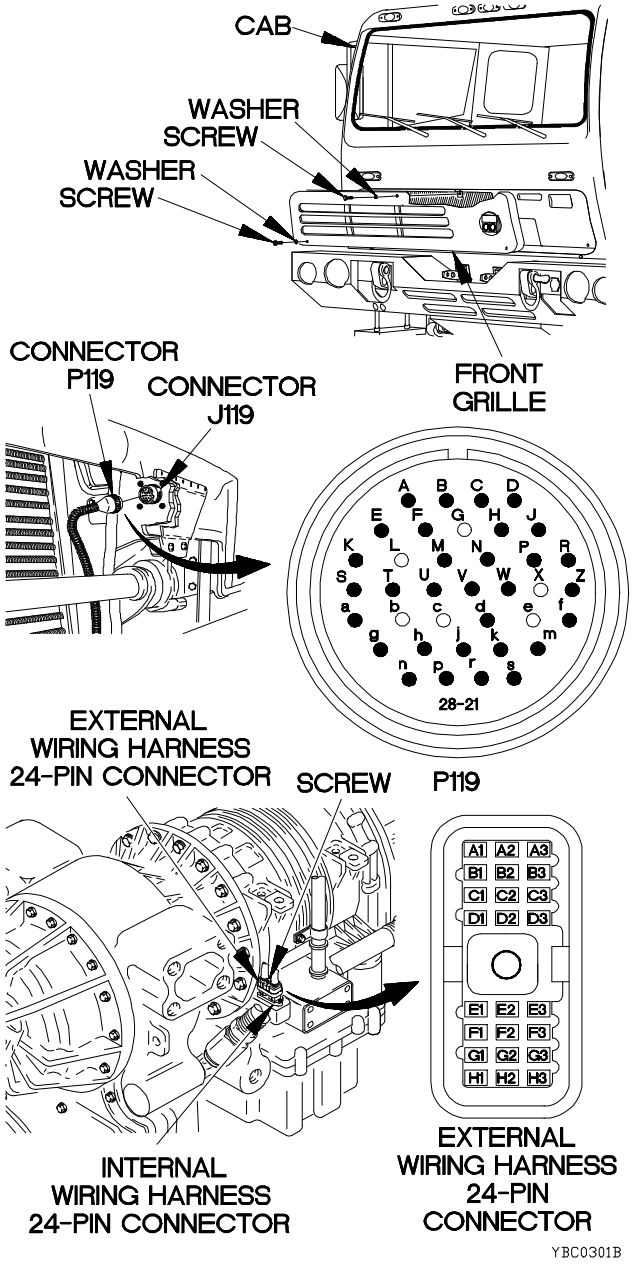
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

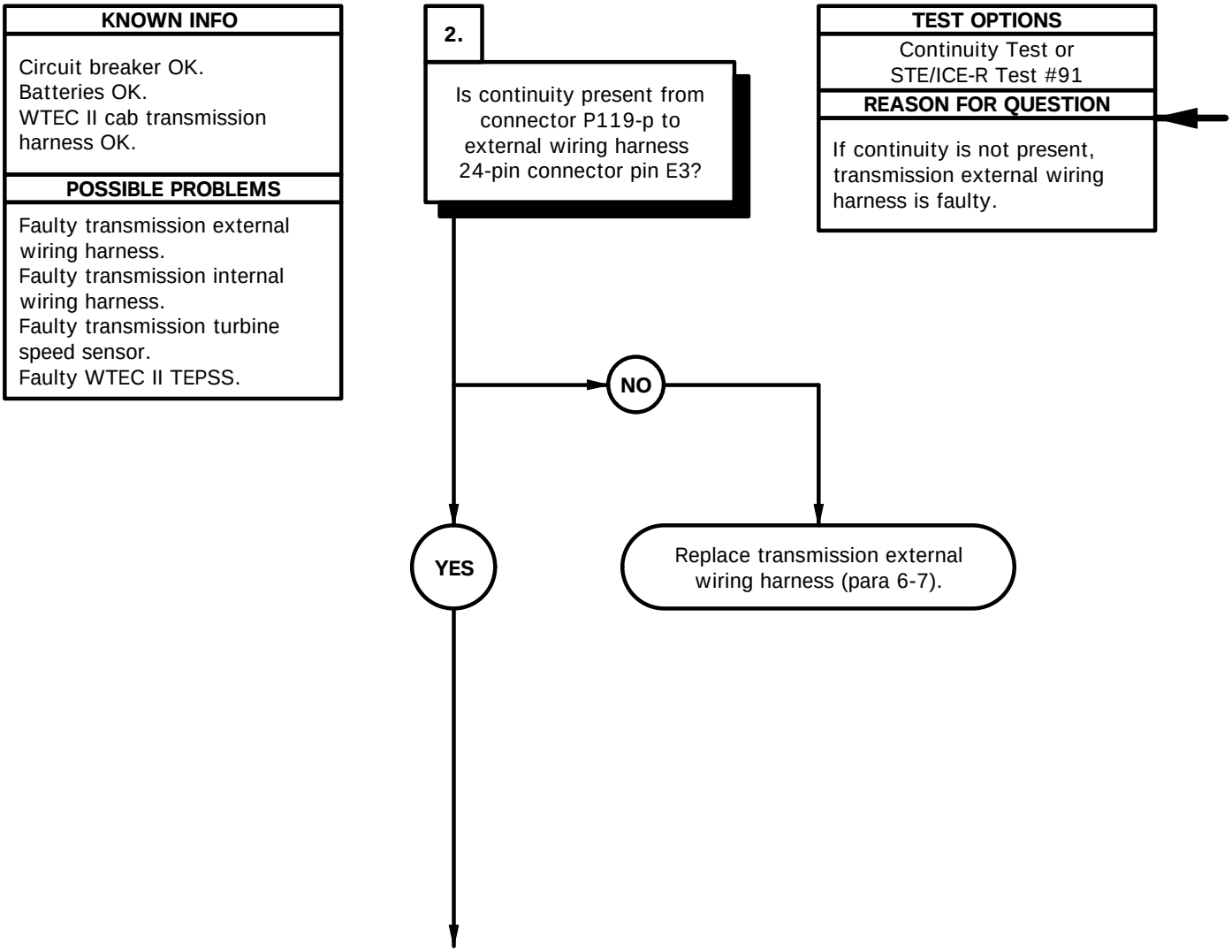
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Loosen screw in external wiring harness 24-pin connector.
(6) Disconnect external wiring harness 24-pin connector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

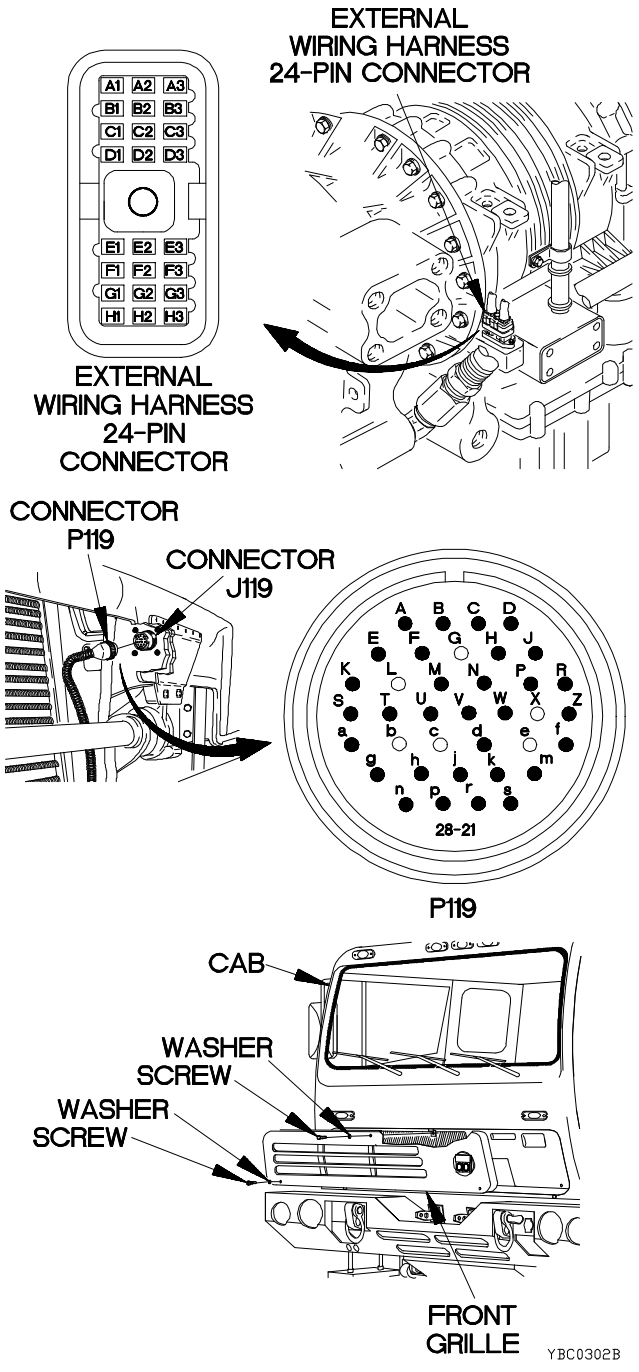


c3. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

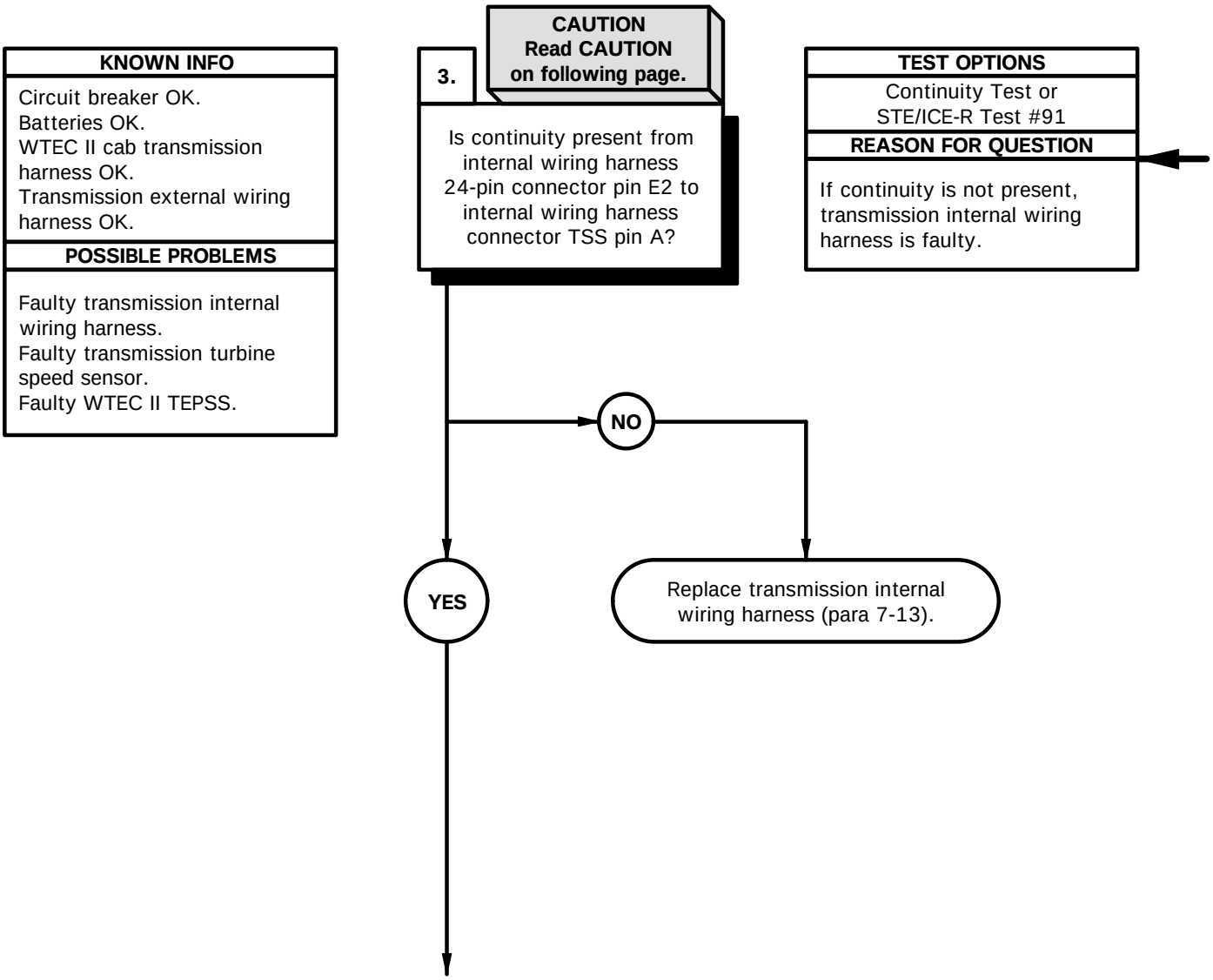


CONTINUITY TEST

(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)

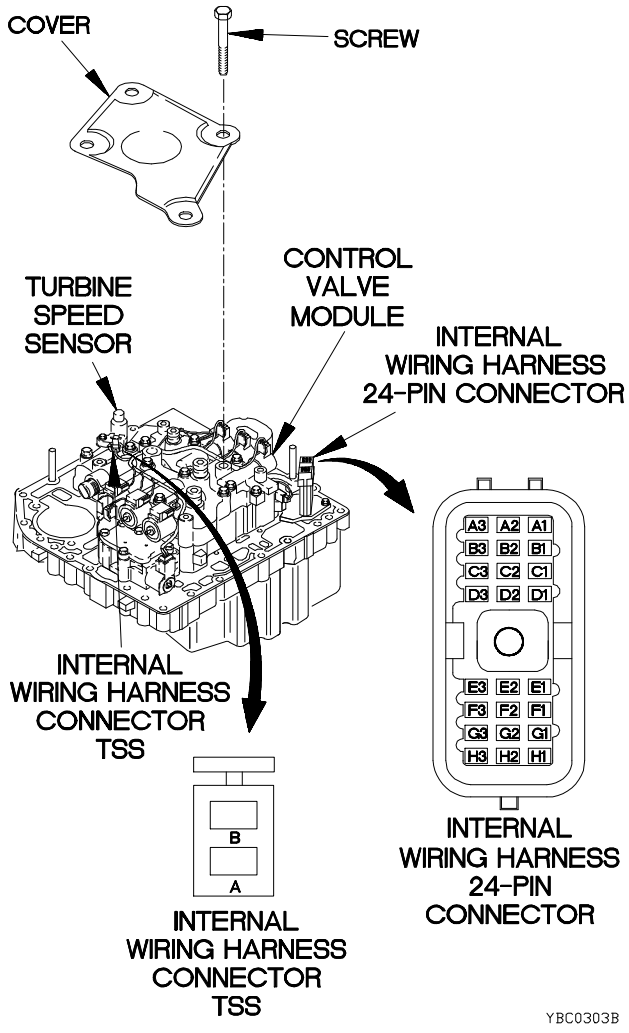


CAUTION

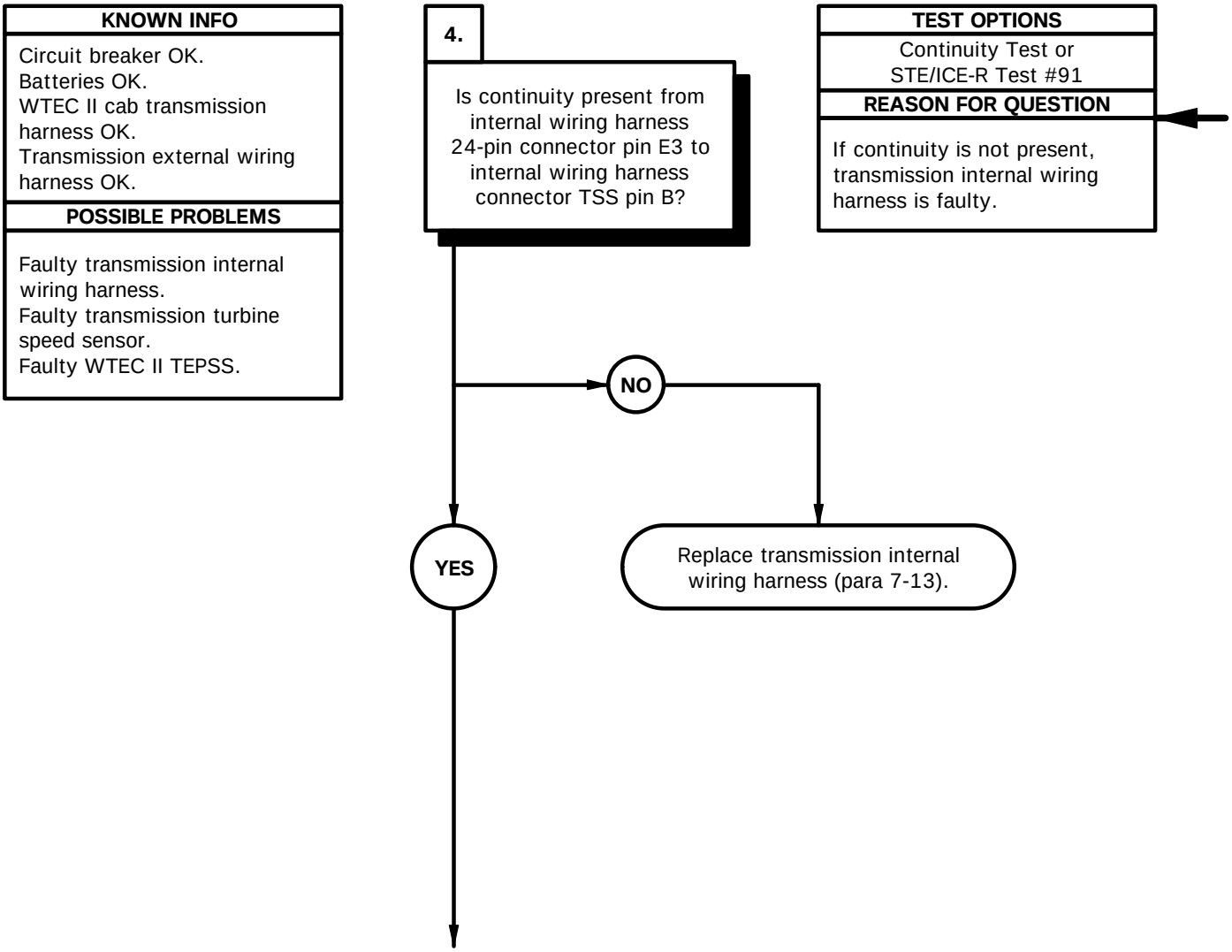
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

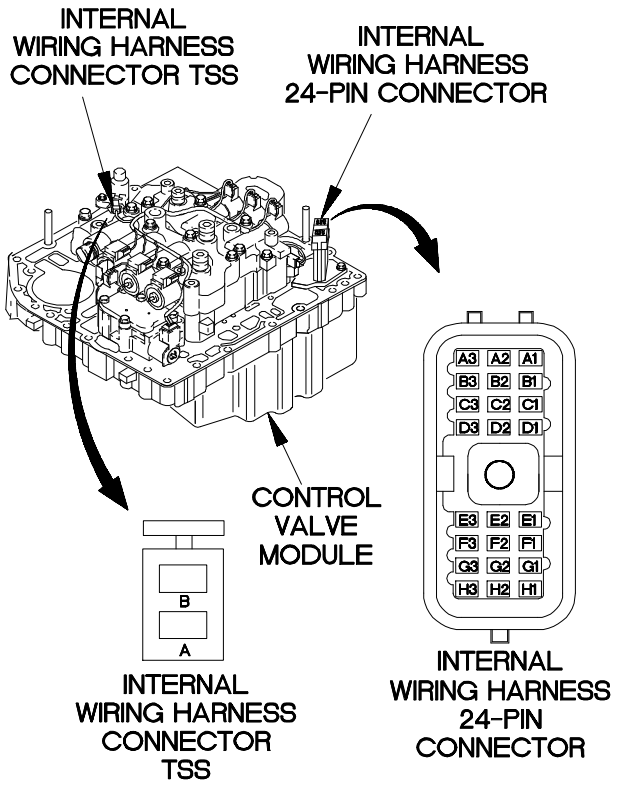


c3. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

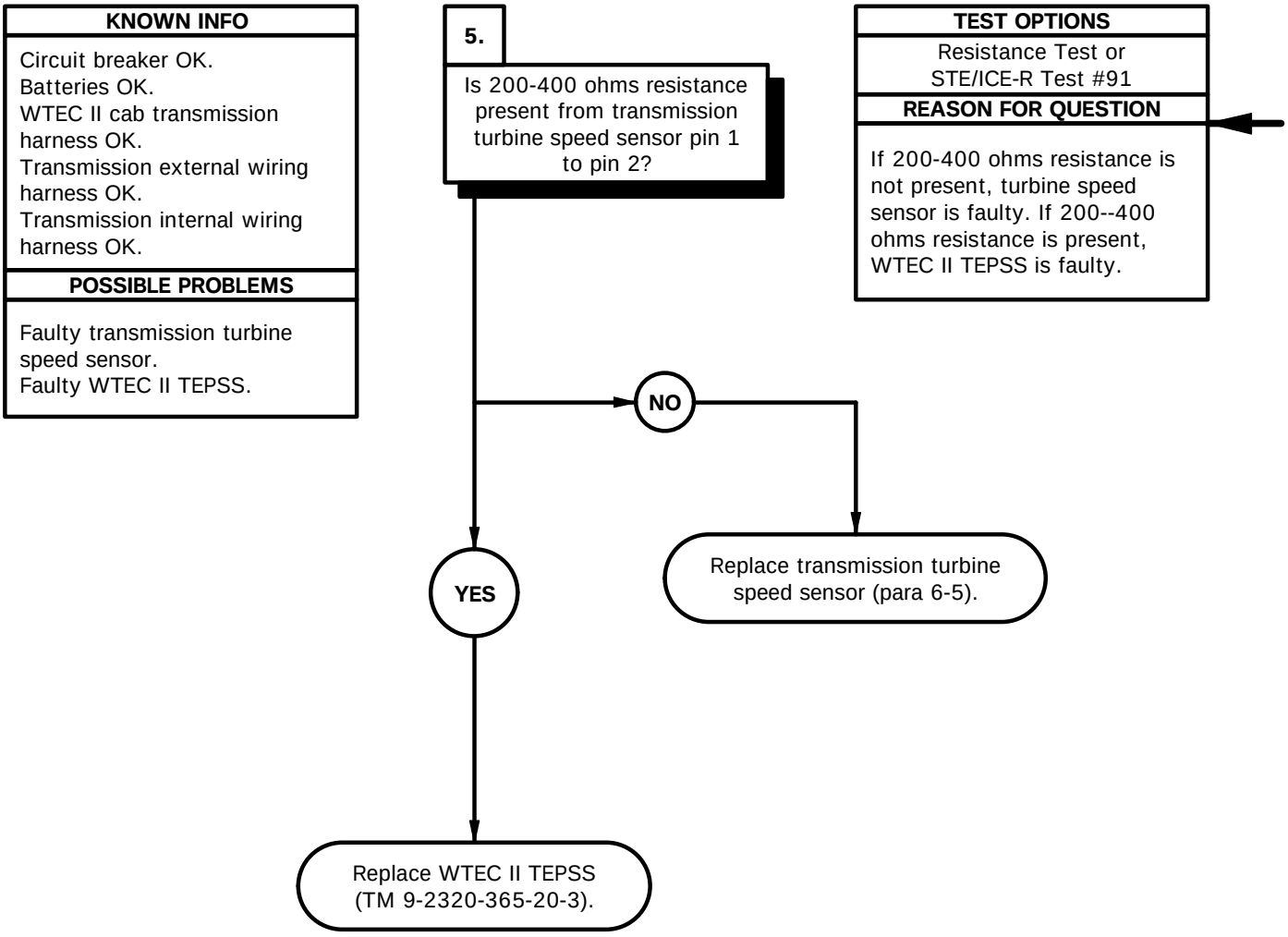


CONTINUITY TEST

(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).

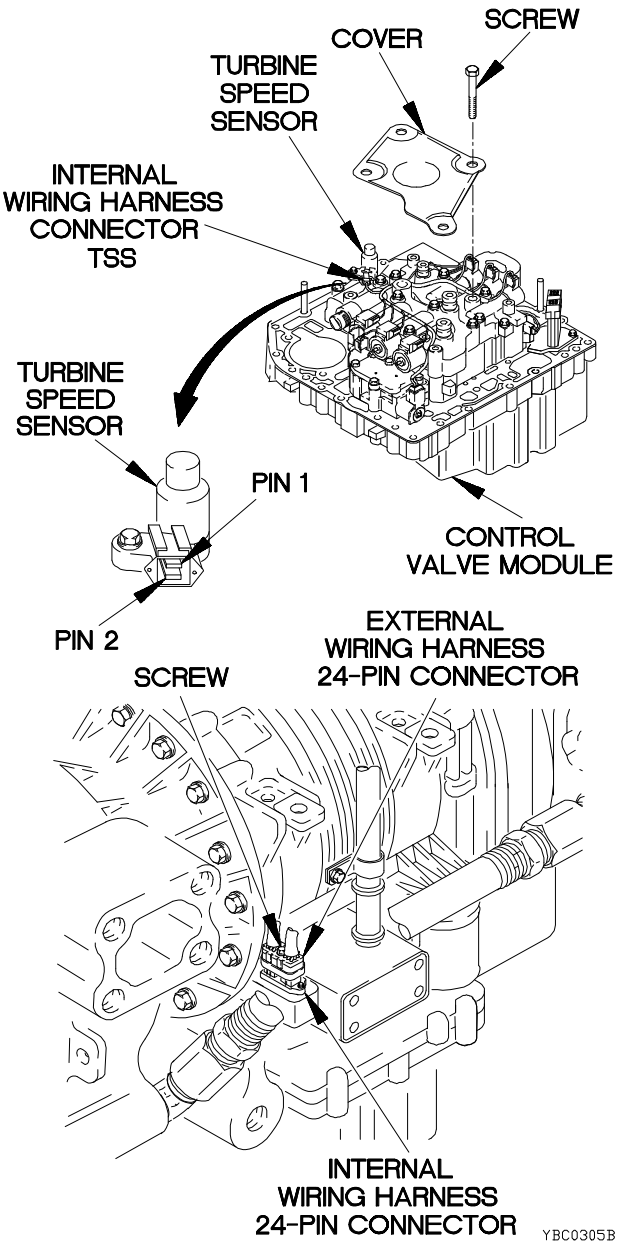


c3. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)



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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

INITIAL SETUP

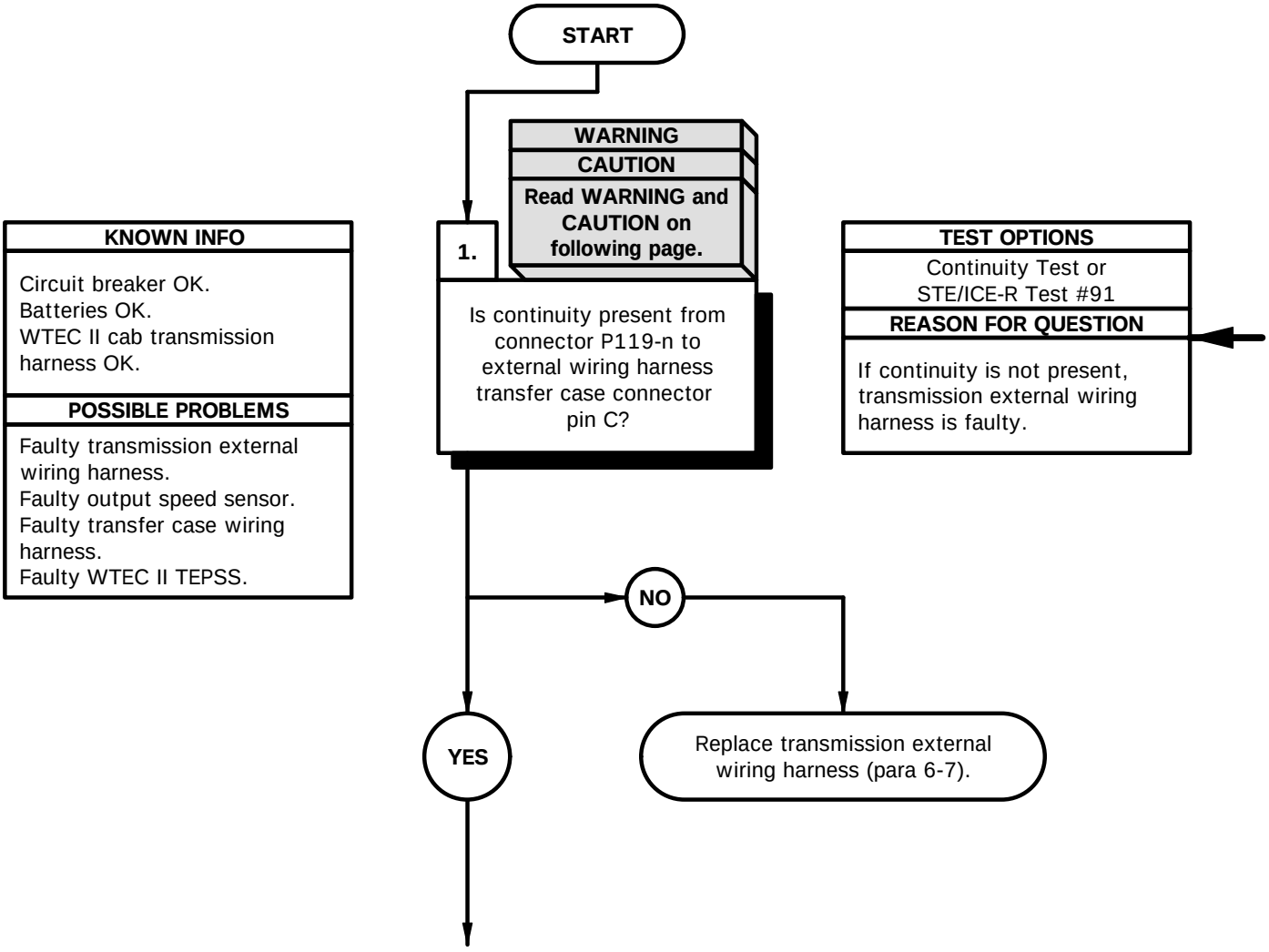
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Pan, Drain (Item 36, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)

Materials/Parts
Gasket (Item 41, Appendix F)
Oil, Lubricating (Item 46, Appendix C)
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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

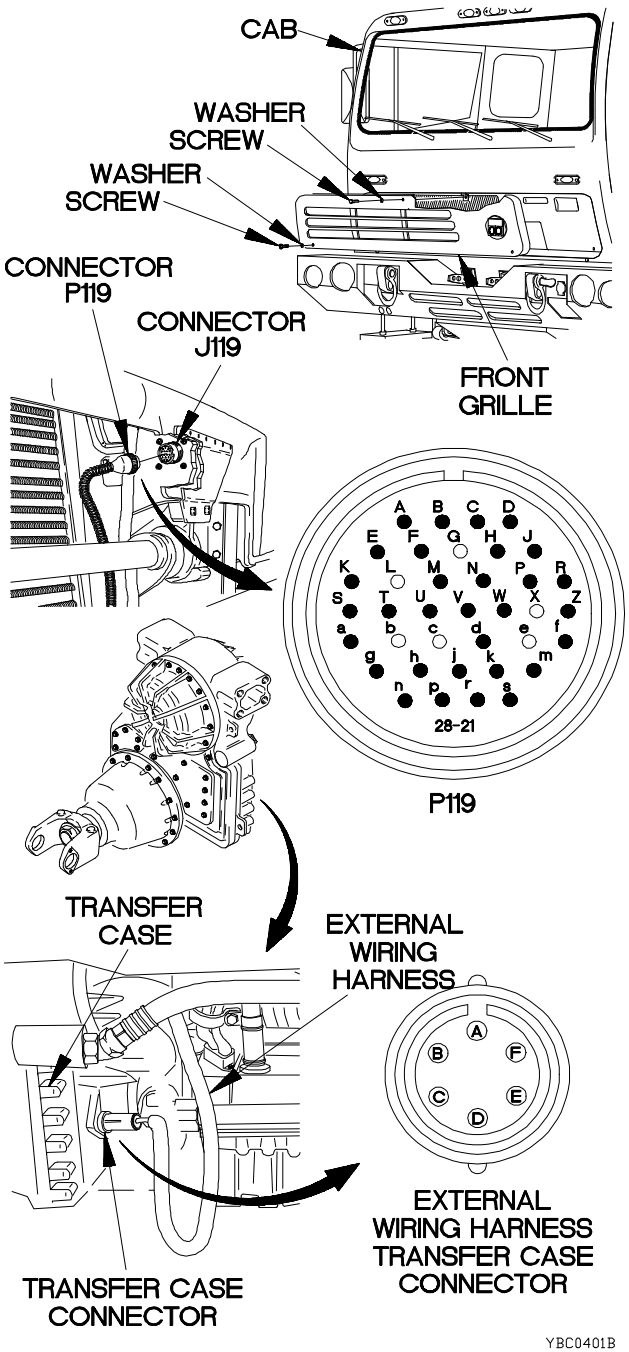
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

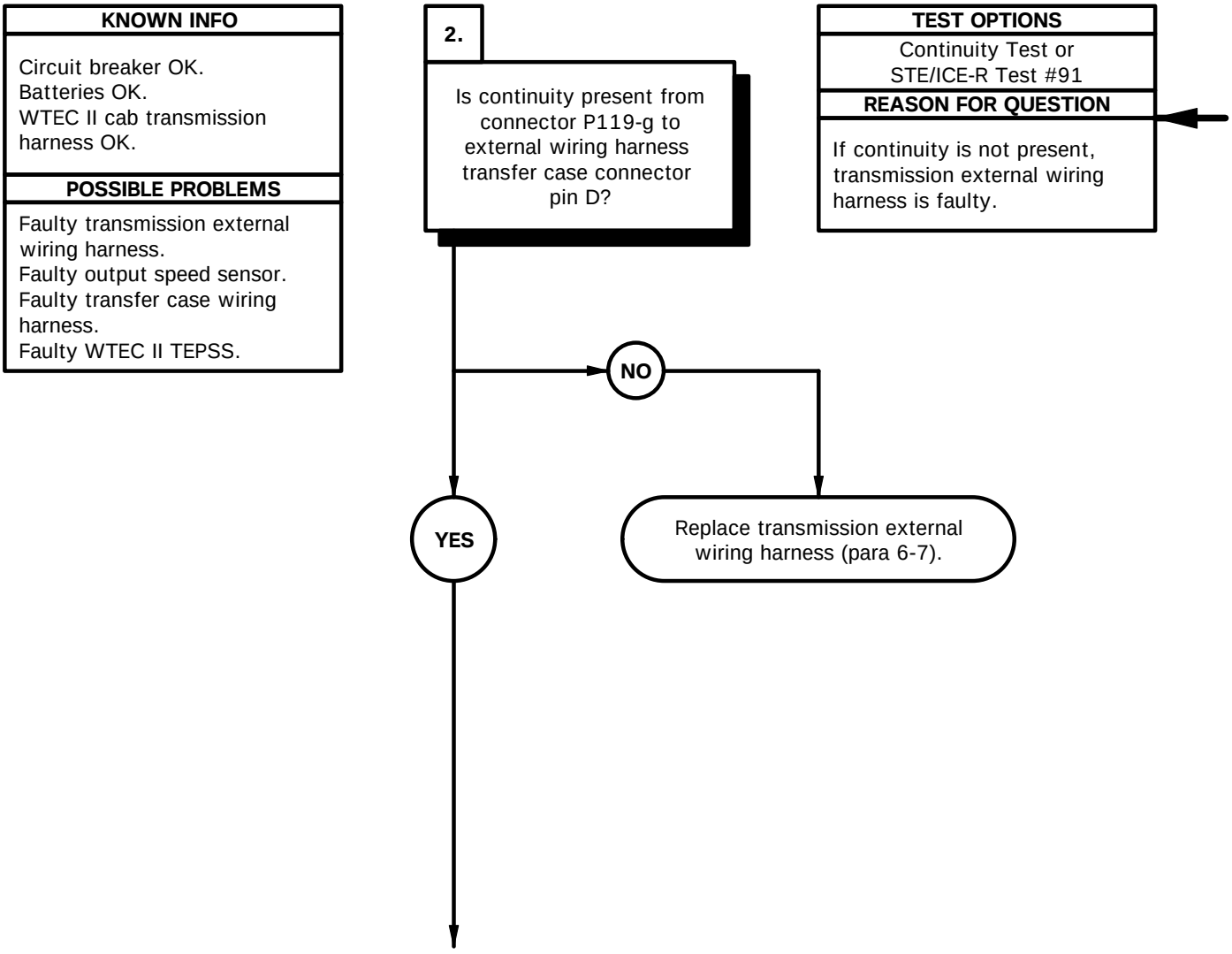
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness transfer case connector from transfer case connector.
(6) Set multimeter to ohms.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

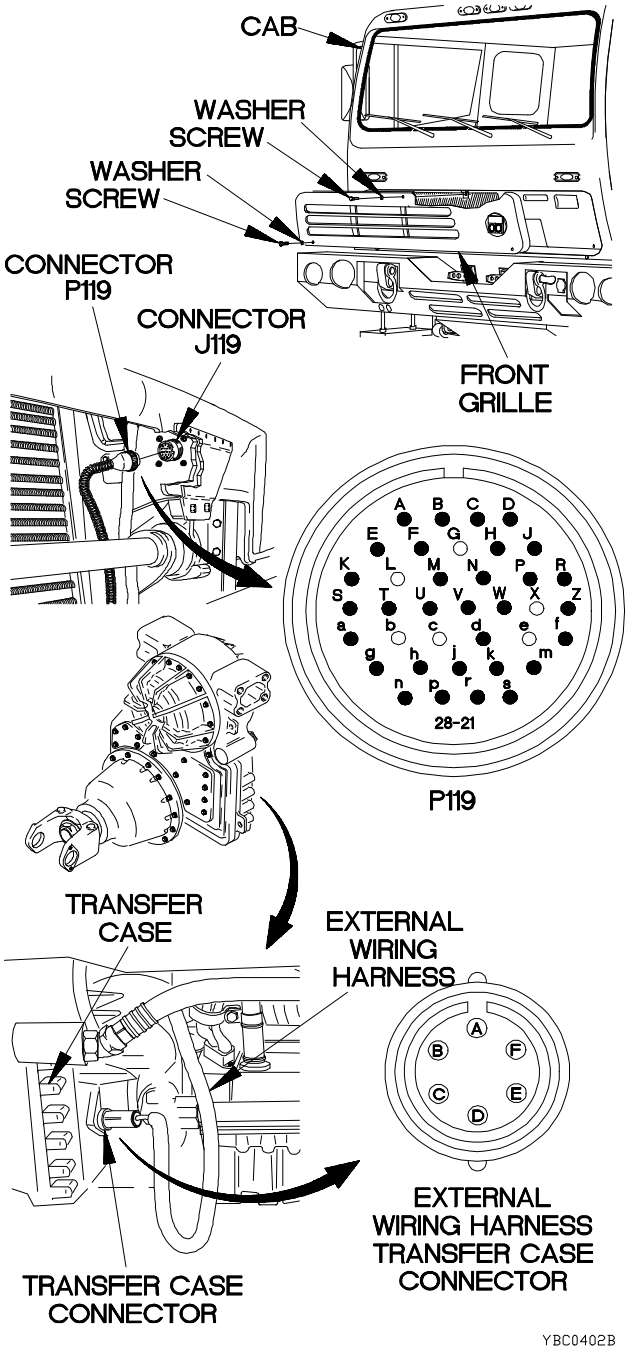


c4. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 16 (CONT)



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).



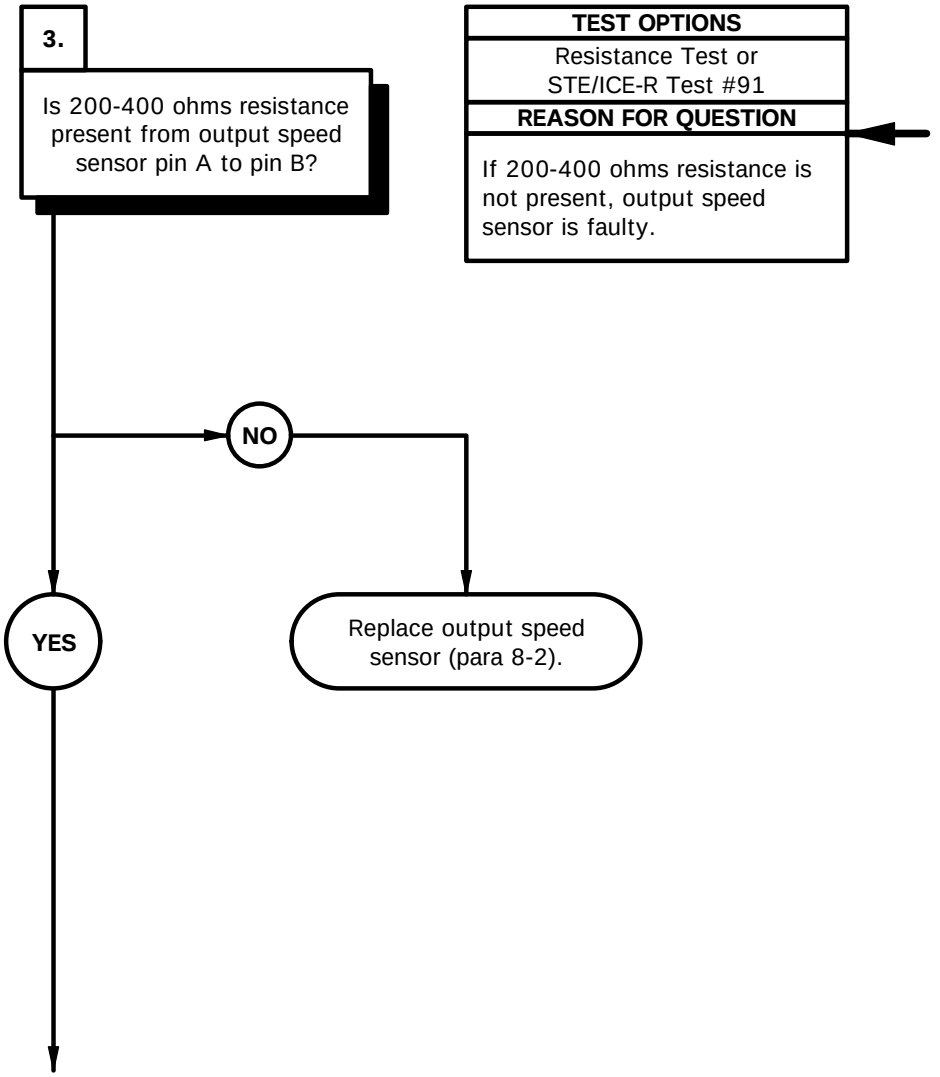
c4. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 16 (CONT)

KNOWN INFO

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

POSSIBLE PROBLEMS

Faulty output speed sensor.
Faulty transfer case wiring harness.
Faulty WTEC II TEPSS.



TEST OPTIONS

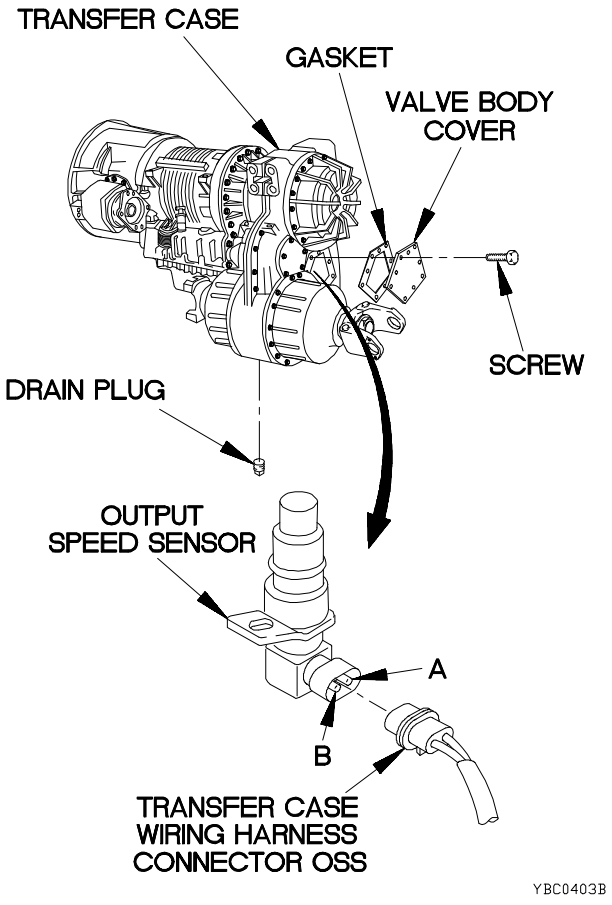
Resistance Test or
STE/ICE-R Test #91

REASON FOR QUESTION

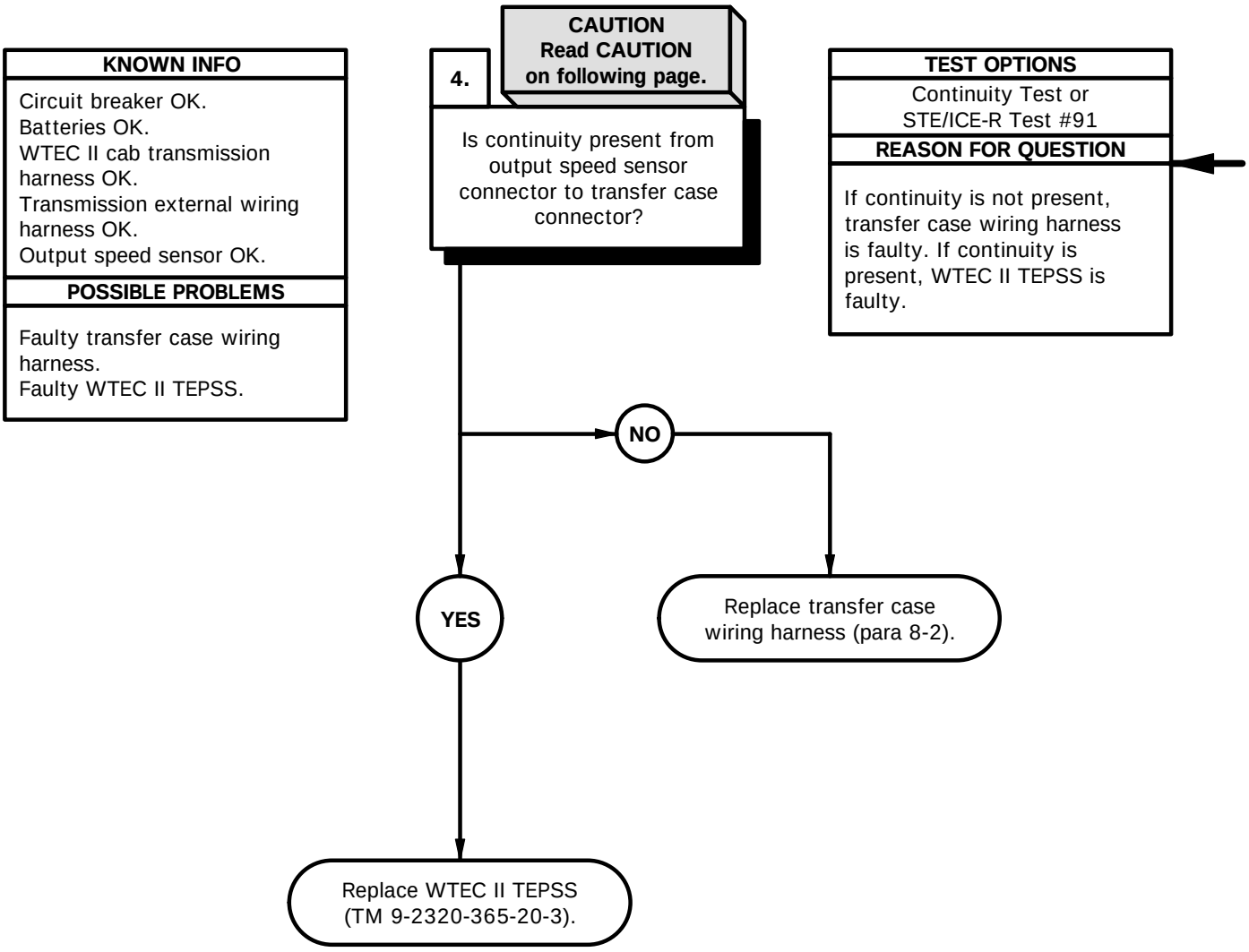
If 200-400 ohms resistance is not present, output speed sensor is faulty.

RESISTANCE TEST

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



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

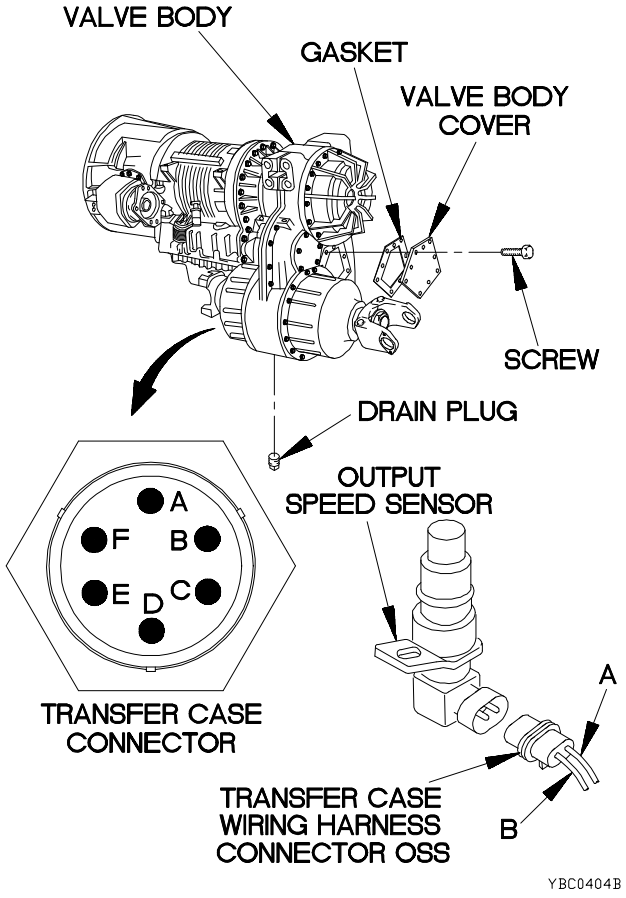


CAUTION

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 9-2320-365-20-3).
(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 9-2320-365-20).
(13) Connect batteries (TM 9-2320-365-20-3).



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

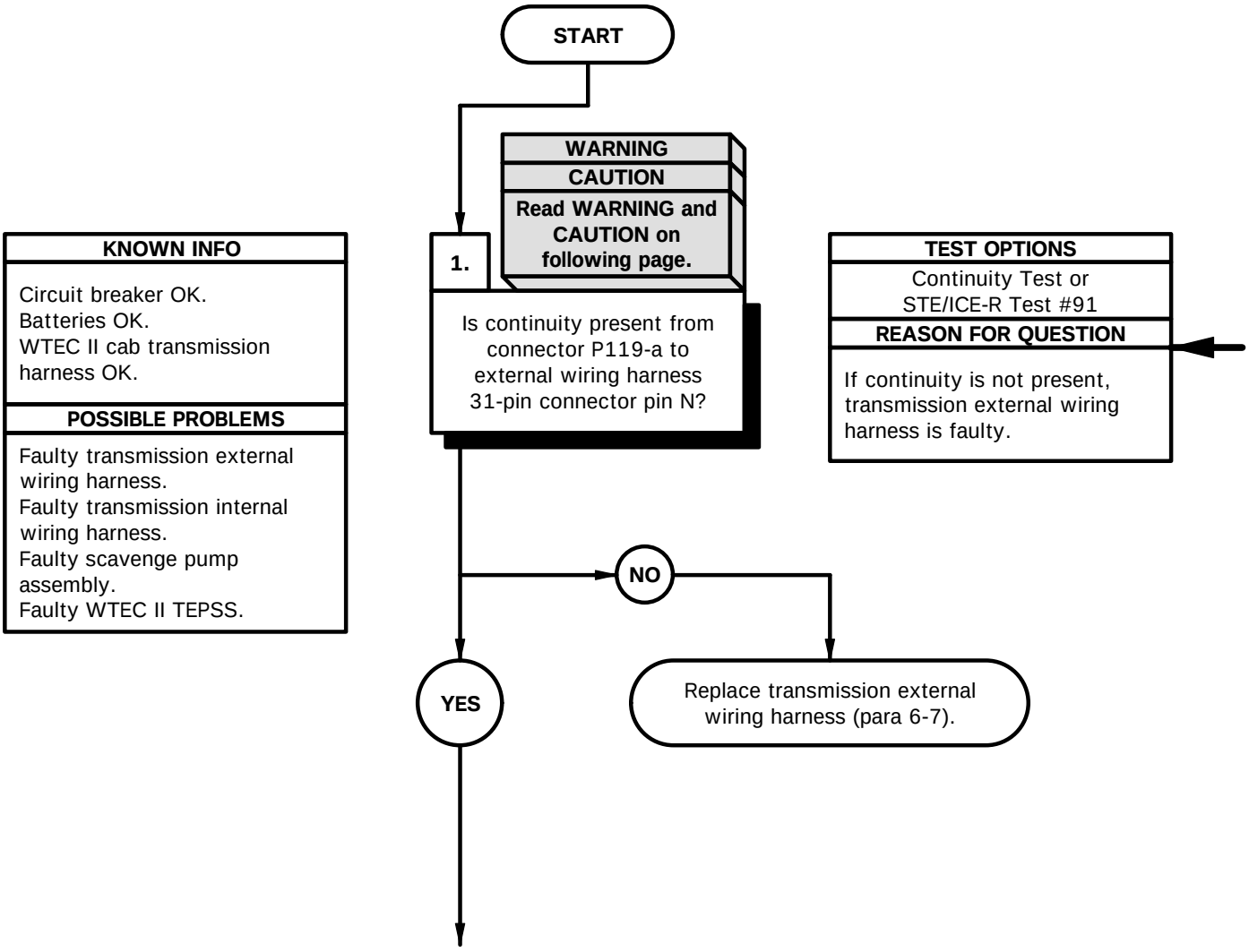
Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)
Pan, Drain (Item 36, Appendix B)

Materials/Parts
Wire, Elect, 50 ft (Item 94, 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

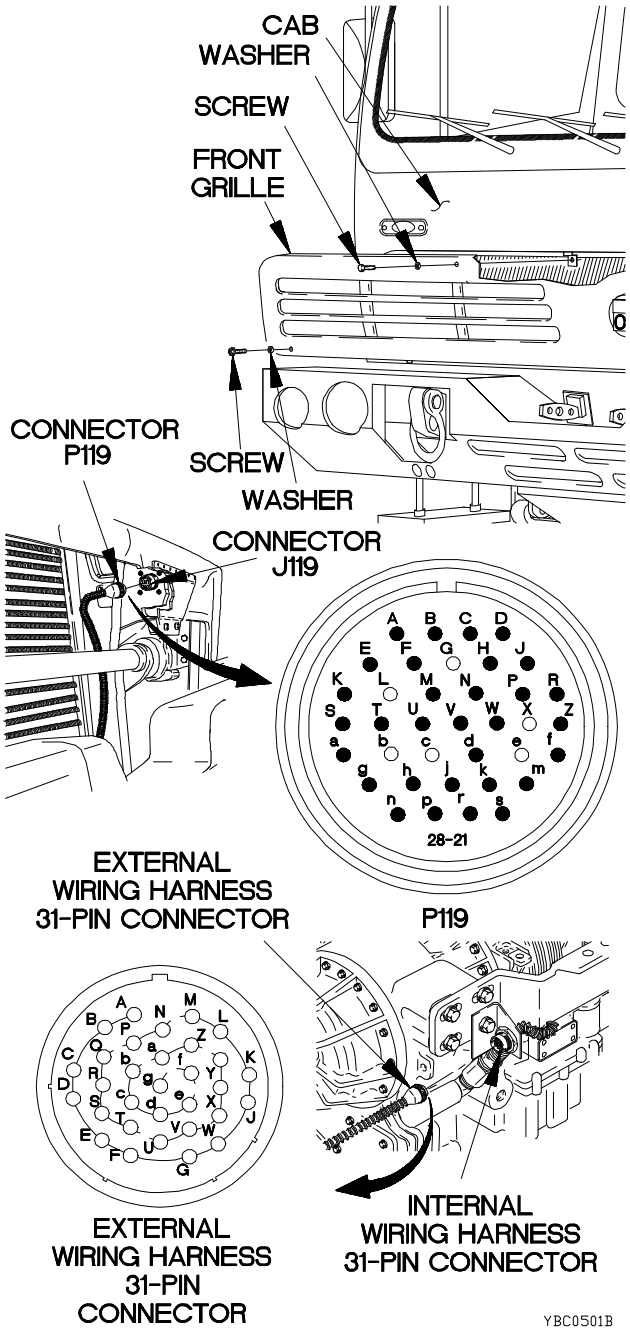
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

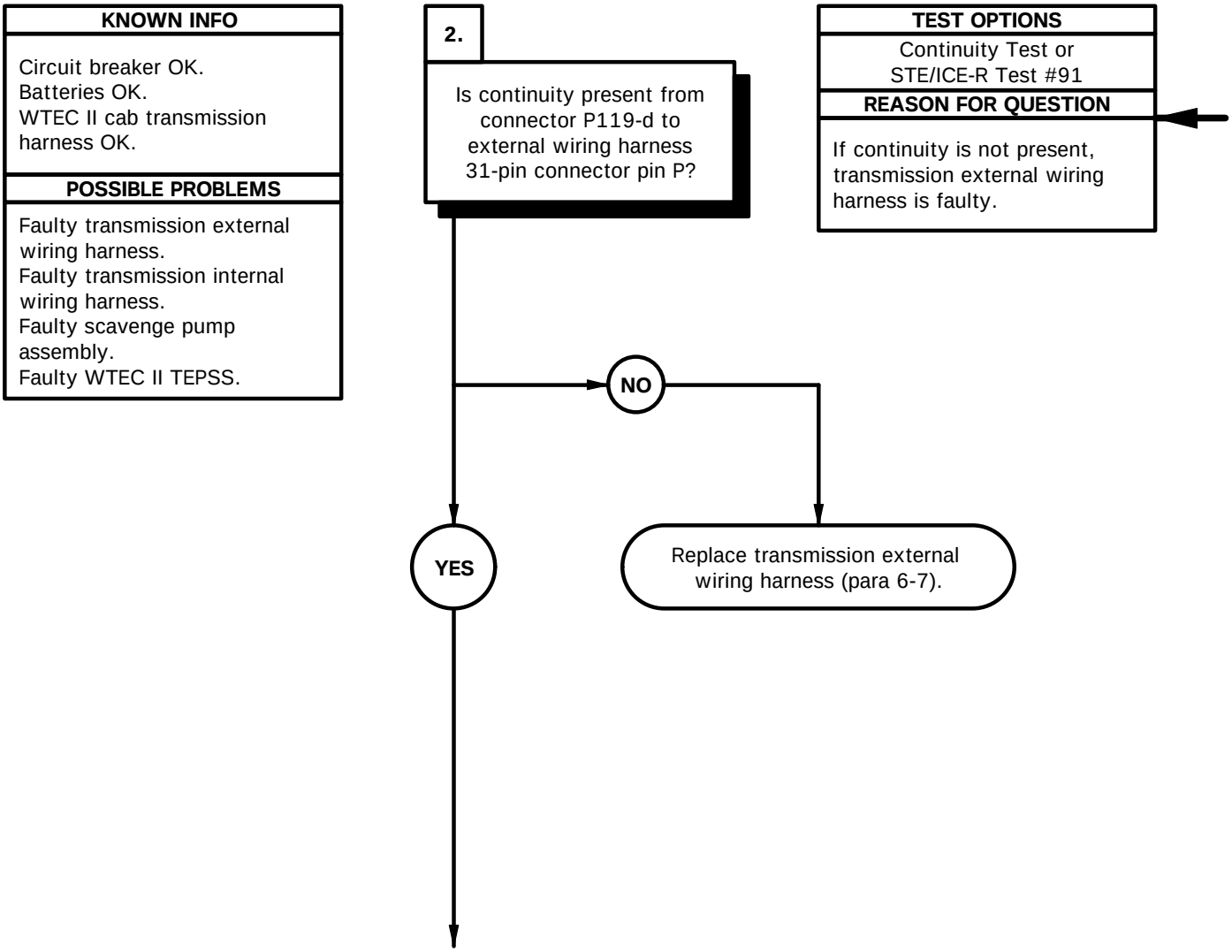
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin connector .
(6) Set multimeter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

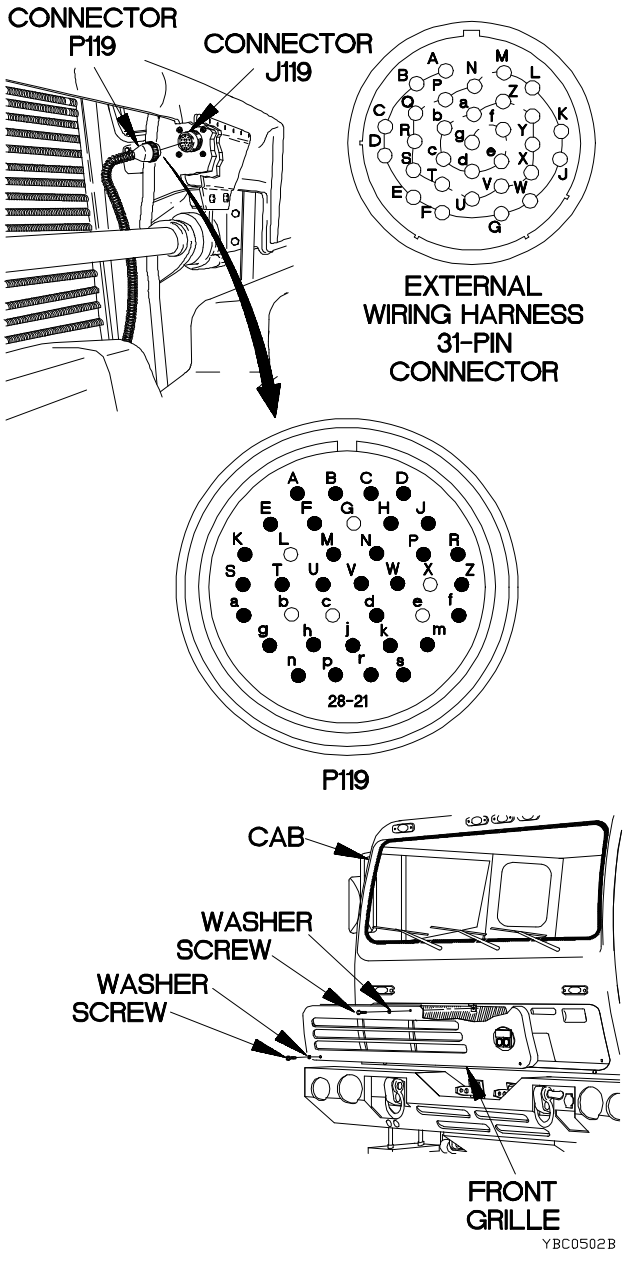


c5. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

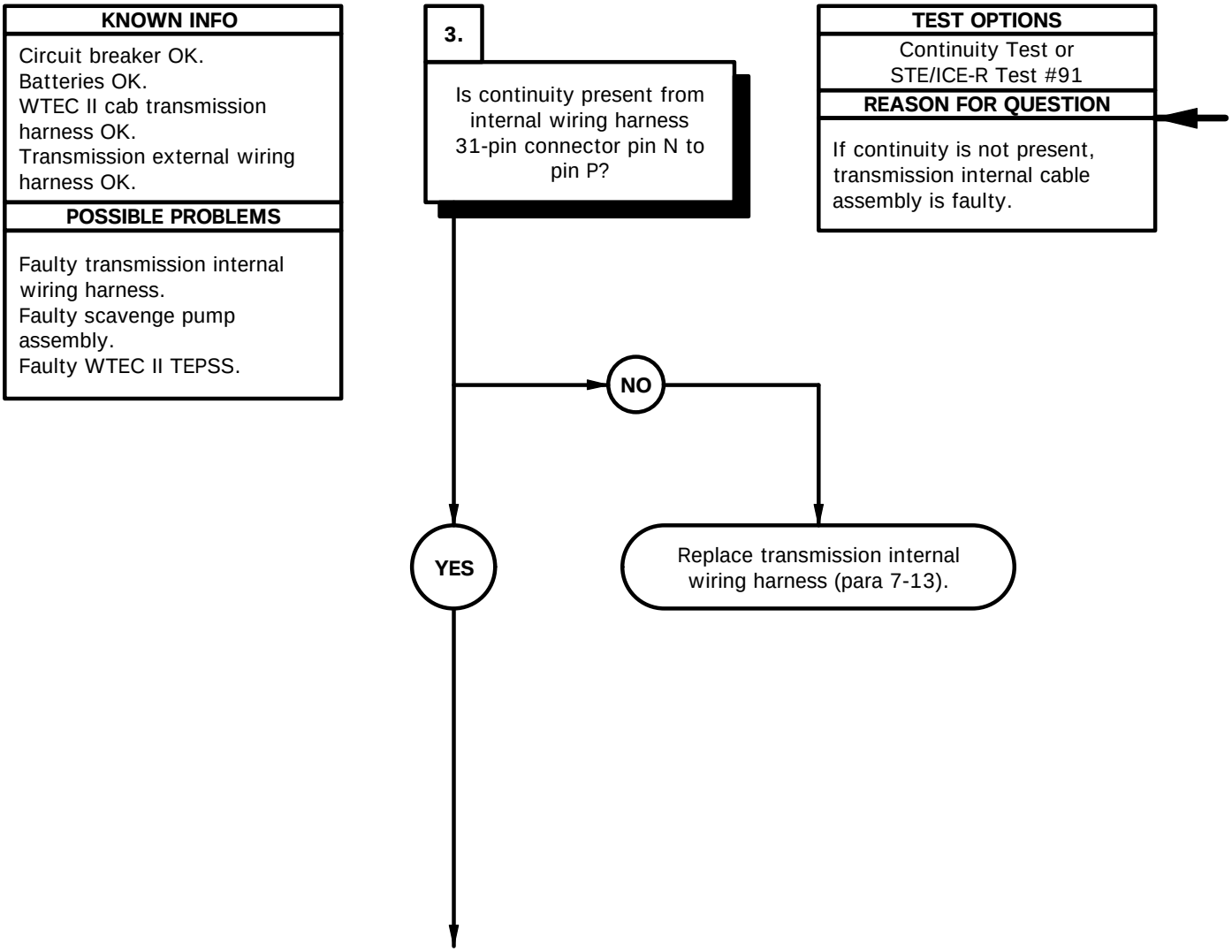


CONTINUITY TEST

(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).

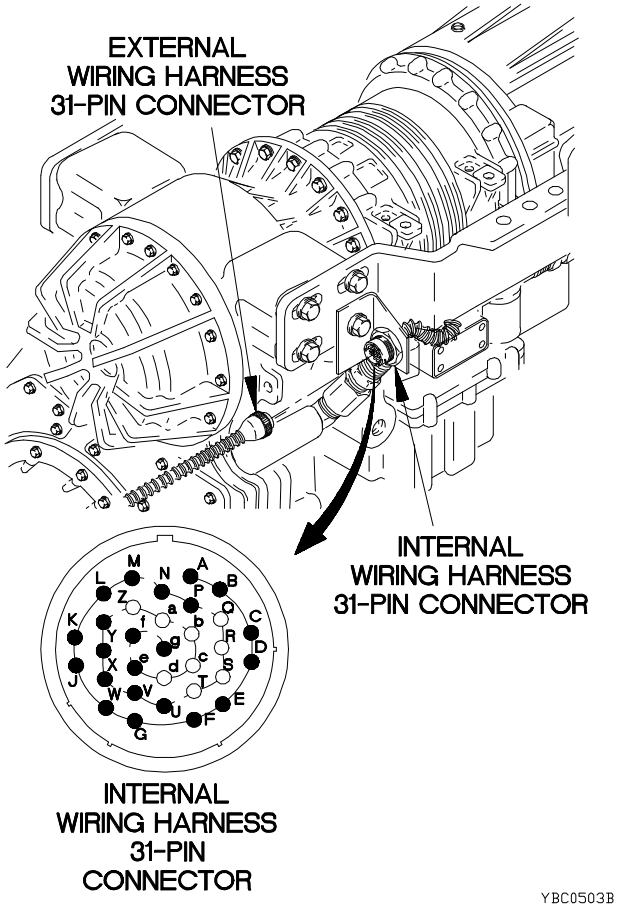


c5. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



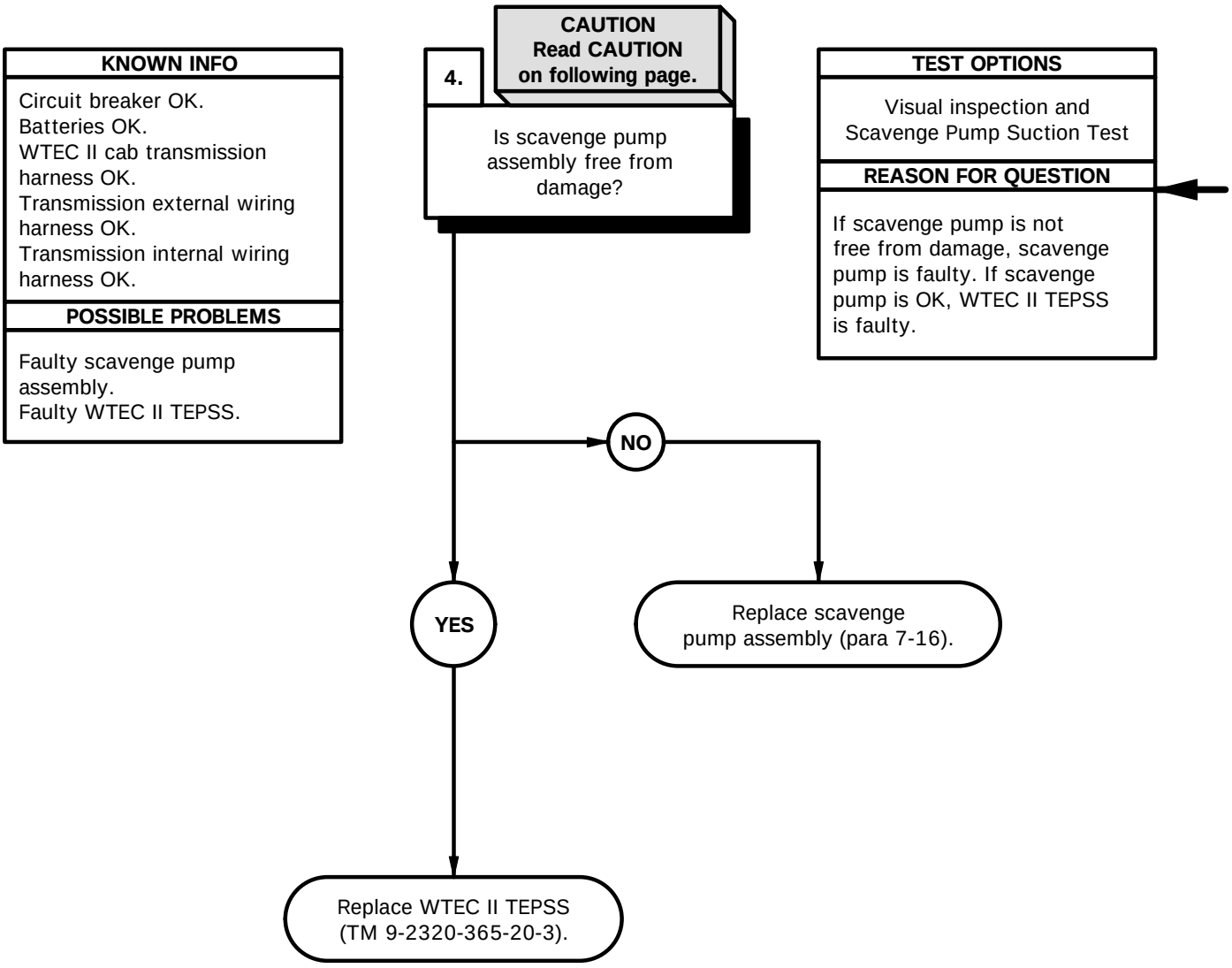
CONTINUITY TEST

(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.



YBC0503B

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



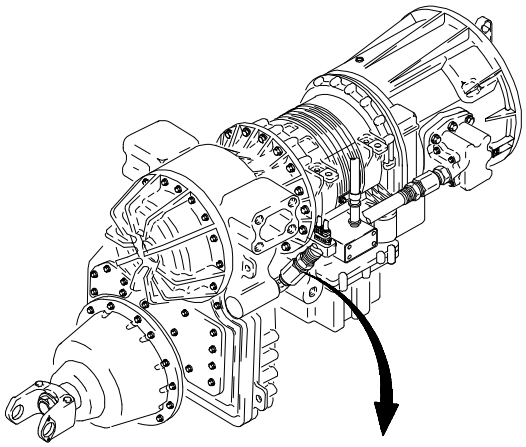
(1) Place drain pan under transfer case.
(2) Disconnect scavenge pump suction hose at transfer case.
(3) Connect batteries (TM 9-2320-365-20-3).
(4) Start engine (TM 9-2320-365-10).
(5) If oil drips or runs from fitting on transfer case, replace scavenge pump assembly (para 7-16).
(6) Shut down engine (TM 9-2320-365-10).

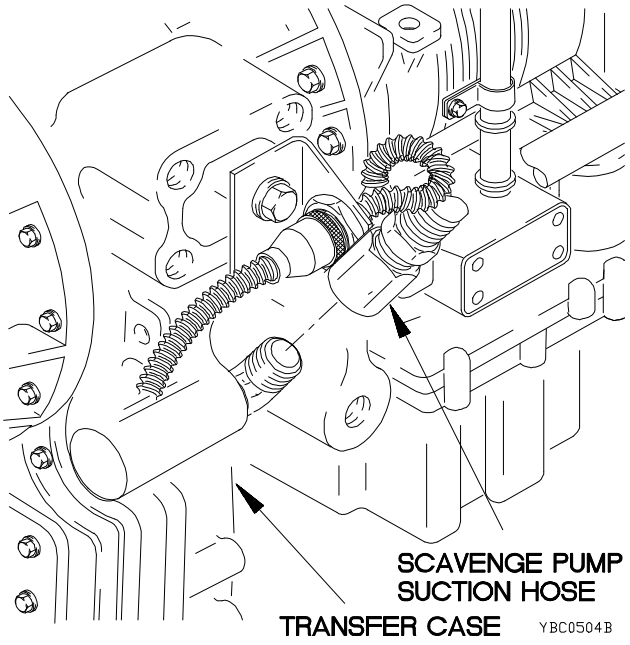
CAUTION

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 9-2320-365-10).
(3) Select neutral on WTEC II TEPSS (TM 9-2320-365-10) 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 9-2320-365-10).
(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

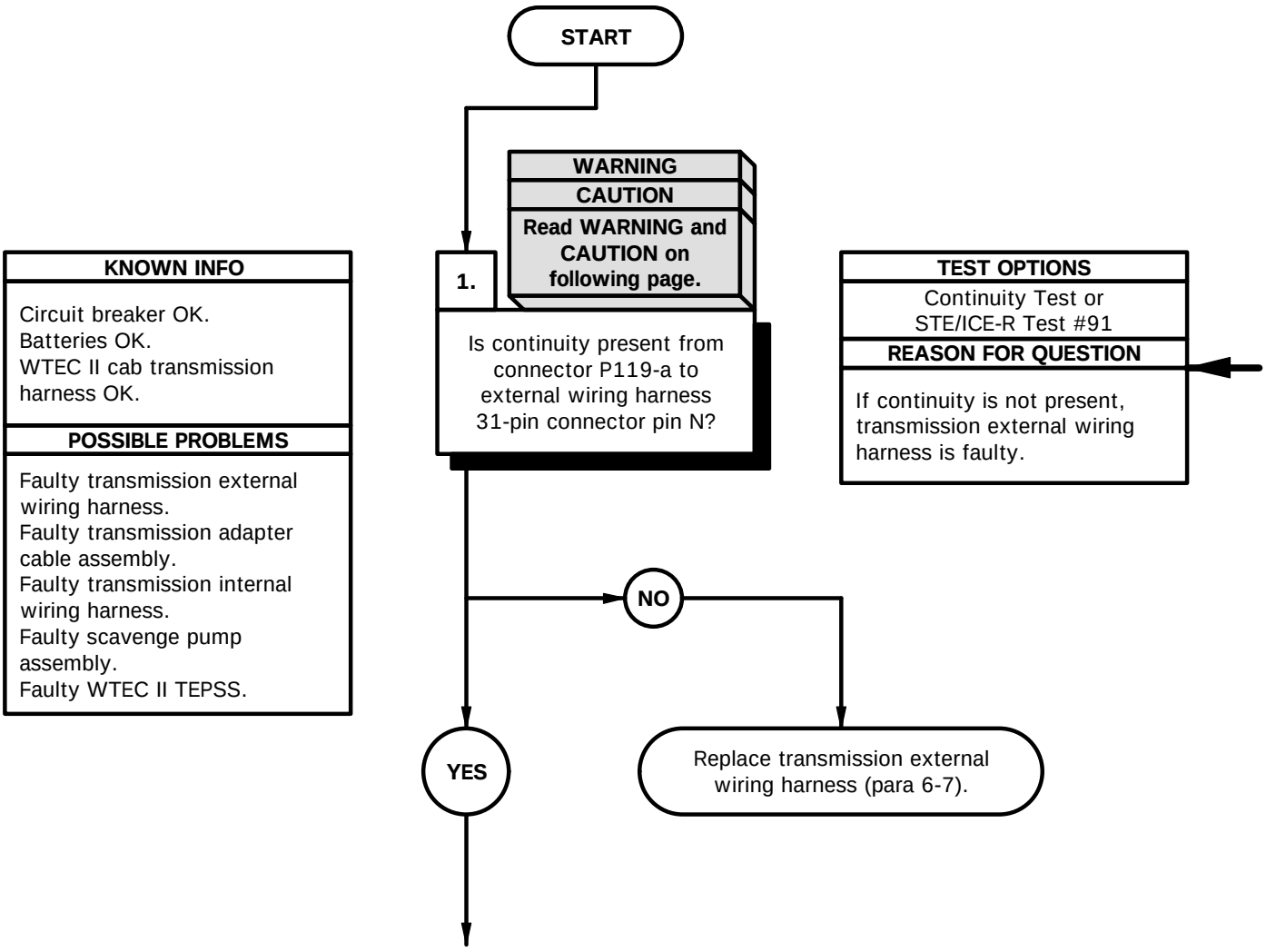
Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)
Pan, Drain (Item 36, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

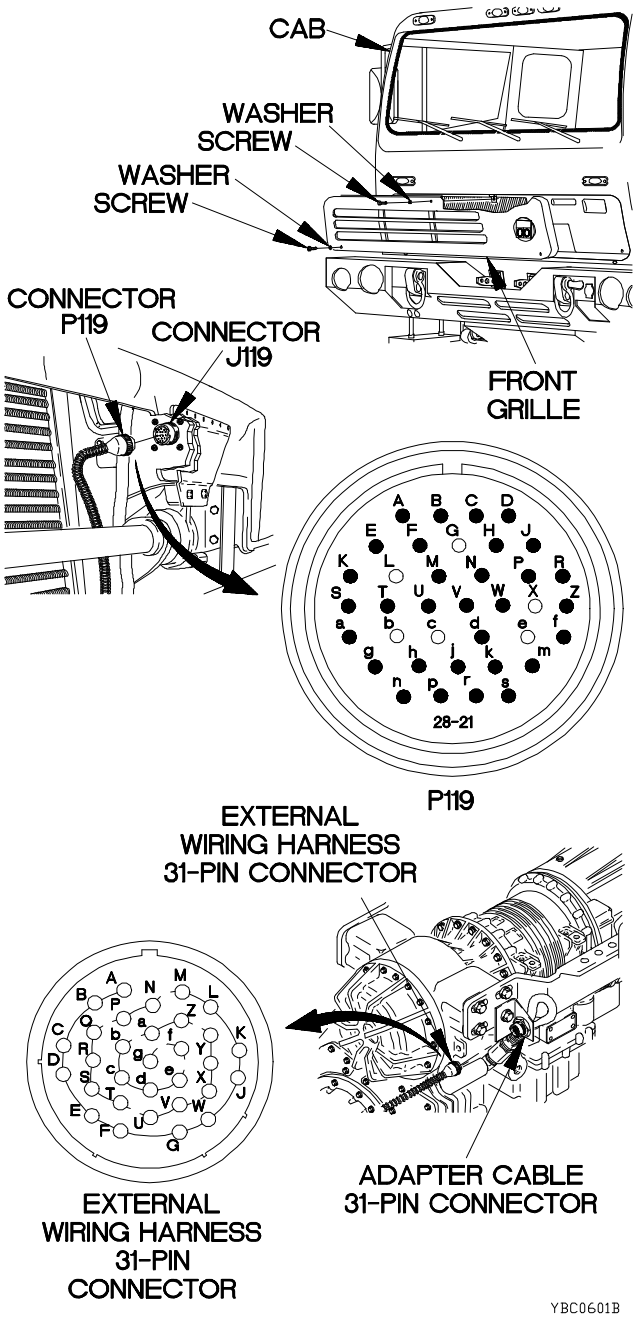
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

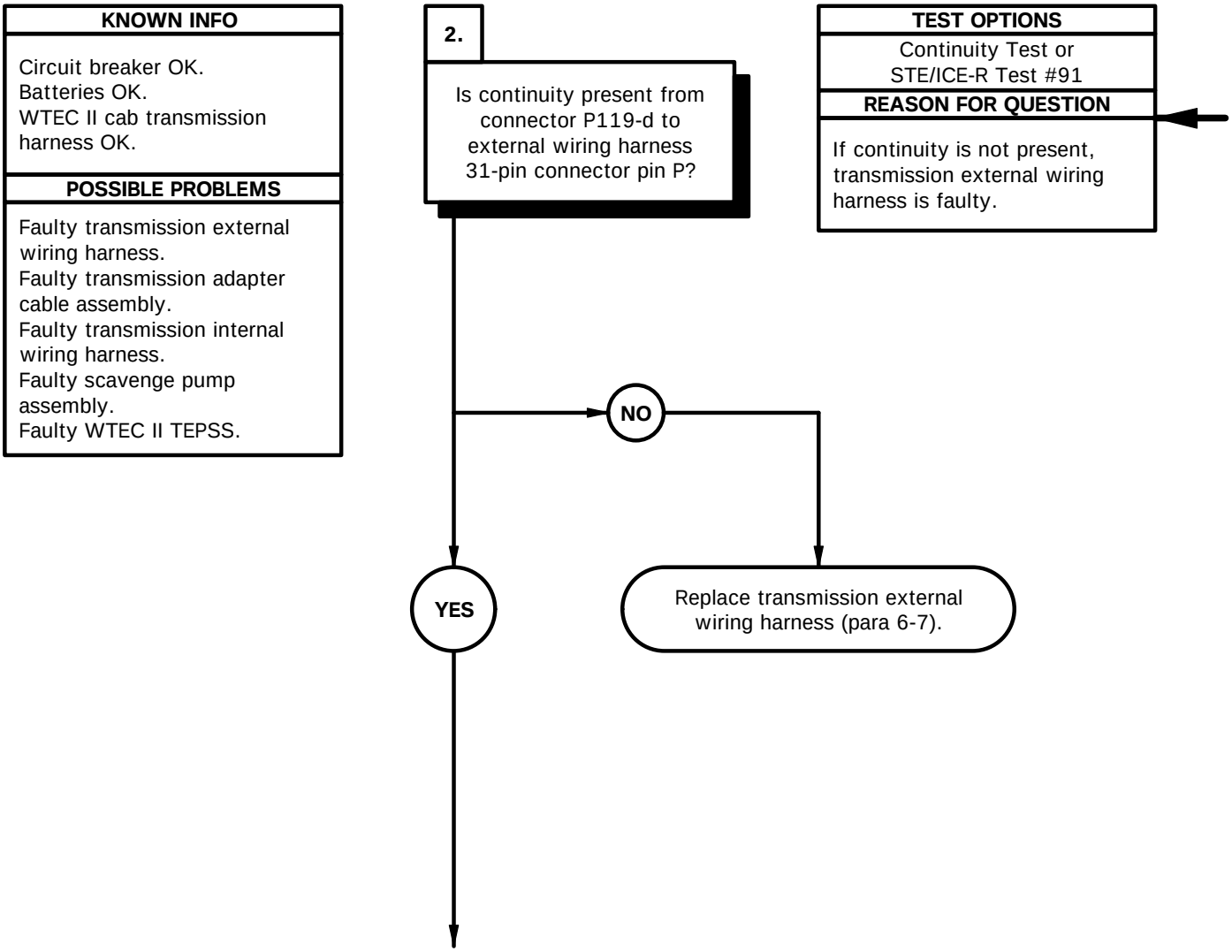
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from adaptor cable 31-pin connector.
(6) Set multimeter to ohms.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

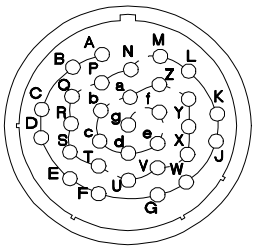


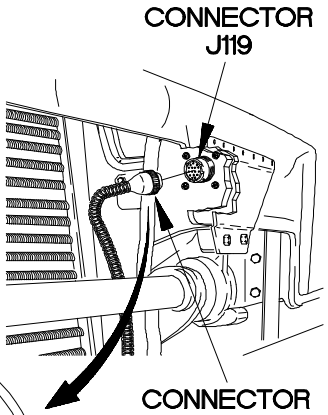
c6. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

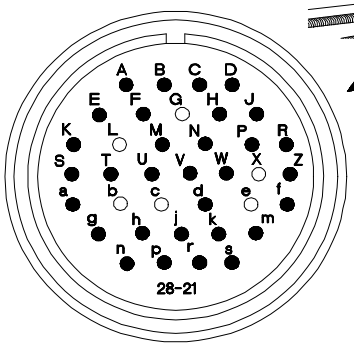


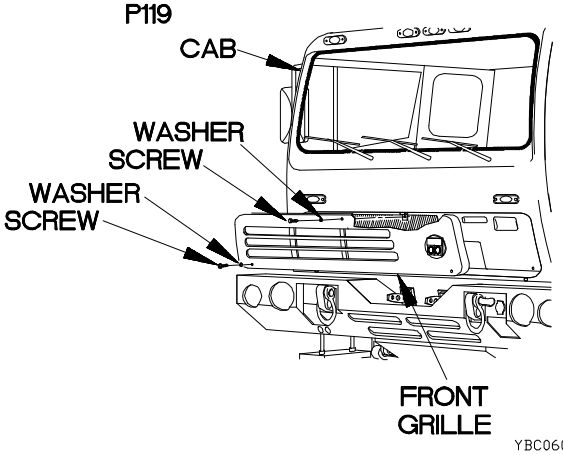
CONTINUITY TEST

(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).

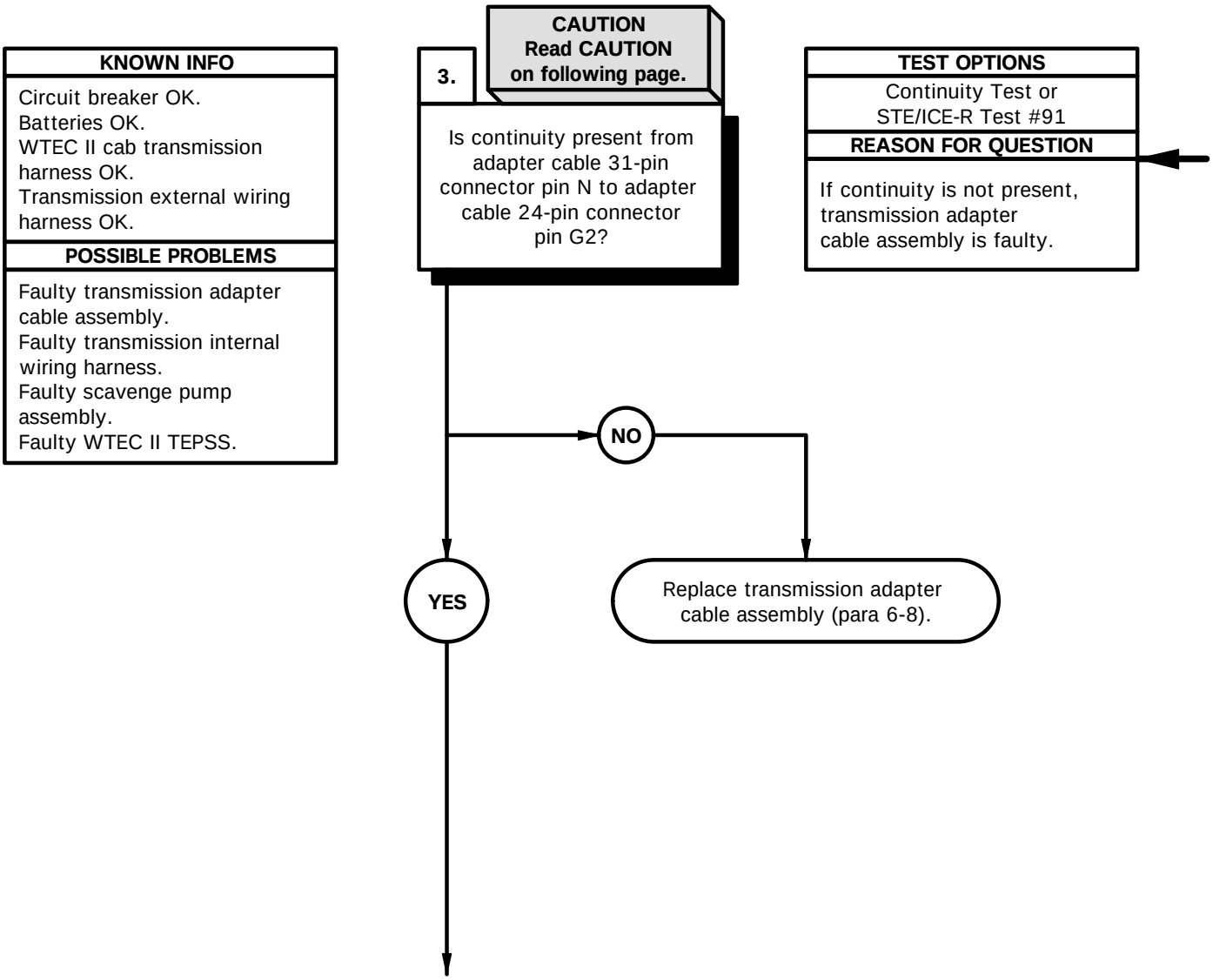








c6. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

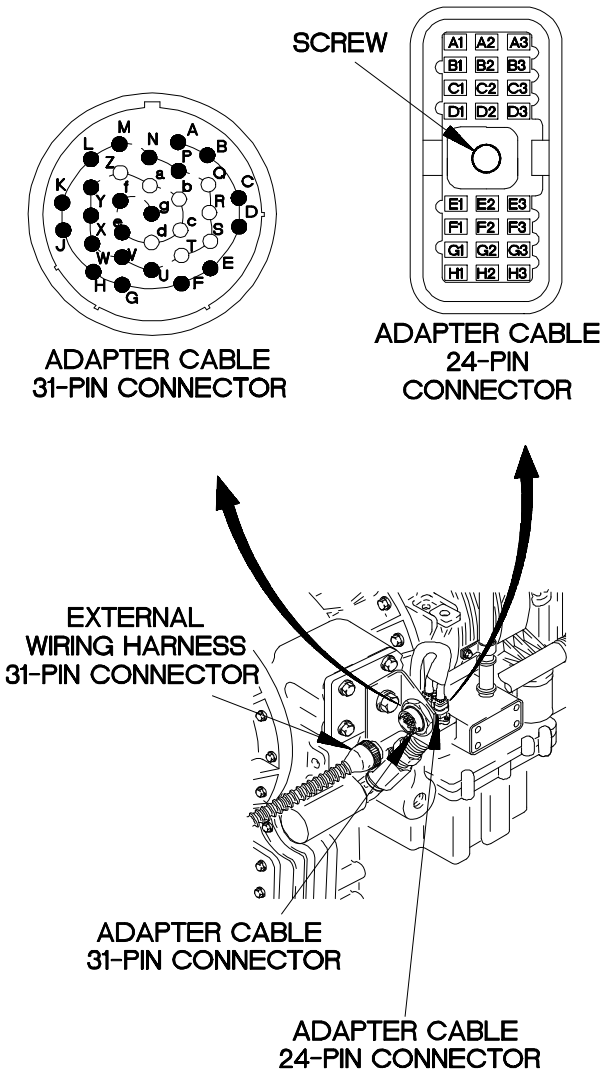


CAUTION

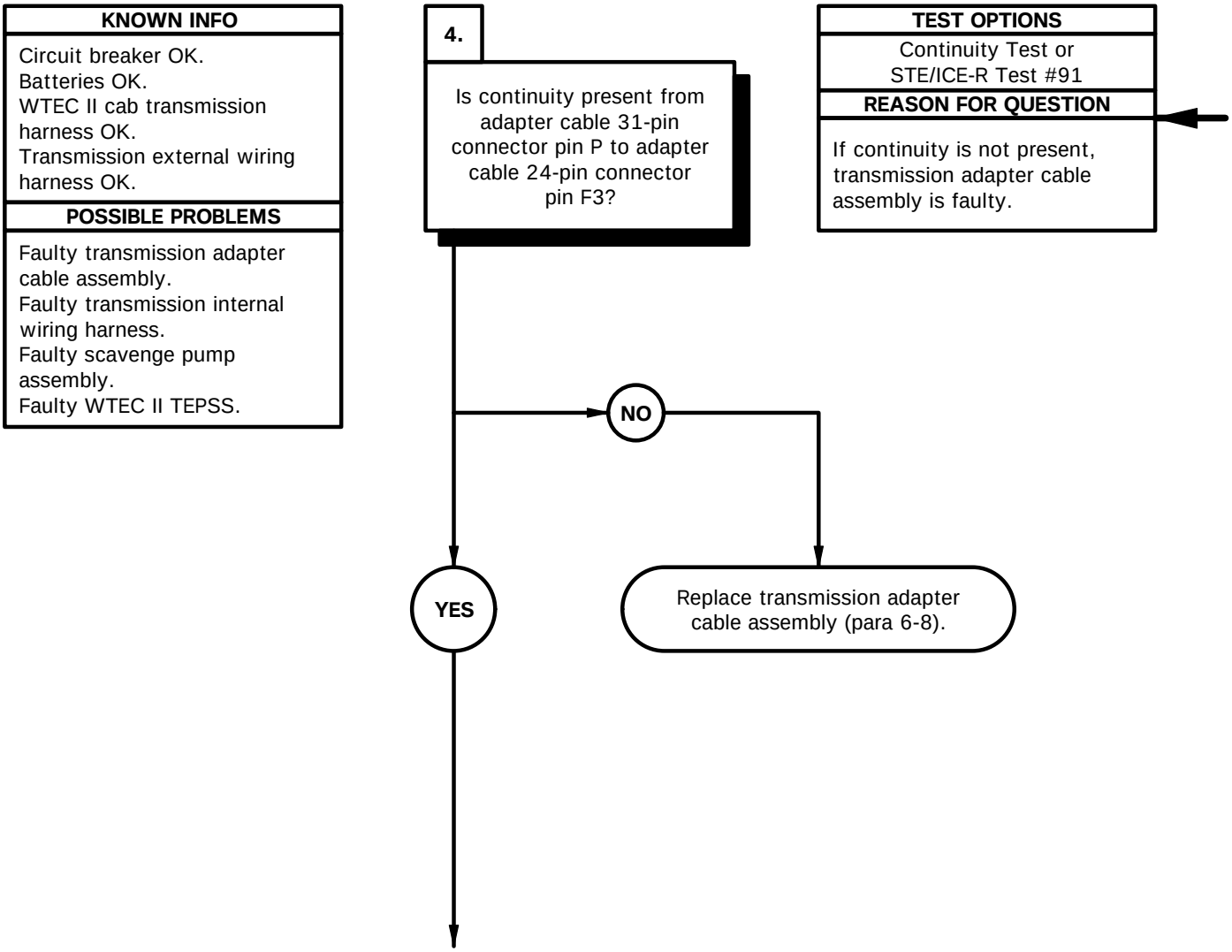
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

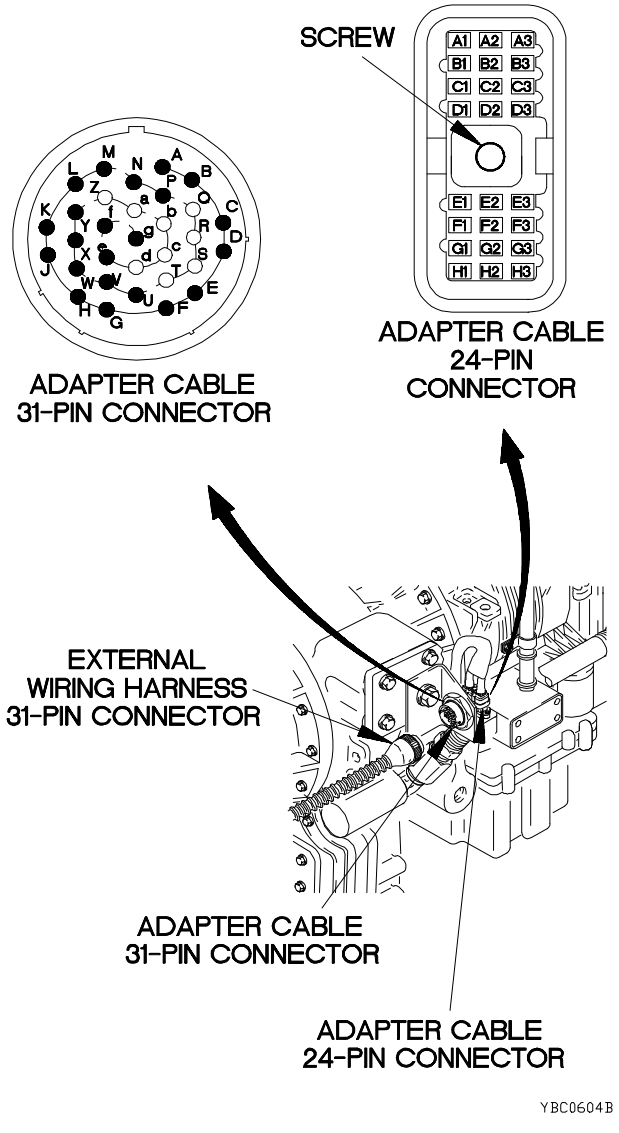


c6. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

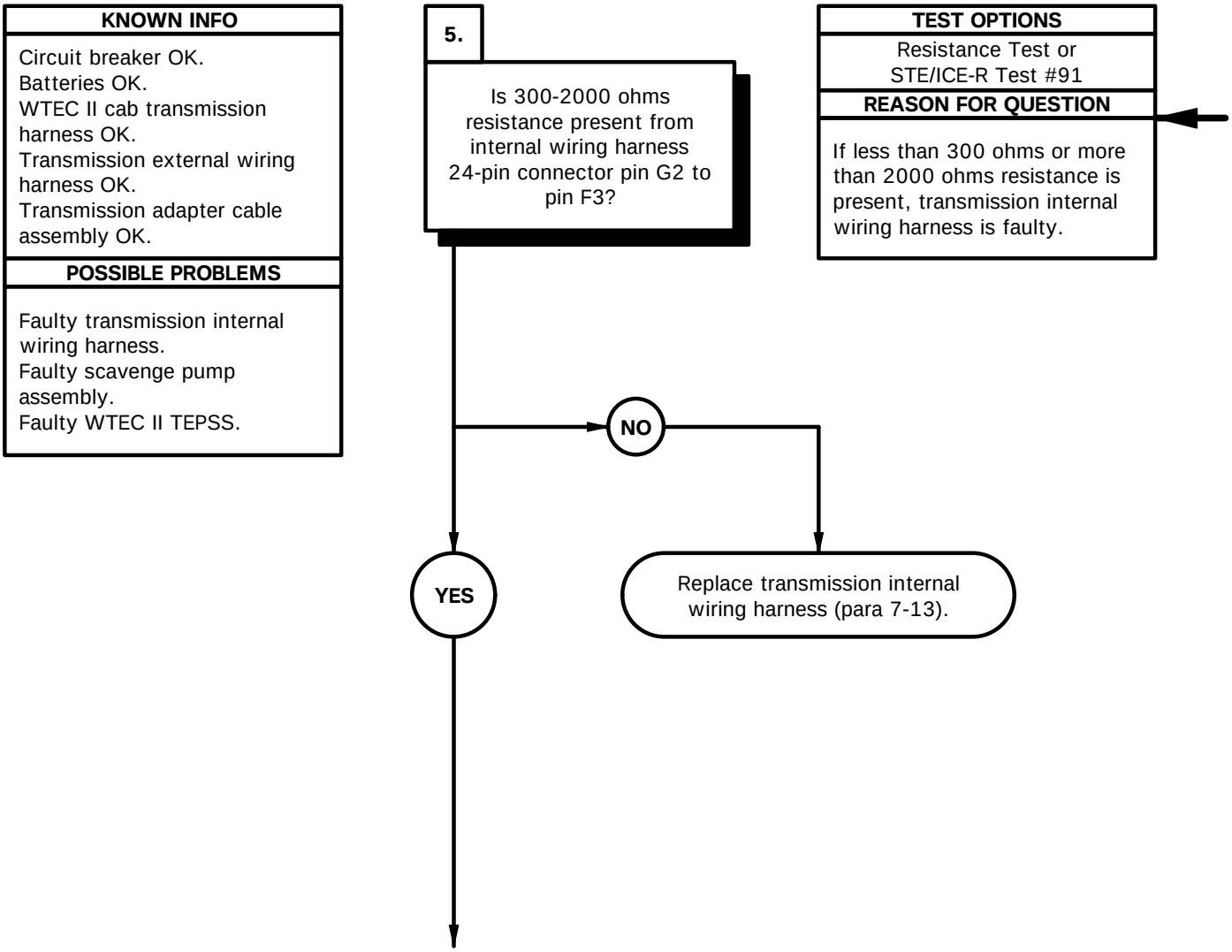


CONTINUITY TEST

(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.

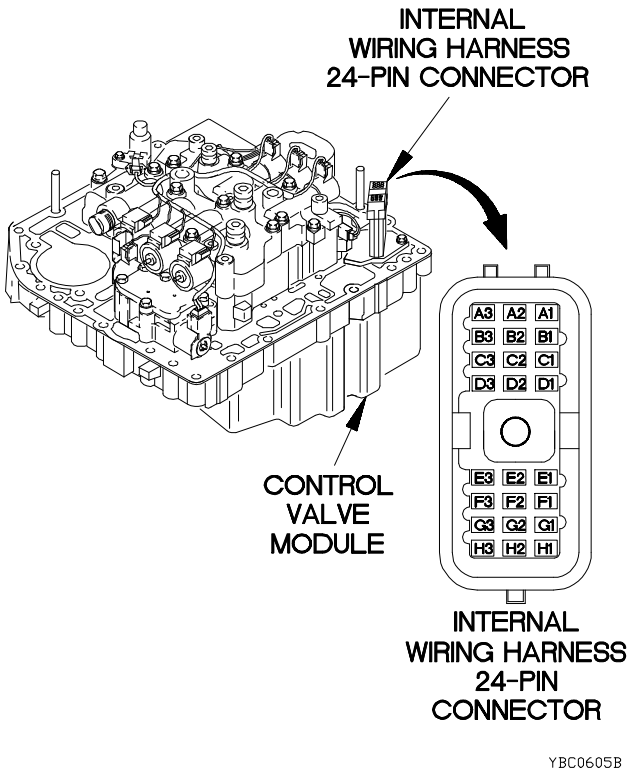


c6. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

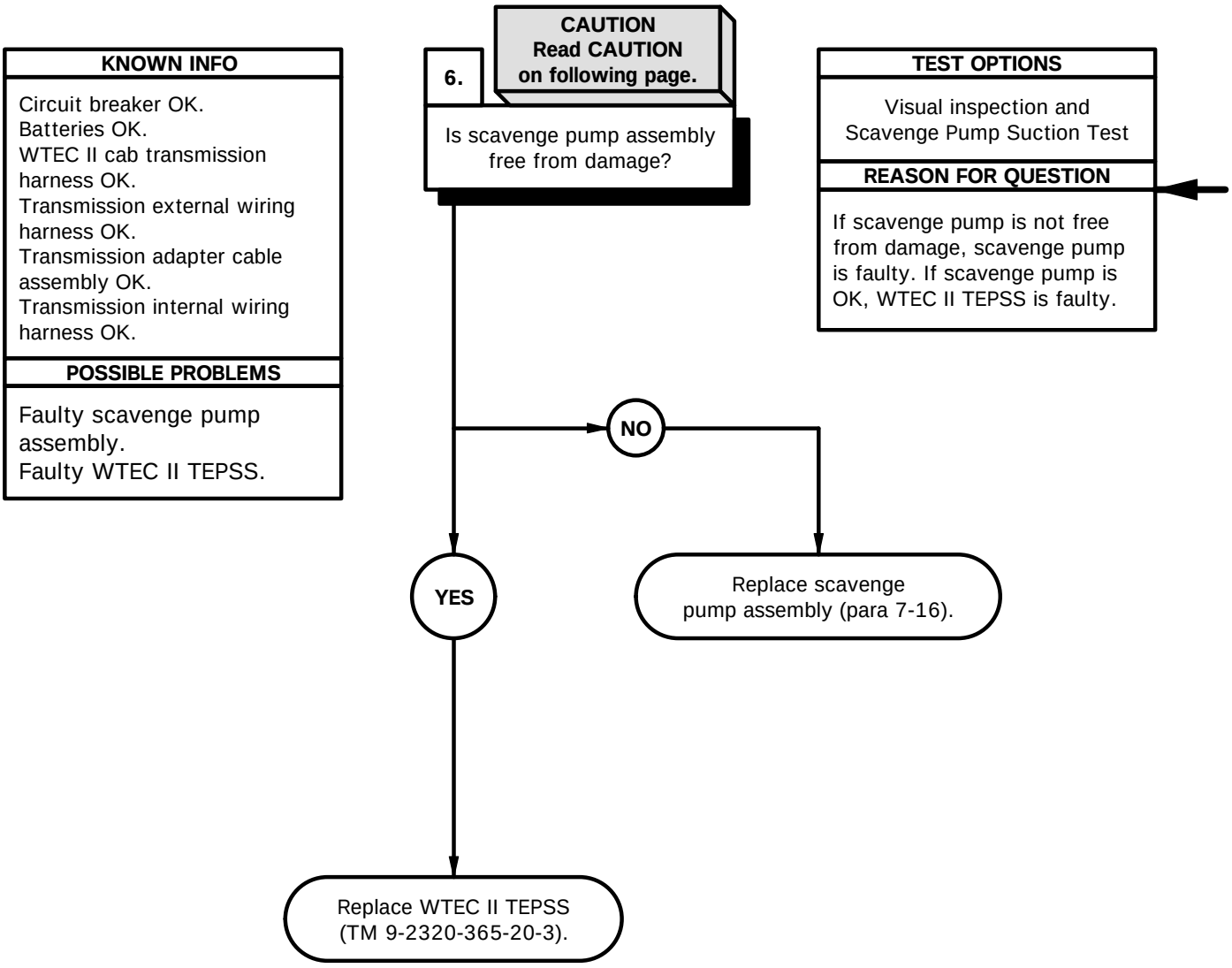


RESISTANCE TEST

(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)



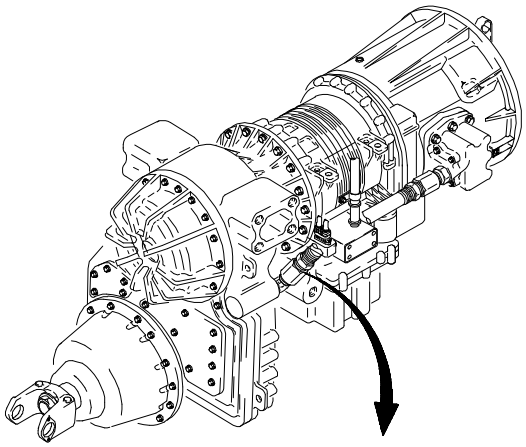
(1) Place drain pan under transfer case.
(2) Disconnect scavenge pump suction hose at transfer case.
(3) Connect batteries (TM 9-2320-365-20-3).
(4) Start engine (TM 9-2320-365-10).
(5) If oil drips or runs from fitting on transfer case, replace scavenge pump assembly (para 7-16).
(6) Shut down engine (TM 9-2320-365-10).

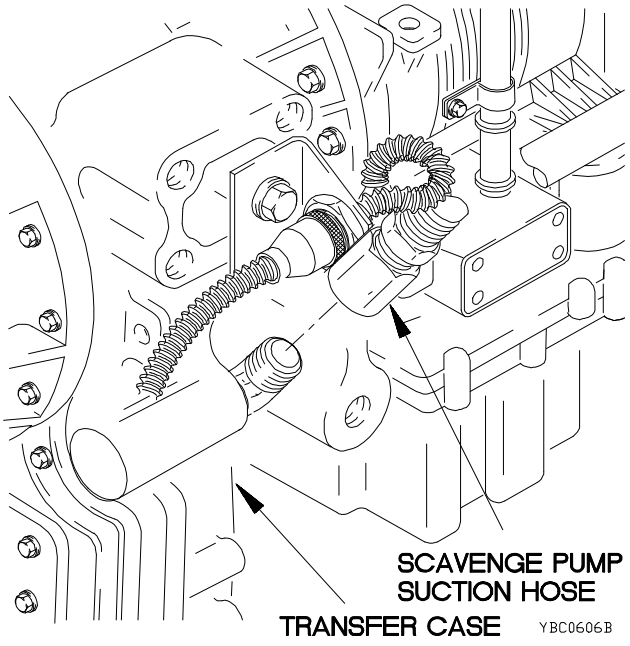
CAUTION

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 9-2320-365-10).
(3) Select neutral on WTEC II TEPSS (TM 9-2320-365-10) 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 9-2320-365-10).
(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 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)
Pan, Drain (Item 36, Appendix B)

Materials/Parts
Wire, Elect, 50 ft (Item 94, Appendix C)

Personnel Required
(2)

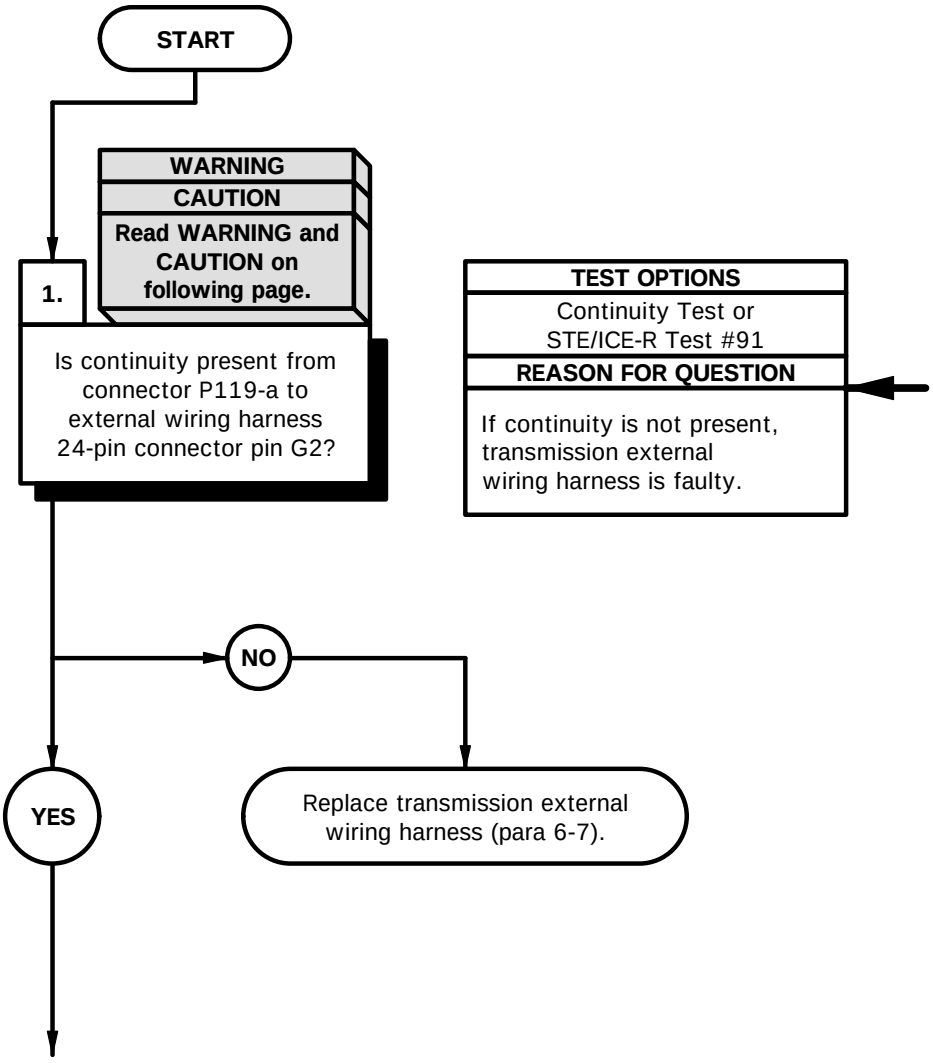
References
TM 9-4910-571-12&P

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 scavenge pump assembly.
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

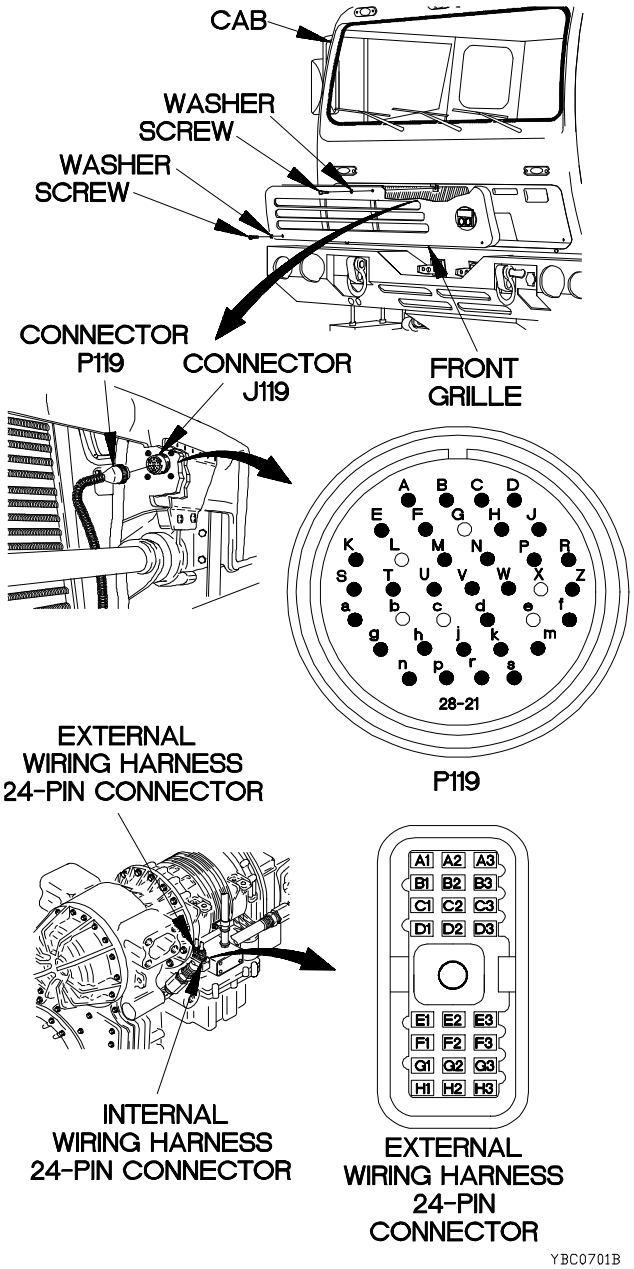
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

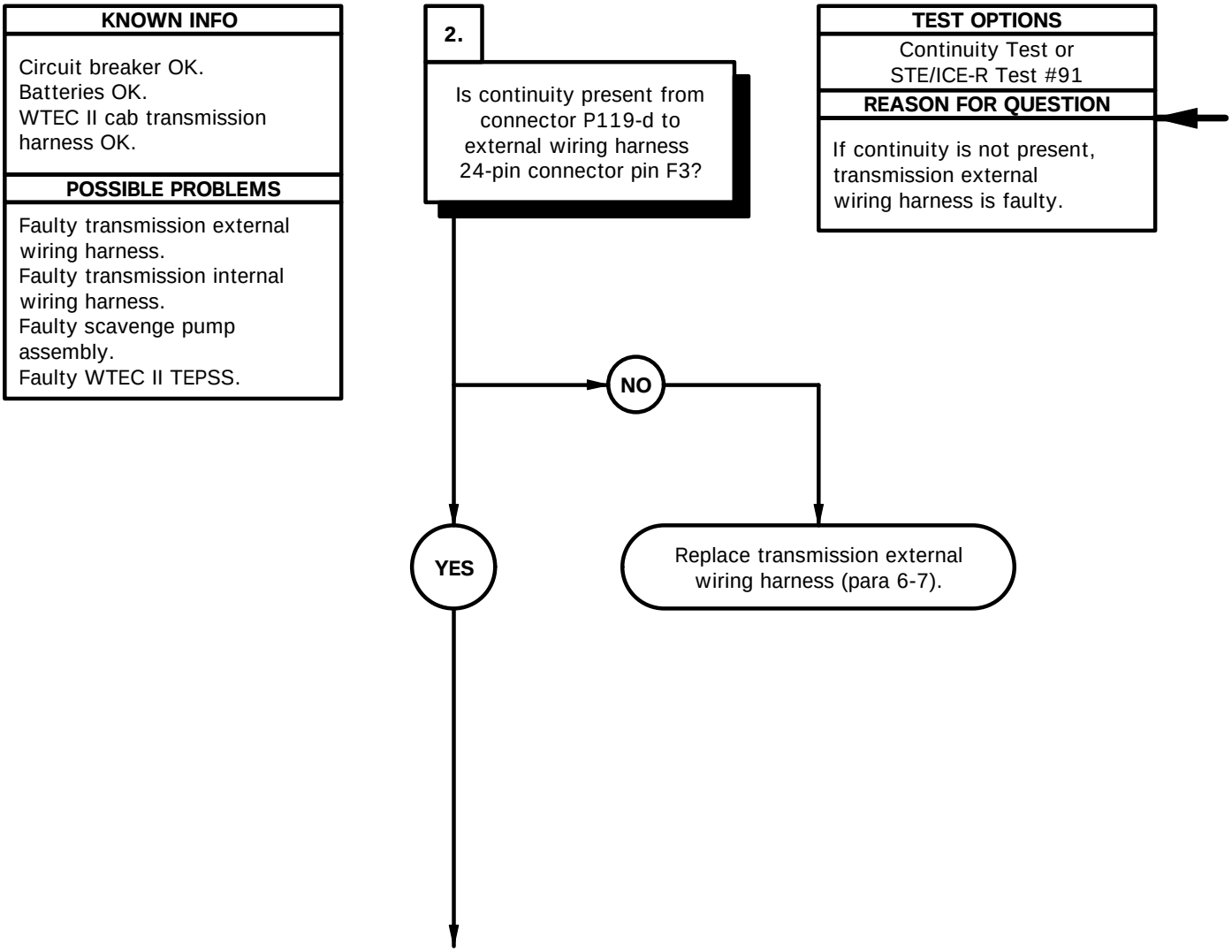
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 24-pin connector from internal wiring harness 24-pin connector.
(6) Set multimeter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

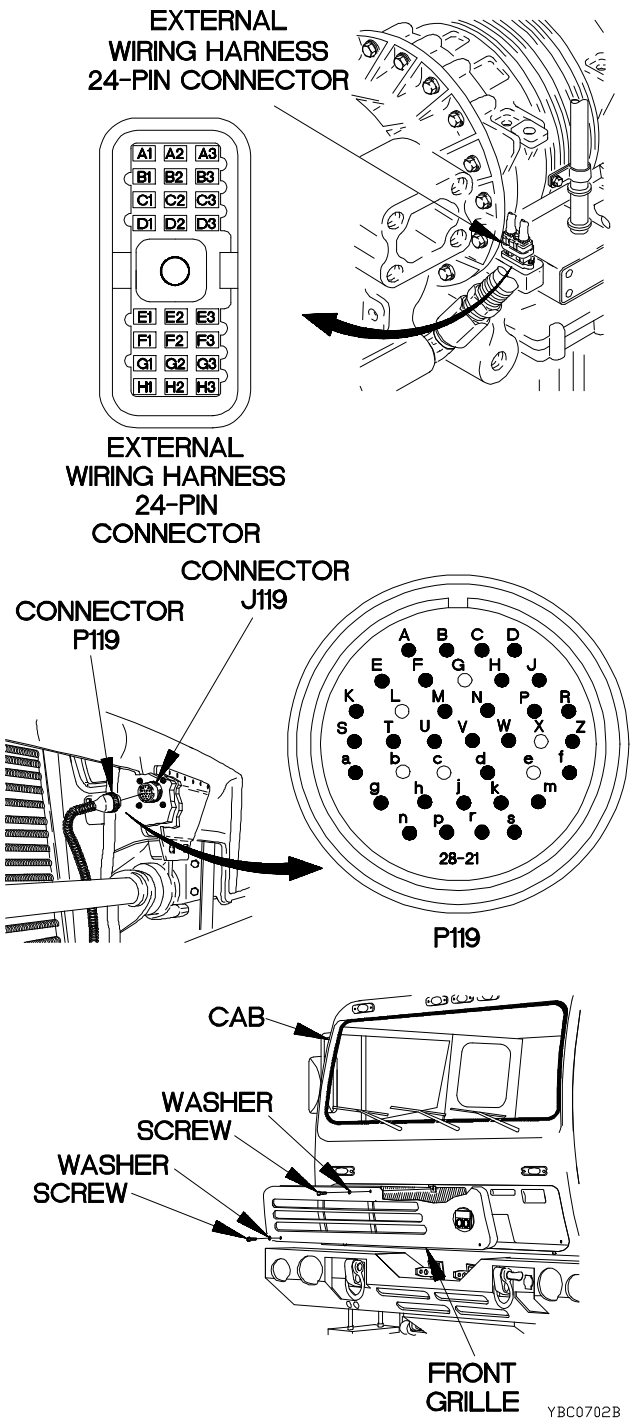


c7. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

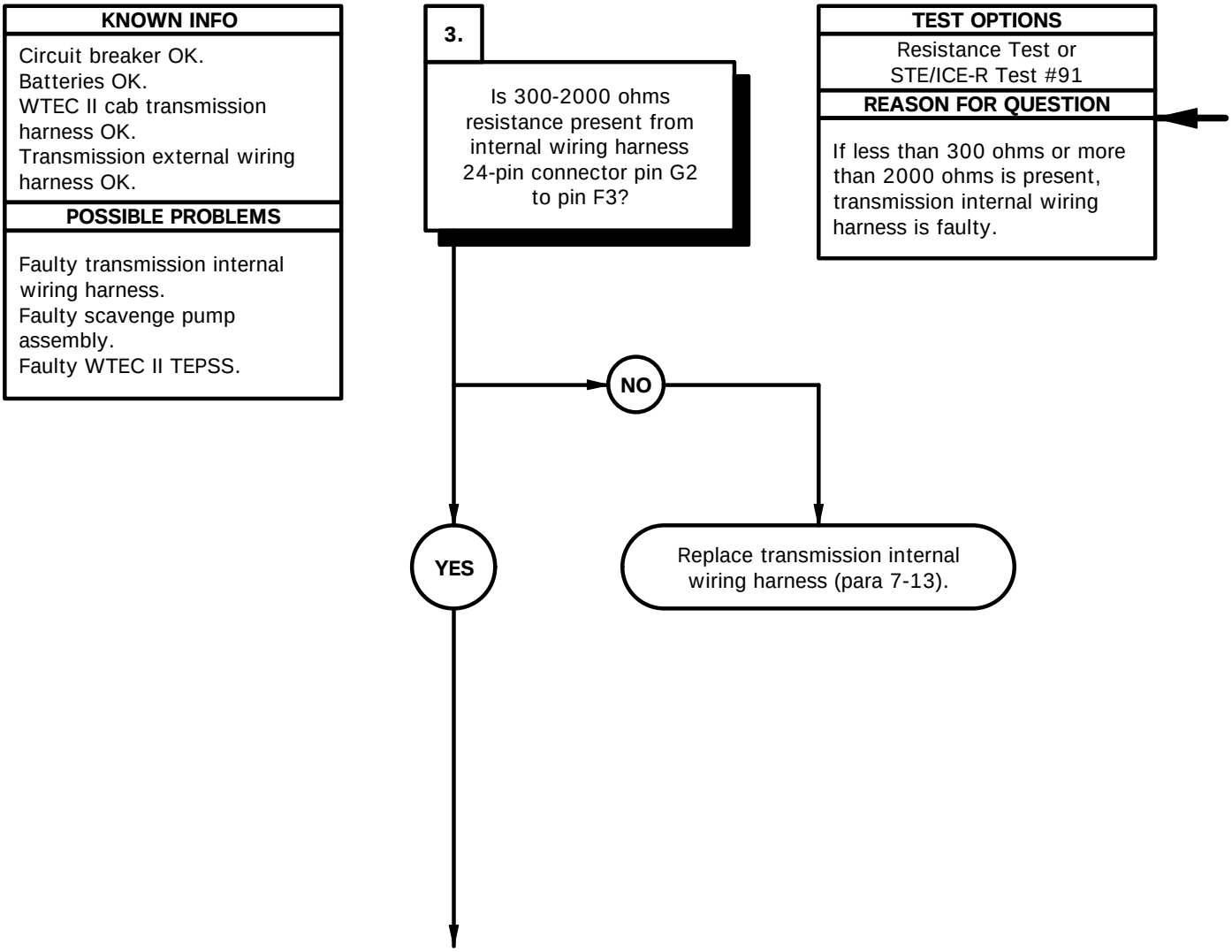


CONTINUITY TEST

(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).

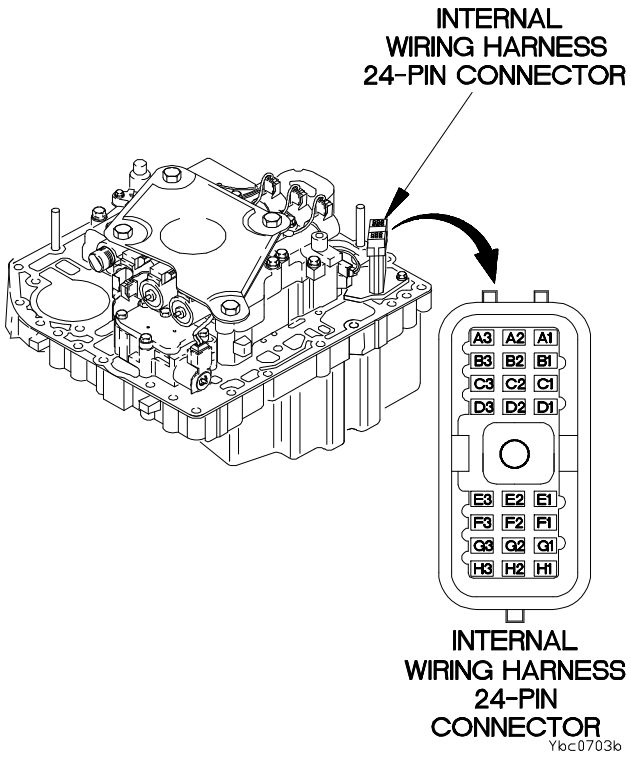


c7. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

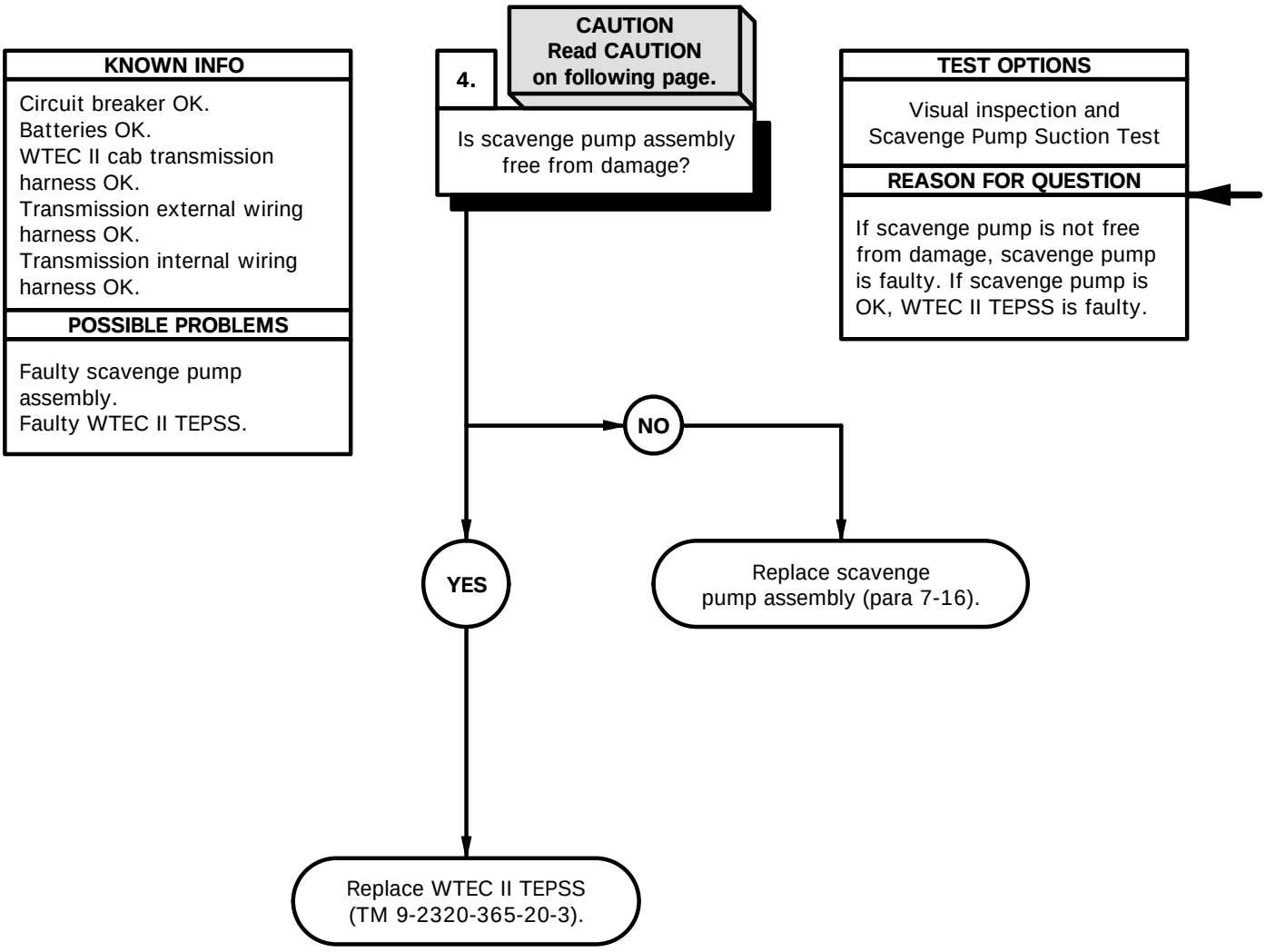


RESISTANCE TEST

(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)



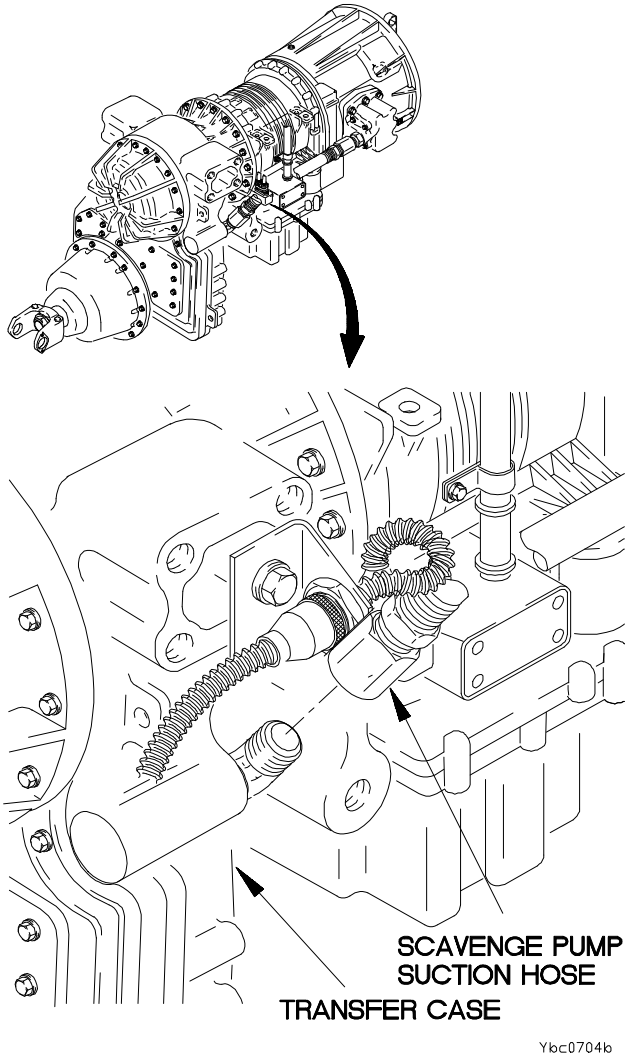
(1) Place drain pan under transfer case.
(2) Disconnect scavenge pump suction hose at transfer case.
(3) Connect batteries (TM 9-2320-365-20-3).
(4) Start engine (TM 9-2320-365-10).
(5) If oil drips or runs from fitting on transfer case, replace scavenge pump assembly (para 7-16).
(6) Shut down engine (TM 9-2320-365-10).

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 9-2320-365-10).
(3) Select neutral on WTEC II TEPSS (TM 9-2320-365-10) 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 9-2320-365-10).
(6) Connect scavenge pump suction hose to transfer case.
(7) Remove drain pan.



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

INITIAL SETUP

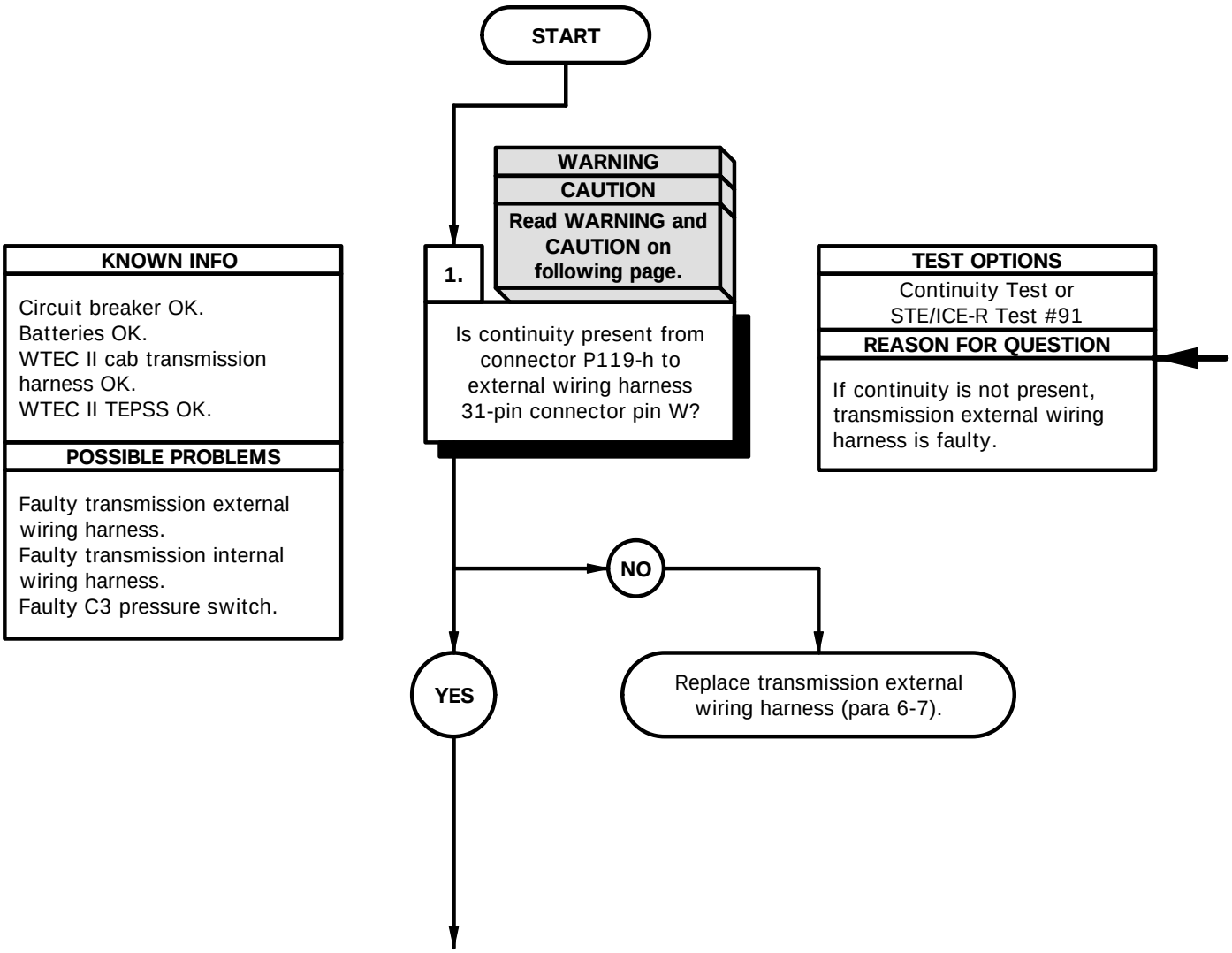
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

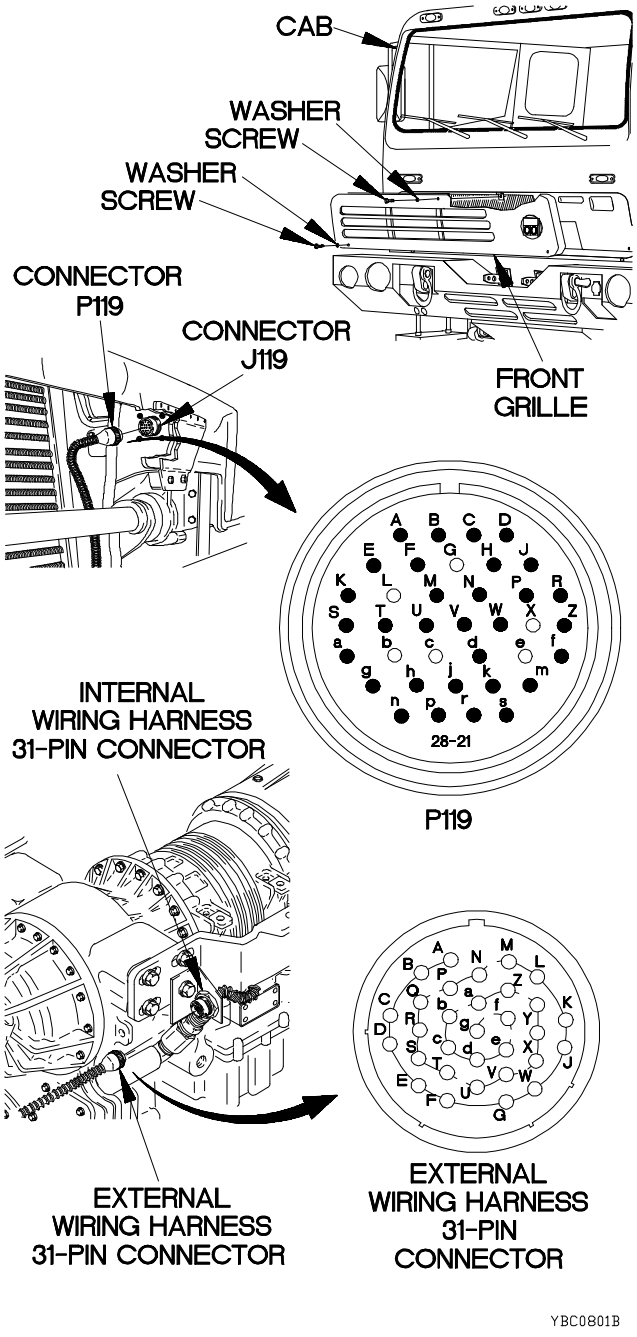
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

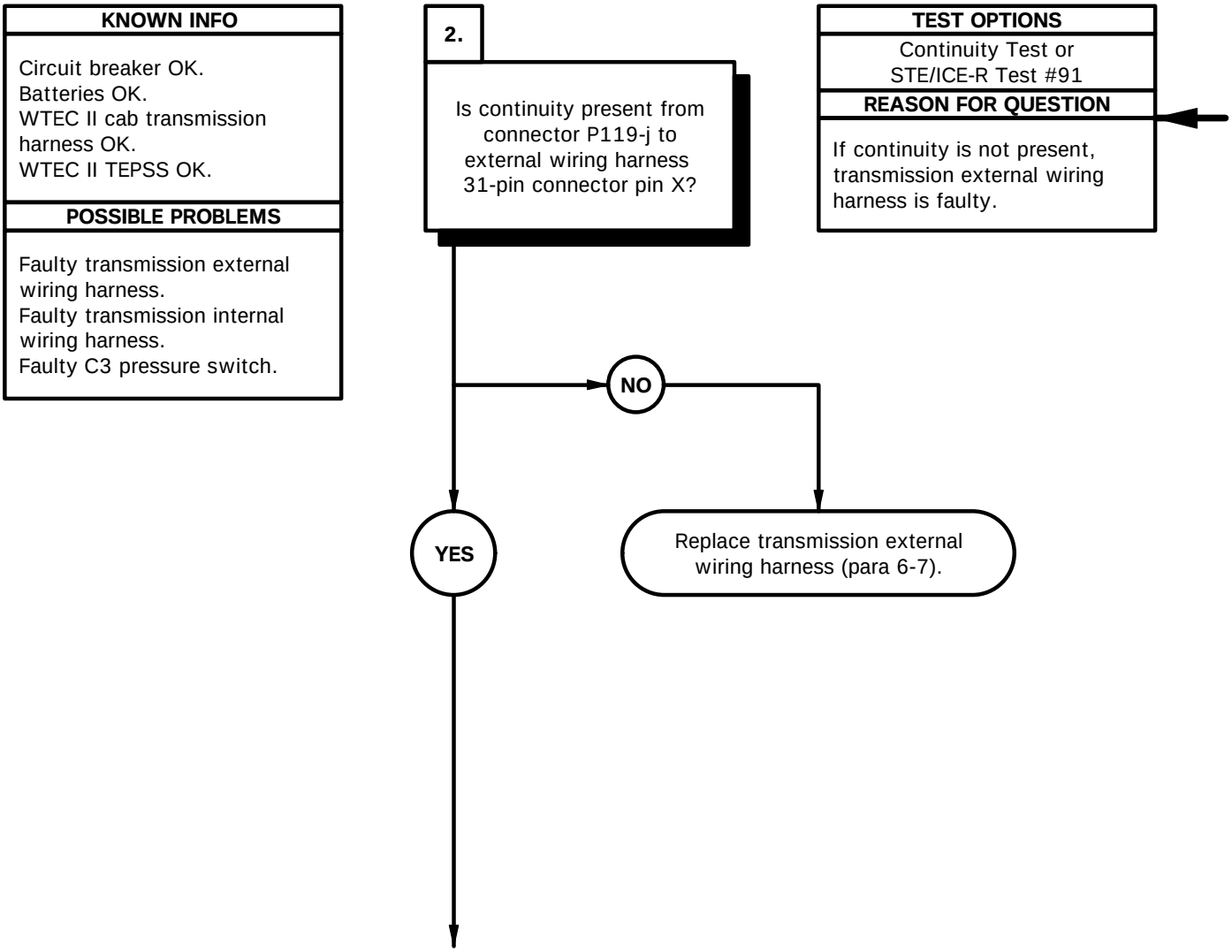
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin connector.
(6) Set multimeter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

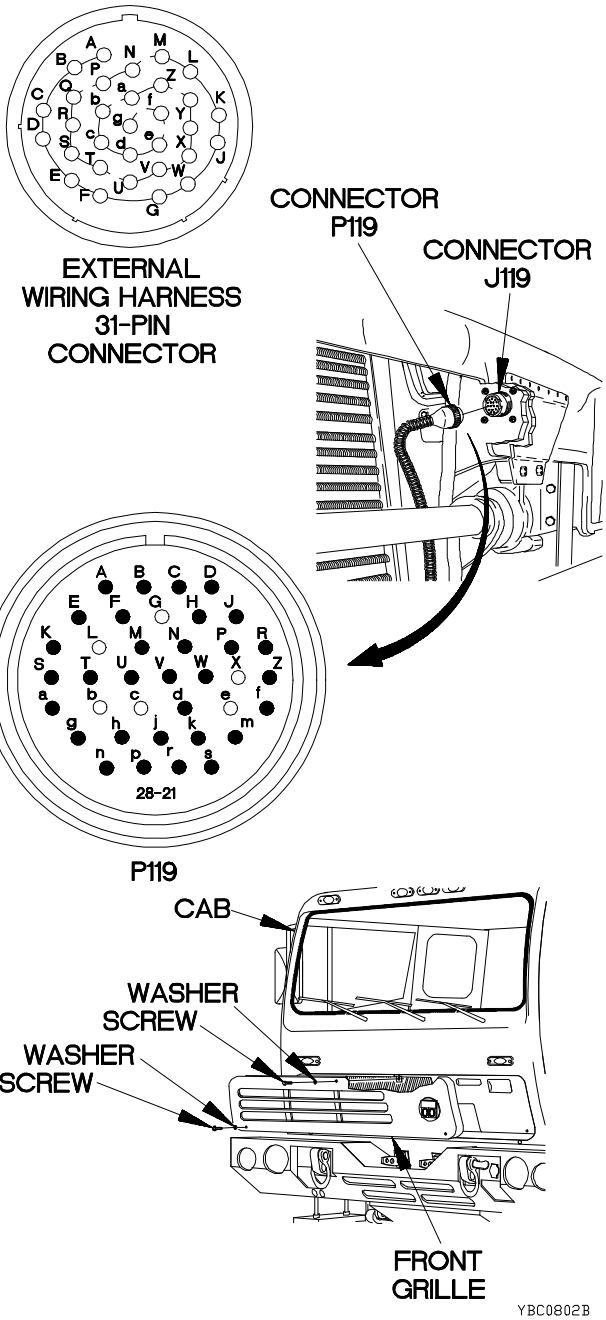


c8. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

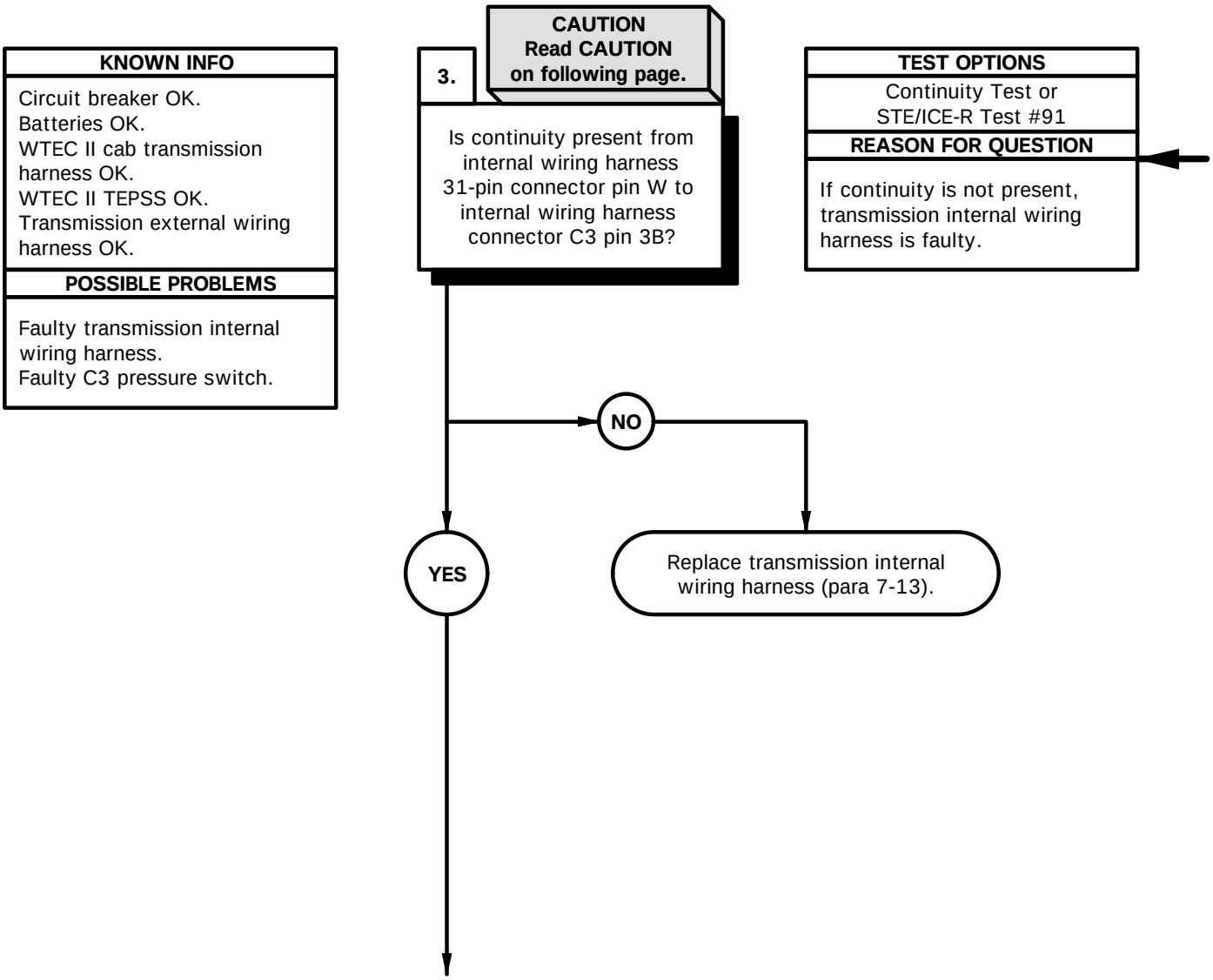


CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P119-j.
(3) Connect negative (-) probe of multimeter to 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 ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

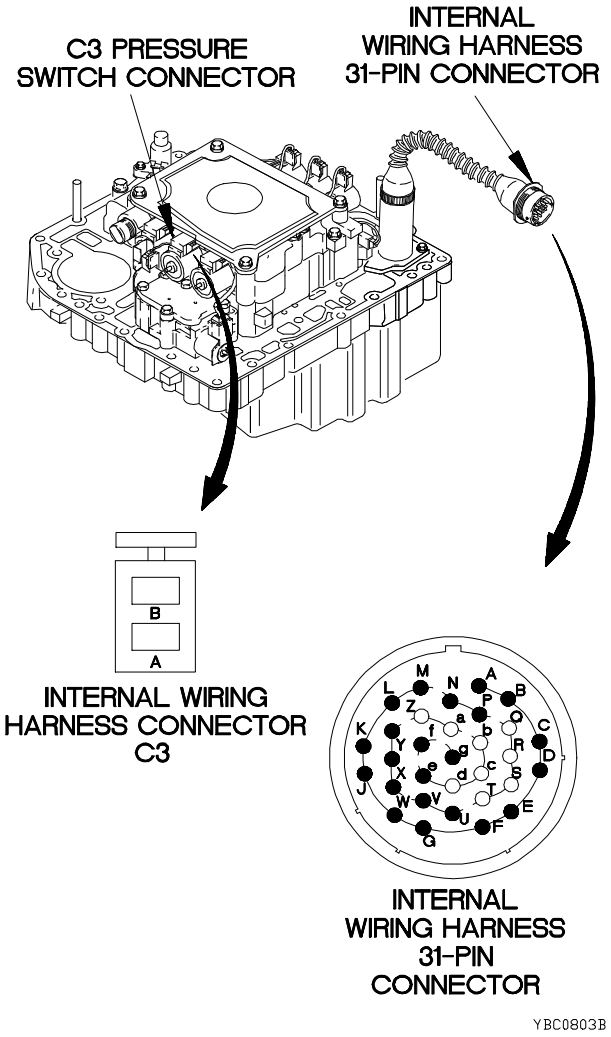


CAUTION

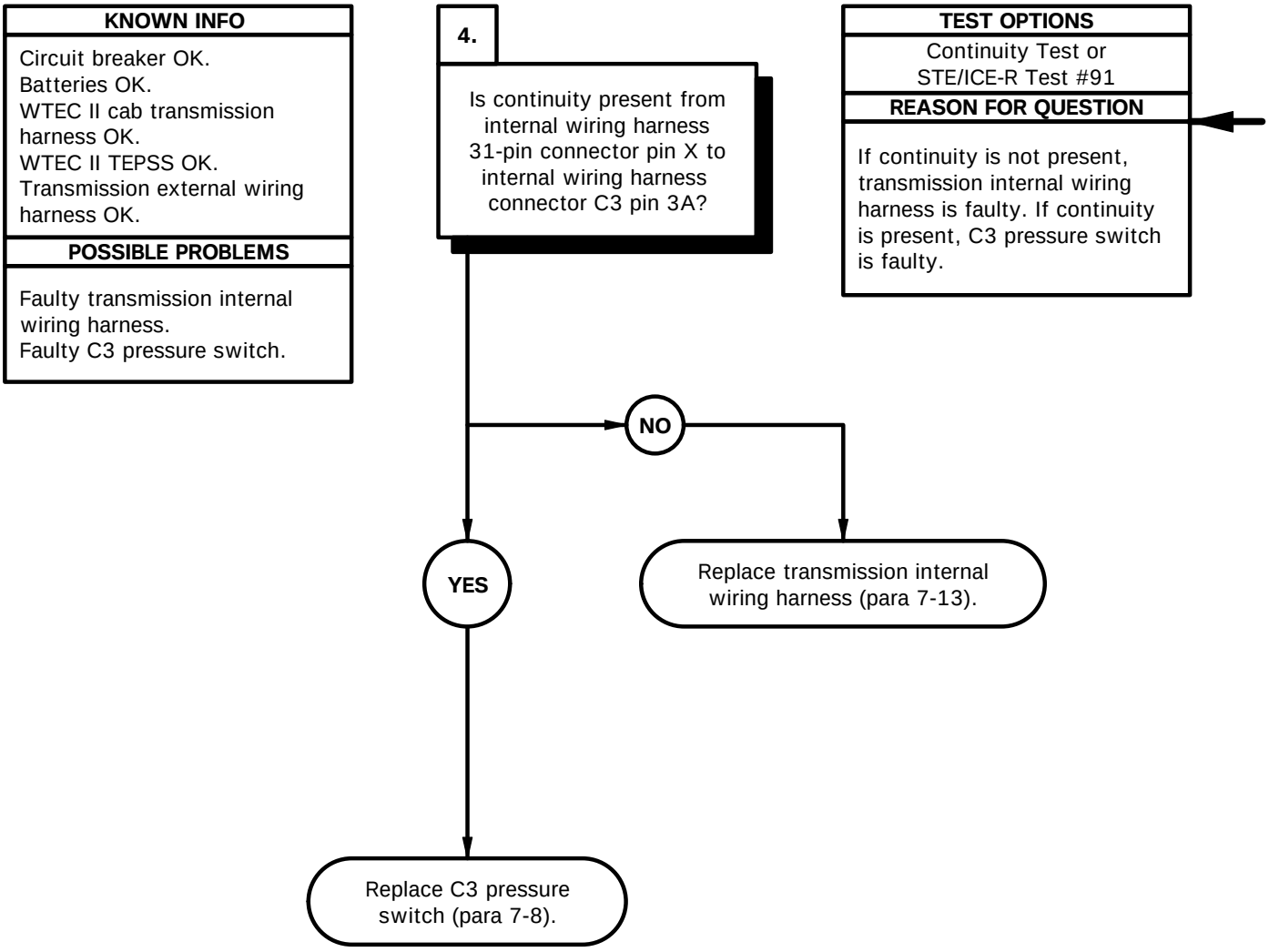
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

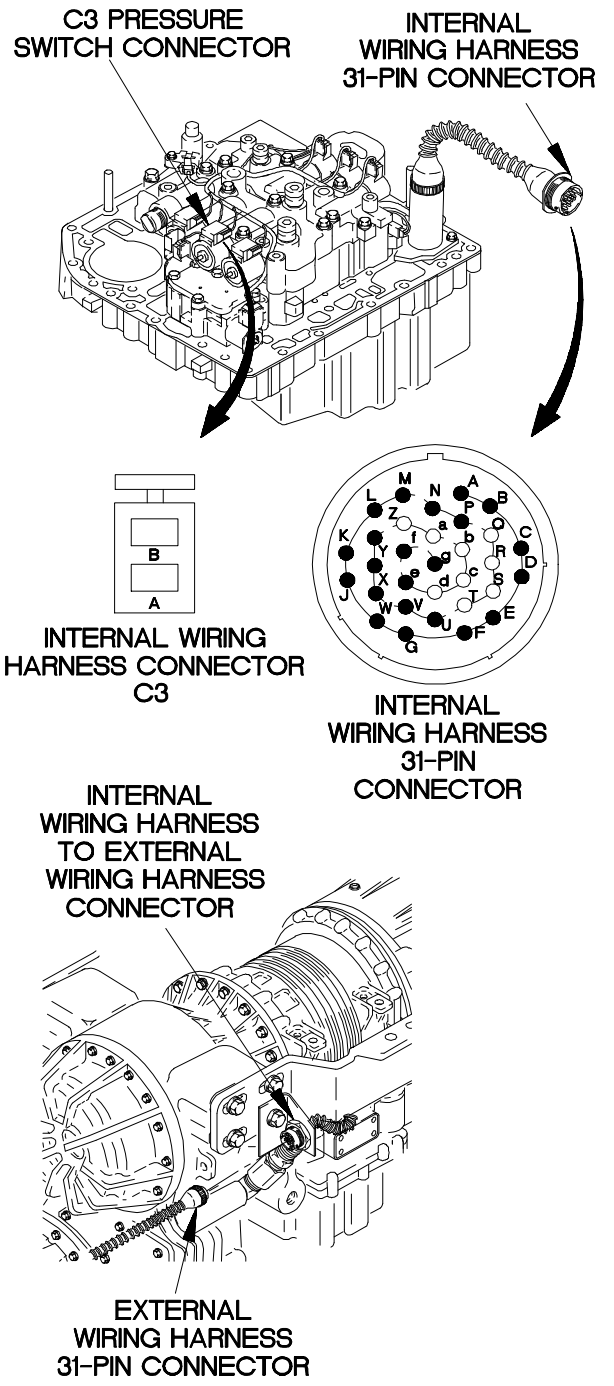


c8. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



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 9-2320-365-20-3).



YBC0804B

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

INITIAL SETUP

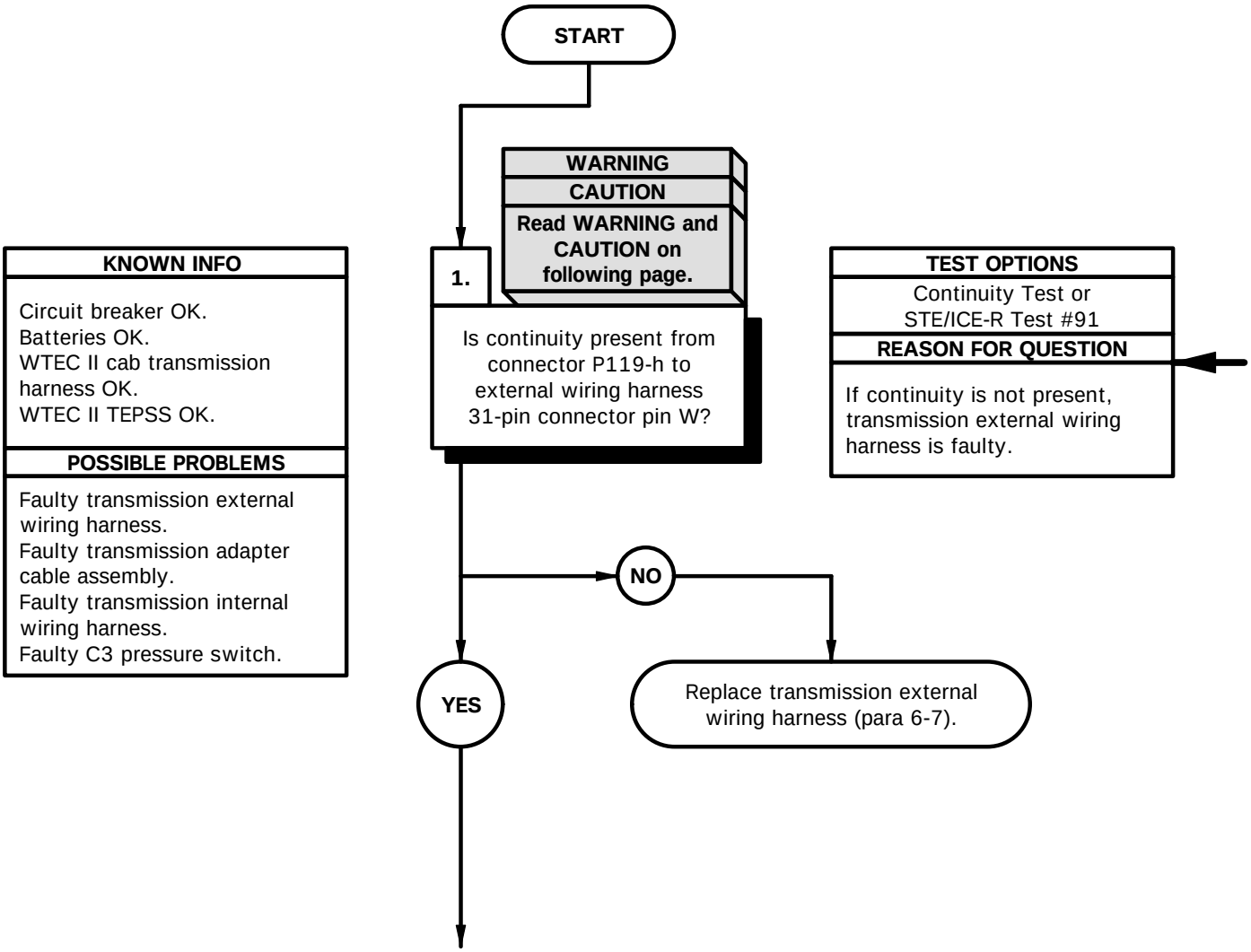
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

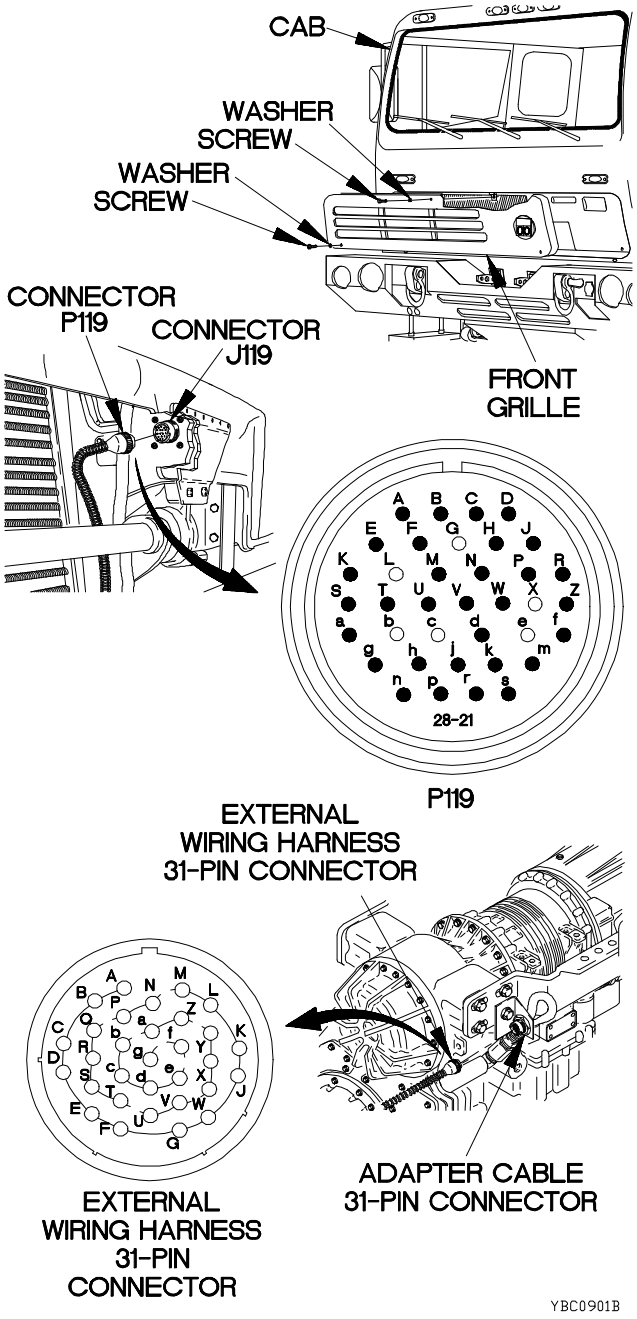
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

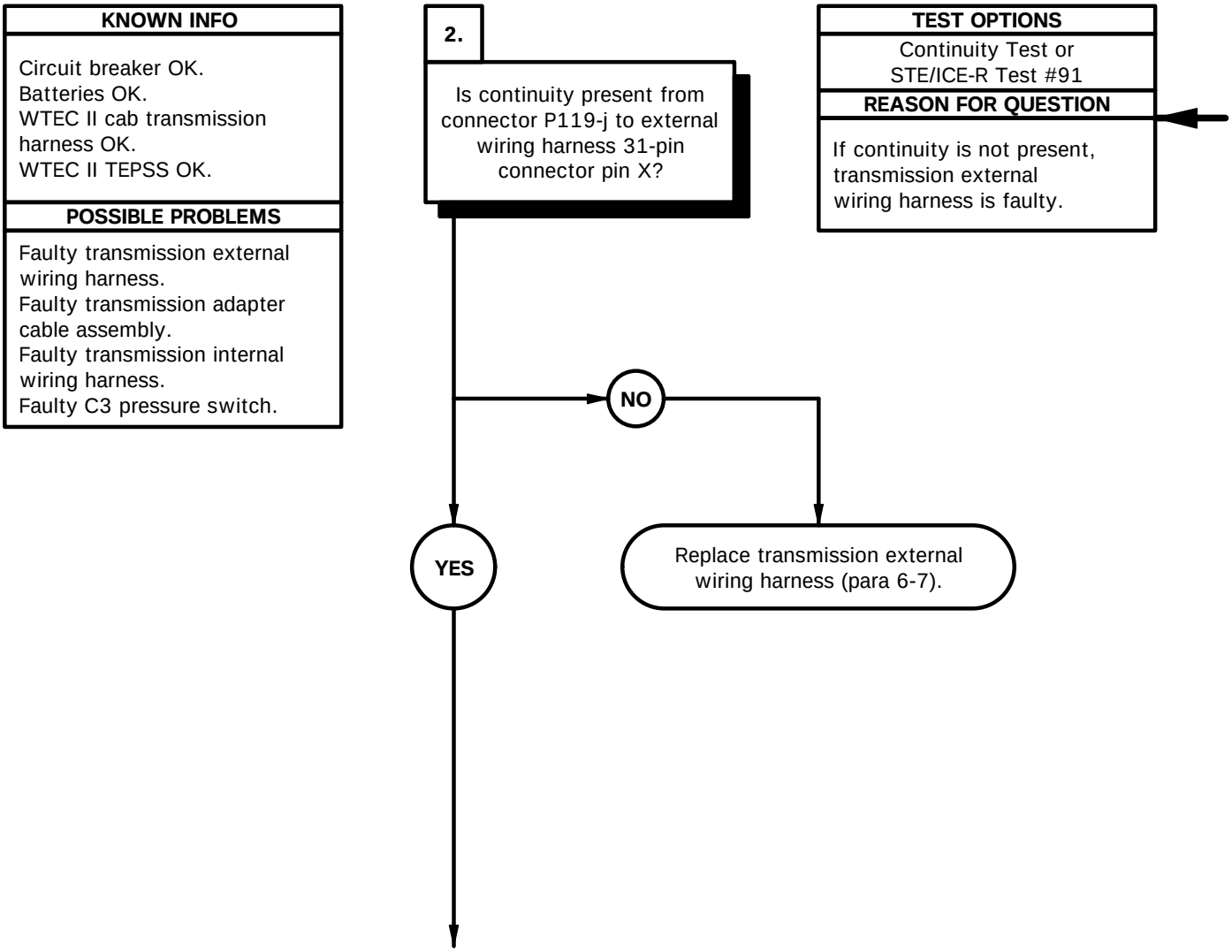
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from adapter cable 31-pin connector.
(6) Set multimeter to ohms.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

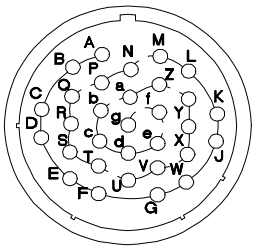


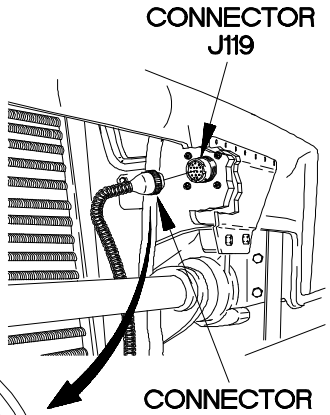
c9. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

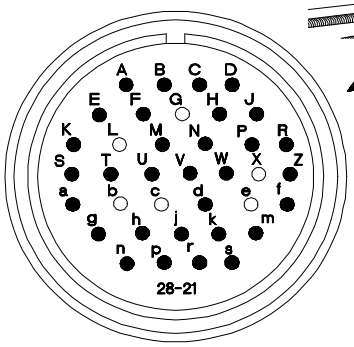


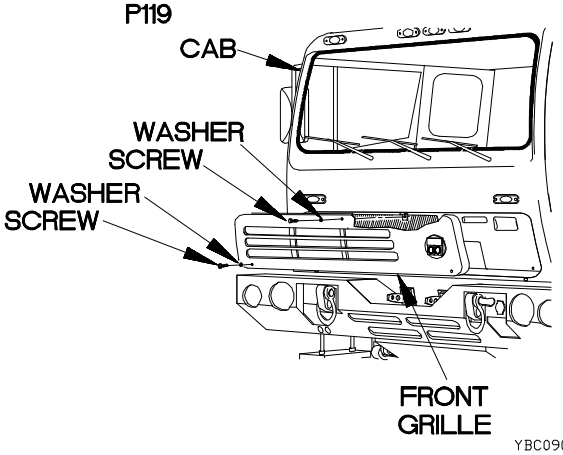
CONTINUITY TEST

(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).

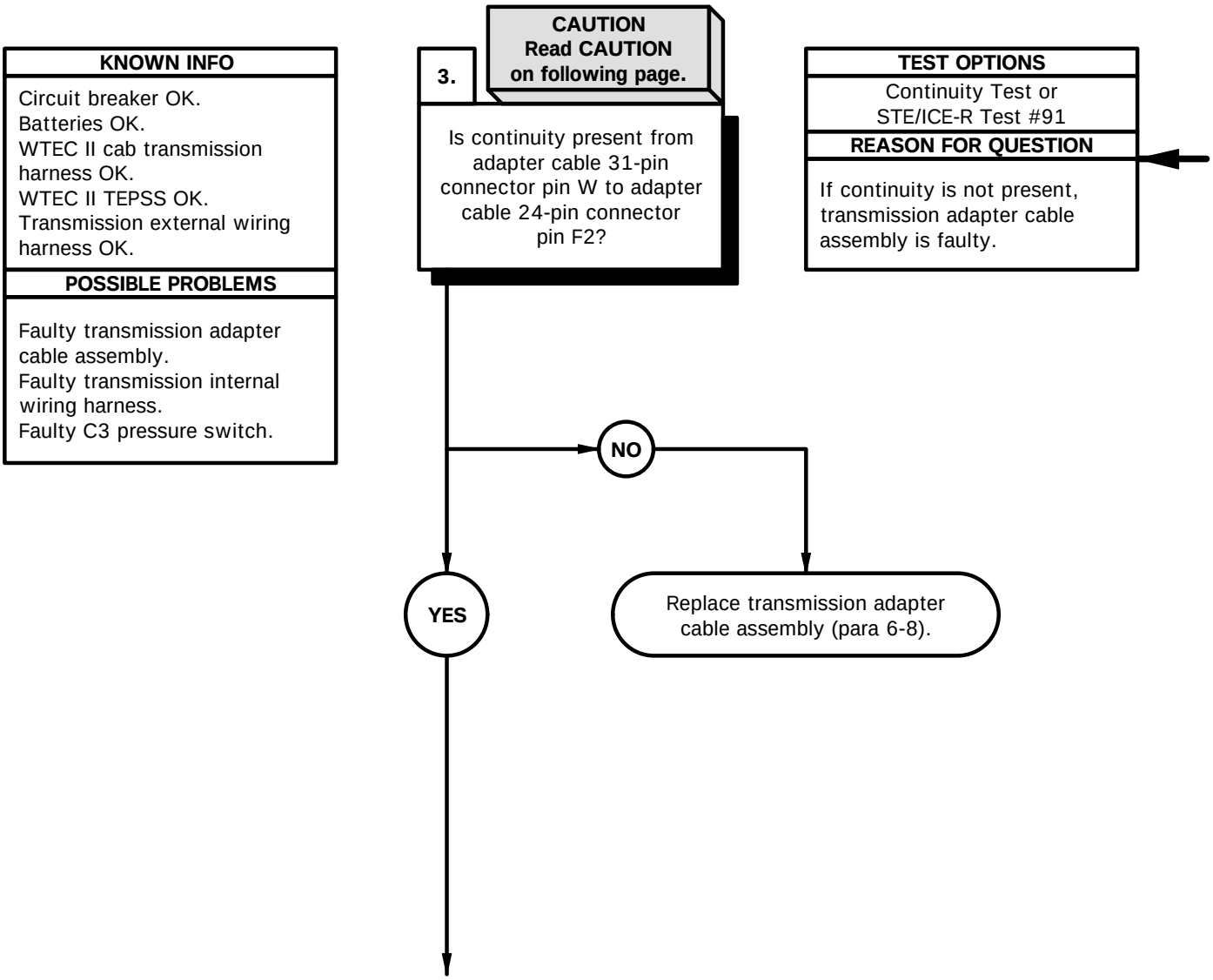








c9. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

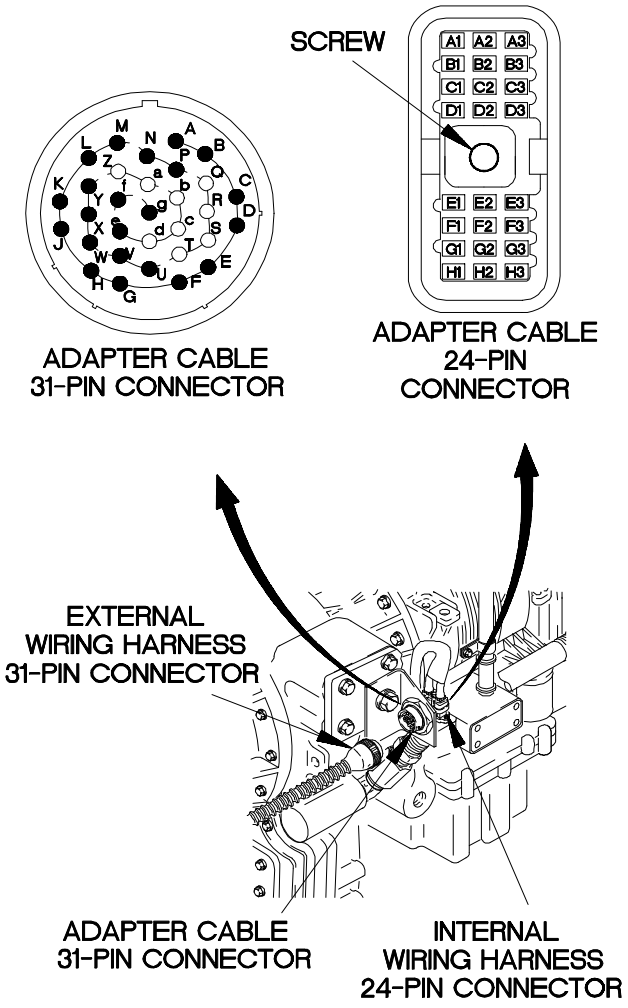


CAUTION

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).



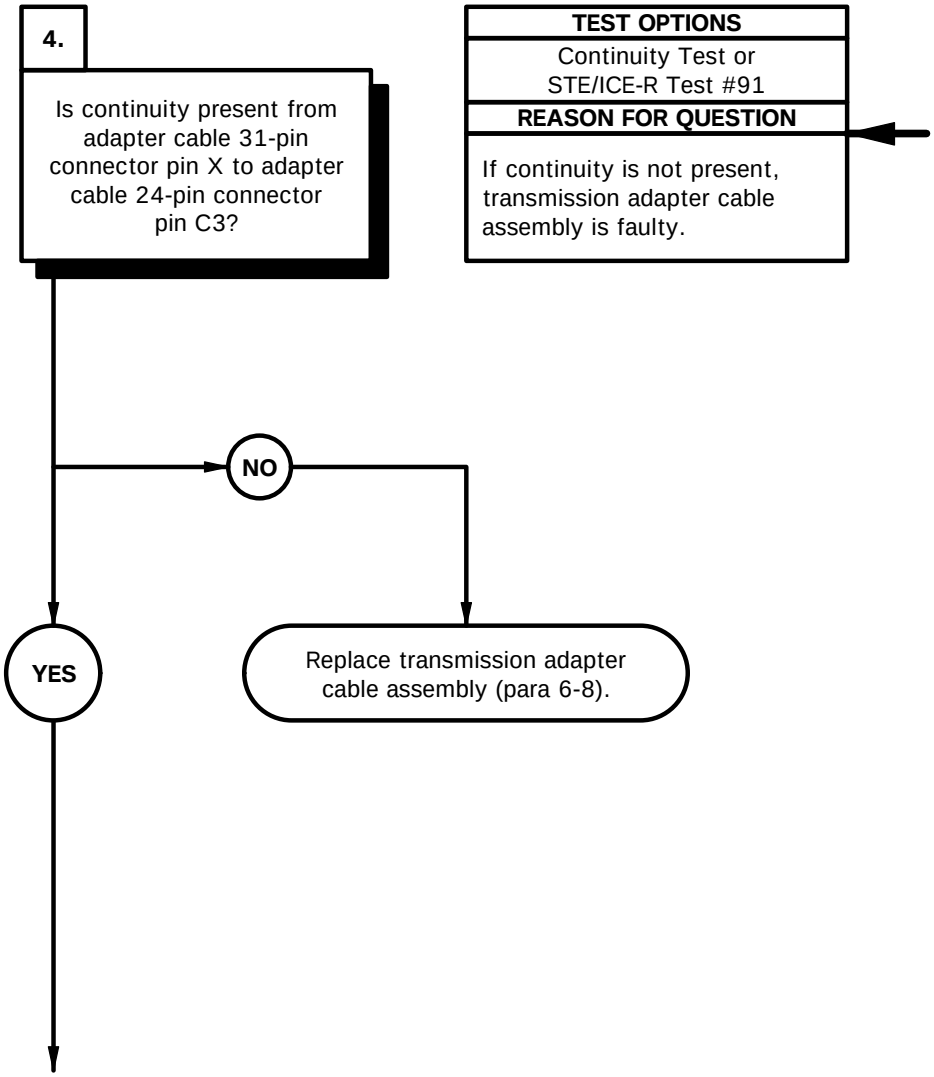
c9. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO

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

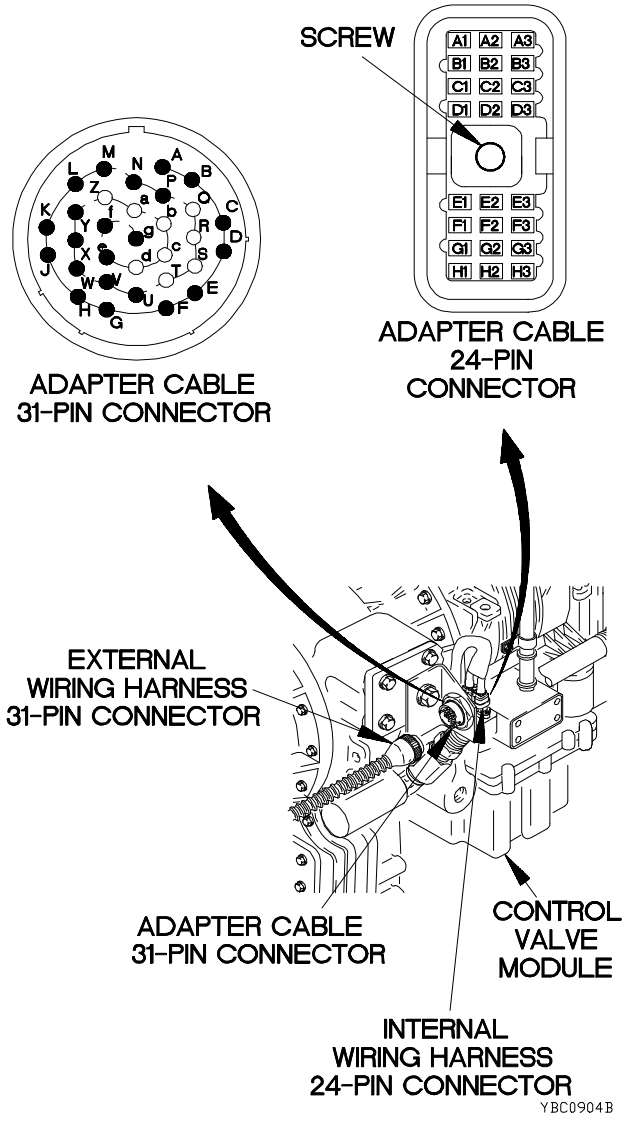
POSSIBLE PROBLEMS

Faulty transmission adapter cable assembly.
Faulty transmission internal wiring harness.
Faulty C3 pressure switch.

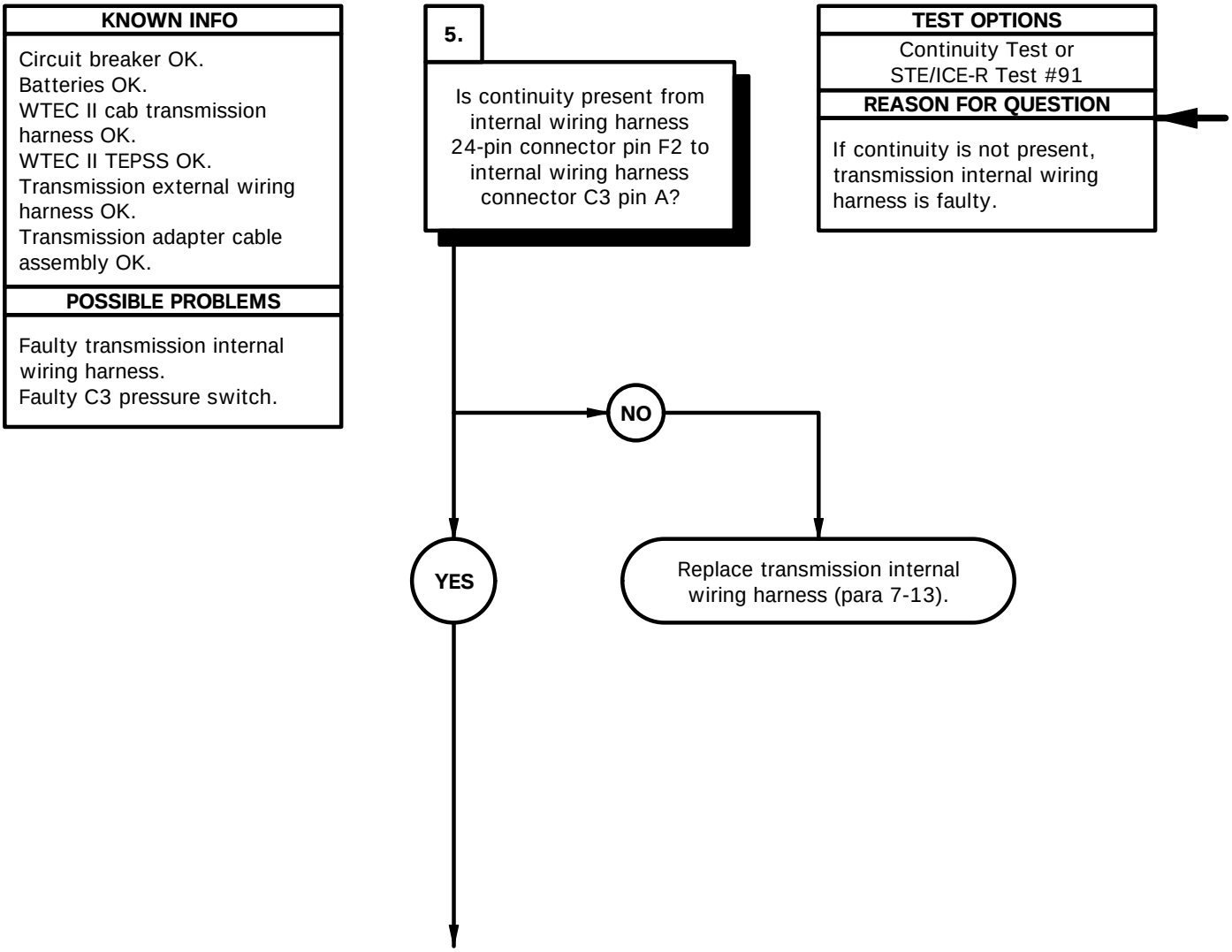


CONTINUITY TEST

(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).

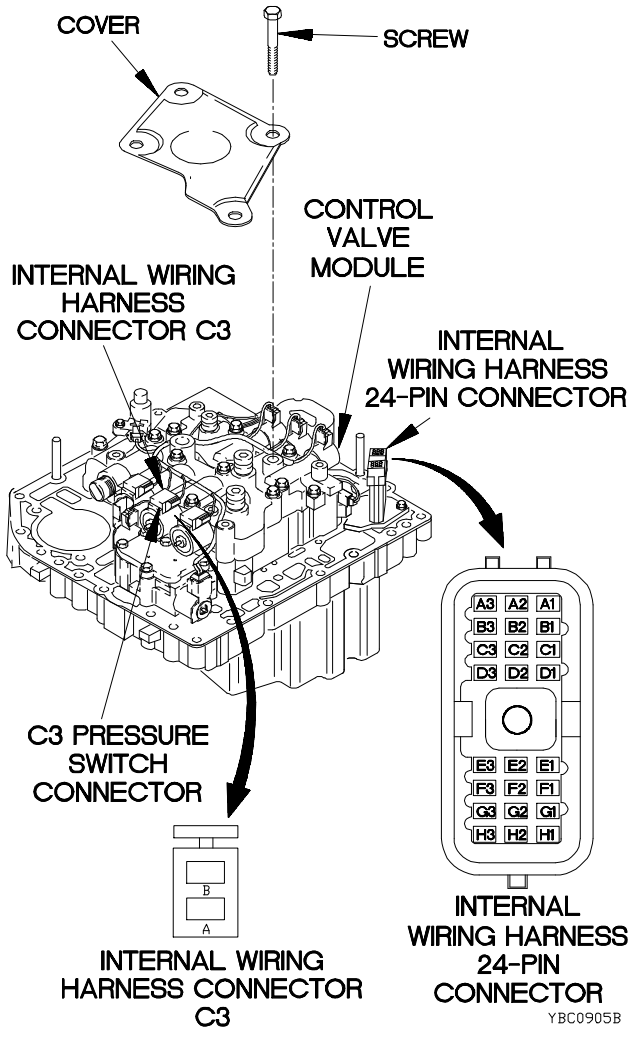


c9. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

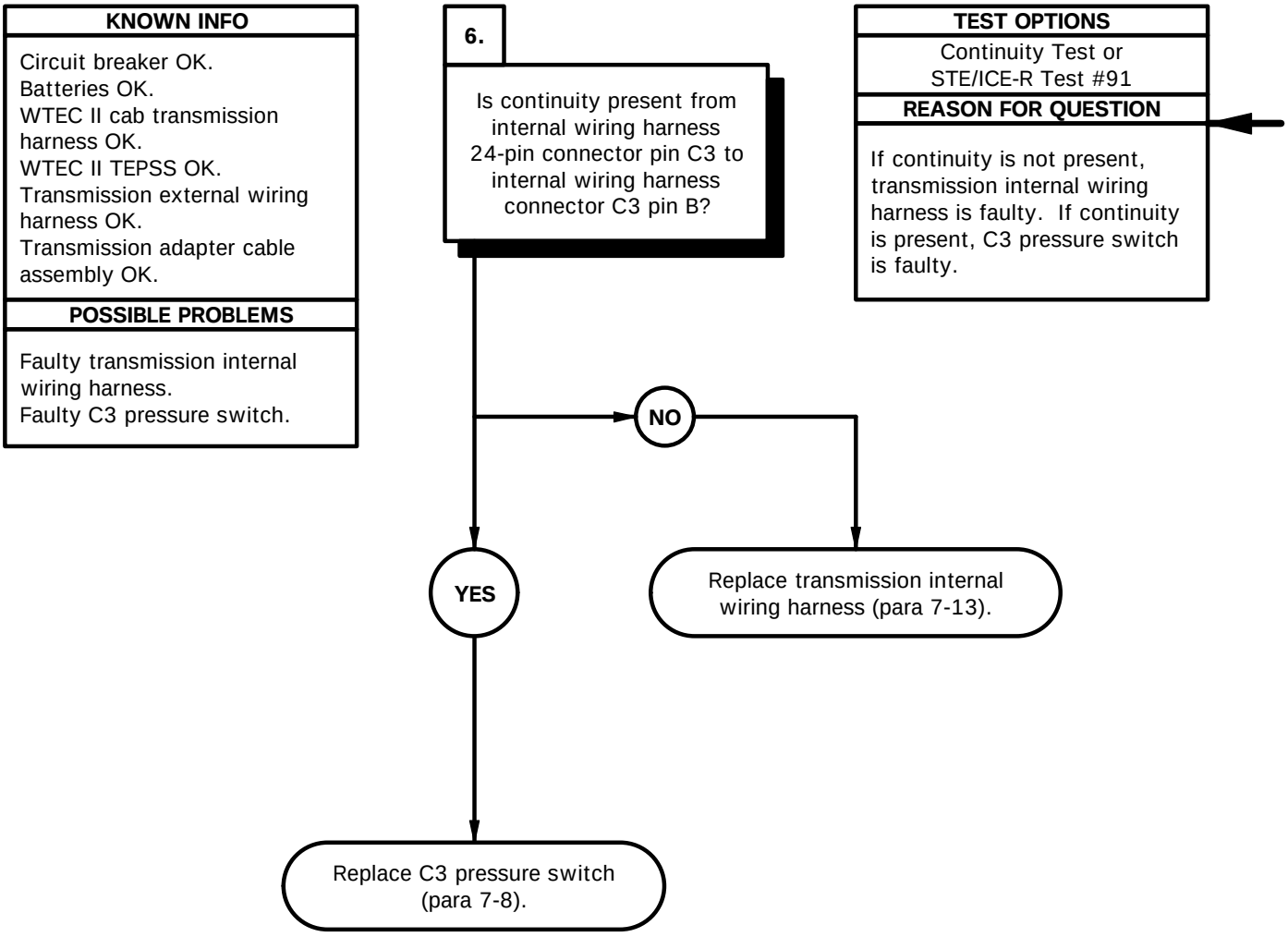


CONTINUITY TEST

(1) Remove control valve module (para 7-10).
(2) Remove four screws and cover from control valve module.
(3) 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).

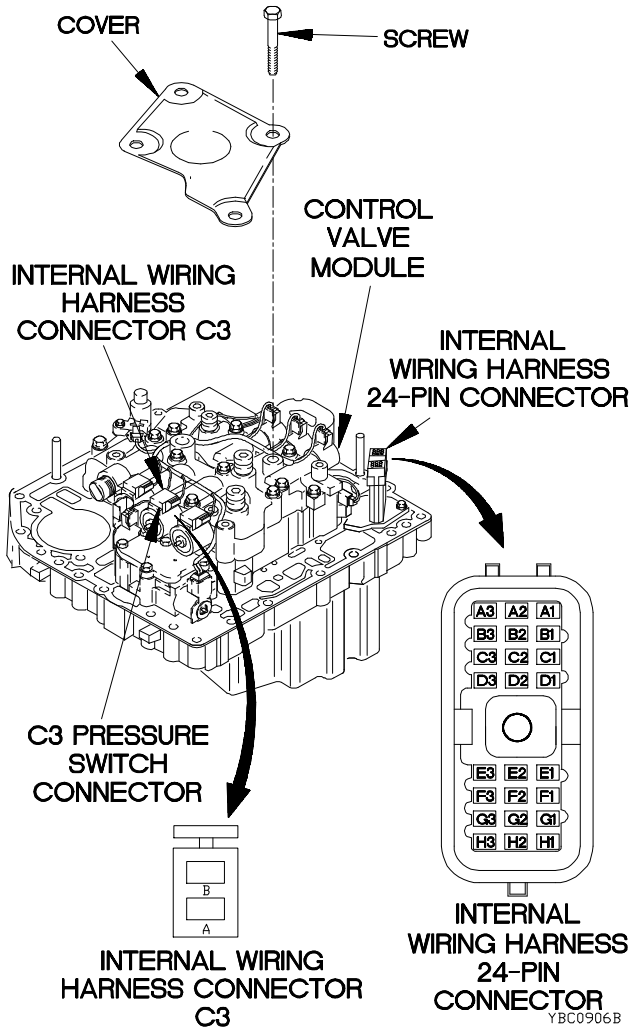


c9. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



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 9-2320-365-20-3).



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

INITIAL SETUP

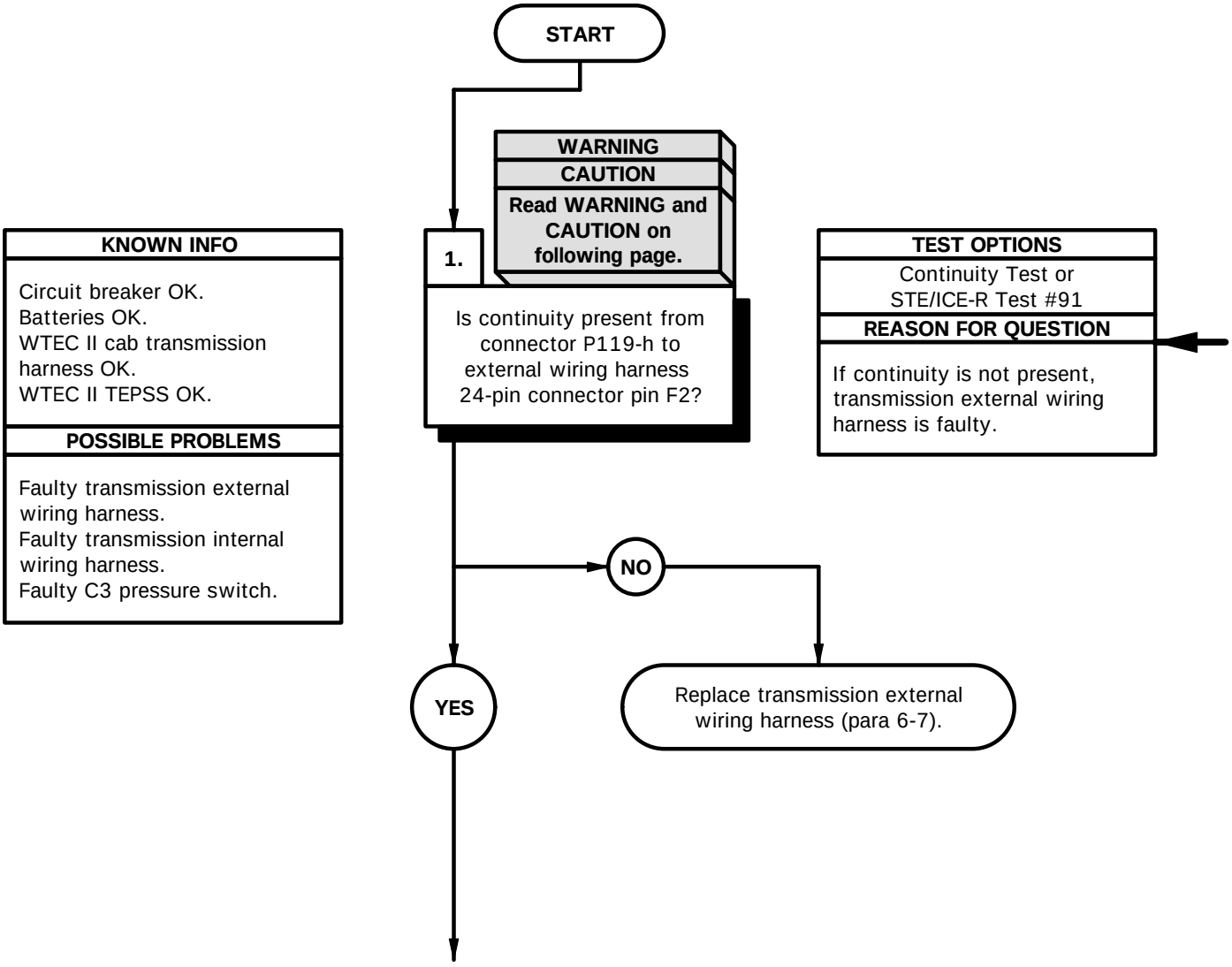
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

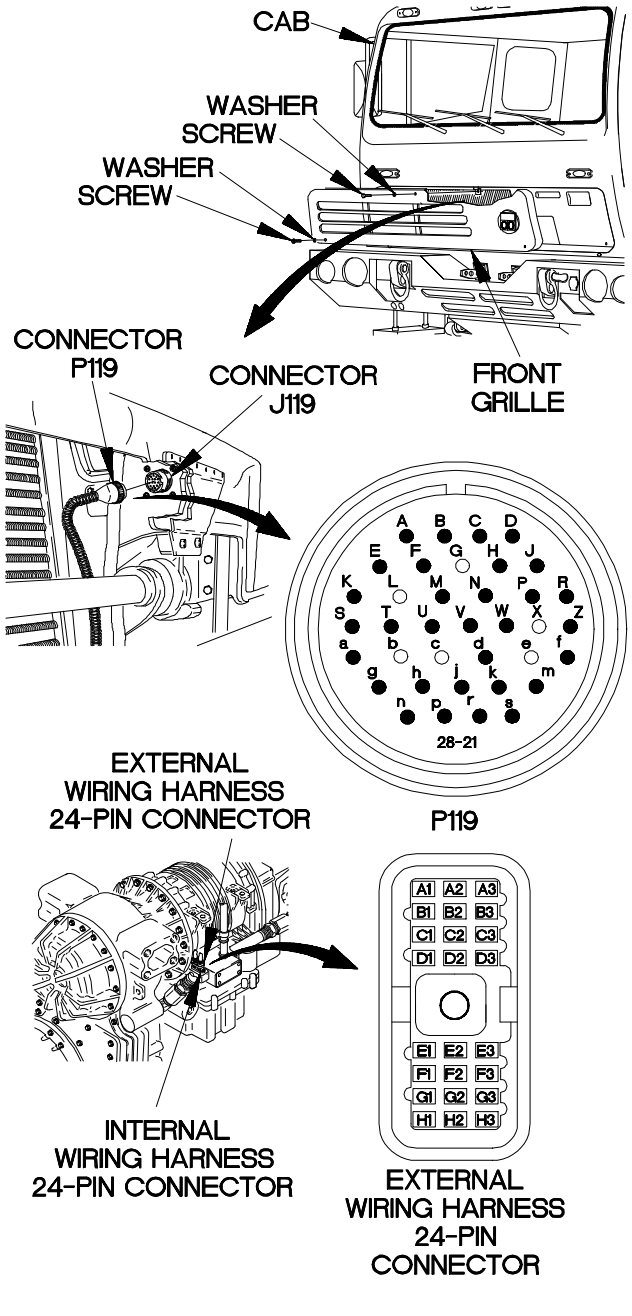
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

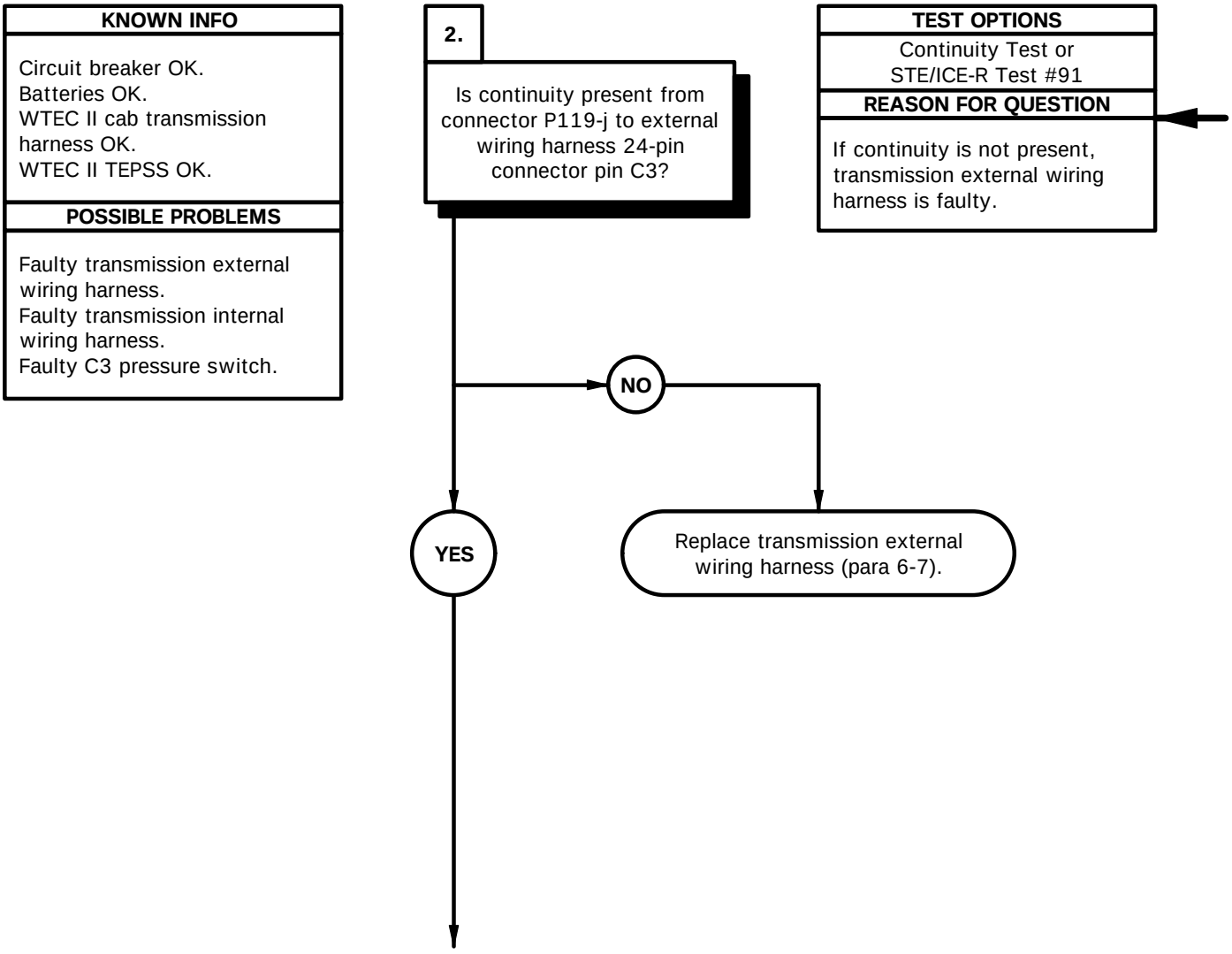
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Loosen screw in external wiring harness 24-pin connector.
(6) Disconnect external wiring harness 24-pin connector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

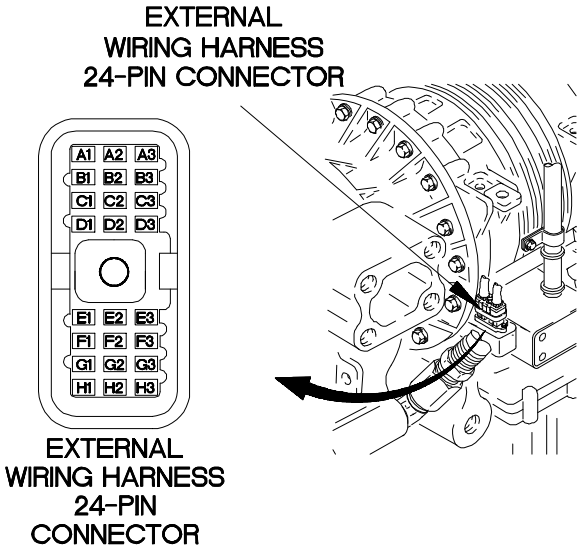


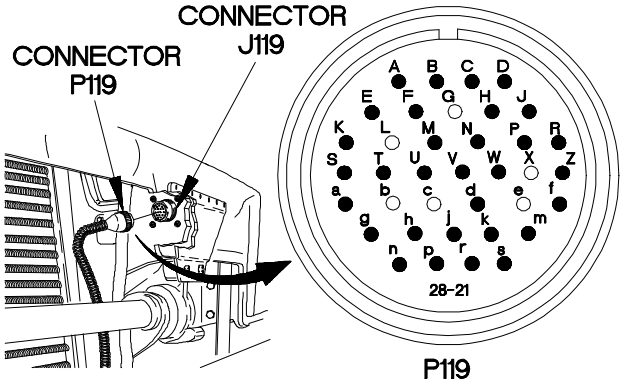
c10. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

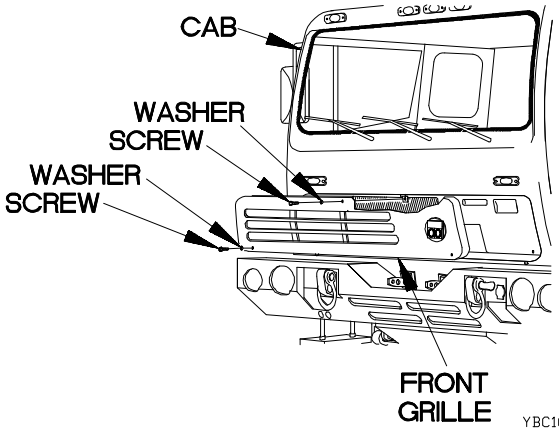


CONTINUITY TEST

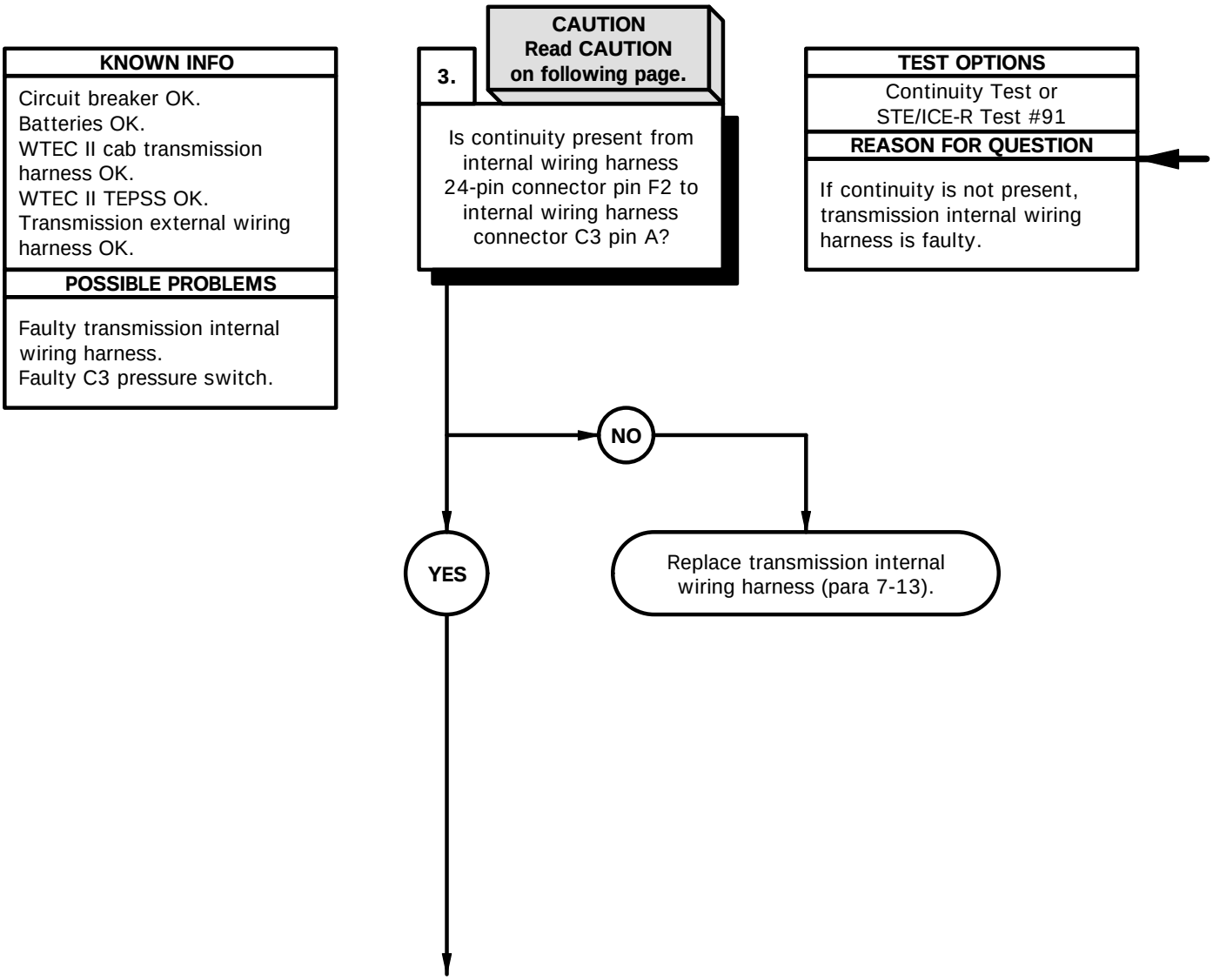
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P119-j.
(3) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin C3 and note reading on multimeter.
(4) If continuity is not present, replace transmission external wiring harness (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 ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

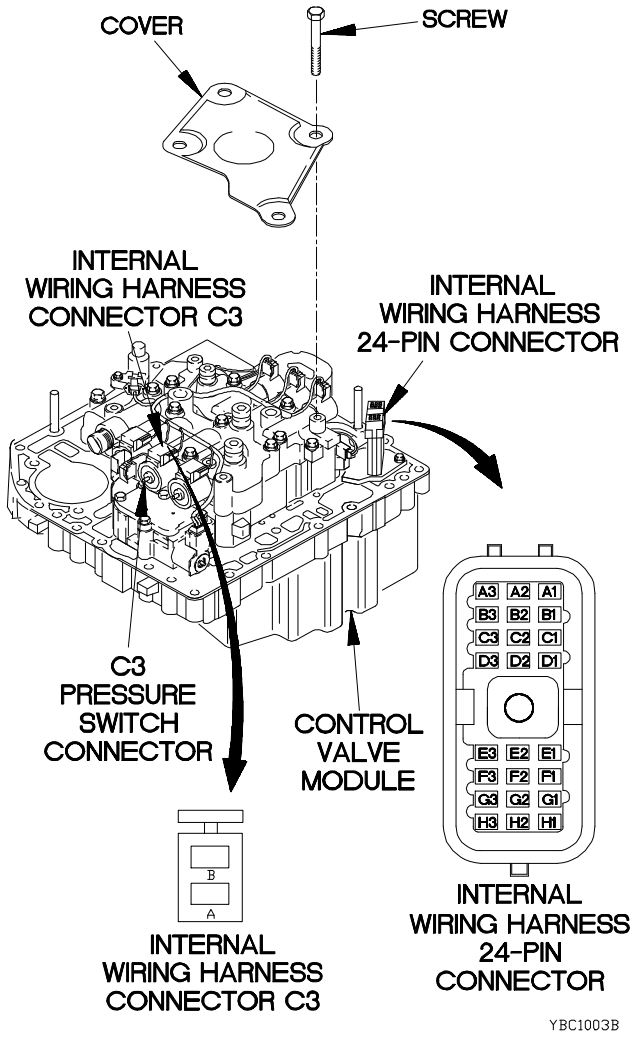


CAUTION

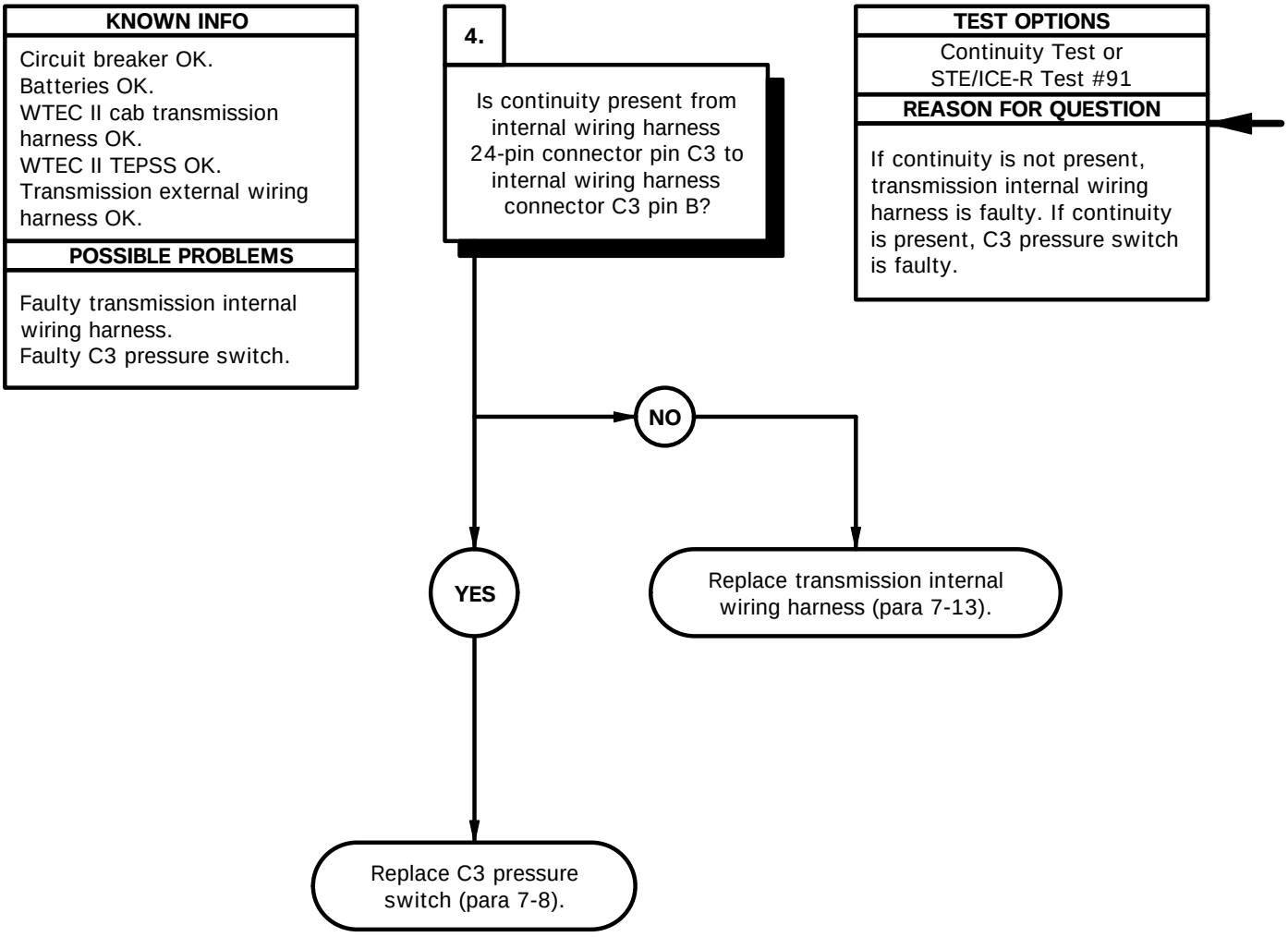
Use care when disconnecting transmission internal wiring harness connectors. Failure to comply may result in damage to equipment.

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).

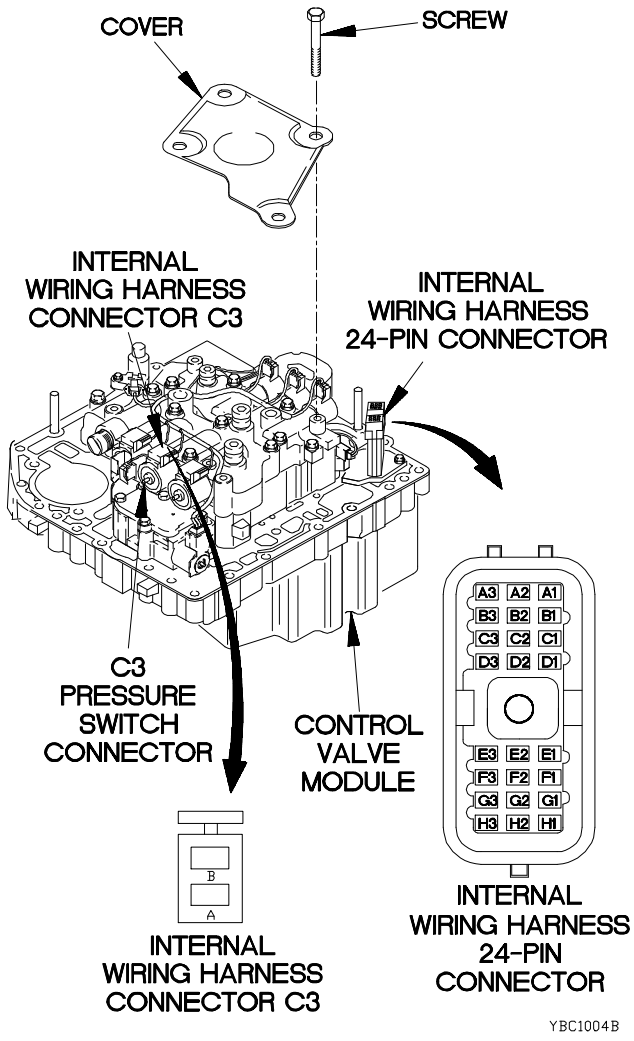


c10. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369) (CONT)



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 9-2320-365-20-3).



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

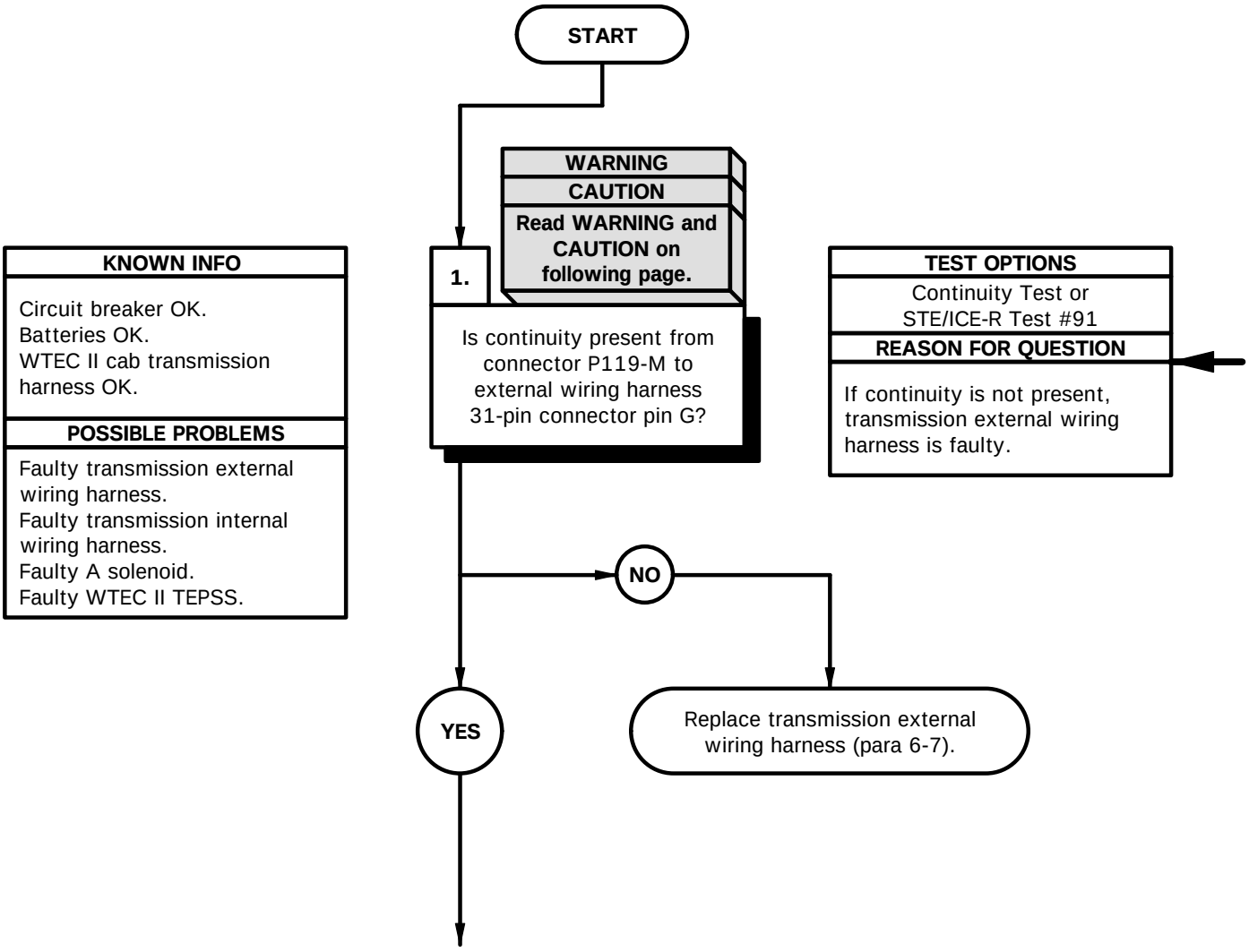
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

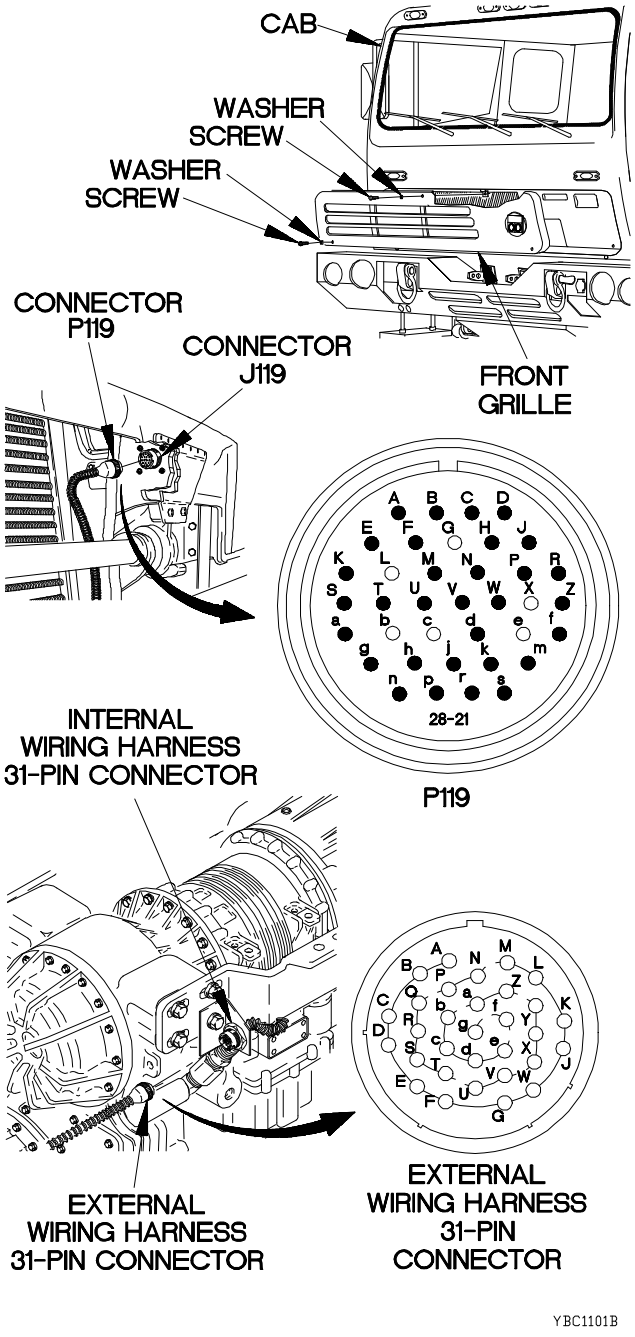
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

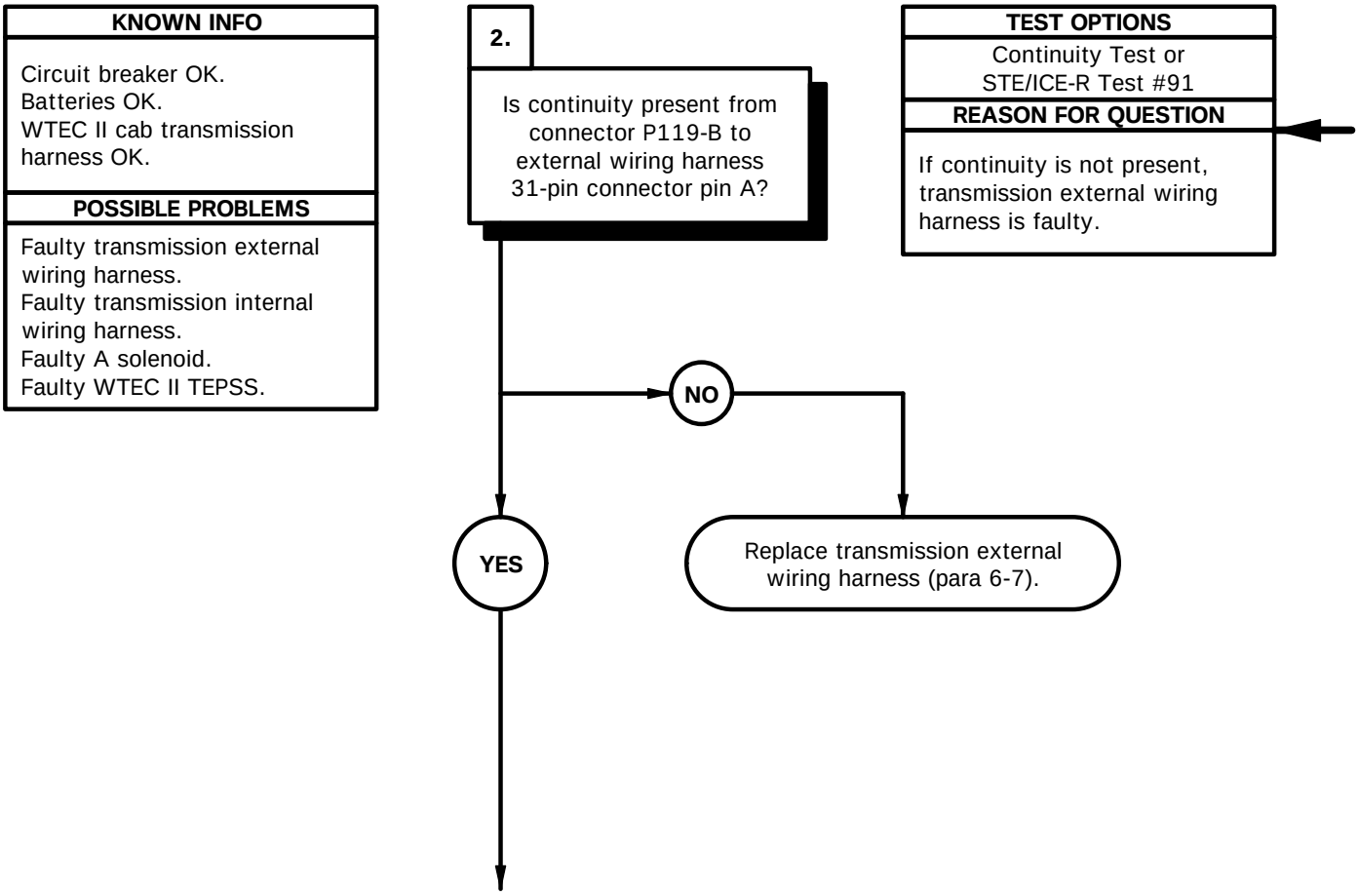
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin connector.
(6) Set multimeter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

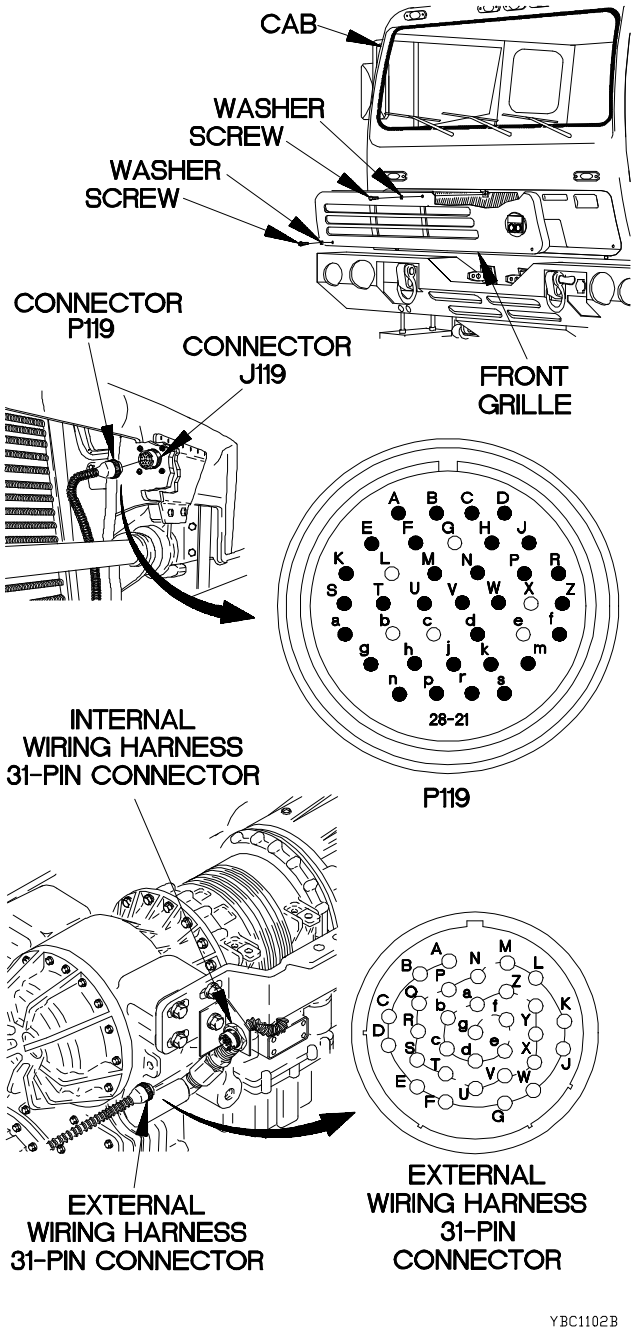


c11. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

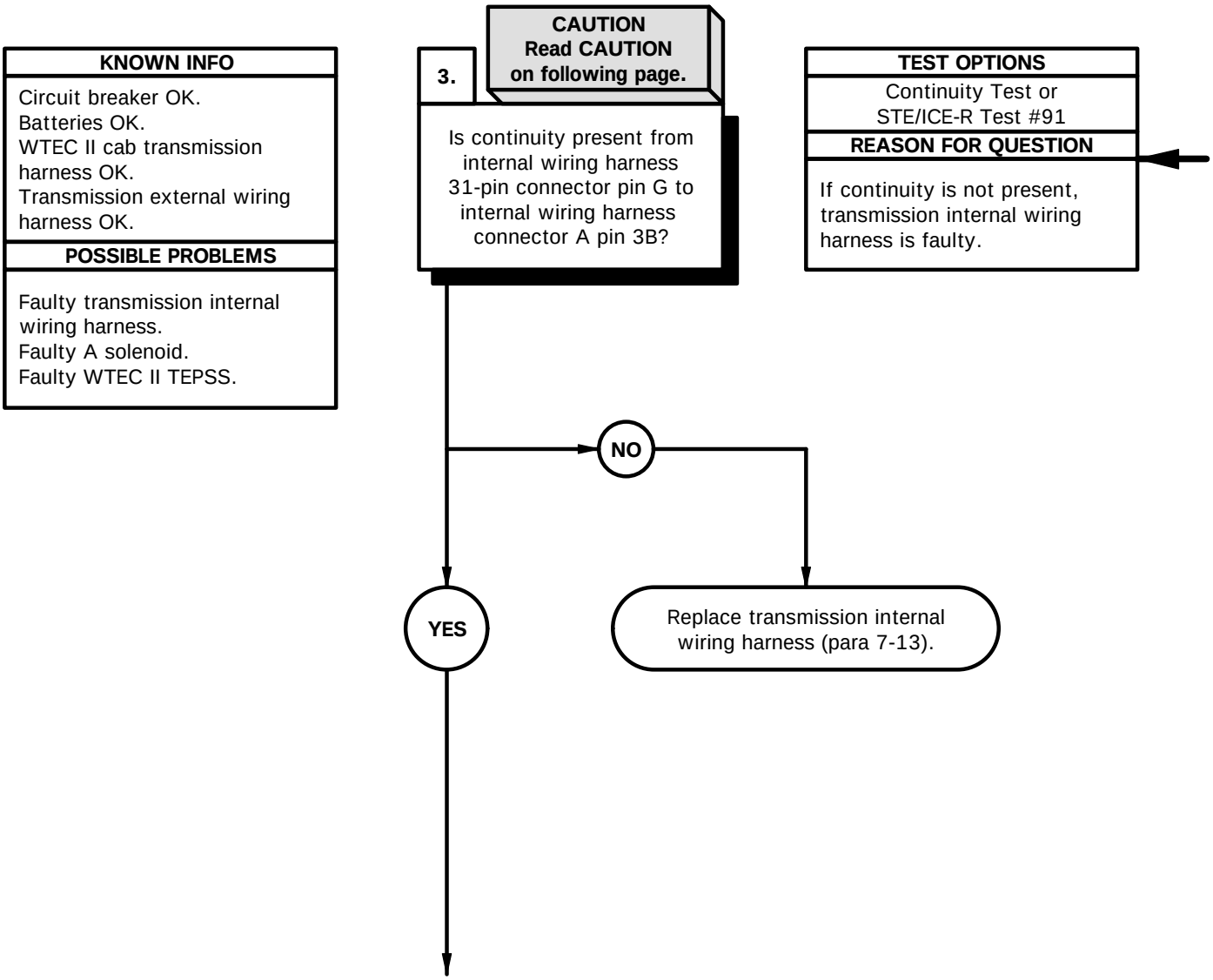


CONTINUITY TEST

(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)

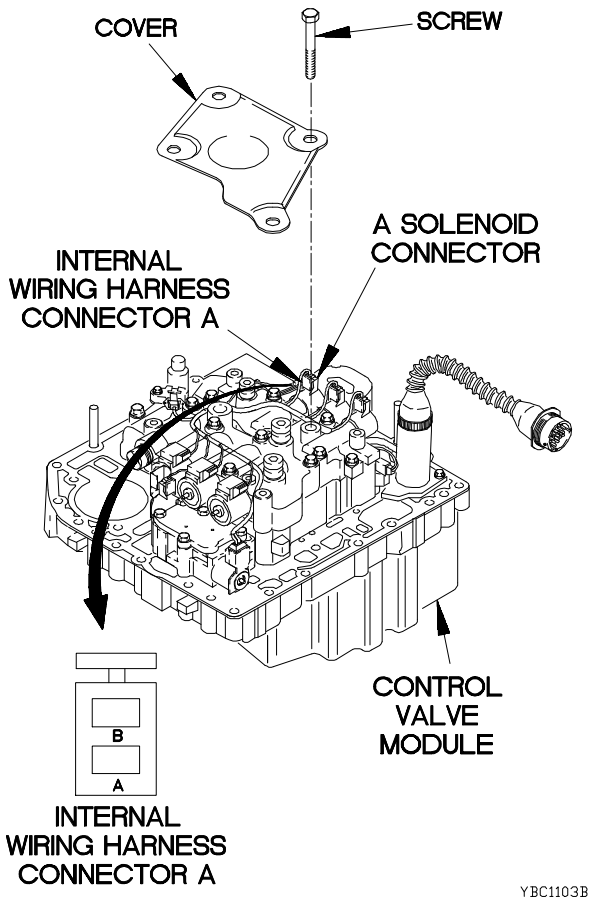


CAUTION

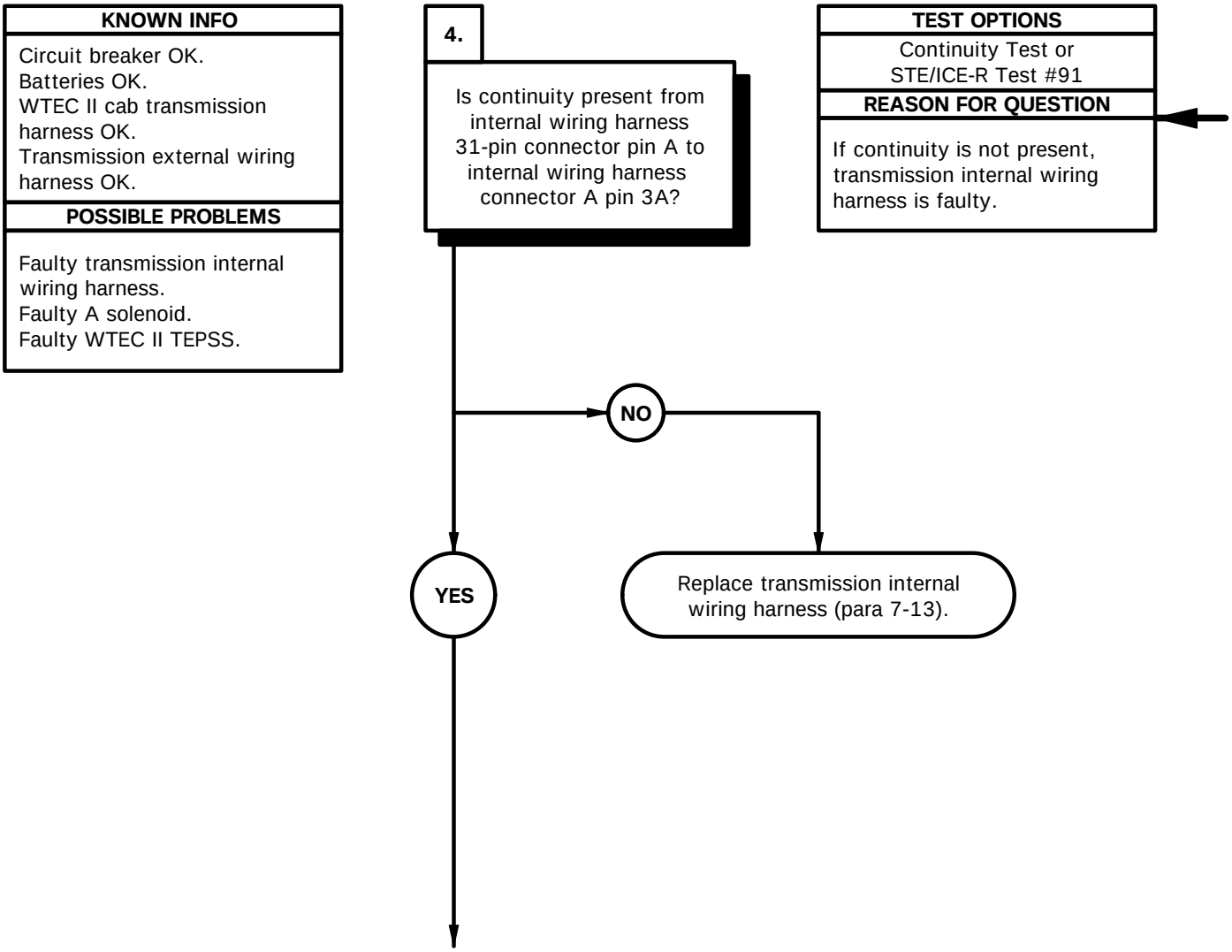
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

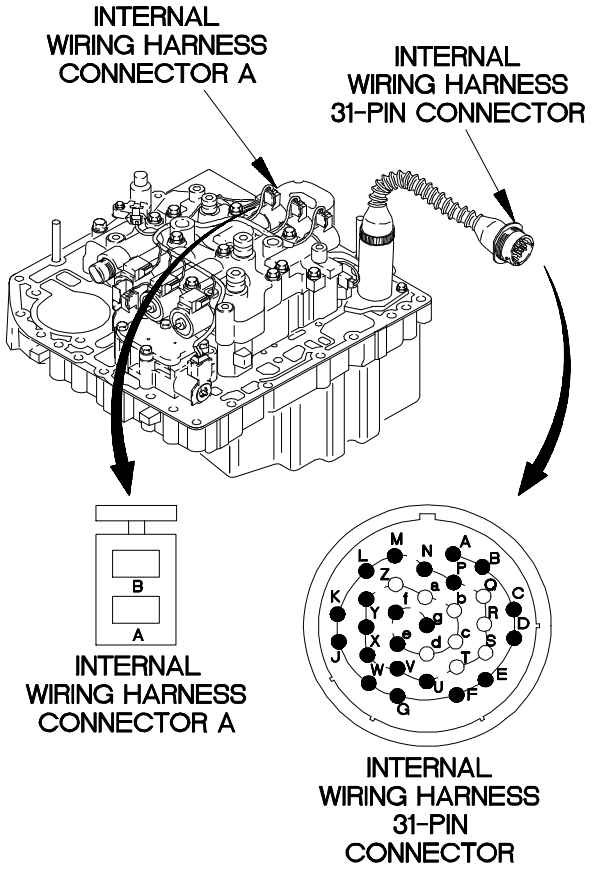


c11. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

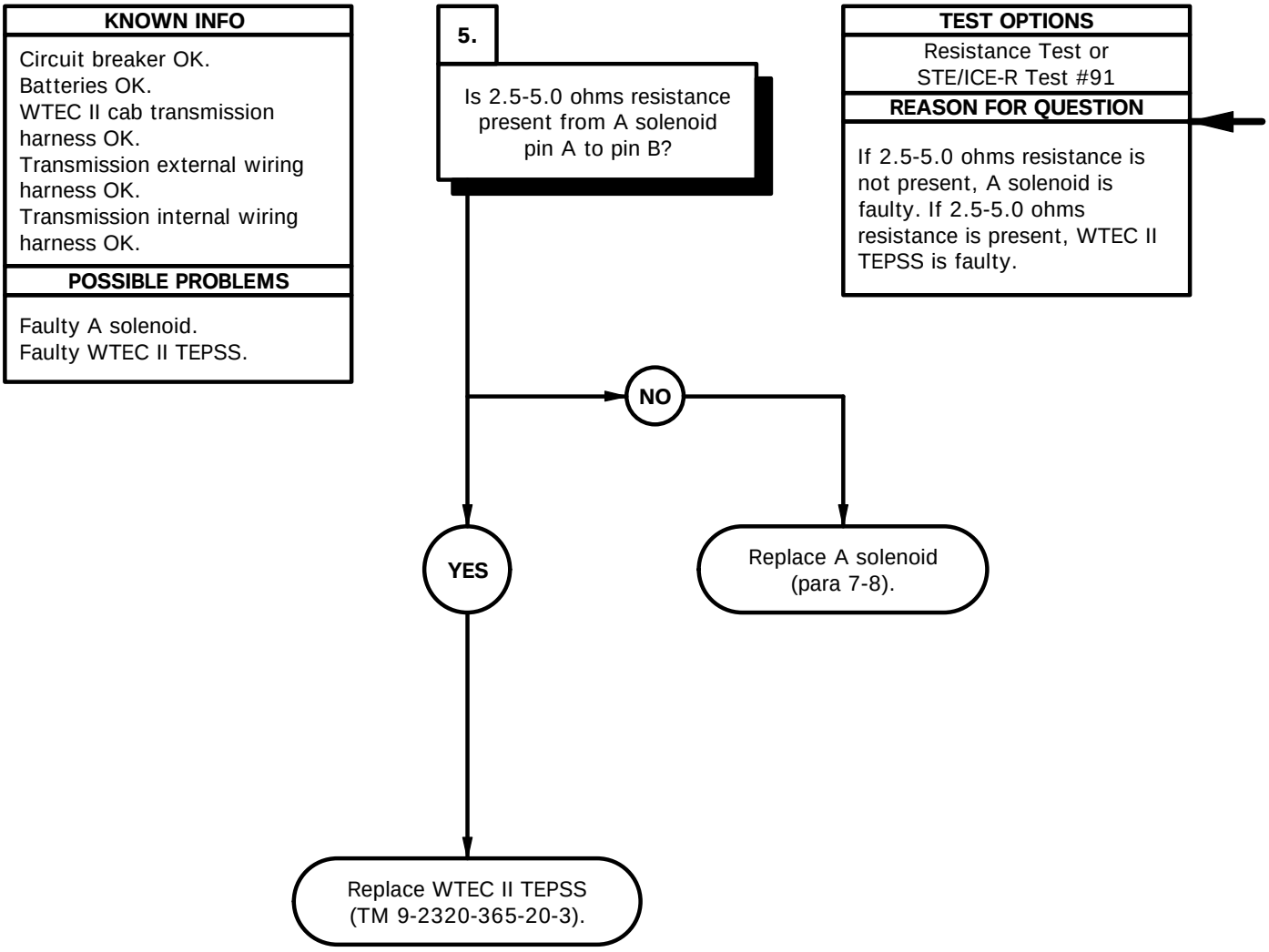


CONTINUITY TEST

(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).

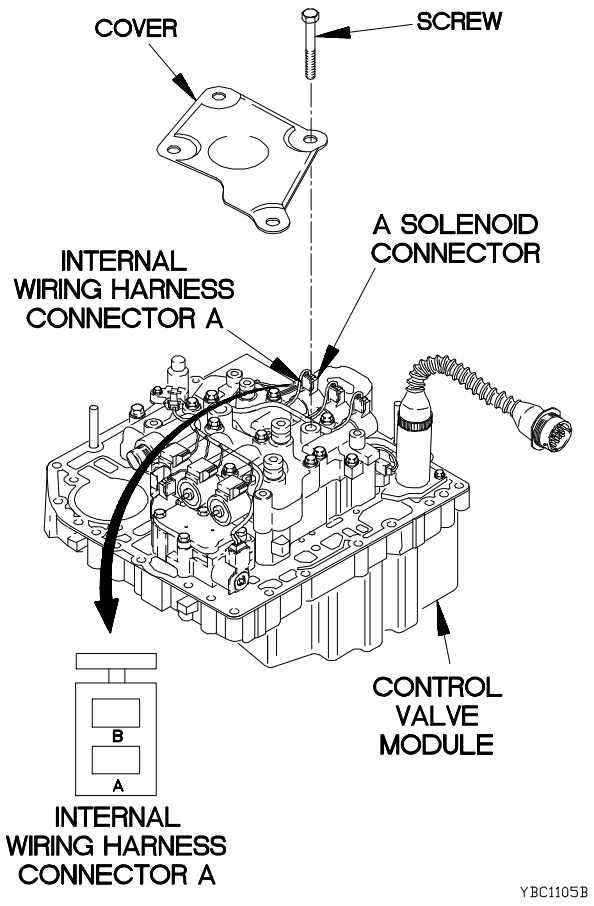


c11. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

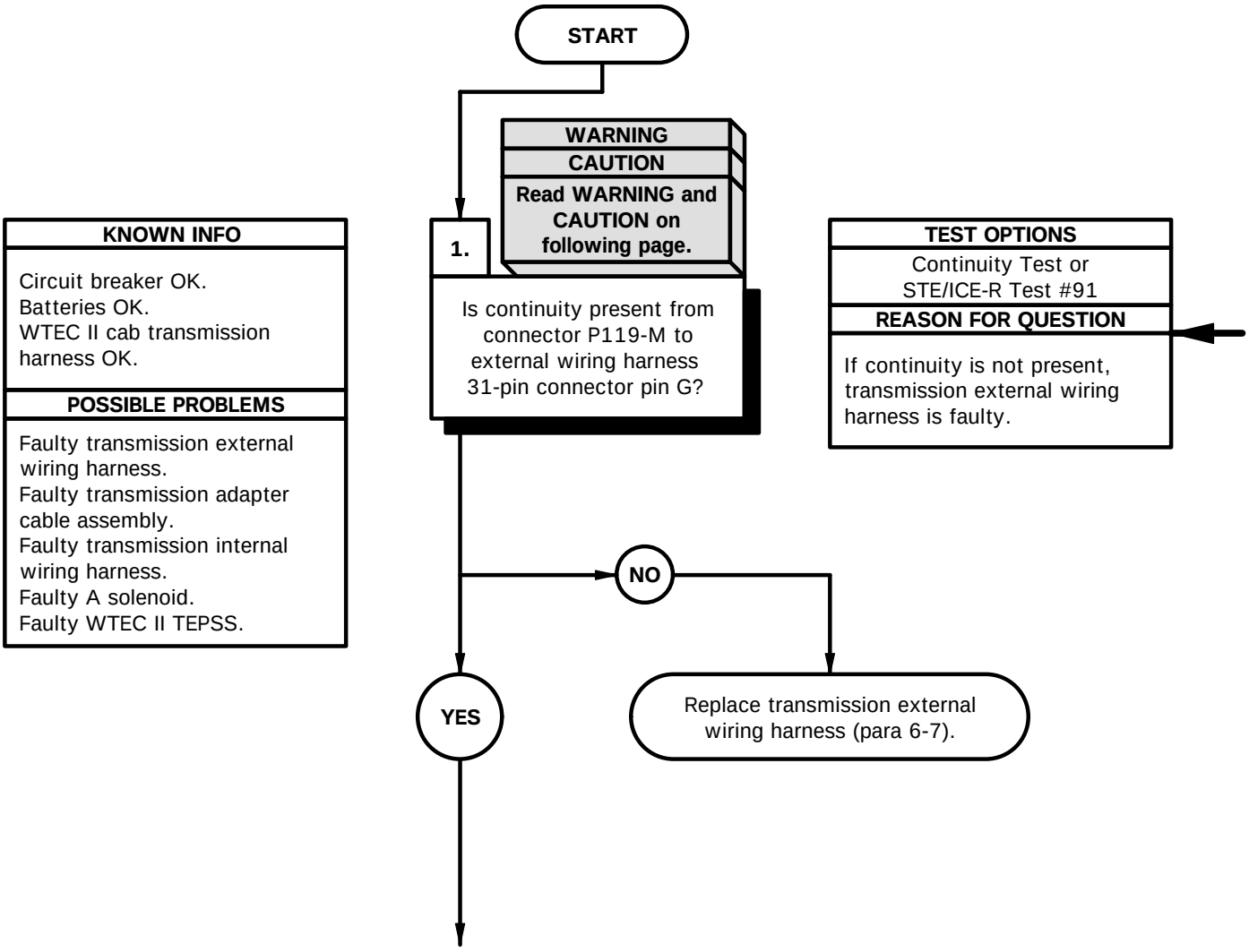
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

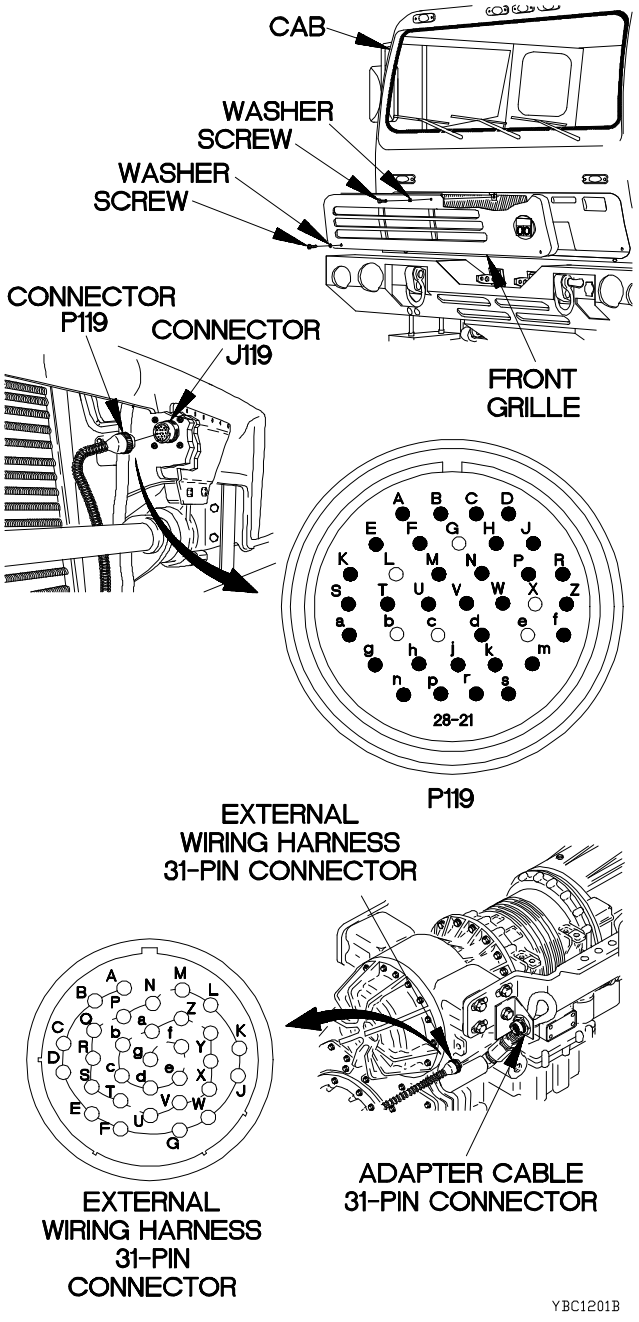
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



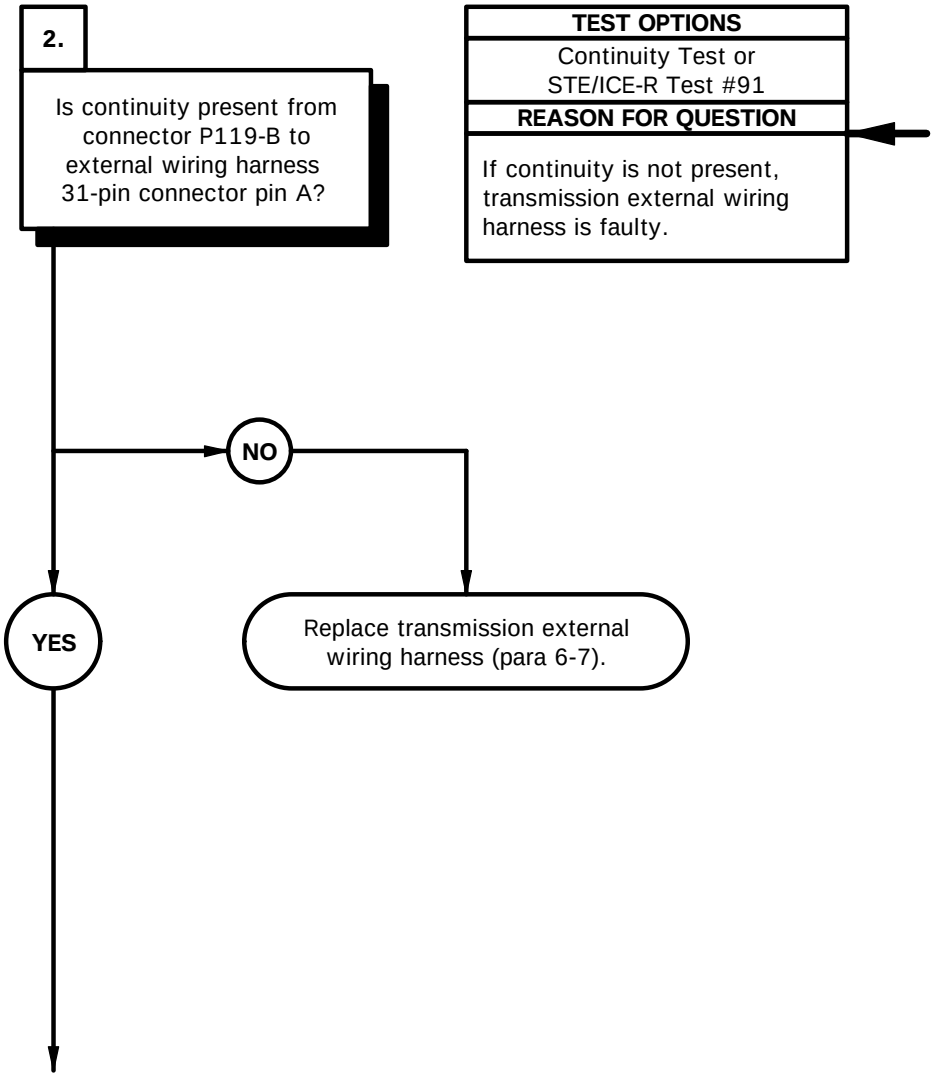
c12. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO

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

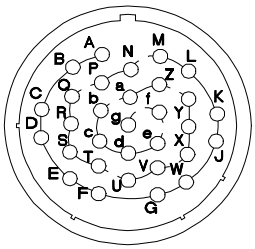
POSSIBLE PROBLEMS

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

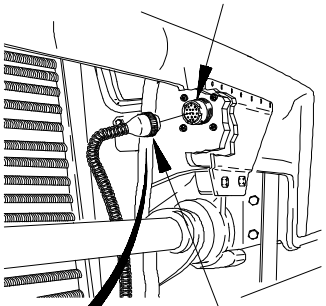


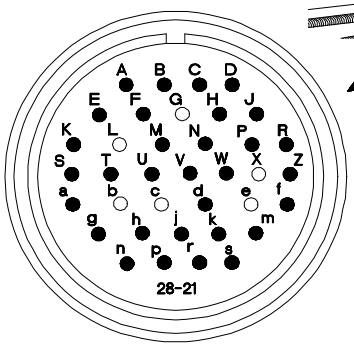
CONTINUITY TEST

(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).

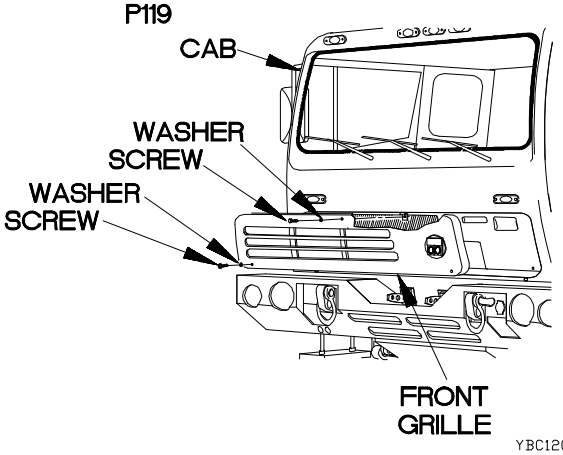


EXTERNAL WIRING HARNESS 31-PIN CONNECTOR

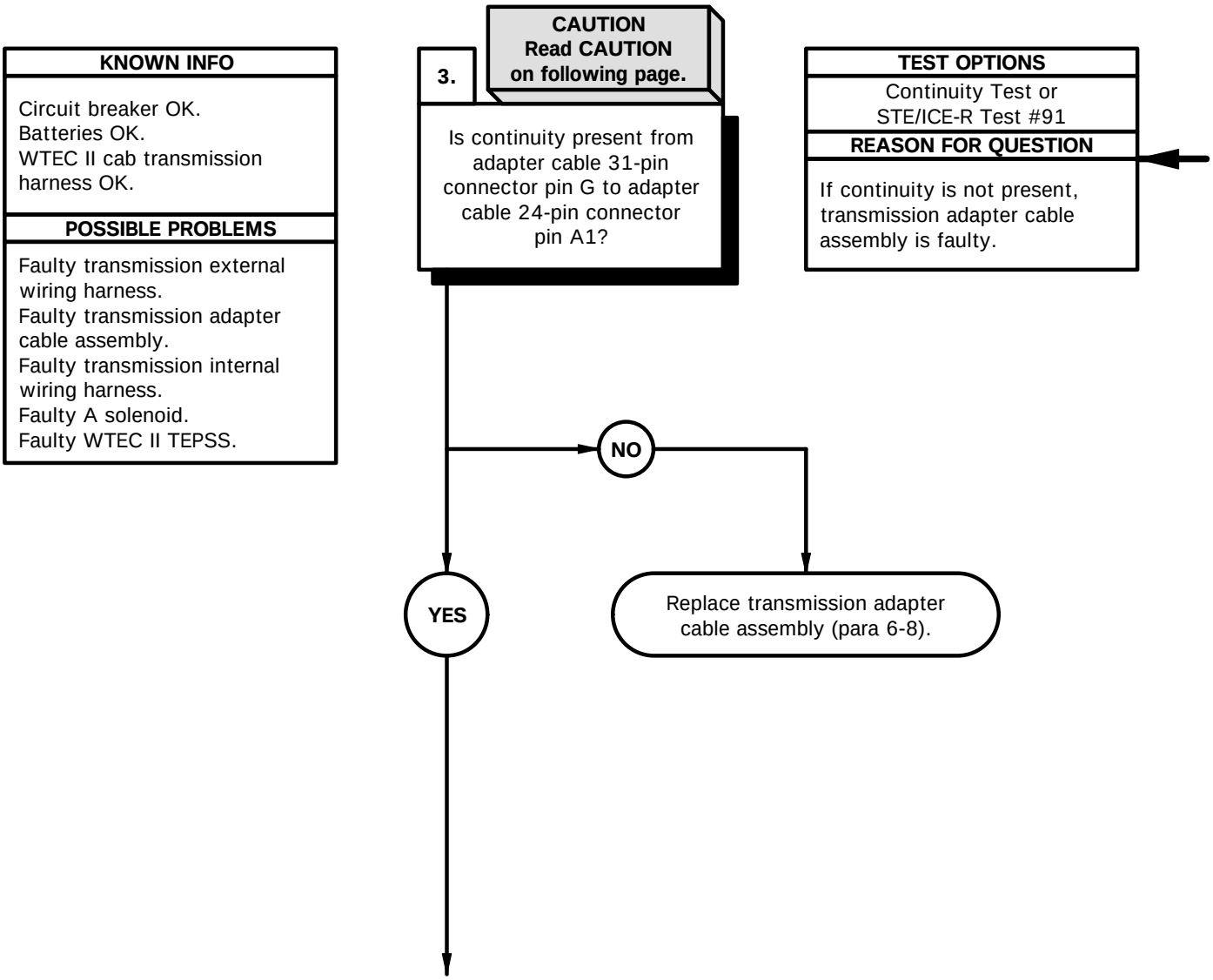




P119



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)

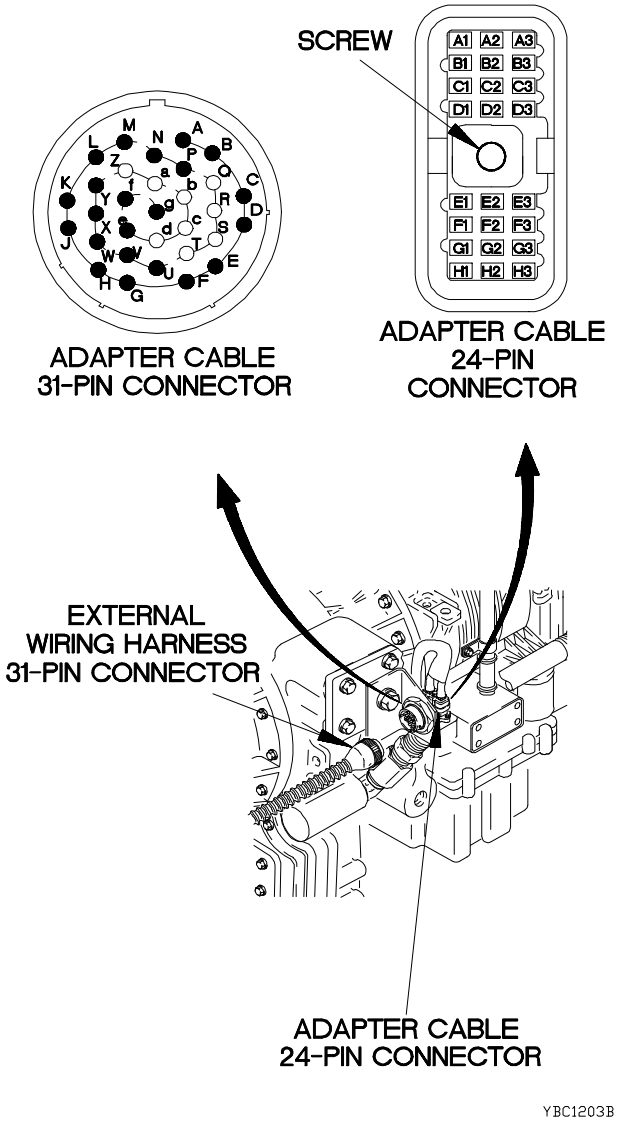


CAUTION

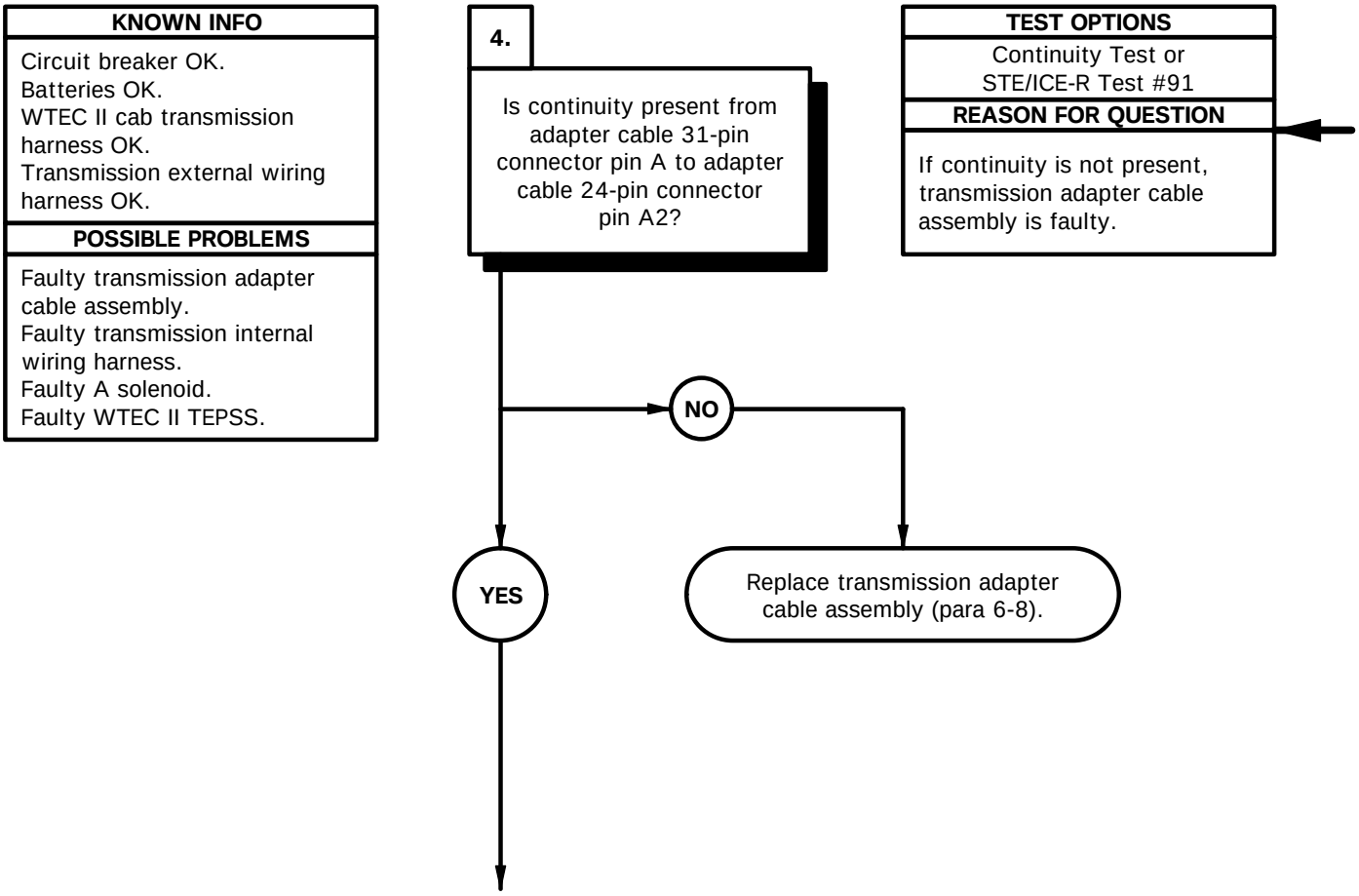
Use care when disconnecting transmission adapter cable connectors. Failure to comply may result in damage to equipment.

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).

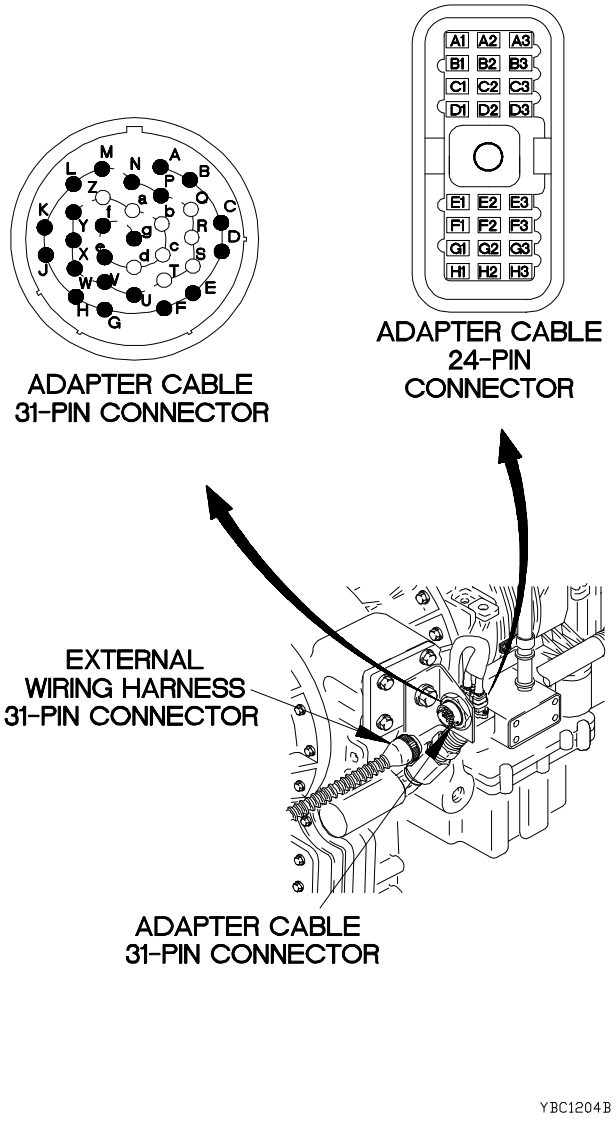


c12. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

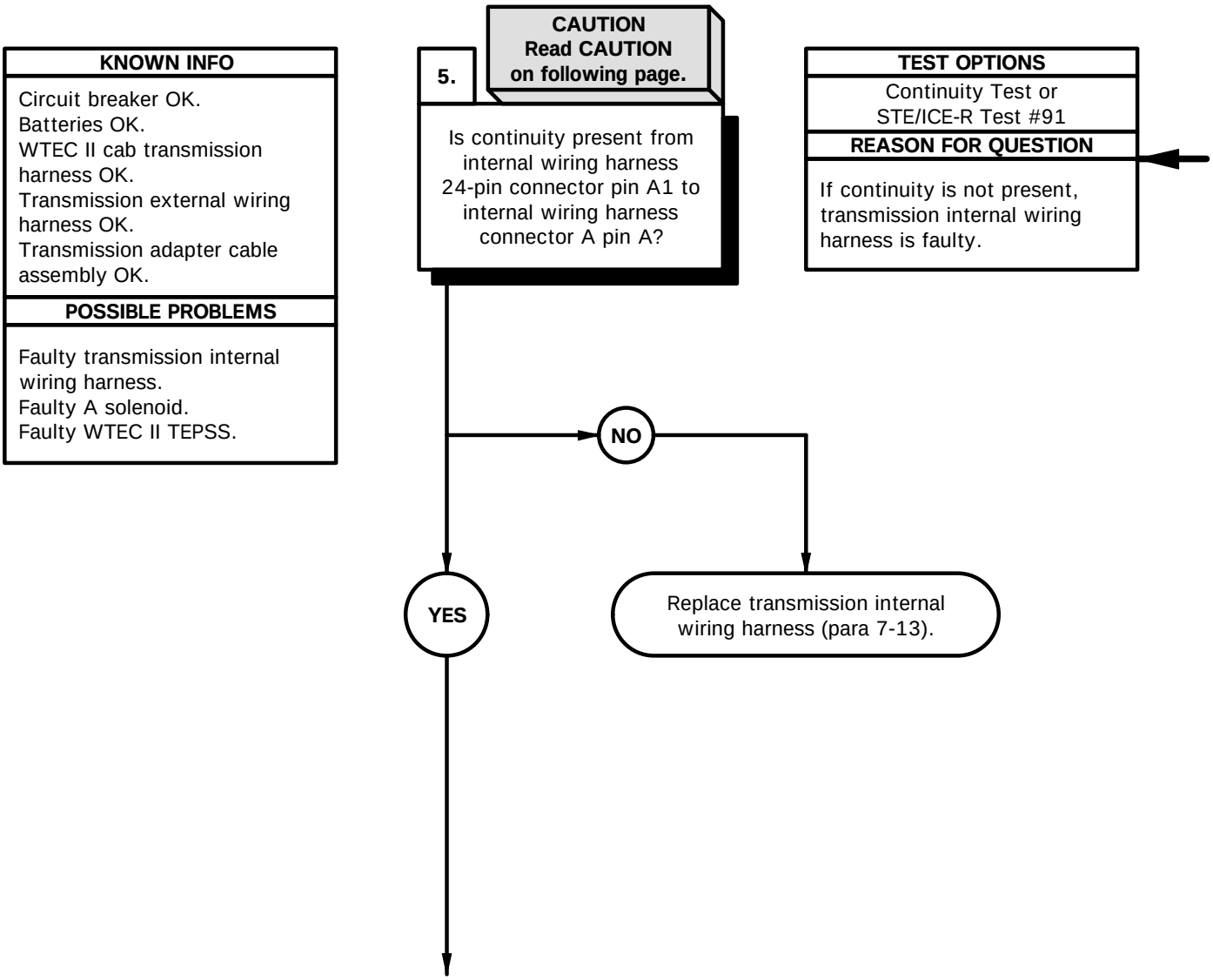


CONTINUITY TEST

(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)

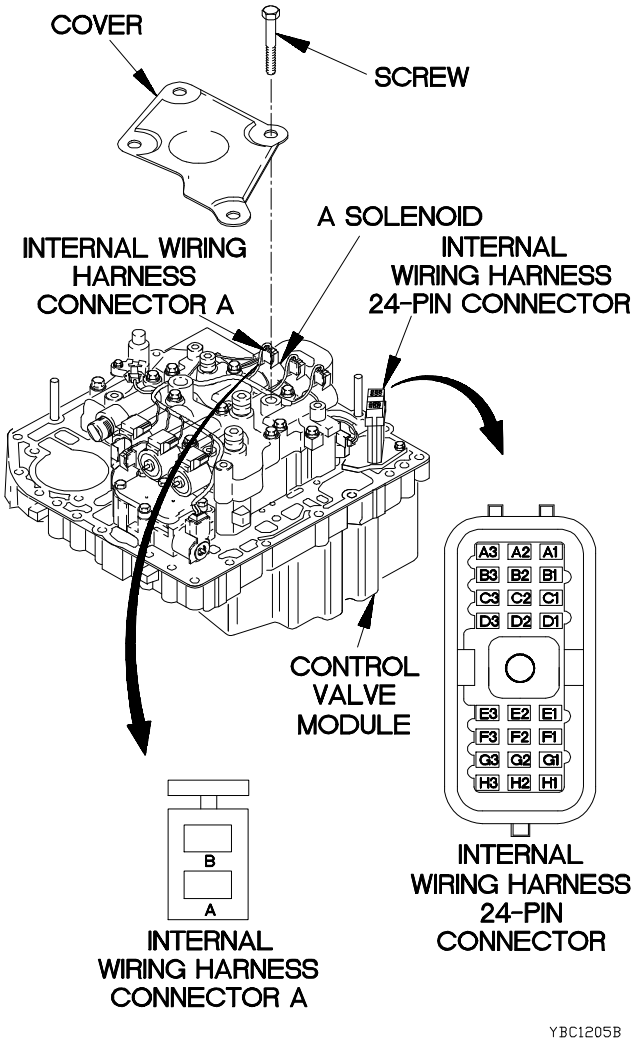


CAUTION

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, 45, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO

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

POSSIBLE PROBLEMS

Faulty transmission internal wiring harness.
Faulty A solenoid.
Faulty WTEC II TEPSS.

6.

Is continuity present from internal wiring harness 24-pin connector pin A2 to internal wiring harness connector A pin B?

TEST OPTIONS

Continuity Test or
STE/ICE-R Test #91

REASON FOR QUESTION

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

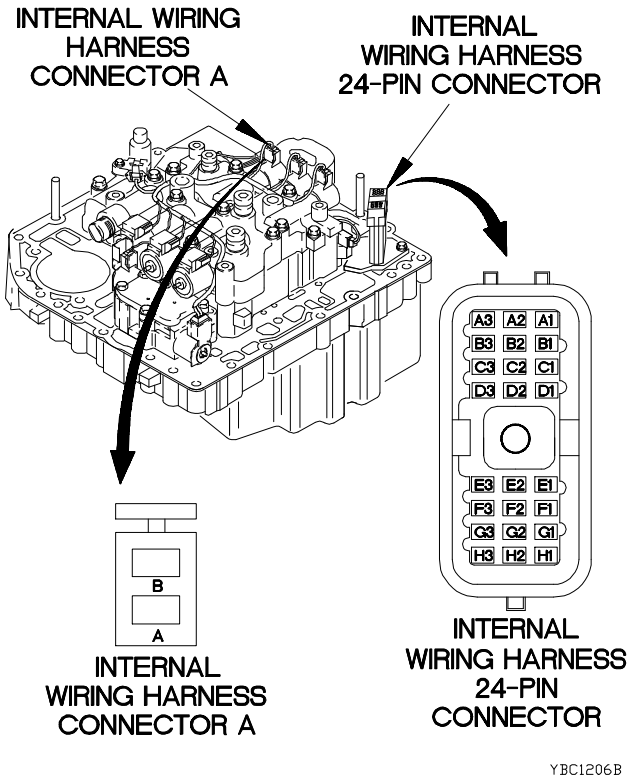
NO

YES

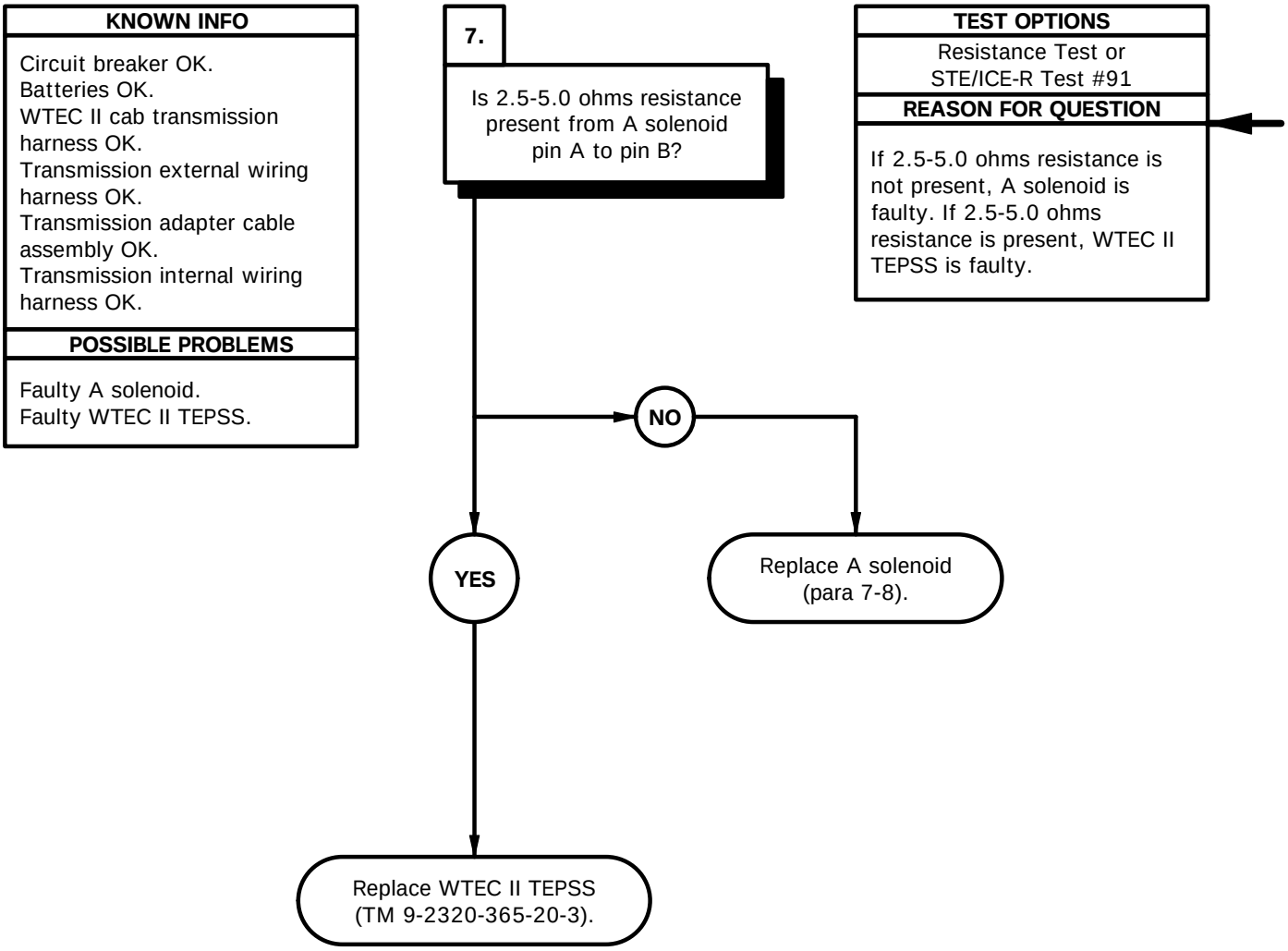
Replace transmission internal wiring harness (para 7-13).

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).

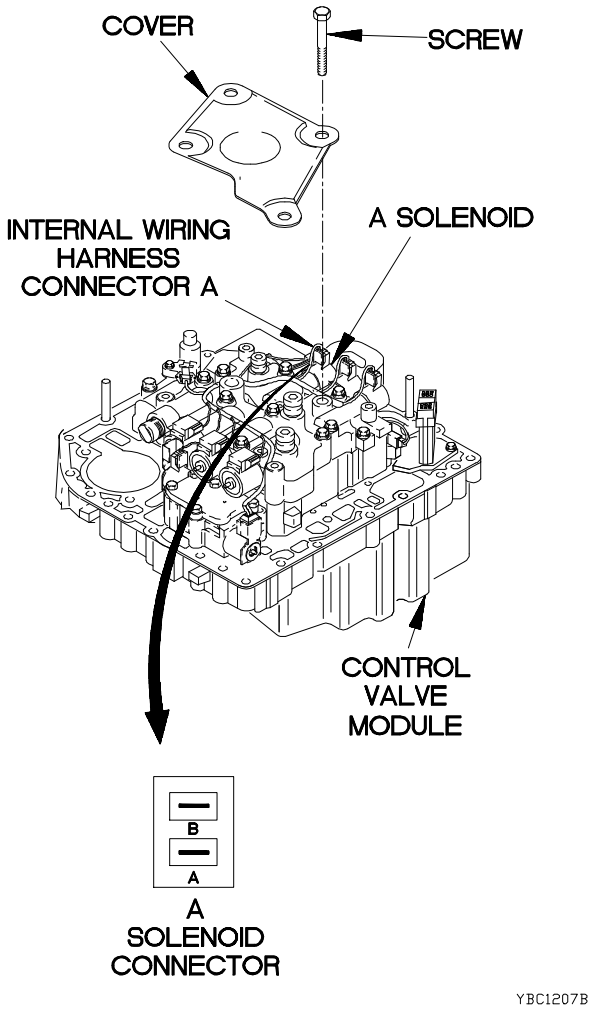


c12. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

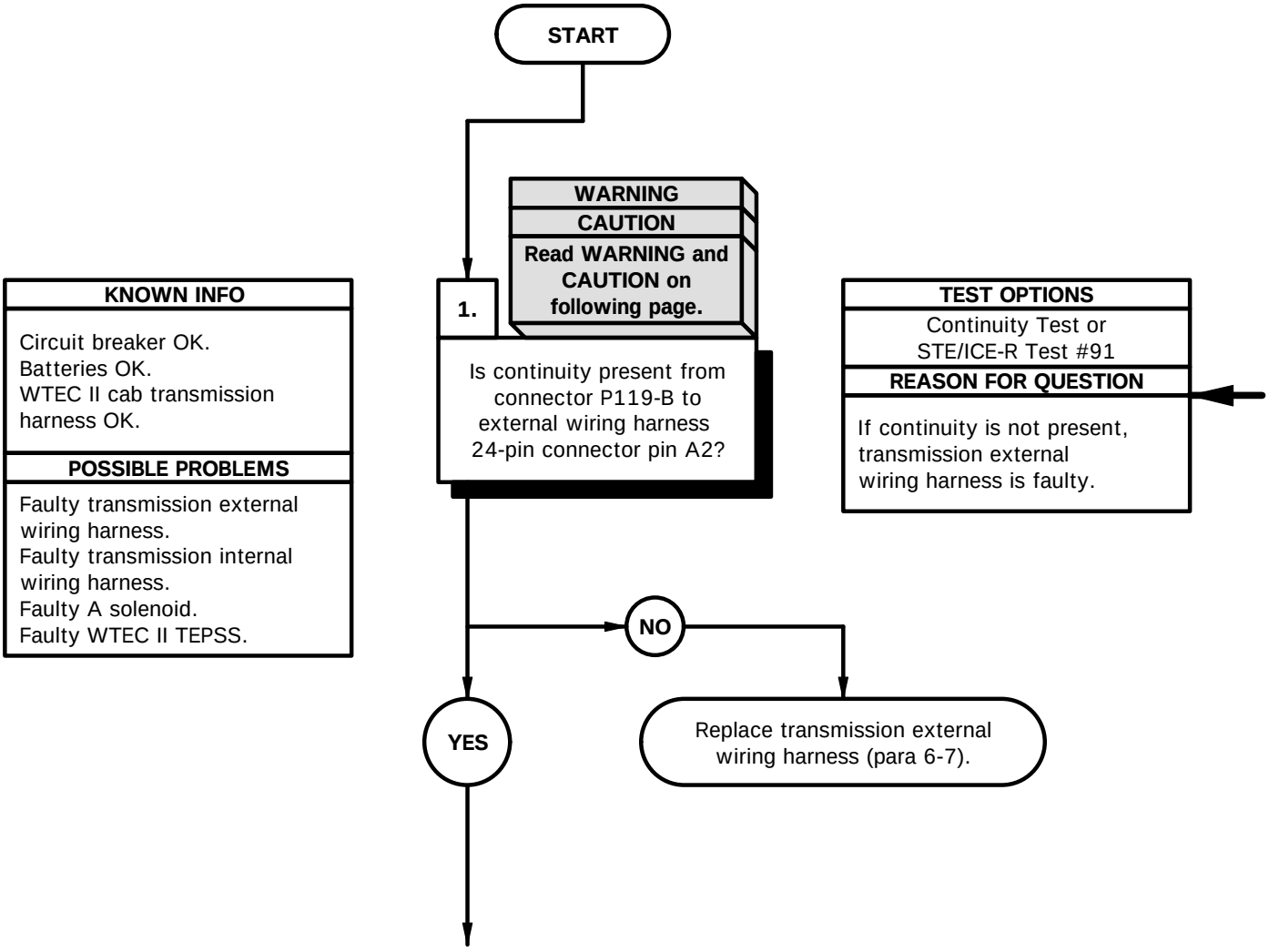
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

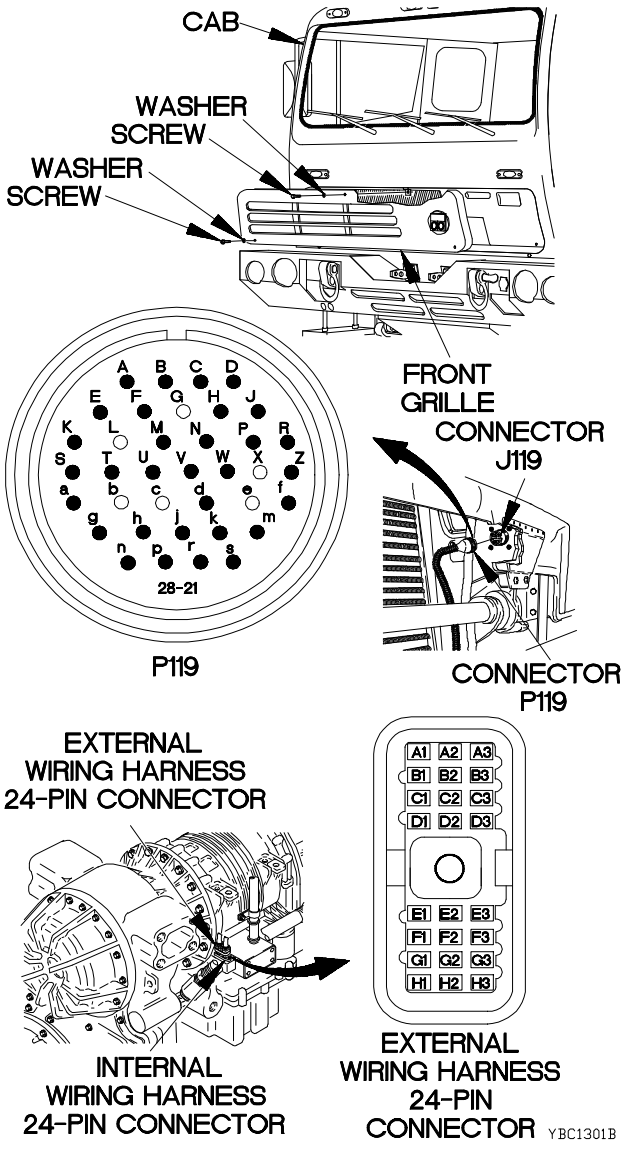
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

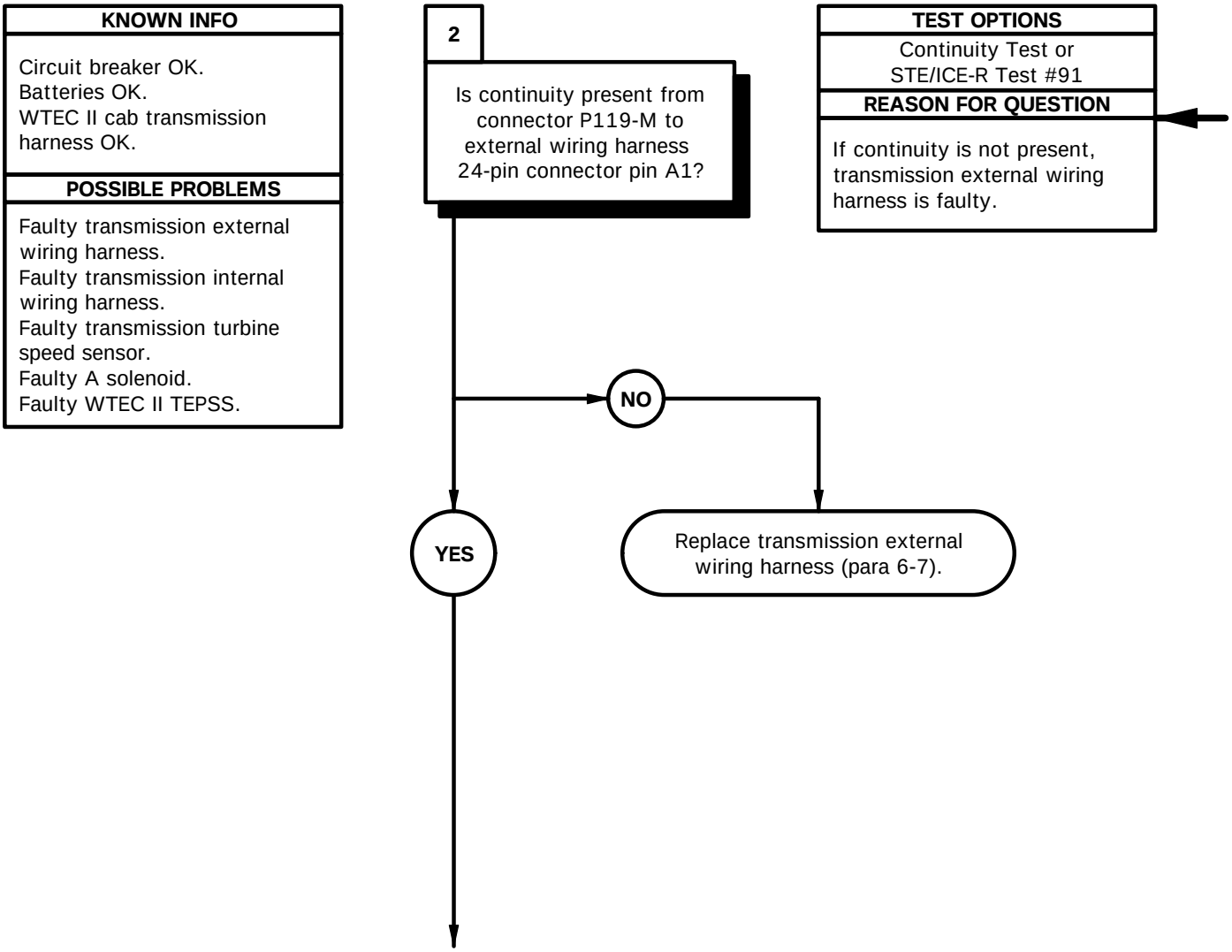
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Loosen screw in external wiring harness 24-pin connector.
(6) Disconnect external wiring harness 24-pin connector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

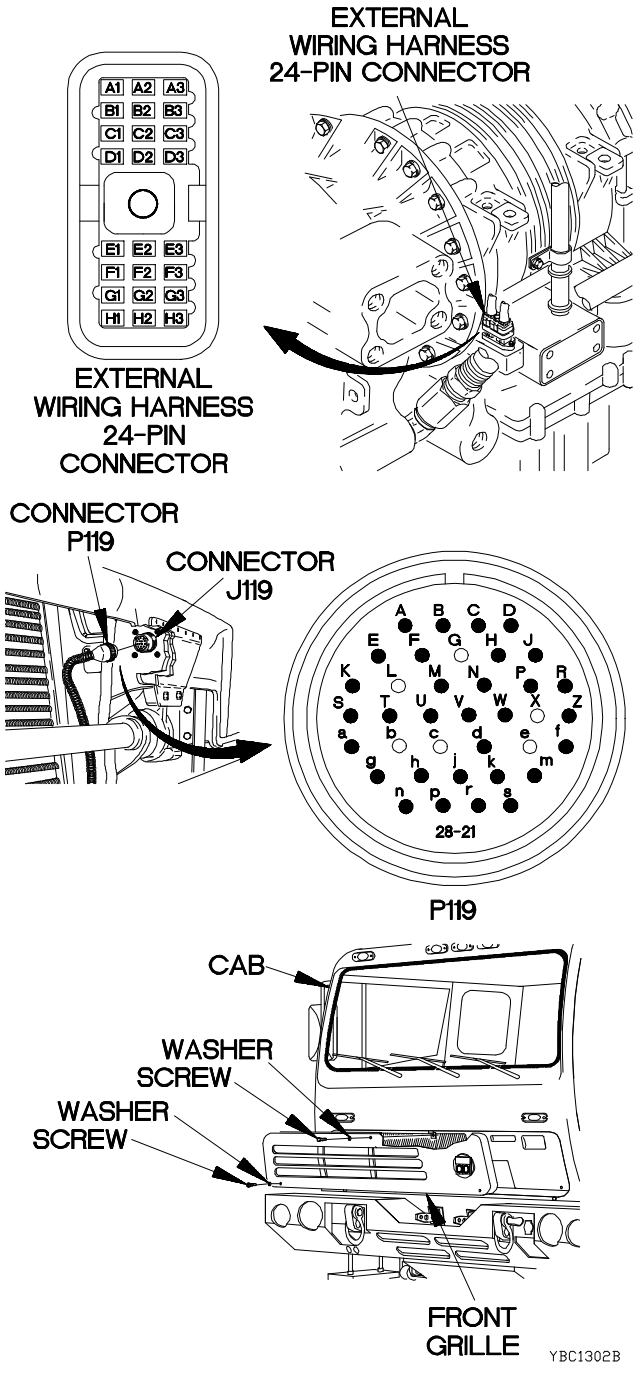


c13. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

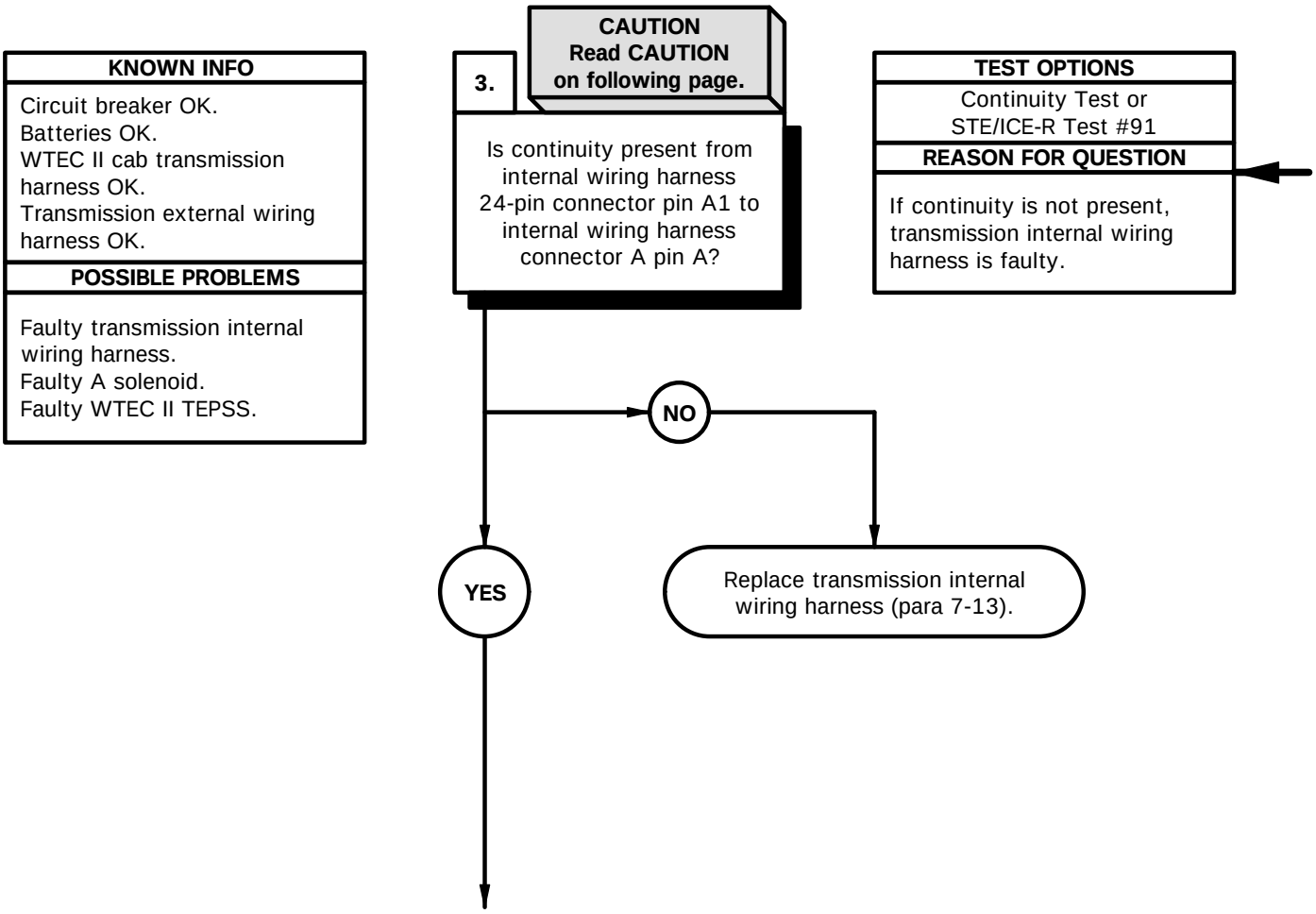


CONTINUITY TEST

(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)

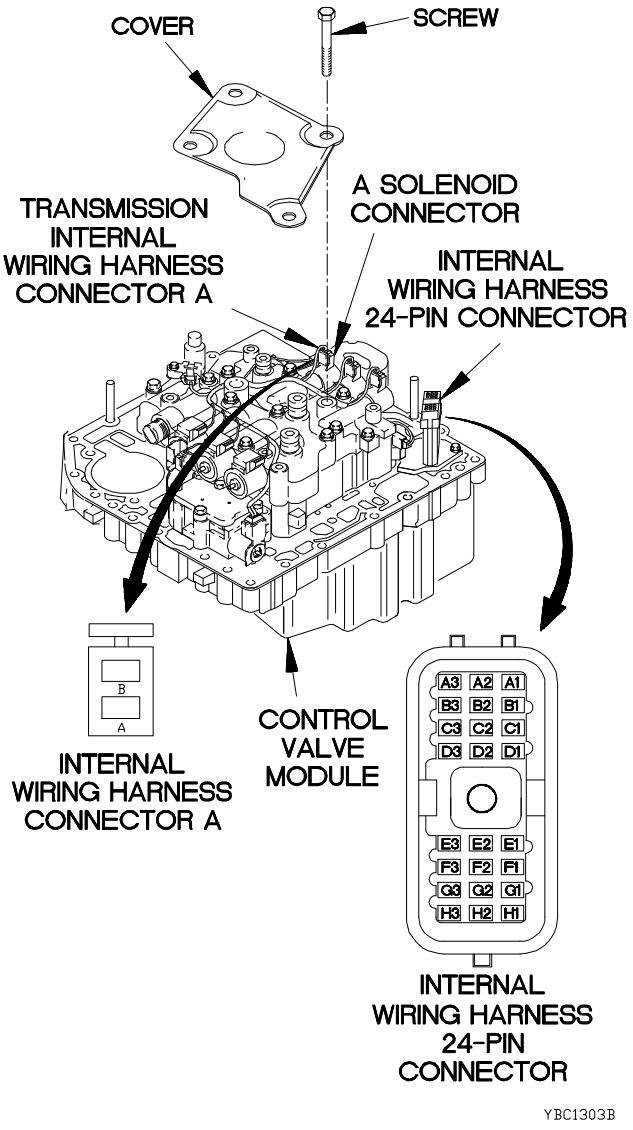


CAUTION

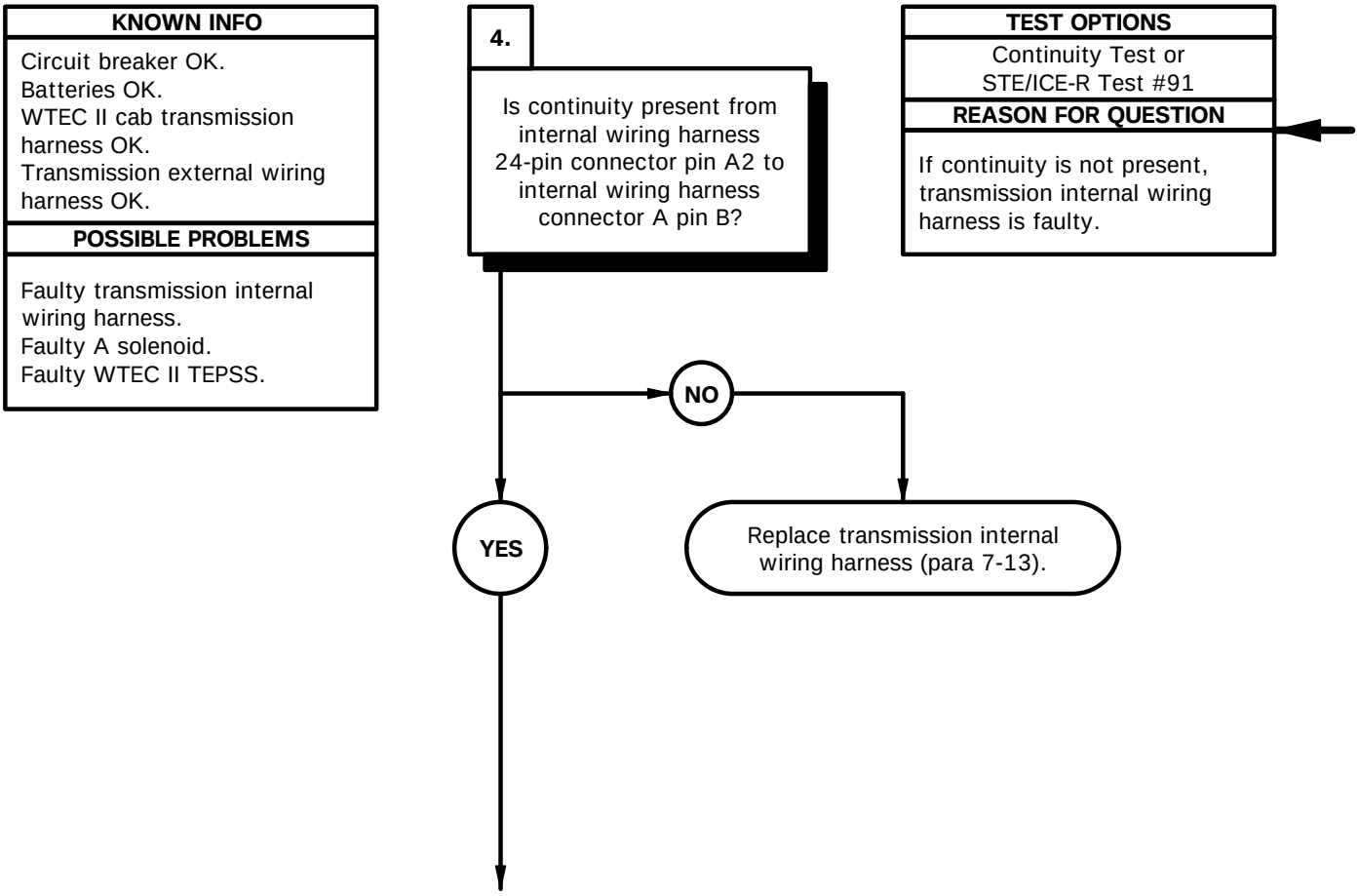
Use care when disconnecting transmission internal wiring harness connectors. Failure to comply may result in damage to equipment.

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).

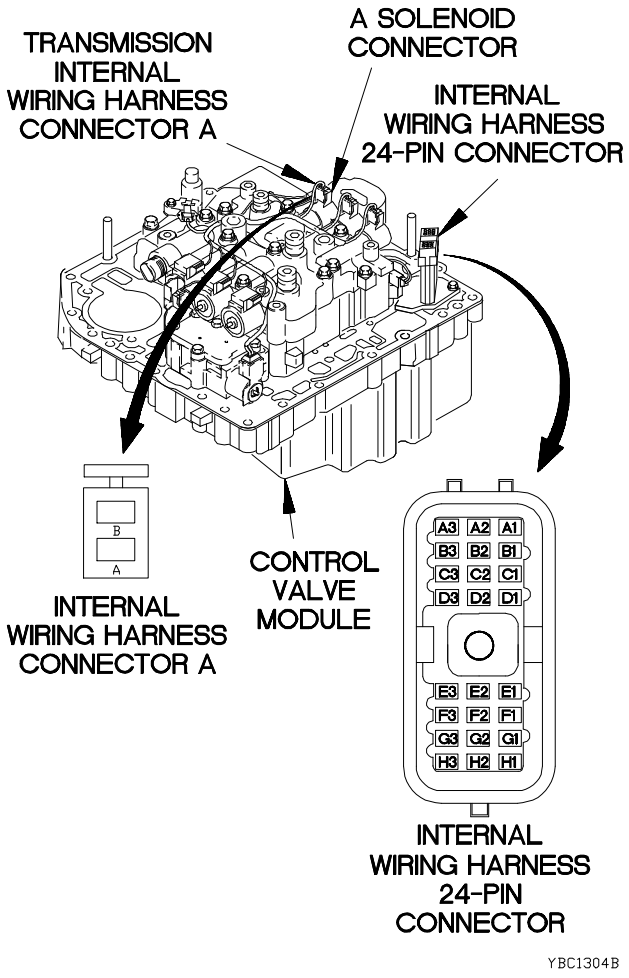


c13. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

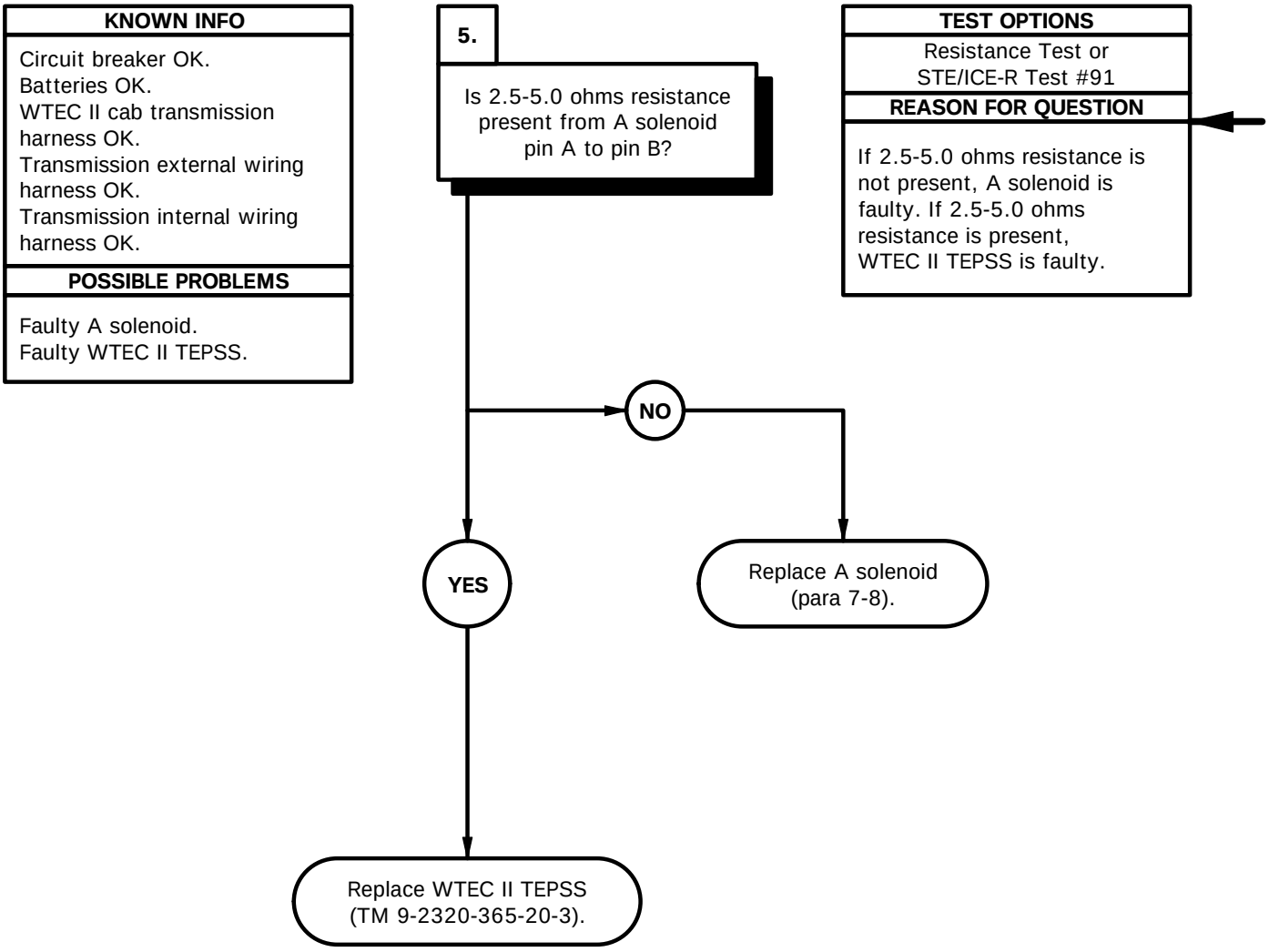


CONTINUITY TEST

(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).

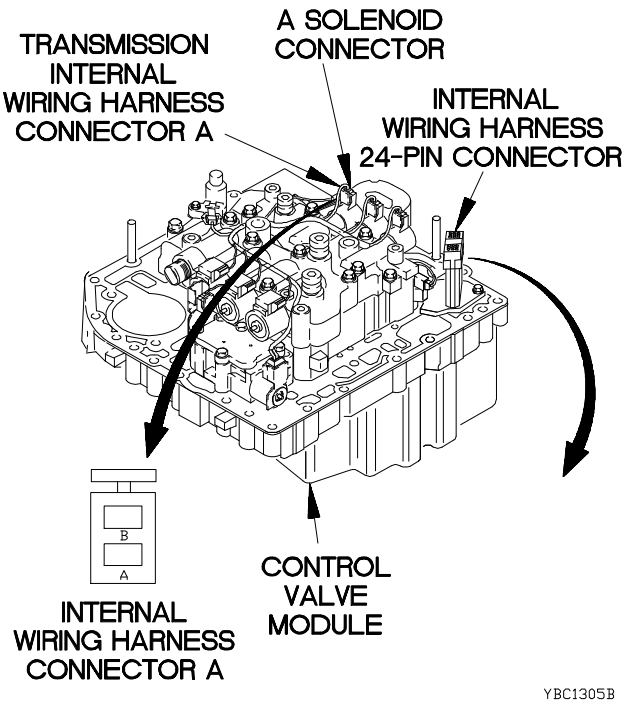


c13. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)



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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

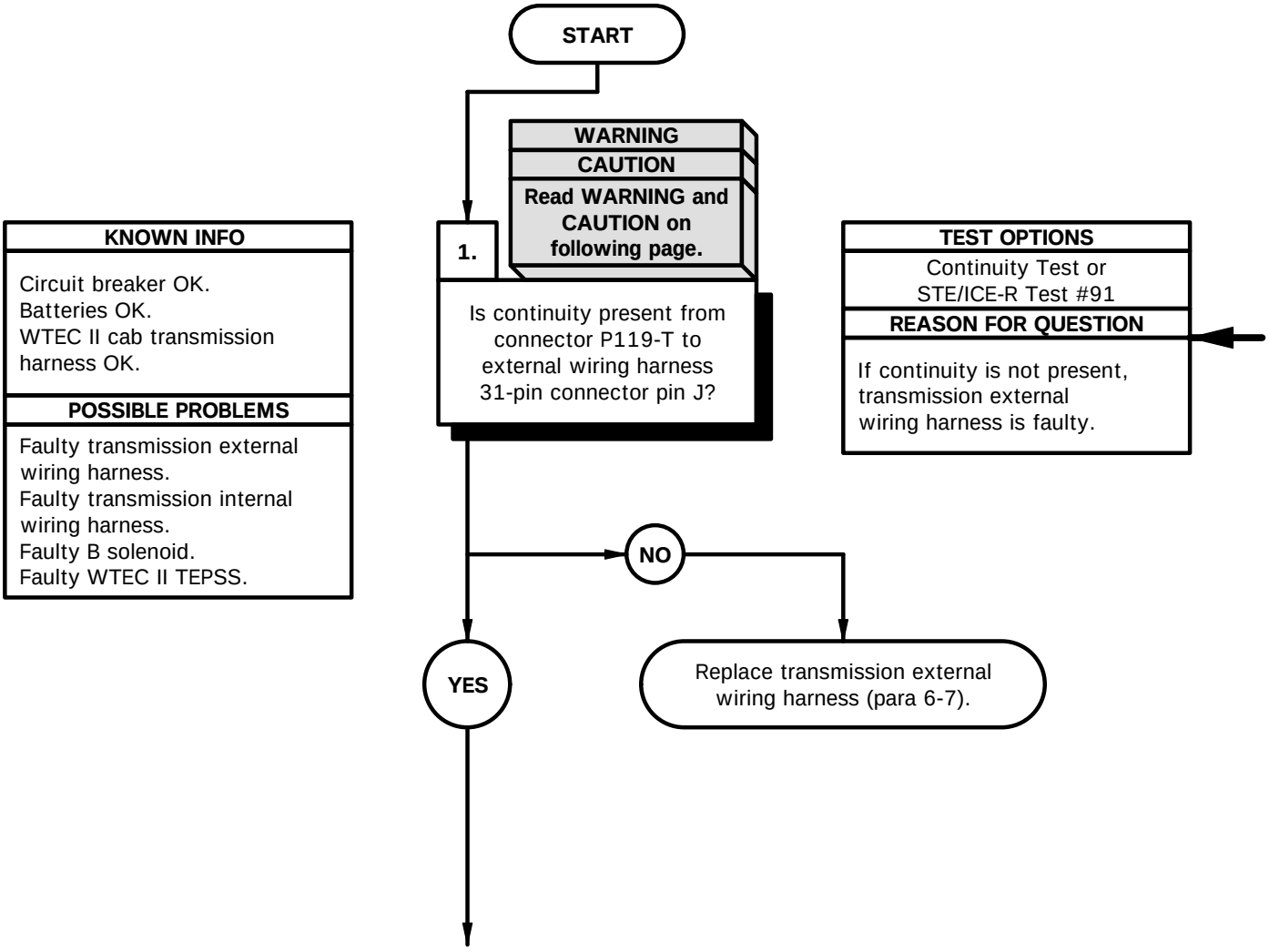
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

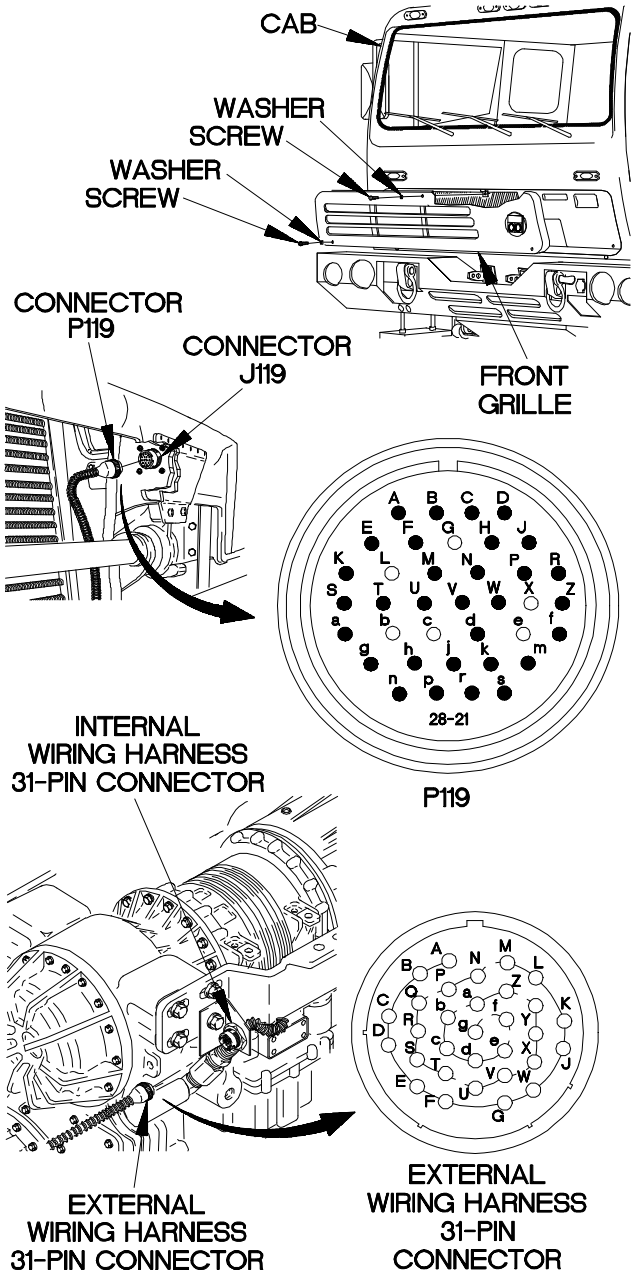
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

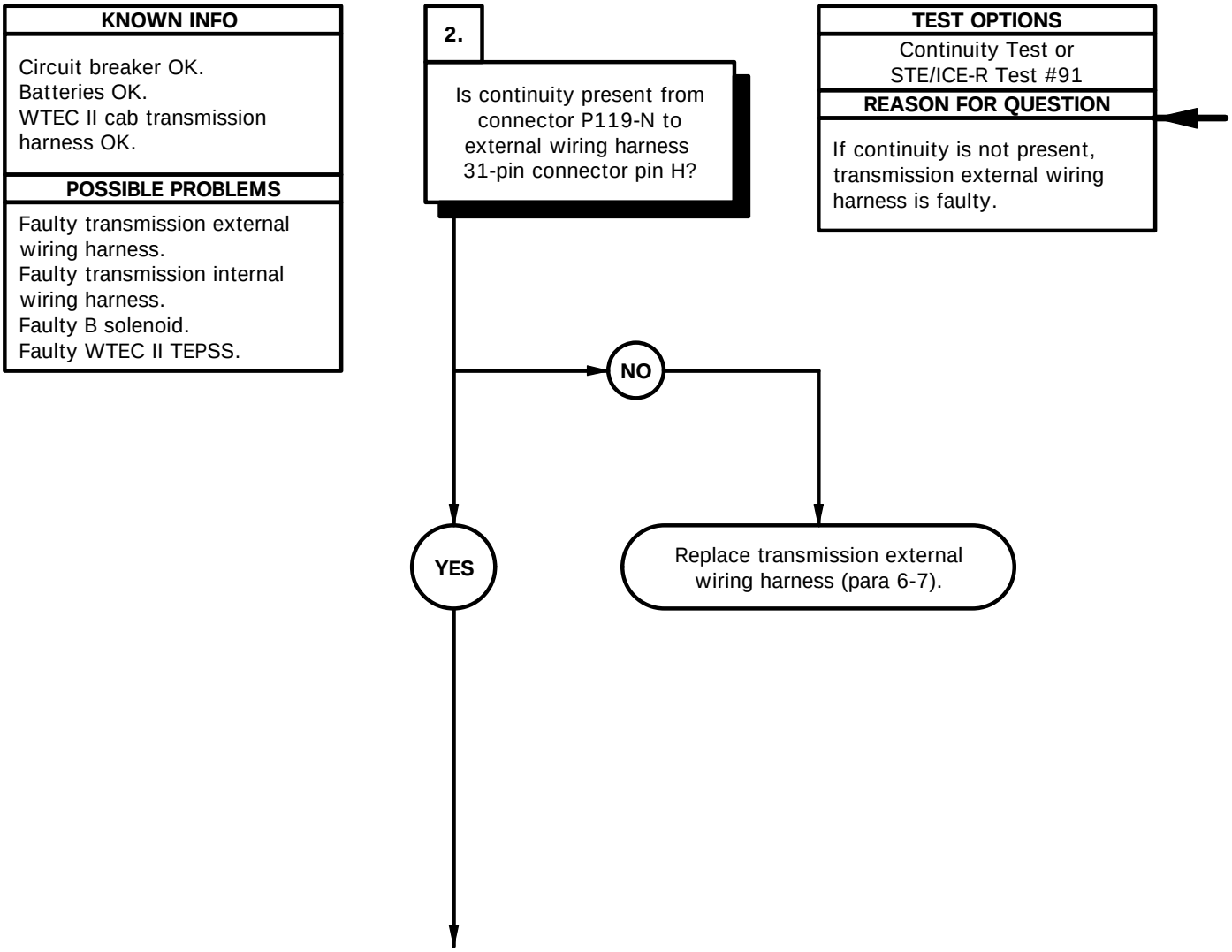
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin from internal wiring harness 31-pin connector.
(6) Set multimeter to ohms.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

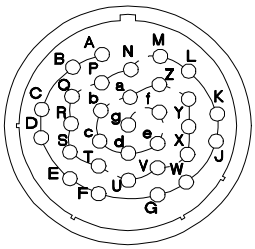


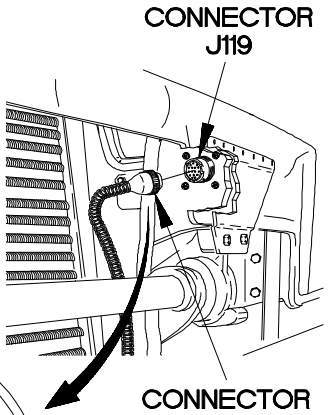
c14. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

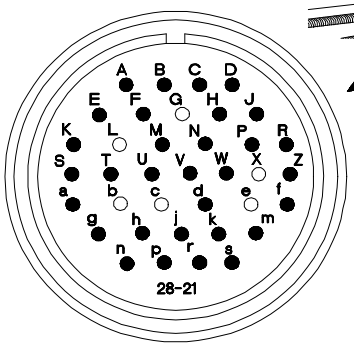


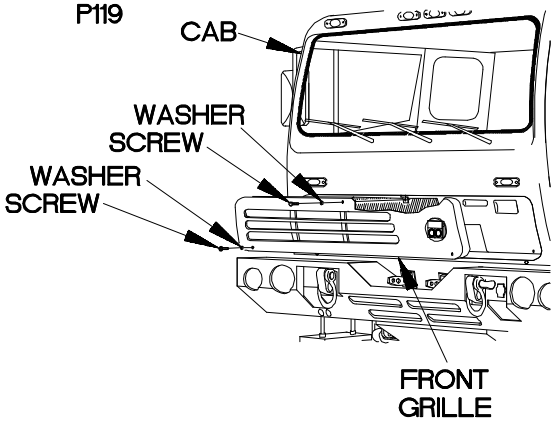
CONTINUITY TEST

(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).

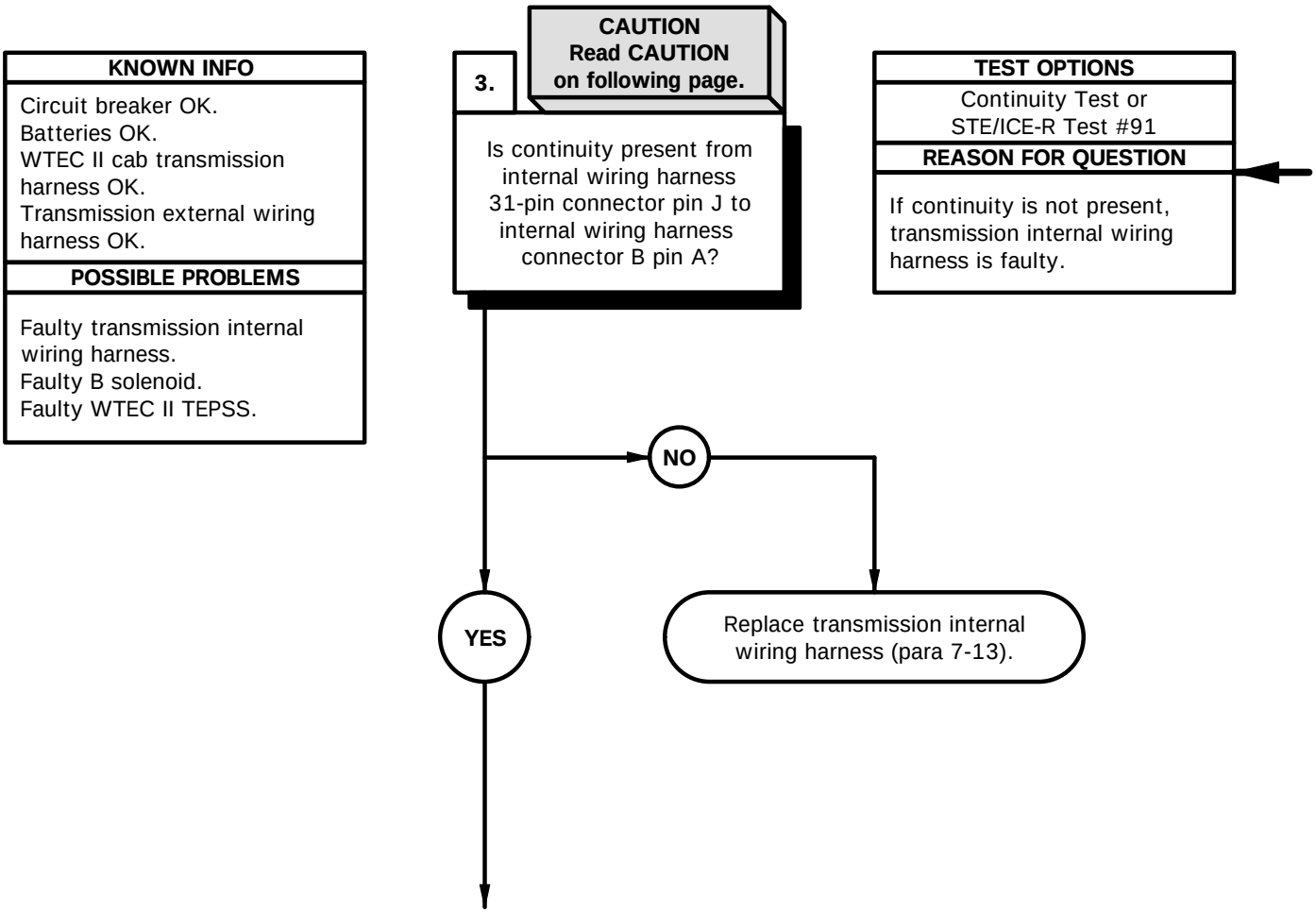








c14. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

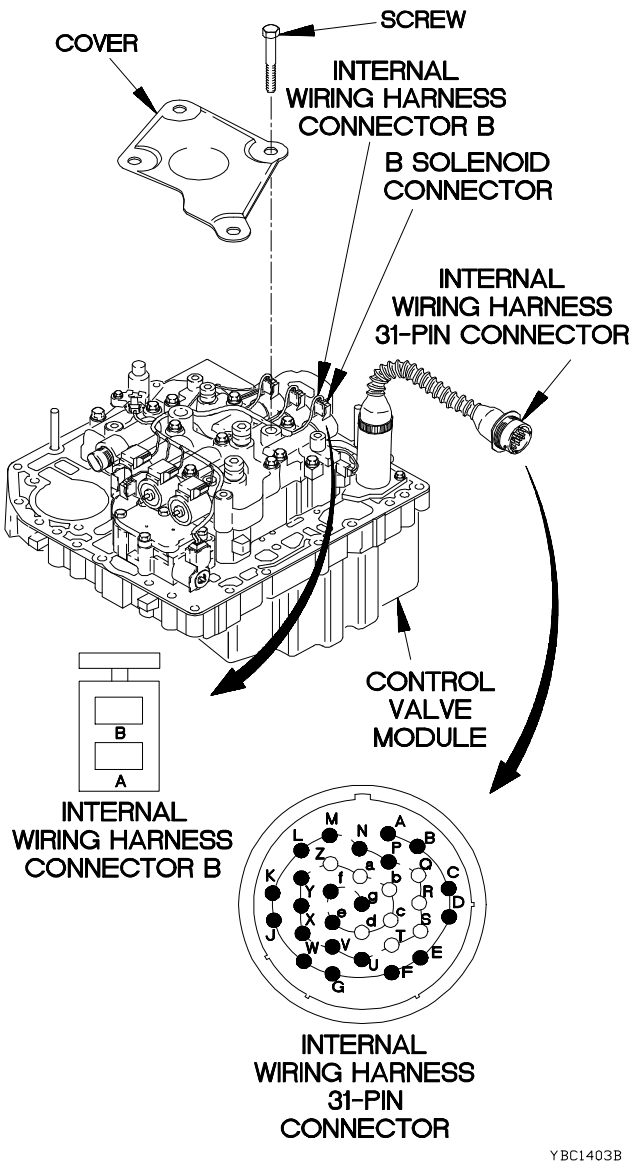


CAUTION

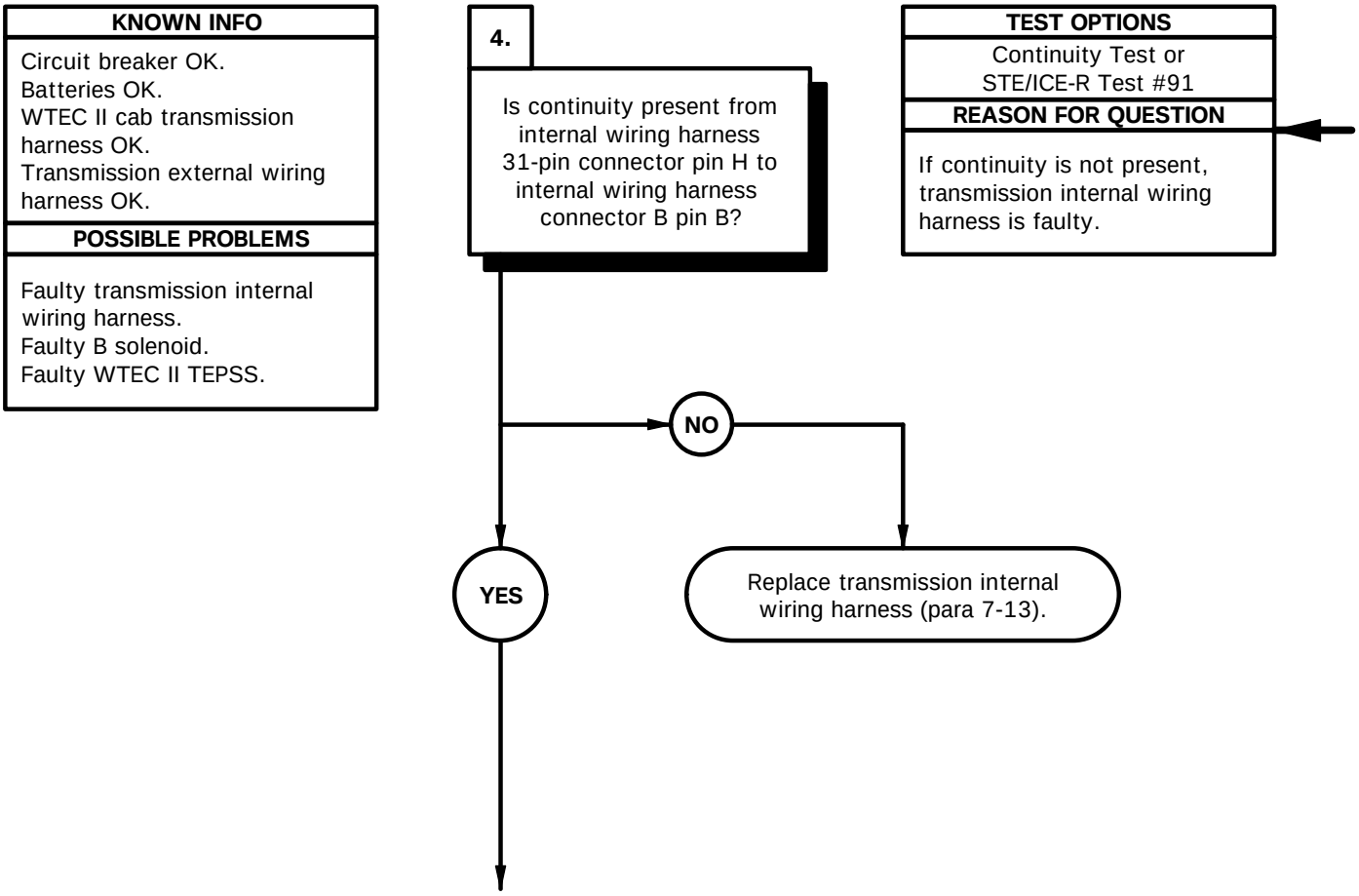
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

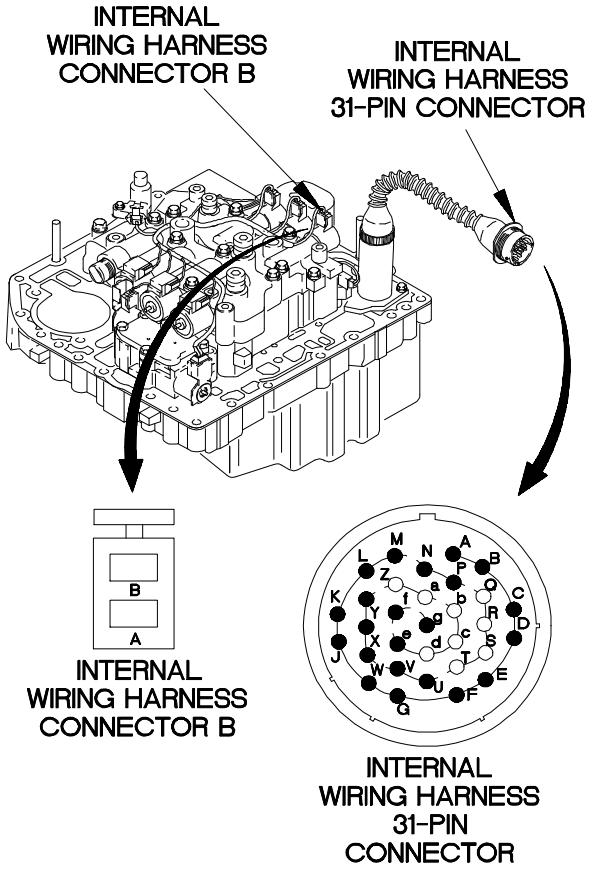


c14. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

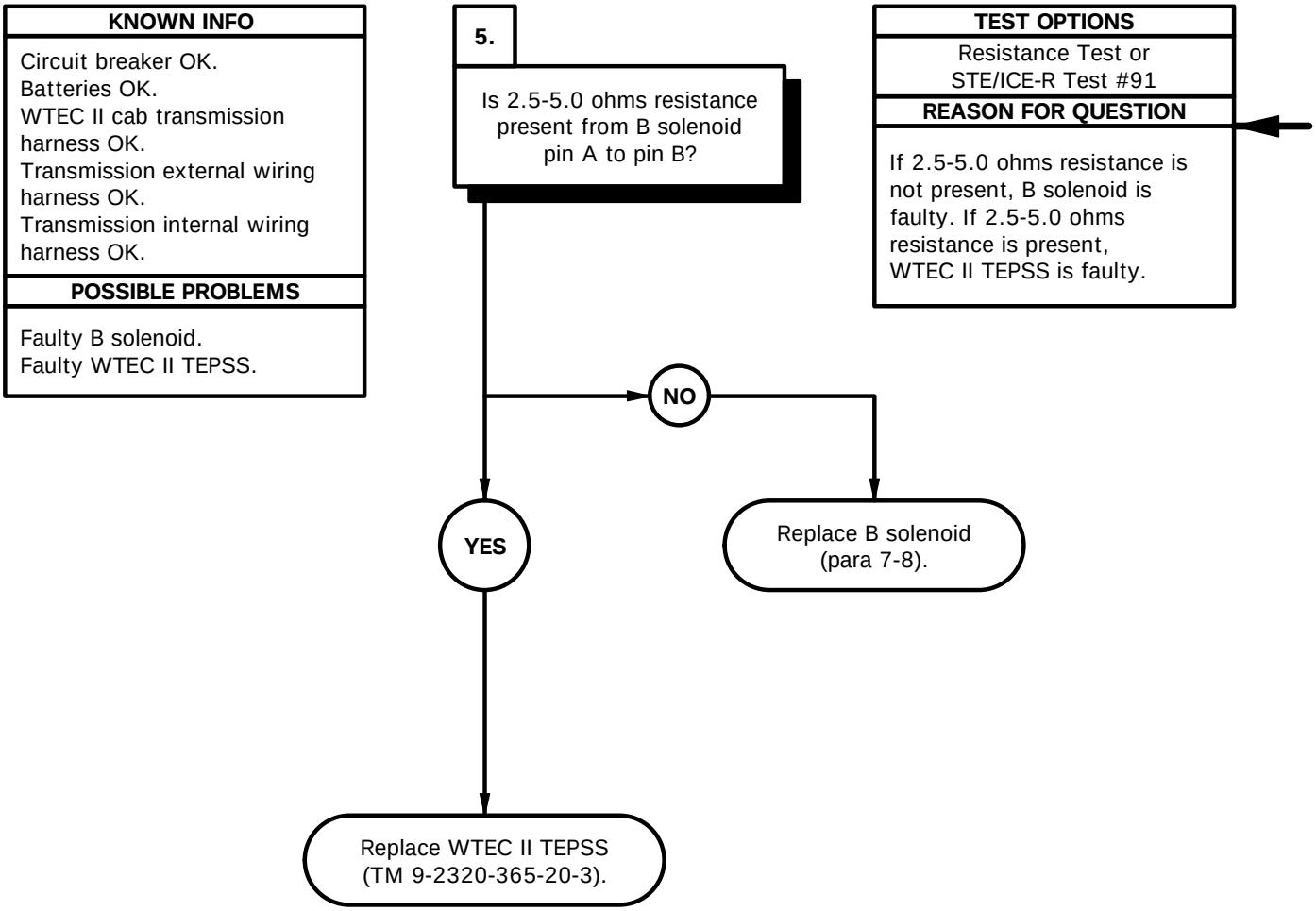


CONTINUITY TEST

(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).

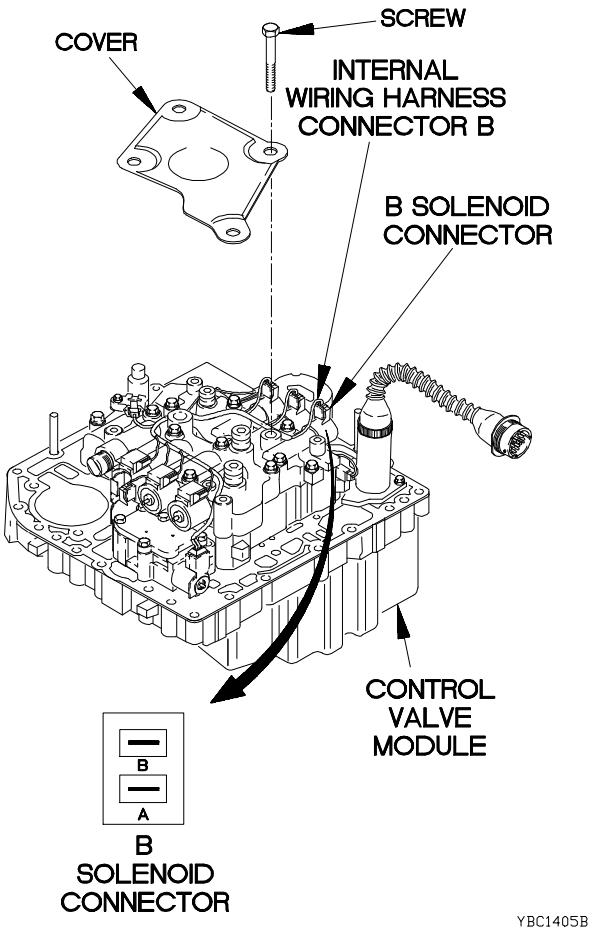


c14. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)

Materials/Parts
Wire, Elect, 50 ft (Item 94, Appendix C)

Personnel Required
(2)

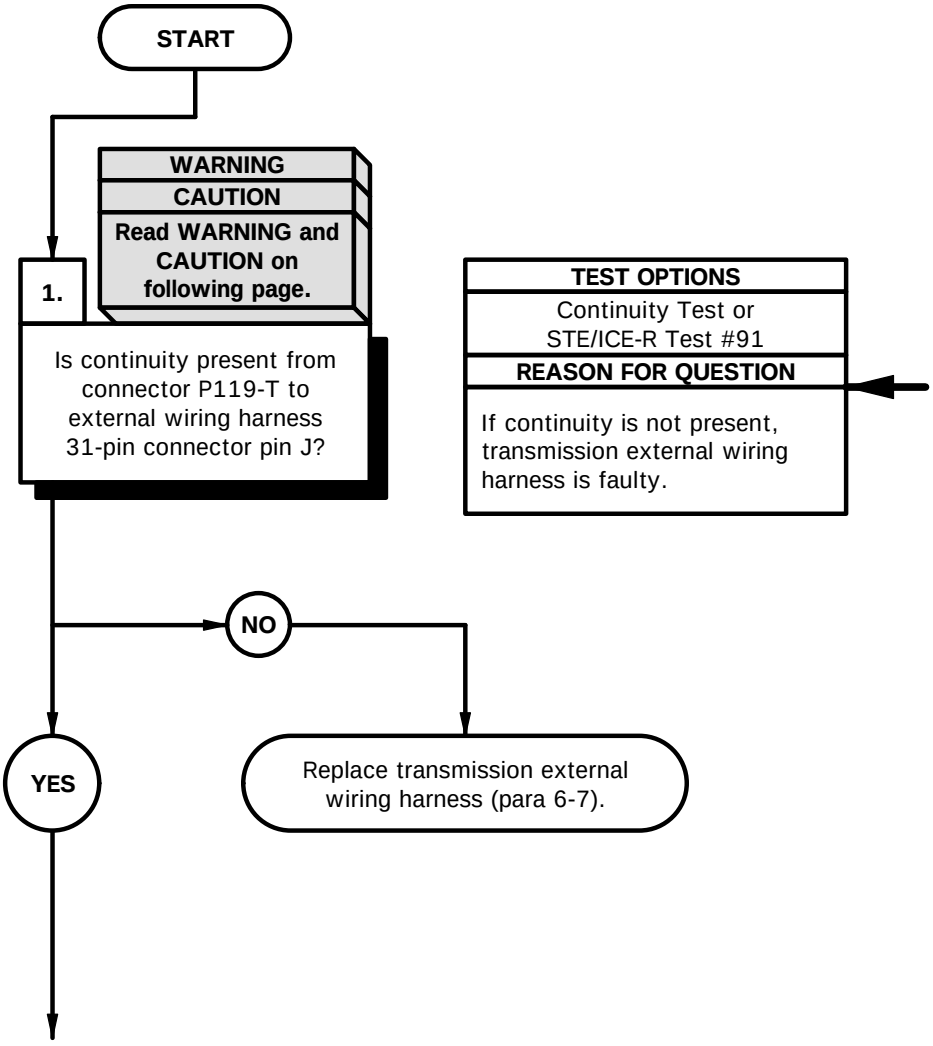
References
TM 9-4910-571-12&P

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 B 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

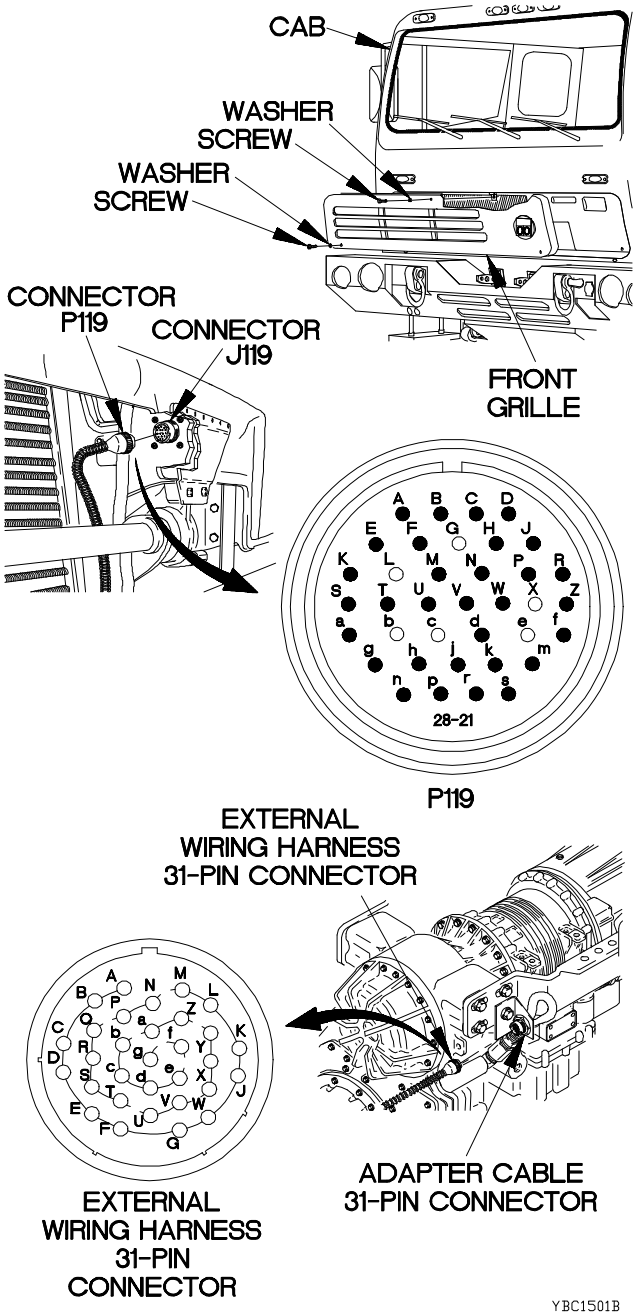
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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) 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).



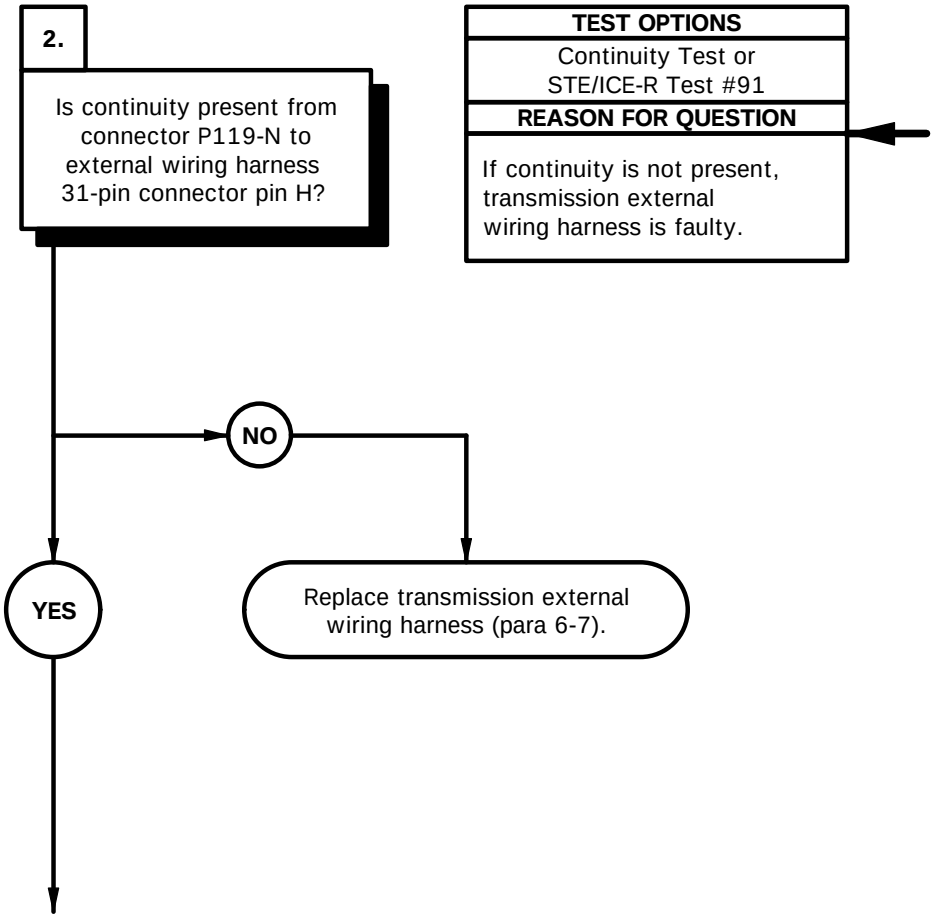
c15. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

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

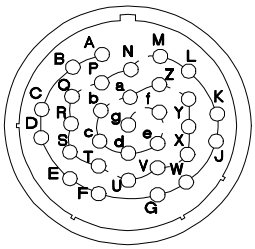
Continuity Test or
STE/ICE-R Test #91

REASON FOR QUESTION

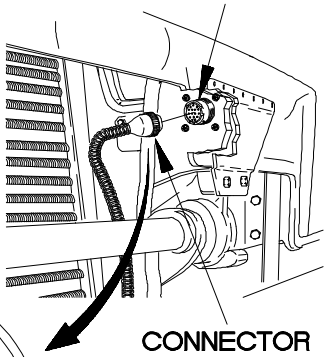
If continuity is not present, transmission external wiring harness is faulty.

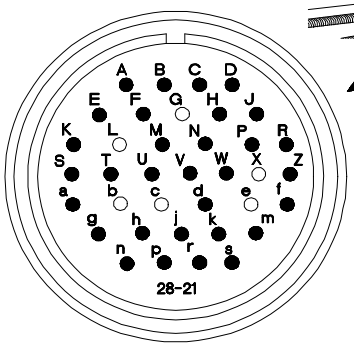
CONTINUITY TEST

(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).

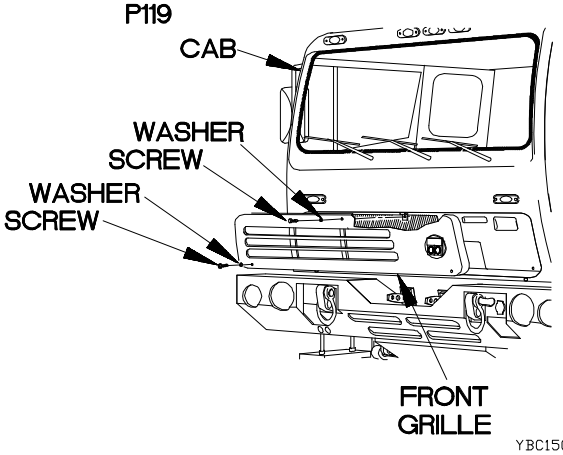


EXTERNAL WIRING HARNESS 31-PIN CONNECTOR

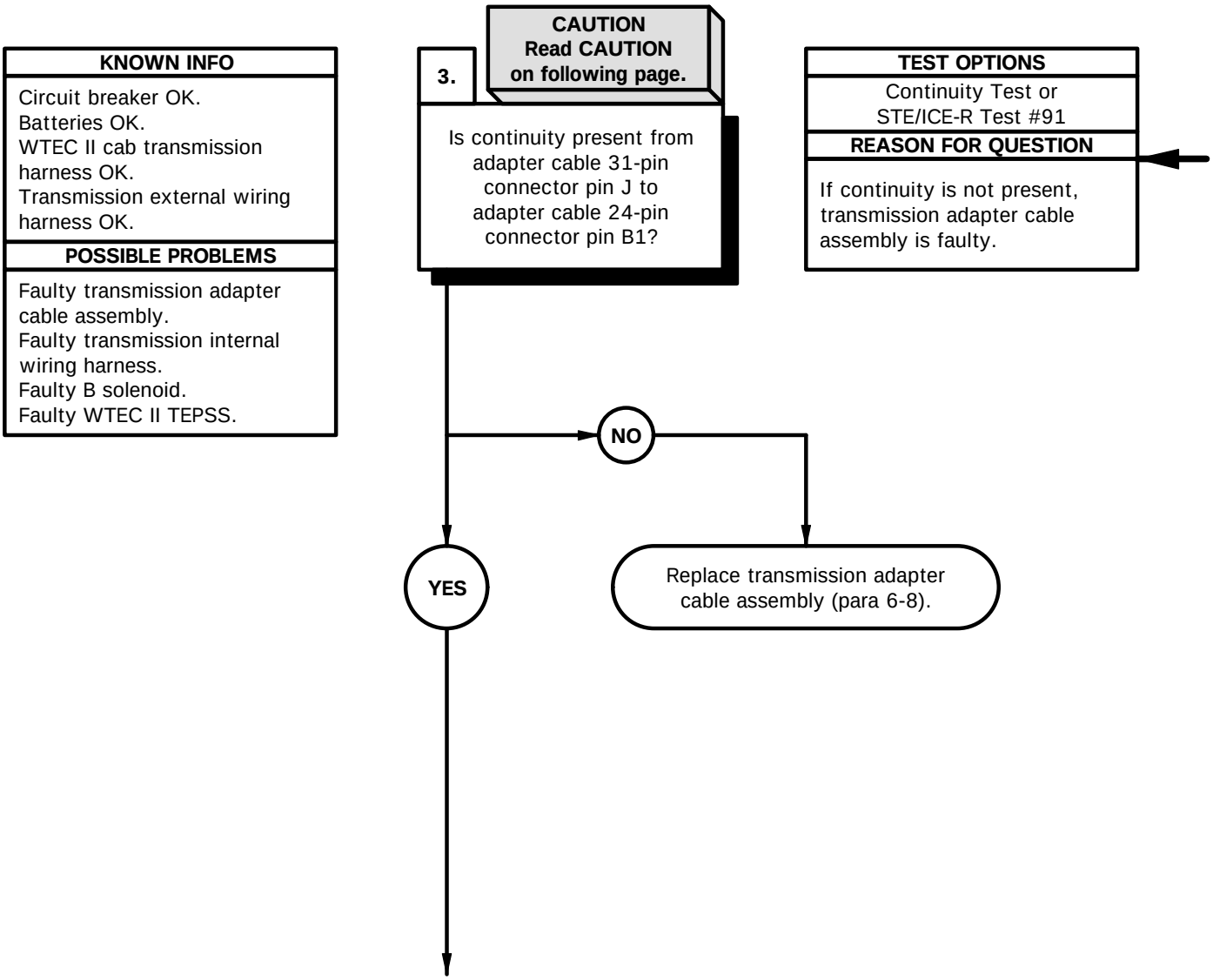




P119



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)

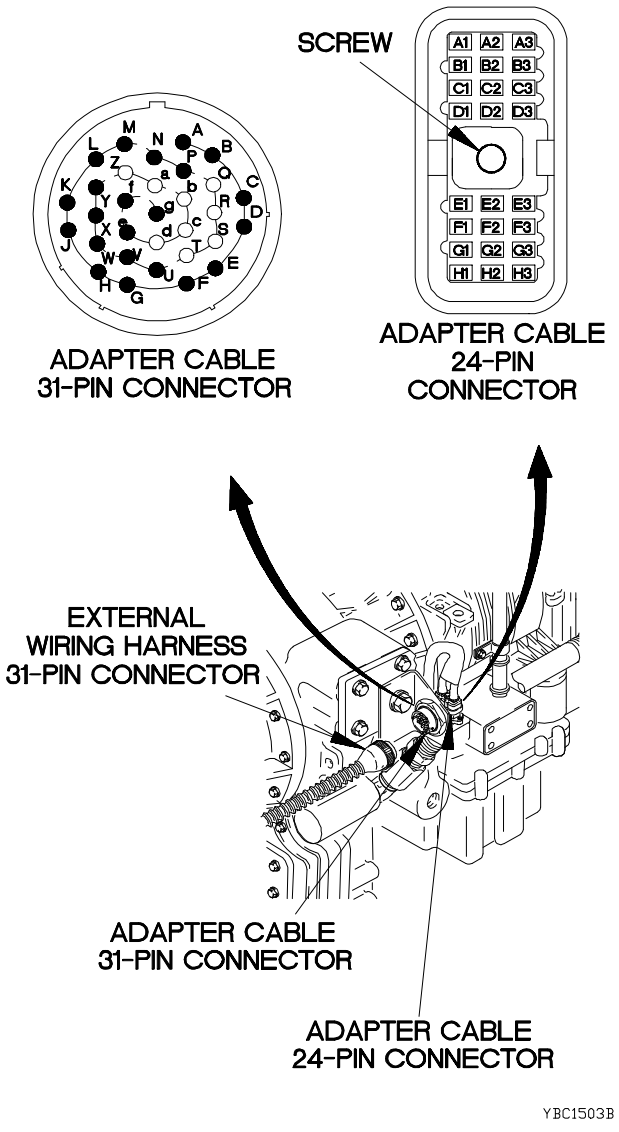


CAUTION

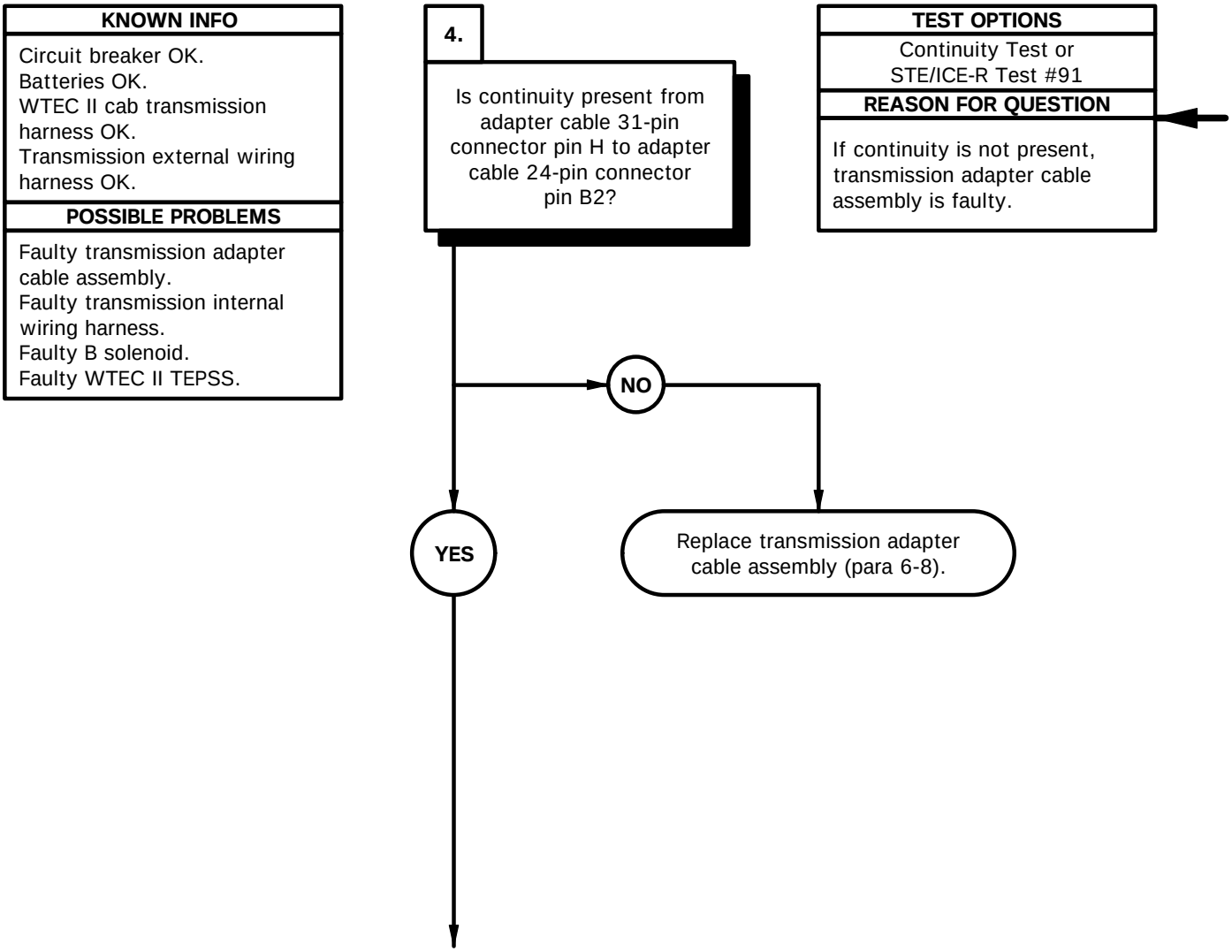
Use care when disconnecting adapter cable connectors. Failure to comply may result in damage to equipment.

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).

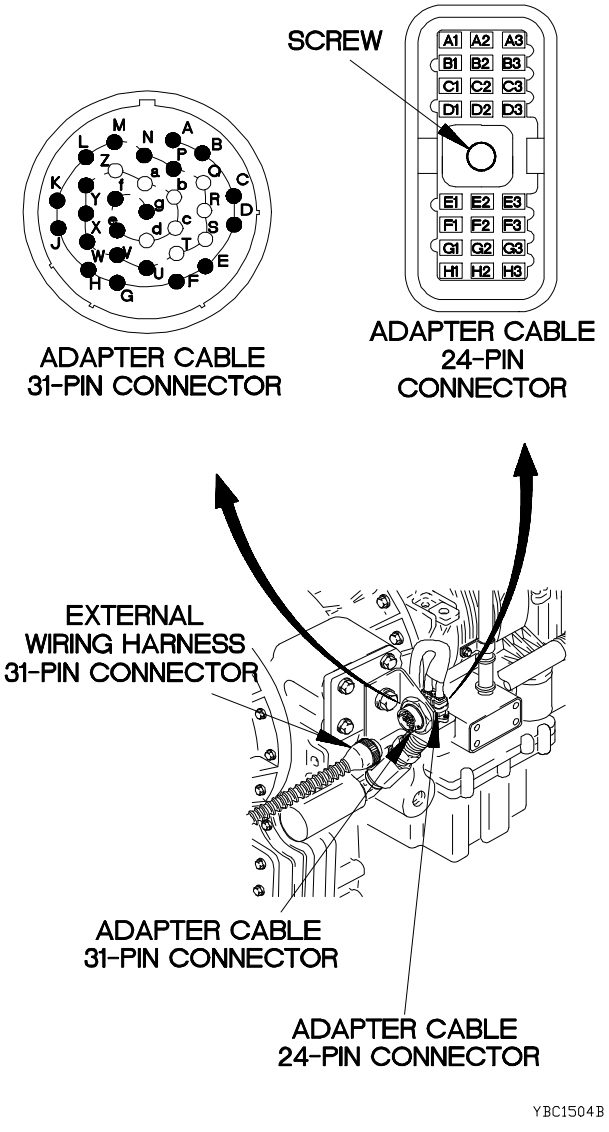


c15. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

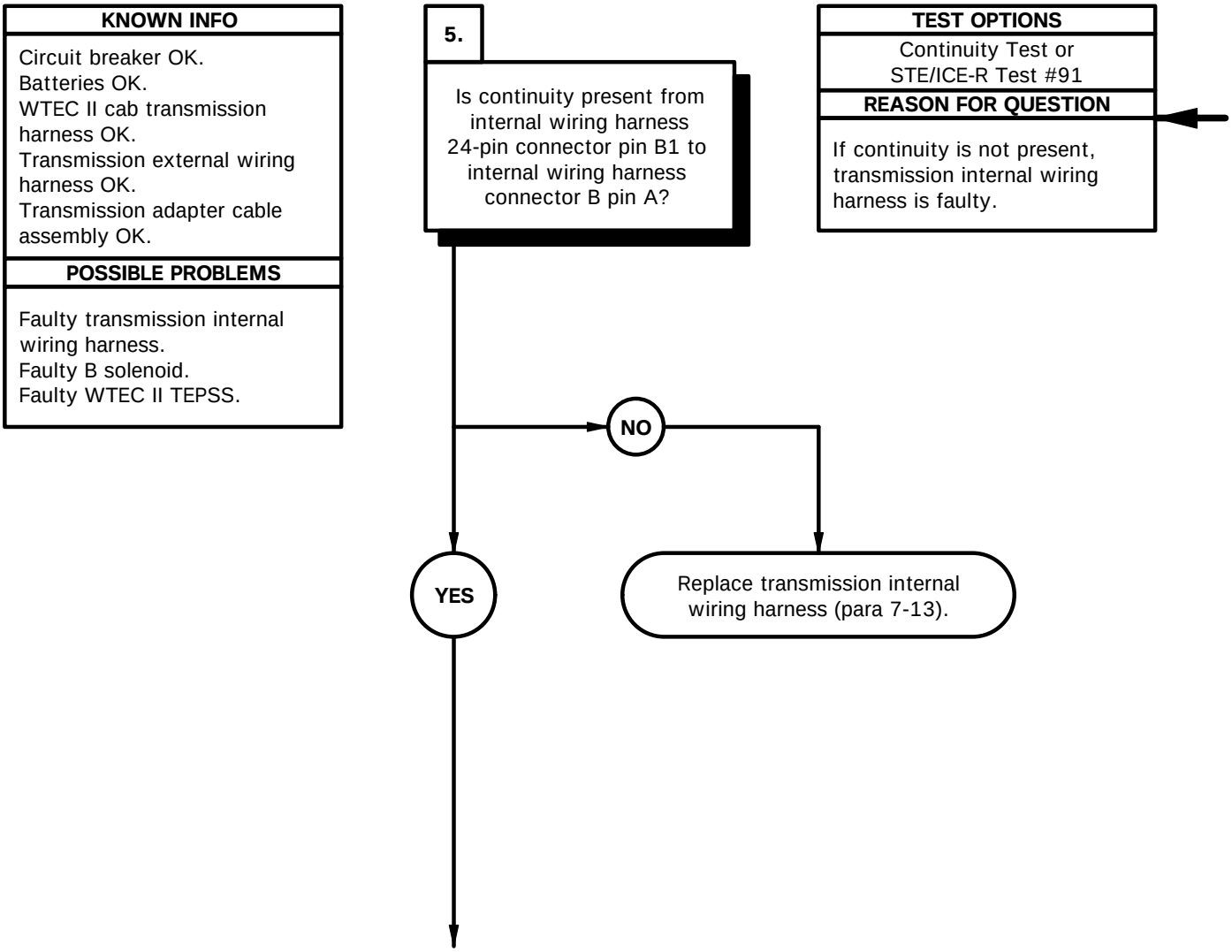


CONTINUITY TEST

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

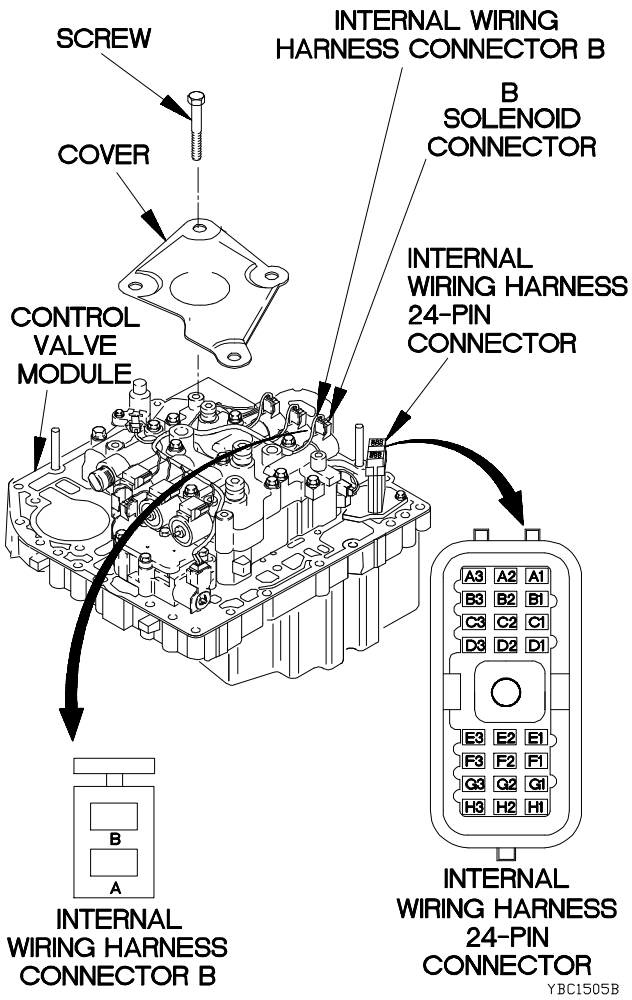


c15. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

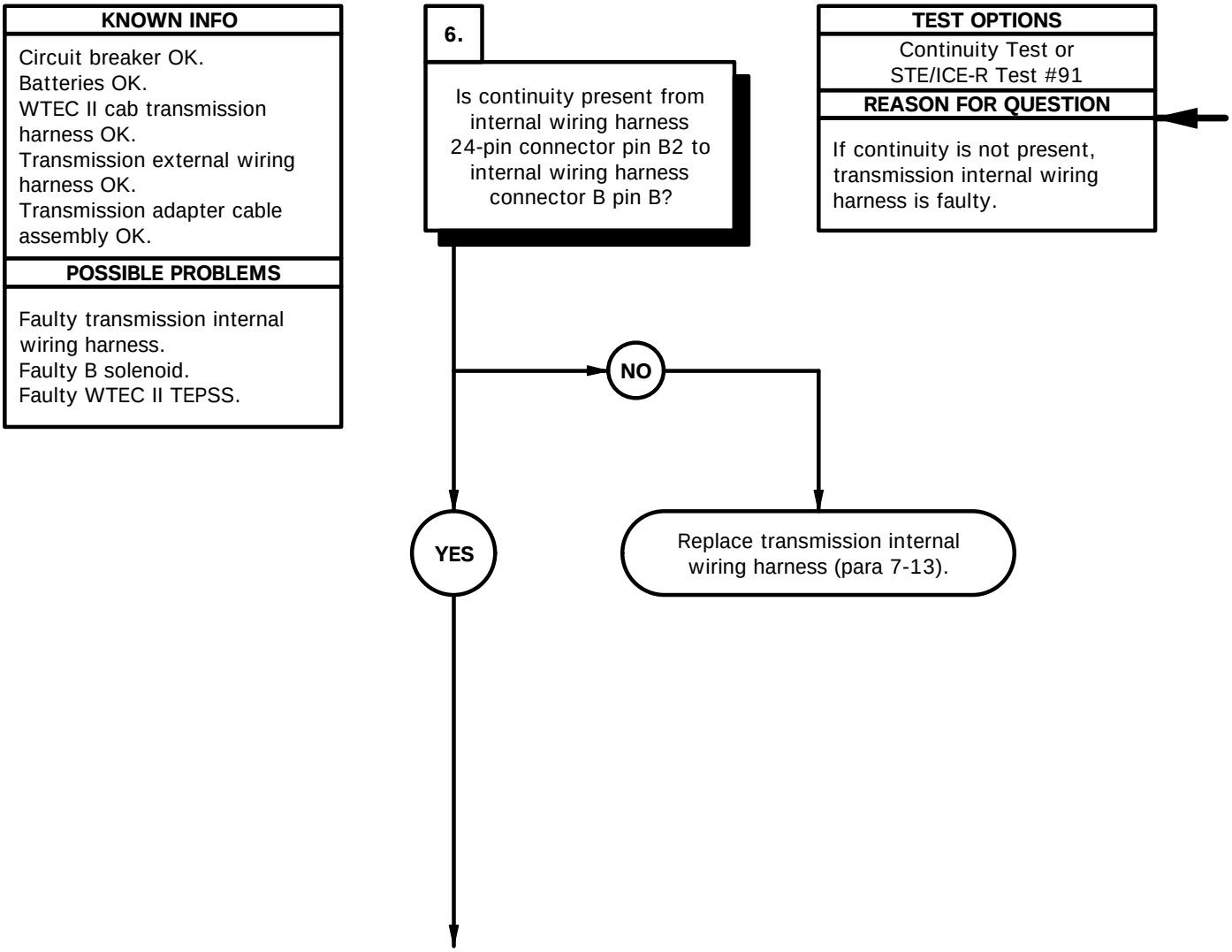


CONTINUITY TEST

(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).

