TECHNICAL MANUAL
MAINTENANCE INSTRUCTIONS
UNIT MAINTENANCE
M1083 SERIES, 5-TON, 6 X 6,
MEDIUM TACTICAL VEHICLES (MTV)
VOLUME NO. 2 OF 5

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

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PROPELLER SHAFT TROUBLESHOOTING PAGE 2-1823
POWER TAKE-OFF (PTO) TROUBLESHOOTING PAGE 2-1831
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WHEEL TROUBLESHOOTING PAGE 2-1989
HYDRAULIC SYSTEM TROUBLESHOOTING PAGE 2-1997

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

HEADQUARTERS, DEPARTMENTS OF THE ARMY AND THE AIR FORCE

SEPTEMBER 1998

WARNING SUMMARY

WARNING

EXHAUST GASES CAN KILL

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

   Headache

   Dizziness

   Sleepiness

   Loss of Muscular Control

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

   Remove person from area.

   Expose to open air.

   Keep person warm.

   Do not permit person to move.

   Administer cardiopulmonary resuscitation, if necessary.*

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

WARNING

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

WARNING

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

WARNING SUMMARY (CONT)

WARNING

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

WARNING

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 Dry Cleaning Solvent contacts skin or clothes, flush with cold water. If Dry Cleaning 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

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

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

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

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

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

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

WARNING SUMMARY (CONT)

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

Never let moving wire rope slide through hands, even when wearing gloves. A broken wire could cut through gloves and cut hands. Failure to comply may result in injury to personnel.

WARNING

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

WARNING

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

WARNING

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

WARNING SUMMARY (CONT)

WARNING

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

WARNING

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

WARNING

Coolant may be very hot and under pressure from engine operation. Ensure engine is cool before performing maintenance. Failure to comply may result in injury to personnel.

WARNING

Light Material Handling Crane (LMHC) weighs approximately 250 lbs (114 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel.

WARNING

Light Material Handling Crane (LMHC) mast weighs approximately 110 lbs (50 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Light Material Handling Crane (LMHC) boom assembly weighs approximately 150 lbs (68 kgs). Use an assistant when removing boom assembly. Failure to comply may result in injury to personnel.

WARNING

Light Material Handling Crane (LMHC) boom weighs approximately 60 lbs (27 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

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

WARNING

Ensure vehicle is on level ground prior to installation/removal of collapsible drums. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING

Ensure cargo bed is free of equipment and debris and not warped or damaged in any way. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING

Both collapsible drums weigh approximately 235 lbs (107 kgs) empty and 3800 lbs (1725 kgs) full. Attach a suitable lifting device prior to installation. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING

S-280 shelter weighs approximately 1500 lbs (680 kgs) empty. Attach a suitable lifting device prior to installation. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING

Ensure vehicle is on level ground prior to installation or removal of tank and pump unit. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING

Tank weighs approximately 500 lbs (227 kgs) empty or 4000 lbs (1816 kgs) full. Attach a suitable lifting device prior to installation. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING SUMMARY (CONT)

WARNING

Pump unit weighs approximately 870 lbs (395 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING

Do not remove oil filter while engine is hot. Failure to comply may result in injury to personnel.

WARNING

Starting fluid is toxic and highly flammable. Container is pressurized. NEVER heat container and NEVER discharge starting fluid in confined areas or near open flame. Failure to comply may cause serious injury or death to personnel.

WARNING

Tab of HAND THROTTLE lever must be positioned above throttle pivot bar. Failure to comply may result in injury to personnel or damage to equipment.

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

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

WARNING

Radiator and charge air cooler assembly weigh approximately 160 lbs (73 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Cargo sling must be placed under charge air cooler inlet and outlet ports. 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

Starting motor weighs approximately 60 lbs (27 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Negative battery terminals must be connected last. Failure to comply may result in serious injury or death to personnel.

WARNING

Negative battery terminals and battery tester negative terminal lug must be disconnected first. Failure to comply may result in serious injury or death to personnel.

WARNING

Battery box weighs approximately 70 lbs (32 kgs). The aid of two assistants is required to remove battery box from vehicle frame. Failure to comply may result in injury to personnel.

WARNING

Battery box weighs approximately 70 lbs (32 kgs). The aid of two assistants is required to position battery box on vehicle frame. Failure to comply may result in injury to personnel.

WARNING

Ensure WTEC III cab transmission harness does not interfere with throttle linkage. Failure to comply may result in injury to personnel.

WARNING

Self-adjusting brakes will not self-adjust without applying brake pedal. Failure to comply may result in injury to personnel.

WARNING SUMMARY (CONT)

WARNING

Ensure air hoses are connected to correct fittings. Failure to comply may result in serious injury or death to personnel.

WARNING

Proper adjustment of load sensing valve may only be accomplished with vehicle unloaded. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Always use an inflation safety cage to inflate tires mounted on multipiece rims, and tire/rim assemblies not mounted on a tire changing machine that has a positive lock down device designed to hold the assembly during inflation (TM 9-2610-200-14). When using a tire changing machine, always follow manufacturer's mounting and safety instructions. Failure to comply may result in serious injury or death to personnel. Always inflate tires that are mounted on rims with demountable side ring flanges or lockrings in an inflation safety cage or serious injury or death may result.

WARNING

Tire weighs approximately 350 lbs (159 kgs). Use extreme care when handling tire. Failure to comply may result in injury to personnel.

WARNING

Wheel drum weighs approximately 92 lbs (42 kgs). Use the aid of an assistant to help remove wheel drum from axle. Failure to comply may result in injury to personnel.

WARNING

The sudden release of high pressure air can cause damage to eyes. Wear appropriate eye protection when working near pressurized air. Failure to comply may result in injury to personnel.

WARNING

Leave shackles installed in front bumper to support front bumper until ready to remove. Failure to comply may result in injury to personnel.

WARNING

Front bumper weighs approximately 100 lbs (45 kgs). Use the aid of an assistant to remove front bumper. Failure to comply may result in injury to personnel.

WARNING

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

WARNING

Spare tire retainer weighs approximately 150 lbs (68 kgs). The aid of two assistants is required to remove spare tire retainer from vehicle. Failure to comply may result in injury to personnel.

WARNING

Rear stabilizer bar weighs approximately 50 lbs (22 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Cab roof weighs approximately 110 lbs (50 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel.

WARNING

Use care when removing/installing window. Do not force window, or window may shatter. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Tailgate assembly 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

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

WARNING SUMMARY (CONT)

WARNING

Rear tool box weighs approximately 75 lbs (34 Kgs) empty. Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

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

WARNING

Remote control must be used to operate 30K winch while breaking in cables. Failure to comply may result in injury to personnel.

WARNING

Cab weighs approximately 3000 lbs (1362 kgs) attach a suitable lifting device prior to raising cab. Failure to comply may result in injury to personnel.

WARNING

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

WARNING

Extreme care must be taken when lowering gravel deflector. Coolant hoses could be pulled loose. Failure to comply could result in serious eye injury.

WARNING

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

WARNING

Do not open coolant fill cap if temperature reads above 110 degrees F (43 degrees C). Steam or hot coolant is under pressure. Failure to comply may result in injury to personnel.

WARNING

Pressure in reservoir tank must be released before removing cap. Failure to comply may result in injury to personnel.

WARNING

200 amp alternator weighs approximately 72 lbs (33 kgs). The aid of an assistant is required to install 200 amp alternator. Failure to comply may result in injury to personnel.

WARNING

100 amp alternator weighs approximately 70 lbs (32 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel.

WARNING

Both collapsible drums weigh approximately 235 lbs (107 kgs) empty and 3800 lbs (1725 kgs) full each. 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

Air dryer may contain air pressure. Loosen input air hose connector slowly to vent off air pressure. Failure to comply may result in injury to personnel.

WARNING

Radiator and charge air cooler assembly weigh approximately 160 lbs (73 Kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Tractor platform weighs approximately 550 lbs (250 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

Spare tire retainer weighs approximately 150 lbs (68 kgs). The aid of two assistants is required to install spare tire retainer on vehicle. Failure to comply may result in injury to personnel.

WARNING

Rear stabilizer bar weighs approximately 50 lbs (22 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Cab roof weighs approximately 110 lbs (50 kgs). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel.

WARNING

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

WARNING

Wear appropriate eye protection when removing spring rings. Spring rings are under tension and can act as projectiles when being removed. Failure to comply may result in injury to personnel.

WARNING

Wear appropriate eye protection when installing spring rings. Spring rings are under tension and can act as projectiles when being installed. Failure to comply may result in injury to personnel.

ARMY TM 9-2320-366-20-2
AIR FORCE T.O. 36A12-1C-1102-2

CHANGE
NO. 2

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

TECHNICAL MANUAL
MAINTENANCE INSTRUCTIONS
UNIT MAINTENANCE
M1083 SERIES, 5-TON, 6x6,
MEDIUM TACTICAL VEHICLE
(MTV)

VOLUME NO. 2 OF 5

TM 9-2320-366-20-2, 15 September 1998, is changed as follows:

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

Remove Pages	Insert Pages
e and f	e and f
none	Change 2 Authentication Sheet
A and B	A and B
none	C/(D Blank)
iii and iv	iii and iv
2-945 thru 2-958.6	2-945 thru 2-958.6
none	2-958.7 thru 2-958.20
2-959 and 2-960	2-959 and 2-960
2-1161 thru 2-1170	2-1161 thru 2-1170
2-1445 thru 2-1446.2	2-1445 thru 2-1446.2
2-1446.3 and 2-1446.4	2-1446.3 and 2-1446.12
2-1446.5 thru 2-1446.12	none
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B-5 thru B-8	B-5 thru B-8
B-27 thru B-29/	B-27 thru B-29/
(B-30 Blank)	(B-30 Blank)
C-1 thru C-4	C-1 thru C-4
D-1 thru D-6	D-1 thru D-6
G-1 thru G-12	G-1 thru G-12
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K-1 thru K-4	K-1 thru K-4
INDEX-1 thru INDEX-4	INDEX-1 thru INDEX-4
INDEX-9 thru INDEX-12	INDEX-9 thru INDEX-12
FO-1 FP-69/(FP-70 Blank)	FO-1 FP-69/(FP-70 Blank)
Metric Conversion Chart	Metric Conversion Chart
/PIN	/PIN

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

By Order of the Secretary of the Army:

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Distribution:

To be distributed in accordance with the initial distribution number (IDN) 380940, requirements for TM 9-2320-366-20-2.

CHANGE NO. 1

**HEADQUARTERS
DEPARTMENTS OF THE ARMY
AND THE AIR FORCE**

Washington, D.C., 1 July 2003

TECHNICAL MANUAL
MAINTENANCE INSTRUCTIONS
UNIT MAINTENANCE
M1083 SERIES, 5-TON, 6x6,
MEDIUM TACTICAL VEHICLE
(MTV)

VOLUME NO. 2 OF 5

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Remove Pages	Insert Pages
m and n	m and n
none	A and B
i thru iv	i thru iv
none	v and vi
none	2-942.1/(2-942.2 Blank)
2-943 thru 2-958	2-943 thru 2-958
none	2-958.1 thru 2-958.6
2-959 and 2-960	2-959 and 2-960
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none	2-1056.1 thru 2-1056.10
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2-1445 and 2-1446	2-1445 and 2-1446
none	2-1446.1 thru 2-1446.12
2-1447 thru 2-1450	2-1447 thru 2-1450
none	2-1450.1 thru 2-1450.28
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none	2-1456.1 thru 2-1456.22
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none	2-1478.1 and 2-1478.2
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none	2-1490.1 thru 2-1490.6
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none	2-1706.1 thru 2-1706.42
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none	2-1710.1 thru 2-1701.4
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none	2-1734.1 and 2-1734.2
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none	2-1794.1 and 2-1794.2
2-1795 thru 2-1821/(2-1822 Blank)	2-1795 thru 2-1822
none	2-1822.1 thru 2-1822.29/(2-1822.30 Blank)
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2-1829/(2-1830 Blank)	2-1829/(2-1830 Blank)
2-1835 and 2-1836	2-1835 and 2-1836
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2-1899 and 2-1900	2-1899/(2-1900 Blank)
2-1901 and 2-1902	none
2-1903 and 2-1904	(2-1903 Blank)/2-1904
2-1905 thru 2-1930	2-1905 thru 2-1930
2-1931 and 2-1932	2-1931/(2-1932 Blank)
2-1933 and 2-1934	(2-1933 Blank)/2-1934
2-1945/(2-1946 Blank)	2-1945 and 2-1946
none	2-1946.1/(2-1946.2 Blank)
2-1947 thru 2-1964	2-1947 thru 2-1964
2-1971 thru 2-1976	2-1971 thru 2-1976
none	2-1976.1 thru 2-1976.64
2-1977 thru 2-1982	2-1977 thru 2-1982
2-1987/(2-1988 Blank)	2-1987 and 2-1988
none	2-1988.1 thru 2-1988.7/(2-1988.8 Blank)
A-1 thru A-4	A-1 thru A-4
B-3 and B-4	B-3 and B-4
B-23 thru B-30	B-23 thru B-29/(B-30 Blank)
C-1 thru C-4	C-1 thru C-4
D-1 thru D-5/(D-6 Blank)	D-1 thru D-6

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

Remove Pages	Insert Pages	Remove Pages	Insert Pages
None	D-7/(D-8 Blank)		
E-1 thru E-6	E-1 thru E-6		
E-15 and E-16	E-15 and E-16		
none	E-27 thru E-31/(E-32 Blank)		
G-1 thru G-11(G-12 Blank)	G-1 thru G-12		
H-1 thru H-12	H-1 thru H-12		
H-21 and H-22	H-21 and H-22		
H-25 thru H-28	H-25 thru H-28		
H-31 and H-32	H-31 and H-32		
none	K-1 thru K-4		
INDEX-1 thru INDEX-12	INDEX-1 thru INDEX-12		
none	INDEX-13/(INDEX-14 Blank)		
FO-1 PF-1/(FP-2 Blank)	FO-1 PF-1/(FP-2 Blank)		
thru PF-21/(FP-22 Blank)	thru PF-21/(FP-22 Blank)		
FO-1 FP-25/(FP-26 Blank)	FO-1 FP-25/(FP-26 Blank)		
FO-1 FP-29/(FP-30 Blank)	FO-1 FP-29/(FP-30 Blank)		
thru FP-67/(FP-68 Blank)	thru FP-67/(FP-68 Blank)		
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DA FORM 2028-2	DA FORM 2028-2		
DA FORM 2028-2	DA FORM 2028-2		
DA FORM 2028-2	DA FORM 2028-2		
Metric Conversion Chart	Metric Conversion Chart		
Cover	Cover		

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

By Order of the Secretary of the Army:

JOHN M. KEANE
General, United States Army
Chief of Staff

Official:

JOEL B. HUDSON
Administrative Assistant to the
Secretary of the Army
0110110

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Dates of issue for original and changed pages are:

Original ..... 0..... 15 September 1998
Change ..... 1..... 1 July 2003
Change ..... 2..... 20 August 2005

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TECHNICAL MANUAL
NO. 9-2320-366-20-2

TECHNICAL ORDER
NO. 36A12-1C-1102-2

HEADQUARTERS
DEPARTMENTS OF THE ARMY
AND THE AIR FORCE

Washington, D.C., 15 September 1998

Unit Maintenance Manual

M1083 SERIES, 5-TON, 6 x 6, MEDIUM TACTICAL VEHICLES (MTV)

VOLUME NO. 2 OF 5

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

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HOW TO USE THIS MANUAL

OVERVIEW

This Technical Manual (TM) is provided to help you maintain the MTV at the Unit Maintenance level. Because of its size, it is divided into five volumes. 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.

- **CHAPTER 2, VEHICLE MAINTENANCE.** This chapter contains the continuation of the troubleshooting tables.

- **APPENDIX A, REFERENCES.** Lists publications used with the MTV.

- **APPENDIX B, MAINTENANCE ALLOCATION CHART.** The maintenance allocation chart denotes the level of maintenance which performs specific maintenance tasks and the time required. It also lists tools and special tools required for each task.

- **APPENDIX C, TOOLS IDENTIFICATION LIST.** Lists equipment used in the performance of maintenance and references publications which contain information regarding the equipment.
- **APPENDIX D, EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST.** Lists expendable and durable items used in the performance of maintenance.
- **APPENDIX E, ILLUSTRATED LIST OF MANUFACTURED ITEMS.** Illustrates and describes items that must be fabricated from bulk materials for repair of the MTV.
- **APPENDIX F, TORQUE LIMITS.** Lists the standard torque values for specific attaching hardware.
- **APPENDIX G, MANDATORY REPLACEMENT PARTS.**
- **APPENDIX H, LUBRICATION ORDER.**
- **APPENDIX J, ADDITIONAL AUTHORIZATION LIST (AAL).**
- **APPENDIX K, 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 associated paragraph number.

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.

TROUBLESHOOTING

Troubleshooting is contained in chapter 2. 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.

MAINTENANCE

- **SCHEDULED MAINTENANCE.** Your scheduled maintenance is located in table 2-1, PMCS. These checks and services are mandatory at the intervals listed. Always follow the WARNINGS and CAUTIONS.

MAINTENANCE (CONT)

- **UNSCHEDULED MAINTENANCE.** Unscheduled maintenance is located in chapters 3 through 24. The PMCS and troubleshooting tables often reference you to these procedures. When you perform maintenance, look over the entire procedure before starting. Make sure you have the necessary tools and materials at hand. Always follow the WARNINGS and CAUTIONS.

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.

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2-16. ELECTRICAL SYSTEM TROUBLESHOOTING (CONT)

Table 2-7. Electrical System Fault Index (Cont)

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e139.	Main Winch LH or RH Speed Switch Does Not Operate From Wrecker Control Panel	2-1446.12
e140.	Main Winch LH or RH Freespool Switch Does Not Operate From Wrecker Control Panel	2-1452
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e149.	M1088/M1089 (LH) Worklights Do Not Illuminate	2-1558
e150.	M1088/M1089 (RH) Worklights Do Not Illuminate	2-1562
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e152.	M1084/M1086 Worklights Do Not Illuminate	2-1576

e85. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT OPERATE

INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

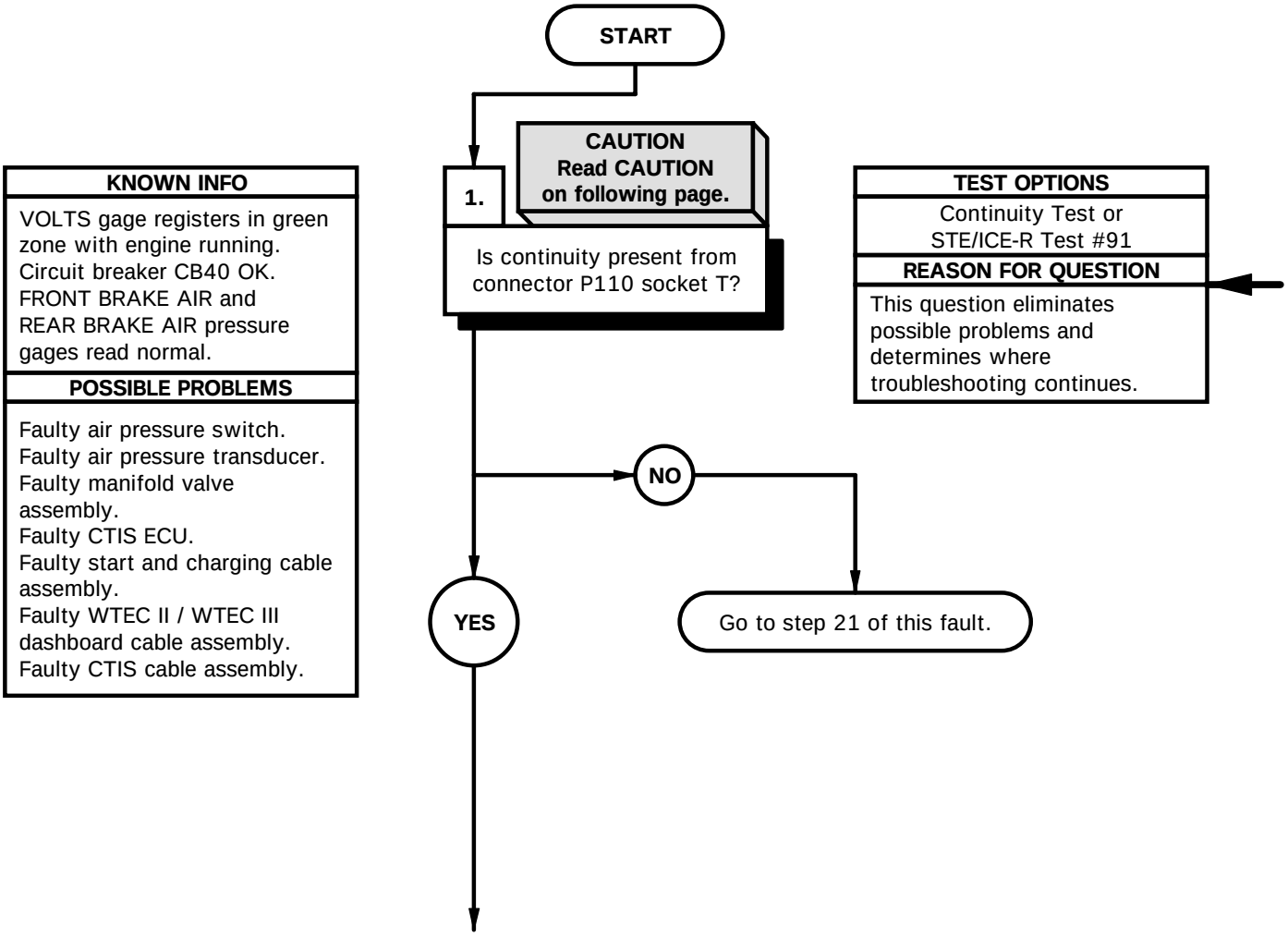
Materials/Parts
Wire, Elect, 50 ft (Item 71, Appendix D)

Personnel Required
(2)

References
TM 9-4910-571-12&P

NOTE

Perform Electrical System Troubleshooting e1. Circuit Breaker Does Not Operate on circuit breaker CB40 prior to beginning this task.



CAUTION

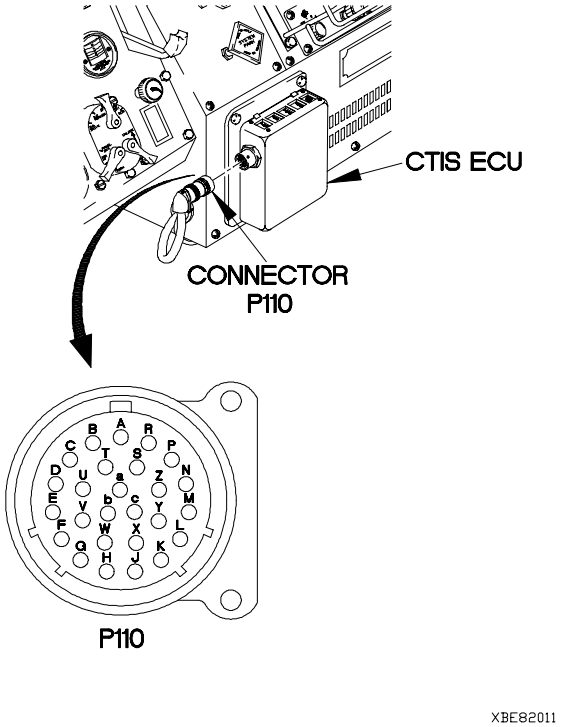
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

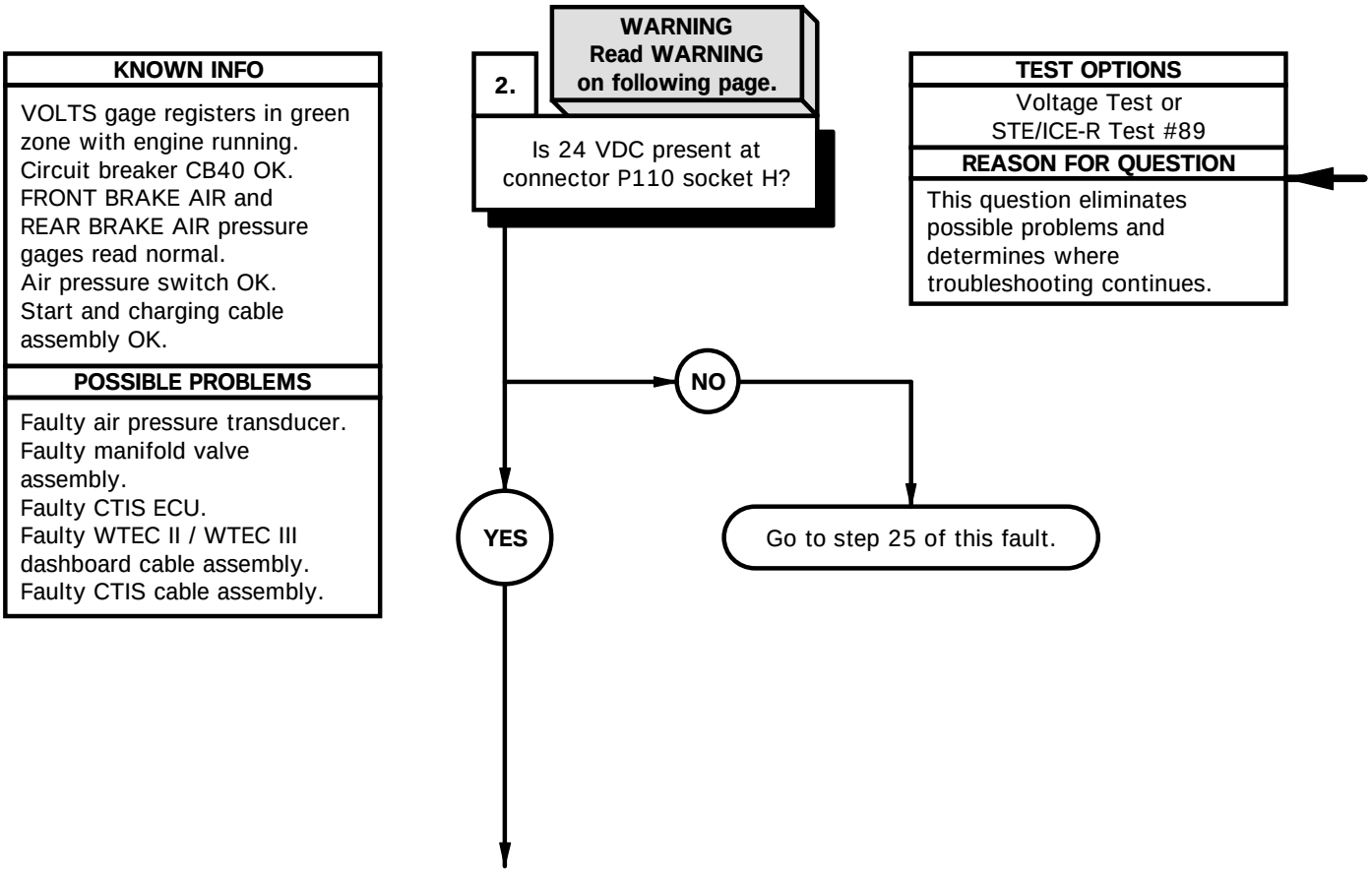
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Start engine (TM 9-2320-366-10-1).
(2) Allow air pressure to build until FRONT BRAKEAIR and REAR BRAKE AIR pressure gages read approximately 120 PSI.
(3) Shut down engine (TM 9-2320-366-10-1).
(4) Disconnect connector P110 from CTIS ECU.
(5) Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter to connector P110 socket T.
(7) Connect negative (-) probe of multimeter to known good ground and note reading on multimeter.
(8) If continuity is not present, go to step 21 of this fault.



e85. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT OPERATE (CONT)

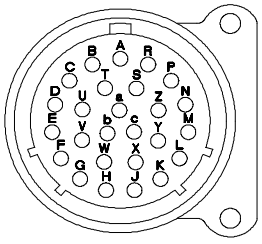


WARNING

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 circuits and cause severe burns or electrical shock.

VOLTAGE TEST

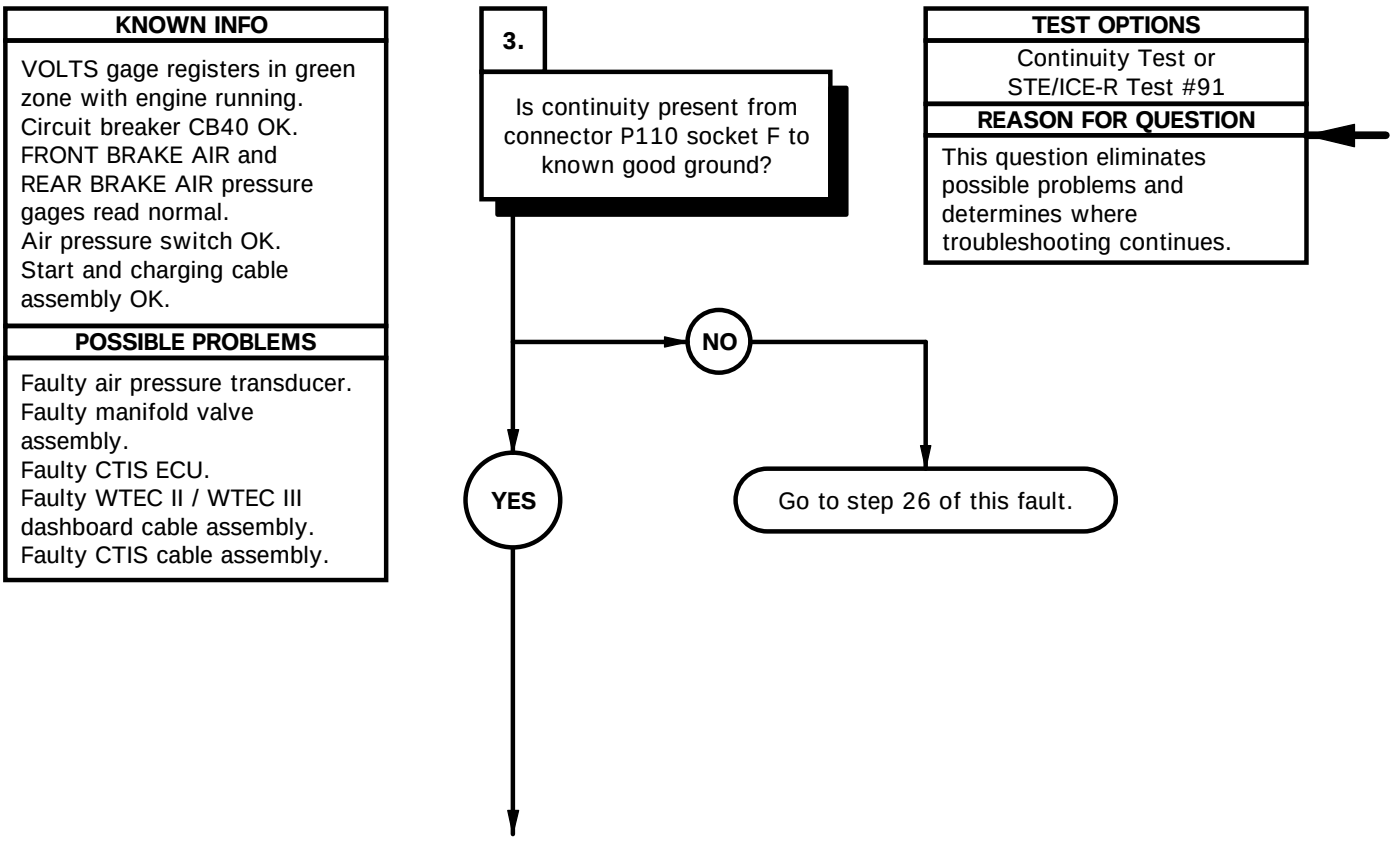
(1) Position master power switch to on (TM 9-2320-366-10-1).
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to connector P110 socket H.
(4) Connect negative (-) probe of multimeter to known good ground and note reading on multimeter.
(5) If 24 VDC is not present, go to step 25 of this fault.
(6) Position master power switch to off (TM 9-2320-366-10-1).



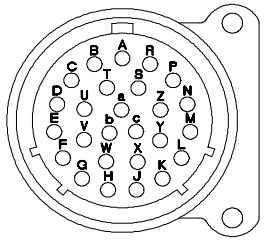
P110

XBE82021

e85. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT OPERATE (CONT)



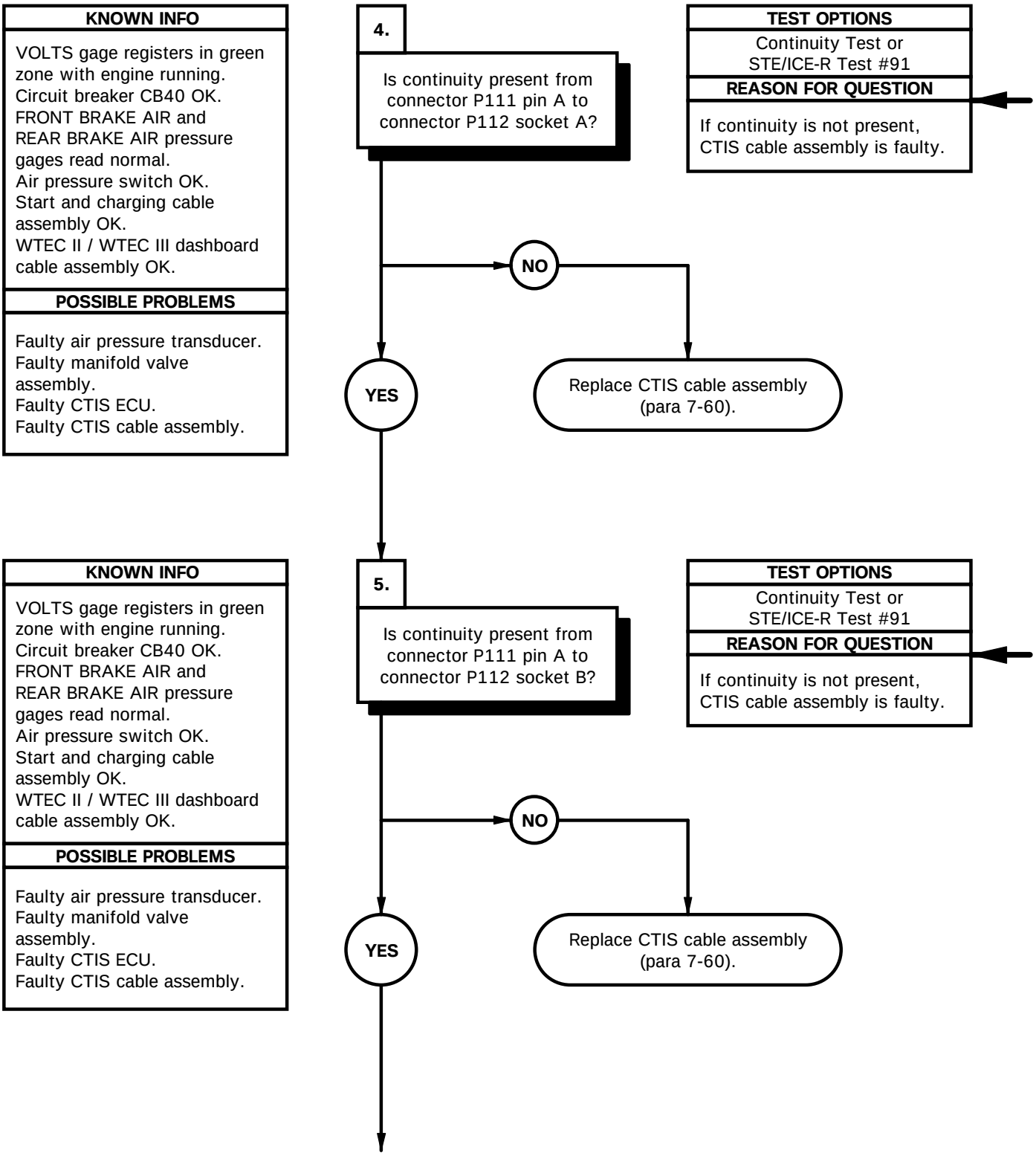
CONTINUITY TEST
(1) Set multimeter to ohms. (2) Connect positive (+) probe of multimeter to connector P110 socket F. (3) Connect negative (-) probe of multimeter to known good ground and note reading on multimeter. (4) If continuity is not present, go to step 26 of this fault.



P110

XBE82031

e85. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT OPERATE (CONT)

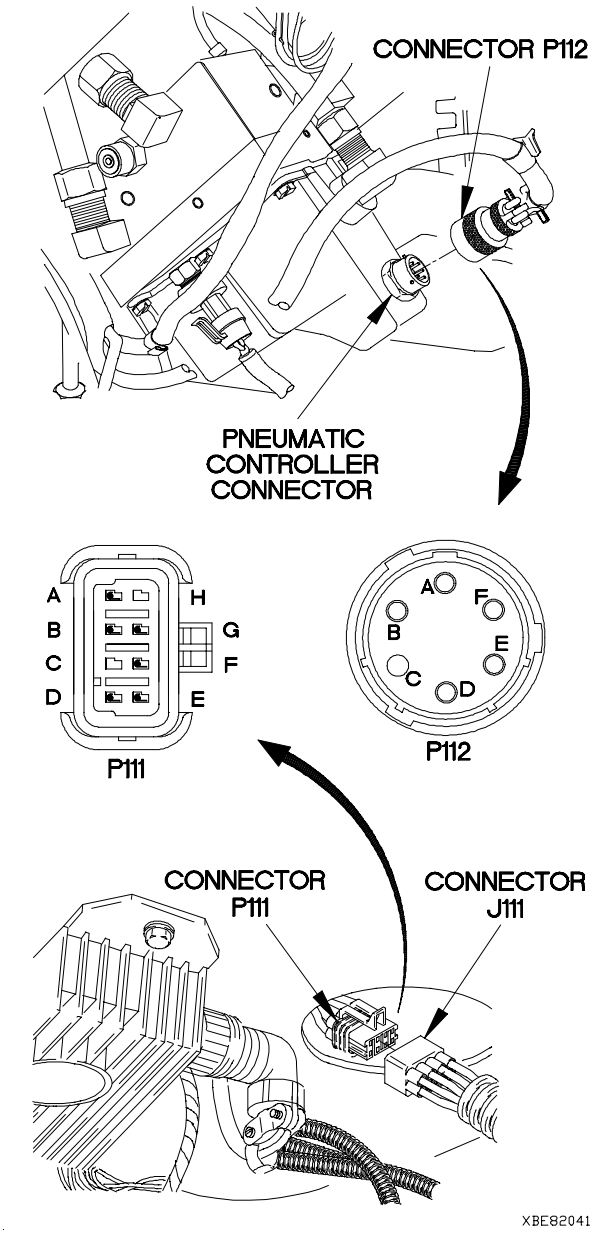


CONTINUITY TEST

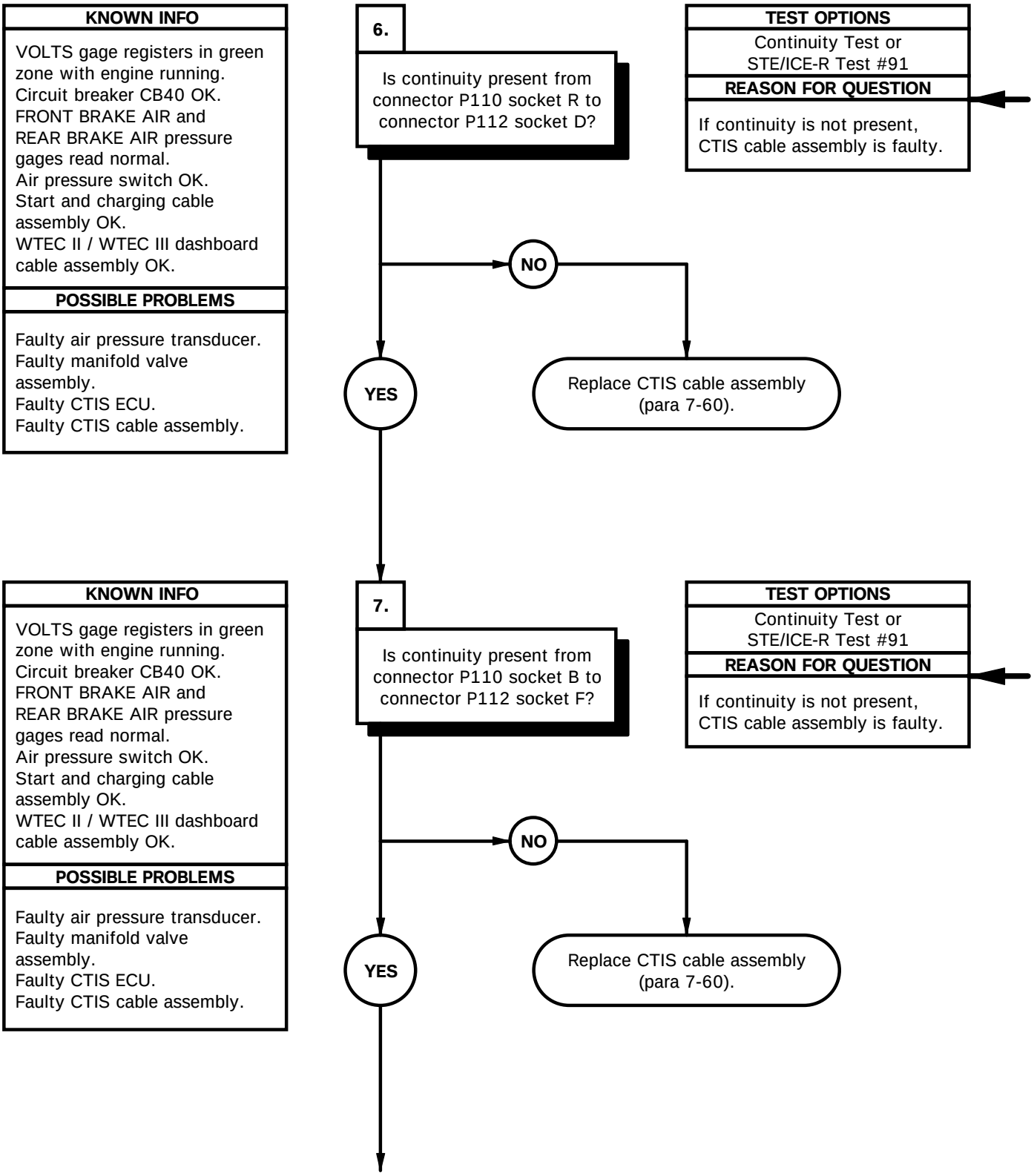
(1) Remove kick panel (para 16-3).
(2) Disconnect connector P112 from pneumatic controller connector.
(3) Disconnect connector J111 from connector P111.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to connector P111 pin A.
(6) Connect negative (-) probe of multimeter to connector P112 socket A and note reading on multimeter.
(7) If continuity is not present, replace CTIS cable assembly (para 7-60).

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P111 pin A.
(3) Connect negative (-) probe of multimeter to connector P112 socket B and note reading on multimeter.
(4) If continuity is not present, replace CTIS cable assembly (para 7-60).
(5) Connect connector J111 from connector P111.

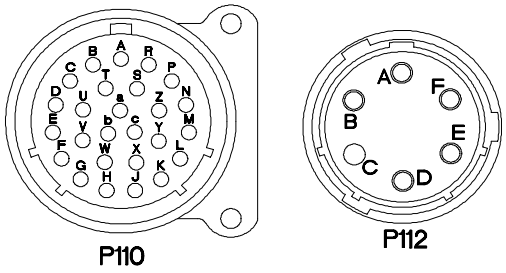


e85. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT OPERATE (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P110 socket R.
(3) Connect negative (-) probe of multimeter to connector P112 socket D and note reading on multimeter.
(4) If continuity is not present, replace CTIS cable assembly (para 7-60).

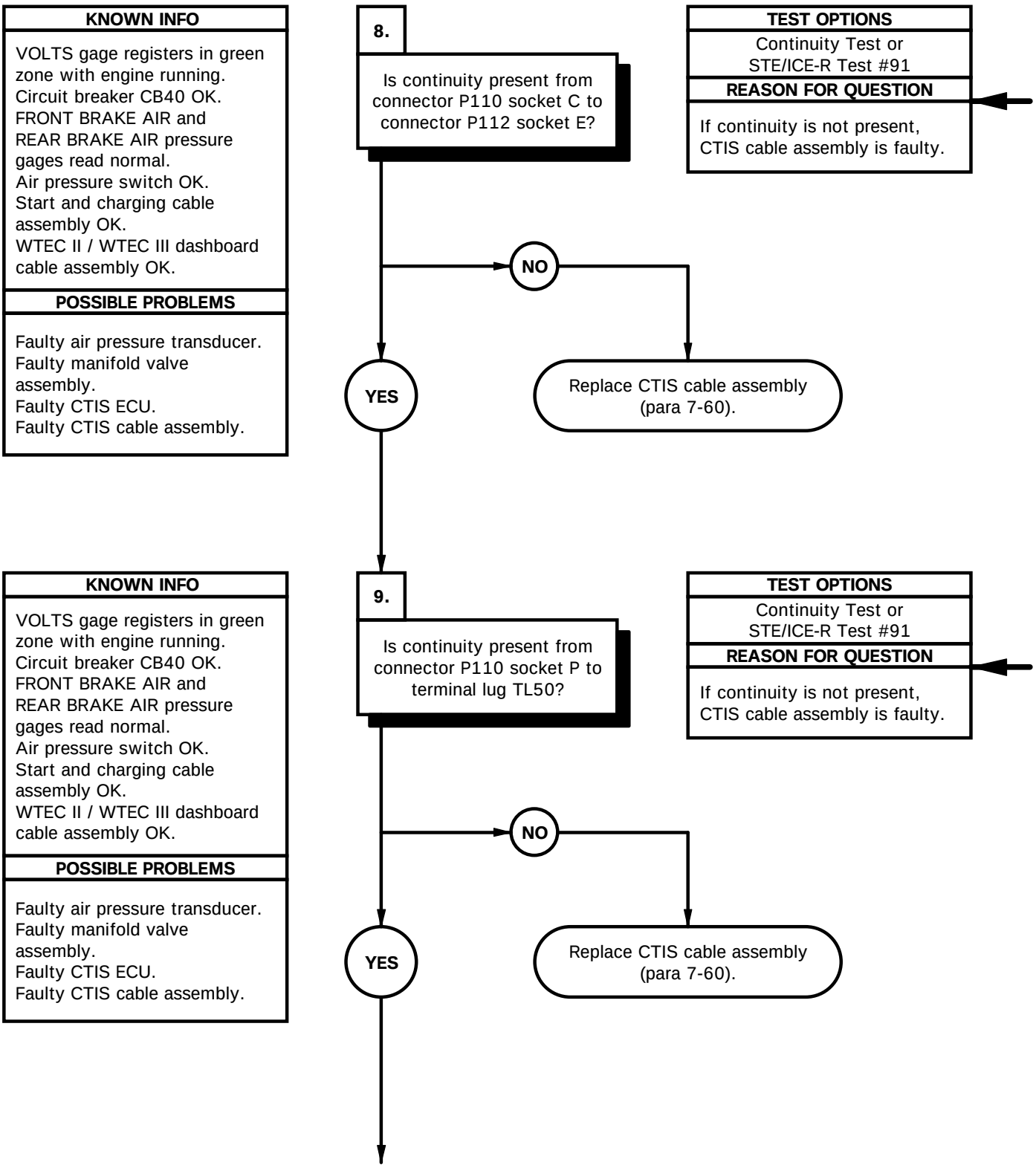


XBE82051

CONTINUITY TEST

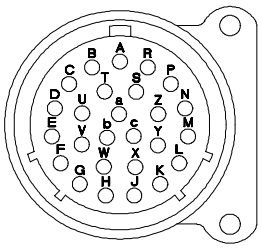
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P110 socket B.
(3) Connect negative (-) probe of multimeter to connector P112 socket F and note reading on multimeter.
(4) If continuity is not present, replace CTIS cable assembly (para 7-60).

e85. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT OPERATE (CONT)

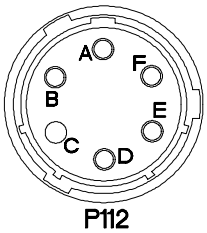


CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P110 socket C.
(3) Connect negative (-) probe of multimeter to connector P112 socket E and note reading on multimeter.
(4) If continuity is not present, replace CTIS cable assembly (para 7-60).



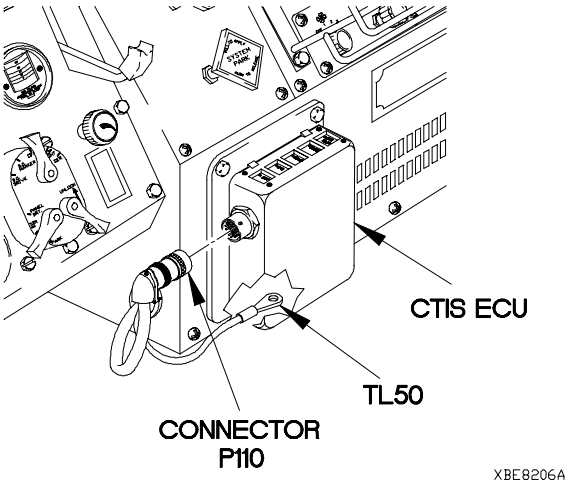
P110



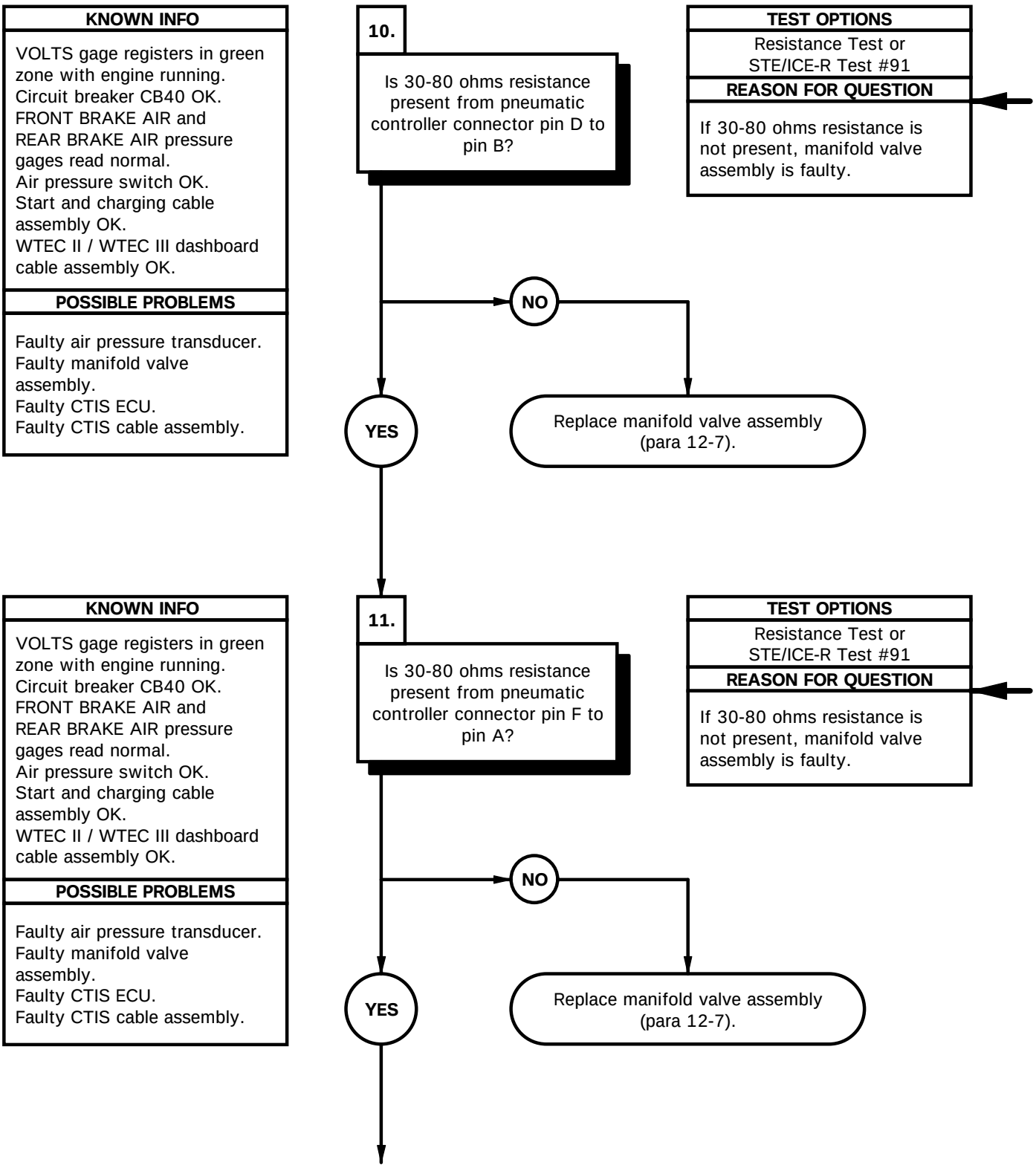
P112

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P110 socket P.
(3) Connect negative (-) probe of multimeter to terminal lug TL50 and note reading on multimeter.
(4) If continuity is not present, replace CTIS cable assembly (para 7-60).
(5) Connect connector P110 to CTIS ECU.



e85. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT OPERATE (CONT)

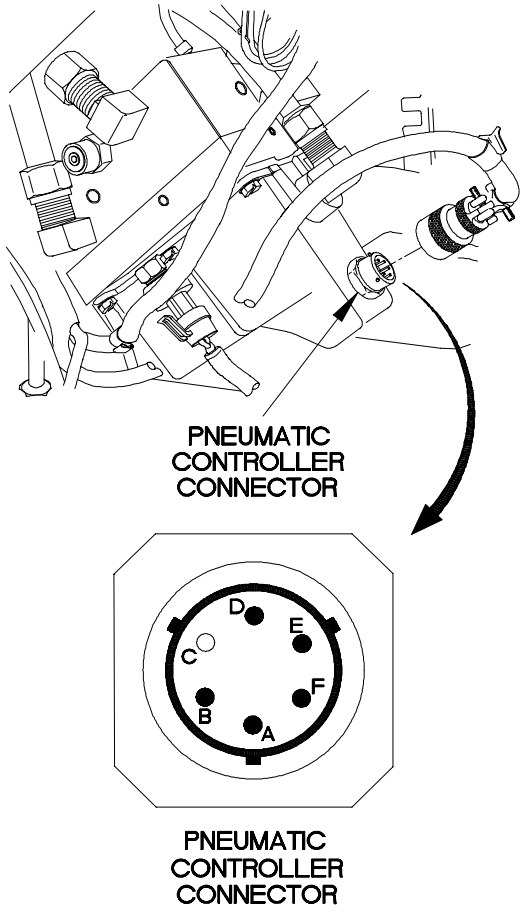


RESISTANCE TEST

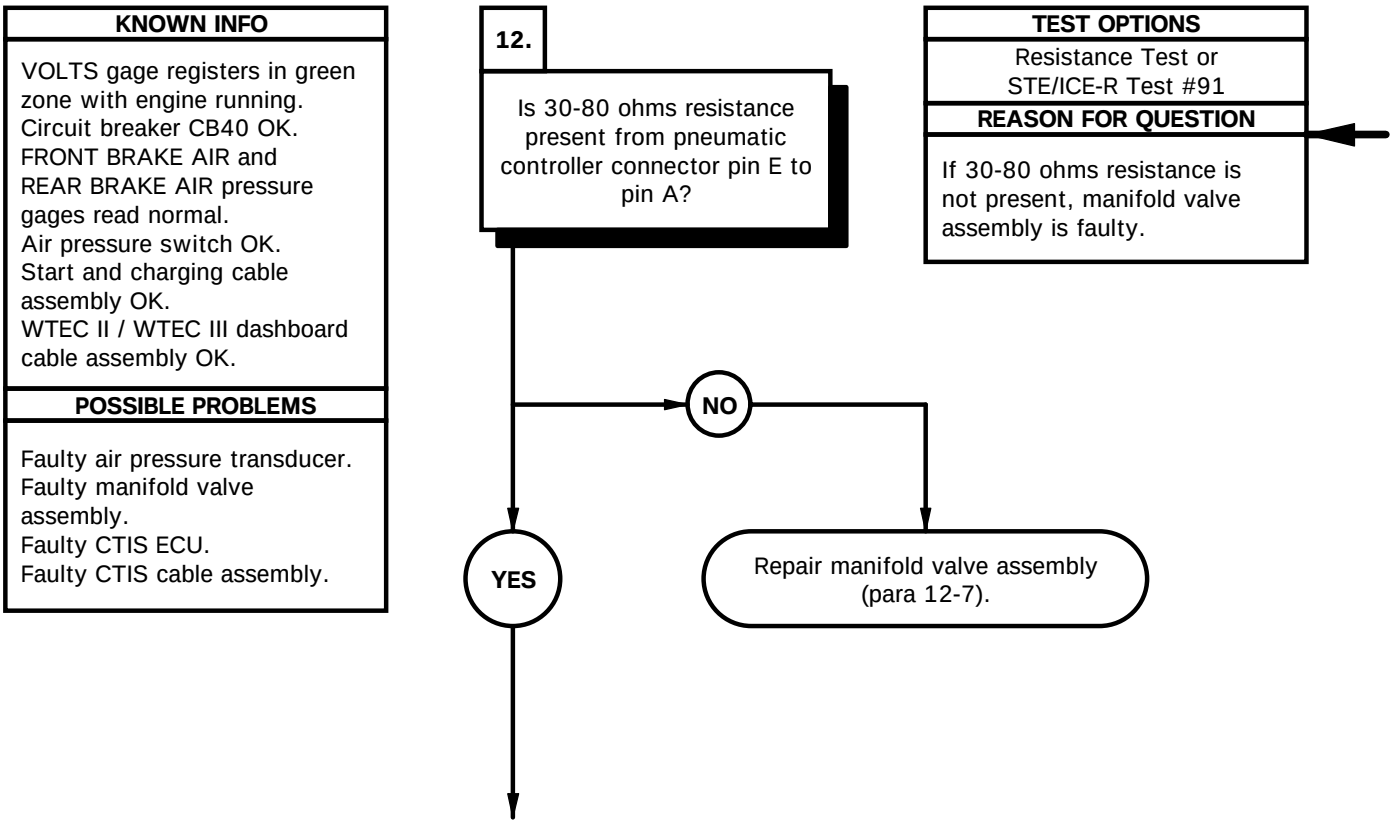
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to pneumatic controller connector pin D.
(3) Connect negative (-) probe of multimeter to pneumatic controller connector pin B and note reading on multimeter.
(4) If 30-80 ohms resistance is not present, replace manifold valve assembly (para 12-7).

RESISTANCE TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to pneumatic controller connector pin F.
(3) Connect negative (-) probe of multimeter to pneumatic controller connector pin A and note reading on multimeter.
(4) If 30-80 ohms resistance is not present, replace manifold valve assembly (para 12-7).

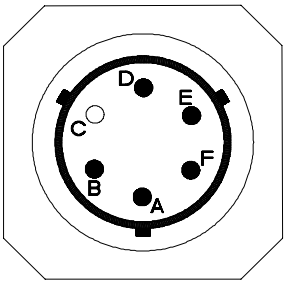


e85. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT OPERATE (CONT)

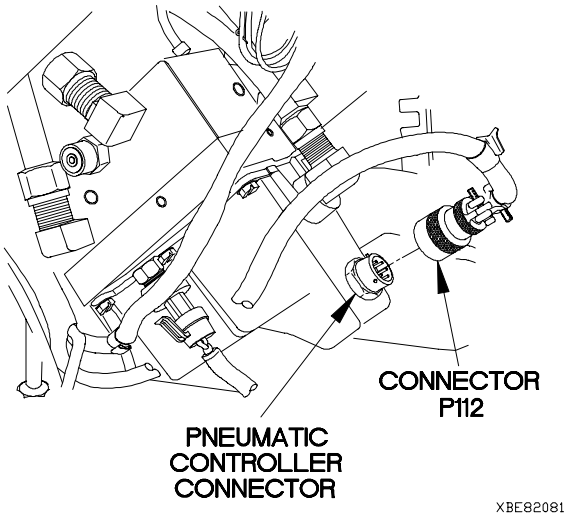


RESISTANCE TEST

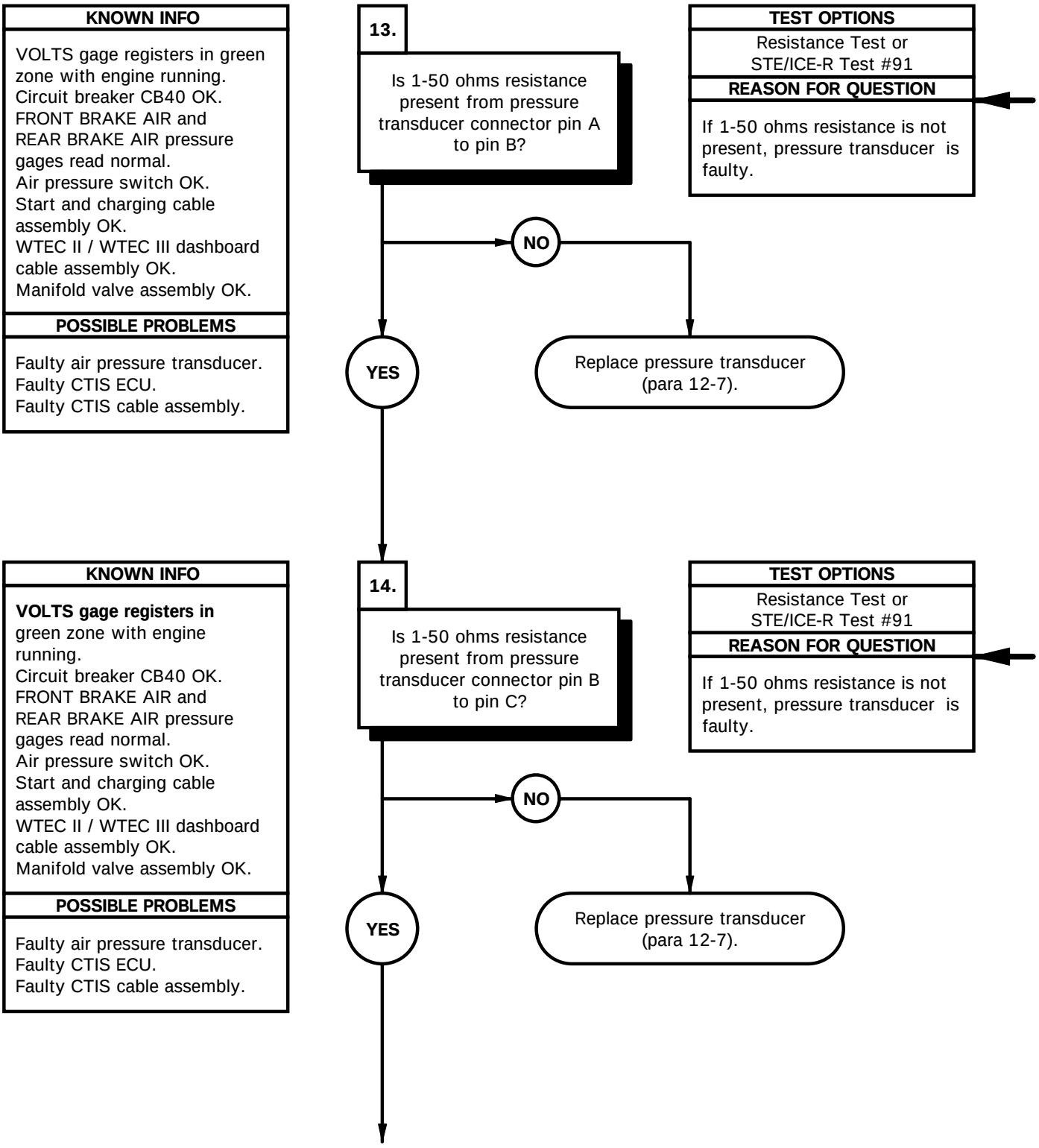
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to pneumatic controller connector pin E.
(3) Connect negative (-) probe of multimeter to pneumatic controller connector pin A and note reading on multimeter.
(4) If 30-80 ohms resistance is not present, repair manifold valve assembly (para 12-7).
(5) Connect connector P112 to pneumatic controller connector.



PNEUMATIC CONTROLLER CONNECTOR



e85. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT OPERATE (CONT)

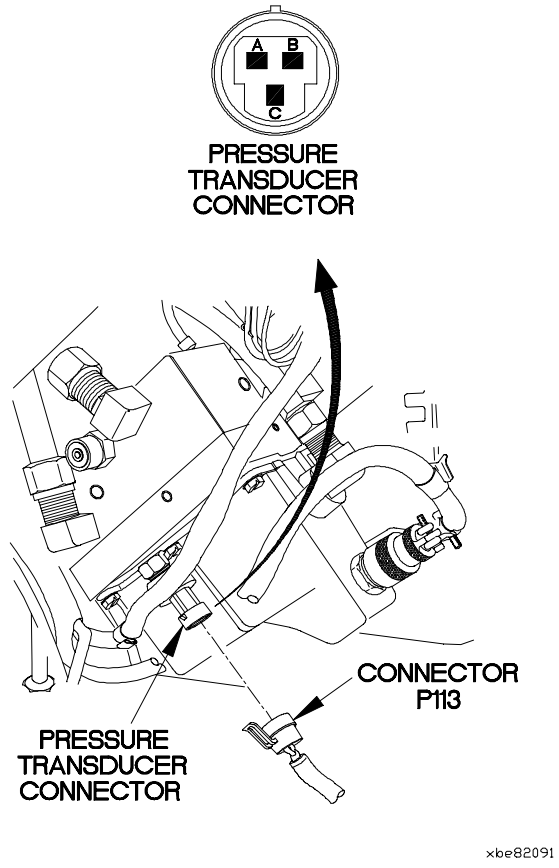


RESISTANCE TEST

(1) Disconnect connector P113 from pressure transducer connector.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to pressure transducer connector pin A.
(4) Connect negative (-) probe of multimeter to pressure transducer connector pin B and note reading on multimeter.
(5) If 1-50 ohms resistance is not present, replace pressure transducer (para 12-7).

RESISTANCE TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to pressure transducer connector pin B.
(3) Connect negative (-) probe of multimeter to pressure transducer connector pin C and note reading on multimeter.
(4) If 1-50 ohms resistance is not present, replace pressure transducer (para 12-7).



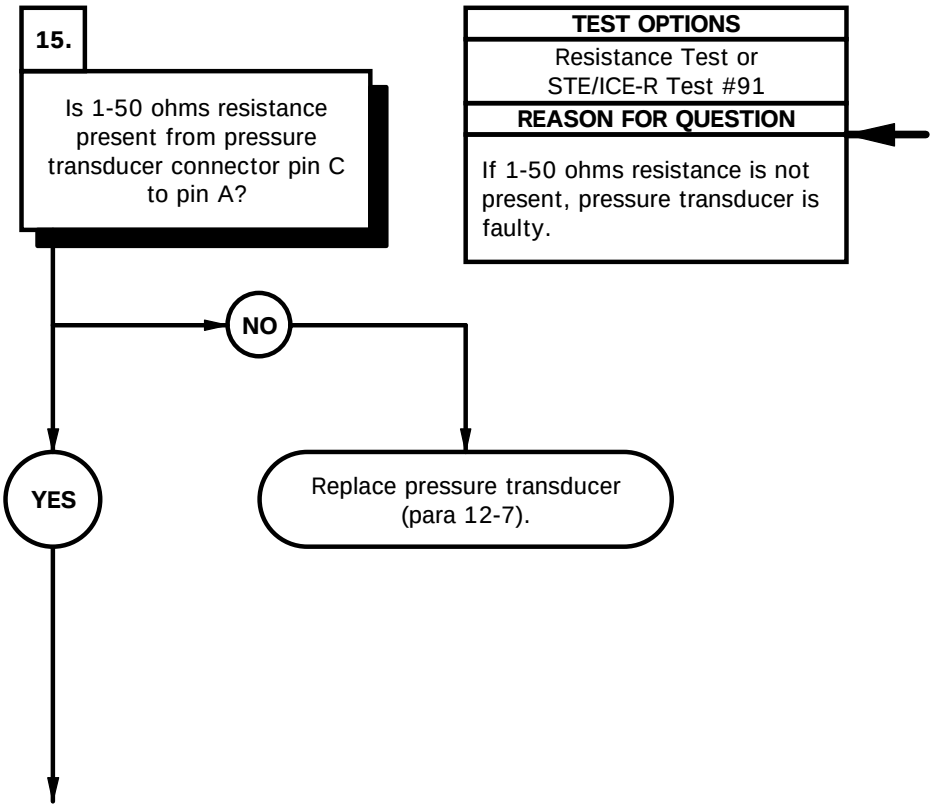
e85. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT OPERATE (CONT)

KNOWN INFO

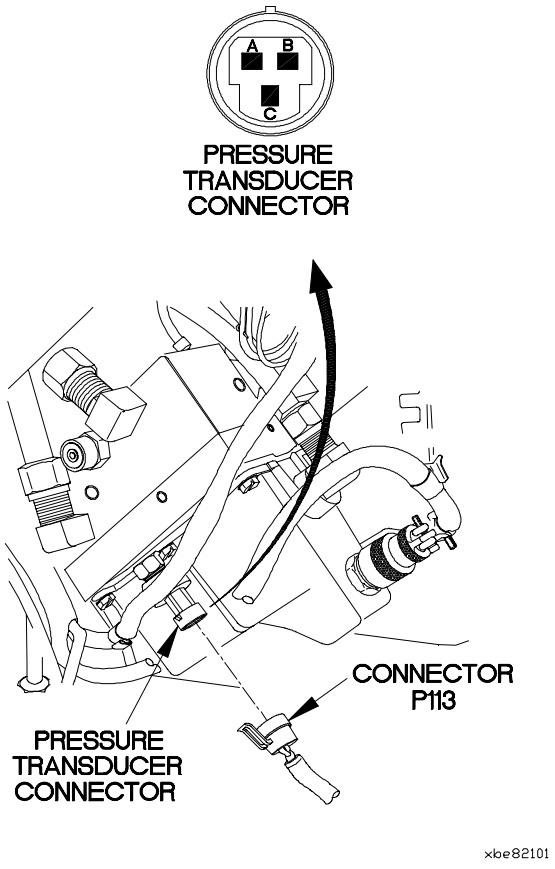
VOLTS gage registers in green zone with engine running.
Circuit breaker CB40 OK.
FRONT BRAKE AIR and REAR BRAKE AIR pressure gages read normal.
Air pressure switch OK.
Start and charging cable assembly OK.
WTEC II / WTEC III dashboard cable assembly OK.
Manifold valve assembly OK.