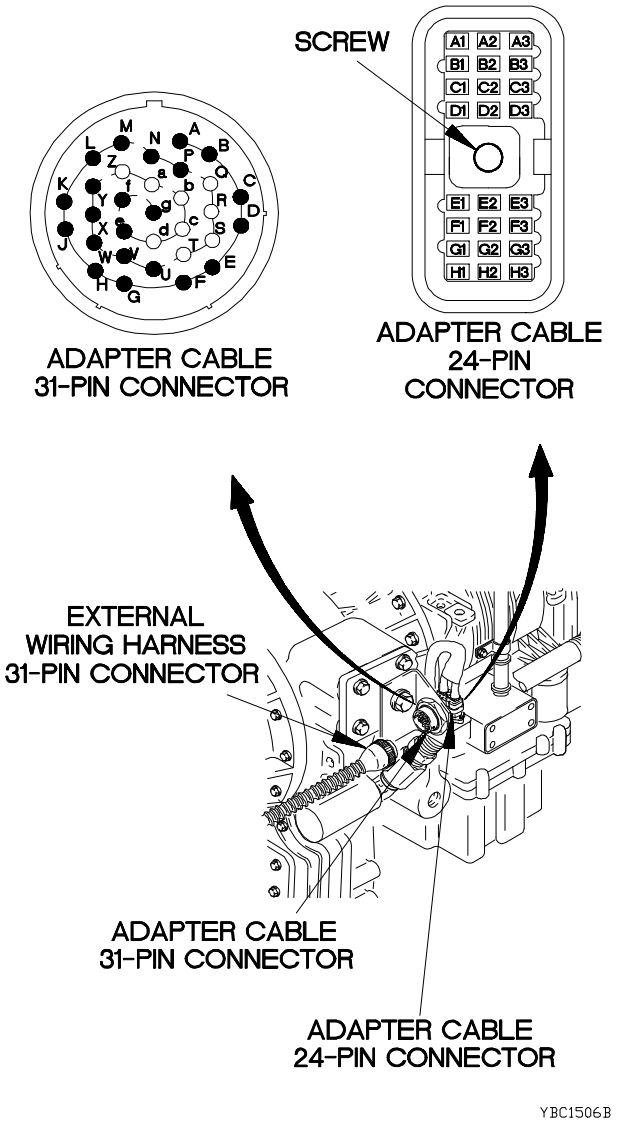


c15. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

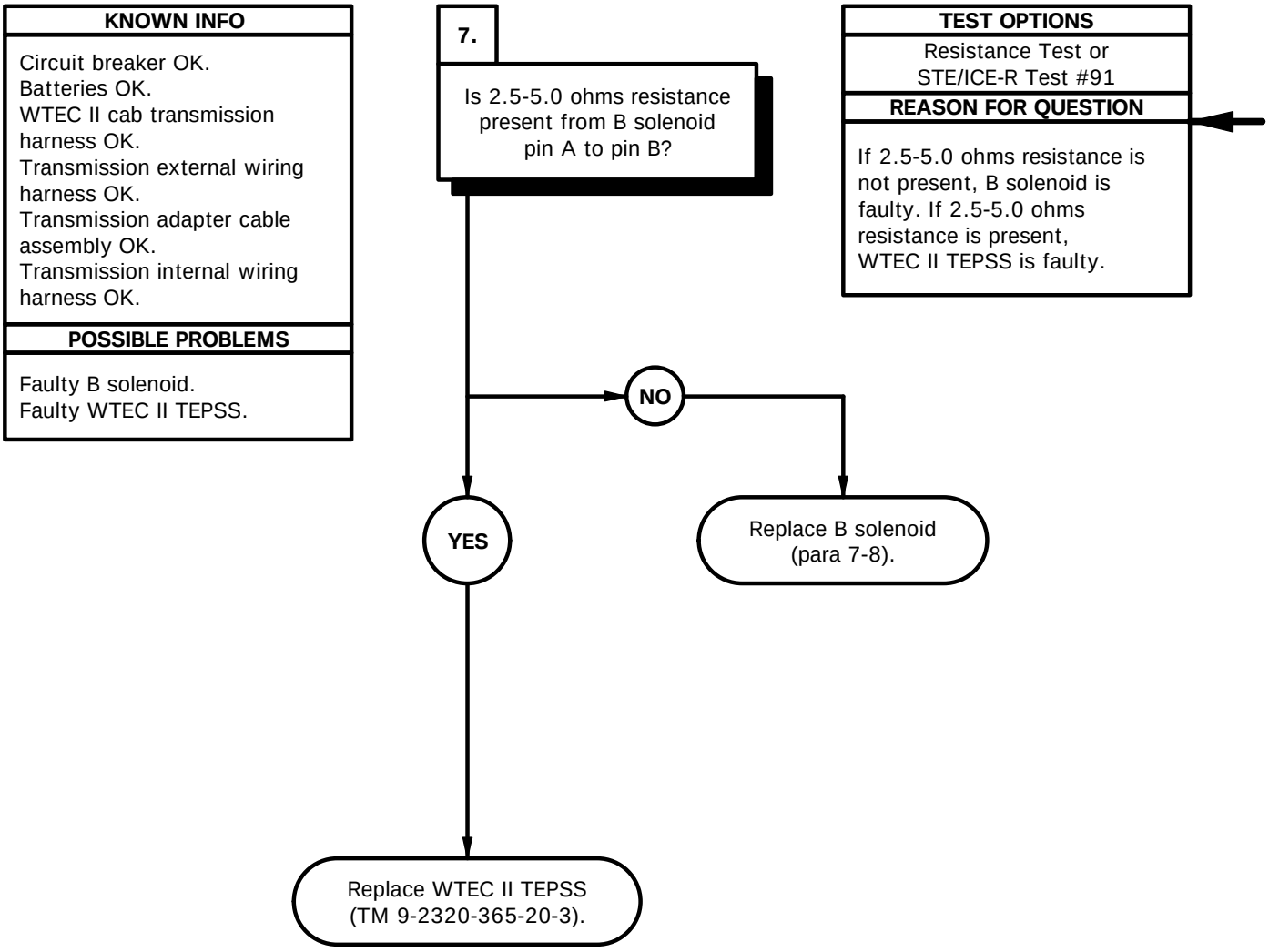


CONTINUITY TEST

(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).

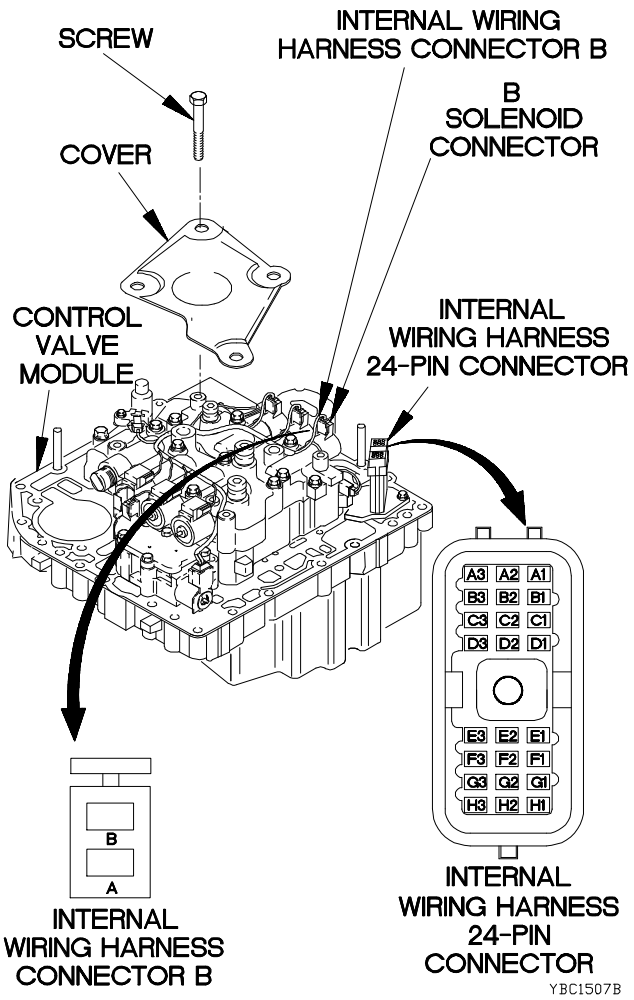


c15. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)

Materials/Parts
Wire, Elect, 50 ft (Item 94, Appendix C)

Personnel Required
(2)

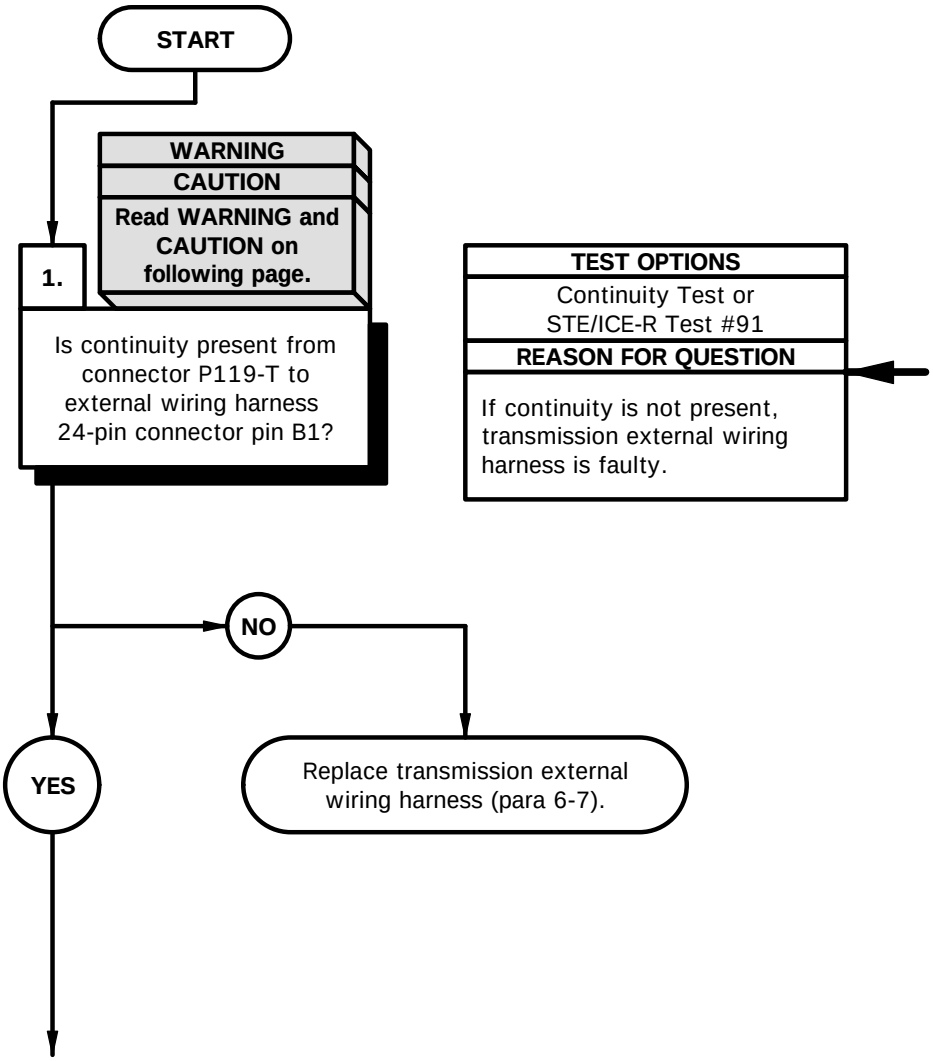
References
TM 9-4910-571-12&P

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 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.

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

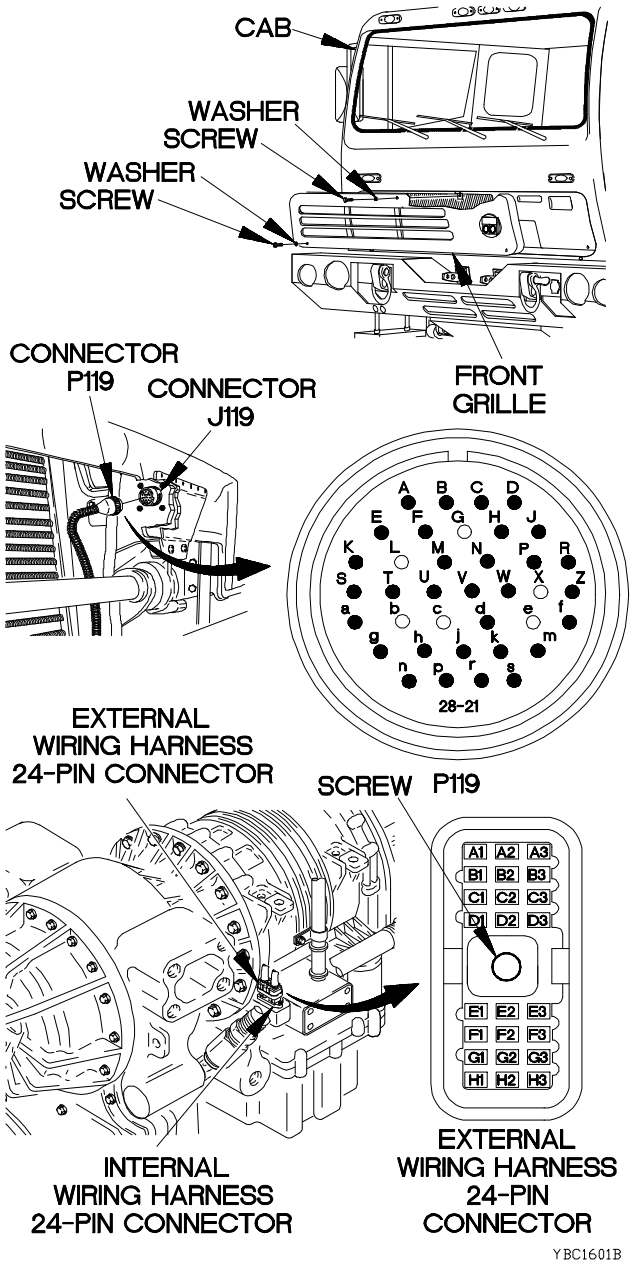
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

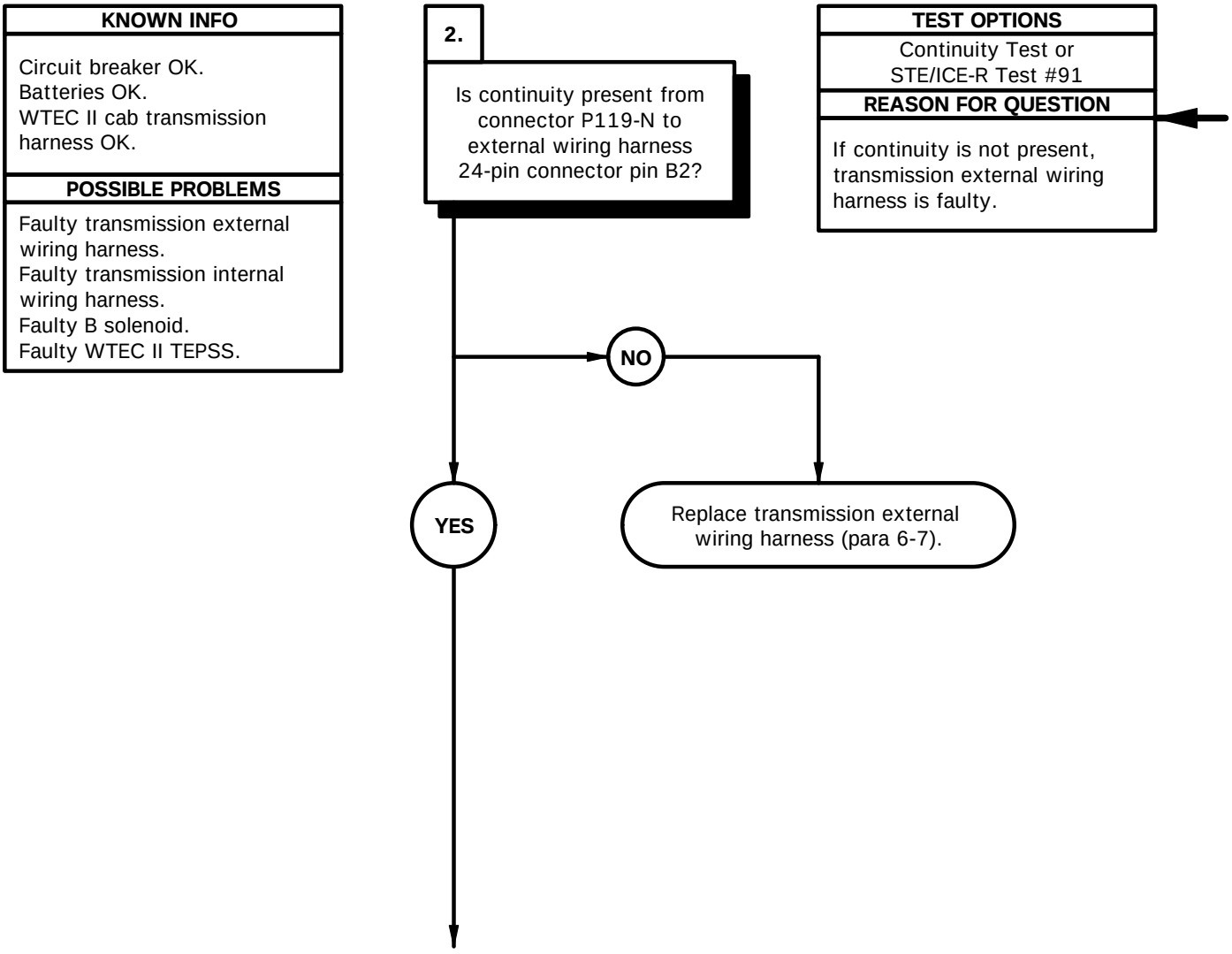
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Loosen screw in external wiring harness 24-pin connector.
(6) Disconnect external wiring harness 24-pin connector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

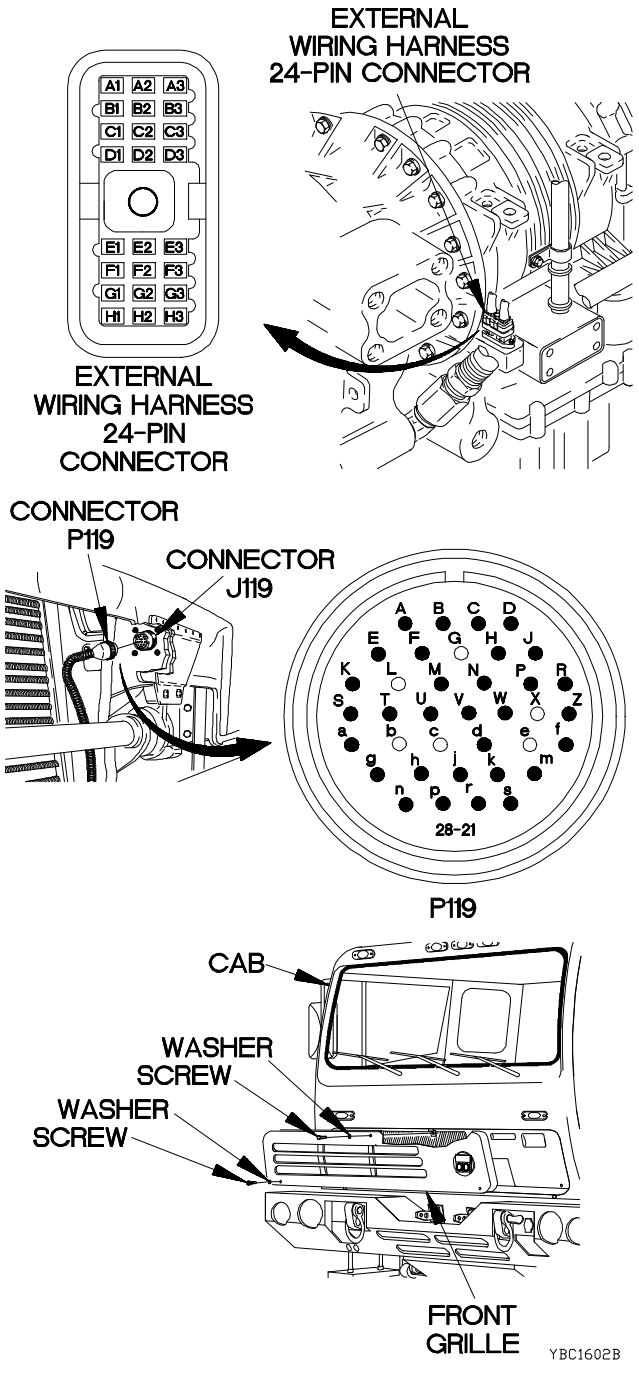


c16. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

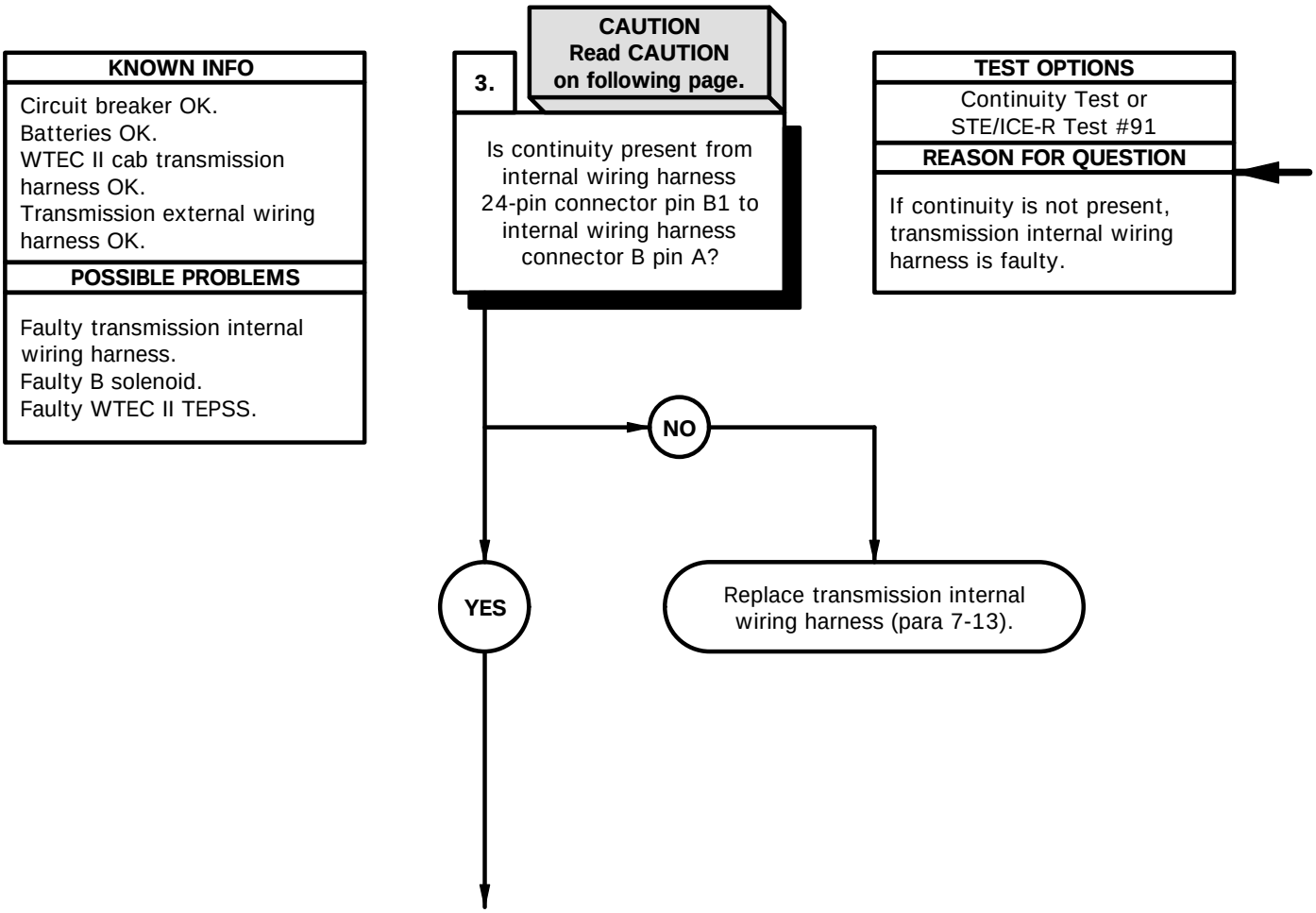


CONTINUITY TEST

(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)

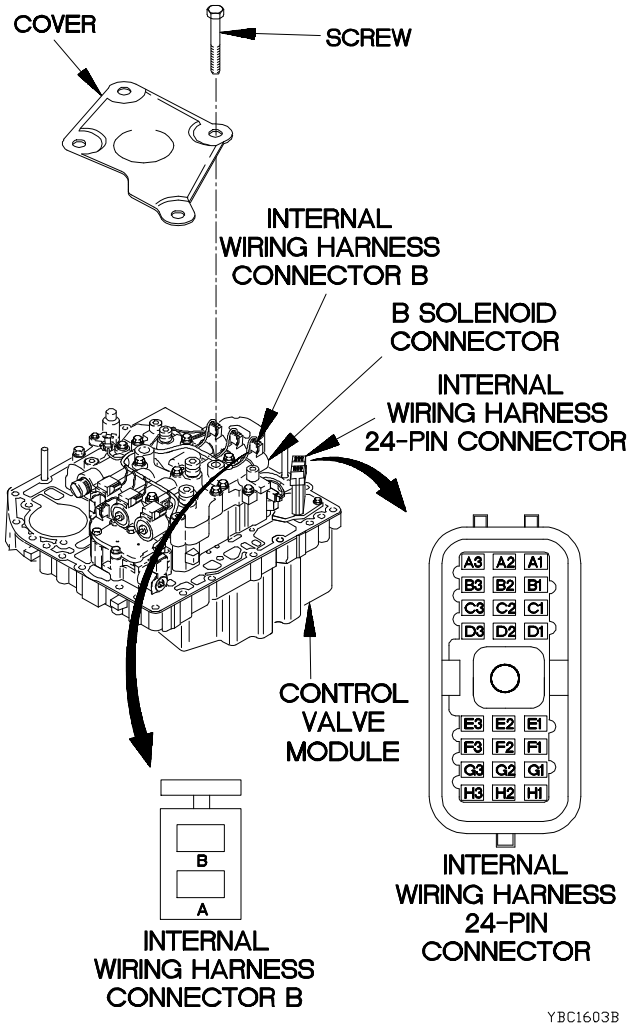


CAUTION

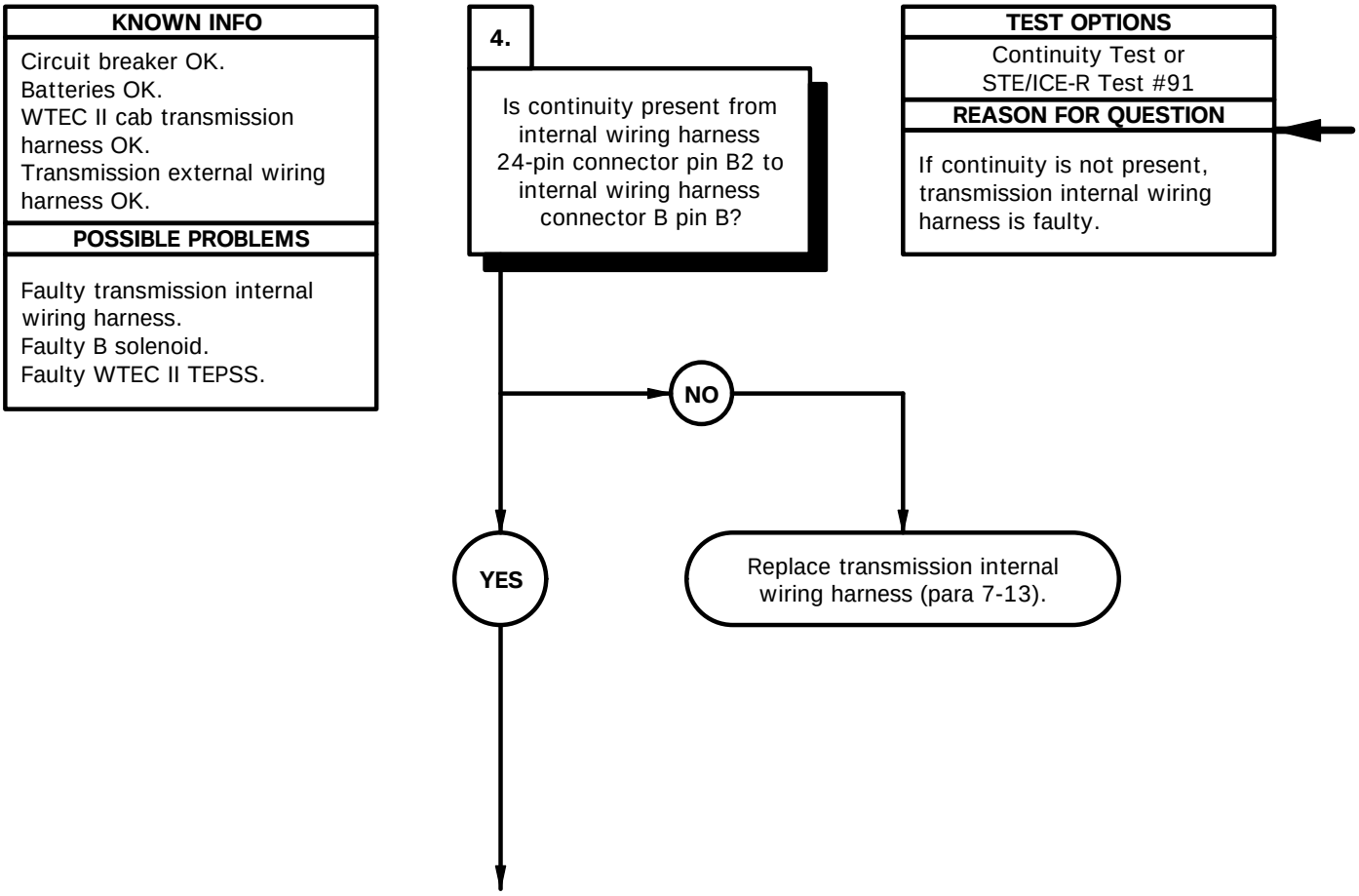
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

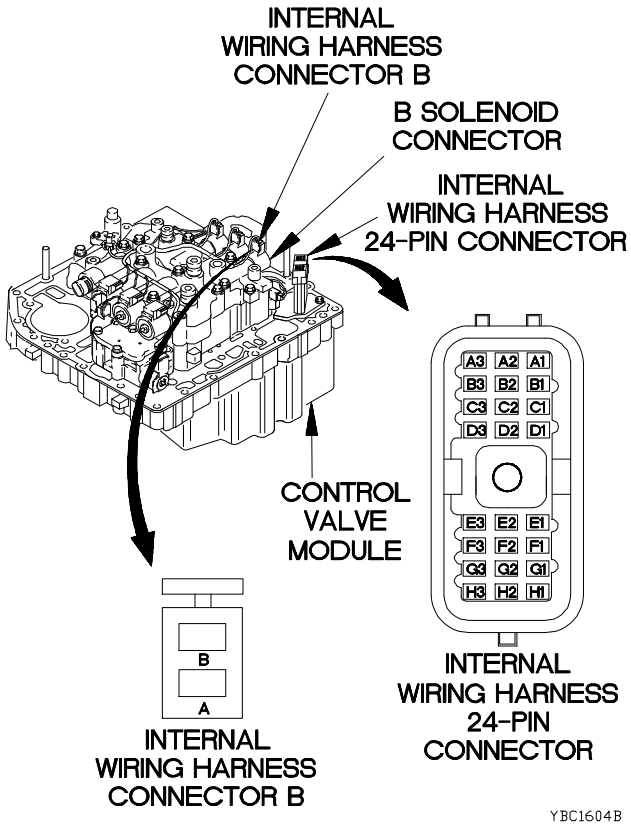


c16. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

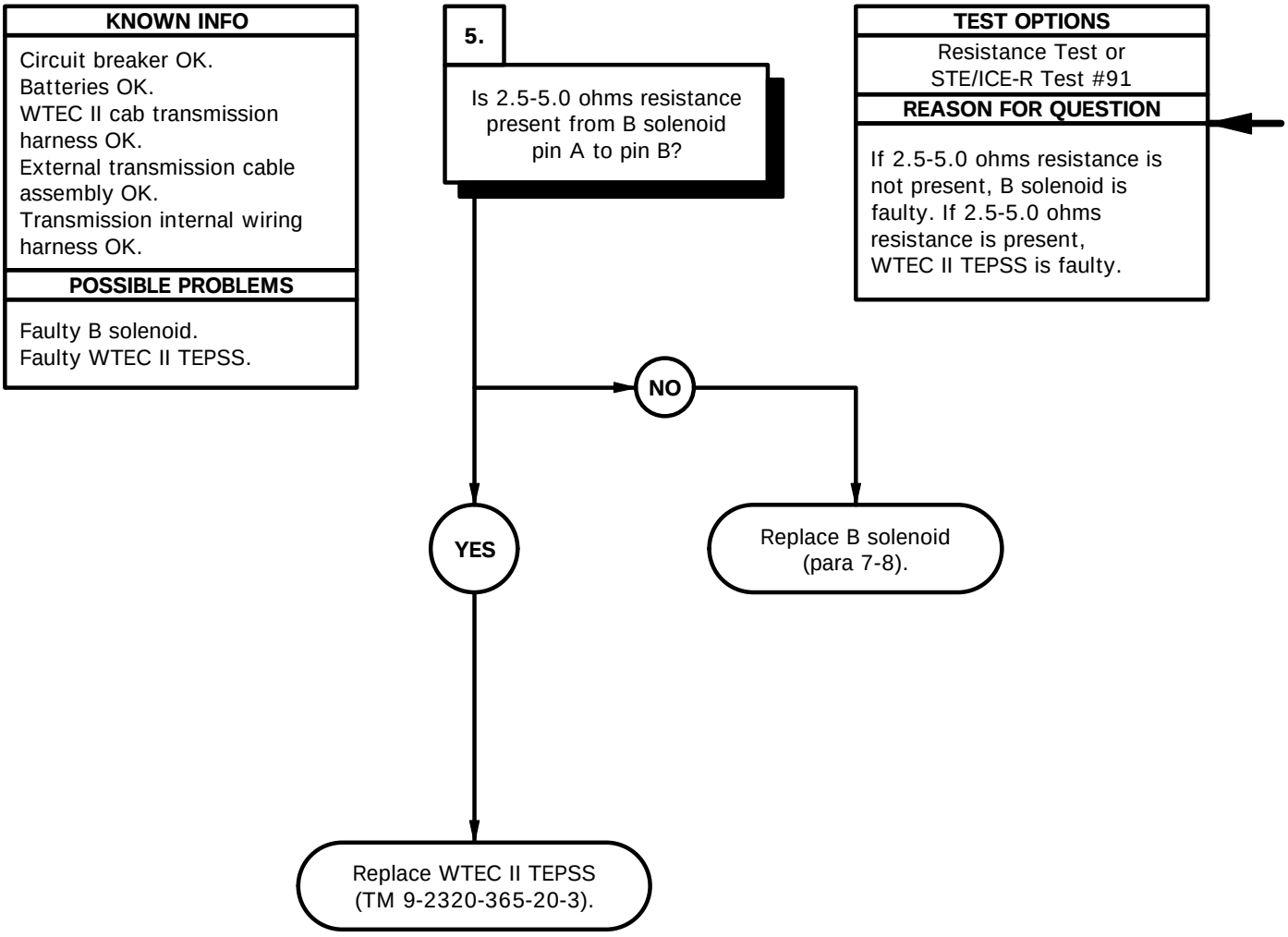


CONTINUITY TEST

(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).

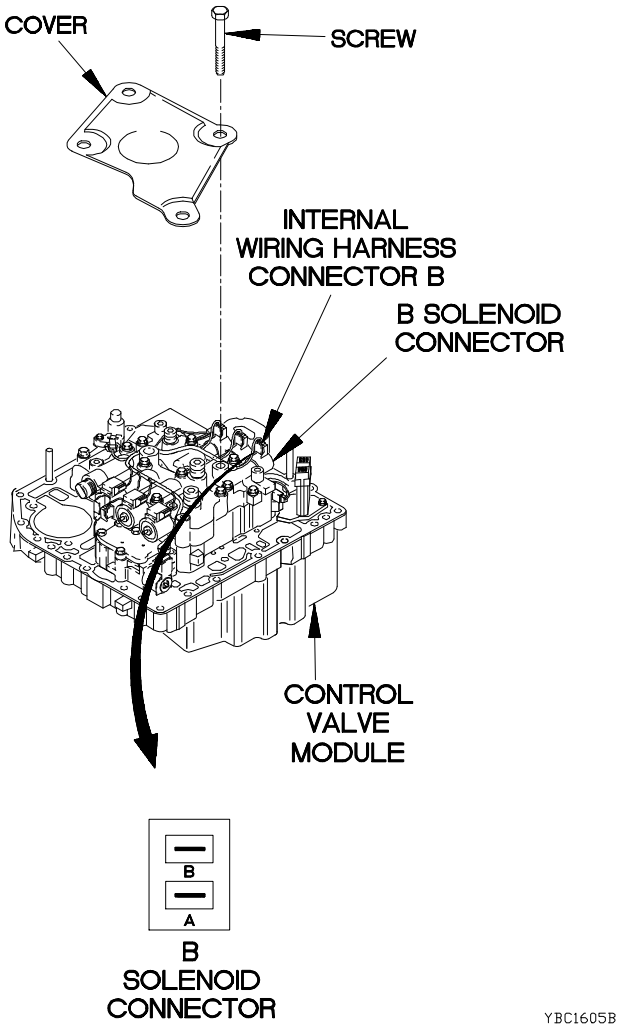


c16. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)



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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

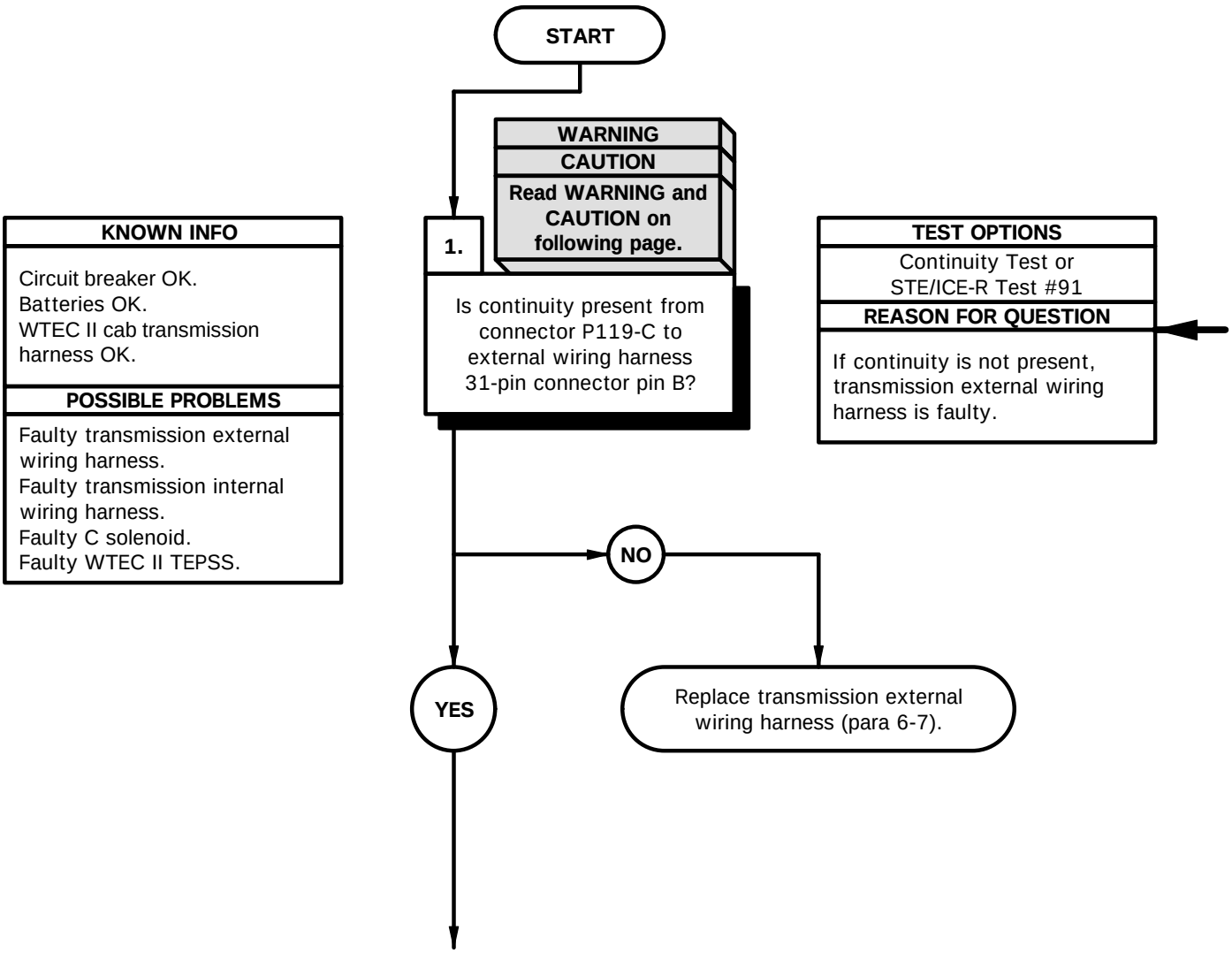
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

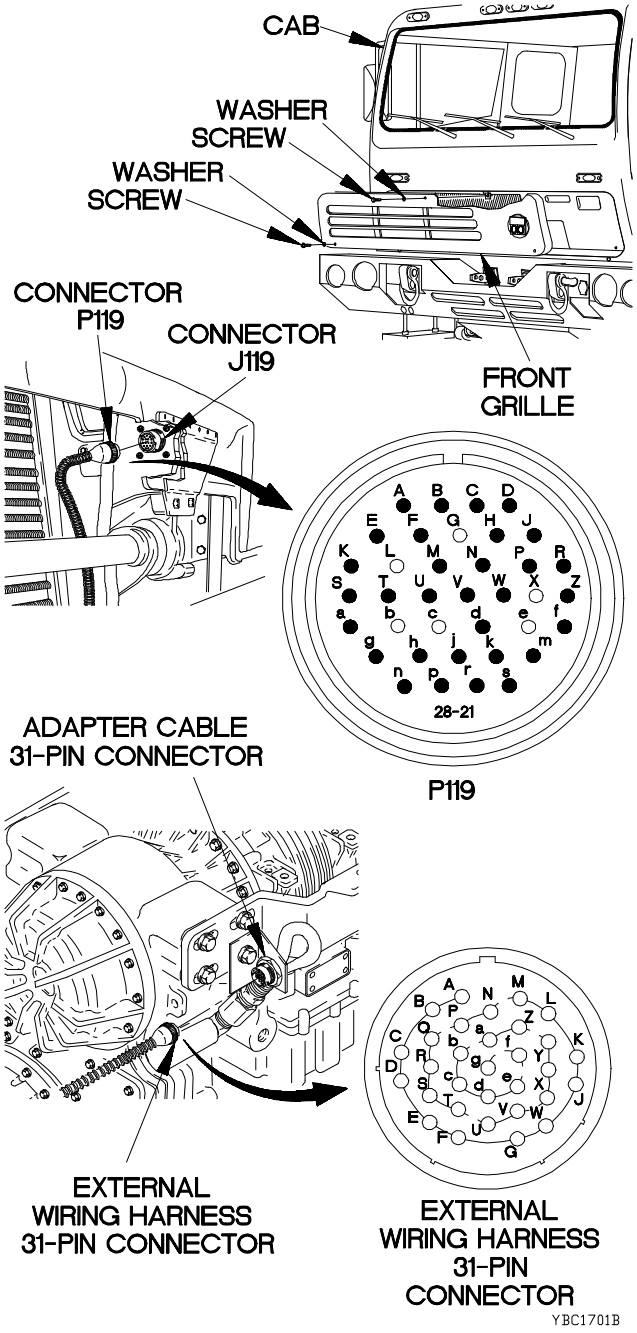
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

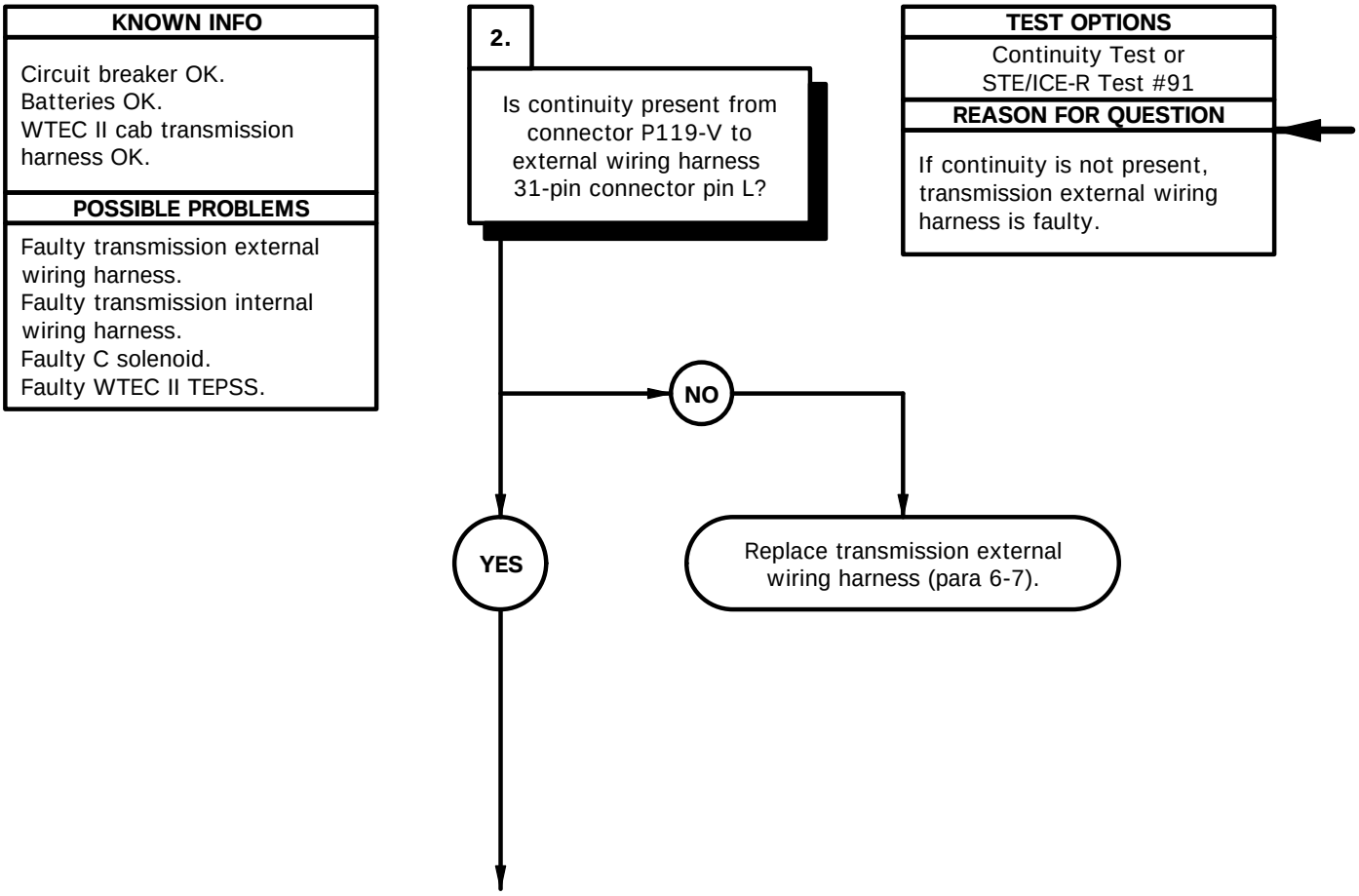
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin connector.
(6) Set multimeter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

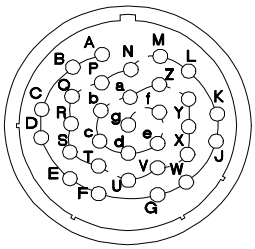


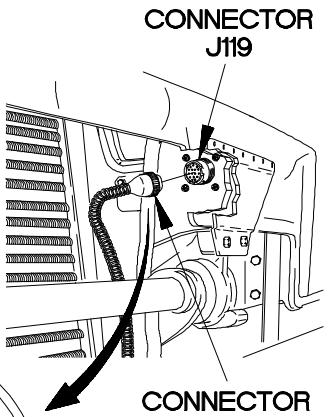
c17. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 14 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

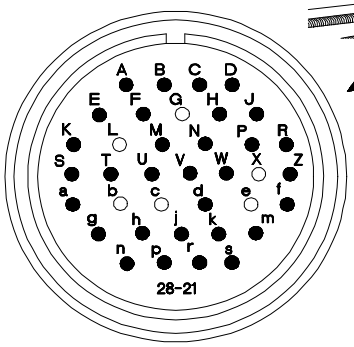


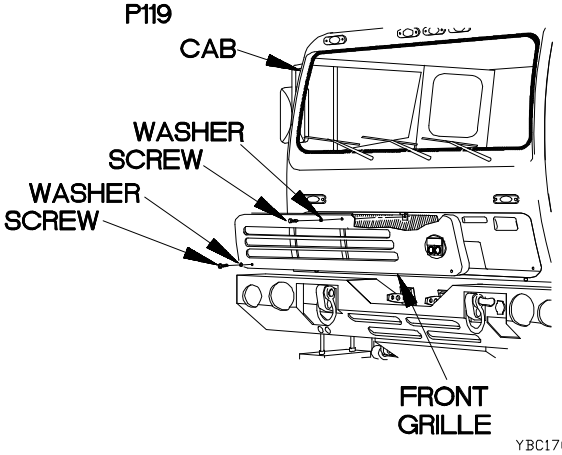
CONTINUITY TEST

(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).

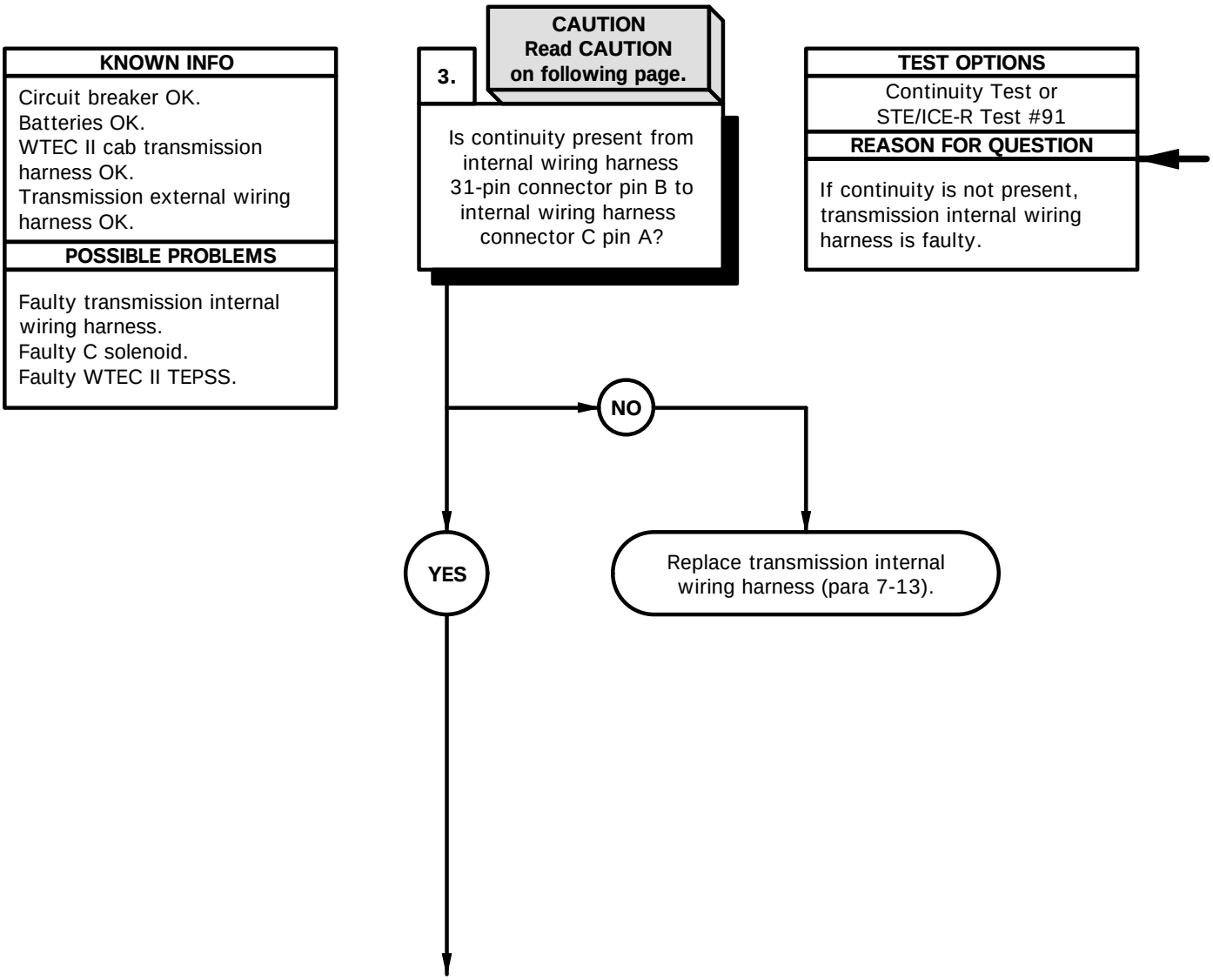








c17. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 14 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

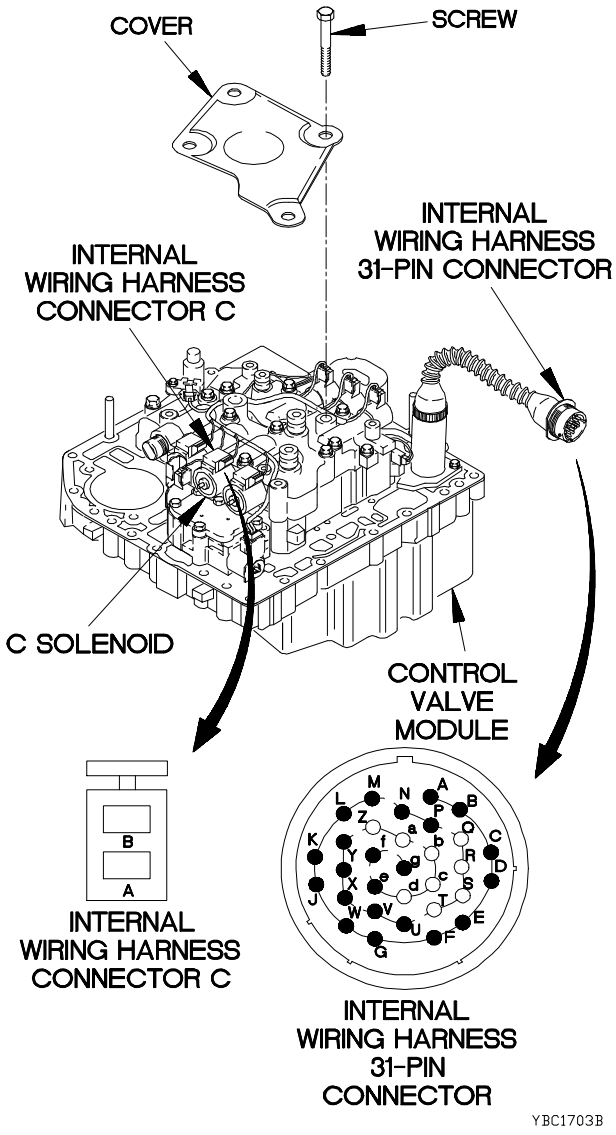


CAUTION

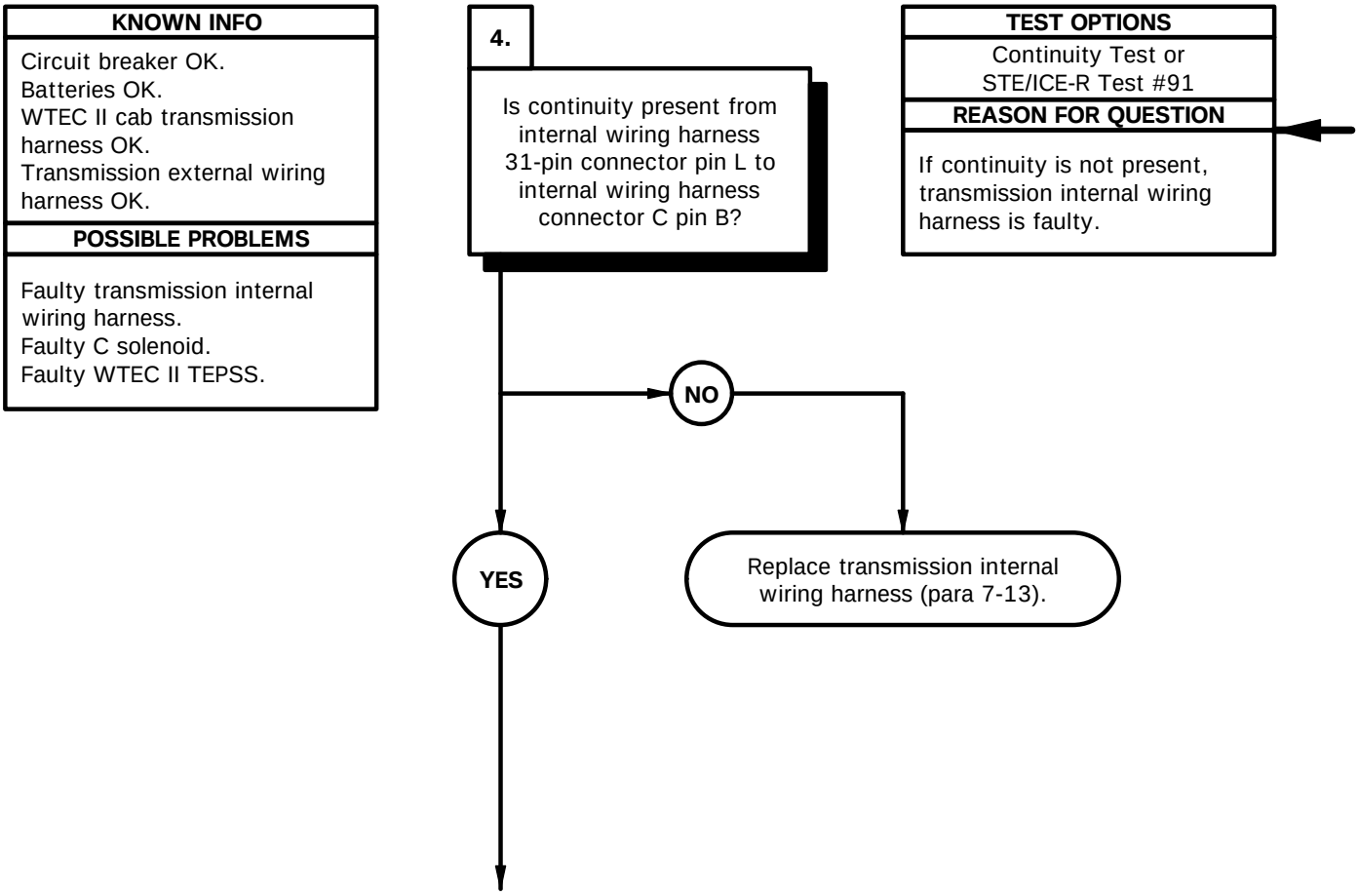
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

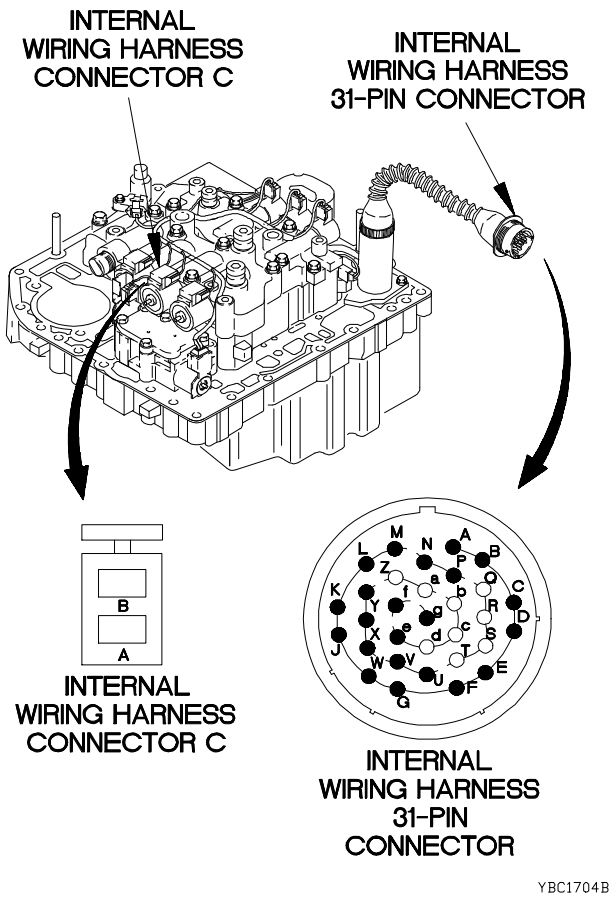


c17. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 14 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

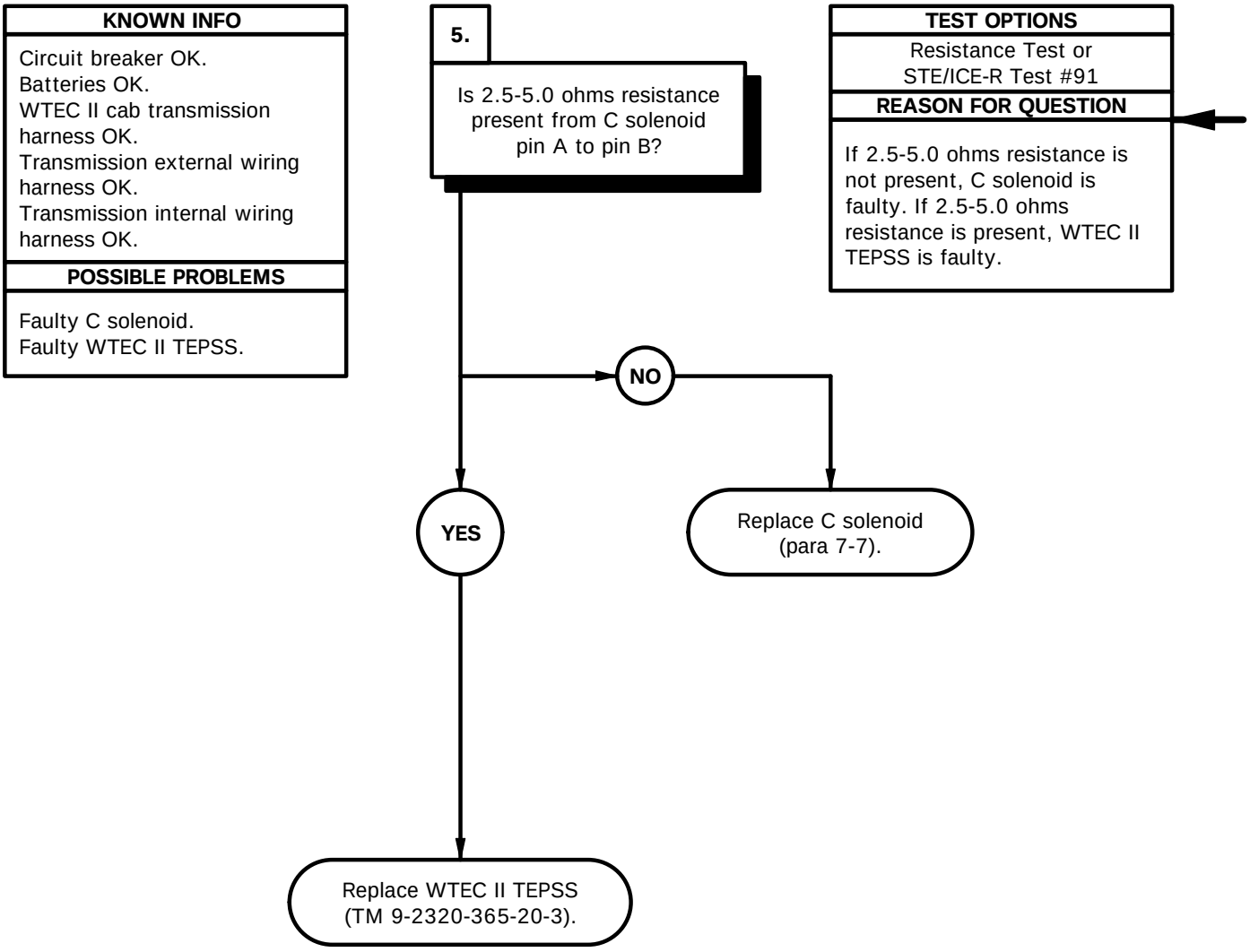


CONTINUITY TEST

(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).

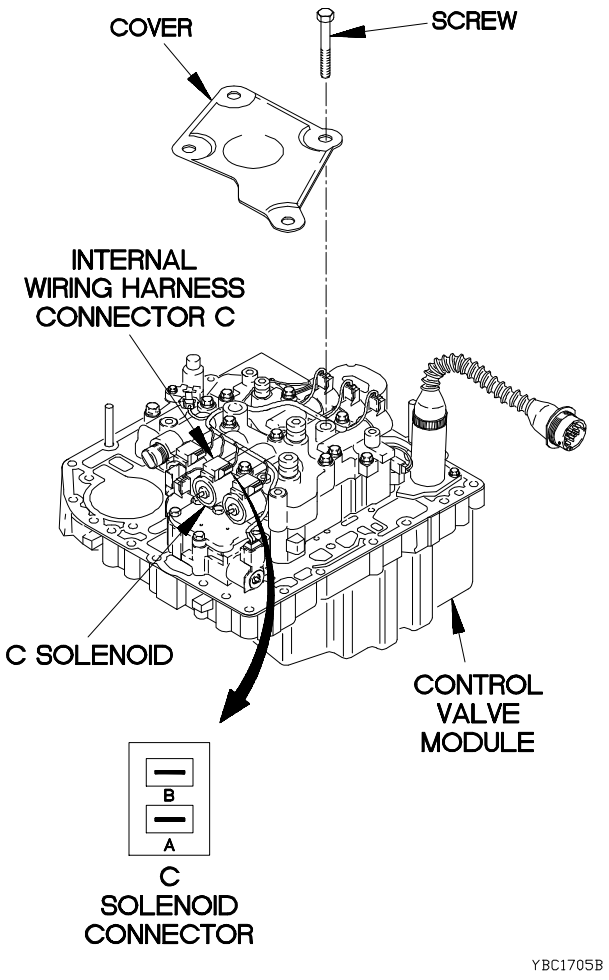


c17. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 14 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)

Materials/Parts
Wire, Elect, 50 ft (Item 94, Appendix C)

Personnel Required
(2)

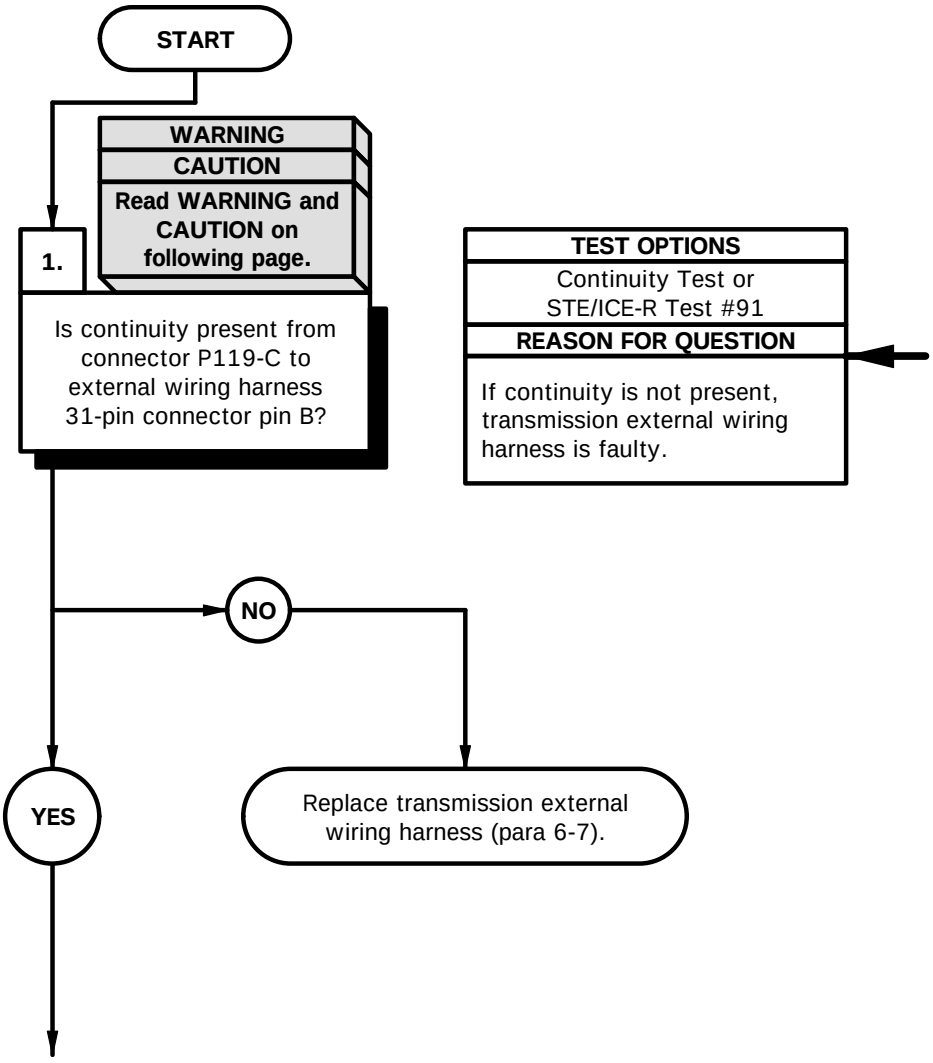
References
TM 9-4910-571-12&P

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 C 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

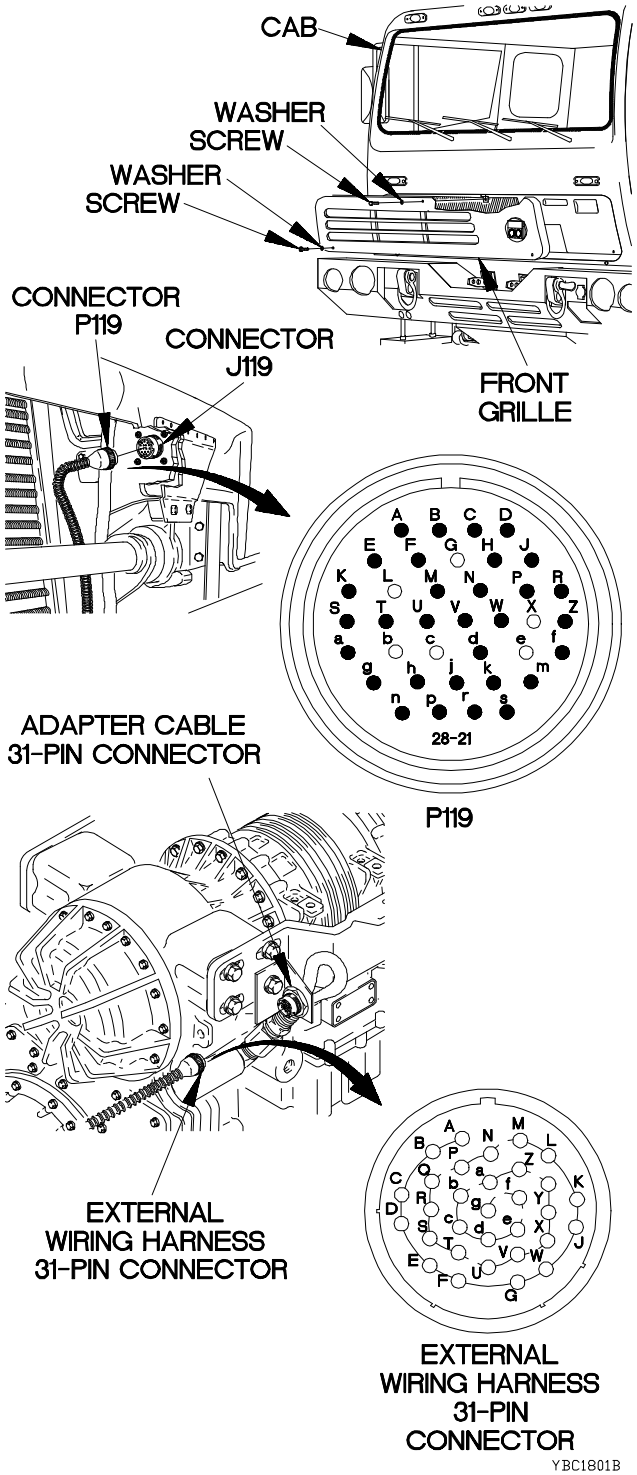
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

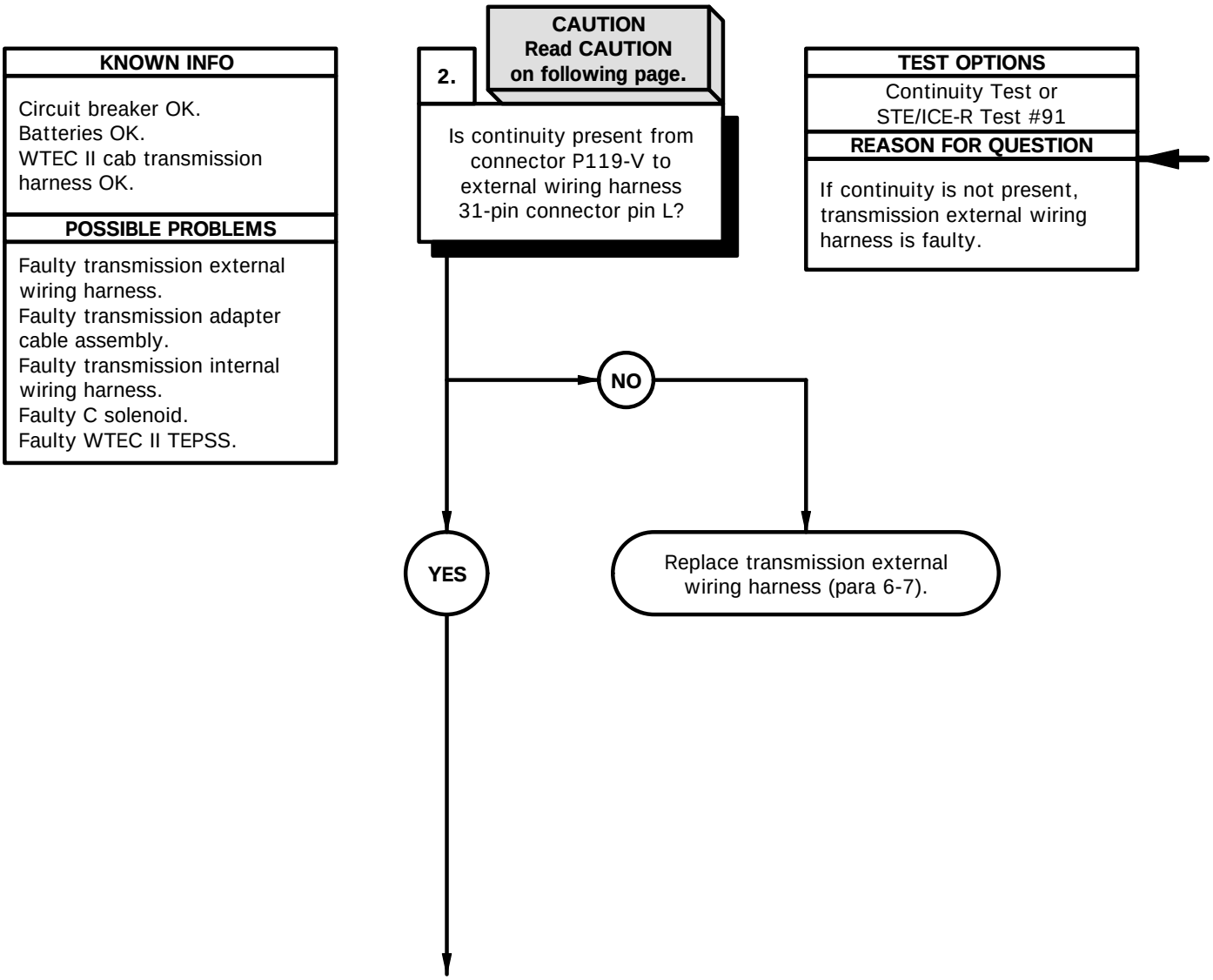
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from adapter cable 31-pin connector.
(6) Set multimeter to ohms.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

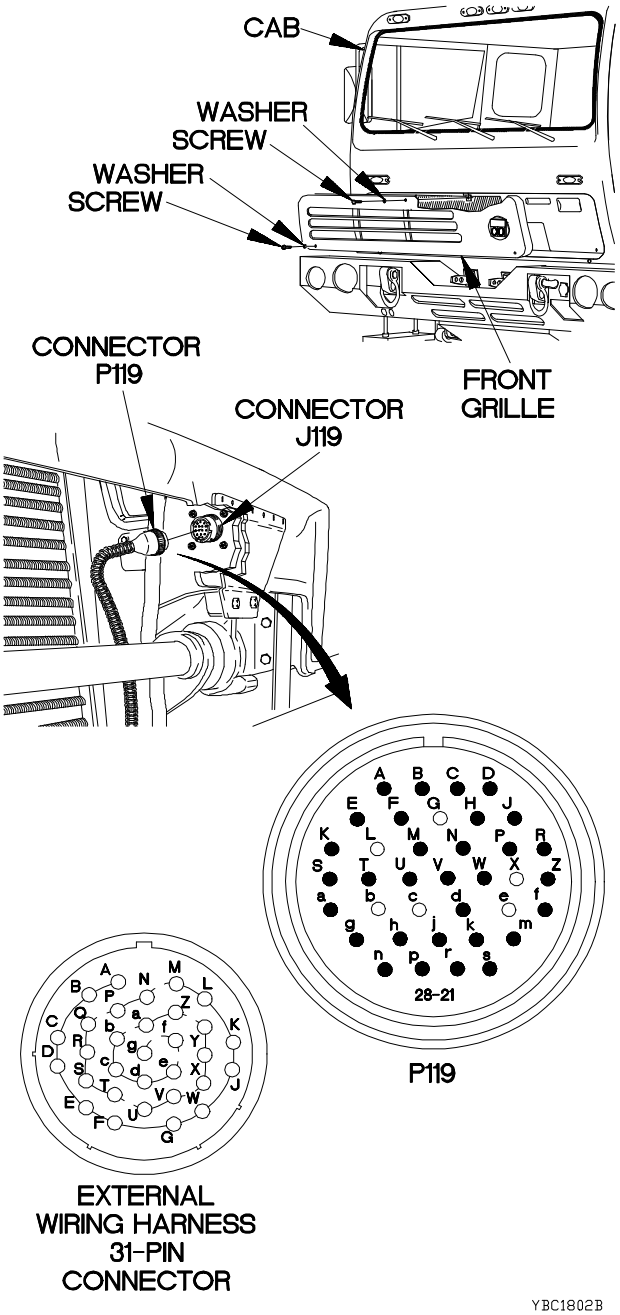
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

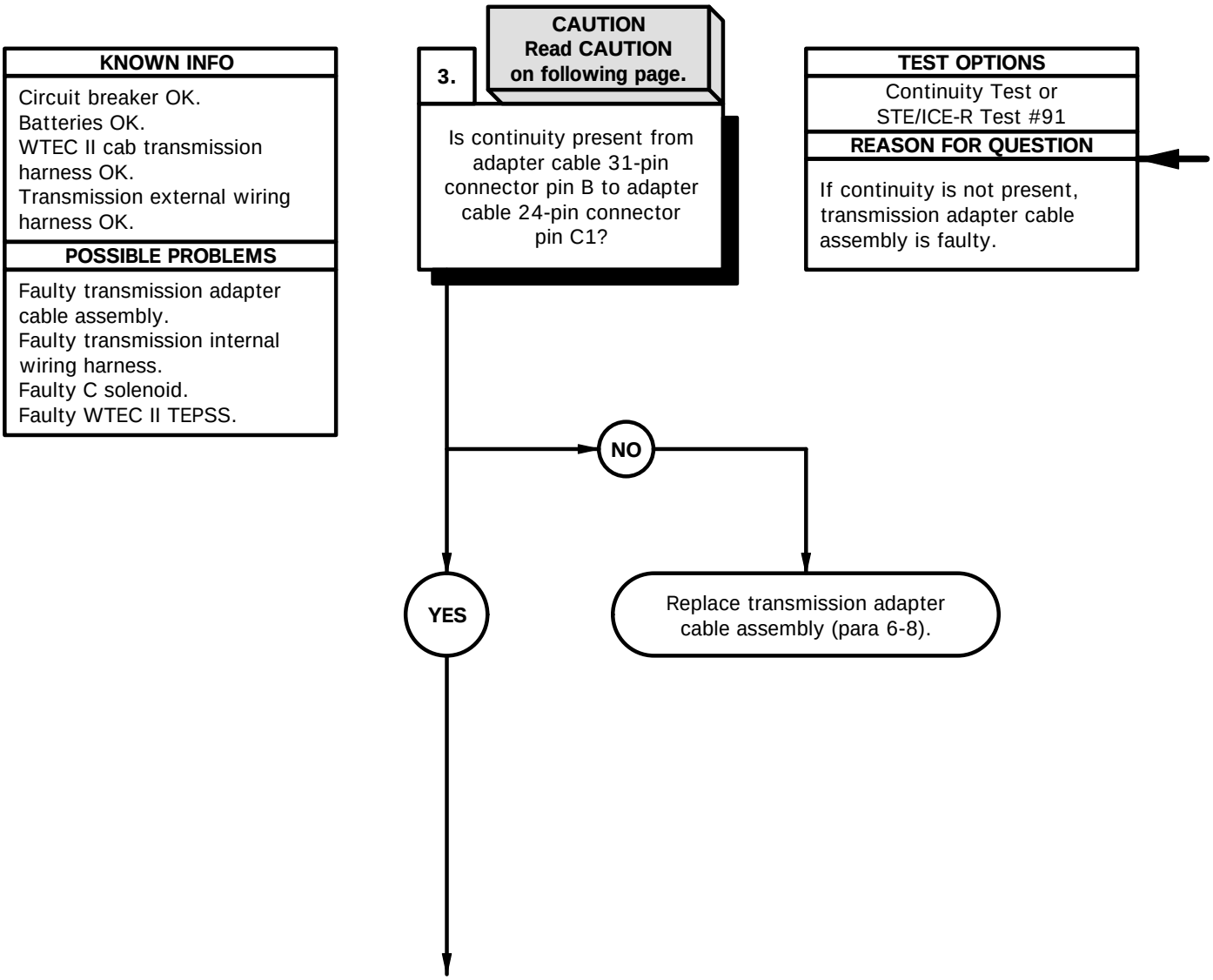
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

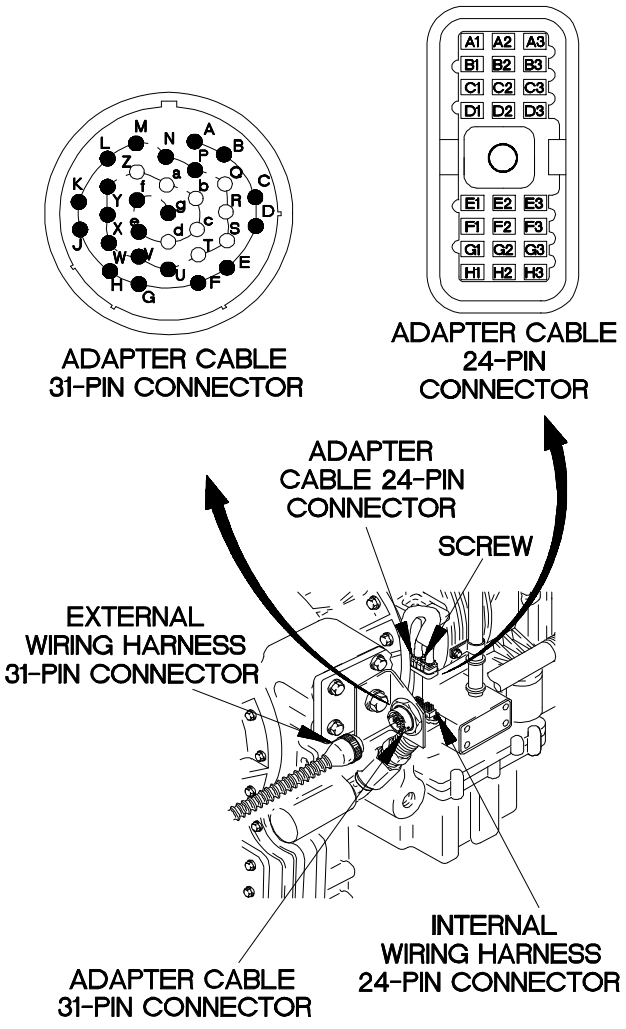
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

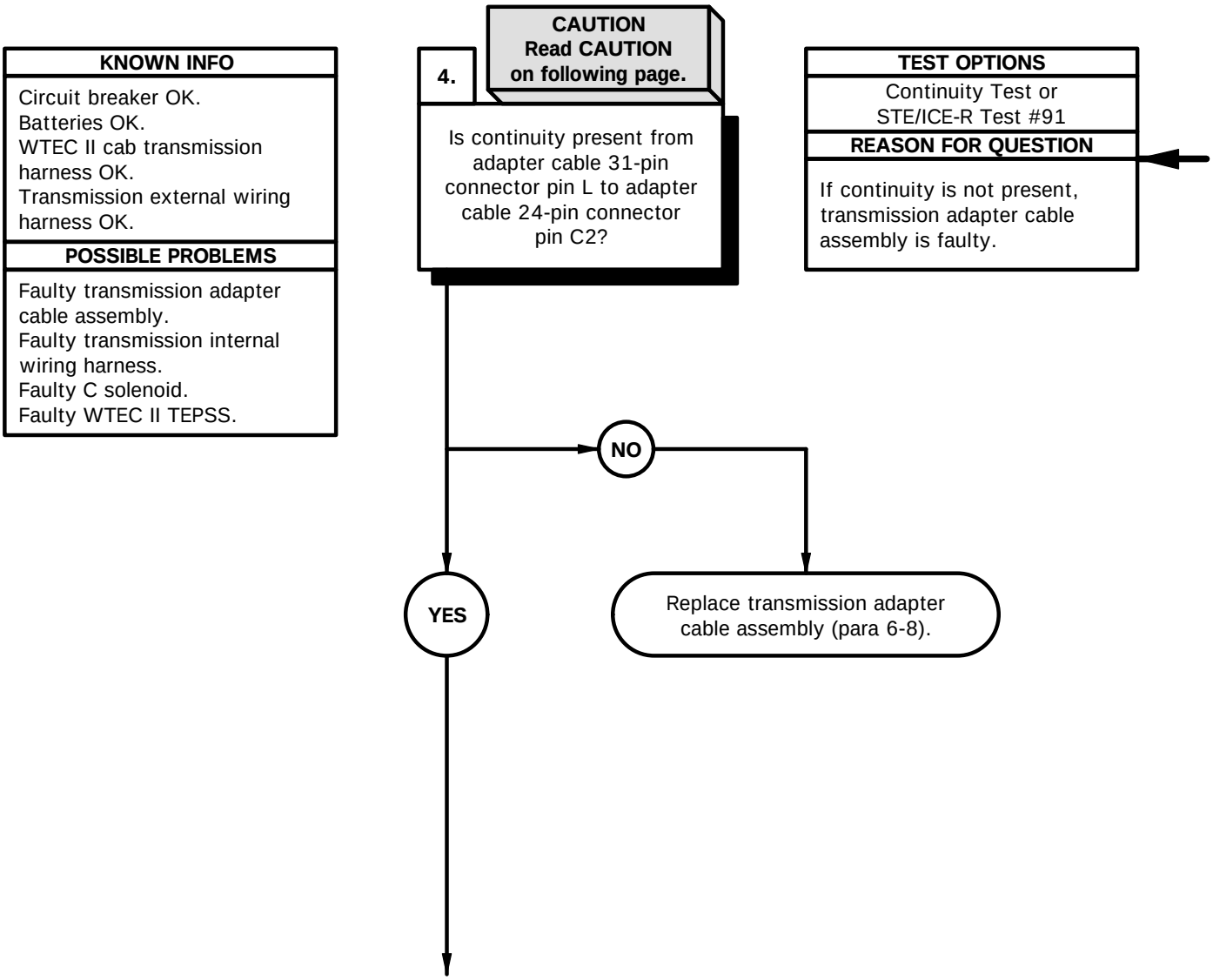
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

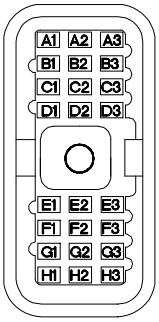
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

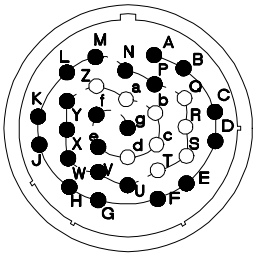
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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.



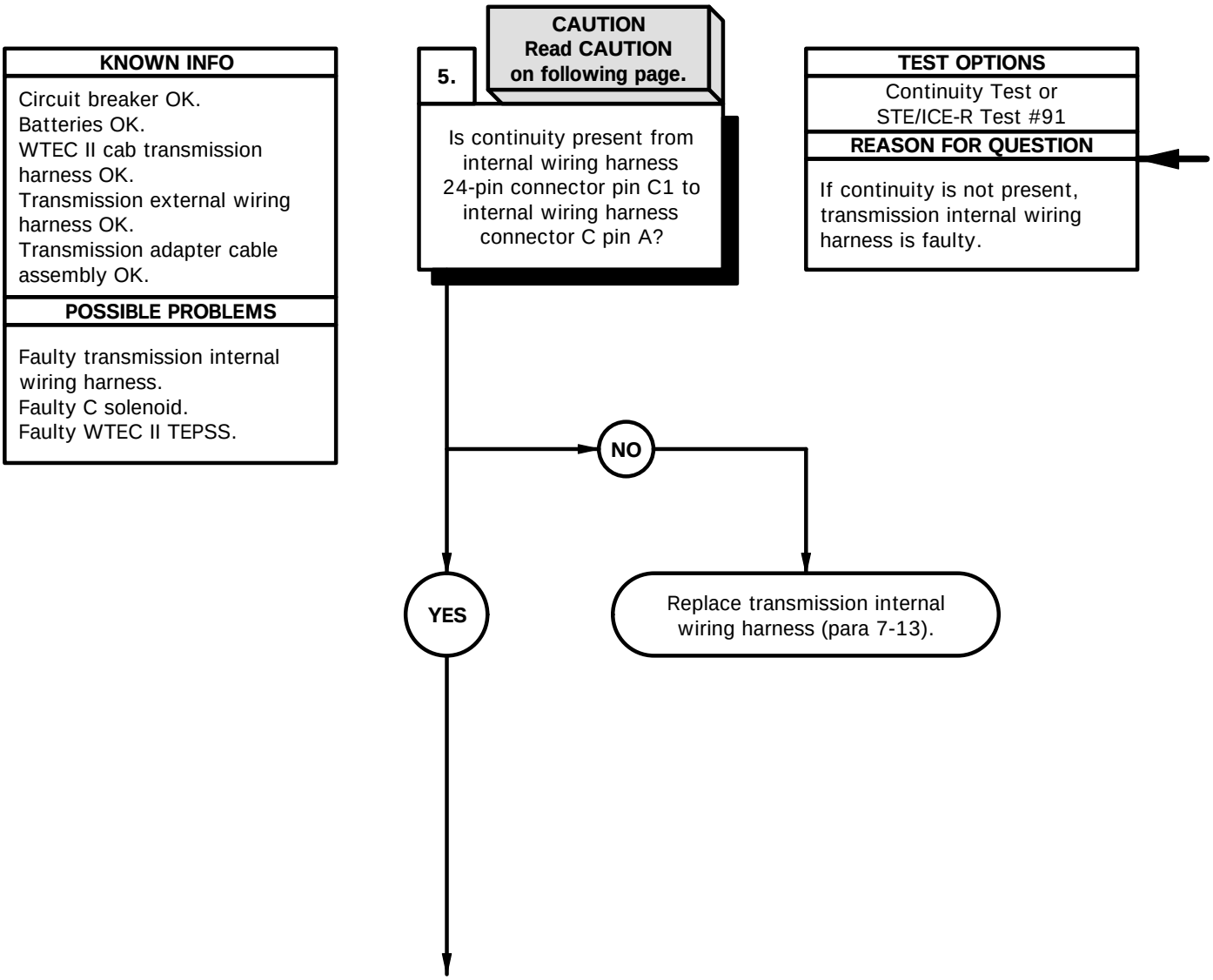
ADAPTER CABLE
24-PIN
CONNECTOR



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

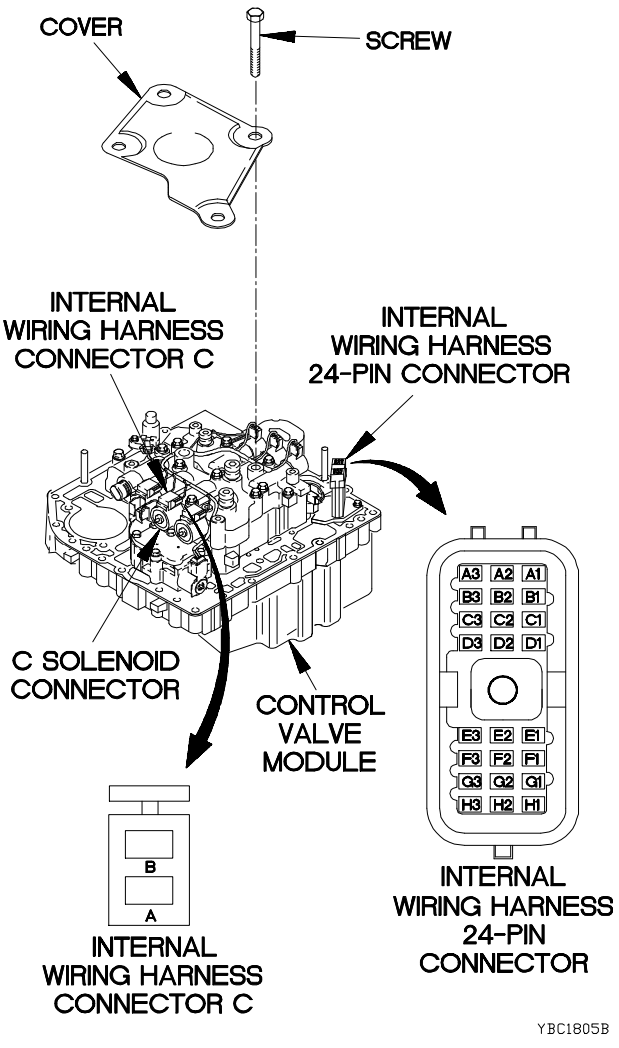
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

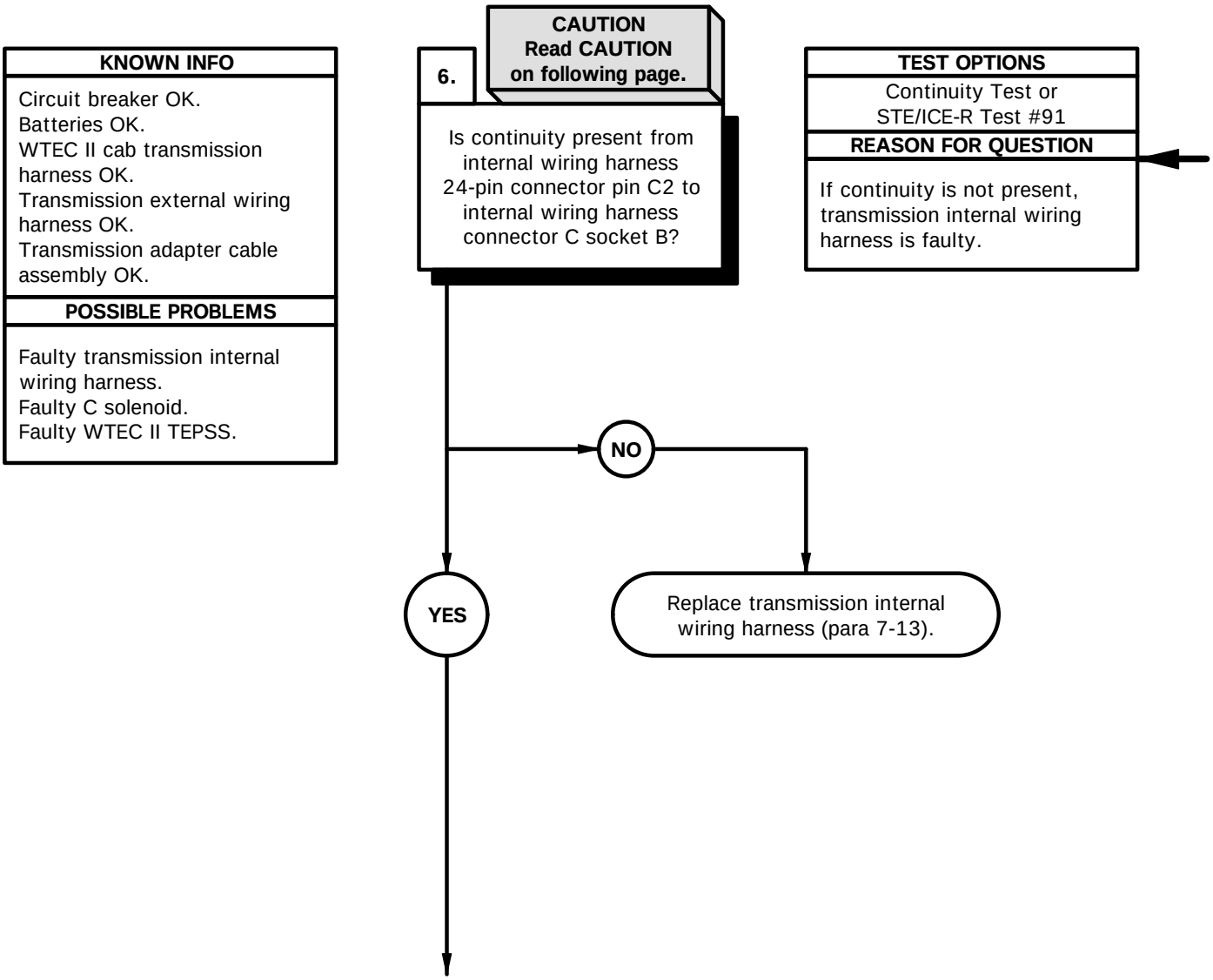
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

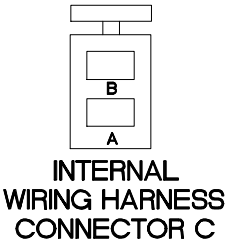
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

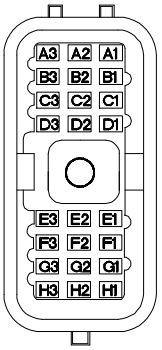
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



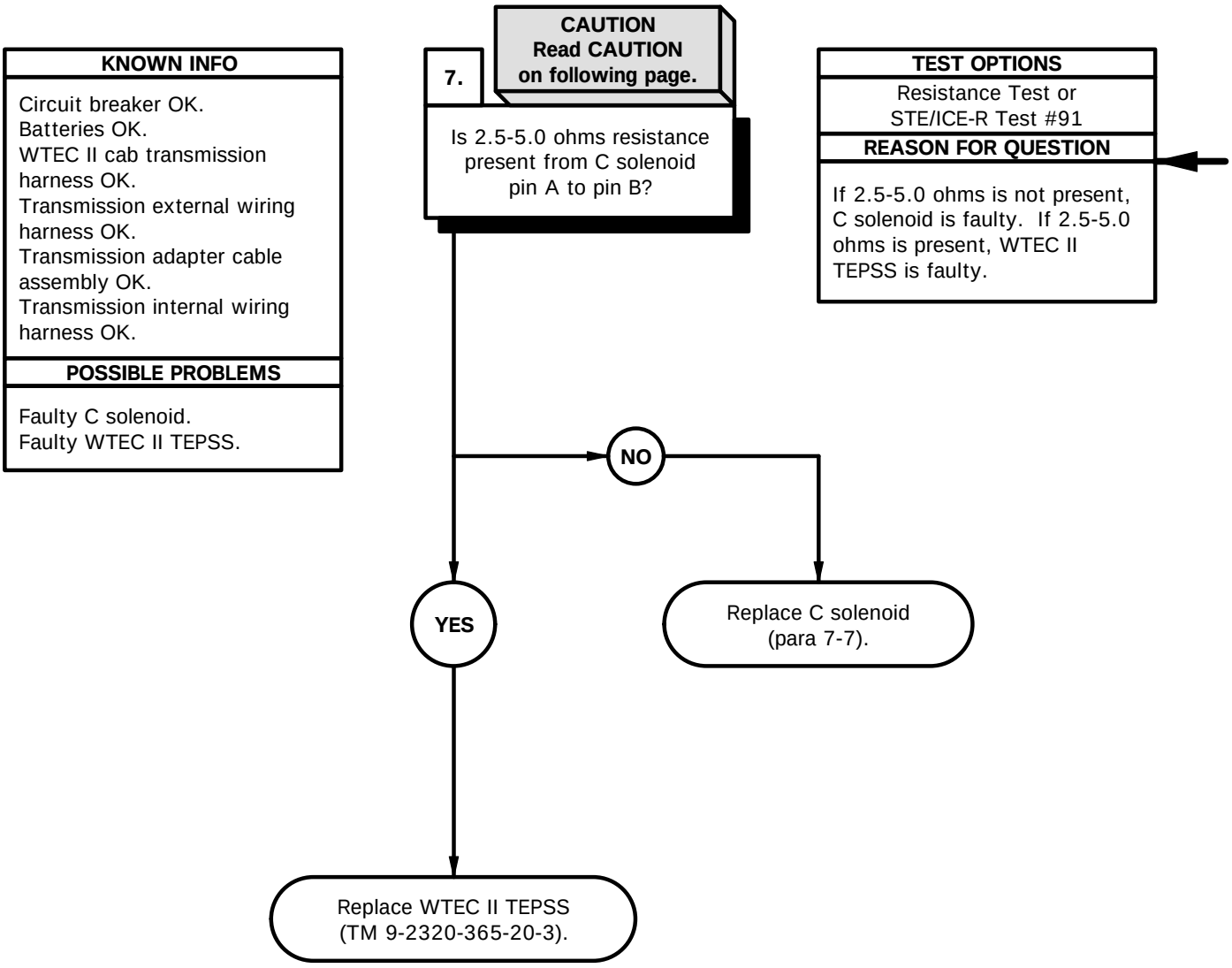
INTERNAL WIRING HARNESS CONNECTOR C



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

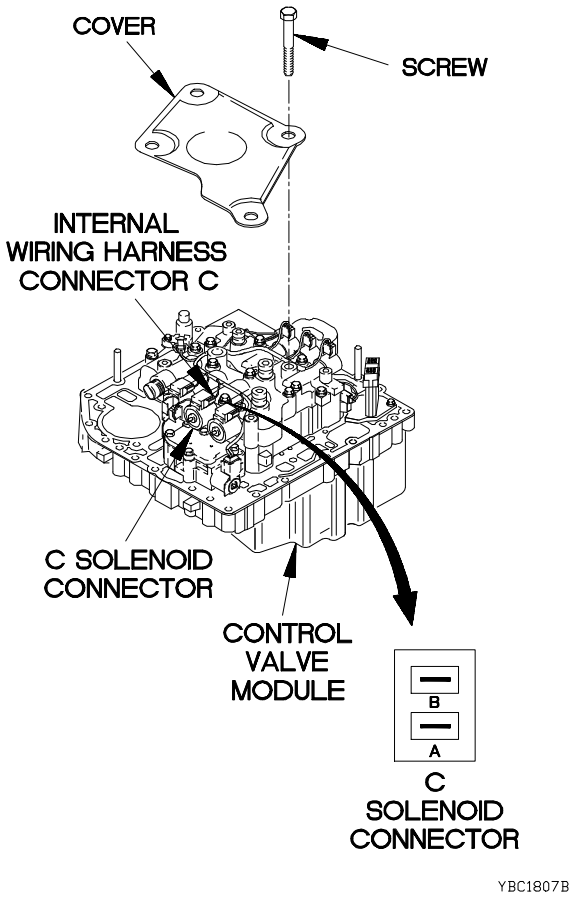
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

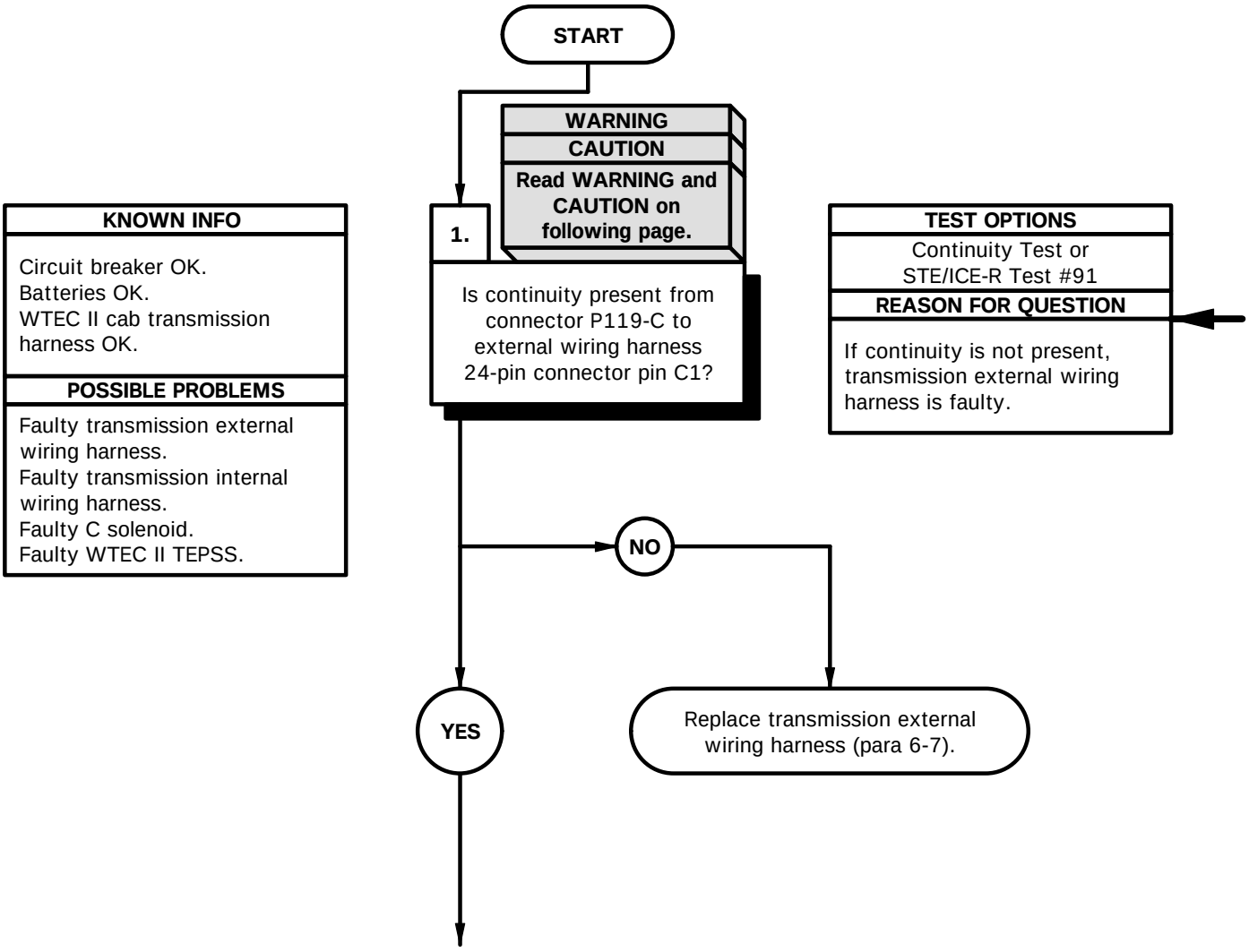
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

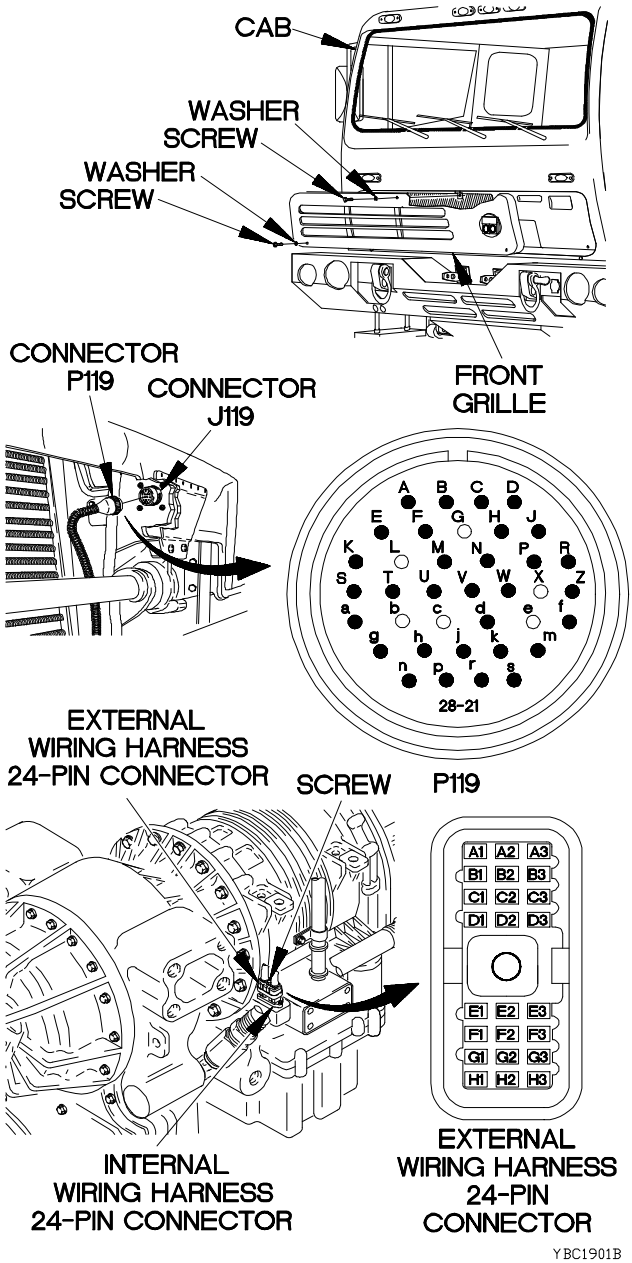
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

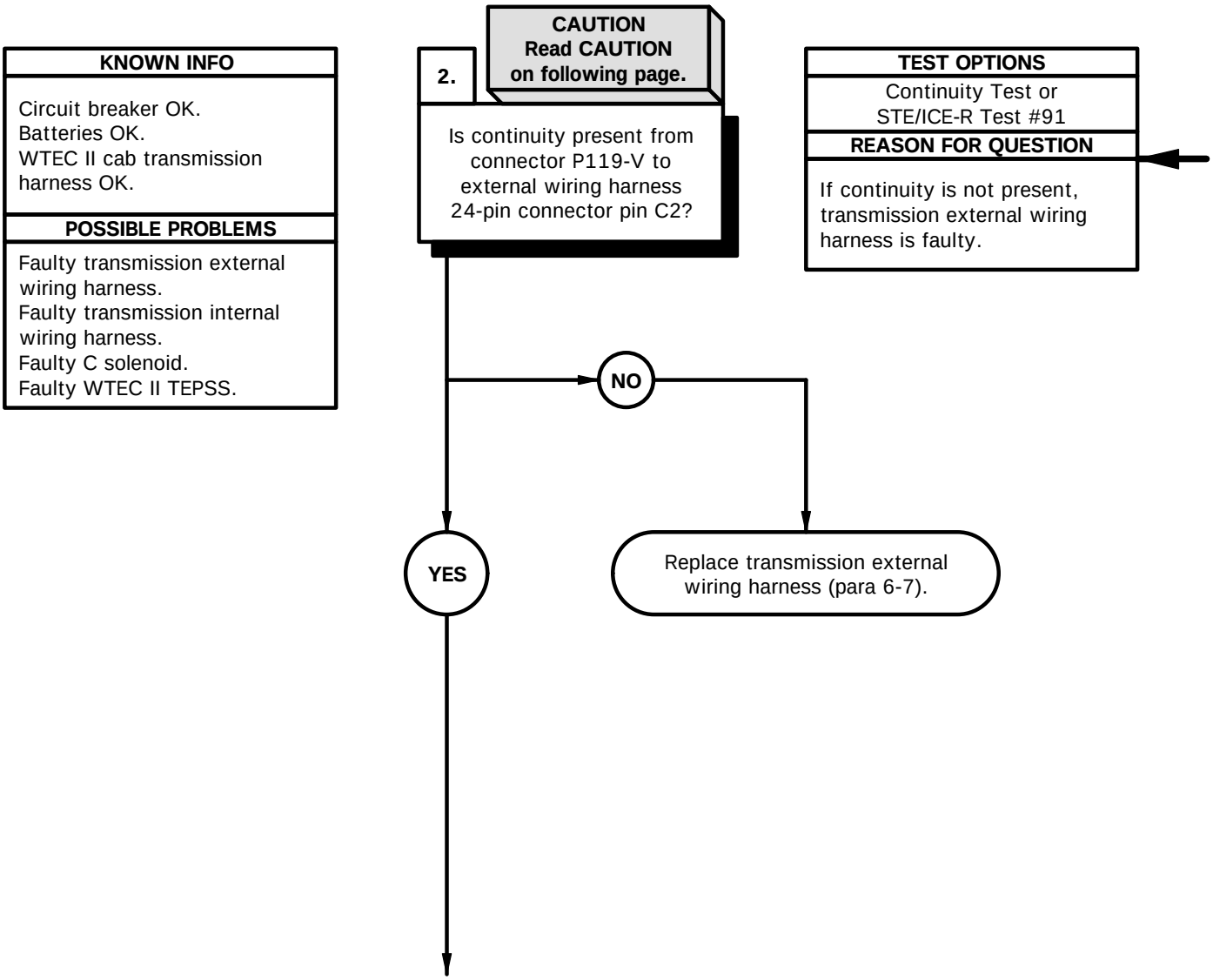
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Loosen screw in external wiring harness 24-pin connector.
(6) Disconnect external wiring harness 24-pin connector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

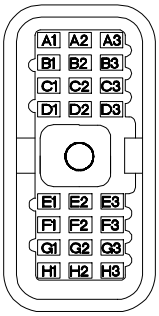
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

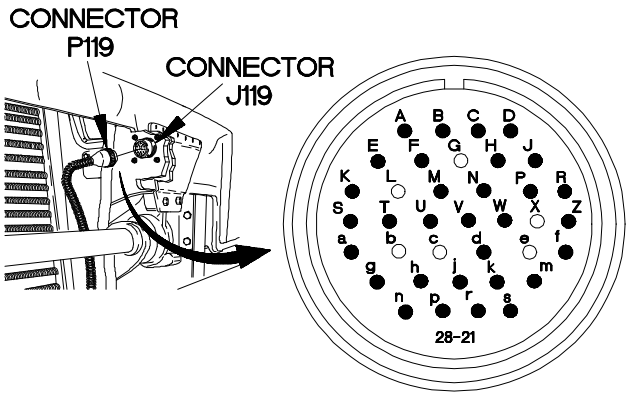
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

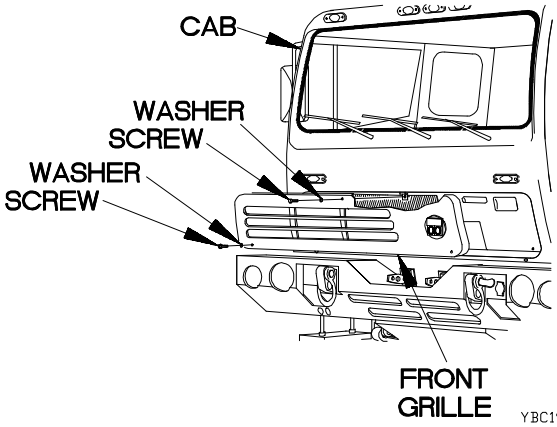
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P119-V.
(3) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin C2 and note reading on multimeter.
(4) If continuity is not present, replace transmission external wiring harness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



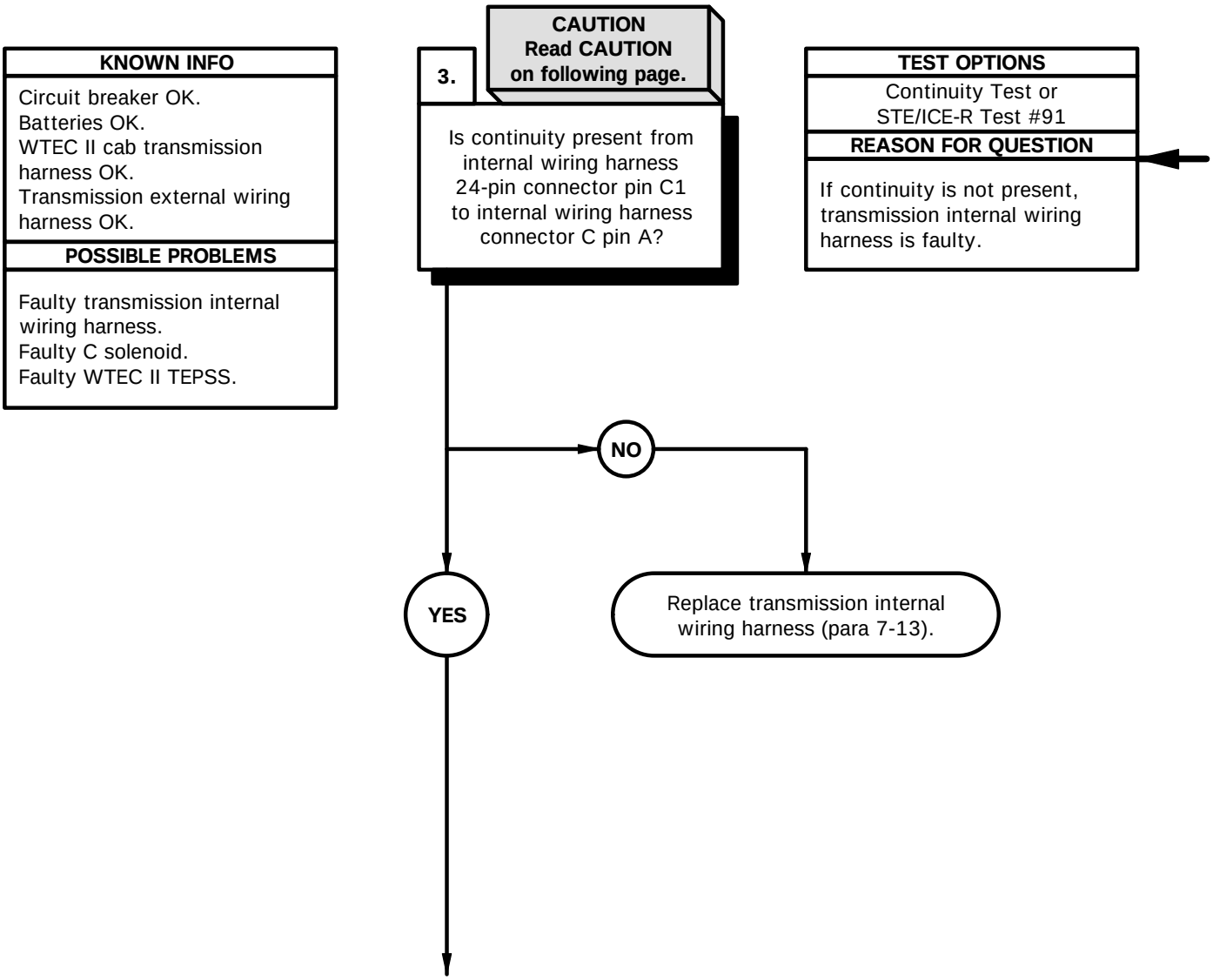
EXTERNAL WIRING HARNESS 24-PIN CONNECTOR



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

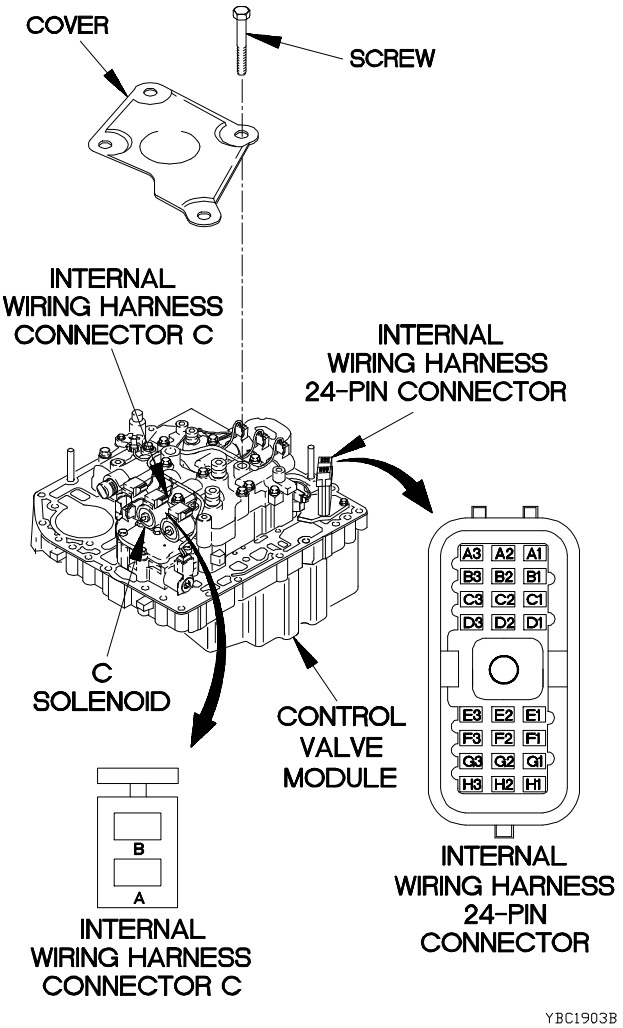
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

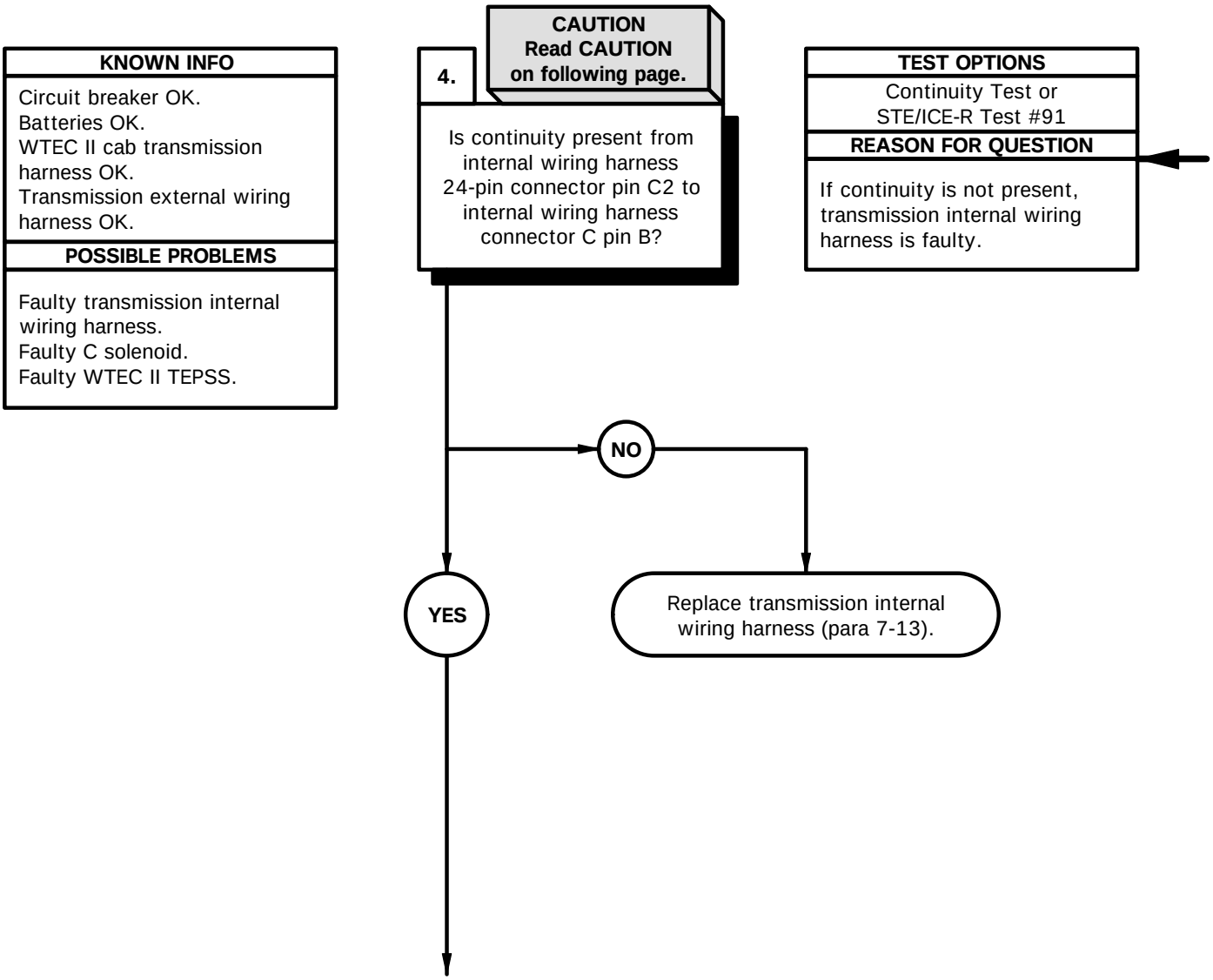
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

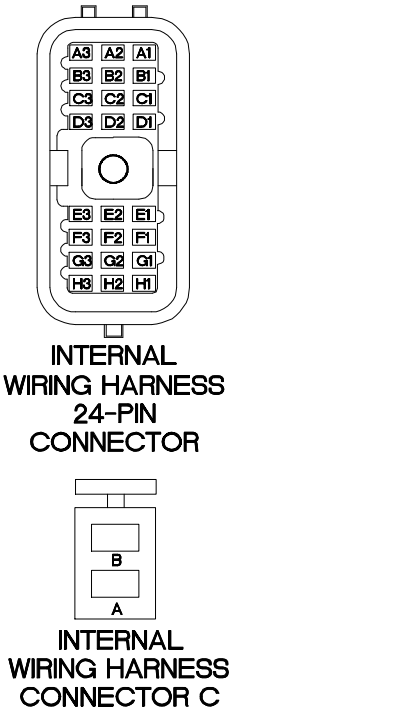
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

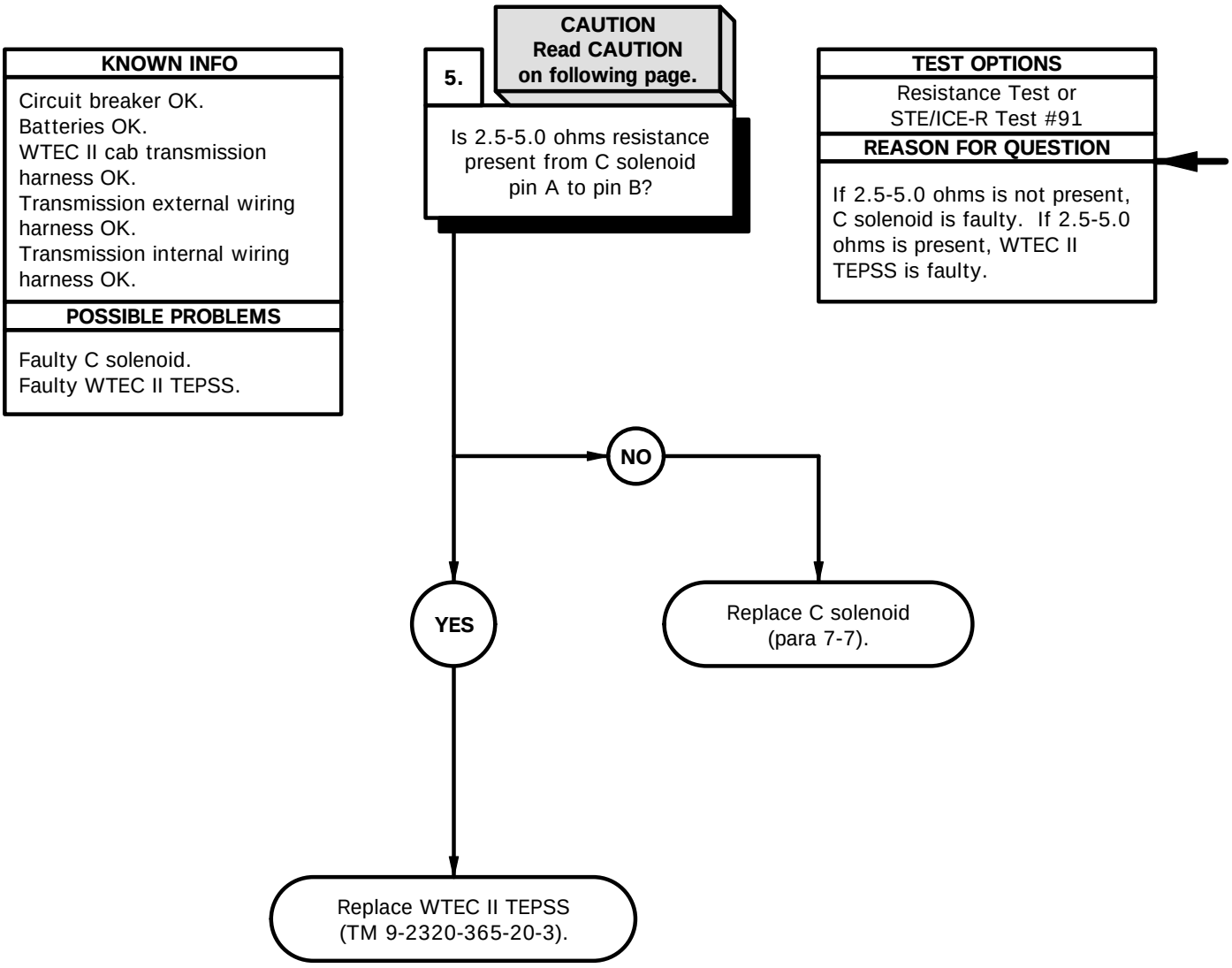
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



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

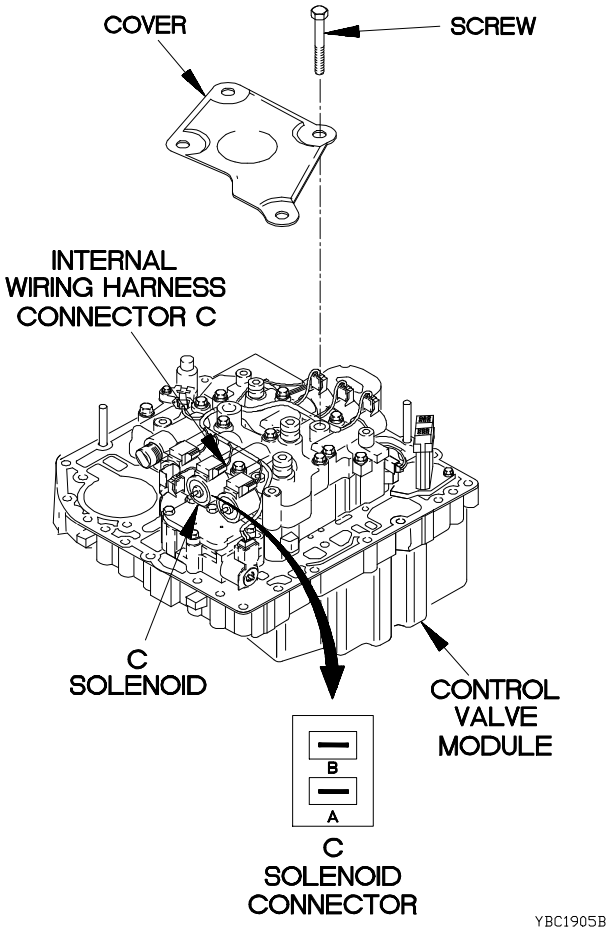
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

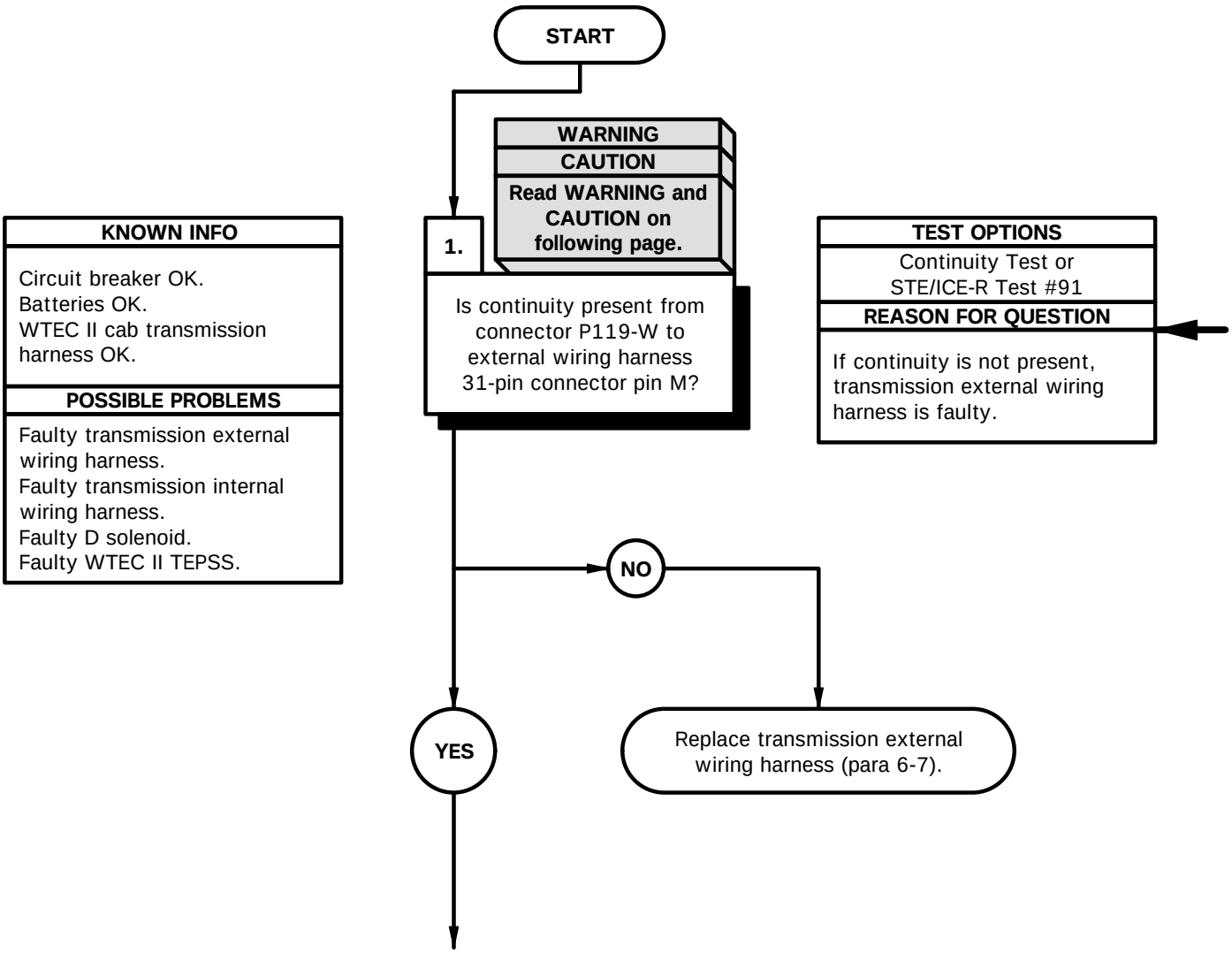
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

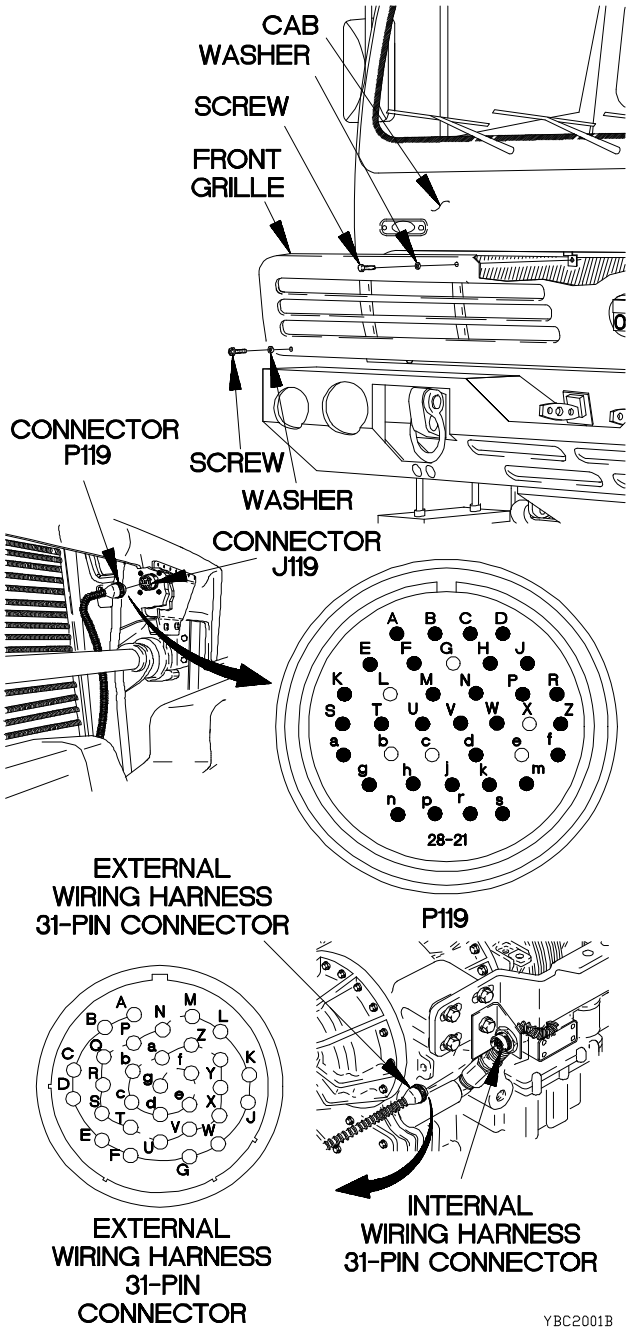
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

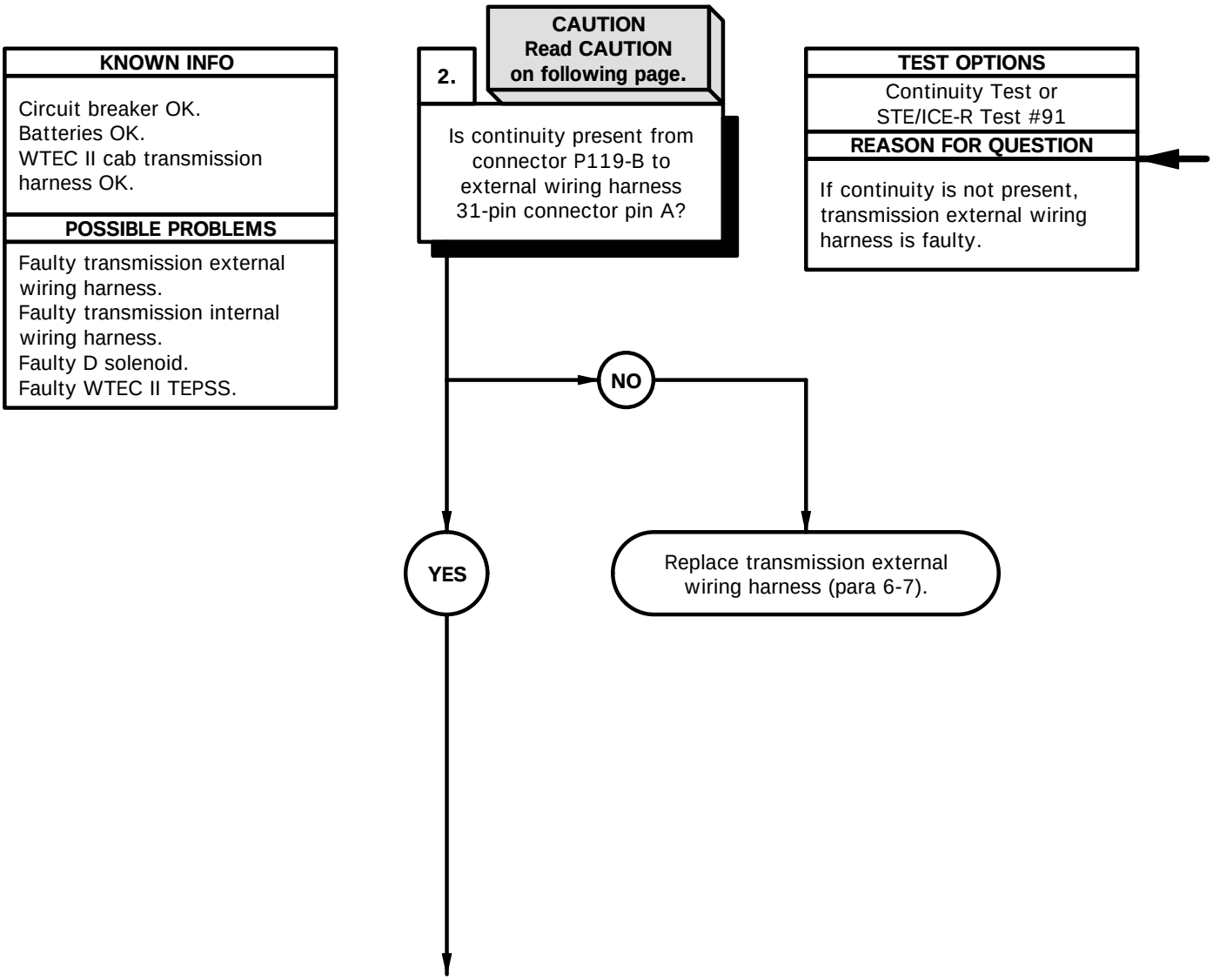
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin connector.
(6) Set multimeter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

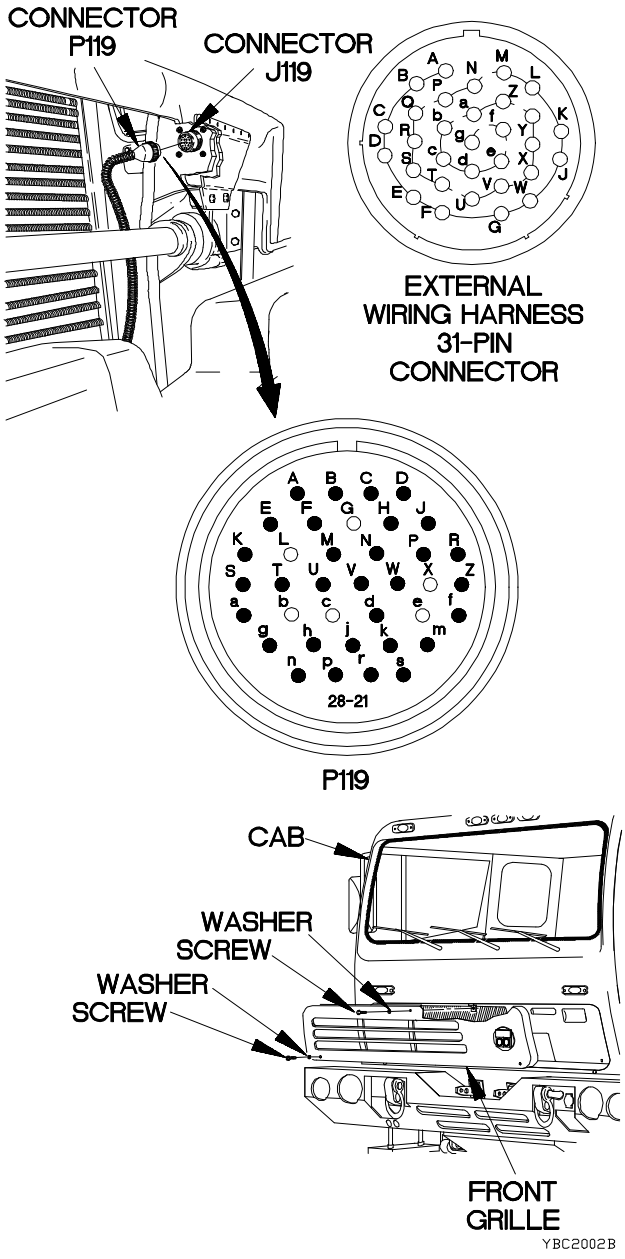
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

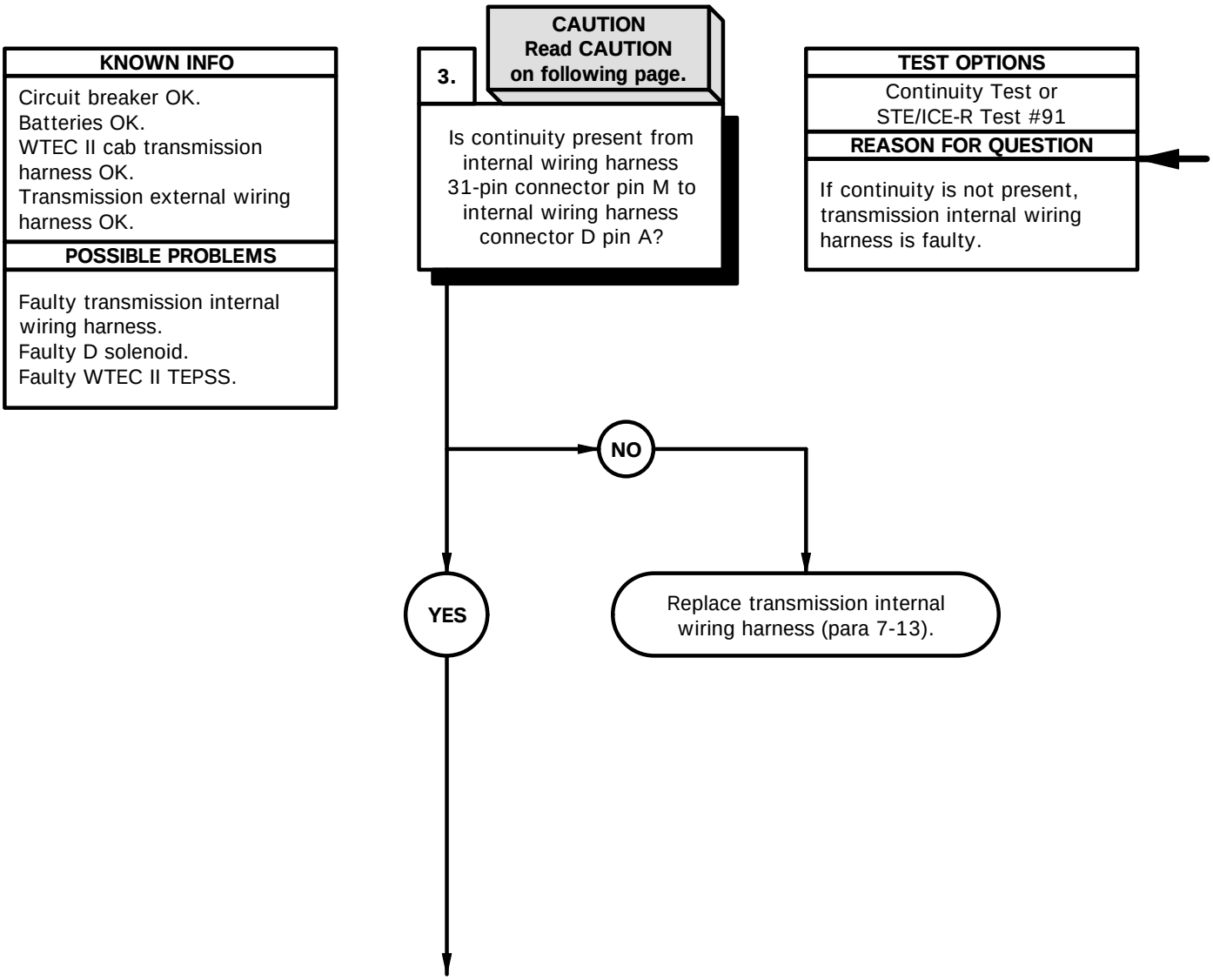
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

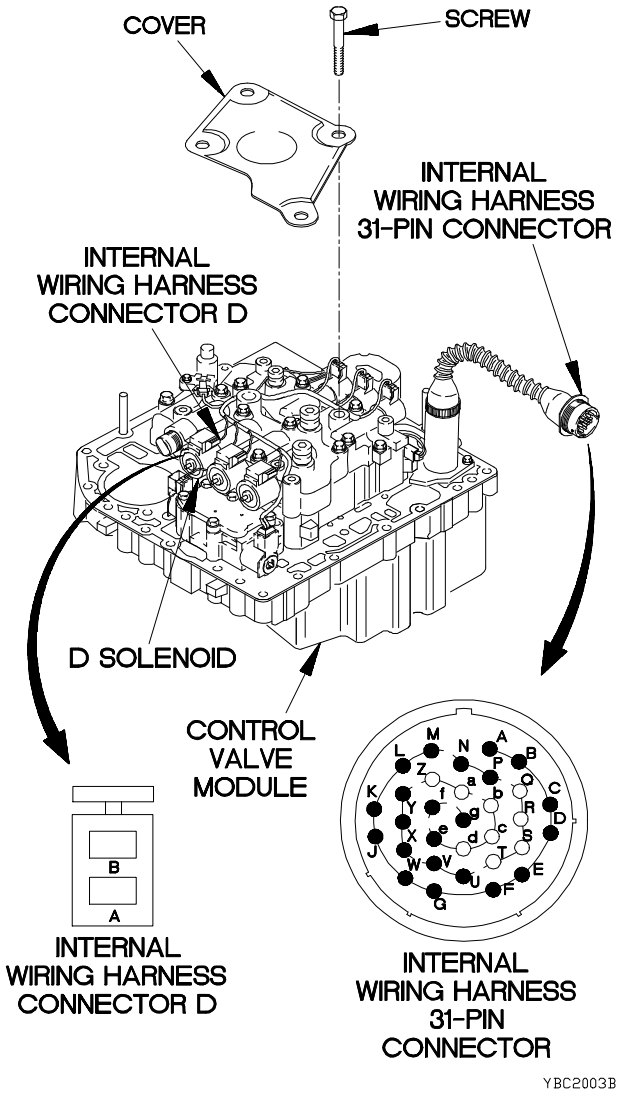
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

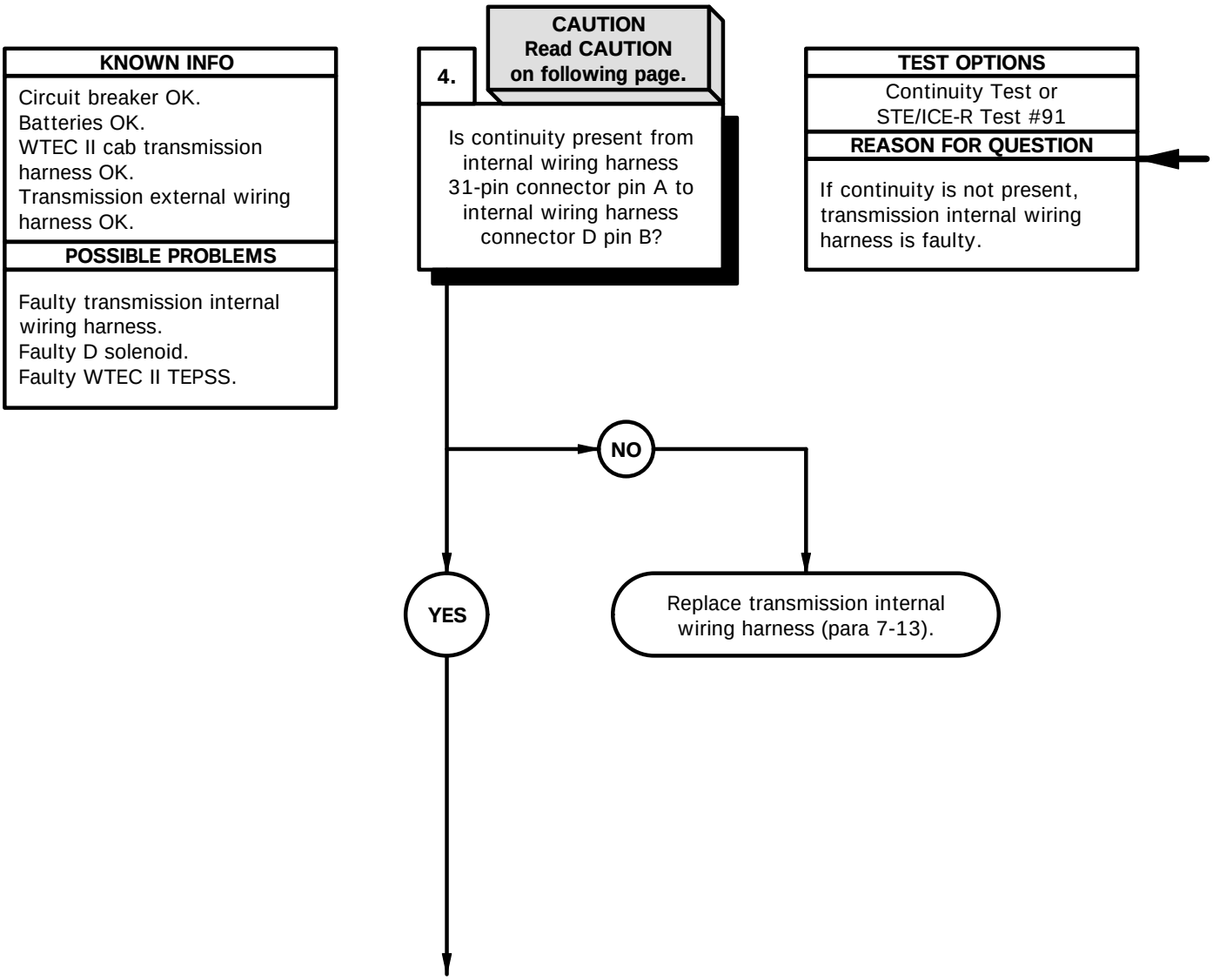
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

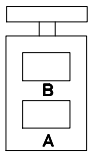
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

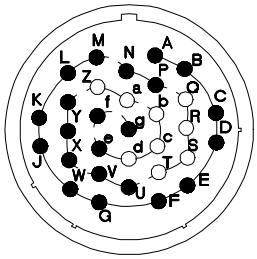
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



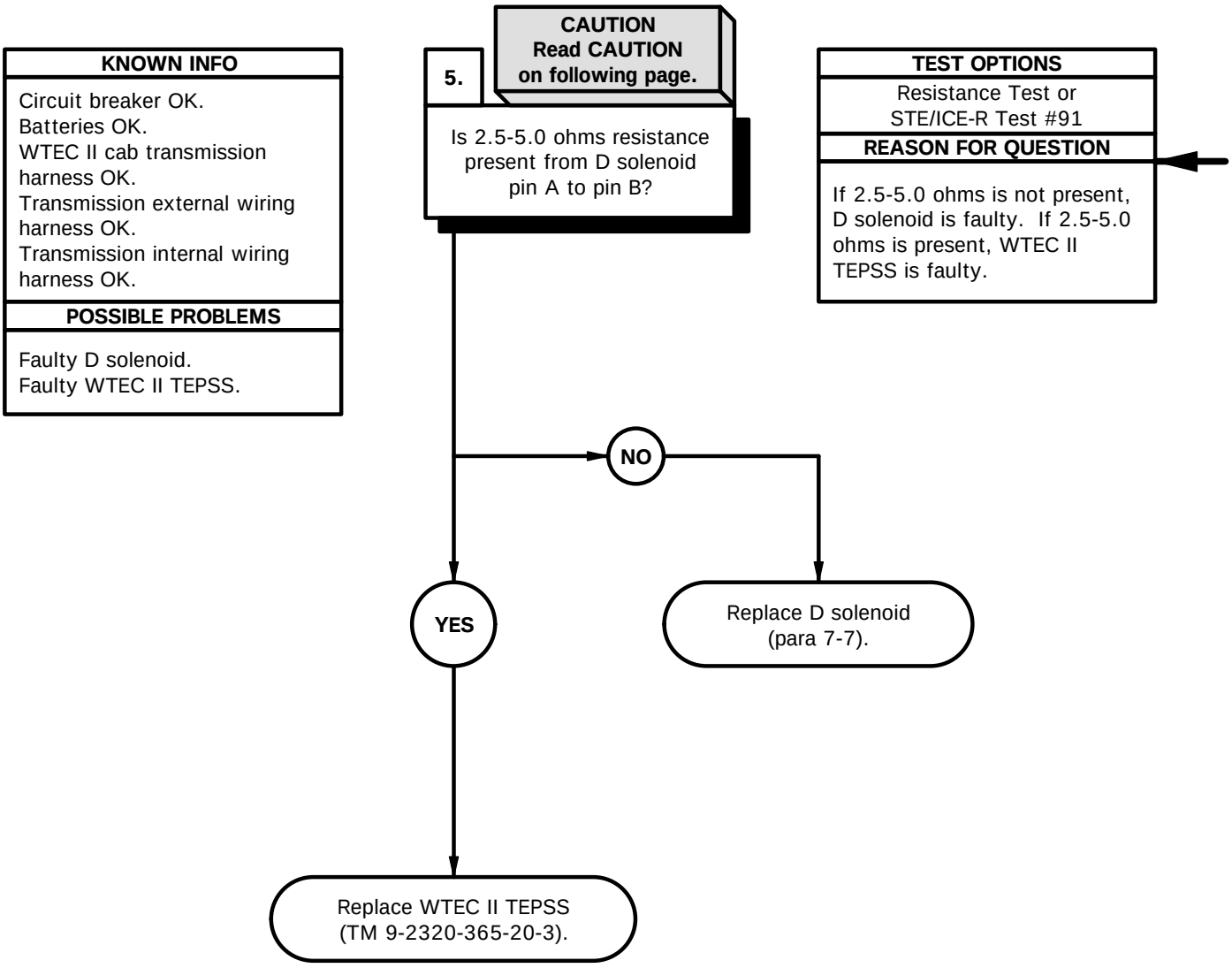
INTERNAL WIRING HARNESS CONNECTOR D



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

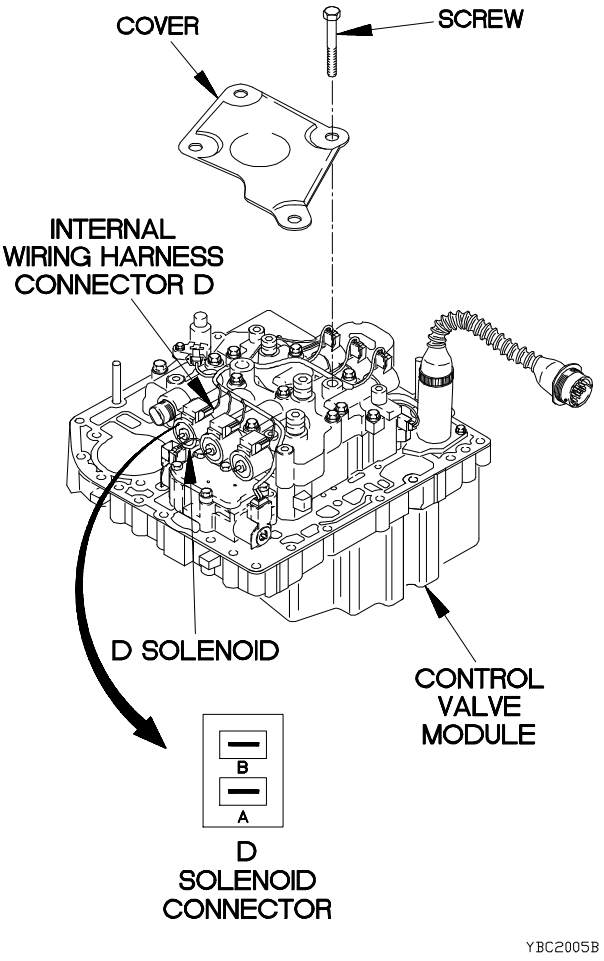
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

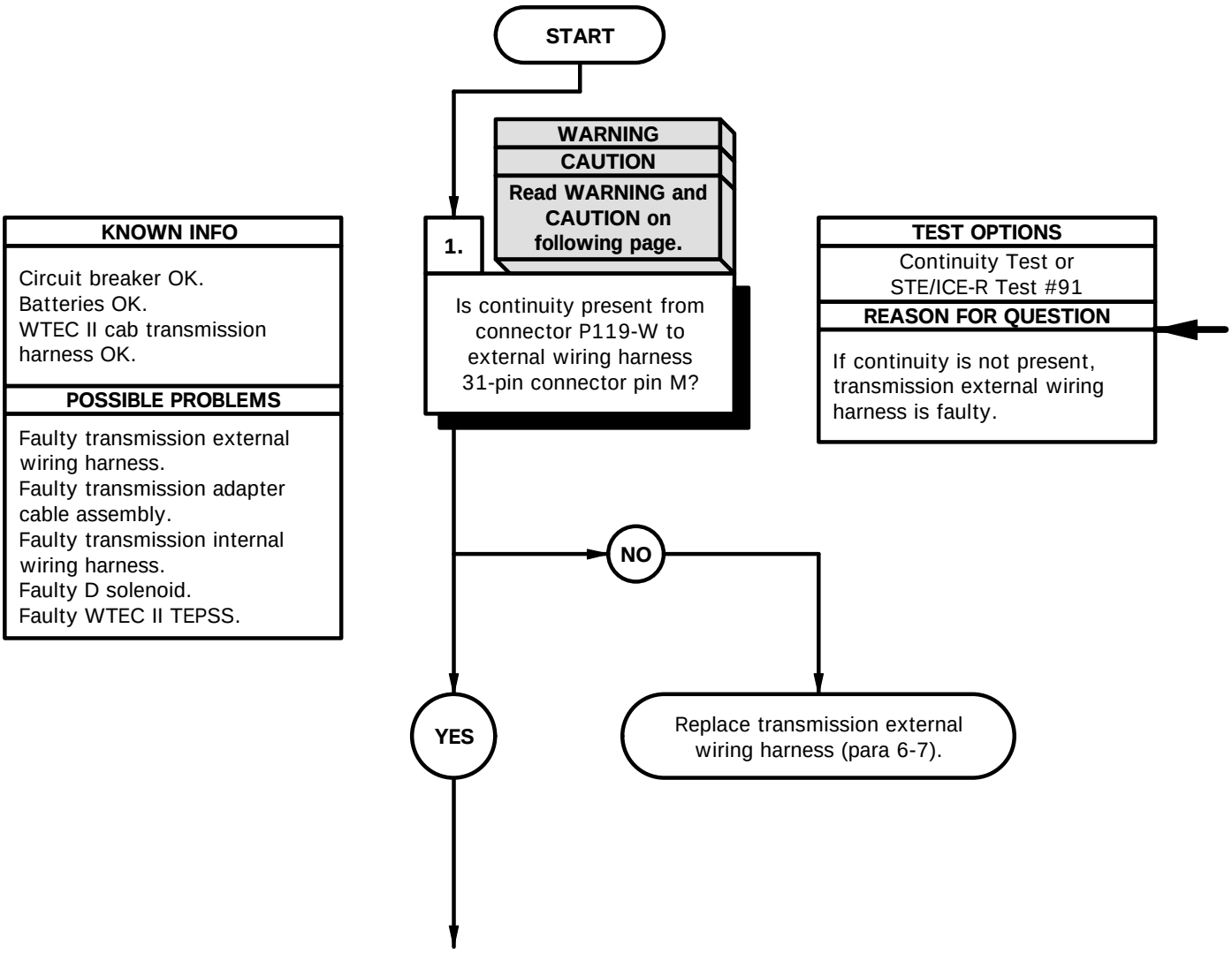
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

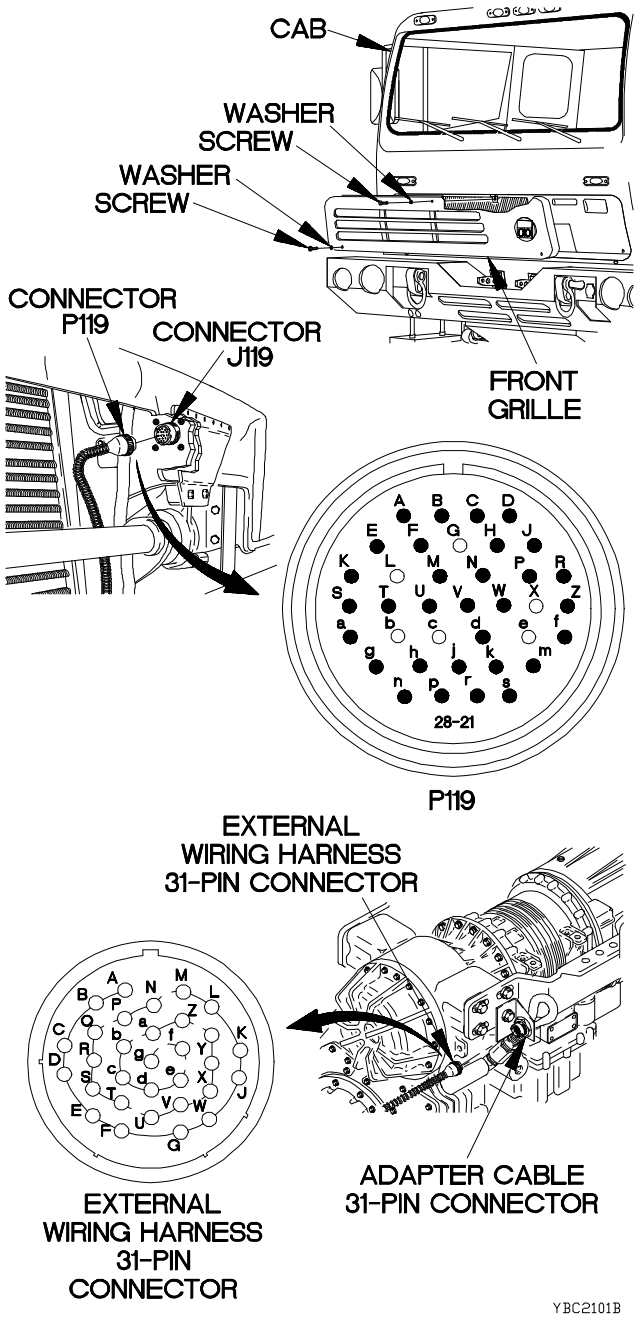
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

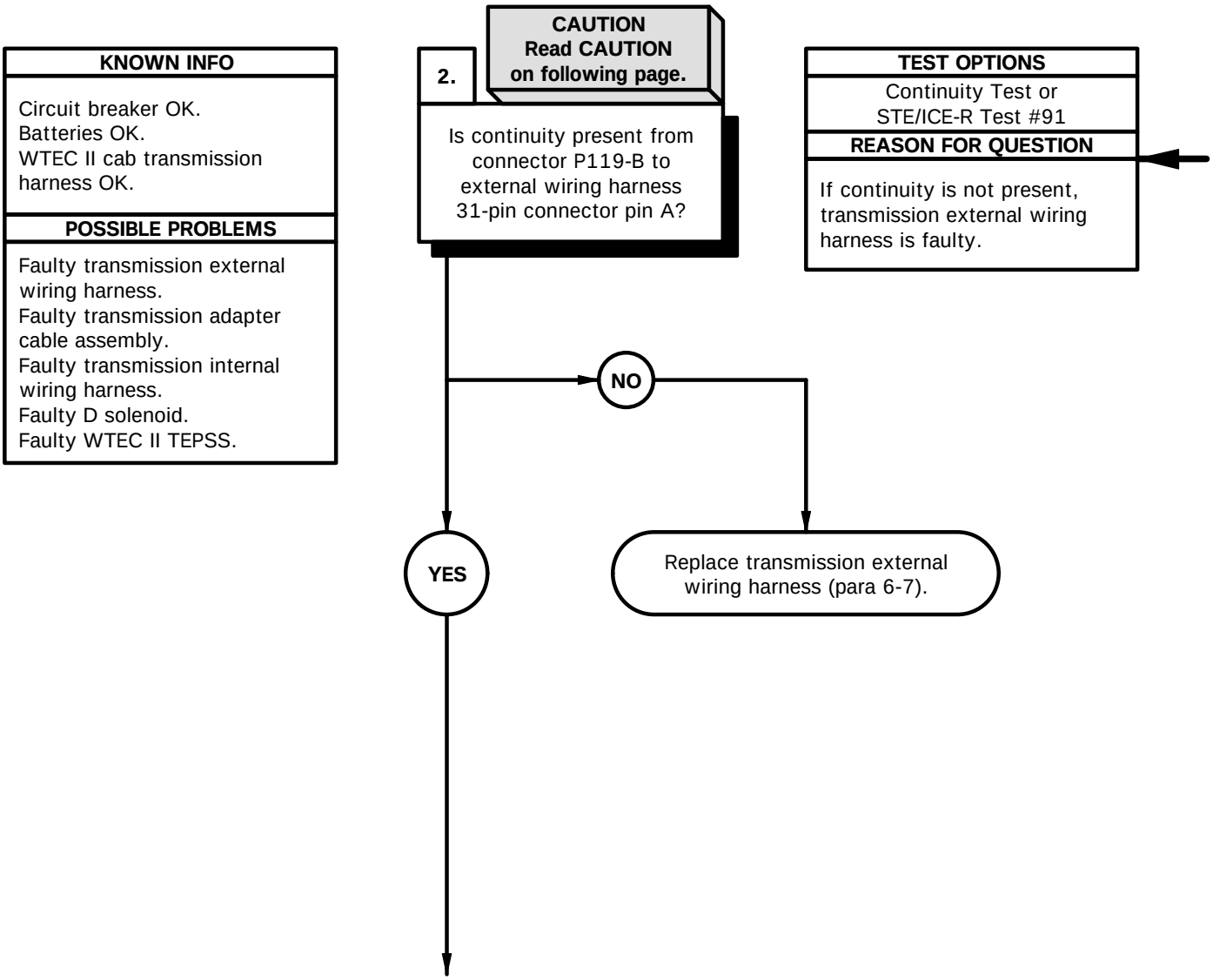
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from adapter cable 31-pin connector.
(6) Set multimeter to ohms.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

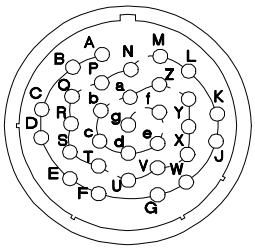
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

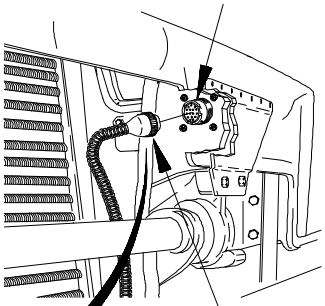
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

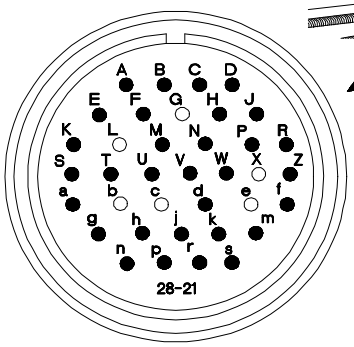
CONTINUITY TEST

(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).

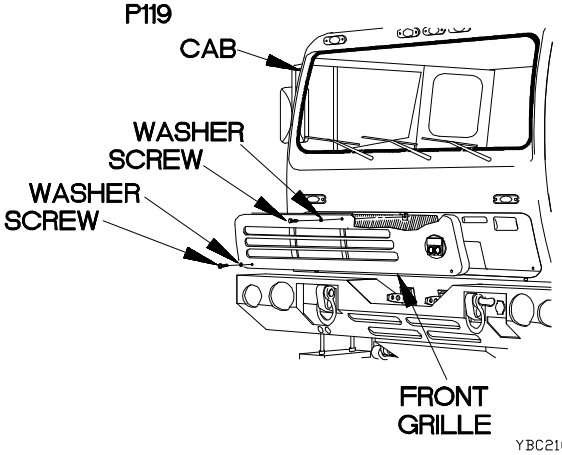


EXTERNAL WIRING HARNESS 31-PIN CONNECTOR

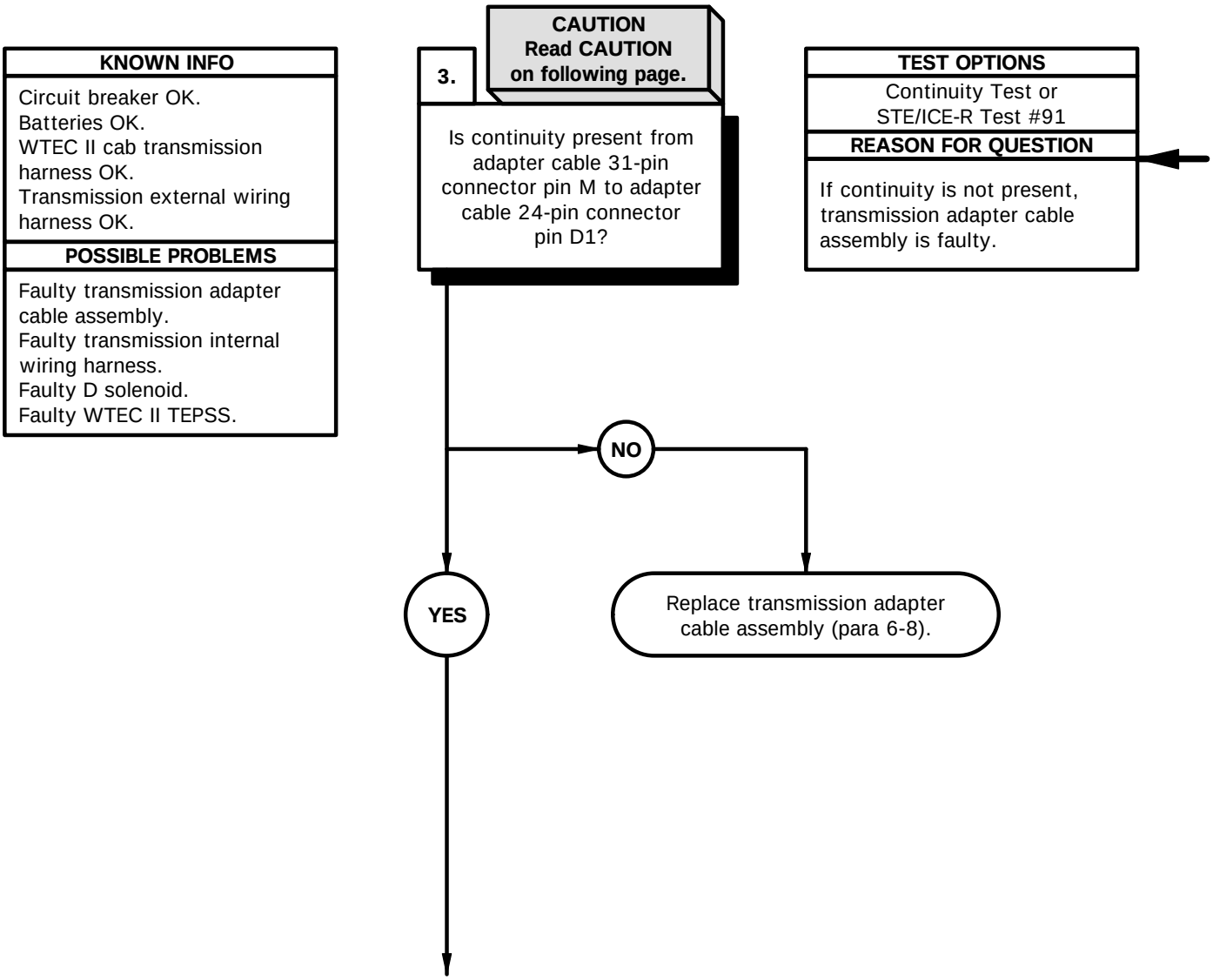




P119



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)

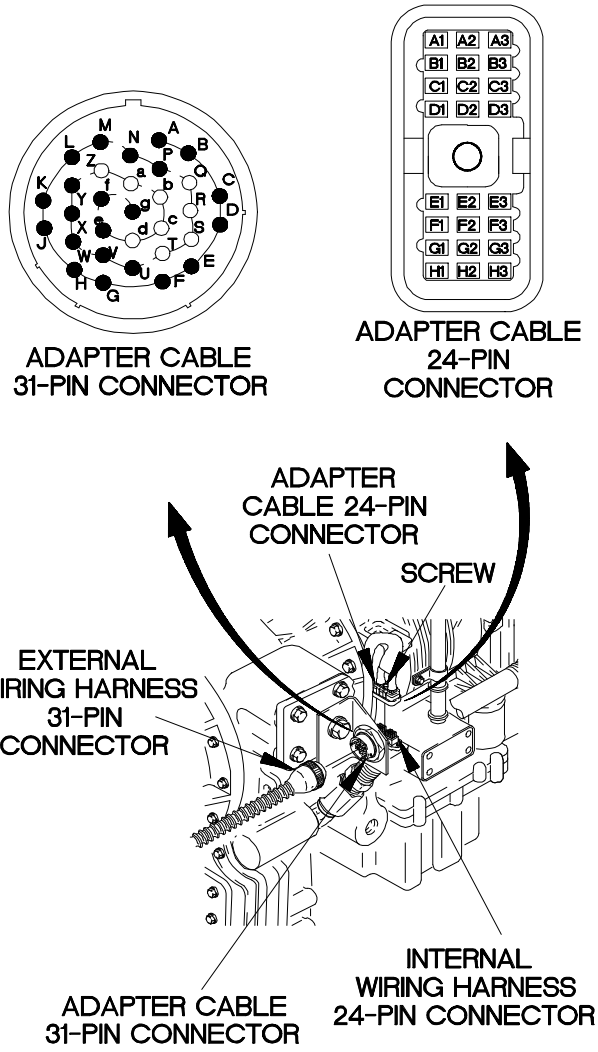


CAUTION

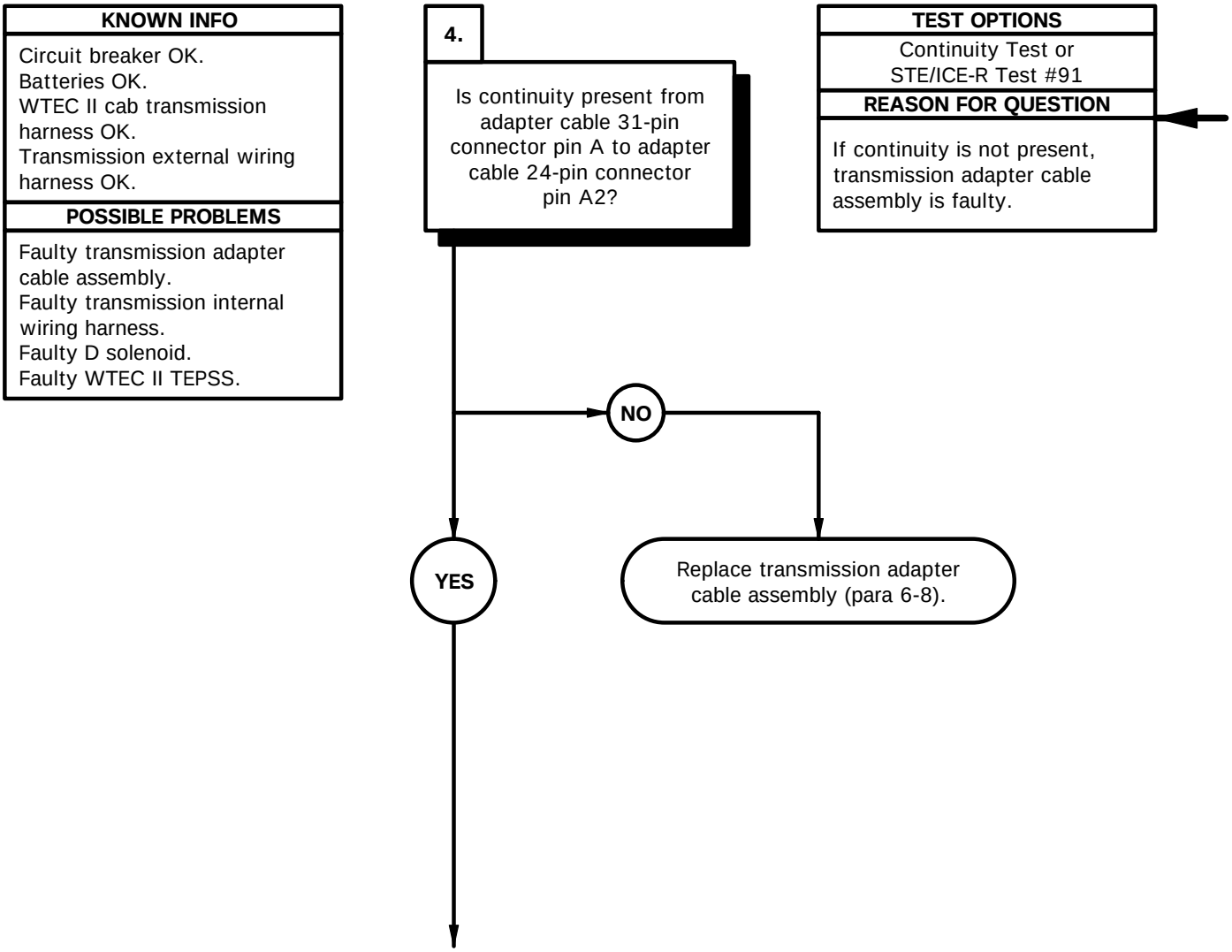
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

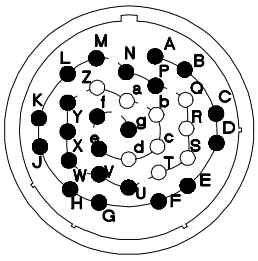


c21. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

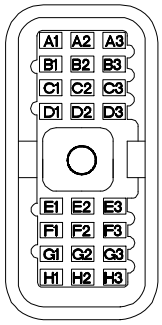


CONTINUITY TEST

(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.



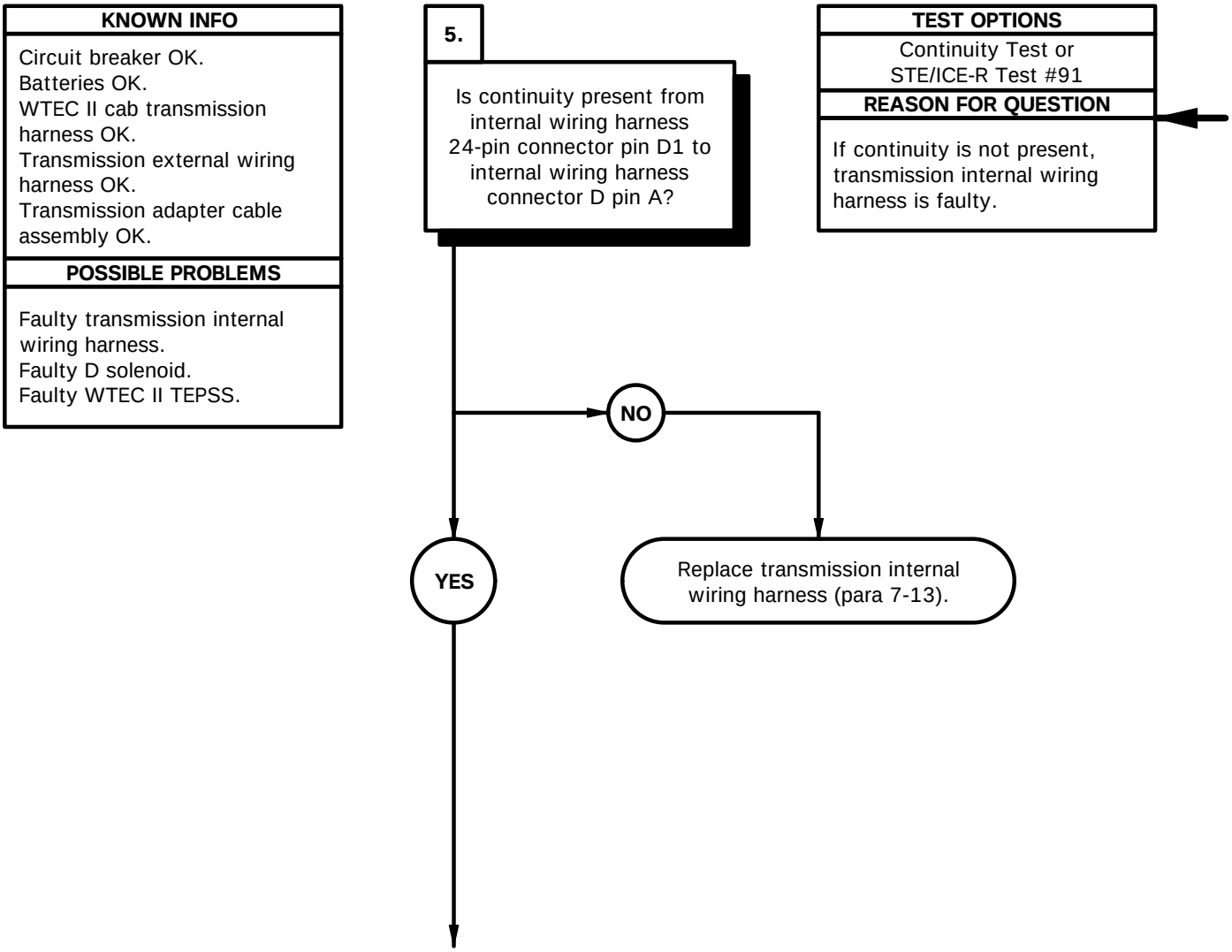
ADAPTER CABLE
31-PIN CONNECTOR



ADAPTER CABLE
24-PIN
CONNECTOR

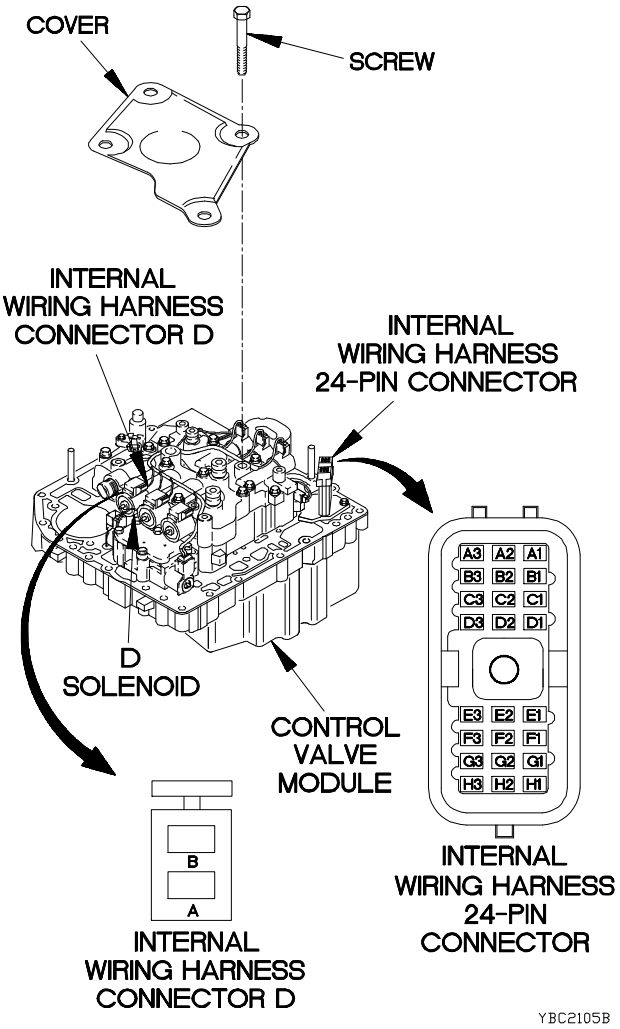
YBC2104B

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)

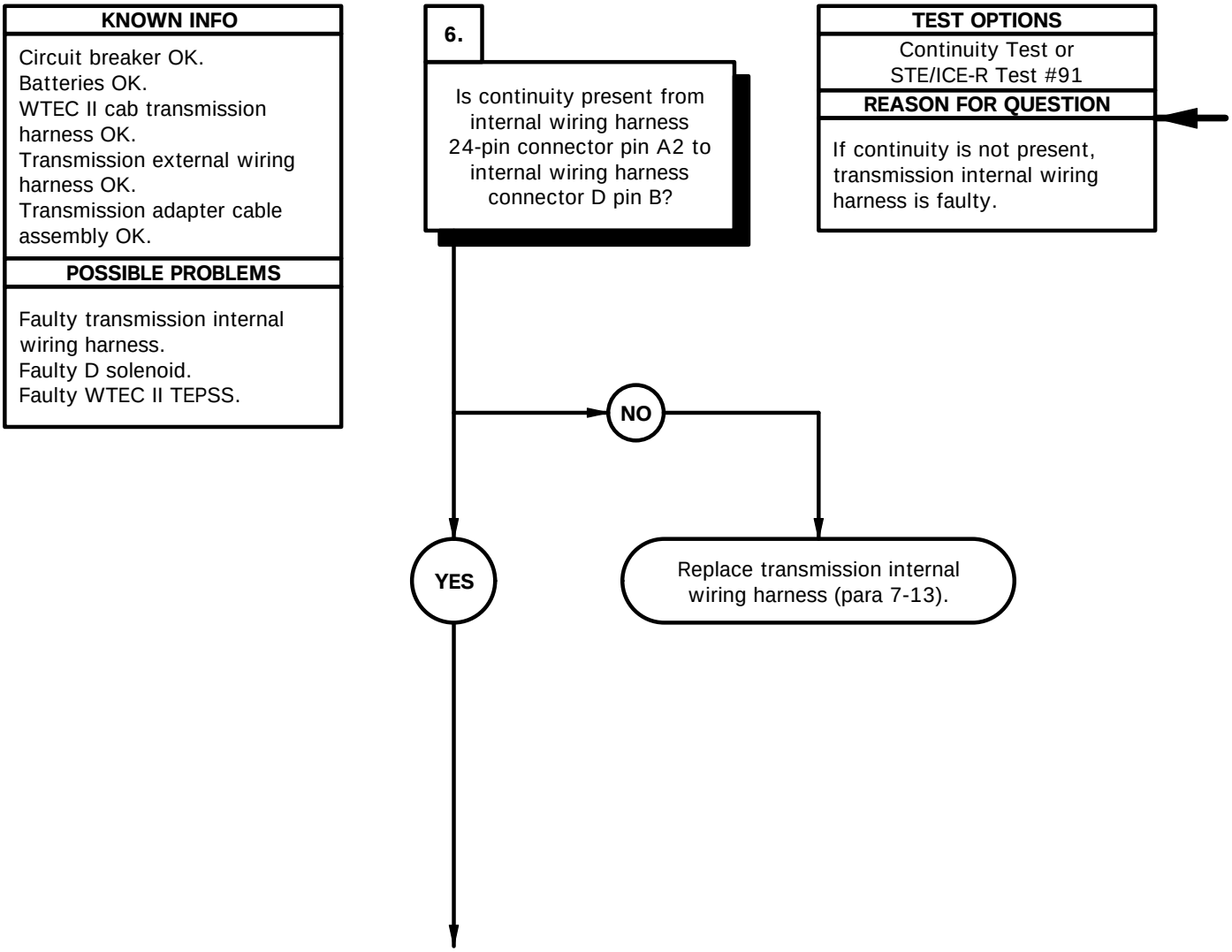


CONTINUITY TEST

(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).

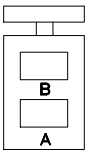


c21. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

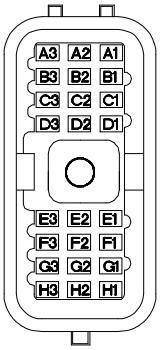


CONTINUITY TEST

(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).



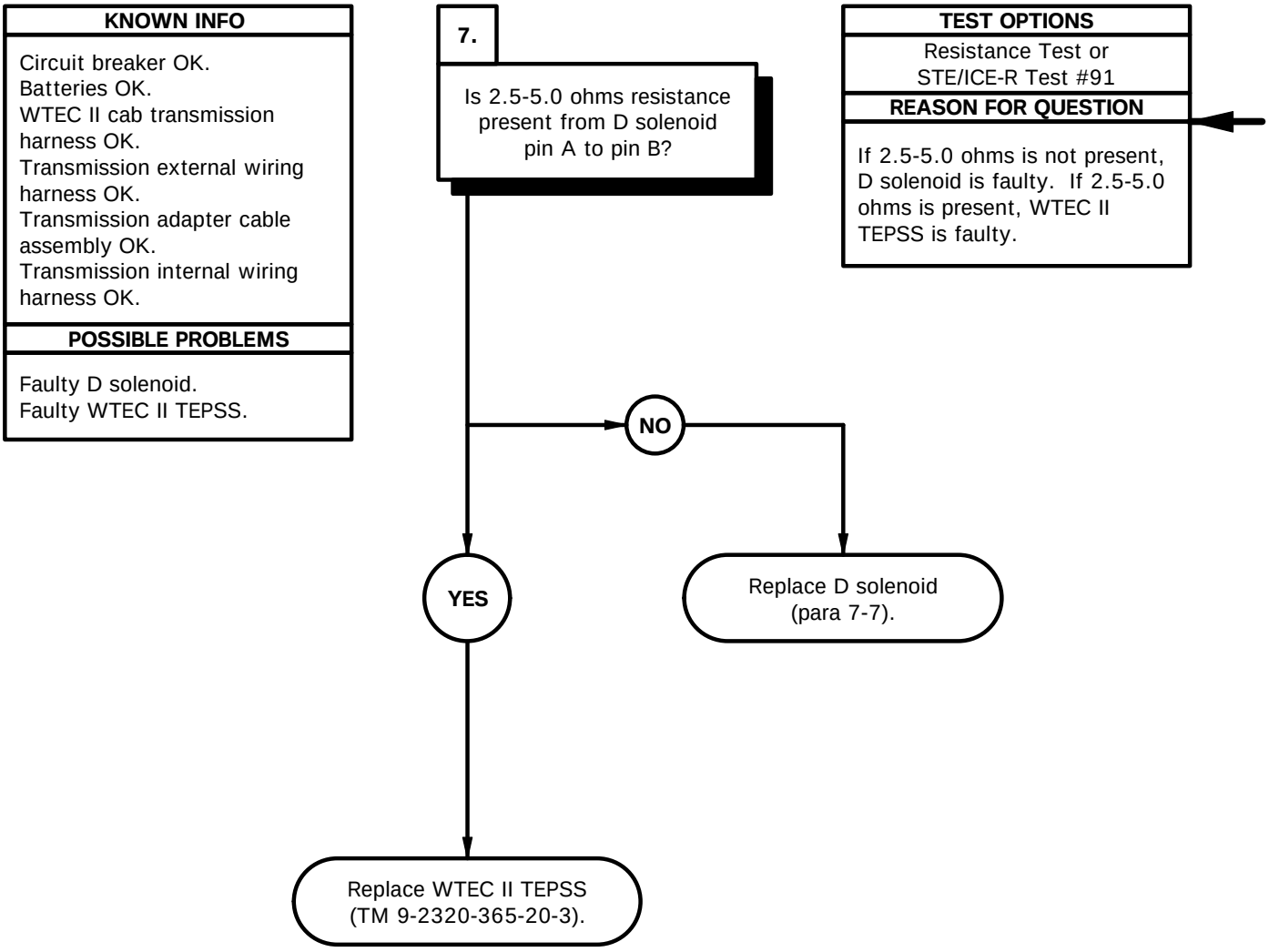
INTERNAL WIRING HARNESS CONNECTOR D



INTERNAL WIRING HARNESS 24-PIN CONNECTOR

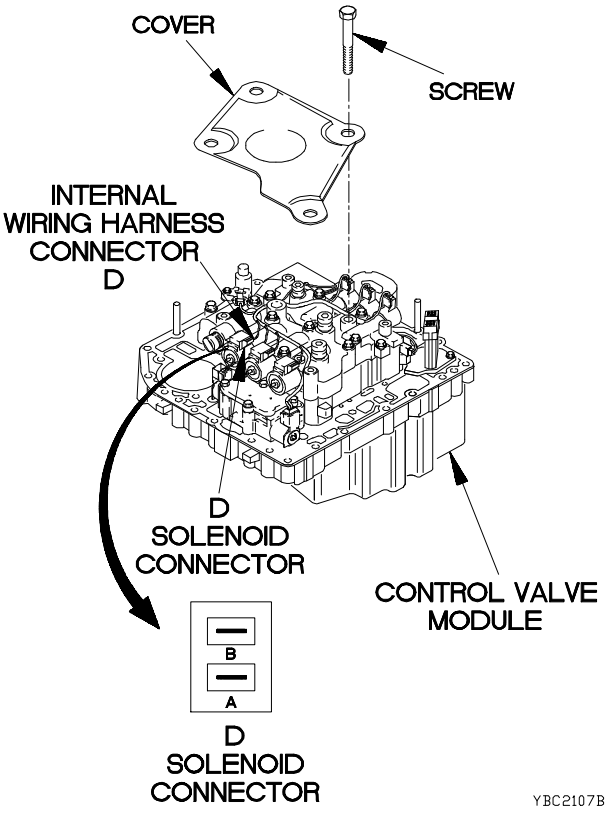
YBC2106B

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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

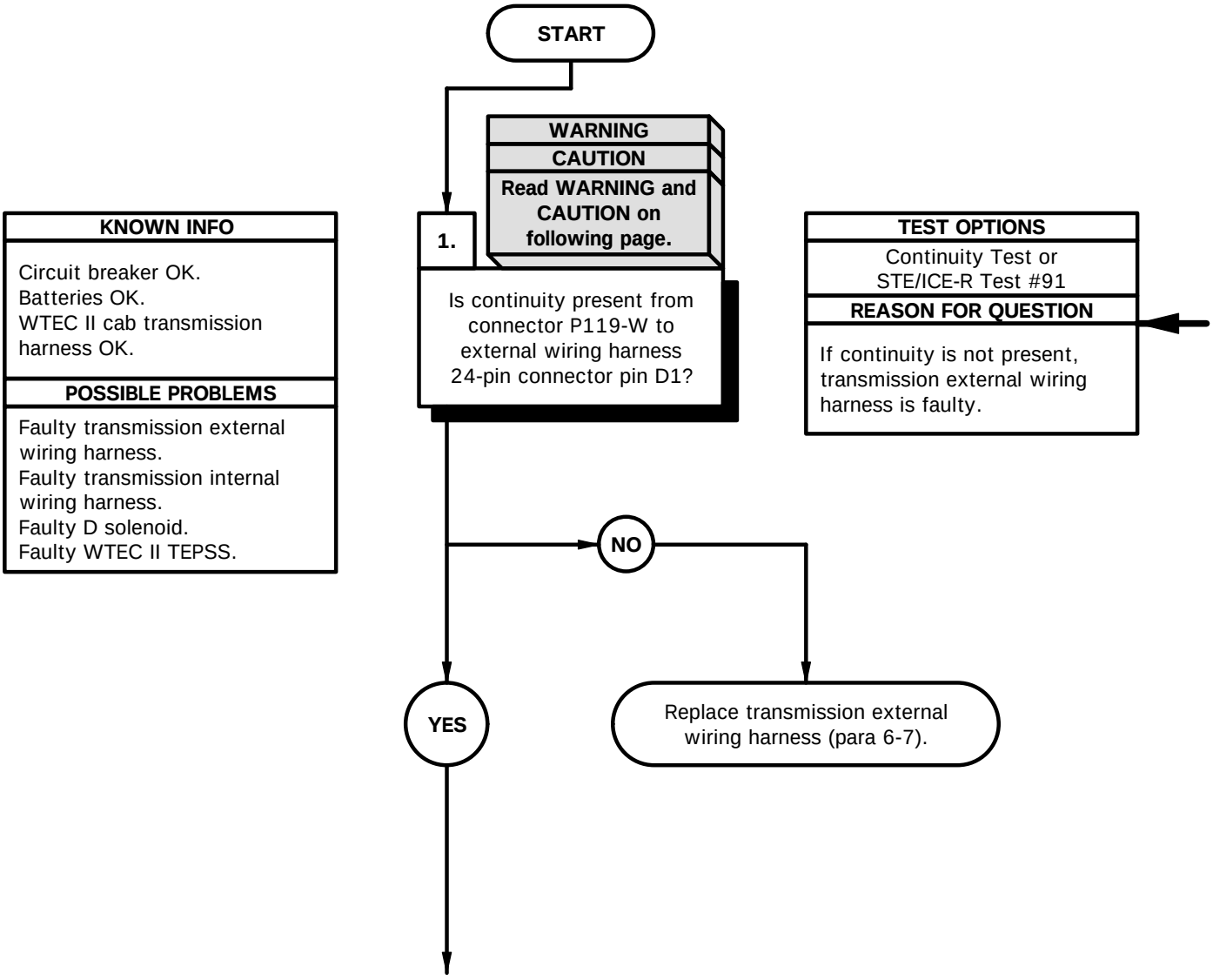
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

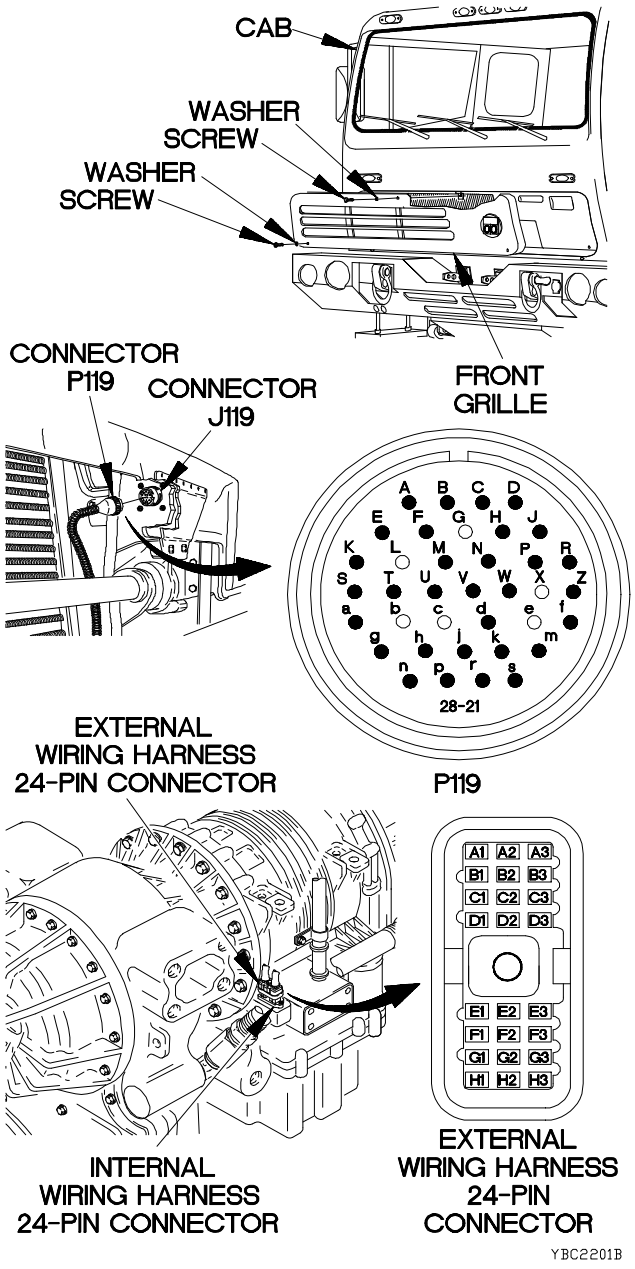
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

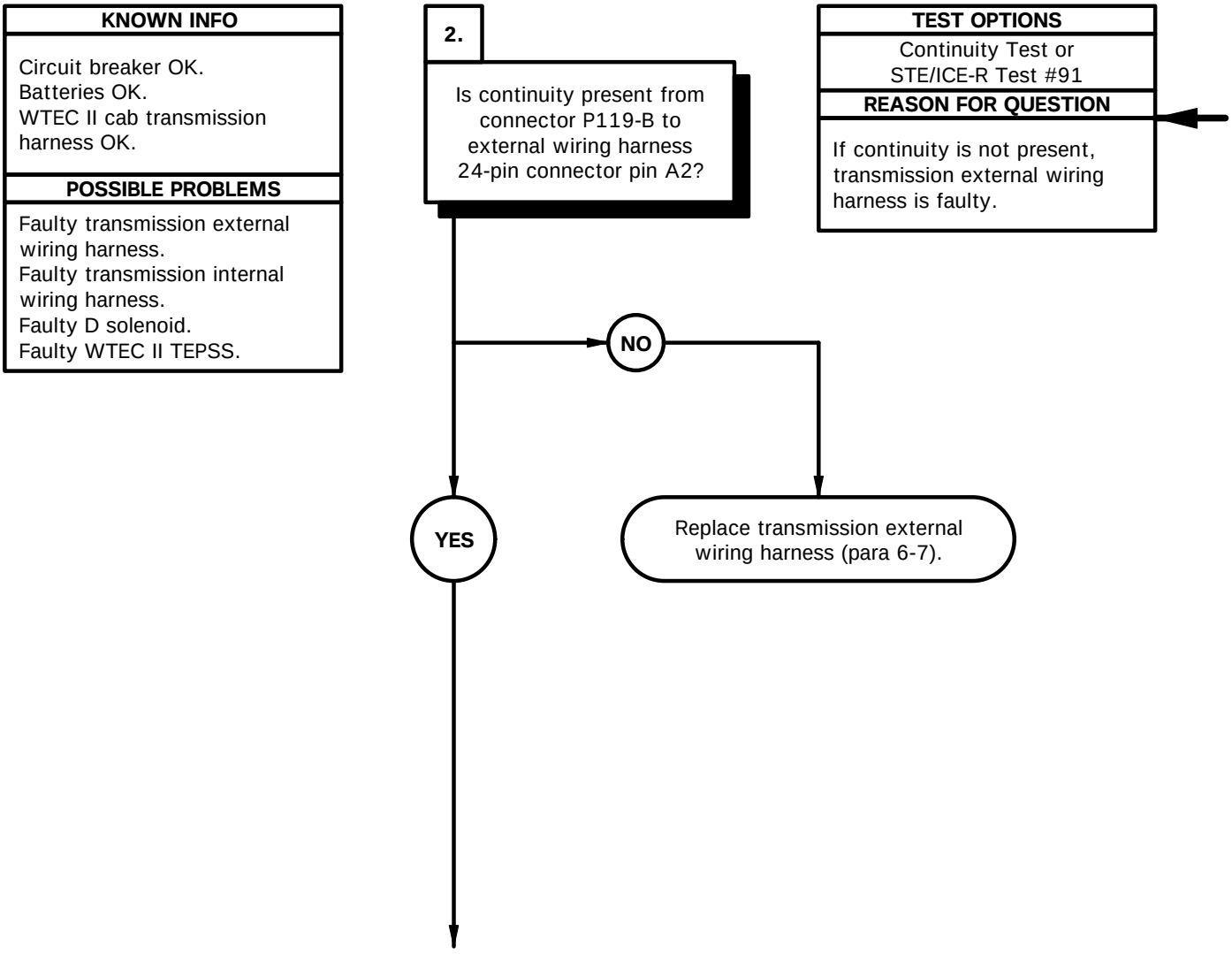
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Loosen screw in external wiring harness 24-pin connector.
(6) Disconnect external wiring harness 24-pin connector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

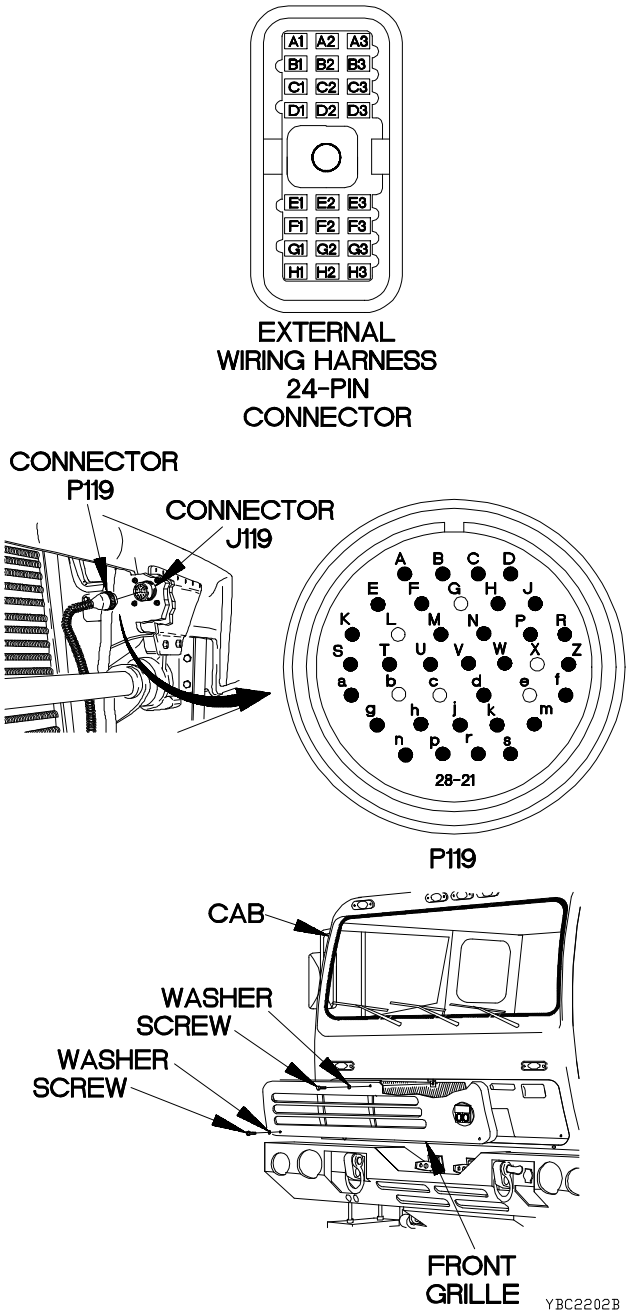


c22. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

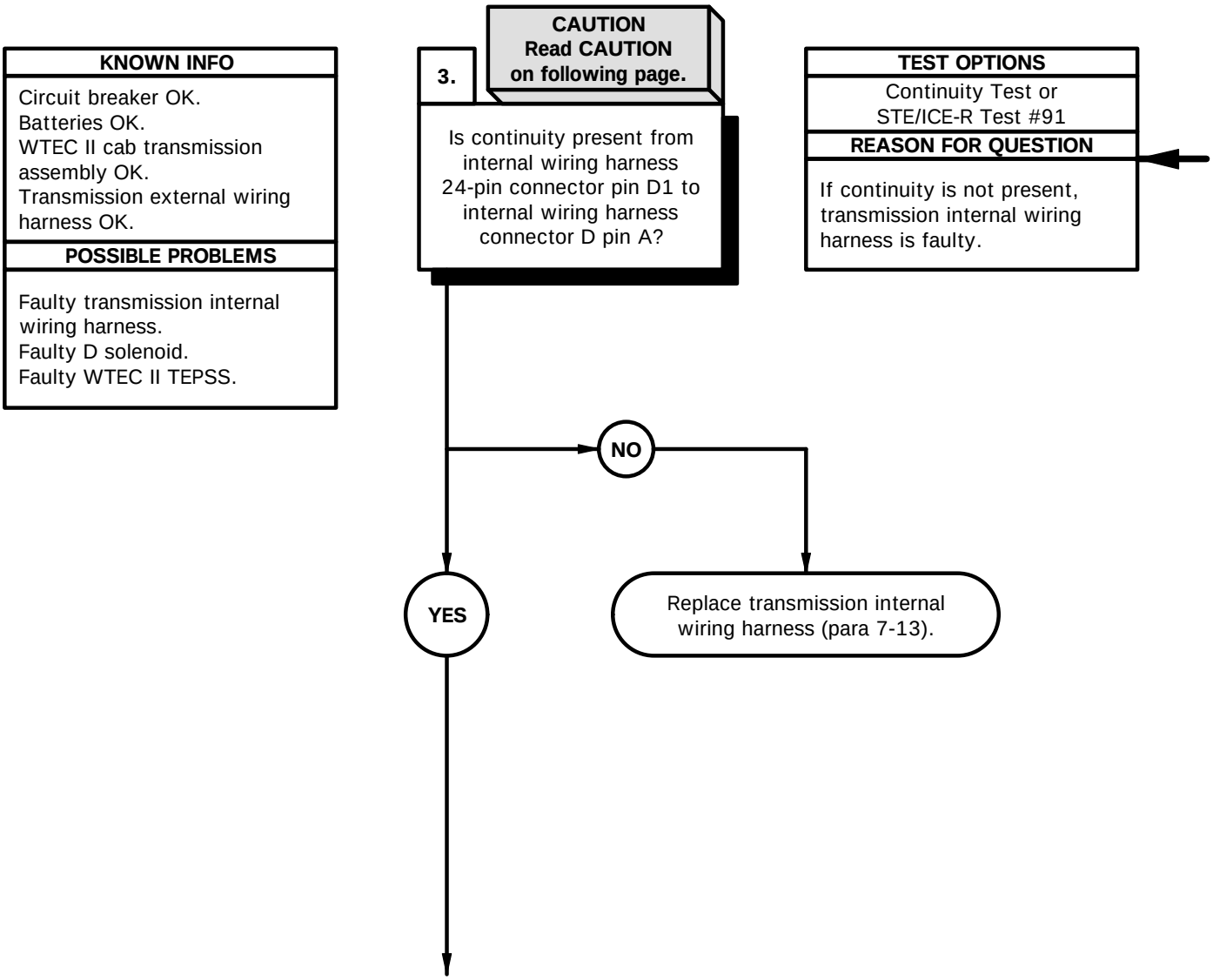


CONTINUITY TEST

(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

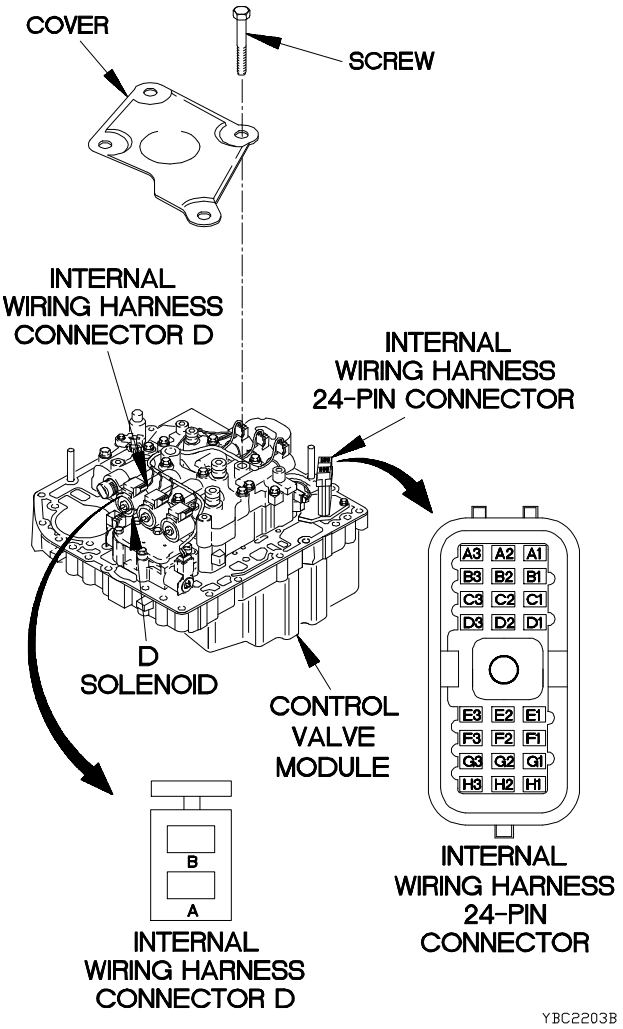
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

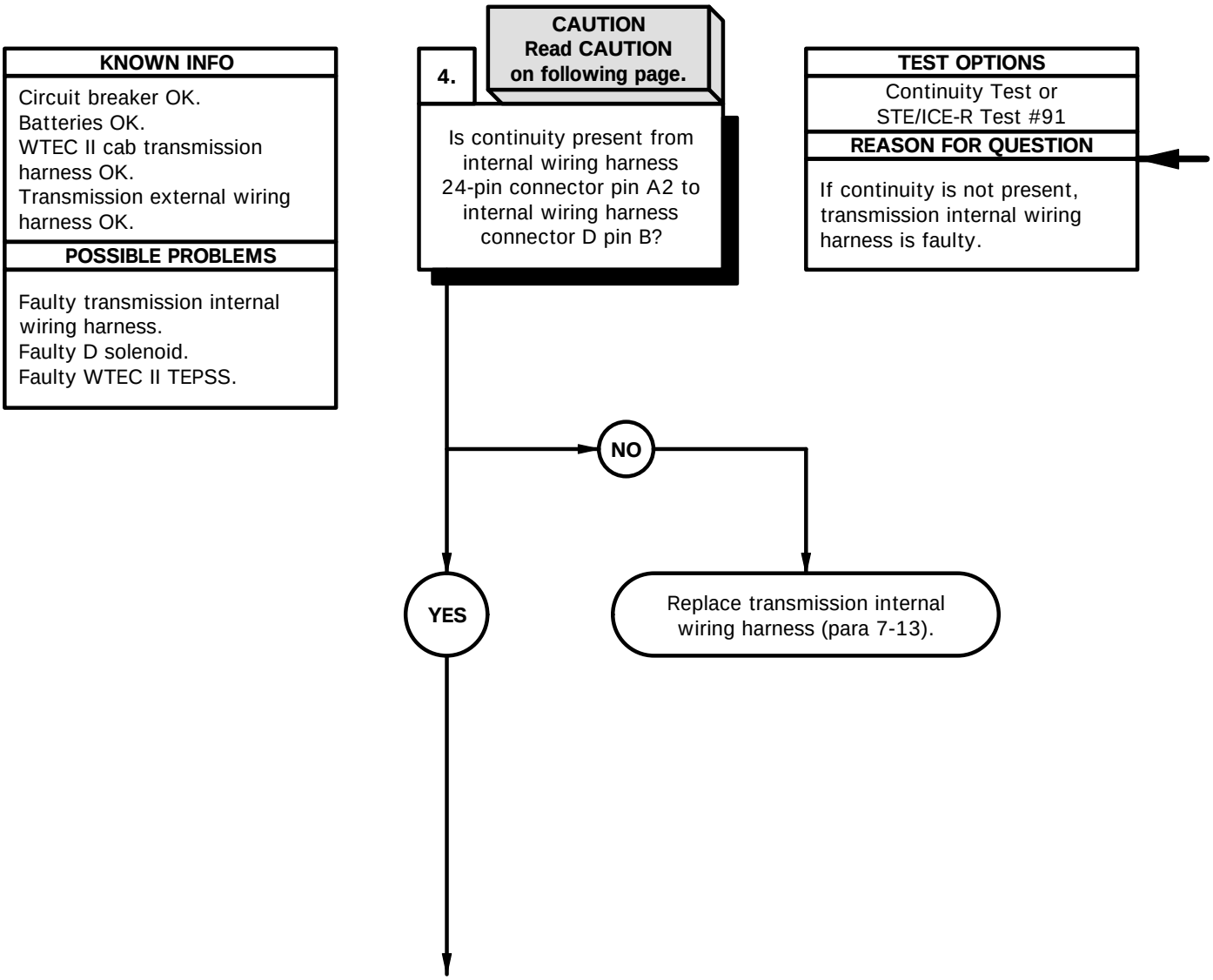
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

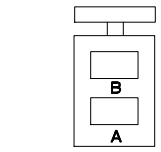
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

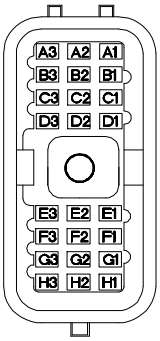
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



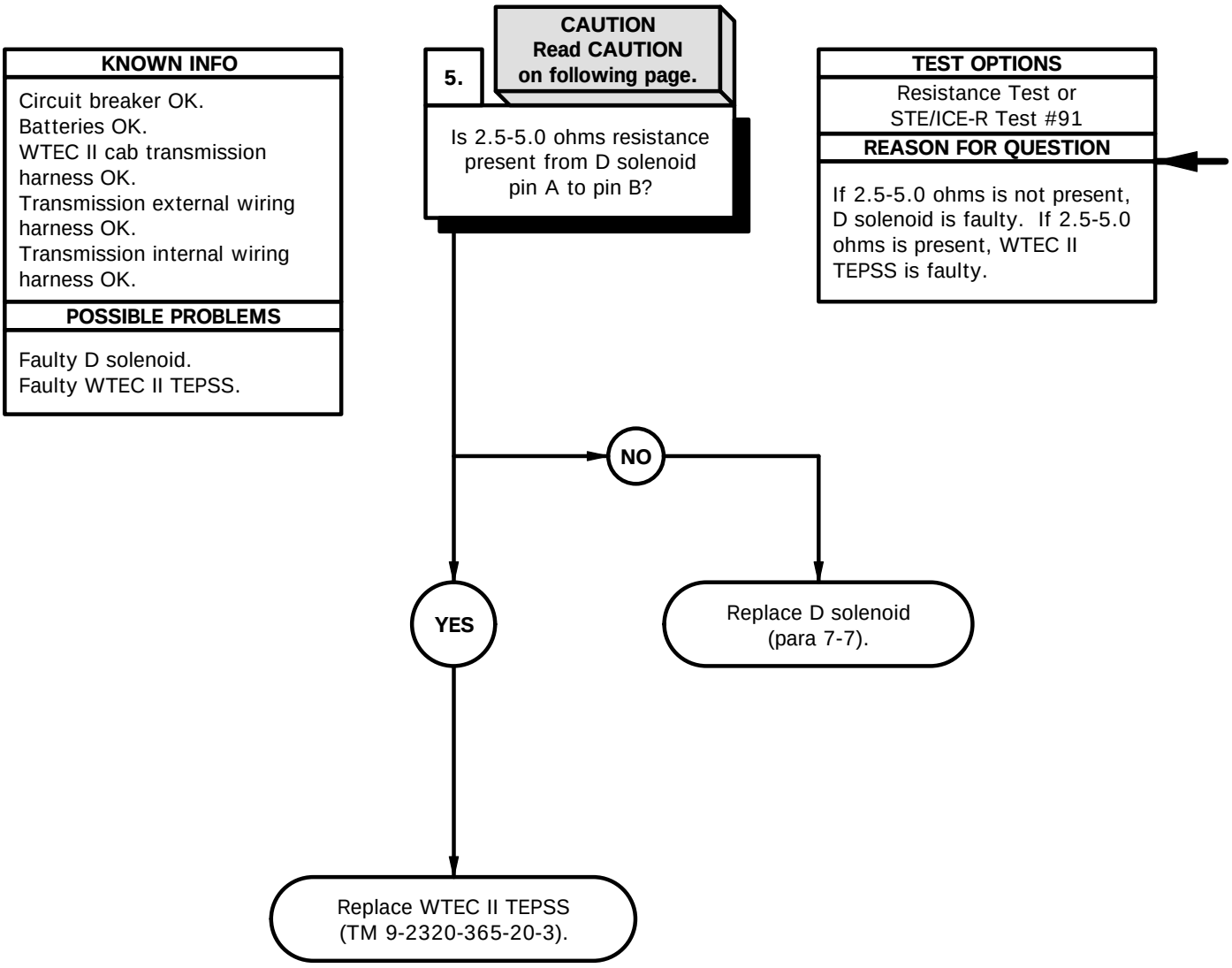
INTERNAL WIRING HARNESS CONNECTOR D



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

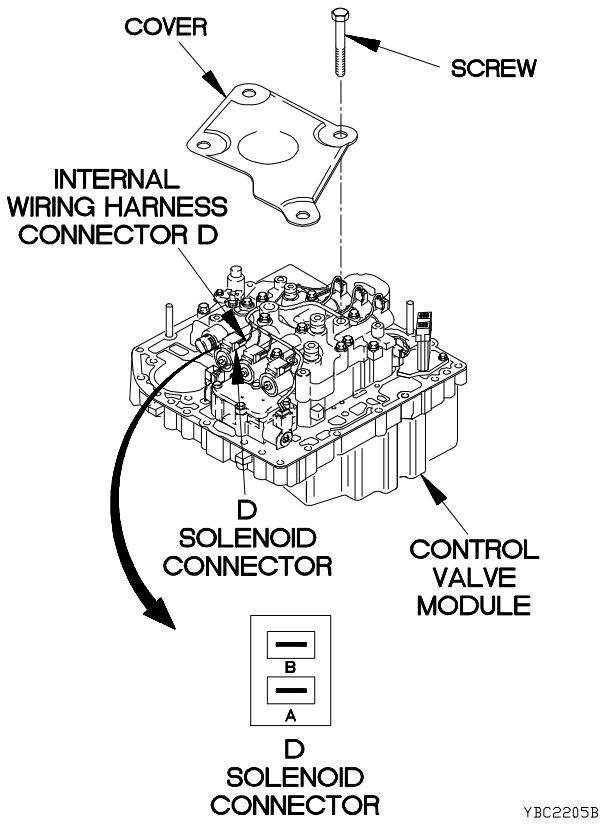
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

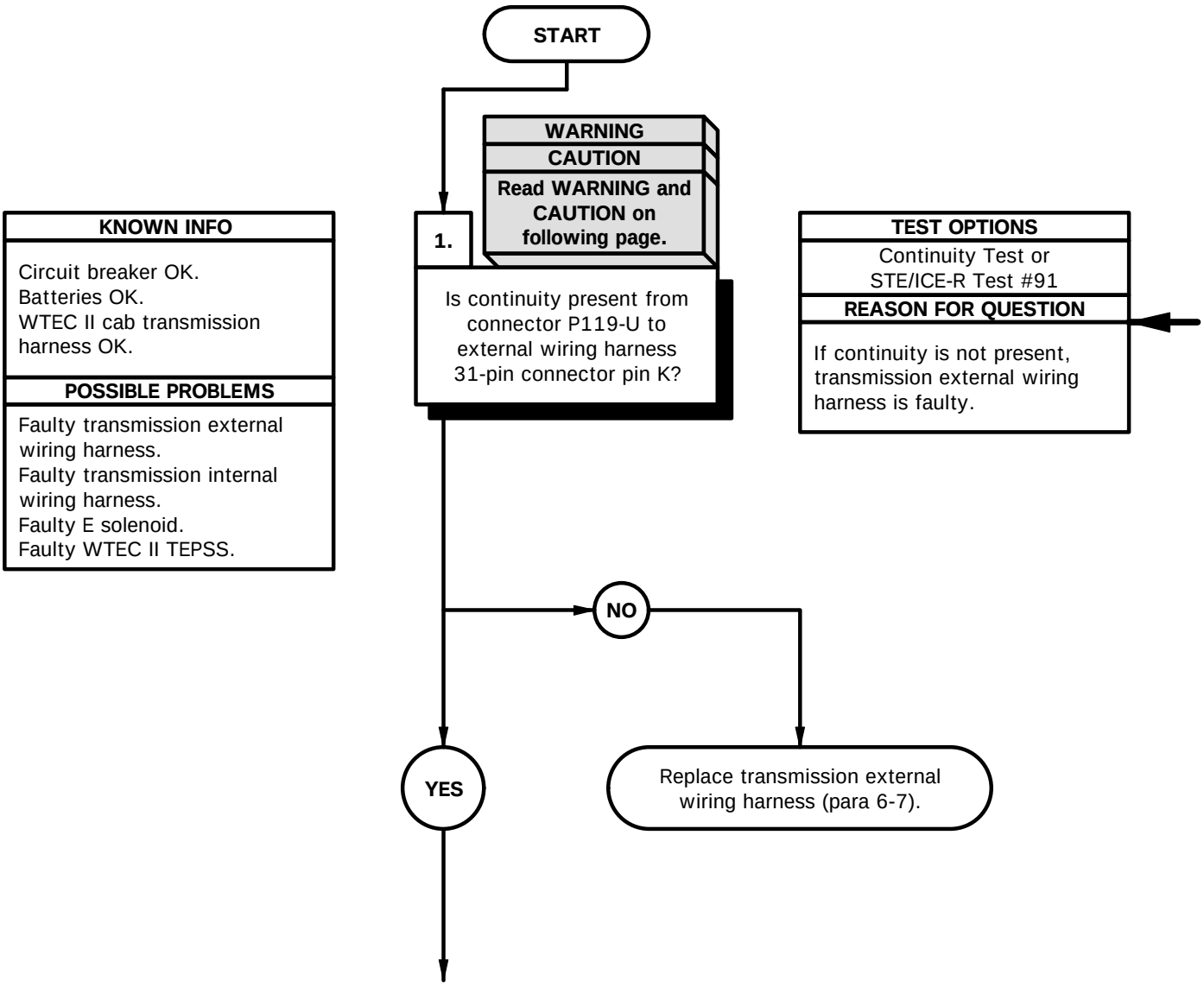
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

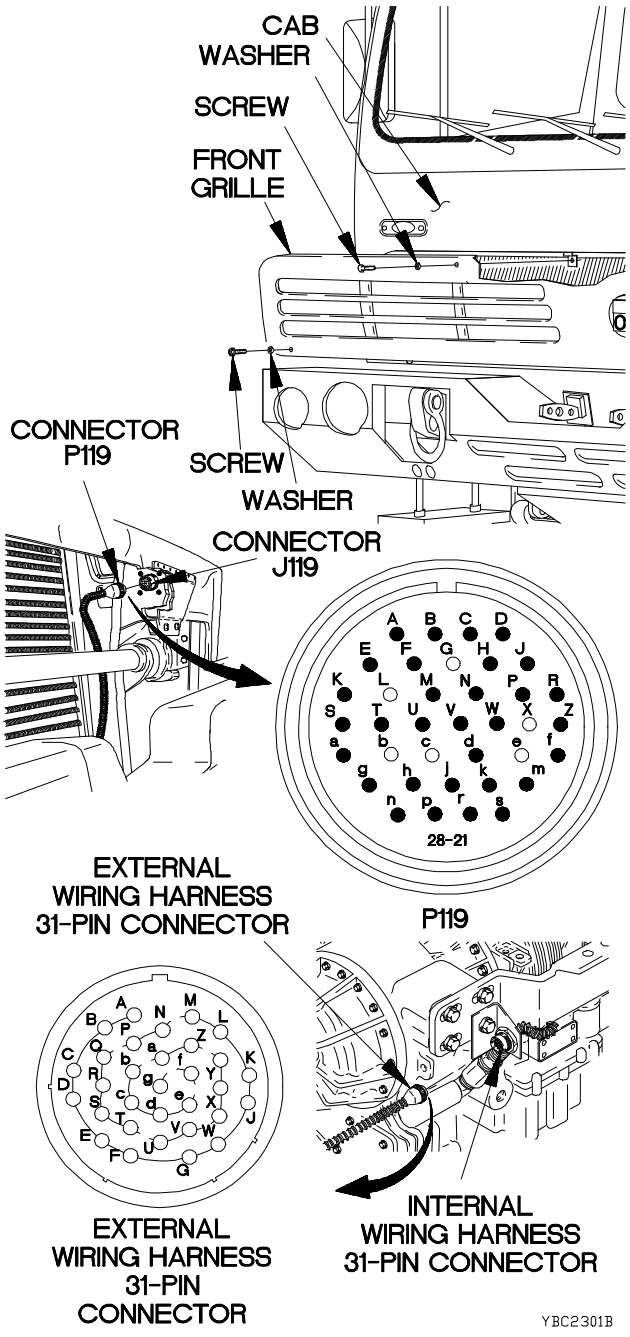
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

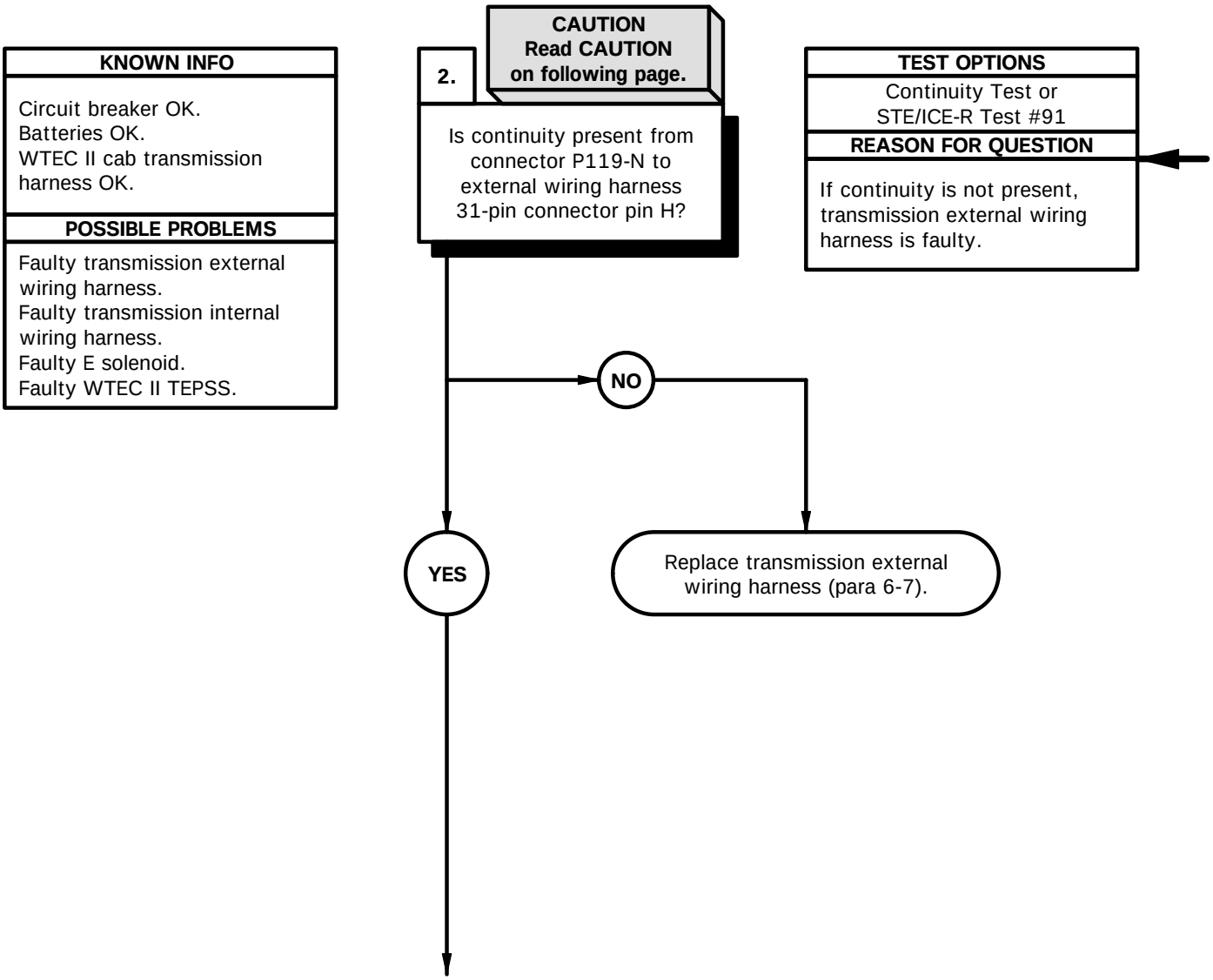
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin connector.
(6) Set multimeter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

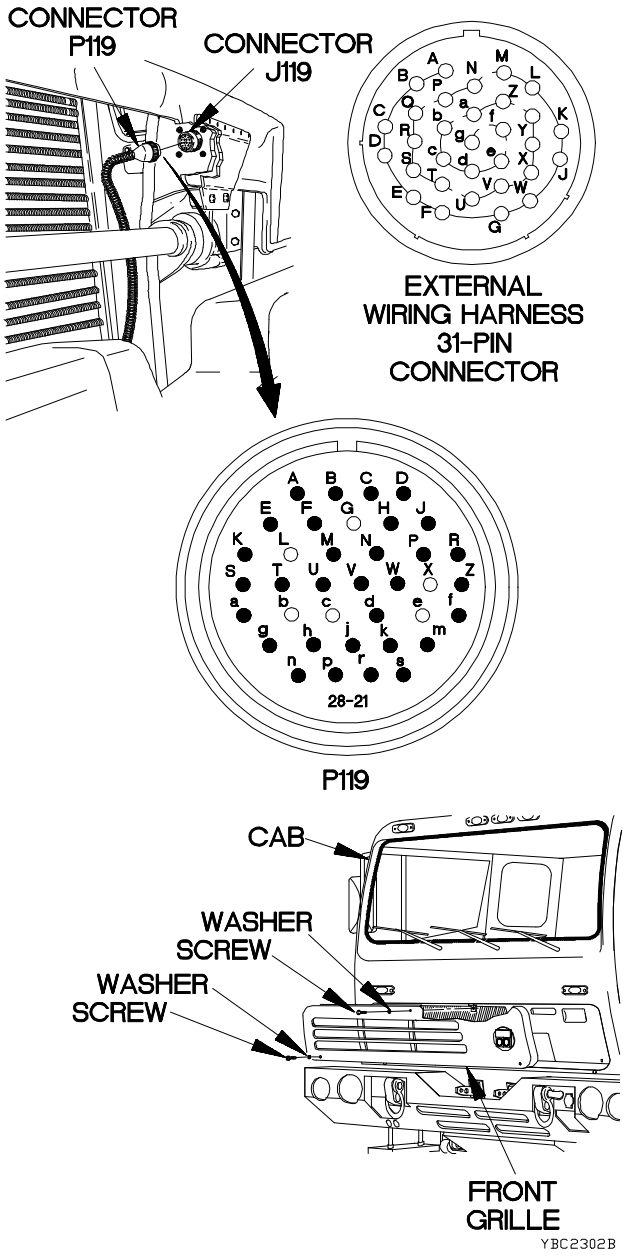
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

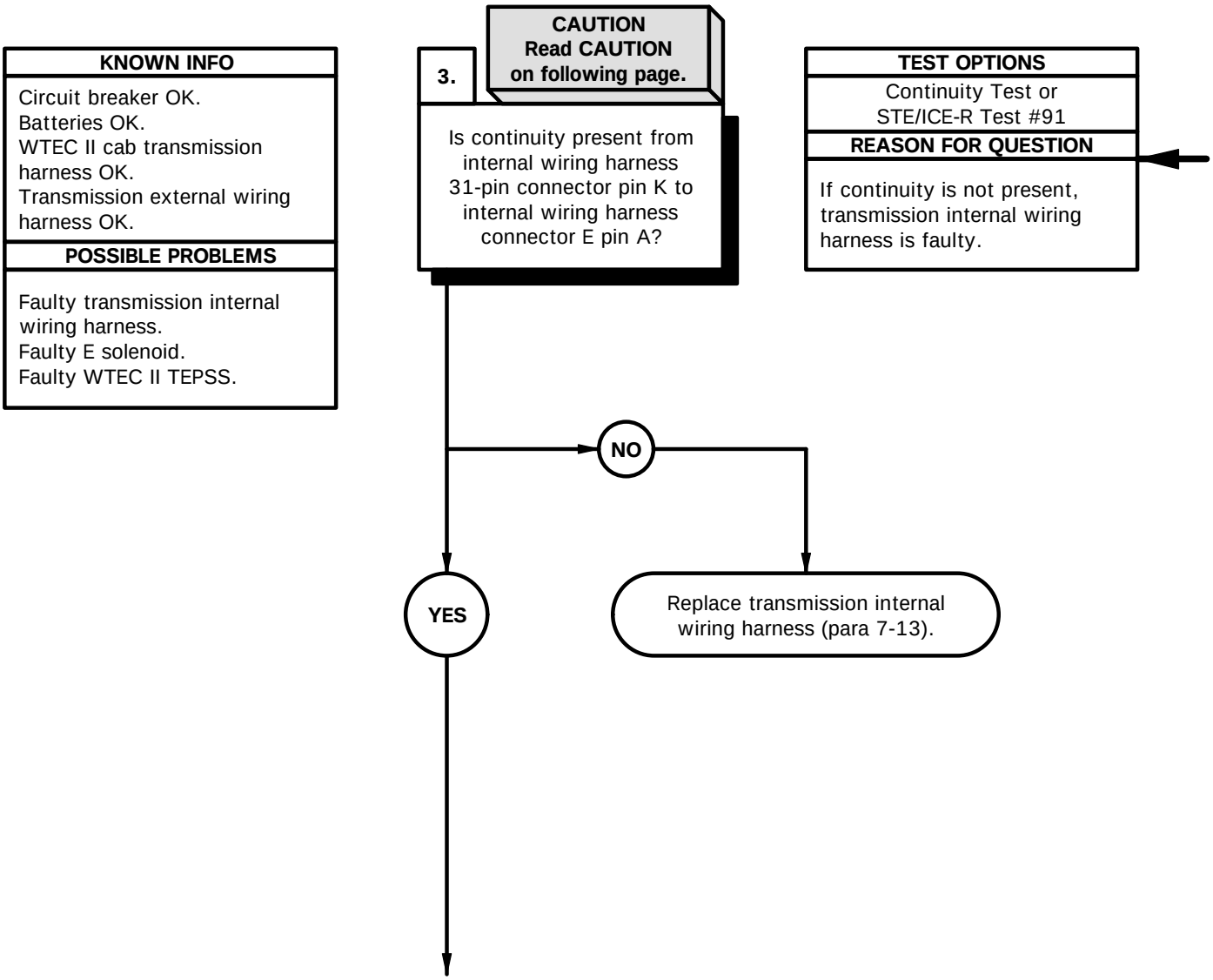
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

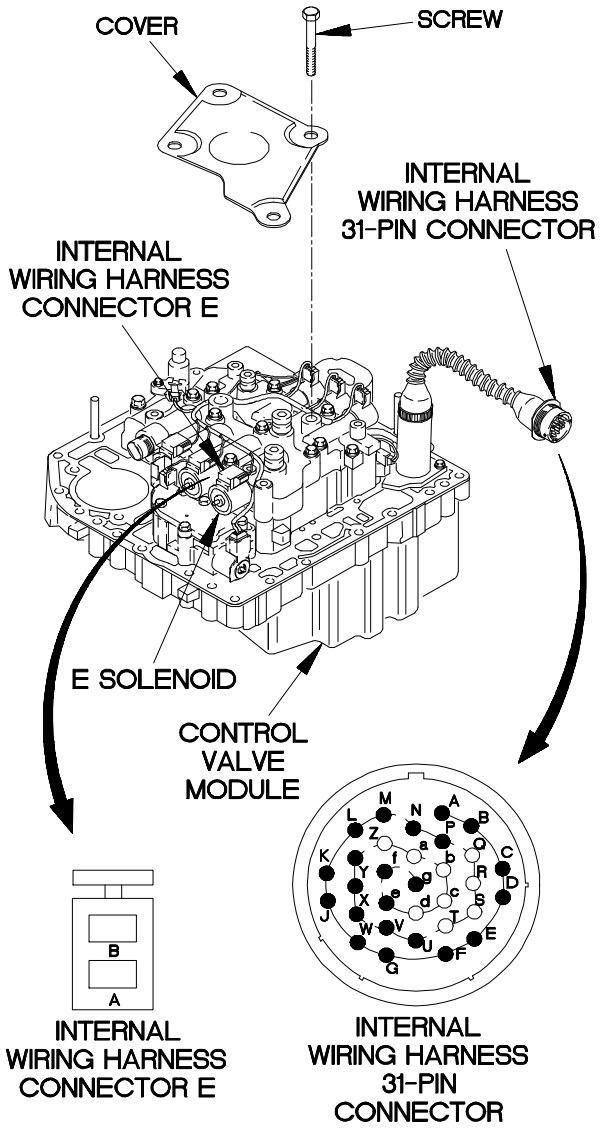
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

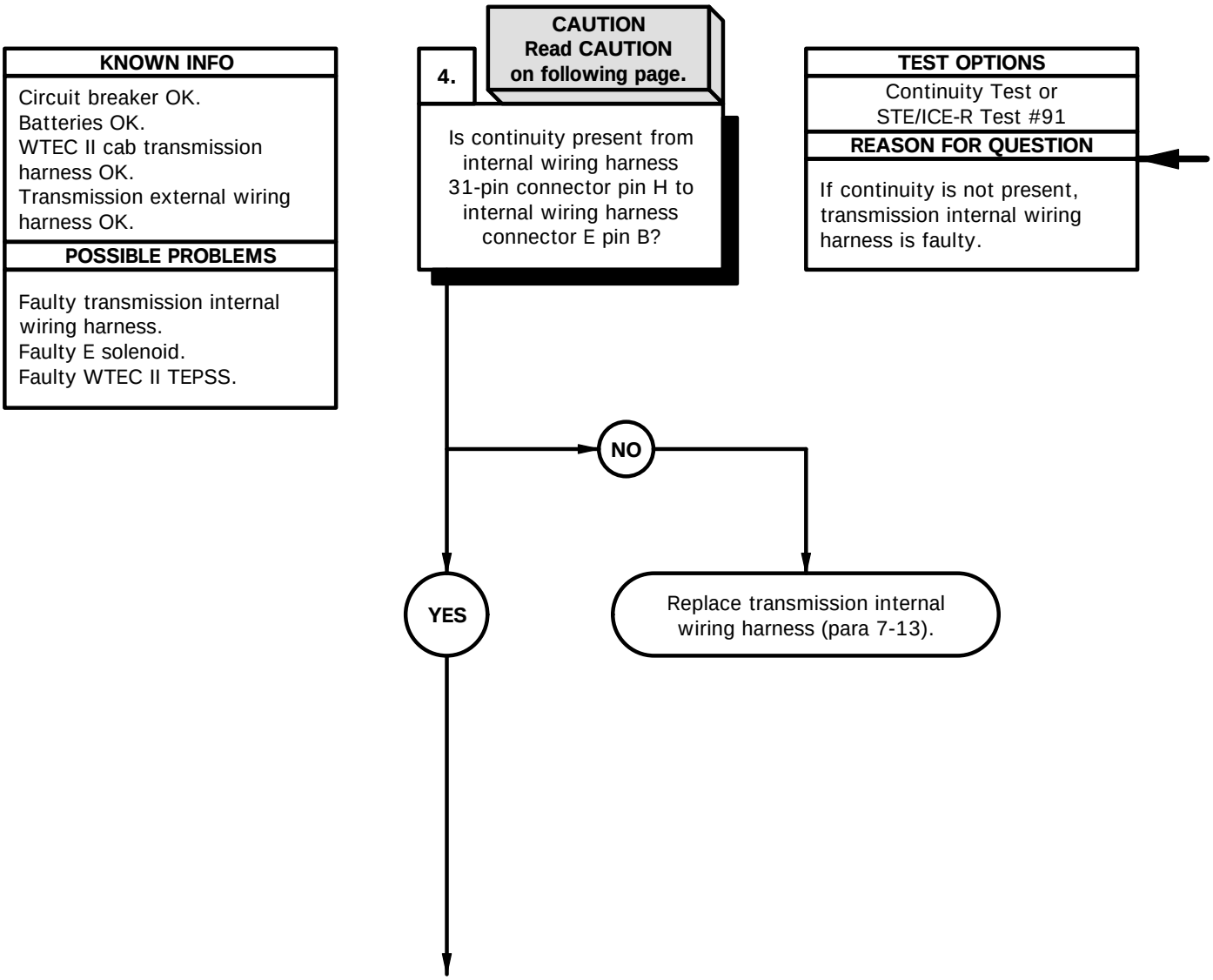
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

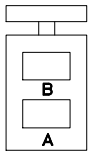
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

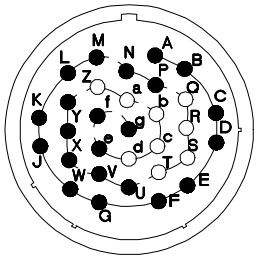
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



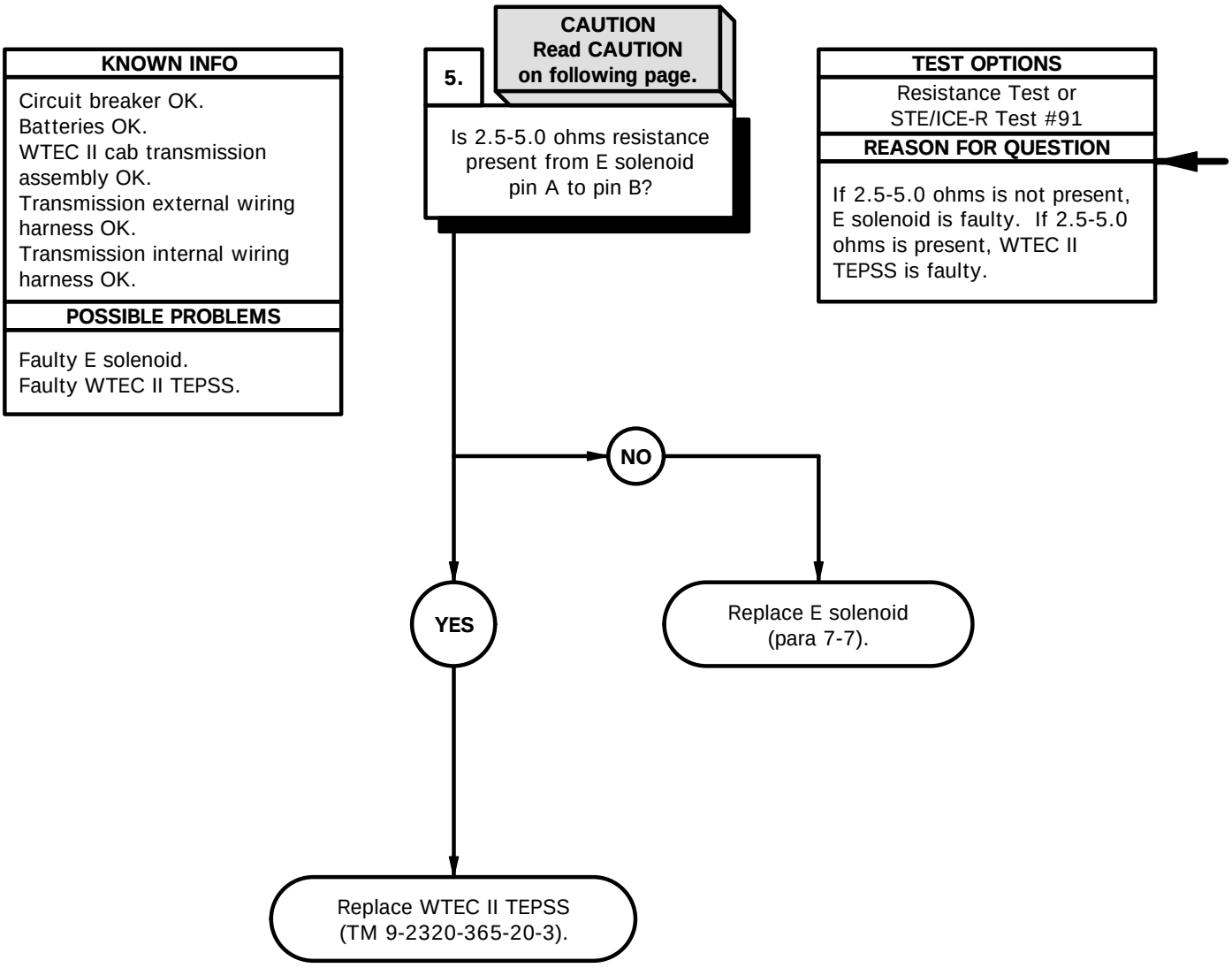
INTERNAL
WIRING HARNESS
CONNECTOR E



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

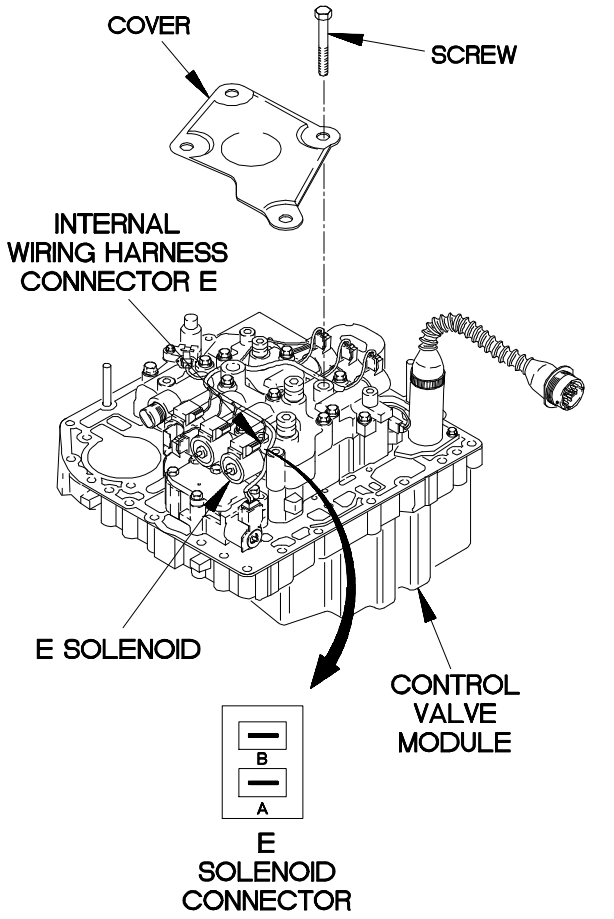
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

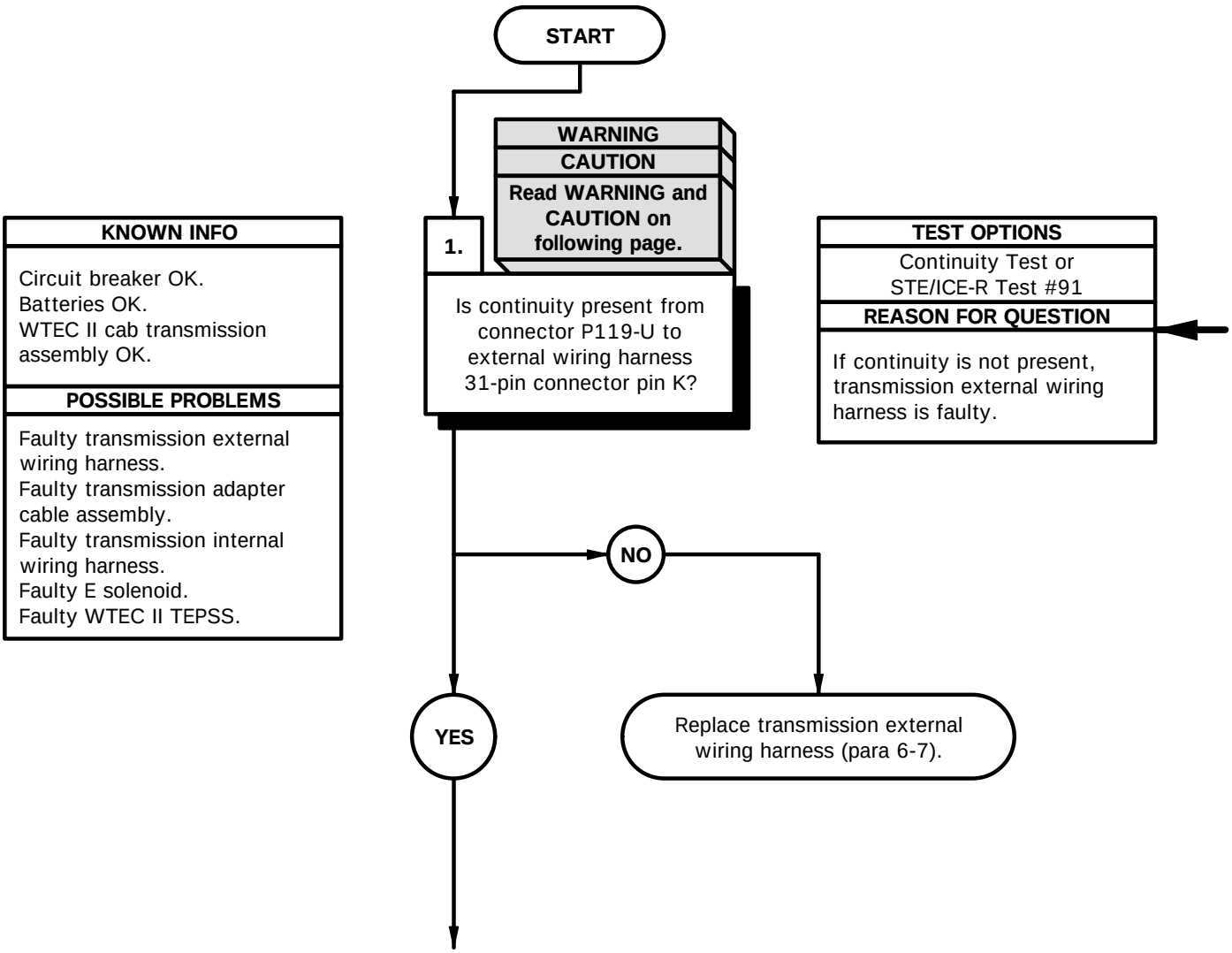
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

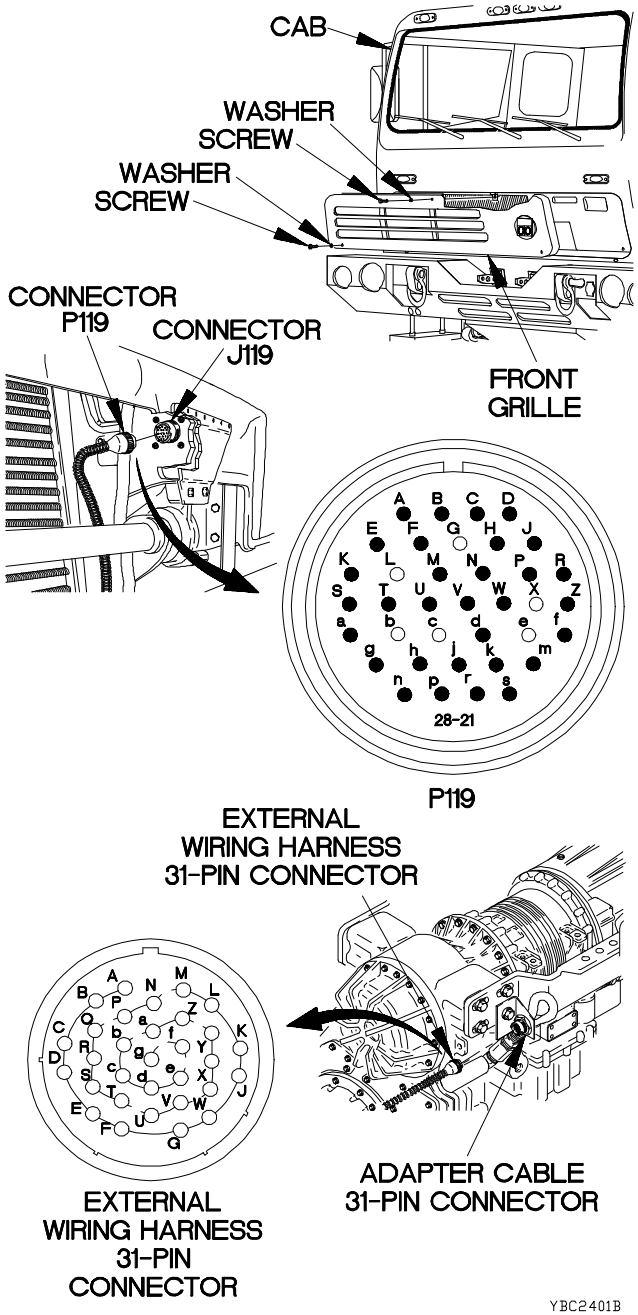
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

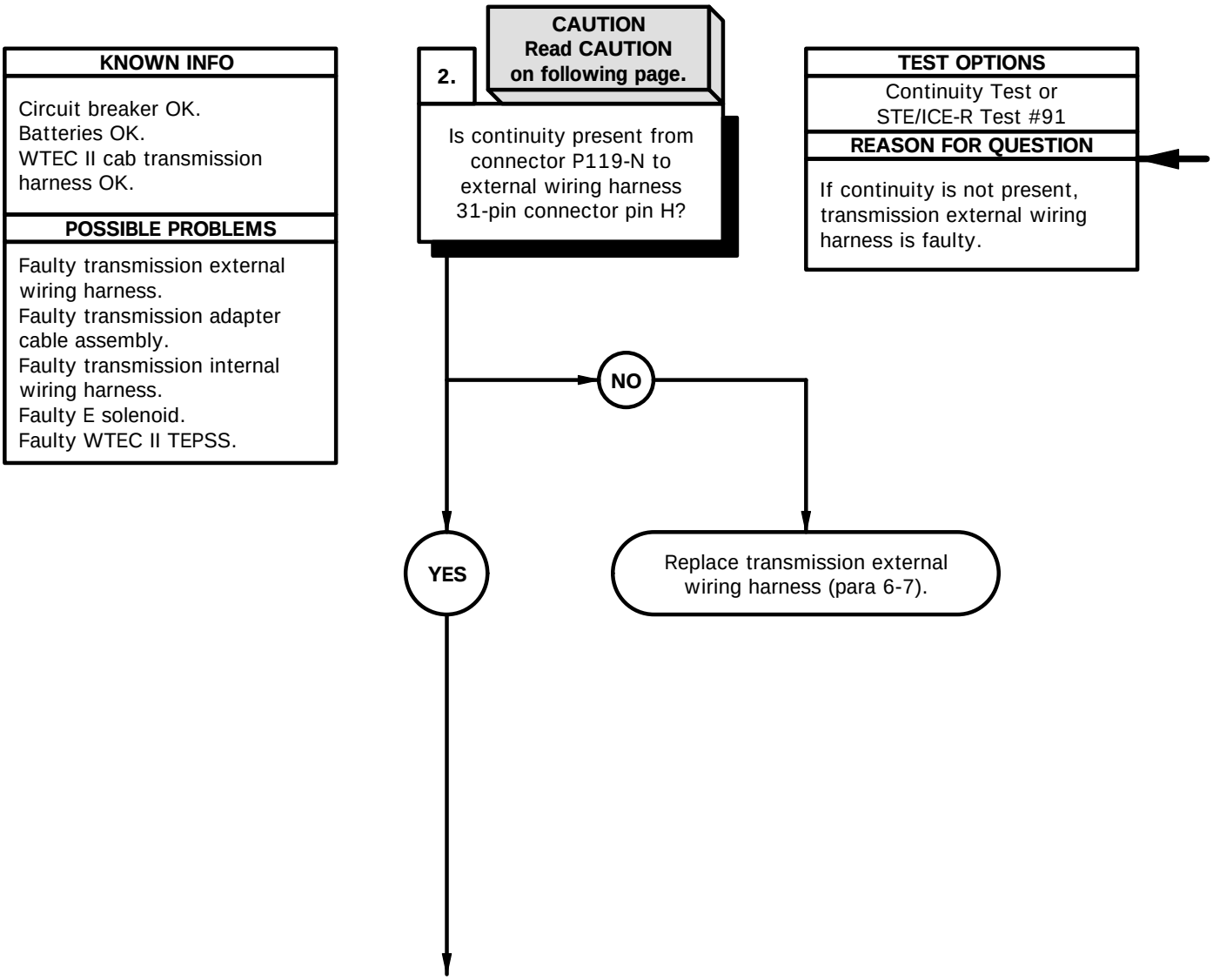
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from adapter cable 31-pin connector.
(6) Set multimeter to ohms.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

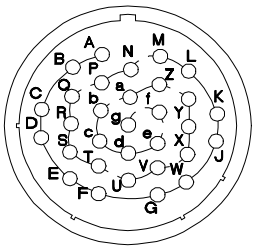
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

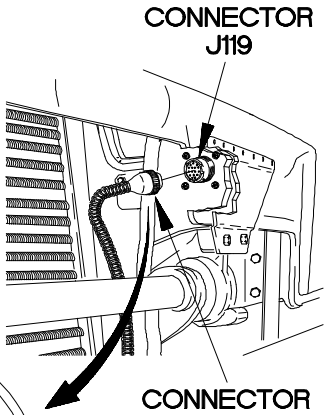
NOTE

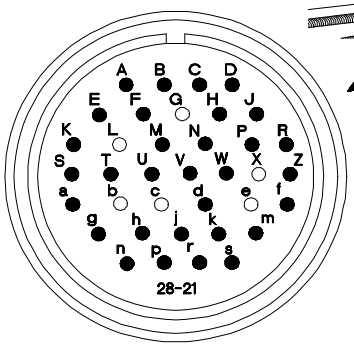
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

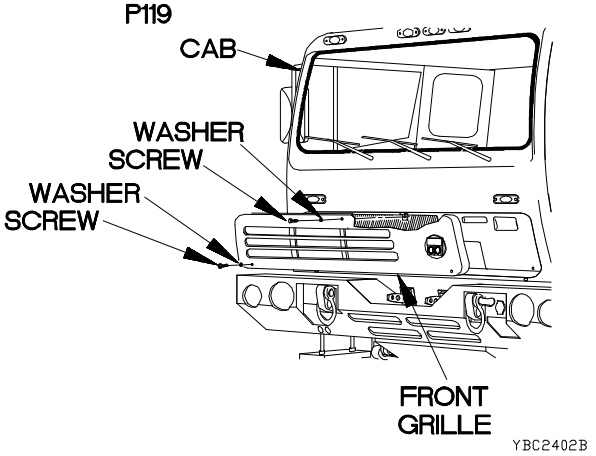
CONTINUITY TEST

(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).

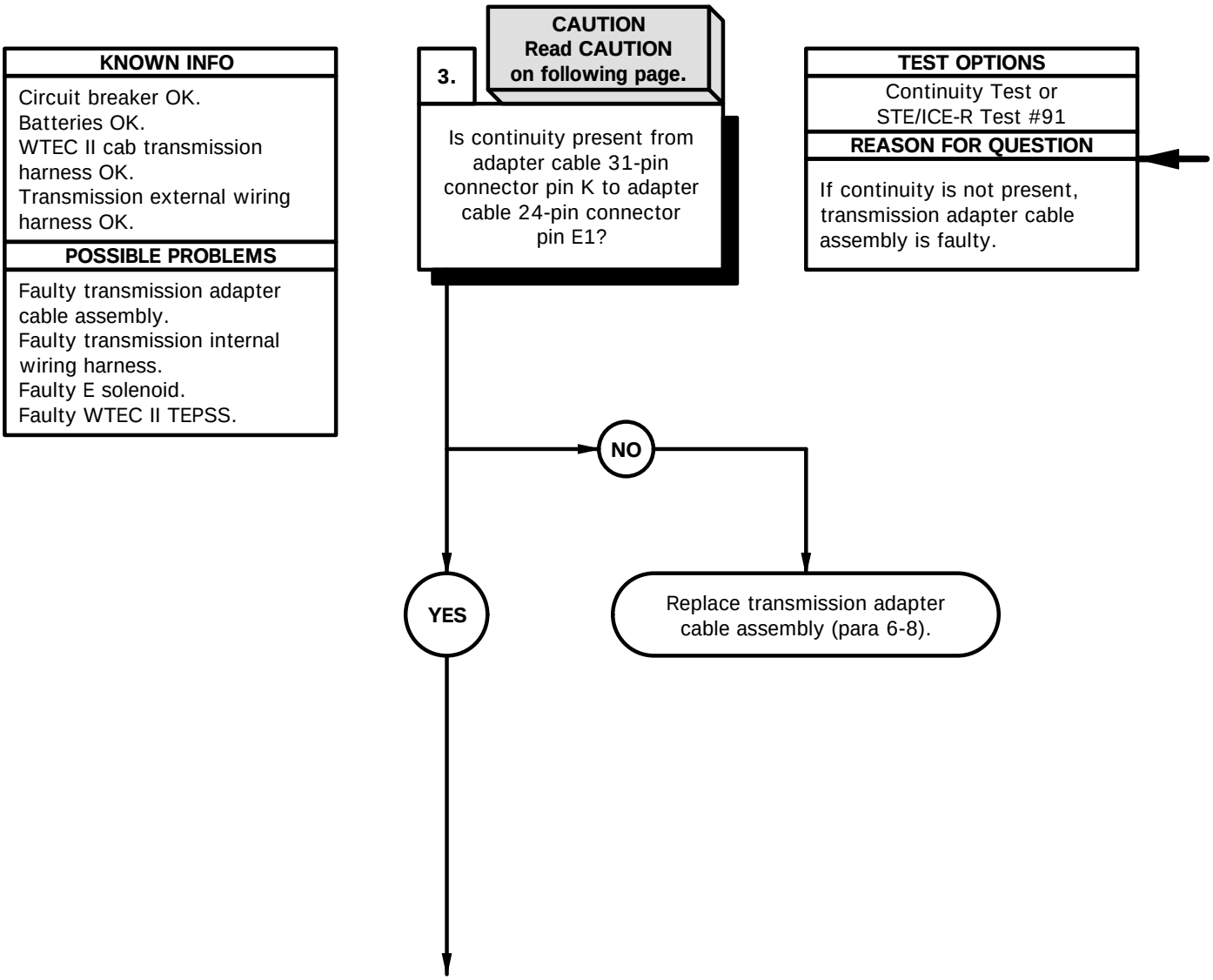








c24. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 16 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



CAUTION

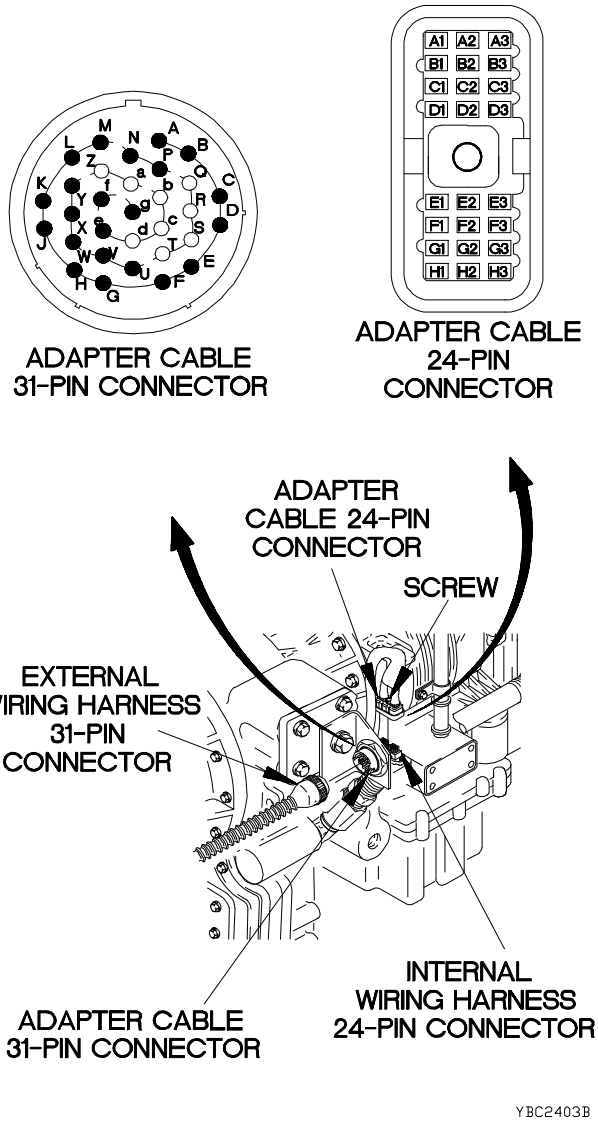
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

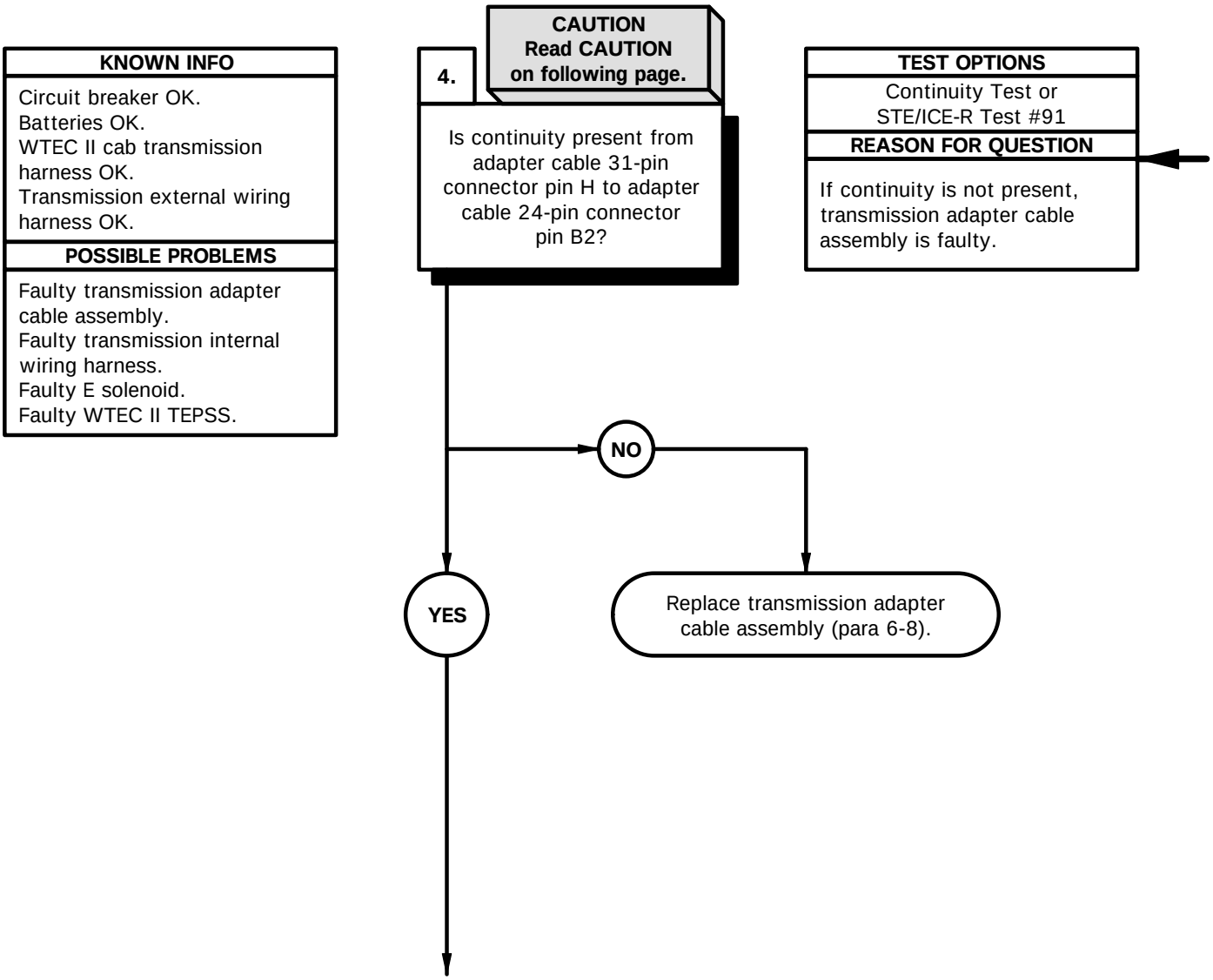
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

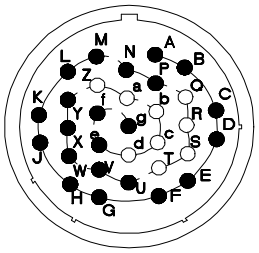
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

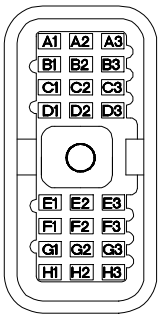
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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.



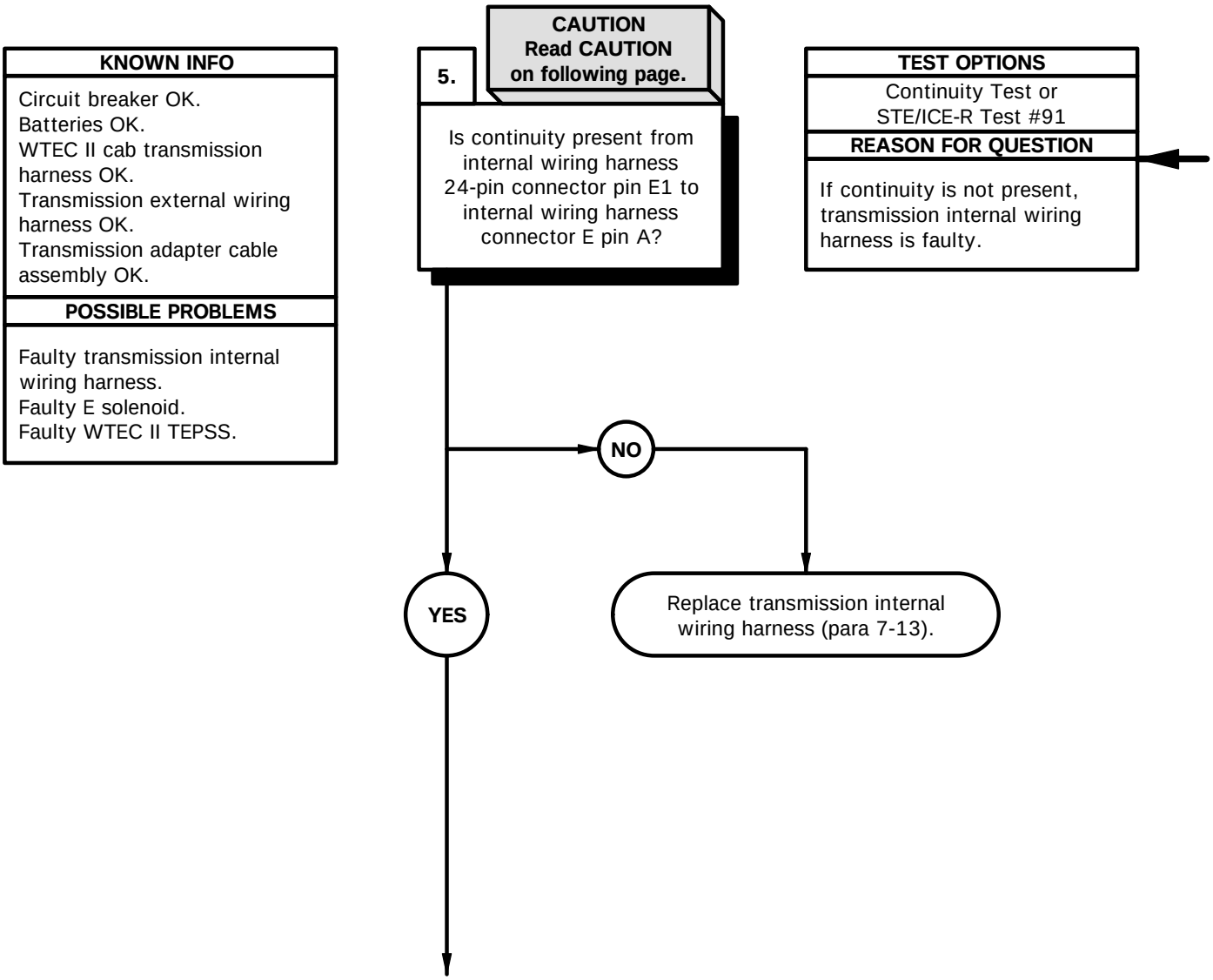
ADAPTER CABLE
31-PIN CONNECTOR



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

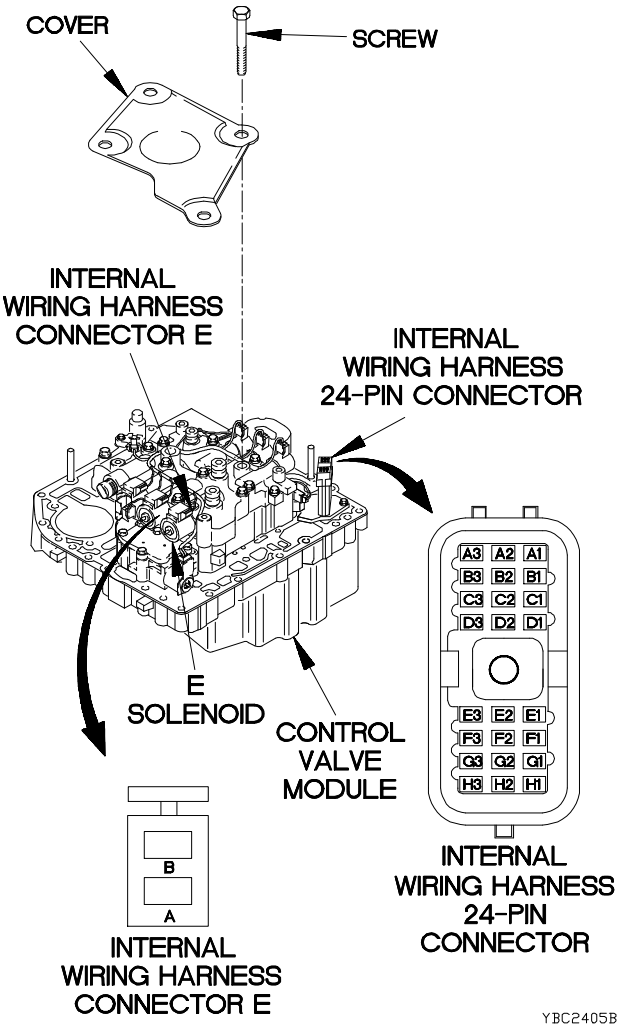
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

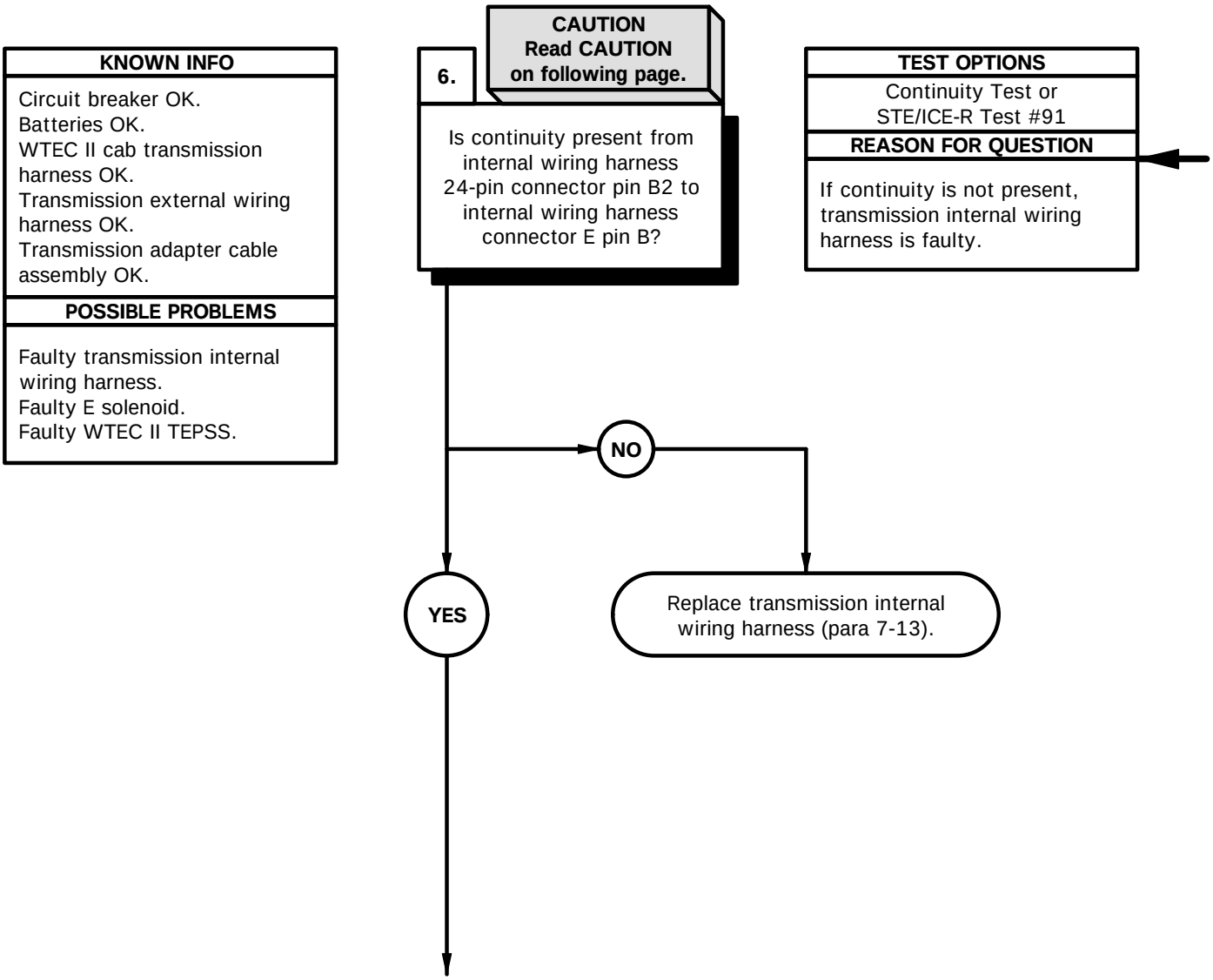
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

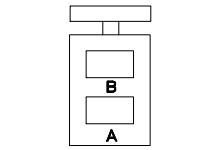
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

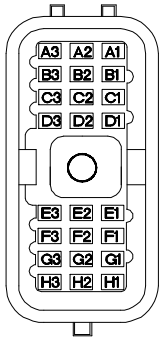
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



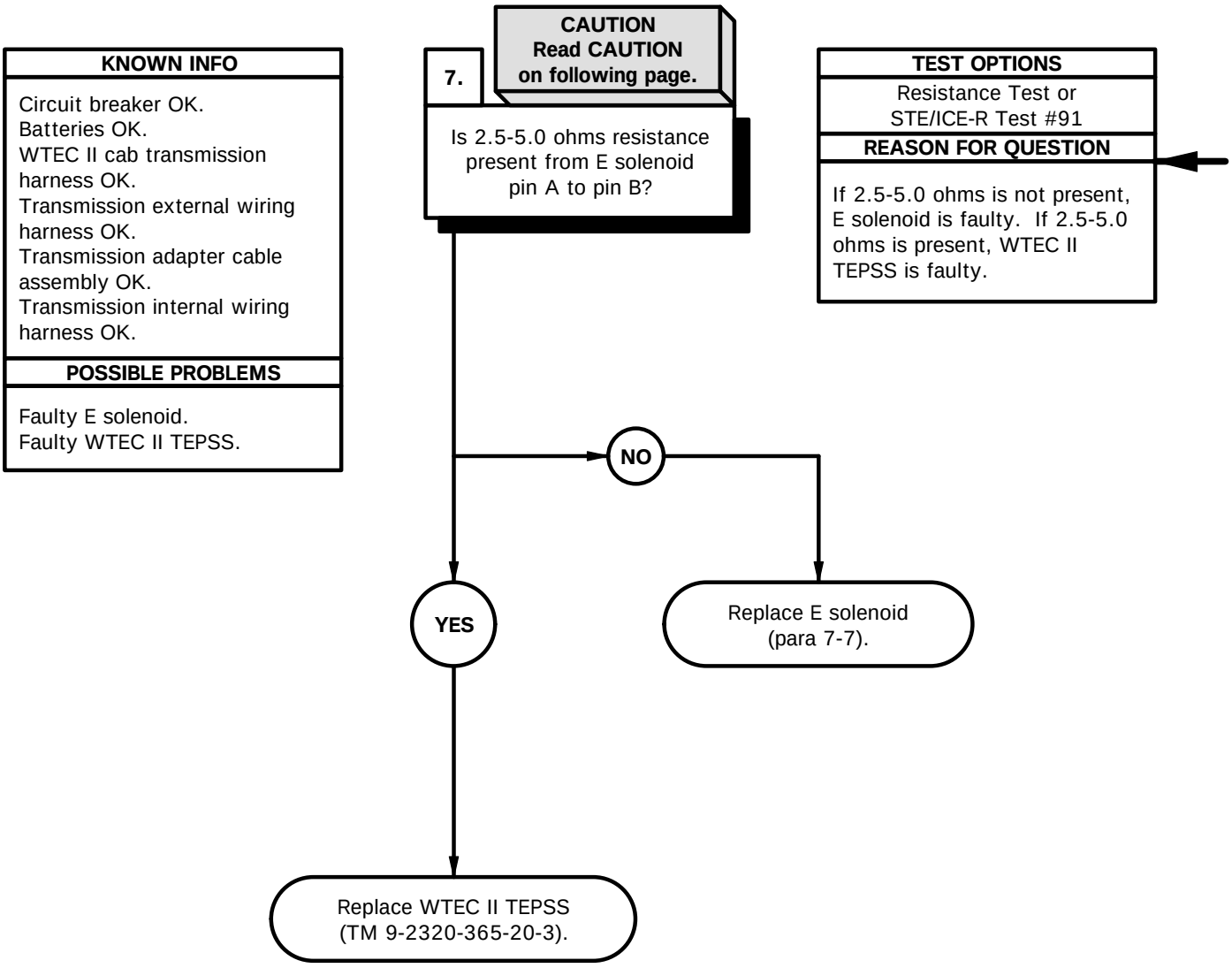
INTERNAL WIRING HARNESS CONNECTOR E



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

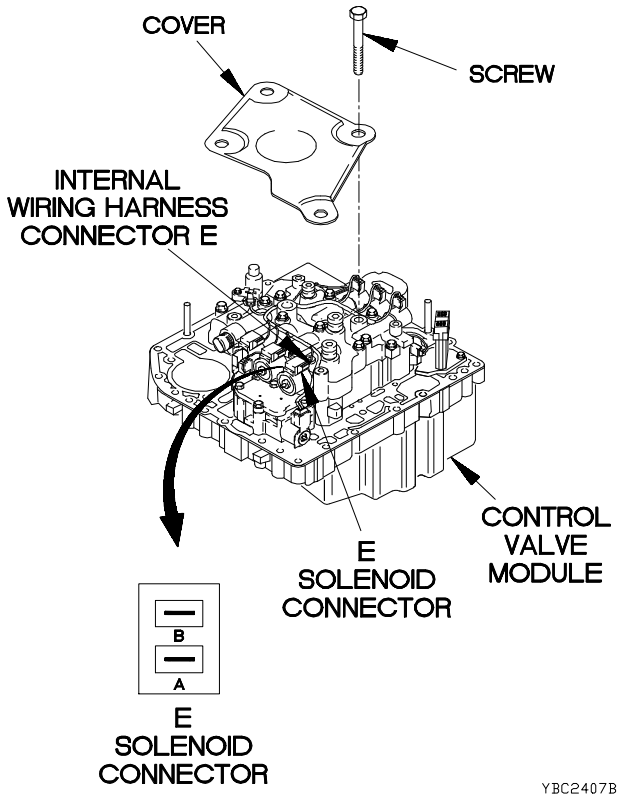
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

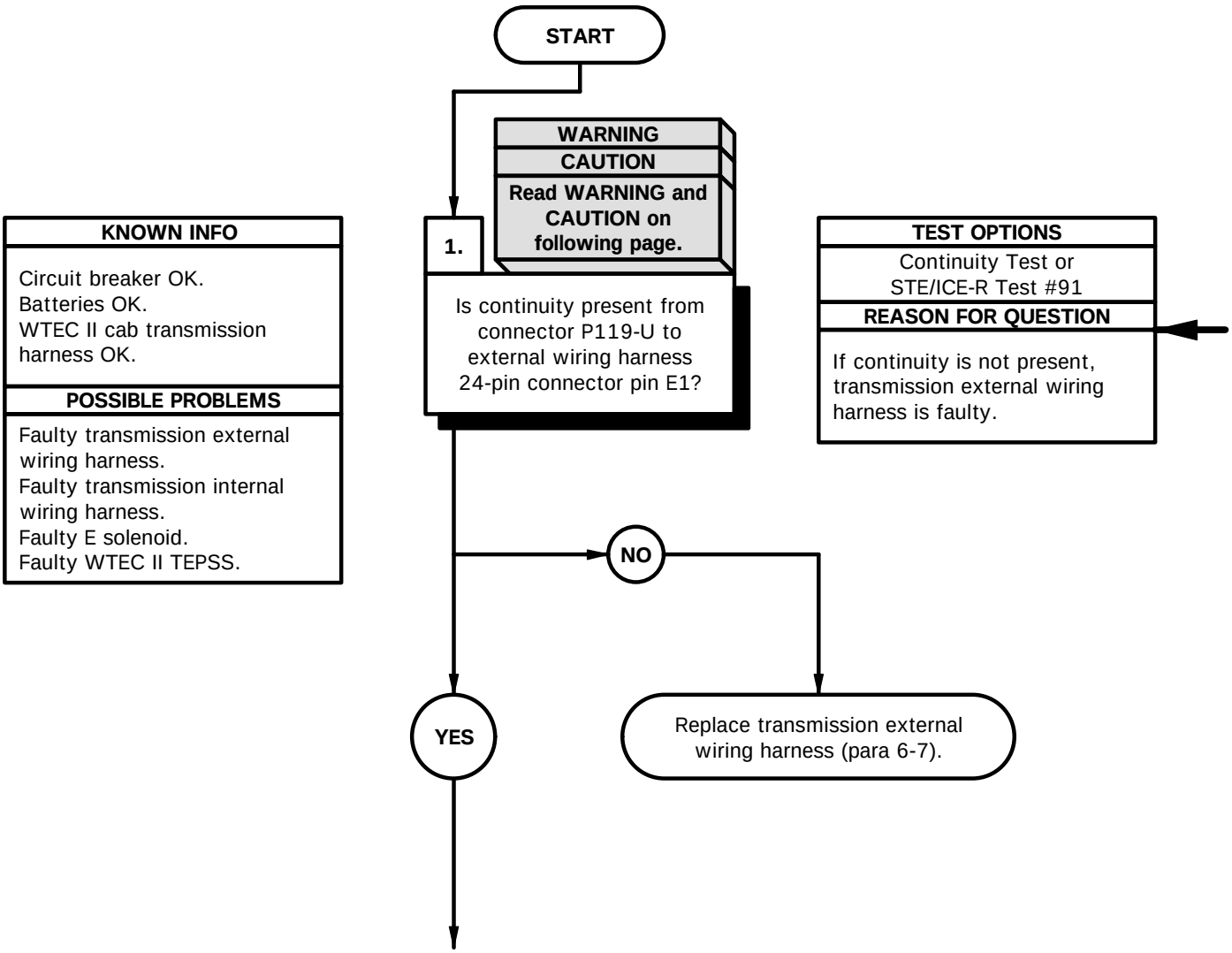
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

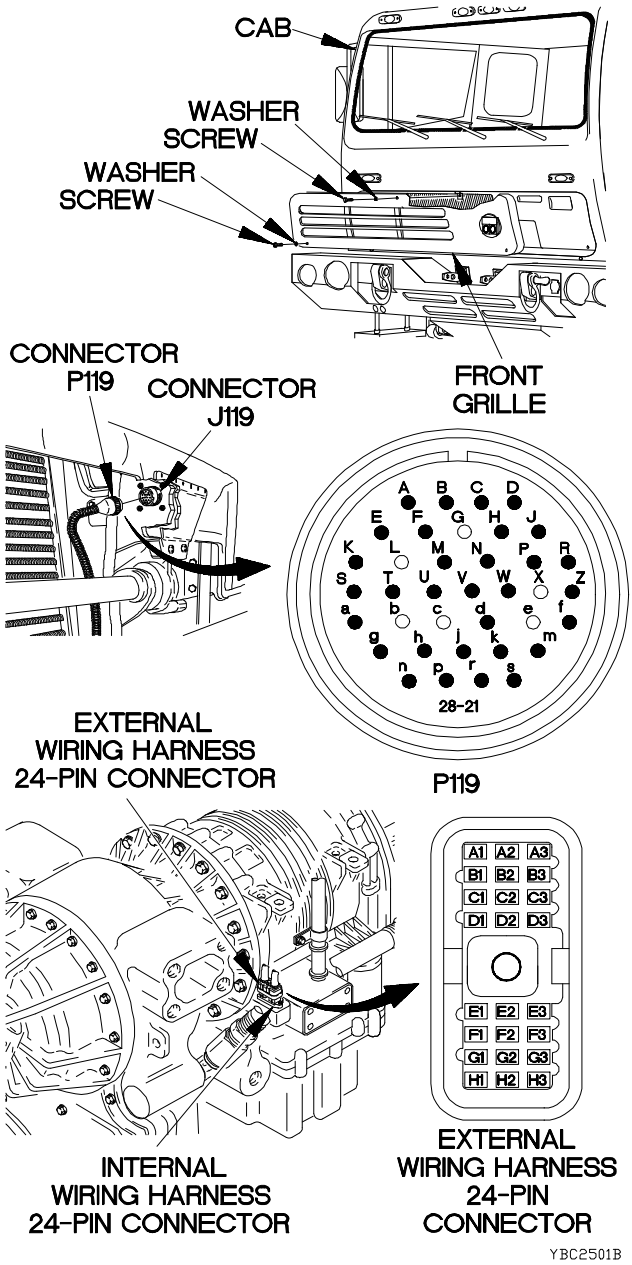
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

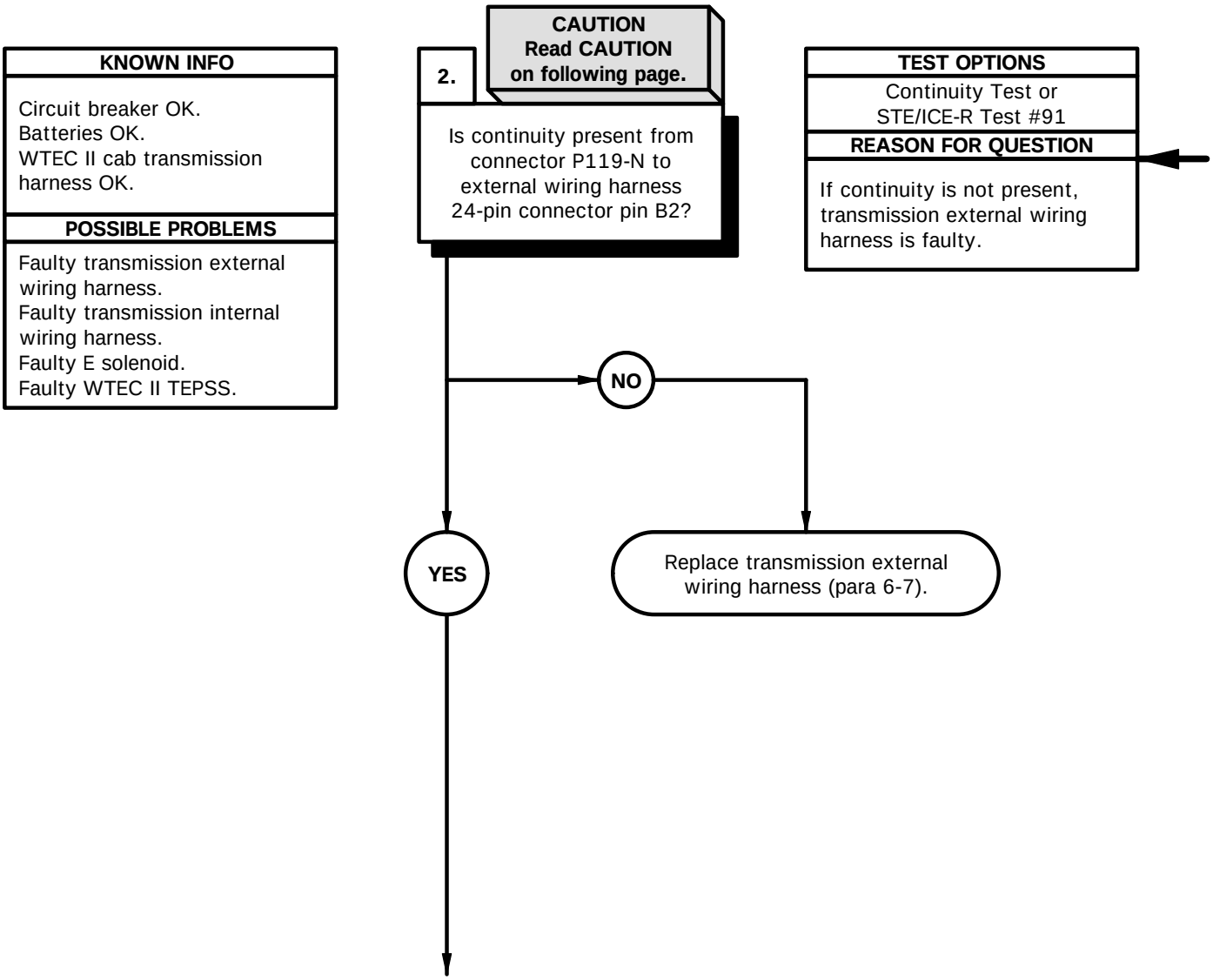
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Loosen screw in external wiring harness 24-pin connector.
(6) Disconnect external wiring harness 24-pin from internal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

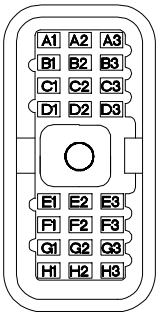
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

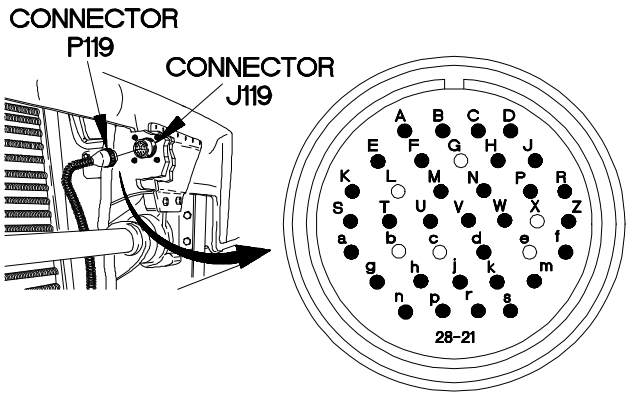
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

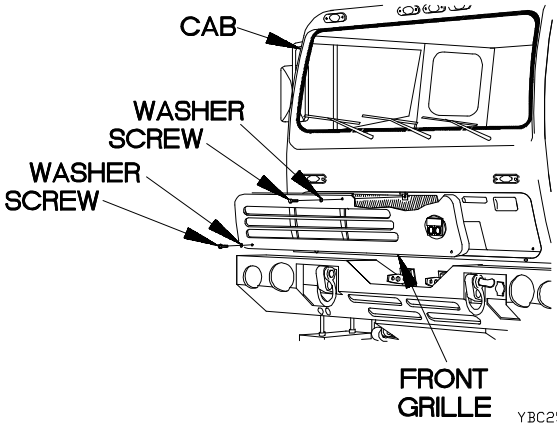
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P119-N.
(3) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin B2 and note reading on multimeter.
(4) If continuity is not present, replace transmission external wiring harness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



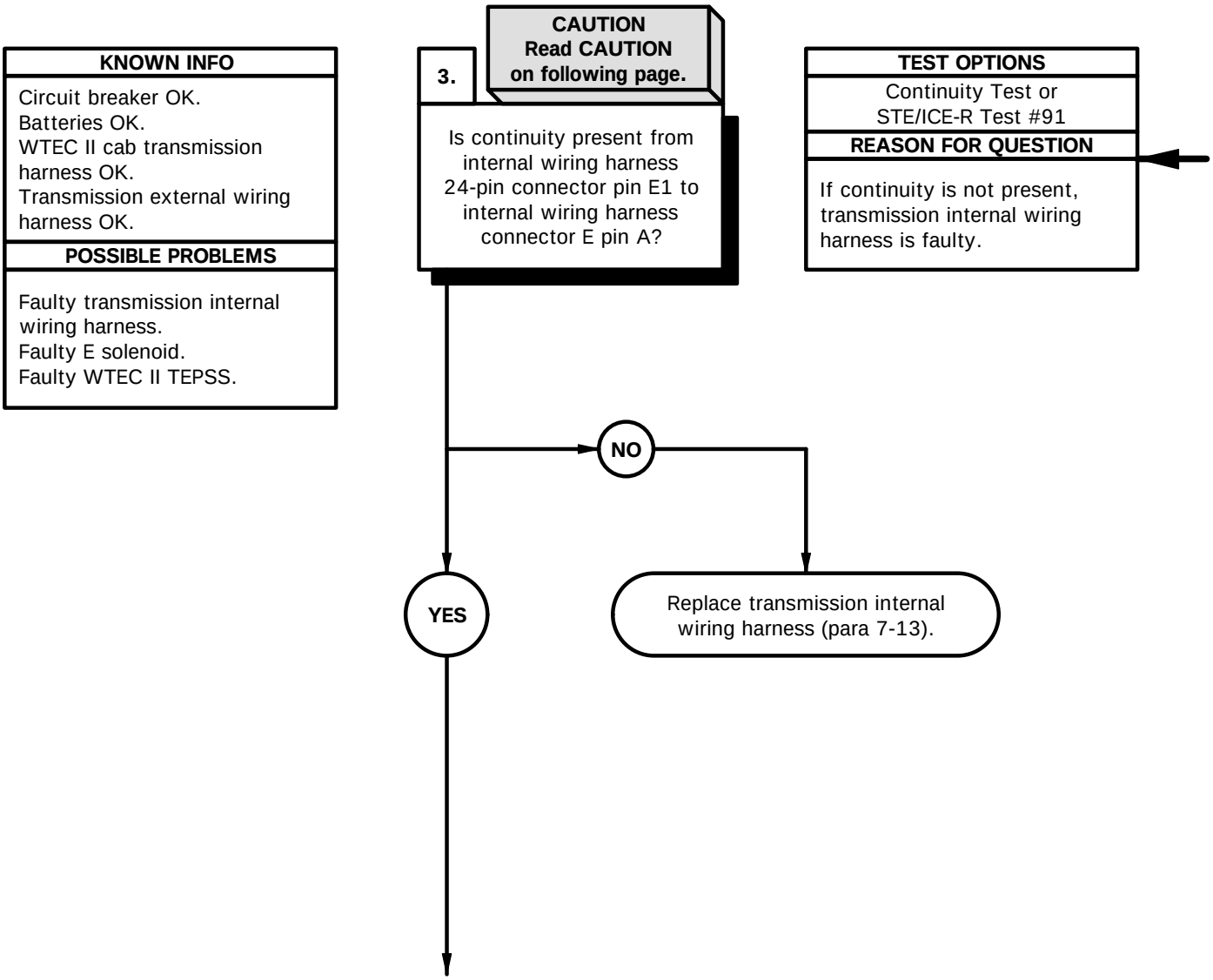
EXTERNAL WIRING HARNESS 24-PIN CONNECTOR



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

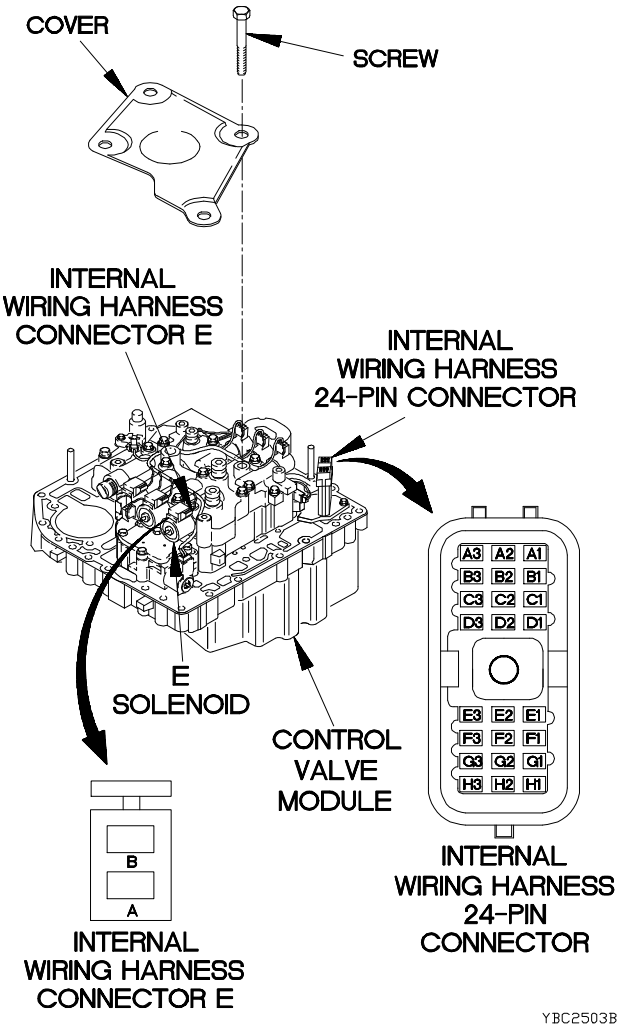
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

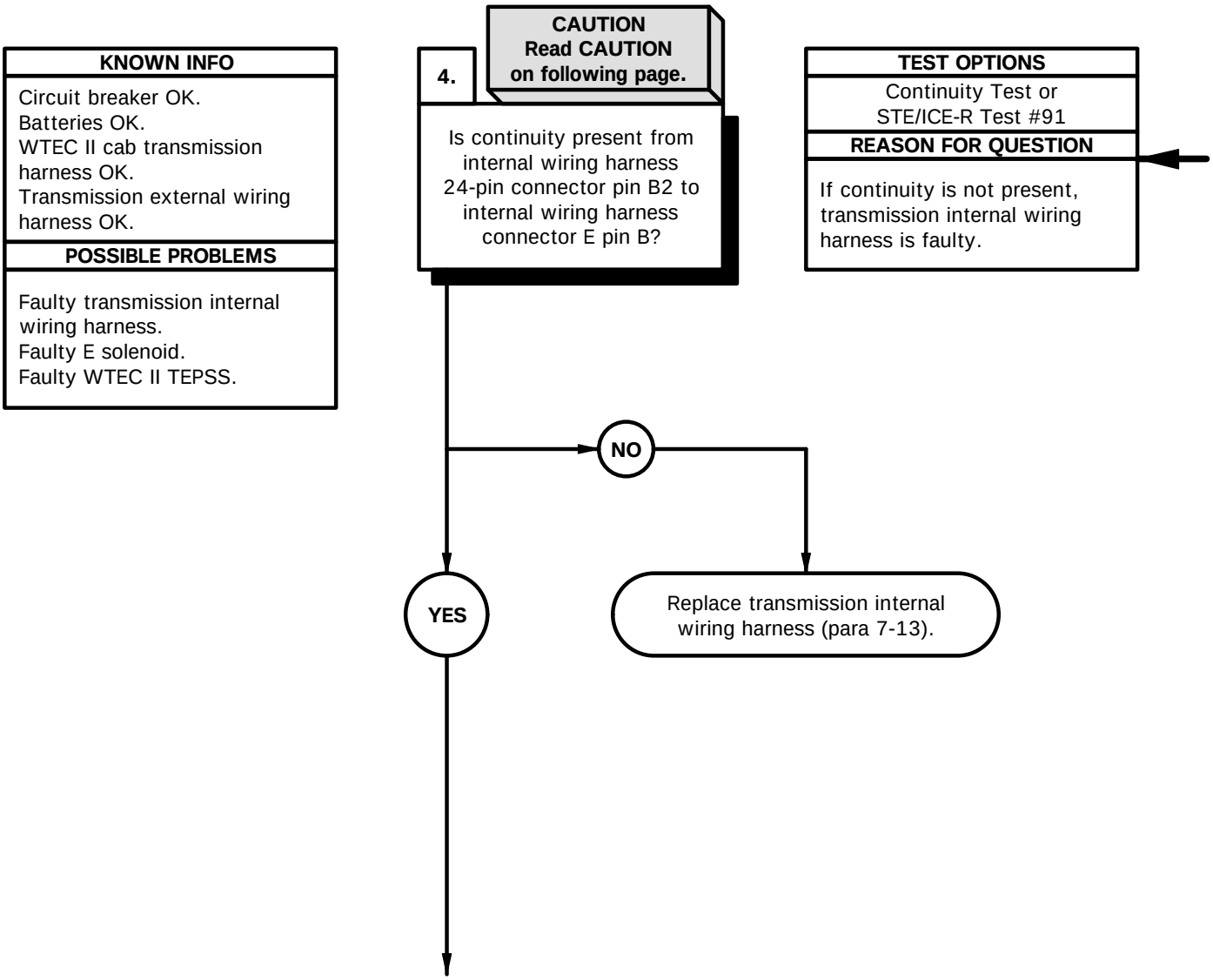
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

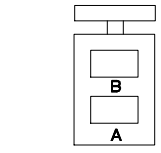
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

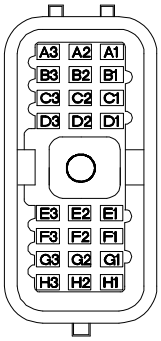
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



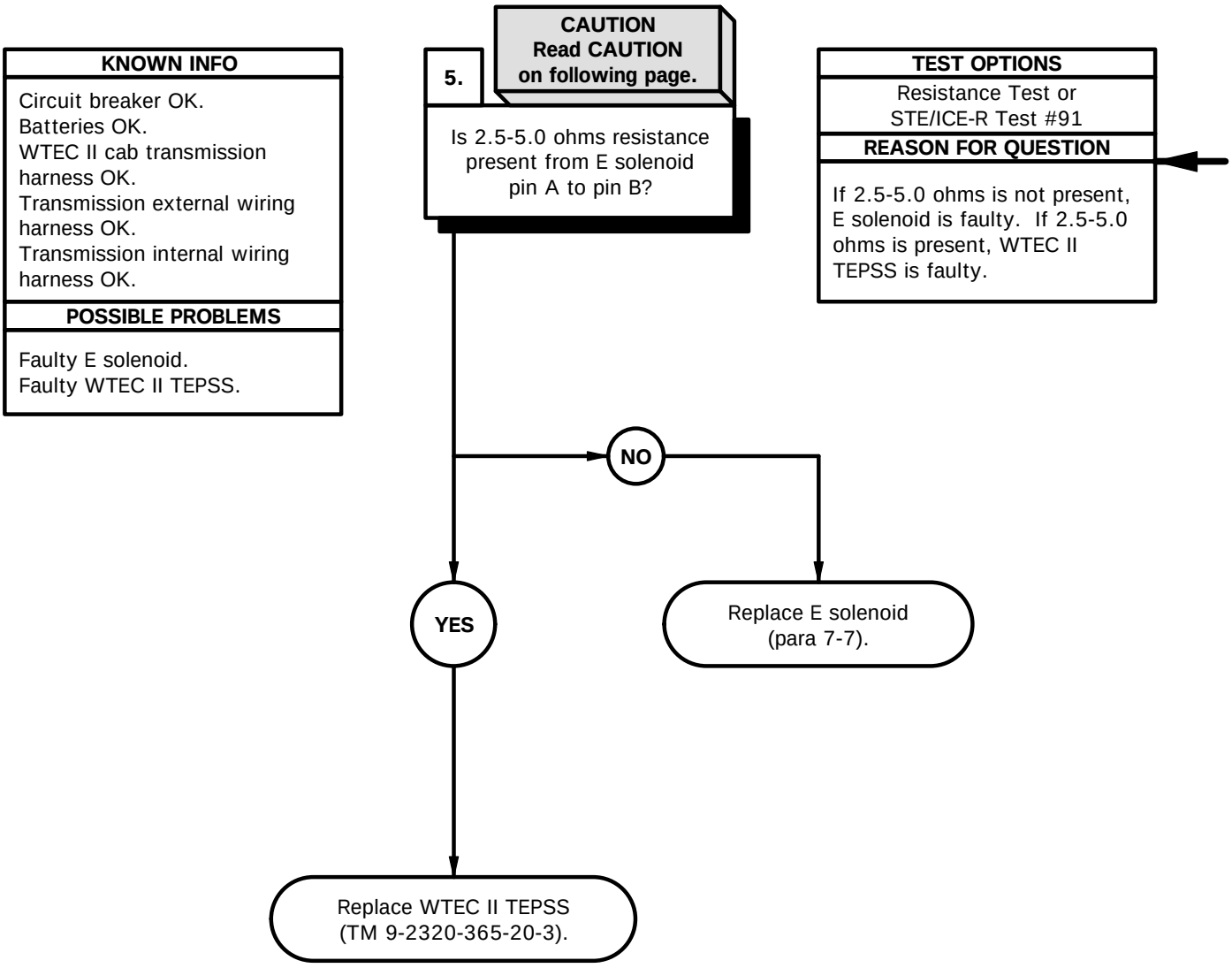
INTERNAL WIRING HARNESS CONNECTOR E



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

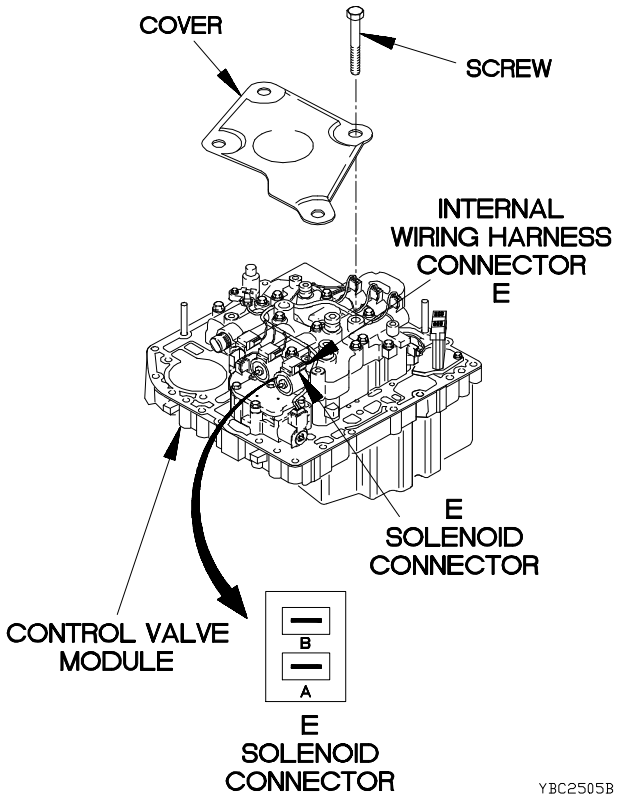
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

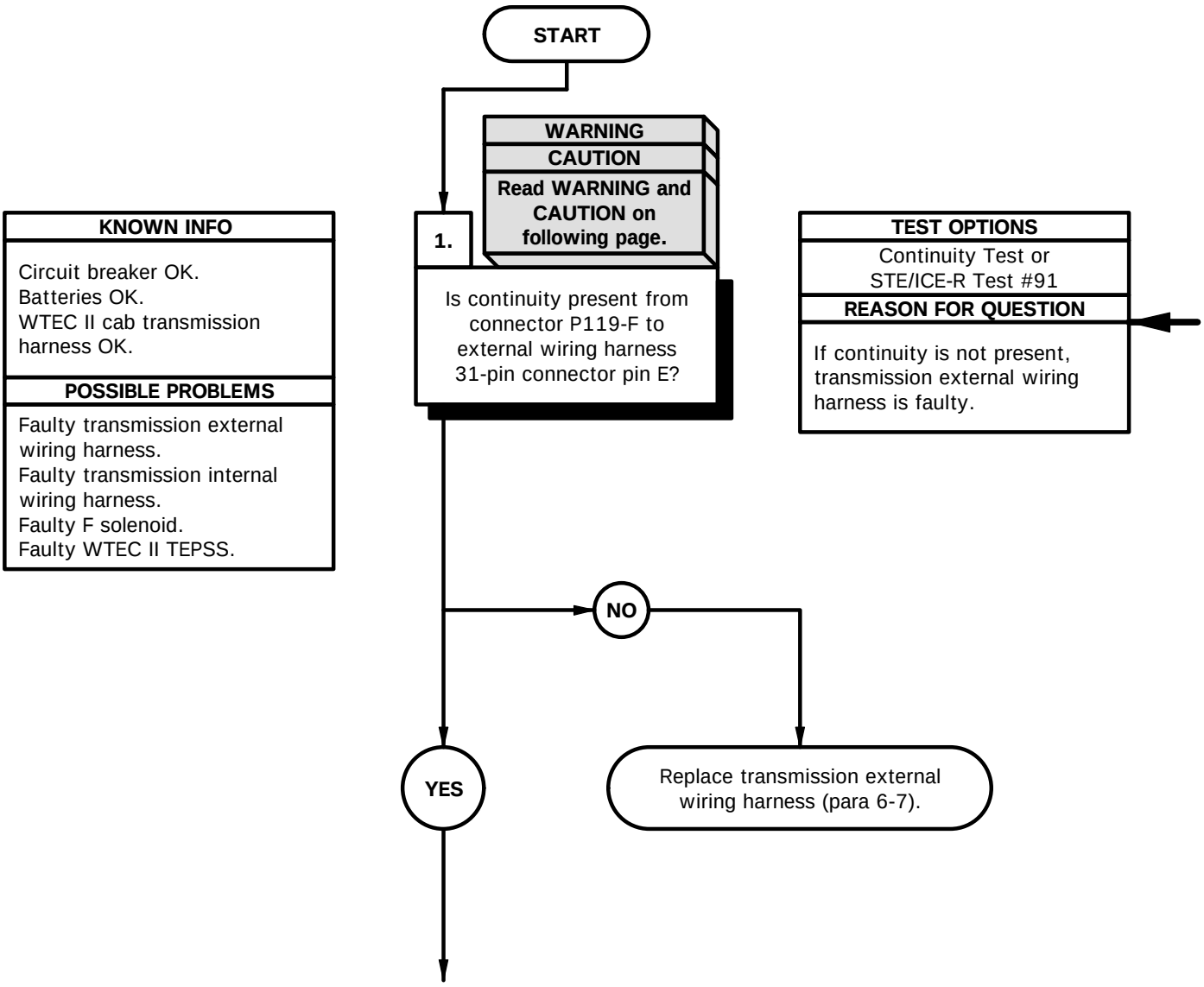
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

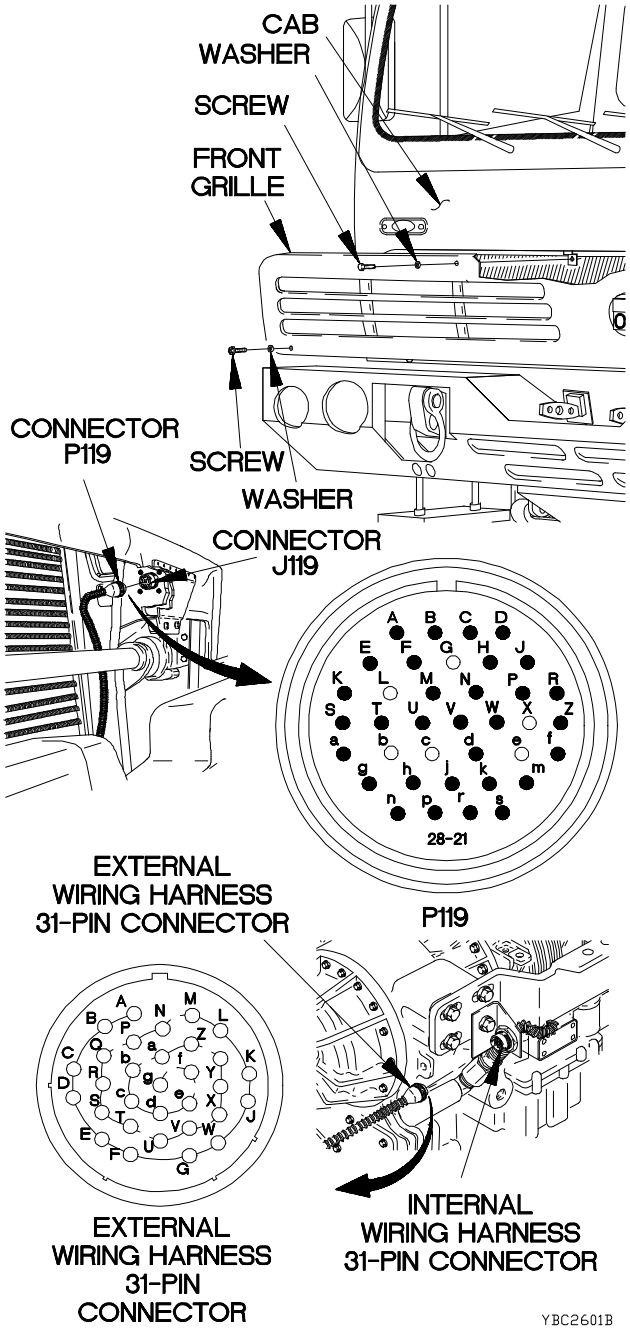
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

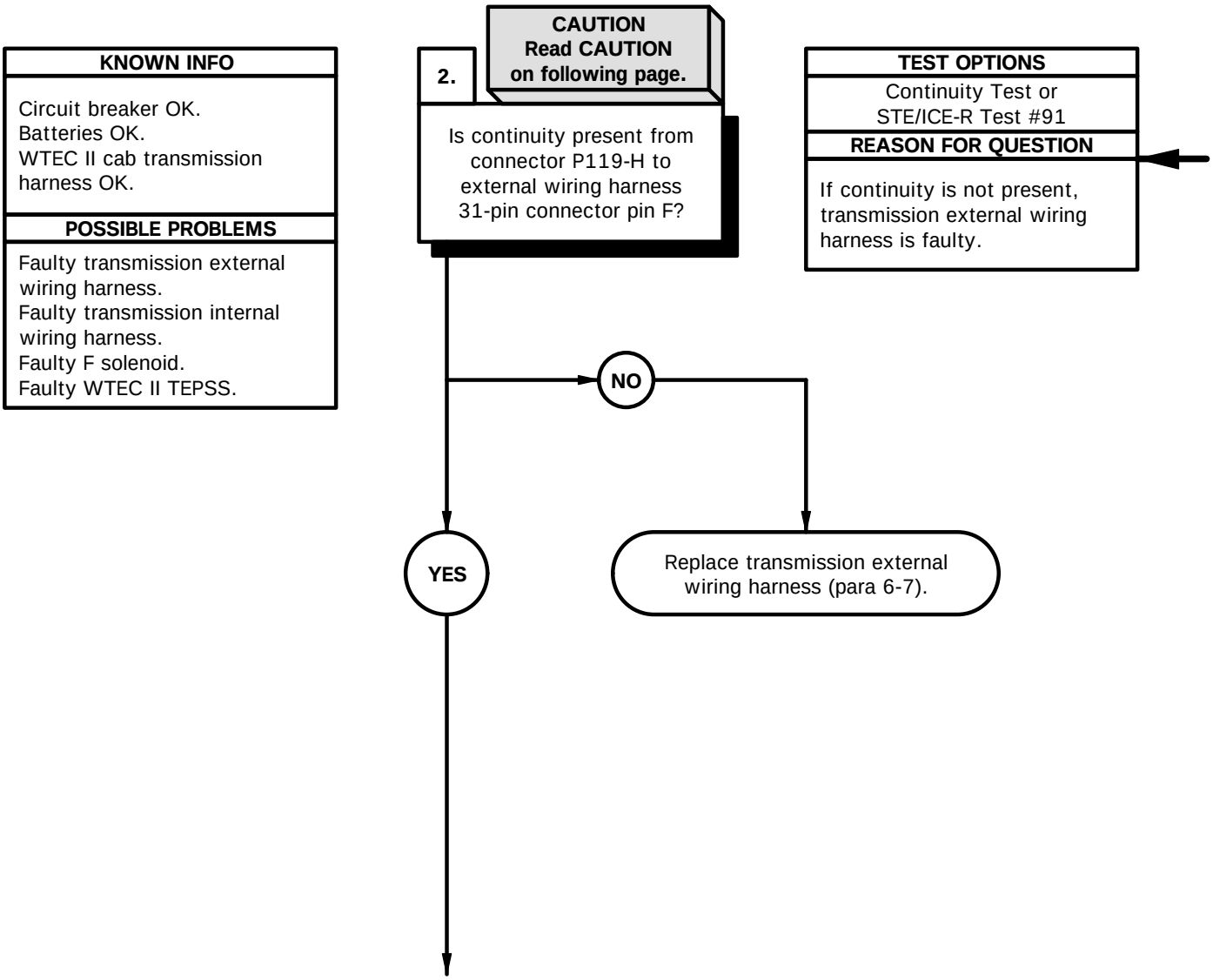
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin connector.
(6) Set multimeter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

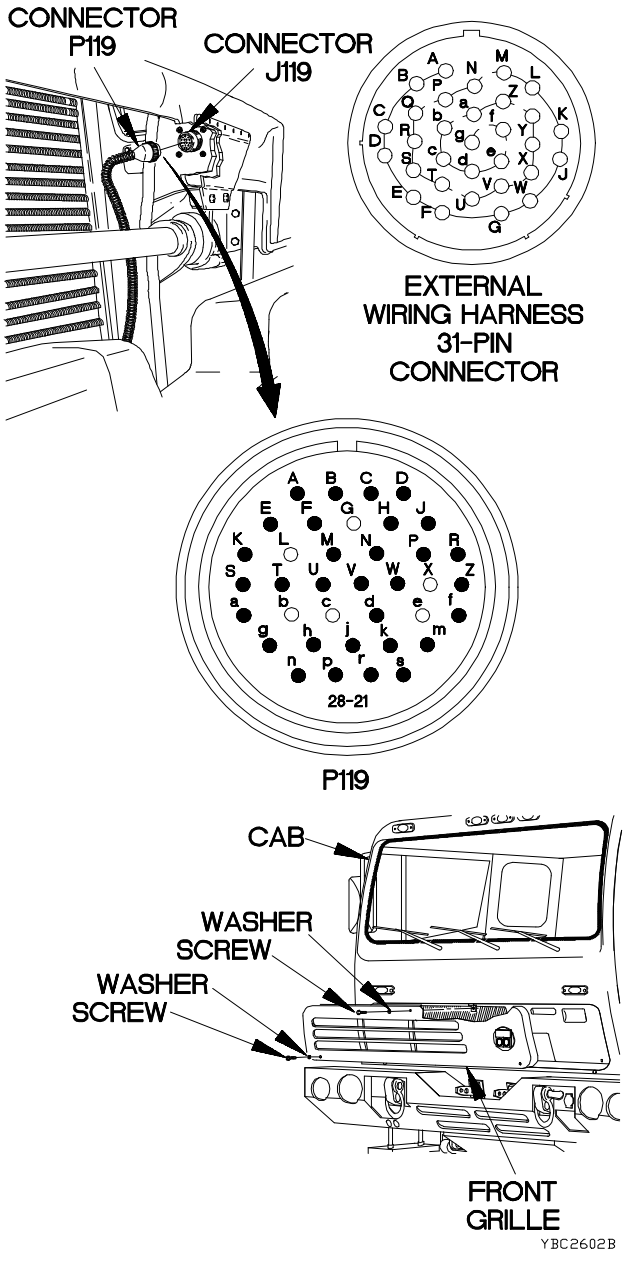
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

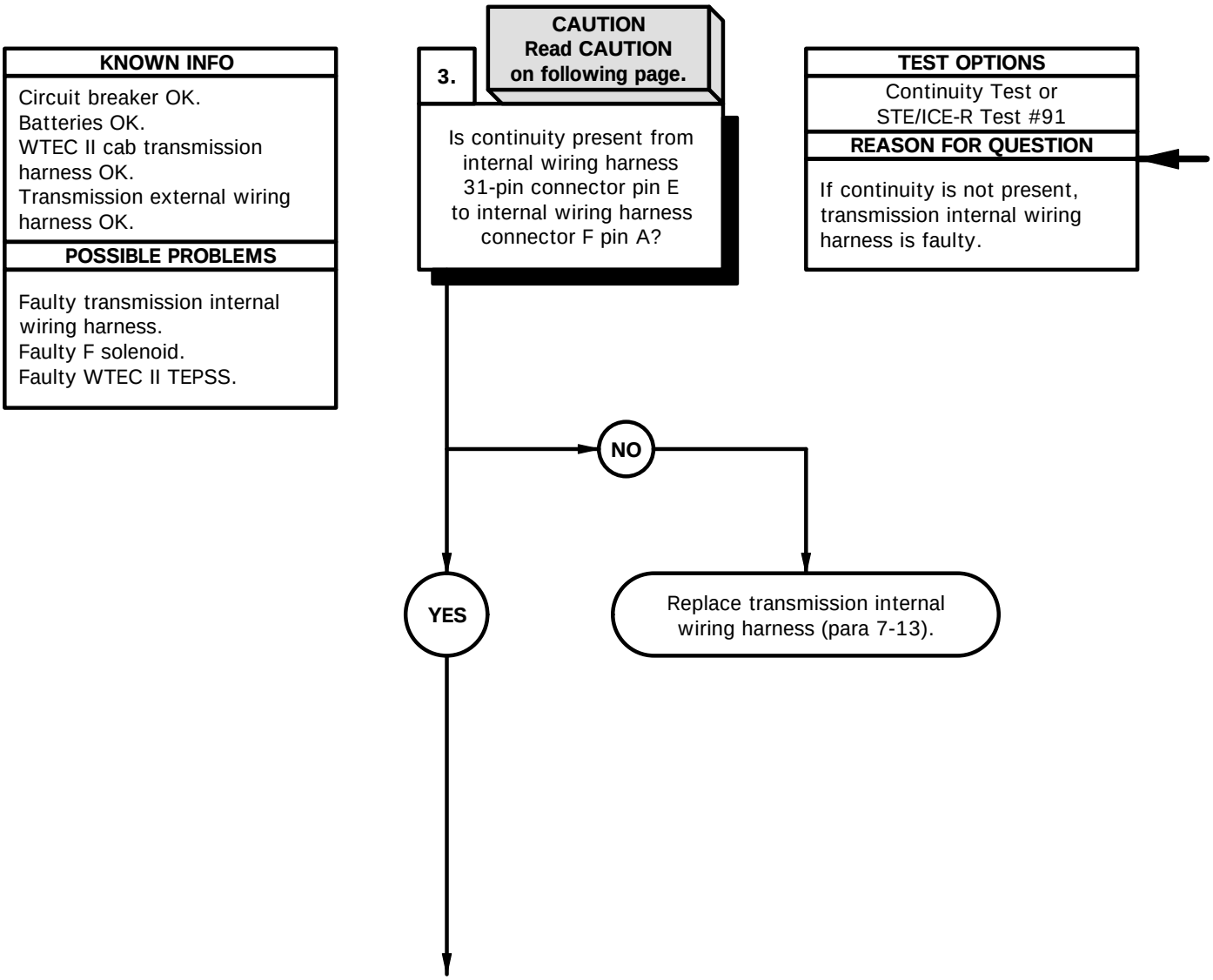
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

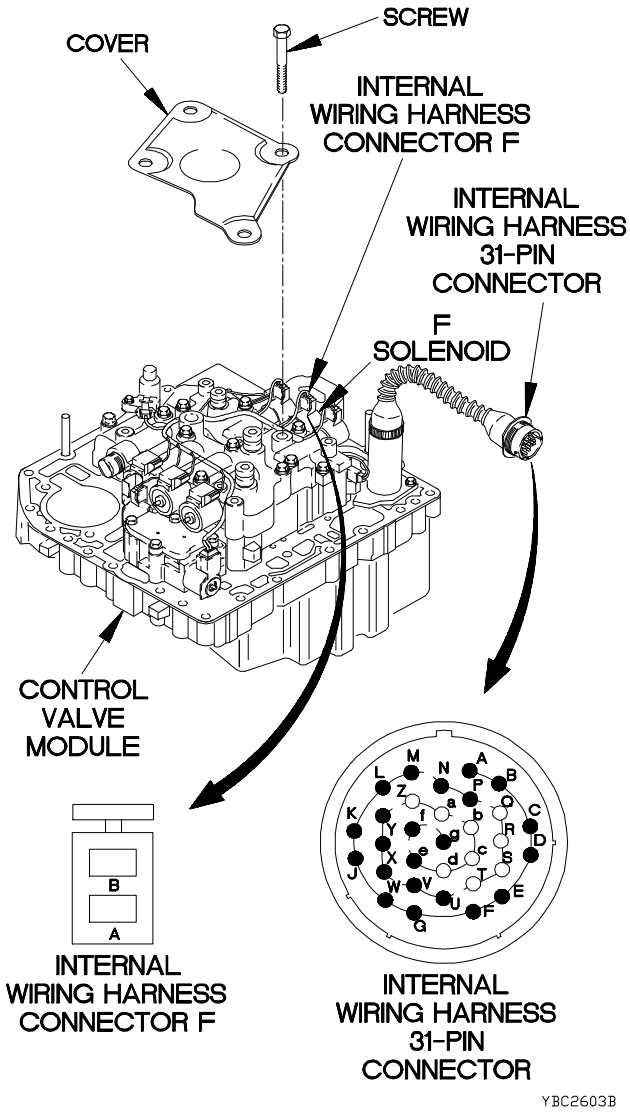
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

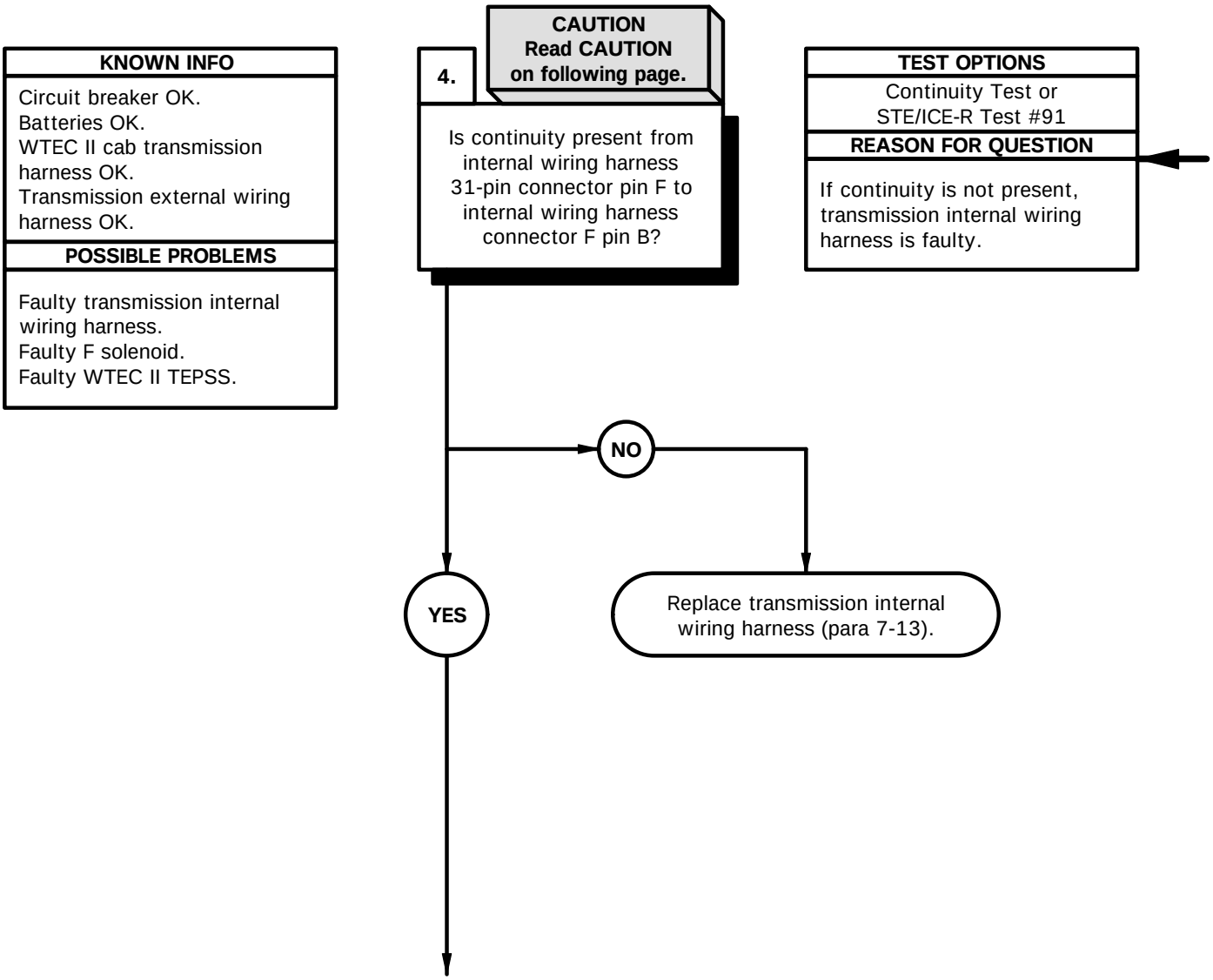
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

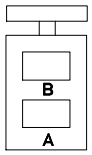
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

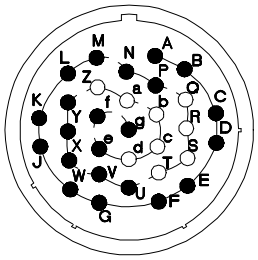
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



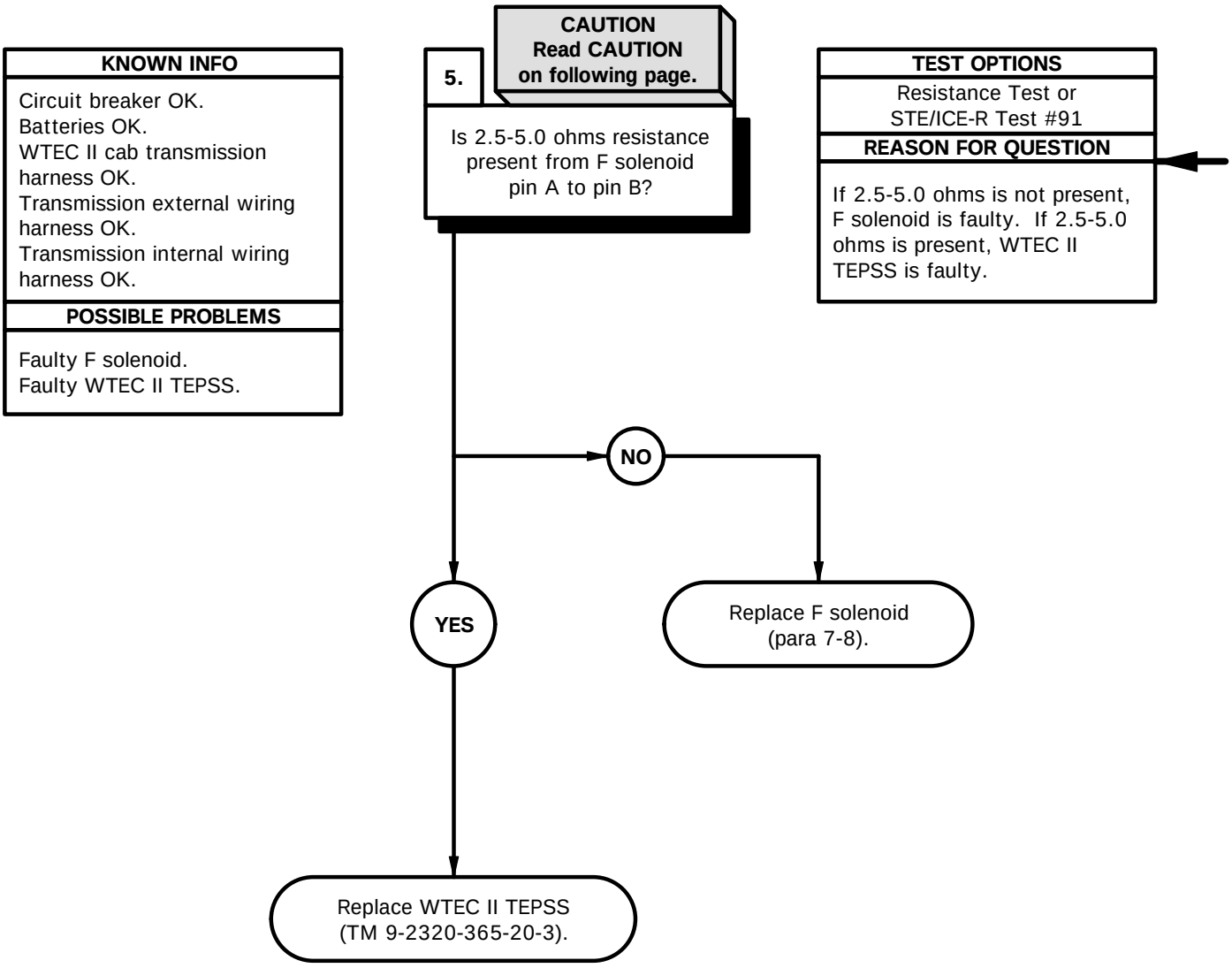
INTERNAL WIRING HARNESS CONNECTOR F



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

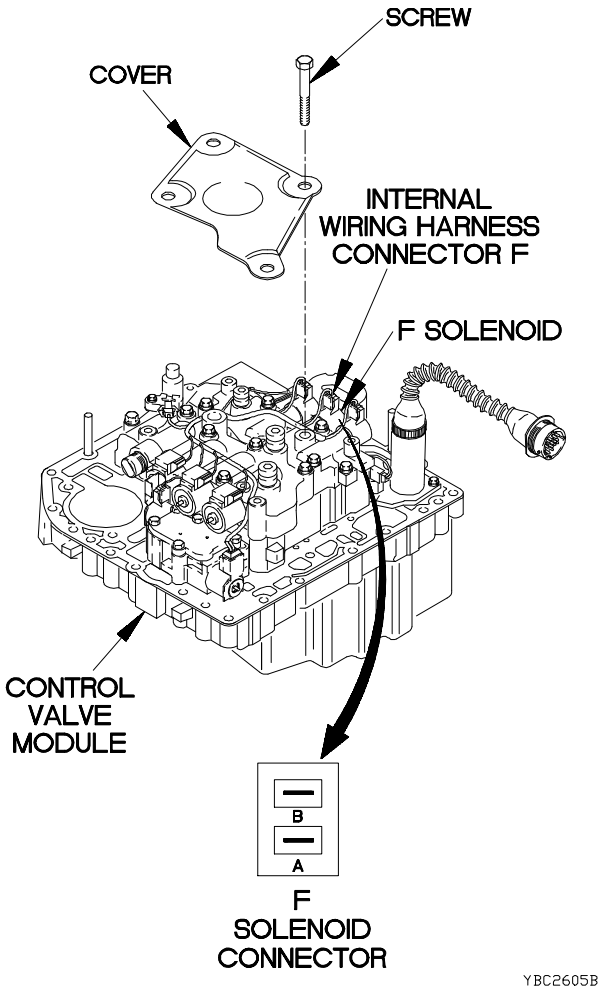
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

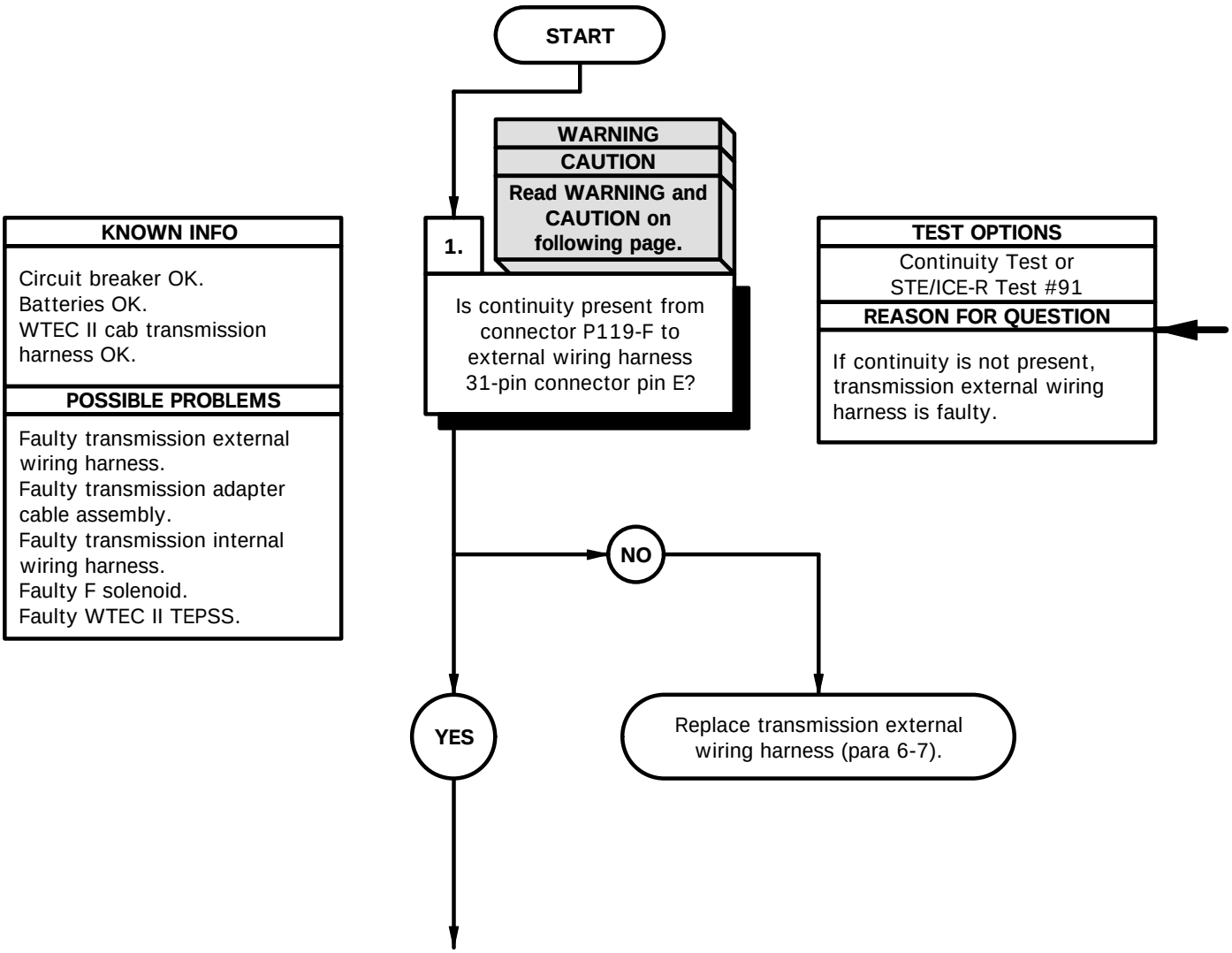
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

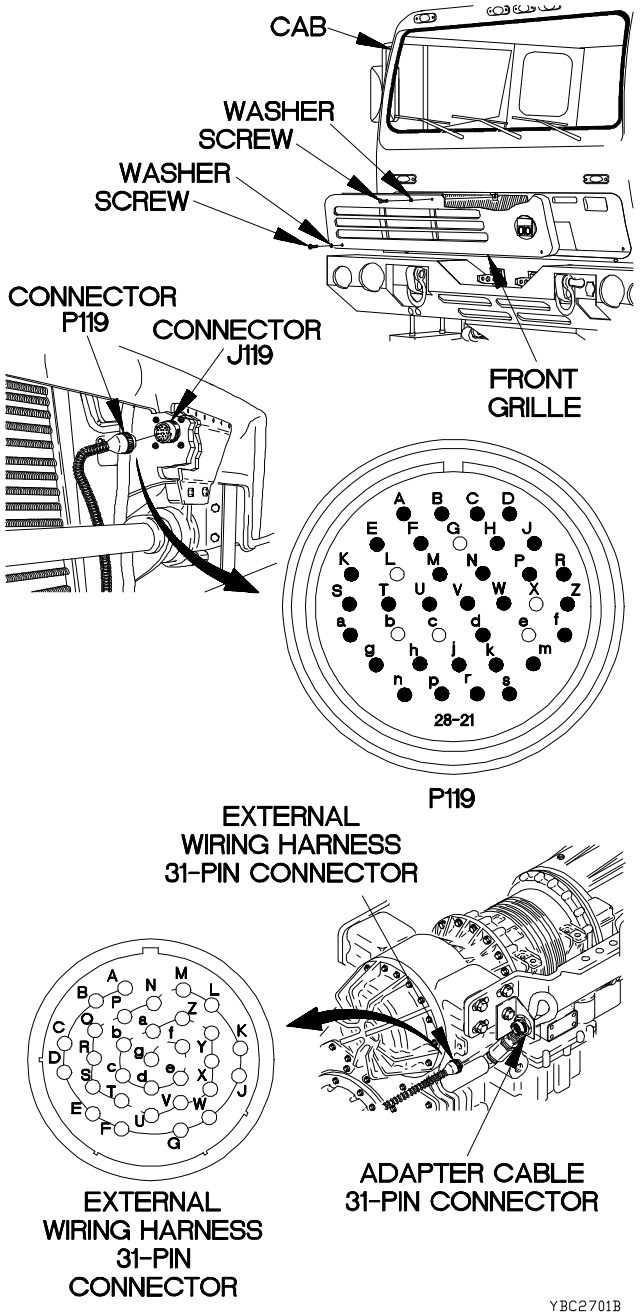
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

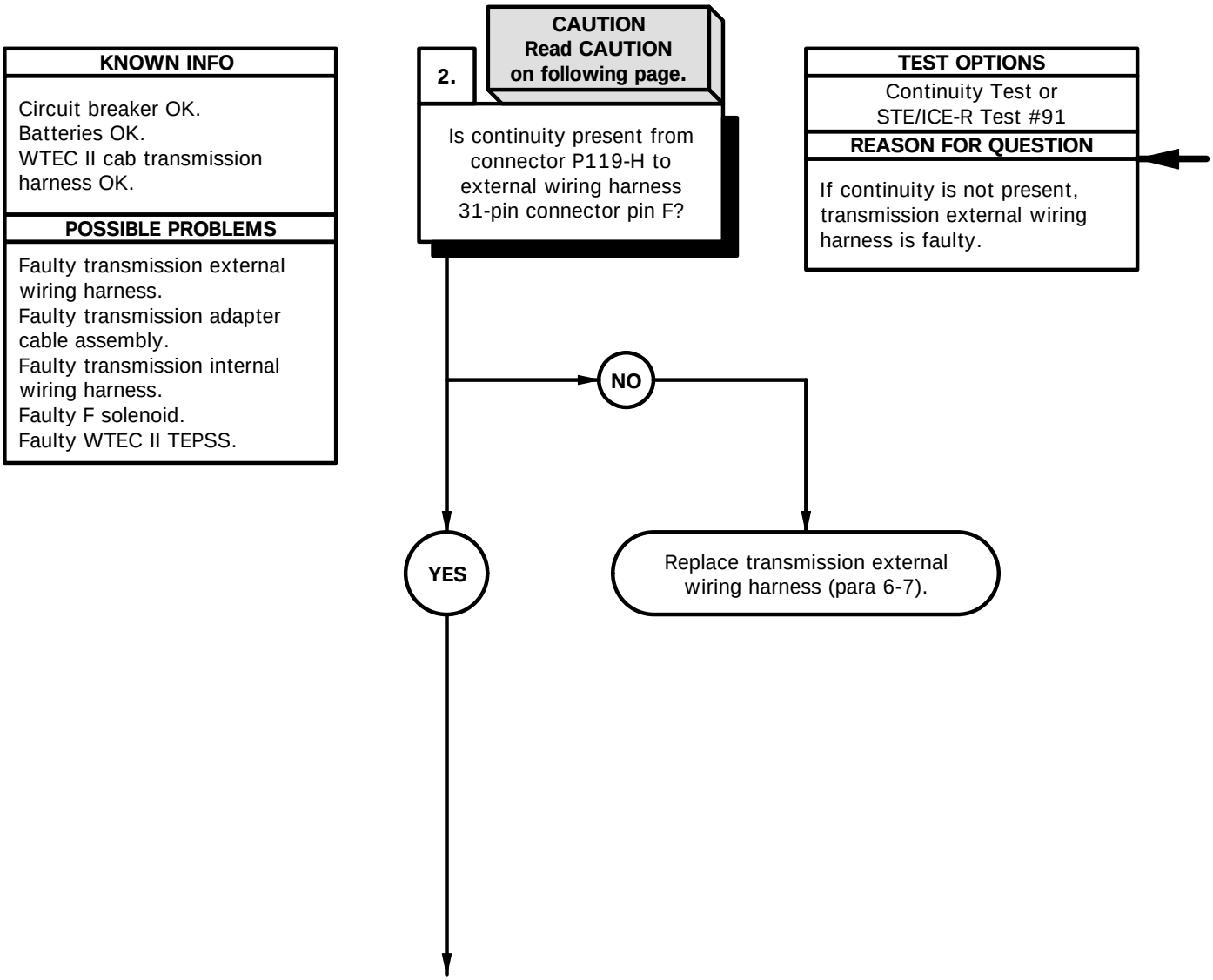
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from adapter cable 31-pin connector.
(6) Set multimeter to ohms.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

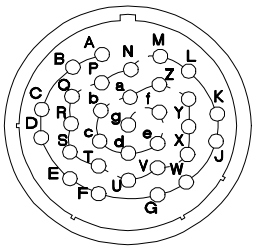
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

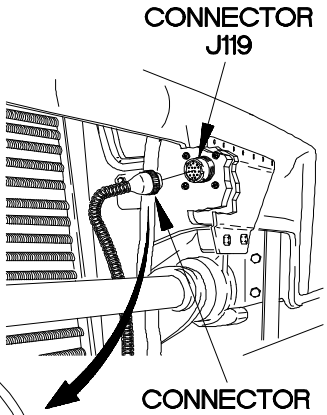
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

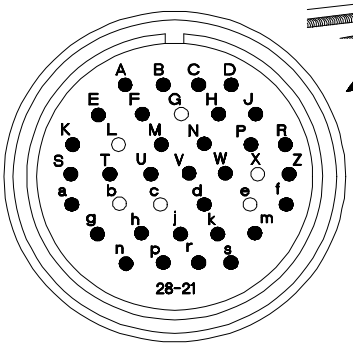
CONTINUITY TEST

(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).

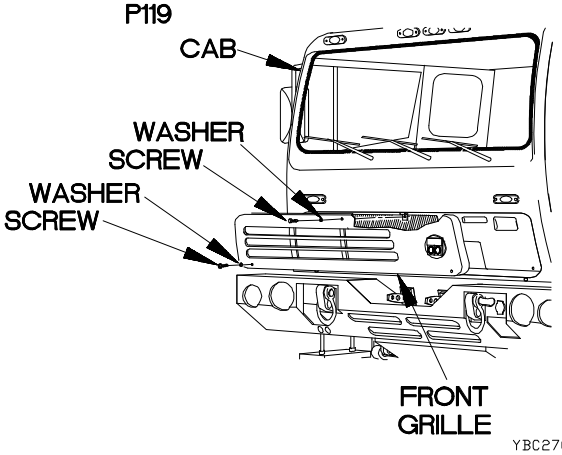


EXTERNAL WIRING HARNESS 31-PIN CONNECTOR

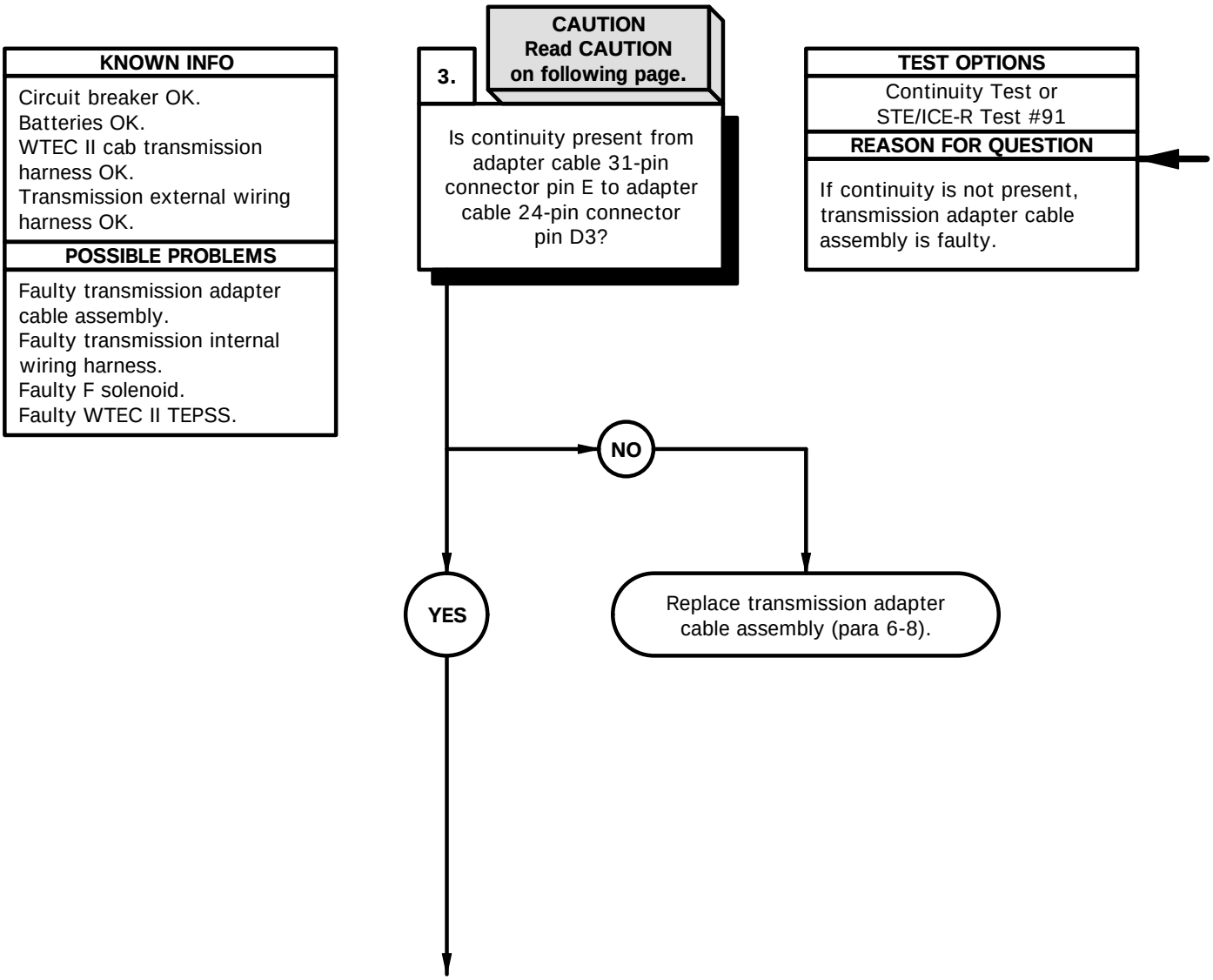




P119



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

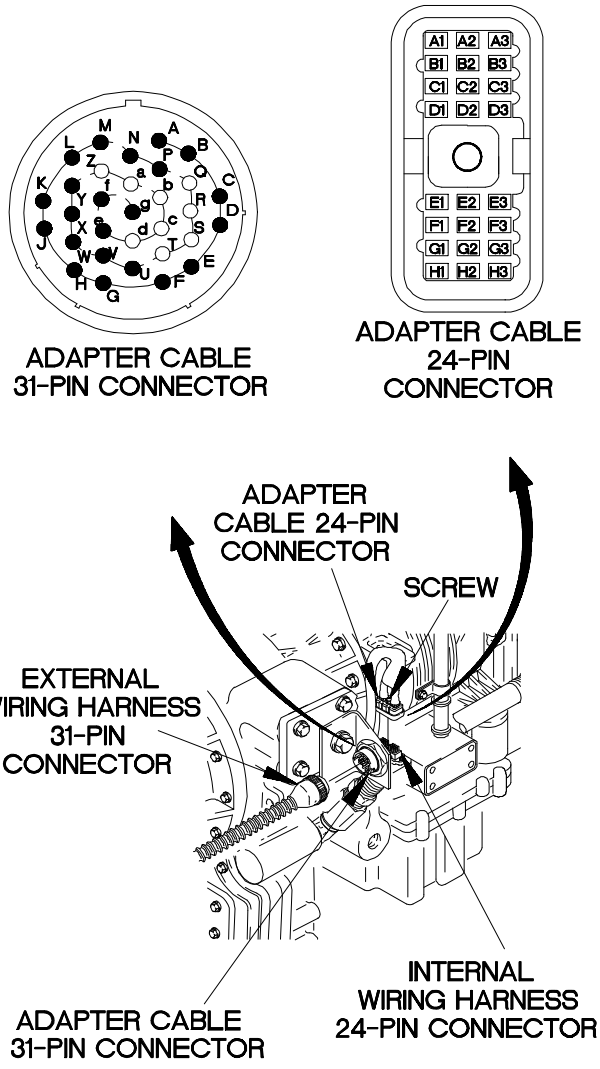
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

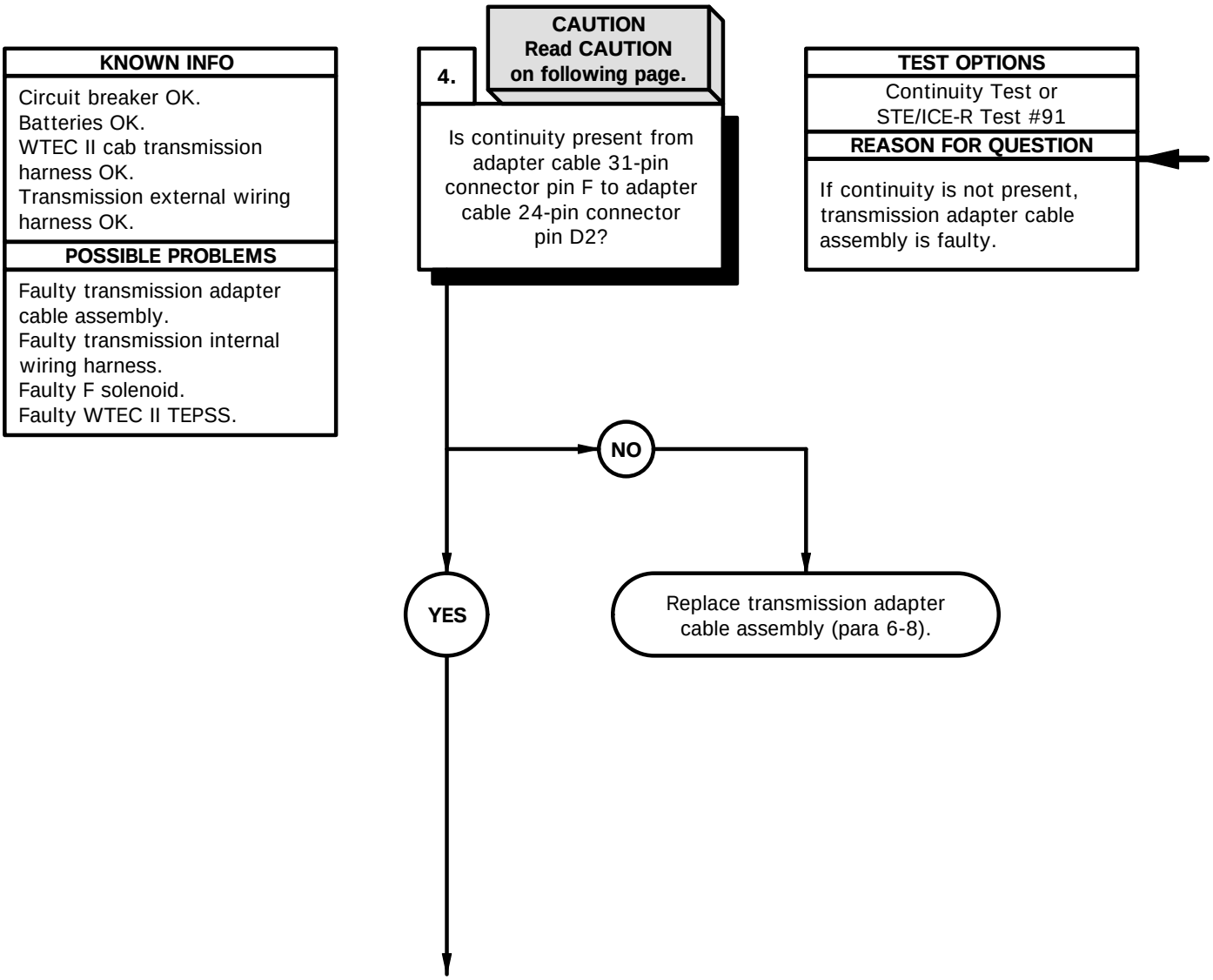
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

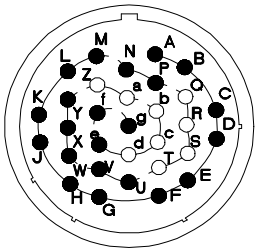
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

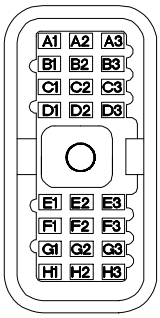
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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.