POSSIBLE PROBLEMS

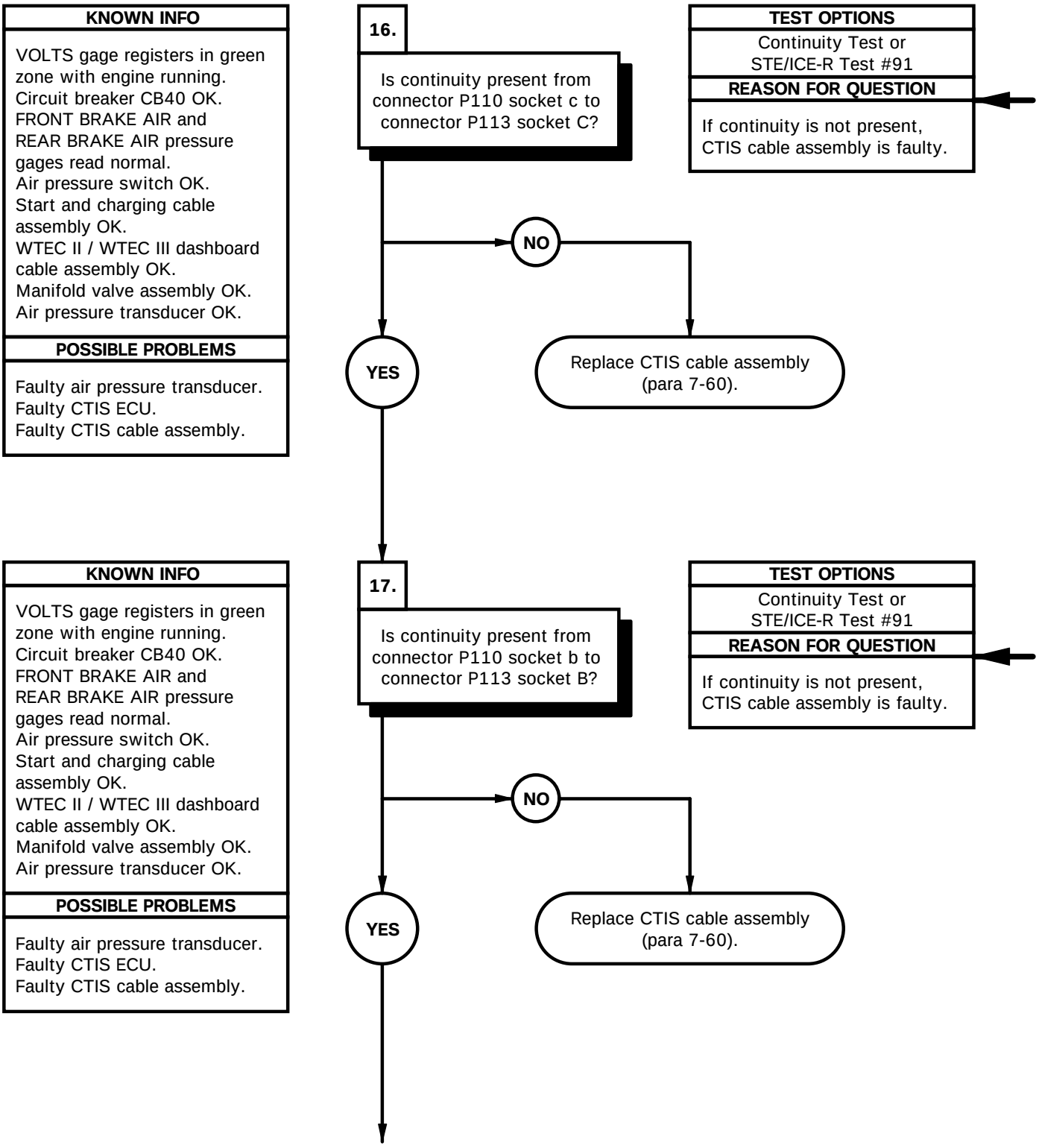
Faulty air pressure transducer.
Faulty CTIS ECU.
Faulty CTIS cable assembly.



RESISTANCE TEST
(1) Set multimeter to ohms. (2) Connect positive (+) probe of multimeter to pressure transducer connector pin C. (3) Connect negative (-) probe of multimeter to pressure transducer connector pin A and note reading on multimeter. (4) If 1-50 ohms resistance is not present, replace pressure transducer (para 12-7).

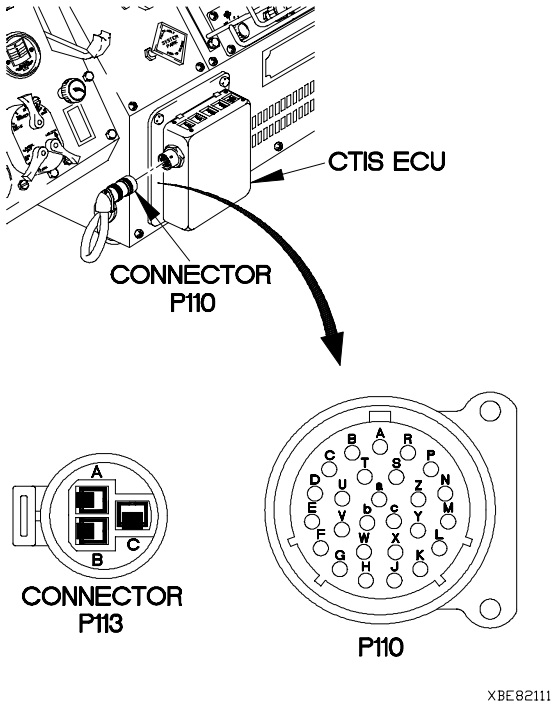


e85. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT OPERATE (CONT)



CONTINUITY TEST

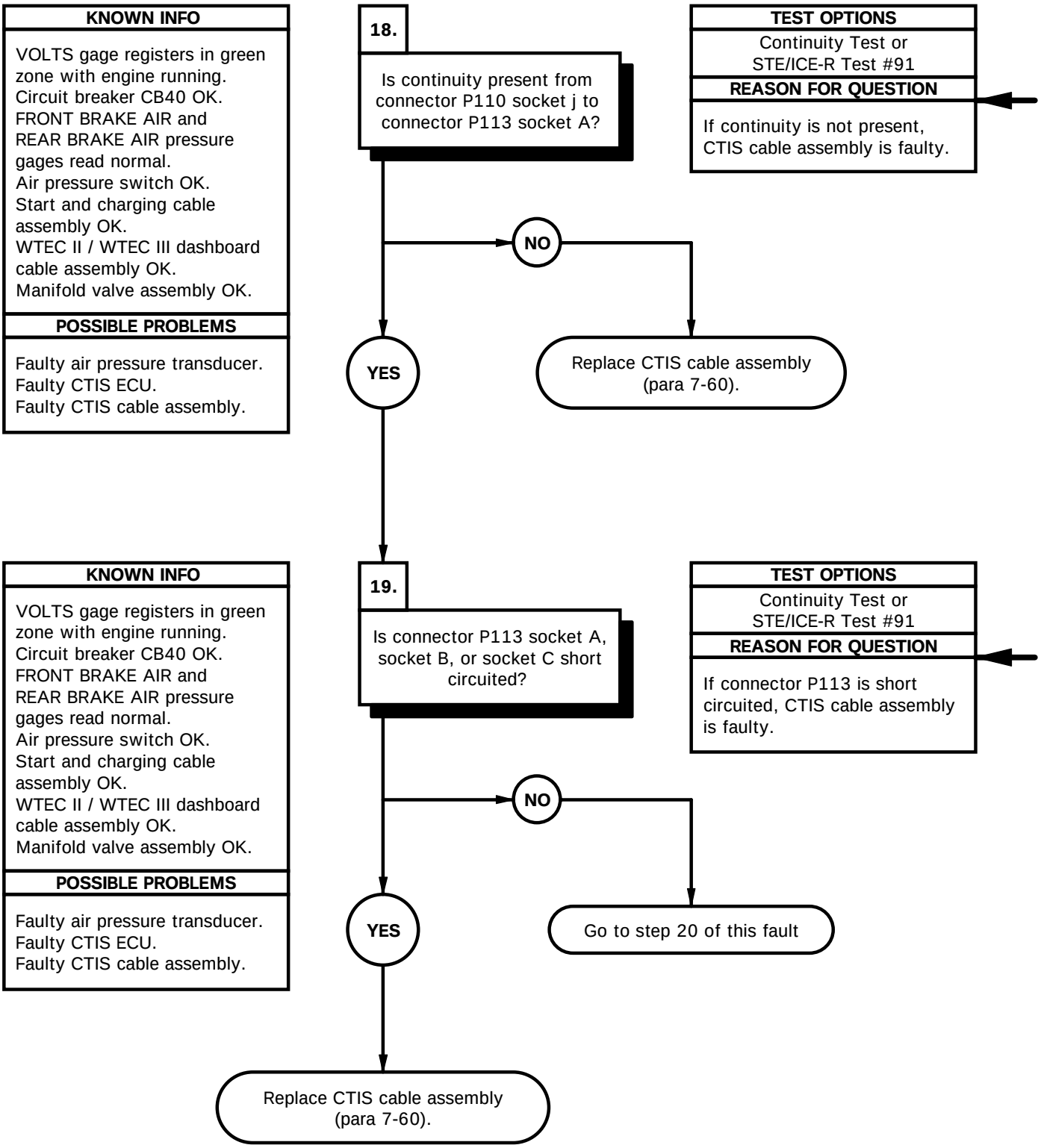
(1) Disconnect connector P110 from CTIS ECU.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector P110 socket c.
(4) Connect negative (-) probe of multimeter to connector P113 socket C and note reading on multimeter.
(5) If continuity is not present, replace CTIS cable assembly (para 7-60).



CONTINUITY TEST

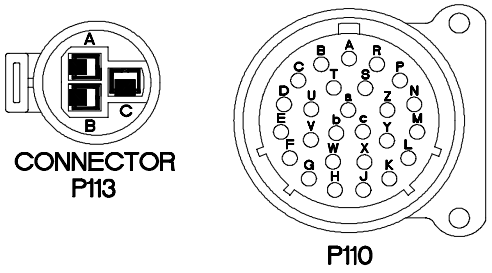
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P110 socket b.
(3) Connect negative (-) probe of multimeter to connector P113 socket B and note reading on multimeter.
(4) If continuity is not present, replace CTIS cable assembly (para 7-60).

e85. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT OPERATE (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P110 socket j.
(3) Connect negative (-) probe of multimeter to connector P113 socket A and note reading on multimeter.
(4) If continuity is not present, replace CTIS cable assembly (para 7-60).

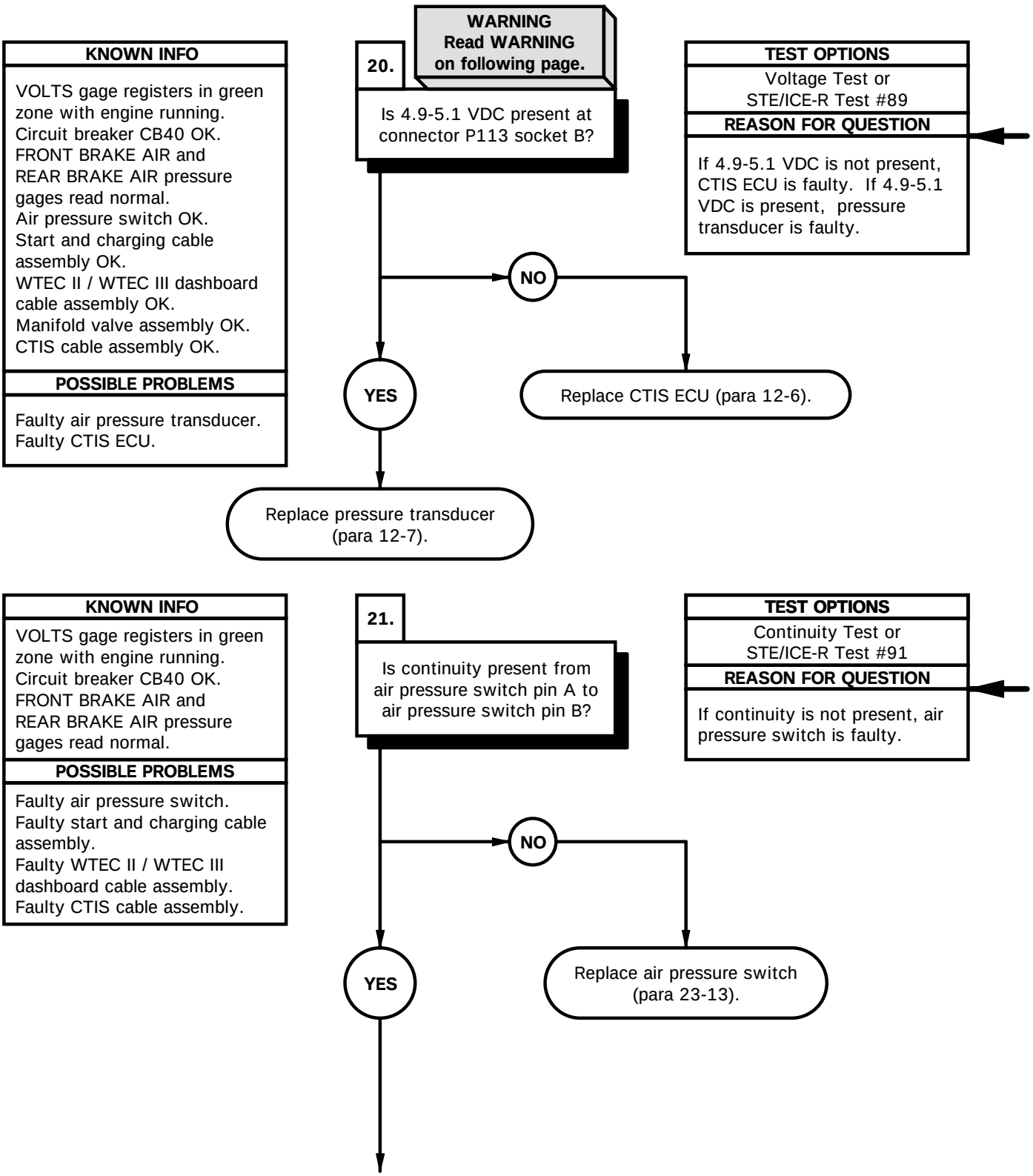


XBE82121

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P113 socket A.
(3) Connect negative (-) probe of multimeter to known good ground and note reading on multimeter.
(4) Connect negative (-) probe of multimeter to all other sockets on connector P113 and note reading on multimeter.
(5) Connect positive (+) probe of multimeter to connector P113 socket B.
(6) Connect negative (-) probe of multimeter to known good ground and note reading on multimeter.
(7) Connect negative (-) probe of multimeter to all other sockets on connector P113 and note reading on multimeter.
(8) Connect positive (+) probe of multimeter to connector P113 socket C.
(9) Connect negative (-) probe of multimeter to known good ground and note reading on multimeter.
(10) Connect negative (-) probe of multimeter to all other sockets on connector P113 and note reading on multimeter
(11) If continuity not present is steps 3, 4, 6, 7, 9, and 10, go to step 20 of this fault.
(12) If continuity present is steps 3, 4, 6, 7, 9, or 10, replace CTIS cable assembly (para 7-60).

e85. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT OPERATE (CONT)



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 circuits and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Connect connector P110 from CTIS ECU.
(2) Position master power switch to on (TM 9-2320-366-10-1).
(3) Set multimeter to volts DC.
(4) Connect positive (+) probe of multimeter to connector P113 socket B.
(5) Connect negative (-) probe of multimeter to known good ground and note reading on multimeter.
(6) Position master power switch to off (TM 9-2320-366-10-1).
(7) If 4.9-5.1 VDC is not present, replace CTIS ECU (para 12-6).
(8) If 4.9-5.1 VDC is present, replace air pressure transducer (para 12-7).

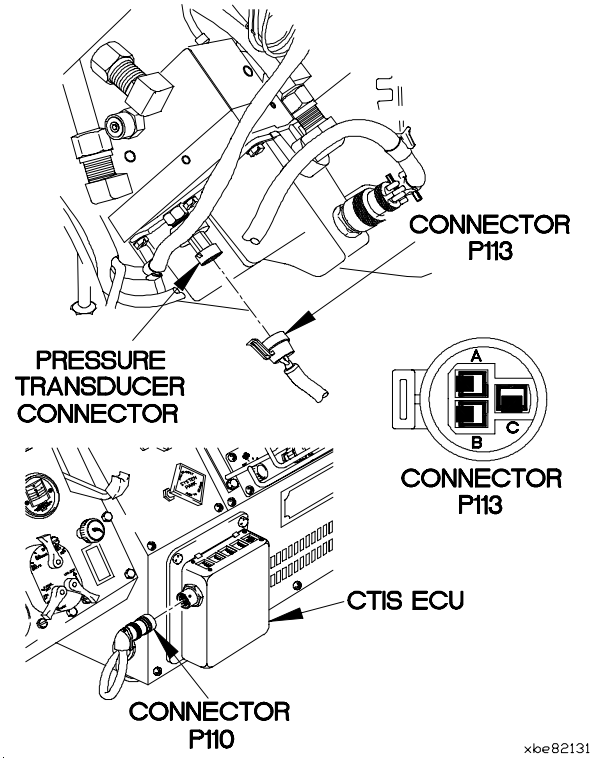
NOTE

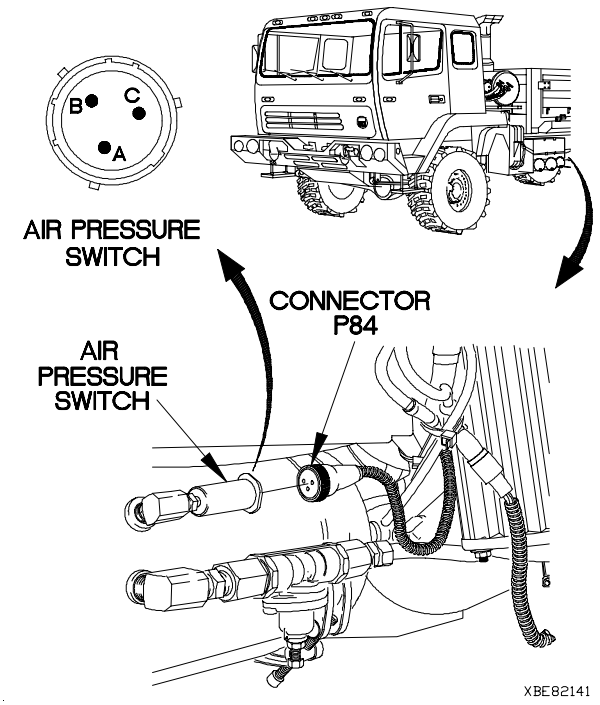
Perform steps (9) and (10) if 4.9-5.1 VDC is not present.

(9) Connect connector P113 to air pressure transducer connector.
(10) Install kick panel (para 16-3).

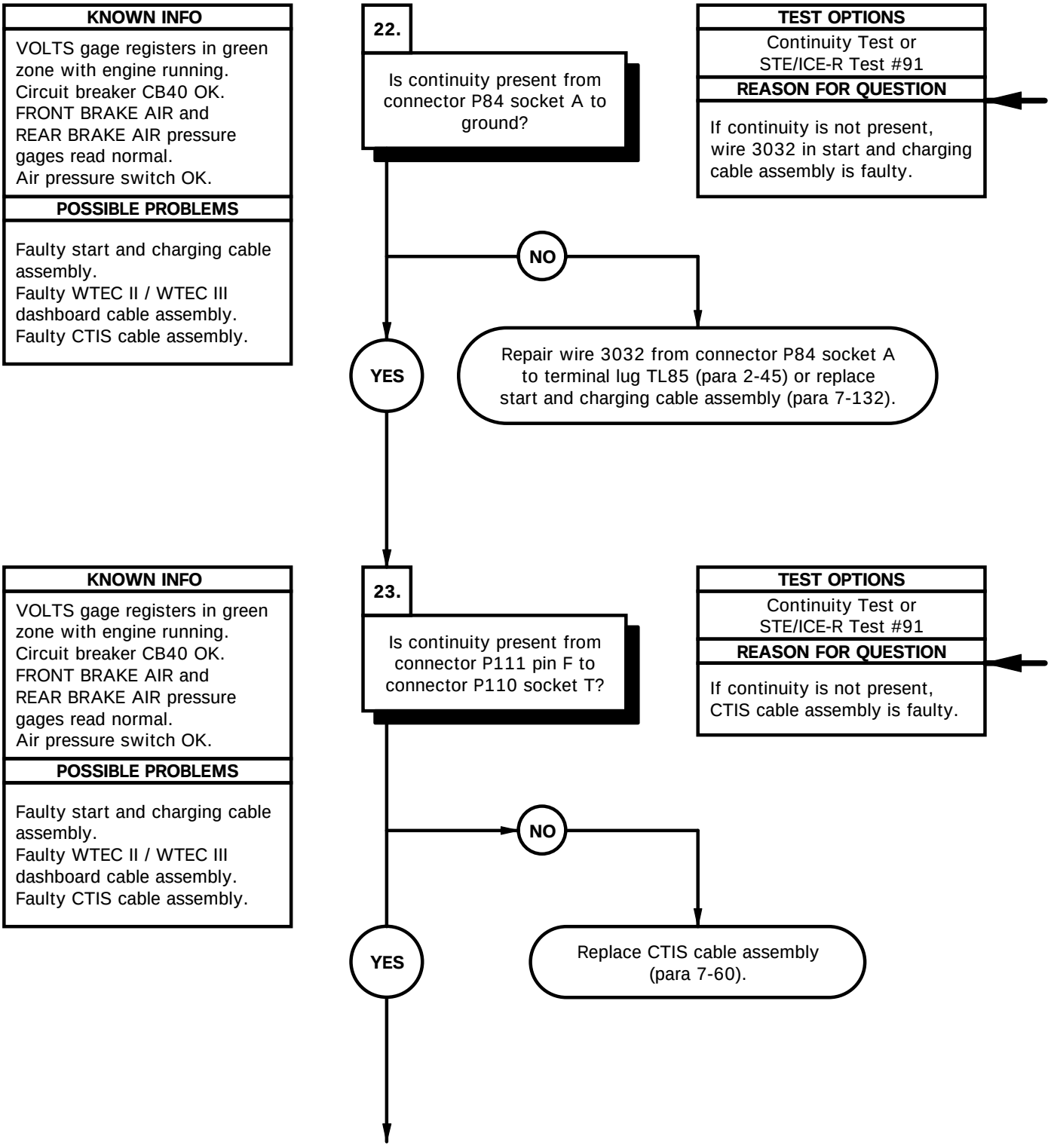
CONTINUITY TEST

(1) Connect connector P110 to CTIS ECU.
(2) Disconnect connector P84 from air pressure switch.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to air pressure switch pin A.
(5) Connect negative (-) probe of multimeter to air pressure switch pin B and note reading on multimeter.
(6) If continuity is not present, replace air pressure switch (para 23-13).



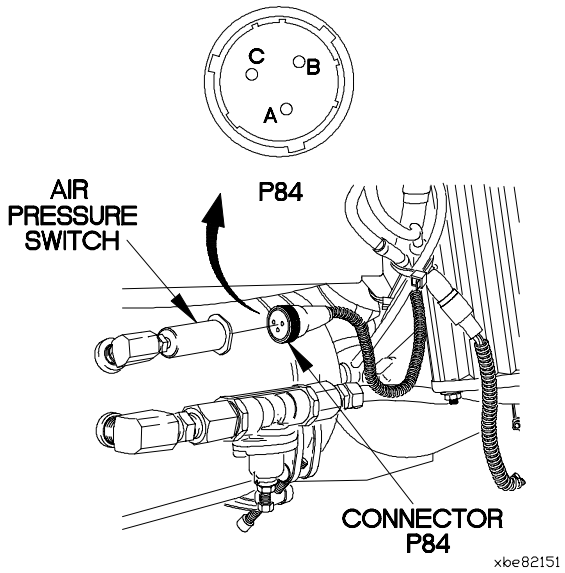


e85. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT OPERATE (CONT)



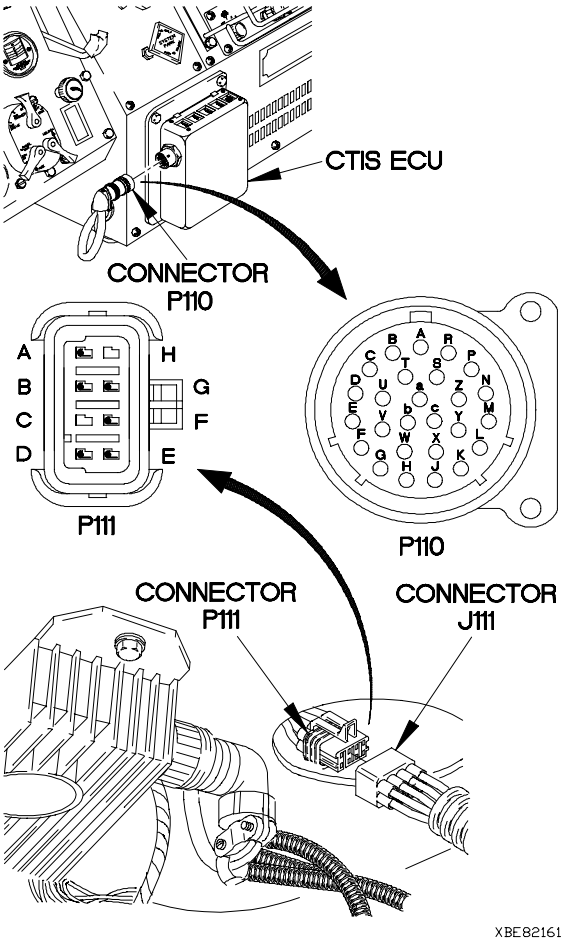
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P84 socket A.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair wire 3032 from connector P84 socket A to terminal lug TL85 (para 2-45) or replace start and charging cable assembly (para 7-132).
(5) Connect connector P84 to air pressure switch.

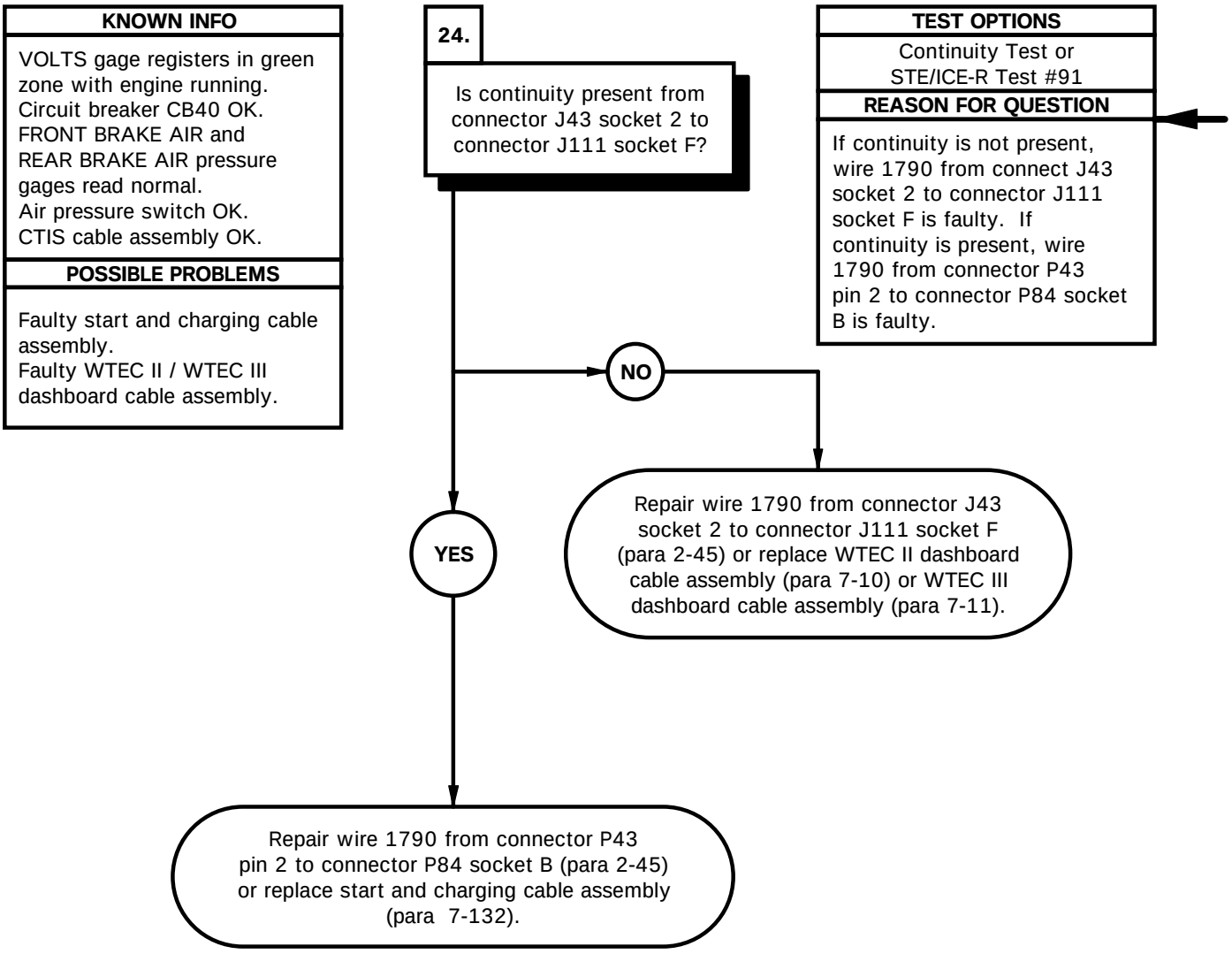


CONTINUITY TEST

(1) Disconnect connector P110 from CTIS ECU.
(2) Remove kick panel (para 16-3).
(3) Disconnect connector P111 from connector J111.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to connector P111 pin F.
(6) Connect negative (-) probe of multimeter to connector P110 socket T and note reading on multimeter.
(7) If continuity is not present, replace CTIS cable assembly (para 7-60).

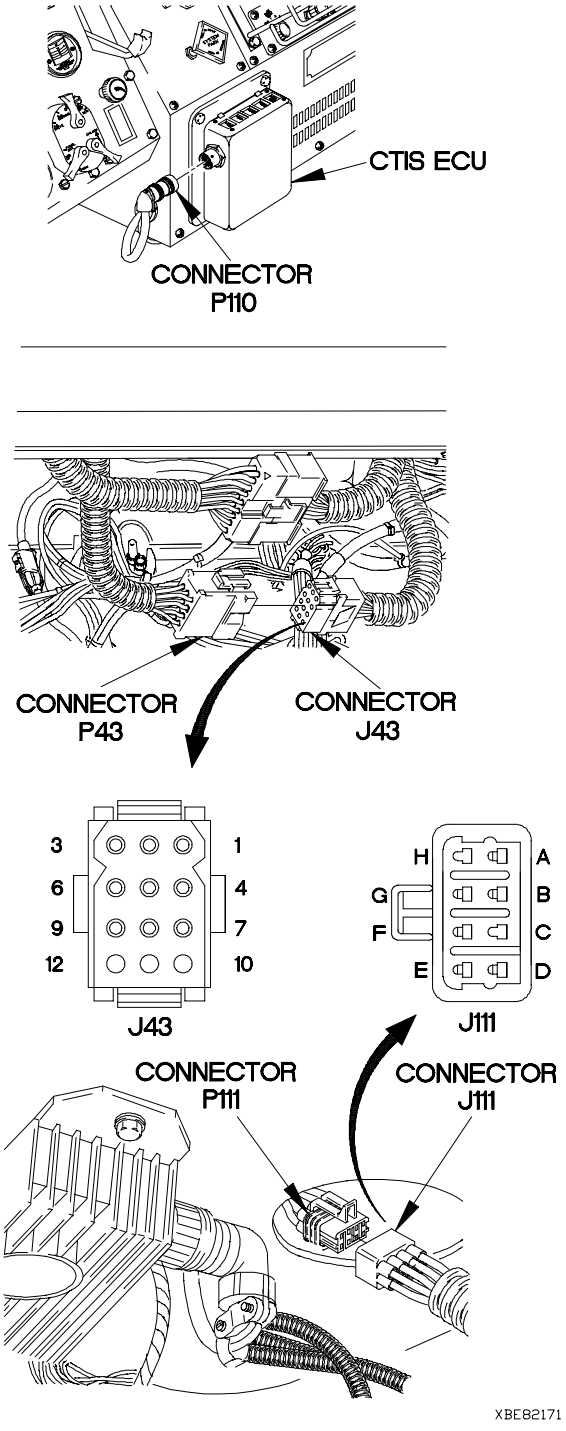


e85. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT OPERATE (CONT)

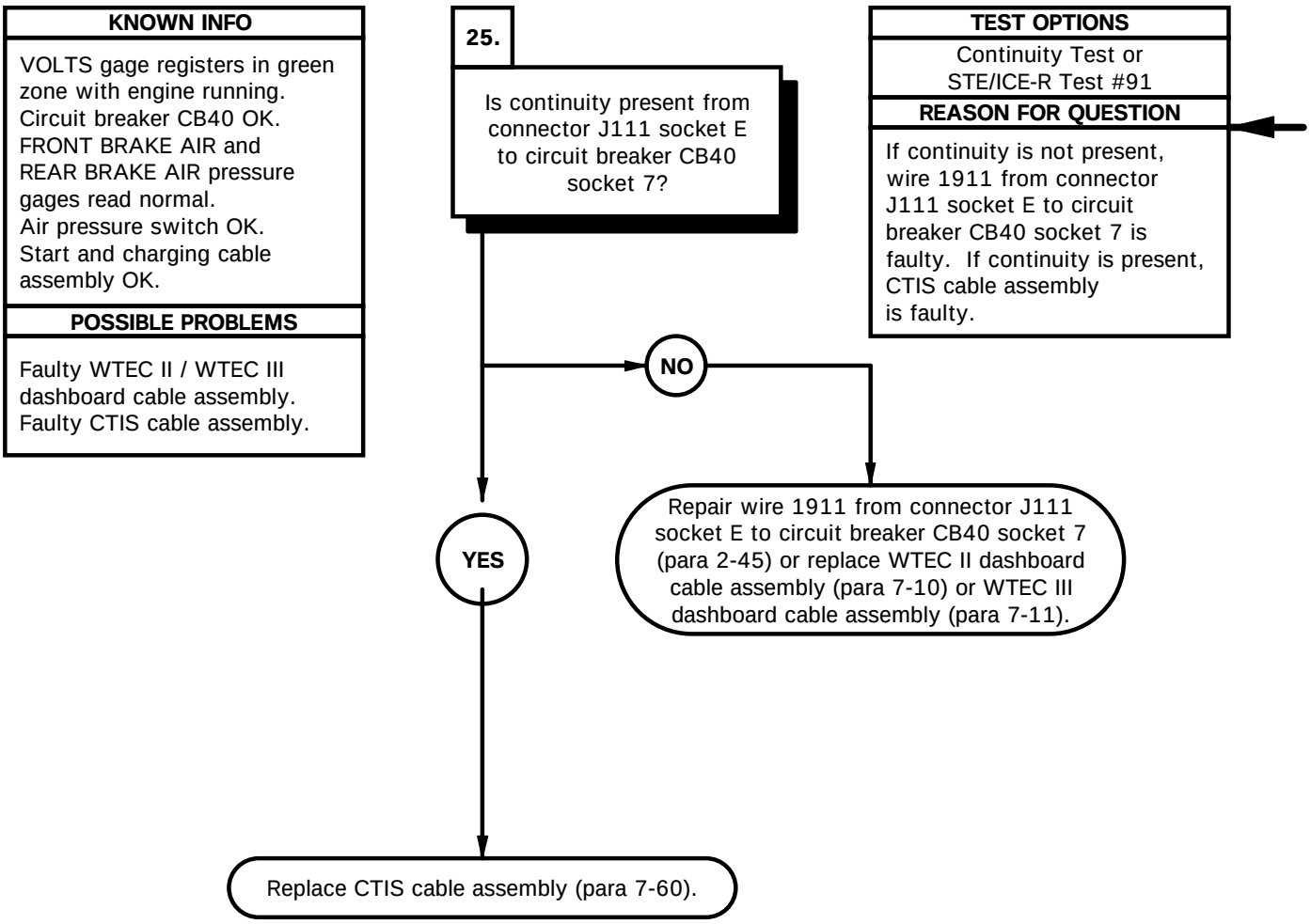


CONTINUITY TEST

(1) Connect connector P110 to CTIS ECU.
(2) Remove instrument panel assembly for access (para 7-15).
(3) Disconnect connector J43 from connector P43.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to connector J43 socket 2.
(6) Connect negative (-) probe of multimeter to connector J111 socket F and note reading on multimeter.
(7) If continuity is not present, repair wire 1790 from connector J43 socket 2 to connector J111 socket F (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(8) If continuity is present, repair wire 1790 from connector P43 pin 2 to connector P84 socket B (para 2-45) or replace start and charging cable assembly (para 7-132).
(9) Connect connector P43 to connector J43.
(10) Install instrument panel assembly (para 7-15).
(11) Connect connector J111 to connector P111.
(12) Install kick panel (para 16-3).

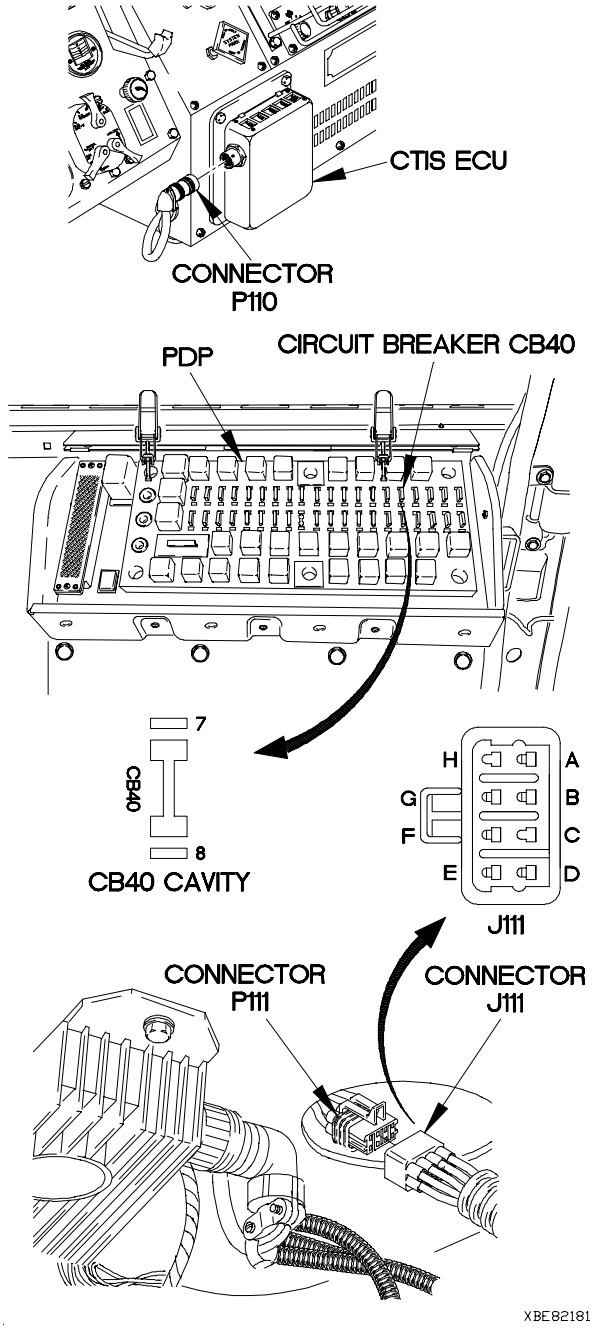


e85. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT OPERATE (CONT)

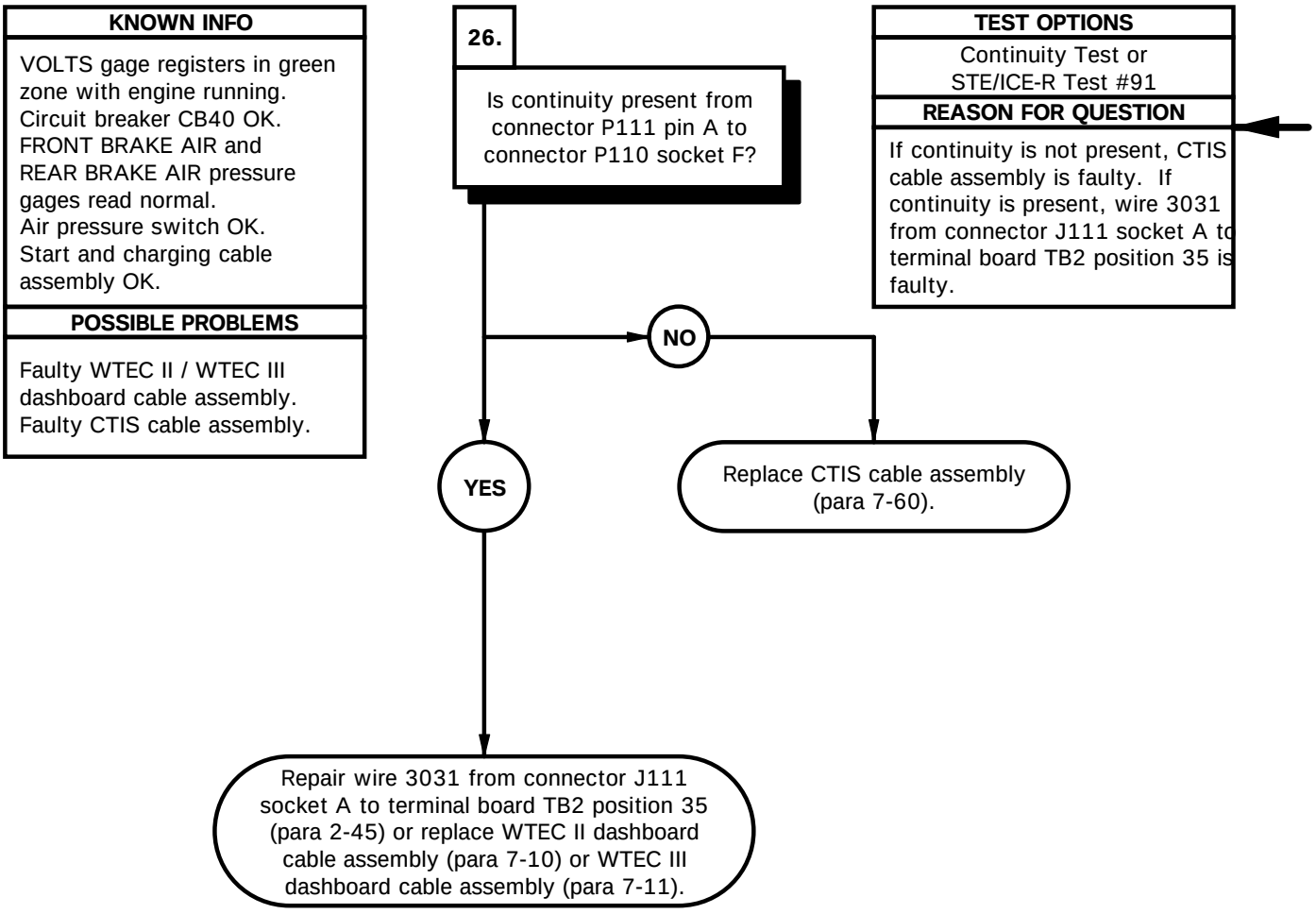


CONTINUITY TEST

(1) Connect connector P110 to CTIS ECU.
(2) Remove kick panel (para 16-3).
(3) Remove circuit breaker CB40 from PDP.
(4) Disconnect connector P111 from connector J111.
(5) Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter to connector J111 socket E.
(7) Connect negative (-) probe of multimeter to circuit breaker CB40 socket 7 and note reading on multimeter.
(8) If continuity is not present, repair wire 1911 from connector J111 socket E to circuit breaker CB40 socket 7 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(9) If continuity is present, replace CTIS cable assembly (para 7-60).
(10) Install circuit breaker CB40 on PDP.
(11) Connect connector J111 to connector P111.
(12) Install kick panel (para 16-3).

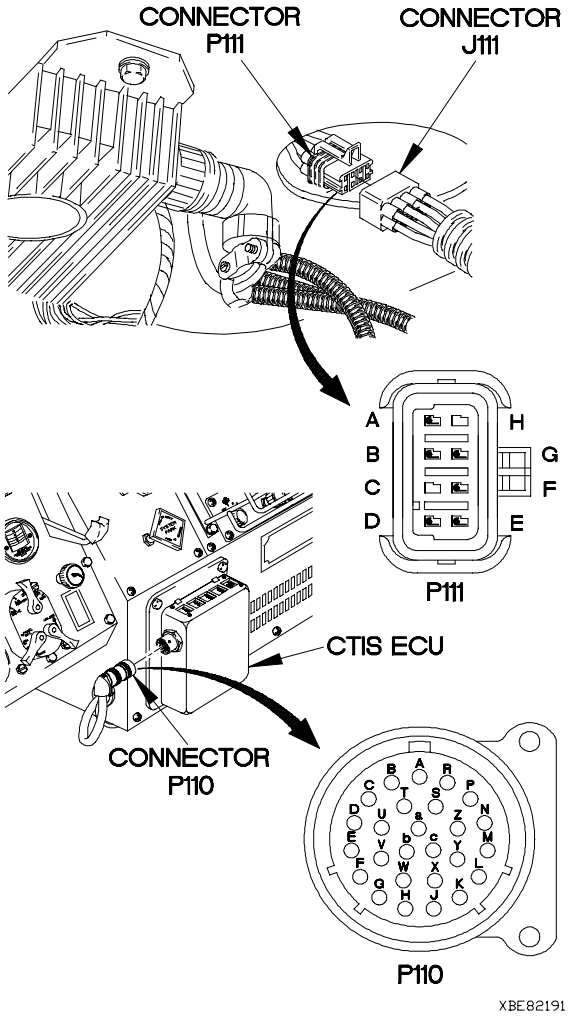


e85. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT OPERATE (CONT)



CONTINUITY TEST

(1) Remove kick panel (para 16-3).
(2) Disconnect connector J111 from connector P111.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector P110 socket F.
(5) Connect negative (-) probe of multimeter to connector P111 pin A and note reading on multimeter.
(6) If continuity is not present replace CTIS cable assembly (para 7-60).
(7) If continuity is present, repair wire 3031 from connector J111 socket A to terminal board TB2 position 35 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(8) Connect connector J111 to connector P111.
(9) Install kick panel (para 16-3).
(10) Connect connector P110 to CTIS ECU.



e86. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT INFLATE TIRES

INITIAL SETUP

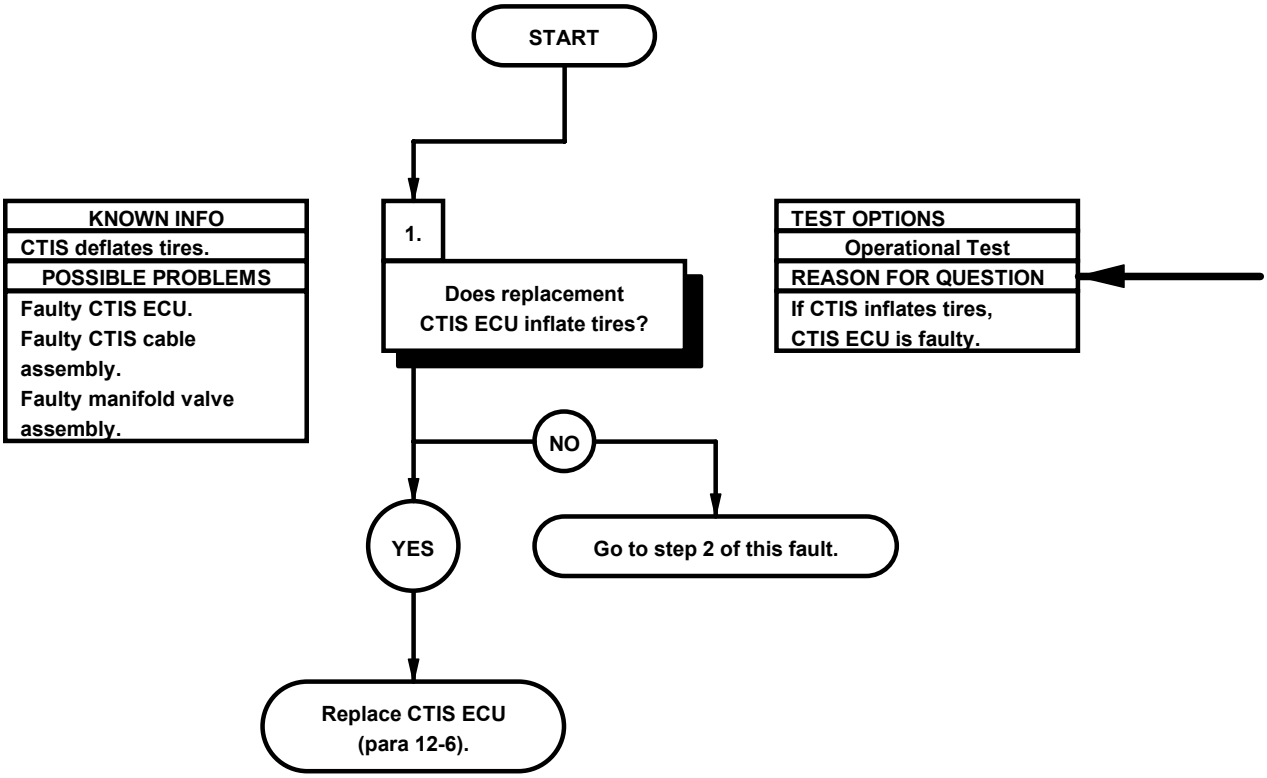
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).

Personnel Required
(2)

References
TM 9-4910-571-12&P

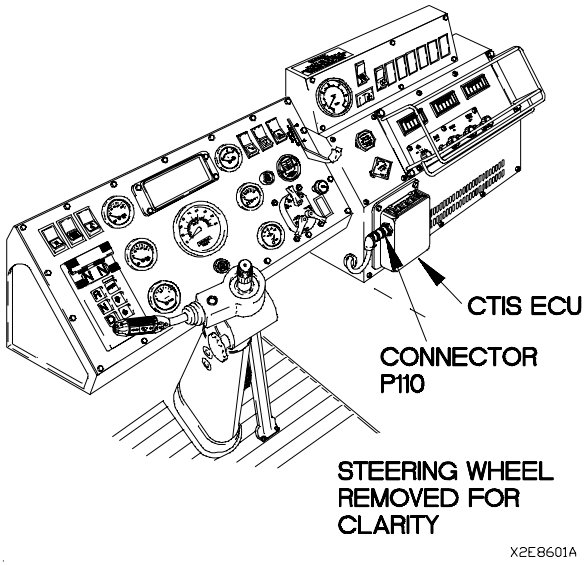
Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

Materials/Parts
Wire, Elect, 50 ft (Item 71, Appendix D)

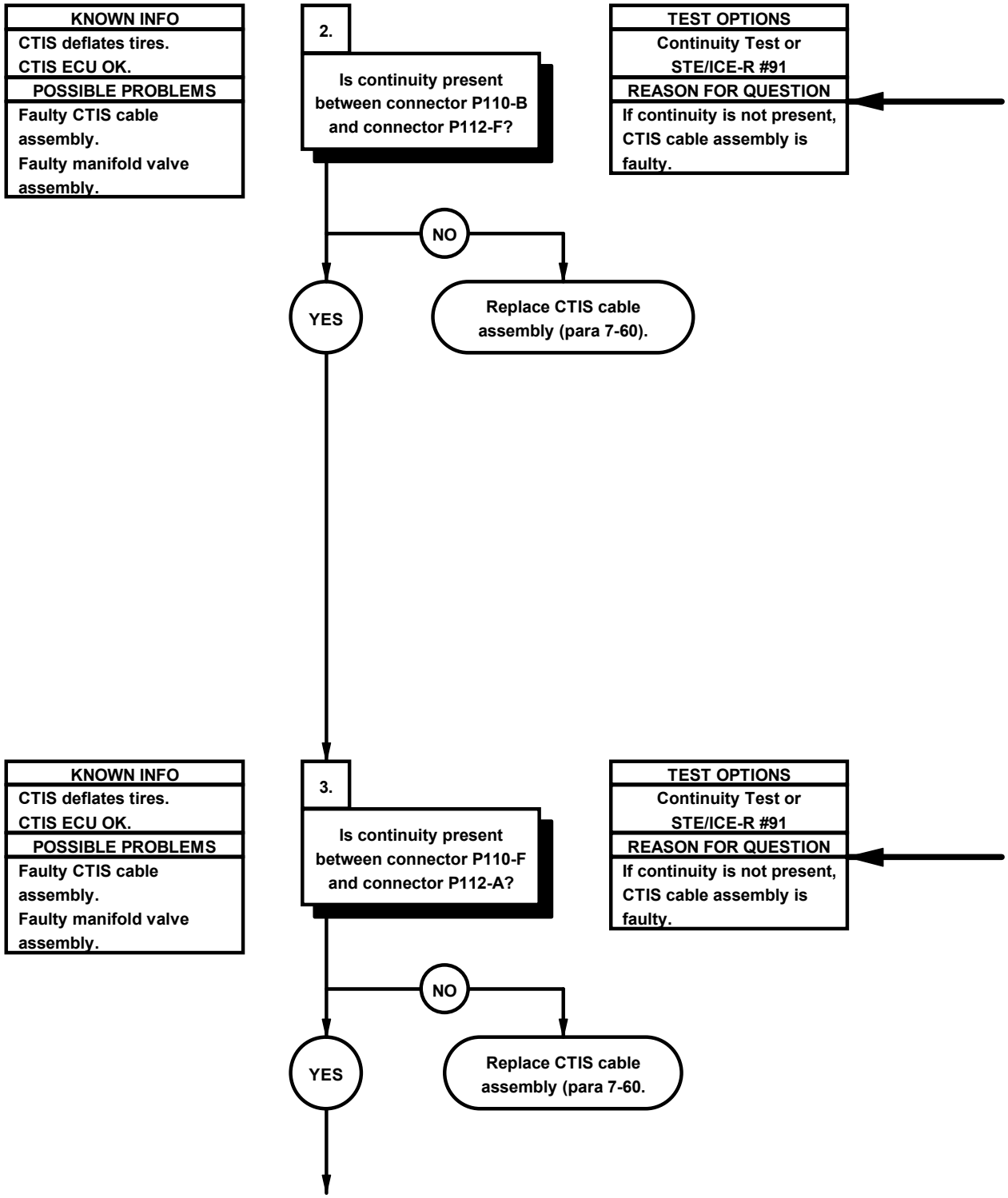


OPERATIONAL TEST

(1) Disconnect connector P110 from CTIS ECU.
(2) Connect connector P110 to a known-good CTIS ECU.
(3) Start vehicle (TM 9-2320-366-10-1).
(4) Allow air pressure to reach 85 psi.
(5) Deflate tires (TM 9-2320-366-10-1).
(6) If tires do not inflate, go to step 2 of this fault.
(7) If tires inflate, replace CTIS ECU (para 12-6).
(8) Shut down vehicle (TM 9-2320-366-10-1).
(9) Disconnect connector P110 from known-good CTIS ECU.

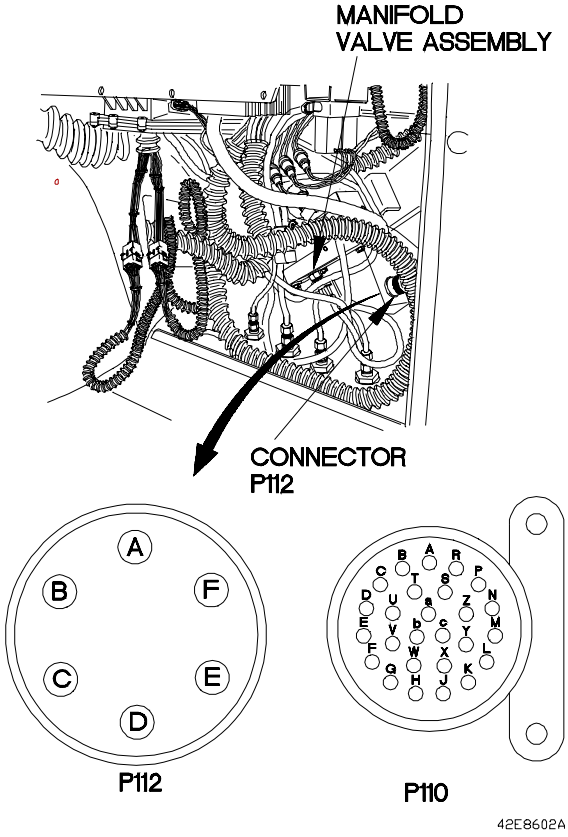


e86. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT INFLATE TIRES (CONT)

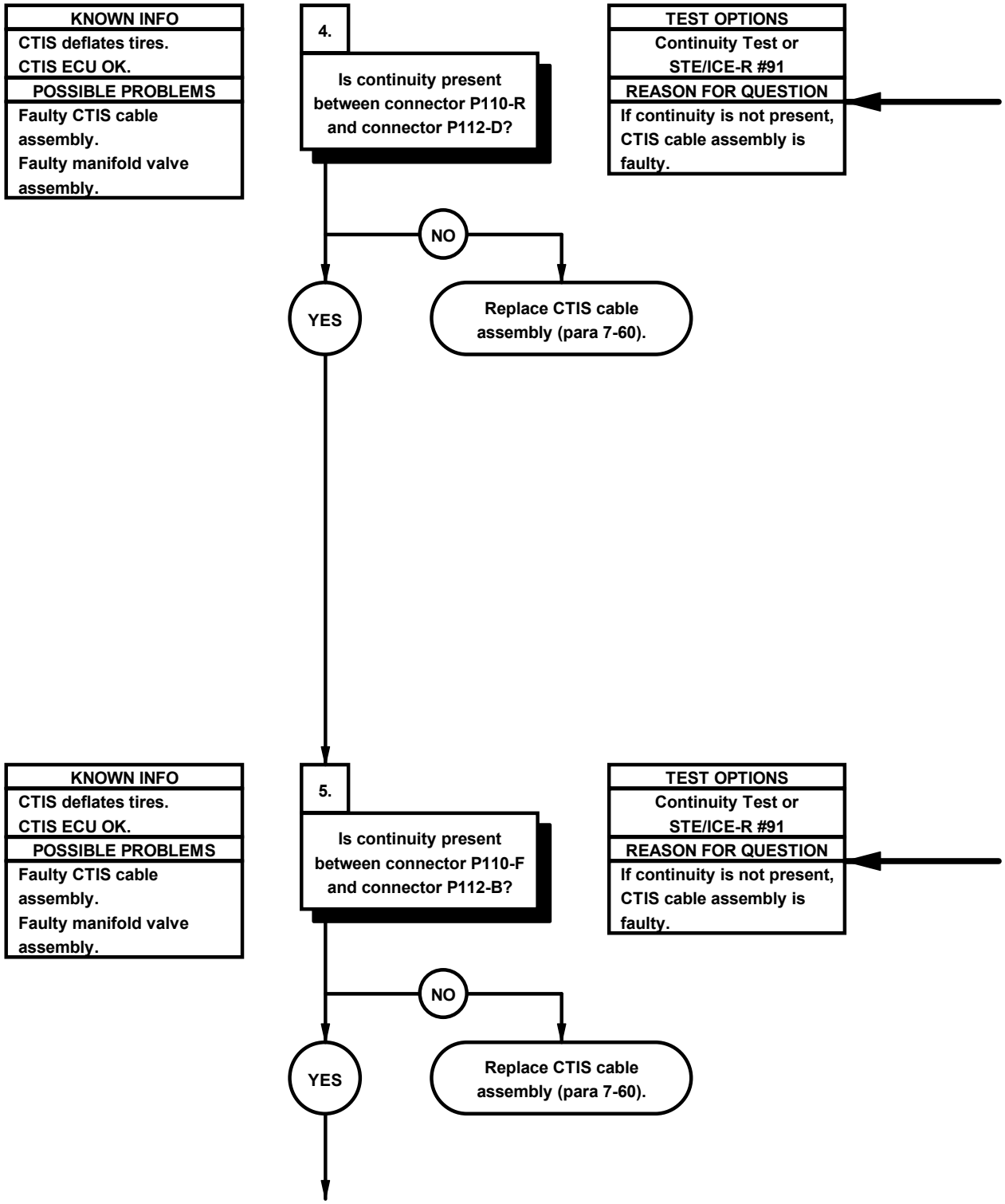


CONTINUITY TEST
(1) Remove kick panel (para 16-3).
(2) Disconnect connector P112 from manifold valve assembly.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector P110-B.
(5) Connect negative (-) probe of multimeter to connector P112-F and note reading on multimeter.
(6) If continuity is not present, replace CTIS cable assembly (para 7-60).

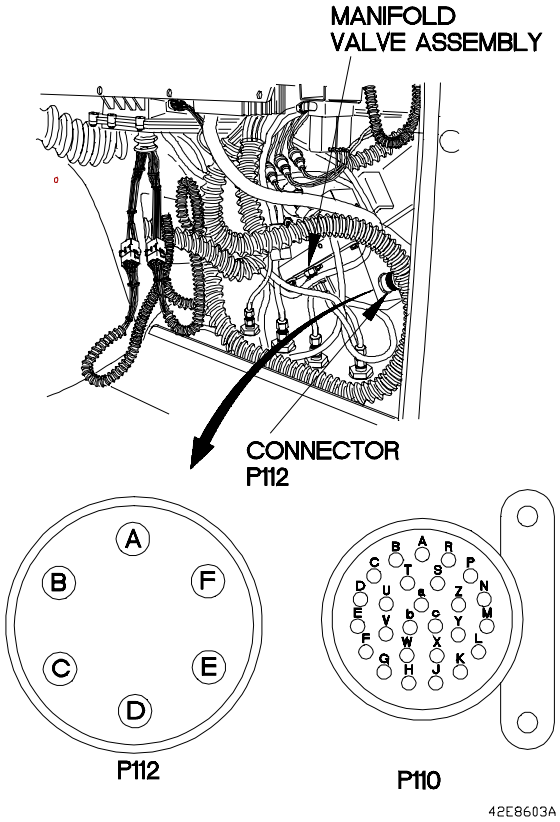
CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P110-F.
(3) Connect negative (-) probe of multimeter to connector P112-A and note reading on multimeter.
(4) If continuity is not present, replace CTIS cable assembly (para 7-60).



e86. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT INFLATE TIRES (CONT)

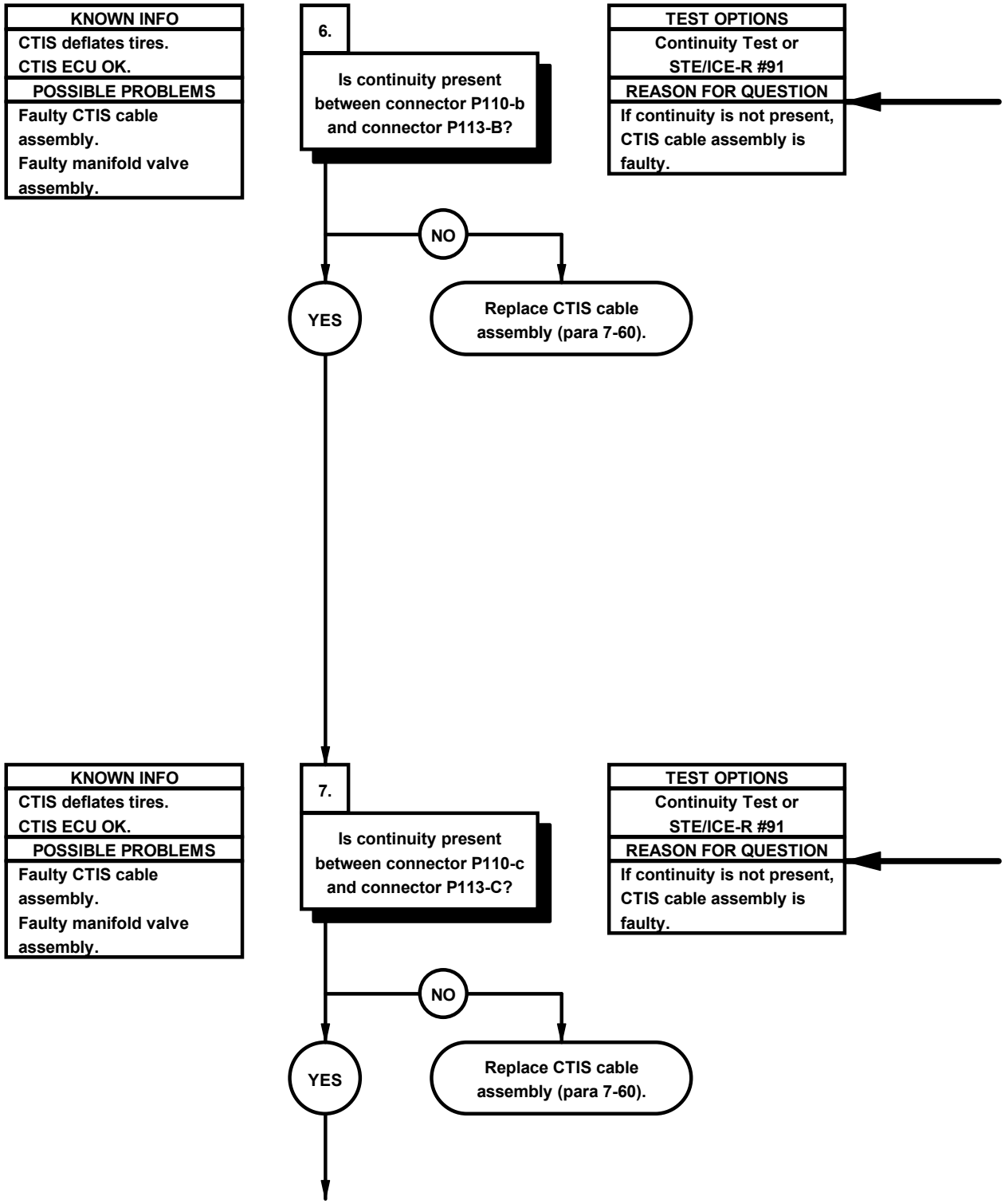


CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P110-R.
(3) Connect negative (-) probe of multimeter to connector P112-D and note reading on multimeter.
(4) If continuity is not present, replace CTIS cable assembly (para 7-60).

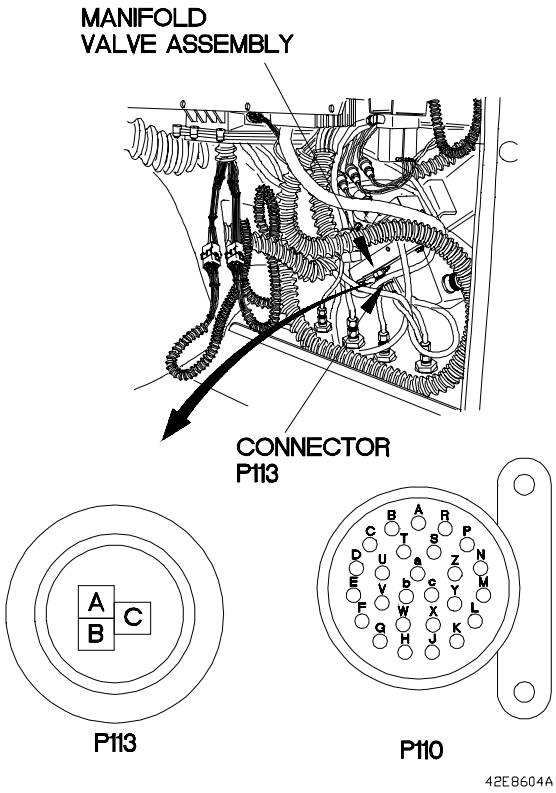


CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P110-F.
(3) Connect negative (-) probe of multimeter to connector P112-B and note reading on multimeter.
(4) If continuity is not present, replace CTIS cable assembly (para 7-60).
(5) Connect connector P112 to manifold valve assembly.

e86. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT INFLATE TIRES (CONT)

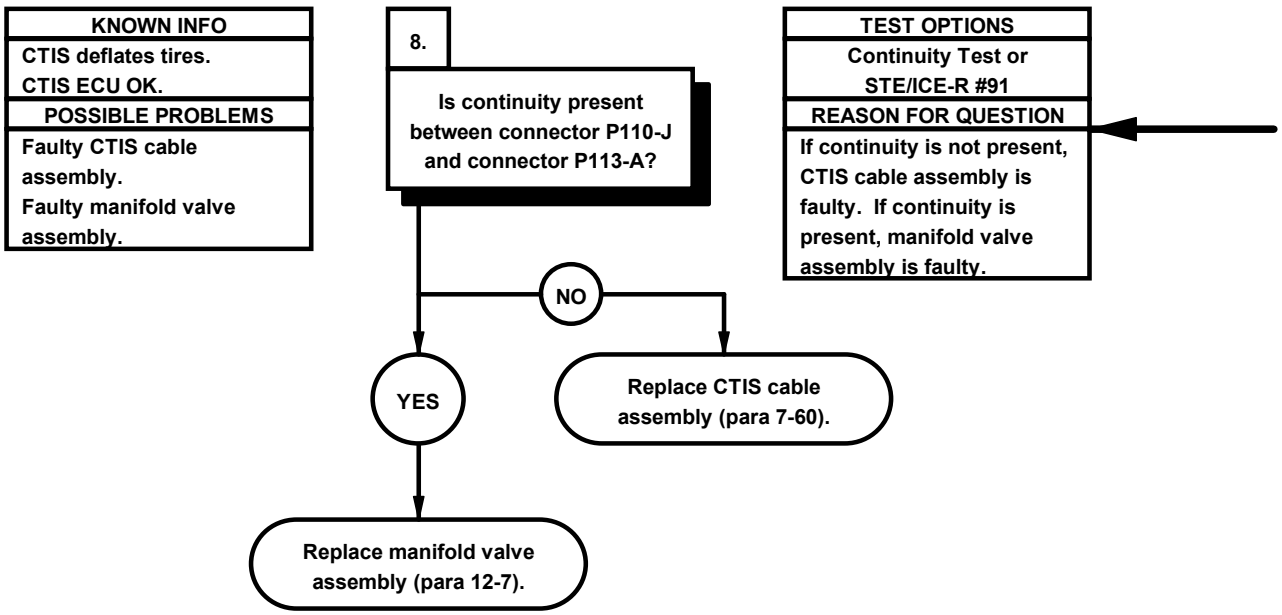


CONTINUITY TEST
(1) Disconnect connector P113 from manifold valve assembly.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector P110-b.
(4) Connect negative (-) probe of multimeter to connector P113-B and note reading on multimeter.
(5) If continuity is not present, replace CTIS cable assembly (para 7-60).

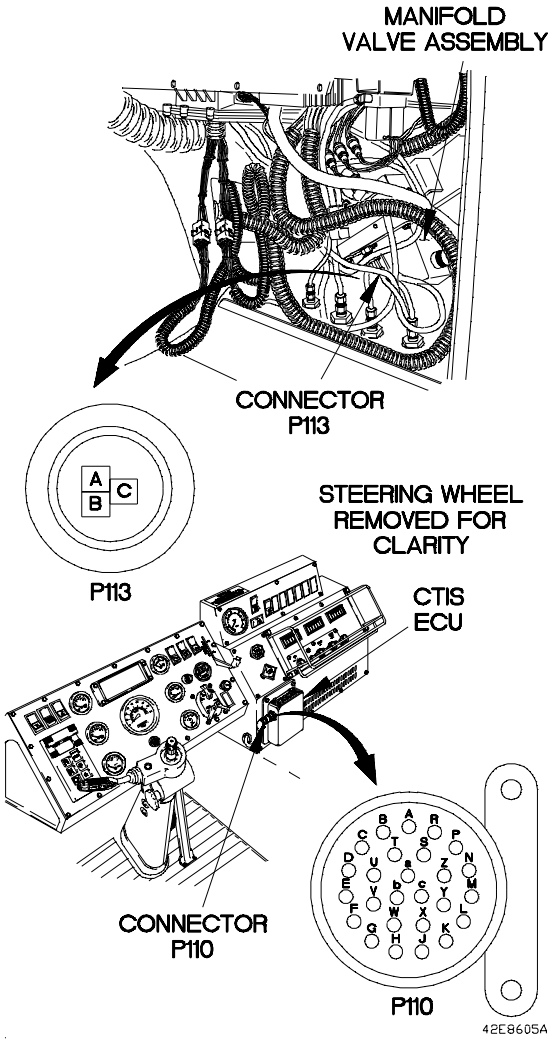


CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P110-c.
(3) Connect negative (-) probe of multimeter to connector P113-C and note reading on multimeter.
(4) If continuity is not present, replace CTIS cable assembly (para 7-60).