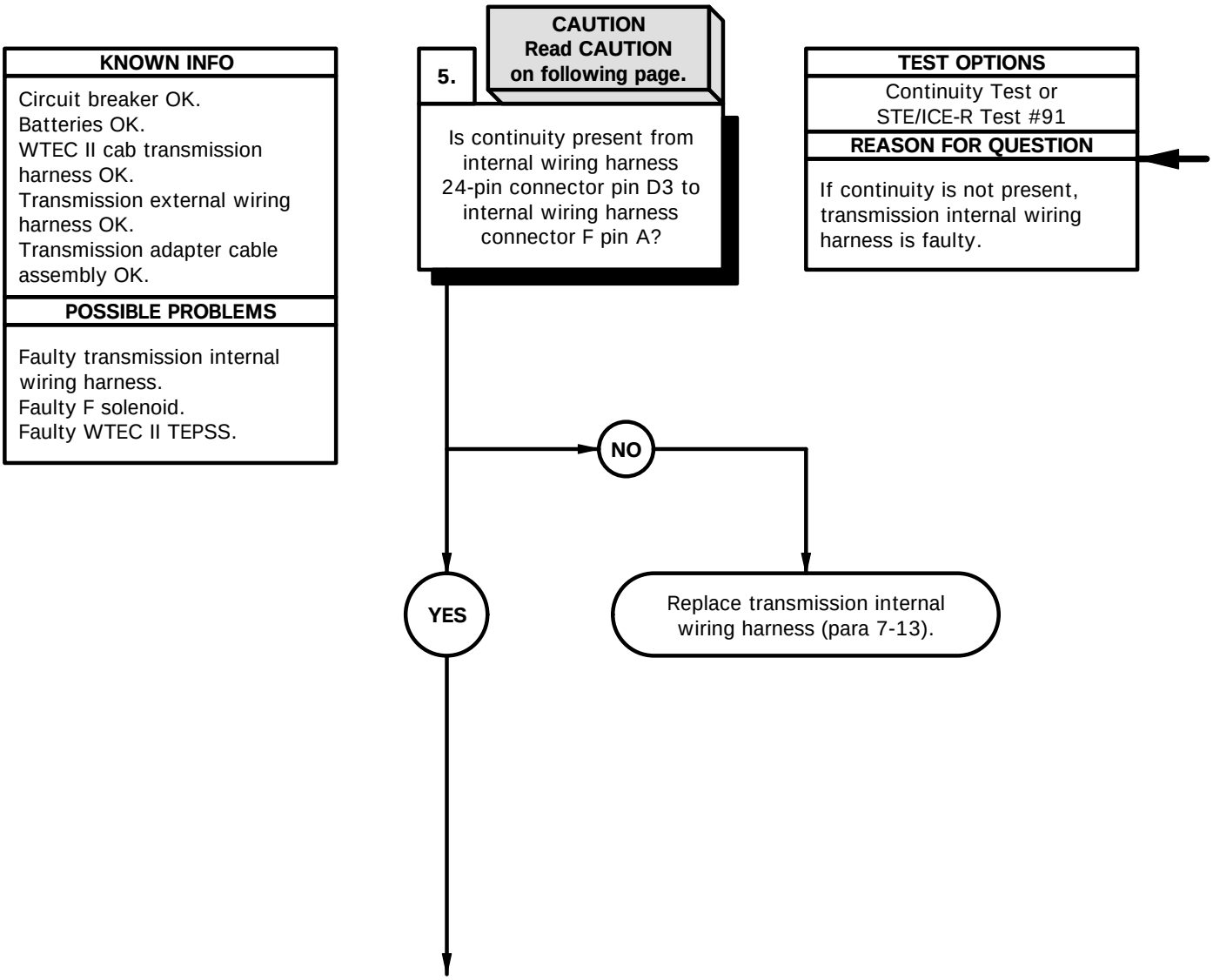
ADAPTER CABLE
31-PIN CONNECTOR



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

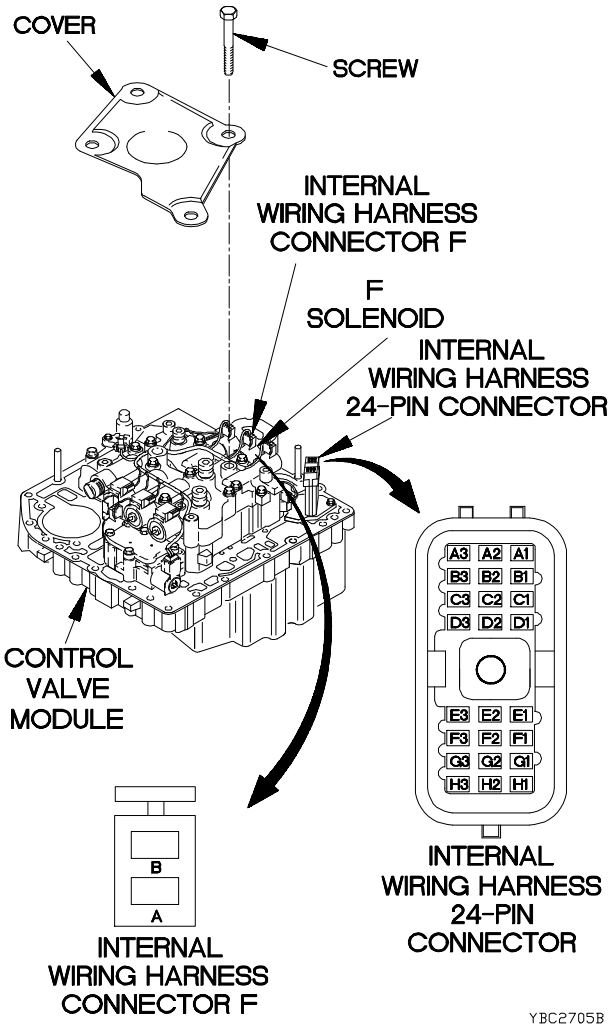
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

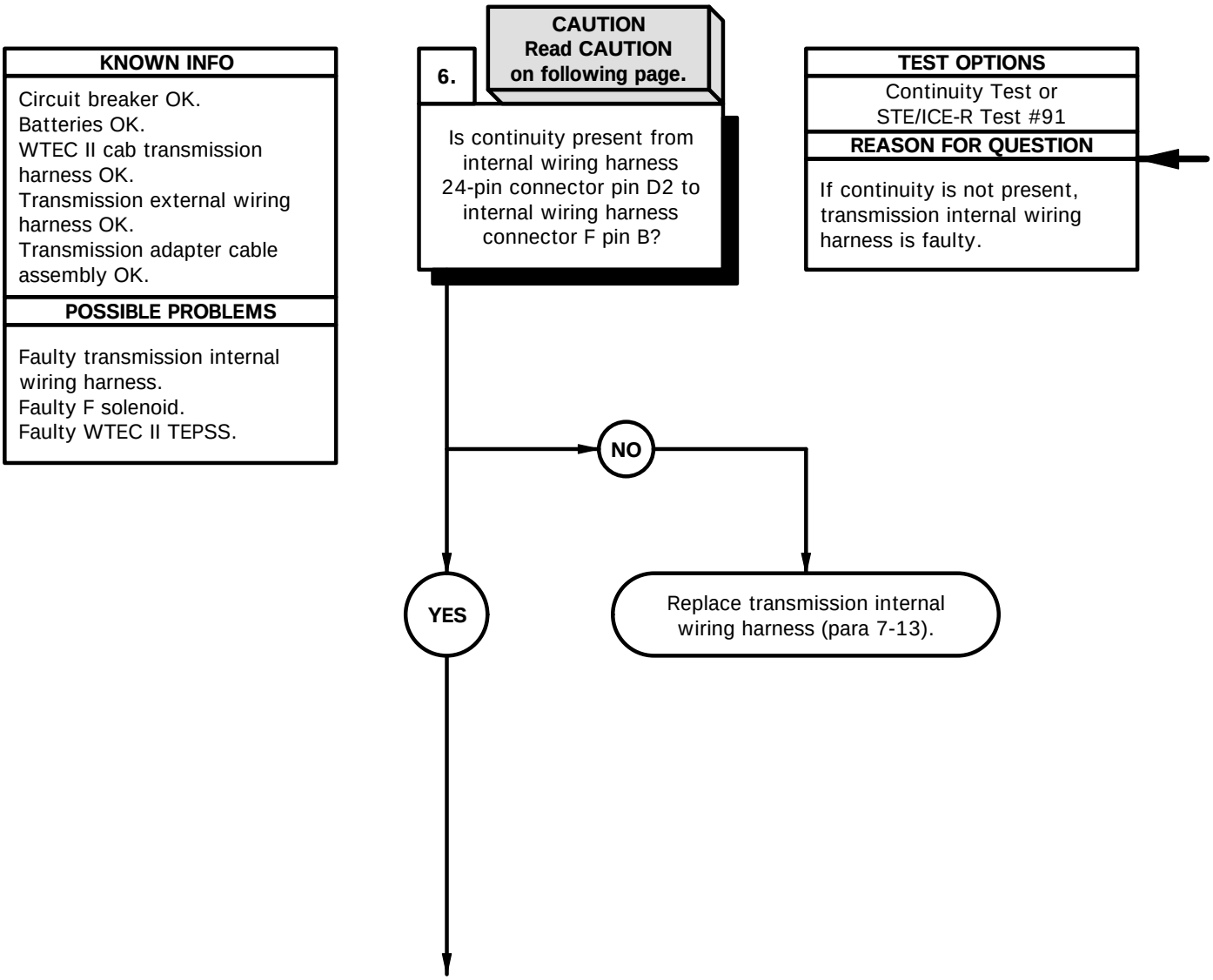
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

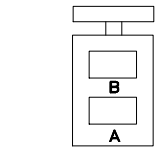
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

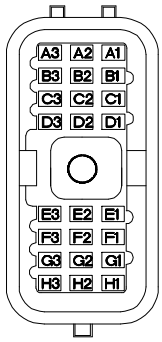
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



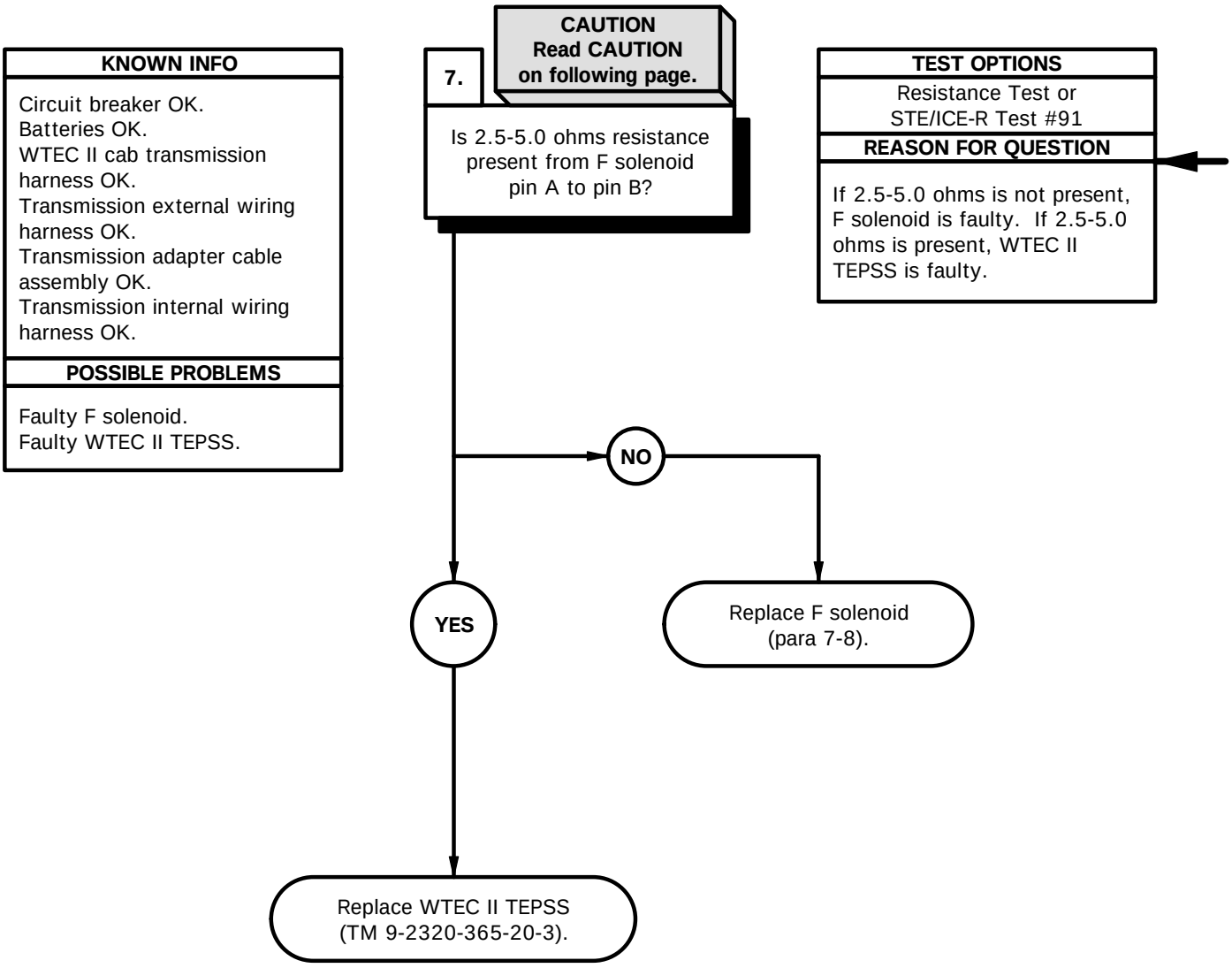
INTERNAL WIRING HARNESS CONNECTOR F



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

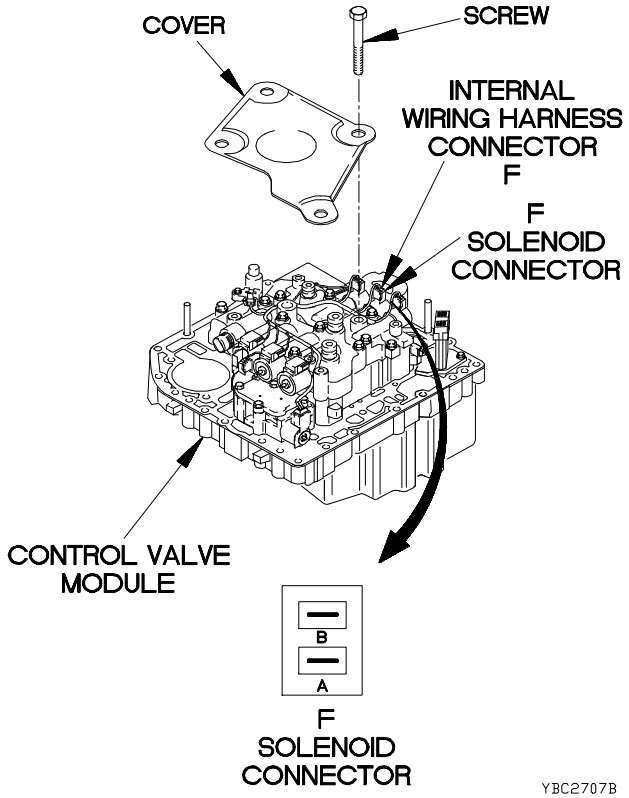
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)

Materials/Parts
Wire, Elect, 50 ft (Item 94, Appendix C)

Personnel Required
(2)

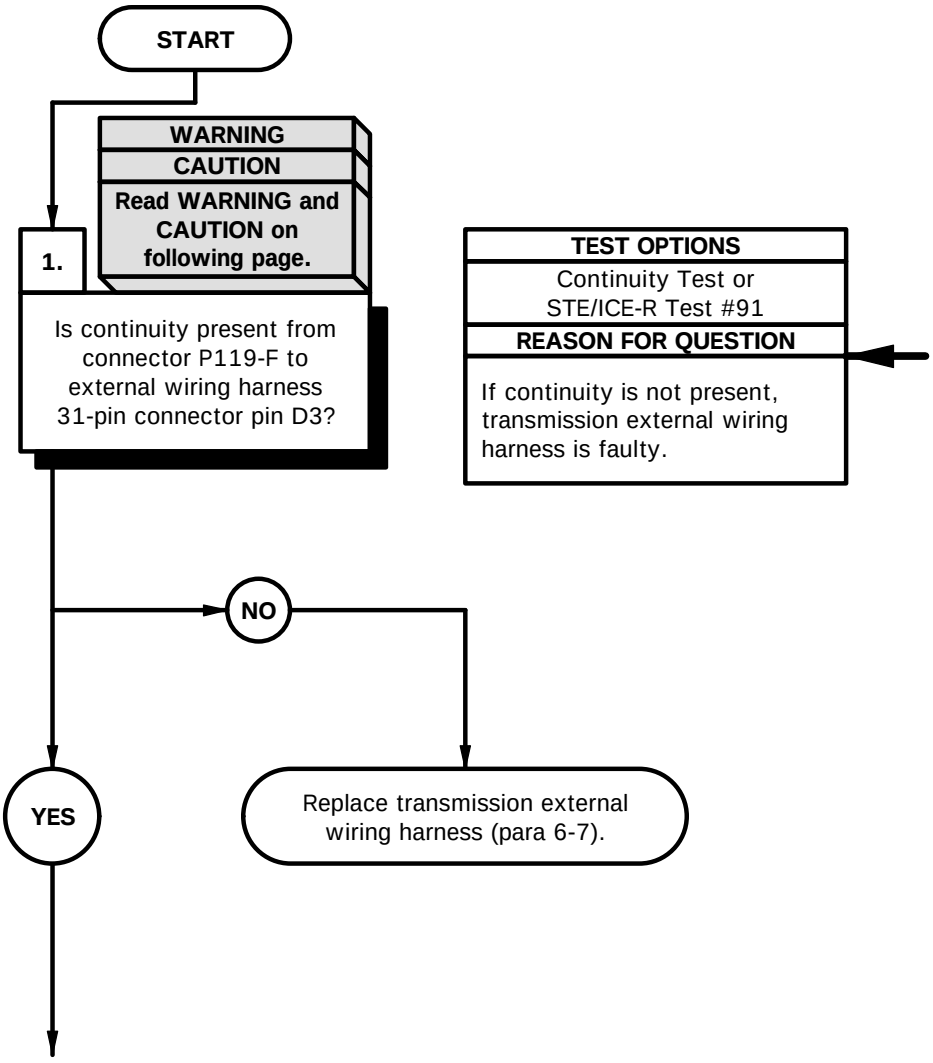
References
TM 9-4910-571-12&P

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 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.

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

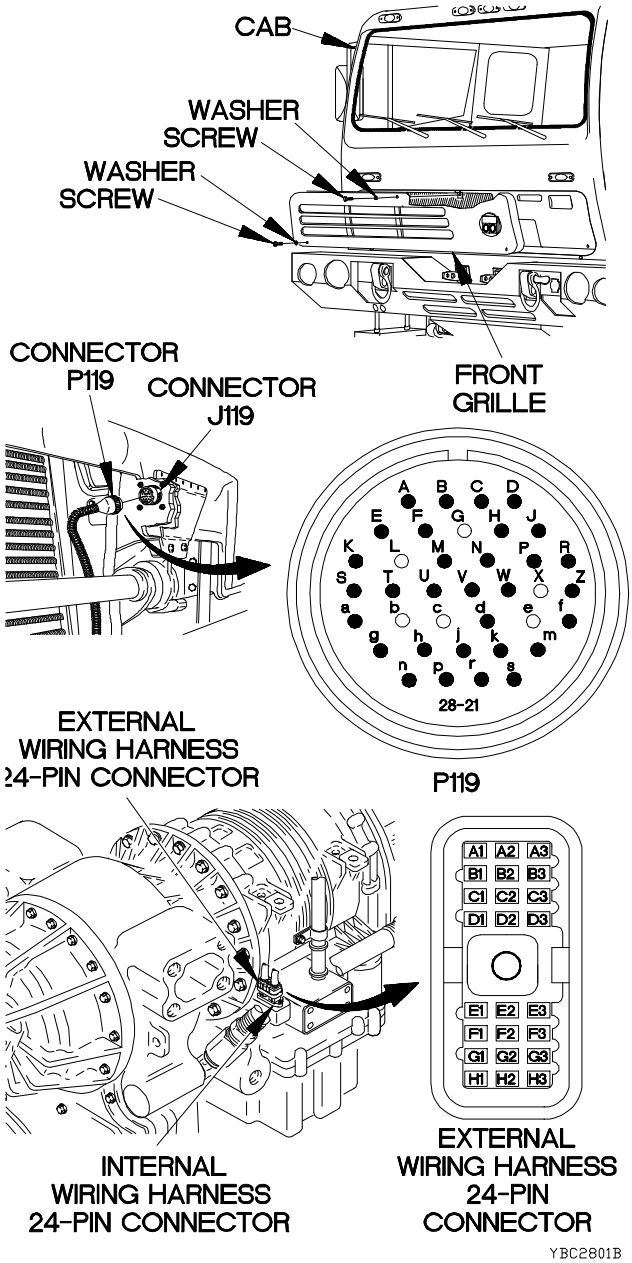
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

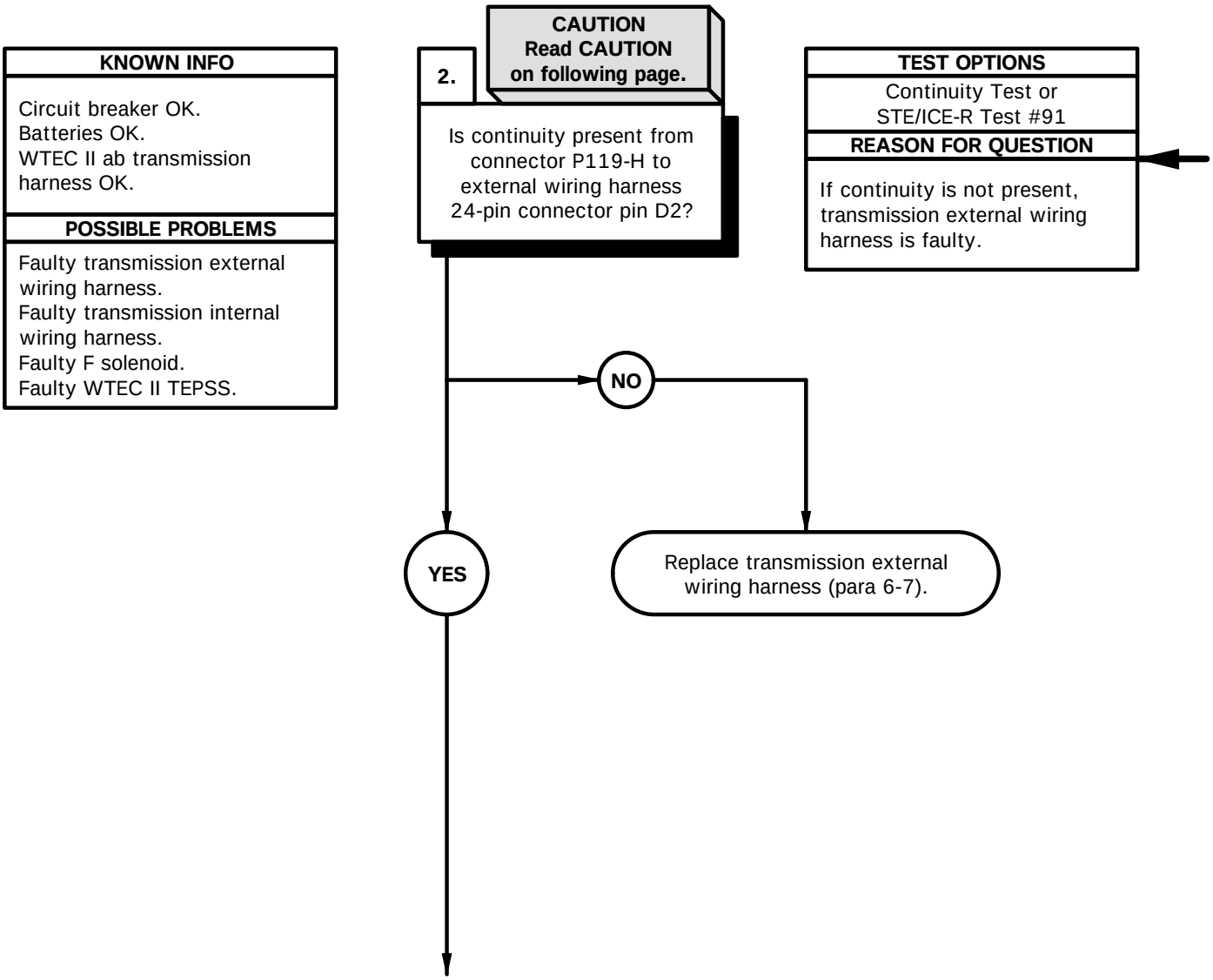
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Loosen screw in external wiring harness 24-pin connector.
(6) Disconnect external wiring harness 24-pin connector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

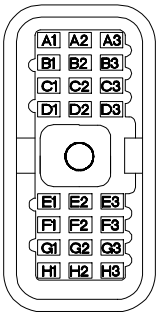
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

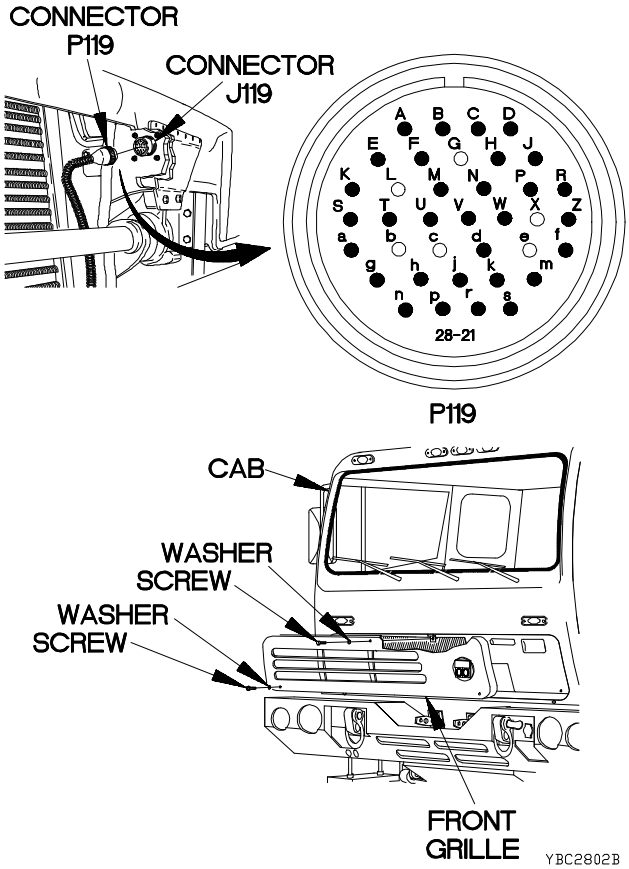
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

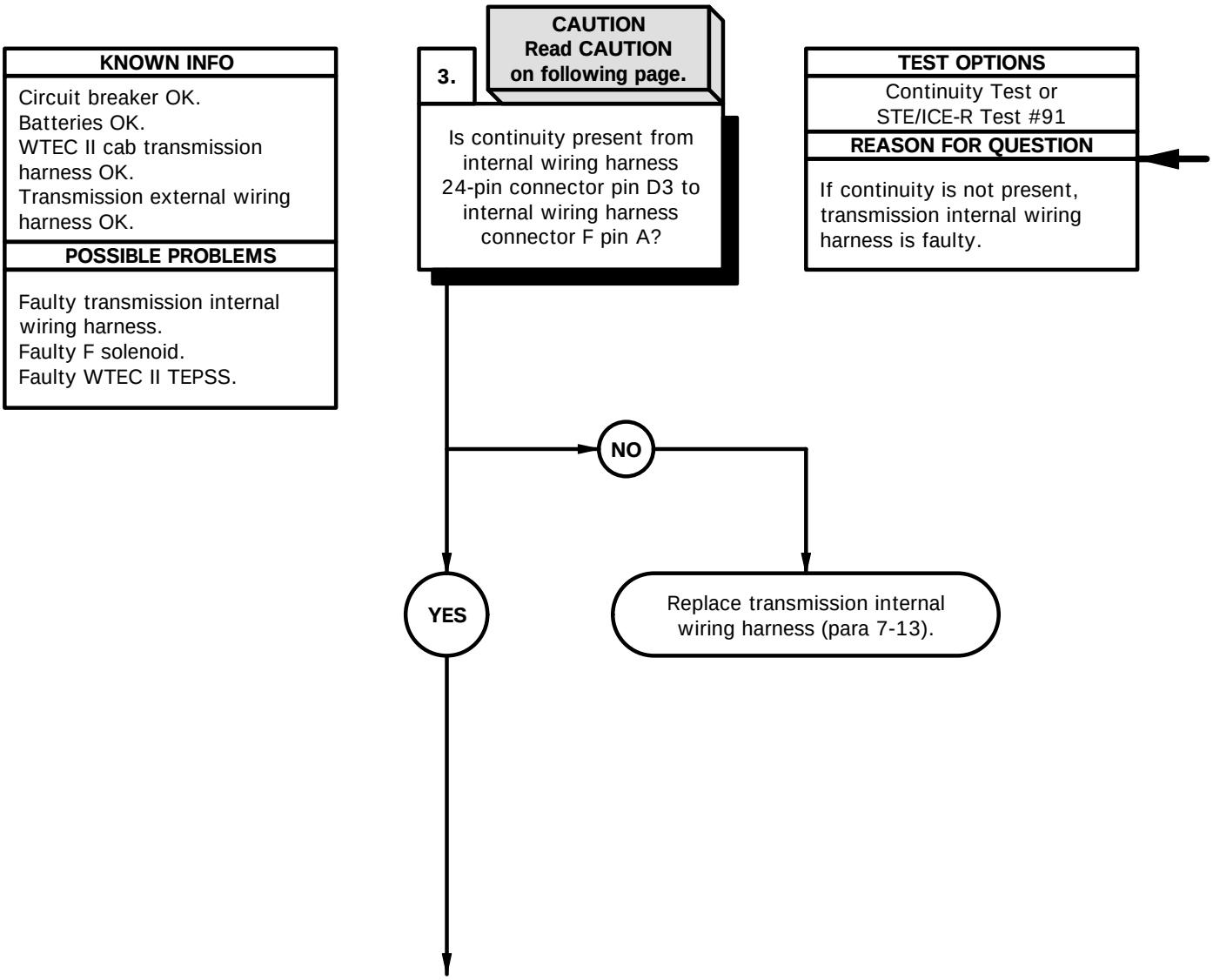
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P119-H.
(3) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin D2 and note reading on multimeter.
(4) If continuity is not present, replace transmission external wiring harness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



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

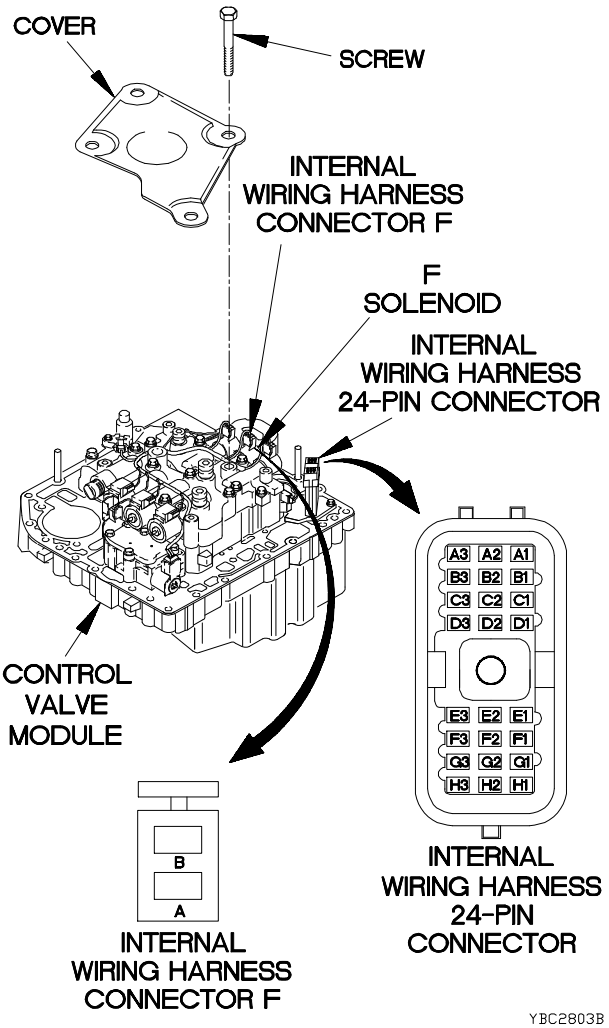
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

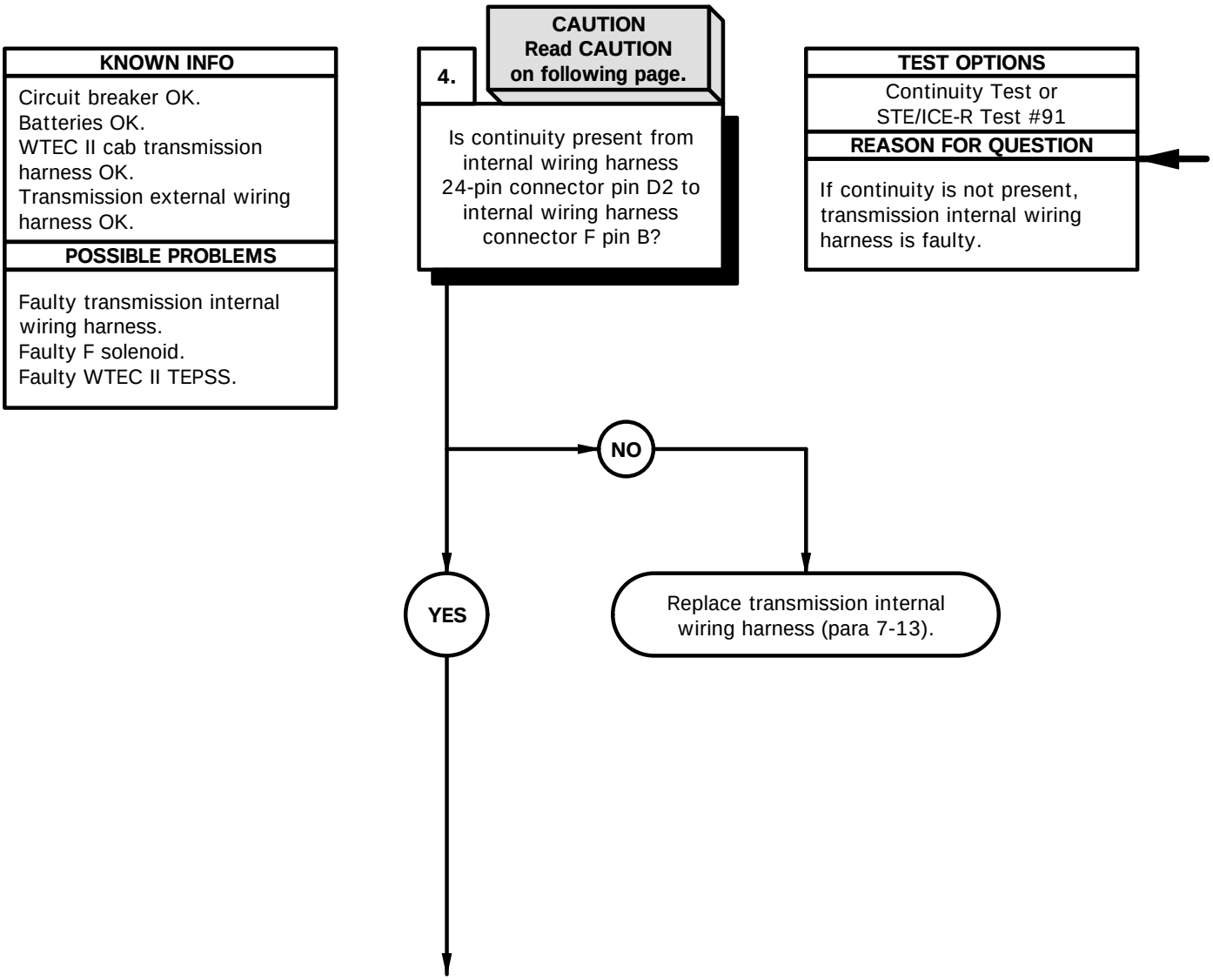
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

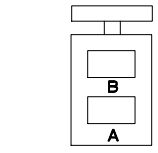
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

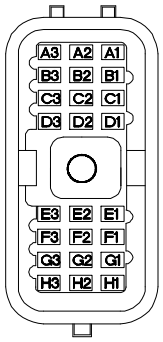
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



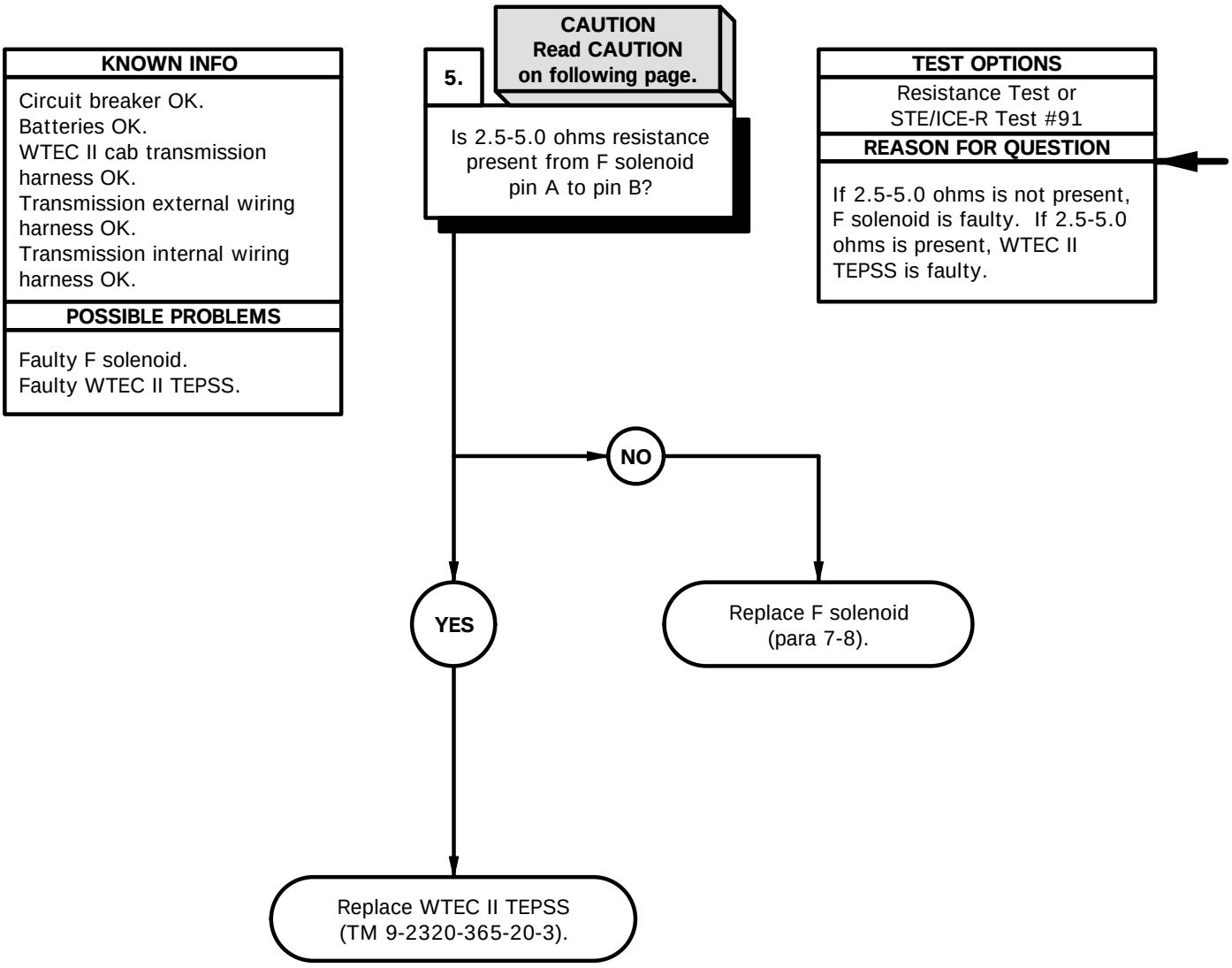
INTERNAL WIRING HARNESS CONNECTOR F



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

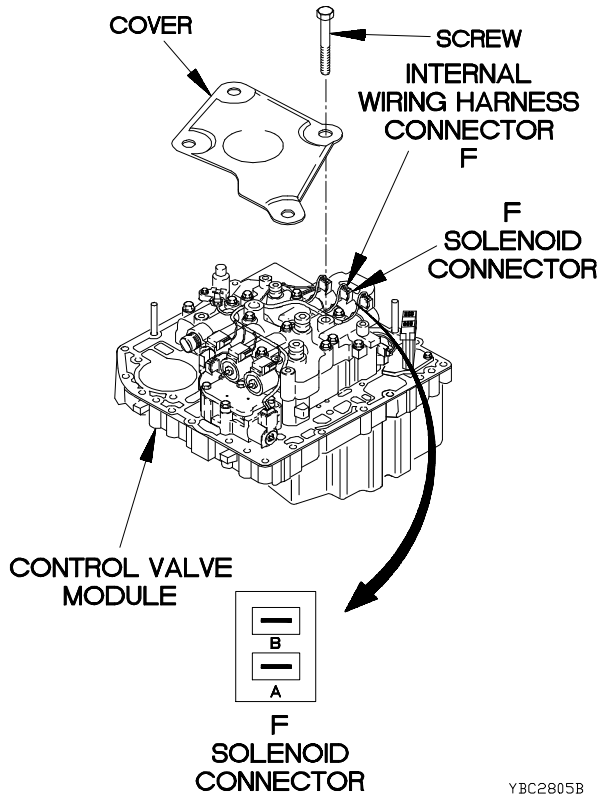
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

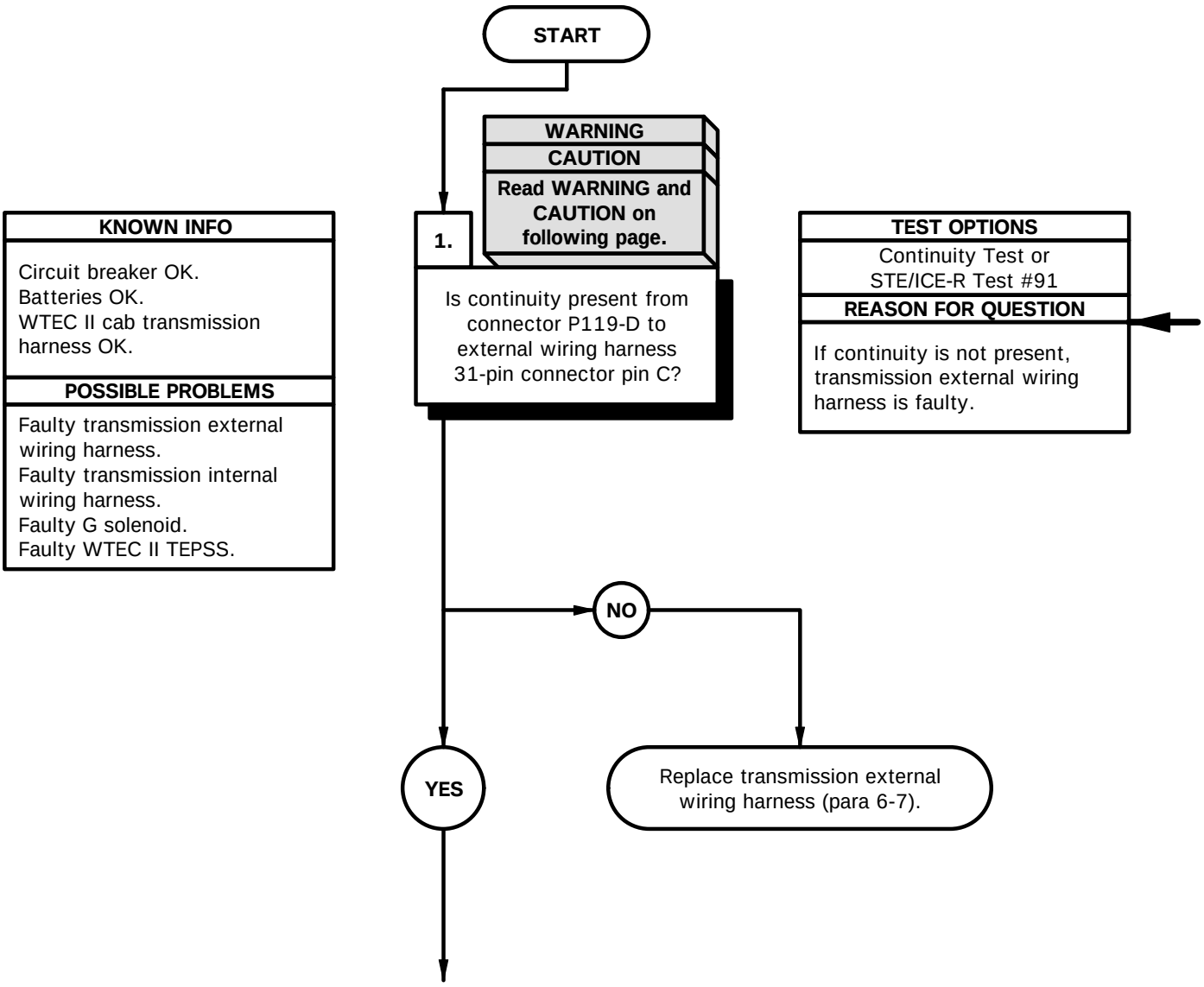
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

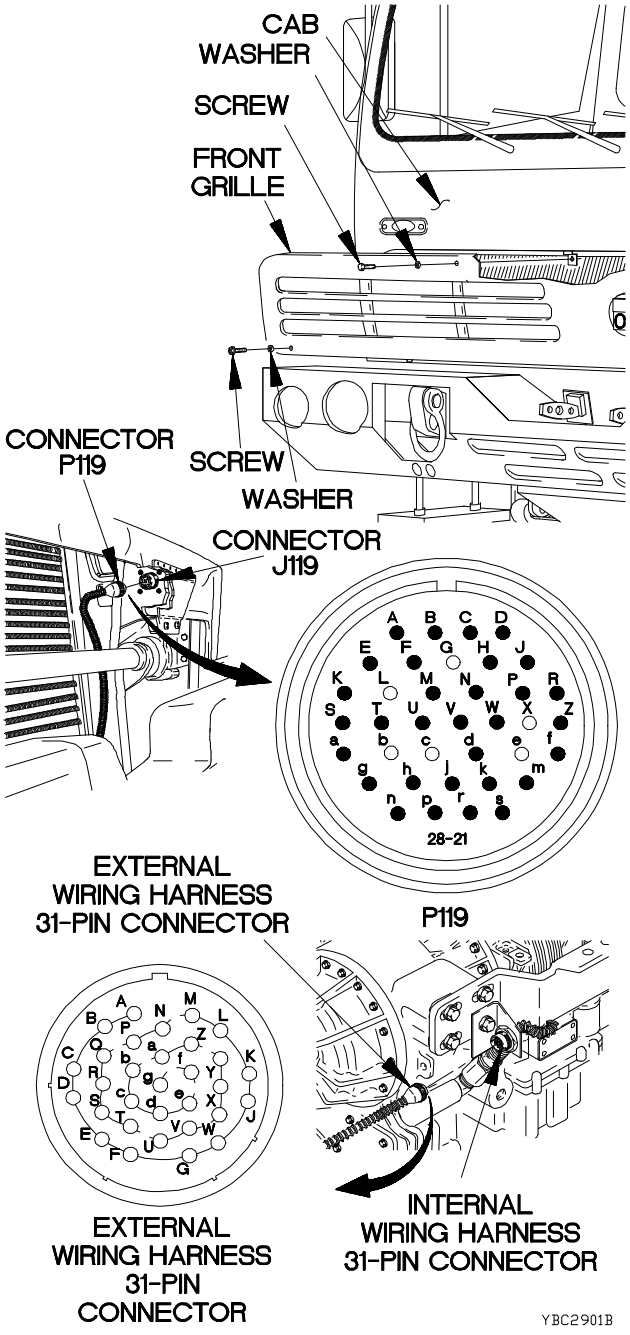
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

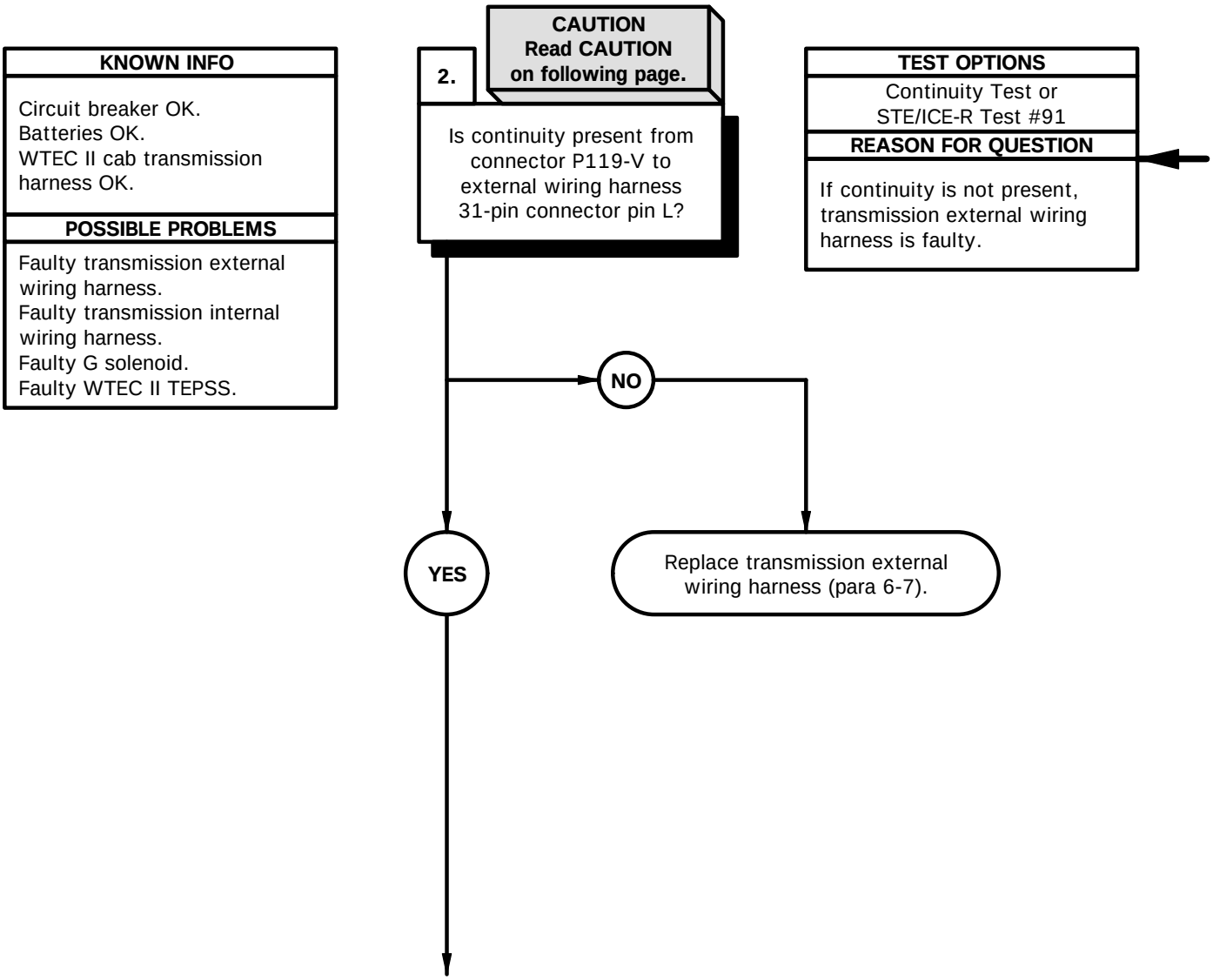
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin harness connector.
(6) Set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

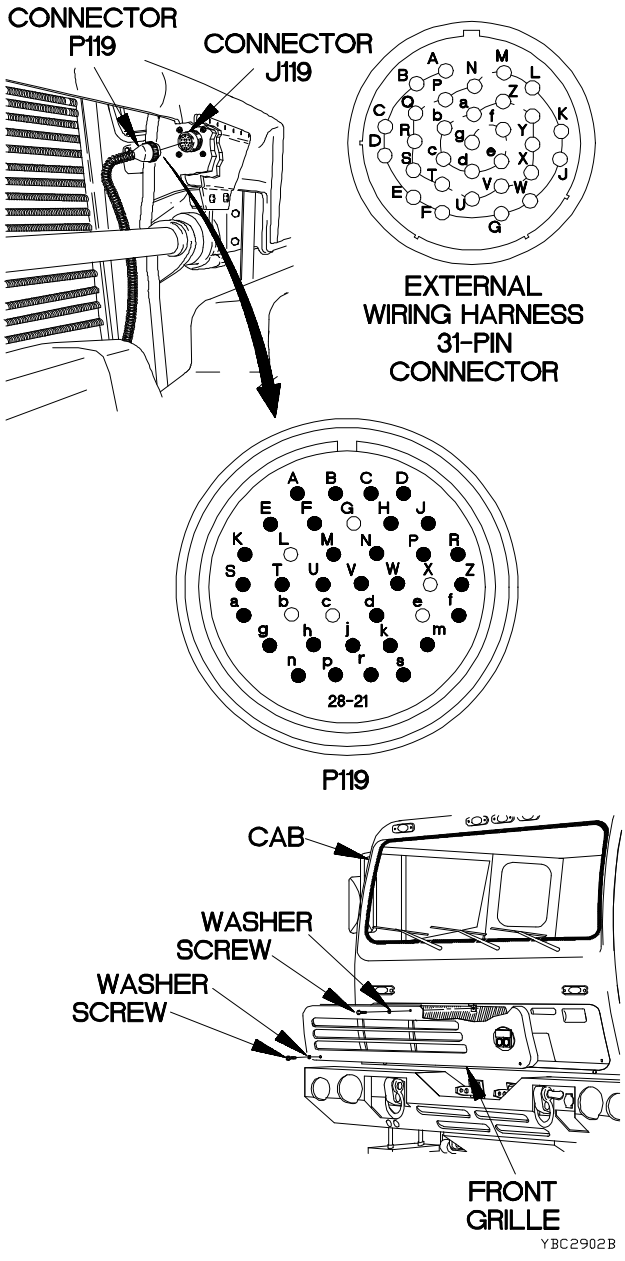
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

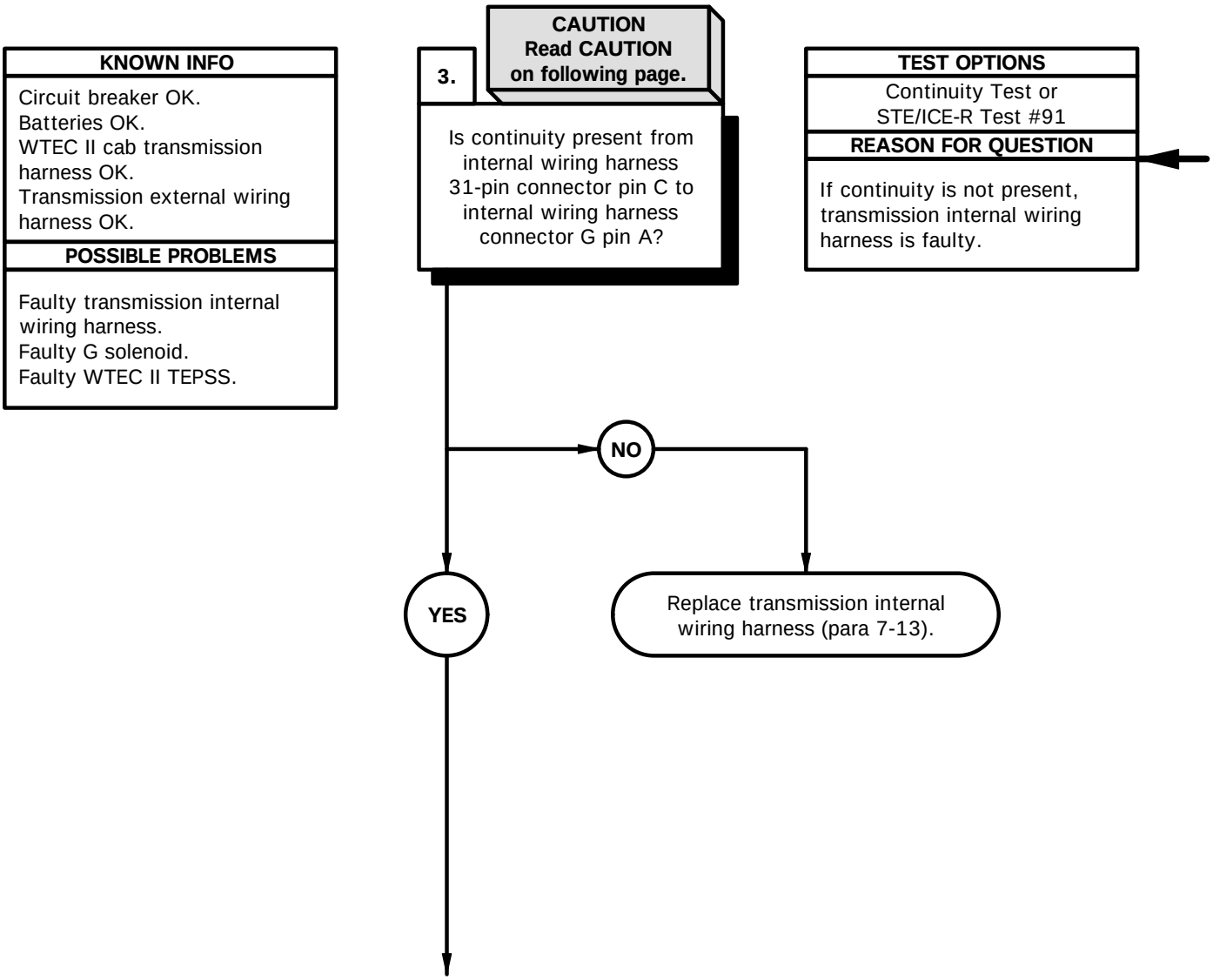
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

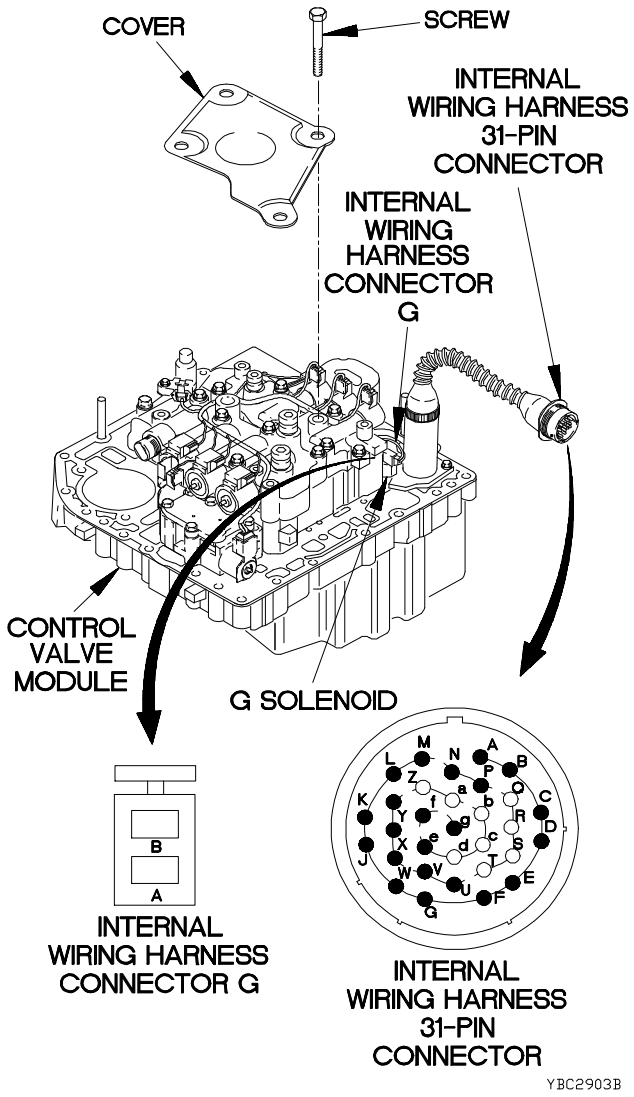
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

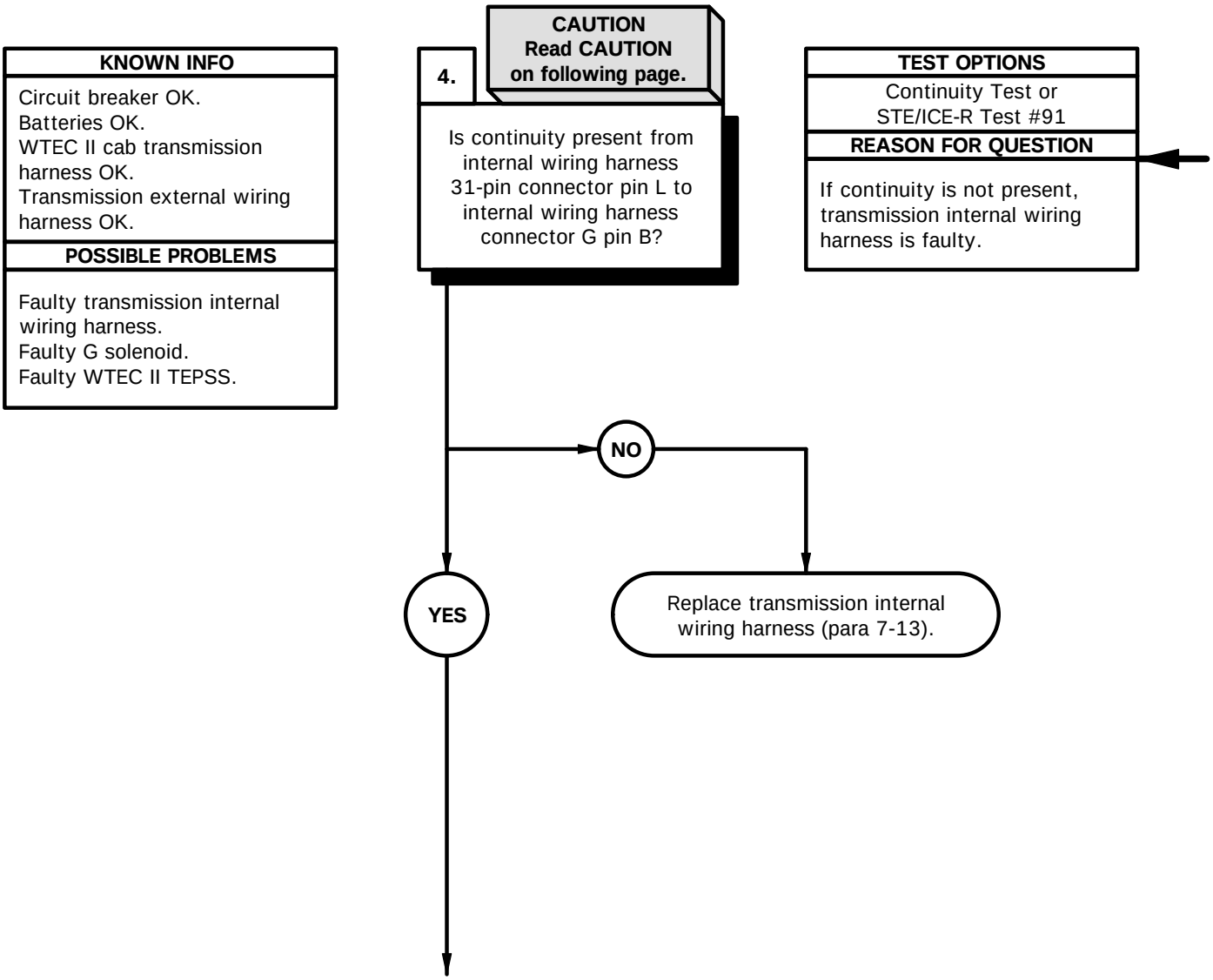
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

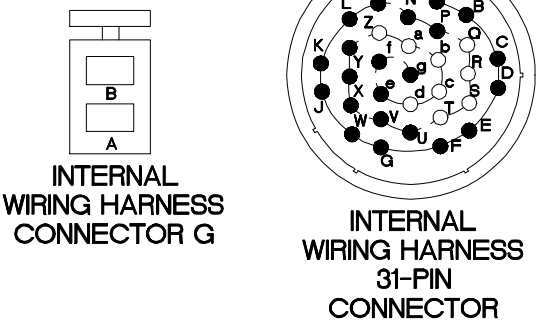
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

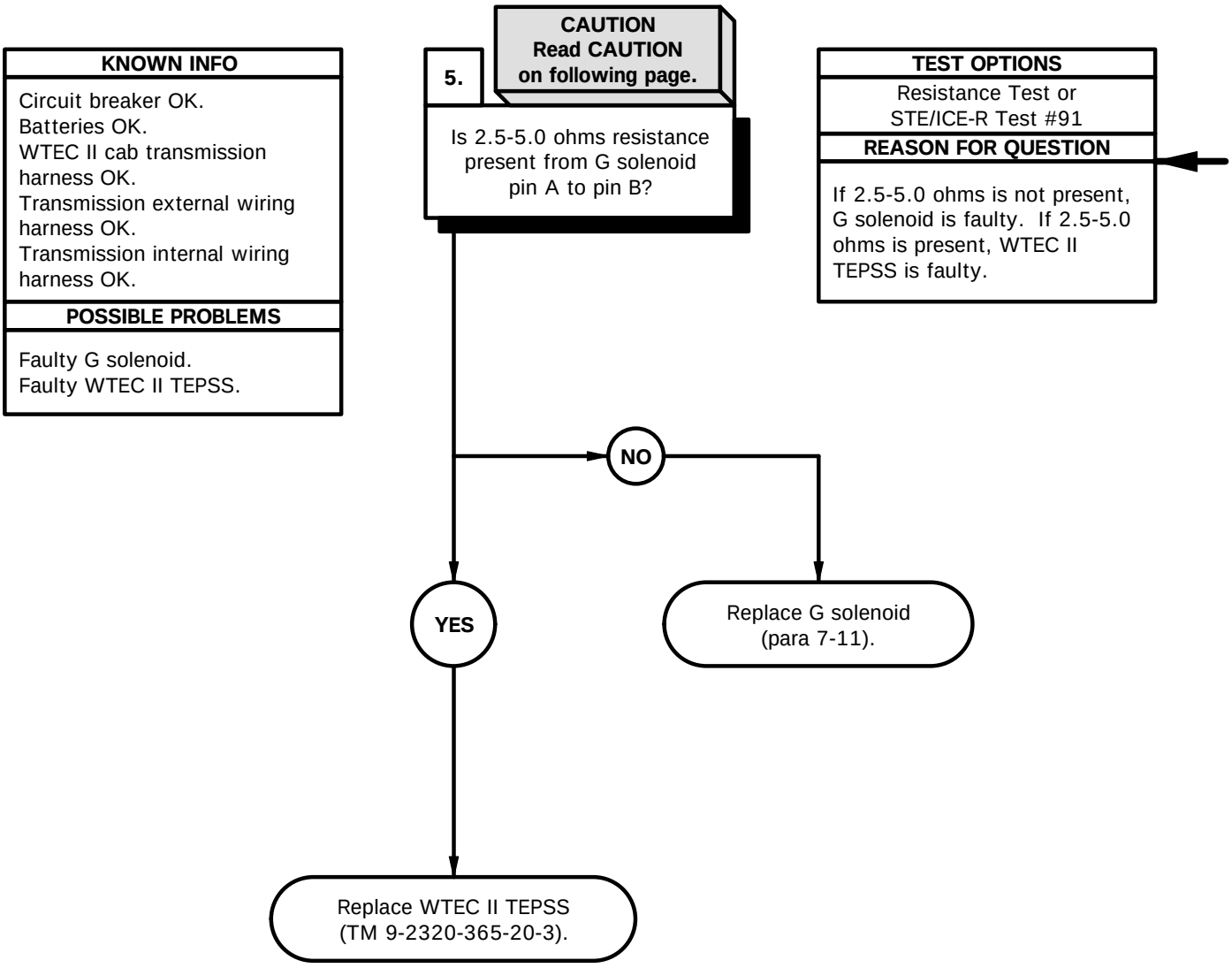
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

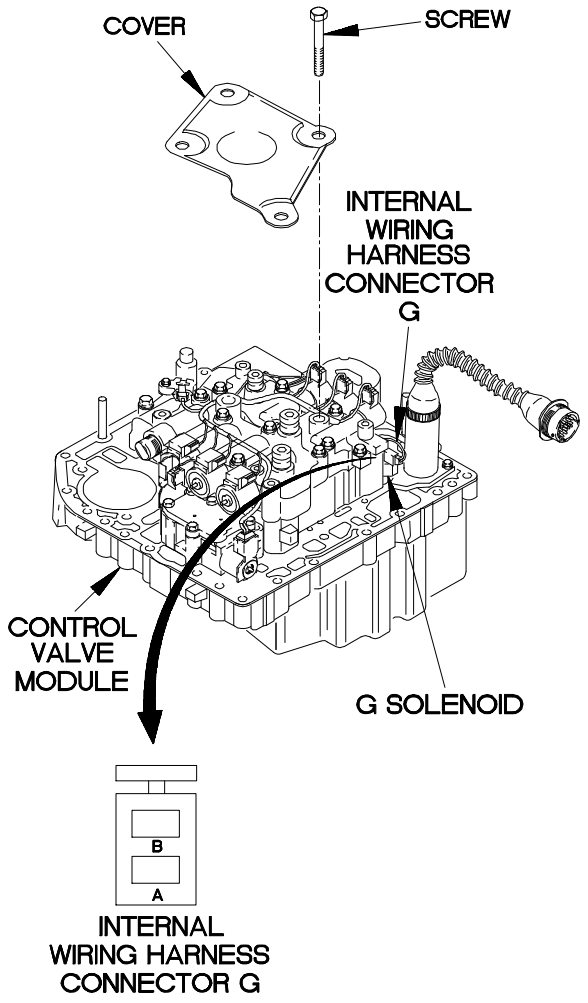
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

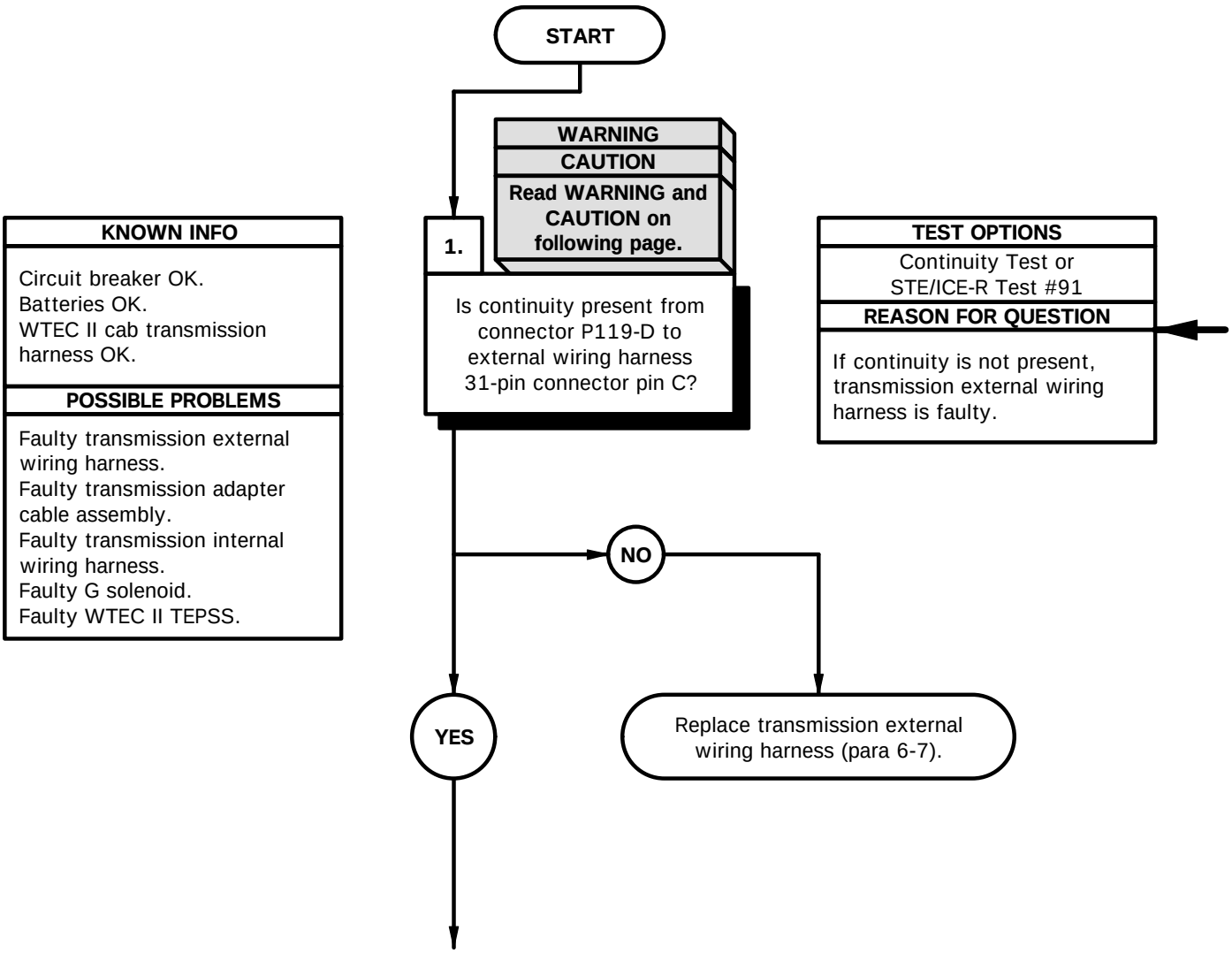
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

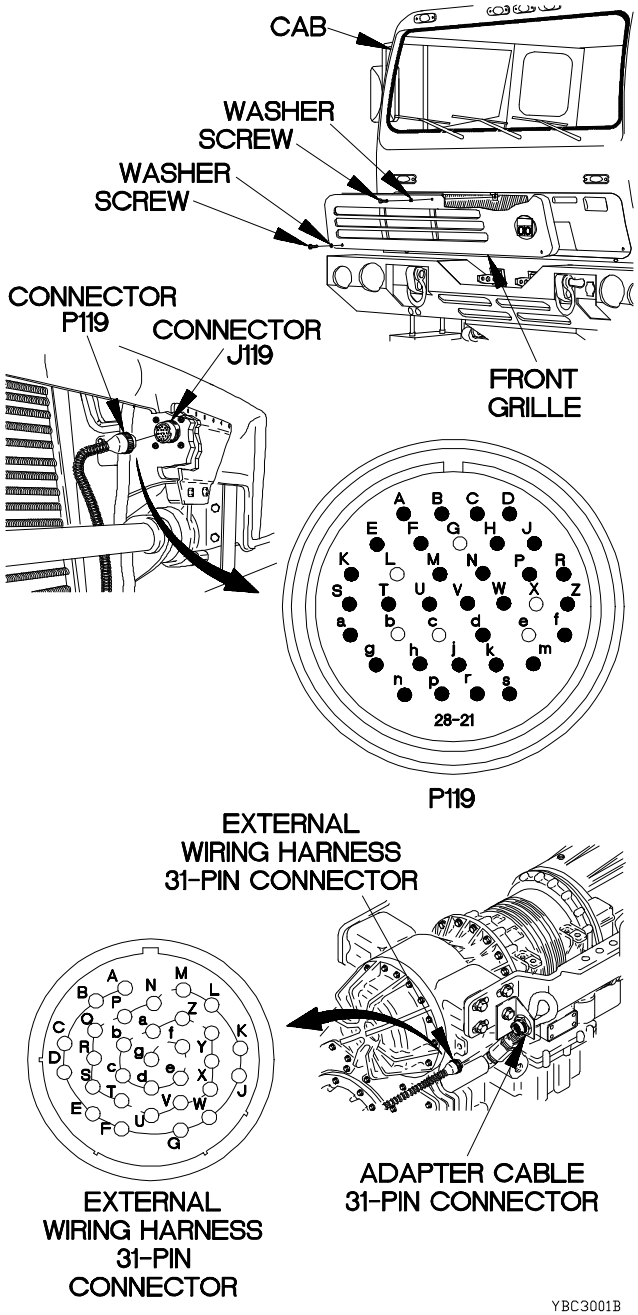
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

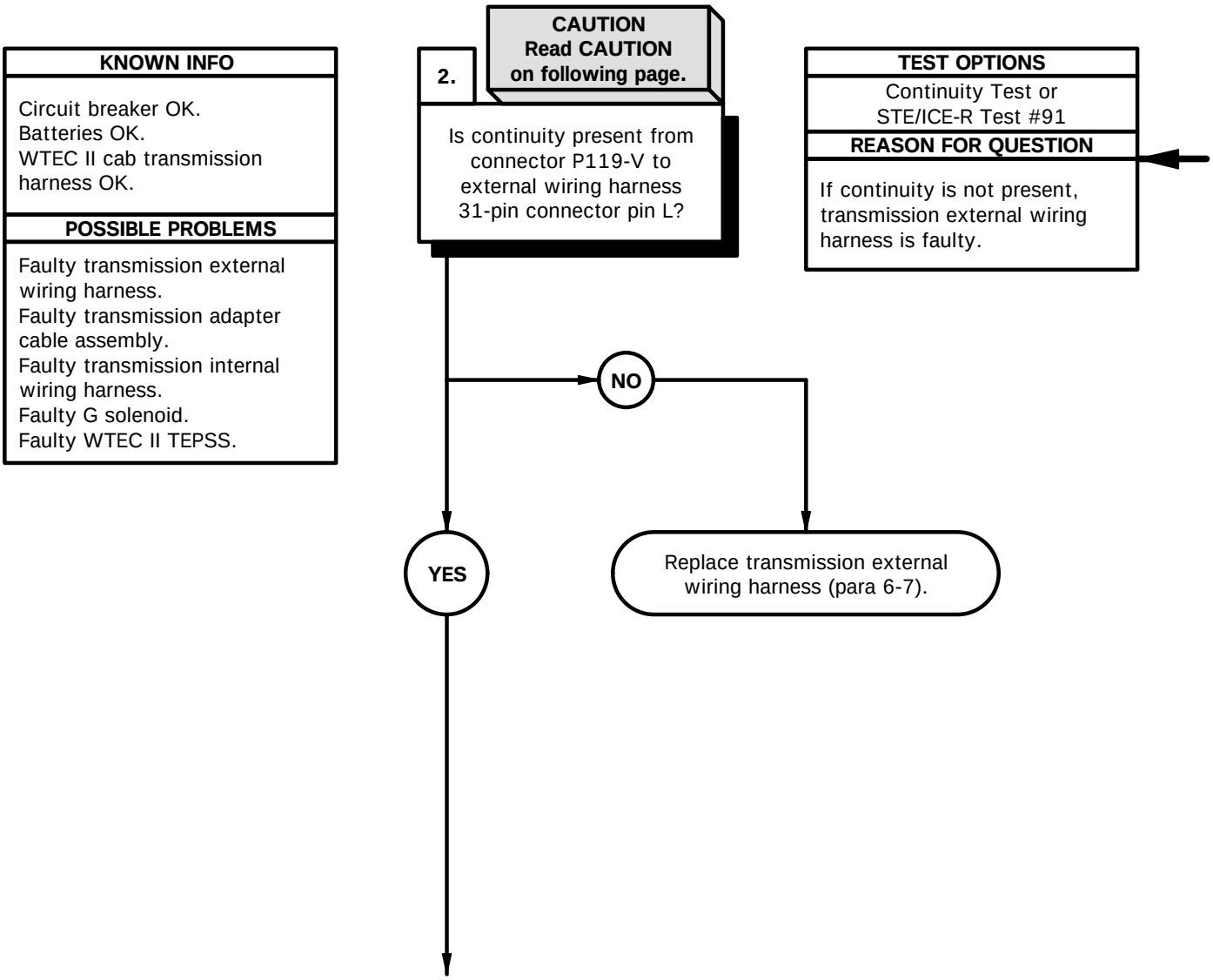
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from adapter cable 31-pin connector.
(6) Set multimeter to ohms.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

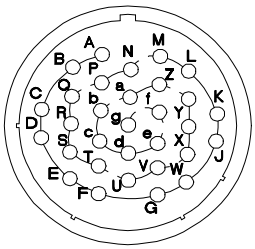
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

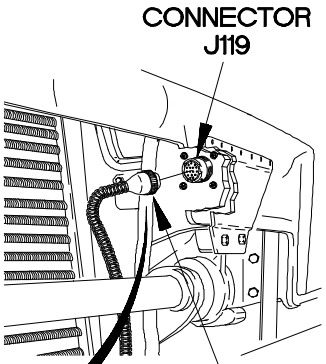
NOTE

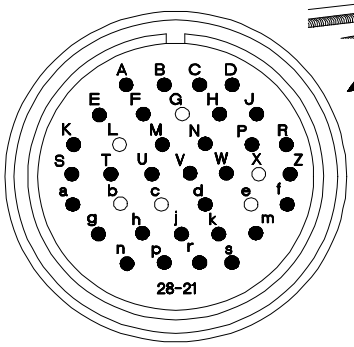
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

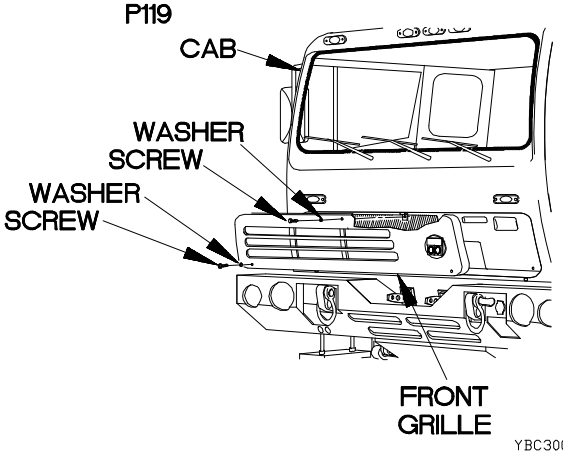
CONTINUITY TEST

(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).

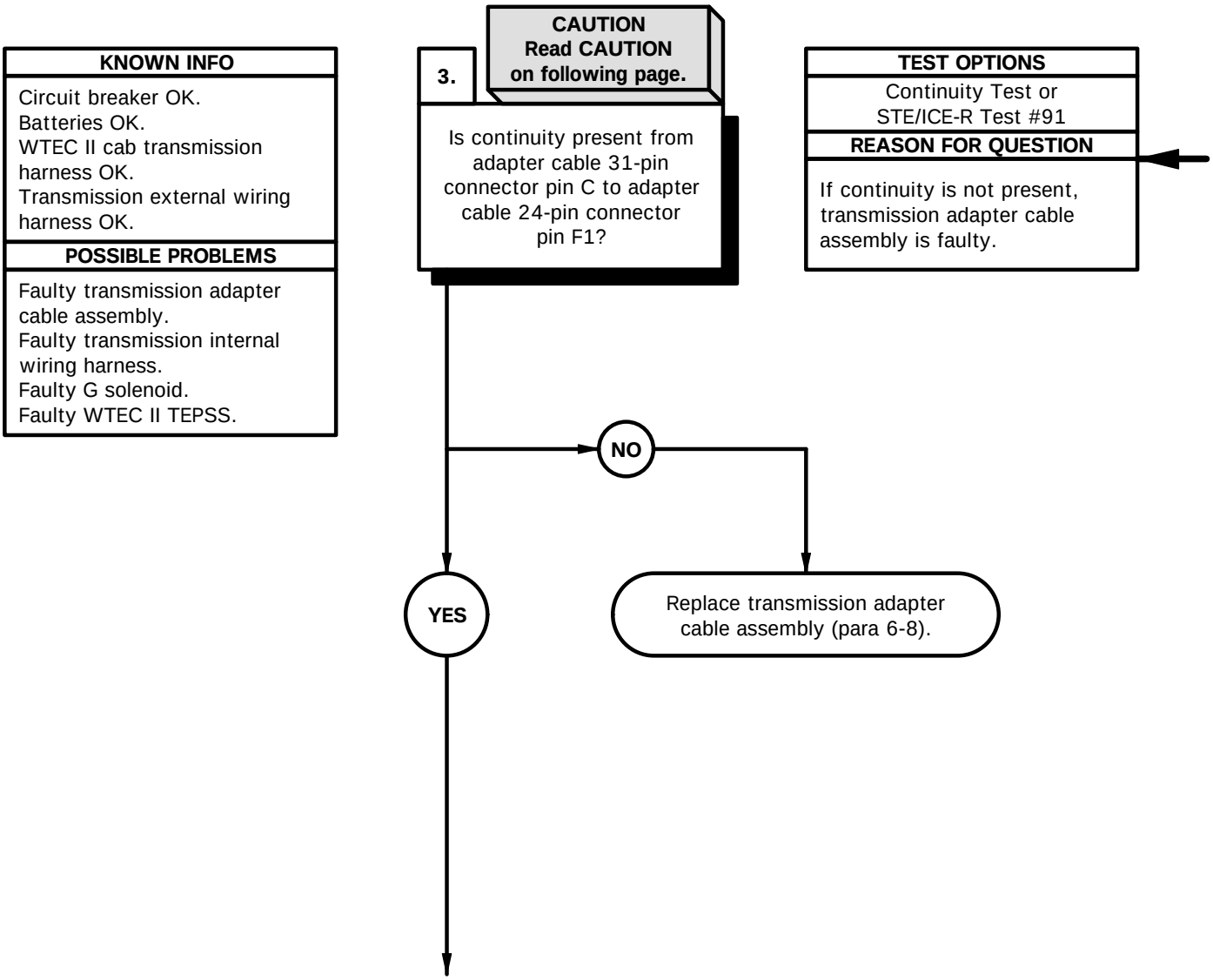








c30. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 SUB CODE 22 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



CAUTION

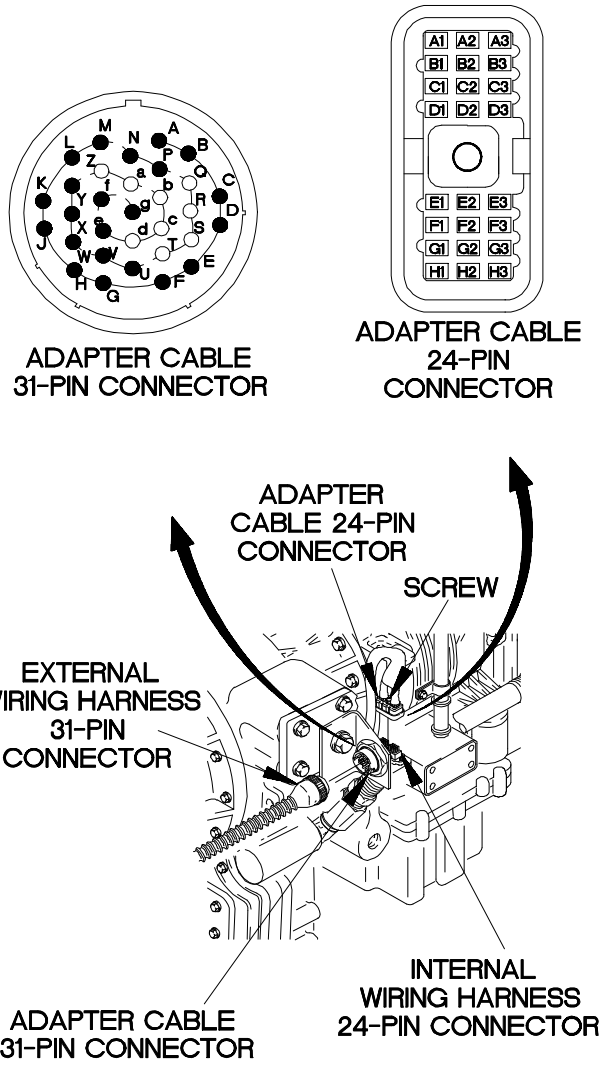
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

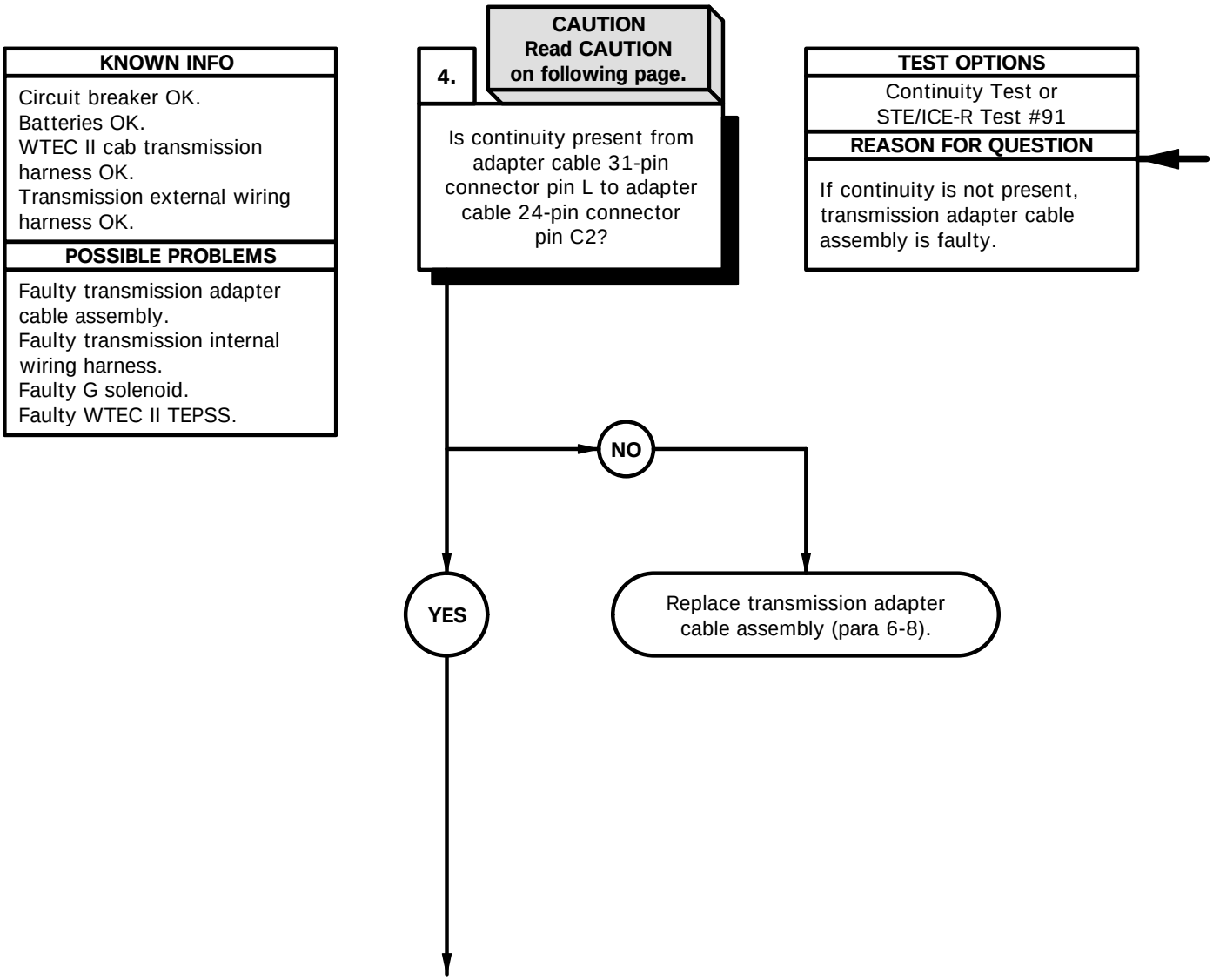
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

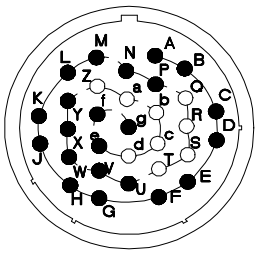
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

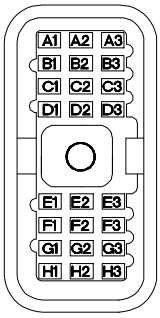
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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.



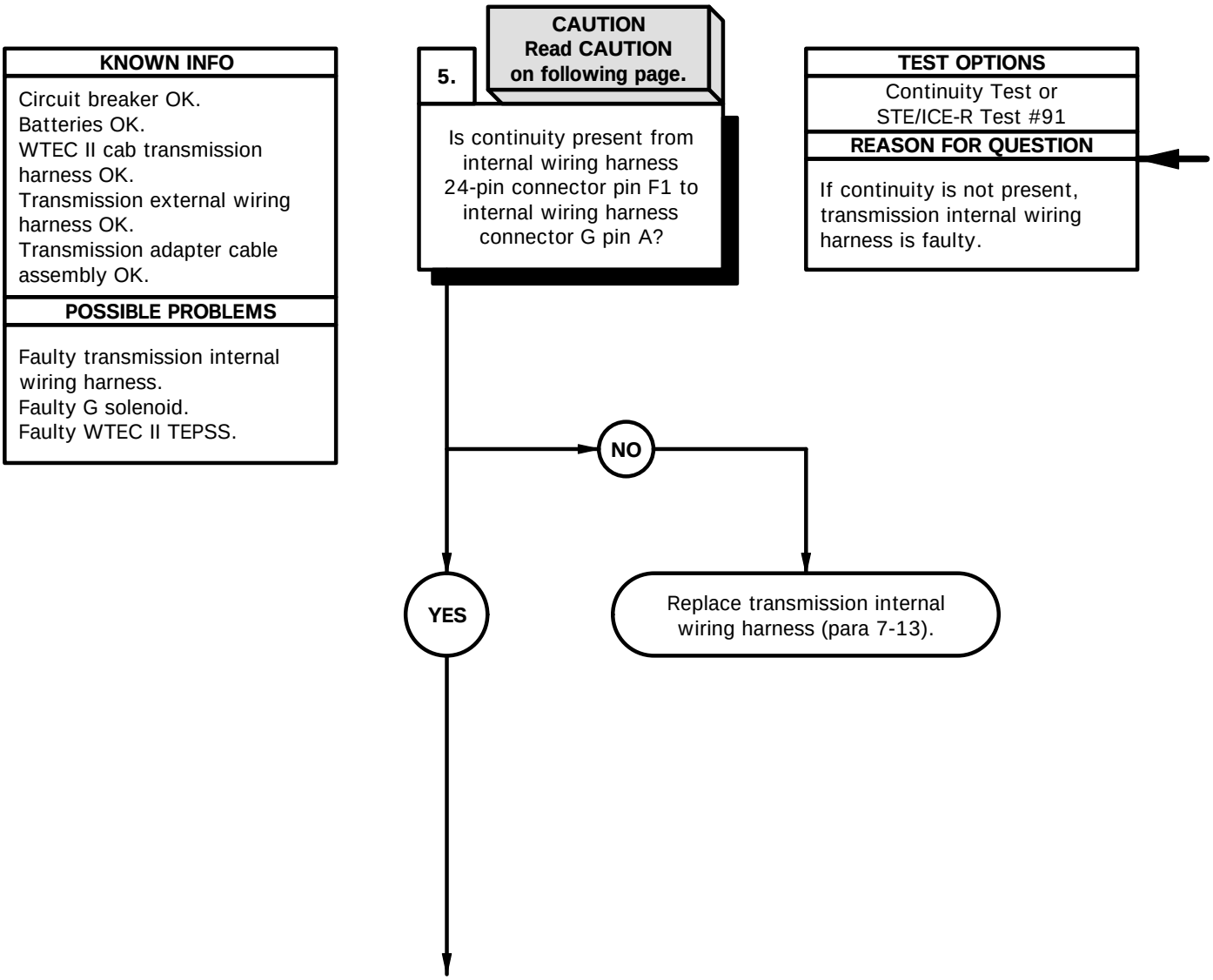
ADAPTER CABLE
31-PIN CONNECTOR



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

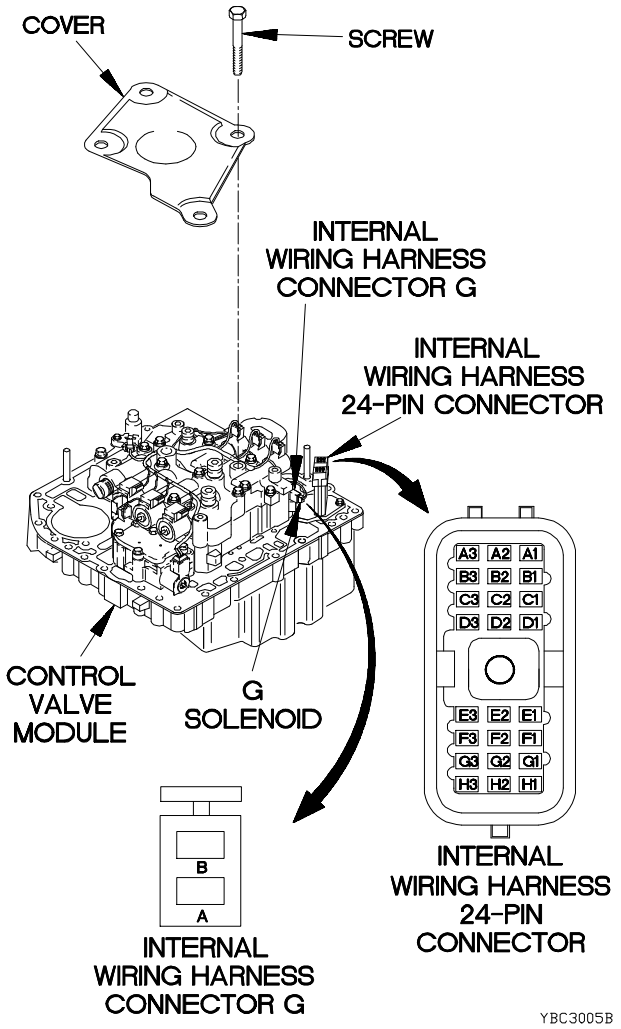
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

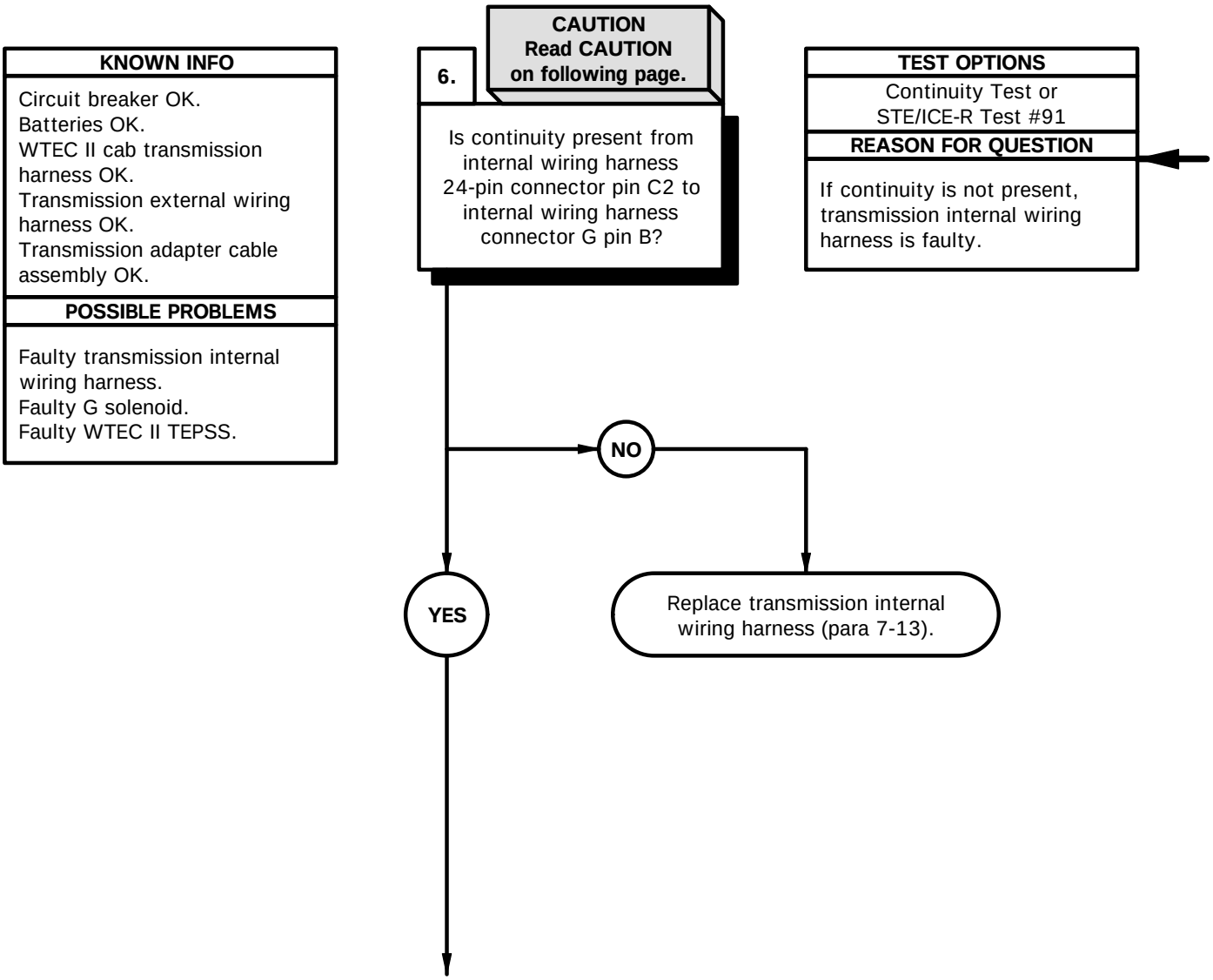
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

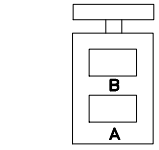
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

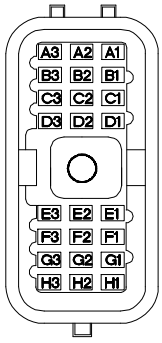
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



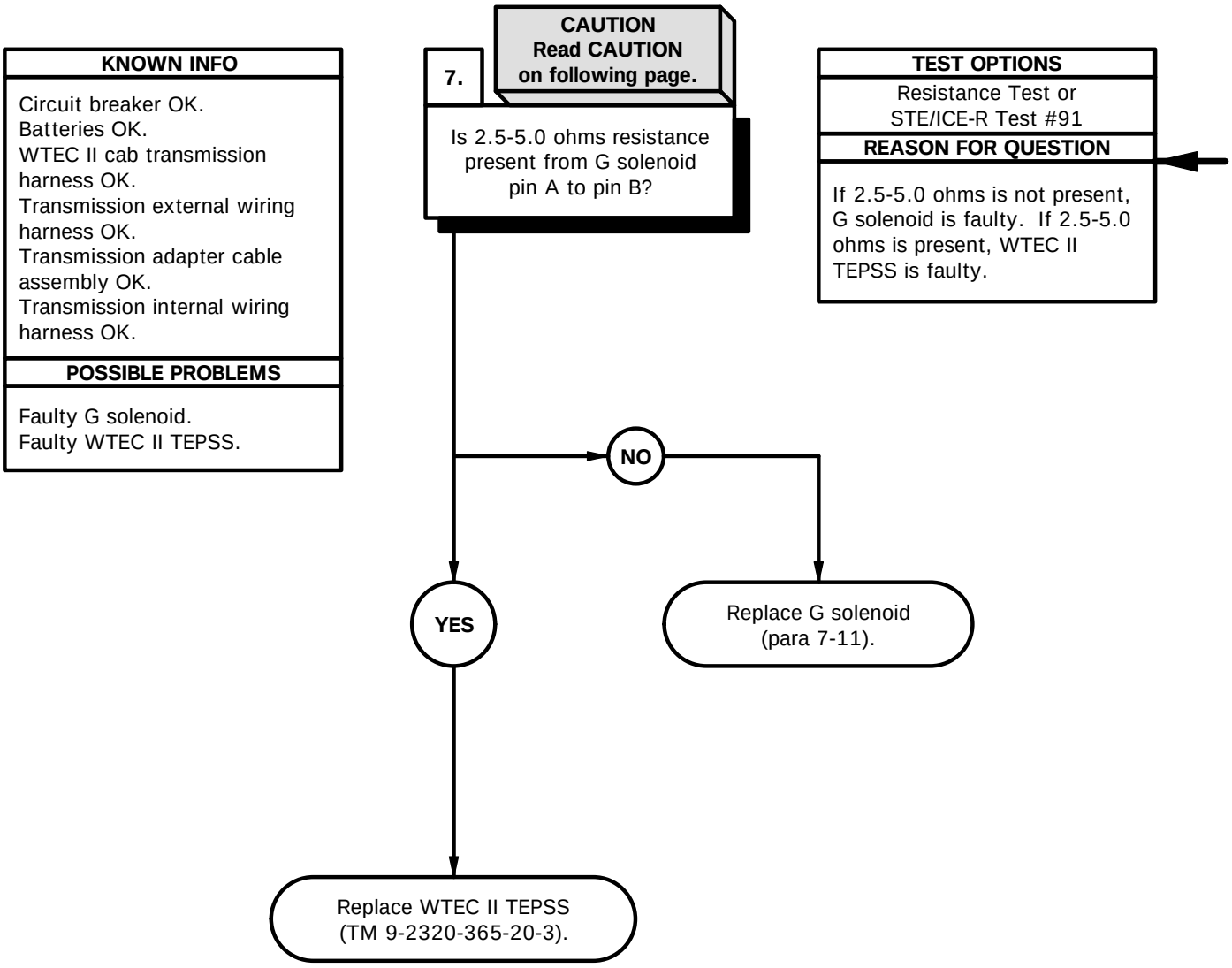
INTERNAL WIRING HARNESS CONNECTOR G



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

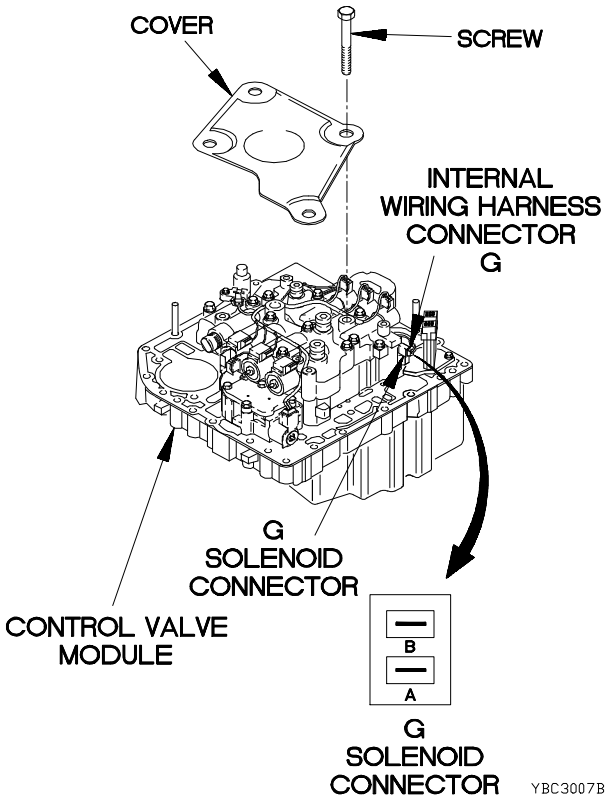
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

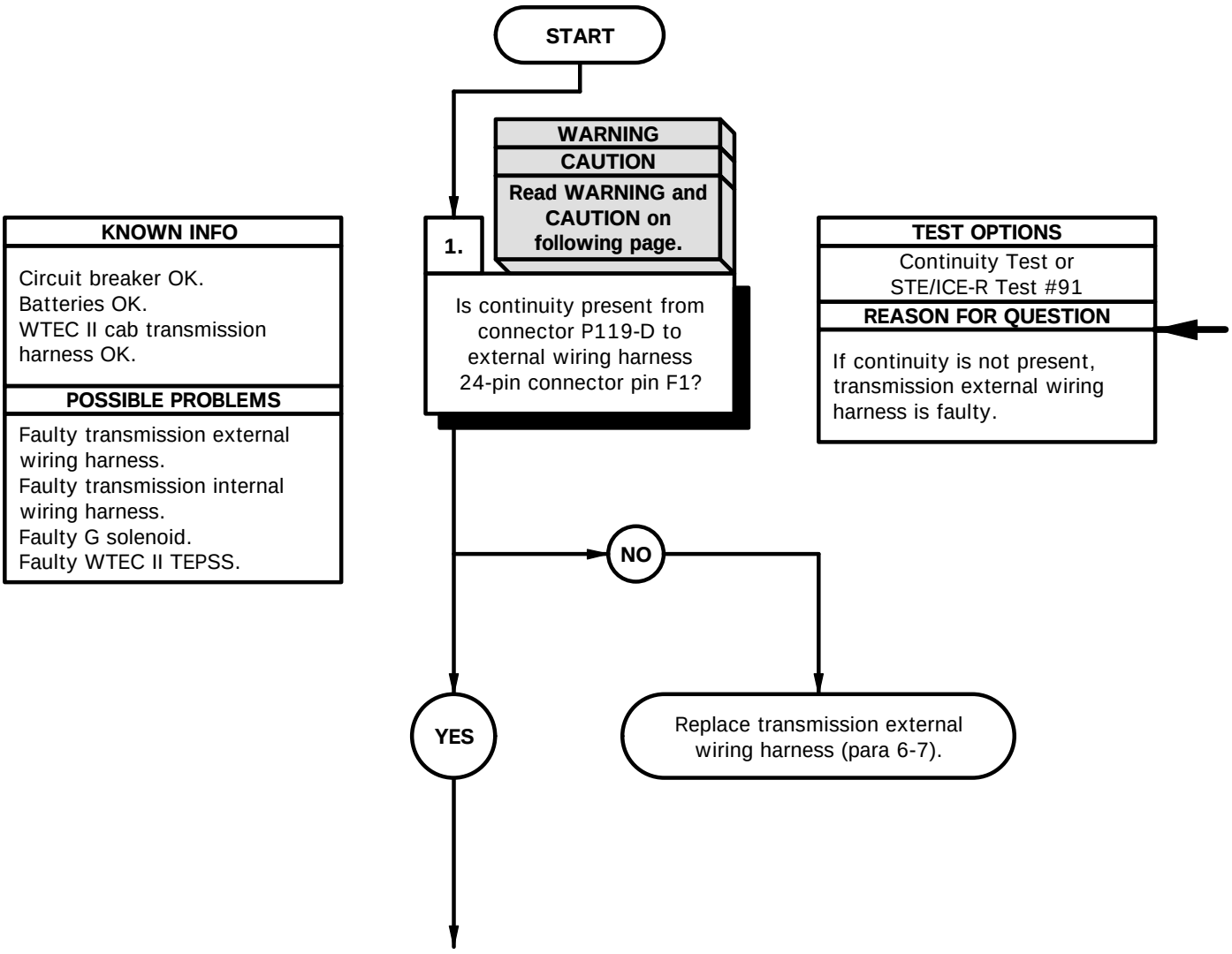
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

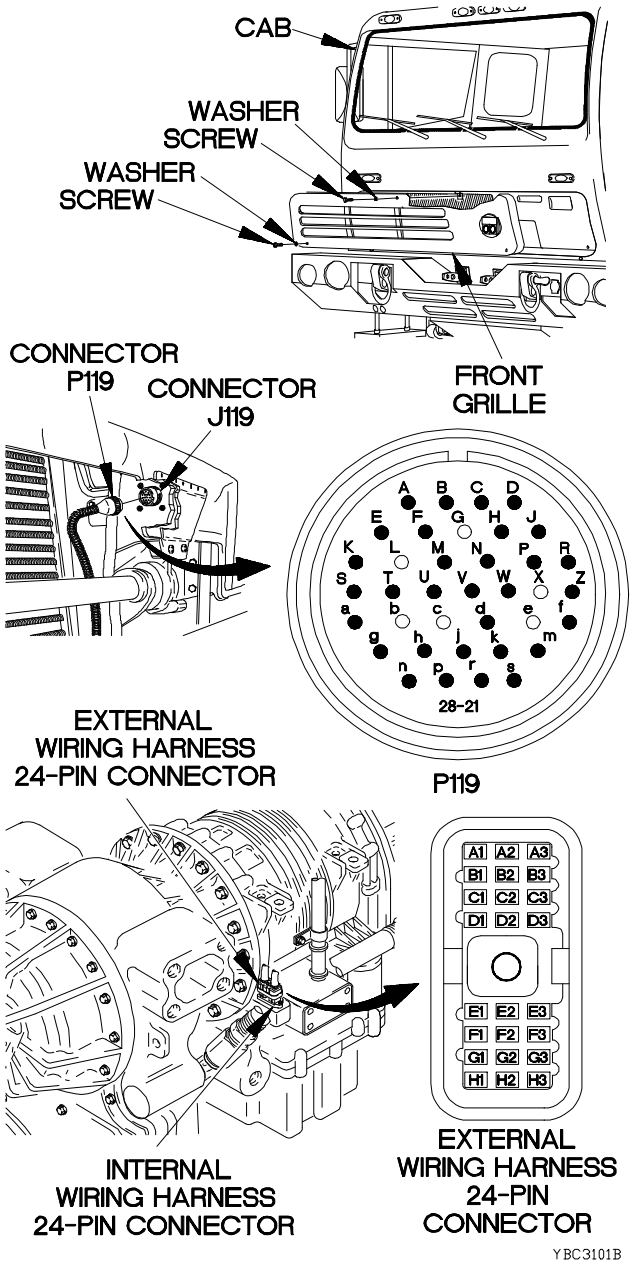
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

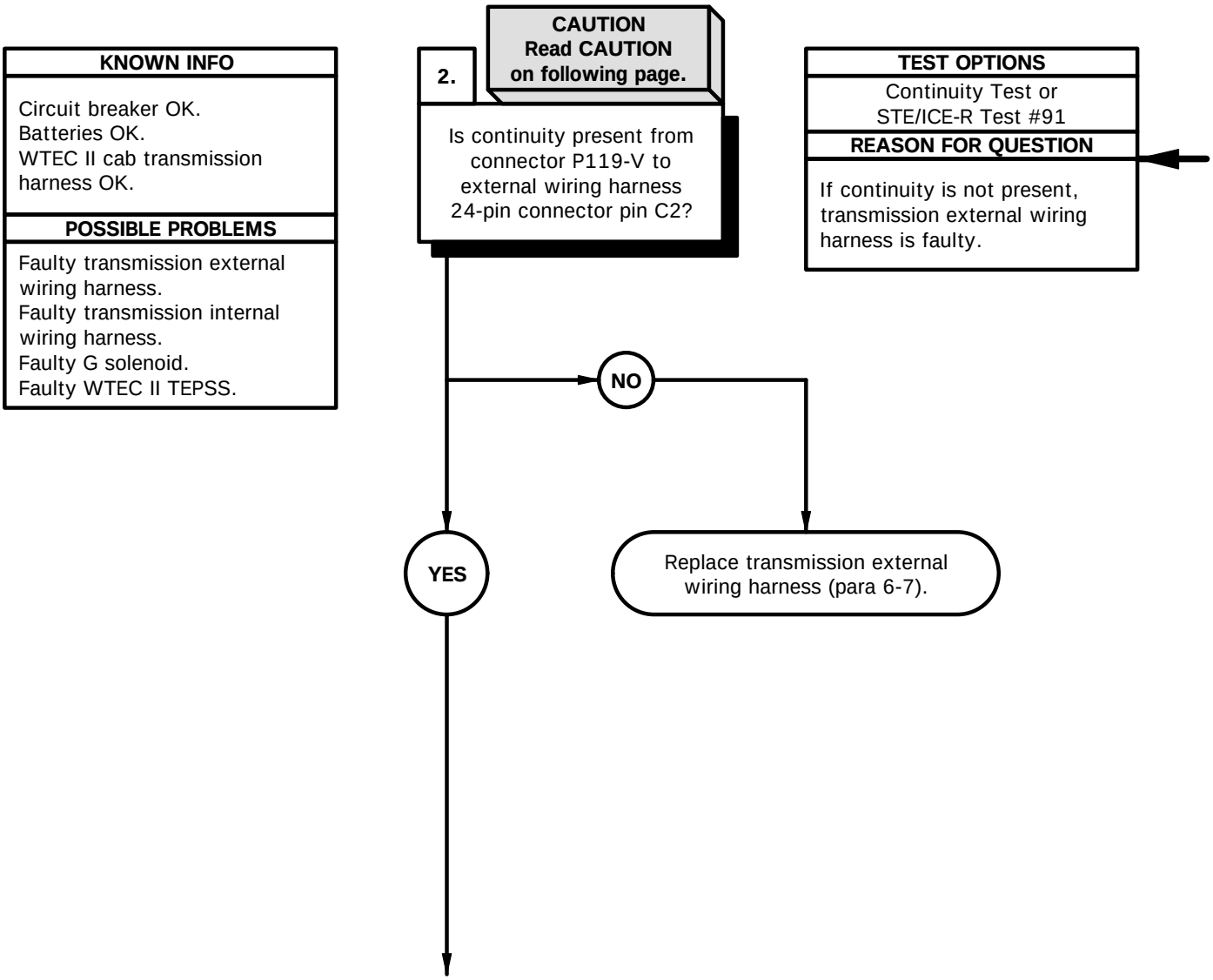
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Loosen screw in external wiring harness 24-pin connector.
(6) Disconnect external wiring harness 24-pin connector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

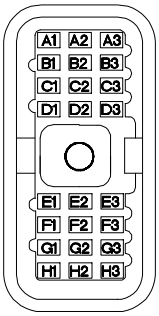
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

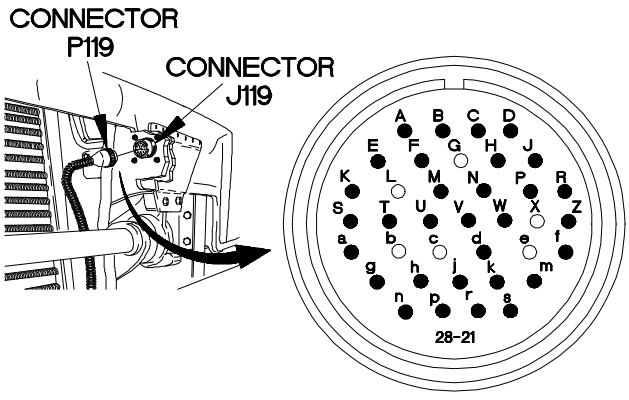
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

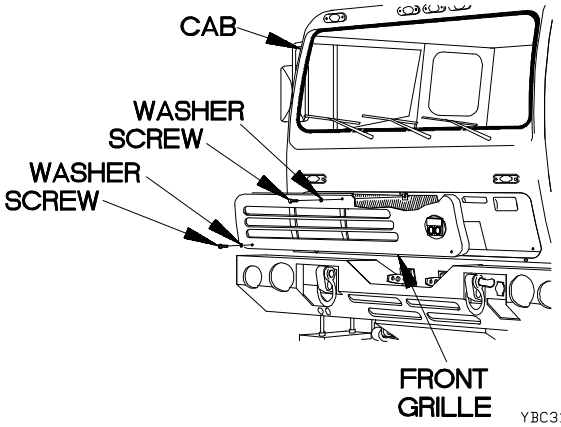
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P119-V.
(3) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin C2 and note reading on multimeter.
(4) If continuity is not present, replace transmission external wiring harness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



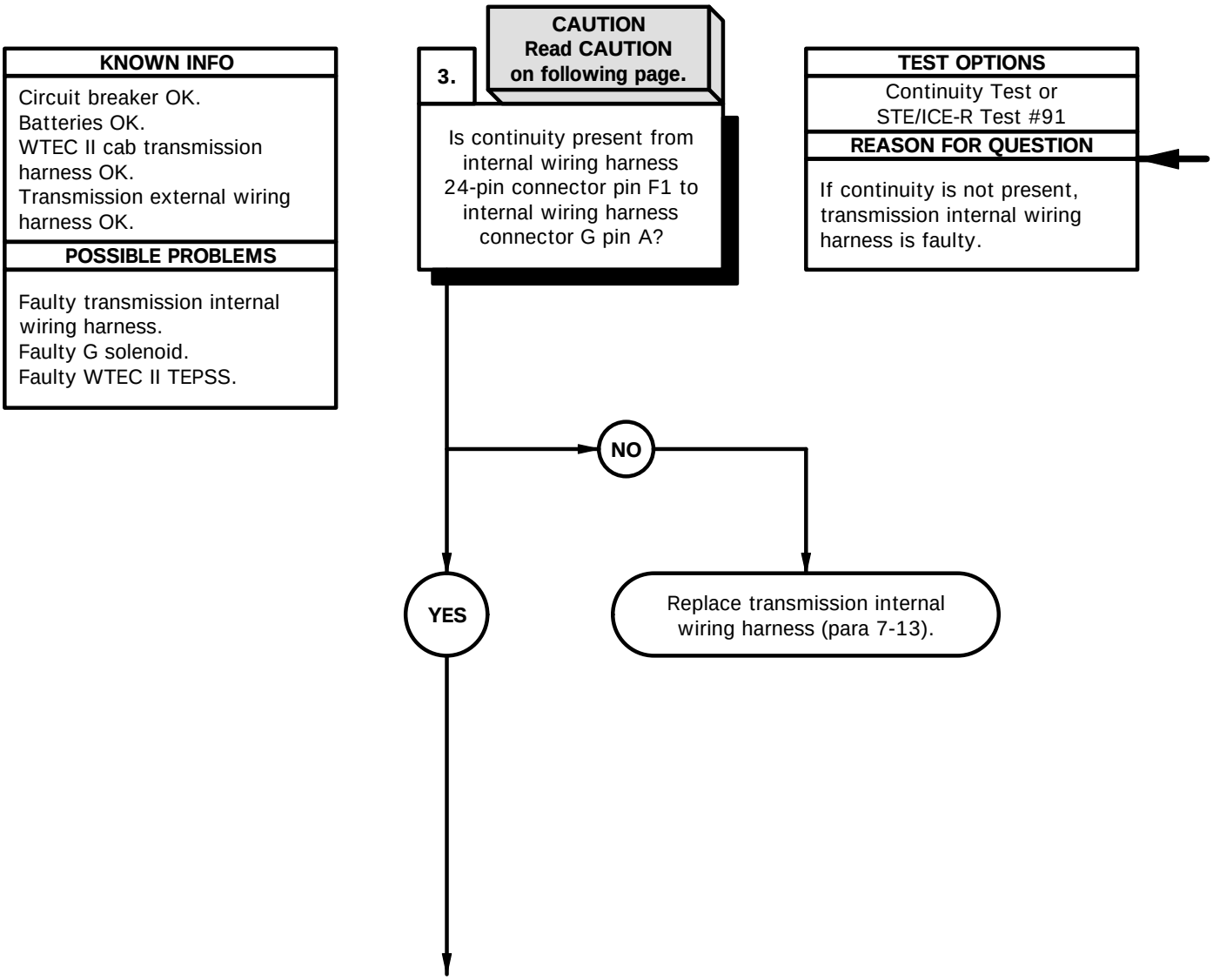
EXTERNAL WIRING HARNESS 24-PIN CONNECTOR



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

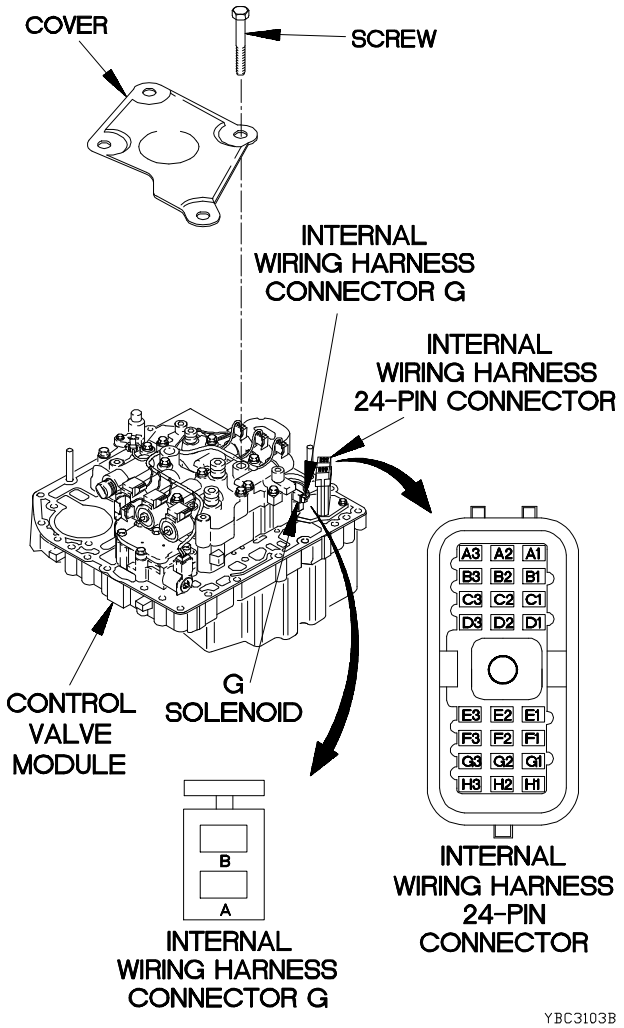
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

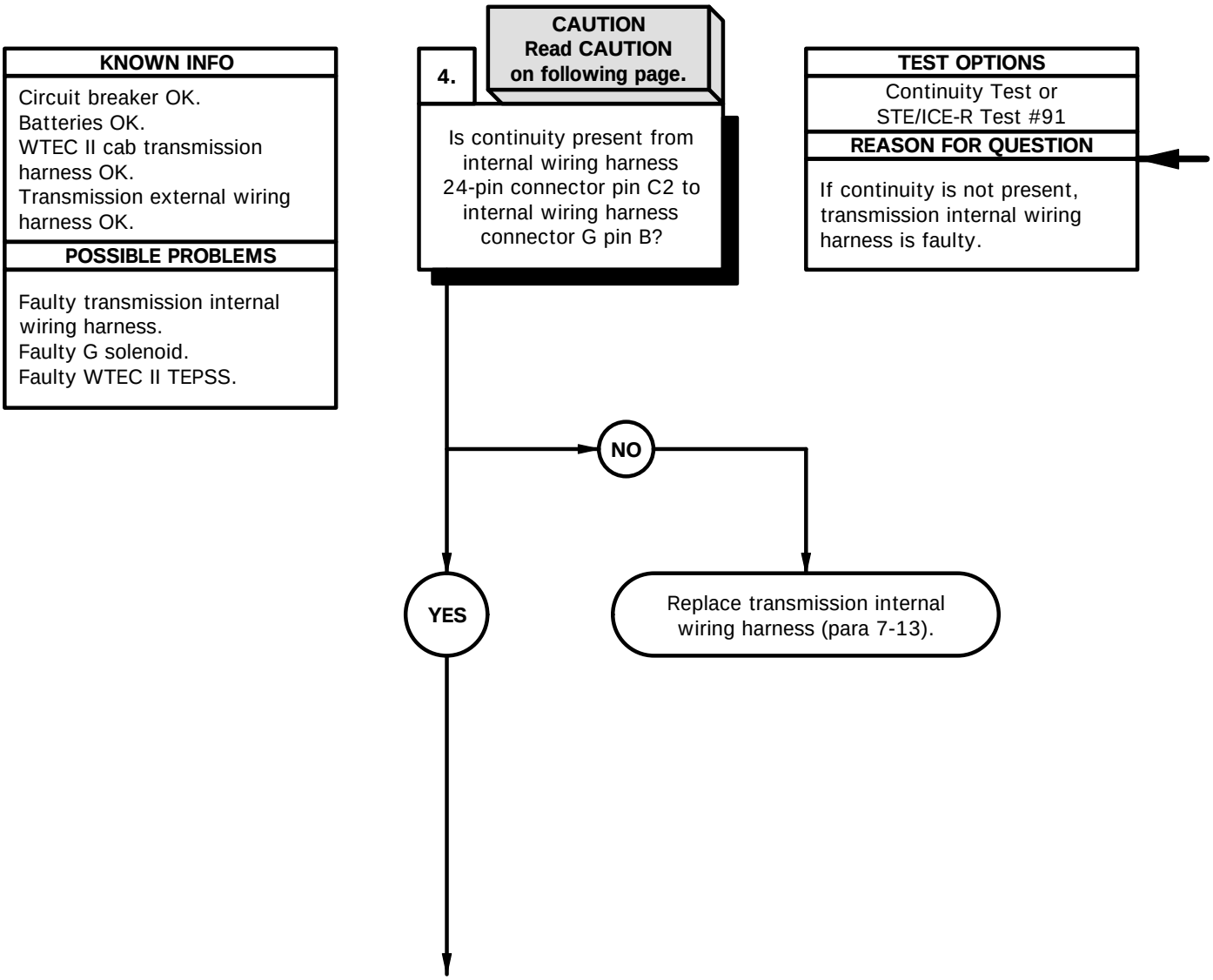
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

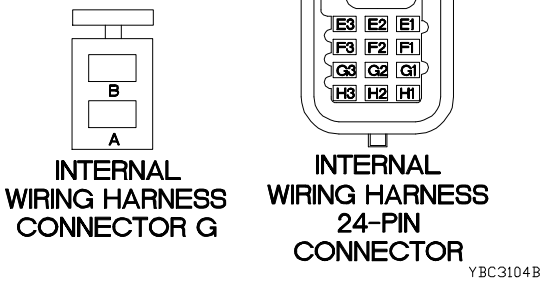
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

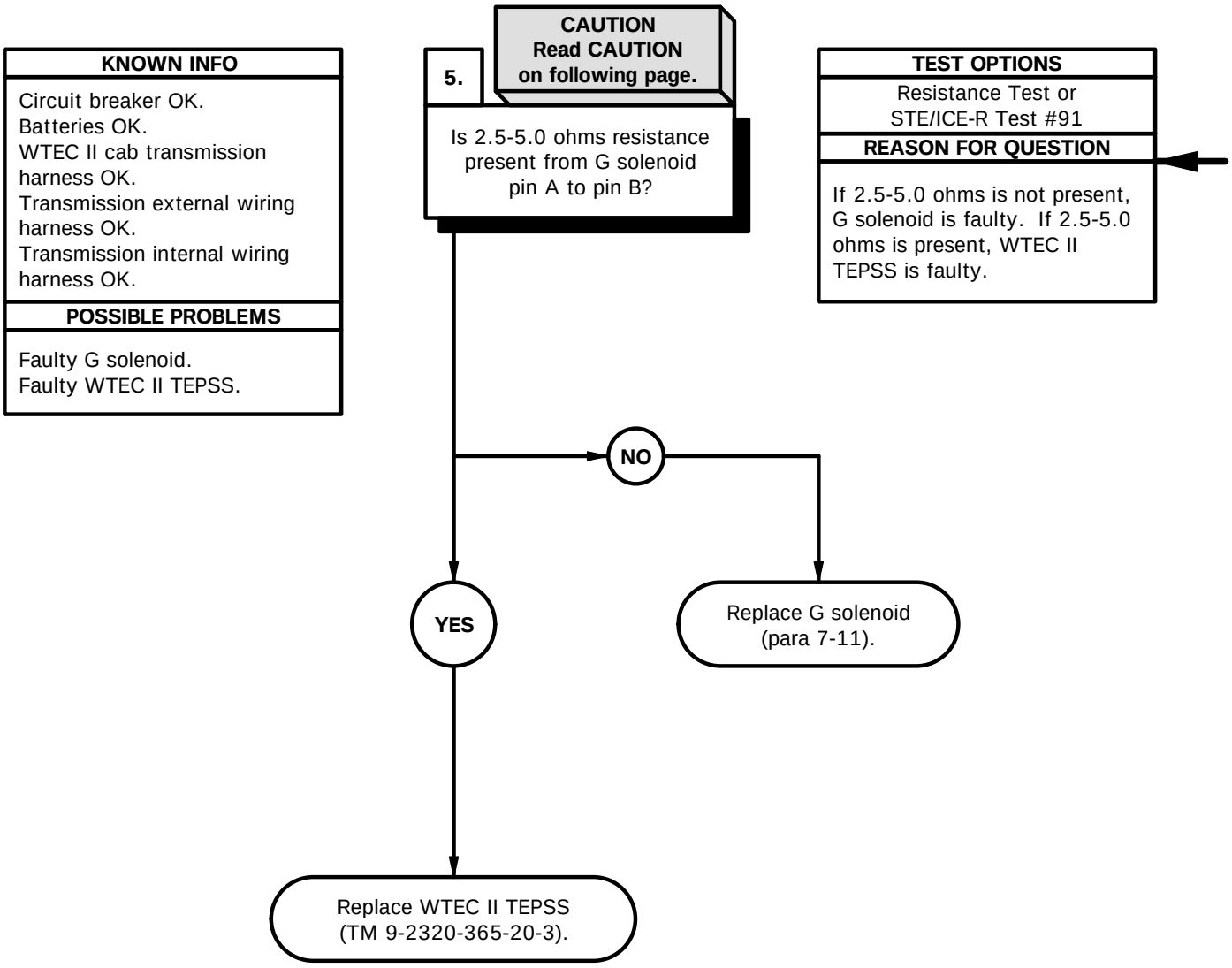
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

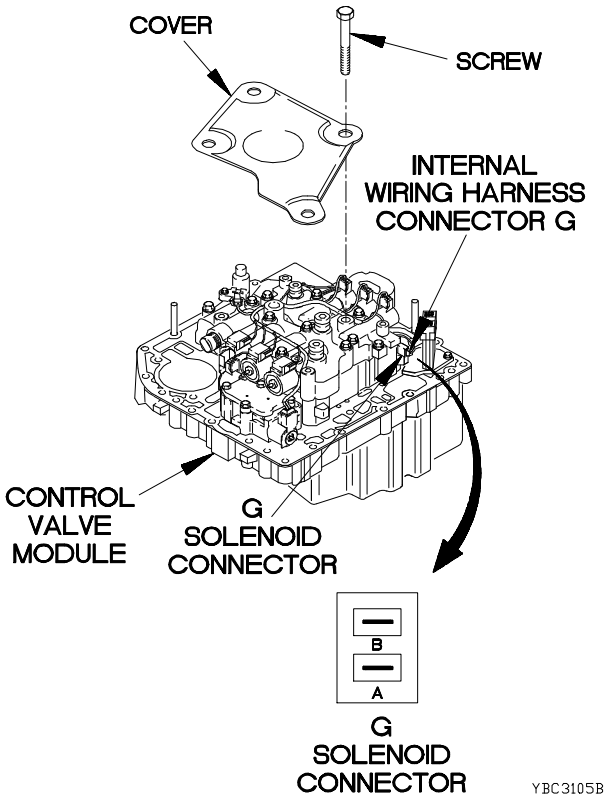
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)

Materials/Parts
Gasket (Item 44, Appendix F)
Wire, Elect, 50 ft (Item 81, Appendix C)

Personnel Required
(2)

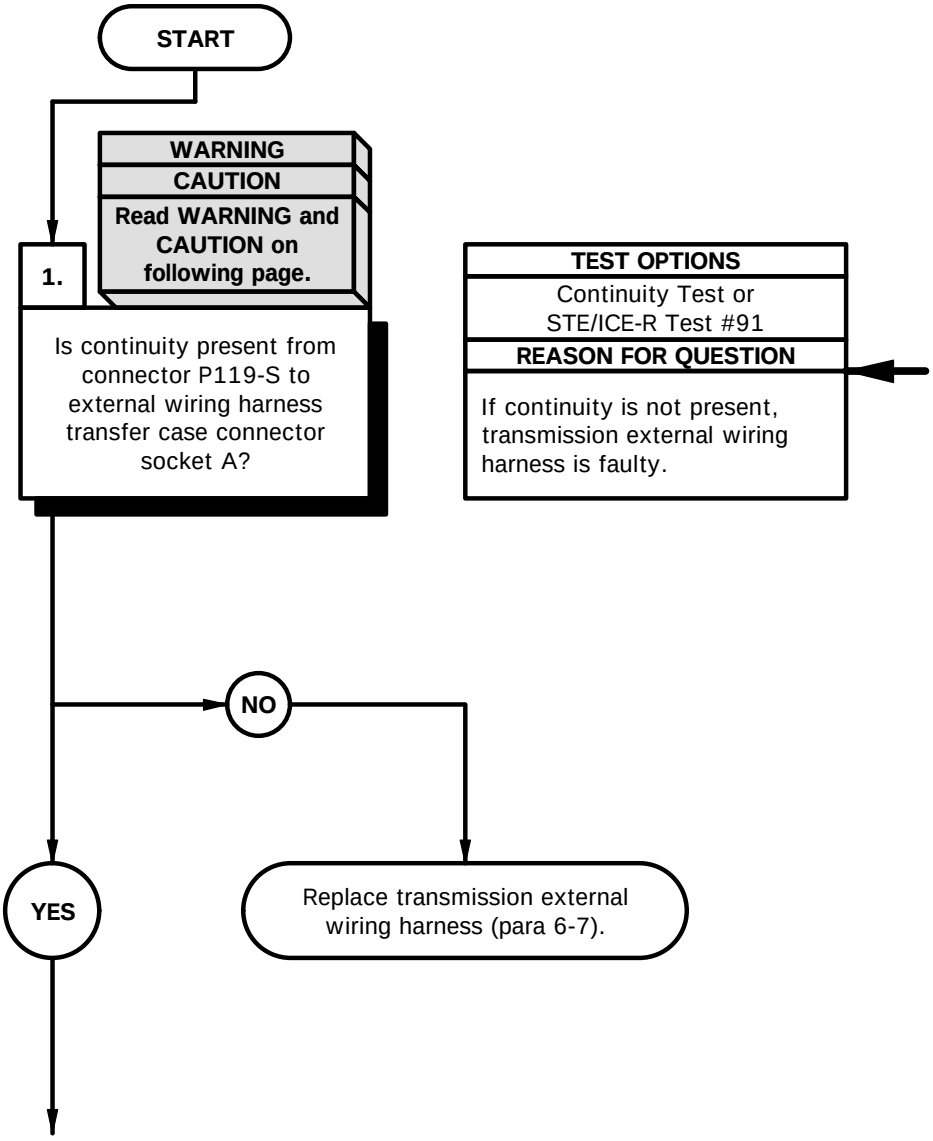
References
TM 9-4910-571-12&P

KNOWN INFO

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

POSSIBLE PROBLEMS

Faulty transmission external wiring harness.
Faulty transfer case wiring harness.
Faulty H 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

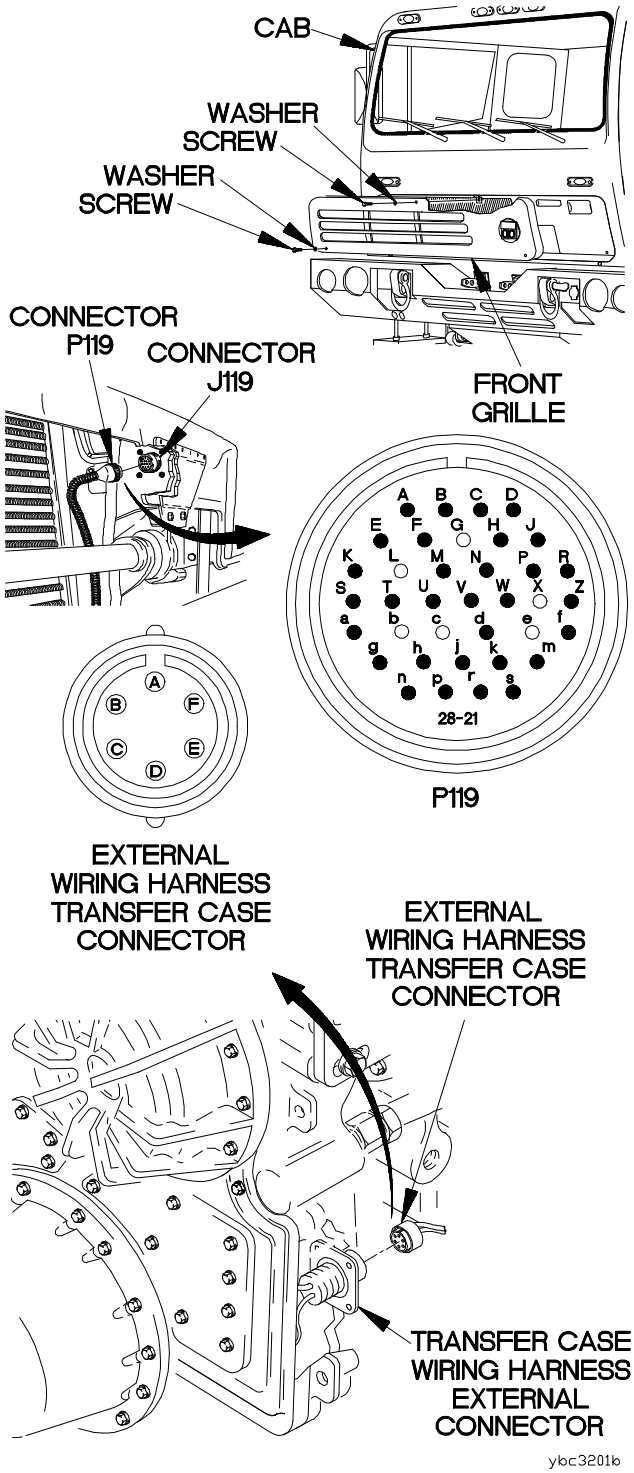
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

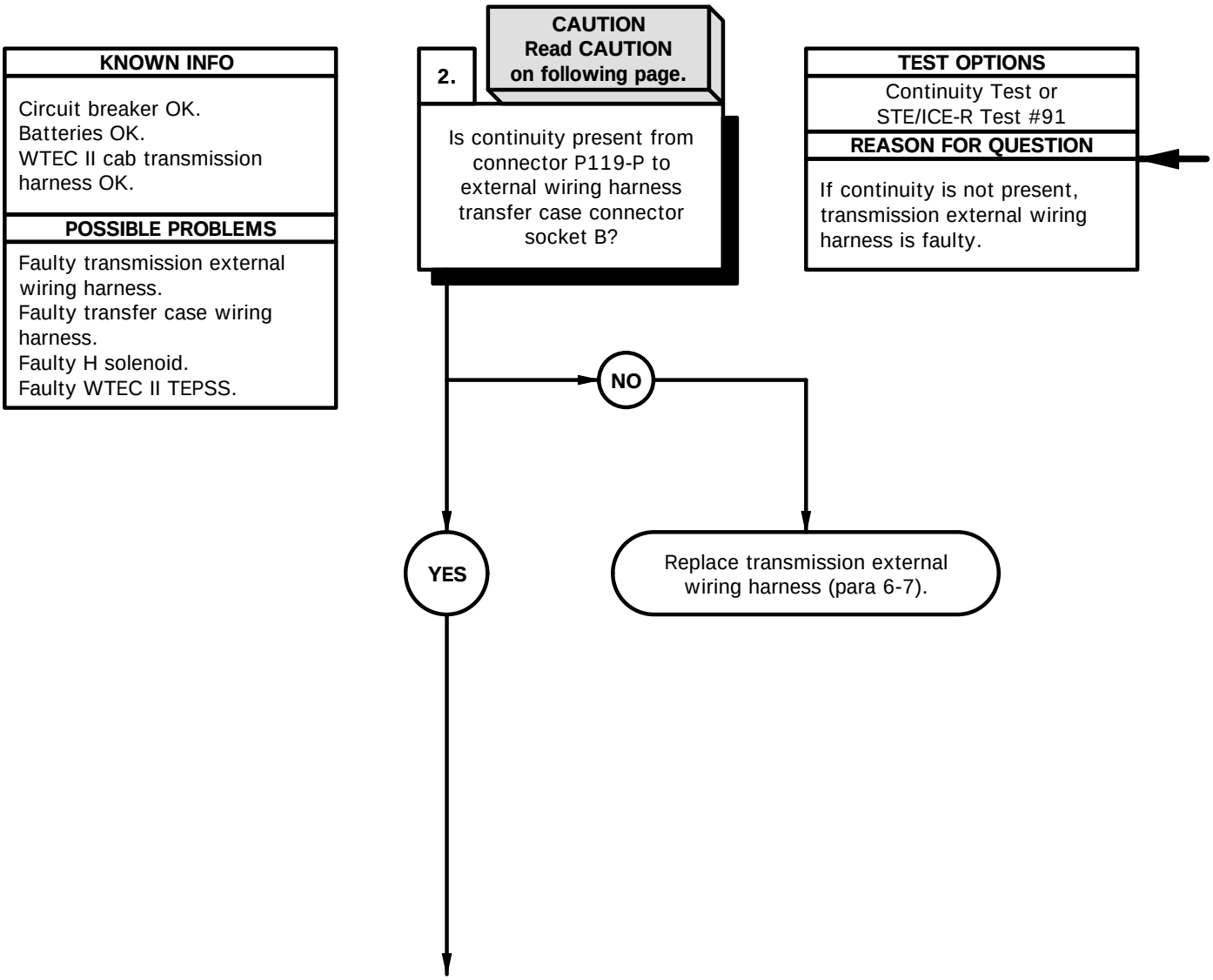
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness transfer case connector from transfer case wiring harness external connector.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

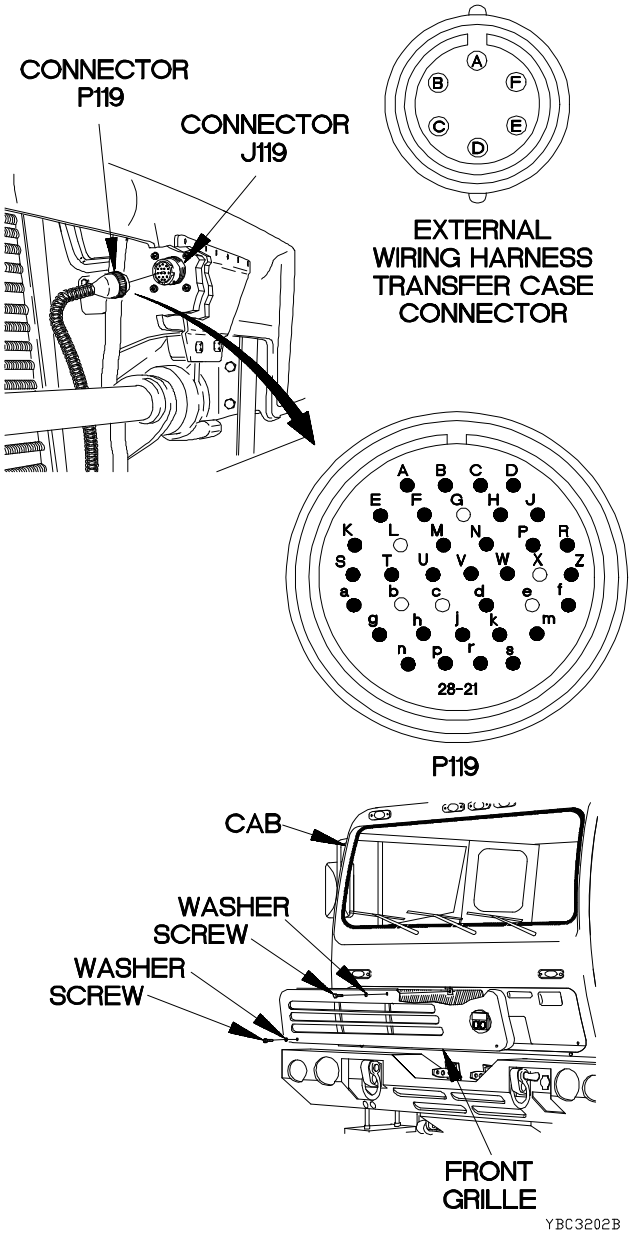
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

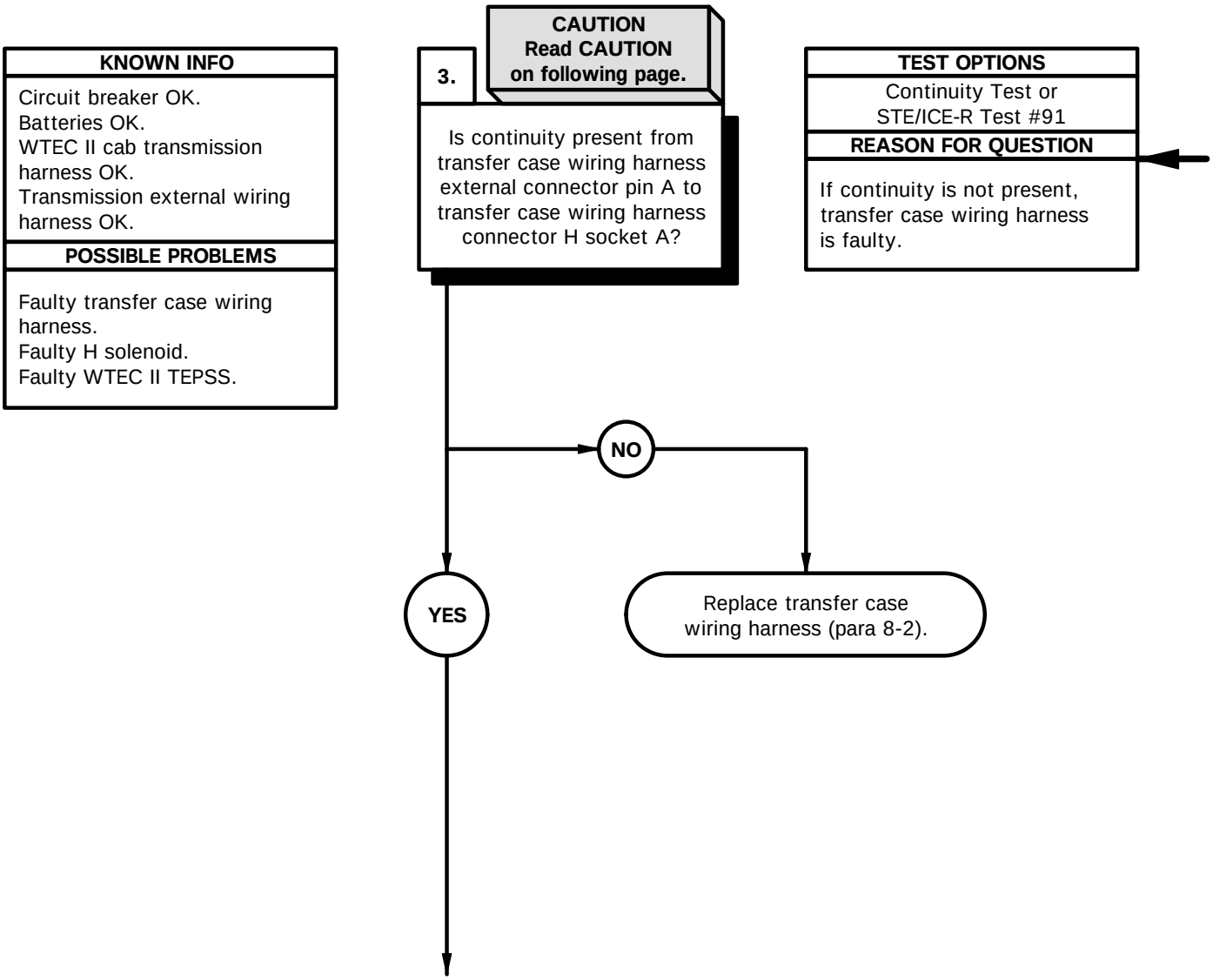
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

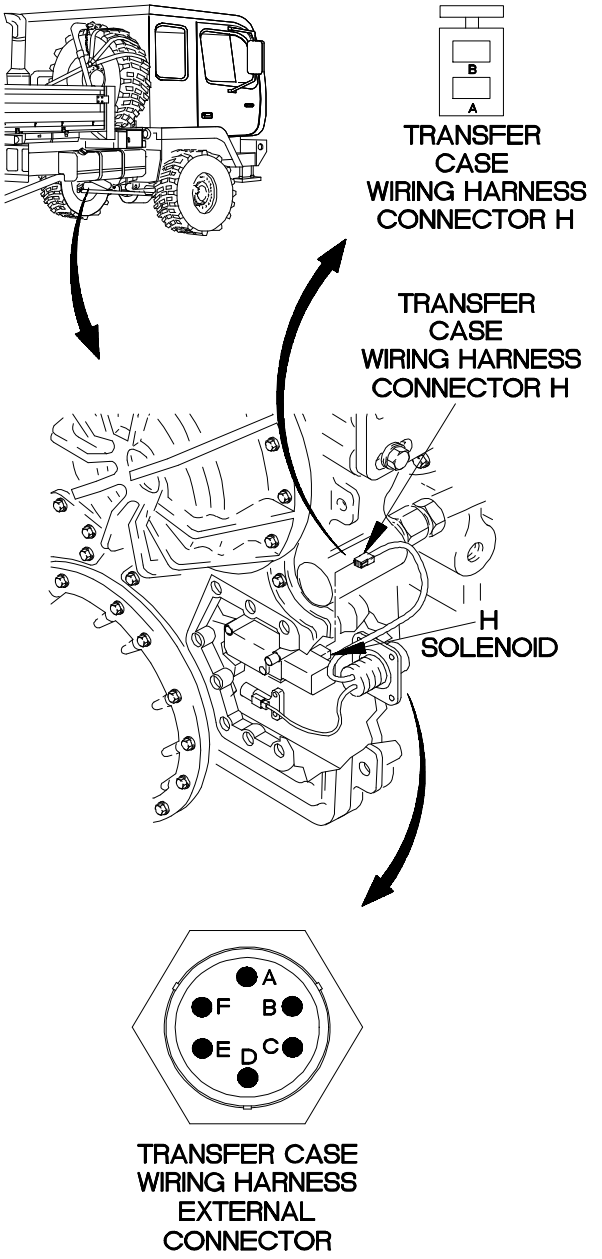
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

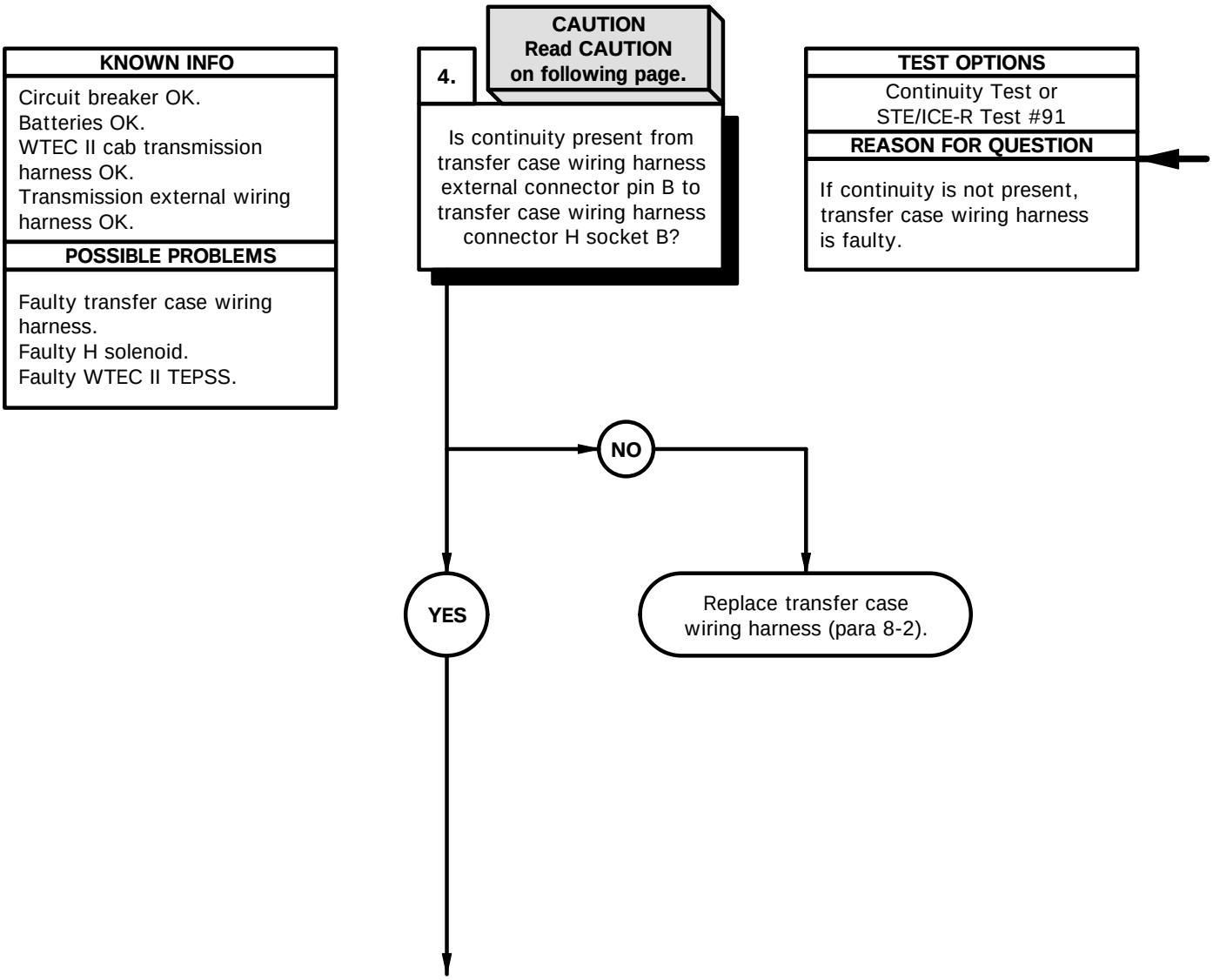
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

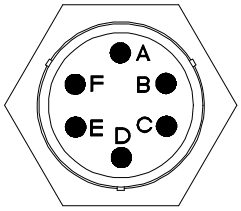
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

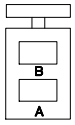
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



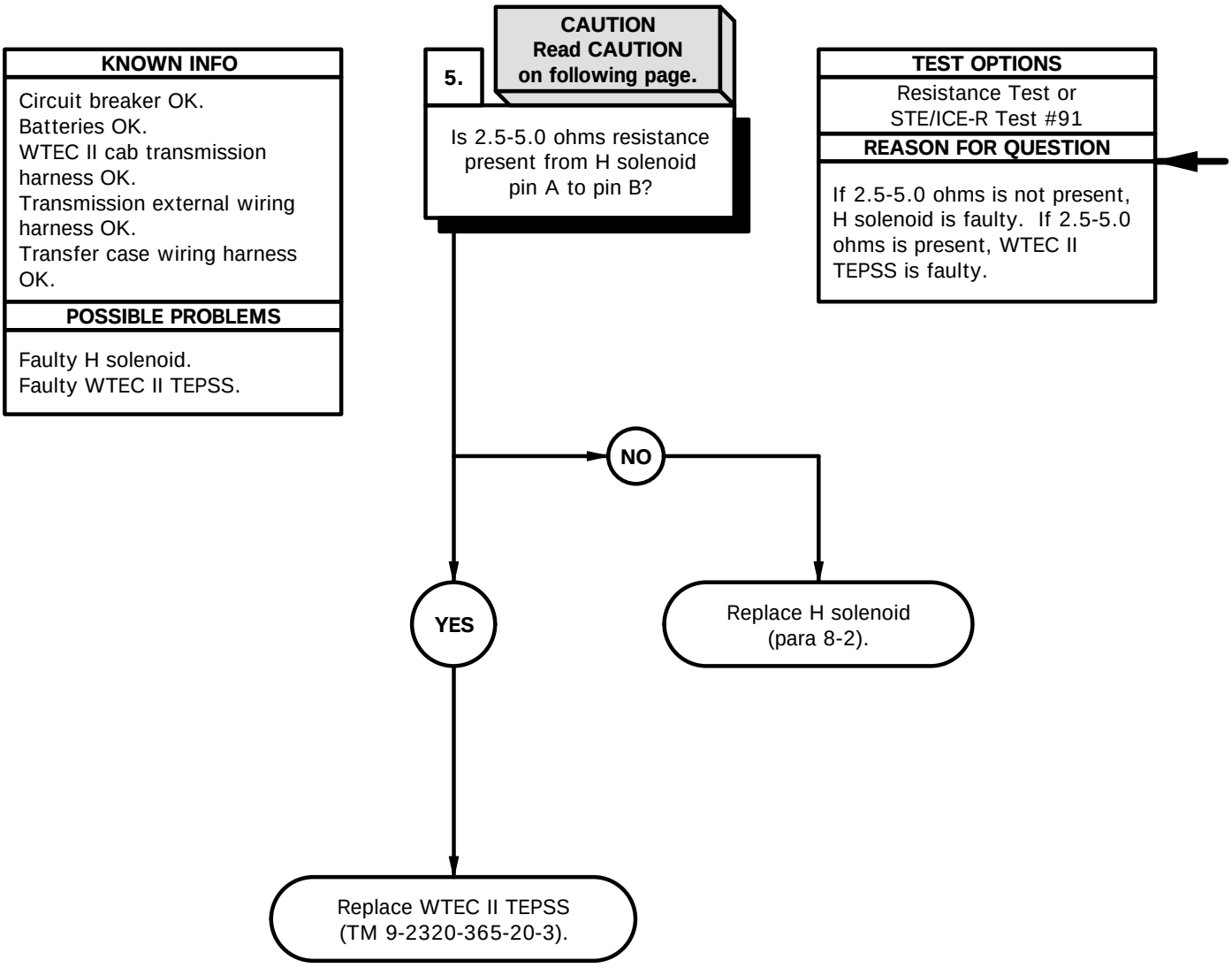
TRANSFER CASE WIRING HARNESS EXTERNAL CONNECTOR



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

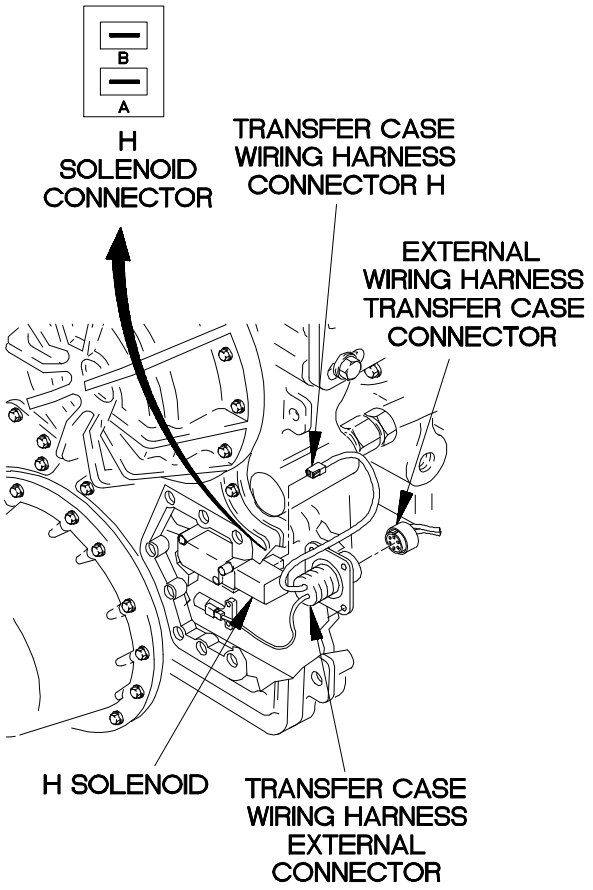
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

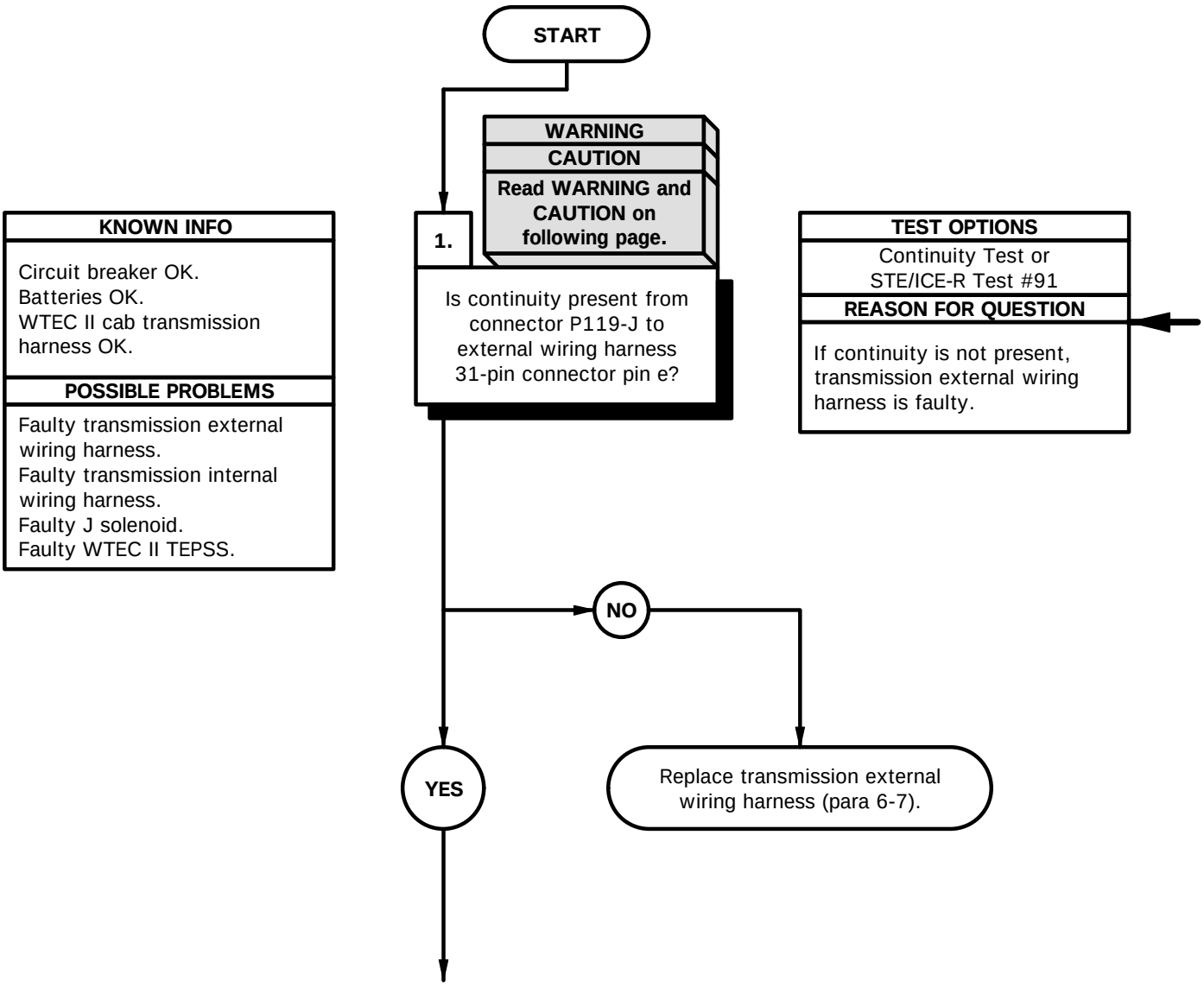
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

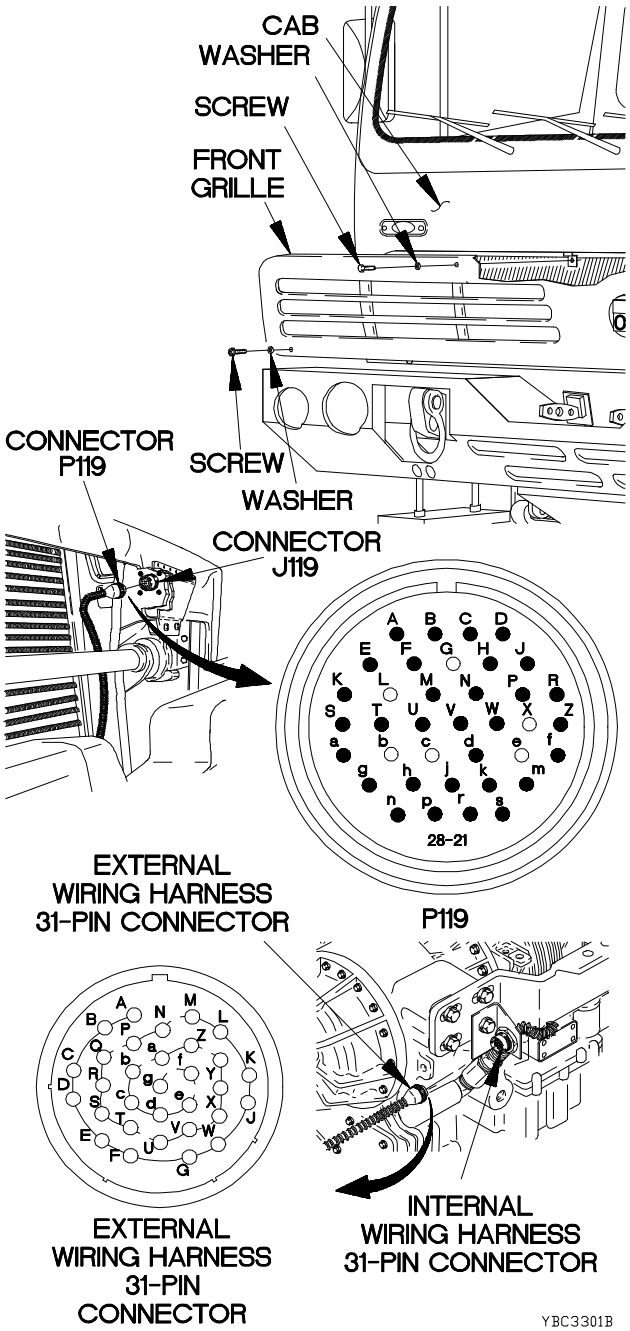
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

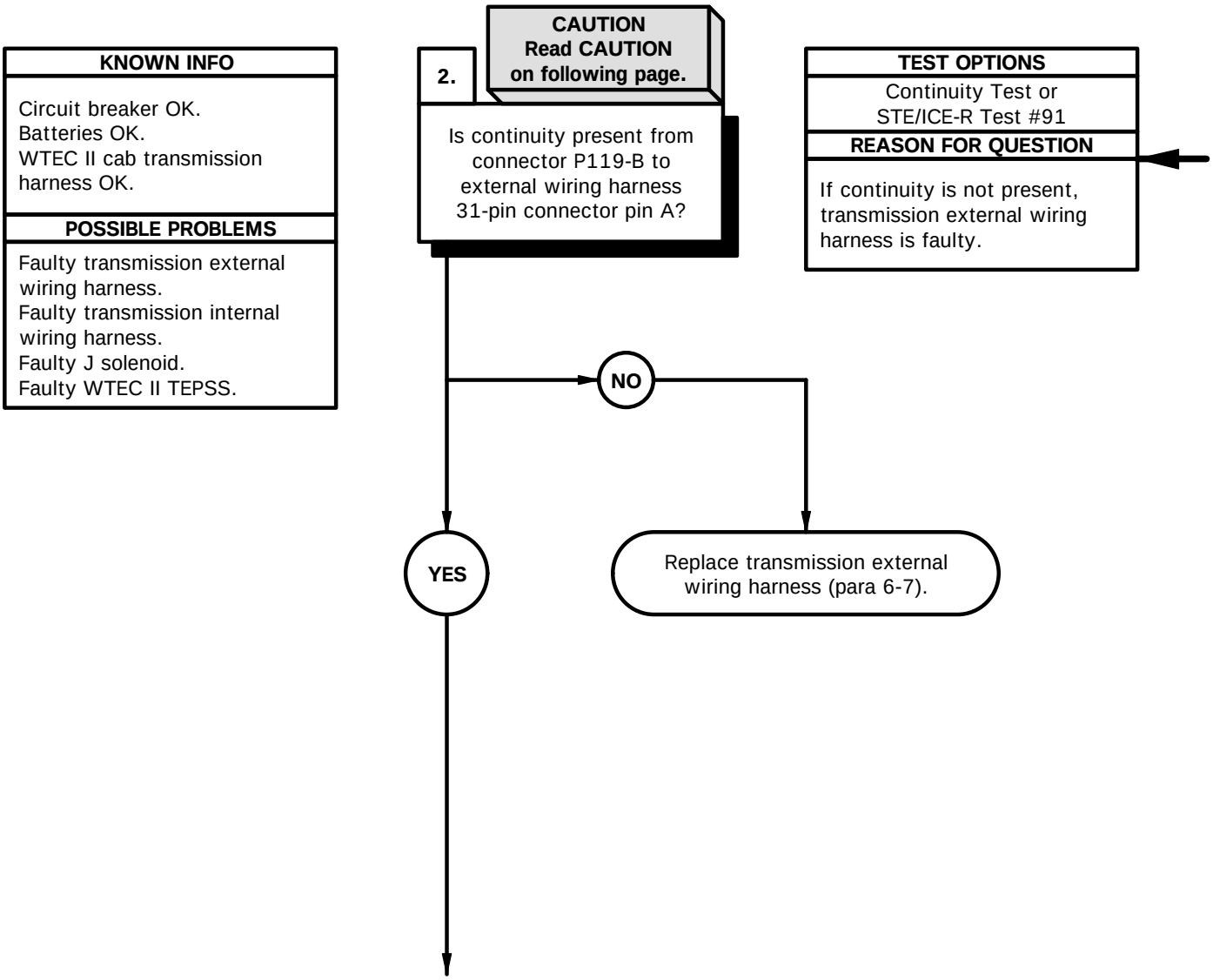
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin connector.
(6) Set multimeter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

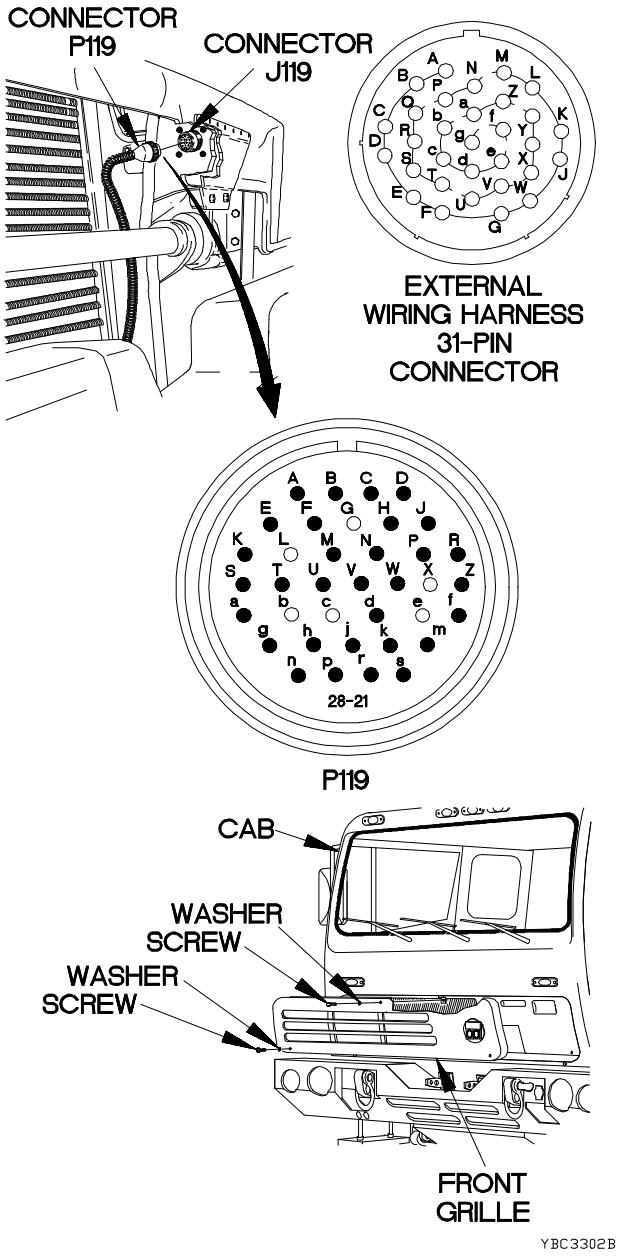
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

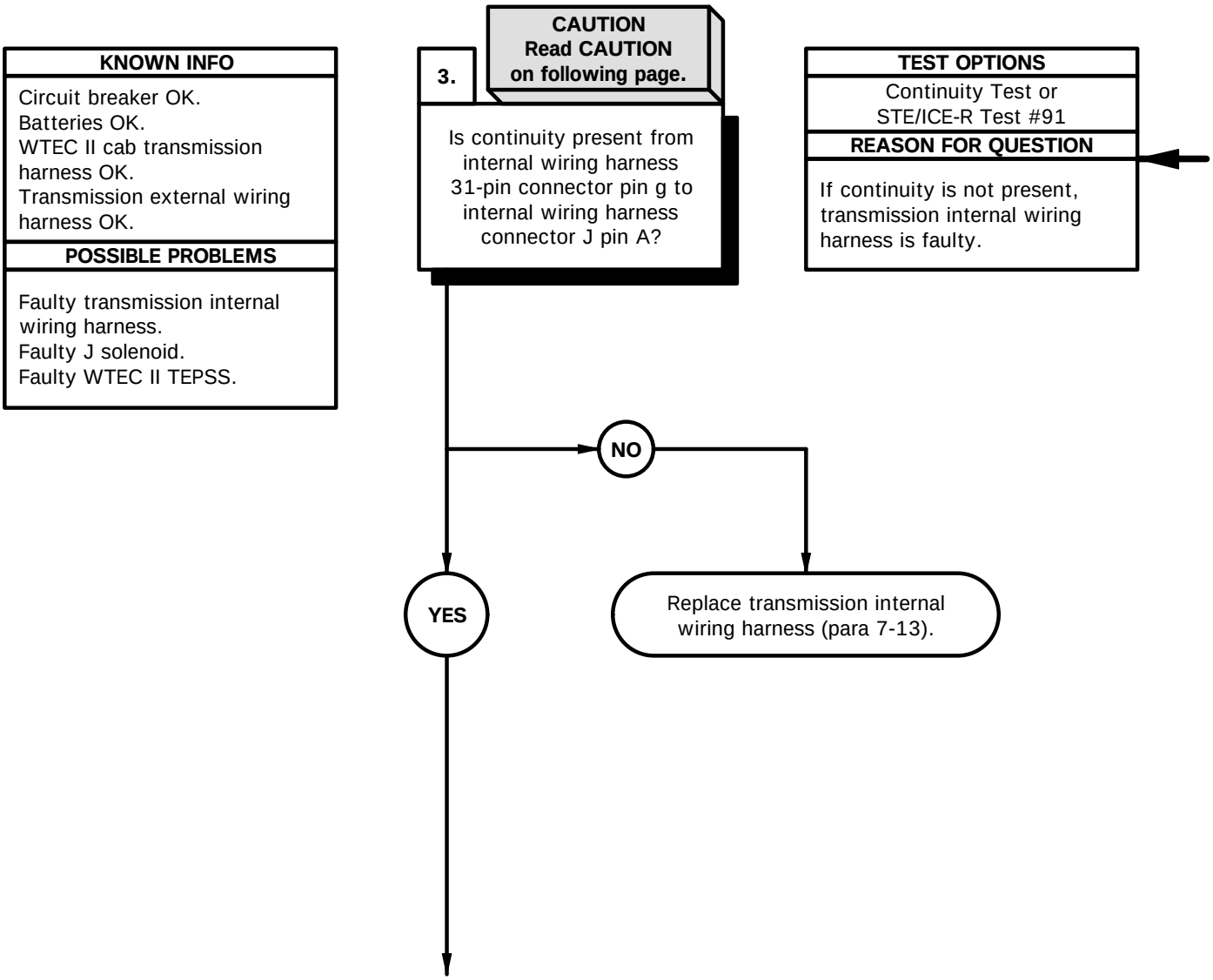
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

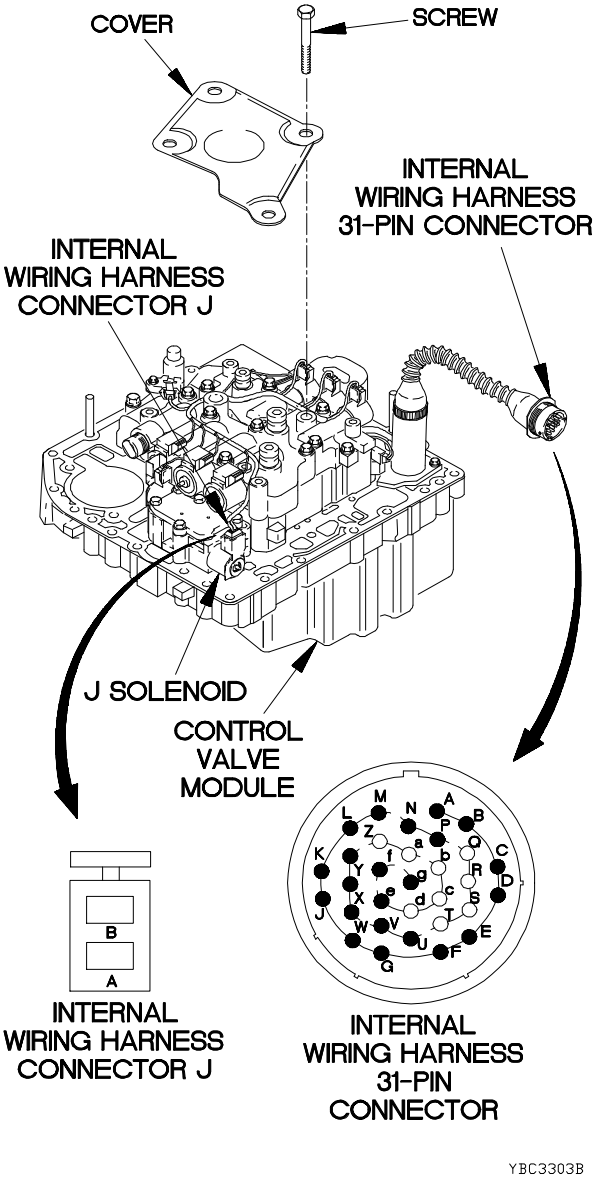
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

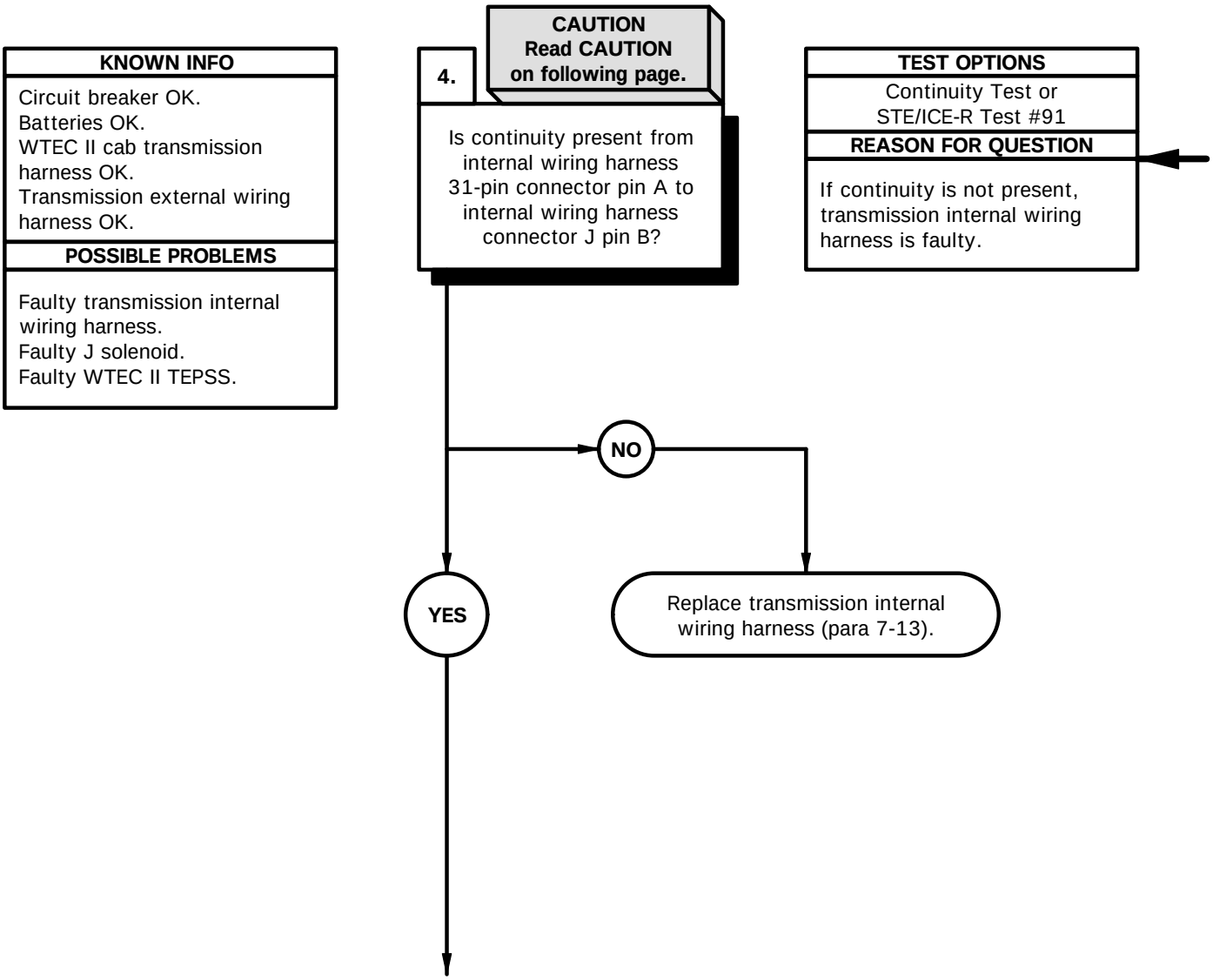
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

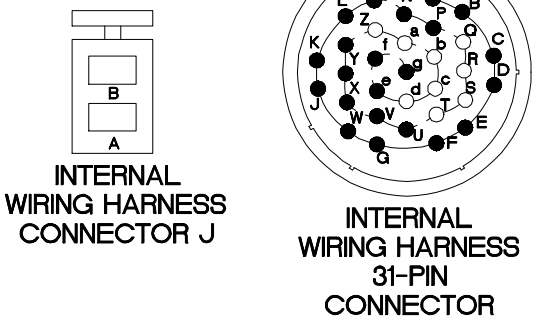
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

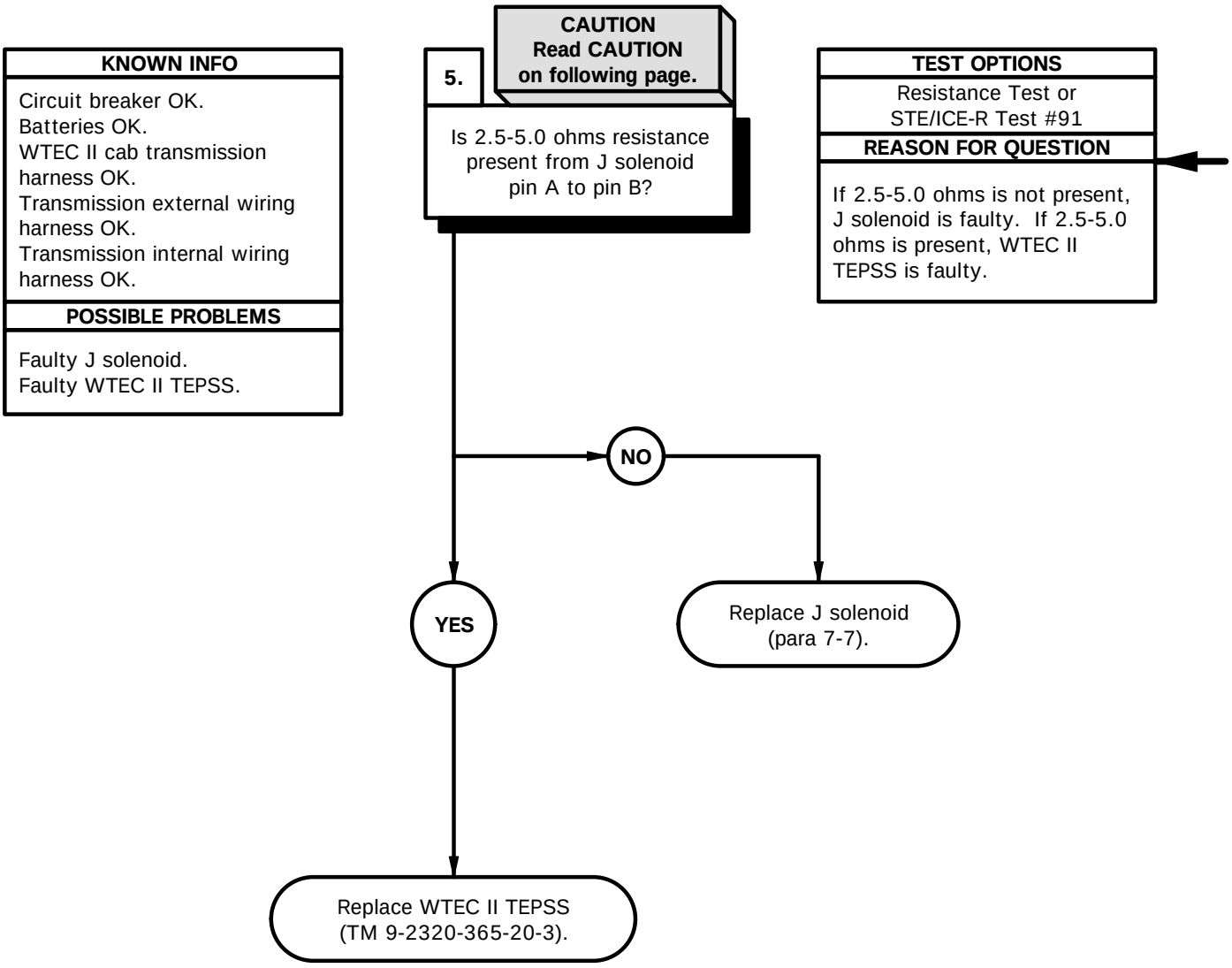
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

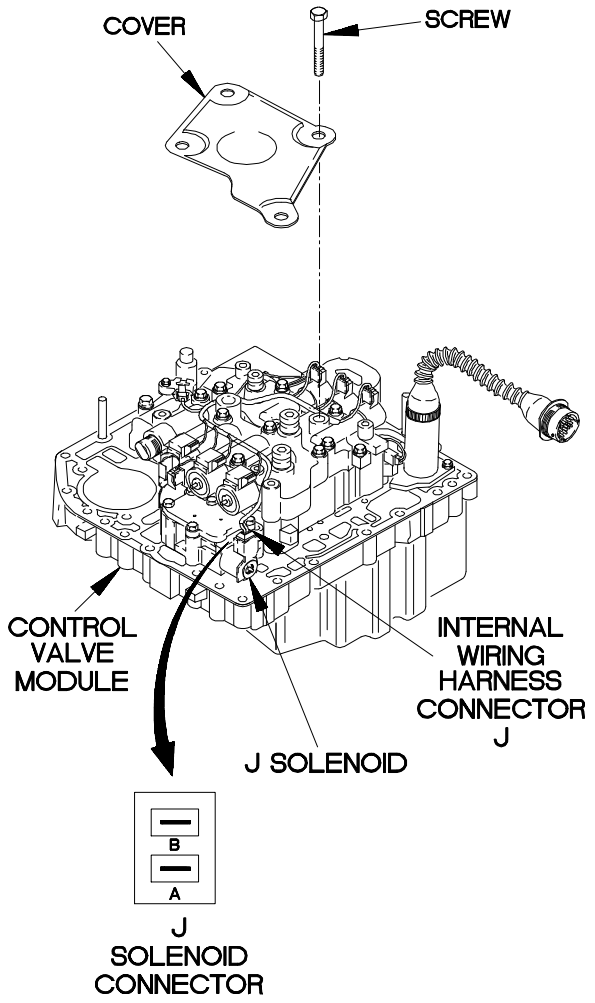
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

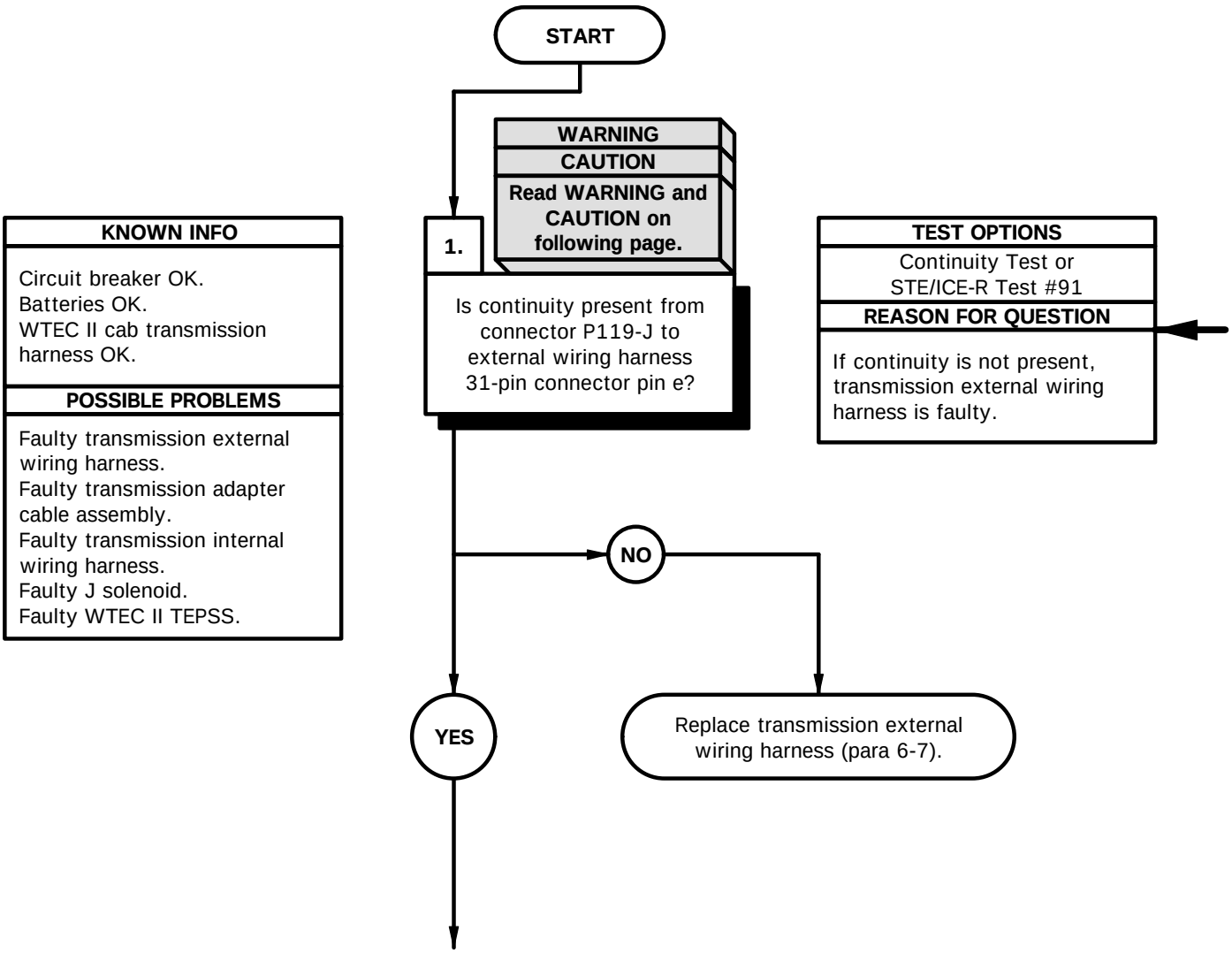
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

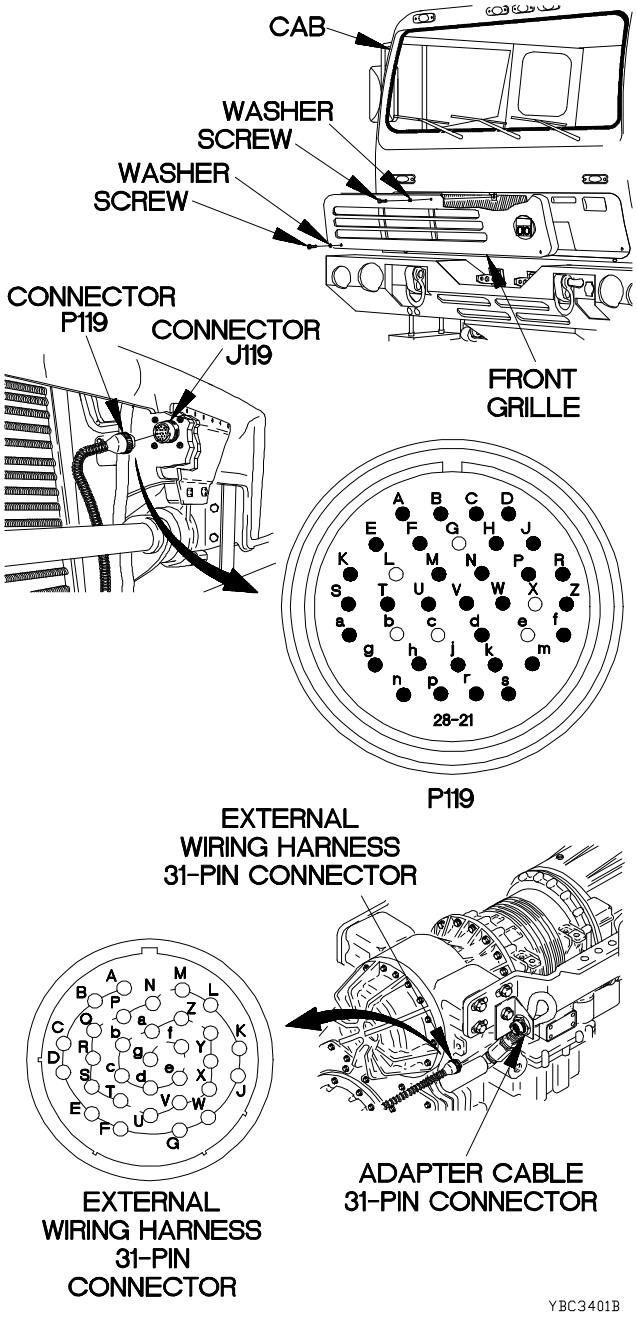
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

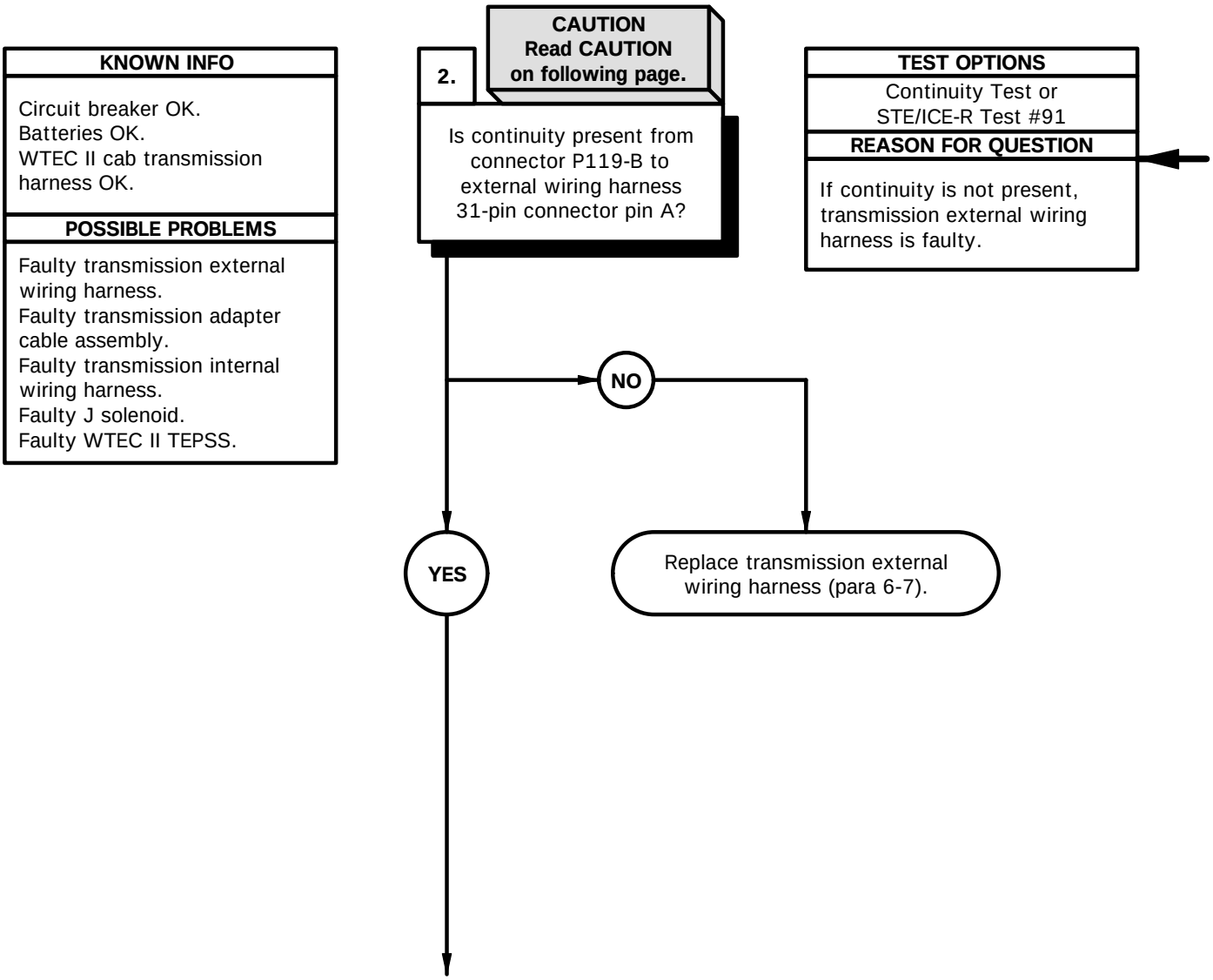
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from adapter cable 31-pin connector.
(6) Set multimeter to ohms.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

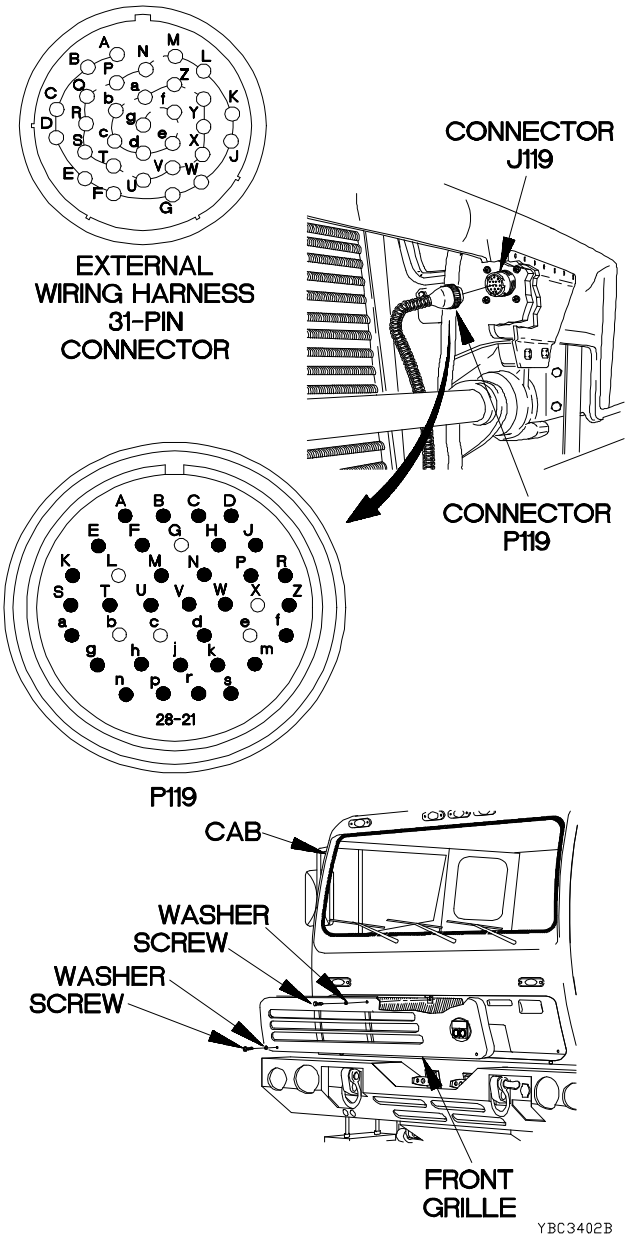
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

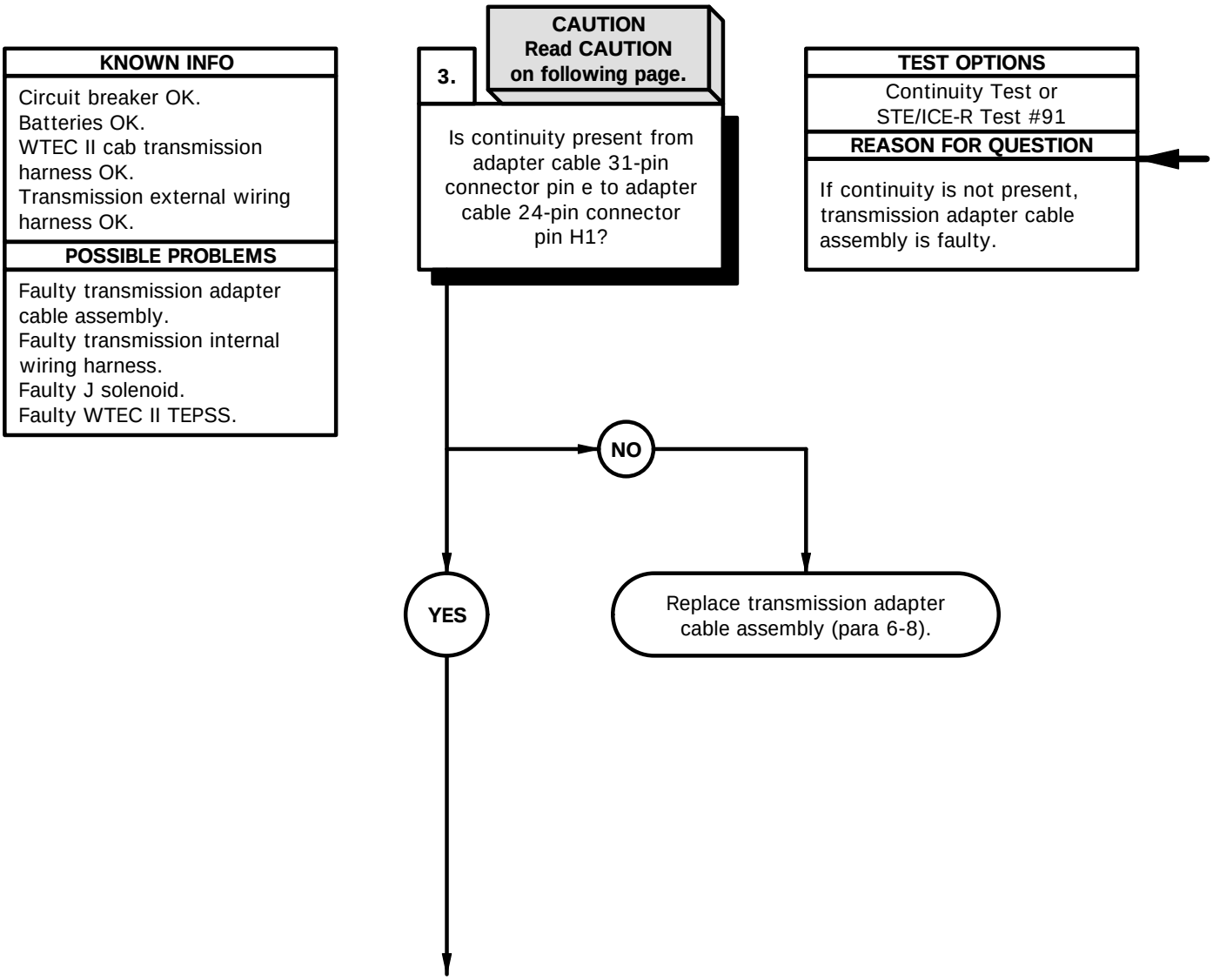
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



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

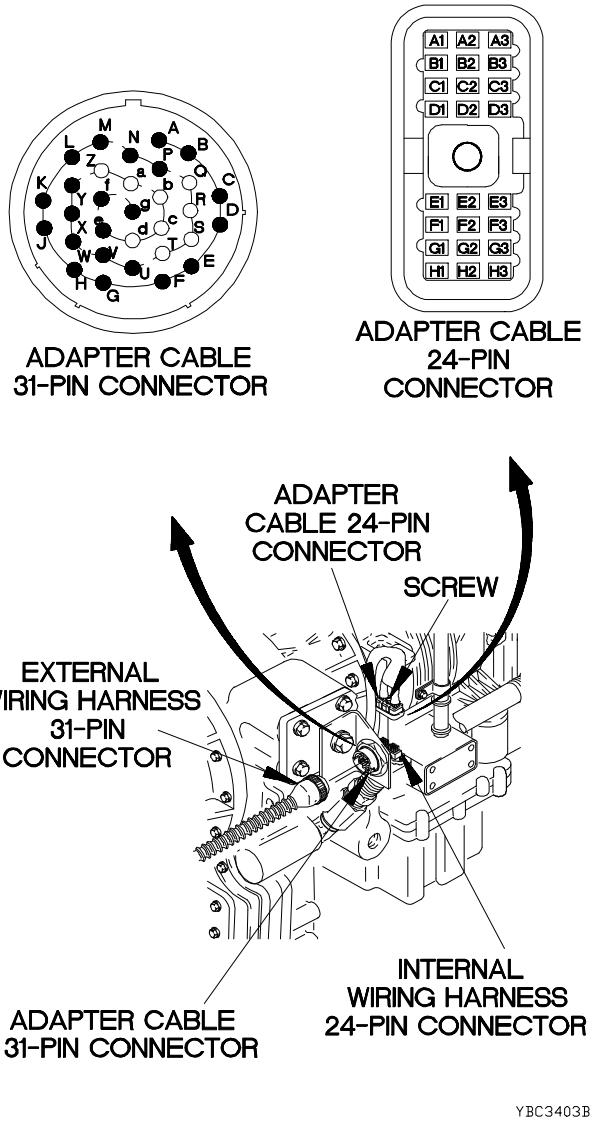
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

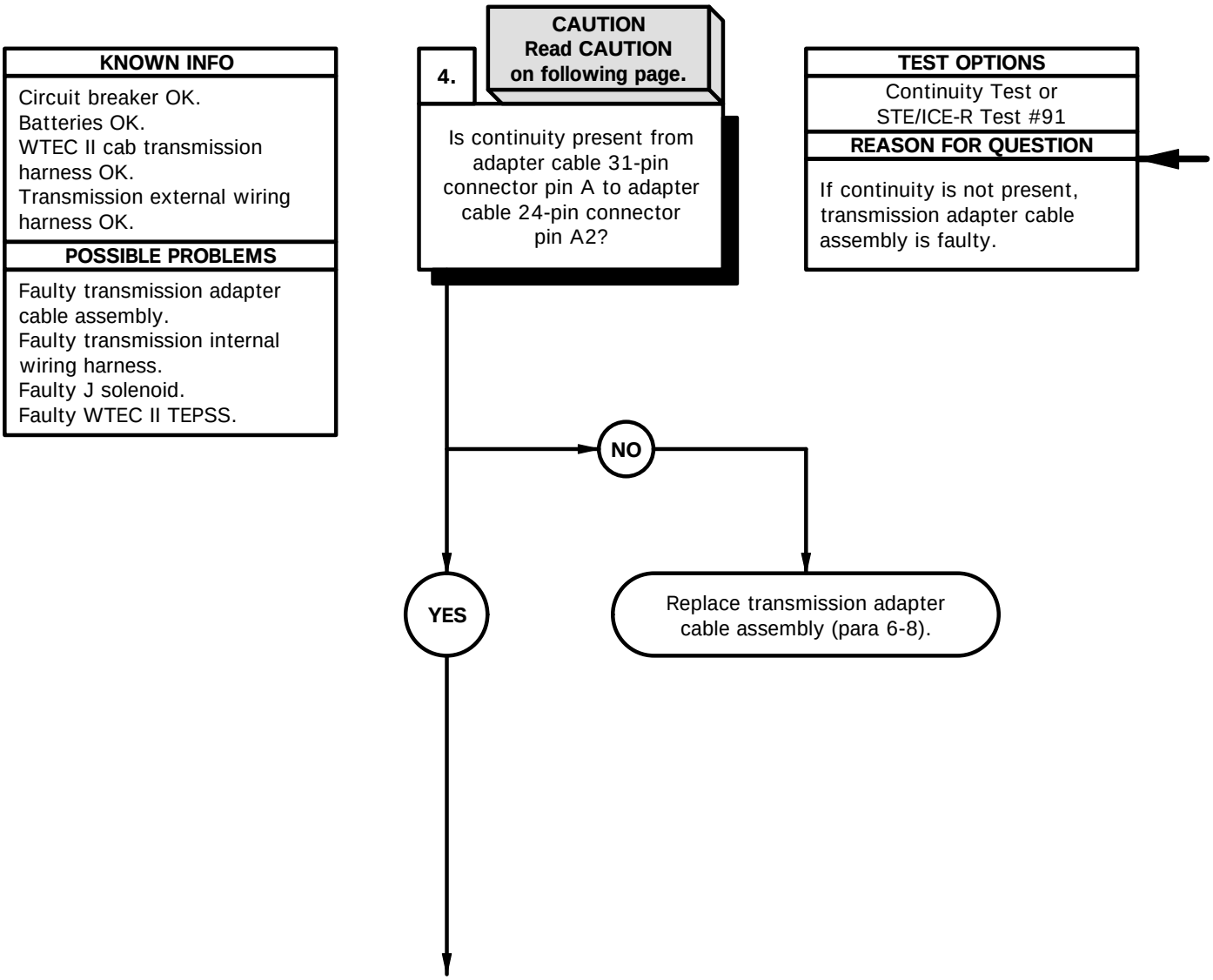
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

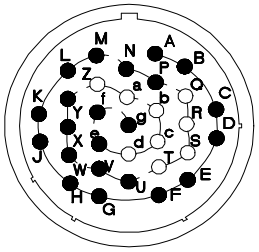
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

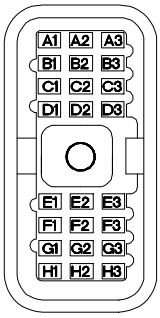
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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.



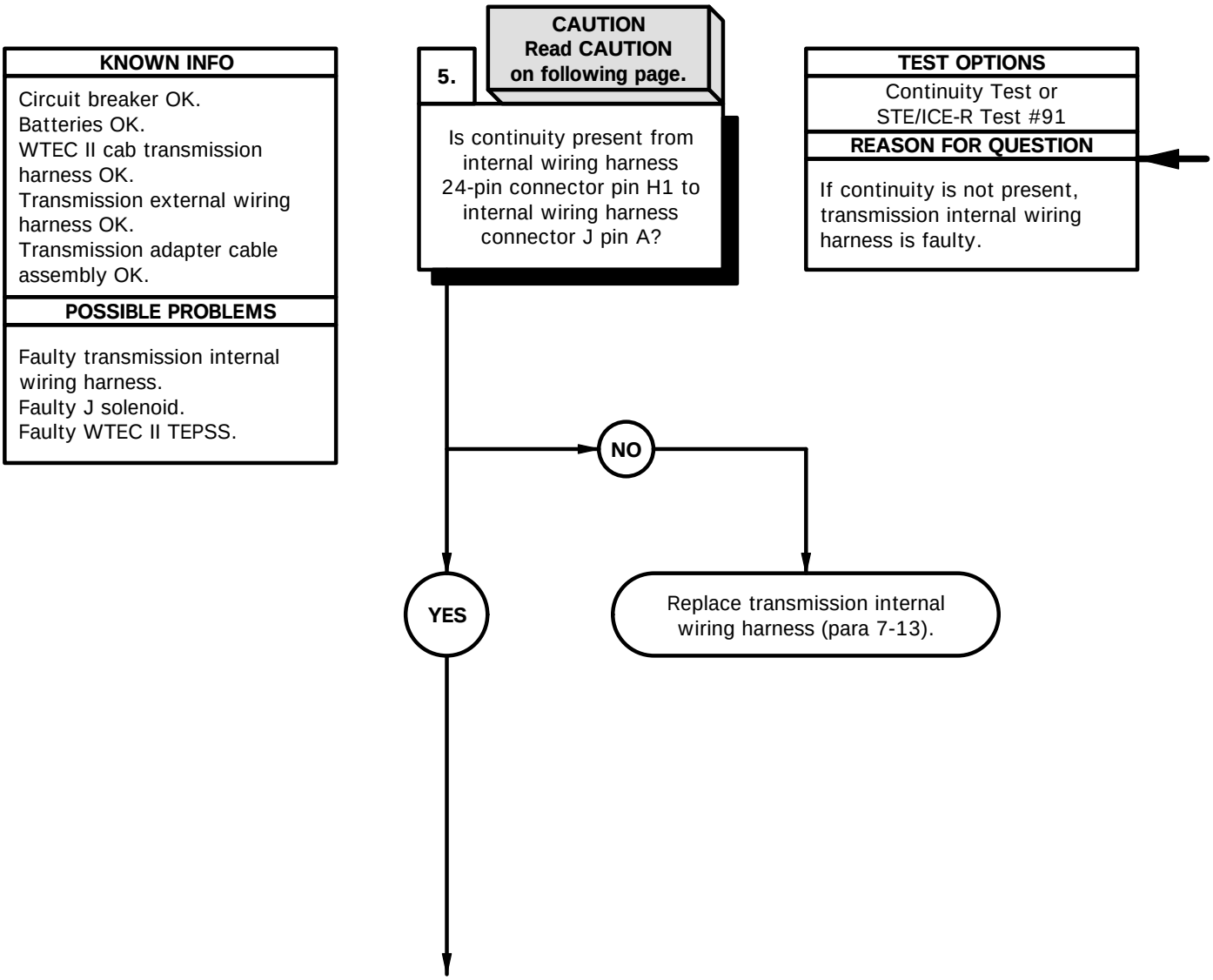
ADAPTER CABLE
31-PIN CONNECTOR



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

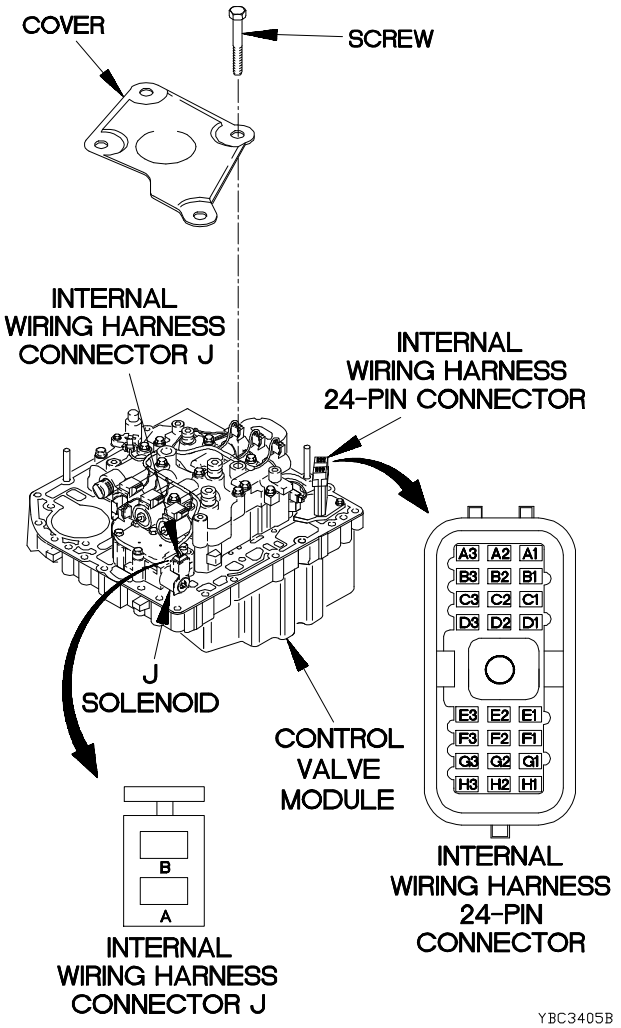
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

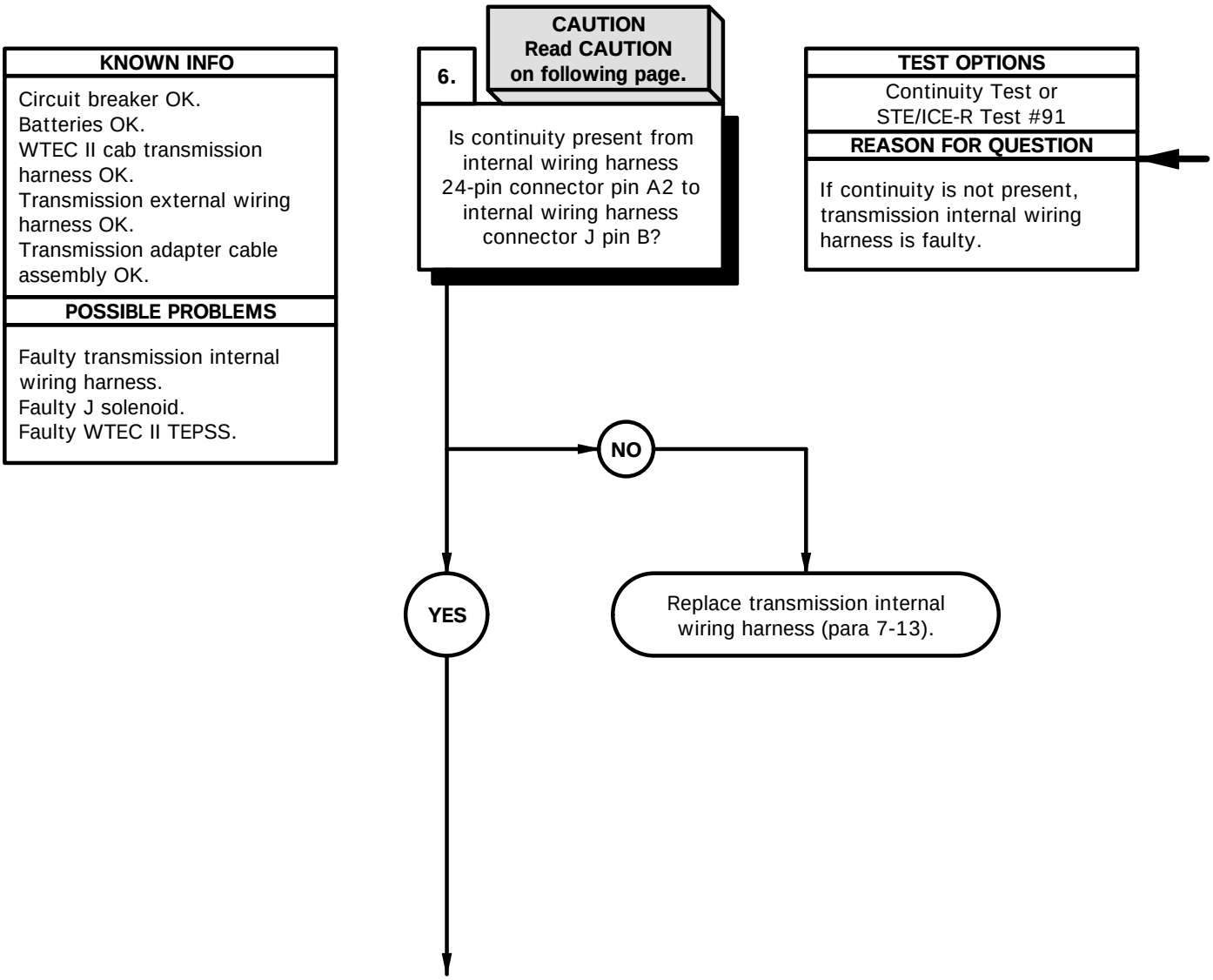
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

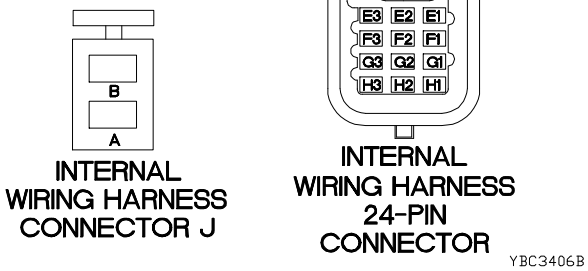
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

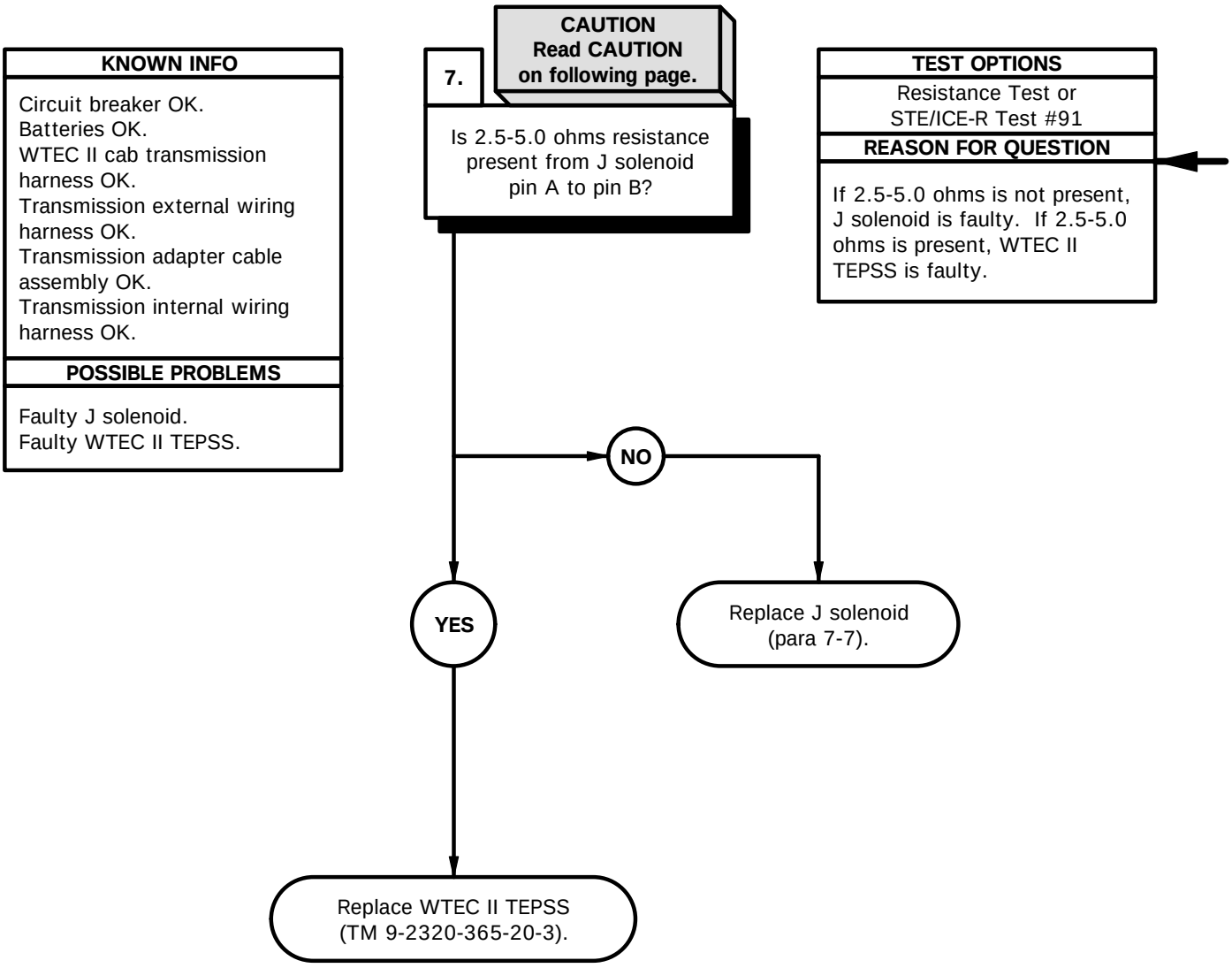
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

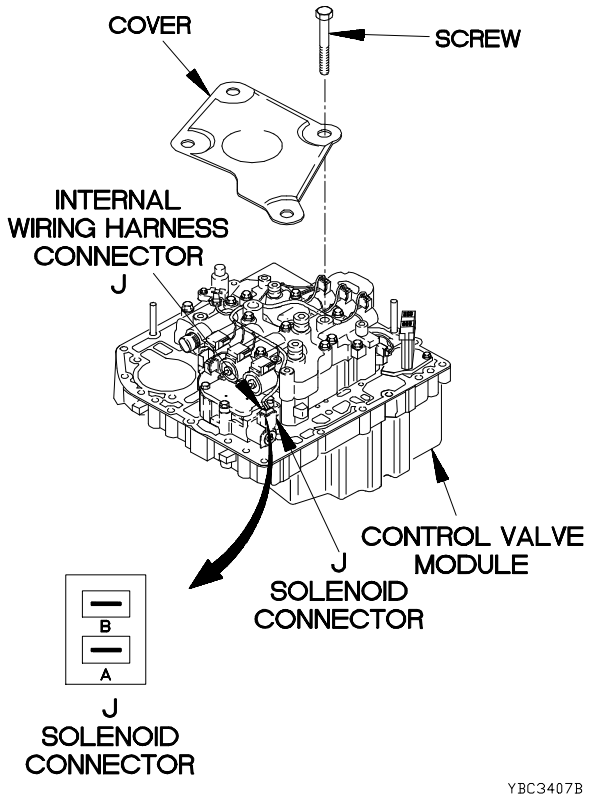
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

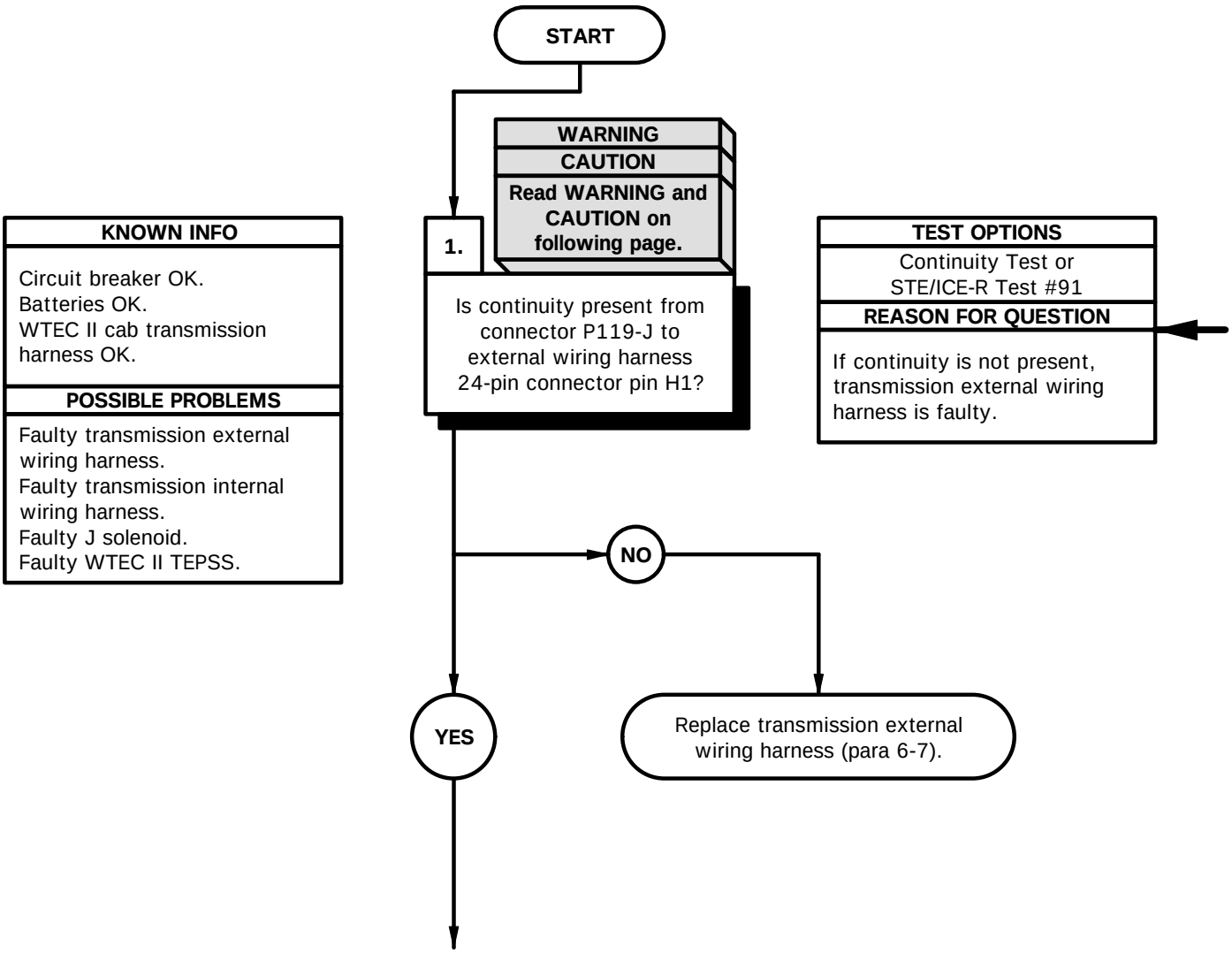
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

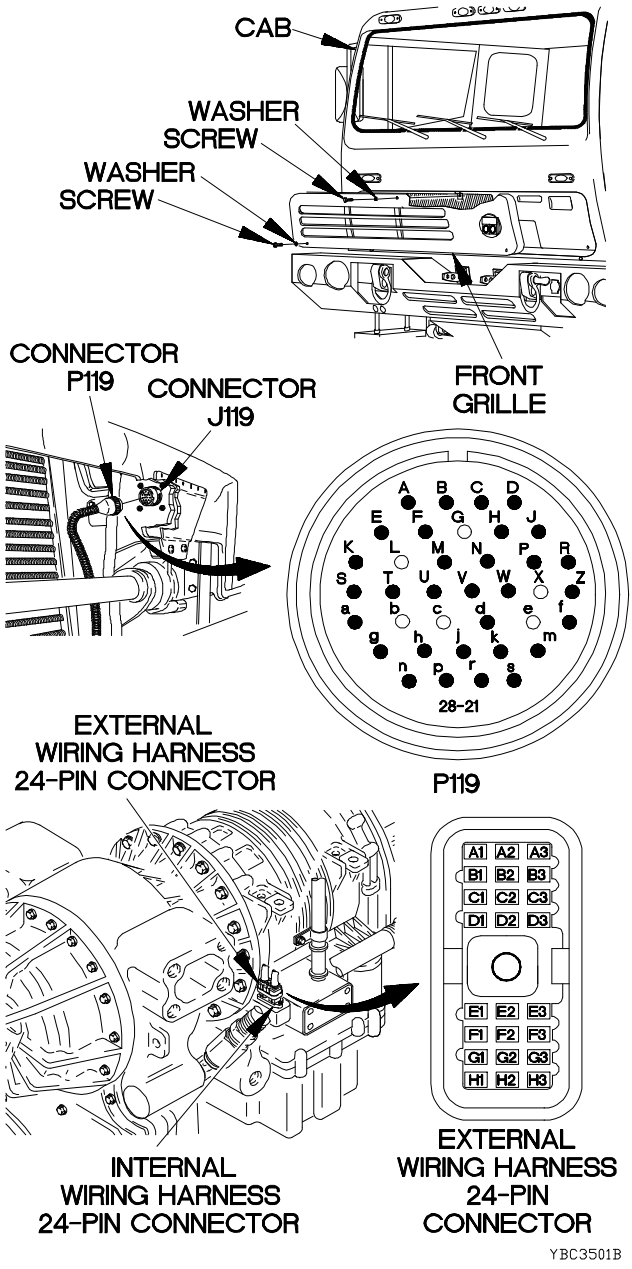
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

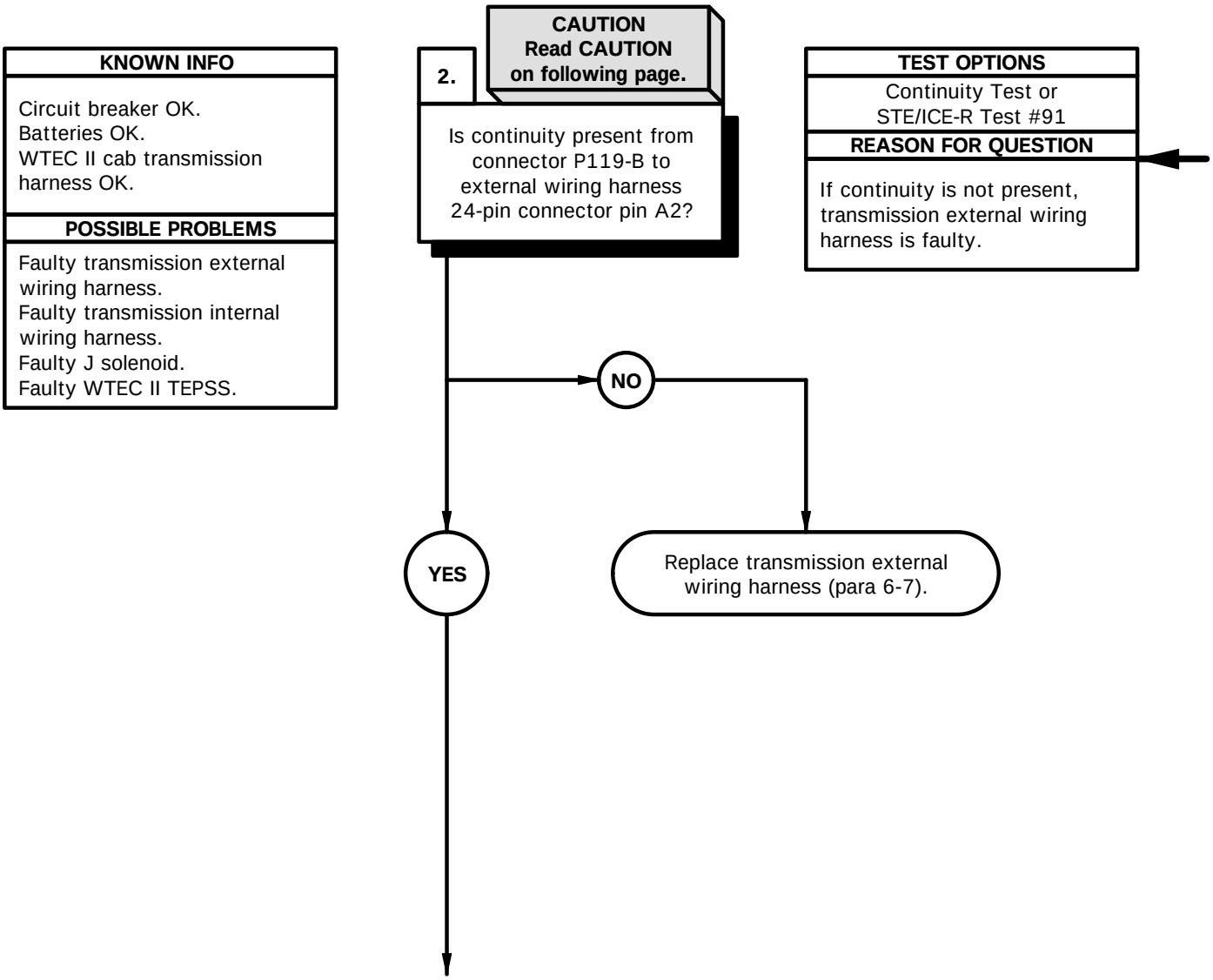
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Loosen screw in external wiring harness 24-pin connector.
(6) Disconnect external wiring harness 24-pin connector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

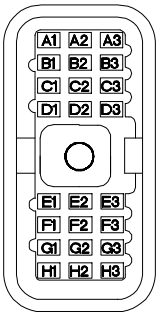
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

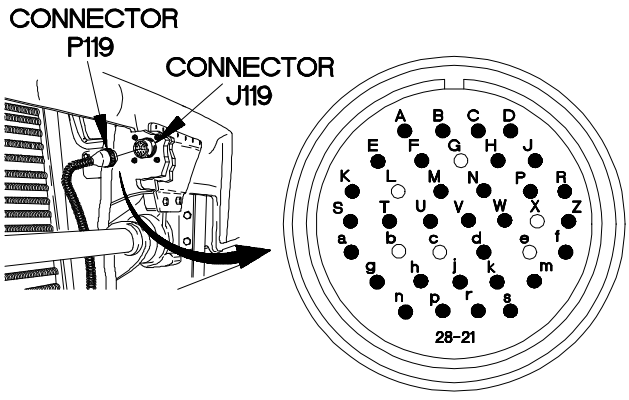
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

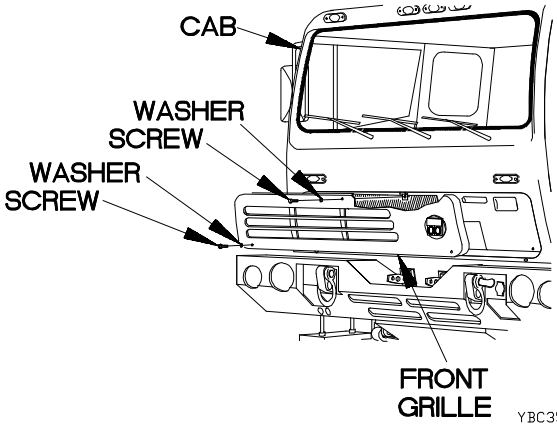
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P119 pin B.
(3) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin A2 and note reading on multimeter.
(4) If continuity is not present, replace transmission external wiring harness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



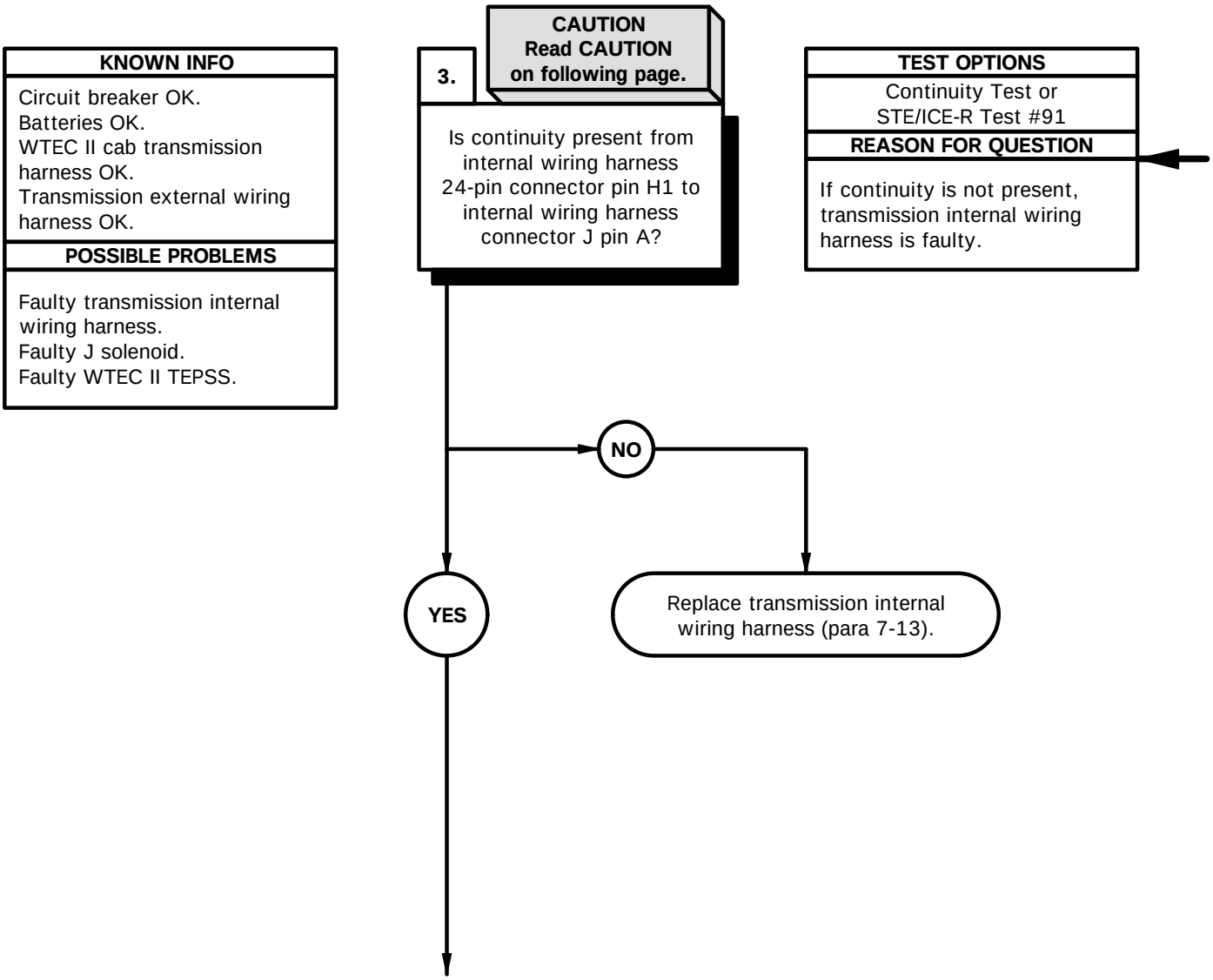
EXTERNAL WIRING HARNESS 24-PIN CONNECTOR



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

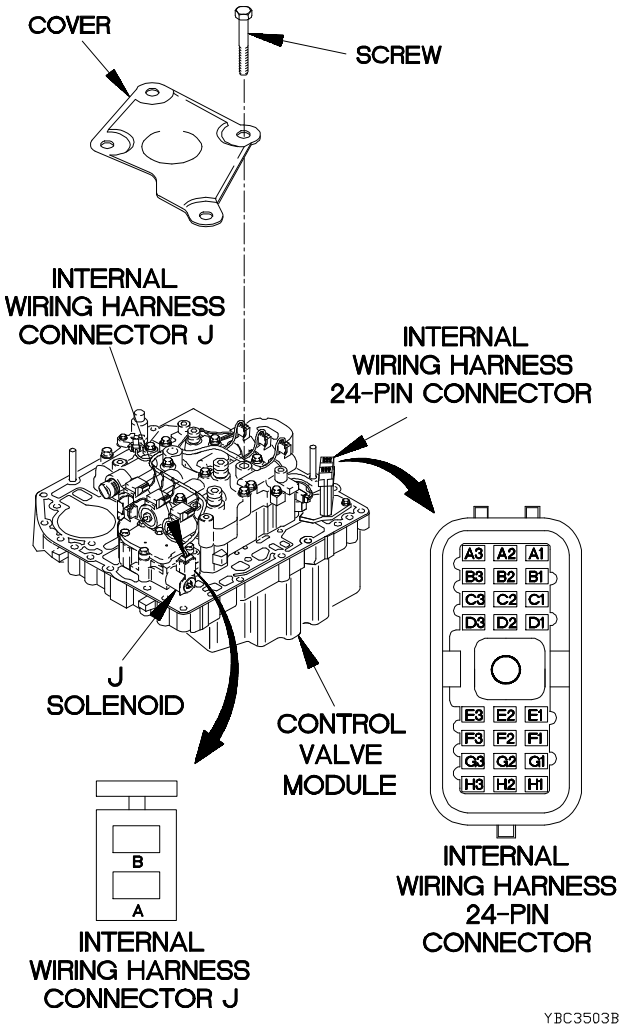
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

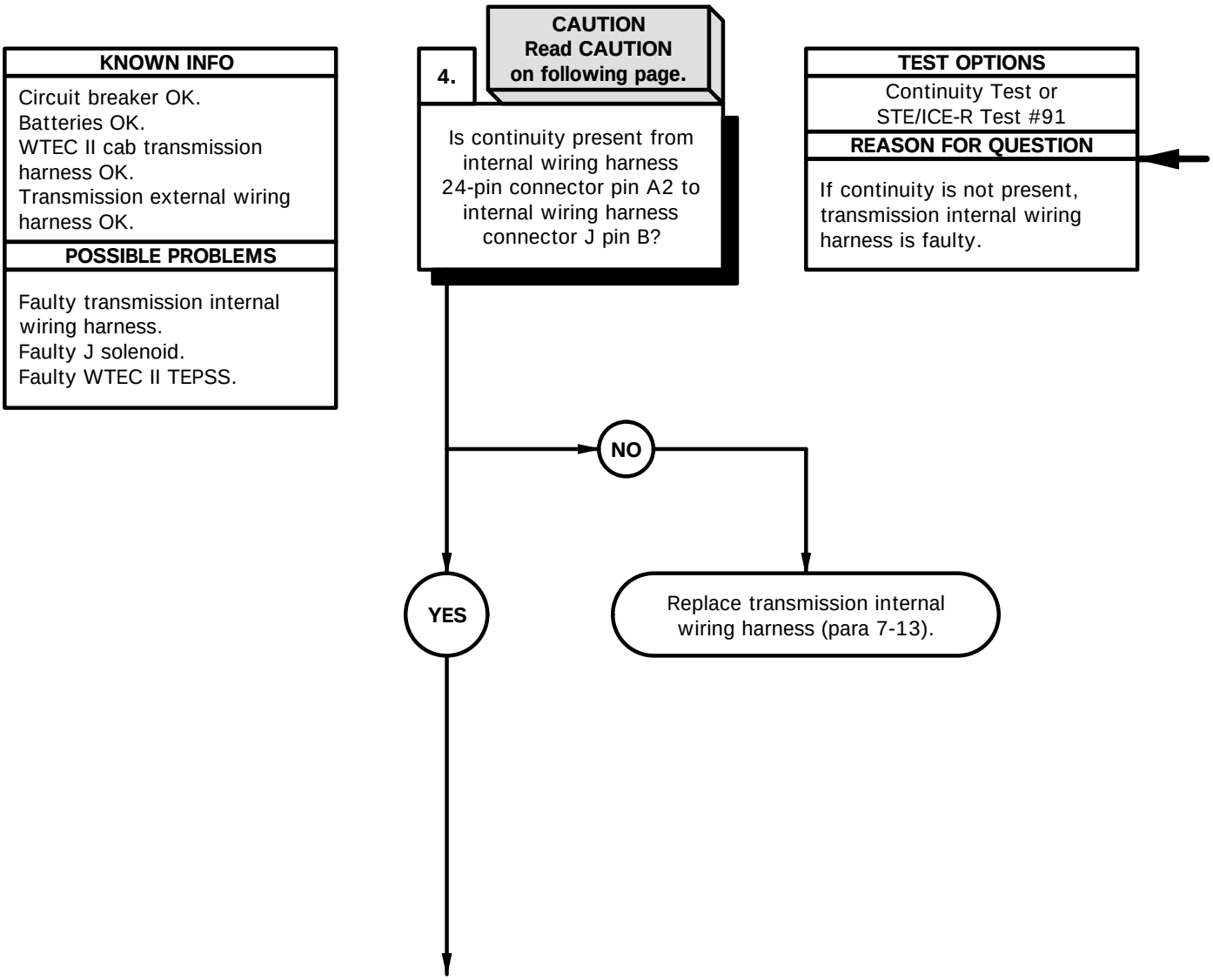
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

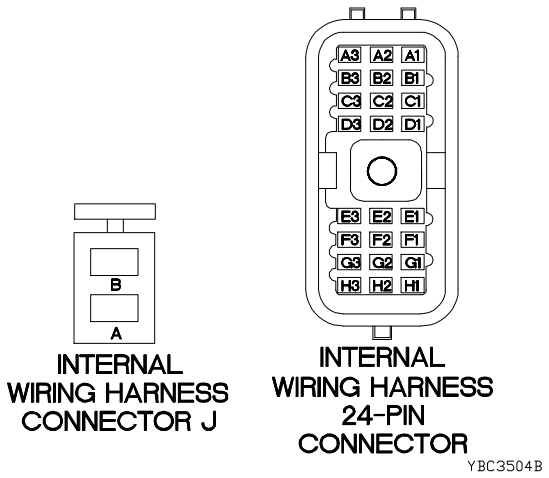
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

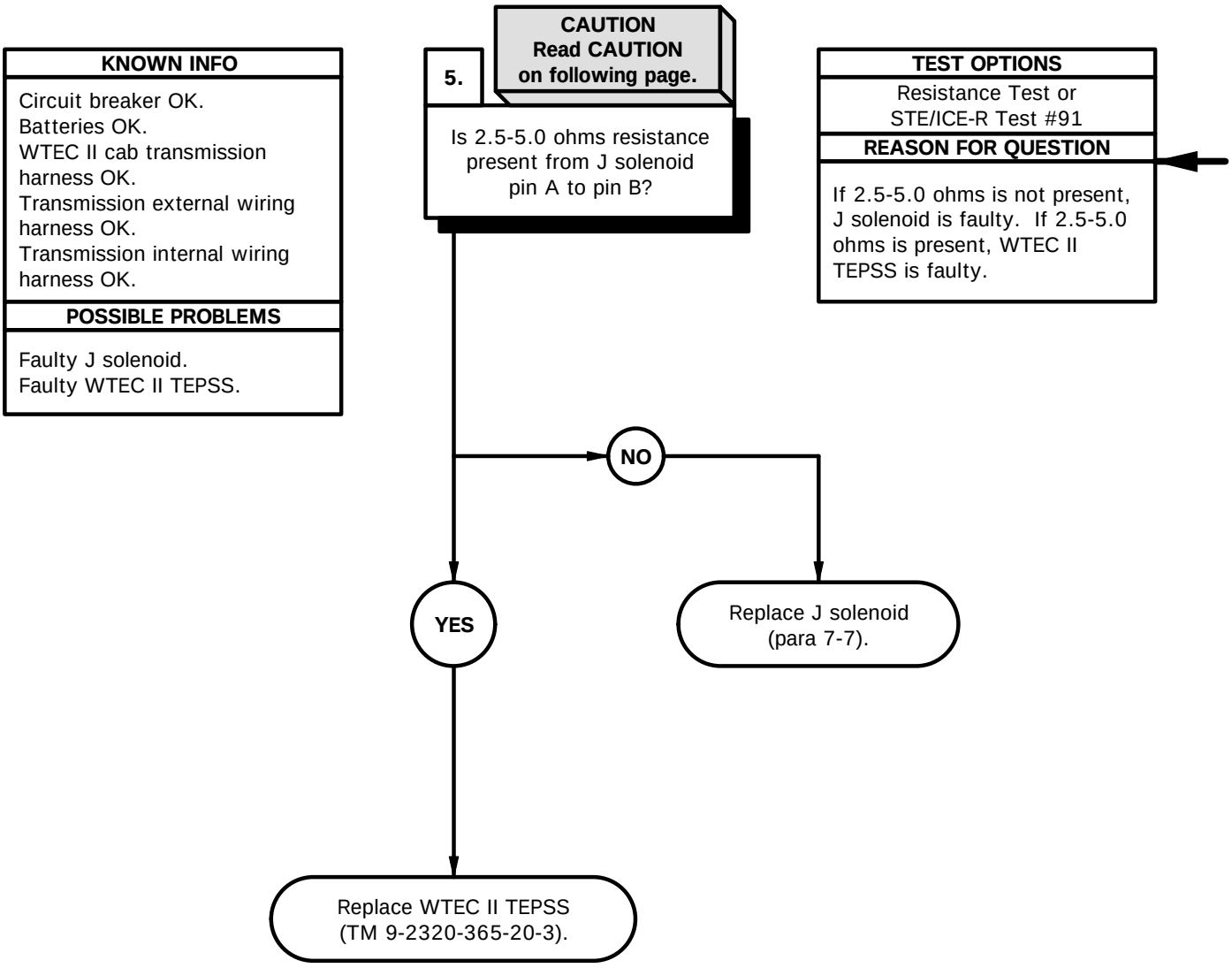
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

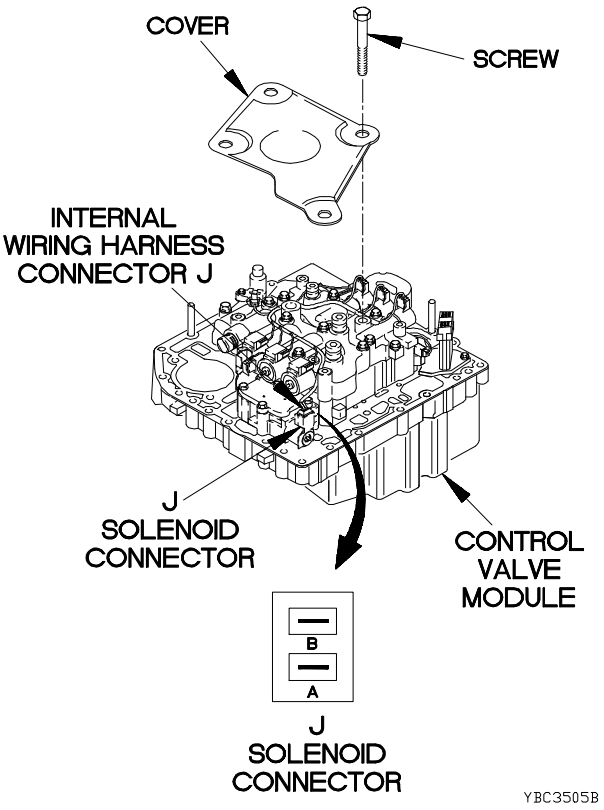
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

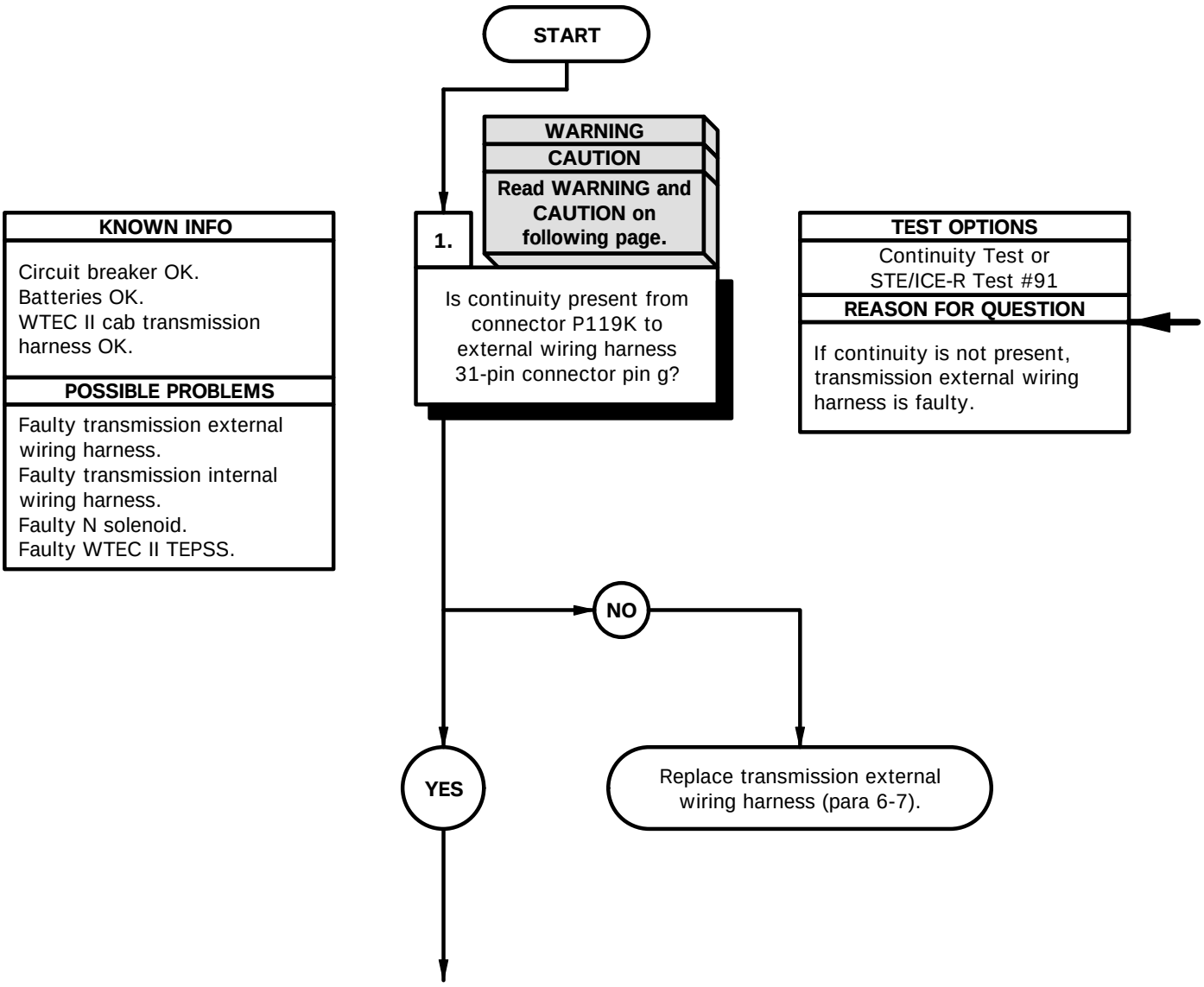
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

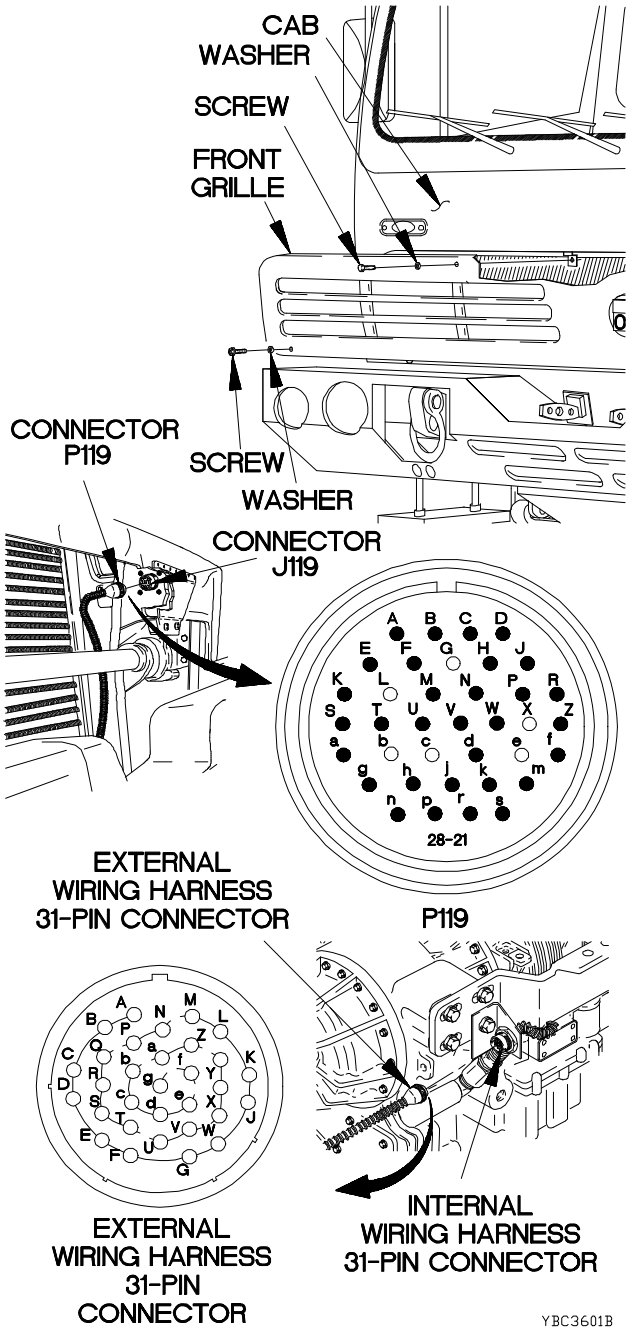
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

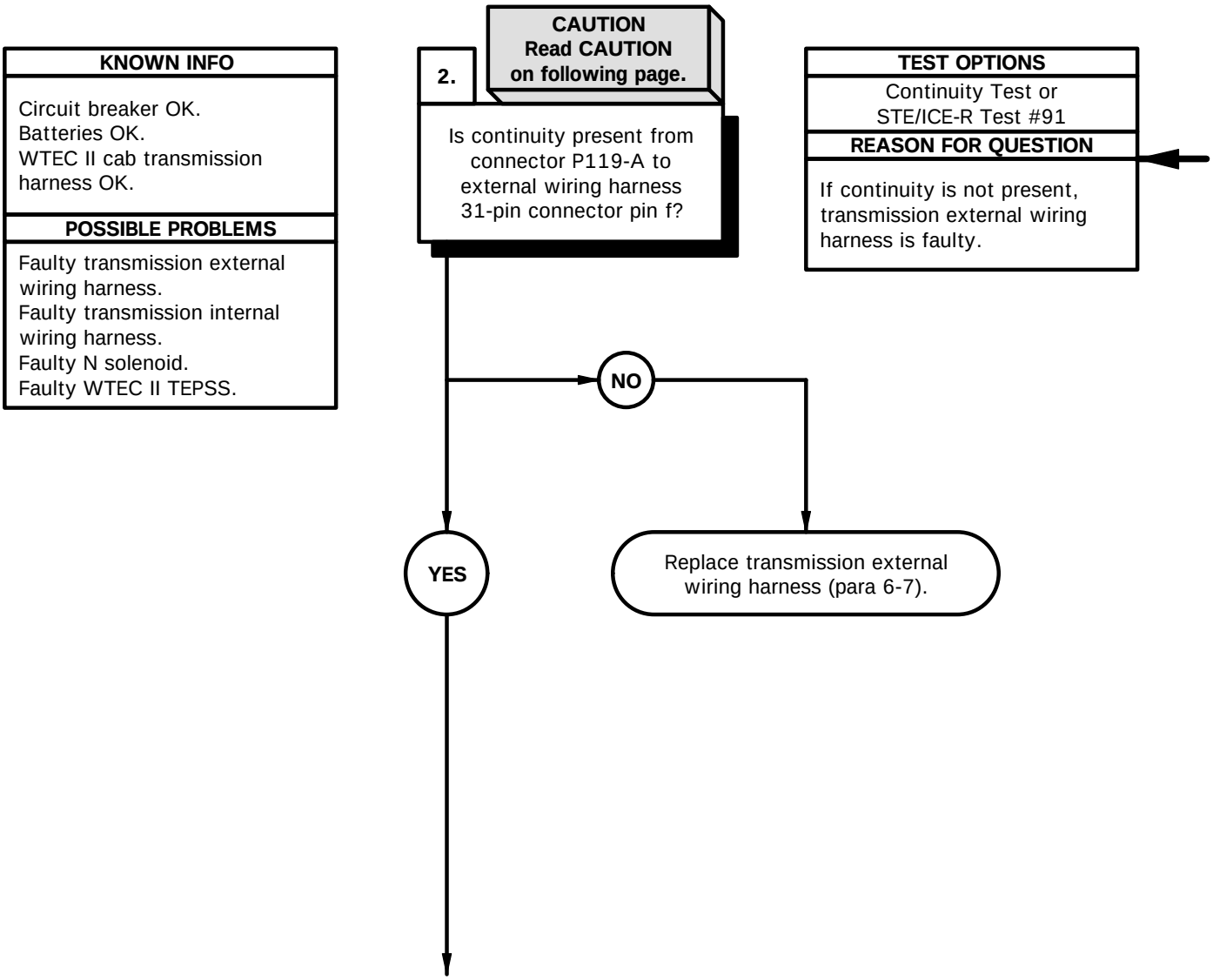
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from internal wiring 31-pin connector.
(6) Set multimeter to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

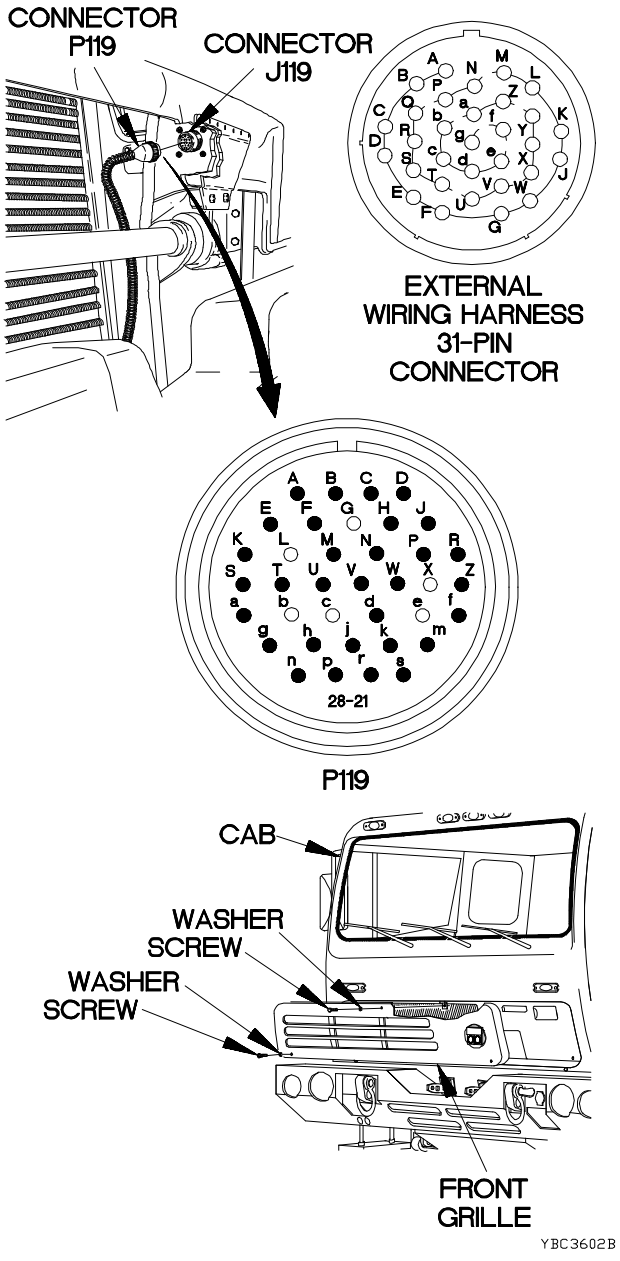
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

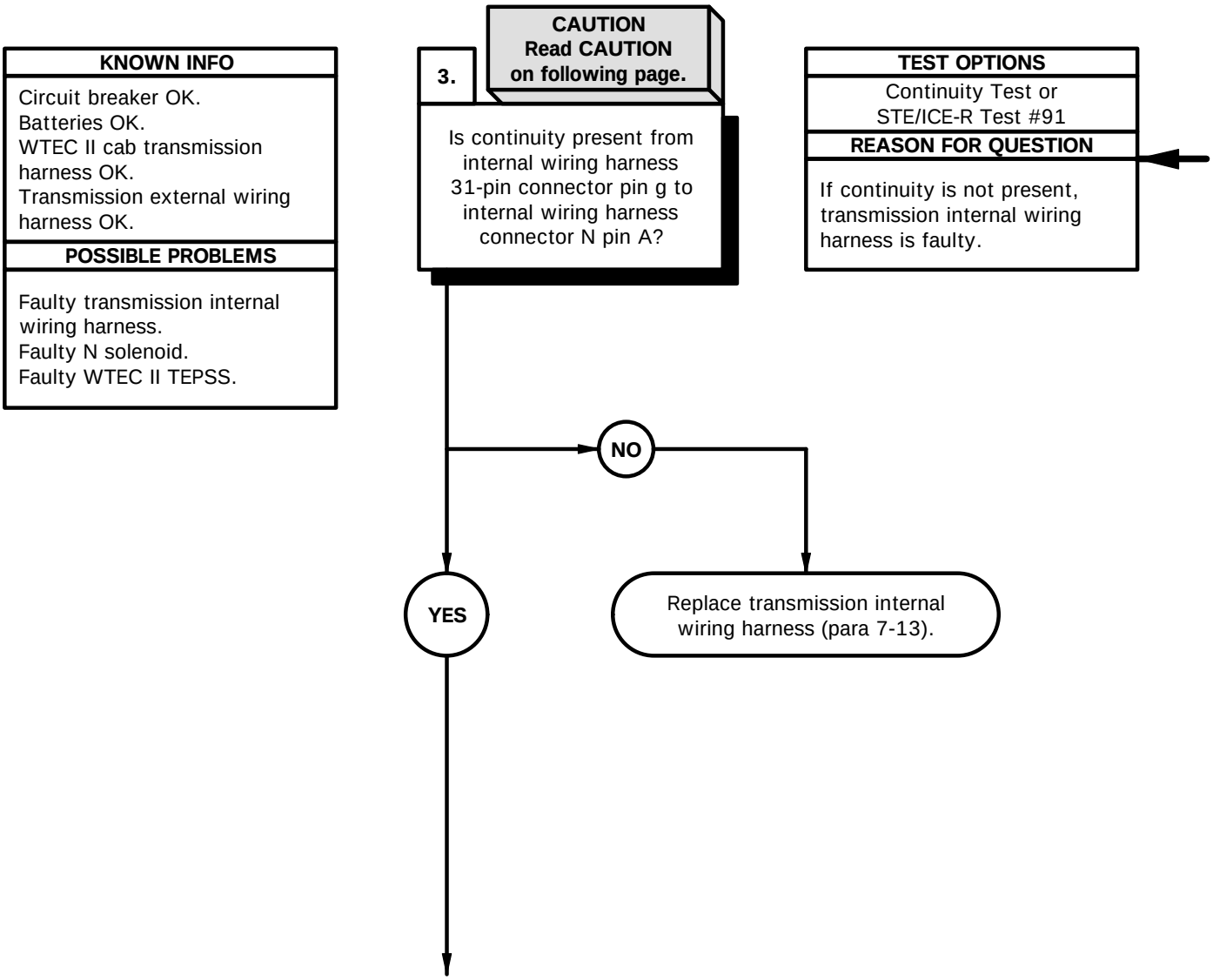
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

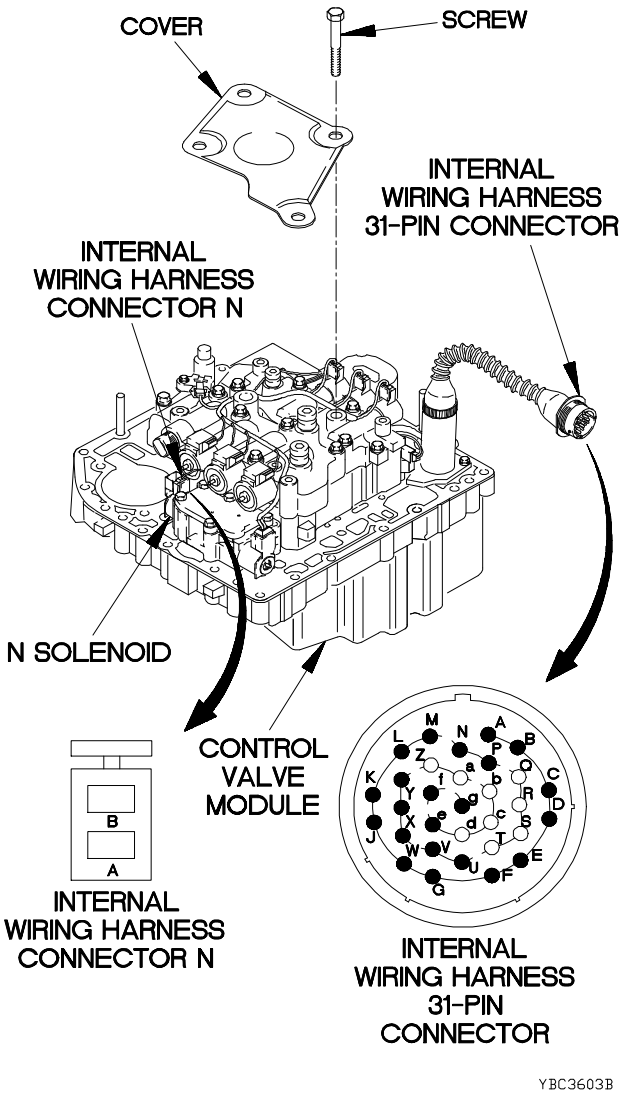
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

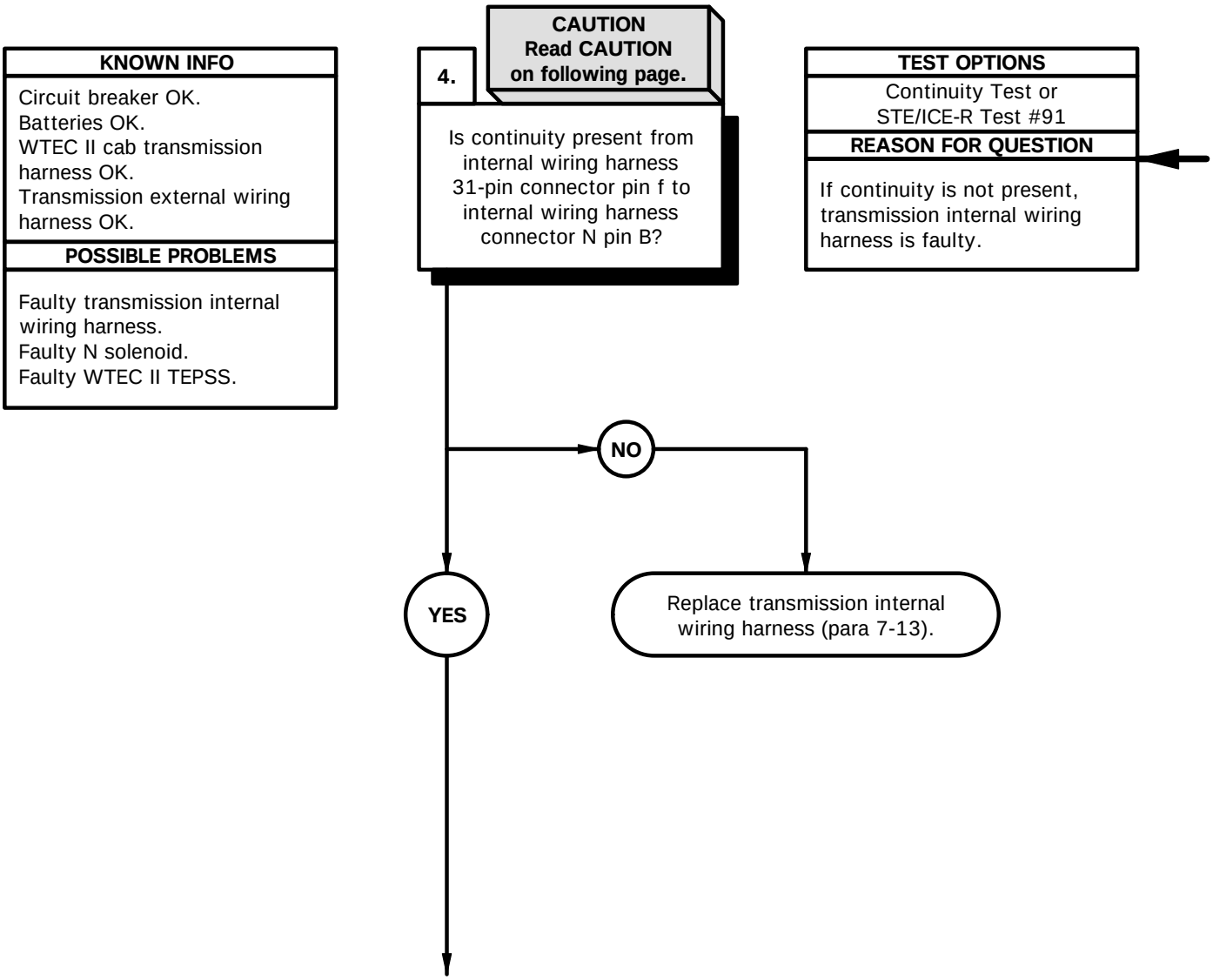
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

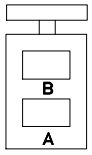
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

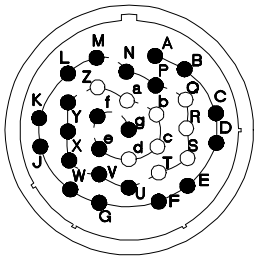
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



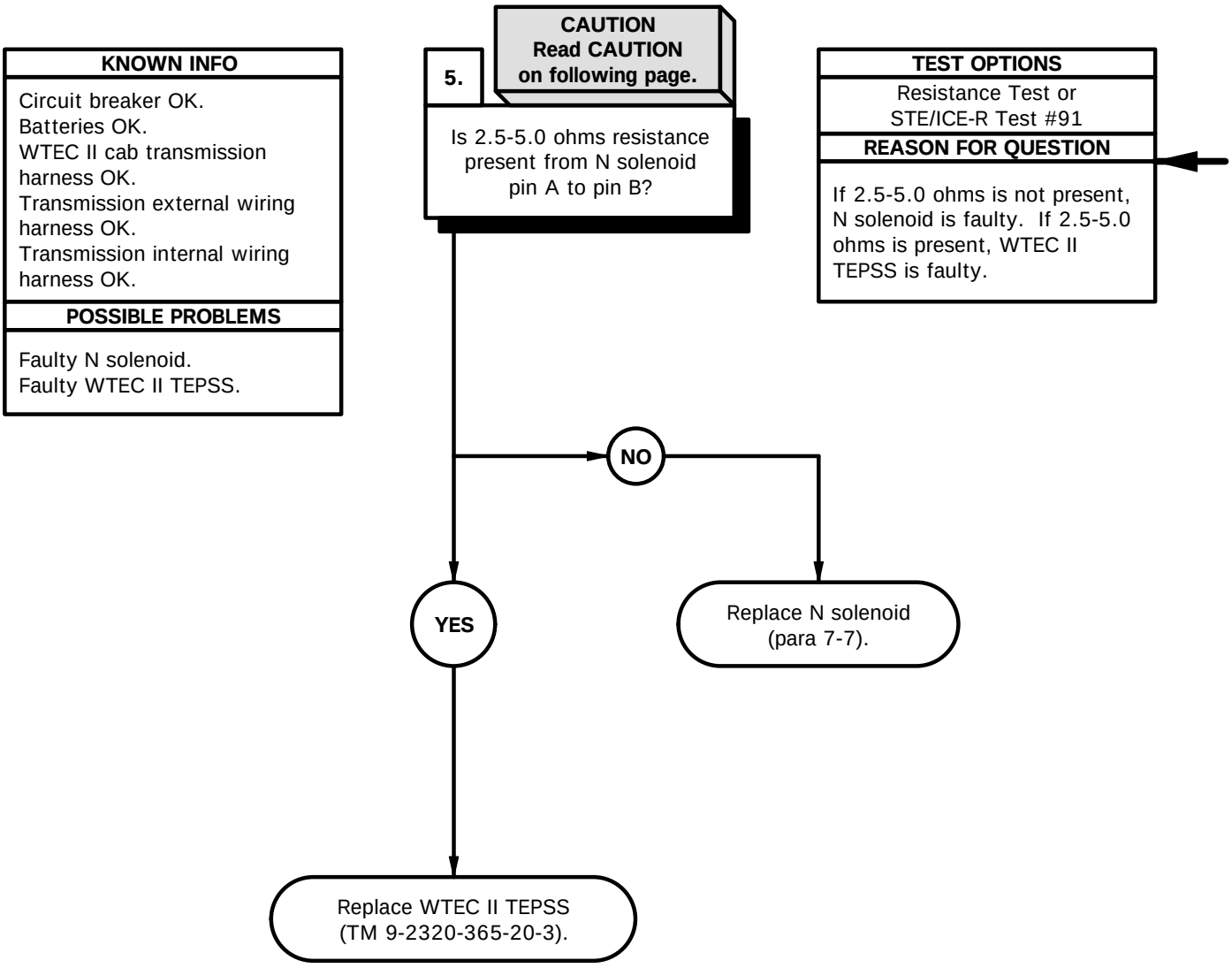
INTERNAL WIRING HARNESS CONNECTOR N



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

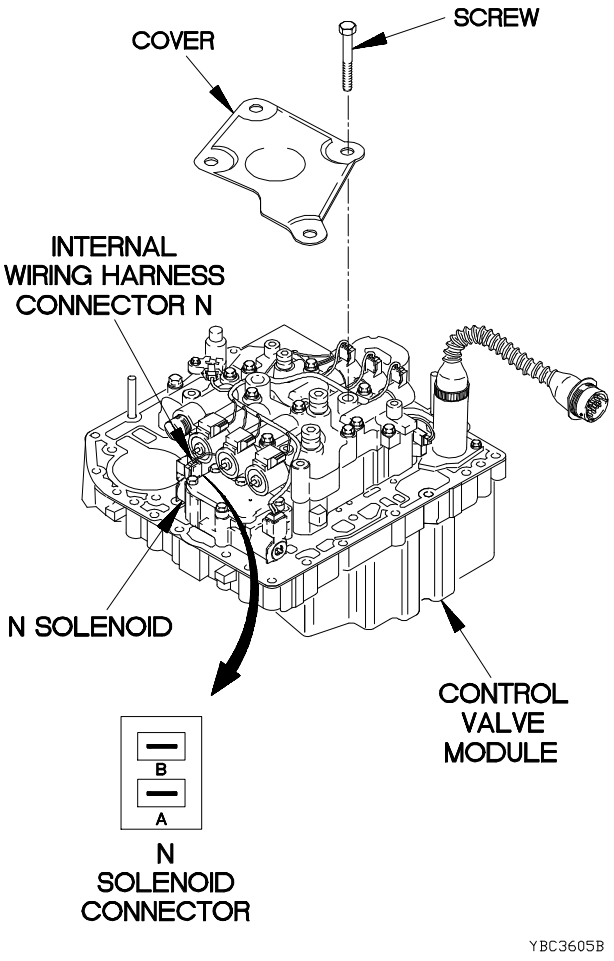
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

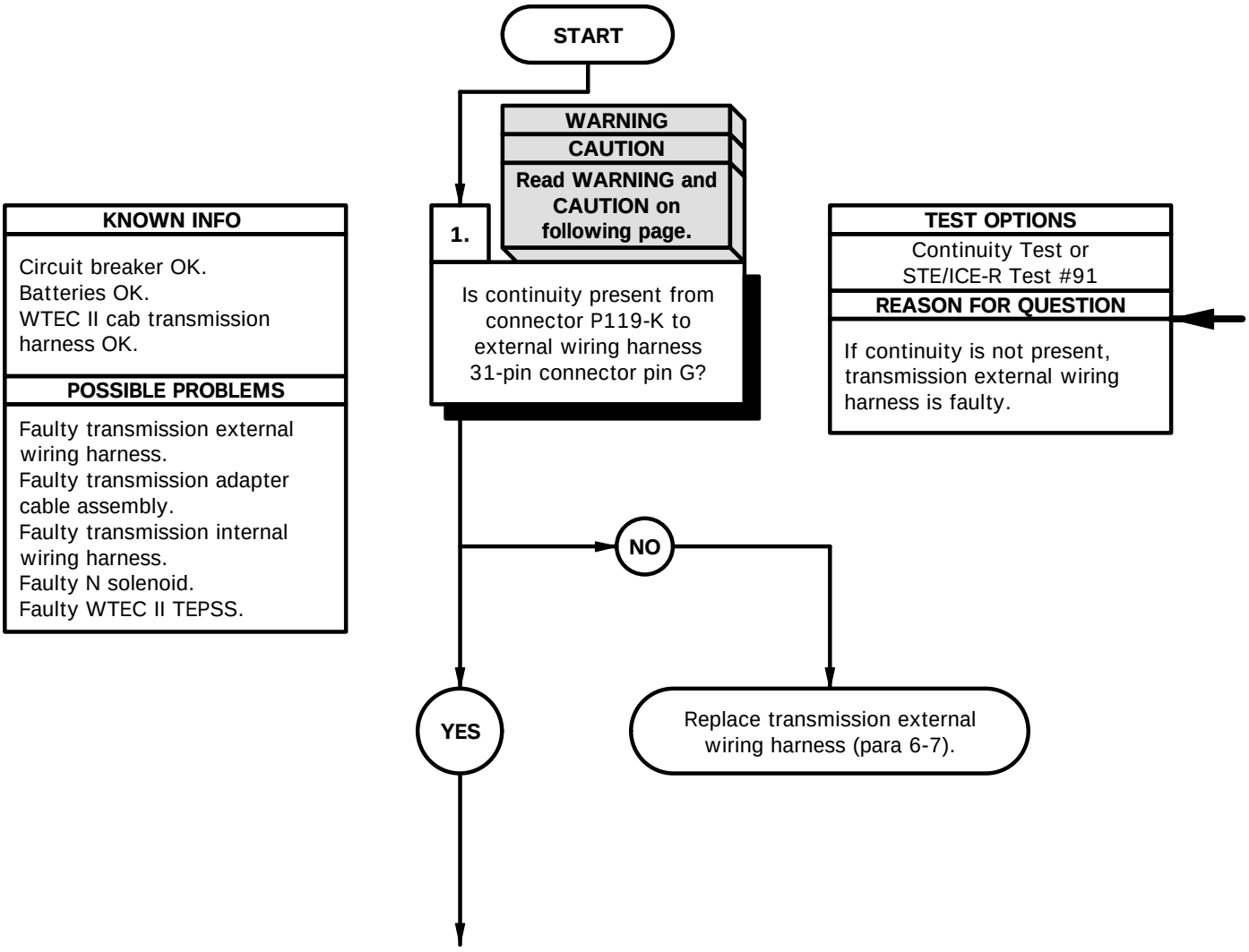
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

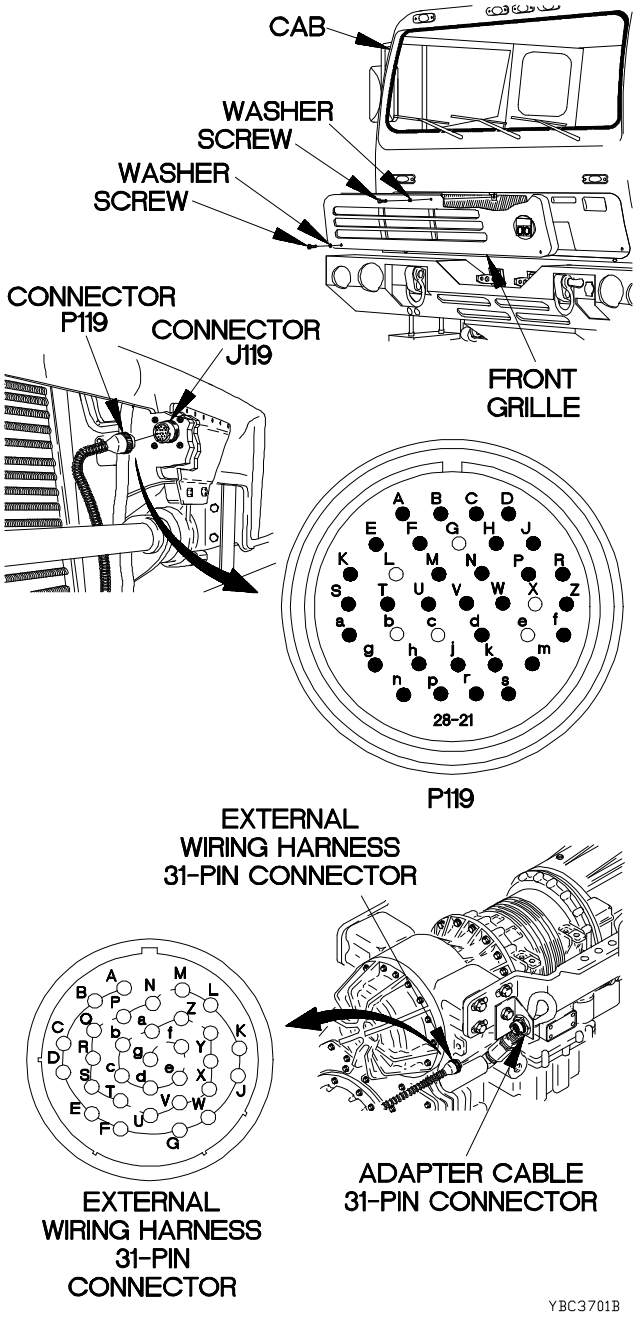
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

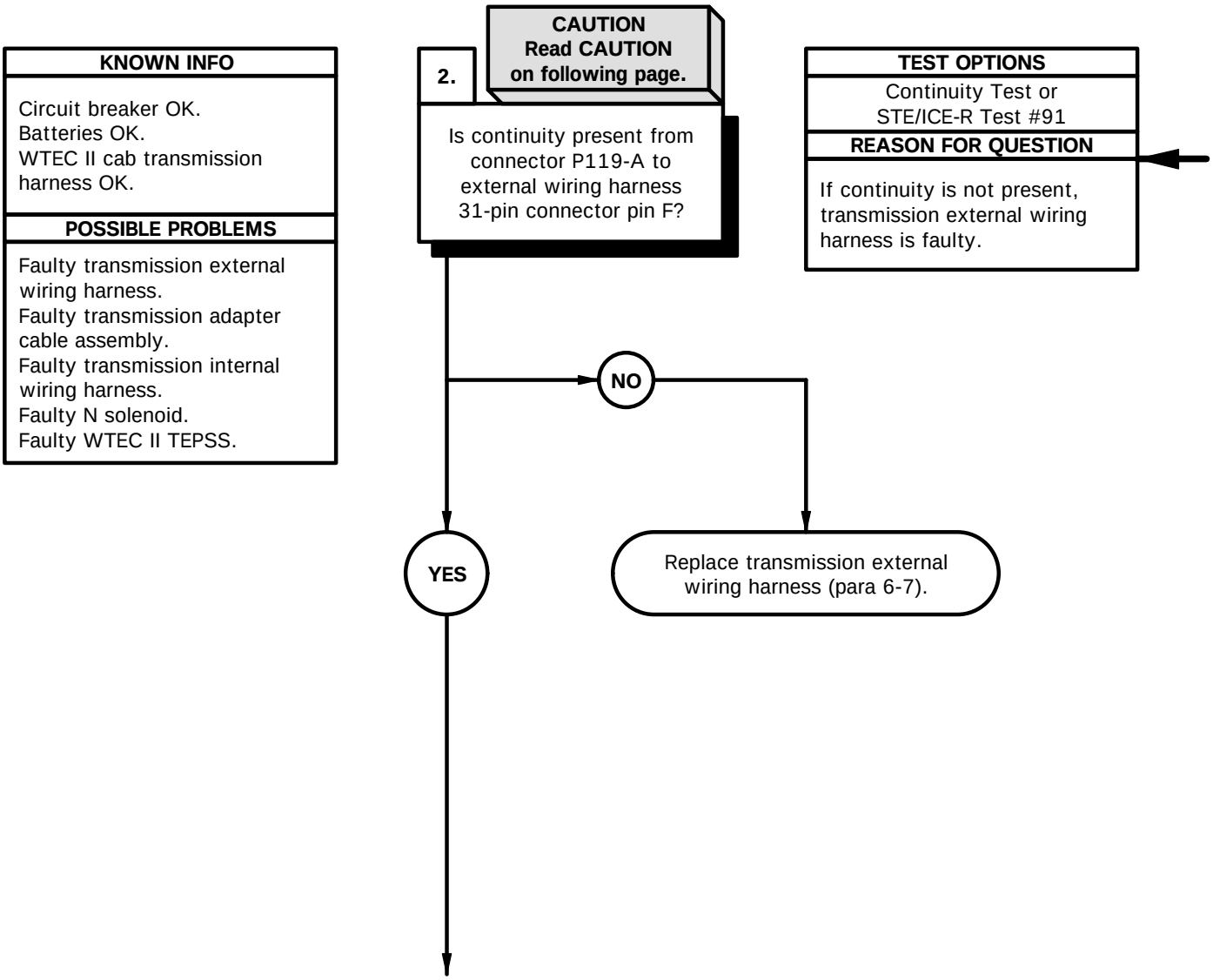
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from adapter cable 31-pin connector.
(6) Set multimeter to ohms.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

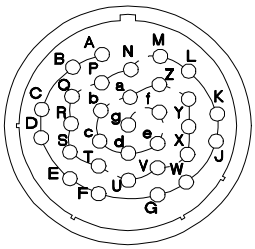
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

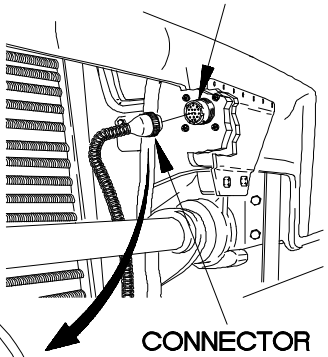
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

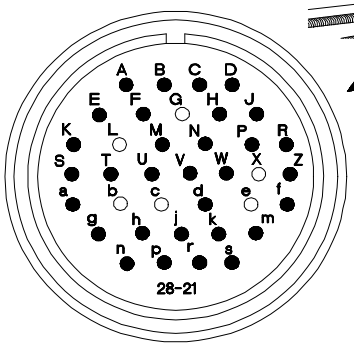
CONTINUITY TEST

(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).

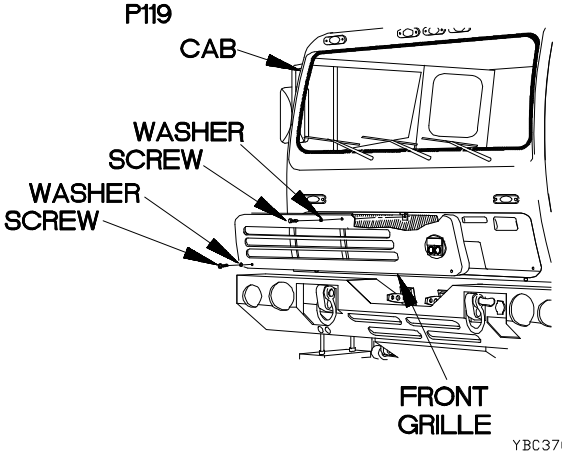


EXTERNAL WIRING HARNESS 31-PIN CONNECTOR

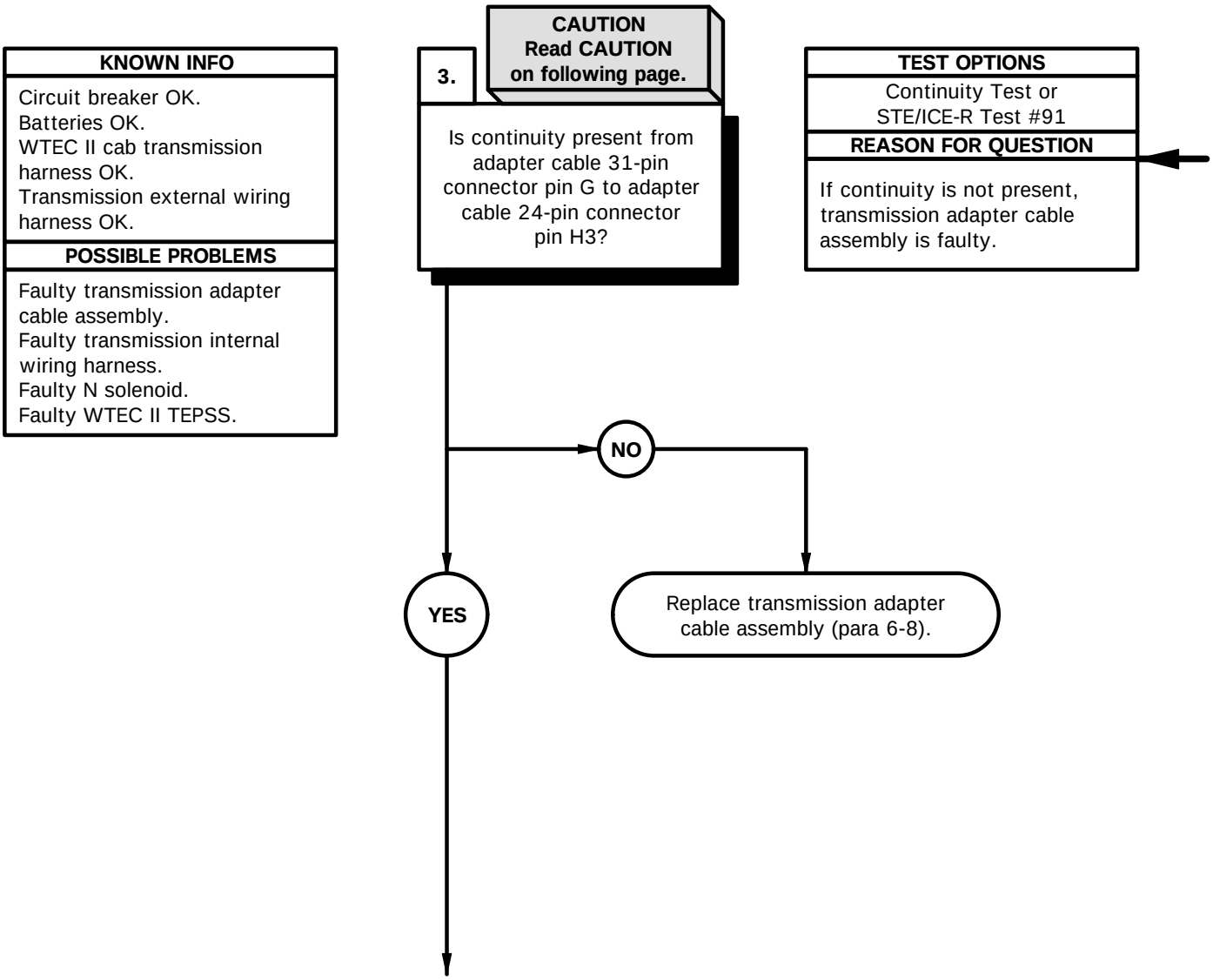




P119



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

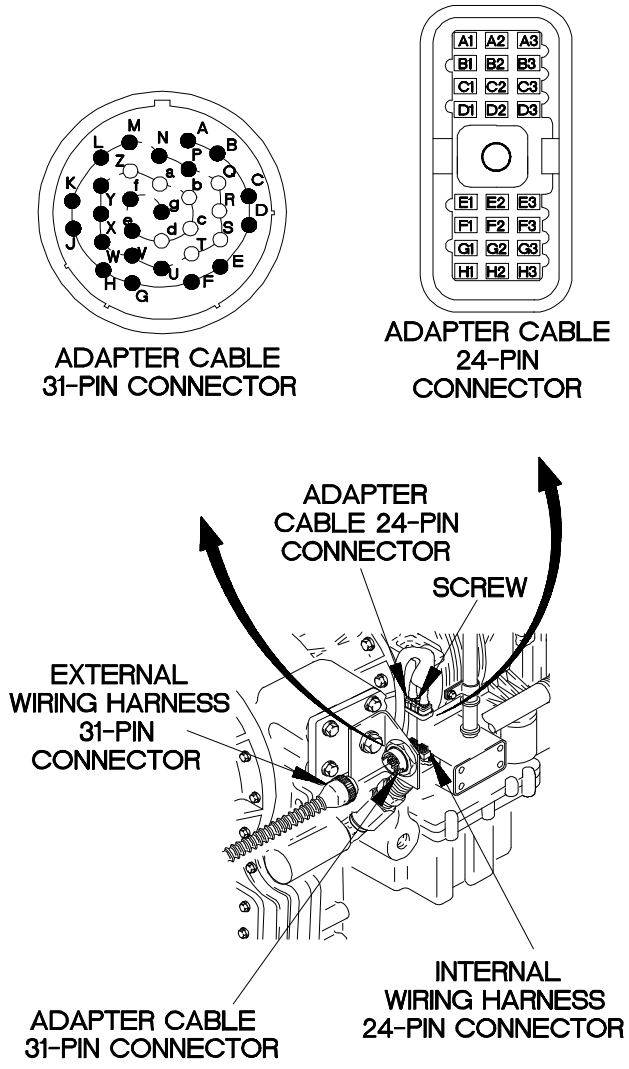
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

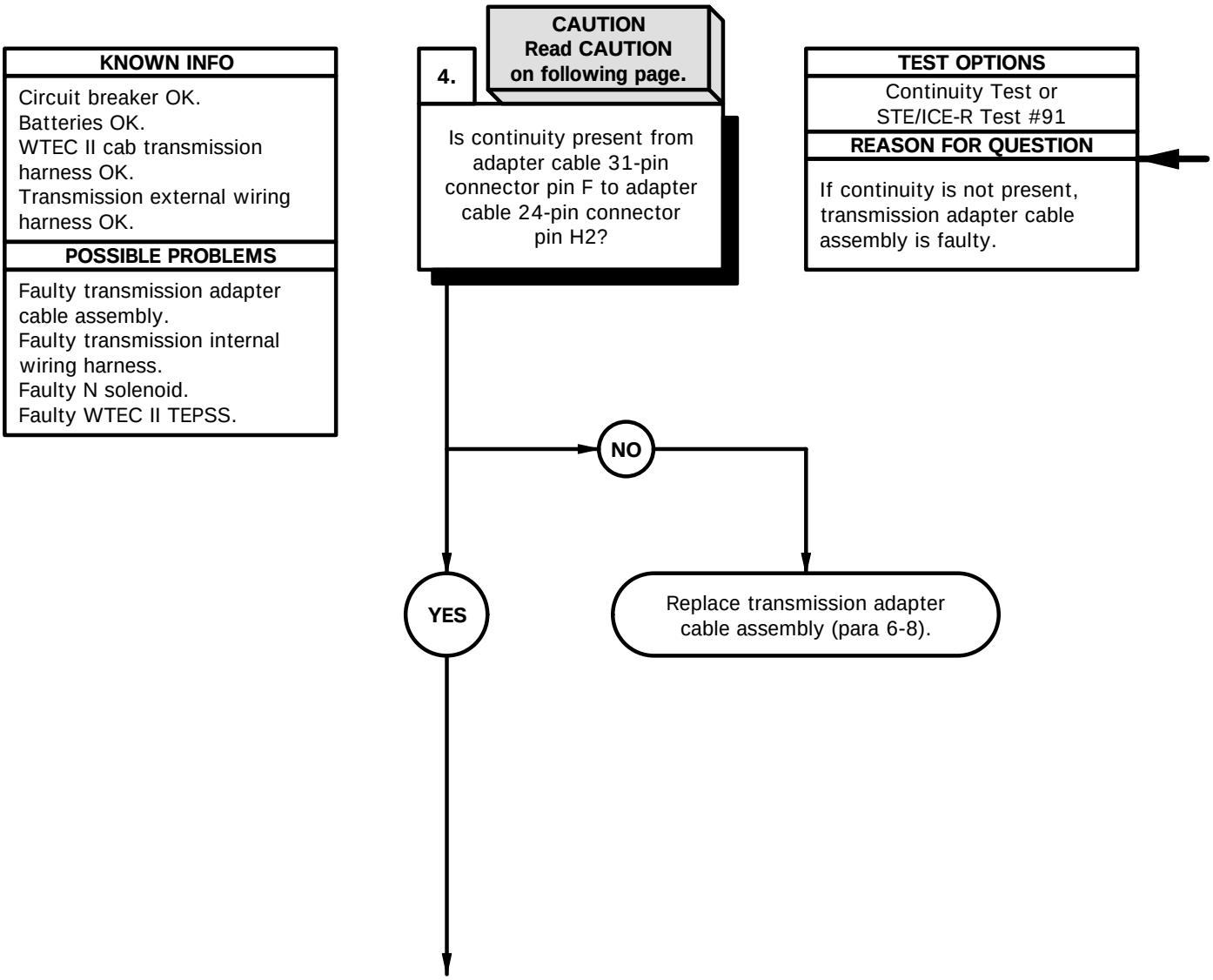
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

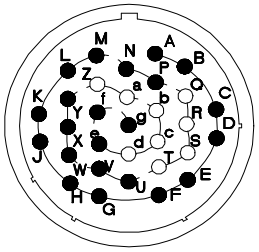
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

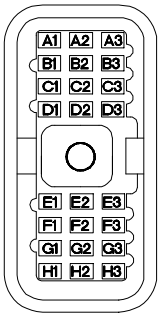
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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.



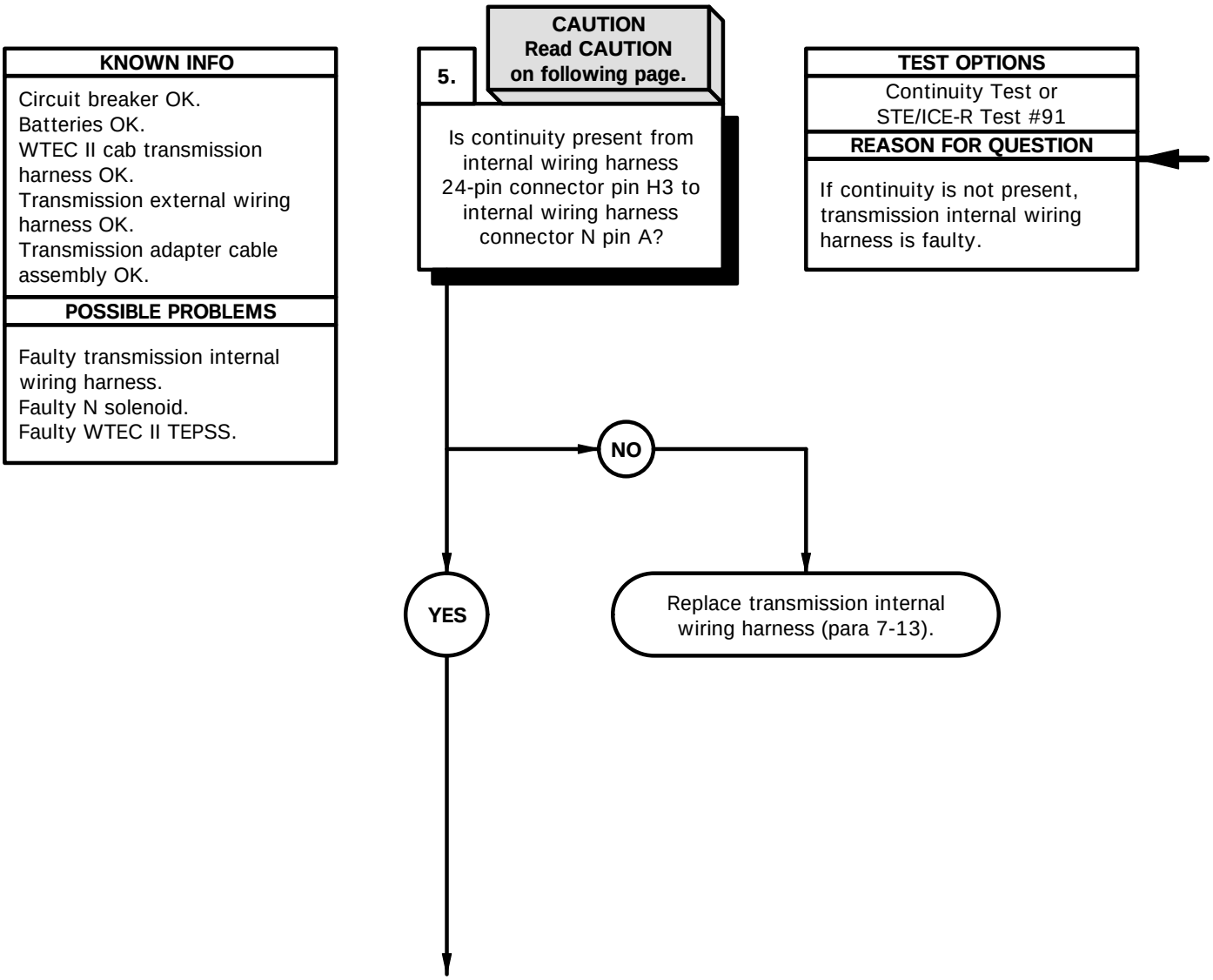
ADAPTER CABLE
31-PIN CONNECTOR



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

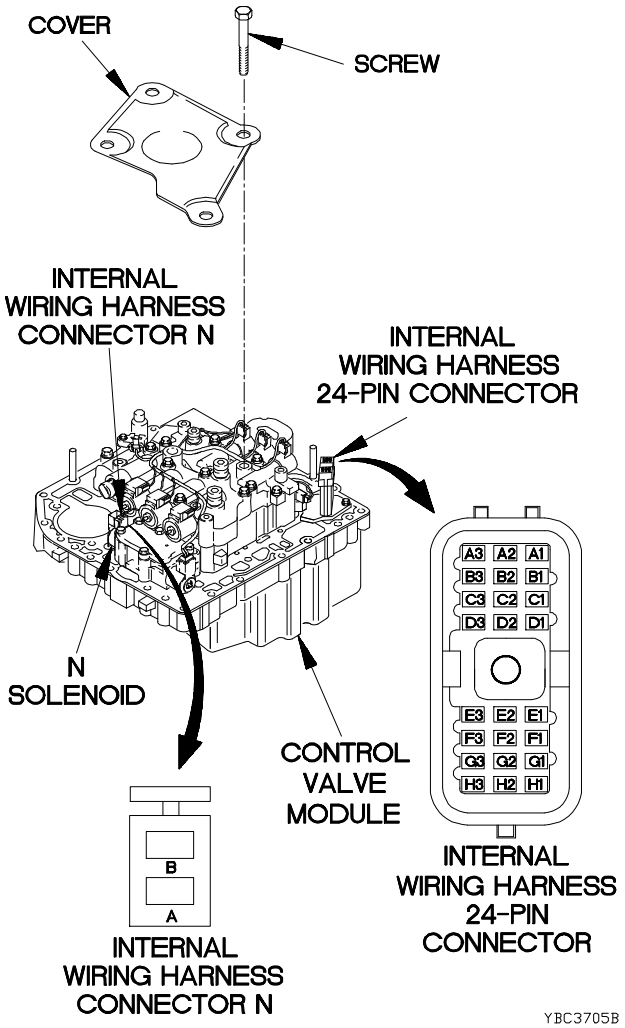
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

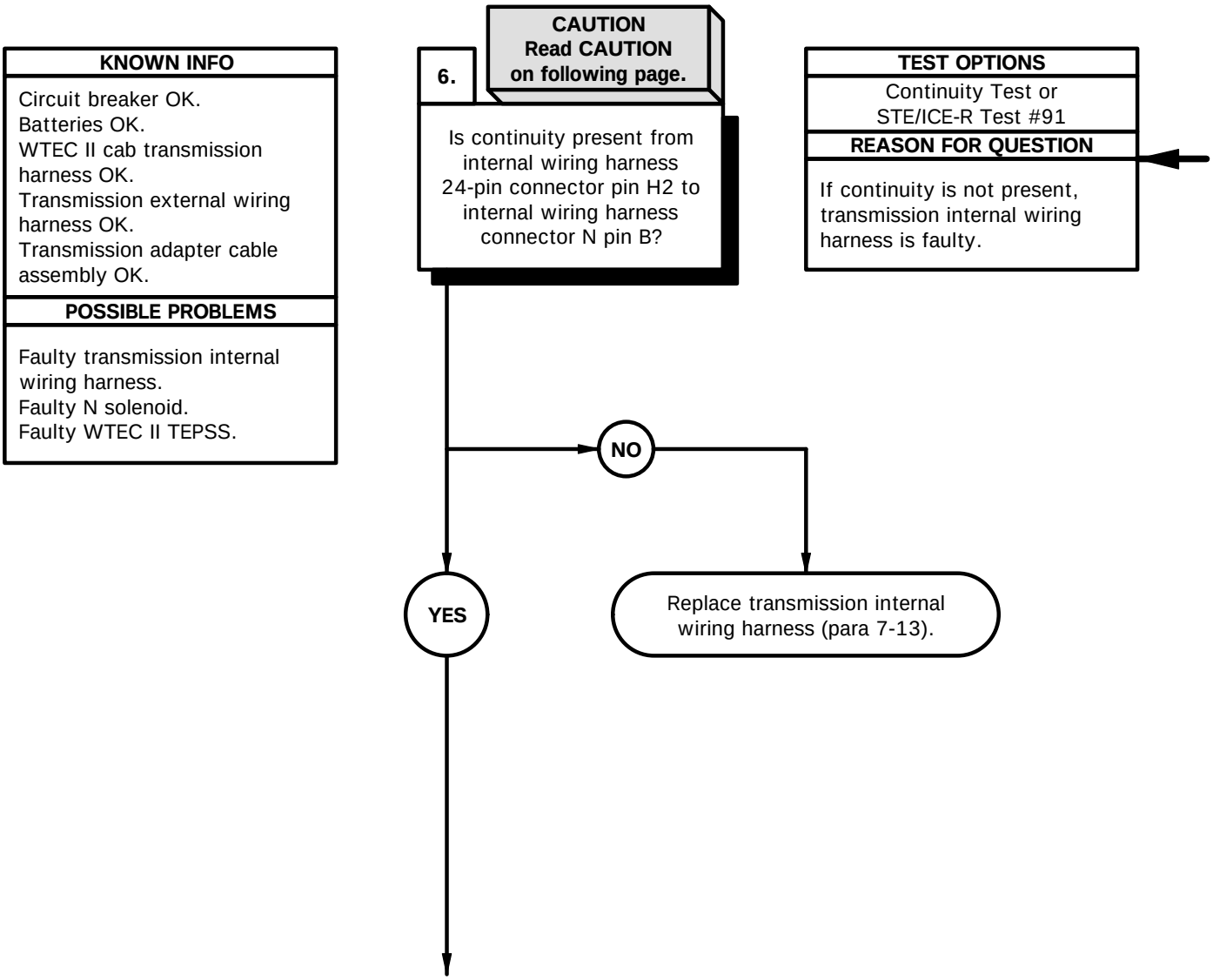
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

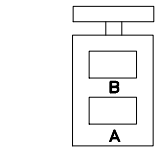
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

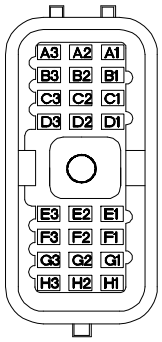
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



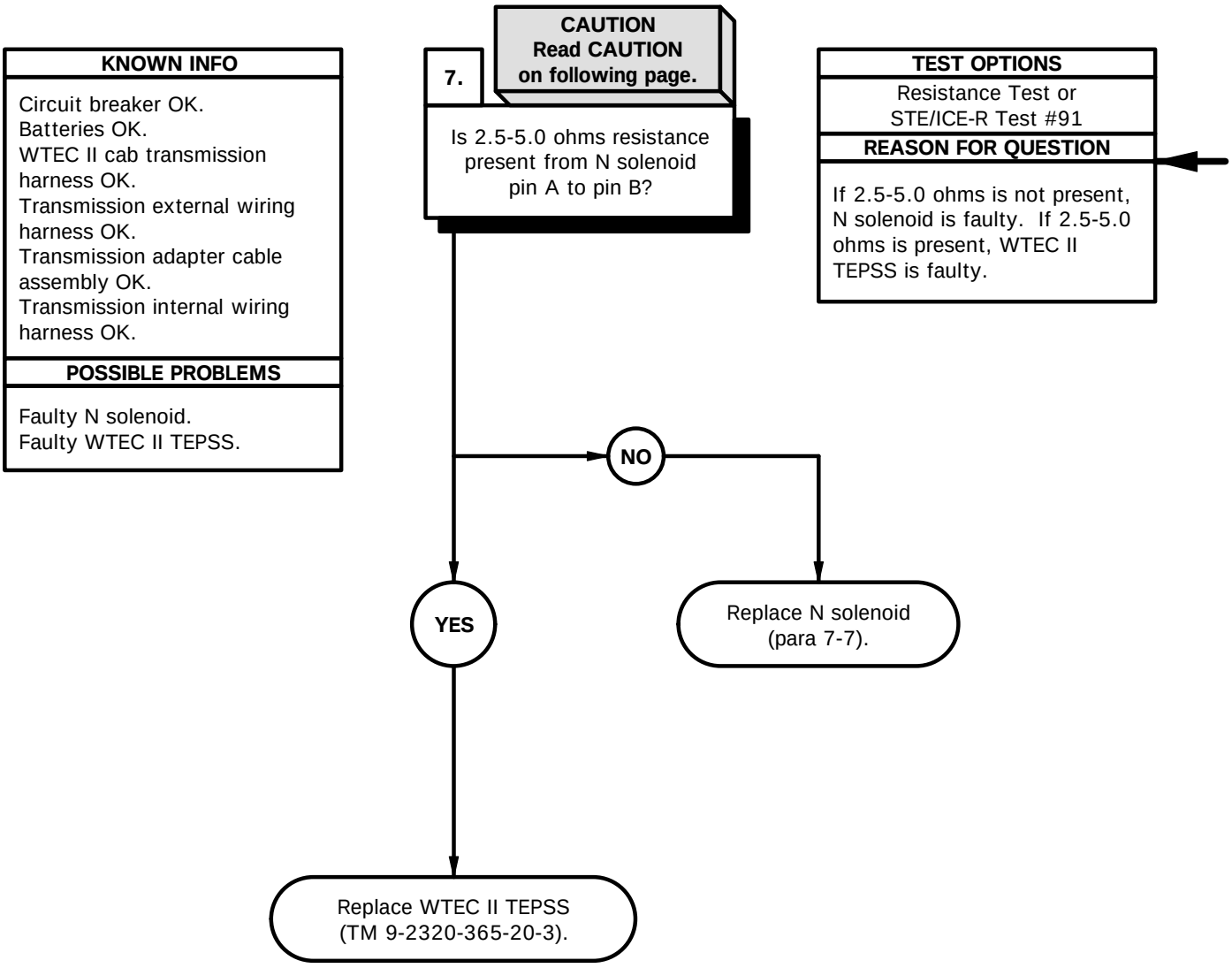
INTERNAL WIRING HARNESS CONNECTOR N



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

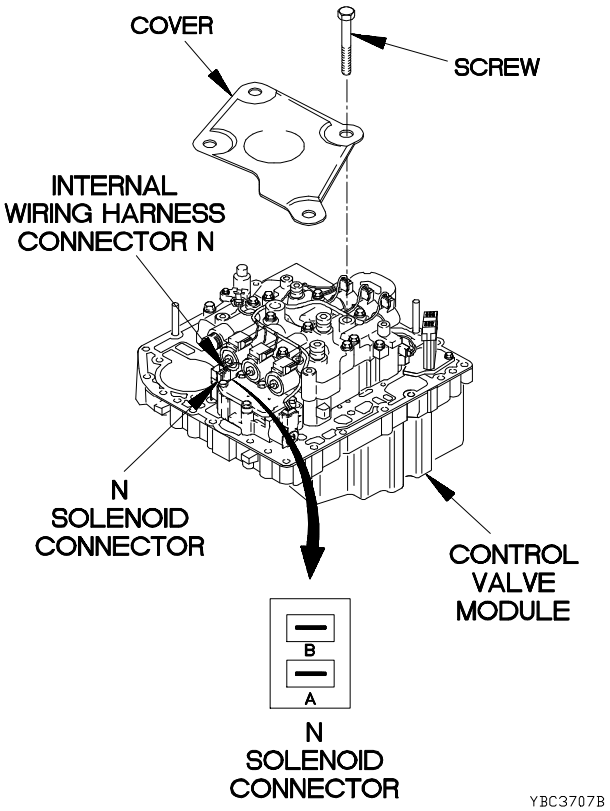
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

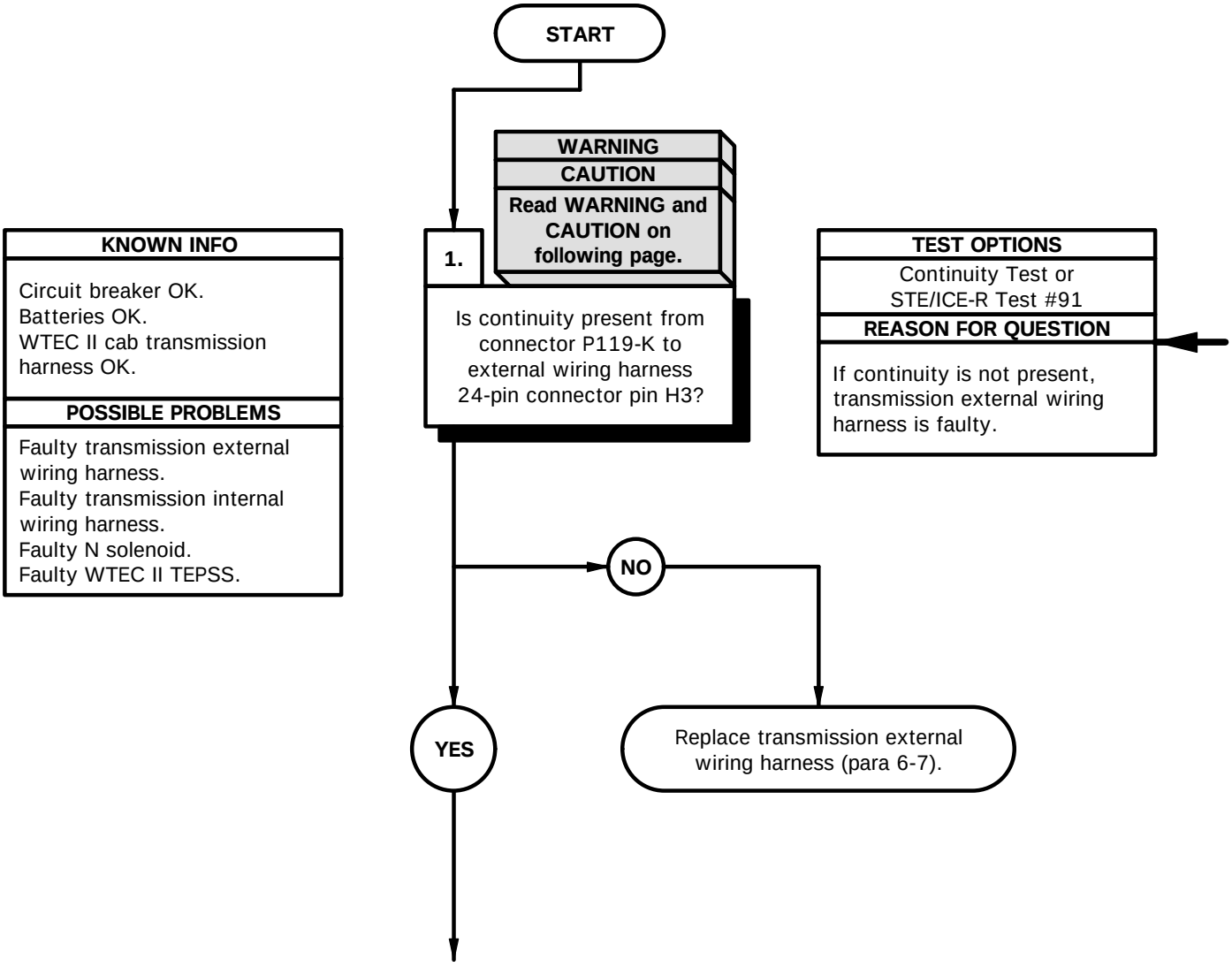
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, 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 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

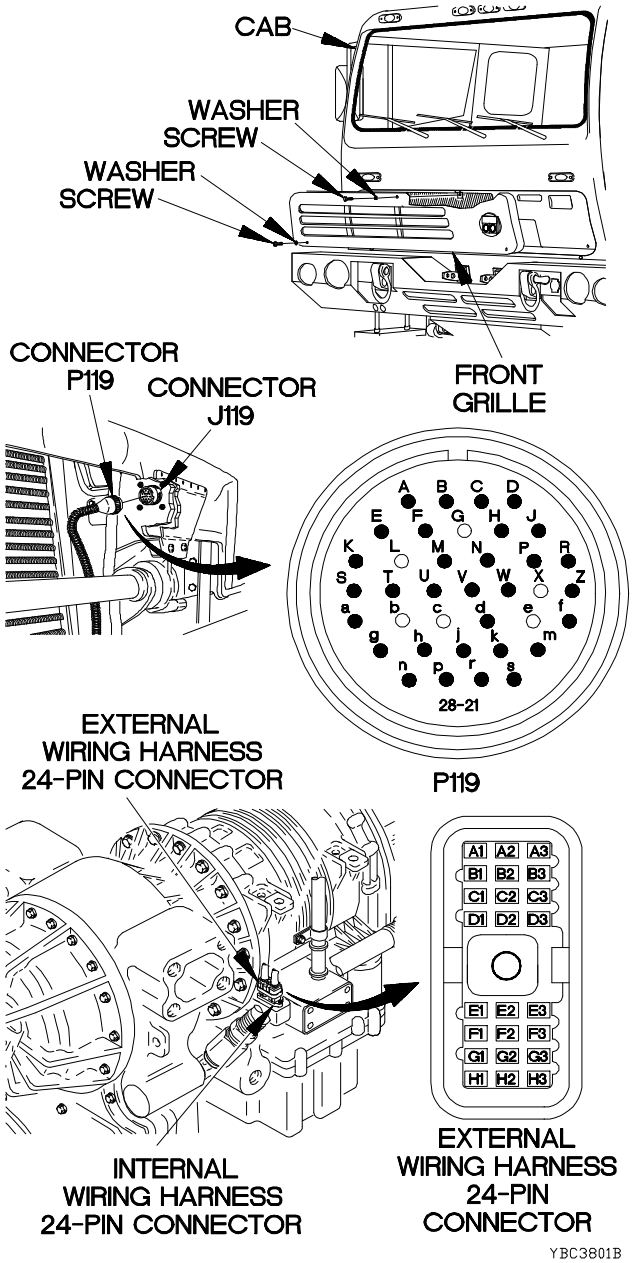
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

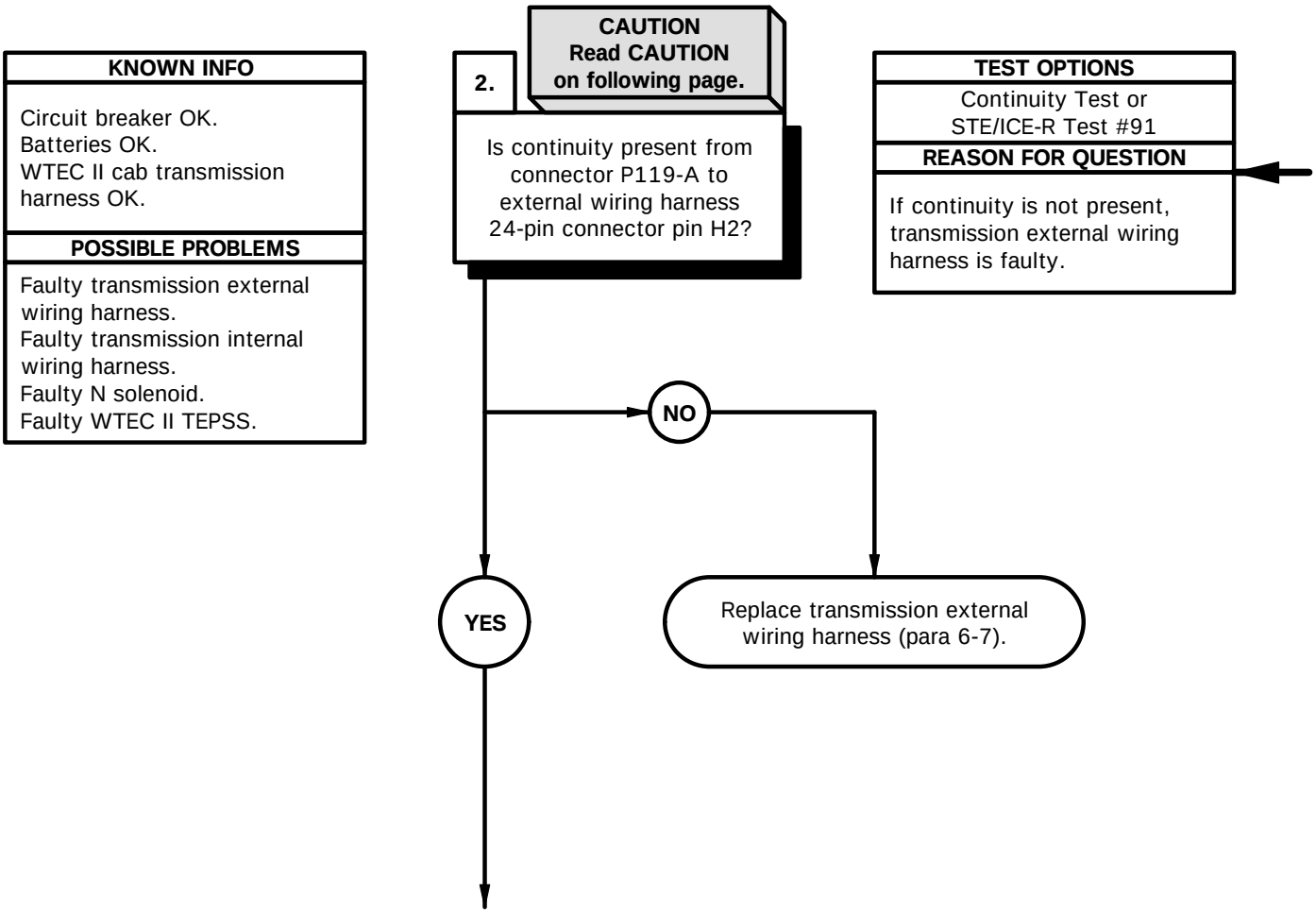
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Loosen screw in external wiring harness 24-pin connector.
(6) Disconnect external wiring harness 24-pin from internal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

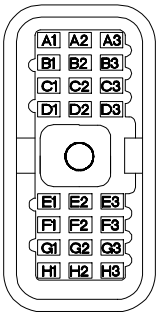
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

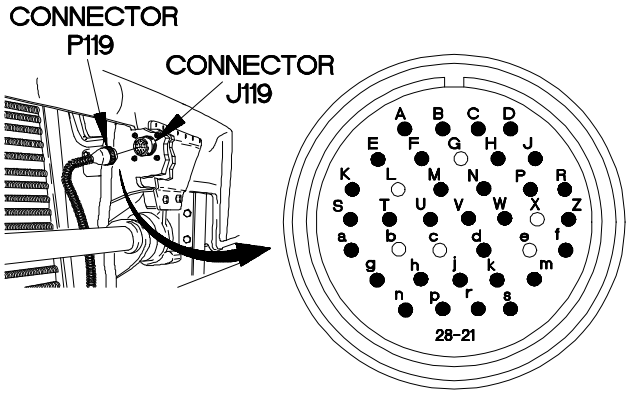
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

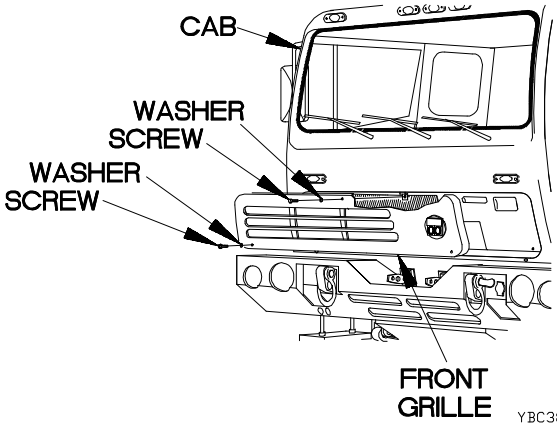
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P119-A.
(3) Connect negative (-) probe of multimeter to external wiring harness 24-pin connector pin H2 and note reading on multimeter.
(4) If continuity is not present, replace transmission external wiring harness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



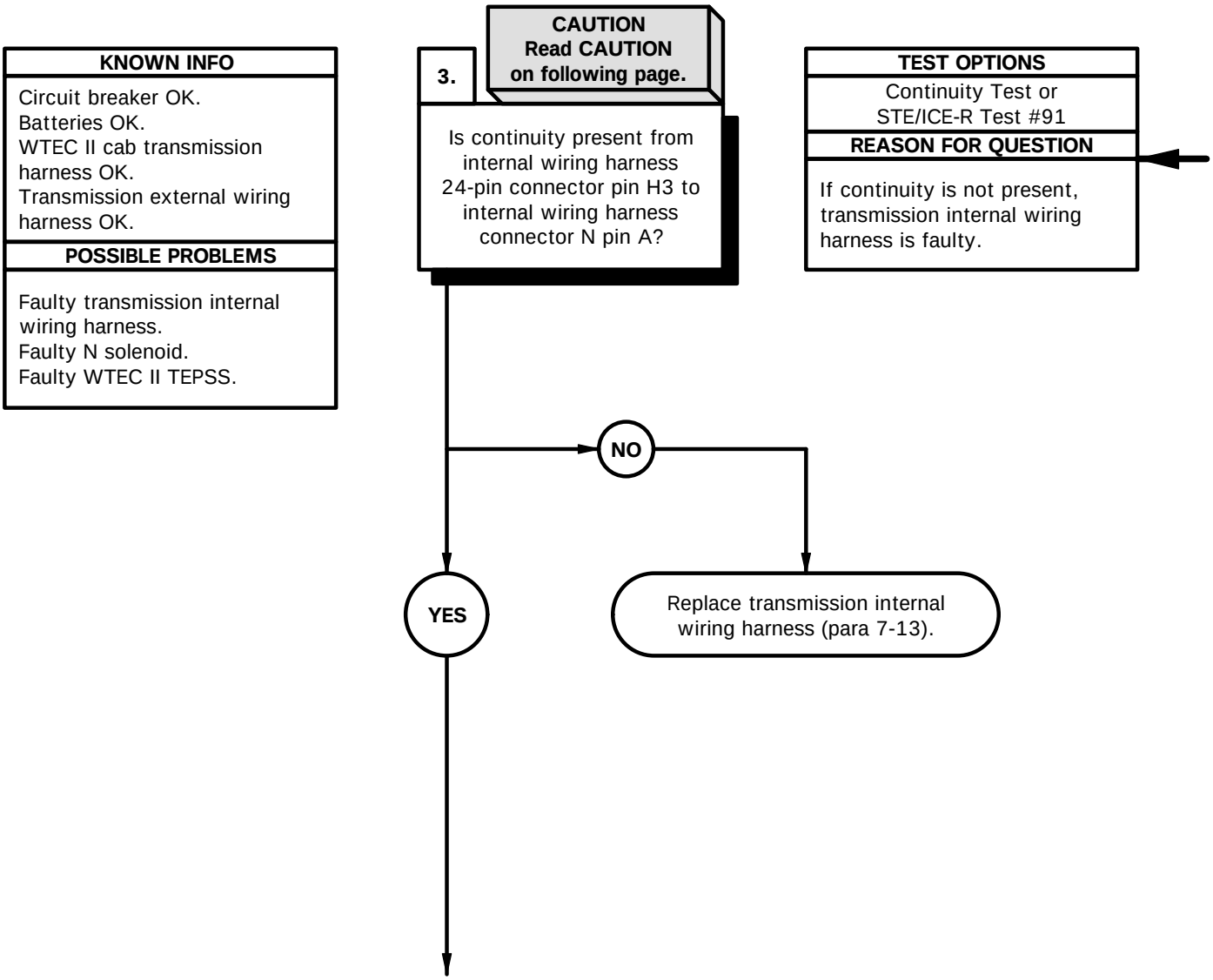
EXTERNAL WIRING HARNESS 24-PIN CONNECTOR



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

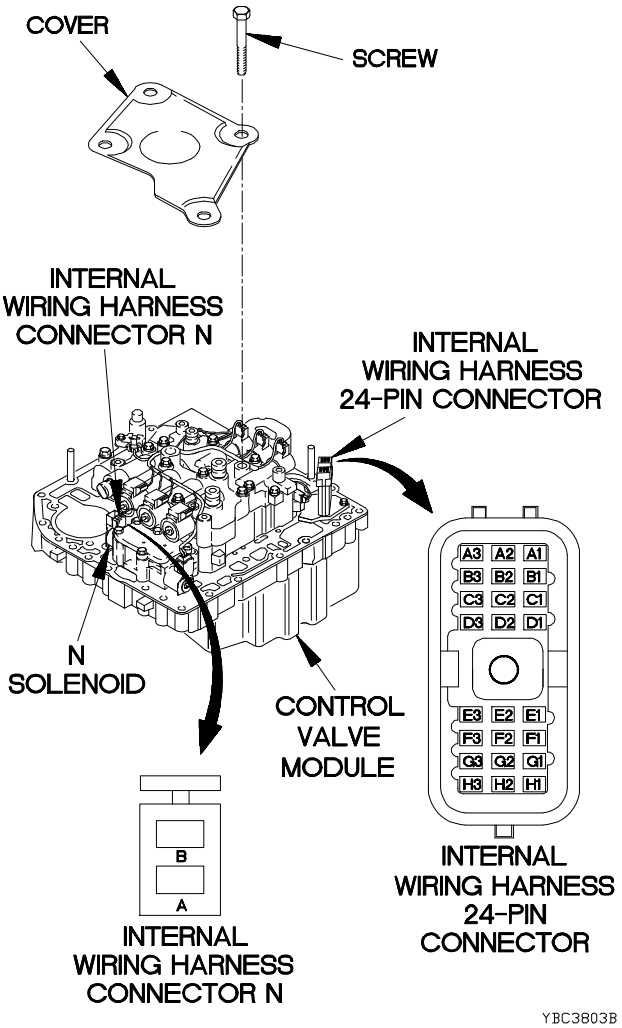
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

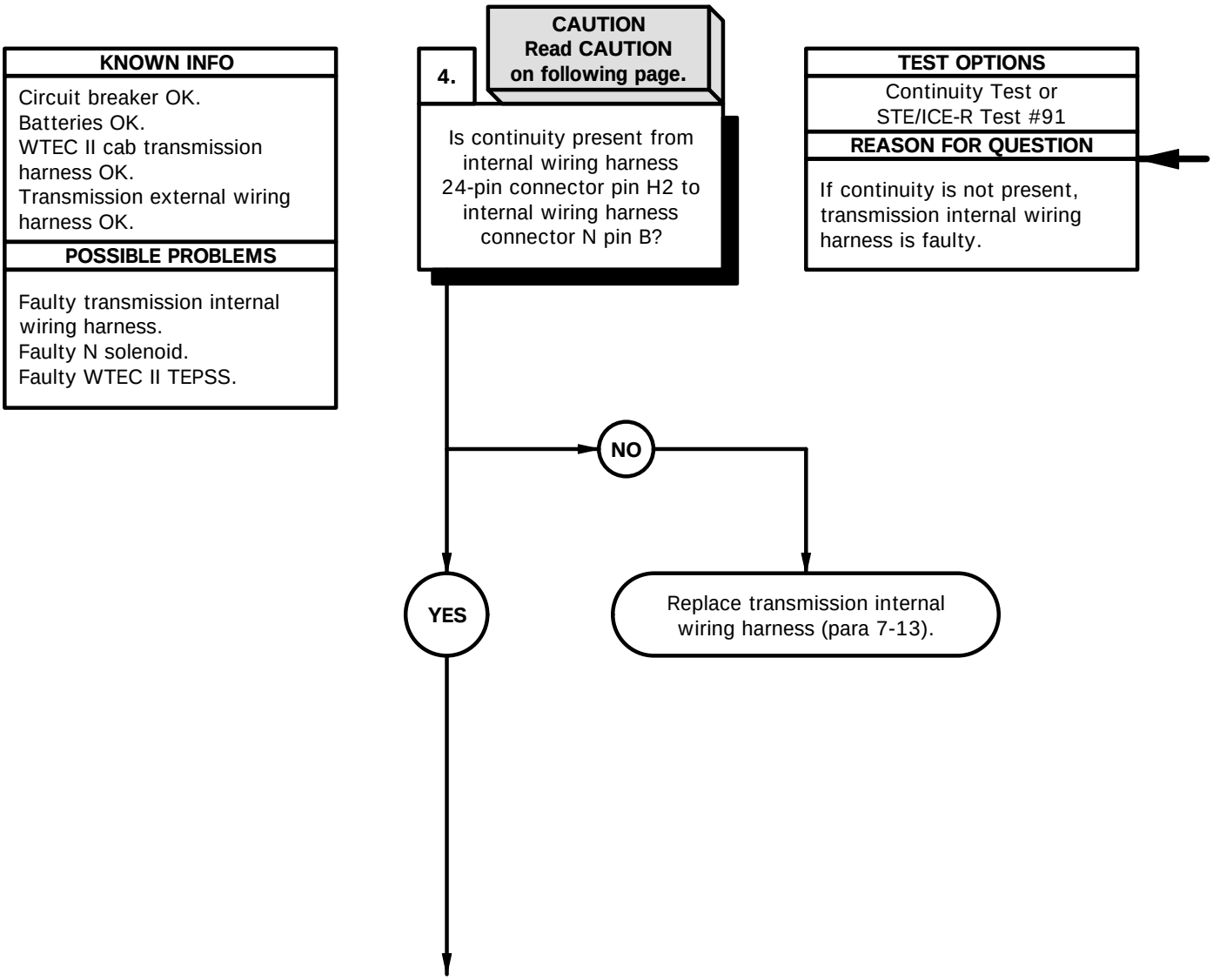
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

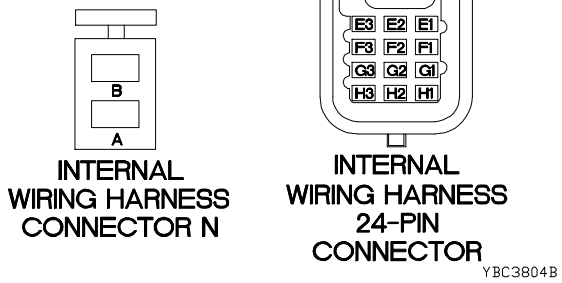
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

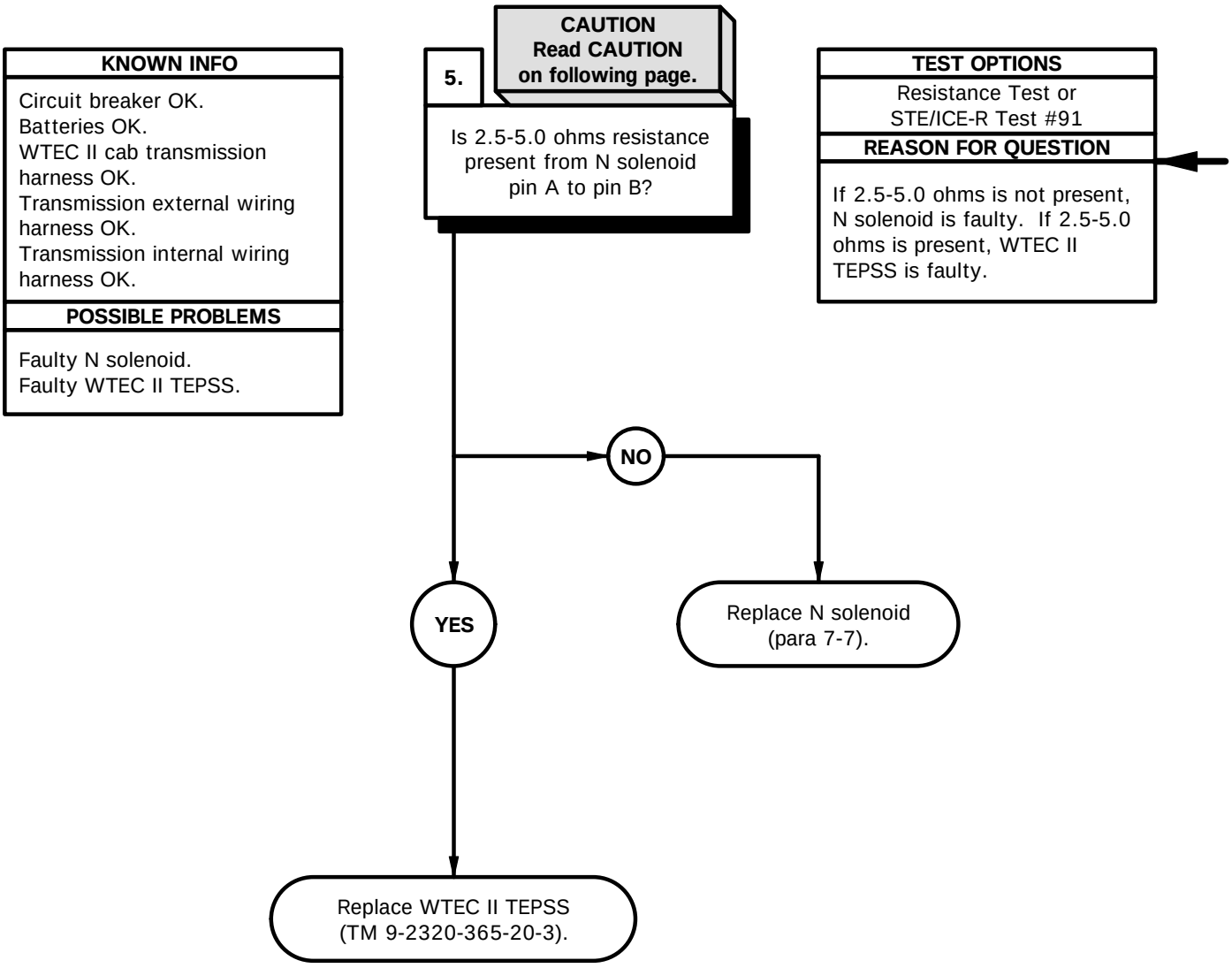
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

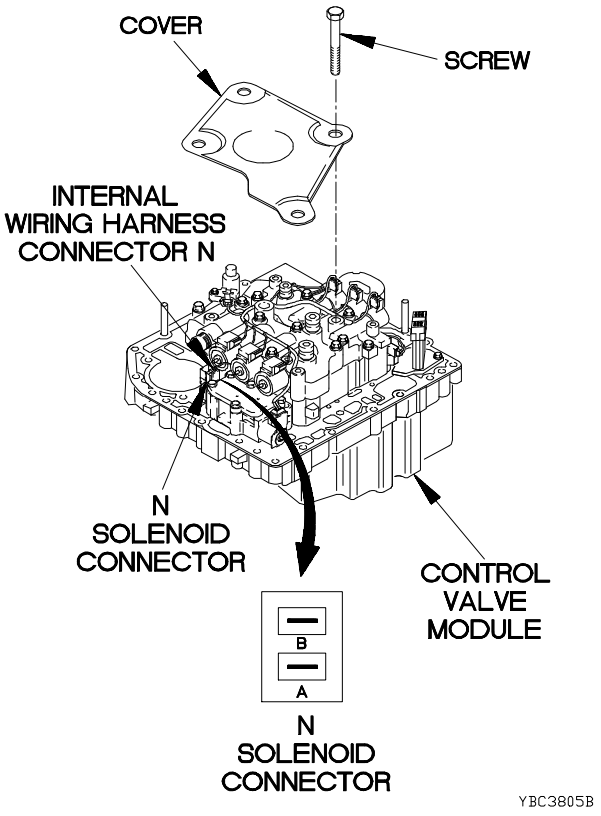
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

INITIAL SETUP

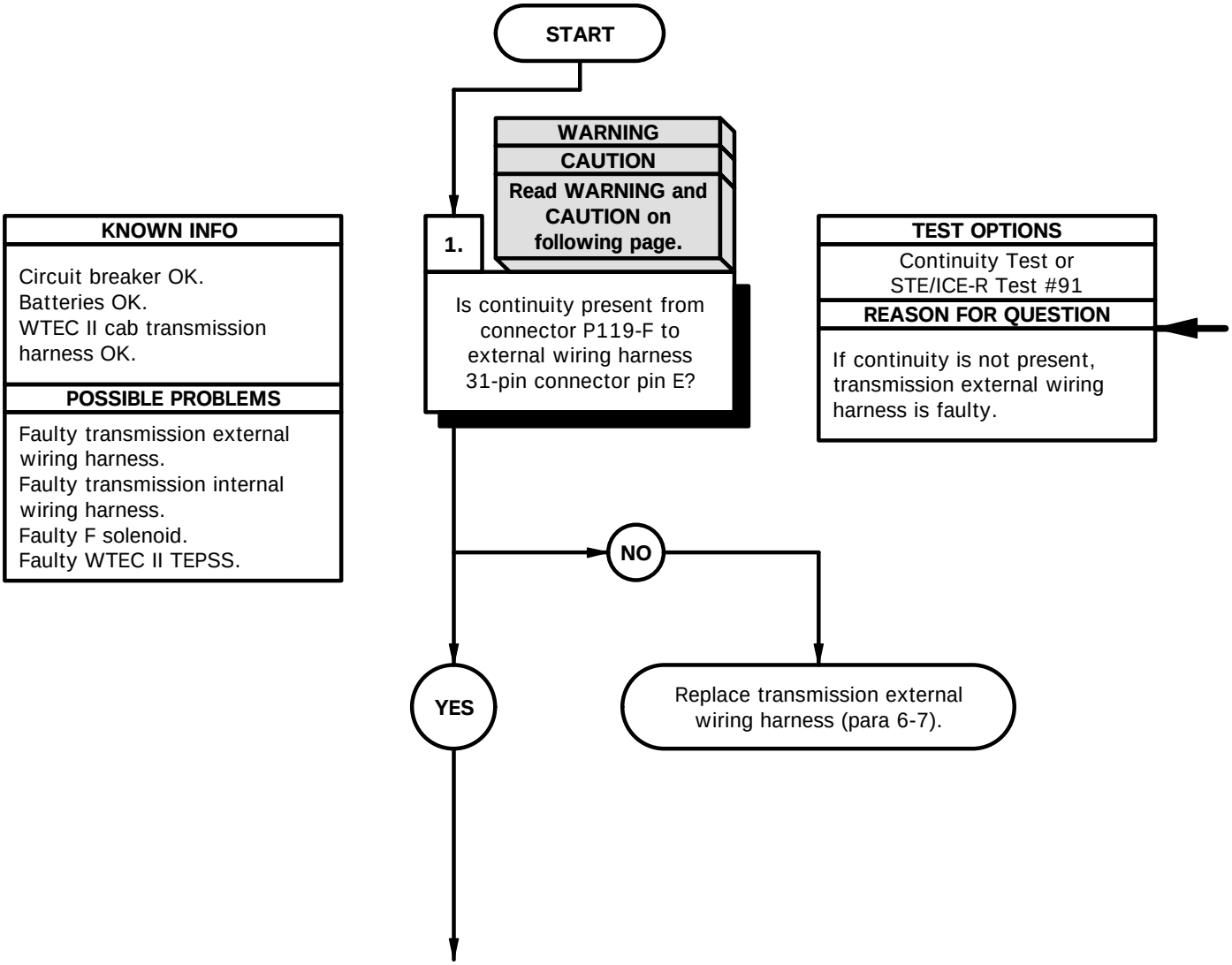
Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)

Materials/Parts
Wire, Elect, 50 ft (Item 94, 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

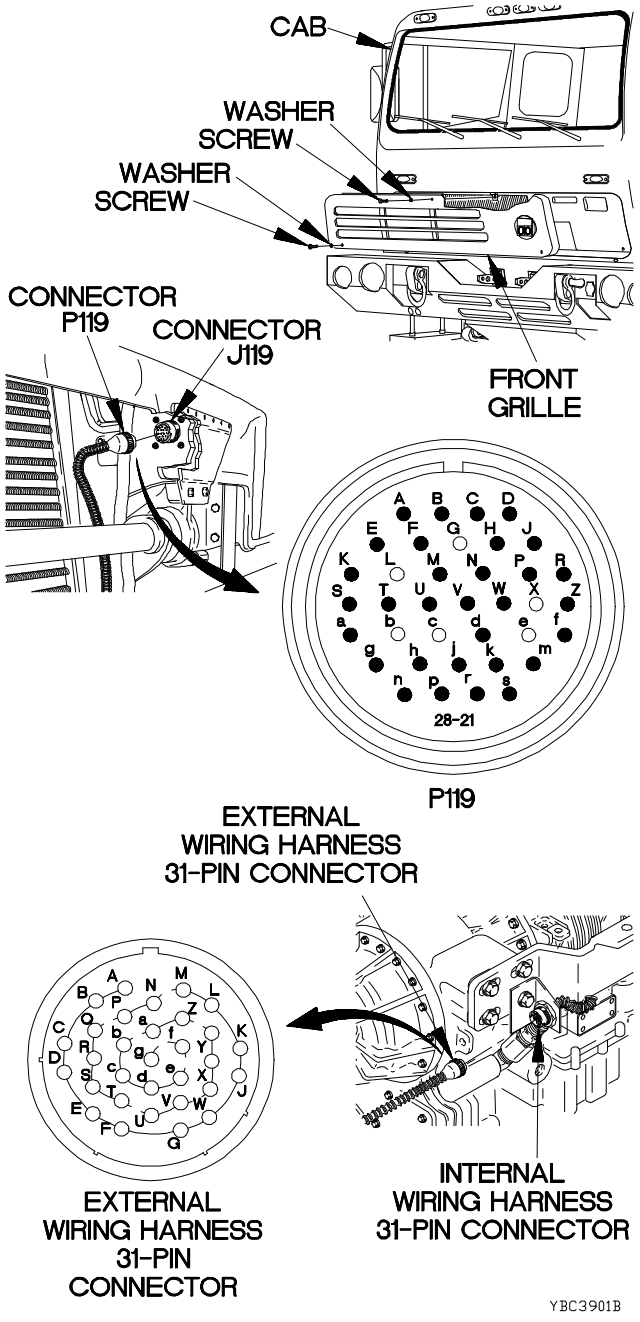
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

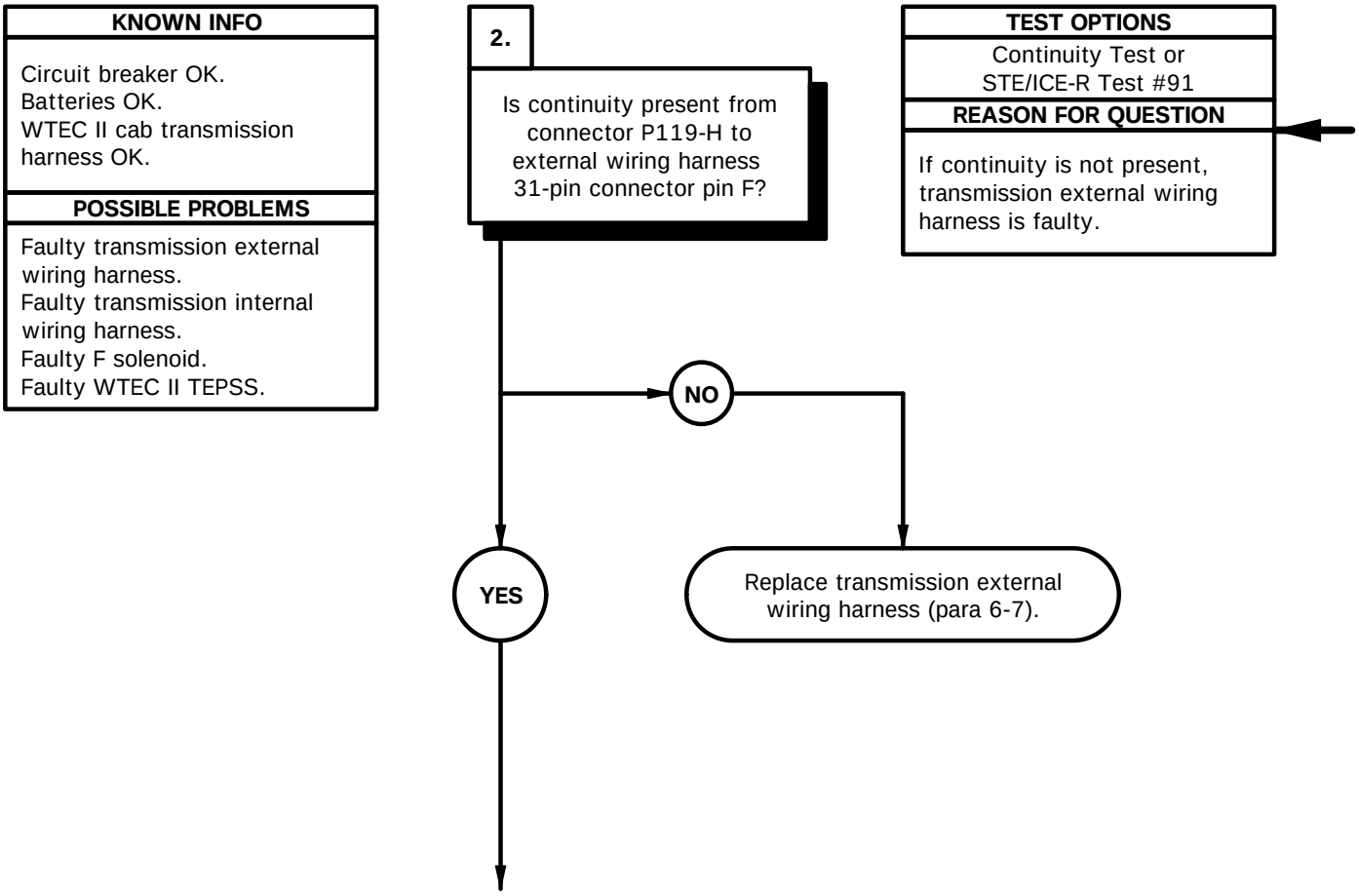
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin connector.
(6) Set multimeter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

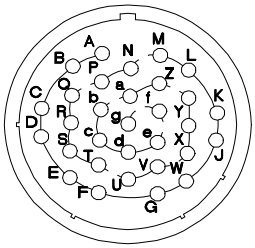


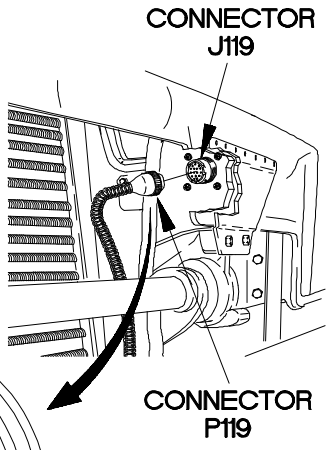
c39. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

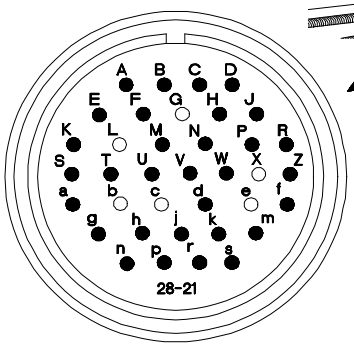


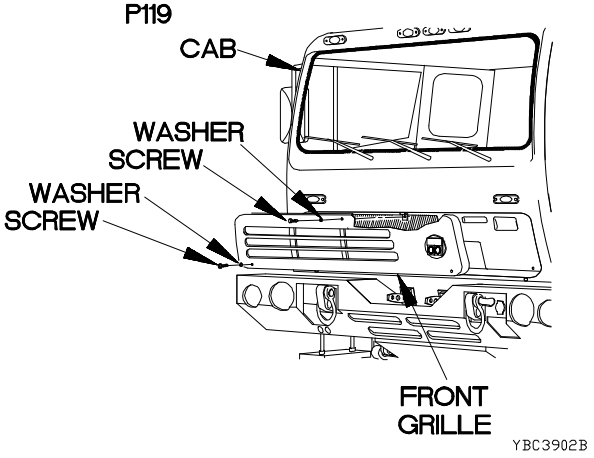
CONTINUITY TEST

(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).

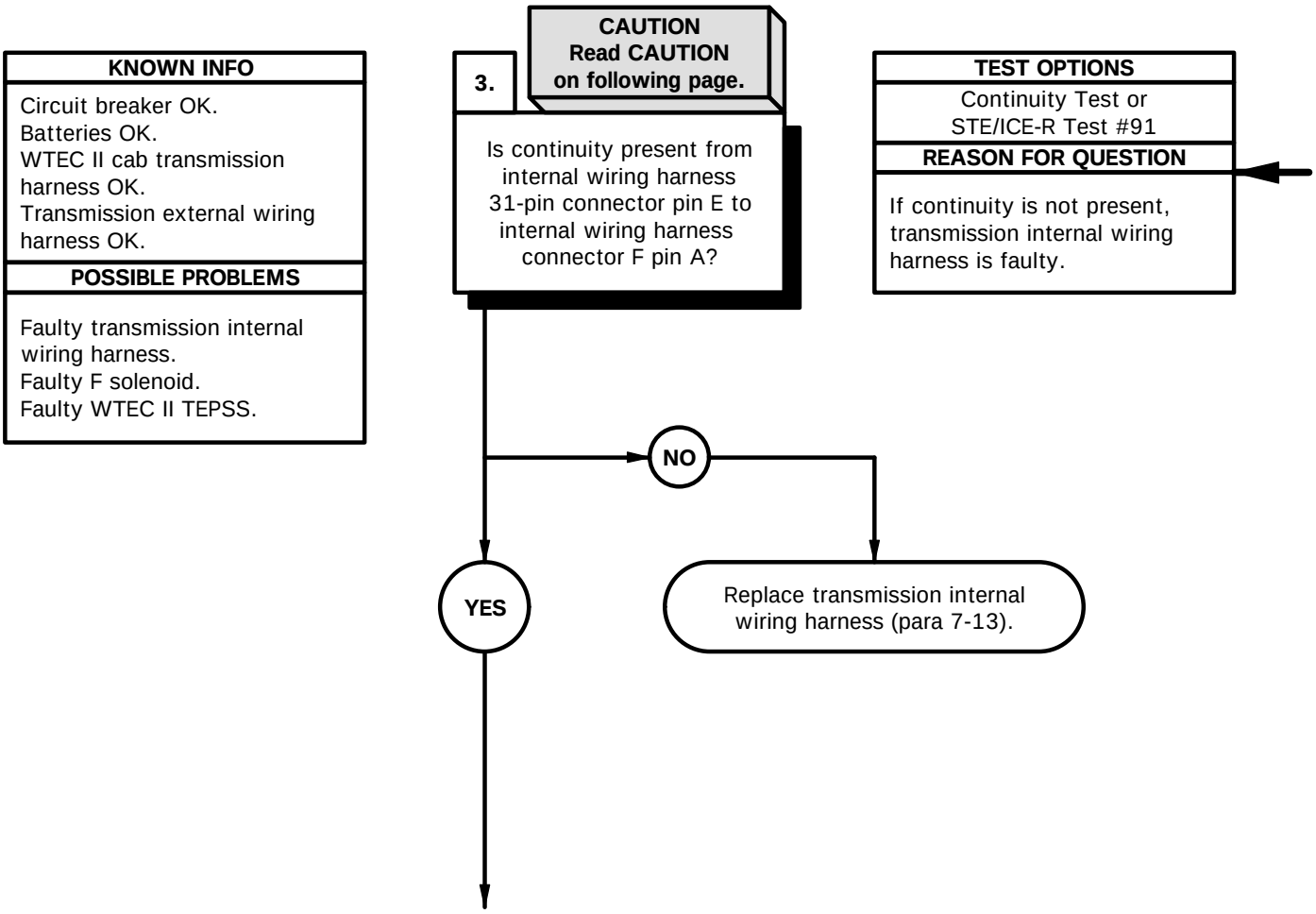








c39. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

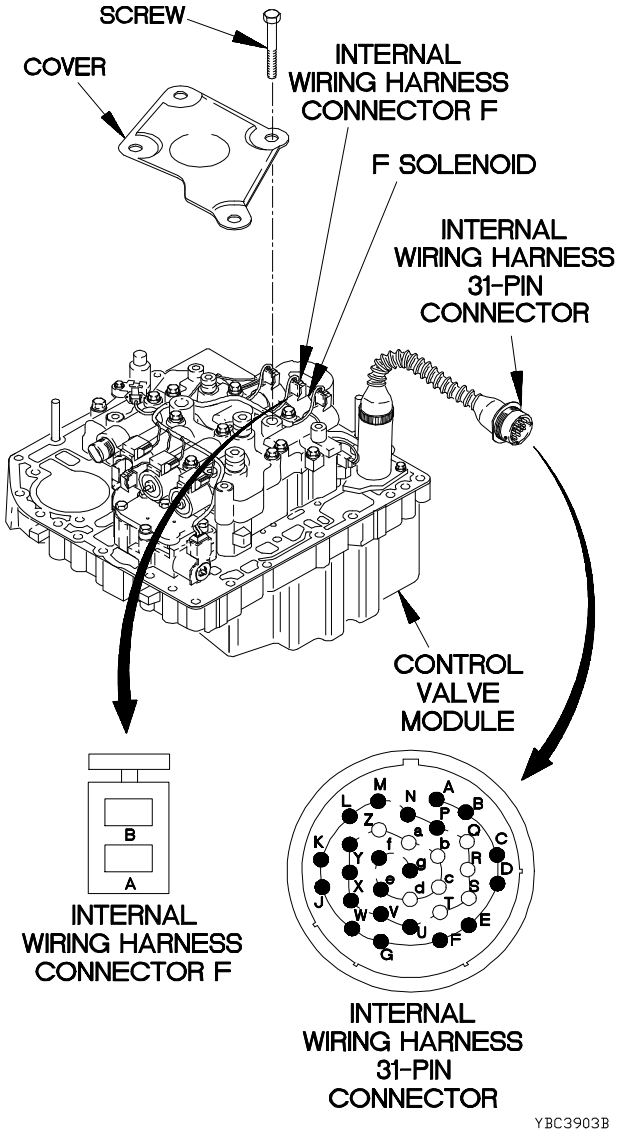


CAUTION

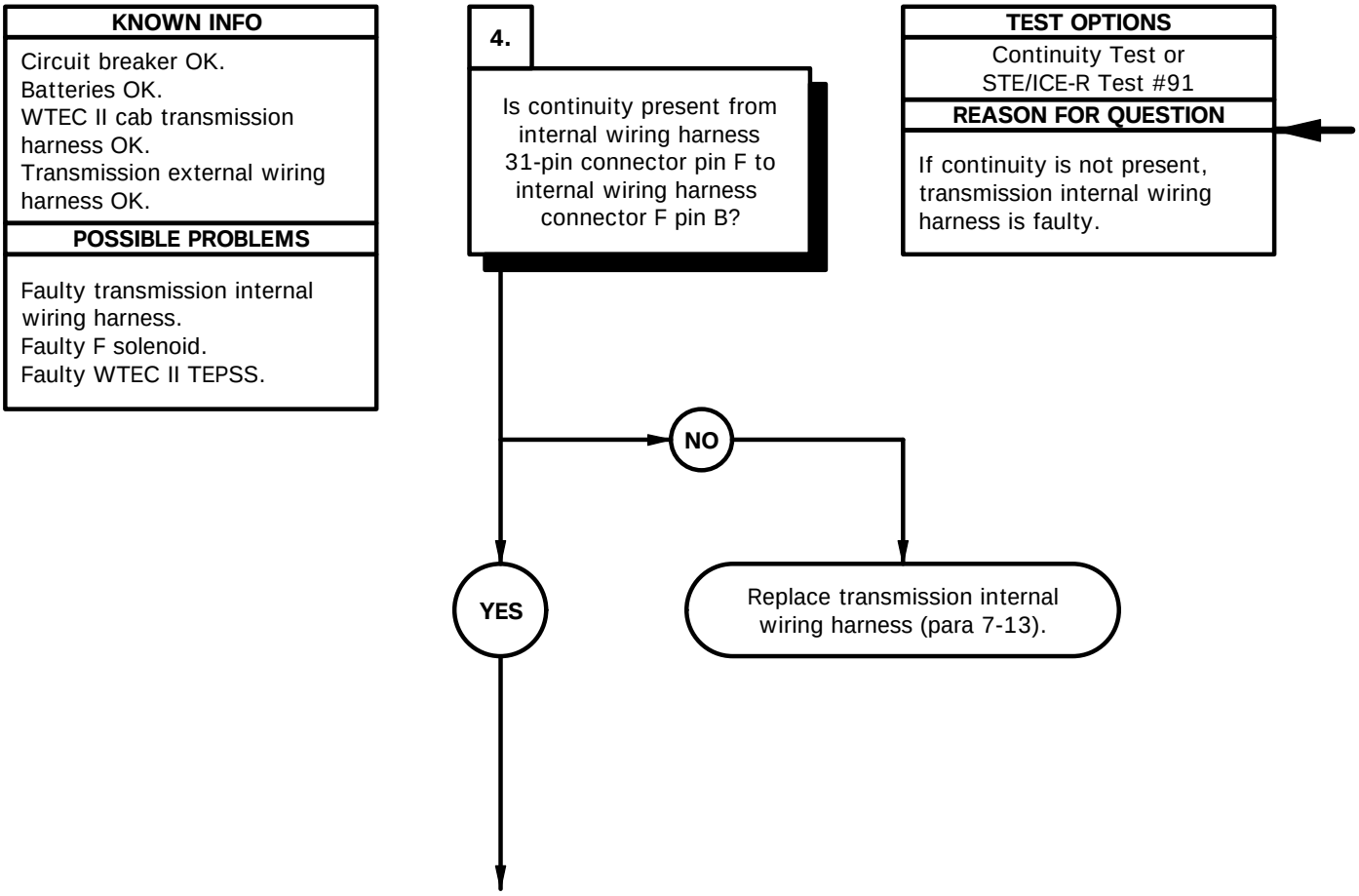
Use care when disconnecting wire harness connectors. Failure to comply may result in damage to equipment.

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).

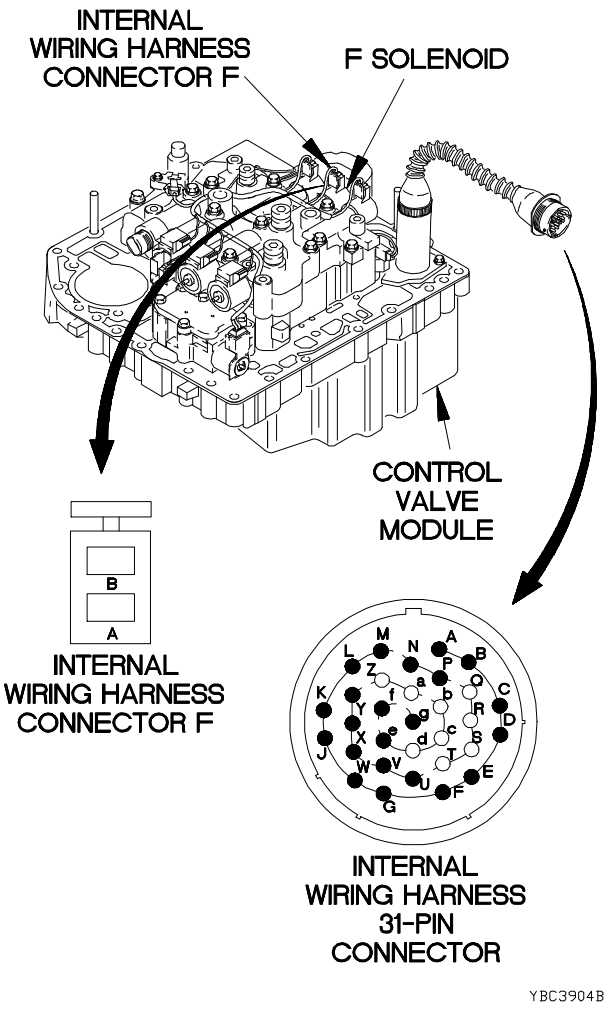


c39. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

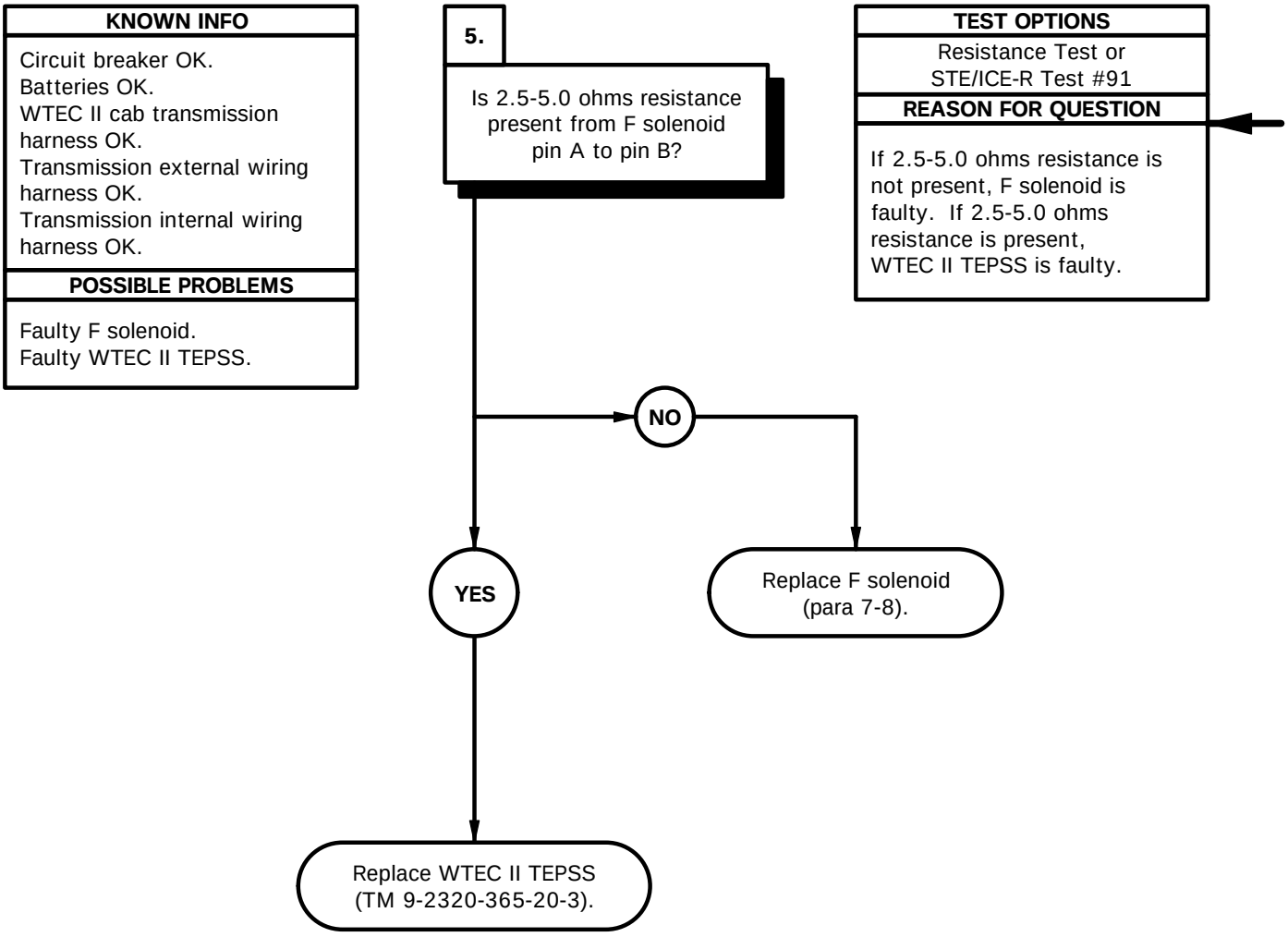


CONTINUITY TEST

(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).

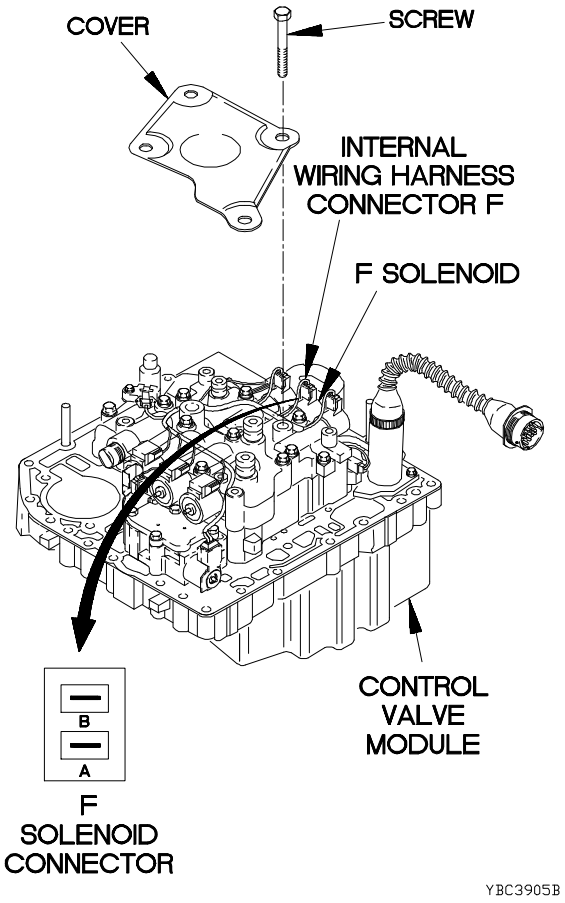


c39. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

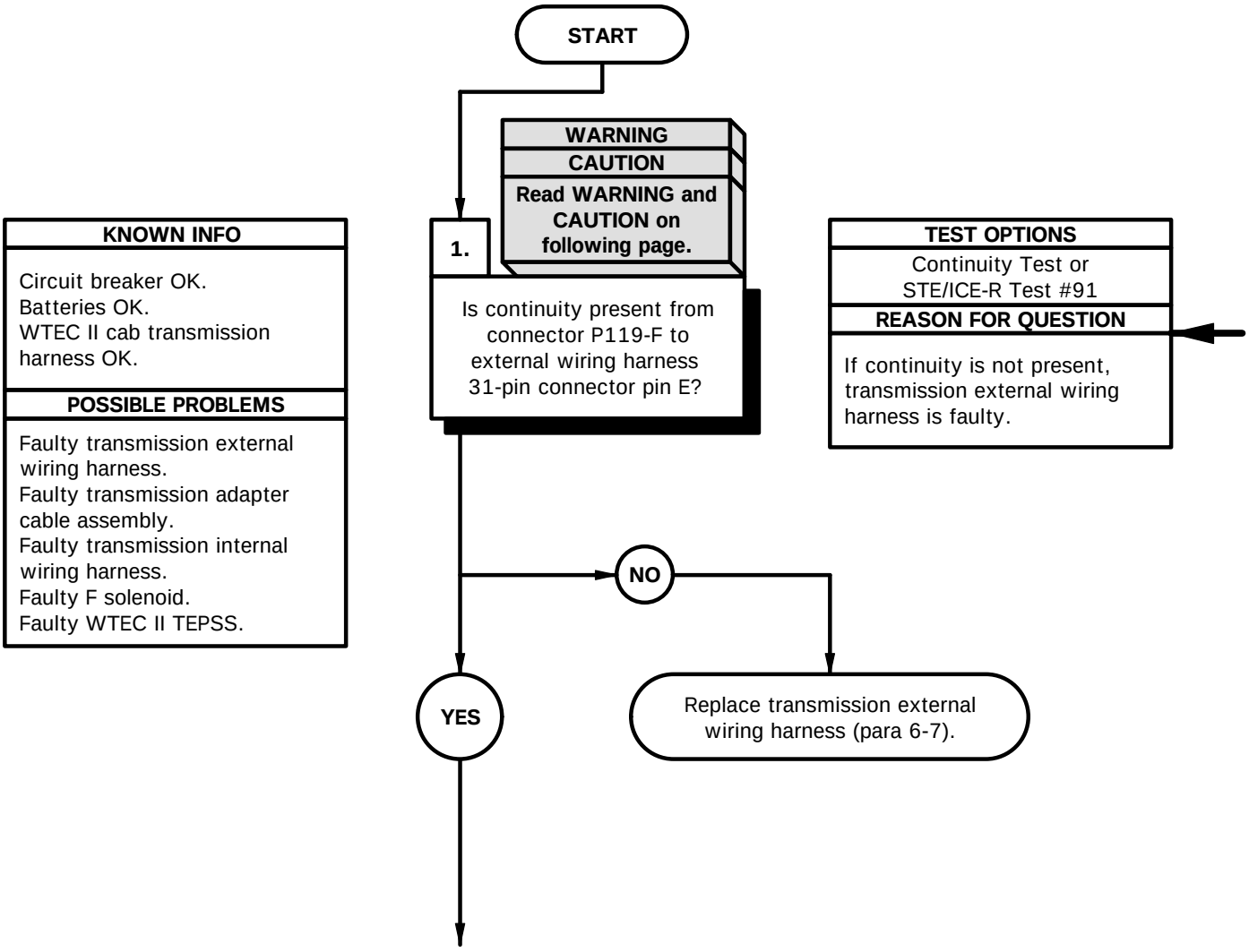
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

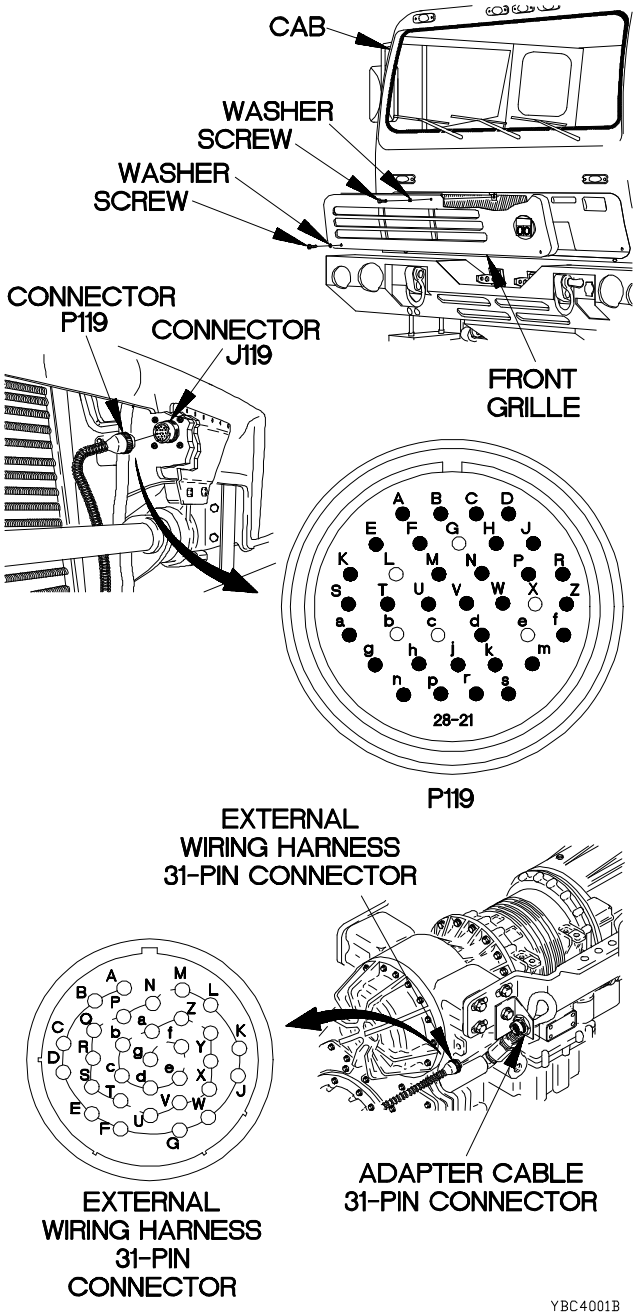
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

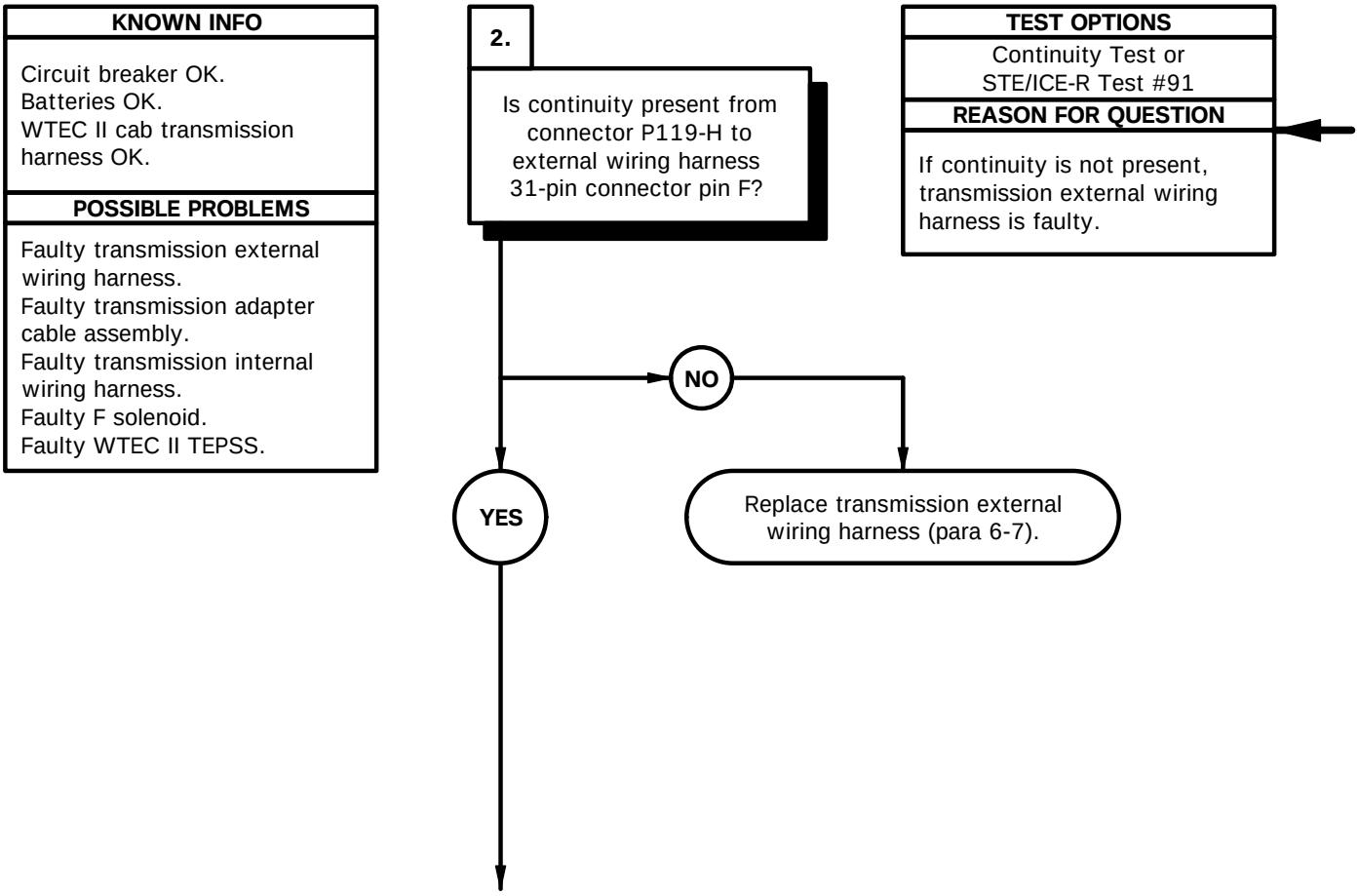
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from adapter cable 31-pin connector.
(6) Set multimeter to ohms.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

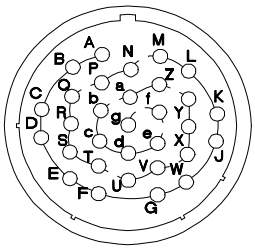


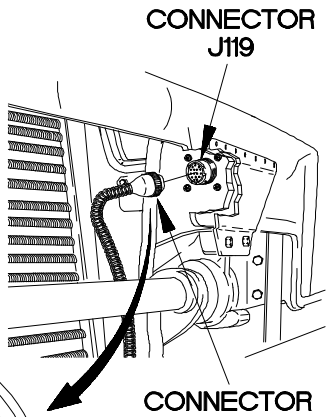
c40. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

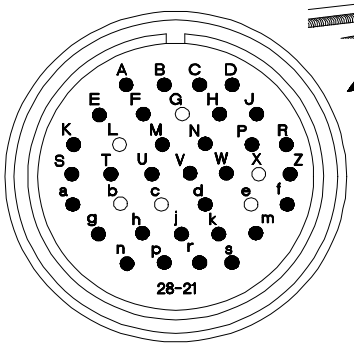


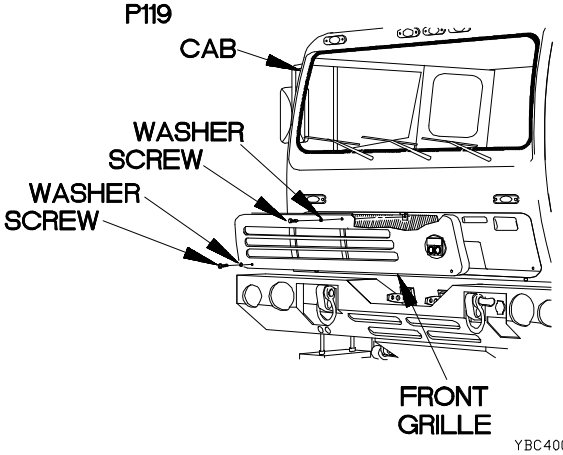
CONTINUITY TEST

(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).

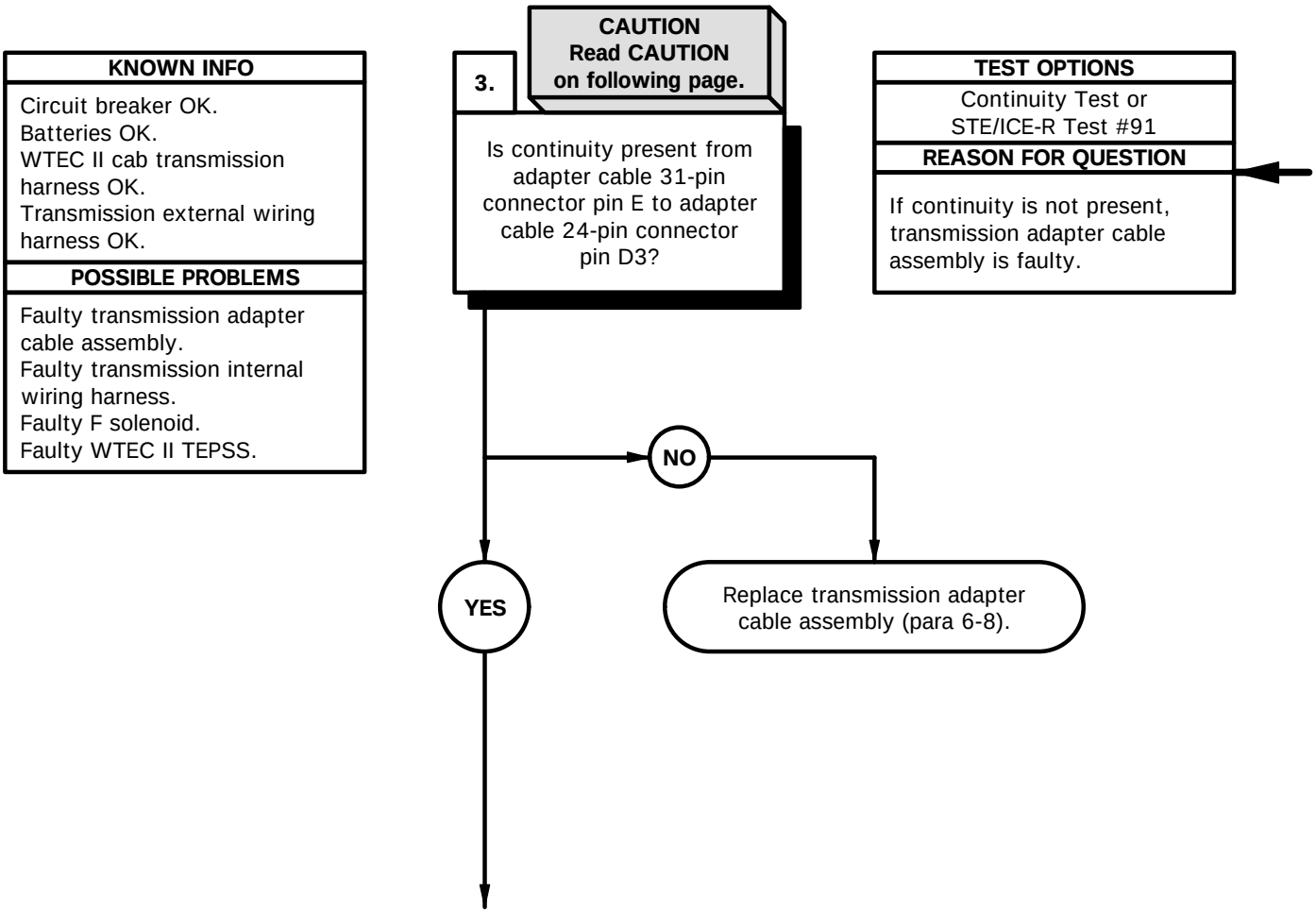








c40. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

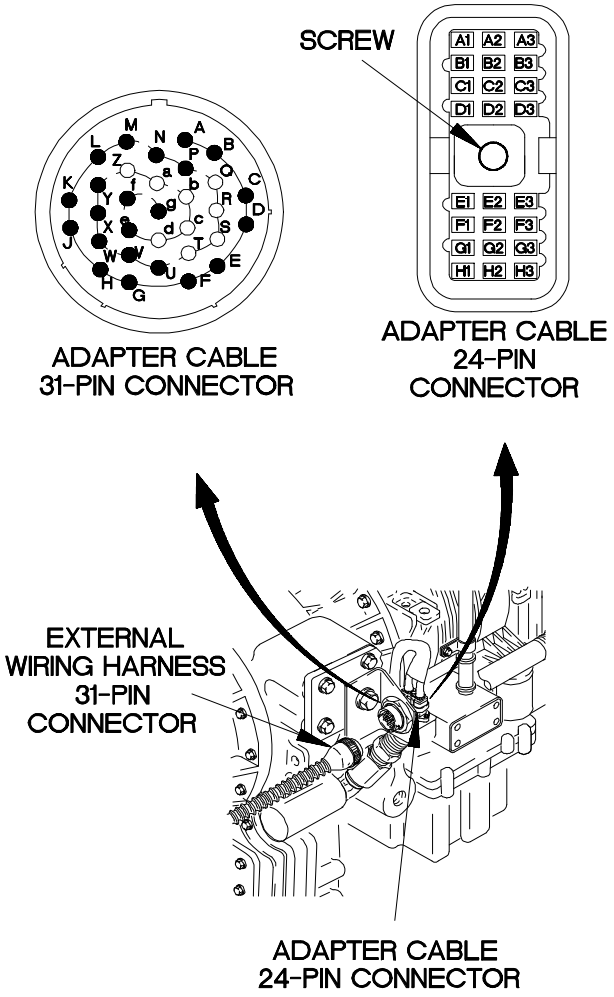


CAUTION

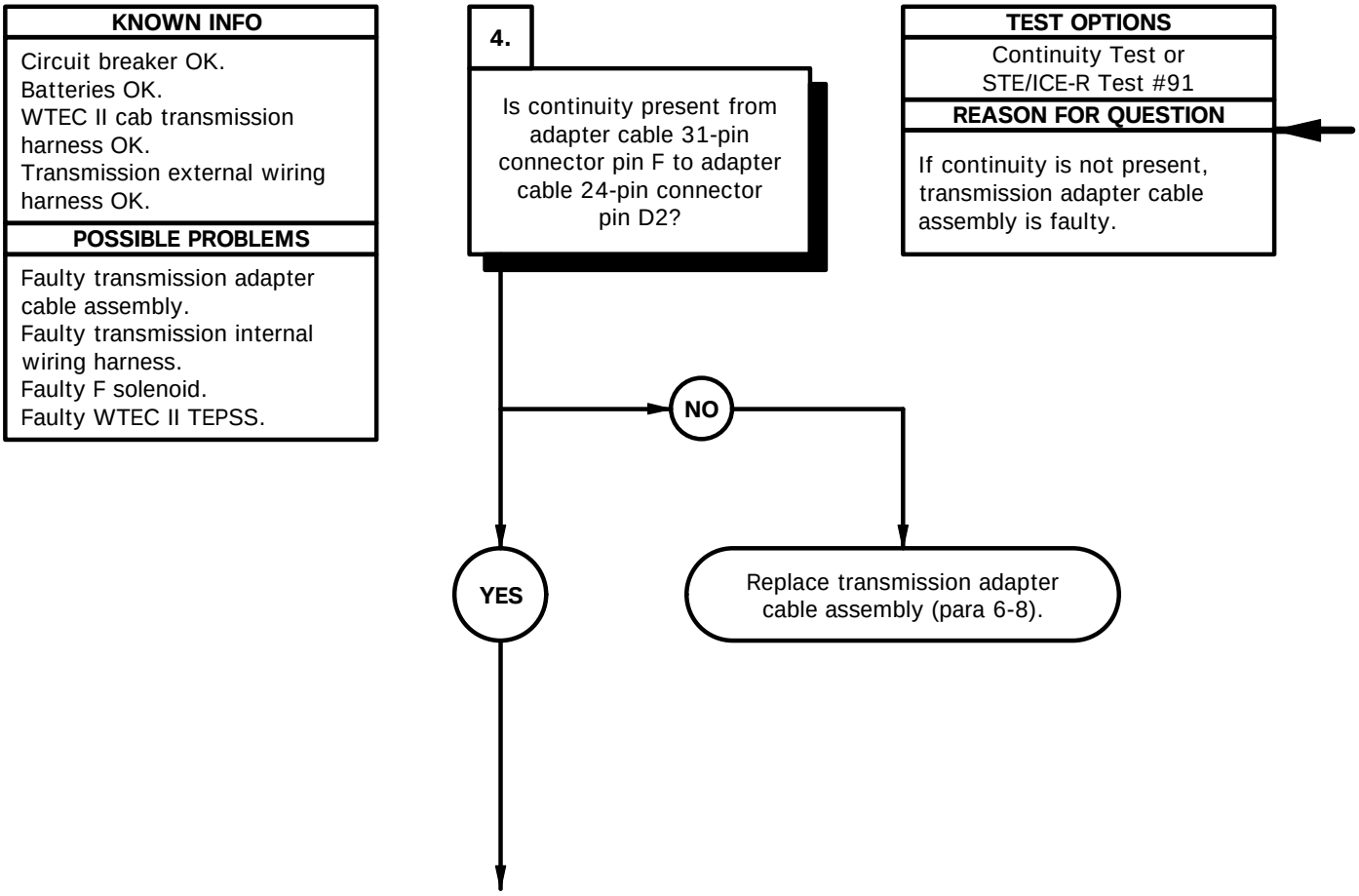
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

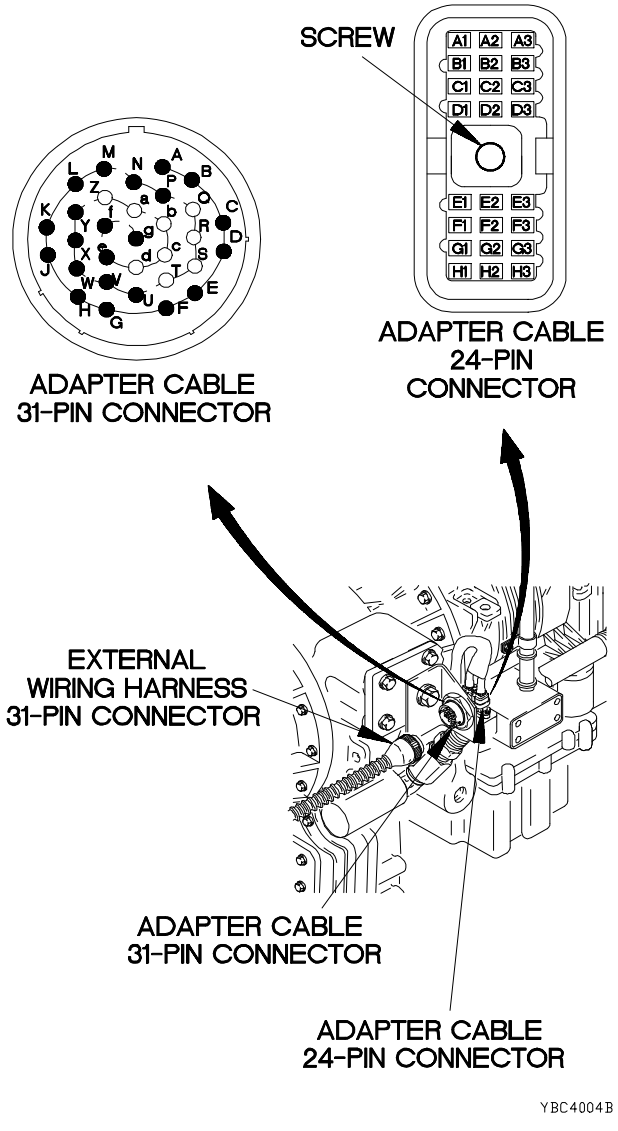


c40. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

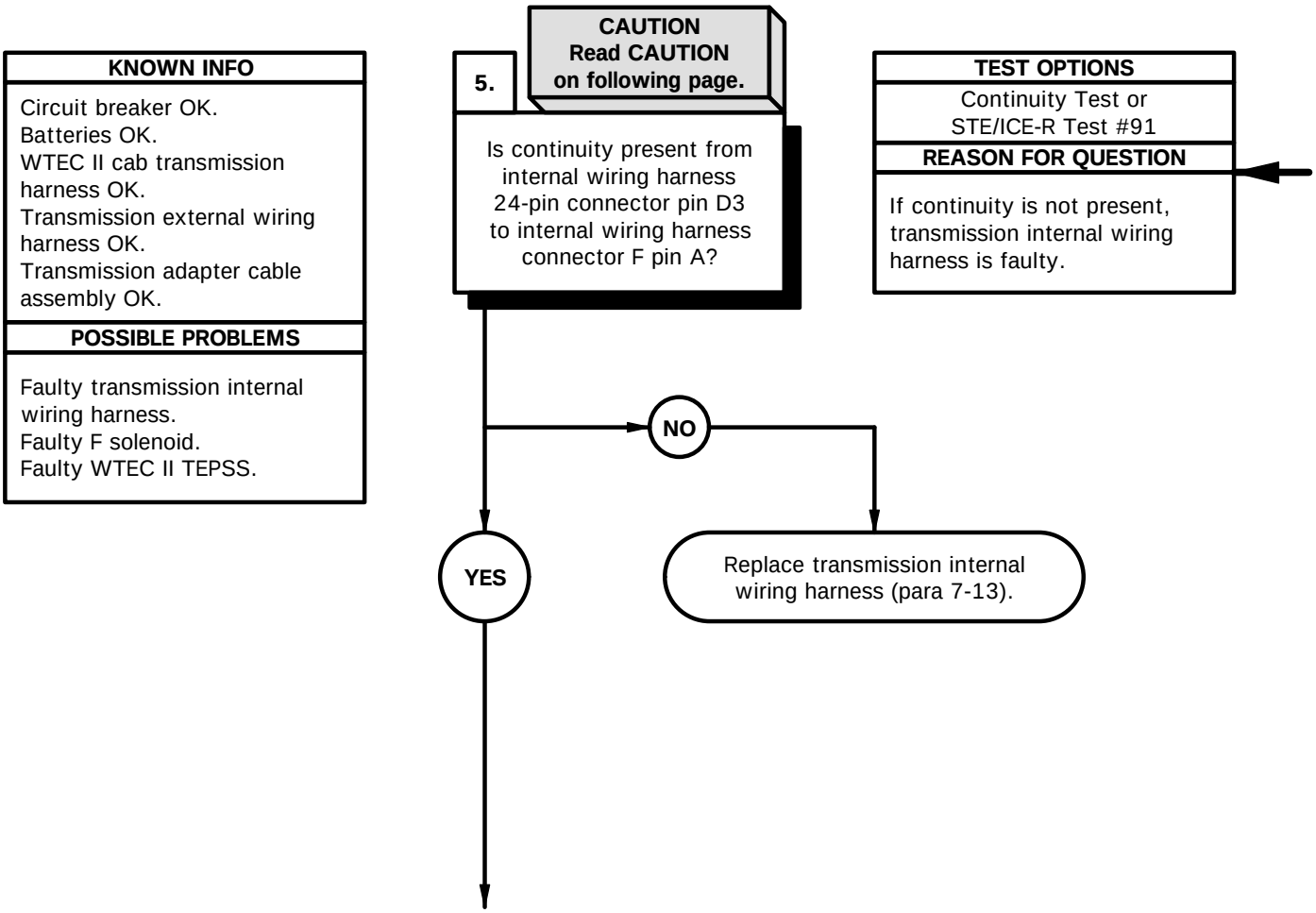


CONTINUITY TEST

(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)

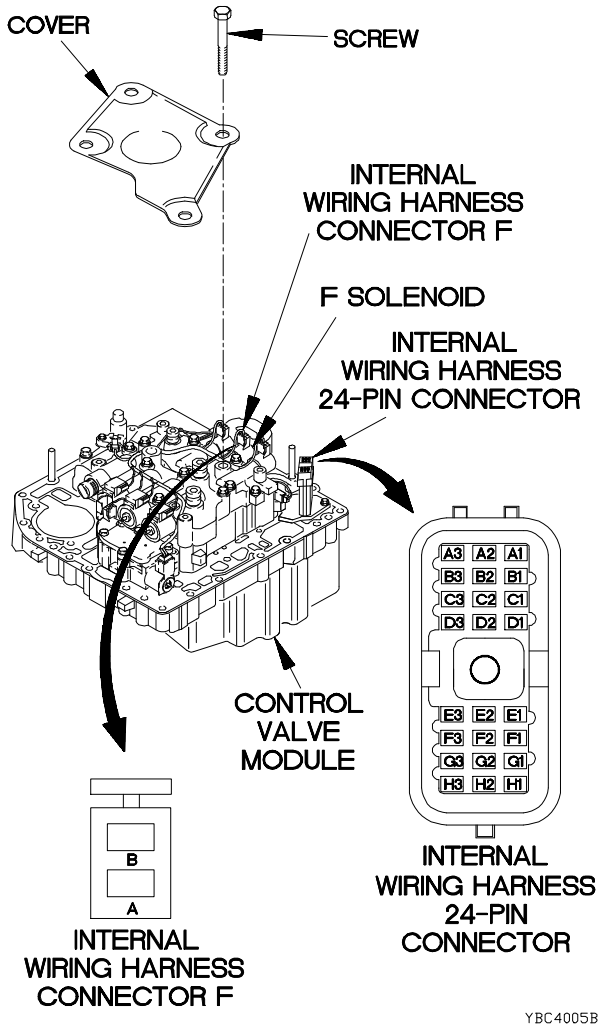


CAUTION

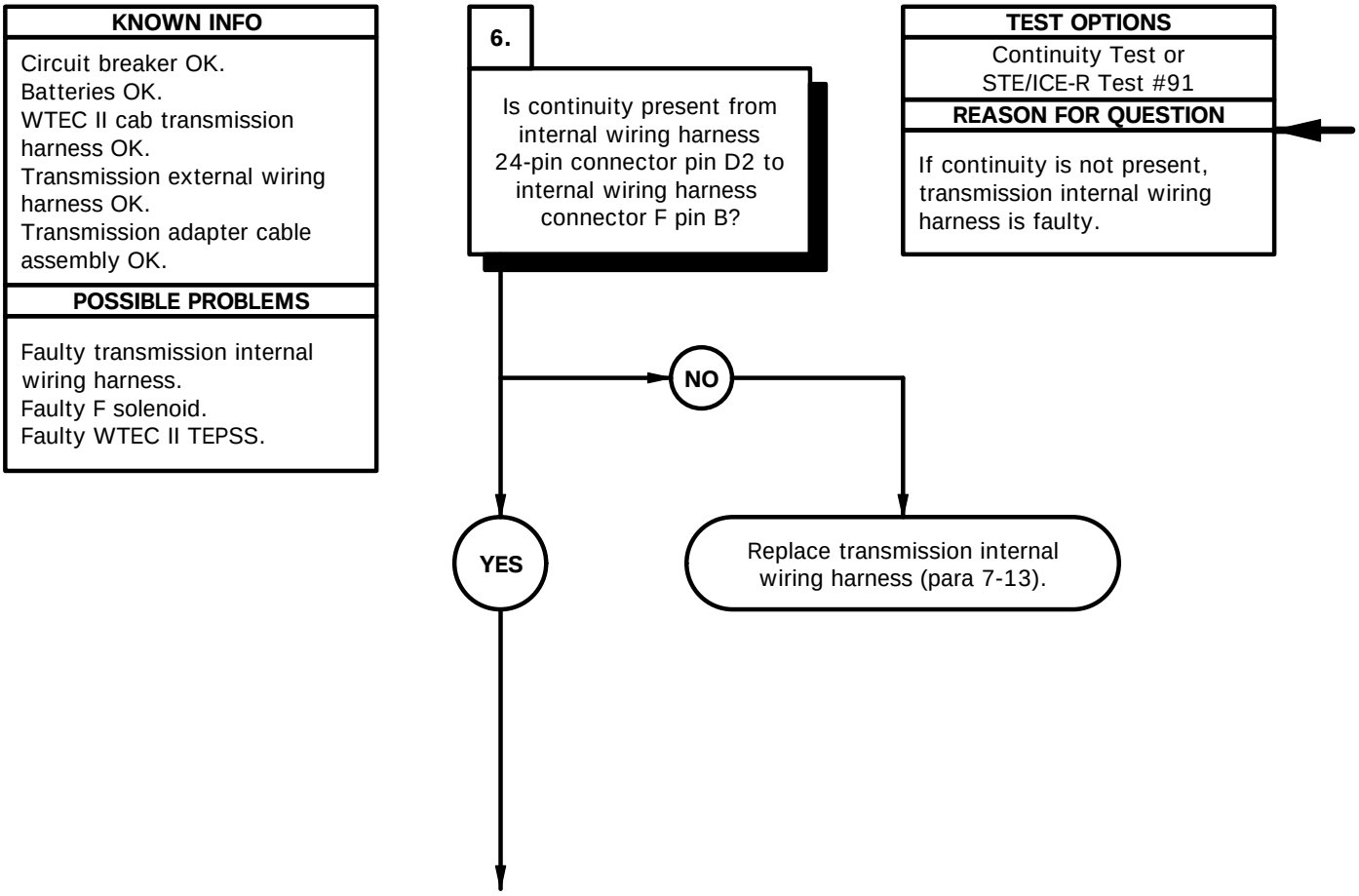
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

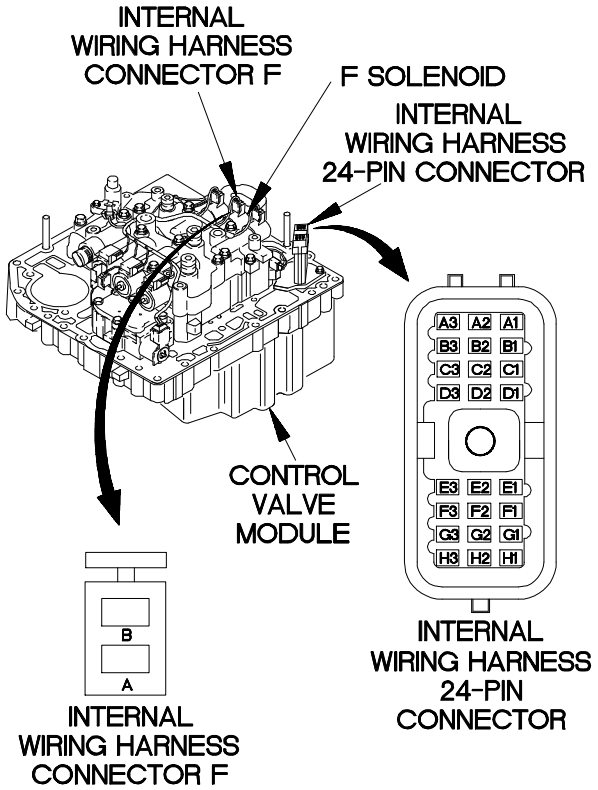


c40. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

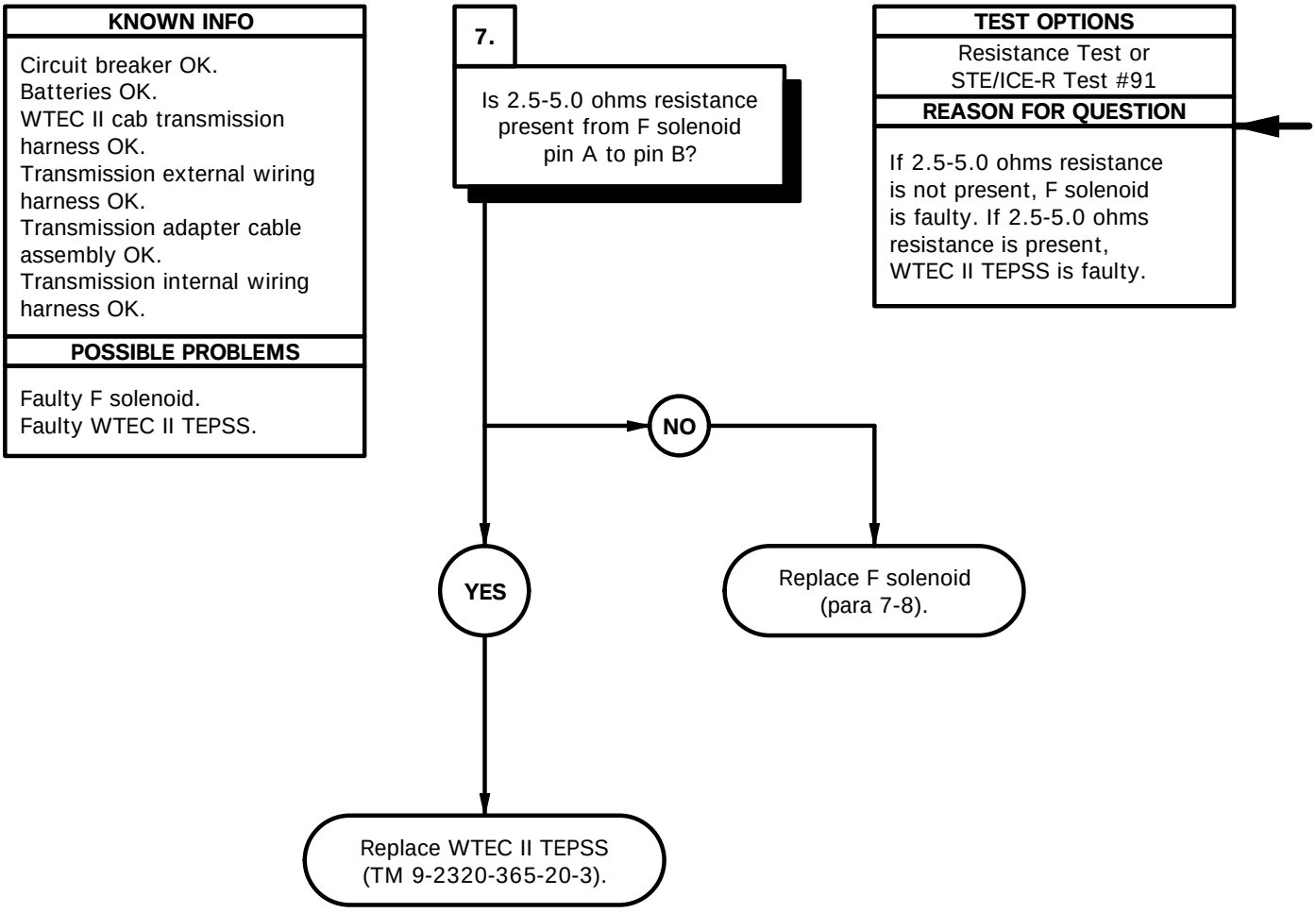


CONTINUITY TEST

(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).

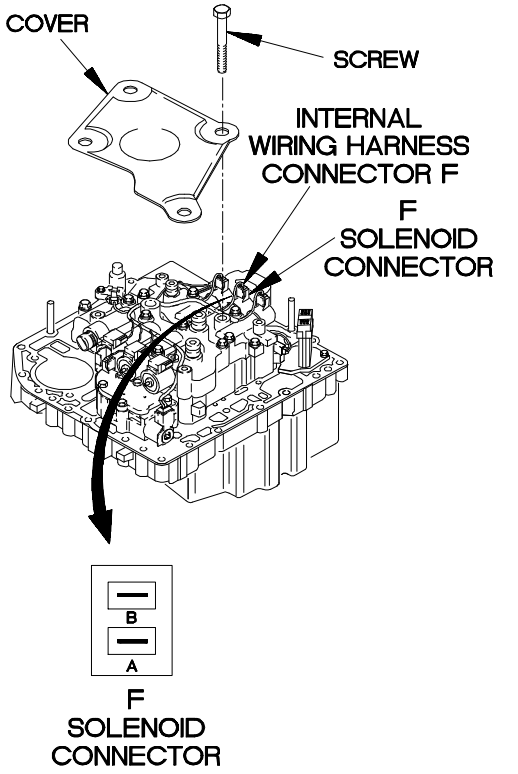


c40. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

INITIAL SETUP

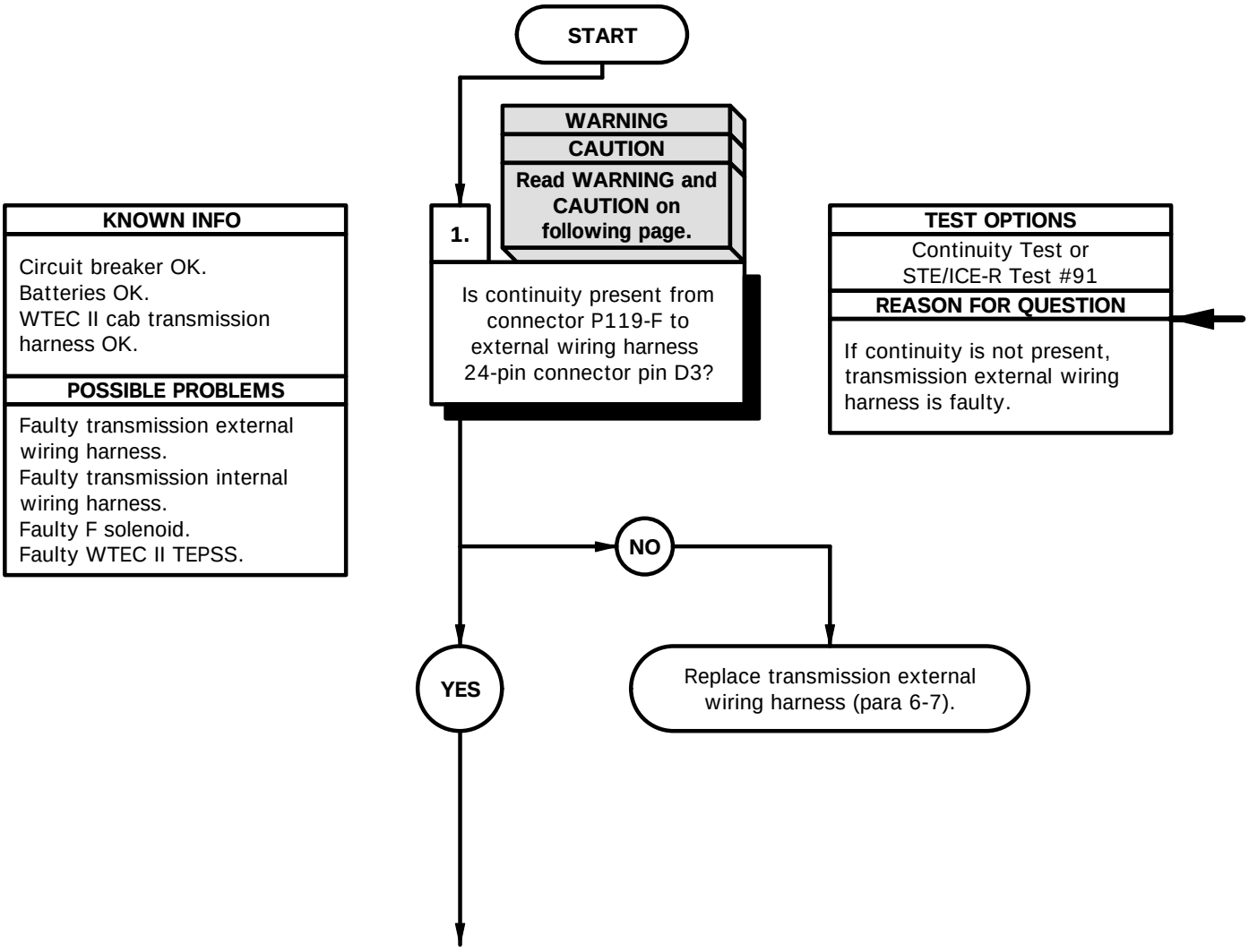
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

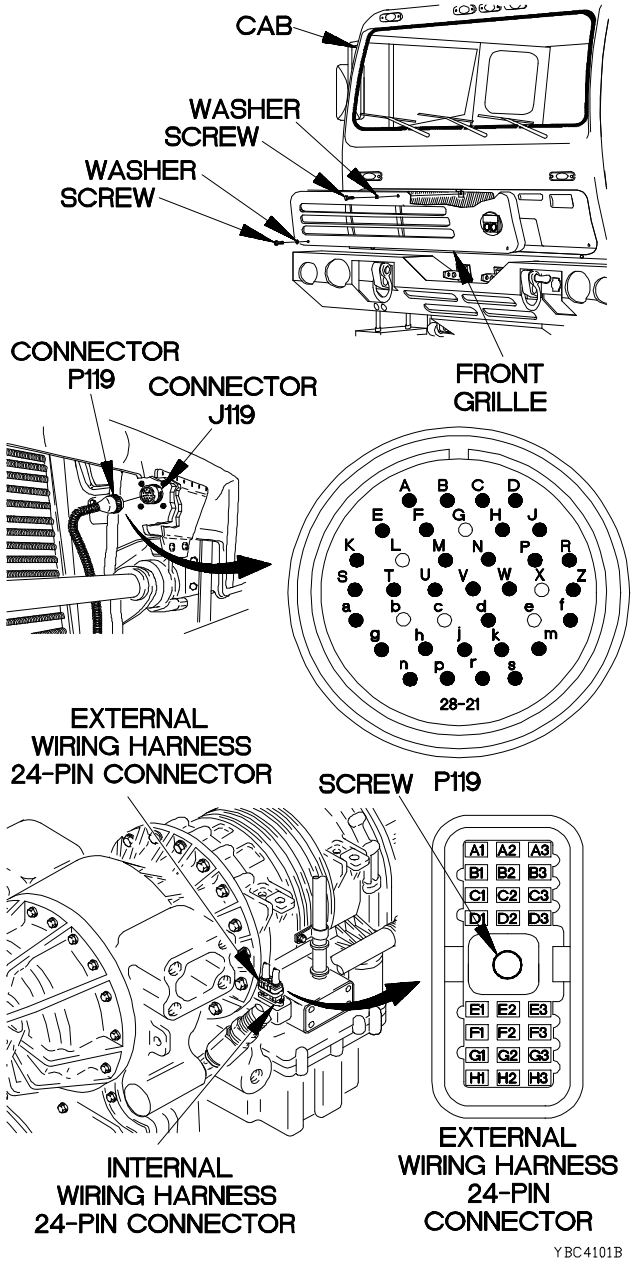
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



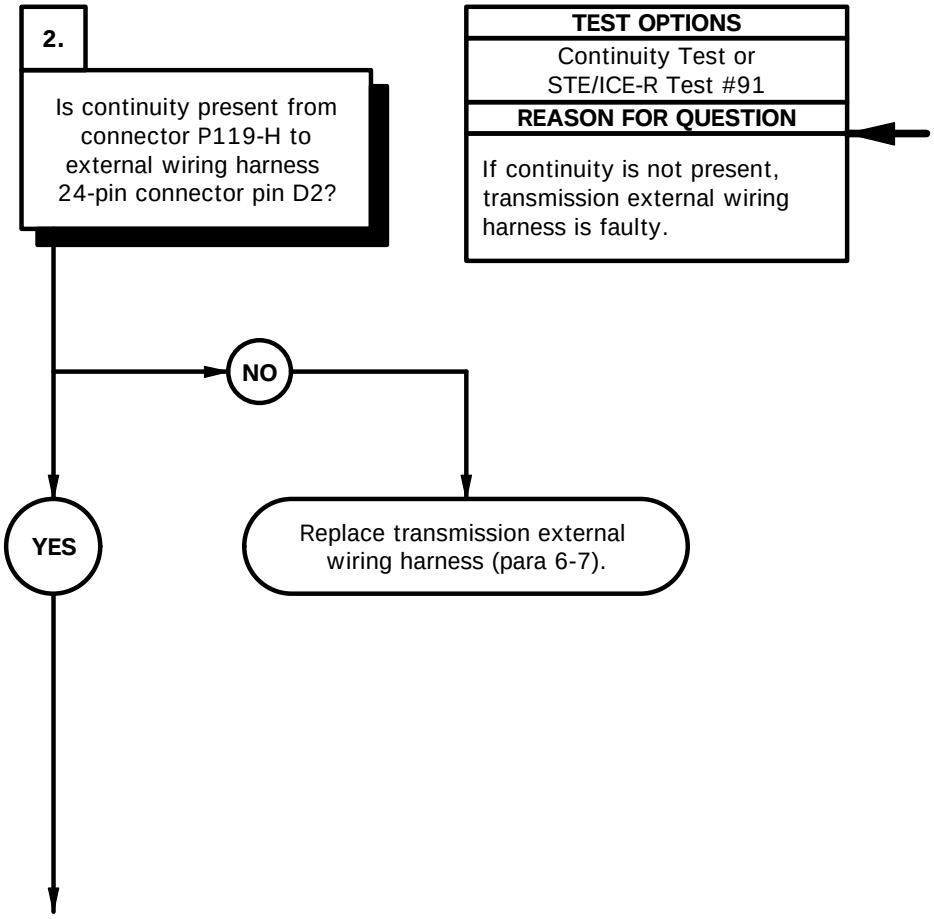
c41. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

KNOWN INFO

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

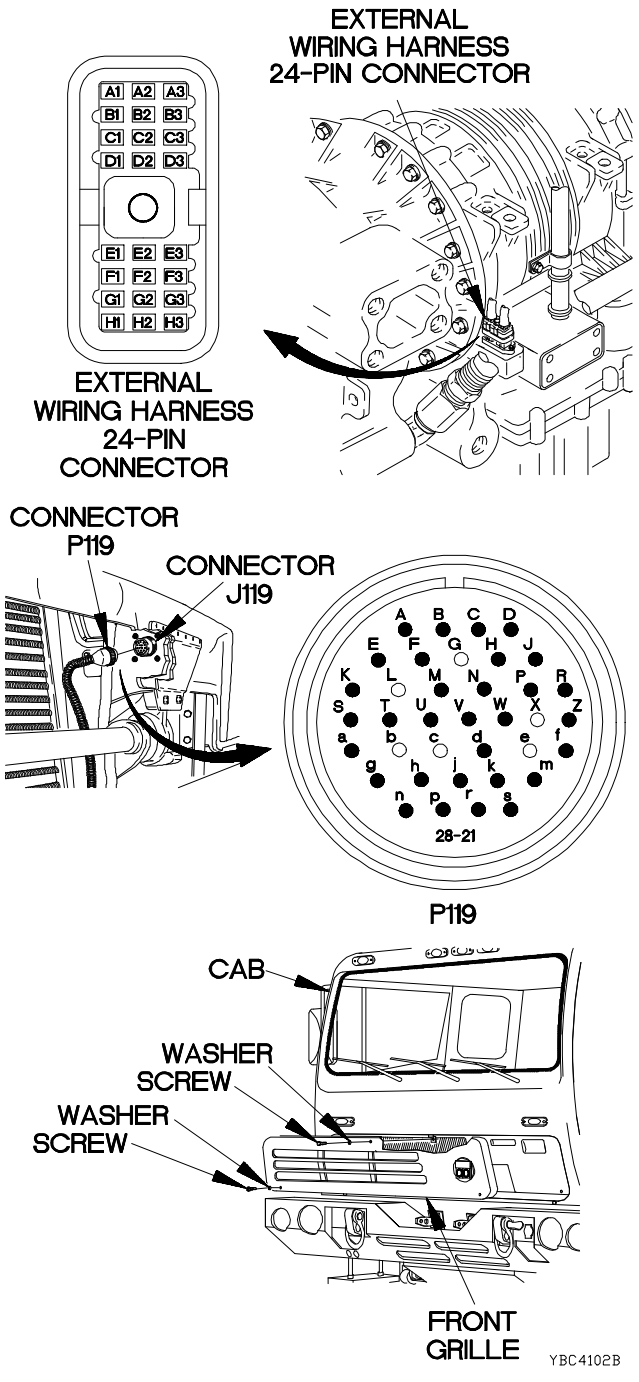
POSSIBLE PROBLEMS

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

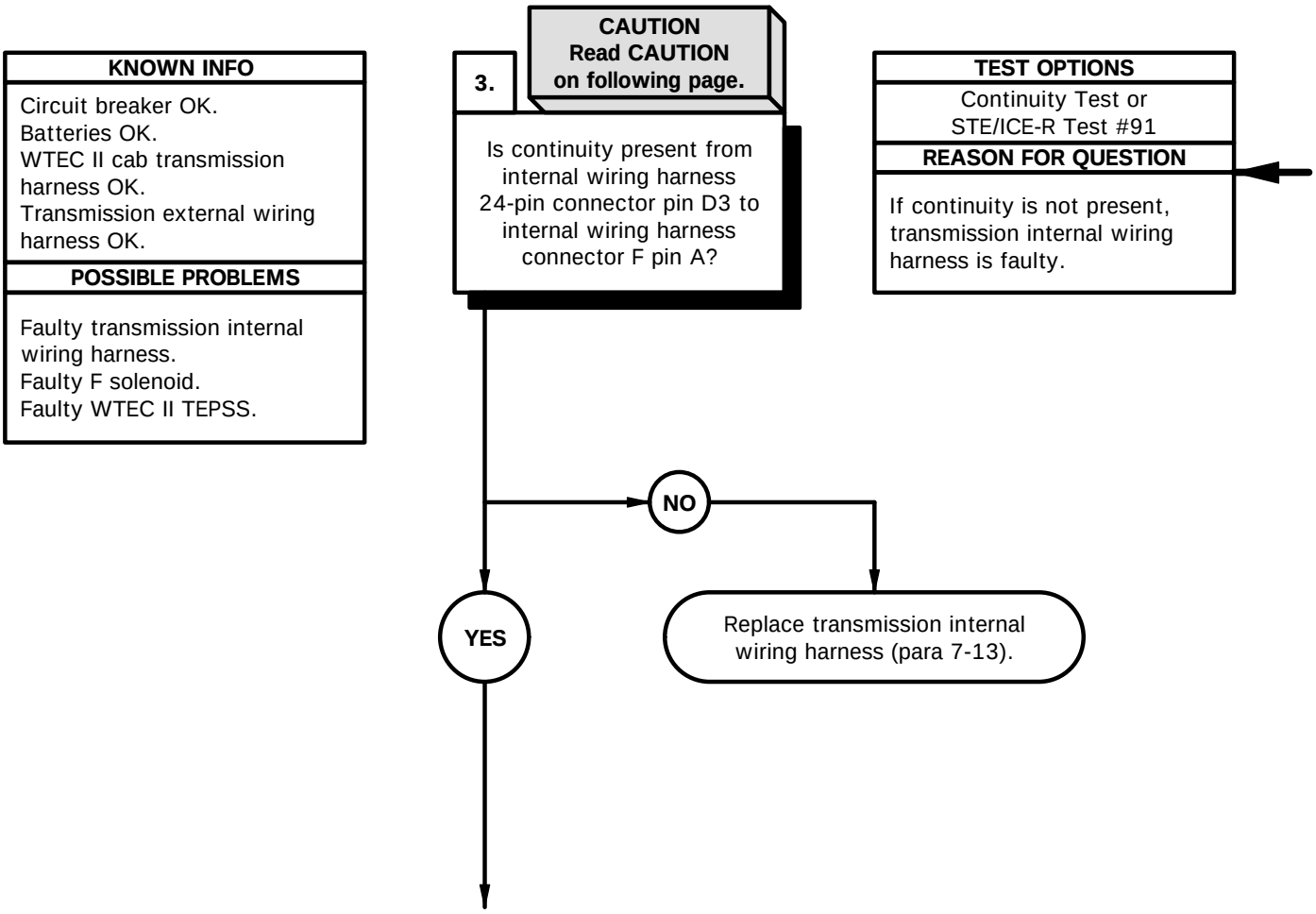


CONTINUITY TEST

(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)

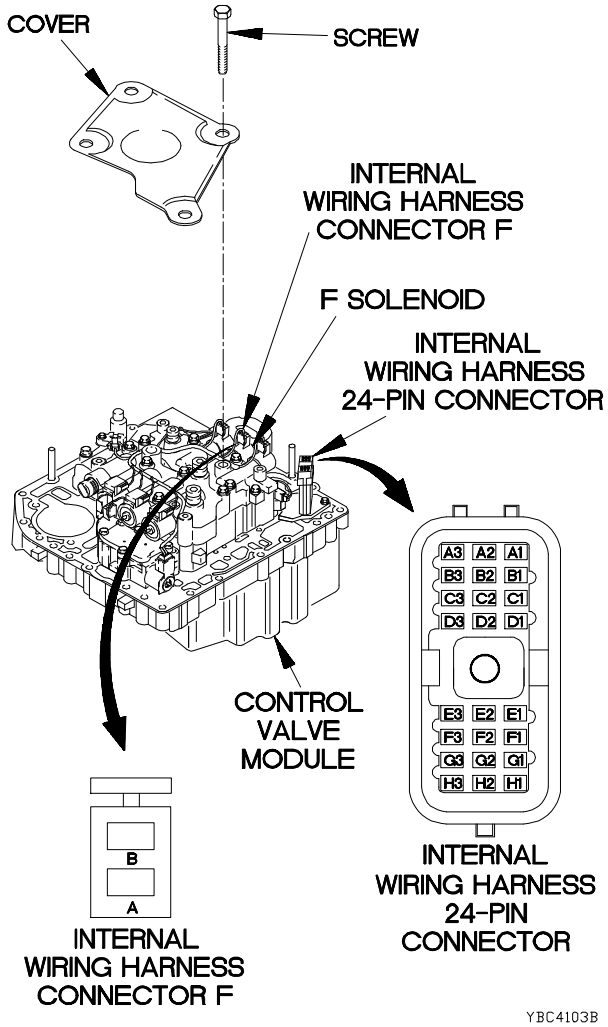


CAUTION

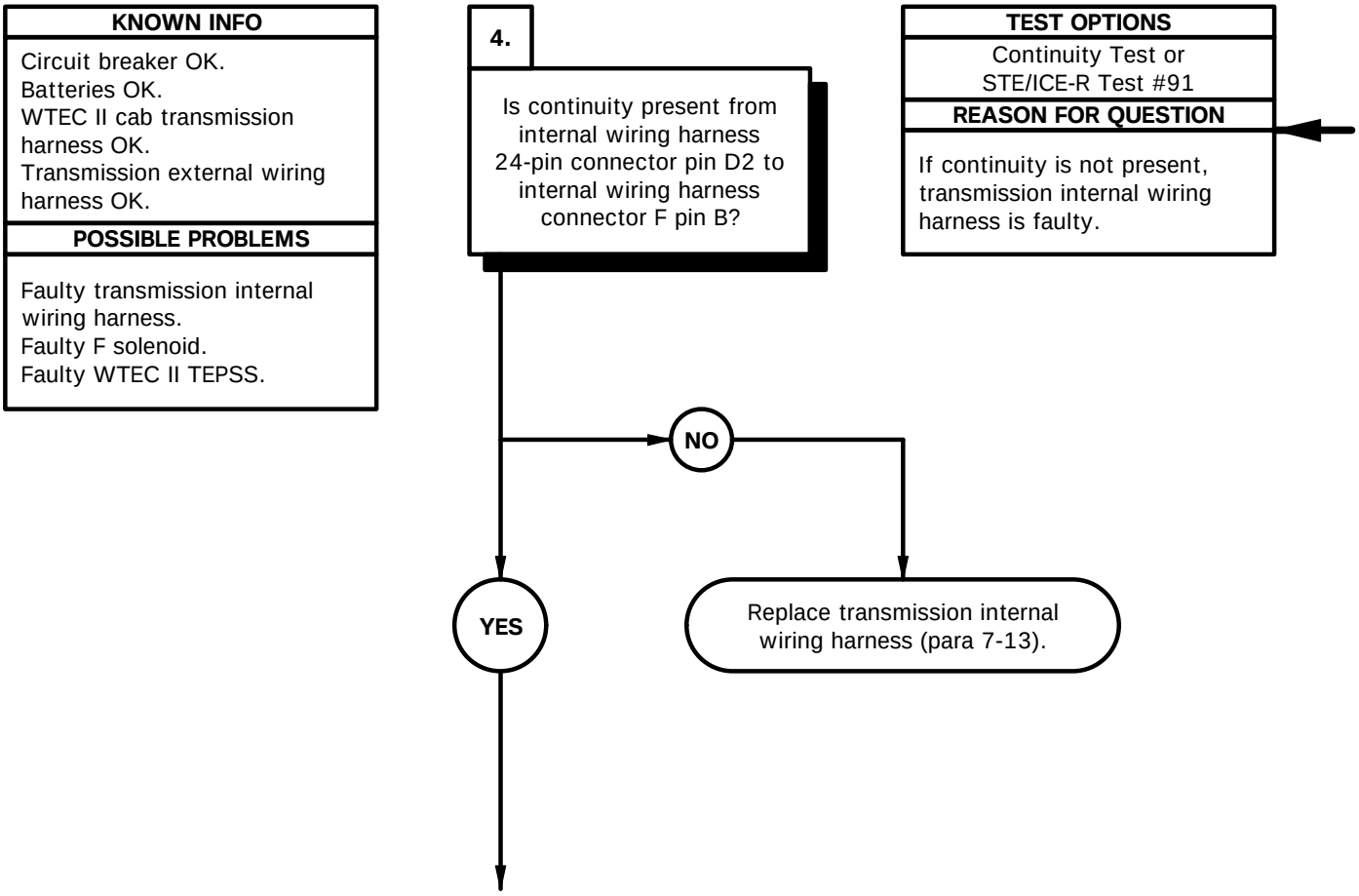
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

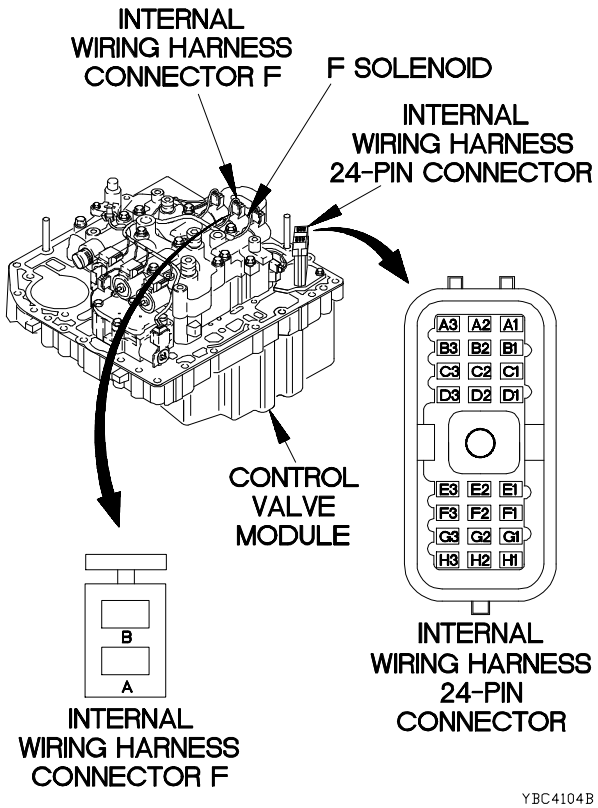


c41. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

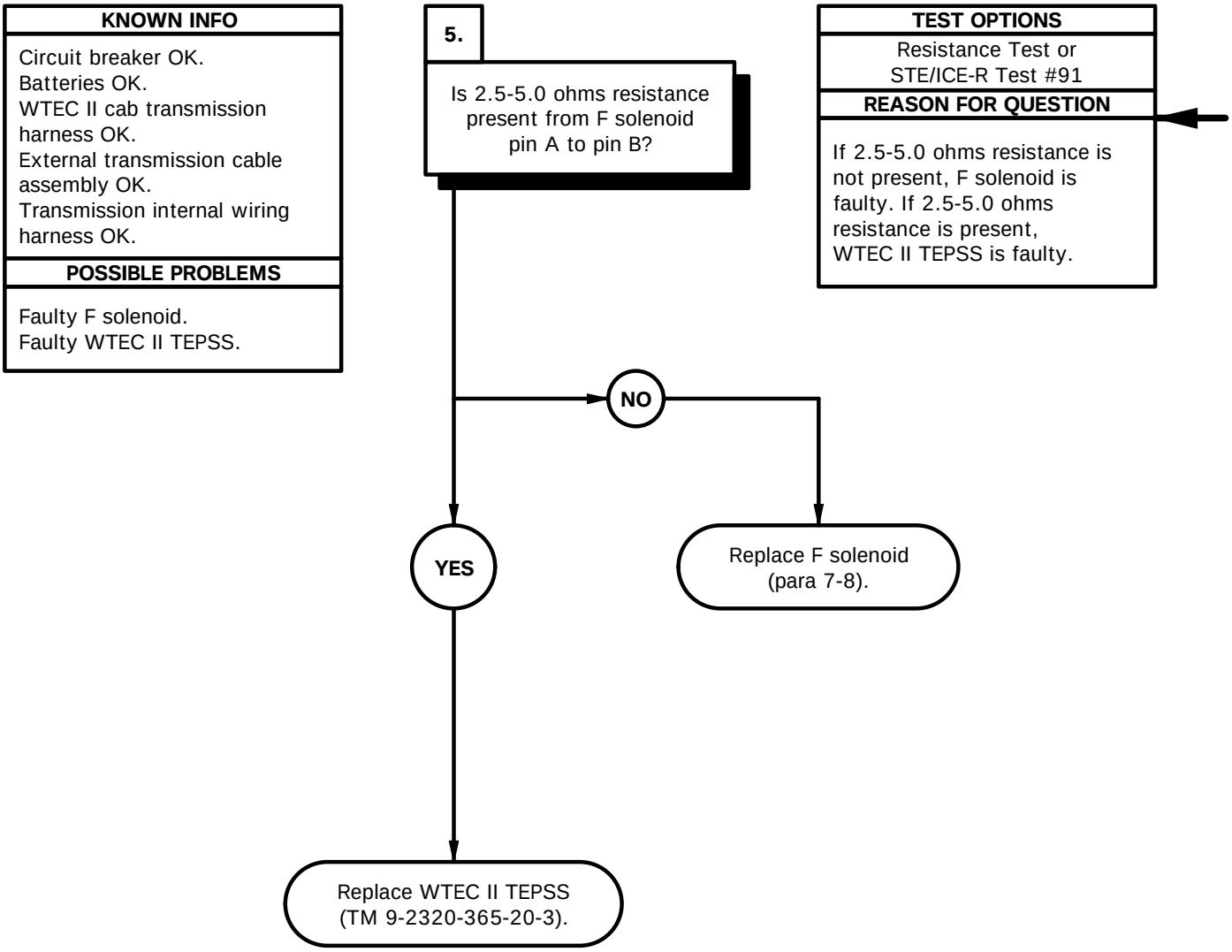


CONTINUITY TEST

(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).

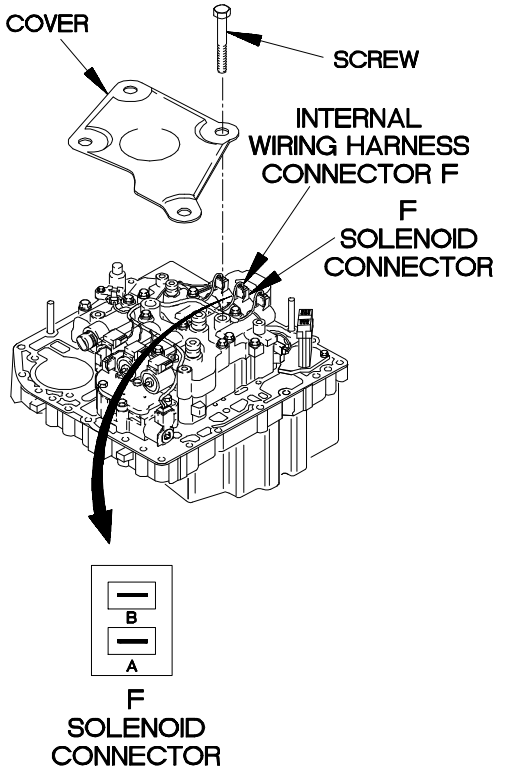


c41. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)



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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

INITIAL SETUP

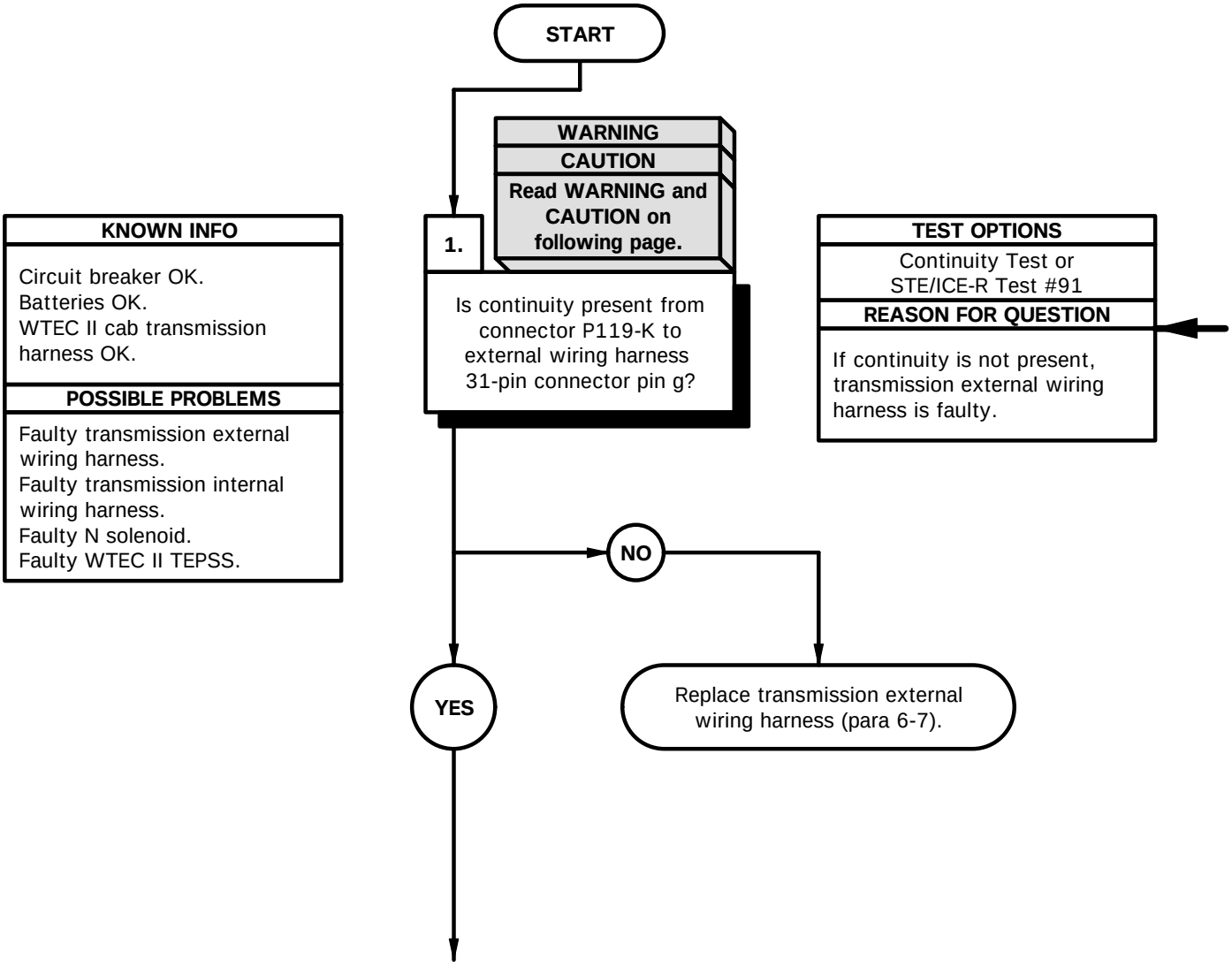
Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)

Materials/Parts
Wire, Elect, 50 ft (Item 94, 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

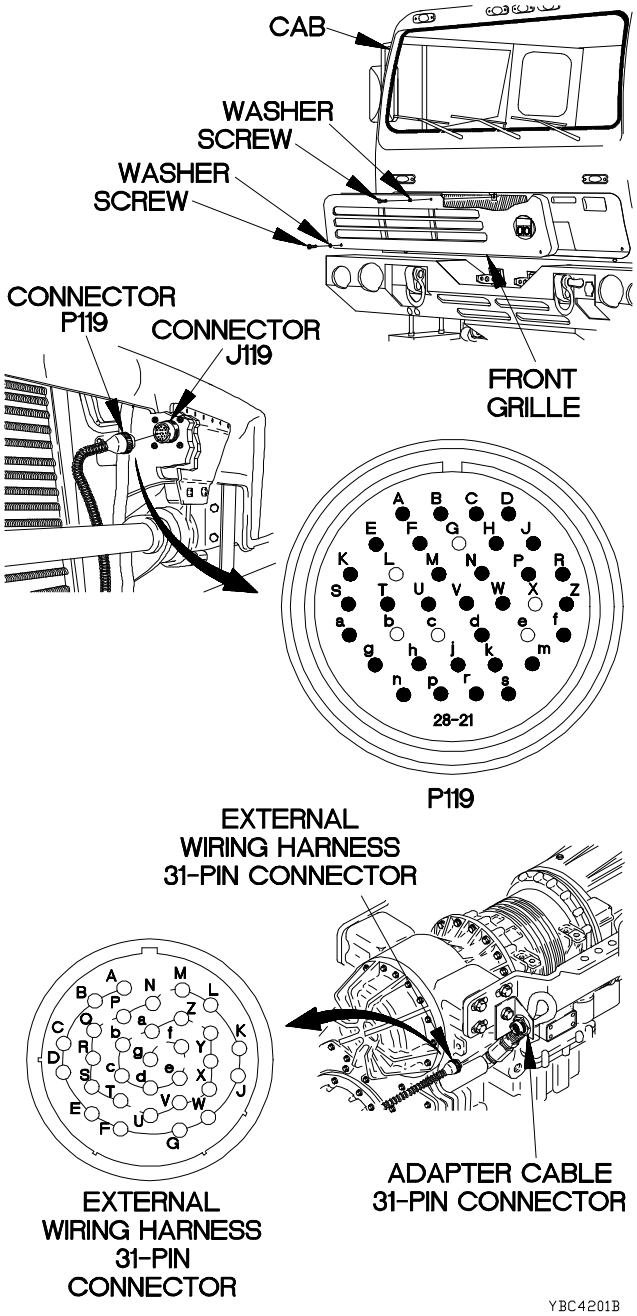
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

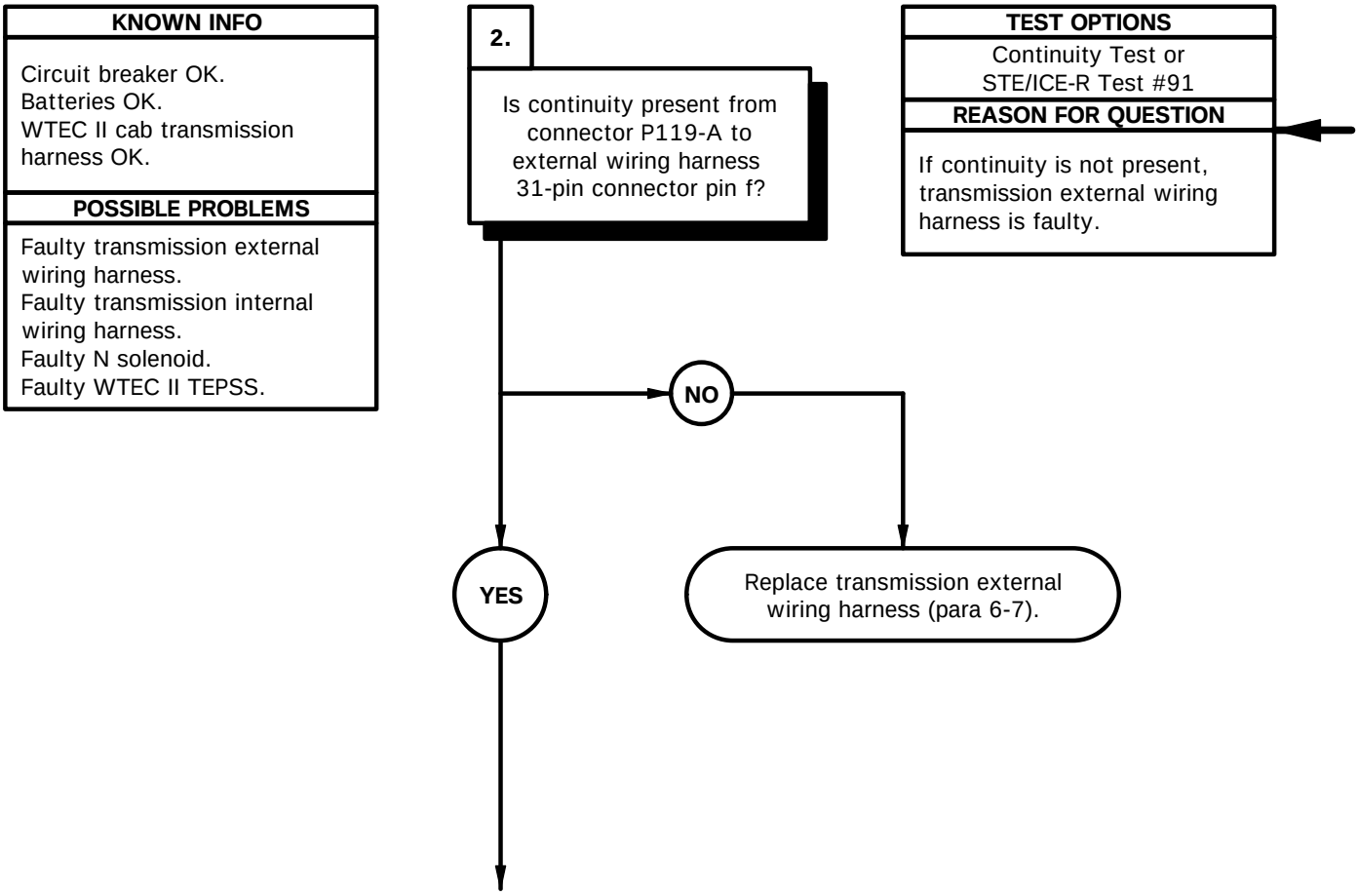
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from internal wiring harness 31-pin connector.
(6) Set multimeter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

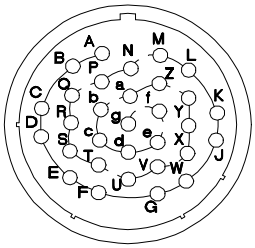


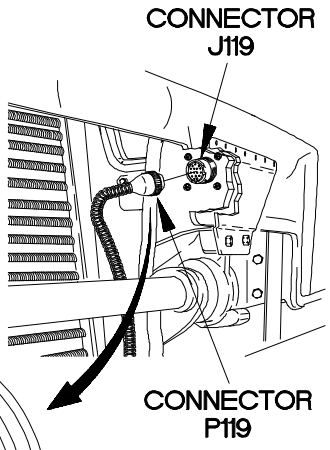
c42. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

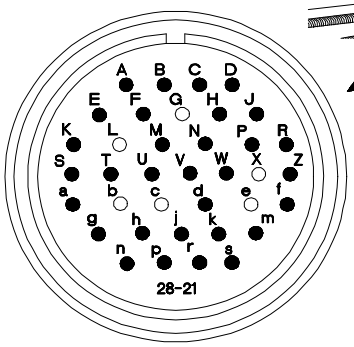


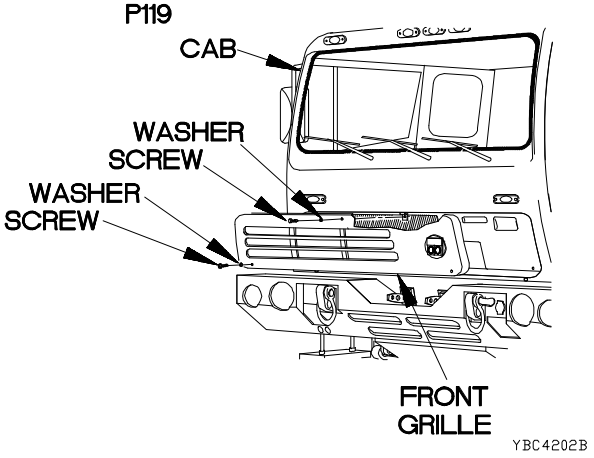
CONTINUITY TEST

(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).

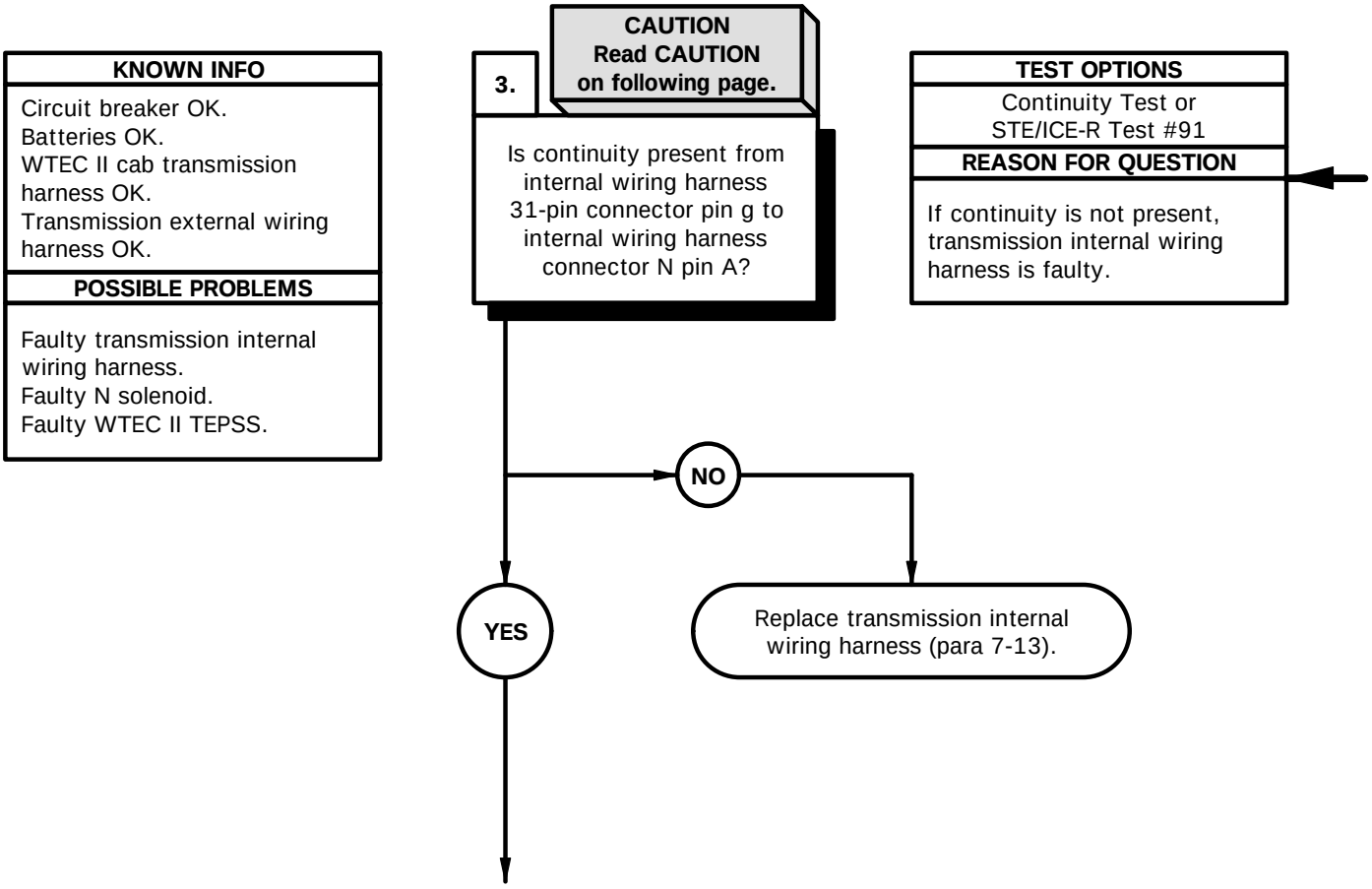








c42. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

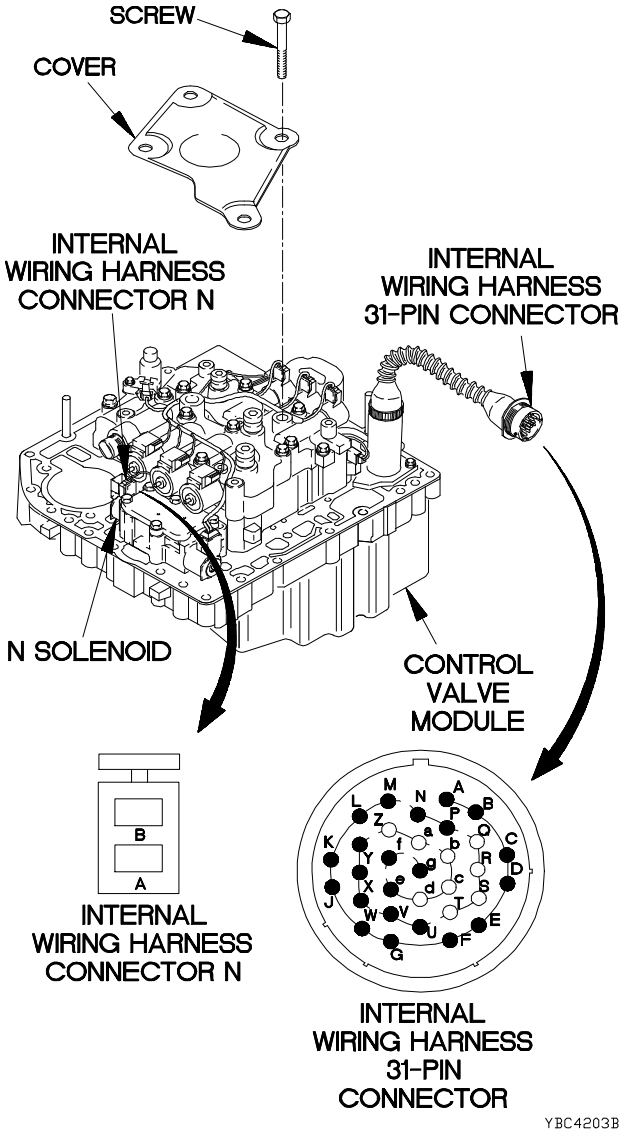


CAUTION

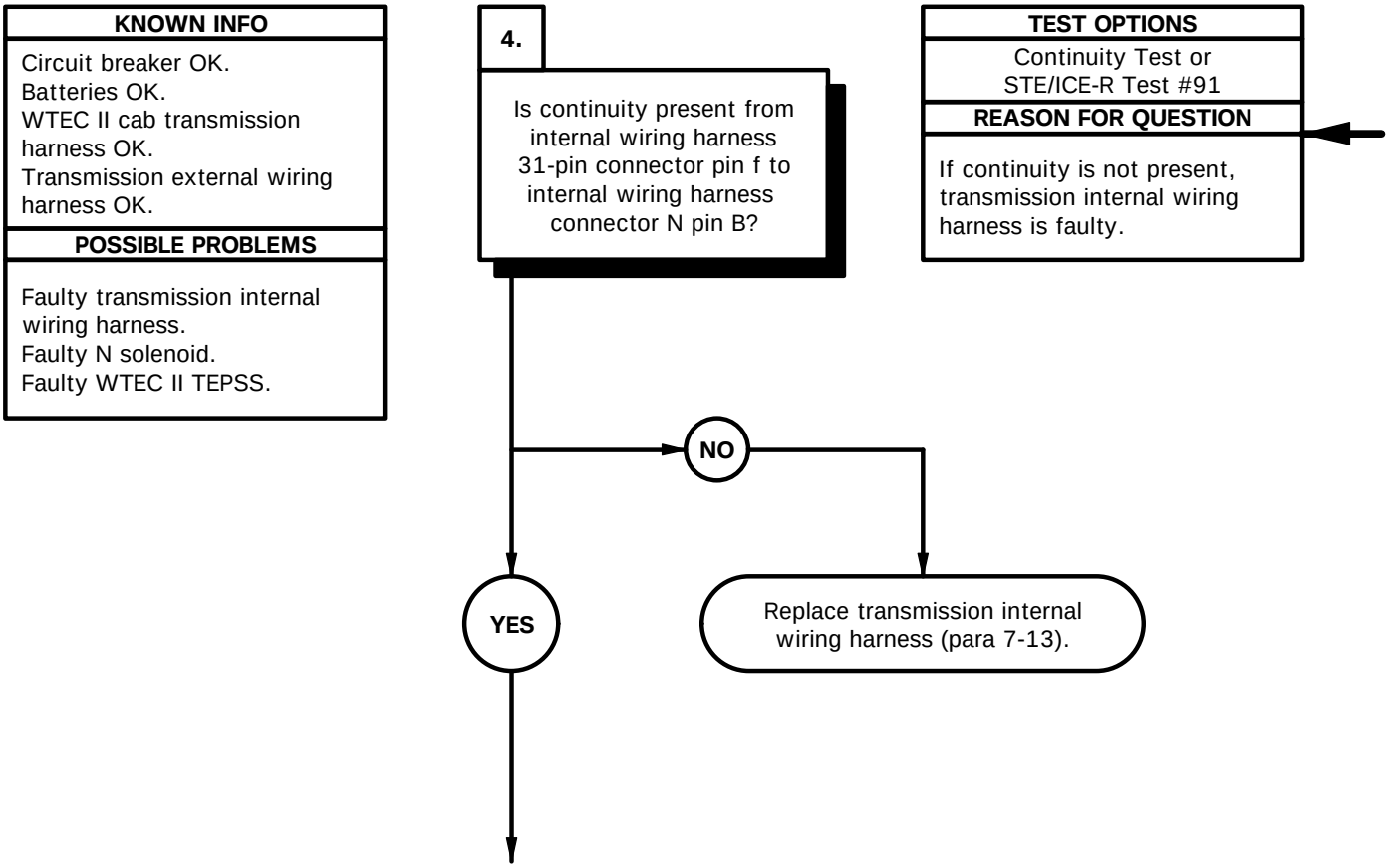
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

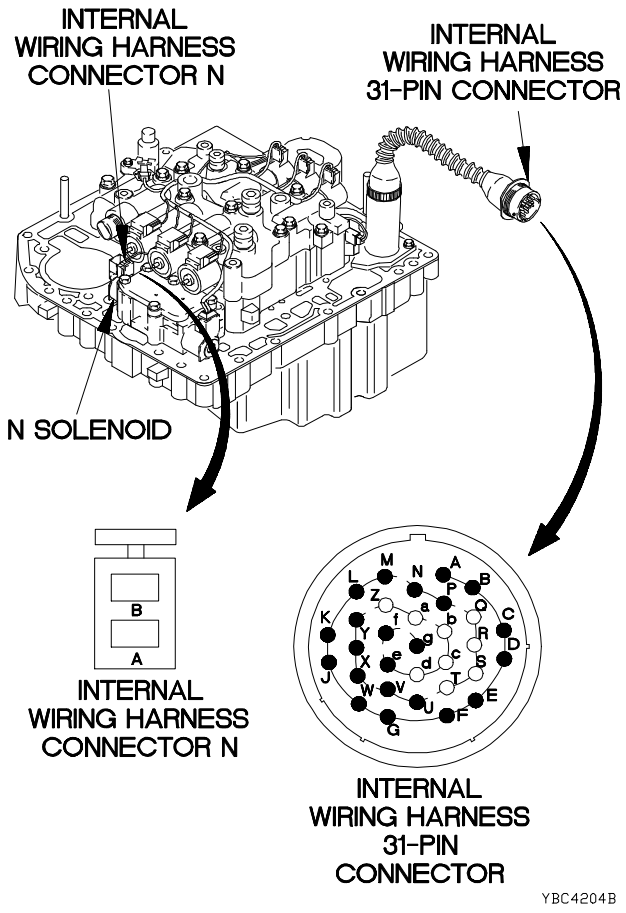


c42. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

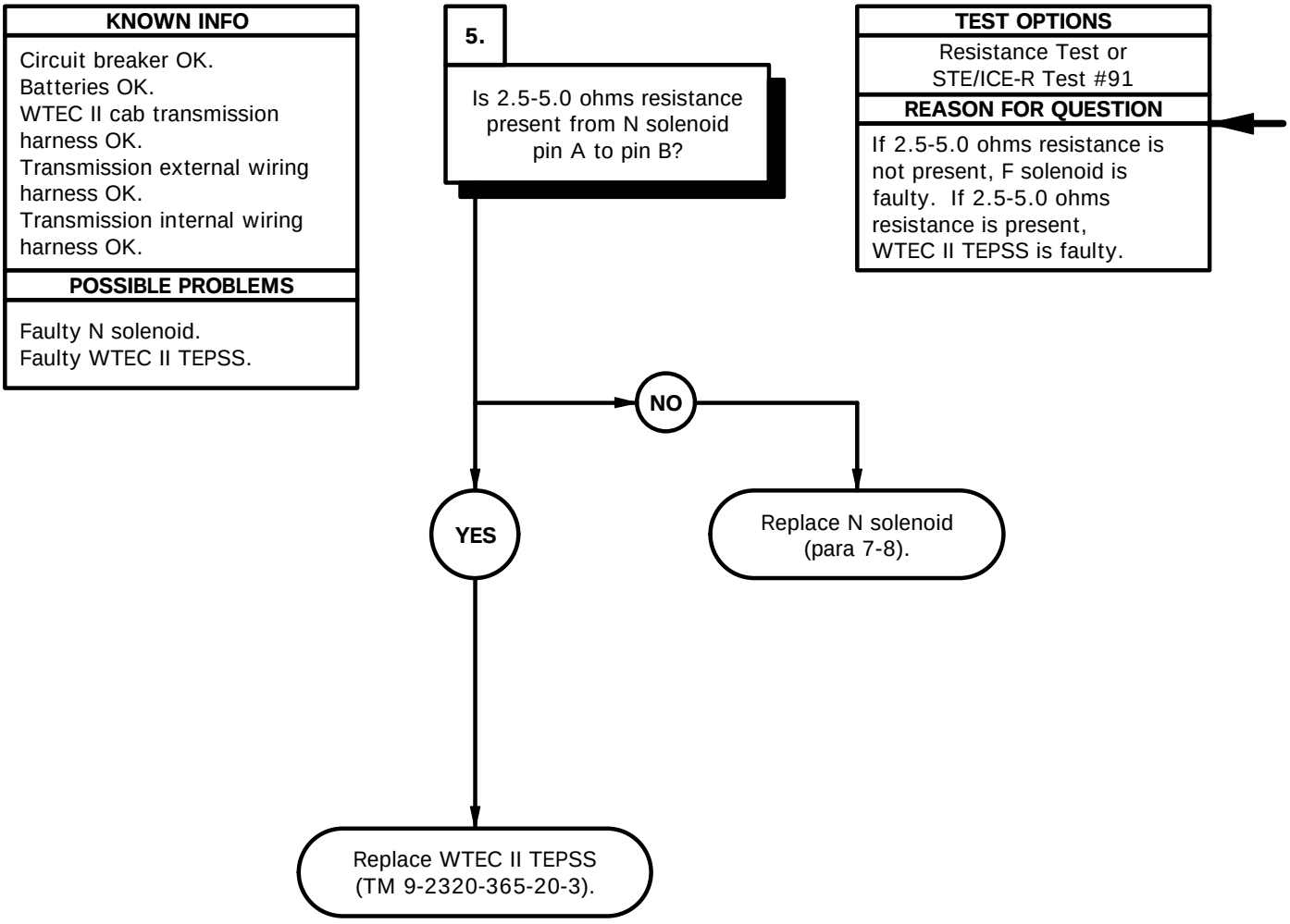


CONTINUITY TEST

(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).

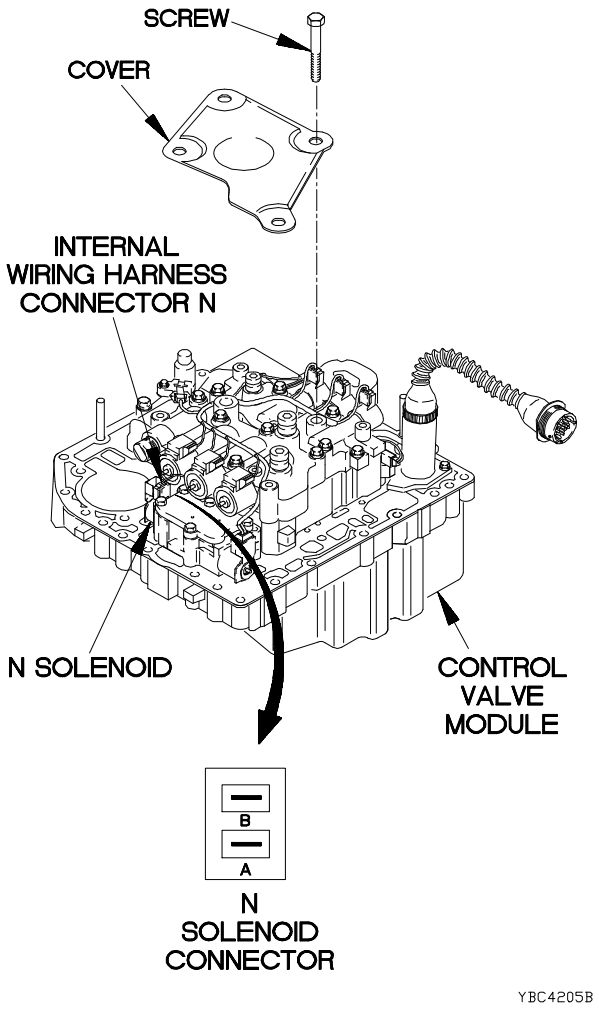


c42. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)

Materials/Parts
Wire, Elect, 50 ft (Item 94, Appendix C)

Personnel Required
(2)

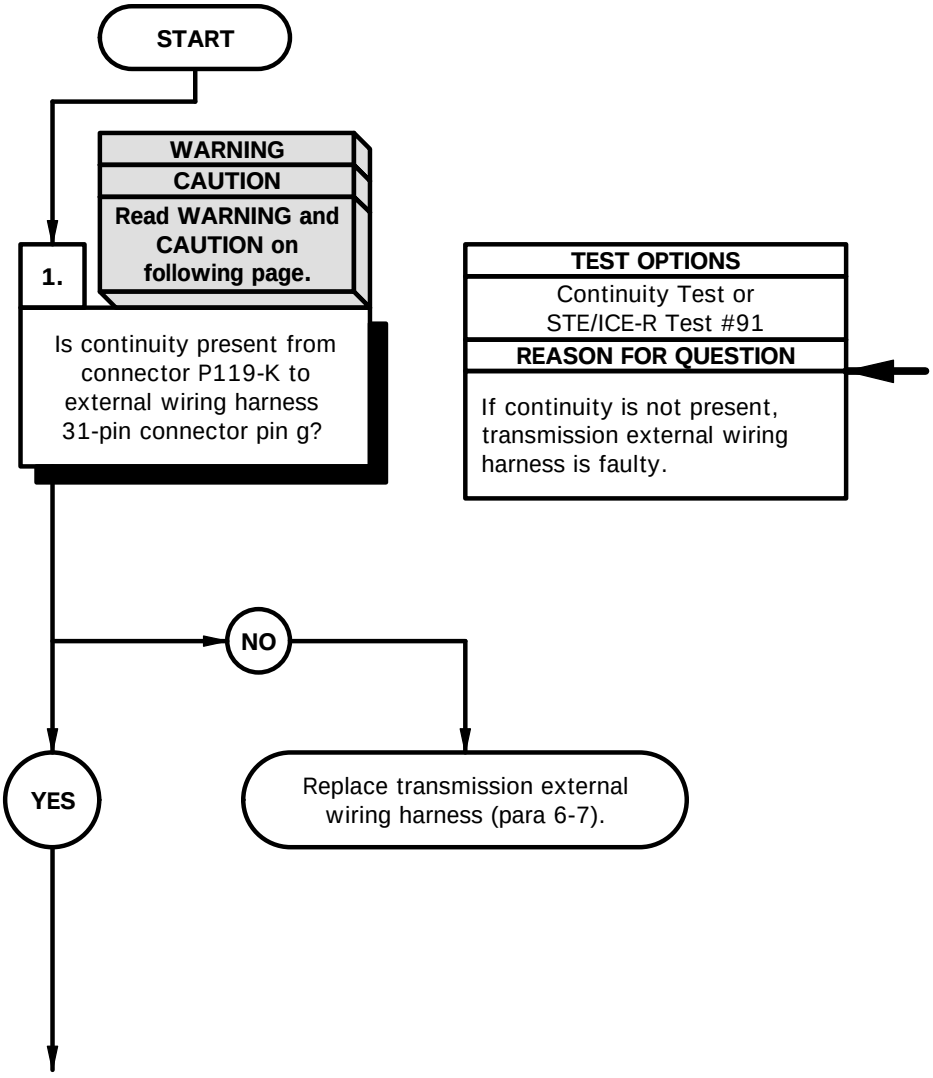
References
TM 9-4910-571-12&P

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 N 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

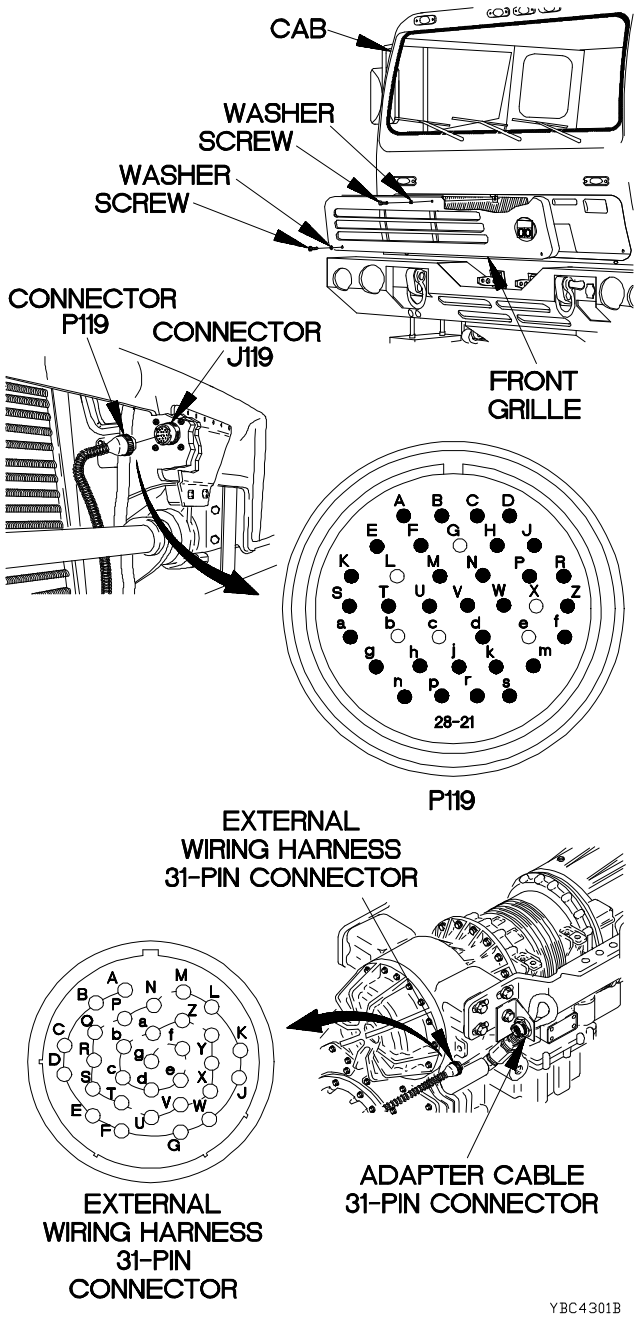
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

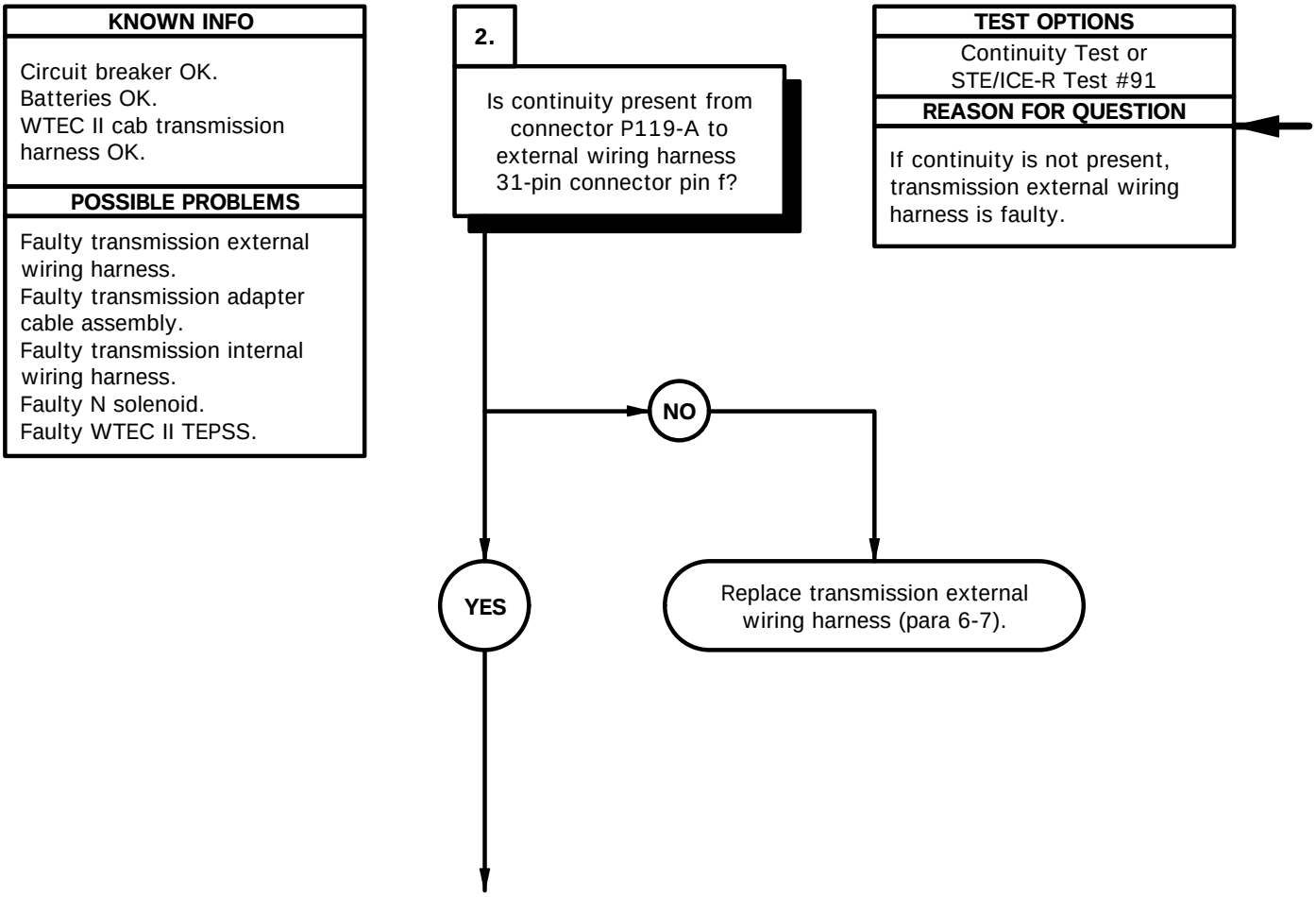
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from adapter cable 31-pin connector.
(6) Set multimeter to ohms.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

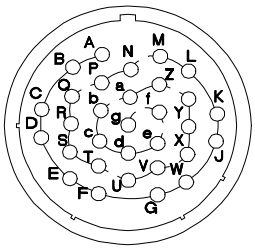


c43. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

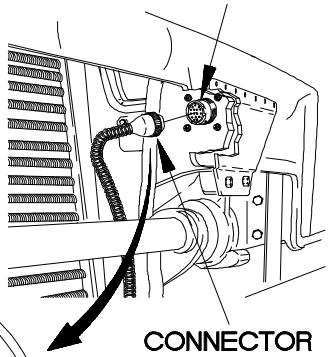


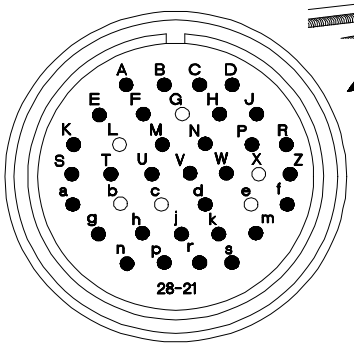
CONTINUITY TEST

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

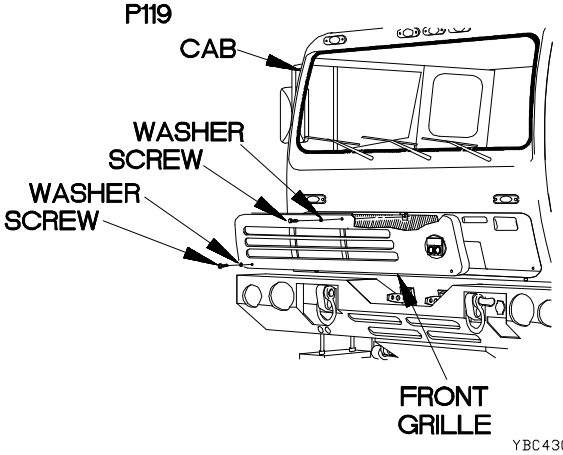


EXTERNAL WIRING HARNESS 31-PIN CONNECTOR

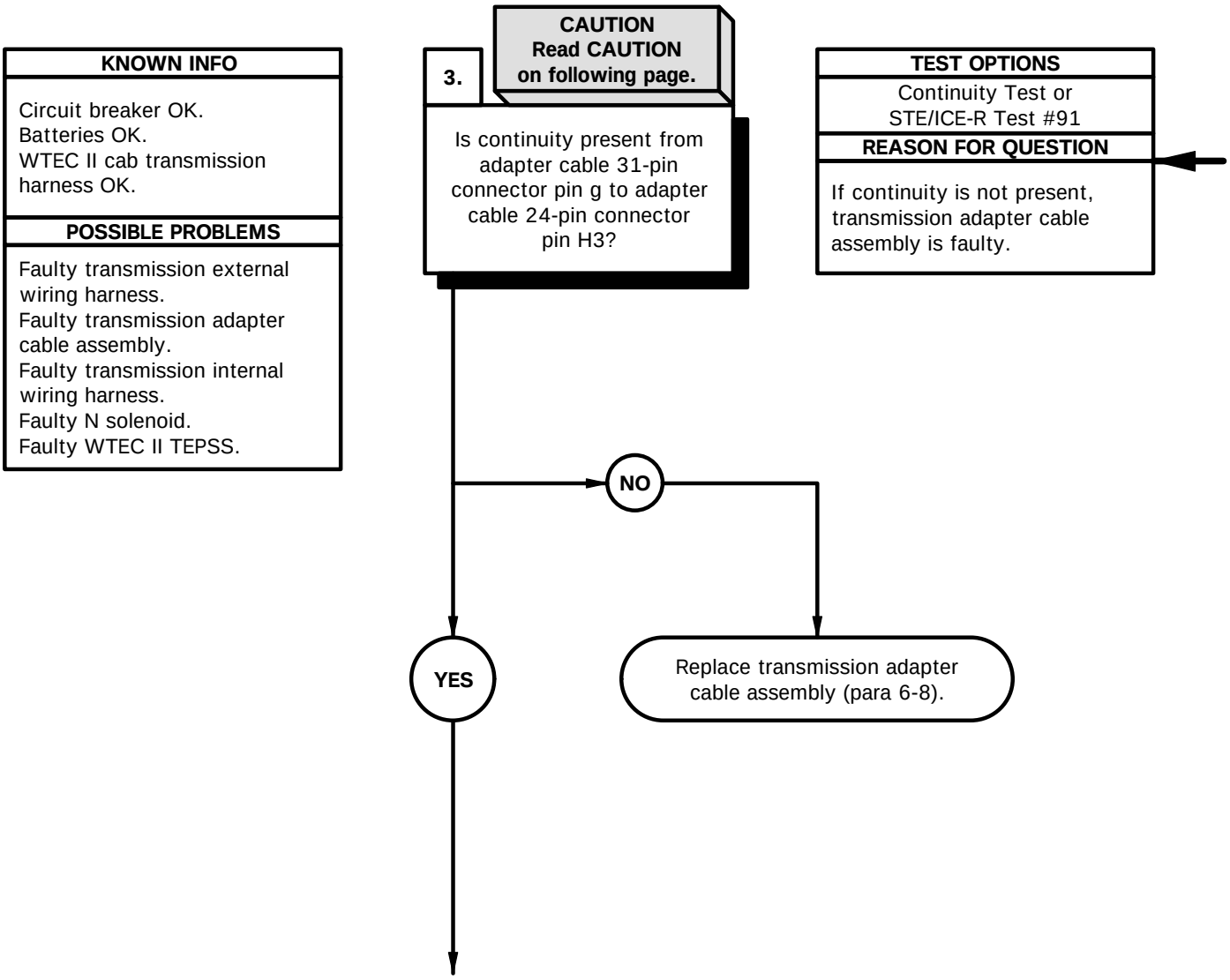




P119



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)

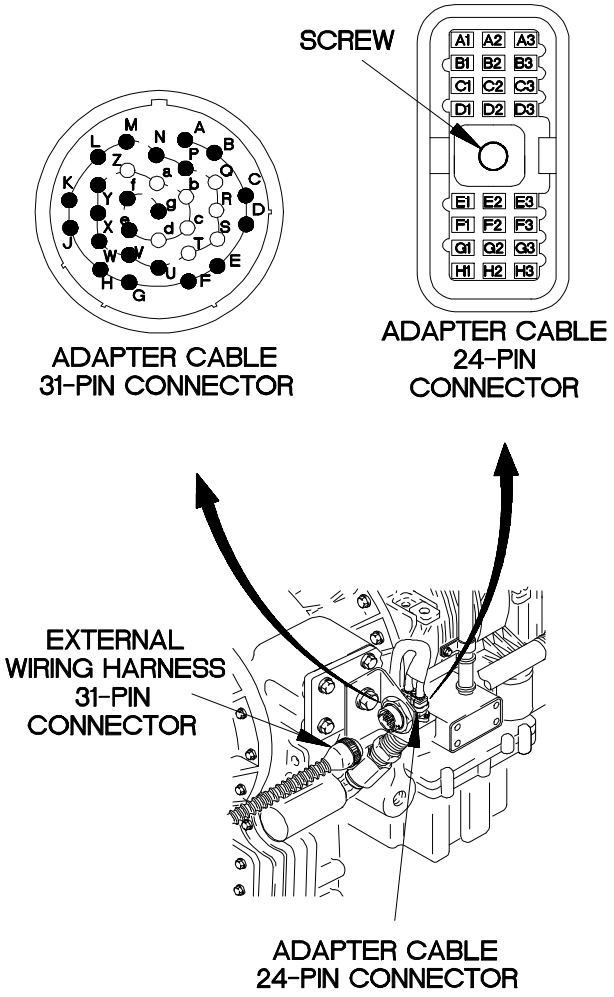


CAUTION

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).



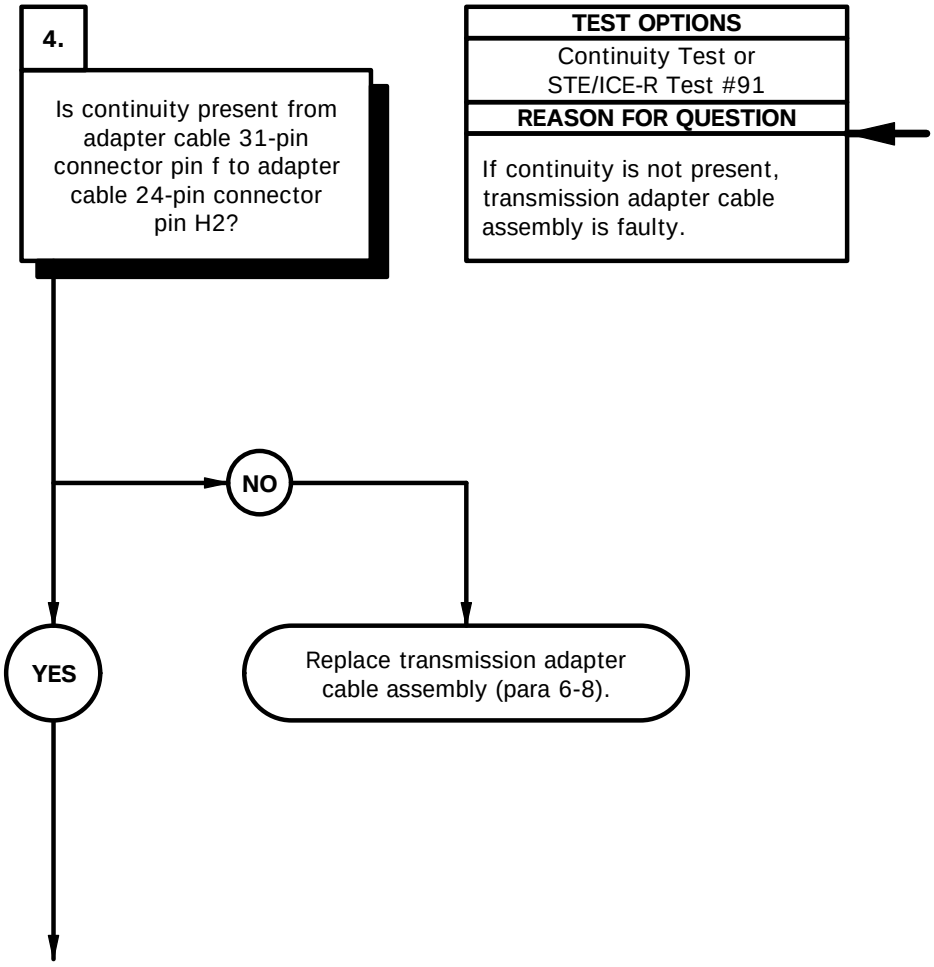
c43. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO

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

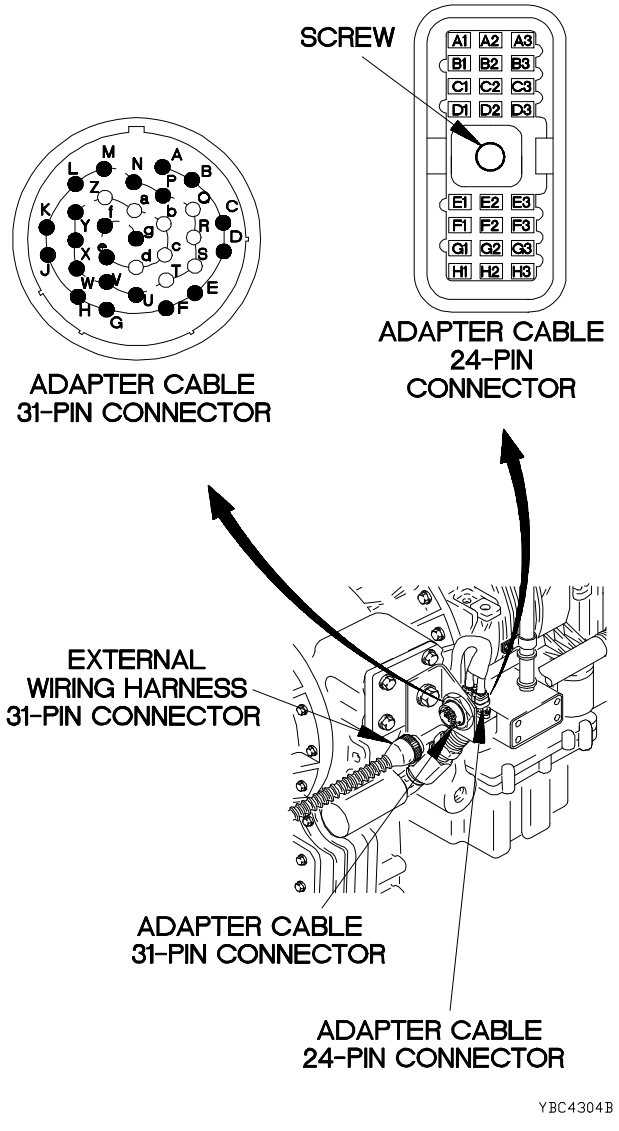
POSSIBLE PROBLEMS

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

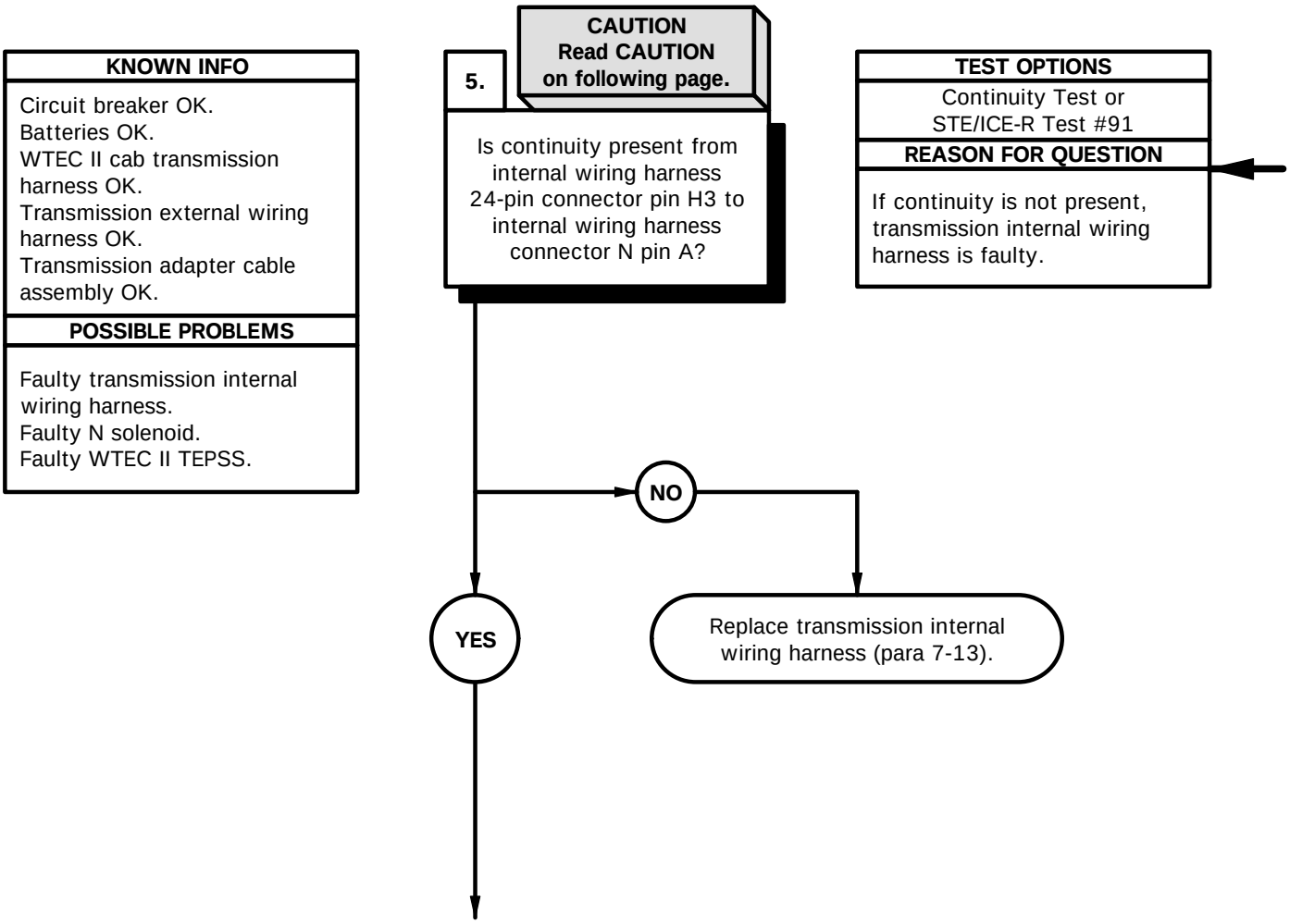


CONTINUITY TEST

(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)

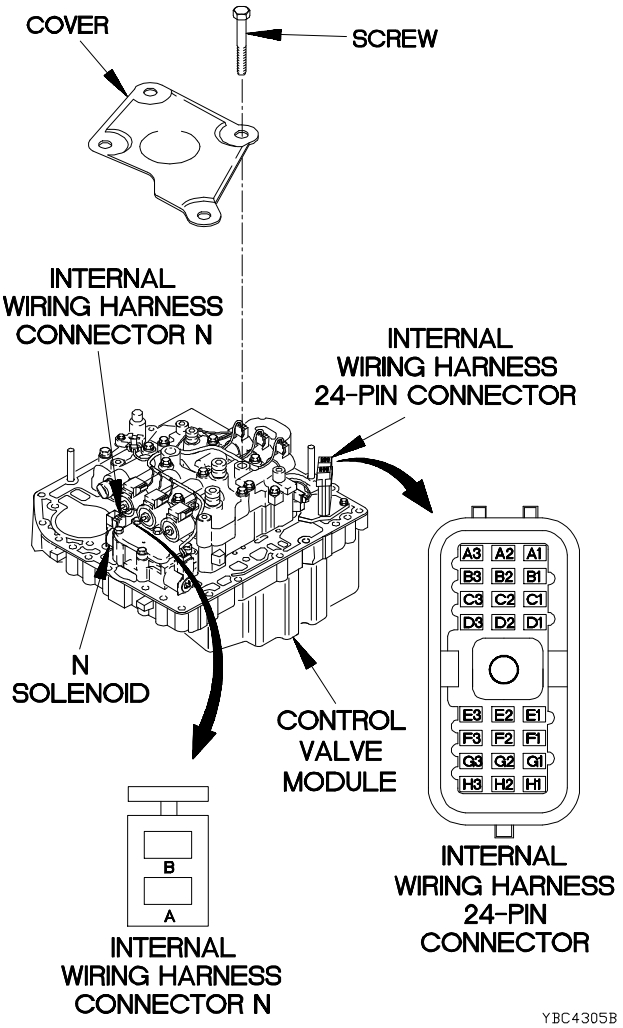


CAUTION

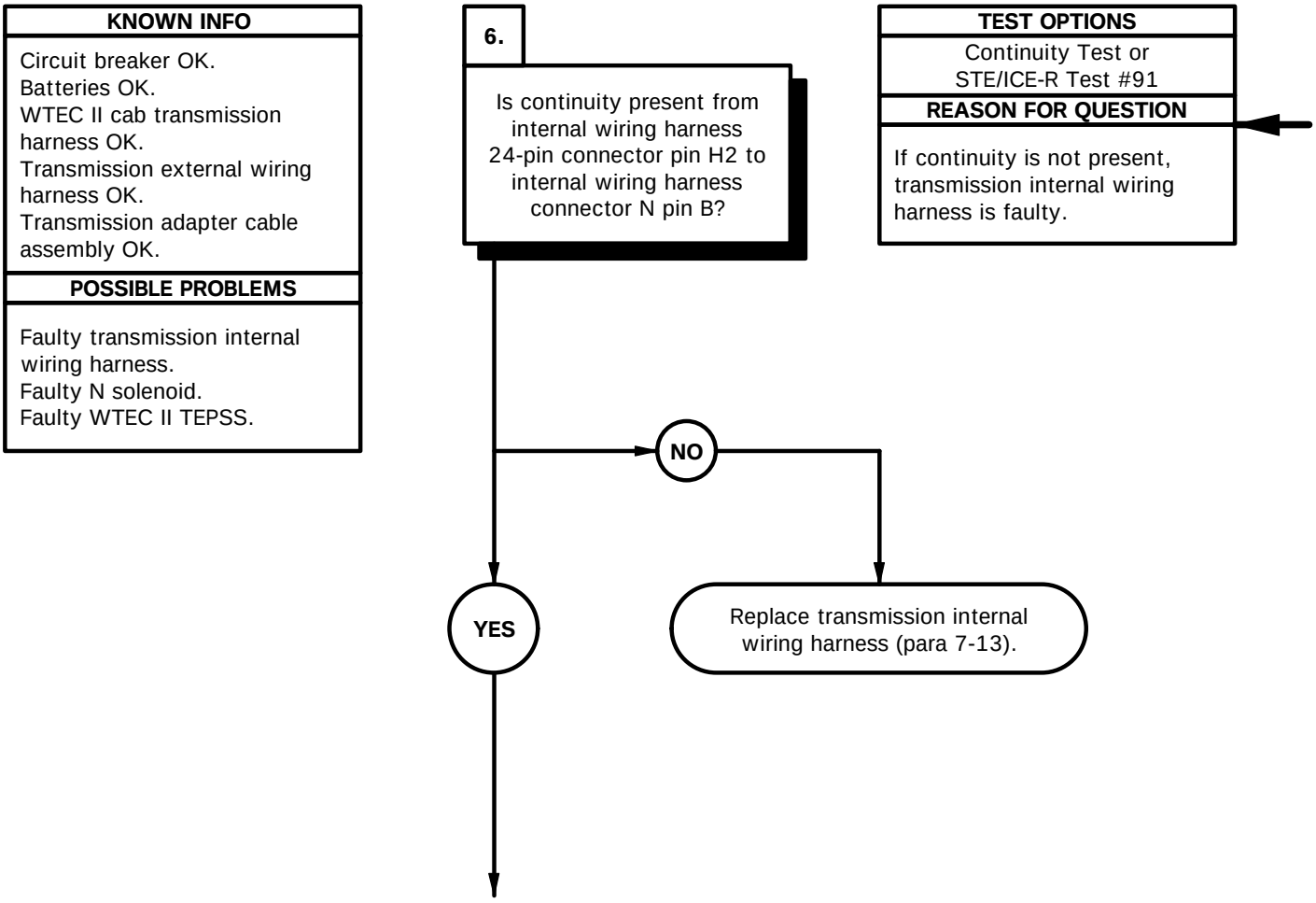
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

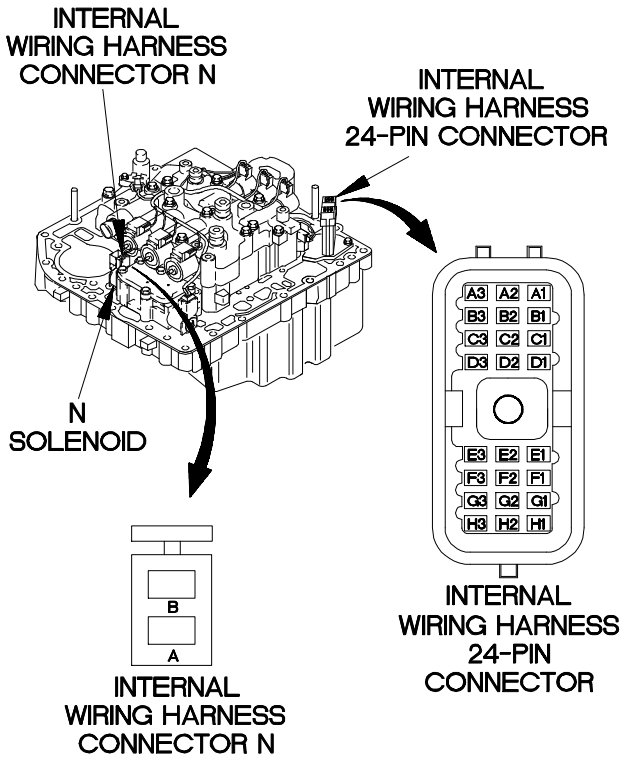


c43. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

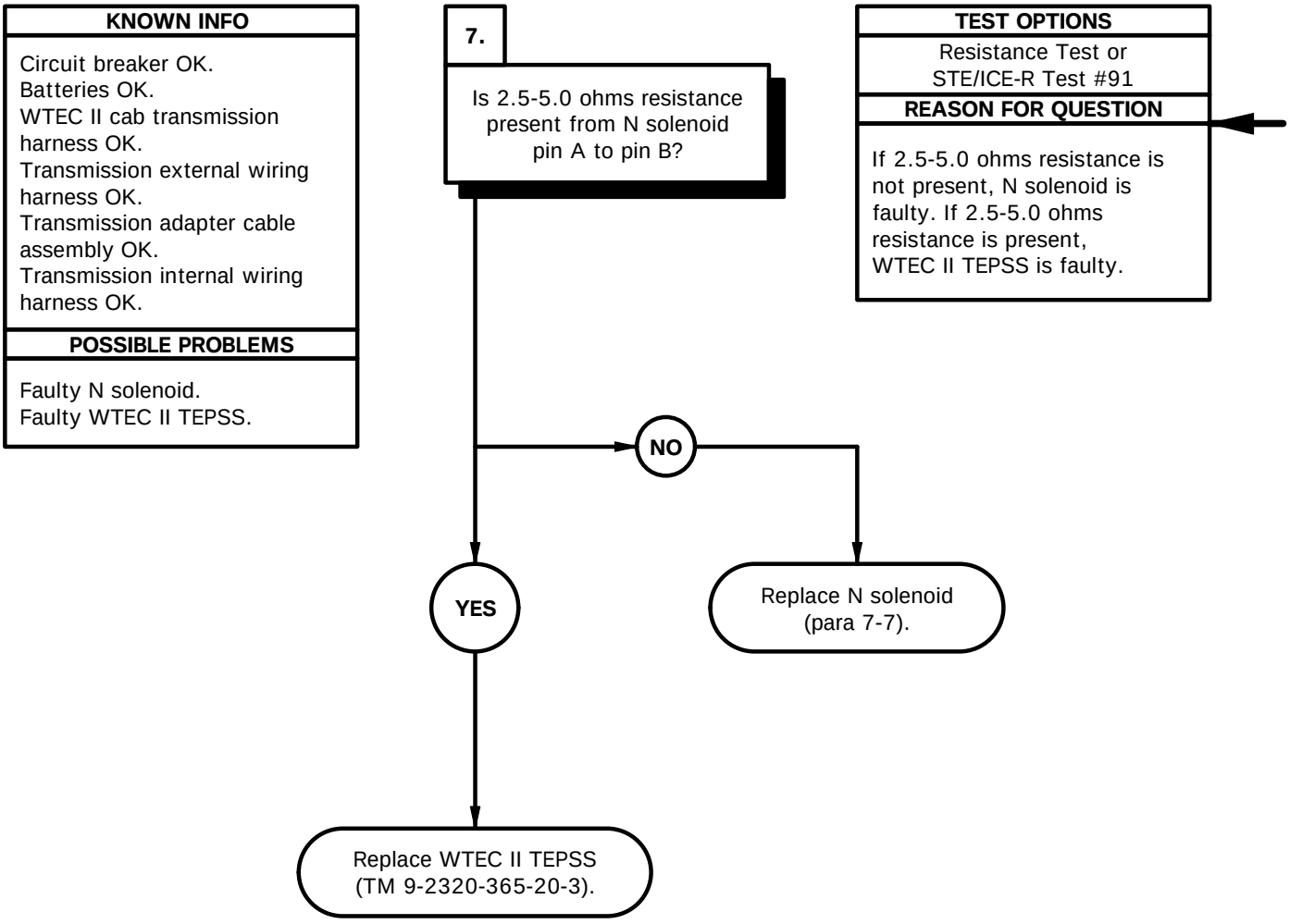


CONTINUITY TEST

(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).

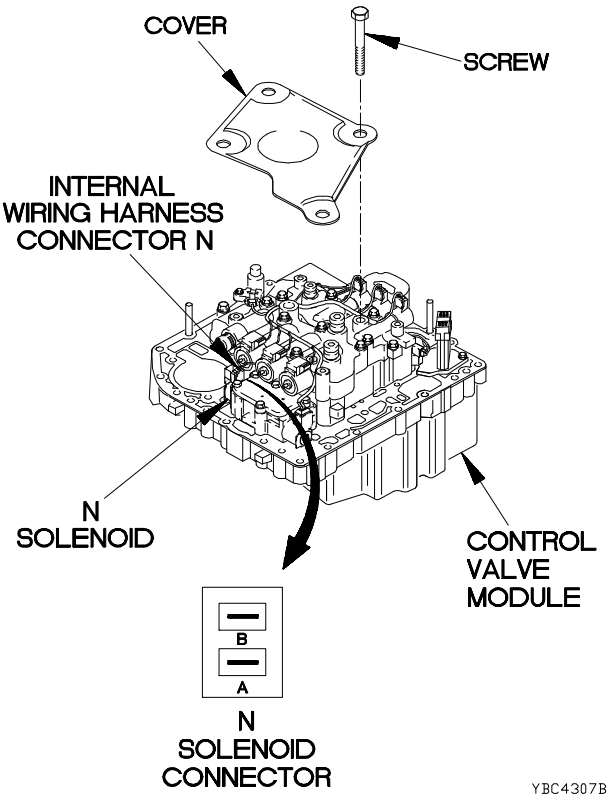


c43. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

INITIAL SETUP

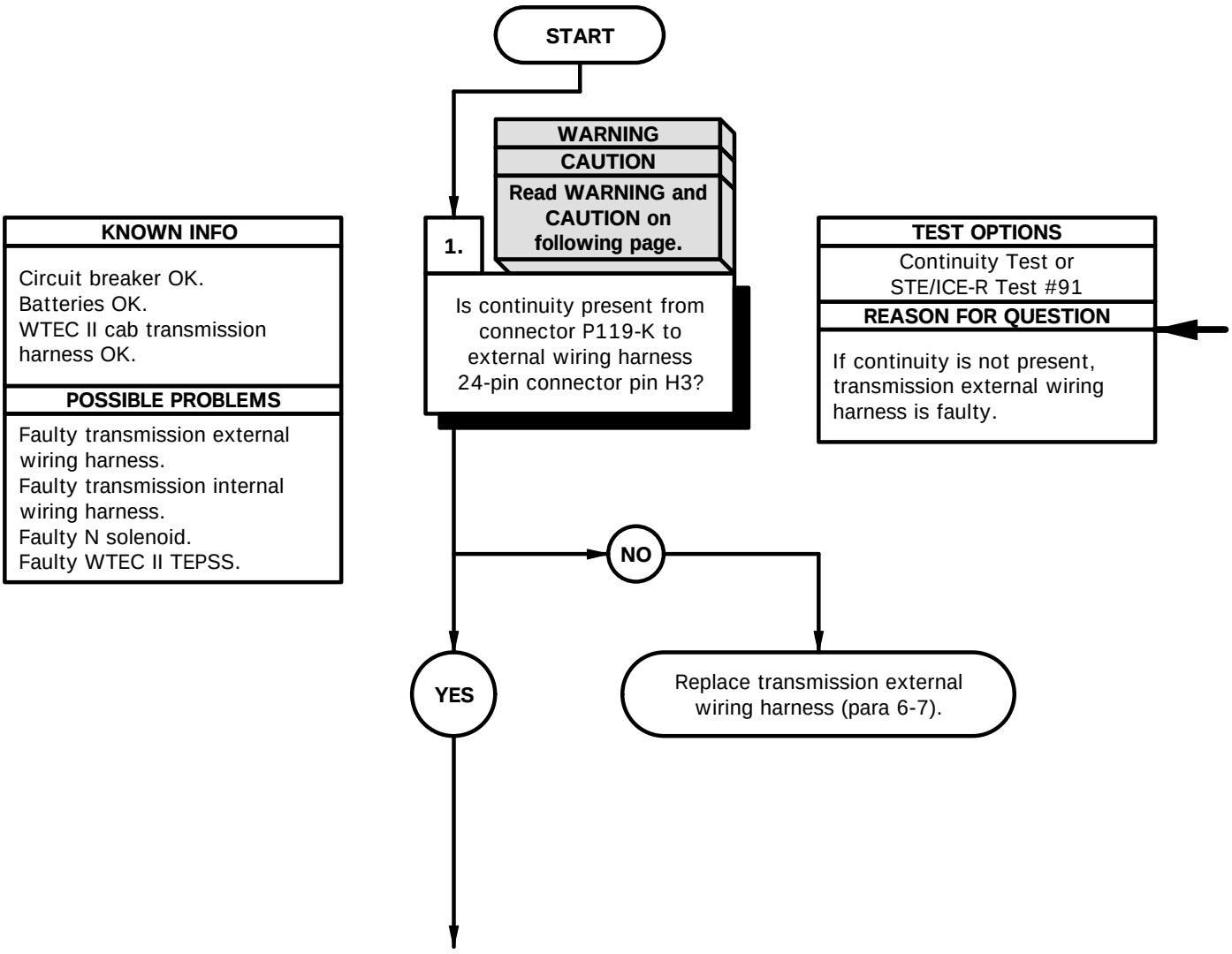
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

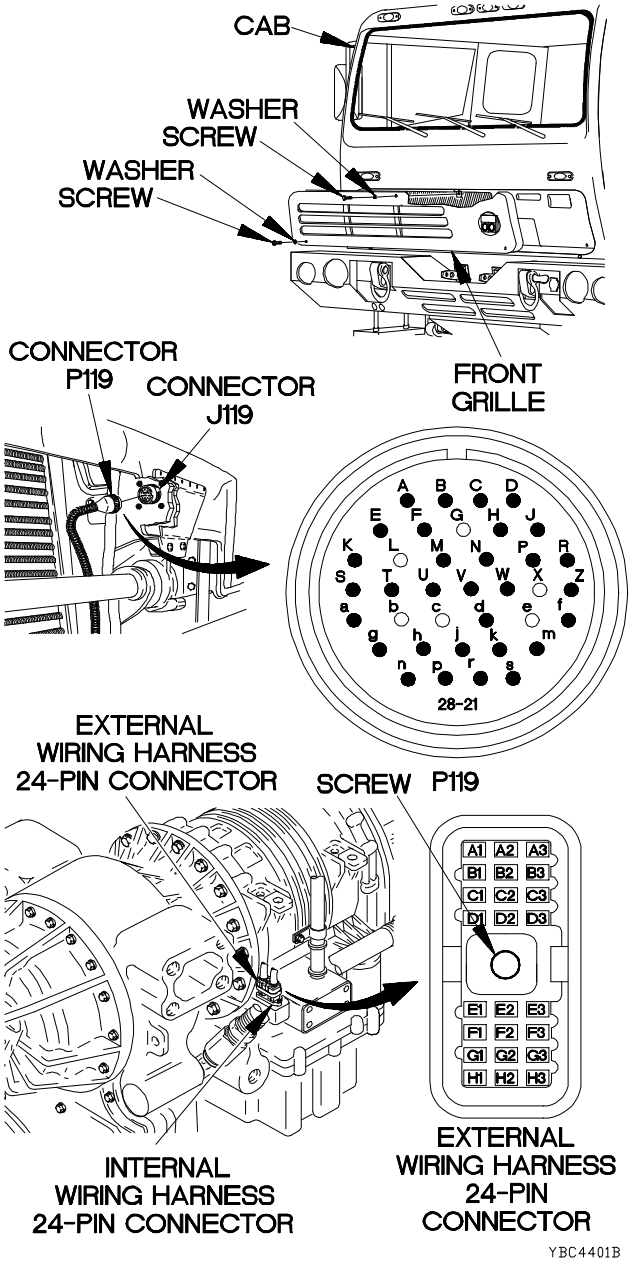
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



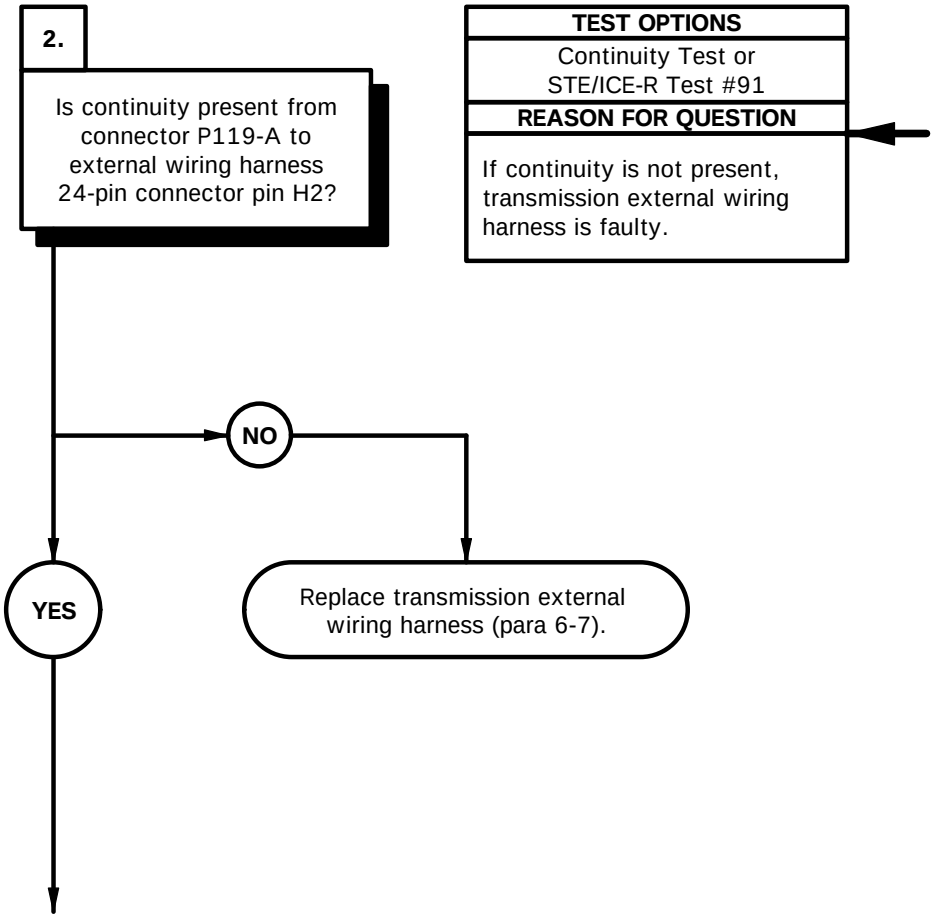
c44. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

KNOWN INFO

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

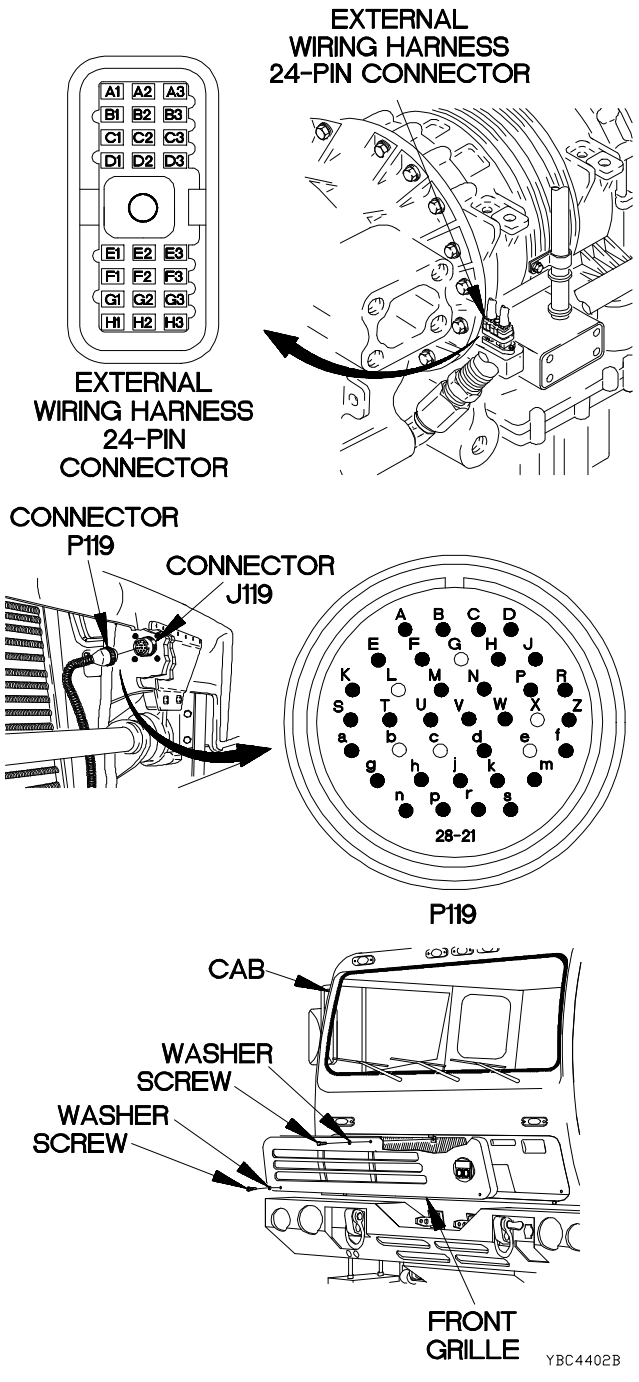
POSSIBLE PROBLEMS

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

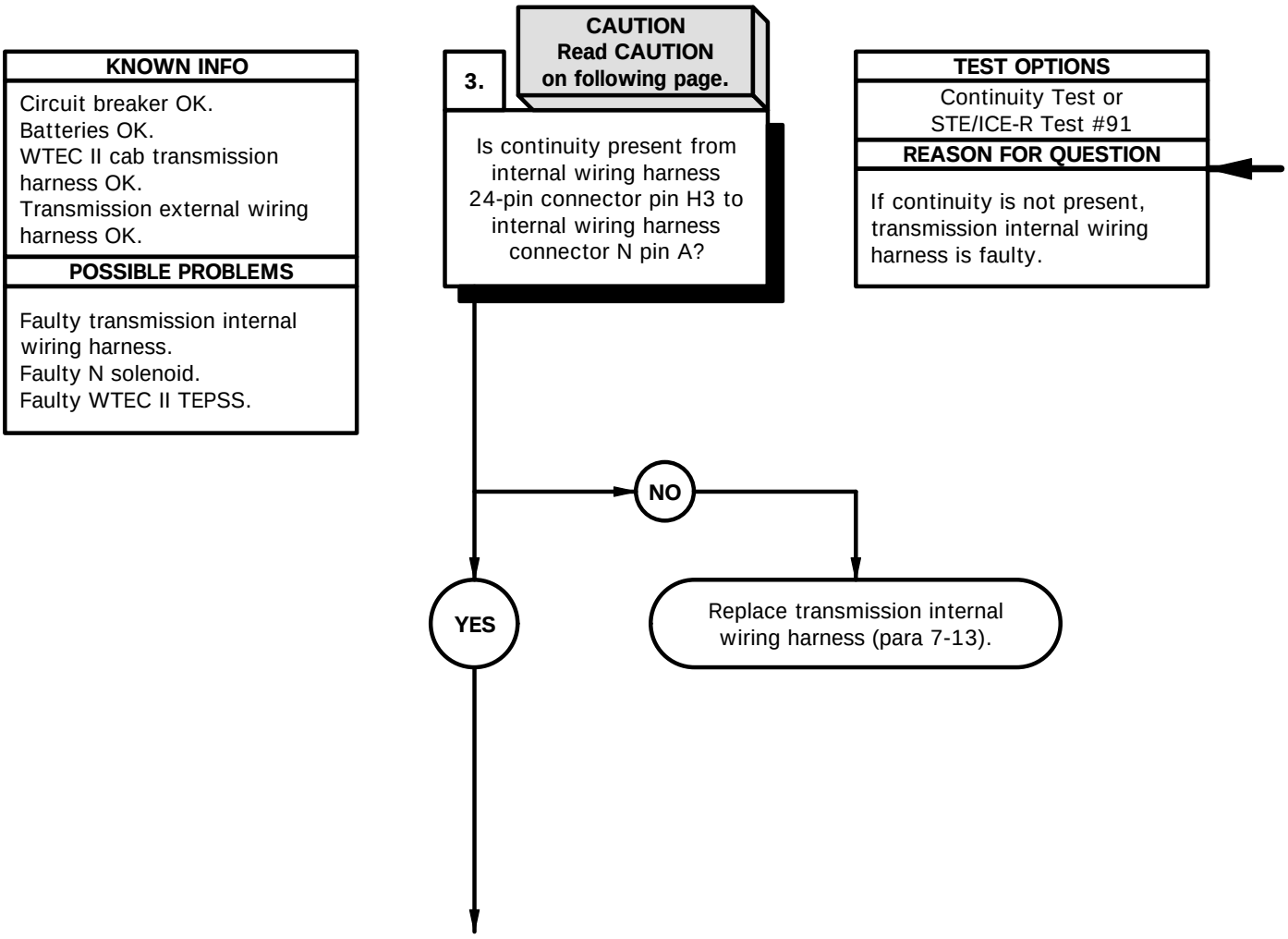


CONTINUITY TEST

(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)

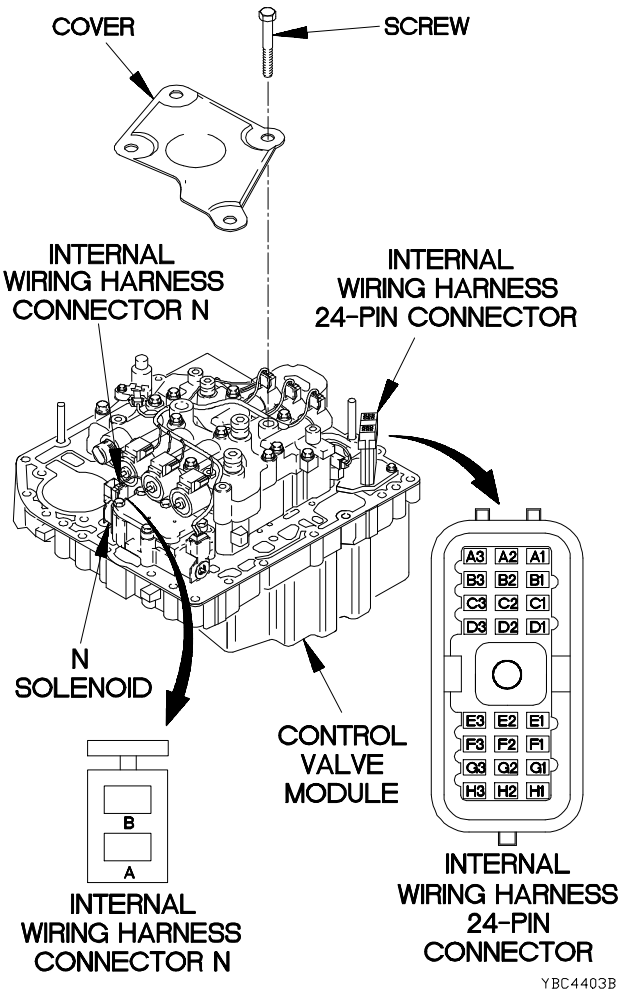


CAUTION

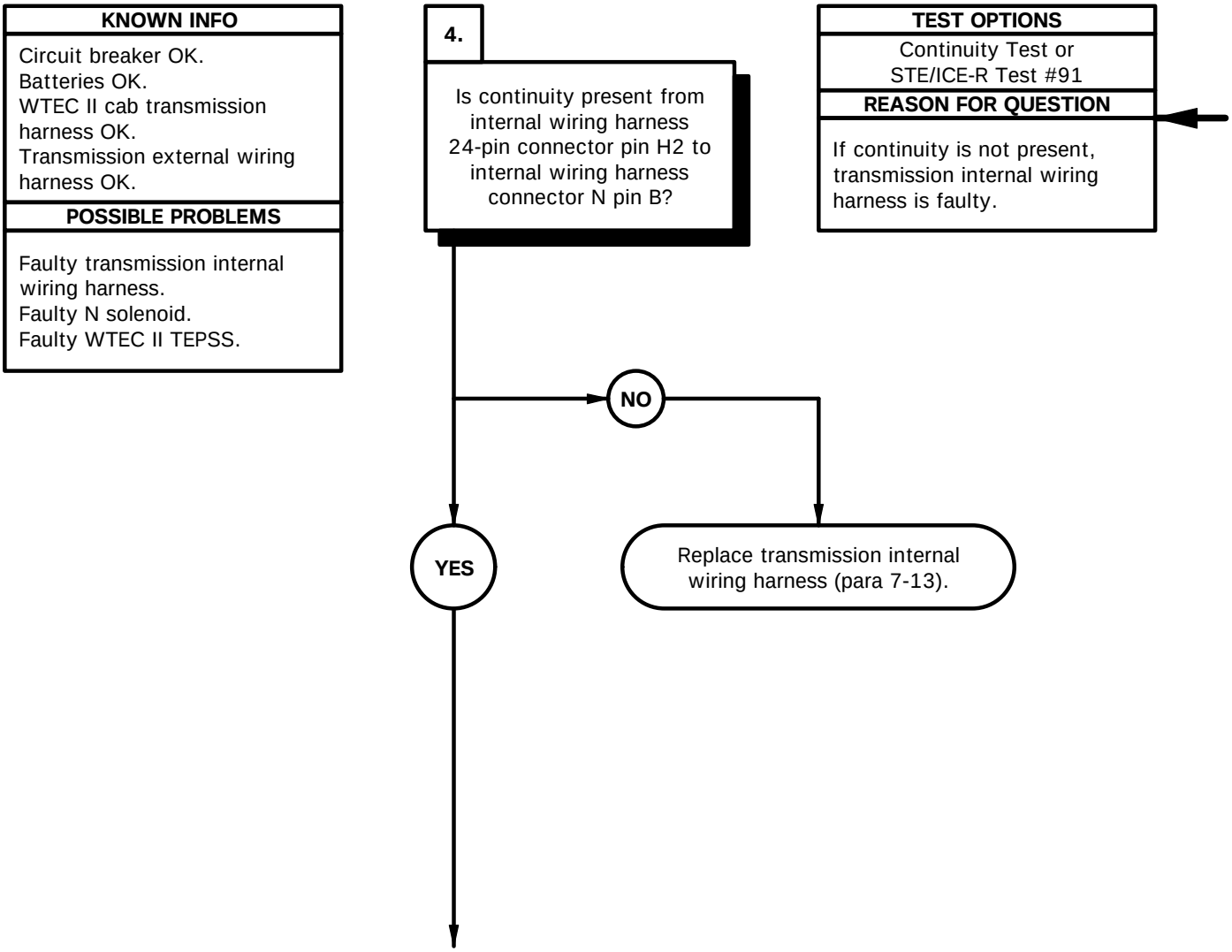
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

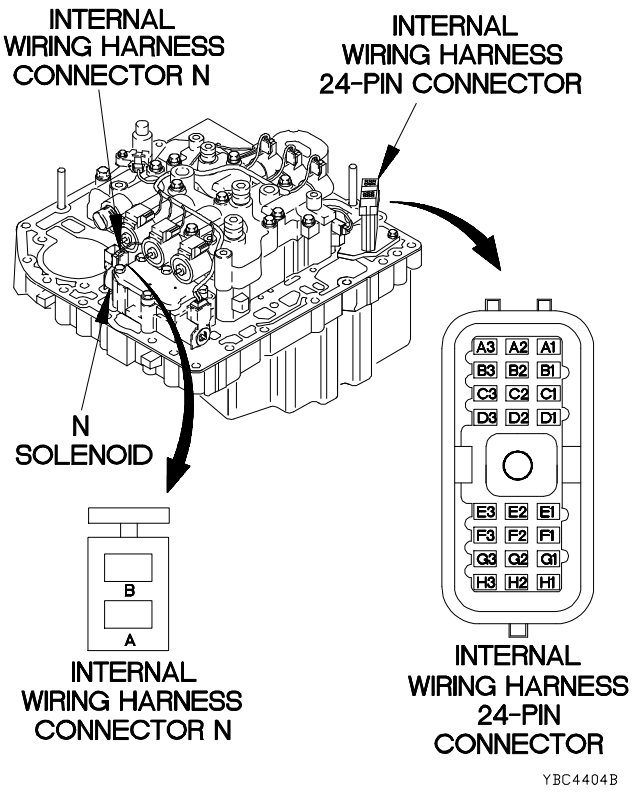


c44. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

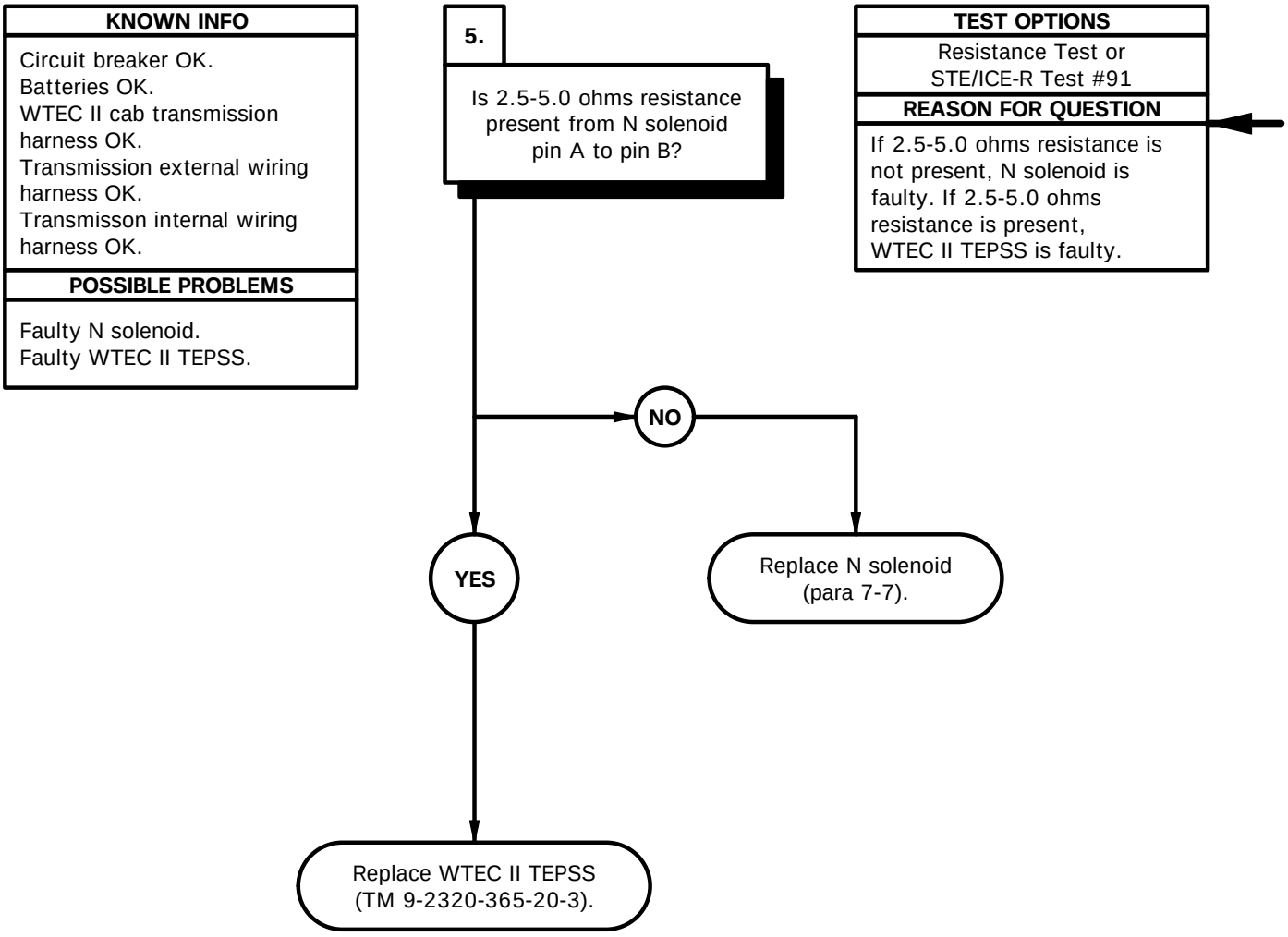


CONTINUITY TEST

(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).

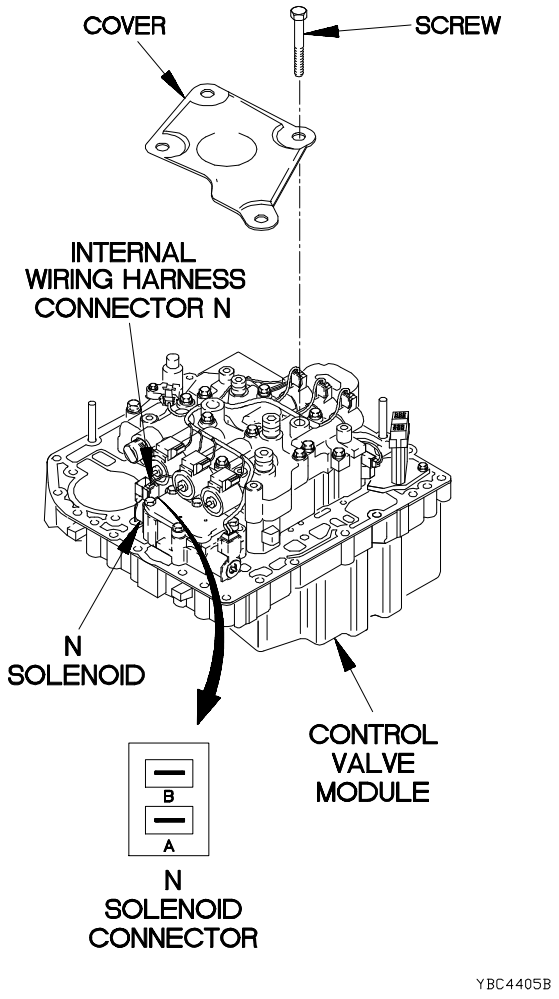


c44. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369) (CONT)



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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

INITIAL SETUP

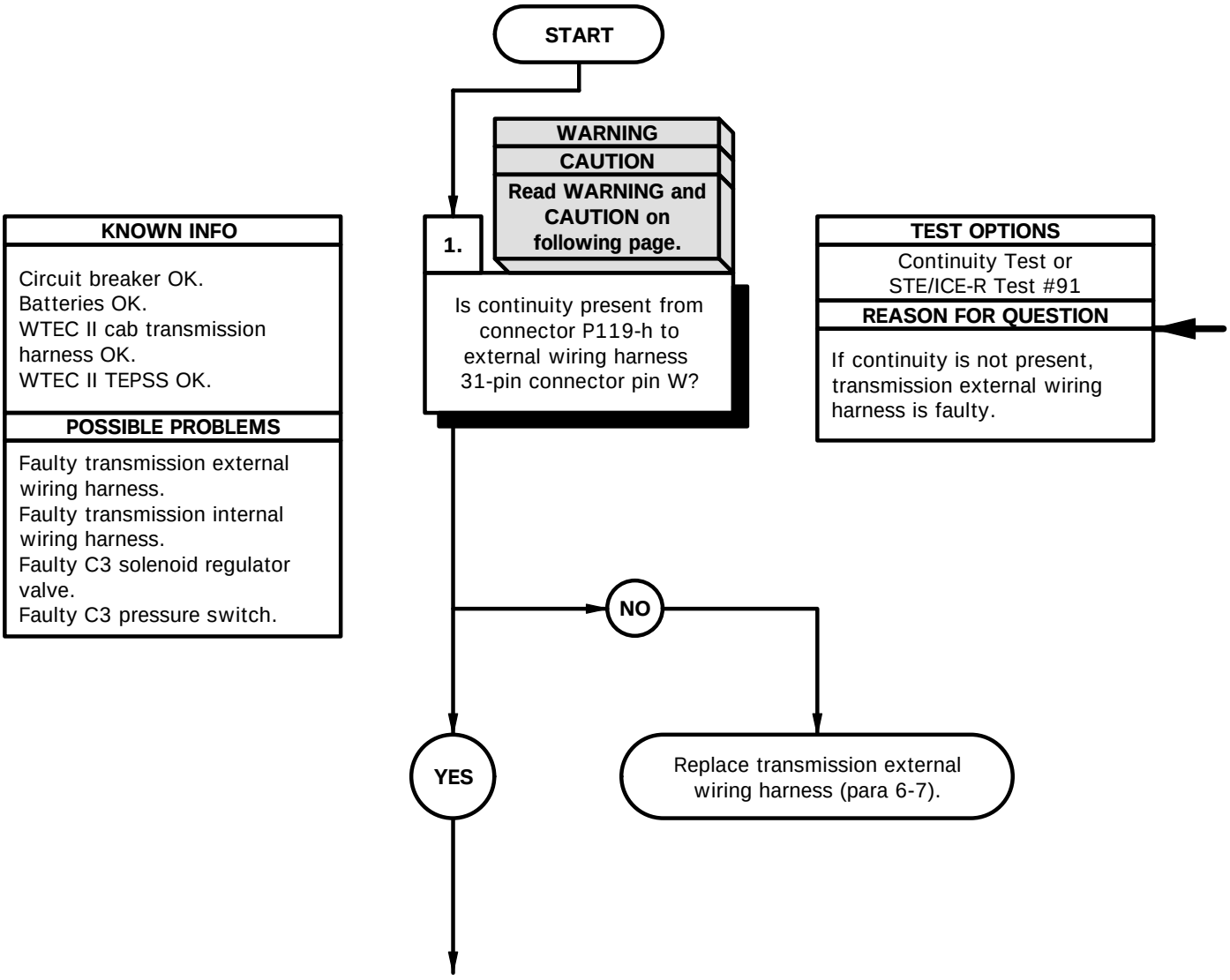
Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)

Materials/Parts
Wire, Elect, 50 ft (Item 94, 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 41.1, 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

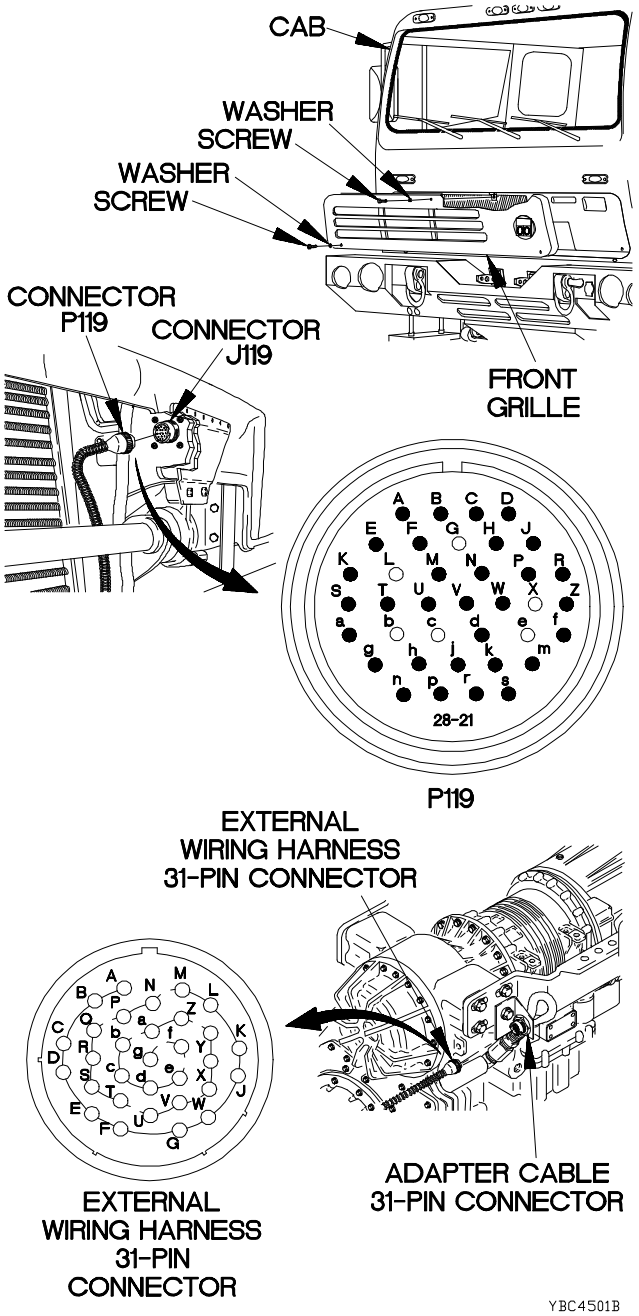
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

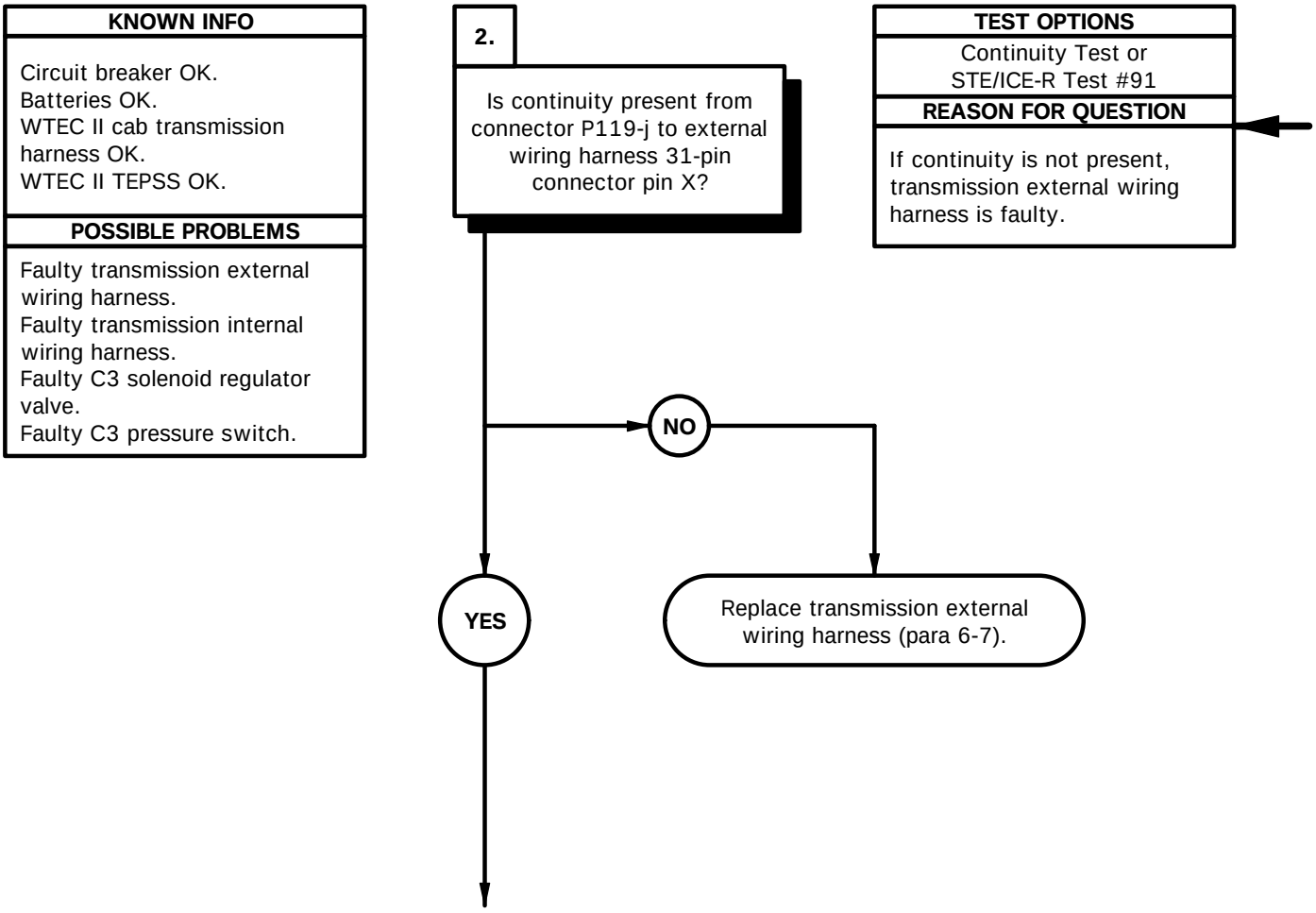
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from internal wiring 31-pin connector.
(6) Set multimeter to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

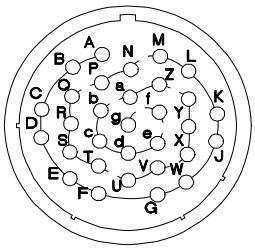


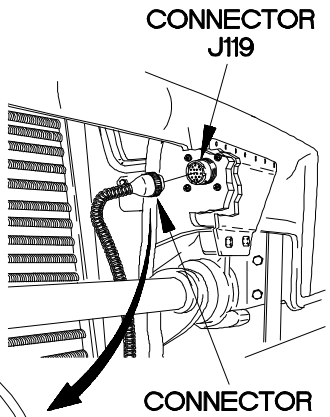
c45. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

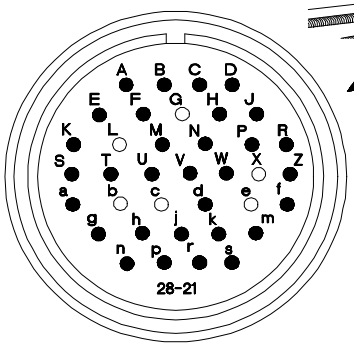


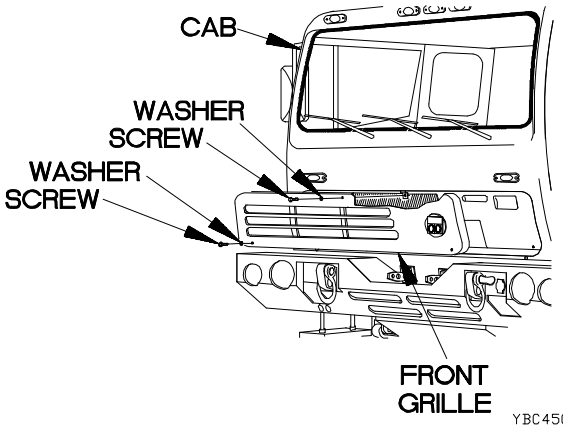
CONTINUITY TEST

(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).

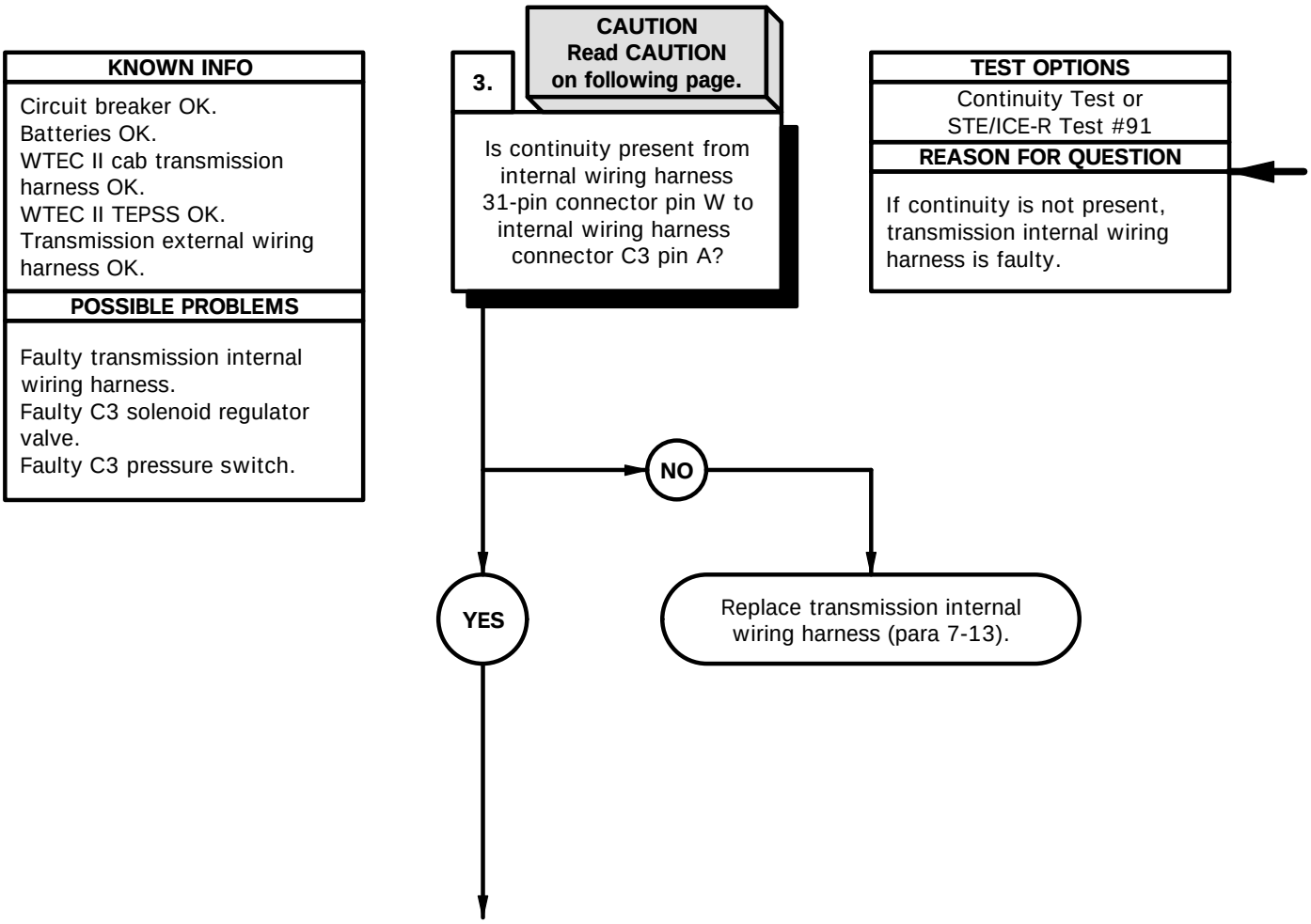








c45. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

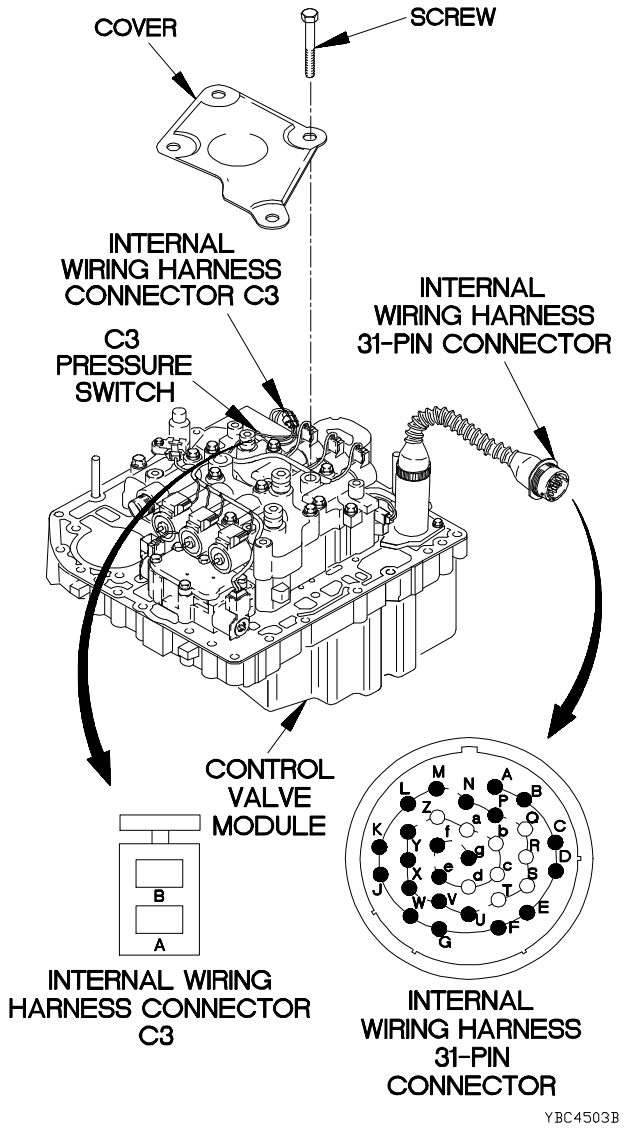


CAUTION

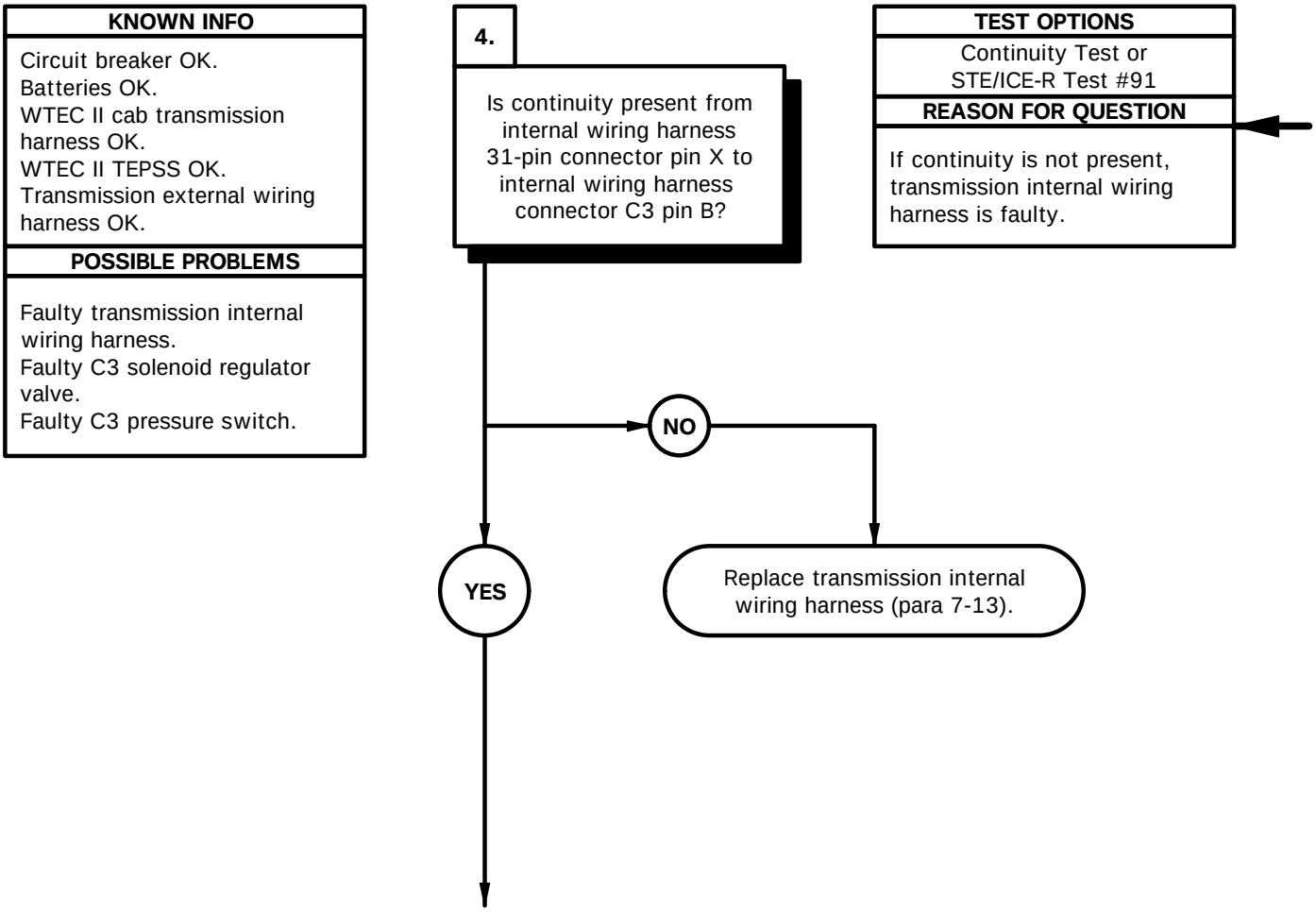
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

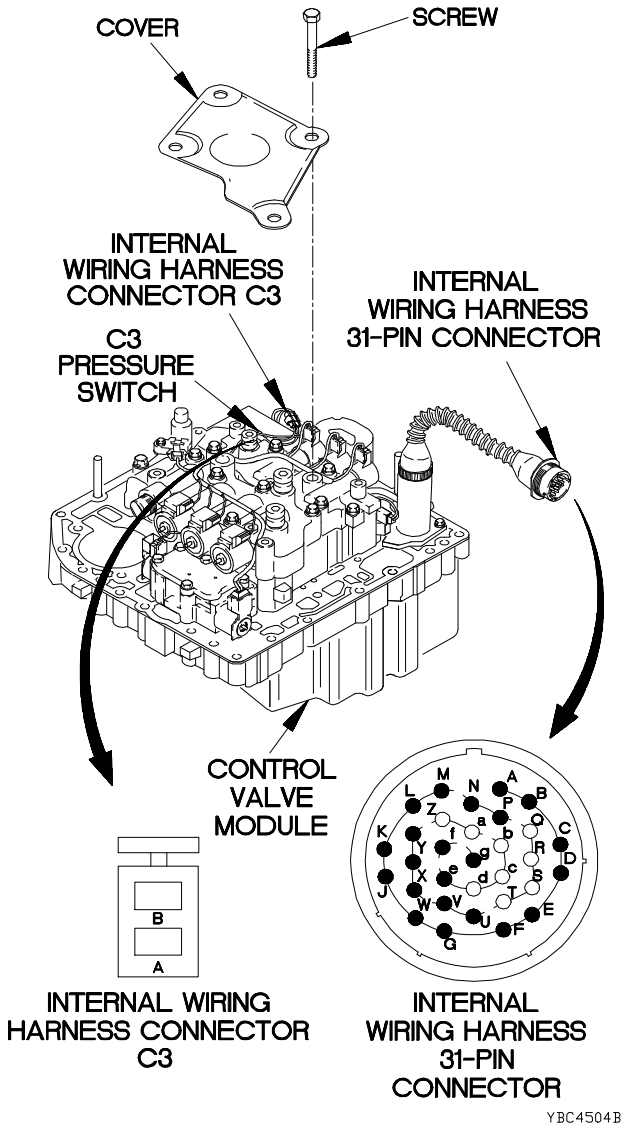


c45. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

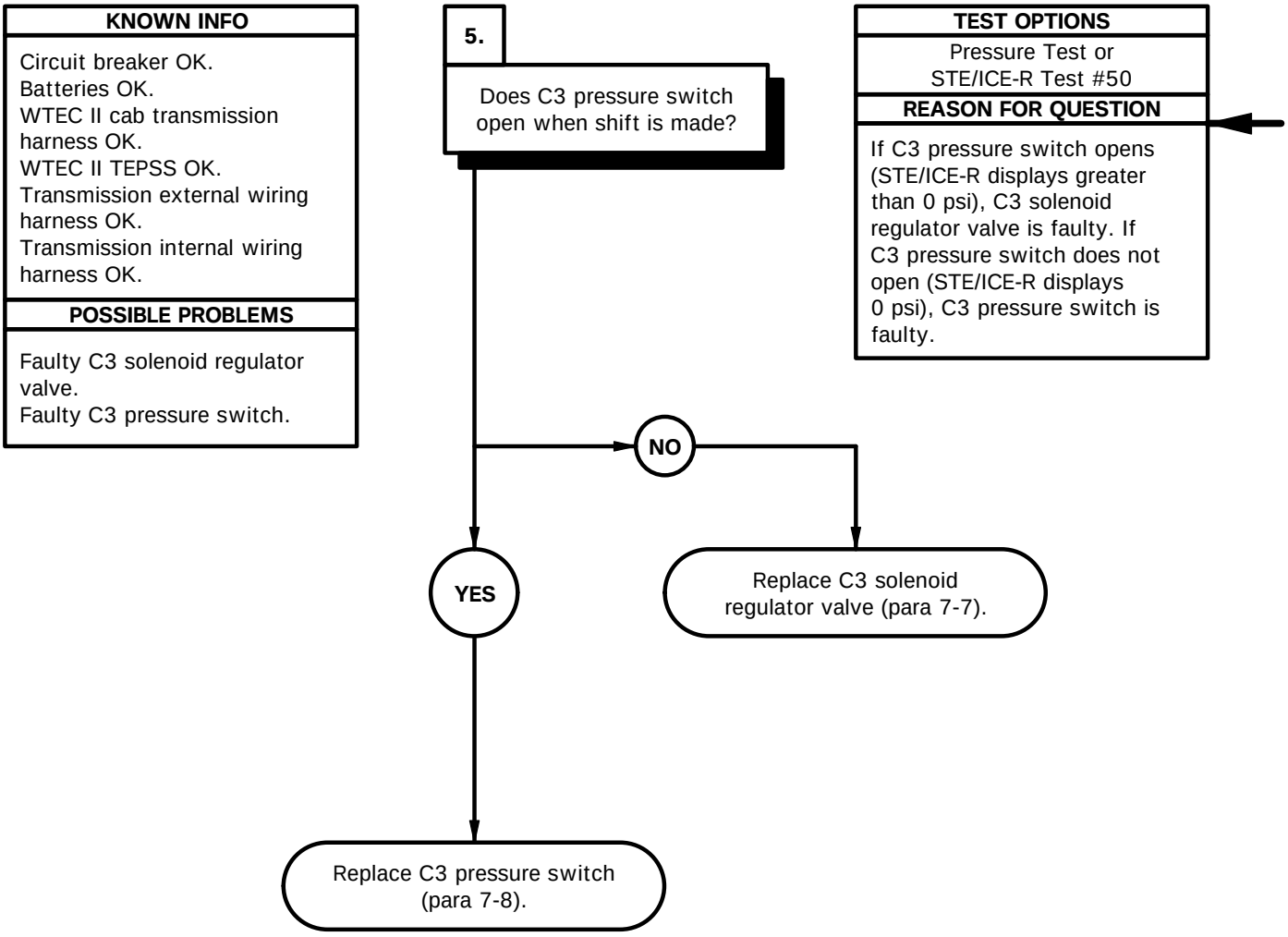


CONTINUITY TEST

(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 9-2320-365-20-3).



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

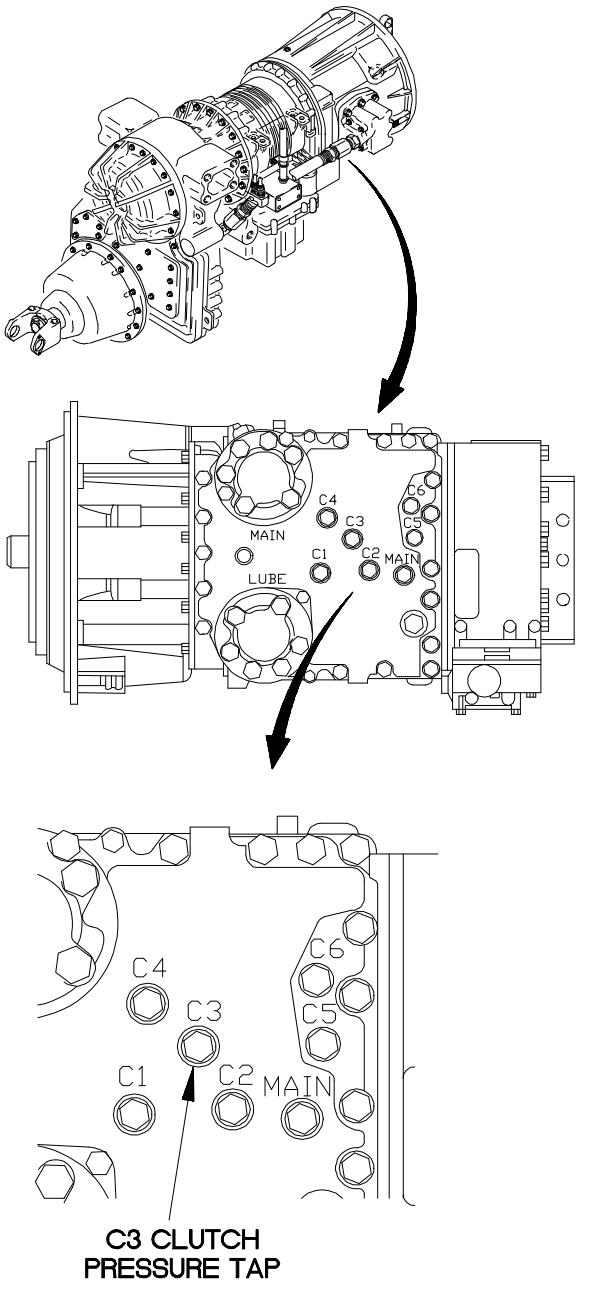


PRESSURE TEST

(1) Remove front and rear propeller shafts (TM 9-2320-365-20-3).
(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 9-2320-365-20-3).
(6) Perform STE/ICE-R test #50 (TM 9-4910-571-12&P).
(7) Start engine (TM 9-2320-365-10).
(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 9-2320-365-10).
(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 rear propeller shafts (TM 9-2320-365-20-3).

Table 2-4.1. 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

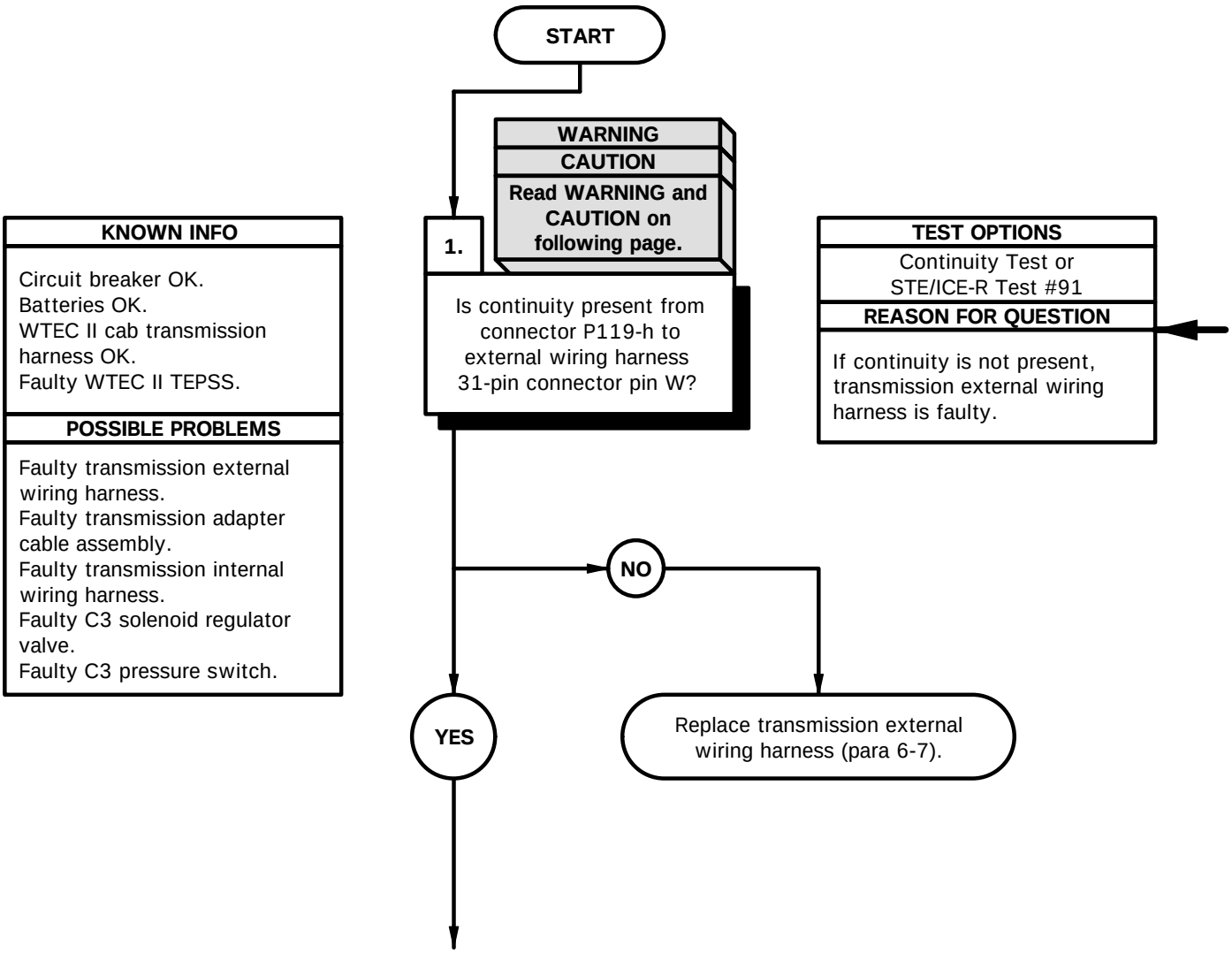
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)

Materials/Parts
Wire, Elect, 50 ft (Item 94, 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 41.1, 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

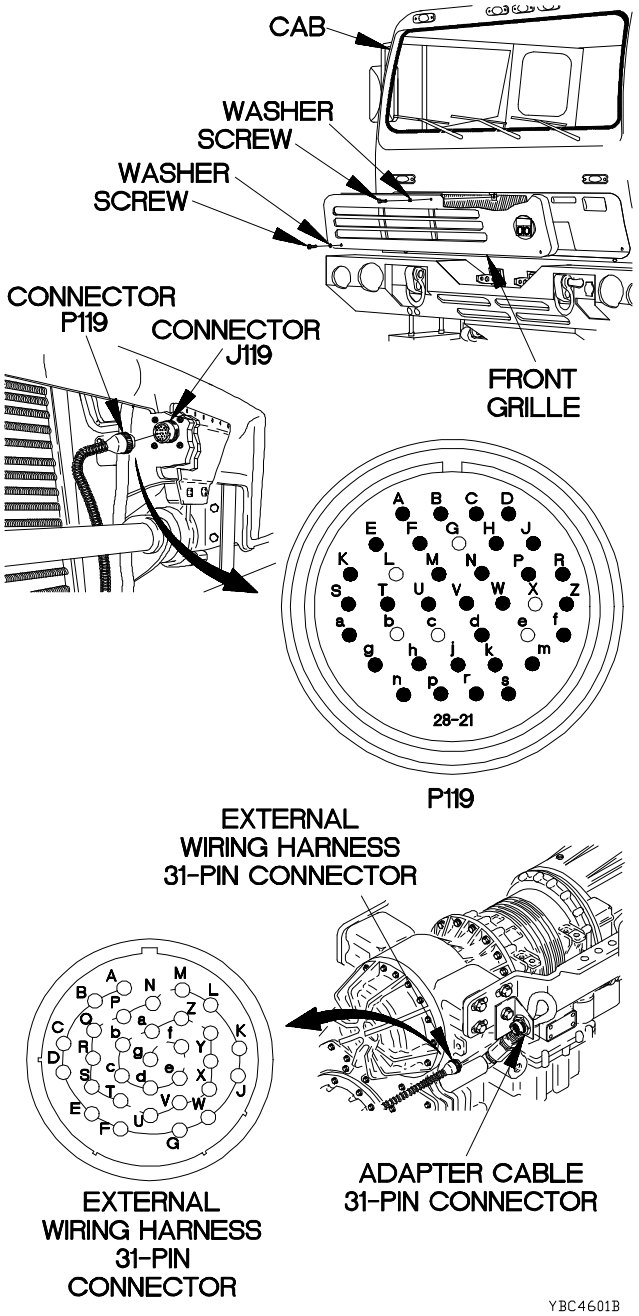
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

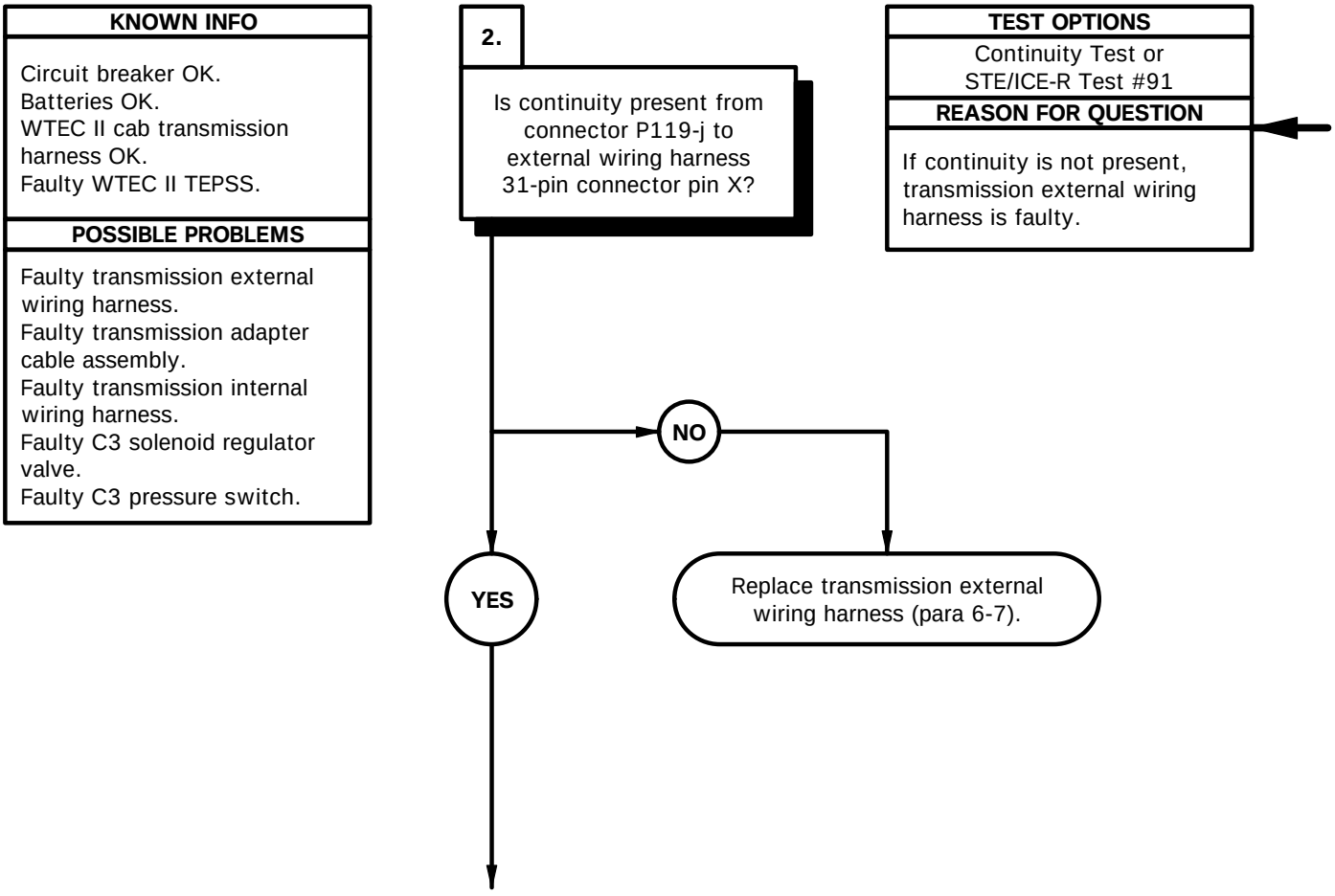
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness 31-pin connector from adapter cable 31-pin connector.
(6) Set multimeter to ohms.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

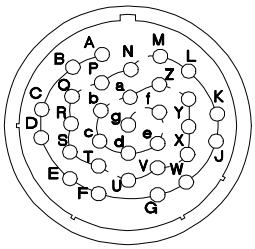


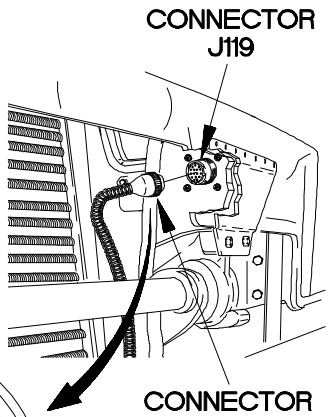
c46. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 56 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

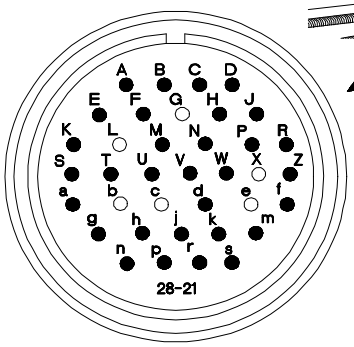


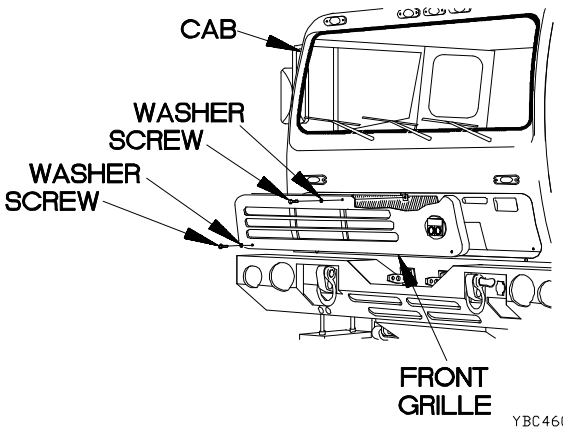
CONTINUITY TEST

(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).

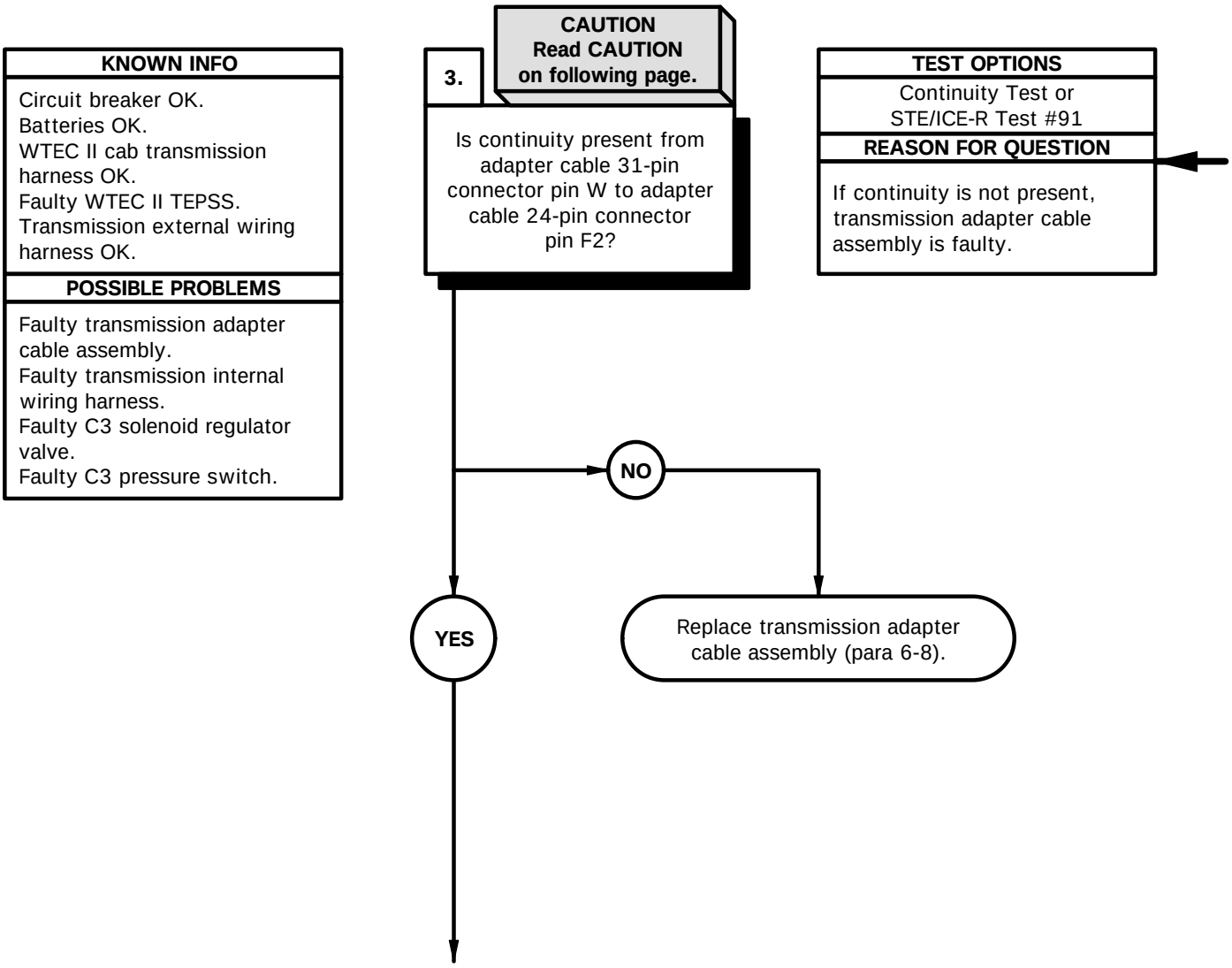








c46. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 56 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

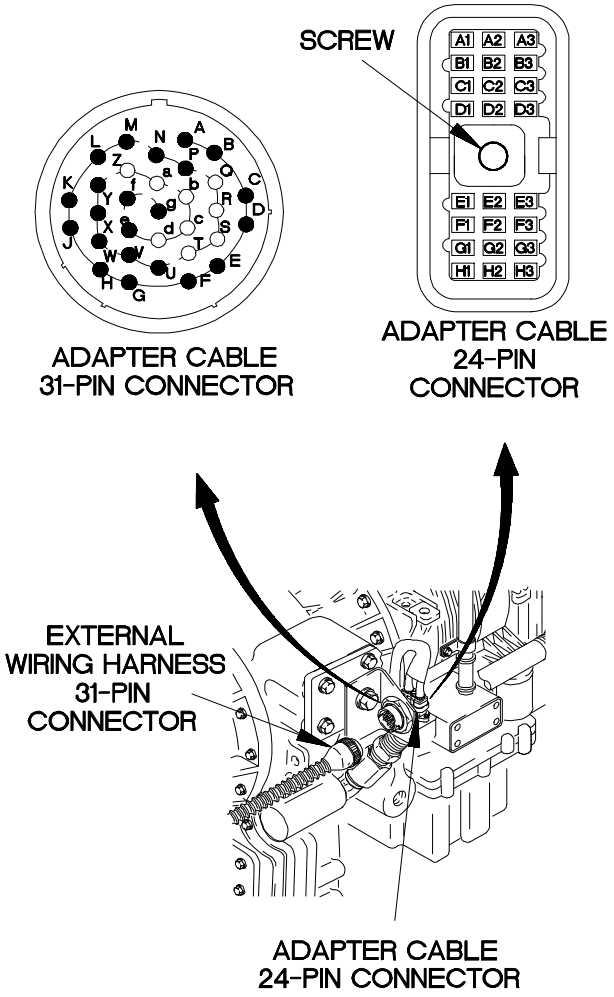


CAUTION

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).



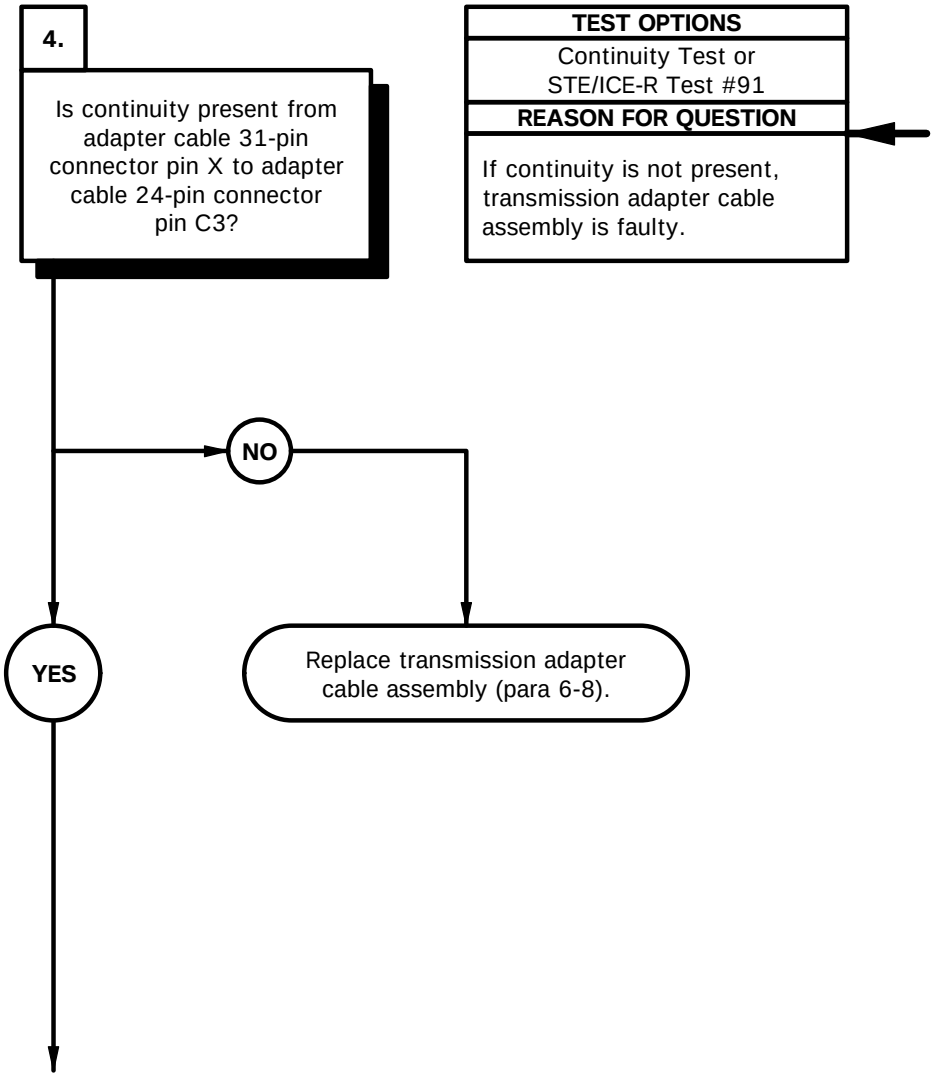
c46. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 56 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO

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

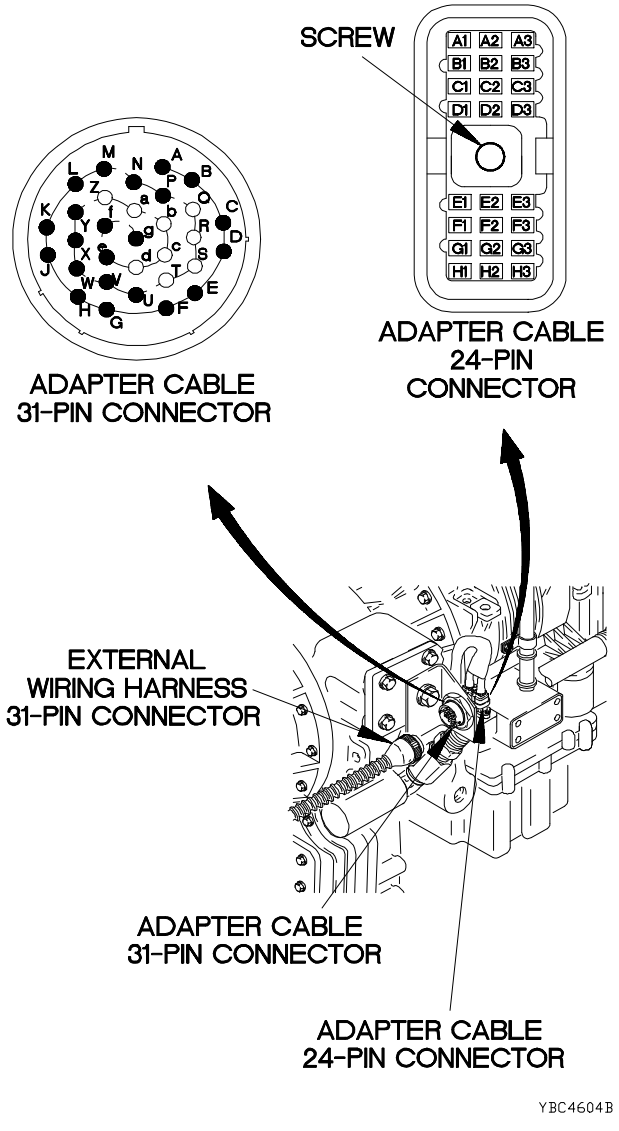
POSSIBLE PROBLEMS

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

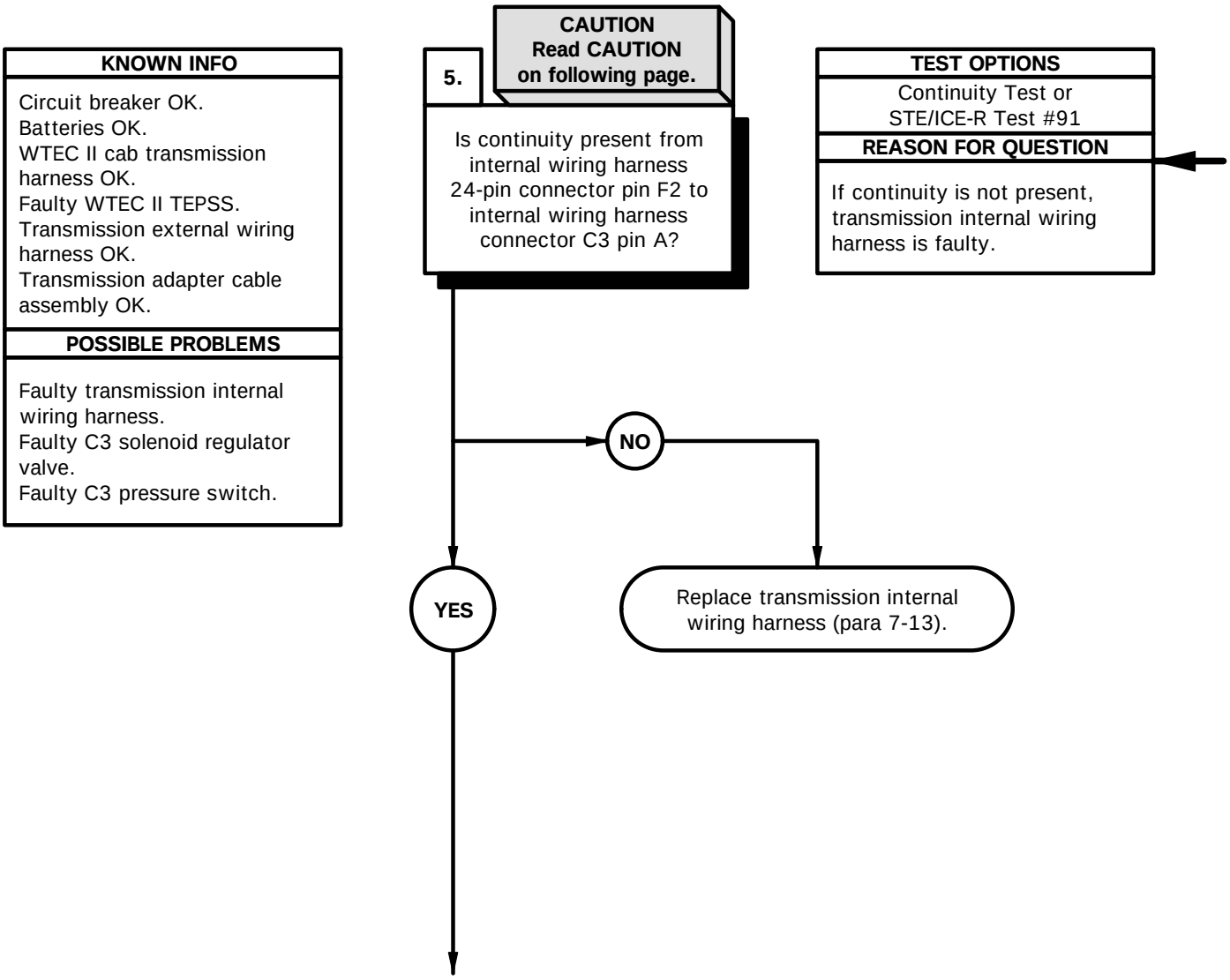


CONTINUITY TEST

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

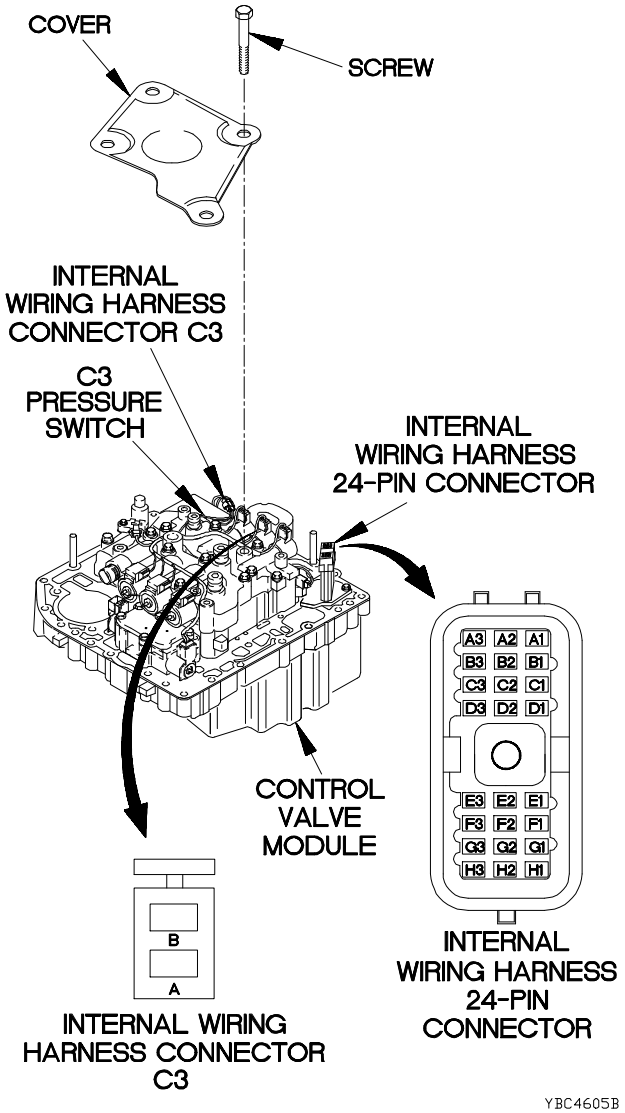


CAUTION

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).



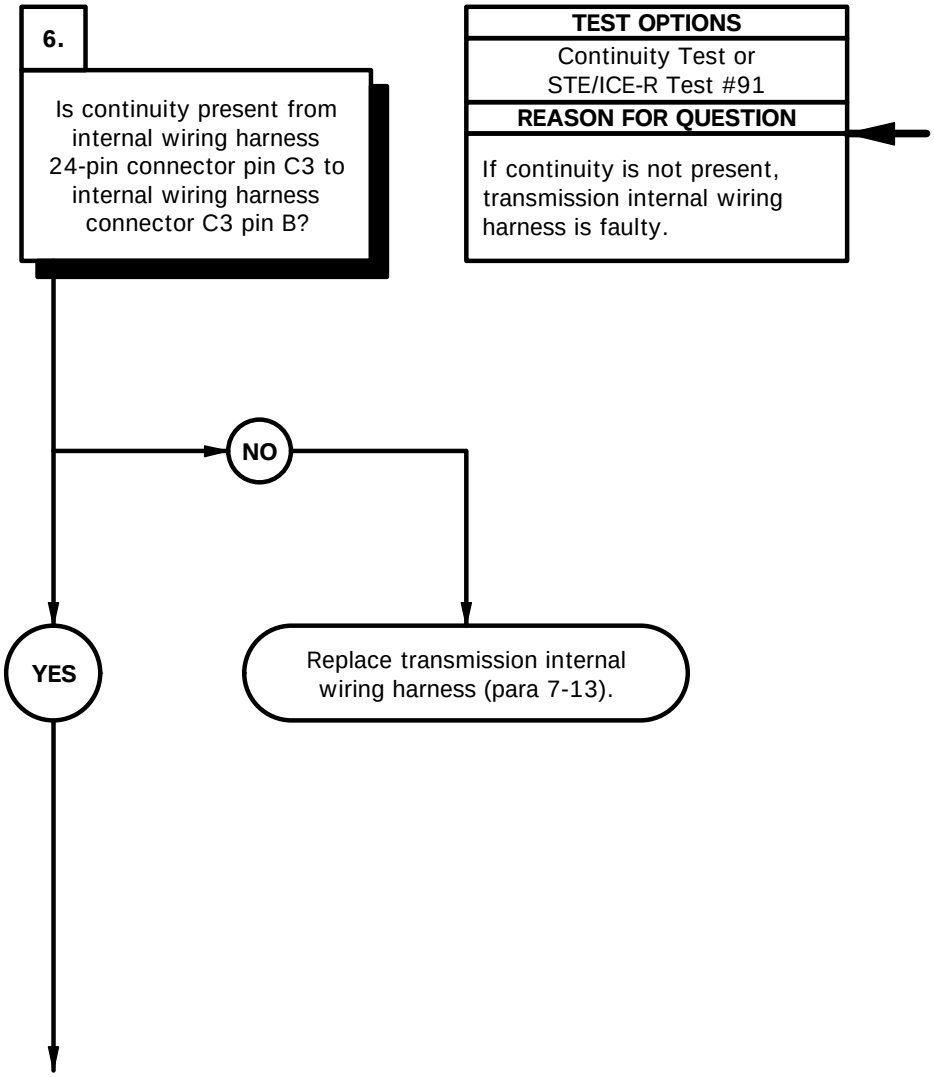
c46. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 56 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

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.

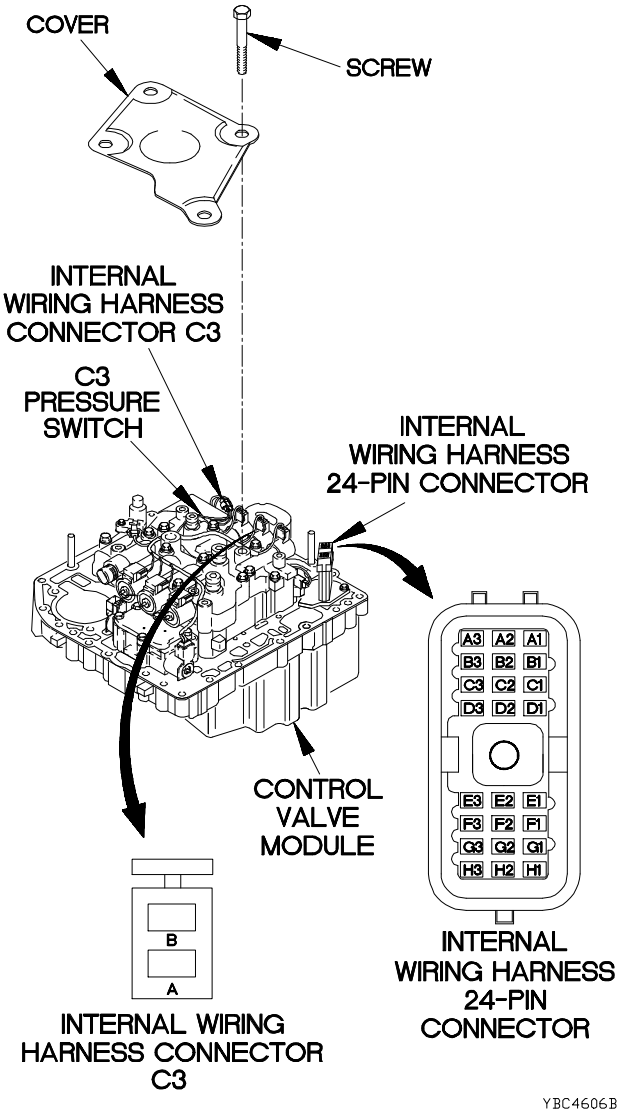
POSSIBLE PROBLEMS

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

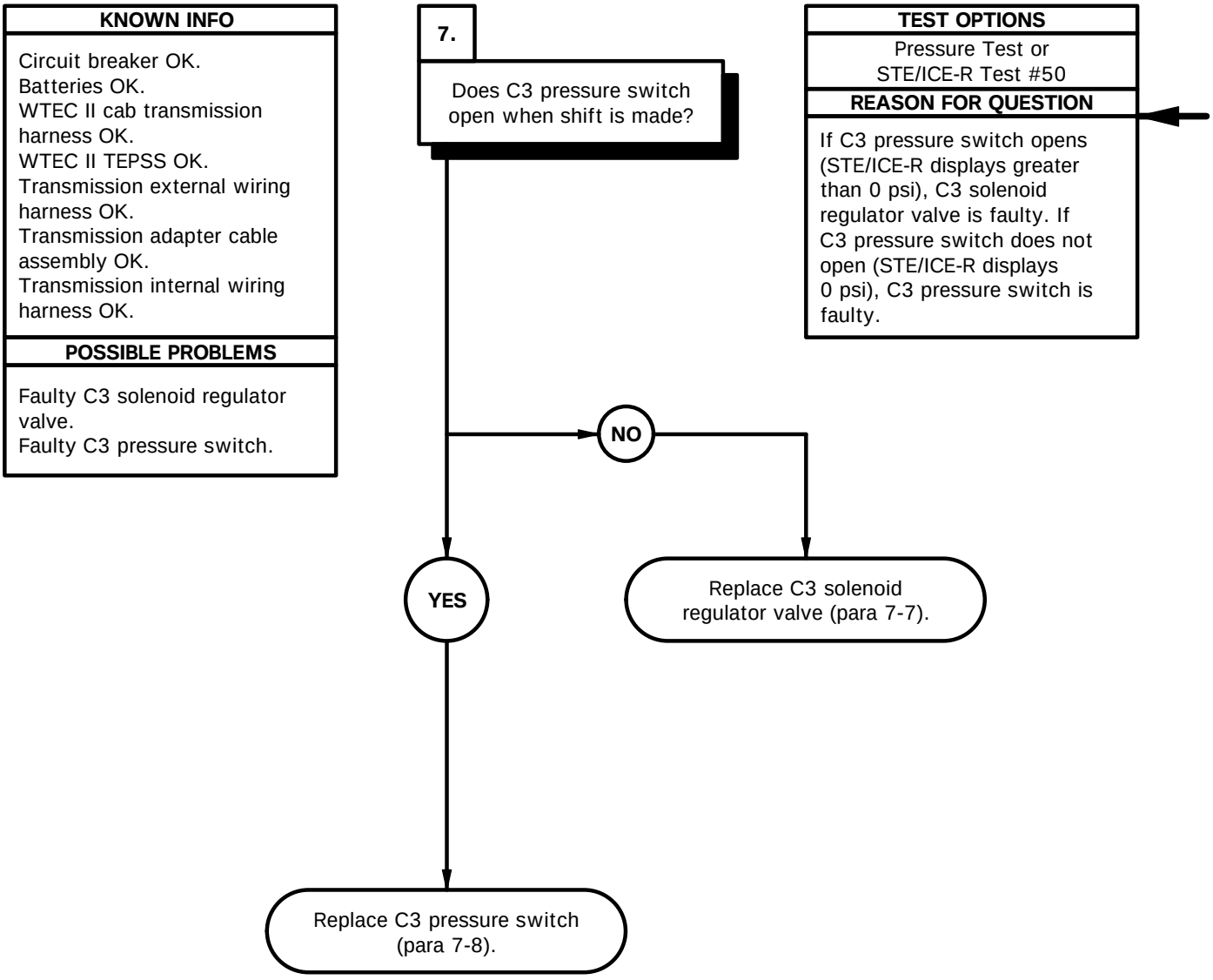


CONTINUITY TEST

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

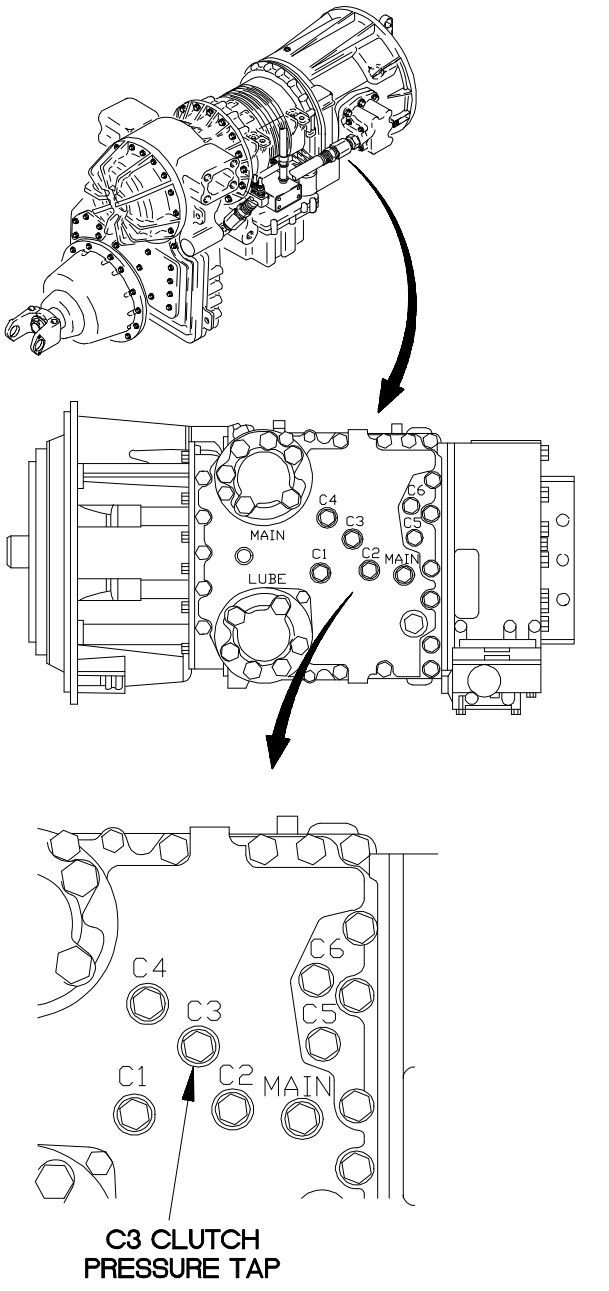


PRESSURE TEST

(1) Remove front and rear propeller shafts (TM 9-2320-365-20-3).
(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 9-2320-365-20-3).
(6) Perform STE/ICE-R test #50 (TM 9-4910-571-12&P).
(7) Start engine (TM 9-2320-365-10).
(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 9-2320-365-10).
(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 rear propeller shafts (TM 9-2320-365-20-3).

Table 2-4.2. 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

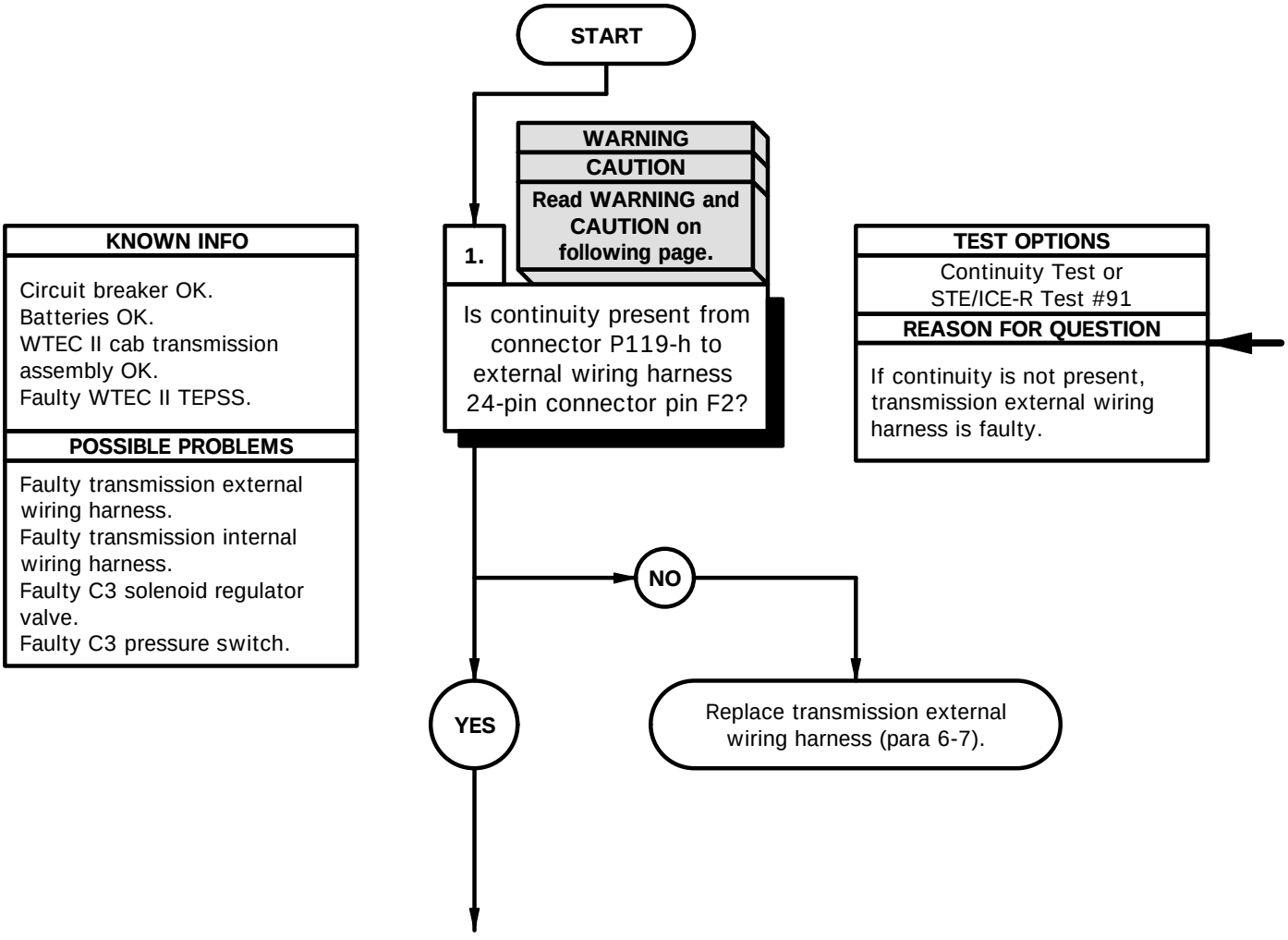
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)

Materials/Parts
Wire, Elect, 50 ft (Item 94, 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 41.1, 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

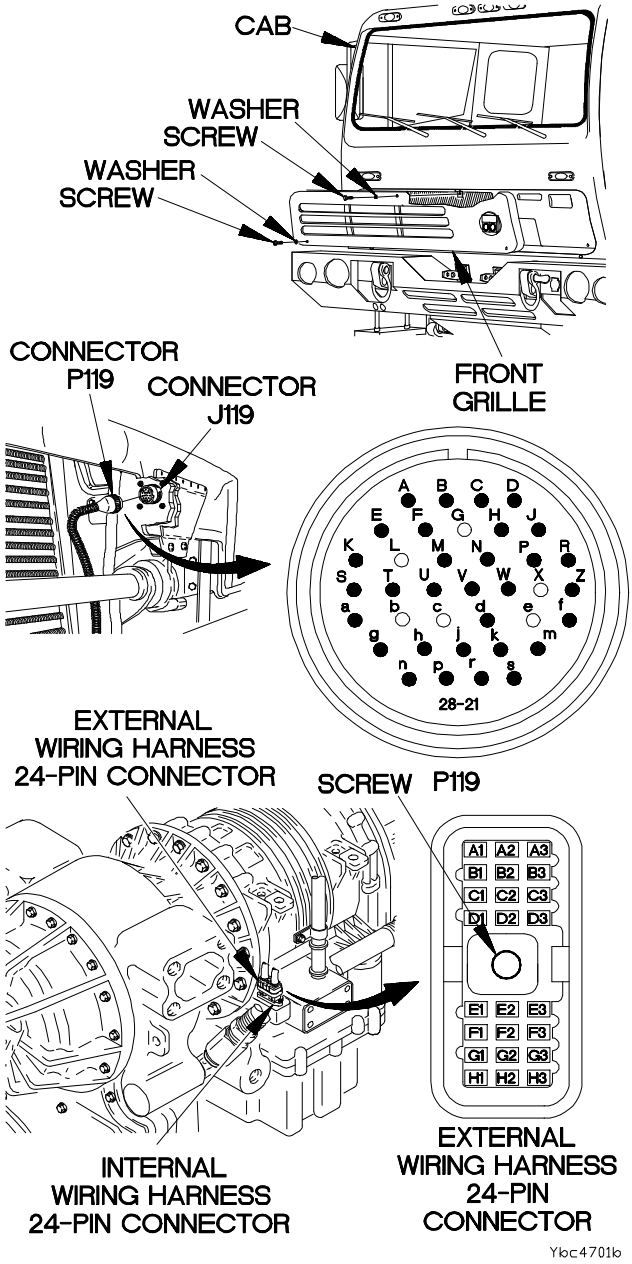
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

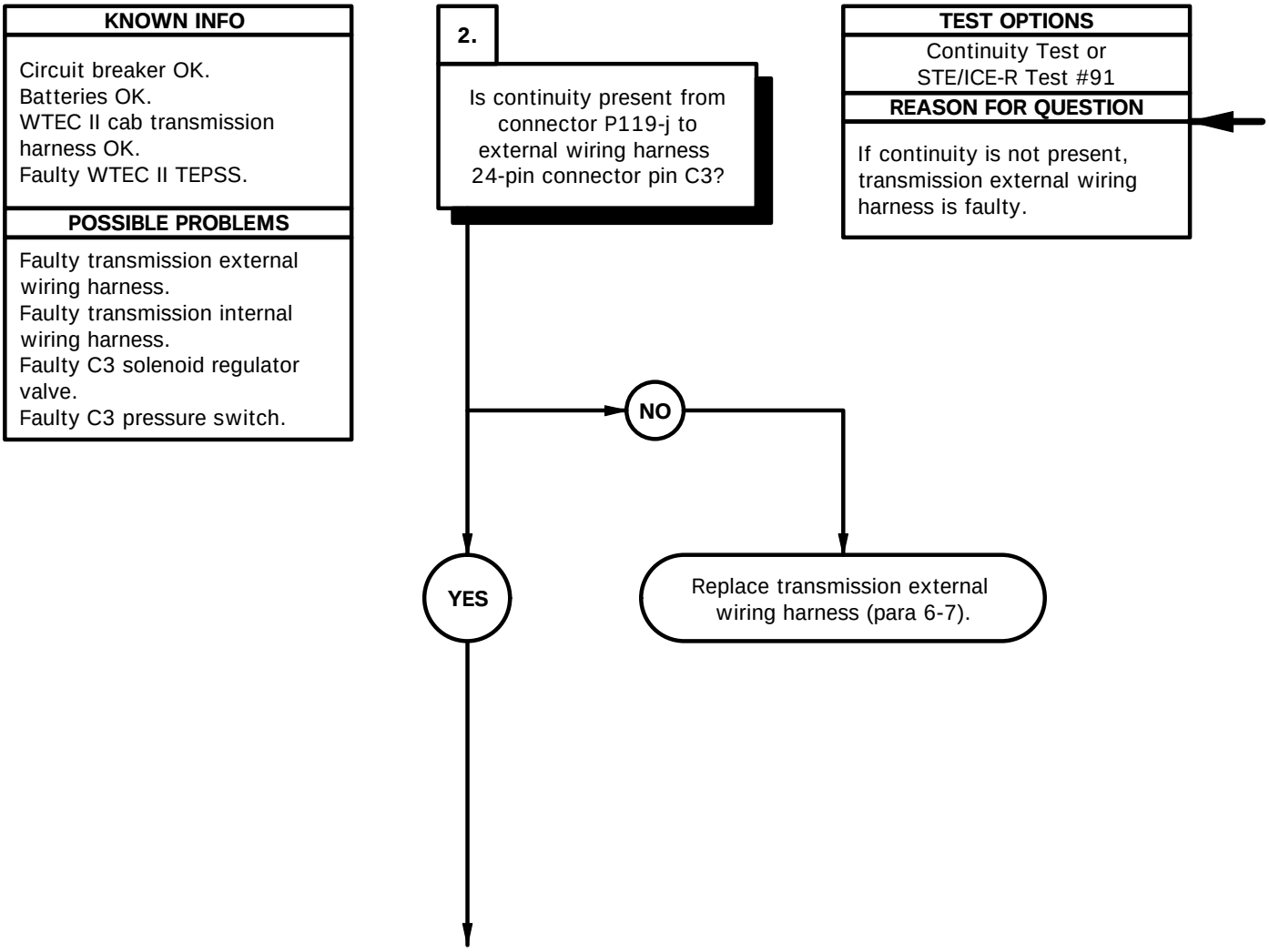
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Loosen screw in external wiring 24-pin connector.
(6) Disconnect external wiring harness 24-pin connector from internal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

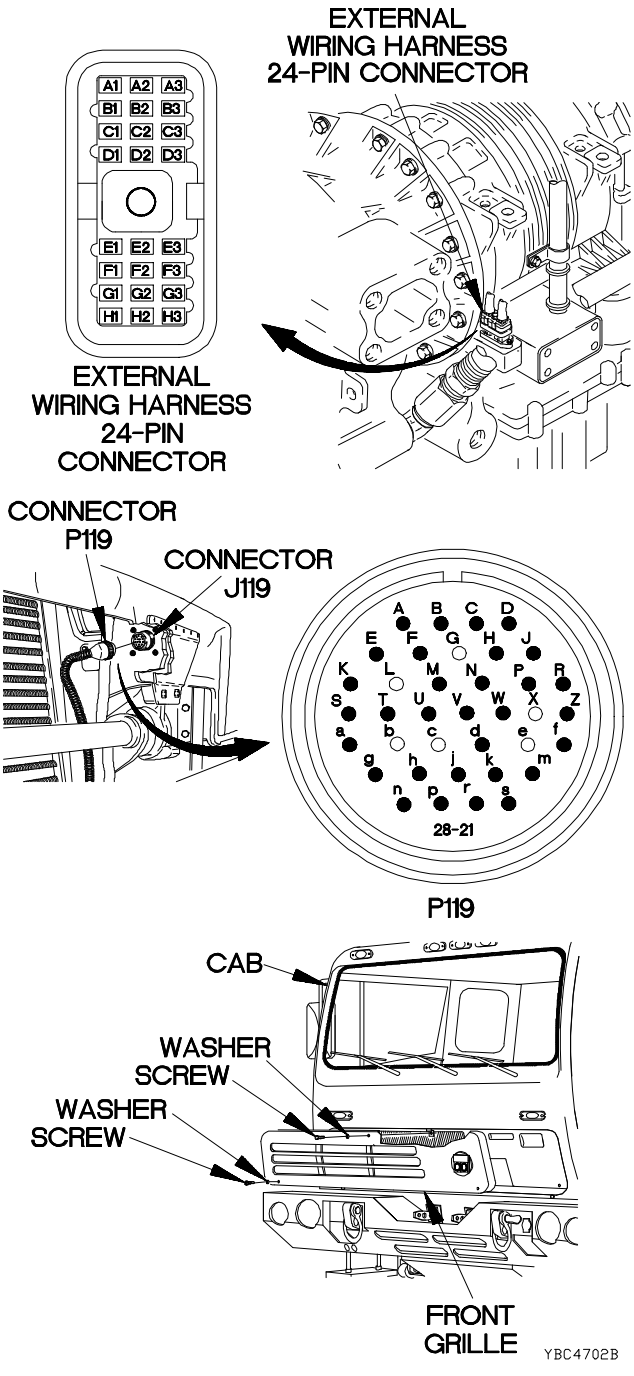


c47. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

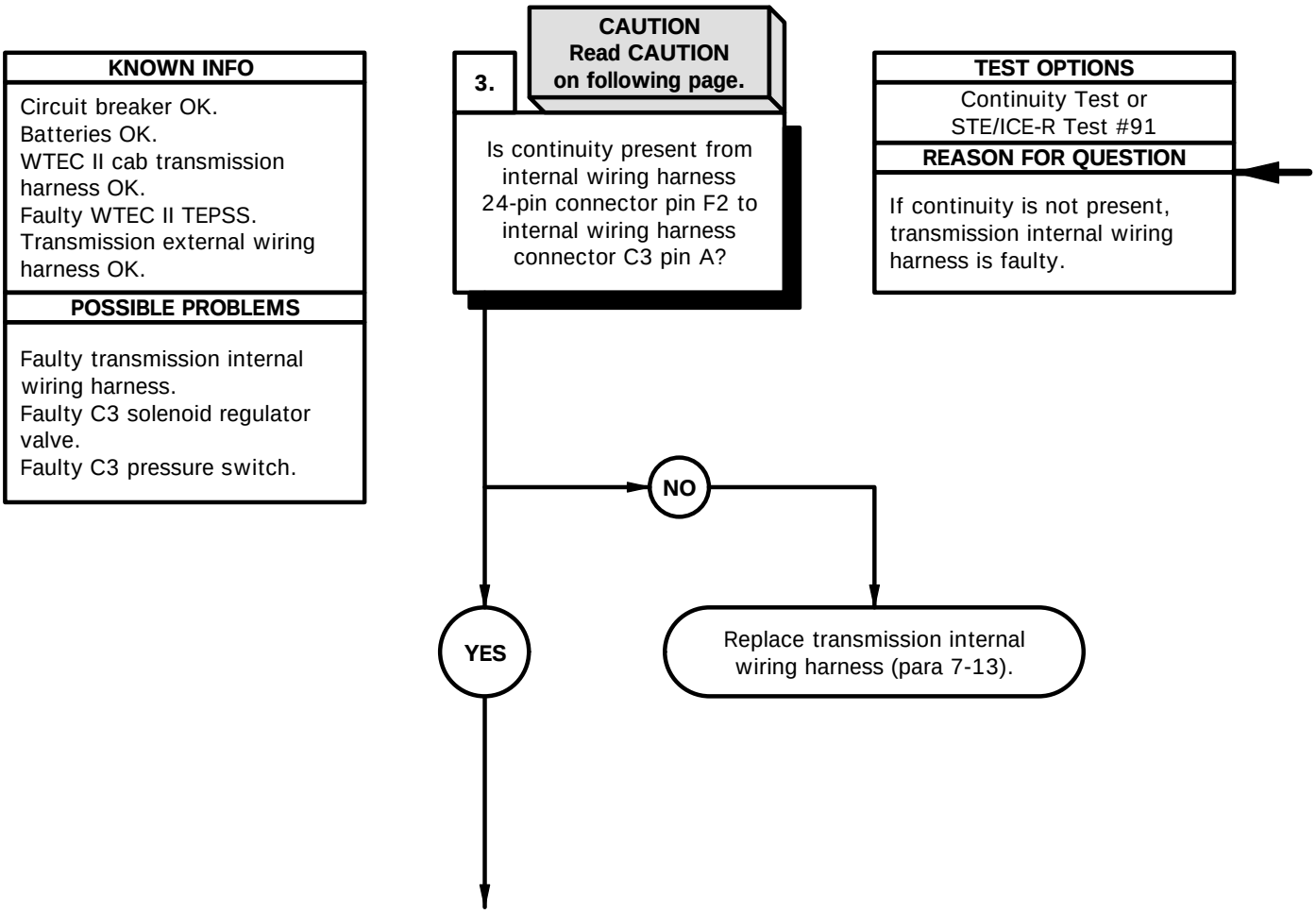


CONTINUITY TEST

(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)

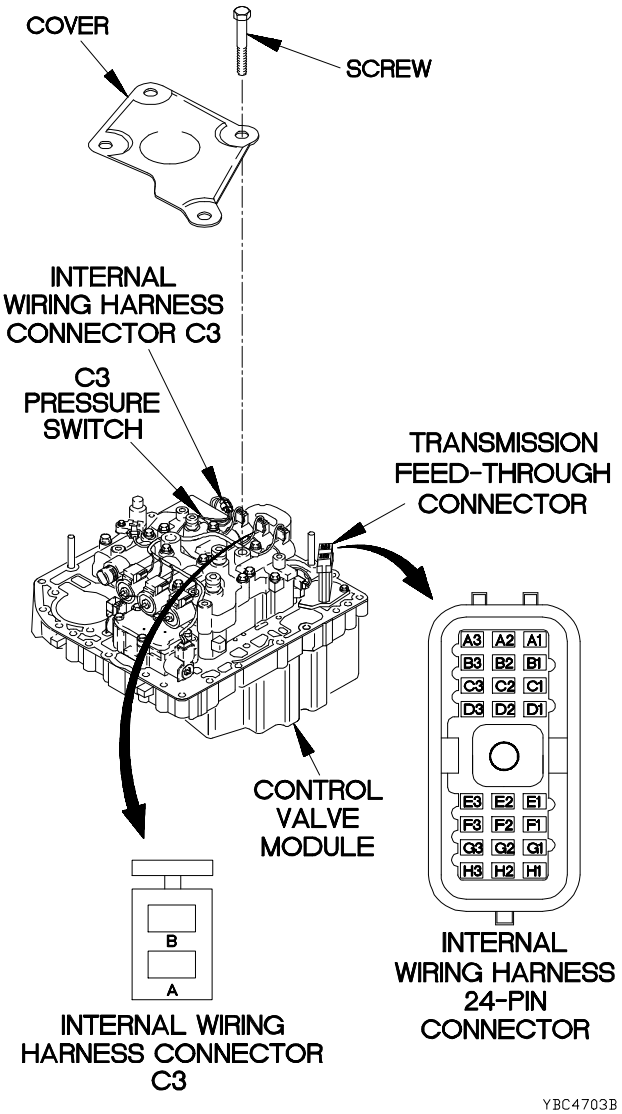


CAUTION

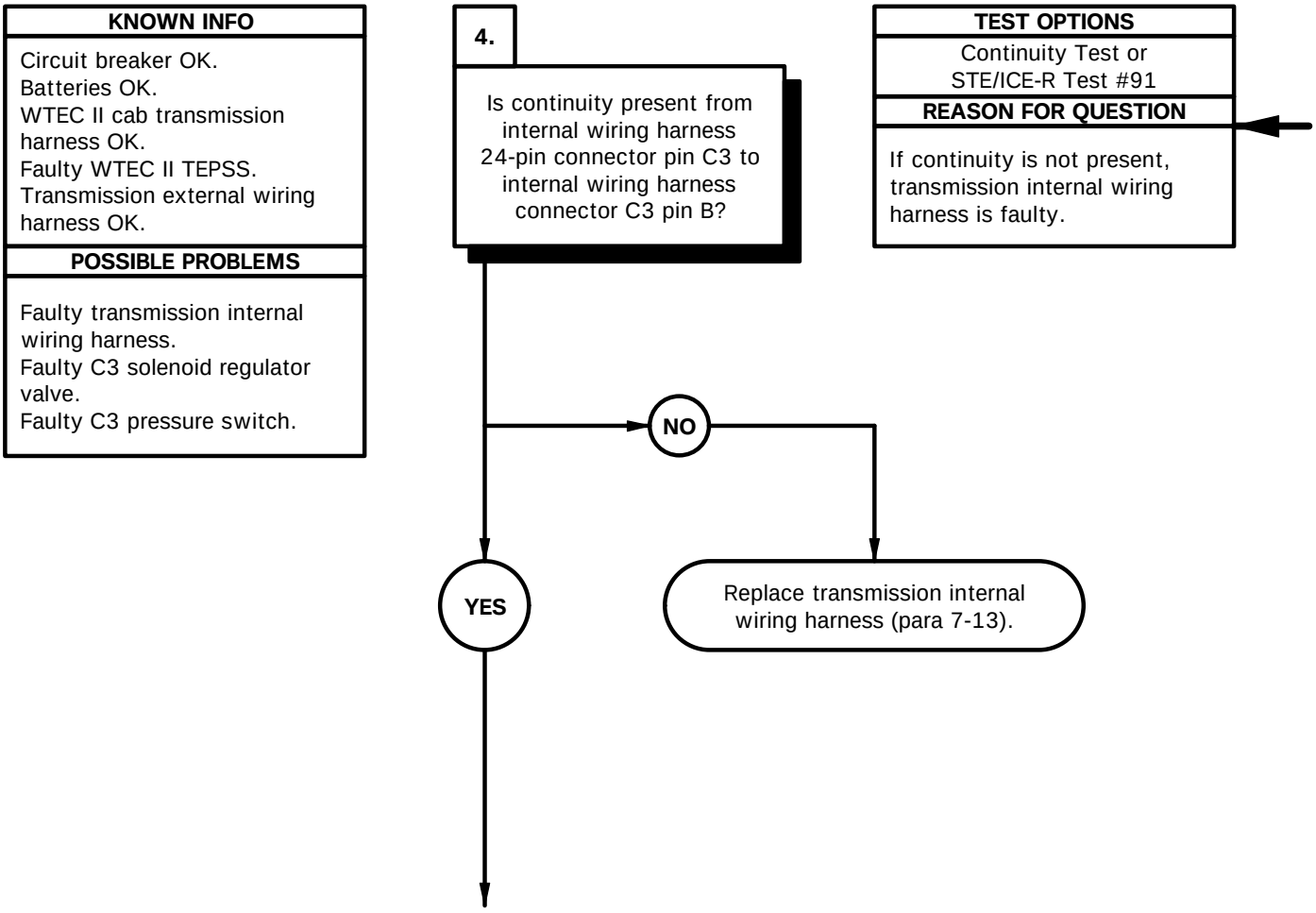
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

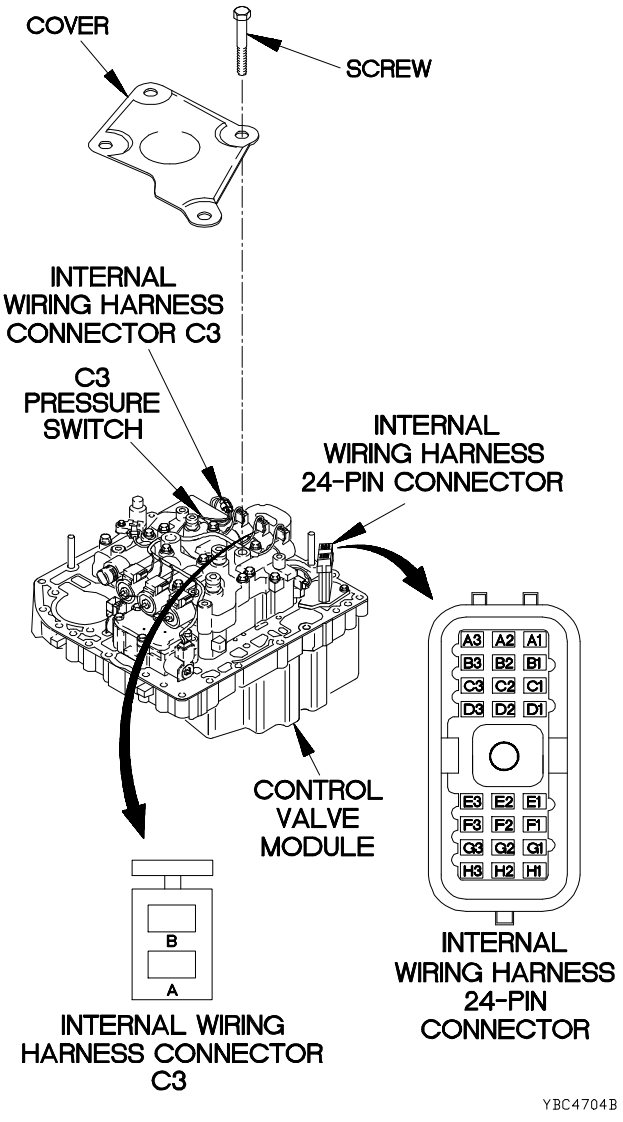


c47. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369) (CONT)

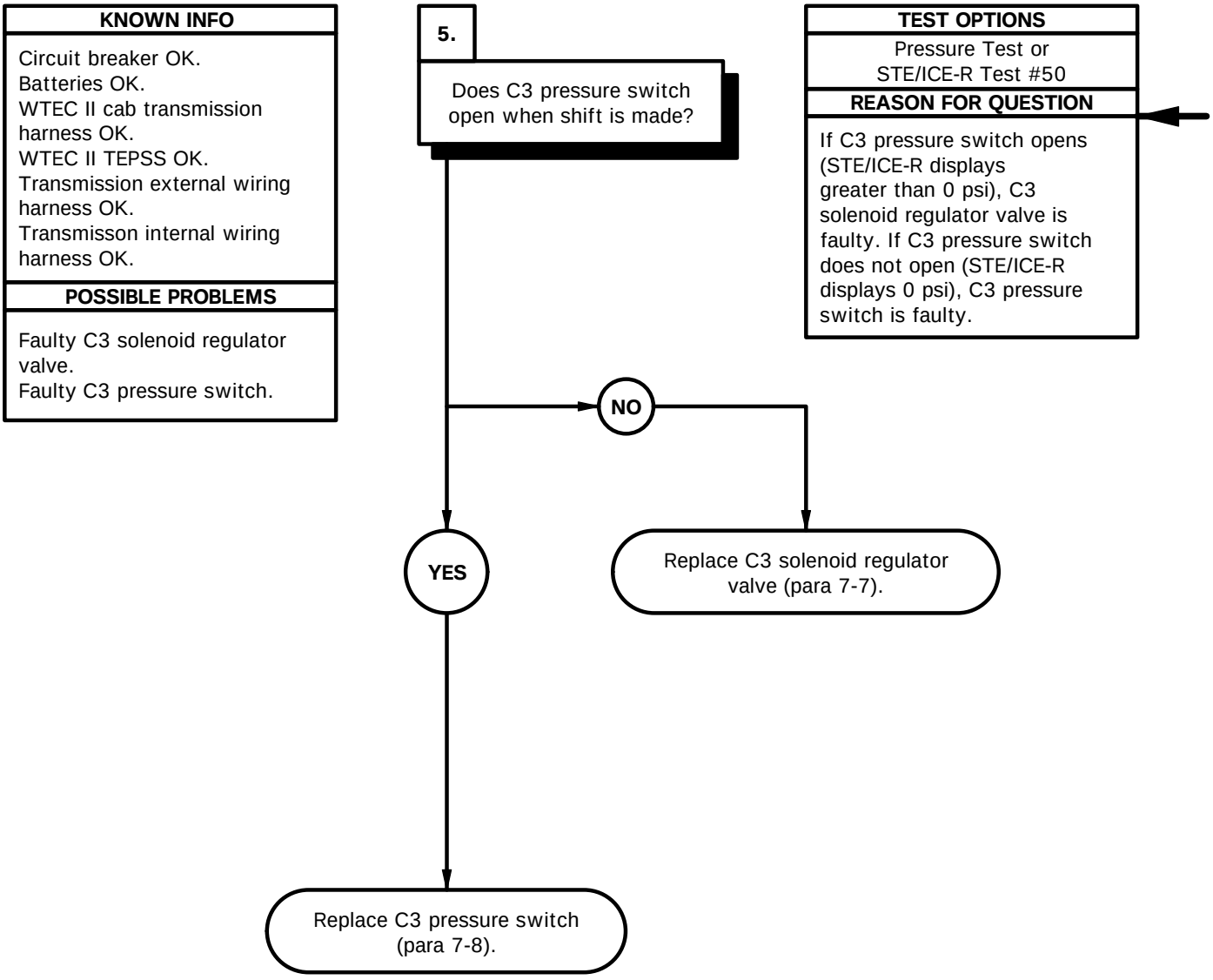


CONTINUITY TEST

(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 9-2320-365-20-3).



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

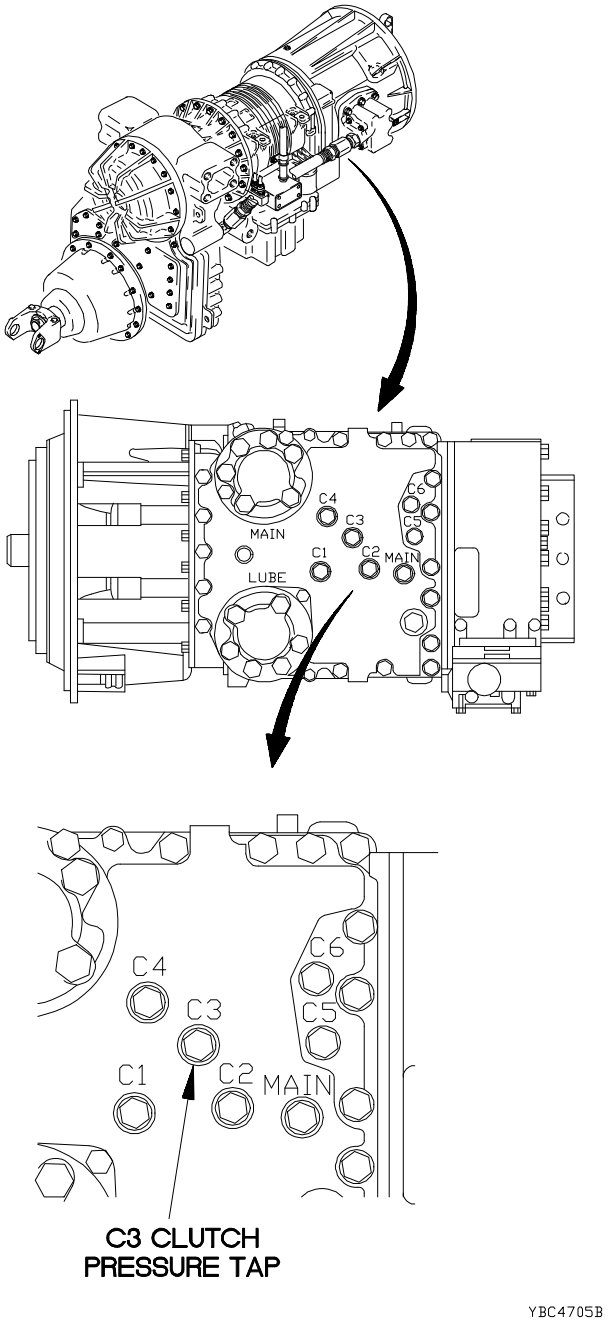


PRESSURE TEST

(1) Remove front and rear propeller shafts (TM 9-2320-365-20-3).
(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 9-2320-365-20-3).
(6) Perform STE/ICE-R test #50 (TM 9-4910-571-12&P).
(7) Start engine (TM 9-2320-365-10).
(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 9-2320-365-10).
(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 rear propeller shafts (TM 9-2320-365-20-3).

Table 2-4.3. 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



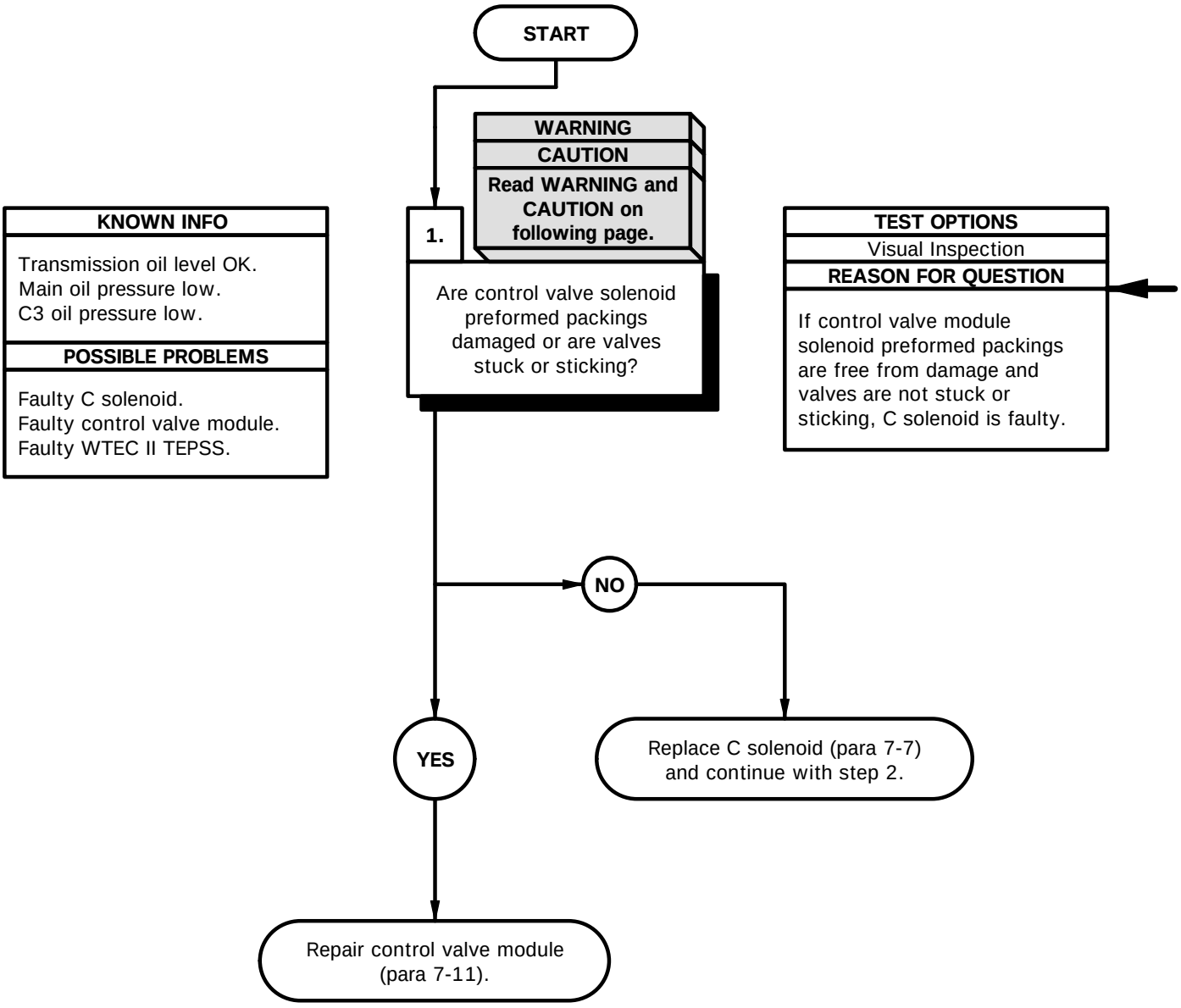
c47A. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 55 AND ANY SUB CODE

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
Goggles, Industrial (Item 25, Appendix B)



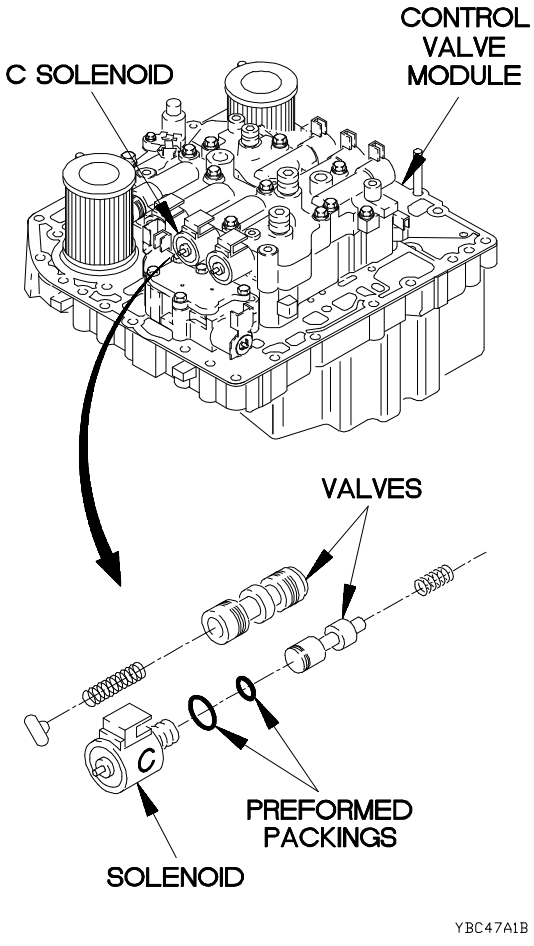
WARNING

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

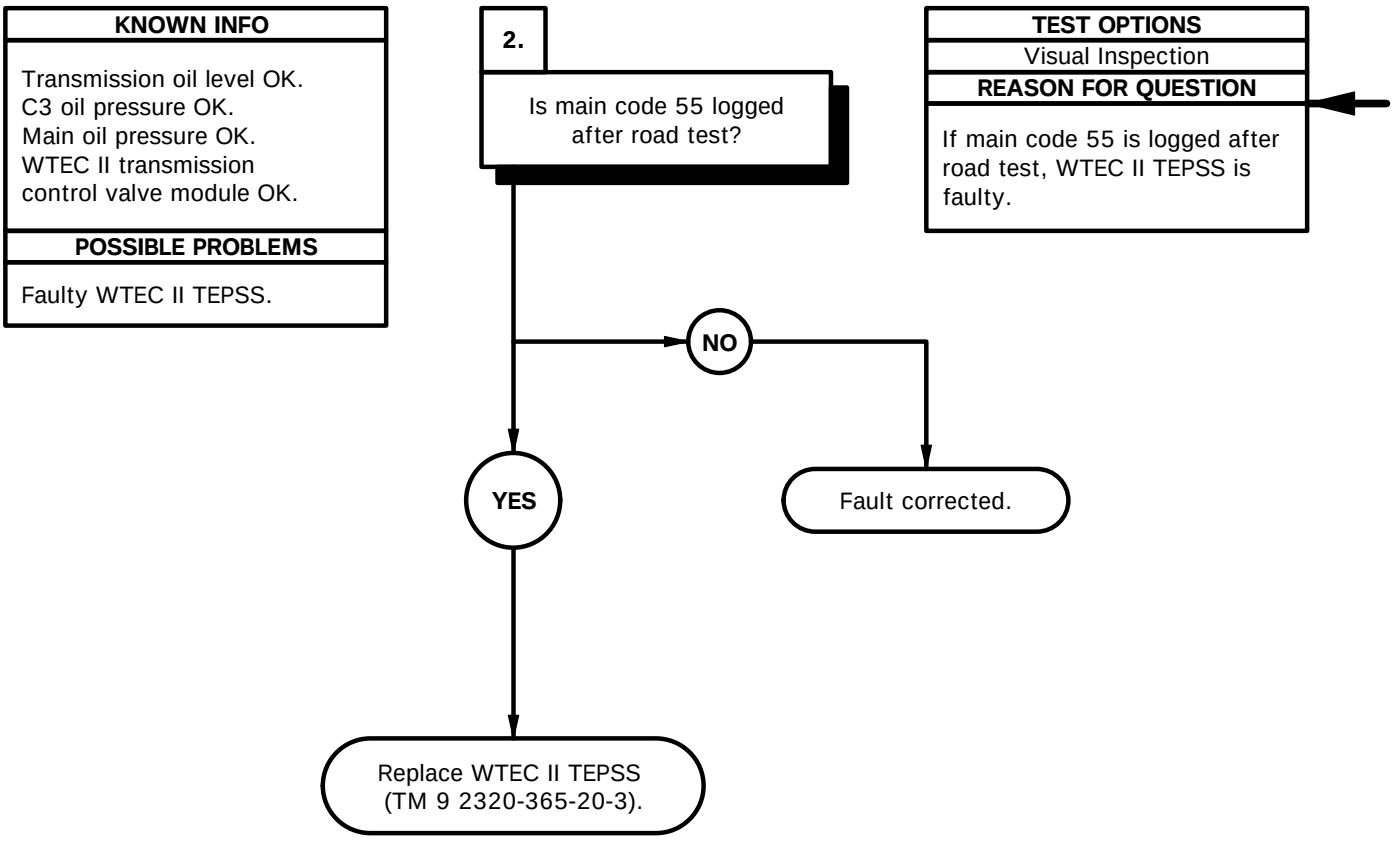
CAUTION

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 9-2320-365-20-3).
(2) Road test vehicle.
(3) Read diagnostic codes (TM 9-2320-365-20-3).
(4) If main code 55 is logged, replace WTEC II TEPSS. (TM 9-2320-365-20-3).
(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

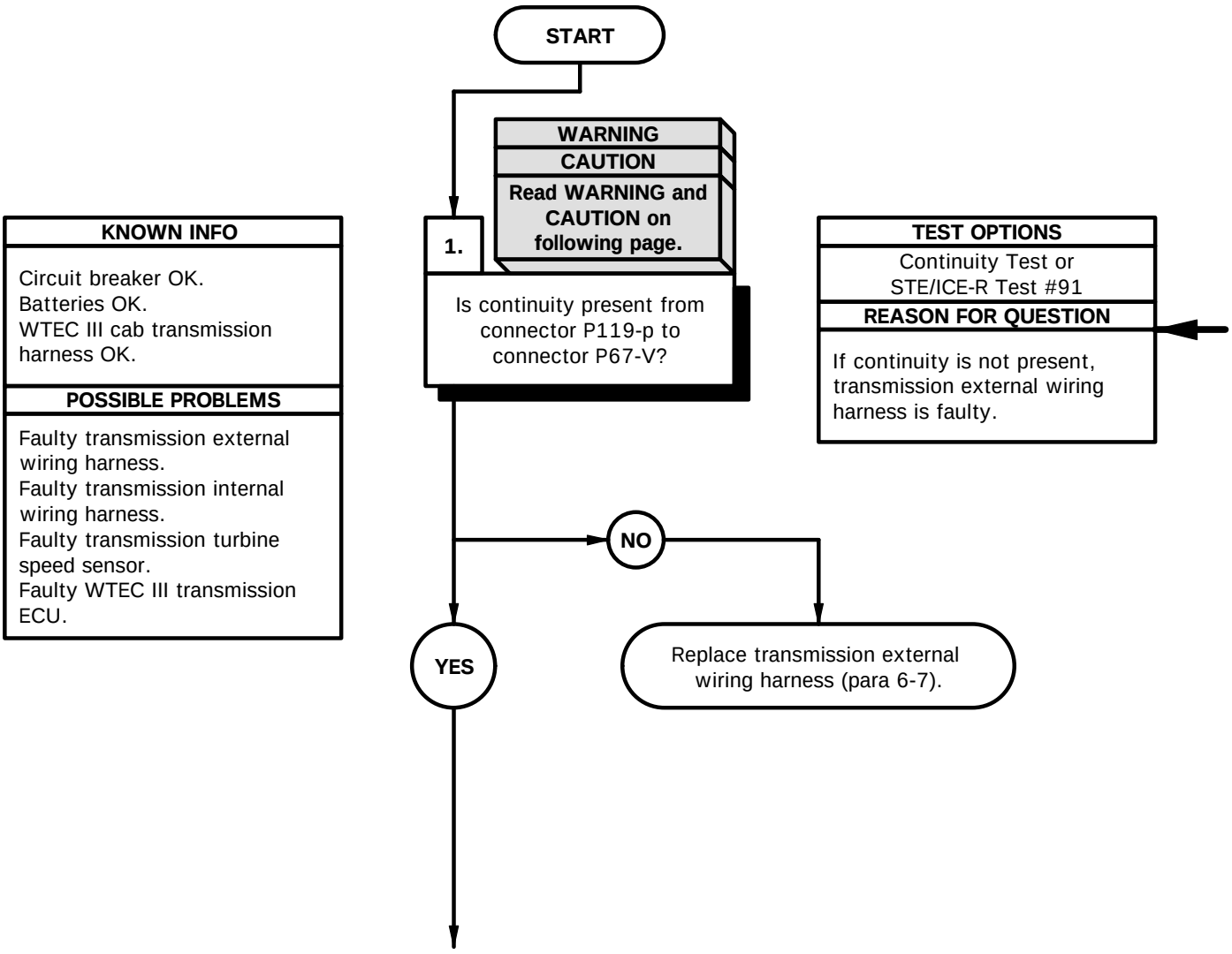
Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)

Materials/Parts
Wire, Elect, 50 ft (Item 94, 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

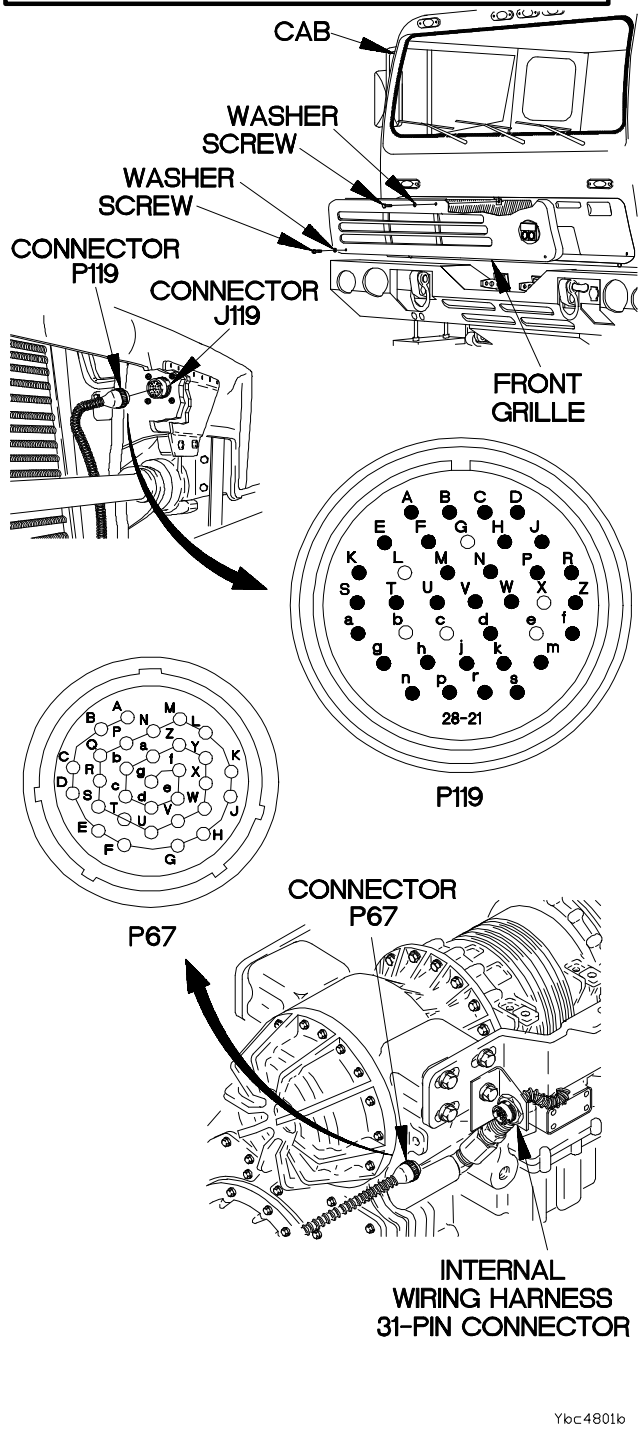
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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.

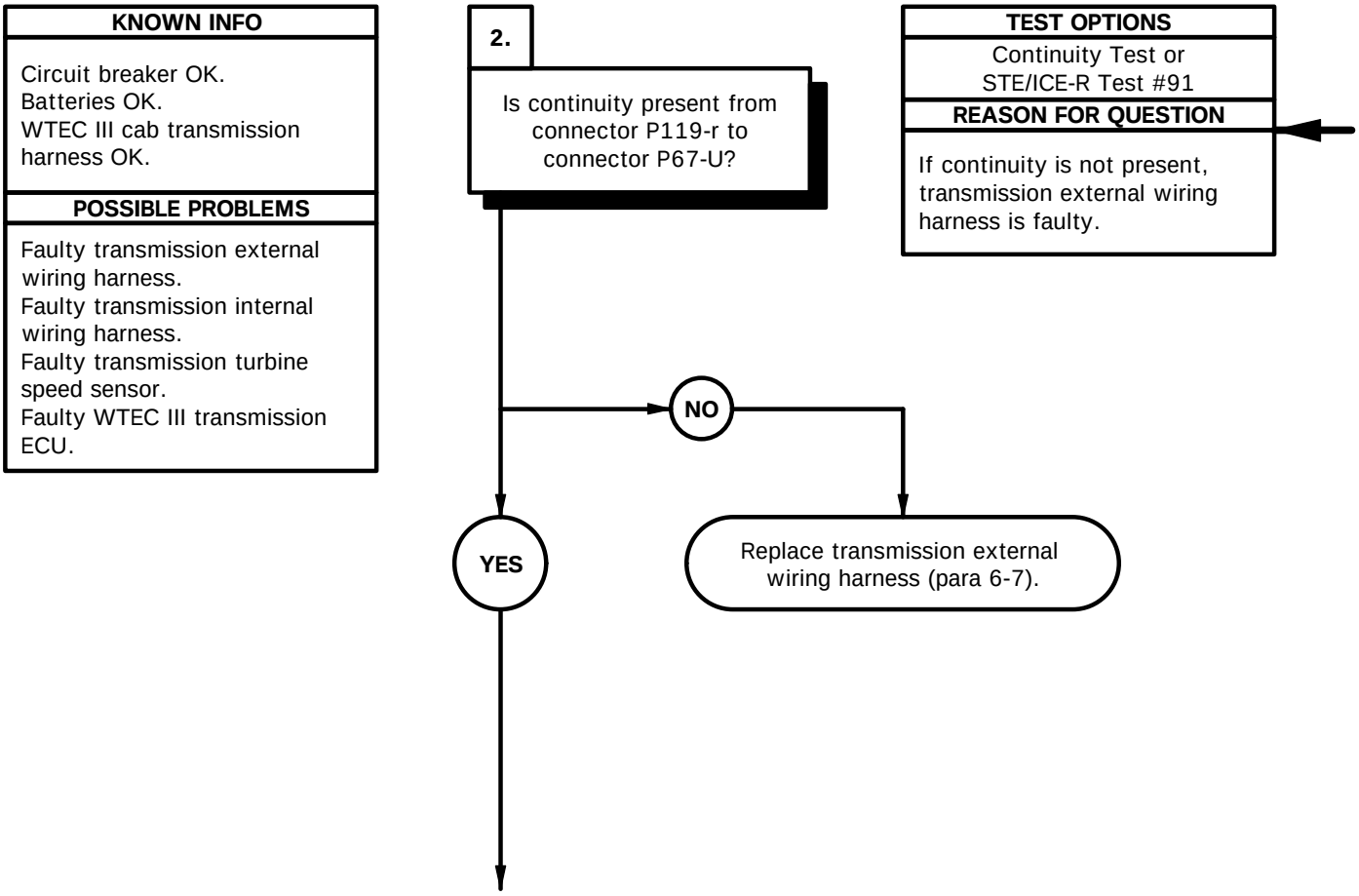
CONTINUITY TEST (Cont)

(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).



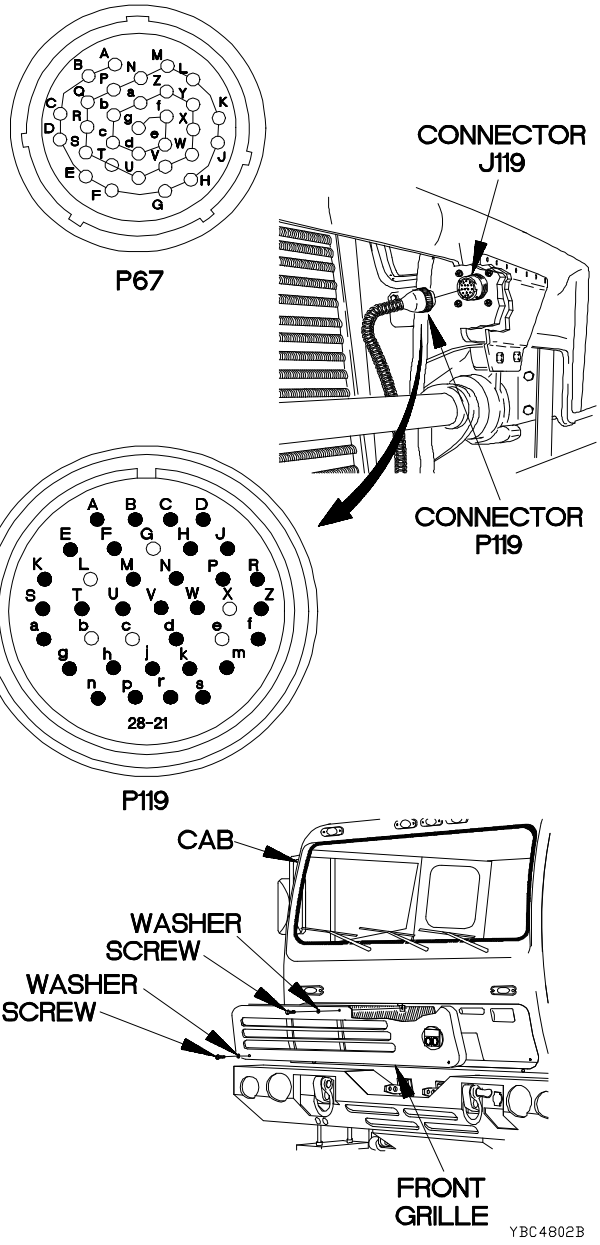
Ybc4801b

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

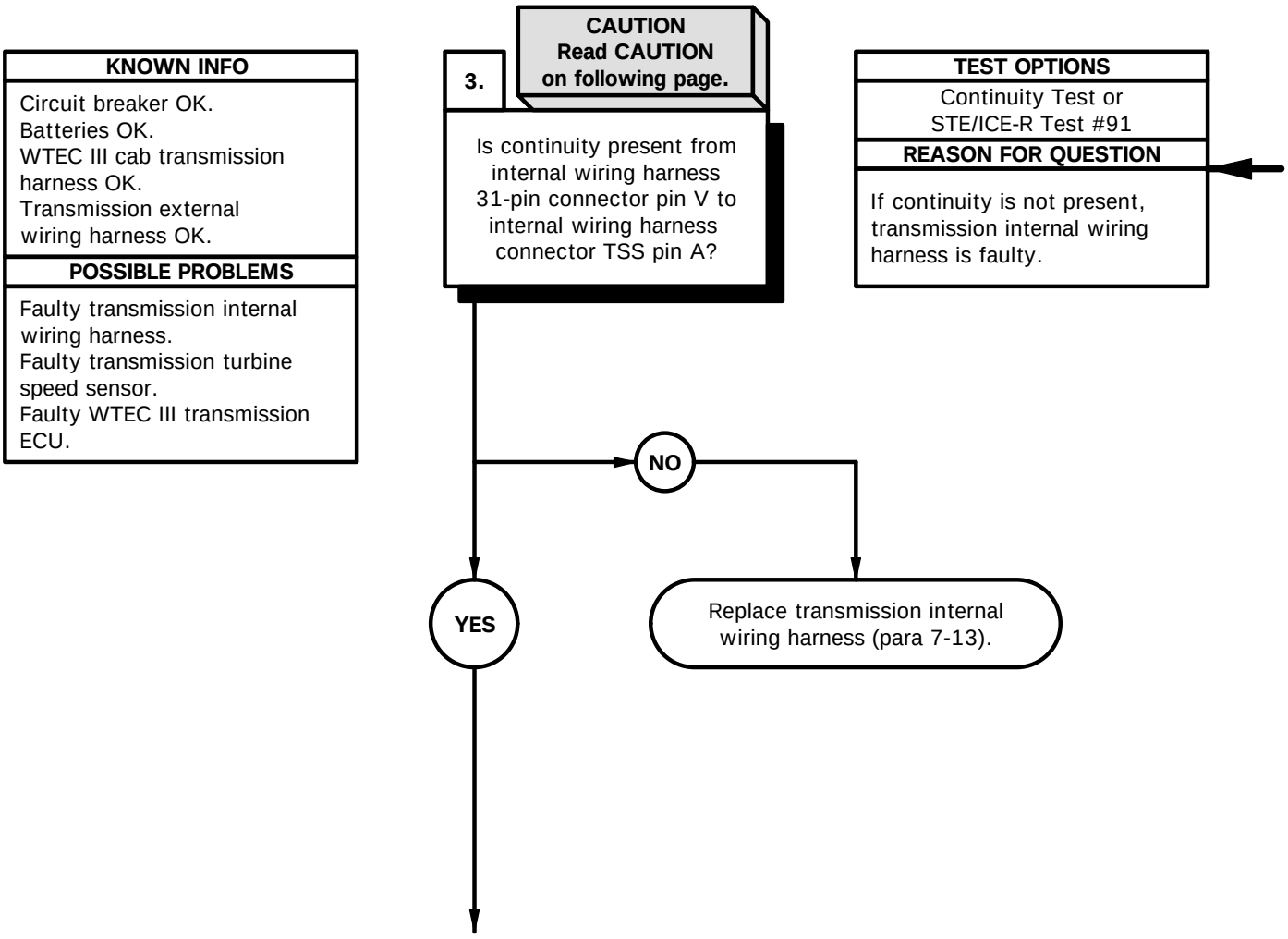


CONTINUITY TEST

(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)

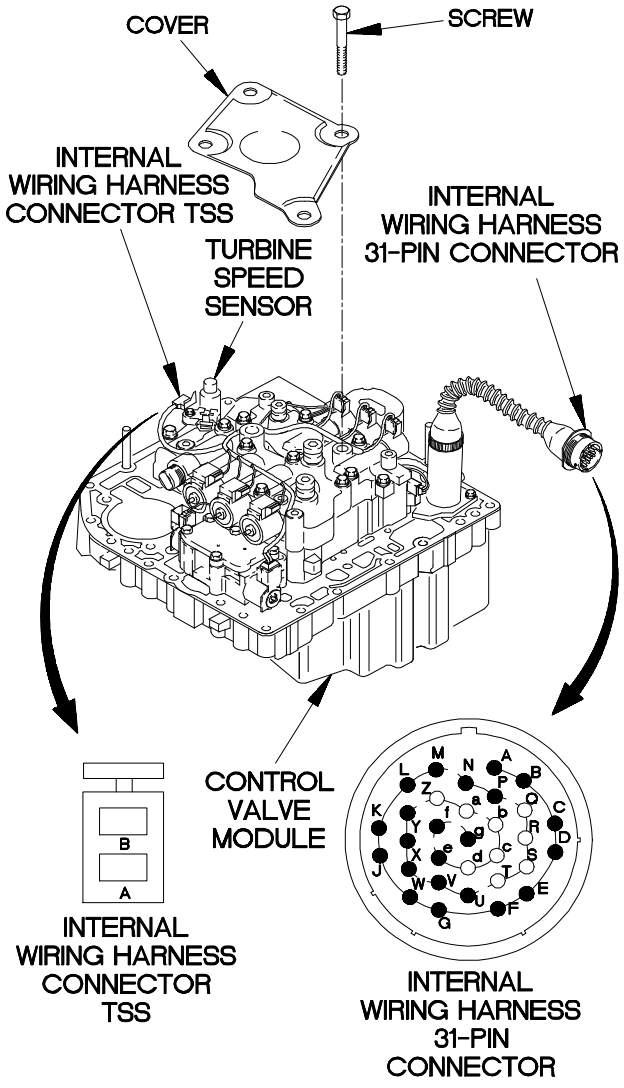


CAUTION

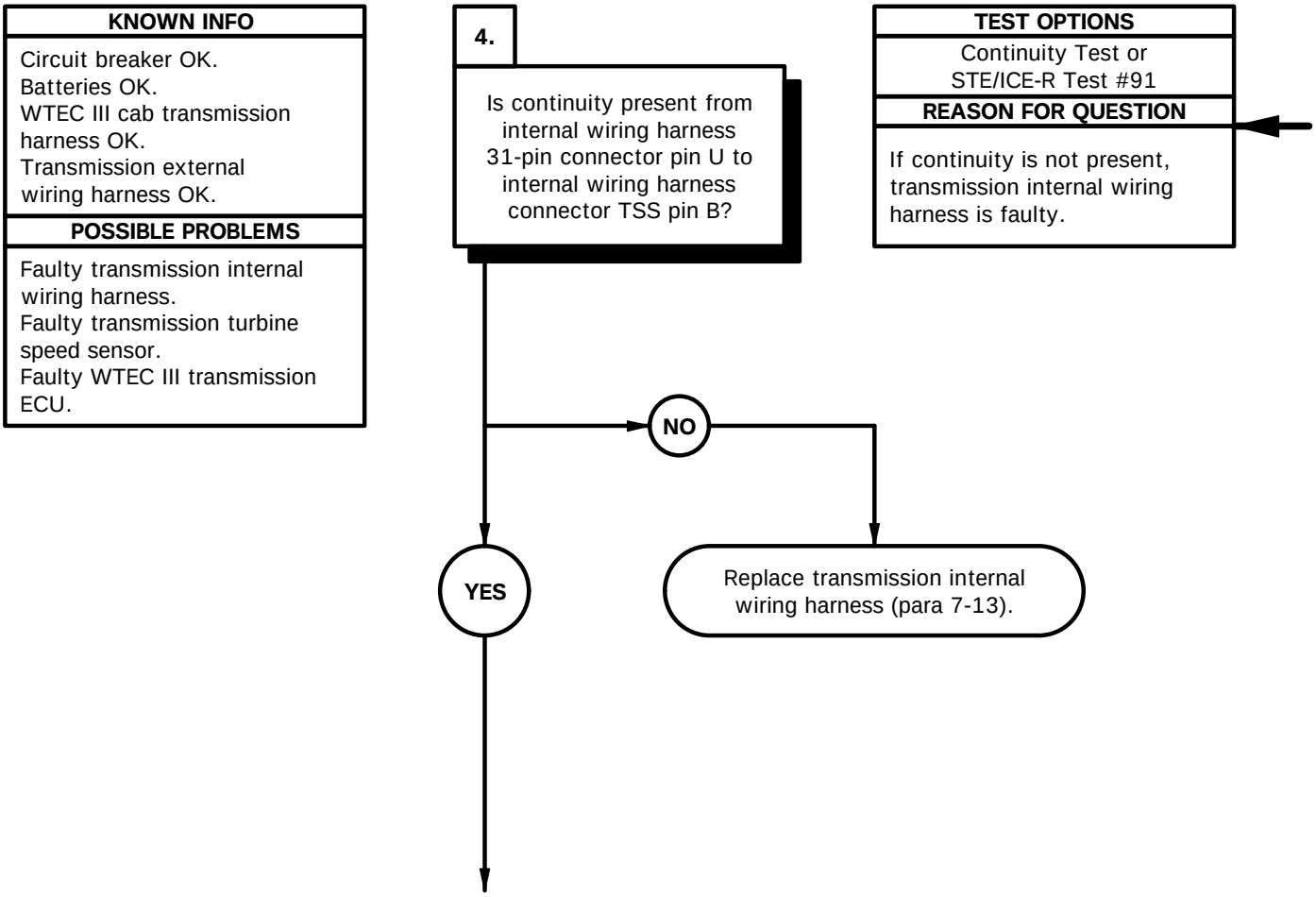
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

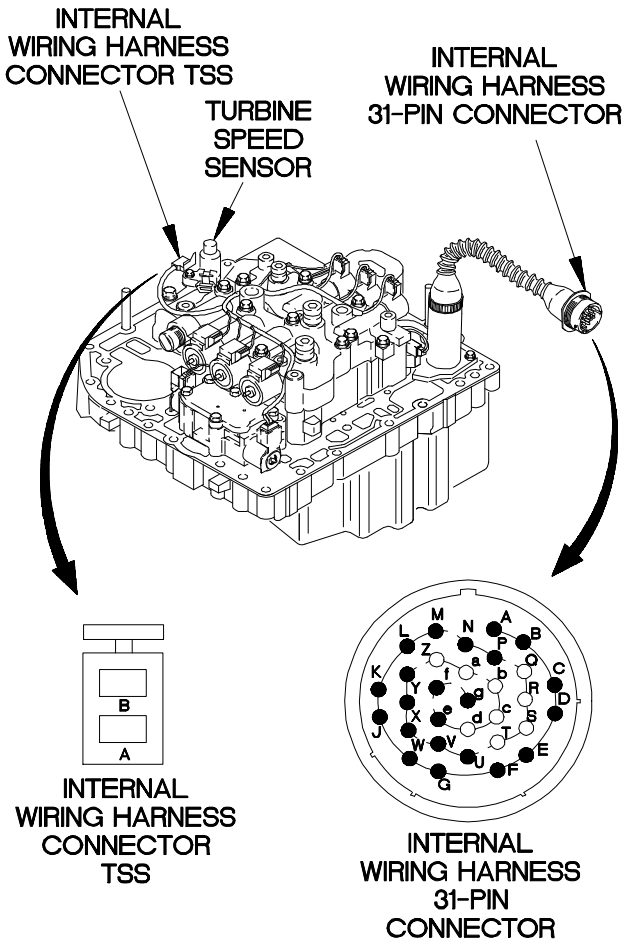


c48. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

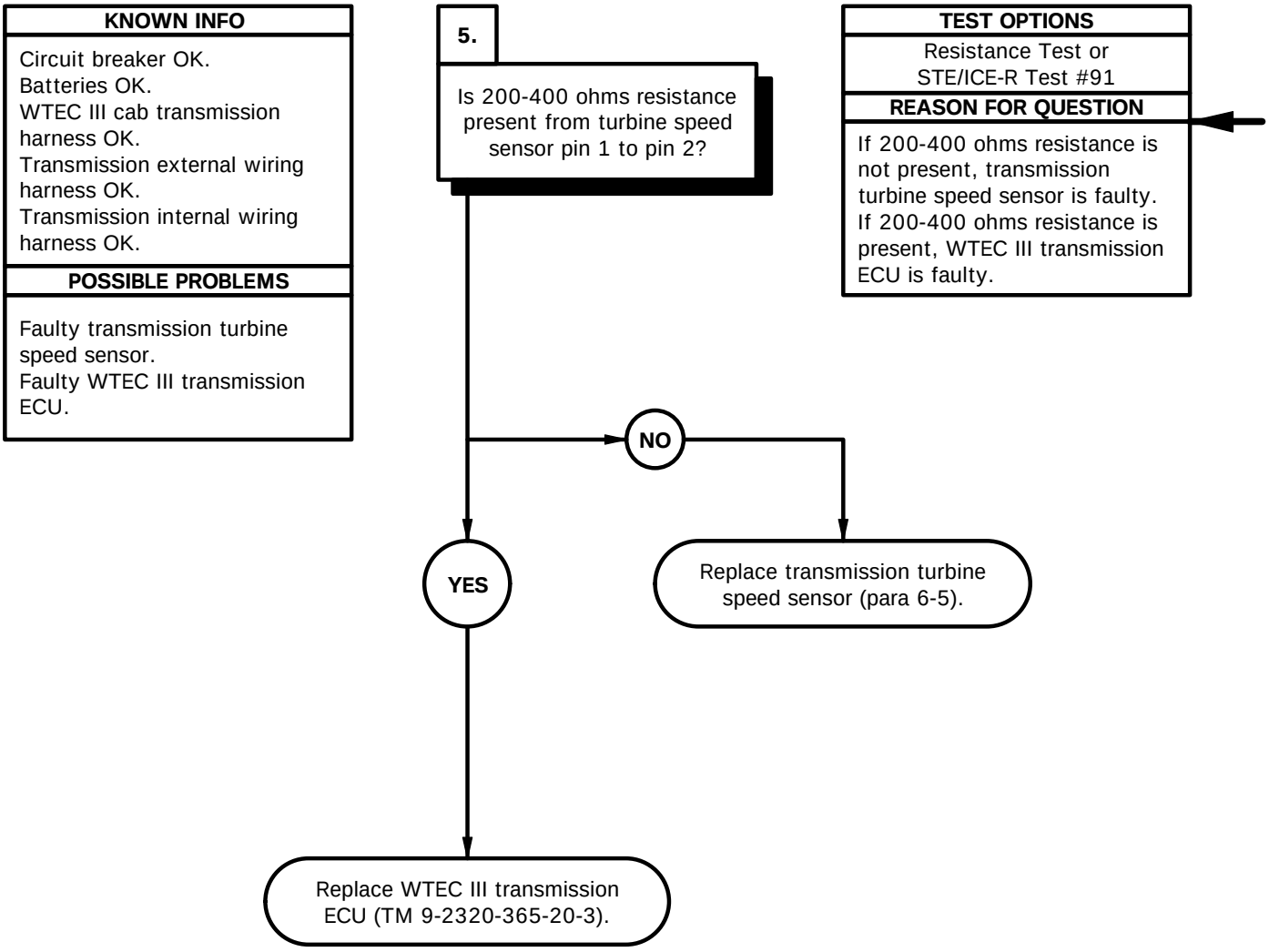


CONTINUITY TEST

(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).

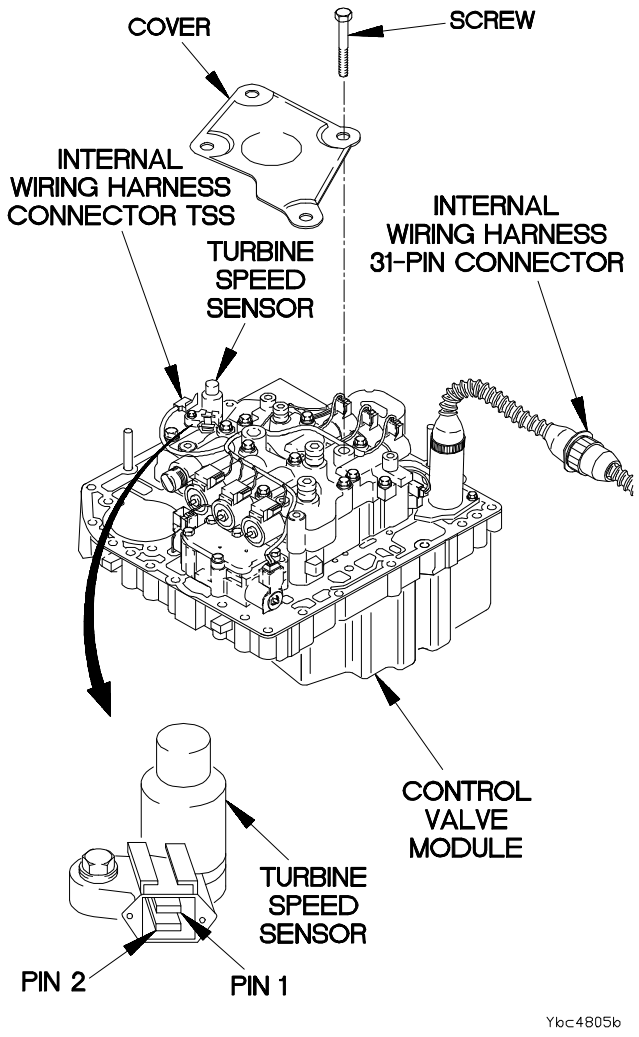


c48. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

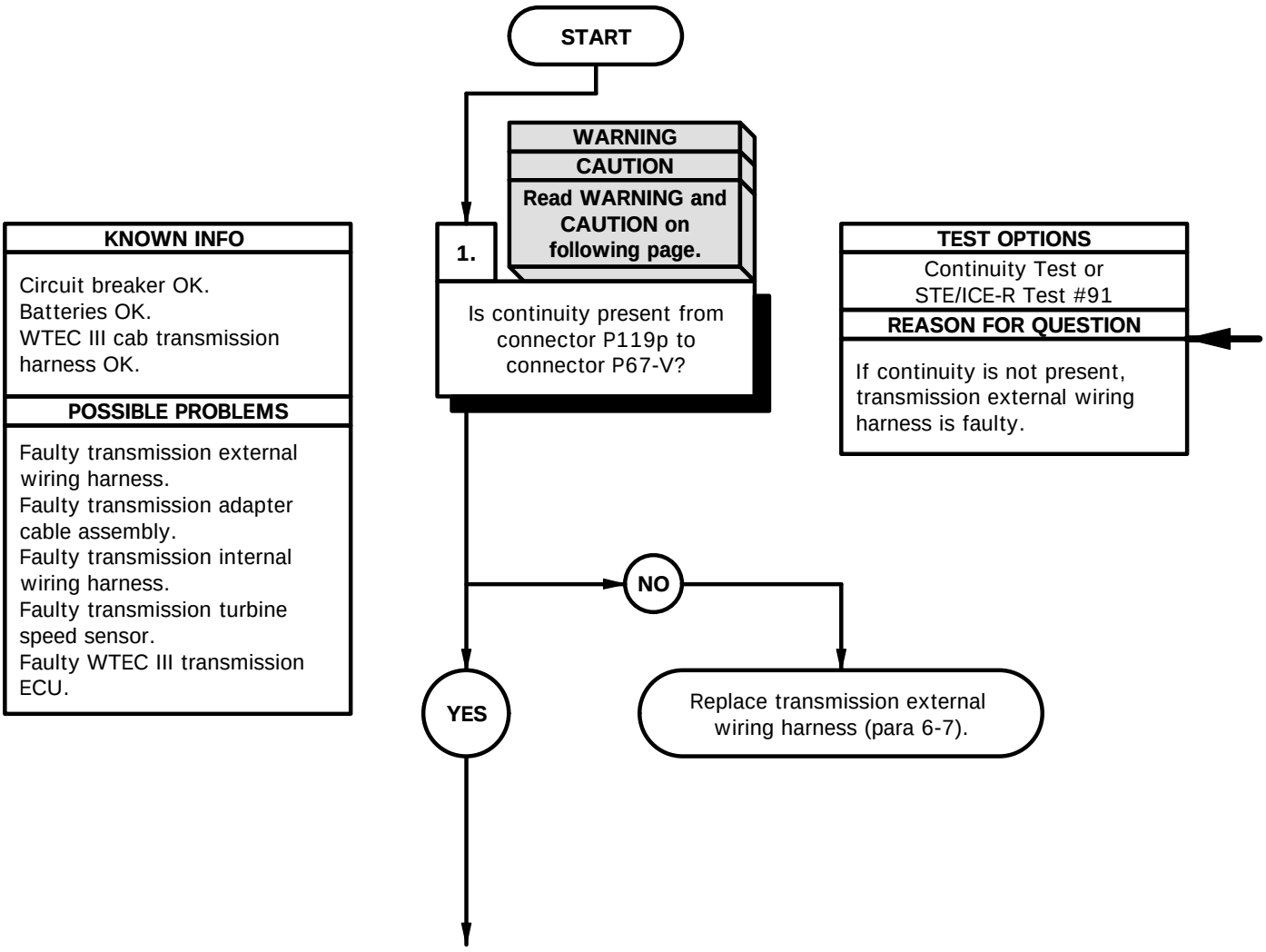
Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)

Materials/Parts
Wire, Elect, 50 ft (Item 94, 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

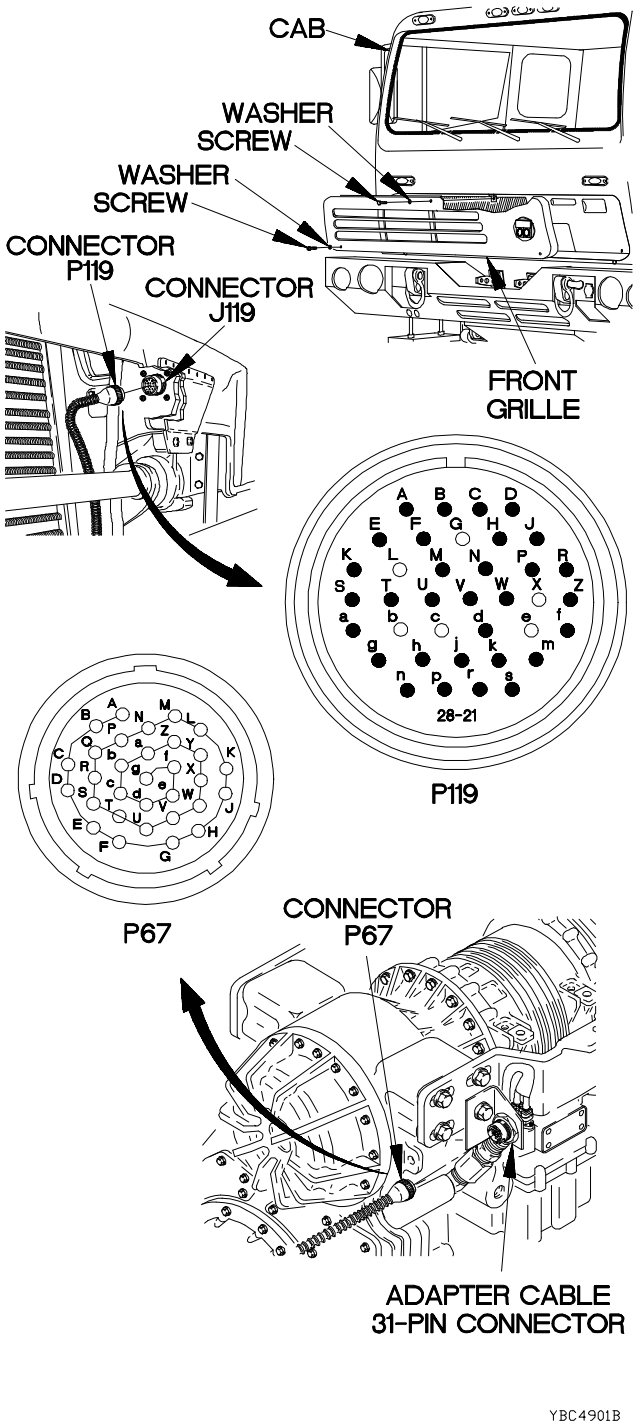
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

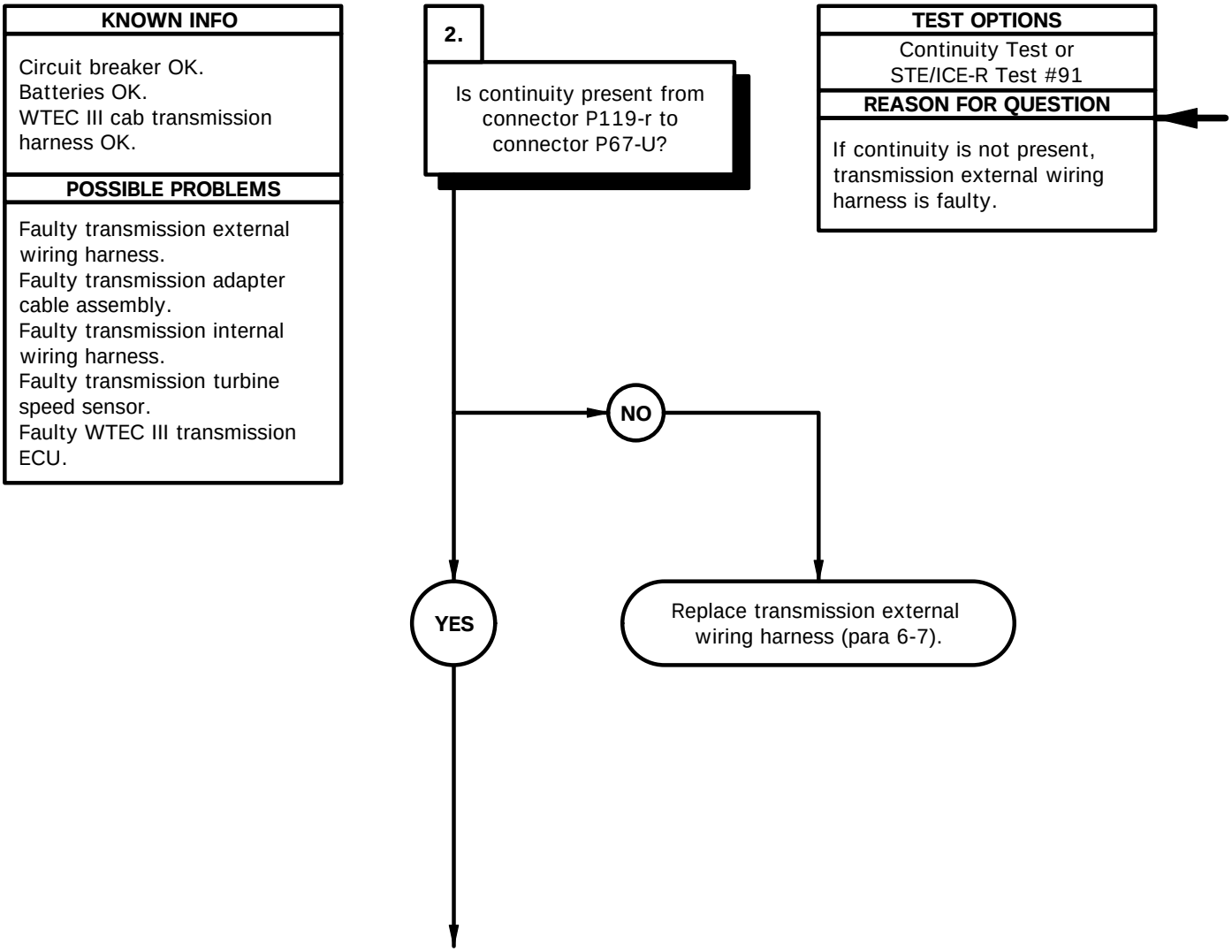
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from adaptor cable 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect positive (+)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

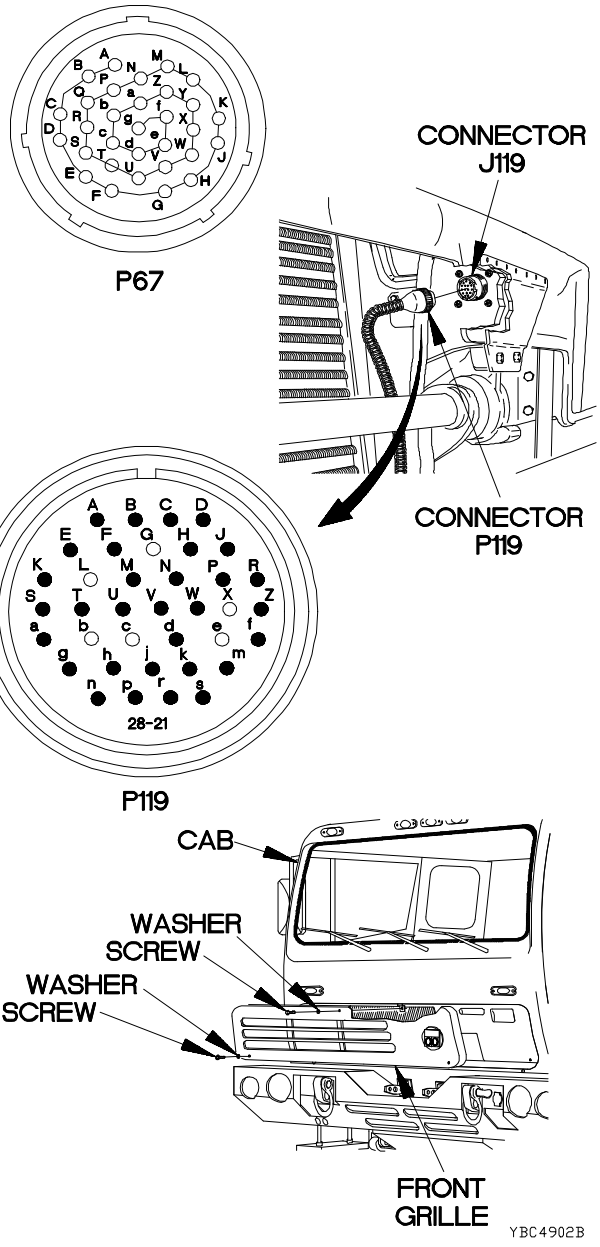


c49. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

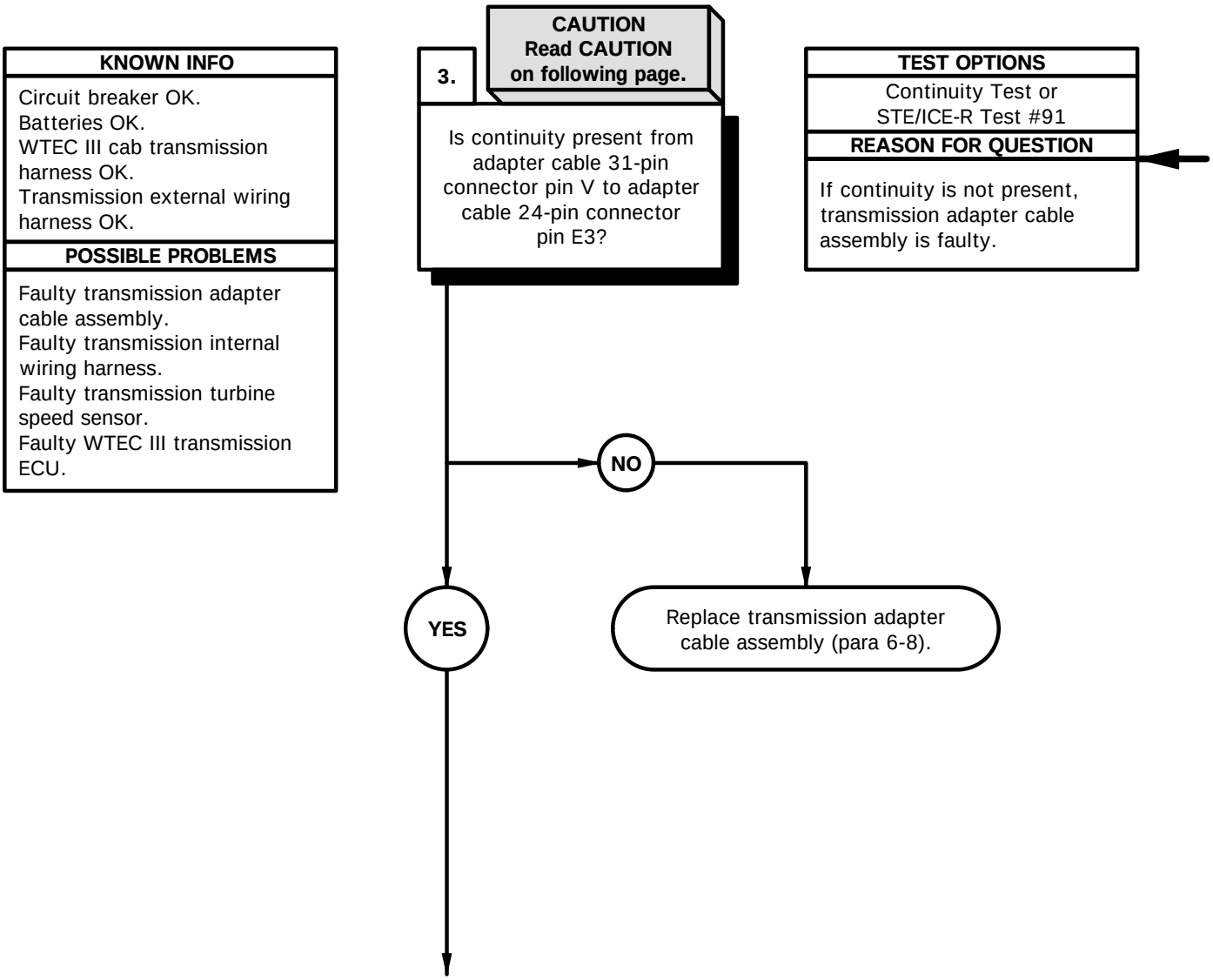


CONTINUITY TEST

(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)

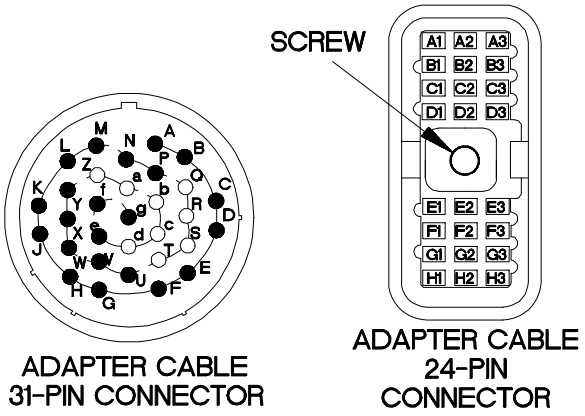


CAUTION

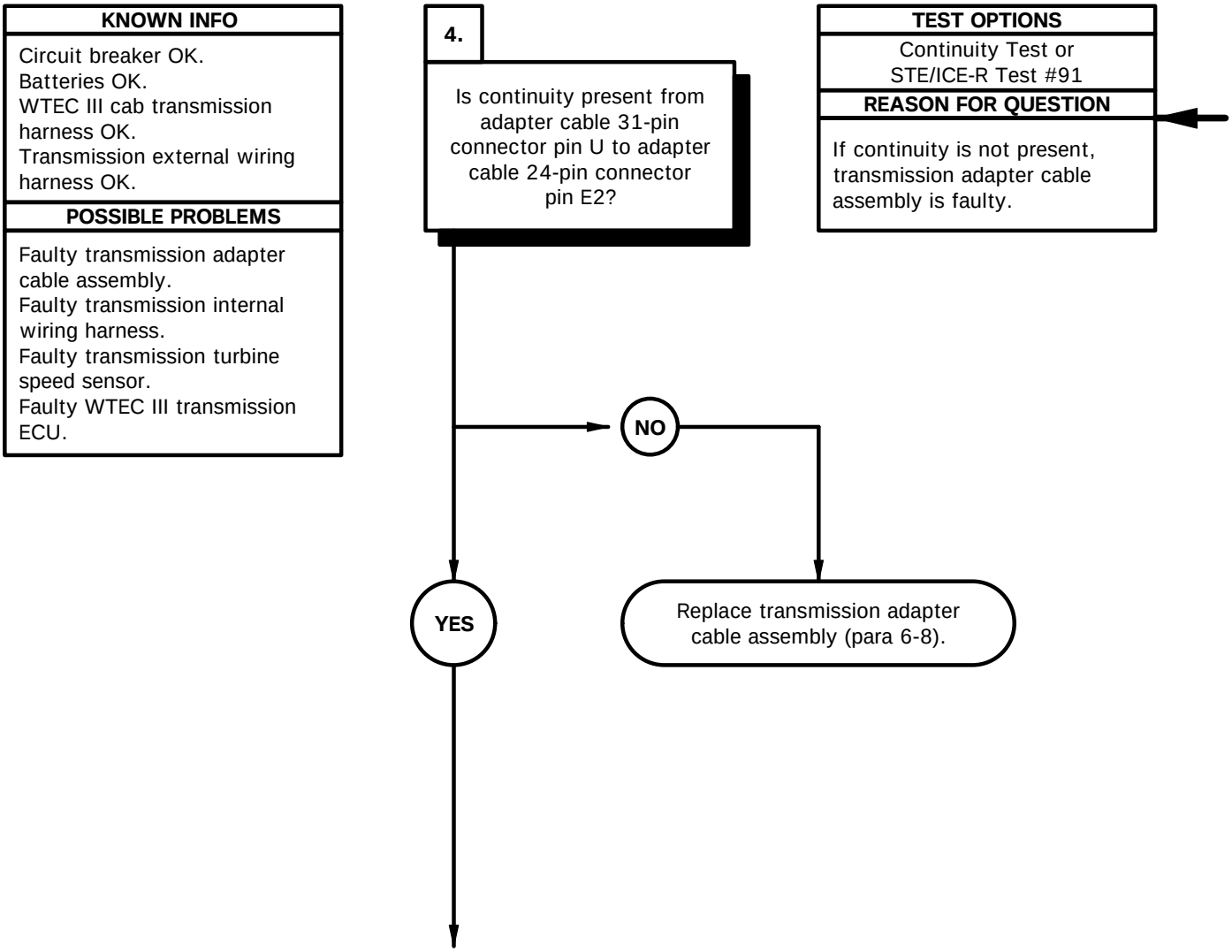
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

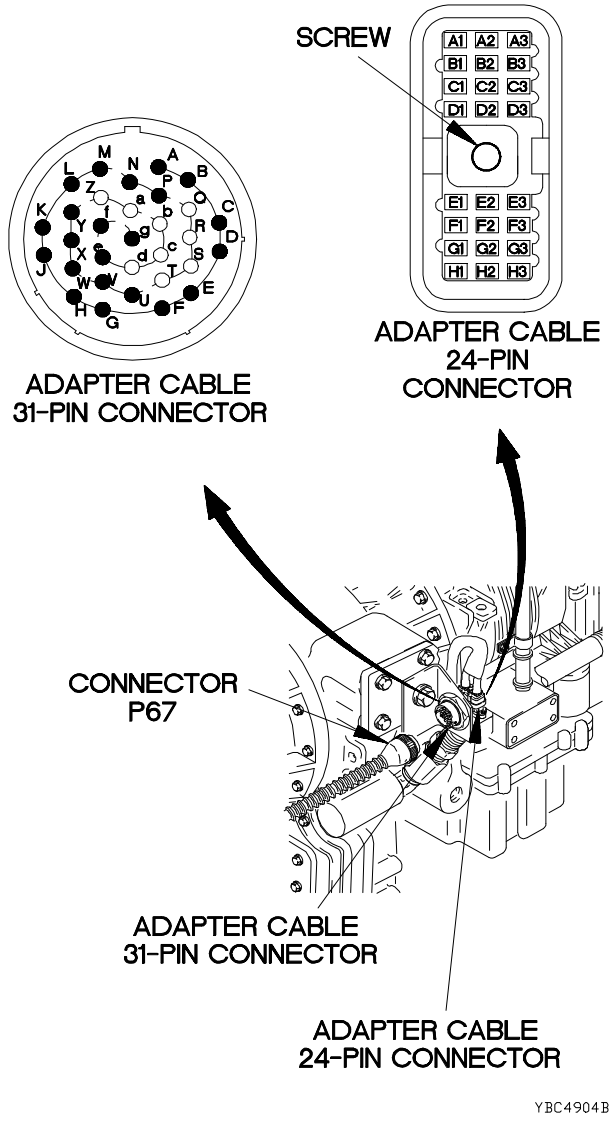


c49. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

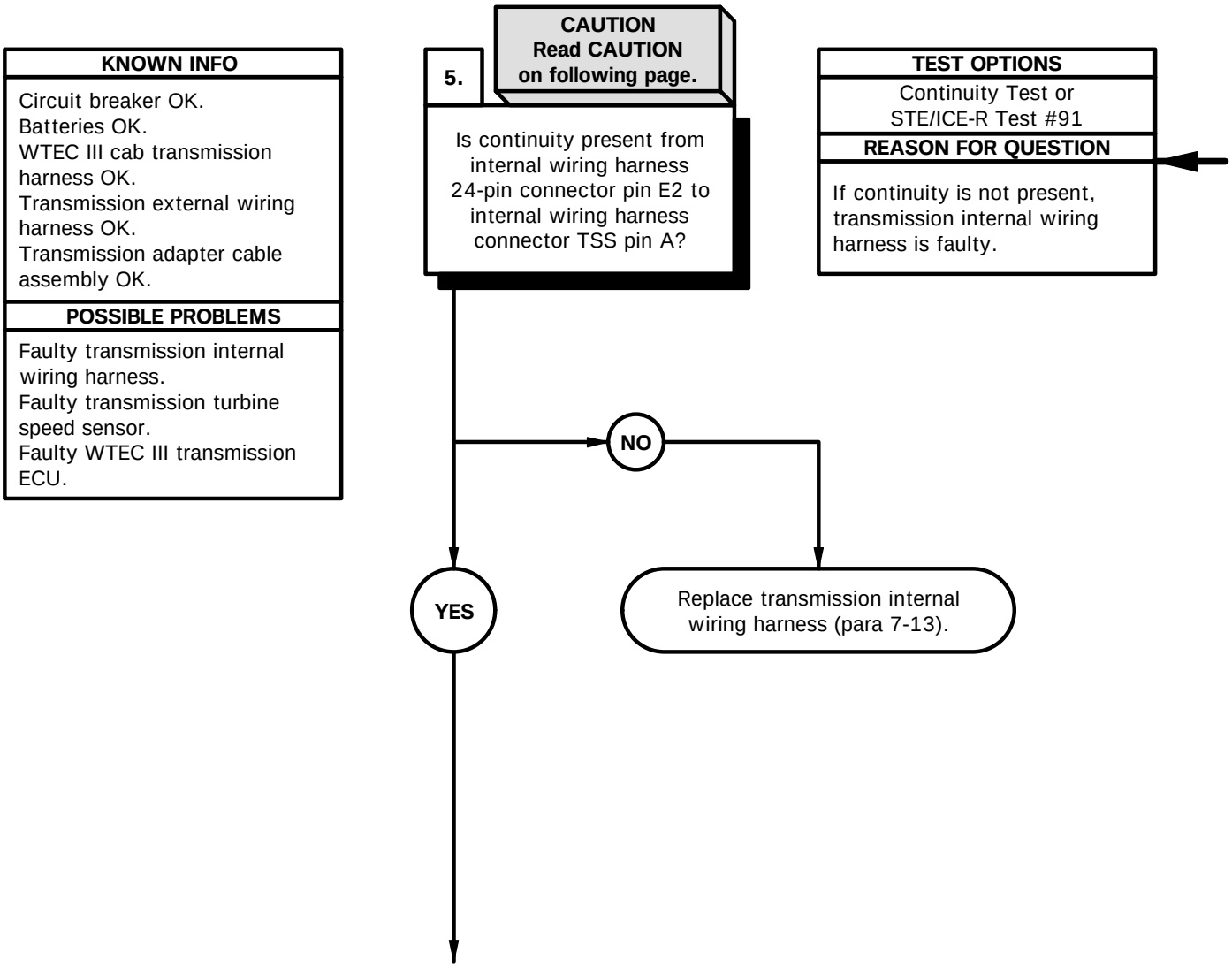


CONTINUITY TEST

(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)

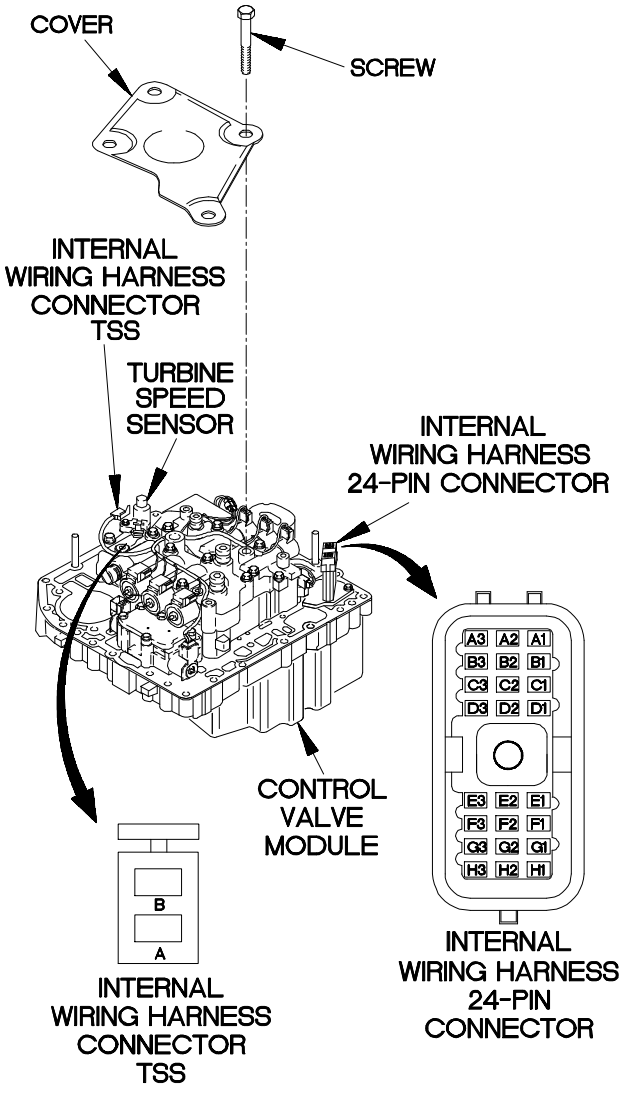


CAUTION

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).



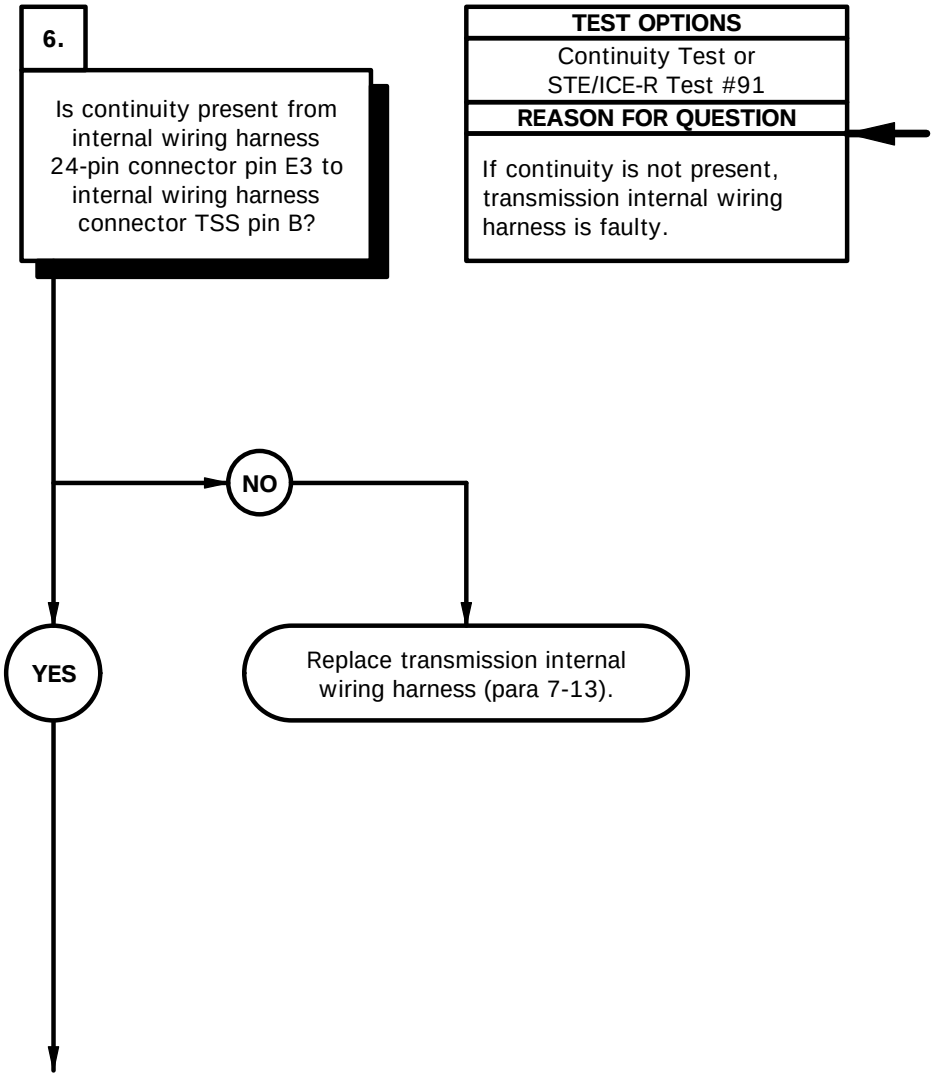
c49. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO

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

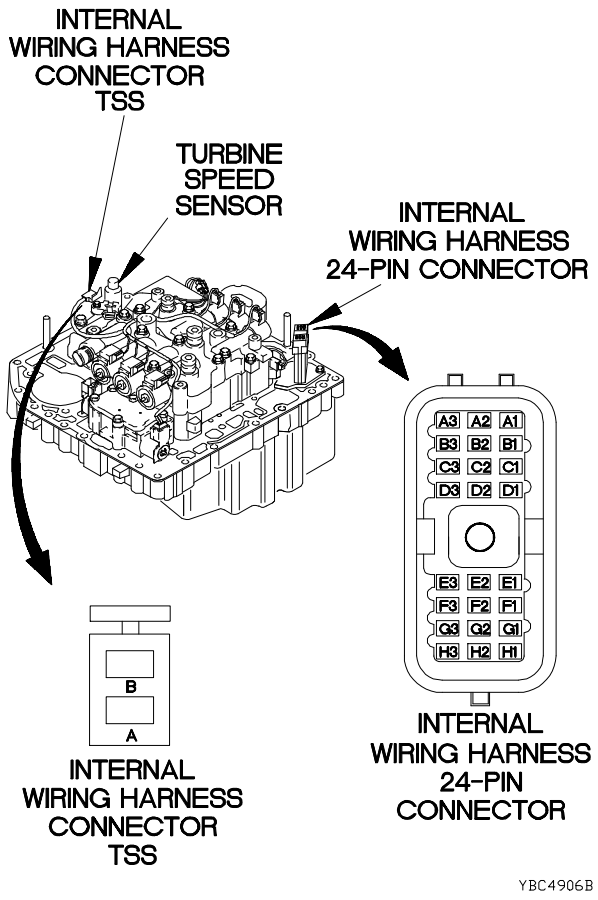
POSSIBLE PROBLEMS

Faulty transmission internal wiring harness.
Faulty transmission turbine speed sensor.
Faulty WTEC III transmission ECU.

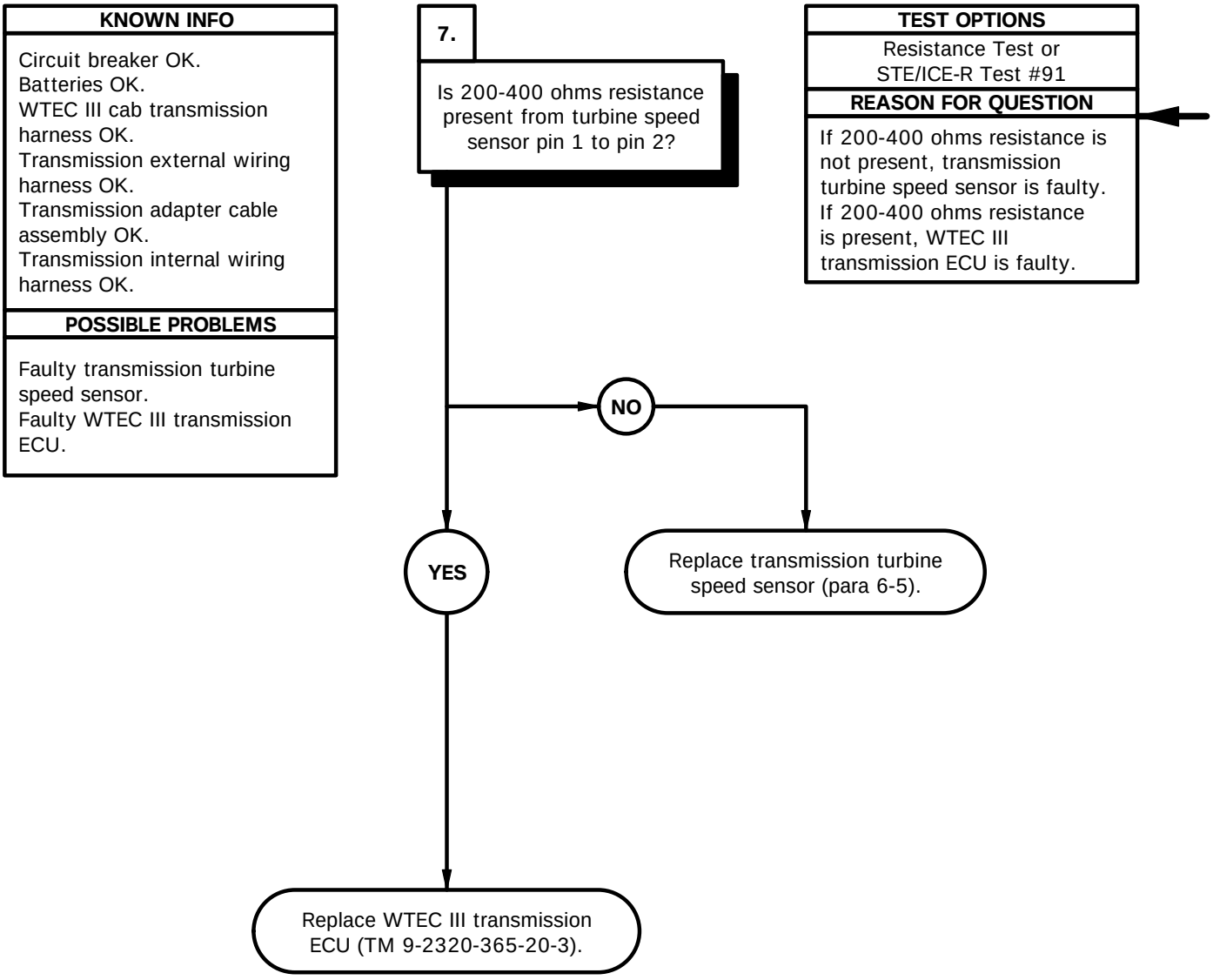


CONTINUITY TEST

(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).

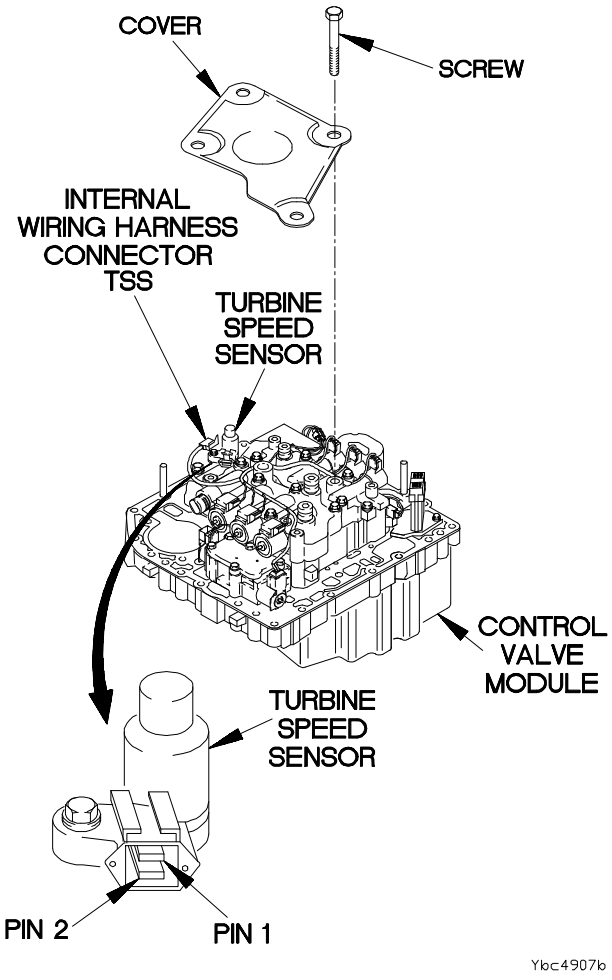


c49. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



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 9-2320-365-20-3).
(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 9-2320-365-20-3).



c50. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 16

INITIAL SETUP

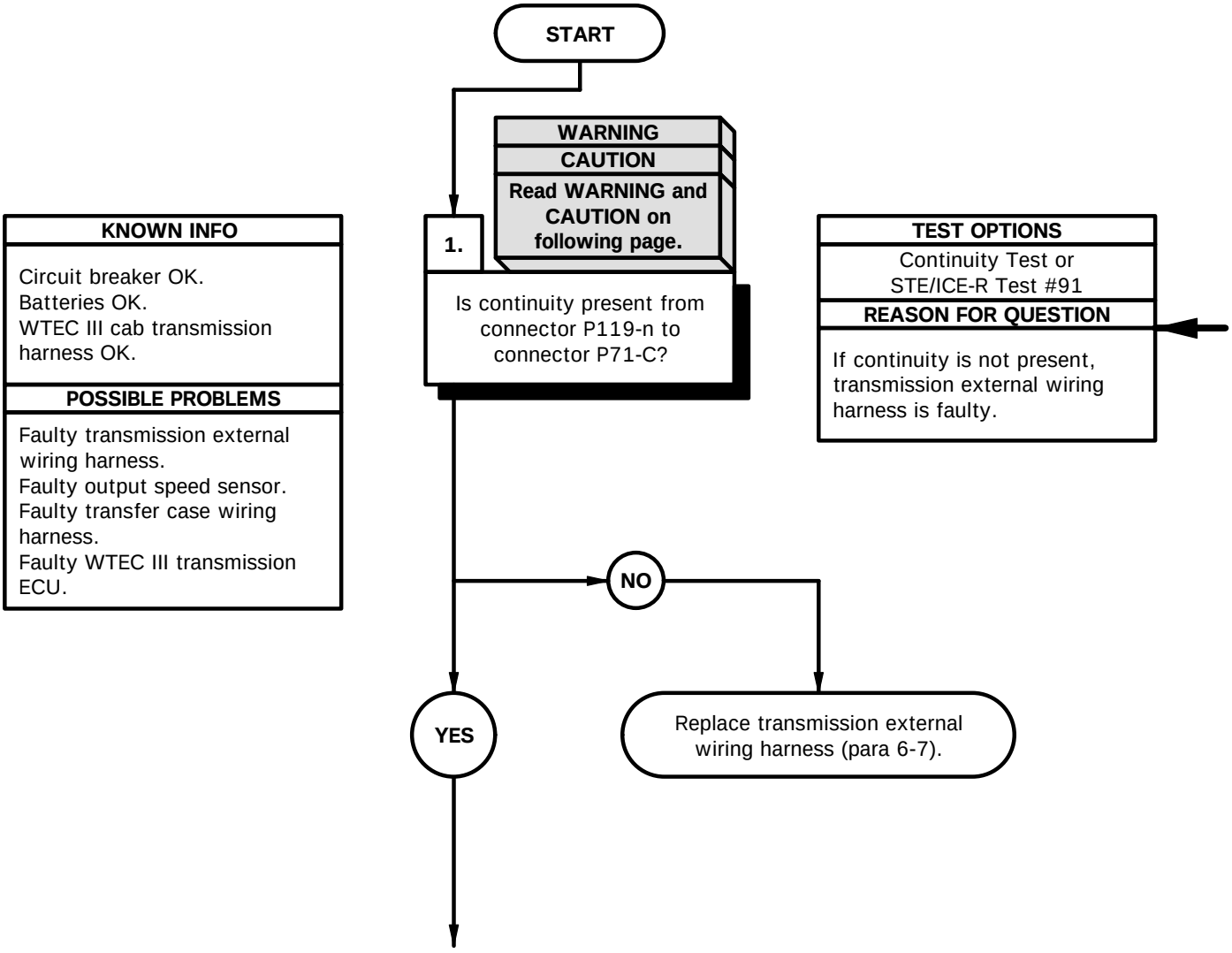
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Pan, Drain (Item 36, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)

Materials/Parts
Gasket (Item 41, Appendix F)
Oil, Lubricating (Item 46, Appendix C)
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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

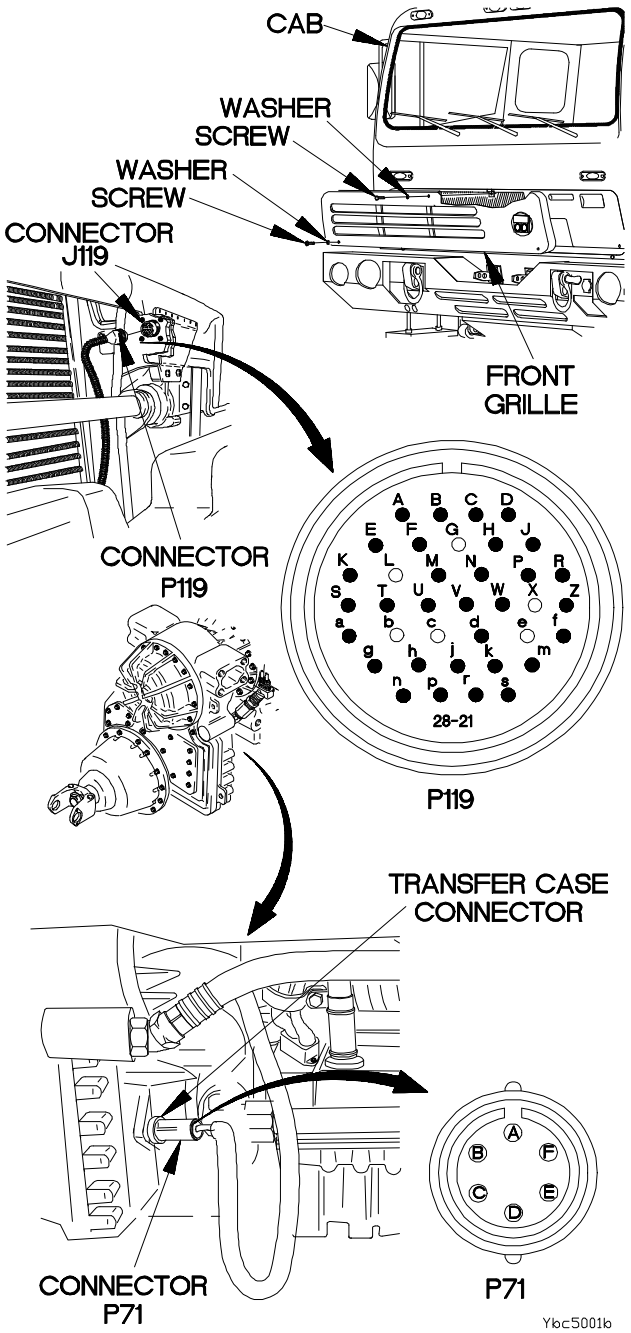
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



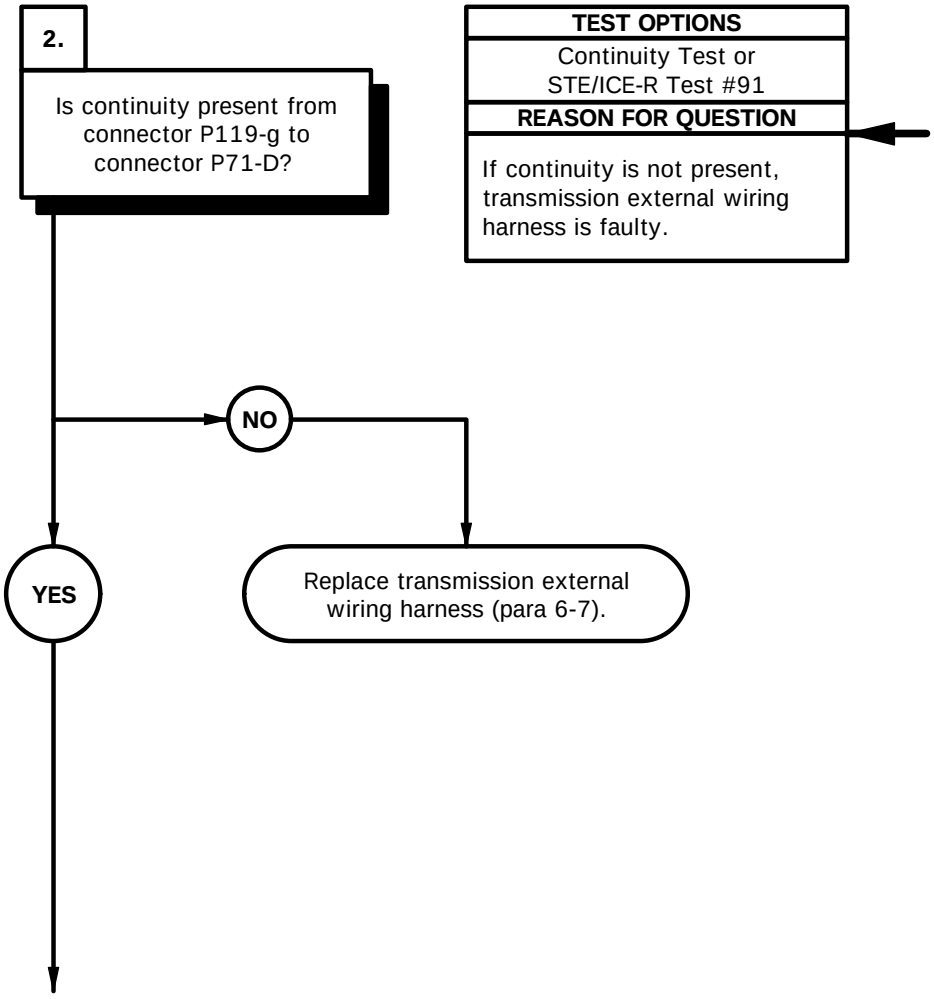
c50. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 16 (CONT)

KNOWN INFO

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

POSSIBLE PROBLEMS

Faulty transmission external wiring harness.
Faulty output speed sensor.
Faulty transfer case wiring harness.
Faulty WTEC III transmission ECU.



TEST OPTIONS

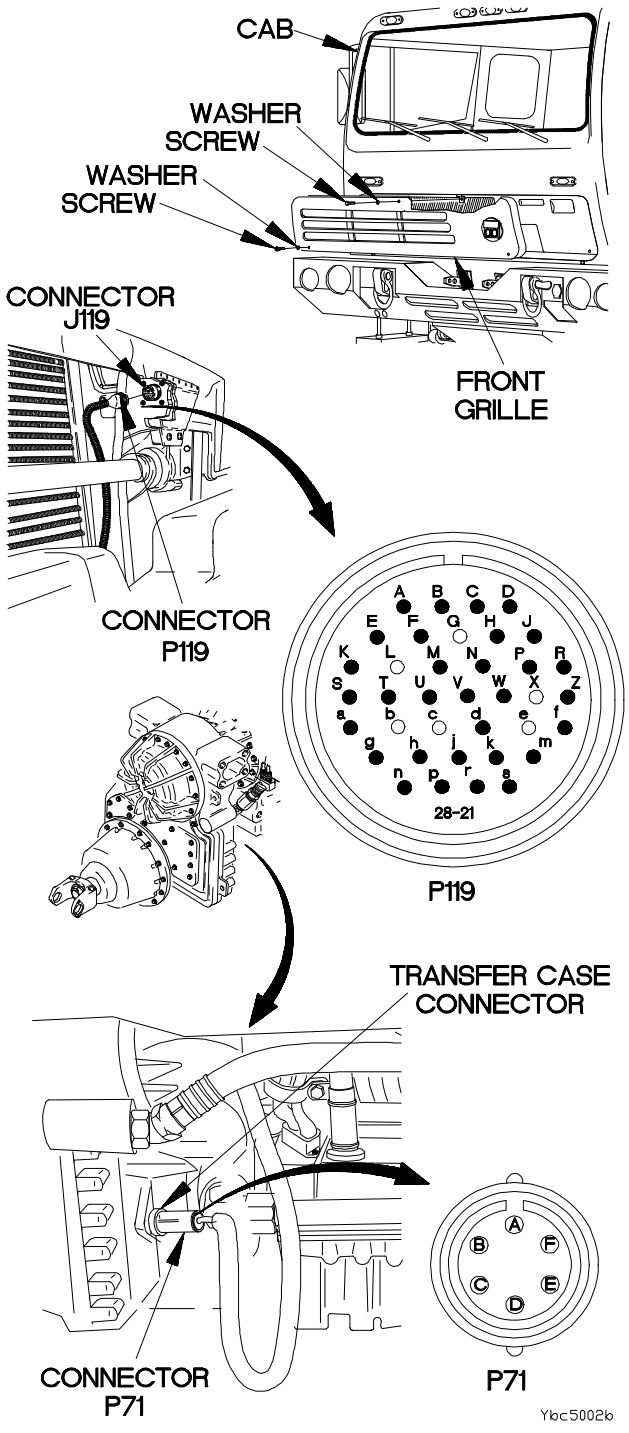
Continuity Test or
STE/ICE-R Test #91

REASON FOR QUESTION

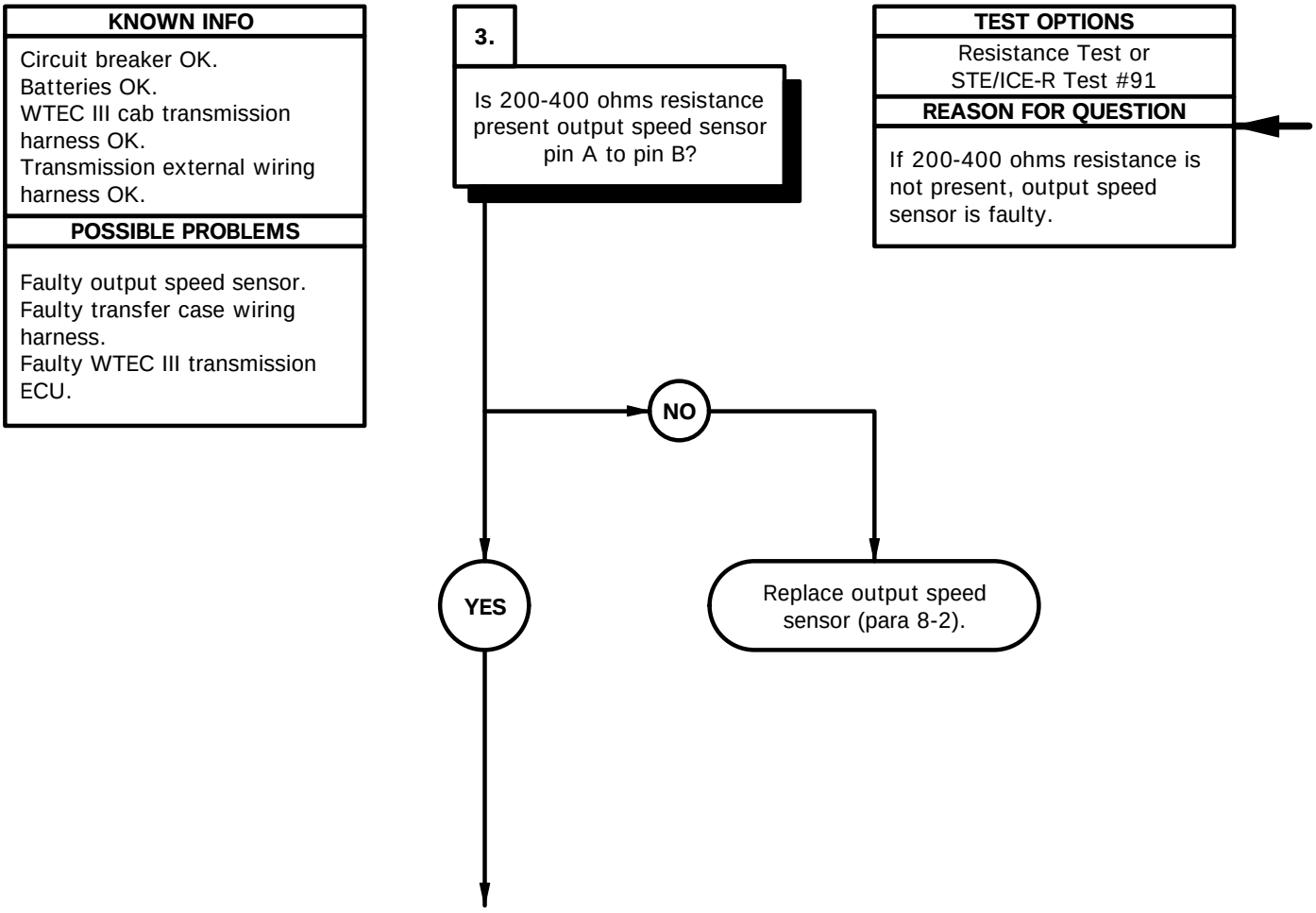
If continuity is not present, transmission external wiring harness is faulty.

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P119-g.
(3) Connect negative (-) probe of multimeter to connector P71-D and note reading on multimeter.
(4) If continuity is not present, replace transmission external wiring harness (para 6-7).
(5) Connect positive (+) probe of multimeter to connector P119-g.
(6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
(7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
(9) Connect connector P119 to connector J119.
(10) Position front grille on cab with washer and screw.
(11) Position two washers and screws in front grille.
(12) Tighten screw to 48-60 lb-in. (5-7 N·m).
(13) Tighten two screws to 24 lb-in. (3 N·m).

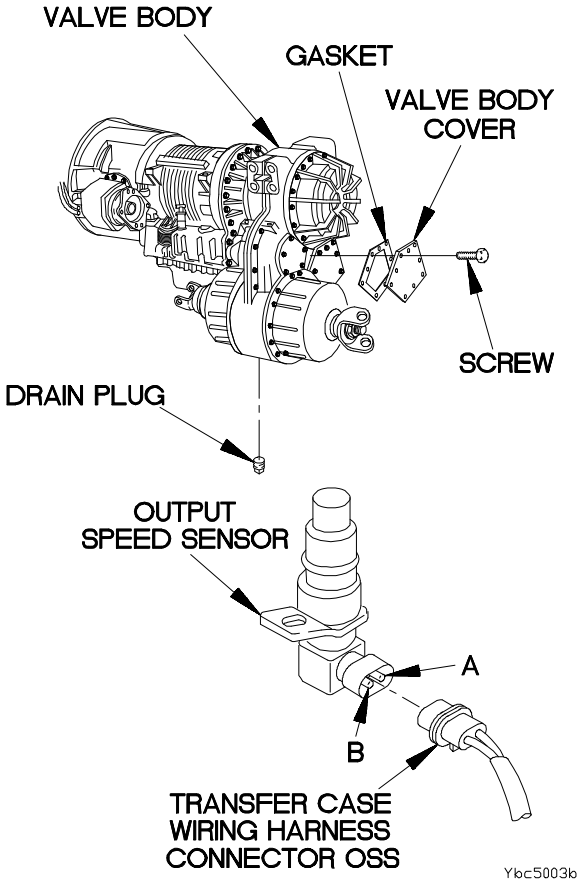


c50. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 16 (CONT)

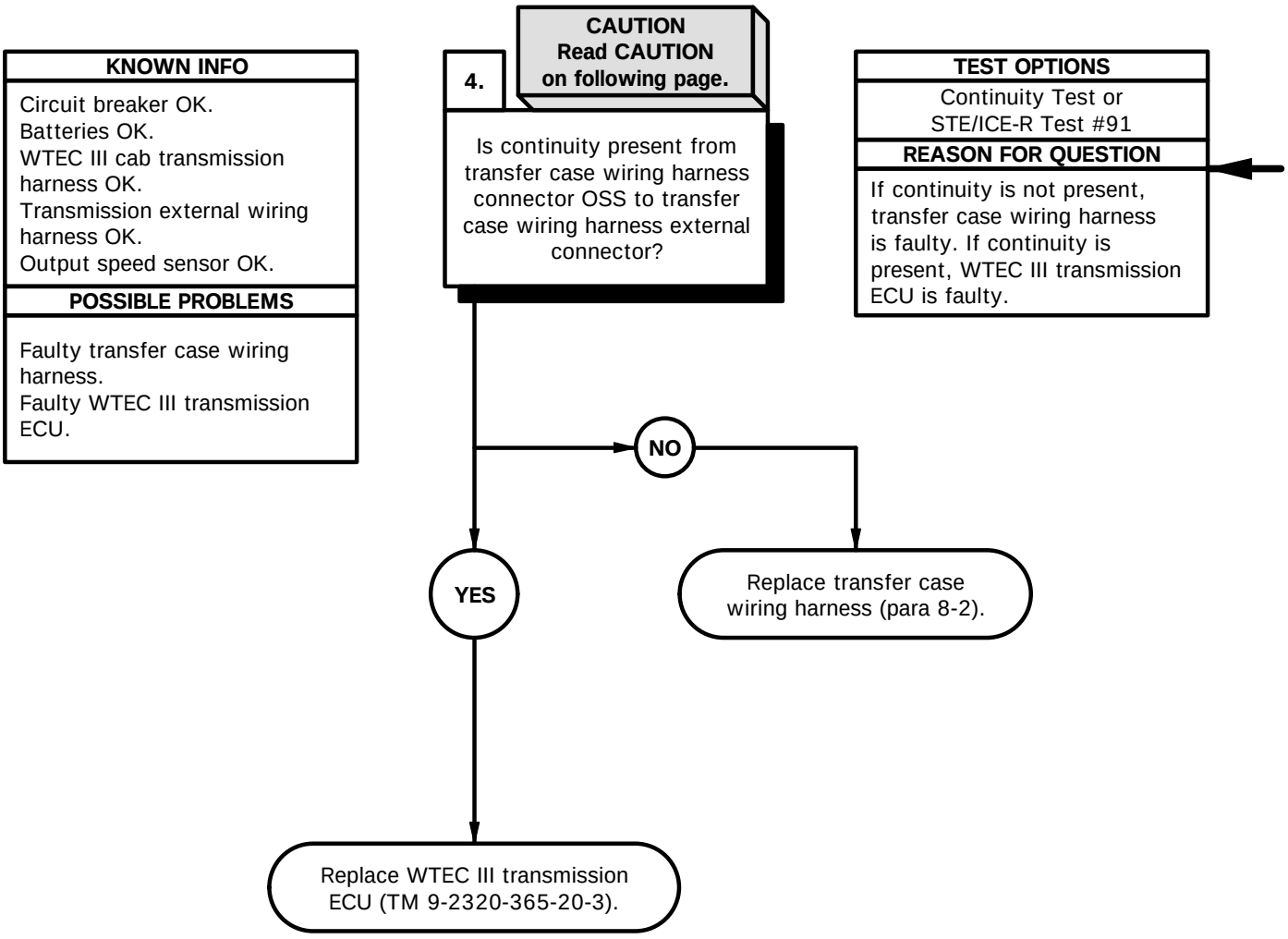


RESISTANCE TEST

(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 (CONT)

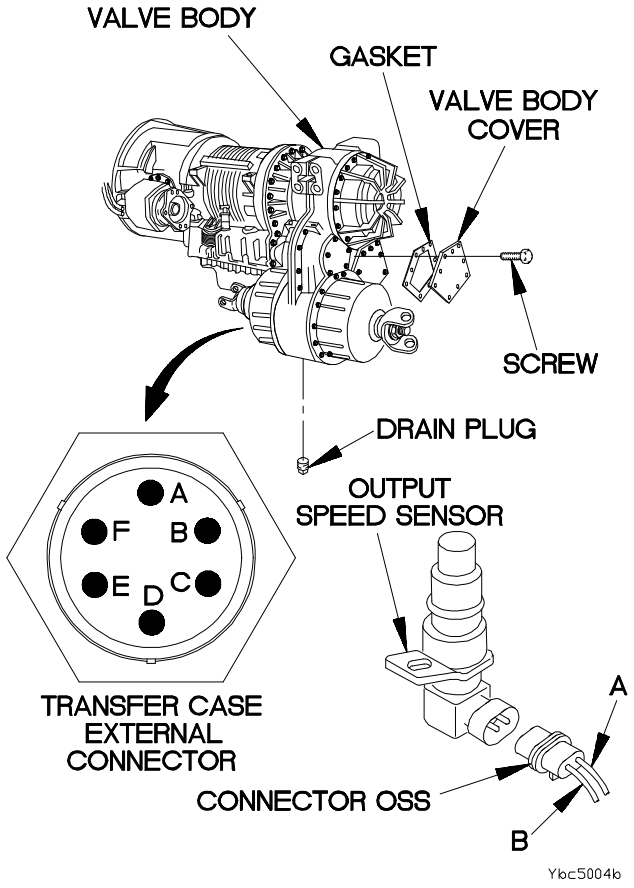


CAUTION

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 9-2320-365-20-3).
(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 9-2320-365-20).
(13) Connect batteries (TM 9-2320-365-20-3).



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

INITIAL SETUP

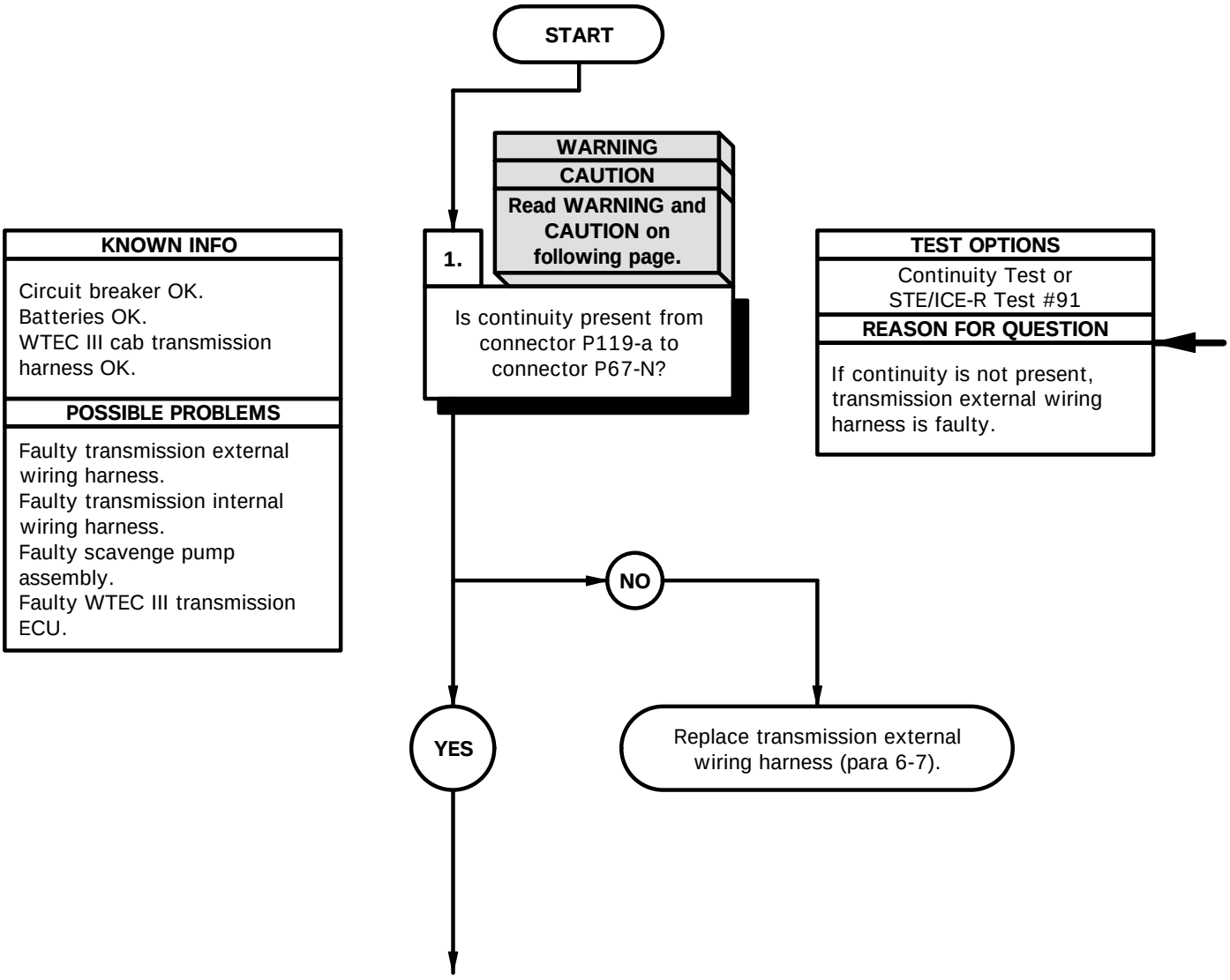
Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)

Tools and Special Tools (Cont)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)
Pan, Drain (Item 36, 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

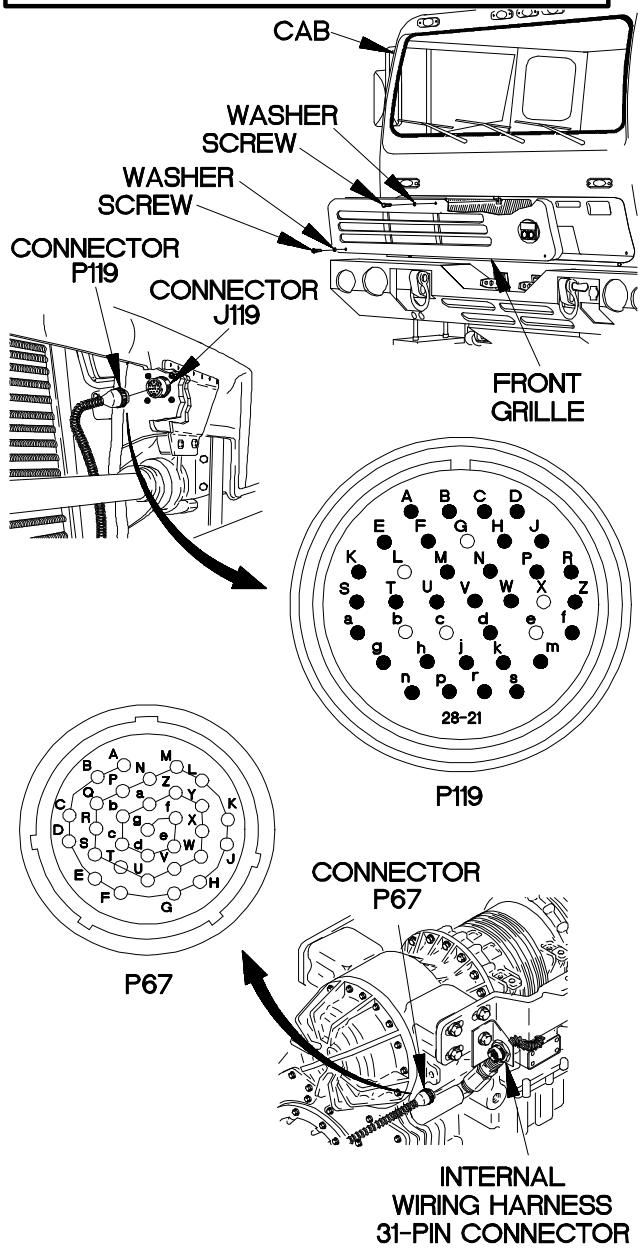
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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.