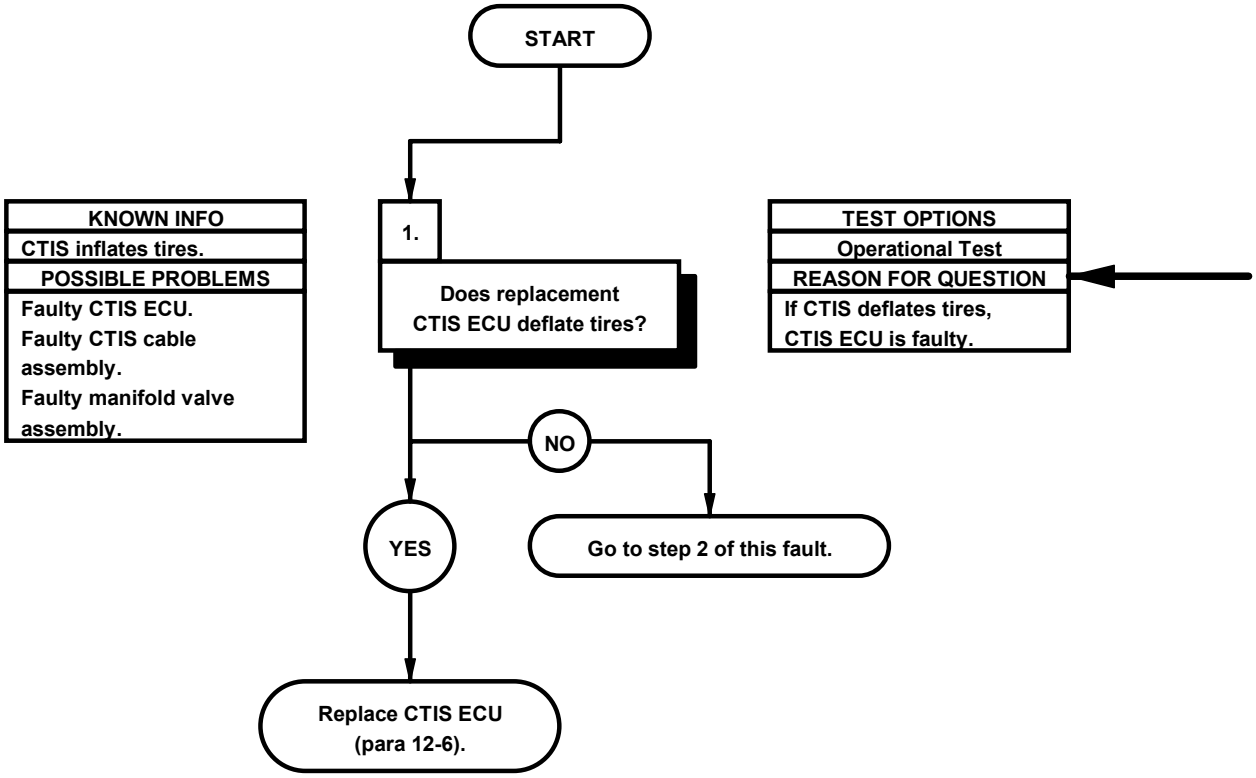
e86. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT INFLATE TIRES (CONT)



CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P110-J.
(3) Connect negative (-) probe of multimeter to connector P113-A and note reading on multimeter.
(4) If continuity is not present, replace CTIS cable assembly (para 7-60).
(5) If continuity is present, replace manifold valve assembly (para 12-7).
(6) Connect connector P113 to manifold valve assembly.
(7) Install kick panel (para 16-3).
(8) Connect connector P110 to CTIS ECU.

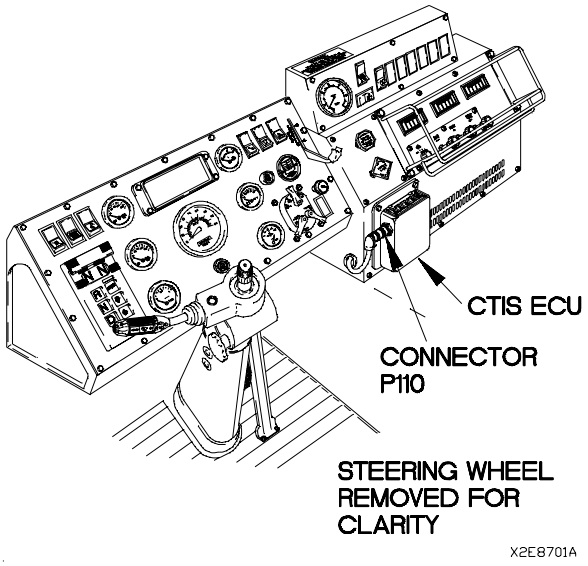


e87. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT DEFLATE TIRES	
INITIAL SETUP	
Equipment Condition Engine shut down (TM 9-2320-366-10-1).	**Tools and Special Tools** Tool Kit, Genl Mech (Item 46, Appendix C) STE/ICE-R (Item 41, Appendix C) Multimeter, Digital (Item 22, Appendix C)
Personnel Required (2)	**Materials/Parts** Wire, Elect, 50 ft (Item 71, Appendix D)
References TM 9-4910-571-12&P	

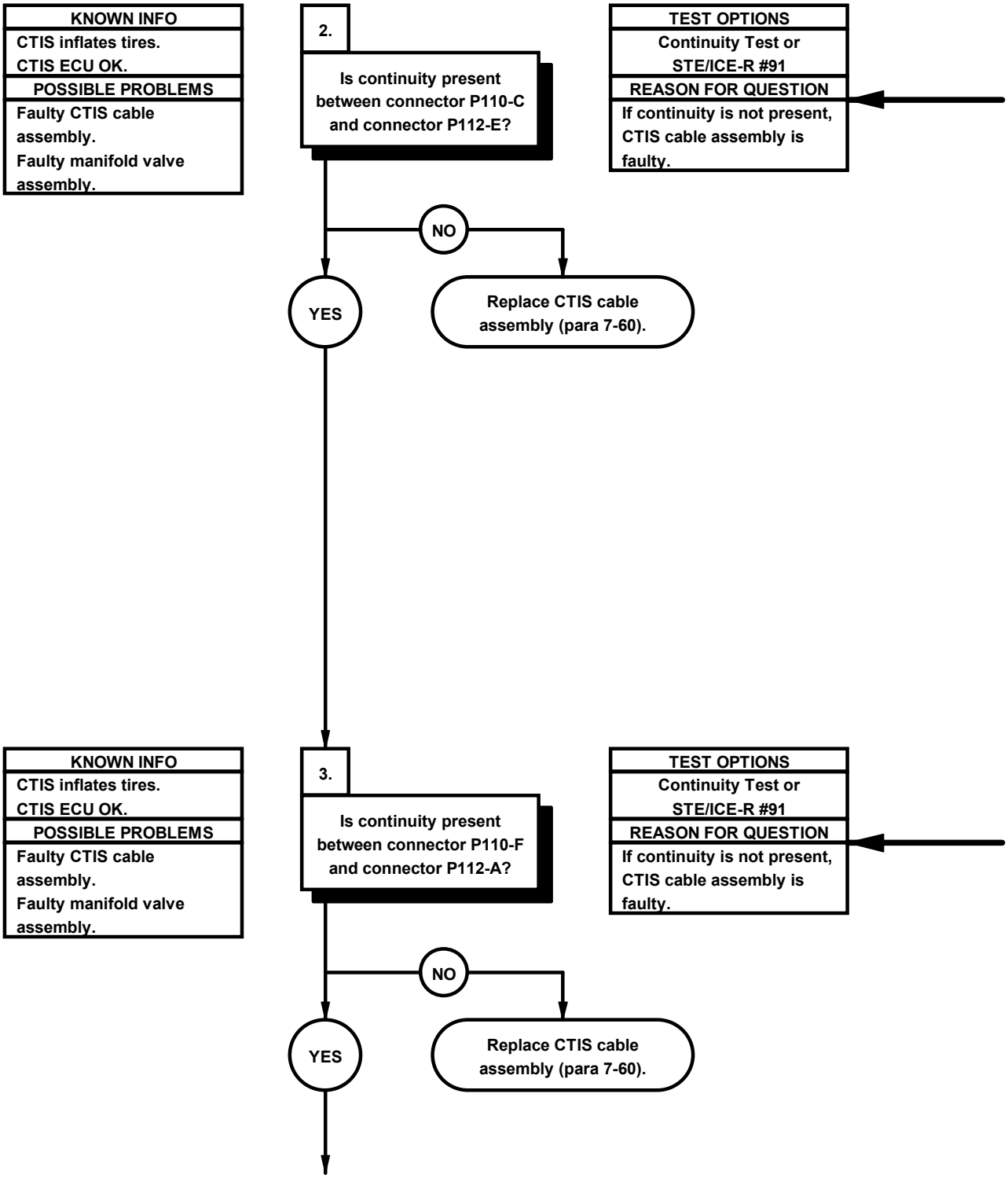


OPERATIONAL TEST

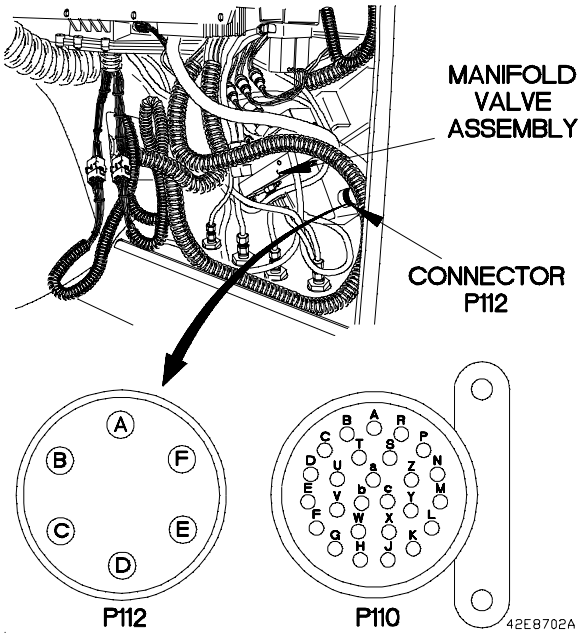
(1) Disconnect connector P110 from CTIS ECU.
(2) Connect connector P110 to a known-good CTIS ECU.
(3) Start vehicle (TM 9-2320-366-10-1).
(4) Allow air pressure to reach 85 psi.
(5) Deflate tires (TM 9-2320-366-10-1).
(6) If tires do not deflate, go to step 2 of this fault.
(7) If tires deflate, replace CTIS ECU (para 12-6).
(8) Shut down vehicle (TM 9-2320-366-10-1).
(9) Disconnect connector P110 from known-good CTIS ECU.



e87. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT DEFLATE TIRES (CONT)

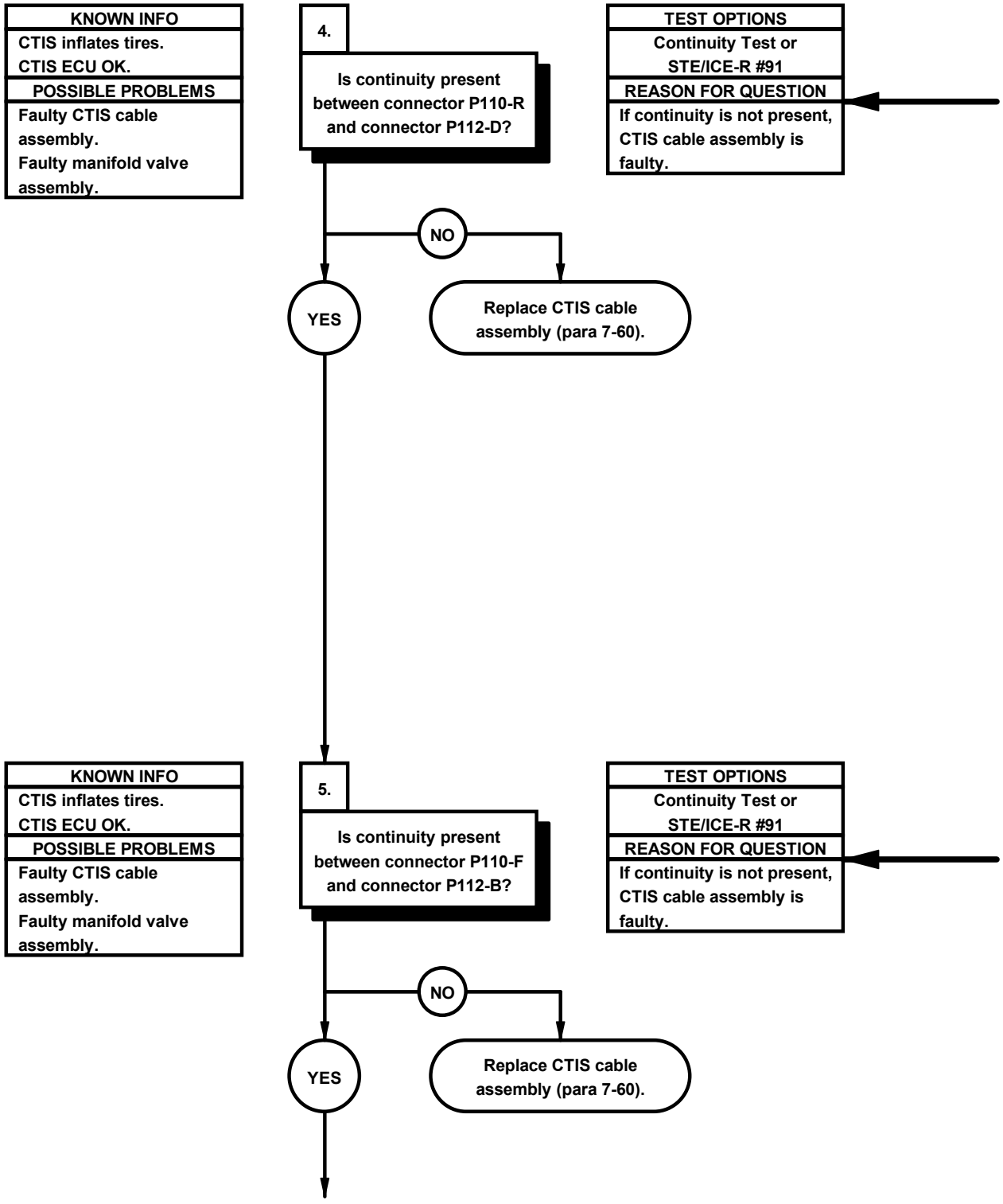


CONTINUITY TEST
(1) Remove kick panel (para 16-3).
(2) Disconnect connector P112 from manifold valve assembly.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector P110-C.
(5) Connect negative (-) probe of multimeter to connector P112-E and note reading on multimeter.
(6) If continuity is not present, replace CTIS cable assembly (para 7-60).

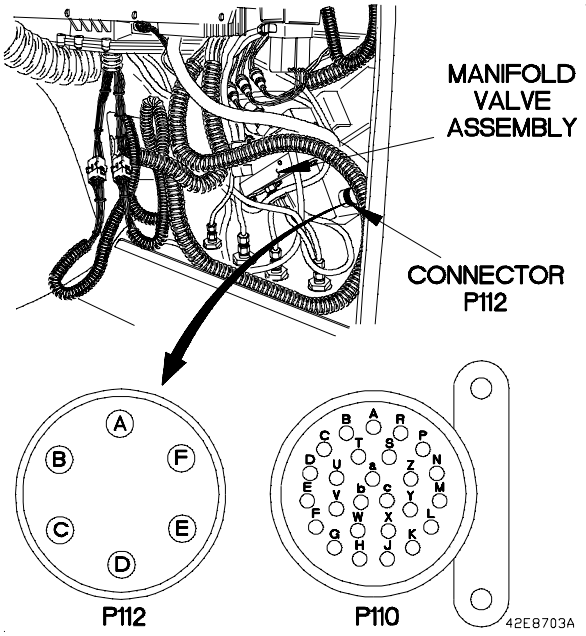


CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P110-F.
(3) Connect negative (-) probe of multimeter to connector P112-A and note reading on multimeter.
(4) If continuity is not present, replace CTIS cable assembly (para 7-60).

e87. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT DEFLATE TIRES (CONT)

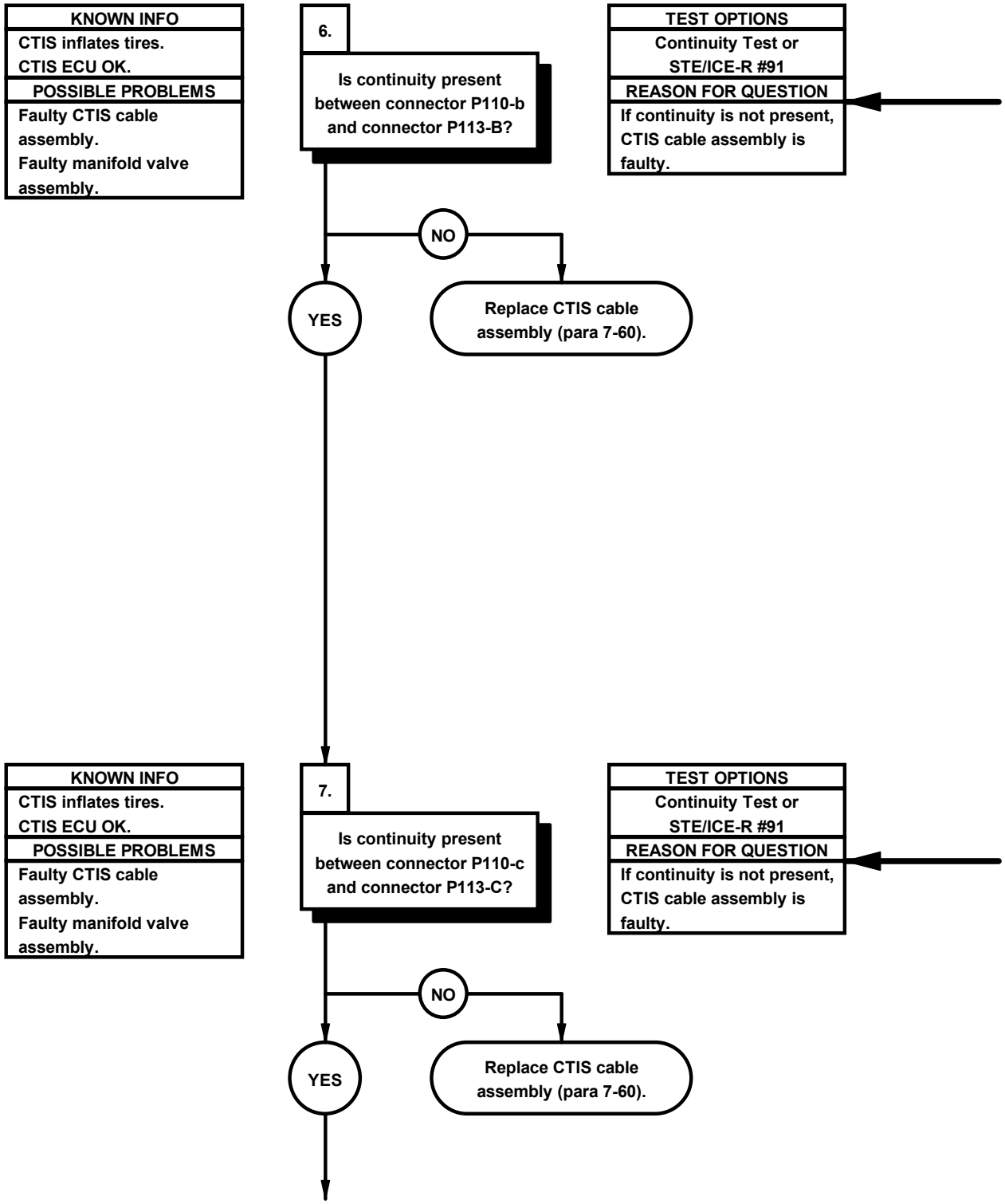


CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P110-R.
(3) Connect negative (-) probe of multimeter to connector P112-D and note reading on multimeter.
(4) If continuity is not present, replace CTIS cable assembly (para 7-60).

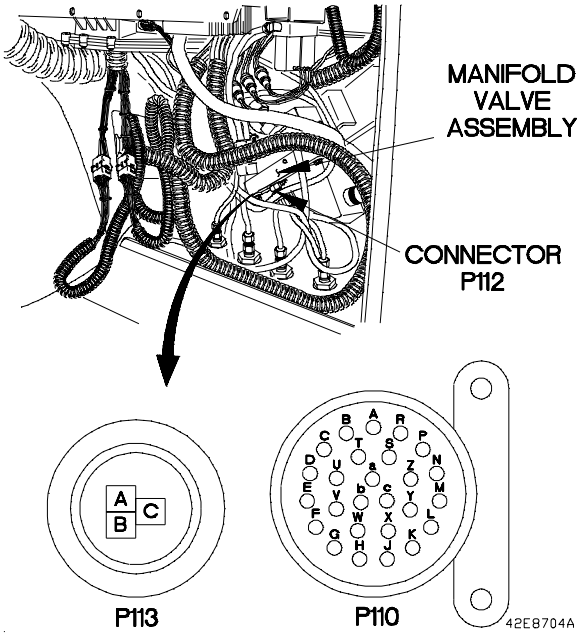


CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P110-F.
(3) Connect negative (-) probe of multimeter to connector P112-B and note reading on multimeter.
(4) If continuity is not present, replace CTIS cable assembly (para 7-60).
(5) Connect connector P112 to manifold valve assembly.

e87. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT DEFLATE TIRES (CONT)

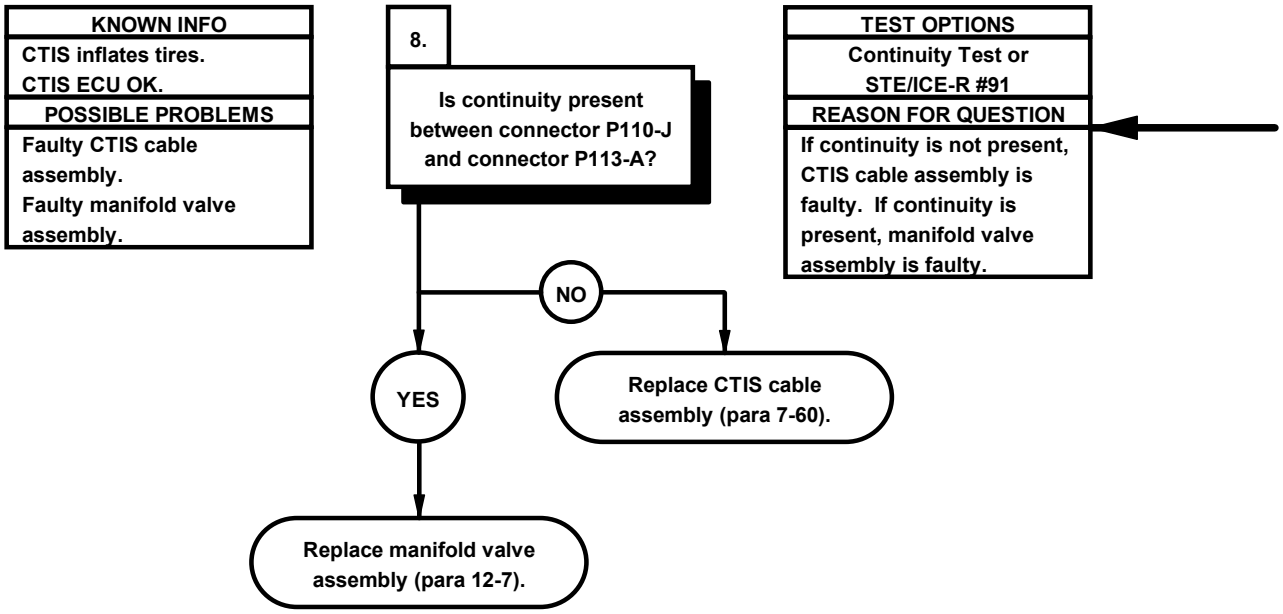


CONTINUITY TEST
(1) Disconnect connector P113 from manifold valve assembly.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector P110-b.
(4) Connect negative (-) probe of multimeter to connector P113-B and note reading on multimeter.
(5) If continuity is not present, replace CTIS cable assembly (para 7-60).

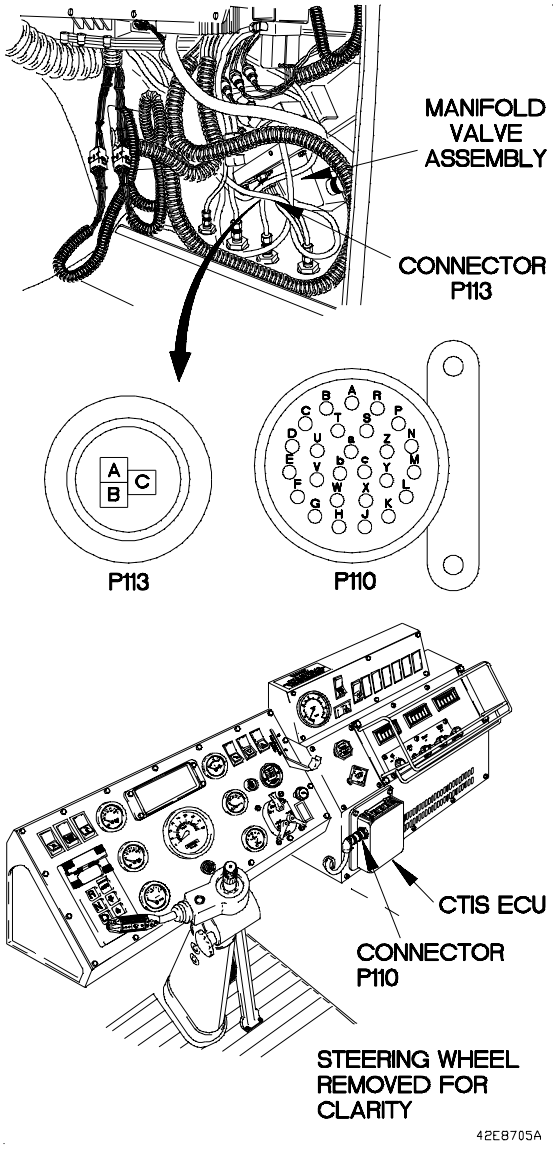


CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P110-c.
(3) Connect negative (-) probe of multimeter to connector P113-C and note reading on multimeter.
(4) If continuity is not present, replace CTIS cable assembly (para 7-60).

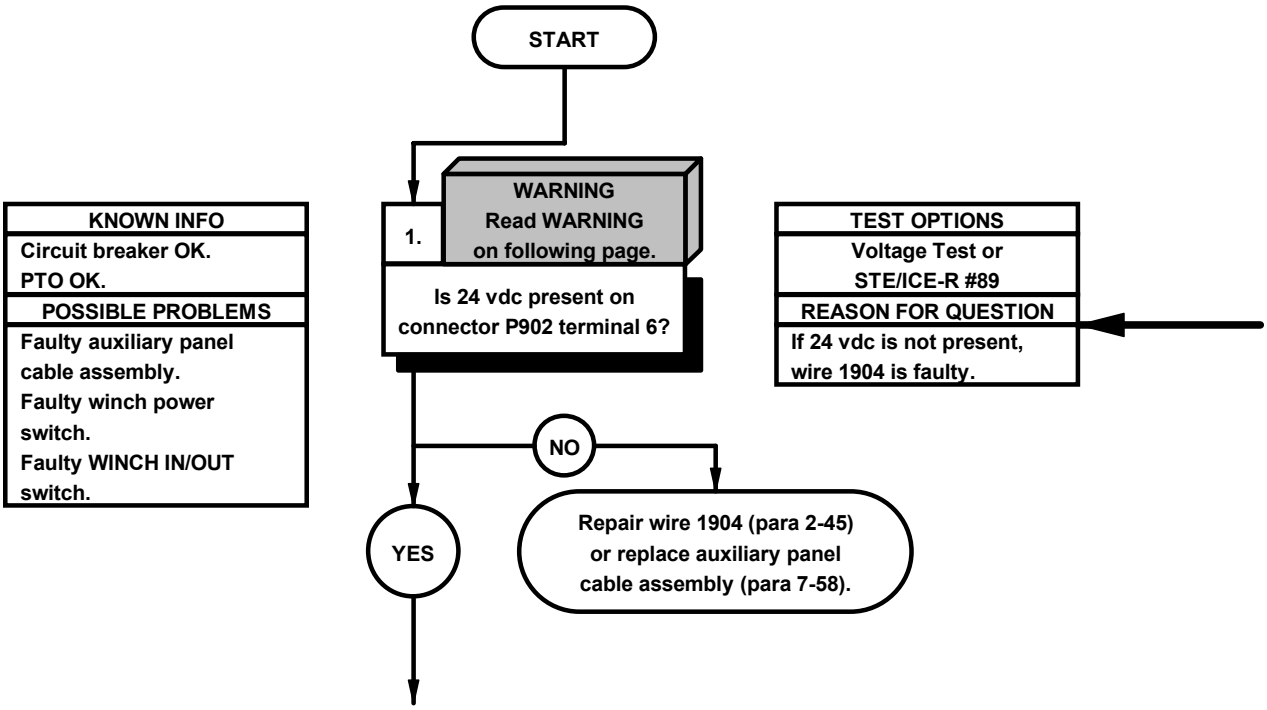
e87. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT DEFLATE TIRES (CONT)



CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P110-J.
(3) Connect negative (-) probe of multimeter to connector P113-A and note reading on multimeter.
(4) If continuity is not present, replace CTIS cable assembly (para 7-60).
(5) If continuity is present, replace manifold valve assembly (para 12-7).
(6) Connect connector P113 to manifold valve assembly.
(7) Install kick panel (para 16-3).
(8) Connect connector P110 to CTIS ECU.



e88. 15K SELF-RECOVERY WINCH (SRW) DOES NOT REEL IN OR PAY OUT	
INITIAL SETUP	
Equipment Condition Engine shut down (TM 9-2320-366-10-1). Personnel Required (2) Materials/Parts Wire, Elect, 50 ft (Item 71, Appendix D)	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) STE/ICE-R (Item 41, Appendix C) Multimeter, Digital (Item 22, Appendix C) References TM 9-4910-571-12&P

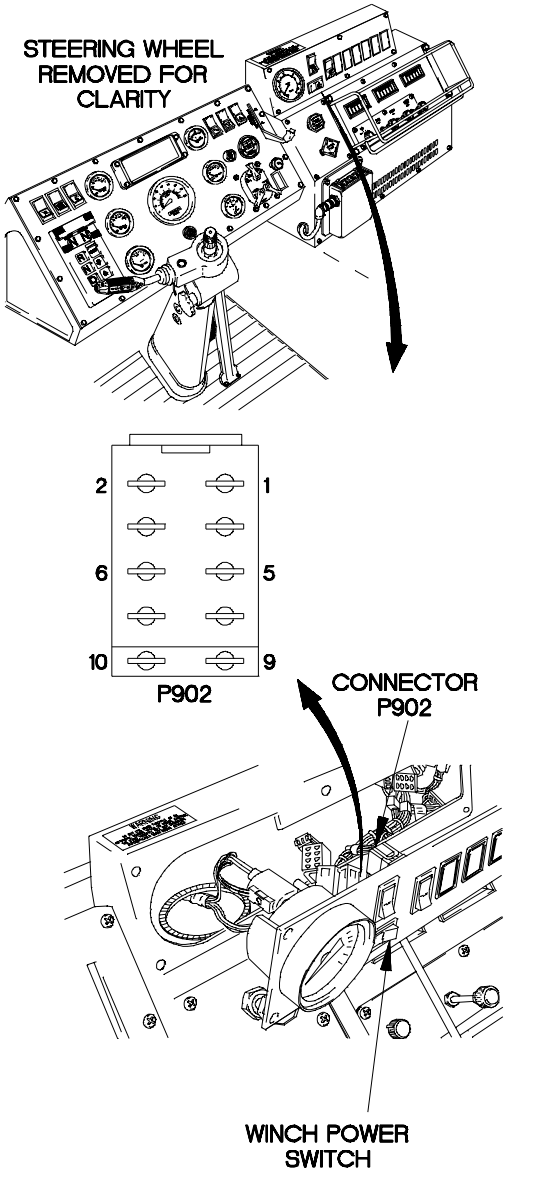


WARNING

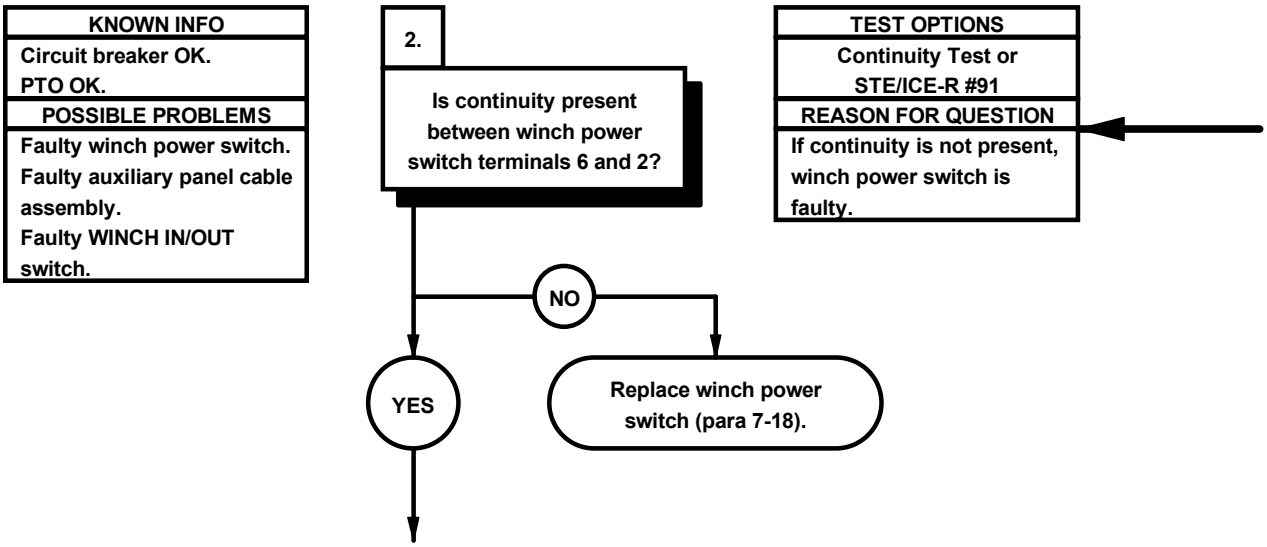
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

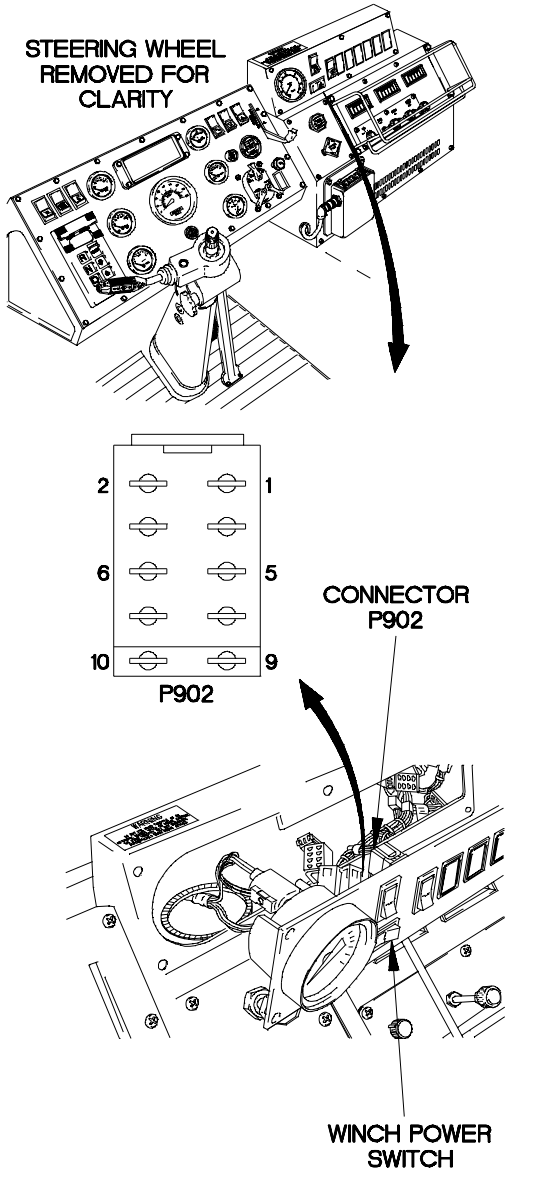
(1) Remove auxiliary panel and tilt back. Do not disconnect connectors (para 7-8).
(2) Disconnect connector P902 from winch power switch.
(3) Set multimeter to volts dc.
(4) Connect positive (+) probe of multimeter to connector P902 terminal 6.
(5) Connect negative (-) probe of multimeter to ground.
(6) Position master power switch to on (TM 9-2320-366-10-1).
(7) Position PTO switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(8) If 24 vdc is not present, repair wire 1904 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
(9) Position PTO switch to off (TM 9-2320-366-10-1).
(10) Position master power switch to off (TM 9-2320-366-10-1).



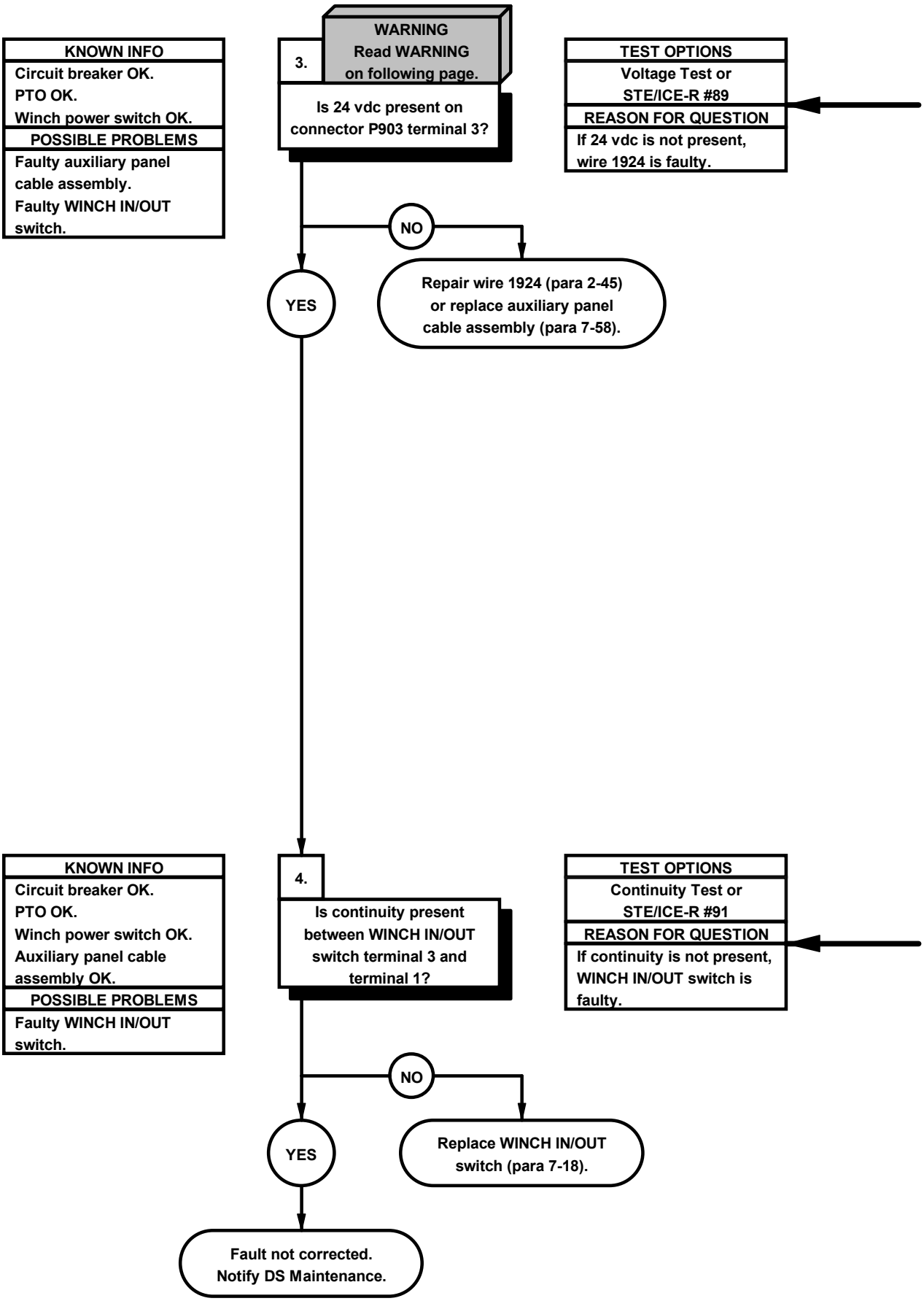
e88. 15K SELF-RECOVERY WINCH (SRW) DOES NOT REEL IN OR PAY OUT (CONT)



CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to winch power switch terminal 6.
(3) Connect negative (-) probe of multimeter to winch power switch terminal 2.
(4) Position winch power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(5) If continuity is not present, replace winch power switch (para 7-18).
(6) Position winch power switch to off (TM 9-2320-366-10-1).
(7) Connect connector P902 to winch power switch.



e88. 15K SELF-RECOVERY WINCH (SRW) DOES NOT REEL IN OR PAY OUT (CONT)



WARNING

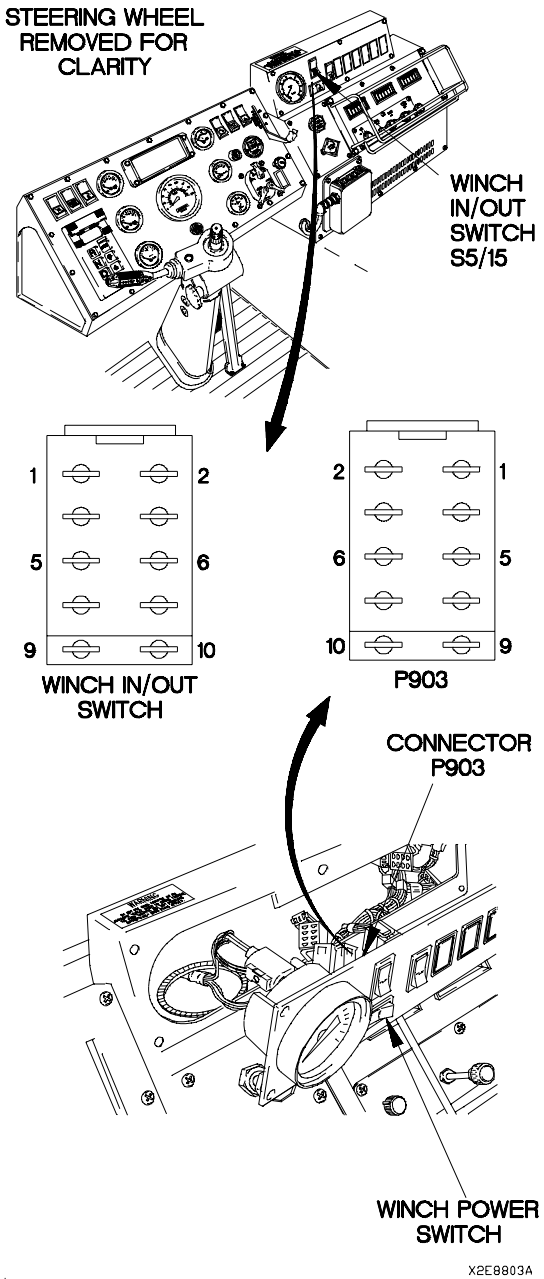
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

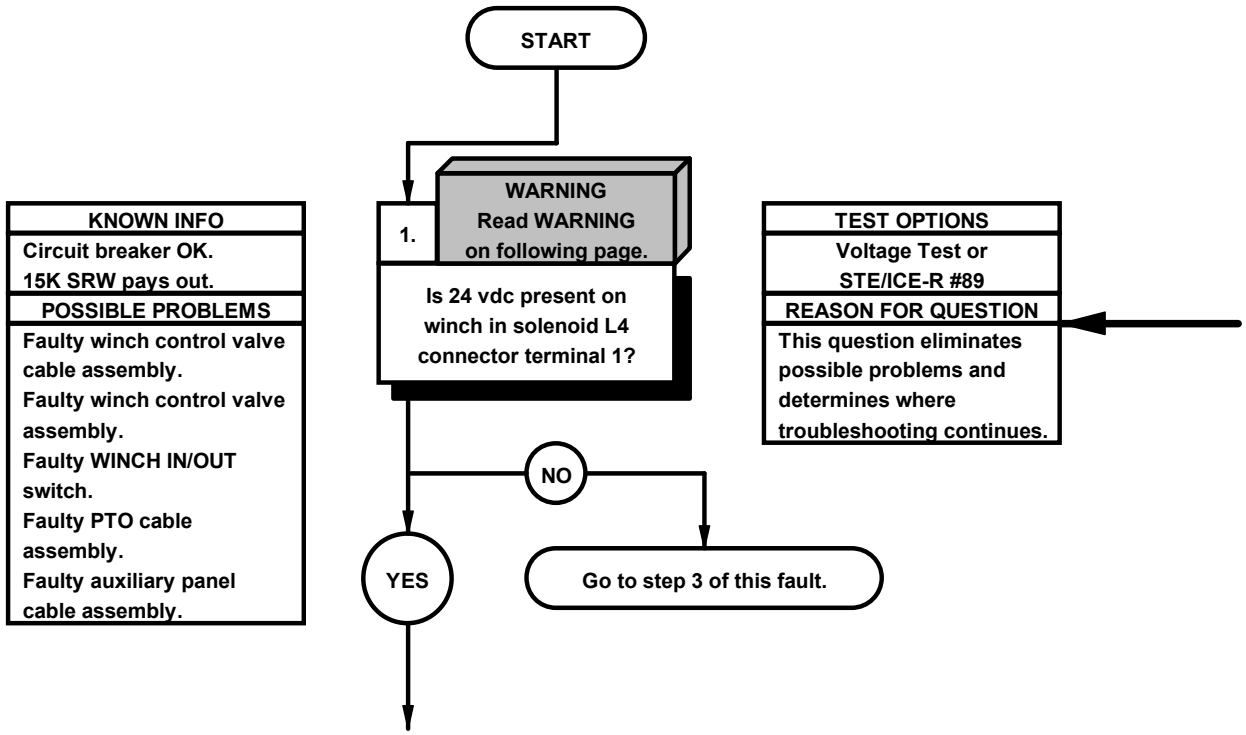
(1) Disconnect connector P903 from WINCH IN/OUT switch.
(2) Set multimeter to volts dc.
(3) Connect positive (+) probe of multimeter to connector P903 terminal 3.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position master power switch to on (TM 9-2320-366-10-1).
(6) Position PTO switch to on (TM 9-2320-366-10-1).
(7) Position winch power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(8) If 24 vdc is not present, repair wire 1924 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
(9) Position winch power switch to off (TM 9-2320-366-10-1).
(10) Position PTO switch to off (TM 9-2320-366-10-1).
(11) Position master power switch to off (TM 9-2320-366-10-1).

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to WINCH IN/OUT switch terminal 3.
(3) Connect negative (-) probe of multimeter to WINCH IN/OUT switch terminal 1.
(4) Position WINCH IN/OUT switch to in (TM 9-2320-366-10-1) and note reading on multimeter.
(5) If continuity is not present, replace WINCH IN/OUT switch (para 7-18).
(6) If continuity is present, fault not corrected. Notify DS Maintenance.
(7) Connect connector P903 to WINCH IN/OUT switch.
(8) Install auxiliary panel (para 7-8).



e89. 15K SELF-RECOVERY WINCH (SRW) DOES NOT REEL IN	
INITIAL SETUP	
Equipment Condition Engine shut down (TM 9-2320-366-10-1).	**Tools and Special Tools** Tool Kit, Genl Mech (Item 46, Appendix C) STE/ICE-R (Item 41, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Personnel Required (2)	
References TM 9-4910-571-12&P	**Materials/Parts** Wire, Elect, 50 ft (Item 71, Appendix D)

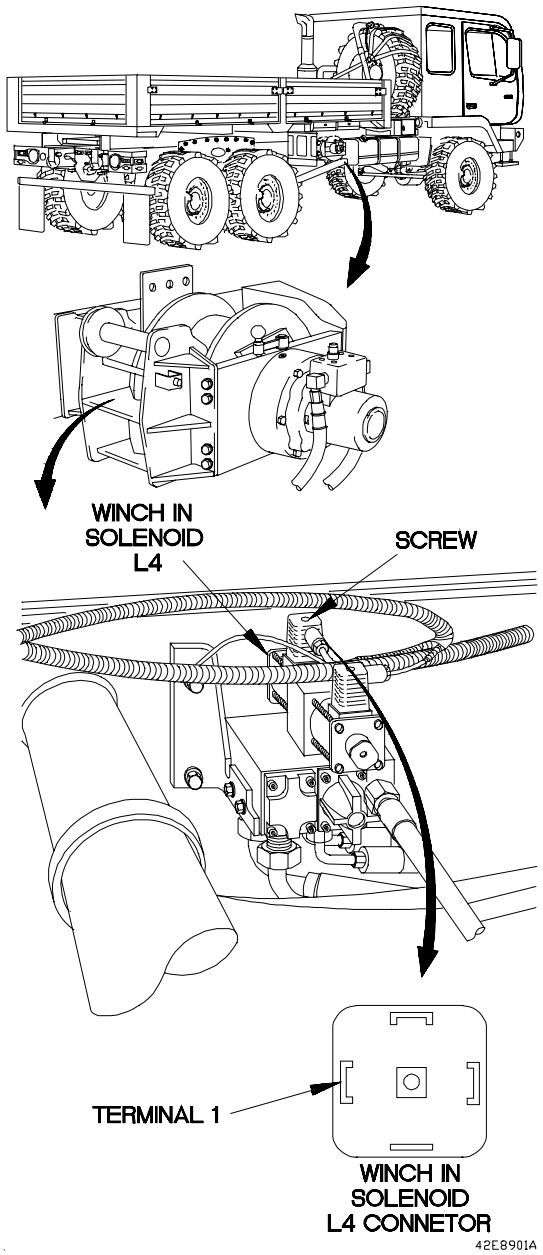


WARNING

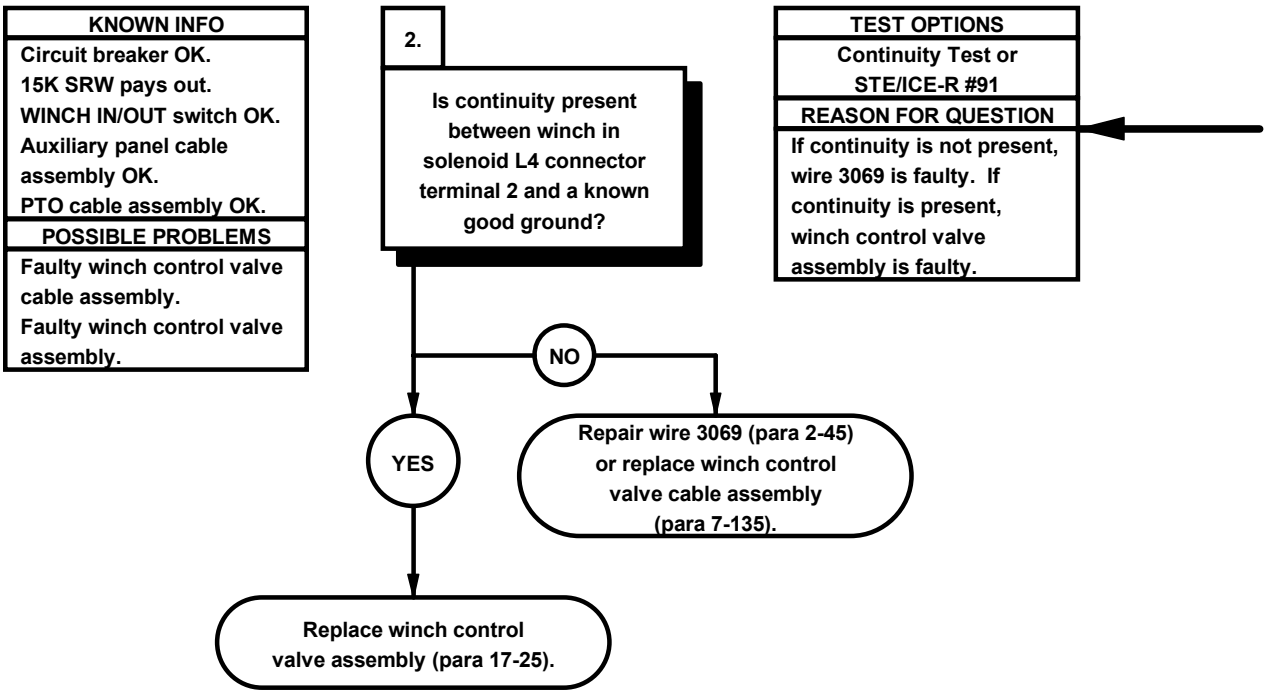
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Remove four nuts, washers, solenoid bracket, washers, and screws.
(2) Loosen screw and disconnect winch in solenoid L4 connector from solenoid L4.
(3) Set multimeter to volts dc.
(4) Connect positive (+) probe of multimeter to winch in solenoid L4 connector terminal 1.
(5) Connect negative (-) probe of multimeter to ground.
(6) Position master power switch to on (TM 9-2320-366-10-1).
(7) Position PTO switch to on (TM 9-2320-366-10-1).
(8) Position winch power switch to on (TM 9-2320-366-10-1).
(9) Position WINCH IN/OUT switch to IN (TM 9-2320-366-10-1) and note reading on multimeter.
(10) If 24 vdc is not present, go to step 3 of this fault.
(11) Position winch power switch to off (TM 9-2320-366-10-1).
(12) Position PTO switch to off (TM 9-2320-366-10-1).
(13) Position master power switch to off (TM 9-2320-366-10-1).

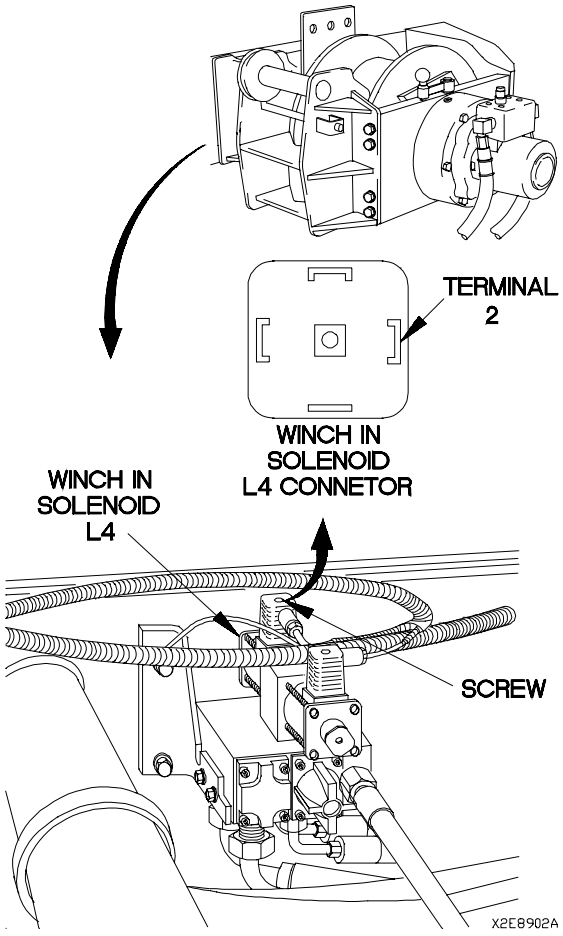


e89. 15K SELF-RECOVERY WINCH (SRW) DOES NOT REEL IN (CONT)

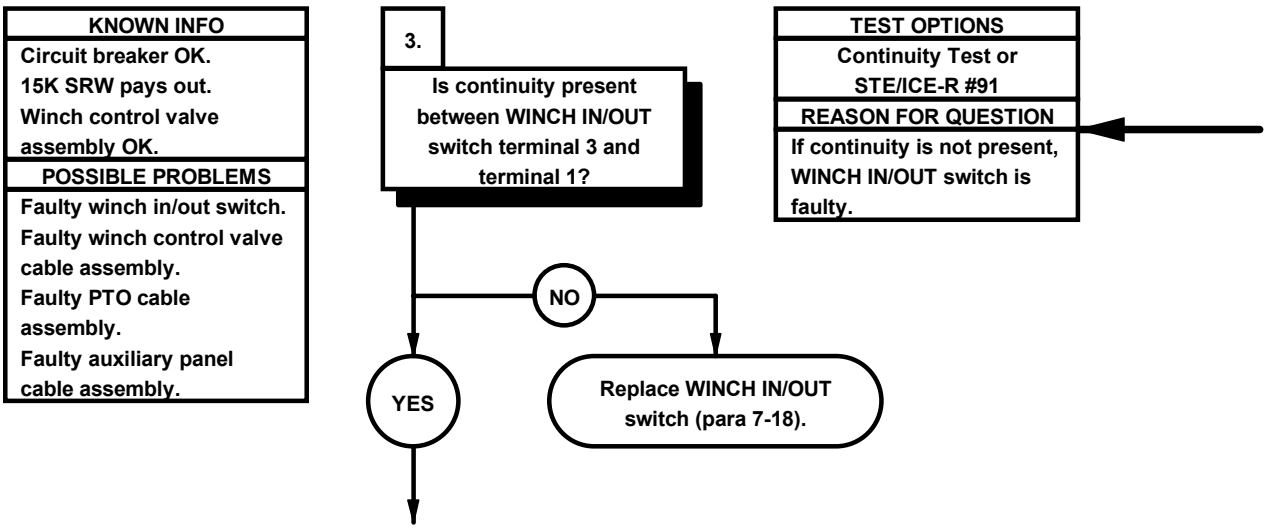


CONTINUITY TEST

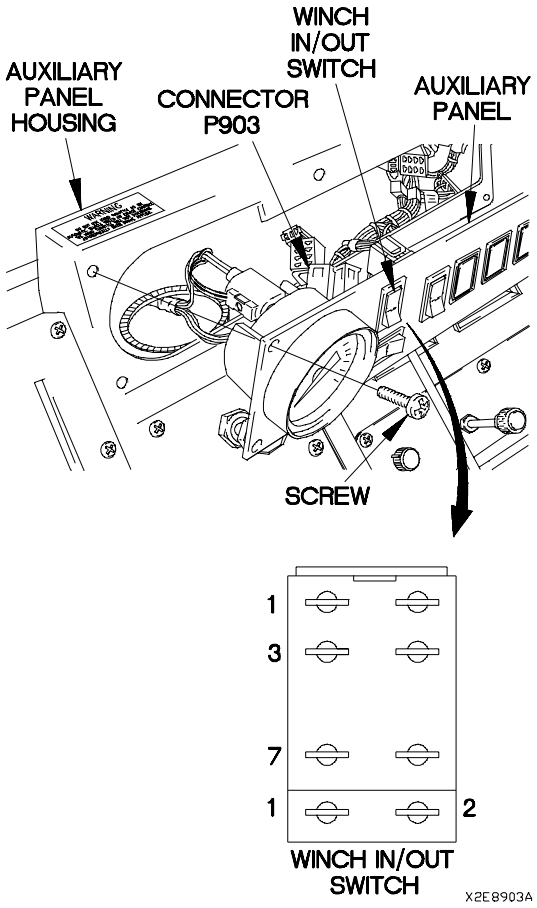
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to winch in solenoid L4 terminal 2.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair wire 3069 (para 2-45) or replace winch control valve cable assembly (para 7-135).
(5) If continuity is present, replace winch control valve assembly (para 17-25).
(6) Connect winch in solenoid L4 connector on solenoid L4 and tighten screw.



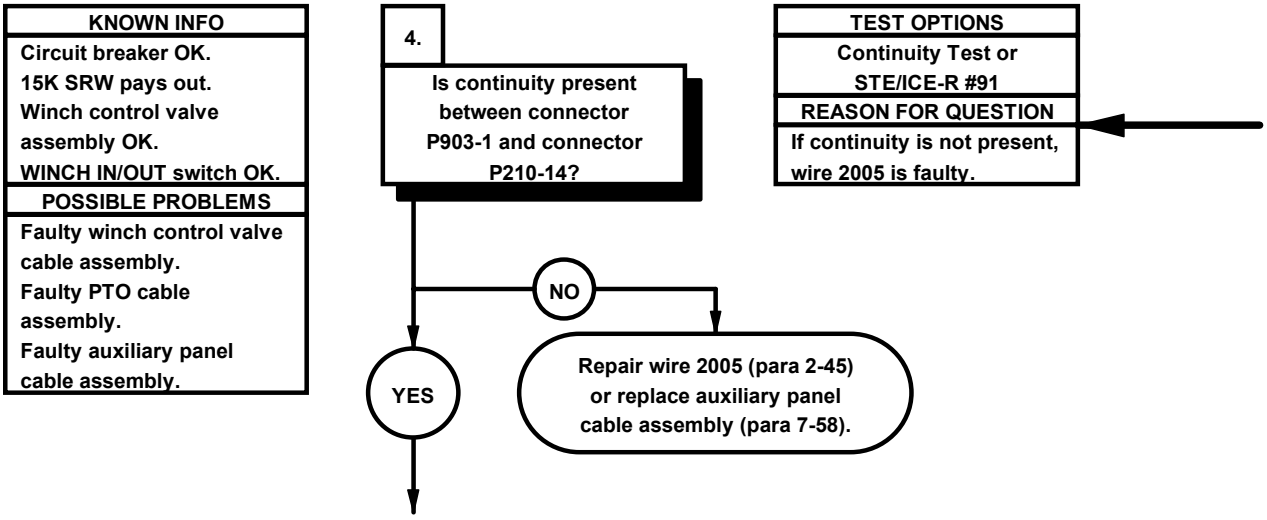
e89. 15K SELF-RECOVERY WINCH (SRW) DOES NOT REEL IN (CONT)



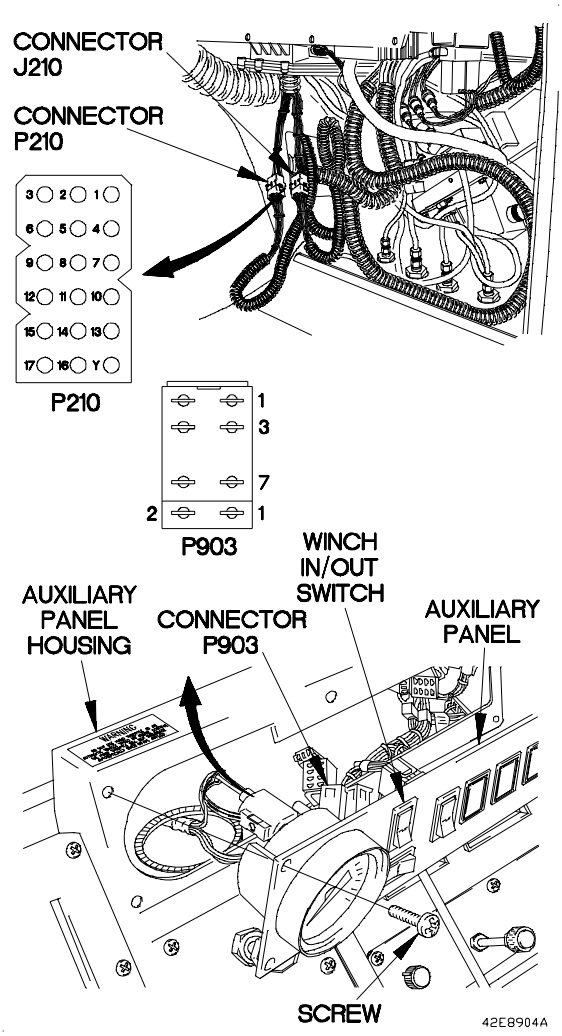
CONTINUITY TEST
(1) Remove six screws from auxiliary panel.
(2) Lift auxiliary panel from auxiliary panel housing to gain access.
(3) Disconnect connector P903 from WINCH IN/OUT switch.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to WINCH IN/OUT switch terminal 3.
(6) Connect negative (-) probe of multimeter to WINCH IN/OUT switch terminal 1.
(7) Position WINCH IN/OUT switch to in (TM 9-2320-366-10-1) and note reading on multimeter.
(8) If continuity is not present, replace WINCH IN/OUT switch (para 7-18).



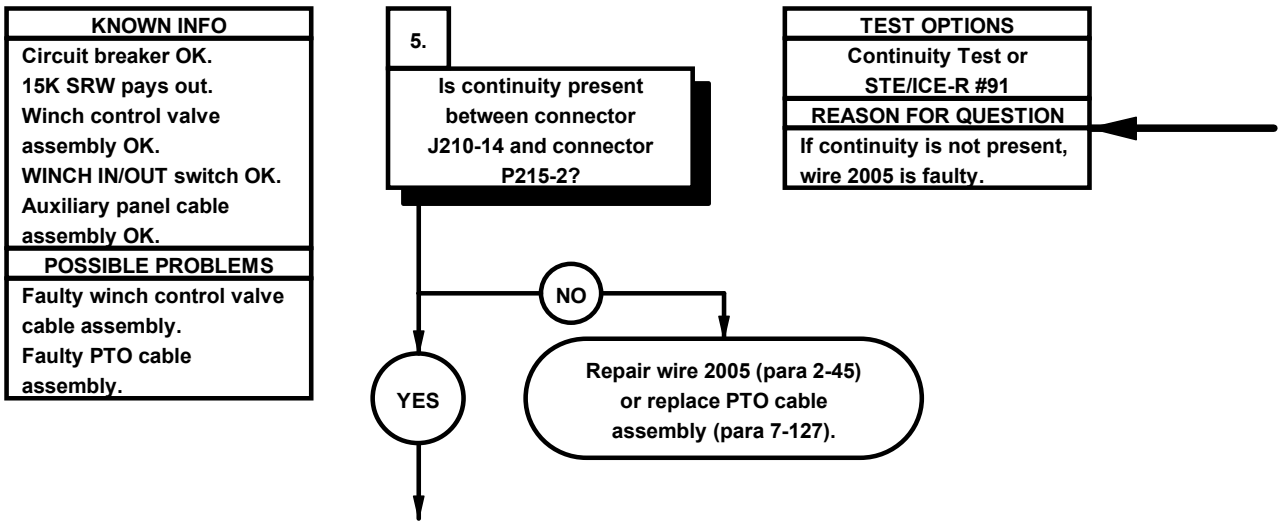
e89. 15K SELF-RECOVERY WINCH (SRW) DOES NOT REEL IN (CONT)



CONTINUITY TEST
(1) Remove kick panel (para 16-3).
(2) Disconnect connector P210 from connector J210.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector P903-1.
(5) Connect negative (-) probe of multimeter to connector P210-14 and note reading on multimeter.
(6) If continuity is not present, repair wire 2005 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
(7) Connect connector P903 to WINCH IN/OUT switch.
(8) Position auxiliary panel on auxiliary panel housing with six screws.
(9) Tighten six screws to 24 lb-in. (3 N·m).

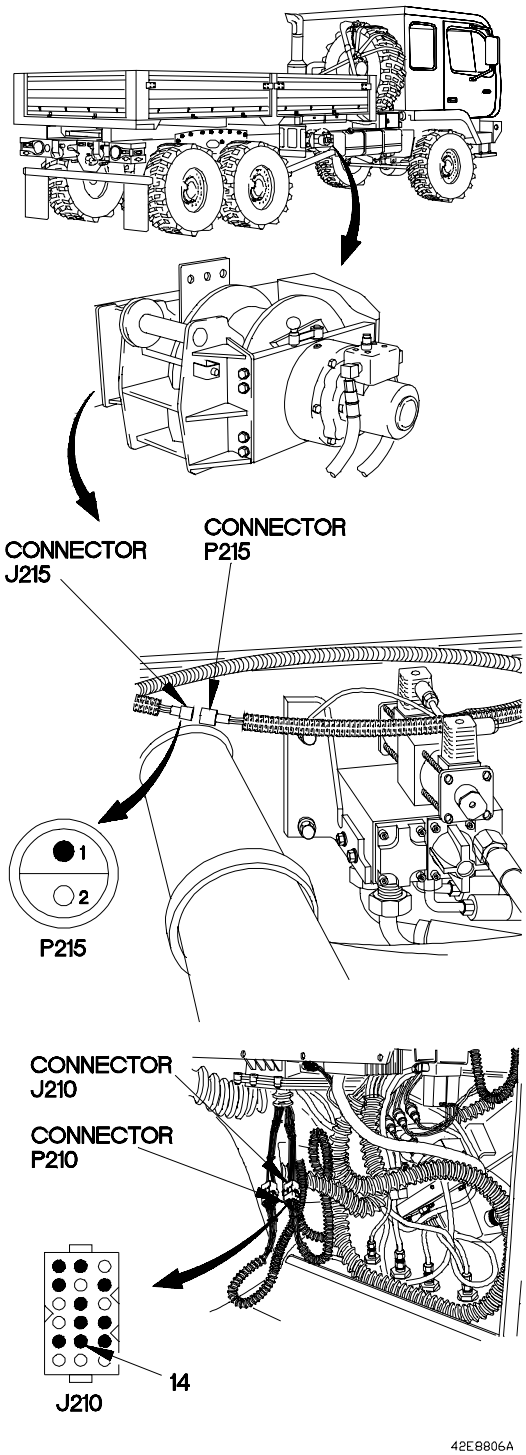


e89. 15K SELF-RECOVERY WINCH (SRW) DOES NOT REEL IN (CONT)

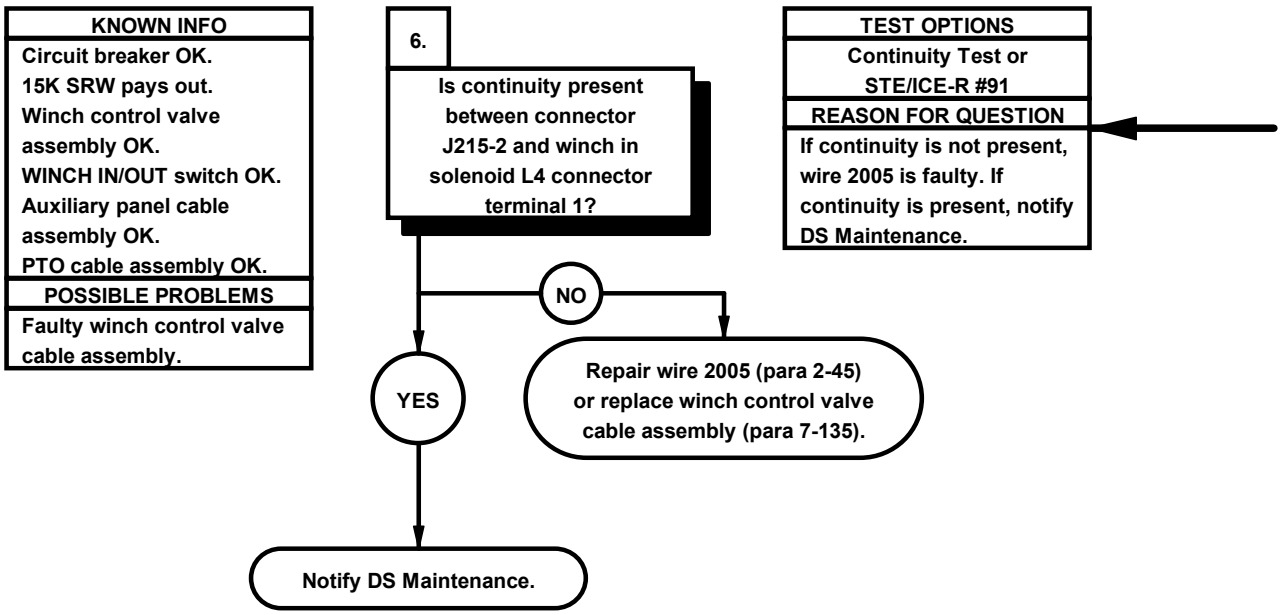


CONTINUITY TEST

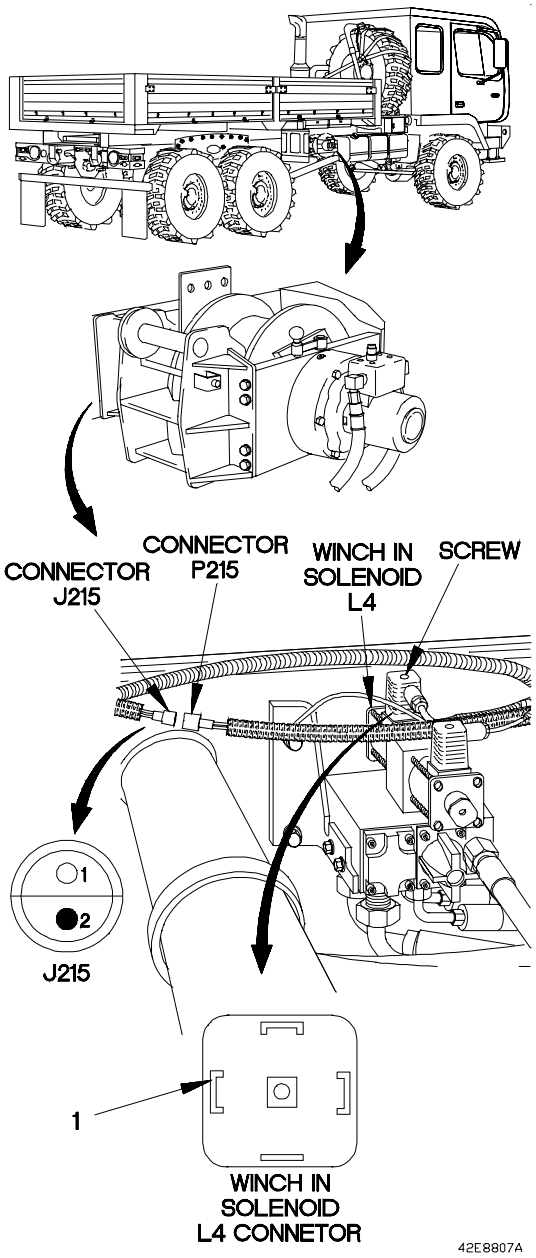
(1) Disconnect connector P215 from connector J215.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector J210-14.
(4) Connect negative (-) probe of multimeter to connector P215-2 and note reading on multimeter.
(5) If continuity is not present, repair wire 2005 (para 2-45) or replace PTO cable assembly (para 7-127).
(6) Connect connector P210 to connector J210.
(7) Install kick panel (para 16-3).