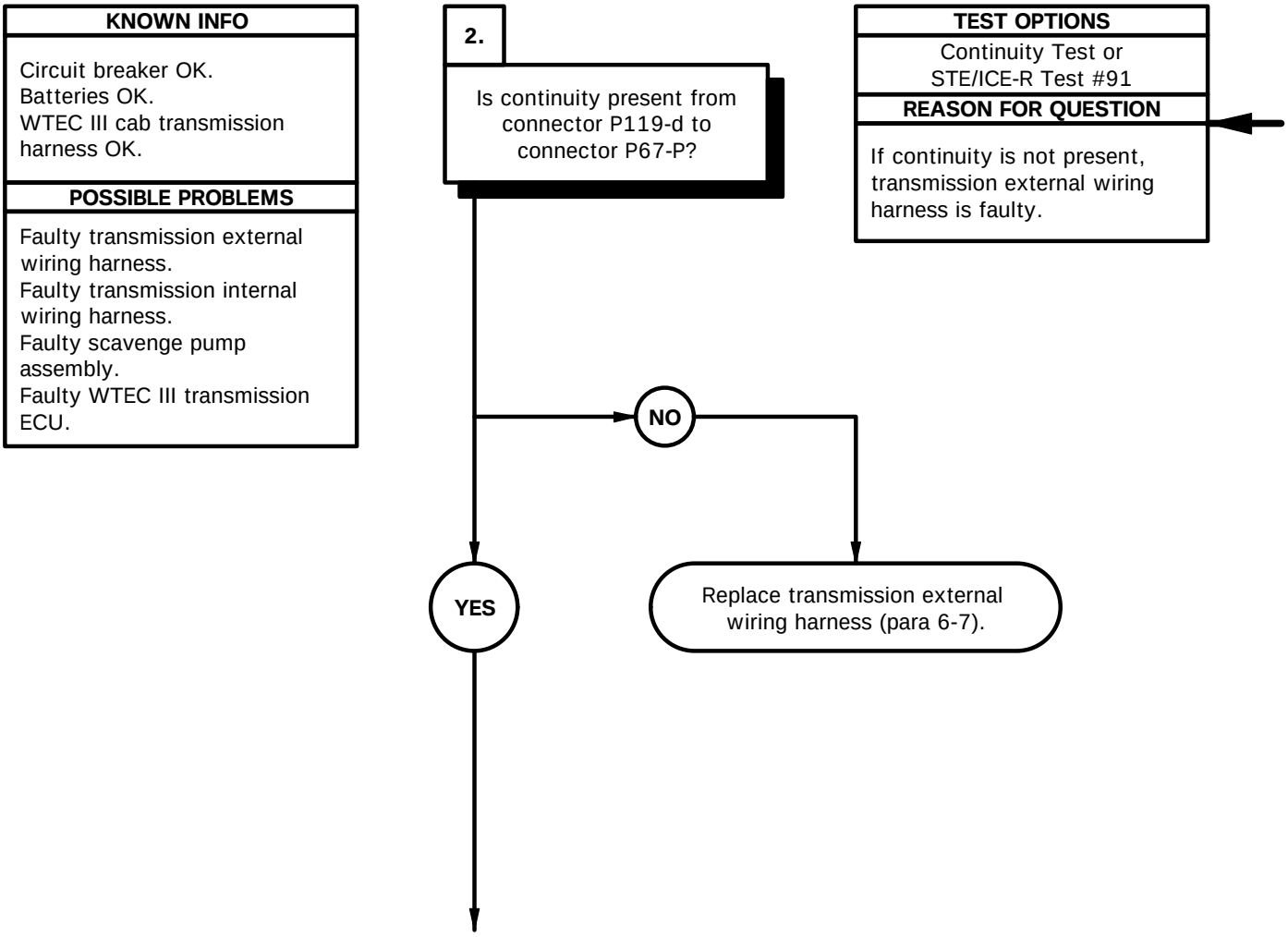
CONTINUITY TEST (Cont)

(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).



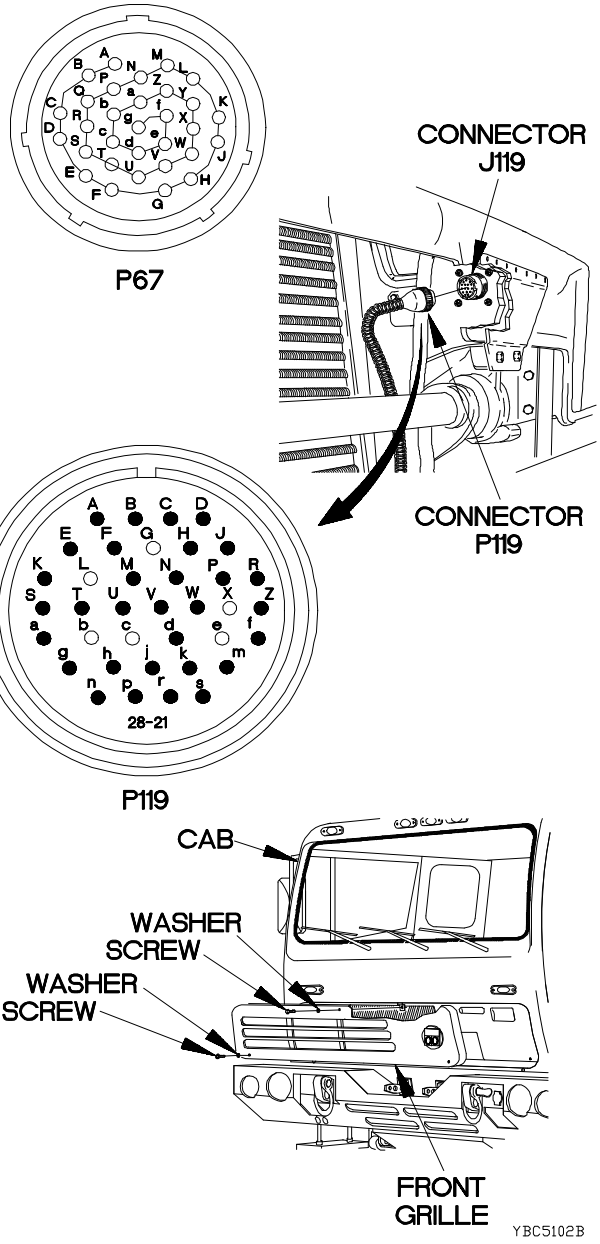
Ybc5101b

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

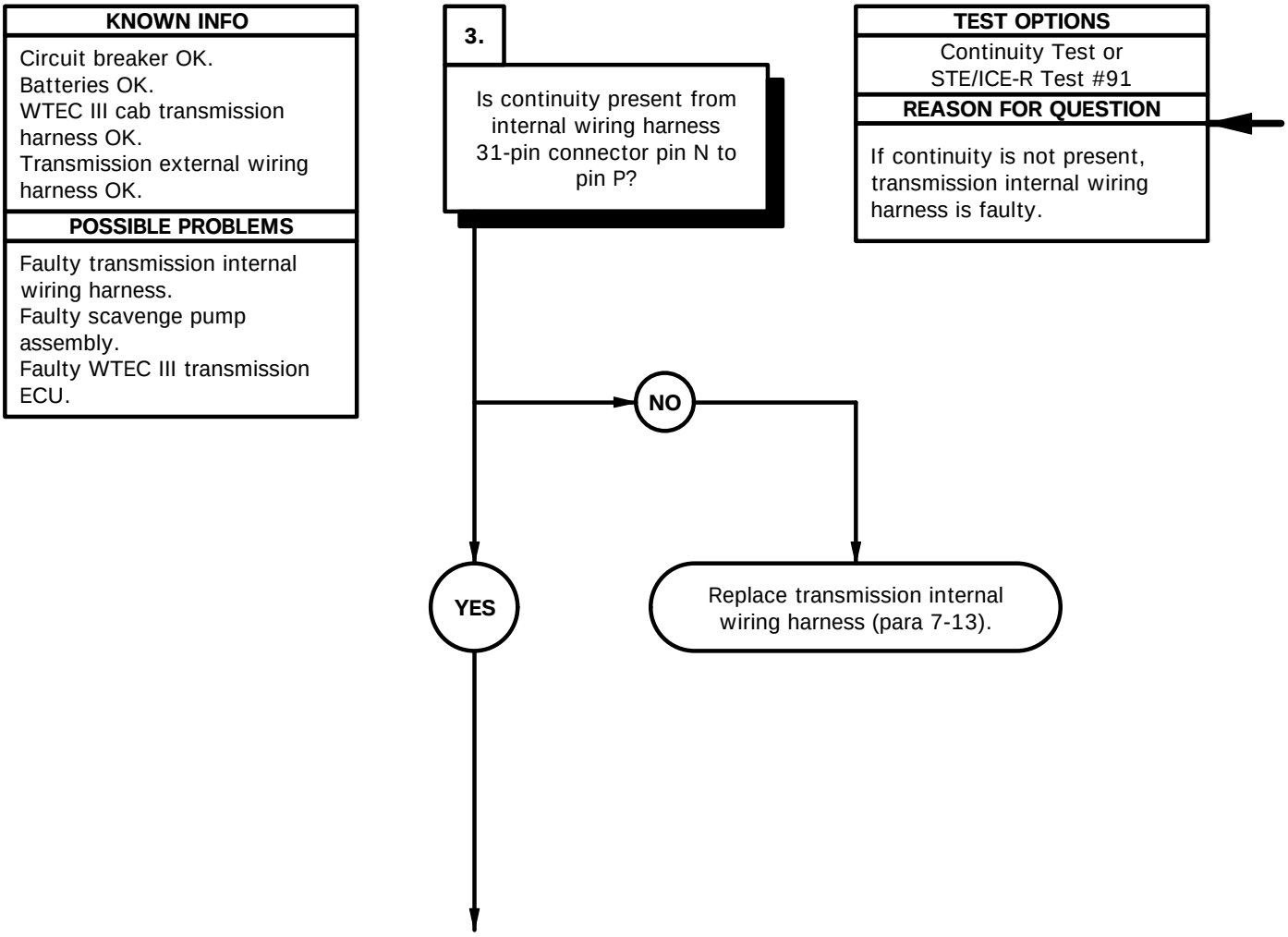


CONTINUITY TEST

(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).

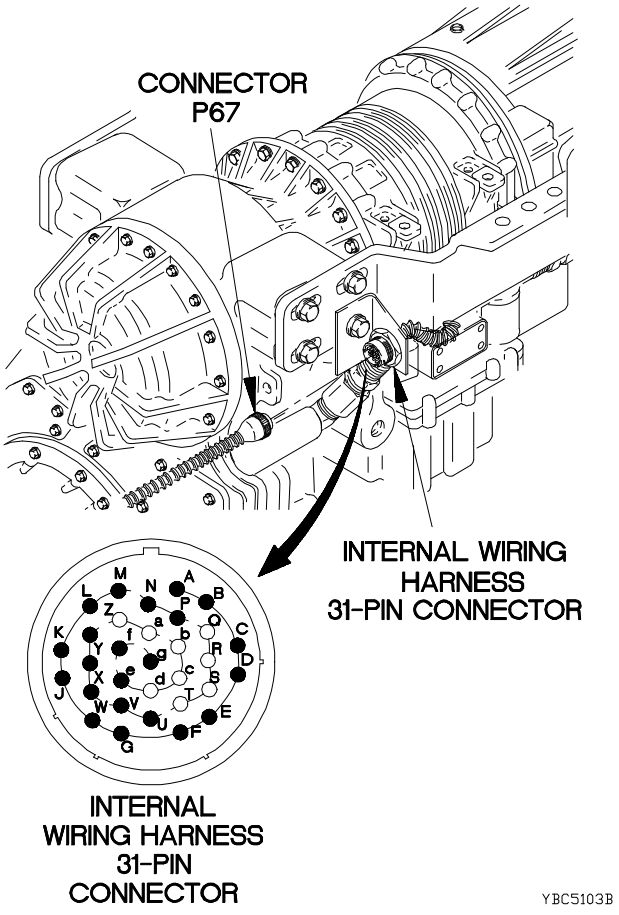


c51. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

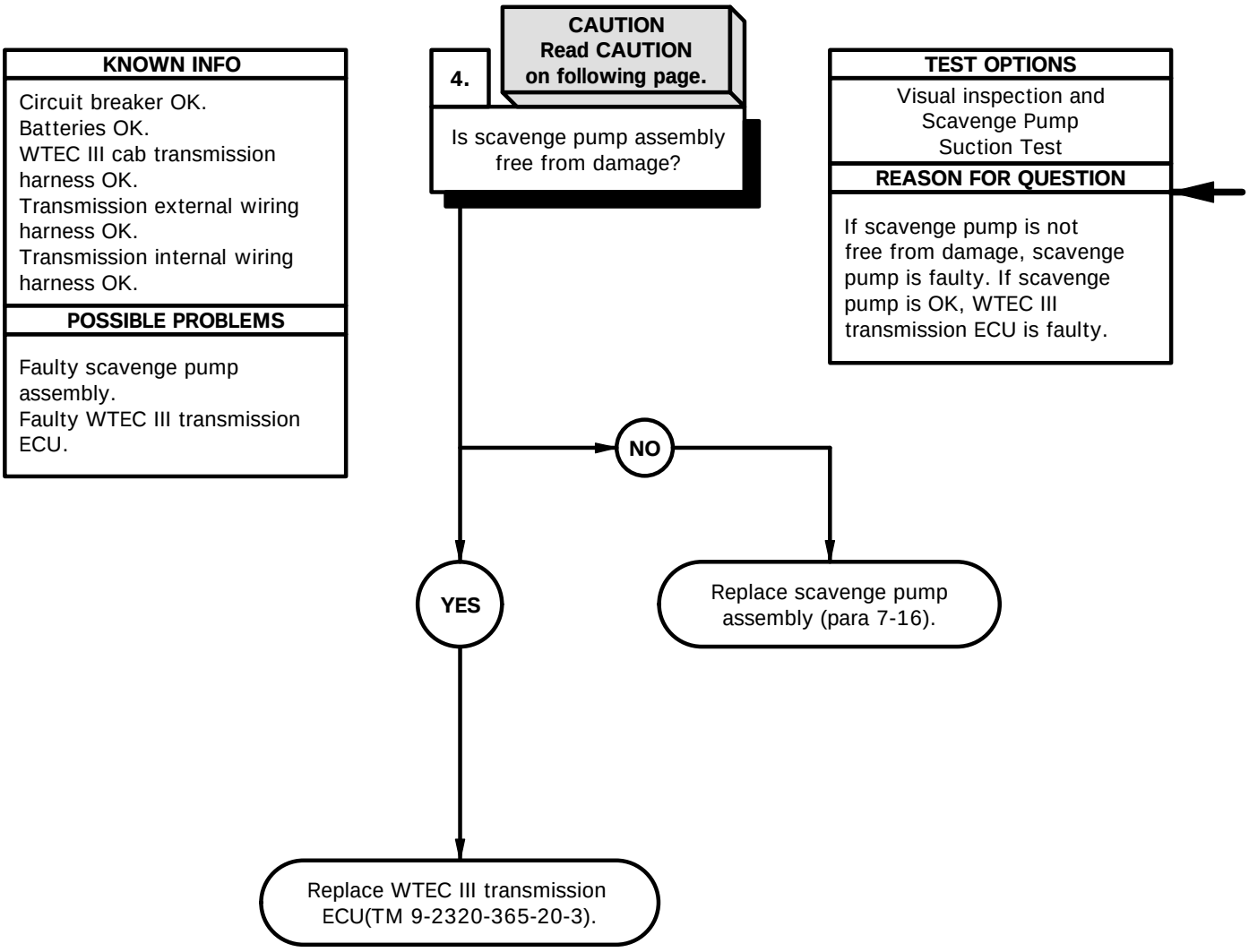


CONTINUITY TEST

(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)



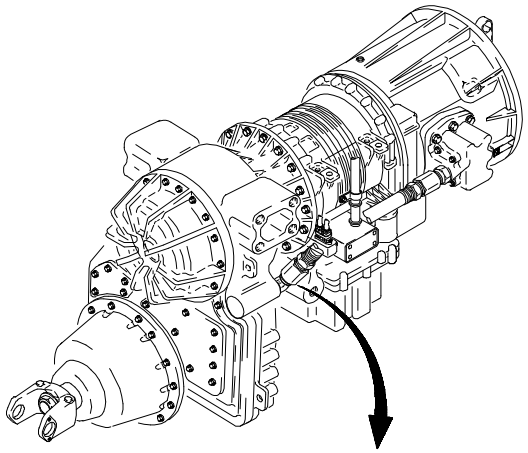
(1) Place drain pan under transfer case.
(2) Disconnect scavenge pump suction hose at transfer case.
(3) Connect batteries (TM 9-2320-365-20-3).
(4) Start engine (TM 9-2320-365-10).
(5) If oil drips or runs from fitting on transfer case, replace scavenge pump assembly (para 7-16).
(6) Shut down engine (TM 9-2320-365-10).

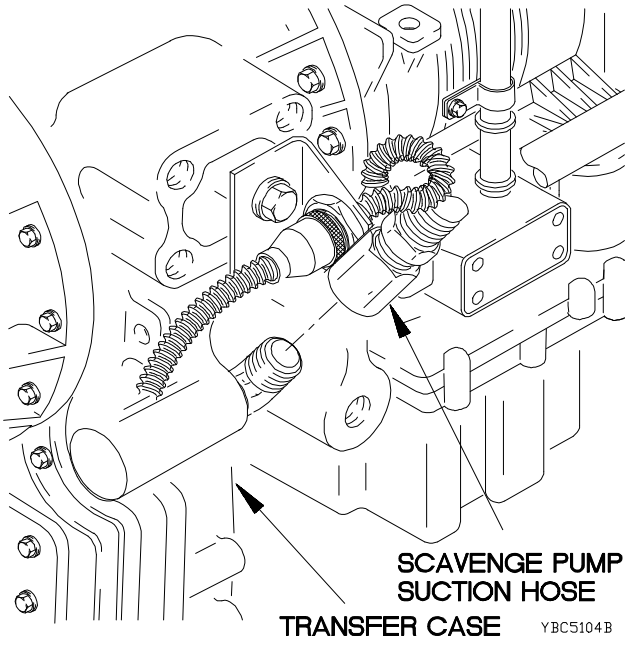
CAUTION

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 9-2320-365-10).
(3) Select neutral on WTEC III TPSS (TM 9-2320-365-10) 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 9-2320-365-10).
(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

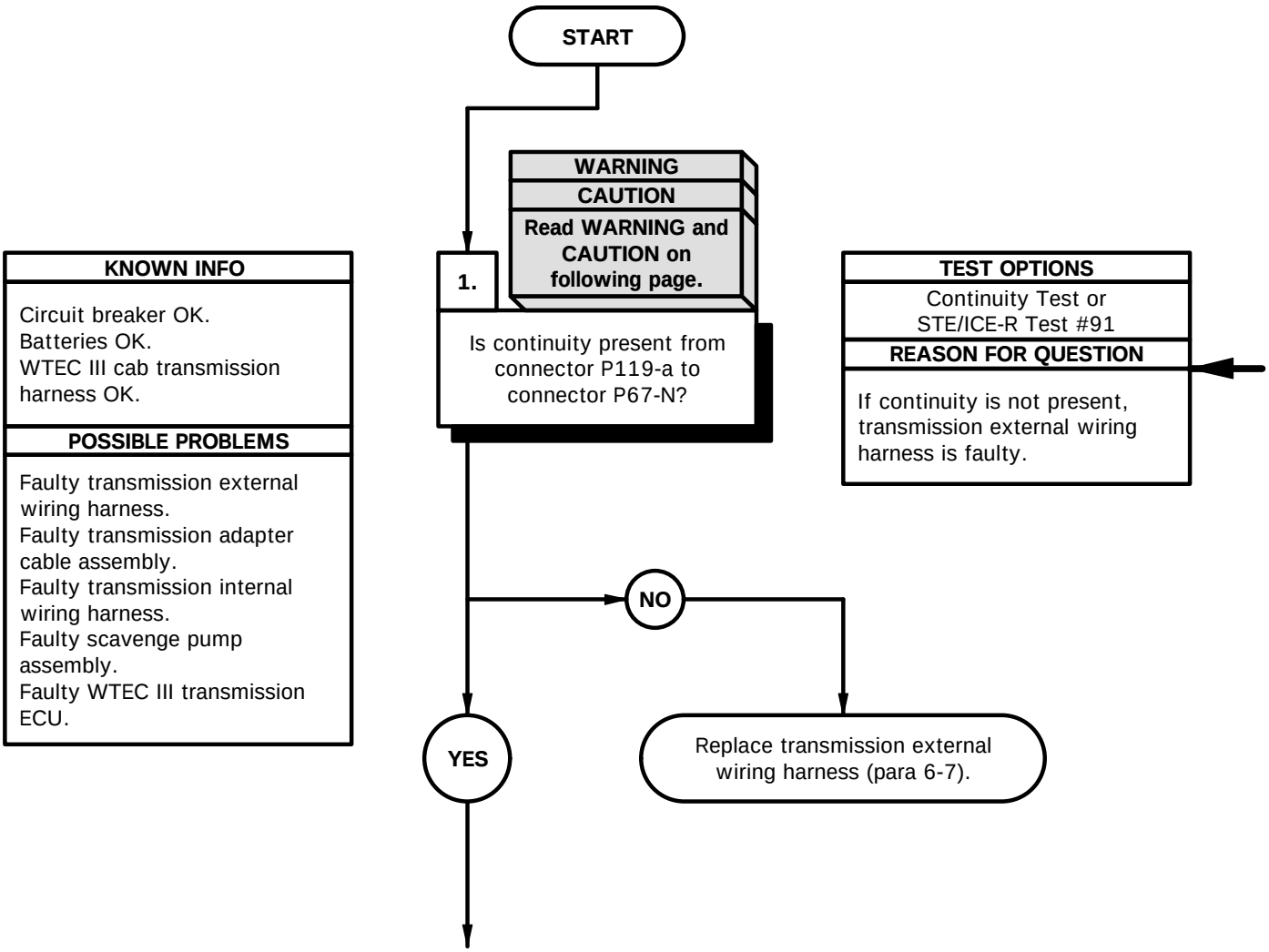
Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)

Tools and Special Tools (Cont)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Pan, Drain (Item 36, Appendix B)

Personnel Required
(2)

References
TM 9-4910-571-12&P



WARNING

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

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

CAUTION

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

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

NOTE

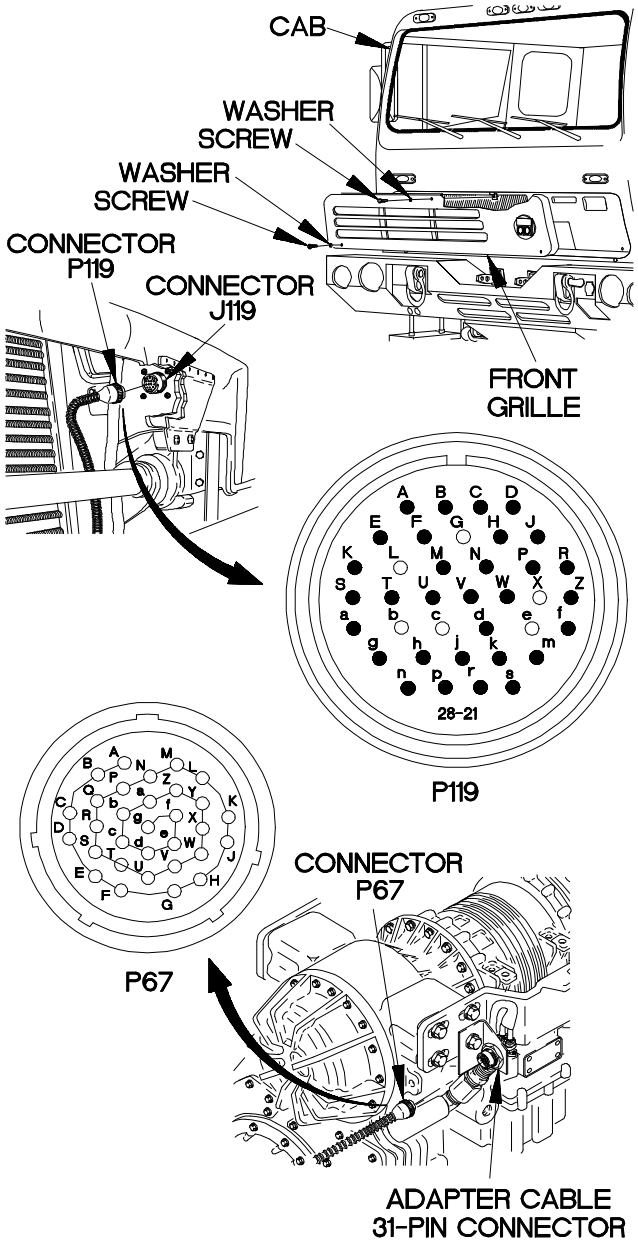
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from adapter cable 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect positive (+) probe of multimeter to connector P119-a.
(8) Connect negative (-) probe of multimeter to connector P67-N and note reading on multimeter.
(9) If continuity is not present, replace transmission external wiring harness (para 6-7).
(10) Connect positive (+) probe of multimeter to connector P119-a.

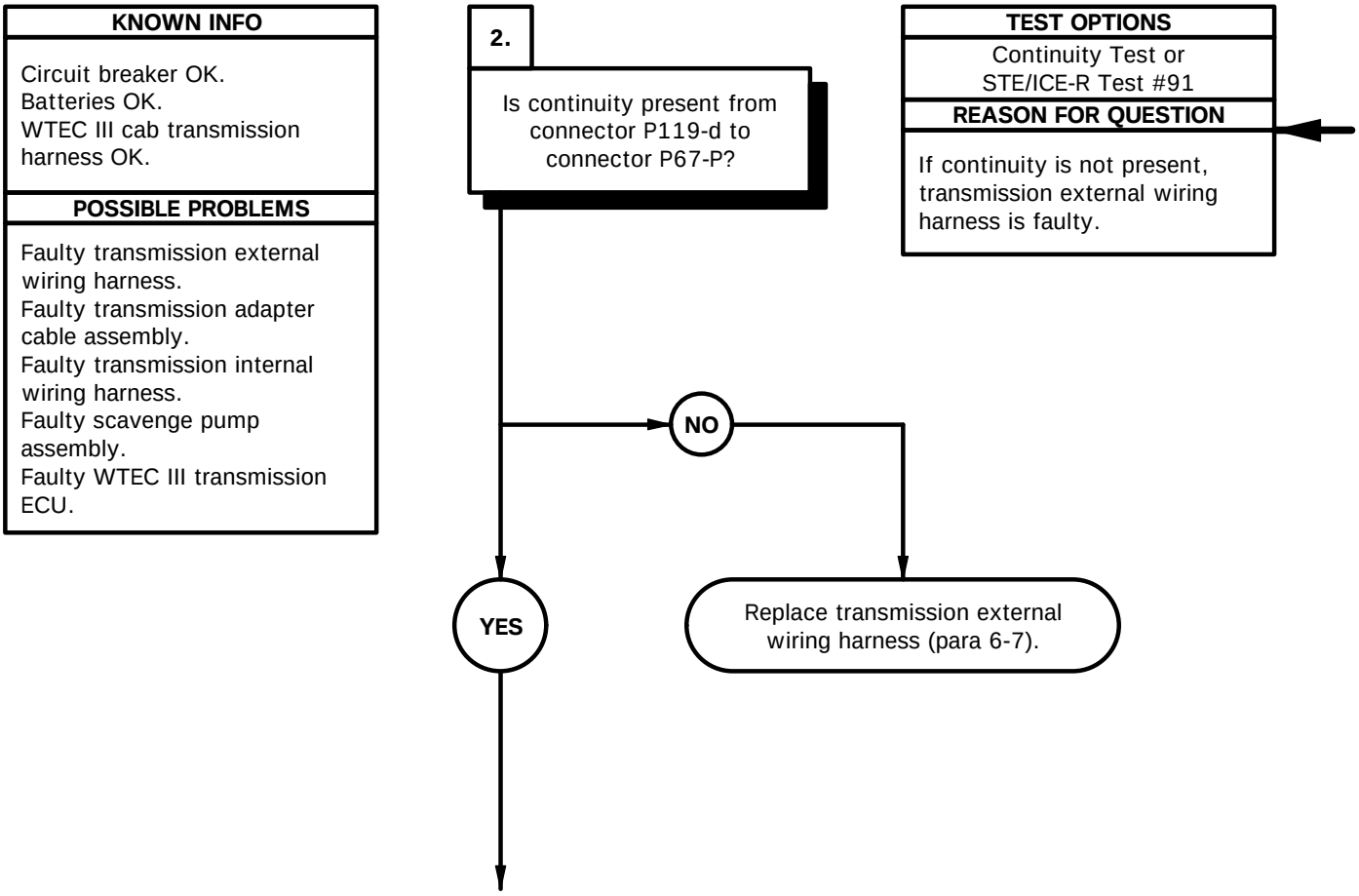
CONTINUITY TEST (Cont)

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



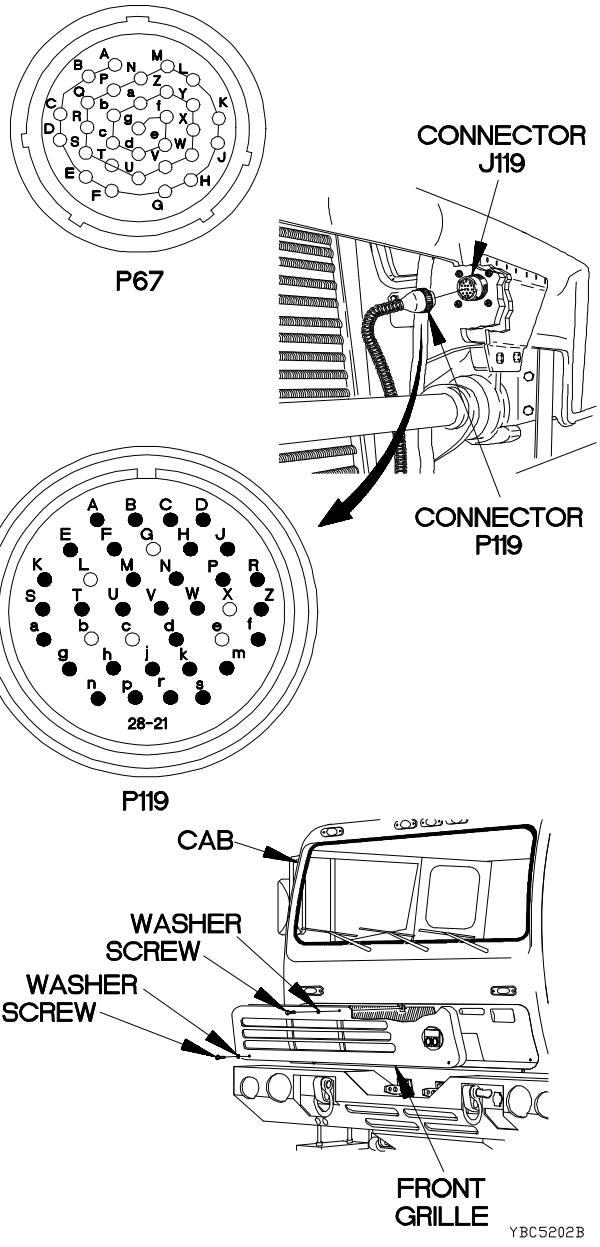
YBC5201B

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

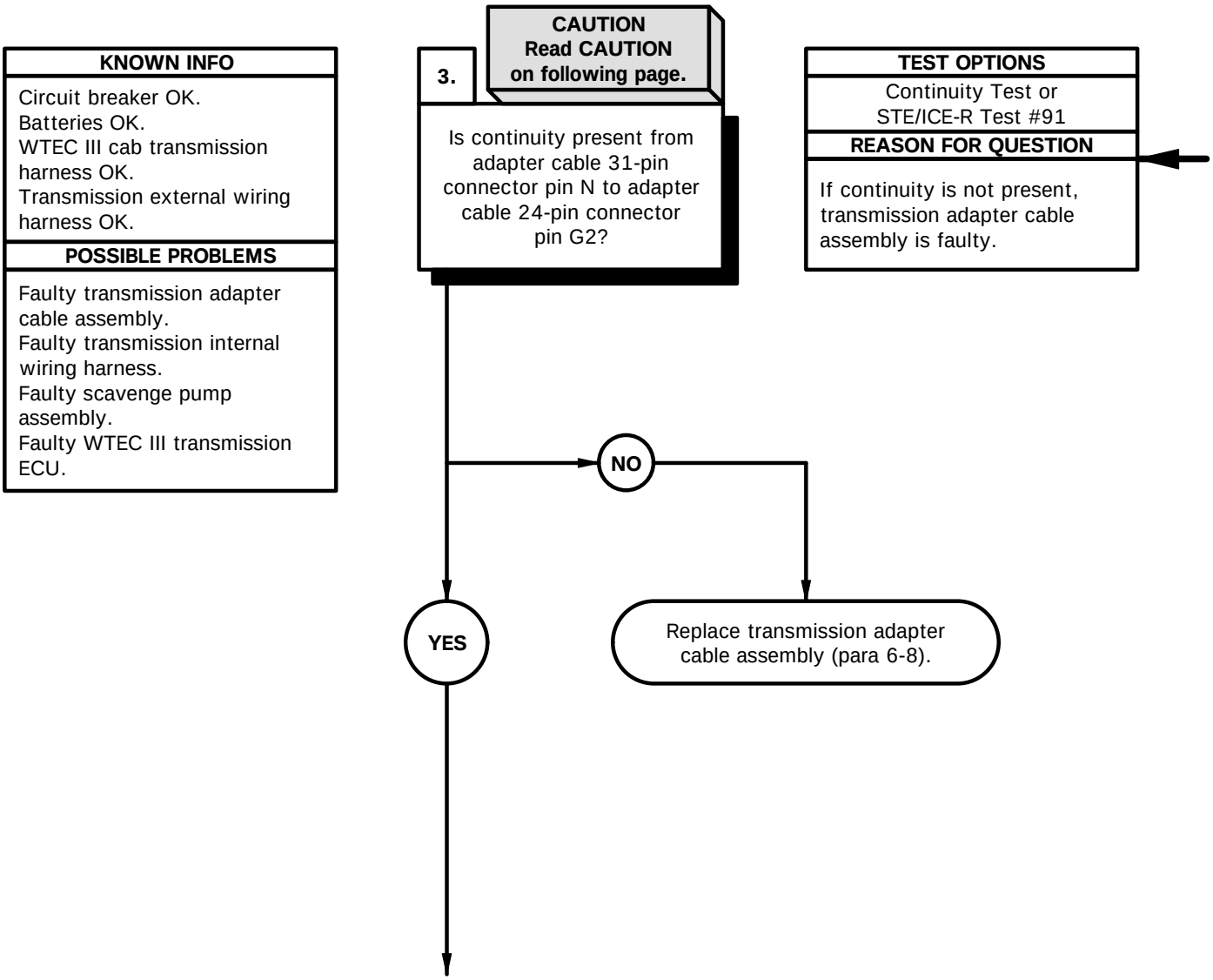


CONTINUITY TEST

(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)

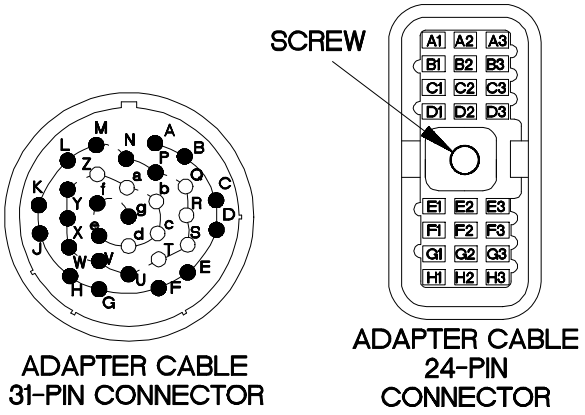


CAUTION

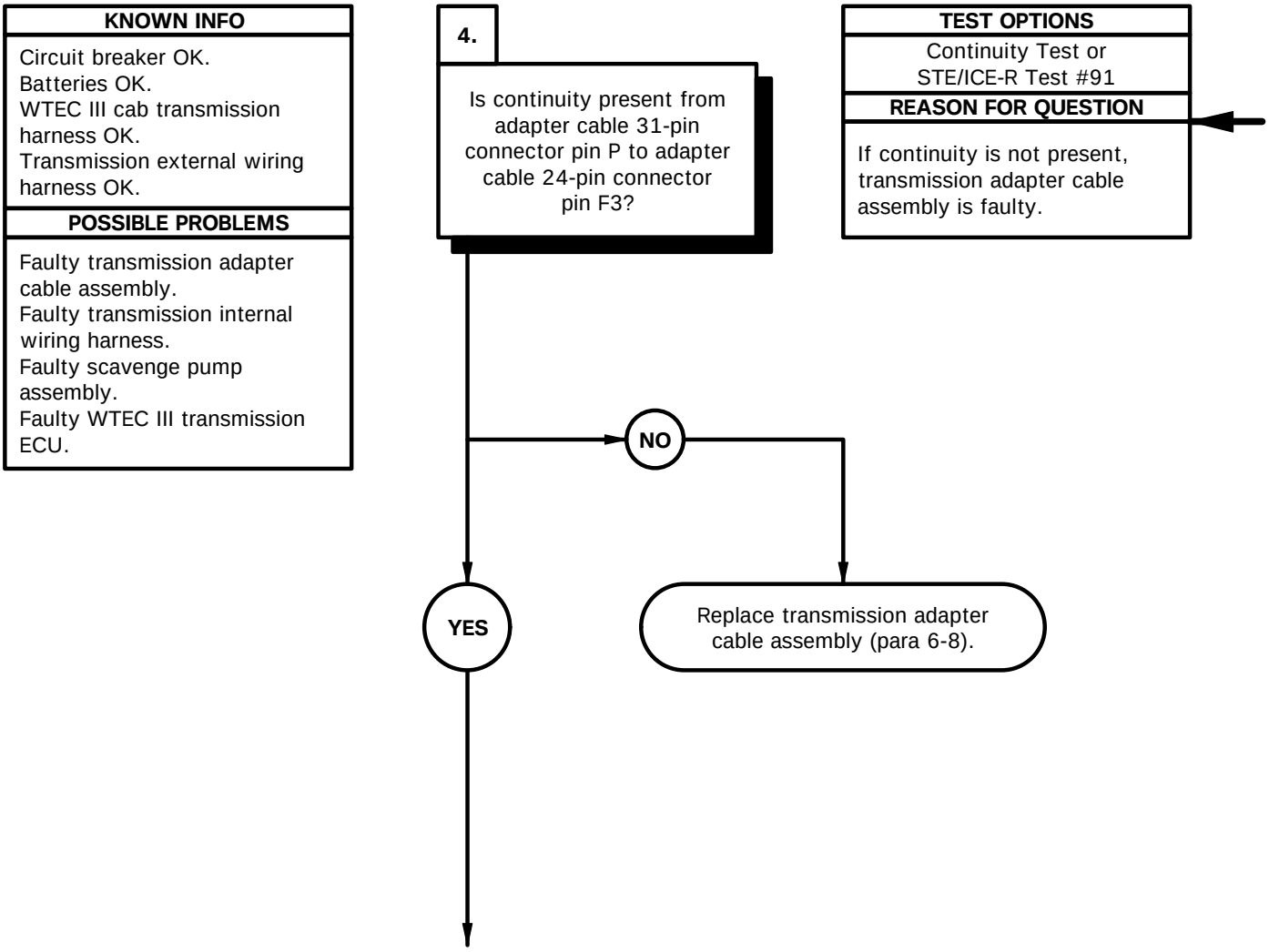
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

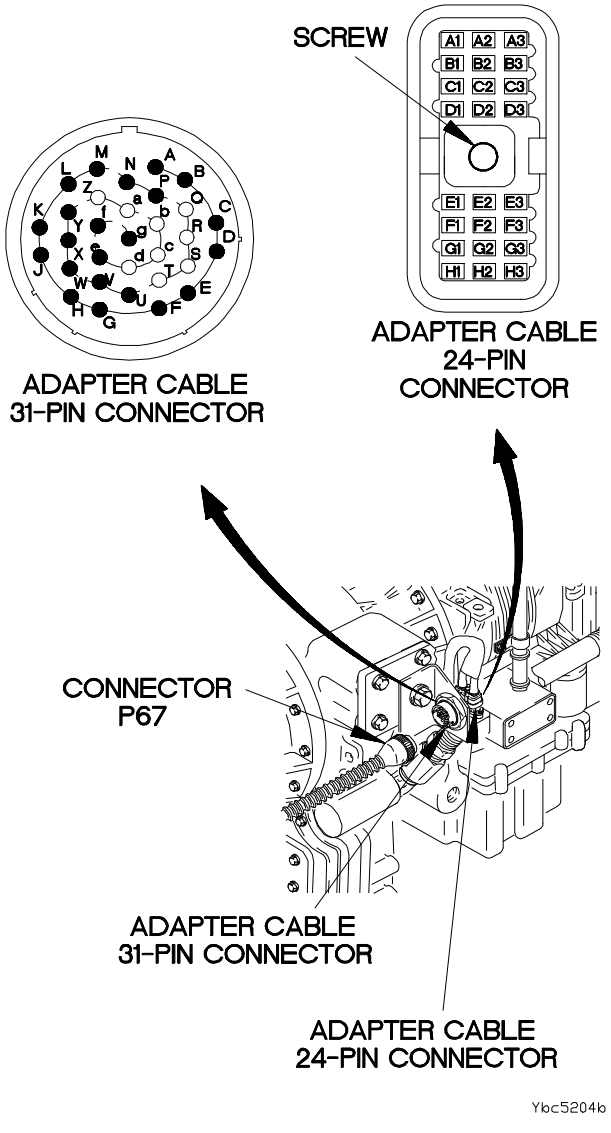


c52. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

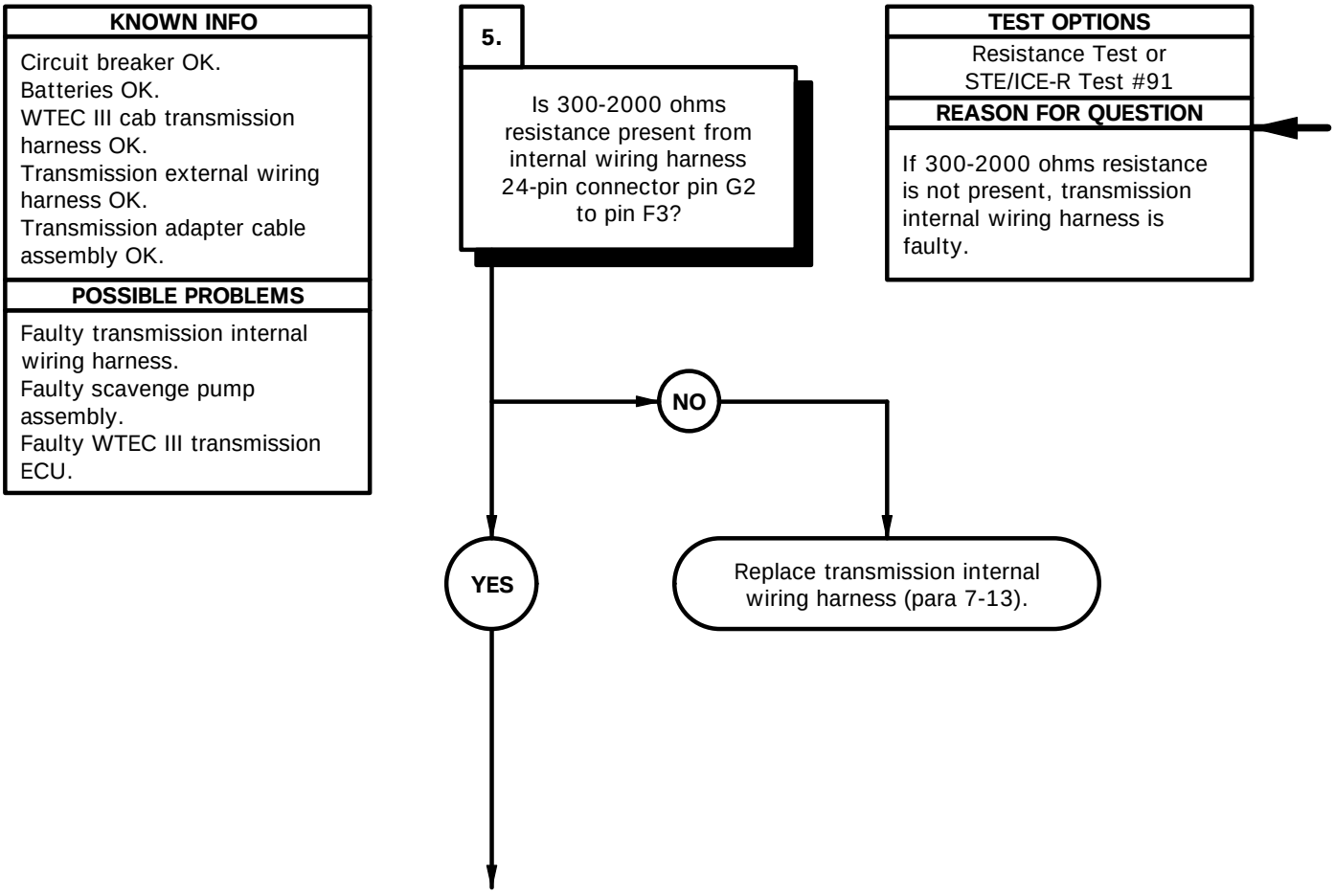


CONTINUITY TEST

(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.

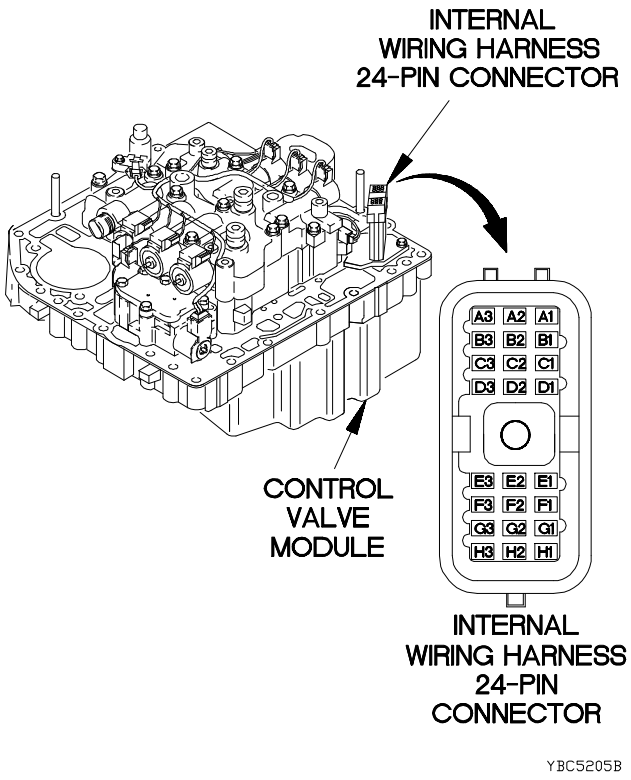


c52. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 SUB CODE 12 OR 23 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

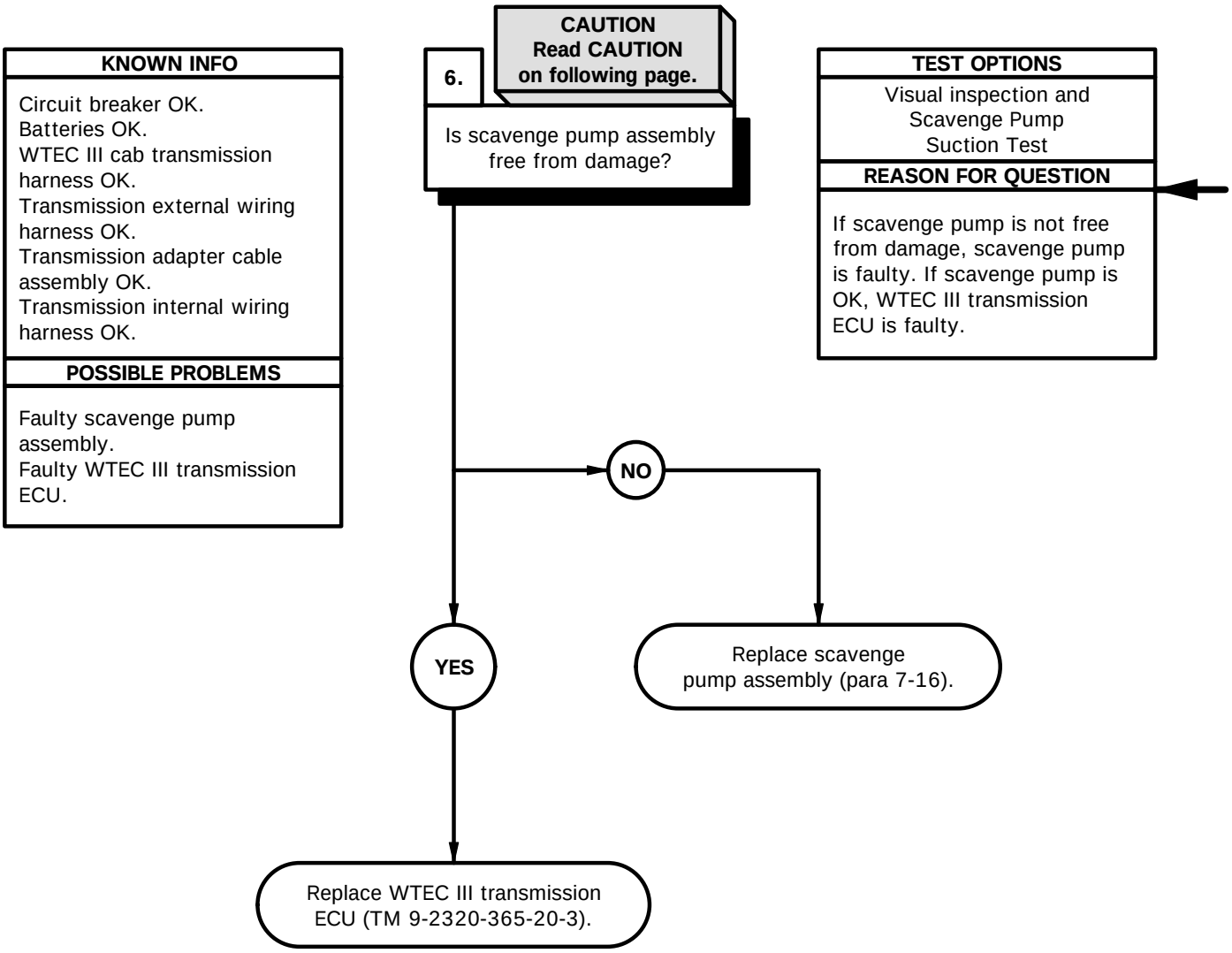


RESISTANCE TEST

(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)



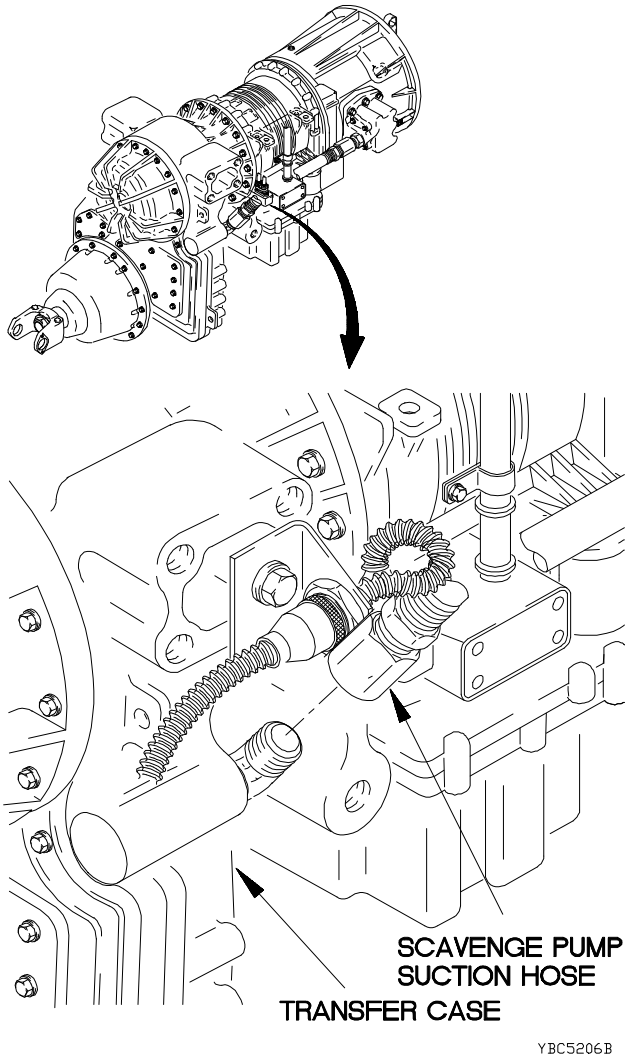
(1) Place drain pan under transfer case.
(2) Disconnect scavenge pump suction hose at transfer case.
(3) Connect batteries (TM 9-2320-365-20-3).
(4) Start engine (TM 9-2320-365-10).
(5) If oil drips or runs from fitting on transfer case, replace scavenge pump assembly (para 7-16).
(6) Shut down engine (TM 9-2320-365-10).

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 9-2320-365-10).
(3) Select neutral on WTEC III TPSS (TM 9-2320-365-10) 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 9-2320-365-10).
(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 ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

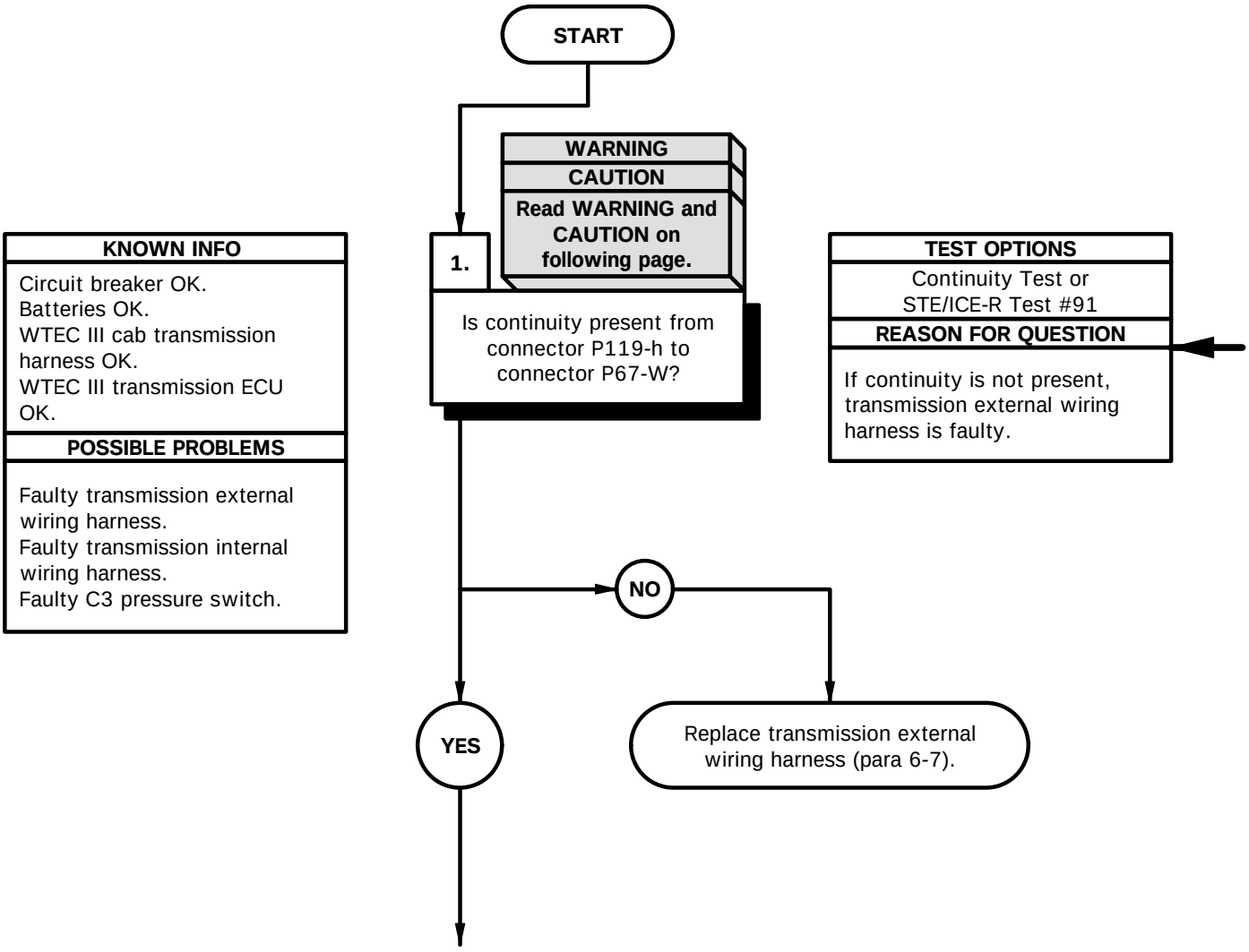
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

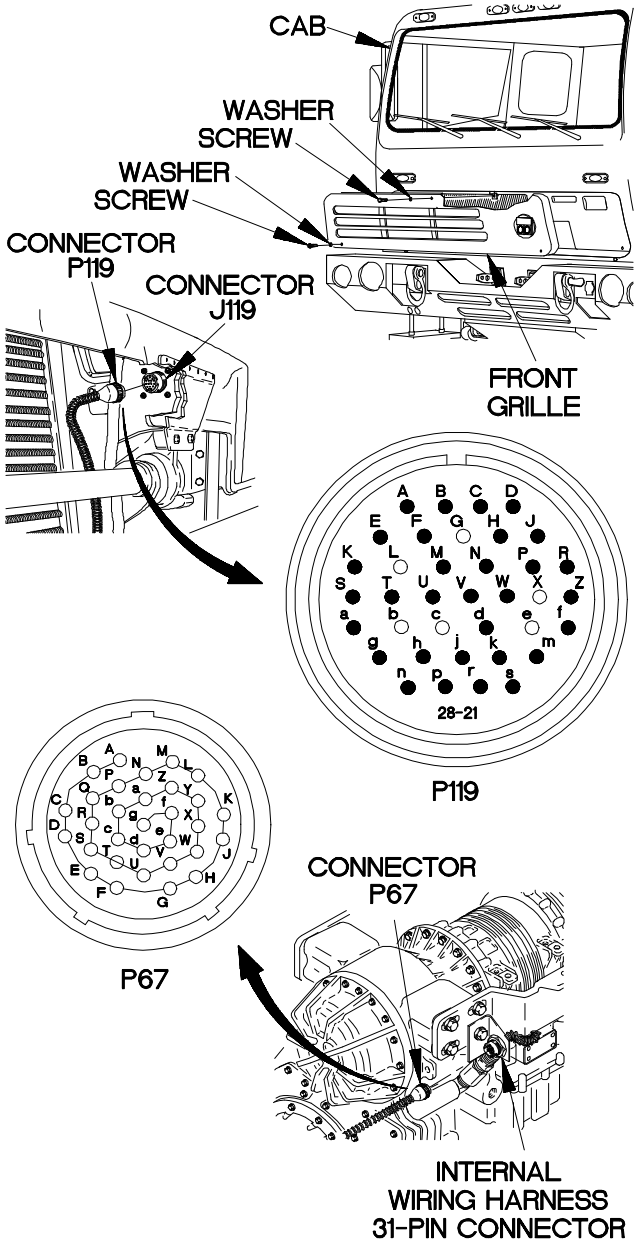
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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.

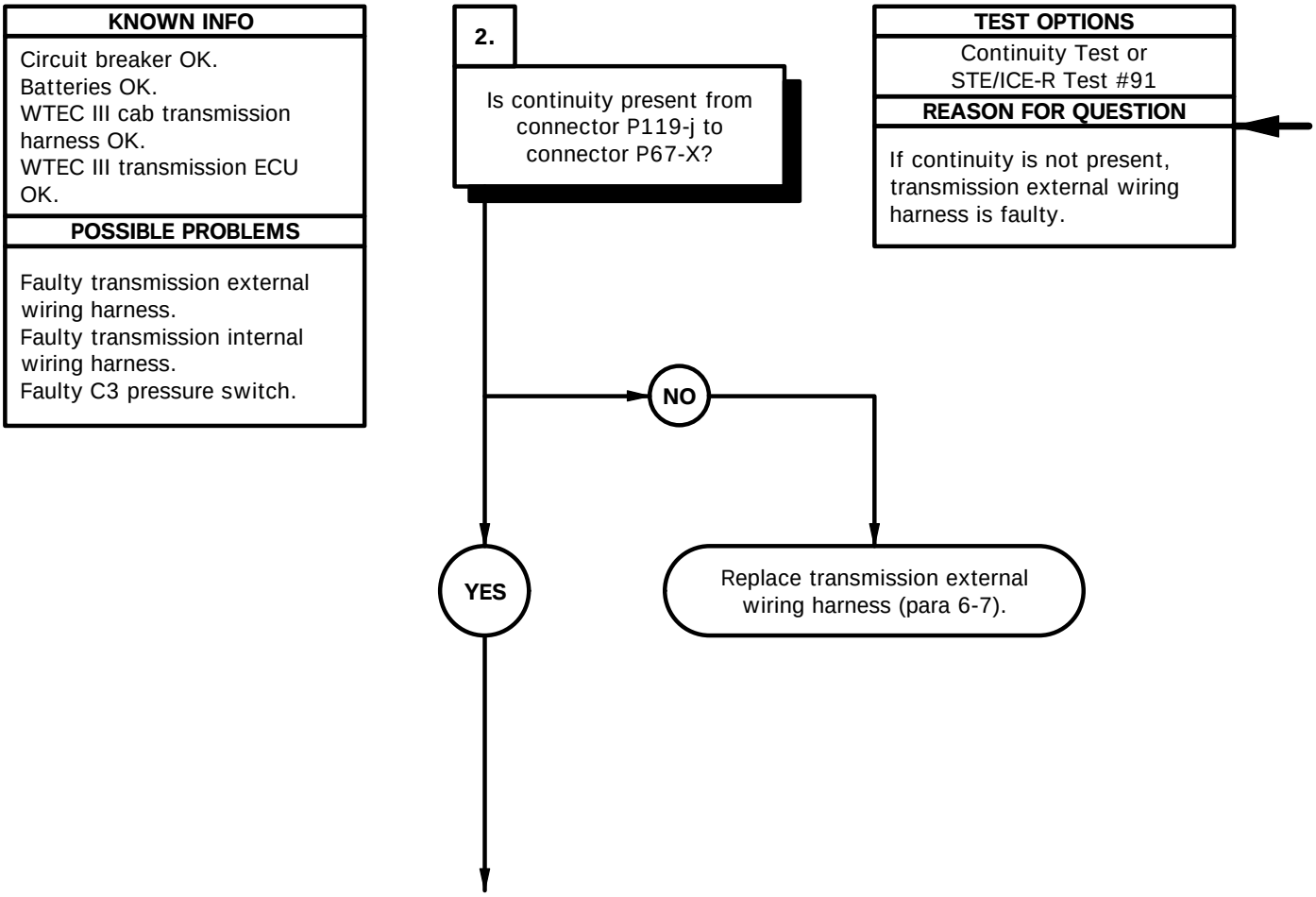
CONTINUITY TEST (Cont)

(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).



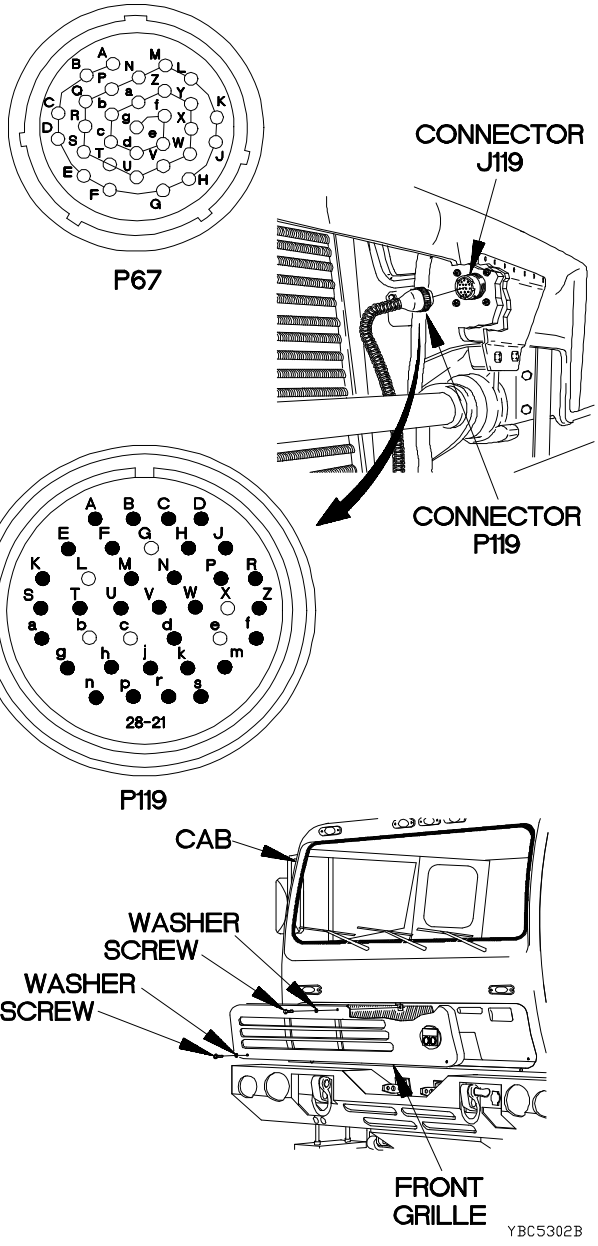
Ybc5301b

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

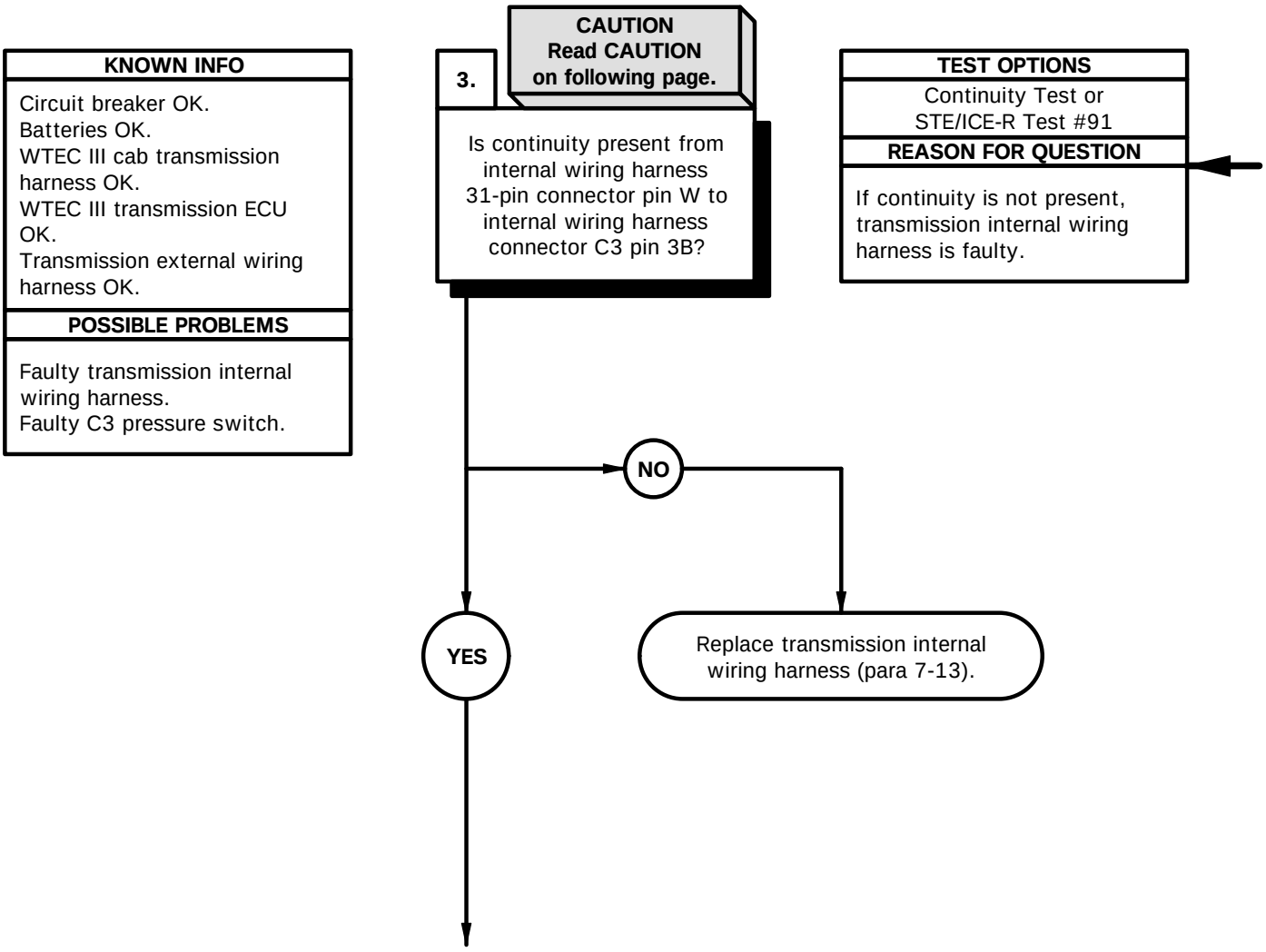


CONTINUITY TEST

(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 ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

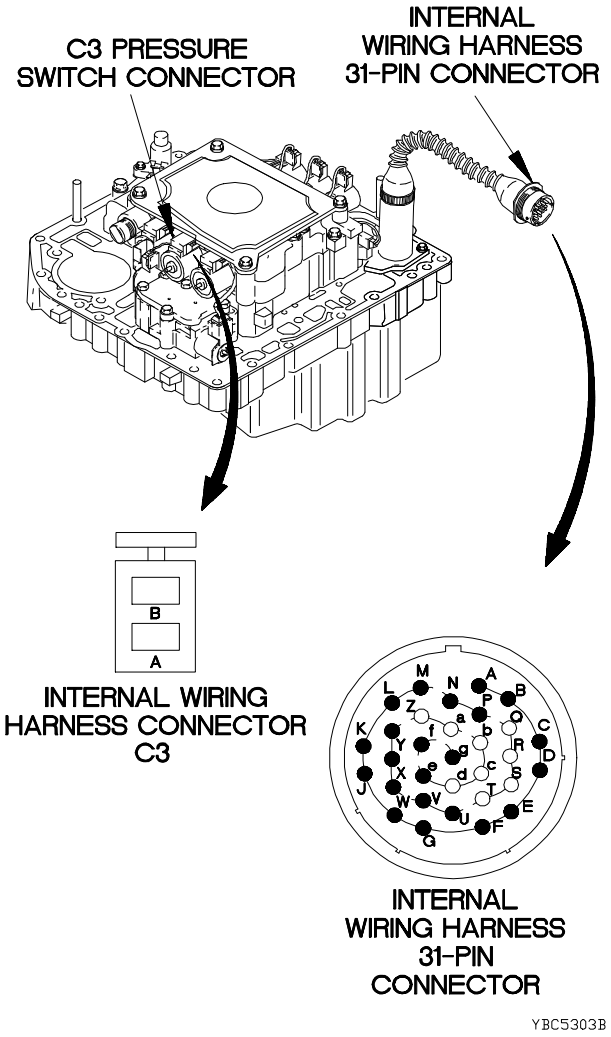


CAUTION

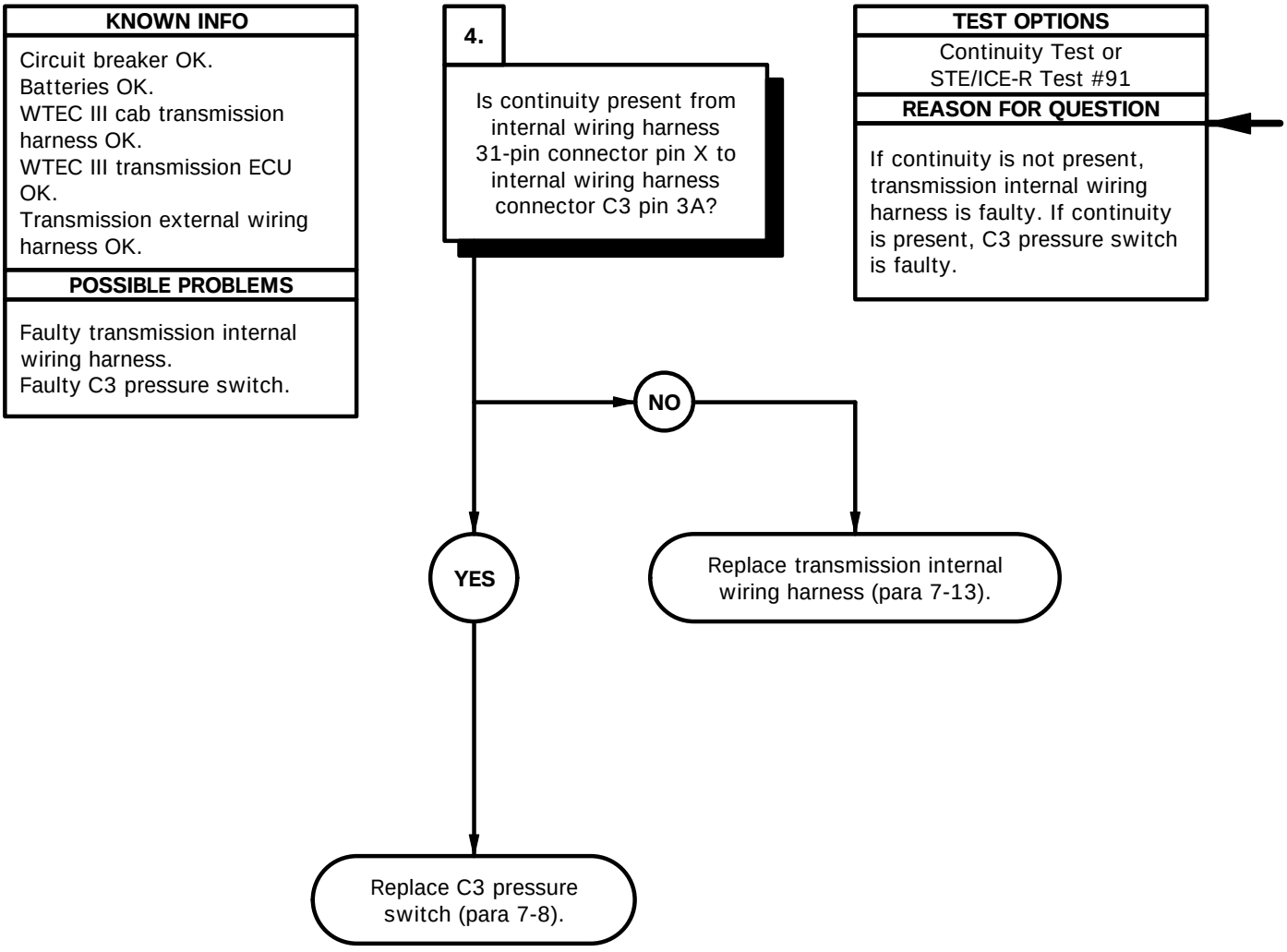
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

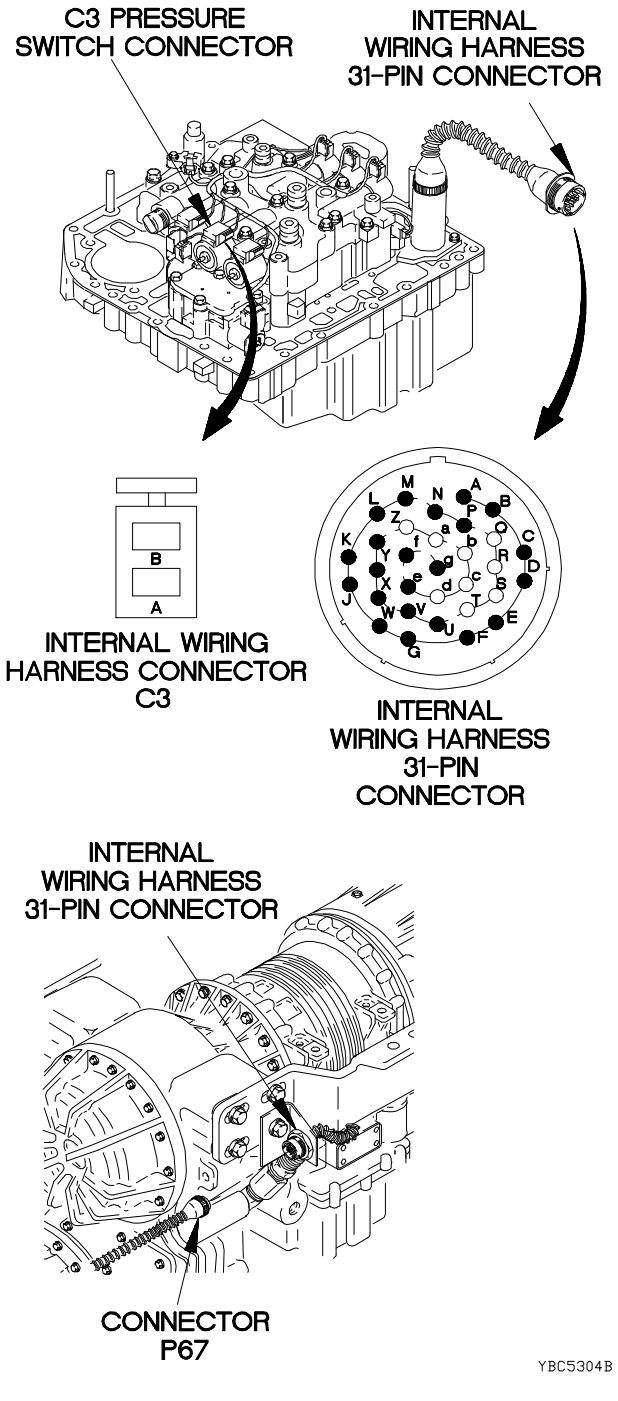


c53. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



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 9-2320-365-20-3).



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

INITIAL SETUP

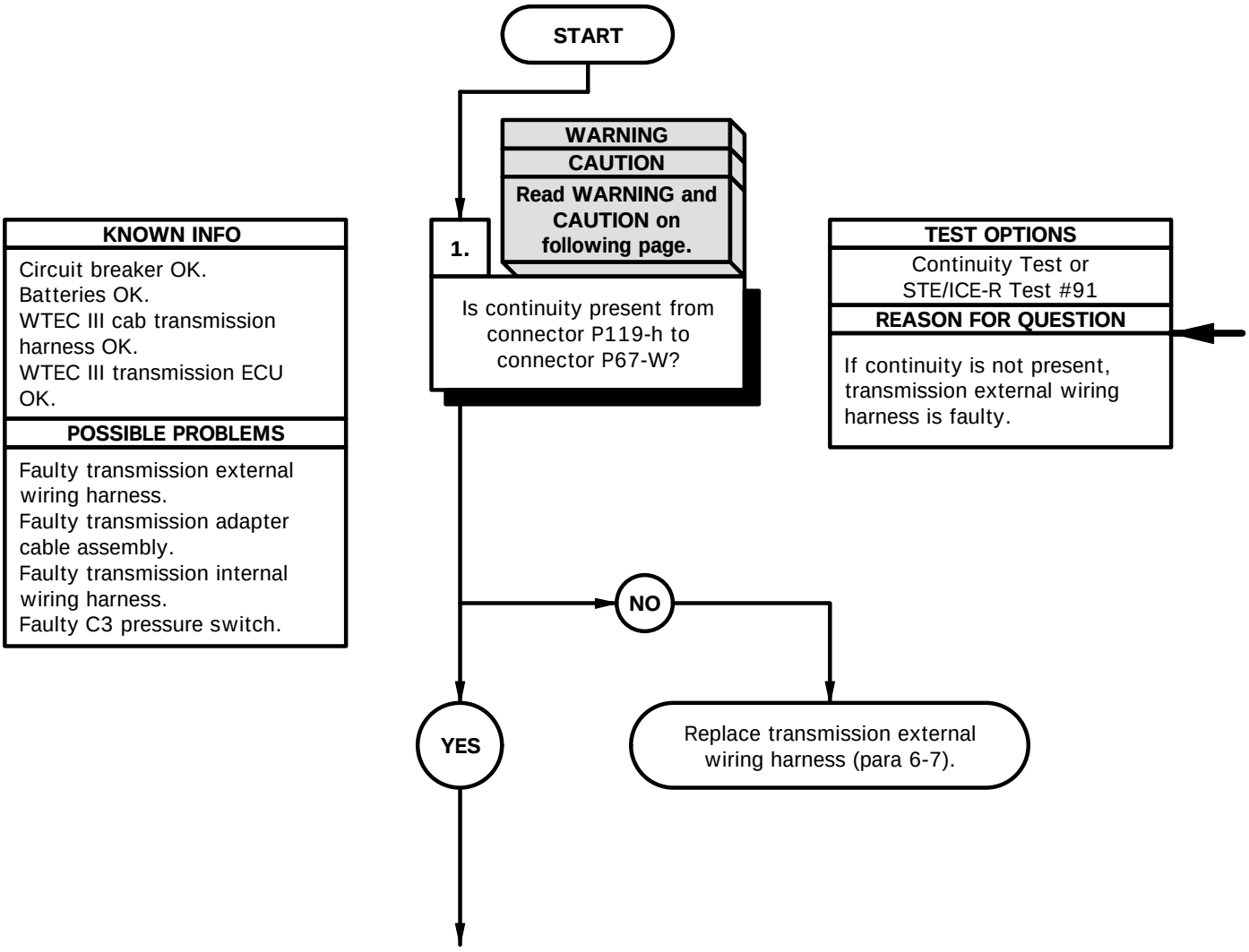
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

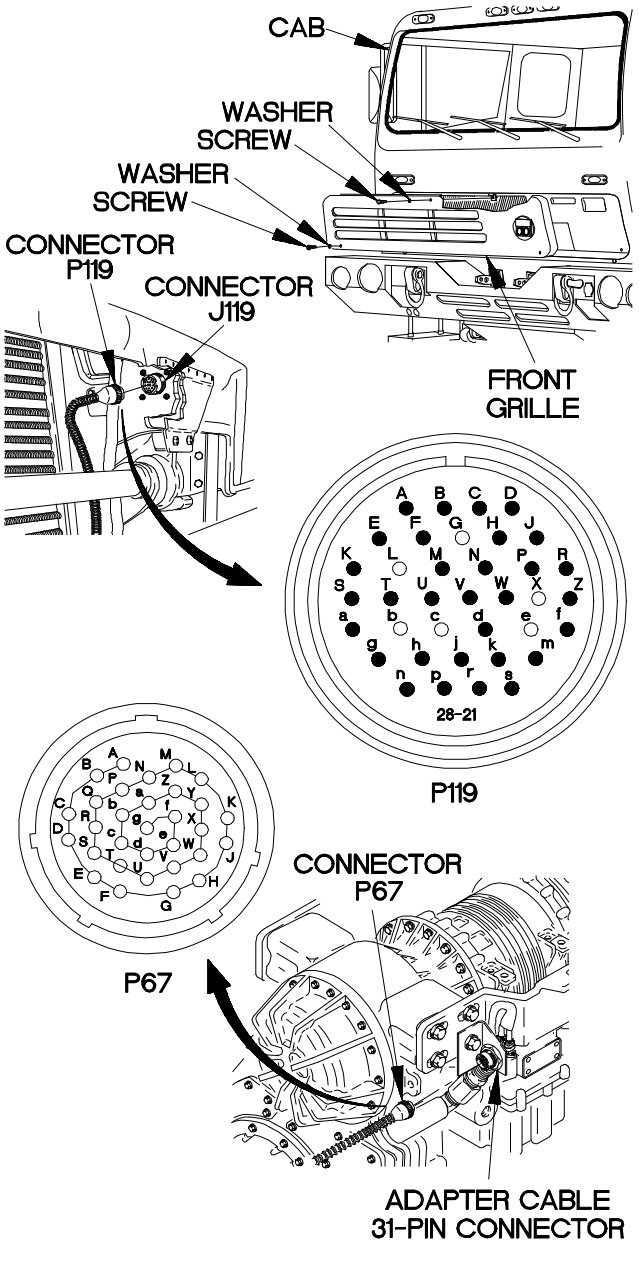
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



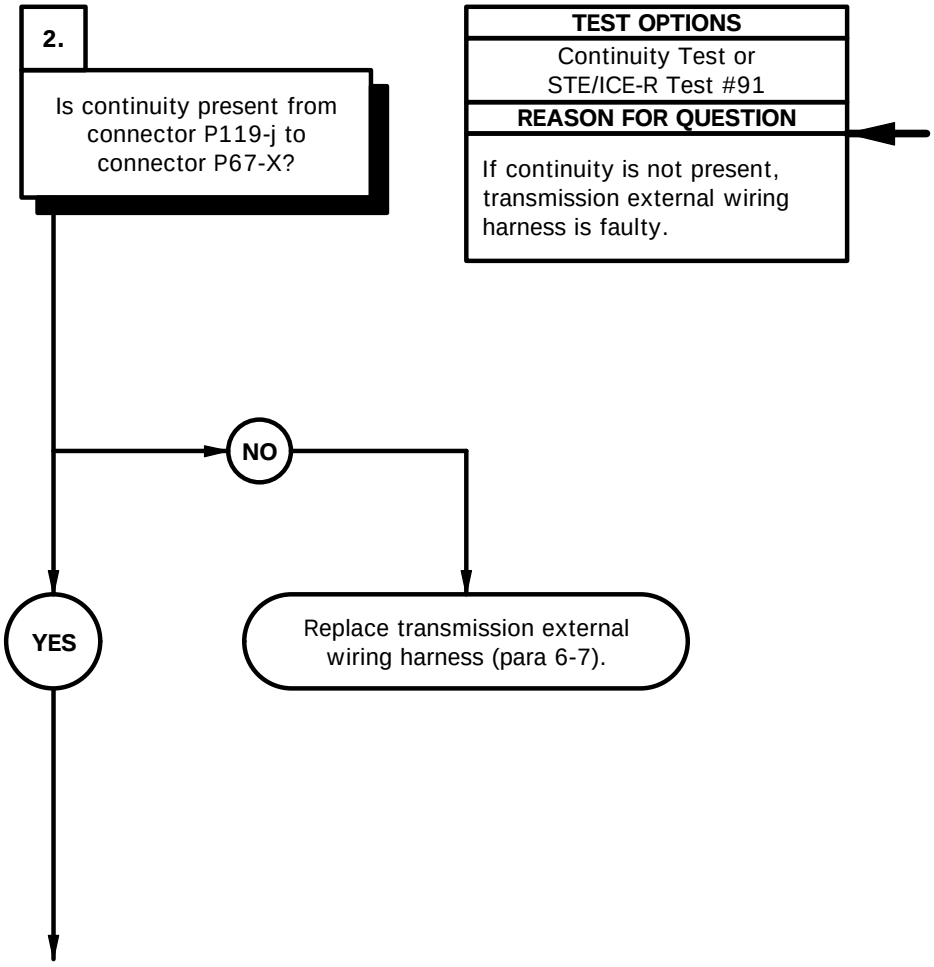
c54. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO

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

POSSIBLE PROBLEMS

Faulty transmission external wiring harness.
Faulty transmission adapter cable assembly.
Faulty transmission internal wiring harness.
Faulty C3 pressure switch.



TEST OPTIONS

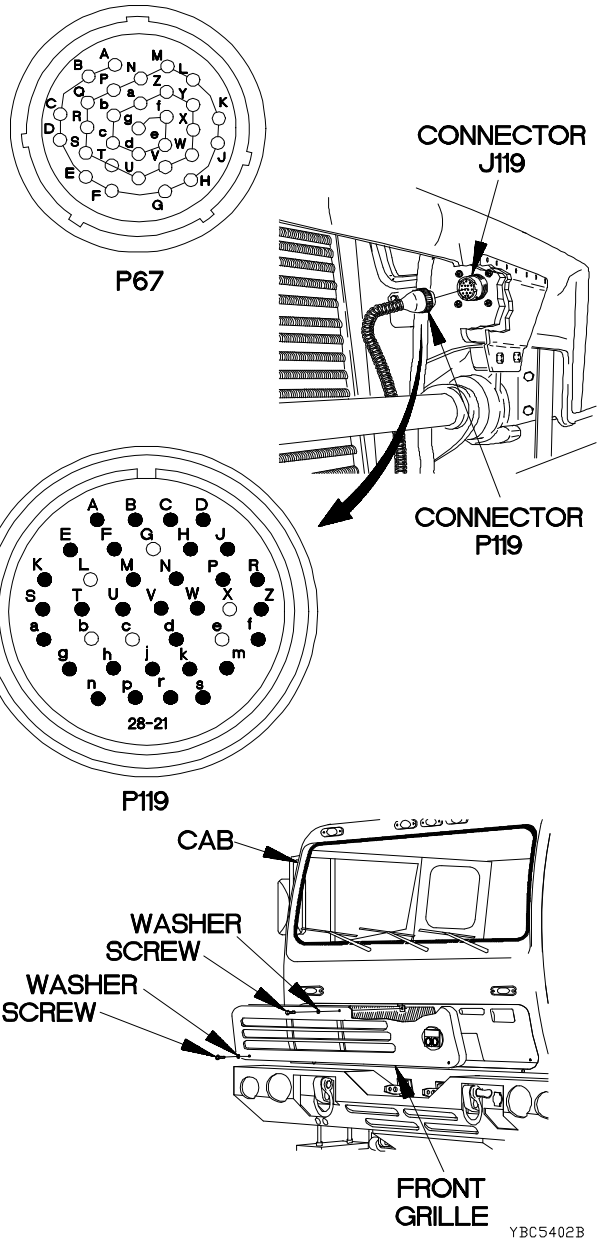
Continuity Test or
STE/ICE-R Test #91

REASON FOR QUESTION

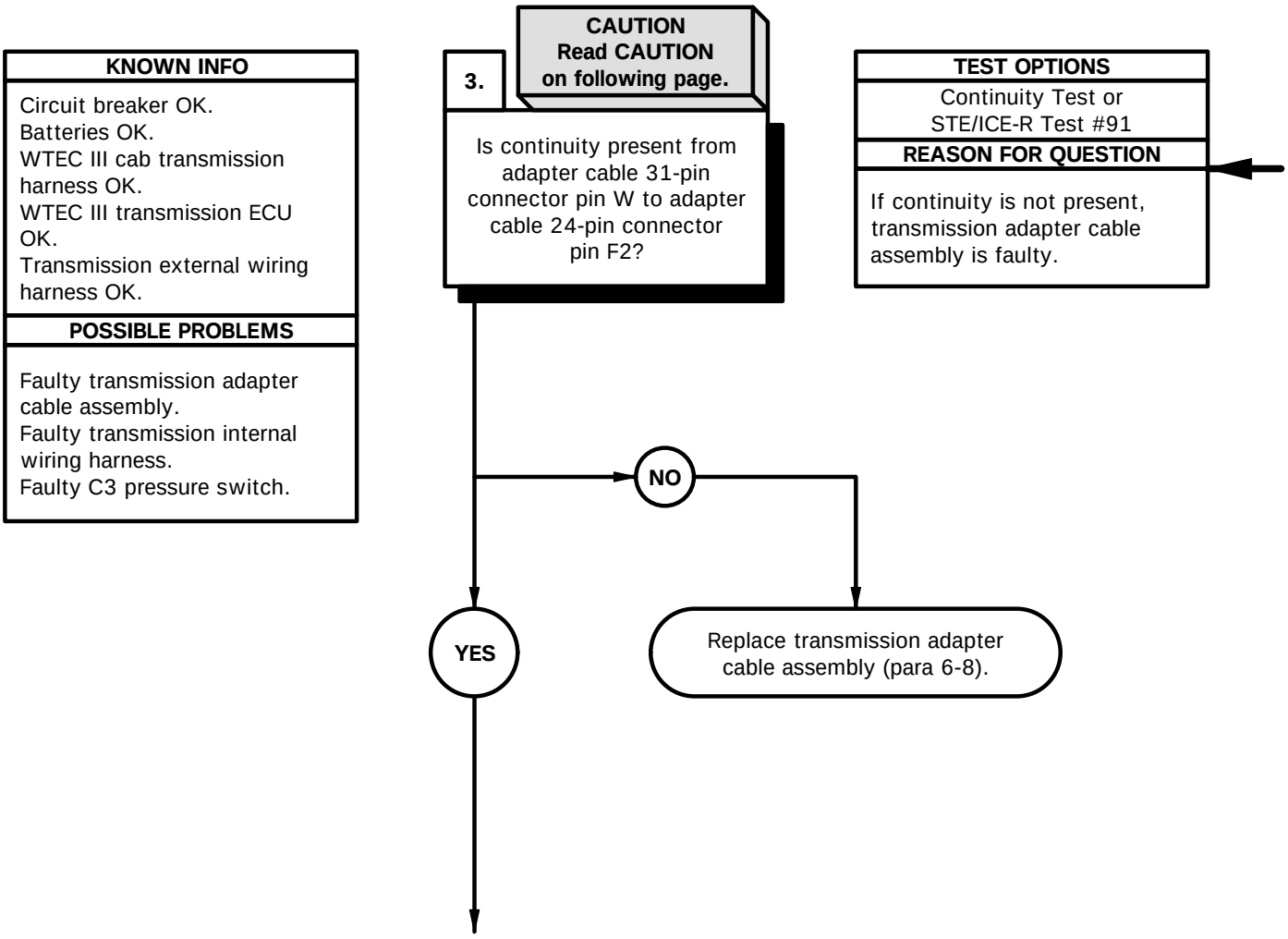
If continuity is not present, transmission external wiring harness is faulty.

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P119-j.
(3) Connect negative (-) probe of multimeter to connector P67-X and note reading on multimeter.
(4) If continuity is not present, replace transmission external wiring harness (para 6-7).
(5) Connect positive (+) probe of multimeter to connector P119-j.
(6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
(7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
(9) Connect connector P119 to connector J119.
(10) Position front grille on cab with washer and screw.
(11) Position two washers and screws in front grille.
(12) Tighten screw to 48-60 lb-in. (5-7 N·m).
(13) Tighten two screws to 24 lb-in. (3 N·m).



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

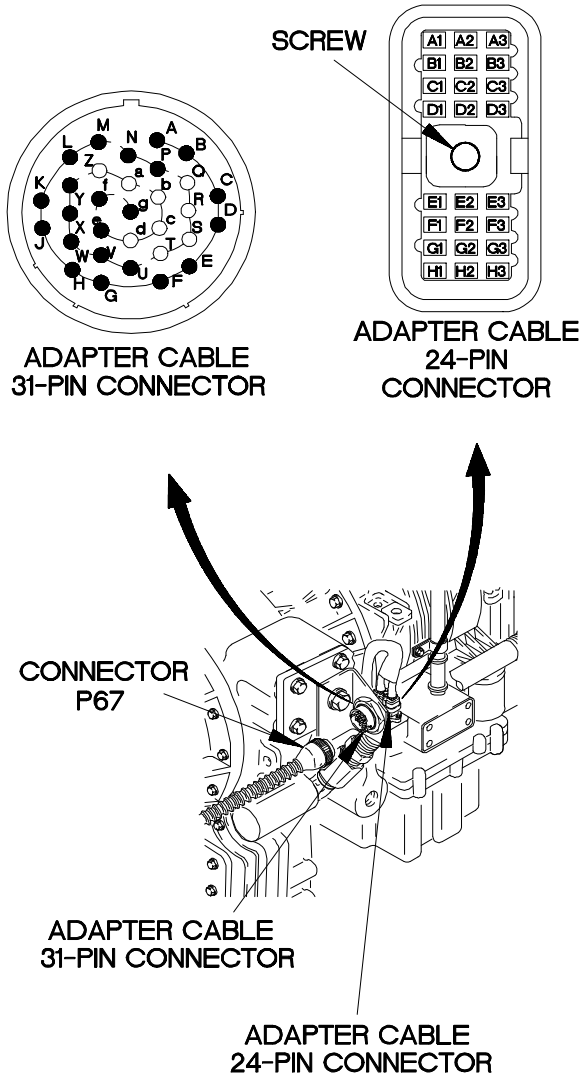


CAUTION

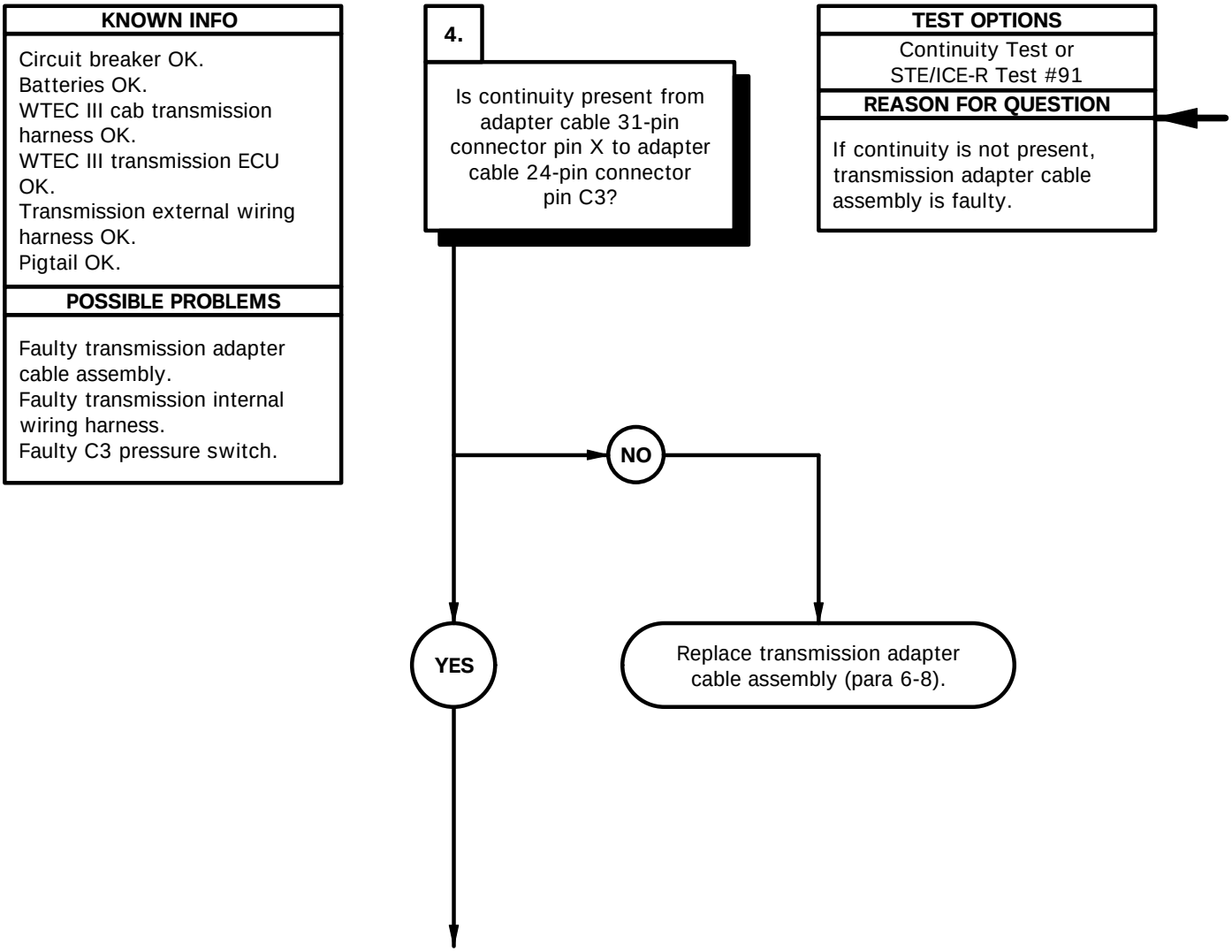
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

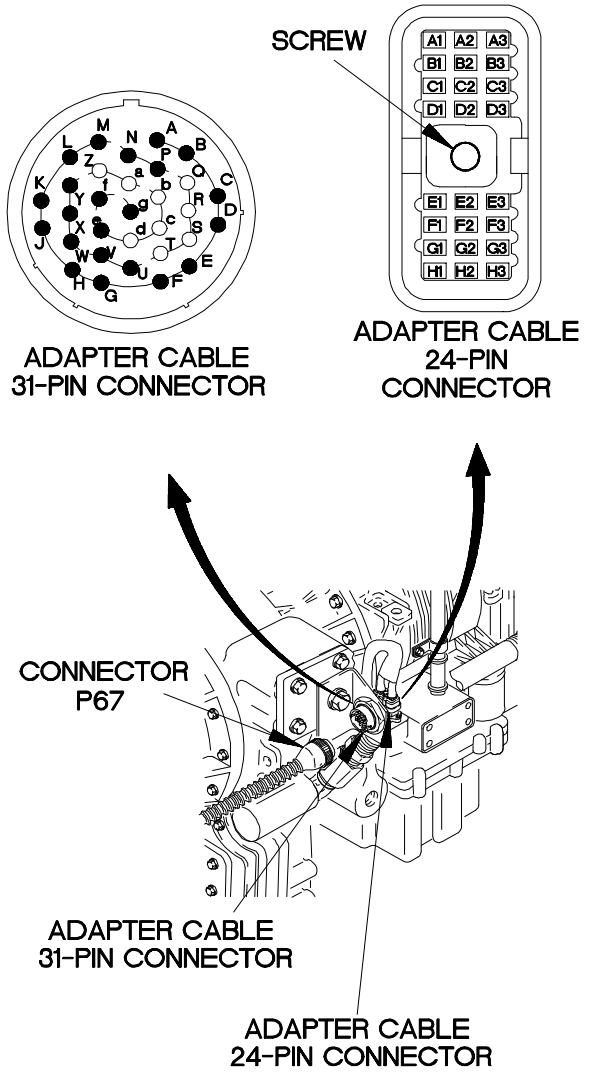


c54. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



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).



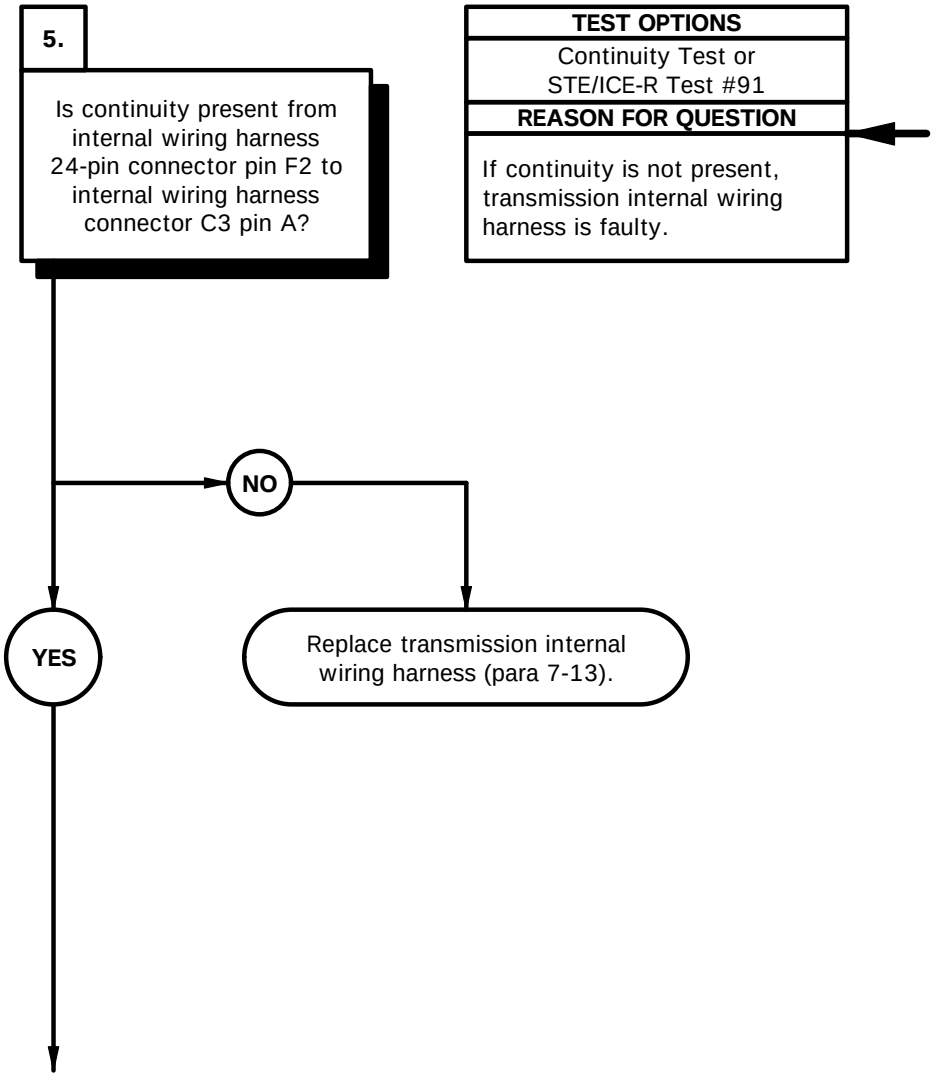
c54. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO

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

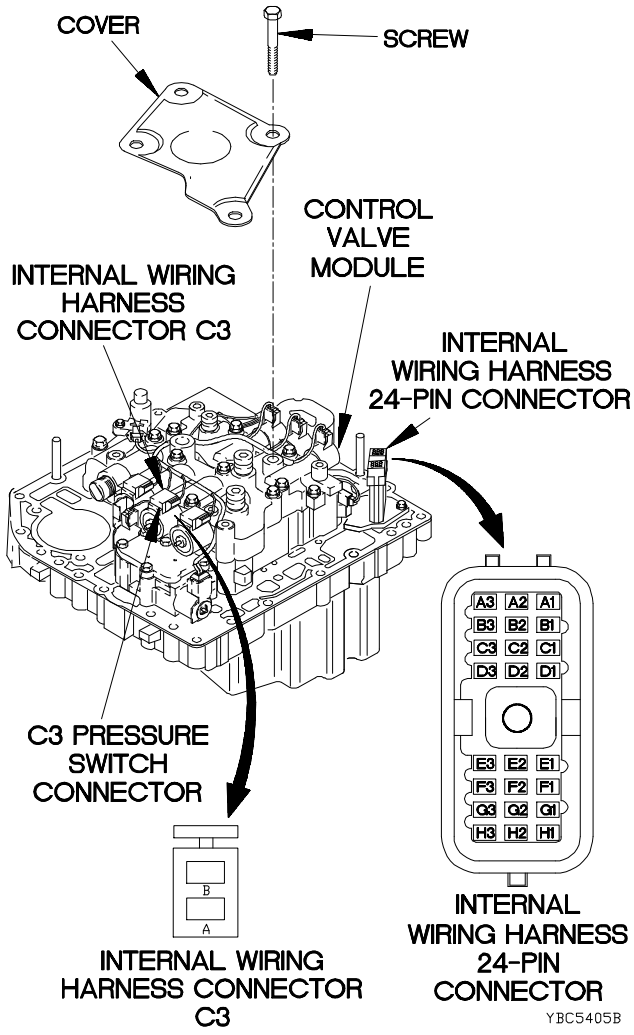
POSSIBLE PROBLEMS

Faulty transmission internal wiring harness.
Faulty C3 pressure switch.

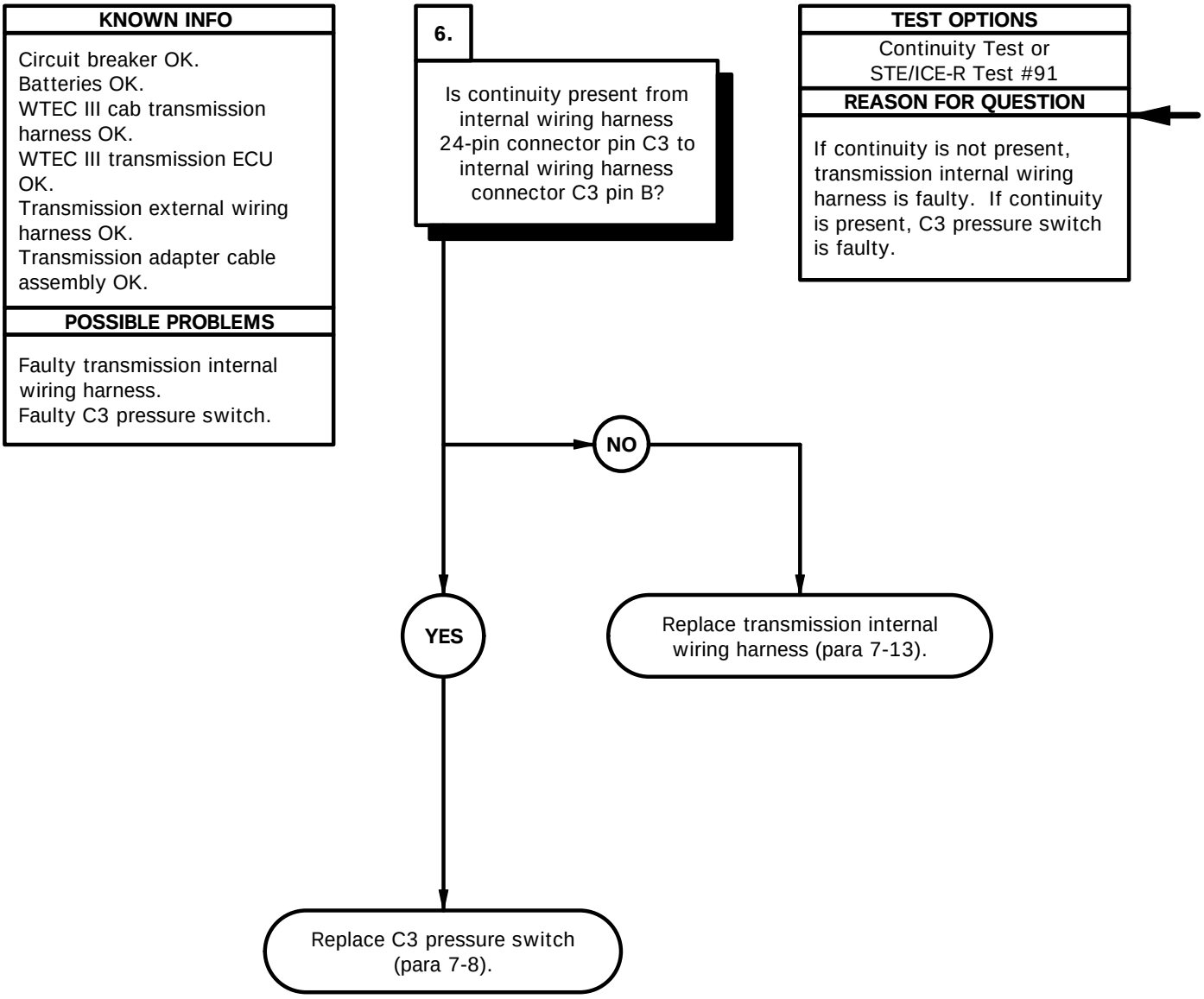


CONTINUITY TEST

(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).

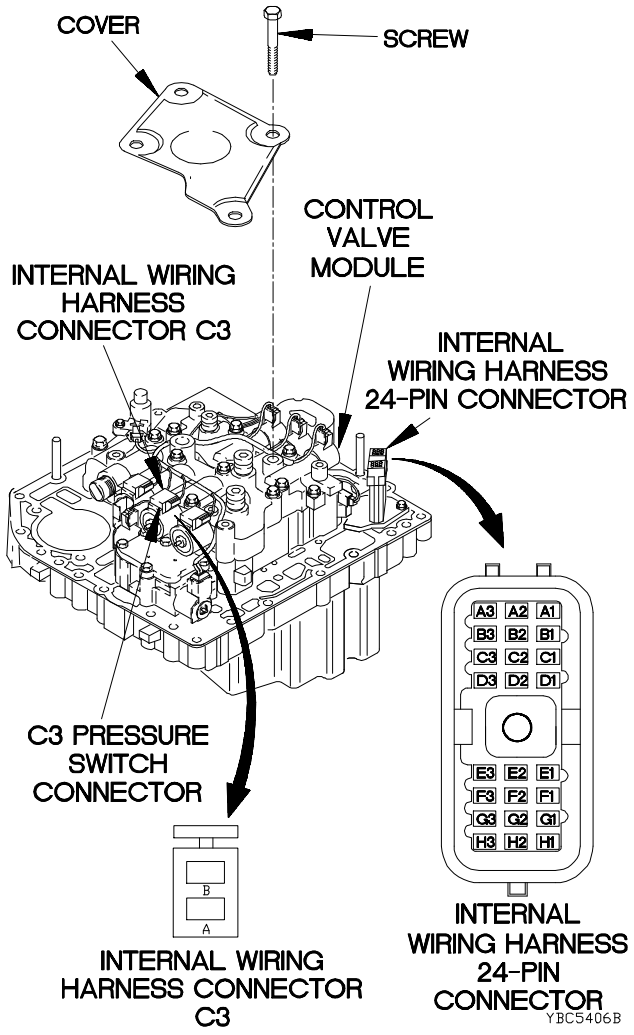


c54. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



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 9-2320-365-20-3).



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

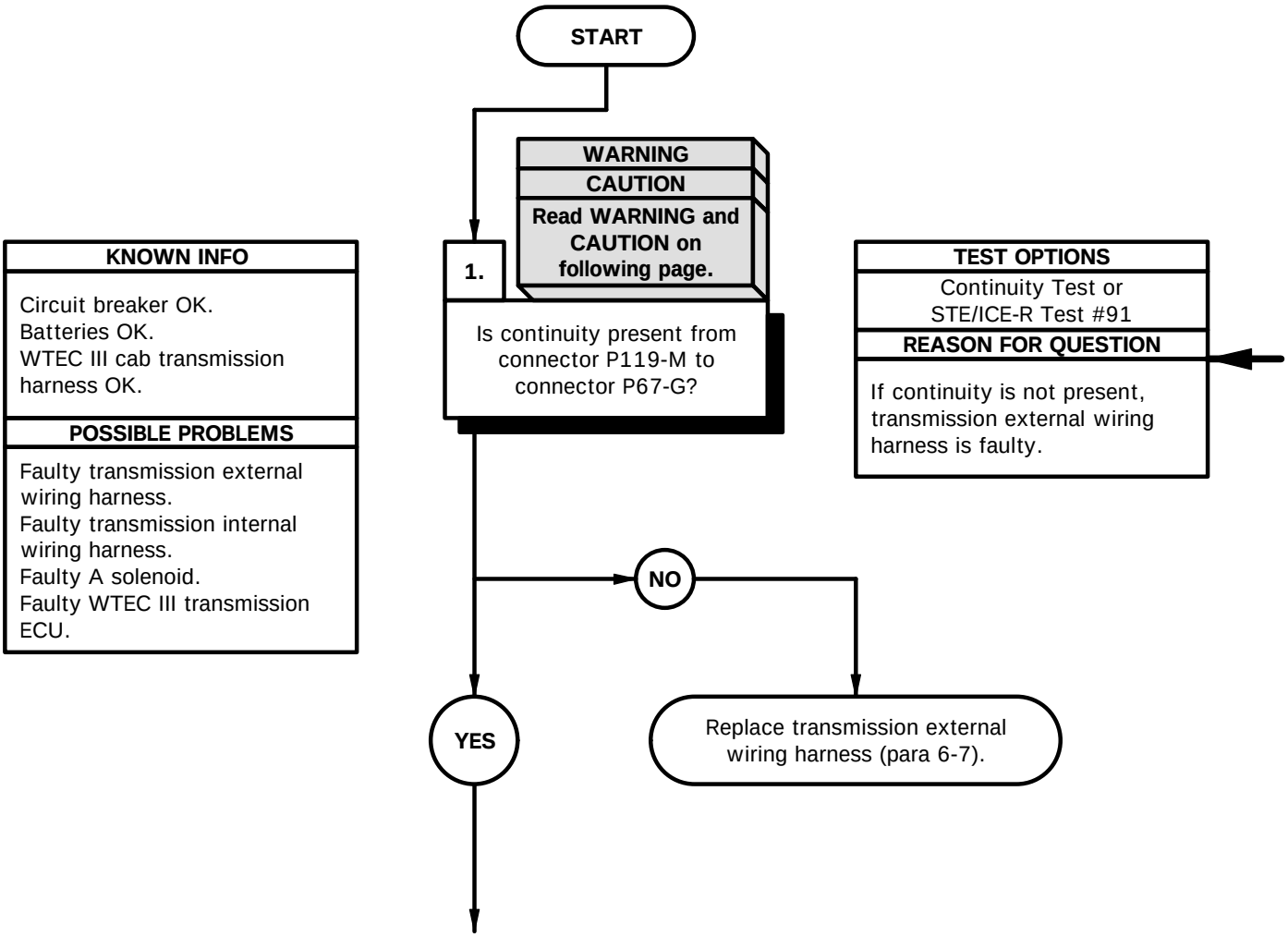
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

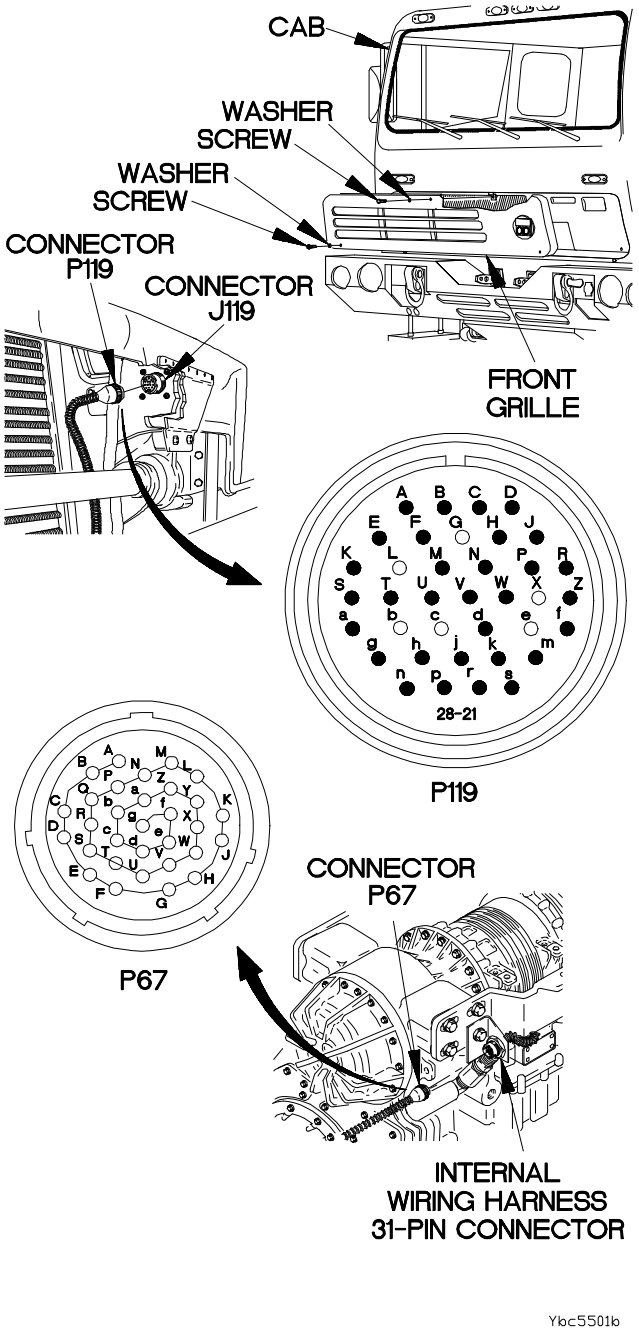
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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.

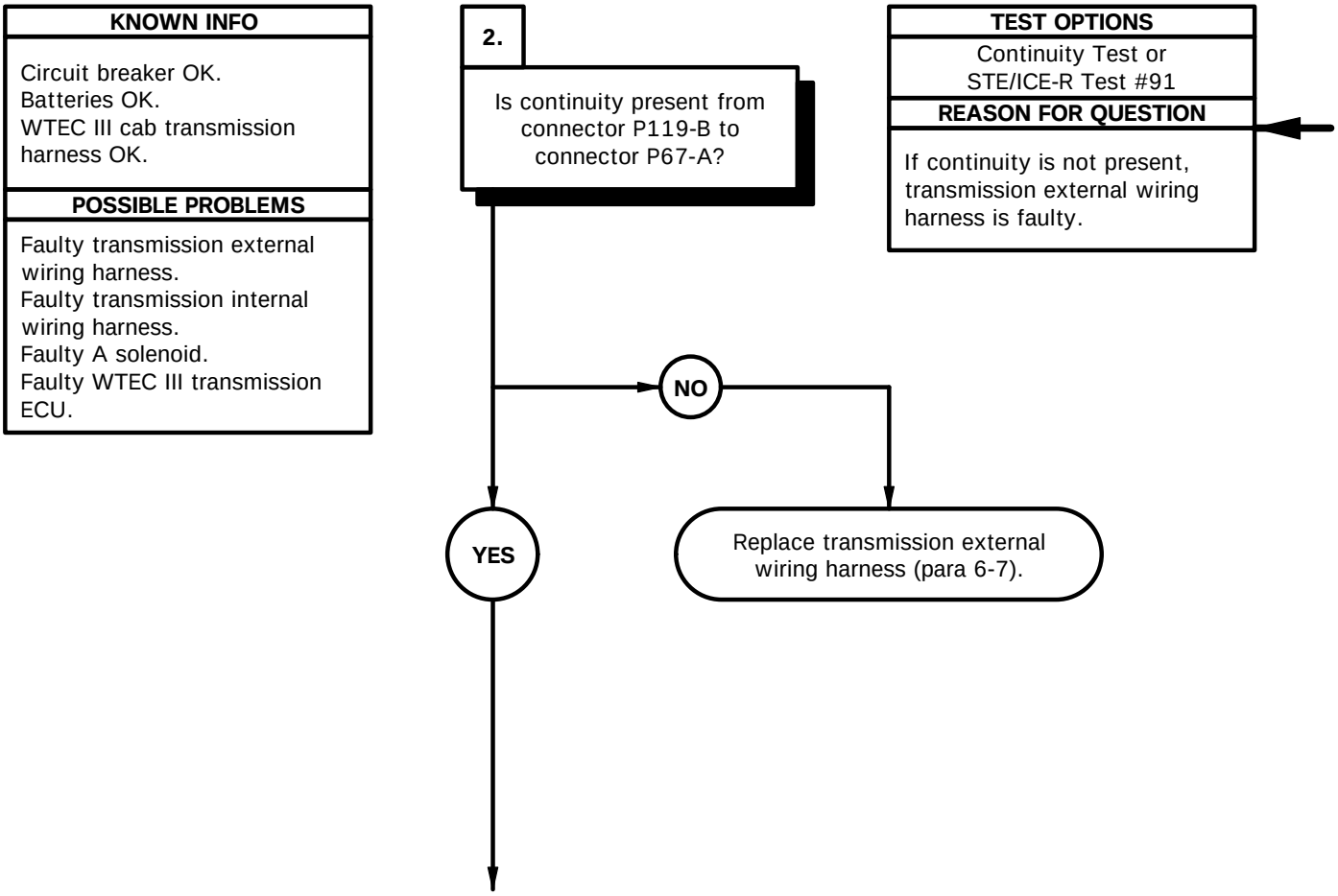
CONTINUITY TEST (Cont)

(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).



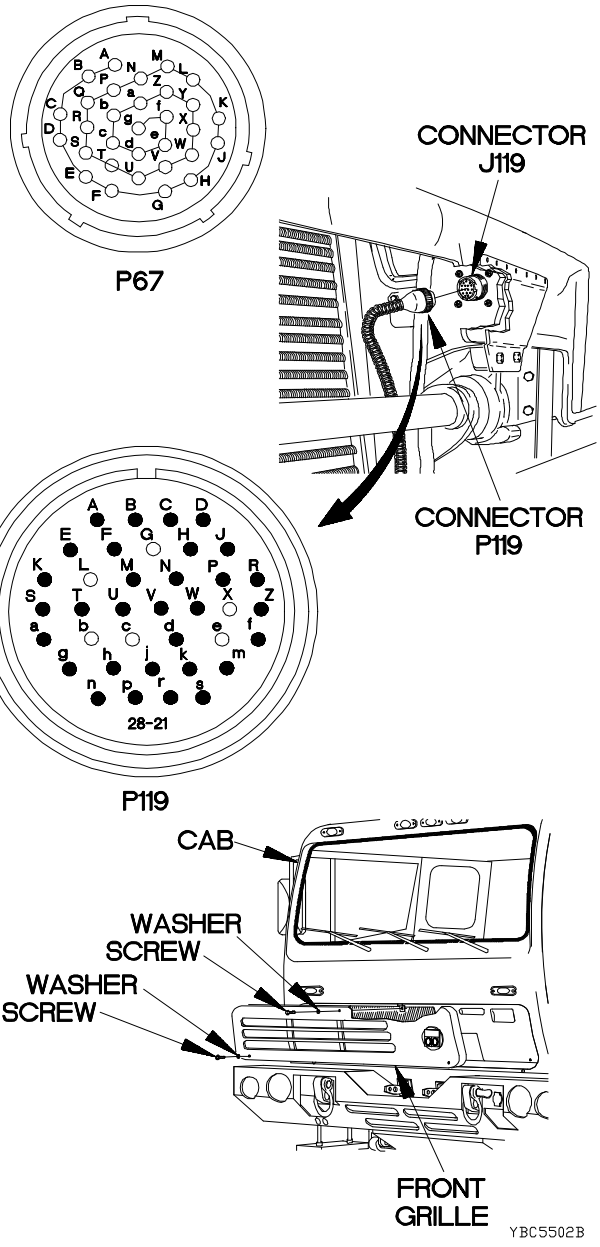
Ybc5501b

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)

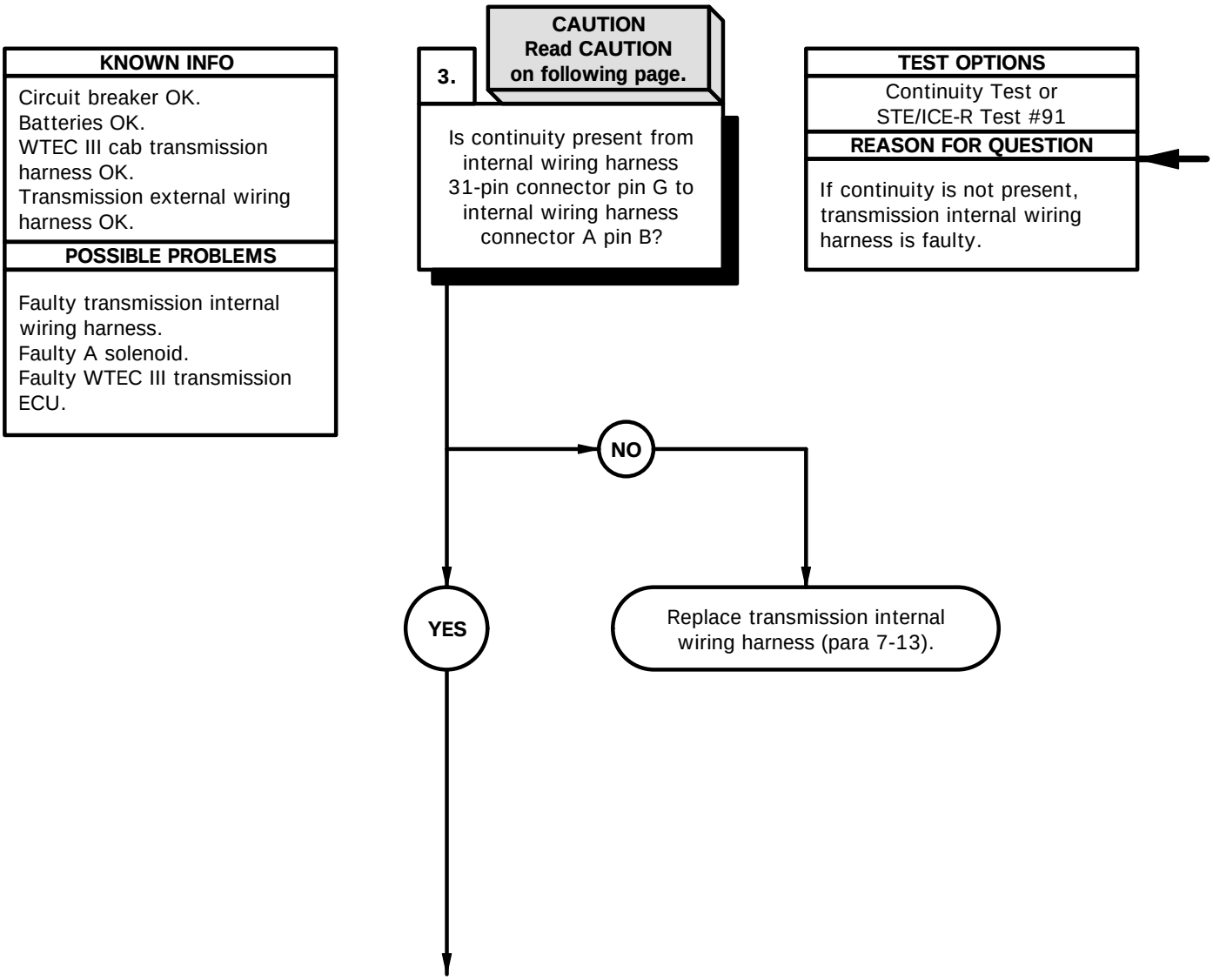


CONTINUITY TEST

(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)

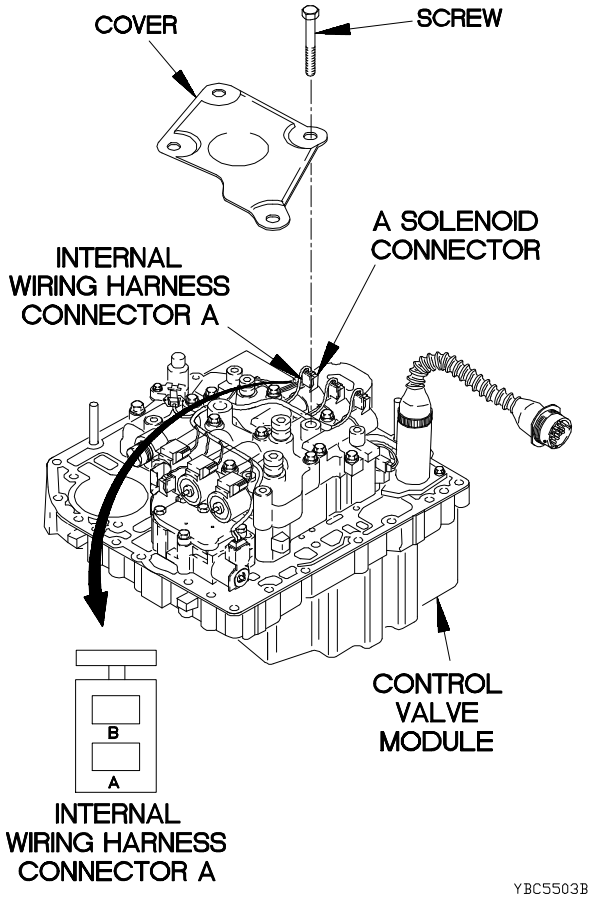


CAUTION

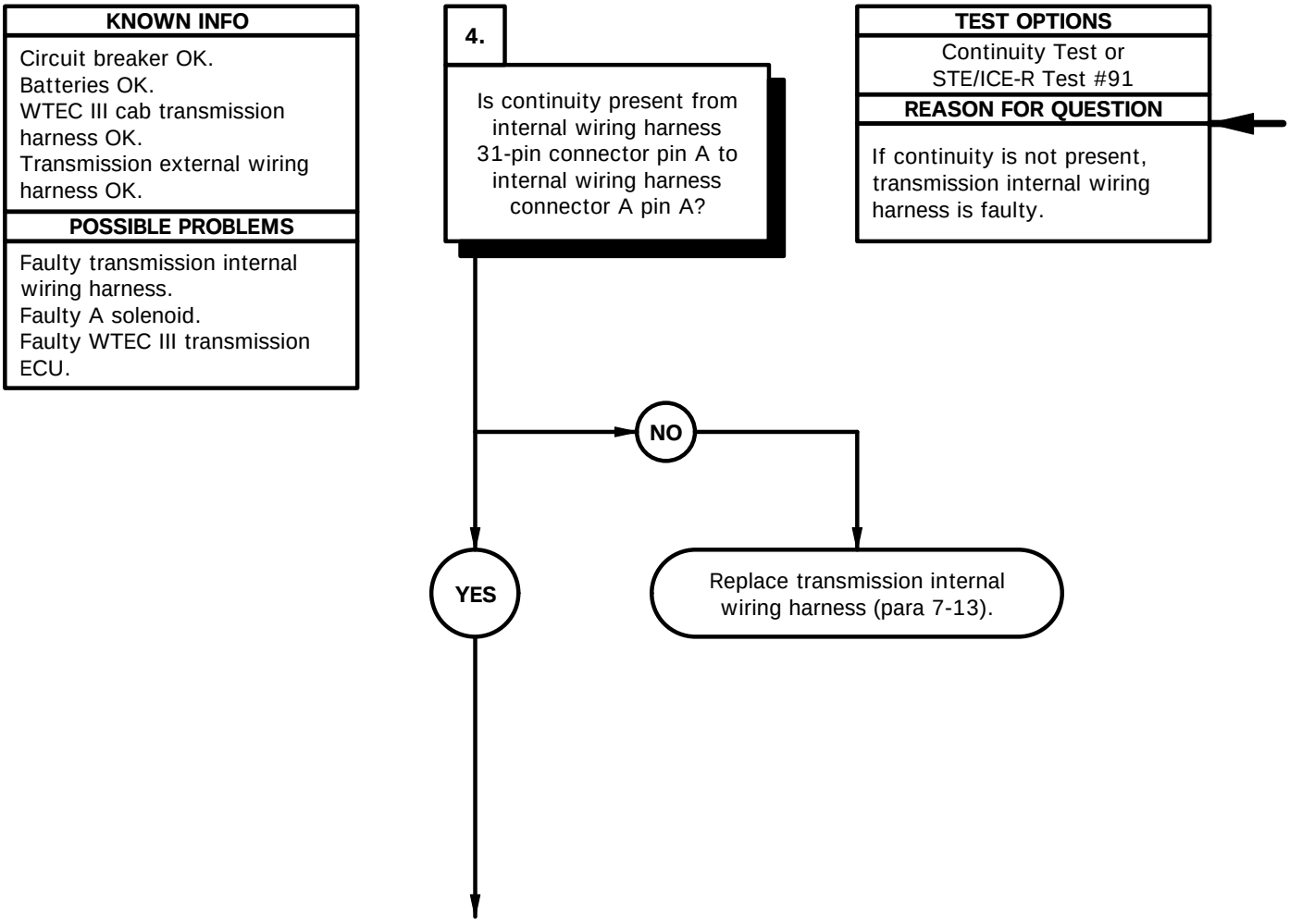
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

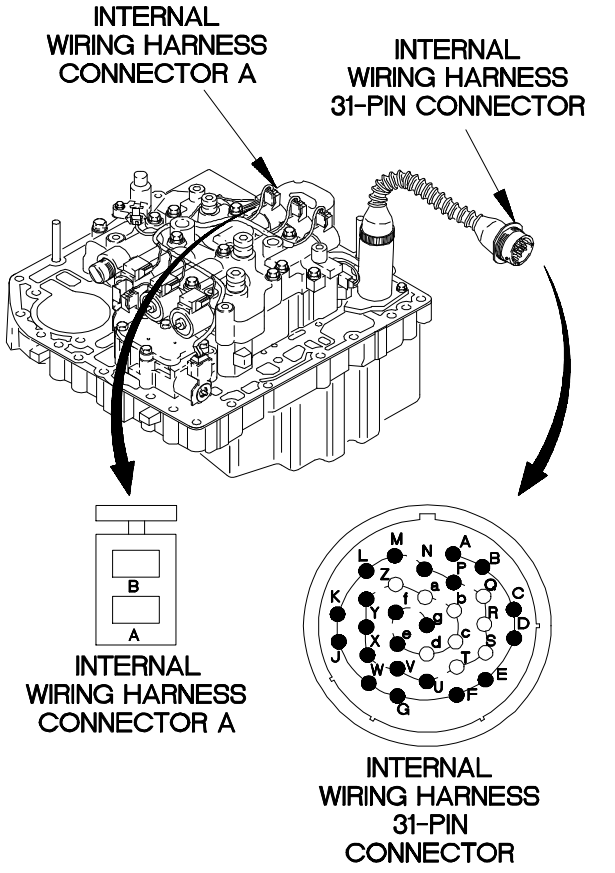


c55. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 12 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

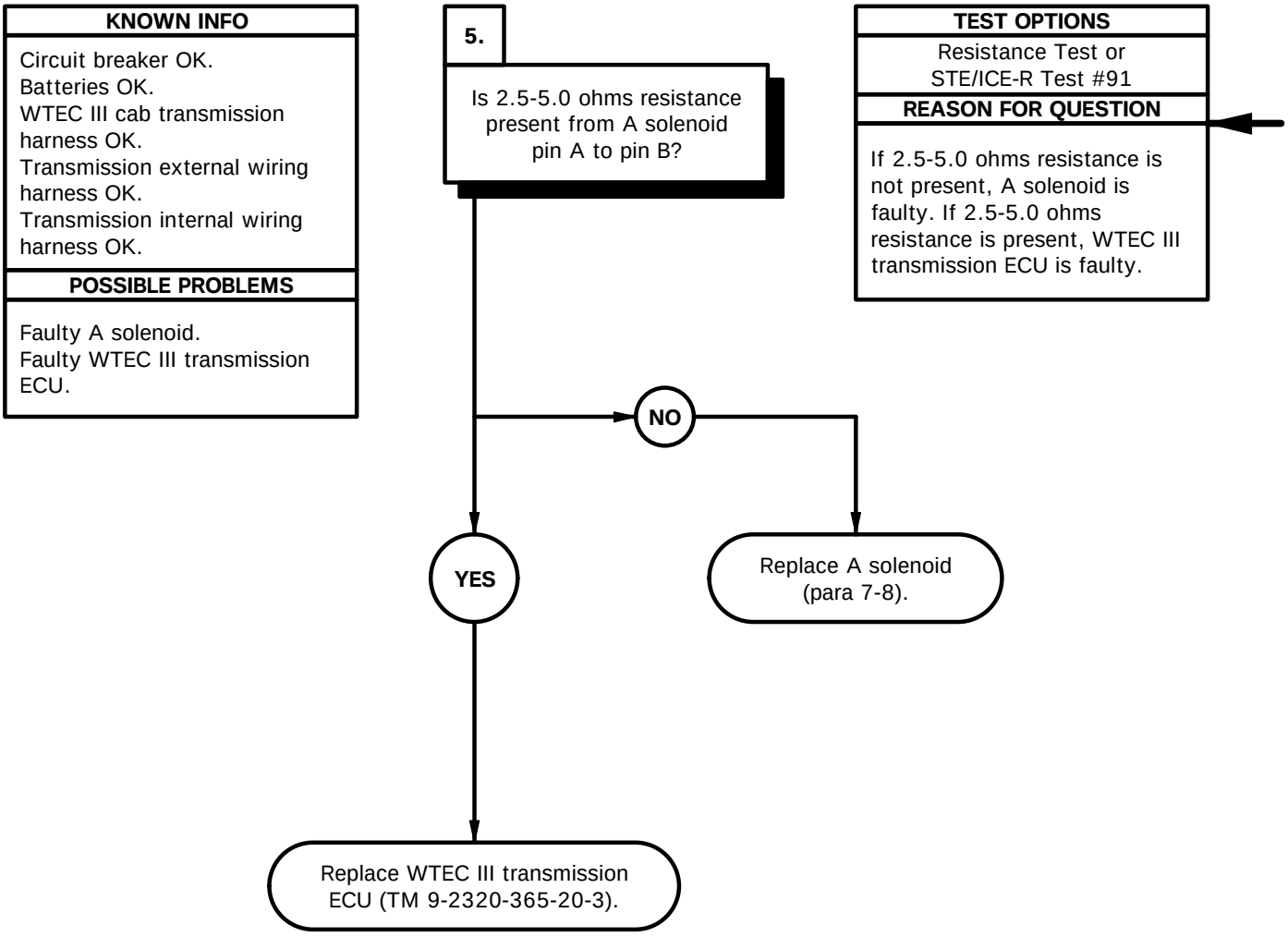


CONTINUITY TEST

(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).

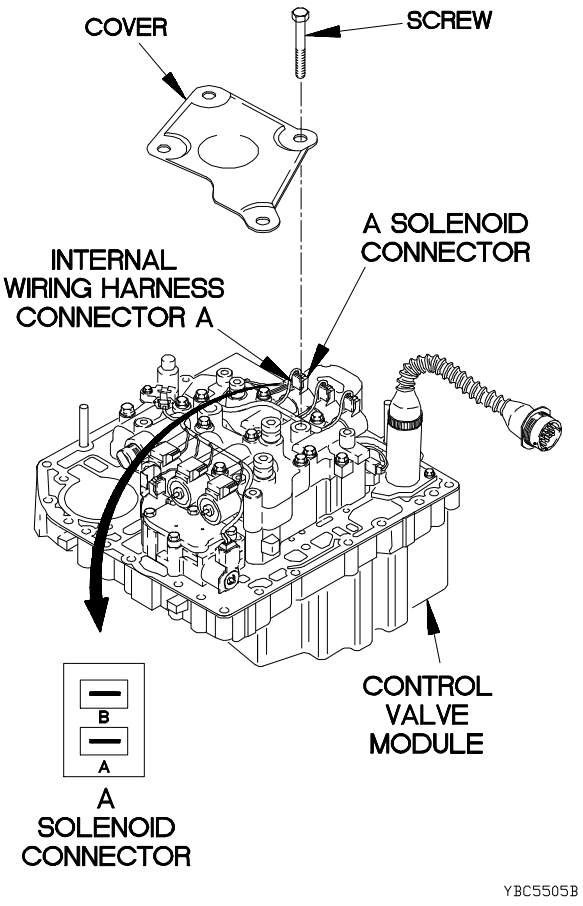


c55. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 12 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)

Materials/Parts
Wire, Elect, 50 ft (Item 94, Appendix C)

Personnel Required
(2)

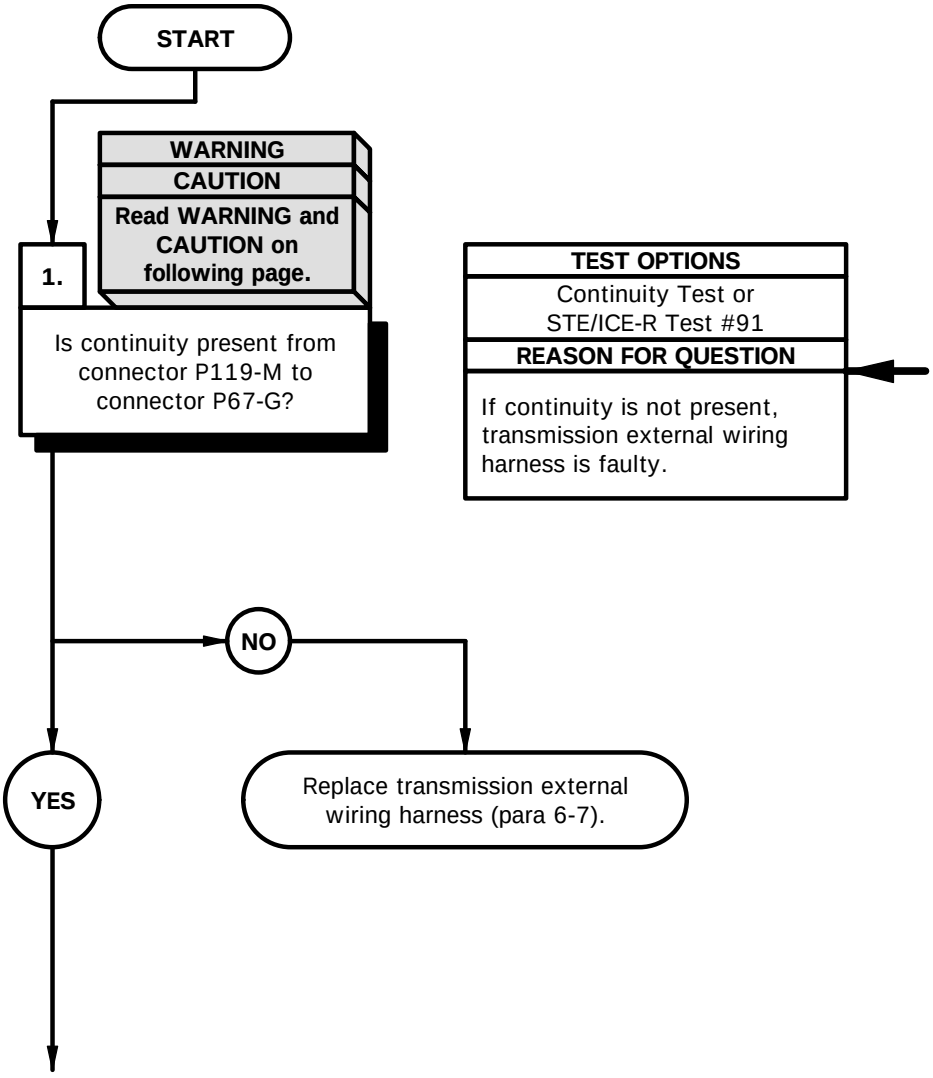
References
TM 9-4910-571-12&P

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

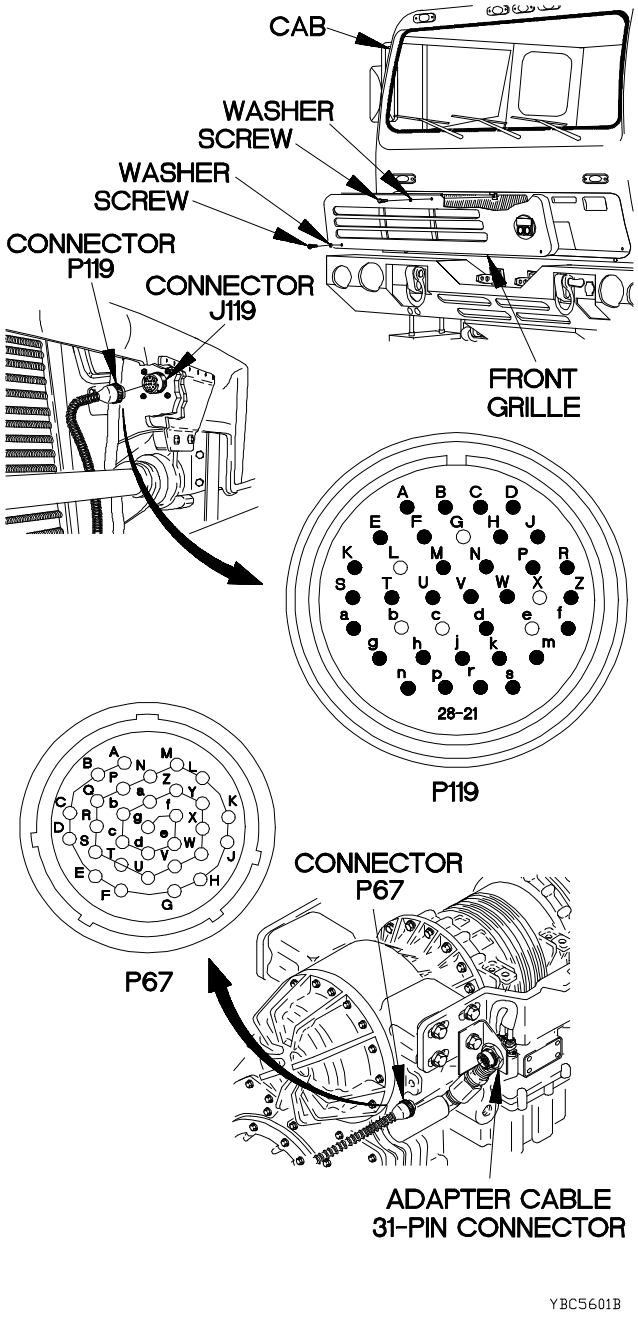
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



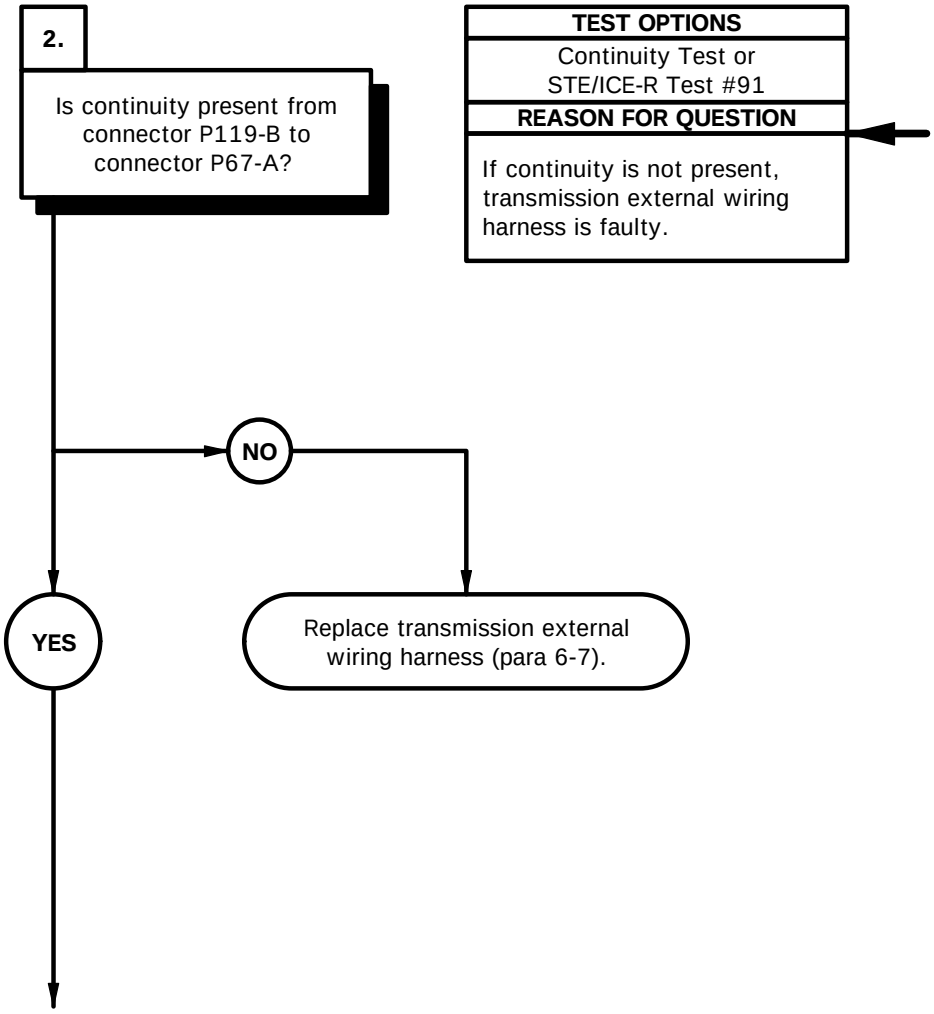
c56. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO

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

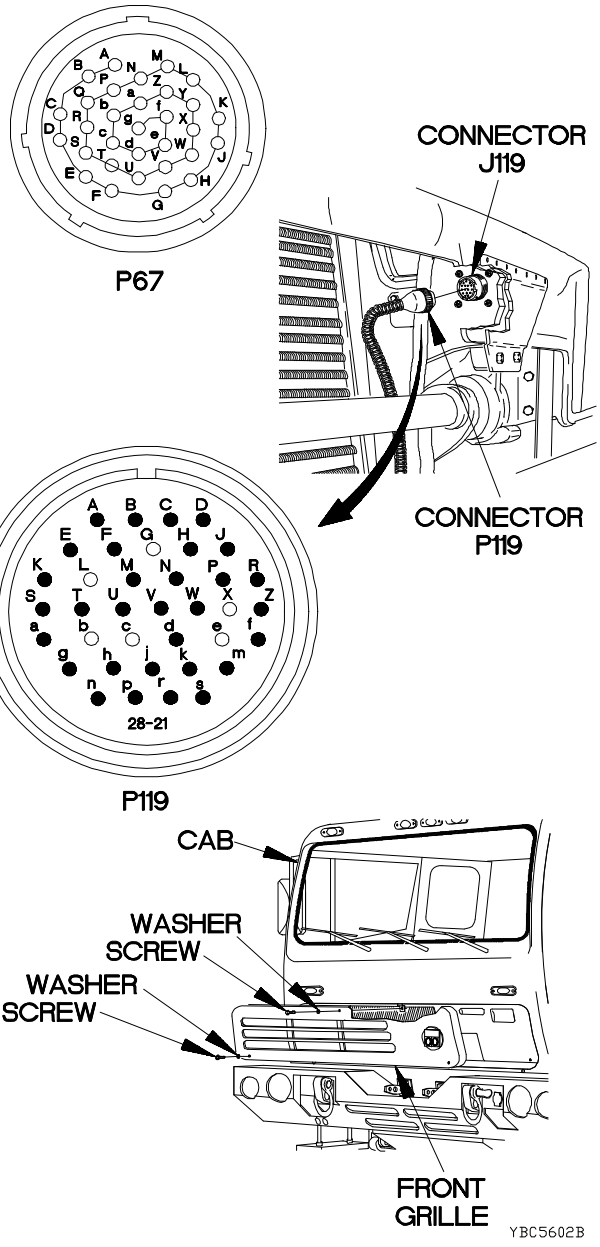
POSSIBLE PROBLEMS

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

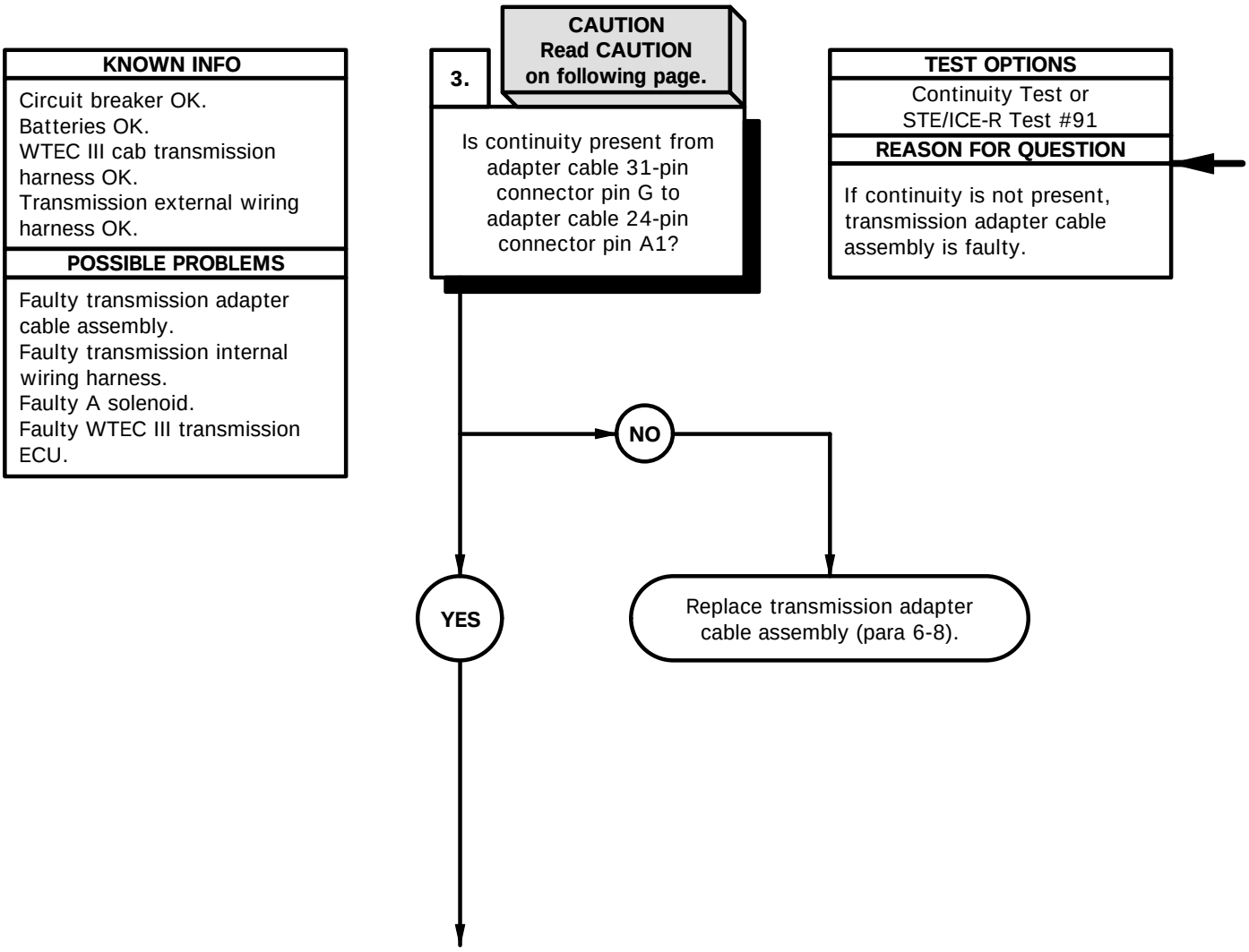


CONTINUITY TEST

(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)

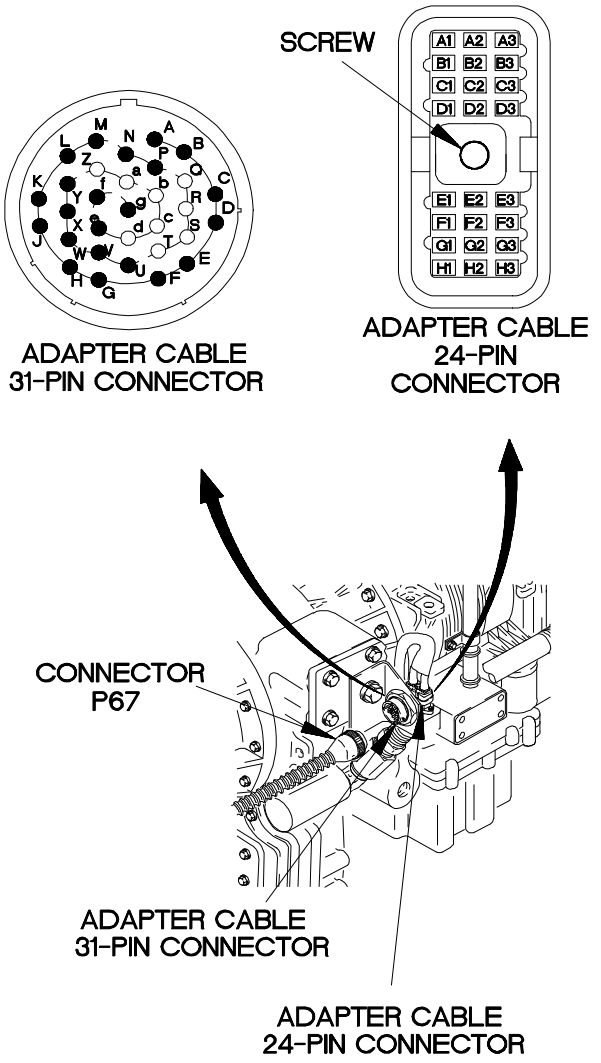


CAUTION

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).



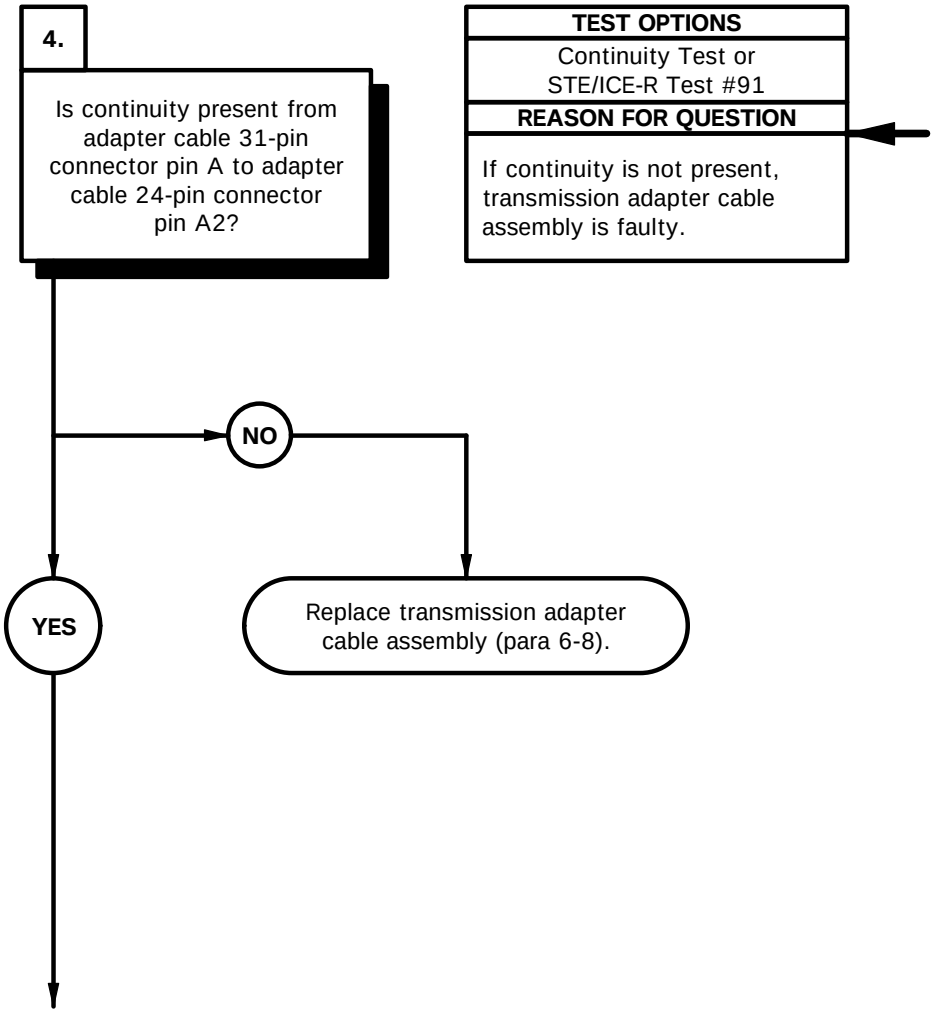
c56. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO

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

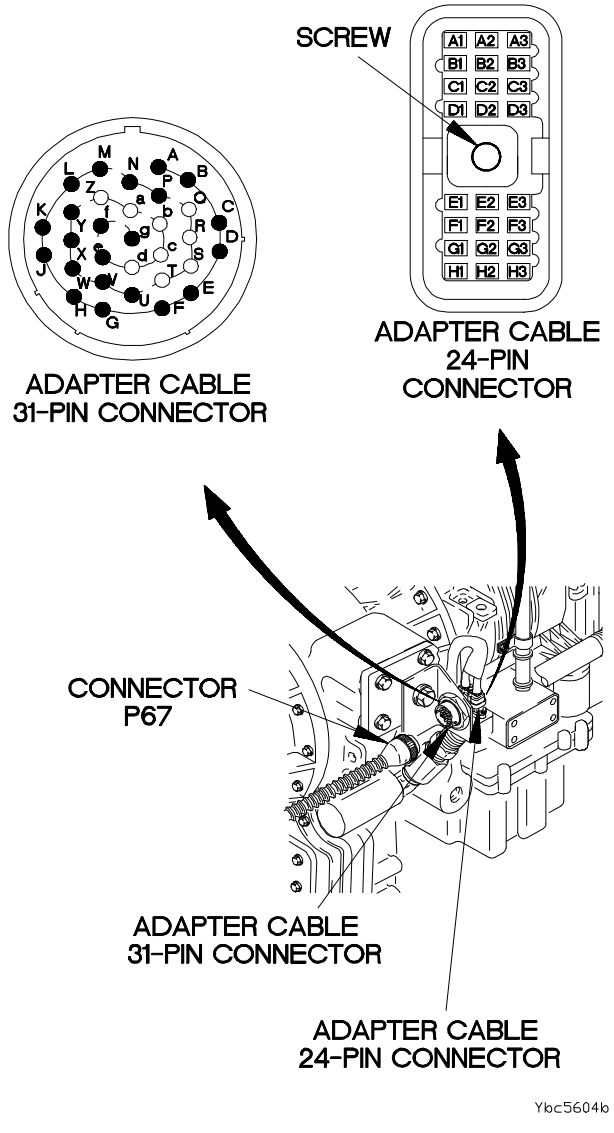
POSSIBLE PROBLEMS

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

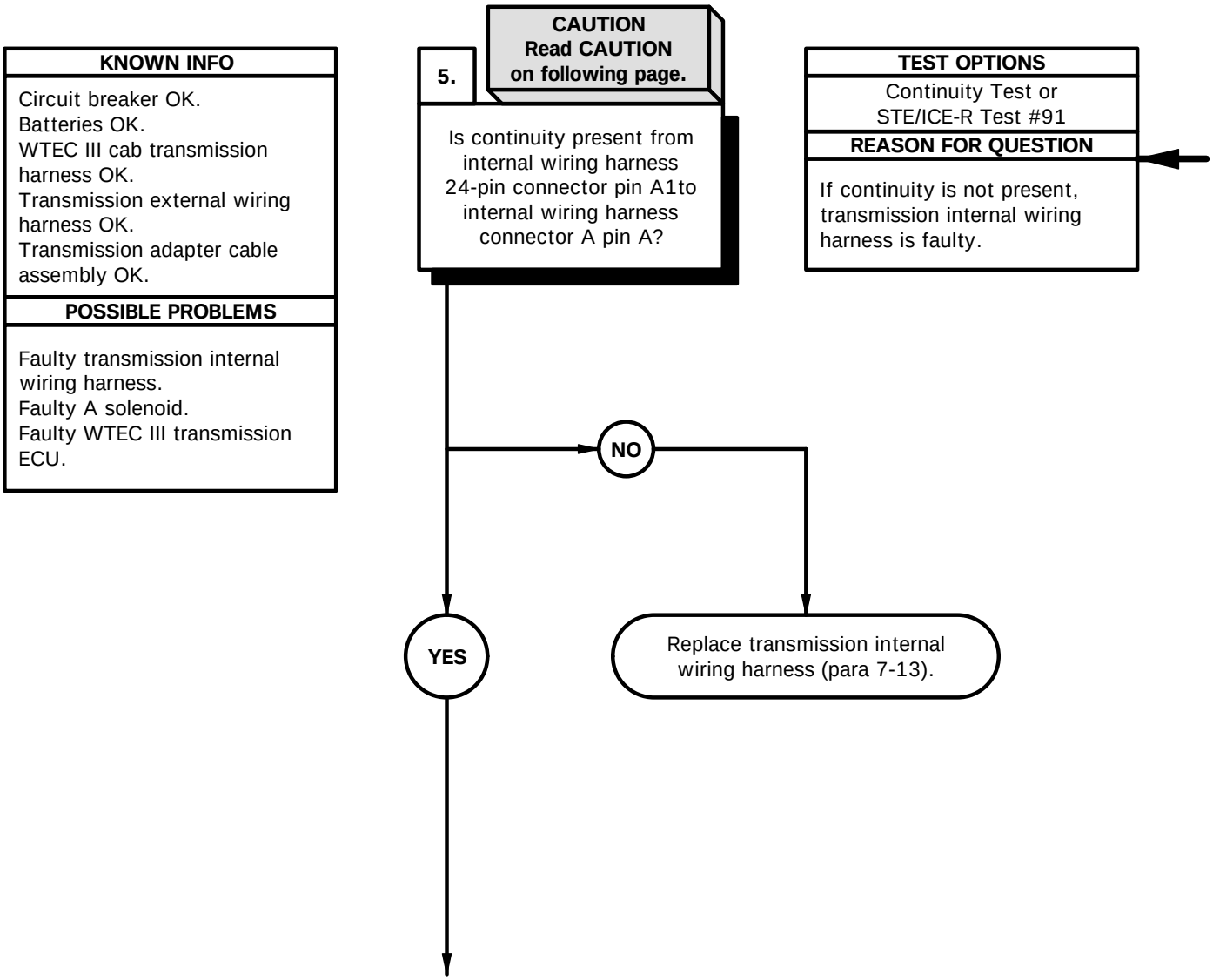


CONTINUITY TEST

(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)

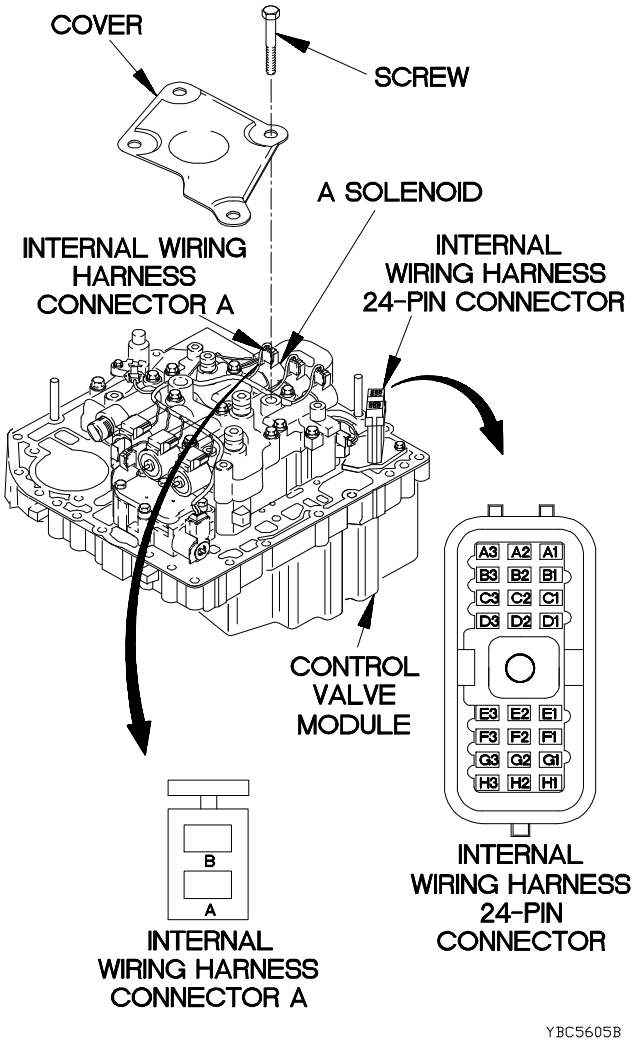


CAUTION

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).



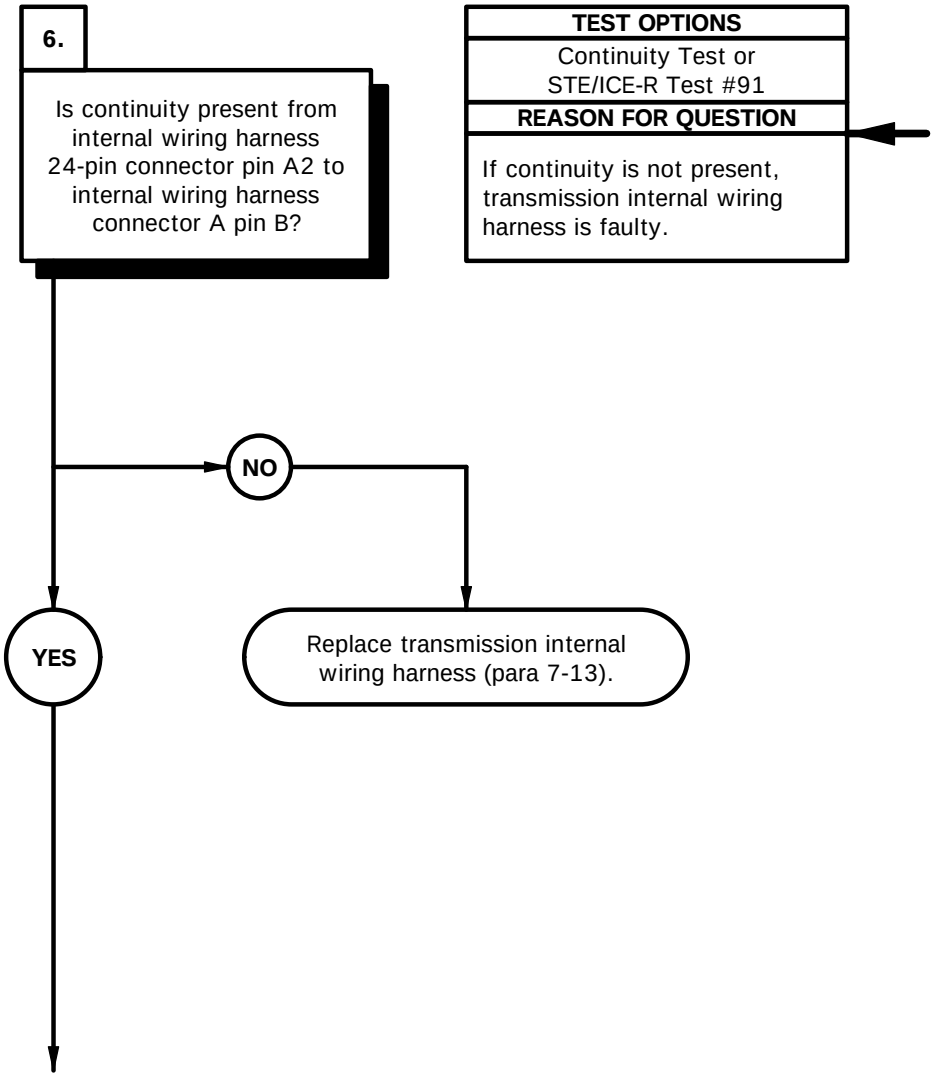
c56. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO

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

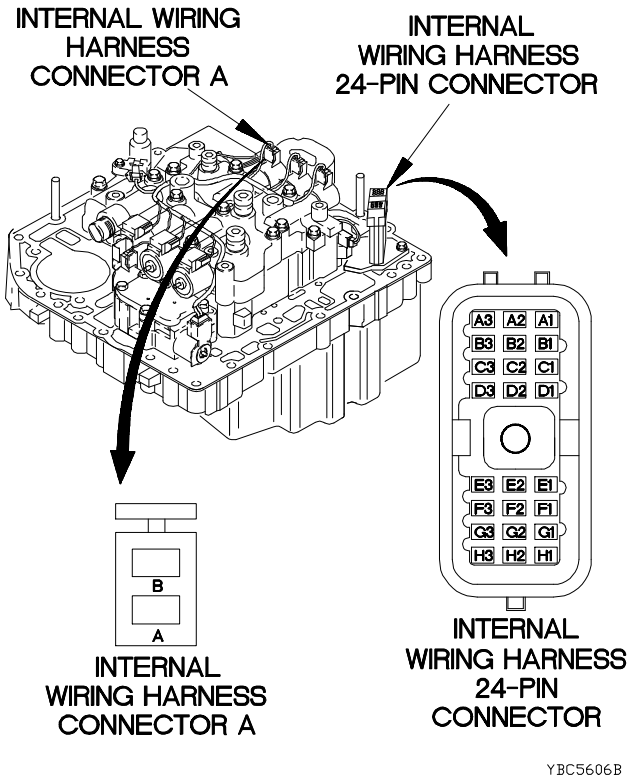
POSSIBLE PROBLEMS

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

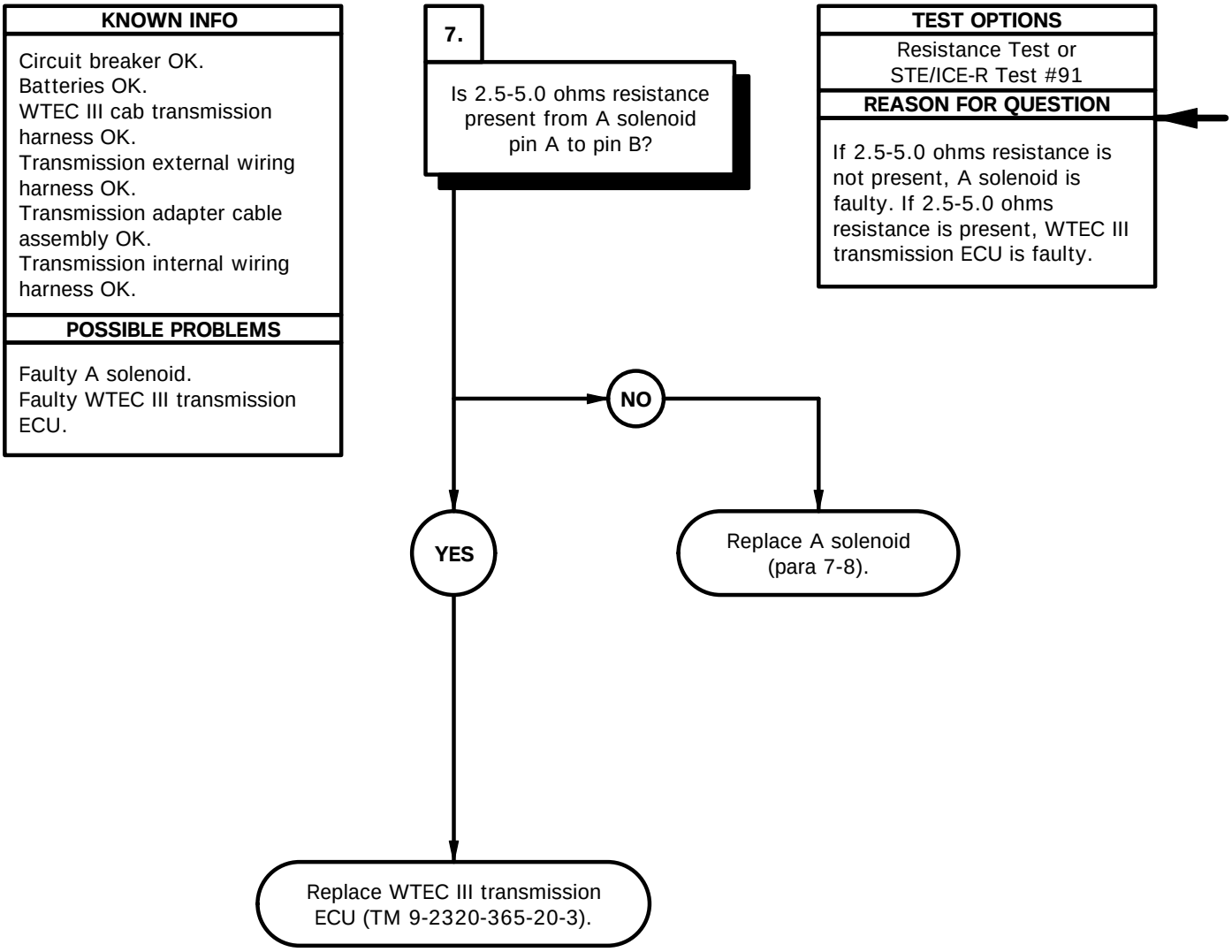


CONTINUITY TEST

(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).

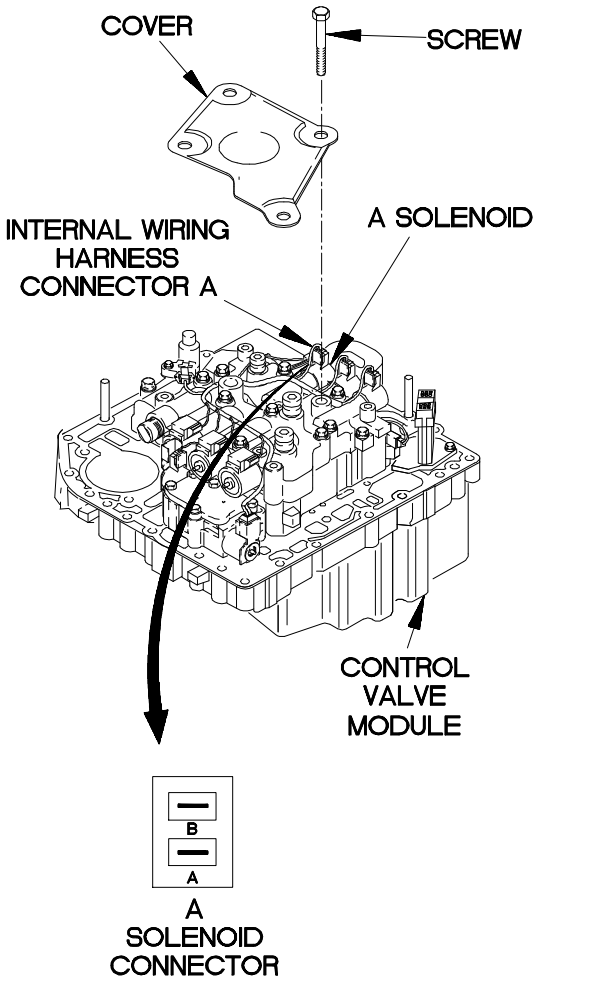


c56. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 12 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

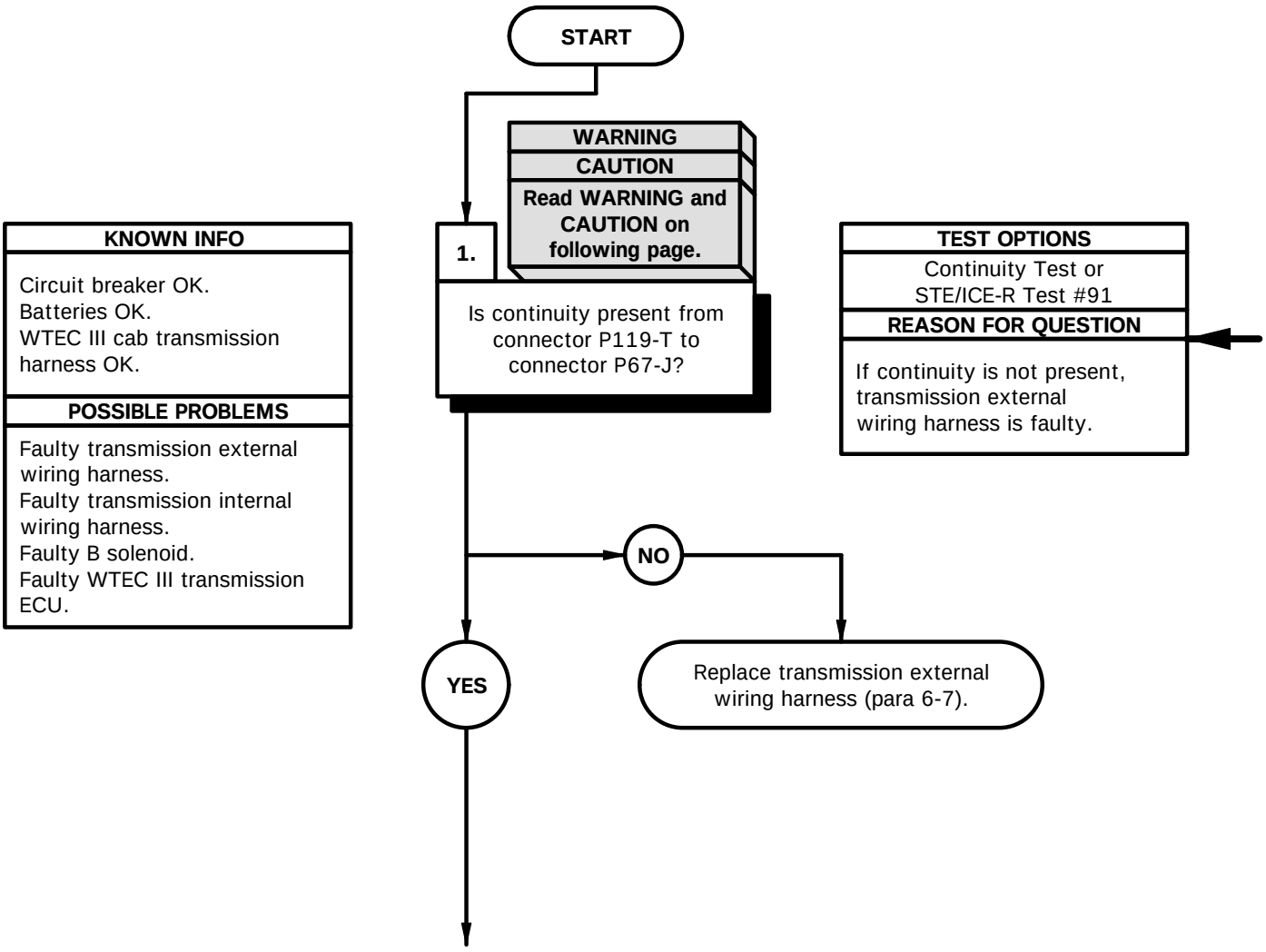
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

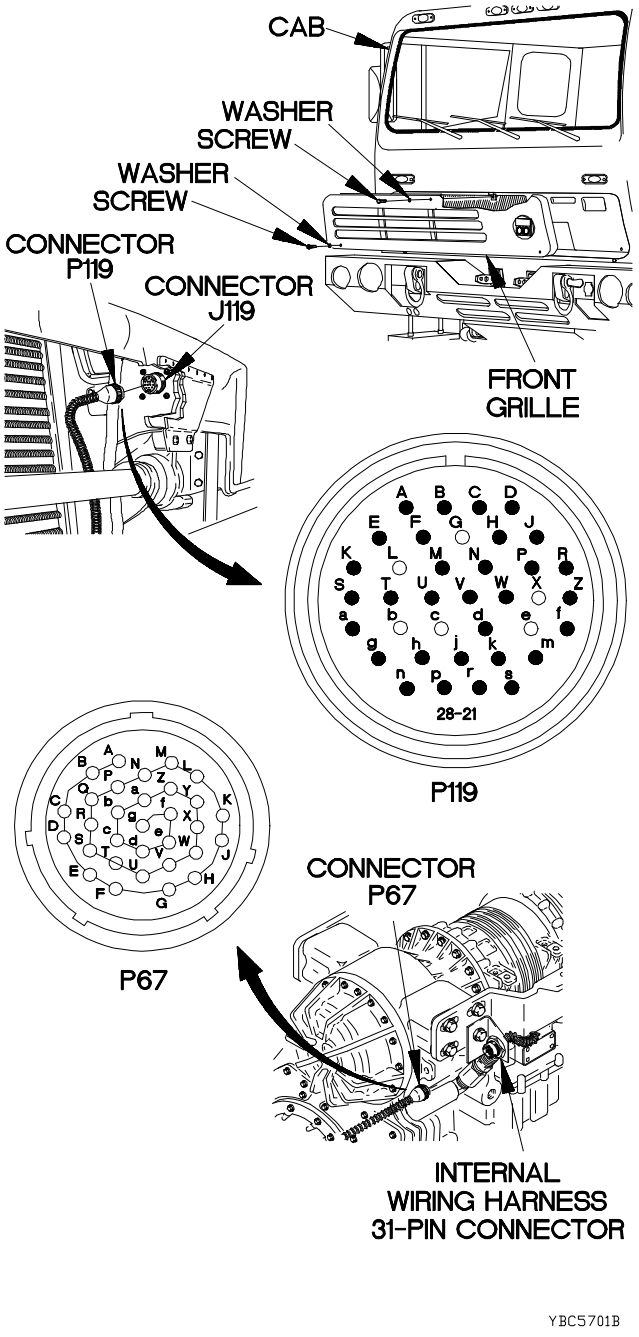
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

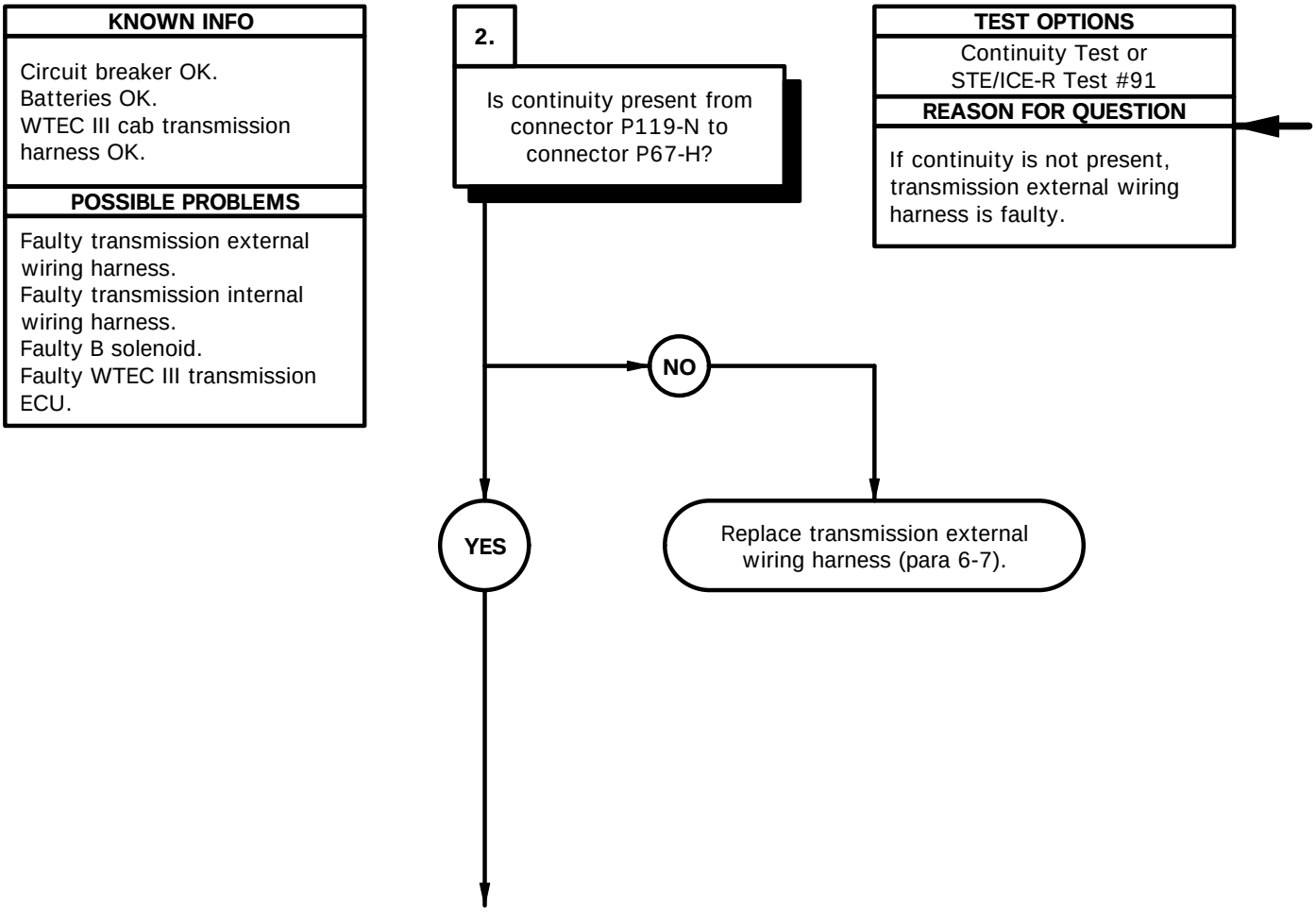
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness connector P67 from internal wiring harness 31-pin connector.
(6) Set multimeter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

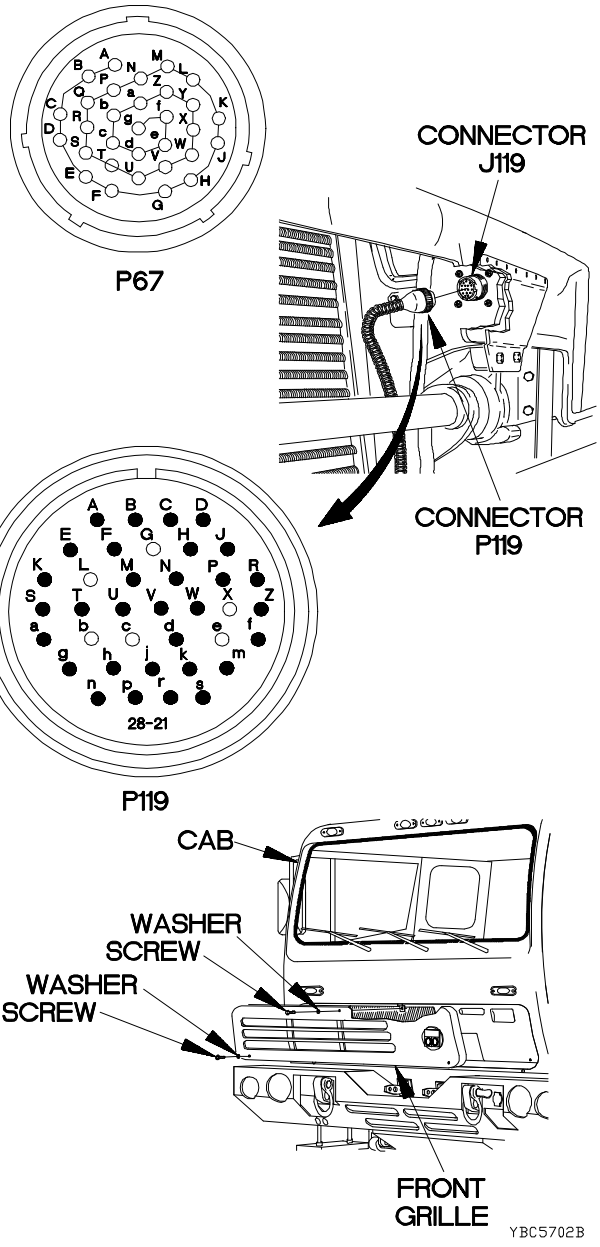


c57. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 13 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

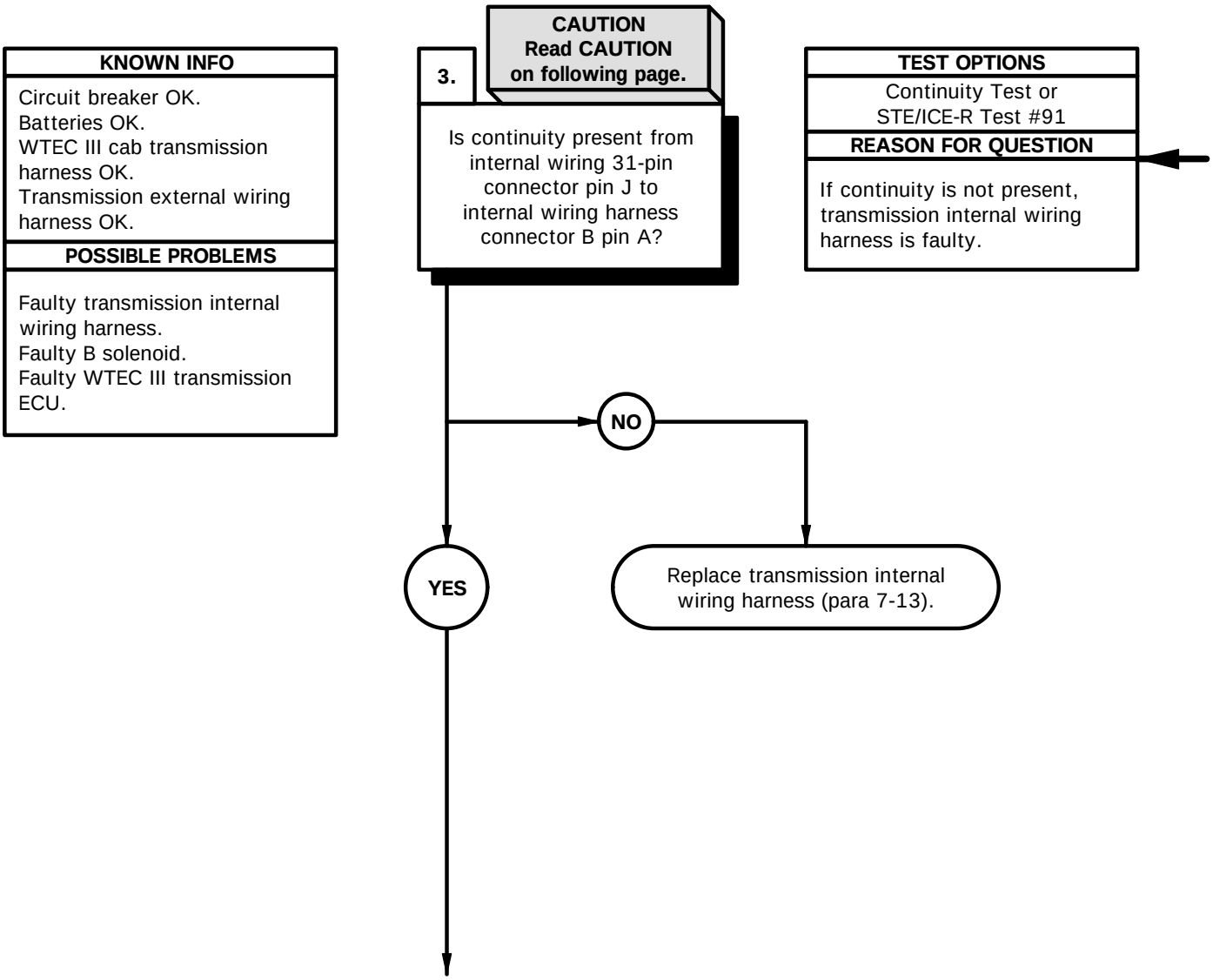


CONTINUITY TEST

(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)

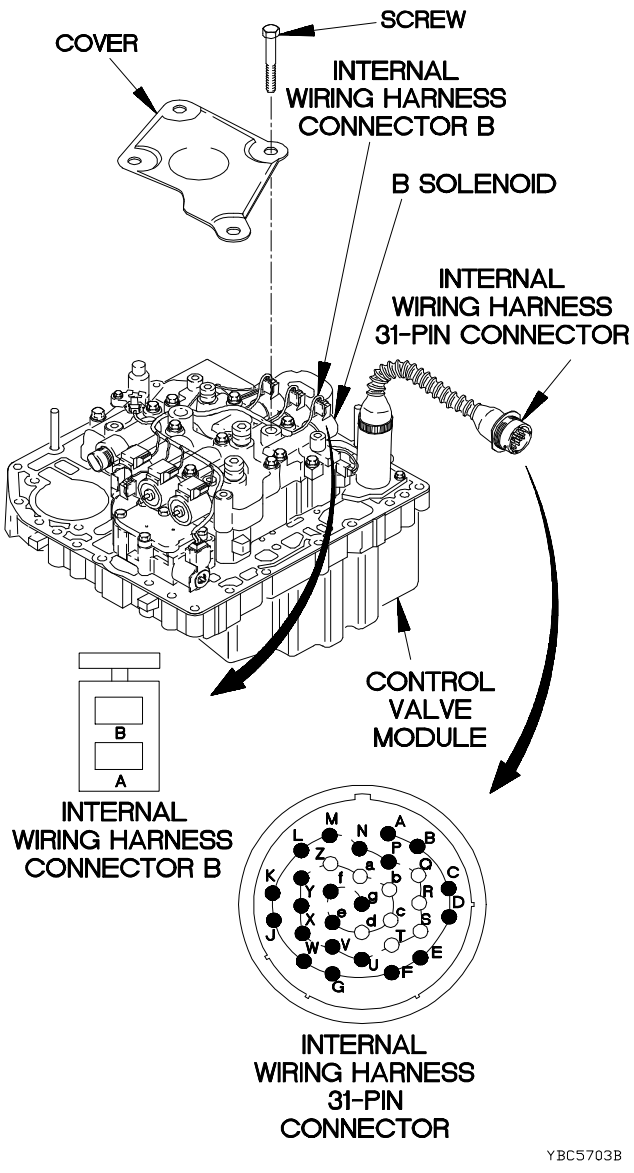


CAUTION

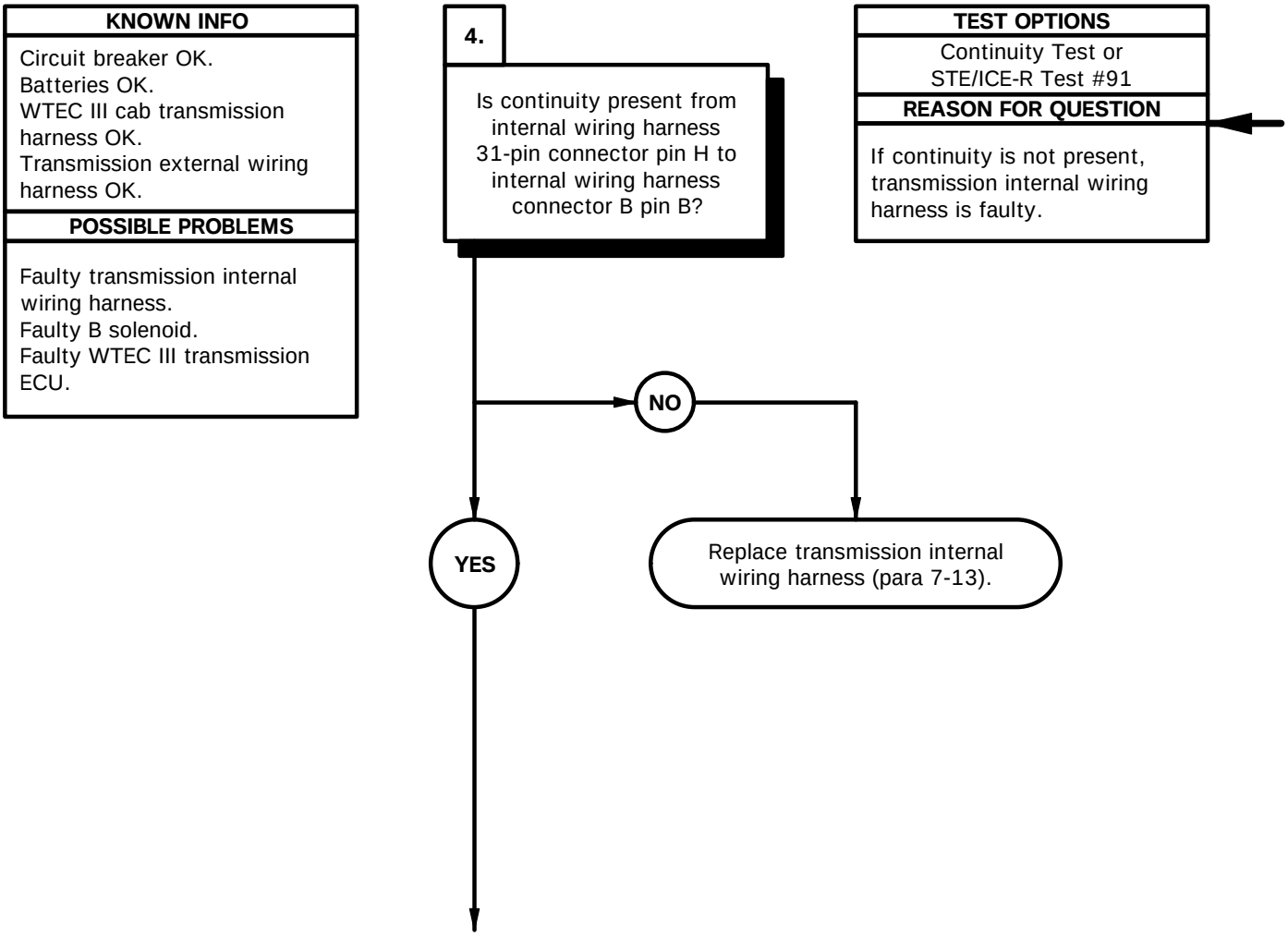
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

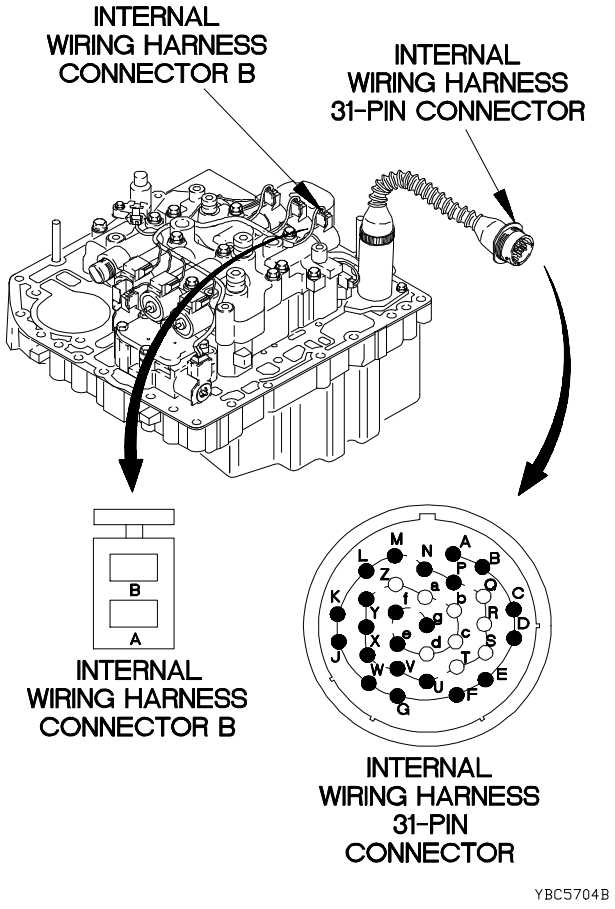


c57. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 13 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

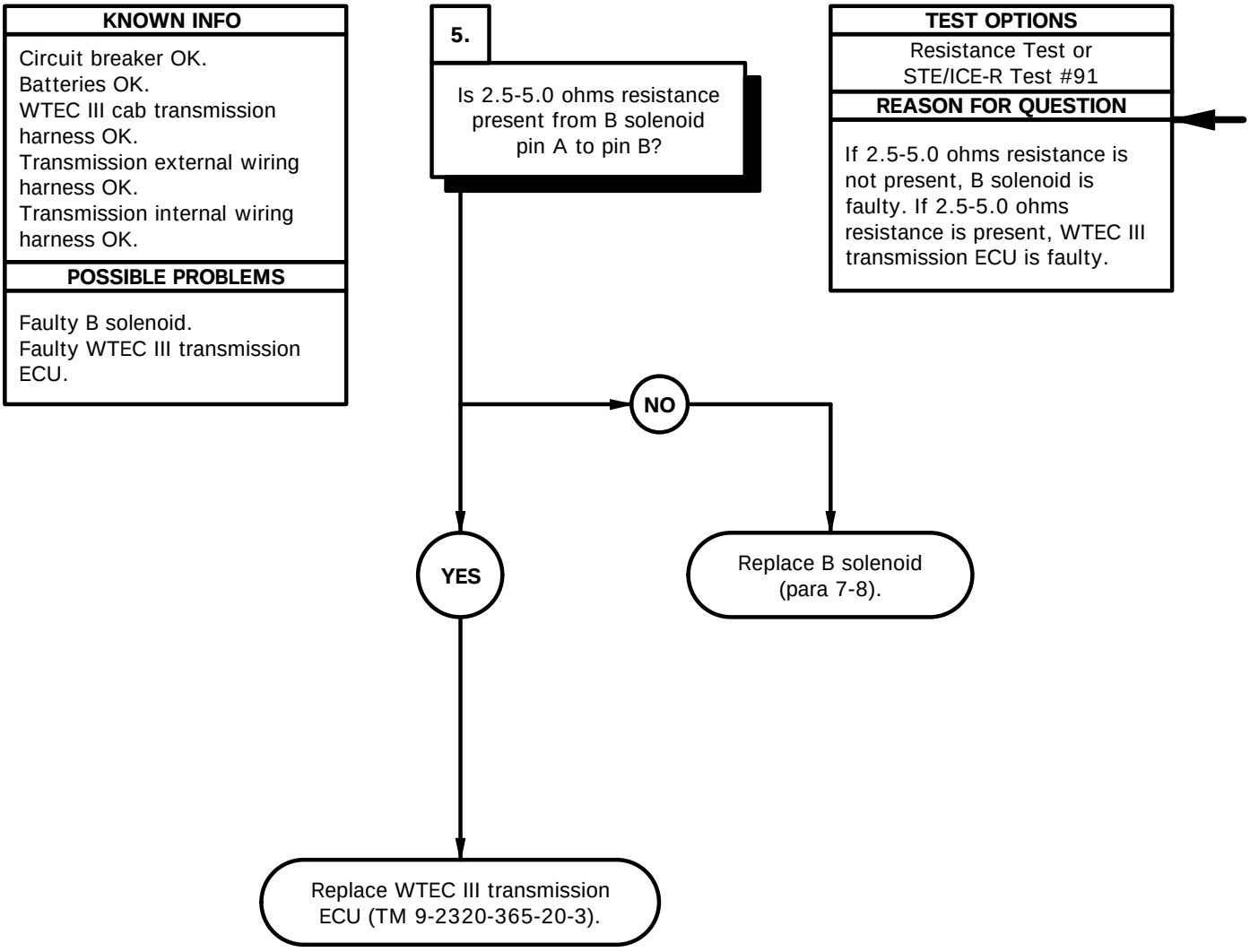


CONTINUITY TEST

(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).

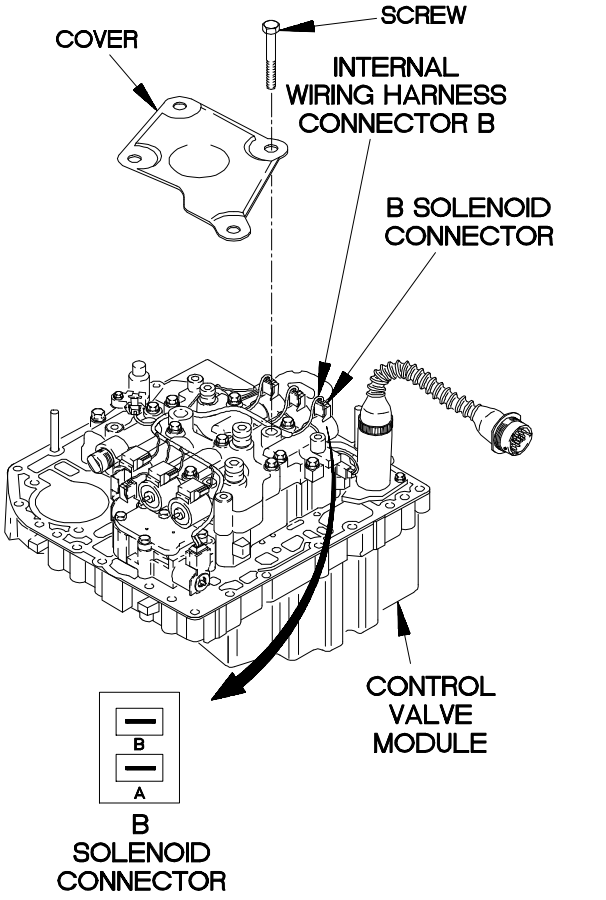


c57. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 13 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)

Materials/Parts
Wire, Elect, 50 ft (Item 94, Appendix C)

Personnel Required
(2)

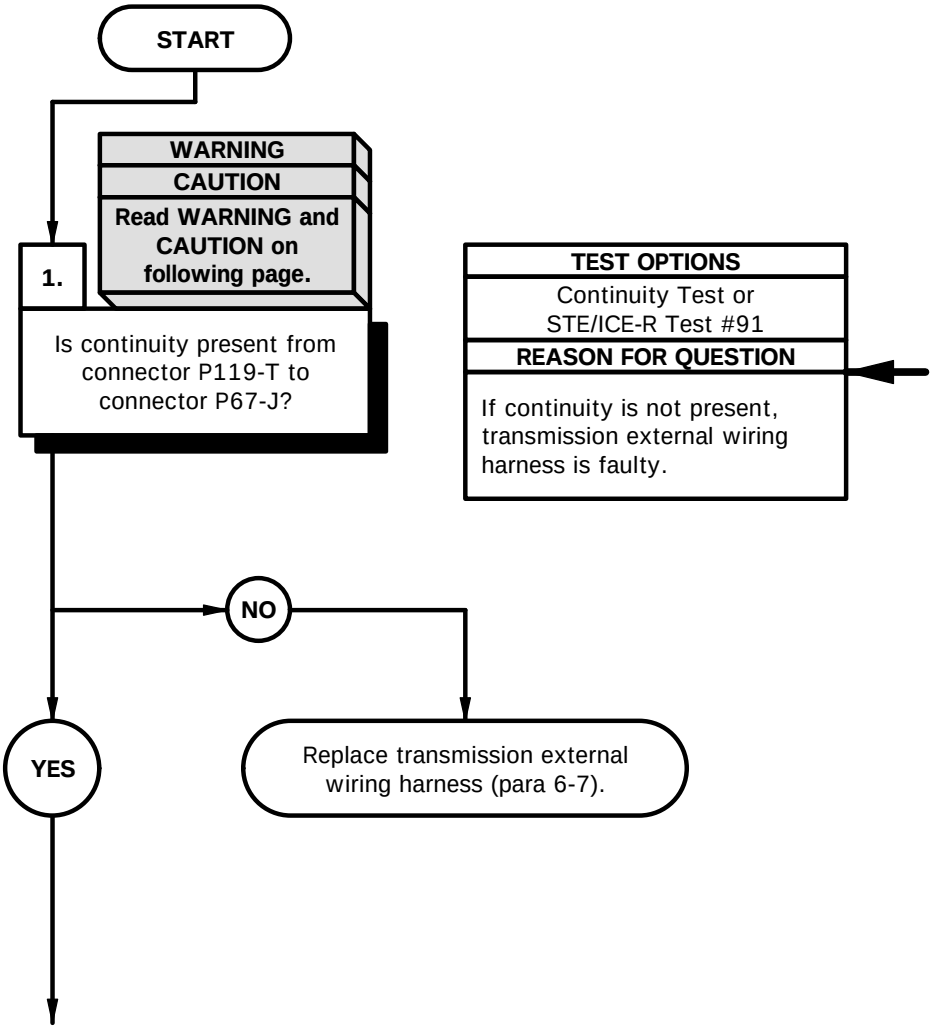
References
TM 9-4910-571-12&P

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

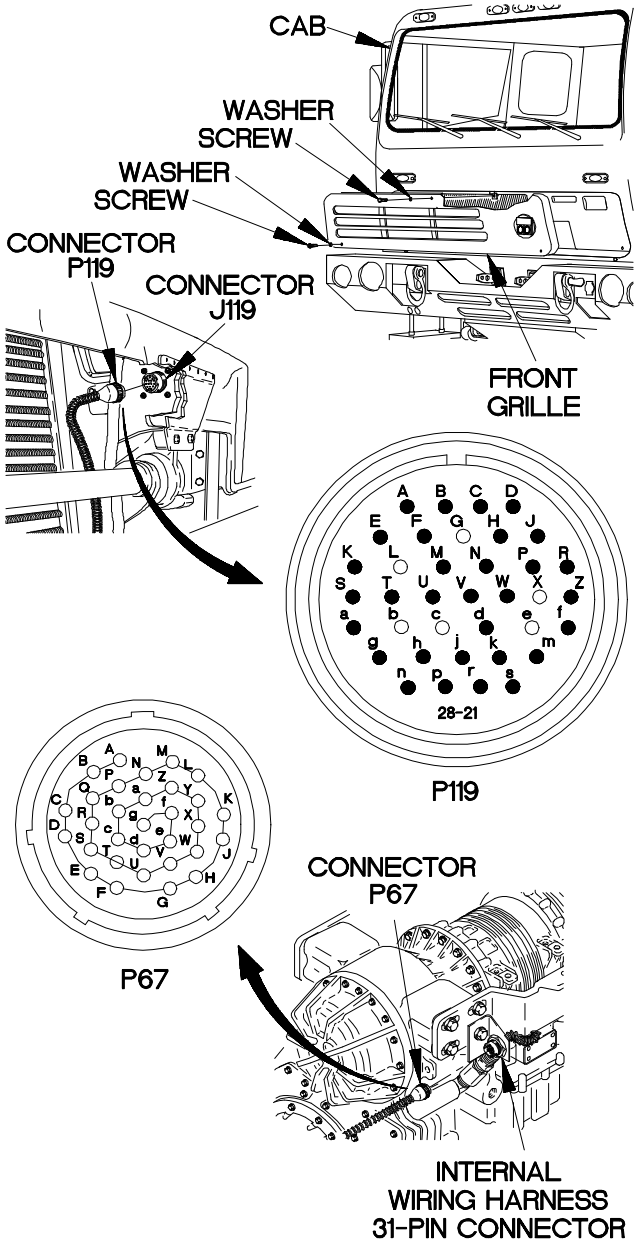
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

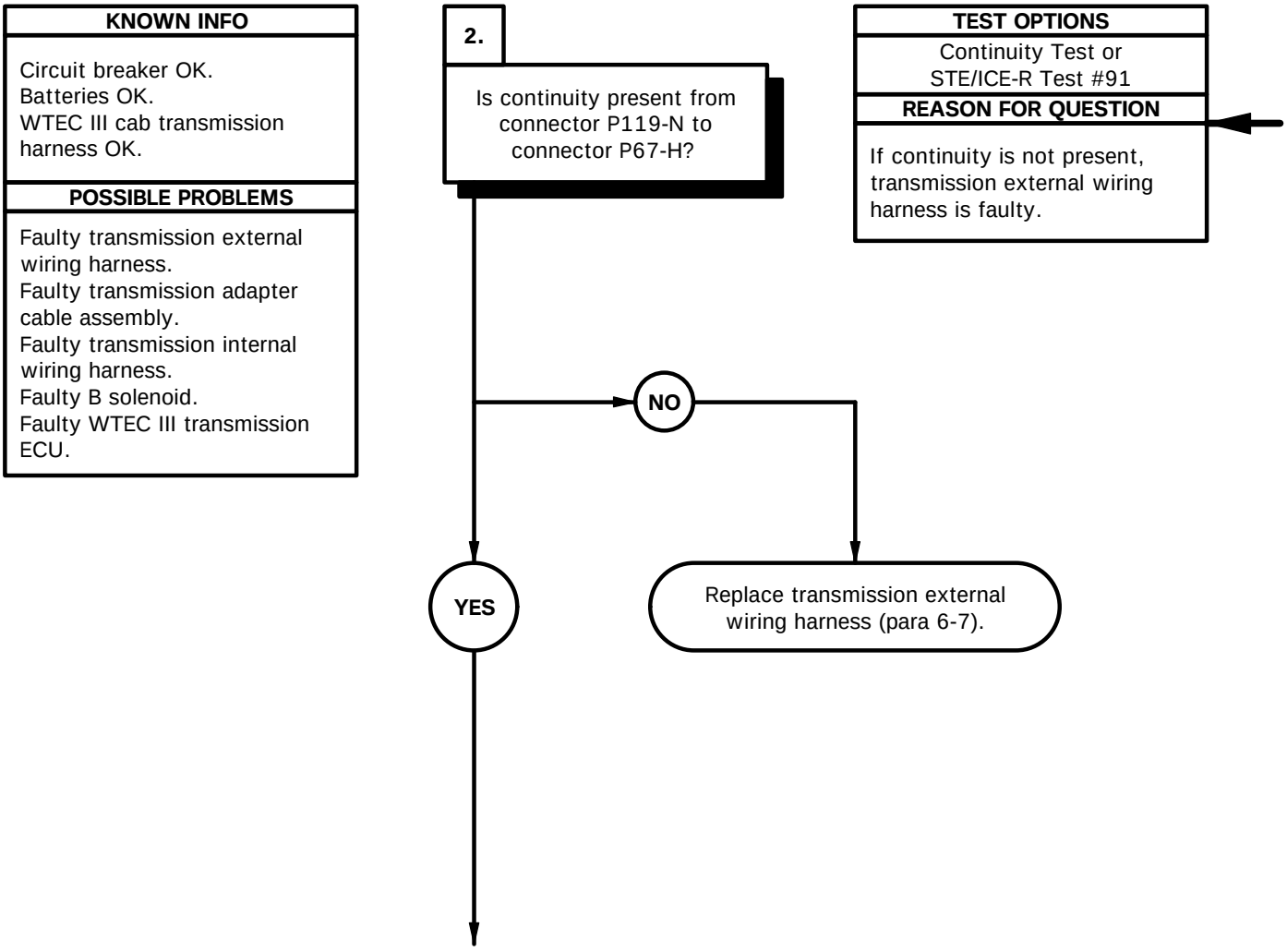
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from adapter cable to 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect positive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

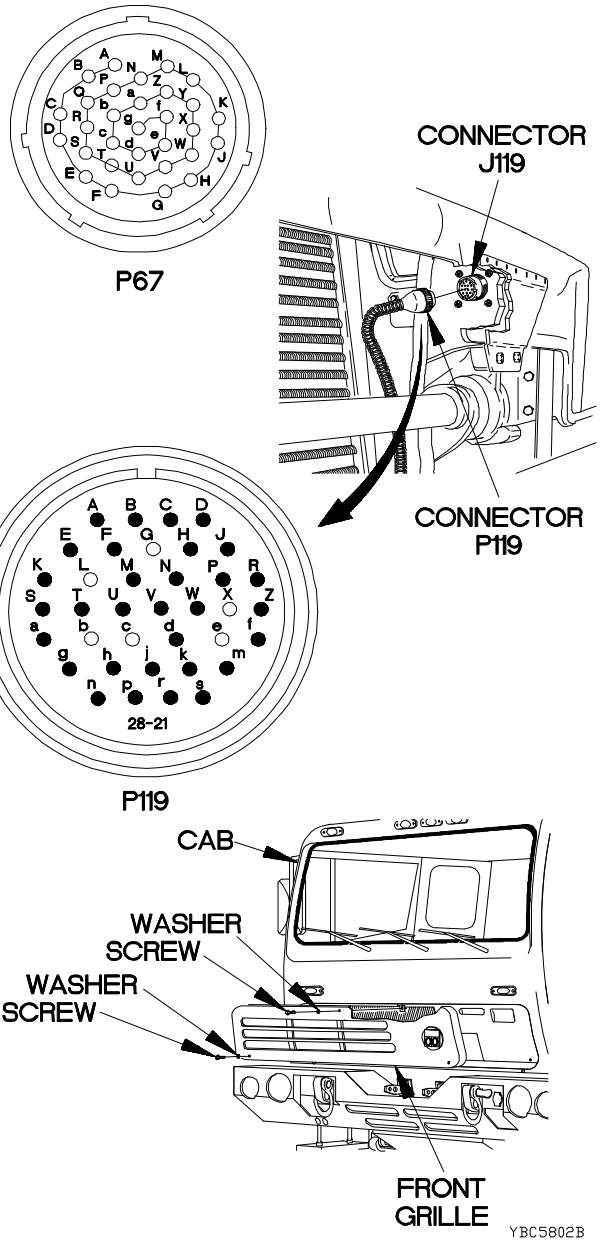


c58. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

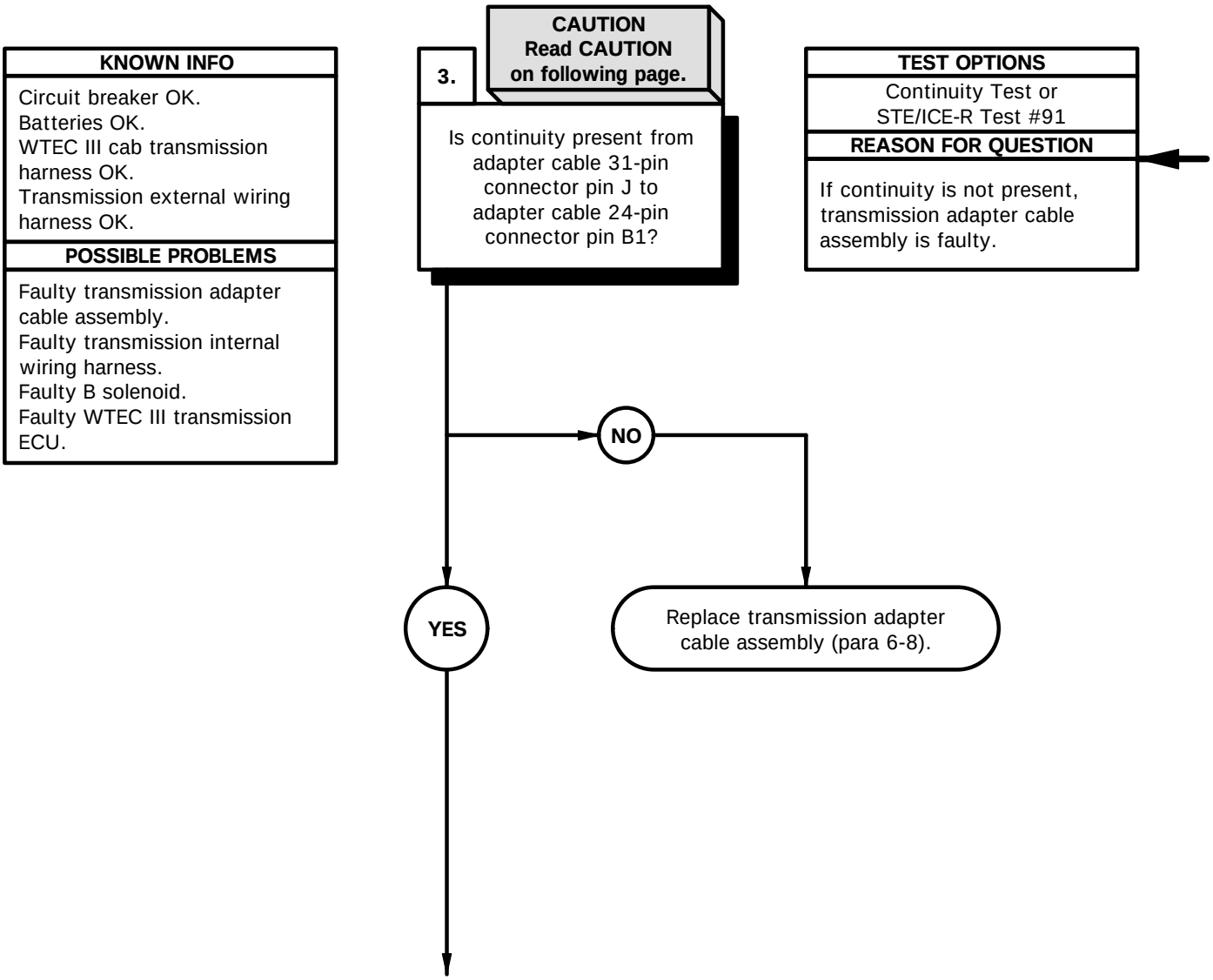


CONTINUITY TEST

(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)

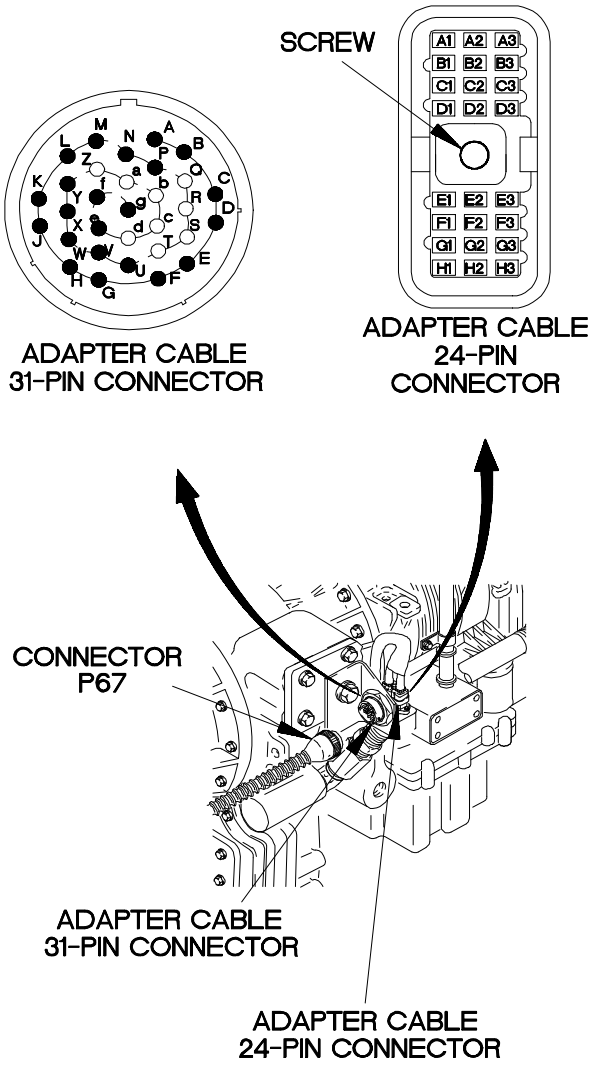


CAUTION

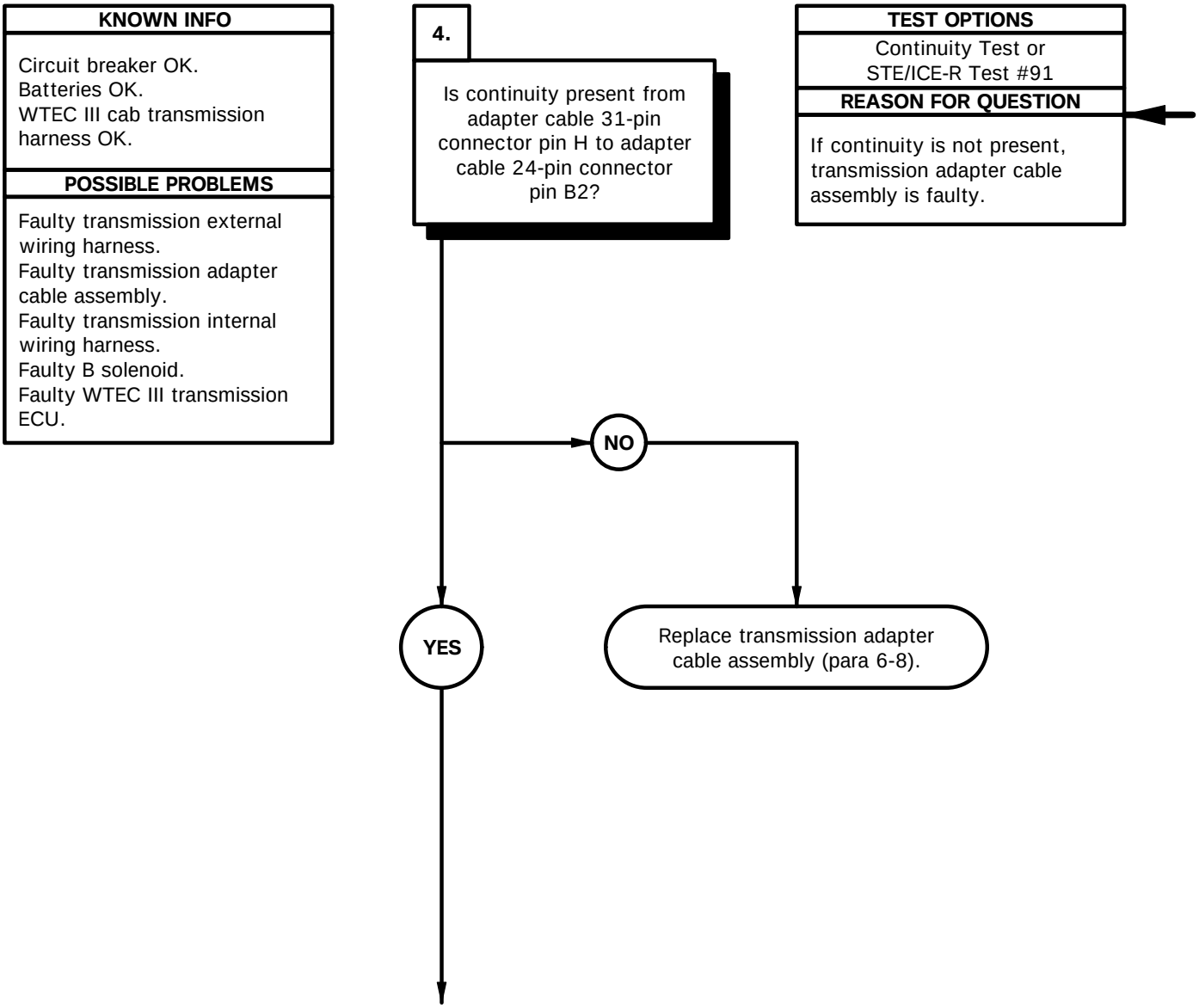
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

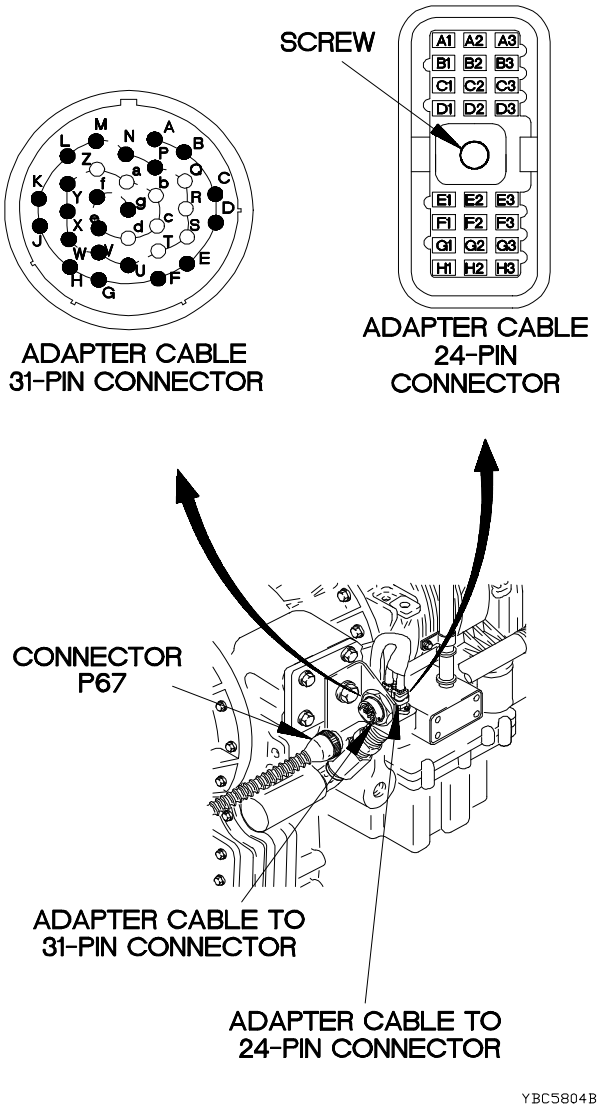


c58. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

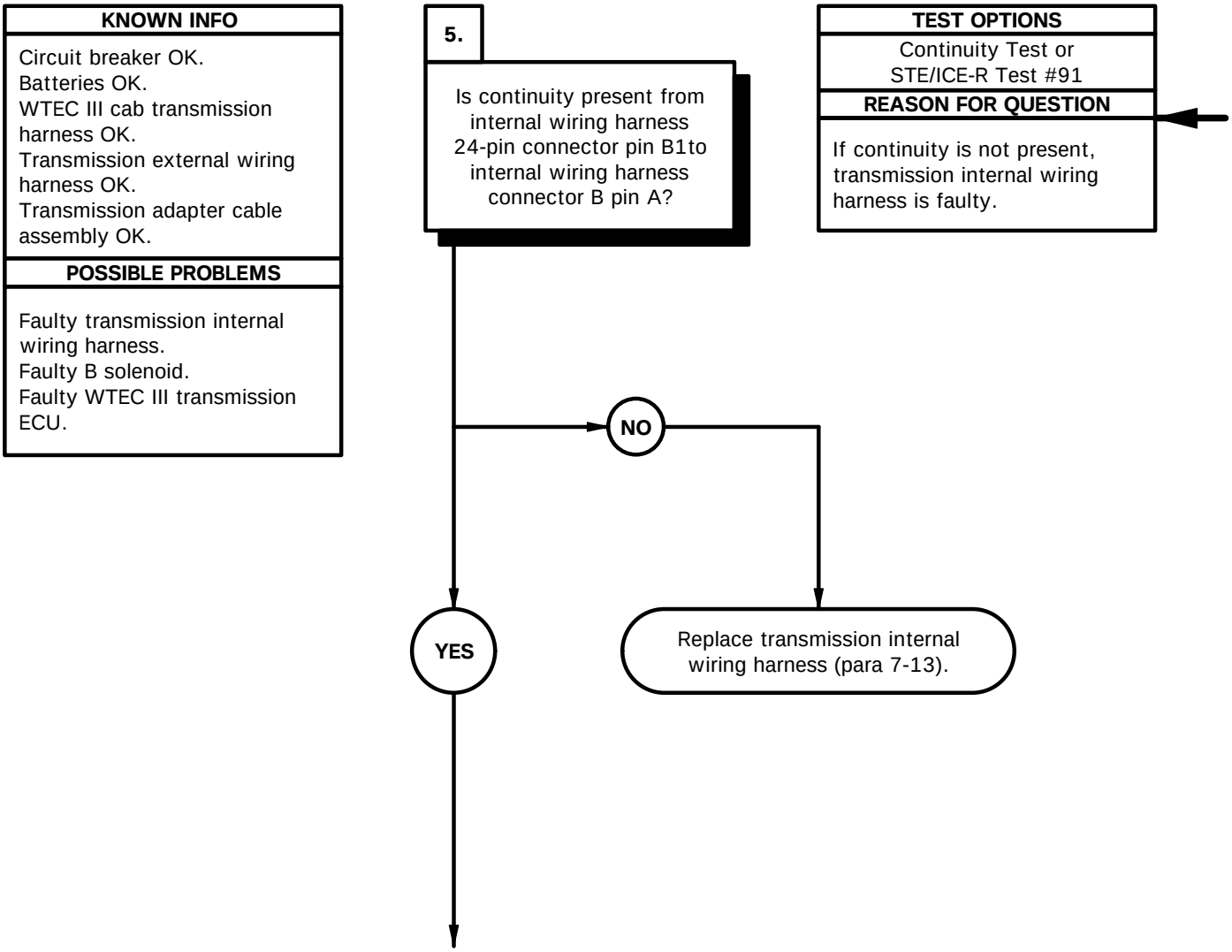


CONTINUITY TEST

(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.

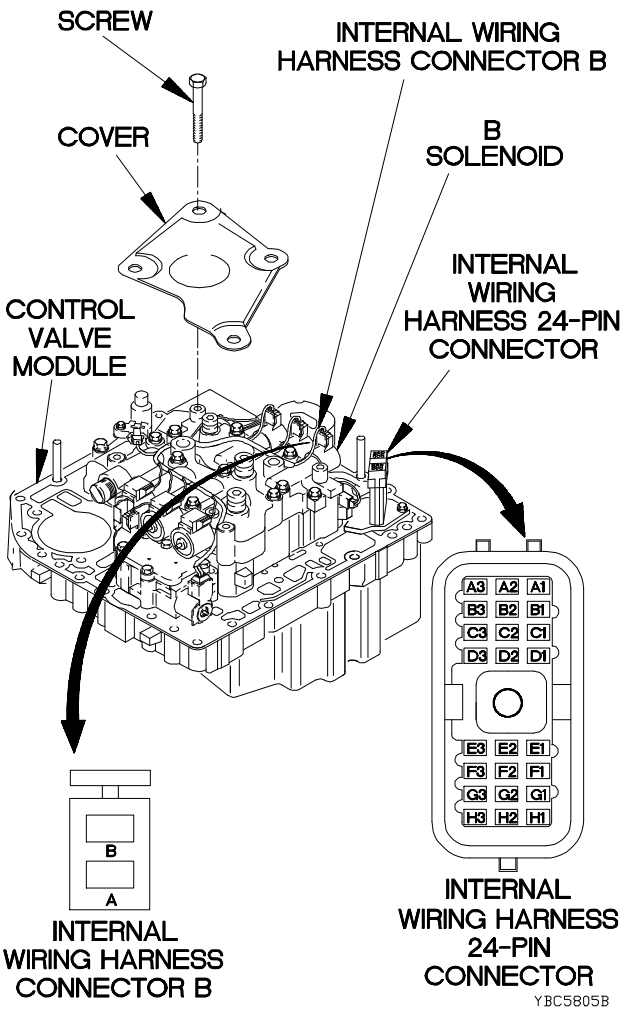


c58. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

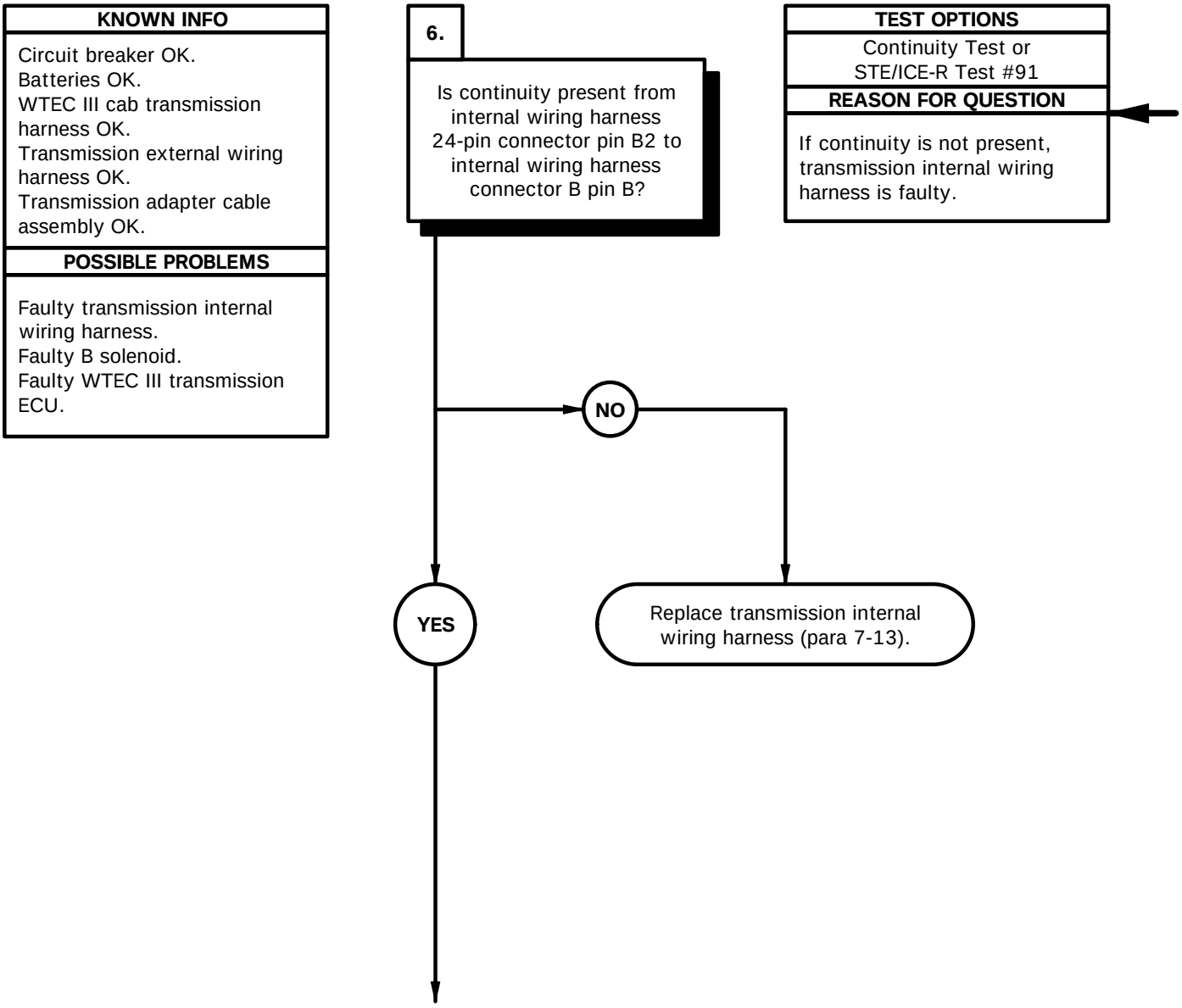


CONTINUITY TEST

(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).

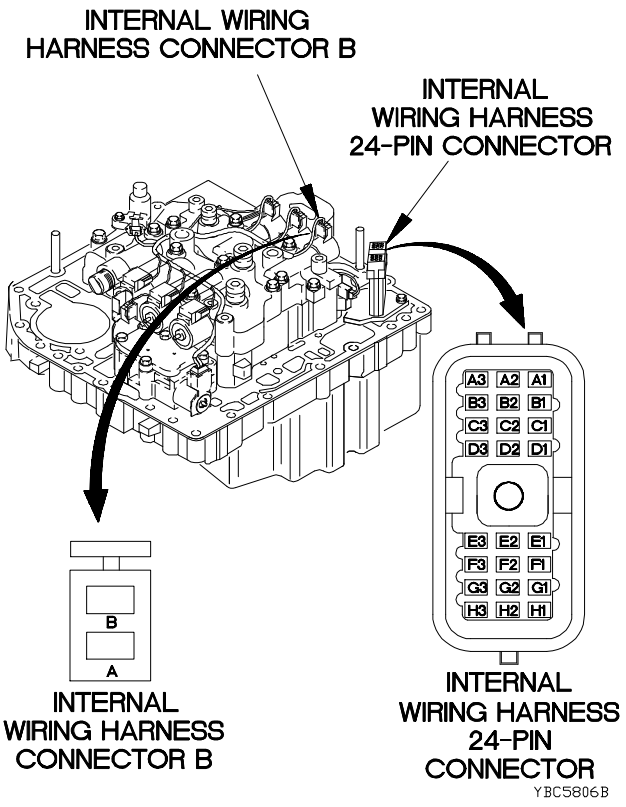


c58. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

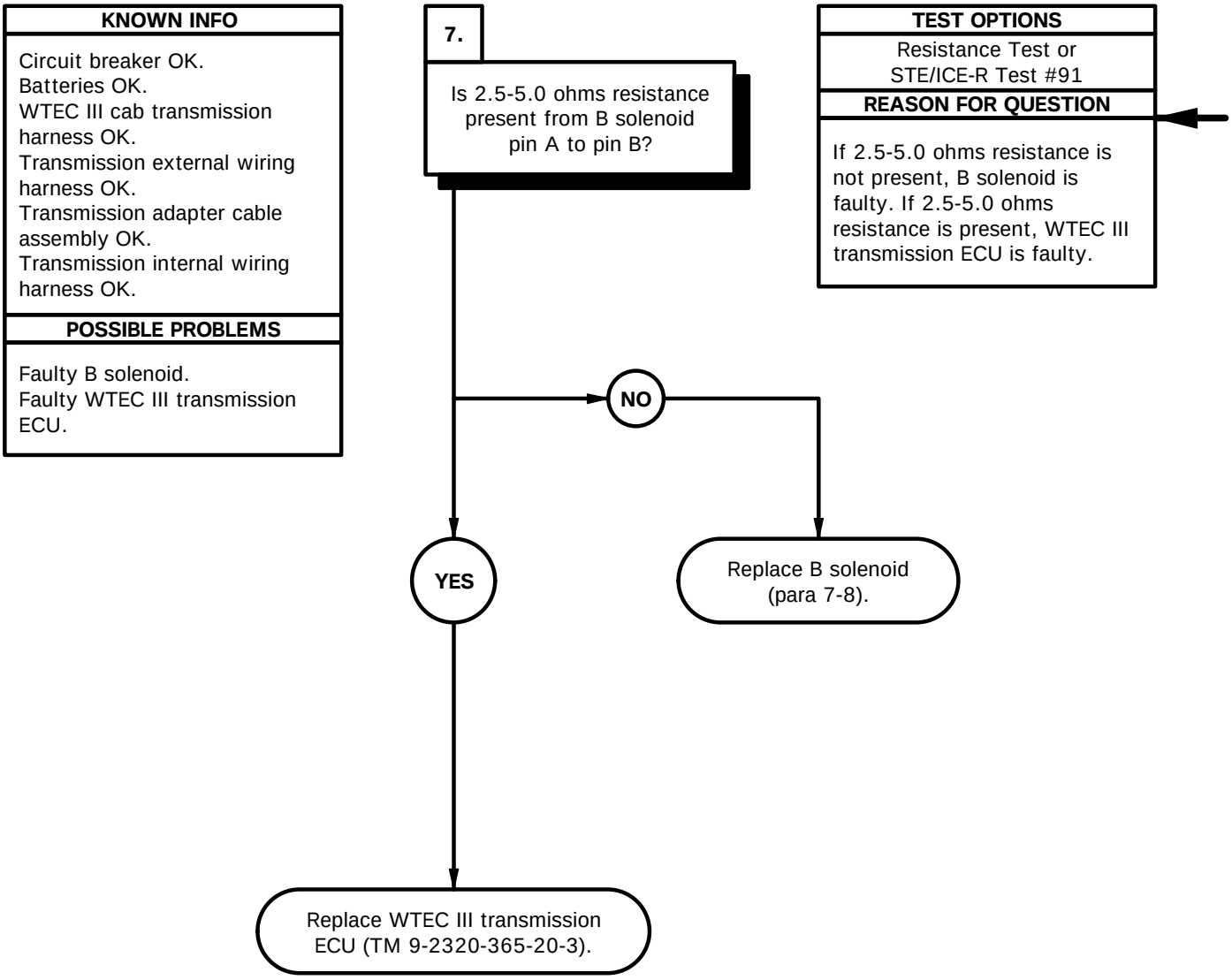


CONTINUITY TEST

(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).

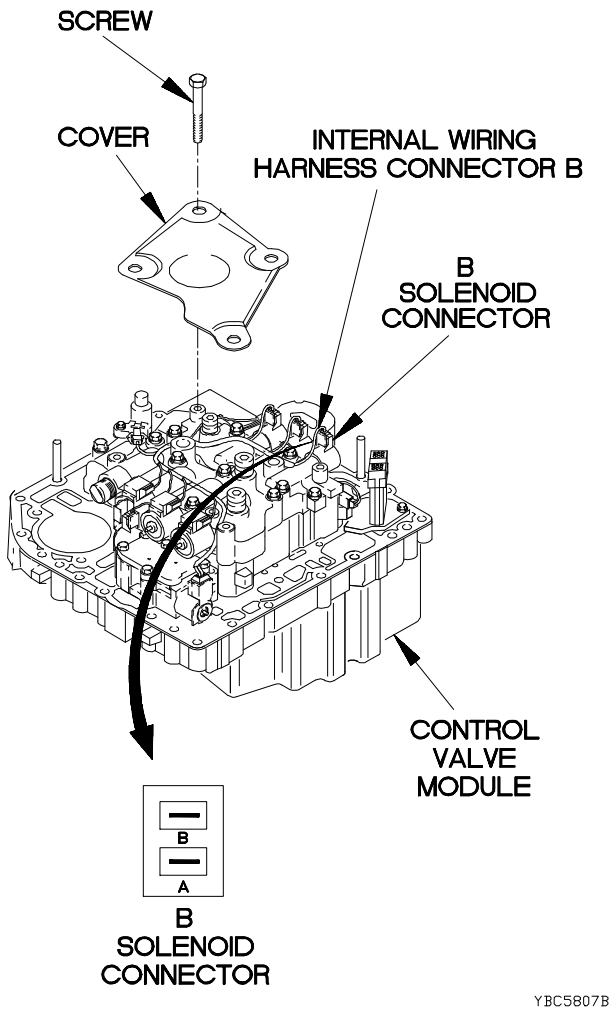


c58. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 13 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)

Materials/Parts
Wire, Elect, 50 ft (Item 94, Appendix C)

Personnel Required
(2)

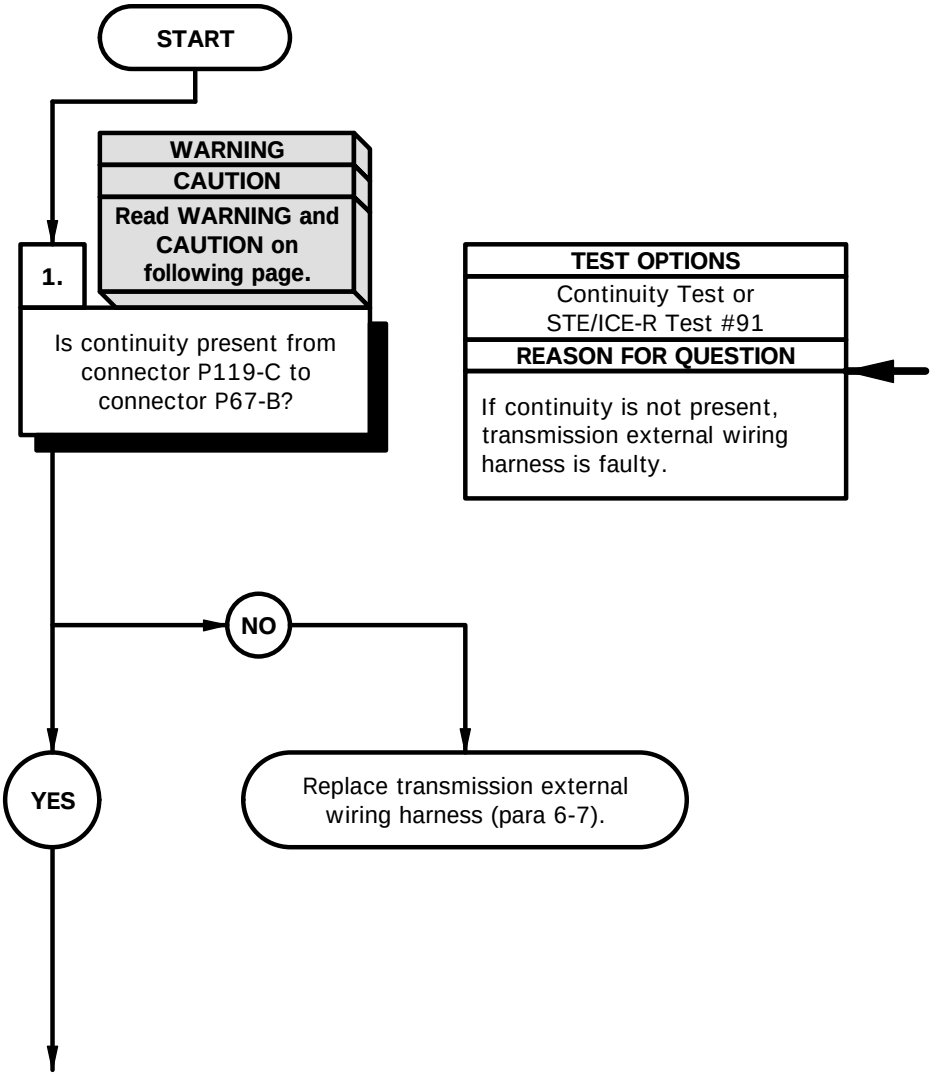
References
TM 9-4910-571-12&P

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 C 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

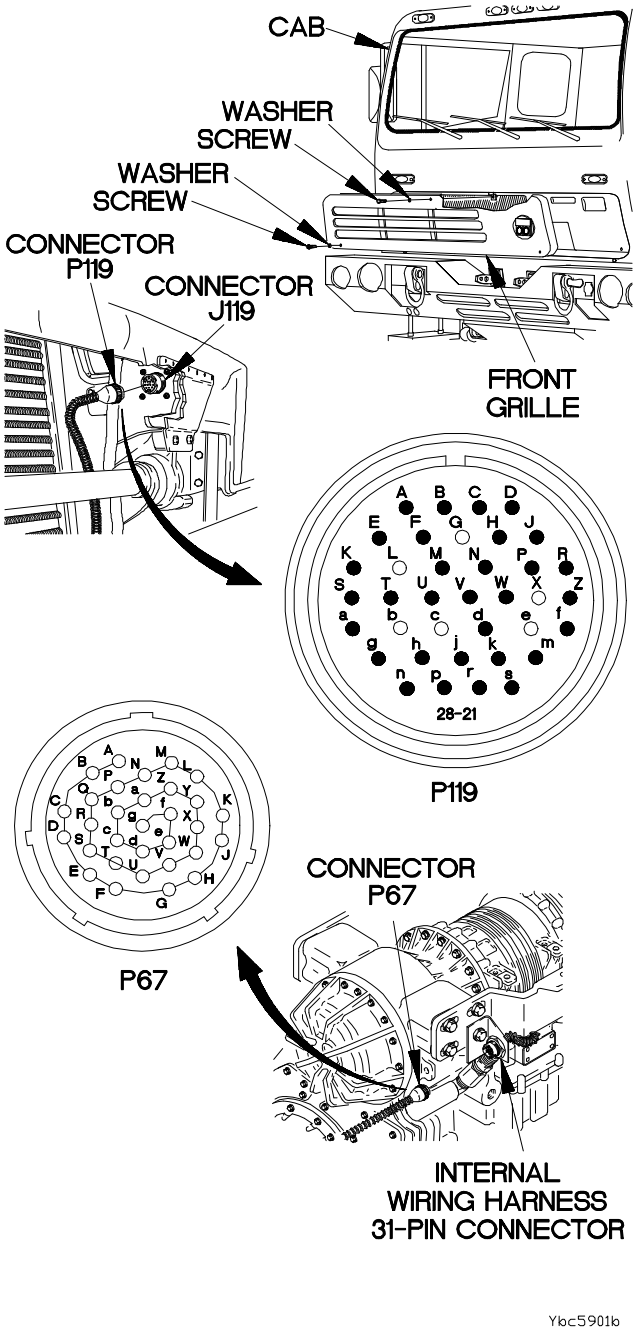
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

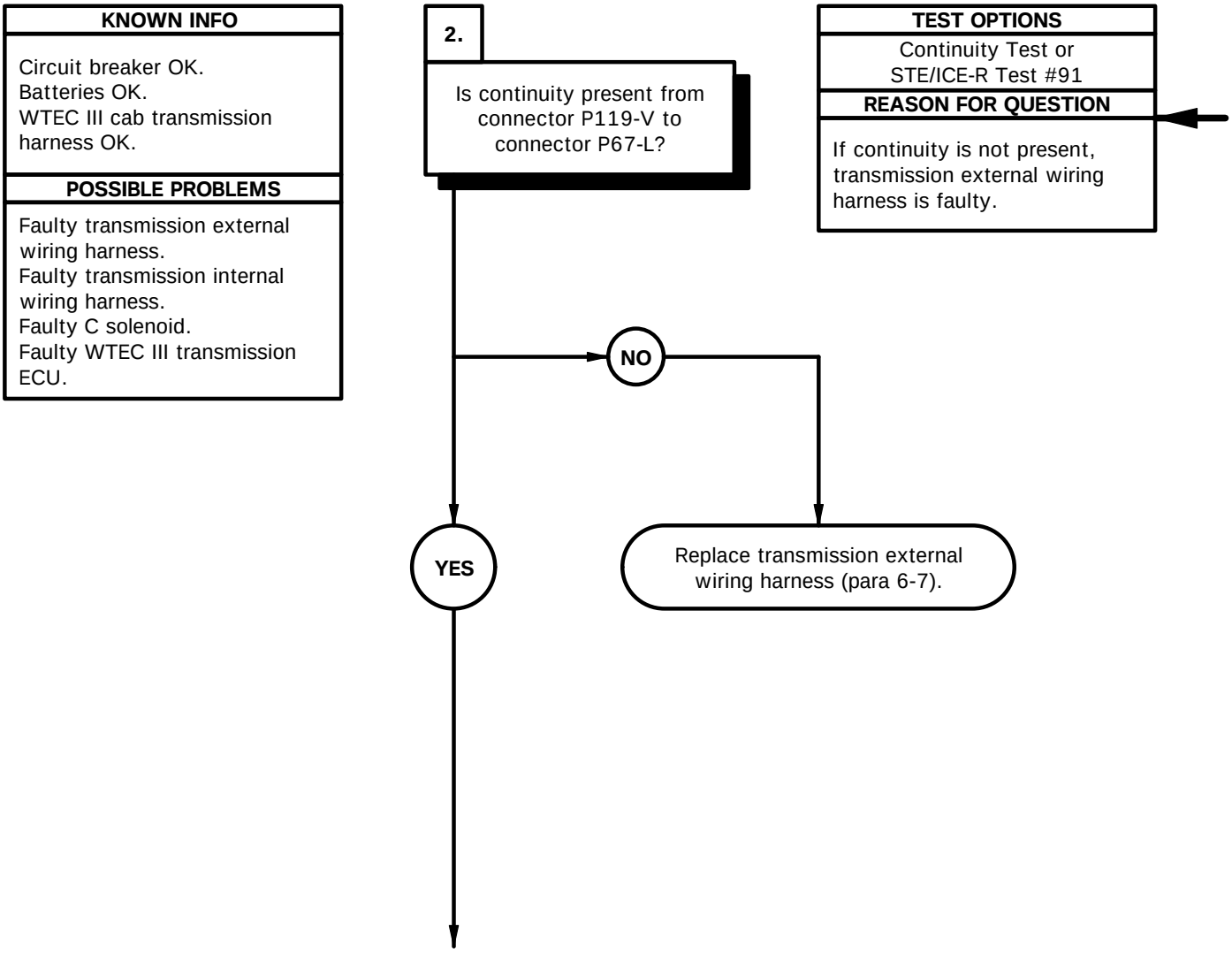
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from internal wiring harness 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect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

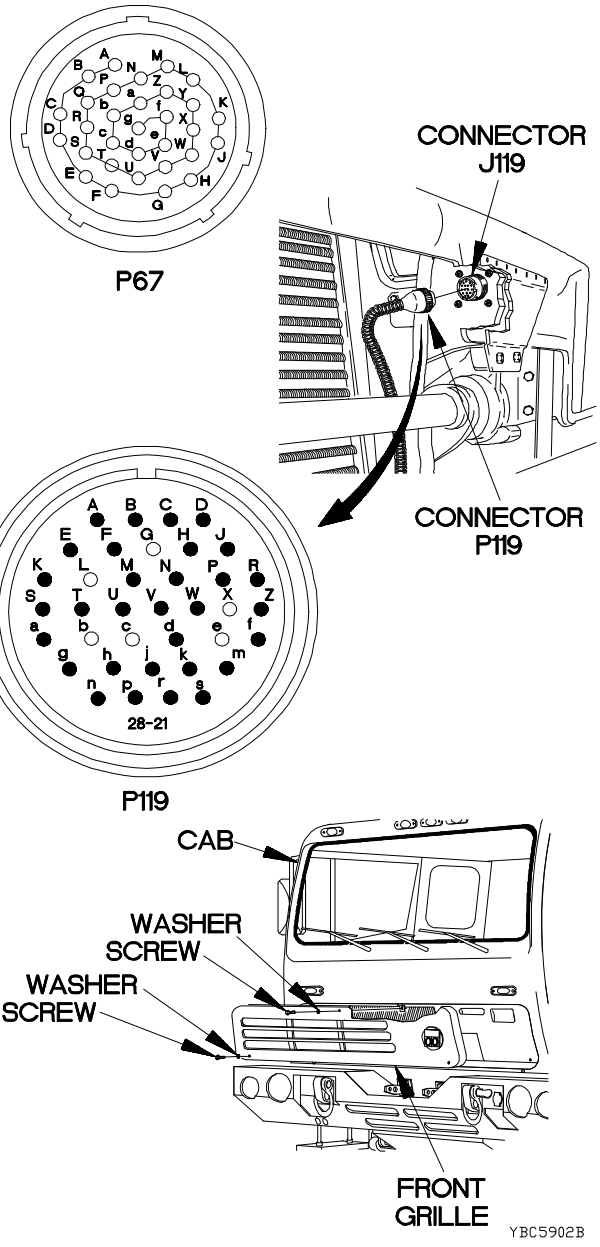


c59. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 14 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

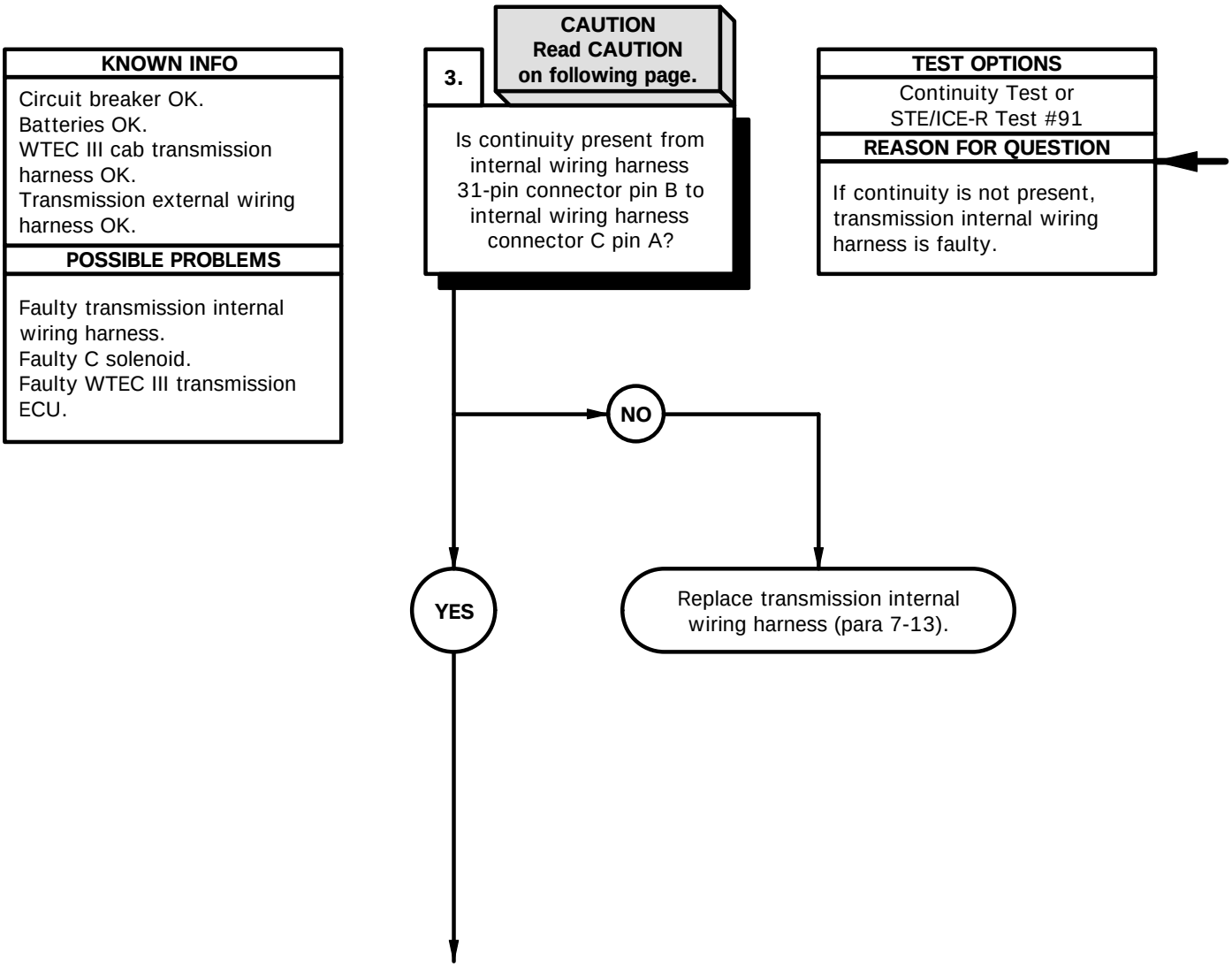


CONTINUITY TEST

(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)

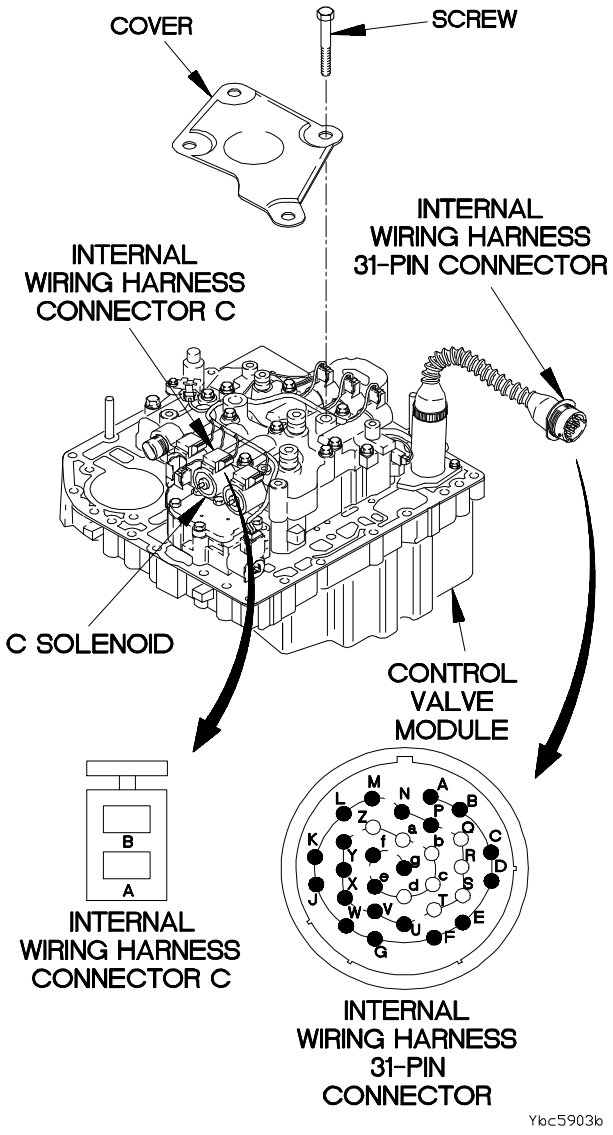


CAUTION

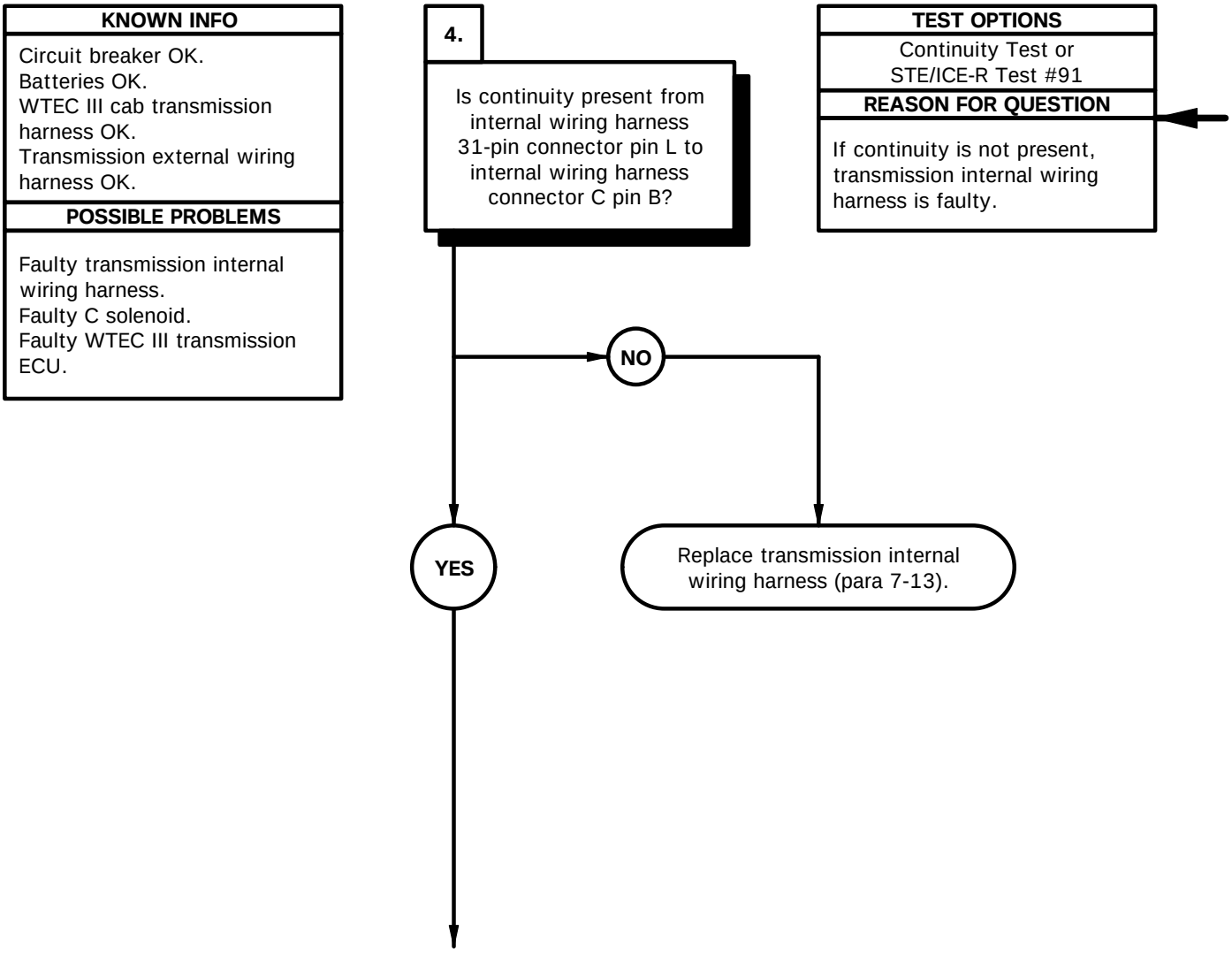
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

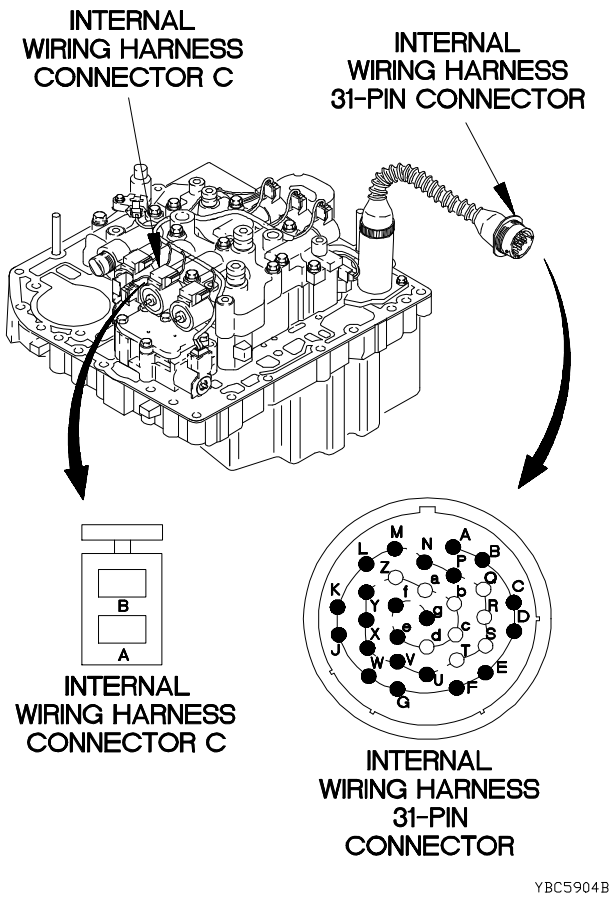


c59. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 14 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

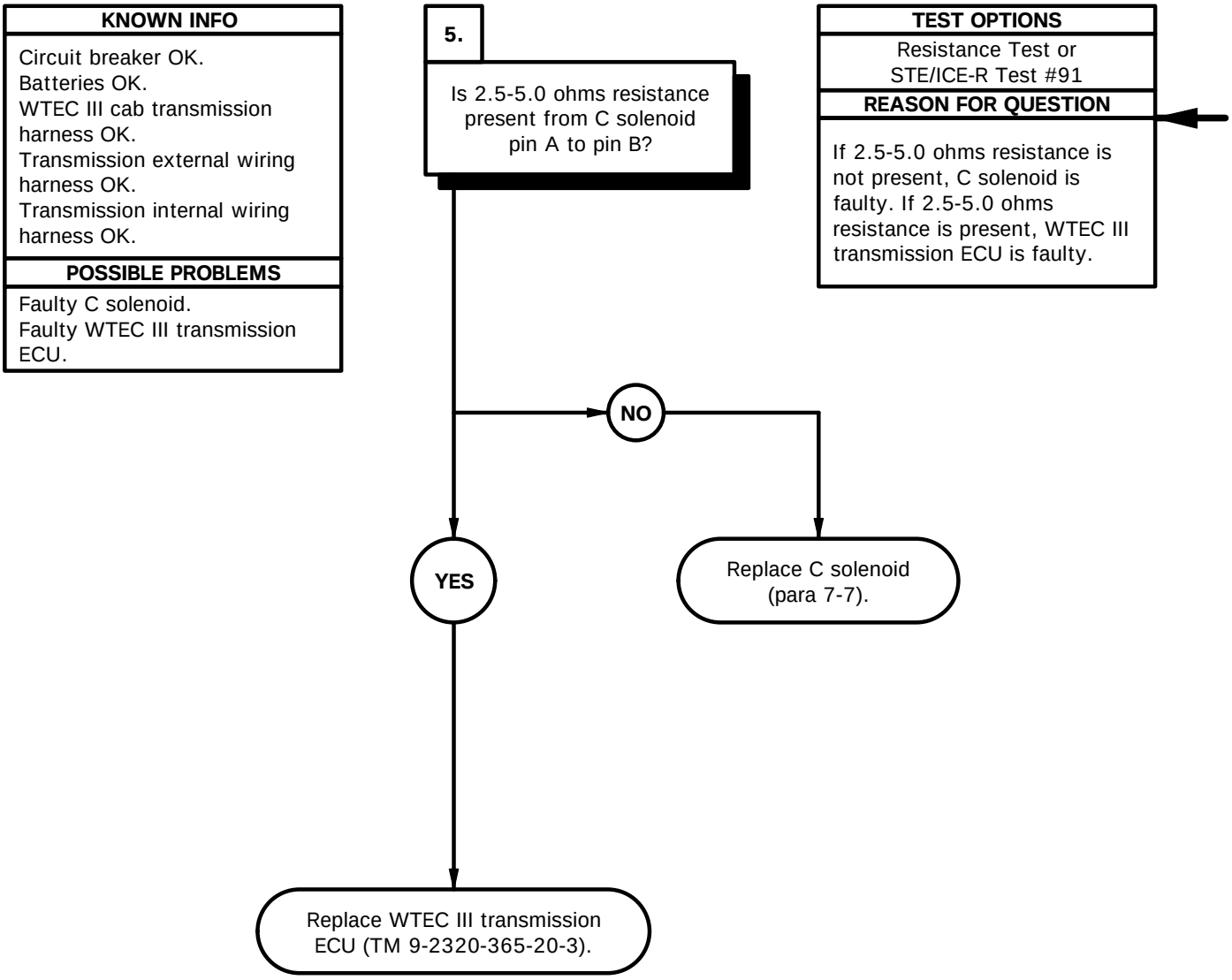


CONTINUITY TEST

(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).

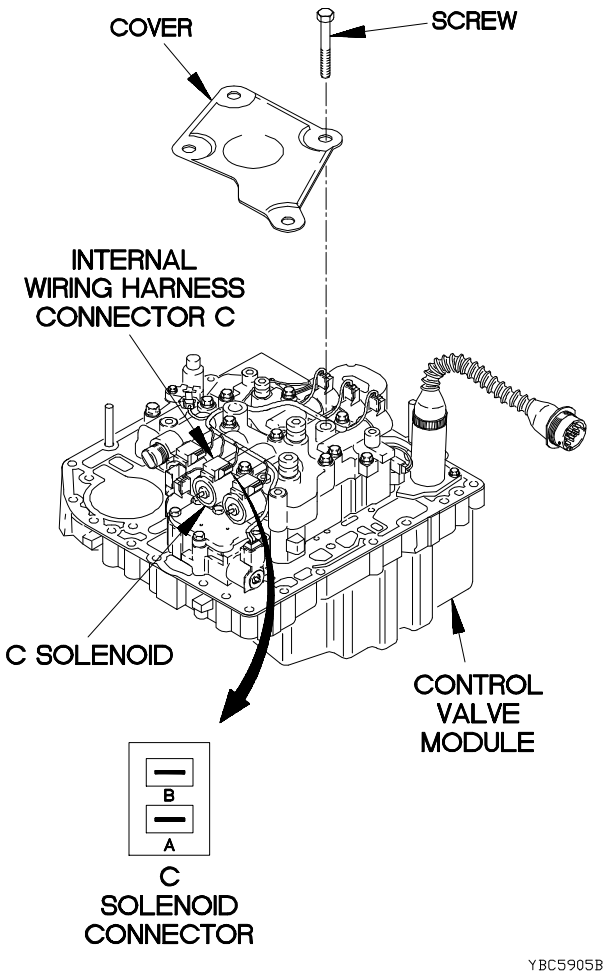


c59. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 14 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

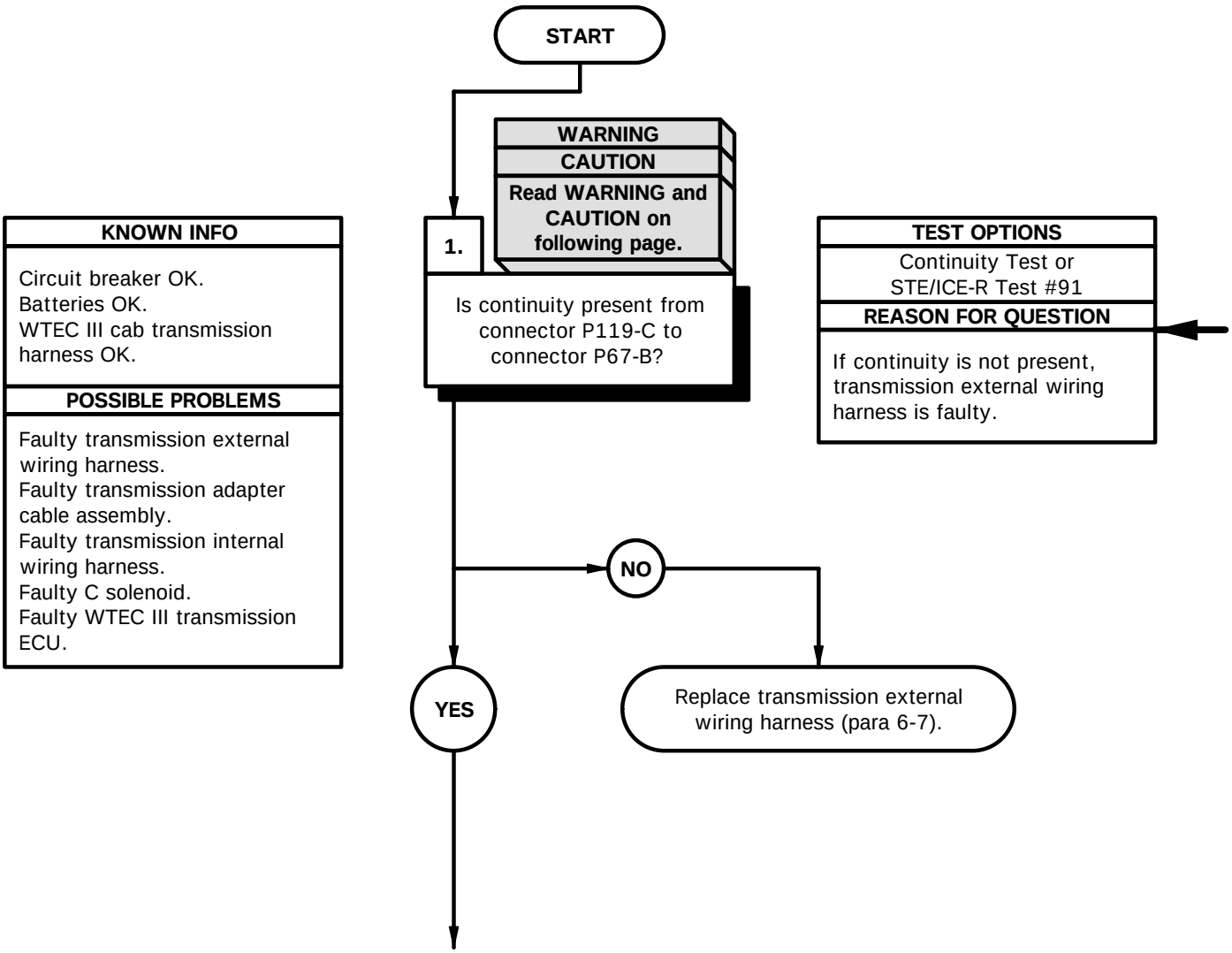
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

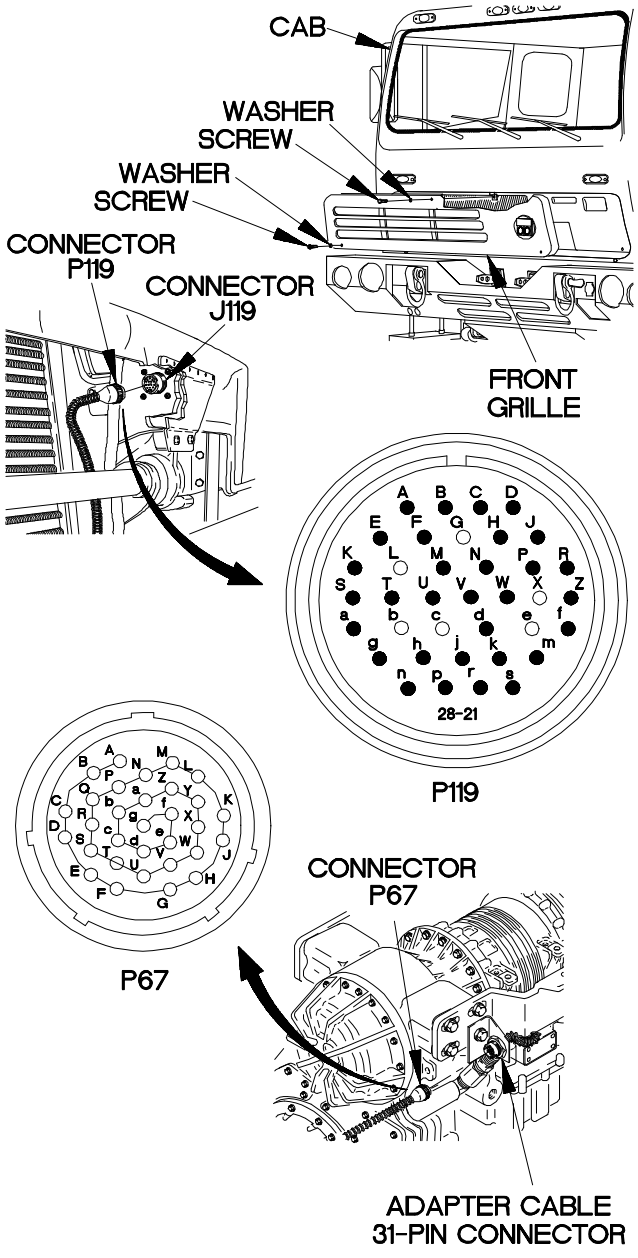
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



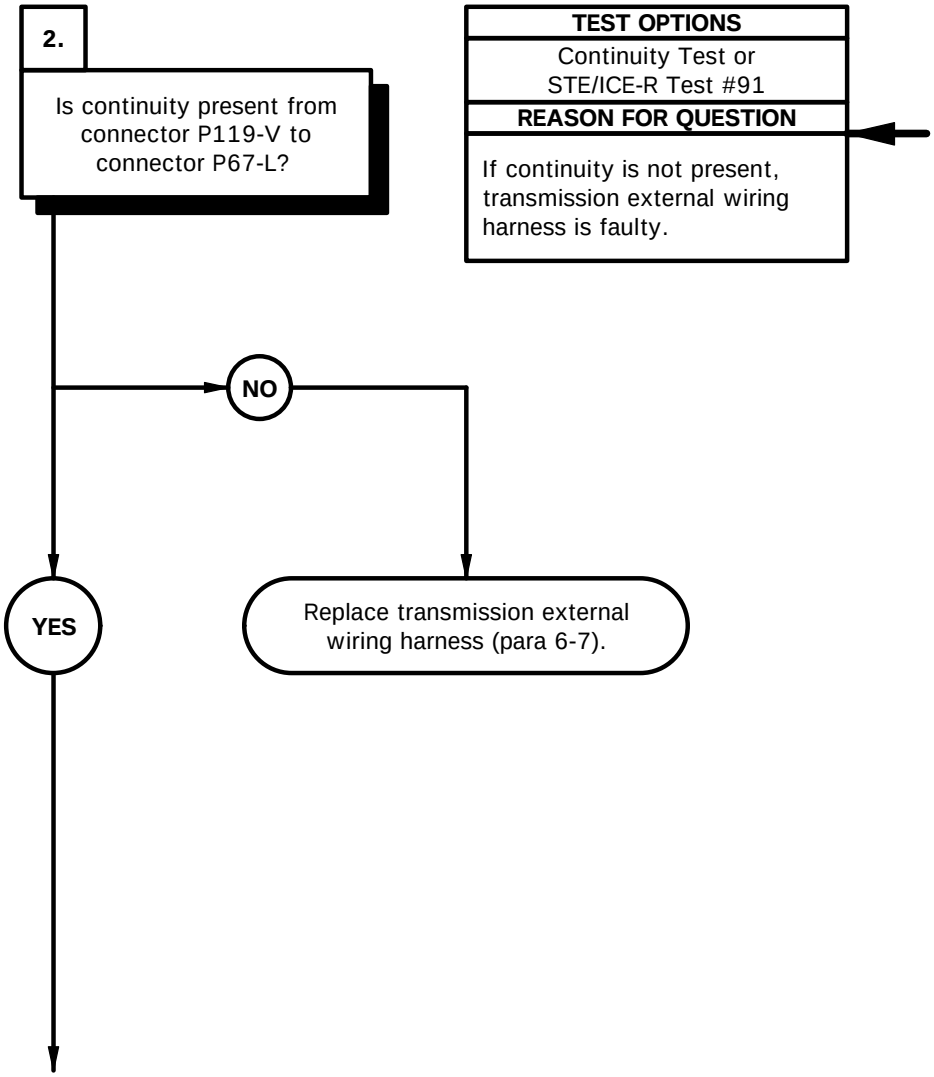
c60. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 14 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO

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

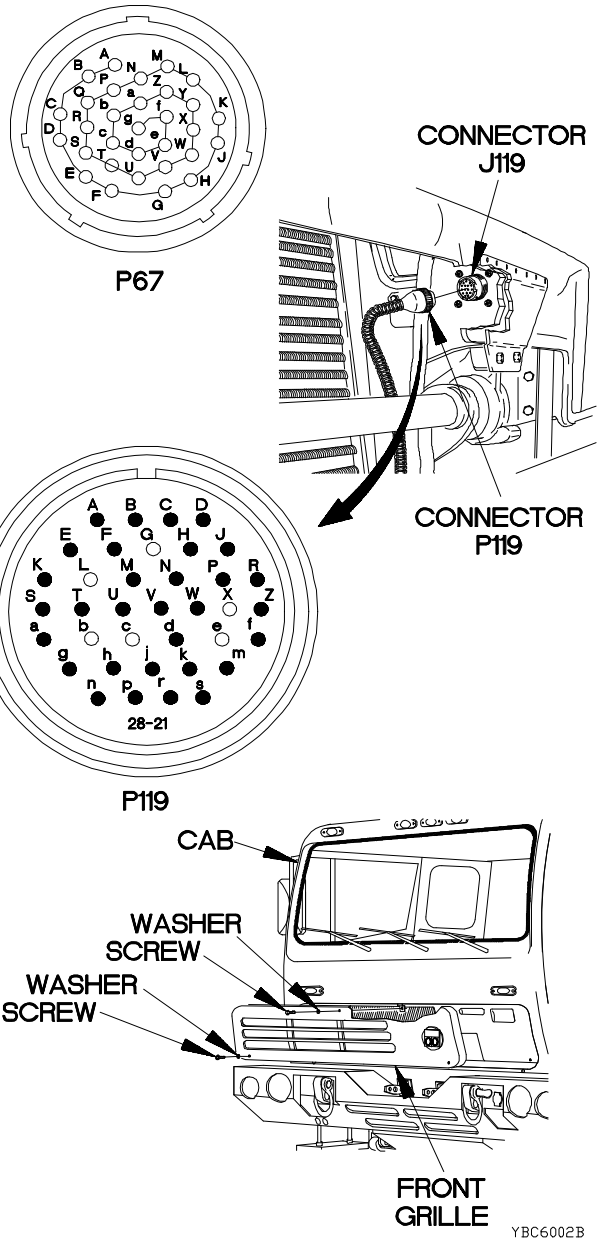
POSSIBLE PROBLEMS

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

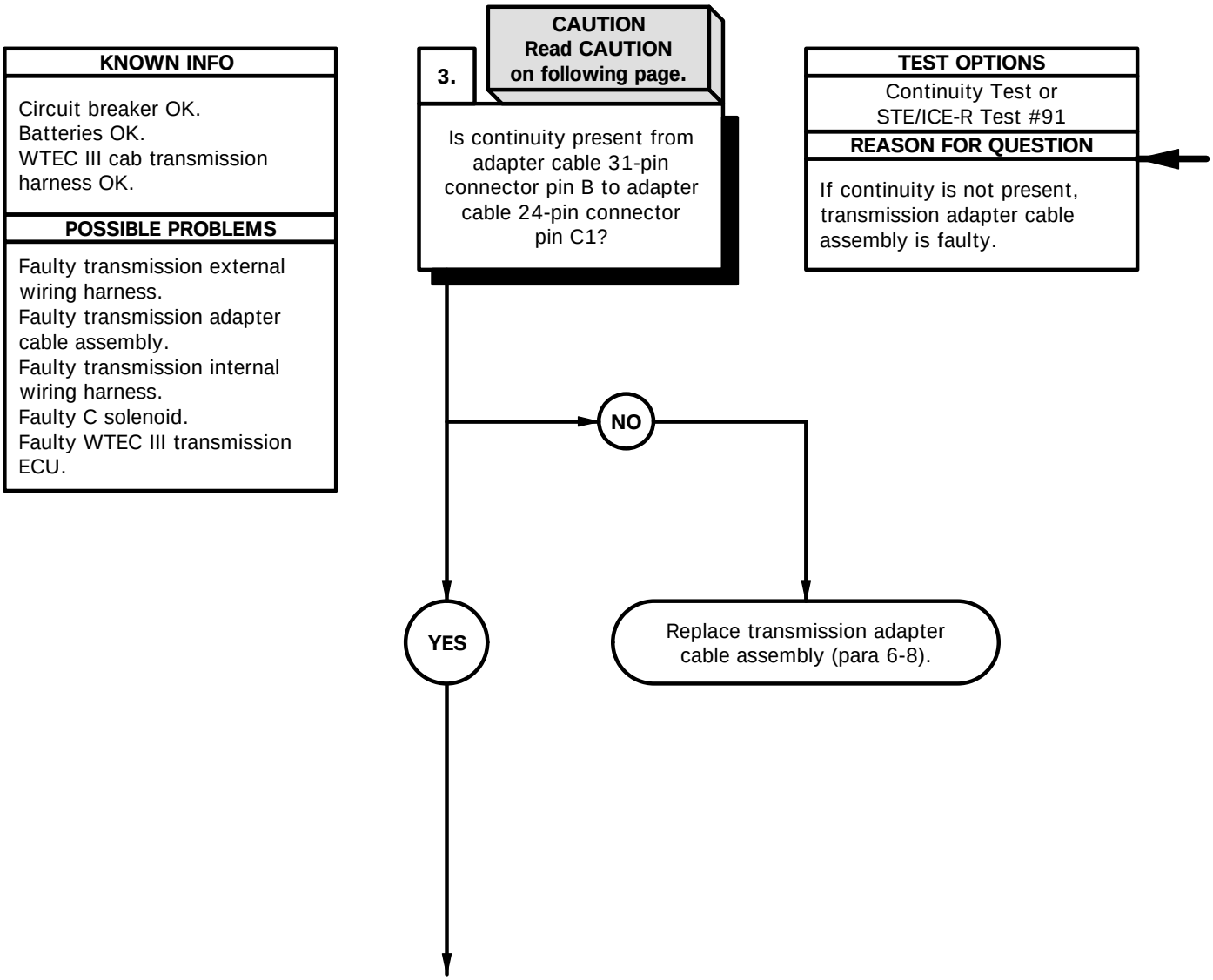


CONTINUITY TEST

(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)

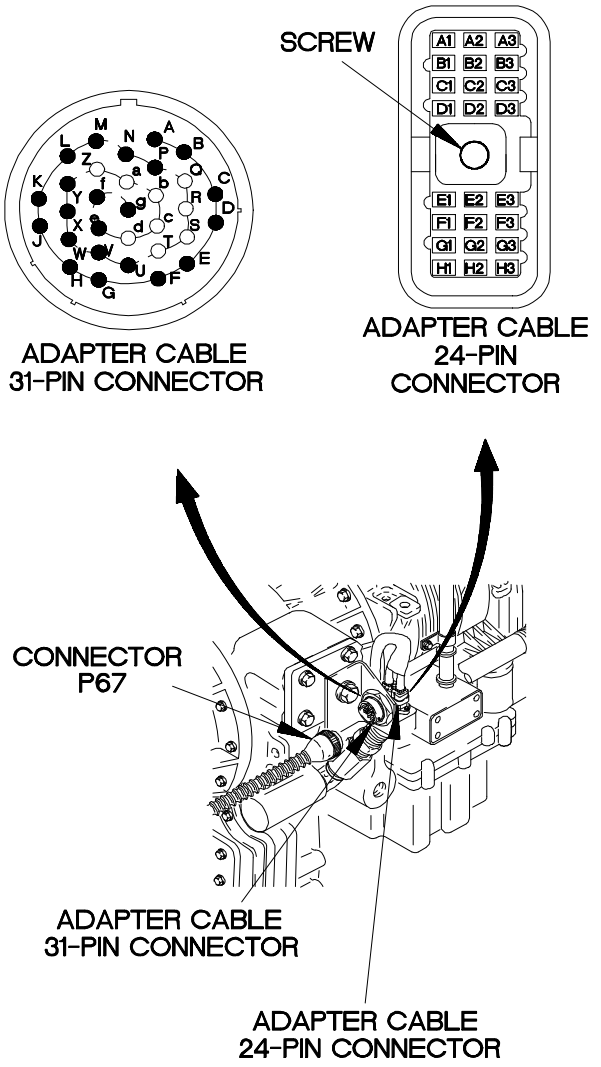


CAUTION

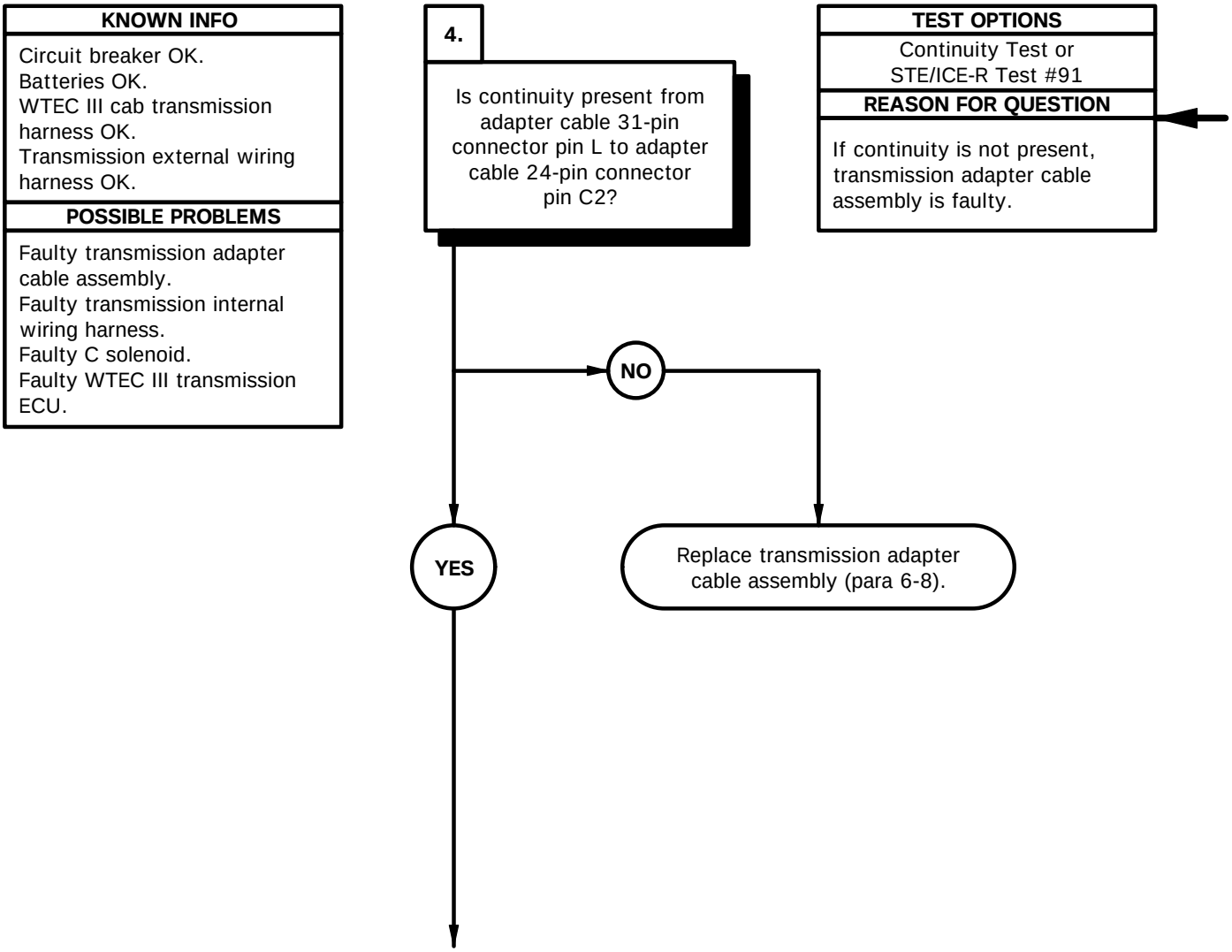
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

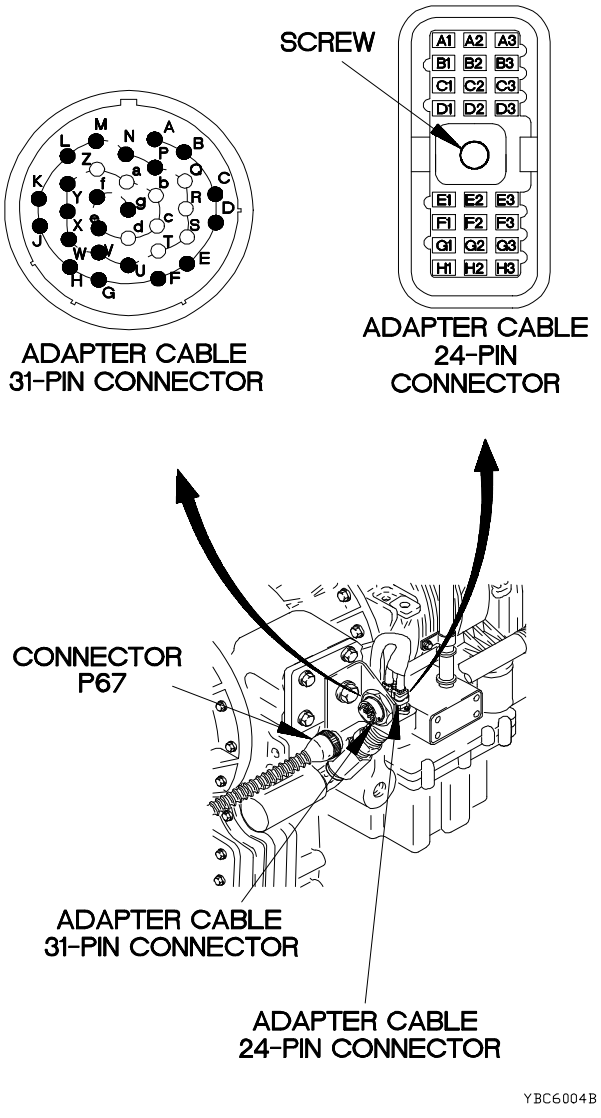


c60. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 14 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

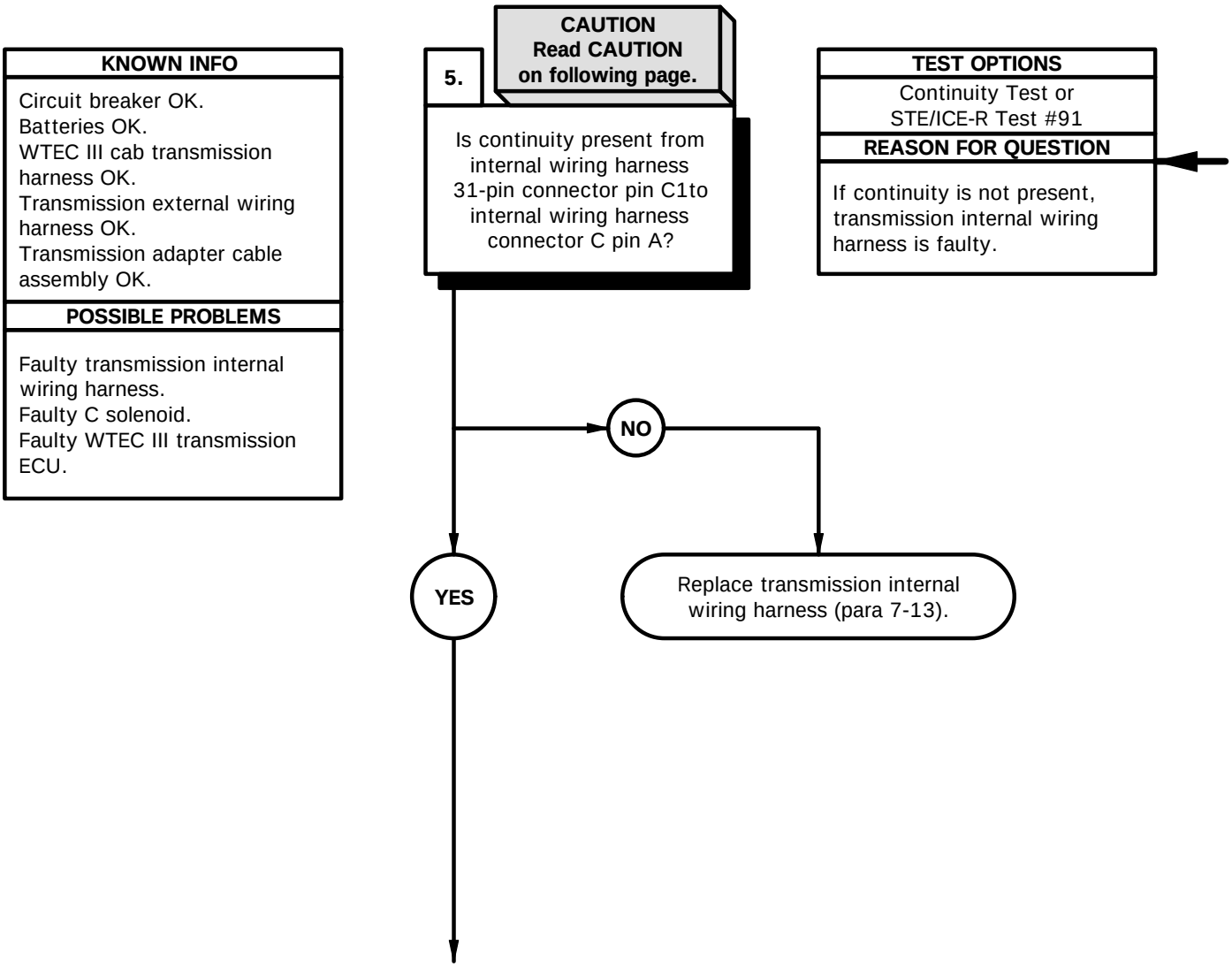


CONTINUITY TEST

(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)

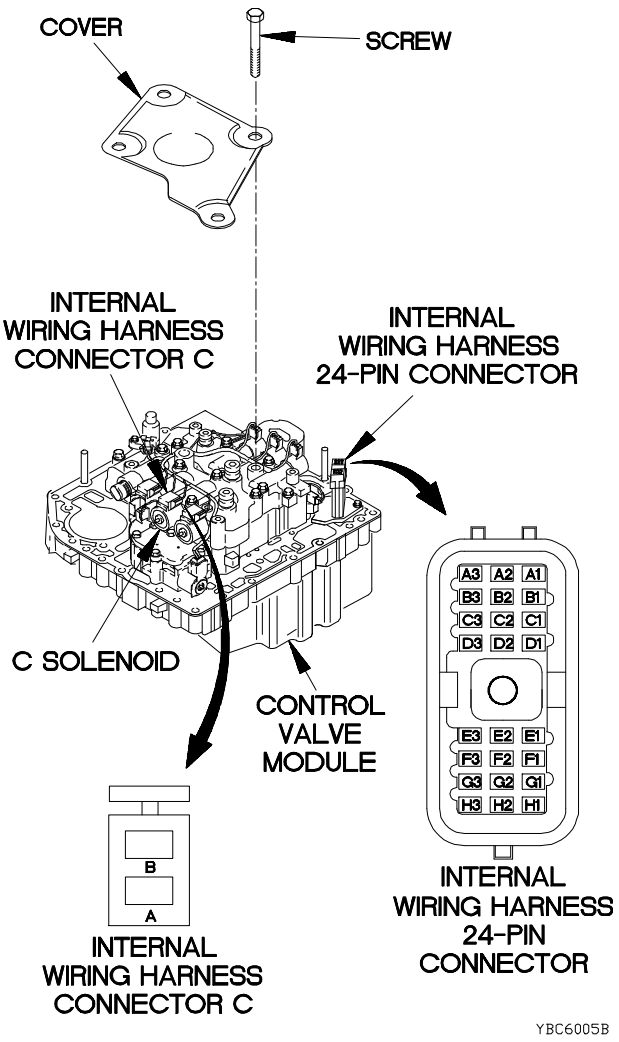


CAUTION

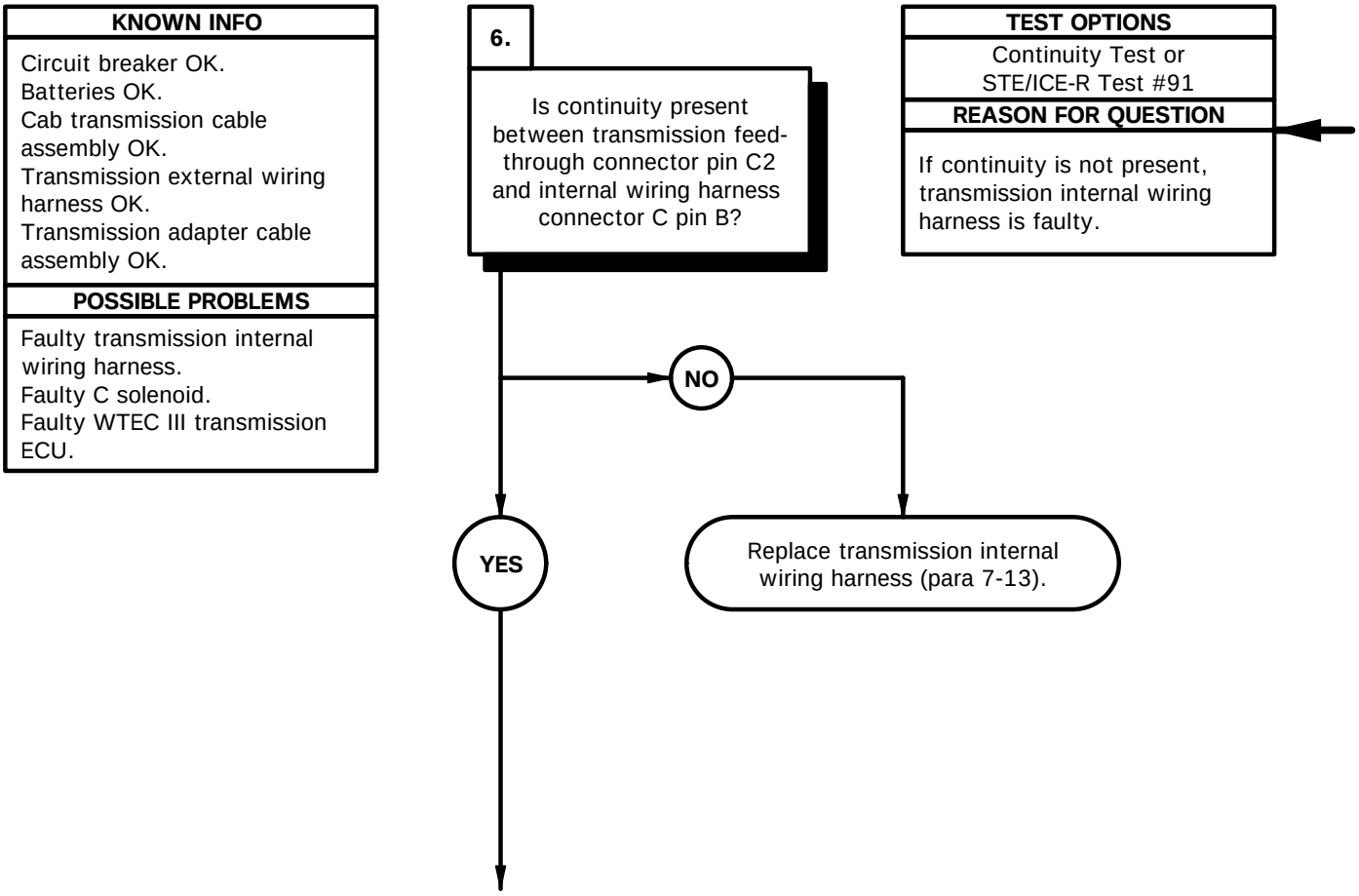
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

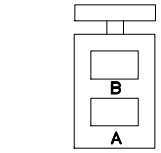


c60. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 14 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

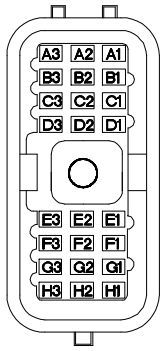


CONTINUITY TEST

(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).



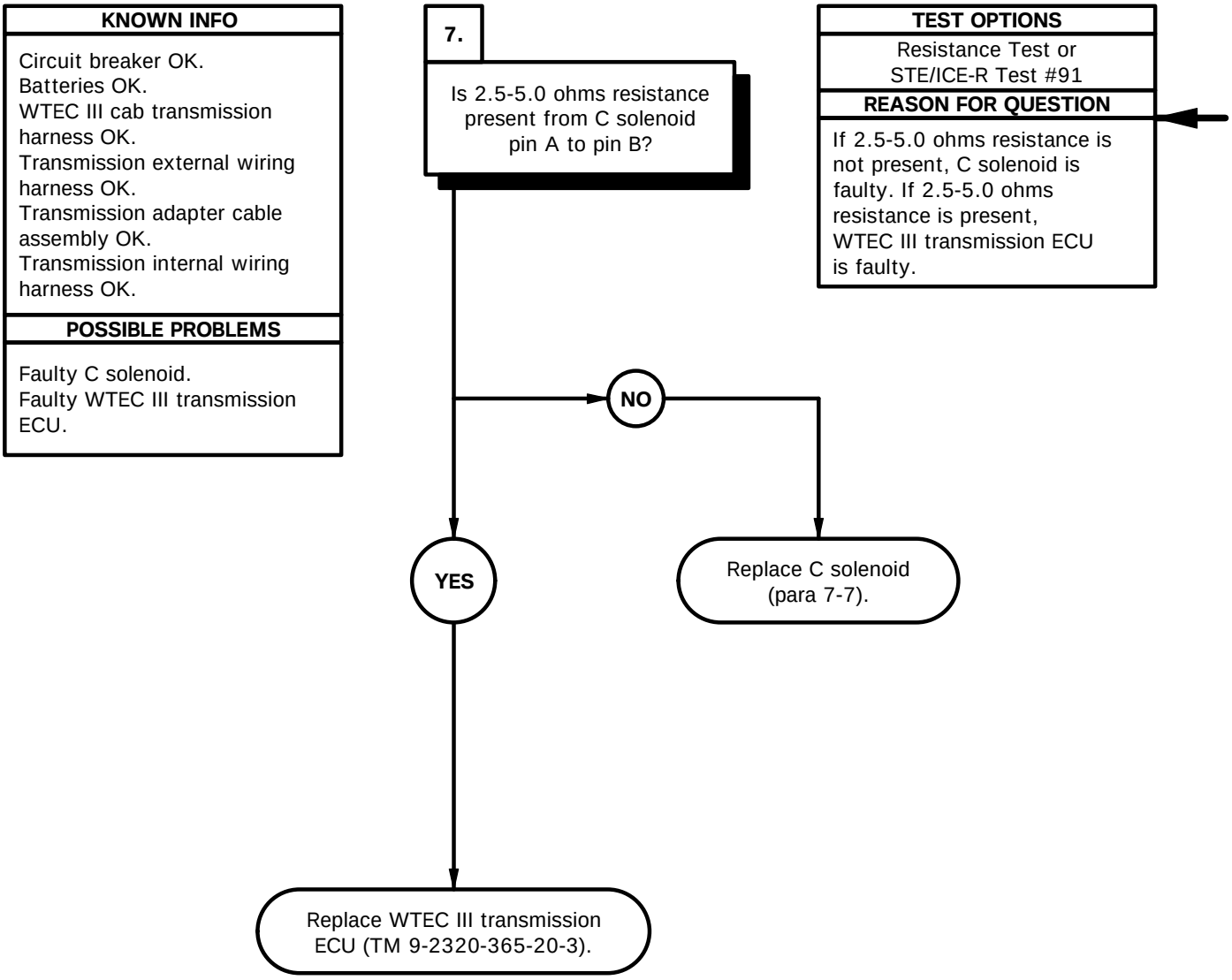
INTERNAL WIRING HARNESS CONNECTOR C



TRANSMISSION FEED-THROUGH CONNECTOR

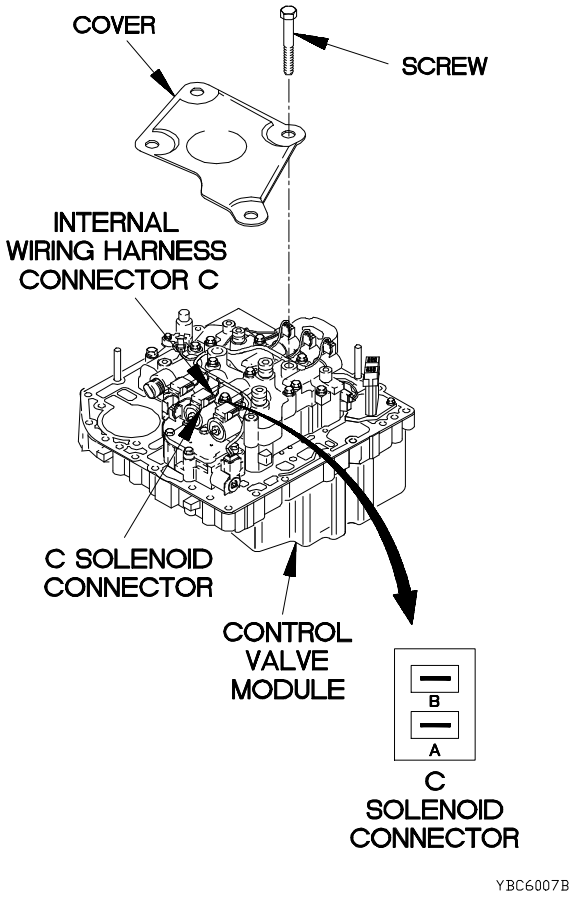
YBC6006B

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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)

Materials/Parts
Wire, Elect, 50 ft (Item 94, Appendix C)

Personnel Required
(2)

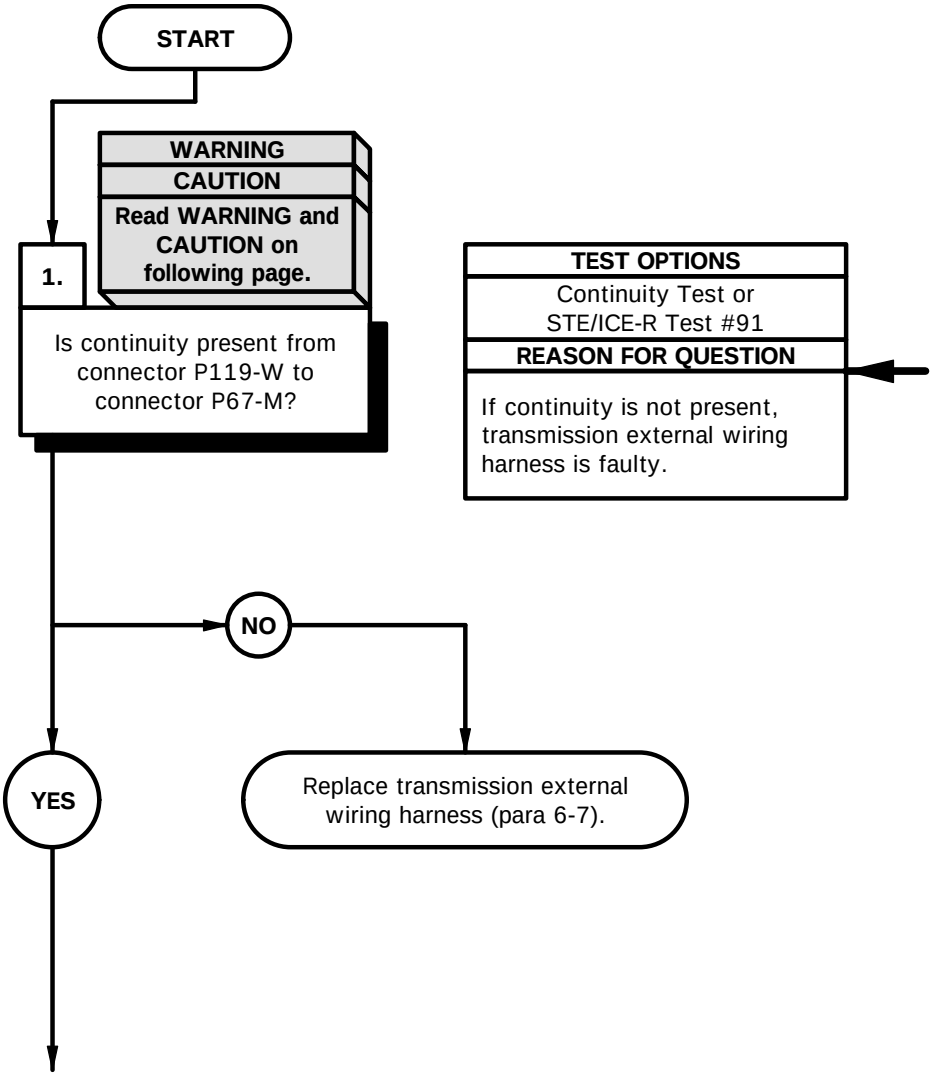
References
TM 9-4910-571-12&P

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 D solenoid.
Faulty WTEC III transmission ECU.



TEST OPTIONS

Continuity Test or
STE/ICE-R Test #91

REASON FOR QUESTION

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

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

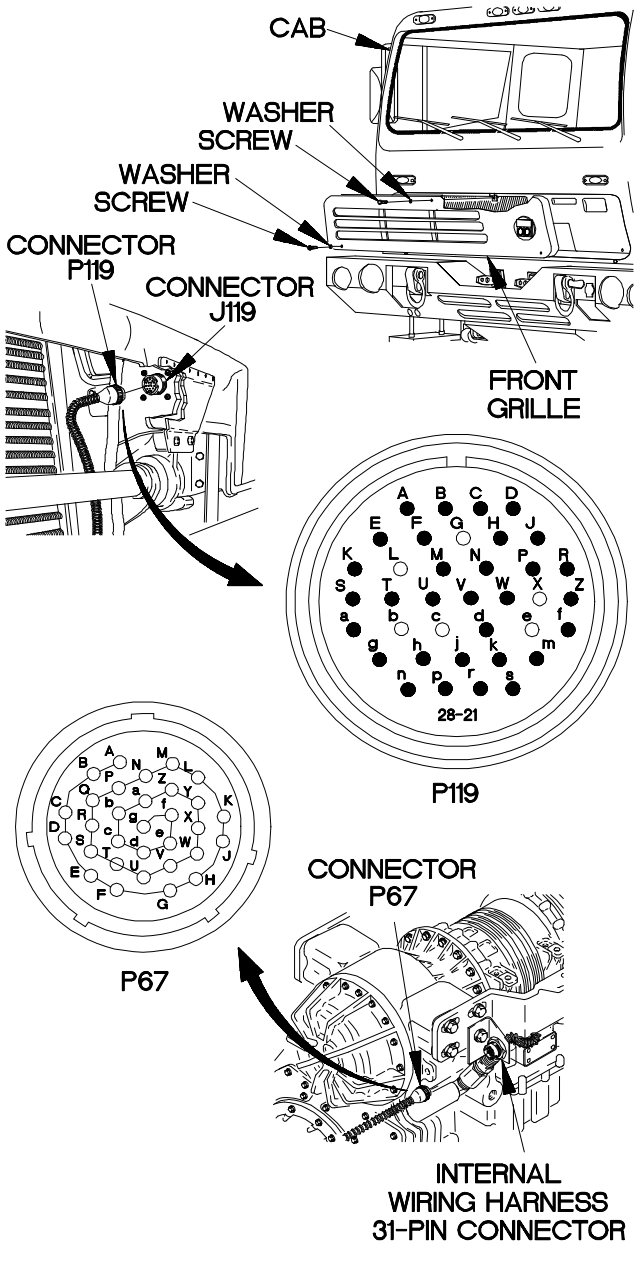
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

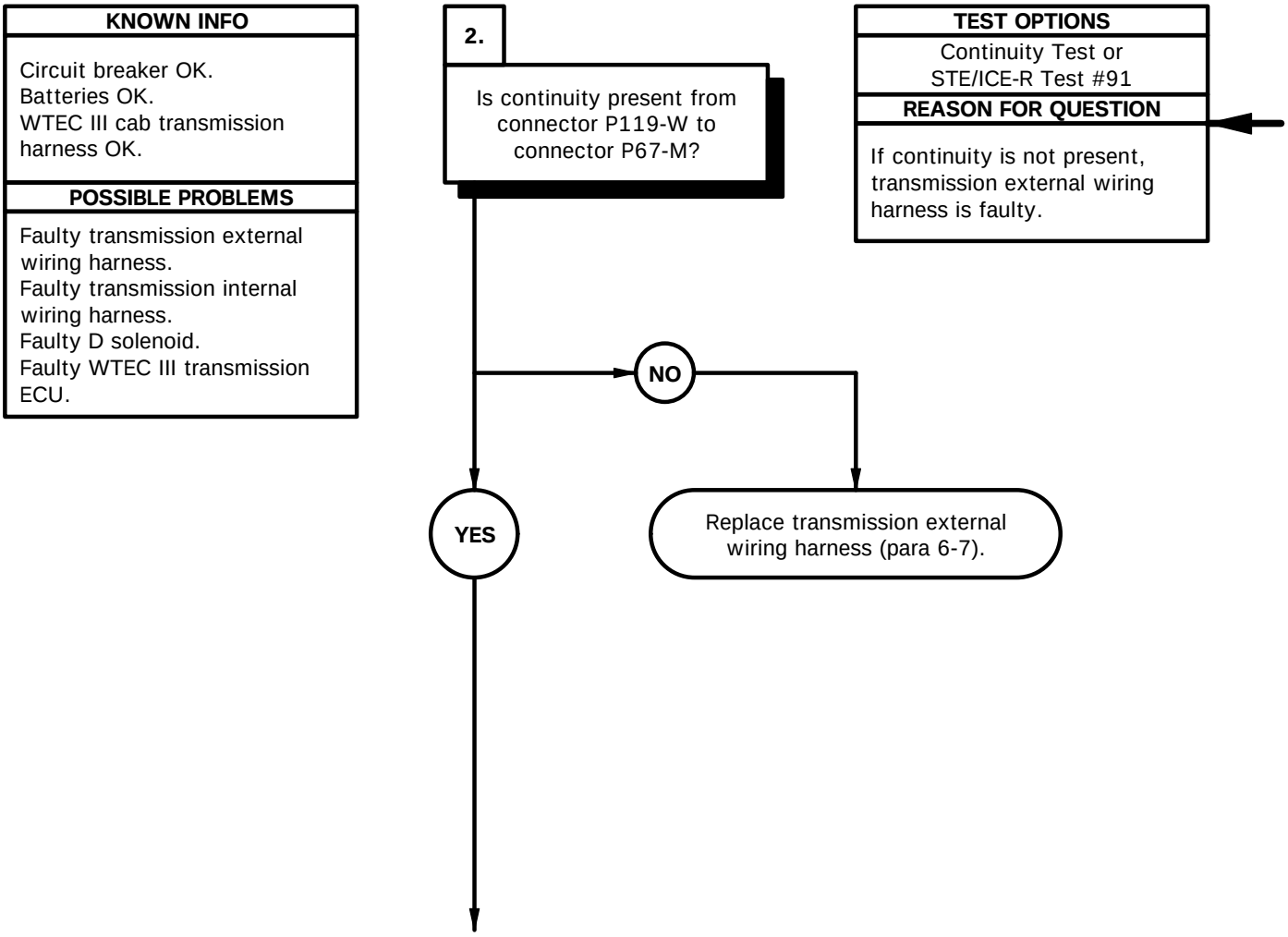
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from internal wiring harness 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect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

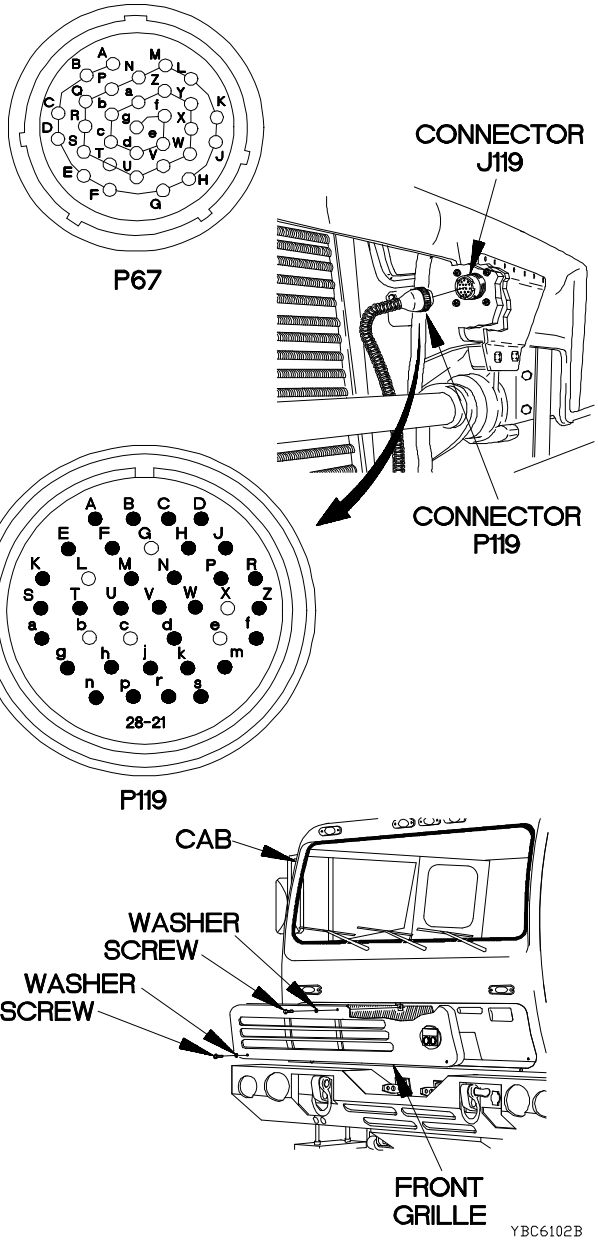


c61. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

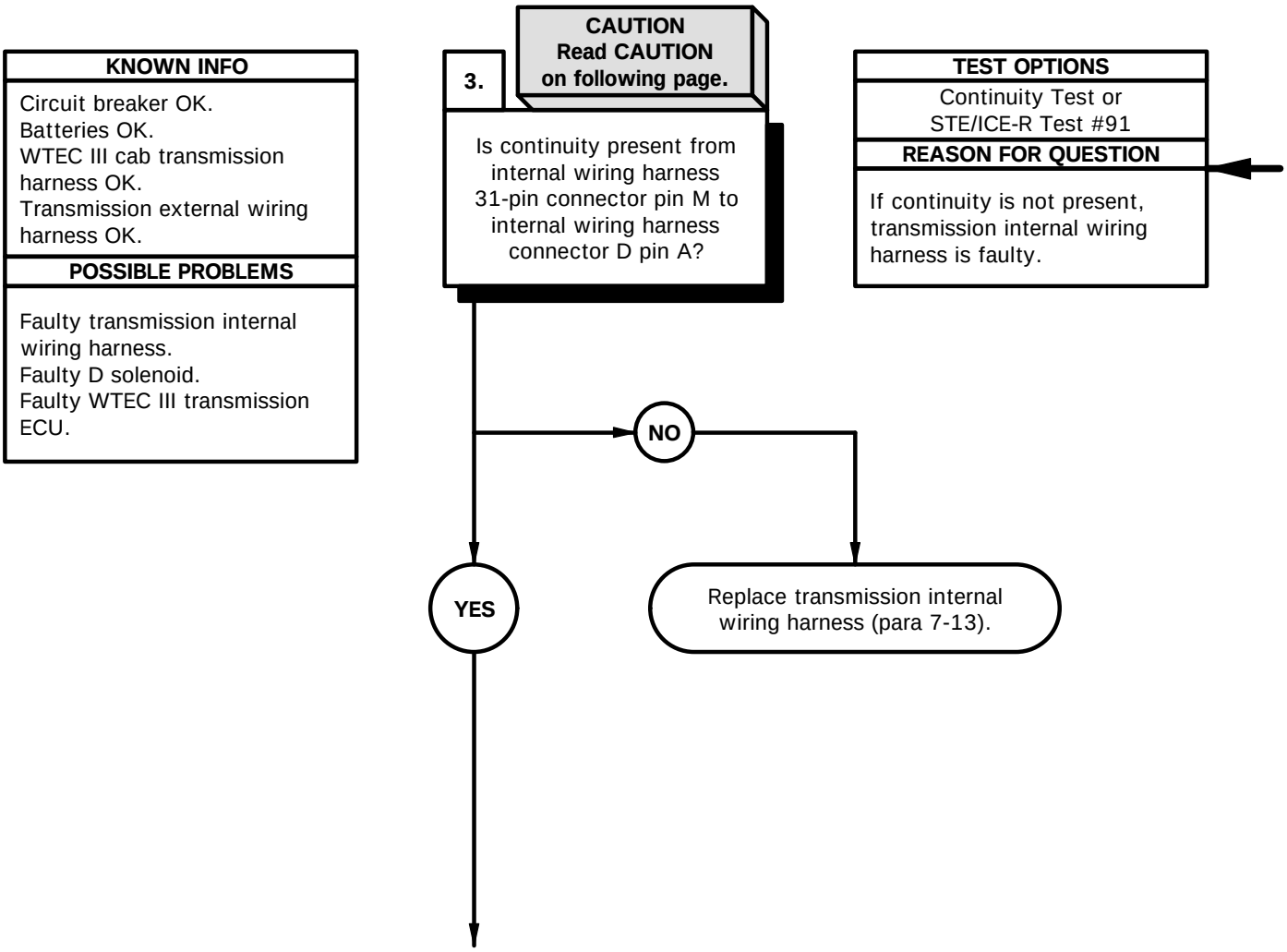


CONTINUITY TEST

(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)

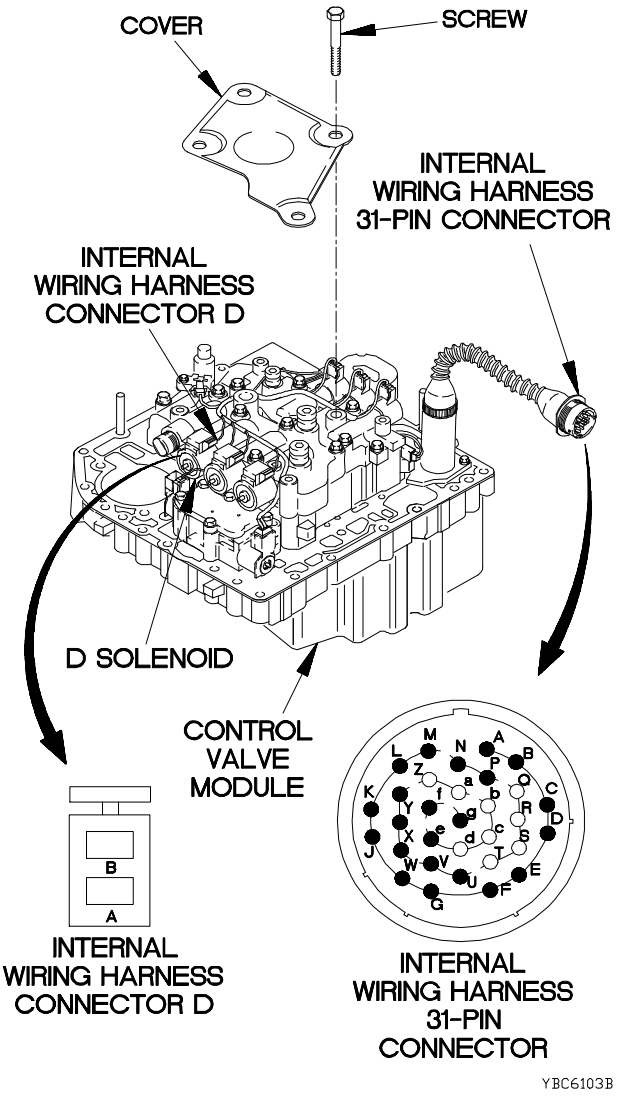


CAUTION

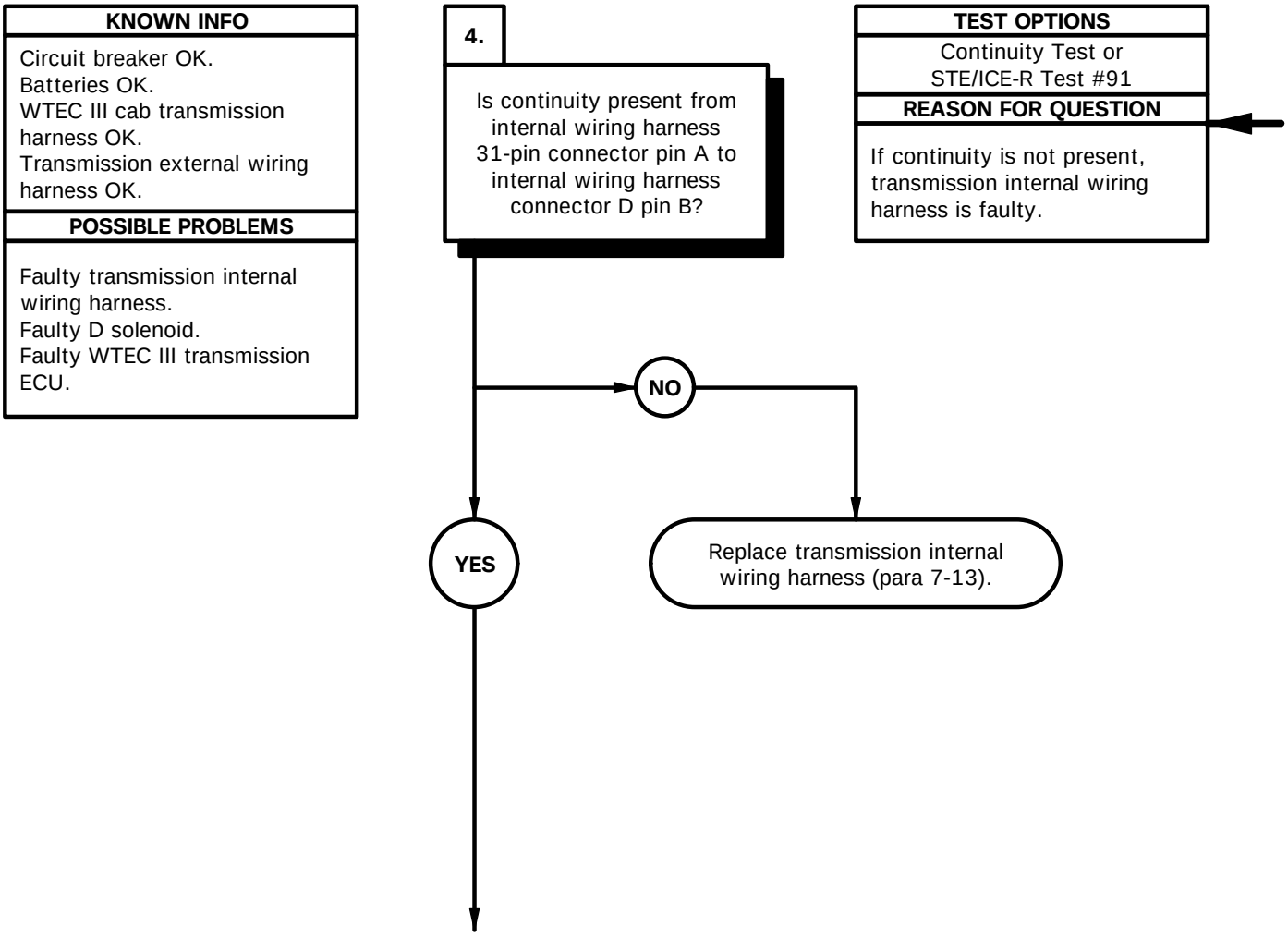
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

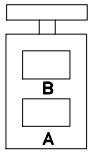


c61. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 15 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

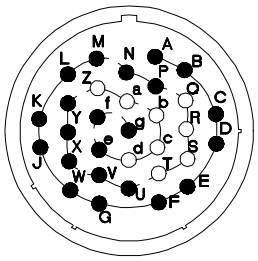


CONTINUITY TEST

(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).



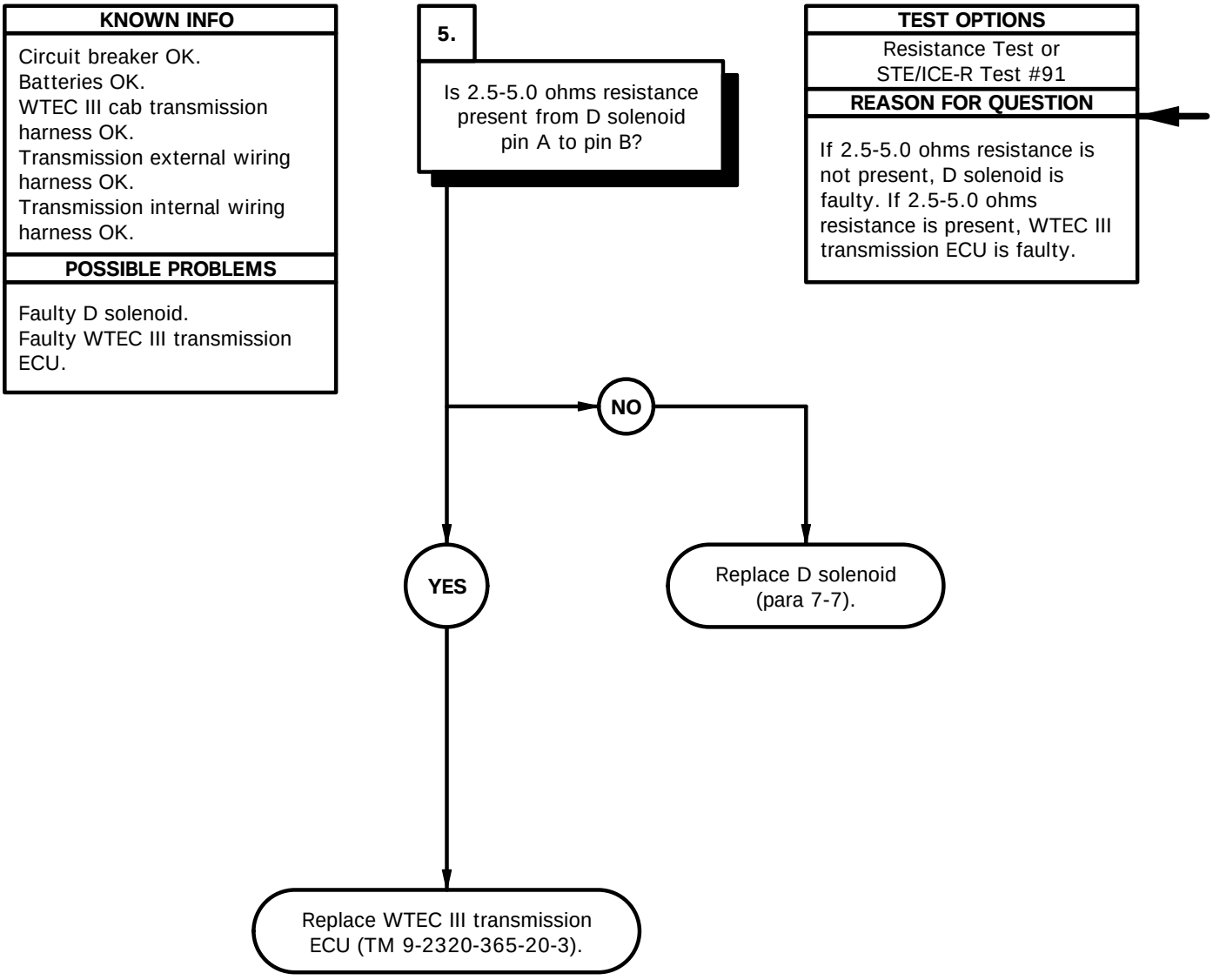
INTERNAL
WIRING HARNESS
CONNECTOR D



INTERNAL
WIRING HARNESS
31-PIN
CONNECTOR

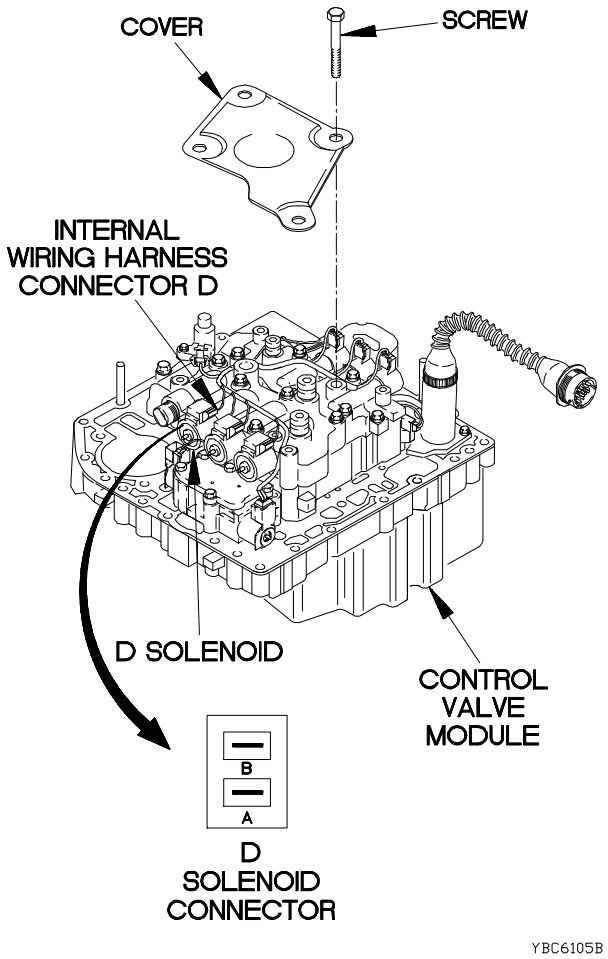
YBC6104B

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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

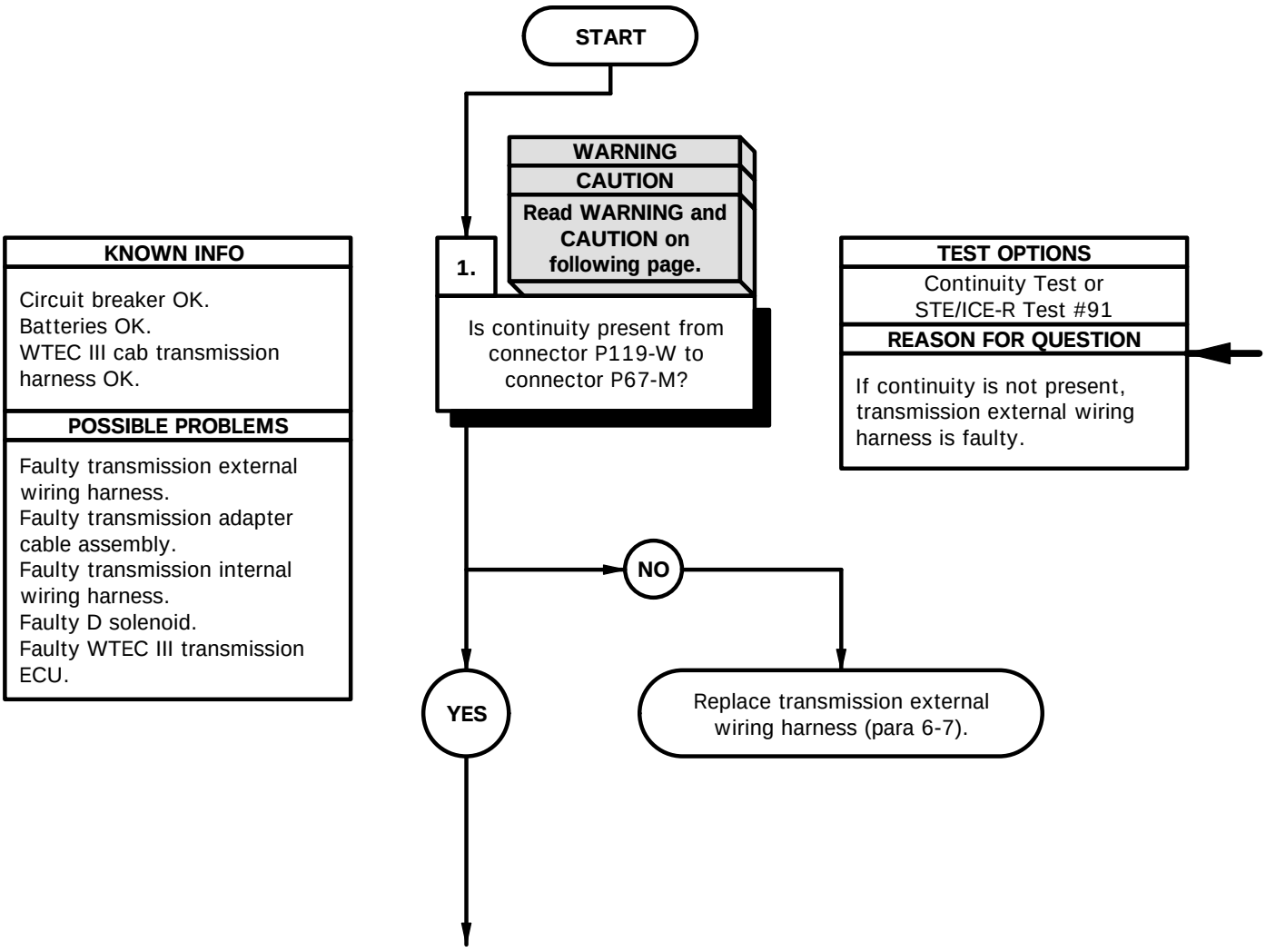
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

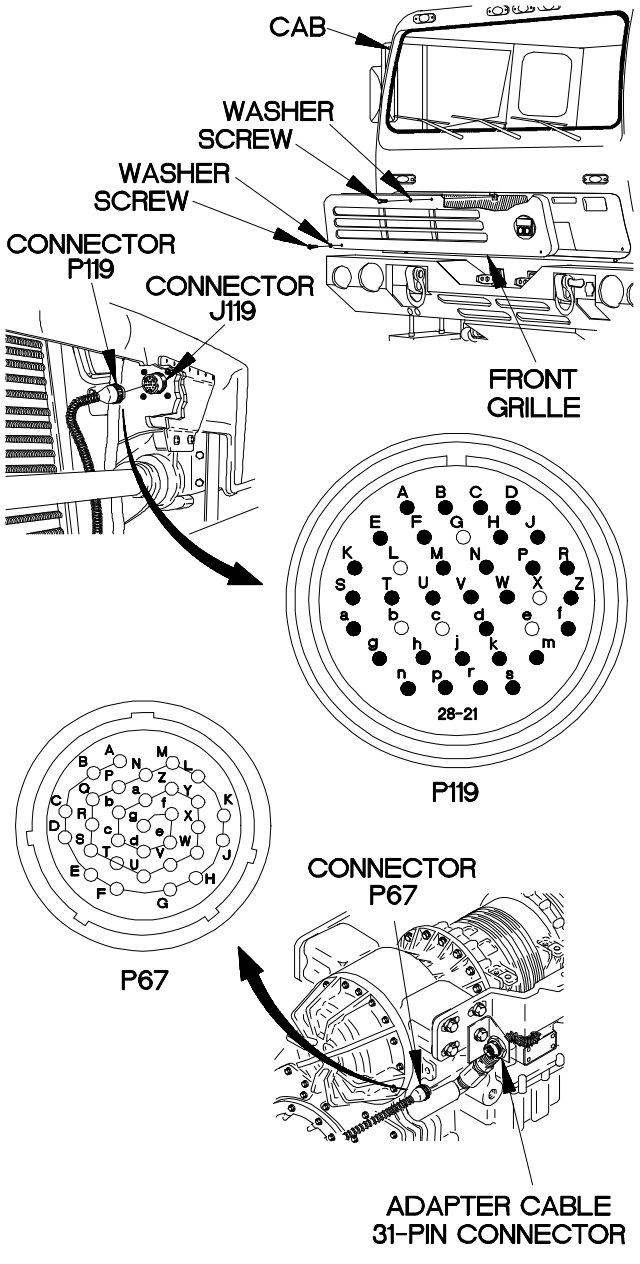
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

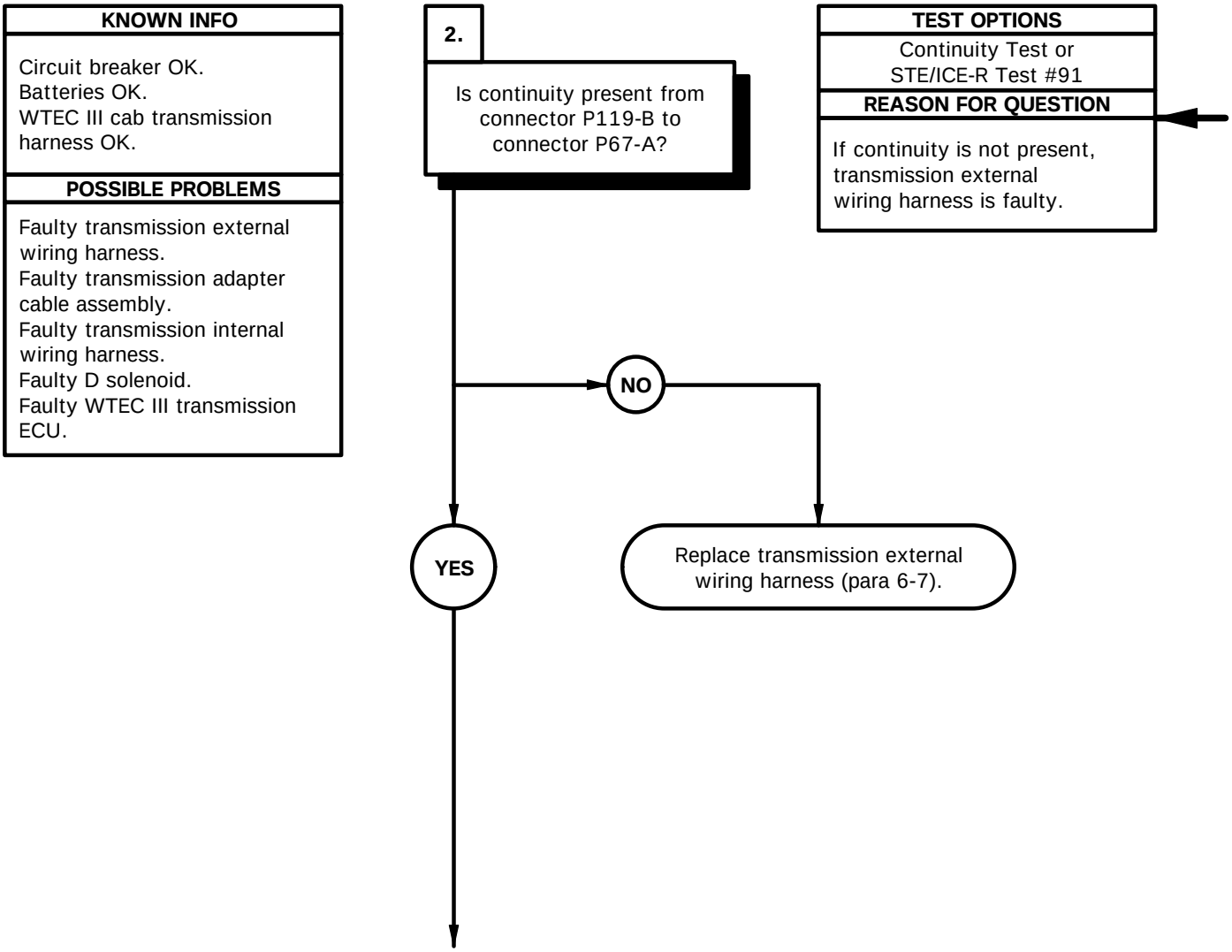
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from adapter cable 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect positive (+)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

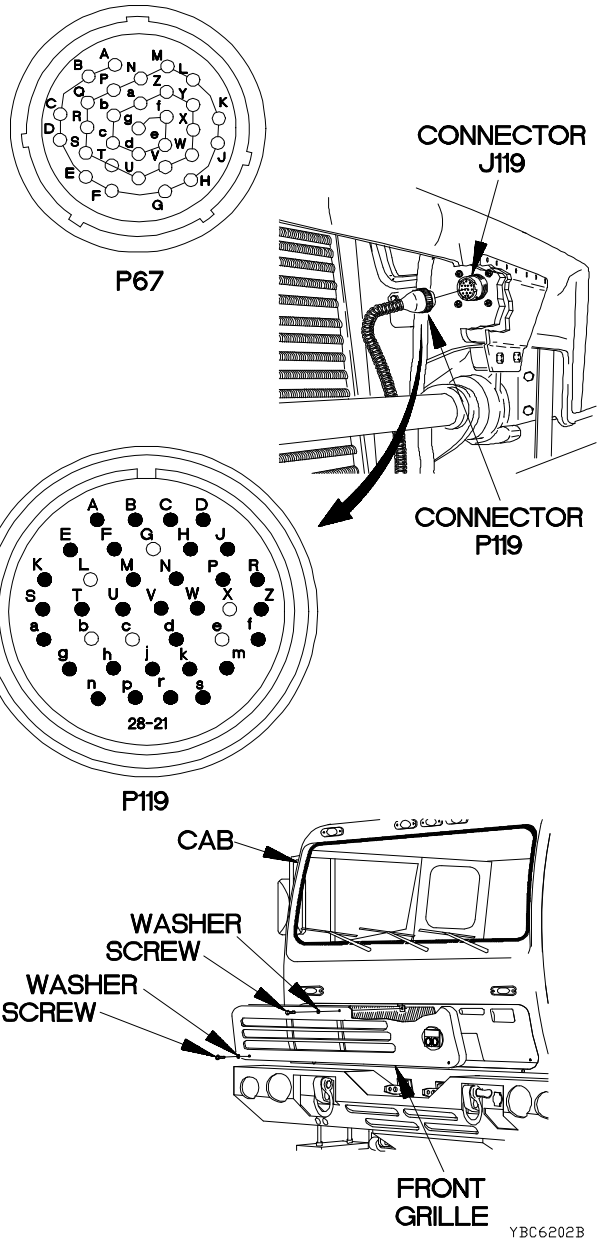


c62. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

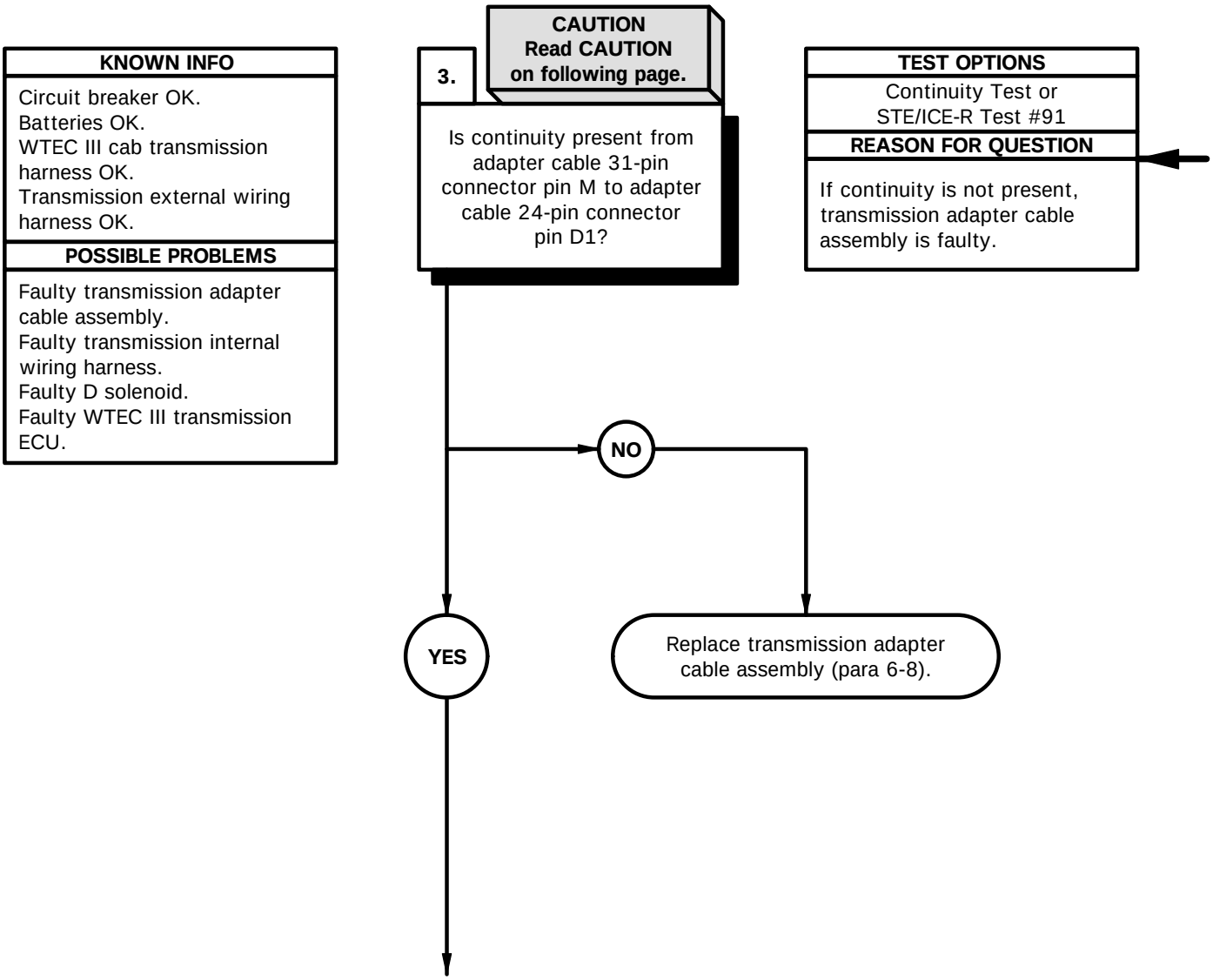


CONTINUITY TEST

(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)

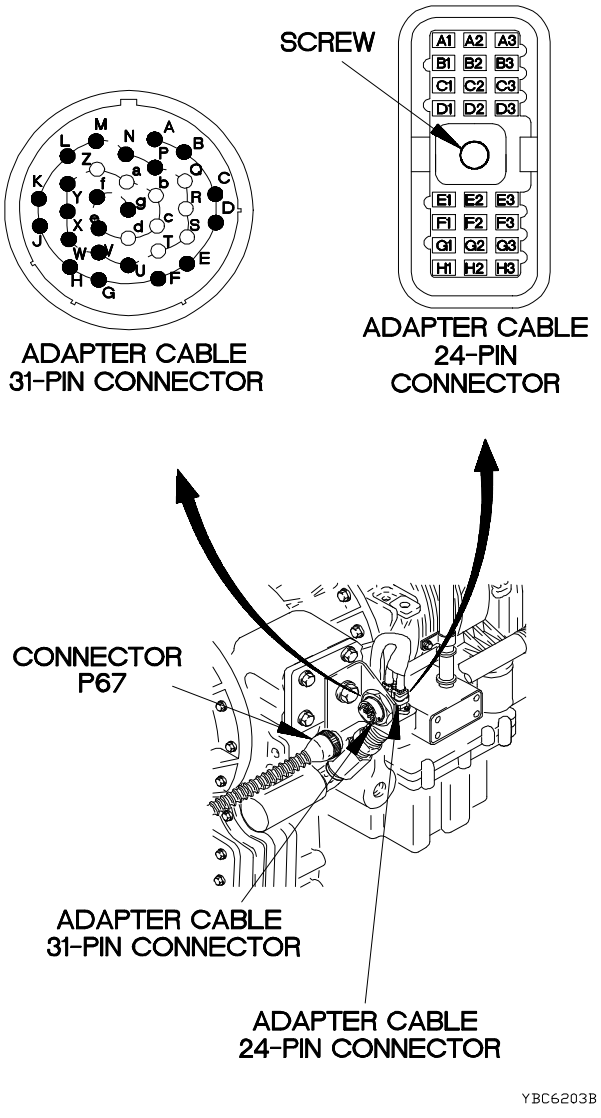


CAUTION

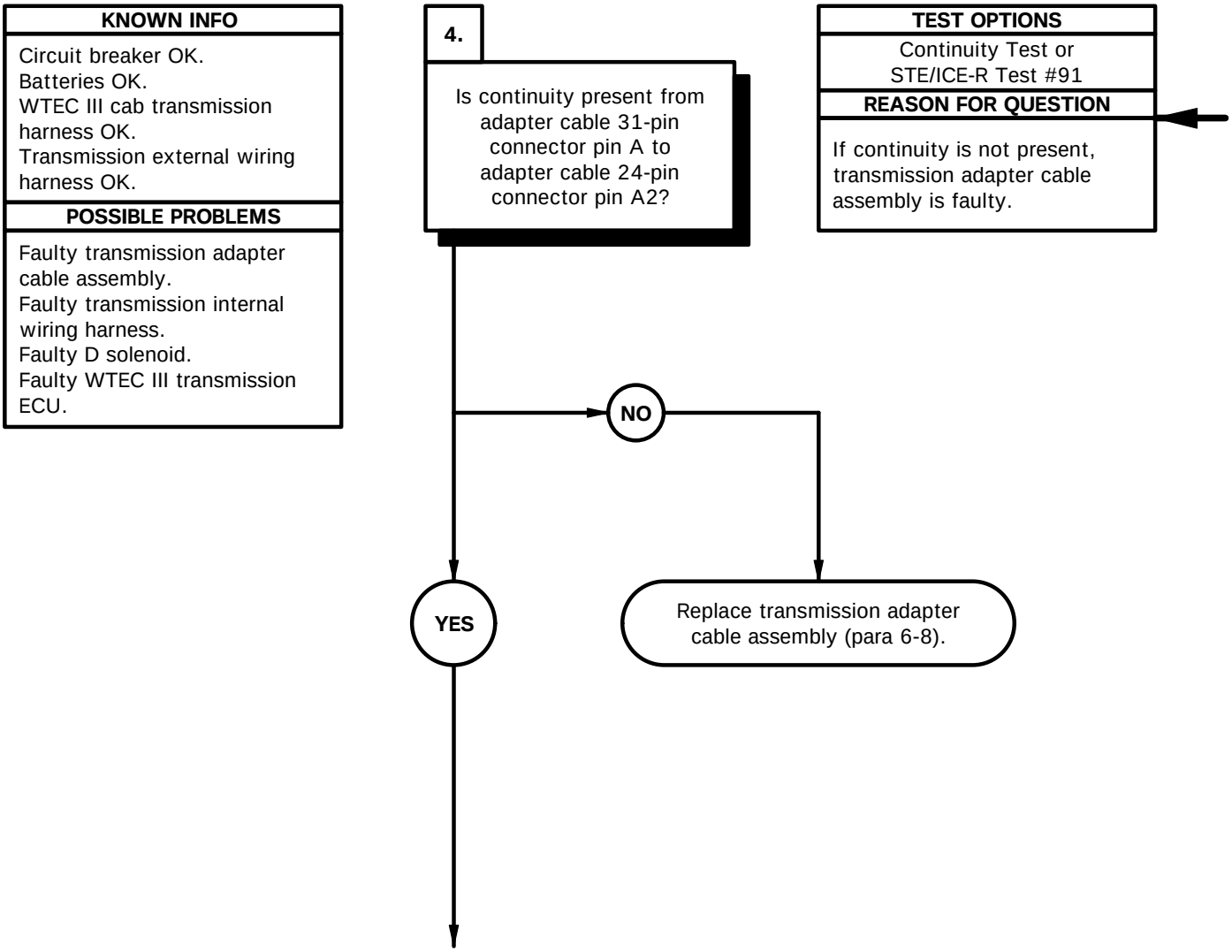
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

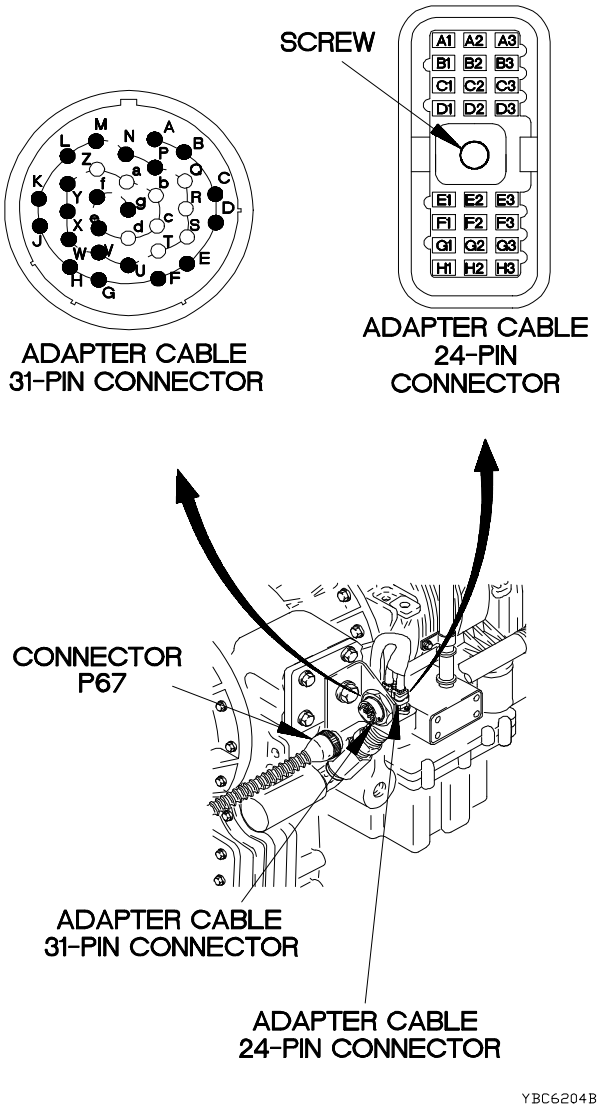


c62. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

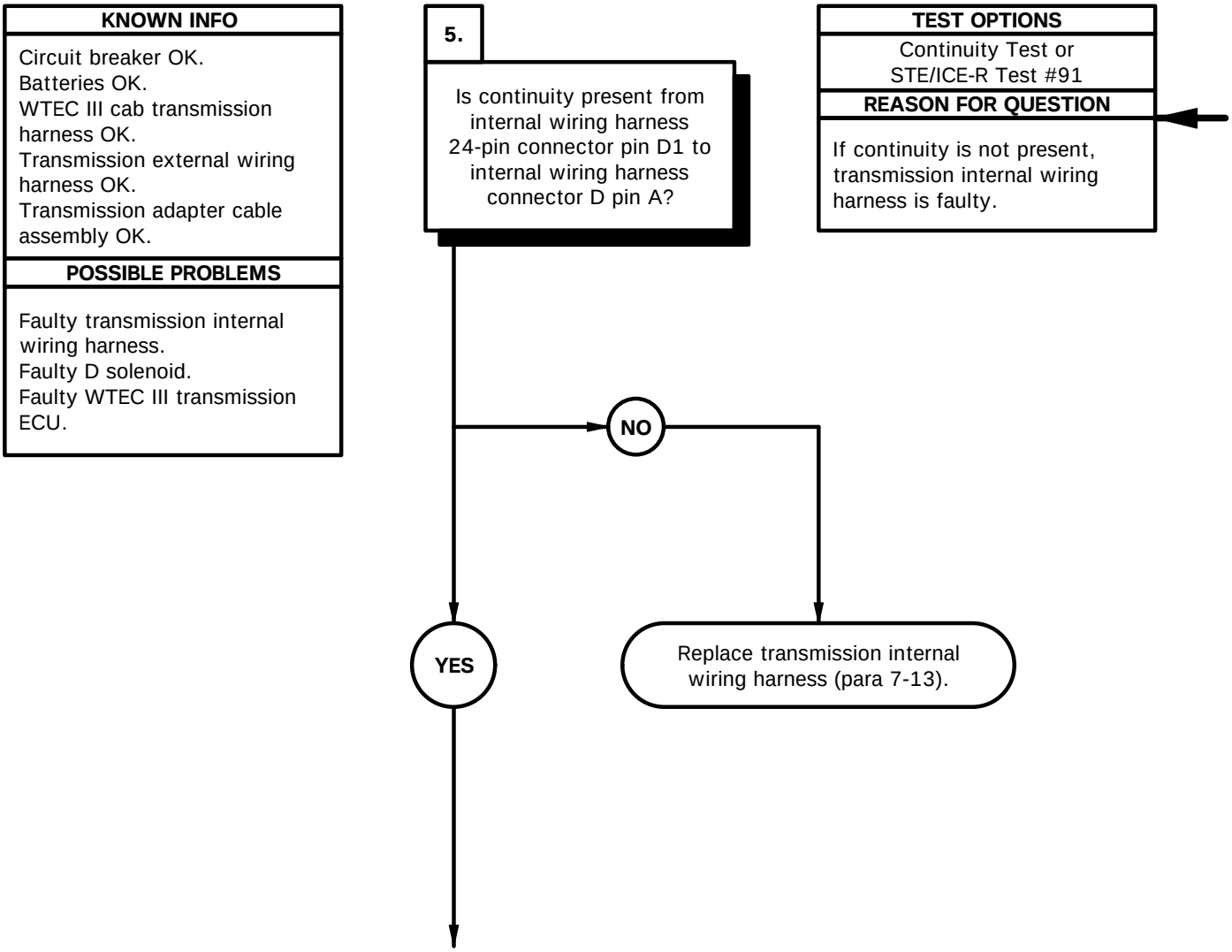


CONTINUITY TEST

(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.

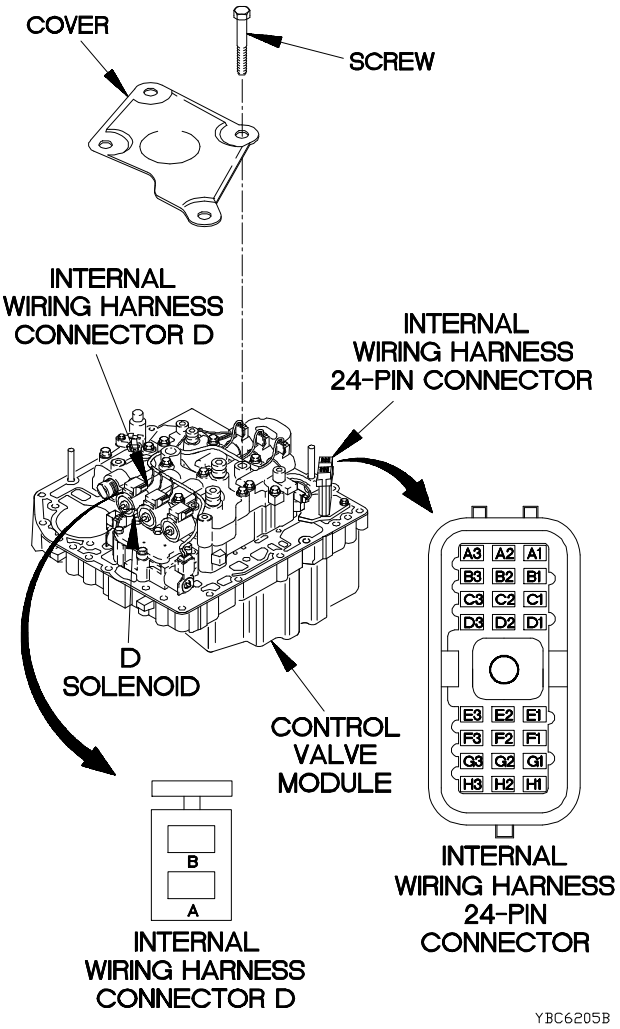


c62. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

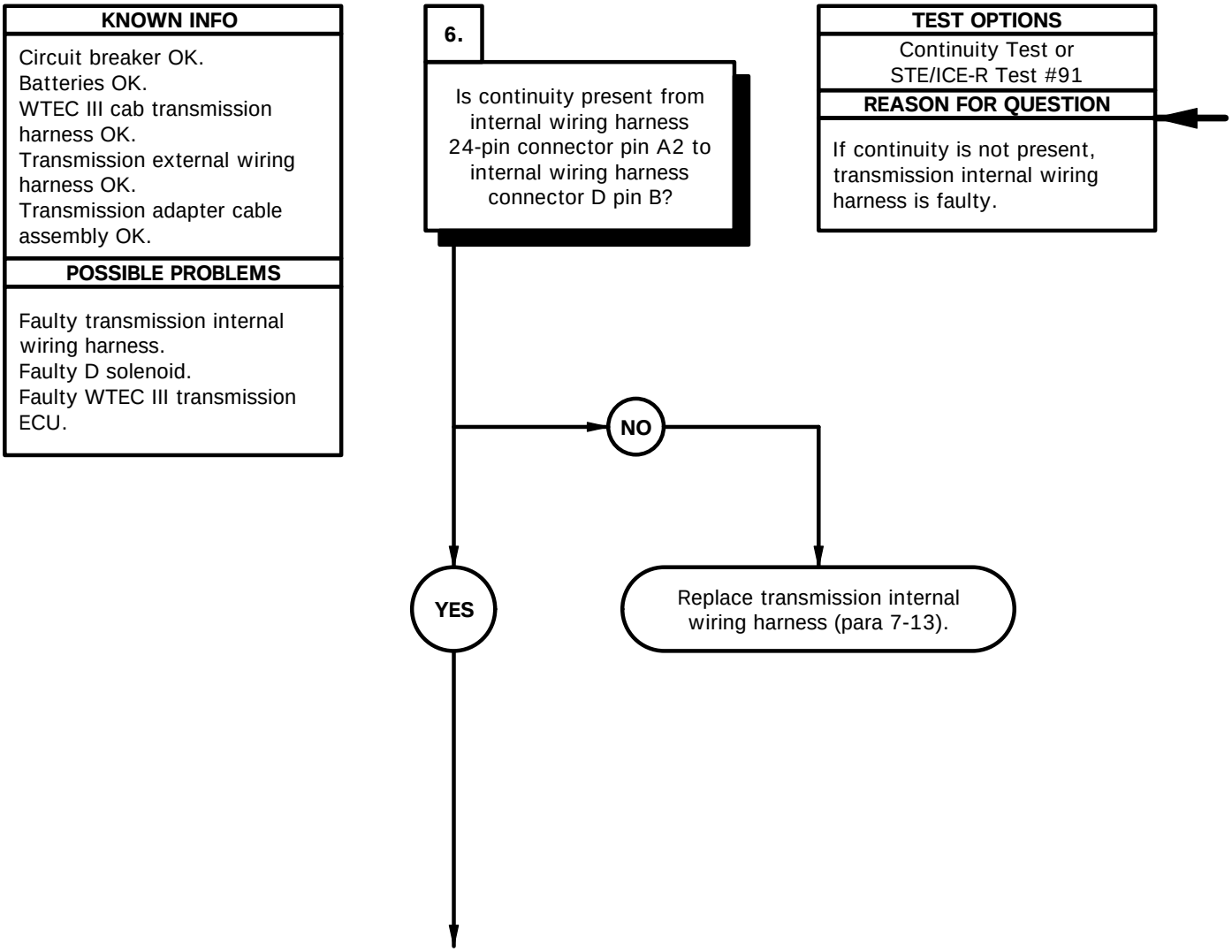


CONTINUITY TEST

(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).

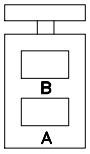


c62. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 15 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

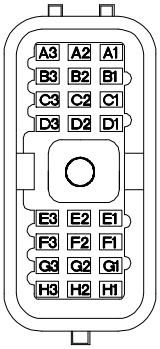


CONTINUITY TEST

(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).



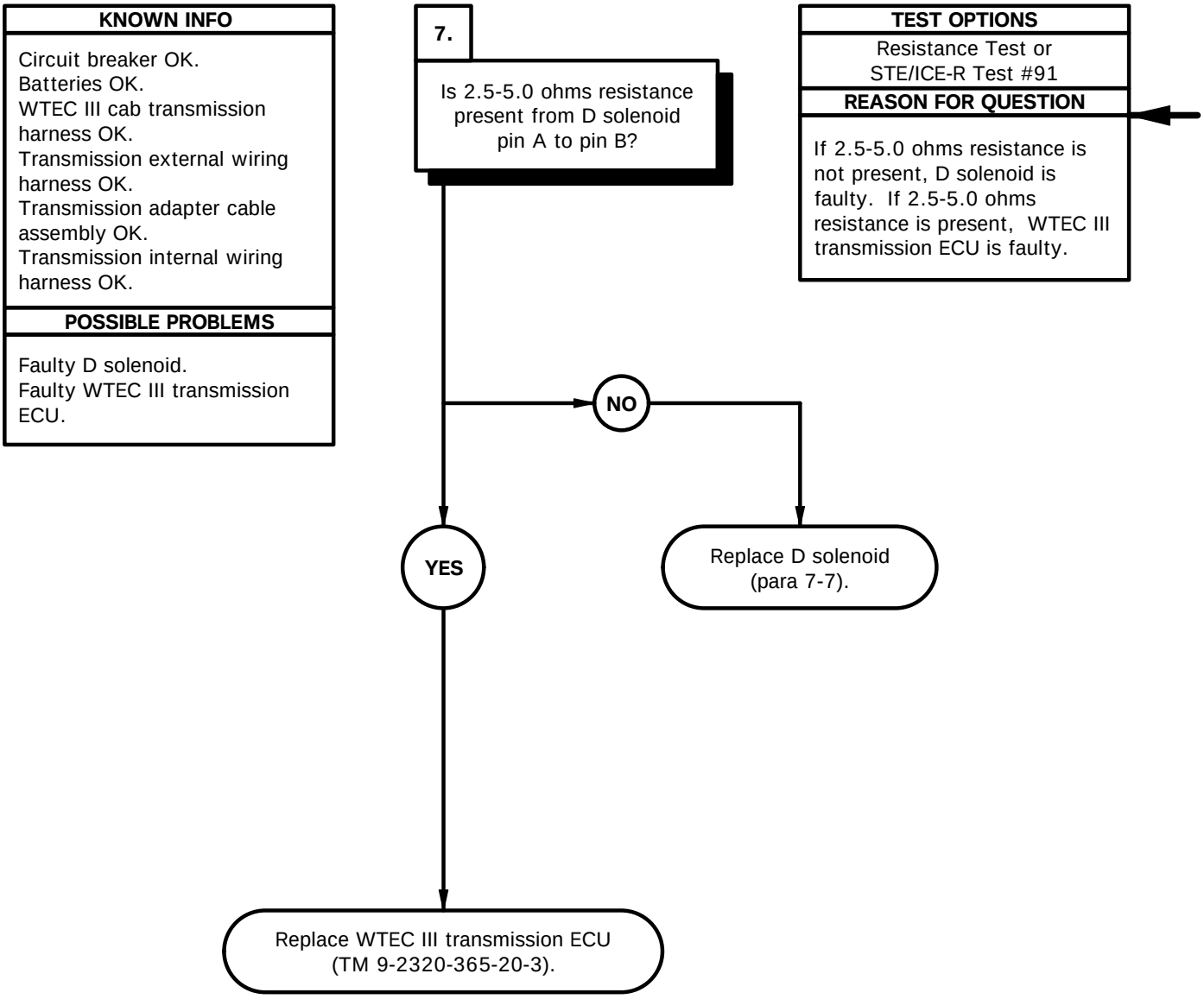
INTERNAL WIRING HARNESS CONNECTOR D



INTERNAL WIRING HARNESS 24-PIN CONNECTOR

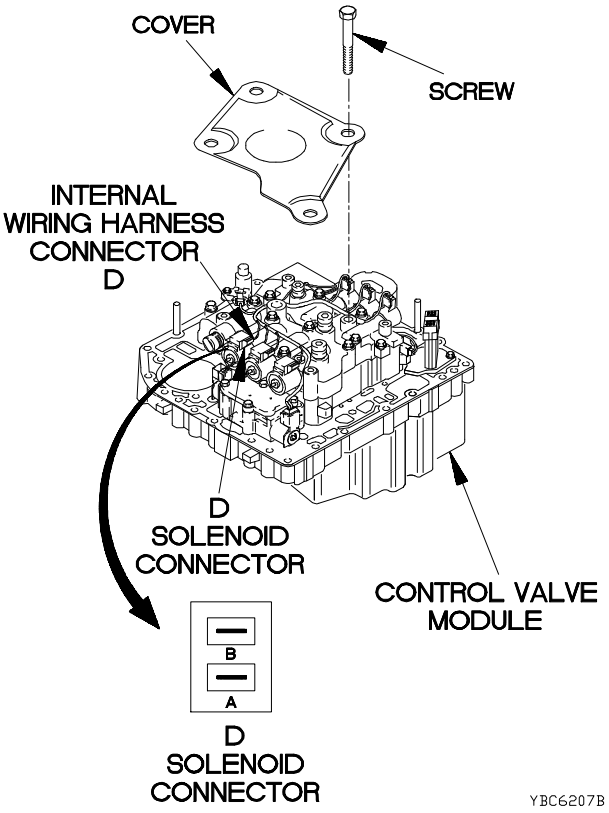
YBC6206B

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



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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)

Materials/Parts
Wire, Elect, 50 ft (Item 94, Appendix C)

Personnel Required
(2)

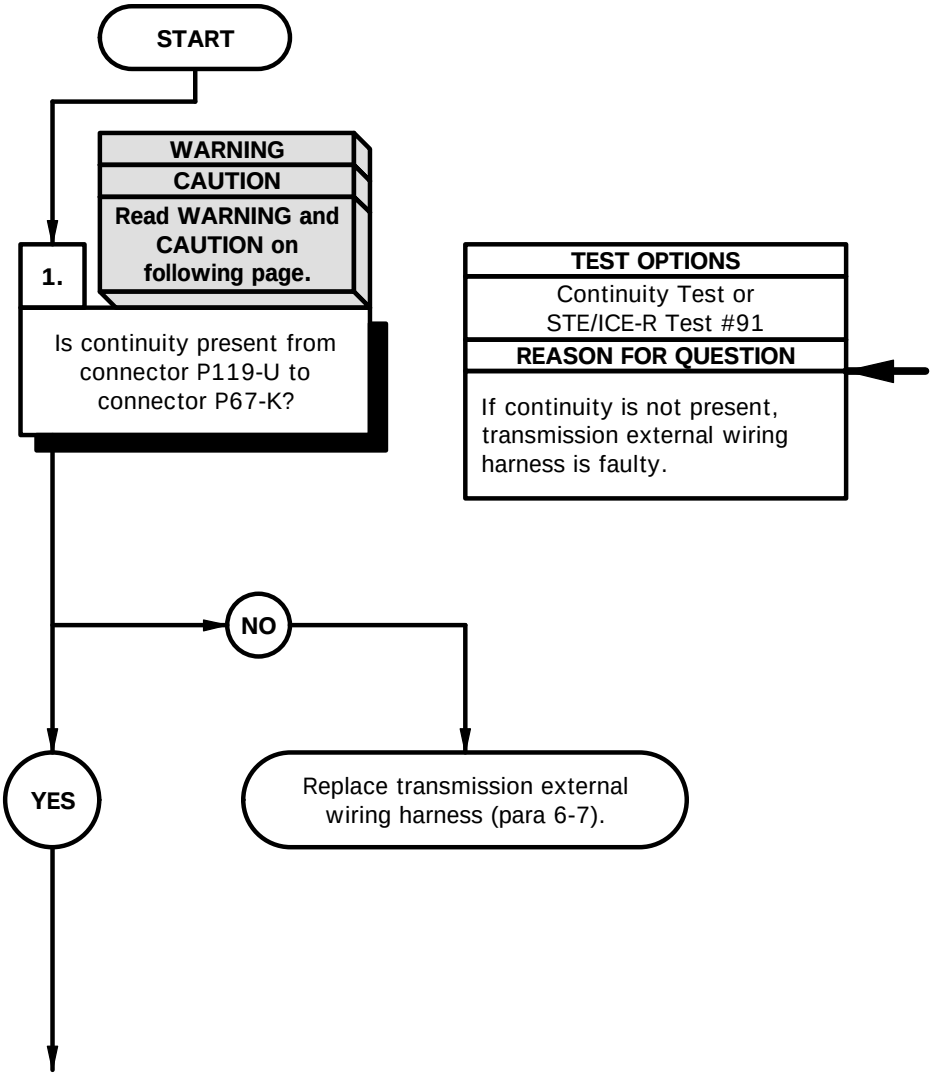
References
TM 9-4910-571-12&P

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 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

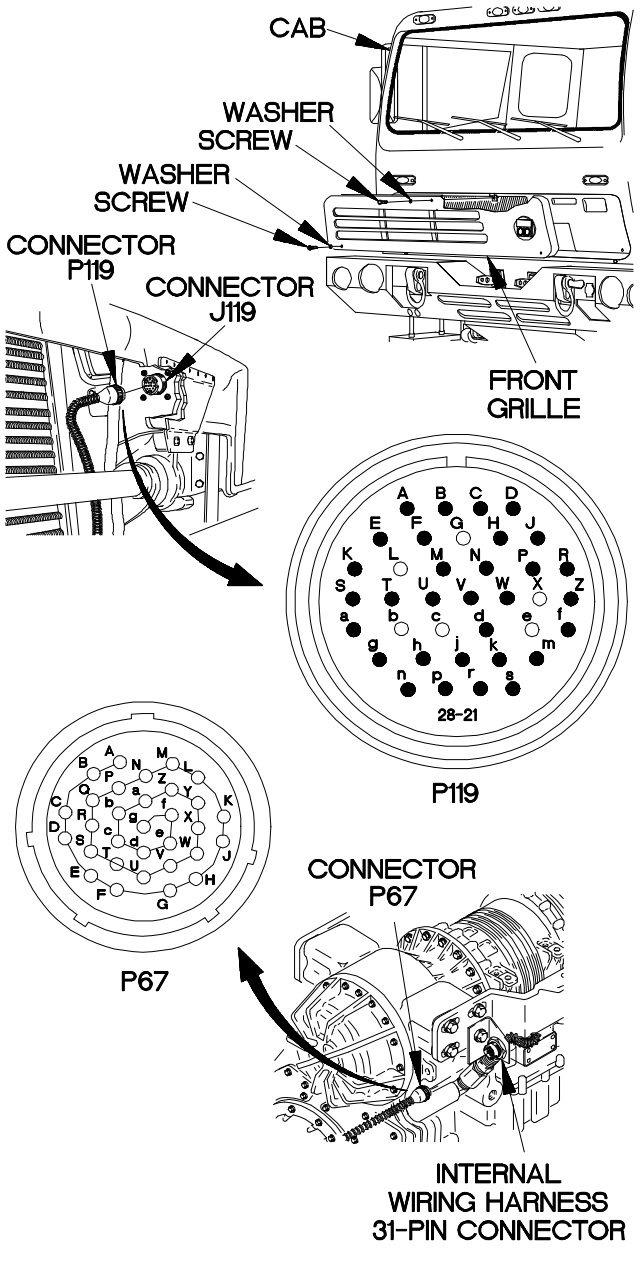
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

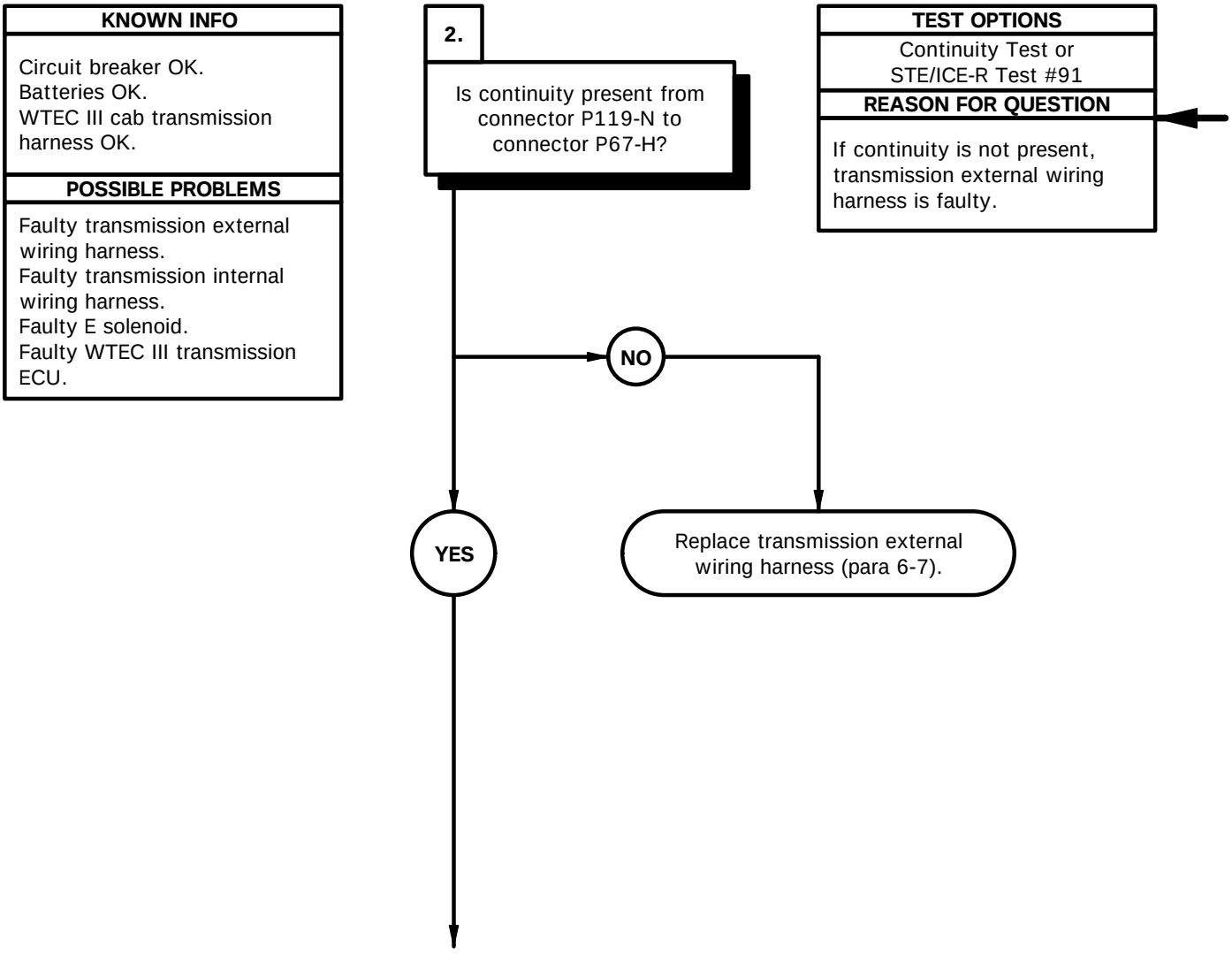
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from internal wiring harness 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect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

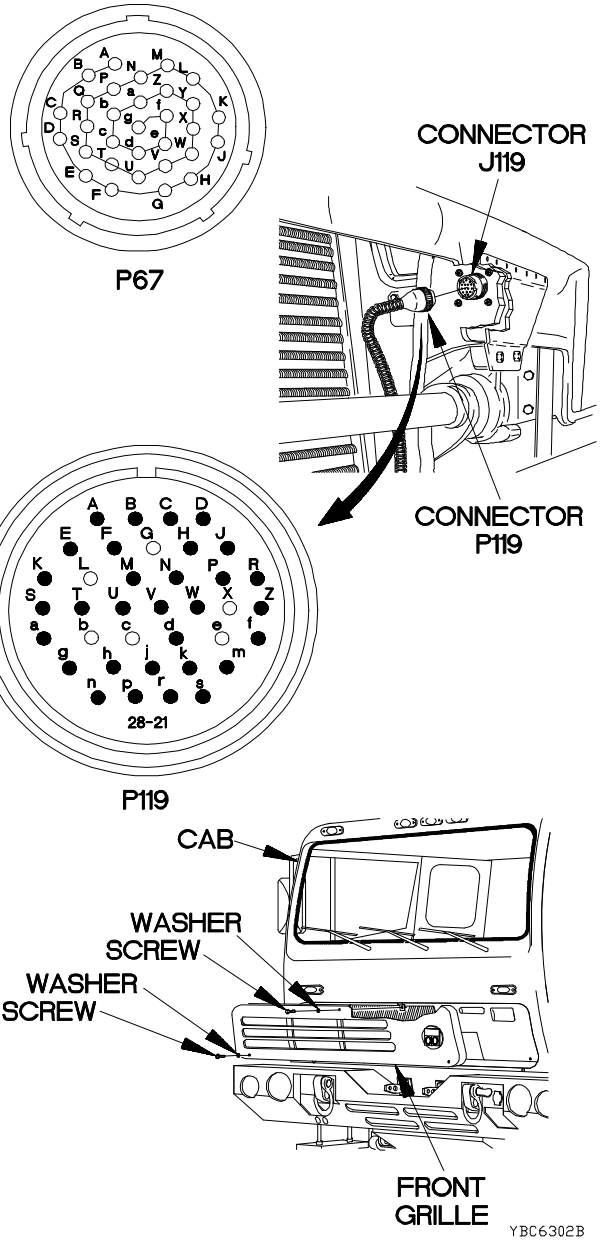


c63. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 16 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

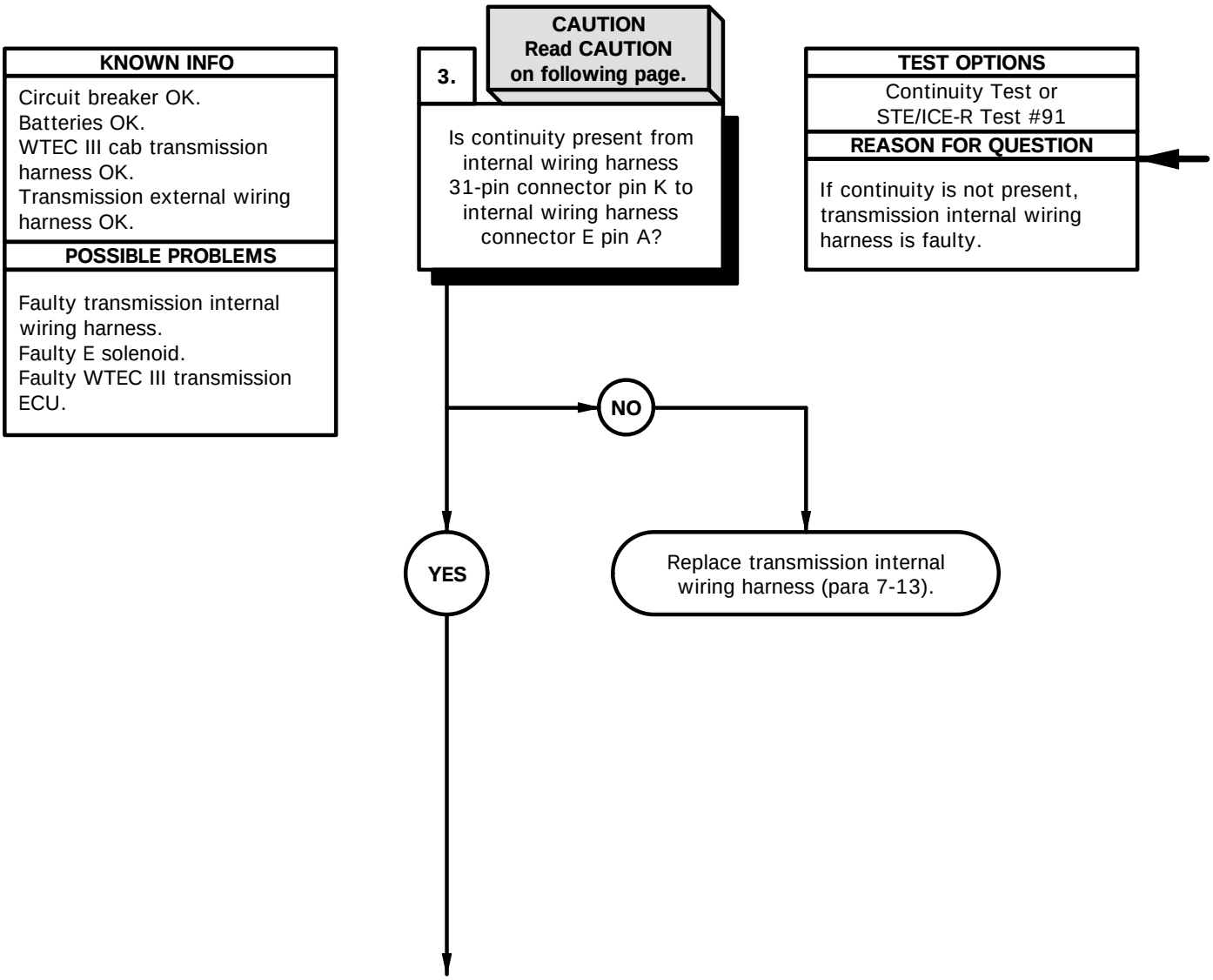


CONTINUITY TEST

(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)

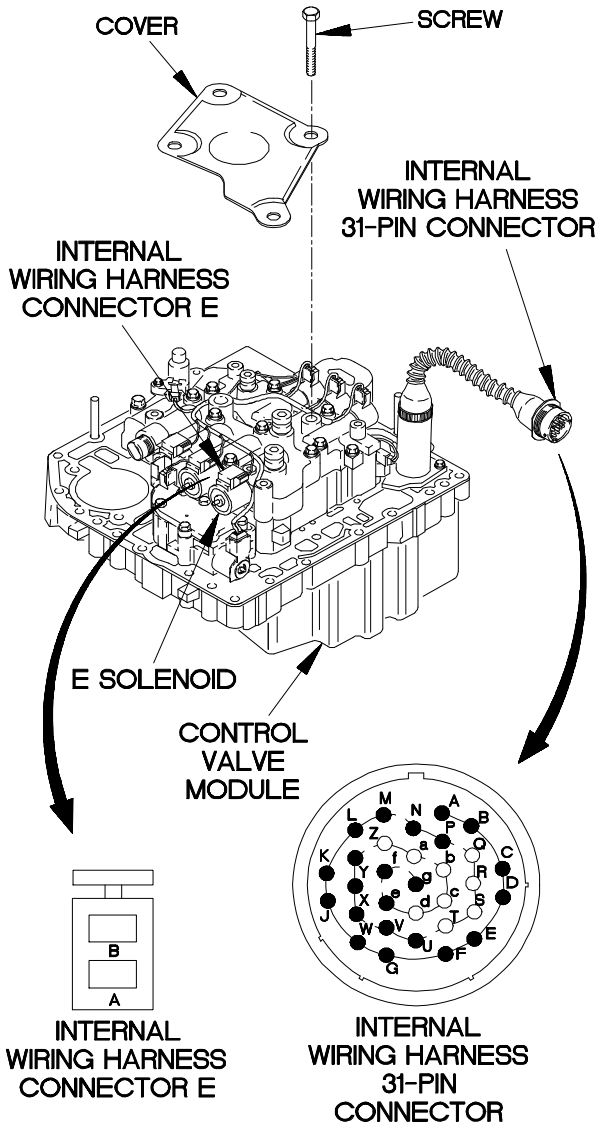


CAUTION

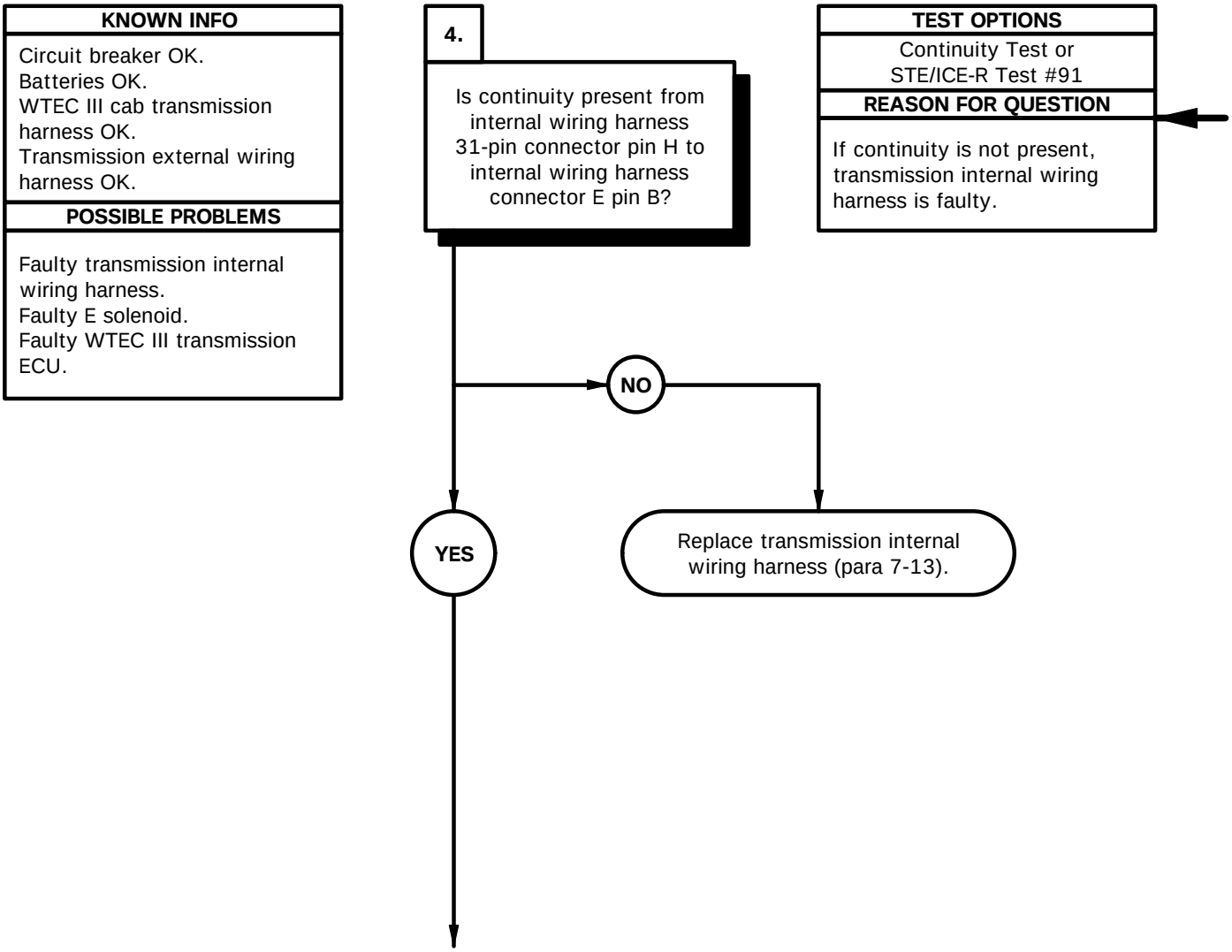
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

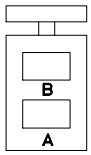


c63. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 16 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

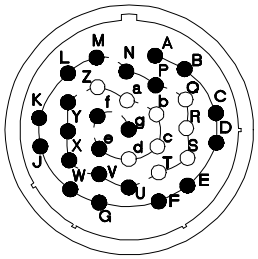


CONTINUITY TEST

(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).



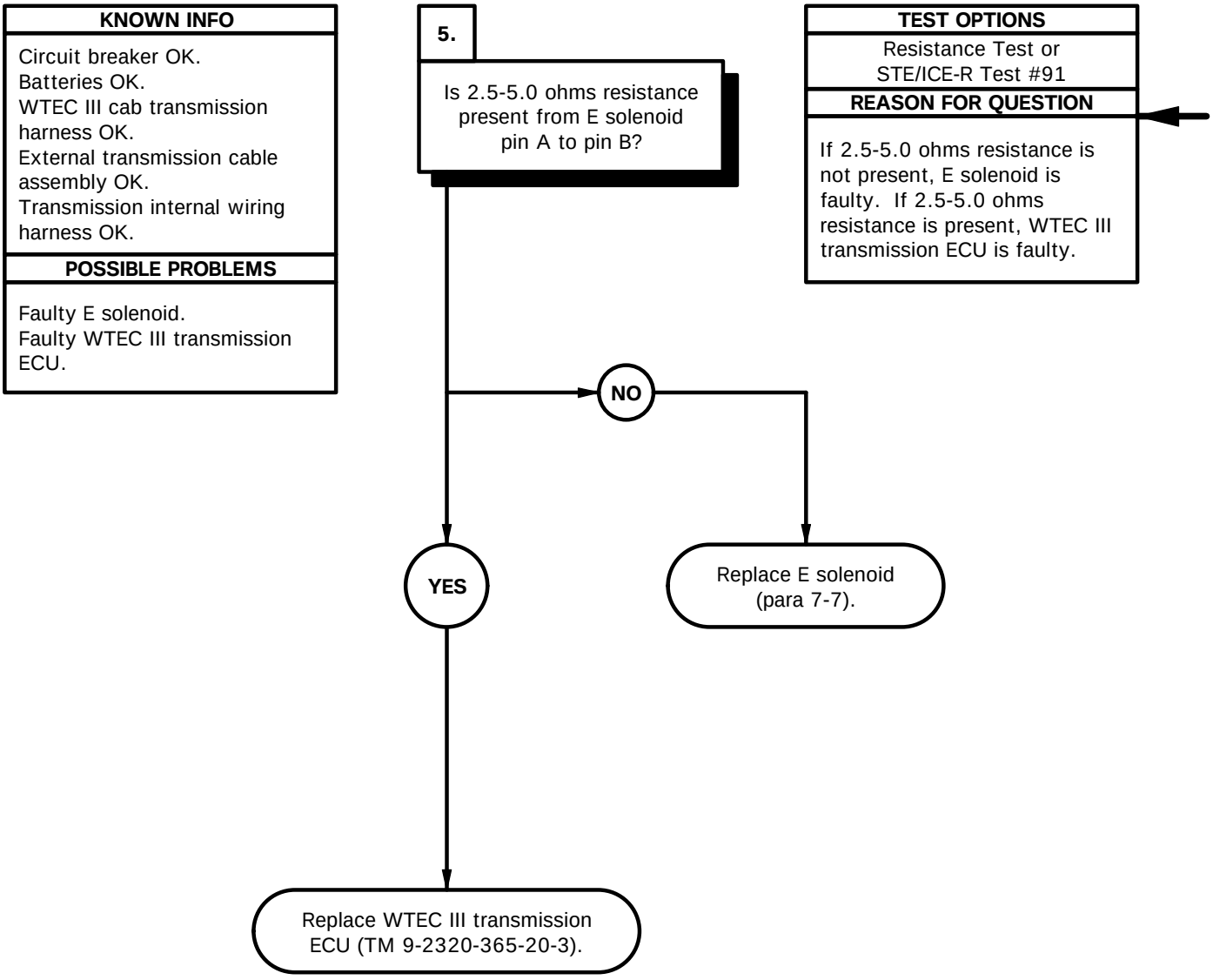
INTERNAL WIRING HARNESS CONNECTOR E



INTERNAL WIRING HARNESS 31-PIN CONNECTOR

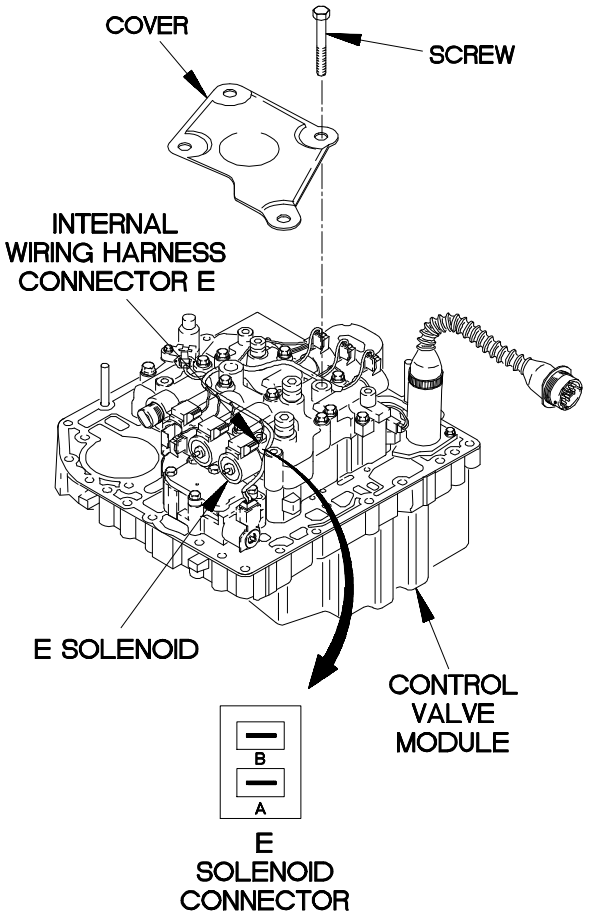
YBC6304B

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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)

Materials/Parts
Wire, Elect, 50 ft (Item 94, Appendix C)

Personnel Required
(2)

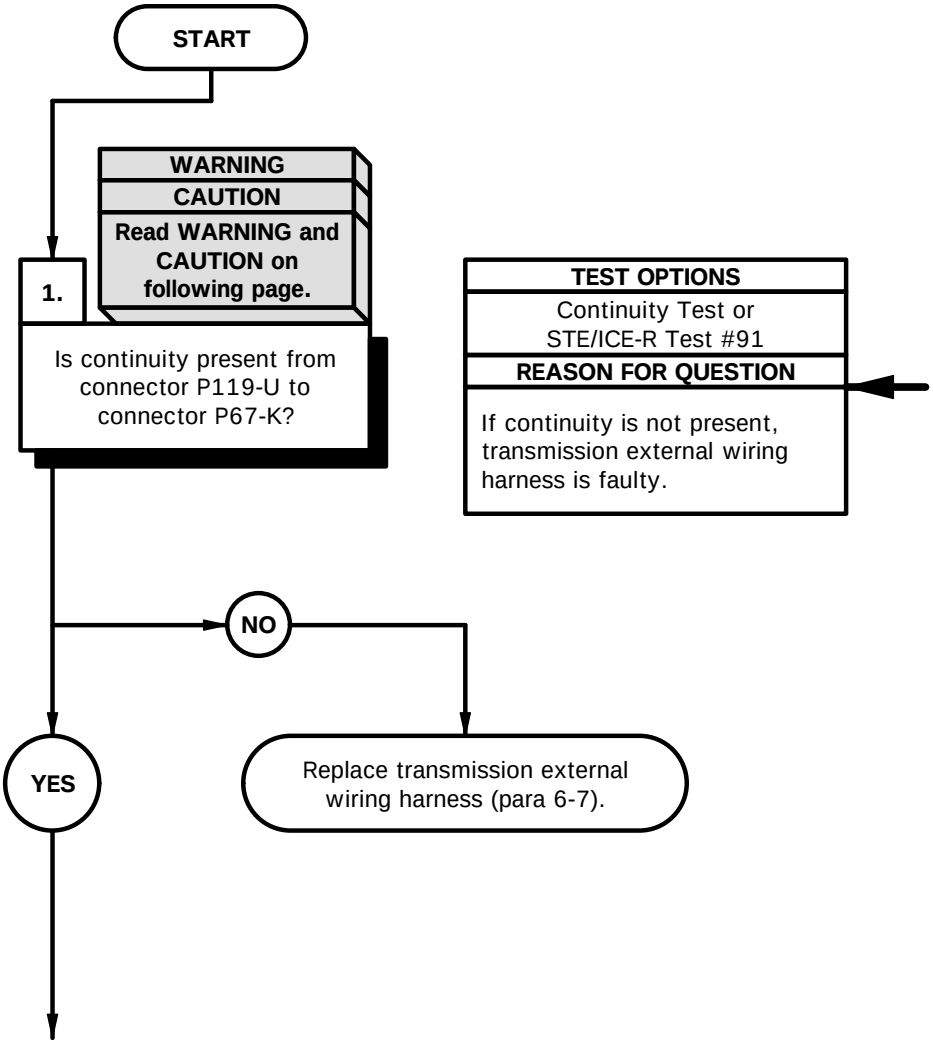
References
TM 9-4910-571-12&P

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

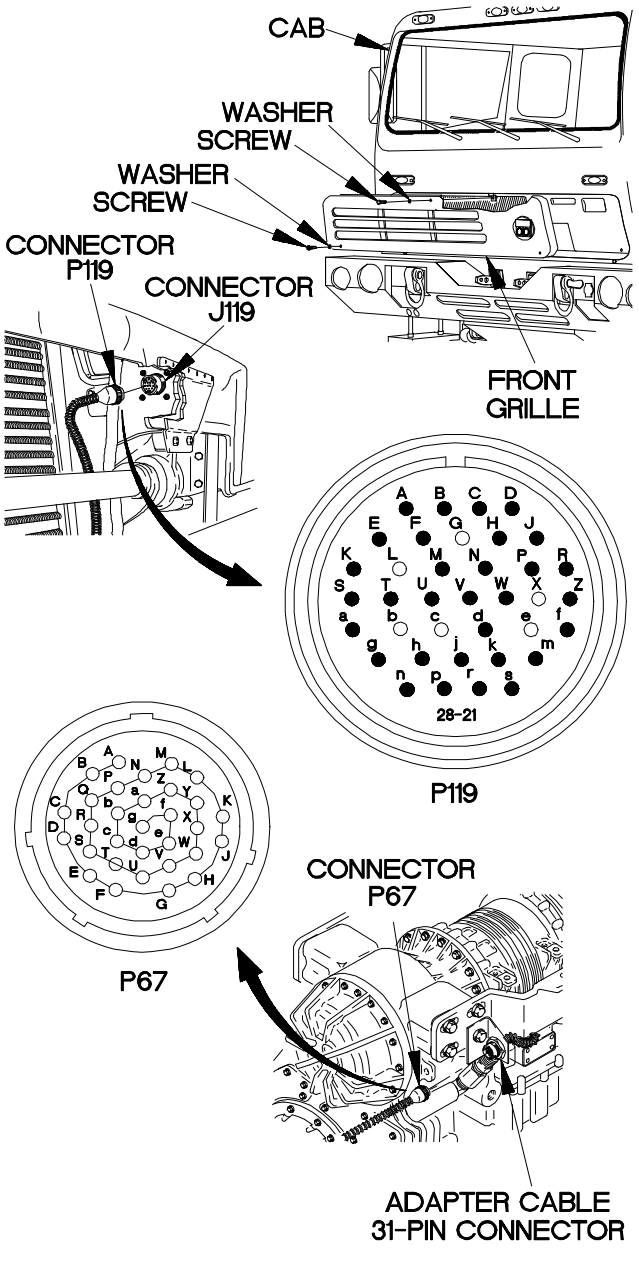
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

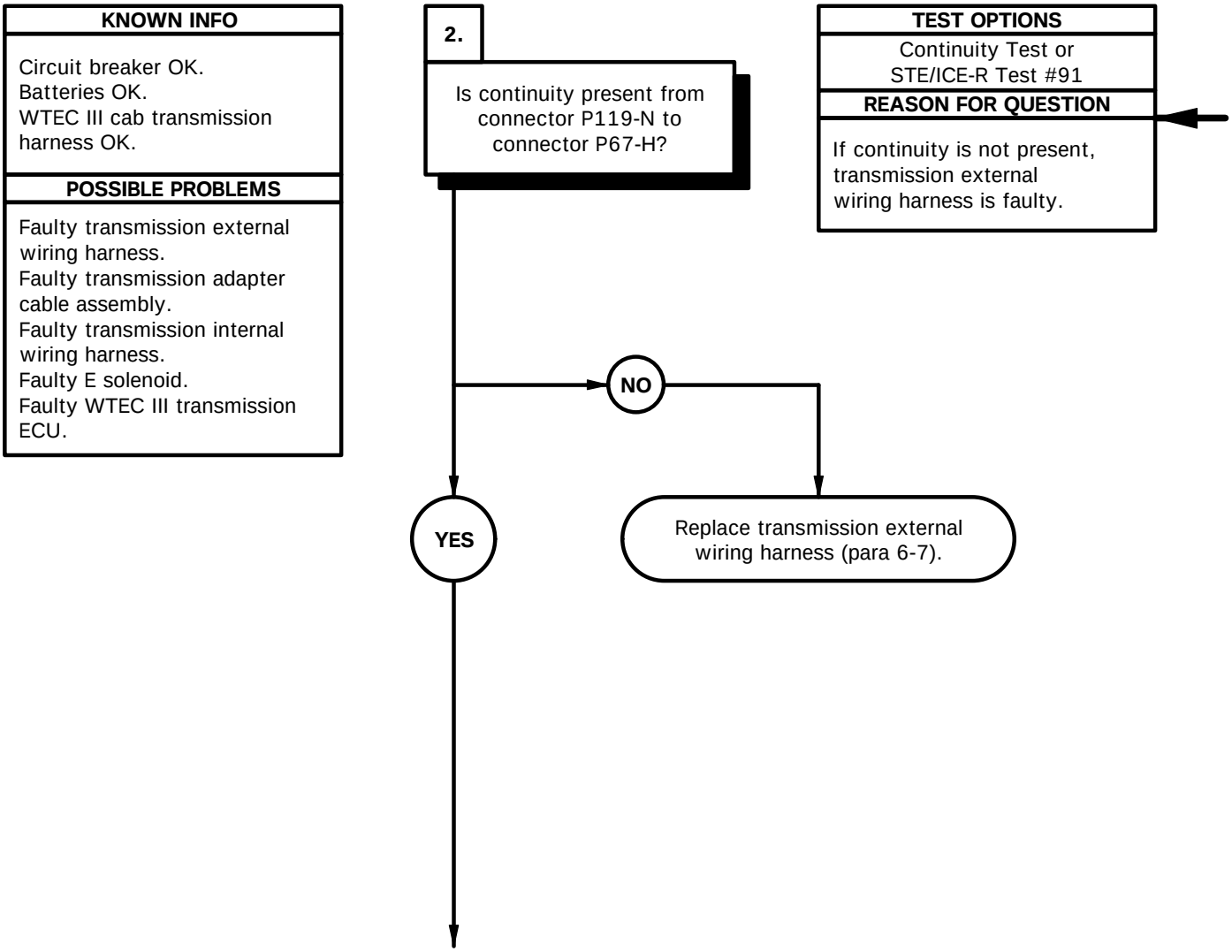
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from adapter cable 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect positive (+)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

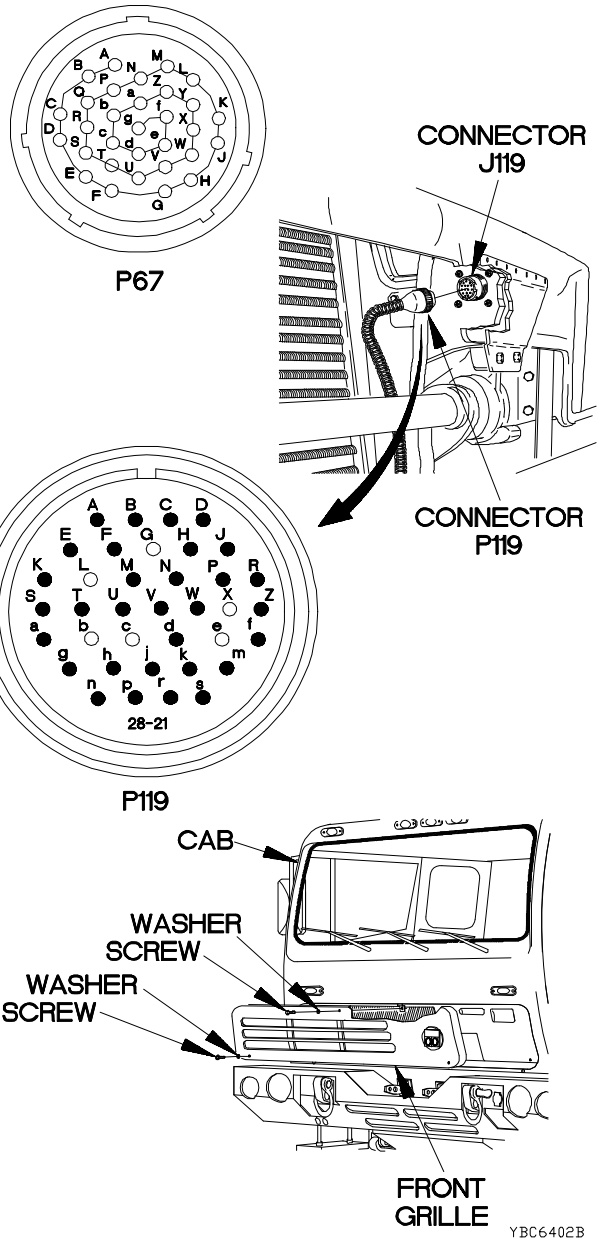


c64. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 16 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

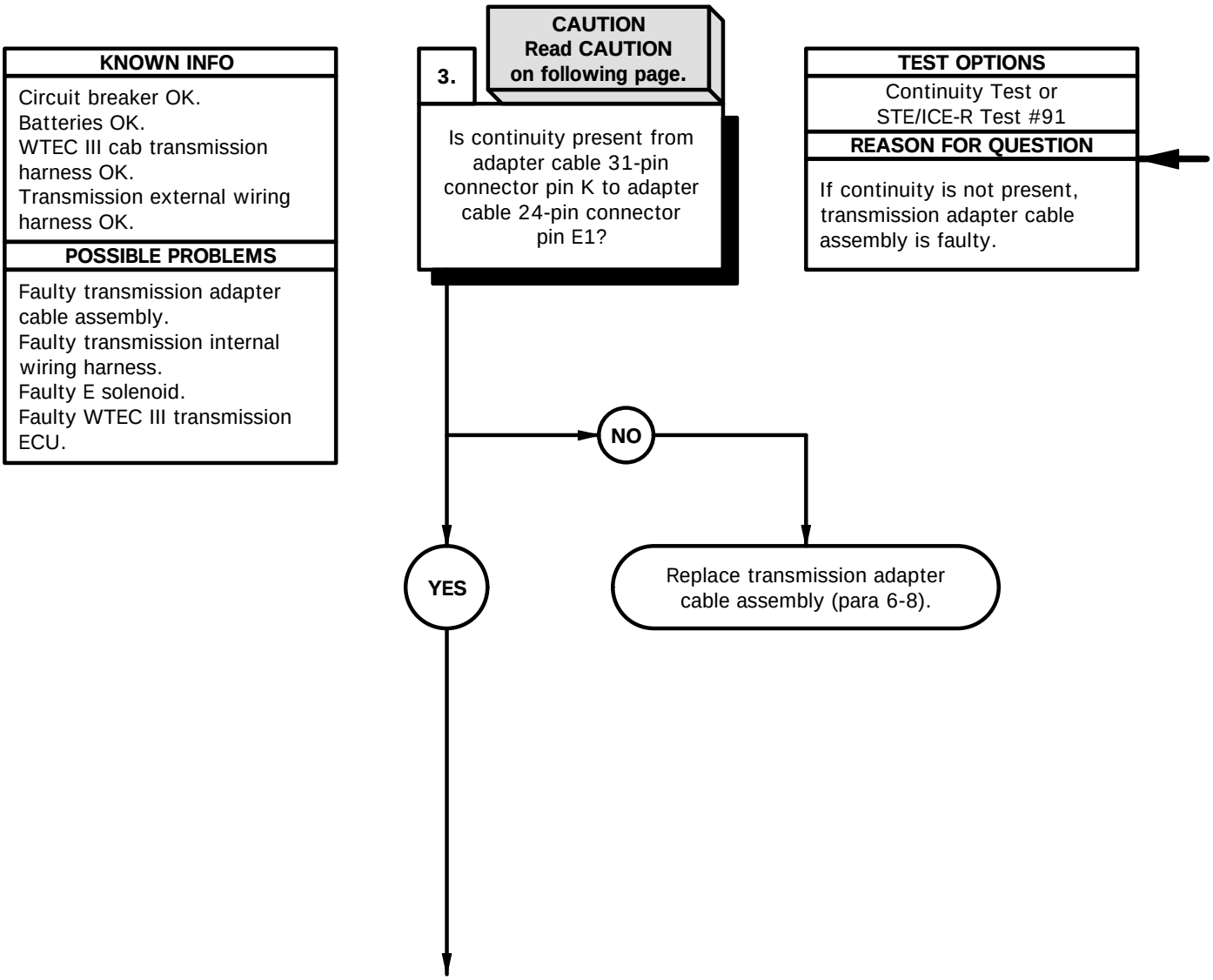


CONTINUITY TEST

(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)

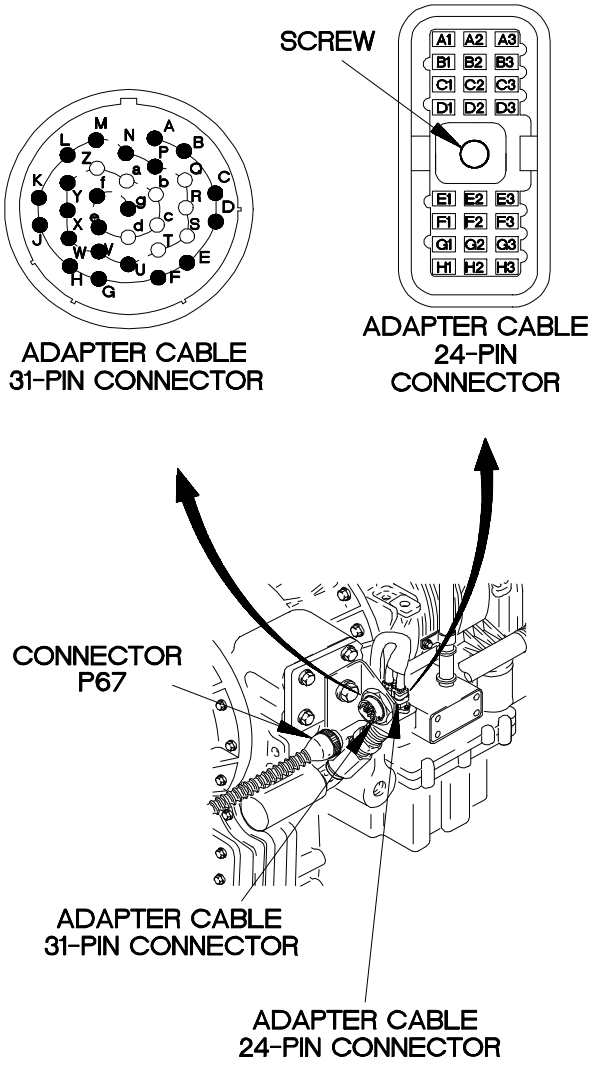


CAUTION

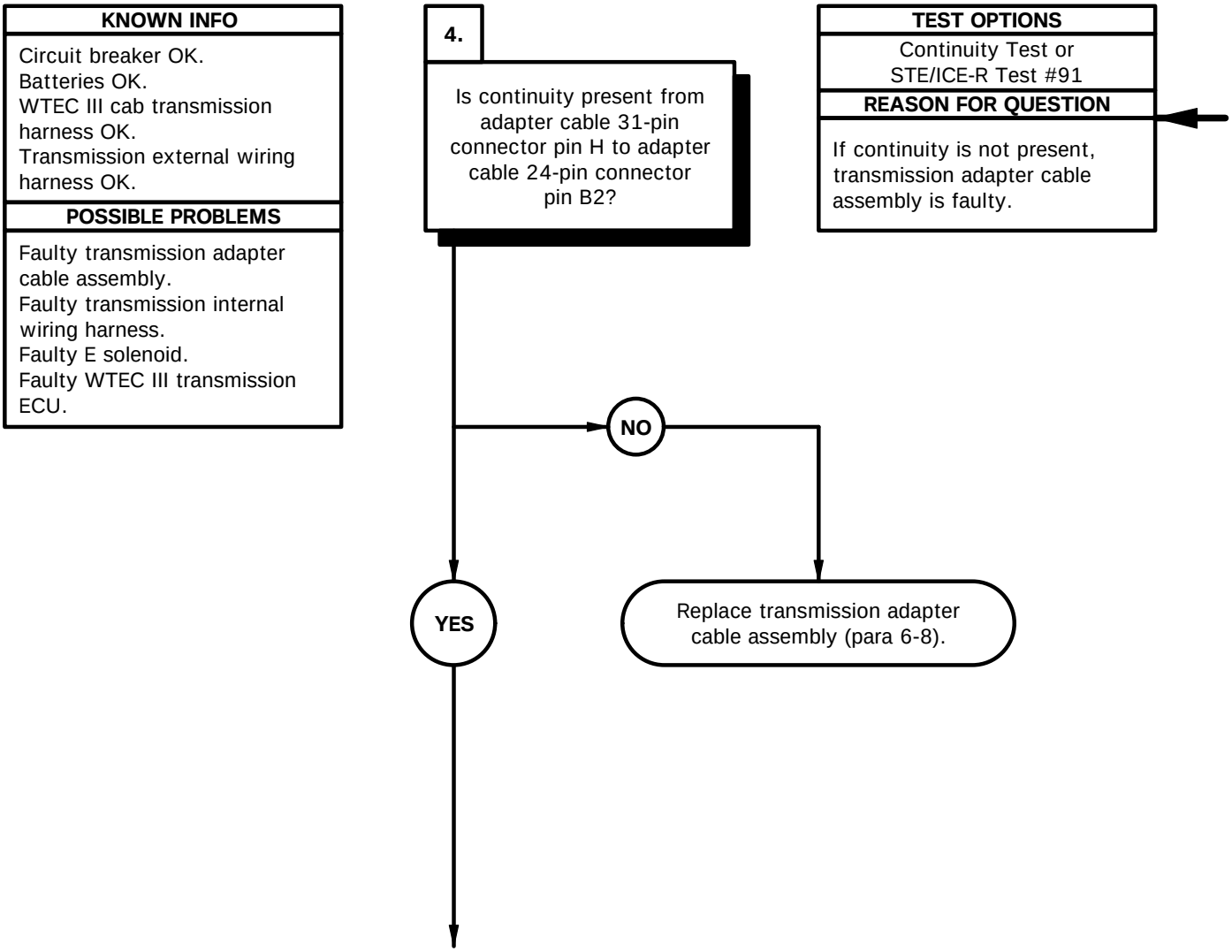
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

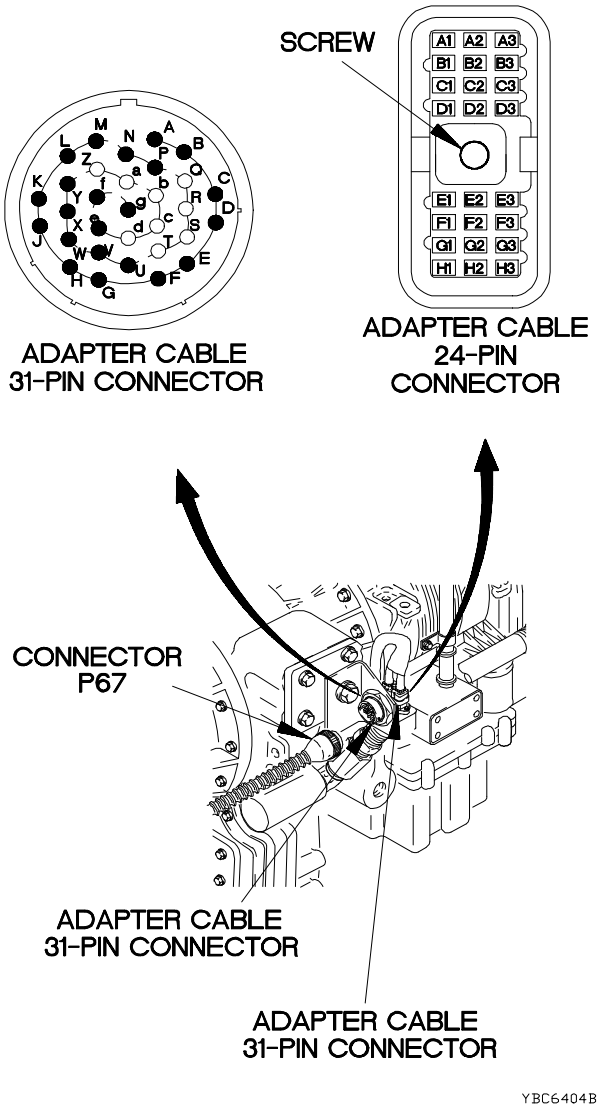


c64. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 16 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

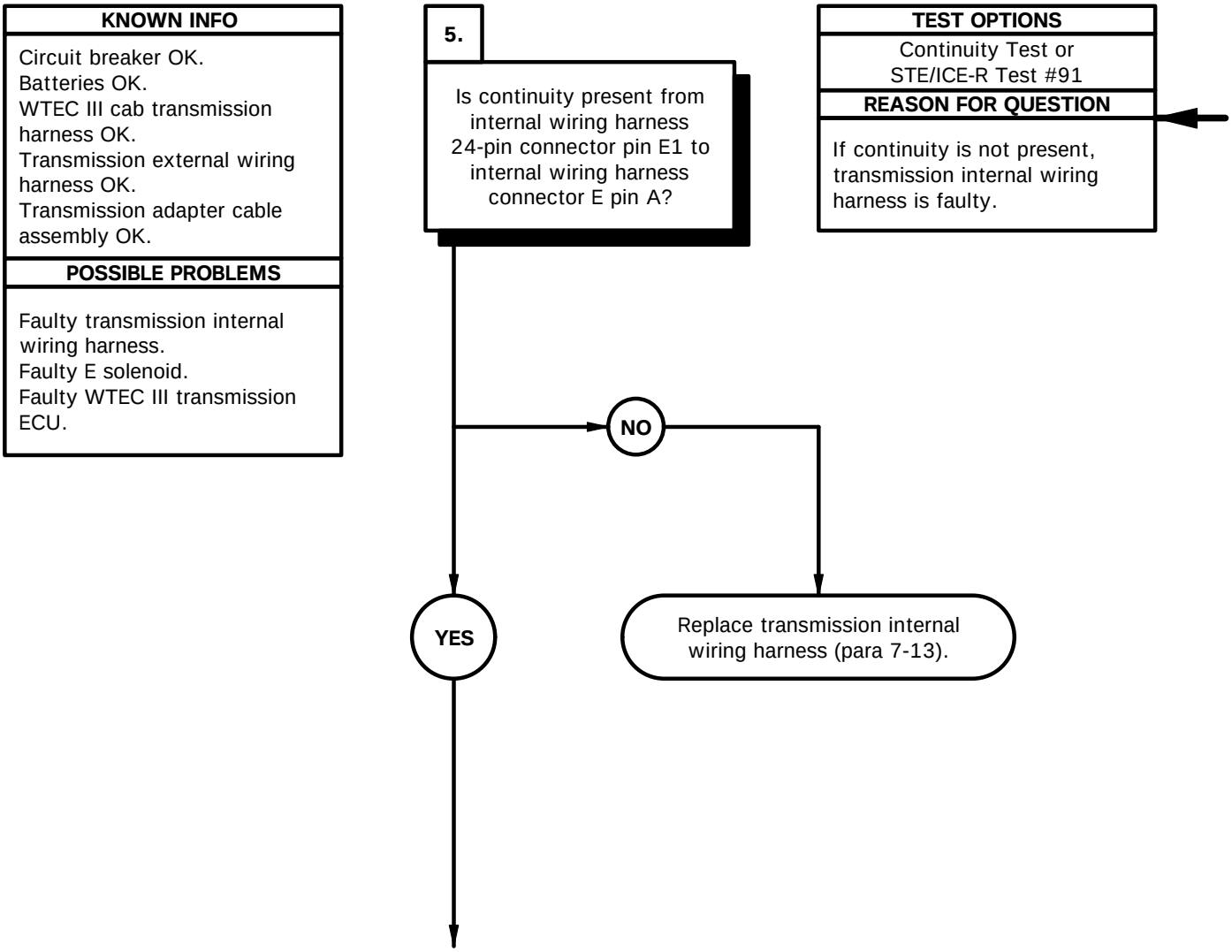


CONTINUITY TEST

(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.

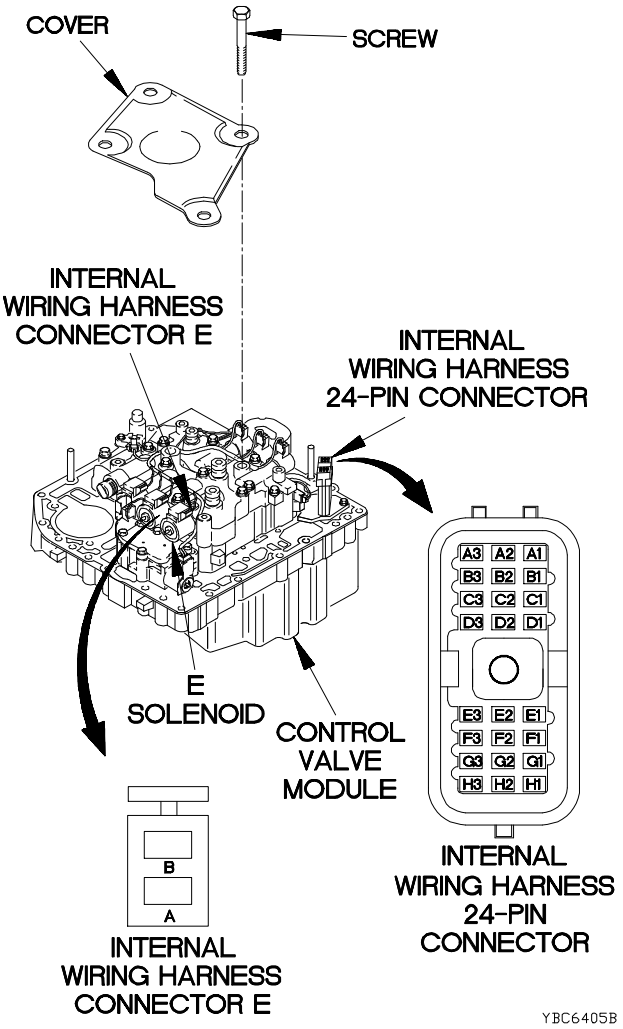


c64. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 16 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

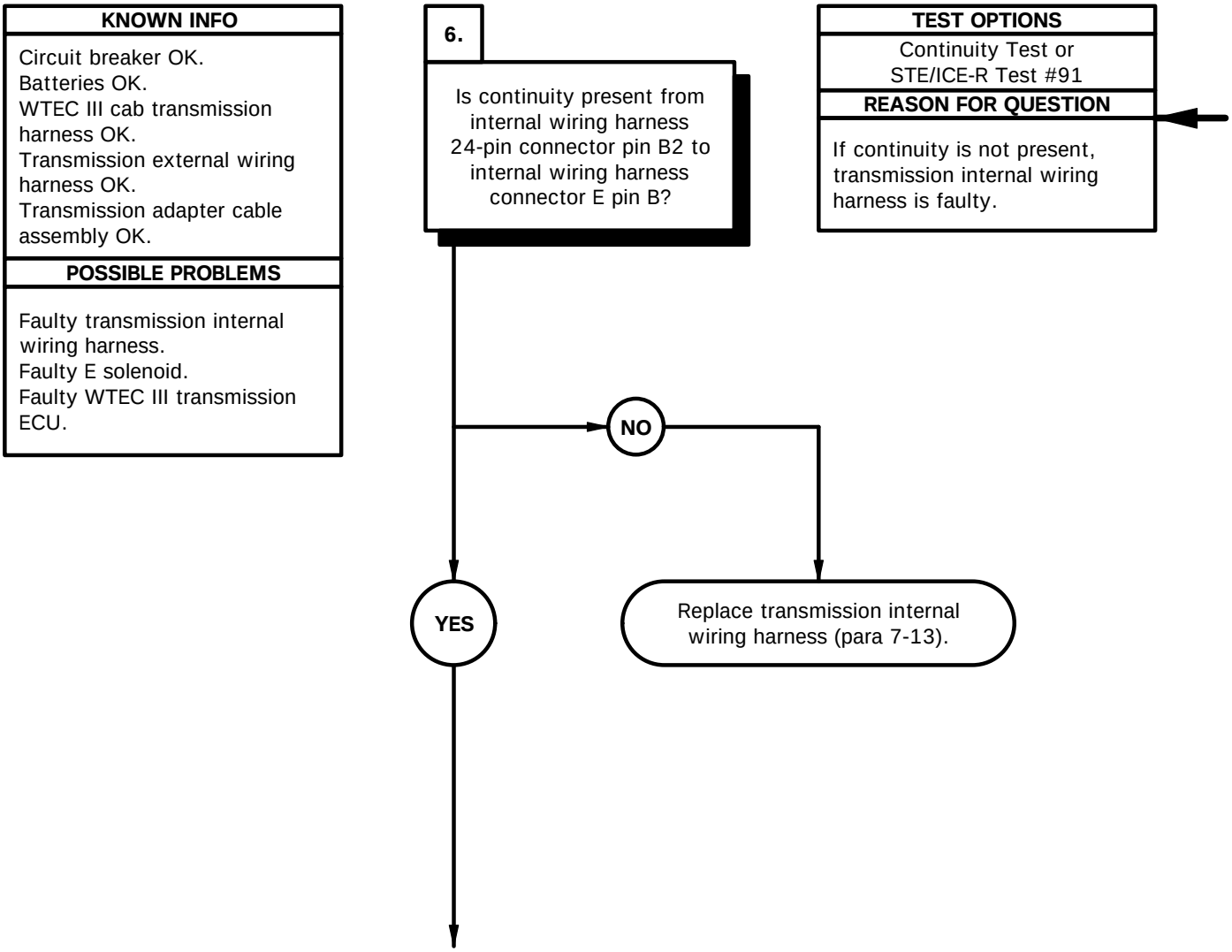


CONTINUITY TEST

(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).

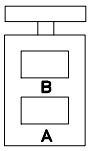


c64. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 16 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

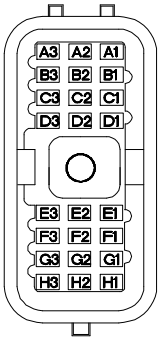


CONTINUITY TEST

(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).



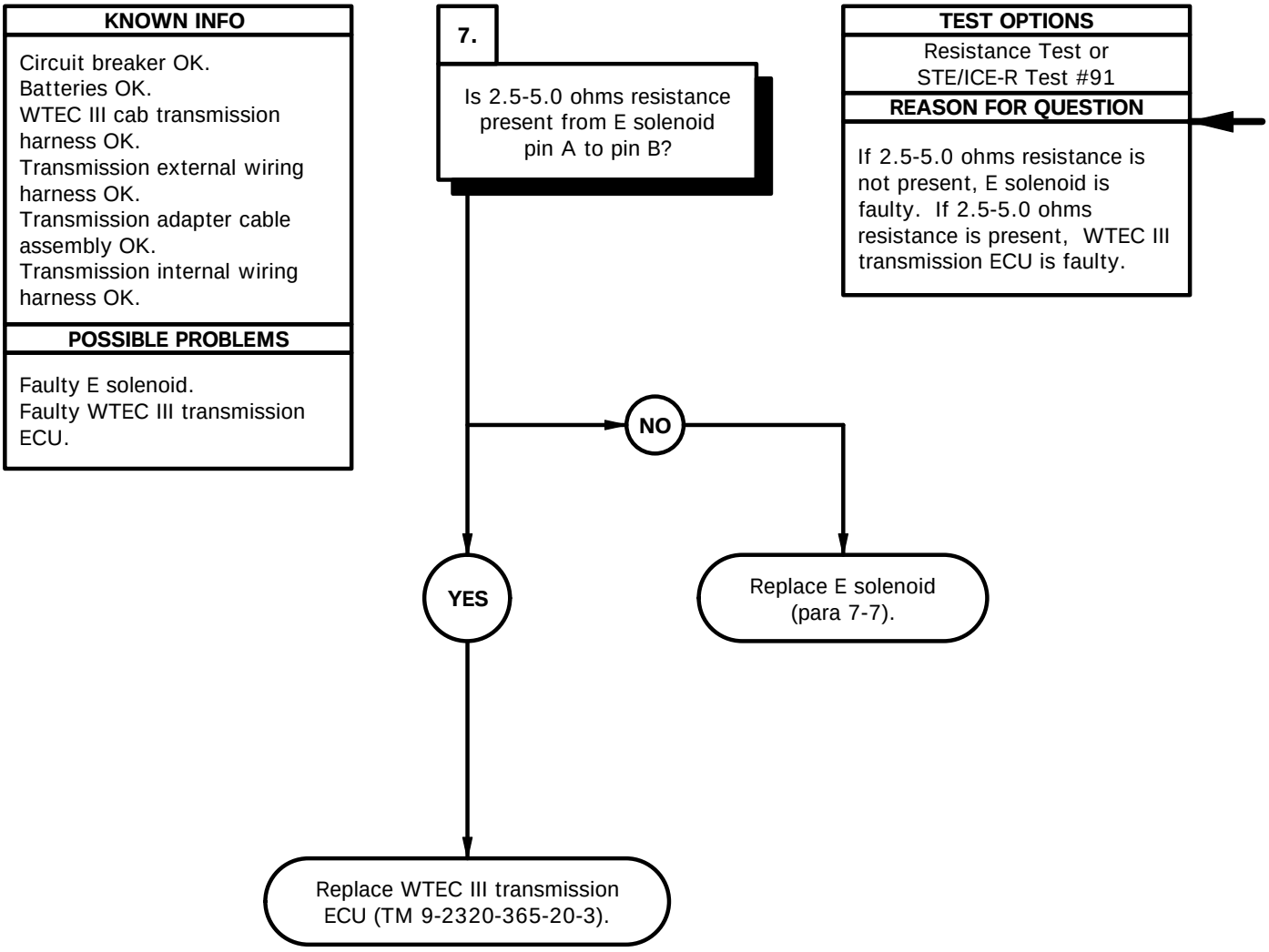
INTERNAL WIRING HARNESS CONNECTOR E



INTERNAL WIRING HARNESS 24-PIN CONNECTOR

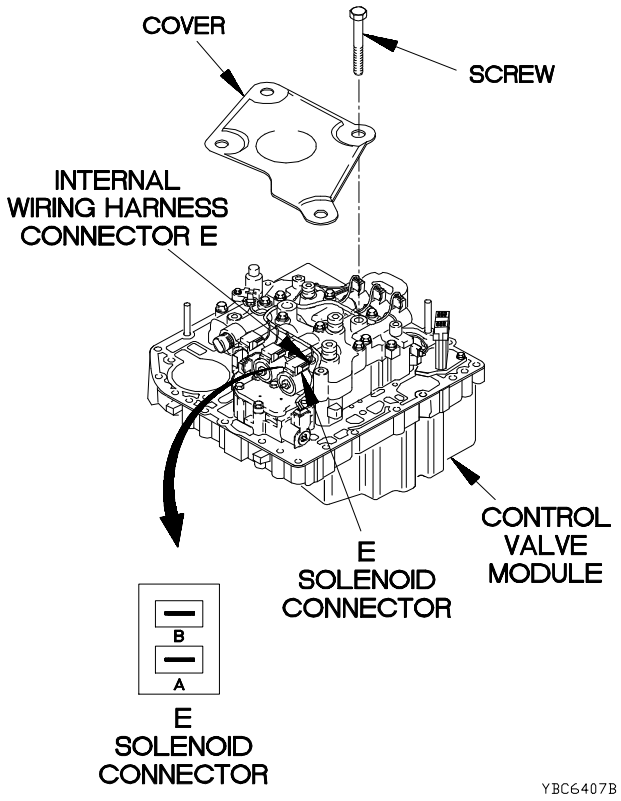
YBC6406B

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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

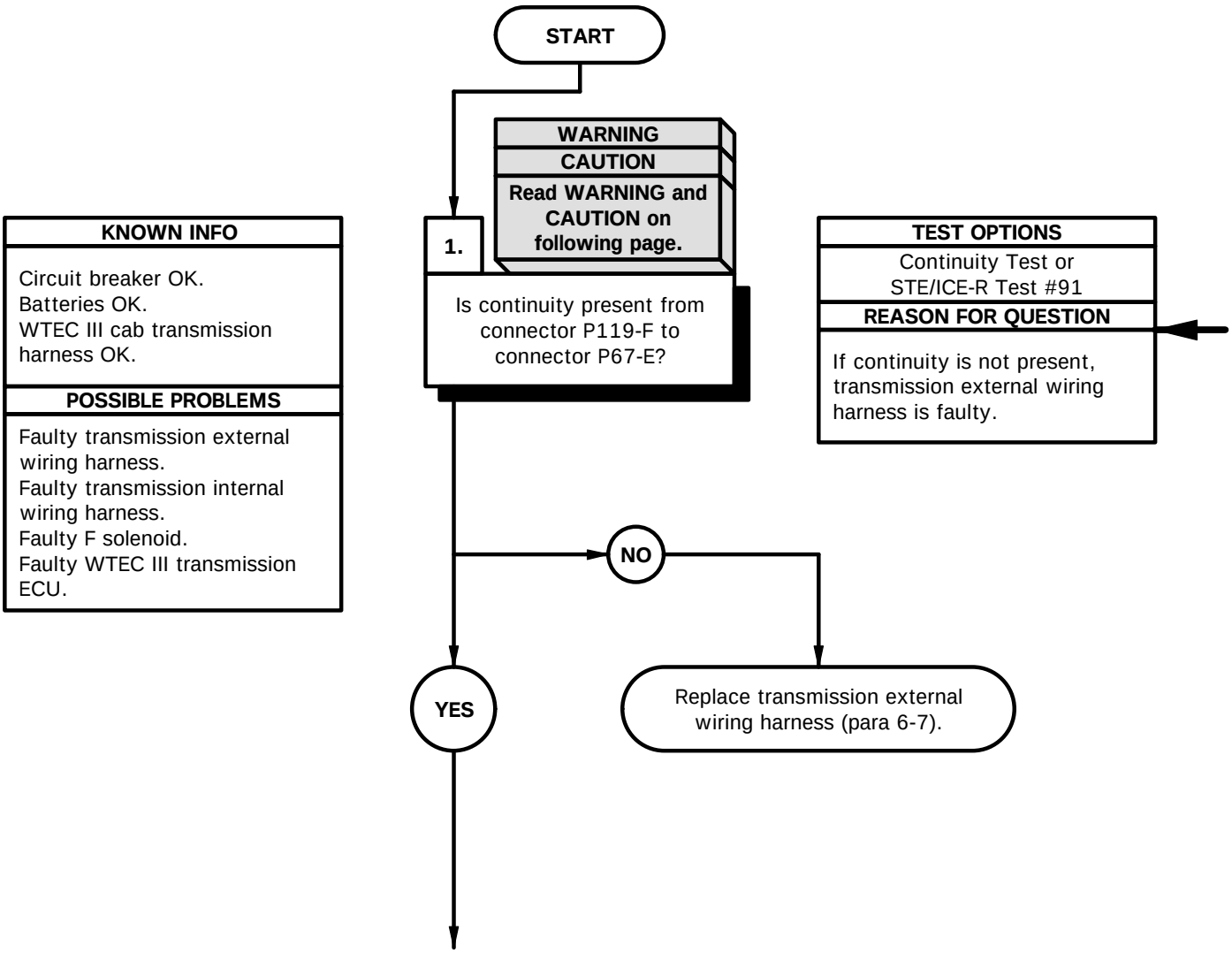
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

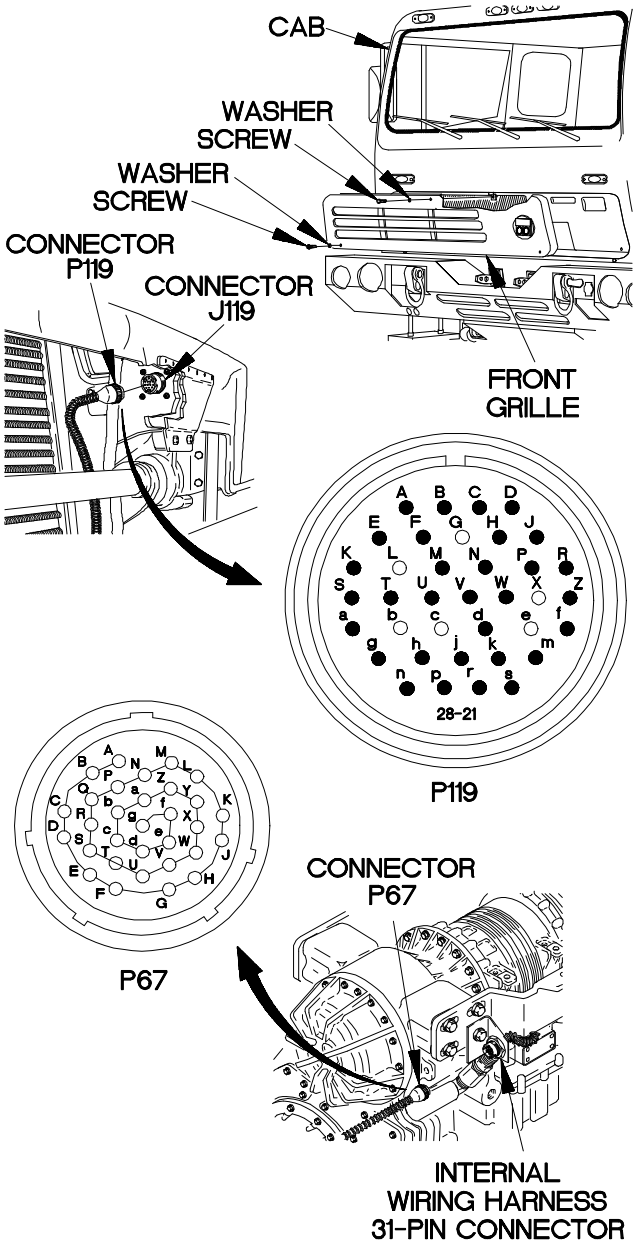
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

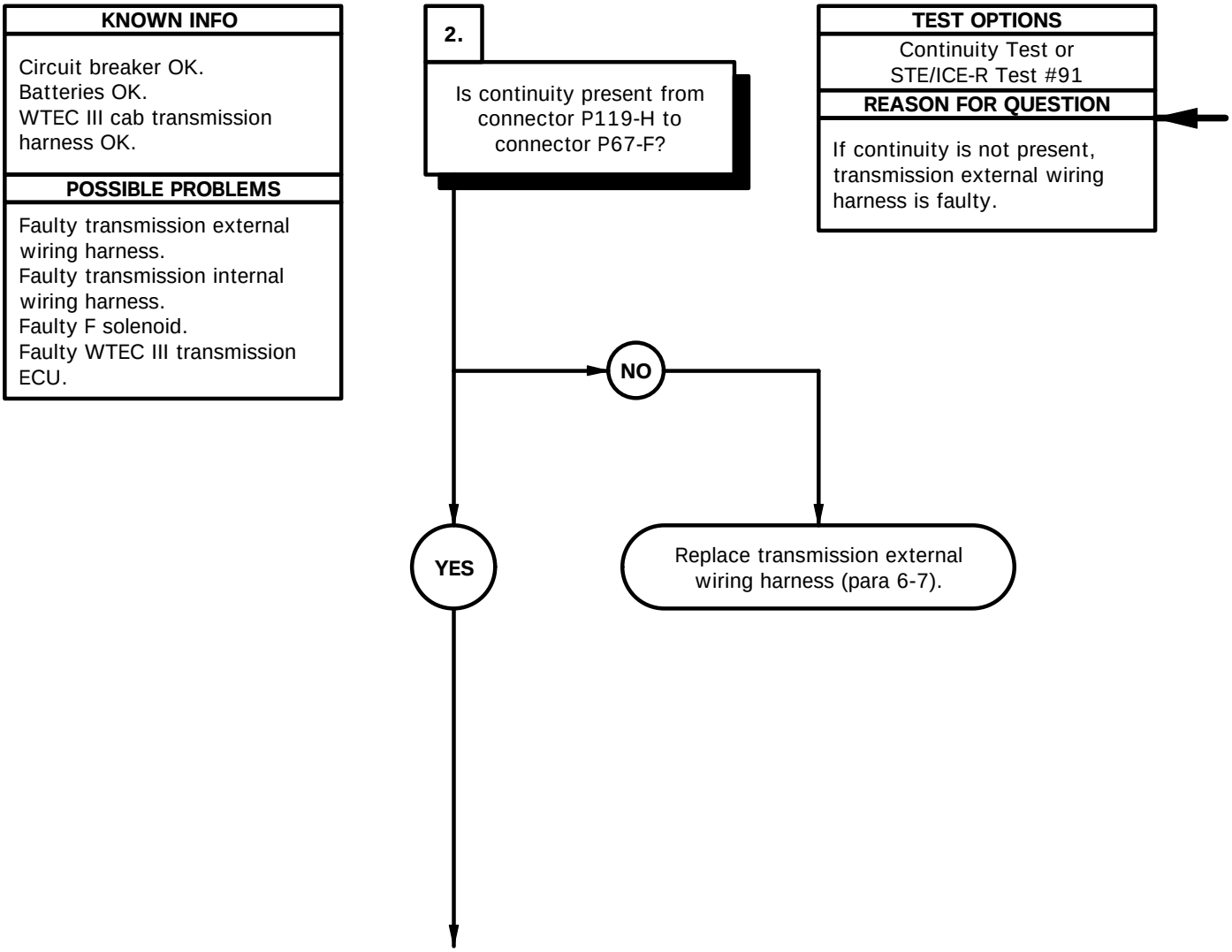
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect external wiring harness connector P67 from internal wiring harness 31-pin connector.
(6) Set multimeter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

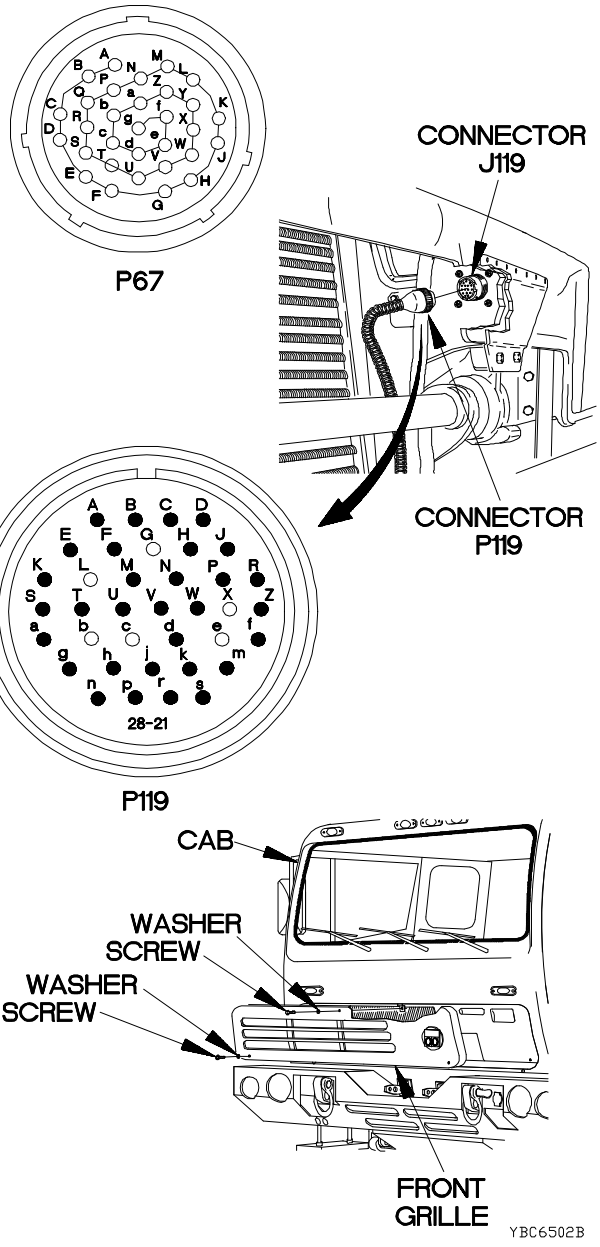


c65. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

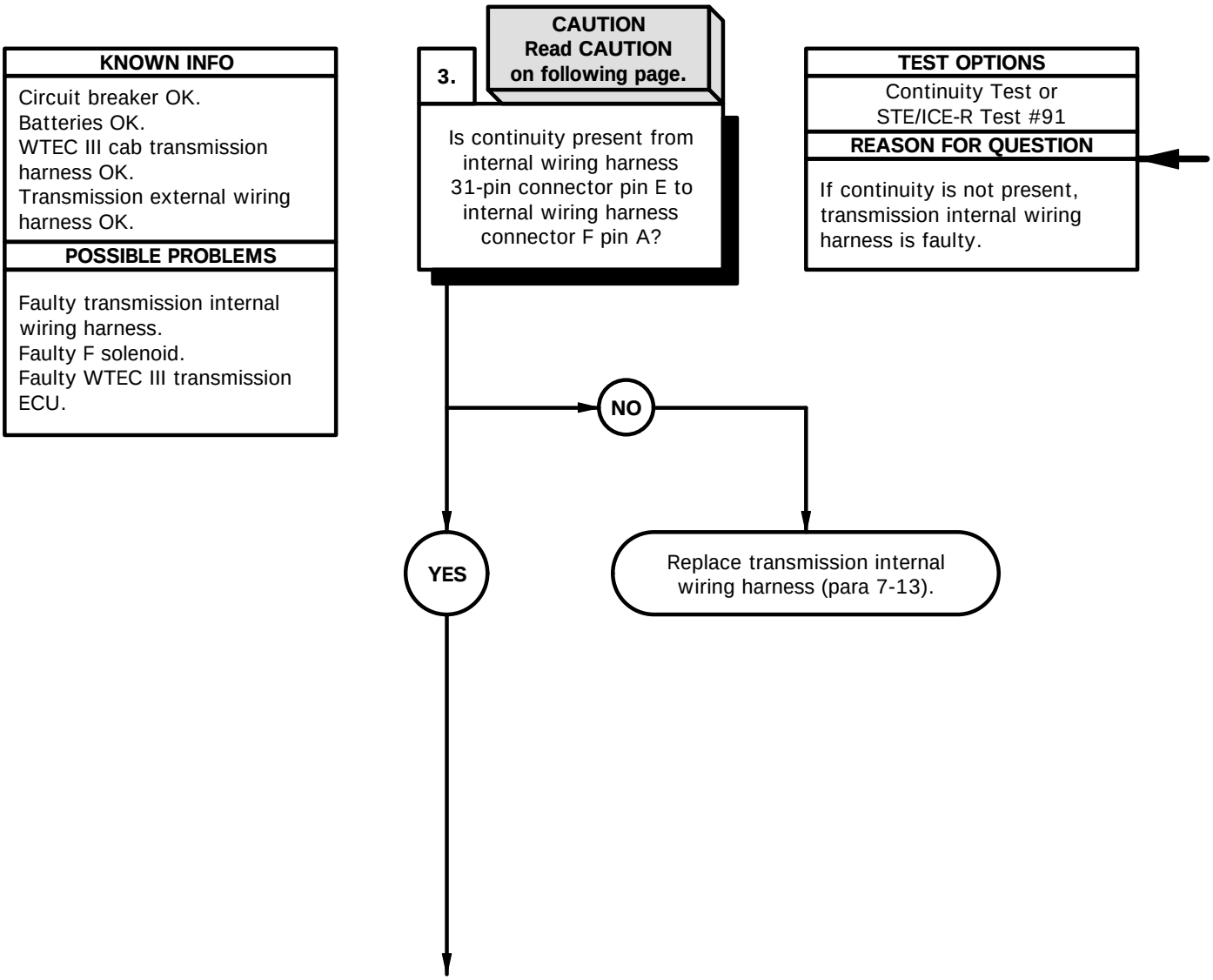


CONTINUITY TEST

(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)

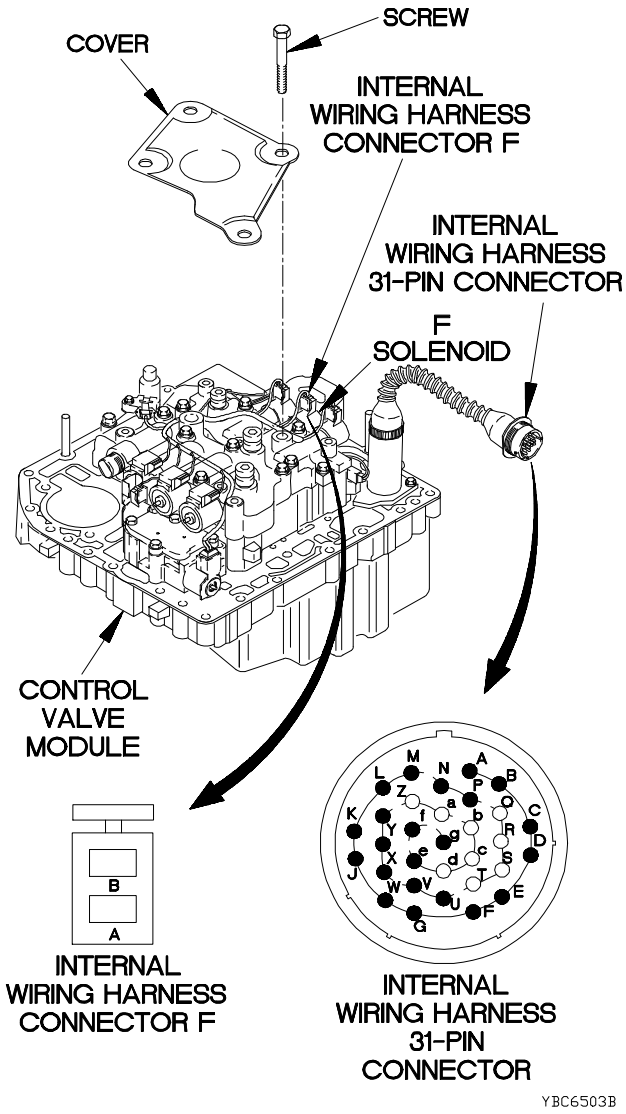


CAUTION

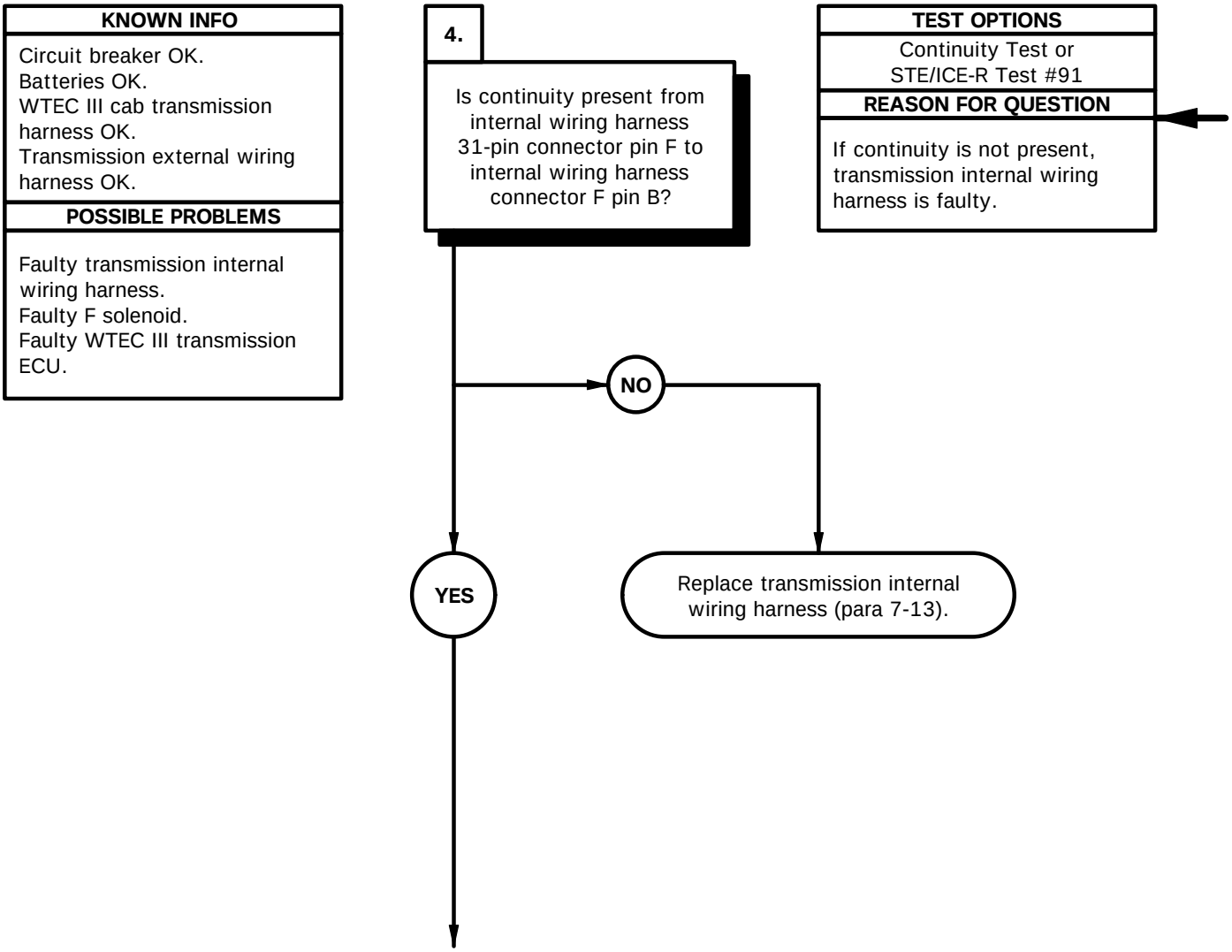
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

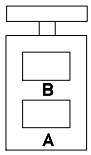


c65. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

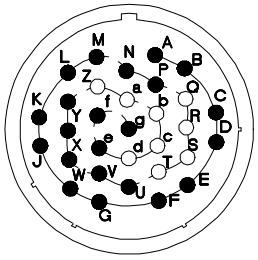


CONTINUITY TEST

(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).



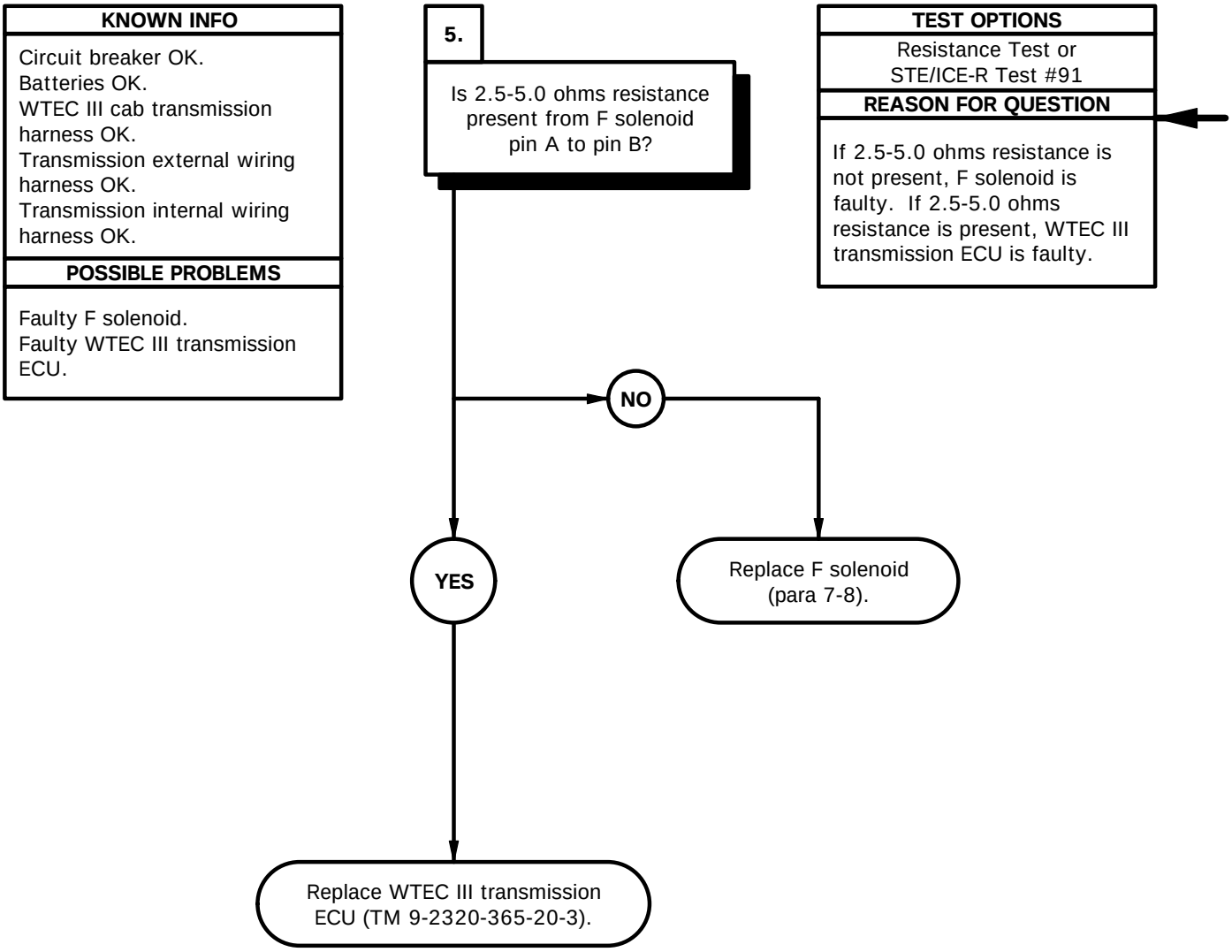
INTERNAL WIRING HARNESS CONNECTOR F



INTERNAL WIRING HARNESS 31-PIN CONNECTOR

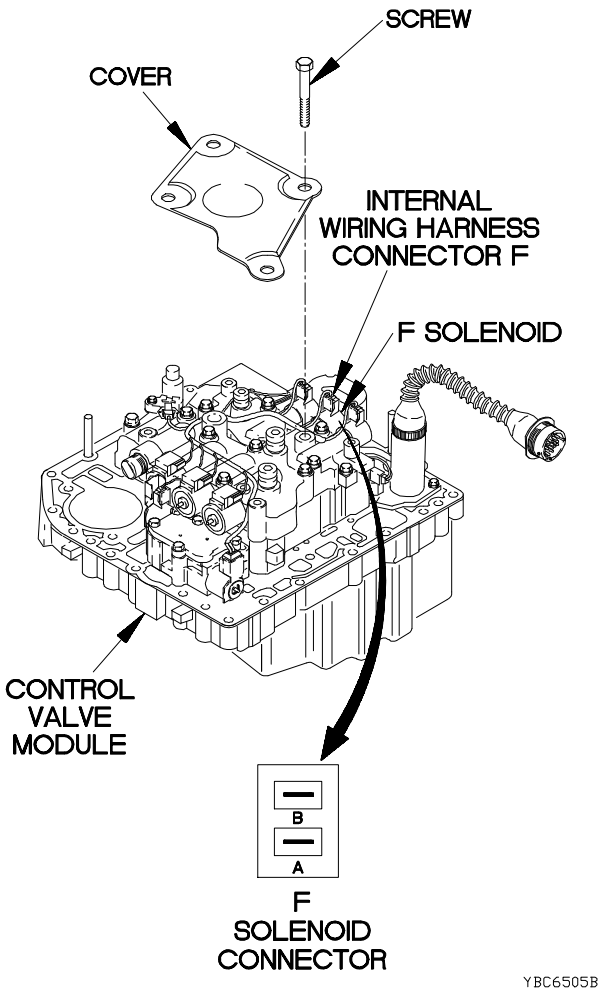
YBC6504B

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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)

Materials/Parts
Wire, Elect, 50 ft (Item 94, Appendix C)

Personnel Required
(2)

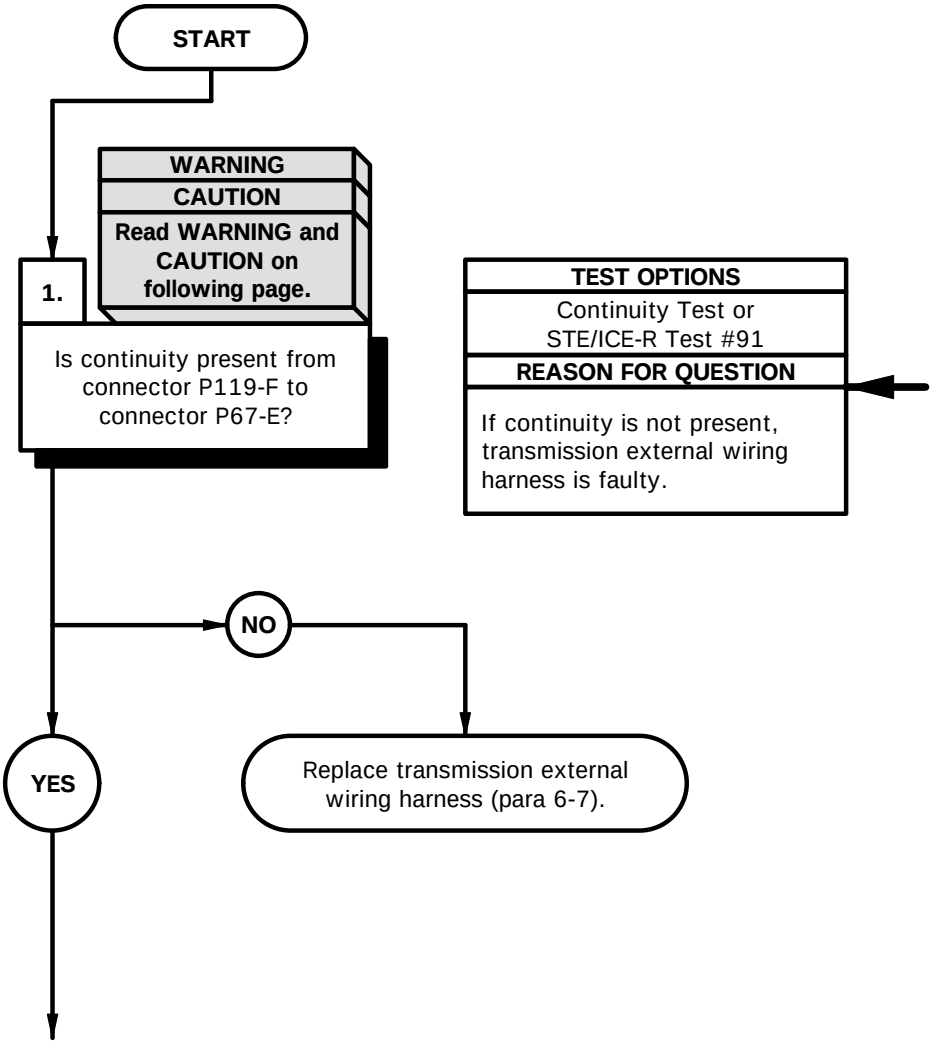
References
TM 9-4910-571-12&P

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 F 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

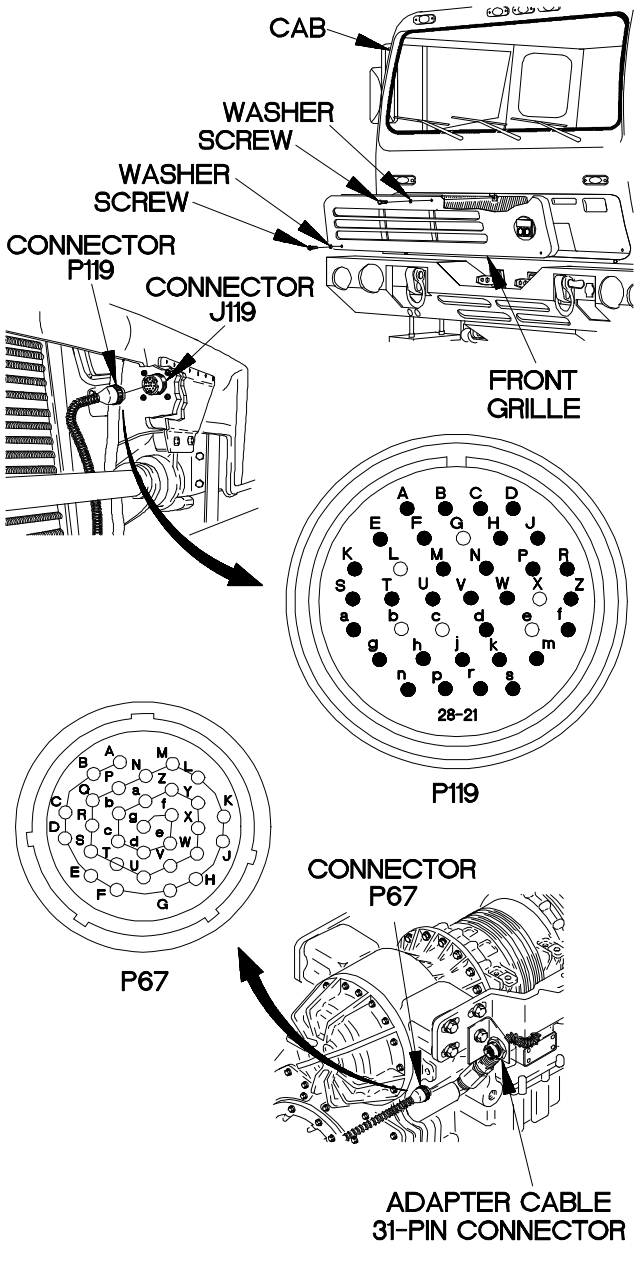
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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-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).



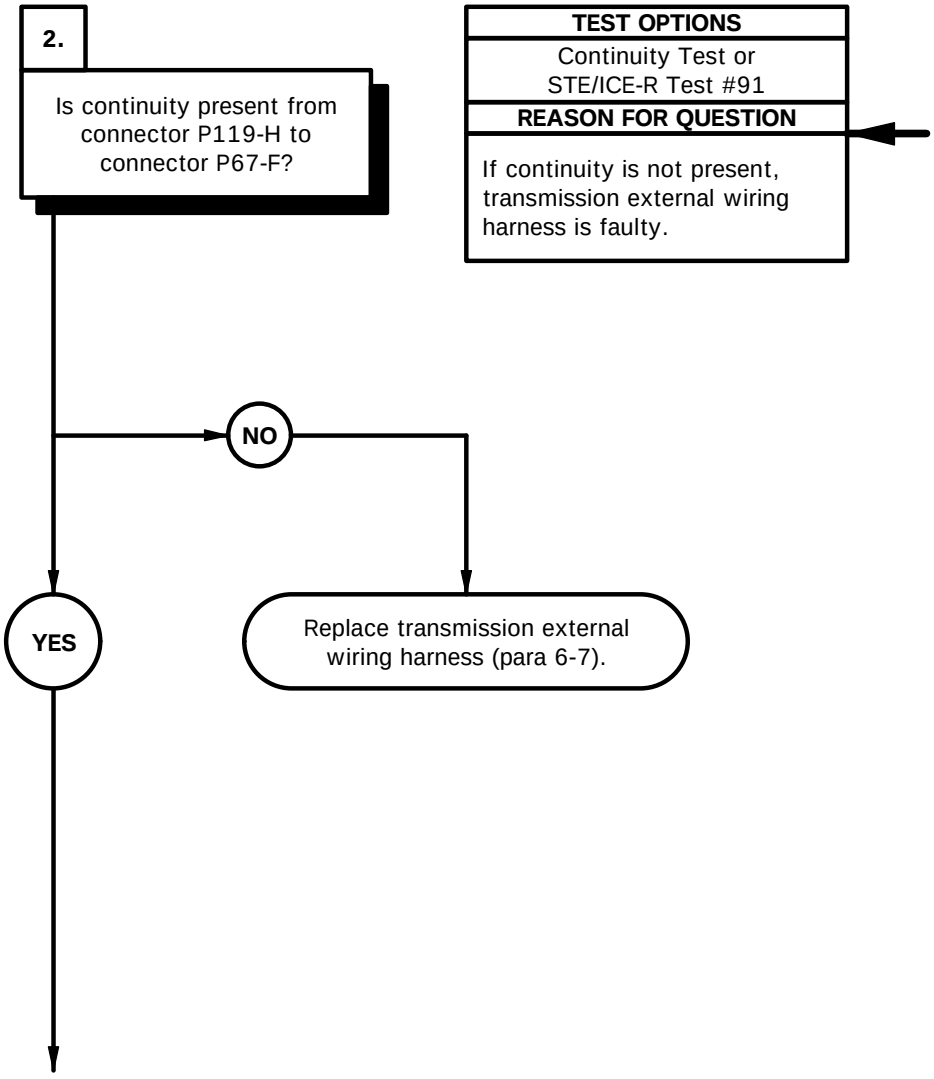
c66. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO

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

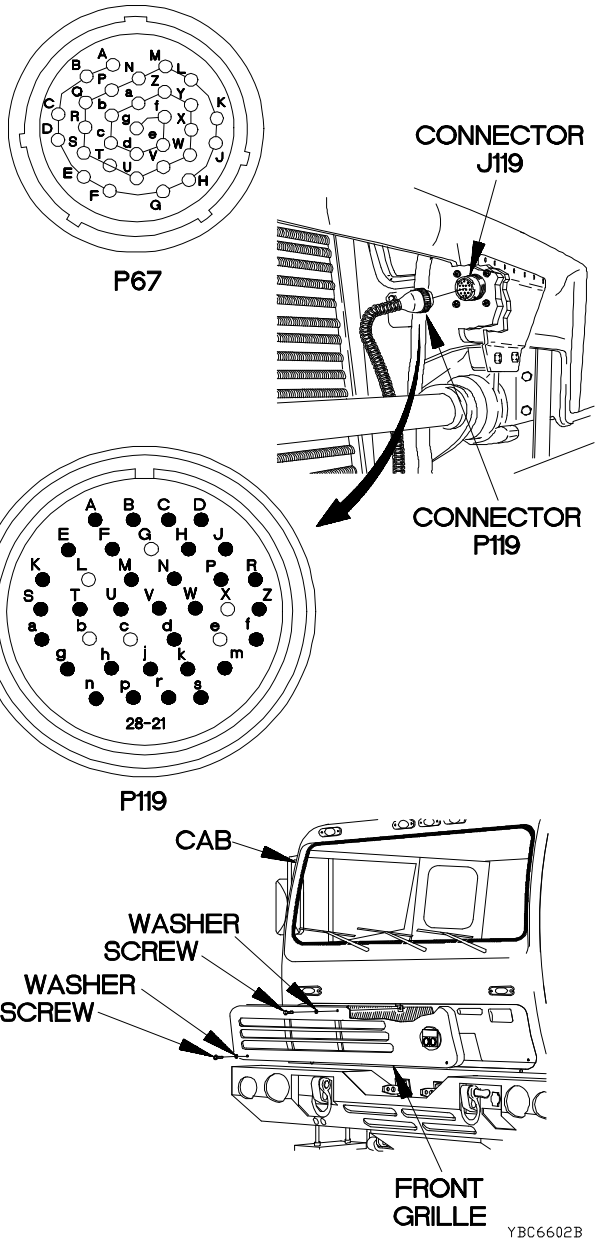
POSSIBLE PROBLEMS

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

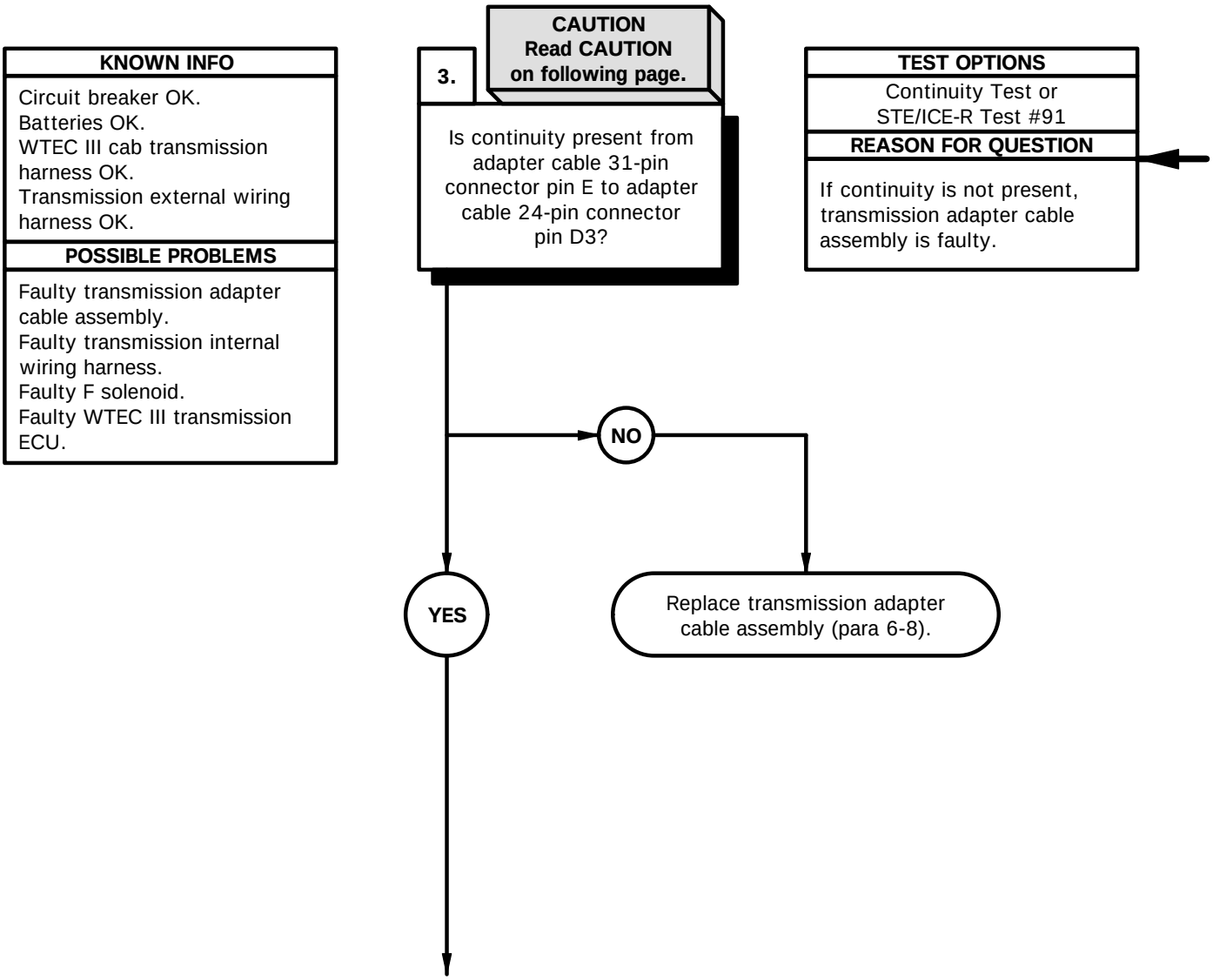


CONTINUITY TEST

(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)

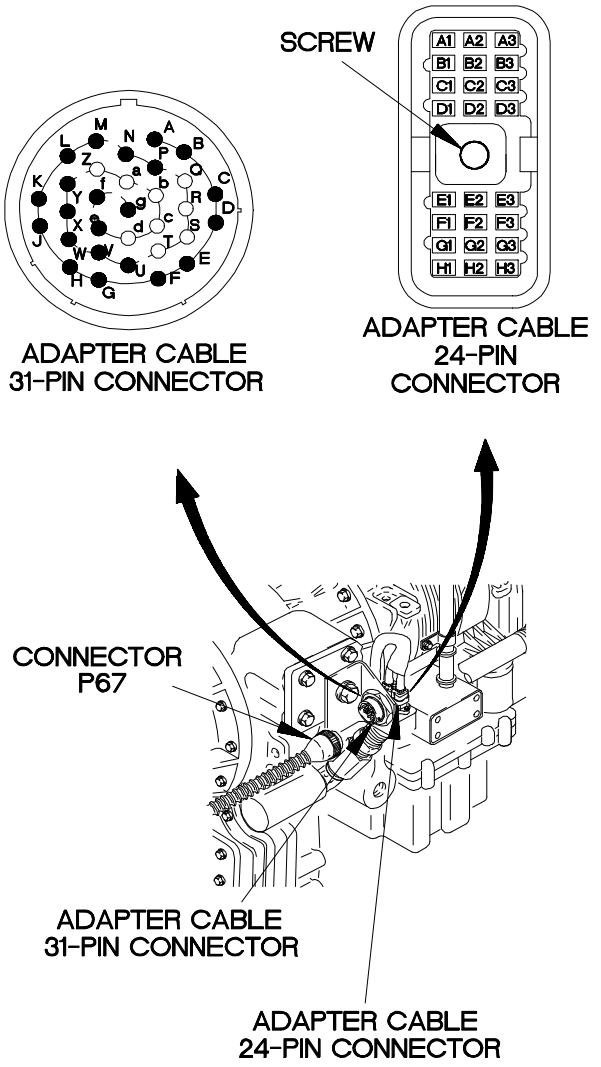


CAUTION

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).



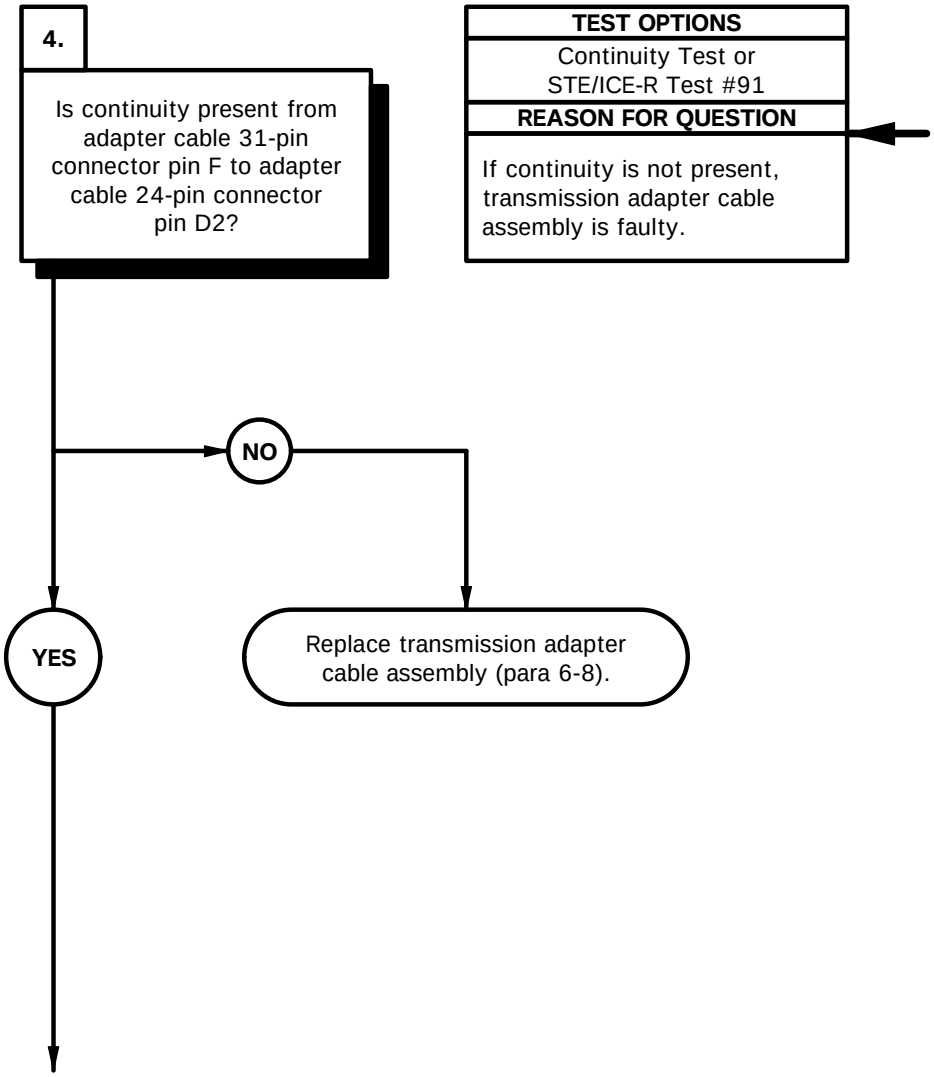
c66. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO

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

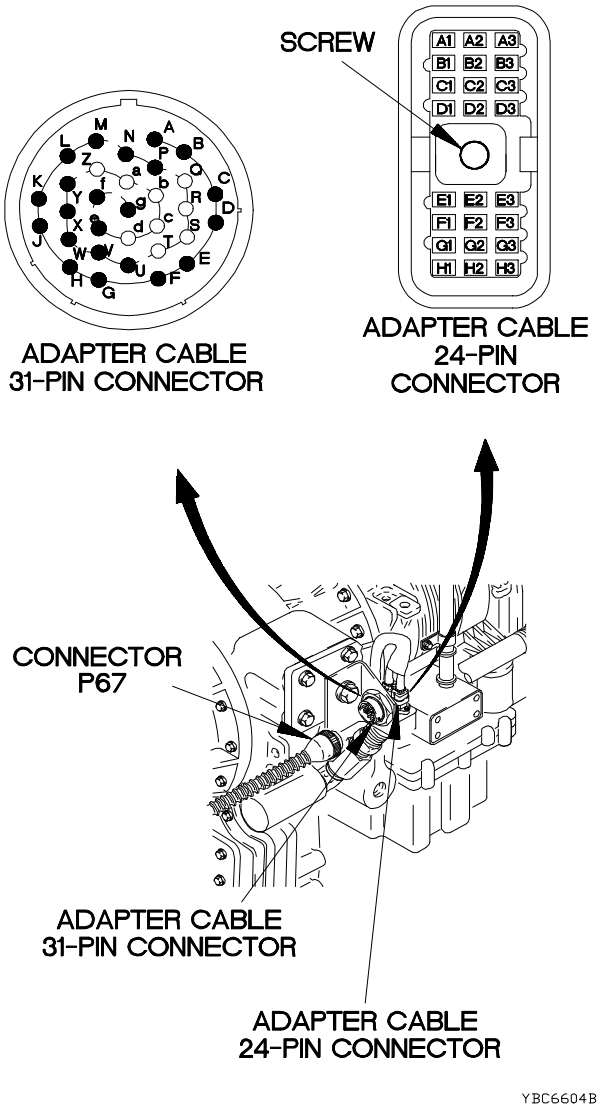
POSSIBLE PROBLEMS

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

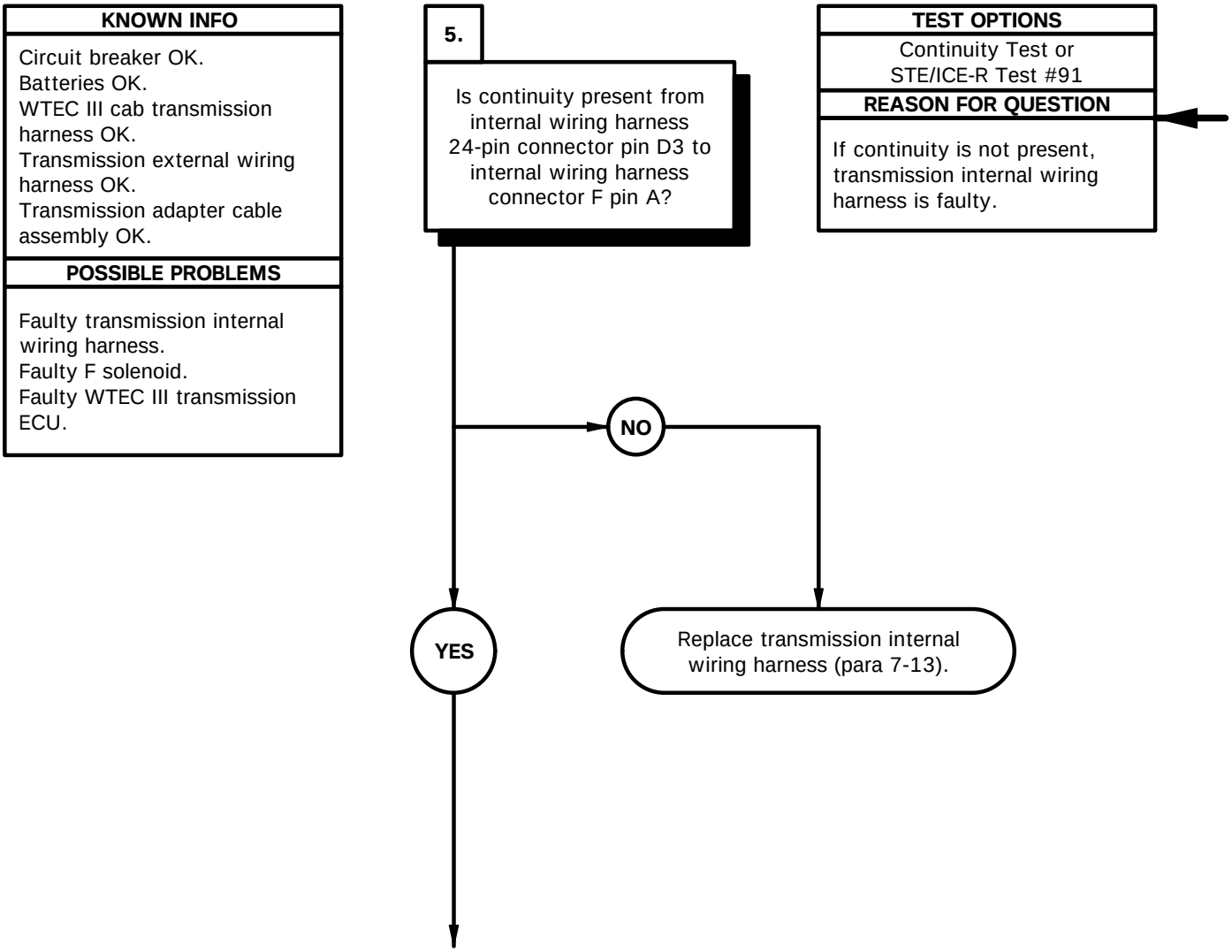


CONTINUITY TEST

(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.

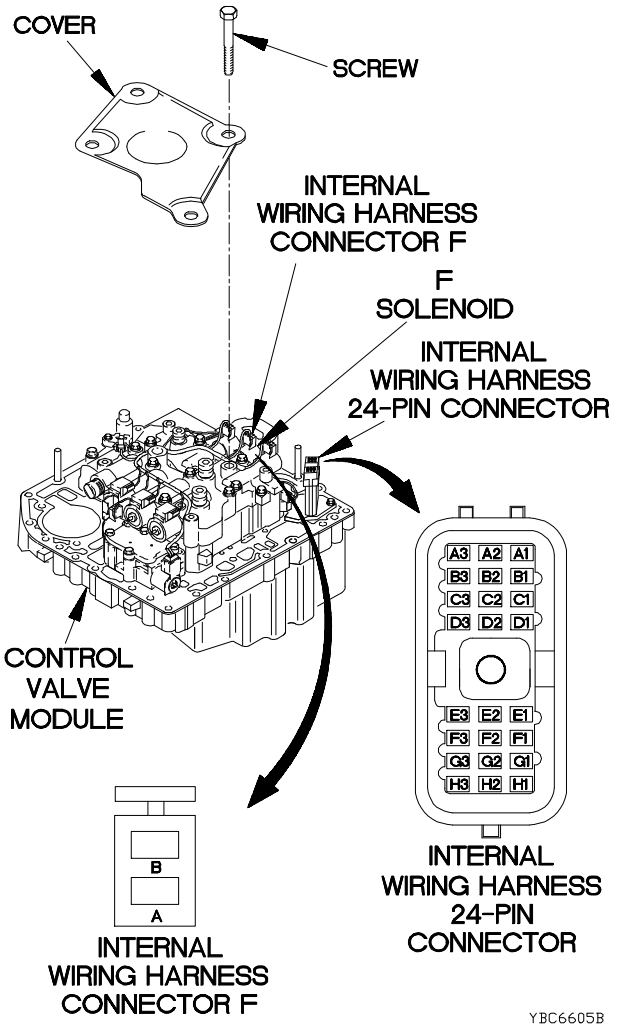


c66. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



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).



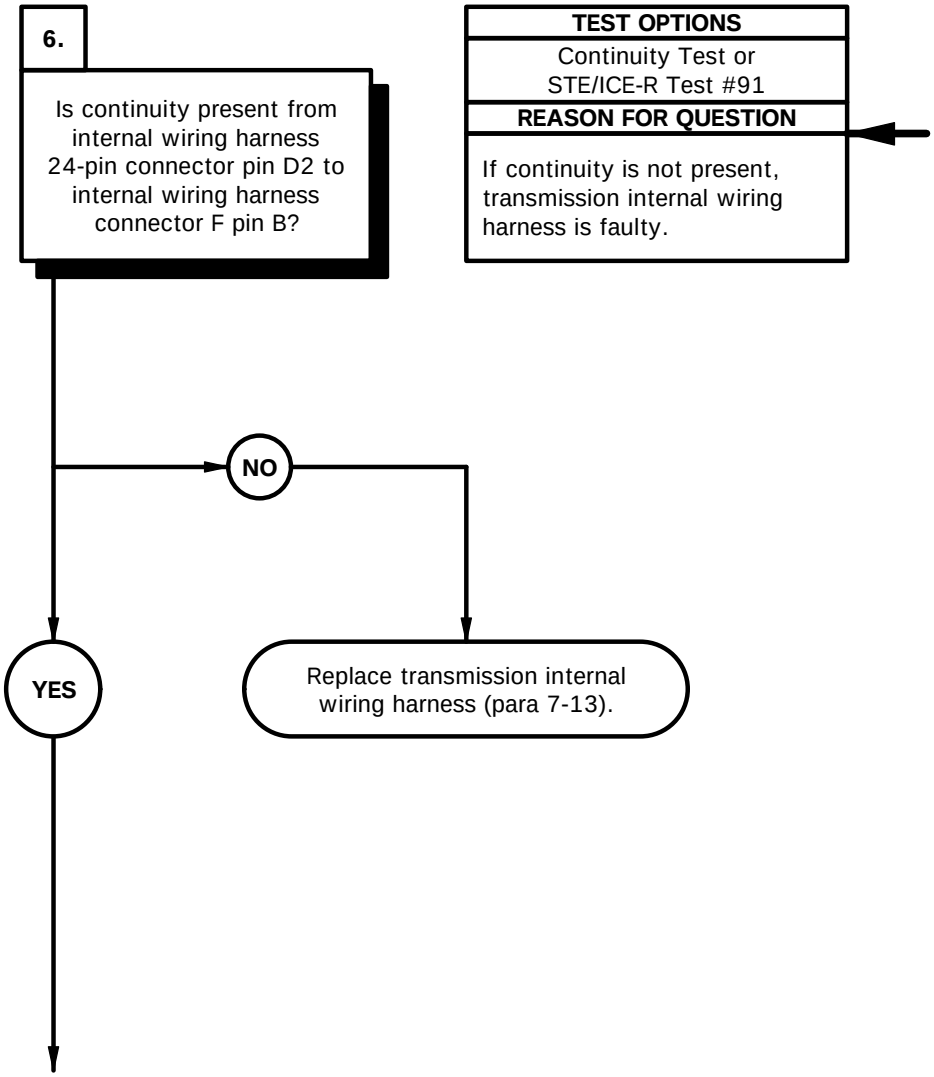
c66. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO

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

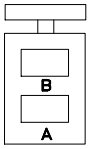
POSSIBLE PROBLEMS

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

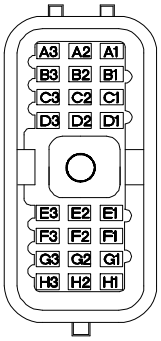


CONTINUITY TEST

(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).



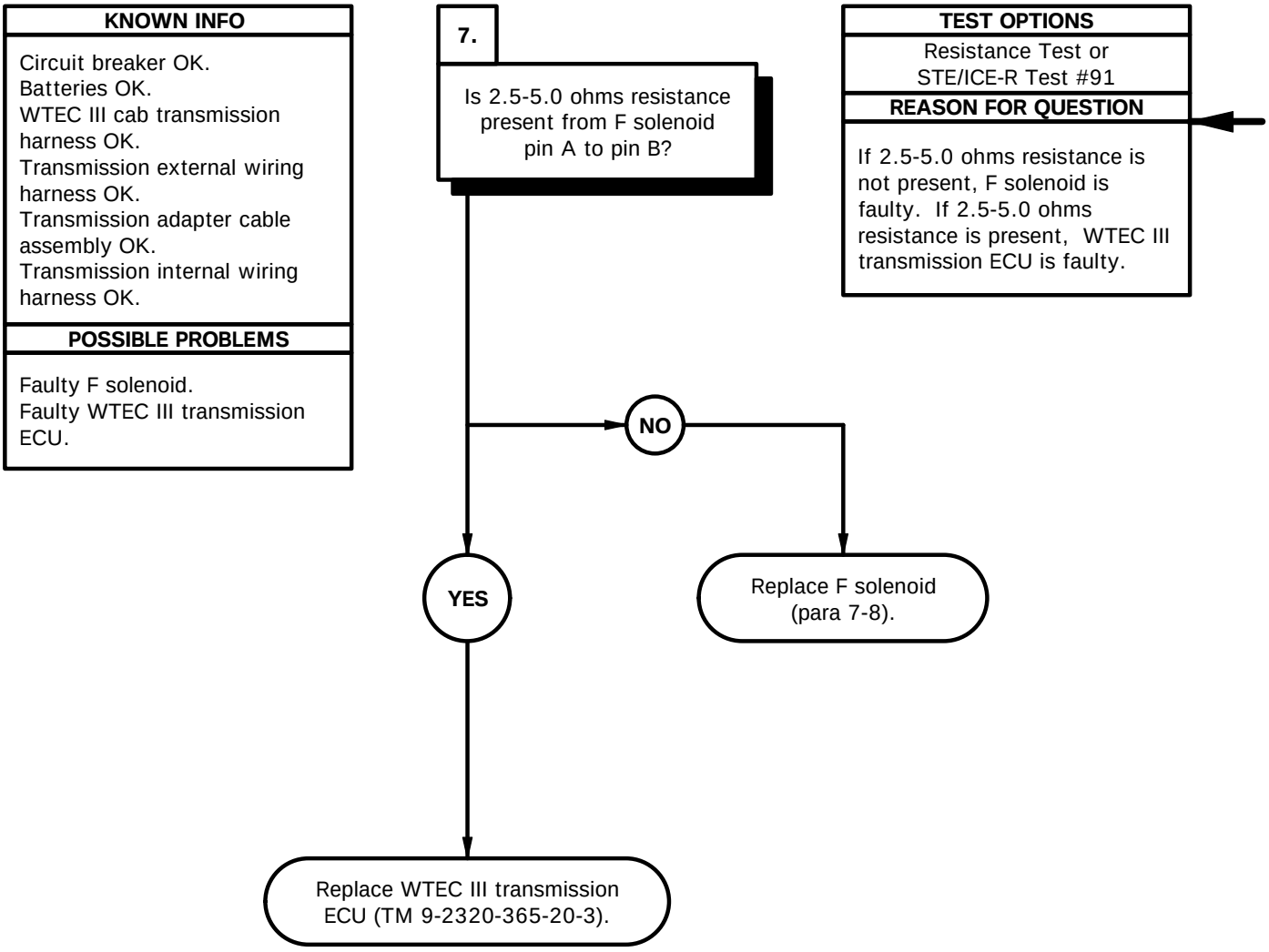
INTERNAL WIRING HARNESS CONNECTOR F



INTERNAL WIRING HARNESS 24-PIN CONNECTOR

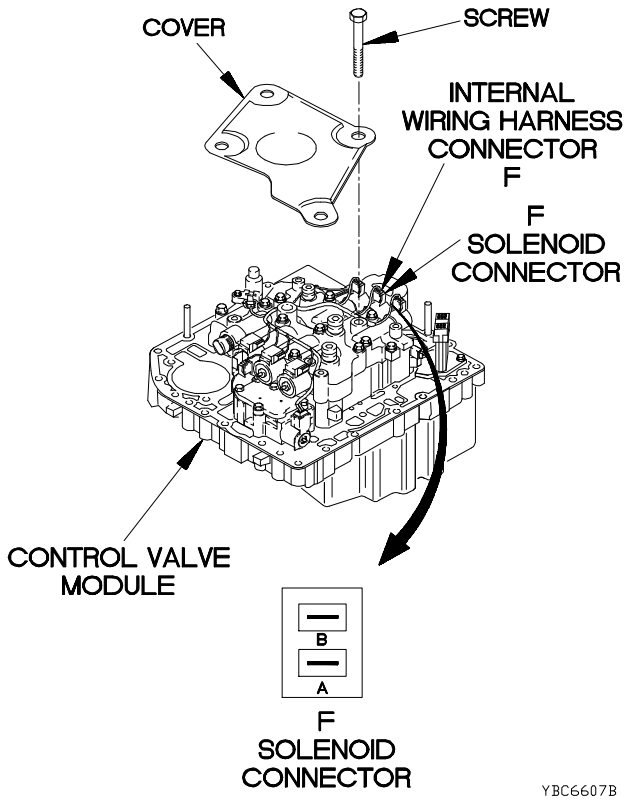
YBC6606B

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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)

Materials/Parts
Wire, Elect, 50 ft (Item 94, Appendix C)

Personnel Required
(2)

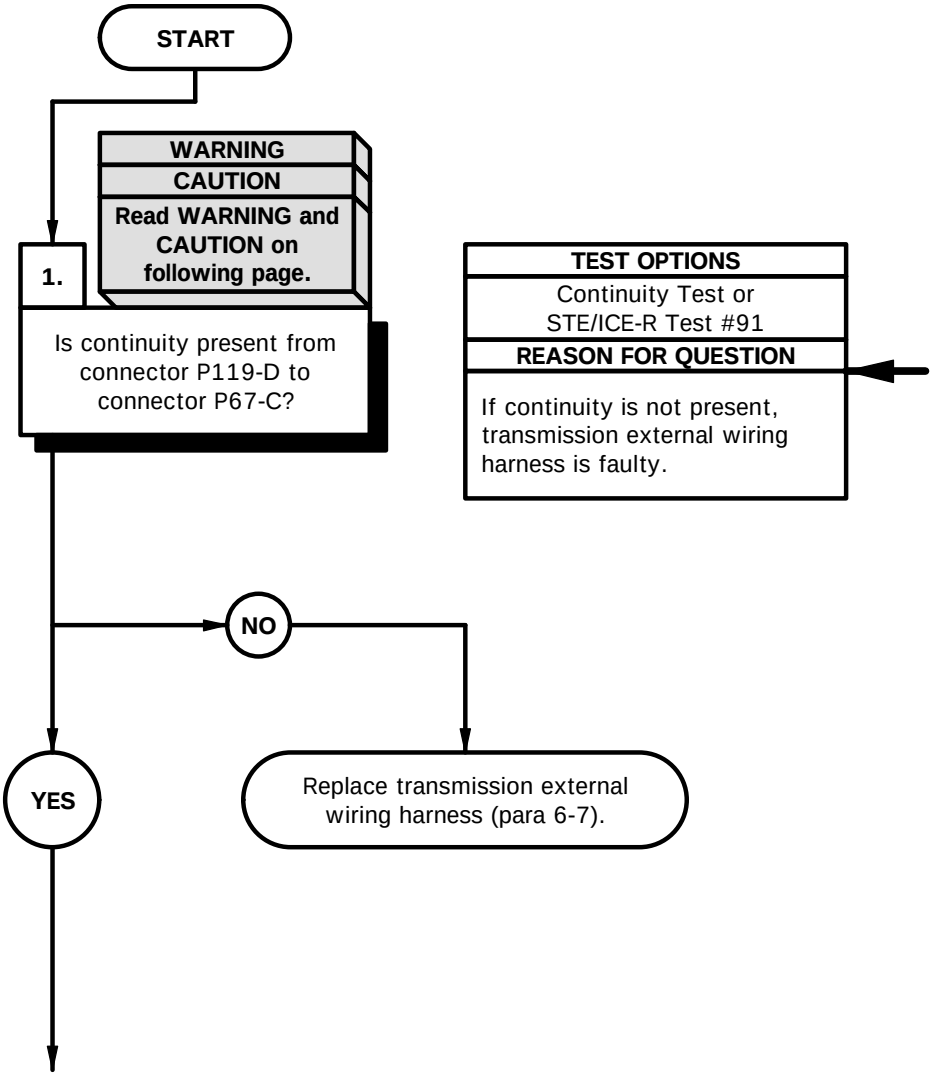
References
TM 9-4910-571-12&P

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

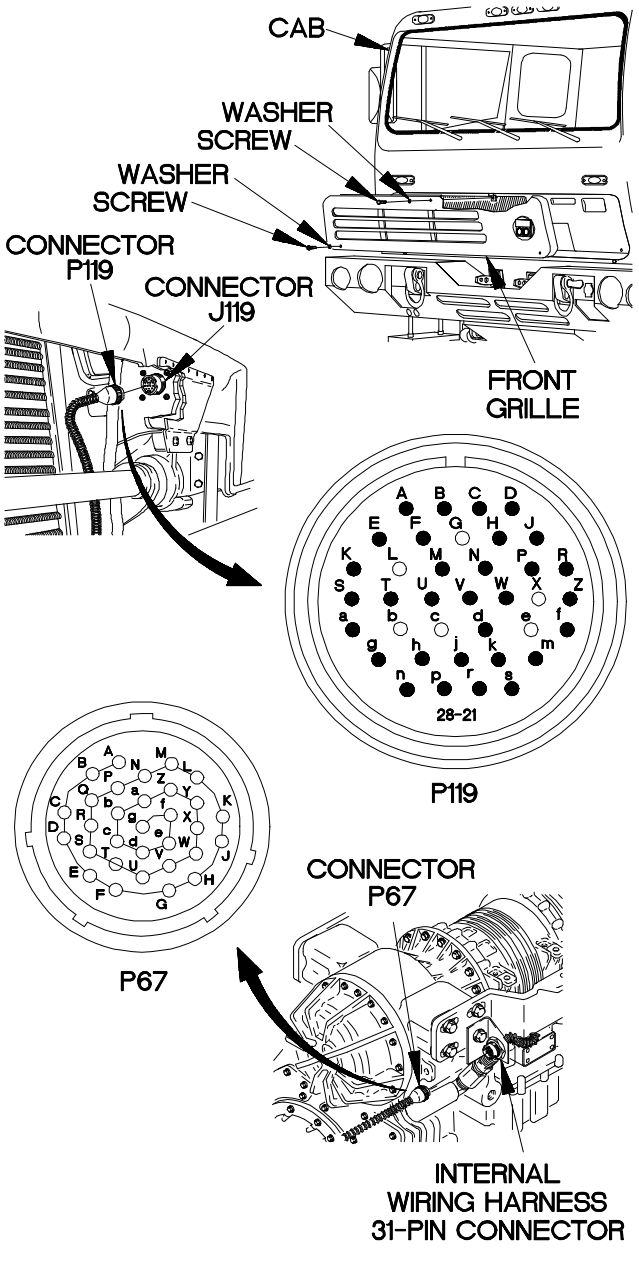
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

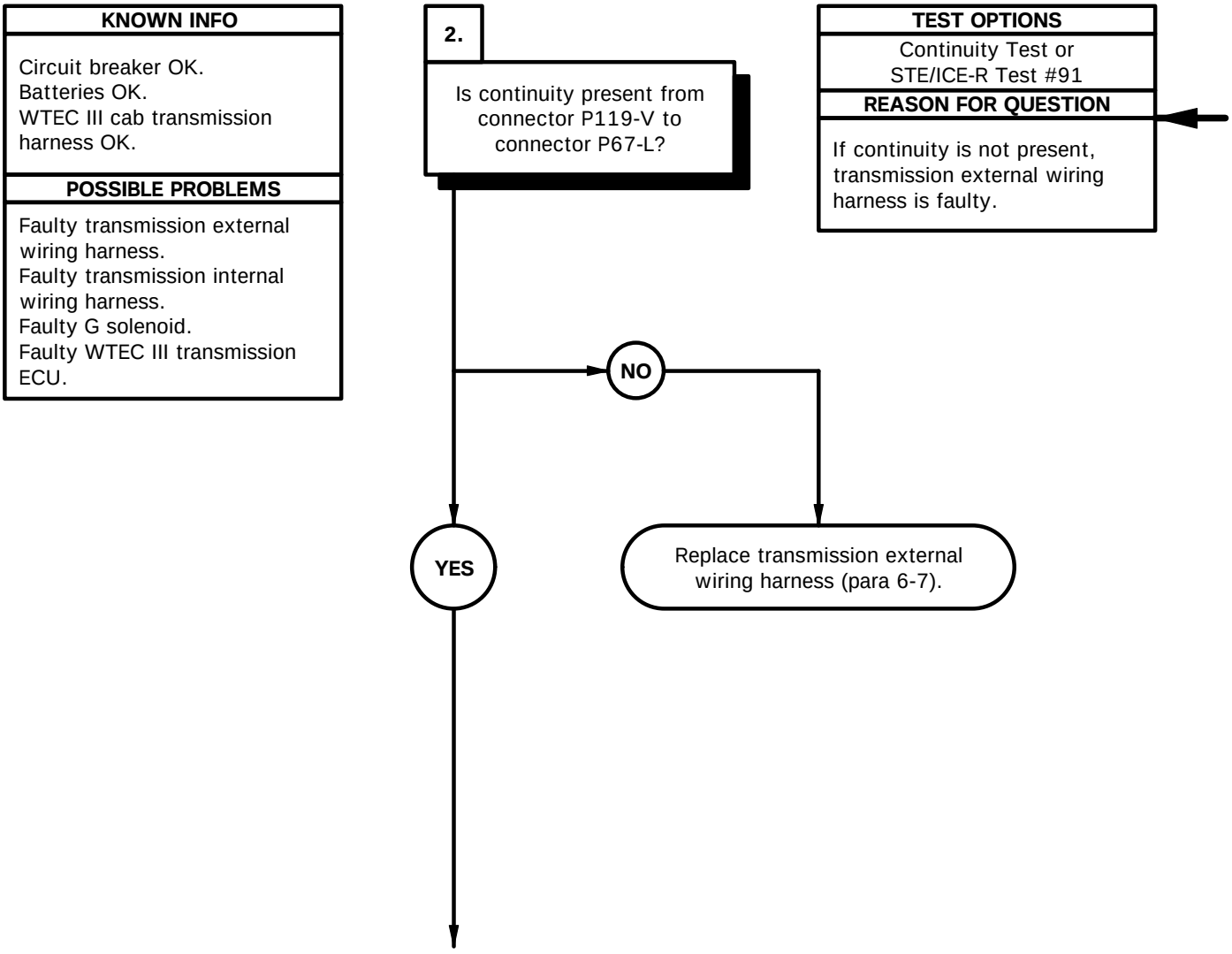
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from internal wiring harness 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect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

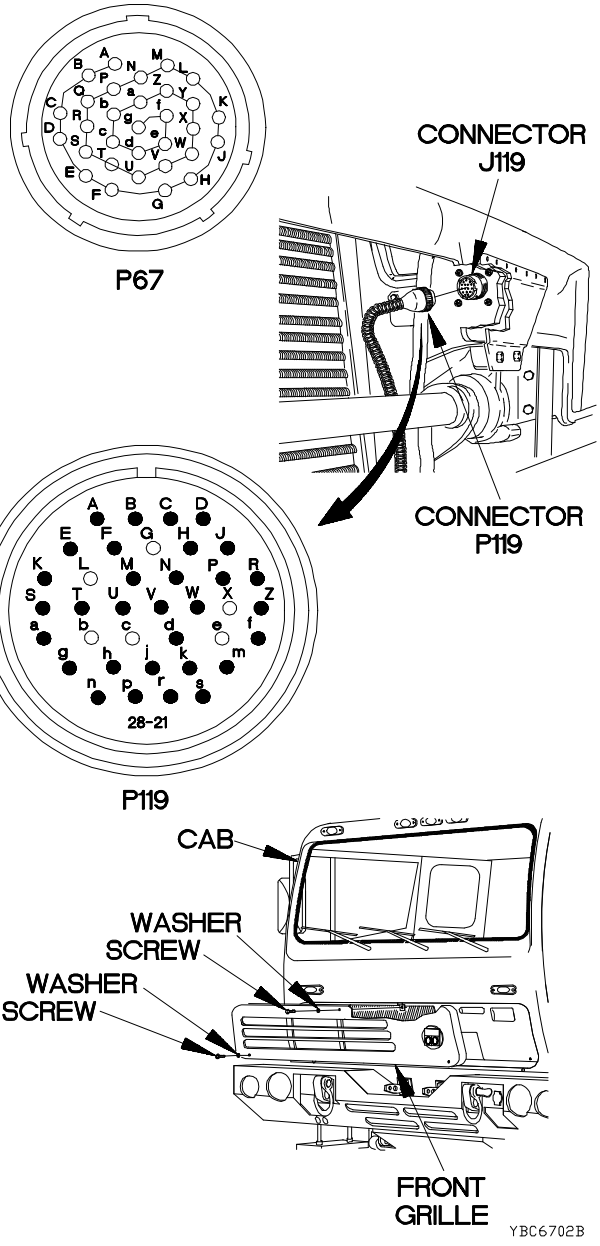


c67. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 22 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

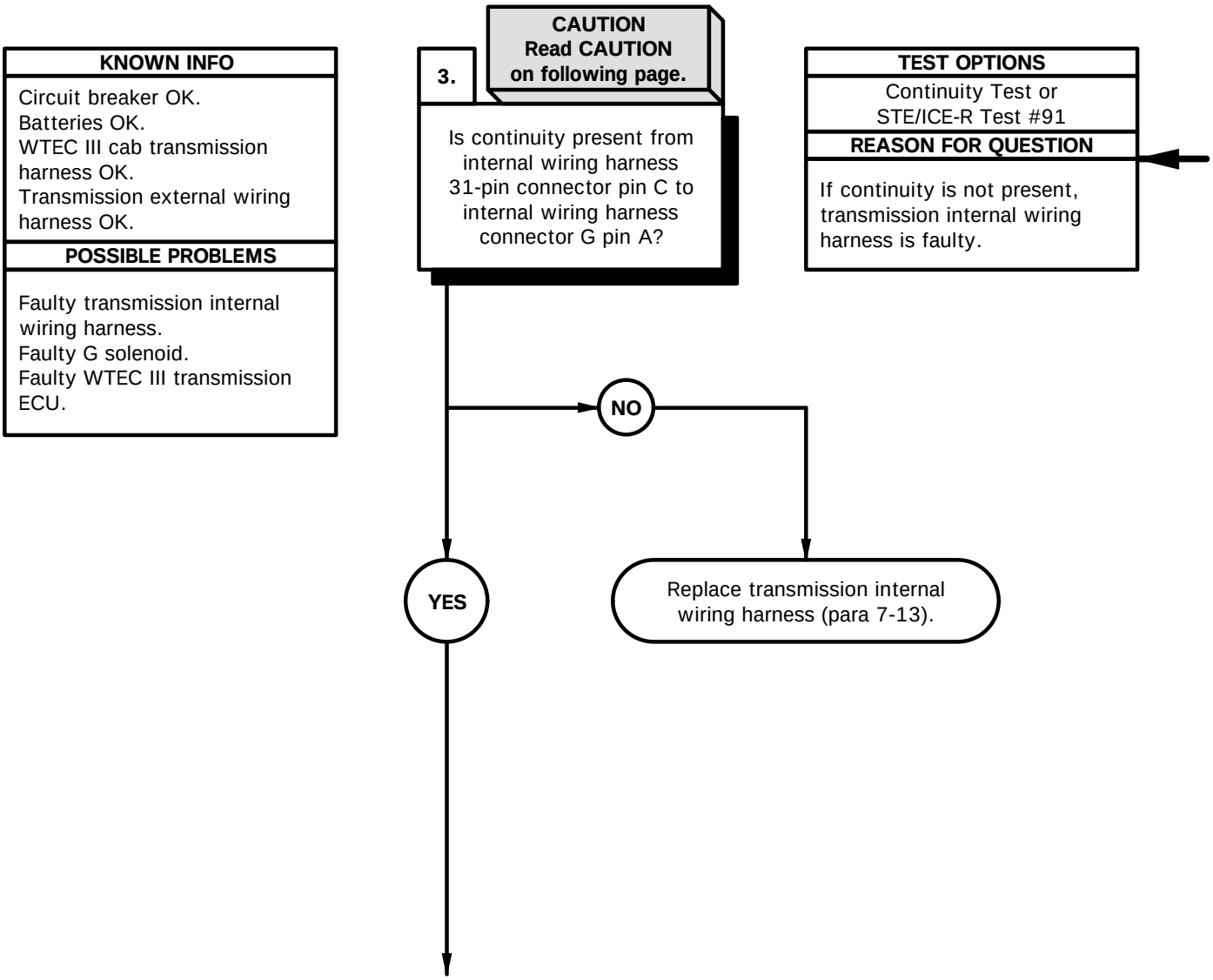


CONTINUITY TEST

(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)

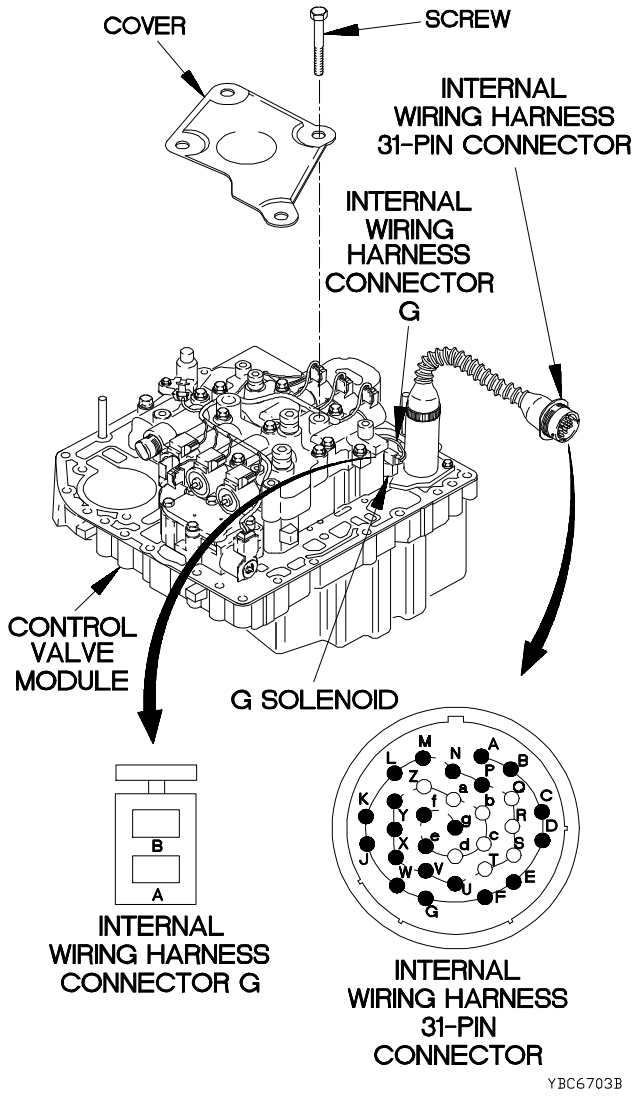


CAUTION

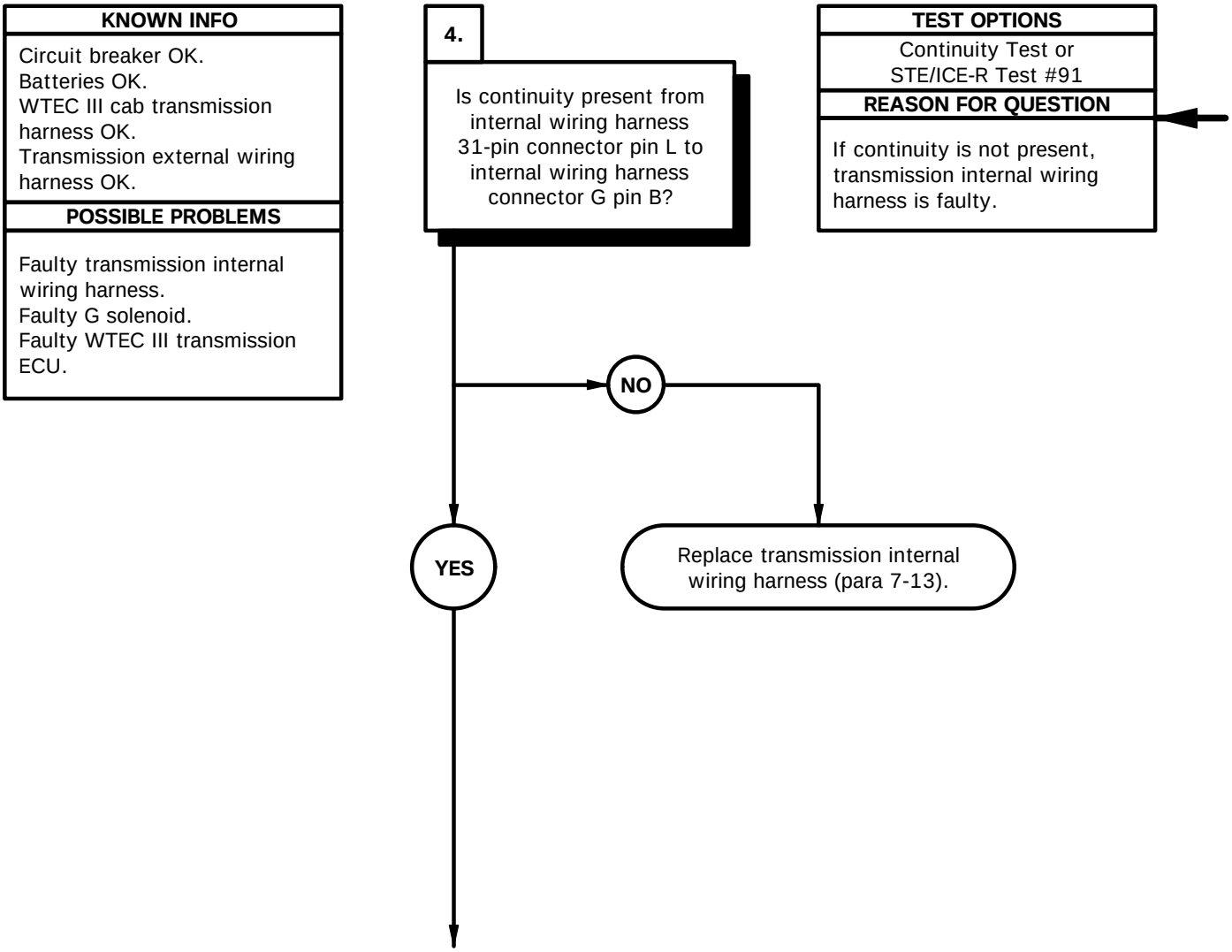
Use care when disconnecting transmission internal wiring harness connectors. Failure to comply may result in damage to equipment.

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 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).

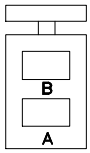


c67. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 22 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

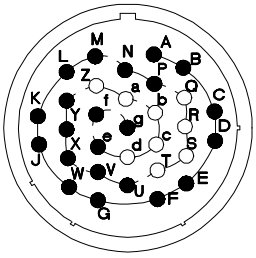


CONTINUITY TEST

(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).



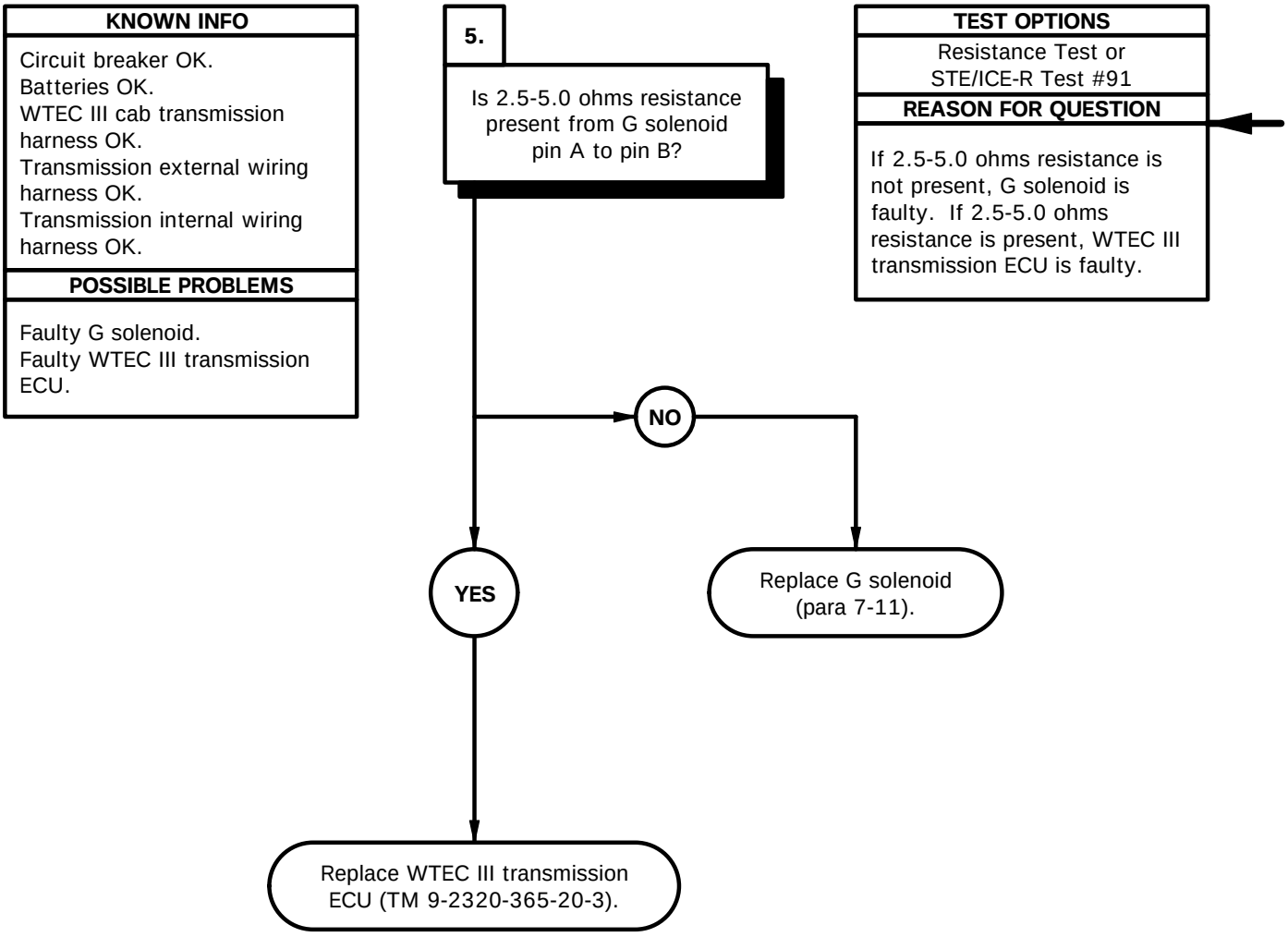
INTERNAL WIRING HARNESS CONNECTOR G



INTERNAL WIRING HARNESS 31-PIN CONNECTOR

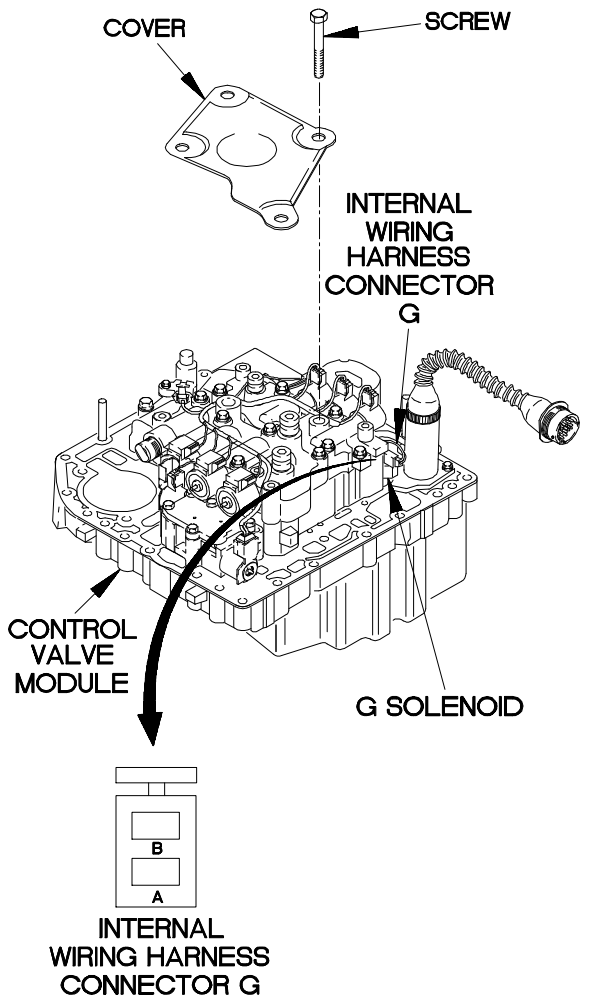
YBC6704B

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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)

Materials/Parts
Wire, Elect, 50 ft (Item 94, Appendix C)

Personnel Required
(2)

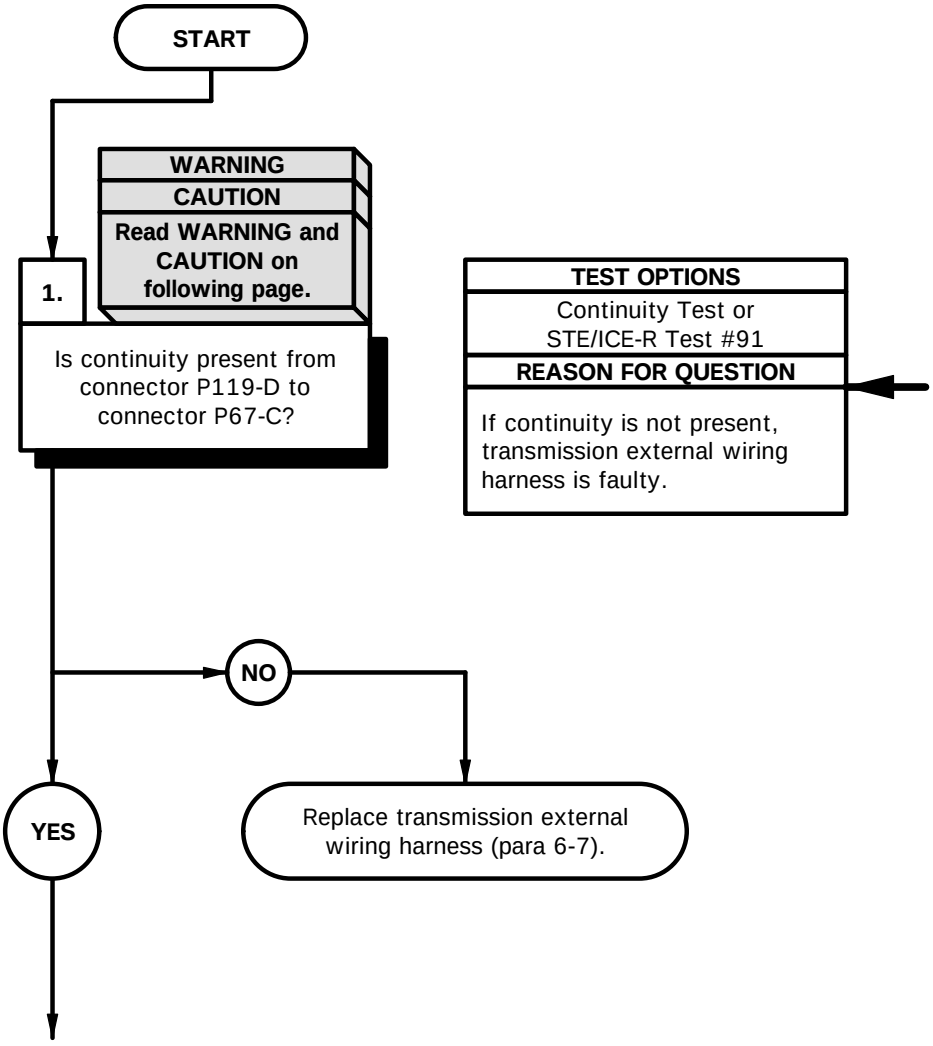
References
TM 9-4910-571-12&P

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

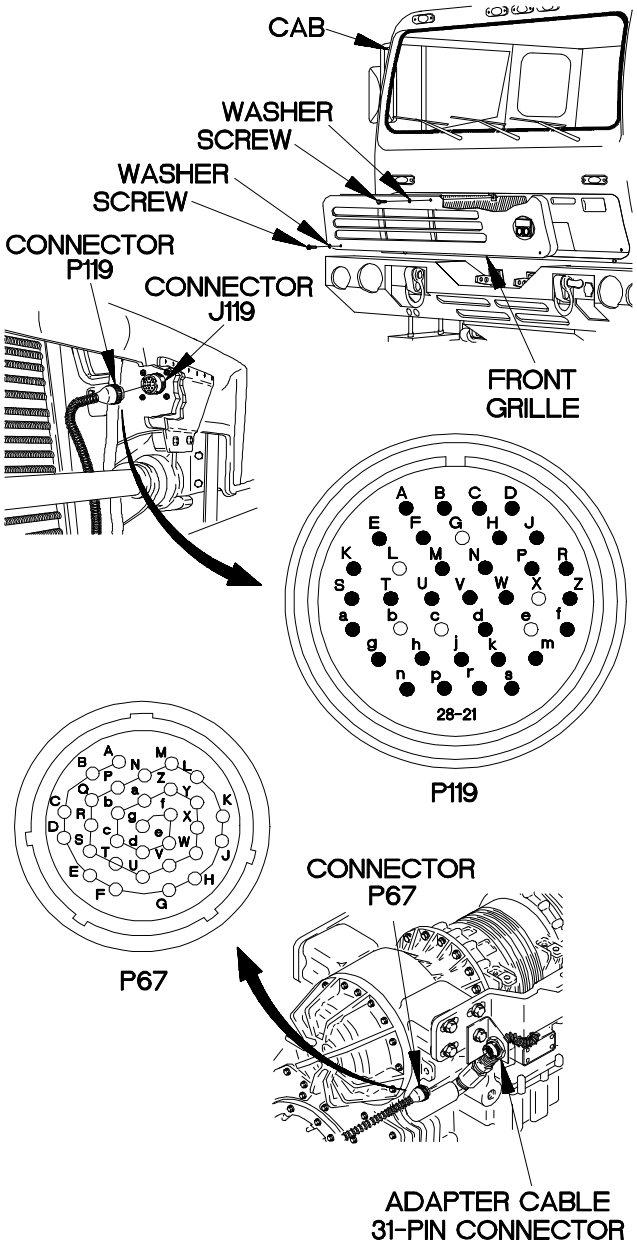
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

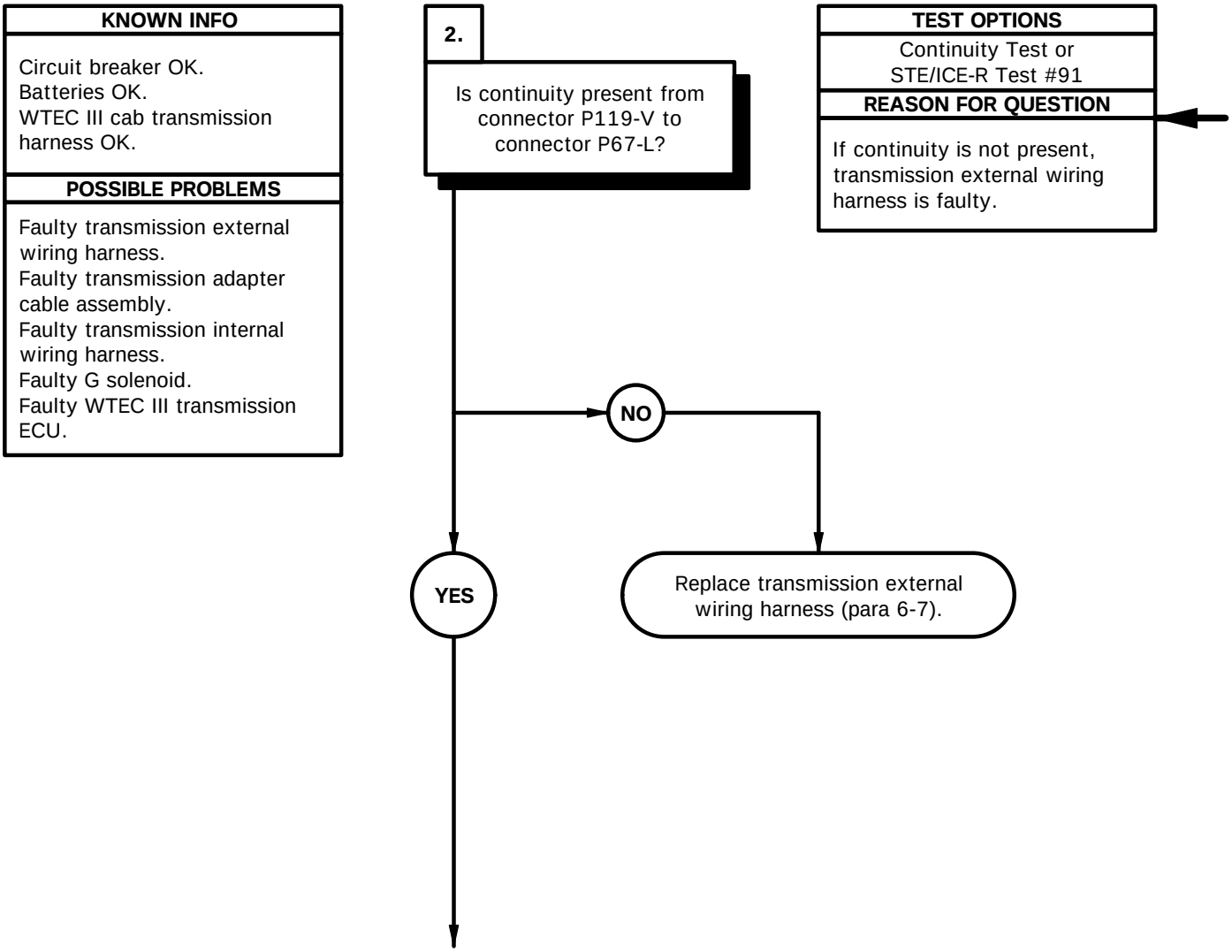
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from adapter cable 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect positive (+)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

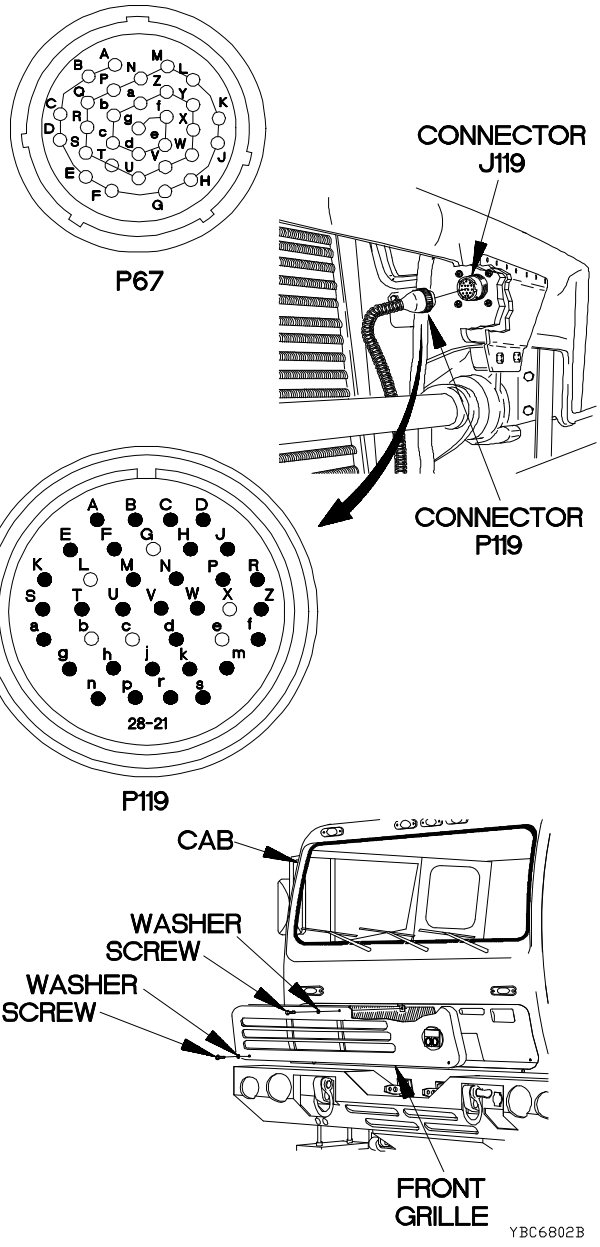


c68. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 22 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

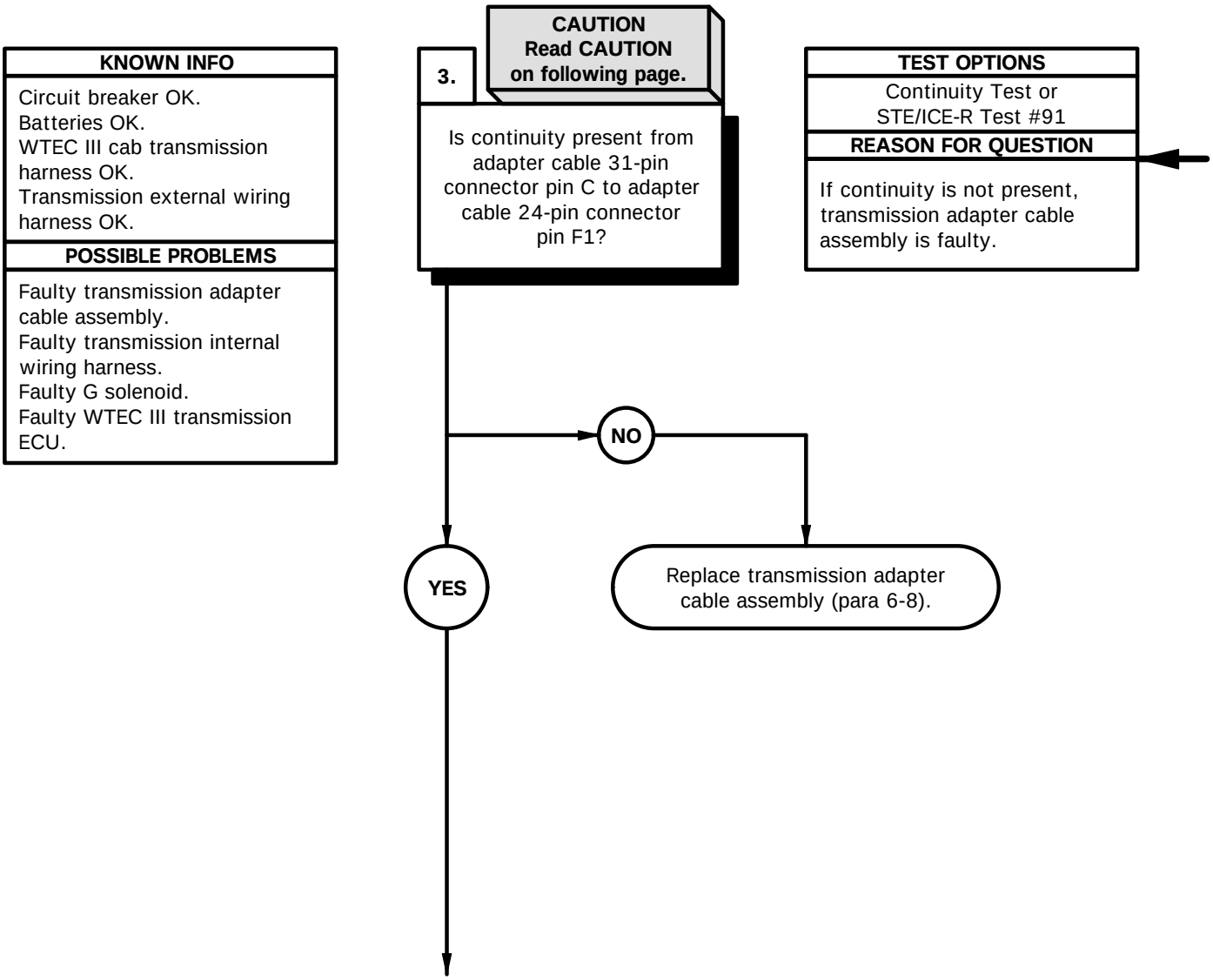


CONTINUITY TEST

(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)

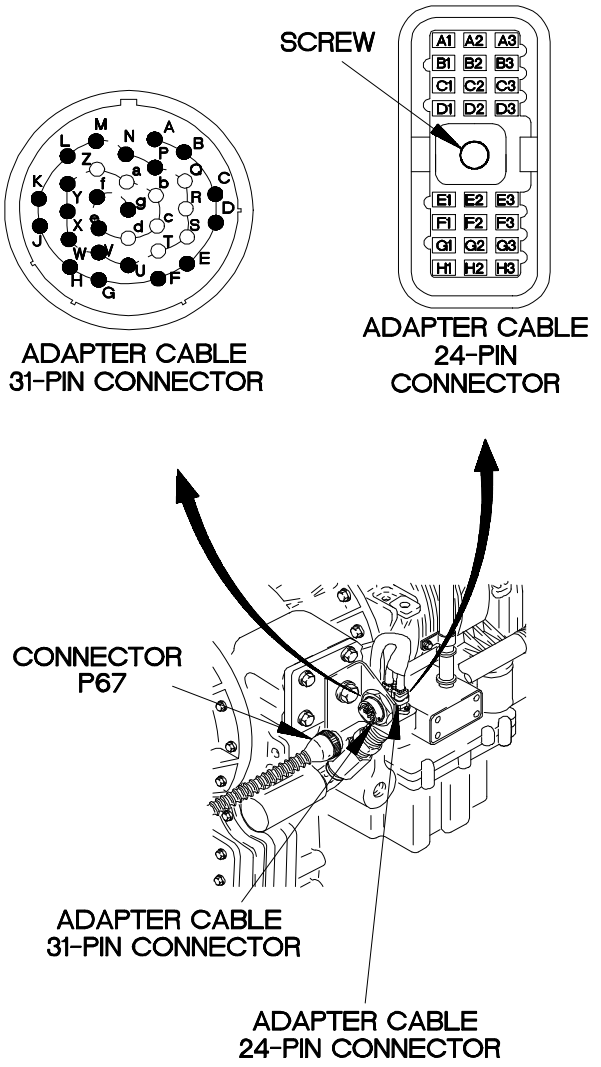


CAUTION

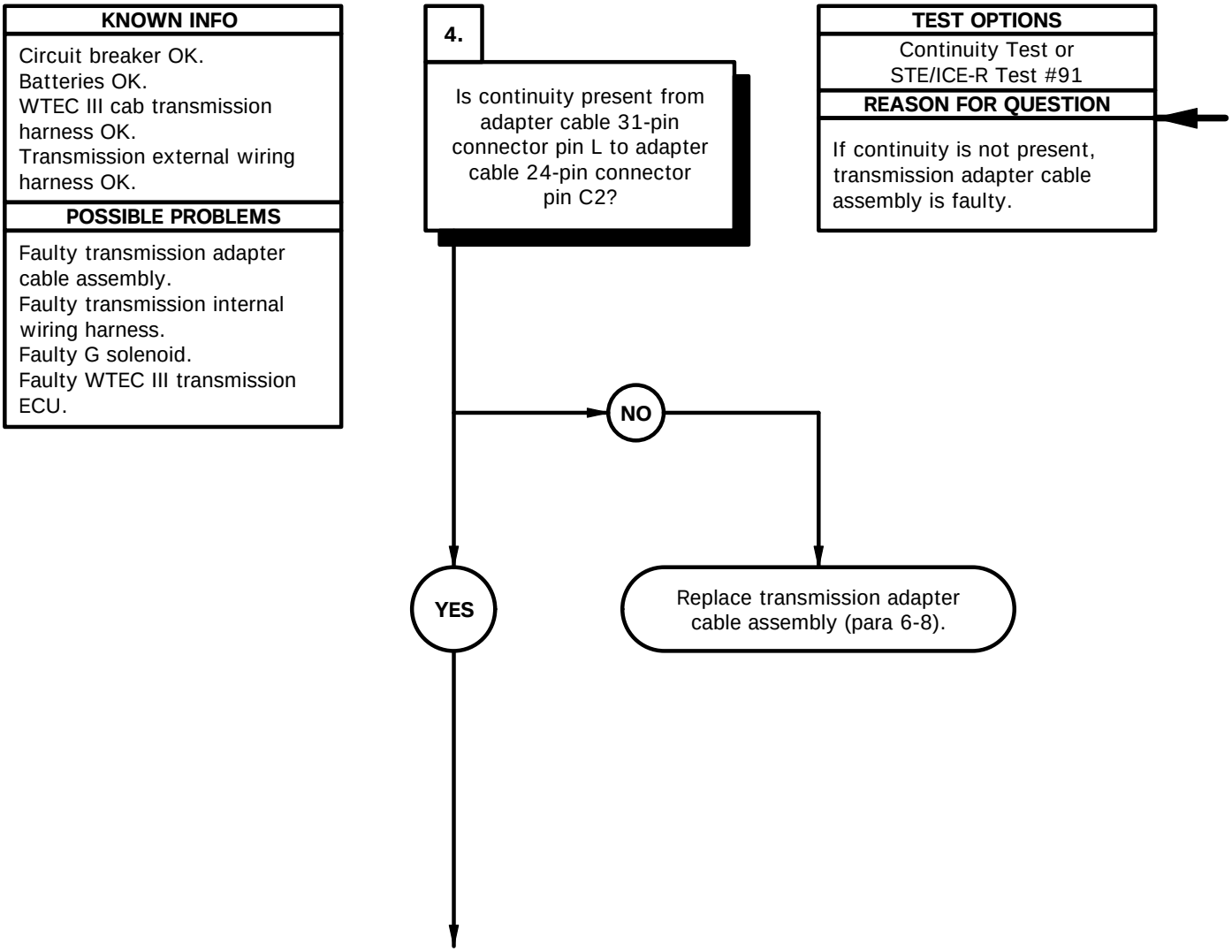
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

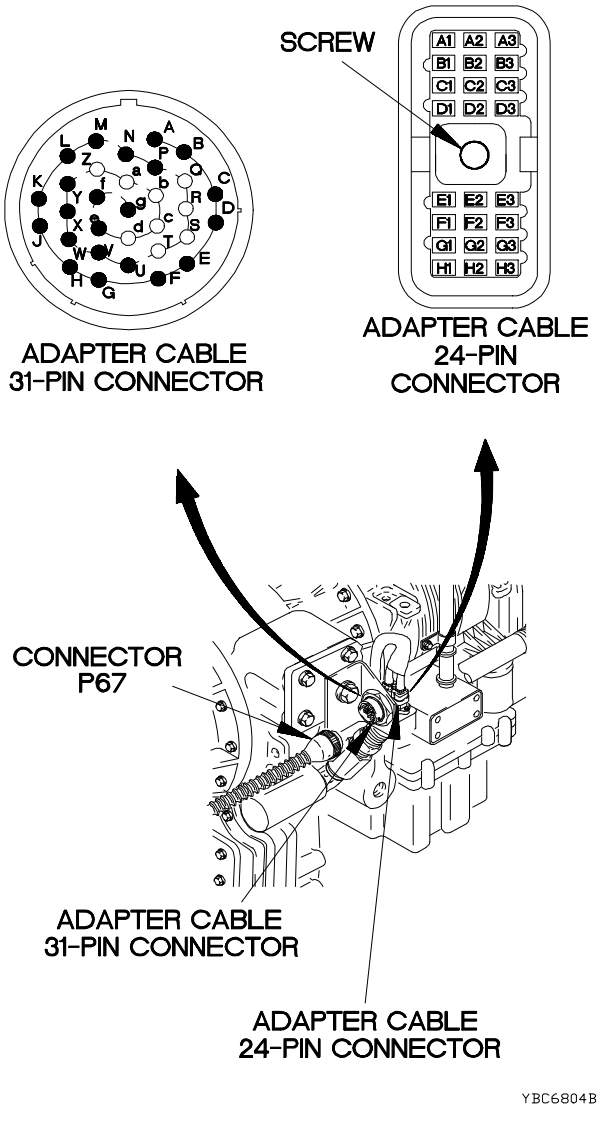


c68. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 22 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

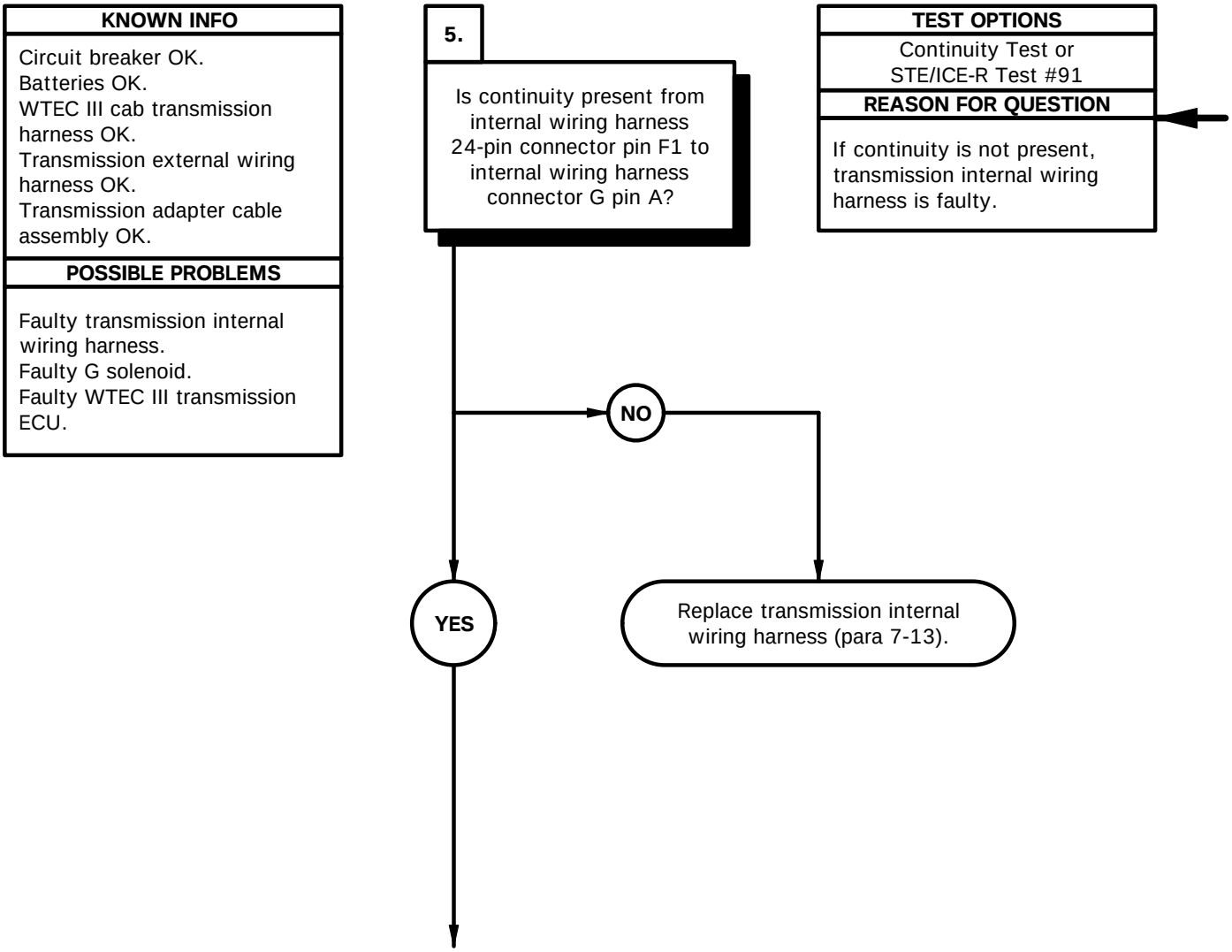


CONTINUITY TEST

(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.

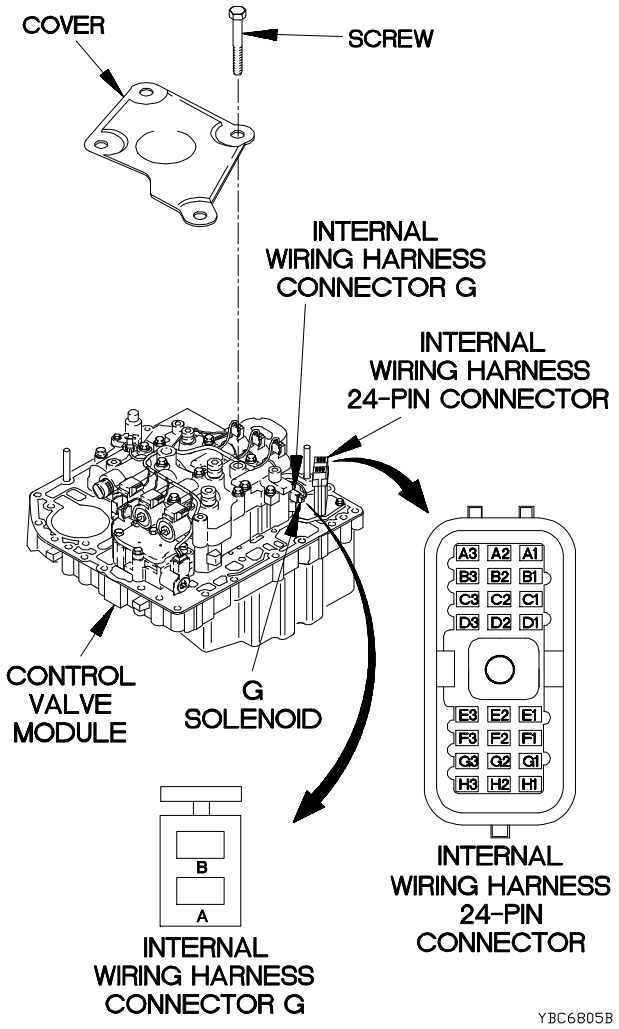


c68. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 22 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

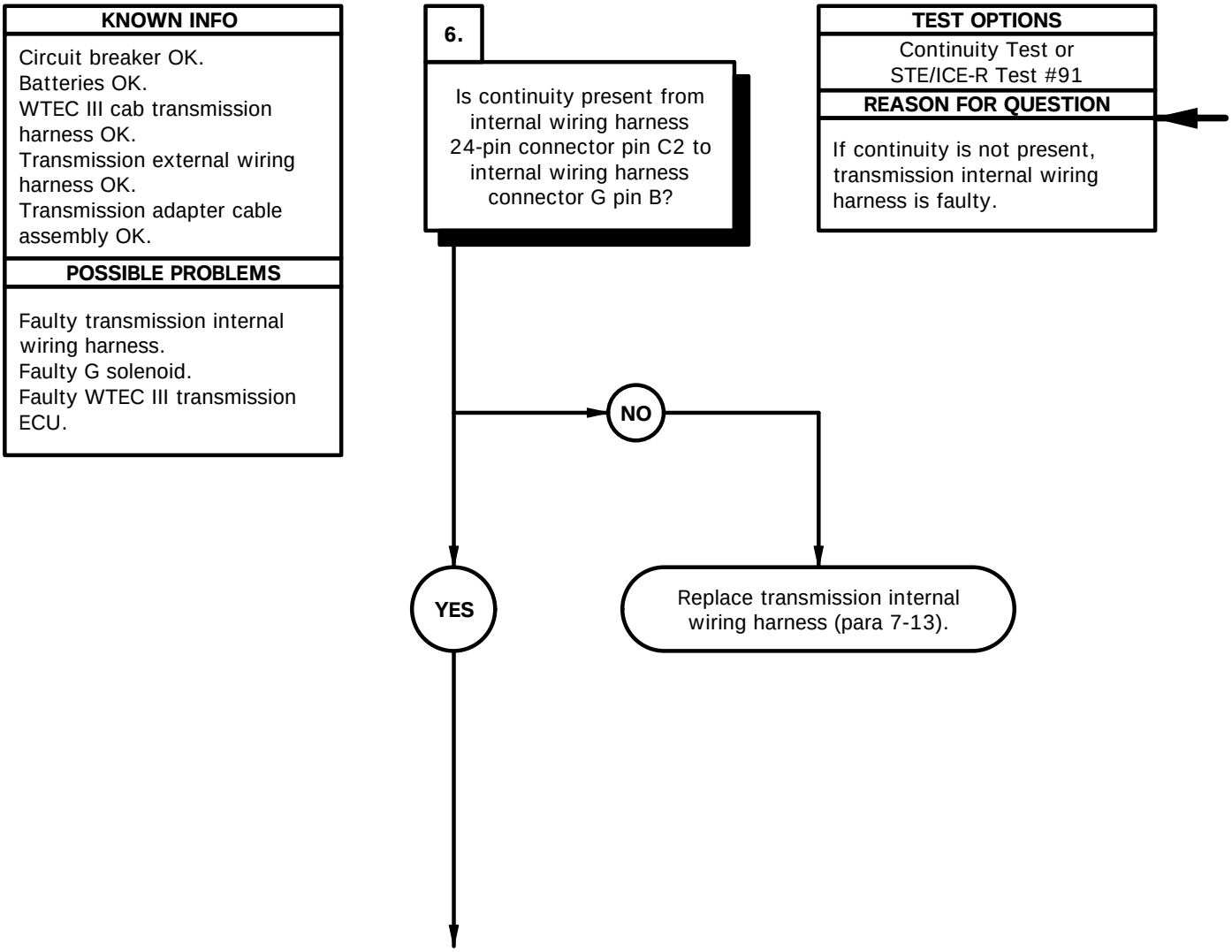


CONTINUITY TEST

(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).

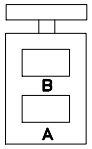


c68. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 22 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

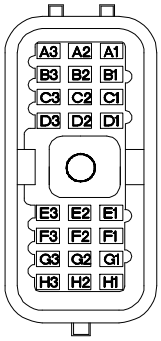


CONTINUITY TEST

(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).



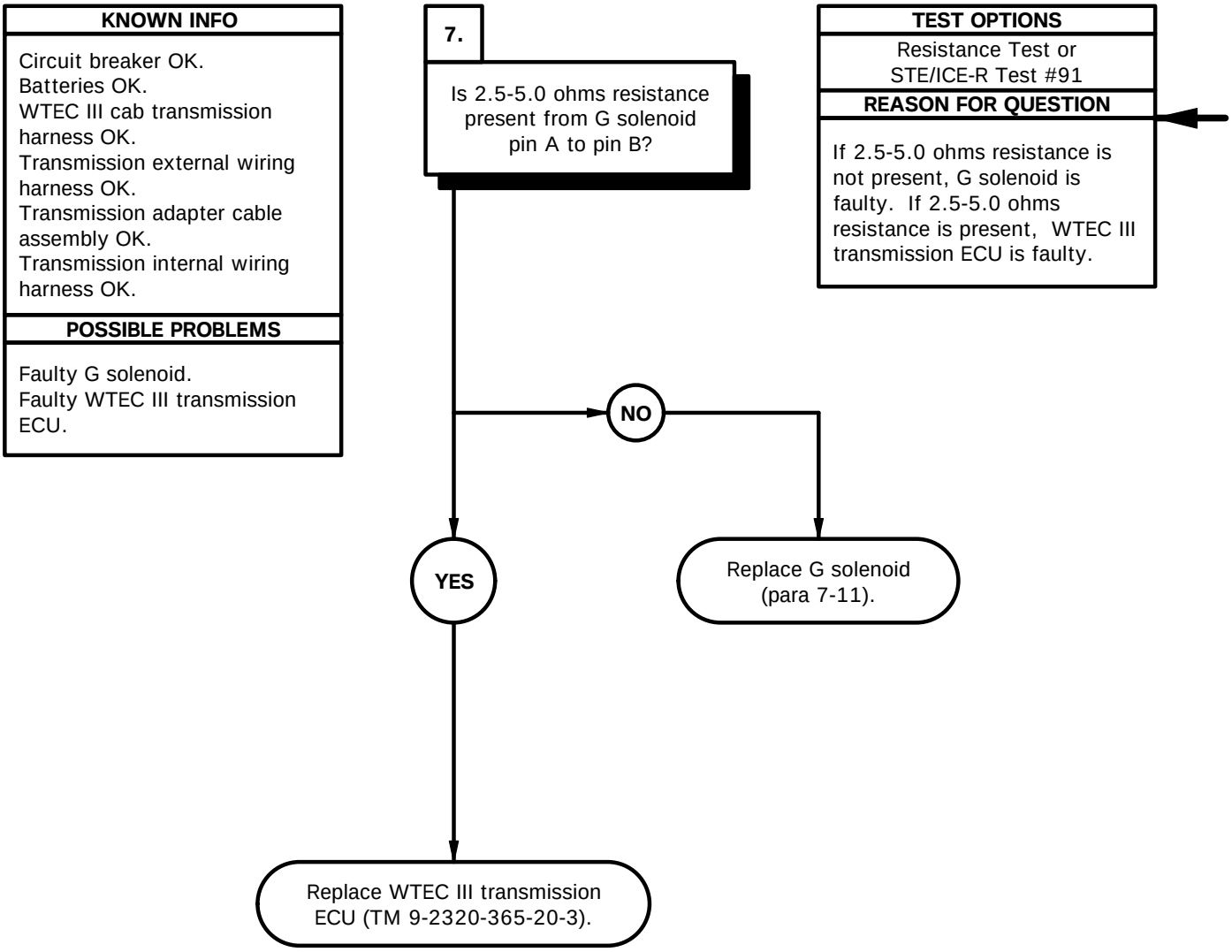
INTERNAL WIRING HARNESS CONNECTOR G



INTERNAL WIRING HARNESS 24-PIN CONNECTOR

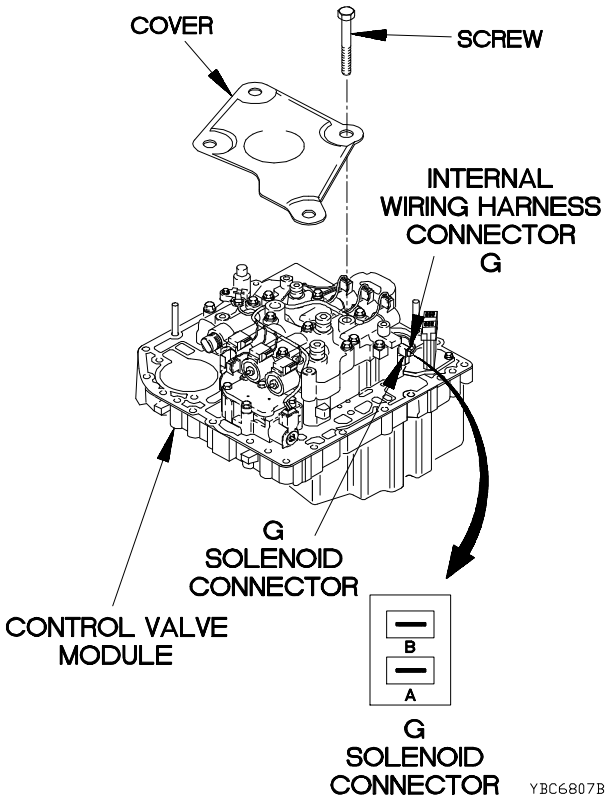
TA248306B

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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

INITIAL SETUP

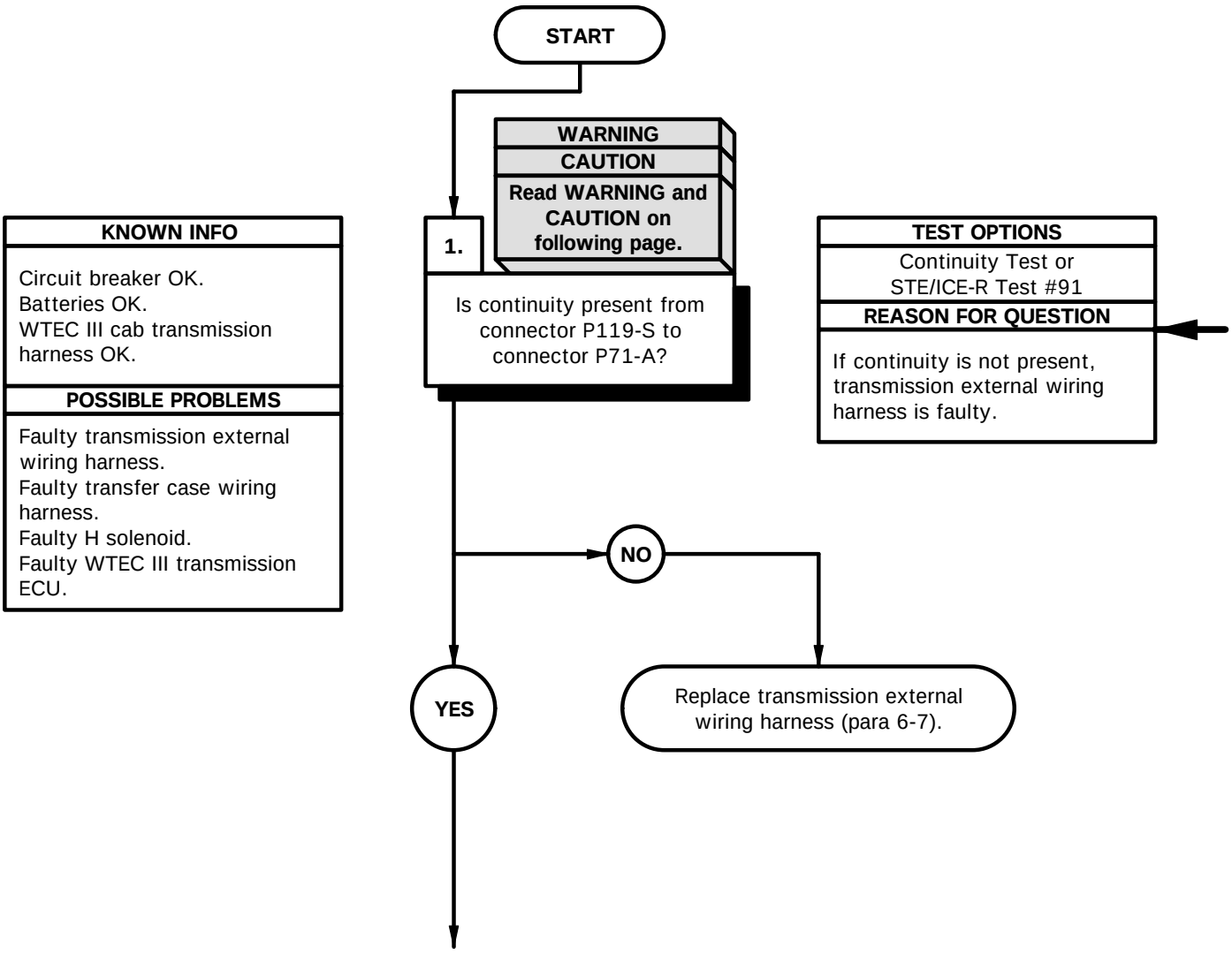
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

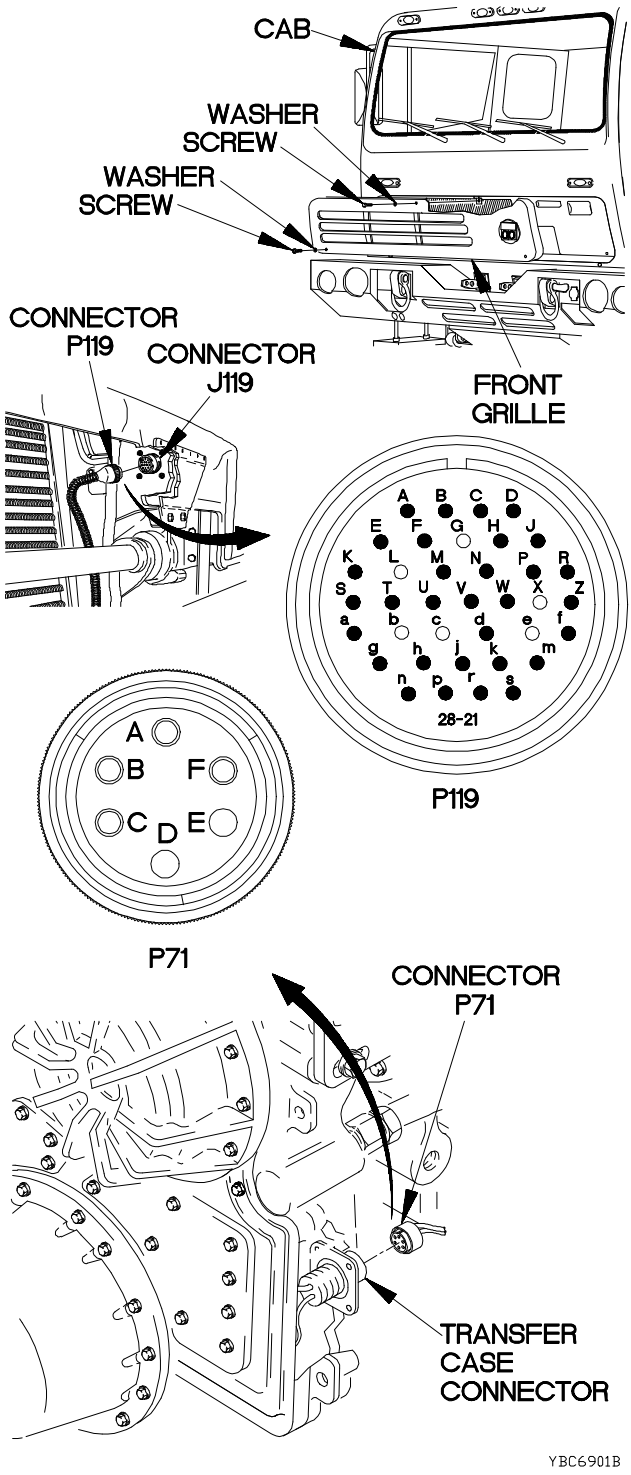
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

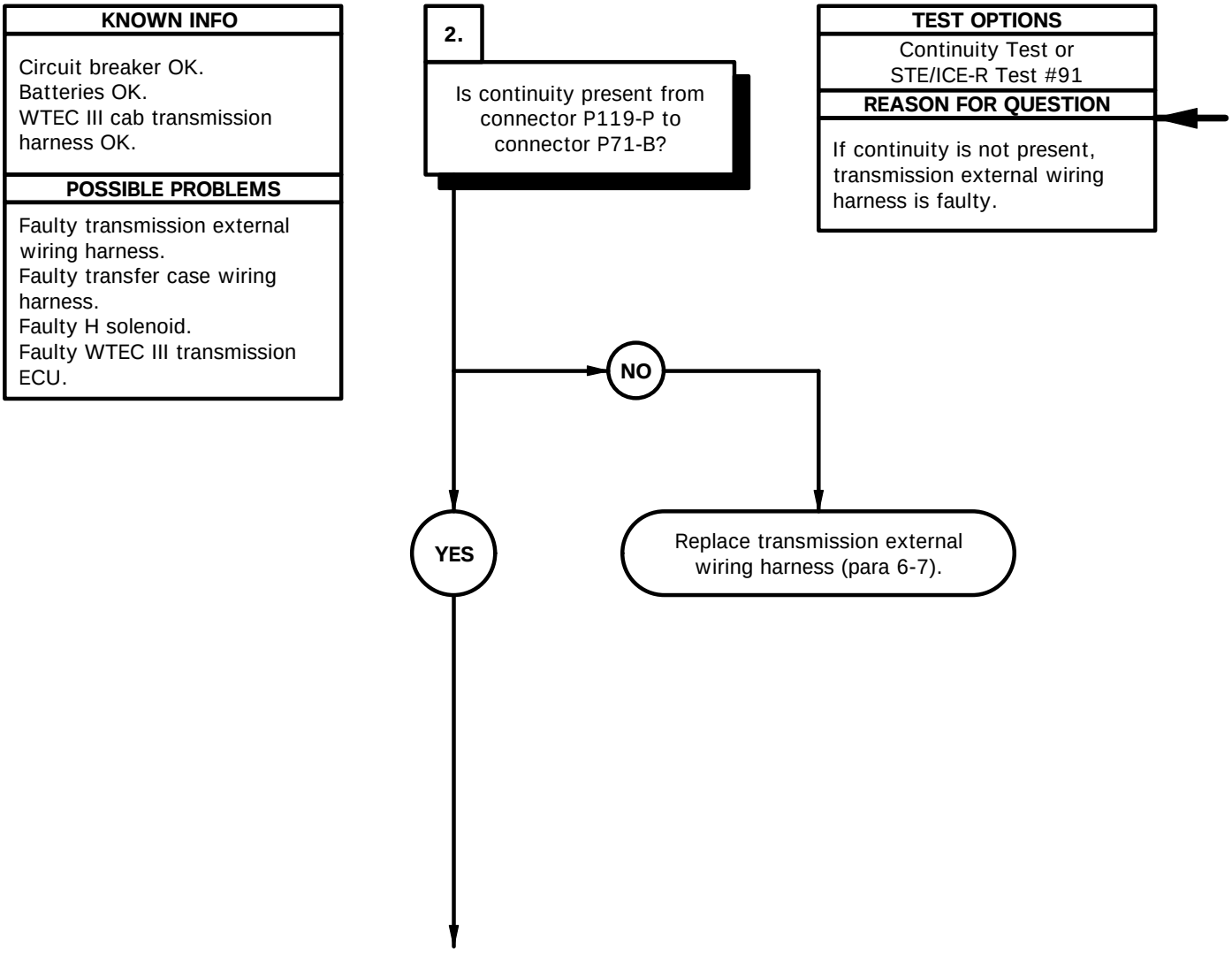
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P71 from transfer case connector.
(6) Set multimeter to ohms.
(7) Connect positive (+) probe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

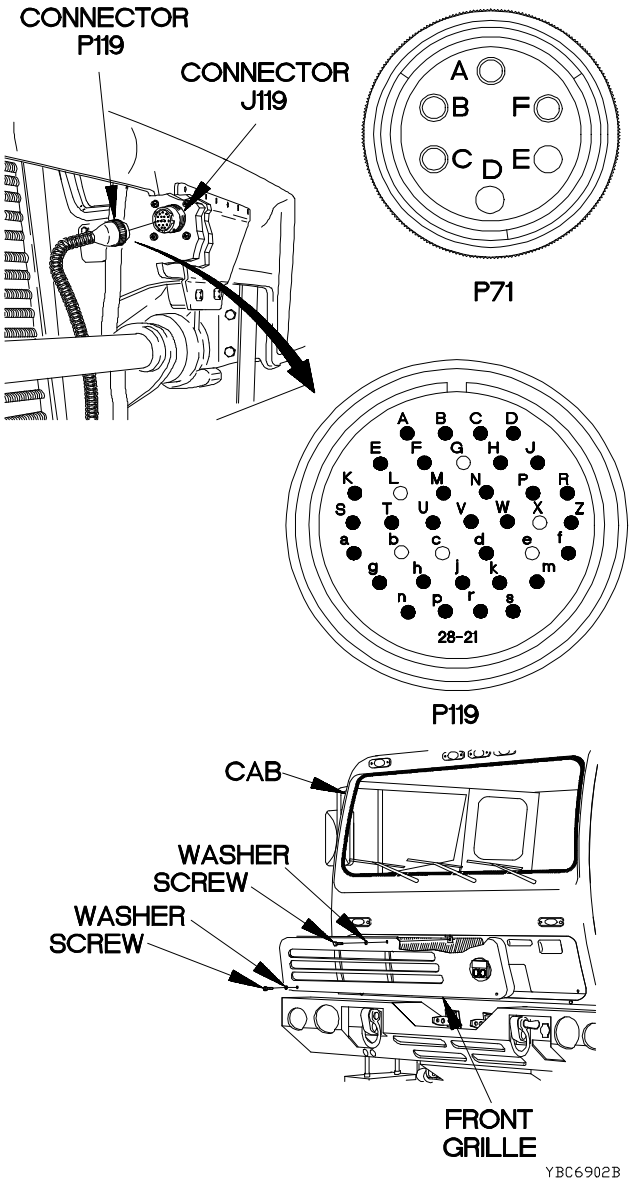


c69. WTEC III TRANSMISSIO PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, 46 AND/OR 69 SUB CODE 23 (CONT)

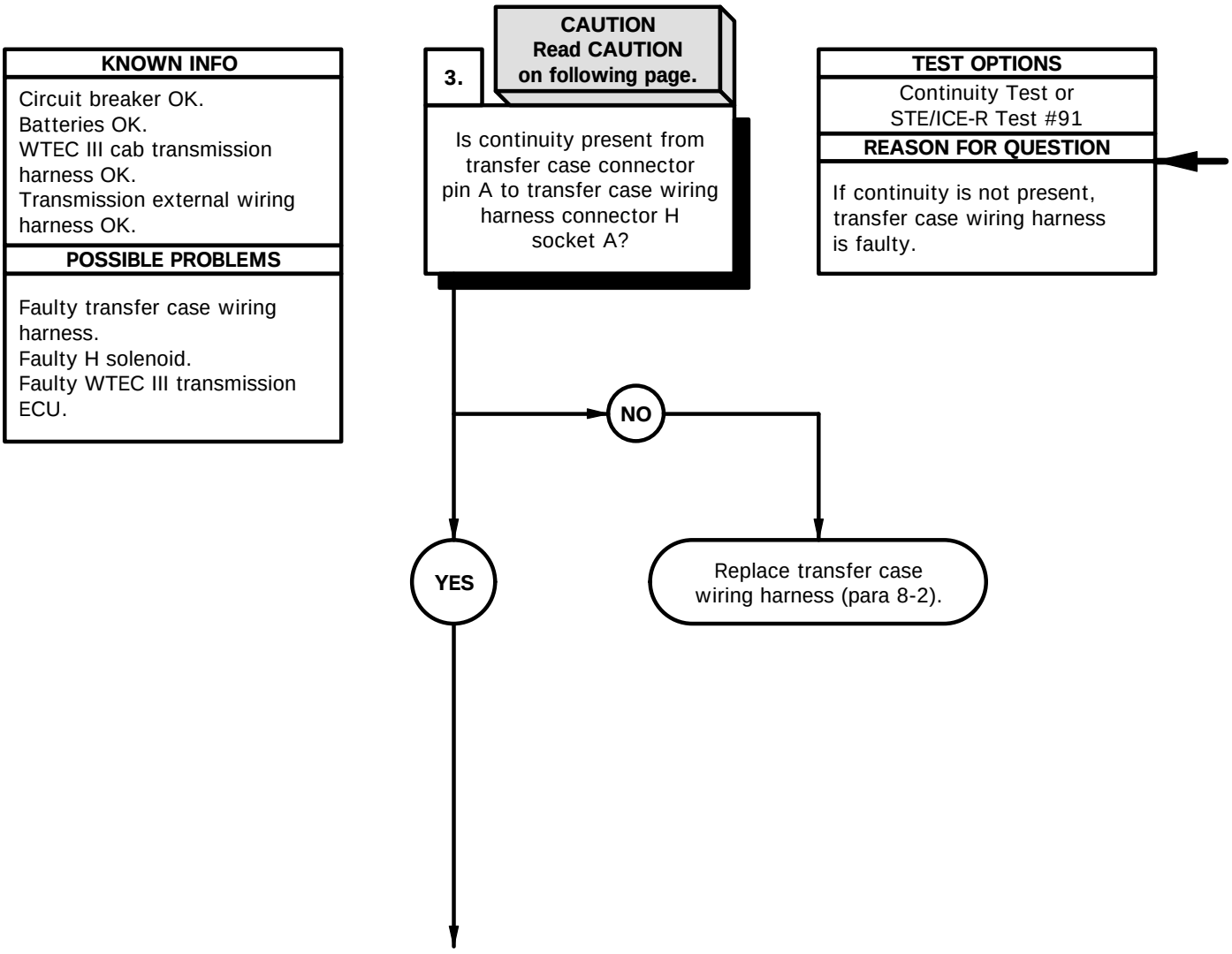


CONTINUITY TEST

(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 TRANSMISSIO PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, 46 AND/OR 69 SUB CODE 23 (CONT)

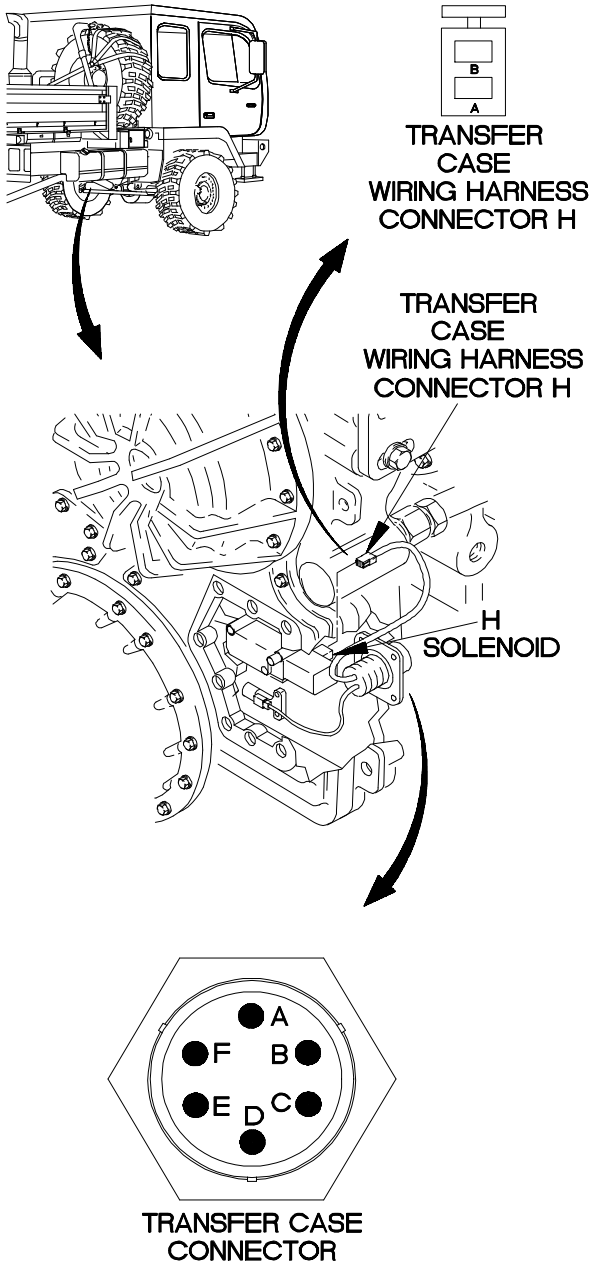


CAUTION

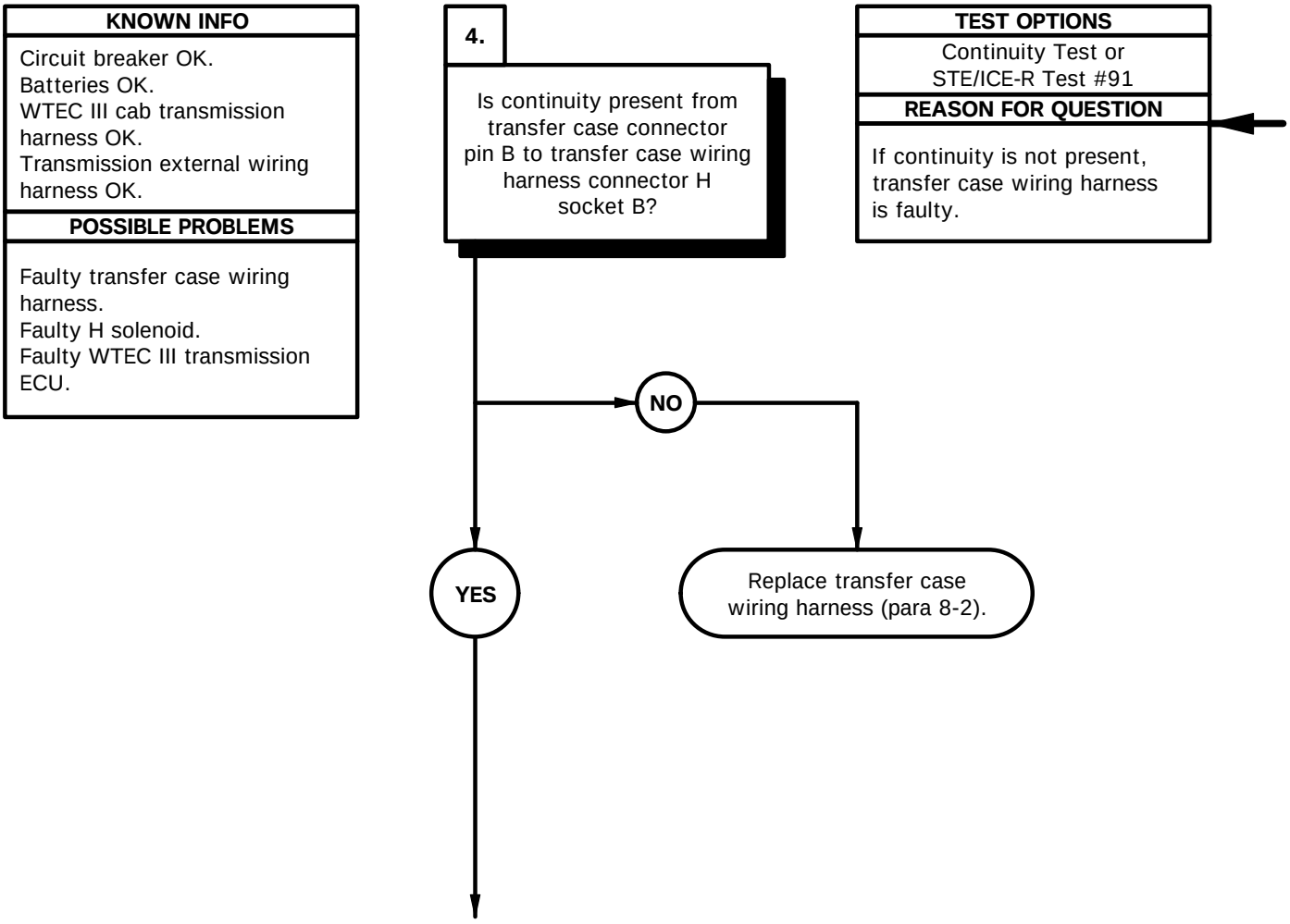
Use care when disconnecting transmission internal wiring harness connectors. Failure to comply may result in damage to equipment.

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).

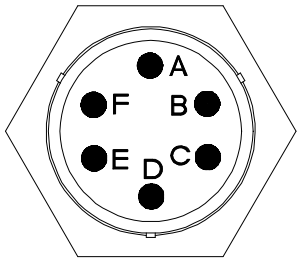


c69. WTEC III TRANSMISSIO PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, 46 AND/OR 69 SUB CODE 23 (CONT)

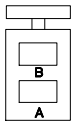


CONTINUITY TEST

(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).



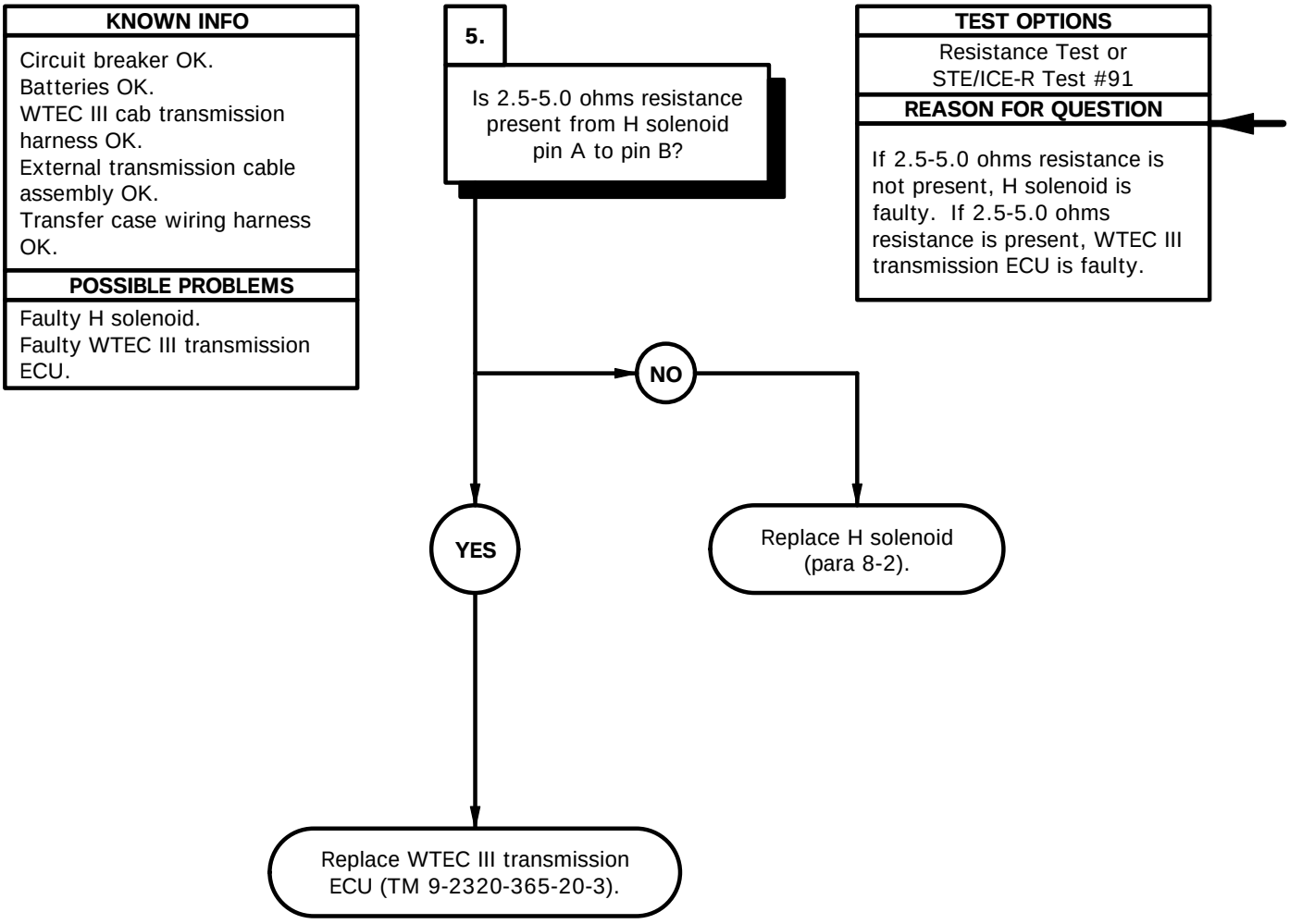
TRANSFER CASE CONNECTOR



TRANSFER CASE WIRING HARNESS CONNECTOR H

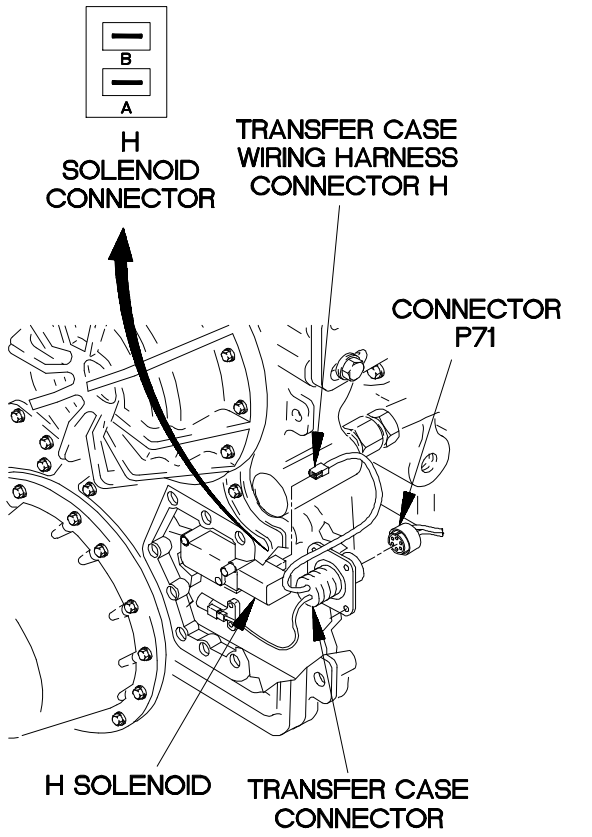
YBC6904B

c69. WTEC III TRANSMISSIO PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 41, 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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)

Materials/Parts
Wire, Elect, 50 ft (Item 94, Appendix C)

Personnel Required
(2)

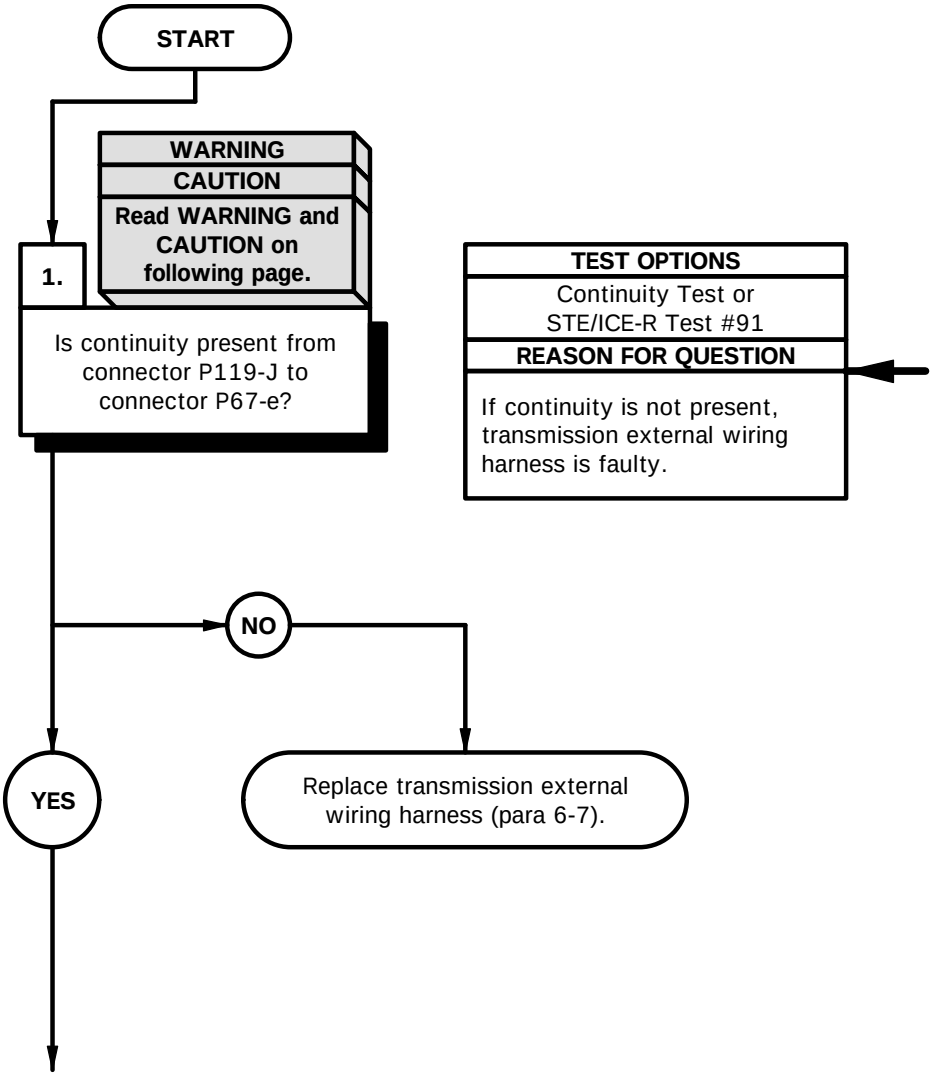
References
TM 9-4910-571-12&P

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 J 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

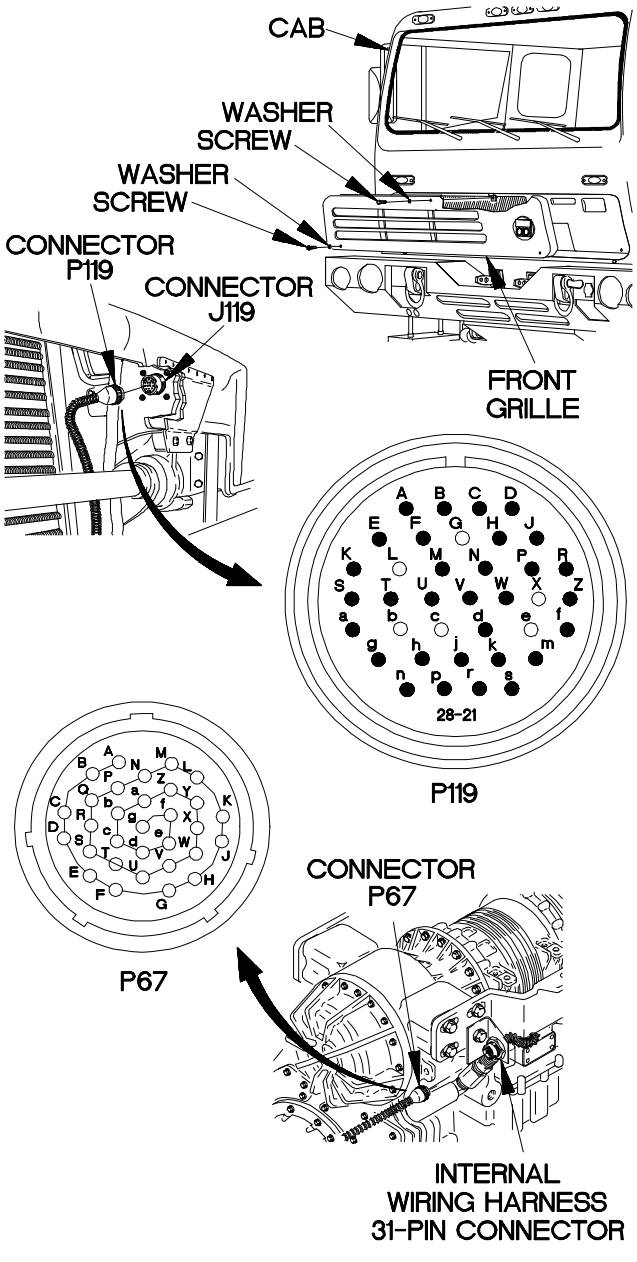
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

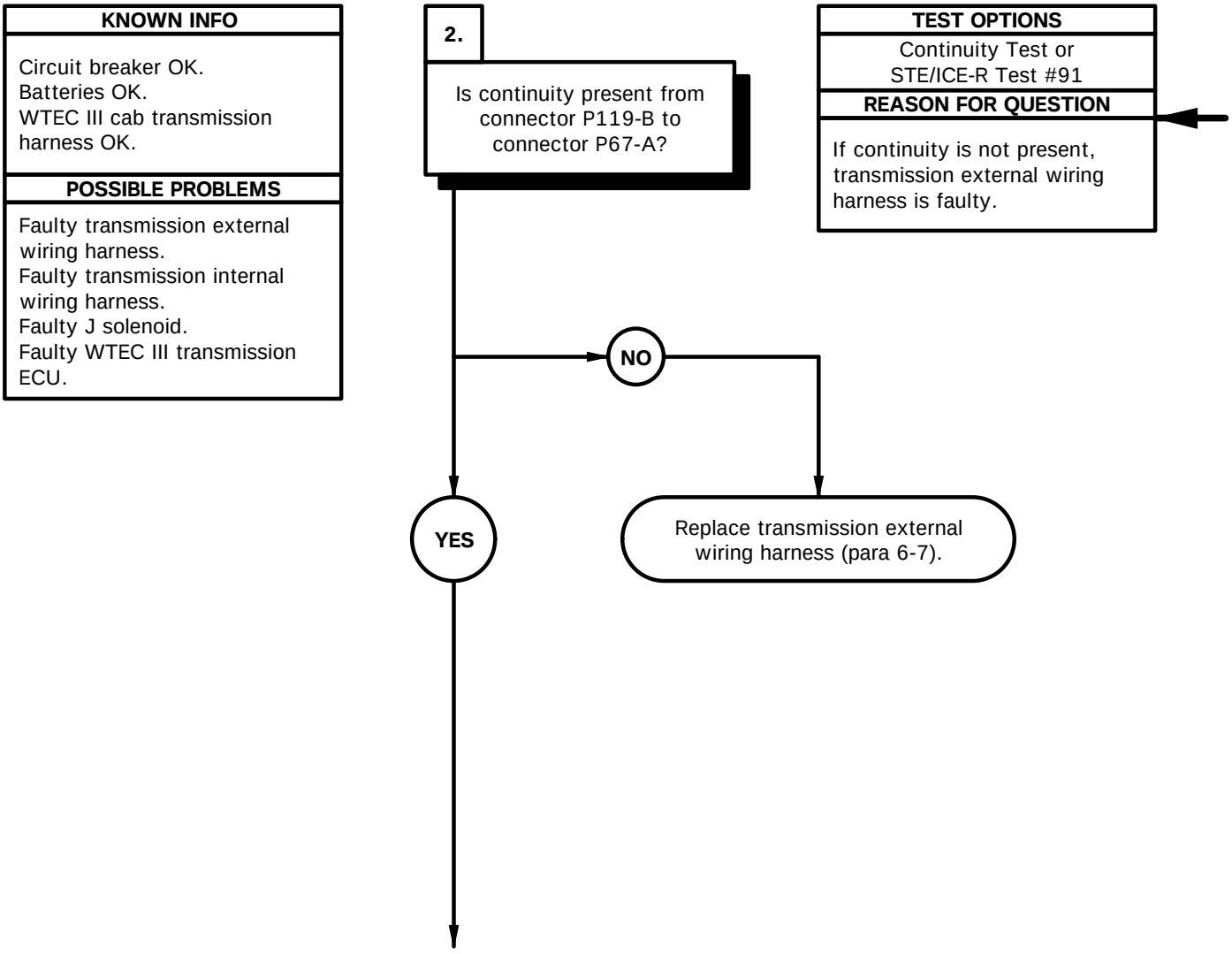
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from internal wiring 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect positive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

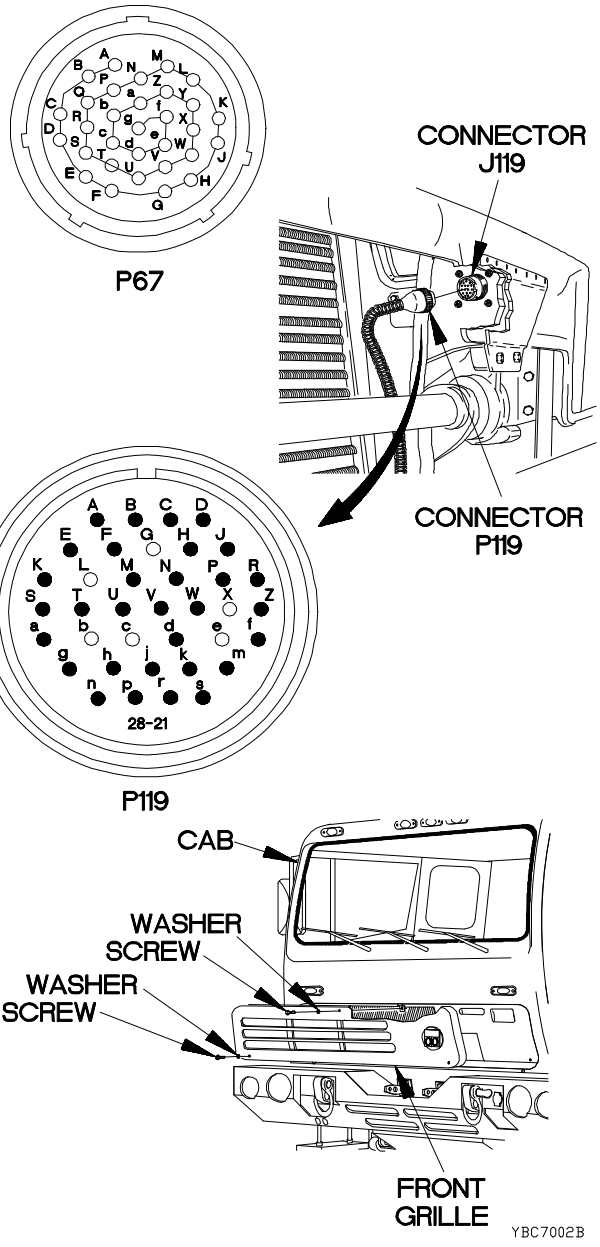


c70. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 24 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

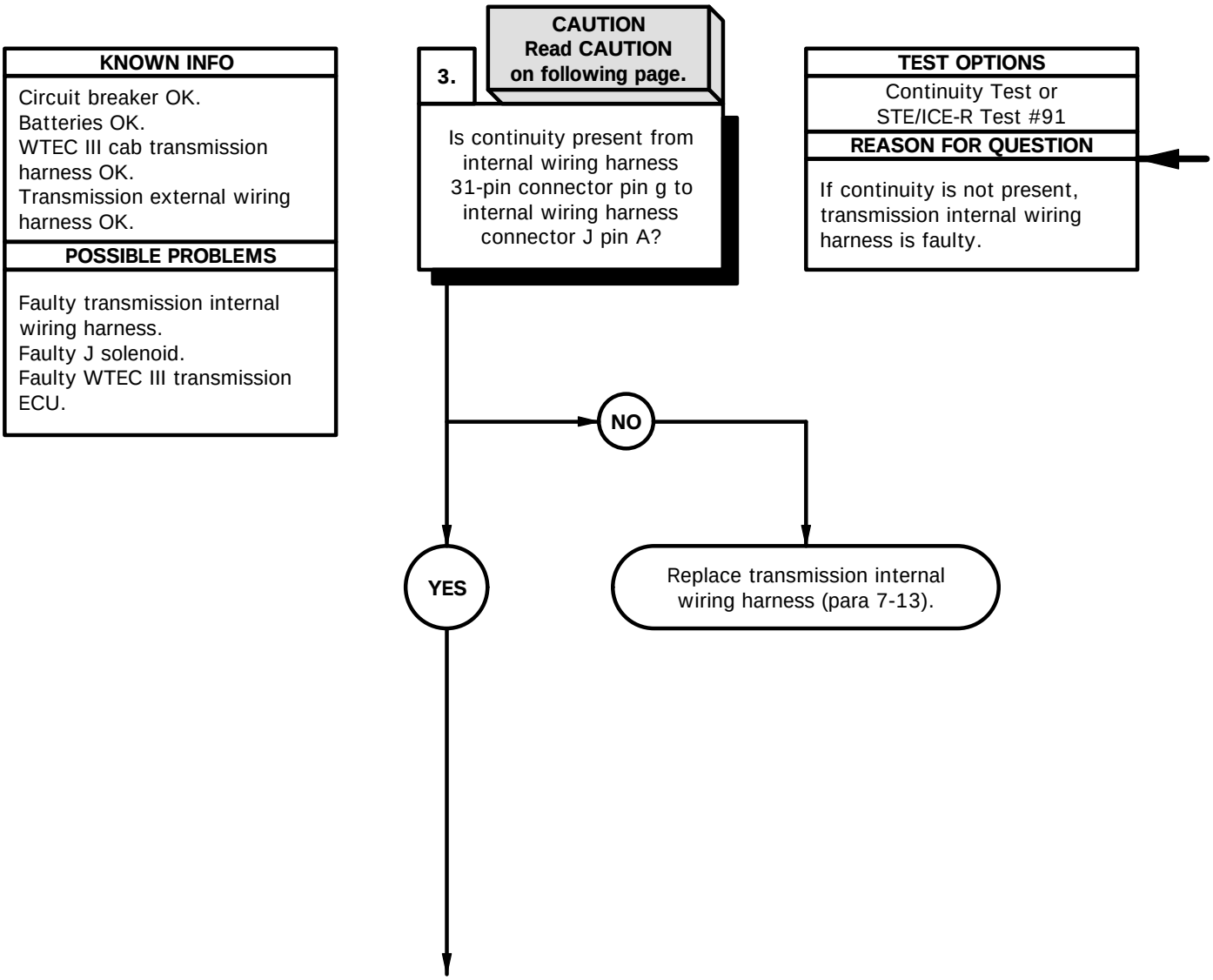


CONTINUITY TEST

(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)

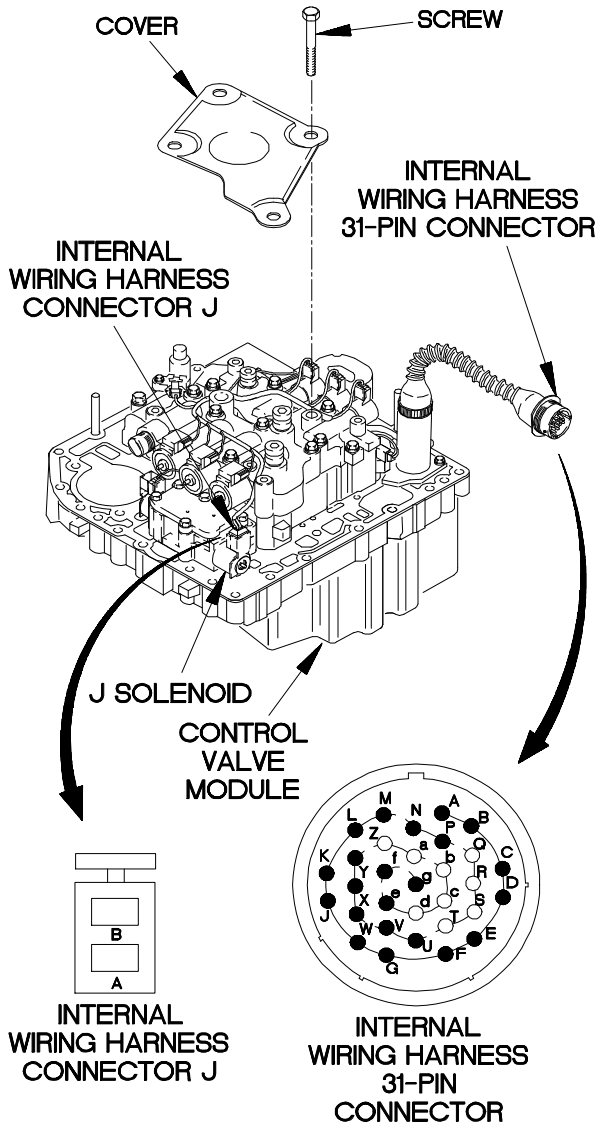


CAUTION

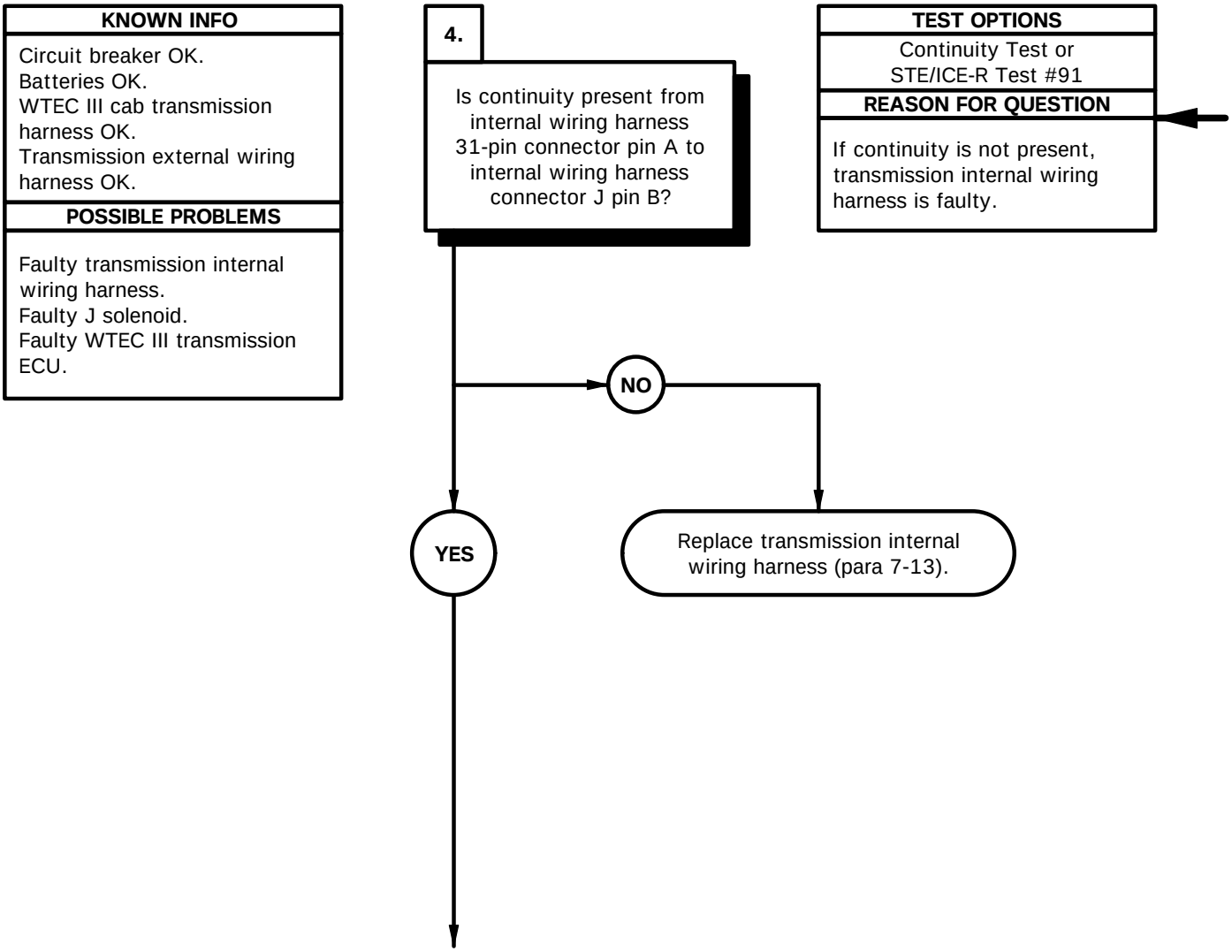
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

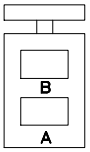


c70. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 24 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

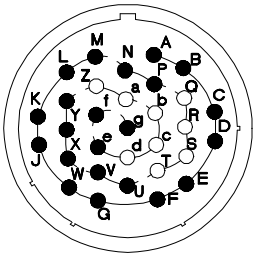


CONTINUITY TEST

(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).



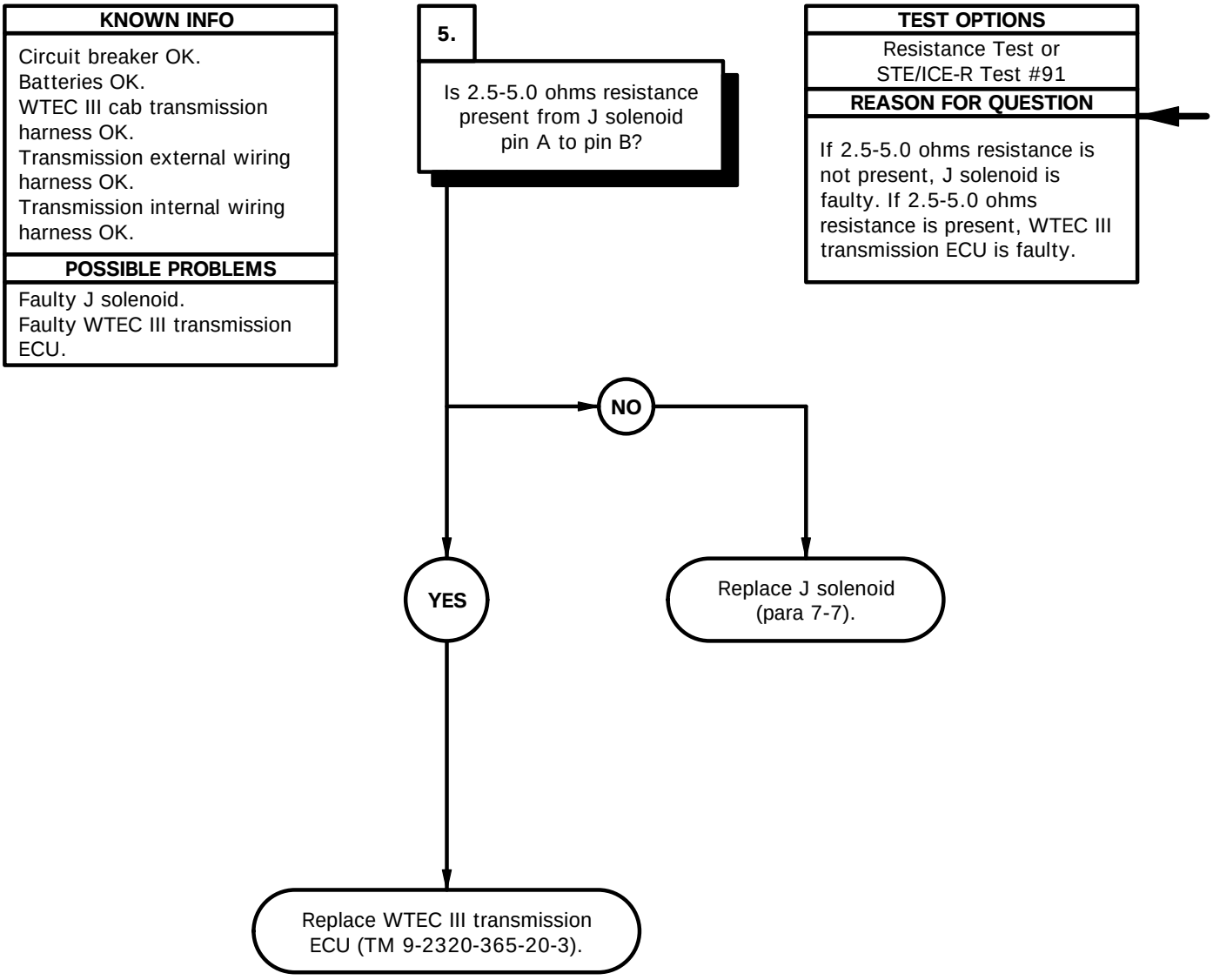
INTERNAL WIRING HARNESS CONNECTOR J



INTERNAL WIRING HARNESS 31-PIN CONNECTOR

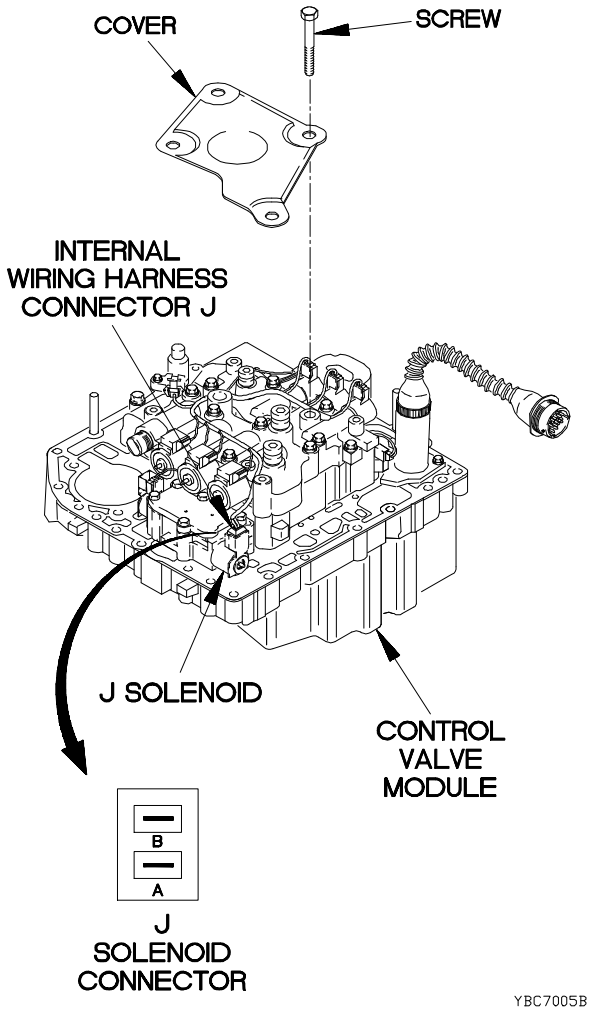
YBC7004B

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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

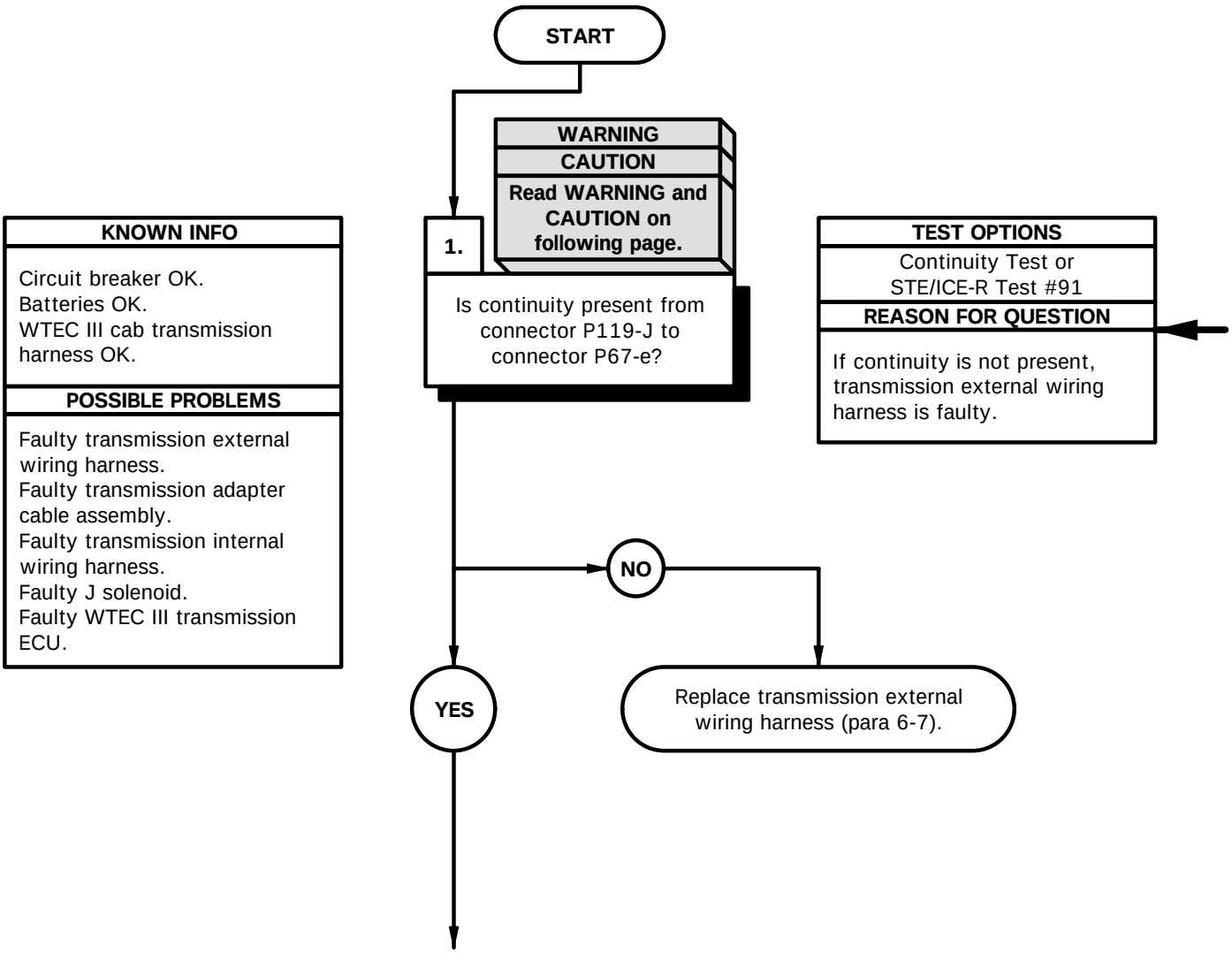
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

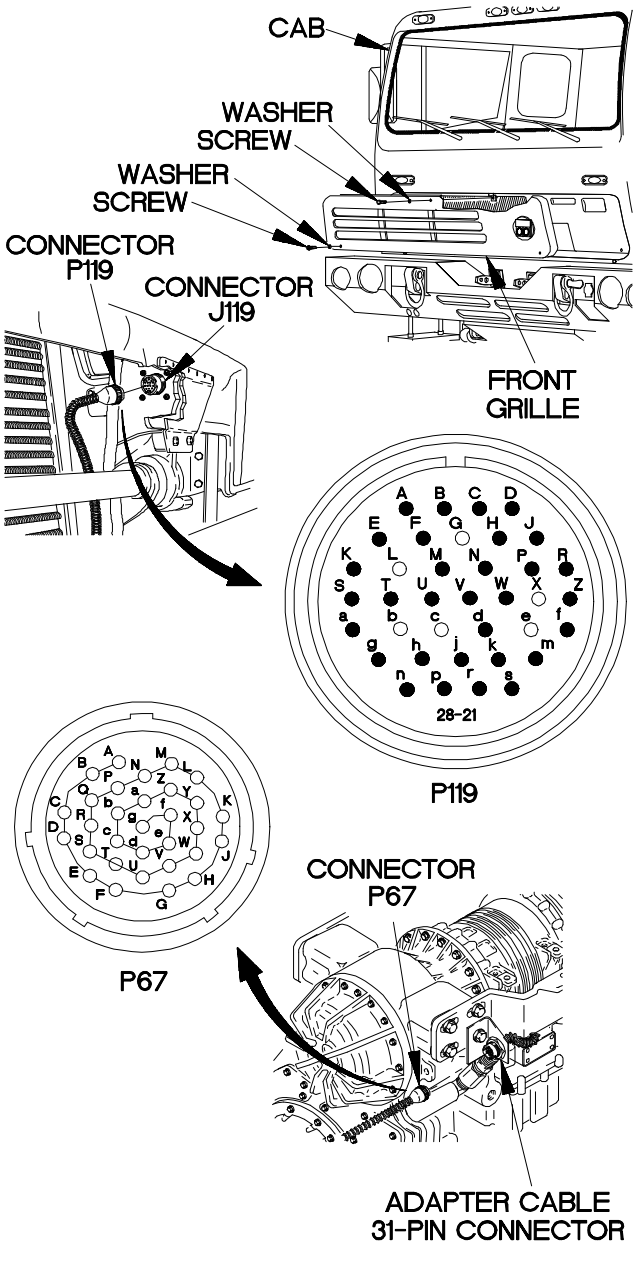
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

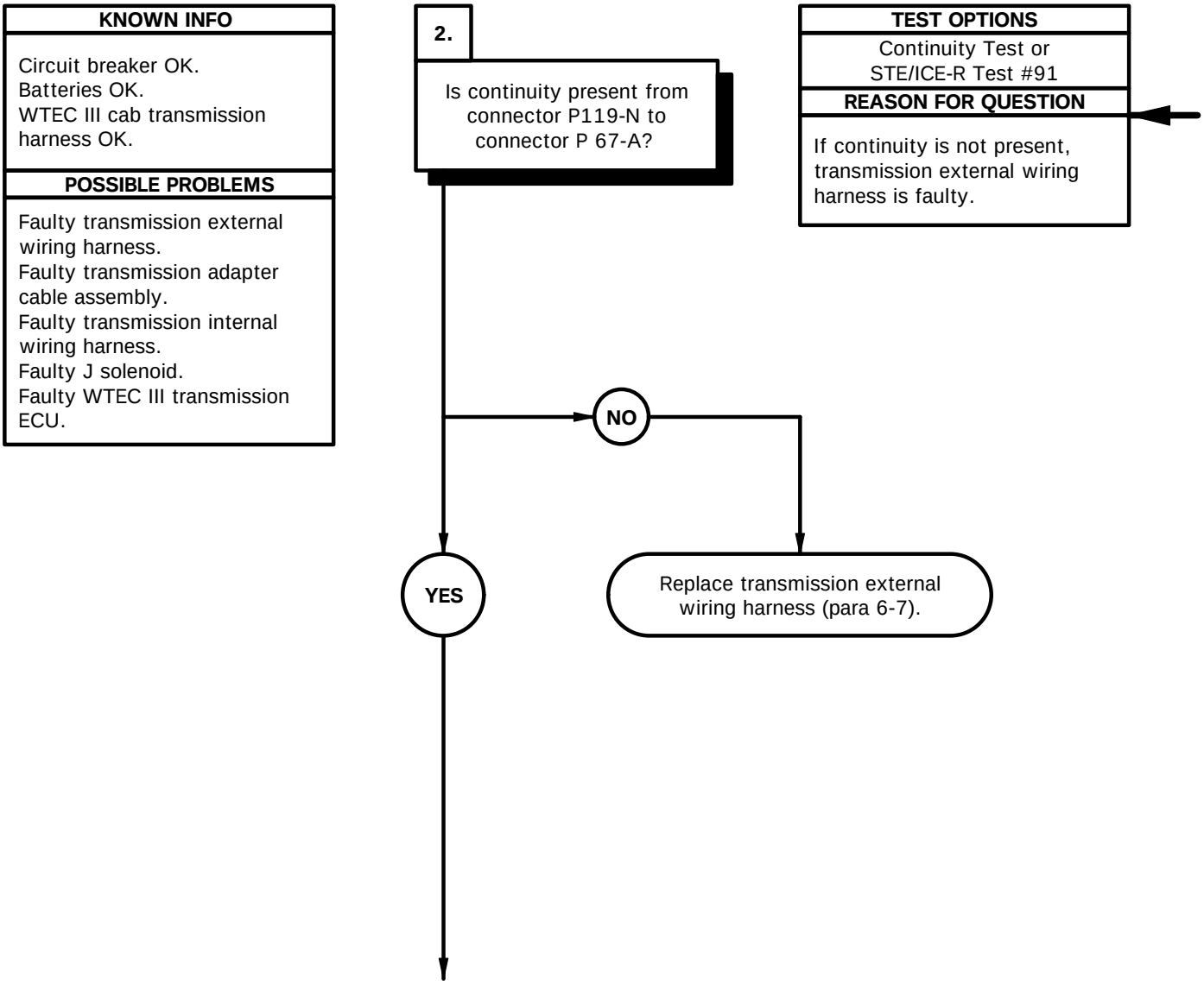
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from adapter cable 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect positive (+)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

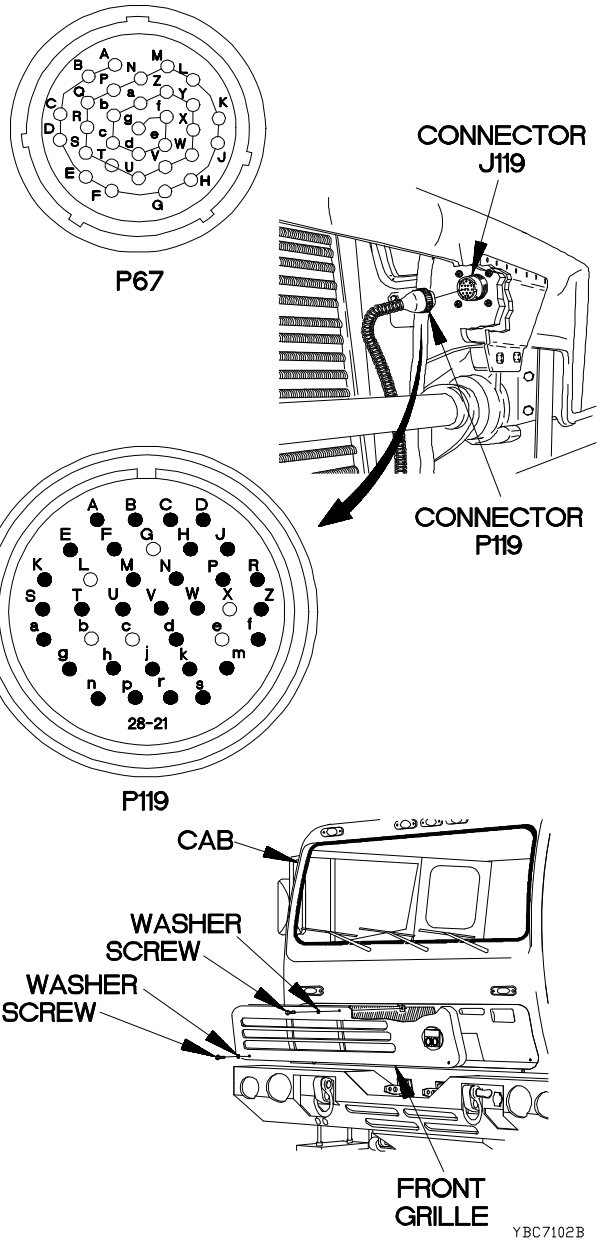


c71. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 24 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

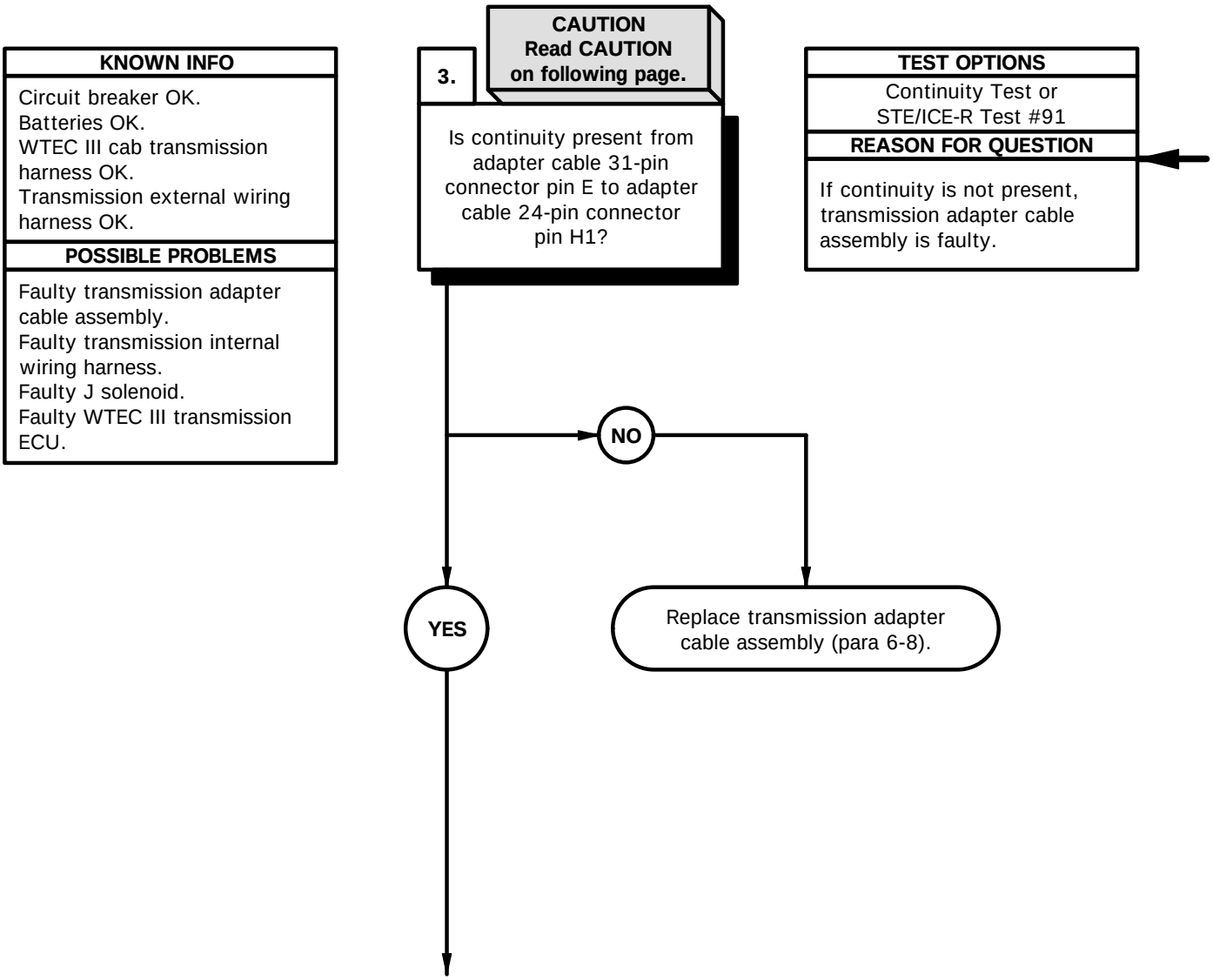


CONTINUITY TEST

(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)

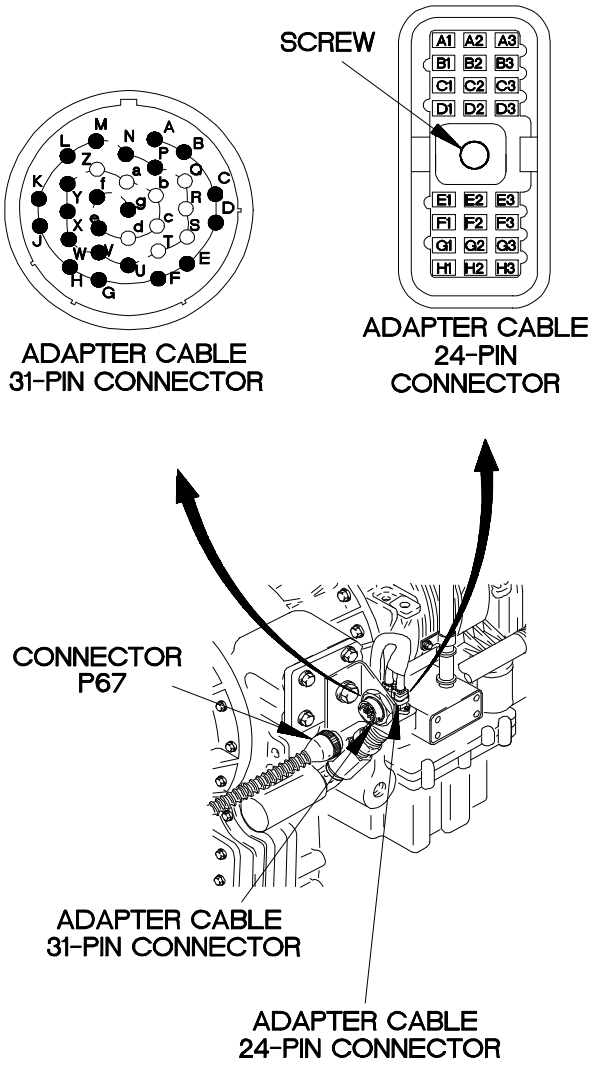


CAUTION

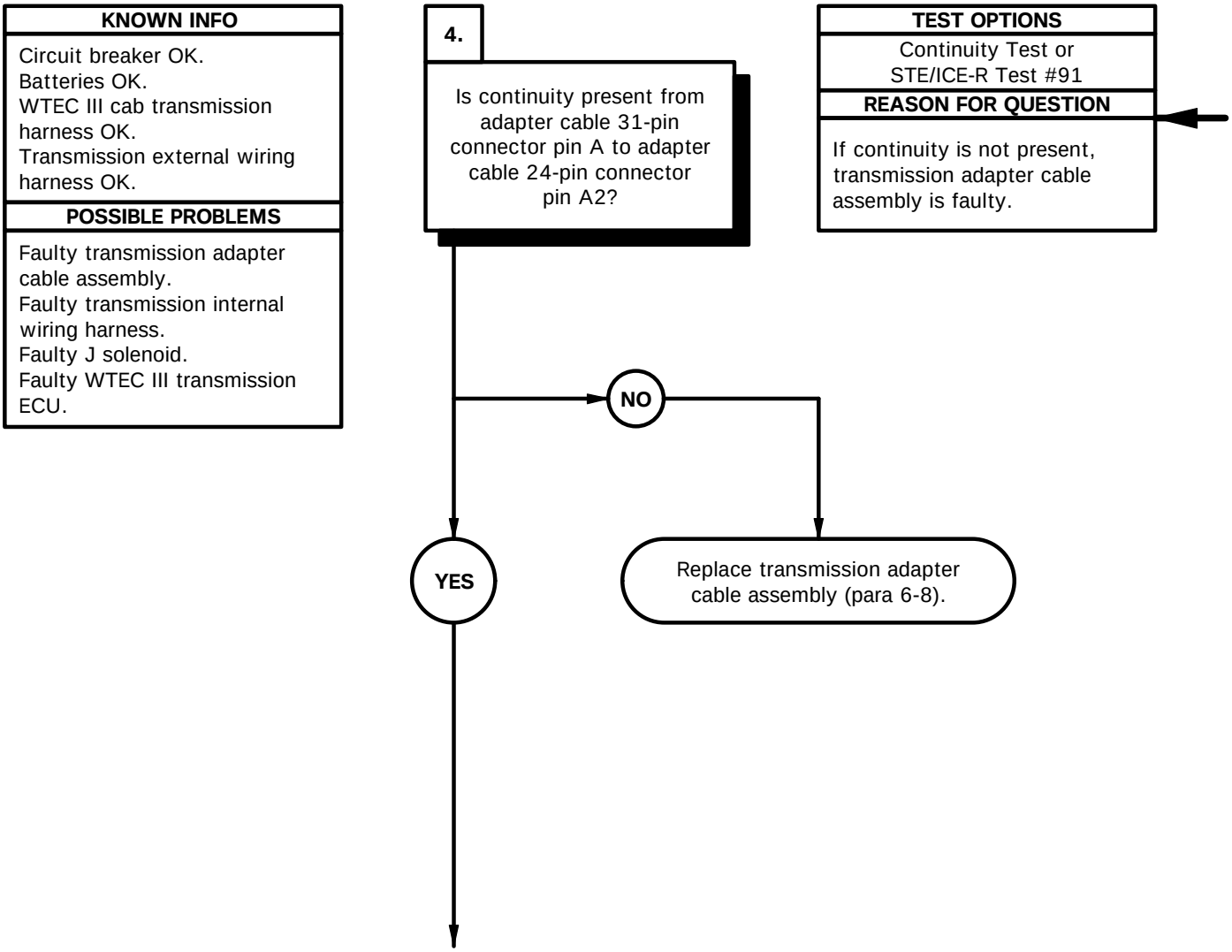
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

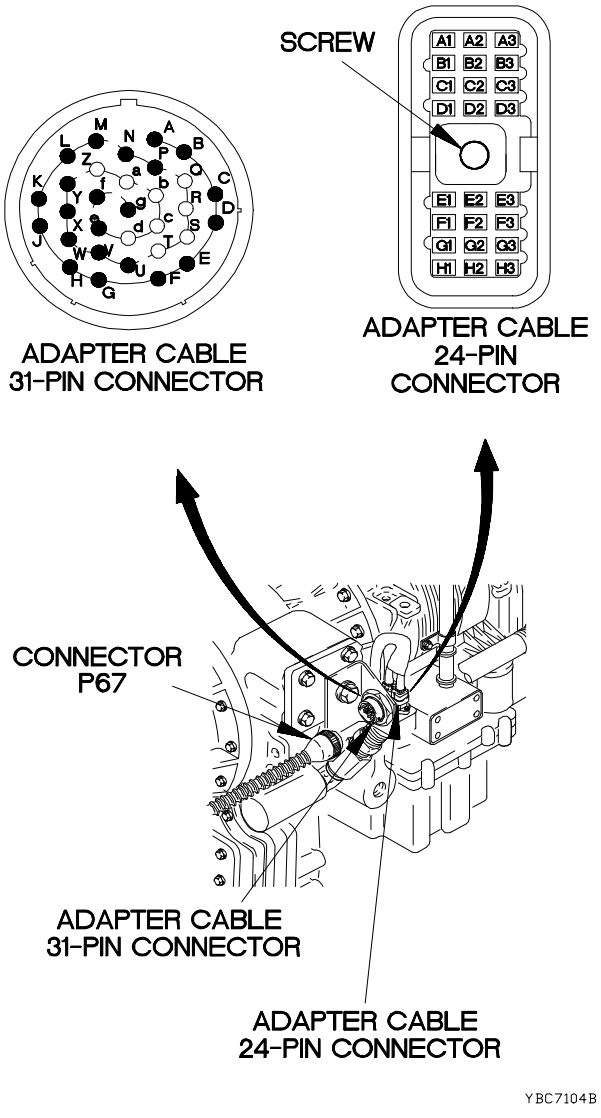


c71. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 24 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

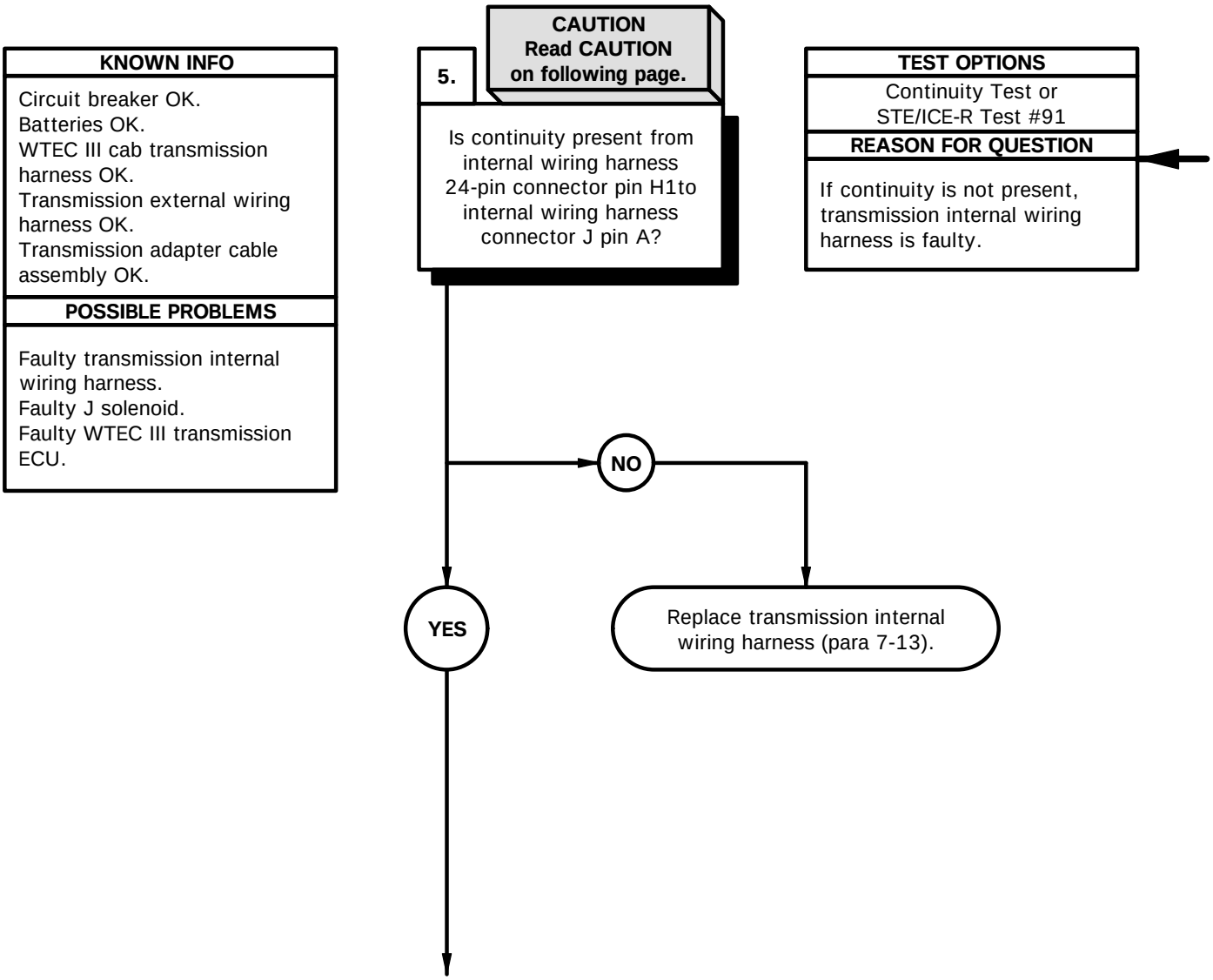


CONTINUITY TEST

(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)

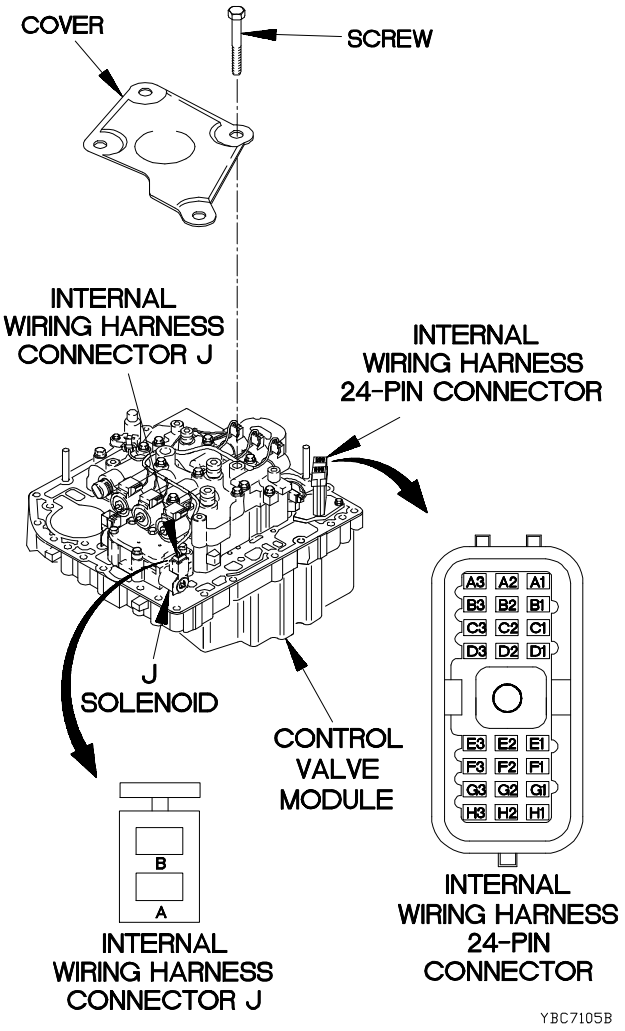


CAUTION

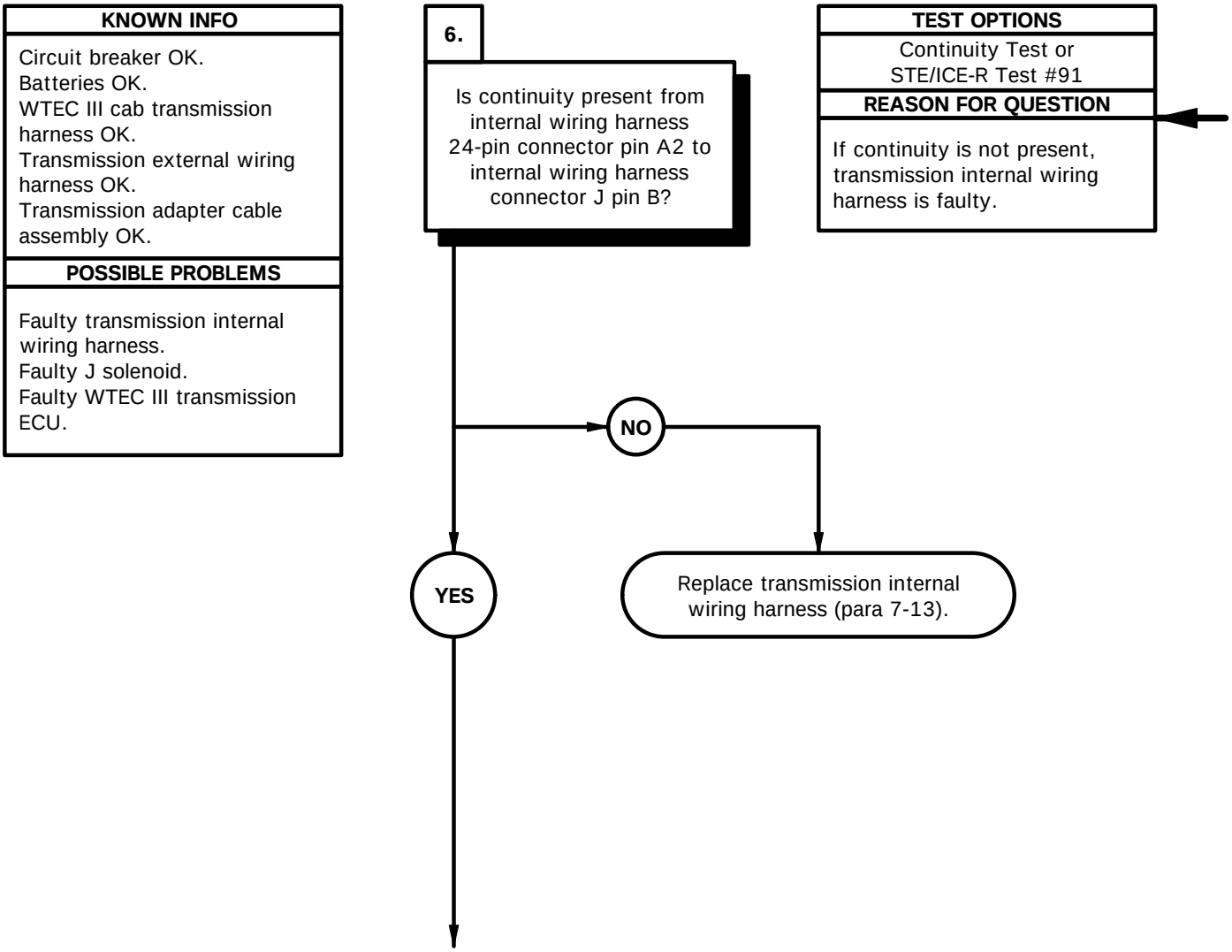
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

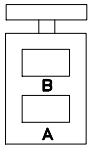


c71. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 SUB CODE 24 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

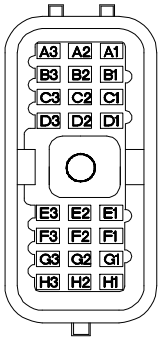


CONTINUITY TEST

(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).



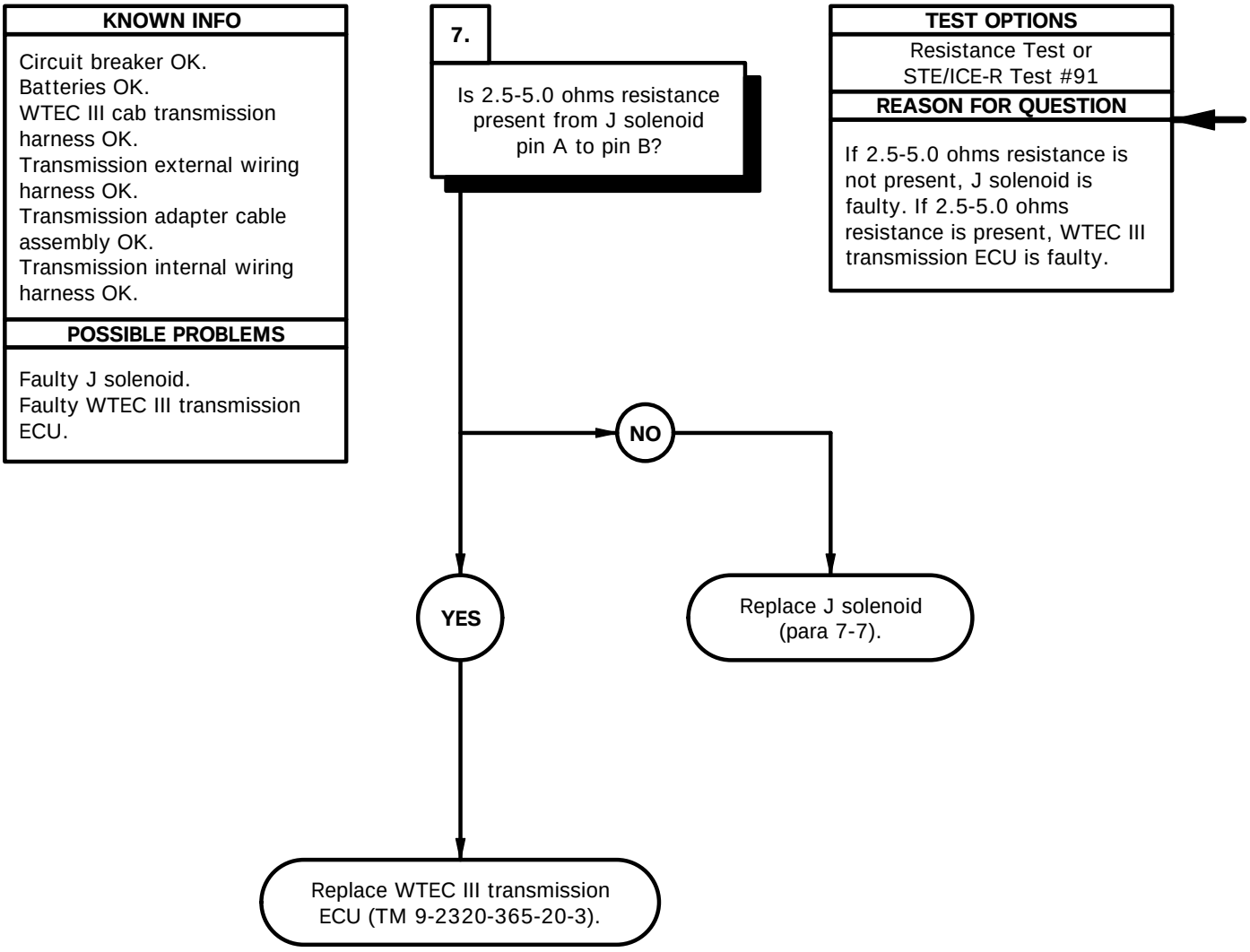
INTERNAL WIRING HARNESS CONNECTOR J



INTERNAL WIRING HARNESS 24-PIN CONNECTOR

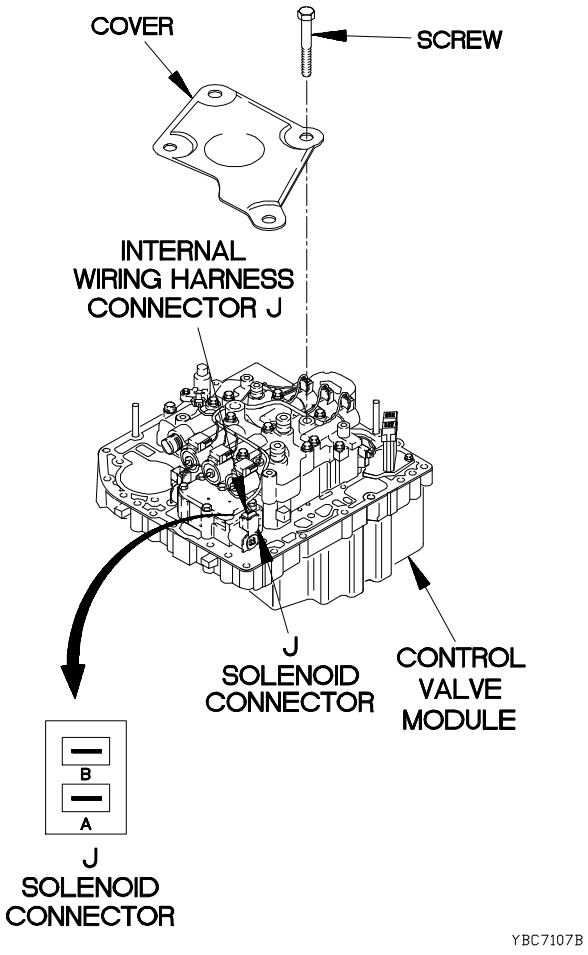
TA277106B

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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

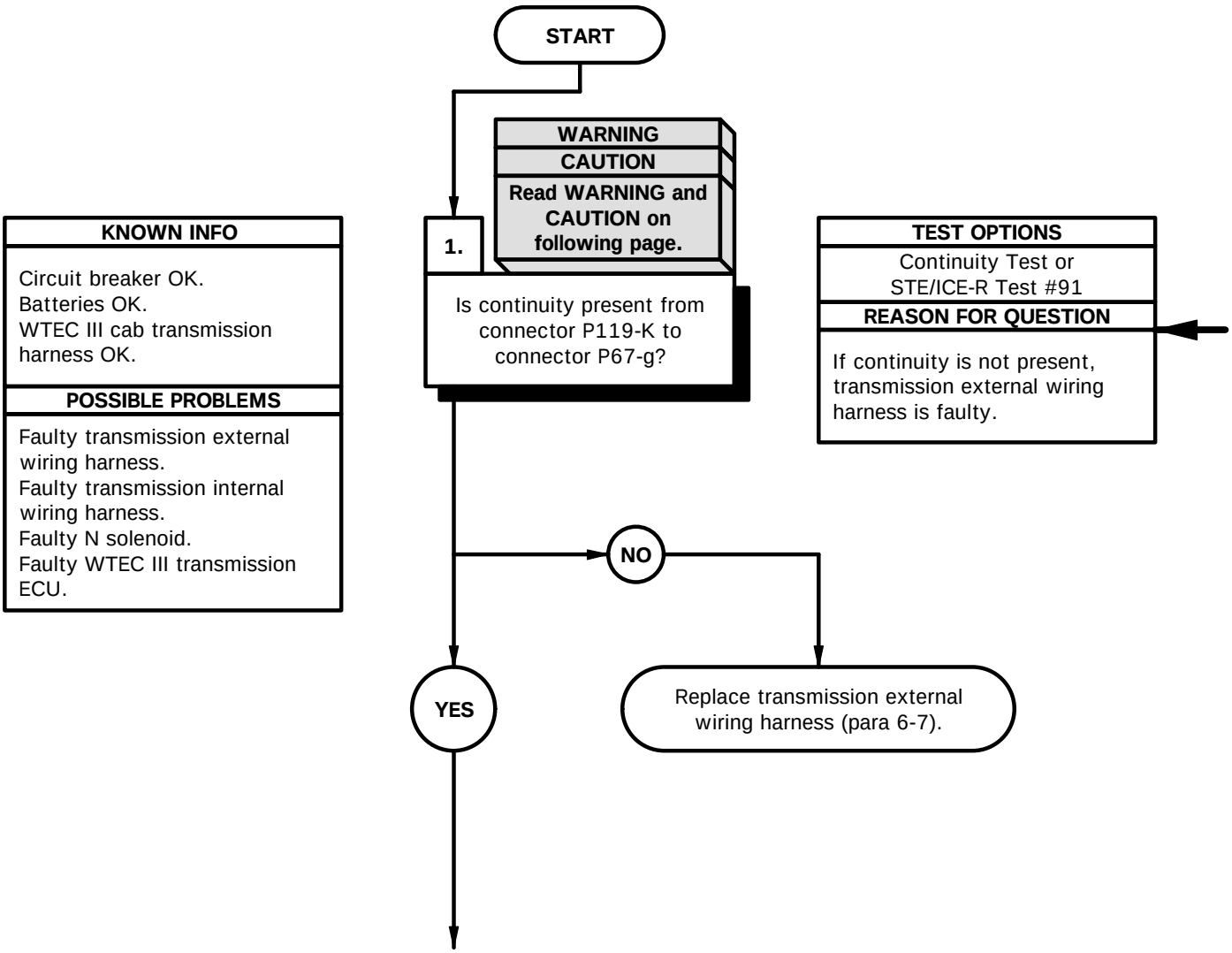
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

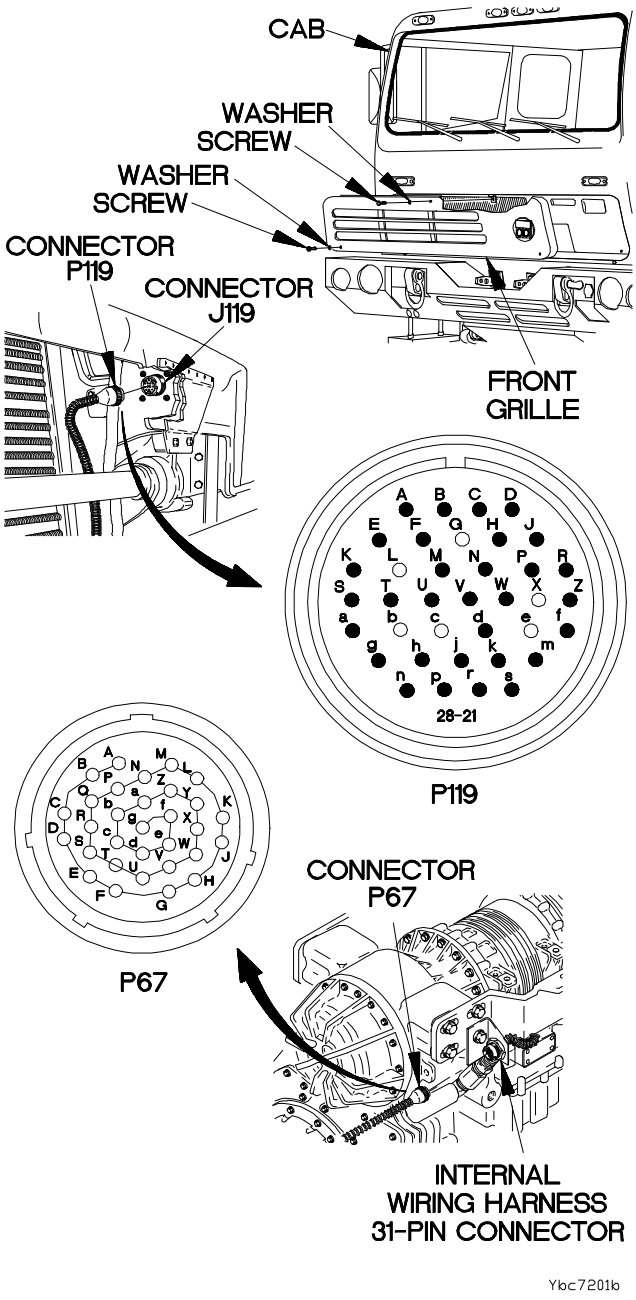
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



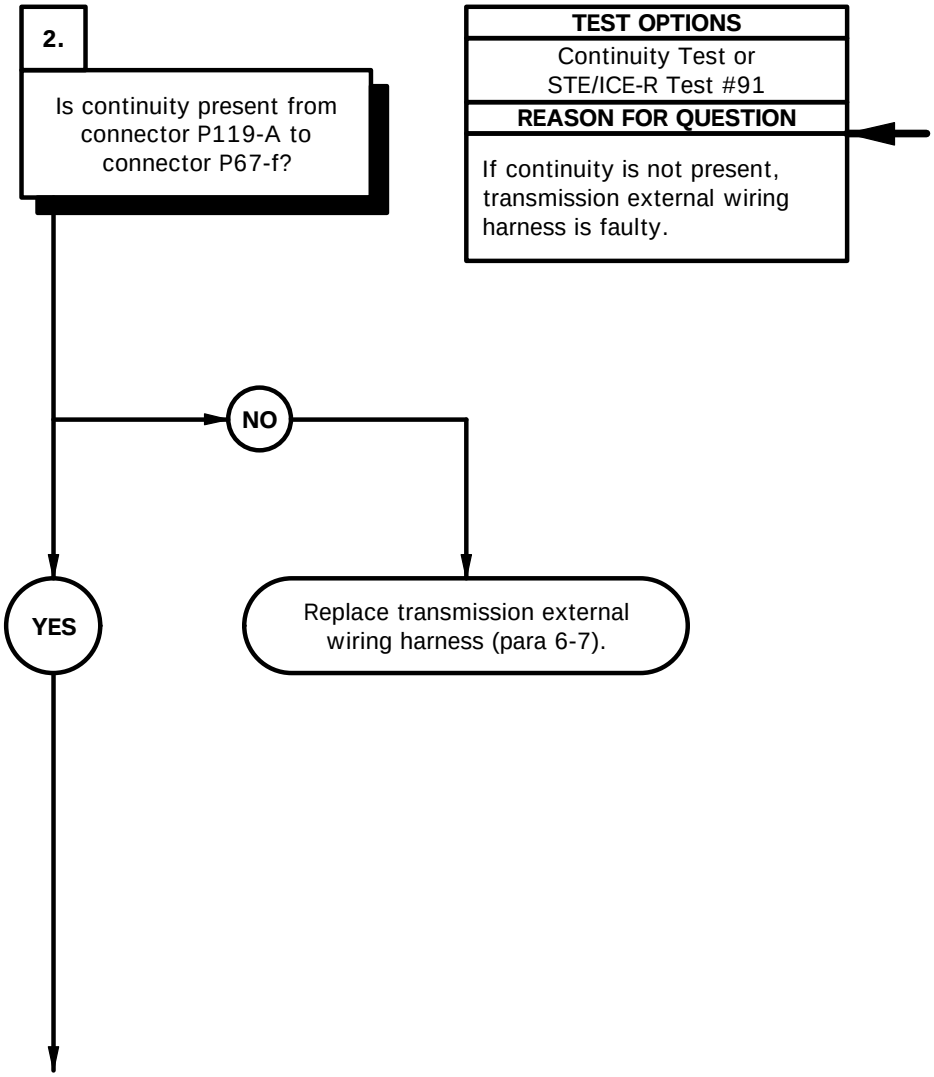
c72. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

KNOWN INFO

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

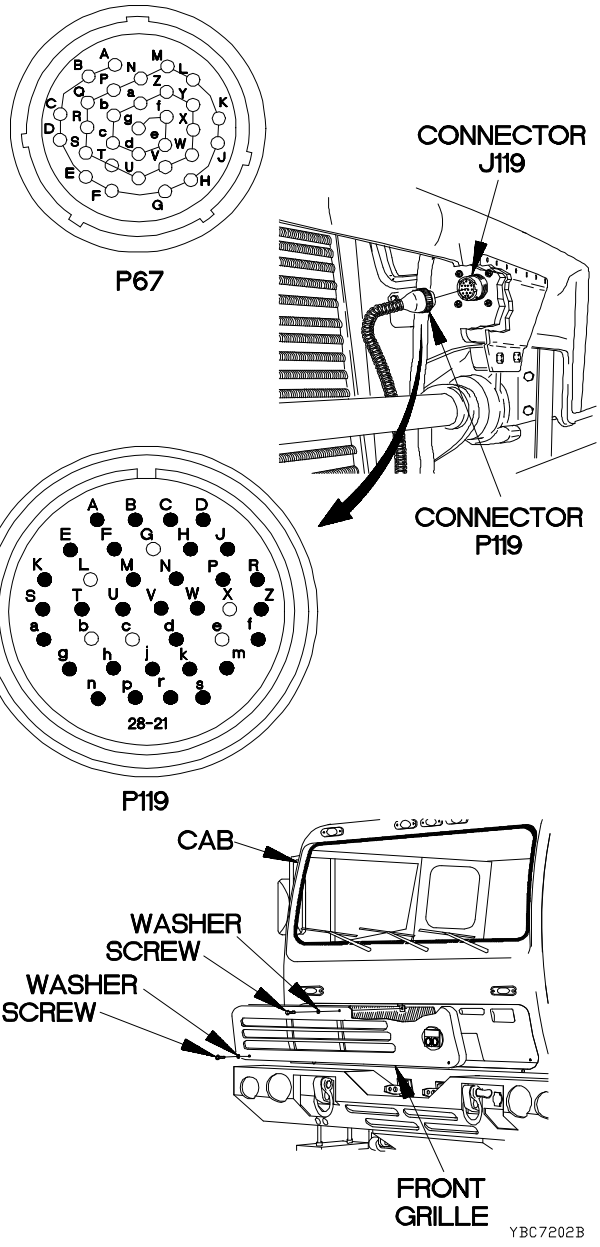
POSSIBLE PROBLEMS

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

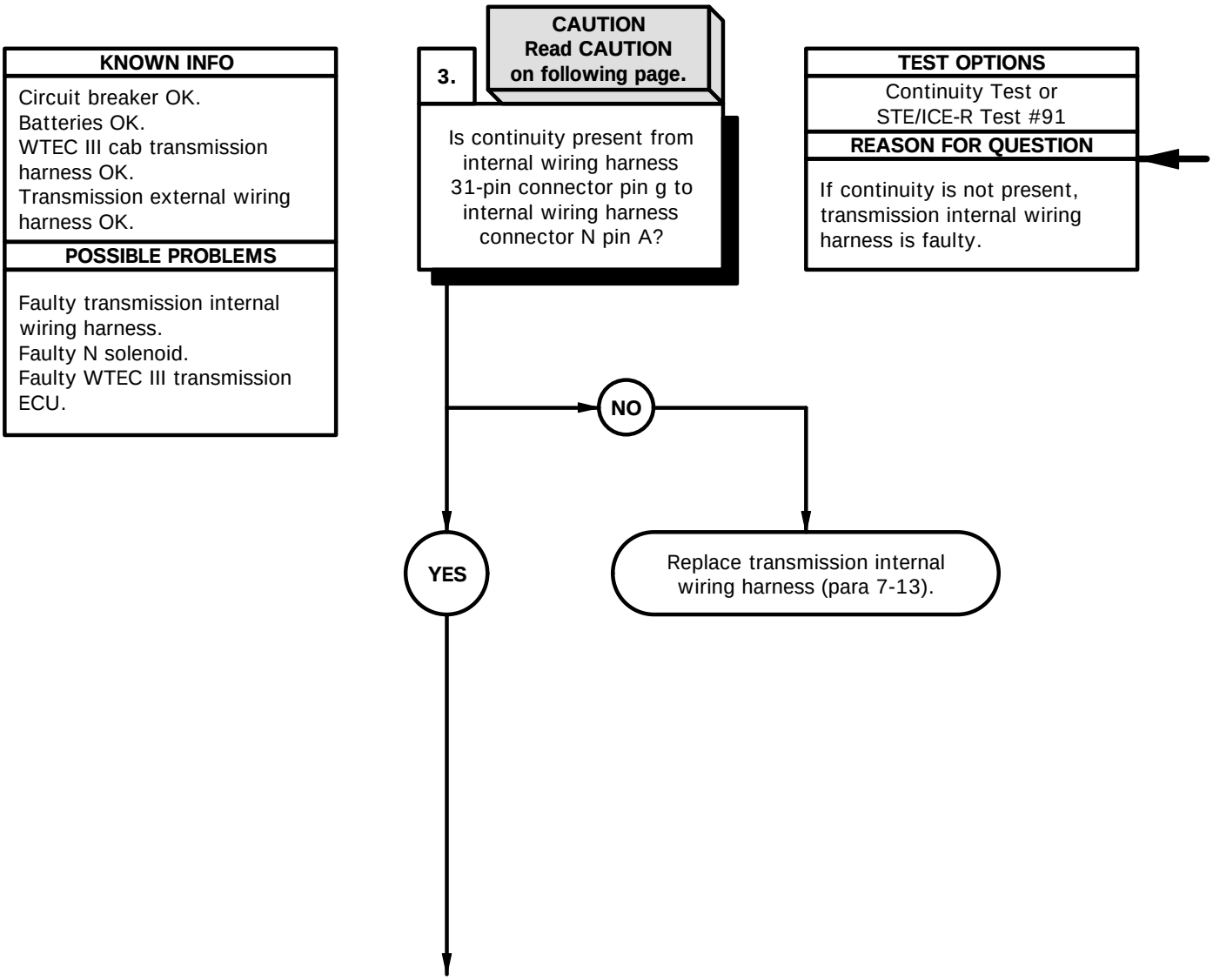


CONTINUITY TEST

(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)

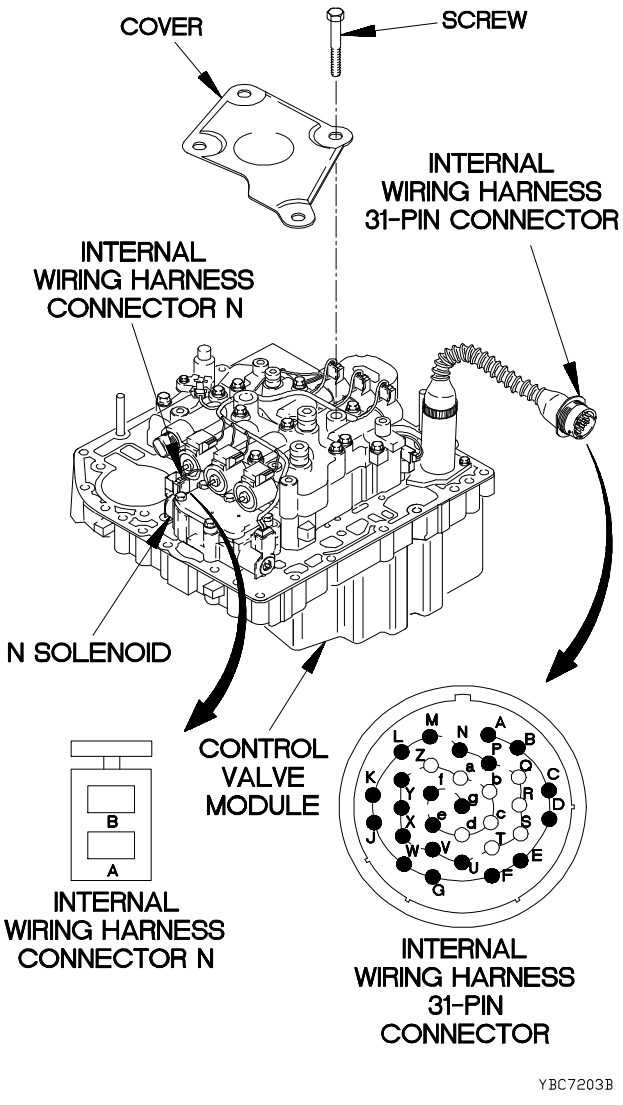


CAUTION

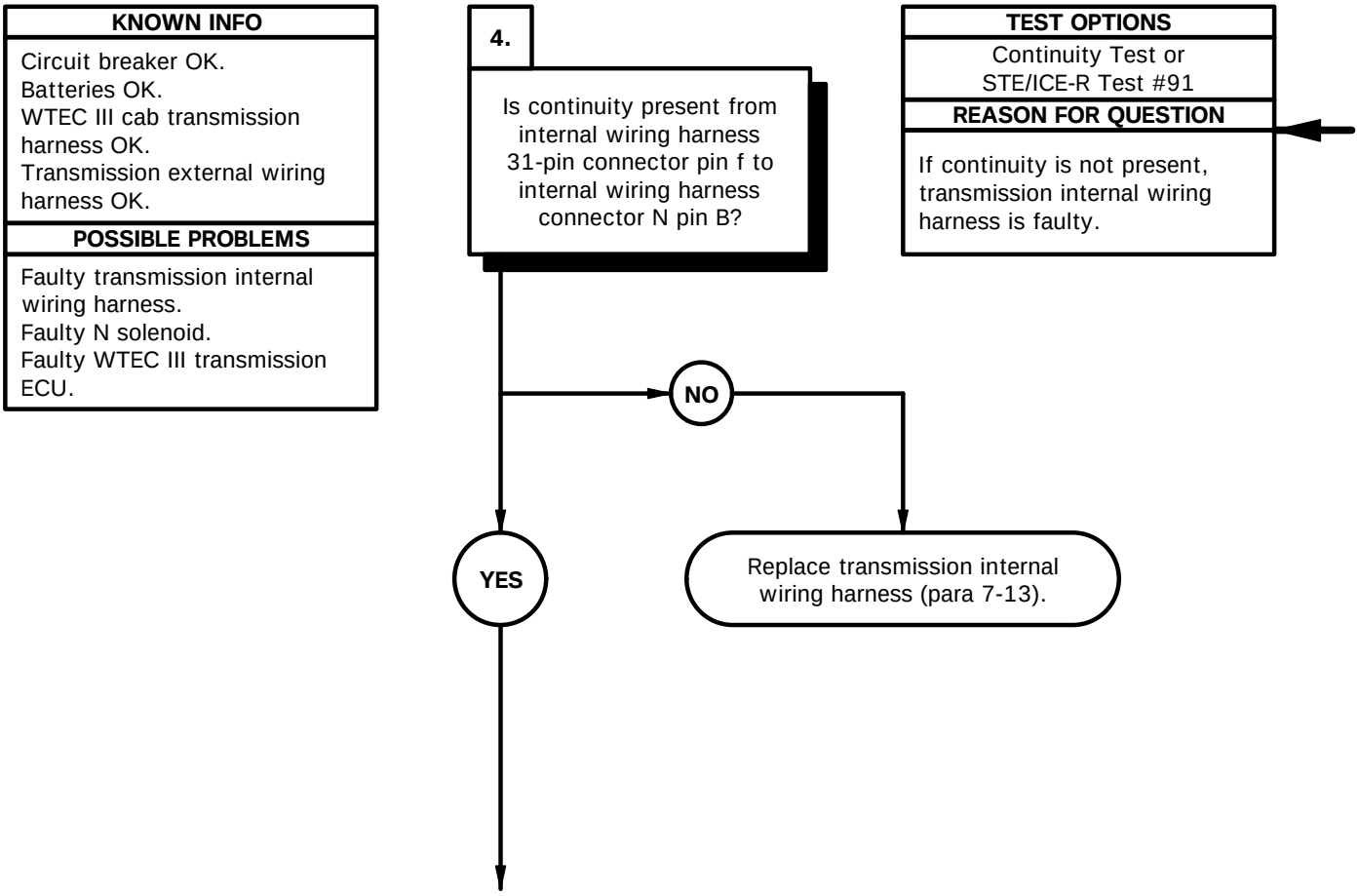
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

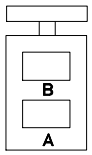


c72. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

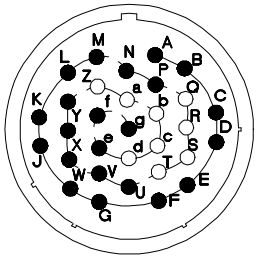


CONTINUITY TEST

(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).



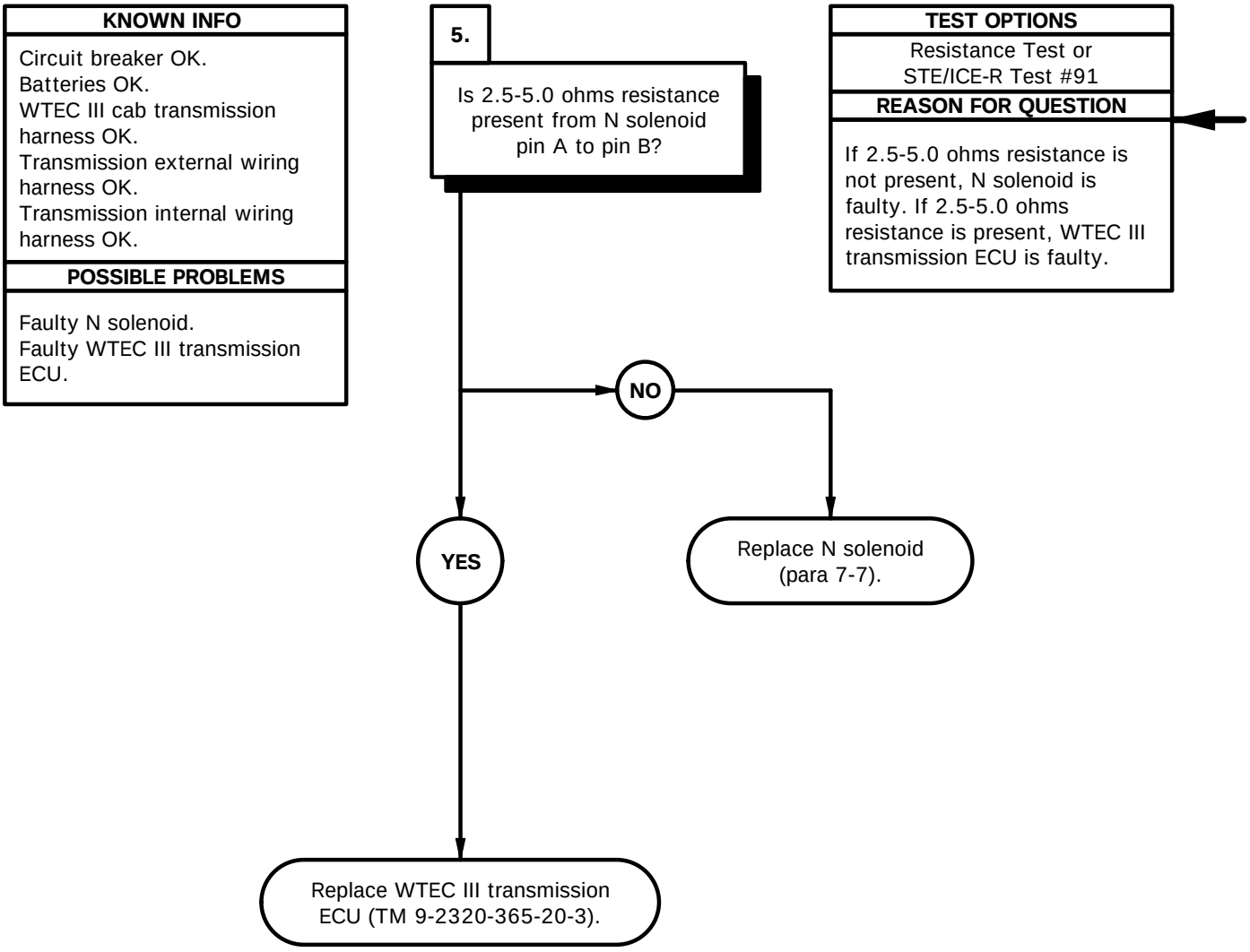
INTERNAL WIRING HARNESS CONNECTOR N



INTERNAL WIRING HARNESS 31-PIN CONNECTOR

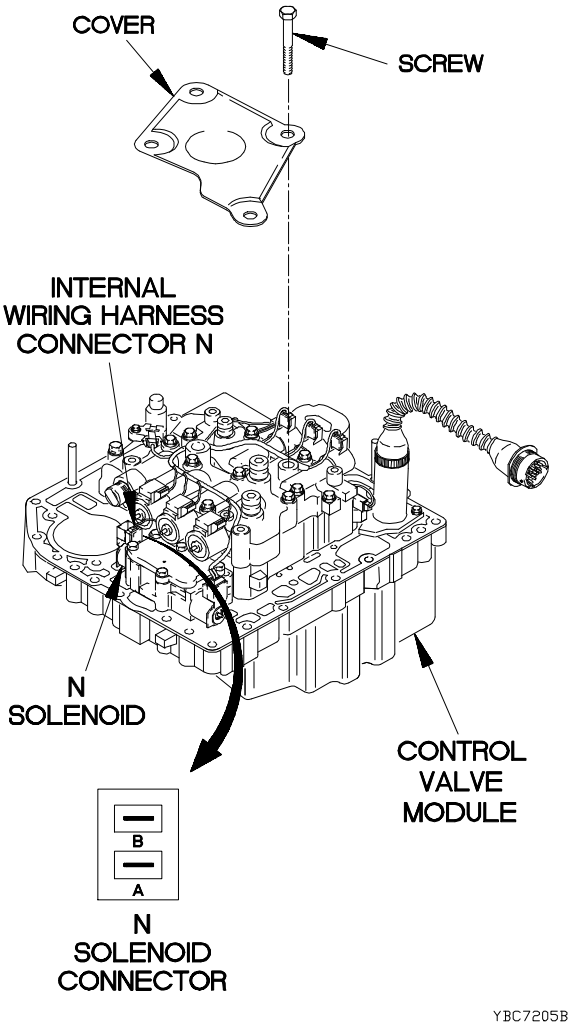
YBC7204B

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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

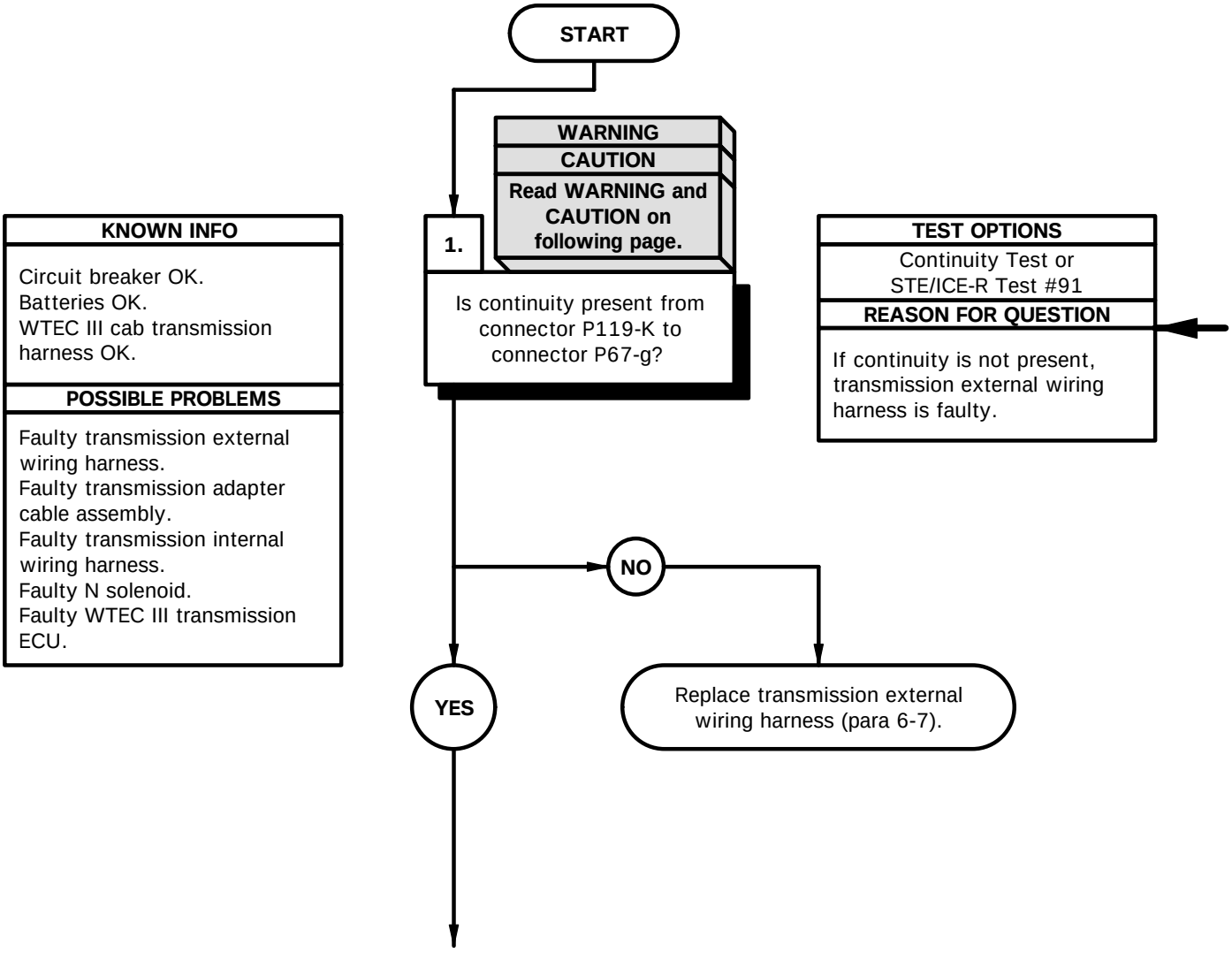
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

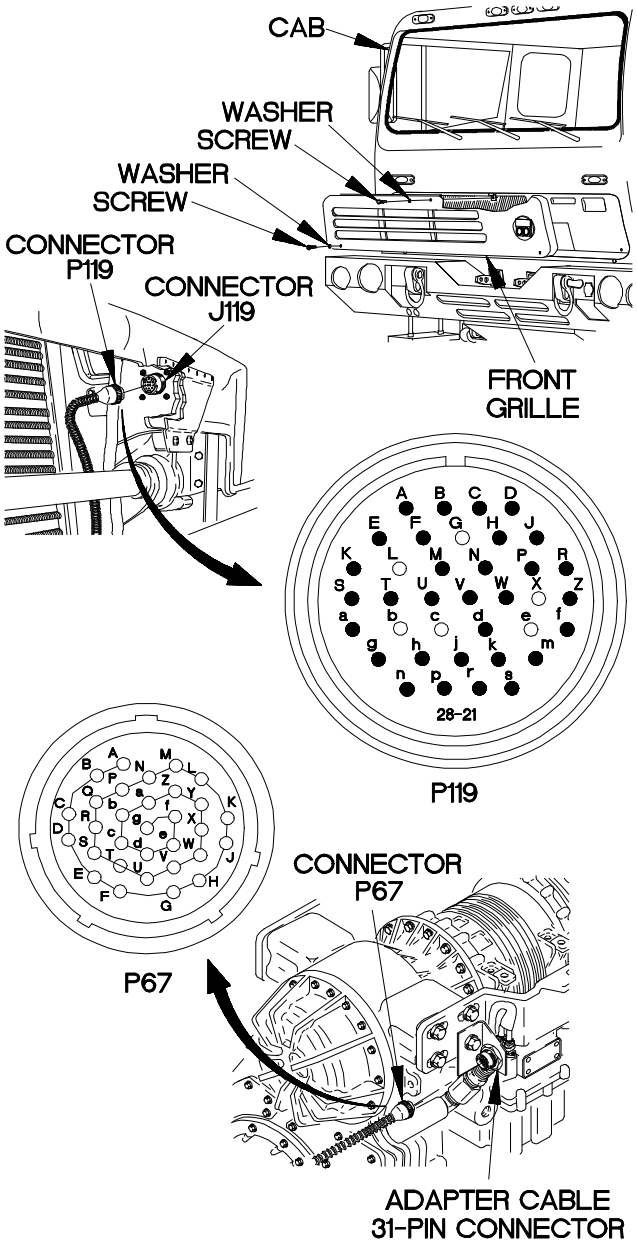
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



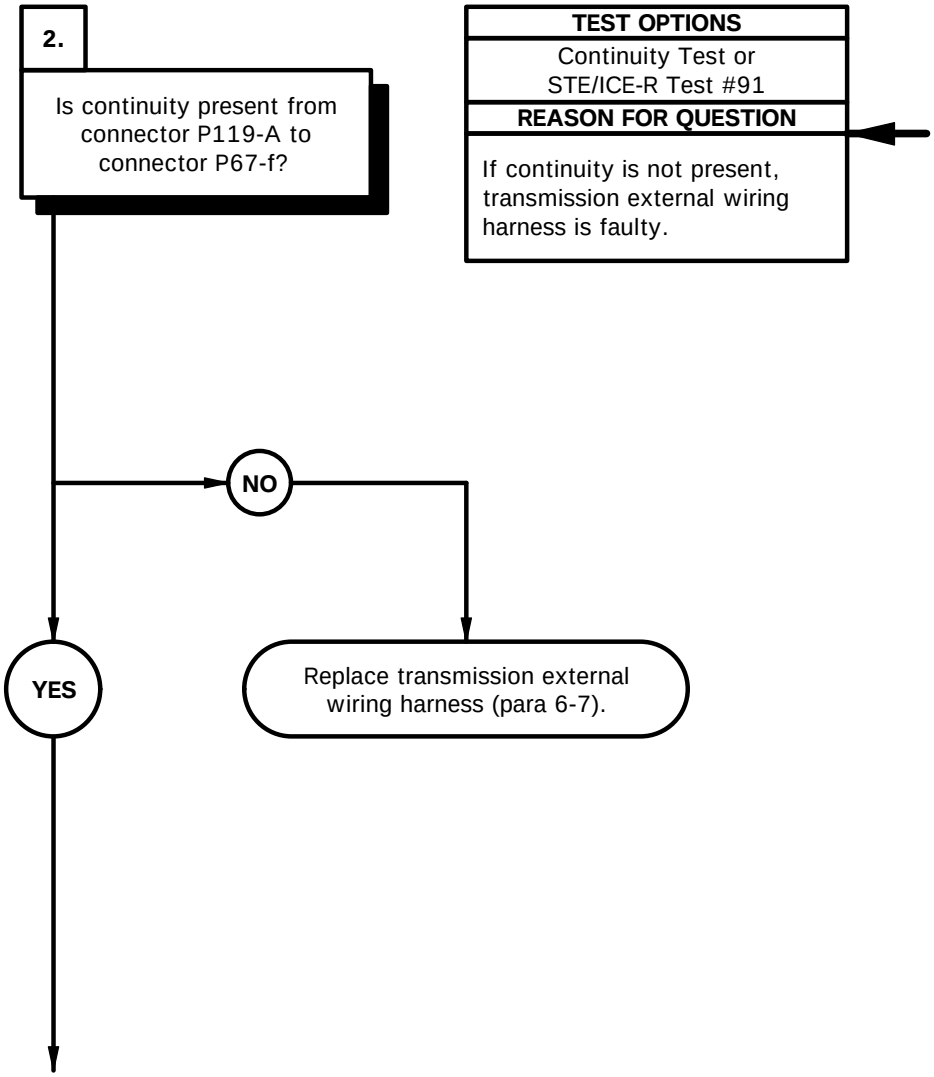
c73. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

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.



TEST OPTIONS

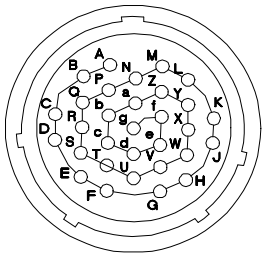
Continuity Test or
STE/ICE-R Test #91

REASON FOR QUESTION

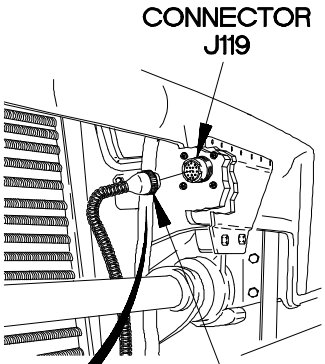
If continuity is not present, transmission external wiring harness is faulty.

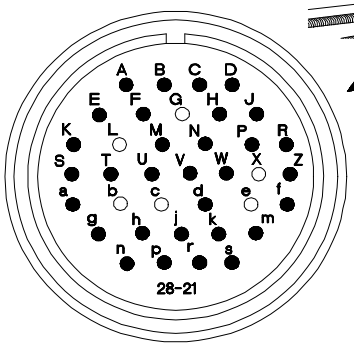
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P119-A.
(3) Connect negative (-) probe of multimeter to connector P67-f and note reading on multimeter.
(4) If continuity is not present, replace transmission external wiring harness (para 6-7).
(5) Connect positive (+) probe of multimeter to connector P119-A.
(6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
(7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
(9) Connect connector P119 to connector J119.
(10) Position front grille on cab with washer and screw.
(11) Position two washers and screws in front grille.
(12) Tighten screw to 48-60 lb-in. (5-7 N·m).
(13) Tighten two screws to 24 lb-in. (3 N·m).

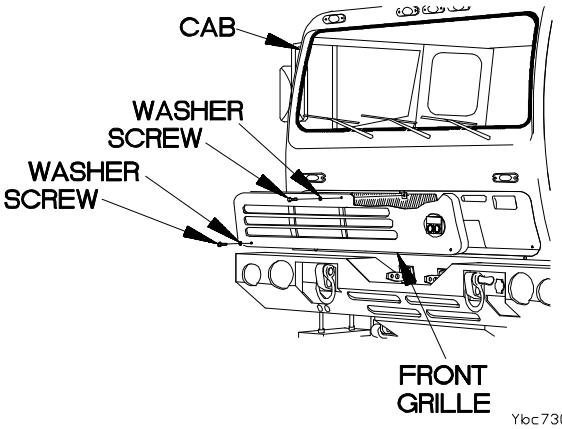


P67

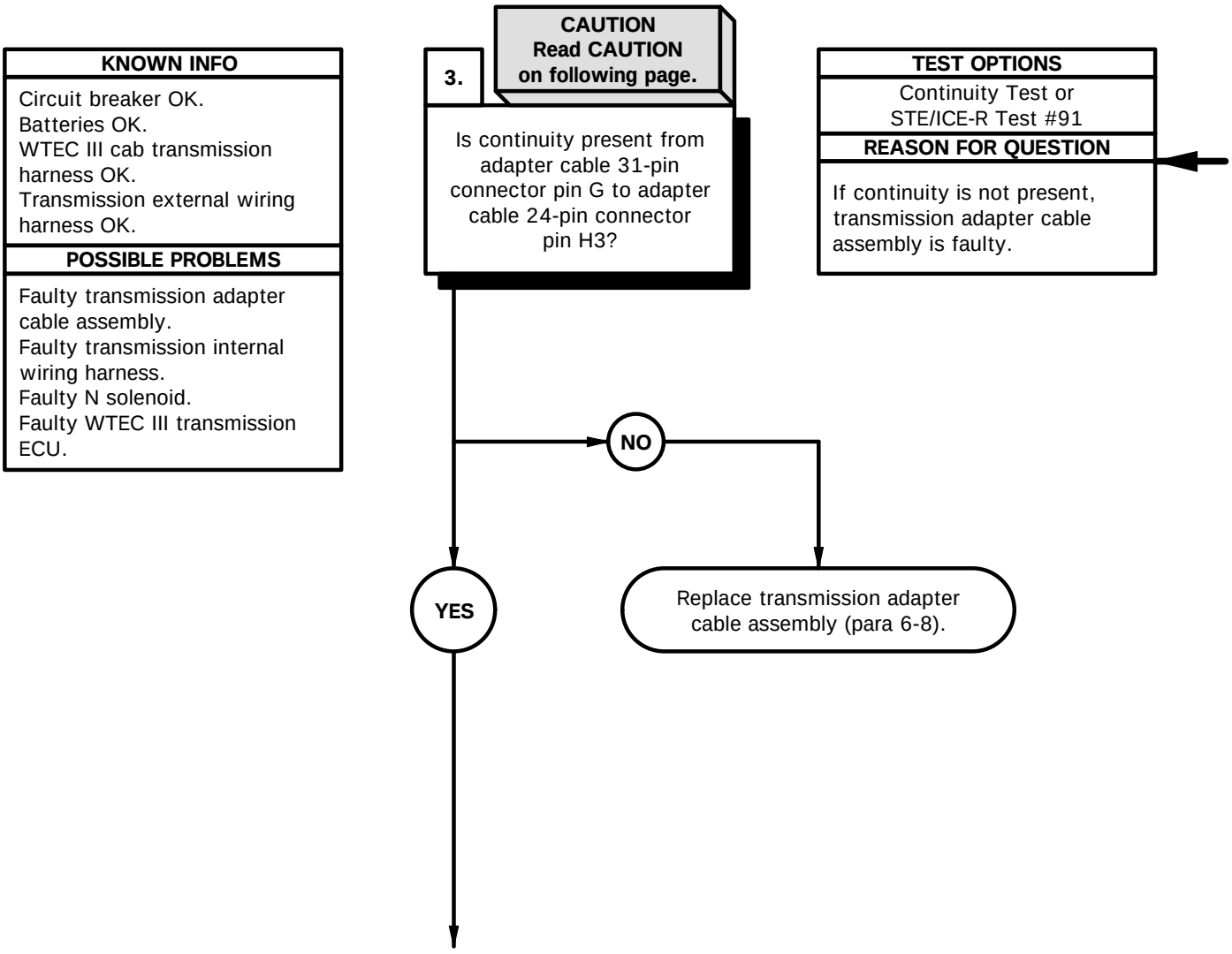




P119



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)

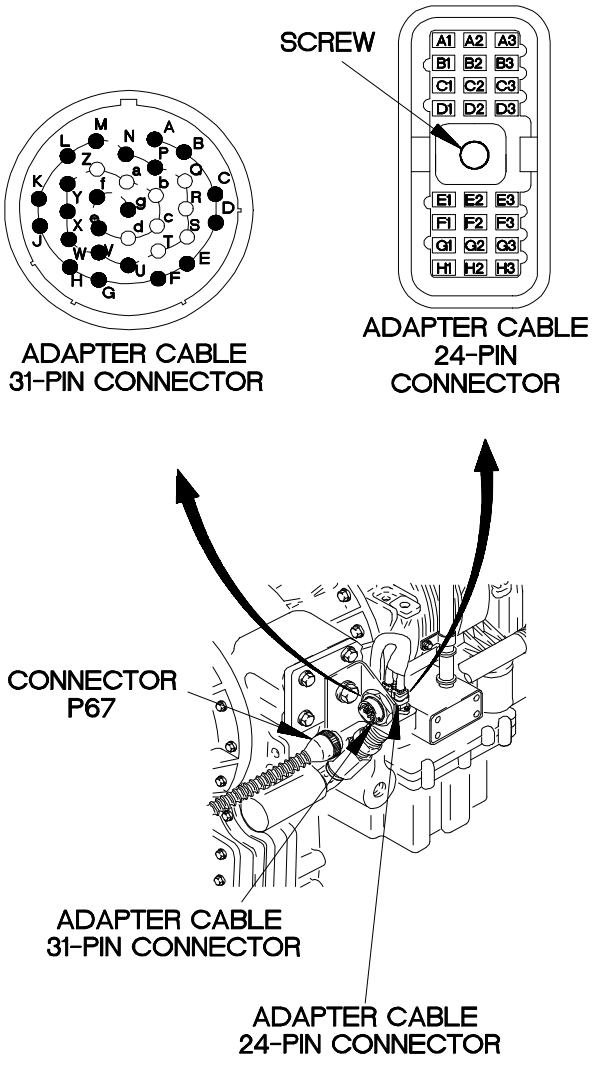


CAUTION

Use care when disconnecting transmission adapter cable assembly feed-through 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).



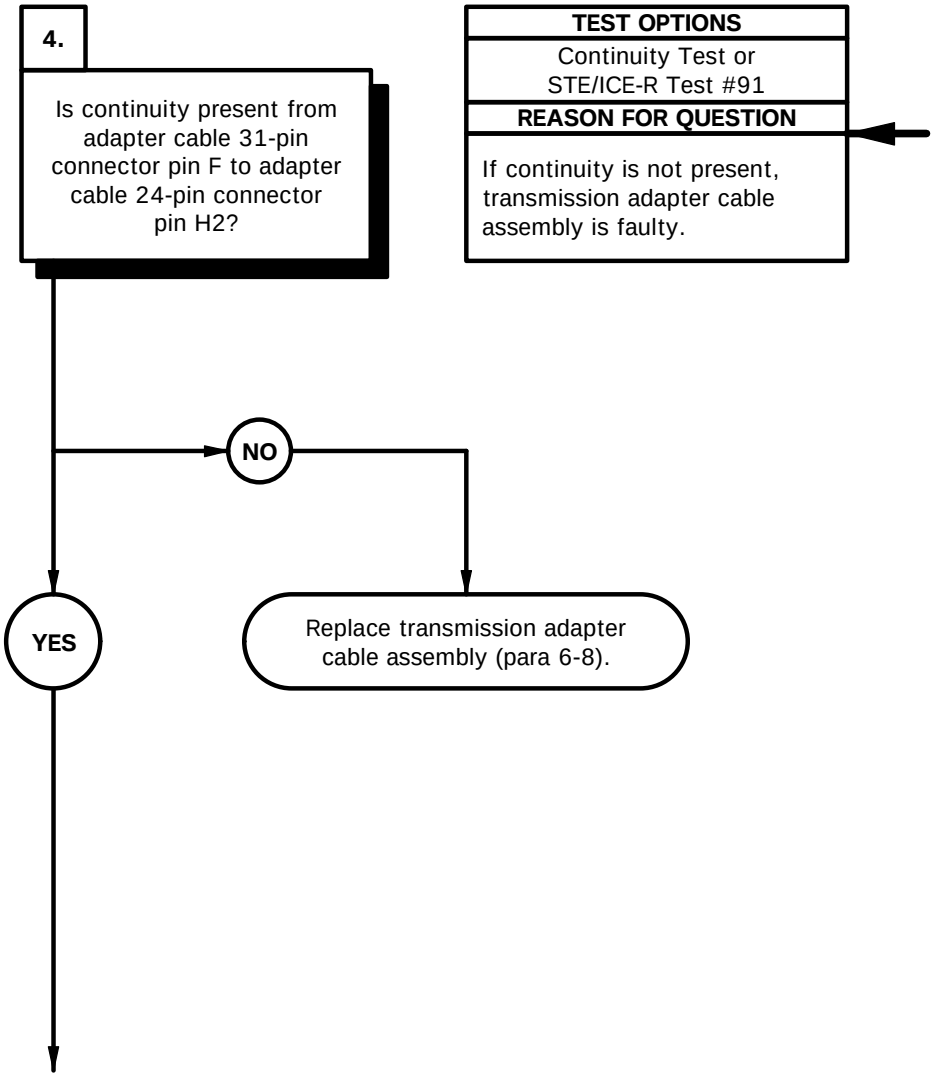
c73. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO

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

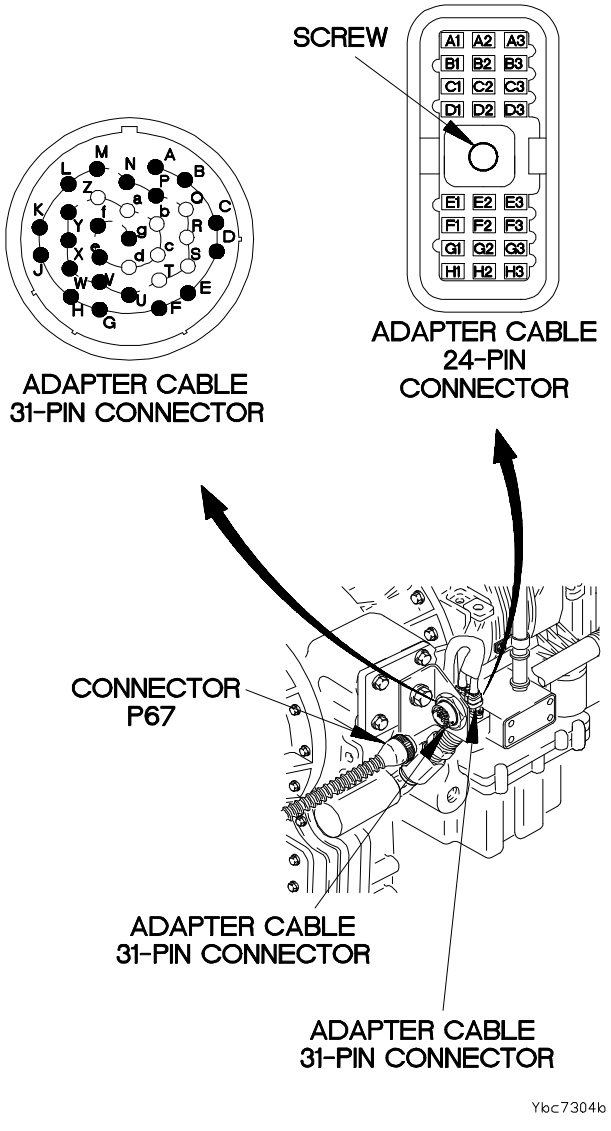
POSSIBLE PROBLEMS

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

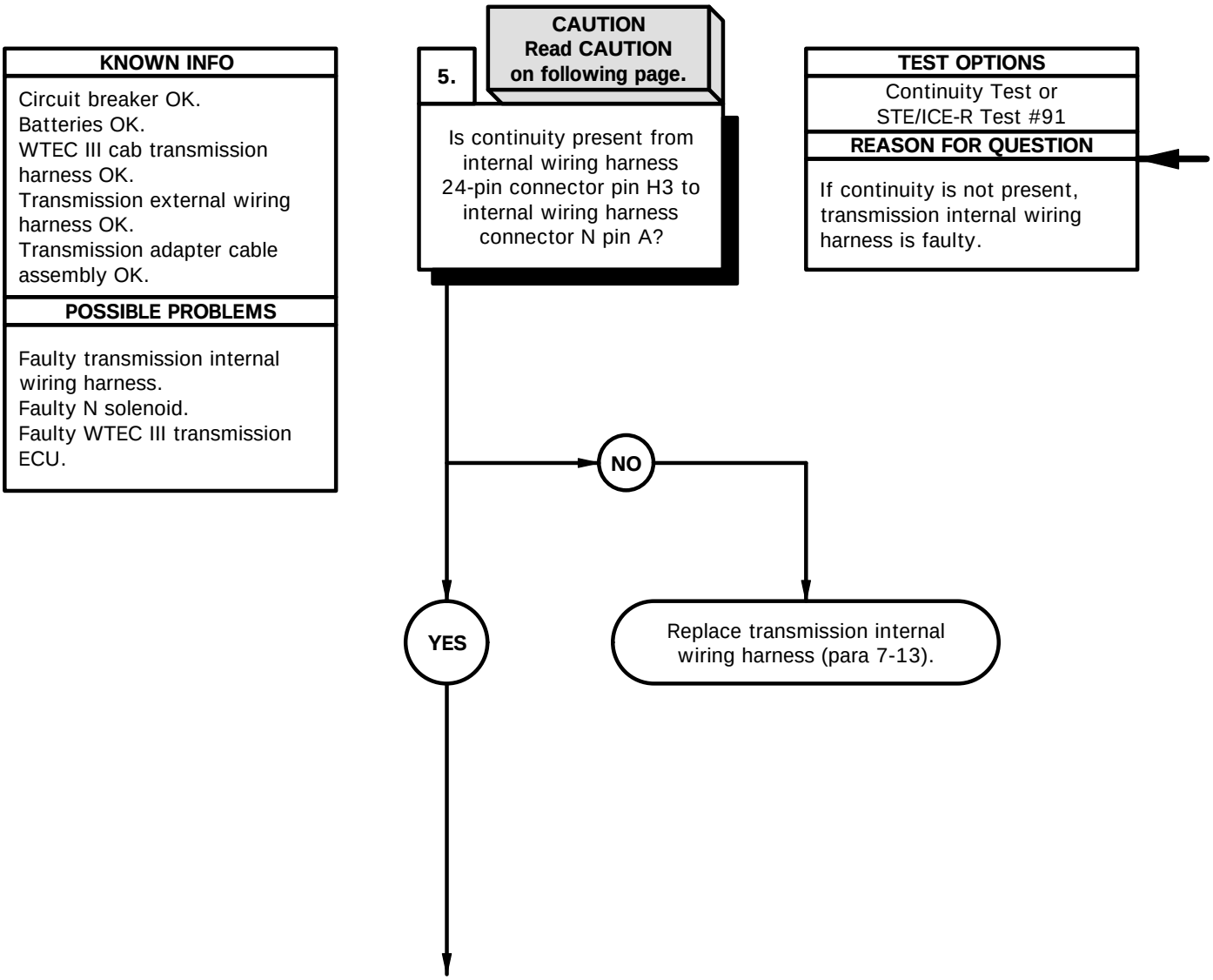


CONTINUITY TEST

(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)

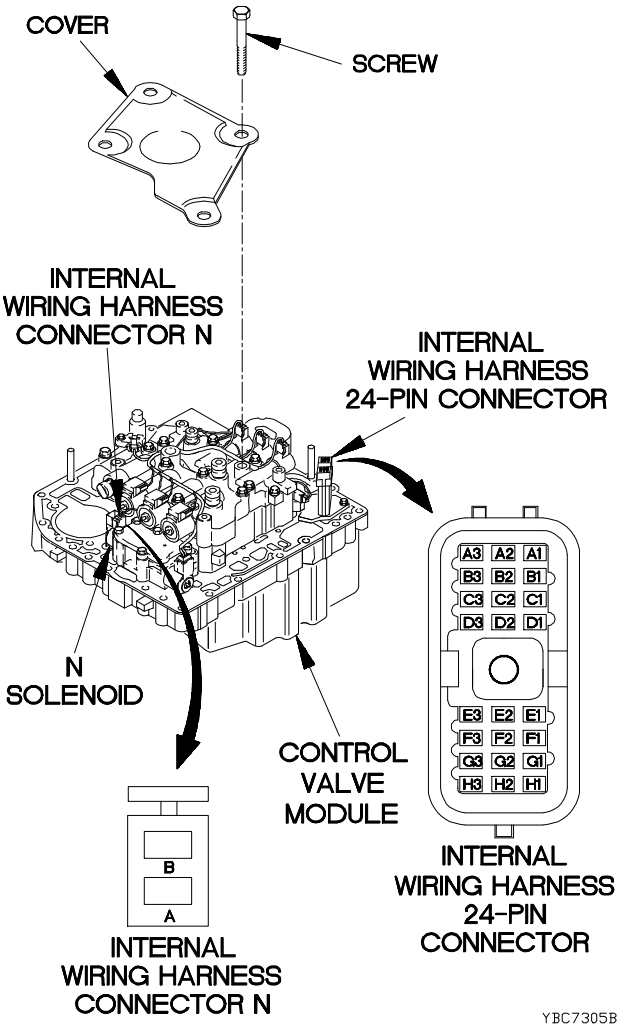


CAUTION

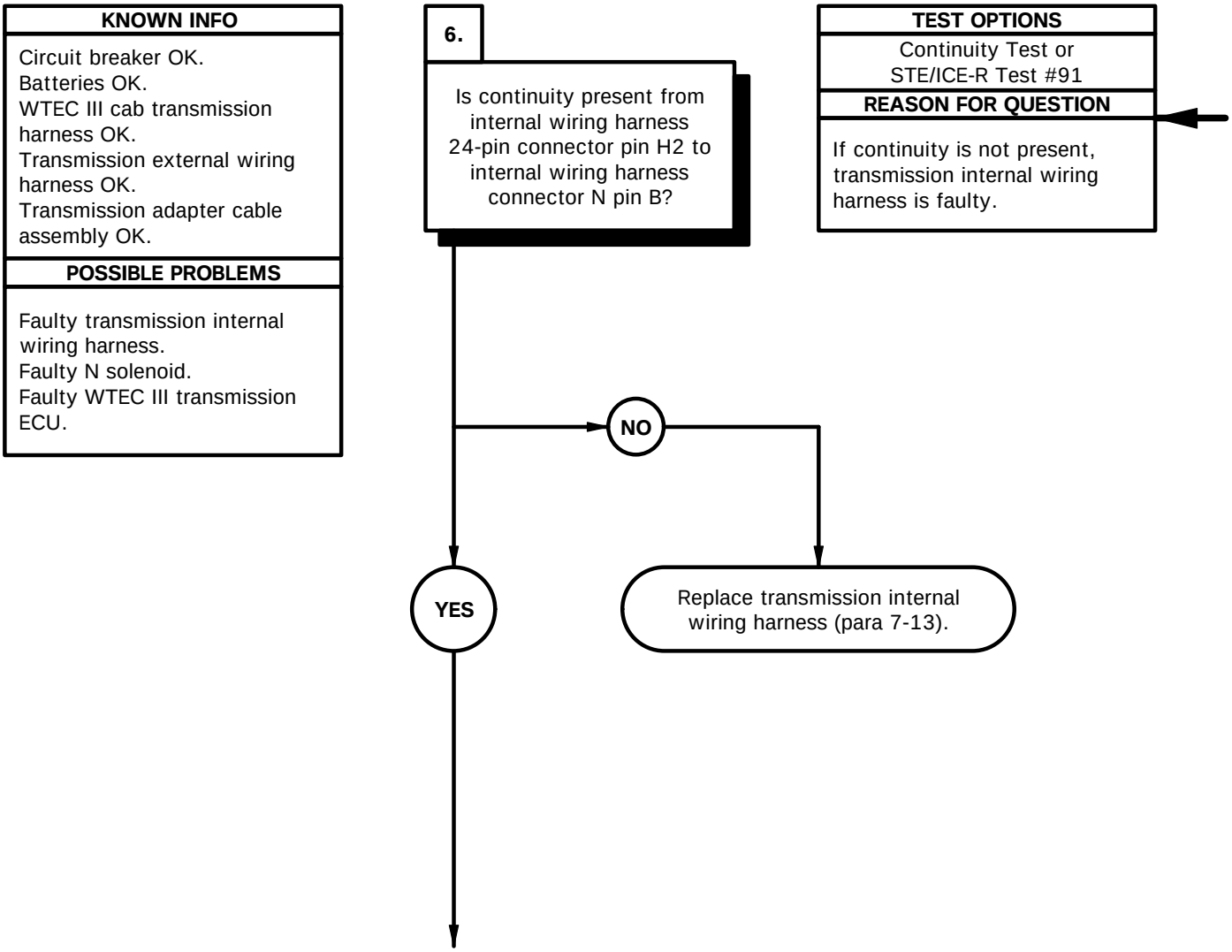
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

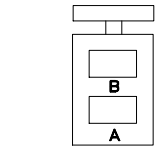


c73. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

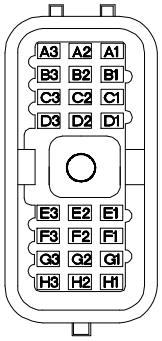


CONTINUITY TEST

(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

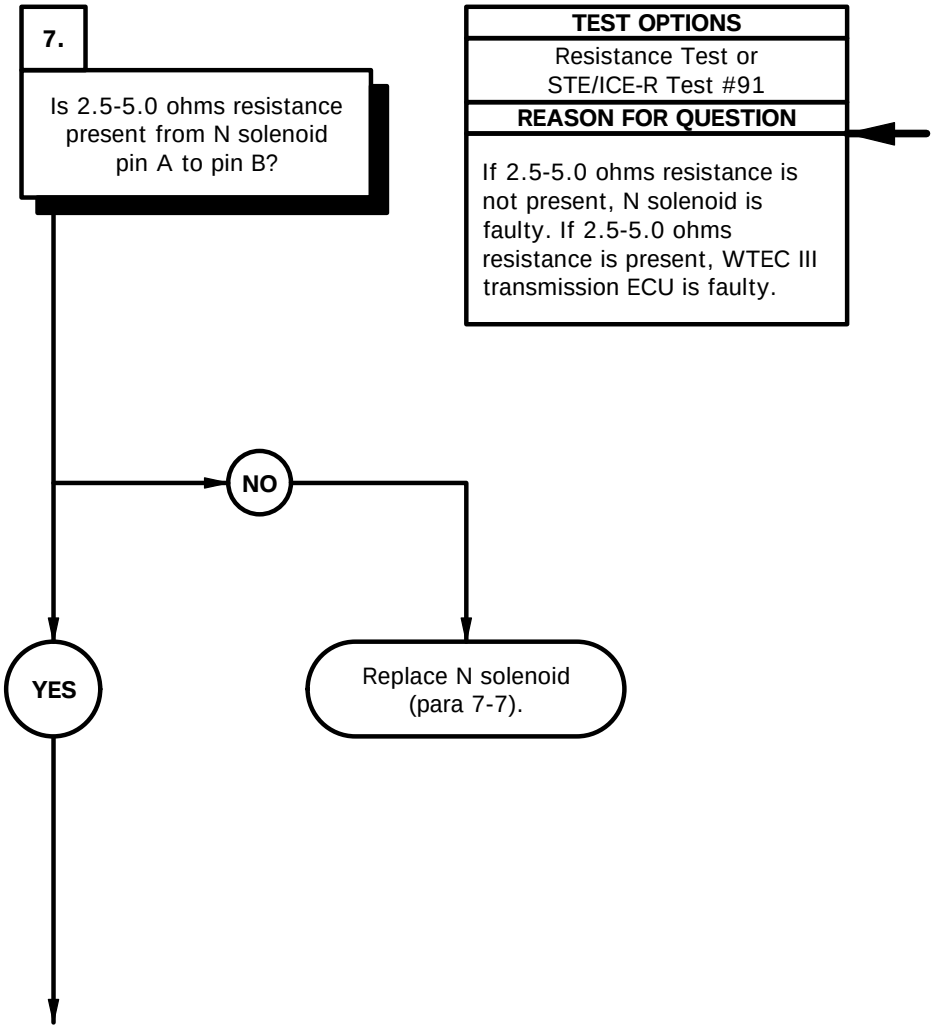
c73. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, AND/OR 69 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO

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

POSSIBLE PROBLEMS

Faulty N solenoid.
Faulty WTEC III transmission ECU.



TEST OPTIONS

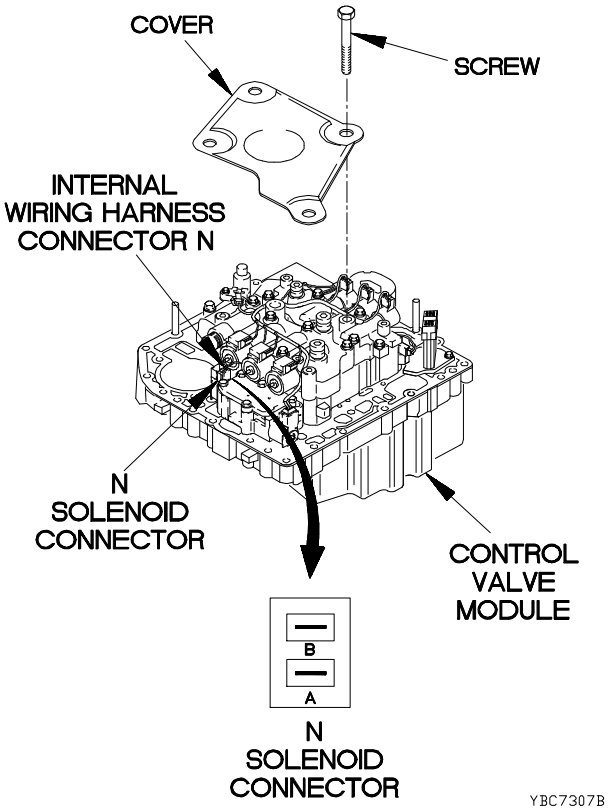
Resistance Test or STE/ICE-R Test #91

REASON FOR QUESTION

If 2.5-5.0 ohms resistance is not present, N solenoid is faulty. If 2.5-5.0 ohms resistance is present, WTEC III transmission ECU is faulty.