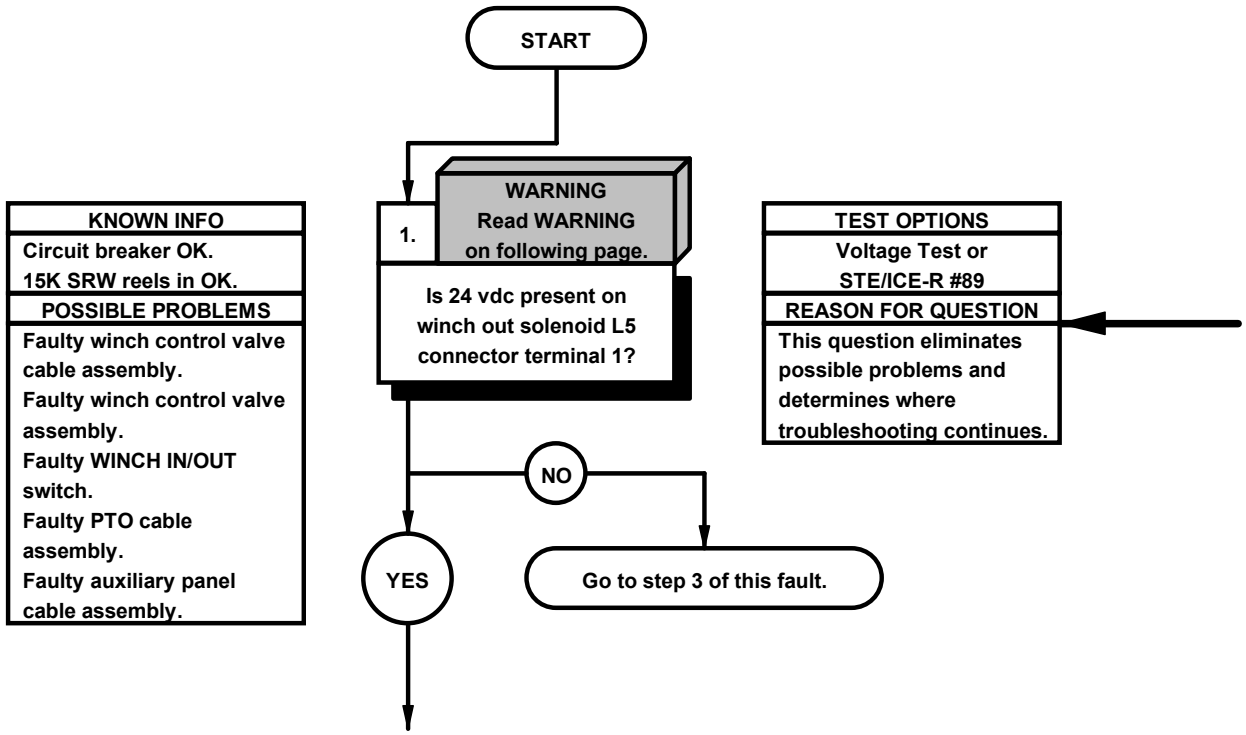
e89. 15K SELF-RECOVERY WINCH (SRW) DOES NOT REEL IN (CONT)



CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector J215-2.
(3) Connect negative (-) probe of multimeter to winch in solenoid L4 connector terminal 1 and note reading on multimeter.
(4) If continuity is not present, repair wire 2005 (para 2-45) or replace winch control valve cable assembly (para 7-135).
(5) If continuity is present, notify DS Maintenance.
(6) Connect connector P215 to connector J215.
(7) Connect winch in solenoid L4 connector to solenoid L4 and tighten screw.



e90. 15K SELF-RECOVERY WINCH (SRW) DOES NOT PAY OUT	
INITIAL SETUP	
Equipment Condition Engine shut down (TM 9-2320-366-10-1). **Personnel Required** (2) **References** TM 9-4910-571-12&P	**Tools and Special Tools** Tool Kit, Genl Mech (Item 46, Appendix C) STE/ICE-R (Item 41, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C) **Materials/Parts** Wire, Elect, 50 ft (Item 67, Appendix D)

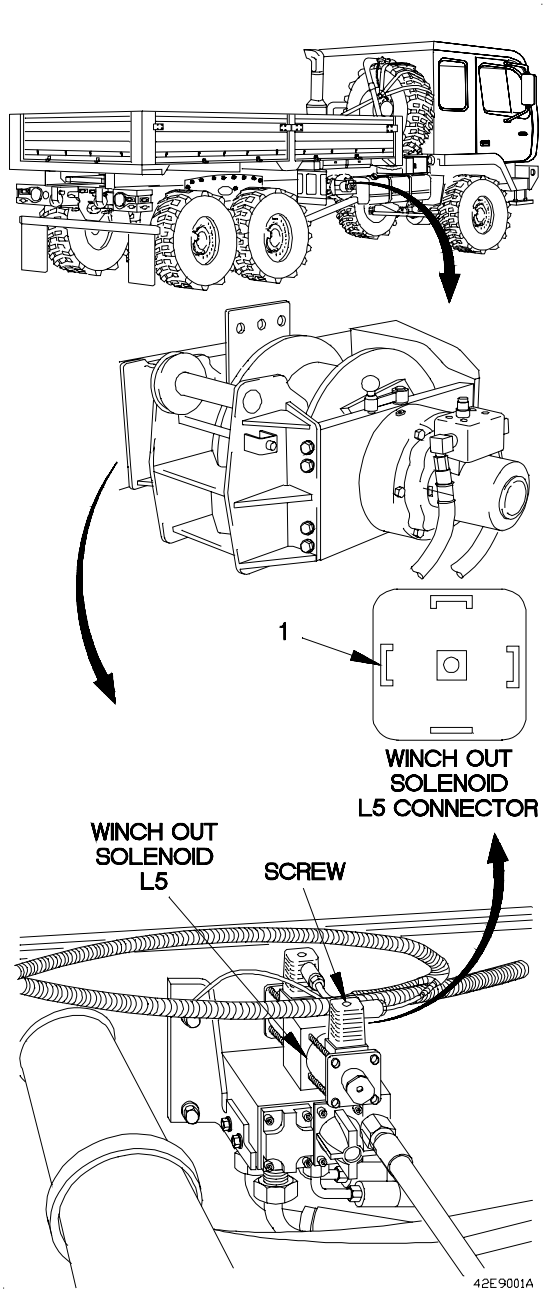


WARNING

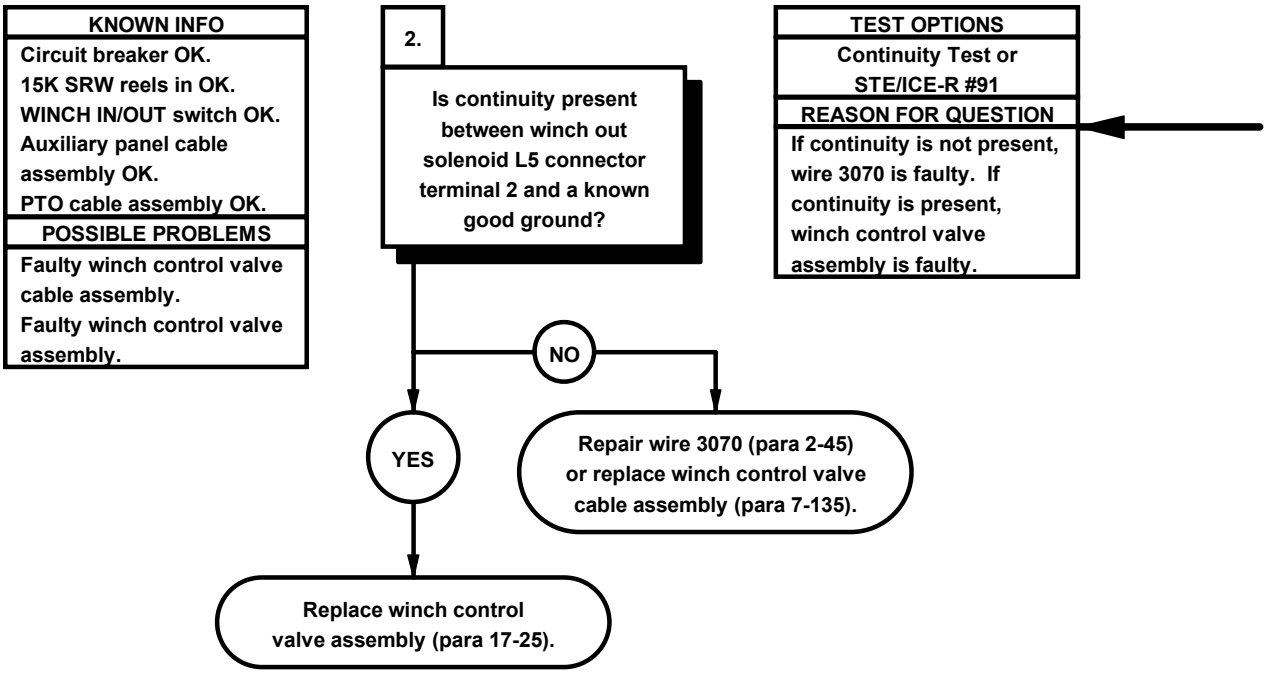
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Remove four nuts, washers, solenoid bracket, washers, and screws.
(2) Loosen screw and disconnect winch out solenoid L5 connector from solenoid L5.
(3) Set multimeter to volts dc.
(4) Connect positive (+) probe of multimeter to winch out solenoid L5 connector terminal 1.
(5) Connect negative (-) probe of multimeter to ground.
(6) Position master power switch to on (TM 9-2320-366-10-1).
(7) Position PTO switch to on (TM 9-2320-366-10-1).
(8) Position winch power switch to on (TM 9-2320-366-10-1).
(9) Position WINCH IN/OUT switch to OUT (TM 9-2320-366-10-1) and note reading on multimeter.
(10) If 24 vdc is not present, go to step 3 of this fault.
(11) Position winch power switch to off (TM 9-2320-366-10-1).
(12) Position PTO switch to off (TM 9-2320-366-10-1).
(13) Position master power switch to off (TM 9-2320-366-10-1).

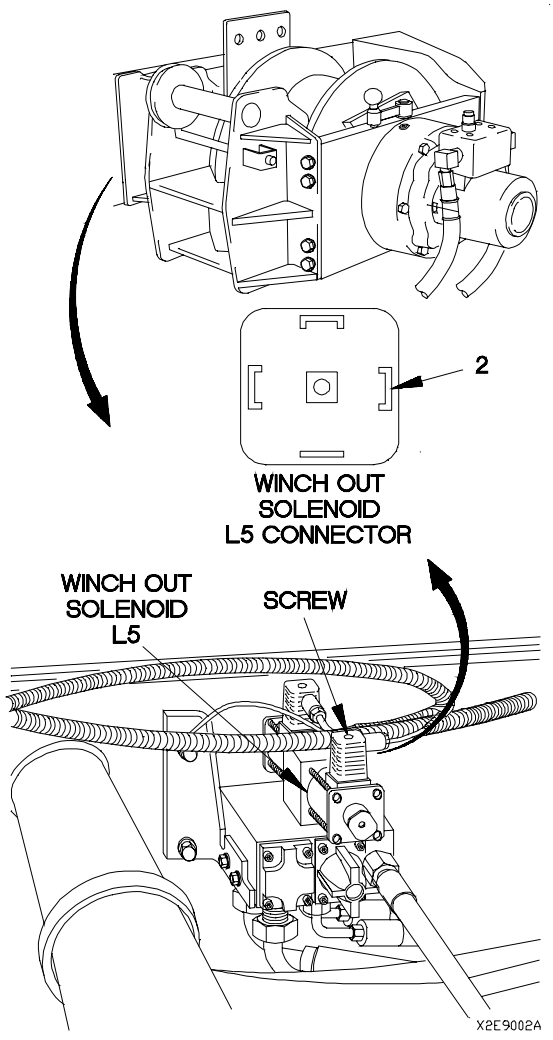


e90. 15K SELF-RECOVERY WINCH (SRW) DOES NOT PAY OUT (CONT)

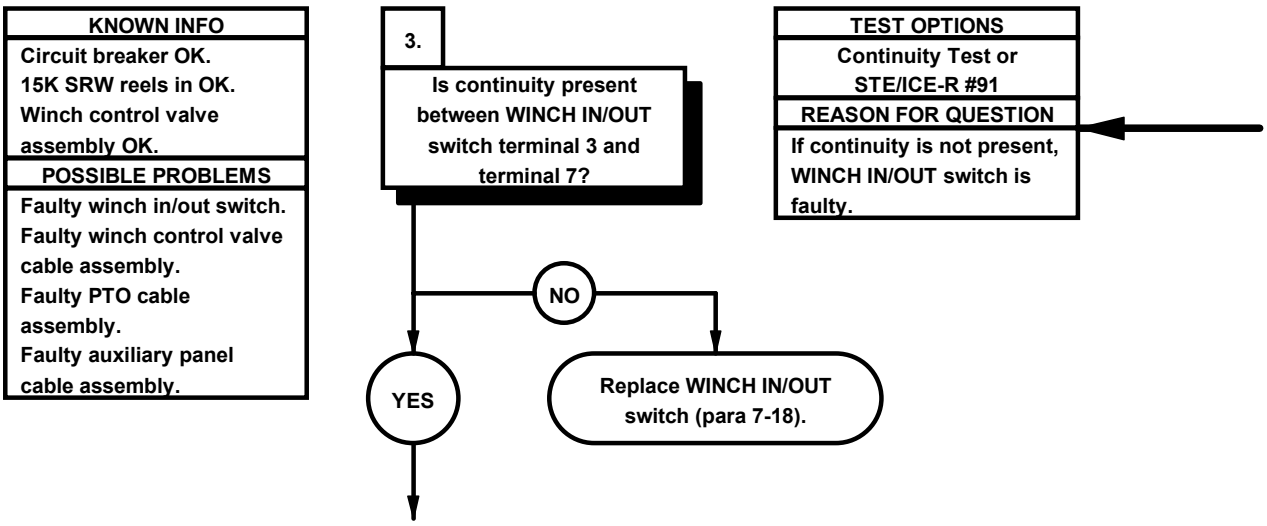


CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to winch out solenoid L5 terminal 2.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair wire 3070 (para 2-45) or replace winch control valve cable assembly (para 7-135).
(5) If continuity is present, replace winch control valve assembly (para 17-25).
(6) Connect winch out solenoid L5 connector on solenoid L5 and tighten screw.

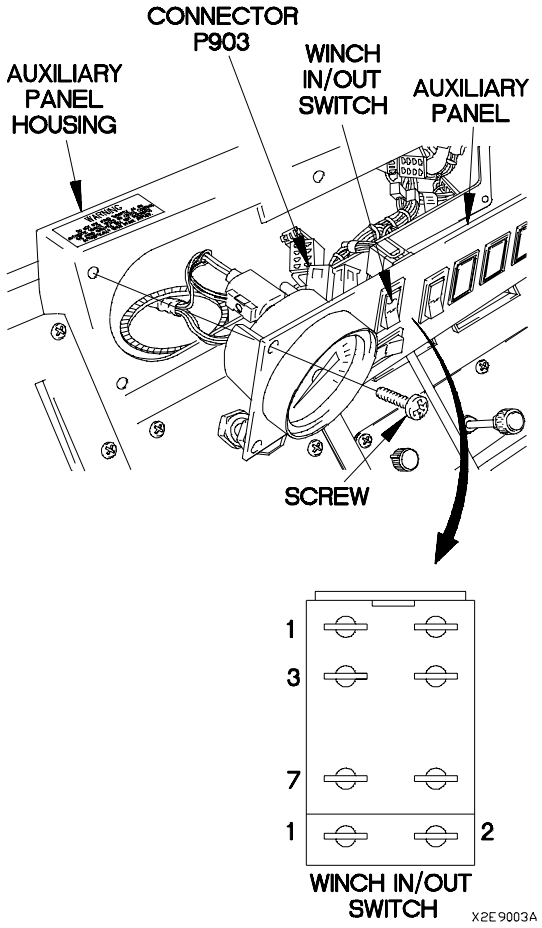


e90. 15K SELF-RECOVERY WINCH (SRW) DOES NOT PAY OUT (CONT)

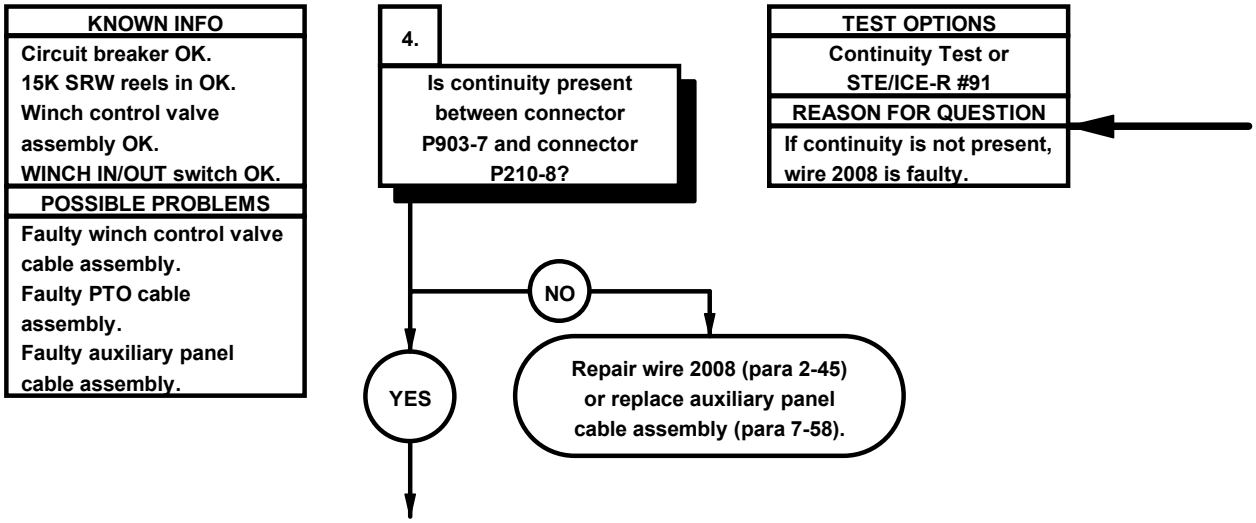


CONTINUITY TEST

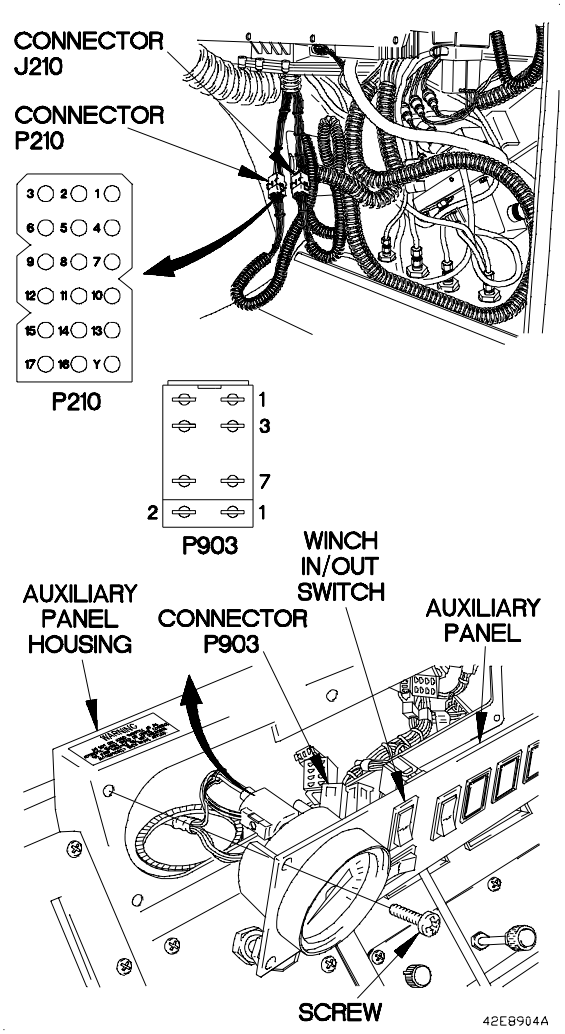
(1) Remove six screws from auxiliary panel.
(2) Lift auxiliary panel from auxiliary panel housing to gain access.
(3) Disconnect connector P903 from WINCH IN/OUT switch.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to WINCH IN/OUT switch terminal 3.
(6) Connect negative (-) probe of multimeter to WINCH IN/OUT switch terminal 7.
(7) Position WINCH IN/OUT switch to out (TM 9-2320-366-10-1) and note reading on multimeter.
(8) If continuity is not present, replace WINCH IN/OUT switch (para 7-18).



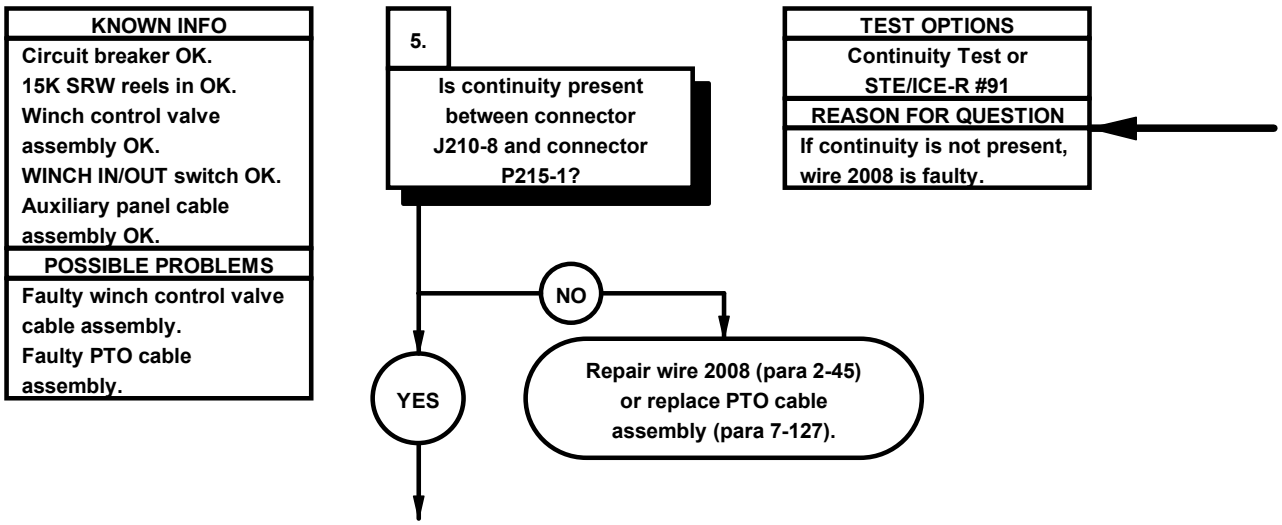
e90. 15K SELF-RECOVERY WINCH (SRW) DOES NOT PAY OUT (CONT)



CONTINUITY TEST
(1) Remove kick panel (para 16-3).
(2) Disconnect connector P210 from connector J210.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector P903-7.
(5) Connect negative (-) probe of multimeter to connector P210-8 and note reading on multimeter.
(6) If continuity is not present, repair wire 2008 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
(7) Connect connector P903 to WINCH IN/OUT switch.
(8) Position auxiliary panel on auxiliary panel housing with six screws.
(9) Tighten six screws to 24 lb-in. (3 N·m).

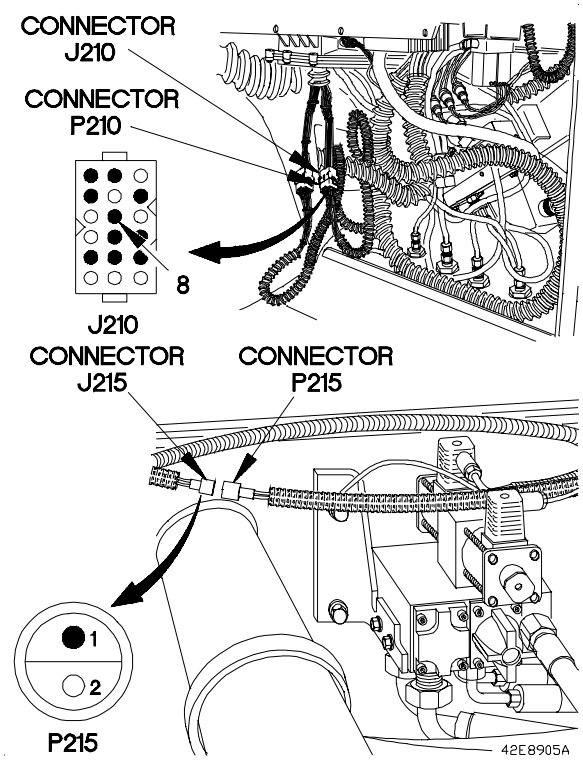


e90. 15K SELF-RECOVERY WINCH (SRW) DOES NOT PAY OUT (CONT)

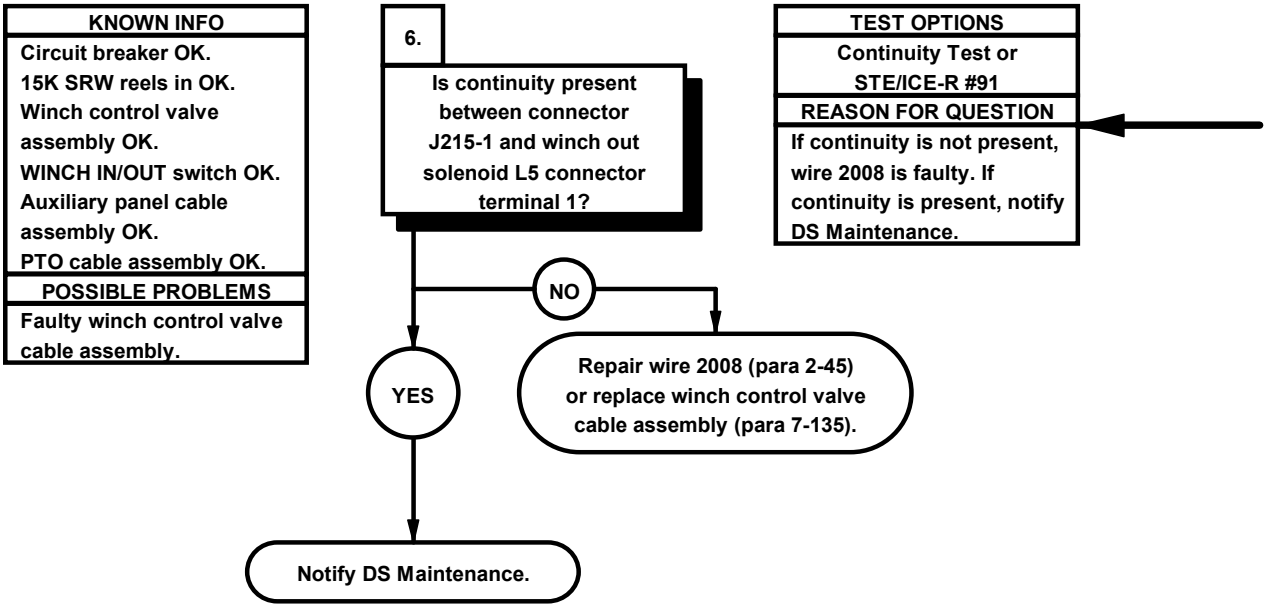


CONTINUITY TEST

(1) Disconnect connector P215 from connector J215.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector J210-8.
(4) Connect negative (-) probe of multimeter to connector P215-1 and note reading on multimeter.
(5) If continuity is not present, repair wire 2008 (para 2-45) or replace PTO cable assembly (para 7-127).
(6) Connect connector P210 to connector J210.
(7) Install kick panel (para 16-3).

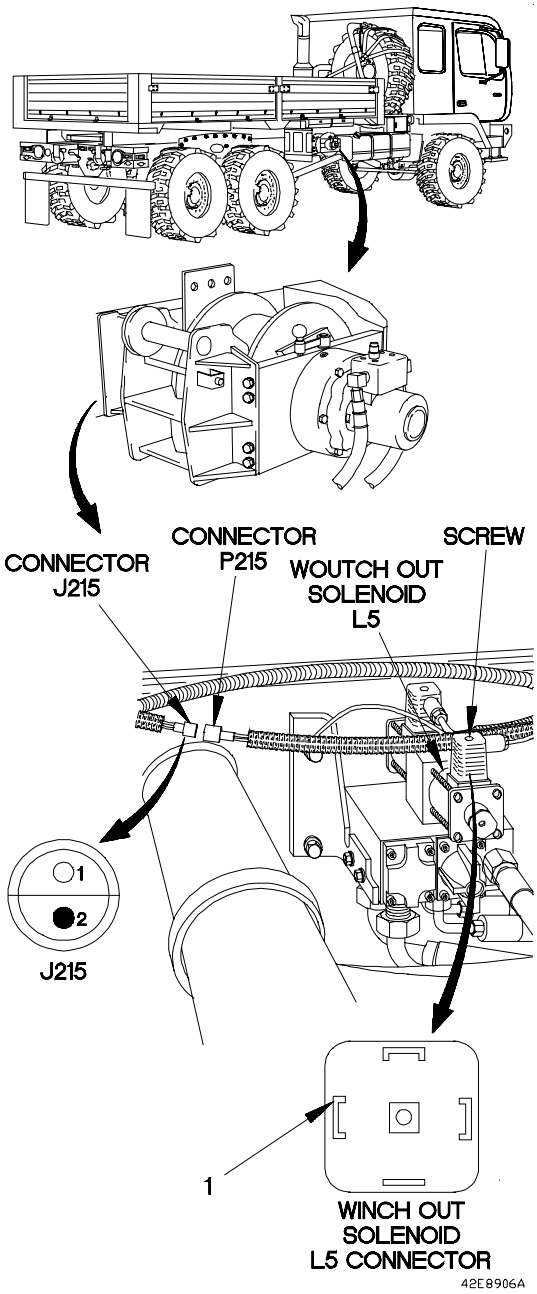


e90. 15K SELF-RECOVERY WINCH (SRW) DOES NOT PAY OUT (CONT)

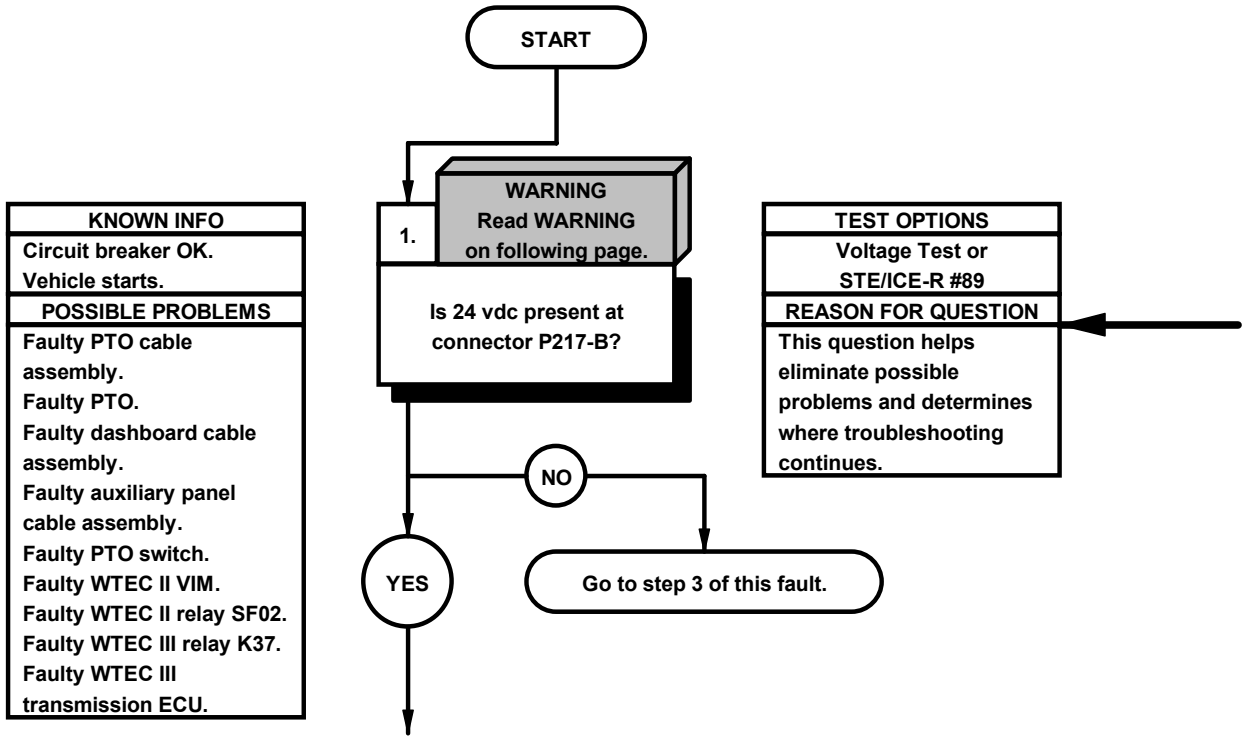


CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector J215-1.
(3) Connect negative (-) probe of multimeter to winch out solenoid L5 connector terminal 1 and note reading on multimeter.
(4) If continuity is not present, repair wire 2008 (para 2-45) or replace winch control valve cable assembly (para 7-135).
(5) If continuity is present, notify DS Maintenance.
(6) Connect connector P215 to connector J215.
(7) Connect winch out solenoid L5 connector to solenoid L5 and tighten screw.



e91. POWER TAKE-OFF (PTO) DOES NOT OPERATE	
INITIAL SETUP	
Equipment Condition Engine shut down (TM 9-2320-366-10-1).	**Tools and Special Tools** Tool Kit, Genl Mech (Item 46, Appendix C) STE/ICE-R (Item 41, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Personnel Required (2)	
References TM 9-4910-571-12&P	**Materials/Parts** Wire, Elect, 50 ft (Item 71, Appendix D) Wire, Relay Test (Item E-9, Appendix E)

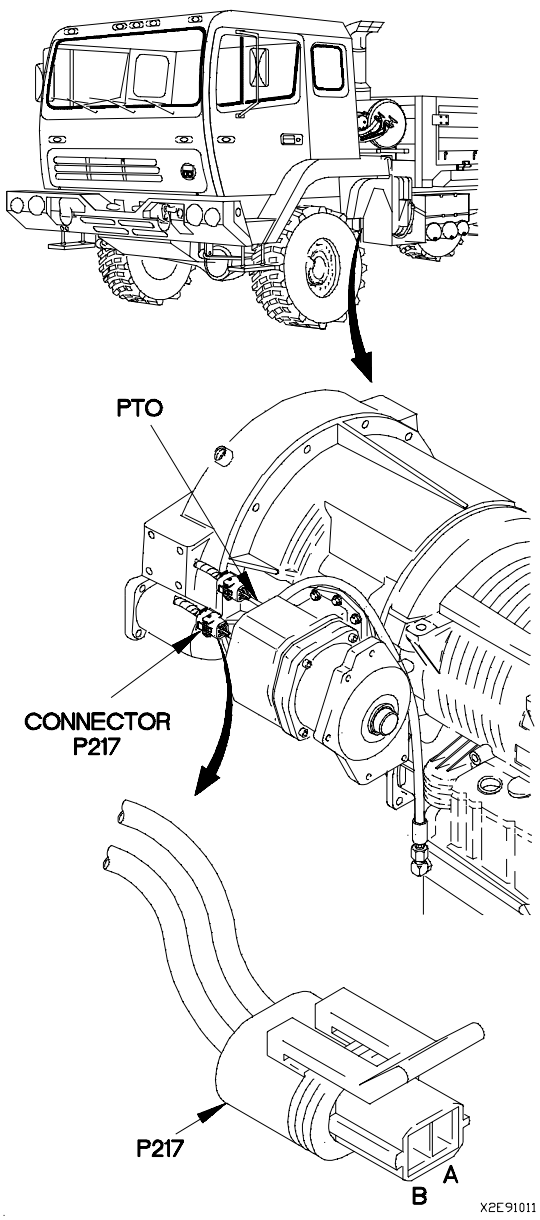


WARNING

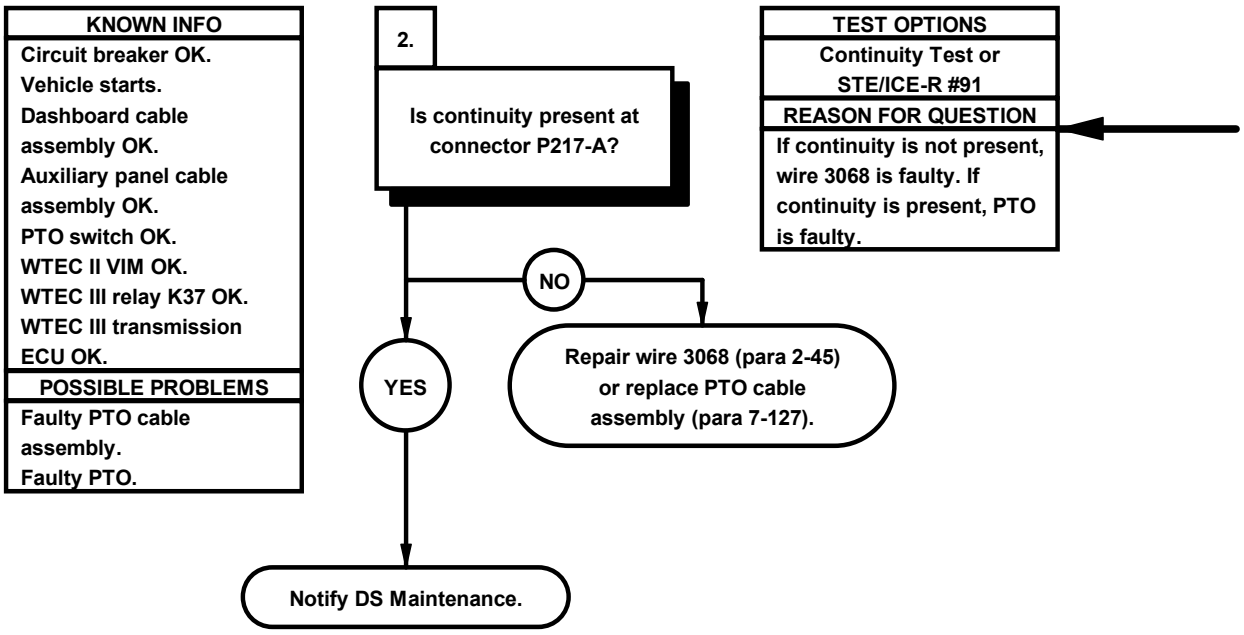
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Disconnect connector P217 from PTO.
(2) Set multimeter to volts dc.
(3) Connect positive (+) probe of multimeter to connector P217-B.
(4) Connect negative (-) probe of multimeter to ground.
(5) Start engine (TM 9-2320-366-10-1).
(6) Position PTO switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(7) If 24 vdc is not present, go to step 3 of this fault.
(8) Position PTO switch to off (TM 9-2320-366-10-1).
(9) Shut down engine (TM 9-2320-366-10-1).

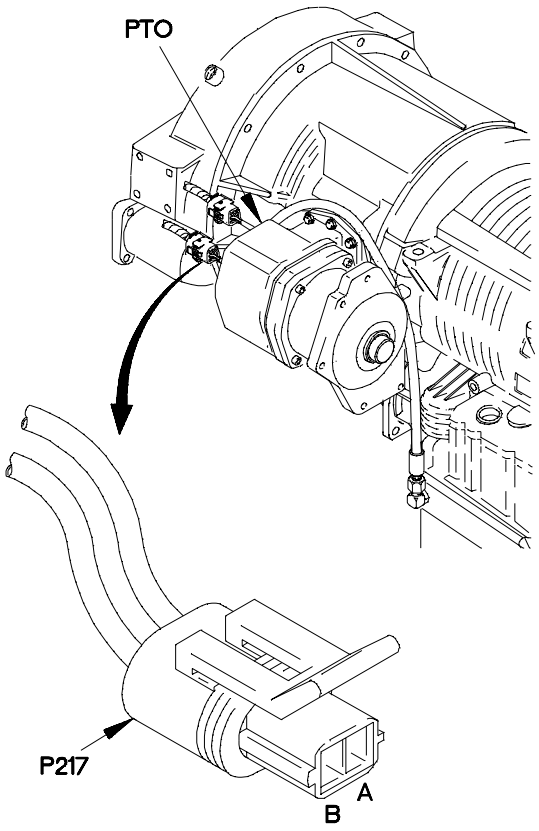


e91. POWER TAKE-OFF (PTO) DOES NOT OPERATE (CONT)



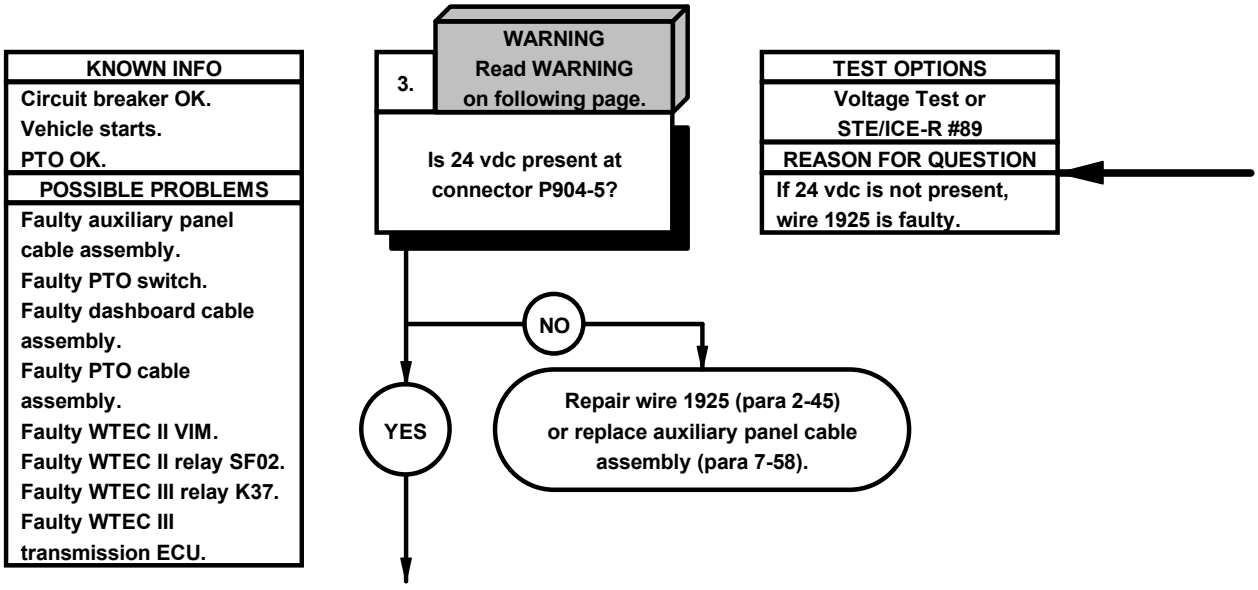
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P217-A.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair wire 3068 (para 2-45) or replace PTO cable assembly (para 7-127).
(5) If continuity is present, notify DS Maintenance.
(6) Connect connector P217 to PTO.



X2E91021

e91. POWER TAKE-OFF (PTO) DOES NOT OPERATE (CONT)

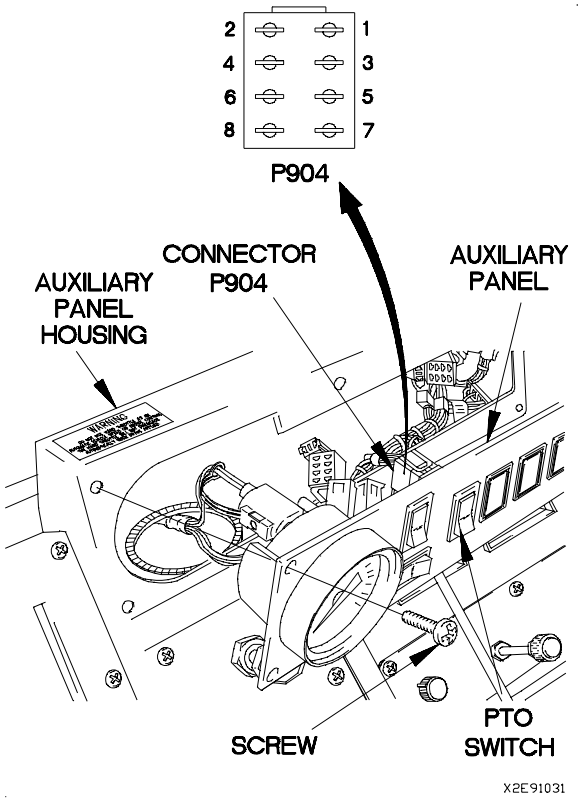


WARNING

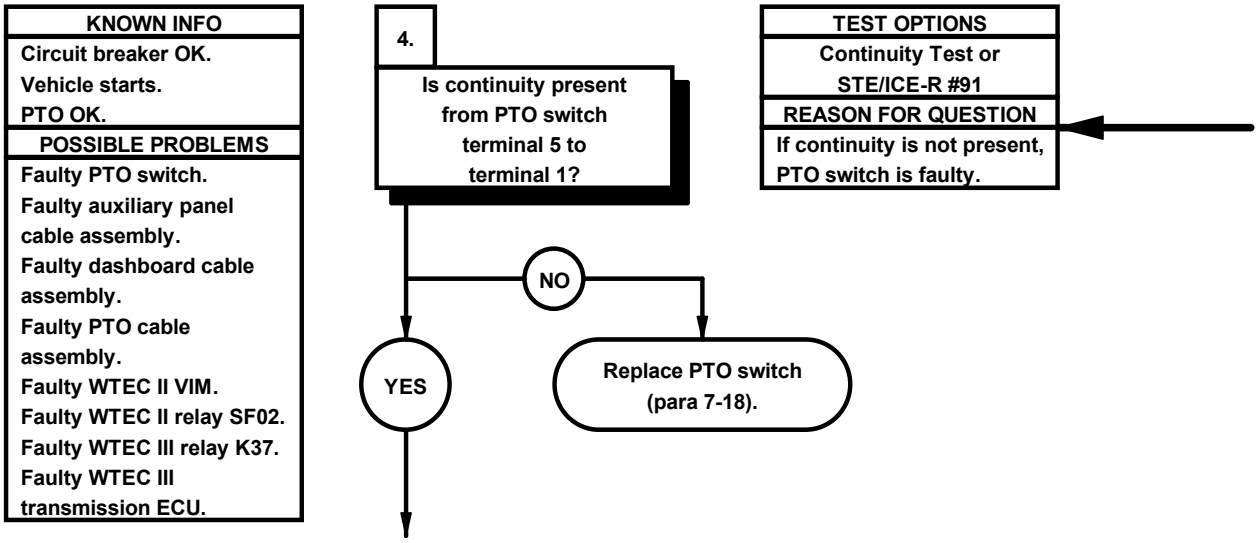
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Remove six screws from auxiliary panel.
(2) Lift auxiliary panel from auxiliary panel housing to gain access.
(3) Disconnect connector P904 from PTO switch.
(4) Set multimeter to volts dc.
(5) Connect positive (+) probe of multimeter to connector P904-5.
(6) Connect negative (-) probe of multimeter to ground.
(7) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(8) If 24 vdc is not present, repair wire 1925 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
(9) Position master power switch to off (TM 9-2320-366-10-1).

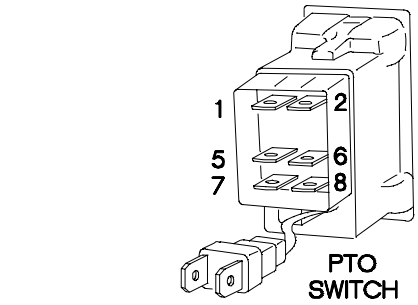


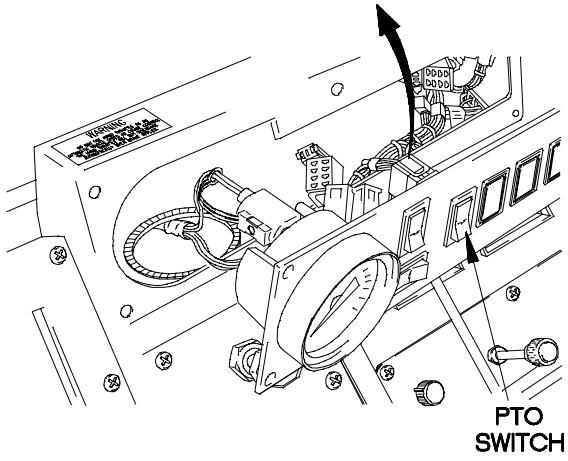
e91. POWER TAKE-OFF (PTO) DOES NOT OPERATE (CONT)



CONTINUITY TEST

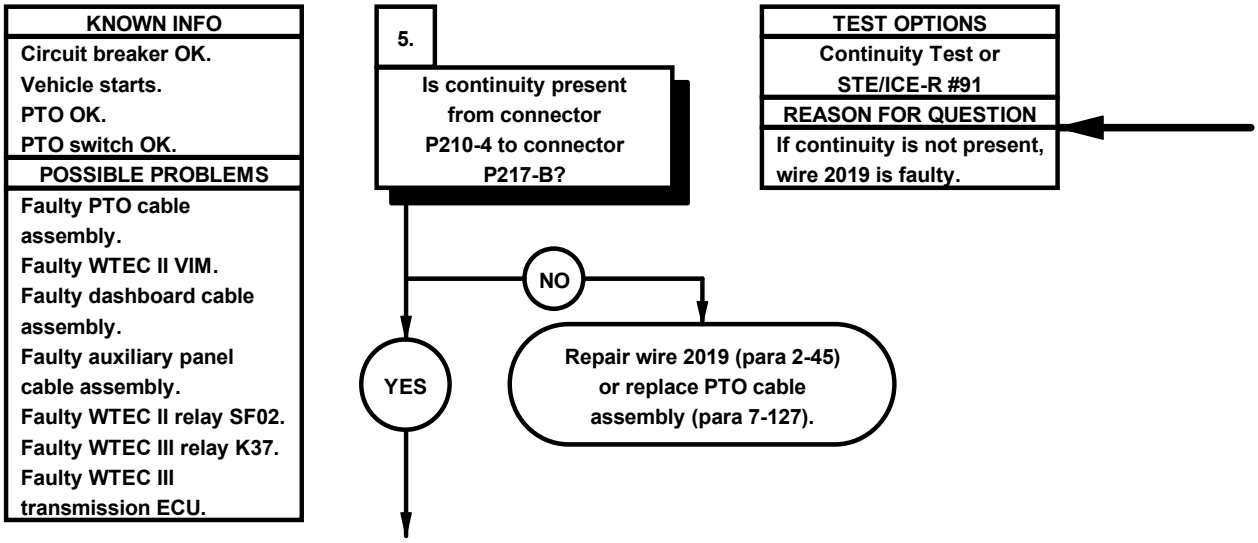
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to PTO switch terminal 5.
(3) Connect negative (-) probe of multimeter to PTO switch terminal 1.
(4) Position PTO switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(5) If continuity is not present, replace PTO switch (para 7-18).
(6) Position PTO switch to off (TM 9-2320-366-10-1).





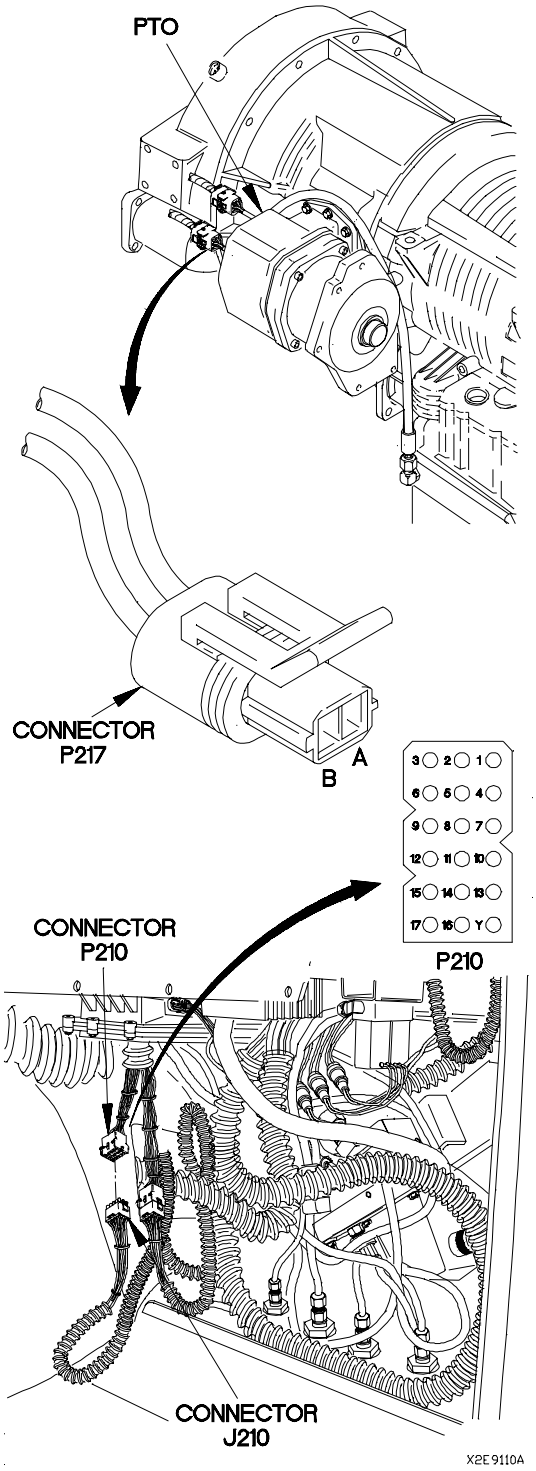
X2E91041

e91. POWER TAKE-OFF (PTO) DOES NOT OPERATE (CONT)

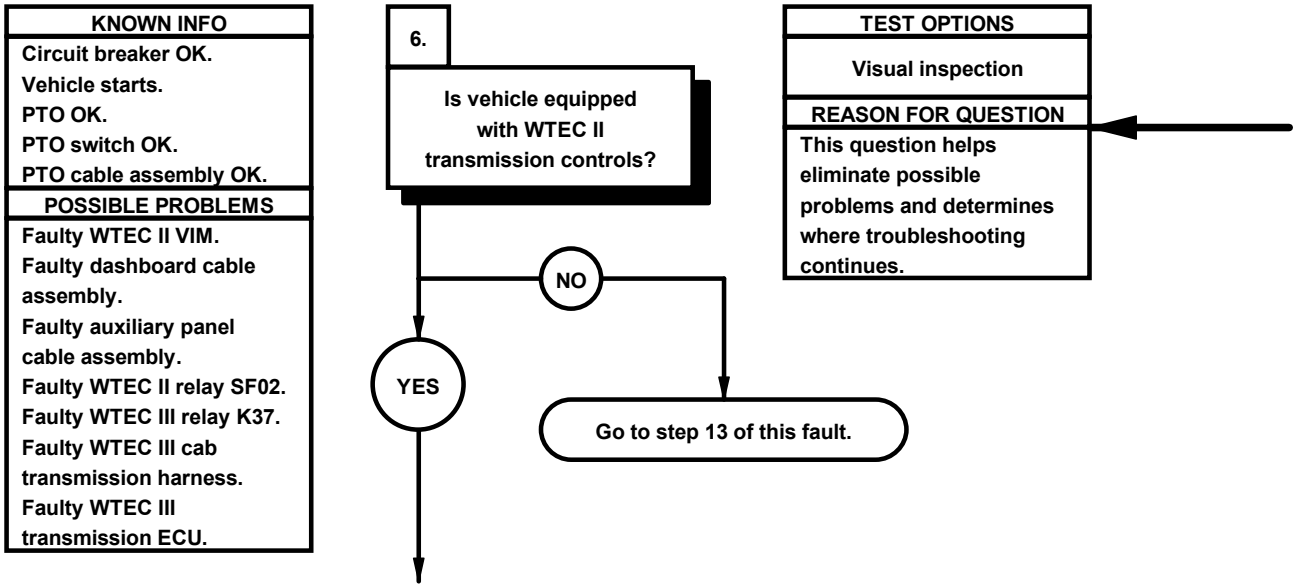


CONTINUITY TEST

(1) Remove kick panel (para 16-3).
(2) Disconnect connector P210 from connector J210.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector P210-4.
(5) Disconnect connector P217 from PTO.
(6) Connect negative (-) probe of multimeter to connector P217-B and note reading on multimeter.
(7) If continuity is not present, repair wire 2019 (para 2-45) or replace PTO cable assembly (para 7-127).
(8) Connect connector P217 to PTO.
(9) Connect connector P210 to connector J210.

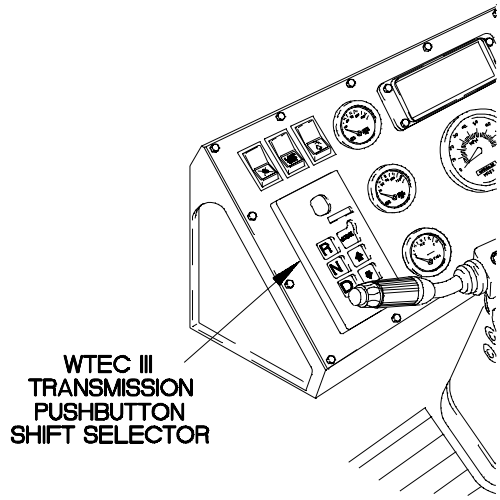


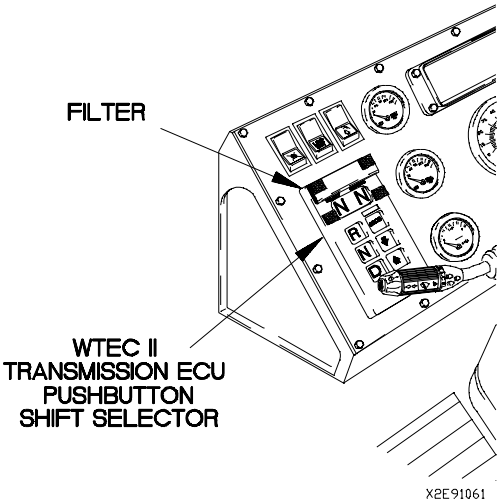
e91. POWER TAKE-OFF (PTO) DOES NOT OPERATE (CONT)



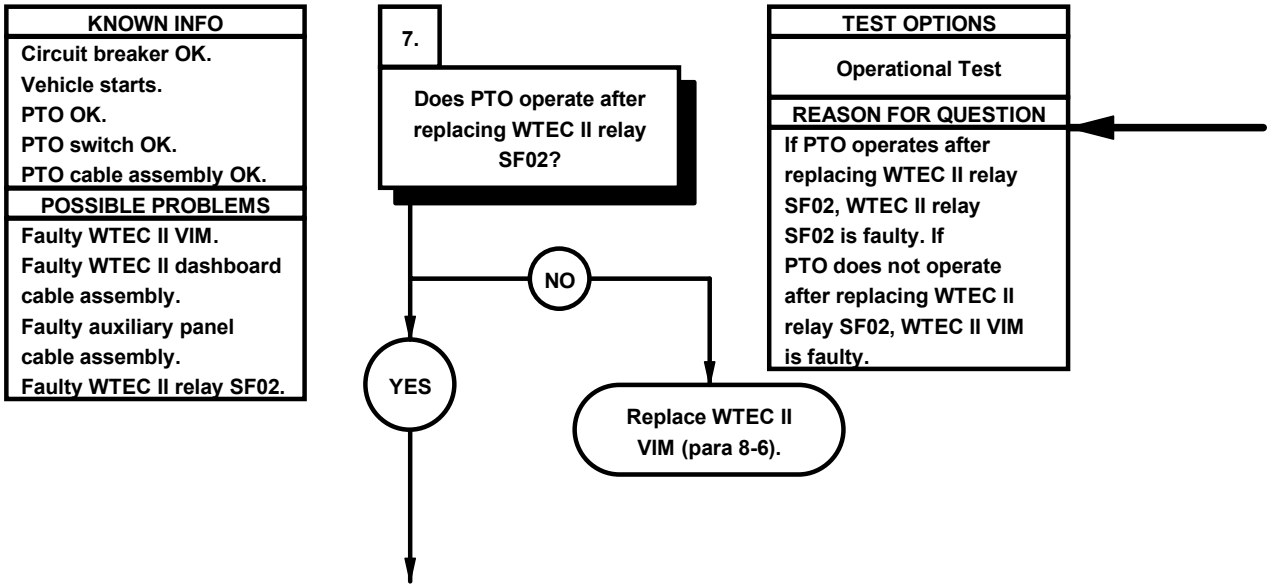
(1) Check if vehicle is equipped with WTEC II TEPSS.

(2) If transmission pushbutton shift selector is not mounted with four screws and does not have a filter cover, go to step 13.





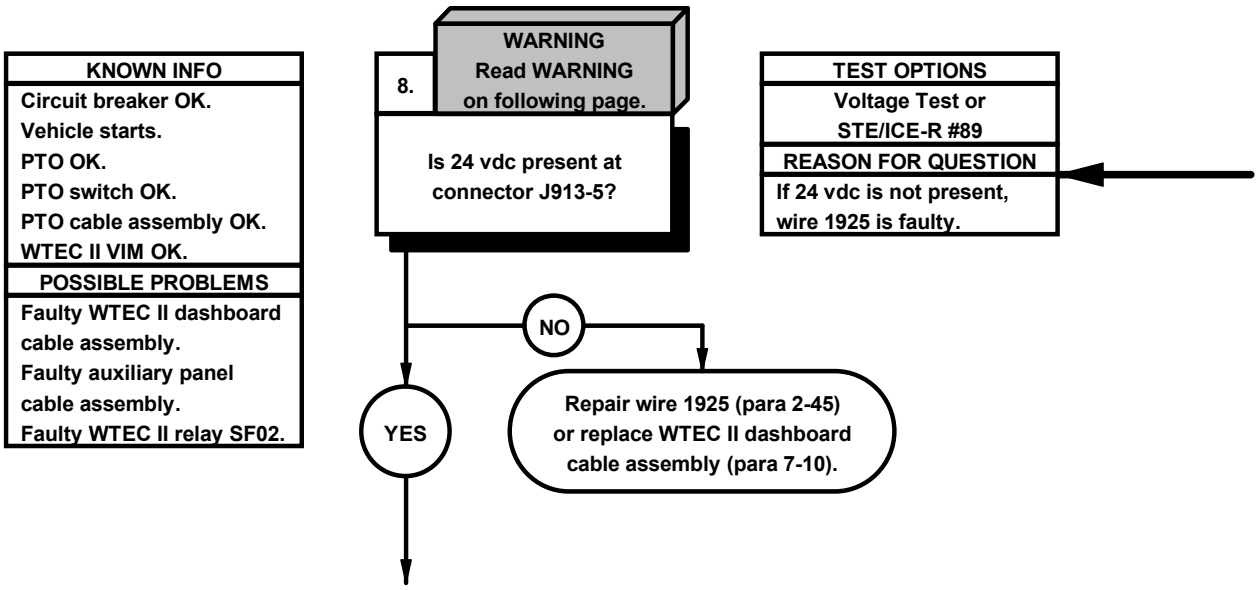
e91. POWER TAKE-OFF (PTO) DOES NOT OPERATE (CONT)



OPERATIONAL TEST

(1) Remove WTEC II relay SF02 (para 8-6).
(2) Install new WTEC II relay SF02 (para 8-6).
(3) Start engine (TM 9-2320-366-10-1).
(4) Position PTO switch to on (TM 9-2320-366-10-1).
(5) If PTO operates, replace WTEC II relay SF02 (para 8-6).
(6) If PTO does not operate, replace WTEC II VIM (para 8-6).

e91. POWER TAKE-OFF (PTO) DOES NOT OPERATE (CONT)

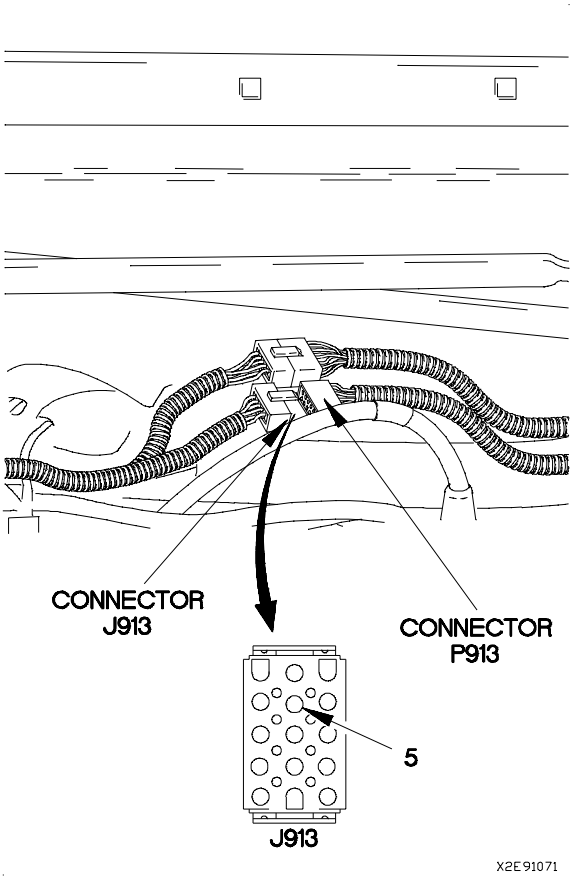


WARNING

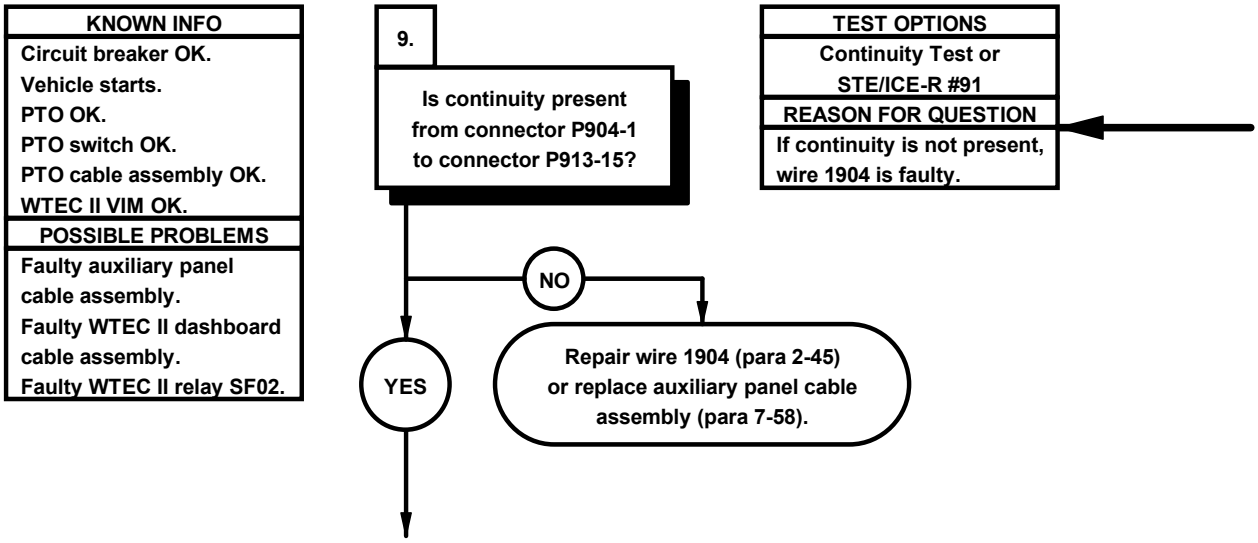
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

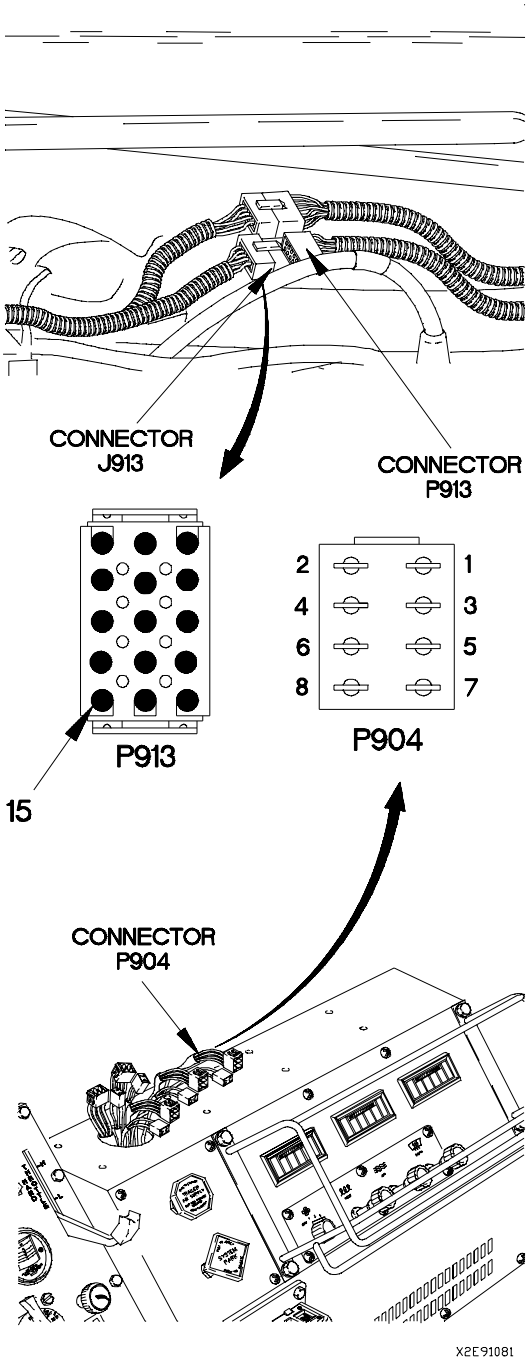
(1) Remove personnel heater for access (para 18-9).
(2) Disconnect connector J913 from connector P913.
(3) Set multimeter to volts dc.
(4) Connect positive (+) probe of multimeter to connector J913-5.
(5) Connect negative (-) probe of multimeter to ground.
(6) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(7) If 24 vdc is not present, repair wire 1925 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).
(8) Position master power switch to off (TM 9-2320-366-10-1).



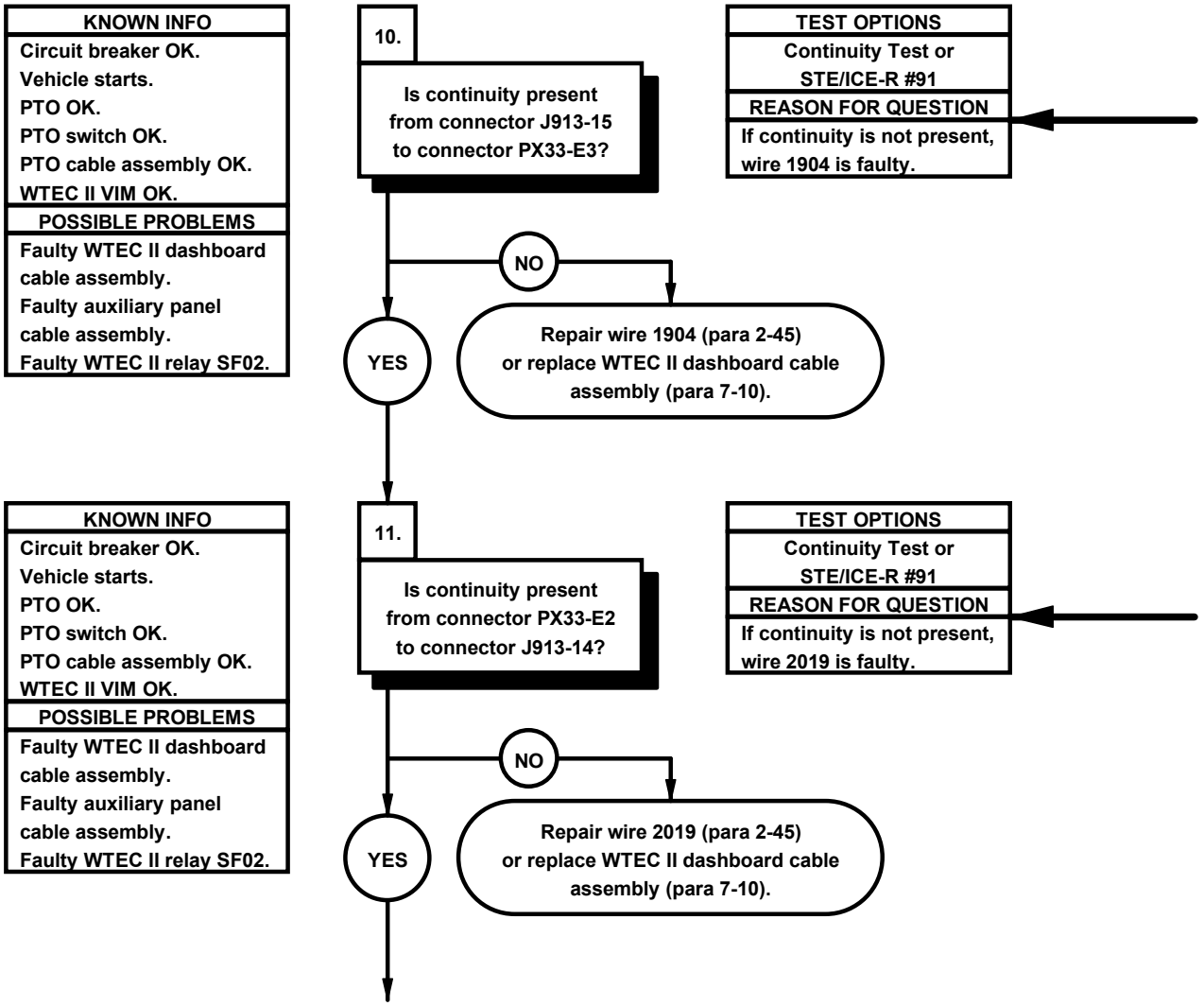
e91. POWER TAKE-OFF (PTO) DOES NOT OPERATE (CONT)



CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P904-1.
(3) Connect negative (-) probe of multimeter to connector P913-15 and note reading on multimeter.
(4) If continuity is not present, repair wire 1904 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).



e91. POWER TAKE-OFF (PTO) DOES NOT OPERATE (CONT)

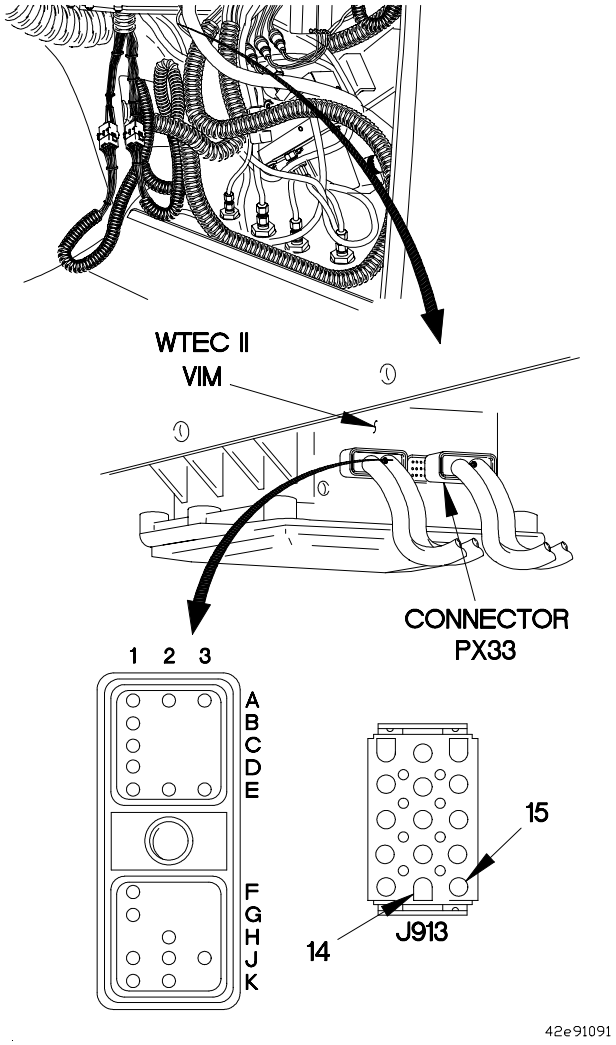


CONTINUITY TEST

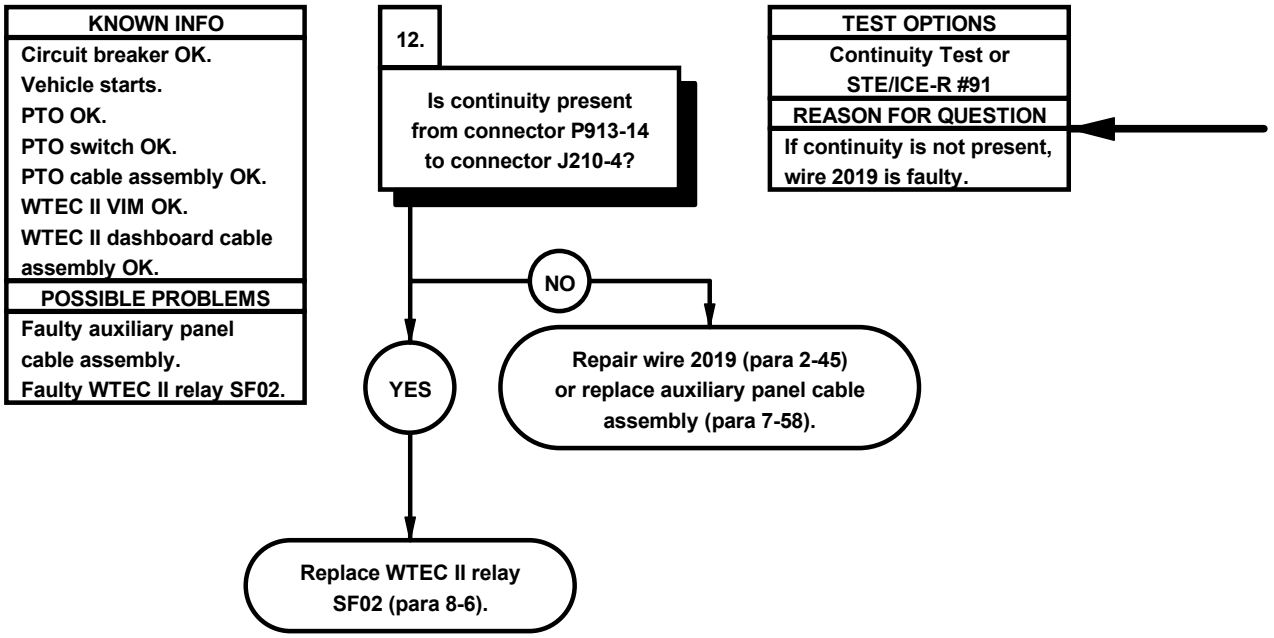
(1) Loosen screw in connector PX33.
(2) Disconnect connector PX33 from WTEC II VIM.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector J913-15.
(5) Connect negative (-) probe of multimeter to connector PX33-E3 and note reading on multimeter.
(6) If continuity is not present, repair wire 1904 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).

CONTINUITY TEST

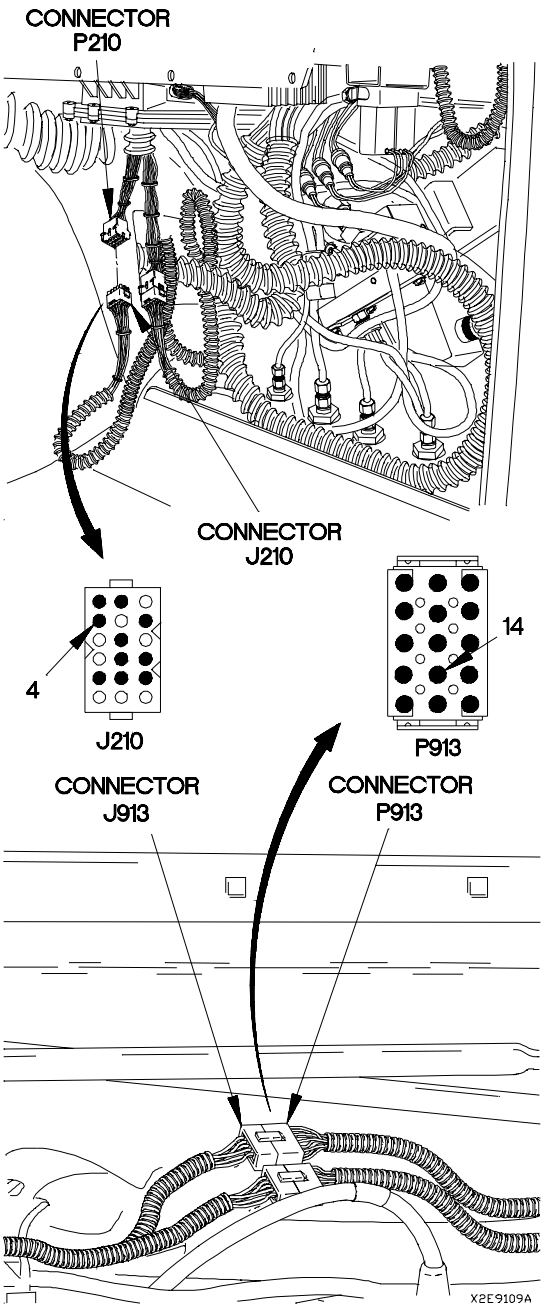
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector PX33-E2.
(3) Connect negative (-) probe of multimeter to connector J913-14 and note reading on multimeter.
(4) If continuity is not present, repair wire 2019 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).
(5) Connect connector PX33 to WTEC II VIM.
(6) Tighten screw in connector PX33.



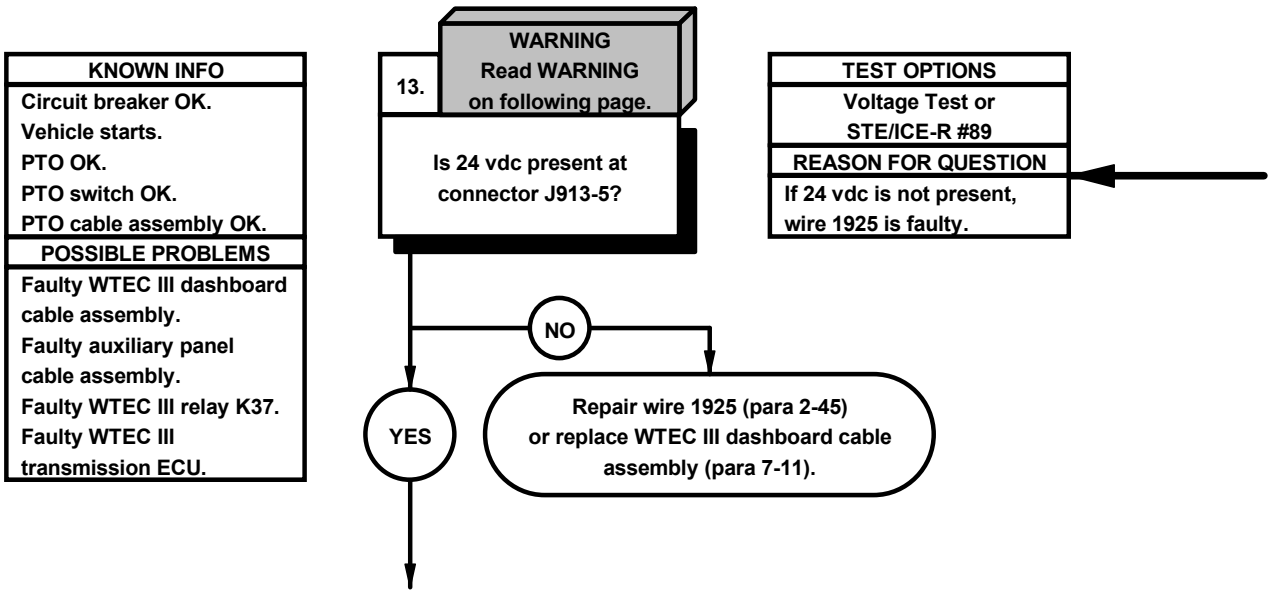
e91. POWER TAKE-OFF (PTO) DOES NOT OPERATE (CONT)



CONTINUITY TEST
(1) Disconnect connector P210 from connector J210.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector P913-14.
(4) Connect negative (-) probe of multimeter to connector J210-4 and note reading on multimeter.
(5) If continuity is not present, repair wire 2019 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
(6) If continuity is present, replace WTEC II relay SF02 (para 8-6).
(7) Connect connector P913 to connector J913.
(8) Connect connector J210 to connector P210.
(9) Install personnel heater (para 18-9).



e91. POWER TAKE-OFF (PTO) DOES NOT OPERATE (CONT)

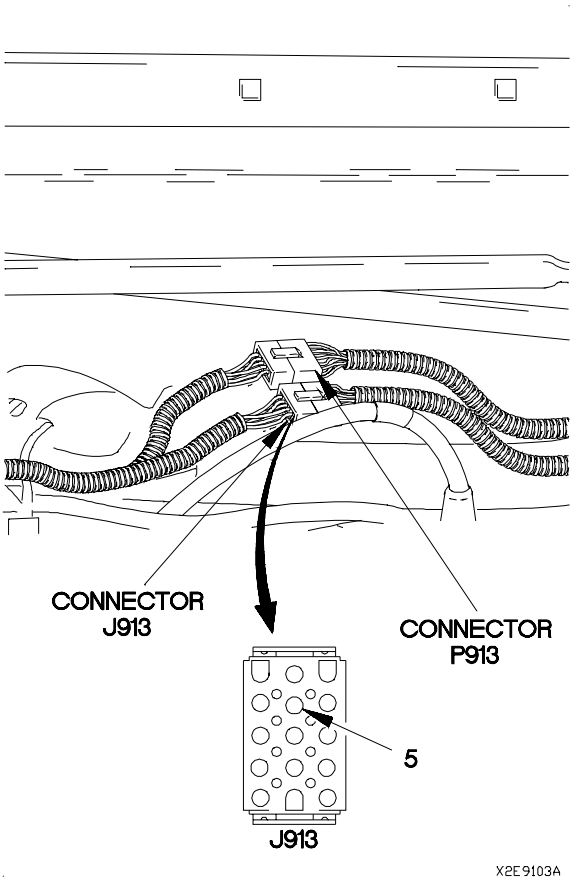


WARNING

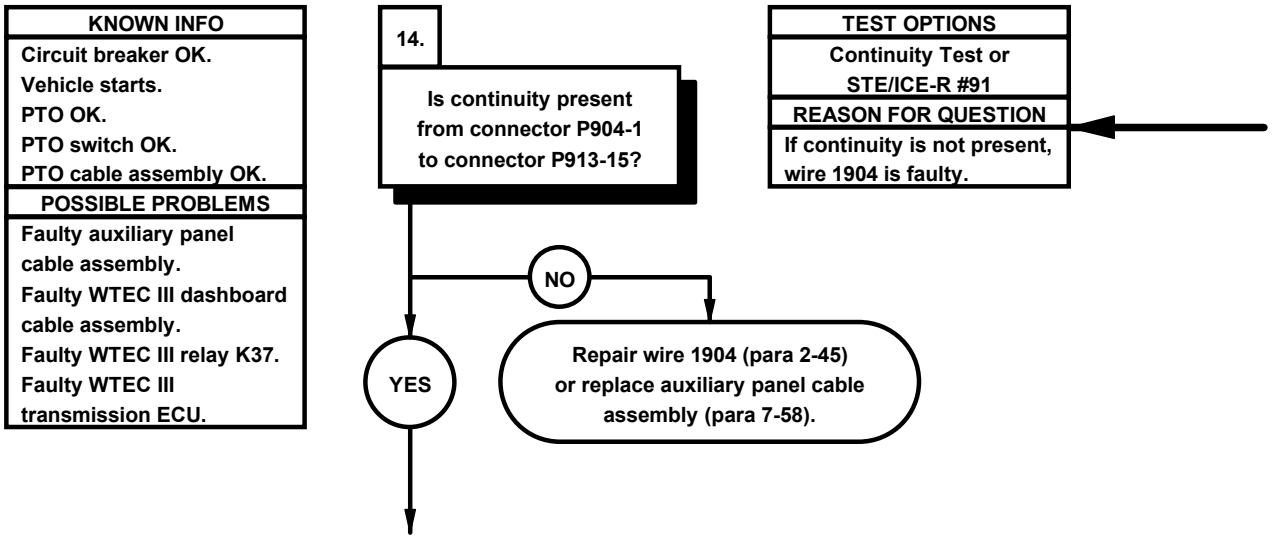
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Remove personnel heater for access (para 18-9).
(2) Disconnect connector J913 from connector P913.
(3) Set multimeter to volts dc.
(4) Connect positive (+) probe of multimeter to connector J913-5.
(5) Connect negative (-) probe of multimeter to ground.
(6) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(7) If 24 vdc is not present, repair wire 1925 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).
(8) Position master power switch to off (TM 9-2320-366-10-1).

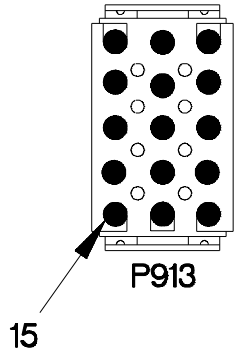


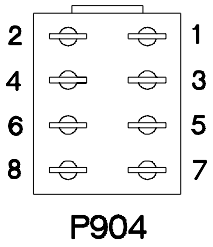
e91. POWER TAKE-OFF (PTO) DOES NOT OPERATE (CONT)



CONTINUITY TEST

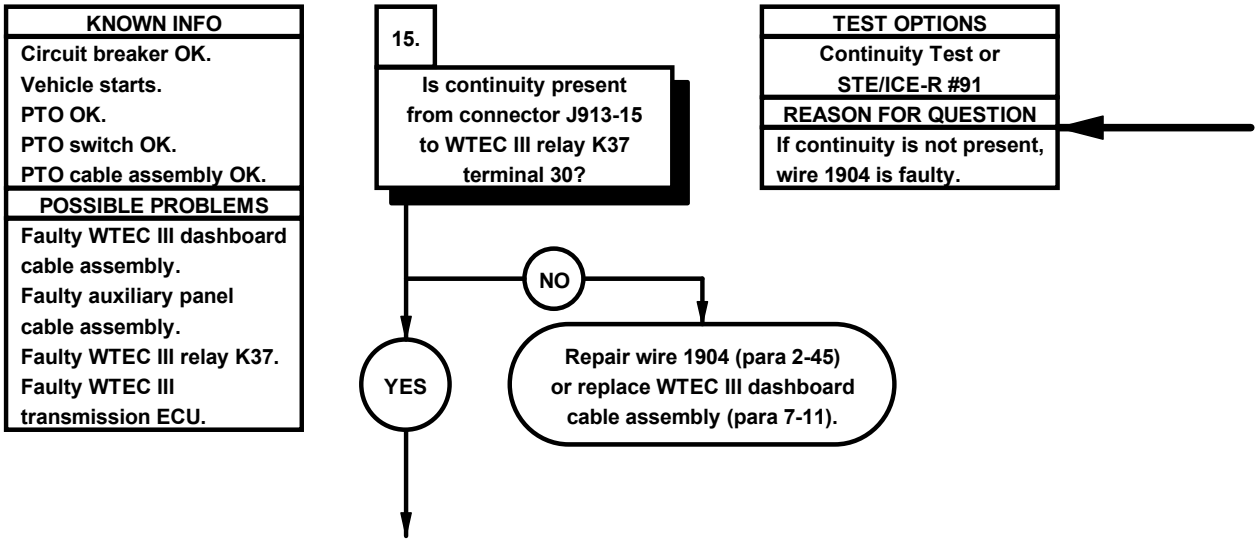
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P904-1.
(3) Connect negative (-) probe of multimeter to connector P913-15 and note reading on multimeter.
(4) If continuity is not present, repair wire 1904 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).





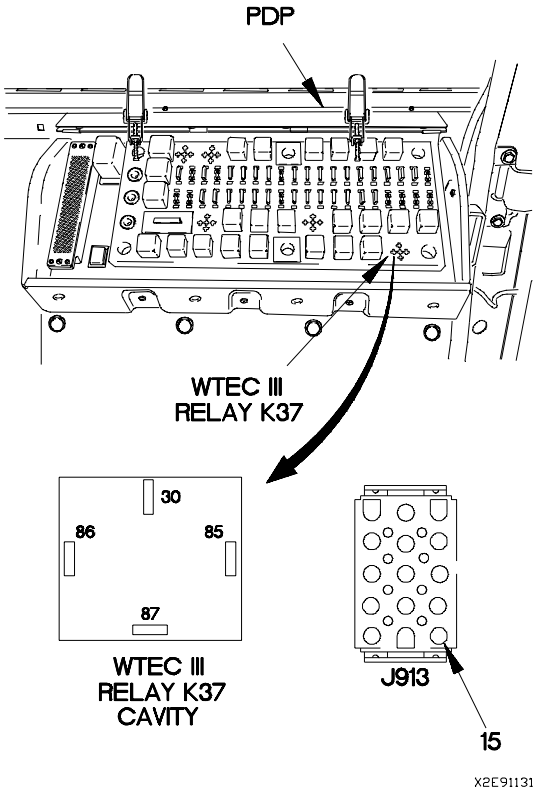
X2E91121

e91. POWER TAKE-OFF (PTO) DOES NOT OPERATE (CONT)

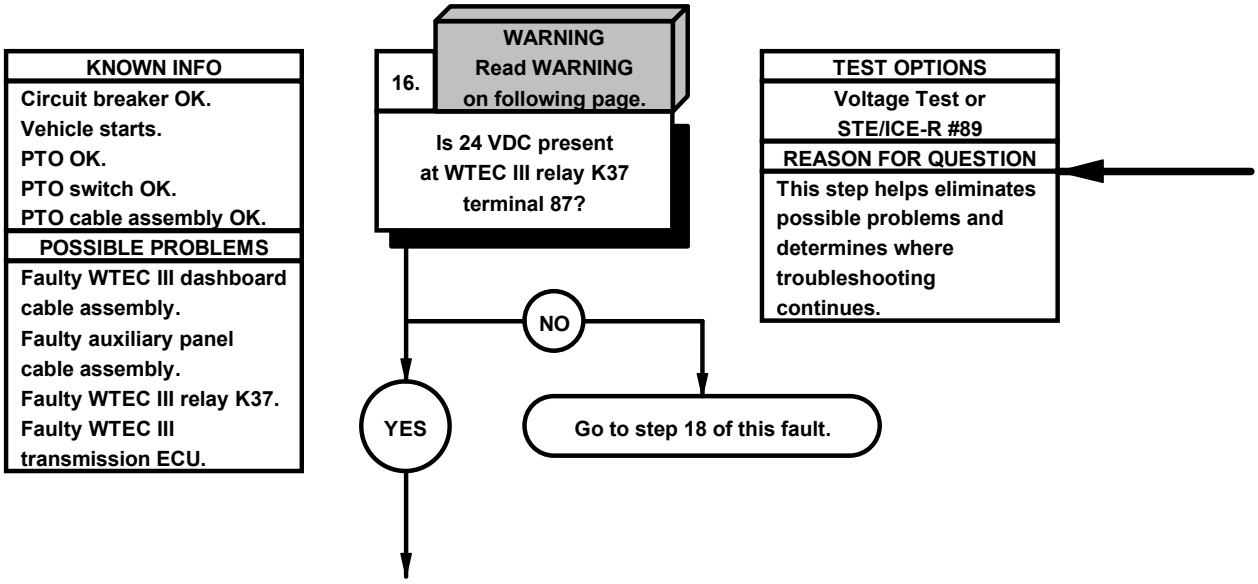


CONTINUITY TEST

(1) Remove WTEC III relay K37 from PDP.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector J913-15.
(4) Connect negative (-) probe of multimeter to PDP, terminal 30, where WTEC III relay K37 was removed, and note reading on multimeter.
(5) If continuity is not present, repair wire 1904 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).
(6) Install WTEC III relay K37 in PDP.



e91. POWER TAKE-OFF (PTO) DOES NOT OPERATE (CONT)

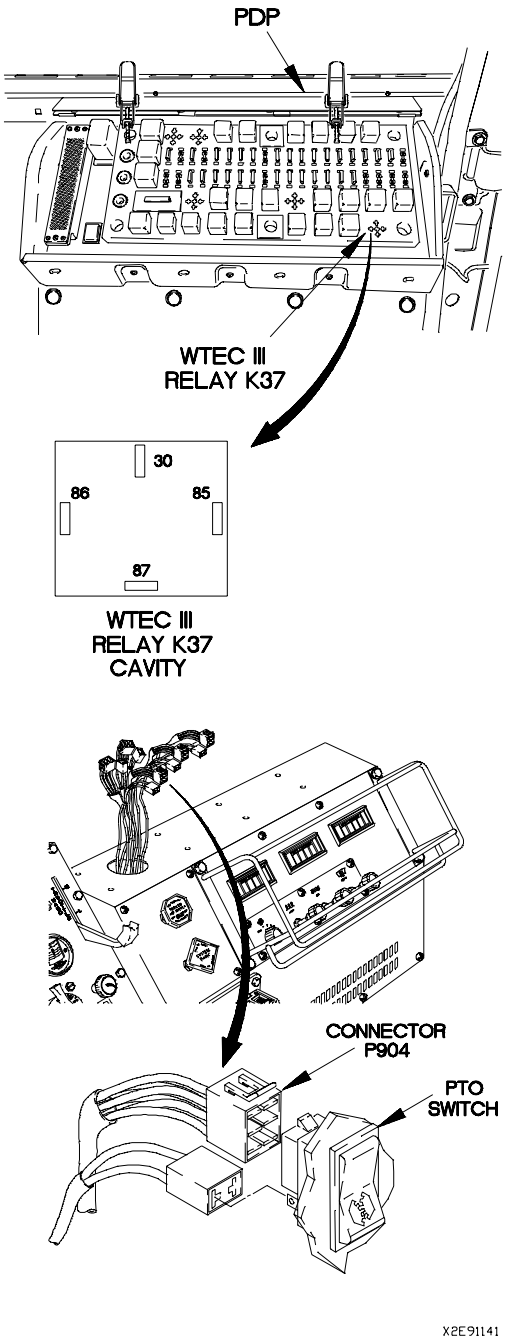


WARNING

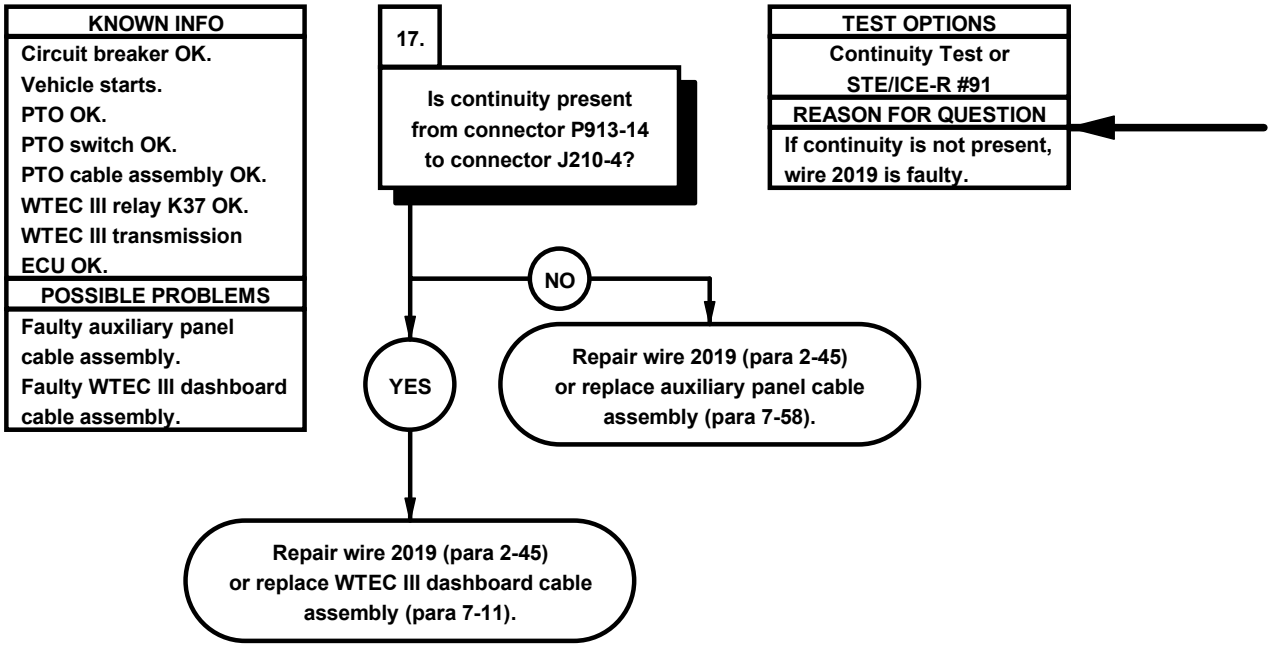
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Install personnel heater hoses (para 18-9).
(2) Remove PTO switch from auxiliary panel.
(3) Install PTO switch on connector P904.
(4) Remove WTEC III relay K37 from PDP.
(5) Insert relay test wire in PDP terminal 87, where WTEC III relay K37 was removed.
(6) Install WTEC III relay K37 in PDP.
(7) Set multimeter to volts dc.
(8) Connect positive (+) probe of multimeter to relay test wire.
(9) Connect negative (-) probe of multimeter to ground.
(10) Start engine (TM 9-2320-366-10-1).
(11) Position PTO switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(12) If 24 vdc is not present, go to step 18 of this faulty.
(13) Position PTO switch to off (TM 9-2320-366-10-1).
(14) Shut down engine (TM 9-2320-366-10-1).
(15) Remove WTEC III relay relay K37 from PDP.
(16) Remove relay test wire from PDP.
(17) Install WTEC III relay K37 in PDP.

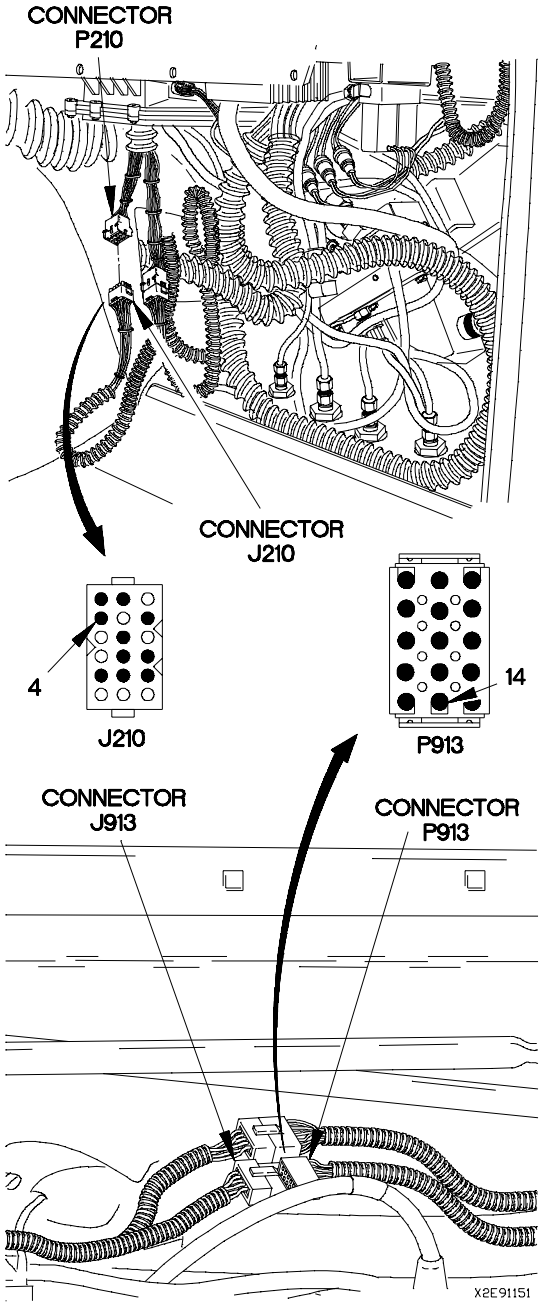


e91. POWER TAKE-OFF (PTO) DOES NOT OPERATE (CONT)

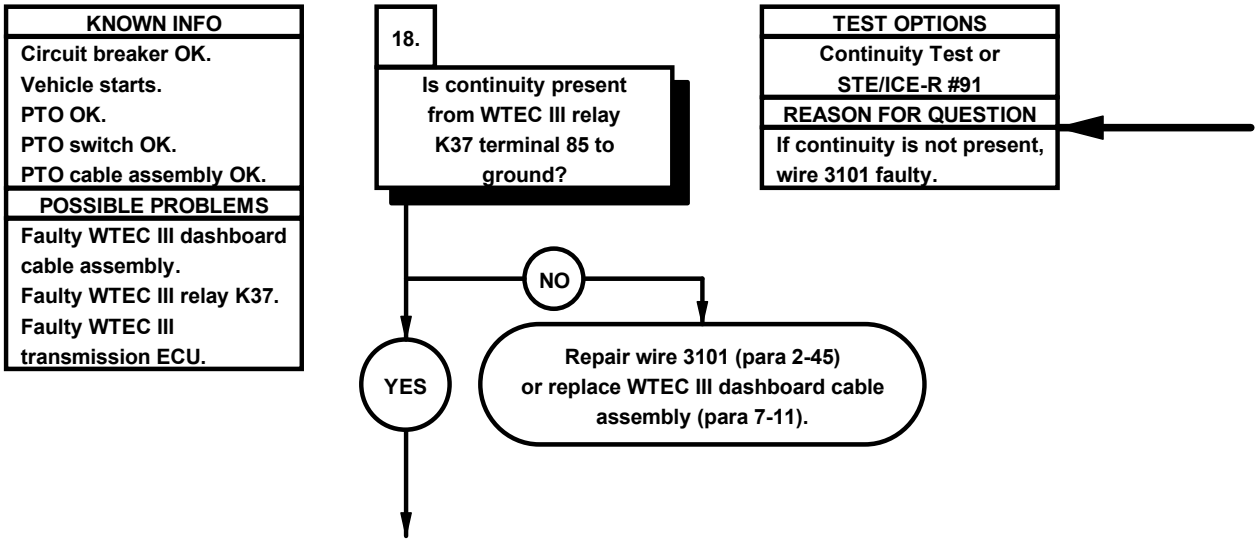


CONTINUITY TEST

(1) Disconnect connector P210 from connector J210.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector P913-14.
(4) Connect negative (-) probe of multimeter to connector J210-4 and note reading on multimeter.
(5) If continuity is not present, repair wire 2019 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
(6) If continuity is present, repair wire 2019 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).
(7) Connect connector P913 to connector J913.
(8) Remove PTO switch from connector P904.
(9) Install personnel heater (para 18-9).

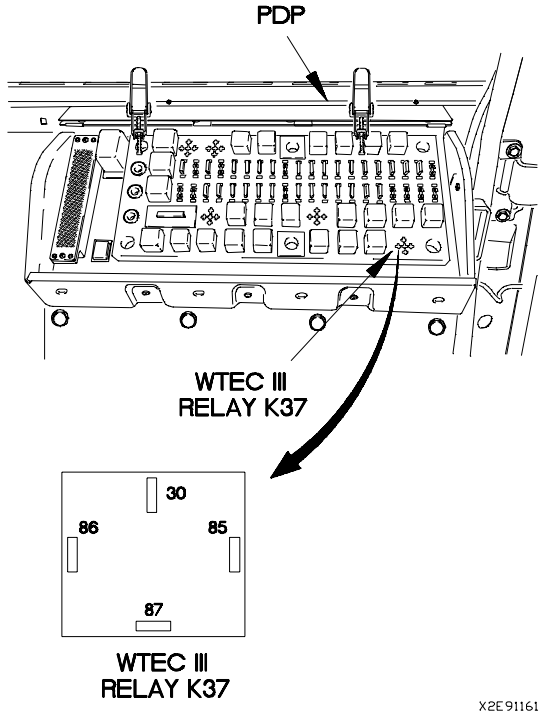


e91. POWER TAKE-OFF (PTO) DOES NOT OPERATE (CONT)

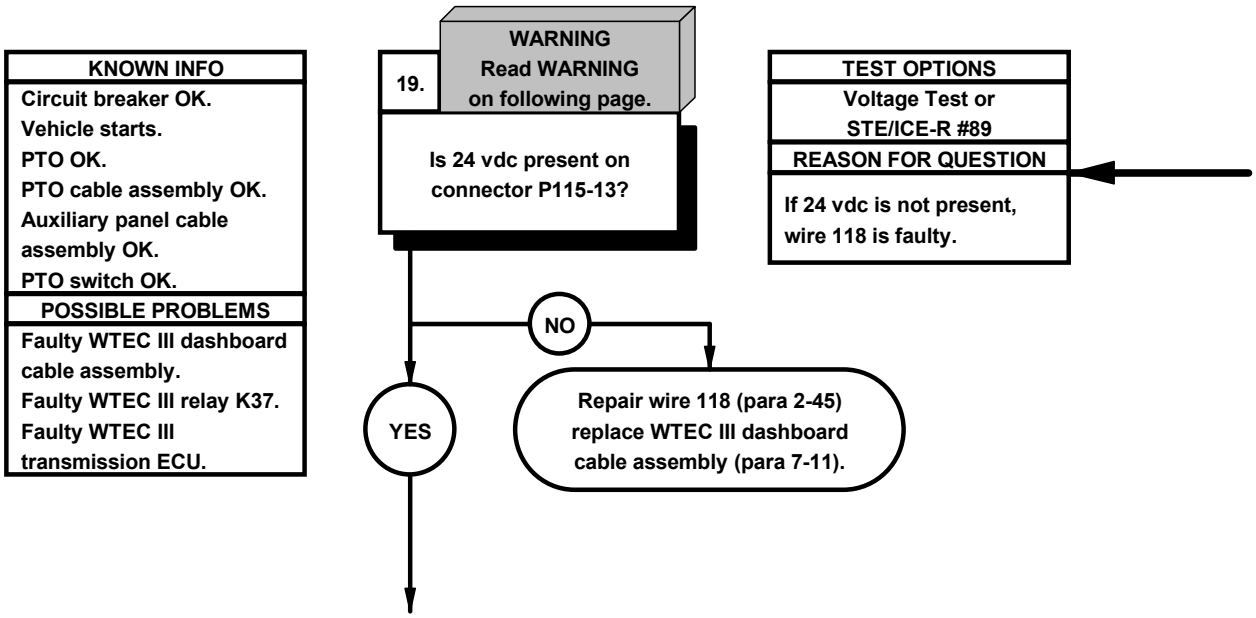


CONTINUITY TEST

(1) Remove WTEC III relay K37 from PDP.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to PDP, where WTEC III relay K37 terminal 85 was removed.
(4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(5) If continuity is not present, repair wire 3101 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).



e91. POWER TAKE-OFF (PTO) DOES NOT OPERATE (CONT)

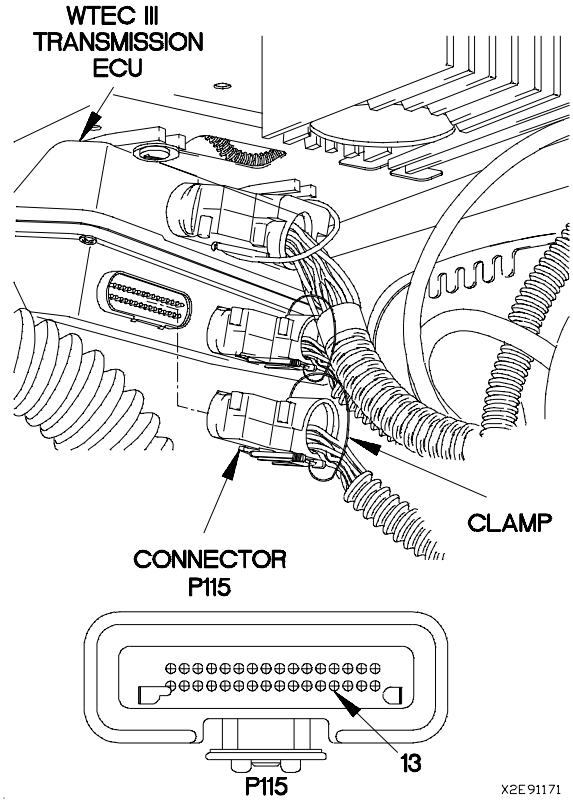


WARNING

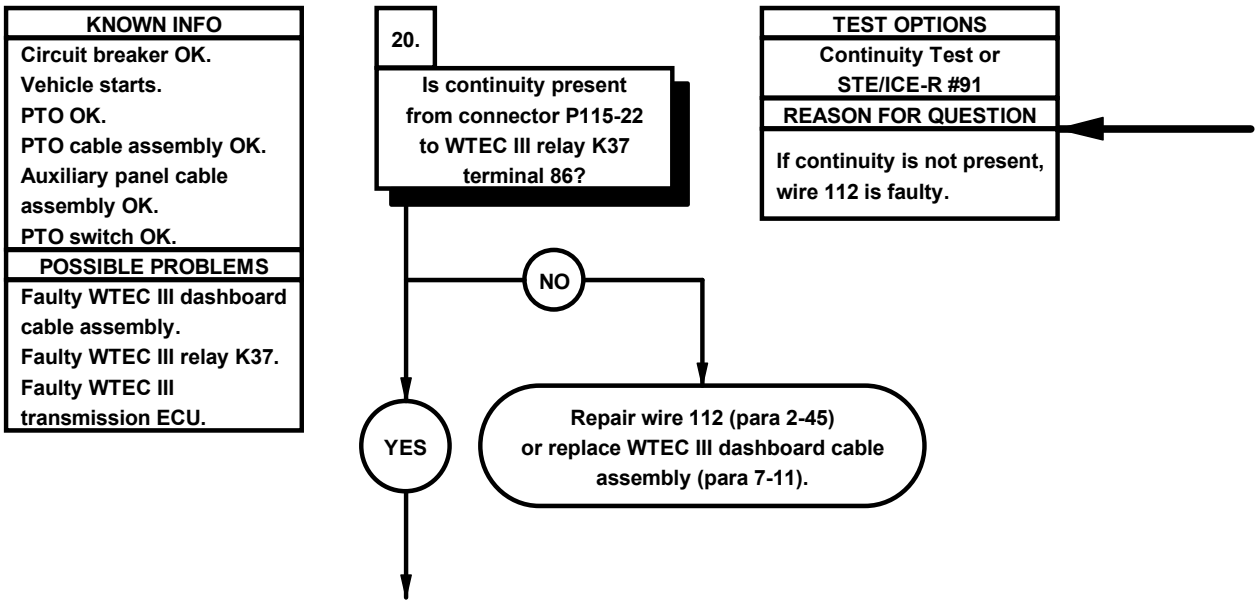
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Disconnect connector clamp from connector P115.
(2) Disconnect connector P115 from WTEC III transmission ECU.
(3) Set multimeter to volts dc.
(4) Connect positive (+) probe of multimeter to connector P115-13.
(5) Connect negative (-) probe of multimeter to ground.
(6) Position master power switch to on (TM 9-2320-366-10-1).
(7) Position PTO switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(8) If 24 vdc is not present, repair wire 118 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).
(9) Position PTO switch to off (TM 9-2320-366-10-1).
(10) Position master power switch to off (TM 9-2320-366-10-1).

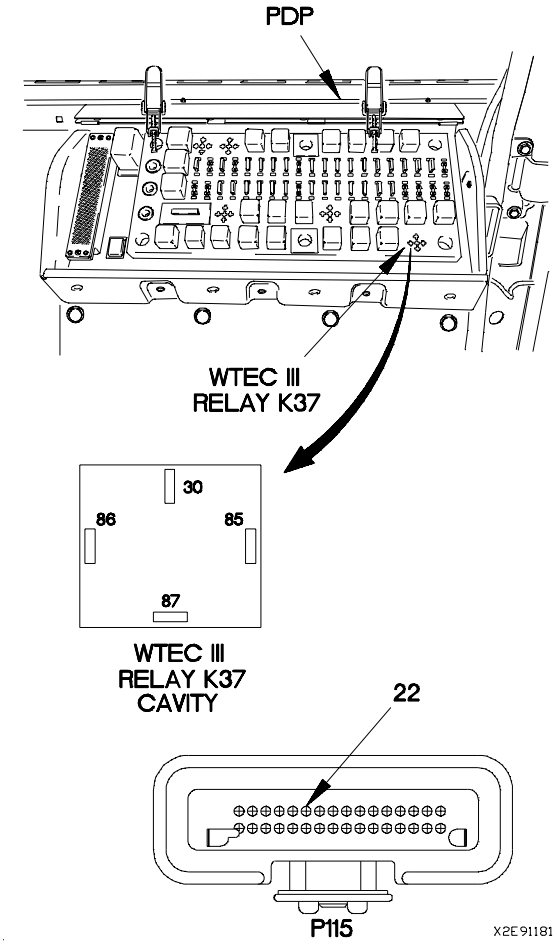


e91. POWER TAKE-OFF (PTO) DOES NOT OPERATE (CONT)

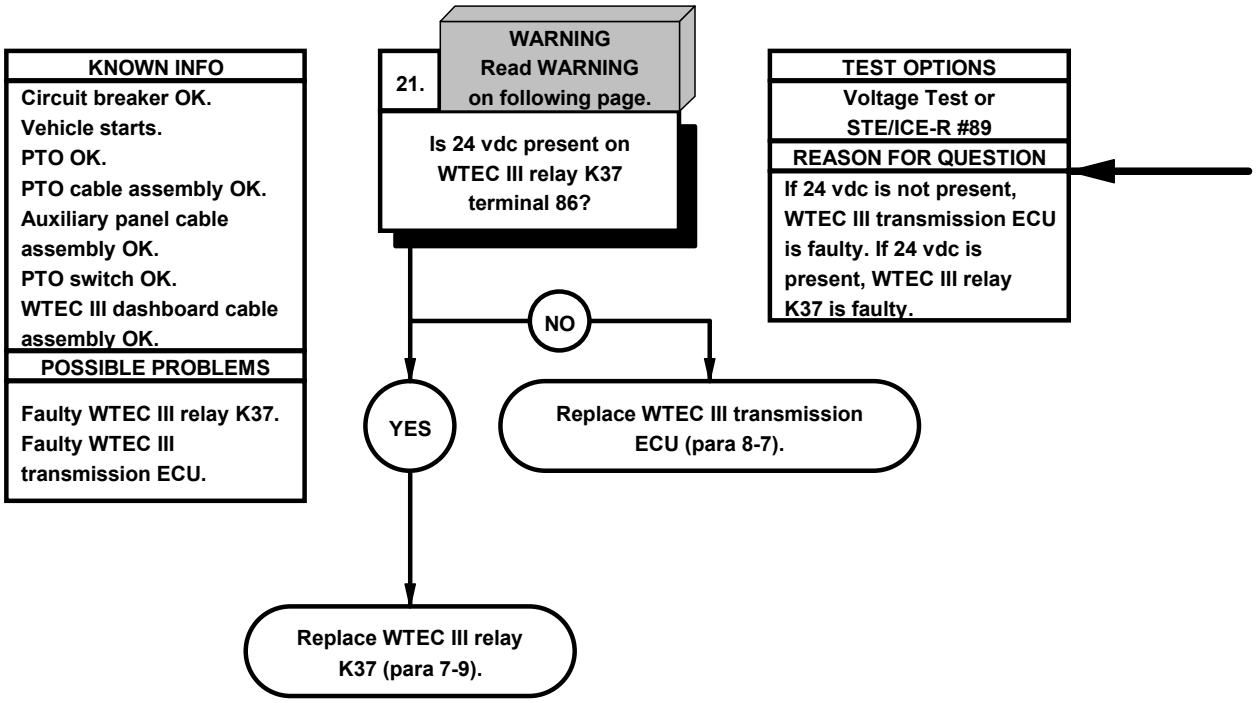


CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positve (+) probe of multimeter to connector P115-22.
(3) Connect negative (-) probe of multimeter to PDP, where WTEC III relay K37 terminal 86 was removed, and note reading on multimeter.
(4) If continuity is not present, repair wire 112 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).
(5) Connect connector P115 to WTEC III transmission ECU.
(6) Connect connector clamp on connector P115.



e91. POWER TAKE-OFF (PTO) DOES NOT OPERATE (CONT)

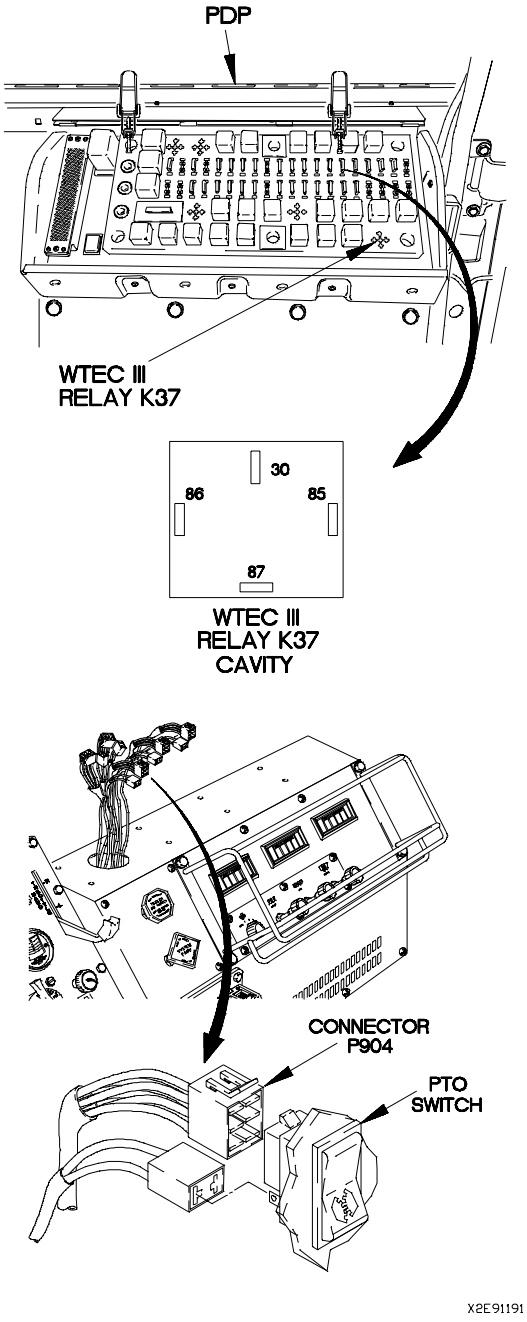


WARNING

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.

VOLTAGE TEST

(1) Set multimeter to volts dc.
(2) Connect positive (+) probe of multimeter to PDP, where WTEC III relay K37 terminal 86 was removed.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If 24 vdc is not present, replace WTEC III transmission ECU (para 8-7).
(5) If 24 vdc is present, replace WTEC III relay K37 (para 7-9).
(6) Install WTEC III relay K37 on PDP.
(7) Remove PTO switch from connector P904.
(8) Install personnel heater (para 18-9).



e92. ELECTRICAL SYSTEM DOES NOT MAINTAIN A CHARGE

INITIAL SETUP

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

Materials/Parts
Wire, Elect, 50 ft (Item 71, Appendix D)
Wire, Relay Test (Item 9, Appendix E)
Nut, Self-Locking (Item 144.1, Appendix G) (100 AMP)
Nut, Self-Locking (Item 143.1, Appendix G) (200 AMP)

References
TM 9-6140-200-14
TM 9-4910-571-12&P

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Apron, Rubber (Item 3, Appendix C)
Gloves, Rubber (Item 13, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Tester, Antifreeze and Battery (Item 42, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)

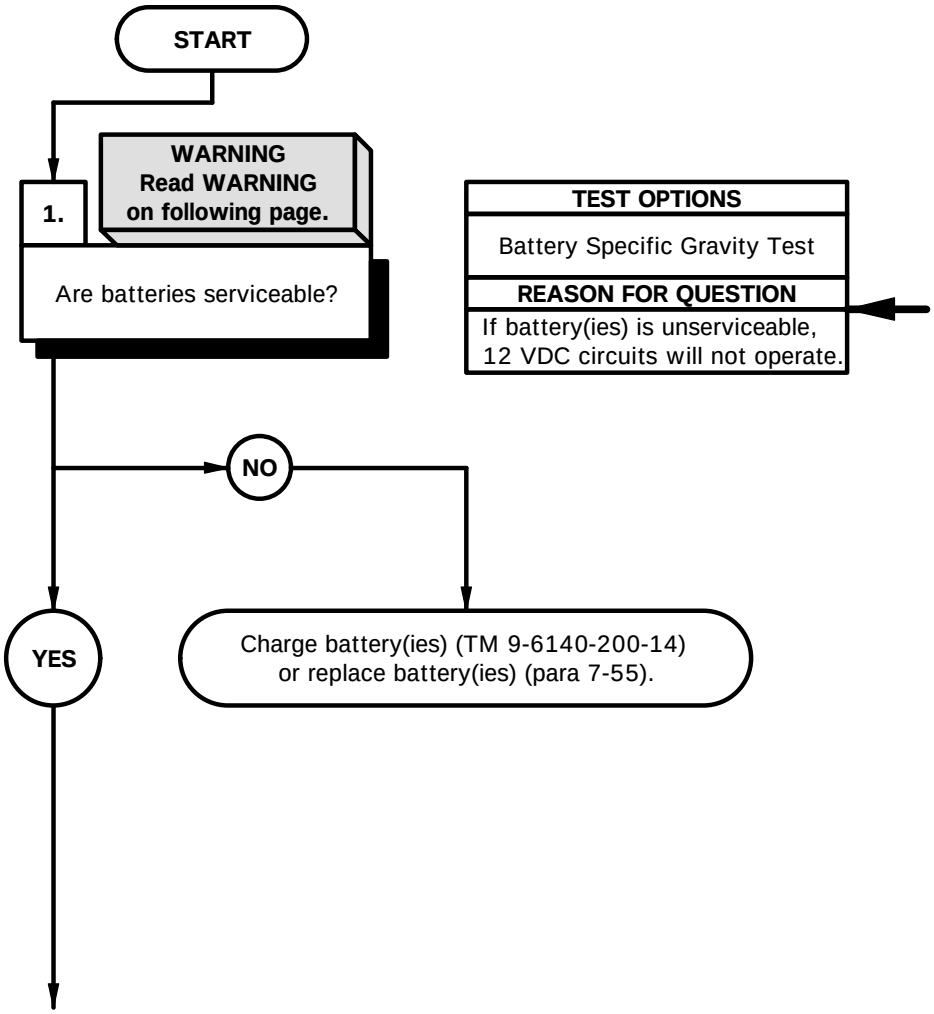
Personnel Required
(2)

KNOWN INFO

Engine oil pressure indicator light illuminates.
OIL PRESS gage operates.
Engine starts.
Alternator belts OK.

POSSIBLE PROBLEMS

Faulty battery(ies).
Faulty engine oil pressure switch.
Faulty relay K11.
Faulty dashboard cable assembly.
Faulty engine control cable assembly.
Faulty alternator ground strap.
Faulty alternator.
Faulty voltage regulator.
Faulty 100 AMP alternator to reverse polarity relay 12 VDC cable.
Faulty 200 AMP alternator to terminal block 12 VDC cable.
Faulty 100 AMP alternator to reverse polarity relay 24 VDC cable.
Faulty 200 AMP alternator to terminal block 24 VDC cable.



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.

BATTERY SPECIFIC GRAVITY TEST

(1) Remove battery box cover from battery box (TM 9-2320-366-10-2).
(2) Remove four batteries from battery box (para 7-55).
(3) Test batteries for serviceability (TM 9-6140-200-14).
(4) Replace battery(ies) if unserviceable (TM 9-6140-200-14).
(5) Install four batteries in battery box (para 7-55).
(6) Install battery box cover on battery box (TM 9-2320-366-10-2).

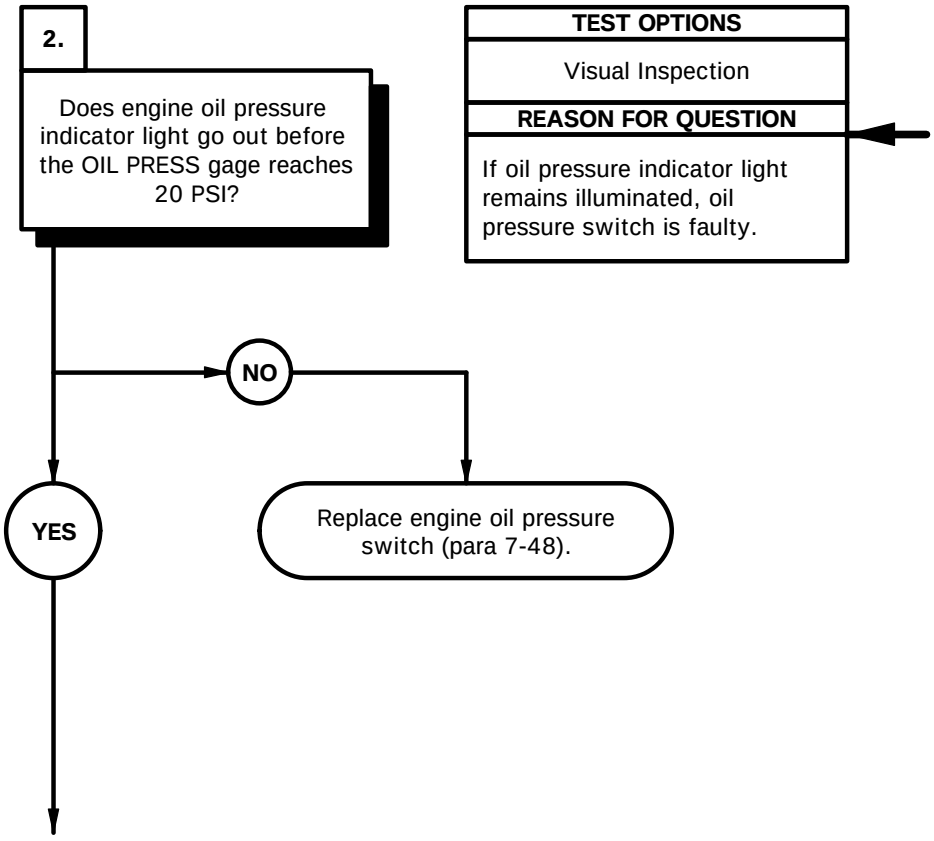
e92. ELECTRICAL SYSTEM DOES NOT MAINTAIN A CHARGE (CONT)

KNOWN INFO

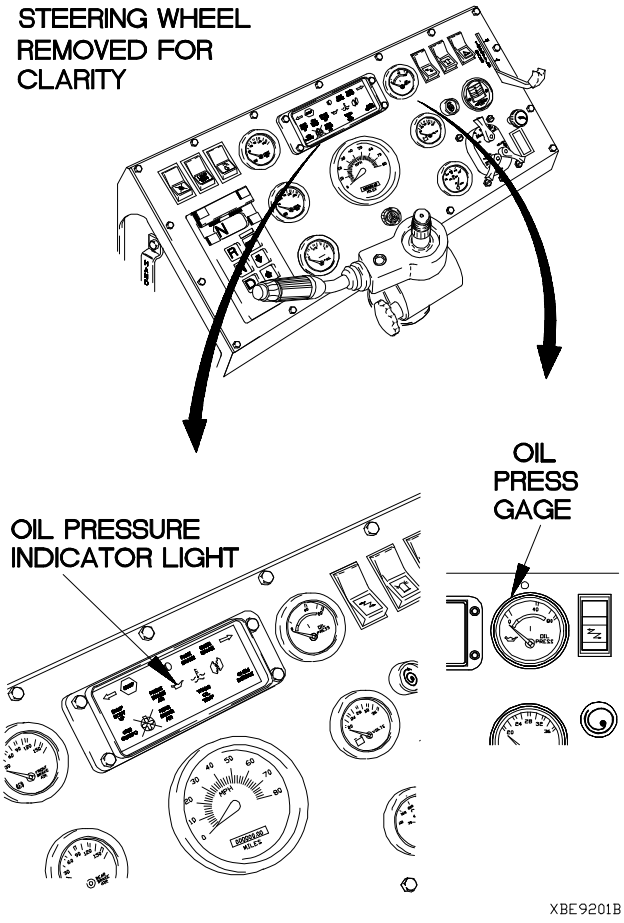
Engine oil pressure indicator light illuminates.
OIL PRESS gage operates.
Engine starts.
Alternator belts OK.
Battery(ies) OK.

POSSIBLE PROBLEMS

Faulty engine oil pressure switch.
Faulty relay K11.
Faulty dashboard cable assembly.
Faulty engine control cable assembly.
Faulty alternator ground strap.
Faulty alternator.
Faulty voltage regulator.
Faulty 100 AMP alternator to reverse polarity relay 12 VDC cable.
Faulty 200 AMP alternator to terminal block 12 VDC cable.
Faulty 100 AMP alternator to reverse polarity relay 24 VDC cable.
Faulty 200 AMP alternator to terminal block 24 VDC cable.



(1) Start engine (TM 9-2320-366-10-1).
(2) If engine oil pressure indicator light remains on after OIL PRESS gage reaches 20 PSI, replace engine oil pressure switch (para 7-48).
(3) Shut down engine (TM 9-2320-366-10-1).



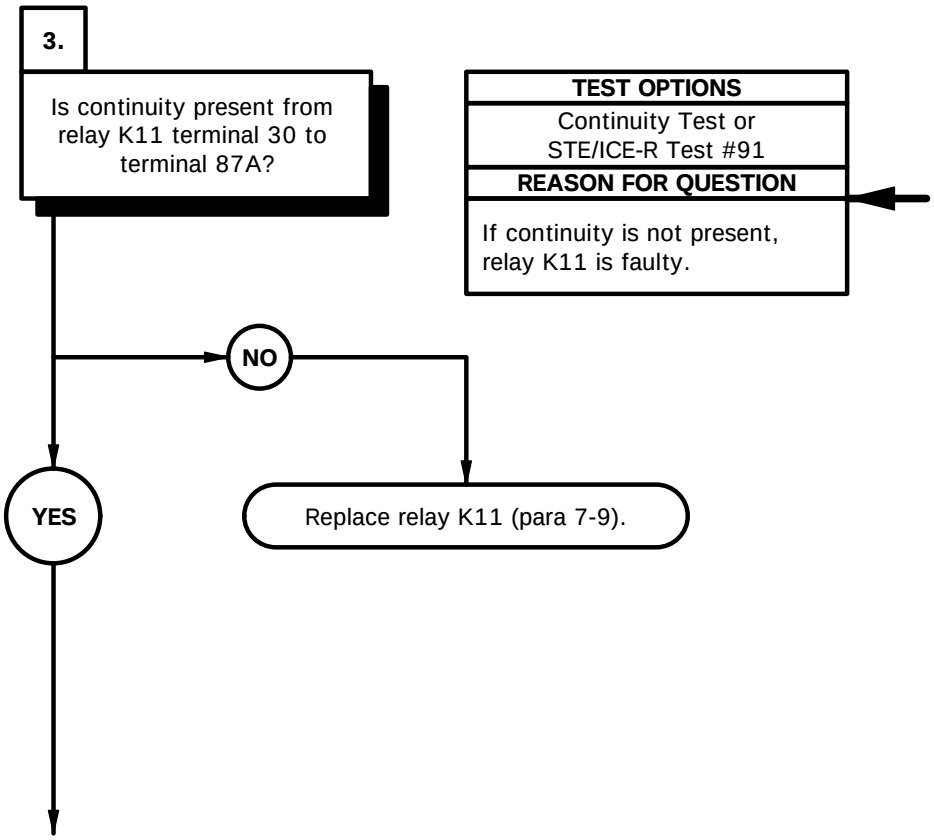
e92. ELECTRICAL SYSTEM DOES NOT MAINTAIN A CHARGE (CONT)

KNOWN INFO

Engine oil pressure indicator light illuminates.
OIL PRESS gage operates.
Engine starts.
Alternator belts OK.
Battery(ies) OK.
Engine oil pressure switch OK.

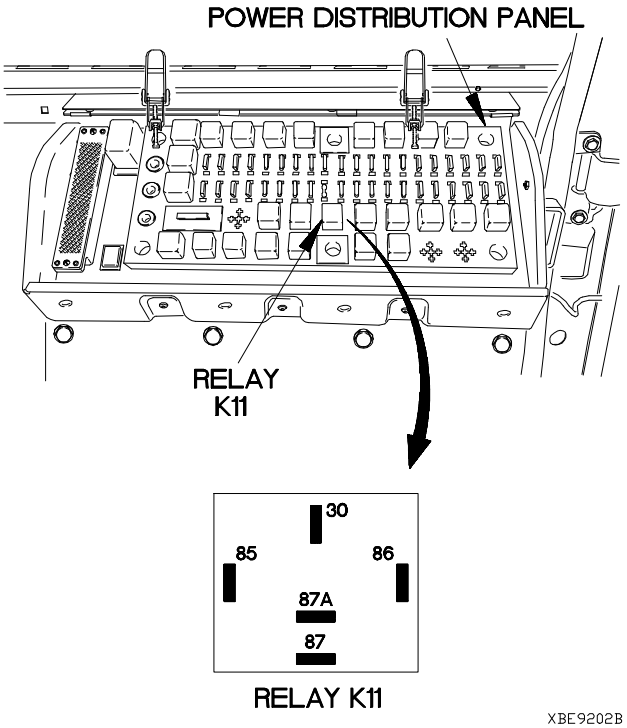
POSSIBLE PROBLEMS

Faulty relay K11.
Faulty dashboard cable assembly.
Faulty engine control cable assembly.
Faulty alternator ground strap.
Faulty alternator.
Faulty voltage regulator.
Faulty 100 AMP alternator to reverse polarity relay 12 VDC cable.
Faulty 200 AMP alternator to terminal block 12 VDC cable.
Faulty 100 AMP alternator to reverse polarity relay 24 VDC cable.
Faulty 200 AMP alternator to terminal block 24 VDC cable.



CONTINUITY TEST

(1) Disconnect batteries (para 7-57).
(2) Remove power distribution panel (PDP) cover (para 16-2).
(3) Remove relay K11 from power distribution panel (PDP).
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to relay K11 terminal 30.
(6) Connect negative (-) probe of multimeter to relay K11 terminal 87A and note reading on multimeter.
(7) If continuity is not present, replace relay K11 (para 7-9).



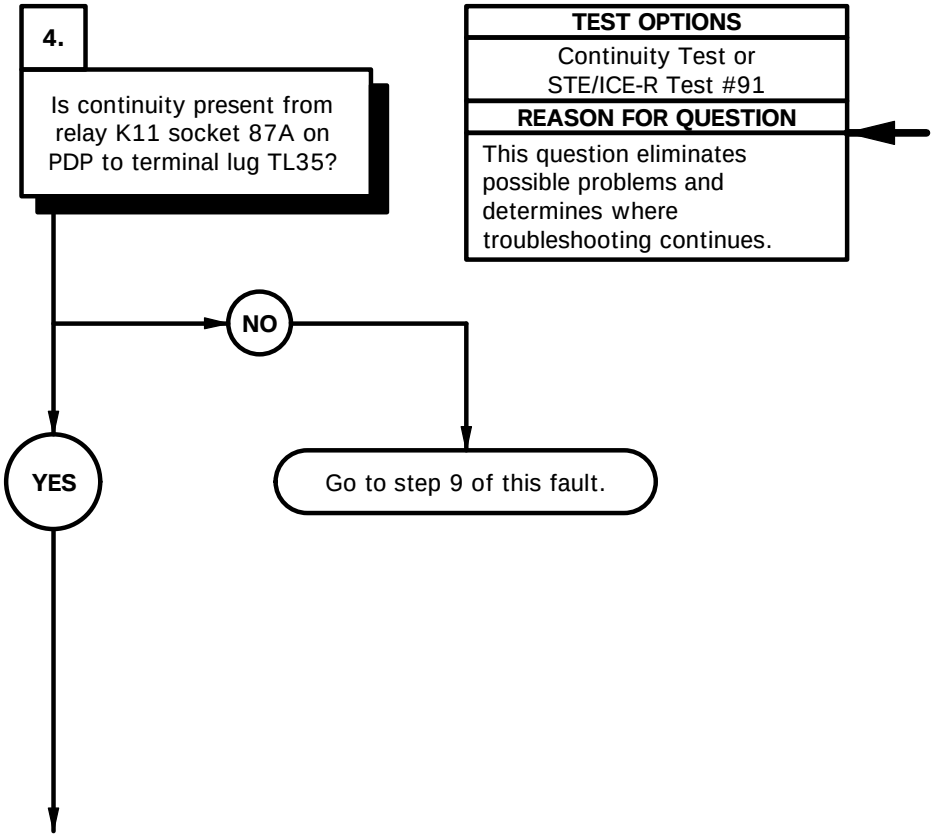
e92. ELECTRICAL SYSTEM DOES NOT MAINTAIN A CHARGE (CONT)

KNOWN INFO

Engine oil pressure indicator light illuminates.
OIL PRESS gage operates.
Engine starts.
Alternator belts OK.
Battery(ies) OK.
Engine oil pressure switch OK.
Relay K11 OK.

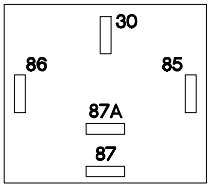
POSSIBLE PROBLEMS

Faulty dashboard cable assembly.
Faulty engine control cable assembly.
Faulty alternator ground strap.
Faulty alternator.
Faulty voltage regulator.
Faulty 100 AMP alternator to reverse polarity relay 12 VDC cable.
Faulty 200 AMP alternator to terminal block 12 VDC cable.
Faulty 100 AMP alternator to reverse polarity relay 24 VDC cable.
Faulty 200 AMP alternator to terminal block 24 VDC cable.