RESISTANCE TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to pin A of N solenoid connector.
(3) Connect negative (-) probe of multimeter to pin B of N solenoid connector and note reading on multimeter.
(4) If resistance is less than 2.5 ohms or greater than 5.0 ohms, replace N solenoid (para 7-7).
(5) If resistance is between 2.5-5.0 ohms, replace WTEC III transmission ECU (TM 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

INITIAL SETUP

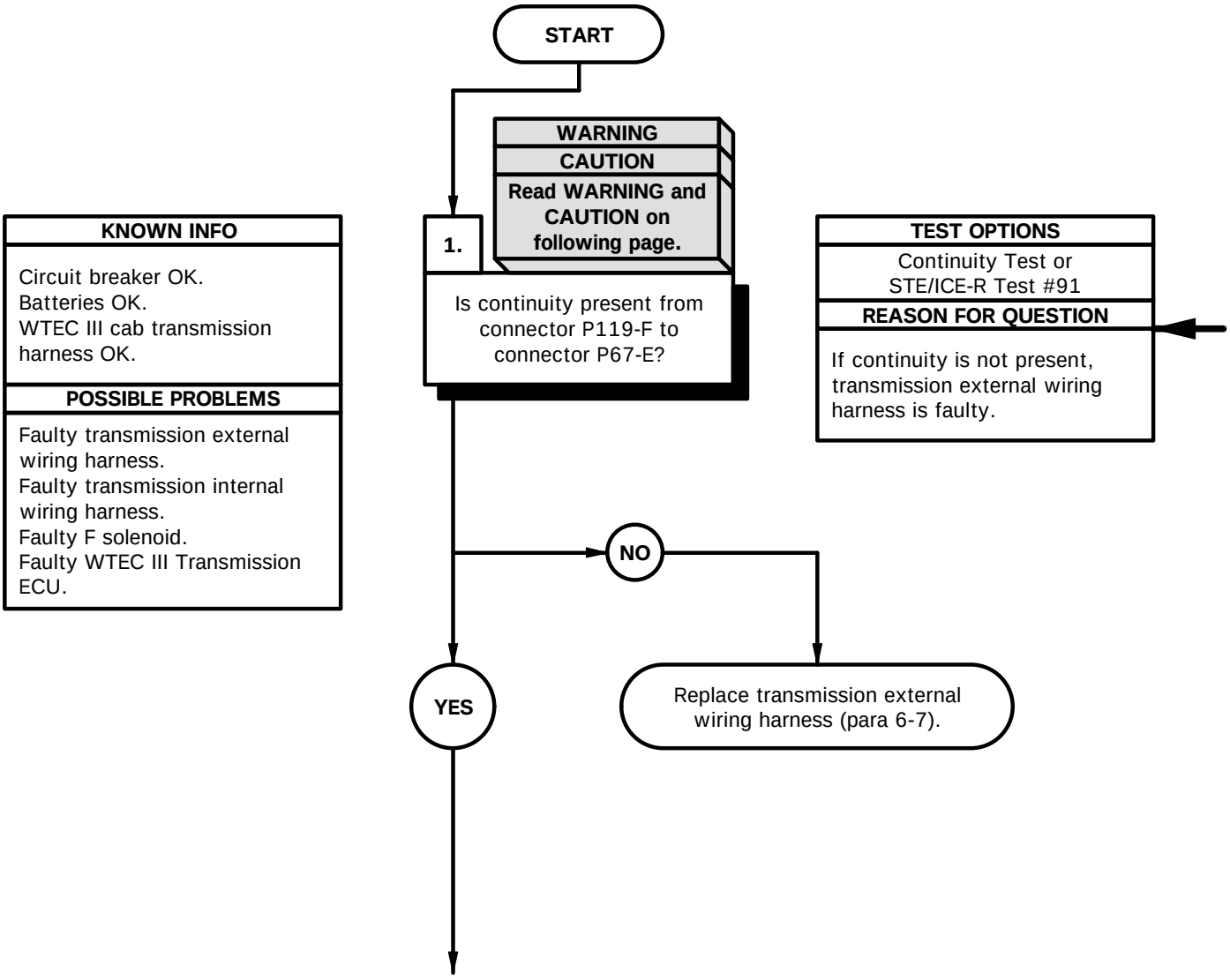
Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)

Materials/Parts
Wire, Elect, 50 ft (Item 94, 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

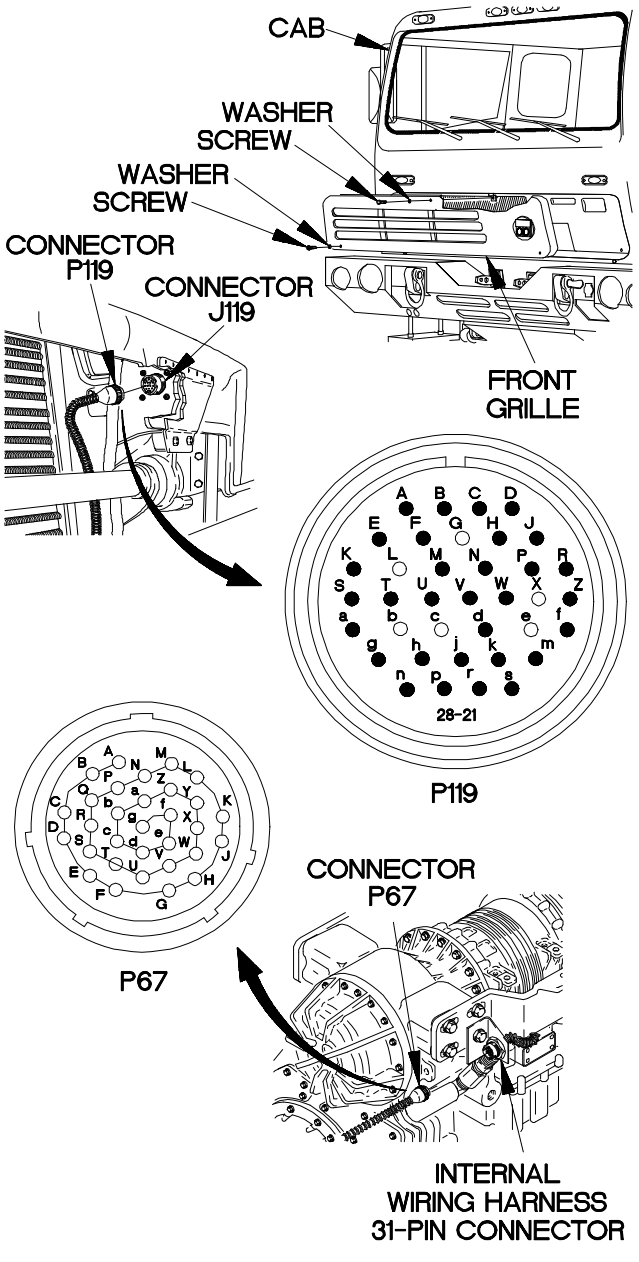
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

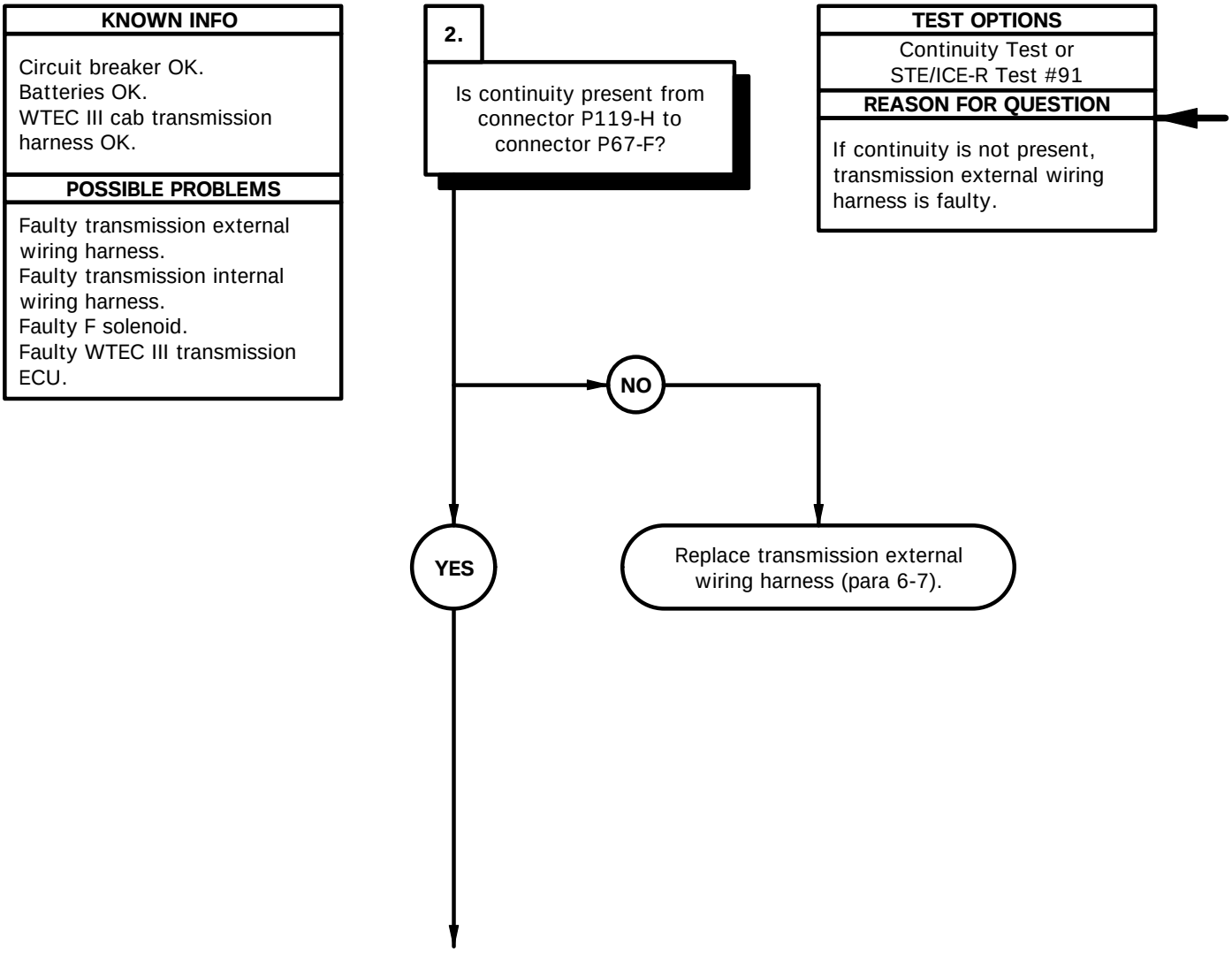
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from internal wiring harness 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect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

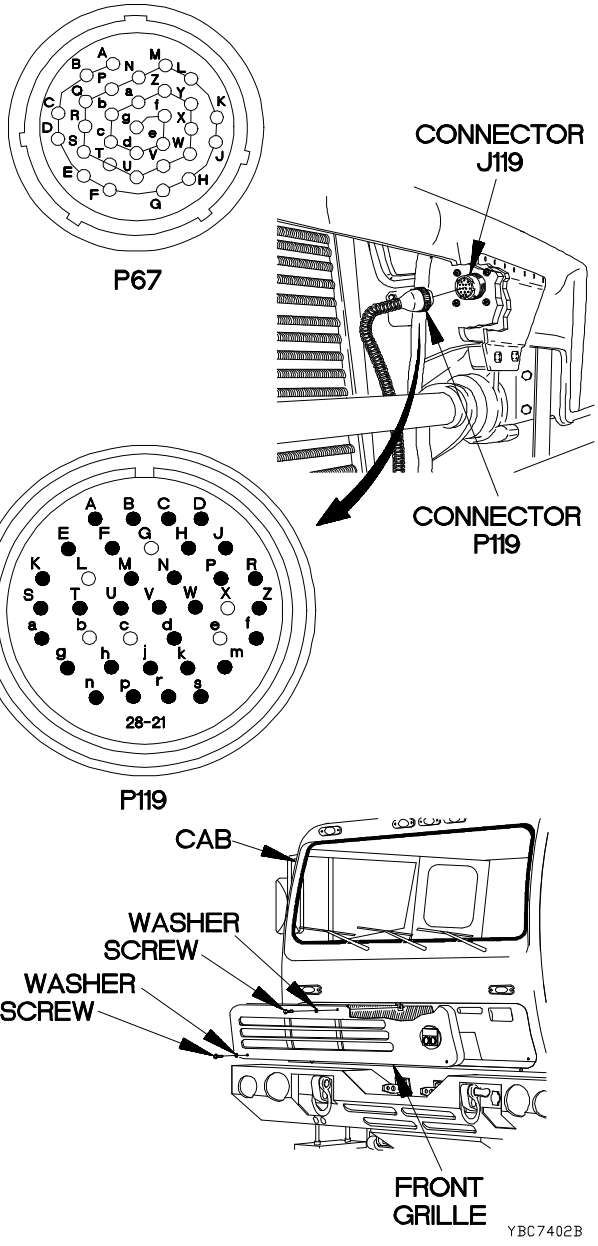


c74. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

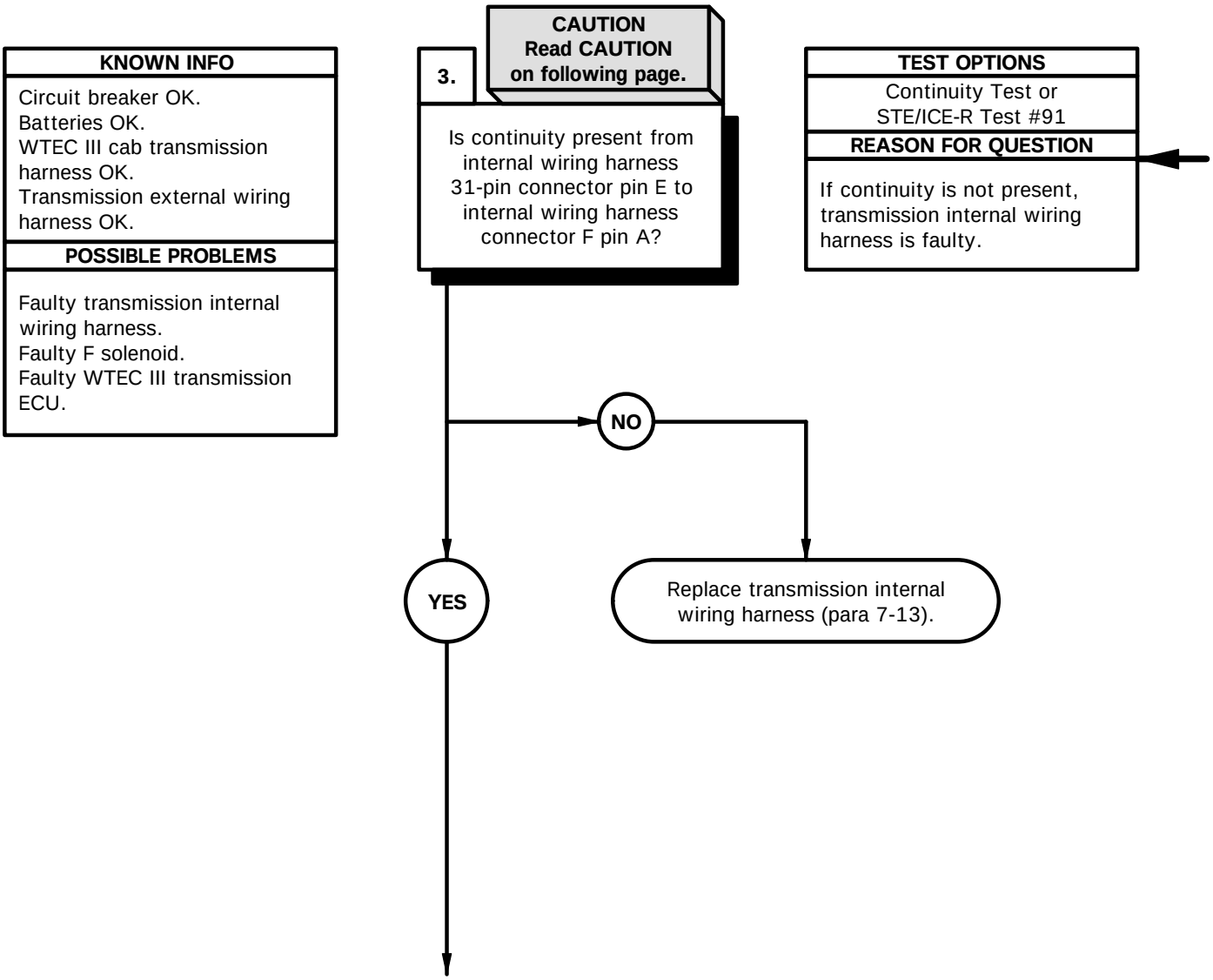


CONTINUITY TEST

(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)

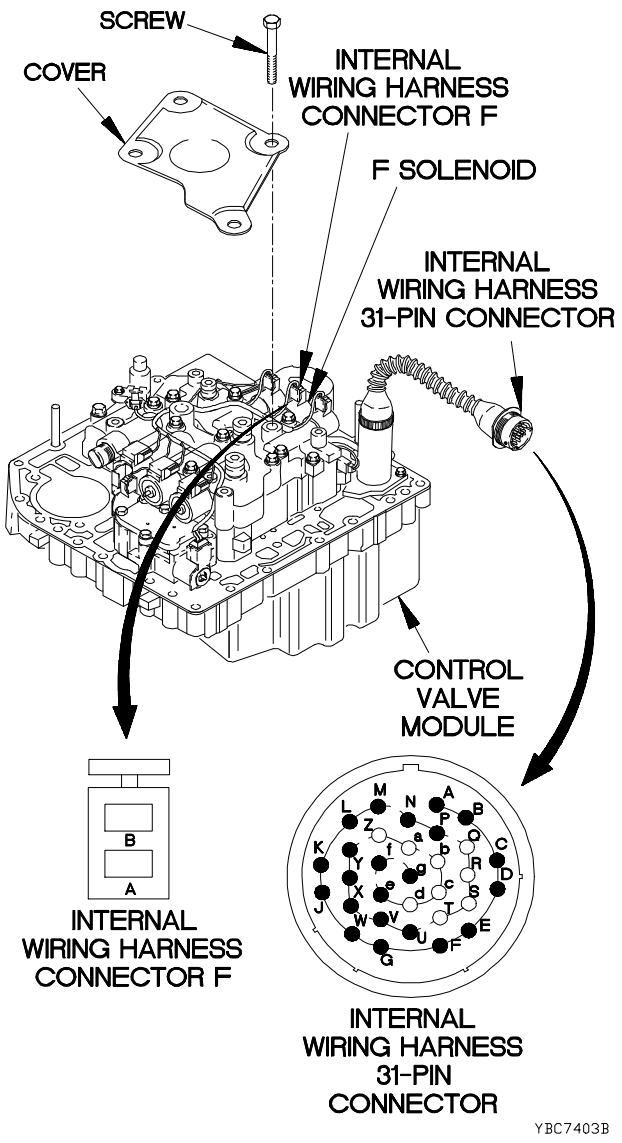


CAUTION

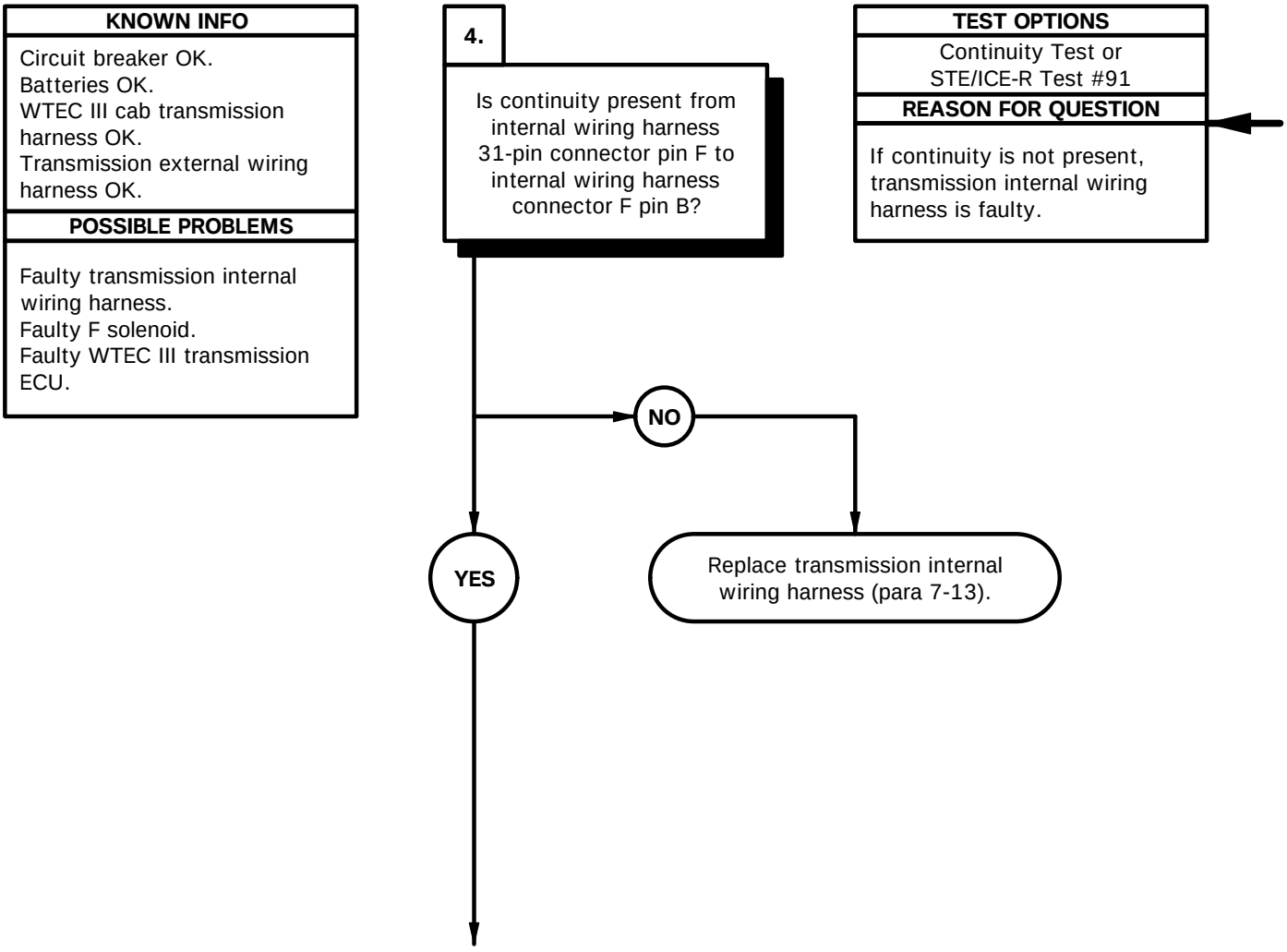
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

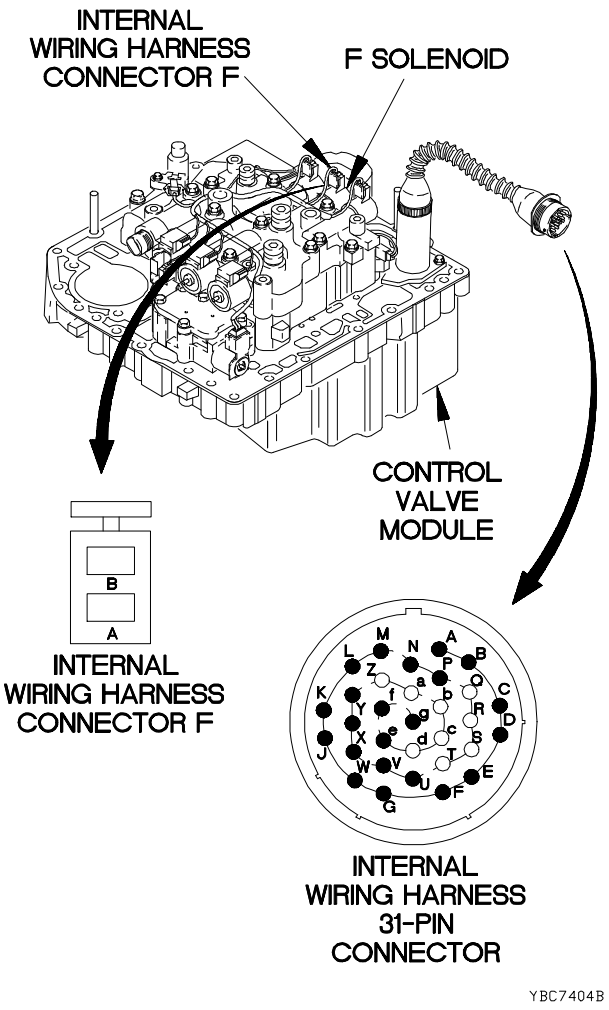


c74. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

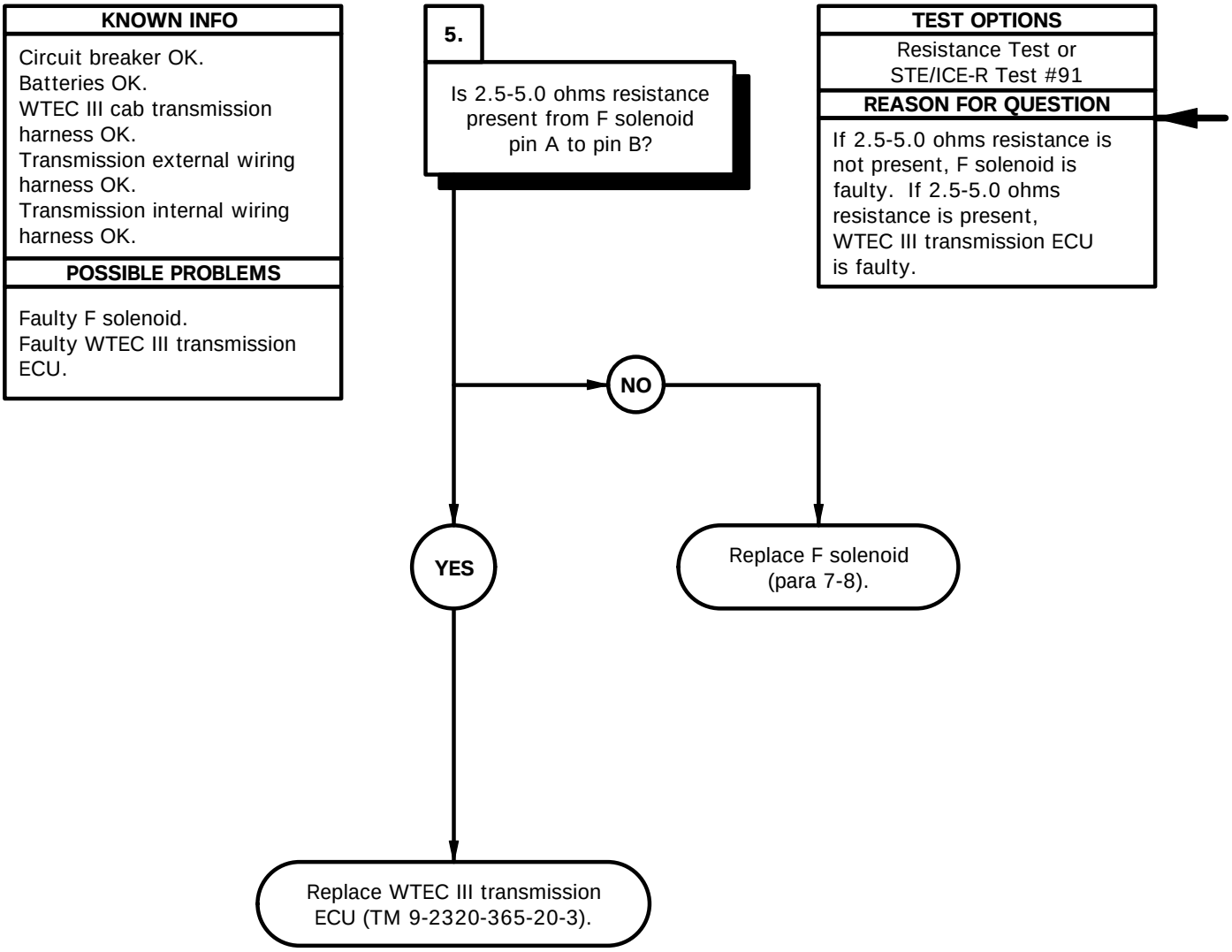


CONTINUITY TEST

(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).

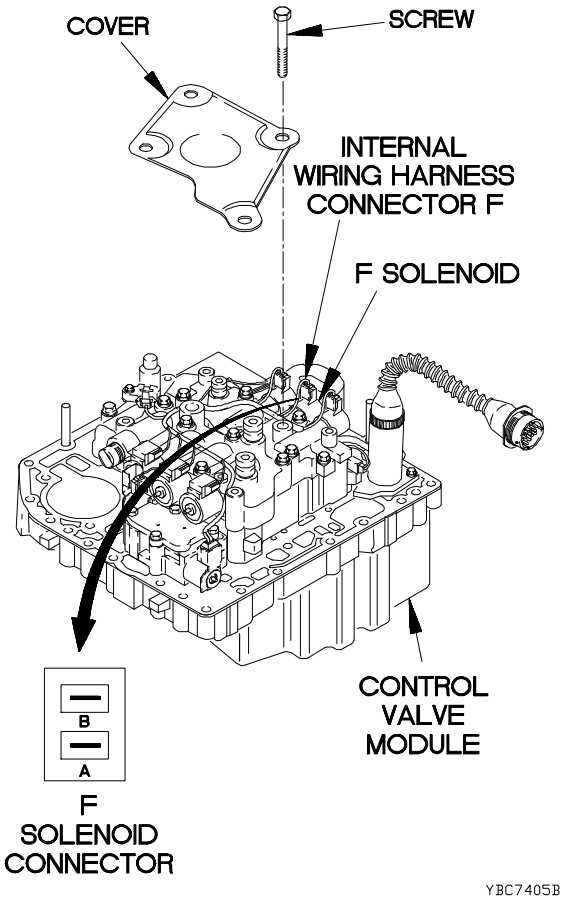


c74. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

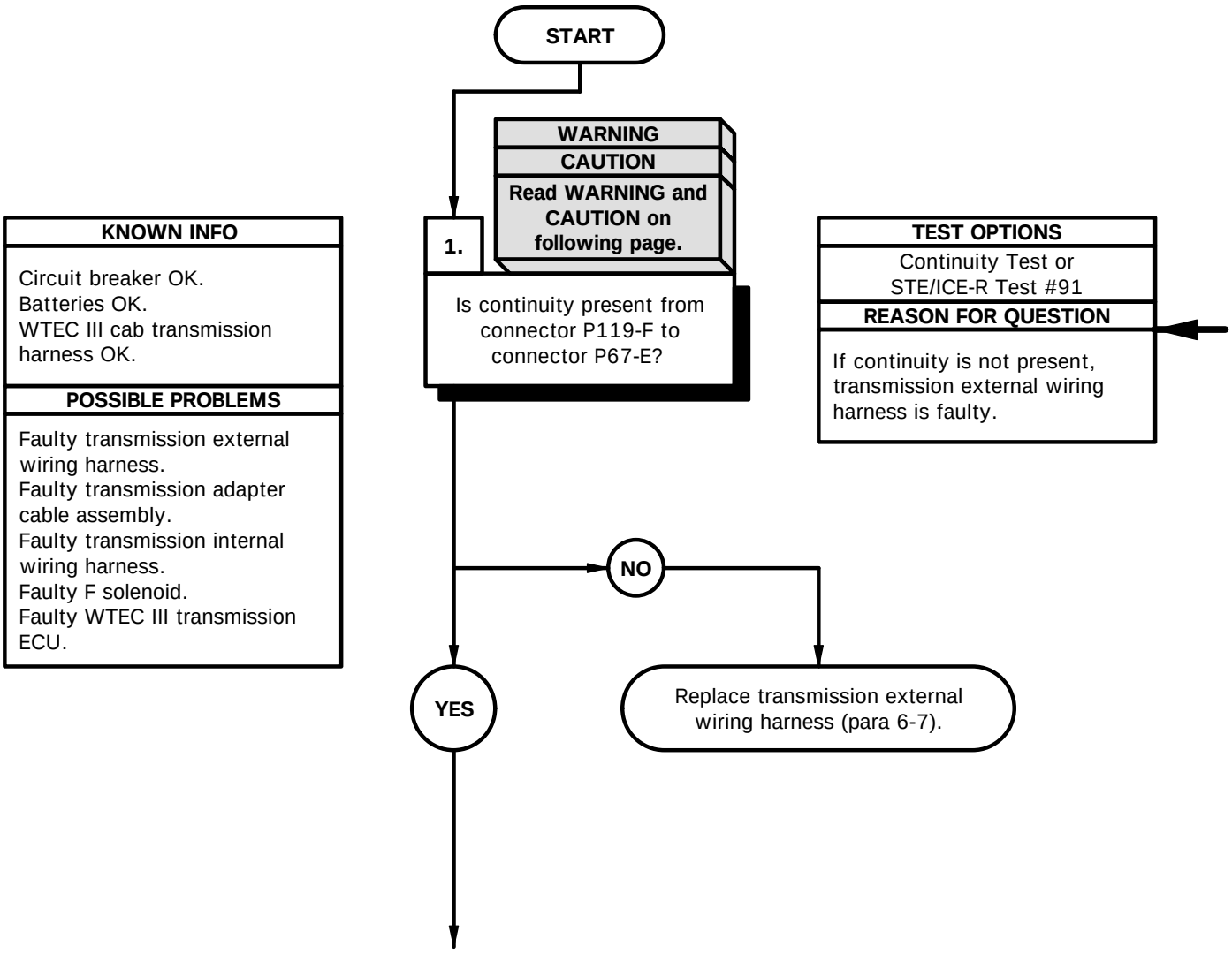
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

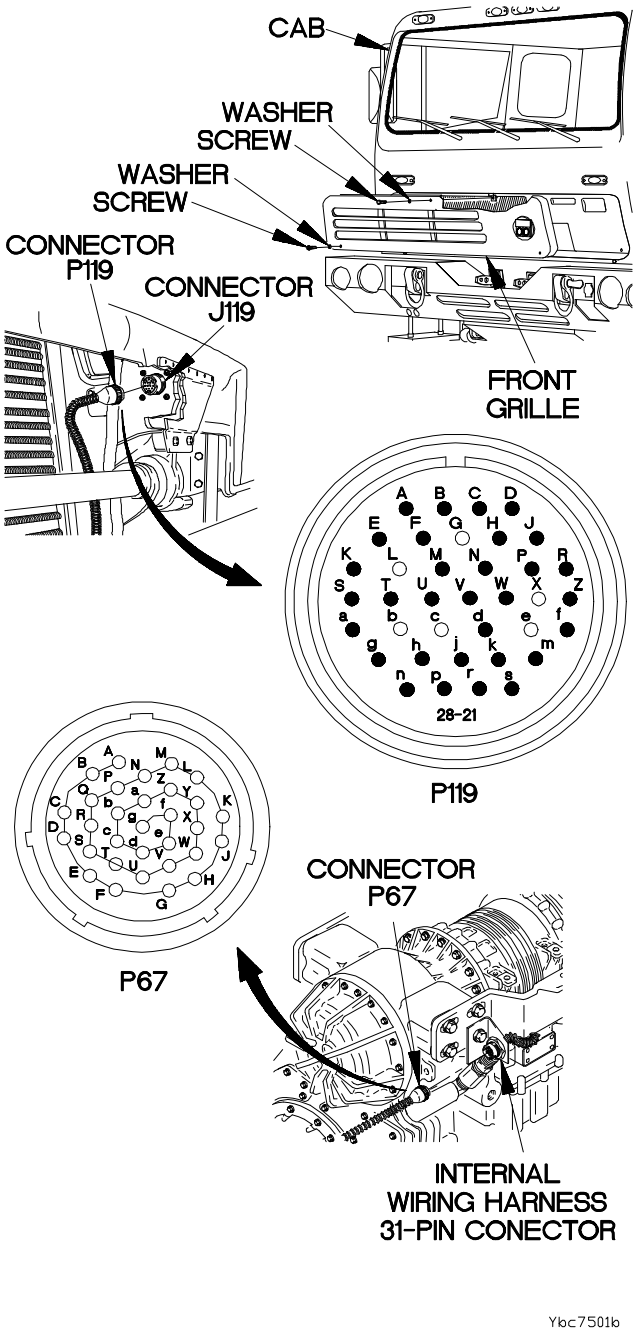
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

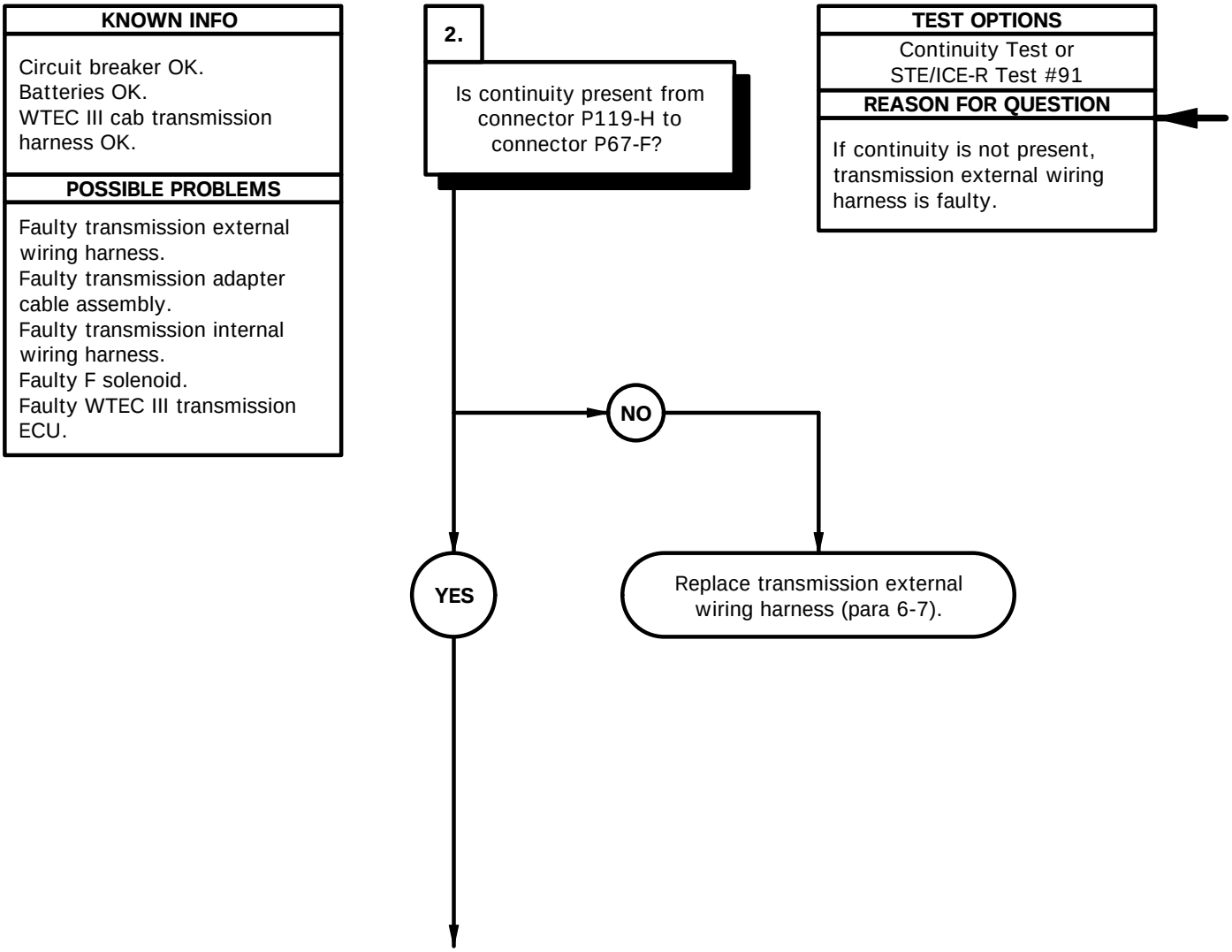
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from adapter cable 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect positive (+)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

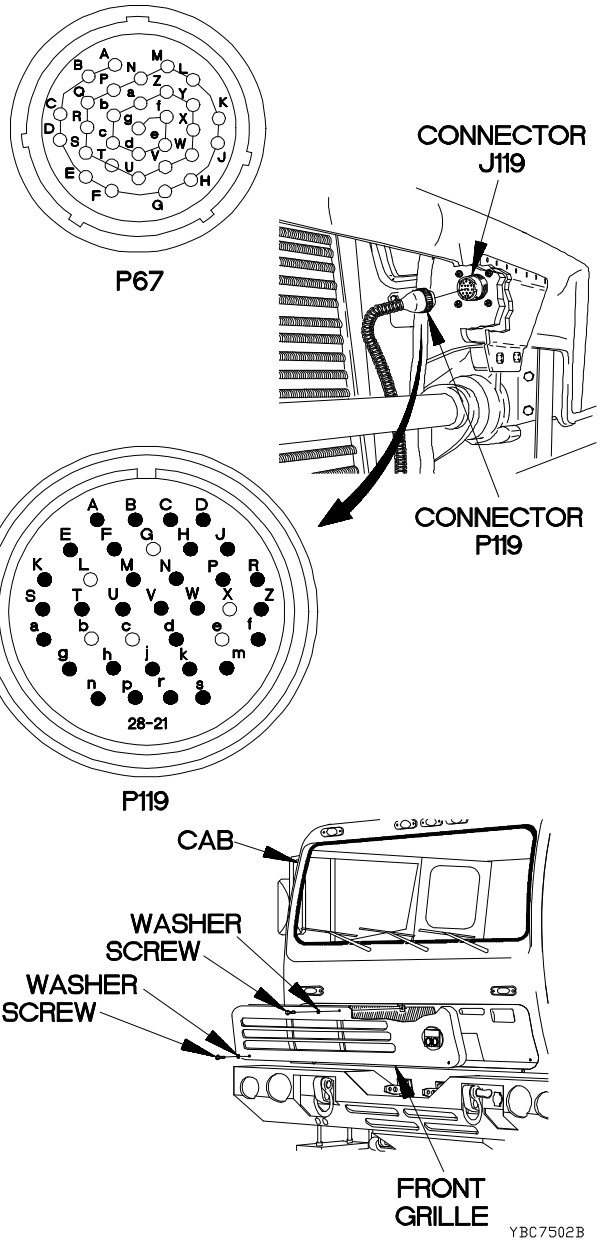


c75. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

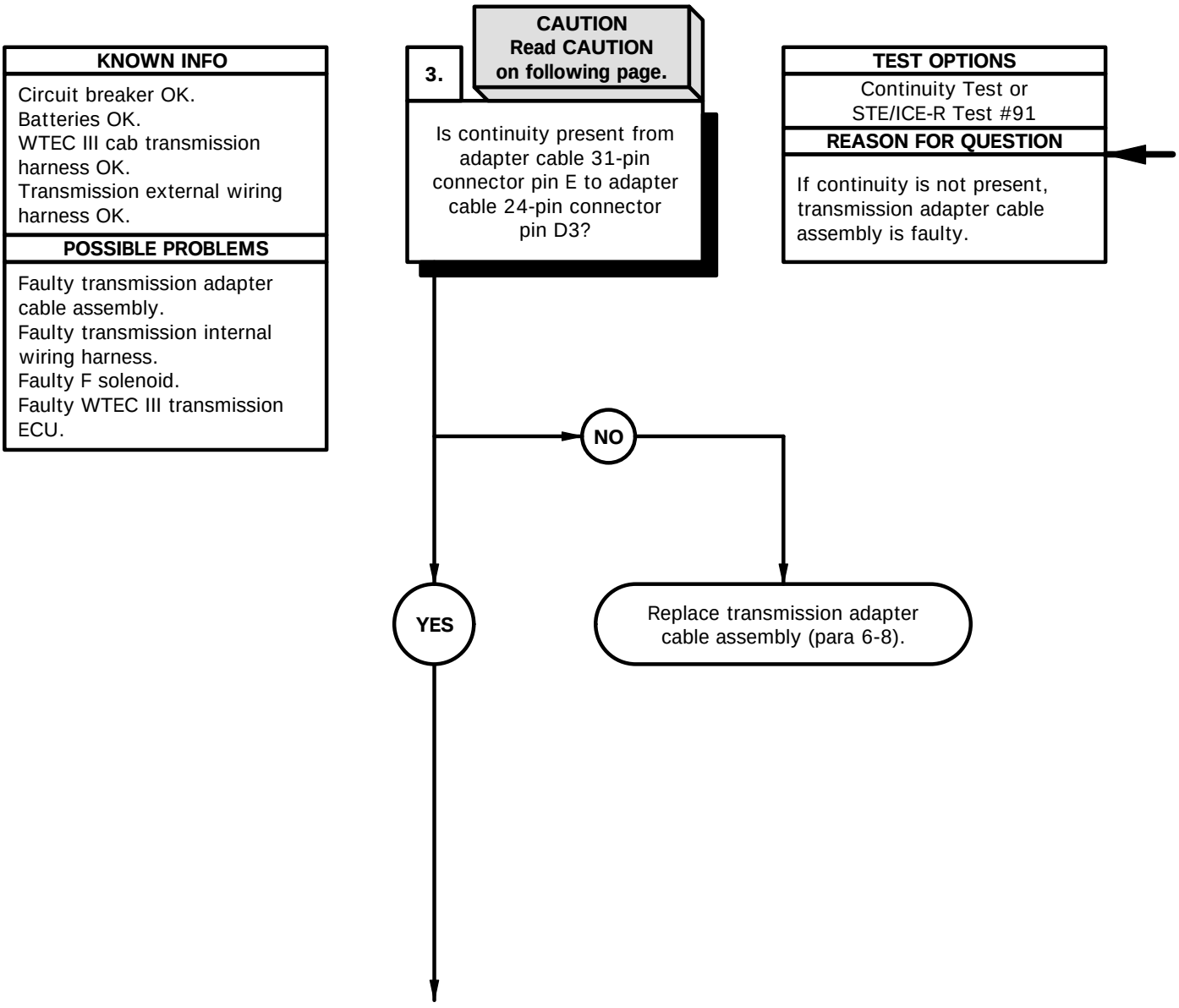


CONTINUITY TEST

(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)

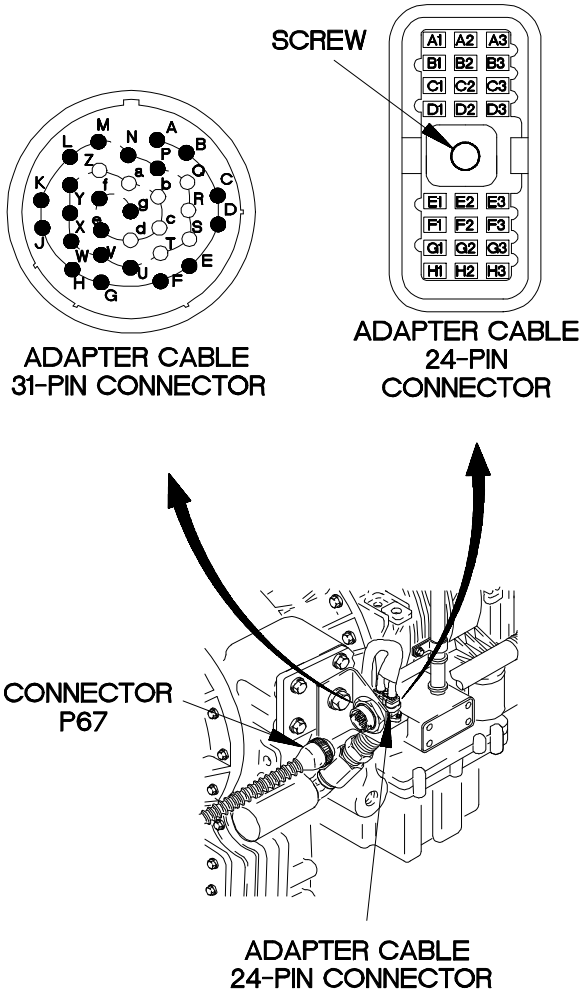


CAUTION

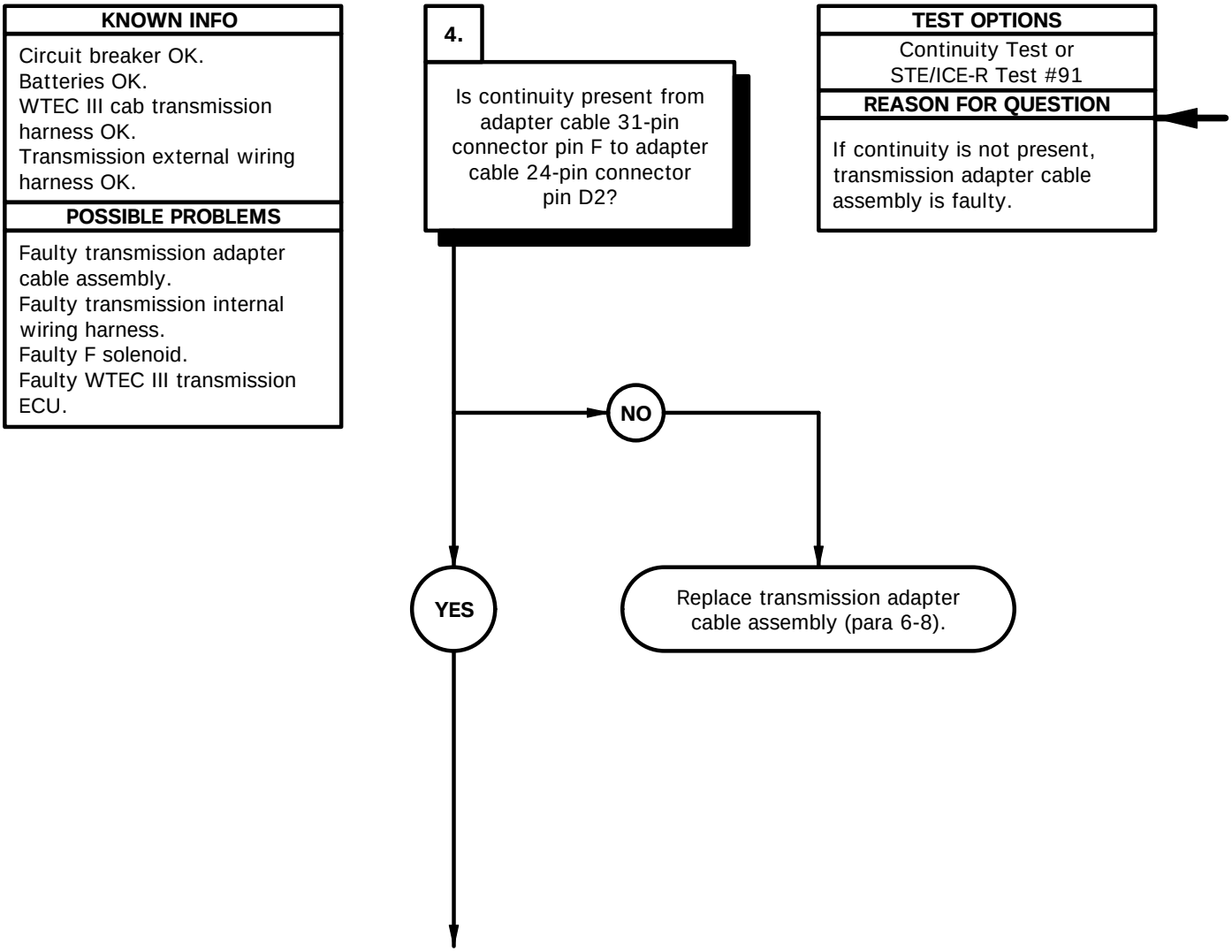
Use care when disconnecting transmission adapter cable assembly feed-through connectors. Failure to comply may result in damage to equipment.

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).

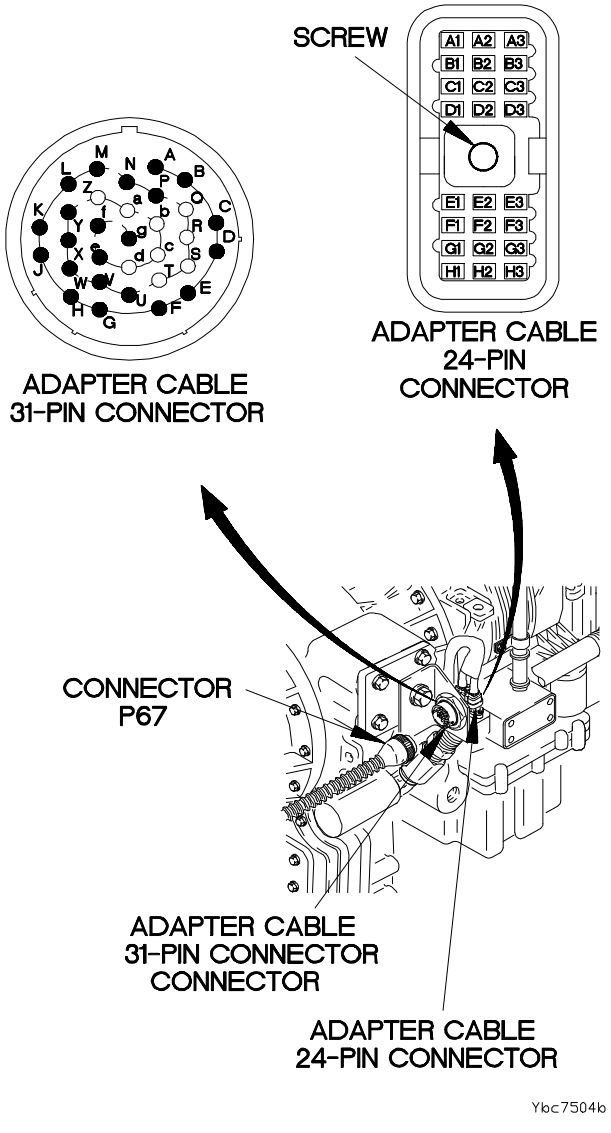


c75. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

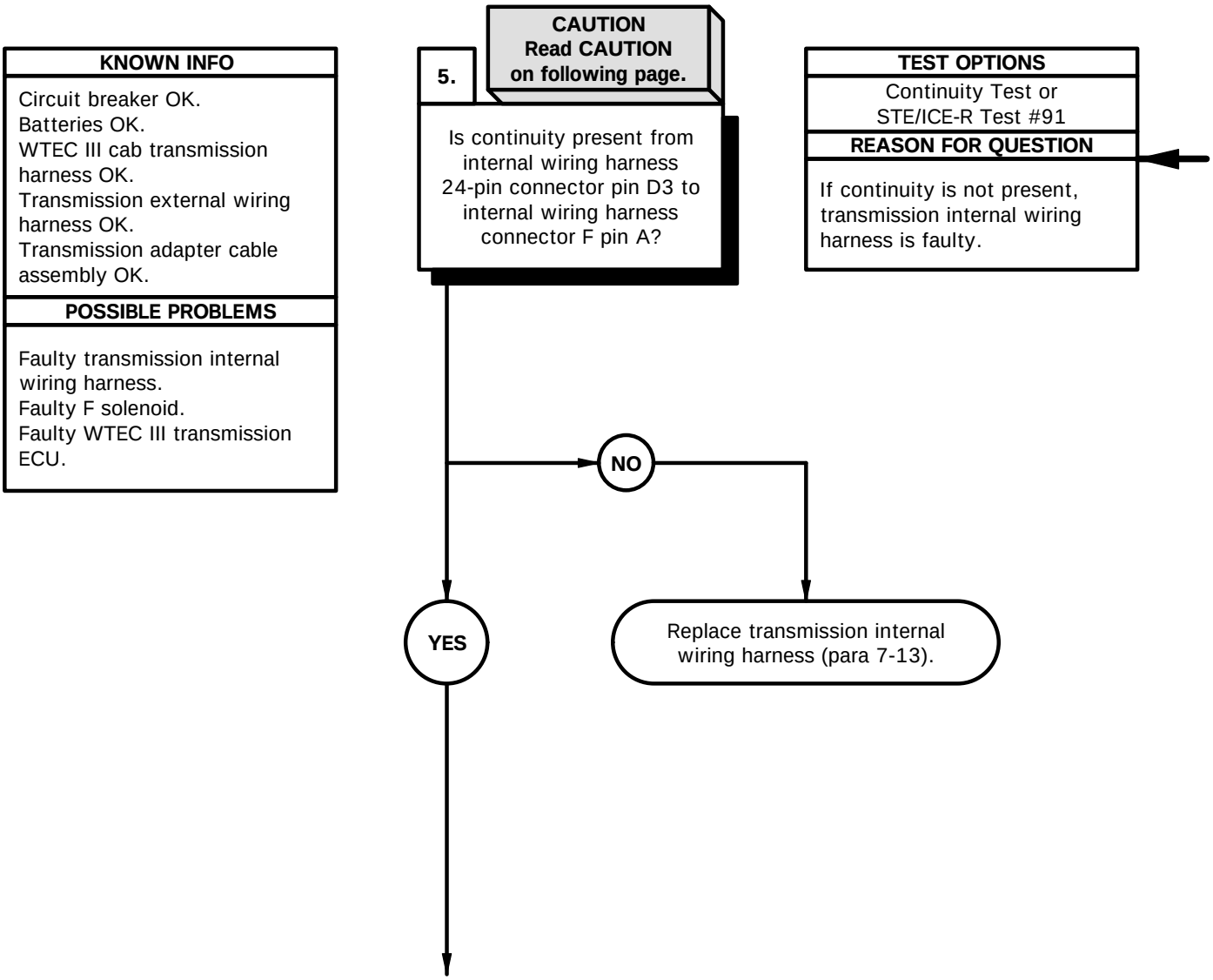


CONTINUITY TEST

(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)

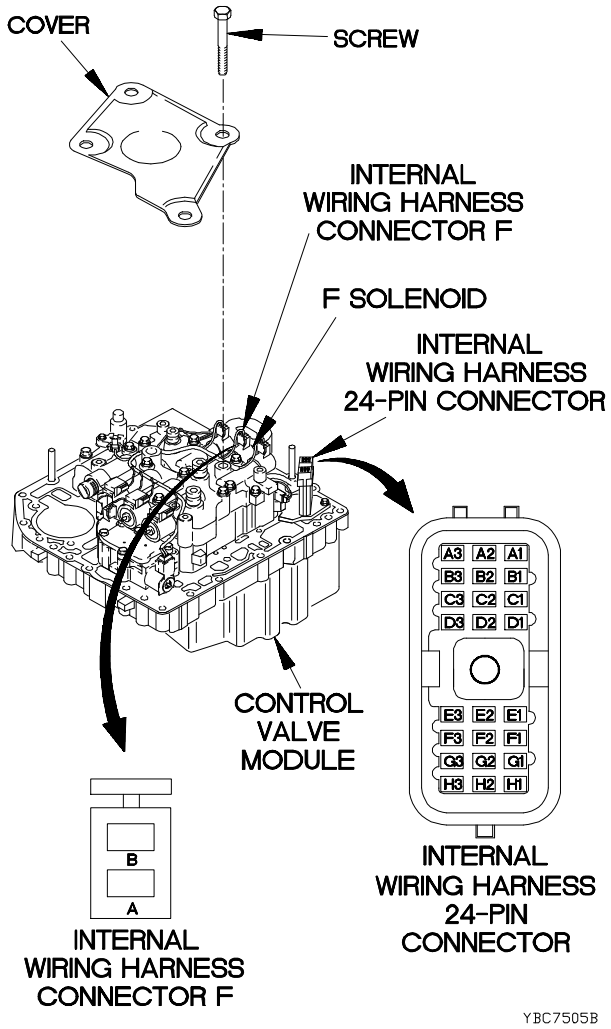


CAUTION

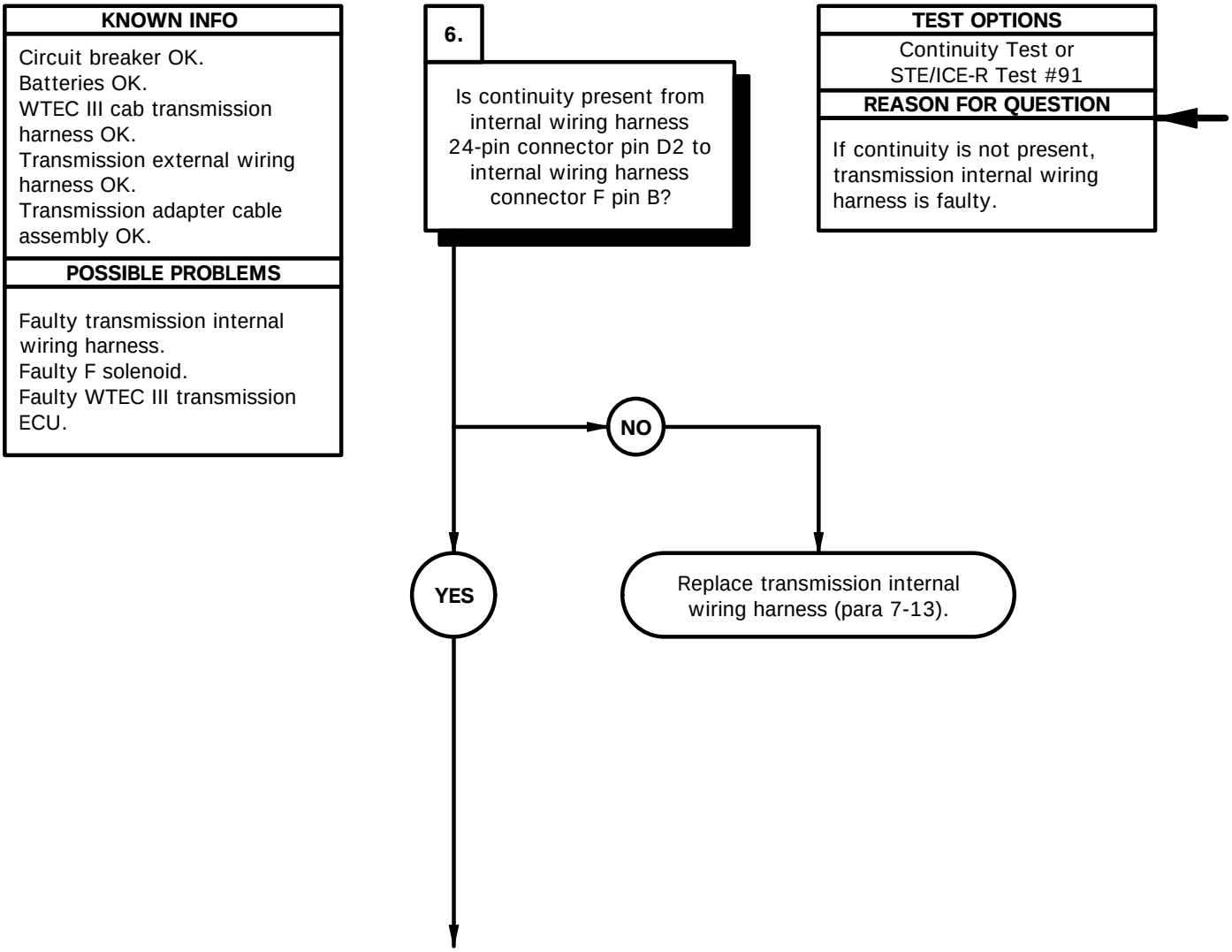
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

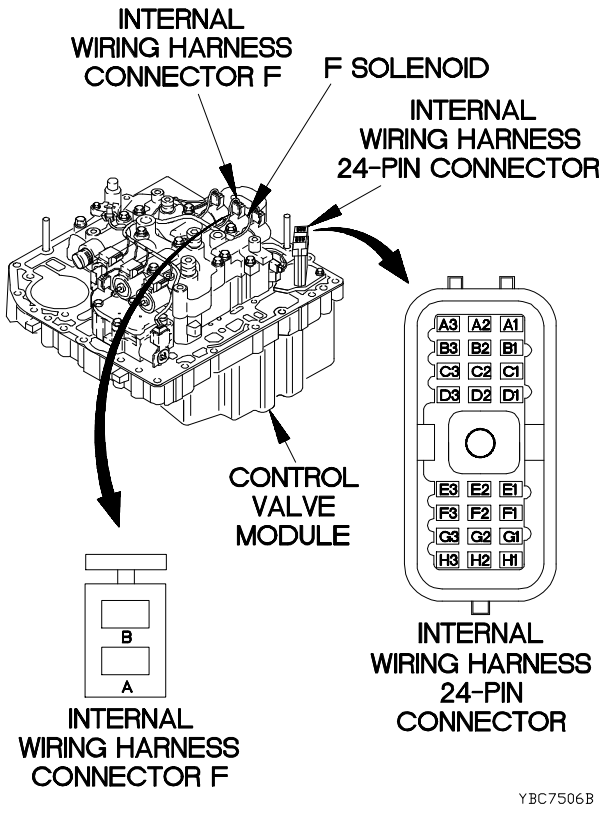


c75. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

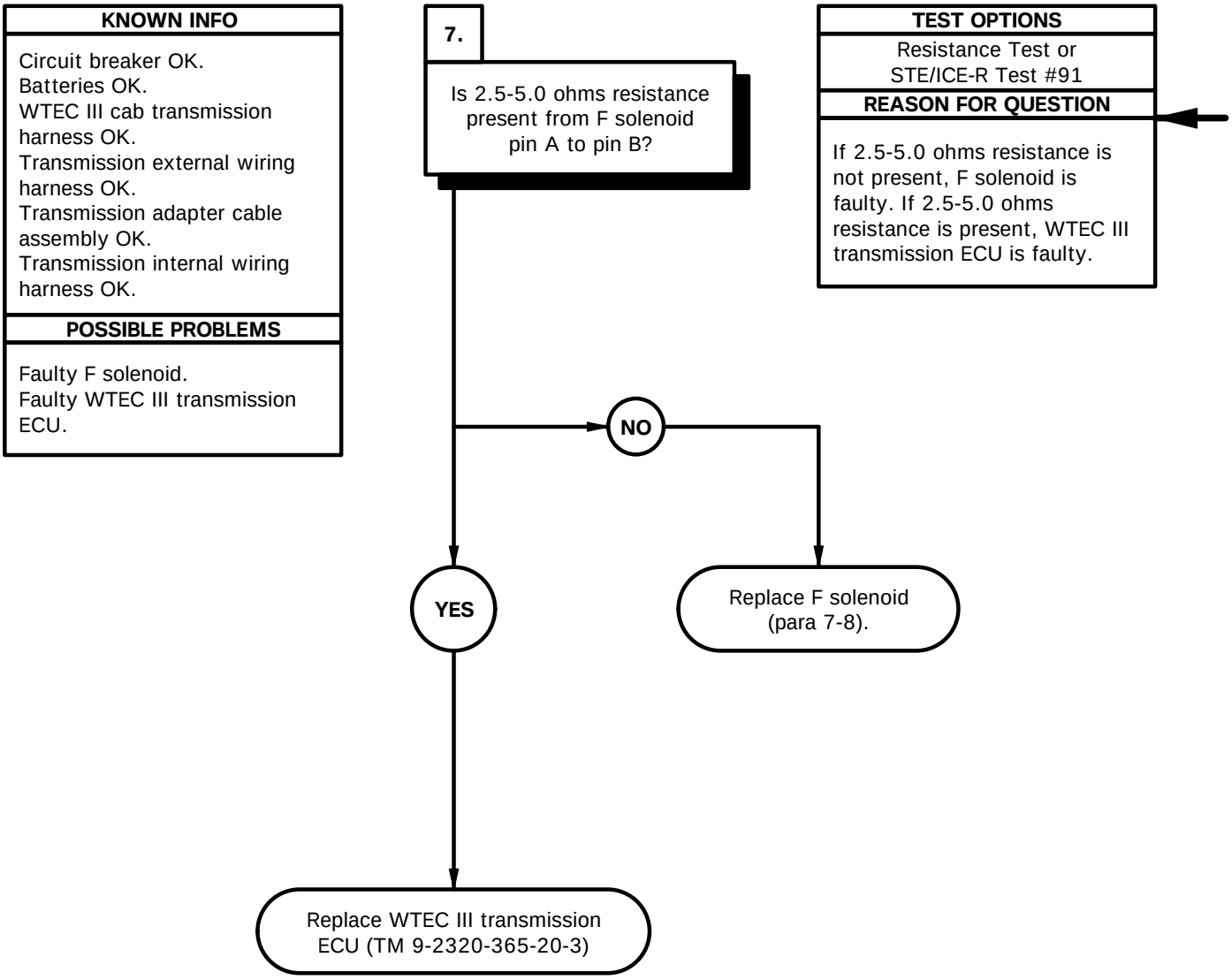


CONTINUITY TEST

(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).

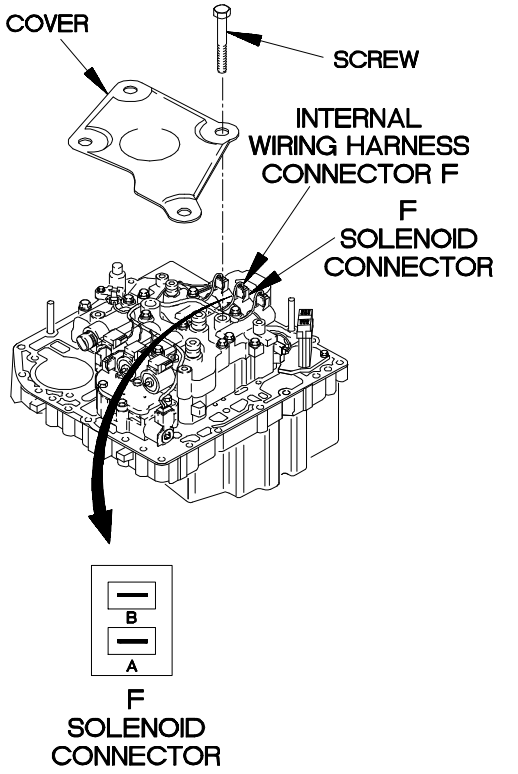


c75. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 21 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)

Materials/Parts
Wire, Elect, 50 ft (Item 94, Appendix C)

Personnel Required
(2)

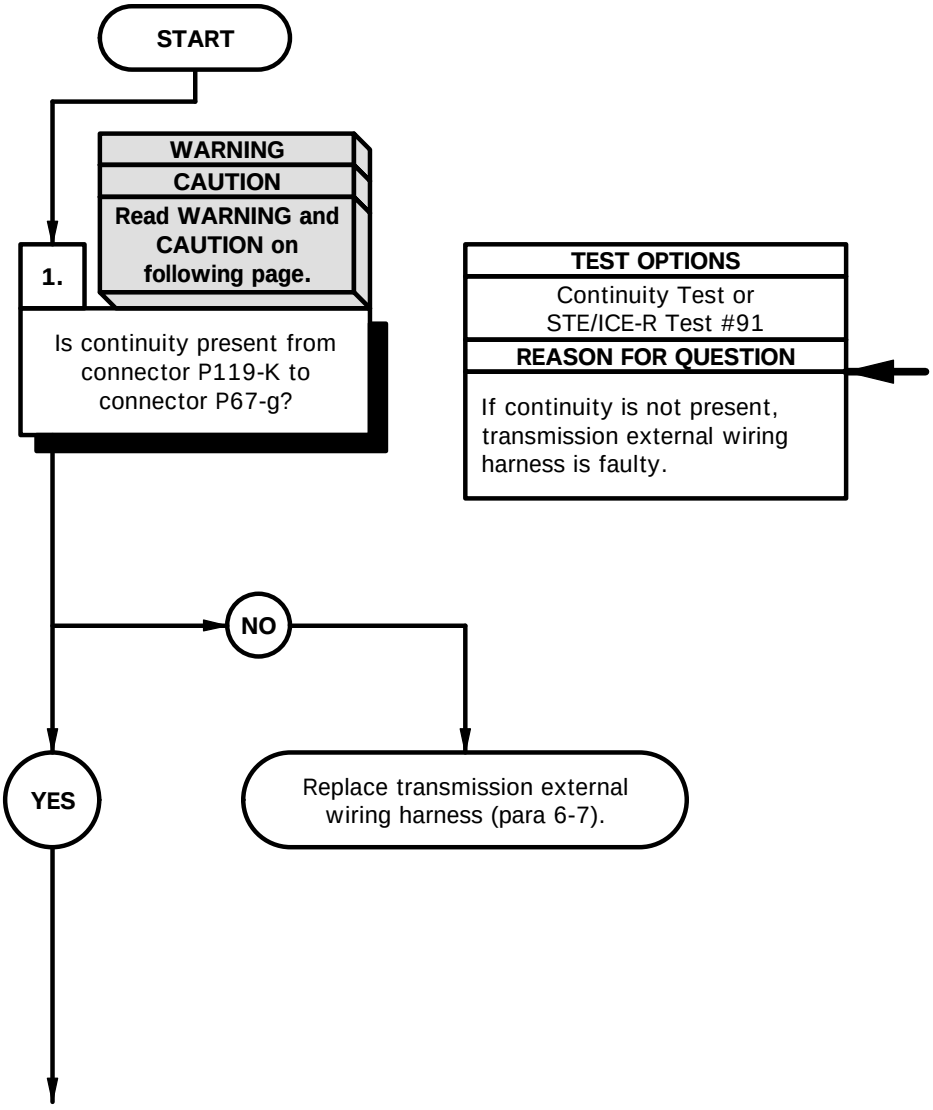
References
TM 9-4910-571-12&P

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 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

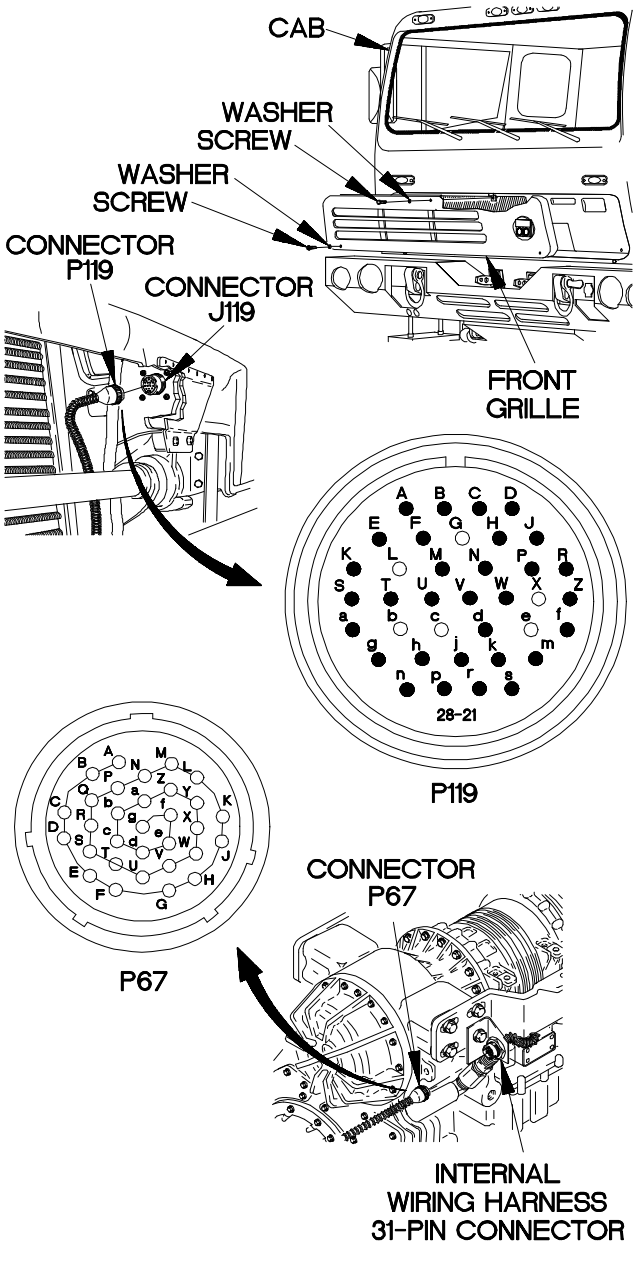
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

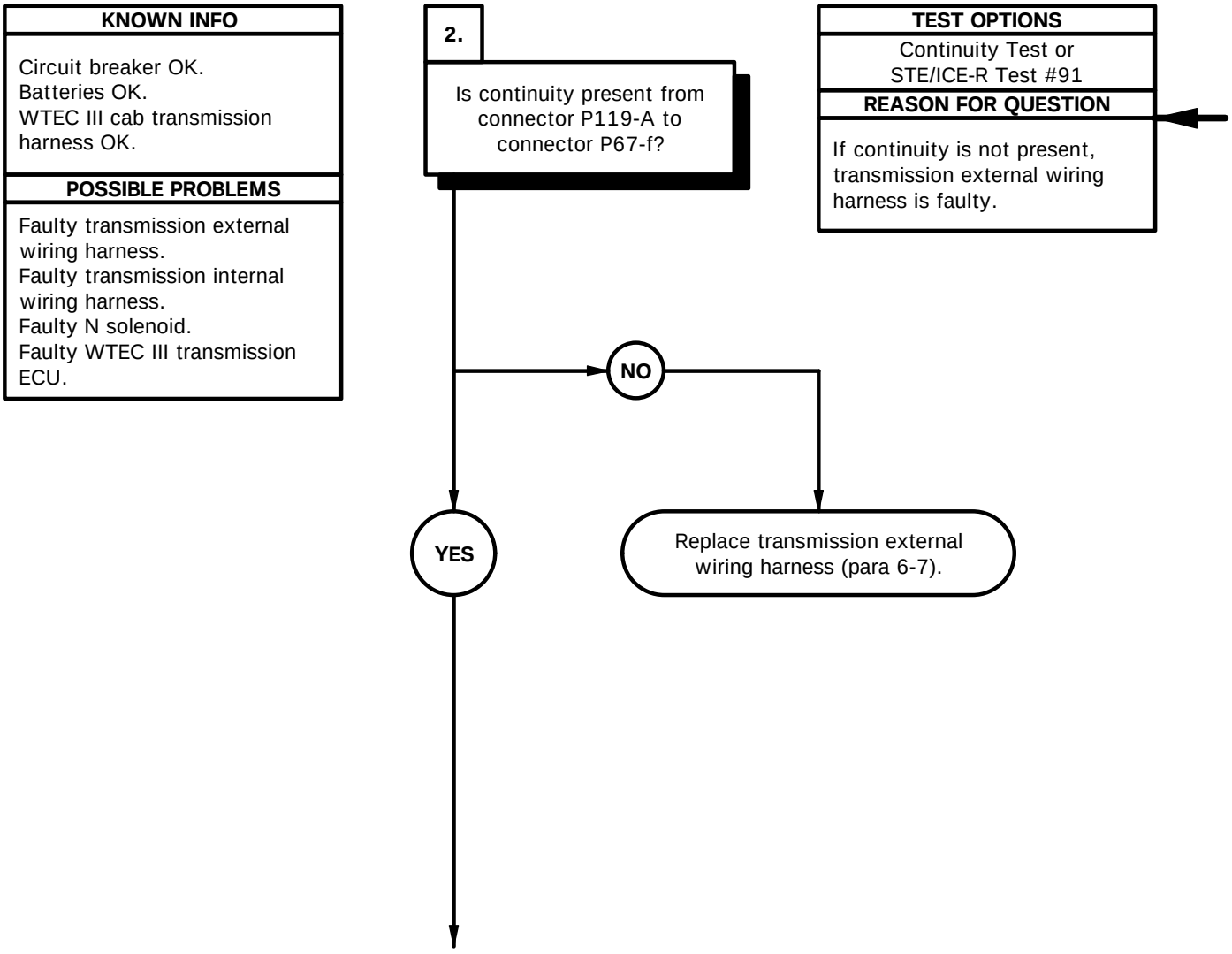
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from internal wiring harness 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect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

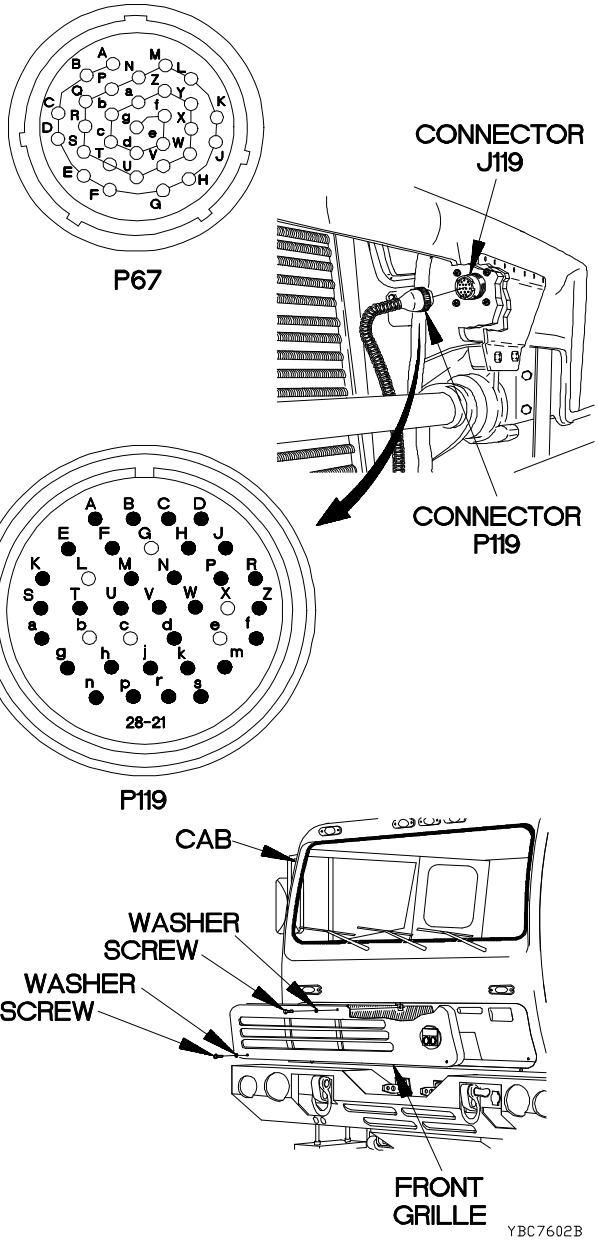


c76. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

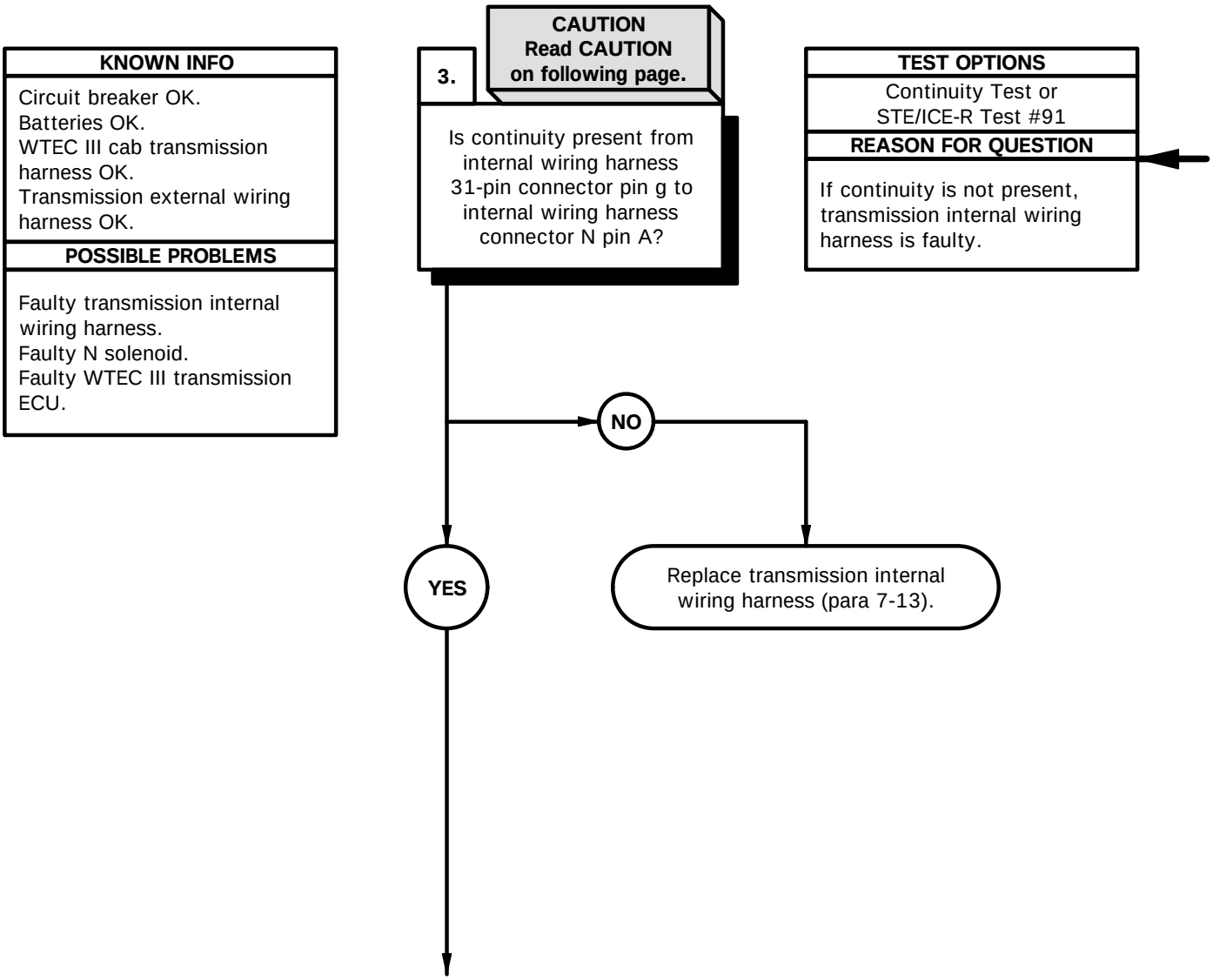


CONTINUITY TEST

(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)

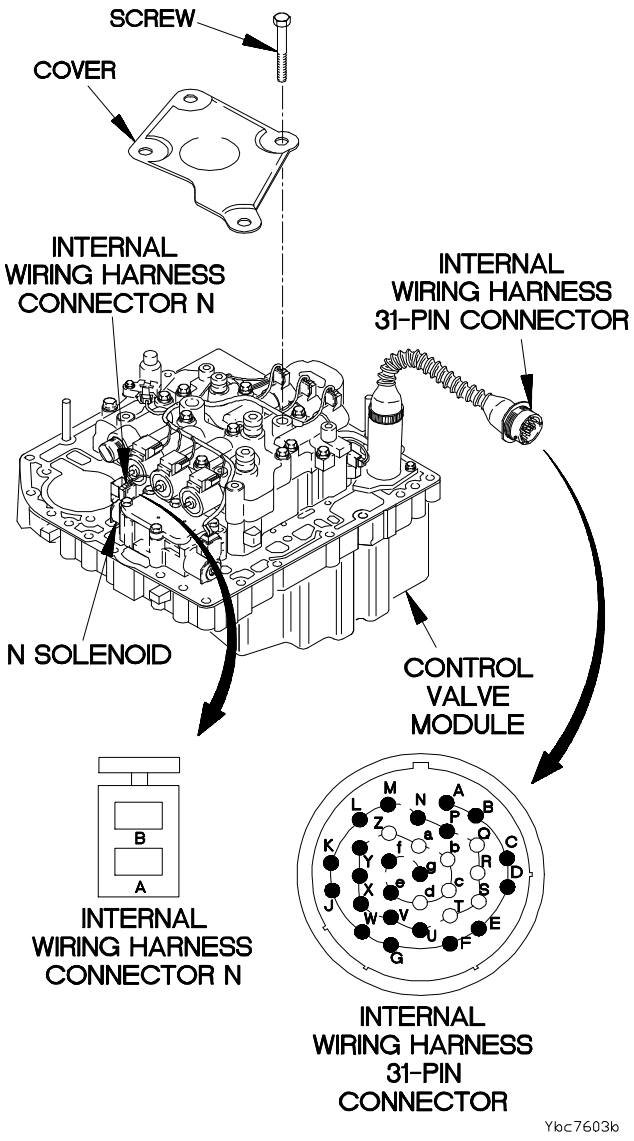


CAUTION

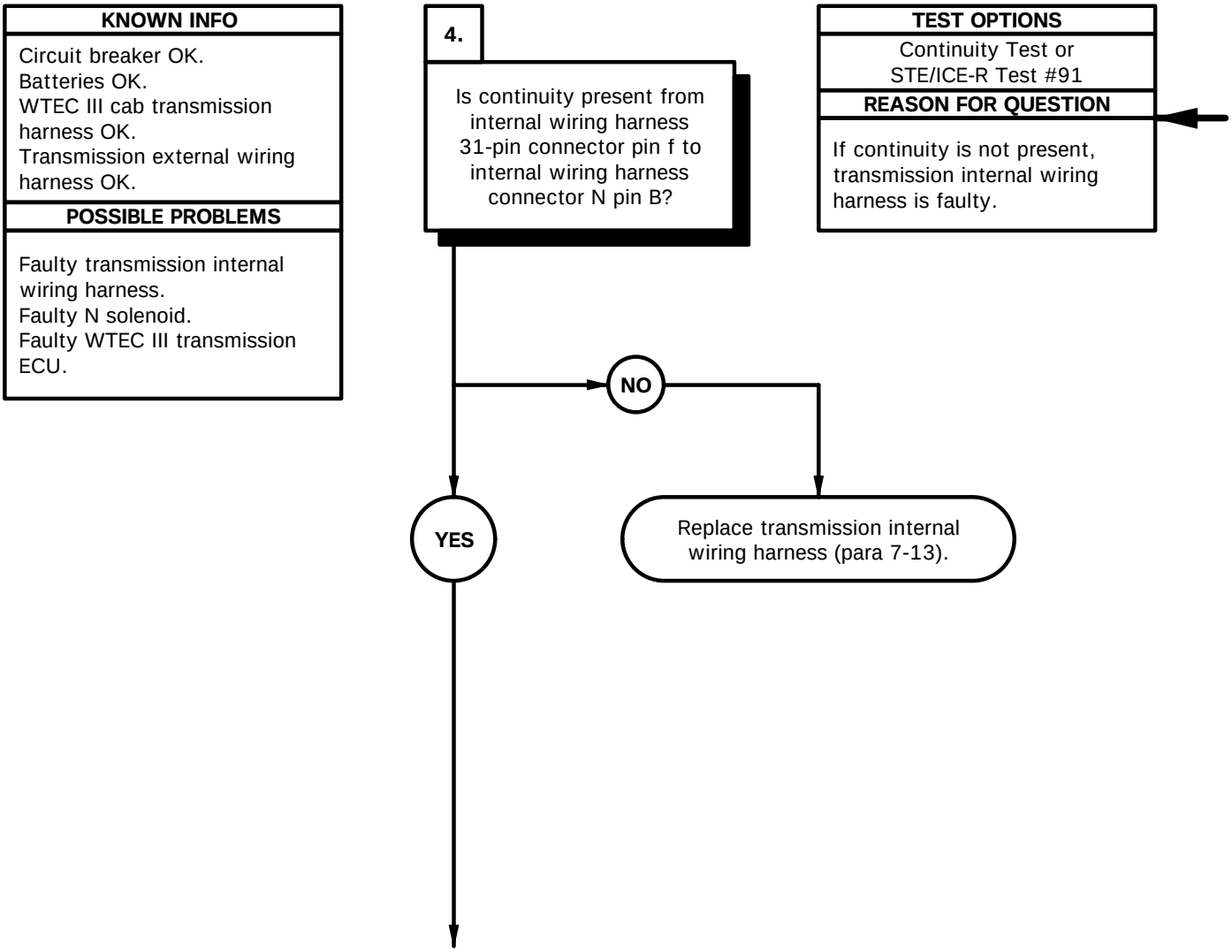
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

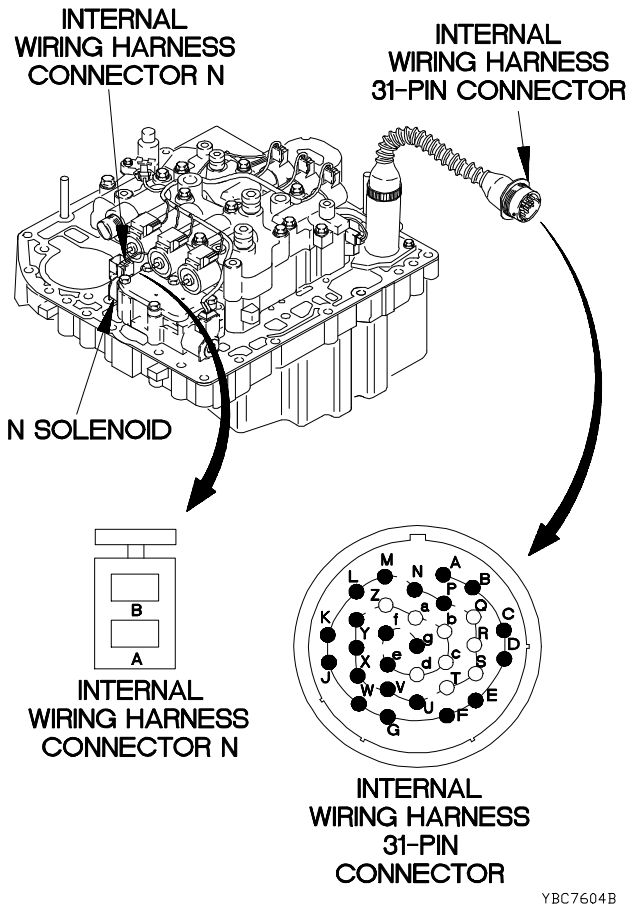


c76. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

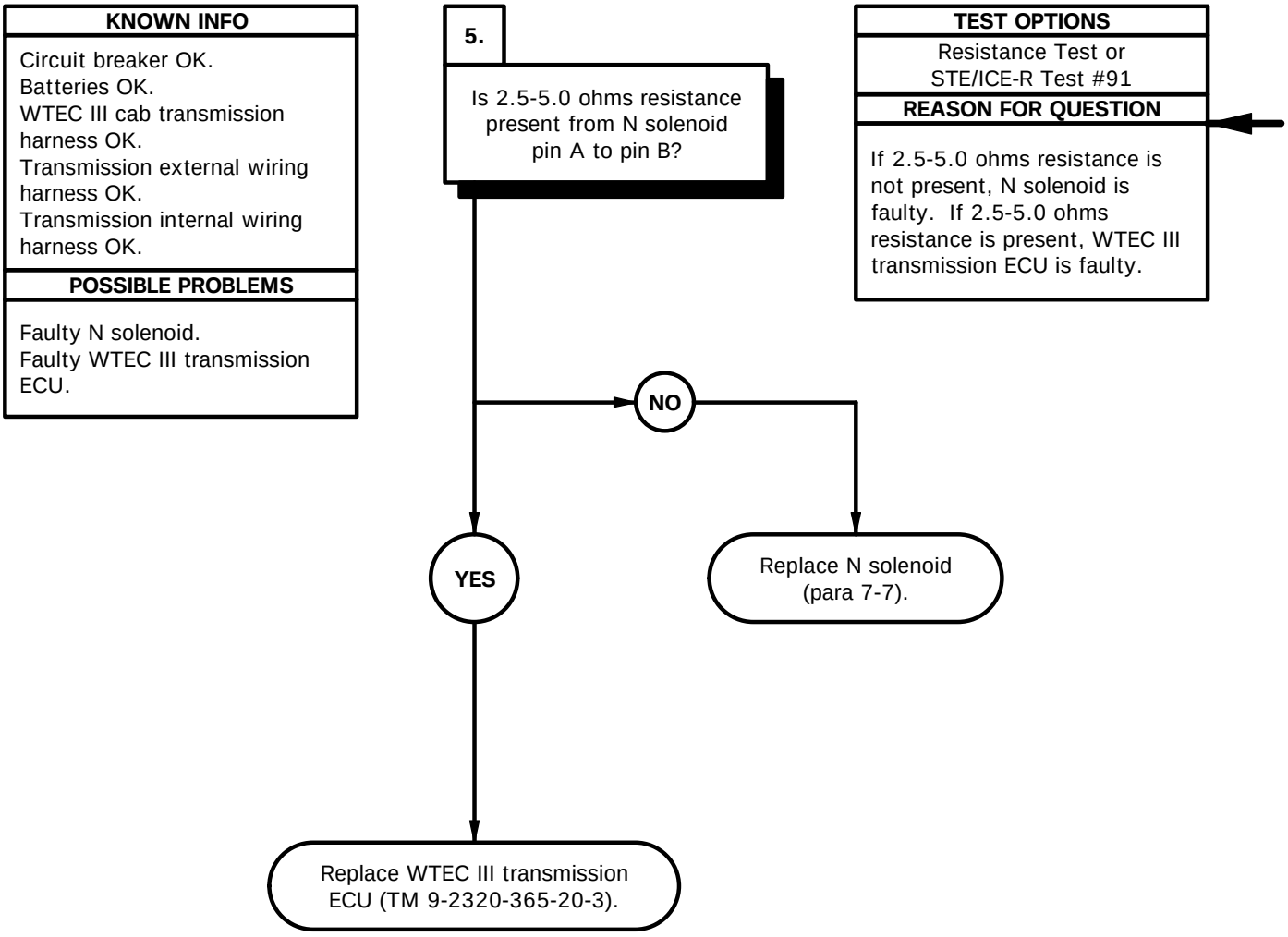


CONTINUITY TEST

(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).

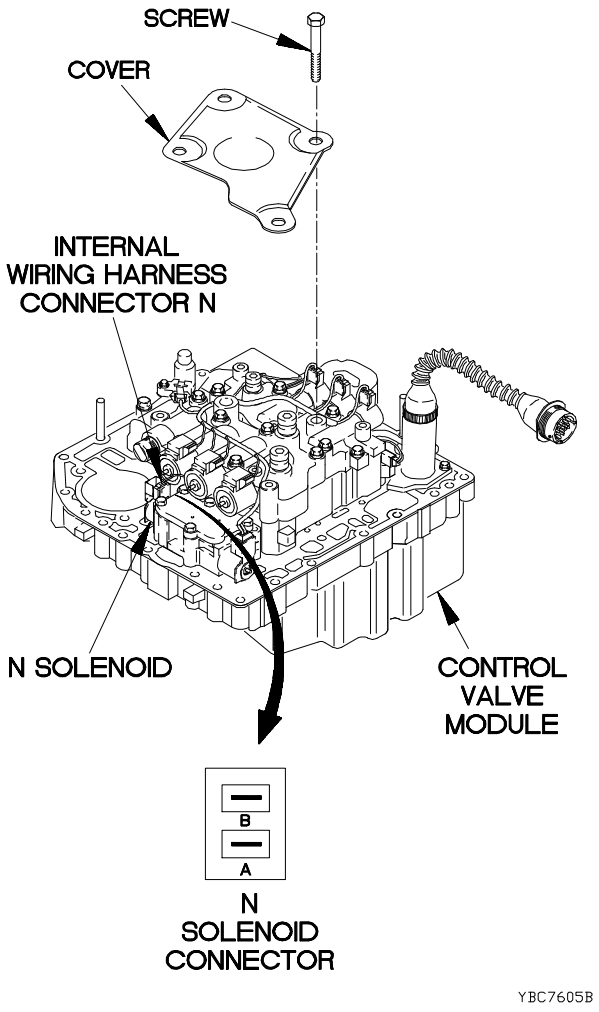


c76. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)



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 9-2320-365-20-3).
(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 9-2320-365-20-3).



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

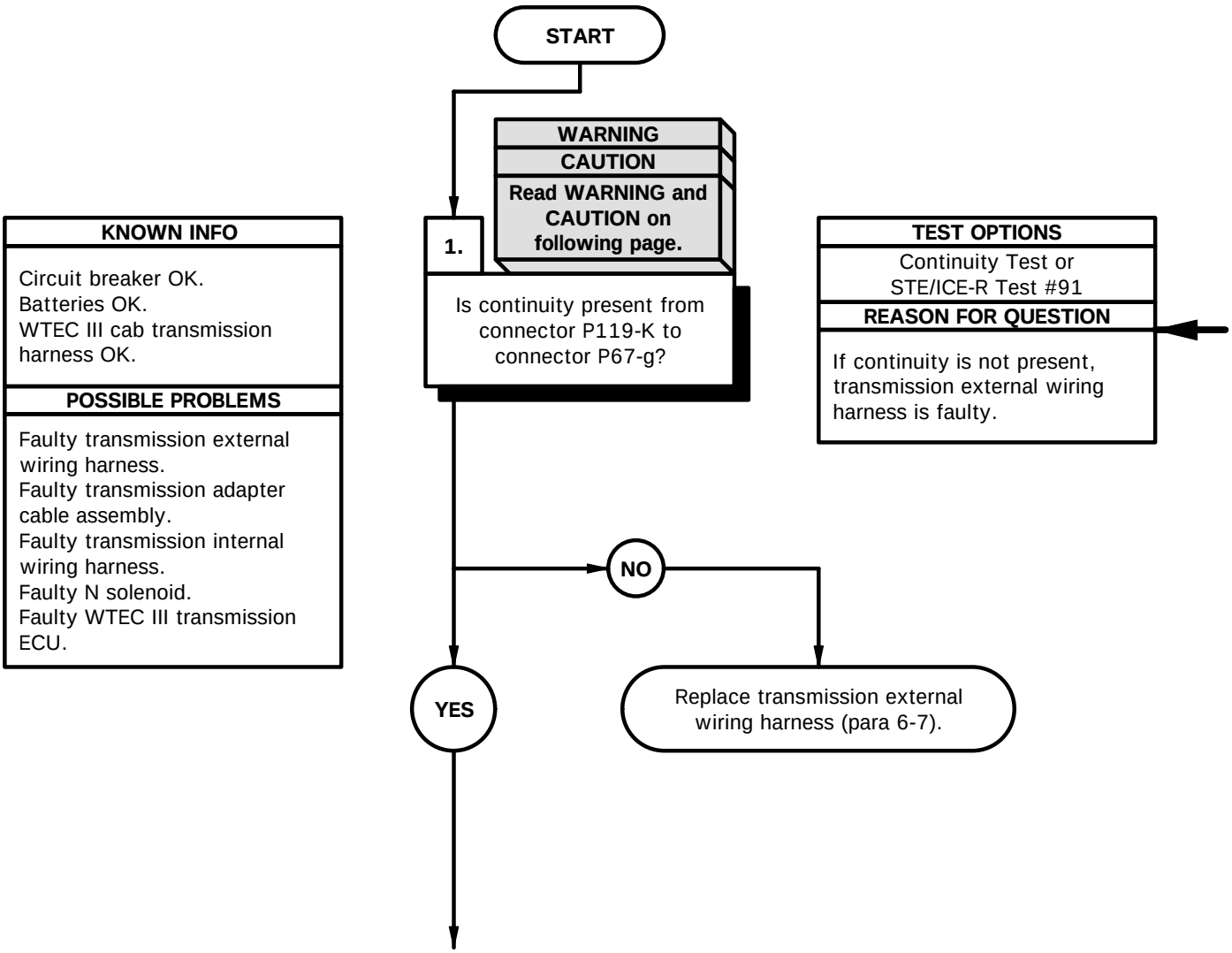
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, 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 testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

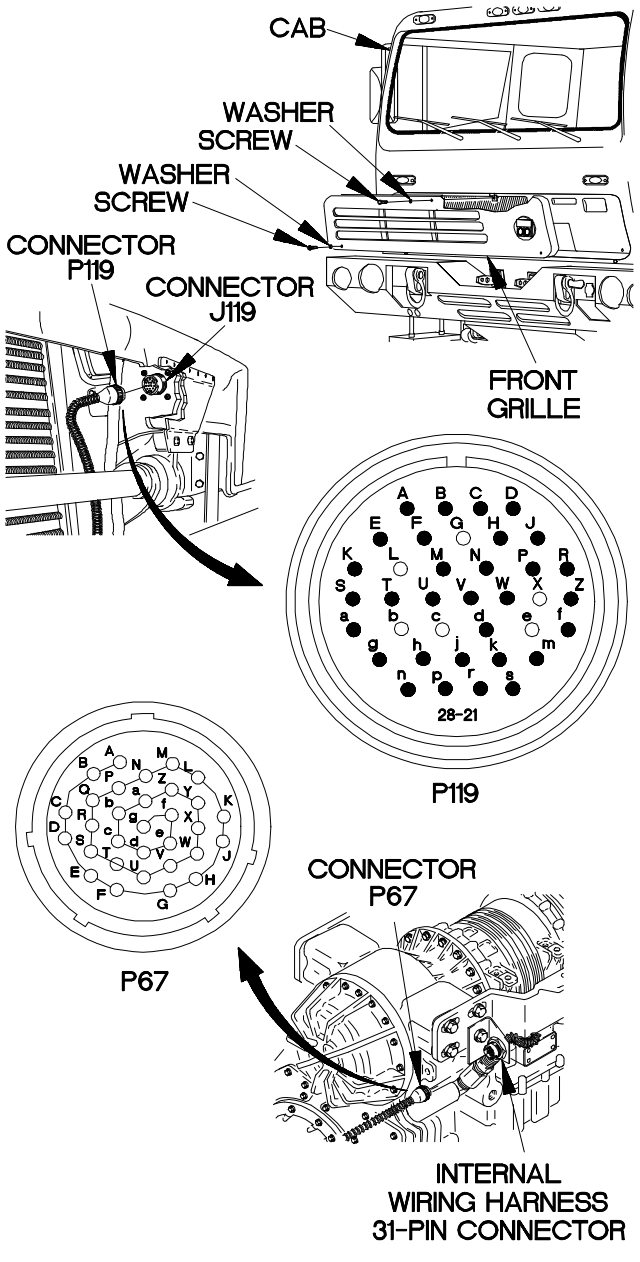
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

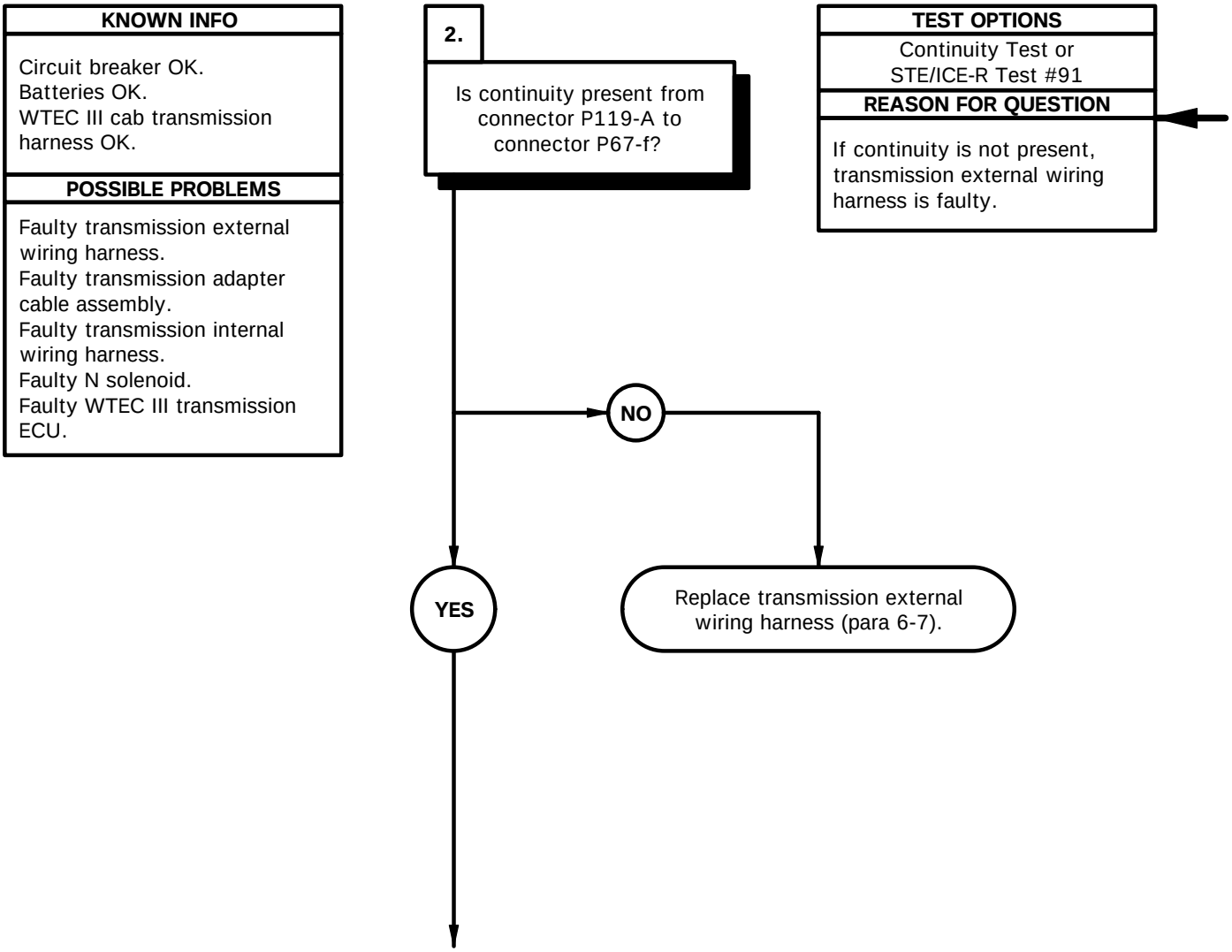
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from adapter cable 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect positive (+)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

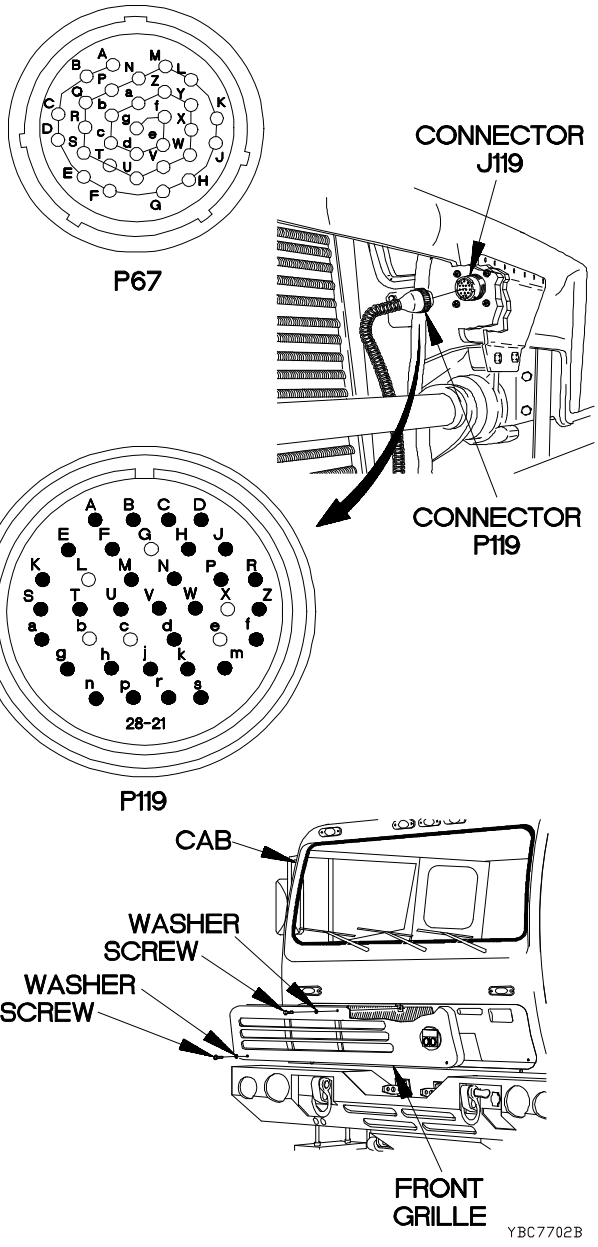


c77. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

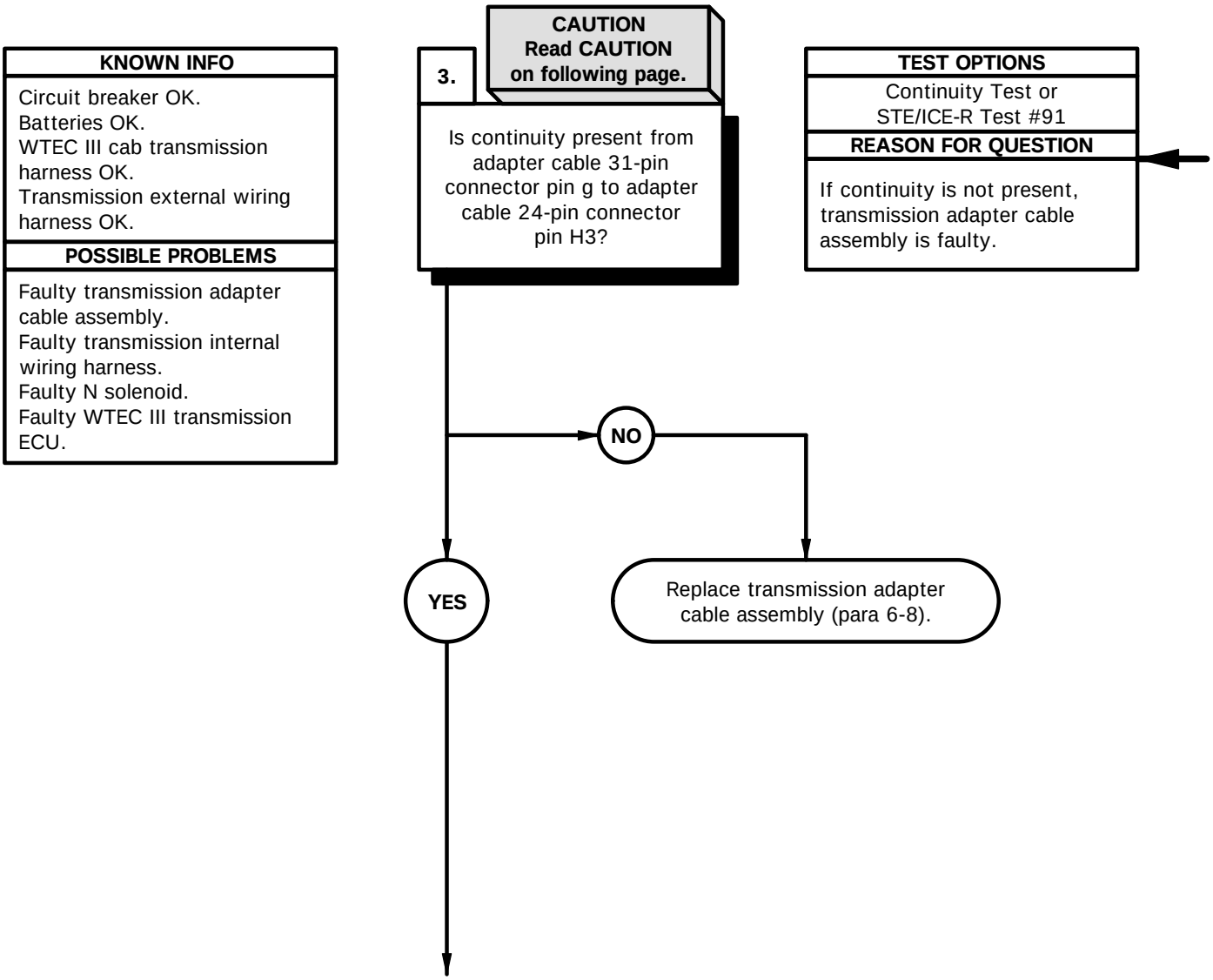


CONTINUITY TEST

(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)

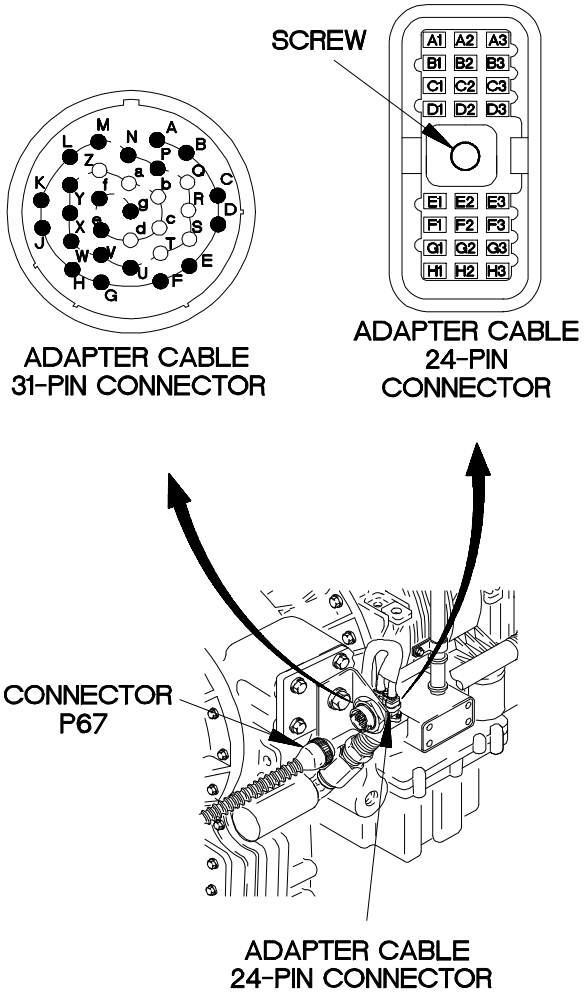


CAUTION

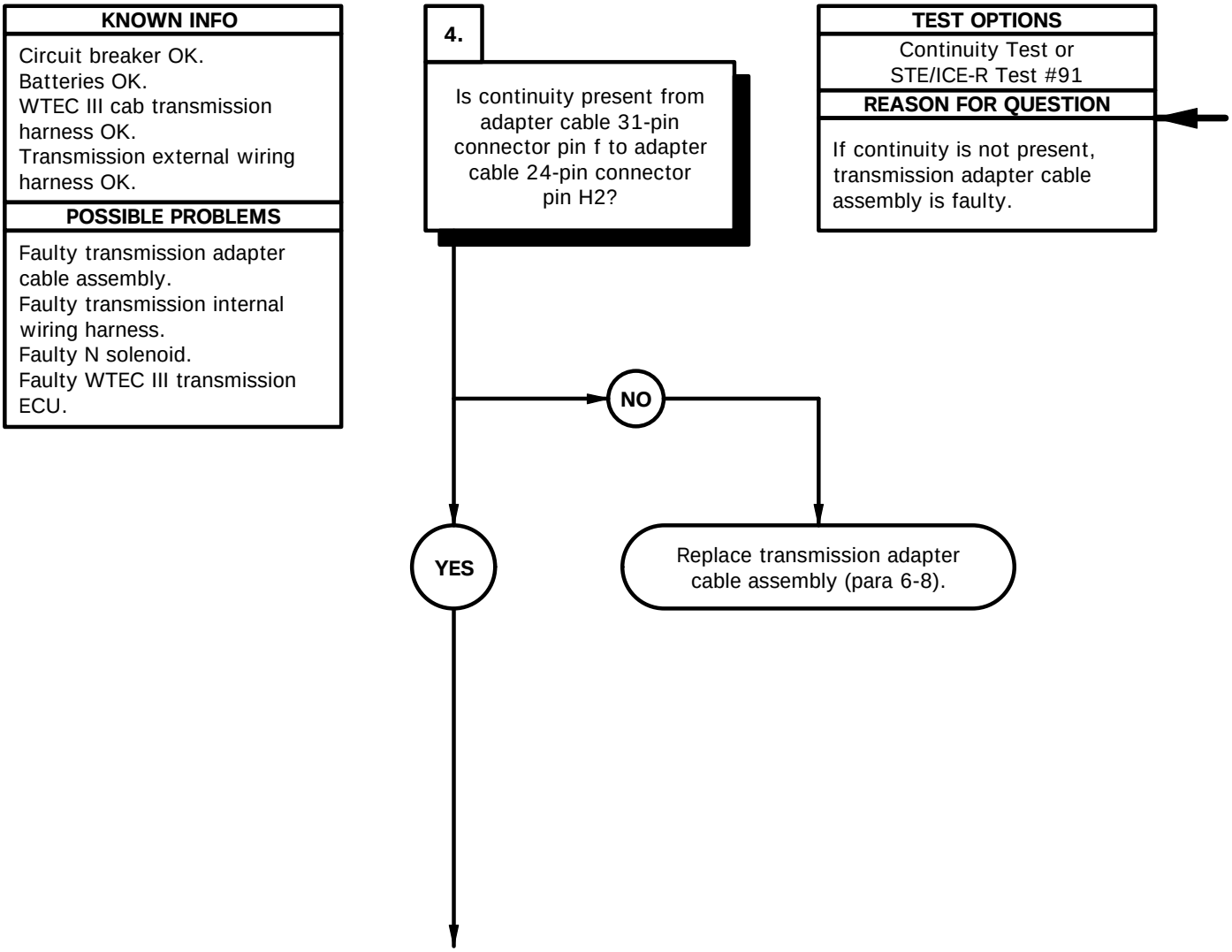
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

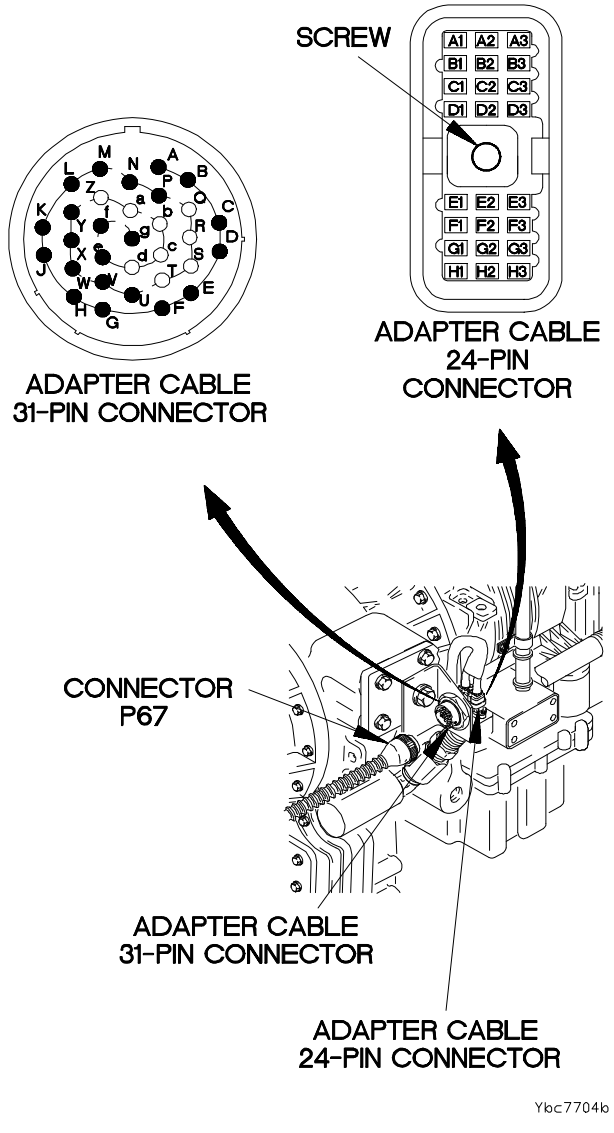


c77. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

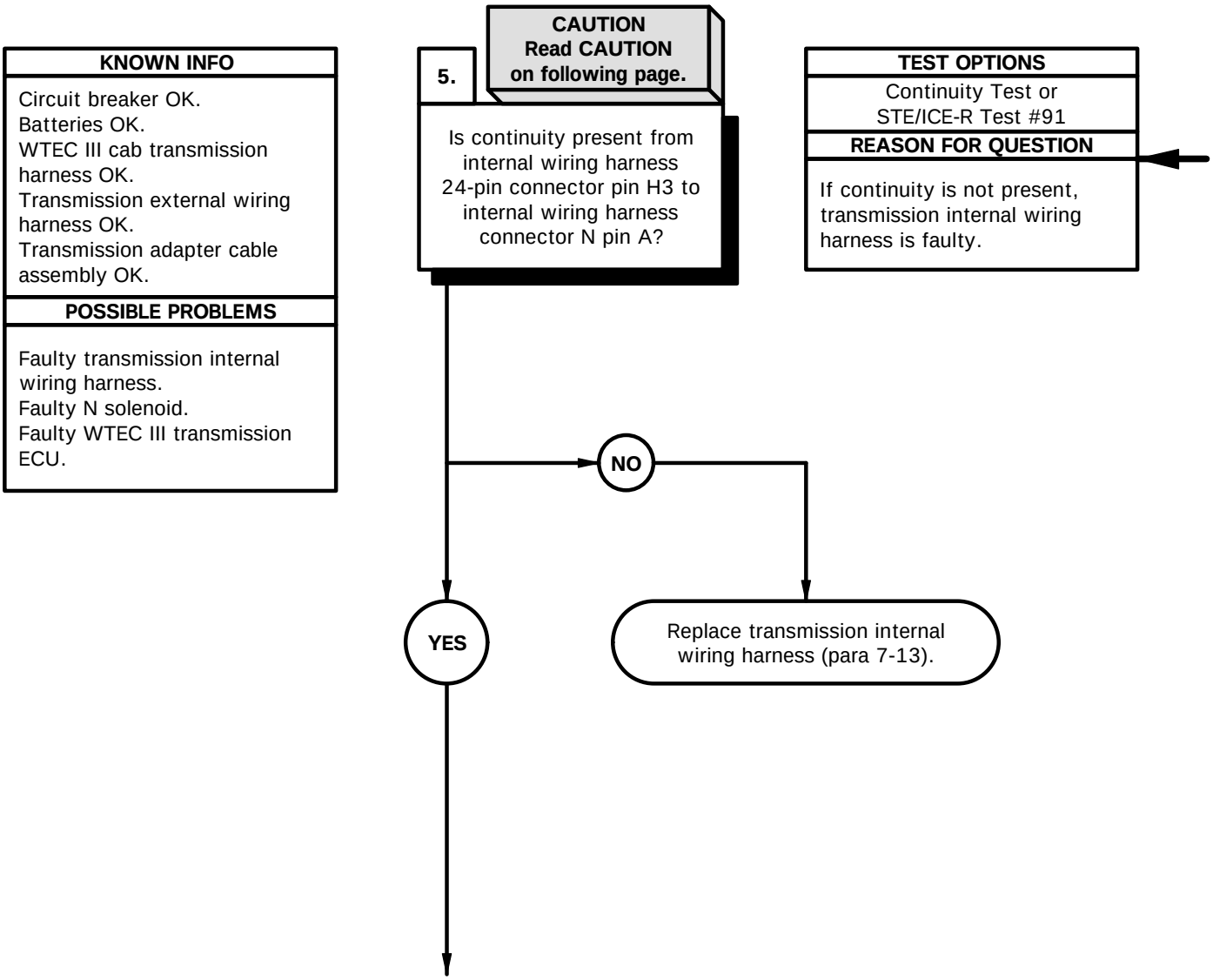


CONTINUITY TEST

(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)

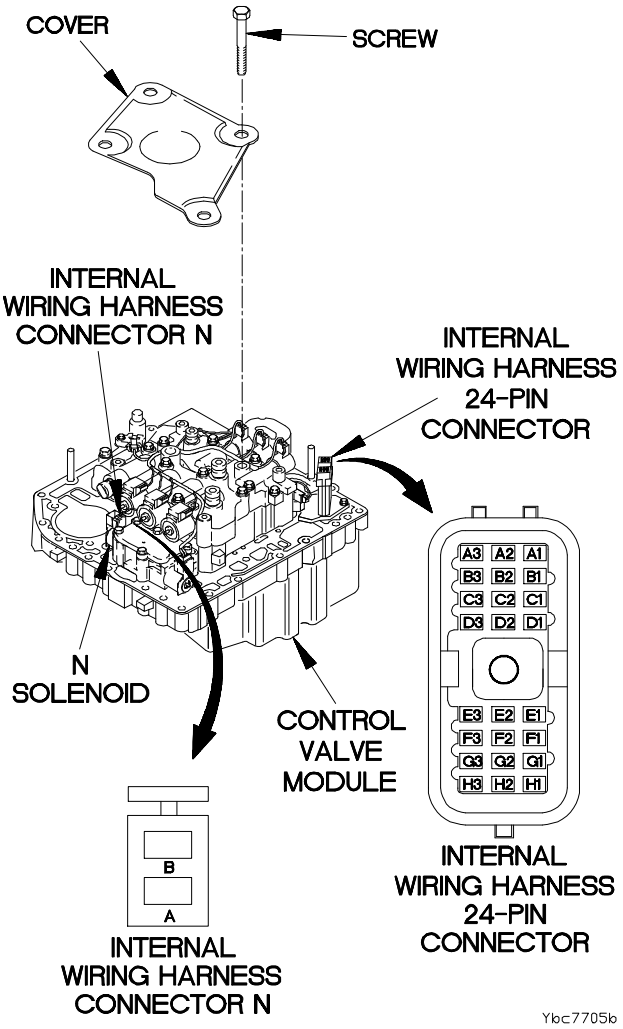


CAUTION

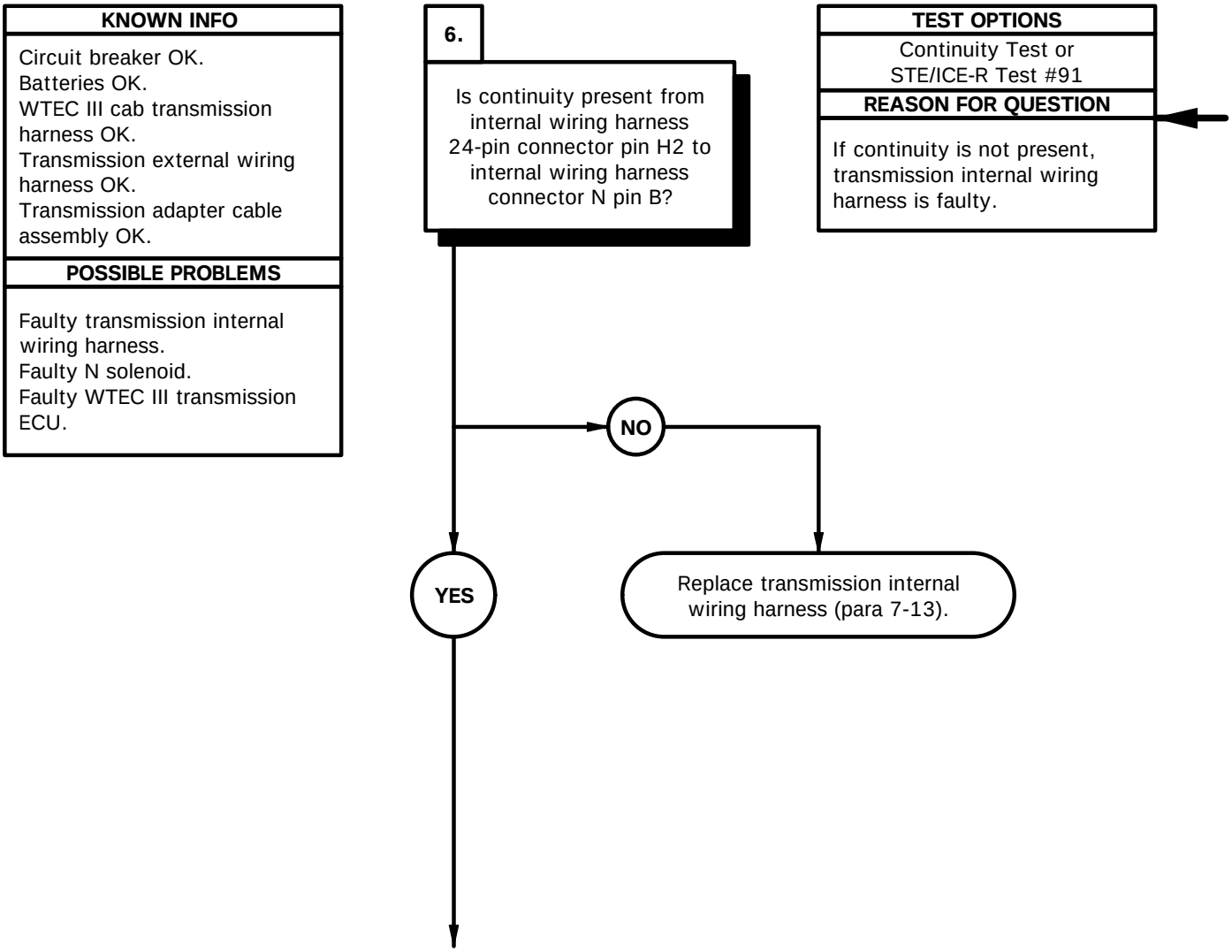
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

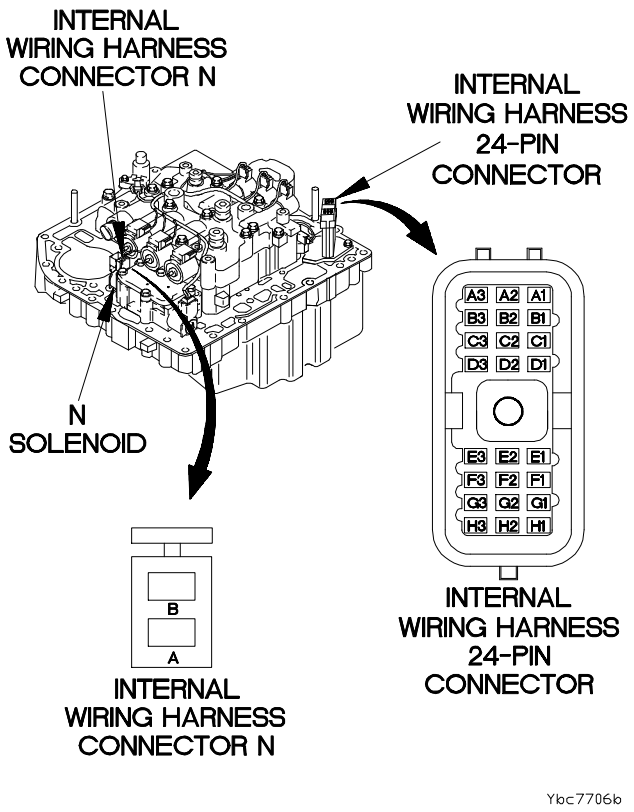


c77. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



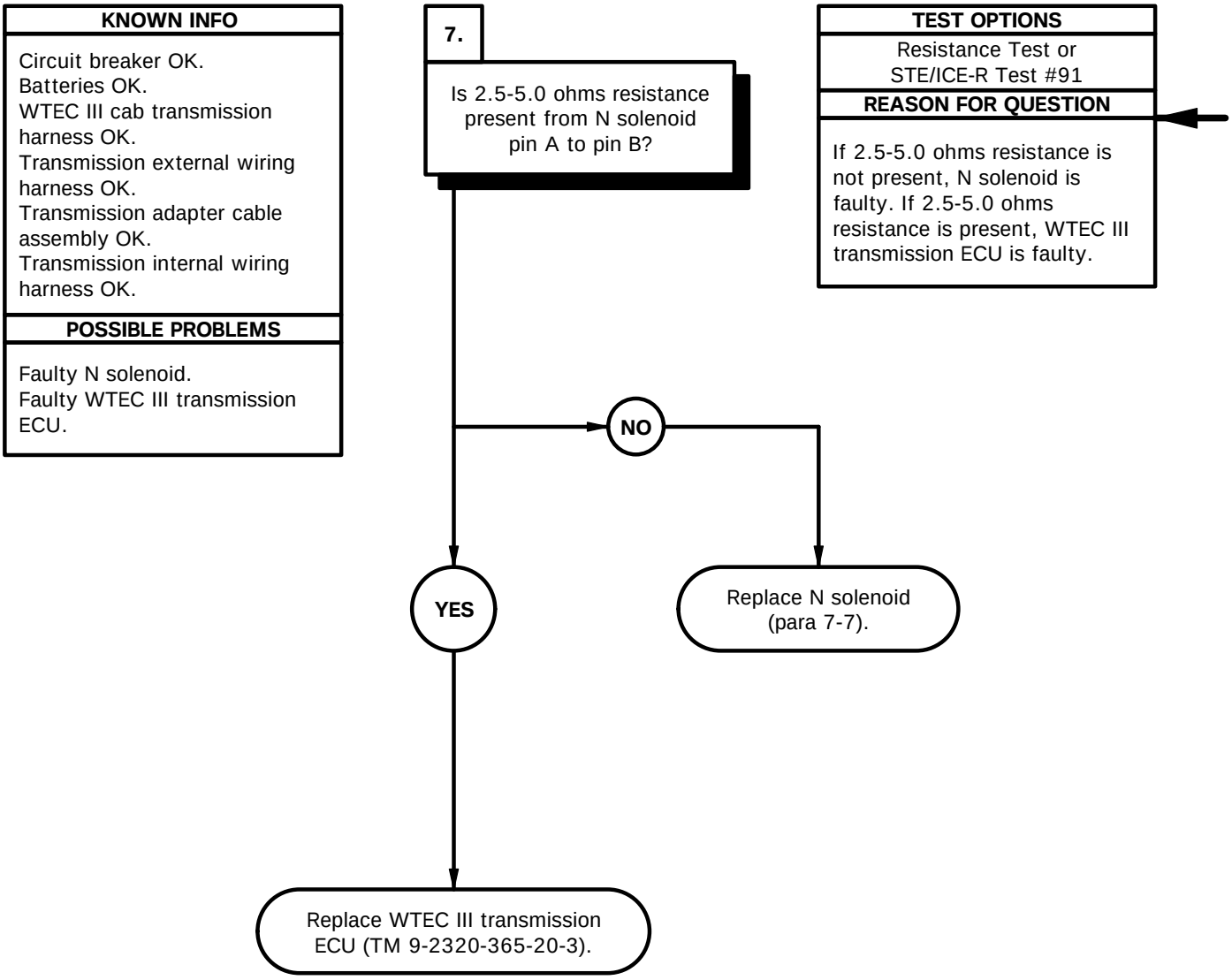
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin H2.
(3) Connect negative (-) probe of multimeter to internal wiring harness connector N pin B and note reading on multimeter.
(4) If continuity is not present, replace transmission internal wiring harness (para 7-13).
(5) Connect positive (+) probe of multimeter to internal wiring harness 24-pin connector pin H2.
(6) Connect negative (-) probe of multimeter to all other pins in internal wiring harness 24-pin connector and note reading on multimeter.
(7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(8) If continuity is present, transmission internal wiring harness is shorted; replace transmission internal wiring harness (para 7-13).



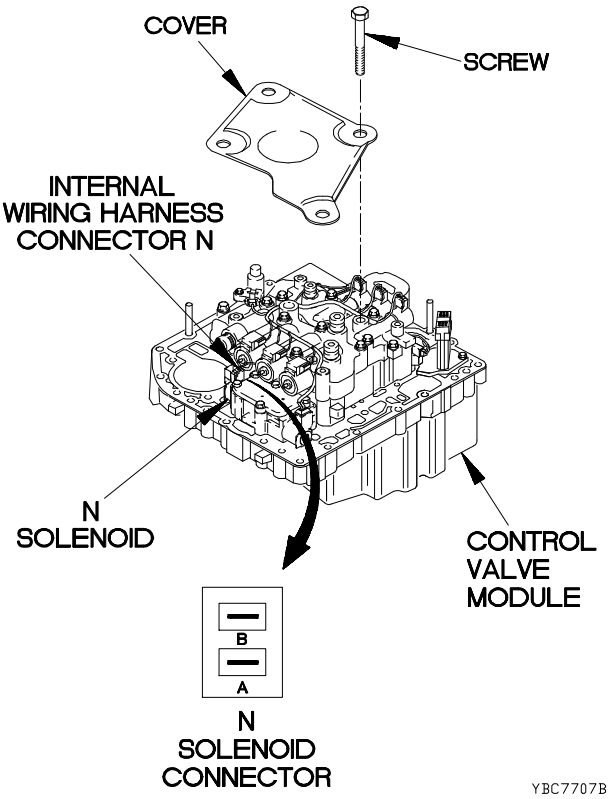
Ybc7706b

c77. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 43 SUB CODE 26 (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)



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 9-2320-365-20-3).
(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 9-2320-365-20-3).



c78. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER)

INITIAL SETUP

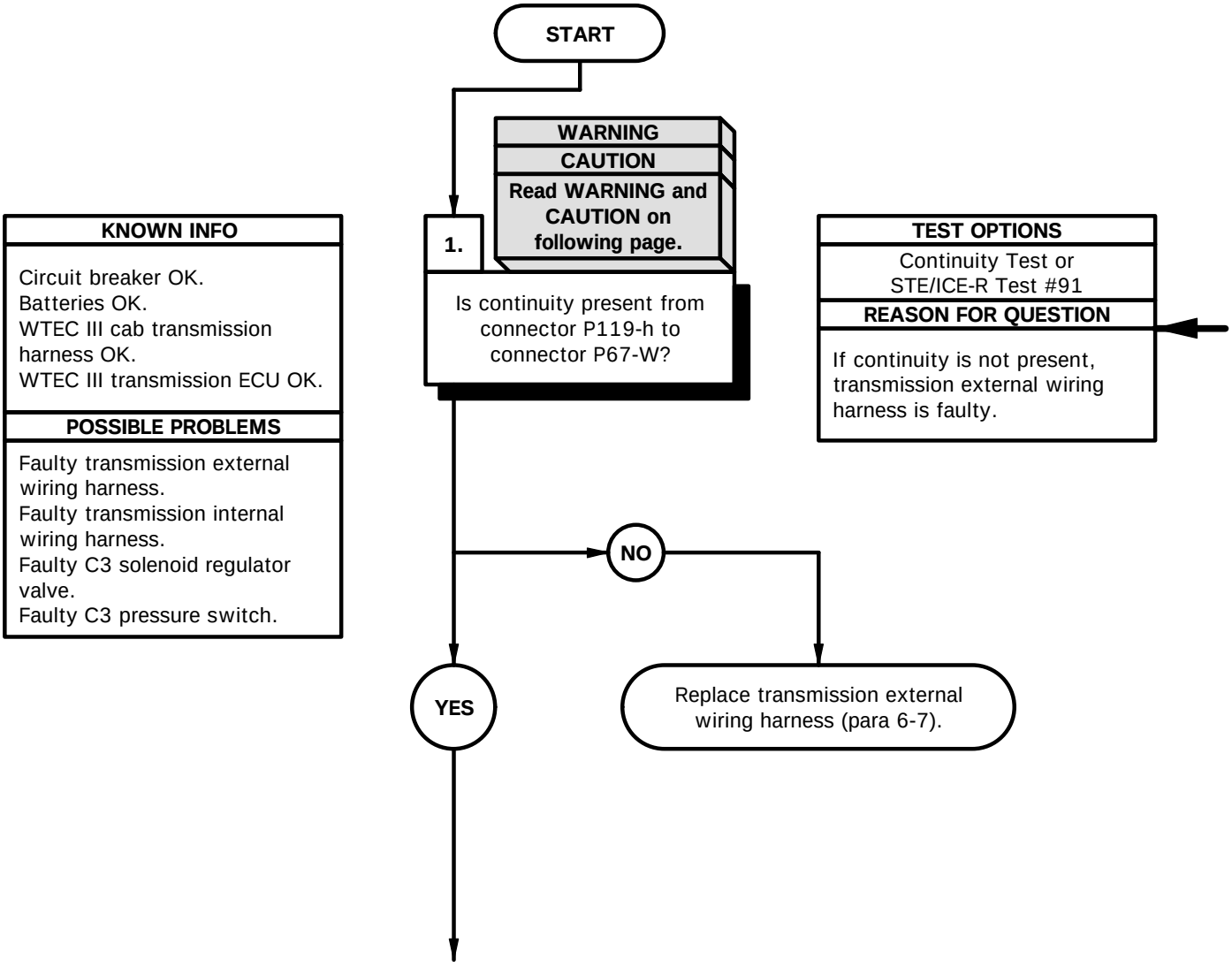
Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)

Materials/Parts
Wire, Elect, 50 ft (Item 94, 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 41.1, 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

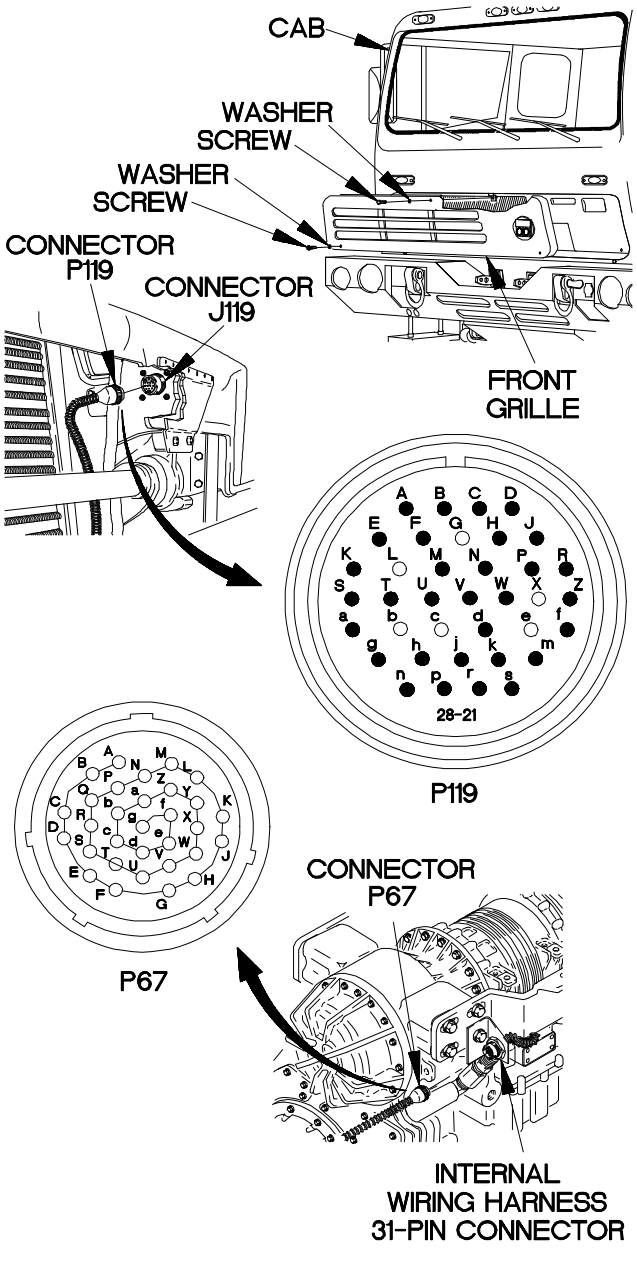
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

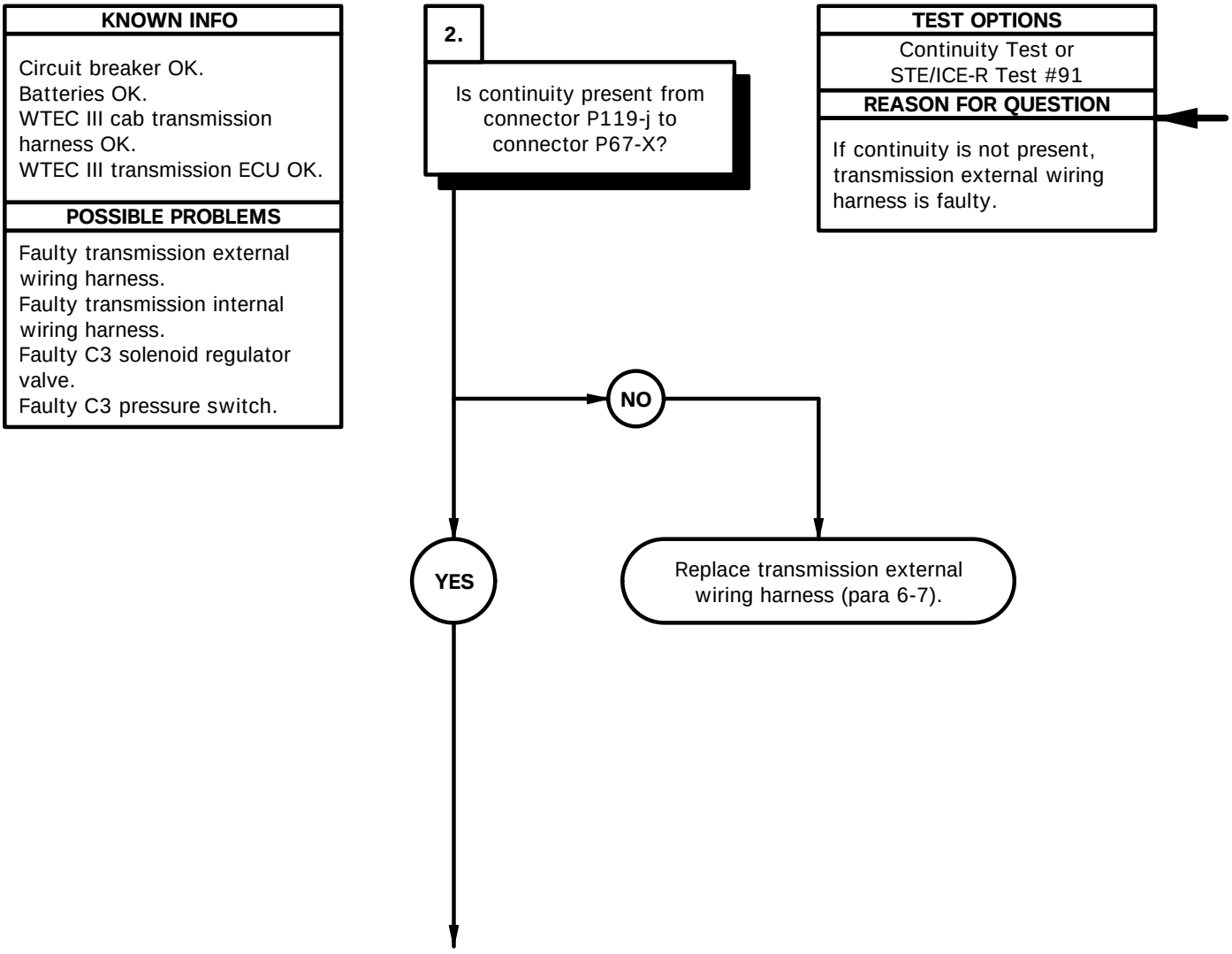
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Disconnect connector P67 from internal wiring harness 31-pin connector.
(6) Set multimeter to ohms.
(7) Connect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

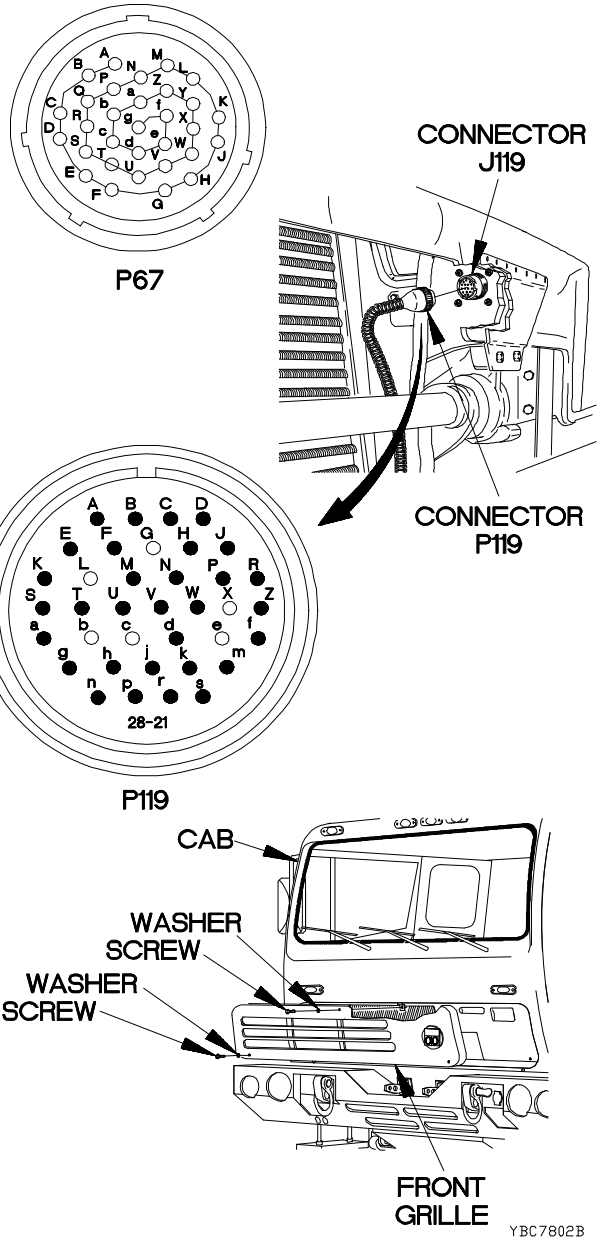


c78. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

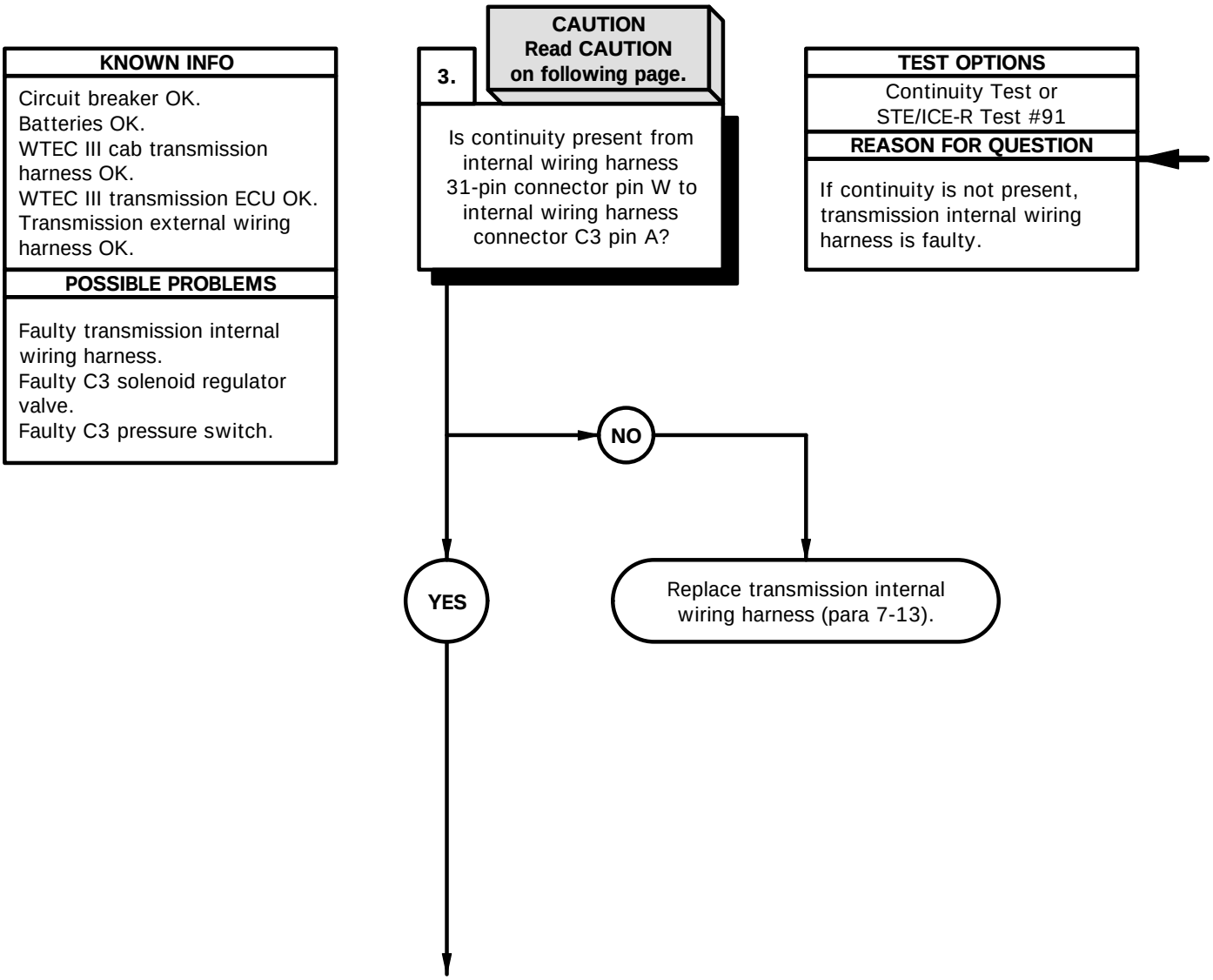


CONTINUITY TEST

(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)

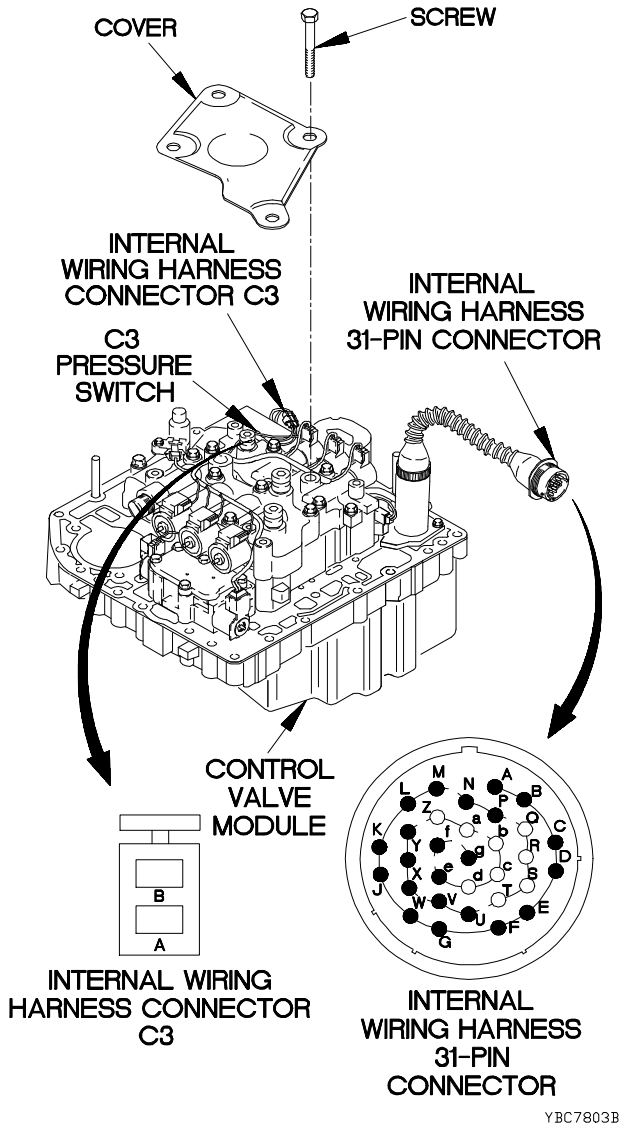


CAUTION

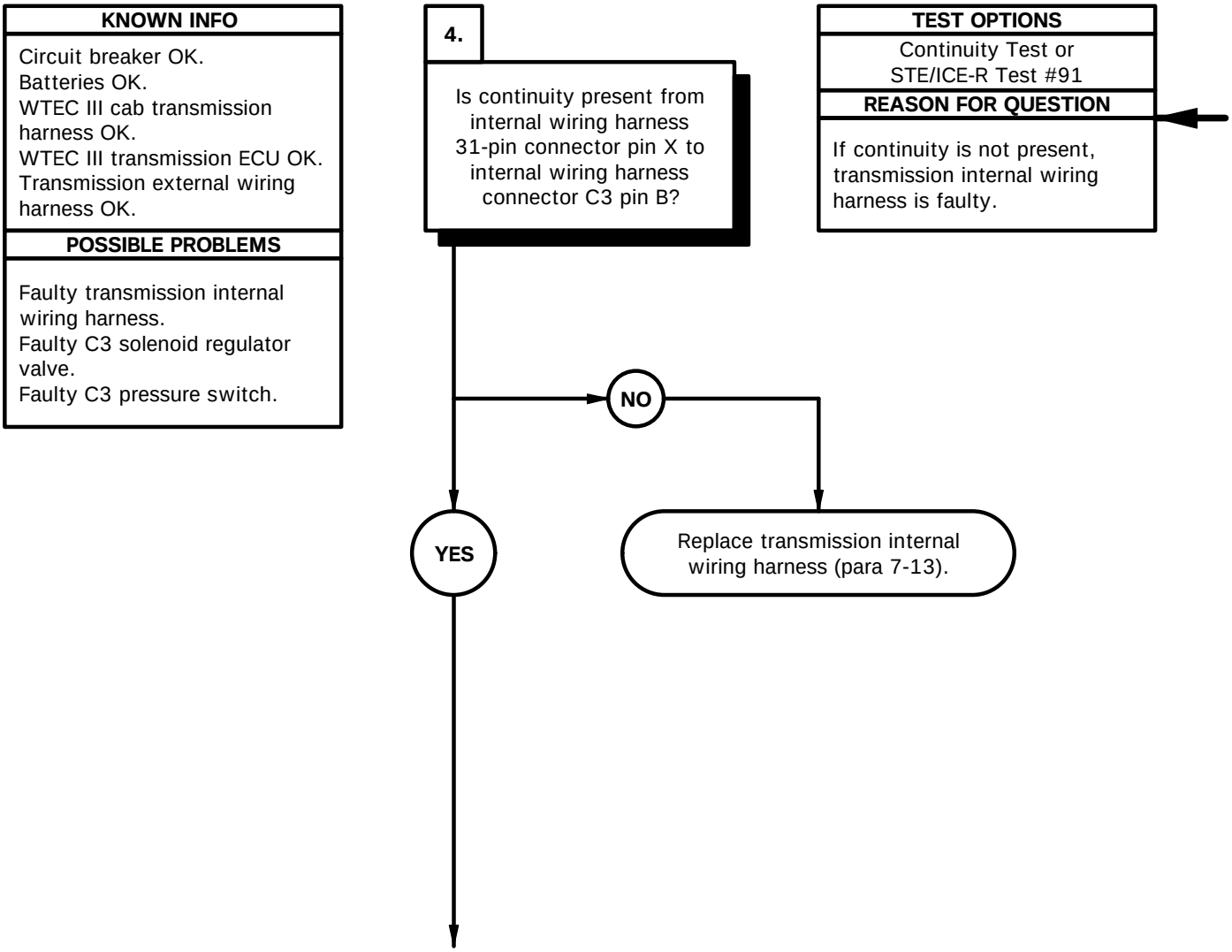
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

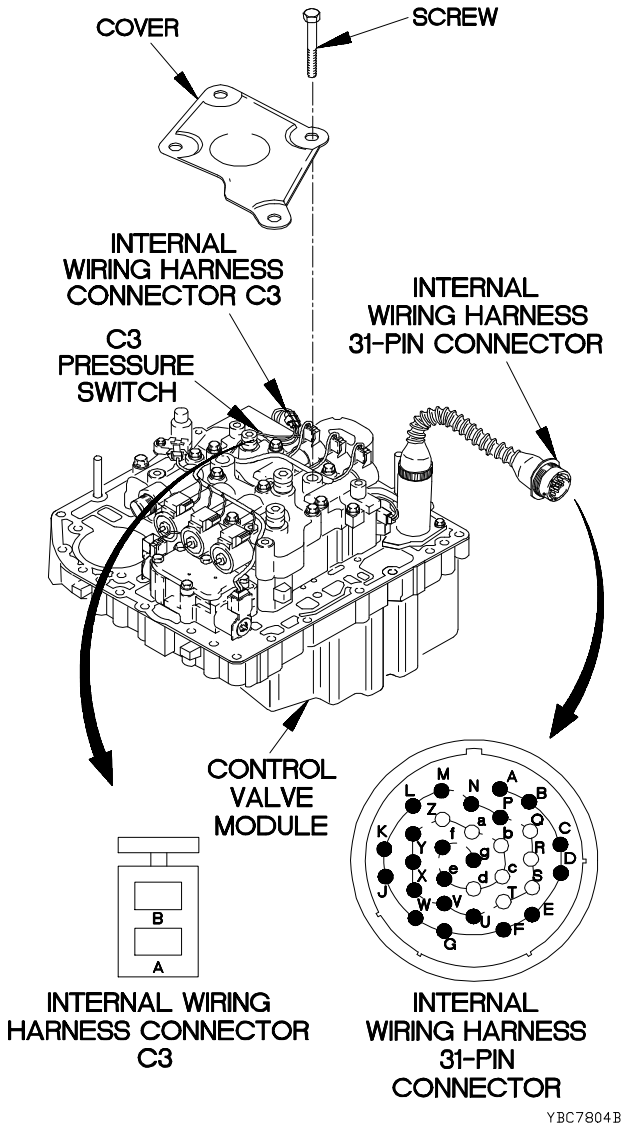


c78. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

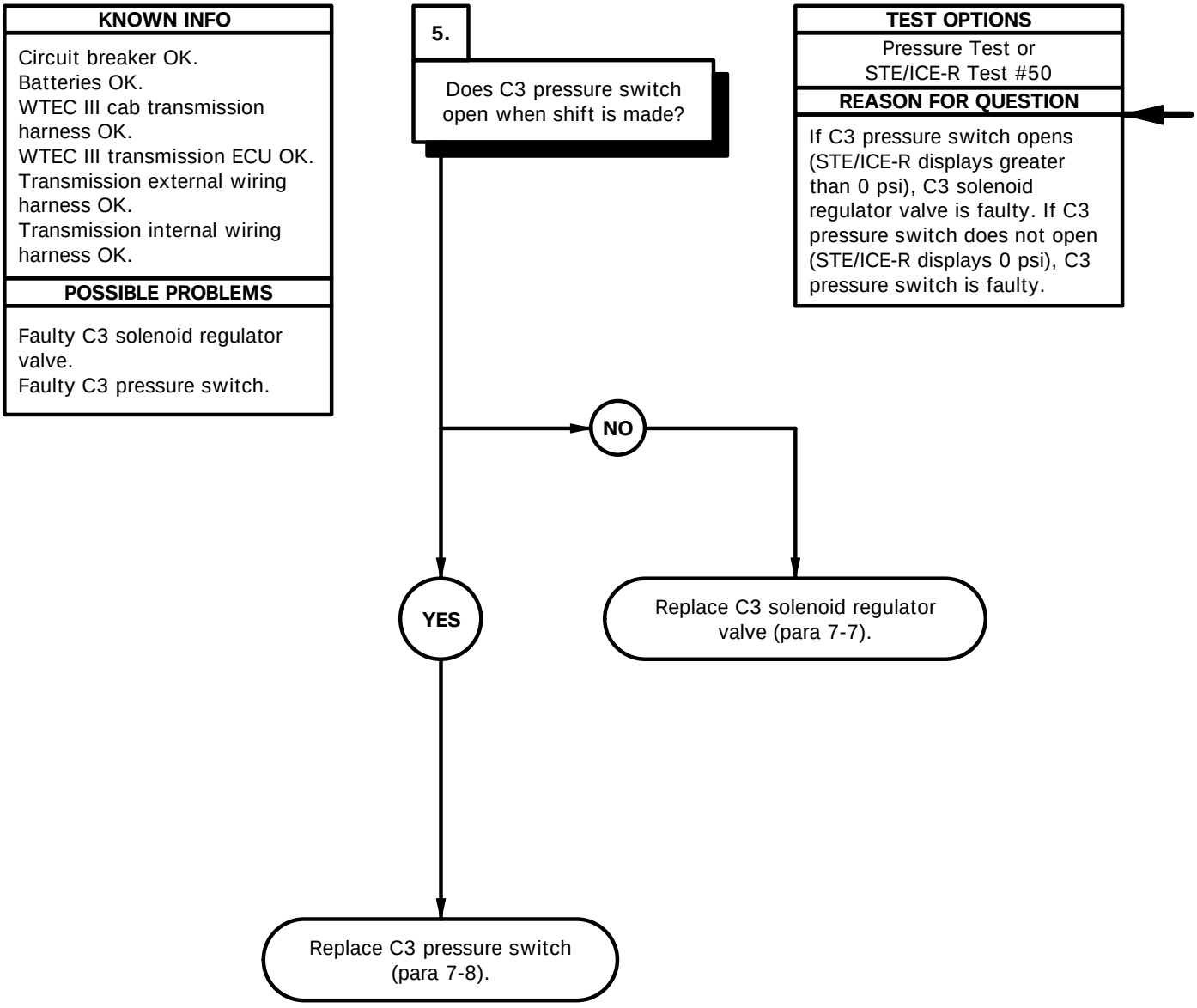


CONTINUITY TEST

(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 9-2320-365-20-3).



c78. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (SERIAL NUMBER 6510032369 AND HIGHER) (CONT)

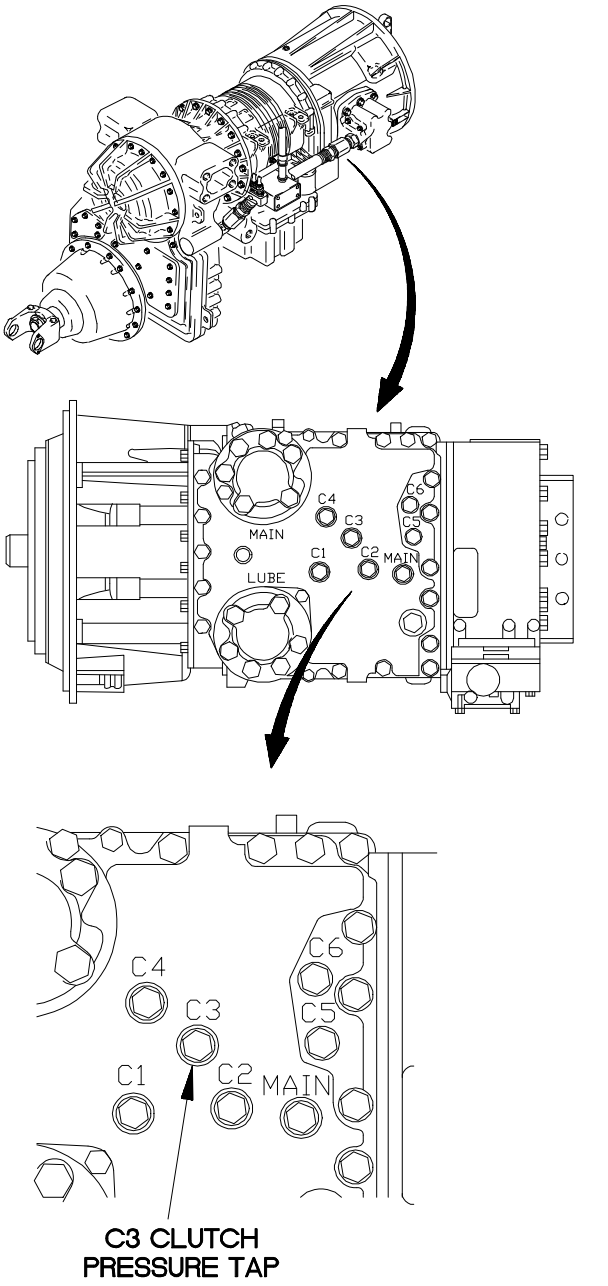


PRESSURE TEST

(1) Remove front and rear propeller shafts (TM 9-2320-365-20-3).
(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 9-2320-365-20-3).
(6) Perform STE/ICE-R test #50 (TM 9-4910-571-12&P).
(7) Start engine (TM 9-2320-365-10).
(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 9-2320-365-10).
(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 rear propeller shafts (TM 9-2320-365-20-3).

Table 2-4.4. 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

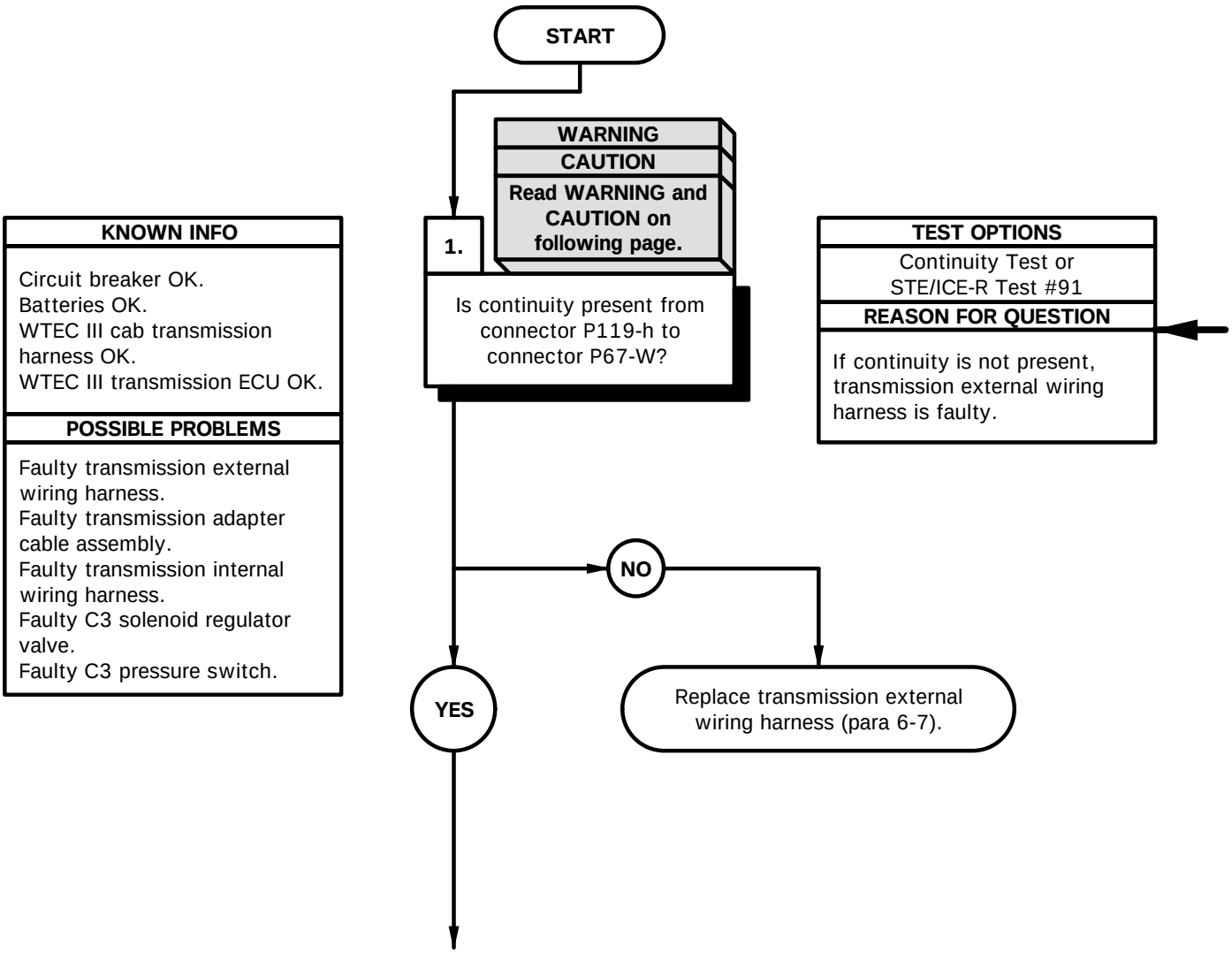
Equipment Condition
Engine shut down (TM 9-2320-365-10).
Batteries disconnected (TM 9-2320-365-20-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
STE/ICE-R (Item 60, Appendix B)
Multimeter, Digital (Item 34, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Wrench, Torque, 0-200 lb-in. (Item 81, Appendix B)
Wrench Set, Socket (Item 75, Appendix B)

Materials/Parts
Wire, Elect, 50 ft (Item 94, 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 41.1, 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

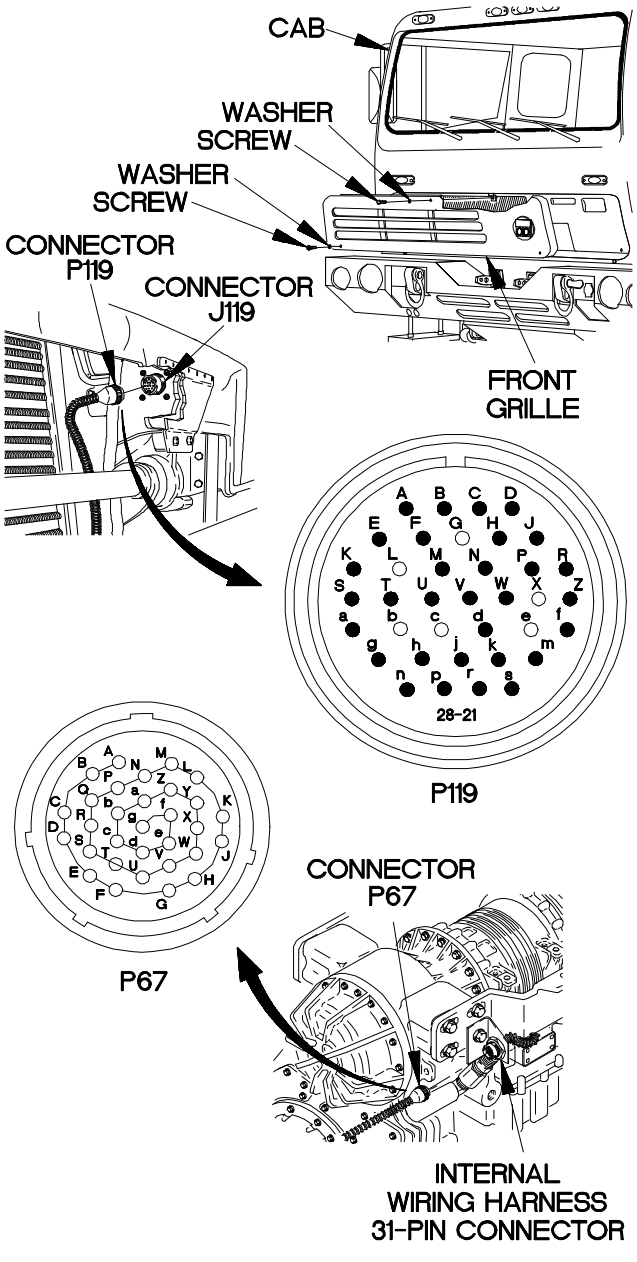
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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).



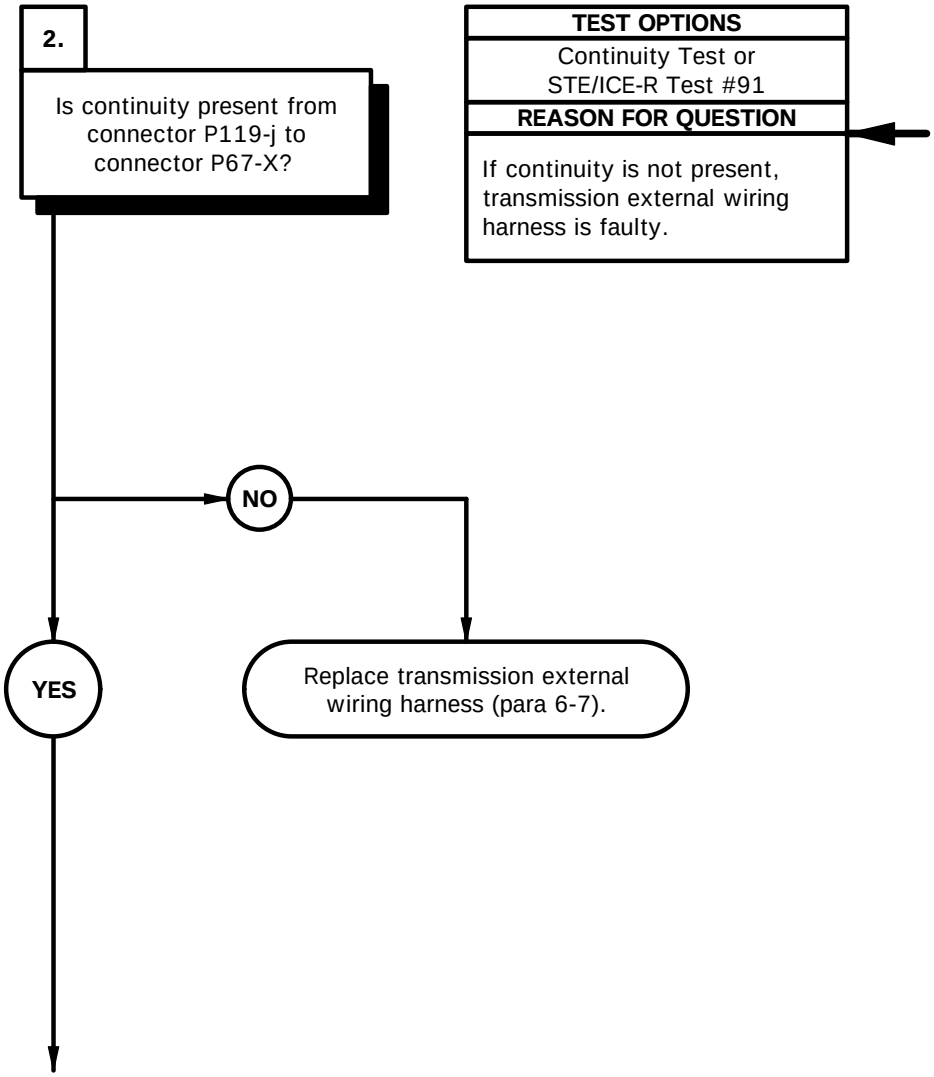
c79. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO

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

POSSIBLE PROBLEMS

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



TEST OPTIONS

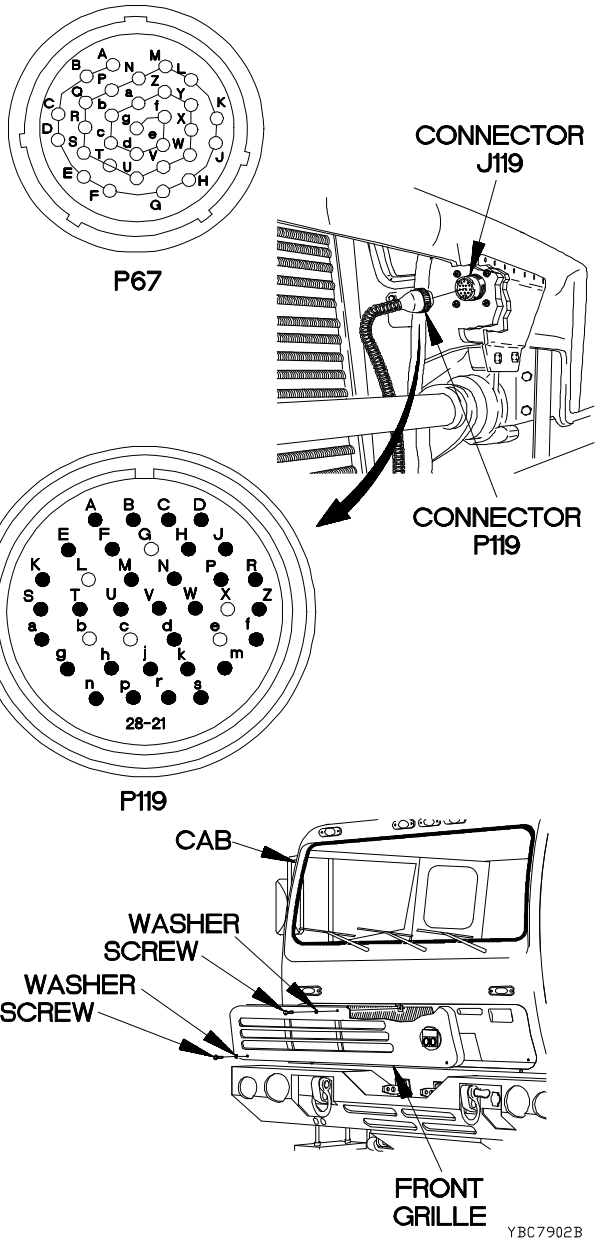
Continuity Test or
STE/ICE-R Test #91

REASON FOR QUESTION

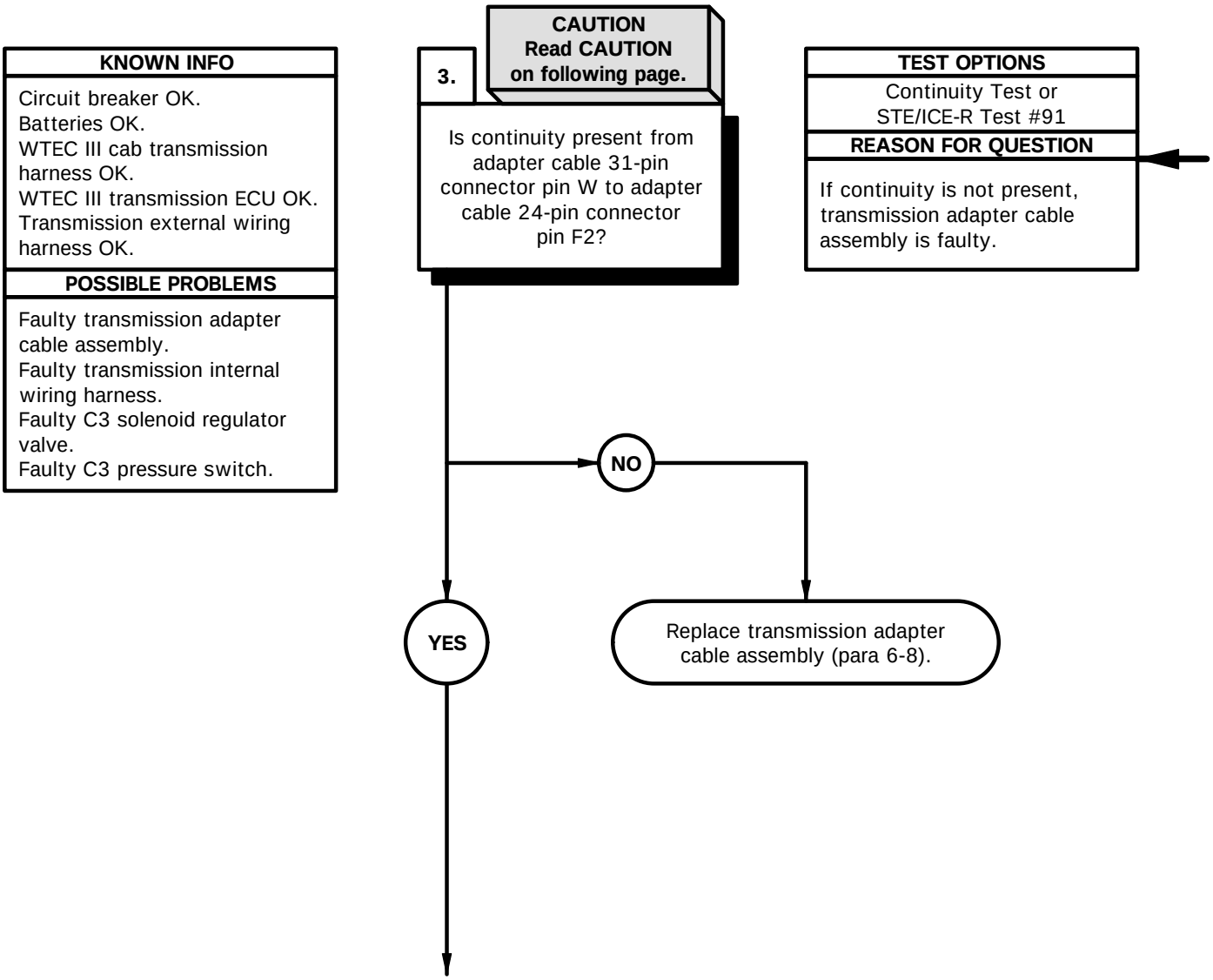
If continuity is not present, transmission external wiring harness is faulty.

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P119-j.
(3) Connect negative (-) probe of multimeter to connector P67-X and note reading on multimeter.
(4) If continuity is not present, replace transmission external wiring harness (para 6-7).
(5) Connect positive (+) probe of multimeter to connector P119-j.
(6) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
(7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(8) If continuity is present, transmission external wiring harness is shorted; replace transmission external wiring harness (para 6-7).
(9) Connect connector P119 to connector J119.
(10) Position front grille on cab with washer and screw.
(11) Position two washers and screws in front grille.
(12) Tighten screw to 48-60 lb-in. (5-7 N·m).
(13) Tighten two screws to 24 lb-in. (3 N·m).



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)

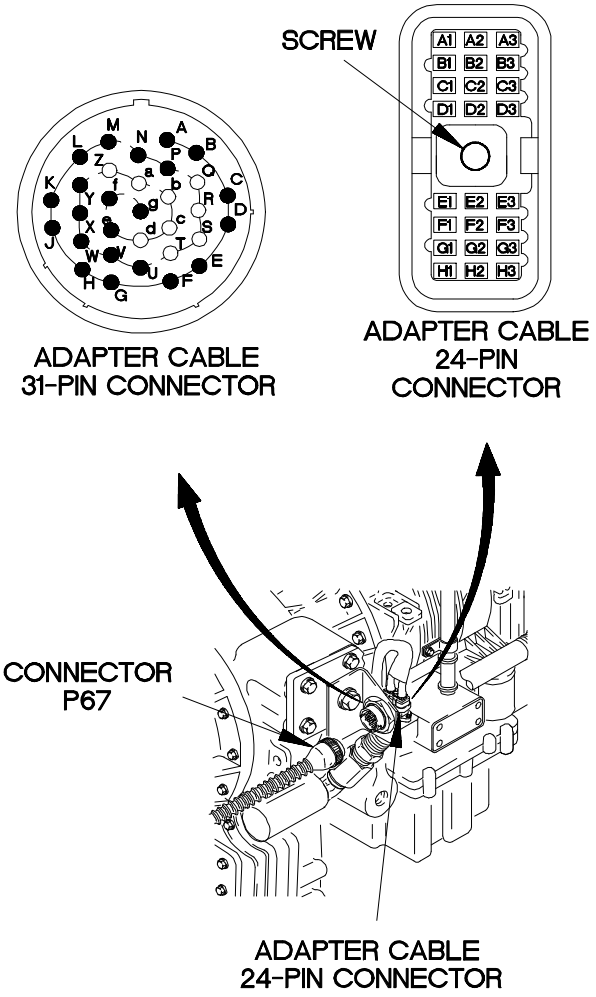


CAUTION

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).



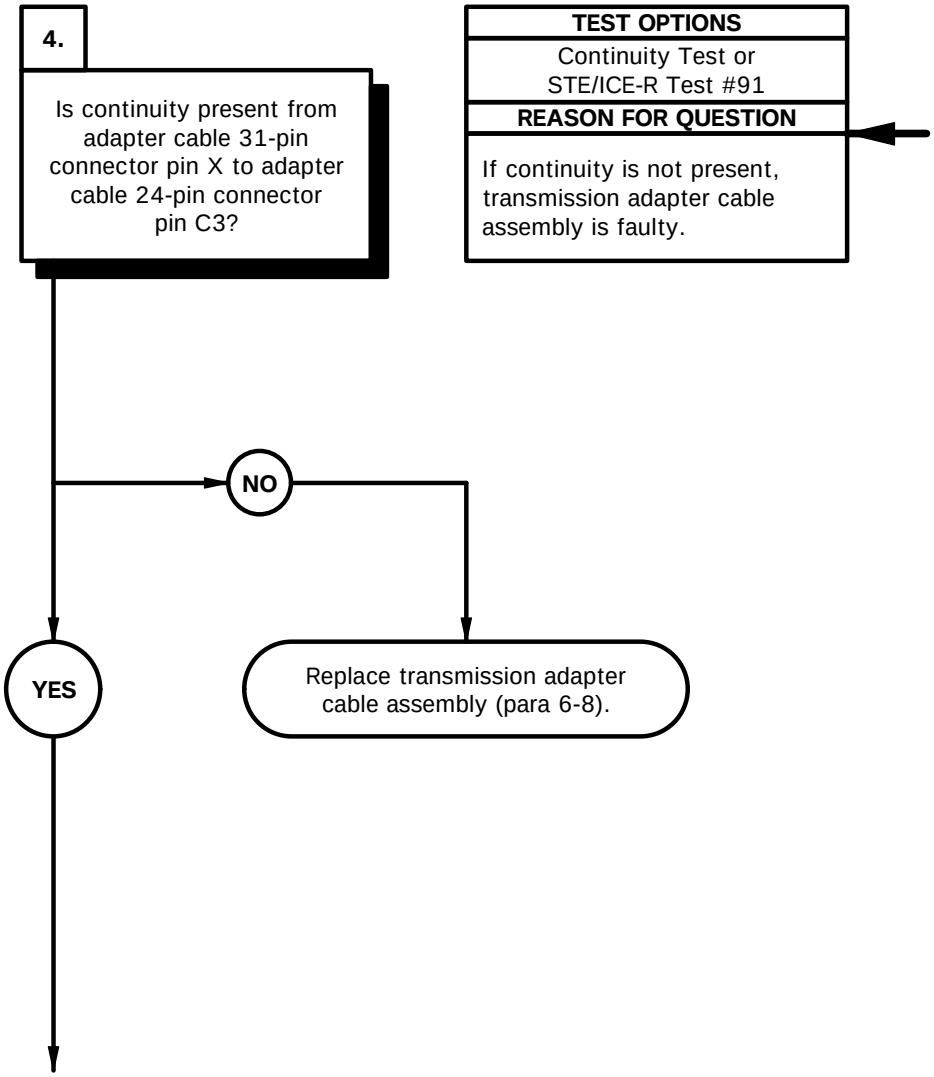
c79. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

KNOWN INFO

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

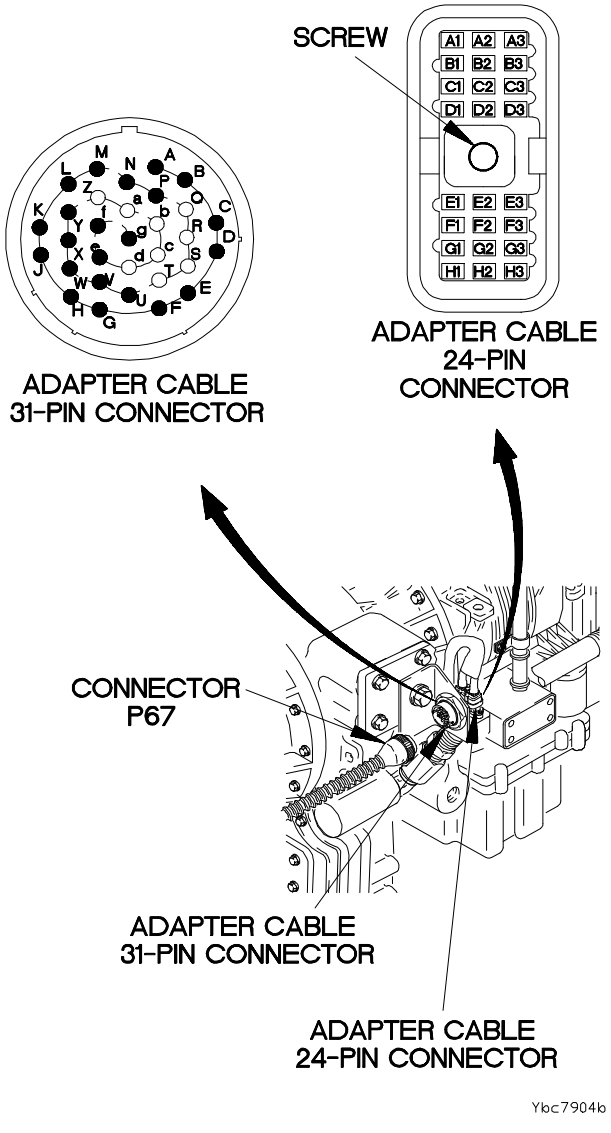
POSSIBLE PROBLEMS

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

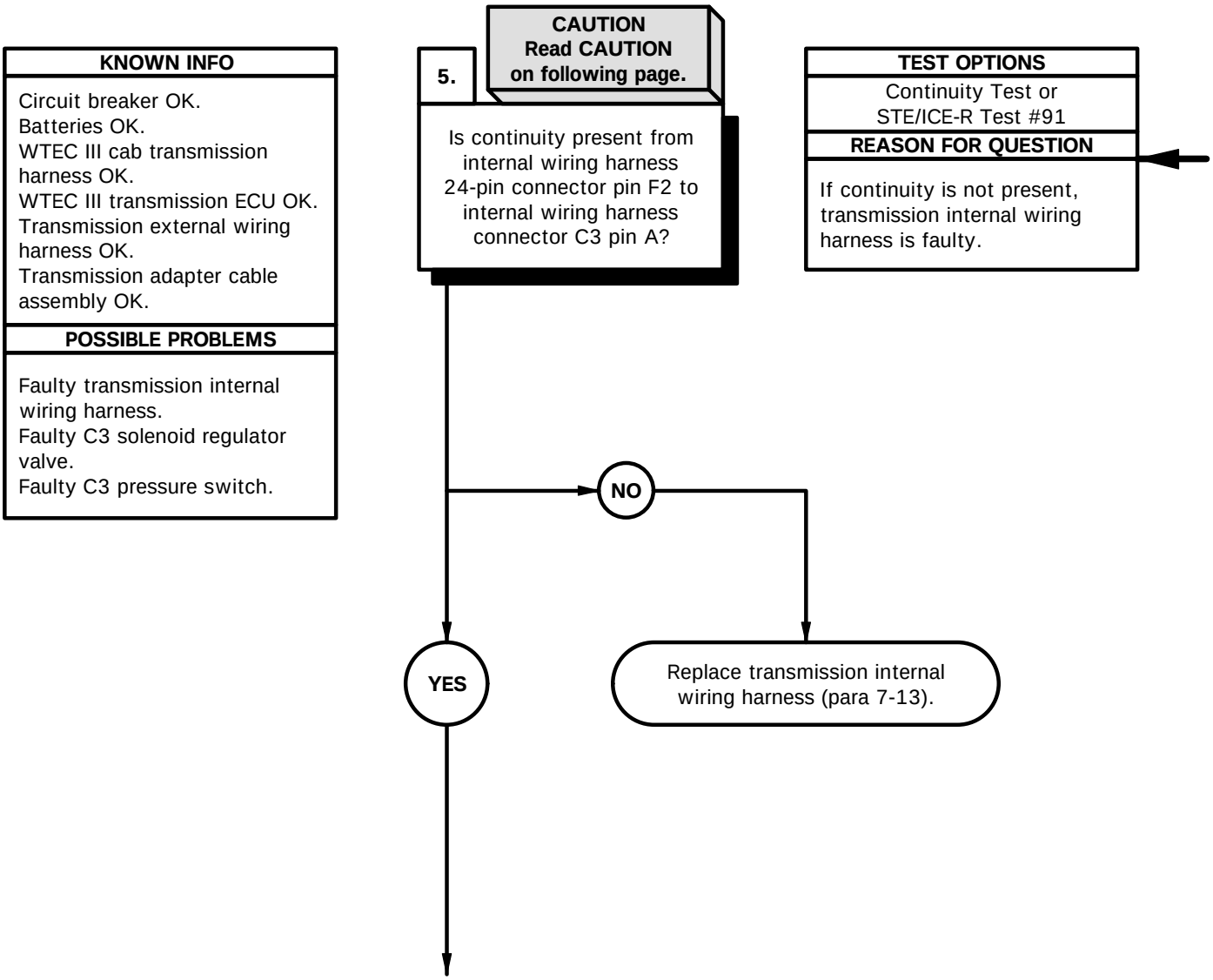


CONTINUITY TEST

(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)

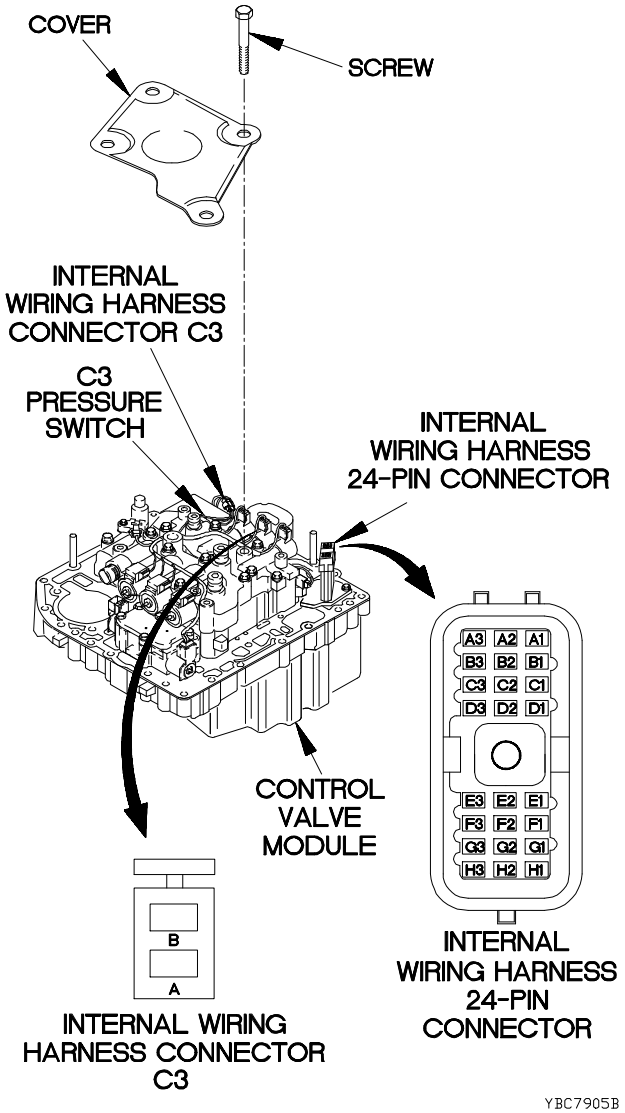


CAUTION

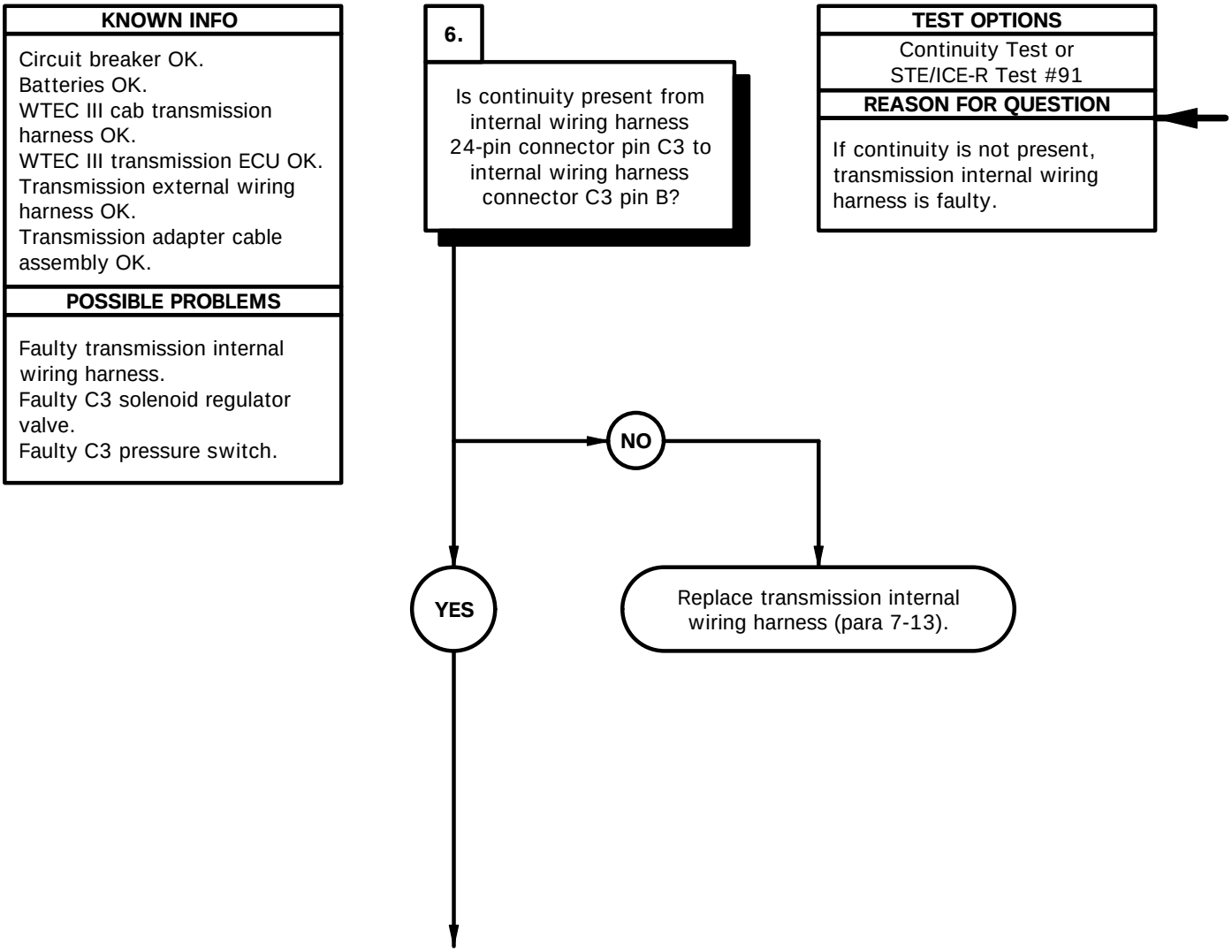
Use care when disconnecting wiring harness connectors. Failure to comply may result in damage to equipment.

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).

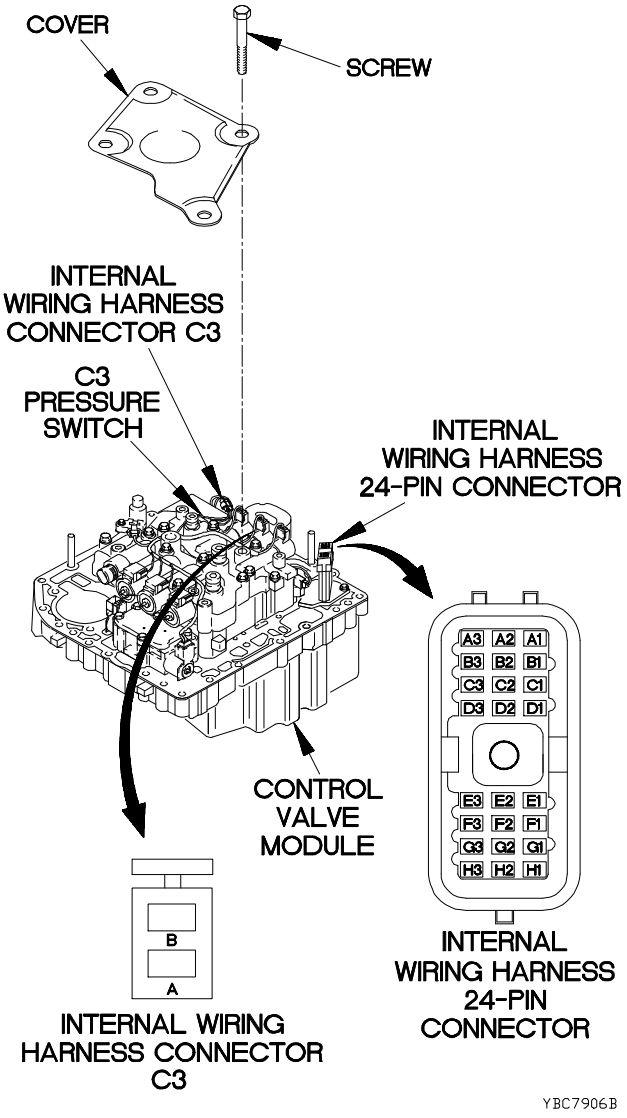


c79. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (PRIOR TO SERIAL NUMBER 6510032369 WITH TRANSMISSION ADAPTER CABLE ASSEMBLY) (CONT)

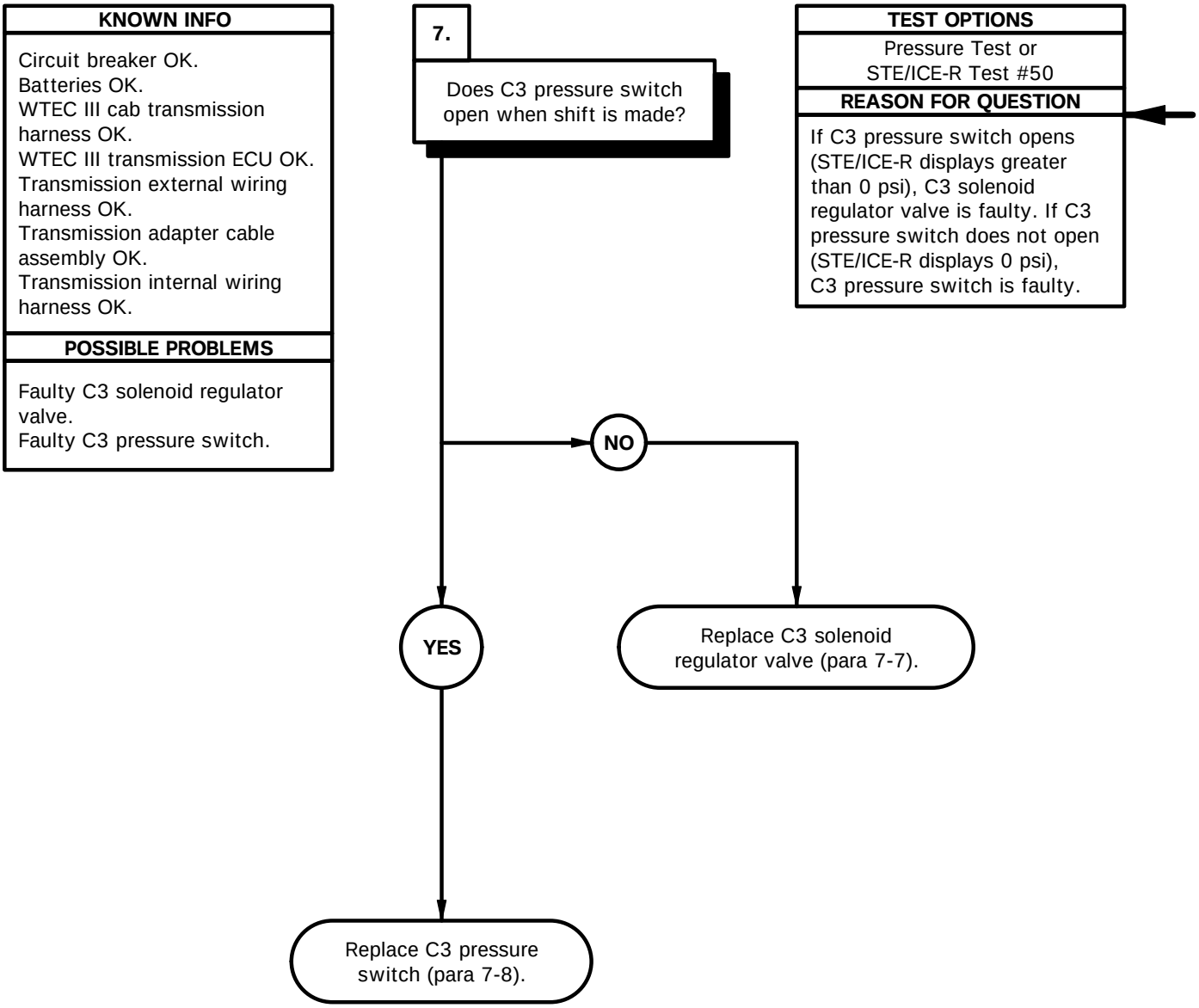


CONTINUITY TEST

(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)

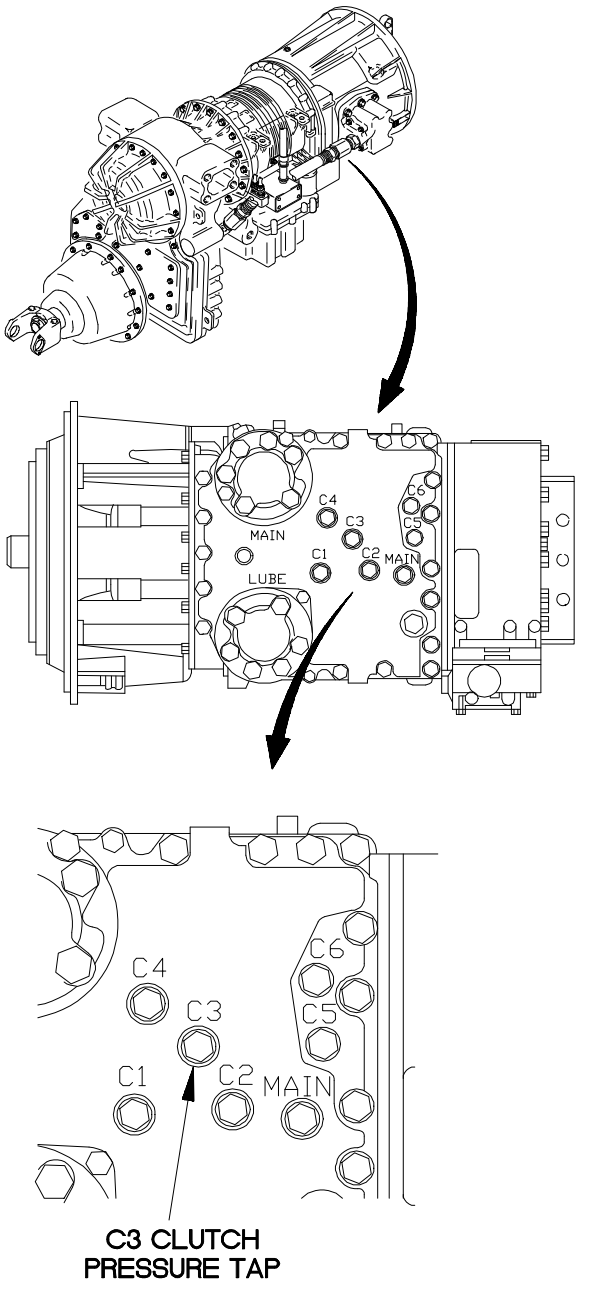


PRESSURE TEST

(1) Remove front and rear propeller shafts (TM 9-2320-365-20-3).
(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 9-2320-365-20-3).
(6) Perform STE/ICE-R test #50 (TM 9-4910-571-12&P).
(7) Start engine (TM 9-2320-365-10).
(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 9-2320-365-10).
(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 rear propeller shafts (TM 9-2320-365-20-3).

Table 2-4.5. C3 Pressure Switch

Sub Code	Shift From - To
01	1-2
	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



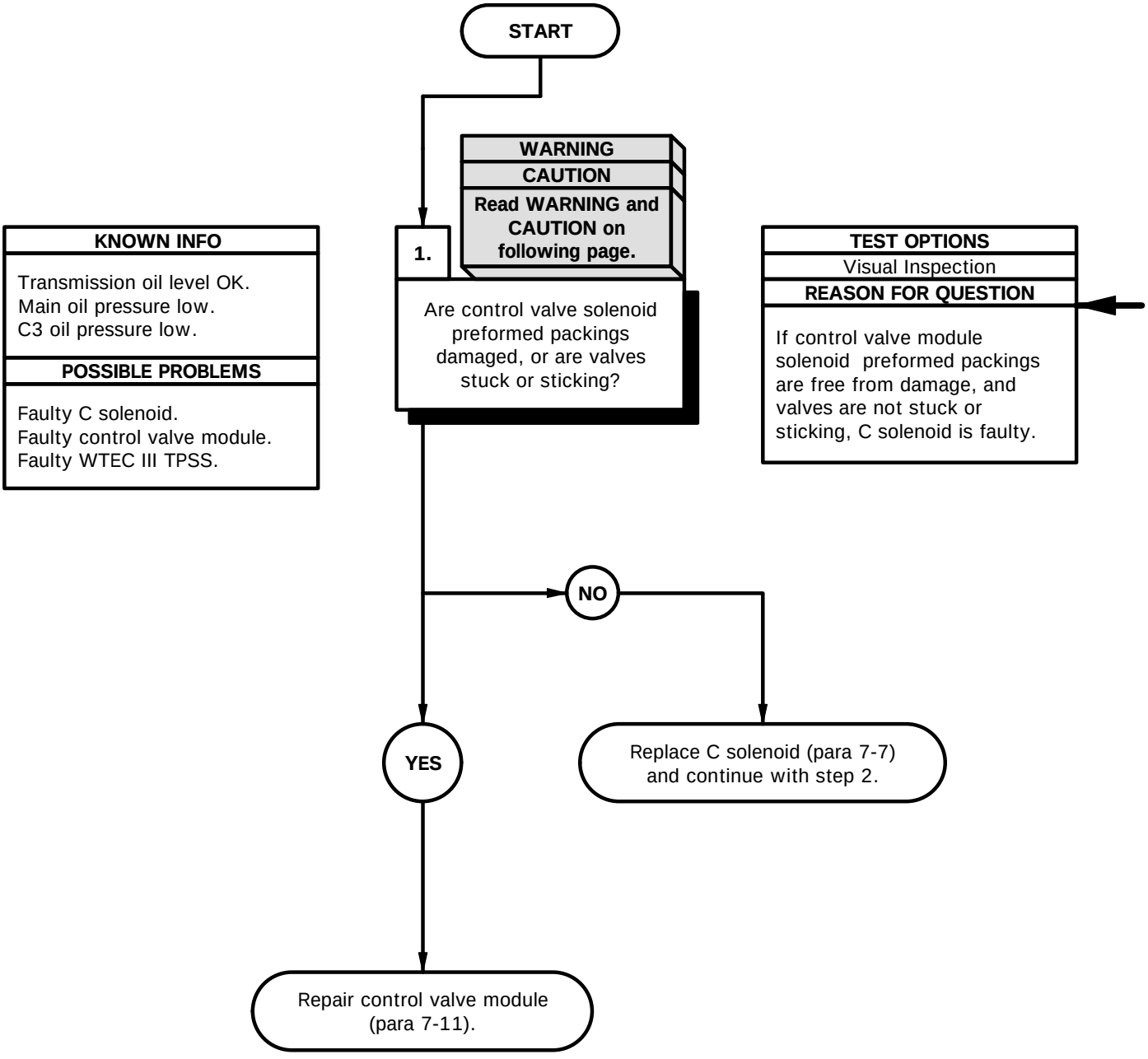
c80. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 55 AND ANY SUB CODE

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
Goggles, Industrial (Item 25, Appendix B)



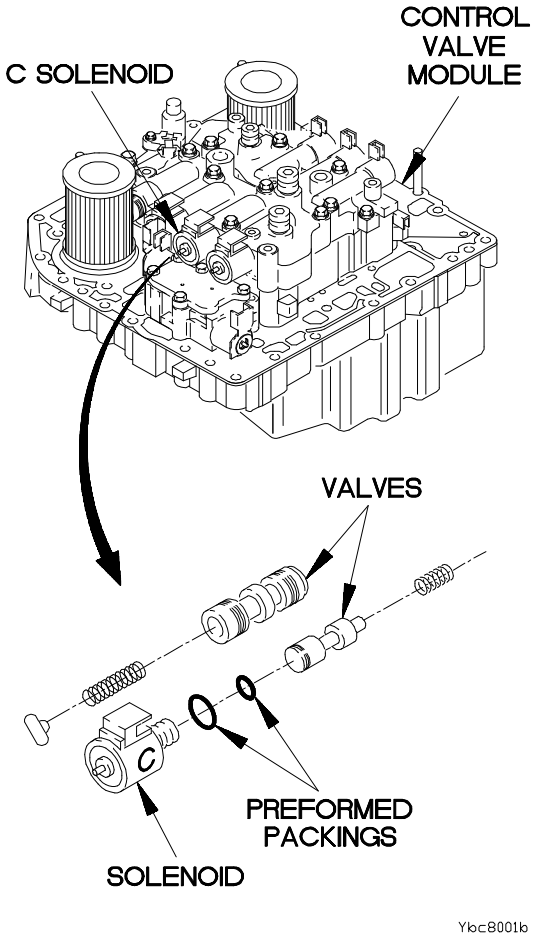
WARNING

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

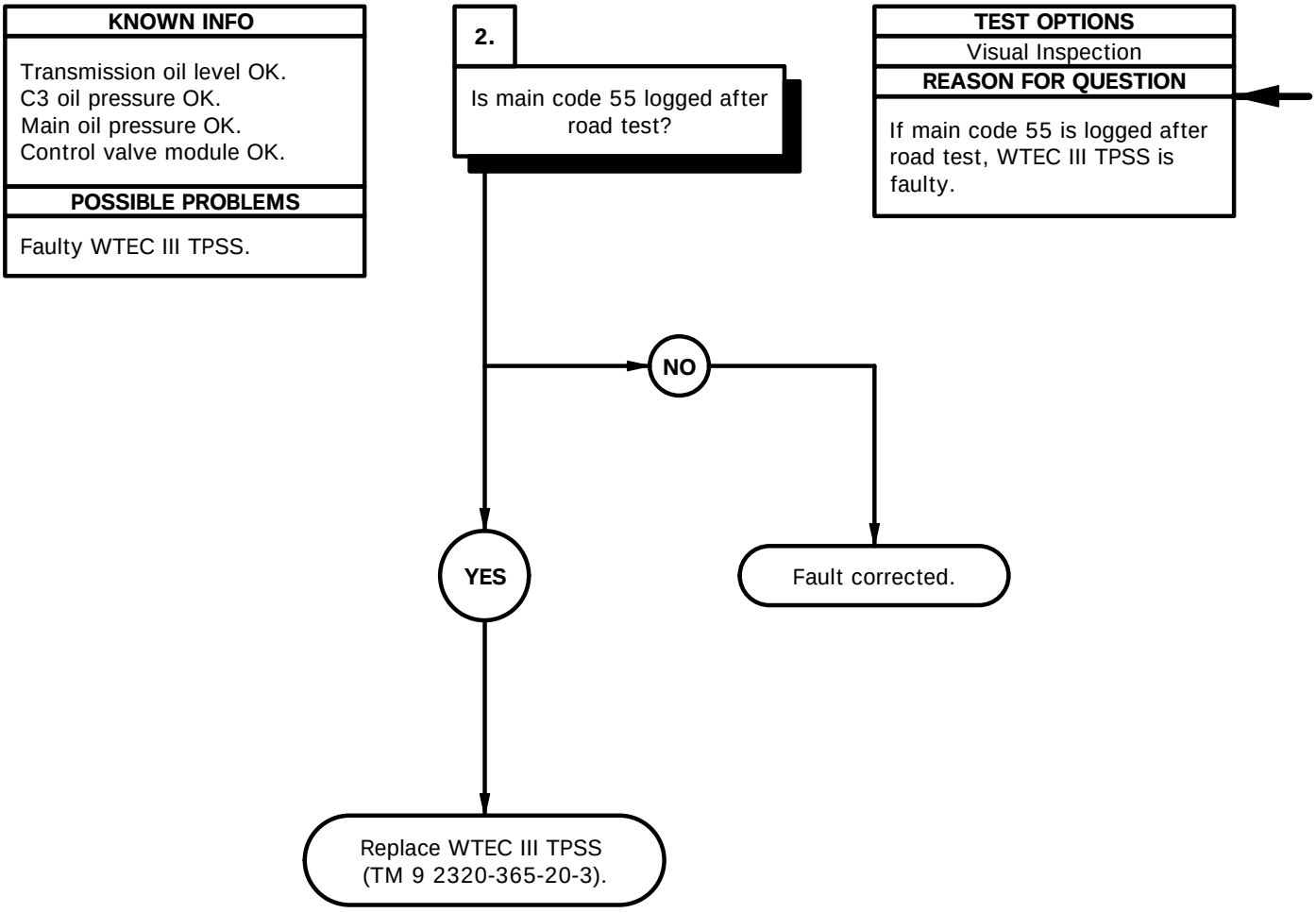
CAUTION

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 9-2320-365-20-3).
(2) Road test vehicle.
(3) Read diagnostic codes (TM 9-2320-365-20-3).
(4) If main code 55 is logged, replace WTEC III TPSS. (TM 9-2320-365-20-3).
(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 2-5, lists faults for the Wheel of the vehicle.

Table 2-5. Wheel Fault Index

Fault No.	Description	Page
d1.	Wheel Wobbles or Shimmies	2-960

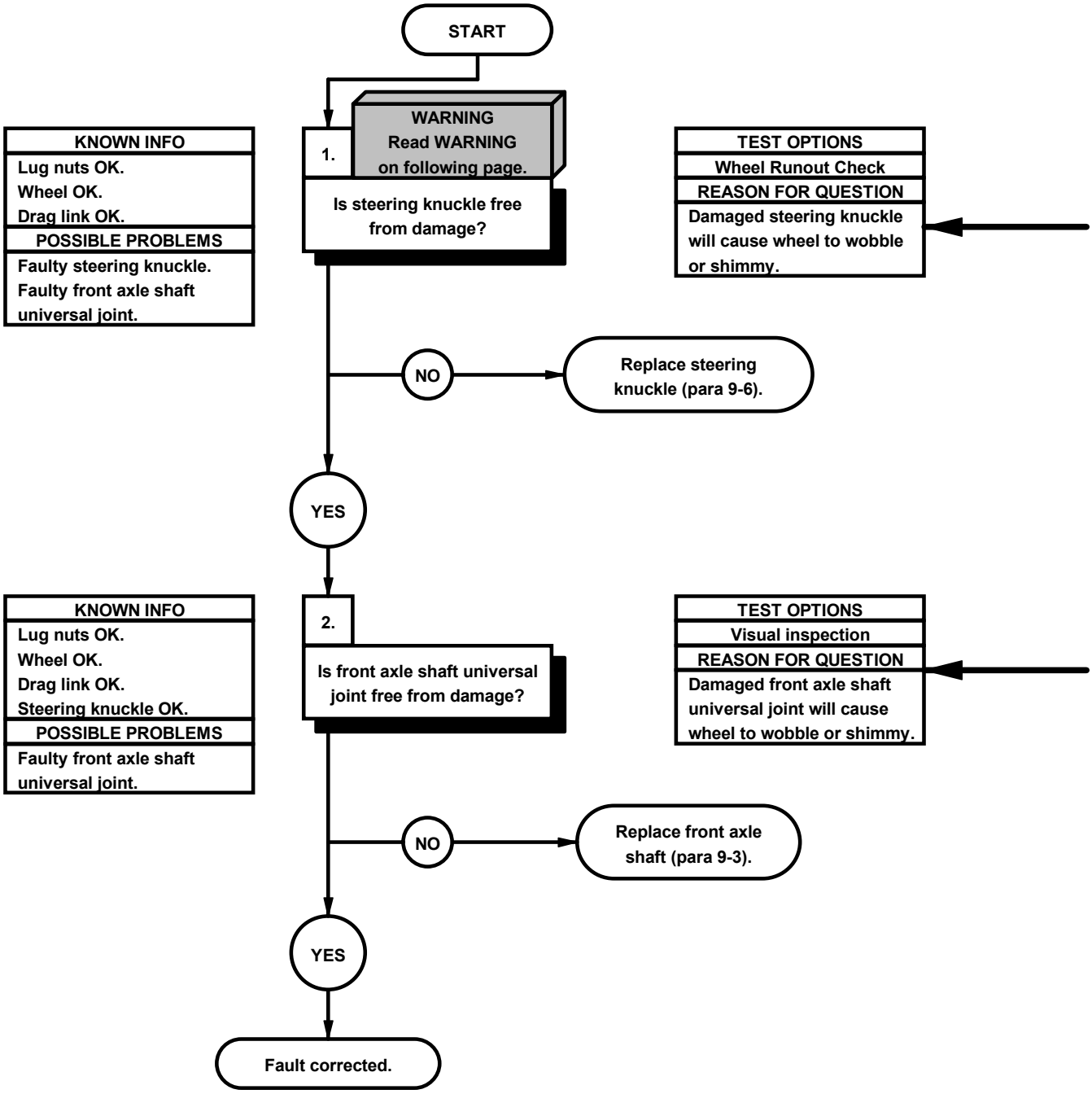
d1. WHEEL WOBBLES OR SHIMMIES

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
Jack, Dolly-Type, Hydraulic, (Item 31, Appendix B)
Trestles, Motor Vehicle Maintenance (Item 71, Appendix B)



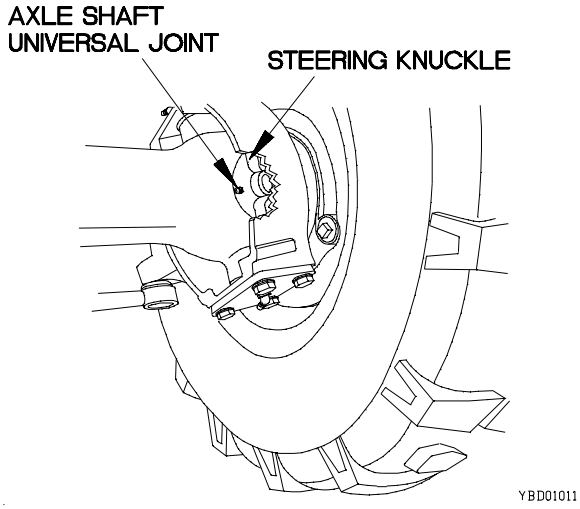
WHEEL RUNOUT CHECK

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 9-2320-365-10) 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 9-2320-365-10).

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 2-6, lists faults for the Hydraulic System of the vehicle.

Table 2-6. Hydraulic System Fault Index

Fault No.	Description	Page
e1.	Loss of Hydraulic Pressure (Single Stage Pump)	2-964

e1. LOSS OF HYDRAULIC PRESSURE

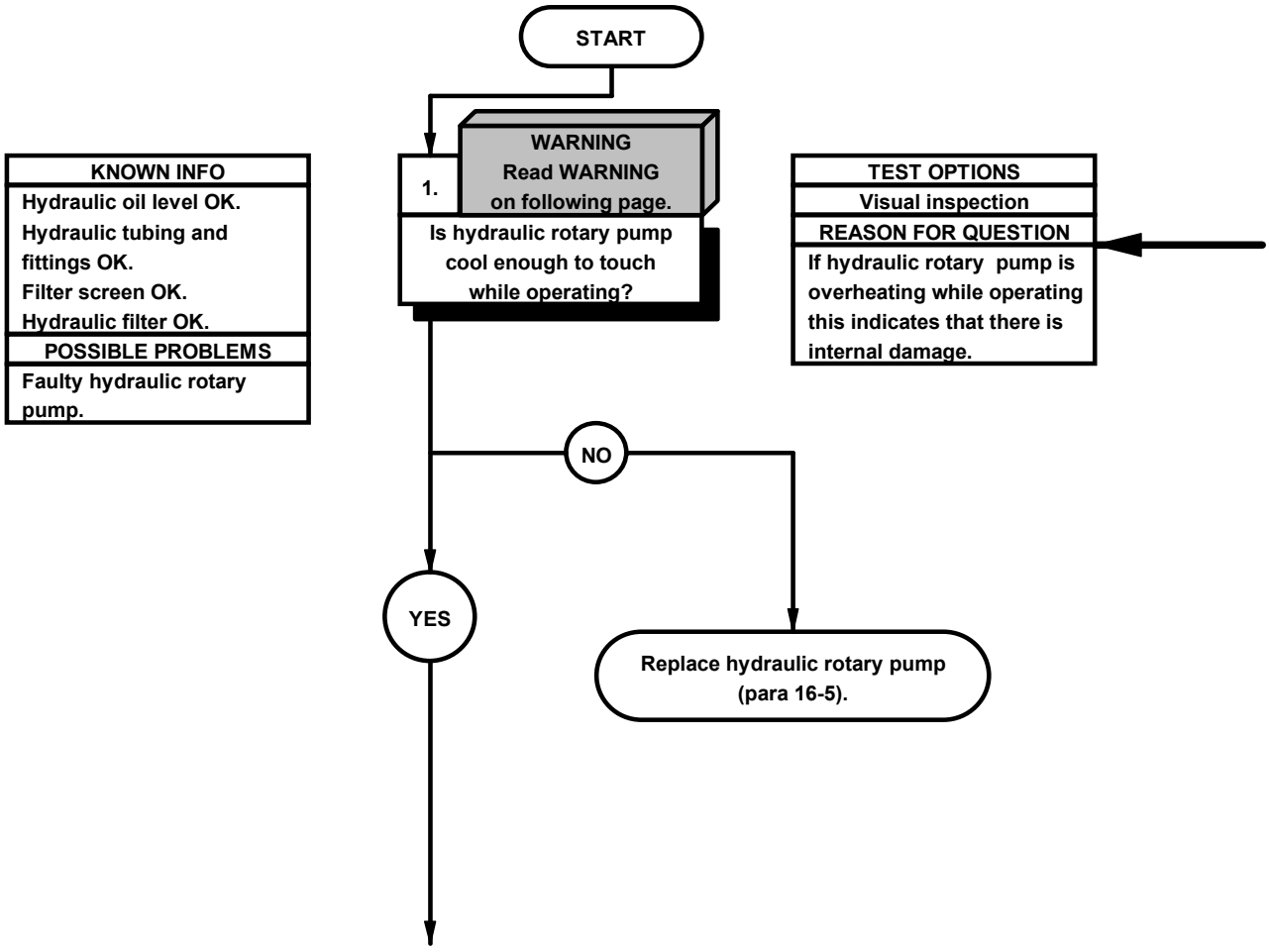
INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Personel Required
(2)

Materials/Parts
Rag, Wiping (Item 59, Appendix C)
Hose (2) (Item 41, Appendix C)
Fitting (2) (Item 32, Appendix C)
Adapter, Pipe (Item 1, Appendix C)

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
Tester, Hydraulic (Item 63, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
Pan, Drain (Item 36, Appendix B)

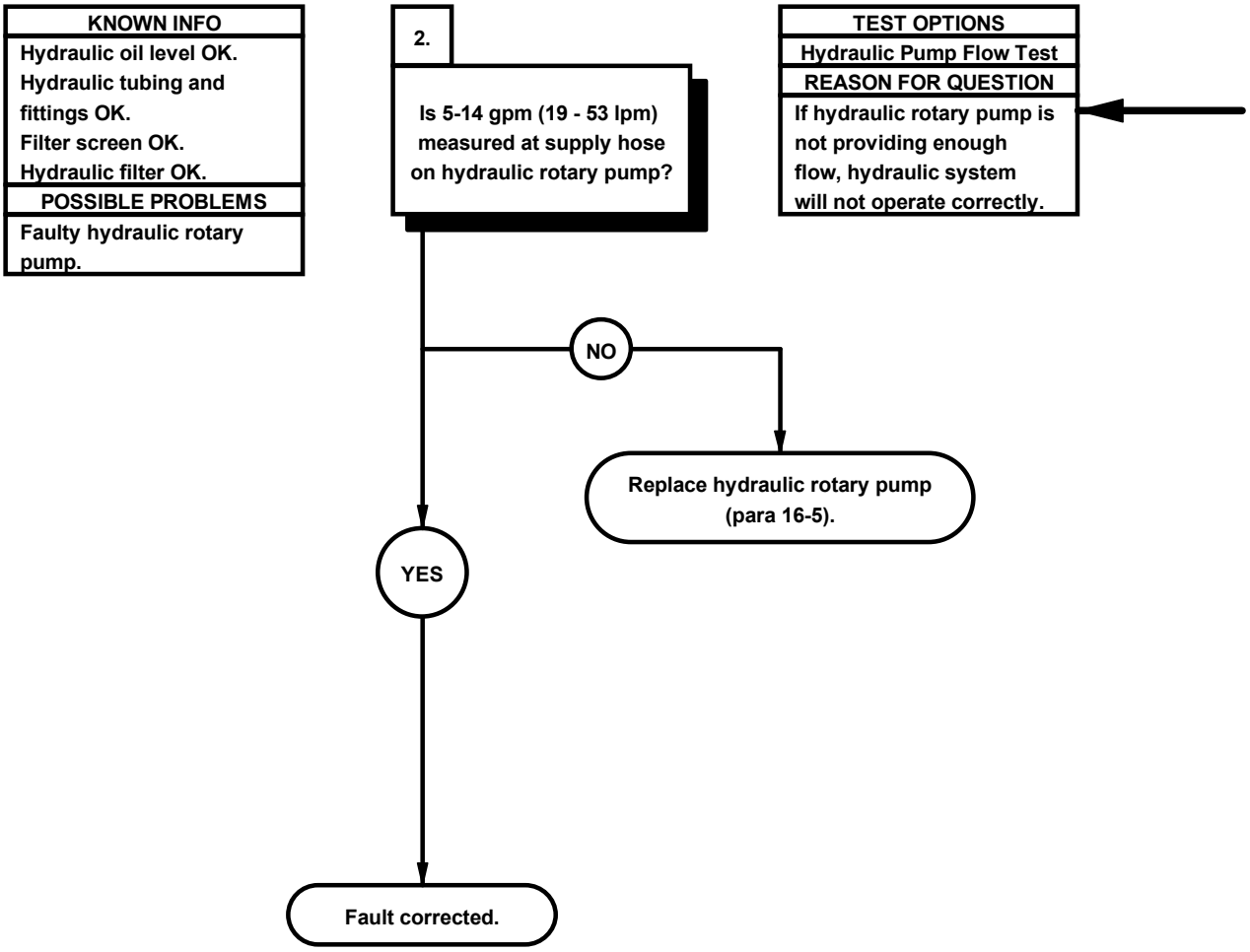


WARNING

- **Disconnecting any hydraulic line or fitting without first dropping pressure to zero, may result in injury to personnel.**
- **Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into your eyes. If oil contacts eyes, seek medical attention immediately.**
- **Fuel and oil are slippery and can cause falls. To avoid injury, wipe up spilled fuel or oil with rags.**

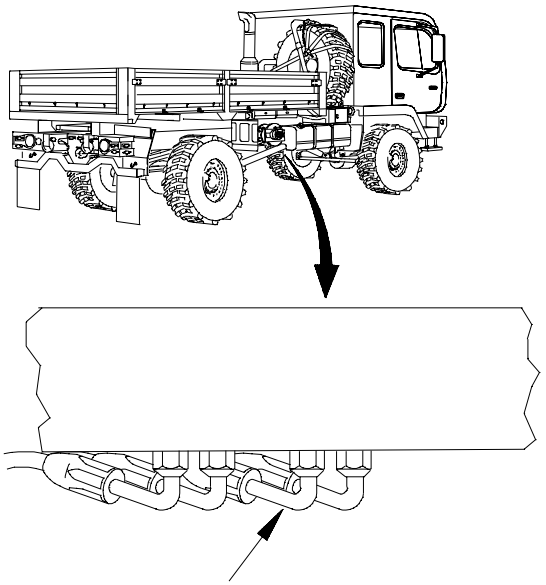
(1) Start engine (TM 9-2320-365-10). Allow engine to run until reaching normal operating temprature.
(2) Engage PTO (TM 9-2320-365-10).
(3) Increase engine rpm to 1250-1450 rpm (TM 9-2320-365-10).
(4) Check hydraulic rotary pump for overheating with engine at normal operating temperature.
(5) Decrease engine rpm to 750 rpm.
(6) Disengage PTO (TM 9-2320-365-10).
(7) Shut down engine (TM 9-2320-365-10).

e1. LOSS OF HYDRAULIC PRESSURE (SINGLE STAGE PUMP) (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 9-2320-365-10).
(6) Engage PTO (TM 9-2320-365-10).
(7) Increase engine rpm to 1250-1450 rpm (TM 9-2320-365-10) and note reading on hydraulic tester.
(8) If flow is less than 5 gpm (19 ipm), replace hydraulic rotary pump (para 16-5).
(9) Decrease engine rpm to 750 rpm.
(10) Disengage PTO (TM 9-2320-365-10).
(11) Shut down engine (TM 9-2320-365-10).
(12) Disconnect hydraulic tester from vehicle and disassemble test equipment: adapter from hose, hoses from hydraulic tester.
(13) Connect supply hose to fitting.
(14) Remove drain pan from under vehicle.



2-14. STEERING TROUBLESHOOTING

This paragraph covers Steering Troubleshooting. The Steering Fault Index, Table 2-7, lists faults for the steering system of the vehicle.

Table 2-7. Steering Fault Index

Fault No.	Description	Page
f1.	Hard to Steer	2-970

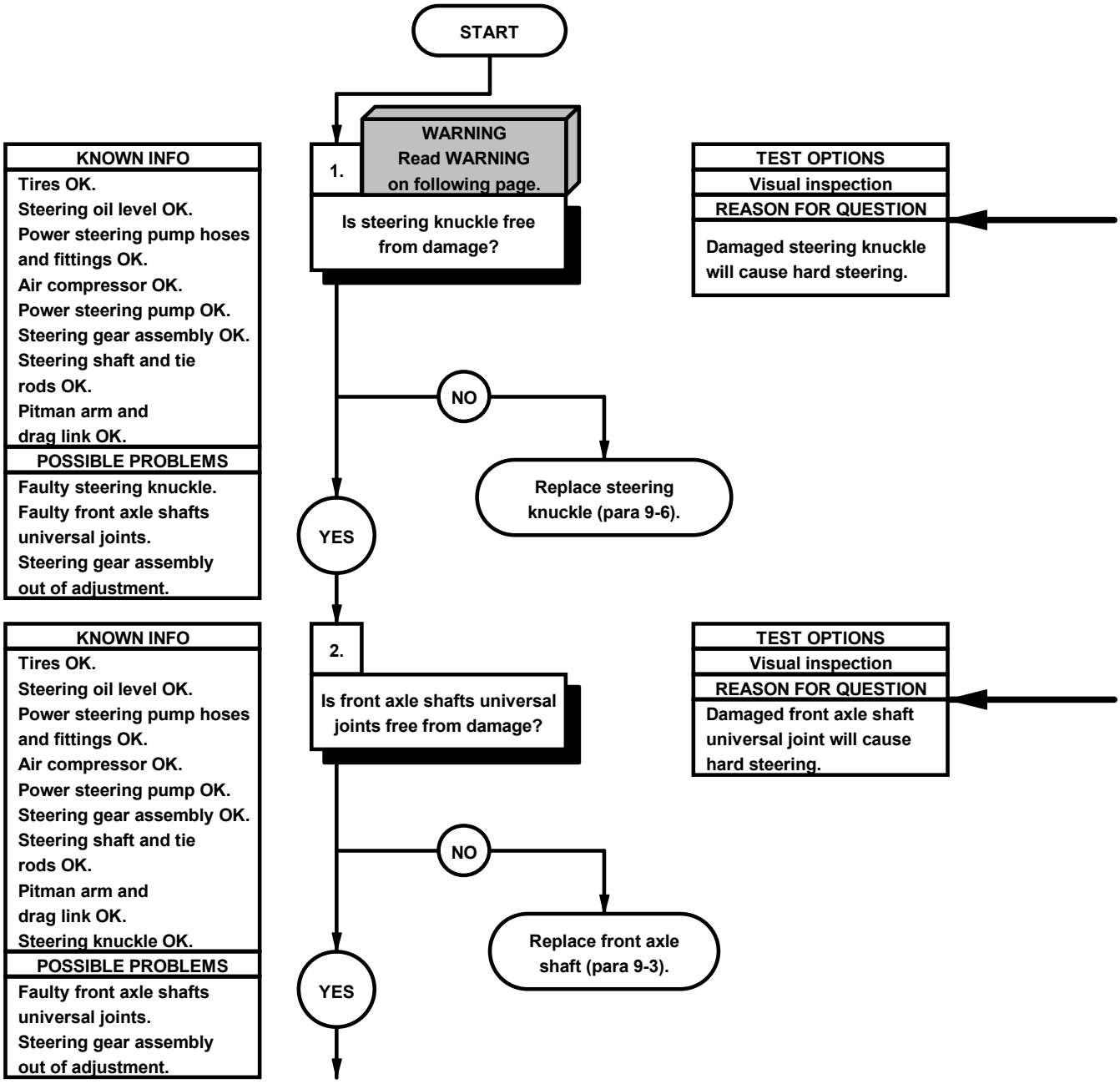
f1. HARD TO STEER

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Personnel Required
(2)

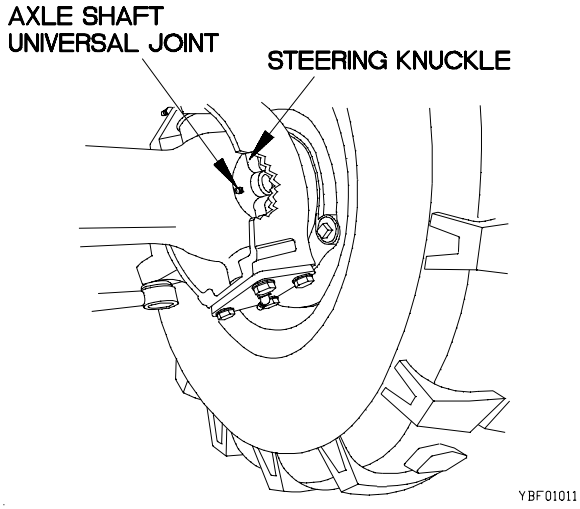
Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
Jack, Dolly-Type, Hydraulic (Item 31, Appendix B)
Trestle, Motor Vehicle Maintenance (Item 71, Appendix B)
Goggles, Industrial (Item 25, Appendix B)



WARNING

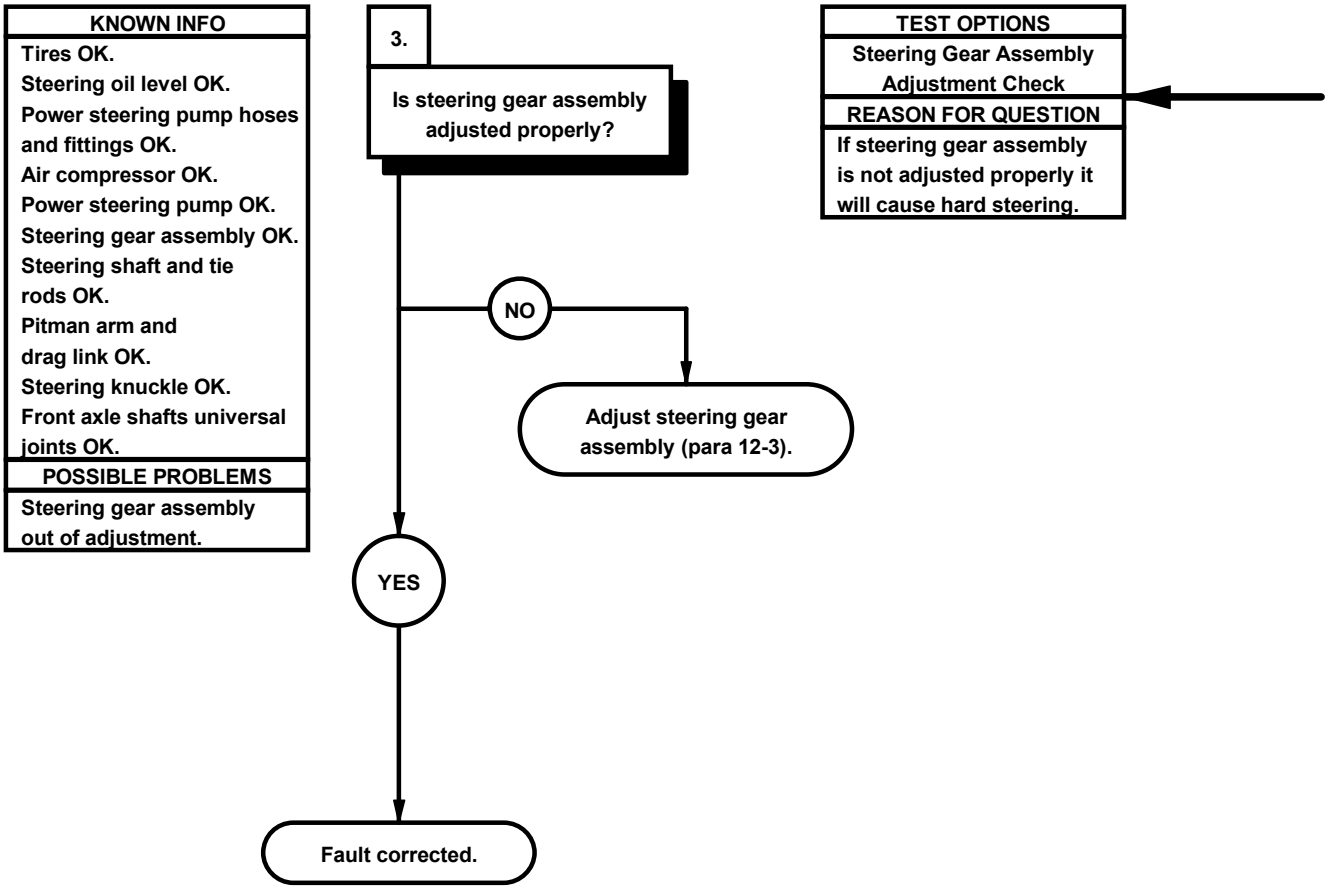
- **Vehicle must be on level ground and wheels must be chocked. Failure to comply may result in injury to personnel.**
- **Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.**

(1) Jack up vehicle (TM 9-2320-365-10) 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 9-2320-365-10).



(1) Start engine (TM 9-2320-365-10).
(2) Turn steering wheel all the way to the left or right.
(3) Shut down engine (TM 9-23320-366-10).
(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. 11K SELF-RECOVERY WINCH (SRW) TROUBLESHOOTING

This paragraph covers 11K Self-Recovery Winch Troubleshooting. The 11K Self-Recovery Winch (SRW) Fault Index, Table 2-8, lists faults for the 11K Self-Recovery Winch of the vehicle.

Table 2-8. 11K Self-Recovery Winch (SRW) Fault Index

Fault No.	Description	Page
g1.	11K Self-Recovery Winch (SRW) Does Not Operate	2-976

g1. 11K SELF-RECOVERY WINCH DOES NOT WORK

INITIAL SETUP

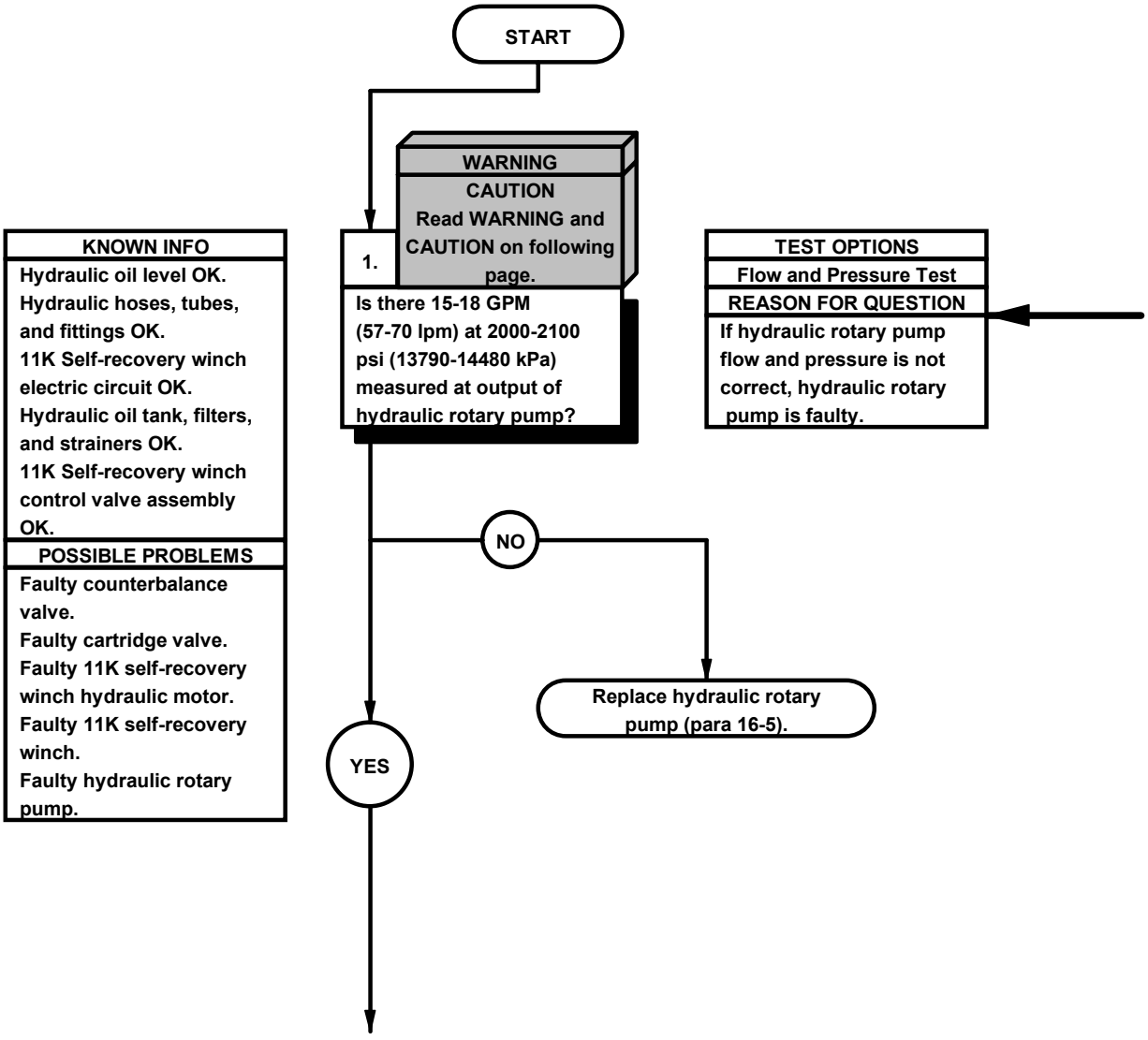
Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Materials/Parts
Rag, Wiping (Item 59, Appendix C)
Hose (2) (Item 41, Appendix C)
Fitting (2) (Item 32, Appendix C)
Fitting (Item 33, Appendix C)
Reducer, Tube (Item 60, Appendix C)
Adapter, Swivel (Item 3, Appendix C)
Adapter, Pipe (Item 2, Appendix C)
Adapter, Pipe (Item 1, Appendix C)

Tools and Special Tools
Tool Kit, Genl Mech (Item 68, Appendix B)
Tester, Hydraulic (Item 63, Appendix B)
Pan, Drain (Item 36, Appendix B)
Goggles, Industrial (Item 25, Appendix B)
STE/ICE-R (Item 60, Appendix B)

Personnel Required
(2)

References
TM 9-4910-571-12&P



WARNING

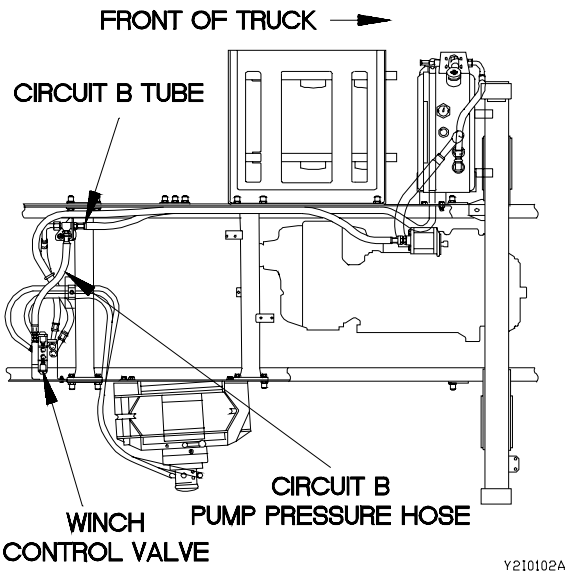
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

CAUTION

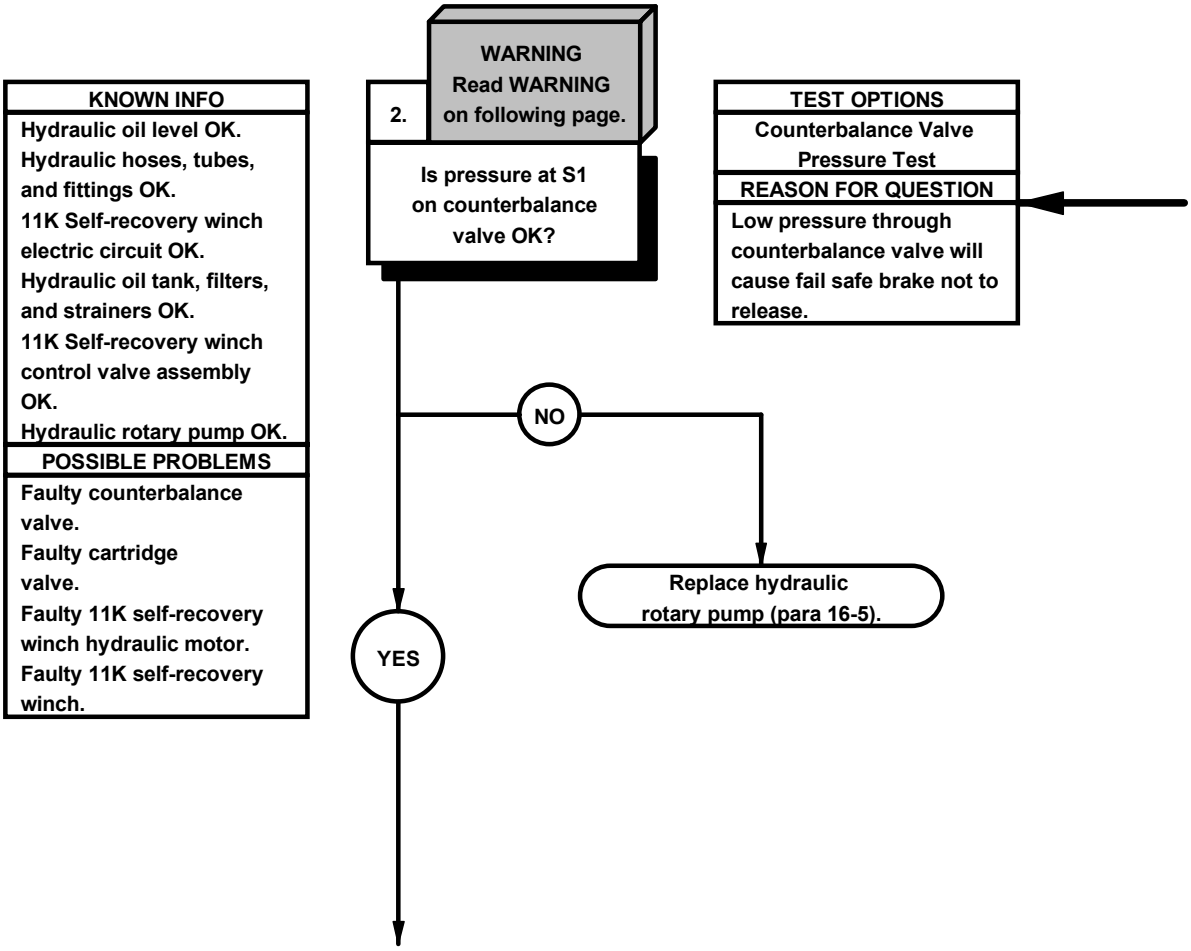
Maintain engine rpm at 1,250-1,450 rpm while performing pressure and flow tests. Failure to comply may result in damage to equipment.

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 9-2320-365-10).
(7) Engage PTO (TM 9-2320-365-10).
(8) Increase engine rpm to 1250-1450 rpm (TM 9-2320-365-10).
(9) Slowly close load valve on hydraulic tester until 2000-2100 psi (13790-14480 kPa) is reached and note flow on hydraulic tester.
(10) If flow is not 15-18 GPM (57-70 lpm) at 2000-2100 psi, replace hydraulic rotary pump (para 16-5).
(11) Open load valve on hydraulic tester.
(12) Decrease engine speed with manual throttle control.
(13) Disengage PTO (TM 9-2320-365-10).
(14) Shut down engine (TM 9-2320-365-10).
(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.



g1. 11K SELF-RECOVERY WINCH DOES NOT WORK (CONT)



WARNING

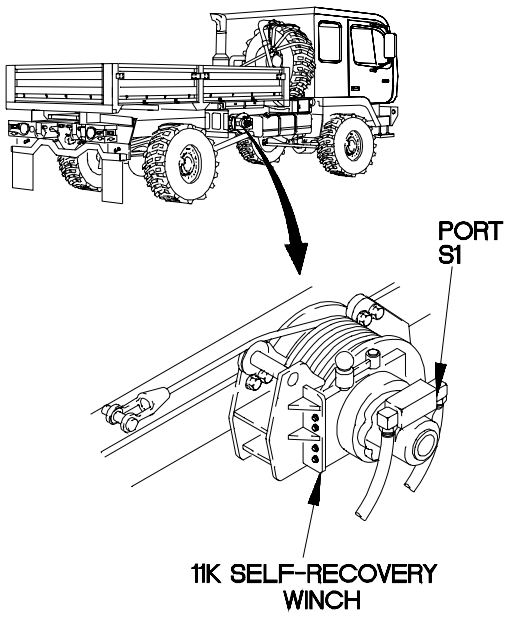
Wear appropriate eye protection when working under vehicle due to the possibity of falling debris. Failure to comply may result in injury to personnel.

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.

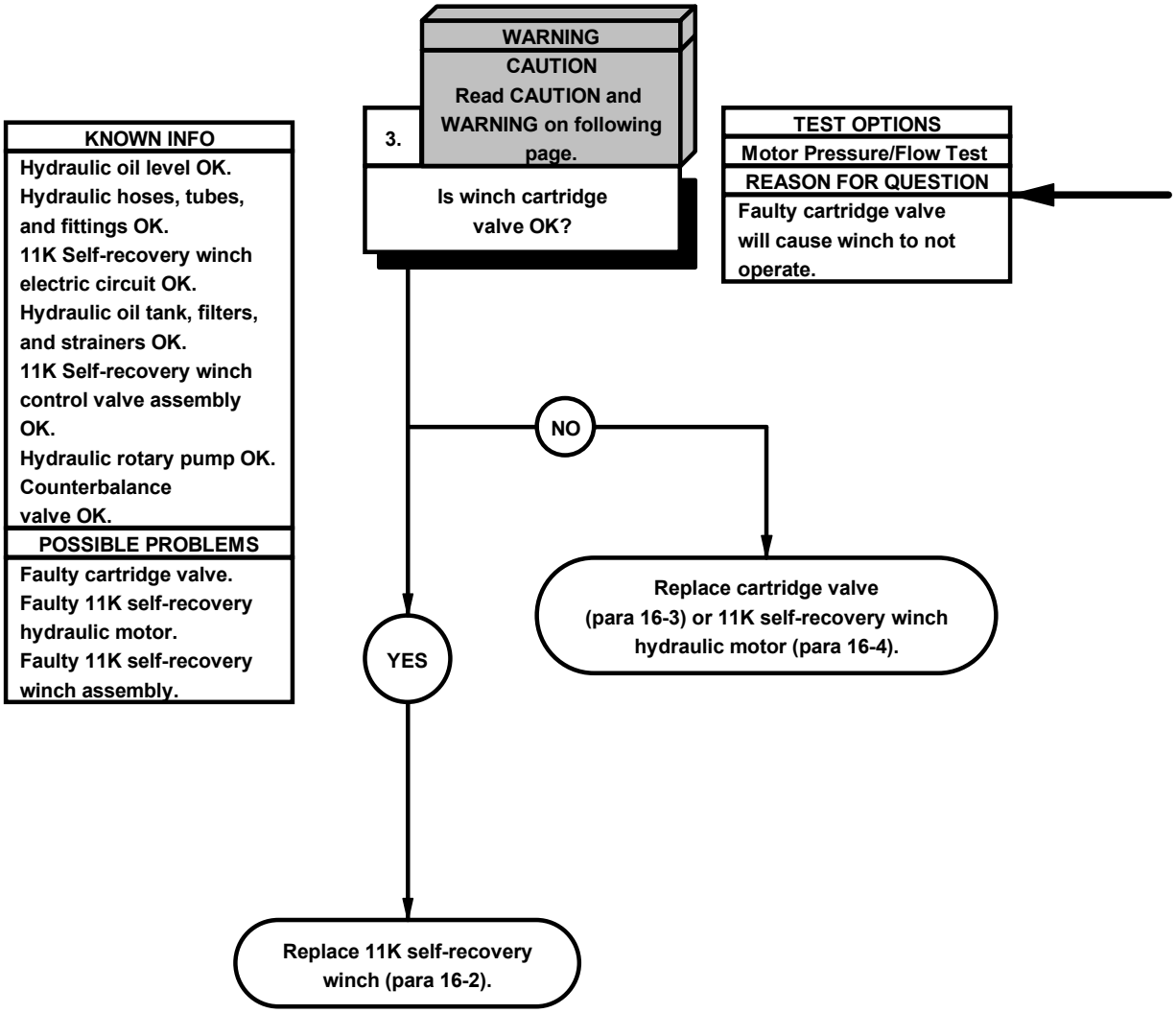
HYDRAULIC FLOW AND PRESSURE TEST

(1) Position drain pan under winch control valve.
(2) Disconnect circuit B pump pressure hose from circuit B tube.
(3) Connect pressure hose to pressure/flow kit.
(4) Connect pressure hose from pressure/flow kit to circuit B tube.
(5) Completely open pressure/flow kit load valve.
(6) Start and run engine until ormal operating temperature is reached (TM 9-2320-365-10).
(7) Engage PTO (TM 9-2320-365-10)
(8) Set engine speed with manual throttle control to 1,350 rpm.
(9) Slowly close load valve on pressure/flow kit until 2,500 psi (17,238 kPa) is reached and note flow on pressure/flow kit.
(10) If flow is not 15-18 GPM (51-70 lpm) at 2,500 psi (17,238 kPa), replace single stage hydraulic pump (para 16-5).
(11) Open load valve on pressure/flow kit.
(12) Decrease engine speed with manual throttle control.
(13) Disengage PTO (TM 9-2320-365-10).
(14) Shut down engine (TM 9-2320-365-10).
(15) Disconnect pressure hose from pressure/flow kit from circuit B tube.
(16) Disconnect circuit B pressure hose from pressure/flow kit.
(17) Connect circuit B pressure hose to circuit B tube.
(18) Remove drain pan from under winch control valve.



52I0103A

g1. 11K SELF-RECOVERY WINCH DOES NOT WORK (CONT)



WARNING

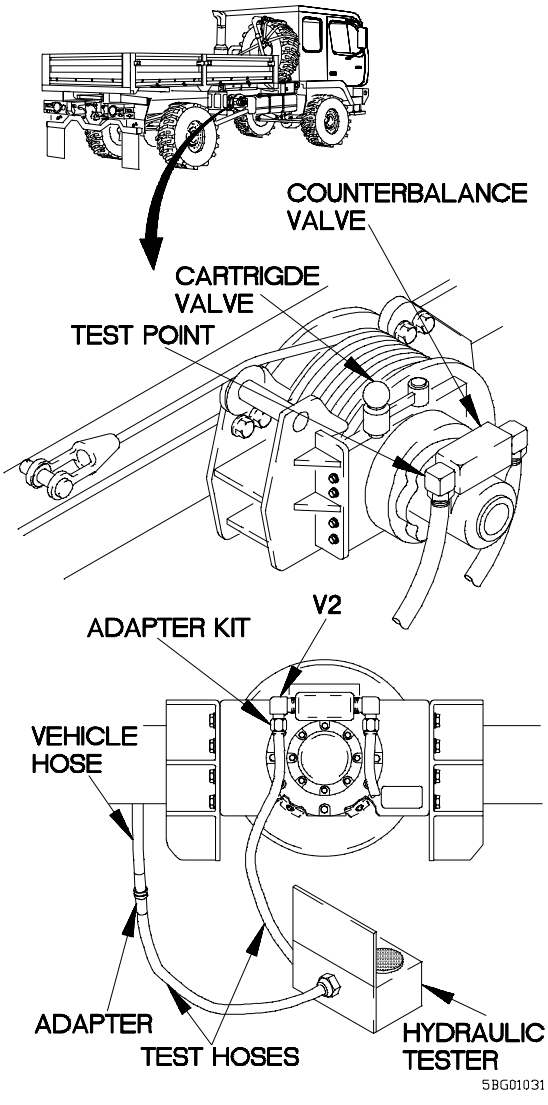
- **Drop hydraulic pressure to zero before disconnecting any hydraulic line. Failure to comply may result in injury to personnel.**
- **Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.**
- **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

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 11K self-recovery winch toward front of vehicle).
(3) Connect STE/ICE-R (see test #50) to S1 port.
(4) Start engine (TM 9-2320-365-10).
(5) Attach stall load to winch cable (TM 9-2320-365-10).
(6) Position PTO switch and WINCH POWER switch to ON (TM 9-2320-365-10).
(7) Engage winch clutch (TM 9-2320-365-10).
(8) Toggle WINCH IN/OUT switch to IN position and hold (TM 9-2320-365-10).
(9) Perform STE/ICE test #50 and note pressure gage 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 9-2320-365-10).
(12) Position WINCH POWER and PTO switches to OFF (TM 9-2320-365-10).
(13) Shut down engine (TM 9-2320-365-10).
(14) Disconnect and disassemble STE/ICE-R, hoses and adapters.
(15) Install plug in S1 port.



Section IV. MAINTENANCE PROCEDURES

2-16. MAINTENANCE INTRODUCTION

This section provides general procedures to be followed for the Unit, Direct Support, and General Support Maintenance levels 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.

2-17. 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 9-2320-365-10 for mooring condition and tiedown locations.

d. Hoisting. Sling assemblies and towing eyes used for hoisting are found on the vehicle.

2-18. 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.

2-19. GENERAL DISASSEMBLY INSTRUCTIONS

a. Cleanliness. Work area must be as clean as possible to prevent contamination to components.

2-19. GENERAL DISASSEMBLY INSTRUCTIONS (CONT)

CAUTION

Self-locking fasteners that are loosened must be replaced, not tightened.

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.

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.

2-20. 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 80, 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 80, 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 80, 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 71, Appendix C) to remove Dry Cleaning Solvent.

CAUTION

Do not clean tires, lubricant seals, rubber hoses, or electrical components with solvent mixture.

e. Rubber Parts. Do not clean preformed packings or other rubber parts in drycleaning solvent. Wipe parts clean with a dry wiping rag (Item 56, 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.

2-20. GENERAL CLEANING INSTRUCTIONS (CONT)

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.

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 41, 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 80, 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 56, Appendix C) moistened with Dry Cleaning Solvent P-D-680 (Item 80, Appendix C).

CAUTION

Do not use soap or alkalies for cleaning tank interiors.

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 80, 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.

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 80, 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 41, Appendix C).

2-21. 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.

2-21. GENERAL INSPECTION INSTRUCTIONS (CONT)

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.

2-22. 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 21, 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 retap the hole for the next oversize screw or stud. If the retapping will weaken the part, or if the cost of the part makes retapping 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 10, 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.

2-23. 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 41, 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 71, Appendix C) or anti-seizeing tape (Item 79, 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 gage 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.

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.

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.

2-24. 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. Damage to equipment may result.

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.

2-25. 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.

2-26. PREPARATION FOR STORAGE OR SHIPMENT

a. Perform Preventive Maintenance Checks and Services (PMCS) listed in TM 9-2320-365-20-1.

WARNING

- **Heavy objects/loads, such as tool boxes and heavy parts, must always be carried on the floor with the weight distributed as equally as possible between left and right sides of M1079 van. Failure to comply decreases the stability of the M1079 van and will increase the likelihood of a rollover.**
- **Heavy cabinets must always be mounted as low as possible with the weight distributed as equally as possible between left and right sides of M1079 van. Remember to consider the weight of the items that will be stored in the cabinets. Failure to comply decreases the stability of the M1079 van and will increase the likelihood of a rollover.**
- **Always keep in mind, when placing items inside the M1079 van, that heavier items must always be positioned as low as possible and the weight distributed as equally as possible between left and right sides of M1079 van. Failure to comply decreases the stability of the M1079 van and will increase the likelihood of a rollover.**

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.

2-27. 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 tires.

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 9-2320-365-10 and TM 9-2320-365-20.

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° 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, recoat 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 winch. While operating winch or crane, 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 LMTV 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. LMTV.

Hand Receipt Covering Contents of Components of End Item (COEI), Basic Issue Items (BII), and Additional Authorization List (AAL), for M1078 Series, 2 1/2-Ton, 4x4, Light Medium Tactical Vehicles (LMTV) . . . . . TM 9-2320-365-10-HR

A-4. OTHER PUBLICATIONS (CONT)

b. LMTV (cont)

Warranty Program for M1078 Series, 2 1/2-Ton, 4x4, Light Medium Tactical Vehicle (LMTV) . . . . . TB 9-2300-365-15
Operator's Manual for M1078 Series, 2 1/2-Ton, 4x4, Light Medium Tactical Vehicle (LMTV) . . . . . TM 9-2320-365-10
Organizational Maintenance Repair Parts and Special Tools List for M1078 Series, 2 1/2-Ton, 4x4, Light Medium Tactical Vehicle (LMTV) . . . . . TM 9-2320-365-24P
Organizational Maintenance Manual for M1078 Series, 2 1/2-Ton, 4x4, Light Medium Tactical Vehicle (LMTV) . . . . . TM 9-2320-365-20
Direct Support and General Support Repair Parts and Special Tools List for M1078 Series, 2 1/2-Ton, 4x4, Light Medium Tactical Vehicle (LMTV) . . . . . TM 9-2320-365-24P

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 Including Repair Parts and Special Tools List Simplified Test Equipment for Internal Combustion Engines Reprogrammable (STE/ICE-R) (NSN 4910-01-222-6589) . . . . . 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

d. General Maintenance and Repair. (Cont)

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
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	5120-00-144-5207	11655788-3	SC 4910-95-A31
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	BLADE, HAND, HACKSAW	5110-00-277-4587	RS1018	SC 5180-90-CL-N05
5	BRUSH, WIRE	7920-00-291-5815	D-1416	SC 4910-95-A31
6	CALIPER SET, MICROMETER,	5120-01-117-0468	6181	SC 4910-95-A31
7	CALIPER, MICROMETER,	5120-00-221-1921	124B	SC 4910-95-A02
8	CALIPER, VERNIER	5120-01-113-1548	6420	SC 4910-95-A31

TOOLS IDENTIFICATION LIST (CONT)

(1) Item Number	(2) Item Name	(3) National Stock Number	(4) Part Number	(5) Reference
9	CAPS, VISE JAW	5120-00-221-1506	404-4	SC 4910-95-A31
10	CLAMP	5120-00-203-6431	A-A-431	SC 4910-95-A02
11	CLEANER, STEAM, PRESSURE JET	4940-00-186-0027	200-A0	SC 4910-95-A31
12	COMPRESSOR UNIT, RECIPROCATING	4310-00-542-4566	MIL-C-52980	SC 4910-95-A62
13	COMPRESSOR, PISTON RING	5120-00-250-6055	GGG-C-555	SC 4910-95-A63
14	CROWFOOT ATTACHMENT,	5120-00-222-7975	GGG-W-646	SC 4910-95-A31
15	DEGREASER, PORTABLE LIQUID	4940-00-449-6689	MILD12491	SC 4910-95-A31
16	DISPENSING PUMP, HAND DRIVEN	4930-00-263-9886	BR2-10	SC 4910-95-A74
17	DRILL SET, TWIST	5130-00-293-0983	58	SC 4910-95-A62
18	DRILL, ELECTRIC, PORTABLE	5130-00-293-1849	W-D-661	SC 4910-95-A62
19	EXTRACTOR, SCREW	5120-00-610-1888	A-A-283SZ1-9	SC 5180-90-CL-N05
20	FRAME, HAND HACKSAW	5110-00-289-9657	163-20	SC 4910-95-A02
21	GAGE SET, TELESCOPING	5210-00-473-9350	GGG-G-17	SC 4910-95-A63
22	GAGE, DEPTH MICROMETER	5210-00-619-4045	445B-Z-6RL	CTA 50-909
23	GLOVES, RUBBER	8415-00-641-4601	ZZ-G-381	SC 4910-95-A74
24	GLOVES, WELDER'S	8415-00-268-7859	A-A-50022	SC 4910-95-A02
25	GOGGLES, INDUSTRIAL	4240-00-052-3776	A-A-1110	SC 4910-95-A74
26	GRINDING KIT, VALVE SEAT	4910-00-473-6437	1750	SC 4910-95-A02
27	GUN, AIR BLOW	4940-00-333-5541	GGGG770	SC 4910-95-A31
28	HAMMER, HAND, SOFT HEAD	5120-01-065-9037	57-533	SC 5180-90-CL-N05

(1) Item Number	(2) Item Name	(3) National Stock Number	(4) Part Number	(5) Reference
29	HOSE ASSEMBLY, NONMETALLIC	4720-00-356-8557	ZZ-4-461	SC 4910-95-A31
30	INDICATOR, DIAL	5210-00-277-8840	196A	SC 4940-95-CL-B20
31	JACK, DOLLY TYPE, HYDRAULIC	4910-00-289-7233	93660	SC 4910-95-A31
32	LIFT, TRANSMISSION AND DIFFERENTIAL	4910-00-585-3622	49	SC 4910-95-A62
33	LIFTER, VALVE SPRING	5120-00-239-8686	T286A	SC 4910-95-A63
34	MULTIMETER, DIGITAL	6625-01-139-2512	T00377	SC 4910-95-CL-A74
35	MULTIPLIER, TORQUE WRENCH	5120-00-574-9318	292	SC 4910-95-CL-A72
36	PAN, DRAIN	4910-00-387-9592	450	SC 4910-95-A31
37	PLIERS, RETAINING RING	5120-00-293-0045	0300	SC 4910-95-A31
38	PLIERS, RETAINING RING	5120-00-293-0048	0409	SC 4910-95-A31
39	PLIERS, RETAINING RING	5120-00-293-0186	0900	SC 4910-95-CL-A74
40	PLIERS, SLIP JOINT	5120-00-624-8065	529-10	SC 4910-95-A31
41	PRESS, ARBOR, HAND OPERATED	3444-00-449-7295	A-A-51194	SC 4910-95-A02
42	PRESSURE TESTER, RADIATOR	4910-00-728-8227	J24460-01	SC 4910-95-CL-A74
43	PULLER KIT, UNIVERSAL	5180-00-313-9496	1178	SC 4910-95-A62
44	PULLER KIT, UNIVERSAL	5180-00-423-1596	PE12	SC 4910-95-A31
45	PULLER, MECHANICAL	5120-00-595-9305	GGGP781	SC 4910-95-A31
46	RESPIRATOR, AIR FILTERING	4240-00-022-2524	GGG-M-125/6	SC 4910-95-A62
47	SET, TAP AND DIE	5136-01-119-0005	TDM99117	SC 4910-95-A31
48	SLING, CARGO	1670-00-823-5043	63J4261-13	CTA 50-970

TOOLS IDENTIFICATION LIST (CONT)

(1) Item Number	(2) Item Name	(3) National Stock Number	(4) Part Number	(5) Reference
49	SLING, ENGINE AND TRANSMISSION	4910-01-243-5556	DFP-188	SC 4910-95-A02
50	SOCKET SET, IMPACT	5130-01-117-0466	415IMMY	SC 4910-95-A31
51	SOCKET SET, SOCKET WRENCH	5120-01-117-3876	B107.5	SC 4910-95-A31
52	SOCKET WRENCH ATTACHMENT,	5120-00-596-8508	GGG-W-641	SC 4910-95-A31
53	SOCKET WRENCH ATTACHMENT,	5120-01-079-8033	SAM14A	SC 4910-95-A31
54	SOCKET WRENCH ATTACHMENT,	5120-01-101-1943	J35174-A	SC 4910-95-A31
55	SOCKET, SOCKET WRENCH	5120-00-236-2263	4707	SC 4910-95-A31
56	SOCKET, SOCKET WRENCH	5130-01-116-1643	IMM 300	SC 4910-95-A02
57	SQUARE, COMBINATION	5210-00-078-8948	GGG-S-656	SC 4910-95-A02
58	STAND, RADIATOR TEST AND REPAIR	4910-00-505-4786	60A	SC 4910-95-A02
59	STAND, TRANSPORT,	4910-00-338-6673	8708857	SC 4910-95-A62
60	STE/ICE-R	4910-222-6589	12259266	TM 9-4910-571-12&P
61	STRAIGHT EDGE	6675-00-224-8807	564000-36	SC 4910-95-A02
62	TEST STAND, AUTOMOTIVE	4910-00-767-0218	MILT4544	SC 4910-95-A02
63	TESTER, HYDRAULIC	4940-01-136-4830	13222E4767	SC 4940-95-CL-B07
64	TIE DOWN, CARGO AIRCRAFT	1670-00-725-1437	SP4067	CTA 50-970
65	TOOL KIT, AUTO FUEL & ELECTRICAL	5180-00-754-0655	SC 4910-95-CLA50	SC 4910-95-CL-A50
66	TOOL KIT, BLIND RIVET	5180-01-201-4978	D-100-MIL-1	SC 4910-95-CL-A72
67	TOOL KIT, ELECTRICAL	5180-00-876-9336	7550526	SC 4910-95-CL-A72
68	TOOL KIT, GENERAL MECHANIC'S	5180-00-177-7033	SC 5180-90-CL-N26	SC 5180-90-CL-N26

(1) Item Number	(2) Item Name	(3) National Stock Number	(4) Part Number	(5) Reference
69	TOOL KIT, VALVE SEAT RING	5120-00-698-7979	MILT13918	SC 4910-95-A63
70	TORCH SET, CUTTING AND	3433-00-294-6743	MIL-T-13880	SC 4910-95-A02
71	TRESTLE, MOTOR VEHICLE	4910-00-251-8013	306	SC 4910-95-A31
72	VISE, MACHINIST	5120-00-293-1439	504M2	SC 4910-95-A62
73	WRENCH SET, SOCKET	5120-00-081-2309	GGG-W-641	SC 5180-90-CL-N05
74	WRENCH SET, SOCKET	5120-00-204-1999	GGG-W-641	SC 4910-95-A02
75	WRENCH SET, SOCKET	5120-00-322-6231	GGG-W-641	SC 5180-90-CL-N05
76	WRENCH, ADJUSTABLE	5120-00-423-6728	6187328	SC 4910-95-A31
77	WRENCH, IMPACT, ELECTRIC	5130-00-221-0607	WW650	SC 4910-95-A31
78	WRENCH, TORQUE, 0-150 LB-FT	5120-00-247-2540	1503BFP	SC 4910-95-A31
79	WRENCH, TORQUE, 0-150 LB-IN.	5120-00-230-6380	TQ12B	SC 4910-95-A62
80	WRENCH, TORQUE, 0-175 LB-FT	5120-00-640-6364	1753LDF	SC 4910-95-A02
81	WRENCH, TORQUE, 0-200 LB-IN.	5120-00-853-4538	F200I	SC 4910-95-CL-A72
82	WRENCH, TORQUE, 0-250 N•M	5120-01-115-1723	1753DFE	SC 4910-95-A31
83	WRENCH, TORQUE, 0-300 LB-IN.	5120-00-247-2536	F3001	SC 4910-95-A31
84	WRENCH, TORQUE, 0-60 N•M	5120-01-112-9531	TESI60	SC 4910-95-A31
85	WRENCH, TORQUE, 0-600 LB-FT	5120-00-221-7983	SW130-301	SC 4910-95-A31
86	WRENCH, TORQUE, 0-75 LB-IN.	5120-01-112-9532	B107.14MTY1CLCST 1	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 LMTV 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) 2022-8-12S	ea
2	F/H	4730-01-286-4614	Adapter, Pipe (81343) 2022-8-12S	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	F/H	4730-01-113-9251	Adapter, Union	ea
5	O/F/H	8040-00-118-2695	Adhesive (72799) RTV162	kt
6	F/H	8040-00-728-3088	Adhesive (78500) 1199-T-3842 6 oz kit	oz

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
7	O/F/H	8040-01-250-3969	Adhesive (05972) 242	ea
8	F/H	8040-01-331-7470	Adhesive (81349) MIL-A-46106 5 oz tube	oz
9	F/H	8040-01-126-1422	Adhesive (52152) 1099	qt
10	H		Adhesive (04963) DP-100 1.7 oz tube	oz
10.1	O/F	8040-01-446-7842	Adhesive (01139) RTV123 10 oz	ca
11	O/F/H	6850-00-174-1806	Antifreeze (81349) MIL-A-11755 55 gl drum	gl
12	O/F/H		Antifreeze (81349) MIL-A-46153	
		6850-00-181-7929	1 gl can	gl
		6850-00-181-7940	55 gl drum	gl
13	F/H	8030-00-597-5367	Antiseize Compound (81349) MIL-A-907 2-1/2 lb can	lb
14	F/H	8415-00-222-8074	Apron, Plastic, Disposable (32075) E2-2845 Box of 100	ea
15	F/H	5306-00-174-4150	Bolt, Machine (11083) 3B4772	ea
16	F/H	5306-00-381-9928	Bolt, Machine (19207) 12414307-080	ea
16.1	F/H		Bolt, Machine (19207) 12414307-075	ea
17	F/H	7920-00-926-5243	Bucket, Mop (88001) C1122F	ea
18	F/H	5340-00-450-5718	Cap and Plug Set (19207) 10935405	ea
19	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
20	F/H	7510-00-162-2910	Chalk Line, Marking Powder 09-304147	ea
21	O/F/H	6850-01-347-0073	Cleaning Compound, Windshield (81349) O-C-1901	cl
22	F/H	5350-00-221-0872	Cloth Abrasive Crocus Cloth (81348) P-C-458 50 sheet package	sh
23	F/H	5350-00-174-0985	Cloth, Abrasive, 600 Grit (81348) GGG-C-520 Box of 100	sh

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
24	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
25	F/H	4730-00-881-1161	Coupling, Pipe 207P-6	ea
26	F/H	6850-00-856-7955	Desiccant, Activated (81349) MIL-D-3464	
			18, 5 gl bags	bg
27	F/H	7930-00-068-1669	Detergent, General Purpose (81348) P-D-1747	
			1/2 gl bottle	gl
28	C/O/F/H		Diesel Fuel (Arctic) (81348) VVF800FRADEDDFA	
		9140-00-286-5282	5 gl cn	cn
		9140-00-286-5283	Bulk	gl
		9140-00-286-5284	55 gl drum	gl
		9140-00-286-5285	55 gl drum	gl
29	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
30	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
31	C/O/F/H	7520-01-209-1152	Dispenser, Pressure Sensitive Adhesive Tape (55203) 5006-0-9	ea
32	F/H		Fitting 190923-02S	ea
33	F/H		Fitting 2027-8-4S	ea
34	F/H	5210-00-640-6176	Gage, Bearing Clearance (77220) PLASTIGAGEPB1	
			Box of 12	ea
35	F/H	8040-01-038-5043	Gasket Cement (11083) 5H2471	
			8 oz can	oz

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
35.1	F	8040-01-437-6864	Gasket Cement (11083) 1U-8846	
36	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	b
		9150-00-190-0905	6-1/2 lb can	lb
		9150-00-190-0907	35 lb can	lb
37	F/H	9150-00-180-6382	Grease, General Purpose (81349) MIL-T-24139	
			6-1/2 lb can	lb
38	F/H	9150-00-223-4004	Grease, Molybdenum Disulfide (81349) MIL-G-21164	
			6-1/2 lb can	lb
39	F/H	9150-00-664-0050	Grease, Ordnance, Extreme Pressure (12474) Molylube 80	
			1 pt can	pt
40	F/H	5345-01-356-8913	Honing Stone Assembly (10133) R150761-SA	ea
41	F/H		Hose (81343) FC 324-12	ea
41.1	O/F	4720-00-988-3842	Hose Assembly, Nonmetallic (50599) R25679-1	ea
41.2	O/F		Hydraulic Fluid (81349) MIL-H-5606	
		9150-00-252-6383	1 qt can	qt
		9150-00-223-4134	1 gl can	gl
42	O/F/H	5970-01-100-4464	Insulating Compound, Electrical (08800) RTV-102 White	
			2.8 oz tube	ea
43	O/F/H	5970-00-767-0524	Insulation, Sleeving, Electrical (81349) MIL-I-23053/5	
			4 in.	ea
43.1	O/F	5970-01-378-3018	Insulation, Sleeving, Electrical (06090) ATUM-1/4-0-4FT	lg
44	C/O/F/H		Lubricating Oil, Engine (81349) MIL-L-2104 OE/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

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
45	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
46	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
47	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
48	O/F/H	9150-01-152-4117	Lubricating Oil, Engine (81349) MIL-L-2104 OE/HDO 15W-40	
			1 qt can	qt
49	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
50	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
51	O/F/H	9150-01-035-5395	Lubricating Oil, Gear (81349) MIL-L-2105 85W-140	
			5 gl can	gl
52	F/H	5310-01-369-6073	Nut, Self-Locking (19207) 12414308-007	ea
53	F/H	5310-01-362-6171	Nut, Self-Locking N9406	ea
53.1	F/H		Paper, Abrasive 2347	ea
54	O/F/H	6530-01-283-6227	Paraffin and Mineral Oil (25973) 76-1026	
			7 lb can	lb
55	F/H	8030-00-043-1688	Primer, Sealing Compound (81349) MIL-S-224373	
			1 gl can	gl
56	F/H	4204-00-759-3290	Protector, Hearing 19A	ea

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
57	F/H	8010-00-652-3626	Prussian Blue, Paste, Bearing Surface (81349) MIL-P-30501 1 oz tube	oz
58	F/H		Pulley, Groove (19207) 12421165	ea
59	C/O/F/H	7920-00-205-1711	Rag, Wiping (58536) A-A-531 50 lb bale	ea
60	F/H	4730-01-113-9251	Reducer, Tube (81343) 2027-8-12S	ea
61	F/H	4020-00-593-9584	Rope, Fibrous 9868-165X4PC50	ea
62	F/H	5210-00-293-3393	Rule, Multiple, Folding (81348) GGG-R-791	ea
63	F/H	5330-00-003-5427	Rubber Sheet, Solid (81349) MIL-R-3065	sh
64	F/H		Sealant (11083) 2P2333	ea
64.1	F	8030-00-728-9665	Sealant (62377) 80017 1 pt can	pt
65	F/H	8030-00-981-7005	Sealant, Adhesive (05972) AA15-1	ea
66	F/H		Sealant, Adhesive (78500) 1199-E-3931	ea
67	F/H		Sealant, Adhesive (78500) 2297-B-5436	ea
67.1	F	1015-01-255-4144	Sealant, Pipe (19207) 12297953 50 ml tube	tu
67.2	F/H	8030-00-111-6404	Sealing Compound (05972) 640-31 50 cc bottle	bt
68	O/F/H	8030-00-204-9149	Sealing Compound (05972) 592-41 250 cc tube	tu
69	F/H	8030-00-656-1426	Sealing Compound (81349) MIL-S-45180 1 pt can	pt
70	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	O/F/H	8030-01-155-3238	Sealing Compound (11083) 6V6640 50 ml tube (box contains 6 tubes)	bx
72	F/H	8030-00-220-6973	Sealing Compound (81349) MIL-S-45180 4 oz can	cn

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
73	F/H		Sealing Compound IN 8846	
74	F/H	8030-01-171-7628	Sealing Compound (05972) 272-40 50 cc bottle	bt
75	O/F/H	8030-00-148-9833	Sealing Compound (05972) 271 10 cc bottle (box contains 10 bottles)	bx
75.1	O/F	8030-01-371-8405	Sealing Compound (83574) PR-1422 B-1/2 6 oz cartridge (case contains 36 cartridges)	ca
76	F/H	5305-00-152-0533	Screw, Cap, Hex Head 2-0B113	ea
76.1	F/H	5305-01-157-1391	Screw, Cap, Hex Head 10501611	ea
77	F/H	5305-01-359-8004	Screw, Cap, Hex Head 29505612	ea
78	F/H	5305-01-374-1087	Screw, Cap, Hex Head 12414307-194	ea
78.1	F/H	5305-01-377-0696	Screw, Cap, Hex Head 12414419-128	ea
79	C/O/F/H	7930-00-082-0584	Soap, Laundry (81348) P-S-1792 2 lb box	bx
80	F/H	3439-01-164-0593	Solder (61404) 14675 5 lb spool	sl
81	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
81.1	O/F	5940-01-456-1319	Splice, Conductor (0FW39) 12420927-001	ea
82	F/H	8030-00-060-3167	Tape, Antiseizing (73165) FEL-PRO 51520 520 in. roll	ro
83	O/F/H	8030-00-889-3534	Tape, Antiseizing (81349) MIL-T-27730	ea
84	O/F/H	5640-00-103-2254	Tape, Duct (39428) 1791K70 60 yd roll	ro
85	O/F/H	5970-00-644-3167	Tape, Insulation, Electrical (80063) TL83 85 ft roll	ro
86	F/H	4730-01-146-4113	Tee, Pipe to Tube (96906) MS5154A6	ea
87	F/H		Tee, Swivel (81343) R6X/063T12R6X	ea
88	F/H	8010-00-242-2089	Thinner, Paint Products (81348) TT-T-291TY1 1 gl can	gl

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
89	O/F/H	5935-01-379-4997	Ties, Cable, Plastic box of 100	 bx
89.1	C		Turbine Fuel, Aviation, Kerosene Type (MIL-T-83133), Grade JP-8	
89.2	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
89.3	C		Turbine Fuel, (MIL-F-5624), Grade JP-4 (NATO Code No. F40)	
		9130-00-273-2380	Drum, 16 gage	dr
89.4	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
90	F/H	4020-00-241-8893	Twine, Fibrous (80063) 6Z8827 860 ft ball	 ea
91	F/H	5310-00-110-8978	Washer, Flat 133B6663-6	ea
92	F/H	5310-01-267-1686	Washer, Flat (96906) MS51412-3	ea
93	F/H	5130-00-289-9586	Wheel, Abrasive (81348) GGG-W-290	ea
94	F/H	6145-01-148-2263	Wire, Electrical (80009) 175-0825-00 50 ft	 ft
95	F/H	9505-00-221-2650	Wire, Non-electrical (96906) MS20995C20 1 lb roll	 lb

APPENDIX D
ILLUSTRATED LIST OF MANUFACTURED ITEMS

Section I. INTRODUCTION

D-1. INTRODUCTION

This appendix includes complete instructions for manufacturing or fabricating authorized items locally. All bulk materials needed to manufacture an item are listed by part number or specification number. Figures are provided as needed. See standards and specifications DoD-Std-00100D(AR) and ANSI Y14.5M1982 for required details.

Section II. MANUFACTURED ITEMS INDEX

ITEM NAME/PART NUMBER	ITEM DESCRIPTION	PARA NO.
Brake Adjusting Tool Support		D-1
Brake Plunger Seal Driver		D-2
Cab Front Support Spanner Socket		D-3
Cab Maintenance Stand		D-4
Cab Support Tool		D-5
Engine Stand Bracket Assembly		D-6
Headlight Adjustment Screen		D-7
Left Front Leaf Spring U-Bolt Socket		D-8
Machine Gun Ring Drill Stop		D-9
Machine Gun Ring Wooden Support		D-10
Main Valve Body Spring Compression TooL		D-11
Marking Sleeve		D-12
Relay Test Wire		D-13
Spanner Socket Tool		D-14
Spanner Wrench Tool		D-15
Spreader Bar		D-16
Steering Stop Shim Gage		D-17
Transfer Case Lift Bracket Assembly		D-18
Transmission Auxillary Oil Cooler Rubber Seal		D-19
Transmission Lift and Mounting Bracket Assembly		D-20
Transmission Lifting Bracket		D-21
Wheel Bearing Shim Tool Rest		D-22
12378512	Battery 12V Cable Assembly	D-23
12378575	Battery Ground Cable Assembly	D-24
12378576	Battery 24V Cable Assembly	D-25
12420265	Double-Sided Tape	D-26
12420489	Block Seal	D-27
12412332-003	Air Duct Hose	D-28
12412332-012	Air Duct Hose	D-28
12412332-040	Air Duct Hose	D-28
12412332-048	Air Duct Hose	D-28
12412332-066	Air Duct Hose	D-28
12412332-096	Air Duct Hose	D-28

Section II. MANUFACTURED ITEMS INDEX (CONT)

ITEM NAME/PART NUMBER	ITEM DESCRIPTION	PARA NO.
12412332-180	Air Duct Hose	D-28
12412367-038	Non-Metallic Flex Conduit	D-29
12412367-046	Non-Metallic Flex Conduit	D-29
12412367-064	Non-Metallic Flex Conduit	D-29
12412367-094	Non-Metallic Flex Conduit	D-29
12412367-178	Non-Metallic Flex Conduit	D-29
12414690-001	Pneumatic Tube	D-30
12414690-002	Pneumatic Tube	D-30
12414690-004	Pneumatic Tube	D-30
12414690-005	Pneumatic Tube	D-30
12414690-010	Pneumatic Tube	D-30
12414690-101	Pneumatic Tube	D-30
12414690-102	Pneumatic Tube	D-30
12414690-103	Pneumatic Tube	D-30
12414690-104	Pneumatic Tube	D-30
12414690-105	Pneumatic Tube	D-30
12414690-106	Pneumatic Tube	D-30
12414690-107	Pneumatic Tube	D-30
12414690-108	Pneumatic Tube	D-30
12414690-109	Pneumatic Tube	D-30
12414690-112	Pneumatic Tube	D-30
12414690-113	Pneumatic Tube	D-30
12414690-115	Pneumatic Tube	D-30
12414690-118	Pneumatic Tube	D-30
12414690-119	Pneumatic Tube	D-30
12414690-120	Pneumatic Tube	D-30
12414690-121	Pneumatic Tube	D-30
12414690-122	Pneumatic Tube	D-30
12414690-123	Pneumatic Tube	D-30
12414690-124	Pneumatic Tube	D-30
12414690-125	Pneumatic Tube	D-30
12414690-126	Pneumatic Tube	D-30
12414690-127	Pneumatic Tube	D-30
12414690-201	Pneumatic Tube	D-30
12414690-202	Pneumatic Tube	D-30
12414690-203	Pneumatic Tube	D-30
12414690-205	Pneumatic Tube	D-30
12414690-206	Pneumatic Tube	D-30
12414690-207	Pneumatic Tube	D-30
12414690-208	Pneumatic Tube	D-30
12414690-209	Pneumatic Tube	D-30
12414690-210	Pneumatic Tube	D-30
12414690-211	Pneumatic Tube	D-30
12414690-212	Pneumatic Tube	D-30
12414690-213	Pneumatic Tube	D-30
12414690-214	Pneumatic Tube	D-30
12414690-215	Pneumatic Tube	D-30
12414690-216	Pneumatic Tube	D-30
12414690-217	Pneumatic Tube	D-30
12414690-218	Pneumatic Tube	D-30
12414690-219	Pneumatic Tube	D-30
12414690-220	Pneumatic Tube	D-30
12414690-221	Pneumatic Tube	D-30

Section II. MANUFACTURED ITEMS INDEX (CONT)

ITEM NAME/PART NUMBER	ITEM DESCRIPTION	PARA NO.
12414690-222	Pneumatic Tube	D-30
12414690-223	Pneumatic Tube	D-30
12414690-224	Pneumatic Tube	D-30
12414690-225	Pneumatic Tube	D-30
12414690-226	Pneumatic Tube	D-30
12414690-227	Pneumatic Tube	D-30
12414690-228	Pneumatic Tube	D-30
12414690-229	Pneumatic Tube	D-30
12414690-230	Pneumatic Tube	D-30
12414690-231	Pneumatic Tube	D-30
12414690-301	Pneumatic Tube	D-30
12414690-302	Pneumatic Tube	D-30
12414690-303	Pneumatic Tube	D-30
12414694-X508	Pneumatic Hose Assembly	D-31
12414694-X558	Pneumatic Hose Assembly	D-31
12416381P1	Non-Metallic Electrical Cable Conduit	D-32
12416381P10	Non-Metallic Electrical Cable Conduit	D-32
12416381P11	Non-Metallic Electrical Cable Conduit	D-32
12416381P12	Non-Metallic Electrical Cable Conduit	D-32
12416381P13	Non-Metallic Electrical Cable Conduit	D-32
12416381P14	Non-Metallic Electrical Cable Conduit	D-32
12416381P15	Non-Metallic Electrical Cable Conduit	D-32
12416381P16	Non-Metallic Electrical Cable Conduit	D-32
12416381P17	Non-Metallic Electrical Cable Conduit	D-32
12416381P2	Non-Metallic Electrical Cable Conduit	D-32
12416381P20	Non-Metallic Electrical Cable Conduit	D-32
12416381P21	Non-Metallic Electrical Cable Conduit	D-32
12416381P22	Non-Metallic Electrical Cable Conduit	D-32
12416381P23	Non-Metallic Electrical Cable Conduit	D-32
12416381P26	Non-Metallic Electrical Cable Conduit	D-32
12416381P3	Non-Metallic Electrical Cable Conduit	D-32
12416381P30	Non-Metallic Electrical Cable Conduit	D-32
12416381P32	Non-Metallic Electrical Cable Conduit	D-32
12416381P34	Non-Metallic Electrical Cable Conduit	D-32
12416381P35	Non-Metallic Electrical Cable Conduit	D-32
12416381P36	Non-Metallic Electrical Cable Conduit	D-32
12416381P37	Non-Metallic Electrical Cable Conduit	D-32
12416381P38	Non-Metallic Electrical Cable Conduit	D-32
12416381P4	Non-Metallic Electrical Cable Conduit	D-32
12416381P5	Non-Metallic Electrical Cable Conduit	D-32
12416381P6	Non-Metallic Electrical Cable Conduit	D-32
12416381P8	Non-Metallic Electrical Cable Conduit	D-32
12416381P9	Non-Metallic Electrical Cable Conduit	D-32
12417926-001	Compressor Hose	D-33
12417926-002	Compressor Hose	D-33
12417926-004	Compressor Hose	D-33
12418037	Steering Gear Return Hose	D-34
12418460-001	Transmission Oil Cooler Hose	D-34
12418460-002	Transmission Oil Cooler Hose	D-34
12418763	Lanyard Assembly	D-35
12420036	Wooden Skid	D-36
12420062-002	Pneumatic Hose Assembly	D-31
12420062-003	Pneumatic Hose Assembly	D-31

Section II. MANUFACTURED ITEMS INDEX (CONT)

ITEM NAME/PART NUMBER	ITEM DESCRIPTION	PARA NO.
12420062-004	Pneumatic Hose Assembly	D-31
12420062-005	Pneumatic Hose Assembly	D-31
12420063-002	Pneumatic Hose Assembly	D-31
12420064-001	Pneumatic Hose Assembly	D-31
12420064-002	Pneumatic Hose Assembly	D-31
12420064-006	Pneumatic Hose Assembly	D-31
12420064-009	Pneumatic Hose Assembly	D-31
12420196	Lanyard Assembly	D-35
12420197-001	Non-Metallic Vent Air Hose	D-37
12420197-002	Non-Metallic Vent Air Hose	D-37
12420197-003	Non-Metallic Vent Air Hose	D-37
12420197-004	Non-Metallic Vent Air Hose	D-37
12420197-005	Non-Metallic Vent Air Hose	D-37
12420197-006	Non-Metallic Vent Air Hose	D-37
12420198-001	Non-Metallic Vent Air Hose	D-37
12420198-002	Non-Metallic Vent Air Hose	D-37
12420308-457	Personnel Heater Air Duct Hose	D-38
12420308-760	Personnel Heater Air Duct Hose	D-38
12420398	CTIS Quick Release Valve Spacer	D-39
12420419-001	CTIS Vent Hose	D-40
12420419-002	CTIS Vent Hose	D-40
3256-H-1048	CTIS Seal Driver	D-41
3256-J-1050	Front Axle Shaft Seal Driver	D-42
3256-K-1051	Wheel Hub Grease Seal Driver	D-43
3256-M-1053	Differential Pinion Seal Driver	D-44
3256-S-1059	Front and Rear Differential Yoke Seal Driver	D-45
Dimmer Switch Test Wire		D-46
Purge Valve Tool		D-47
M1079 Blackout Shield Seals		D-48
M1079 Door Gaskets		D-49
M1079 Window Sash Glazing Seals		D-50
Block Seal 12420489 Fabrication		D-51

Section III. MANUFACTURED ITEMS

D-1. BRAKE ADJUSTING TOOL SUPPORT

Make the brake adjusting tool support from 0.134 in. (3.4 mm) flat steel stock according to the following instructions. Refer to the parts list and **Figure D-1. 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

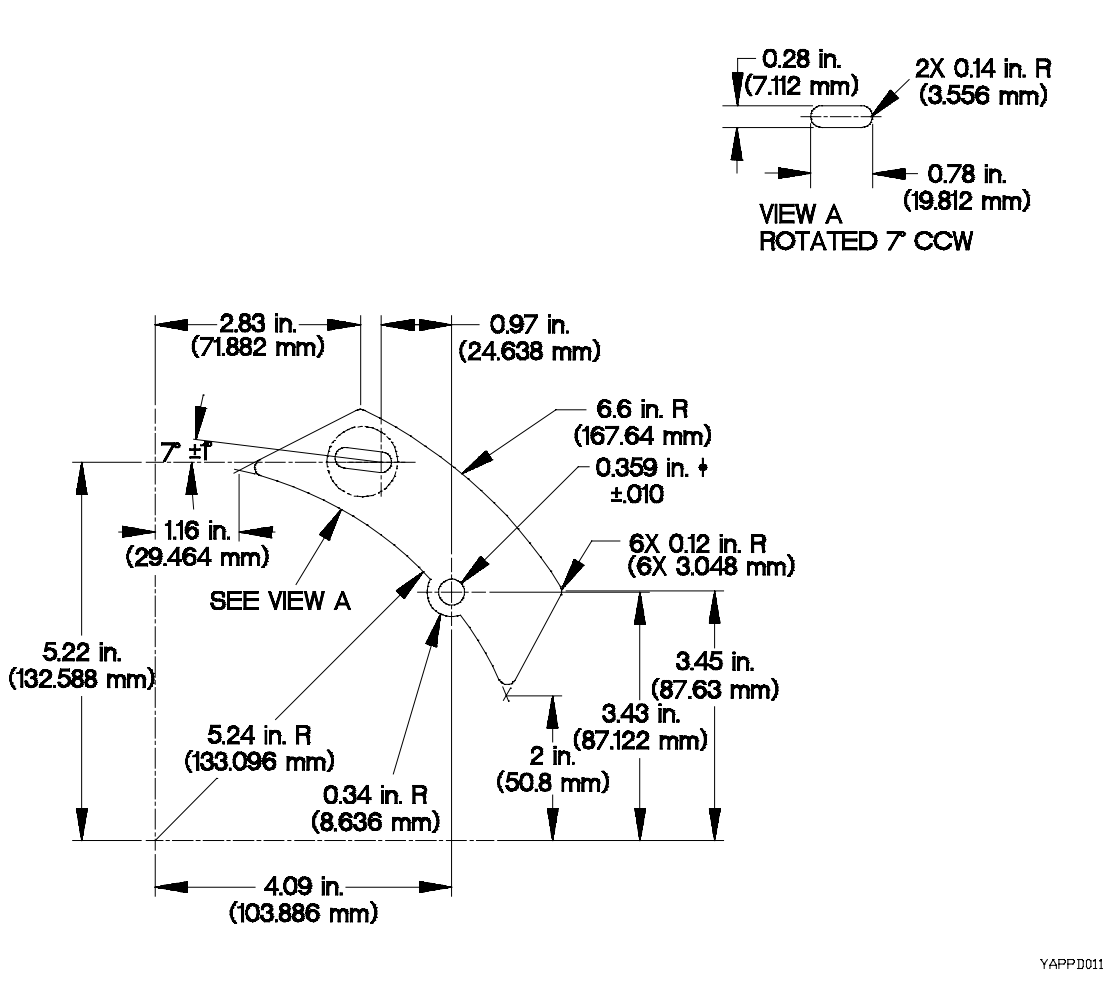


Figure D-1. Brake Adjusting Tool Support

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

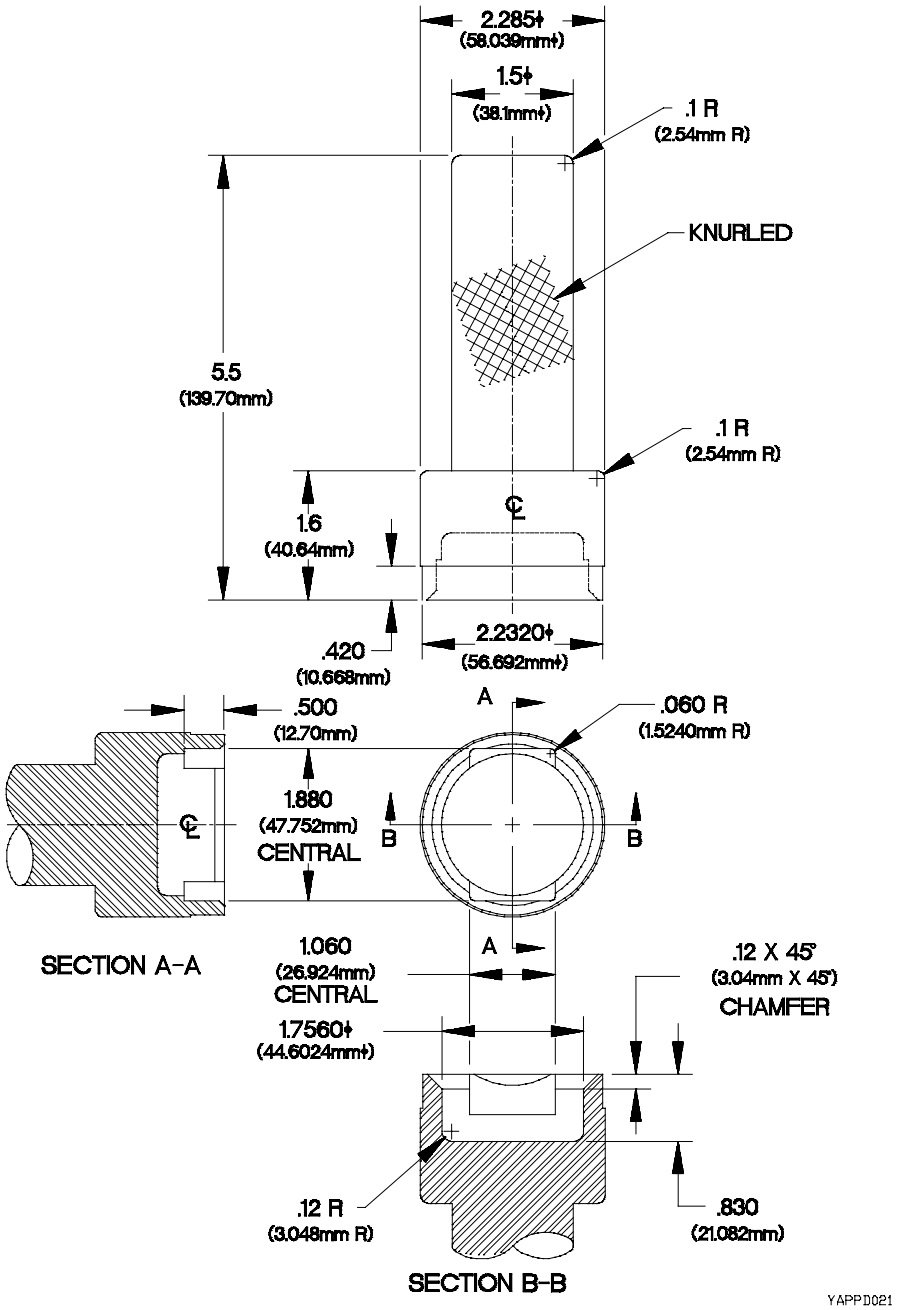


Figure D-2. Brake Plunger Seal Driver

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

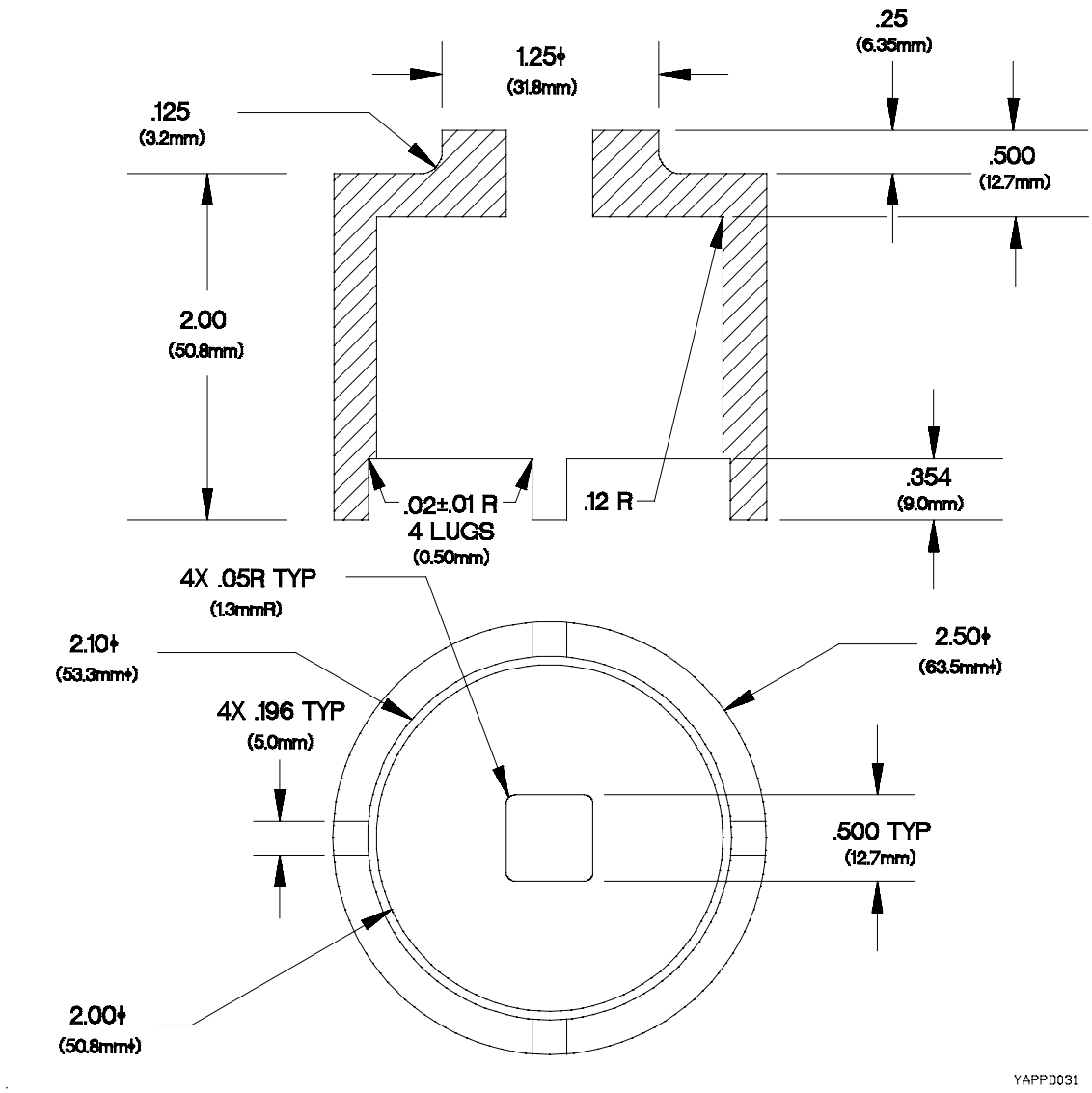


Figure D-3. Cab Front Support Spanner Socket

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

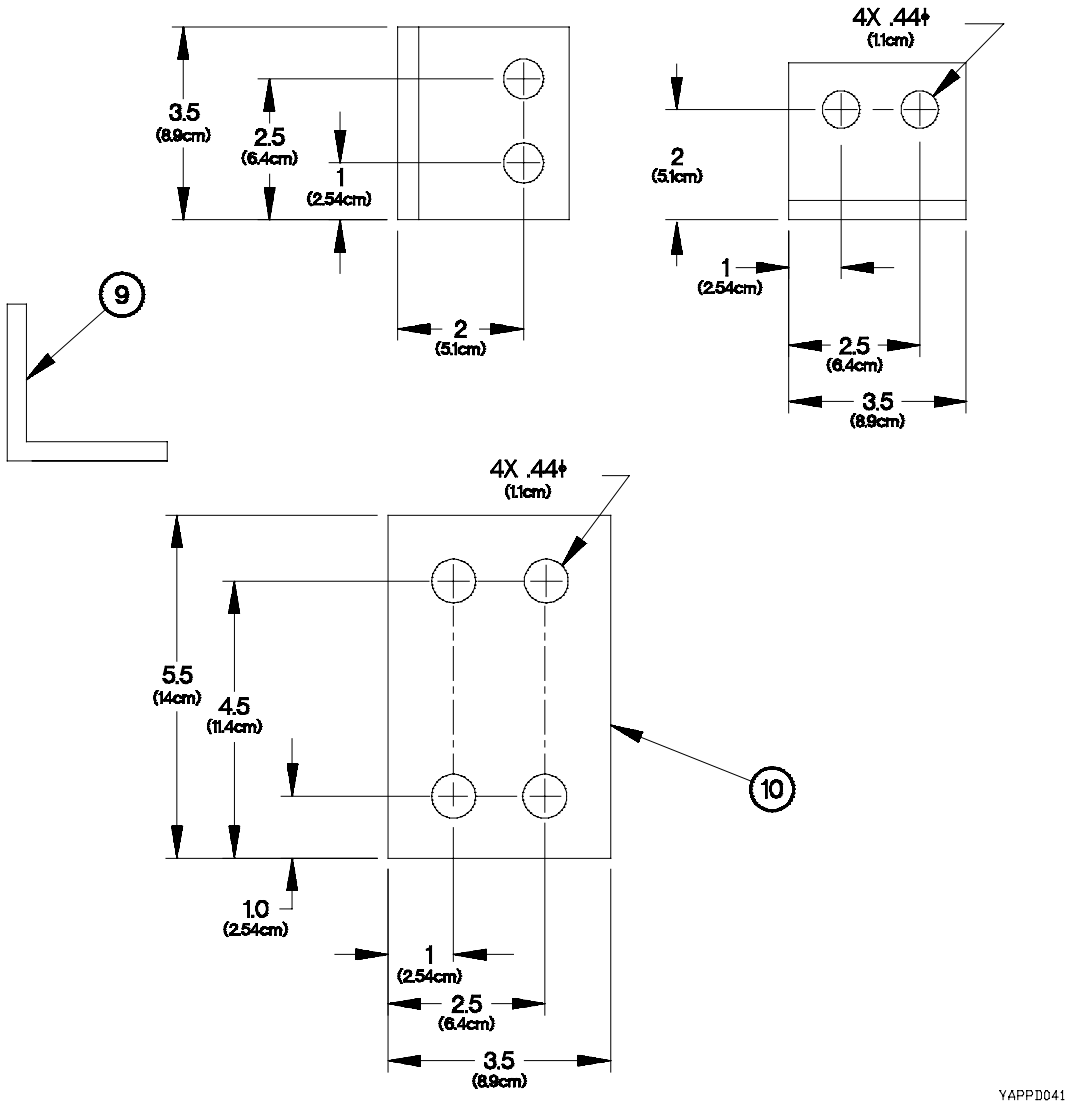


Figure D-4. Cab Maintenance Stand Angle Brackets and Straight Brackets

a. All dimensions are in inches (millimeters).
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.

D-4. CAB MAINTENANCE STAND (CONT)

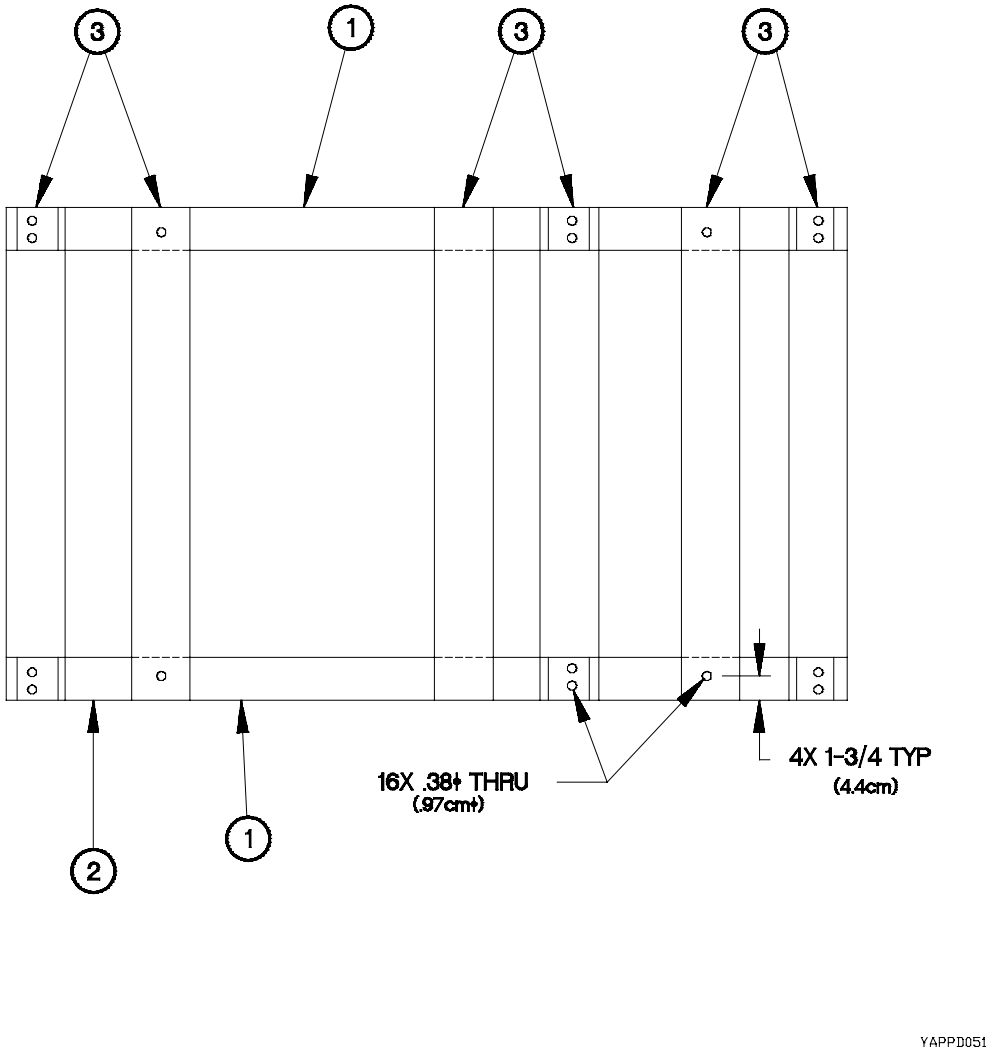


Figure D-5. Cab Maintenance Stand Base Angle Bracket Locations

e. Using angle bracket (9) as a template, mark holes and match drill 0.38 in (9.6 mm) 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.

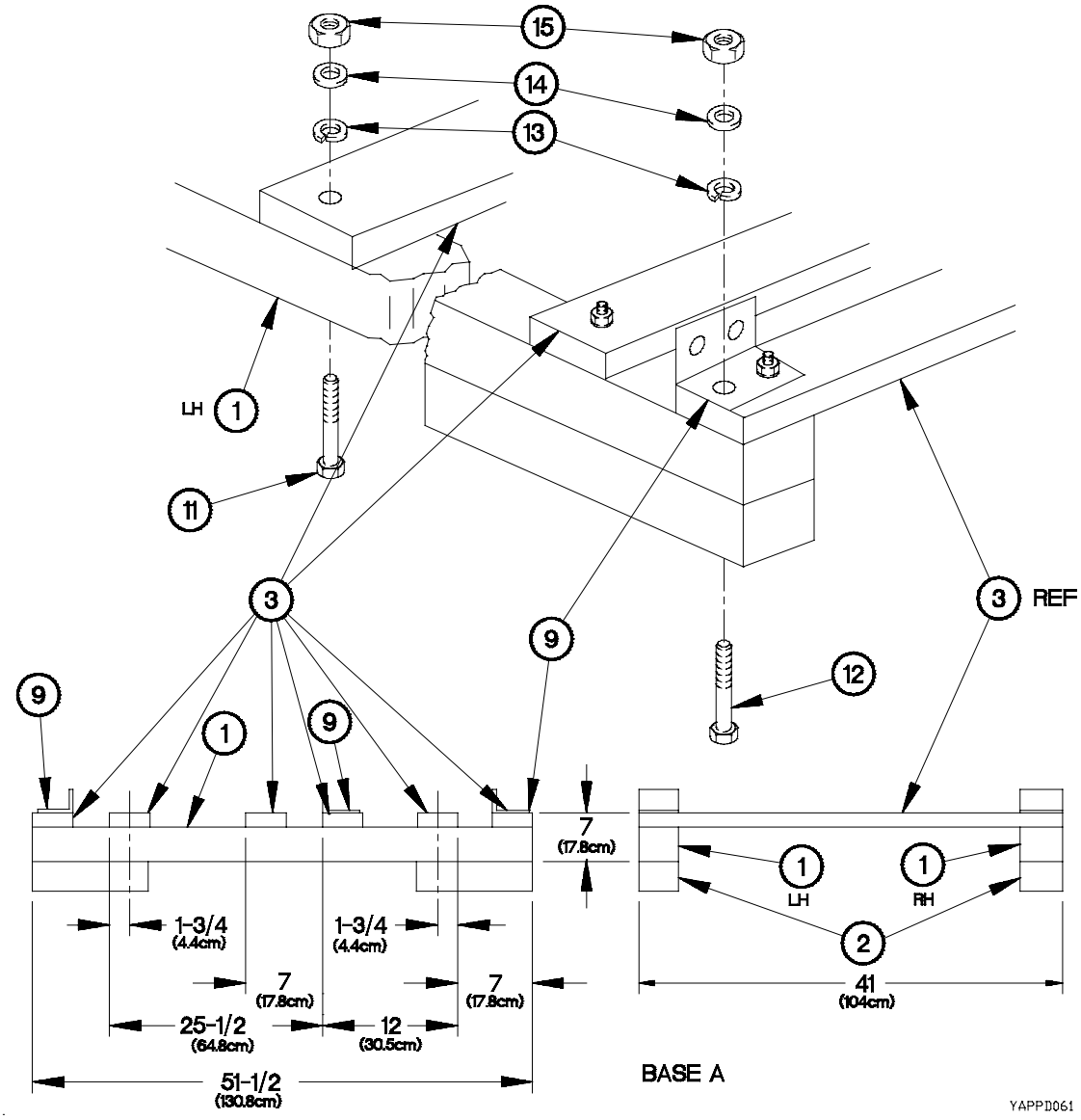


Figure D-6. Cab Maintenance Stand Base Fabrication

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**.

D-4. CAB MAINTENANCE STAND (CONT)

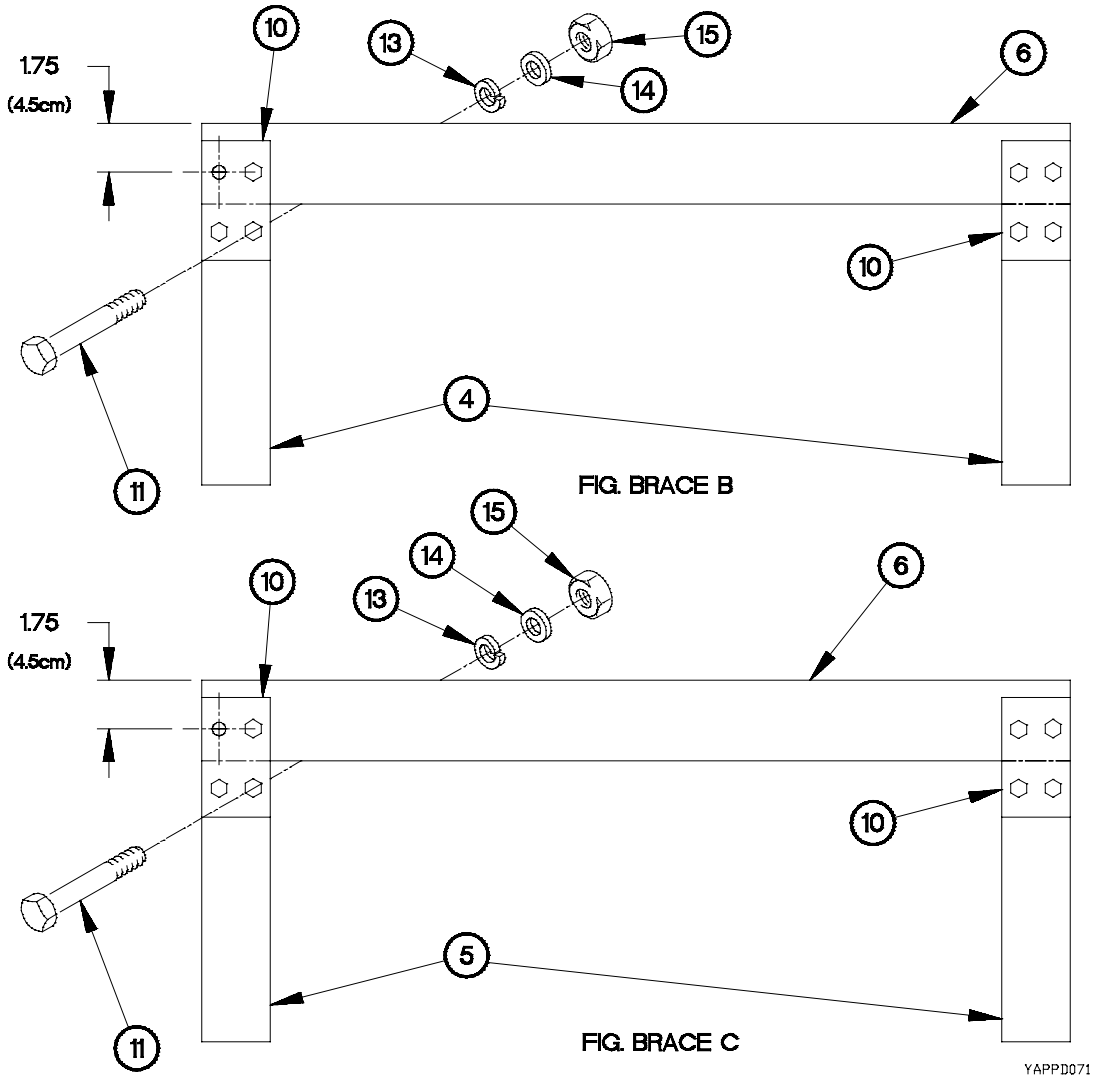


Figure D-7. Cab Maintenance Stand Brace Bracket Locations

h. Using straight bracket (10) as a template, mark holes and match drill 0.38 in. (9.6 mm) 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. (9.6 mm) 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).

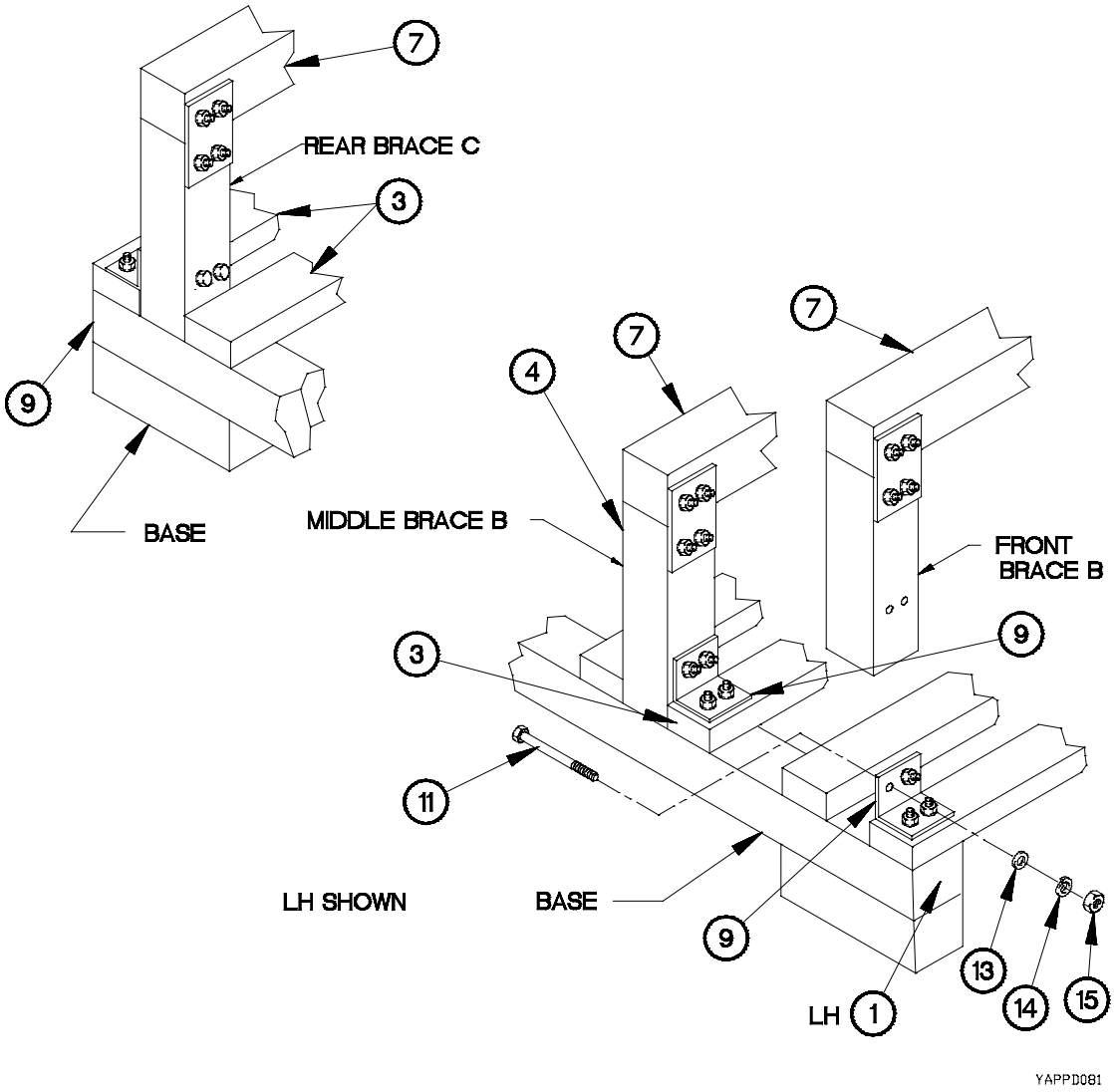


Figure D-8. Cab Maintenance Stand Brace to Base Assembly

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. (9.6 mm) 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.

D-4. CAB MAINTENANCE STAND (CONT)

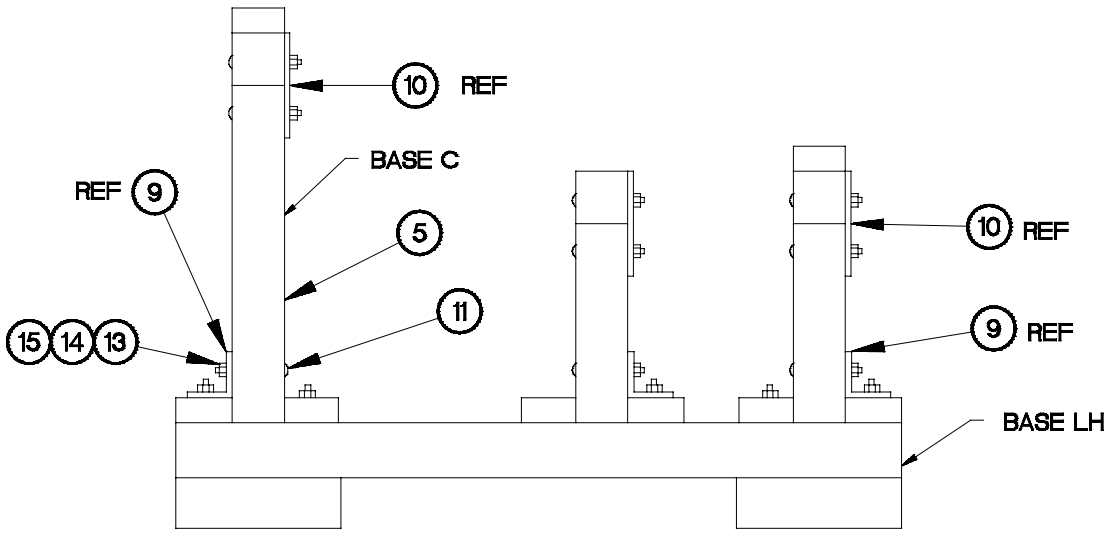


Figure D-9. Cab Maintenance Stand Side Braces Side View

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. (9.6 mm) 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.

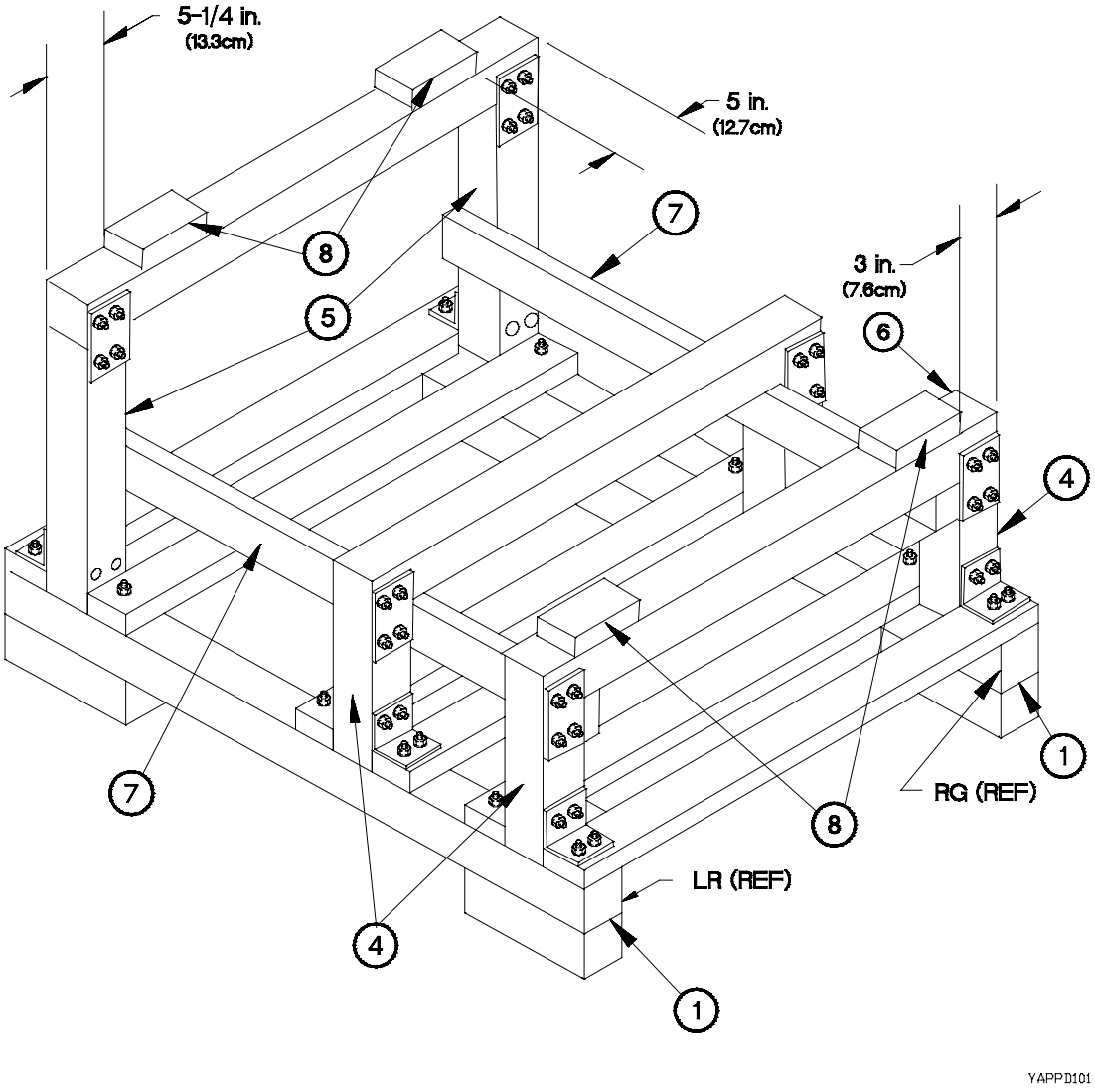


Figure D-10. Cab Maintenance Stand Assembly

t. Nail 1 pad (8) to support (6) at rear of stand 5-1/4 in. (133 mm) from left hand rear brace (5). Nail 1 pad (8) to support (6) at rear of stand 5 in. (127 mm) from right hand rear brace (5) using number 16 nails.
u. Nail 2 pads (8) to support (6) at front of stand 3 in. (76 mm) 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 in. (9.6 mm) 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. (102 mm) X 33.38 in. X (84.8 cm) X 0.38 in. (9.6 mm)	1
2	N/A	Steel, Flat Bar	4.0 in. (102 mm) X 12.0 in. (305 mm) X 0.38 in. (9.6 mm)	1
3	N/A	Angle Iron	2.0 in. (51 mm) X 2.0 in. (51 mm) X 3.5 in. (89 mm)	2
4	H.S.105VW-1	Omsi;gro[. CSA 105 C		
5	IC 551	Coating, Compound, Plastisol	NA	1

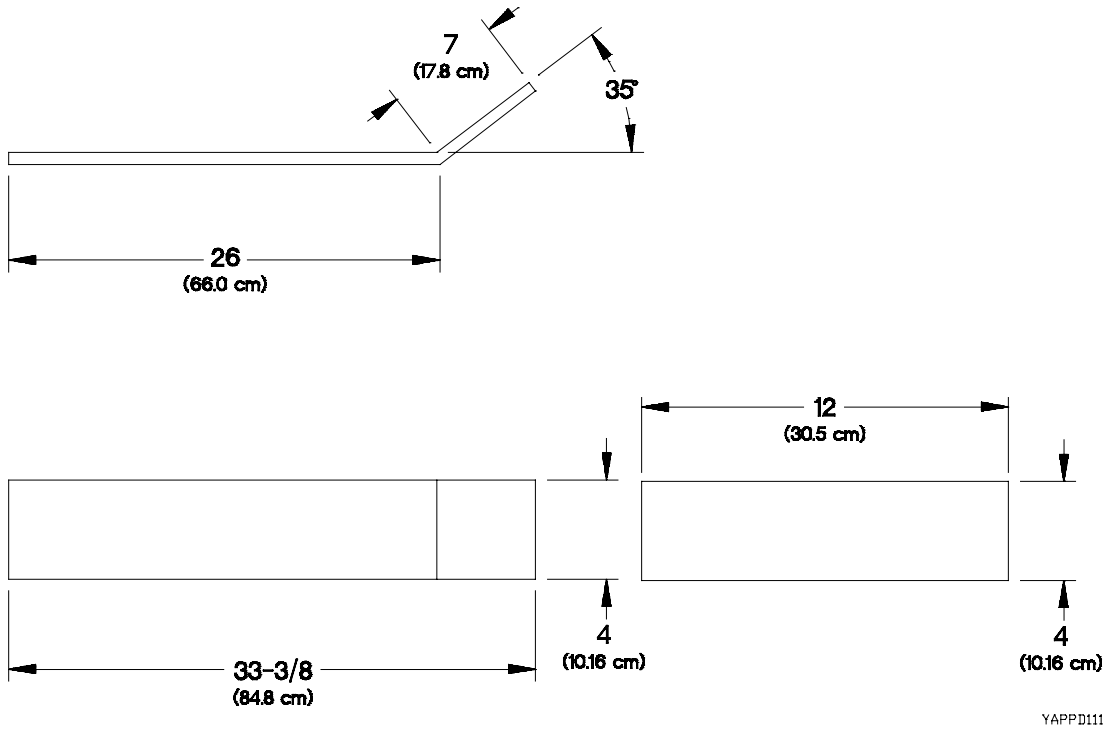


Figure D-11. Cab Support Tool Strut and Cab Rest

a. All dimensions are in inches (millimeters).
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.

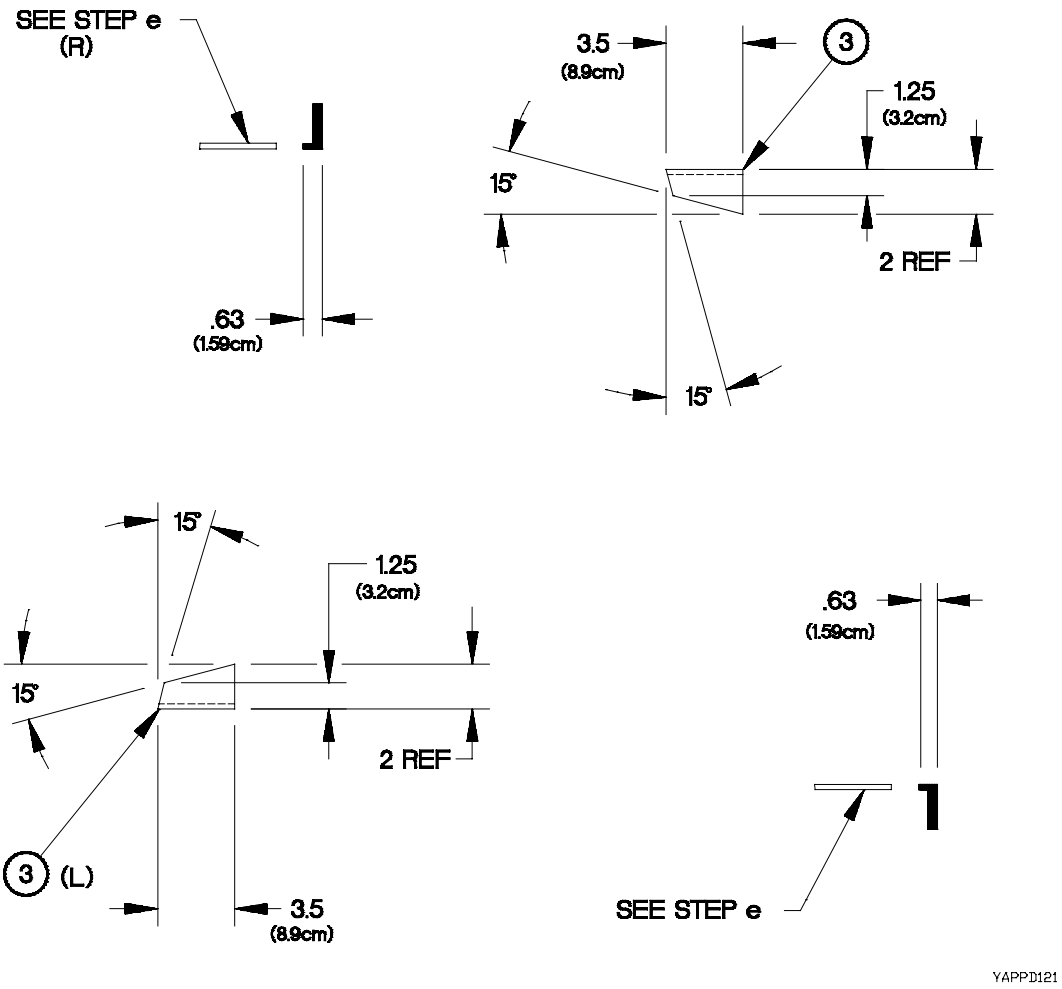


Figure D-12. Cab Support Tool Seat

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 D-12. Cab Support Tool Seat**.
g. De-burr and remove sharp edges.

D-5. CAB SUPPORT TOOL (CONT)

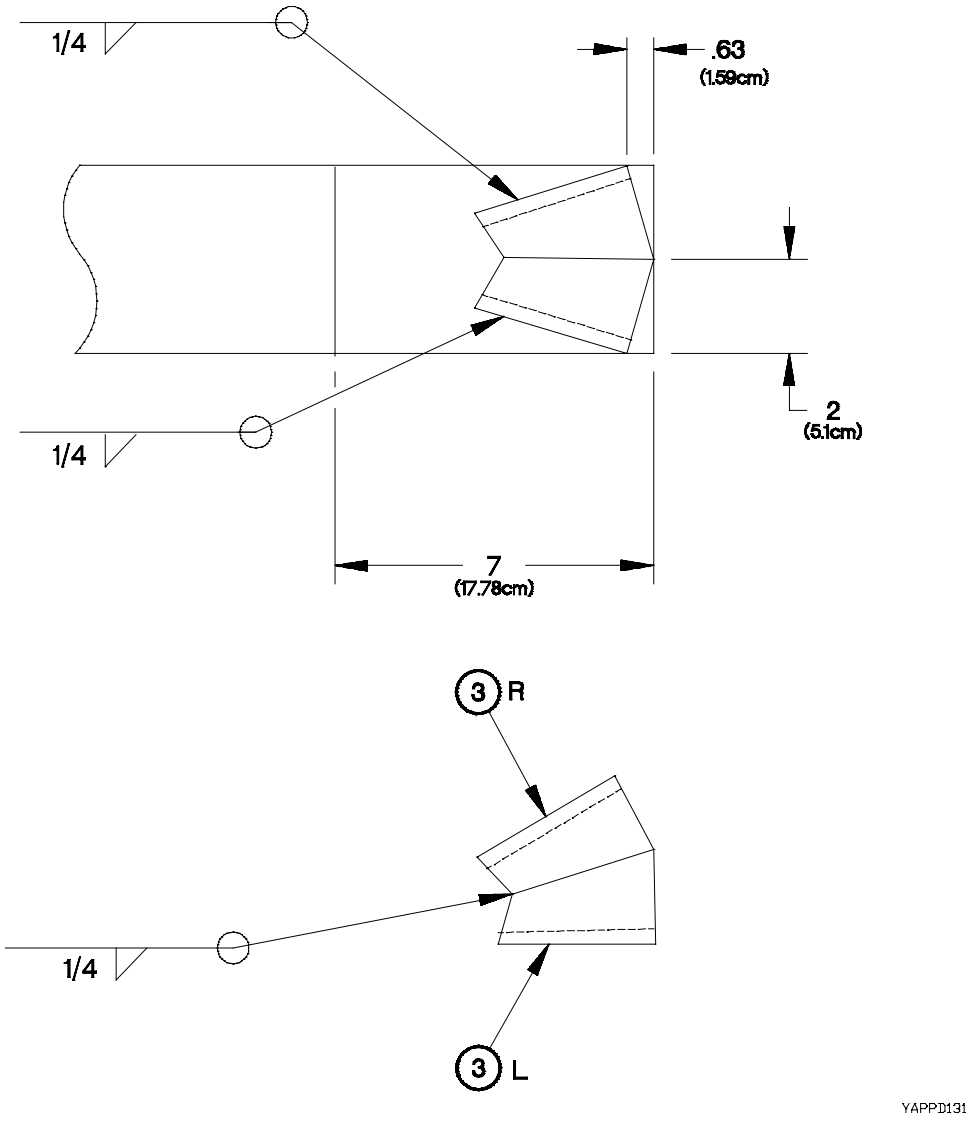


Figure D-13. Cab Support Tool Seat Layout

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.

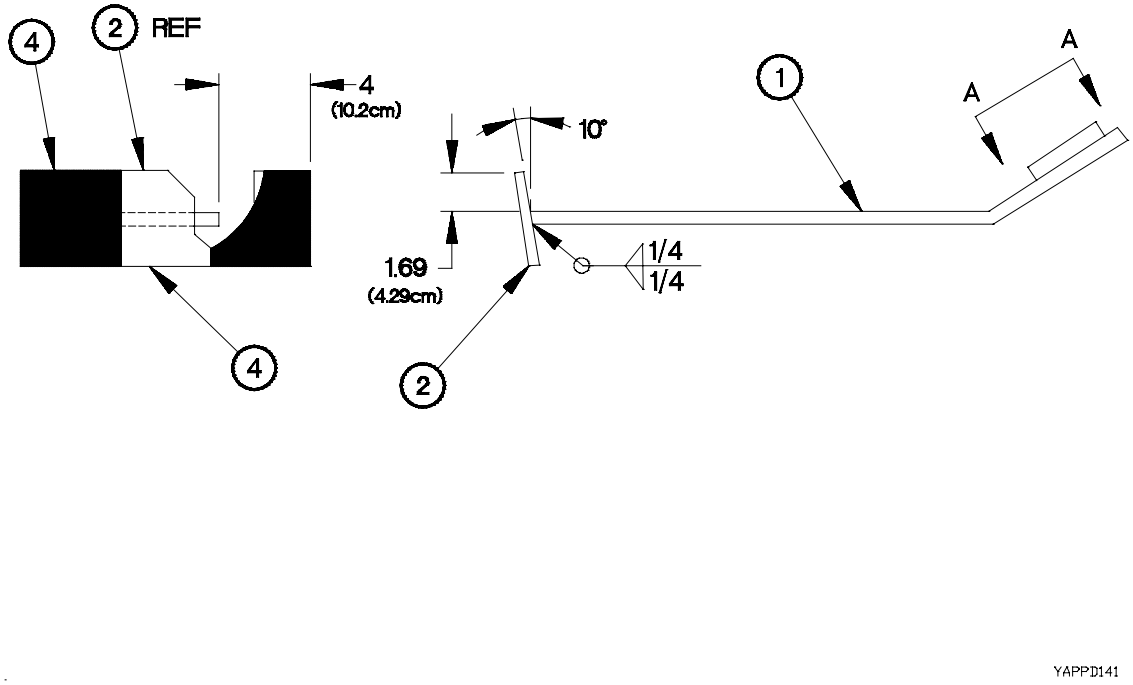


Figure D-14. Cab Support Tool Assembly

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. 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

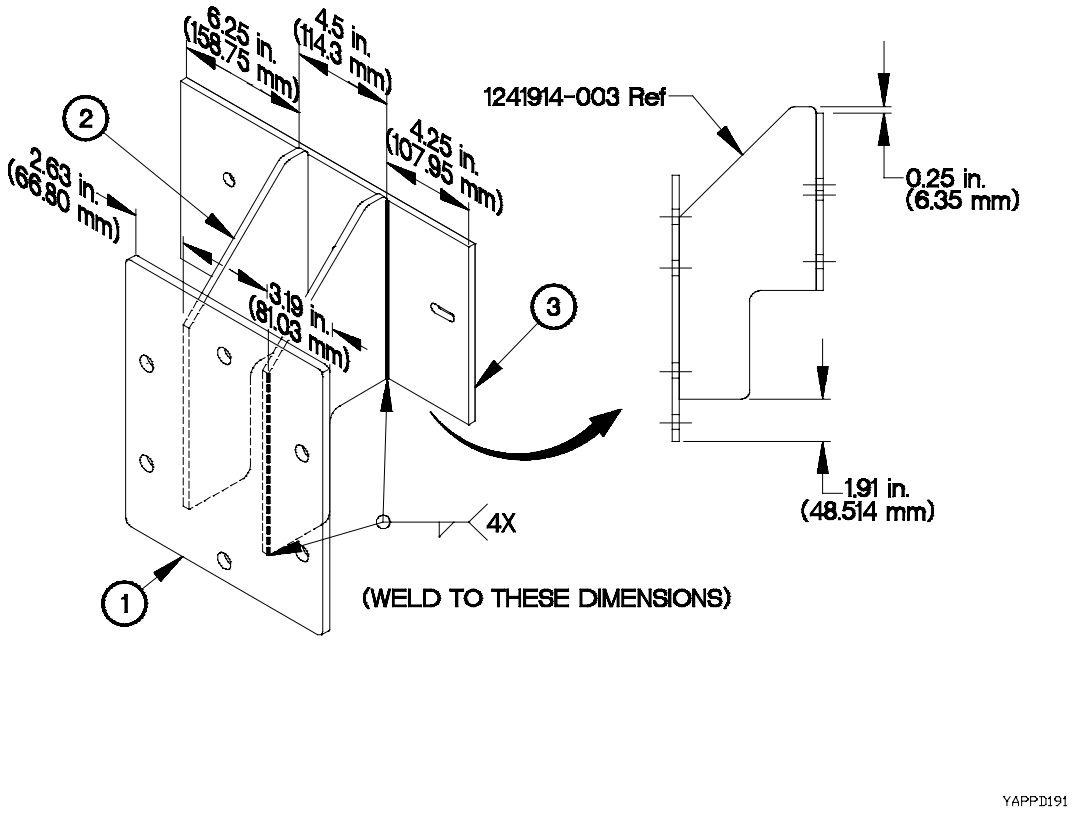


Figure D-15. Engine Stand Bracket Assembly

a. All dimensions are in inches (millimeters).
b. Weld (1), (2) and (3) together as shown by dimensions in **Figure D-15. Engine Stand Bracket Assembly**.

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

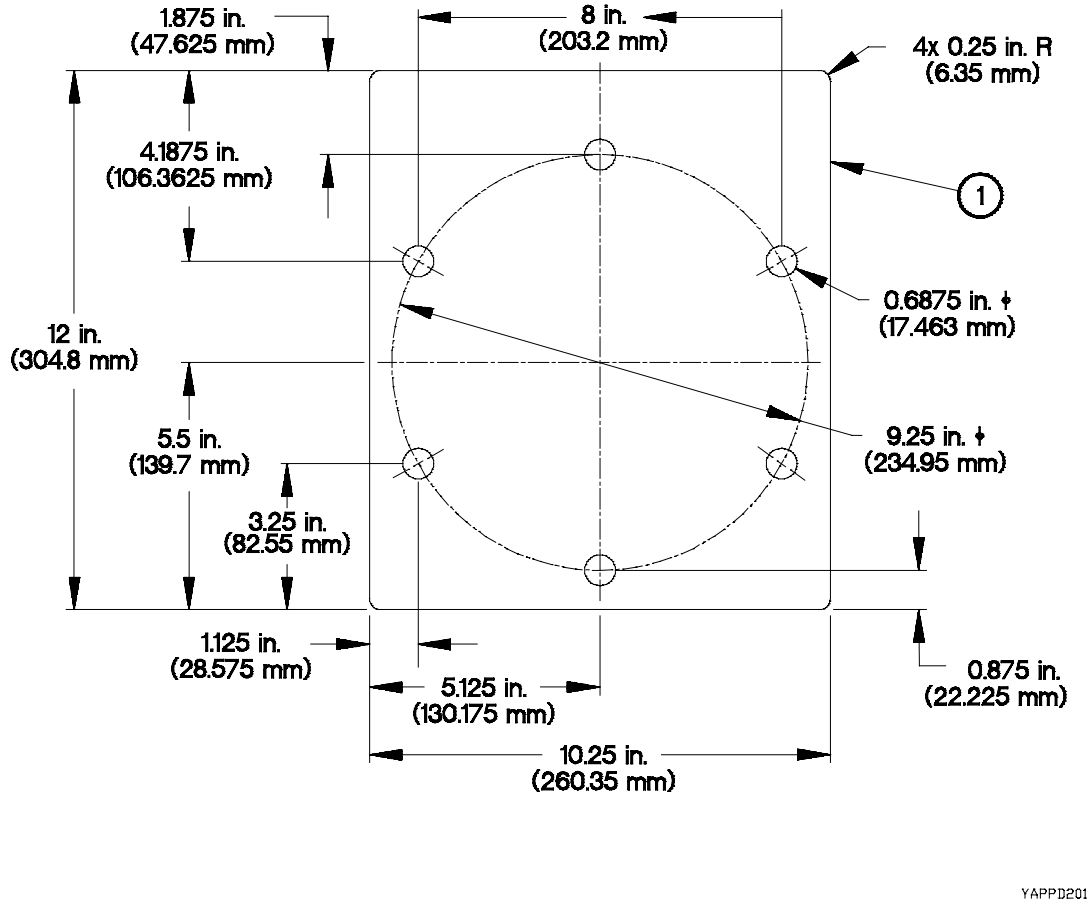


Figure D-16. Engine Stand Bracket Front Plate

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-16. Engine Stand Bracket Front Plate**.
d. Round four corners to 0.25 in. (6.35 mm) radius as shown in **Figure D-16. Engine Stand Bracket Front Plate**.

D-6. ENGINE STAND BRACKET ASSEMBLY (CONT)

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

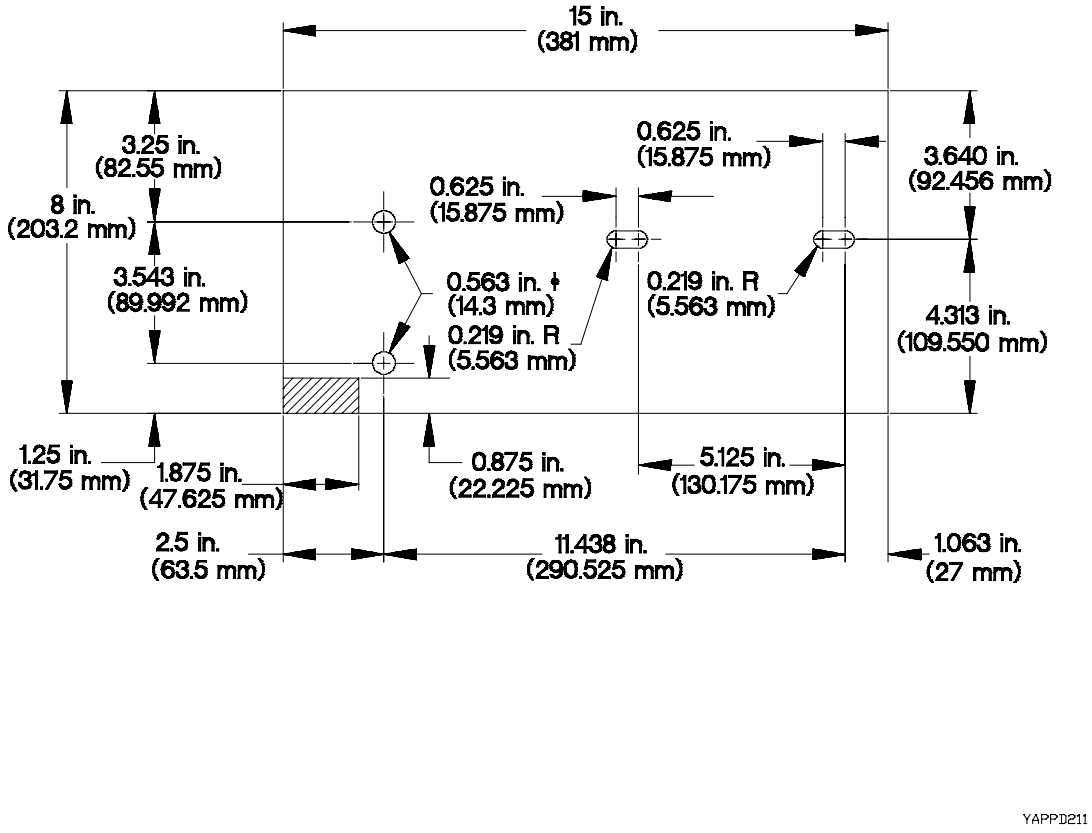


Figure D-17. Engine Stand Bracket Rear Plate

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-17. 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-17. Engine Stand Bracket Rear Plate**.
e. Cut or mill between 0.438 in. (11.1 mm) diameter holes as shown in **Figure D-17. Engine Stand Bracket Rear Plate**.
f. De-burr and remove all sharp edges.

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

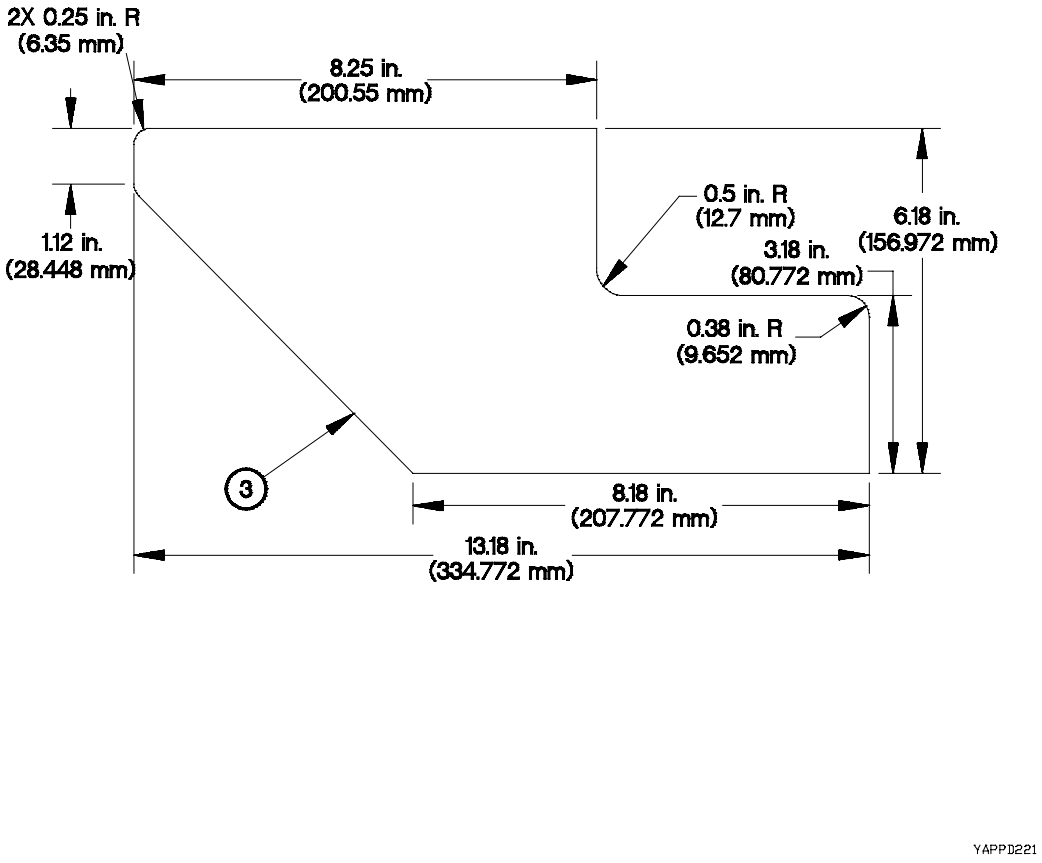


Figure D-18. Engine Stand Bracket Side Plates

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-18. Engine Stand Bracket Side Plates**.
e. Round corner to 0.38 in. (9.65 mm) radius as shown in **Figure D-18. Engine Stand Bracket Side Plates**.
f. De-burr and remove all sharp edges.

D-7. HEADLIGHT ADJUSTMENT SCREEN

The headlight adjustment screen may be drawn on any vertical surface at least 50 in. (1270 mm) high and 100 in. (2540 mm) wide.

a. Draw two vertical lines (1) 50 in. (1270 mm) high and 90.6 in. (2300 mm) apart (centered on headlight adjustment screen).

b. Locate two points 40 in. (1016 mm) from floor and 15.3 in. (389 mm) toward the center from each vertical line (1).

c. Draw vertical line (2) about 3-5 in. (76-127 mm) centered on each of the two points.

d. Draw horizontal line (3) about 3-5 in. (76-127 mm) centered on each of the two points.

e. Measure out 4 in. (102 mm) along each vertical line (2) and horizontal line (3) from each of the two points to make 8 in. (203 mm) squares (4).

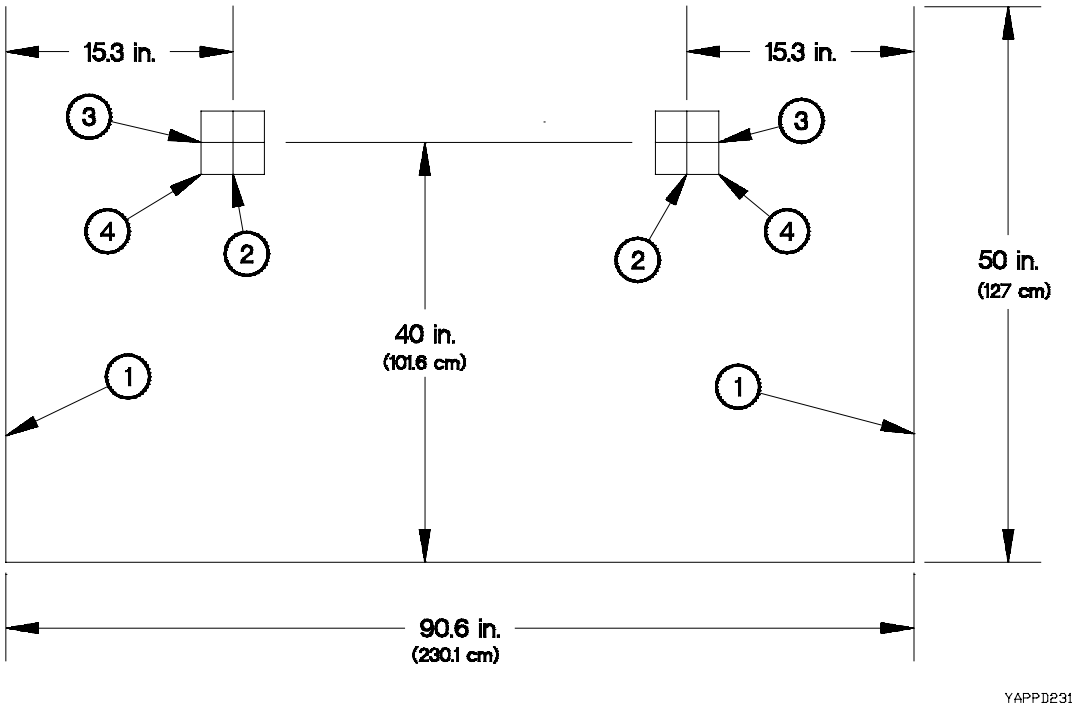


Figure D-19. Headlight Adjustment Screen

D-8. LEFT FRONT LEAF SPRING U-BOLT SOCKET

Use a 6-point 1-1/16 in. or 27 mm 3/4 in. drive impact socket. Grind down wrenching end to a maximum OD of 15 in. (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-9. 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 (19 mm) X 0.25 in. (6.3 mm) long	1
2	5305-00-404-8272	Setscrew	0.164 in. OD (4.1 mm) x 0.125 in. length (3.2 mm) 32 UNC	1

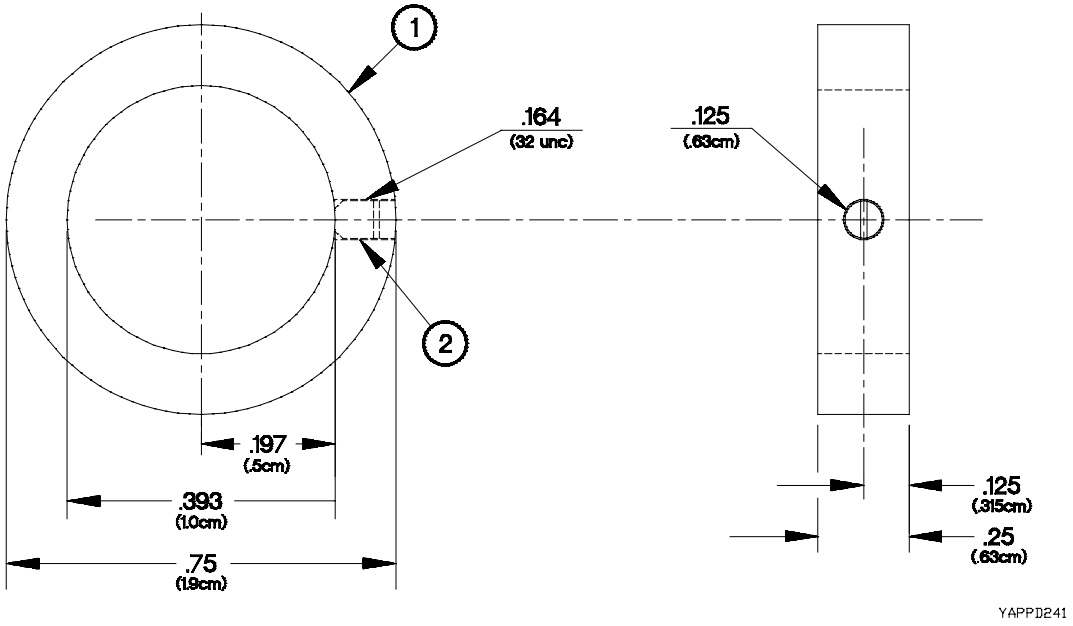


Figure D-20. Machine Gun Ring Drill Stop

a. All dimensions are in in. (millimeters).
b. Drill 0.393 in. (9.9 mm) diameter hole through as shown in **Figure D-20. Machine Gun Ring Drill Stop**.
c. Drill 0.125 in (3.2 mm) diameter hole through for setscrew as shown in **Figure D-20. 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-10 MACHINE GUN RING WOODEN SUPPORT

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 (203 mm) long.
c. Sand and remove sharp edges.

D-11. 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. (12.7 mm) ID X 1.50 in. (38 mm)	1

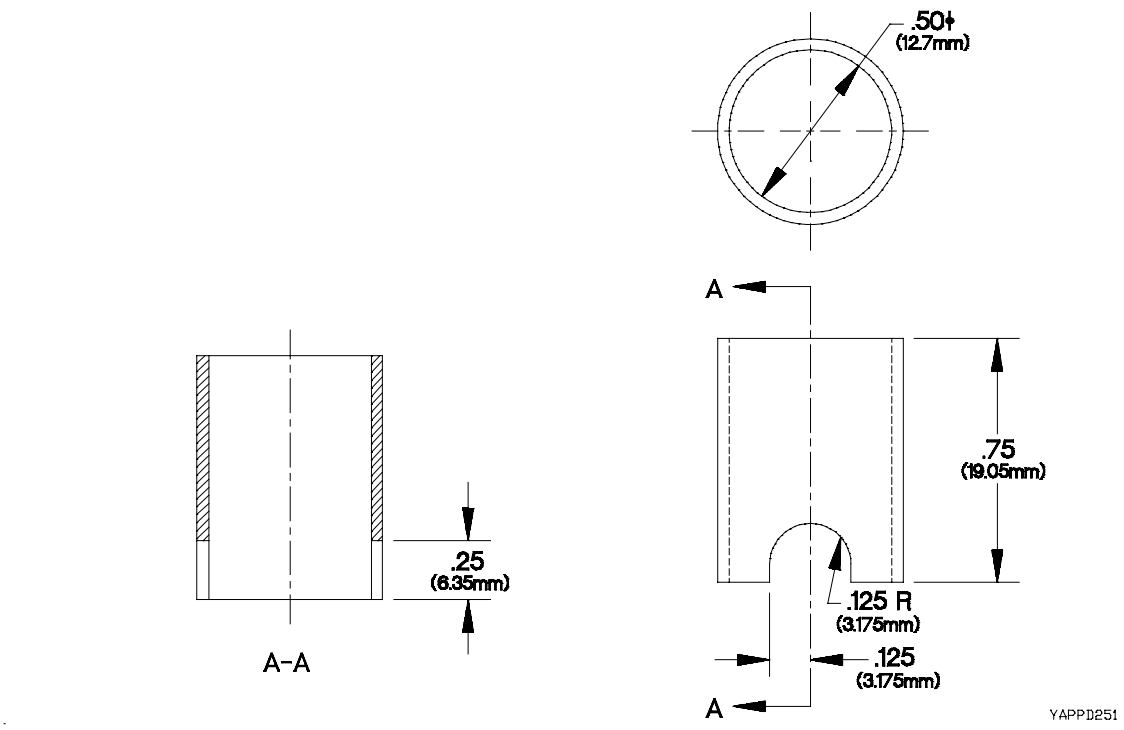


Figure D-21. Main Valve Body Spring Compression Tool

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-12. MARKING SLEEVE FABRICATION

Fabricate marking sleeves according to the following information.

a. Cut from bulk sleeve material 12414663 FP-301-12.7, 2 in. (51 mm).
b. All dimensions are in inches (millimeters).
c. Identify by applying the following applicable numbers to the sleeve according to MIL-STD 130.

CAGE CODE PART NUMBER

D-13. 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-14. 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

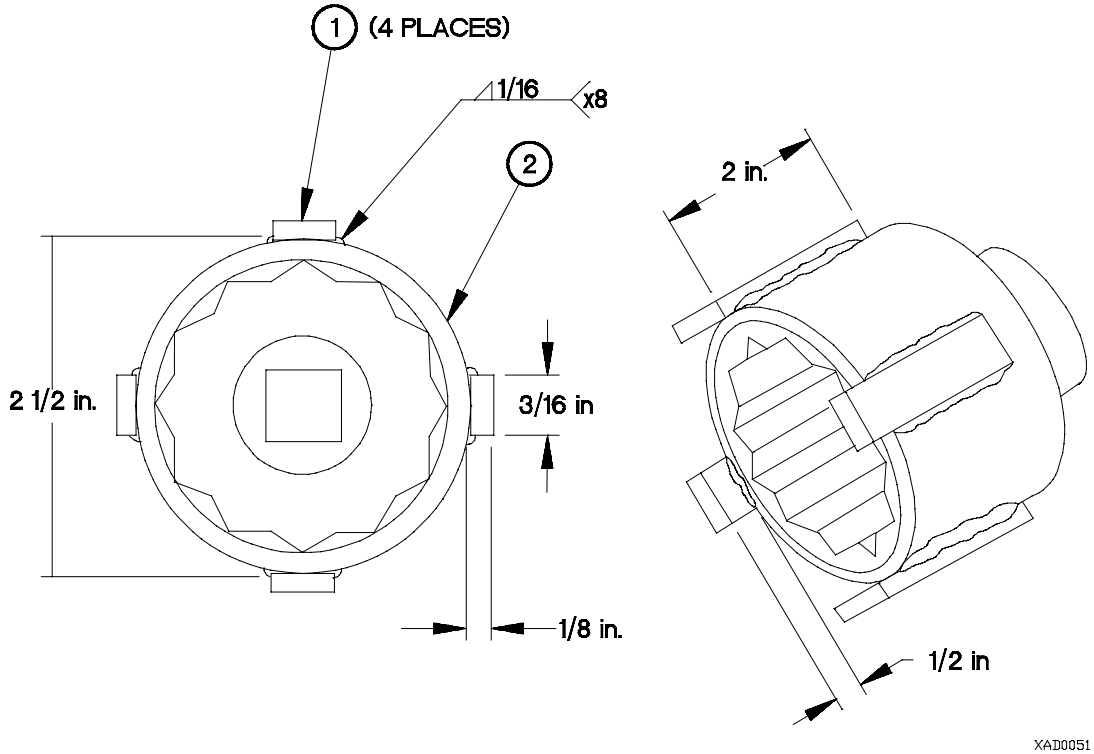


Figure D-22. Spanner Socket Tool

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-22. Spanner Socket Tool**. Ensure keystock extends 1/2 inch beyond socket face.
c. Remove sharp edges.

D-15. SPANNER WRENCH TOOL

Make the spanner wrench tool from 0.38 in. (9.6 mm) 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

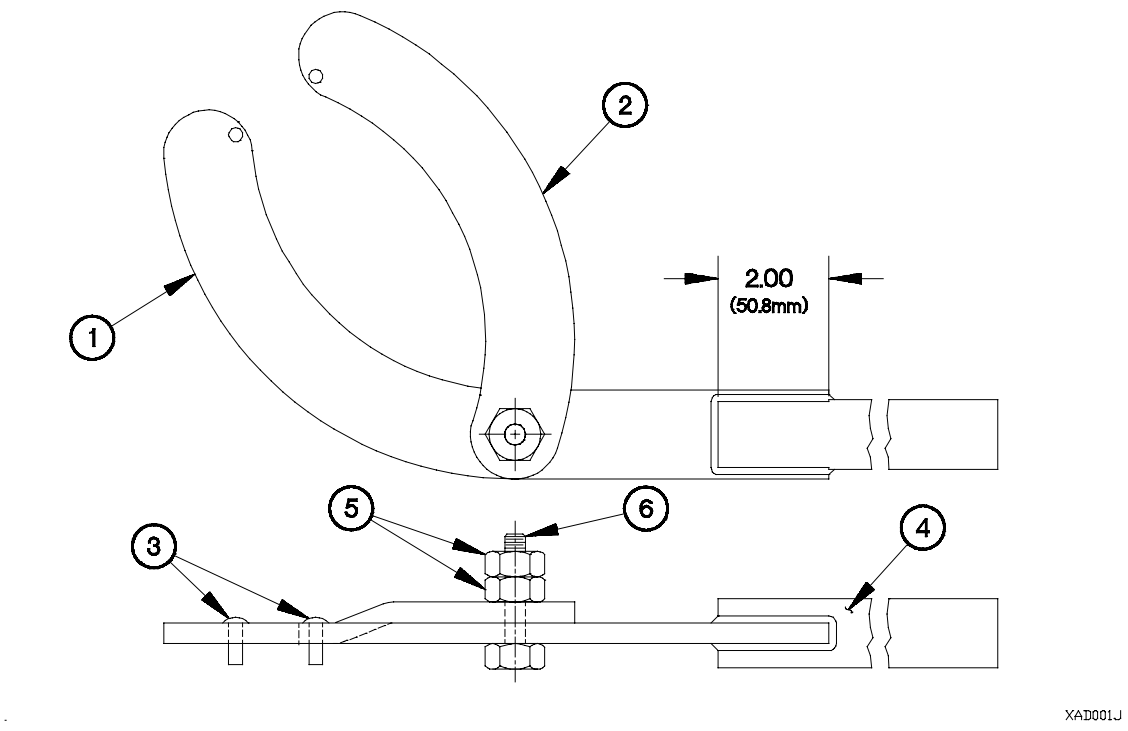


Figure D-23. Spanner Wrench Tool Assembly

a. Weld pins (3) in spanner handle (1) and spanner jaw (2) as shown in **Figure D-23. Spanner Wrench Tool Assembly**.
b. Position and clamp handle (4) to spanner handle piece (1) as shown in **Figure D-23. 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).

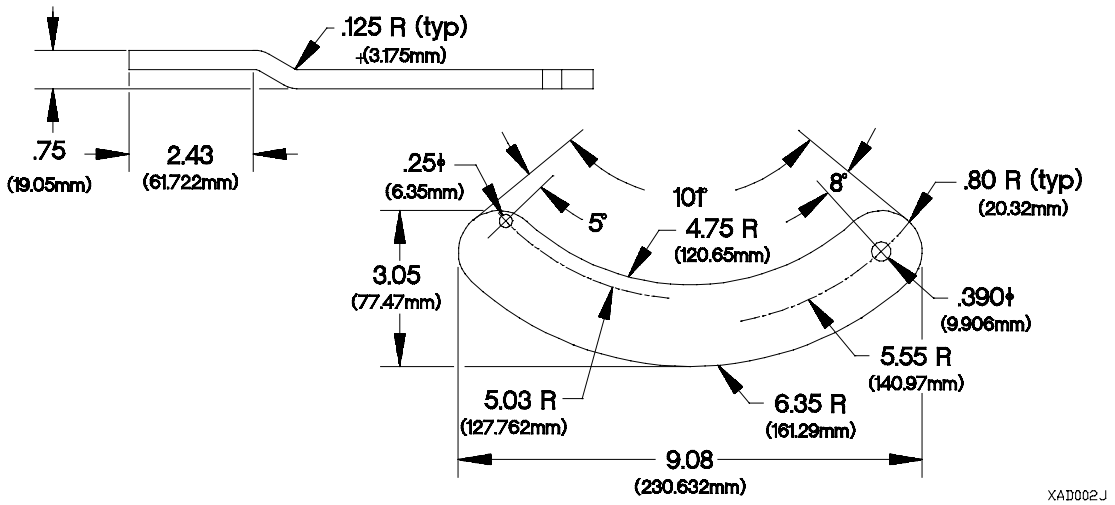


Figure D-24. Spanner Wrench Jaw

a. Shape spanner jaw (2) as shown in **Figure D-24. 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.

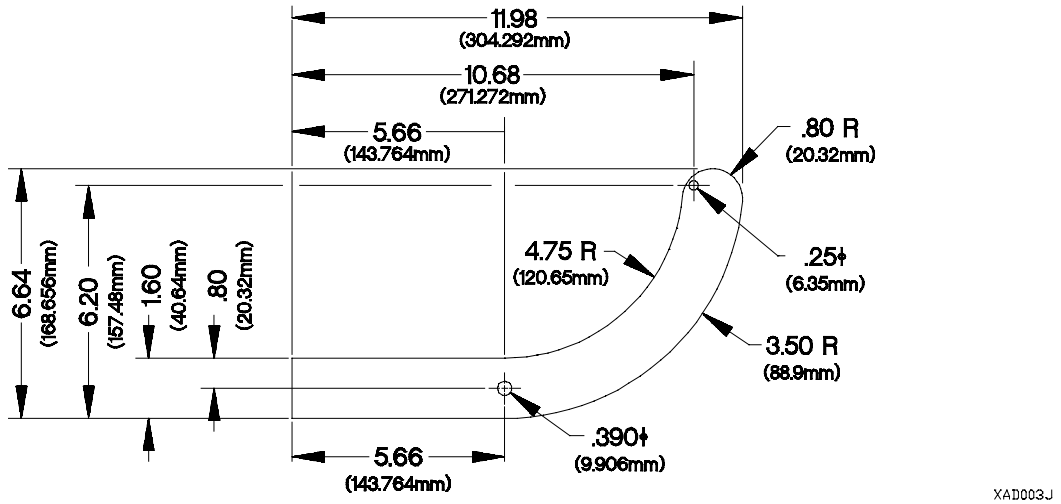


Figure D-25. Spanner Wrench Handle Piece

a. Shape spanner handle piece (1) the same as (2) except as shown in **Figure D-25. 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-25. Spanner Wrench Handle Piece**.
c. Cut slot in handle (4) as shown in **Figure D-25 Spanner Wrench Handle Piece**.
d. De-burr and remove sharp edges.