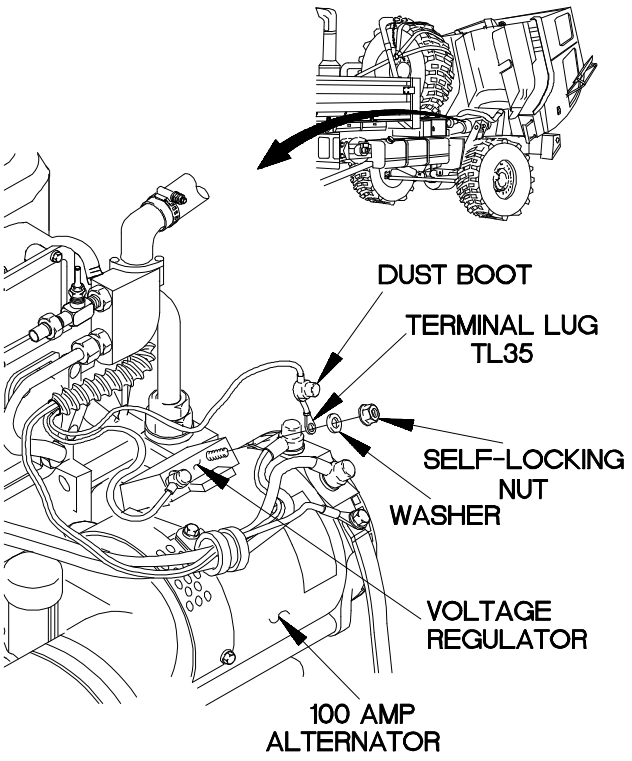


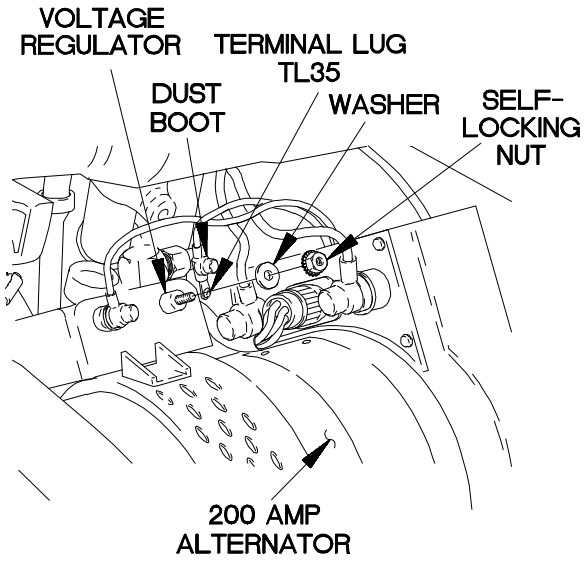
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to relay K11 socket 87A on PDP.
(3) Raise cab (TM 9-2320-366-10-1).
(4) Lift dust boot on terminal lug TL35.
(5) Remove self-locking nut, washer, and terminal lug TL35 from voltage regulator. Discard self-locking nut.
(6) Connect negative (-) probe of multimeter to terminal lug TL35 and note reading on multimeter.
(7) If continuity is not present, go to step 9 of this fault.
(8) Position terminal lug TL35 on voltage regulator with washer and self-locking nut.
(9) Tighten self-locking nut to 23-27 lb-in. (3 N.m).
(10) Position dust boot on terminal lug TL35.



RELAY K11 CAVITY





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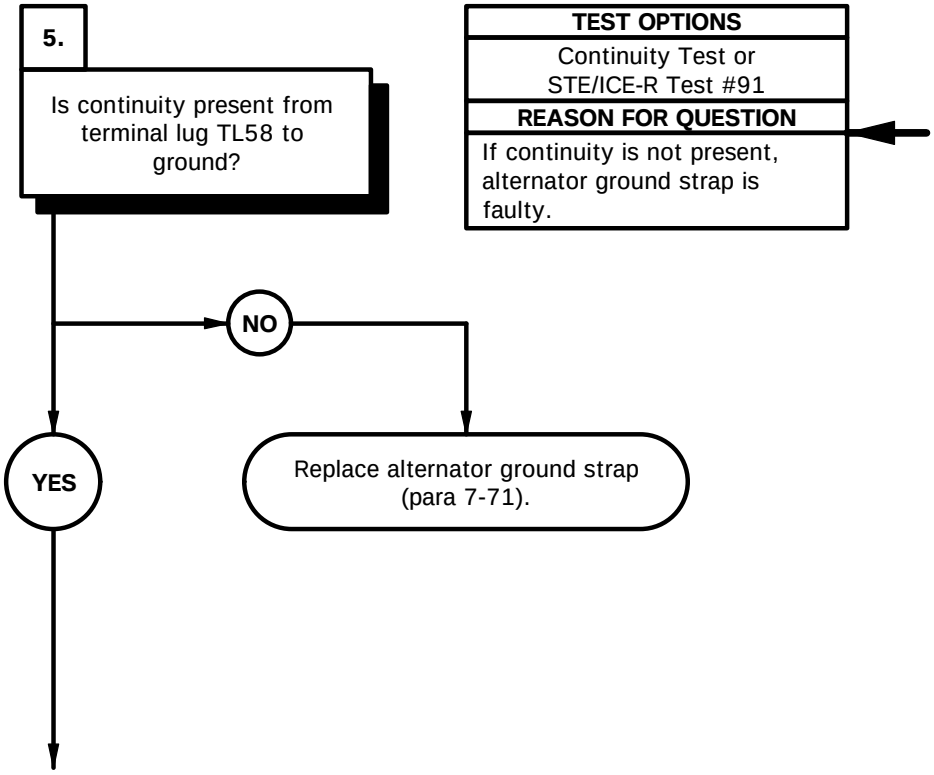
e92. ELECTRICAL SYSTEM DOES NOT MAINTAIN A CHARGE (CONT)

KNOWN INFO

Engine oil pressure indicator light illuminates.
OIL PRESS gage operates.
Engine starts.
Alternator belts OK.
Battery(ies) OK.
Engine oil pressure switch OK.
Relay K11 OK.
Dashboard cable assembly OK.
Engine control cable assembly OK.

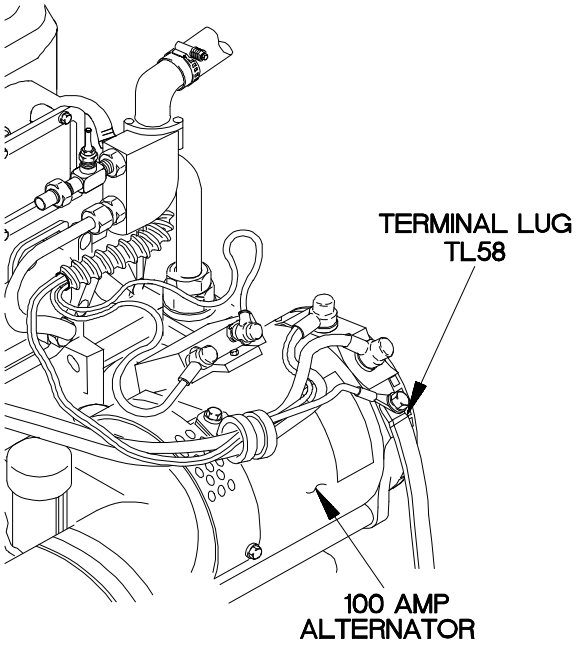
POSSIBLE PROBLEMS

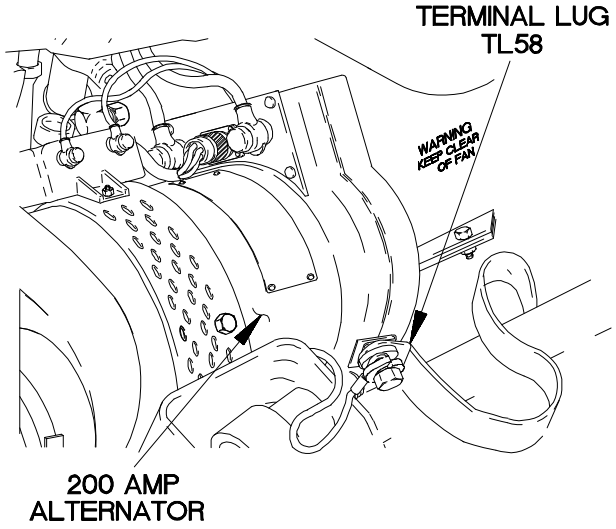
Faulty alternator ground strap.
Faulty alternator.
Faulty voltage regulator.
Faulty 100 AMP alternator to reverse polarity relay 12 VDC cable.
Faulty 200 AMP alternator to terminal block 12 VDC cable.
Faulty 100 AMP alternator to reverse polarity relay 24 VDC cable.
Faulty 200 AMP alternator to terminal block 24 VDC cable.



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to terminal lug TL58.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, replace alternator ground strap (para 7-71).
(5) Connect batteries (para 7-57).





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e92. ELECTRICAL SYSTEM DOES NOT MAINTAIN A CHARGE (CONT)

KNOWN INFO

Engine oil pressure indicator light illuminates.
OIL PRESS gage operates.
Engine starts.
Alternator belts OK.
Battery(ies) OK.
Engine oil pressure switch OK.
Relay K11 OK.
Dashboard cable assembly OK.
Engine control cable assembly OK.
Alternator ground strap OK.

POSSIBLE PROBLEMS

Faulty alternator.
Faulty voltage regulator.
Faulty 100 AMP alternator to reverse polarity relay 12 VDC cable.
Faulty 200 AMP alternator to terminal block 12 VDC cable.
Faulty 100 AMP alternator to reverse polarity relay 24 VDC cable.
Faulty 200 AMP alternator to terminal block 24 VDC cable.

WARNING
Read WARNING on following page.

6. Is 12 VDC present at terminal lug TL60?

TEST OPTIONS

Voltage Test or
STE/ICE-R Test #89

REASON FOR QUESTION

If 12 VDC is not present, 100 AMP alternator to reverse polarity relay 12 VDC cable or 200 AMP alternator to terminal block 12 VDC cable is faulty.

NO

Replace 100 AMP alternator to reverse polarity relay 12 VDC cable (para 7-72) or replace 200 AMP alternator to terminal block 12 VDC cable (para 20-48).

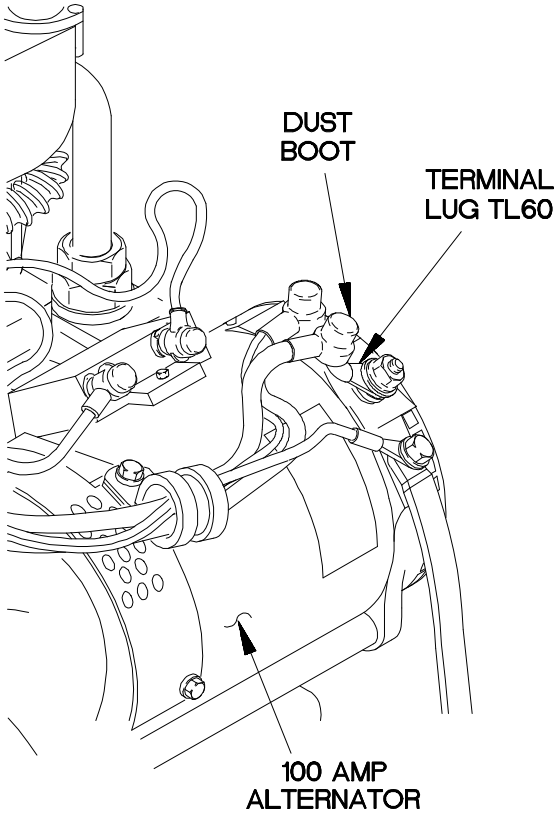
YES

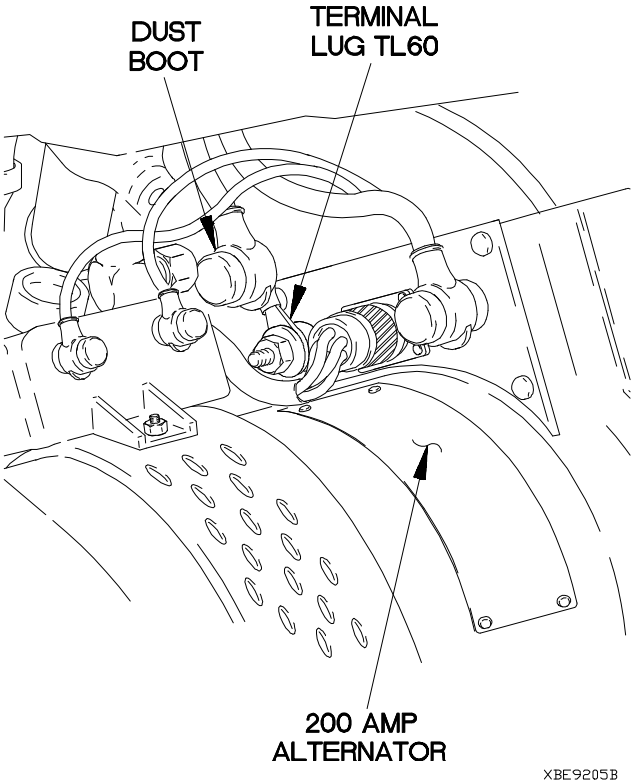
WARNING

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 circuits and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Raise cab (TM 9-2320-366-10-1).
(2) Lift dust boot from terminal lug TL60.
(3) Set multimeter to volts DC.
(4) Connect positive (+) probe of multimeter to terminal lug TL60.
(5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(6) If 12 VDC is not present, replace 100 AMP alternator to reverse polarity relay 12 VDC cable (para 7-72) or replace 200 AMP alternator to terminal block 12 VDC cable (para 20-48).
(7) Position dust boot on terminal lug TL60.





e92. ELECTRICAL SYSTEM DOES NOT MAINTAIN A CHARGE (CONT)

KNOWN INFO

Engine oil pressure indicator light illuminates.
OIL PRESS gage operates.
Engine starts.
Alternator belts OK.
Battery(ies) OK.
Engine oil pressure switch OK.
Relay K11 OK.
Dashboard cable assembly OK.
Engine control cable assembly OK.
Alternator ground strap OK.
100 AMP alternator to reverse polarity relay 12 VDC cable OK.
200 AMP alternator to terminal block 12 VDC cable OK.

POSSIBLE PROBLEMS

Faulty alternator.
Faulty voltage regulator.
Faulty 100 AMP alternator to reverse polarity relay 24 VDC cable.
Faulty 200 AMP alternator to terminal block 24 VDC cable.

WARNING
Read WARNING on following page.

7. Is 24 VDC present at terminal lug TL2?

TEST OPTIONS

Voltage Test or
STE/ICE-R Test #89

REASON FOR QUESTION

If 24 VDC is not present, 100 AMP alternator to reverse polarity relay 24 VDC cable or 200 AMP alternator to terminal block 24 VDC cable is faulty.

NO → Replace 100 AMP alternator to reverse polarity relay 24 VDC cable (para 7-73) or replace 200 AMP alternator to terminal block 24 VDC cable (para 20-50).

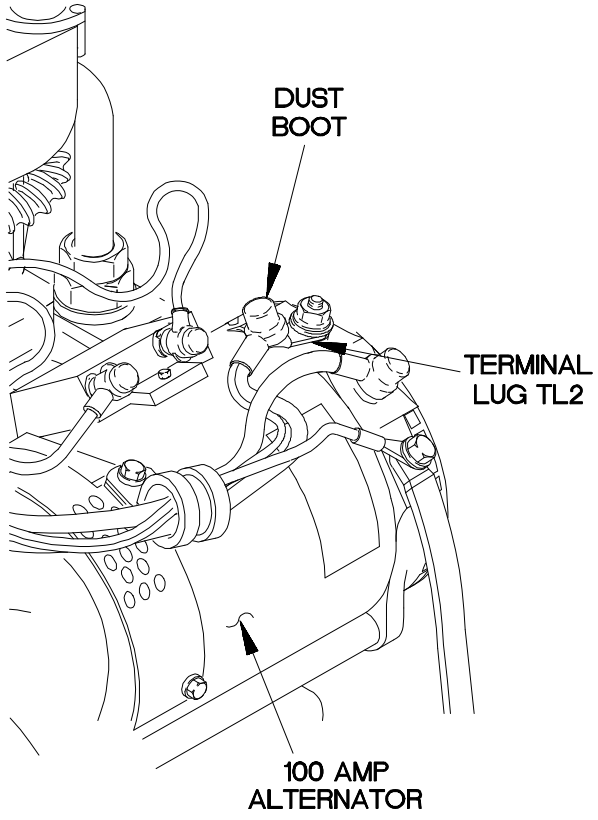
YES

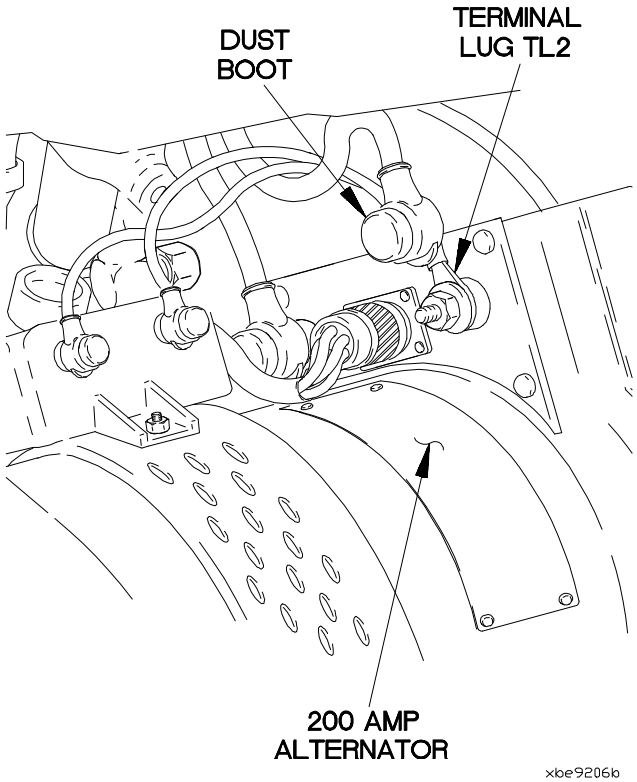
WARNING

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 circuits and cause severe burns or electrical shock.

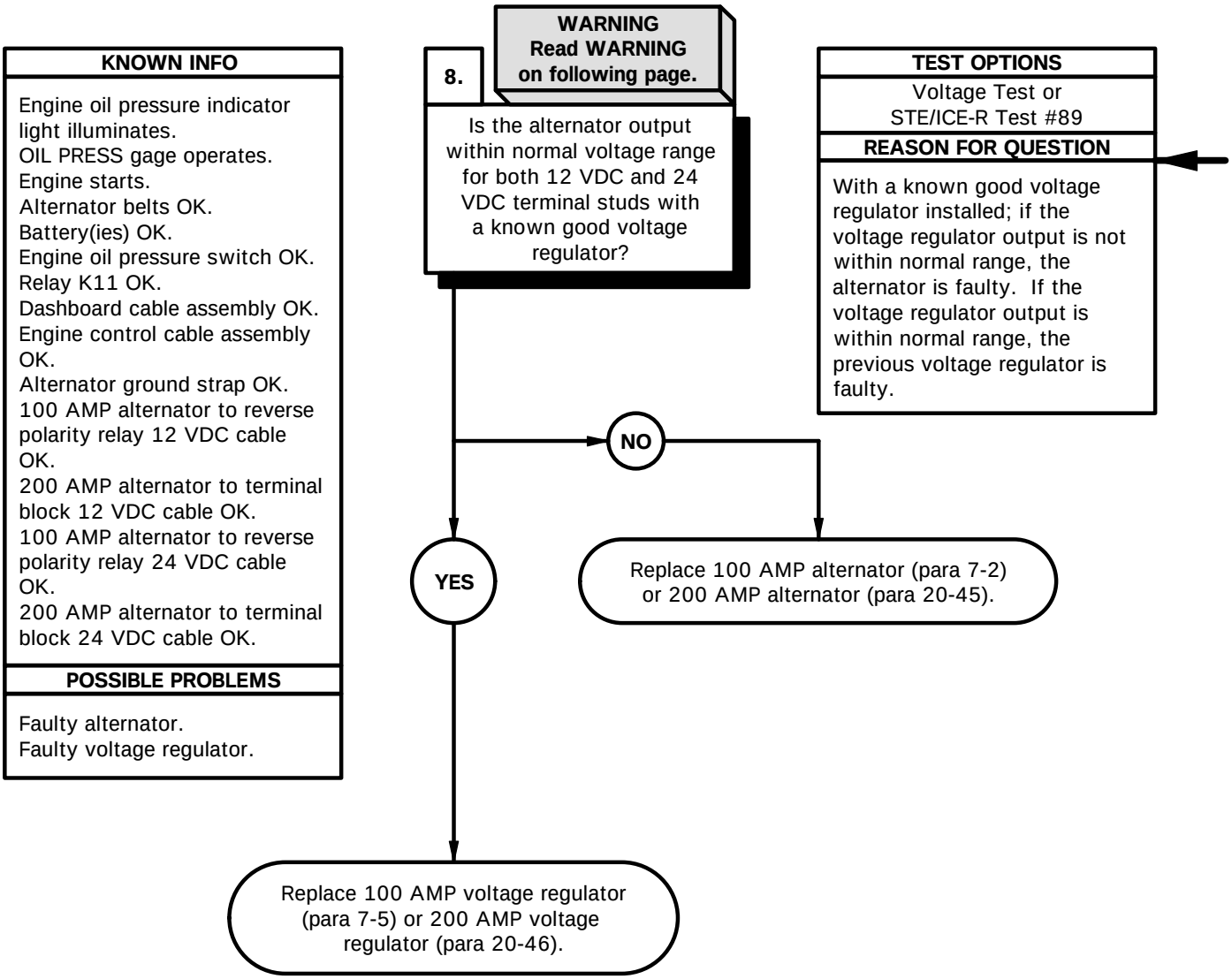
VOLTAGE TEST

(1) Lift dust boot from terminal lug TL2.
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to terminal lug TL2.
(4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(5) If 24 VDC is not present, replace 100 AMP alternator to reverse polarity relay 24 VDC cable (para 7-73) or replace 200 AMP alternator to terminal block 12 VDC cable (para 20-50).
(6) Position dust boot on terminal lug TL2.
(7) Disconnect batteries (para 7-57).
(8) Lower cab (TM9-2320-366-10-1).
(9) Install relay K11 in PDP.
(10) Install PDP cover (para 16-2).
(11) Connect batteries (para 7-57).





e92. ELECTRICAL SYSTEM DOES NOT MAINTAIN A CHARGE (CONT)

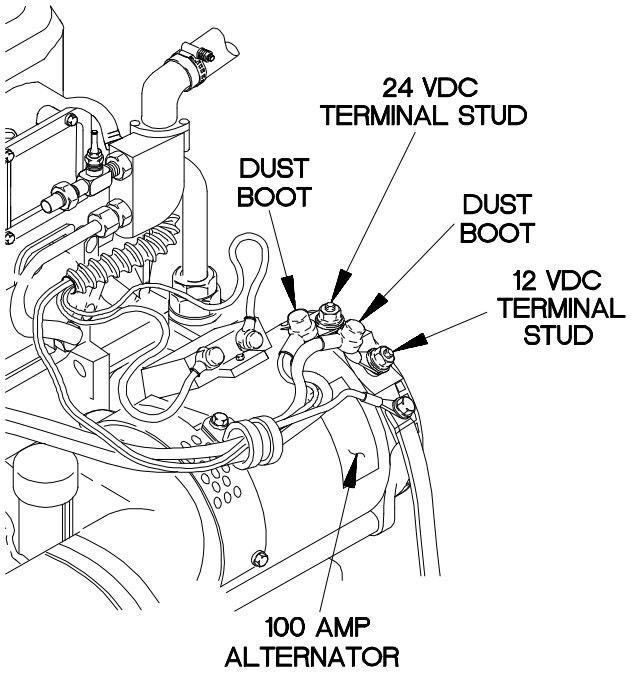


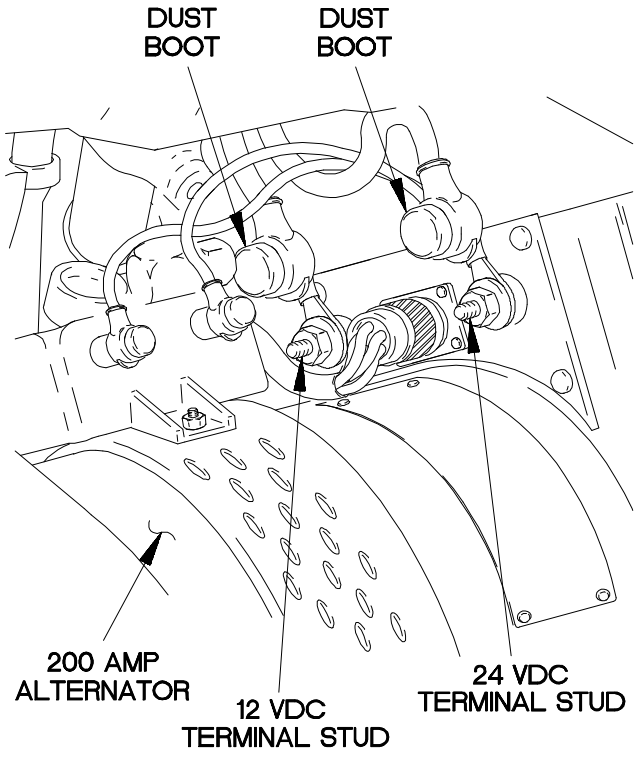
WARNING

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 circuits and cause severe burns or electrical shock.

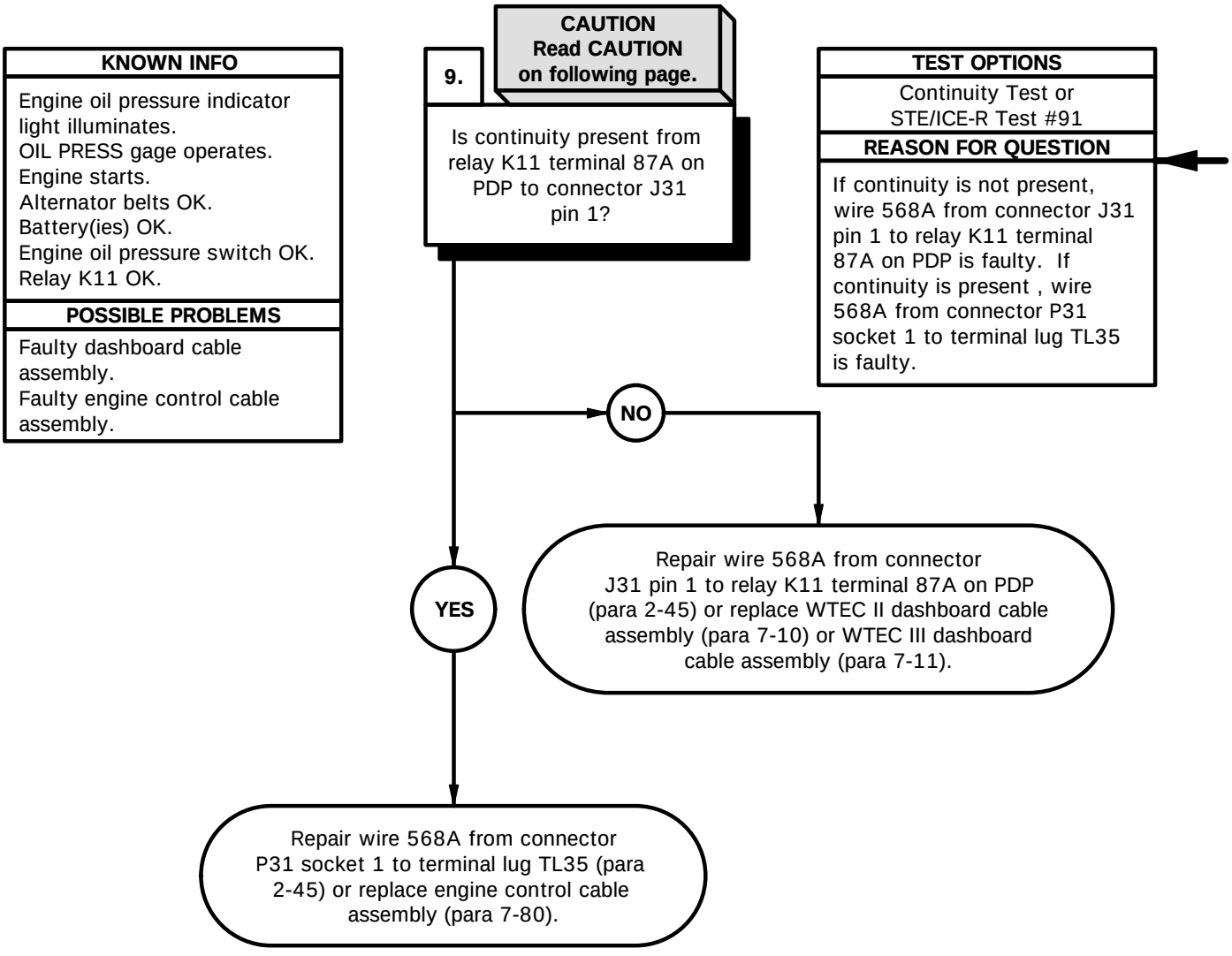
VOLTAGE TEST

(1) Replace 100 AMP voltage regulator (para 7-5) or 200 AMP voltage regulator (para 20-46) with a known good voltage regulator.
(2) Start engine (TM 9-2320-366-10-1).
(3) Raise cab (TM 9-2320-366-10-1).
(4) Lift dust boot from alternator 12 VDC terminal stud.
(5) Set multimeter to volts DC.
(6) Connect positive (+) probe of multimeter to alternator 12 VDC terminal stud.
(7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(8) If 13.25 -14.75V is not present, replace 100 AMP alternator (para 7-2) or 200 AMP alternator (para 20-45).
(9) If 13.25-14.75V is present, replace 100 AMP voltage regulator (para 7-5) or 200 AMP voltage regulator (para 20-46).
(10) Position dust boot on alternator 12 VDC terminal stud.
(11) Lift dust boot from alternator 24 VDC terminal stud.
(12) Connect positive (+) probe of multimeter to alternator 24 VDC terminal stud.
(13) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(14) If 27.25 -28.75V is not present, replace 100 AMP alternator (para 7-2) or 200 AMP alternator (para 20-45).
(15) If 27.25-28.75V is present, replace 100 AMP voltage regulator (para 7-5) or 200 AMP voltage regulator (para 20-46).
(16) Position dust boot on alternator 24 VDC terminal stud.
(17) Lower cab (TM 9-2320-366-10-1).
(18) Shut down engine (TM 9-2320-366-10-1).





e92. ELECTRICAL SYSTEM DOES NOT MAINTAIN A CHARGE (CONT)



CAUTION

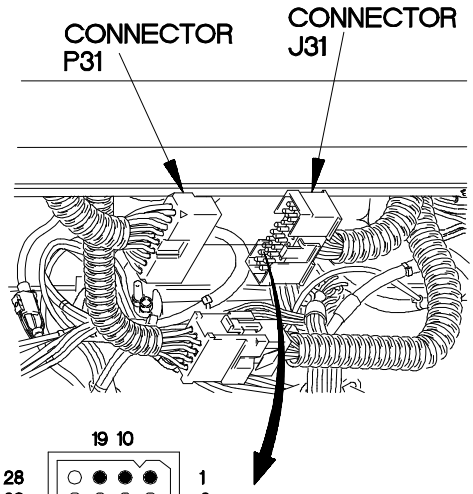
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

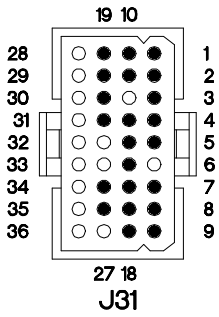
NOTE

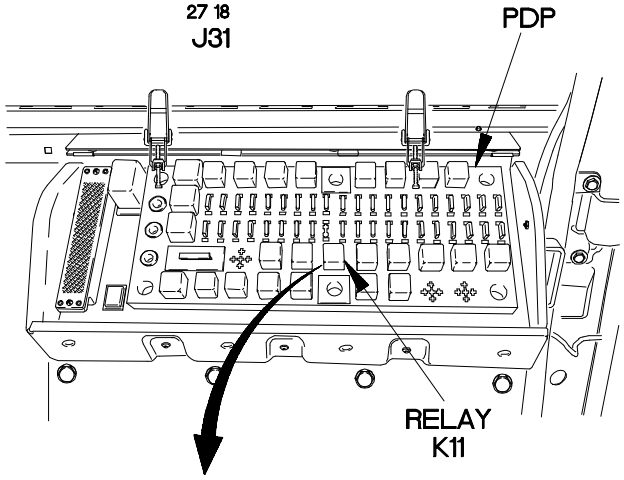
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back or not capable of making good contact.

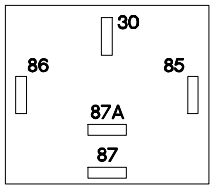
CONTINUITY TEST

(1) Lower cab (TM 9-2320-366-10-1).
(2) Remove instrument panel for access (para 7-15).
(3) Disconnect connector J31 from connector P31.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to relay K11 terminal 87A on PDP.
(6) Connect negative (-) probe of multimeter to connector J31 pin 1 and note reading on multimeter.
(7) If continuity is not present, repair wire 568A from connector J31 pin 1 to relay K11 terminal 87A (para 2-45) on PDP or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(8) If continuity is present, repair wire 568A from connector P31 socket 1 to terminal lug TL35 (para 2-45) or replace engine control cable assembly (para 7-80).
(9) Connect connector J31 to connector P31.
(10) Install instrument panel (para 7-15).
(11) Install relay K11 in PDP.
(12) Install PDP cover (para 16-2).
(13) Connect batteries (para 7-57).









RELAY K11 CAVITY

XBE9208B

e93. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) ILLUMINATION DOES NOT DIM

INITIAL SETUP

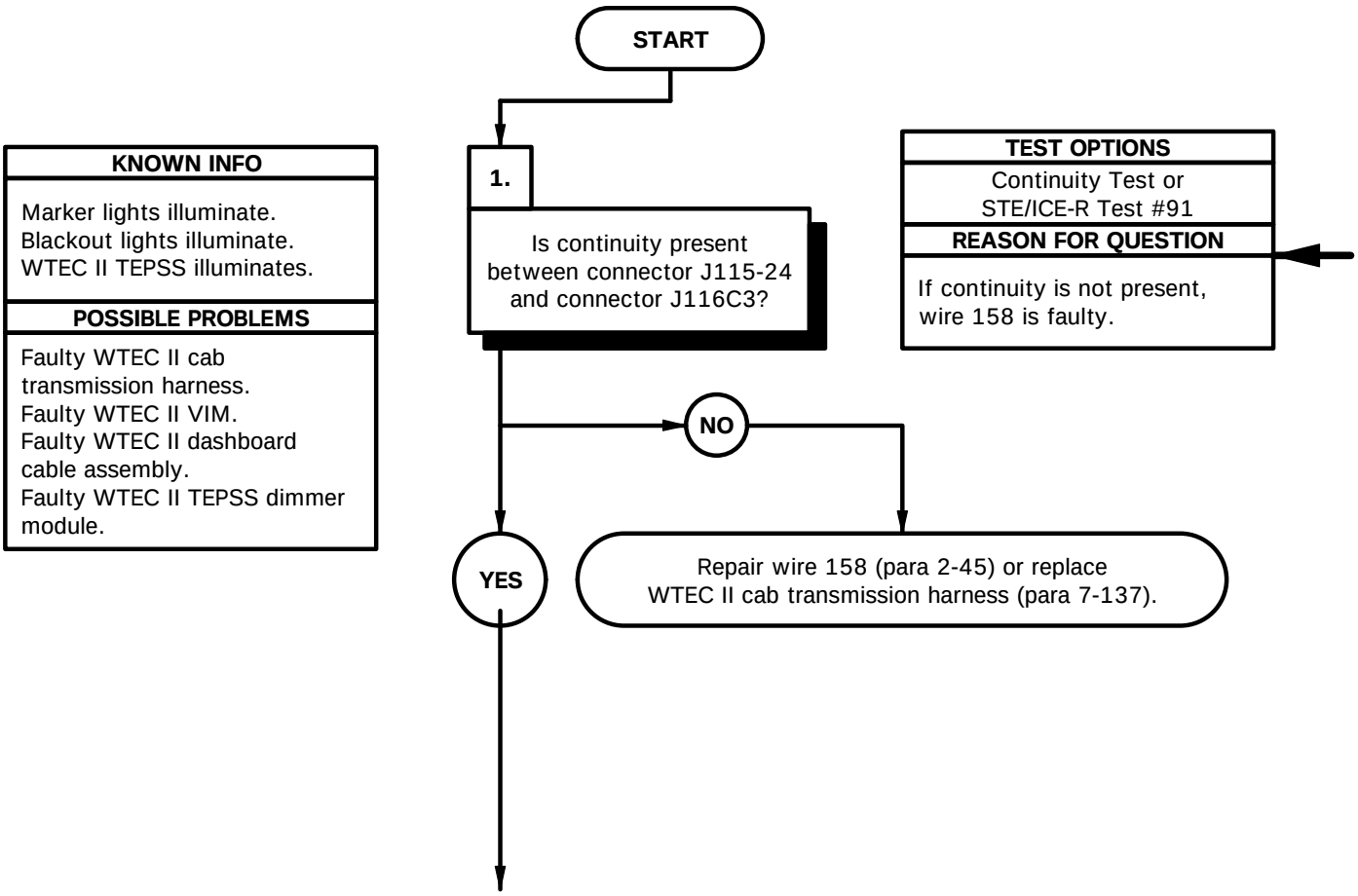
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).

Personnel Required
(2)

References
TM 9-4910-571-12&P

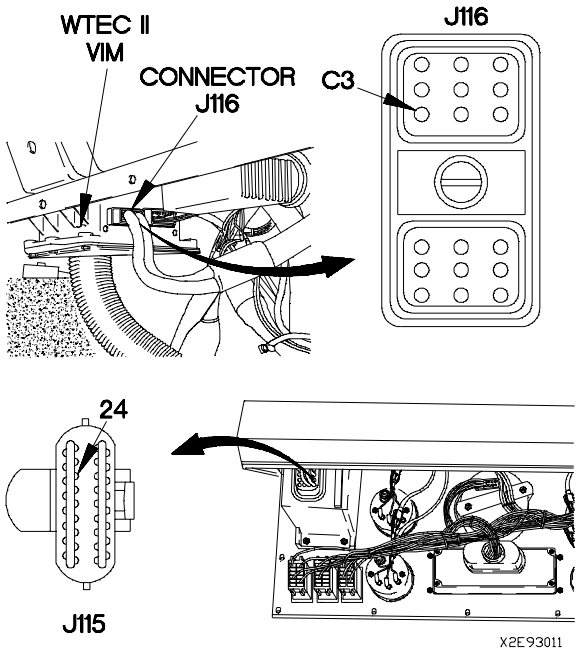
Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

Materials/Parts
Wire, Elect, 50 ft (Item 71, Appendix D)

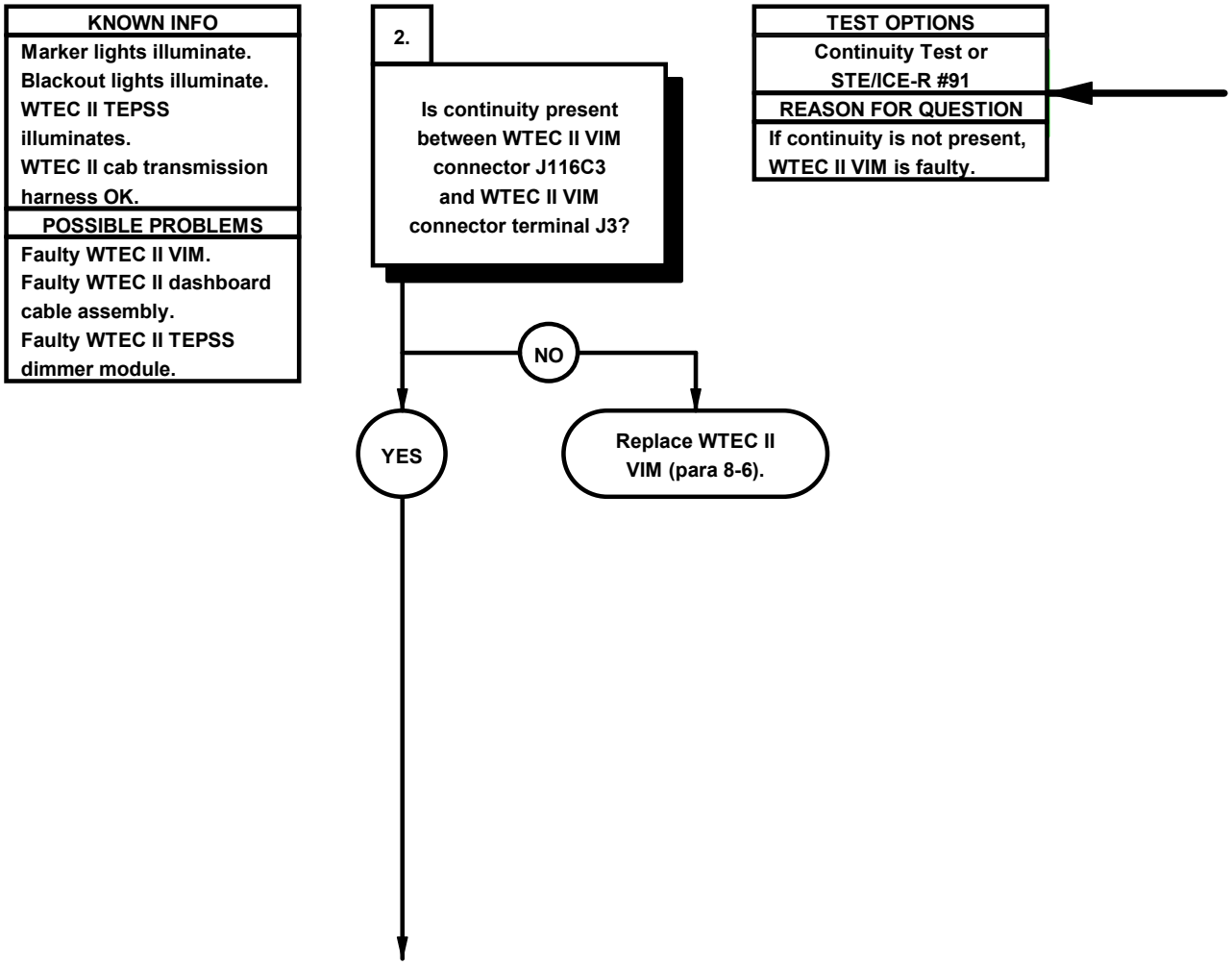


CONTINUITY TEST

(1) Remove kick panel (para 16-3).
(2) Disconnect connector J116 from WTEC II VIM.
(3) Remove instrument panel assembly for access (para 7-15).
(4) Disconnect connector J115 (top connector) from WTEC II TEPSS.
(5) Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter to connector J115-24.
(7) Connect negative (-) probe of multimeter to connector J116C3.
(8) If continuity is not present, repair wire 158 (para 2-45) or replace WTEC II cab transmission harness (para 7-137).
(9) Connect connector J115 to WTEC II TEPSS.
(10) Install instrument panel assembly (para 7-15).

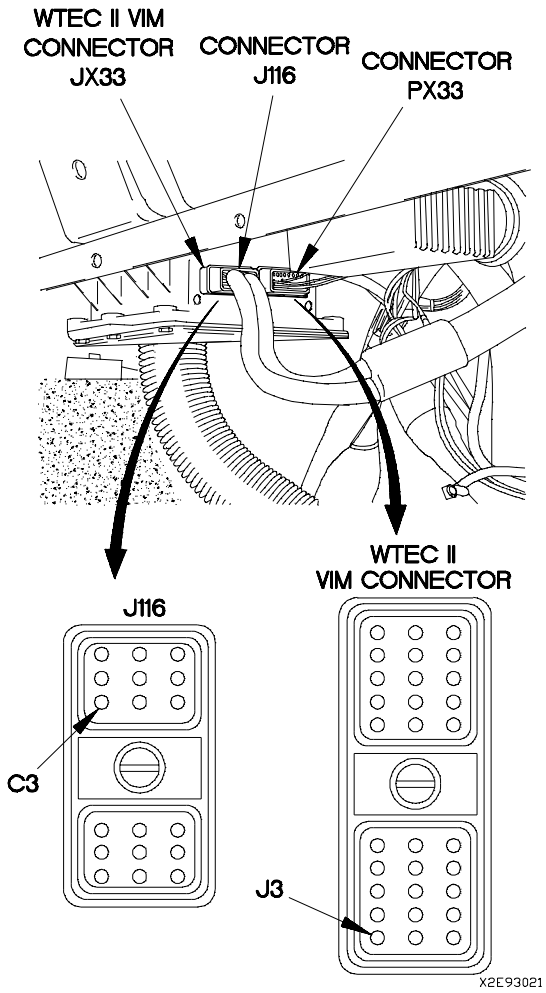


e93. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) ILLUMINATION DOES NOT DIM (CONT)

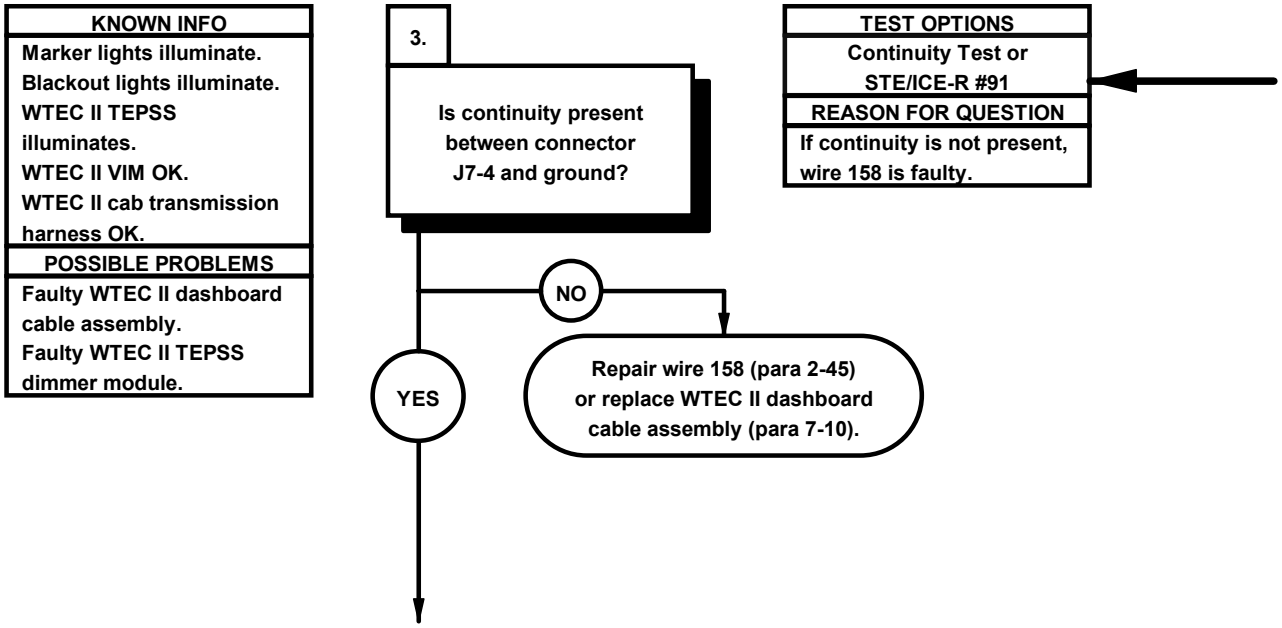


CONTINUITY TEST

(1) Loosen screw and disconnect connector PX33 from WTEC II VIM.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to WTEC II VIM connector J116C3.
(4) Connect negative (-) probe of multimeter to WTEC II VIM connector terminal J3 and note reading on multimeter.
(5) If continuity is not present, replace WTEC II VIM (para 8-6).
(6) Connect connector J116 to WTEC II VIM.
(7) Connect connector PX33 to WTEC II VIM and tighten screw.

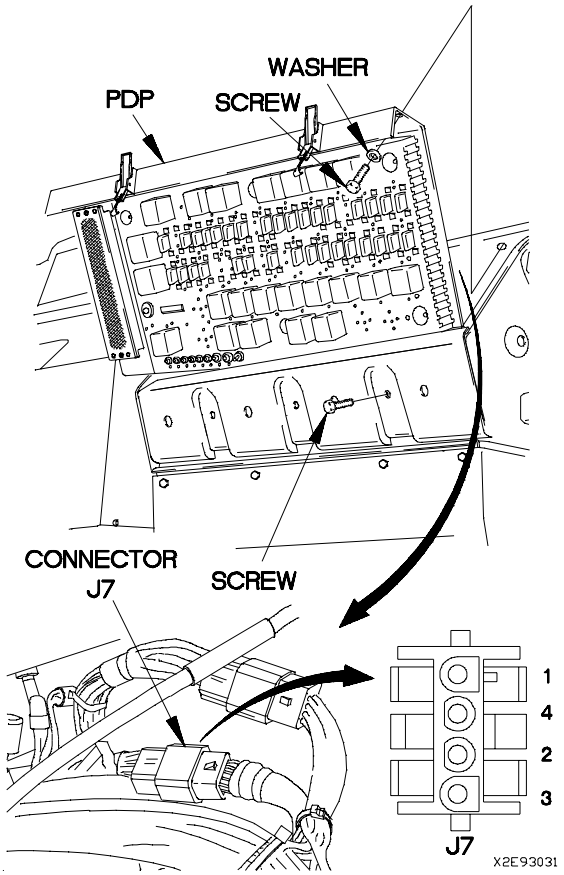


e93. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) ILLUMINATION DOES NOT DIM (CONT)

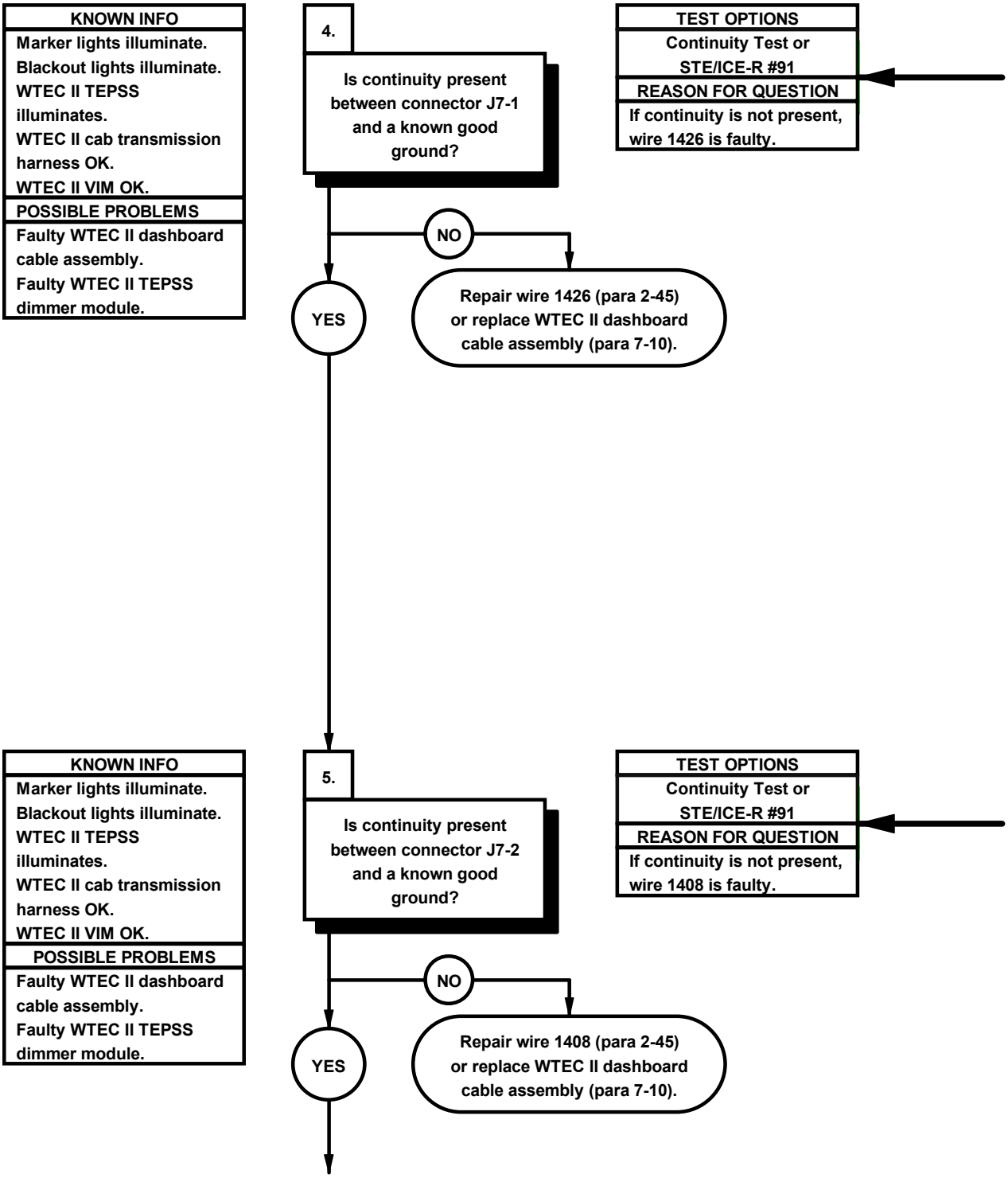


CONTINUITY TEST

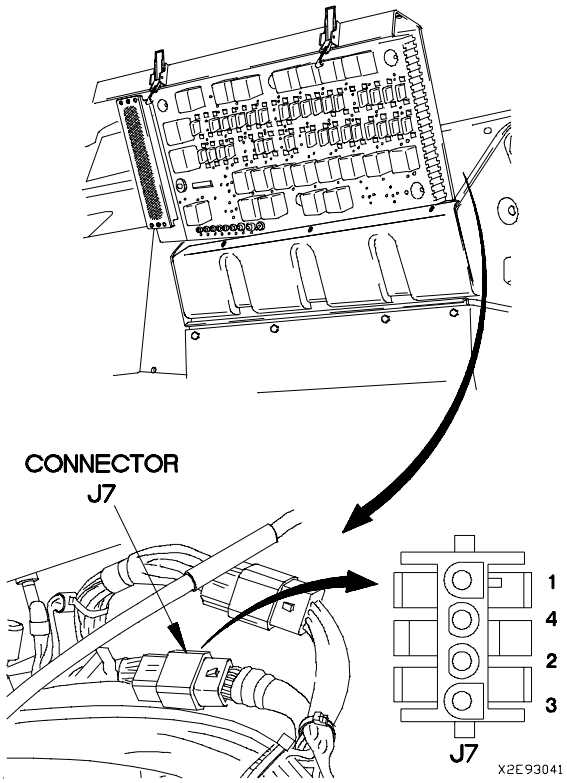
(1) Remove three screws and washers from PDP.
(2) Remove three screws from PDP.
(3) Lift PDP outward to gain access.
(4) Disconnect connector J7 from WTEC II TEPSS dimmer module.
(5) Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter to connector J7-4.
(7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(8) If continuity is not present, repair wire 158 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).



e93. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) ILLUMINATION DOES NOT DIM (CONT)

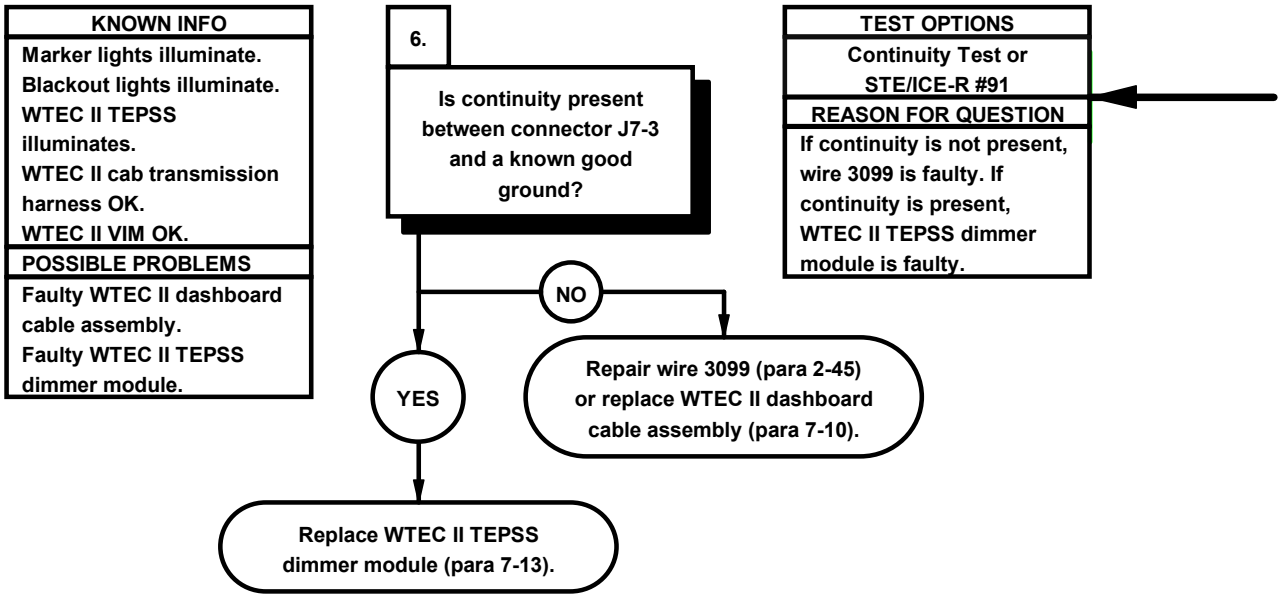


CONTINUITY TEST
(1) Set multimeter to ohms. (2) Connect positive (+) probe of multimeter to connector J7-1. (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter. (4) If continuity is not present, repair wire 1426 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).



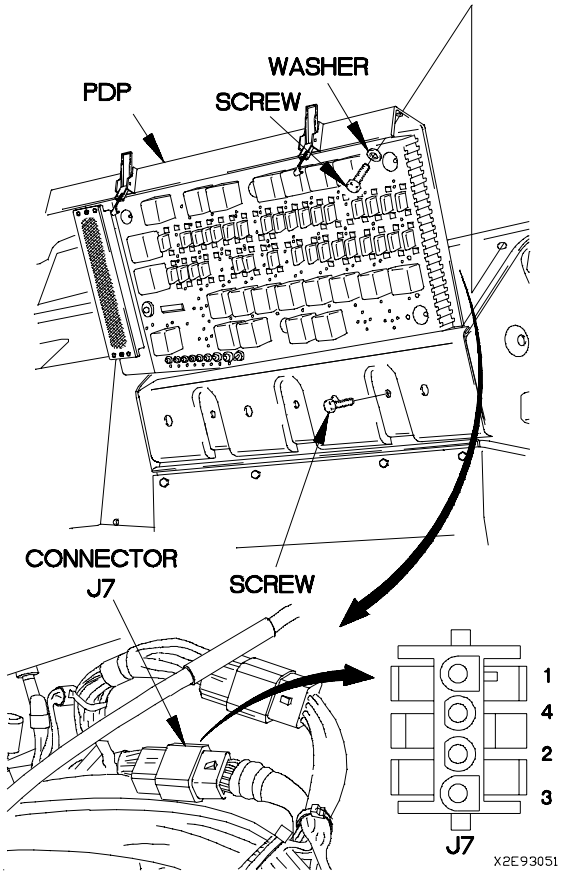
CONTINUITY TEST
(1) Set multimeter to ohms. (2) Connect positive (+) probe of multimeter to connector J7-2. (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter. (4) If continuity is not present, repair wire 1408 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).

e93. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) ILLUMINATION DOES NOT DIM (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector J7-3.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair wire 3099 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).
(5) If continuity is present, replace WTEC II TEPSS dimmer module (para 7-13).
(6) Connect connector J7 to WTEC II TEPSS dimmer module.
(7) Install PDP on dashboard with three screws.
(8) Install three washers and screws in PDP.
(9) Install kick panel (para 16-3).



e94. DIFFERENTIAL LOCK SOLENOID DOES NOT OPERATE

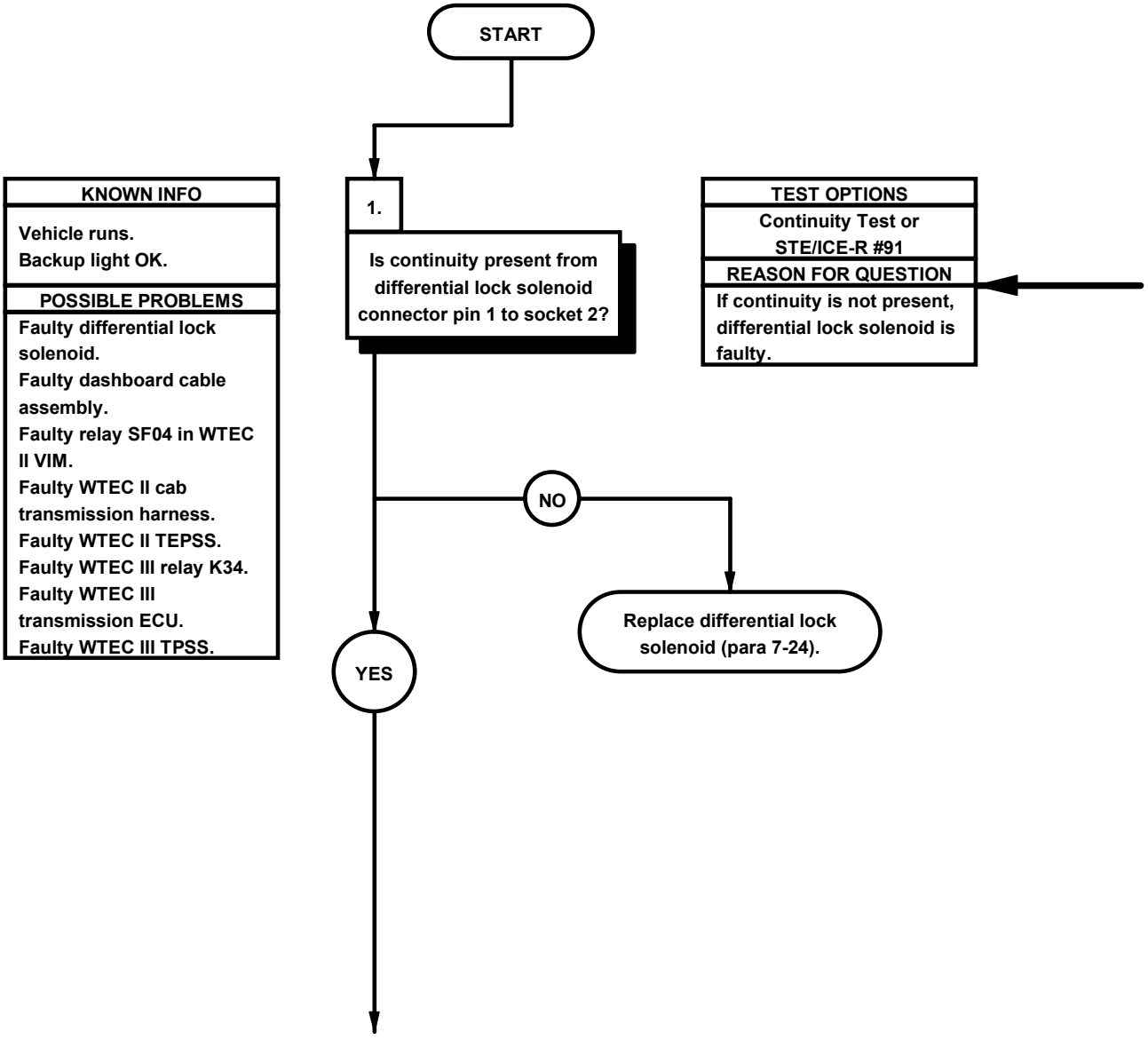
INITIAL SETUP

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

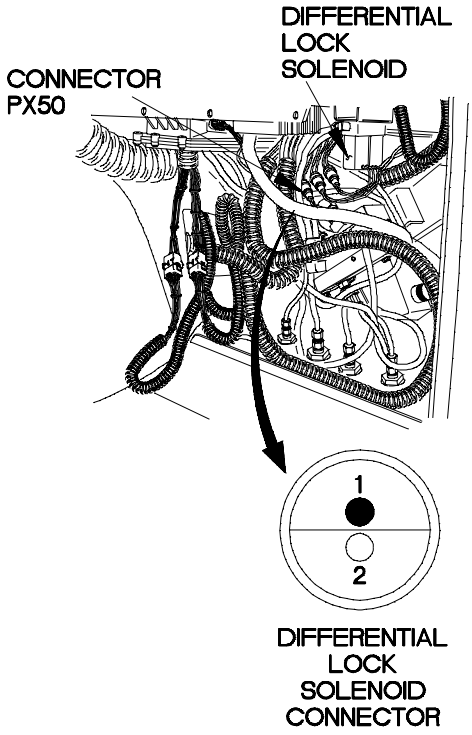
Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

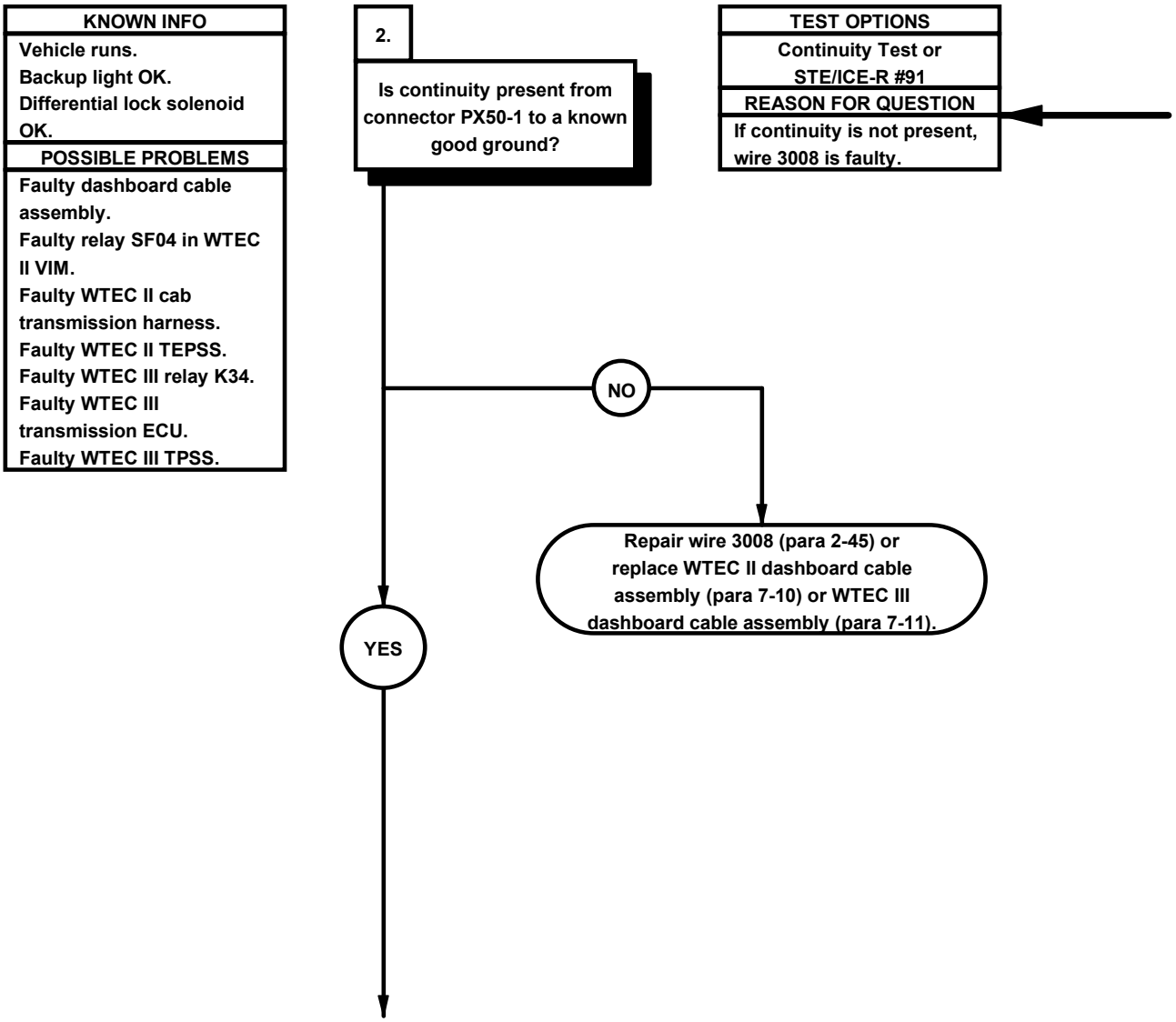
References
TM 9-4910-571-12&P



CONTINUITY TEST
(1) Remove kick panel (para 16-3).
(2) Disconnect connector PX50 from differential lock solenoid connector.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to differential lock solenoid connector pin 1.
(5) Connect negative (-) probe of multimeter to differential lock solenoid connector socket 2 and note reading on multimeter.
(6) If continuity is not present, replace differential lock solenoid (para 7-24).

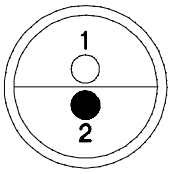


e94. DIFFERENTIAL LOCK SOLENOID DOES NOT OPERATE (CONT)



CONTINUITY TEST

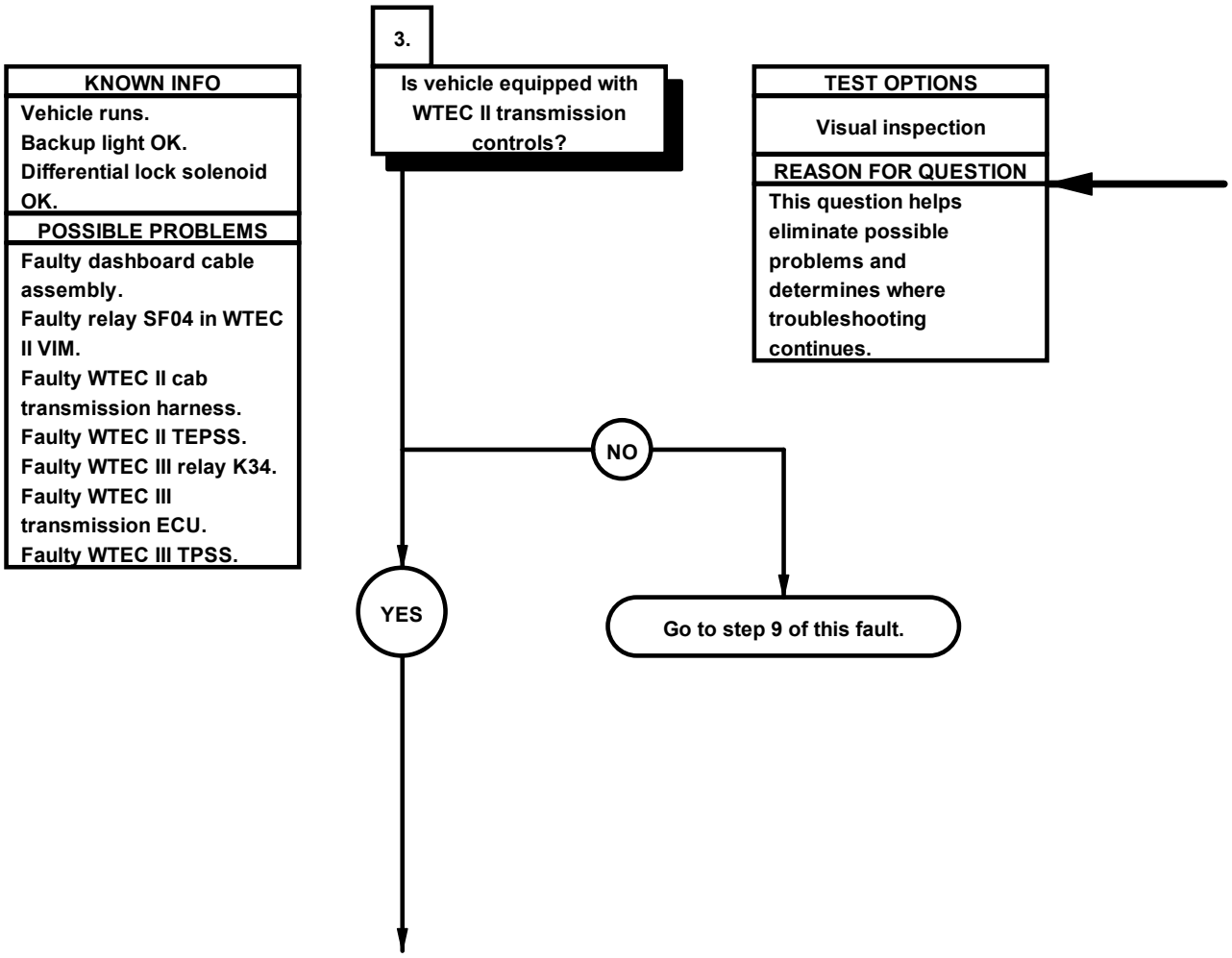
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector PX50-1.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair wire 3008 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).



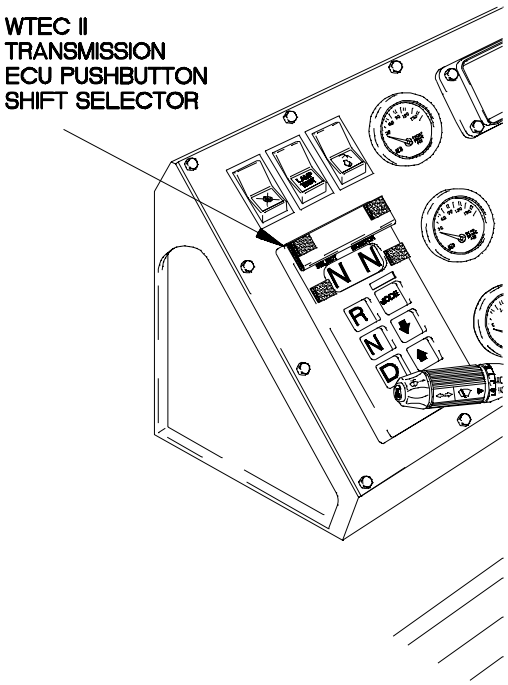
PX50

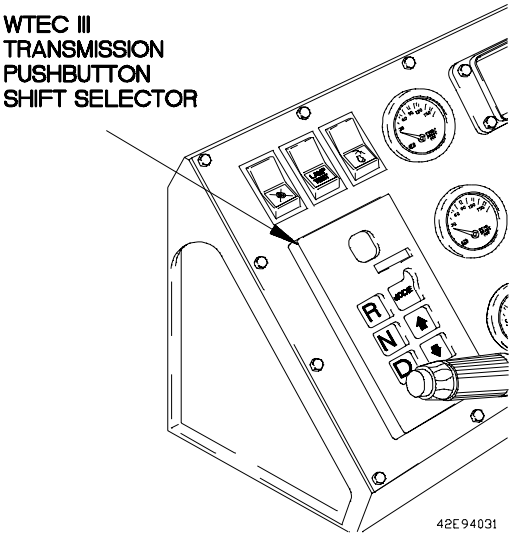
42E94021

e94. DIFFERENTIAL LOCK SOLENOID DOES NOT OPERATE (CONT)

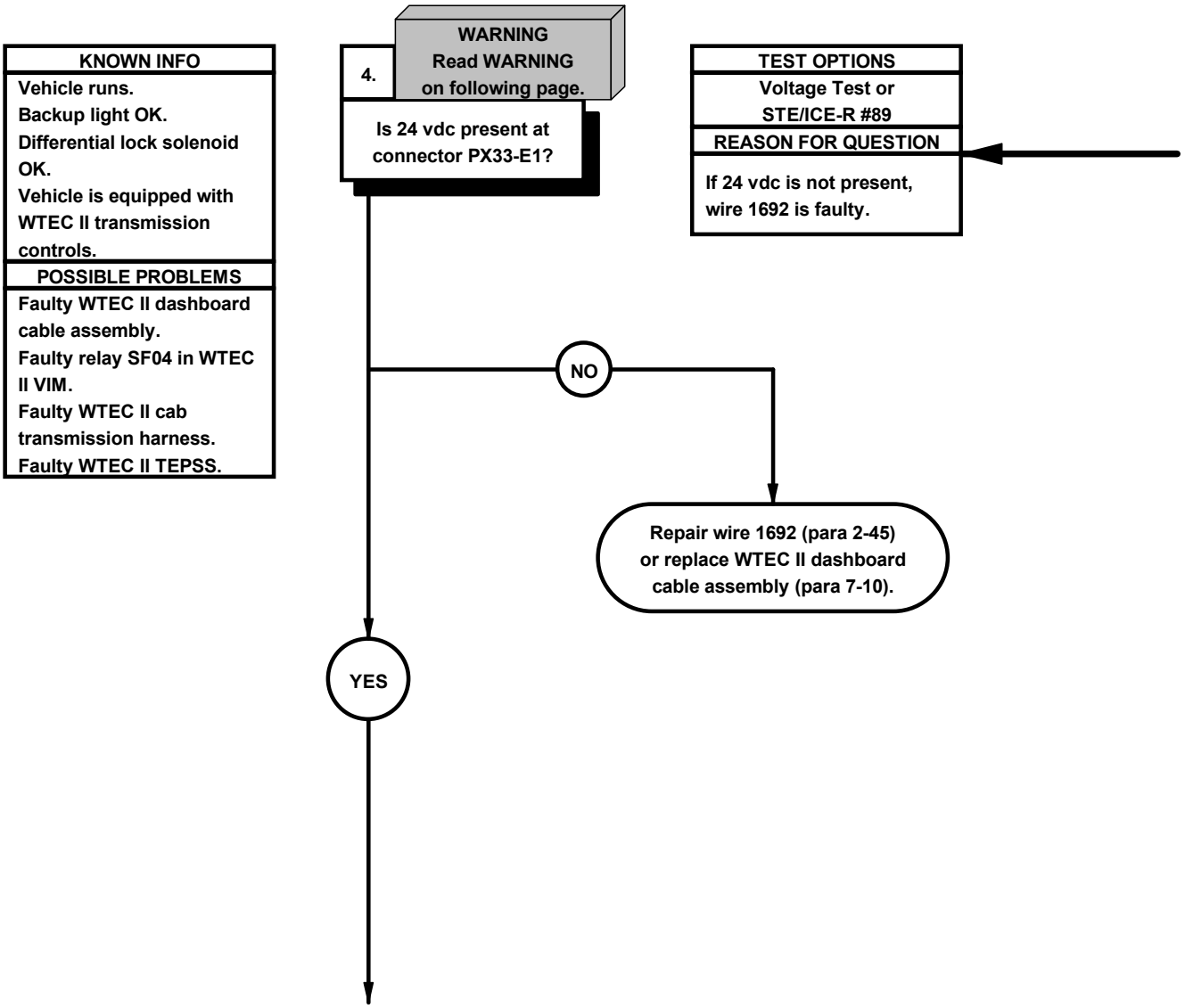


(1) Check if vehicle is equipped with WTEC II TEPSS.
(2) If transmission pushbutton shift selector is not mounted with four screws and does not have a filter cover, go to step 9 of this fault.





e94. DIFFERENTIAL LOCK SOLENOID DOES NOT OPERATE (CONT)

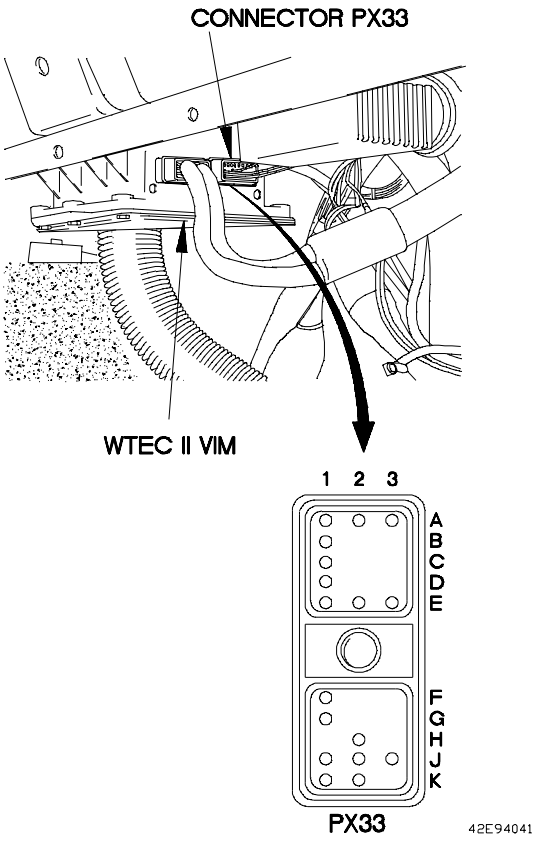


WARNING

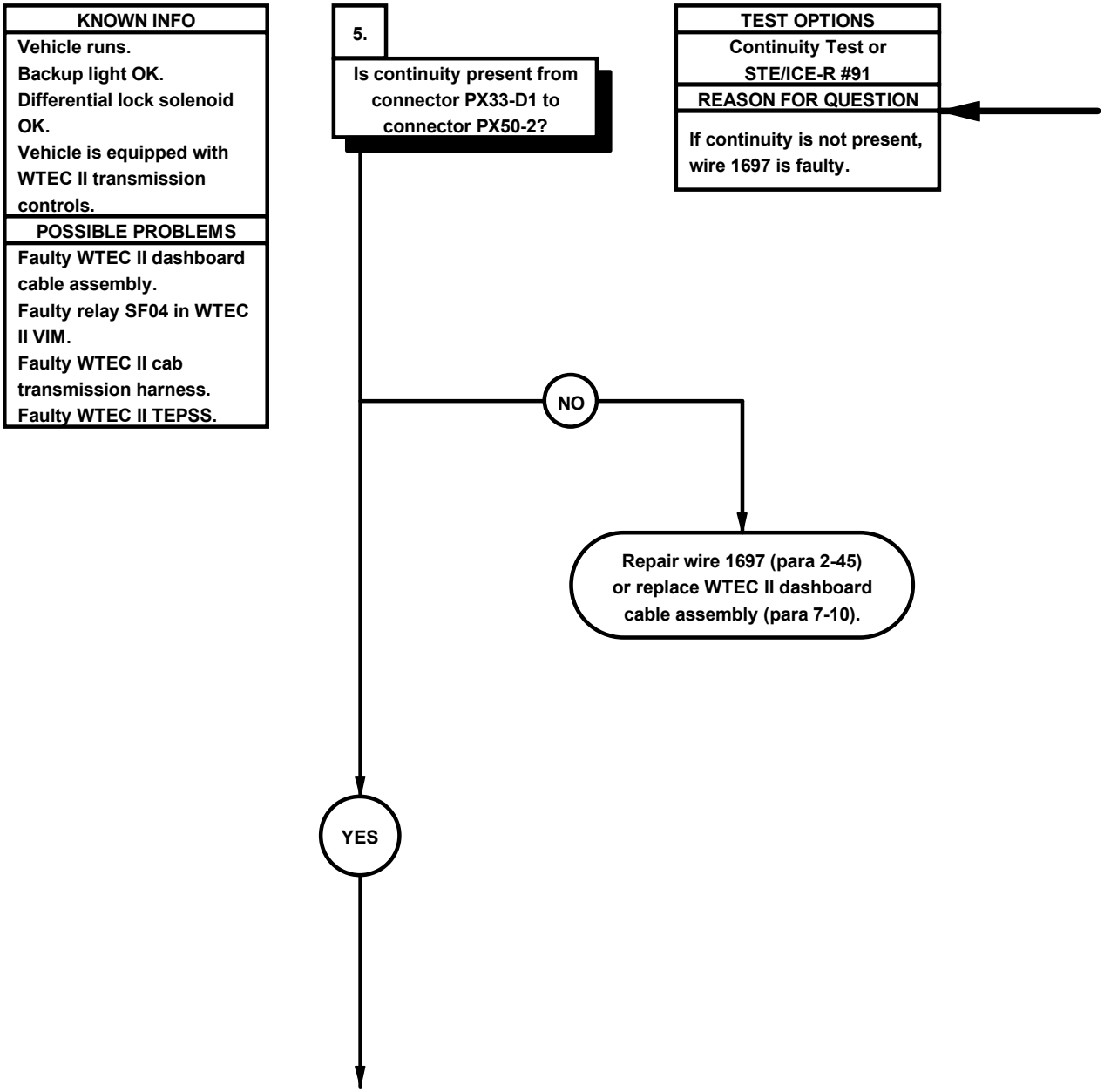
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

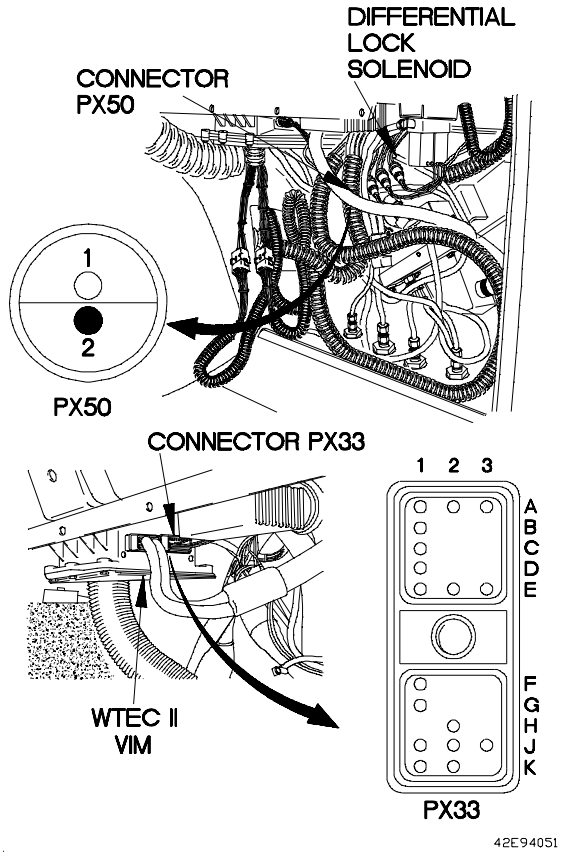
(1) Loosen screw in connector PX33.
(2) Disconnect connector PX33 from WTEC II VIM.
(3) Set multimeter to volts dc.
(4) Connect positive (+) probe of multimeter to connector PX33-E1.
(5) Connect negative (-) probe of multimeter to ground.
(6) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(7) If 24 vdc is not present, repair wire 1692 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).
(8) Position master power switch to off (TM 9-2320-366-10-1).



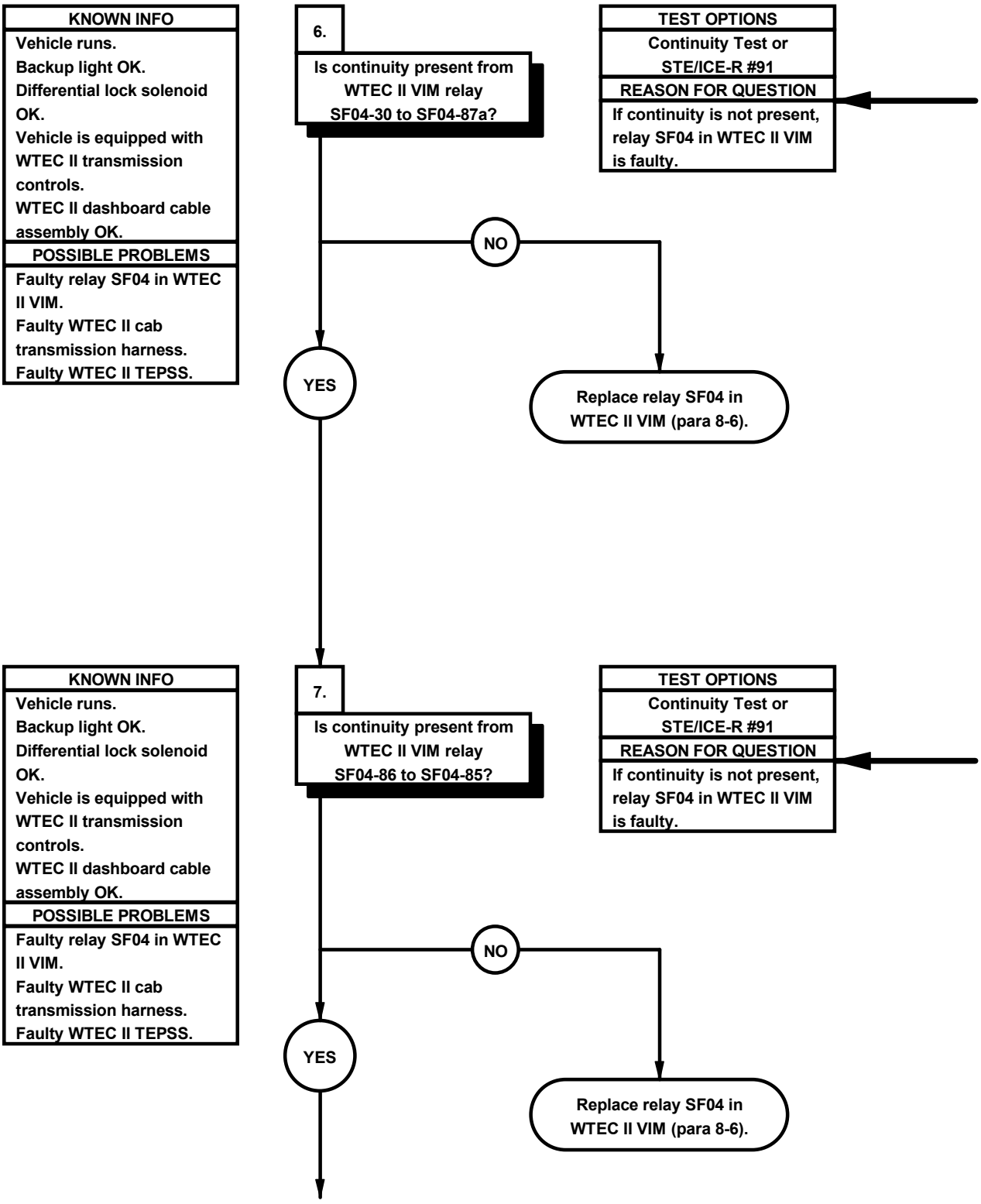
e94. DIFFERENTIAL LOCK SOLENOID DOES NOT OPERATE (CONT)



CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector PX33-D1.
(3) Connect negative (-) probe of multimeter to connector PX50-2 and note reading on multimeter.
(4) If continuity is not present, repair wire 1697 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).
(5) Connect connector PX33 to WTEC II VIM.
(6) Tighten screw in connector PX33.
(7) Connect connector PX50 to differential lock solenoid connector.



e94. DIFFERENTIAL LOCK SOLENOID DOES NOT OPERATE (CONT)

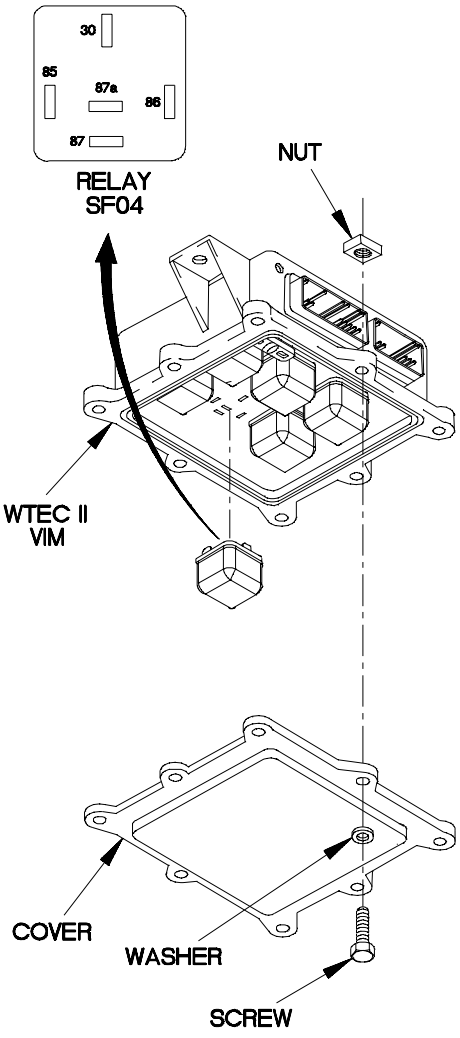


CONTINUITY TEST

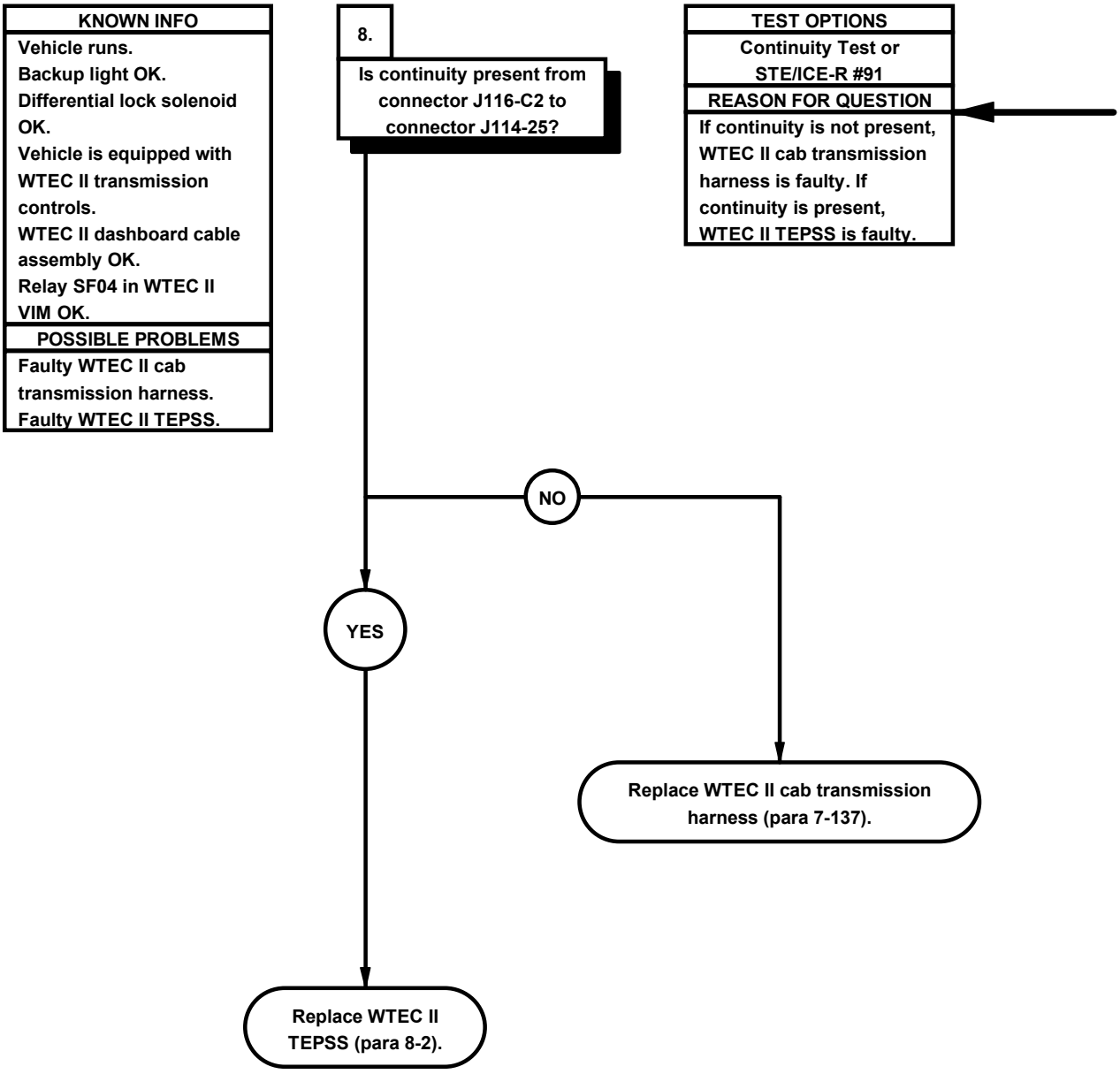
(1) Remove seven screws and washers from cover.
(2) Remove screw, washer, cover, and nut from WTEC II VIM.
(3) Remove relay SF04 from WTEC II VIM.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to relay SF04 terminal 30.
(6) Connect negative (-) probe of multimeter to relay SF04 terminal 87a and note reading on multimeter.
(7) If continuity is not present, replace relay SF04 in WTEC II VIM (para 8-6).

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to relay SF04 terminal 86.
(3) Connect negative (-) probe of multimeter to relay SF04 terminal 85 and note reading on multimeter.
(4) If continuity is not present, replace relay SF04 in WTEC II VIM (para 8-6).
(5) Install relay SF04 in WTEC II VIM.
(6) Install cover on WTEC II VIM with nut, washer, and screw.
(7) Install seven washers and screws in cover.

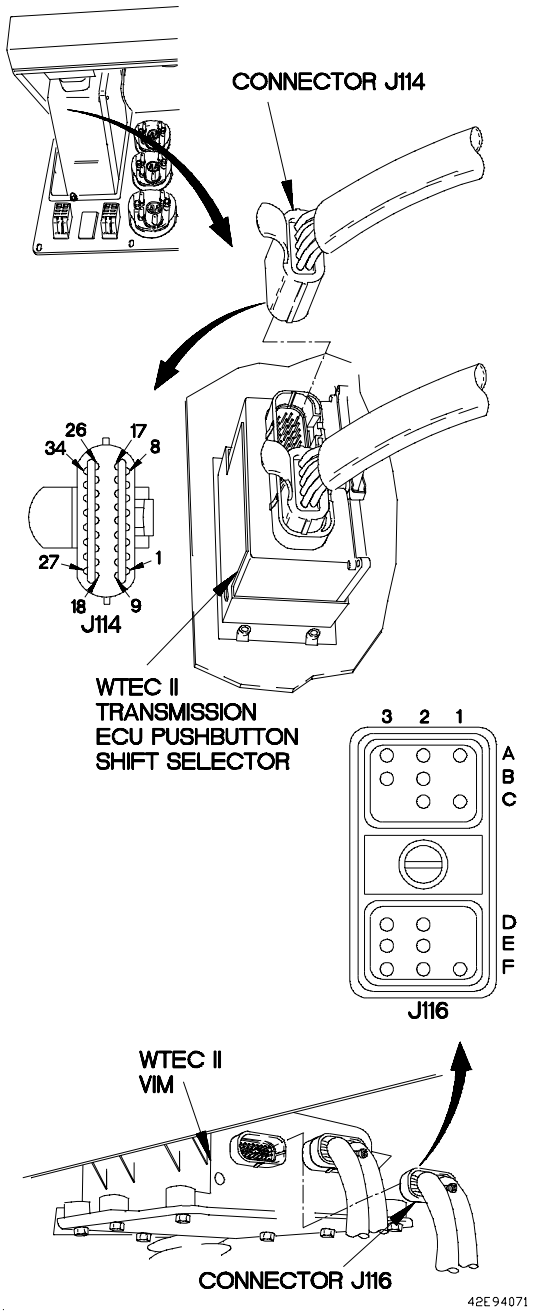


e94. DIFFERENTIAL LOCK SOLENOID DOES NOT OPERATE (CONT)

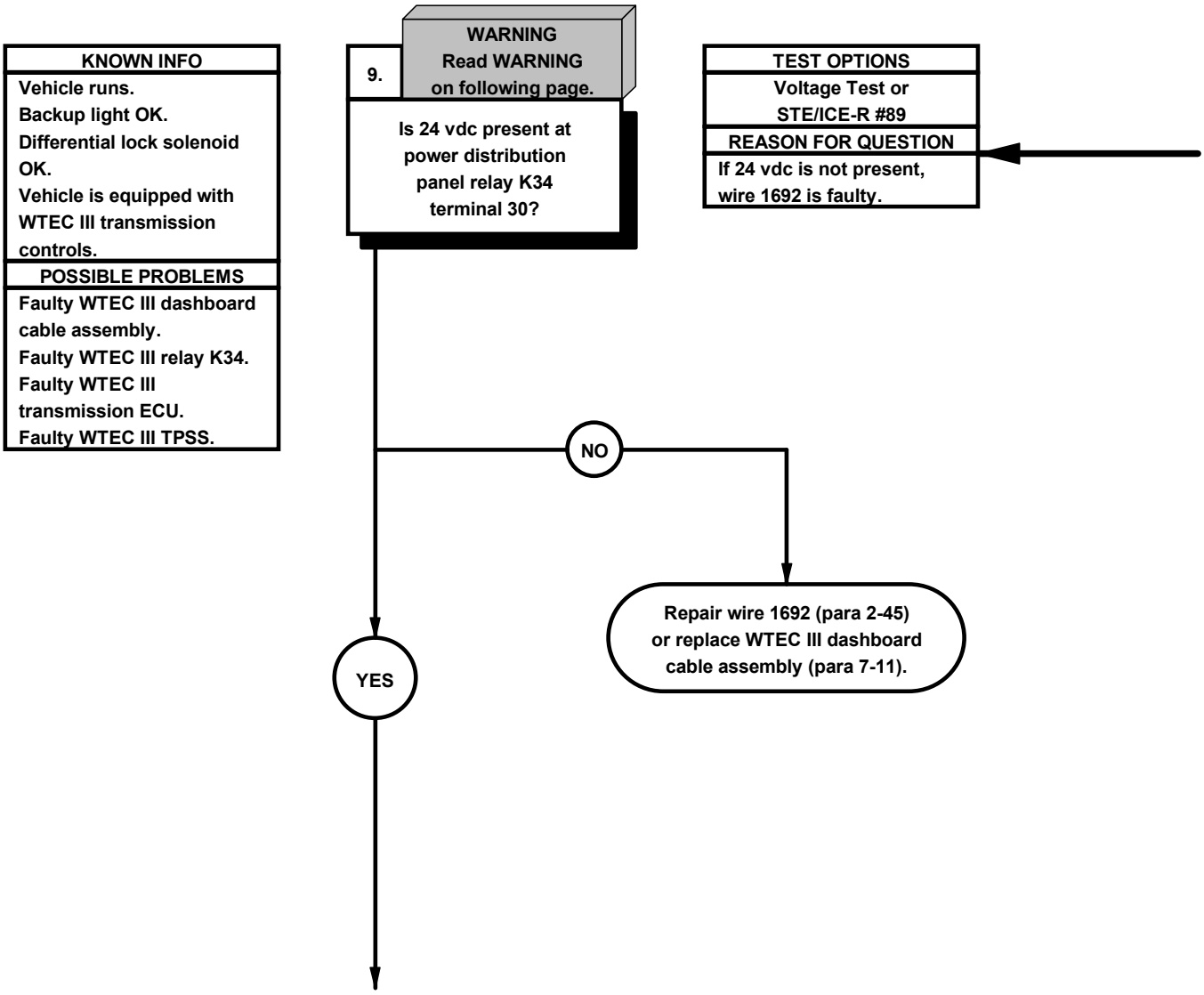


CONTINUITY TEST

(1) Remove instrument panel assembly for access (para 7-15).
(2) Disconnect connector J114 from WTEC II TEPSS.
(3) Loosen screw in connector J116.
(4) Disconnect connector J116 from WTEC II VIM.
(5) Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter to connector J116-C2.
(7) Connect negative (-) probe of multimeter to connector J114-25 and note reading on multimeter.
(8) If continuity is not present, replace WTEC II cab transmission harness (para 7-137).
(9) If continuity is present, replace WTEC II TEPSS (para 8-2).
(10) Connect connector J114 to WTEC II TEPSS.
(11) Install instrument panel assembly (para 7-15).
(12) Connect connector J116 to WTEC II VIM.
(13) Tighten screw in connector J116.
(14) Install kick panel (para 16-3).



e94. DIFFERENTIAL LOCK SOLENOID DOES NOT OPERATE (CONT)

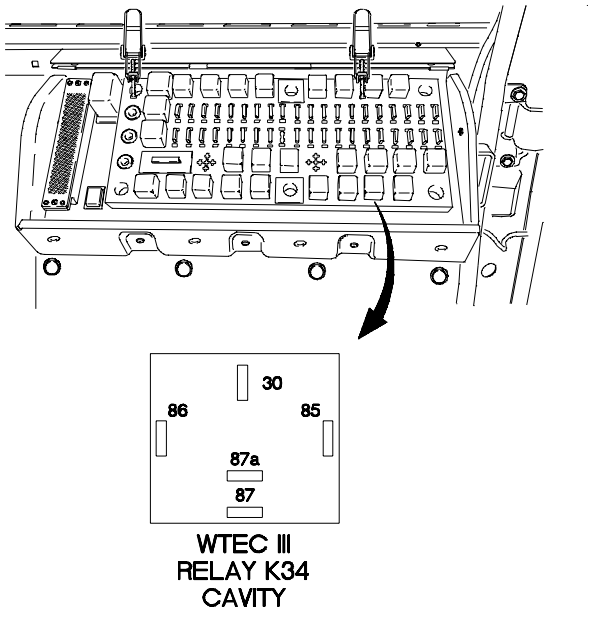


WARNING

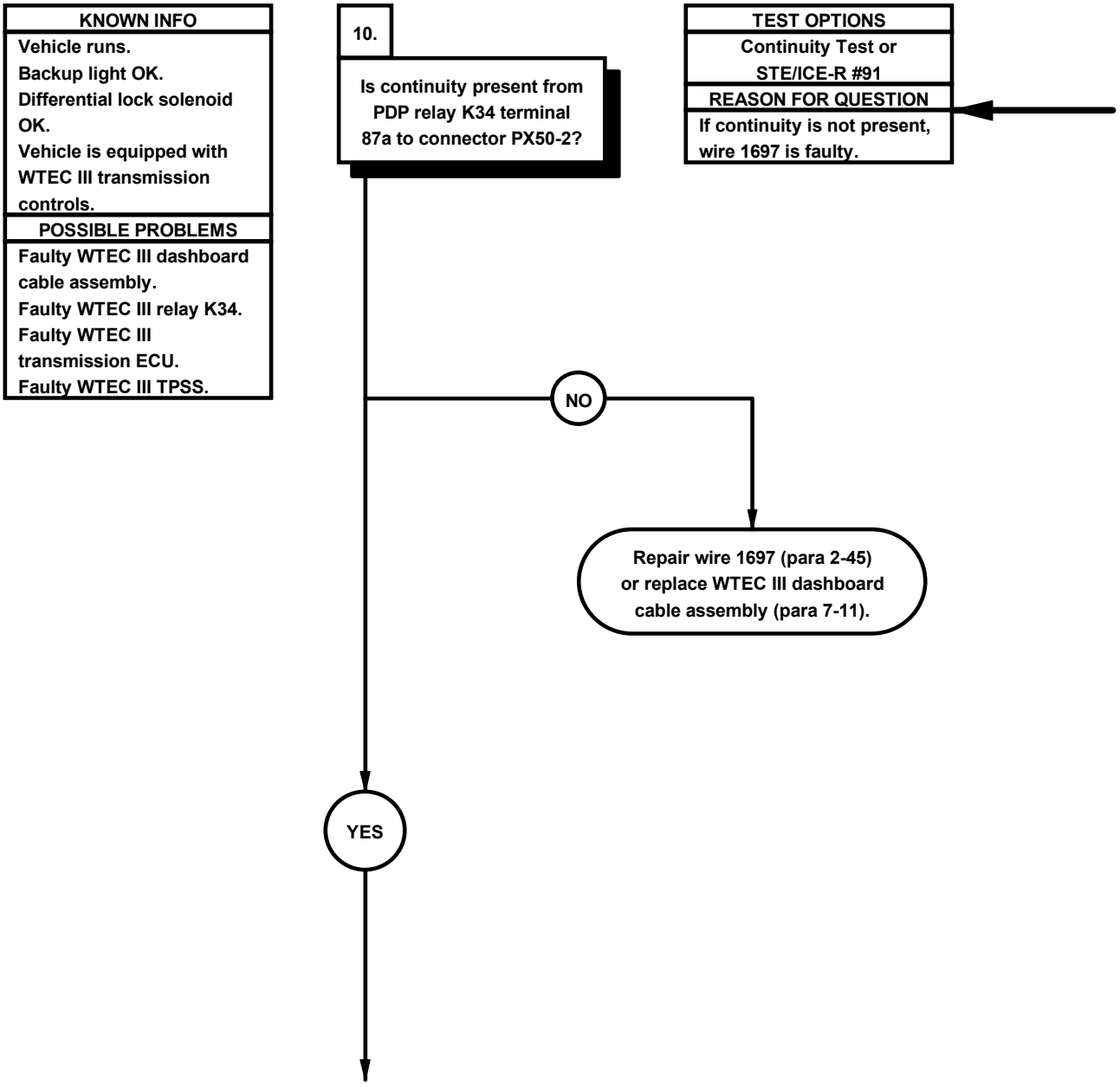
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Remove WTEC III relay K34 from PDP.
(2) Set multimeter to volts dc.
(3) Connect positive (+) probe of multimeter to PDP, terminal 30, where WTEC III relay K34 was removed.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(6) If 24 vdc is not present, repair wire 1692 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).
(7) Position master power switch to off (TM 9-2320-366-10-1).

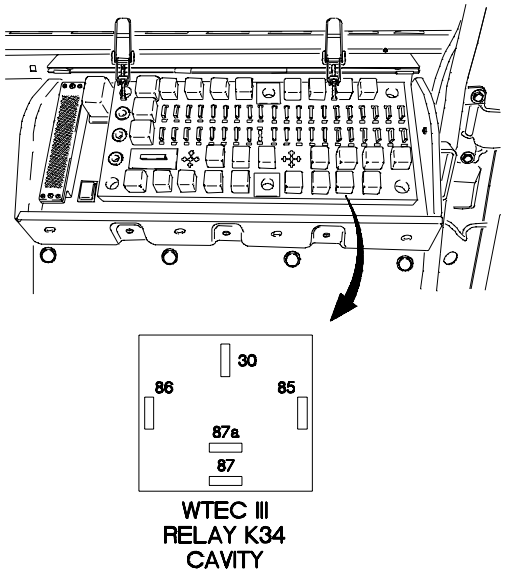


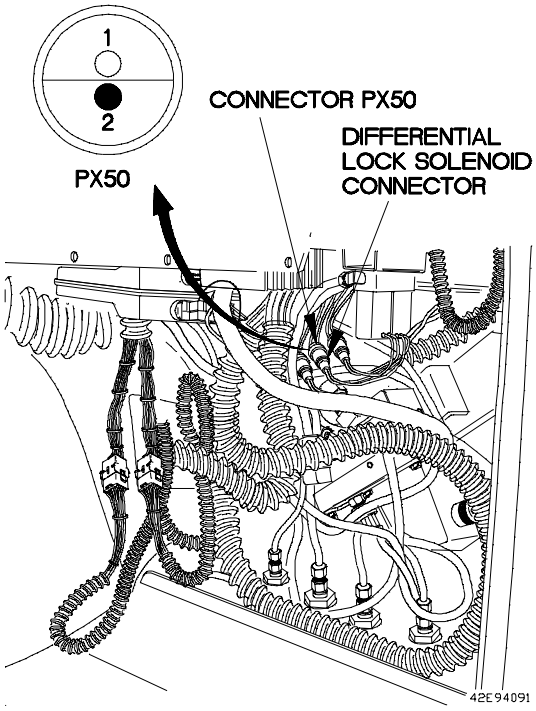
e94. DIFFERENTIAL LOCK SOLENOID DOES NOT OPERATE (CONT)



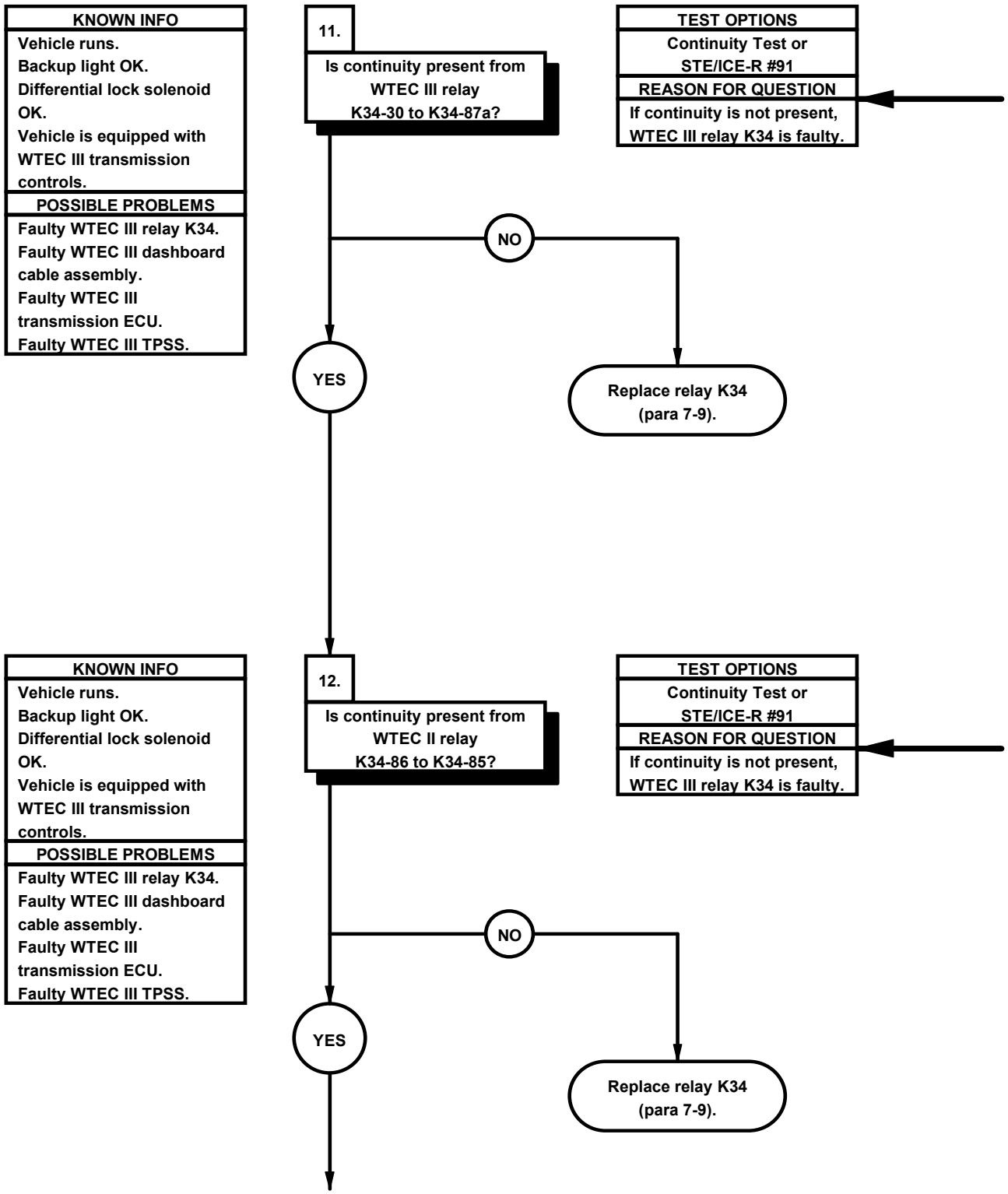
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to PDP, terminal 87a, where WTEC III relay K34 was removed.
(3) Connect negative (-) probe of multimeter to connector PX50-2 and note reading on multimeter.
(4) If continuity is not present, repair wire 1697 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).
(5) Connect connector PX50 to differential lock solenoid connector.



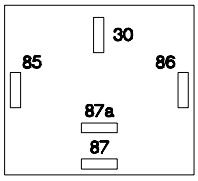


e94. DIFFERENTIAL LOCK SOLENOID DOES NOT OPERATE (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to WTEC III relay K34 terminal 30.
(3) Connect negative (-) probe of multimeter to WTEC III relay K34 terminal 87a and note reading on multimeter.
(4) If continuity is not present, replace WTEC III relay K34 (para 7-9).



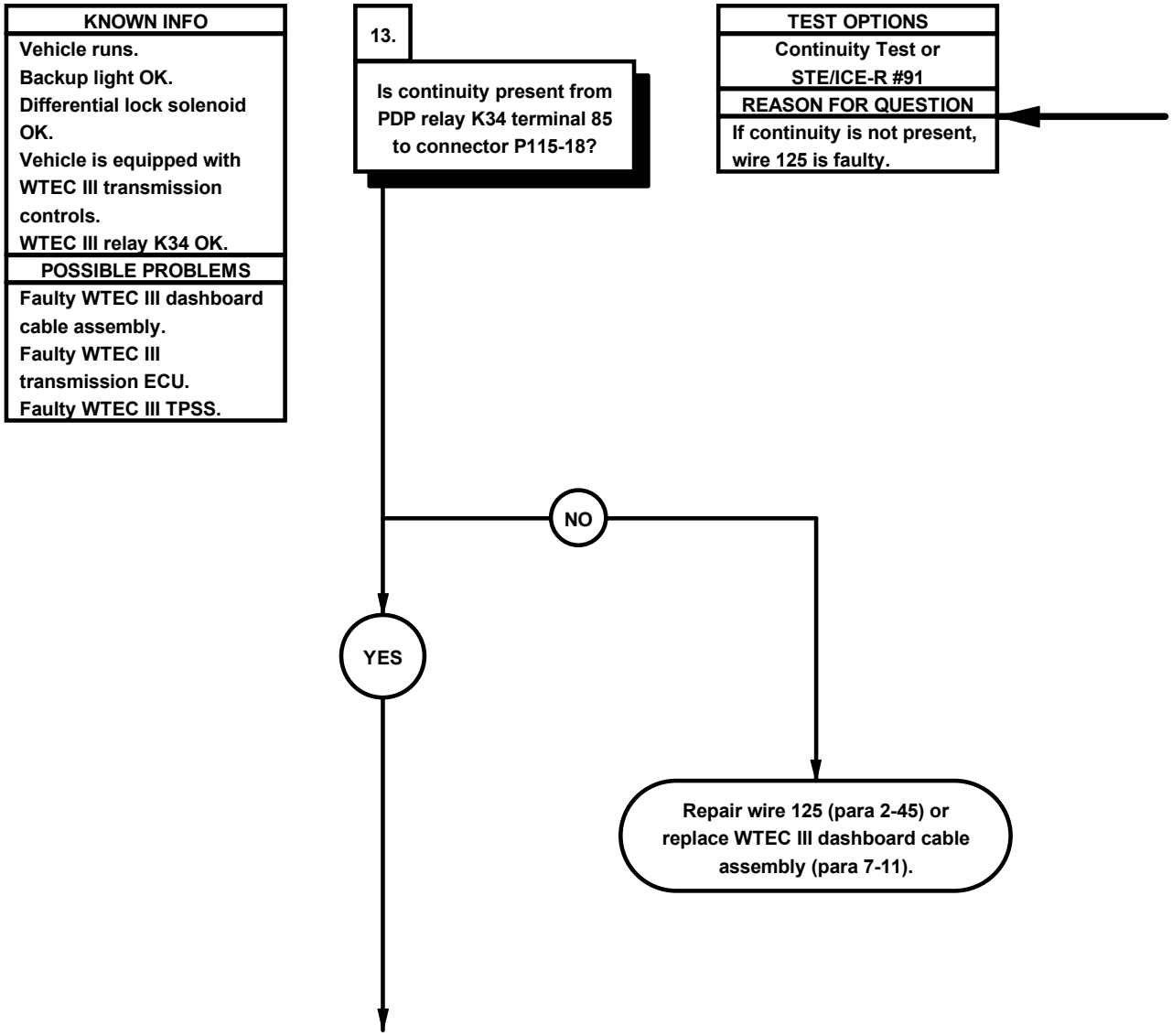
WTEC III
RELAY K34

42E94101

CONTINUITY TEST

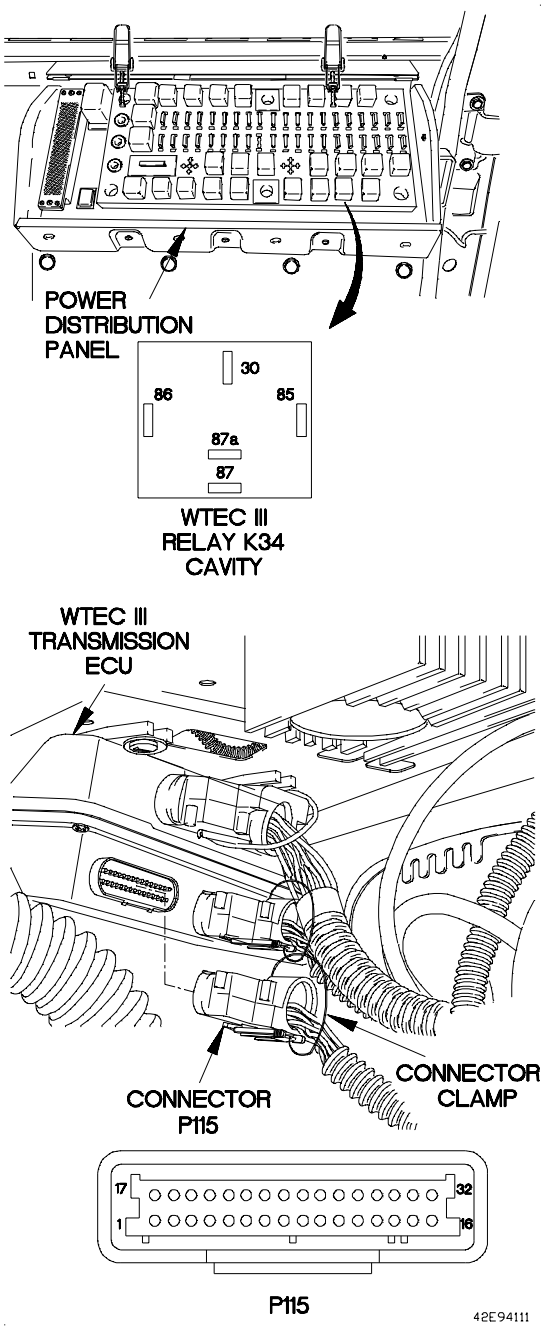
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to WTEC III relay K34 terminal 86.
(3) Connect negative (-) probe of multimeter to WTEC III relay K34 terminal 85 and note reading on multimeter.
(4) If continuity is not present, replace WTEC III relay K34 (para 7-9).

e94. DIFFERENTIAL LOCK SOLENOID DOES NOT OPERATE (CONT)

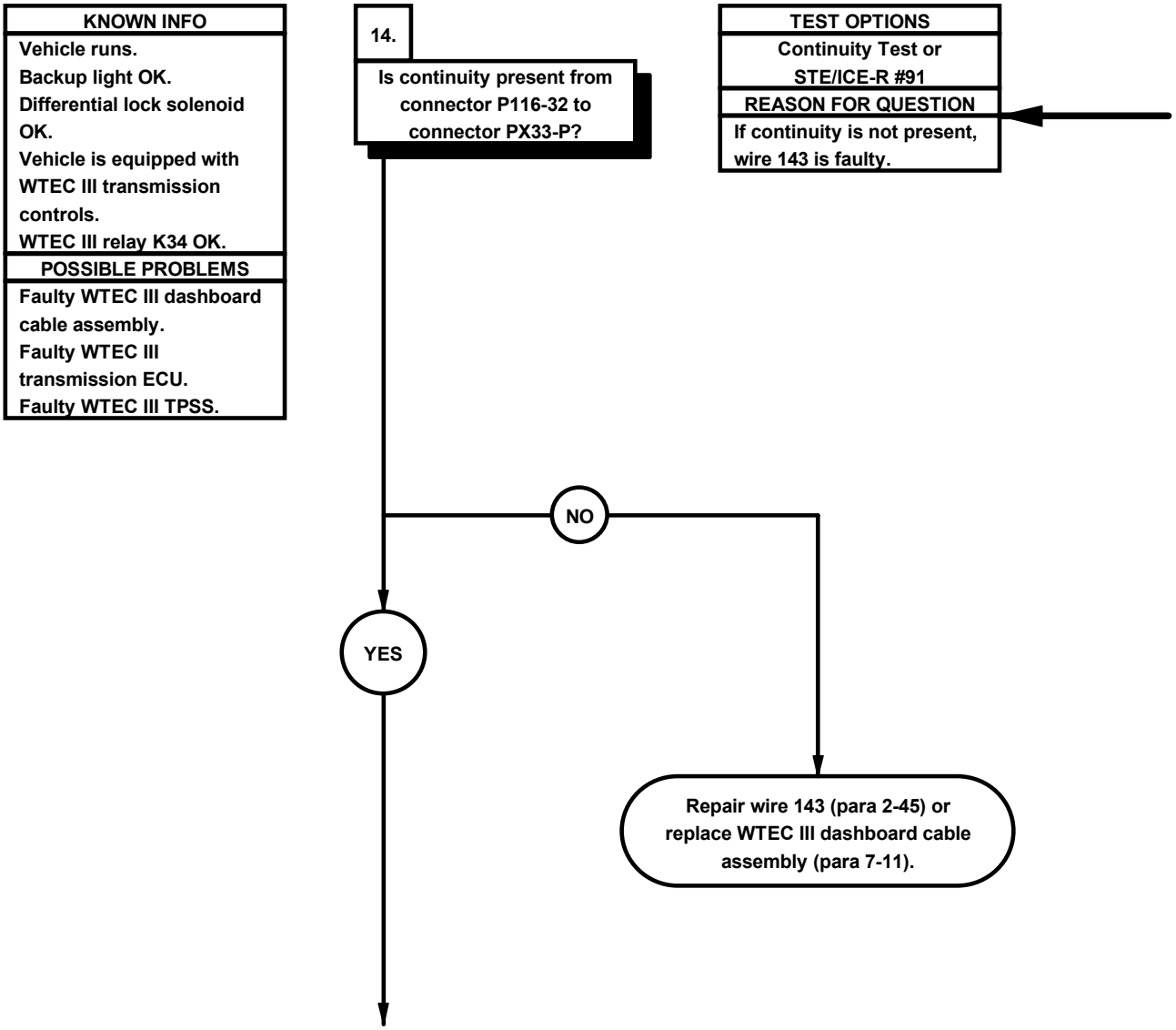


CONTINUITY TEST

(1) Disconnect connector clamp from connector P115.
(2) Disconnect connector P115 from WTEC III transmission ECU.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector P115-18.
(5) Connect negative (-) probe of multimeter to PDP, terminal 85, where WTEC III relay K34 was removed, and note reading on multimeter.
(6) If continuity is not present, repair wire 125 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).
(7) Connect connector P115 to WTEC III transmission ECU.
(8) Connect connector clamp on connector P115.
(9) Install WTEC III relay K34 on PDP.

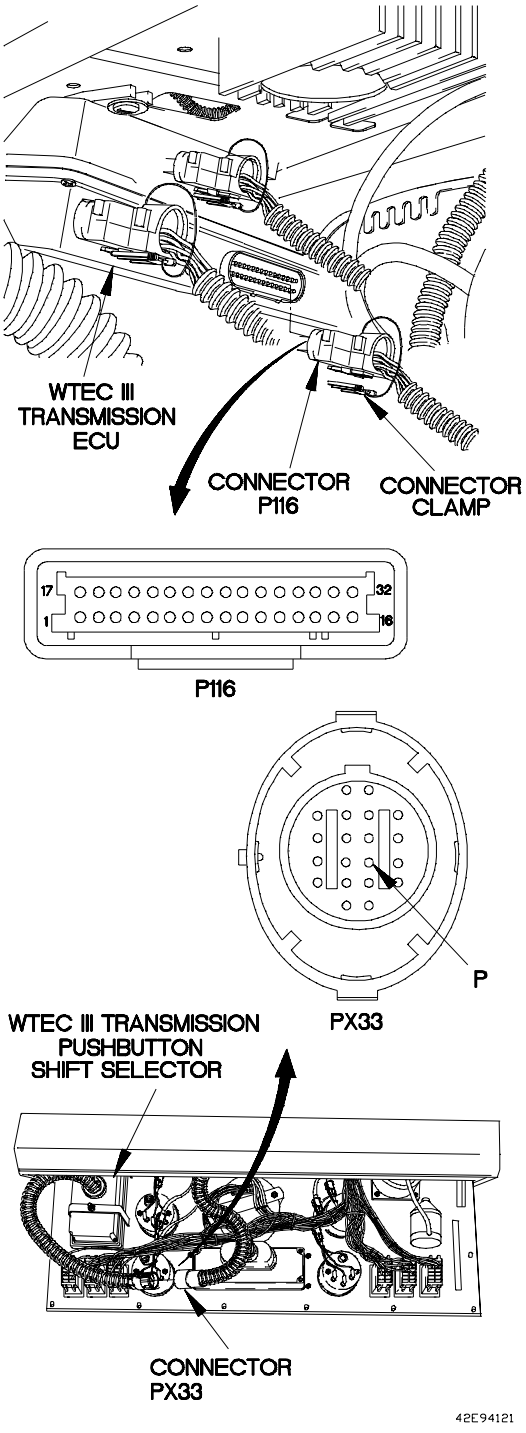


e94. DIFFERENTIAL LOCK SOLENOID DOES NOT OPERATE (CONT)

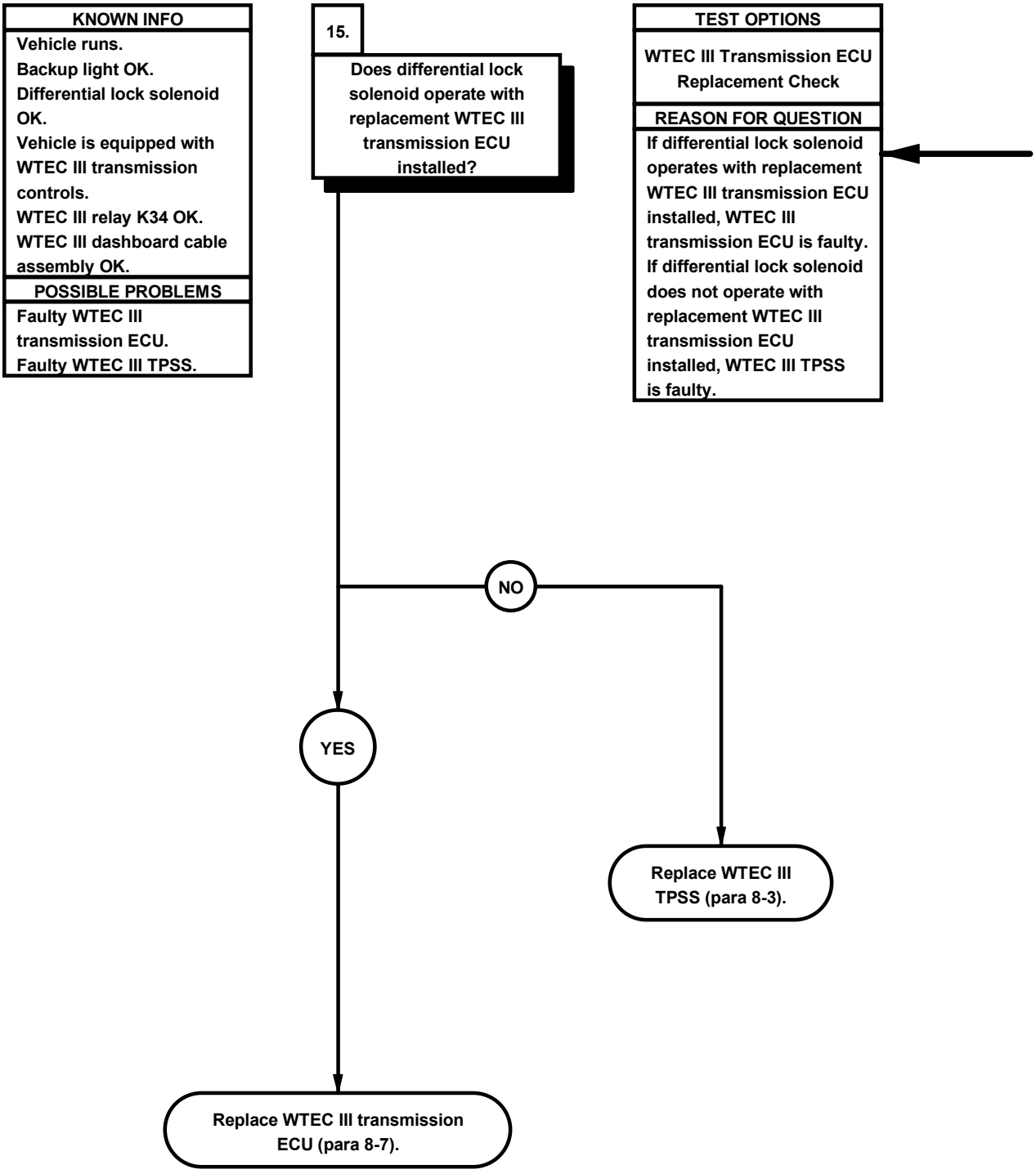


CONTINUITY TEST

(1) Remove instrument panel assembly for access (para 7-15).
(2) Disconnect connector PX33 from WTEC III TPSS.
(3) Disconnect connector clamp from connector P116.
(4) Disconnect connector P116 from WTEC III transmission ECU.
(5) Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter to connector P116-32.
(7) Connect negative (-) probe of multimeter to connector PX33-P and note reading on multimeter.
(8) If continuity is not present, repair wire 143 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).
(9) Connect connector PX33 to WTEC III TPSS.
(10) Install instrument panel assembly (para 7-15).
(11) Connect connector P116 to WTEC III transmission ECU.
(12) Connect connector clamp on connector P116.

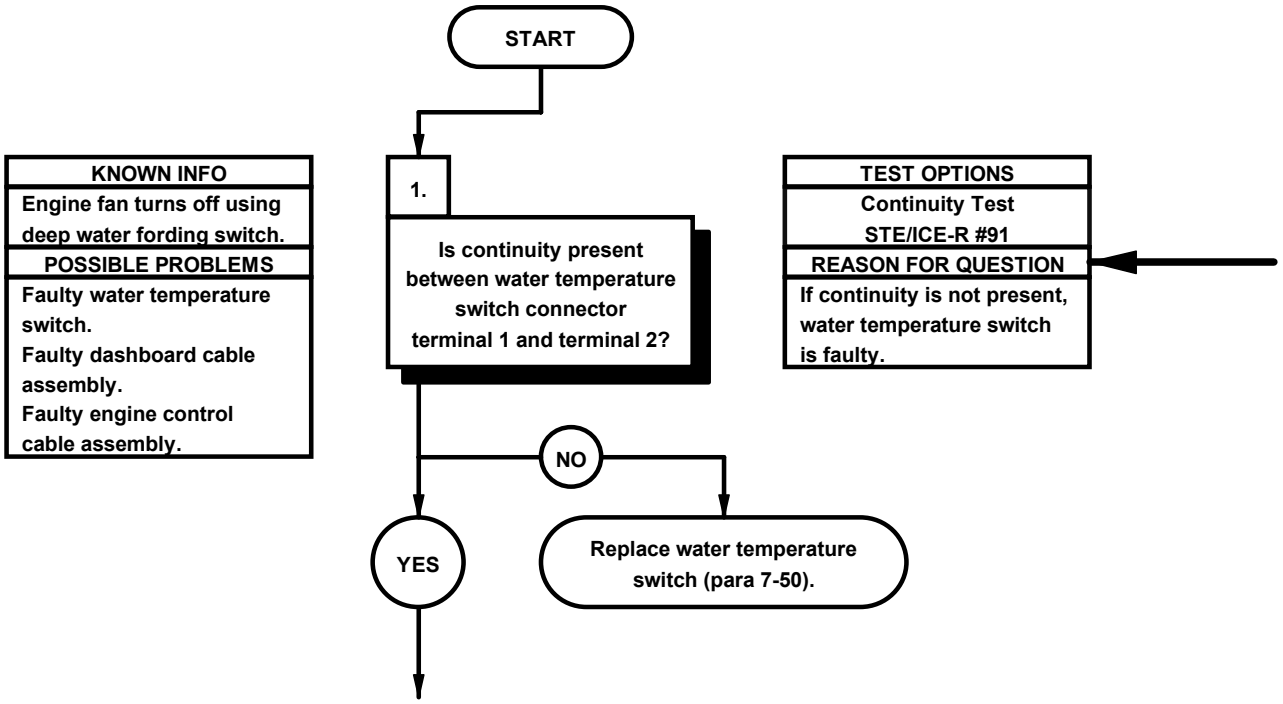


e94. DIFFERENTIAL LOCK SOLENOID DOES NOT OPERATE (CONT)



(1) Remove original WTEC III transmission ECU (para 8-7).
(2) Install replacement WTEC III transmission ECU (para 8-7).
(3) Start engine (TM 9-2320-366-10-1).
(4) Select MODE on WTEC III transmission TPSS (TM 9-2320- 366-10-1) and listen for operation of differential lock solenoid.
(5) If differential lock solenoid operates, replace WTEC III transmission ECU (para 8-7).
(6) If differential lock solenoid does not operate, replace WTEC III TPSS (para 8-3).
(7) Shut down engine (TM 9-2320-366-10-1).
(8) Install original WTEC III transmission ECU (para 8-7).

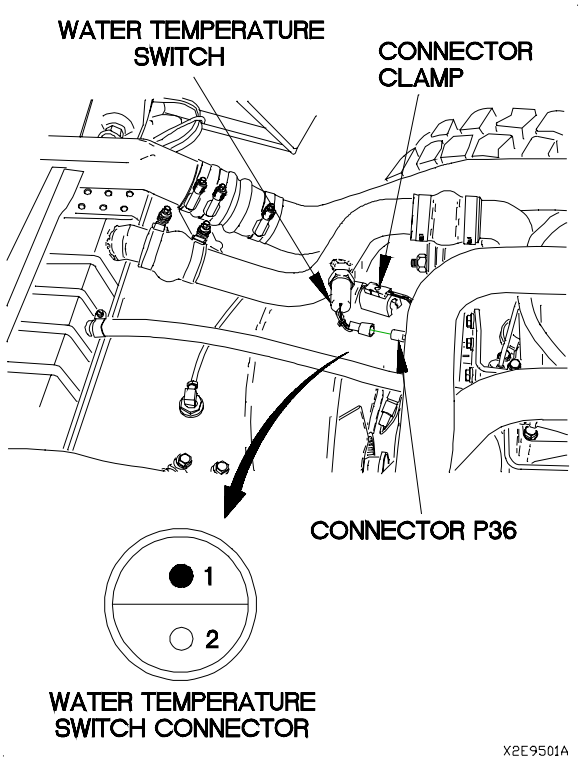
e95. ENGINE FAN RUNS CONSTANTLY	
INITIAL SETUP	
Equipment Condition Engine shut down (TM 9-2320-366-10-1). Personnel Required (2)	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) STE/ICE-R (Item 41, Appendix C) Multimeter, Digital (Item 22, Appendix C) References TM 9-4910-571-12&P



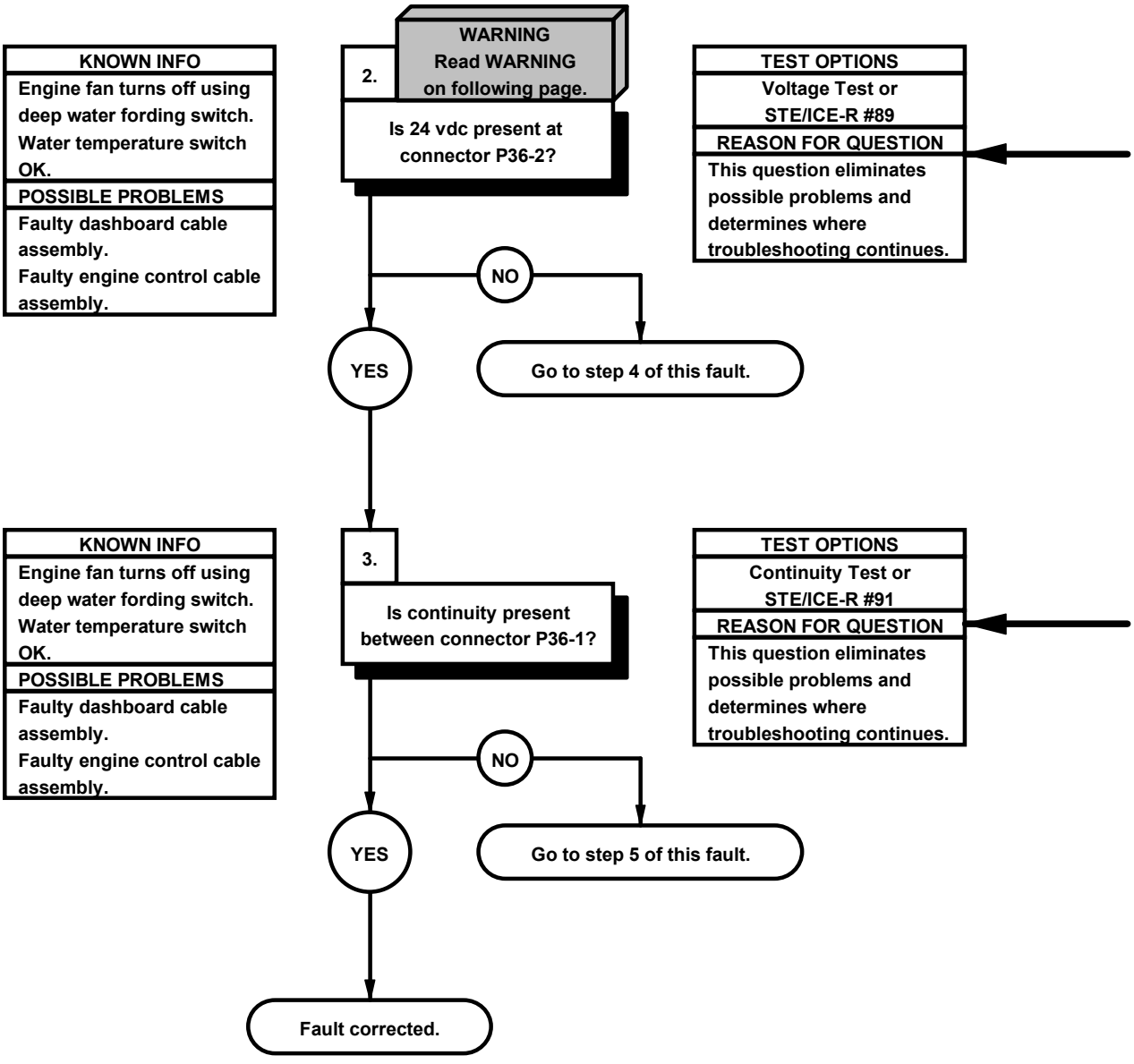
CONTINUITY TEST

NOTE
Engine must be cool during test.