D-16. 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. (1981 mm) X 5.00 in. (127 mm) X 1.75 in. (44 mm) X 0.38 in. (9.6 mm) thick	1
2	N/A	Rod, steel, ASTM A-36	29.0 in. (736 mm) X 1.00 in. OD (25.4 mm)	1
3	N/A	Rod, steel, ASTM A-36	13.0 in. (330 mm) X 1.00 in. OD (25.4 mm)	2

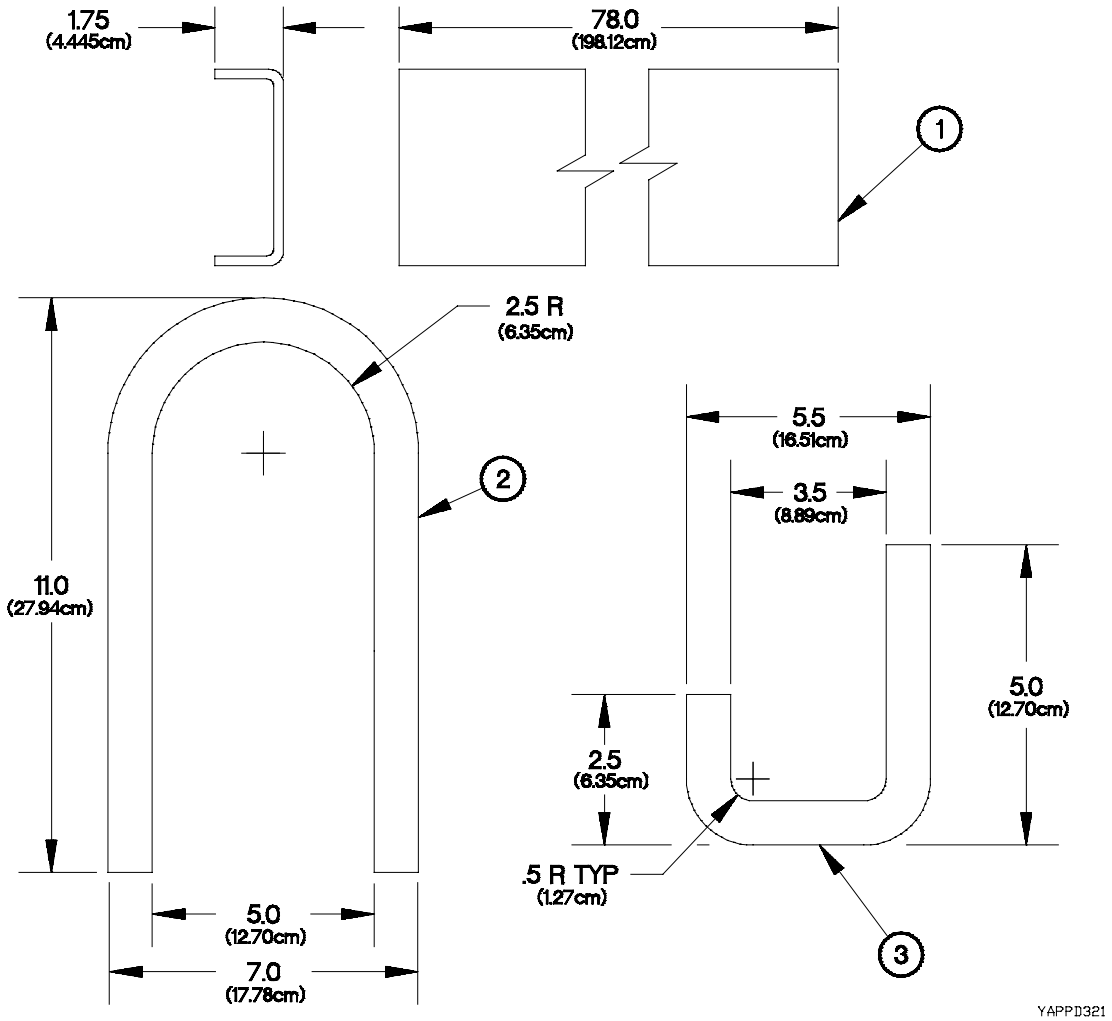


Figure D-26. Spreader Bar Layout

a. All dimensions are in inches (millimeters).
b. Heat and bend lift rod (2) to dimensions shown in **Figure D-26. Spreader Bar Layout**.
c. Heat and bend two guide rods (3) to dimensions shown in **Figure D-26. Spreader Bar Layout**.
d. Cut lift rod (2) and guide rods (3) to final dimensions shown in **Figure D-26 Spreader Bar Layout**.
e. De-burr and remove sharp edges.

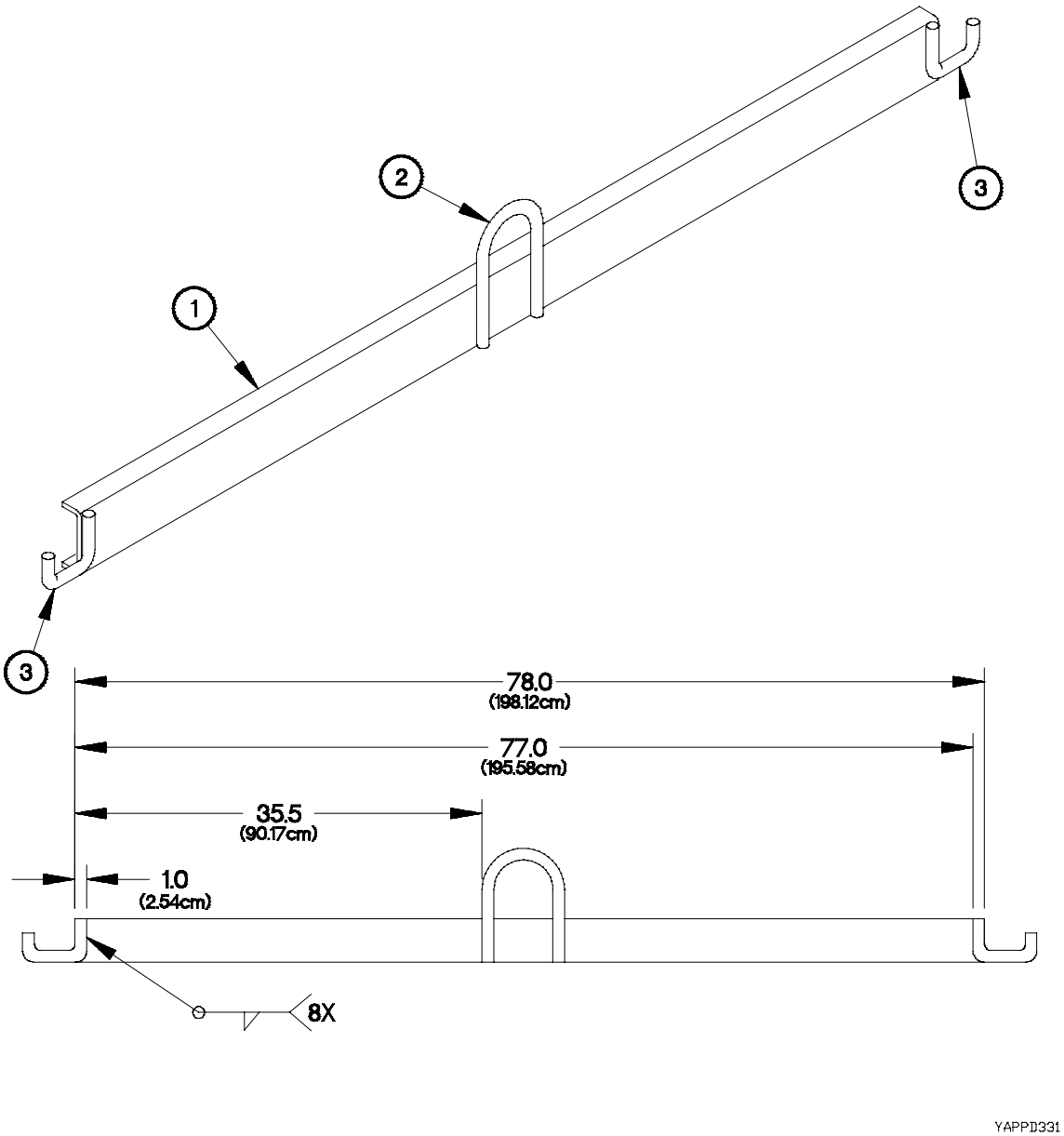


Figure D-27. Spreader Bar Assembly

f. Position and clamp lift rod (2) and guide rods (3) to steel channel (1) as shown in **Figure D-27. Spreader Bar Assembly**.
g. Weld lift rod (2) and guide rods (3) to steel channel (1) as shown in **Figure D-27. Spreader Bar Assembly**.
h. Maximum lifting capacity of the spreader bar is 2040 lbs (926 kgs).

D-17. 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 0.118 in. (0.3 cm) thick	2.361 in. (5.9 cm) X 0.625 in. (1.587 cm) X 0.118 in. (0.3 cm)	1

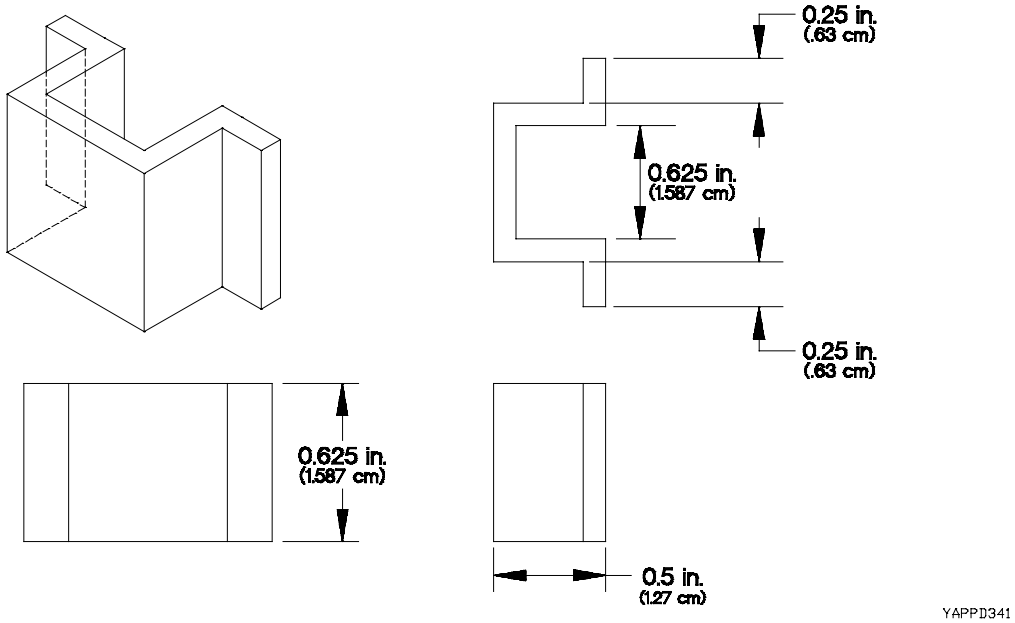


Figure D-28. Steering Stop Shim Gage

a. All dimensions are in inches (millimeters).
b. Form and bend steel stock to contours and dimensions shown in **Figure D-28. Steering Stop Shim Gage**.
c. De-burr and remove sharp edges and corners.

D-18. 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

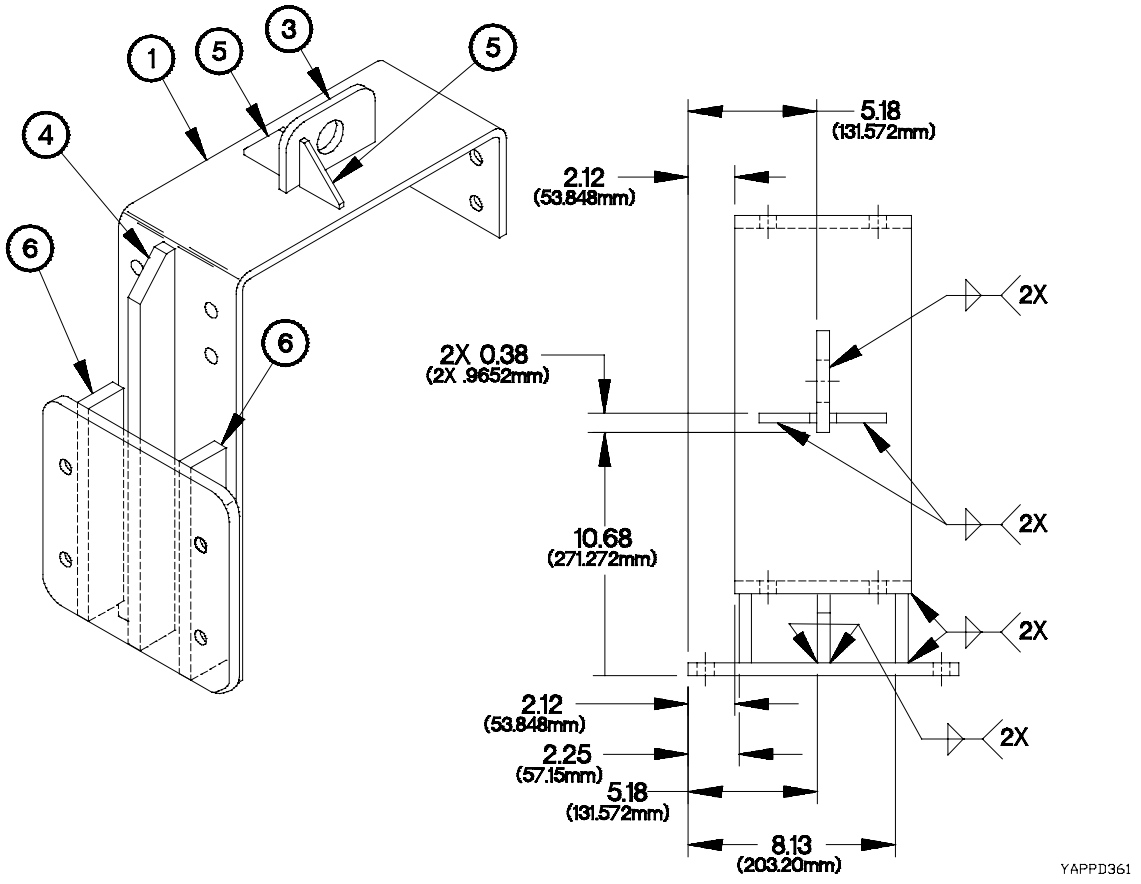


Figure D-29. Transfer Case Lift Bracket Assembly

a. All dimensions are in inches (millimeters).
b. Position items (1 through 6) together as shown by dimensions in **Figure D-29. Transfer Case Lift Bracket Assembly**.
c. Weld items (1 through 6) together as shown in **Figure D-29. Transfer Case Lift Bracket Assembly**.

D-18. 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

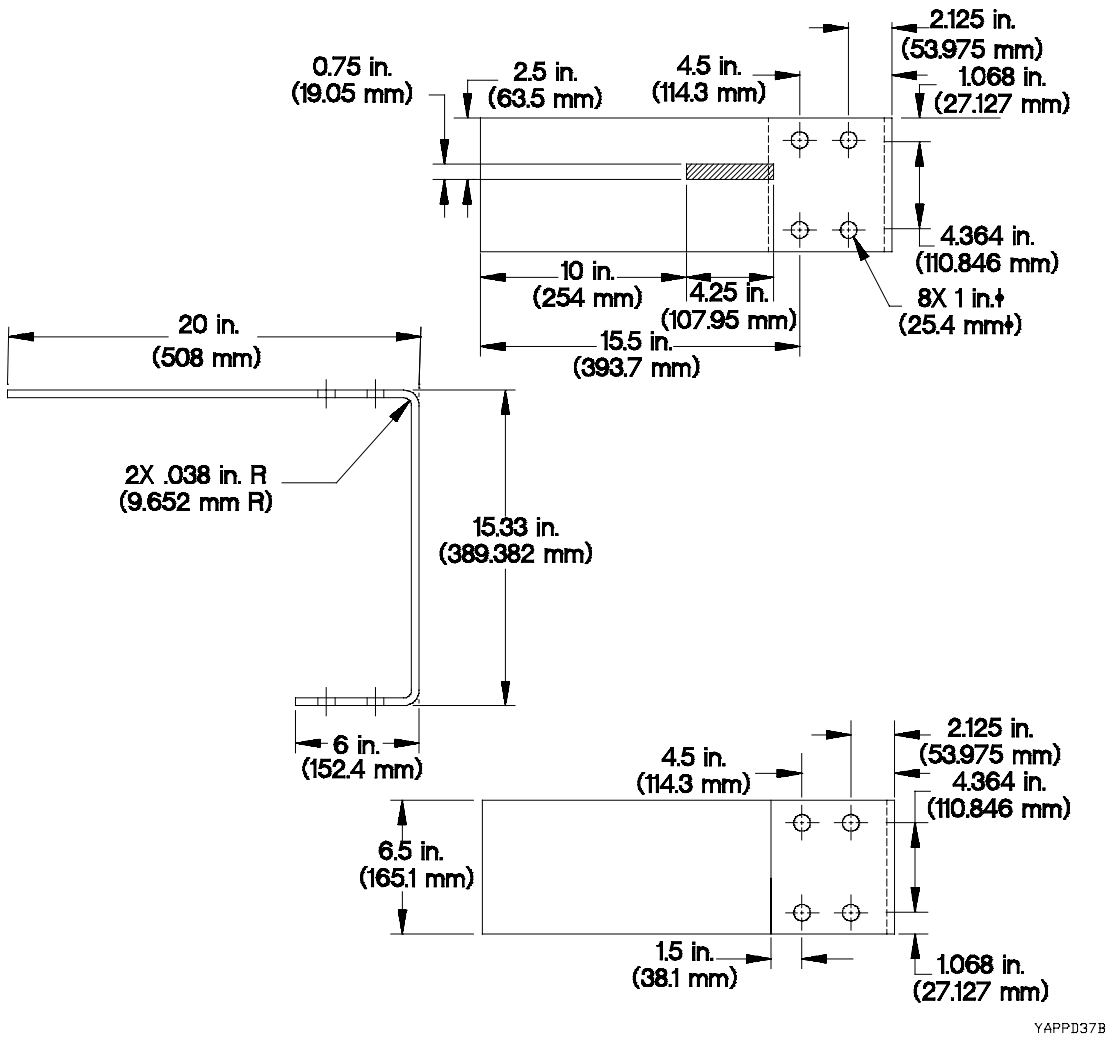


Figure D-30. Transfer Case Lift Bracket Main Mounting Bracket

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-30. 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-30. 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

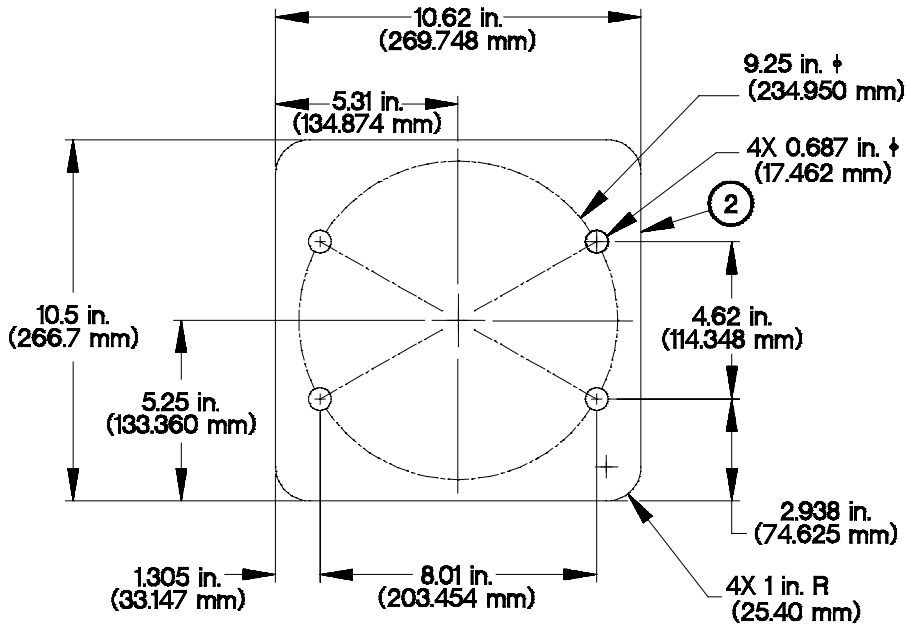


Figure D-31. Transfer Case Lift Bracket Bolt Mounting Bracket

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-31. Transfer Case Lift Bracket Bolt Mounting Bracket**.
d. Round four corners to 1.0 in. (25.4 mm) radius as shown in **Figure D-31. Transfer Case Lift Bracket Bolt Mounting Bracket**.
e. De-burr and remove sharp edges.

D-18. 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

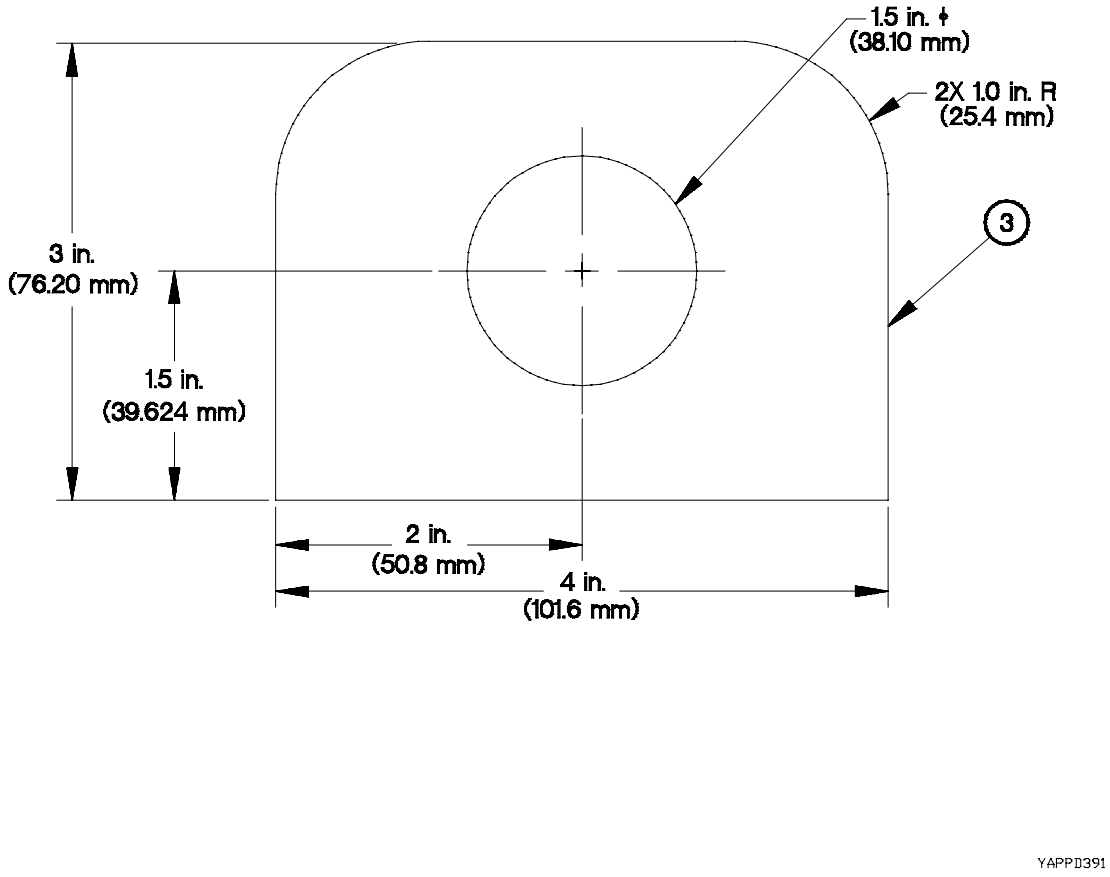


Figure D-32. Transfer Case Lift Bracket Lifting Plate

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-32. Transfer Case Lift Bracket Lifting Plate**.
d. Round two corners to 1.0 in. (25.4 mm) radius as shown in **Figure D-32. 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

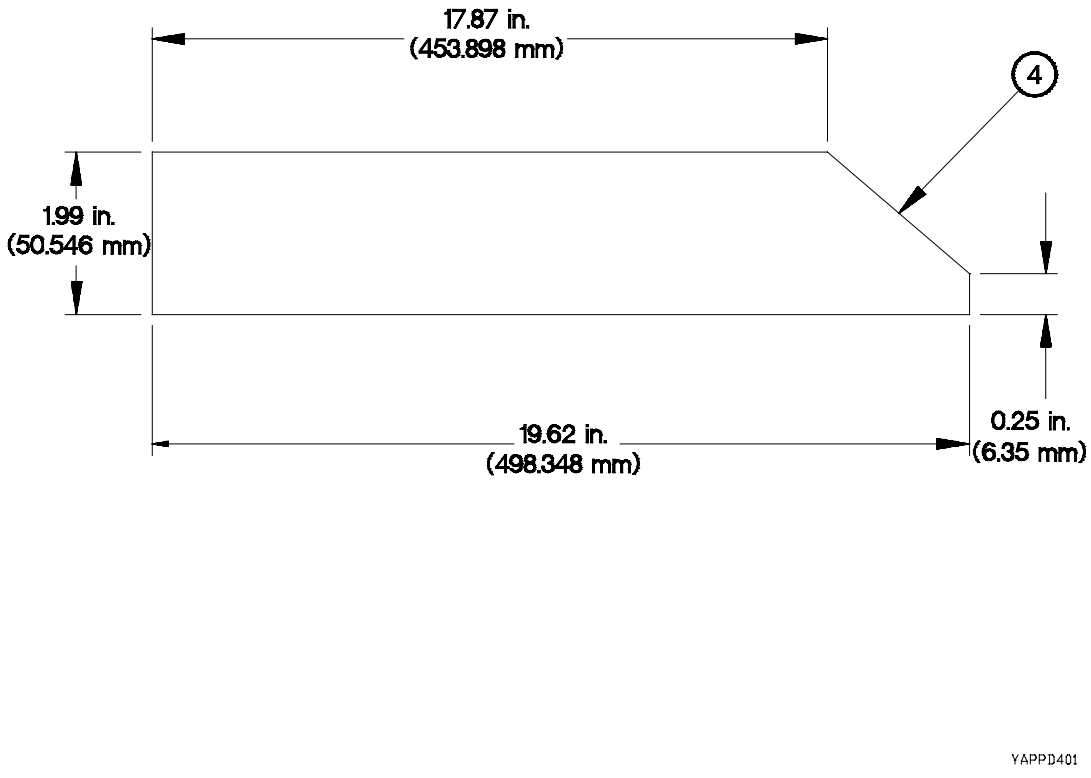


Figure D-33. Transfer Case Lift Bracket Center Support Plate

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-18. 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

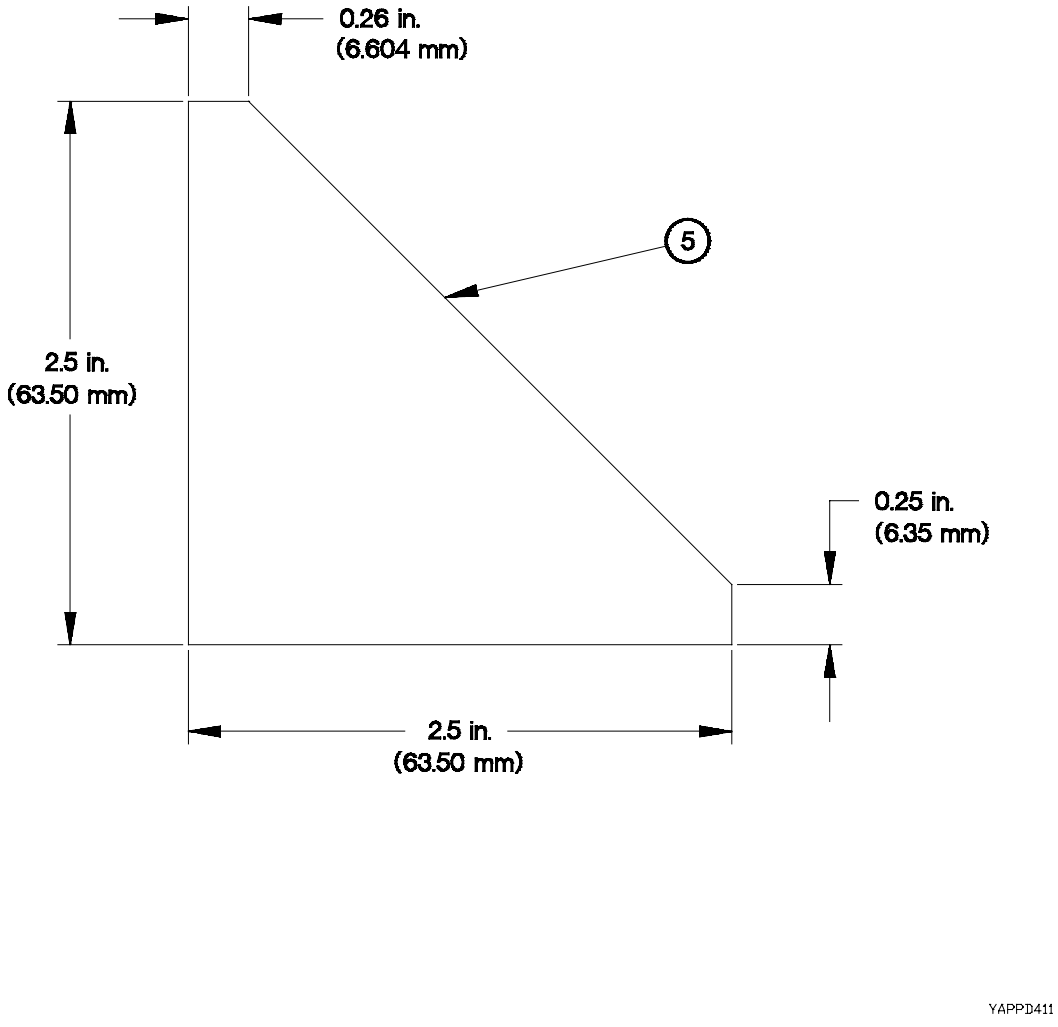


Figure D-34. Transfer Case Lift Bracket Lifting Plate Braces

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

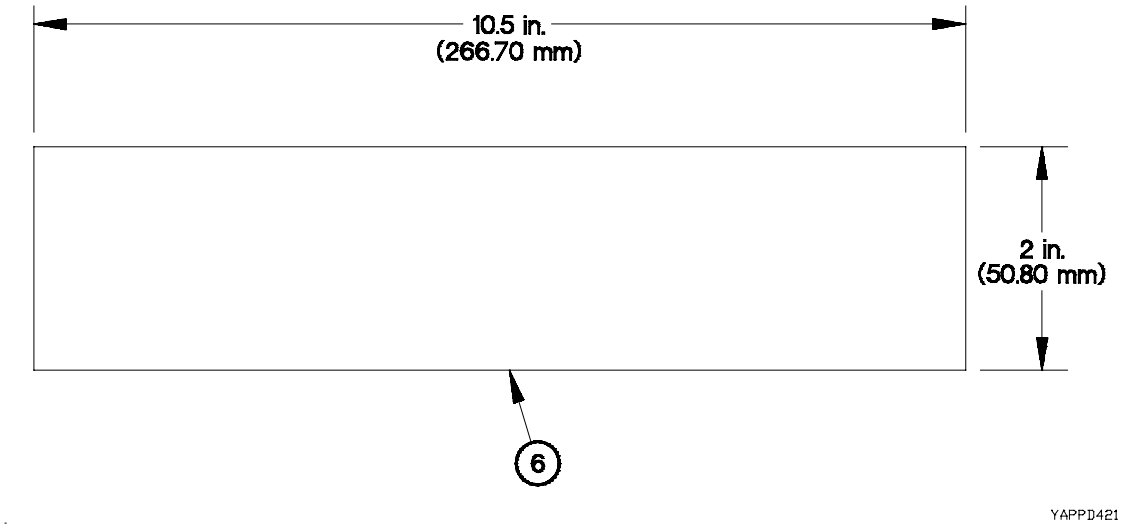


Figure D-35. Transfer Case Lift Bracket Bolt Mounting Bracket Supports

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-19. 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	
			in.	mm
MIL-R-6130	Tape, Adhesive, Rubber	9320-00-501-7537	24.7	627

D-20. 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

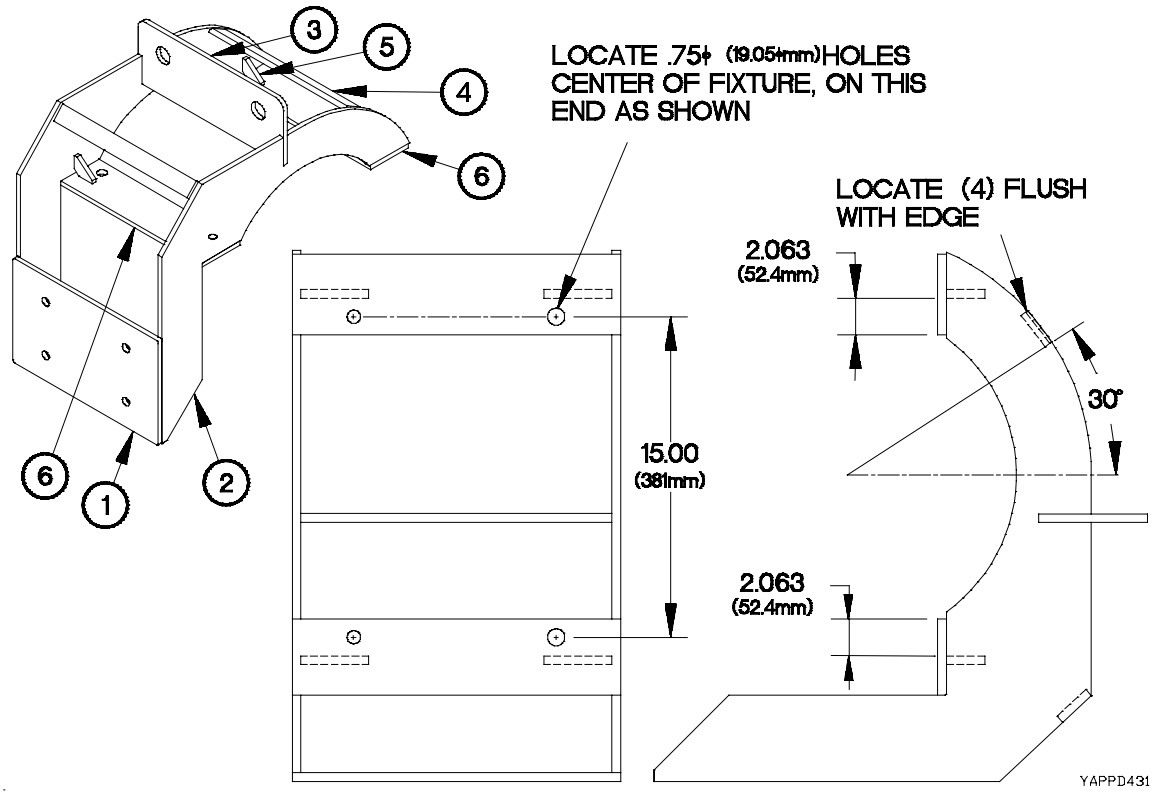


Figure D-36. Transmission Lift and Mounting Bracket Assembly

a. All dimensions are in inches (millimeters).
b. Position items (1 through 6) together as shown by dimensions in **Figure D-36. Transmission Lift and Mounting Bracket Assembly**.
c. Weld items (1 through 6) together as shown by Section A - A in **Figure D-36. 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-36. 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-36. 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

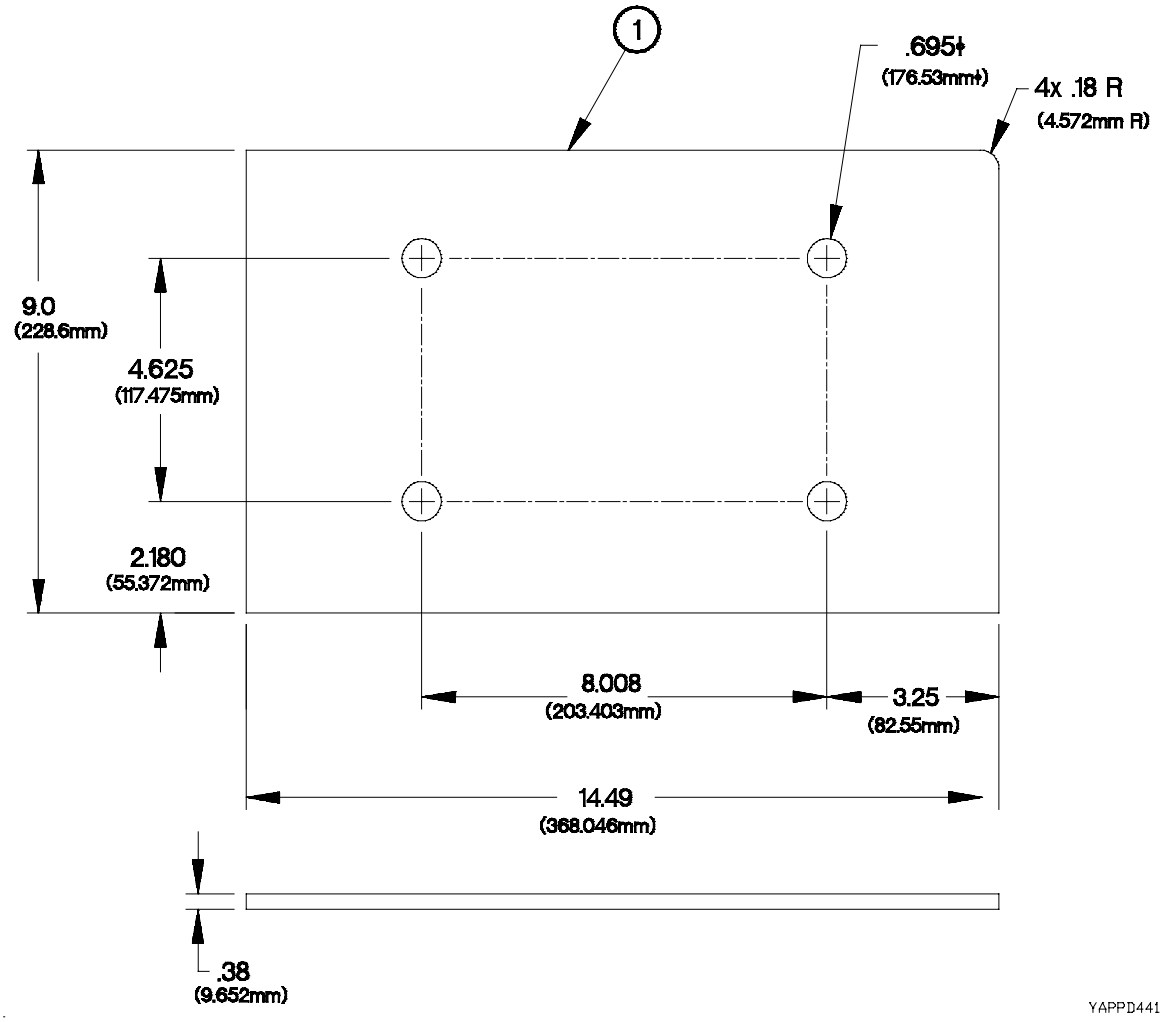


Figure D-37. Transmission Lift and Mounting Bracket Bottom Plate

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-37. Transmission Lift and Mounting Bracket Bottom Plate**.
d. Round four corners to 0.18 in. (4.6 mm) radius as shown in **Figure D-37. Transmission Lift and Mounting Bracket Bottom Plate**.
e. De-burr and remove sharp edges.

D-20. 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

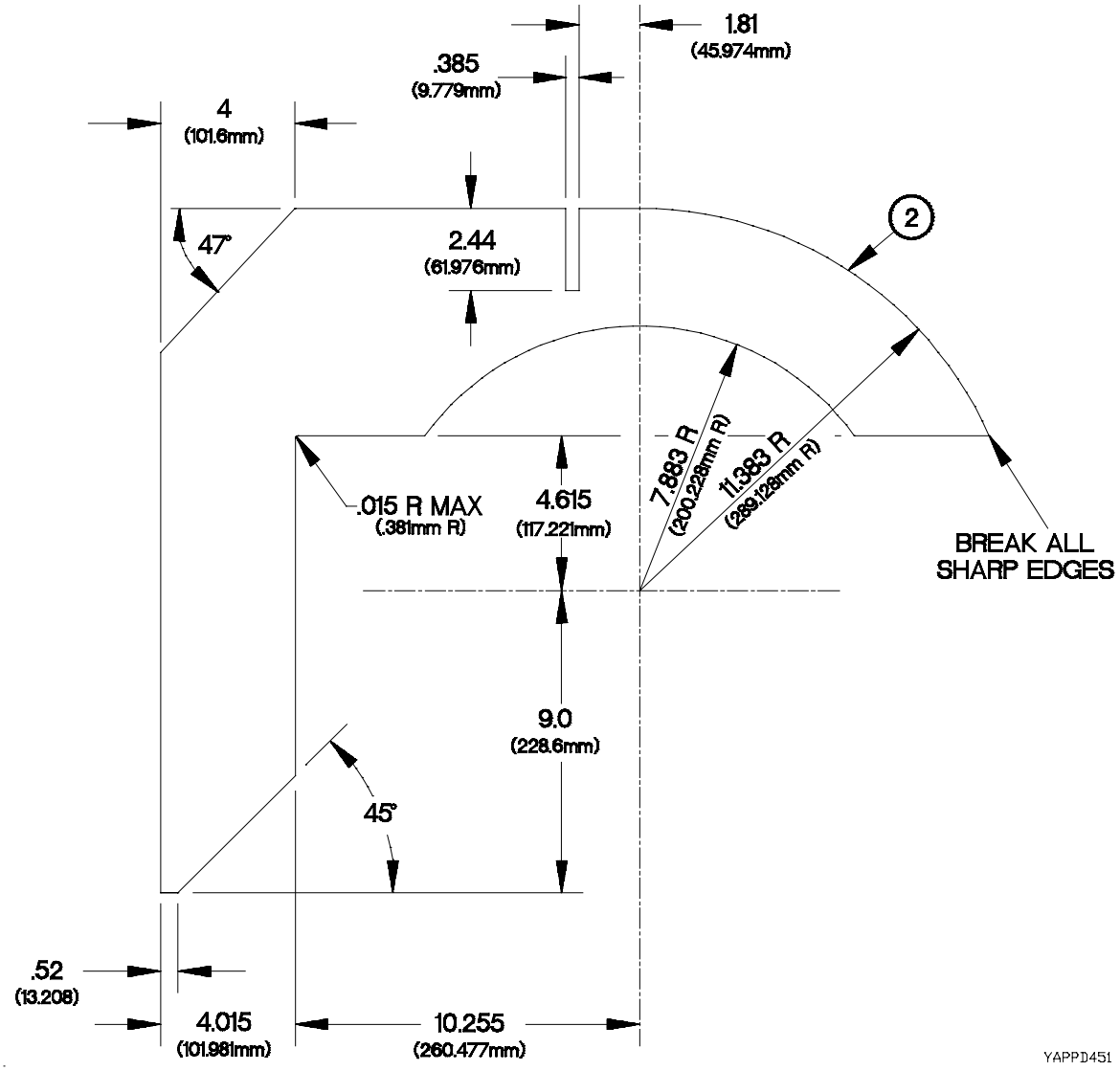


Figure D-38. Transmission Lift and Mounting Bracket Side Plates

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-38. Transmission 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

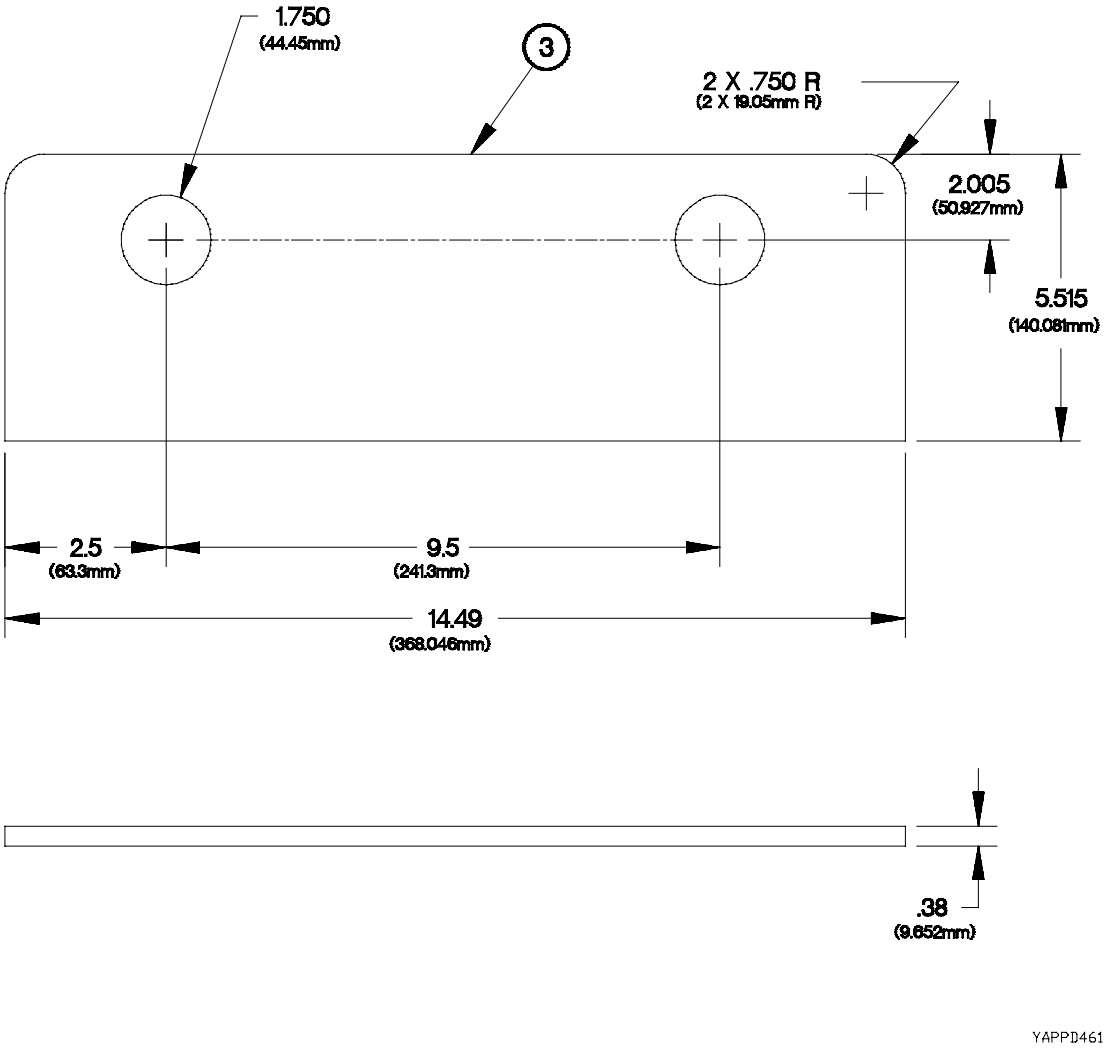


Figure D-39. Transmission Lift and Mounting Bracket Top Plate

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-39. Transmission Lift and Mounting Bracket Top Plate**.
d. Round two corners to 0.750 in (19 mm) radius as shown in **Figure D-39. Transmission Lift and Mounting Bracket Top Plate**.
e. De-burr and remove sharp edges.

D-20. 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

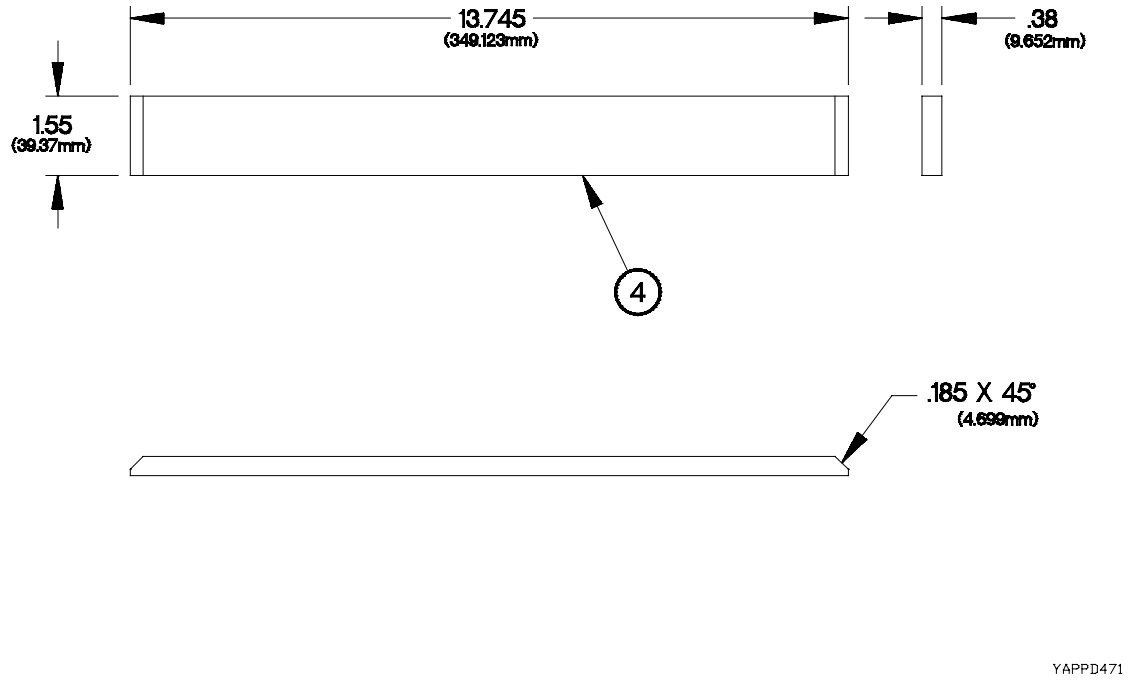


Figure D-40. Transmission Lift and Mounting Bracket Top and Bottom Braces

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-40. Transmission 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

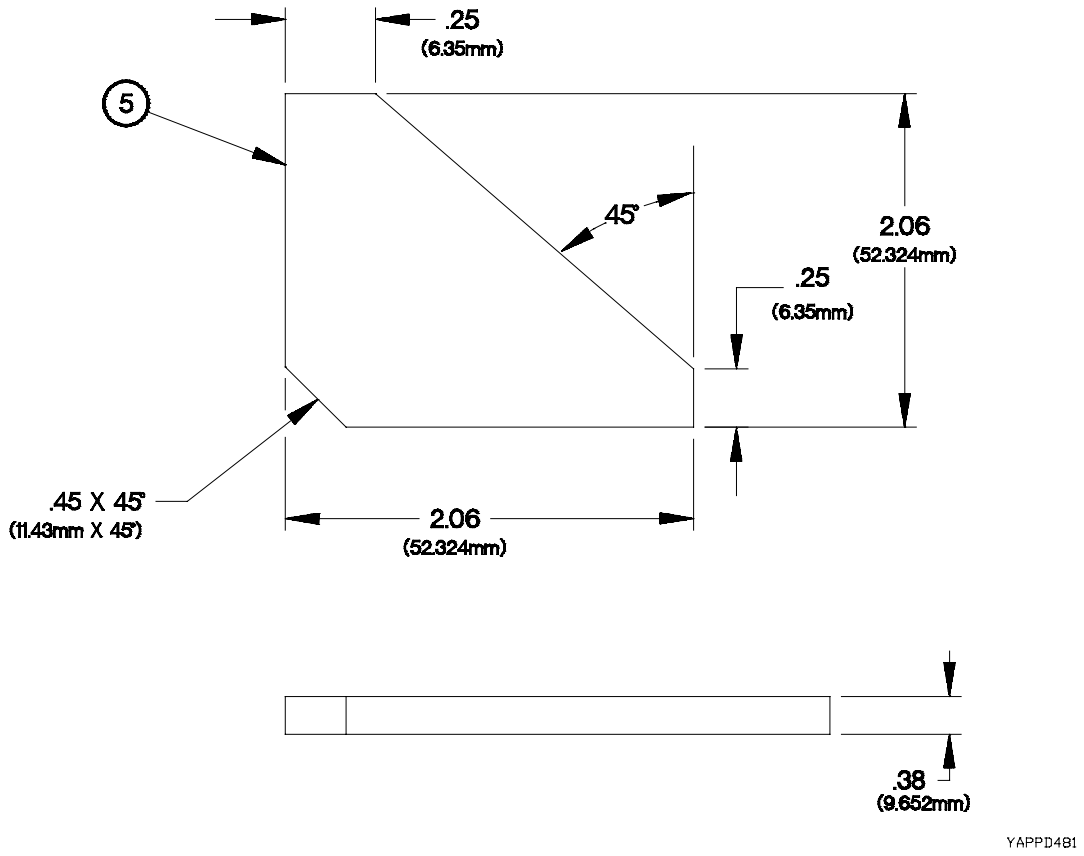


Figure D-41. Transmission Lift and Mounting Bracket Side Supports

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-20. 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

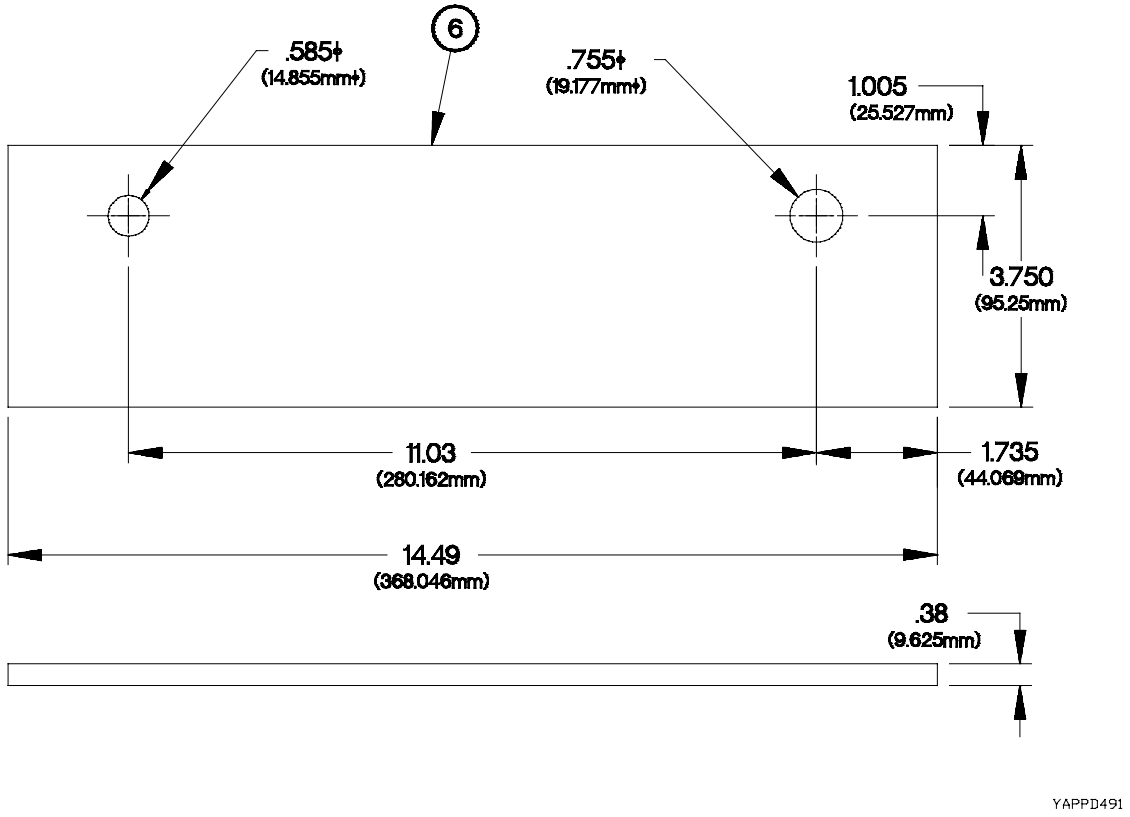


Figure D-42. Transmission Lift and Mounting Bracket Bolt Mounting Plates

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-42. Transmission Lift and Mounting Bracket Bolt Mounting Plates**.
d. Drill 0.585 in. (14.8 mm) diameter hole through as shown in **Figure D-42. Transmission Lift and Mounting Bracket Bolt Mounting Plates**.
e. De-burr and remove sharp edges.

D-21. 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

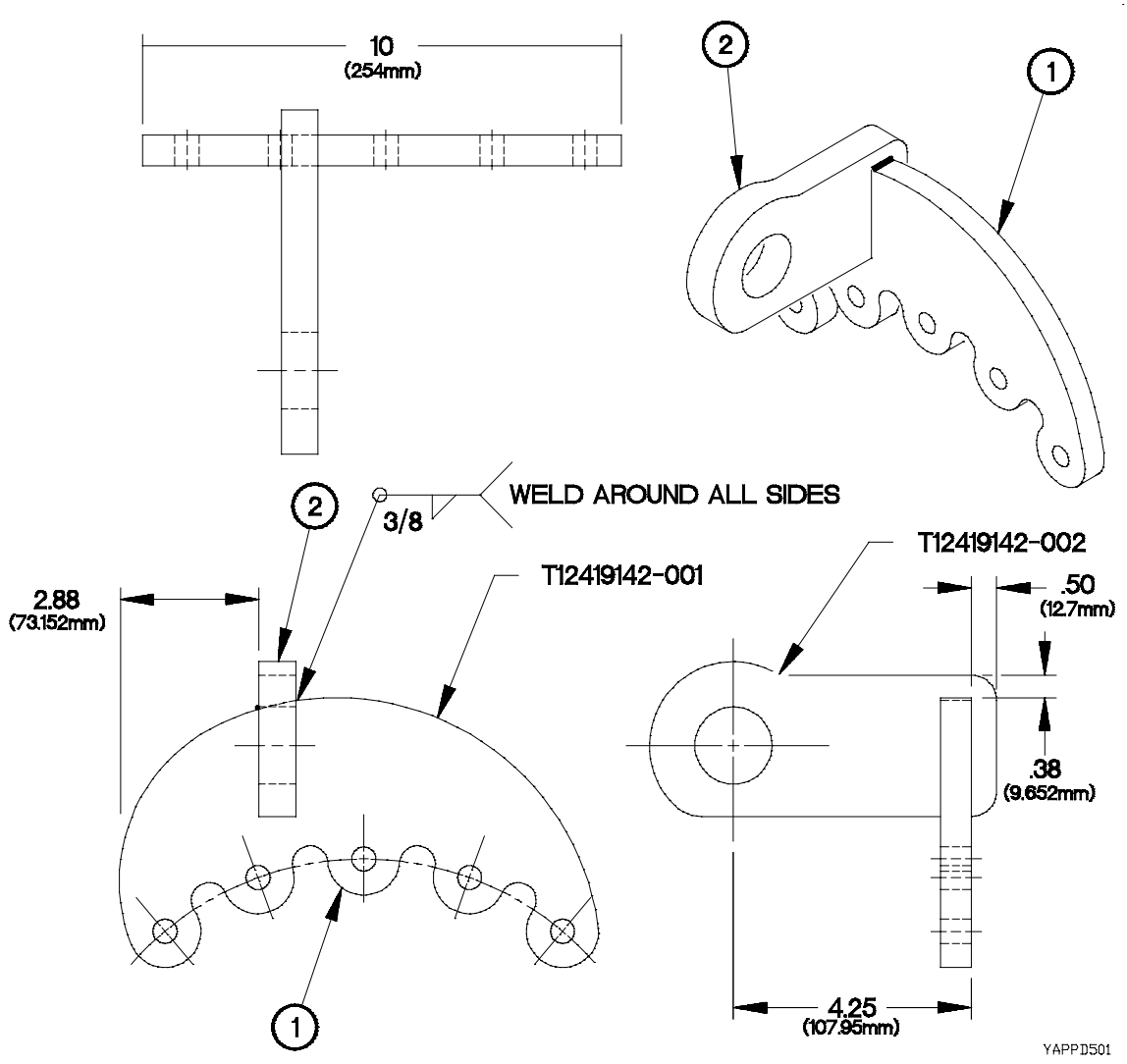


Figure D-43. Transmission Lift Bracket Assembly

a. All dimensions are in inches (millimeters).
b. Weld (1) to (2) on both sides in accordance with dimensions in **Figure D-43. Transmission Lift Bracket Assembly**. Weld to be magnetic particle inspected per ASTM E1444. No cracks allowed.

D-21. 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

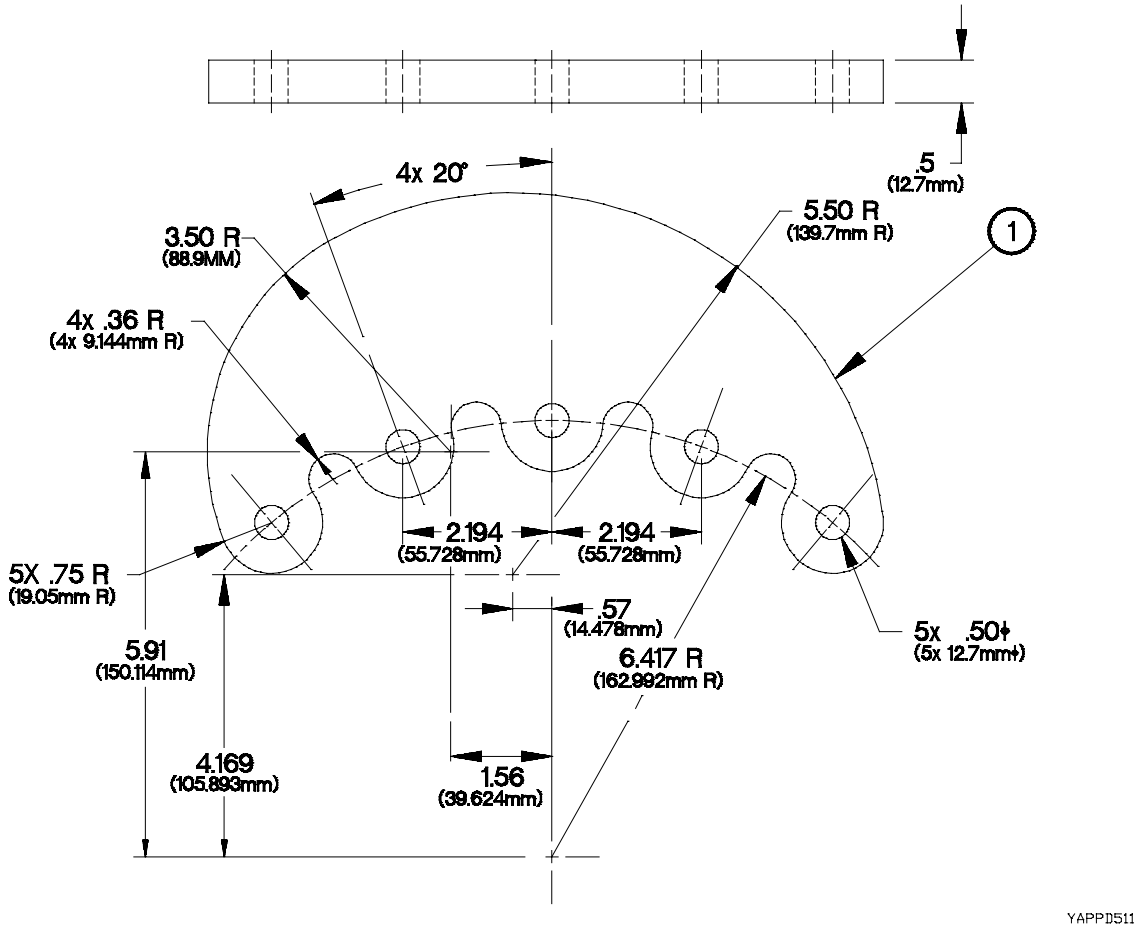


Figure D-44. Lower Lift Bracket

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-44. 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-44. 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-44. Lower Lift Bracket**.
f. Round piece to 5.50 in. (139.7 mm) radius as shown in **Figure D-44. Lower Lift Bracket**.
g. Drill 4 slots 0.37 in. (9.4 mm) diameter on 6.417 in. (163 mm) radius as shown in **Figure D-44. 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

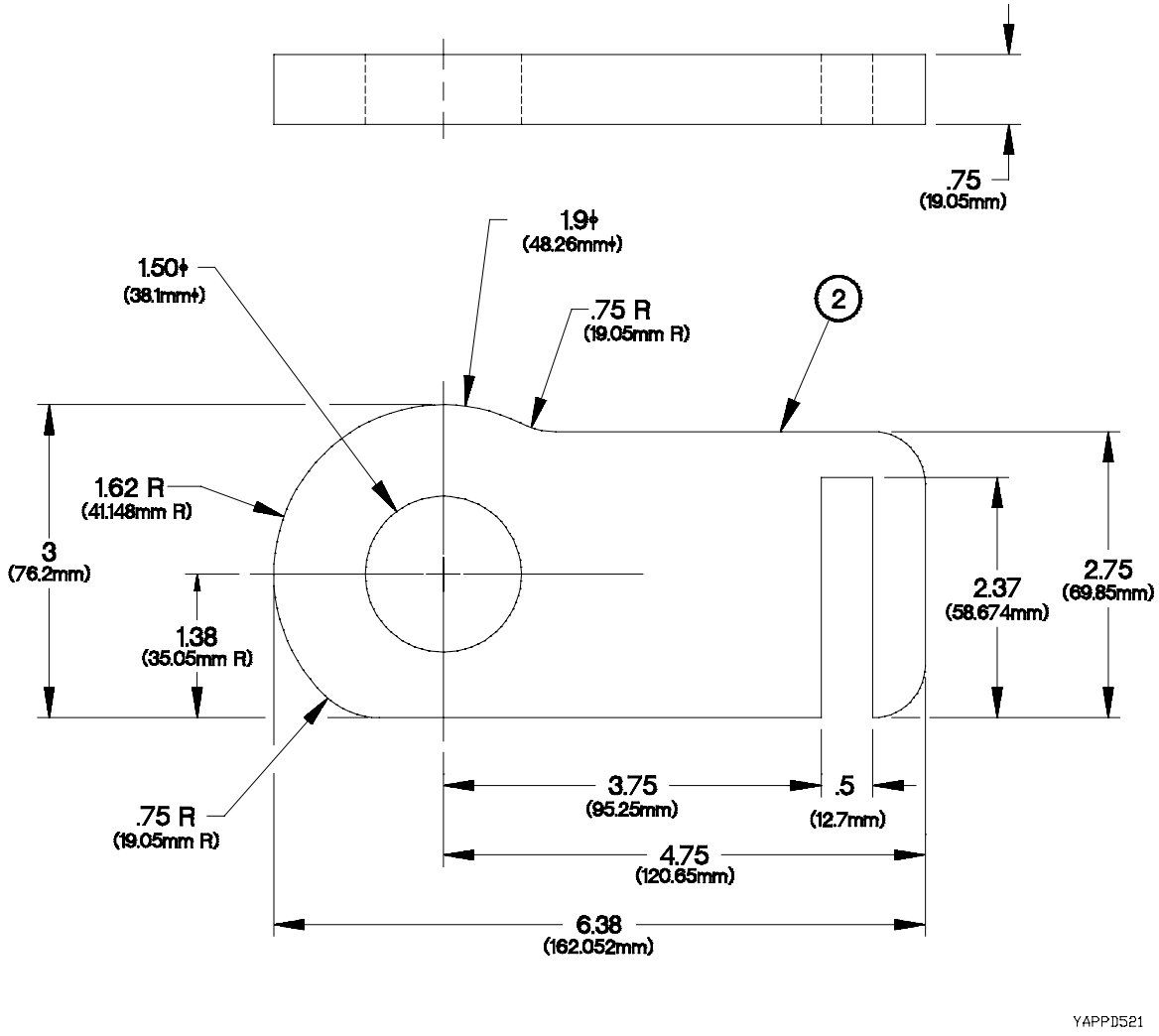


Figure D-45. Upper Lift Bracket

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-45. Upper Lift Bracket** will be held to ±0.01 in (±0.25 mm).
d. Drill 1.50 in. (38.1 mm) diameter hole through 1 place as shown in **Figure D-45. Upper Lift Bracket**.
e. Cutout slot 0.50 in. (1.27 mm) X 2.37 in. (60.2 mm) 1 place as shown in **Figure D-45. Upper Lift Bracket**.
f. De-burr and remove all sharp edges.
g. Round off sharp corners and round to radius shown in **Figure D-45. Upper Lift Bracket**.

D-22. 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

D-23. 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-46. Battery 12V Cable Assembly** for details. Refer to specification Mil-B-43436 for requirements.

Item	Part Number	Material Description	Size		Qty
			in.	mm	
1	12378873-050	Electrical cable 2 AWG	38.6	980	1
2	12378873-050	Electrical cable 2 AWG	7.9	201	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	25.4	2
8	M23053/5-210C	Sleeve, Cable	1.0	25.4	2
9	M23053/4-3050	Sleeving	1.0	25.4	8
10	12414580	Thermoplastic Adhesive			A/R
11a,b	12378873-050	Electrical cable 2 AWG	7.5	190	2
12a,b	12414644-002	Negative Terminal			2

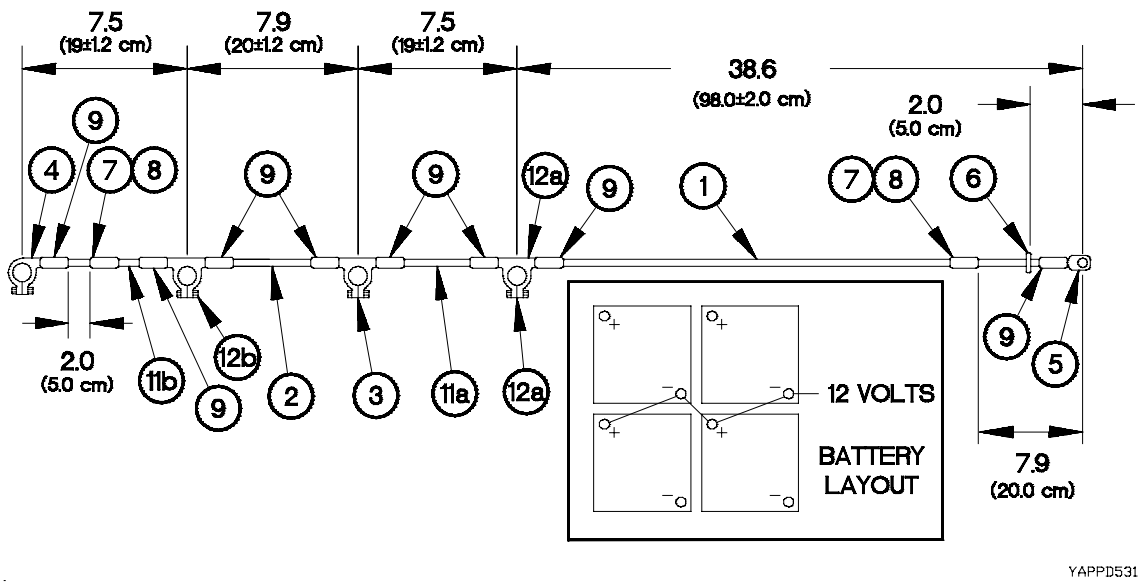


Figure D-46. Battery 12V Cable Assembly

a. All dimensions are in inches (millimeters).
b. Strip 0.69 in. (13 mm) insulation from ends of three cables (1, 2 and 11).
c. Install band marker (6) on cable (1) at position shown in **Figure D-46. Battery 12V Cable Assembly**.
d. Mark two marker sleeves (7) in ink with characters 1/8 in. (3 mm) high, as follows: **19207-12378575**.
e. Install marker sleeve (7) on cable (1) at position shown in **Figure D-46. Battery 12V Cable Assembly**.
f. Install marker sleeve (7) on cable (11) at position shown in **Figure D-46. 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-46. 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-46. 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-46. 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-46. 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-46. Battery 12V Cable Assembly**.
u. Crimp lug terminal (12b) to end of cable (2).
v. Insert end of cable (11b) into lug terminal (12b).

D-23. BATTERY 12V CABLE ASSEMBLY 12378512 (CONT)

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-46. 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-46. 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-24. 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-47. Battery Ground Cable Assembly** for details. Refer to specification Mil-B-43436 for requirements.

Item	Part Number	Material Description	Size		Qty
			in.	mm	
1	12378873-050	Electrical cable 2 AWG	50.4	1280	1
2	12378873-050	Electrical cable 2 AWG	11.8	300	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	25.4	2
8	M23053/5-210C	Sleeve, Cable	1.0	25.4	2
9	M23053/4-3050	Sleeving	1.0	25.4	4
10	12414580	Adhesive Thermoplastic			A/R

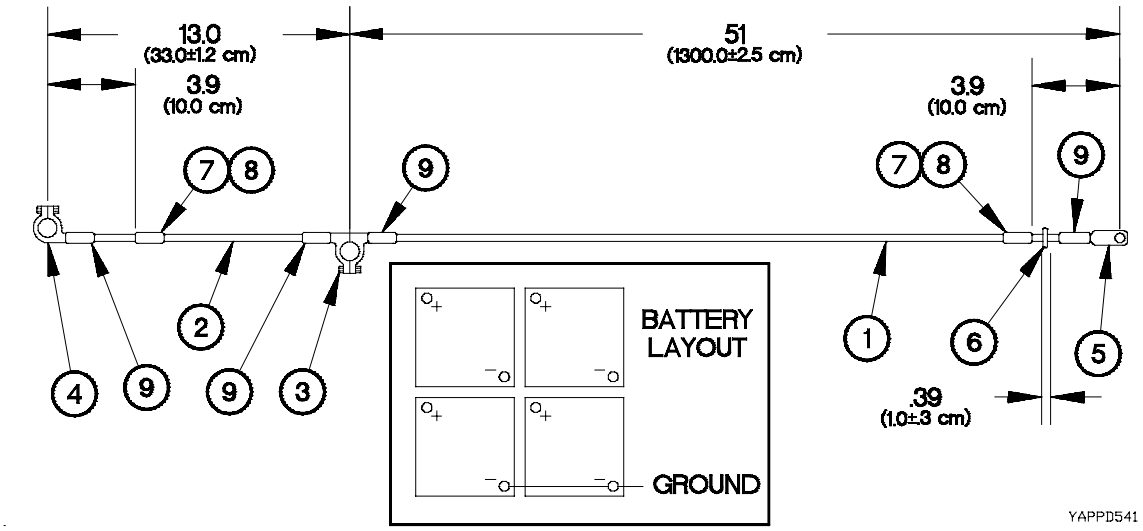


Figure D-47. Battery Ground Cable Assembly

a. All dimensions are in inches (millimeters).
b. Strip 0.69 in. (18 mm) insulation from ends of cables (1 and 2).
c. Install band marker (6) on cable (1) at position shown on **Figure D-47. Battery Ground Cable Assembly**.
d. Mark two marker sleeves (7) in ink with characters 0.13 in. (3 mm) high, as follows: **19207-12378575**.
e. Install marker sleeve (7) on cable (1) at position shown in **Figure D-47. Battery Ground Cable Assembly**.
f. Install marker sleeve (7) on cable (2) at position shown in **Figure D-47. 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-47. 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-47. 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-47. 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-47. 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-47. 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-25. 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-48. Battery 24V Cable Assembly** for details. Refer to specification Mil-B-43436 for requirements.

Item	Part Number	Material Description	Size		Qty
			in.	mm	
1	12378873-050	Electrical cable 2 AWG	33.5	851	1
2	12378873-050	Electrical cable 2 AWG	11.8	300	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	25.4	2
8	M23053/5-210C	Sleeve, Cable	1.0	25.4	2
9	M23053/4-3050	Sleeving	1.0	25.4	4
10	12414580	Adhesive Thermoplastic			A/R

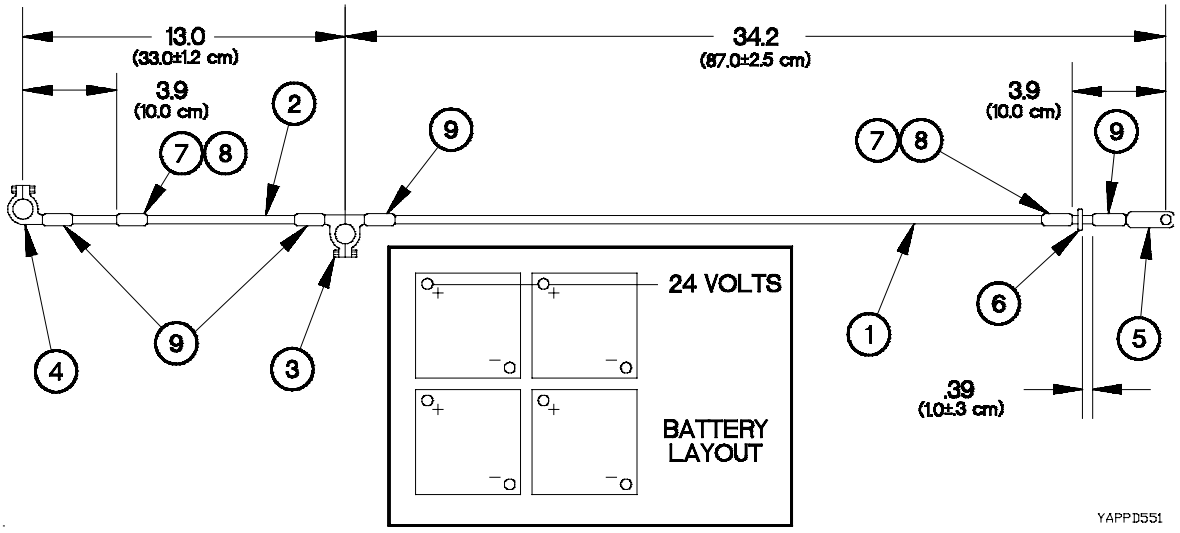


Figure D-48. Battery 24V Cable Assembly

a. All dimensions are in inches (millimeters).
b. Strip 0.69 in. (18 mm) insulation from ends of cables (1 and 2).
c. Install band marker (6) on cable (1) at position shown in **Figure D-48. Battery 24V Cable Assembly**.
d. Mark two marker sleeves (7) in ink with characters 0.13 in. (3 mm) high, as follows: **19207-12378575**.
e. Install marker sleeve (7) on cable (1) at position shown in **Figure D-48. Battery 24V Cable Assembly**.
f. Install marker sleeve (7) on cable (2) at position shown in **Figure D-48. 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-48. 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-48. 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 D48. 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-48. 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-48. 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-26. DOUBLE-SIDED TAPE 12420265X2

Make from P/N 4940(52152) X 2 in. (51 mm)

D-27. 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 in. (13.2 mm) long.

D-28. 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. (76.2 mm)
12412332-012	12 in. (304.8 mm)
12412332-040	40 in. (1016 mm)
12412332-048	48 in. (1219.2 mm)
12412332-066	66 in. (1676.4 mm)
12412332-096	96 in. (2438.4 mm)
12412332-180	180 in. (4572 mm)

D-29. 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.

Cutoff Length Part Number	Cutoff Length in in. (mm)	Cutoff Length Part Number	Cutoff Length in in. (cm)
12412367-038	38 (965.2)	12412367-094	94 (238.76)
12412367-046	46 (1168.4)	12412367-178	178 (452.12)
12412367-064	64 (1625.6)		

D-30. 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	
		in.	mm
12414690-001	NT-100-4 (79470)	18.1	460
12414690-002	NT-100-4 (79470)	16.0	406
12414690-004	NT-100-4 (79470)	74.8	1900
12414690-005	NT-100-4 (79470)	69.7	1770
12414690-006	NT-100-4 (79470)	239.0	6070
12414690-007	NT-100-4 (79470)	254.8	6470
12414690-008	NT-100-4 (79470)	286.3	7270
12414690-009	NT-100-4 (79470)	394.1	7470
12414690-010	NT-100-4 (79470)	180.0	4572
12414690-101	J844TYBSIZE 3/8 (81343)	18.0	457
12414690-102	J844TYBSIZE 3/8 (81343)	35.4	900
12414690-103	J844TYBSIZE 3/8 (81343)	20.9	530
12414690-104	J844TYBSIZE 3/8 (81343)	13.8	350
12414690-105	J844TYBSIZE 3/8 (81343)	11.8	300
12414690-106	J844TYBSIZE 3/8 (81343)	20.5	520
12414690-107	J844TYBSIZE 3/8 (81343)	39.0	990
12414690-108	J844TYBSIZE 3/8 (81343)	15.4	390
12414690-109	J844TYBSIZE 3/8 (81343)	23.0	584
12414690-112	J844TYBSIZE 3/8 (81343)	80.0	1980
12414690-113	J844TYBSIZE 3/8 (81343)	11.4	290
12414690-115	J844TYBSIZE 3/8 (81343)	82.8	2102
12414690-118	J844TYBSIZE 3/8 (81343)	11.8	300
12414690-119	J844TYBSIZE 3/8 (81343)	269.5	6845
12414690-120	J844TYBSIZE 3/8 (81343)	11.9	302

Table D-1. Pneumatic Tube Lengths (Cont)

Tube Part Number	Bulk Tubing Part Number	Cut Length	
		in.	mm
12414690-121	J844TYBSIZE 3/8 (81343)	43.0	1092
12414690-122	J844TYBSIZE 3/8 (81343)	44.1	1120
12414690-123	J844TYBSIZE 3/8 (81343)	259.4	6590
12414690-124	J844TYBSIZE 3/8 (81343)	288.2	7320
12414690-125	J844TYBSIZE 3/8 (81343)	10.8	273
12414690-126	J844TYBSIZE 3/8 (81343)	17.0	432
12414690-127	J844TYBSIZE 3/8 (81343)	17.0	432
12414690-201	C608-100BLK (13174)	14.8	376
12414690-202	C608-100BLK (13174)	14.1	358
12414690-203	C608-100BLK (13174)	6.5	165
12414690-205	C608-100BLK (13174)	14.5	368
12414690-206	C608-100BLK (13174)	14.8	377
12414690-207	C608-100BLK (13174)	15.6	395
12414690-208	C608-100BLK (13174)	6.7	170
12414690-209	C608-100BLK (13174)	19.5	495
12414690-210	C608-100BLK (13174)	15.5	393
12414690-211	C608-100BLK (13174)	8.0	203
12414690-213	C608-100BLK (13174)	118.5	3010
12414690-214	C608-100BLK (13174)	124.0	3150
12414690-212	C608-100BLK (13174)	17.0	430
12414690-215	C608-100BLK (13174)	163.0	4140
12414690-216	C608-100BLK (13174)	160.0	4064
12414690-217	C608-100BLK (13174)	62.6	1590
12414690-218	C608-100BLK (13174)	119.8	3042
12414690-219	C608-100BLK (13174)	69.0	1753
12414690-220	C608-100BLK (13174)	45.5	1156
12414690-221	C608-100BLK (13174)	12.6	320
12414690-222	C608-100BLK (13174)	5.5	140
12414690-223	C608-100BLK (13174)	14.6	371
12414690-224	C608-100BLK (13174)	170.0	4318
12414690-225	C608-100BLK (13174)	174.0	4420
12414690-226	C608-100BLK (13174)	103.5	2630
12414690-227	C608-100BLK (13174)	328.0	832
12414690-228	C608-100BLK (13174)	3.5	89
12414690-229	C608-100BLK (13174)	62.2	1581
12414690-230	C608-100BLK (13174)	14.6	370
12414690-231	C608-100BLK (13174)	60.5	1537
12414690-301	PFT-10B-BLK-100 (61424)	19.0	483
12414690-302	PFT-10B-BLK-100 (61424)	56.0	1422
12414690-303	PFT-10B-BLK-100 (61424)	118.1	3000

D-31. 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 in. (mm)	Fitting A	Fitting B
12420062-002	4720-00-143-9390	97.1 (2466)	6-6 3014xx 5/8-18	6-6 3001xx 5/8-18
12420062-003	4720-00-143-9390	48.7 (1237)	6-6 3014xx 5/8-18	6-6 3001xx 5/8-18
12420062-004	J30R2Type1 1/2 ID	65. (1651)	8-8 3014xx 3/4-16	8-8 3001xx 3/4-16
12420062-005	J30R2Type1 1/2 ID	57. (1448)	8-8 3014xx 3/4-16	8-8 3001xx 3/4-16
12420064-001	4720-00-912-3092	25. (635)	4-4 3001xx 7/16-20	4-4 3001xx 7/16-20
12420064-002	4720-00-912-3092	30. (762)	4-4 3001xx 7/16-20	4-4 3001xx 7/16-20
12420064-007	4720-00-143-9390	15. (378)	6-6 3002xx 5/8-18	6-6 3002xx 5/8-18
12420064-009	4720-00-143-9390	14. (356)	6-6 3002xx 5/8-18	6-6 3001xx 5/8-18
12414694-X508	4720-00-095-1011	20. (508)	300166 5/8-18 UNF	150166 3/8 NPTF
12414694-X558	4720-00-095-1011	22. (558)	300166 5/8-18 UNF	150166 3/8 NPTF

D-32. 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	
		in.	mm
12416381P1	49008	8.9	226
12416381P10	49008	17.8	452
12416381P11	49008	29.9	759
12416381P12	49008	33.0	838
12416381P13	49008	13.9	353
12416381P14	49008	4.0	102
12416381P15	49008	17.4	442
12416381P16	49008	3.2	81
12416381P17	49008	4.5	114
12416381P2	49008	16.2	411
12416381P20	27413	32.8	833
12416381P21	27413	9.2	234
12416381P22	27413	8.0	203
12416381P23	27413	23.3	592
12416381P26	49008	2.5	64
12416381P3	27413	7.3	185

Table D-2. Non-Metallic Electrical Cable Conduit Lengths (Cont)

Tube Part Number	Bulk Tube Part Number	Cut Length	
		in.	mm
12416381P30	49007	17.0	432
12416381P32	49005	1.7	43
12416381P34	49005	20.7	526
12416381P35	49005	21.8	554
12416381P36	49005	5.5	140
12416381P37	49005	8.0	203
12416381P38	49008	3.7	94
12416381P4	49008	12.0	305
12416381P5	49008	26.0	660
12416381P6	49008	7.7	196
12416381P7	49008	26.7	678
12416381P8	49008	5.2	132
12416381P9	49008	16.8	427

D-33. 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 in. (mm)	Fitting A	Fitting B
12417926-001	SAE 100R14-10	110 (2794)	SAE 30011010	SAE 30011010
12417926-002	SAE 100R14-10	16.5 (419)	SAE 30011010	SAE 30011010
12417926-004	SAE 100R14-4	16.5 (419)	SAE 300144	SAE 300144

D-34. 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	
		in.	mm
12418037	A110 (30327)	75.5	1917
12418460-001	MS521302B110360 (96906)	17.5	444
12418460-002	MS521301A206R (96906)	16.0	406

D-35. 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-49. 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

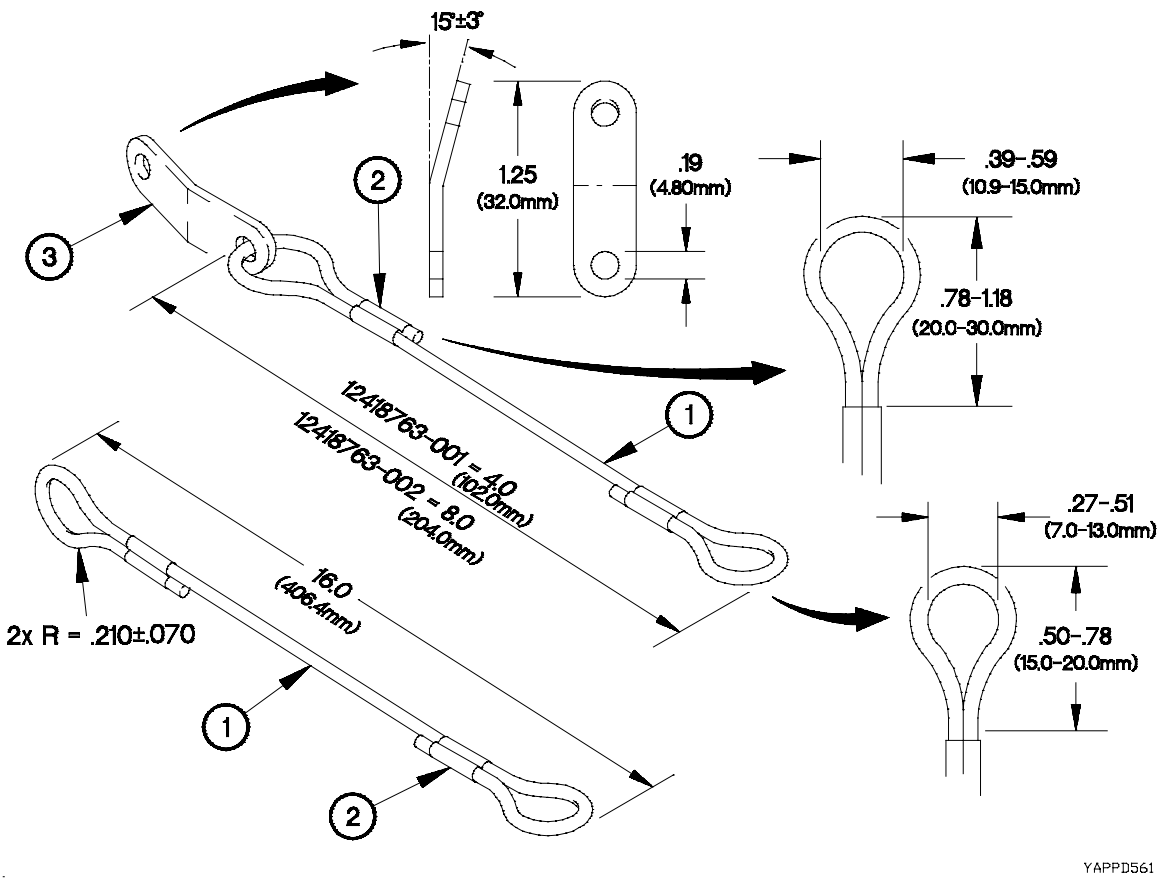


Figure D-49. Lanyard Assembly

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-49 Lanyard Assembly**.
d. De-burr and remove sharp edges.
e. Bend tab as shown in **Figure D-49 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-49. Lanyard Assembly**.
g. Crimp two sleeves over cable ends.

D-36. WOODEN SKID FABRICATION 12420036

Cut, shape and drill the wooden skid from bulk wood stock according to the following information. **Figure D-50. Wooden Skid** illustrates the dimensions and hole locations.

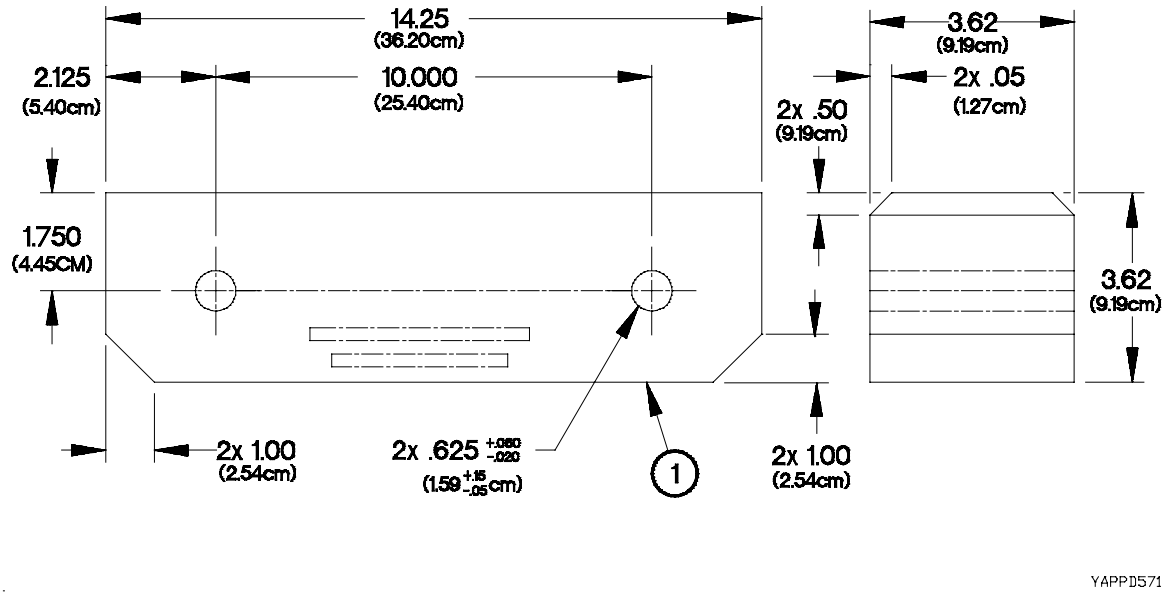


Figure D-50. Wooden Skid

a. All dimensions are in inches (millimeters).
b. Fabricate (1) from MIL-STD 736 Group IV untreated bulk wood stock as illustrated in **Figure D-50. Wooden Skid**.
c. Drill 0.625 in. (15.8 mm) diameter hole 2 places as shown in **Figure D-50. Wooden Skid**.
d. Sand and remove sharp edges.
e. Mark 19207-12420036 with characters 0.25 in. (6.5 mm) high using ink TT-I-1795 where shown in **Figure D-50 Wooden Skid** and clear coat with lacquer per TT-L-50.

D-37. 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	
		in.	mm
12420197-001	483666 (02280)	180.0	4572
12420197-002	483666 (02280)	120.0	3048
12420197-003	483666 (02280)	96.0	2438
12420197-004	483666 (02280)	36.0	914
12420197-005	483666 (02280)	156.0	3962
12420197-006	483666 (02280)	72.0	1829
12420198-001	881-16 (98441)	120.0	3048
12420198-002	11657469	36.0	914

D-38. 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	
		in.	mm
12420308-457	8711054 (19207)	18.3	464
12420308-760	8711054 (19207)	30.4	772

D-39. 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 in. (25.4 mm) 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-40. 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 in. (mm)	Fitting A	Fitting B
12420419-001	4720-01-226-3715	39.0 (991)	10-10301447	10-10300147
12420419-002	4720-01-226-3715	37.0 (94)	10-1031447	10-10300147

D-41. CTIS SEAL DRIVER (3256-H-1048)

Used on Front and Rear Axle CTIS Seals.

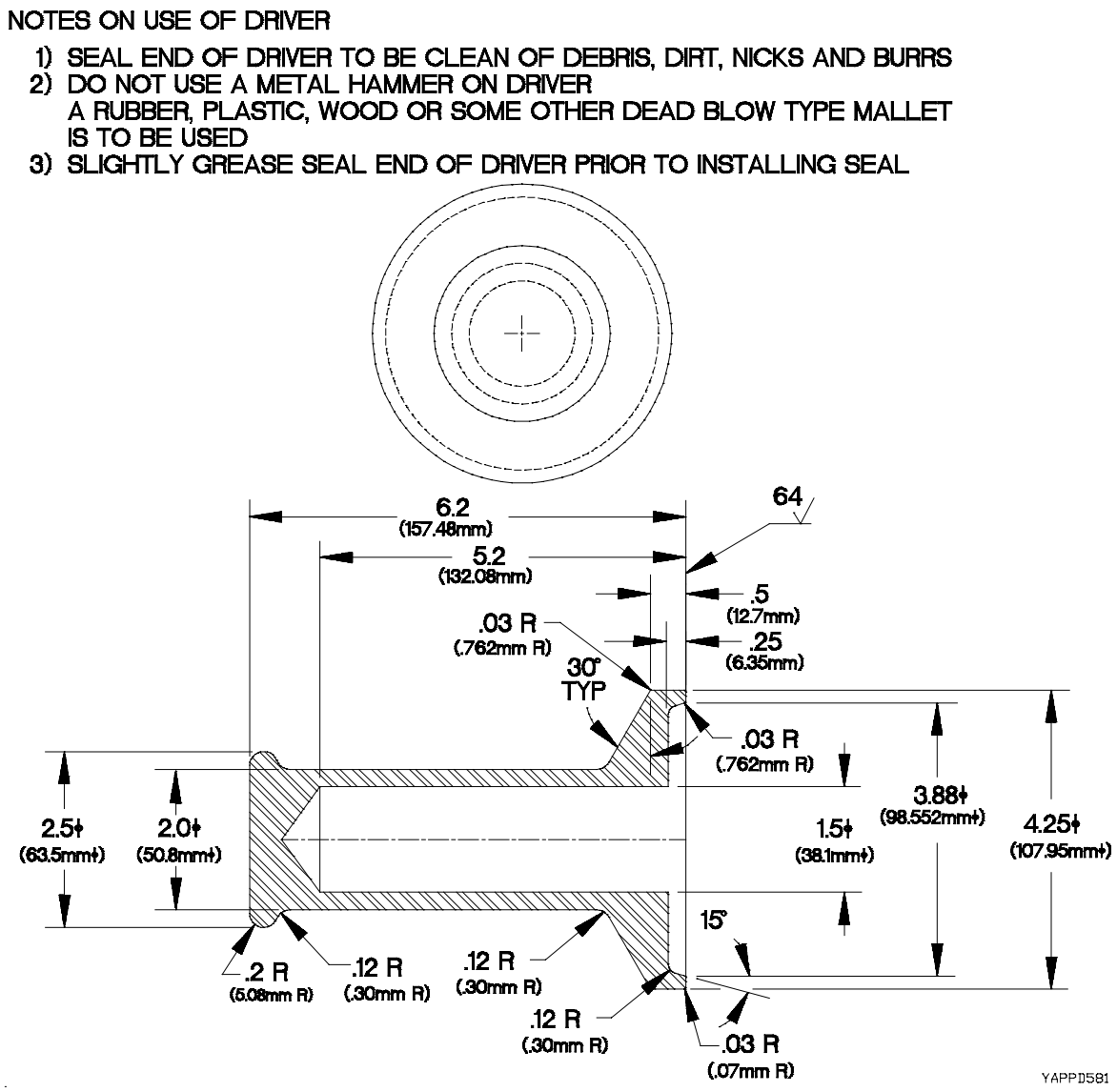


Figure D-51. CTIS Seal Driver

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-42. 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

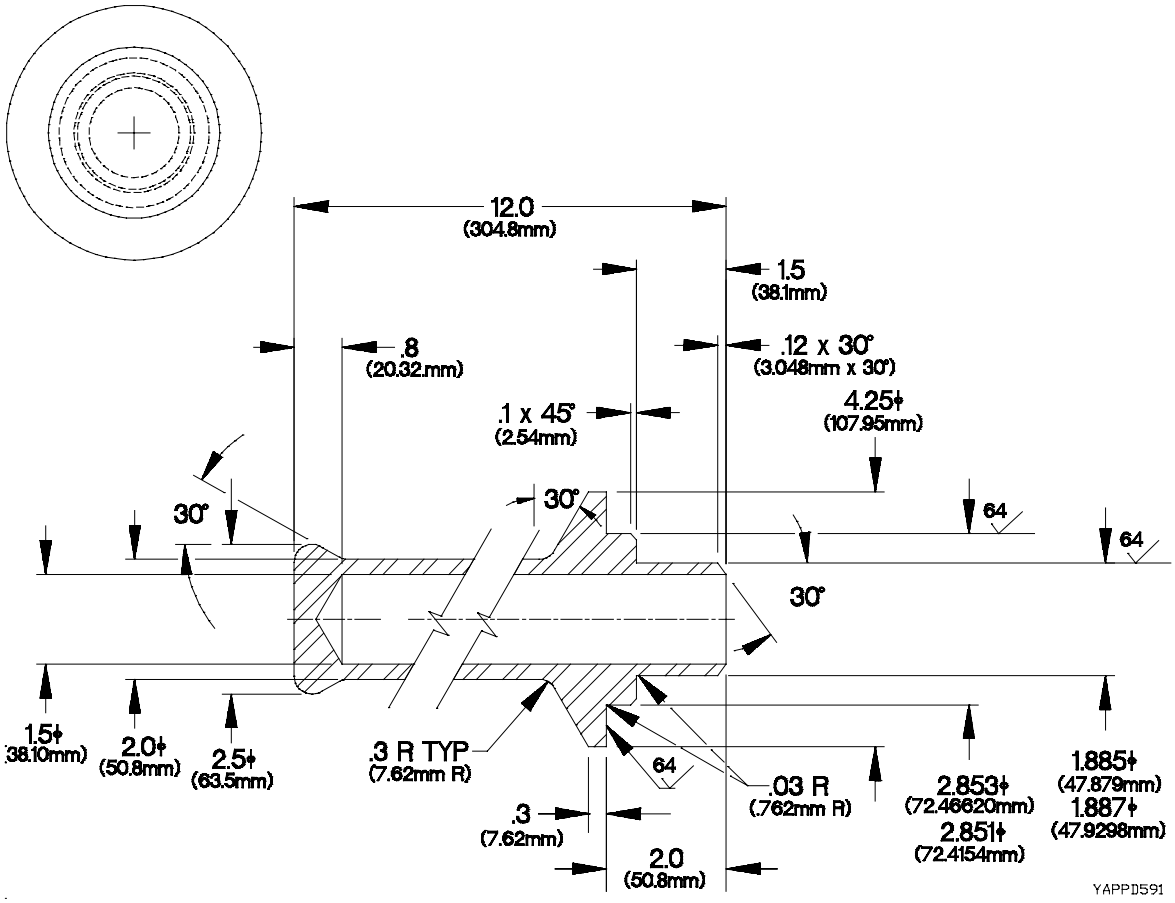


Figure D-52. Front Axle Shaft Seal Driver

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-43. 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

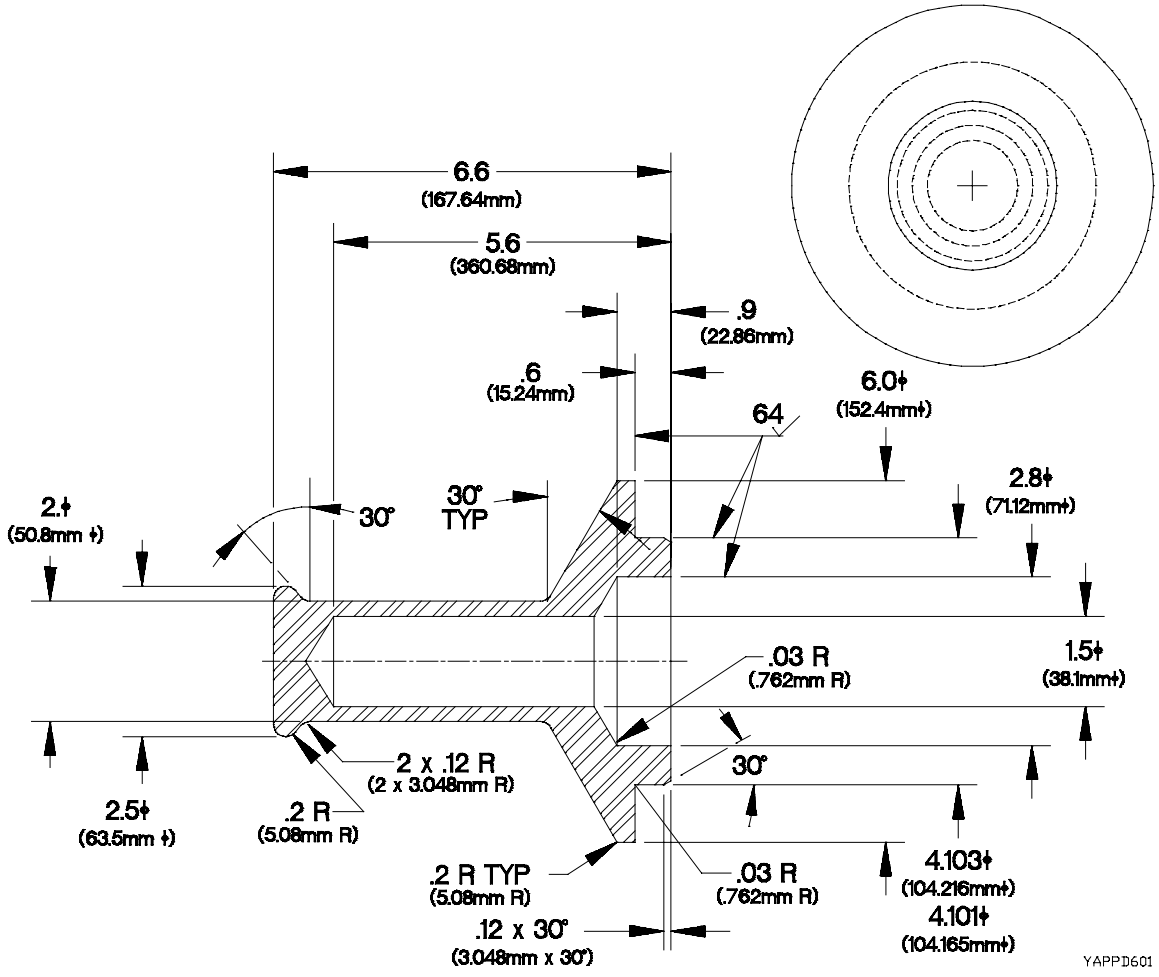


Figure D-53. Wheel Hub Grease Seal Driver

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-44. DIFFERENTIAL PINION SEAL DRIVER (3256-M-1053)

Used on Front and Rear Differential Pinion Seals.

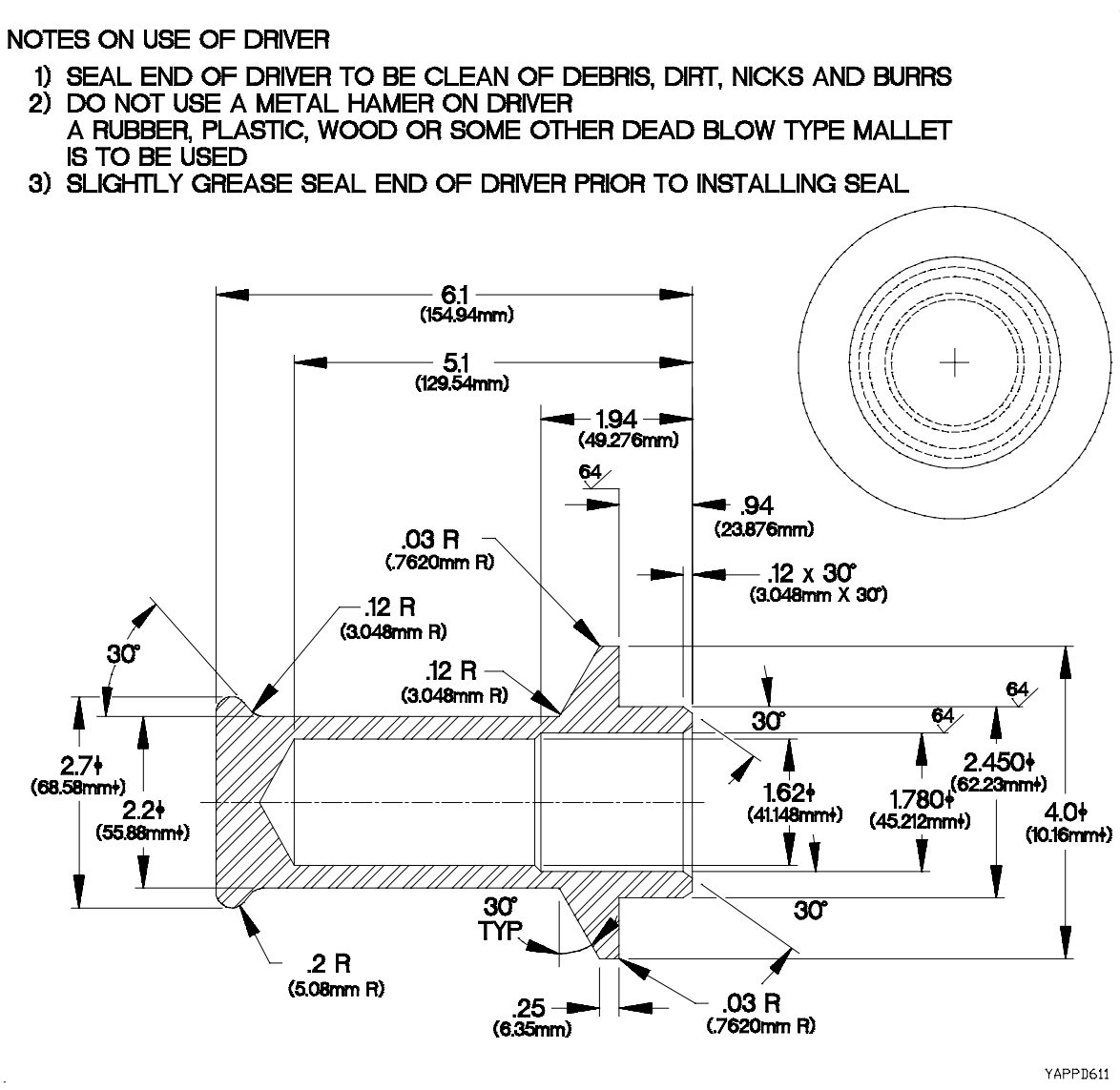


Figure D-54. Differential Pinion Seal Driver

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-45. FRONT AND REAR DIFFERENTIAL YOKE SEAL DRIVER (3256-S-1059)

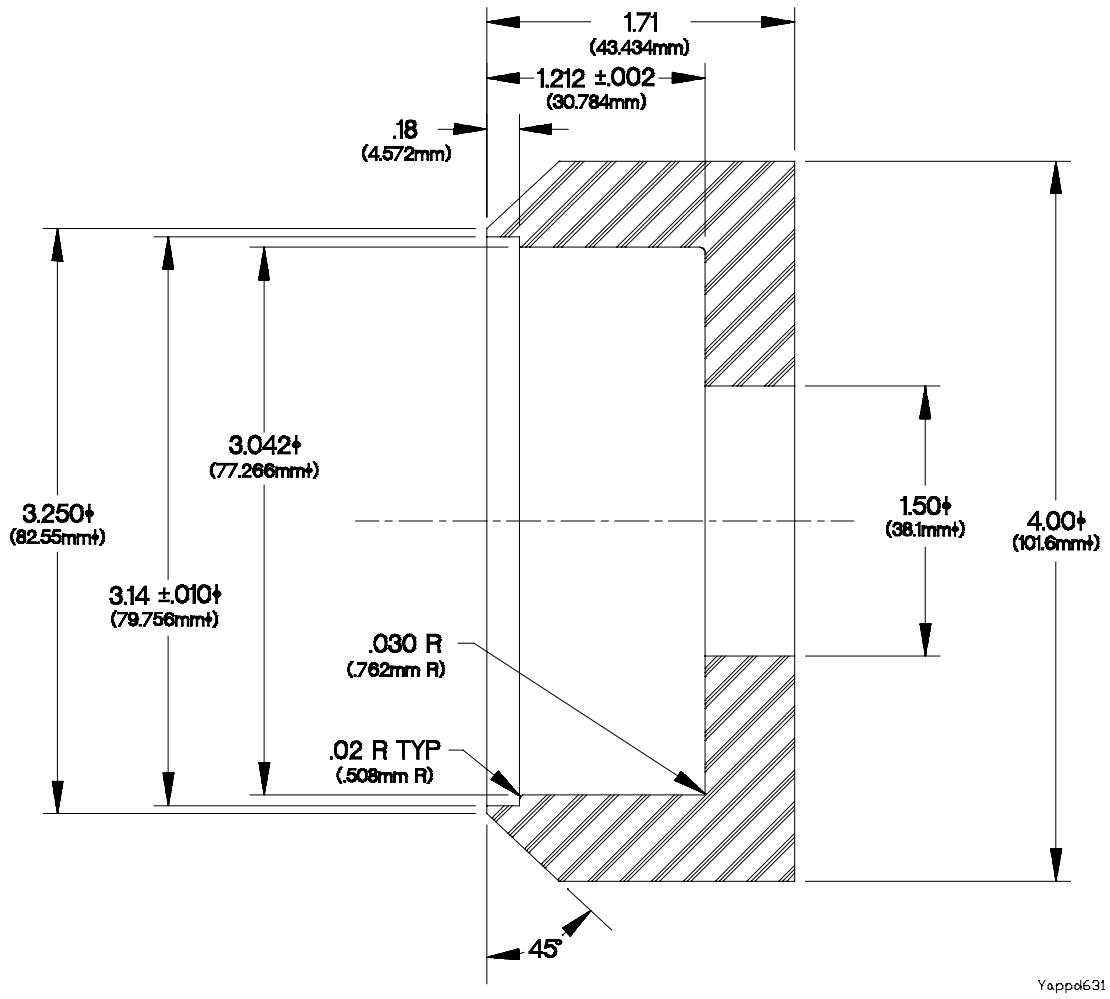


Figure D-55. Front and Rear Differential Yoke Seal Driver

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-46. 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-47. PURGE VALVE TOOL

Fabricate Purge Valve Tool according to the following instructions. Refer to Figure D-56. 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

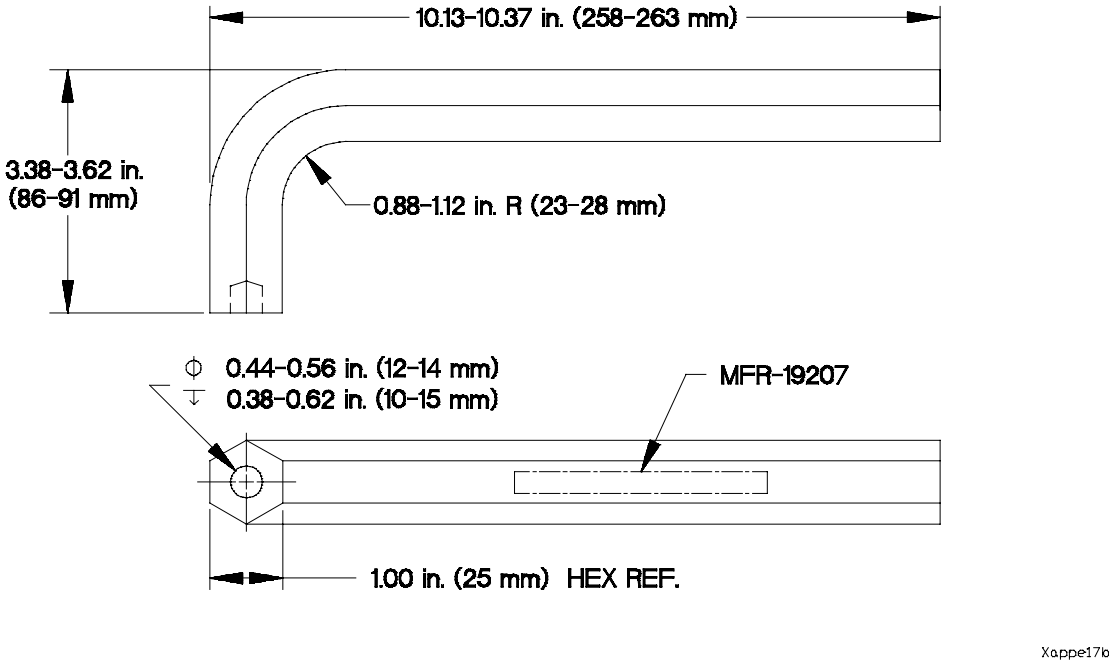


Figure D-56. Purge Valve Tool

a. All dimensions are in inches (cm).
b. Cut steel bar (1) and bend to shape as shown in Figure D-56.
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-48. M1079 BLACKOUT SHIELD SEALS

Fabricate the M1079 blackout shield seals according to the following steps. Refer to the following parts list for materials.

Description	Material Part Number	CAGE Code	Cut Length
Blackout Shield Header Seal	942P00001	0SHR6	28-3/4 in. (730 mm)
Blackout Shield Jamb Seal (van body serial numbers 001 through 190)	942P00001	0SHR6	63-3/8 in. (1610 mm)
Blackout Shield Jamb Seal (van body serial number 191 and higher)	942P00001	0SHR6	33 in. (838 mm)

a. Dimensions are in inches (millimeters).
b. Cut seal material to the specified length using a fine-toothed hacksaw or other suitable cutting tool.

D-49. M1079 DOOR GASKETS

Fabricate the M1079 door gaskets according to the following steps. Refer to the following parts list for materials.

Description	Material Part Number	CAGE Code	Cut Length
LH Door Gasket	12416417	19207	214 in. (5435 mm)
RH Door Gasket	12416417	19207	197 in. (5004 mm)

a. Dimensions are in inches (millimeters).
b. Cut seal material to the specified length using a fine-toothed hacksaw or other suitable cutting tool.
c. Glue ends of gasket to each other using adhesive MIL-A-46106 GP1TY1 (Item 11, Appendix D).

D-50. M1079 WINDOW SASH GLAZING SEALS

Fabricate the M1079 window sash glazing seals according to the following steps. Refer to the following parts list for materials.

Description	Material Part Number	CAGE Code	Cut Length
Window Sash Top/Bottom Seal	941P00001	0SHR6	26-13/16 in. (681 mm)
Window Sash Side Seal (van body serial numbers 001 through 190)	941P00001	0SHR6	28-1/2 in. (724 mm)
Window Sash Side Seal (van body serial number 191 and higher)	941P00001	0SHR6	12-11/16 in. (322 mm)

a. Dimensions are in inches (millimeters).
b. Cut seal material to the specified length using a fine-toothed hacksaw or other suitable cutting tool.

NOTE

Cut miters so that short side of seal faces toward glass.

c. Cut 45-degree miters on ends of window sash seals.

D-51. 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.

APPENDIX E
TORQUE LIMITS

E-1. GENERAL

This appendix provides general torque limits for screws and nuts used on the vehicle. Special torque limits are shown in the maintenance procedures for applicable components. Use the general torque limit given in this appendix when specific torque limits are not given in the maintenance procedure. These general torque limits can not be applied to screws that retain rubber components. The rubber components will be damaged before the torque limit is reached. If a special torque limit is not given in the maintenance instructions for a fastener which retains a rubber component, tighten the screw or nut until it touches metal, then tighten one more turn. Whenever possible, the tightening force (torque) should be applied to the nut side of the fastener group.

E-2. TORQUE LIMITS

Refer to **Table E-1. Torque Limits for SAE and ANSI Fasteners** for torque limits on standard (SAE and ANSI) screws and free spinning nuts. Refer to **Table E-2. Torque Limits for SAE and ANSI Prevailing Torque Nuts** for torque limits on standard (SAE and ANSI) self-locking nuts. Refer to **Table E-3. Torque Limits for Metric Screws and Free Spinning Nuts** for torque limits on metric screws and free spinning nuts. Refer to **Table E-4. Torque Limits for Metric Prevailing Torque Nuts** for torque limits on metric self-locking nuts.

E-3. USE OF TORQUE TABLES

(1) Measure the diameter of the screw to be installed.

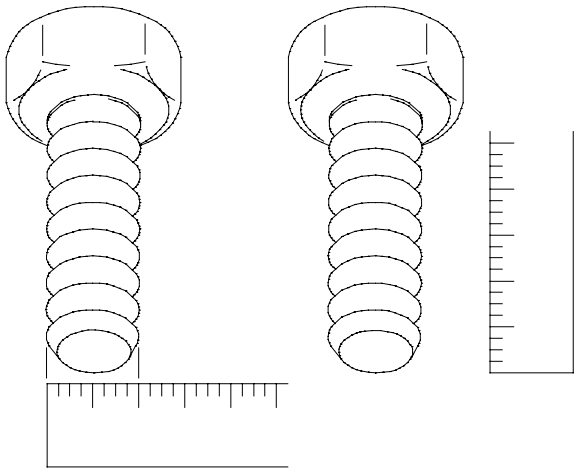
(2) Count the number of threads per inch.

(3) Under the heading DIAMETER look down the column until the diameter of the screw is found. (There are usually two lines beginning with the same diameter.)

(4) Under the heading THREADS PER INCH (SAE and ANSI) or THREAD PITCH (metric), find the number of threads per inch that matches the number counted in step (2).

(5) To find the grade of the screw, match the markings on the head to the correct picture under CAPSCREW HEAD MARKINGS on the torque table.

(6) Look down the column under the picture found in step (5) until the torque limit (lb-ft or N·m) for the diameter and threads per inch (or thread pitch, in the case of metric fasteners) of the screw are located.



YAPPE011

APPENDIX E
TORQUE LIMITS

Table E-1. Dry Torque Limits for SAE and ANSI Screws and Free Spinning Nuts

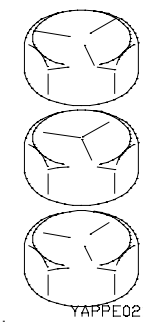
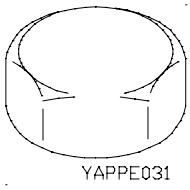
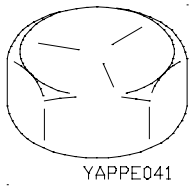
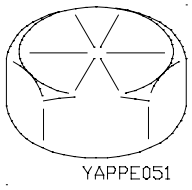
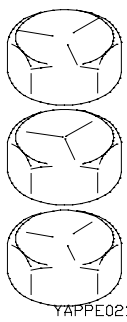
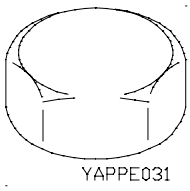
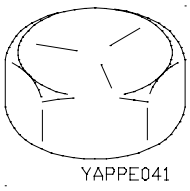
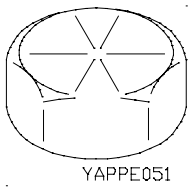
 YAPPE021 **NOTE Manufacturer's marks may vary. These are all SAE Grade 5.**		**Material Grade Markings**					
		 YAPPE031 **SAE Grade 2**		 YAPPE041 **SAE Grade 5**		 YAPPE051 **SAE Grade 8**	
Diameter	**Threads per inch**	**Torque**					
inch		**lb-ft**	**N·m**	**lb-ft**	**N·m**	**lb-ft**	**N·m**
1/4	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

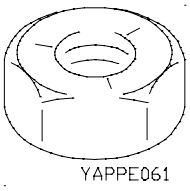
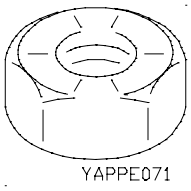
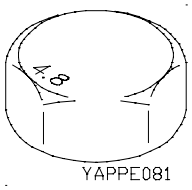
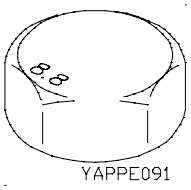
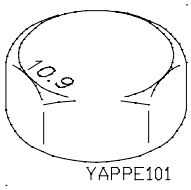
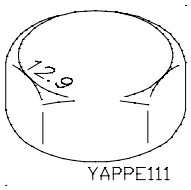
		Material Grade Markings			
		 YAPPE061		 YAPPE071	
		SAE Grade 5		SAE Grade 8	
Hole Diameter	Threads per inch	Torque			
inch		lb-ft	N·m	lb-ft	N·m
1/4	20	10-12	14-16	15-17	20-24
1/4	28	12-14	16-18	14-18	21-25
5/16	18	20-24	27-33	26-32	36-44
5/16	24	22-26	30-36	29-35	40-48
3/8	16	35-41	47-55	48-58	65-77
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

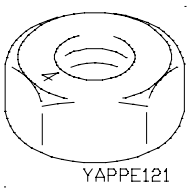
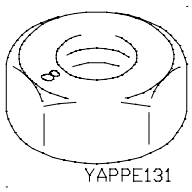
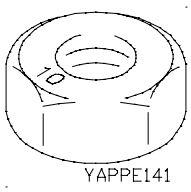
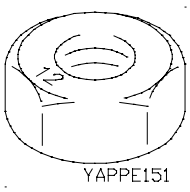
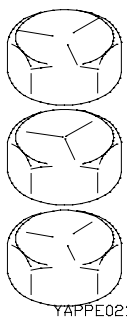
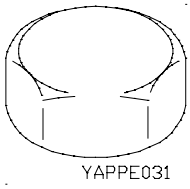
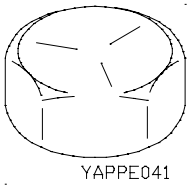
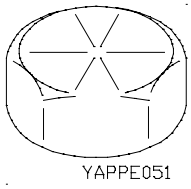
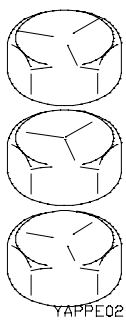
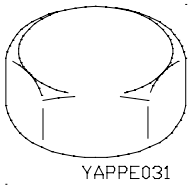
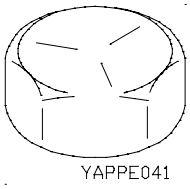
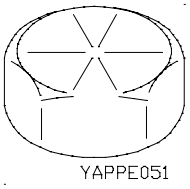
		Material Grade Markings							
		 Metric Grade 4.8		 Metric Grade 8.8		 Metric Grade 10.9		 Metric Grade 12.9	
Diameter	Thread Pitch	Torque							
mm		lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m
6	1	5-6	7-8	7-9	10-12	10-12	14-17	11-14	15-19
8	1.25	12-14	16-18	18-22	24-30	24-30	32-40	27-33	36-46
8	1	12-14	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 LMTV 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	1225K-1259	3120-01-362-4365
2	BOLT	12414307-079	5306-01-381-9941
3	BOLT	12414307-080	5306-01-381-9928
4	BOLT	12414307-138	5306-01-372-0786
5	BOLT	12414307-140	5306-01-372-3536
6	BOLT	12414307-141	5306-01-371-7161
7	BOLT	12414307-142	5306-01-372-3537
8	BOLT	12414307-143	5306-01-372-0787
9	BOLT	12414307-145	5306-01-386-3966
10	BOLT	12414307-147	5306-01-377-0750
11	BOLT	12414307-149	5306-01-384-3485
12	BOLT	12421697-001	
13	BOLT	12421697-002	
14	BOLT	12421697-003	
15	BOLT	12421697-004	

MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
15.1	BOLT, U	12417904-002	5306-01-371-3099
15.2	BOOT	225313 (35510)	
16	BRACKET	3280-M-9243	
17	BRUSH SET	5702711	3120-00-089-2707
18	BRUSH SET, ELECTRICAL CONTACT	71035	5977-00-758-9555
19	BUSHING, BLANK	4001-40690-01	5365-01-331-9503
20	BUSHING, NON-METALLIC	12418159	5365-01-371-9556
20.1	BUSHING, SLEEVE	Z082095780	3120-01-306-9870
21	BUSHING, SLEEVE	12418155	3120-01-371-7961
22	BUSHING, SLEEVE	12419961	3120-01-420-8269
22.1	BUSHING, SLEEVE	71059	3120-00-064-1723
22.2	BUSHING, SLEEVE	73644	3120-00-111-3711
23	BUSHING, SLEEVE	N9405	3120-01-362-5055
24	EXCLUDER	4R9999	
25	FILTER ELEMENT	29502194	2940-01-360-7986
26	GASKET	28239	5330-01-300-1216
27	GASKET	350903	5330-00-576-4626
28	GASKET	6776456	5330-01-329-9093
29	GASKET	12420037	5330-01-394-2410
30	GASKET	12420056	5330-01-394-2411
31	GASKET	23042433	5330-01-360-7516
32	GASKET	23048037	5330-01-360-7520
33	GASKET	29501144	5330-01-407-1644
34	GASKET	29503185	5330-01-360-7518
35	GASKET	29503263	5330-01-360-9034
36	GASKET	29503283	5330-01-360-9035
37	GASKET	29503288	5330-01-361-0274
38	GASKET	29534357	5330-01-360-7521
39	GASKET	29506210	5330-01-360-9036
40	GASKET	29506211	5330-01-360-7519
41	GASKET	29506212	5330-01-360-9038

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
42	GASKET	29506213	5330-01-360-9039
43	GASKET	29506323	5330-01-360-5262
44	GASKET	29506352	5330-01-360-9037
45	GASKET	113-6200	5330-01-361-1458
46	GASKET	113-6250	5330-01-360-5933
47	GASKET	115-4202	5330-01-360-5939
48	GASKET	1S7057	5330-00-105-0339
49	GASKET	22-P-53	5330-01-043-5832
50	GASKET	35P-74	5330-01-381-2357
51	GASKET	3N4087	5330-01-061-8003
52	GASKET	4P1623	5330-01-360-5932
53	GASKET	4P6930	5330-01-360-7172
54	GASKET	6D1004	5330-01-059-9593
55	GASKET	7C0358	5330-01-360-5936
56	GASKET	7C1160	5330-01-360-5937
57	GASKET	7C7431	5330-01-360-5940
58	GASKET	7E0844	5330-01-360-5492
59	GASKET	7E9817	5330-01-360-5938
60	GASKET	7W2398	5330-01-360-5935
61	GASKET	7W5340	5330-01-360-7173
62	GASKET	7W6552	5330-01-360-5929
63	GASKET	7W9699	5330-01-360-5928
64	GASKET	9Y4634	5330-01-360-5930
65	INSULATION PANEL	12418384-001	2510-01-377-4333
66	INSULATION PANEL	12418384-004	
67	INSULATION PANEL	12418384-005	
68	INSULATION PANEL	12418384-006	
69	INSULATION PANEL	12418384-007	
70	INSULATION PANEL	12418384-008	
71	INSULATION SLEEVING, ELECTRICAL	313H232-6-250	5970-01-373-5692
72	INSULATION SLEEVING, ELECTRICAL	313H243-6-250	5970-01-373-5690
73	INSULATION SLEEVING, ELECTRICAL	313H253-6-250	5970-01-373-5691

MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
74	INSULATION SLEEVING, ELECTRICAL	313H274-6-250	5970-01-374-0823
75	INSULATION SLEEVING, ELECTRICAL	313H285-6-250	5970-01-374-0822
76	INSULATION SLEEVING, ELECTRICAL	333H263-6-250	5970-01-374-0339
77	INSULATION SLEEVING, ELECTRICAL	333H274-6-250	5970-01-387-7008
78	INSULATION SLEEVING, ELECTRICAL	333H285-6-250	5970-01-387-7193
79	INSULATION SLEEVING, ELECTRICAL	EPS-3003/4B	5970-01-379-7195
80	INSULATION SLEEVING, ELECTRICAL	M23053/4-302-0	5970-01-161-6796
81	INSULATION SLEEVING, ELECTRICAL	M23053/4-304-0	5970-01-163-1103
82	INSULATION SLEEVING, ELECTRICAL	M23053/4-305-0	5970-01-210-3272
83	INSULATION SLEEVING, ELECTRICAL	M23053/5-210-C	5970-00-990-9911
84	INSULATION SLEEVING, ELECTRICAL	M23053/5-303-9	5970-01-312-5497
85	KEY, WOODRUFF	N9040	5315-01-166-2355
85.1	KIT, REPAIR	1033-05432-02	
86	KIT, SEAL	9638	5330-01-344-2573
87	LOCKNUT, TUBE FITTING	9X6620	4730-01-360-4179
88	LOCKWASHER	152.269	5310-00-189-8468
89	LOCKWASHER	152.544	5310-01-395-0823
90	LOCKWASHER	152.552	5310-01-308-8205
91	LOCKWASHER	1388	5310-01-162-5737
92	LOCKWASHER	1395	5310-00-194-9209
93	LOCKWASHER	1495	5310-01-161-2527
94	LOCKWASHER	2434	5310-00-775-5139
95	LOCKWASHER	10241	5310-01-416-3010
96	LOCKWASHER	12414560-017	5310-01-395-0820
97	LOCKWASHER	12414560-018	5310-01-381-3281
98	LOCKWASHER	3059-00870-03	5310-00-397-4524
99	LOCKWASHER	6V5839	5310-01-360-0983
100	LOCKWASHER	9B7233	5310-00-559-0070
101	LOCKWASHER	D70336/1-20	5310-01-110-7933
102	LOCKWASHER	MS35335-38	5310-00-616-6354
103	LOCKWASHER	MS35335-62	5310-00-184-9562

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
104	LOCKWASHER	MS35338-48	5310-00-003-4094
105	LOCKWASHER	MS35335-61	5310-00-527-3634
106	LOCKWASHER	N9015	5310-01-046-0186
107	LOCKWASHER	N9018	5310-01-032-4827
108	LOCKWASHER	N9265	5310-01-136-4888
109	LOCKWASHER	N9459	5310-01-348-8393
109.1	LOCKWASHER	Z093078423	5310-01-145-4355
110	LOCKWASHER	2523	5310-00-775-5182
111	LOCKWASHER	12414560-029	5310-01-395-0817
112	LOCKWASHER	N9461	5310-01-348-8392
113	LOCKWASHER	N9574	
114	LOCKWASHER	Z0930-78423	5310-01-120-6997
115	MOUNT, RESILIENT	12414590	5340-01-374-0501
116	NUT, CLINCH	ALS3-470-2.0	5310-01-384-7280
117	NUT, CLINCH	ALS3-610-4.2	5310-01-368-8065
118	NUT, PLAIN, HEX	12414474-011	5310-01-363-4879
119	NUT, PLAIN, HEX	12414474-018	5310-01-376-0488
120	NUT, PLAIN, HEX	12414474-010	5310-01-370-7447
121	NUT, PLAIN, HEX	0770-023-003	5310-01-423-3725
122	NUT, SELF-LOCKING	11649930	5310-01-390-5105
123	NUT, SELF-LOCKING	11649930	5310-00-402-5220
124	NUT, SELF-LOCKING	12418084	5310-01-371-8419
125	NUT, SELF-LOCKING	29507834	5310-01-359-8789
126	NUT, SELF-LOCKING	12414308-002	5310-01-381-9819
127	NUT, SELF-LOCKING	12414308-004	5310-01-369-5703
128	NUT, SELF-LOCKING	12414308-007	5310-01-369-6073
129	NUT, SELF-LOCKING	12414308-016	5310-01-381-9945
130	NUT, SELF-LOCKING	12414308-017	5310-01-381-9830
131	NUT, SELF-LOCKING	12414308-018	5310-01-369-3337
132	NUT, SELF-LOCKING	12414308-019	5310-01-369-9522
133	NUT, SELF-LOCKING	12414308-021	5310-01-369-3338
134	NUT, SELF-LOCKING	12414308-025	5310-01-369-6706

MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
135	NUT, SELF-LOCKING	12414308-027	5310-01-369-3339
135.1	NUT, SELF-LOCKING	12414315-004	5310-01-342-2739
136	NUT, SELF-LOCKING	12414315-006	5310-01-369-3332
137	NUT, SELF-LOCKING	12414315-009	5310-01-365-7236
138	NUT, SELF-LOCKING	12414315-011	5310-01-368-8667
139	NUT, SELF-LOCKING	12414315-012	5310-01-369-3331
140	NUT, SELF-LOCKING	12414315-017	5310-01-368-8065
141	NUT, SELF-LOCKING	12414315-020	5310-01-372-6337
142	NUT, SELF-LOCKING	12414315-021	5310-01-434-3778
143	NUT, SELF-LOCKING	3029-01371-01	5310-01-194-0481
144	NUT, SELF-LOCKING	40-X-1241	5310-01-391-5249
145	NUT, SELF-LOCKING	DIN 934 ST M6	5310-01-342-2739
146	NUT, SELF-LOCKING	MS20500-524	5310-00-208-4023
147	NUT, SELF-LOCKING	MS21083N6	5310-00-926-1852
148	NUT, SELF-LOCKING	MS51943-52	5310-00-241-6666
149	NUT, SELF-LOCKING	N9091	5310-01-050-5005
150	NUT, SELF-LOCKING	N9099	5310-01-165-1312
151	NUT, SELF-LOCKING	N9406	5310-01-362-6171
152	NUT, SELF-LOCKING	N9410	5310-01-348-8398
153	NUT, SELF-LOCKING	N9416	5310-01-348-8360
154	NUT, SELF-LOCKING	N9467	5310-01-350-4257
155	NUT, SELF-LOCKING	N9556	5310-01-423-0880
155.1	PACKING, PREFORMED	F4001-16	5331-01-466-0354
155.2	PACKING, PREFORMED	J515-16-3	5331-01-465-3634
155.3	PACKING, PREFORMED	XA-2265	5331-01-459-5254
156	PACKING, PREFORMED	9612	5330-01-357-0846
157	PACKING, PREFORMED	9972	5330-01-359-2151
158	PACKING, PREFORMED	11446	5330-00-996-3989
159	PACKING, PREFORMED	14121	5330-01-400-1864
160	PACKING, PREFORMED	197755	5330-01-415-9632

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
160.1	PACKING, PREFORMED	225163 (35510)	
161	PACKING, PREFORMED	71041	5330-00-633-6827
162	PACKING, PREFORMED	74980	5330-00-838-6729
163	PACKING, PREFORMED	250192	5330-00-510-3255
164	PACKING, PREFORMED	251216	5330-01-417-5170
165	PACKING, PREFORMED	251217	5330-01-417-5104
166	PACKING, PREFORMED	251391	
167	PACKING, PREFORMED	420828	5340-01-417-3788
168	PACKING, PREFORMED	23014057	5330-01-360-6016
169	PACKING, PREFORMED	23019664	5330-01-361-0235
170	PACKING, PREFORMED	23043446	5330-01-424-6629
171	PACKING, PREFORMED	23046274	5330-01-360-6018
172	PACKING, PREFORMED	29500969	5330-01-360-7852
173	PACKING, PREFORMED	29501439	5330-01-388-1528
174	PACKING, PREFORMED	29503380	5330-01-360-6014
175	PACKING, PREFORMED	29503381	5330-01-360-6015
176	PACKING, PREFORMED	29503382	5330-01-360-6013
177	PACKING, PREFORMED	29503383	5330-01-360-6017
178	PACKING, PREFORMED	29507700	5330-01-424-4552
179	PACKING, PREFORMED	114-8718	5330-01-348-2720
180	PACKING, PREFORMED	125-8274	5330-01-360-6012
181	PACKING, PREFORMED	1J9671	5330-00-613-6500
182	PACKING, PREFORMED	1T1068	5330-01-336-8776
183	PACKING, PREFORMED	22-P-92	5330-01-361-6962
184	PACKING, PREFORMED	28-P-120	5330-00-832-9514
185	PACKING, PREFORMED	28-P-121	5330-01-064-6284
186	PACKING, PREFORMED	28-P-190	
187	PACKING, PREFORMED	28-P-191	5330-01-361-6959
188	PACKING, PREFORMED	2M9780	5330-00-939-0687
189	PACKING, PREFORMED	3-906-N522-90	5330-01-104-1093
190	PACKING, PREFORMED	3J1907	5330-01-333-6444

MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
191	PACKING, PREFORMED	3J7354	5330-00-952-8008
192	PACKING, PREFORMED	3K0360	5330-00-948-6482
193	PACKING, PREFORMED	3P1156	5330-00-385-7587
194	PACKING, PREFORMED	4F7391	5330-00-562-1073
195	PACKING, PREFORMED	4F9029	5330-00-118-6559
196	PACKING, PREFORMED	4F9653	5330-00-038-4327
197	PACKING, PREFORMED	4J5477	5330-00-885-8059
198	PACKING, PREFORMED	5F9657	5330-00-291-9572
199	PACKING, PREFORMED	6F6673	5330-00-865-0404
200	PACKING, PREFORMED	8L2786	5330-00-973-8301
201	PACKING, PREFORMED	8M4445	5330-00-914-5821
202	PACKING, PREFORMED	9002-00491-68	5330-01-393-5630
203	PACKING, PREFORMED	9002-00741-58	5330-01-195-1500
203.1	PACKING, PREFORMED	9730	
204	PACKING, PREFORMED	Z053-074979	5330-00-579-6495
205	PACKING, PREFORMED	M83248-2-908	5330-00-167-5173
206	PACKING, PREFORMED	M83248/1-906	5330-00-020-0186
207	PACKING, PREFORMED	M83461/1-438	5330-01-160-4337
208	PACKING, PREFORMED	M83461/1-442	5330-01-183-0987
209	PACKING, PREFORMED	MS28778-12	5330-01-251-8839
210	PACKING, PREFORMED	MS28778-16	5330-00-804-5694
211	PACKING, PREFORMED	MS28778-20	5330-01-816-3546
212	PACKING, PREFORMED	MS28778-4	5330-00-805-2966
213	PACKING, PREFORMED	MS28778-6	5330-00-804-5695
214	PACKING, PREFORMED	MS9770-116	5330-01-388-4084
215	PACKING, PREFORMED	Z053-074979	5330-00-579-6495
215.1	PACKING, PREFORMED	Z053095777	5331-01-304-3453
216	PACKING, RETAINER	23049377	5330-01-361-9052
217	PACKING, RETAINER	29503208	5330-01-361-9785
218	PANEL, DEFROSTER	12420495-004	

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
219	PARTS KIT, DISC AND SPRING	94012	2530-01-344-5748
220	PARTS KIT, ENGINE FUEL PUMP	5R9065	2910-01-363-6816
221	PARTS KIT, SEAL REPLACEMENT	9403	5330-01-344-2572
222	PARTS KIT, SEAL REPLACEMENT	23042434	5330-01-360-5459
223	PARTS KIT, SEAL REPLACEMENT	29503974	5330-01-388-1576
224	PARTS KIT, WINCH	9402	2590-01-374-2510
225	PIN, COTTER	1199R2176	5315-00-880-6027
226	PIN, COTTER	K-2412-Z	5315-01-179-9882
226.1	PIN, COTTER	MS24665-385	5315-00-187-9382
227	PIN, COTTER	MS24665-423	5315-00-013-7228
228	PIN, COTTER	MS24665-457	5315-00-187-9393
229	PIN, COTTER	MS24665-459	5315-00-187-9394
230	PIN, COTTER	XB-781-1	5315-01-369-1346
231	PIN, SPRING	M16562-50	5315-00-814-3531
231.1	PIN, STRAIGHT, HEADED	12417962-081	5315-01-447-2297
232	PLUG	3h5552	5340-00-007-6350
233	PLUG, EXPANSION	2M6471	5340-00-410-6762
234	PLUG, PLASTIC	12418065-004	4730-01-375-1450
235	PLUG, PLASTIC	12418065-005	4730-01-375-0329
236	PLUG, RUBBER	12417526	5340-01-375-3042
237	PLUG, RUBBER	12417527	5340-01-377-1543
238	PLUG, RUBBER	12417599	5340-01-381-3855
239	PLUG, RUBBER	12418348	5340-01-384-0869
240	PLUG, RUBBER	12420305-001	5340-01-384-1120
241	PLUG, RUBBER	12420305-003	5970-01-089-7447
242	RETAINER, PACKING	202624	5330-01-417-7794
243	RETAINER, PACKING	11863-012	5330-01-292-7266
244	RING, PISTON	14265	4320-01-301-8429
245	RING, RETAINING	6I3033	5365-01-360-0953
246	RING, RETAINING	6I3035	5365-01-360-0954

MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
247	RING, RETAINING	N9008	5365-01-032-4222
248	RING, RETAINING	N9009	5365-01-034-2757
248.1	RING, SEAL	225148	5331-01-459-6517
249	RING, SEAL	9M4849	5330-00-847-4351
249.1	RIVET, BLIND	12421770-004	
250	RIVET, COMPRESSION	12420756	
251	RUBBER STRIP	12420421	5330-01-389-6109
251.1	SCREW, CAP	CSH5-24-39	5305-01-479-7857
252	SCREW, CAP	639A52710	5305-01-081-7393
253	SCREW, CAPTIVE	12421366	
253.1	SCREW, SELF-LOCKING	7X3347	5305-01-360-0952
254	SEAL	12415307	5340-01-376-0672
255	SEAL	12418327	5365-01-381-3976
256	SEAL, CONNECTOR TUBE	4K1388	5330-00-933-3305
257	SEAL, DOOR	12417485	5330-01-375-2909
258	SEAL, INPUT	A-1205-F-2502	
259	SEAL, NON-METALLIC	23046376	5330-01-360-6006
260	SEAL, NON-METALLIC	23048727	5330-01-360-7826
261	SEAL, NON-METALLIC	1205F2164	5330-01-362-3392
262	SEAL ,PLAIN	3018-01507-01	5330-01-393-5626
263	SEAL, PLAIN	3018-01519-01	5330-01-331-9283
263.1	SEAL, PLAIN ENCASED	KIT-4451	5330-01-362-6102
264	SEAL, PLAIN ENCASED	29507528	5330-01-360-5917
265	SEAL, PLAIN ENCASED	29515690	5330-01-430-3477
266	SEAL, PLAIN ENCASED	115-4109	5330-01-361-1456
267	SEAL, PLAIN ENCASED	28-P-119	5330-01-044-6592
268	SEAL, PLAIN ENCASED	4R8831	5330-01-360-9023
269	SEAL, PLAIN ENCASED	A-1205-D-2344	5330-01-360-5253
270	SEAL, PLAIN ENCASED	97799	5330-01-079-6372
271	SEAL, PLAIN ENCASED	28-P-193	5330-00-483-2296

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
272	SEAL, URETHANE FOAM	12420420-001	
273	SEAL, URETHANE FOAM	12420420-003	
274	SEALRING	23045611	5330-01-360-9099
275	SEALRING	23045612	5330-01-360-9100
276	SEALRING	23045613	5330-01-360-9101
277	SEALRING	23045614	5330-01-360-9102
278	SEALRING	23045615	5330-01-360-9103
279	SEALRING	23045654	5330-01-360-9104
280	SEALRING	23045655	5310-01-360-9105
281	SEALRING	23046868	5330-01-360-5980
282	SEALRING	29501189	5330-01-360-5978
283	SEALRING	29501190	5330-01-360-5979
284	SEALRING	29502161	5365-01-360-1675
285	SEALRING	29502164	5365-01-360-1674
286	SEALRING	29506399	5330-01-360-5980
287	SETSCREW	29506222	5305-01-360-1667
288	SPRING	4088-40615-01	5360-01-392-9389
289	SPRING, COMPRESSION	2322	5360-01-345-5384
290	SPRING, FLAT	29500064	5360-01-360-2023
291	SPRING, HELICAL COMPRESSION	9L9188	5360-00-175-2701
292	STRAINER, SUCTION	29503670	4730-01-360-4458
293	VALVE CHECK	7C1493	4820-01-284-5435
294	WASHER	1229-M-1625	5310-01-059-7130
295	WASHER	MS27183-10	5310-00-809-4058
296	WASHER, BRAKE HOUSING	1911644	5310-00-130-8033
297	WASHER, FIBER	Z095077721	3120-01-302-9301
297.1	WASHER, FLAT	12414473-014	5310-01-363-0740
298	WASHER, FLAT	36900	5310-00-482-1999
299	WASHER, FLAT	78302	5310-01-112-1738
299.1	WASHER, INSULATION	MES-76 (35510)	
299.1	WASHER, SEAL	XA 1470	5310-01-460-5998
300	WASHER, SEAL	29500025	5310-01-359-8840

MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
301	WASHER, SEAL	29506215	5310-01-359-8842
302	WASHER, SPRING TENSION	12417503	5310-01-406-6326
303	WASHER, SPRING TENSION	12418220	5310-01-372-3495
304	WASHER, SPRING TENSION	12414560-019	5310-01-369-6074
305	WASHER, SPRING TENSION	D63474/1-27	5310-01-PAE-6769
306	WASHER, SPRING TENSION	75777	5310-01-112-1740
306.1	WASHER, THRUST	57023	3120-01-460-9421
307	WICK	225165	9390-01-459-7969
308	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 9-2320-365-20-3 paragraph 8-2 or 8-3.

H-2. EXPLANATION OF COLUMNS

a. Column (1) - Installed Controls or Controls Being Installed. This column lists all of the variables concerning which version of transmission controls are installed in the vehicle, or may need to be installed, to communicate correctly with the transmission.

b. Column (2) - Installed Transmission or Transmission Being Installed. This column lists all of the various revisions of the Allison MD3070PT transmissions that may be installed in the vehicle.

c. Column (3) - Required Modification. This column lists the various electrical interface (hardware) modifications that may be required to allow the transmission controls to communicate with the transmission.

H-3. HOW TO USE THIS CHART

a. Determine which controls and transmission are installed in the vehicle.

b. Determine which component requires replacement.

c. Read across the row to column (3) to determine the required modification.

Section II.

TRANSMISSION/TRANSMISSION CONTROLS ADAPTABILITY CHART

(1) Installed Controls or Controls Being Installed	(2) Installed Transmission or Transmission Being Installed	(3) Required Modification (Refer to Section III)
WTEC II (with 24-pin connector)	PRE-ID w/ 24-pin connector (transmission serial number prior to 6510032369)	No modification required.
WTEC II (with 24-pin connector)	PRE-ID w/ 31-pin connector (transmission serial number 6510032369 to 6510090785)	Install 31-pin connector.
WTEC II (with 24-pin connector)	TID 1 (transmission serial number 6510090786 to 6510142171)	Install 31-pin connector.
WTEC II (with 24-pin connector)	TID 2 (transmission serial number 6510142172 to 6510262116)	Install 31-pin connector and replace transmission internal wiring harness.

TRANSMISSION/TRANSMISSION CONTROLS ADAPTABILITY CHART (CONT)

(1) Installed Controls or Controls Being Installed	(2) Installed Transmission or Transmission Being Installed	(3) Required Modification (Refer to Section III)
WTEC II (with 24-pin connector)	TID 3 (transmission serial number 6510262117 and subsequent)	Install 31-pin connector, replace transmission internal wiring harness, and reprogram WTEC II TEPSS. [1]
WTEC II (with 31-pin connector)	PRE-ID w/ 24-pin connector (transmission serial number prior to 6510032369)	Install adapter cable assembly.
WTEC II (with 31-pin connector)	PRE-ID w/ 31-pin connector (transmission serial number 6510032369 to 6510090785)	No modification required.
WTEC II (with 31-pin connector)	TID 1 (transmission serial number 6510090786 to 6510142171)	No modification required.
WTEC II (with 31-pin connector)	TID 2 (transmission serial number 6510142172 to 6510262116)	Replace transmission internal wiring harness.
WTEC II (with 31-pin connector)	TID 3 (transmission serial number 6510262117 and subsequent)	Replace transmission internal wiring harness and reprogram WTEC II TEPSS. [1]
WTEC III (with ECU manufactured prior to October 1999) [2]	PRE-ID w/ 24-pin connector (transmission serial number prior to 6510032369)	Install adapter cable assembly and ID harness.
WTEC III (with ECU manufactured prior to October 1999) [2]	PRE-ID w/ 31-pin connector (transmission serial number 6510032369 to 6510090785)	Install ID harness.
WTEC III (with ECU manufactured prior to October 1999) [2]	TID 1 (transmission serial number 6510090786 to 6510142171)	No modification required.
WTEC III (with ECU manufactured prior to October 1999) [2]	TID 2 (transmission serial number 6510142172 to 6510262116)	No modification required.
WTEC III (with ECU manufactured prior to October 1999) [2]	TID 3 (transmission serial number 6510262117 and subsequent)	Reprogram WTEC III ECU [1] or install new WTEC III ECU (P/N 12421787-002).
WTEC III (with ECU manufactured after to October 1999) [3]	PRE-ID w/ 24-pin connector (transmission serial number prior to 6510032369)	Install adapter cable assembly and ID harness.
WTEC III (with ECU manufactured after to October 1999) [3]	PRE-ID w/ 31-pin connector (transmission serial number 6510032369 to 6510090785)	Install ID harness.
WTEC III (with ECU manufactured after to October 1999) [3]	TID 1 (transmission serial number 6510090786 to 6510142171)	No modification required.

[1] Reprogramming can only be accomplished by an authorized Allison Transmission distributor. You must provide the transmission serial number of the transmission being installed to ensure correct reprogramming. If at a later time, an earlier version transmission is installed in a WTEC II equipped vehicle, WTEC II TEPSS will require reprogramming again.
[2] Vehicle serial number 012477 and lower. Refer to Figure 1.
[3] Vehicle serial number 012478 and higher. Refer to Figure 1.

(1) Installed Controls or Controls Being Installed	(2) Installed Transmission or Transmission Being Installed	(3) Required Modification (Refer to Section III)
WTEC III (with ECU manufactured after to October 1999) [3]	TID 2 (transmission serial number 6510142172 to 6510262116)	No modification required.
WTEC III (with ECU manufactured after to October 1999) [3]	TID 3 (transmission serial number 6510262117 and subsequent)	No modification required.

Section III.

MODIFICATION PARTS IDENTIFICATION

Identification	Part Number	Description
31-pin connector	29519127	Converts a transmission external wiring harness from a 24-pin ("D" type) connector to a 31-pin (round type) connector.
Transmission internal wiring harness	29529474	Converts a TID 2 transmission to a TID 1 configuration to allow WTEC II controls to communicate with the transmission.
ID harness	200100	Allows WTEC III controls to communicate with a PRE-ID transmission.
Adapter cable assembly	29519210	Adapts a PRE-ID transmission with 24-pin ("D" type) connector to a transmission external wiring harness with a 31-pin (round) connector.

MODIFICATION PARTS IDENTIFICATION (CONT)

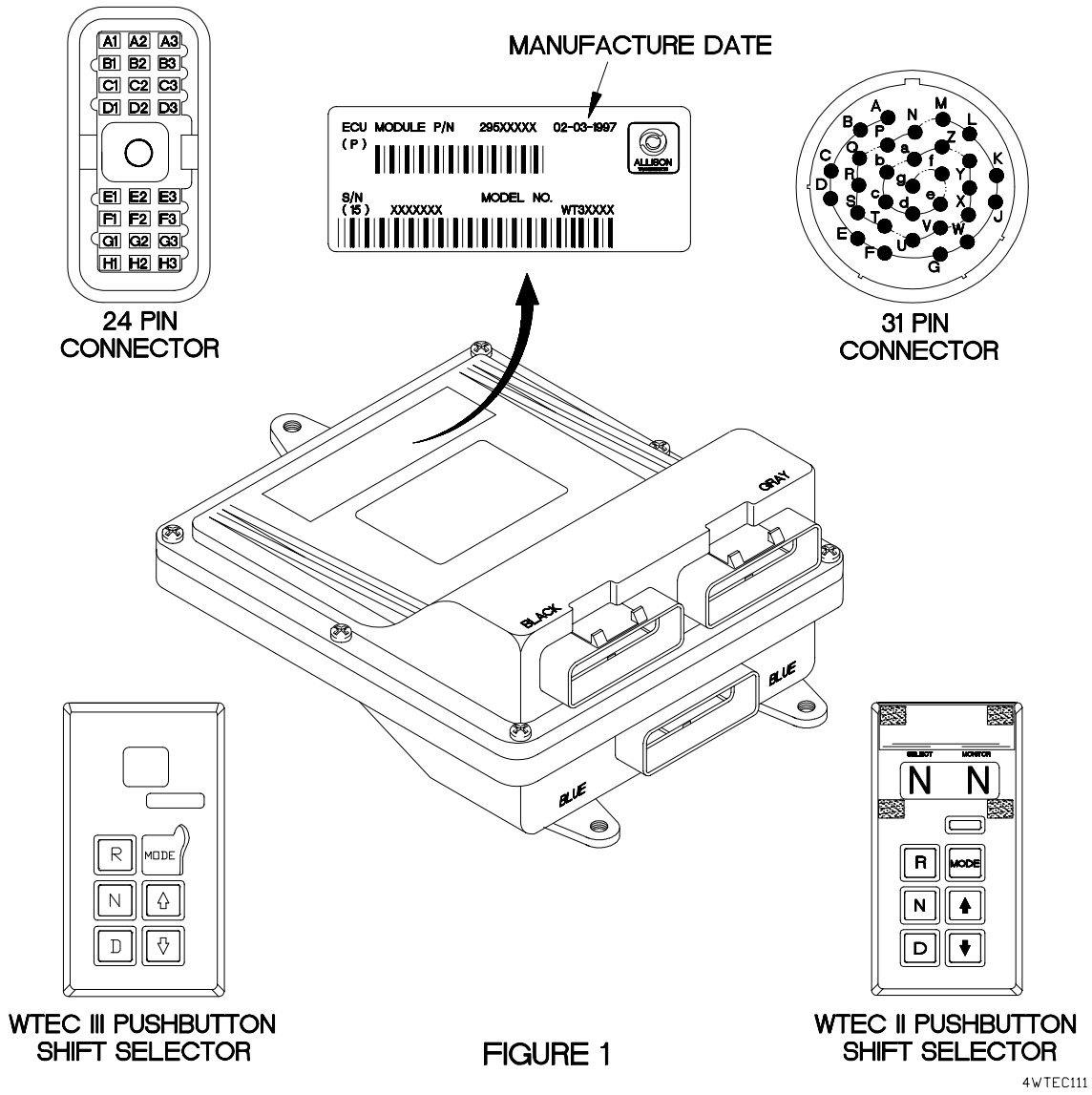


FIGURE 1

SUBJECT INDEX

Subject Para

A

Adapter
Housing Module Repair 21-6
Transmission Adapter Cable Assembly Replacement 6-8
Air
Compressor Replacement 11-2
Engine Air Intake System 1-11
Inlet Elbow Replacement 3-20
System 1-19
Transportability Hydraulic System 1-18
Alternator
100 Amp Alternator Repair 6-2
200 Amp Alternator Repair 18-3
Amp
100 Amp Alternator Repair 6-2
200 Amp Alternator Repair 18-3
Angle
Front Angle Bracket Replacement 13-3
M1081 Angle Bracket Replacement 13-10
Arm
Rocker Arm and Push Rod Replacement /Repair 3-12
Armament/Sighting and Fire Control Material Maintenance Introduction 19-1
Axle
Front Axle Assembly Replacement 9-2
Front Axle Differential Carrier Repair 23-2
Front Axle Differential Carrier Replacement 9-4
Front Axle Differential Pinion Seal, Yoke Seal and Drive Yoke Replacement 9-5
Front Axle Maintenance Introduction 9-1
Front Axle Maintenance Introduction 23-1
Front Axle Shaft and Seals Replacement 9-3
Rear Axle Assembly Replacement 10-2
Rear Axle Differential Carrier Repair 24-2
Rear Axle Differential Carrier Replacement 10-4
Rear Axle Differential Pinion Seal, Yoke Seal and Drive Yoke Replacement . . . 10-3
Rear Axle Maintenance Introduction 10-1
Rear Axle Maintenance Introduction 24-1

B

Base
Oil Filter Base Replacement 3-18

Subject Para

B (Cont)

Beam
Rear Tension Beam and Taillight Mounting Bracket Replacement 13-5
Bearing(s)
Camshaft and Bearing Replacement /Repair 20-7
Crankshaft and Main Bearings Replacement/Repair 20-5
Bed
Cargo Bed Replacement 15-8
Block
Cylinder Block Repair 20-4
Blue Exhaust Smoke from Engine 2-9
Body
And Cab Maintenance Introduction 15-1
Main Valve Body Assembly Repair 7-12
Bracket(s)
Engine and Transmission Mount Bracket Replacement 7-17
Engine Bracket Replacement 3-5
Engine Front Resilient Mount and Mounting Bracket Replacement 3-4
Frame Muffler Support Bracket Replacement 13-18
Front Lifting Bracket Replacement 13-12
M1081 Angle Bracket Replacement 13-10
M1081 Sideload Bracket Replacement 13-2
Radiator Bracket Replacement 13-19
Rear Spring Brackets Replacement 13-9
Rear Tension Beam and Taillight Mounting Bracket Replacement 13-5
Transmission Oil Cooler Mounting Bracket Replacement 7-15
Transmission Resilient Mount and Bracket Replacement 7-6
Brake System 1-15
Brake System Maintenance Introduction 11-1
Bumper
Rear Bumper Replacement 13-8

C

C3/C4 Clutch Module Repair 21-13
C6
Clutch Housing Assembly Repair 21-14
Clutch Solenoid Assembly Replacement /Repair 7-9

SUBJECT INDEX

Subject Para

C (Cont)

C7 Clutch Housing and Front Output Housing Assembly Repair 21-15
Cab
Body and Cab Maintenance Introduction 15-1
Front Support Replacement/Repair 15-3
M1081 Cab Rear Wall Replacement /Repair 15-5
M1081 Cab Side Wall Replacement /Repair 15-4
M1081 Cab Windshield Frame Replacement /Repair 15-6
Replacement 15-2
Windshield, Side Windows and Door Side Window Replacement 15-7
Cable
Electrical Wire and Cable Repair 6-6
Transmission Adapter Cable Assembly Replacement 6-8
Cam Roller Followers Replacement 3-13
Camshaft and Bearing Replacement/Repair . . . 20-7
Cargo Bed Replacement 15-8
Carrier
Front Axle Differential Carrier Repair 23-2
Front Axle Differential Carrier Replacement 9-4
P1 Planetary Carrier Module Repair 21-10
P2 Planetary Carrier Module Repair 21-9
P3 Planetary Carrier Module Repair 21-7
P4 Planetary Carrier Assembly Repair 21-12
Rear Axle Differential Carrier Repair 24-2
Rear Axle Differential Carrier Replacement 10-4
Cartridge/Counterbalance
11K Self-Recovery Winch (SRW) Cartridge /Counterbalance Valve Replacement 16-3
Case
Transfer Case Control Valve Assembly Replacement/Repair 8-2
Transfer Case Housing Repair 22-4
Transfer Case Module Seal and Drive Yoke Replacement 8-3
Charging
Front Support/Charging Pump Module Repair 21-3

Subject Para

C (Cont)

Check(s)
Fuel Setting Check 4-4
Fuel Timing Checks 4-5
Cleaning
General Cleaning Instructions 2-20
Clearance
Valve Clearance Adjustment 3-14
Clutch
C3/C4 Clutch Module Repair 21-13
C6 Clutch Housing Assembly Repair 21-14
C6 Clutch Solenoid Assembly Replacement /Repair 7-9
C7 Clutch Housing and Front Output Housing Assembly Repair 21-15
Engine Fan Clutch Repair (P/N 1090-08000-01) 5-3
Rotating Clutch Module Repair 21-4
Rotating Clutch Solenoid Assembly Replacement/Repair 7-8
Stationary Clutch Solenoid Assembly Replacement/Repair 7-7
Common Tools and Equipment 2-1
Compressor
Air Compressor Replacement 11-2
Conditions
Transmission Assembly Replacement (Unusual Conditions) 7-18
Transmission Assembly Replacement (Usual Conditions) 7-4
Connecting
Piston and Connecting Rod Assembly Replacement/Repair 20-6
Control
Fuel Control Linkage Replacement 4-7
Transfer Case Control Valve Assembly Replacement/Repair 8-2
Valve Module Repair 7-11
Valve Module Replacement 7-10
Valve Module Strainer Replacement 7-14
Converter
Housing Module Repair 21-5
Torque Converter Replacement/Repair 7-2
Coolant
In Engine Oil 2-9
Loss of Coolant 2-10

Subject Para

C (Cont)

Cooler
Oil Cooler Replacement 3-19
Transmission Oil Cooler Mounting Bracket Replacement 7-15
Cooling
Cooling System 1-13
Oil In Cooling System 2-10
System Maintenance Introduction 5-1
System Troubleshooting 2-10
Cover
Engine Front Cover Replacement 3-15
Inlet Manifold Cover Replacement 3-21
Cranks
Engine Cranks But Does Not Start 2-9
Engine Cranks But Does Not Start 2-9A
Crankshaft
And Main Bearings Replacement/Repair 20-5
Front Seal Replacement 3-8
Rear Seal Replacement 3-9
Crossmember
Front Crossmember Replacement 13-16
Intermediate Crossmember Replacement . . 13-17
Rear Crossmember Replacement 13-6
Shock Mount Crossmember Replacement . . . 13-7
Cylinder
Block Repair 20-4
Head Repair 20-3
Head/Head Gasket Replacement 3-6
Suspension Cylinder Replacement 17-2

D

Damper
Pulley Damper Replacement 3-7
Deprocessing
Unpacking and Deprocessing 2-4
Description
Location and Description of Major Components 1-8
Destruction of Army Materiel to Prevent Enemy Use 1-3
Differences Between Models 1-9
Differential
Front Axle Differential Carrier Repair 23-2
Front Axle Differential Carrier Replacement 9-4
Front Axle Differential Pinion Seal, Yoke Seal and Drive Yoke Replacement 9-5

Subject Para

D (Cont)

Differential (Cont)
Rear Axle Differential Carrier Repair 24-2
Rear Axle Differential Carrier Replacement 10-4
Rear Axle Differential Pinion Seal, Yoke Seal and Drive Yoke Replacement . . . 10-3
Door
Cab Windshield, Side Windows and Door Side Window Replacement 15-7
Dressed Engine Unpacking/Packing 3-2
Drive
Front Axle Differential Pinion Seal, Yoke Seal and Drive Yoke Replacement 9-5
Power Transfer and Final Drive Assembly Maintenance Introduction 8-1
Power Transfer and Final Drive Assembly Maintenance Introduction 22-1
Rear Axle Differential Pinion Seal, Yoke Seal and Drive Yoke Replacement . . . 10-3
Transfer Case Module Seal and Drive Yoke Replacement 8-3

E

EIR
Reporting Equipment Improvement Recommendations (EIR) 1-5
Elbow
Air Inlet Elbow Replacement 3-20
Electrical
System 1-14
System Maintenance Introduction 6-1
Wire and Cable Repair 6-6
Engine
Air Intake System 1-11
And Transmission Mount Bracket Replacement 7-17
Assembly Replacement 3-3
Bracket Replacement 3-5
Coolant in Engine Oil 2-9
Cranks But Does Not Start 2-9
Cranks But Does Not Start 2-9A
Does Not Crank 2-9
Dressed Engine Unpacking/Packing 3-2
Excessive Black or Gray Exhaust Smoke from Engine 2-9
Excessive Engine Oil Consumption 2-9
Fan Clutch Repair 5-3
Front Cover Replacement 3-15

SUBJECT INDEX

Subject Para

E (Cont)

Engine (Cont)
Front Resilient Mount and Mounting Bracket Replacement 3-4
Low Engine Oil Pressure 2-9
Maintenance Introduction 20-1
Overheats 2-9
Overheats 2-10
Overspeeds on Start 2-9
Speed is not Stable 2-9
Stalls at Low RPM 2-9
Starts but Misfires, Runs Rough, or Lacks Power 2-9
System Introduction 3-1
System Troubleshooting 2-9
To Maintenance Stand Mounting 20-2
Too Much Vibration in Engine 2-9
White Exhaust Smoke from Engine 2-9
Equipment
Characteristics, Capabilities, and Features 1-7
Common Tools and Equipment 2-1
Hand Receipt Manual and Inventory of Equipment 2-5
Reporting Equipment Improvement Recommendations (EIR) 1-5
Special Tools, TMDE, and Support Equipment 2-2
Excessive
Black or Gray Exhaust Smoke from Engine 2-9
Engine Oil Consumption 2-9
Exhaust
Excessive Black or Gray Exhaust Smoke from Engine 2-9
Manifold Replacement 3-23
White Exhaust Smoke from Engine 2-9
Extension
M1078/M1079 Pintle Hook Extension Kit Initial Installation 18-2
External
Transmission External Wiring Harness Replacement 6-7

F

Fan
Engine Fan Clutch Repair (P/N 1090-08000-01) 5-3

Subject Para

F (Cont)

Features
Equipment Characteristics, Capabilities, and Features 1-7
Filter
Oil Filter Base Replacement 3-18
Fire
Armament/Sighting and Fire Control Material Maintenance Introduction 19-1
Flexplate Assembly Replacement 3-10
Flywheel Housing Replacement 3-11
Followers
Cam Roller Followers Replacement 3-13
Forms
Maintenance Forms, Records, and Reports 1-2
Frame
M1081 Cab Windshield Frame Replacement /Repair 15-6
M1081 Frame Plate Replacement 13-11
Maintenance Introduction 13-1
Muffler Support Bracket Replacement 13-18
Rail Replacement 13-13
Frame Plate
M1081 Frame Plate Replacement 13-11
Front
Angle Bracket Replacement 13-3
Axle Assembly Replacement 9-2
Axle Differential Carrier Repair 23-2
Axle Differential Carrier Replacement 9-4
Axle Differential Pinion Seal, Yoke Seal and Drive Yoke Replacement 9-5
Axle Maintenance Introduction 9-1
Axle Maintenance Introduction 23-1
Axle Shaft and Seals Replacement 9-3
C7 Clutch Housing and Front Output Housing Assembly Repair 21-15
Cab Front Support Replacement/Repair 15-3
Crankshaft Front Seal Replacement 3-8
Crossmember Replacement 13-16
Engine Front Cover Replacement 3-15
Engine Front Resilient Mount and Mounting Bracket Replacement 3-4
Gear Housing and Idler Gear Replacement 20-8
Leaf Spring Replacement 14-2

Subject Para

F (Cont)

Front (Cont)
Leaf Spring Shackle and Pin Replacement 14-3
Lifting Bracket Replacement 13-12
Support/Charging Pump Module Repair 21-3
Fuel
Control Linkage Replacement 4-7
Governor Replacement/Repair 4-9
Injector Replacement 4-2
Injector Synchronization 4-3
Setting Check 4-4
Shutoff Solenoid Replacement 6-4
System 1-12
System Maintenance Introduction 4-1
Timing Checks 4-5

G

Gasket
Cylinder Head/Head Gasket Replacement 3-6
Gear
Front Gear Housing and Idler Gear Replacement 20-8
Steering Gear Assembly Adjustment 12-3
Steering Gear Replacement 12-2
General
Assembly Instructions 2-23
Cleaning Instructions 2-20
Disassembly Instructions 2-19
Inspection Instructions 2-21
Installation Instructions 2-24
Removal Instructions 2-18
Repair Instructions 2-22
Governor
Fuel Governor Replacement/Repair 4-9
Ground Handling 2-17
Gun
Initial Machine Gun Ring Kit Installation/Removal 19-2

H

Hand Receipt Manual and Inventory of Equipment 2-5
Hard To Steer 2-14
Harness
Transmission External Wiring Harness Replacement 6-7

Subject Para

H (Cont)

Harness (Cont)
Transmission Internal Wiring Harness Replacement 7-13
Head
Cylinder Head Repair 20-3
Cylinder Head/Head Gasket Replacement 3-6
Head Gasket
Cylinder Head/Head Gasket Replacement 3-6
Hook
M1078/M1079 Pintle Hook Extension Kit Initial Installation 18-2
Housing
Adapter Housing Module Repair 21-6
C6 Clutch Housing Assembly Repair 21-14
C7 Clutch Housing and Front Output Housing Assembly Repair 21-15
Converter Housing Module Repair 21-5
Flywheel Housing Replacement 3-11
Front Gear Housing and Idler Gear Replacement 20-8
Rear Output Housing Repair 21-11
Transfer Case Housing Repair 22-4
Hydraulic
11K Self-Recovery Winch Hydraulic Motor Replacement 16-4
Air Transportability Hydraulic System 1-18
Loss of Hydraulic Pressure (Single Stage Pump) 2-13
Rotary Pump Replacement 16-5
System Maintenance Introduction 17-1
System Troubleshooting 2-13

I

Idle Speed Adjustment 4-8
Idler
Front Gear Housing and Idler Gear Replacement 20-8
Information
Warranty Information 1-6
Initial Machine Gun Ring Kit Installation/Removal 19-2
Injector
Fuel Injector Replacement 4-2
Fuel Injector Synchronization 4-3

SUBJECT INDEX

Subject Para

I (Cont)

Inlet
Air Inlet Elbow Replacement 3-20
Manifold Cover Replacement 3-21
Manifold Replacement 3-22
Inspection
General Inspection Instructions 2-21
Instructions
General Assembly Instructions 2-23
General Cleaning Instructions 2-20
General Disassembly Instructions 2-19
General Inspection Instructions 2-21
General Installation Instructions 2-24
General Removal Instructions 2-18
General Repair Instructions 2-22
Troubleshooting Instructions 2-8
Intake
Engine Air Intake System 1-11
Intermediate Crossmember Replacement 13-17
Internal
Transmission Internal Wiring Harness Replacement 7-13
Introduction
11K Self-Recovery Winch (SRW) Maintenance Introduction 16-1
Armament/Sighting and Fire Control Material Maintenance Introduction 19-1
Body and Cab Maintenance Introduction 15-1
Brake System Maintenance Introduction 11-1
Cooling System Maintenance Introduction 5-1
Electrical System Maintenance Introduction 6-1
Engine Maintenance Introduction 20-1
Engine System Introduction 3-1
Frame Maintenance Introduction 13-1
Front Axle Maintenance Introduction 9-1
Front Axle Maintenance Introduction 23-1
Fuel System Maintenance Introduction 4-1
Hydraulic System Maintenance Introduction 7-1
Kits Maintenance Introduction 18-1
Maintenance Introduction 2-16
Power Transfer and Final Drive Assembly Maintenance Introduction 8-1
Power Transfer and Final Drive Assembly Maintenance Introduction 22-1

Subject Para

I (Cont)

Introduction (Cont)
Preparation for Storage or Shipment Introduction 2-25
Rear Axle Maintenance Introduction 10-1
Rear Axle Maintenance Introduction 24-1
Steering System Maintenance Introduction 12-1
To Logic Tree Troubleshooting 2-7
Transmission Maintenance Introduction 21-1
Transmission System Maintenance Introduction 7-1
Inventory
Hand Receipt Manual and Inventory of Equipment 2-5

K

Kit(s)
Initial Machine Gun Ring Kit Installation/Removal 19-2
M1078/M1079 Pintle Hook Extension Kit Initial Installation 18-2
Special Purpose Kits Maintenance Introduction 18-1
Knuckle
Steering Knuckle Mechanism Replacement . . . 9-6

L

Leaf
Front Leaf Spring Replacement 14-2
Front Leaf Spring Shackle and Pin Replacement 14-3
Rear Leaf Spring Replacement 14-4
Lifting
Front Lifting Bracket Replacement 13-12
Linkage
Fuel Control Linkage Replacement 4-7
Location and Description of Major Components 1-8
Logic
Introduction To Logic Tree Troubleshooting 2-7
Loss
Of Coolant 2-10
Of Hydraulic Pressure (Single Stage Pump) 2-13
Low Engine Oil Pressure 2-9

Subject Para

M

M1078 Subframe Rail Replacement 13-14
M1078/M1079 Pintle Hook Extension Kit
Initial Installation 18-2
M1079 Subframe Rail Replacement 13-20
M1081
Angle Bracket Replacement 13-10
Cab Rear Wall Replacement/Repair 15-5
Cab Side Wall Replacement/Repair 15-4
Cab Windshield Frame Replacement
/Repair 15-6
Frame Plate Replacement 13-11
Parachute Suspension Assembly
Replacement 13-4
Sideload Bracket Replacement 13-2
Subframe Rail Replacement 13-15
Machine
Initial Machine Gun Ring Kit
Installation/Removal 19-2
Main
Crankshaft and Main Bearings
Replacement/Repair 20-5
Shaft Module Repair 21-8
Valve Body Assembly Repair 7-12
Main Code
WTEC II Transmission ECU Pushbutton Shift
Selector (TEPSS) Displays Main Code 22
Sub Code 15 (Serial Number 6510032369
and Higher) 2-11
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) 2-11
WTEC II Transmission ECU Pushbutton Shift
Selector (TEPSS) Displays Main Code 22
Sub Code 15 (Prior to Serial Number
6510032369) 2-11
WTEC II Transmission ECU Pushbutton Shift
Selector (TEPSS) Displays Main Code 22
Sub Code 16 2-11
WTEC II Transmission ECU Pushbutton Shift
Selector (TEPSS) Displays Main Code 24
Sub Code 12 or 23 (Serial Number
6510032369 and Higher) 2-11
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) 2-11

Subject Para

M (Cont)

Main Code (Cont)
WTEC II Transmission ECU Pushbutton Shift
Selector (TEPSS) Displays Main Code 24
Sub Code 12 or 23 (Prior to Serial
Number 6510032369) 2-11
WTEC II Transmission ECU Pushbutton Shift
Selector (TEPSS) Displays Main Code 32
and Any Sub Code (Serial Number
6510032369 and Higher) 2-11
WTEC II Transmission ECU Pushbutton Shift
Selector (TEPSS) Displays Main Code 32
and Any Sub Code (Prior to Serial Number
6510032369 With Transmission Adapter
Cable Assembly) 2-11
WTEC II Transmission ECU Pushbutton Shift
Selector (TEPSS) Displays Main Code 32
and Any Sub Code (Prior to Serial
Number 6510032369) 2-11
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) 2-11
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) 2-11
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) 2-11
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) 2-11
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) 2-11
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) 2-11

SUBJECT INDEX

Subject Para

M (Cont)

Main Code (Cont)
- 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) 2-11
- 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) 2-11
- 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) 2-11
- 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) 2-11
- 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) 2-11
- 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) 2-11
- 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) 2-11
- 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) 2-11
- 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) 2-11
- 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) 2-11

Subject Para

M (Cont)

Main Code (Cont)
- 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) 2-11
- 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) 2-11
- 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) 2-11
- 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) 2-11
- 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) 2-11
- WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45 and/or 69 Sub Code 23 2-11
- 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) 2-11
- 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) 2-11
- 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) 2-11
- 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) 2-11

Subject Para

M (Cont)

Main Code (Cont)
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) 2-11
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) 2-11
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 43 Sub Code 21 (Serial Number 6510032369 and Higher) 2-11
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) 2-11
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 43 Sub Code 21 (Prior to Serial Number 6510032369) 2-11
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 43 Sub Code 26 (Serial Number 6510032369 and Higher) 2-11
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) 2-11
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 43 Sub Code 26 (Prior to Serial Number 6510032369) 2-11
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 52 and Any Sub Code (Serial Number 6510032369 and Higher) 2-11
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) 2-11
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 52 and Any Sub Code (Prior to Serial Number 6510032369) 2-11

Subject Para

M (Cont)

Main Code (Cont)
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 55 and Any Sub Code 2-11
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 15 (Serial Number 6510032369 and Higher) 2-11
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 15 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly) 2-11
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 16 2-11
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 24 Sub Code 12 or 23 (Serial Number 6510032369 and Higher) 2-11
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) 2-11
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 32 and Any Sub Code (Serial Number 6510032369 and Higher) 2-11
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 32 and Any Sub Code (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly) 2-11
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) 2-11
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) 2-11
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 13 (Serial Number 6510032369 and Higher) 2-11

SUBJECT INDEX

Subject Para

M (Cont)

Main Code (Cont)
- 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) 2-11
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 14 (Serial Number 6510032369 and Higher) 2-11
- 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) 2-11
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 15 (Serial Number 6510032369 and Higher) 2-11
- 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) 2-11
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 16 (Serial Number 6510032369 and Higher) 2-11
- 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) 2-11
- 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) 2-11
- 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) 2-11

Subject Para

M (Cont)

Main Code (Cont)
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 22 (Serial Number 6510032369 and Higher) 2-11
- 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) 2-11
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, 45, 46 and/or 69 Sub Code 23 2-11
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 24 (Serial Number 6510032369 and Higher) 2-11
- 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) 2-11
- 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) 2-11
- 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) 2-11
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 43 Sub Code 21 (Serial Number 6510032369 and Higher) 2-11
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 43 Sub Code 21 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly) 2-11
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 43 Sub Code 26 (Serial Number 6510032369 and Higher) 2-11

Subject Para

M (Cont)

Main Code (Cont)
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 43 Sub Code 26 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly) . . . 2-11
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 52 and Any Sub Code (Serial Number 6510032369 and Higher) . . . 2-11
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) . . . 2-11
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 55 and Any Sub Code . . . 2-11
Maintenance
11K Self-Recovery Winch (SRW) Maintenance Introduction . . . 16-1
Armament/Sighting and Fire Control Material Maintenance Introduction . . . 19-1
Body and Cab Maintenance Introduction . . . 15-1
Brake System Maintenance Introduction . . . 11-1
Cooling System Maintenance Introduction . . . 5-1
Electrical System Maintenance Introduction . . . 6-1
Engine Maintenance Introduction . . . 20-1
Engine To Maintenance Stand Mounting . . . 20-2
Forms, Records, and Reports . . . 1-2
Frame Maintenance Introduction . . . 13-1
Front Axle Maintenance Introduction . . . 9-1
Front Axle Maintenance Introduction . . . 23-1
Fuel System Maintenance Introduction . . . 4-1
Hydraulic System Maintenance Introduction . . . 7-1
Introduction . . . 2-16
Power Transfer and Final Drive Assembly Maintenance Introduction . . . 8-1
Power Transfer and Final Drive Assembly Maintenance Introduction . . . 22-1
Rear Axle Maintenance Introduction . . . 10-1
Rear Axle Maintenance Introduction . . . 24-1
Special Purpose Kits Maintenance Introduction . . . 18-1
Steering System Maintenance Introduction . . . 12-1
Transmission Maintenance Introduction . . . 21-1

Subject Para

M (Cont)

Maintenance (Cont)
Transmission System Maintenance Introduction . . . 7-1
Transmission To Maintenance Stand . . . 7-5
Manifold
Exhaust Manifold Replacement . . . 3-23
Inlet Manifold Cover Replacement . . . 3-21
Inlet Manifold Replacement . . . 3-22
Manual
Hand Receipt Manual and Inventory of Equipment . . . 2-5
Models
Differences Between Models . . . 1-9
Module
Adapter Housing Module Repair . . . 21-6
C3/C4 Clutch Module Repair . . . 21-13
Control Valve Module Repair . . . 7-11
Control Valve Module Replacement . . . 7-10
Control Valve Module Strainer Replacement . . . 7-14
Converter Housing Module Repair . . . 21-5
Front Support/Charging Pump Module Repair . . . 21-3
Main Shaft Module Repair . . . 21-8
P1 Planetary Carrier Module Repair . . . 21-10
P2 Planetary Carrier Module Repair . . . 21-9
P3 Planetary Carrier Module Repair . . . 21-7
Rotating Clutch Module Repair . . . 21-4
Transfer Case Module Removal . . . 22-2
Transfer Case Module Repair . . . 22-3
Transfer Case Module Seal and Drive Yoke Replacement . . . 8-3
Motor
11K Self-Recovery Winch (SRW) Hydraulic Motor Replacement . . . 16-4
Starting Motor Repair (P/N M0017730MD) . . . 6-3
Starting Motor Repair (P/N M0017730ME) . . . 6-6
Mount
Engine and Transmission Mount Bracket Replacement . . . 7-17
Engine Front Resilient Mount and Mounting Bracket Replacement . . . 3-4
Shock Mount Crossmember Replacement . . . 13-7
Transmission Resilient Mount and Bracket Replacement . . . 7-6
Muffler
Frame Muffler Support Bracket Replacement . . . 13-18

SUBJECT INDEX

Subject Para

O

Official Nomenclature, Names and Designations 1-4
Oil
Coolant in Engine Oil 2-9
Cooler Replacement 3-19
Excessive Engine Oil Consumption 2-9
Filter Base Replacement 3-18
In Cooling System 2-10
Low Engine Oil Pressure 2-9
Pan Replacement 3-16
Pump Replacement 3-17
Transmission Oil Cooler Mounting Bracket Replacement 7-15
Operation
Service Before Operation 2-6
Output
C7 Clutch Housing and Front Output Housing Assembly Repair 21-15
Rear Output Housing Repair 21-11
Overheats
Engine Overheats 2-9
Engine Overheats 2-10
Overspeeds
Engine Overspeeds on Start 2-9

P

P1 Planetary Carrier Module Repair 21-10
P2 Planetary Carrier Module Repair 21-9
P3 Planetary Carrier Module Repair 21-7
P4 Planetary Carrier Assembly Repair 21-12
Packing
Dressed Engine Unpacking/Packing 3-2
Transmission Unpacking/Packing 7-3
Pan
Oil Pan Replacement 3-16
Parachute
M1081 Parachute Suspension Assembly Replacement 13-4
Parts
Repair Parts 2-3
Pinion
Front Axle Differential Pinion Seal, Yoke Seal and Drive Yoke Replacement 9-5
Rear Axle Differential Pinion Seal, Yoke Seal and Drive Yoke Replacement . . . 10-3

Subject Para

P (Cont)

Pintle
M1078/M1079 Pintle Hook Extension Kit Initial Installation 18-2
Piston and Connecting Rod Assembly Replacement/Repair 20-6
Planetary
P1 Planetary Carrier Module Repair 21-10
P2 Planetary Carrier Module Repair 21-9
P3 Planetary Carrier Module Repair 21-7
P4 Planetary Carrier Assembly Repair 21-12
Plate
M1081 Frame Plate Replacement 13-11
Power
Engine Starts but Misfires, Runs Rough, or Lacks Power 2-9
Takeoff (PTO) Replacement/Repair 16-6
Transfer and Final Drive Assembly Maintenance Introduction 8-1
Transfer and Final Drive Assembly Maintenance Introduction 22-1
Preparation for Storage or Shipment Introduction 2-25
Powertrain 1-10
PTO
Power Takeoff (PTO) Replacement/Repair . . 16-6
Pulley Damper Replacement 3-7
Pump
Front Support/Charging Pump Module Repair 21-3
Hydraulic Rotary Pump Replacement 16-5
Loss of Hydraulic Pressure (Single Stage Pump) 2-13
Oil Pump Replacement 3-17
Scavenge Pump Assembly Replacement 7-16
Push Rod
Rocker Arm and Push Rod Replacement /Repair 3-12

R

Radiator
Bracket Replacement 13-19
Radiator Repair 5-2
Rail
Frame Rail Replacement 13-13
M1078 Subframe Rail Replacement 13-14
M1079 Subframe Rail Replacement 13-20
M1081 Subframe Rail Replacement 13-15

Subject Para

R (Cont)

Rear
Axle Assembly Replacement 10-2
Axle Differential Carrier Repair 24-2
Axle Differential Carrier Replacement 10-4
Axle Differential Pinion Seal, Yoke Seal and Drive Yoke Replacement 10-3
Axle Maintenance Introduction 10-1
Axle Maintenance Introduction 24-1
Bumper Replacement 13-8
Crankshaft Rear Seal Replacement 3-9
Crossmember Replacement 13-6
Leaf Spring Replacement 14-4
M1081 Cab Rear Wall Replacement /Repair 15-5
Output Housing Repair 21-11
Spring Brackets Replacement 13-9
Tension Beam and Taillight Mounting Bracket Replacement 13-5
Receipt
Hand Receipt Manual and Inventory of Equipment 2-5
Records
Maintenance Forms, Records, and Reports 1-2
Repair Parts 2-3
Reporting Equipment Improvement Recommendations (EIR) 1-5
Reports
Maintenance Forms, Records, and Reports 1-2
Resilient
Engine Front Resilient Mount and Mounting Bracket Replacement 3-4
Transmission Resilient Mount and Bracket Replacement 7-6
Ring
Initial Machine Gun Ring Kit Installation/Removal 19-2
Rocker Arm and Push Rod Replacement /Repair 3-12
Rod
Rocker Arm and Push Rod Replacement /Repair 3-12
Piston and Connecting Rod Assembly Replacement/Repair 20-6
Roller
Cam Roller Followers Replacement 3-13

Subject Para

R (Cont)

Rotary
Hydraulic Rotary Pump Replacement 16-5
Rotating
Clutch Module Repair 21-4
Clutch Solenoid Assembly Replacement /Repair 7-8

S

Scavenge Pump Assembly Replacement 7-16
Scope 1-1
Seal(s)
Crankshaft Front Seal Replacement 3-8
Crankshaft Rear Seal Replacement 3-9
Front Axle Differential Pinion Seal, Yoke Seal and Drive Yoke Replacement 9-5
Front Axle Shaft and Seals Replacement 9-3
Rear Axle Differential Pinion Seal, Yoke Seal and Drive Yoke Replacement . . . 10-3
Transfer Case Module Seal and Drive Yoke Replacement 8-3
Self-Recovery
11K Self-Recovery Winch (SRW) 1-17
11K Self-Recovery Winch (SRW) Assembly Replacement/Repair 16-2
11K Self-Recovery Winch (SRW) Cartridge /Counterbalance Valve Replacement 16-3
11K Self-Recovery Winch (SRW) Does Not Work 2-15
11K Self-Recovery Winch (SRW) Hydraulic Motor Replacement 16-4
11K Self-Recovery Winch (SRW) Maintenance Introduction 16-1
11K Self-Recovery Winch (SRW) Troubleshooting 2-15
Sensor
Transmission Turbine Speed Sensor Replacement 6-5
Service Before Operation 2-6
Setting
Fuel Setting Check 4-4
Shackle
Front Leaf Spring Shackle and Pin Replacement 14-3
Shaft
Front Axle Shaft and Seals Replacement 9-3
Main Shaft Module Repair 21-8
Shipment
Preparation for Storage or Shipment Introduction 2-25

SUBJECT INDEX

Subject Para

S (Cont)

Shock Mount Crossmember Replacement 13-7
Shutoff
  Fuel Shutoff Solenoid Replacement 6-4
Side
  M1081 Cab Side Wall Replacement /Repair 15-4
Sideload
  M1081 Sideload Bracket Replacement 13-2
Sighting
  Armament/Sighting and Fire Control Material Maintenance Introduction 19-1
Single
  Loss of Hydraulic Pressure (Single Stage Pump) 2-13
Smoke
  Excessive Black or Gray Exhaust Smoke from Engine 2-9
  White Exhaust Smoke from Engine 2-9
Solenoid
  C6 Clutch Solenoid Assembly Replacement /Repair 7-9
  Fuel Shutoff Solenoid Replacement 6-4
  Rotating Clutch Solenoid Assembly Replacement/Repair 7-8
  Stationary Clutch Solenoid Assembly Replacement/Repair 7-7
Special
  Purpose Kits Maintenance Introduction 18-1
  Tools, TMDE, and Support Equipment 2-2
Speed
  Engine Speed is not Stable 2-9
  Idle Speed Adjustment 4-8
  Transmission Turbine Speed Sensor Replacement 6-5
Spring
  Front Leaf Spring Replacement 14-2
  Front Leaf Spring Shackle and Pin Replacement 14-3
  Rear Leaf Spring Replacement 14-4
  Rear Spring Brackets Replacement 13-9
Stage
  Loss of Hydraulic Pressure (Single Stage Pump) 2-13
Stalls
  Engine Stalls at Low RPM 2-9

Subject Para

S (Cont)

Stand
  Engine To Maintenance Stand Mounting 20-2
  Transmission To Maintenance Stand 7-5
Start
  Engine Cranks But Does Not Start 2-9
  Engine Cranks But Does Not Start 2-9A
  Engine Overspeeds on Start 2-9
  Engine Starts but Misfires, Runs Rough, or Lacks Power 2-9
Starting Motor Repair (P/N M0017730MD) 6-3
Starting Motor Repair (P/N M0017730ME) 6-6
Stationary Clutch Solenoid Assembly Replacement/Repair 7-7
Steer
  Hard To Steer 2-14
Steering
  Gear Assembly Adjustment 12-3
  Gear Replacement 12-2
  Knuckle Mechanism Replacement 9-6
  System 1-16
  System Maintenance Introduction 12-1
  Troubleshooting 2-14
Storage
  Preparation for Storage or Shipment Introduction 2-25
Strainer
  Control Valve Module Strainer Replacement 7-14
Subframe
  M1078 Subframe Rail Replacement 13-14
  M1079 Subframe Rail Replacement 13-20
  M1081 Subframe Rail Replacement 13-15
Support
  Cab Front Support Replacement/Repair 15-3
  Frame Muffler Support Bracket Replacement 13-18
  Front Support/Charging Pump Module Repair 21-3
  Special Tools, TMDE, and Support Equipment 2-2
Suspension
  Cylinder Replacement 17-2
  M1081 Parachute Suspension Assembly Replacement 13-4
  Maintenance Introduction 14-1

Subject Para

S (Cont)

Synchronization
  Fuel Injector Synchronization 4-3
System
  Air System 1-19
  Air Transportability Hydraulic System 1-18
  Brake System 1-15
  Brake System Maintenance Introduction 11-1
  Cooling System 1-13
  Cooling System Maintenance Introduction 5-1
  Cooling System Troubleshooting 2-10
  Electrical System 1-14
  Electrical System Maintenance Introduction 6-1
  Engine Air Intake System 1-11
  Engine System Introduction 3-1
  Engine System Troubleshooting 2-9
  Fuel System 1-12
  Fuel System Maintenance Introduction 4-1
  Hydraulic System Maintenance Introduction 7-1
  Hydraulic System Troubleshooting 2-13
  Oil In Cooling System 2-10
  Steering System 1-16
  Steering System Maintenance Introduction 12-1
  Transmission System Maintenance Introduction 7-1
  Transmission System Troubleshooting 2-11

T

Taillight
  Rear Tension Beam and Taillight Mounting Bracket Replacement 13-5
Tension
  Rear Tension Beam and Taillight Mounting Bracket Replacement 13-5
Timing
  Fuel Timing Checks 4-5
Too Much Vibration in Engine 2-9
Tools
  Common Tools and Equipment 2-1
  Special Tools, TMDE, and Support Equipment 2-2
Torque Converter Replacement/Repair 7-2
Transfer Case
  Control Valve Assembly Replacement/Repair 8-2

Subject Para

T (Cont)

Transfer Case (Cont)
  Housing Repair 22-4
  Module Removal 22-2
  Module Repair 22-3
  Module Seal and Drive Yoke Replacement . . . 8-3
Transmission
  Adapter Cable Assembly Replacement 6-8
  Assembly Replacement (Usual Conditions) 7-4
  Assembly Replacement (Unusual Conditions) 7-18
  Engine and Transmission Mount Bracket Replacement 7-17
  External Wiring Harness Replacement 6-7
  Internal Wiring Harness Replacement 7-13
  Maintenance Introduction 21-1
  Oil Cooler Mounting Bracket Replacement 7-15
  Repair 21-2
  Resilient Mount and Bracket Replacement 7-6
  System Troubleshooting 2-11
  To Maintenance Stand 7-5
  Transmission System Maintenance Introduction 7-1
  Turbine Speed Sensor Replacement 6-5
  Unpacking/Packing 7-3
Troubleshooting
  11K Self-Recovery Winch (SRW) Troubleshooting 2-15
  Cooling System Troubleshooting 2-10
  Engine System Troubleshooting 2-9
  Hydraulic System Troubleshooting 2-13
  Instructions 2-8
  Introduction To Logic Tree Troubleshooting 2-7
  Steering Troubleshooting 2-14
  Transmission System Troubleshooting 2-11
  Wheel Troubleshooting 2-12
Turbine
  Transmission Turbine Speed Sensor Replacement 6-5
Turbocharger Replacement 4-6

U

Unpacking
  And Deprocessing 2-4
  Dressed Engine Unpacking/Packing 3-2
  Transmission Unpacking/Packing 7-3

SUBJECT INDEX

Subject Para

U (Cont)

Unusual
Transmission Assembly Replacement (Unusual Conditions) 7-18
Usual
Transmission Assembly Replacement (Usual Conditions) 7-4

V

Valve
11K Self-Recovery Winch (SRW) Cartridge /Counterbalance Valve Replacement 16-3
Clearance Adjustment 3-14
Control Valve Module Repair 7-11
Control Valve Module Replacement 7-10
Control Valve Module Strainer Replacement 7-14
Main Valve Body Assembly Repair 7-12
Transfer Case Control Valve Assembly Replacement/Repair 8-2
Vibration
Too Much Vibration in Engine 2-9

W

Wall
M1081 Cab Rear Wall Replacement /Repair 15-5
M1081 Cab Side Wall Replacement /Repair 15-4
Warranty Information 1-6
Wheel Troubleshooting 2-12
White Exhaust Smoke from Engine 2-9
Winch
11K Self-Recovery Winch (SRW) 1-17
11K Self-Recovery Winch (SRW) Assembly Replacement/Repair 16-2
11K Self-Recovery Winch (SRW) Cartridge /Counterbalance Valve Replacement 16-3
11K Self-Recovery Winch (SRW) Does Not Work 2-15
11K Self-Recovery Winch (SRW) Hydraulic Motor Replacement 16-4
11K Self-Recovery Winch (SRW) Maintenance Introduction 16-1
11K Self-Recovery Winch (SRW) Troubleshooting 2-15

Subject Para

W (Cont)

Windshield
Cab Windshield, Side Windows and Door Side Window Replacement 15-7
M1081 Cab Windshield Frame Replacement /Repair 15-6
Windows
Cab Windshield, Side Windows and Door Side Window Replacement 15-7
Wire
Electrical Wire and Cable Repair 6-6
Wiring
Transmission External Wiring Harness Replacement 6-7
Transmission Internal Wiring Harness Replacement 7-13
WTEC II
Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 15 (Serial Number 6510032369 and Higher) 2-11
Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 15 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly) 2-11
Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 15 (Prior to Serial Number 6510032369) 2-11
Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 16 2-11
Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 24 Sub Code 12 or 23 (Serial Number 6510032369 and Higher) 2-11
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) 2-11
Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 24 Sub Code 12 or 23 (Prior to Serial Number 6510032369) 2-11

Subject Para

W (Cont)

WTEC II (Cont)
- Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 32 and Any Sub Code (Serial Number 6510032369 and Higher) 2-11
- Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 32 and Any Sub Code (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly) 2-11
- Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 32 and Any Sub Code (Prior to Serial Number 6510032369) 2-11
- Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45 and/or 69 Sub Code 12 (Serial Number 6510032369 and Higher) 2-11
- Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45 and/or 69 Sub Code 12 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly) 2-11
- Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45 and/or 69 Sub Code 12 (Prior to Serial Number 6510032369) 2-11
- Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 13 (Serial Number 6510032369 and Higher) 2-11
- 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) 2-11
- Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 13 (Prior to Serial Number 6510032369) 2-11
- Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 14 (Serial Number 6510032369 and Higher) 2-11

Subject Para

W (Cont)

WTEC II (Cont)
- Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 14 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly) 2-11
- Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 14 (Prior to Serial Number 6510032369) 2-11
- Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 15 (Serial Number 6510032369 and Higher) 2-11
- 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) 2-11
- Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 15 (Prior to Serial Number 6510032369) 2-11
- Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 16 (Serial Number 6510032369 and Higher) 2-11
- Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 16 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly) 2-11
- Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 16 (Prior to Serial Number 6510032369) 2-11
- Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45 and/or 69 Sub Code 21 (Serial Number 6510032369 and Higher) 2-11
- Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45 and/or 69 Sub Code 21 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly) 2-11

SUBJECT INDEX

Subject Para

W (Cont)

WTEC II (Cont)
Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45 and/or 69 Sub Code 21 (Prior to Serial Number 6510032369) 2-11
Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 22 (Serial Number 6510032369 and Higher) 2-11
Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 22 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly) 2-11
Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 22 (Prior to Serial Number 6510032369) 2-11
Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45 and/or 69 Sub Code 23 2-11
Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 24 (Serial Number 6510032369 and Higher) 2-11
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) 2-11
Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 Sub Code 24 (Prior to Serial Number 6510032369) 2-11
Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45 and/or 69 Sub Code 26 (Serial Number 6510032369 and Higher) 2-11
Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45 and/or 69 Sub Code 26 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly) 2-11

Subject Para

W (Cont)

WTEC II (Cont)
Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45 and/or 69 Sub Code 26 (Prior to Serial Number 6510032369) 2-11
Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 43 Sub Code 21 (Serial Number 6510032369 and Higher) 2-11
Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 43 Sub Code 21 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly) 2-11
Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 43 Sub Code 21 (Prior to Serial Number 6510032369) 2-11
Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 43 Sub Code 26 (Serial Number 6510032369 and Higher) 2-11
Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 43 Sub Code 26 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly) 2-11
Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 43 Sub Code 26 (Prior to Serial Number 6510032369) 2-11
Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 52 and Any Sub Code (Serial Number 6510032369 and Higher) 2-11
Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 52 and Any Sub Code (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly) 2-11
Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 52 and Any Sub Code (Prior to Serial Number 6510032369) 2-11
Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 55 and Any Sub Code 2-11

Subject Para

W (Cont)

WTEC III
- Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 15 (Serial Number 6510032369 and Higher) . . . 2-11
- Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 15 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly) . . . 2-11
- Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 16 . . . 2-11
- Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 24 Sub Code 12 or 23 (Serial Number 6510032369 and Higher) . . . 2-11
- Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 24 Sub Code 12 or 23 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly) . . . 2-11
- Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 32 and Any Sub Code (Serial Number 6510032369 and Higher) . . . 2-11
- Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 32 and Any Sub Code (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly) . . . 2-11
- Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, 45, 46 and/or 69 Sub Code 12 (Serial Number 6510032369 and Higher) . . . 2-11
- 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) . . . 2-11
- Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 13 (Serial Number 6510032369 and Higher) . . . 2-11
- 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) . . . 2-11

Subject Para

W (Cont)

WTEC III (Cont)
- Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 14 (Serial Number 6510032369 and Higher) . . . 2-11
- 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) . . . 2-11
- Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 15 (Serial Number 6510032369 and Higher) . . . 2-11
- 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) . . . 2-11
- Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 16 (Serial Number 6510032369 and Higher) . . . 2-11
- 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) . . . 2-11
- Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, 45, 46 and/or 69 Sub Code 21 (Serial Number 6510032369 and Higher) . . . 2-11
- 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) . . . 2-11
- Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 22 (Serial Number 6510032369 and Higher) . . . 2-11
- 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) . . . 2-11
- Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, 45, 46 and/or 69 Sub Code 23 . . . 2-11

SUBJECT INDEX

Subject Para

W (Cont)

WTEC III (Cont)
- Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 Sub Code 24 (Serial Number 6510032369 and Higher) 2-11
- 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) 2-11
- Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, 45, 46 and/or 69 Sub Code 26 (Serial Number 6510032369 and Higher) 2-11
- 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) 2-11
- Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 43 Sub Code 21 (Serial Number 6510032369 and Higher) 2-11
- Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 43 Sub Code 21 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly) 2-11
- Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 43 Sub Code 26 (Serial Number 6510032369 and Higher) 2-11
- Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 43 Sub Code 26 (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly) 2-11
- Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 52 and Any Sub Code (Serial Number 6510032369 and Higher) 2-11
- Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 52 and Any Sub Code (Prior to Serial Number 6510032369 With Transmission Adapter Cable Assembly) 2-11

Subject Para

W (Cont)

WTEC III (Cont)
- Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 55 and Any Sub Code 2-11

Y

Yoke
- Front Axle Differential Pinion Seal, Yoke Seal and Drive Yoke Replacement 9-5
- Rear Axle Differential Pinion Seal, Yoke Seal and Drive Yoke Replacement . . . 10-3
- Transfer Case Module Seal and Drive Yoke Replacement 8-3

GLOSSARY
ABBREVIATIONS

CTIS	Central Tire Inflation System
ECU	Electronic Control Unit
LH	Left Hand
LMHC	Light Material Handling Crane
PTO	Power Takeoff
RH	Right Hand
SRW	11K 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)

HORN	BLACKOUT LAMP	LAMP	DUALBEAM LAMP	GROUND	POWER LAMP	OPEN CONTACT	BATTERY	FLUORESCENT LIGHT
TEMPERATURE SWITCH OPEN	TEMPERATURE SWITCH CLOSED	MAGNETIC PICKUP	SENSOR	NORMALLY OPEN	NORMALLY CLOSED	CONNECTOR	RECEPTACLE	ELECTRICAL OUTLET
MOTOR	SOLENOID	LEVEL SENSOR	FILTER	LED	METER OR GAGE	CLOSED CONTACT	DIMMER MODULE	TELEPHONE RECEPTACLE
CIRCUIT BREAKER	TWO-WAY SWITCH	PUSHBUTTON	CIRCULATING PUMP	DPDT SWITCH	DPST SWITCH	PHOTOCELL	FUSE	RELAY
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	CIRCUIT BREAKER	FLASHER	

FIGURE FO-1 ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 1 OF 34

SIZE B | ILL NO. 5WD01L1B | FP-1/ (FP-2 BLANK)

CONNECTORS			
NUMBER	ZONE	SH	DESCRIPTION
A13	A66	8	WTEC II TRANSMISSION CONNECTOR A
A13	A70	8	WTEC II TRANSMISSION CONNECTOR B
A13	A74	9	WTEC II TRANSMISSION CONNECTOR C
J1	D285	32	VAN 110 VAC POWER ENTRY
J2	A185	21	EMI FILTER
J2	E285	32	VAN 110 VAC POWER ENTRY
J3	D205	23	AIRDROP ONLY
J5	A38	5	VEHICLE HORN
J6	A38	5	VEHICLE HORN
J7	A188	21	WTEC II TRANSMISSION DIMMER MODULE
J8	B38	5	BLACKOUT MARKER RIGHT FRONT
J9	C38	5	FRONT RIGHT TURN SIGNAL
J10	B38	5	PARKING LIGHT FRONT RIGHT
J12	D38	5	RIGHT HEADLIGHT
J13	C38	5	RIGHT HEADLIGHT
J14	C38	5	RIGHT HEADLIGHT
J17	H38	5	BLACKOUT DRIVE LIGHT
J18	D38	5	LEFT HEADLIGHT
J19	E38	5	LEFT HEADLIGHT
J19	C177	20	CAB - DASH - LEFT - UNDERDASH
J20	D38	5	LEFT HEADLIGHT
J22	G38	5	PARKING LIGHT FRONT LEFT
J23	F38	5	FRONT LEFT TURN SIGNAL
J24	H38	5	BLACKOUT MARKER LEFT FRONT
J25	G85	10	WINDSHIELD WASHER ROTARY PUMP (B3)
J27	A43	5	CHASSIS - FRONT
J31	E55	7	ENGINE
J31X	F175	20	CAB - DASH - LEFT - UNDERDASH
J39	G61	7	ENGINE
J43	G42	5	CHASSIS - FRONT
J43X	F42	5	CHASSIS - FRONT
J43X	G175	20	CAB - DASH - LEFT - UNDERDASH
J50	E85	10	CAB MARKER LIGHT FRONT UPPER LEFT
J51	D42	5	CHASSIS - FRONT
J52	E38	5	CHASSIS - FRONT BUMPER
J52	B203	23	CHASSIS - FRONT
J53	F200	23	AIRDROP ONLY
J55	C85	10	CAB MARKER LIGHT FRONT UPPER RIGHT
J57	D85	10	CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT
J59	C85	10	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT
J60	D85	10	CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE
J62	E88	10	ROTARY WARNING LIGHT CONNECTOR
J65	E186	21	ROTARY WARNING LIGHT CONNECTOR
J78	F185	21	CAB RADIO CONNECTOR
J80	D78	9	AIR DRYER (EXCEPT DUMP)
J93	B50	6	CHASSIS - SPARE TIRE
J95	E38	5	12V INTERVEHICULAR
J95	B206	23	ENGINE
J99	E187	21	CHEMICAL ALARM CONNECTOR
J106	F50	6	CHEMICAL DETECTOR RECEPTACLE
J108	B222	25	CAB - DASH - CENTER - OPTIONS PANEL
J111	E122	14	CTIS ELECTRONIC CONTROL UNIT
J113	G186	21	CTIS PRESSURE TRANSDUCER
J114	B165	21	CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS
J114	D298	34	WTEC III TRANSMISSION HARNESS (TID1)
J114	D303	34	WTEC III TRANSMISSION HARNESS (TID2)
J115	C154	18	CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS
J116	C159	18	CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS
J117	F161	18	CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS
J117	B289	33	WTEC III DIAGNOSTIC CONNECTOR
J118	D161	18	CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS
J119	B169	19	CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS
J119	D301	34	WTEC III CAB TRANSMISSION HARNESS (TID1)
J119	D305	34	WTEC III CAB TRANSMISSION HARNESS (TID2)
J129	F85	10	CAB MARKER LIGHT FRONT LOWER LEFT
J130	F85	10	CAB MARKER LIGHT LEFT DOOR
J130	F202	23	12 PIN CONNECTOR
J131	B85	10	CAB MARKER LIGHT RIGHT DOOR
J132	B85	10	CAB MARKER LIGHT FRONT LOWER RIGHT
J150	B271	31	VAN FRONT MARKER LIGHT
J151	B271	31	VAN FRONT MARKER LIGHT
J152	B271	31	VAN FRONT MARKER LIGHT
J153	A271	31	VAN FRONT MARKER LIGHT

CONNECTORS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
J154	A271	31	VAN FRONT MARKER LIGHT
J155	B287	32	VAN CURBSIDE MARKER LIGHT
J156	B287	32	VAN CURBSIDE MARKER LIGHT
J157	C287	32	VAN ROADSIDE MARKER LIGHT
J158	C287	32	VAN ROADSIDE MARKER LIGHT
J159	D287	32	VAN REAR CENTER MARKER LIGHT
J160	E287	32	VAN REAR CENTER MARKER LIGHT
J161	E287	32	VAN REAR CENTER MARKER LIGHT
J162	B273	31	VAN CURBSIDE BLACKOUT LIGHT
J163	B274	31	VAN CURBSIDE EMERGENCY LIGHT
J164	H274	31	VAN ROADSIDE BLACKOUT LIGHT
J165	H275	31	VAN ROADSIDE EMERGENCY LIGHT
J166	C271	31	VAN FRONT EMERGENCY LIGHT
J167	D287	32	VAN REAR EMERGENCY LIGHT
J173	G272	31	VAN 12/24 VDC POWER RECEPTACLE
J209A	C230	26	PTO EQUIPPED
J209B	D230	26	PTO EQUIPPED
J210	F222	25	CAB - DASH - CENTER - OPTIONS PANEL
J215	E230	26	PTO EQUIPPED
J230	A282	32	VAN CURBSIDE 110 VAC OUTLET
J231	A283	32	VAN CURBSIDE 110 VAC OUTLET
J232	A284	32	VAN CURBSIDE 110 VAC OUTLET
J233	H282	32	VAN ROADSIDE 110 VAC OUTLET
J234	H283	32	VAN ROADSIDE 110 VAC OUTLET
J235	H284	32	VAN ROADSIDE 110 VAC OUTLET
J236	H275	31	VAN ROADSIDE 24 VDC OUTLET
J237	275	31	VAN CURBSIDE 24 VDC OUTLET
J242	D271	31	VAN A/C
J244	F271	31	VAN THERMOSTAT
J245	E271	31	VAN HEATER
J912	B124	14	CAB - DASH - CENTER - HEATER / CTIS ECU
J912	D209	24	CAB - DASH - CENTER - OPTIONS PANEL
J913	B122	14	CAB - DASH - CENTER - HEATER / CTIS ECU
J921	G62	7	TROOP TRANSPORT ALARM
P2	A185	21	EMI FILTER
P3	D204	23	AIRDROP ONLY
P5	A38	5	VEHICLE HORN
P6	A38	5	VEHICLE HORN
P8	B38	5	BLACKOUT MARKER RIGHT FRONT
P9	C38	5	FRONT RIGHT TURN SIGNAL
P10	B38	5	PARKING LIGHT FRONT RIGHT
P12	D38	5	RIGHT HEADLIGHT
P13	C38	5	RIGHT HEADLIGHT
P14	C38	5	RIGHT HEADLIGHT
P17	H38	5	BLACKOUT DRIVE LIGHT
P18	D38	5	LEFT HEADLIGHT
P18	A177	20	CAB - DASH - LEFT - UNDERDASH
P19	E38	5	LEFT HEADLIGHT
P20	D38	5	LEFT HEADLIGHT
P22	G38	5	PARKING LIGHT FRONT LEFT
P23	F38	5	FRONT LEFT TURN SIGNAL
P24	H38	5	BLACKOUT MARKER LEFT FRONT
P25	G85	10	WINDSHIELD WASHER ROTARY PUMP (B3)
P27	A43	5	CHASSIS - FRONT
P31	E56	7	ENGINE
P31X	D56	7	ENGINE
P32	F59	7	ENGINE OIL PRESSURE SENSOR
P33	H59	7	FUEL/WATER SEPARATOR
P34	E59	7	OIL PRESSURE WARNING LIGHT SWITCH
P36	A57	7	WATER COOLER TEMPERATURE
P37	C57	7	WATER TEMPERATURE SWITCH
P38	F61	7	ENGINE SPEED MAGNETIC PICKUP
P39	G61	7	ENGINE
P41	B57	7	WATER TEMPERATURE SENSOR
P410	E240	27	ARCTIC KIT W/PTO EQUIPPED
P42	F57	7	ETHER SENSOR SWITCH
P43	G42	5	CHASSIS - FRONT
P43X	F42	5	CHASSIS - FRONT
P50	E85	10	CAB MARKER LIGHT FRONT UPPER LEFT
P50	F206	23	LH FRONT TOP CAB MARKER LIGHT
P51	D190	22	CAB - DASH - RIGHT - POWER DISTRIBUTION PANEL
P52F	E38	5	CHASSIS - FRONT
P52R	E196	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE

CONNECTORS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
P53R	D196	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
P54	D197	22	LEFT REAR MARKER
P55	C85	10	CAB MARKER LIGHT FRONT UPPER RIGHT
P55	D206	23	RH FRONT TOP CAB MARKER LIGHT
P56	E197	22	MIDDLE REAR MARKER
P57	D85	10	CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT
P57	F206	23	LH FRONT TOP CAB CLEARANCE LIGHT
P58	E197	22	RIGHT REAR MARKER
P59	C85	10	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT
P59	D206	23	RH FRONT TOP CAB CLEARANCE LIGHT
P60	D85	10	CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE
P60	E206	23	MIDDLE FRONT TOP CLEARANCE LIGHT
P61	F197	22	RH COMPOSITE LIGHT
P62	F197	22	RH COMPOSITE LIGHT
P63	G197	22	RH COMPOSITE LIGHT
P64	F197	22	RH COMPOSITE LIGHT
P65	E186	21	ROTARY WARNING LIGHT CONNECTOR
P67	A74	9	PRE-BLOCK SEVEN W/PIGTAIL TRANSMISSION EXTERNAL
P67	B69	8	WIRING HARNESS TO TRANSMISSION CONNECTOR TID1, TID2, AND TID3 TRANSMISSION EXTERNAL WIRING
			HARNESS TO TRANSMISSION CONNECTOR
P69	D59	7	ENGINE
P71	E66	8	PRE-BLOCK SEVEN TRANSMISSION OUTPUT SPEED SENSOR
P71	E70	8	CONNECTOR TID1, TID2, AND TID3 TRANSMISSION OUTPUT SPEED
P71	E75	9	SENSOR CONNECTOR PRE-BLOCK SEVEN W/PIGTAIL TRANSMISSION OUTPUT
P72	F66	8	SPEED SENSOR CONNECTOR PRE-BLOCK SEVEN TRANSMISSION ENGINE SPEED
P72	F70	8	SENSOR CONNECTOR TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED
P72	E75	9	SENSOR CONNECTOR PRE-BLOCK SEVEN W/PIGTAIL TRANSMISSION ENGINE
P73	F66	8	SPEED SENSOR CONNECTOR PRE-BLOCK SEVEN TRANSMISSION THROTTLE POSITION
P73	F70	8	SENSOR CONNECTOR TID1, TID2, AND TID3 TRANSMISSION THROTTLE POSITION
P73	F75	9	SENSOR CONNECTOR PRE-BLOCK SEVEN W/PIGTAIL TRANSMISSION THROTTLE POSITION SENSOR CONNECTOR
P74	B197	22	LH COMPOSITE LIGHT
P76	C197	22	LH COMPOSITE LIGHT
P77	C197	22	LH COMPOSITE LIGHT
P78	B197	22	LH COMPOSITE LIGHT
P80	G51	6	CHASSIS - REAR
P81	C47	6	CHASSIS - FRONT
P81	D62	7	STARTER THERMO SWITCH
P82	B51	6	FUEL TANK LEVEL SENSOR
P83	B172	20	CAB - DASH - LEFT - UNDERDASH
P84	F51	6	CHASSIS - REAR
P85	A197	22	LH SIDE MARKER LIGHT
P86	A197	22	LH REAR MARKER LIGHT
P87	C197	22	BACKUP LIGHT
P88	H197	22	RH SIDE MARKER LIGHT
P89	G197	22	RH REAR MARKER LIGHT
P99	F186	21	CHEMICAL ALARM CONNECTOR
P10	B38	5	PARKING LIGHT FRONT RIGHT
P110	E119	14	CTIS ELECTRONIC CONTROL UNIT
P111	E122	14	CTIS ELECTRONIC CONTROL UNIT
P112	G123	14	CAB - DASH - CENTER - HEATER / CTIS ECU
P113	F123	14	CTIS ELECTRONIC CONTROL UNIT
P115	C290	33	WTEC III - CAB - DASH - RIGHT - KICK PANEL
P116	C185	21	CAB - DASH - RIGHT - UNDERDASH
P118	D161	18	CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS
P116	E291	33	WTEC III - CAB - DASH - RIGHT - KICK PANEL
P119	A64	8	PRE-BLOCK SEVEN TRANSMISSION CONNECTOR
P119	A69	8	TID1, TID2, AND TID3 TRANSMISSION CONNECTOR
P119	A73	9	PRE-BLOCK SEVEN W/PIGTAIL TRANSMISSION CONNECTOR
P119	B169	19	CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS
P125	G84	10	WINDSHIELD WASHER ROTARY PUMP (B3)
P129	F85	10	CAB MARKER LIGHT FRONT LOWER LEFT
P130	F85	10	CAB MARKER LIGHT LEFT DOOR
P131	A85	10	CAB MARKER LIGHT RIGHT DOOR

CONNECTORS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
P132	B85	10	CAB MARKER LIGHT FRONT LOWER RIGHT
P150	B272	31	VAN FRONT MARKER LIGHT
P151	B272	31	VAN FRONT MARKER LIGHT
P152	B272	31	VAN FRONT MARKER LIGHT
P153	A272	31	VAN FRONT MARKER LIGHT
P154	A272	31	VAN FRONT MARKER LIGHT
P155	B287	32	VAN CURBSIDE MARKER LIGHT
P156	B287	32	VAN CURBSIDE MARKER LIGHT
P157	C287	32	VAN ROADSIDE MARKER LIGHT
P158	C287	32	VAN ROADSIDE MARKER LIGHT
P159	D287	32	VAN REAR CENTER MARKER LIGHT
P160	E287	32	VAN REAR CENTER MARKER LIGHT
P161	D287	32	VAN REAR CENTER MARKER LIGHT
P162	B273	31	VAN CURBSIDE BLACKOUT LIGHT
P163	B274	31	VAN CURBSIDE EMERGENCY LIGHT
P164	G274	31	VAN ROADSIDE BLACKOUT LIGHT
P165	G275	31	VAN ROADSIDE EMERGENCY LIGHT
P166	C272	32	VAN FRONT EMERGENCY LIGHT
P167	D287	31	VAN REAR EMERGENCY LIGHT
P172	E264	30	DUMP BODY CONNECTOR
P173	G271	31	VAN 12/24 VDC POWER
P201	G61	7	ENGINE
P210	F222	25	CAB - DASH - CENTER - OPTIONS PANEL
P210	C227	26	PTO EQUIPPED
P215	E230	26	PTO EQUIPPED
P216	E229	26	PTO EQUIPPED
P217	C229	26	PTO EQUIPPED
P217	B268	30	PTO EQUIPPED
P901	A209	24	CAB - DASH - CENTER - OPTIONS PANEL
P902A	D214	24	CAB - DASH - CENTER - OPTIONS PANEL
P903	C212	24	CAB - DASH - CENTER - OPTIONS PANEL
P903A	D212	24	CAB - DASH - CENTER - OPTIONS PANEL
P904	C211	24	CAB - DASH - CENTER - OPTIONS PANEL
P904A	D211	24	CAB - DASH - CENTER - OPTIONS PANEL
P905	A211	24	CAB - DASH - CENTER - OPTIONS PANEL
P905A	B211	24	CAB - DASH - CENTER - OPTIONS PANEL
P906	A212	24	CAB - DASH - CENTER - OPTIONS PANEL
P906A	B212	24	CAB - DASH - CENTER - OPTIONS PANEL
P908	A215	24	CAB - DASH - CENTER - OPTIONS PANEL
P908A	B215	24	CAB - DASH - CENTER - OPTIONS PANEL
P909	A220	25	CAB - DASH - CENTER - OPTIONS PANEL
P909A	B220	25	CAB - DASH - CENTER - OPTIONS PANEL
P910	C215	24	CAB - DASH - CENTER - OPTIONS PANEL
P910A	D215	24	CAB - DASH - CENTER - OPTIONS PANEL
P911	C220	25	CAB - DASH - CENTER - OPTIONS PANEL
P911A	D220	25	CAB - DASH - CENTER - OPTIONS PANEL
P912	B124	14	CAB - DASH - CENTER - HEATER / CTIS ECU
P913	B122	14	CAB - DASH - CENTER - HEATER / CTIS ECU
P913	F209	24	CAB - DASH - CENTER - OPTIONS PANEL
P914	A214	24	CAB - DASH - CENTER - OPTIONS PANEL
P914A	B214	24	CAB - DASH - CENTER - OPTIONS PANEL
P921	G62	7	TROOP TRANSPORT ALARM
PBSS	C93	11	WTEC II PUSHBUTTON SHIFT SELECTOR
PX1	A92	11	ENGINE FAN OFF SWITCH
PX10	D107	12	CAB - DASH - LEFT - INSTRUMENT PANEL
PX11	G107	12	CAB - DASH - LEFT - INSTRUMENT PANEL
PX12	C112	13	ROTATING WARNING LIGHT SWITCH
PX12A	E112	13	CAB - DASH - LEFT - INSTRUMENT PANEL
PX13	F92	11	ETHER STARTER SWITCH
PX13A	G92	11	CAB - DASH - LEFT - INSTRUMENT PANEL
PX14	F112	13	FULL HAZARD WARNING SWITCH
PX14A	H112	13	CAB - DASH - LEFT - INSTRUMENT PANEL
PX15	C115	13	MAIN LIGHT SWITCH
PX17	A112	13	IGNITION SWITCH
PX17A	C112	13	CAB - DASH - LEFT - INSTRUMENT PANEL
PX1A	B92	11	CAB - DASH - LEFT - INSTRUMENT PANEL
PX2	D92	11	LAMP TEST SWITCH
PX20	C188	21	TURN SIGNAL FLASHER
PX21	A134	15	WIPER DELAY MODULE

FIGURE FO-1 ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 2 OF 34

SIZE B | ILL. NO. 5WD01L2B | FP-3/ (FP-4 BLANK)

CONNECTORS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
PX22	A184	21	EMI FILTER
PX24	G115	13	INSTRUMENT PANEL LIGHTS DIMMER MODULE
PX25	C119	14	CAB DASH CENTER HEATER / CTIS ECU
PX26	B179	20	CAB - DASH - LEFT - UNDERDASH
PX2A	E92	11	CAB - DASH - LEFT - INSTRUMENT PANEL
PX33	B182	21	CAB - DASH - RIGHT - UNDERDASH
PX33	G292	33	WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR
PX34	E188	21	FRONT AIR PRESSURE METER
PX4	F97	11	FAN SOLENOID
PX5	B97	11	REAR AIR PRESSURE METER
PX6	B107	12	CAB - DASH - LEFT - INSTRUMENT PANEL
PX7	A104	12	CAB - DASH - LEFT - INSTRUMENT PANEL
PX8	G102	12	CAB - DASH - LEFT - INSTRUMENT PANEL
PX9	D97	11	FUEL LEVEL METER

LIGHTS			
NUMBER	ZONE	SH	DESCRIPTION
D51	B257	29	POWER LAMP
D52	B257	29	POWER LAMP
DS1	D96	11	CAB - DASH - LEFT - INSTRUMENT PANEL
DS2	G106	12	CAB - DASH - LEFT - INSTRUMENT PANEL
DS3	F96	11	CAB - DASH - LEFT - INSTRUMENT PANEL
DS4	B96	11	CAB - DASH - LEFT - INSTRUMENT PANEL
DS5	B106	12	CAB - DASH - LEFT - INSTRUMENT PANEL
DS6	G101	12	CAB - DASH - LEFT - INSTRUMENT PANEL
DS7	D106	12	CAB - DASH - LEFT - INSTRUMENT PANEL
DS8	C91	11	CAB - DASH - LEFT - INSTRUMENT PANEL
DS9	B101	12	DUMP BODY UP
DS10	E111	13	CAB - DASH - LEFT - INSTRUMENT PANEL
DS11	G91	11	CAB - DASH - LEFT - INSTRUMENT PANEL
DS12	H111	13	CAB - DASH - LEFT - INSTRUMENT PANEL
DS13	C111	13	CAB - DASH - LEFT - INSTRUMENT PANEL
DS14	B101	12	LEFT TURN SIGNAL
DS15	B101	12	RIGHT TURN SIGNAL
DS16	E101	12	HIGH BEAM
DS17	D119	14	HEATER CONTROL PANEL ILLUMINATION
DS18	A208	24	CAB - DASH - CENTER - OPTIONS PANEL
DS19	E101	12	RADIATOR FAN OFF
DS21	C101	12	EMERGENCY BRAKE
DS22	D101	12	PARKING BRAKE
DS23	C101	12	PTO ON
DS24	D101	12	OIL PRESSURE
DS25	C101	12	WATER TEMPERATURE
DS27	C101	12	REAR BRAKE AIR
DS28	E101	12	FRONT AIR BRAKE
DS29	D101	12	ENGINE OIL LEVEL
DS30	F101	12	MASTER STOP
DS31	D213	24	CAB - DASH - CENTER - OPTIONS PANEL
DS32	B101	12	CHEMICAL DETECT
DS34	C101	12	CTIS OVERSPEED
DS35	C198	22	REAR LH COMPOSITE LIGHT
DS36	G198	22	REAR RH COMPOSITE LIGHT
DS37	B198	22	REAR LH COMPOSITE LIGHT
DS38	F198	22	REAR RH COMPOSITE LIGHT
DS39	F37	5	FRONT LEFT TURN SIGNAL
DS41	D101	12	TRANSMISSION OIL TEMPERATURE
DS42	C38	5	FRONT RIGHT TURN SIGNAL
DS43	D212	24	CAB - DASH - CENTER - OPTIONS PANEL
DS44	D37	5	RIGHT HEADLIGHT
DS45	C198	22	BACKUP LIGHT
DS46	D210	24	CAB - DASH - CENTER - OPTIONS PANEL
DS47	G37	5	PARKING LIGHT FRONT LEFT
DS48	B38	5	PARKING LIGHT FRONT RIGHT
DS49	G37	5	BLACKOUT MARKER LEFT FRONT
DS50	B38	5	BLACKOUT MARKER RIGHT FRONT
DS51	C198	22	REAR LH COMPOSITE LIGHT
DS52	F198	22	REAR RH COMPOSITE LIGHT
DS53	H37	5	BLACKOUT DRIVE LIGHT
DS54	D84	10	CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT
DS54	F206	23	LH FRONT TOP CAB CLEARANCE LIGHT
DS55	D84	10	CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE
DS55	E206	23	MIDDLE FRONT TOP CLEARANCE LIGHT

LIGHTS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
DS56	C84	10	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT
DS56	D206	23	RH FRONT TOP CAB CLEARANCE LIGHT
DS57	C84	10	CAB MARKER LIGHT FRONT UPPER RIGHT
DS57	D206	23	RH FRONT TOP CAB MARKER LIGHT
DS58	E84	10	CAB MARKER LIGHT FRONT UPPER LEFT
DS58	F206	23	LH FRONT TOP CAB MARKER LIGHT
DS59	B84	10	CAB MARKER LIGHT RIGHT DOOR
DS60	F84	10	CAB MARKER LIGHT FRONT LOWER LEFT
DS61	A84	10	CAB MARKER LIGHT RIGHT DOOR
DS62	F84	10	CAB MARKER LIGHT LEFT DOOR
DS63	B210	24	CAB - DASH - CENTER - OPTIONS PANEL
DS64	B212	24	CAB - DASH - CENTER - OPTIONS PANEL
DS65	A198	22	LH SIDE MARKER LIGHT
DS66	A198	22	LH REAR MARKER LIGHT
DS67	H198	22	RH SIDE MARKER LIGHT
DS68	G198	22	RH REAR MARKER LIGHT
DS69	D198	22	LEFT REAR MARKER
DS70	E198	22	MIDDLE REAR MARKER
DS71	E198	22	RIGHT REAR MARKER
DS72	B198	22	REAR LH COMPOSITE LIGHT
DS73	F198	22	REAR RH COMPOSITE LIGHT
DS74	D37	5	LEFT HEADLIGHT
DS75	A273	31	VAN CURBSIDE BLACKOUT LIGHT
DS76	H274	31	VAN ROADSIDE BLACKOUT LIGHT
DS78	A274	31	VAN CURBSIDE EMERGENCY LIGHT
DS79	H275	31	VAN ROADSIDE EMERGENCY LIGHT
DS80	H284	32	VAN ROADSIDE FLUORESCENT LIGHT
DS81	H286	32	VAN ROADSIDE FLUORESCENT LIGHT
DS82	A286	32	VAN CURBSIDE FLUORESCENT LIGHT
DS83	A284	32	VAN CURBSIDE FLUORESCENT LIGHT
DS84	B271	31	VAN FRONT MARKER LIGHT
DS85	B271	31	VAN FRONT MARKER LIGHT
DS86	B271	31	VAN FRONT MARKER LIGHT
DS87	A271	31	VAN FRONT MARKER LIGHT
DS88	A271	31	VAN FRONT MARKER LIGHT
DS89	B288	32	VAN CURBSIDE MARKER LIGHT
DS90	B288	32	VAN CURBSIDE MARKER LIGHT
DS91	C288	32	VAN ROADSIDE MARKER LIGHT
DS92	C288	32	VAN ROADSIDE MARKER LIGHT
DS93	D288	32	VAN REAR CENTER MARKER LIGHT
DS94	E288	32	VAN REAR CENTER MARKER LIGHT
DS95	E288	32	VAN REAR CENTER MARKER LIGHT
DS96	B215	24	CAB - DASH - CENTER - OPTIONS PANEL
DS96	C271	31	VAN FRONT EMERGENCY LIGHT
DS97	B219	25	CAB - DASH - CENTER - OPTIONS PANEL
DS97	C271	32	VAN REAR EMERGENCY LIGHT
DS100	B213	24	CAB - DASH - CENTER - OPTIONS PANEL
DS101	D119	14	HEATER CONTROL PANEL ILLUMINATION
DS108	E91	11	CAB - DASH - LEFT - INSTRUMENT PANEL

CIRCUIT BREAKERS			
NUMBER	ZONE	SH	DESCRIPTION
CB1	C285	32	VAN 110 VAC MAIN CIRCUIT BREAKER
CB2	C284	32	VAN A/C
CB3	D284	32	VAN 110 VAC POWER OUT
CB4	D284	32	VAN NOT USED
CB5	E284	32	VAN BLACKOUT OVERRIDE
CB6	E284	32	VAN LIGHTS
CB7	E284	32	VAN 110 VAC OUTLETS
CB8	E284	32	VAN THERMOSTAT/FAN
CB9	E284	32	VAN 110 VAC OUTLETS
CB10	D277	31	VAN BLACKOUT LIGHTS
CB11	D277	31	VAN EMERGENCY/BLACKOUT LIGHTS
CB20	C140	16	CAB RADIO
CB21	C149	17	WTEC II VIM STE/ICE
CB22	C149	17	FAN/ETHER
CB23	C147	17	HEATER BLOWER
CB30	C139	16	CHEMICAL ALARM
CB35	D149	17	WTEC II VIM POWER
CB36	C147	17	HORN POWER
CB37	C151	17	WINDSHIELD WIPER/WASHER
CB38	D147	17	ROTATING BEACON
CB39	C146	17	TRAILER BLACKOUT STOP

CIRCUIT BREAKERS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
CB40	C150	17	CTIS COOLER
CB41	C142	16	TRAILER REAR LIGHTS POWER
CB42	C142	16	BLACKOUT MARKER LIGHTS POWER
CB43	C143	16	REAR COMPOSITE LIGHTS/WTEC III ECU
CB44	C143	16	REAR COMPOSITE LIGHTS
CB45	C139	16	FUEL PREHEAT
CB48	C140	16	ARCTIC CAB/ENGINE KILL
CB49	C151	17	PTO POWER
CB50	F256	29	MAIN POWER CIRCUIT BREAKER SWITCH
CB53	D140	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB54	D142	16	BLACKOUT HEADLIGHT
CB61	D153	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB62	D153	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB63	D151	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB64	D151	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB65	D140	16	PARKING LIGHTS
CB66	D143	16	BLACKOUT MARKER POWER
CB67	D139	16	MARKER LIGHTS
CB68	C152	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB70	D146	17	IGNITION/MAIN LIGHT SWITCH
CB71	D149	17	HAZARD/FLASHER WORKLIGHTS
CB72	D139	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB73	D150	17	BACK-UP LIGHT POWER
CB74	D150	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB76	D143	16	BLACKOUT STOP RELAY POWER
CB77	C152	17	ENGINE INSTR POWER
CB78	D147	17	HEADLIGHTS
CB79	C150	17	WTEC II VIM POWER/WTEC III REVERSE WARNING RELAY
CB80	D142	16	TAILLIGHTS

TERMINAL LUGS			
NUMBER	ZONE	SH	DESCRIPTION
TL1	B54	6	POLARITY PROTECTION
TL1	E60	7	ALTERNATOR
TL2	B53	6	POLARITY PROTECTION
TL2	D60	7	ALTERNATOR
TL2	D53	6	POLARITY PROTECTION (P/P)
TL3	C85	10	CAB MARKER LIGHT FRONT UPPER RIGHT
TL3	D206	23	RH FRONT TOP CAB MARKER LIGHT
TL4	C85	10	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT
TL4	D206	23	RH FRONT TOP CAB CLEARANCE LIGHT
TL5	D60	7	ALTERNATOR
TL6	D60	7	ALTERNATOR
TL8	D85	10	CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE
TL8	E206	23	MIDDLE FRONT TOP CLEARANCE LIGHT
TL9	D47	6	24V AUXILIARY STARTER SOLENOID
TL10	C52	6	CHASSIS - REAR (REF E1)
TL12	C49	6	BATTERIES
TL12	C62	7	STARTER/STARTER SOLENOID
TL14	E88	10	ROTARY WARNING LIGHT CONNECTOR
TL15	A198	22	LH SIDE MARKER LIGHT
TL16	A198	22	LH REAR MARKER LIGHT
TL17	C198	22	BACKUP LIGHT
TL18	C198	22	LONG WHEEL BASE
TL19	H198	22	RH SIDE MARKER LIGHT
TL20	G198	22	RH REAR MARKER LIGHT
TL21	G198	22	RH COMPOSITE LIGHT
TL22	D85	10	CAB MARKER LIGHTS
TL22	E206	23	LH FRONT TOP CAB CLEARANCE LIGHT
TL23	D47	6	24V AUXILIARY STARTER SOLENOID
TL24	D47	6	24V AUXILIARY STARTER SOLENOID
TL25	C47	6	CHASSIS - FRONT
TL25	C62	7	STARTER/STARTER SOLENOID
TL26	C47	6	CHASSIS - FRONT
TL26	C62	7	STARTER/STARTER SOLENOID
TL27	E85	10	CAB MARKER LIGHT FRONT UPPER RIGHT
TL27	F206	23	CAB MARKER LIGHTS FRONT UPPER RIGHT
TL28	G57	7	FUEL SOLENOID
TL29	H57	7	FUEL SOLENOID
TL30	D198	22	LEFT REAR MARKER

TERMINAL LUGS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
TL31	E198	22	MIDDLE REAR MARKER
TL32	E198	22	RIGHT REAR MARKER
TL33	E47	6	24V AUXILIARY STARTER SOLENOID
TL35	D61	7	ALTERNATOR
TL36	B54	6	POLARITY PROTECTION
TL37	F54	6	POLARITY PROTECTION
TL37	C54	6	POLARITY PROTECTION
TL38	E50	6	SHUNT
TL39	C52	6	CHASSIS - REAR (REF E1)
TL41	C53	6	POLARITY PROTECTION
TL42	B54	6	POLARITY PROTECTION
TL44	B54	6	POLARITY PROTECTION
TL44	E54	6	POLARITY PROTECTION
TL45	D50	6	SHUNT
TL46	D49	6	SHUNT
TL46	D62	7	STARTER/STARTER SOLENOID
TL47	C54	6	POLARITY PROTECTION
TL48	E52	6	CHASSIS - REAR (REF E2)
TL49A	D52	6	CHASSIS - REAR (REF E1)
TL49A	F52	6	NATO SLAVE RECEPTACLE
TL50	G121	14	CHASSIS GROUND
TL50A	F52	6	NATO SLAVE RECEPTACLE
TL51	E50	6	SHUNT
TL52	E50	6	SHUNT
TL53	B47	6	CHASSIS - FRONT
TL53	B62	7	STARTER/STARTER SOLENOID
TL55	B47	6	CHASSIS - FRONT
TL55	C62	7	STARTER/STARTER SOLENOID
TL56	F136	16	X3 GROUND
TL57	F136	16	CAB GROUND
TL58	D60	7	ALTERNATOR
TL59	C61	7	ALTERNATOR
TL60	C53	6	POLARITY PROTECTION
TL60	D60	7	ALTERNATOR
TL61	C54	6	POLARITY PROTECTION
TL61	E60	7	ALTERNATOR
TL62	C47	6	CHASSIS - FRONT
TL63	C47	6	CHASSIS - FRONT
TL63	B62	7	STARTER/STARTER SOLENOID
TL66	H61	7	ENGINE (REF P201)
TL68	D224	25	CAB - DASH - CENTER - OPTIONS PANEL
TL69	E224	25	CAB - DASH - CENTER - OPTIONS PANEL
TL70	B38	5	FRONT RH COMPOSITE LIGHT
TL71	A85	10	CAB MARKER LIGHT RIGHT DOOR
TL72	H38	5	BLACKOUT DRIVE LIGHT
TL73	B86	10	CAB - MARKER LIGHTS
TL74	D86	10	CAB - MARKER LIGHTS
TL74	E204	23	AIRDROP ONLY
TL75	F87	10	CAB - MARKER LIGHTS
TL76	D229	26	PTO EQUIPPED
TL79	F38	5	FRONT LH COMPOSITE LIGHT
TL80	C54	6	POLARITY PROTECTION
TL80	F54	6	200 AMP
TL81	C39	5	CHASSIS GROUND
TL82	F38	5	CHASSIS GROUND
TL83	B52	6	FUEL TANK LEVEL SENSOR
TL84	B49	6	CHASSIS - SPARE TIRE (REF J93)
TL85	G52	6	CHASSIS - REAR
TL86	C86	10	CAB - MARKER LIGHTS
TL86	D204	23	AIRDROP ONLY
TL87	F86	10	CAB - MARKER LIGHTS
TL92	F195	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
TL93	G194	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
TL94	G85	10	WINDSHIELD WASHER ROTARY PUMP (B3)
TL96	H271	31	VAN BODY GROUND
TL97	B88	10	CHEMICAL ALARM CONNECTOR
TL98	B88	10	CHEMICAL ALARM CONNECTOR

TERMINAL LUGS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
TL99	D52	6	CHASSIS - REAR (REF E2)
TL100	E54	6	POLARITY PROTECTION
TL110	D61	7	ALTERNATOR
TL111	D230	26	PTO EQUIPPED
TL123	E38	5	CHASSIS - FRONT (REF J19)
TL126	E126	14	CHASSIS GROUND
TL130	F85	10	CAB - MARKER LIGHTS
TL131	A85	10	CAB - MARKER LIGHTS
TL133	F85	10	CAB - MARKER LIGHTS
TL134	B85	10	CAB - MARKER LIGHTS
TL150	F177	20	SENSOR/FRONT AIR PRESSURE TRANSMITTER
TL151	G177	20	SENSOR/REAR AIR PRESSURE TRANSMITTER
TL152	C179	20	STOPLIGHT SWITCH
TL153	C179	20	STOPLIGHT SWITCH
TL154	D179	20	STOPLIGHT SWITCH
TL154	D179	20	STOPLIGHT SWITCH
TL155	D179	20	STOPLIGHT SWITCH
TL156	F177	20	SWITCH/FRONT AIR PRESSURE TRANSMITTER
TL157	G177	20	SWITCH/REAR AIR PRESSURE TRANSMITTER
TL158	E137	16	START INHIBIT PUSHBUTTON
TL159	E136	16	START INHIBIT PUSHBUTTON
TL160	H102	12	AUDIBLE ALARM
TL161	H102	12	AUDIBLE ALARM
TL162	B114	13	STARTER PUSHBUTTON
TL163	B114	13	STARTER PUSHBUTTON
TL164	G62	7	ENGINE (REF J921)
TL165	G62	7	ENGINE (REF J921)
TL166	F54	6	TERMINAL BLOCK
TL167	E54	6	TERMINAL BLOCK
TL169	D53	6	POLARITY PROTECTION (P/P)
TL171	F54	6	TERMINAL BLOCK
TL172	F54	6	TERMINAL BLOCK
TL173	E54	6	POLARITY PROTECTION (P/P)
TL174	D54	6	POLARITY PROTECTION (P/P)
TL190	D290	33	WTEC III PRESSURE SWITCH GROUND
TL201	E125	14	PARKING BRAKE SWITCH
TL202	E125	14	PARKING BRAKE SWITCH
TL320	E232	26	PTO EQUIPPED
TL320	C241	27	ARCTIC KIT W/PTO EQUIPPED

SWITCHES			
NUMBER	ZONE	SH	DESCRIPTION
S3	A177	20	COLUMN SWITCH
S3	C177	20	COLUMN SWITCH
S4	D114	13	MAIN LIGHT SWITCH
S5/1	B111	13	IGNITION SWITCH
S5/11	A91	11	ENGINE FAN OFF SWITCH
S5/14	C213	24	WINCH ON OFF
S5/15	B212	24	WINCH IN-OUT
S5/16	F91	11	ETHER STARTER SWITCH
S5/2	D91	11	LAMP TEST SWITCH
S5/2	D111	13	ROTATING WARNING LIGHT SWITCH
S5/22	G111	13	FULL HAZARD WARNING SWITCH
S5/25	A219	25	SWINGFIRE PUMP SWITCH
S5/6	B210	24	PTO ON/OFF SWITCH
S5/8	A213	24	BLACKOUT OVERRIDE SWITCH
S5/9	A214	24	FUEL PRE-HEAT SWITCH
S6	A114	13	STARTER PUSHBUTTON
S7	F137	16	START INHIBIT PUSHBUTTON
S10A	C179	20	STOPLIGHT SWITCH
S10B	D179	20	STOPLIGHT SWITCH
S11	A287	32	VAN CURBSIDE WINDOW BLACKOUT SWITCH
S12	A287	32	VAN CURBSIDE WINDOW BLACKOUT SWITCH
S13	G288	32	VAN ROADSIDE WINDOW BLACKOUT SWITCH
S14	G288	32	VAN ROADSIDE WINDOW BLACKOUT SWITCH
S15	G288	32	VAN ROADSIDE WINDOW BLACKOUT SWITCH
S17	G288	32	VAN DOOR WINDOW BLACKOUT SWITCH (S/N 191 AND HIGHER)

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 3 OF 34

SIZE B | ILL. NO. 5WD01L3B | FP-5/ (FP-6 BLANK)

SWITCHES (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
S17	G288	32	VAN CURBSIDE WINDOW BLACKOUT SWITCH (S/N 001 THROUGH 190)
S18	D269	30	PTO PRESSURE SWITCH
S20	E177	20	SWITCH/FRONT AIR PRESSURE TRANSMITTER
S23	F52	6	AIR PRESSURE SWITCH FOR CTIS
S24	E125	14	PARKING BRAKE SWITCH
S26	C57	7	WATER TEMPERATURE SENSOR
S27	E59	7	OIL PRESSURE WARNING LIGHT SWITCH
S29	G177	20	SWITCH/REAR AIR PRESSURE TRANSMITTER
S31	A216	24	ARCTIC TROOP HEATER SWITCH
S32	F288	32	VAN LIGHTS ON/OFF SWITCH
S33	E277	31	VAN BLACKOUT SWITCH
S34	D278	31	VAN BLACKOUT SWITCH
S35	H273	31	VAN BLACKOUT OVERRIDE SWITCH
S40	F58	7	ETHER SENSOR SWITCH
S45	E62	7	TROOP ALARM SWITCH
S45	G62	31	VAN FAN ON/OFF SWITCH
S56	A57	7	WATER TEMPERATURE SWITCH
S57	G77	9	LMHC IN/OUT SWITCH

GAGES			
NUMBER	ZONE	SH	DESCRIPTION
M2	D106	12	VOLTMETER
M3	B106	12	ENGINE OIL PRESSURE METER
M4	F96	11	FRONT AIR PRESSURE METER
M5	B96	11	REAR AIR PRESSURE METER
M6	G107	12	WATER TEMPERATURE METER
M7	D96	11	FUEL LEVEL METER
M8	G102	12	SPEEDOMETER
M9	A210	24	TACHOMETER

RELAYS			
NUMBER	ZONE	SH	DESCRIPTION
K1	F149	17	STARTER RELAY
K2	B143	16	CONTROL PANEL RELAY
K6	F144	16	STOPLIGHT RELAY
K7	G153	17	HEADLIGHT RELAY
K8	G151	17	HEADLIGHT LO/HI-BEAM RELAY
K9	A142	16	HAZARD FLASHER BLACKOUT OVERRIDE
K10	F150	17	STOP HAZARD FLASHER RELAY
K11	F146	17	ALTERNATOR EXCITATION RELAY
K12	B139	16	WORKLIGHT RELAY
K13	B149	17	ROTATING BEACON BLACKOUT OVERRIDE RELAY
K15	B140	16	AUXILIARY COOLER RELAY
K19	B150	17	START INHIBIT RELAY
K20	H138	16	MARKER LIGHTS RELAY
K24	B151	17	CRANKING LOCKOUT RELAY
K25	B292	33	WTEC III REVERSE WARNING RELAY
K26	B290	33	WTEC III NEUTRAL START RELAY
K27	H143	16	BLACKOUT STOP RELAY
K28	H142	16	TRAILER REAR LIGHTS RELAY
K29	F142	16	BLACKOUT MARKER RELAY/WTEC III BLACKOUT DRIVE RELAY
K30	H147	17	REAR LEFT COMPOSITE LAMP RELAY
K31	H149	17	REAR RIGHT COMPOSITE LAMP RELAY
K32	B147	17	HORN RELAY
K35	E277	31	VAN 110 VAC OUTLETS
K36	F277	31	VAN FLUORESCENT LIGHTS
K37	B294	33	WTEC III PTO ENABLE OUTPUT RELAY
K52	H139	16	CTIS OVERSPEED INDICATION RELAY
K53	H140	16	RADIO POWER RELAY

RESISTORS			
NUMBER	ZONE	SH	DESCRIPTION
R2	E172	20	CAB - DASH - LEFT - UNDERDASH
R4	D175	20	CAB - DASH - LEFT - UNDERDASH
R5	C175	20	CAB - DASH - LEFT - UNDERDASH
R6	F172	20	CAB - DASH - LEFT - UNDERDASH

SOLENOIDS			
NUMBER	ZONE	SH	DESCRIPTION
KS	D47	6	24V AUXILIARY STARTER SOLENOID
L1	E189	21	FAN SOLENOID
L2	H57	7	FUEL SOLENOID
L3	D269	30	PTO SOLENOID
L4	E233	26	WINCH IN SOLENOID
L5	D233	26	SOLENOID
L15	B51	6	CHASSIS - SPARE TIRE
	E80	9	LMHC IN SOLENOID
	F80	9	LMHC OUT SOLENOID

HORNS AND ALARMS			
NUMBER	ZONE	SH	DESCRIPTION
LS1	A37	5	VEHICLE HORN
LS2	H101	12	AUDIBLE ALARM

MOTORS			
NUMBER	ZONE	SH	DESCRIPTION
B2	A183	21	WINDSHIELD WIPER MOTOR
B4	C118	14	FAN MOTOR
	F81	9	LMHC HOIST MOTOR

BATTERIES			
NUMBER	ZONE	SH	DESCRIPTION
BT1	C52	6	BATTERY
BT2	D52	6	BATTERY
BT3	D52	6	BATTERY
BT4	E52	6	BATTERY

MISCELLANEOUS			
NUMBER	ZONE	SH	DESCRIPTION
10A	C183	21	WTECII VEHICLE INTERFACE MODULE
10A	E183	21	WTECII VEHICLE INTERFACE MODULE
A2	F118	14	CTIS ELECTRONIC CONTROL UNIT
A3	G114	13	INSTRUMENT PANEL LIGHTS DIMMER MODULE
A5	A135	15	WIPER DELAY MODULE
A7	B179	20	FREQUENCY DIVIDER
A18	A103	12	LIGHTED INDICATOR DISPLAY
A20	H59	7	FUEL/WATER SEPARATOR
B1	C63	7	STARTER/STARTER SOLENOID
B3	G83	10	WINDSHIELD WASHER ROTARY PUMP
B10	E67	8	WTEC II TRANSFER CASE (SERIAL # 29513233)
B10	E70	8	WTEC II TRANSFER CASE (SERIAL # 29513233)
B10	E66	8	WTEC II TRANSMISSION (SERIAL # 29513233)
B10	E71	8	WTEC II TRANSFER CASE (SERIAL # 29517497)
B10	E70	8	WTEC II TRANSMISSION (SERIAL # 29517497)
B10	E76	9	WTEC II TRANSFER CASE (SERIAL # 29513233)
B10	E74	9	WTEC II TRANSMISSION (SERIAL # 29513233)
BJ1	A175	20	JUNCTION BOX
BL1	F257	29	FURNACE CONTROL UNIT
BL2	F256	29	FURNACE CONTROL UNIT
BL3	F256	29	FURNACE CONTROL UNIT
D1A	C138	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D1B	C138	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D2A	D138	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D2B	D138	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D3A	B138	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D3B	B138	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
E1	C52	6	BATTERY
E1	D52	6	BATTERY
E1	D52	6	BATTERY
E1	E52	6	BATTERY
E2	C43	5	CHASSIS FRONT BUMPER (REF J27)
E2	C52	6	BATTERY
E2	D52	6	BATTERY
E2	E52	6	BATTERY
E2	E52	6	BATTERY
E3	H148	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
E4	H150	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
E5	B151	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
E14	E194	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE

MISCELLANEOUS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
E15	E197	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E16	A197	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E17	G195	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E18	G194	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E19	F194	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E20	E194	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E21	D195	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E22	B86	10	CAB - MARKER LIGHTS
E23	D86	10	CAB - MARKER LIGHTS
E23	D205	23	AIRDROP ONLY
E24	C85	10	CAB - MARKER LIGHTS
E24	D205	23	AIRDROP ONLY
E25	F86	10	CAB - MARKER LIGHTS
E60	B41	31	24 VDC VAN POWER
E65	B41	5	CHASSIS - FRONT
E66	C41	5	CHASSIS - FRONT
E66	D300	34	WTEC III CAB TRANSMISSION HARNESS (TID1)
E66	D305	34	WTEC III CAB TRANSMISSION HARNESS (TID2)
E67	D38	5	CHASSIS - FRONT
E68	D40	5	CHASSIS - FRONT
E70	C229	26	PTO EQUIPPED
E71	F173	20	CAB - DASH - LEFT - UNDERDASH
E88	B106	12	CAB - DASH - LEFT - INSTRUMENT PANEL
E89	C106	12	CAB - DASH - LEFT - INSTRUMENT PANEL
E90	D300	34	WTEC III CAB TRANSMISSION HARNESS (TID1)
E90	D305	34	WTEC III CAB TRANSMISSION HARNESS (TID2)
E91	C300	34	WTEC III CAB TRANSMISSION HARNESS (TID1)
E91	C305	34	WTEC III CAB TRANSMISSION HARNESS (TID2)
E501	B275	31	VAN EMERGENCY/BLACKOUT LIGHT/24 VDC OUTLET
E502	G274	31	VAN EMERGENCY/BLACKOUT LIGHT
E503	B273	31	VAN MARKER LIGHT
E504	B272	31	VAN MARKER LIGHT
E505	B287	32	VAN REAR MARKER LIGHTS
E506	C287	32	VAN REAR MARKER LIGHTS
E514	C274	31	VAN EMERGENCY LIGHT
E516	H272	31	VAN 24 VDC
F2	H271	31	VAN 24 VDC POWER
FL	E183	21	WTEC II VEHICLE INTERFACE MODULE
FL1	G85	10	EMI FILTER
FL2	A184	21	EMI FILTER
FL3	C118	14	FAN MOTOR
G1	D60	7	ALTERNATOR
MPU1	F61	7	ENGINE SPEED MAGNETIC PICKUP
MT3	F60	7	ENGINE OIL PRESSURE SENSOR
MT4	E177	20	SENSOR/FRONT AIR PRESSURE TRANSMITTER
MT5	G177	20	SENSOR/REAR AIR PRESSURE TRANSMITTER
MT6	B57	7	WATER COOLER TEMPERATURE
MT7	B52	6	FUEL TANK LEVEL SENSOR
NS	E183	21	WTEC II VEHICLE INTERFACE MODULE
P/P	B54	6	POLARITY PROTECTION
P/P	D54	6	POLARITY PROTECTION
R11	D50	6	SHUNT
R1	D79	9	AIR DRYER
TB1	C128	15	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
TB2	F130	15	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
X1	C137	16	24 VDC
X11	F52	6	NATO SLAVE RECEPTACLE
X2	D137	16	24 VDC
X3	F137	16	GROUND
X5	D137	16	24 VDC
X7	D137	16	24 VDC
PHONE 1	A285	32	VAN PHONE 1
PHONE 2	H287	32	VAN PHONE 2

MISCELLANEOUS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
	E77	9	LIGHT MATERIAL HANDLING CRANE (LMHC)
	E77	9	LMHC REMOTE CONTROL BOX
	E77	9	LMHC POWER CABLE
	G78	9	LMHC REMOTE CONTROL IN/OUT
	G302	34	WTEC III TRANSMISSION PRESSURE SWITCH
	B304	34	WTEC III OUTPUT SPEED SENSOR
	C304	34	WTEC III ENGINE SPEED SENSOR
	E304	34	WTEC III SUMP TEMP SENSOR

TRANSMISSION			
NUMBER	ZONE	SH	DESCRIPTION
A10	B183	21	WTEC II VEHICLE INTERFACE MODULE
A13	B67	8	WTEC II TRANSMISSION A13 (SERIAL # 29513233)
A13	A72	8	WTEC II TRANSMISSION A13 (SERIAL # 29517497)
A13	A76	9	WTEC II TRANSMISSION A13 (SERIAL # 29513233)
B10	E67	8	PRE-BLOCK SEVEN TRANSMISSION OUTPUT SPEED SENSOR
B10	E72	8	TID1, TID2, AND TID3 TRANSMISSION OUTPUT SPEED SENSOR
B10	E76	9	PRE-BLOCK SEVEN W/PIGTAIL TRANSMISSION OUTPUT SPEED SENSOR
MT9	F67	8	PRE-BLOCK SEVEN TRANSMISSION ENGINE SPEED SENSOR
MT9	F72	8	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR
MT9	F76	9	PRE-BLOCK SEVEN W/PIGTAIL TRANSMISSION ENGINE SPEED SENSOR
MT11	F67	8	PRE-BLOCK SEVEN TRANSMISSION THROTTLE POSITION SENSOR
MT11	F72	8	TID1, TID2, AND TID3 TRANSMISSION THROTTLE POSITION SENSOR
MT11	F76	9	PRE-BLOCK SEVEN W/PIGTAIL TRANSMISSION THROTTLE POSITION SENSOR
REV	C183	21	WTEC II VEHICLE INTERFACE MODULE
RW	D183	21	WTEC II VEHICLE INTERFACE MODULE
S02	F183	21	WTEC II VEHICLE INTERFACE MODULE
S03	F183	21	WTEC II VEHICLE INTERFACE MODULE
SF01	D183	21	WTEC II VEHICLE INTERFACE MODULE
SF01	D183	21	WTEC II VEHICLE INTERFACE MODULE
SF02	C183	21	WTEC II VEHICLE INTERFACE MODULE
SF02	D183	21	WTEC II VEHICLE INTERFACE MODULE
SF04	C183	21	WTEC II VEHICLE INTERFACE MODULE
SF3	F183	21	WTEC II VEHICLE INTERFACE MODULE
SF4	D183	21	WTEC II VEHICLE INTERFACE MODULE

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 4 OF 34

SIZE B | ILL NO. 5WD01L4B | FP-7/ (FP-8 BLANK)

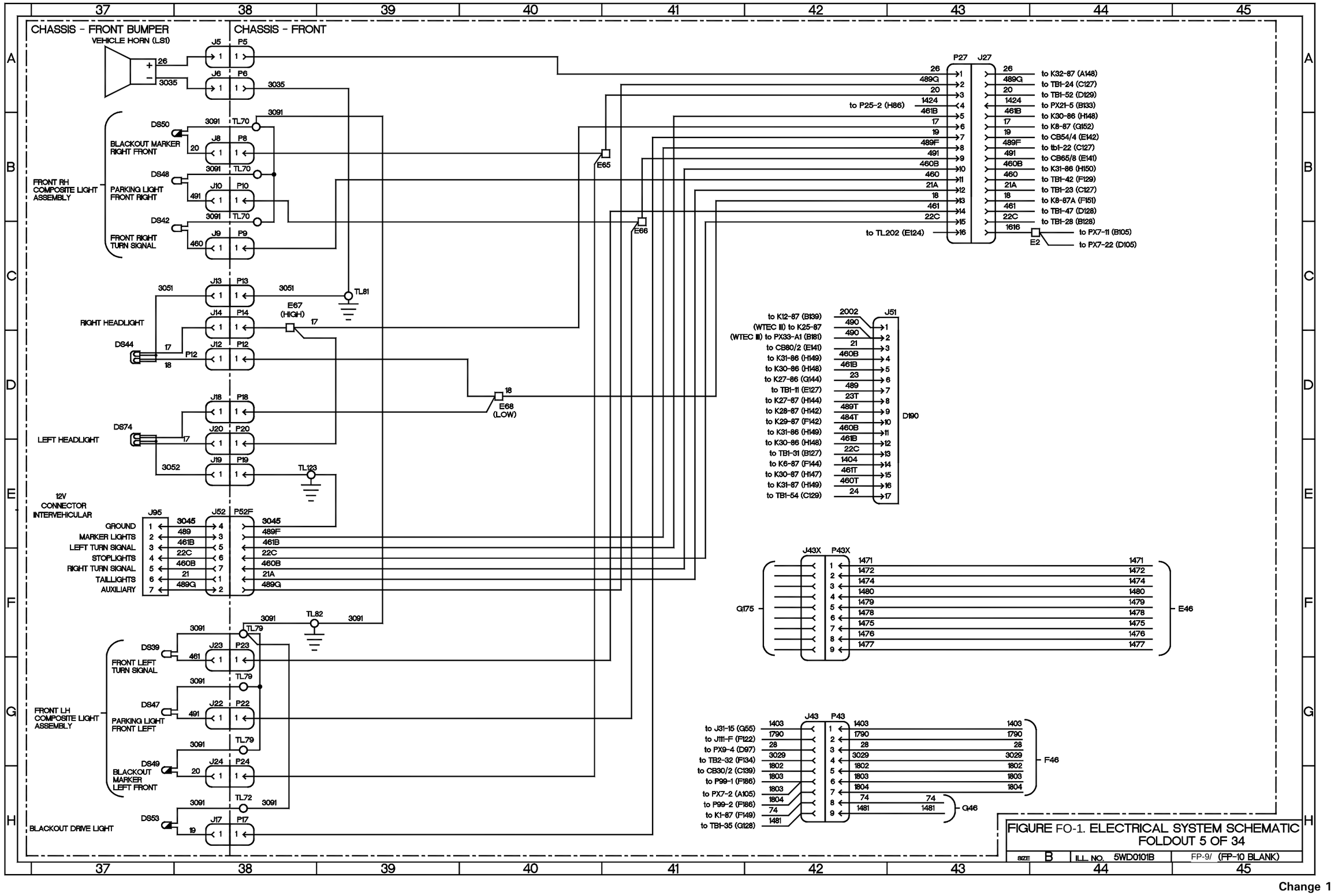


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 5 OF 34

SIZE B | ILL. NO. 5WD0101B | FP-9/ (FP-10 BLANK)

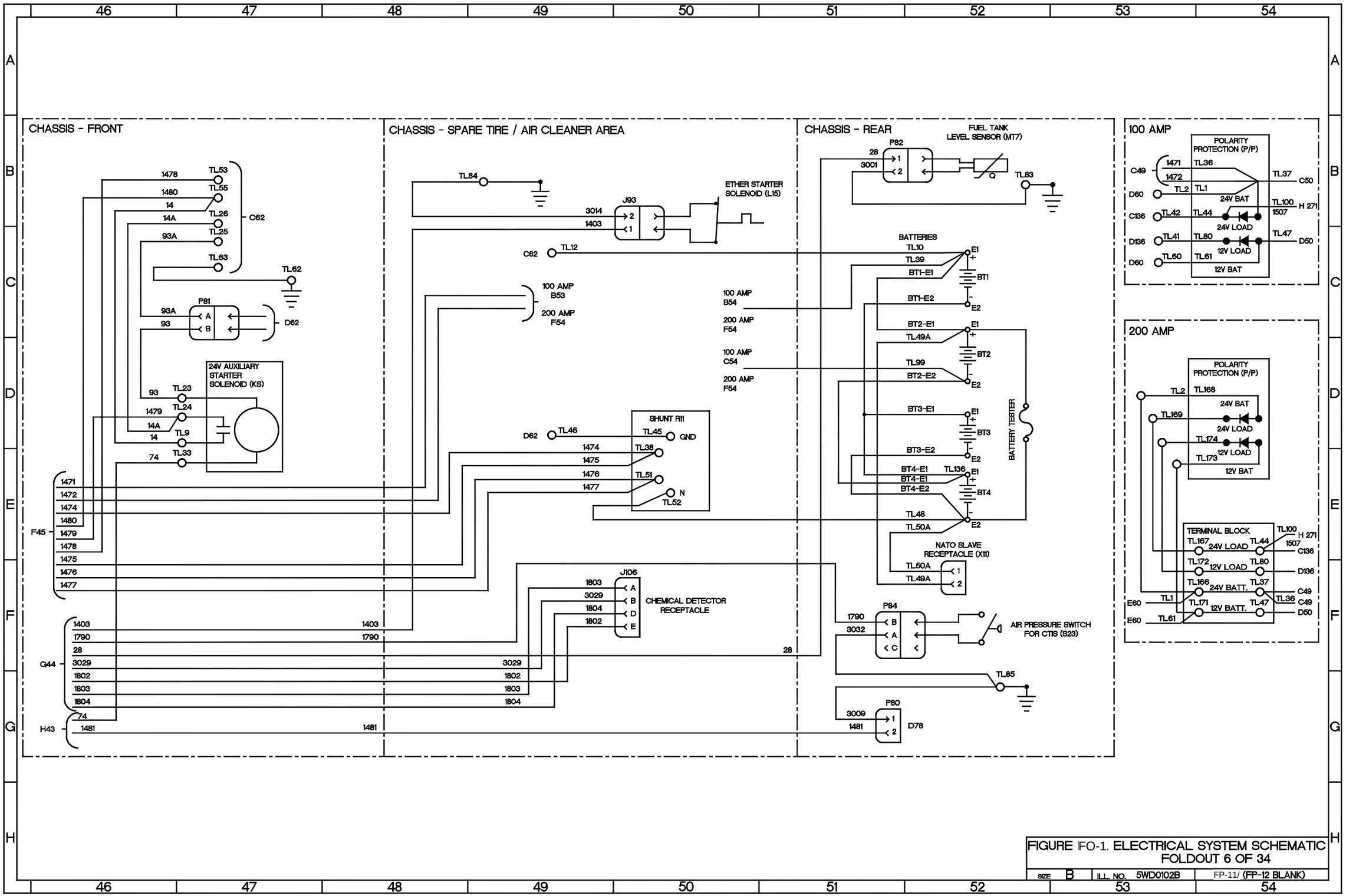


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 6 OF 34

SIZE	ILL. NO.	
B	5WD0102B	FP-11/ (FP-12 BLANK)

ENGINE

WATER COOLER TEMPERATURE (S56)
P36
1807
1805

WATER TEMPERATURE SENSOR (MT6)
P41
33
MT6

WATER TEMPERATURE SWITCH (S26)
P37
3026
35

MT11
F66 124
F70 135A
F75 156
THROTTLE POSITION SENSOR (MT11)

STARTER/STARTER SOLENOID (B1)
TL63
TL53
TL55
B47
L
B1
TL26
TL25
C49 TL12
D49 TL46

STARTER THERMO SWITCH
P81
C47 A
B

P31X
F176
1 1441
2 1452
3 3A
4 1432
5 1433
6 1430
7 1435
8 1434
9 1428
10 1453

P69
1430
1435
1434
1428
Not Used

TL59
100 AMP/200 AMP ALTERNATOR (G1)
1452
TL6
TL2
TL58
3A
TL5
VOLTAGE REGULATOR
24V
GND G1
12V
TL35
TL110
TL60
1453
568A
TL61 F53 (200 AMP) C53 (100 AMP)
TL1 F53 (200 AMP) B53 (100 AMP)

P31 J31
to K11-87A (F146) 568A 1 568A
to PX13-3 (F92) 1402 2 1402
to TB1-38 (F129) 1807 3 1807
to PX1-1 (A92) 1806 4 1805
to TB2-18 (F132) 3015 5 3015
to TB2-10 (F131) 3006 7 3006
to PX26-1 (B180) 1444 8 1444
to TB2-36 (F135) 3028 9 3028
to TB2-28 (F134) 3026 10 3026
to PX6-4 (B107) 36 11 36
to CB49/3 (C152) 1460 13 1460
to K19-87B (B151) 54 14 54
to J43-1 (G42) 1403 15 1403
to PX26-4 (B180) 3083 16 3083
to TL178 (D102) 32 17 32
to K11-87 (F146) 1538 18 1538
to PX7-1 (A105) 1523 19 1523
to PX11-4 (H107) 33 20 33
to K11-85 (H146) 34 21 34
to PX7-12 (C106) 35 22 35
to PX26-5 (B180) 1432 25 1432
to PX26-2 (B180) 1433 26 1433

P42
1402
1403
ETHER SENSE SWITCH (S40)

P34
34
3006
OIL PRESSURE WARNING LIGHT SWITCH (S27)

ENGINE SPEED MAGNETIC PICKUP (MPU1)
P38
3083
1444
(-)
(+)

P32
36
P
ENGINE OIL PRESSURE SENSOR (MT3)

TROOP TRANSPORT ALARM
P39 J39
3028
32
1538
P921 J921
3028 TL164 1
32 TL165 2
TROOP ALARM SWITCH (S45)

1441 TL28
54
3015 TL29
3017 TL29
L
FUEL SOLENOID (L2)

P33
1460
3017
FUEL/WATER SEPARATOR (A20)

P201
1523
TL66 3027
NOT USED

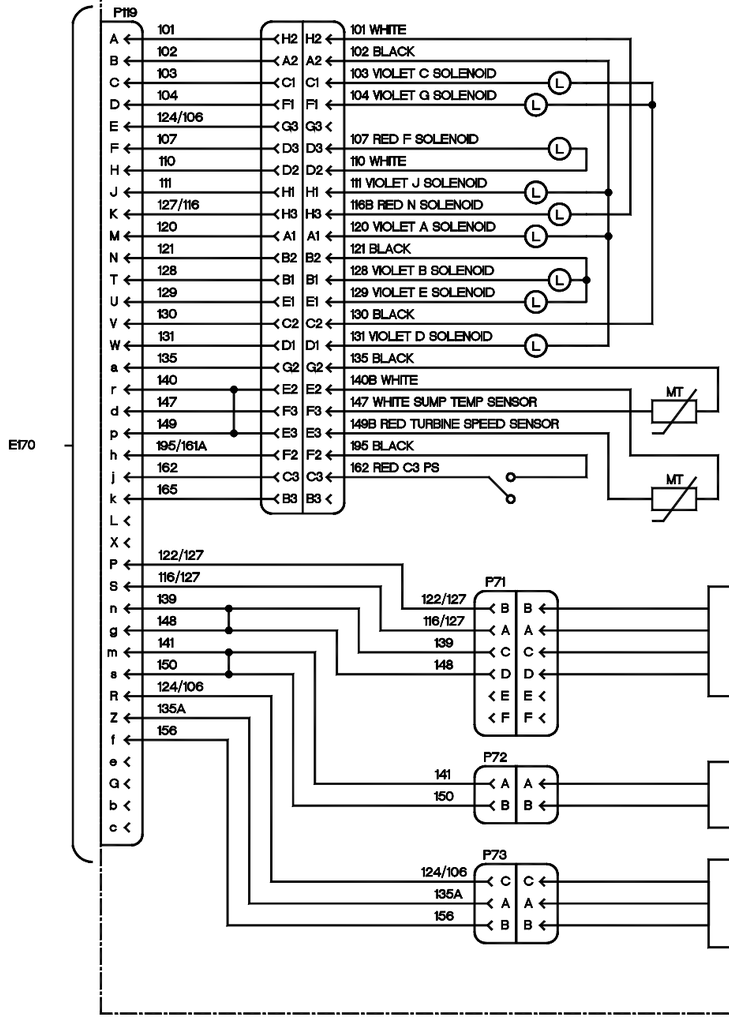
FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 7 OF 34

SIZE B | ILL NO. 5WD0103B | FP-13 / (FP-14 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

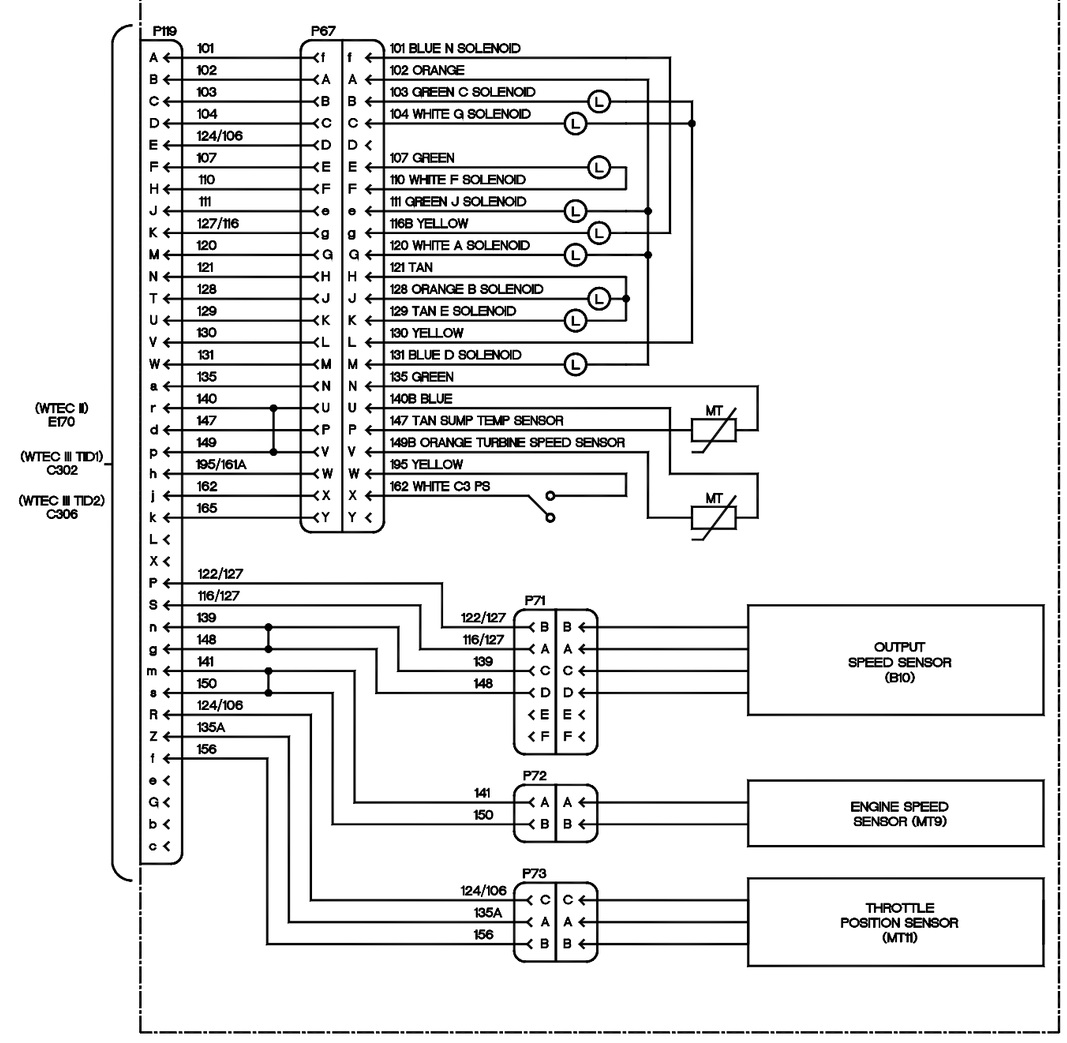


FIGURE FO-1 ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 8 OF 34

SIZE B | ILL. NO. 5WD0104B | FP-15 / (FP-16 BLANK)

PRIOR TO SERIAL NUMBER 6510032369 WITH ADAPTER CABLE ASSEMBLY

PRE-BLOCK SEVEN WITH PIGTAIL TRANSMISSION

200-100 AMPIER CABLE ASSEMBLY (WTEC III ONLY)

TRANSMISSION CONNECTOR P67

TRANSMISSION CONNECTOR

EXTERNAL WIRING HARNESS TO TRANSMISSION CONNECTOR

P119

P119		P67			P67				EXTERNAL WIRING HARNESS TO TRANSMISSION CONNECTOR
A	101	f	f		f	101	H2	H2	101 WHITE
B	102	A	A		A	102	A2	A2	102 BLACK
C	103	B	B		B	103	C1	C1	103 VIOLET C SOLENOID (L)
D	104	C	C		C	104	F1	F1	104 VIOLET G SOLENOID (L)
E	124/106	D	D		D	124/106	G3	G3	
F	107	E	E		E	107	D3	D3	107 RED F SOLENOID (L)
H	110	F	F		F	110	D2	D2	110 WHITE
J	111	e	e		e	111	H1	H1	111 VIOLET J SOLENOID (L)
K	127/116	g	g		g	127/116	H3	H3	116B RED N SOLENOID (L)
M	120	G	G		G	120	A1	A1	120 VIOLET A SOLENOID (L)
N	121	H	H		H	121	B2	B2	121 BLACK
T	128	J	J		J	128	B1	B1	128 VIOLET B SOLENOID (L)
U	129	K	K		K	129	E1	E1	129 VIOLET E SOLENOID (L)
V	130	L	L		L	130	C2	C2	130 BLACK
W	131	M	M		M	131	D1	D1	131 VIOLET D SOLENOID (L)
a	135	N	N		N	135	G2	G2	135 BLACK
r	140	U	U		U	140	E2	E2	140B WHITE
d	147	P	P		P	147	F3	F3	147 WHITE SUMP TEMP SENSOR (MT)
P	149	V	V		V	149	E3	E3	149B RED TURBINE SPEED SENSOR
h	195/161A	W	W		W	195/161A	F2	F2	195 BLACK
j	162	X	X		X	162	C3	C3	162 RED C3 PS (MT)
k	165	Y	Y		Y	165	B3	B3	
L									
X									

(WTEC II) E170

(WTEC III TID1) C301

(WTEC III TID2) C305

P119		P71		
P	122/127	B	B	OUTPUT SPEED SENSOR (B10)
S	116/127	A	A	
n	139	C	C	
g	148	D	D	
m	141	E	E	
s	150	F	F	
R	124/106			
Z	135A			
f	156			
e				
G				
b				
c				

P119		P72		
s	150	A	A	ENGINE SPEED SENSOR (MT9)
R	124/106	B	B	
Z	135A			
f	156			

P119		P73		
R	124/106	C	C	THROTTLE POSITION SENSOR (MT11)
Z	135A	A	A	
f	156	B	B	

J80

1	AIR DRYER (R1)
2	

LIGHT MATERIAL HANDLING CRANE (LMHC)

F52		LMHC POWER CABLE CONNECTOR		LMHC POWER CONNECTOR	
B	150	B	B	B	B
A	170	A	A	A	A

IN SOLENOID (L)

HOIST MOTOR (M)

OUT SOLENOID (L)

IN/OUT (N/O) SWITCH S57

REMOTE CONTROL IN/OUT CONNECTOR

A	A	
B	B	
C	C	

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 9 OF 34

SIZE B | ILL. NO. 5WD0105B | FP-17 / (FP-18 BLANK)

CAB - MARKER LIGHTS

CAB MARKER LIGHT RIGHT DOOR — DS61 — 1947 — J131 P131 — 3096 TL131 — to TB2-2 (F130)

CAB MARKER LIGHT FRONT LOWER RIGHT — DS59 — 1947 — J132 P132 — 3096 TL134 — E22 — 1947 TL73 — to TB1-1 (G127)

CHEMICAL ALARM CONNECTOR
- to J99-1 (F187) — 1803 TL97
- to J99-2 (F187) — 1804 TL98

CAB MARKER LIGHT FRONT UPPER RIGHT — DS57 — 460 — J55 P55 — 3097 TL3

CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT — DS56 — 491 — J59 P59 — 3097 TL4 — E24 — 3097 TL86 — to TB2-4 (F131)

CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE — DS55 — 491 — J60 P60 — 3097 TL8 — E23 — 1951 TL74 — to TB1-3 (G127)

(ALL VEHICLES EXCEPT AIR DROP)
(AIR DROP D204)

CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT — DS54 — 460 — J57 P57 — 3097 TL22

CAB MARKER LIGHT FRONT UPPER LEFT — DS58 — 460 — J50 P50 — 3097 TL27

ROTARY WARNING LIGHT CONNECTOR
- to TB2-12 (F132) — TL14 — 3050 — J62 A
- to J65-1 (E186) — 509 — J62 B

CAB MARKER LIGHT FRONT LOWER LEFT — DS60 — 1949 — J129 P129 — 3098 TL133 — E25 — 1949 TL75 — to TB1-2 (G127)

CAB MARKER LIGHT LEFT DOOR — DS62 — 1949 — J130 P130 — 3098 TL130 — to TB2-6 (F131) — TL87

WINDSHIELD WASHER ROTARY PUMP (B3)

B3 — P125 (1, 2) — EMI FILTER (FL1) — 3038 — 1424 — J25 P25 (1, 2) — 3038 — TO TL126 (E126) — 1424 — to P27-4 (A43)

TL94

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 10 OF 34

SIZE B | ILL NO. 5WD0106B | FP-19 / (FP-20 BLANK)

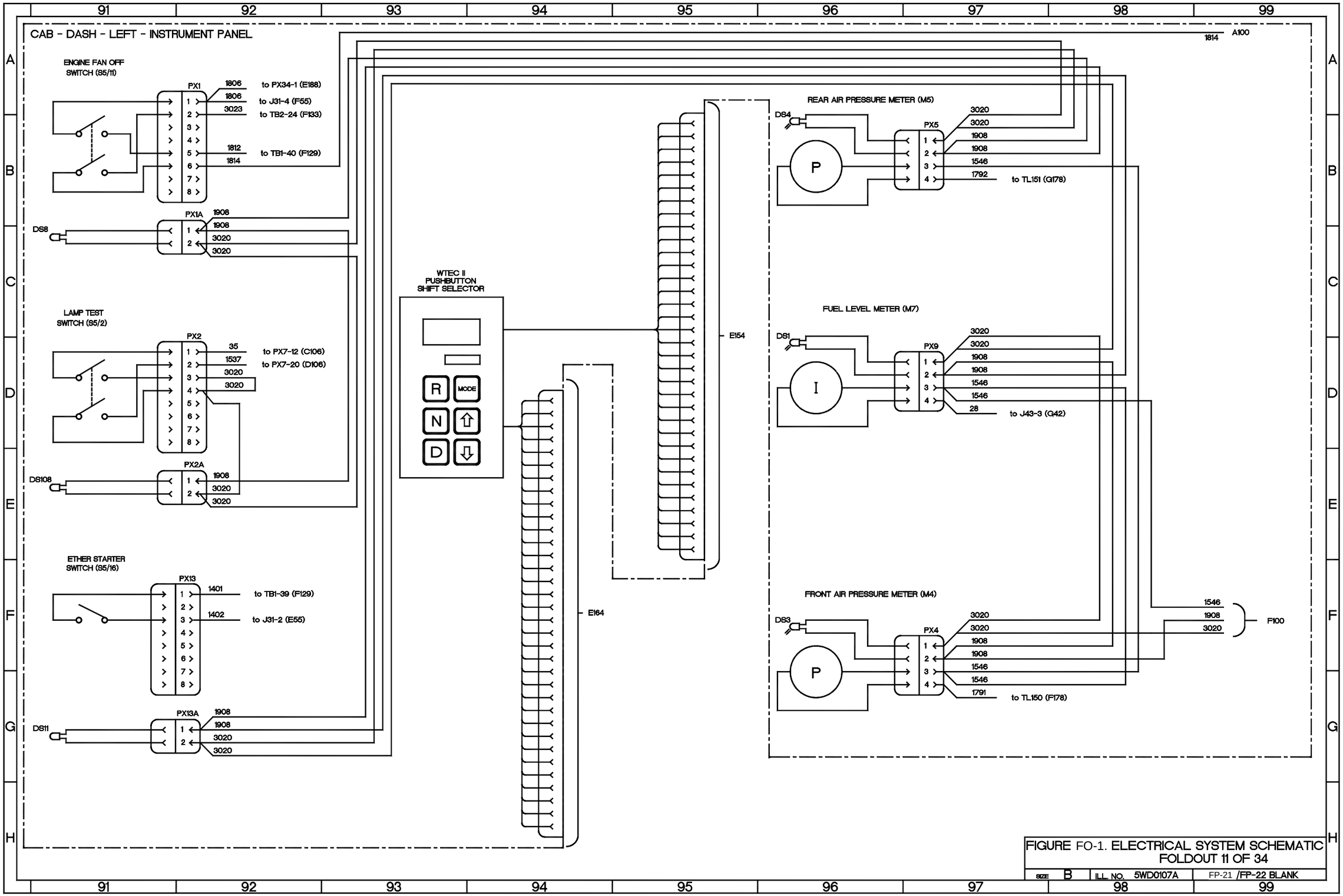


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 11 OF 34

SIZE B | ILL. NO. 5WD0107A | FP-21 /FP-22 BLANK

CAB - DASH - LEFT - INSTRUMENT PANEL

A99 — 1814

LIGHTED INDICATOR DISPLAY (A18)

		PX7	
CHEM DETECT	DS32	1	1523 to J31-19 (Q55)
RIGHT TURN SIGNAL	DS15	2	1803 to J43-6 (H42)
LEFT TURN SIGNAL	DS14	4	1580 to TB1-41 (E129)
	DS9	6	1570 to TB1-47 (E129)
CTIS OVRSPD	DS34	7	3021 to TB2-25 (G133)
PTO ON	DS23	8	2034 to P912-9 (C124)
EMER BRAKE	DS21	9	1528 to J111-D (F122)
WATER TEMPERATURE	DS25	10	2021 to J913-13 (C121)
REAR BRAKE AIR	DS27	11	1616 to J27-16 (C43)
TRANS OIL TEMP	DS41	12	35
ENGINE OIL LEVEL	DS29	13	1525 to TL157 (H178)
PARK BRAKE	DS22	16	1532
OIL PRESSURE	DS24	17	3030 to TB2-33 (G134)
HIGH BEAM	DS16	19	1536
FRONT AIR BRAKE	DS28	20	1537
RADIATOR FAN OFF	DS19	22	1616 to J27-16 (C43)
MASTER STOP	DS30	23	34A to D3B-4 (A138)
		24	1681 to K8-87 (F152)
		25	1530 to TL156 (F178)
		26	1814
		27	1658 to TB1-61 (B129)
		28	2010 to P912-7 (B124)

ENGINE OIL PRESSURE METER (M3)

DS5 — OP — PX6

1	3020	B109
2	3020	
3	1908	
4	1908	
	1546	
	1546	
	36 to J31-11 (F55)	

E88: 35 to PX2-1 (D92); 35 to J31-22 (H55)

E89: 1537 to PX2-2 (D92); 1537 to J118-1 (D162); 105 to P115-19

VOLTMETER (M2)

DS7 — V — PX10

1	3020	D109
2	3020	
3	1908	
4	1908	
	1546	
	1546	E109
	3004 to TB2-9 (G131)	

F99: 1546, 1908, 3020 — 3020, 1908 — F109

SPEEDOMETER (M8)

DS6 — KM — PX8

1	3020	
2	3020	
3	1908	
4	1908	
	1546	
	1546	
	1793 to PX33-H2 (E181) (WTEC II)	
	1793 to J111-B (F122) (WTEC II)	
	157 to J111-B (F122) (WTEC III)	
	157 to P116-30 (F291) (WTEC III)	

AUDIBLE ALARM (LS2)

32	TL178	32	to J31-17 (Q55)
1536	TL160		
1532	TL161		

WATER TEMPERATURE METER (M6)

DS2 — t° — PX11

1	3020	G109
2	3020	
3	1908	
4	1908	
	1546	
	1546	
	33 to J31-20 (Q55)	

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 12 OF 34

SIZE B | ILL NO. 5WD0108B | FP-23 / (FP-24 BLANK)

CAB - DASH - LEFT - INSTRUMENT PANEL

IGNITION SWITCH (S5/1)

PX17

B108: 3020, 3020, 1908, 1908, 1546, 1546

1548 — to K2-86 (A143)

1586 — to CB70/4 (E146)

DS13 — PX17A: 1908, 1908, 3020, 3020

STARTER PUSHBUTTON (S6)

TL163 — TL162 — 1405 — to K24-87 (A152)

3007 — to TB2-11 (G131)

ROTATING WARNING LIGHT SWITCH (S5/2)

PX12

D108: 3020, 3020, 1908, 1908, 1546

E108: 1546

1559 — to K13-86 (A149)

1575

1575 — to K20-86 (G138)

DS10 — PX12A: 1908, 1908, 3020, 3020

MAIN LIGHT SWITCH (S4)

PX15

B	1542	
C	22	to D1A-2 (C138)
D	19	to CB54/3 (D142)
E	1572	to CB66/1 (D143)
F	1586	to CB70/4 (D146)
H	1575	
J	1577	to CB74/5 (D150)
K	1404	to K6-87 (F143)
L	491	to CB65/7 (D141)
M	16	to P18-3 (B178)
N	23	to K27-86 (G143)

F108: 3020, 1908

G108: 3020, 3020, 1908, 1908, 1546

FULL HAZARD WARNING SWITCH (S5/22)

PX14

1565 — to K9-87 (B142)

1566 — to J19-5 (D177)

1566 — to K10-87A (F150)

1567 — to PX20-B (C188)

1568 — to J19-12 (E177)

1568 — to PX20-A (C188)

1514 — to CB74/6 (E150)

DS12 — PX14A: 1908, 1908, 3020, 3020

1908 — to J913-11 (C121)

3020 — to J913-10 (C121)

INSTRUMENT PANEL LIGHTS DIMMER MODULE (A3)

PX24: 1908, 1908, 1542

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 13 OF 34

SIZE B | ILL. NO. 5WD0109A | FP-25 /FP-26 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 (C147)
2 1908
3 3003 to TB2-8 (F131)
4 3003

HEATER CONTROL PANEL ILLUMINATION
DS17
DS101

J913 P913 — G208
1 1673 ← to K12-86 (A139)
2 1674 ← to CB72/2 (D139)
3 1672 ← to D2B-3 (D138)
4 1670 ← to CB45/4 (C139)
5 1925 ← to CB49/3 (C152)
6 1954 ← to J118-9 (E162)
7 161 ← (WTEC II) to PX33-A3 (C181)
8 153 ← (WTEC III) to P115-12 (D291)
9 1546 ← to TB1-61 (B129)
10 3020 ← to PX14A-2 (H112)
11 1908 ← to PX14A-1 (H112)
12 1550 ← to PX26-1 (B179)
13 2021 ← to PX7-10 (B105)
14 2019 ← (WTEC II) to PX33-E2 (D181)
15 1904 ← (WTEC II) to PX33-E3 (D181)

161 ← (WTEC II) to J118-13 (E162)
161/1952 ← (WTEC III) to P115-31 (D291)
153 ← (WTEC II) to J118-8 (D162)
1908 ← to PX10-3 (E107)
3020 ← to TB2-31 (G134)
2019 ← (WTEC III) to K37-87 (B294)
1904 ← (WTEC III) to K37-30 (B294)

P912 J912 — E208
1 1 2006 ← to CB50/2 (C145)
2 2 2069 ← to CB48/8 (C141)
3 3 2012
4 4 2004 ← to K12-87 (B139)
5 5 1328 ← to CB63/1 (D151)
6 6 2010
7 7 2033 ← to PX7-28 (D105)
8 8 2033 ← to CB53/6 (E140)
9 9 2034 ← to PX7-8 (B105)
10 10 2040 ← to TB1-20 (D127)
11 11 2041 ← to TB1-50 (D129)
12 12 1650 ← to X1 (C136)
13 13 1653 ← to X1 (C136)
14 14 2037 ← to K19-87 (B150)
15 15 1811 ← to K15-87A (A140)

2006
2006
2069
2069
2012
2004
1328
2010
2033
2033
2034
2040
2041
1650
1653
2037
1811

PARKING BRAKE SWITCH

C42 — 1616 — TL202 — S24 — 3024 — TL201 — TL126
to P25-1 (Q86)
3038

CTIS ELECTRONIC CONTROL UNIT (A2)

P110
H 01
F 02
Z
M 01
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 E 1911 to CB40/7 (C150)
02 A A 3031 to TB2-35 (G135)
03 B B 1793 to PX8-4 (G103) (WTEC II)
04 G G 157 to PX8-4 (G103) (WTEC III)
05 D D 1911 to K52-87A (G139)
06 F F 1528 to PX7-9 (B105)
1790 to J43-2 (G42)

P113
B
C
A

P112 — Q186
D
F
E
A
B

TL50
CHASSIS GROUND

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 14 OF 34

SIZE B | ILL. NO. 5WD0110B | FP-27 / (FP-28 BLANK)

CAB - DASH - RIGHT - POWER DISTRIBUTION PANEL

PX21

to P18-9 (B178)	1599	1	1
to CB37/1 (C152)	1569	2	2
to J2-4 (B185)	1916	3	3
to TB2-37 (G135)	3034	4	4
to P18-8 (B178)	1424	5	5
to J27-4 (A43)	1424	6	6
to P18-7 (B178)	1597		

WIPER DELAY MODULE (A5)

TB1

22C J51-13 (E42)	31	32	
1940 K10-87 (F150)	29	30	1940 K10-86 (F150)
22 D1A-1 (C138)	27	28	22C J27-15 (C43)
	25	26	1912 CB67-4 (E139)
21A J27-12 (B43)	23	24	489G J27-2 (A43)
	21	22	489F J27-8 (B43)
	19	20	2040 P912-10 (C124)
	17	18	
	15	16	
	13	14	
489 J51-7 (D42)	11	12	
1426 J7-1 (A188)	9	10	
	7	8	
1955 K28-86 (H142)	5	6	
1951 TL74 (D86) / 1951 TL74 (E205)	3	4	
1947 TL73 (B86)	1	2	1949 TL75 (F86)

1930 K11-86 (F146)	63	64	1929 CB77/5 (C152) / 1658 K11-30 (F146)
1546 J913-9 (C122) / 1658 PX7-27 (D105)	61	62	1690 CB79/5 (C150)
1462 K19-30 (A150)	59	60	1460 PX33-C1 (C181) (WTEC II) / 146 K25-86 (B292) (WTEC III)
1463 TL159 (E136)	57	58	146 J17-C (C289) (WTEC III)
	55	56	1572 CB66/2 (E143)
1408 K29-86 (F142)	53	54	24 J51-17 (E42)
1329 K52-86 (H139)	51	52	20 J27-3 (A43)
	49	50	2041 P912-11 (C124)
461 J27-14 (B43) / 1570 PX7-6 (B105)	47	48	
	45	46	1581 J19-1 (C177)
1524 J19-4 (D178)	43	44	
1580 PX7-4 (B105)	41	42	460 J27-11 (B43)
1401 PX13-1 (F92)	39	40	1812 PX1-5 (B92)
1935 CB22/3 (C149)	37	38	1807 J31-3 (F55)
1481 J43-9 (H42)	35	36	1692 CB21/1 (C149) / 1692 PX26-3 (B179)
(WTEC II) 1692 PX33-E1 (D181) / (WTEC III) 1692 K34-30 (B293)	33	34	1692 PX33-F1 (D181) (WTEC II) / 1692 K26-30 (B290) (WTEC III)

3101 K37-85 (B294) (WTEC III)	40	41	
	42	43	3041 K2-85 (A143)
3054 K20-85 (H138)	44	45	
3036 K32-85 (A147)	46	47	3043 TL153 (C180)
	48	49	
3047 K30-85 (H147)	50	51	
	52	53	3048 K31-85 (G149)
	54	55	3049 PX20-C (C189)
3039 K9-85 (A142)	56	57	
3099 J7-3 (B188)	58	59	
3046 K10-85 (F150)	60	61	
3016 K19-85 (A150)	62	63	
	64	65	
	66	67	
	68	69	
3053 K8-85 (F151)	70	71	
	72	73	
3002 K7-85 (F152)	74	75	
	76	77	3012 K15-85 (A141)
	78	79	3011 PX34-2 (E188)

1603 TB2-1 — F136

TB2

1603 X3	1		
3096 TL71 (A86)	2	3	3045 K52-85 (H139)
3097 TL86 (C86)	4	5	
3098 TL87 (F86)	6	7	
3003 PX25-3 (C120)	8	9	3004 PX10-4 (E108)
3006 J31-7 (F55)	10	11	3007 TL163 (B115)
3050 TL14 (E88)	12	13	(WTEC III) 188 TB2-13 (H292)
3008 PX50-1 (D188)	14	15	(WTEC III) 188 TB2-15 (H292)
3101 PX33-K1 (F181) (WTEC II)	16	17	(WTEC II) 3102 PX33-K2 (F181)
143 P115-32 (D291) (WTEC III)			(WTEC III) 3102 K26-85 (B290)
3015 J31-5 (F55)	18	19	
3040 K29-85 (F142)	20	21	3018 J78-2 (F185)
3056 K28-85 (G142)	22	23	3019 J78-4 (F185)
3023 PX1-2 (B92)	24	25	3021 PX7-7 (B105)
3083 PX26-6 (B179)	26	27	(WTEC III) 143 P115-17 (D291)
3026 J31-10 (F55)	28	29	(WTEC III) 143 J17-E (C289)
3067 K12-85 (A139)	30	31	3020 J913-10 (C121)
3029 J43-4 (H42)	32	33	3030 PX7-17 (C105)
3044 K27-85 (H143)	34	35	3031 J17-A (F122)
3028 J31-9 (F55)	36	37	3034 PX21-4 (A193)
	38	39	3037 J2-3 (A185)

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 15 OF 34

SIZE	ILL. NO.	
B	5WD0111B	FP-29 / (FP-30 BLANK)

CAB - DASH - RIGHT
POWER DISTRIBUTION PANEL

34 K24-85 (A151)
34A PX7-23 (D105)
74 K24-30 (A151)
D3B
D3A
1674 CB72/2
3067 TB2-30 (F134)
2004 P912-4 (B124)
2002 J51-1 (D42)
1673 J913-1 (B121)
WORKLIGHT RELAY
K12
1808 CB68/7
1806 PX34-1 (E187)
1811 P912-15 (C134)
3039 TB2-56 (B132)
3012 TB2-77 (C135)
AUX. COOLER RELAY
K15
1566 CB71/4
1514 CB74/6
1565 D2B-4
1565 PX14-1 (F112)
HAZARD FLASHER BO OVERIDE
K9
1602 X1
1637
A145
1548 PX17-1 (A112)
3041 TB2-43 (C130)
1548 CB76/3
1940A X6
CONTROL PANEL RELAY
K2
B145
3054
1566
to CB43 (C289)
to CB79 (B289)
to P912-12 (C124)
1650
to P912-13 (C124)
1653
to TL44 (E54)
to TL44 (B53)
TL42
X1
+24 VDC
X4 1602 K2-30
1602 K1-30
461B J19-2 (C178)
22 PX15-C (D115)
D1B
D1A
461B K30-86
22 TB1-27 (B127)
+24V
CHEMICAL ALARM
CB30
CB45
FUEL PREHEAT
1802 J43-5 (H42)
1670 J913-4 (B121)
CAB RADIO
CB20
CB48
ARCTIC CAB/ ENGINE KILL
1906 K53-30
2069 P912-2 (B124)
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 (C289)(WTEC III)
136 P115-1 (D289)(WTEC III)
1922 K30-30 (WTEC II)
1956 K31-30
1956
C145
X7 1601
X5 1601
1601
D145
+12V
19 PX15-D (D115)
1914A K20-87
TAIL LIGHTS
CB80
CB54
BO HEADLIGHT
21 J51-3 (D42)
19 J27-7 (B43)
1572 PX15-E (D115)
1548 K2-86
BO MARKER POWER
CB66
CB76
BO STOP RELAY POWER
1572 TB1-56 (C129)
1641 K6-30
TL41
X2
+12 VDC
to TL80 (C53)
to TL80 (F54)
1501
1565 K9-87
460B J19-3 (D178)
D2B
D2A
460B K31-86
1672 J913-3 (B121)
1674 K12-30
1914 K20-87
CB72
CB67
MARKER LIGHTS
1674 J913-2 (B121)
1912 TB1-26 (C128)
491 PX15-L (E116)
2033 P912-8 (C124)
CB53
CB65
PARKING LIGHTS
491 J27-9 (B43)
1514
1808
1911
E145
TL159
TL158
to TB1-57 (C129)
1463
1637 K19-86
START INHIBIT PUSHBUTTON (S7)
1958 CB42/4
178 P115-28 (D291)(WTEC III)
1408 J7-2 (B188)
1408 TB1-53 (C129)
484T J51-10 (D42)
3040 TB2-20 (F133)
K29
BO MARKER RELAY WTEC III BLACKOUT DRIVE RELAY
1641 CB76-4
1404 PX15-K (D115)
1404 J51-14 (E42)
1594 TL152 (C180)
K6
STOP LIGHT RELAY
D135
1603 TB2-1
TL57
TL56
CAB GND
X3 GROUND
1602
461B D1B-3
460B
1691
74
G145
1501
1691 K1-86
3044 TB2-34 (F135)
1959 CB39/4
3054 K13-85
1575 PX12-5 (D113)
3054 TB2-44 (B131)
1914 CB67/3
1914A CB80/1
K20
MARKER LIGHTS RELAY
1911 CB40/7
1329 TB1-51 (D129)
1911 J111-G (F123)
3045 TB2-3 (G130)
K52
CTIS OVERSPEED INDICATION RELAY
1906 CB20/6
74 K1-85
1906 J78-3 (F185)
K53
RADIO POWER RELAY
1957 CB41/2
3056 TB2-22 (F133)
1955 TB1-5 (F127)
489T J51-9 (D42)
TRAILER REAR LIGHTS RELAY
K28
BO STOP RELAY
1959 CB39/4
23 PX15-N (E115)
23 J51-6 (D42)
23T J51-8 (D42)
K27

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 16 OF 34

SIZE B | ILL. NO. 5WD0112B | FP-31 / (FP-32 BLANK)

CAB - DASH - RIGHT
POWER DISTRIBUTION PANEL

A144 1637
B144 1604 X6
3054
1566
C144
D144 1601
1922
1956
E144 1514
1808
1911
Q145 1602
461B D1B-3
460B
1691
74
1959

1637 TL158
1658 K11-30
74 D3B-3(B137)
74 K1-85
34 K11-85
1405 TL162 (B115)
E5
1569 J2-2 (A185)
1569 P18-4 (B177)
1569 PX21-2 (A133)
1925 J913-5 (B121)
1460 J31-13 (F55)
1929 TB1-64 (B129)
1808 K15-30
1328 P912-5 (B124)
1577 PX15-J (D115)
1514 PX14-7 (G113)
1903 PX33-B1 (C181)(WTEC II)
1903 K25-30 (B292)(WTEC III)
1566 K9-30
1900 PX33-J1 (E182)
1900 PX33-J2 (E182)
1514 K9-86
1416 K7-30
1416
1911
1658 K24-86
1658 TB1-64 (B129)
1930 TB1-63 (B129)
568A J31-1 (E55)
1538 J31-18 (G55)
34 J31-21 (G55)
1691 K26-87 (B290)(WTEC III)
1602 X1
1691 PX33-G1 (E181)(WTEC II)
1691 K53-86
74 K24-30
74 K53-85
74 J43-8 (H42)
1594 J19-6 (D178)
1940 TB1-30 (B128)
3046 TB2-60 (B133)
1940 TB1-29 (B127)
1566 PX14-2 (GH13)
18 J27-13 (B43)
3053 TB2-70 (B134)
1417 K7-87
16A P18-2 (B178)
17 J27-6 (B43)
1681 PX7-24 (D105)
9002 TB2-74 (B135)
1416 CB78/6
16 P18-3 (B178)
1417 K8-30
1922 CB43/8
3047 TB2-50 (B131)
461T J51-15 (E42)
461B
461B J51-12 (E42)
461B J27-5 (B43)
461B J51-5 (D42)
461B D1B-3
1956 CB44/6
3048 TB2-53 (C132)
460T J51-16 (E42)
460B D2A-1
460B J51-4 (D42)
460B J51-11 (E42)
460B J27-10 (B43)

26 CB36/5
25 P18-12 (C178)
26 J27-1 (A43)
3036 TB2-46 (B131)
K32
HORN RELAY
509 CB38/8
3054 K20-85
K13
ROTATING BEACON BO OVRD RELAY
509 P65-1 (E186)
1559 PX12-1 (D113)
3016 TB2-62 (B133)
1462 TB1-59 (B129)
K19
START INHIBIT RELAY
2037 P912-14 (C124)
54 J31-14 (Q55)
34 K24-85
K24
CRANKING LOCKOUT RELAY
34 D3B-4 (B138)

+24V
SWING FIRE PUMP POWER
CB50 CB39
TRAILER BO STOP LIGHTS
2006 P912-1 (B124)
1959 K27-30
26 K32-30
1601 PX25-1 (C120)
HORN POWER
CB36 CB23
HEATER BLOWER
1692 TB1-36 (C129)
WTEC II VIM STE/ICE
CB21 CB22
FAN/ ETHER
1935 TB1-57 (F129)
1690 TB1-62 (B129)
1911 J111-E (E123)
1911 K52-30
WTEC II VIM POWER
CB79 CB40
CTIS COOLER
WINDSHIELD WIPER/WASHER
CB37 CB49
PTO POWER
ENGINE INSTR POWER
CB77 CB68
+12V
IGNITION/MAIN LIGHT SWITCH
CB70
1586 PX15-F (D115)
1586 PX17-5 (B112)
HEAD LIGHTS
CB78 CB38
ROTATING BEACON
509 K13-30
VIM POWER
CB35 CB71
HAZARD/ FLASHER WORKLIGHTS
BACK-UP LIGHT POWER
CB74 CB73
CB63 CB64
CB61 CB62
74 K24-30
74 K53-85
74 J43-8 (H42)
STARTER RELAY
K1
34 J31-21 (G55)
ALTERNATOR EXCITATION RELAY
K11
3046 TB2-60 (B133)
K10
STOP/HAZARD FLASHER RELAY
18 J27-13 (B43)
K8
HEADLIGHT LO/HI-BEAM RELAY
17 J27-6 (B43)
K7
HEADLIGHT RELAY
K30
REAR LEFT COMPOSITE LAMP RELAY
K31
REAR RIGHT COMPOSITE LAMP RELAY
E3
E4

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 17 OF 34

SIZE B | ILL. NO. 5WD0113B | FP-33 / (FP-34 BLANK)

CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS

G166: 123 118 115 113 105 / 125 119 117 114 112

H168: 135A/B 156 147 149 161A/B / 162 148 150 165

G167 G167 G167 G165

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

C95

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

D185

P118 J118
105 1 1537 PX7-20 (C105)
118 2
119 3
4
137 5
142B 6
151B 7
153 8 153 J913-8 (B121)
155 9 1954 J913-6 (B121)
10
11
154 12
161B 13 161 J913-7 (B121)
163 14 163 PX33-A2 (C181)
15
117 16

J117
143D A
B
C
D
E
F
WTEC II DIAGNOSTIC CONNECTOR
G
136D H
142A J
151A K
L
M

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 18 OF 34

SIZE B | ILL. NO. 5WD0114B | FP-35 / (FP-36 BLANK)

CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS

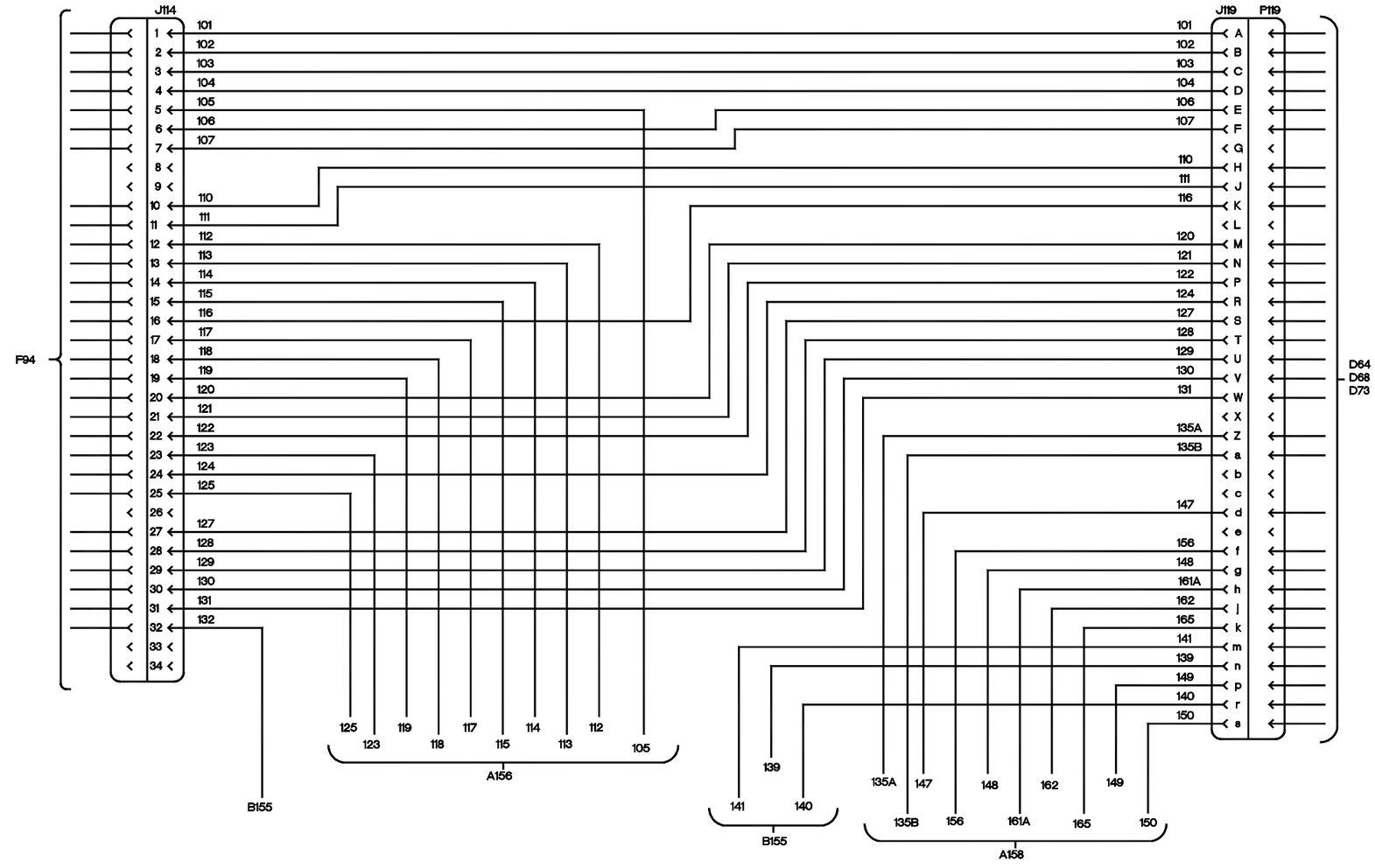


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 19 OF 34

SIZE B | ILL NO. 5WD0115B | FP-37 / (FP-38 BLANK)

CAB - DASH - LEFT - UNDERDASH

JUNCTION BOX (BJ1)

P83

STE / ICE RECEPTACLE

f	1610	1610
AB	1437	1430
AD	1431	
AE	1446	
z	1427	
x	1423	
p	1438	
m	1436	
AA	1612	
g	1439	1437
k	1421	1431
n	1425	1446
w	1447	1427
y	1429	1423
AC	1441	1438
R	1452	
N	3A	1436
P	1432	1612
d	1433	1434
c	1435	
v	1428	1439
u	1453	1421
O	1471	1425
E	1472	1447
V	1474	1429
Y	1480	
T	1479	
S	1478	
M	1475	
F	1476	
X	1477	
W		
h	R2	
j		
s	R6	
U	1482	
Z	1482	E71
a	1482	
b	1482	

BLUE
BROWN
GREEN
RED
YELLOW
BLACK
WHITE

R5
R4

J31X

1441	1
1452	2
3A	3
1432	4
1433	5
1430	6
1435	7
1434	8
1428	9
1453	10

D55

J43X

1471	1
1472	2
1474	3
1480	4
1479	5
1478	6
1475	7
1476	8
1477	9

F42

COLUMN SWITCH (S3)

P18

HORN PUSHBUTTON SWITCH

1	16A	to K8-86 (F152)
2	16	to K7-86 (F153)
3	16	to PX15-M (E116)
4	1569	to CB37/1 (B152)
5	1527	to J2-5 (B186)
6	1590	to J2-1 (A186)
7	1597	to PX21-6 (B133)
8	1424	to PX21-5 (B133)
9	1599	to PX21-1 (A133)
10		
11		
12	25	to K32-86 (A147)

COLUMN SWITCH (S3)

J19

1	1581	to TB1-46 (E129)
2	461B	to D1B-4 (C138)
3	460B	to D2A-2 (D138)
4	1524	to TB1-43 (E129)
5	1566	to PX14-2 (G113)
6	1594	to K10-30 (F150)
7		
8		
9		
10		
11		
12	1568	to PX14-6 (G113)

FREQUENCY DIVIDER (A7)

PX26

INPUT (+)	1	1550 to J913-12 (C121)
OUTPUT (+)	2	1444 to J31-8 (F55)
+24V POWER	3	1433 to J31-26 (H55)
INPUT (-)	4	1692 to TB1-36 (G129)
OUTPUT (-)	5	3083 to J31-16 (G55)
GROUND	6	1432 to J31-25 (H55)
		3083 to TB2-26 (F133)

STOP LIGHT SWITCH (S10A)

TL152 — TL153 — 3043 — 3043 to TB2/47 (C131)
1594 — 1594 to K6-85 (F143)

STOP LIGHT SWITCH (S10B)

TL154 — TL155 — 3043
1594

FRONT AIR PRESSURE TRANSMITTER

SENSOR (MT4) / SWITCH (S20)

TL150 — 1791 to PX4-4 (G97)
P
N/C
TL156 — 1530 to PX7-25 (D105)

REAR AIR PRESSURE TRANSMITTER

SENSOR (MT5) / SWITCH (S29)

TL151 — 1792 to PX5-4 (B97)
P
N/C
TL157 — 1525 to PX7-13 (C105)

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 20 OF 34

SIZE B | ILL. NO. 5WD0116B | FP-39 / (FP-40 BLANK)

CAB - DASH - RIGHT - UNDERDASH

WINDSHIELD WIPER MOTOR (B2)

B2

PX22

EMI FILTER (FL2)

P2 J2

1590 to P18-6 (B178)
1569 to CB37/1 (B152)
3037 to TB2-39 (G135)
1916 to PX21-3 (A133)
1527 to P18-5 (B178)

TRANSMISSION DIMMER MODULE

J7

1426 to TB1-9 (F127)
1408 to K29-86 (F142)
3099 to TB2-58 (B132)
158

WTEC II VEHICLE INTERFACE MODULE (A10)

PX33

to J51-2 (D42)
to J118-14 (E162)
to J913-7 (B121)
to CB73/8 (E150)
to TB1-60 (B129)
to TB1-33 (G129)
to J913-14 (D121)
to J913-15 (D121)
to TB1-34 (G129)
to K1-86 (F149)
to PX8-4 (G103)
to CB35/2 (E149)
to CB35/2 (E149)
to TB2-16 (F132)
to TB2-17 (G132)

SF02 SF04 RW SF01 SF4 NS FL SF03 S02 S03

10A 10A

TURN SIGNAL FLASHER (A1)

OUTPUT
INPUT
GROUND

PX20

1568 to PX14-6 (G113)
1567 to PX14-5 (G113)
3049 to TB2-55 (C132)

PX50

to TB2-14 (F132) (WTEC II)
(WTEC III) K34-87A (B293)

3008
1697
1697

P116

D159

ROTARY WARNING LIGHTS CONNECTION

P65 J65

to K13-87 (B149) 509 509 to J62-B (E88)

FAN SOLENOID (L1)

to K15-86 (A141) 1806
to PX1-1 (A92) 1806
to TB2-79 (C135) 3011

PX34

L

CHEMICAL ALARM CONNECTION

P99 J99

to J43-6 (H42) 1803 1803 to TL88 (B88)
to J43-7 (H42) 1804 1804 to TL98 (B88)

CAB RADIO CONNECTION

J78

to TB2-21 (G133) 3018
to K53-87A (H141) 1906
to TB2-23 (G133) 3019

J113

G123

CTIS PRESSURE TRANSDUCER

CTIS PNEUMATIC CONTROLLER

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 21 OF 34

SIZE B ILL. NO. 5WD0117B FP-41 / (FP-42 BLANK)

REAR LIGHTS

CAB-DASH-RIGHT-POWER DISTRIBUTION PANEL

D43 — 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 — F200

3094	1
489T	2
3094	3
1404	4
460T	5
23T	6
484T	7
461T	8
484T	9
484T	10

E14 — E20 — P52R — B203

21	1
	2
489	3
3045	4
461B	5
22C	6
460B	7

3045 / 3095 — TL92

E19 — E18 — TL93

E16

P85	489	TL15	DS65 — LH SIDE MARKER LIGHT
P86	489	TL16	DS66 — LH REAR MARKER LIGHT
P74	461B		DS37 — LH TURN AND STOPLIGHT
P78	21		DS72 — LH TAILLIGHT
P76	24		DS51 — BLACKOUT MARKER LH REAR
P77	23	TL18 (3094 / 3094)	DS35 — BLACKOUT STOP LH REAR
P87	490	TL17	DS45 — BACKUP LIGHT

LH REAR COMPOSITE LIGHT

E15

P54	489	TL30	DS69 — LEFT REAR MARKER
P56	489	TL31	DS70 — MIDDLE REAR MARKER
P58	489	TL32	DS71 — RIGHT REAR MARKER

E17

P61	460B		DS38 — RH TURN AND STOPLIGHT
P64	21		DS73 — RH TAILLIGHT
P62	24		DS52 — BLACKOUT MARKER RH REAR
P63	23	TL21 (3095 / 3095)	DS36 — BLACKOUT STOP RH REAR
P89	489	TL20 (3095 / 3095)	DS68 — RH REAR MARKER LIGHT
P88	489	TL19 (3095)	DS67 — RH SIDE MARKER LIGHT

RH REAR COMPOSITE LIGHT

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 22 OF 34

SIZE B | ILL. NO. 5WD0118B | FP-43 / (FP-44 BLANK)

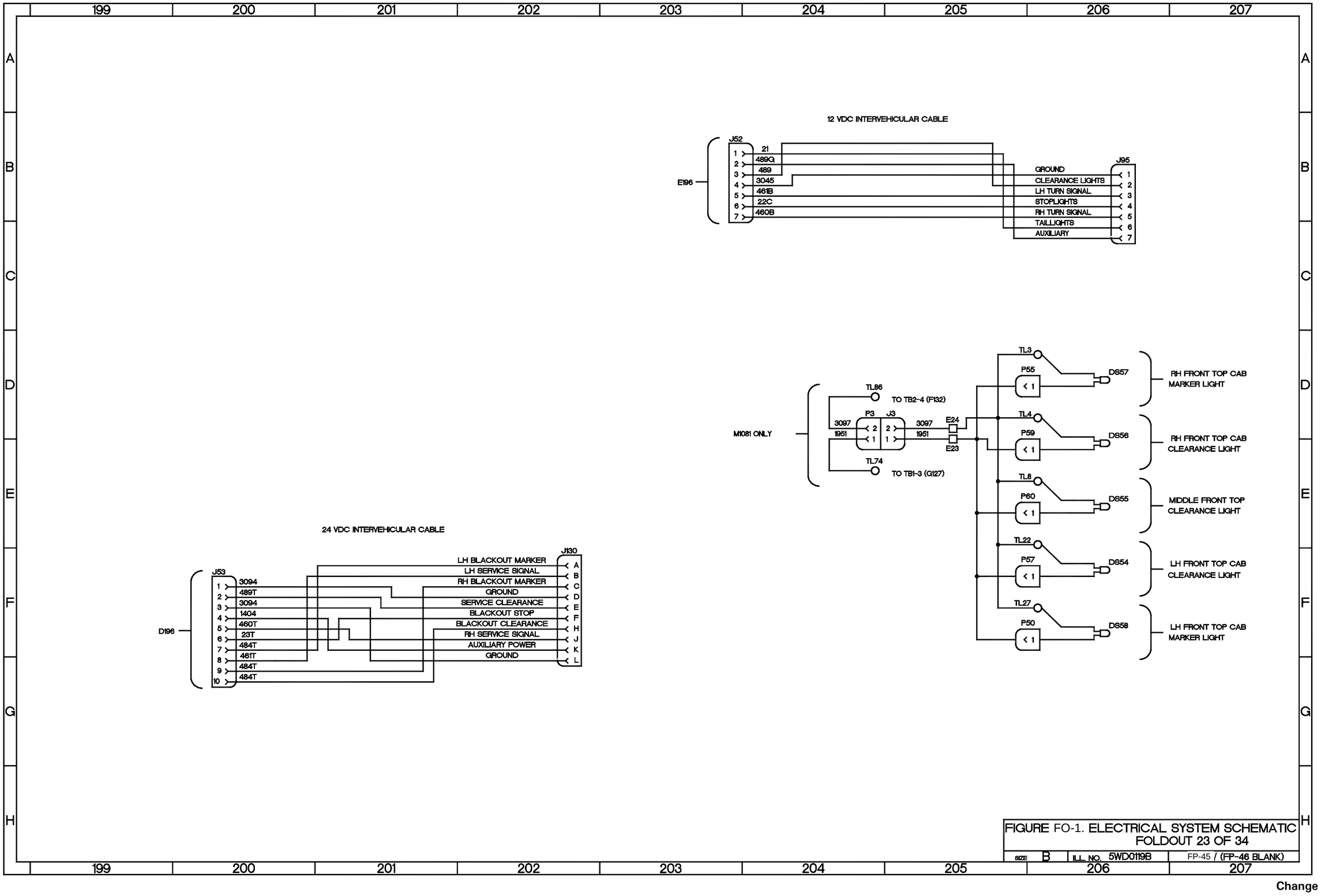
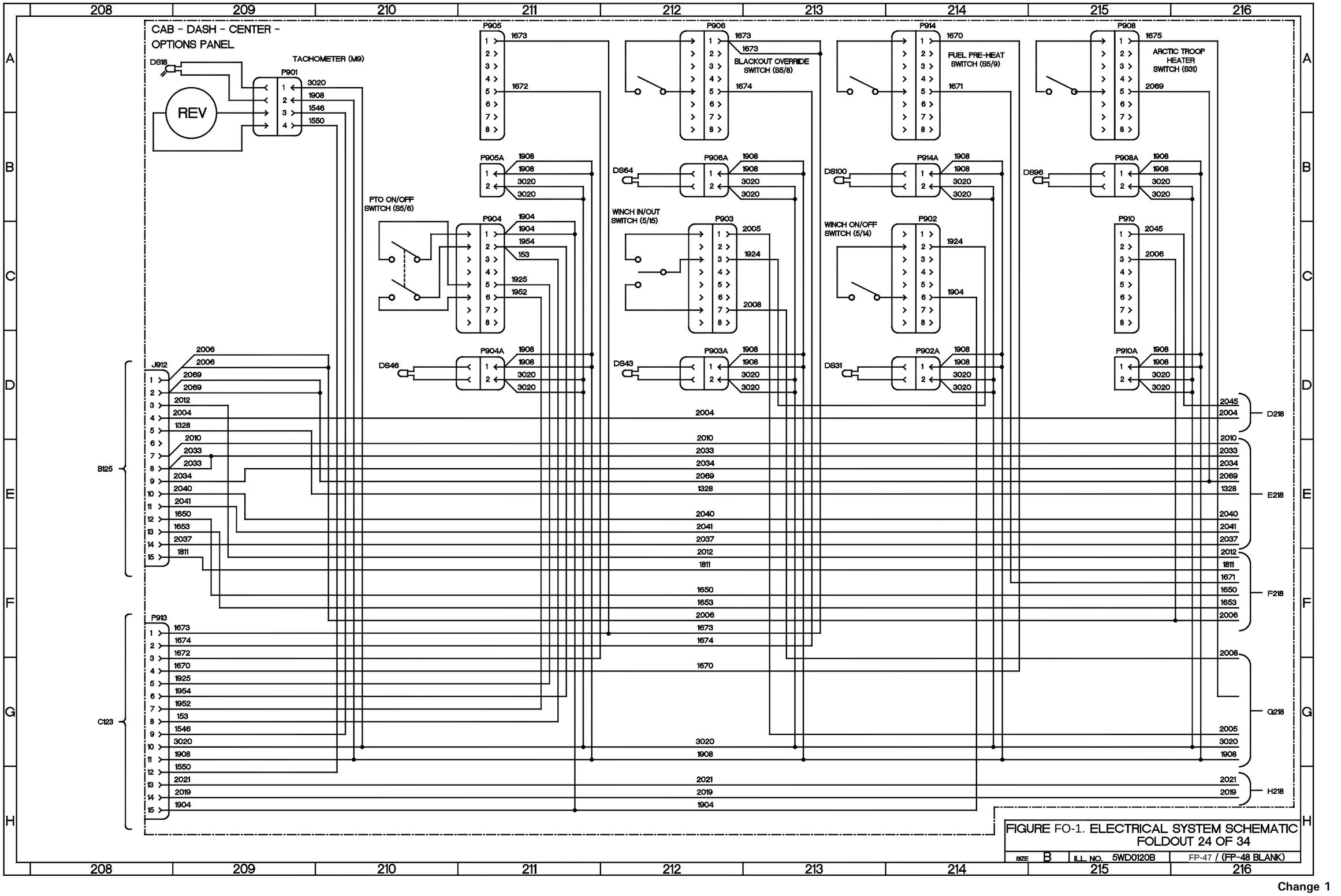


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 23 OF 34

SIZE B | ILL. NO. 5WD0119B | FP-45 / (FP-46 BLANK)


208
209
210
211
212
213
214
215
216
CAB - DASH - CENTER - OPTIONS PANEL
TACHOMETER (M9)
DS18
REV
P901
3020
1908
1546
1550
PTO ON/OFF SWITCH (S5/6)
P905
1673
1672
P905A
1908
P904
1904
1954
153
1925
1952
P904A
DS46
P906
1673
BLACKOUT OVERRIDE SWITCH (S5/8)
1674
P906A
DS64
WINCH IN/OUT SWITCH (5/15)
P903
2005
1924
2008
P903A
DS43
P914
1670
FUEL PRE-HEAT SWITCH (S5/9)
1671
P914A
DS100
WINCH ON/OFF SWITCH (5/14)
P902
1924
1904
P902A
DS31
P908
1675
ARCTIC TROOP HEATER SWITCH (S31)
2069
P908A
DS96
P910
2045
2006
P910A
J912
2006
2069
2012
2004
1328
2010
2033
2034
2040
2041
1650
1653
2037
1811
B125
P913
1673
1674
1672
1670
1925
1954
1952
153
1546
3020
1908
1550
2021
2019
1904
C123
D218
E218
F218
G218
H218
FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 24 OF 34
SIZE B
ILL. NO. 5WD0120B
FP-47 / (FP-48 BLANK)

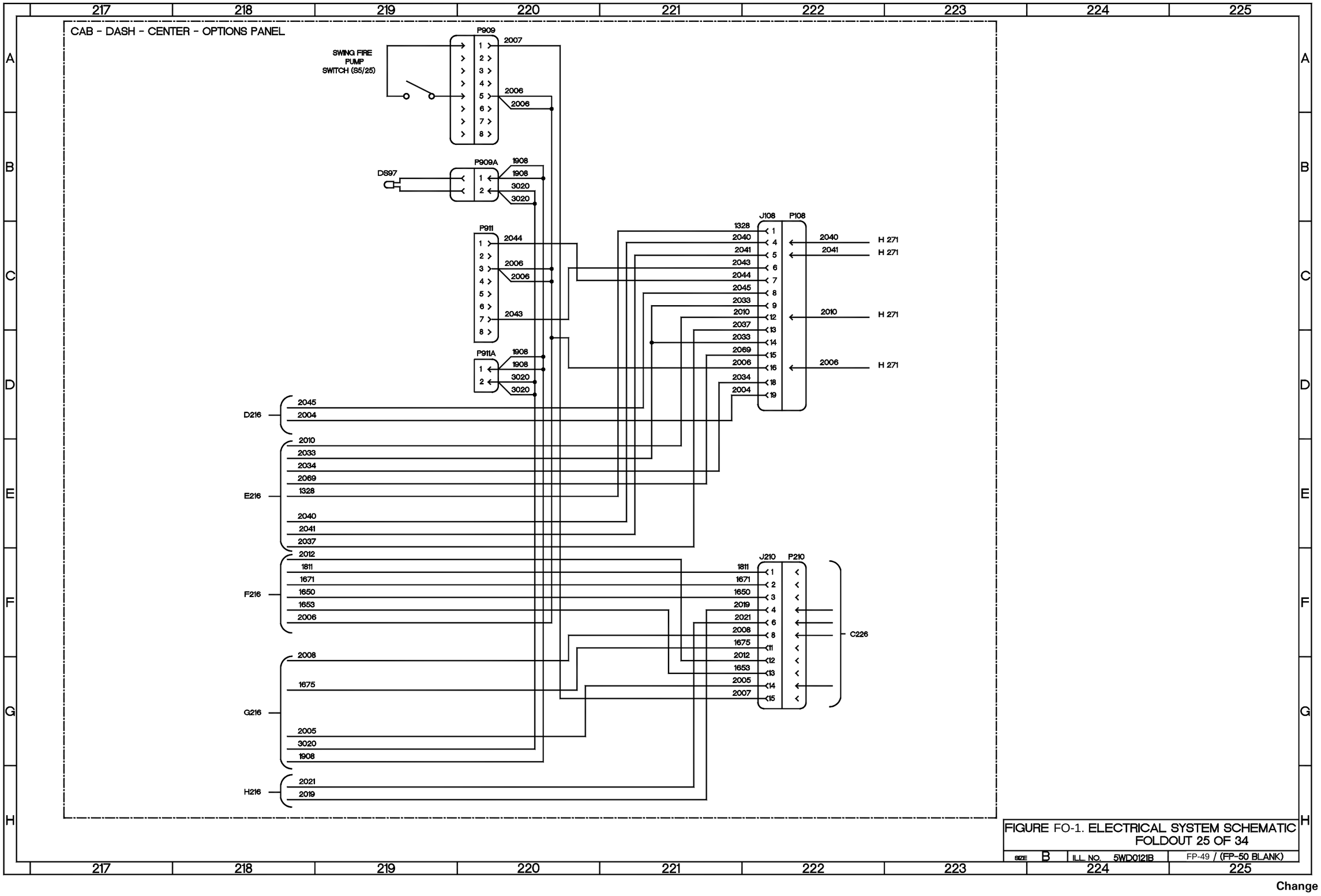


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 25 OF 34

SIZE B | ILL. NO. 5WD0121B | FP-49 / (FP-50 BLANK)

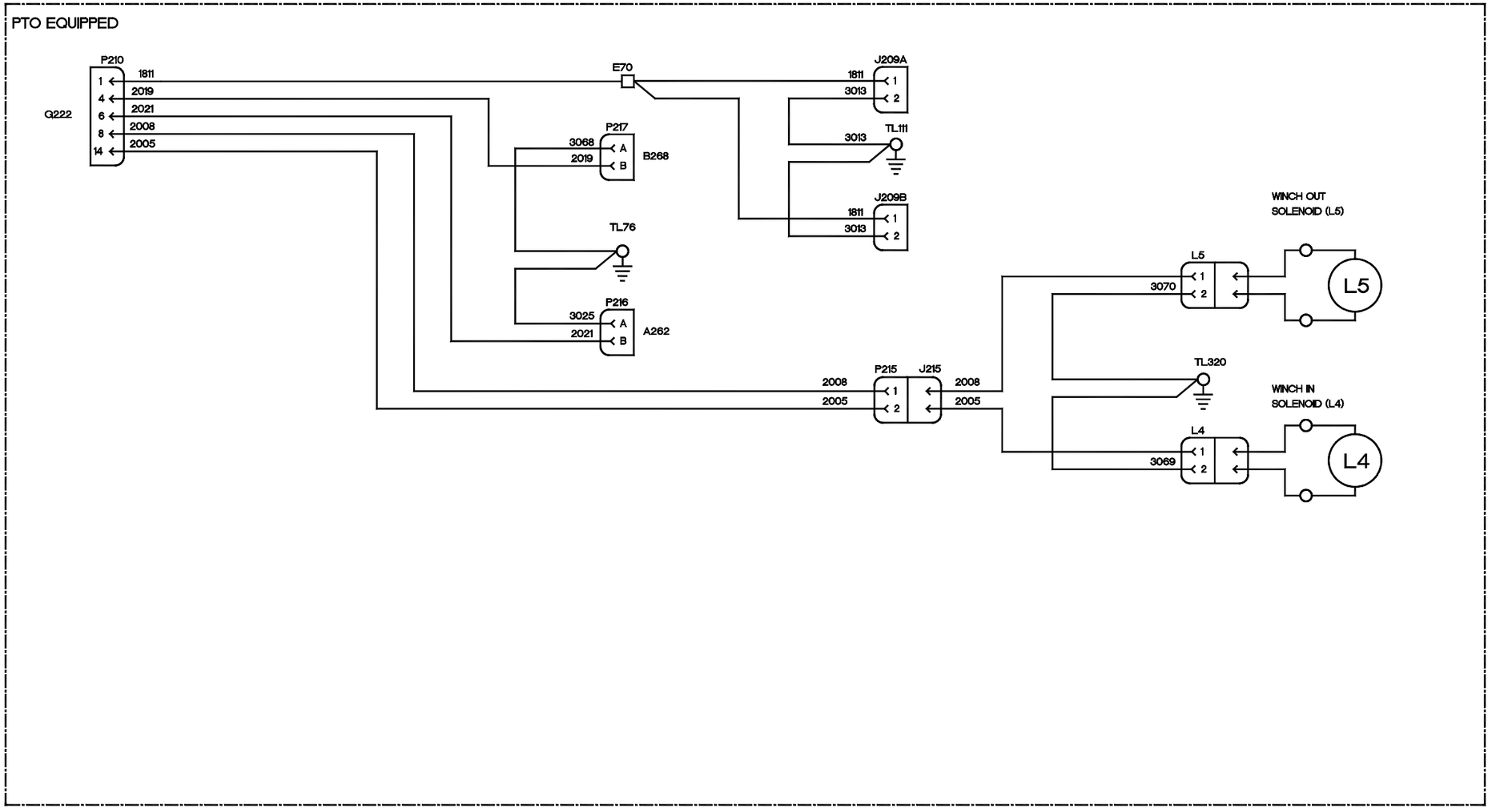


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 26 OF 34

SIZE B | I.L. NO. 5WD0122B | FP-51 / (FP-52 BLANK)

DELETED

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 27 OF 34

SIZE B | ILL. NO. 5WD0123B | FP-53 / (FP-54 BLANK)

DELETED

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 28 OF 34

SIZE B | ILL NO. 5WD0124B | FP-55 / (FP-56 BLANK)

DELETED

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 29 OF 34

SIZE B | ILL NO. 5WD0125B | FP-57 / (FP-58 BLANK)

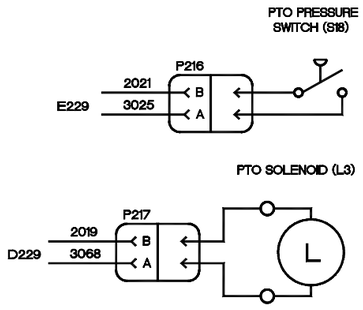


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 30 OF 34

SIZE B | ILL. NO. 5WD0126B | FP-59 / (FP-60 BLANK)

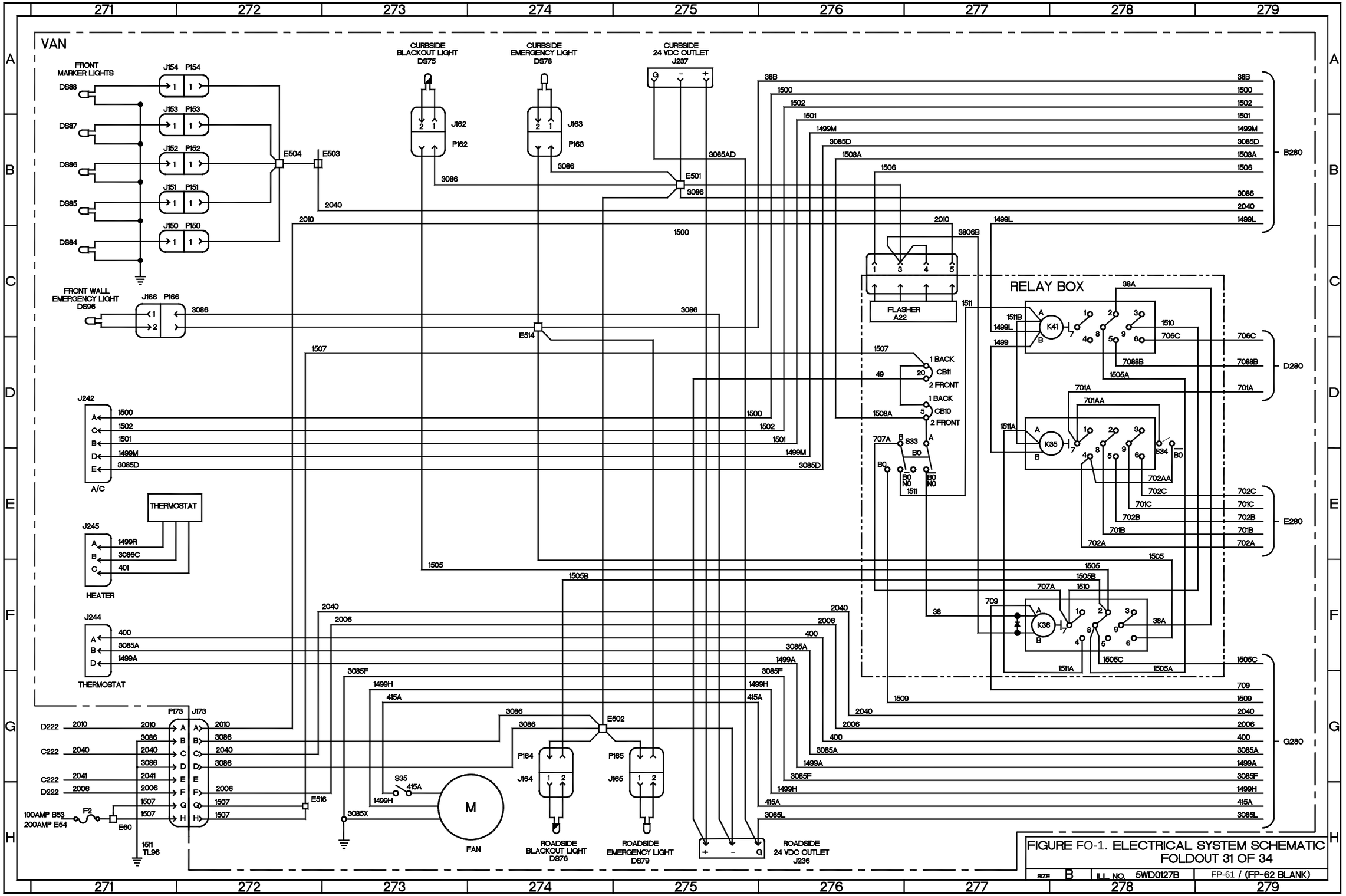


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 31 OF 34

SIZE B | ILL. NO. 5WD0127B | FP-61 / (FP-62 BLANK)

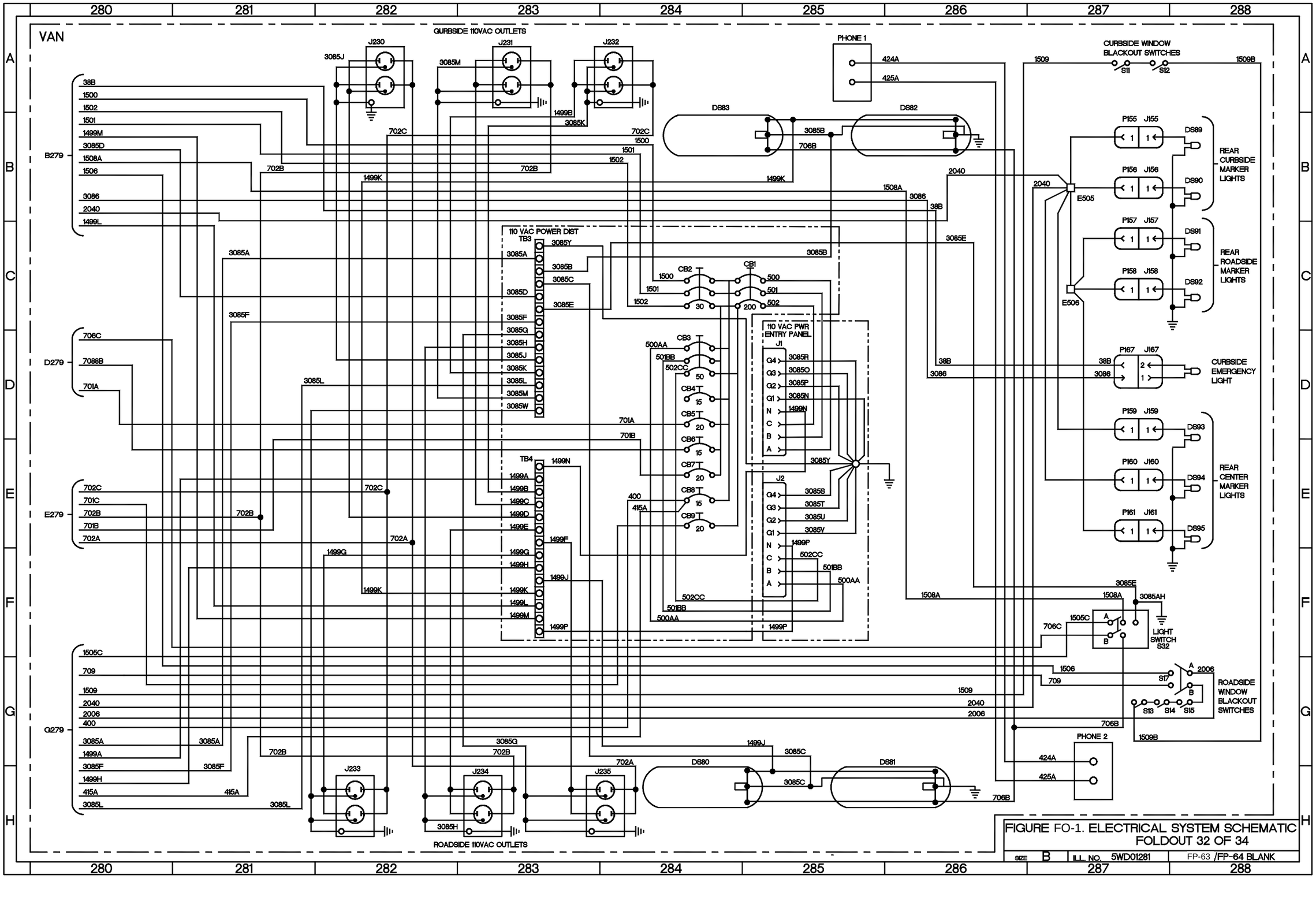


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 32 OF 34

SIZE B | ILL. NO. 5WD01281 | FP-63 /FP-64 BLANK

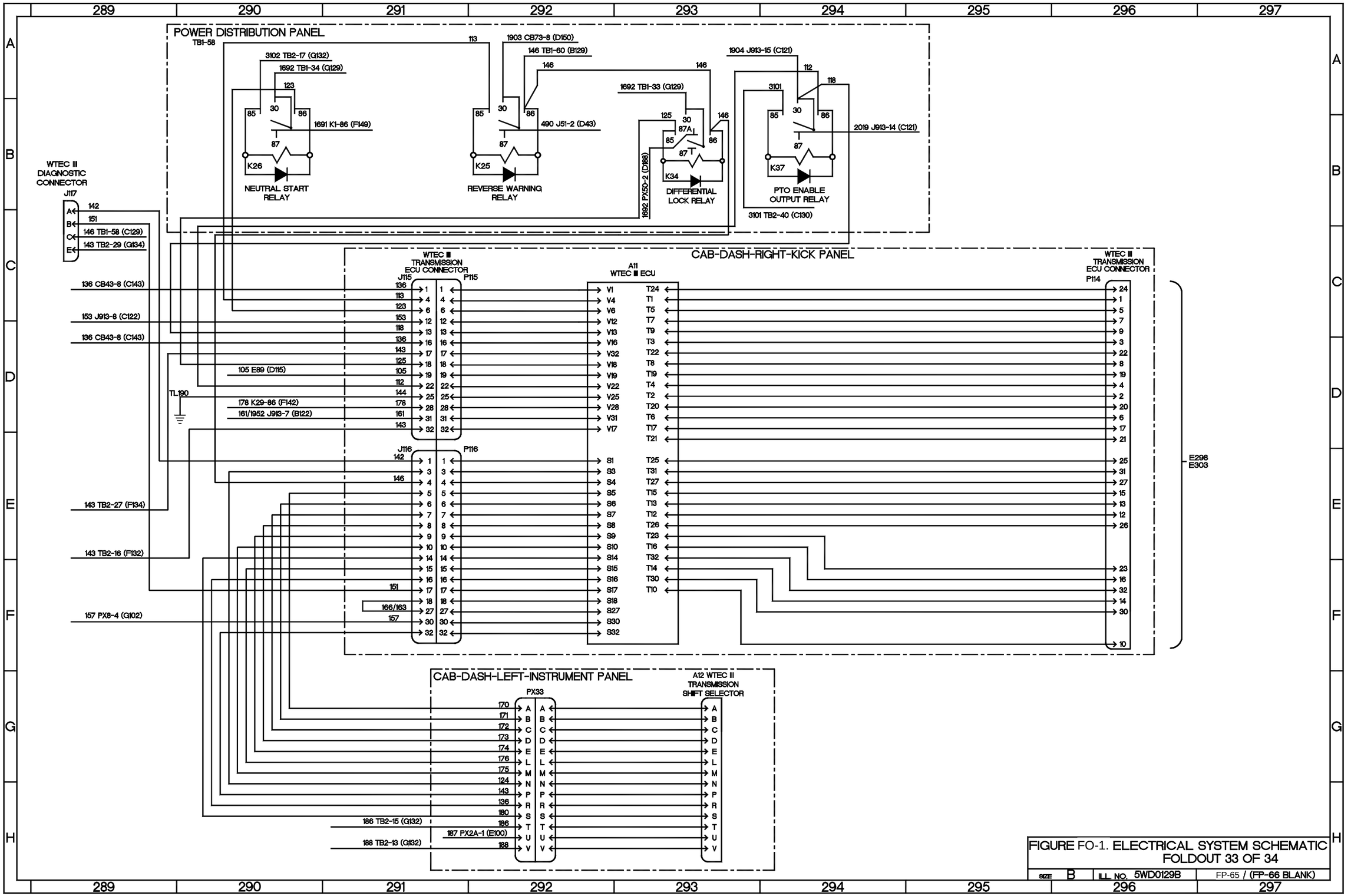
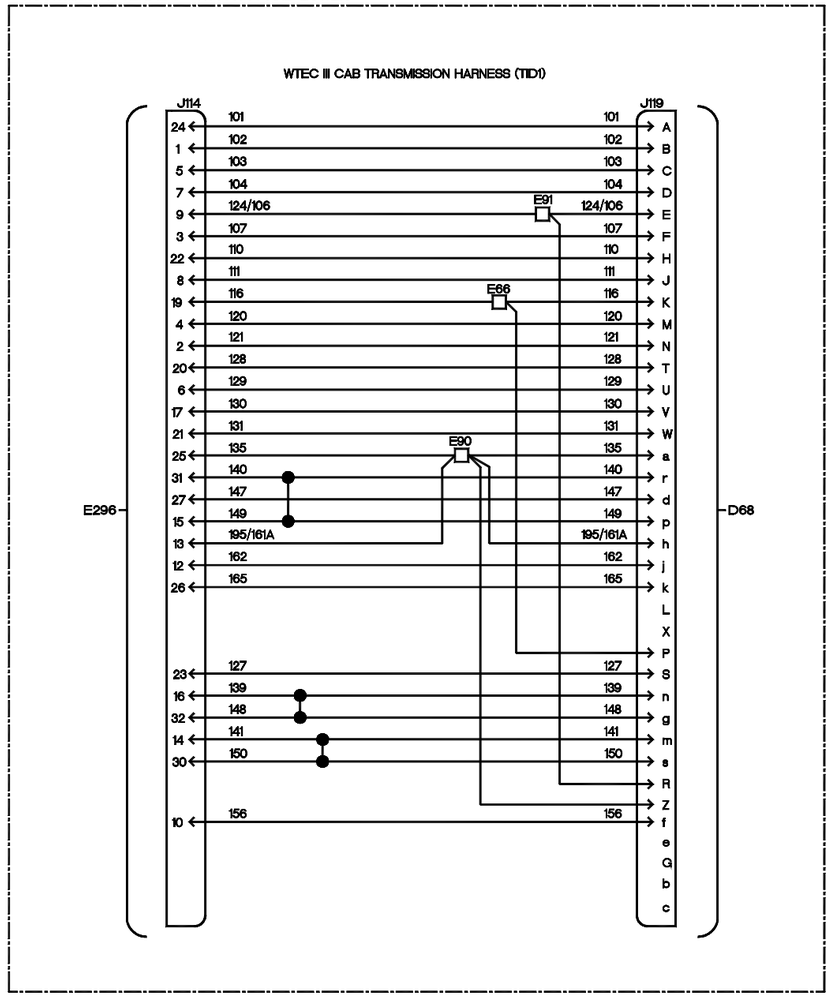


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 33 OF 34

SIZE B | ILL NO. 5WD0129B | FP-65 / (FP-66 BLANK)

TRANSMISSION SERIAL # 6510090785 AND LOWER



TRANSMISSION SERIAL # 6510090786 AND HIGHER

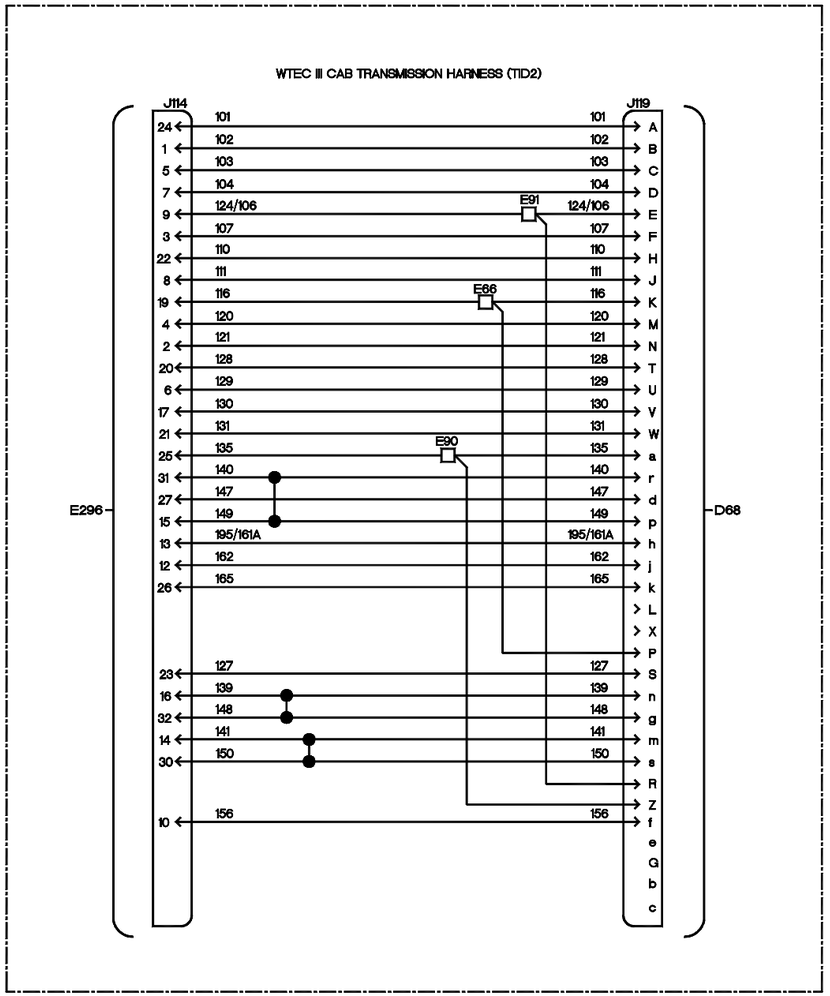


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 34 OF 34

SIZE B | ILL. NO. 5WD0130B | FP67 / (FP-68 BLANK)

REAR AXLE BRAKE CHAMBER	FRONT AXLE BRAKE CHAMBER	COUPLER AIR BRAKE	AIR DRYER	AIR CLEANER INTAKE	AIR COMPRESSOR WITH GOVERNOR	AIR TANKS	DASH GAUGE
MANUAL VALVE	ONE WAY CHECK VALVE	FAN CLUTCH	MODULATED CONTROL VALVE	QUICK RELEASE VAVLE	TWO WAY CHECK VALVE	TIRE	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	CTIS MANIFOLD VALVE	AIR BR AKE PRESSURE TRANSMITTER
EXH KNEELING VALVE	AIR/HYDRAULIC INVERSION VALVE	DELIVERY AIR HOSE NO CONNECTION	WHEEL VALVE	EXH BLEED VALVE			

FIGURE FO-2 PNEUMATIC SYSTEM SCHEMATIC
FOLDOUT 1 OF 4

SIZE B | ILL. NO. 5PD01AL1 | FP-1/FP-2 BLANK

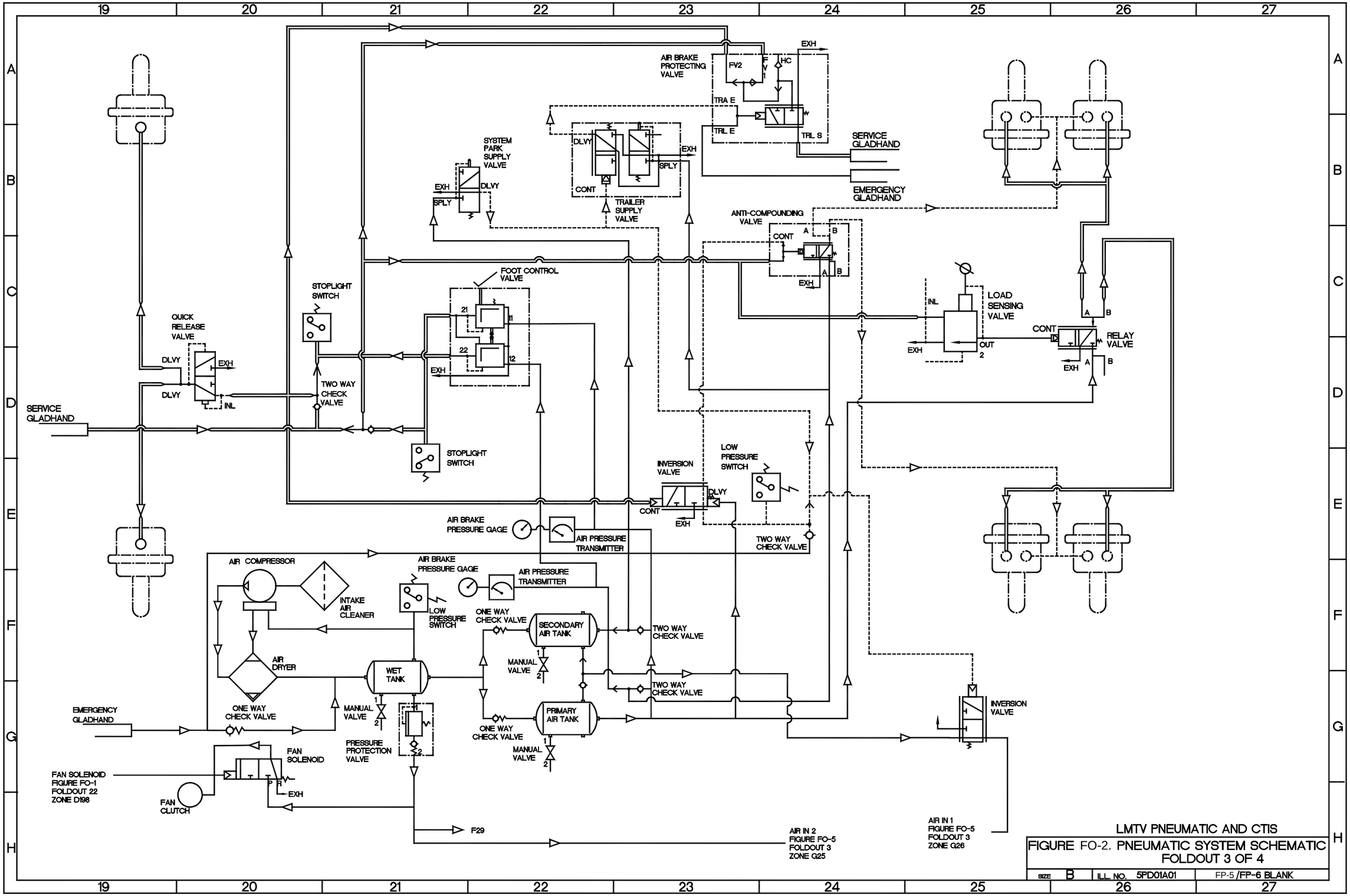
SH	ZONE	DESCRIPTION
3	E22	AIR BRAKE PRESSURE GAGE
3	F22	AIR BRAKE PRESSURE GAGE
3	A23	AIR BRAKE PROTECTING VALVE
3	F20	AIR COMPRESSOR
3	F20	AIR DRYER
3	E22	AIR PRESSURE TRANSMITTER
3	E22	AIR PRESSURE TRANSMITTER
3	C24	ANTI-COMPOUNDING VALVE
4	E31	CONTROL VALVE
4	E31	CTIS MANIFOLD VALVE
4	E32	DEFLATE VALVE
3	G19	EMERGENCY GLADHAND
3	B24	EMERGENCY GLADHAND
3	H20	FAN CLUTCH
3	G20	FAN SOLENOID
3	C22	FOOT CONTROL VALVE
3	F20	INTAKE AIR CLEANER
3	G25	INVERSION VALVE
3	E23	INVERSION VALVE
4	C28	KNEELING VALVE
4	E28	KNEELING VALVE
3	C25	LOAD SENSING VALVE
3	E23	LOW PRESSURE SWITCH
3	F21	LOW PRESSURE SWITCH
3	F22	MANUAL VALVE
3	G22	MANUAL VALVE
3	G21	MANUAL VALVE
3	F22	ONE WAY CHECK VALVE
3	G22	ONE WAY CHECK VALVE
3	G20	ONE WAY CHECK VALVE
3	G21	PRESSURE PROTECTION VALVE
3	G22	PRIMARY AIR TANK
3	C20	QUICK RELEASE VALVE
4	C34	QUICK RELEASE VALVE
4	D30	QUICK RELEASE VALVE
3	D26	RELAY VALVE
3	F22	SECONDARY AIR TANK

SH	ZONE	DESCRIPTION
3	D19	SERVICE GLADHAND
3	B24	SERVICE GLADHAND
3	C20	STOPLIGHT SWITCH
3	E21	STOPLIGHT SWITCH
4	F32	SUPPLY VALVE
3	B21	SYSTEM PARK SUPPLY VALVE
3	B22	TRAILER SUPPLY VALVE
3	D21	TWO WAY CHECK VALVE
3	E24	TWO WAY CHECK VALVE
3	F23	TWO WAY CHECK VALVE
3	G23	TWO WAY CHECK VALVE
3	F21	WET TANK
4	C29	WHEEL VALVE
4	C33	WHEEL VALVE
4	E29	WHEEL VALVE
4	E33	WHEEL VALVE

LMTV PNEUMATIC AND CTIS

FIGURE FO-2. PNEUMATIC SYSTEM SCHEMATIC FOLDOUT 2 OF 4

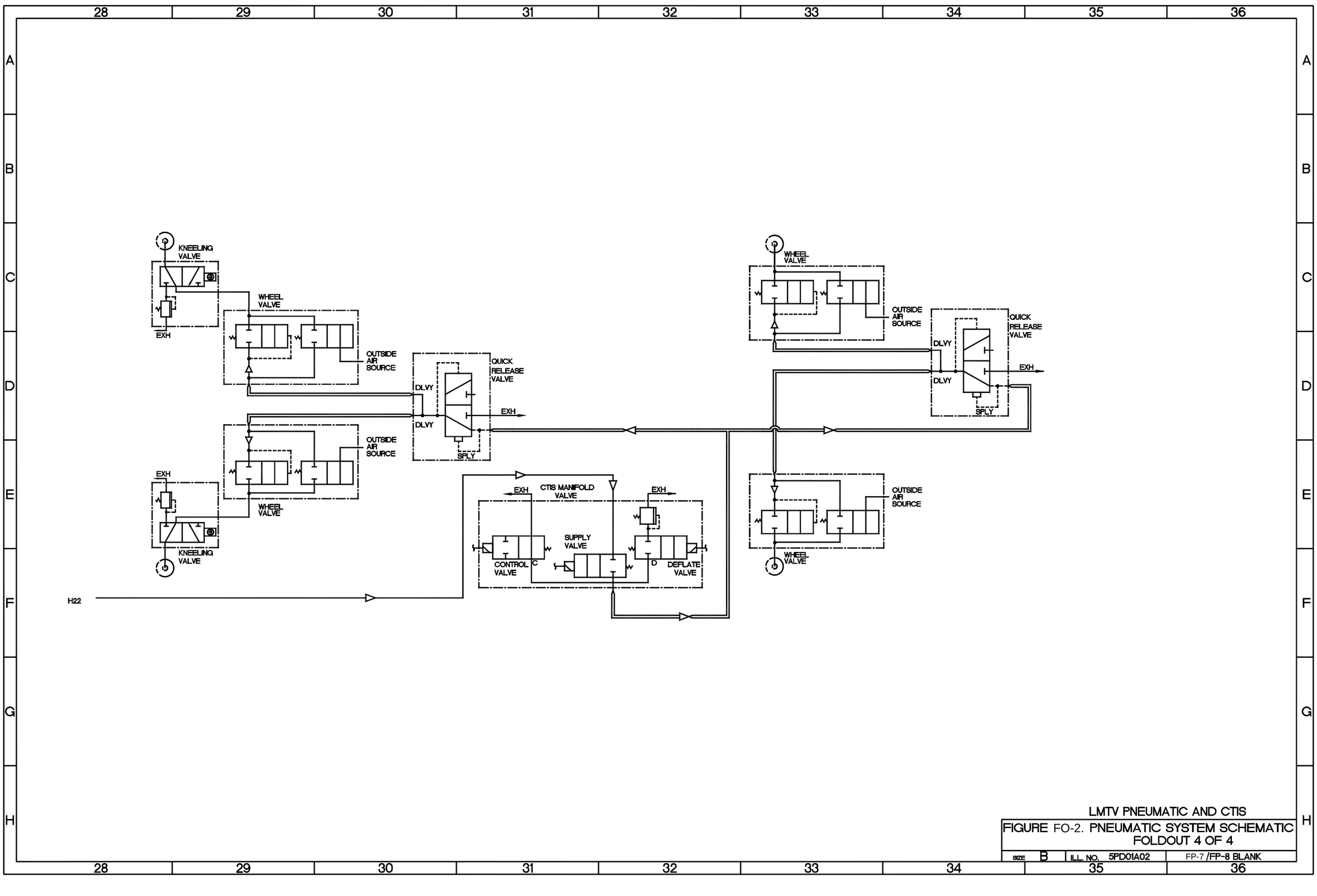
SIZE B | ILL. NO. 5PD01AL2 | FP-3/FP-4 BLANK



LMTV PNEUMATIC AND CTIS

FIGURE FO-2. PNEUMATIC SYSTEM SCHEMATIC FOLDOUT 3 OF 4

SIZE B | ILL. NO. 5PD01A01 | FP-5/FP-6 BLANK



LMTV PNEUMATIC AND CTIS

FIGURE FO-2. PNEUMATIC SYSTEM SCHEMATIC FOLDOUT 4 OF 4

SIZE B | ILL. NO. 5PD01A02 | FP-7 /FP-8 BLANK

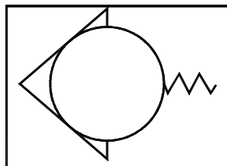
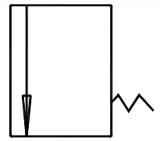
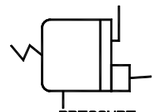
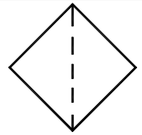
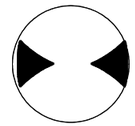
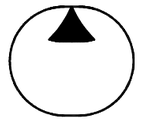
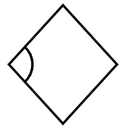
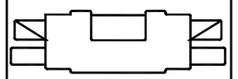
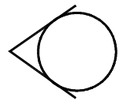
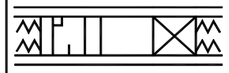
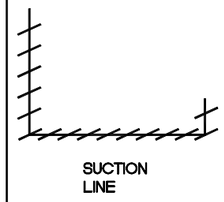
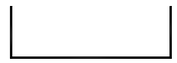
 CHECK VALVE	 BYPASS VALVE	 PRESSURE CONTROL VALVE	 AIR OR OIL FILTER	 MOTOR	 PUMP	 PTO
 AIR LINE LUBRICATOR	 CYLINDER	 CHECK VALVE	 FLOW CONTROL VALVE	 SUCTION LINE	 RESERVOIR	

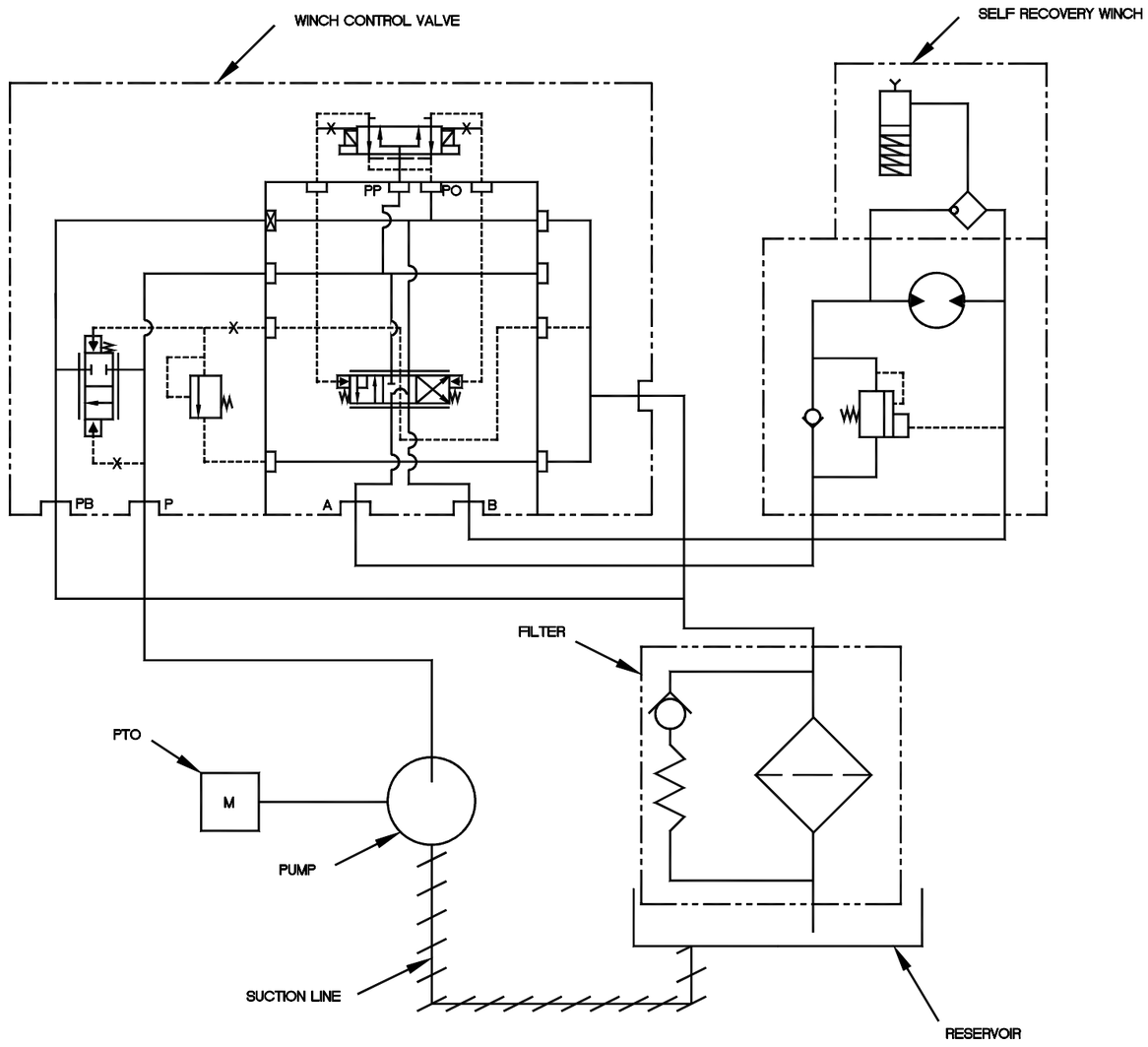
FIGURE FO-3 HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 1 OF 3

SIZE B | ILL. NO. 5HD01AL1 | FP-1/FP-2 BLANK

SHEET	ZONE	DESCRIPTION
3	B21	WINCH CONTROL VALVE
3	B24	SELF RECOVERY WINCH
3	F21	PTO
3	F22	PUMP
3	E23	FILTER
3	G23	RESERVOIR
3	G22	SUCTION LINE

FIGURE FO-3 HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 2 OF 3

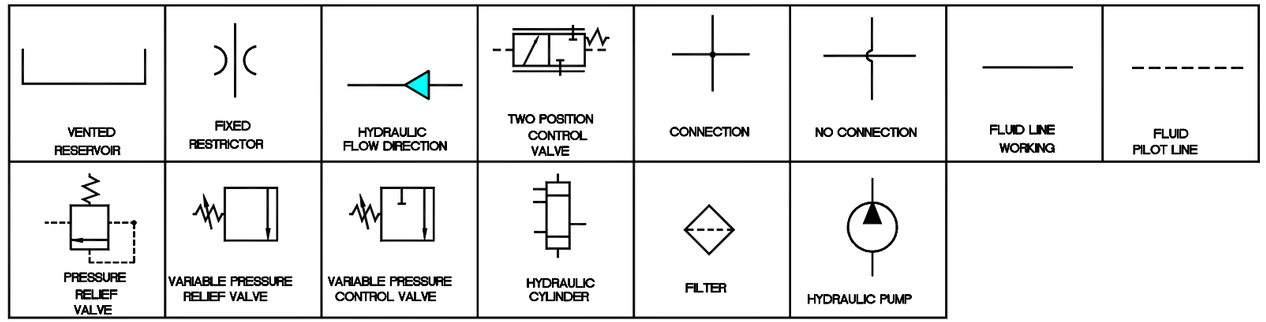
SIZE B | ILL NO. 5HD01-L2 | FP-3 /FP-4 BLANK



LMTV TRUCK W/WINCH

FIGURE FO-3. HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 3 OF 3

SIZE B | ILL. NO. 5HD01-01 | FP-5 /FP-6 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

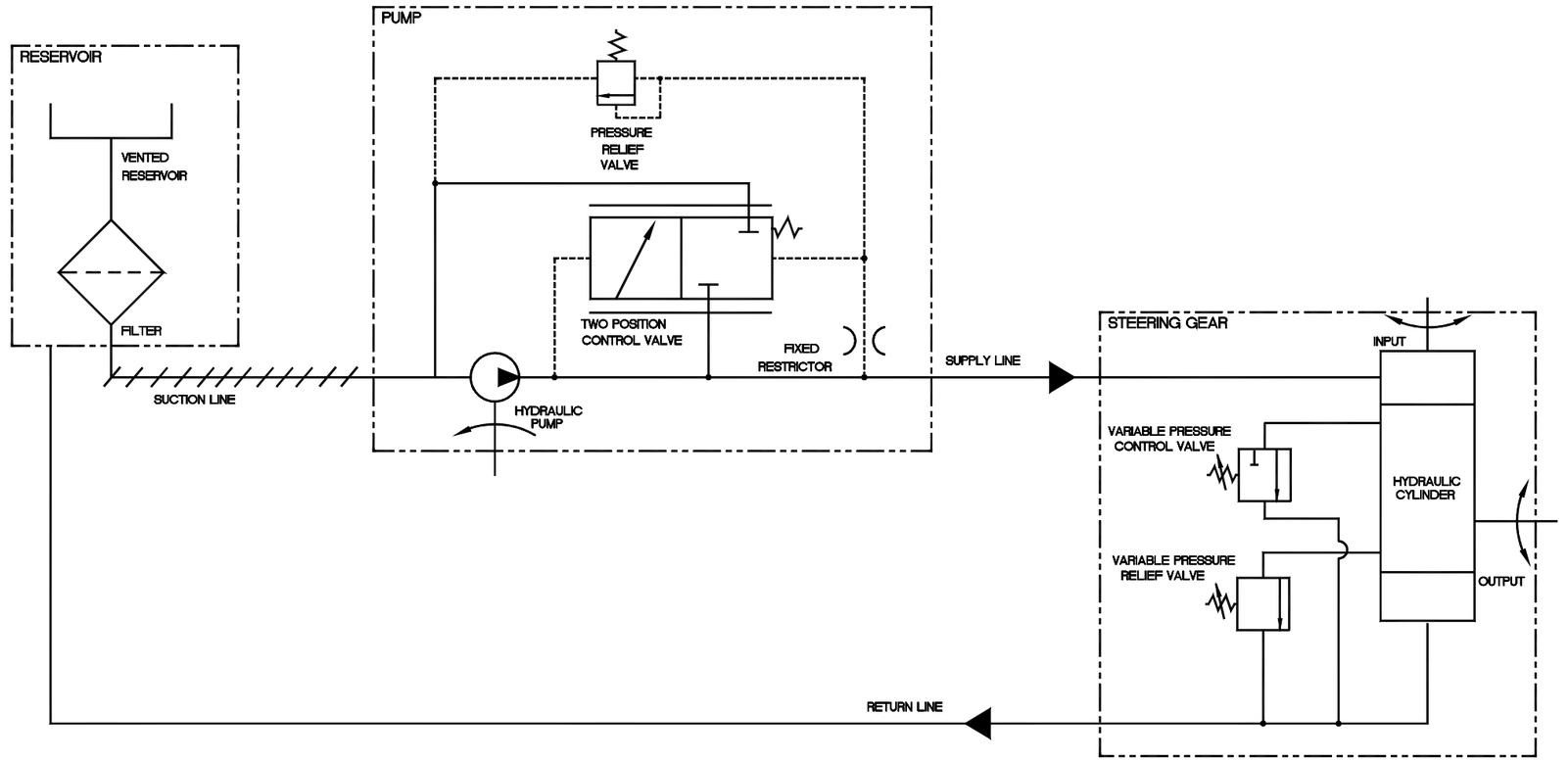


FIGURE FO-4 HYDRAULIC STEERING SYSTEM

FOLDOUT 2 OF 2

SIZE B | ILL. NO. 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 FO-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 FO-5 AIR TRANSPORTABILITY HYDRAULIC/PNEUMATIC SYSTEM SCHEMATIC
FOLDOUT 2 OF 3

SIZE B | ILL NO. YAD01AL2 | FP-3 /FP-4 BLANK

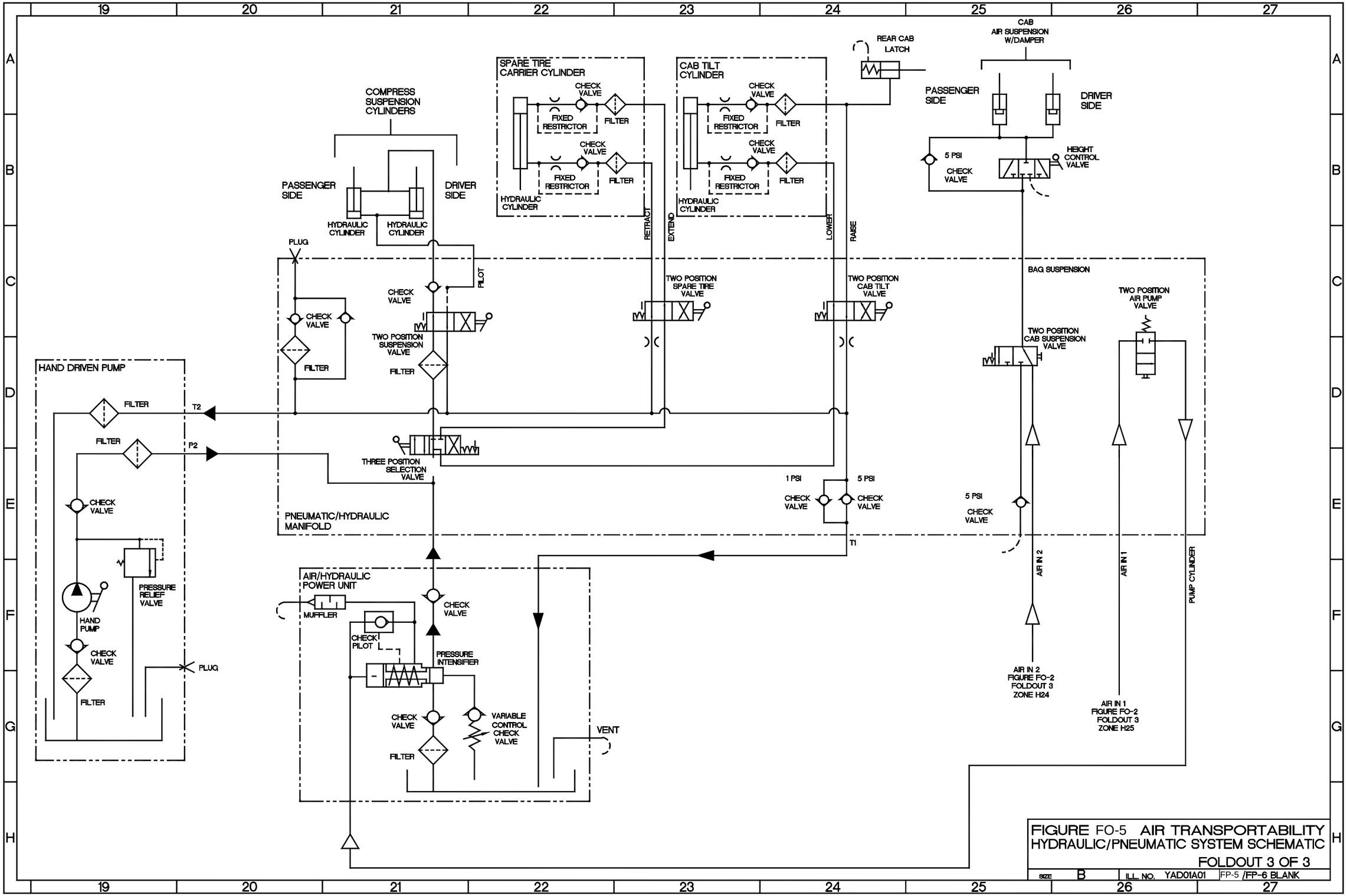


FIGURE FO-5 AIR TRANSPORTABILITY HYDRAULIC/PNEUMATIC SYSTEM SCHEMATIC
FOLDOUT 3 OF 3

SIZE B | ILL NO. YAD01A01 | FP-5 /FP-6 BLANK

By Order of the Secretary of the Army:

DENNIS J. REIMER
General, United States Army
Chief of Staff

Official:

JOEL B. HUDSON
Administrative Assistant to the Secretary of the Army
04993

DISTRIBUTION: To be distributed in accordance with initial distribution number (IDN) 380937 requirements for TM 9-2320-365-34-1.

*U.S. GOVERNMENT PRINTING 0FFICE:1998-646-039/80029

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 Date you filled out this form
TO: *(Forward to proponent of publication or form) (Include ZIP Code)*	FROM: *(Activity and location) (Include ZIP Code)* Enter your mailing address	

PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE
	Publication Date	Publication Title

ITEM	PAGE	PARA-GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON
10	15-33 19-6	15-7 19-2		4		Item 10. Change Illustration. Reason: Text calls out 90-degree fitting. Art shows straight fitting. Text is correct. Step (4) of removal says to disconnect four hydraulic hoses from manifold. The correct number of hydraulic hoses is five. correct the text to reflect the actual quantity of hydraulic hoses. The supporting illustration is correct.

SAMPLE

** Reference to line numbers within the paragraph or subparagraph.*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
Your title	Your telephone number	Your signature

TO: *(Forward direct to addressee listed in publication)*	FROM: *(Activity and location) (Include ZIP Code)*	DATE
	Enter your mailing address	Date you filled out this form.

PART II - REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION NUMBER	DATE	TITLE
	Publication Date	Your Title

PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

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
Your title	Your telephone number	Your signature

SAMPLE

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

** 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

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

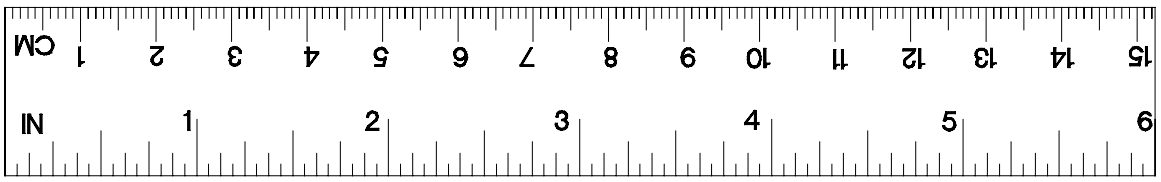
LIQUID MEASURE
1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

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



YMET001A

PIN: 074406-001