(1) Raise cab (TM 9-2320-366-10-1).
(2) Disconnect connector clamp from water temperature switch connector.
(3) Disconnect connector P36 from water temperature switch connector.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to water temperature switch connector terminal 1.
(6) Connect negative (-) probe of multimeter to water temperature switch connector terminal 2 and note reading on multimeter.
(7) If continuity is not present, replace water temperature switch (para 7-50).



e95. ENGINE FAN RUNS CONSTANTLY (CONT)



WARNING

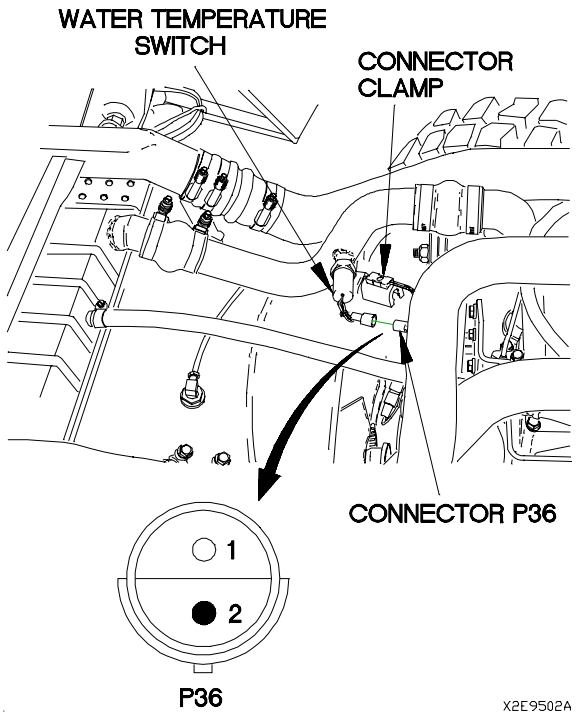
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

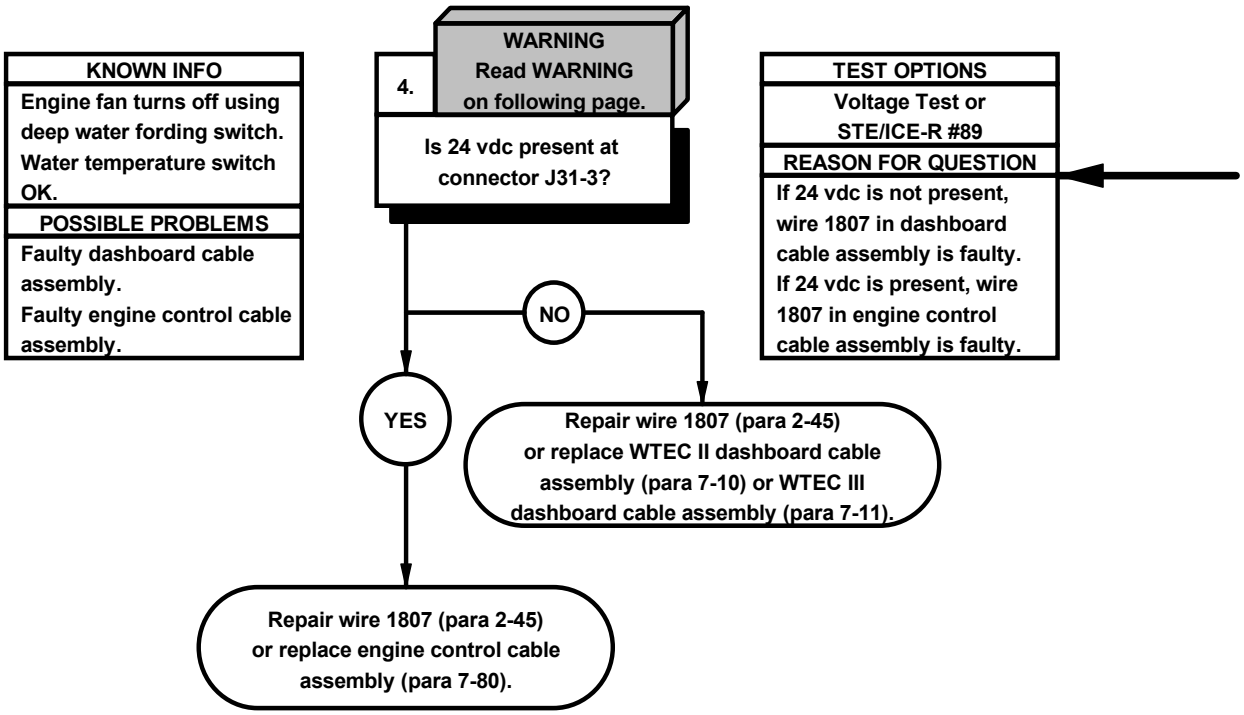
(1) Set multimeter to volts dc.
(2) Connect positive (+) probe of multimeter to connector P36-2.
(3) Connect negative (-) probe of multimeter to ground.
(4) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(5) If 24 vdc is not present, go to step 4 of this fault.
(6) Position master power switch to off (TM 9-2320-366-10-1).

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P36-1.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, go to step 5 of this fault.
(5) If continuity is present, fault corrected.
(6) Connect connector P36 to water temperature switch connector.
(7) Connect connector clamp on water temperature switch connector.



e95. ENGINE FAN RUNS CONSTANTLY (CONT)

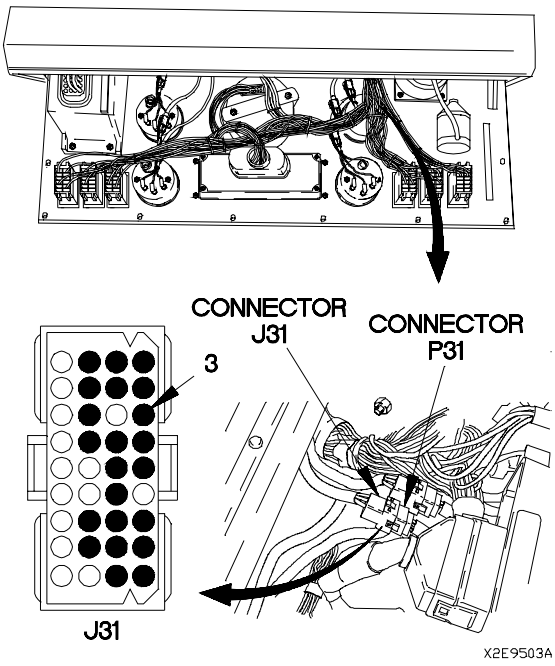


WARNING

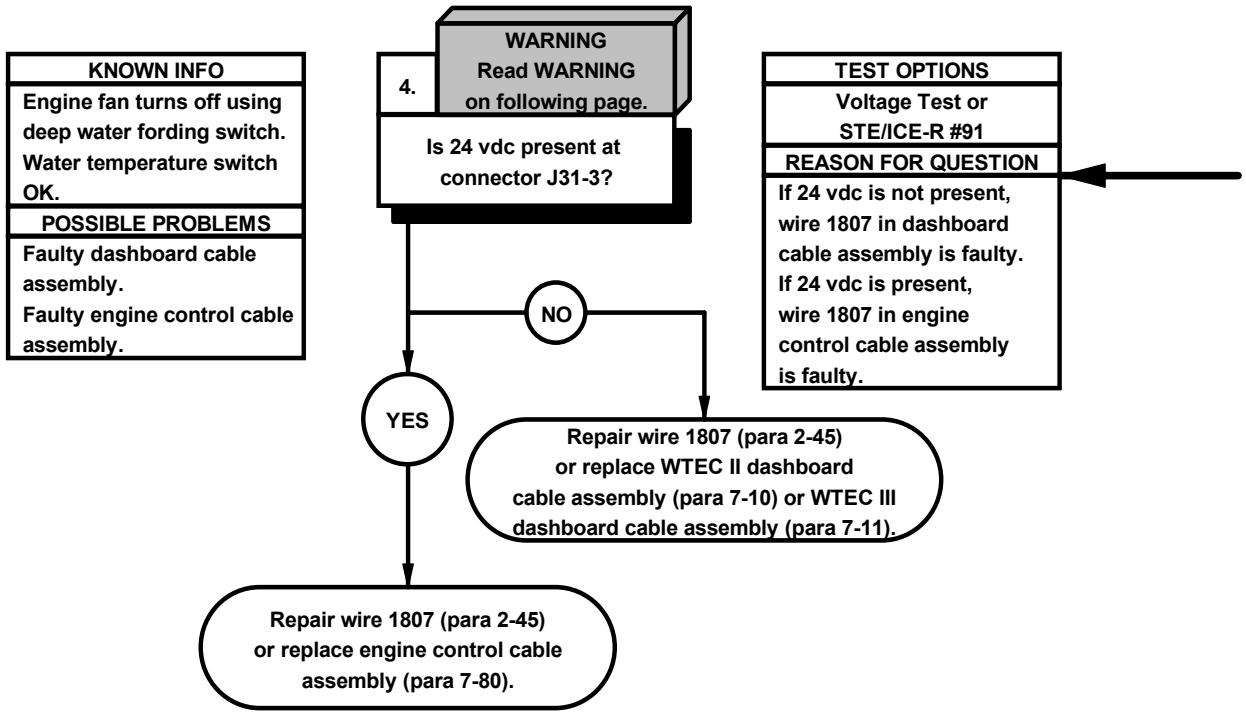
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Lower cab (TM 9-2320-366-10-1).
(2) Remove instrument panel assembly for access (para 7-15).
(3) Disconnect connector J31 from connector P31.
(4) Set multimeter to volts dc.
(5) Connect positive (+) probe of multimeter to connector J31-3.
(6) Connect negative (-) probe of multimeter to ground.
(7) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(8) If 24 vdc is not present, repair wire 1807 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(9) If 24 vdc is present, repair wire 1807 (para 2-45) or replace engine control cable assembly (para 7-80).
(10) Position master power switch to off (TM 9-2320-366-10-1).
(11) Connect connector J31 to connector P31.
(12) Install instrument panel assembly (para 7-15).



e95. ENGINE FAN RUNS CONSTANTLY (CONT)

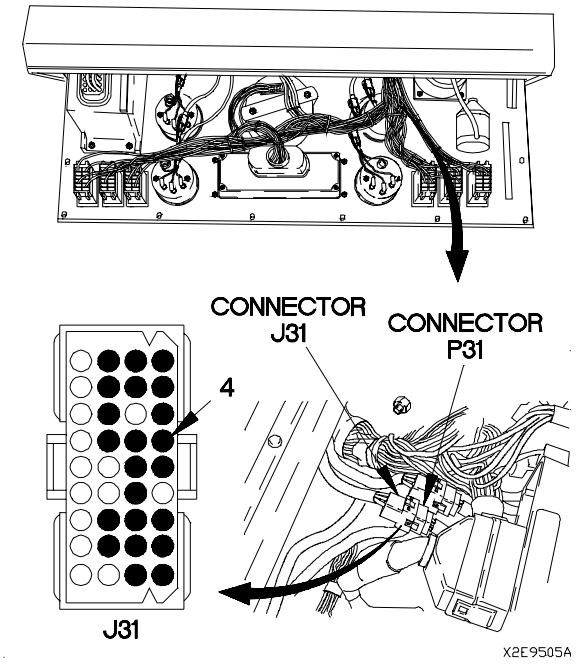


WARNING

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.

VOLTAGE TEST

(1) Lower cab (TM 9-2320-366-10-1).
(2) Remove instrument panel assembly for access (para 7-15).
(3) Disconnect connector J31 from connector P31.
(4) Set multimeter to volts dc.
(5) Connect positive (+) probe of multimeter to connector J31-3.
(6) Connect negative (-) probe of multimeter to ground.
(7) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(8) If 24 vdc is not present, repair wire 1807 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(9) If 24 vdc is present, repair wire 1806 (para 2-45) or replace engine control cable assembly (para 7-80).
(10) Position master power switch to off (TM 9-2320-366-10-1).
(11) Connect connector J31 to connector P31.
(12) Install instrument panel assembly (para 7-15).



e96. ENGINE FAN DOES NOT TURN OFF USING RADIATOR FAN OFF SWITCH

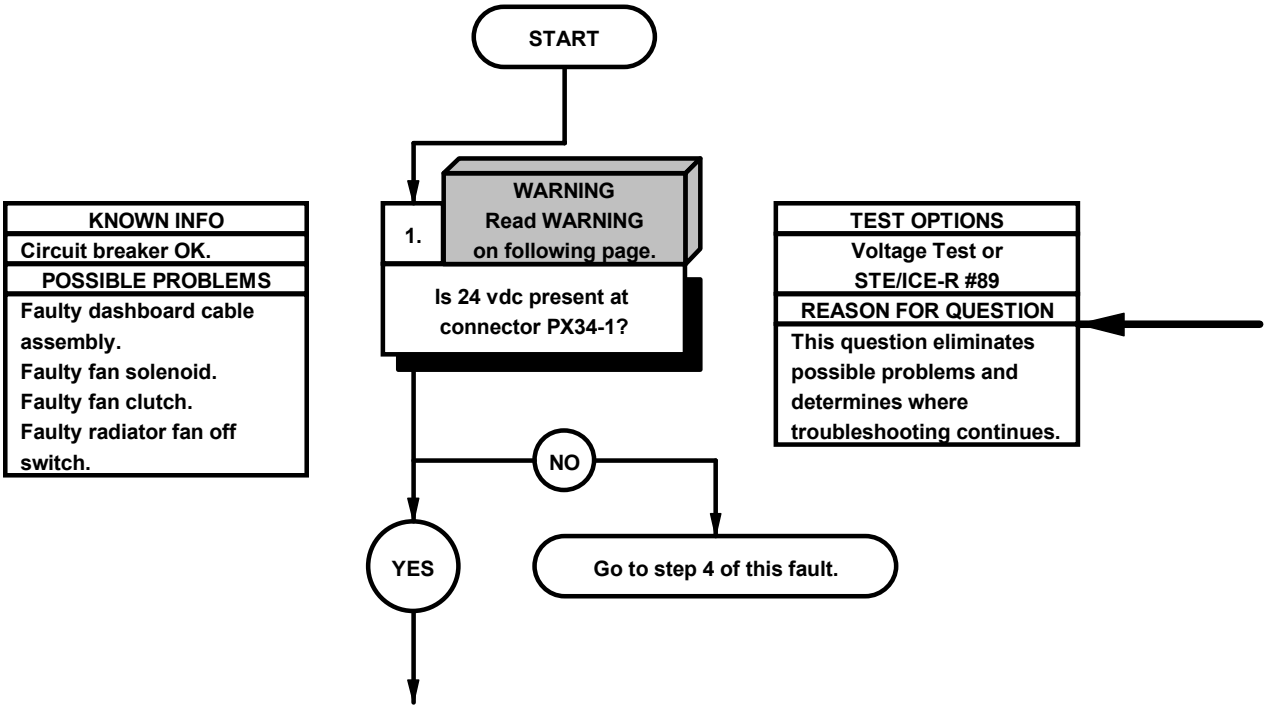
INITIAL SETUP

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

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

References
TM 9-4910-571-12&P

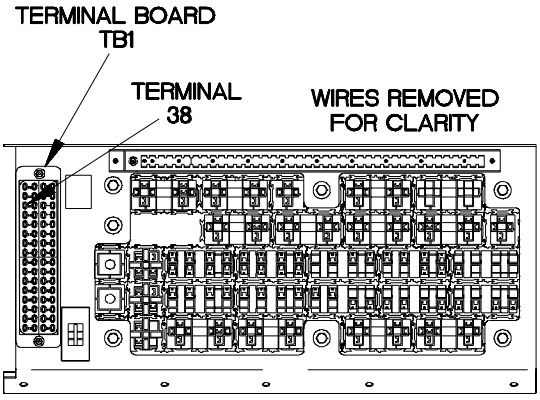


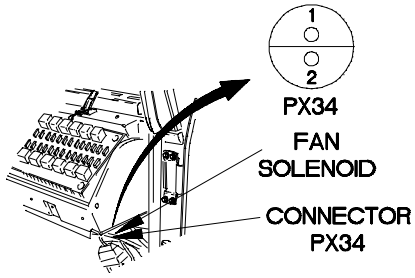
WARNING

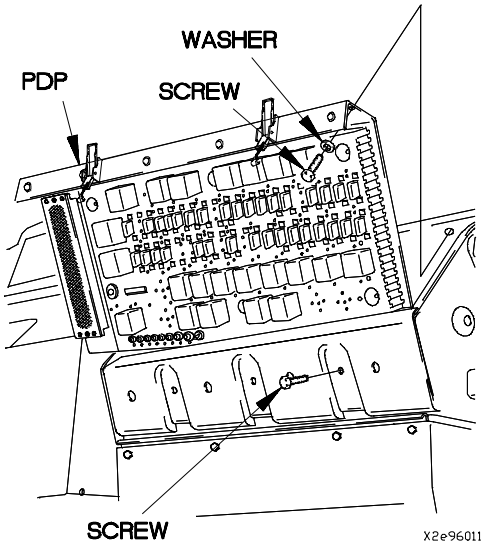
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

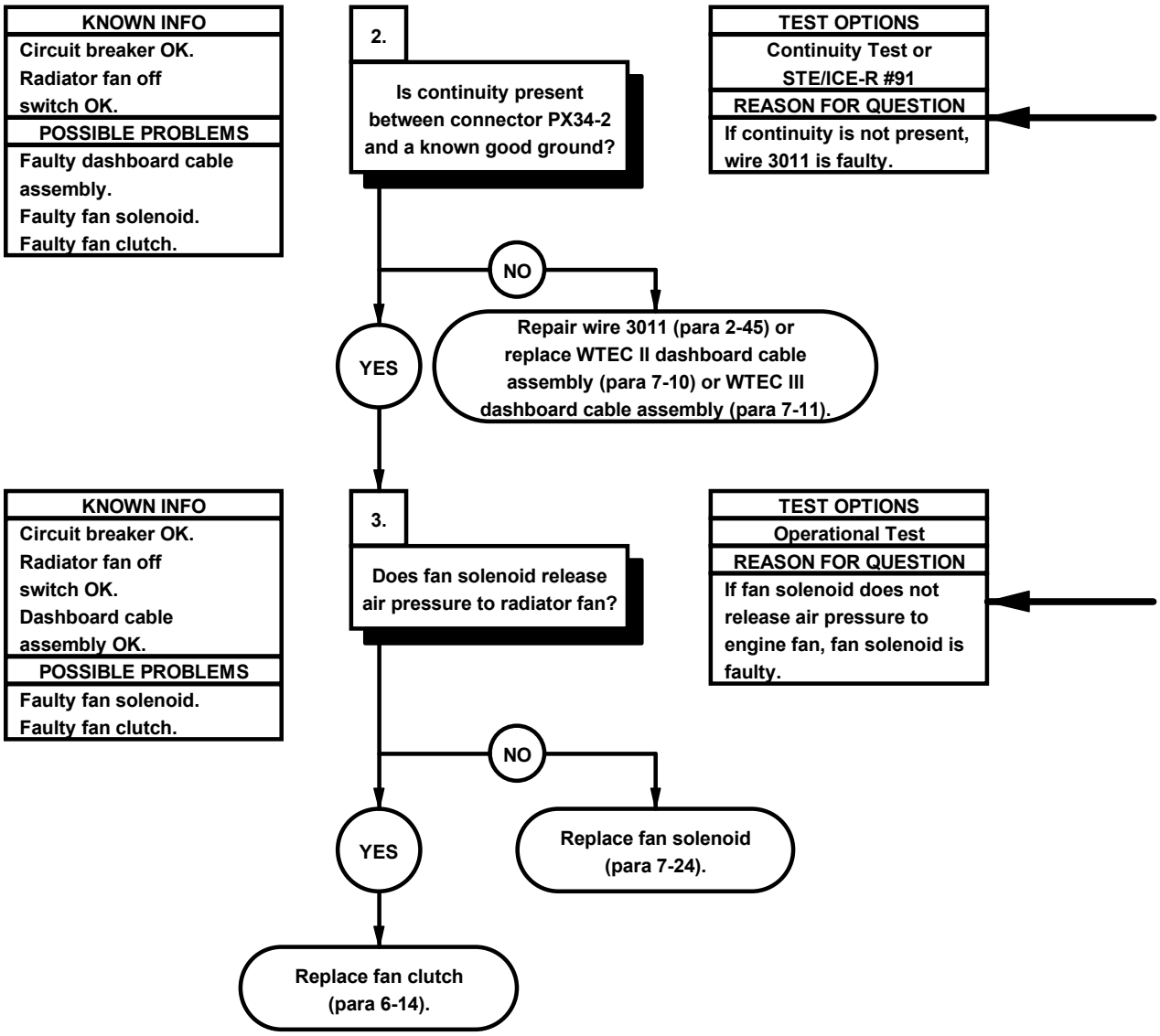
(1) Remove kick panel (para 16-3).
(2) Remove three screws and washers from PDP.
(3) Remove three screws from PDP.
(4) Lift PDP outward to gain access.
(5) Disconnect wire 1807 from terminal board TB1 terminal 38.
(6) Disconnect connector PX34 from fan solenoid JX34.
(7) Set multimeter to volts dc.
(8) Connect positive (+) probe of multimeter to connector PX34-1.
(9) Connect negative (-) probe of multimeter to ground.
(10) Position master power switch to on (TM 9-2320-366-10-1).
(11) Position radiator fan off switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(12) If 24 vdc is not present, go to step 4 of this fault.
(13) Position radiator fan off switch to off (TM 9-2320-366-10-1).
(14) Position master power switch to off (TM 9-2320-366-10-1).
(15) Connect wire 1807 to terminal board TB1 terminal 38.





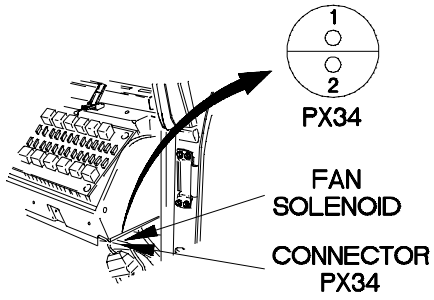


e96. ENGINE FAN DOES NOT TURN OFF USING RADIATOR FAN OFF SWITCH (CONT)



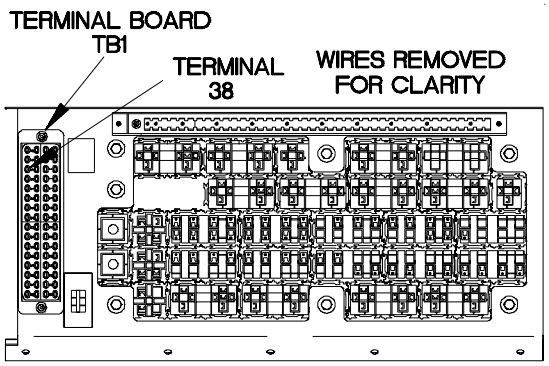
CONTINUITY TEST

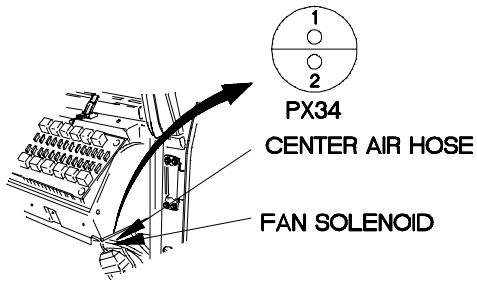
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector PX34-2.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair wire 3011 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(5) Connect connector PX34 to fan solenoid.

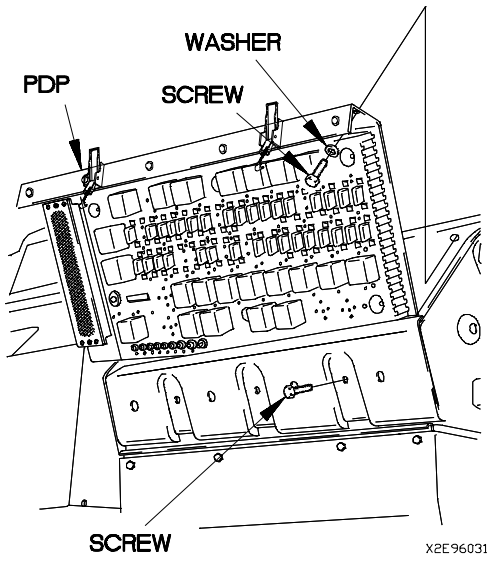


OPERATIONAL TEST

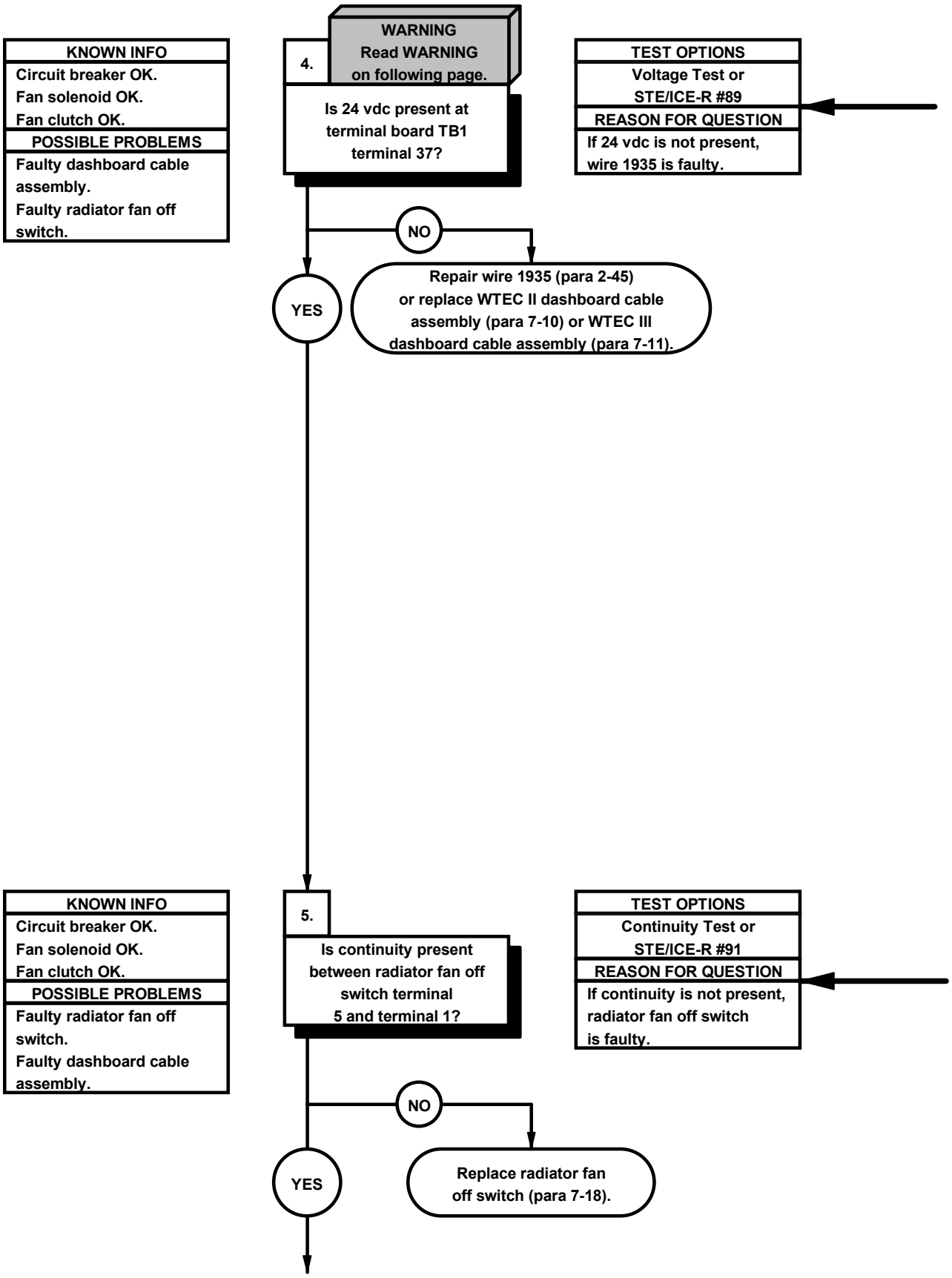
(1) Remove air hose from fan solenoid.
(2) Start engine (TM 9-2320-366-10-1) and allow air pressure to build up to normal level.
(3) Position radiator fan off switch to on (TM 9-2320-366-10-1).
(4) If air pressure is not present, replace fan solenoid (para 7-24).
(5) If air pressure is present, replace fan clutch (para 6-14).
(6) Position radiator fan off switch to off (TM 9-2320-366-10-1).
(7) Position master power switch to off (TM 9-2320-366-10-1).
(8) Connect wire 1807 to terminal board TB1 terminal 38.
(9) Install PDP on dashboard with three screws.
(10) Install three washers and screws in PDP.
(11) Install air hose on fan solenoid.
(12) Install kick panel (para 16-3).







e96. ENGINE FAN DOES NOT TURN OFF USING RADIATOR FAN OFF SWITCH (CONT)



WARNING

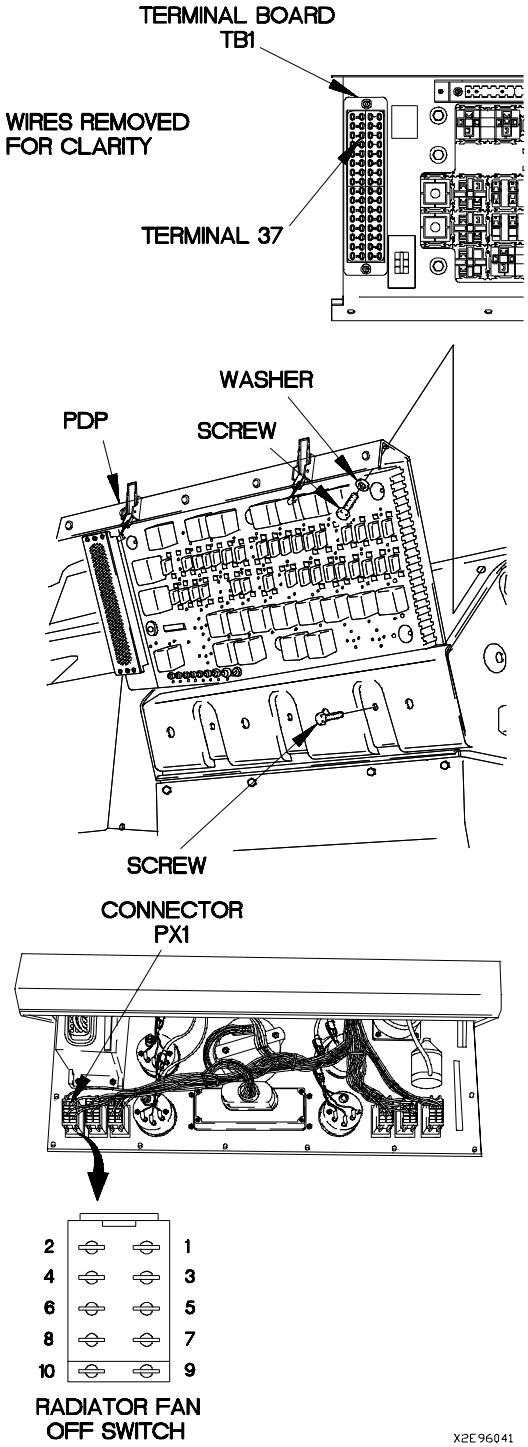
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

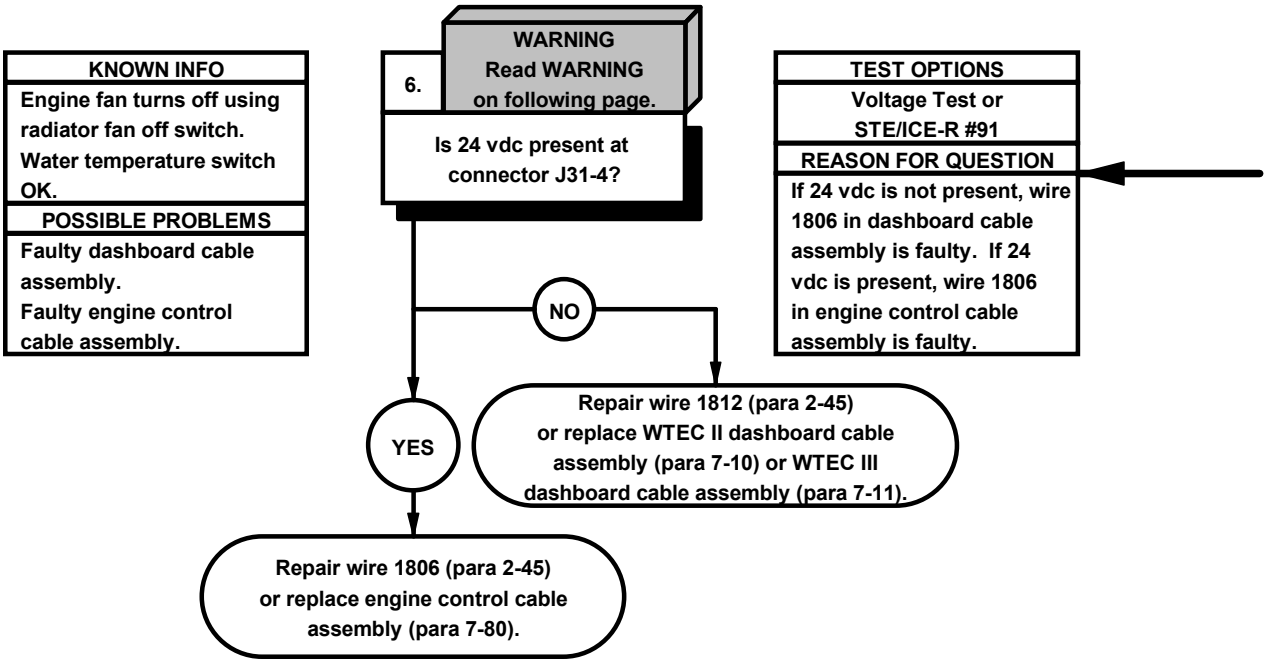
(1) Set multimeter to volts dc.
(2) Connect positive (+) probe of multimeter to terminal board TB1 terminal 37.
(3) Connect negative (-) probe of multimeter to ground.
(4) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(5) If 24 vdc is not present, repair wire 1935 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(6) Position master power switch to off (TM 9-2320-366-10-1).
(7) Install PDP on dashboard with three screws.
(8) Install three washers and screws in PDP.
(9) Install kick panel (para 16-3).

CONTINUITY TEST

(1) Remove instrument panel assembly for access (para 7-15).
(2) Disconnect connector PX1 from radiator fan off switch.
(3) Position radiator fan off switch to on (TM 9-2320-366-10-1).
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to radiator fan off switch terminal 5.
(6) Connect negative (-) probe of multimeter to radiator fan off switch terminal 1.
(7) If continuity is not present, replace radiator fan off switch (para 7-18).
(8) Position radiator fan off switch to off (TM 9-2320-366-10-1).



e96. ENGINE FAN DOES NOT TURN OFF USING RADIATOR FAN OFF SWITCH (CONT)

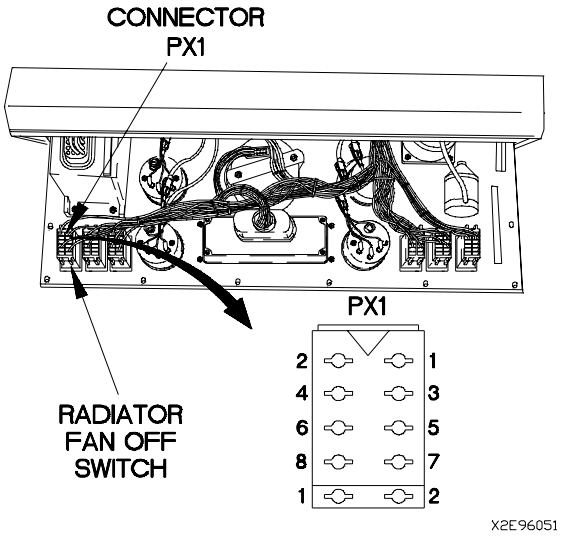


WARNING

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.

VOLTAGE TEST

(1) Lower cab (TM 9-2320-366-10-1).
(2) Remove instrument panel assembly for access (para 7-15).
(3) Disconnect connector J31 from connector P31.
(4) Set multimeter to volts dc.
(5) Connect positive (+) probe of multimeter to connector J31-4.
(6) Connect negative (-) probe of multimeter to ground.
(7) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(8) If 24 vdc is not present, repair wire 1806 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(9) If 24 vdc is present, repair wire 1806 (para 2-45) or replace engine control cable assembly (para 7-80).
(10) Position master power switch to off (TM 9-2320-366-10-1).
(11) Connect connector J31 to connector P31.
(12) Install instrument panel assembly (para 7-15).



e97. ETHER START DOES NOT OPERATE

INITIAL SETUP

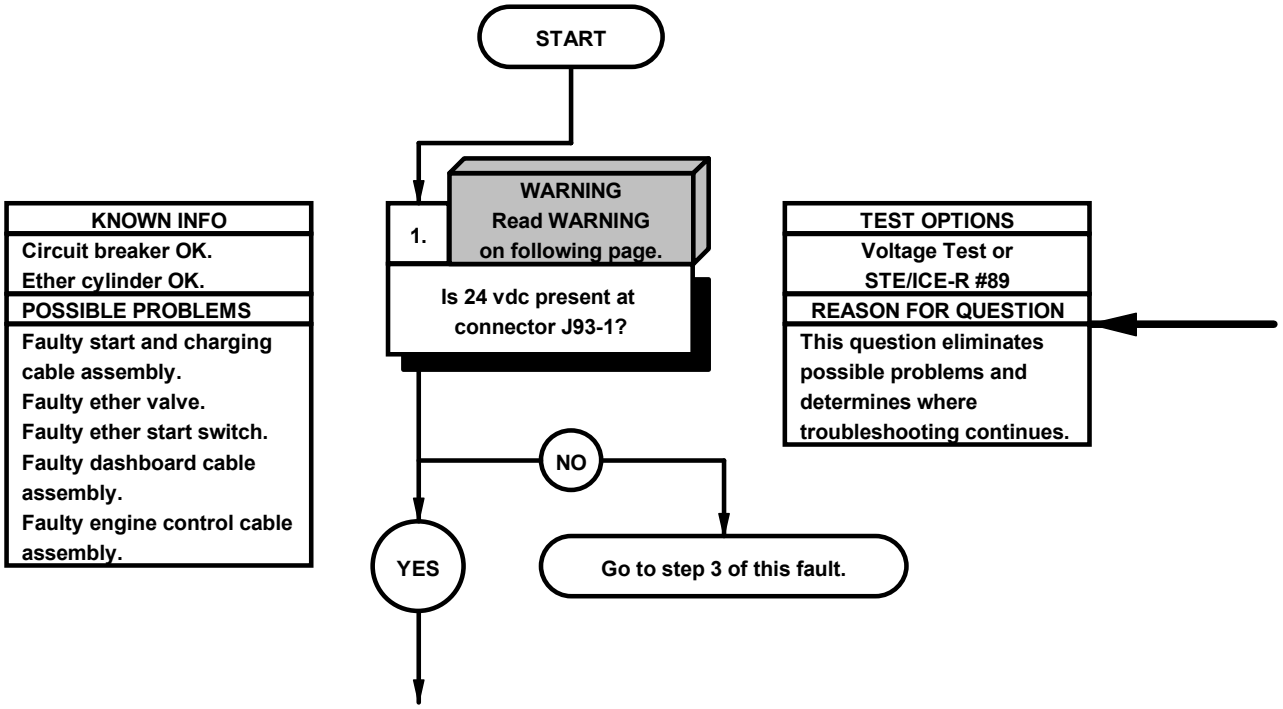
Equipment Condition
- Engine shut down (TM 9-2320-366-10-1).
- Spare tire lowered (TM 9-2320-366-10-2).

Personnel Required
- (2)

Materials/Parts
- Wire, Elect, 50 ft (Item 71, Appendix D)

Tools and Special Tools
- Tool Kit, Genl Mech (Item 46, Appendix C)
- STE/ICE-R (Item 41, Appendix C)
- Multimeter, Digital (Item 22, Appendix C)

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

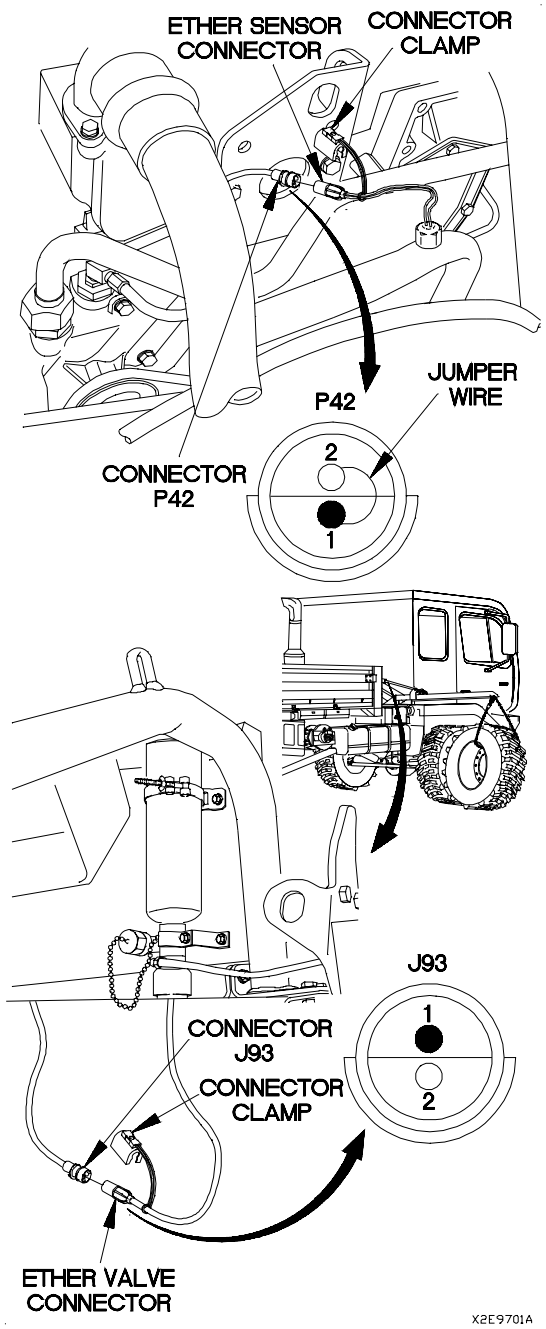


WARNING

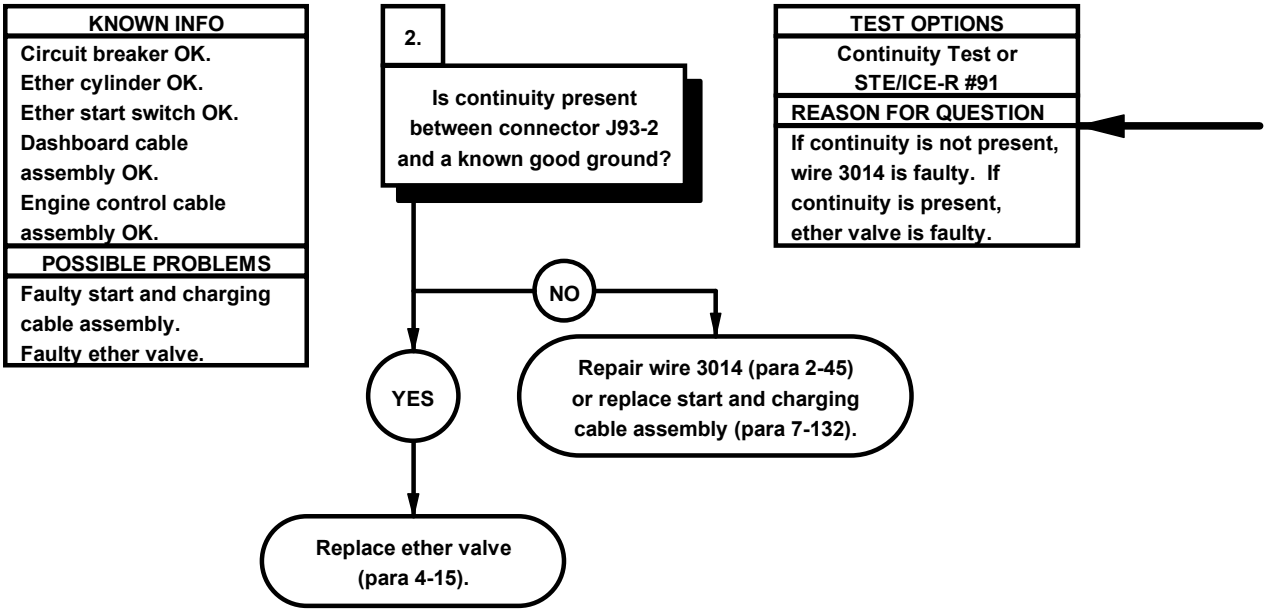
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

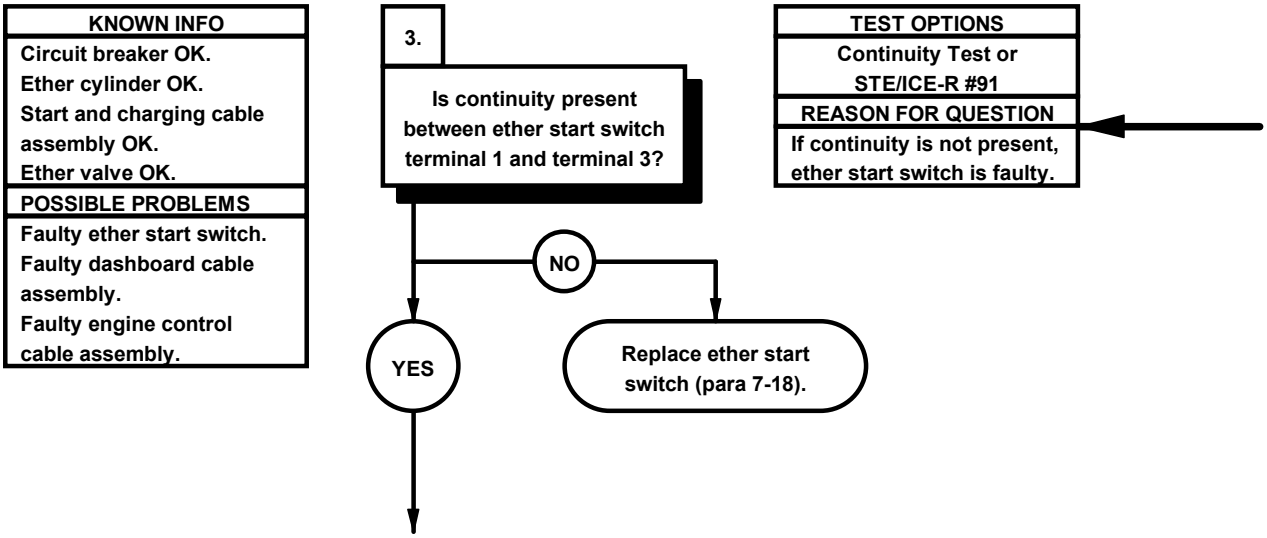
VOLTAGE TEST

(1) Disconnect connector clamp from ether valve connector.
(2) Disconnect ether valve connector from connector J93.
(3) Disconnect connector clamp from ether sensor connector.
(4) Disconnect connector P42 from ether sensor connector.
(5) Install jumper wire from connector P42-1 to connector P42-2.
(6) Set multimeter to volts dc.
(7) Connect positive (+) probe of multimeter to connector J93-1.
(8) Connect negative (-) probe of multimeter to ground.
(9) Position master power switch to on (TM 9-2320-366-10-1).
(10) Press ether start switch (TM 9-2320-366-10-1) and note reading on multimeter.
(11) If 24 vdc is not present, go to step 3 of this fault.
(12) Release ether start switch (TM 9-2320-366-10-1).
(13) Position master power switch to off (TM 9-2320-366-10-1).
(14) Remove jumper wire from connector P42-1 and connector P42-2.
(15) Connect connector P42 to ether sensor connector.
(16) Lower cab (TM 9-2320-366-10-1).



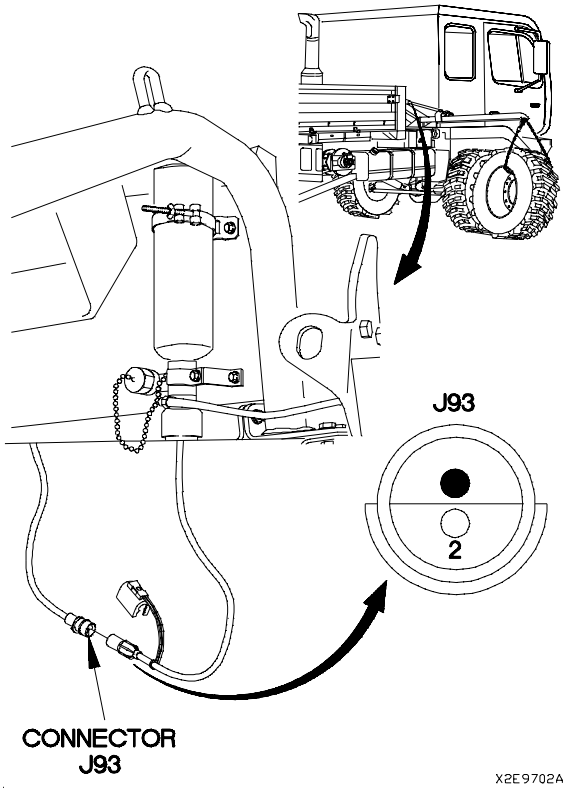
e97. ETHER START DOES NOT OPERATE (CONT)





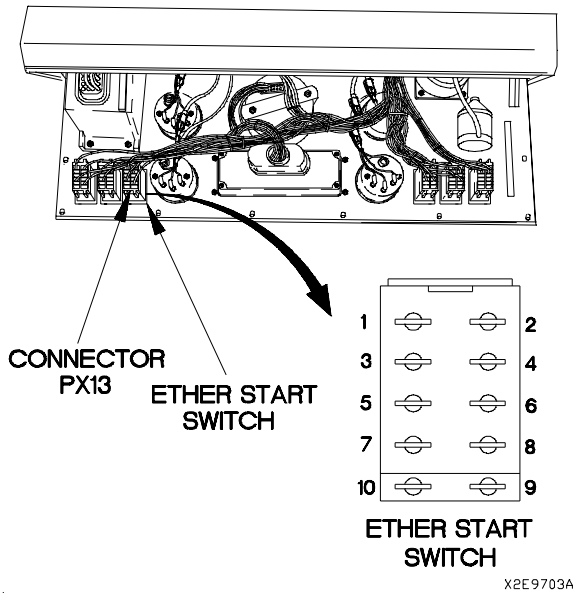
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector J93-2.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair wire 3014 (para 2-45) or replace start and charging cable assembly (para 7-132).
(5) If continuity is present, replace ether valve (para 4-15).
(6) Raise spare tire (TM 9-2320-366-10-1).

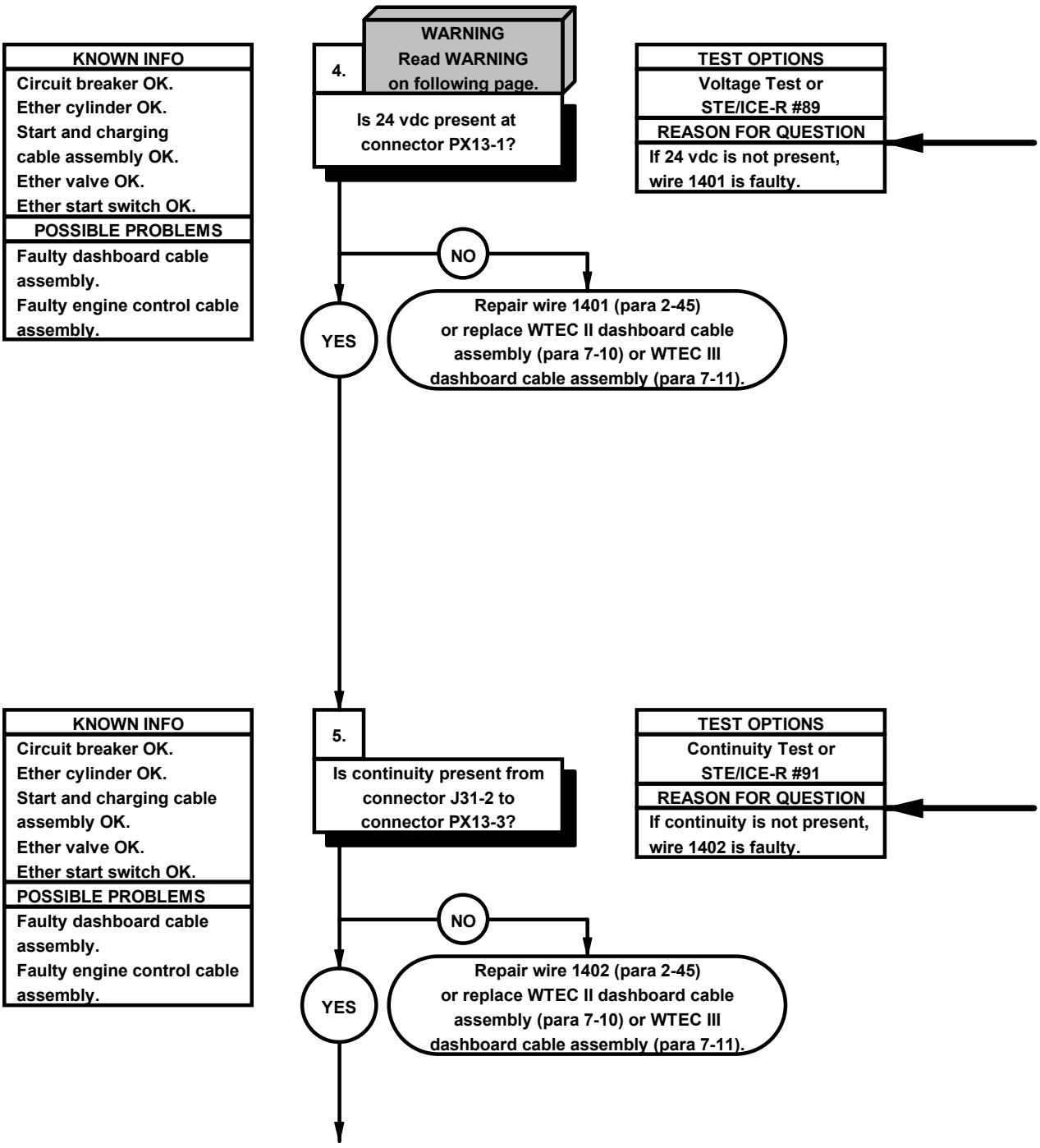


CONTINUITY TEST

(1) Remove instrument panel assembly for access (para 7-15).
(2) Disconnect connector PX13 from ether start switch.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to ether start switch terminal 1.
(5) Connect negative (-) probe of multimeter to ether start switch terminal 3.
(6) Position ether start switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(7) If continuity is not present, replace ether start switch (para 7-18).



e97. ETHER START DOES NOT OPERATE (CONT)

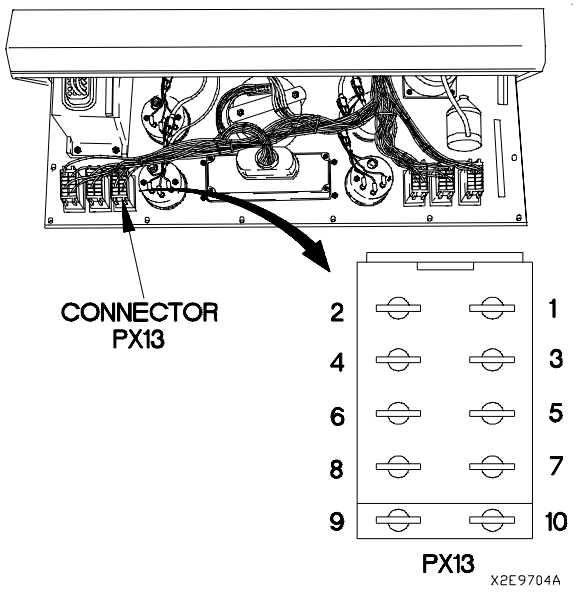


WARNING

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.

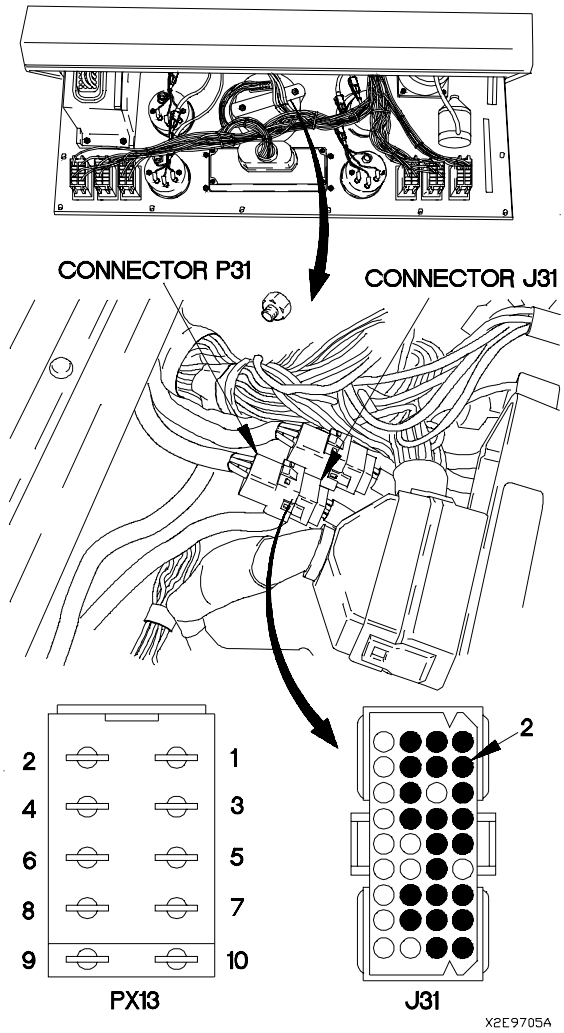
VOLTAGE TEST

(1) Set multimeter to volts dc.
(2) Connect positive (+) probe of multimeter to connector PX13-1.
(3) Connect negative (-) probe of multimeter to ground.
(4) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(5) If 24 vdc is not present, repair wire 1401 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(6) Position master power switch to off (TM 9-2320-366-10-1).

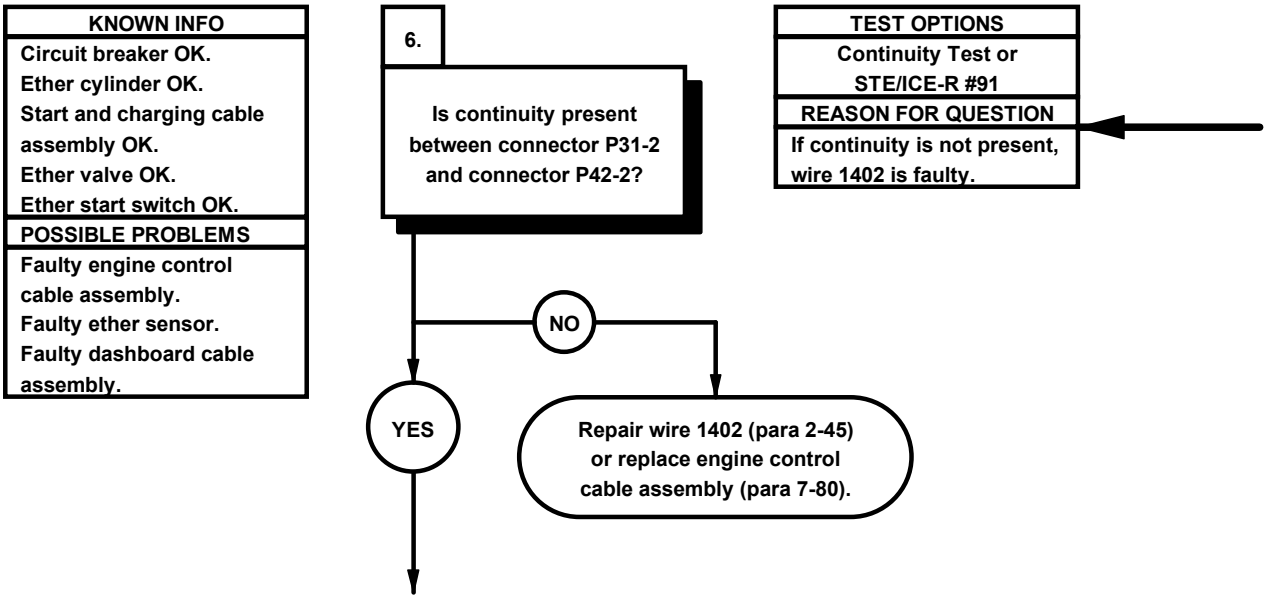


CONTINUITY TEST

(1) Disconnect connector P31 from connector J31.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector PX13-3.
(4) Connect negative (-) probe of multimeter to connector J31-2 and note reading on multimeter.
(5) If continuity is not present, repair wire 1402 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

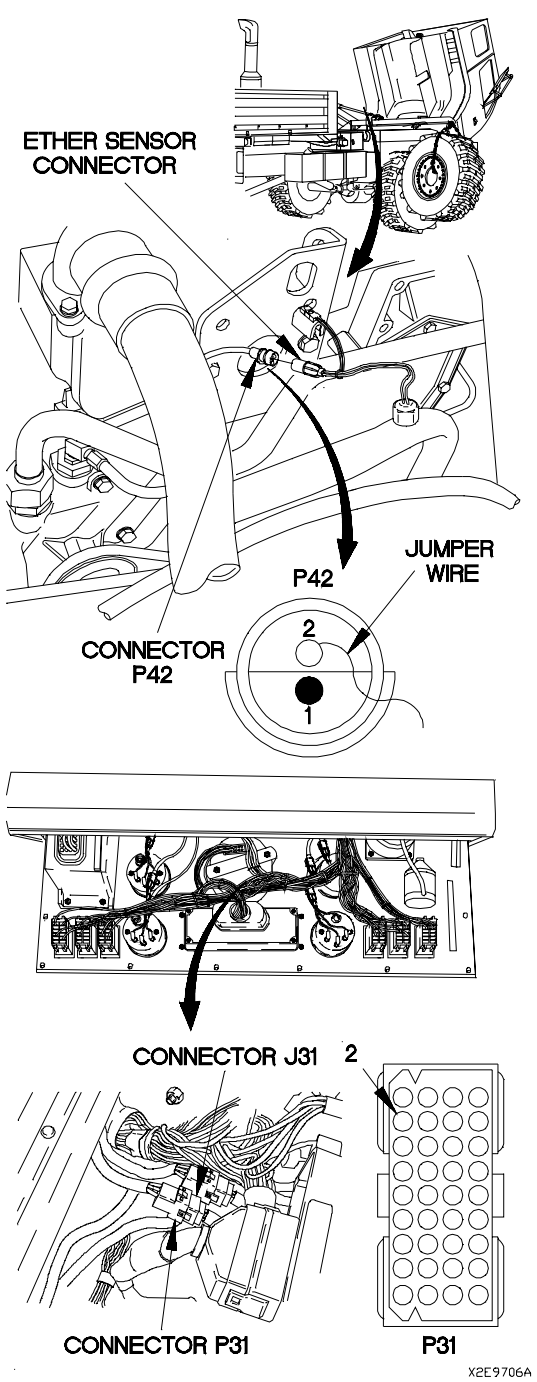


e97. ETHER START DOES NOT OPERATE (CONT)

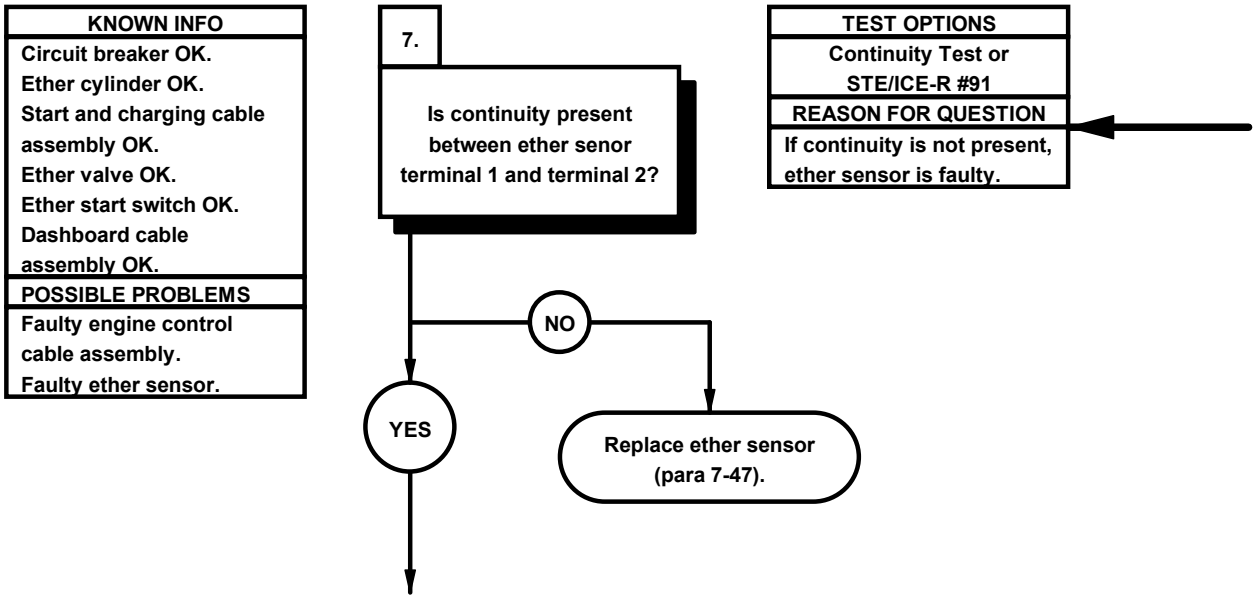


CONTINUITY TEST

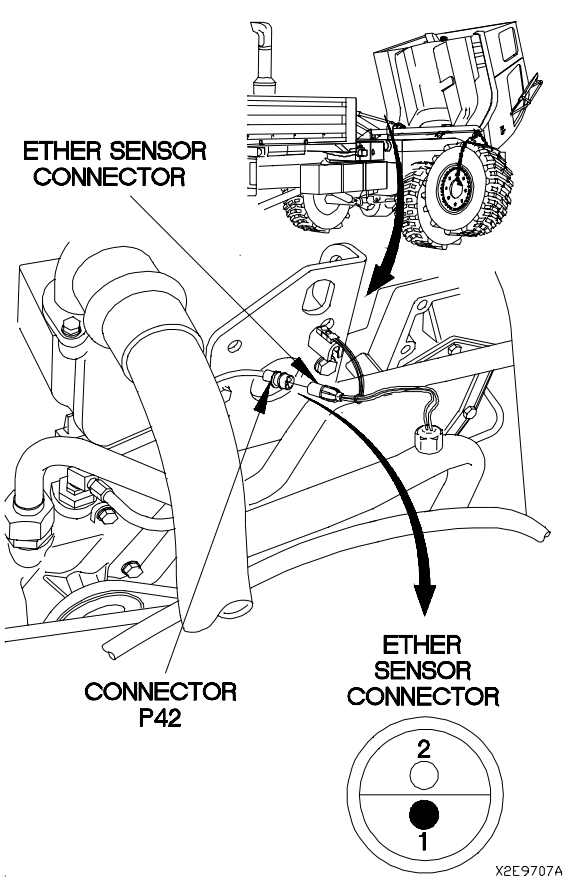
(1) Raise cab (TM 9-2320-366-10).
(2) Disconnect connector P42 from ether sensor connector.
(3) Connect jumper wire to connector P42-2.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to connector P31-2.
(6) Connect negative (-) probe of multimeter to jumper wire and note reading on multimeter.
(7) If continuity is not present, repair wire 1402 (para 2-45) or replace engine control cable assembly (para 7-80).



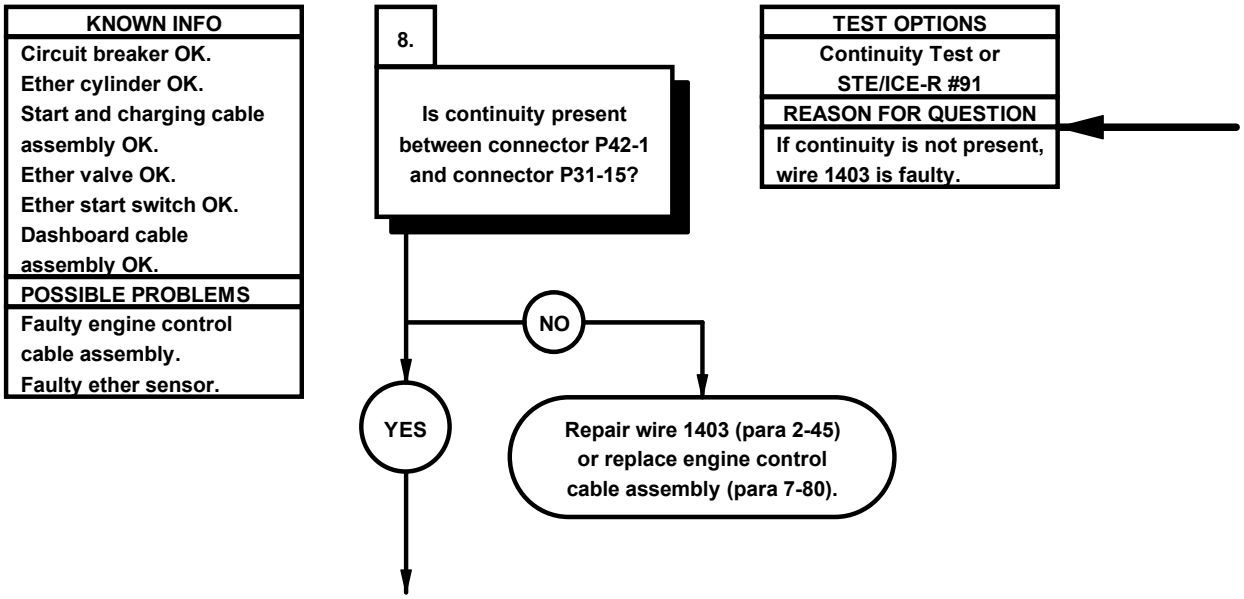
e97. ETHER START DOES NOT OPERATE (CONT)



CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to ether sensor terminal 1.
(3) Connect negative (-) probe of multimeter to ether sensor terminal 2 and note reading on multimeter.
(4) If continuity is not present, replace ether sensor (para 7-47).

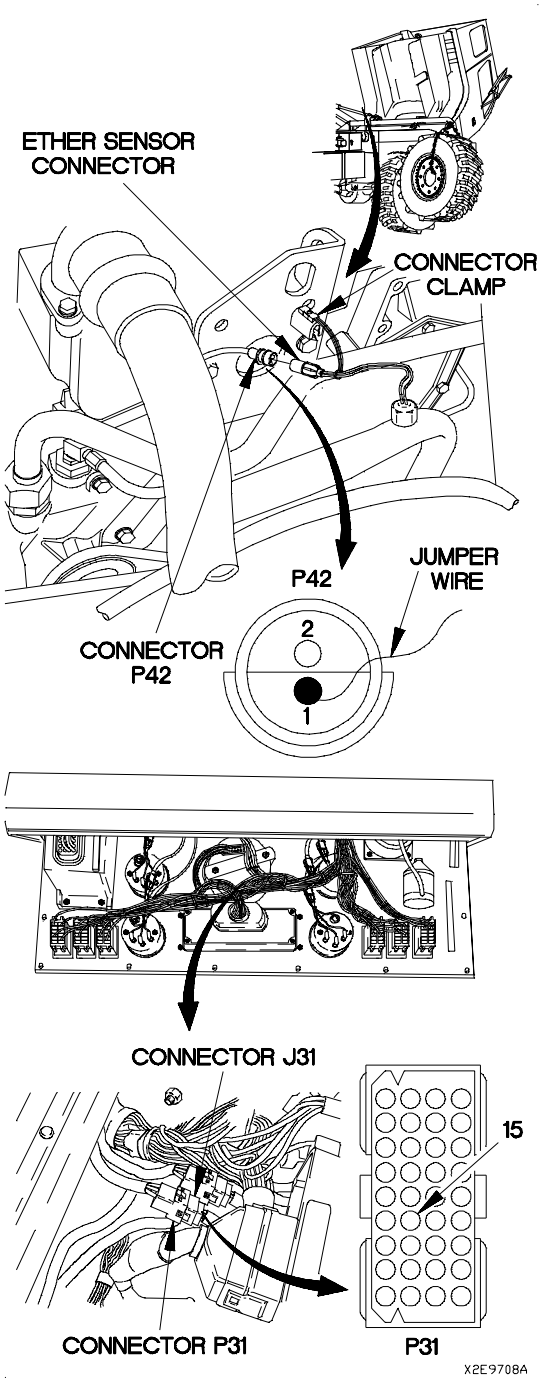


e97. ETHER START DOES NOT OPERATE (CONT)

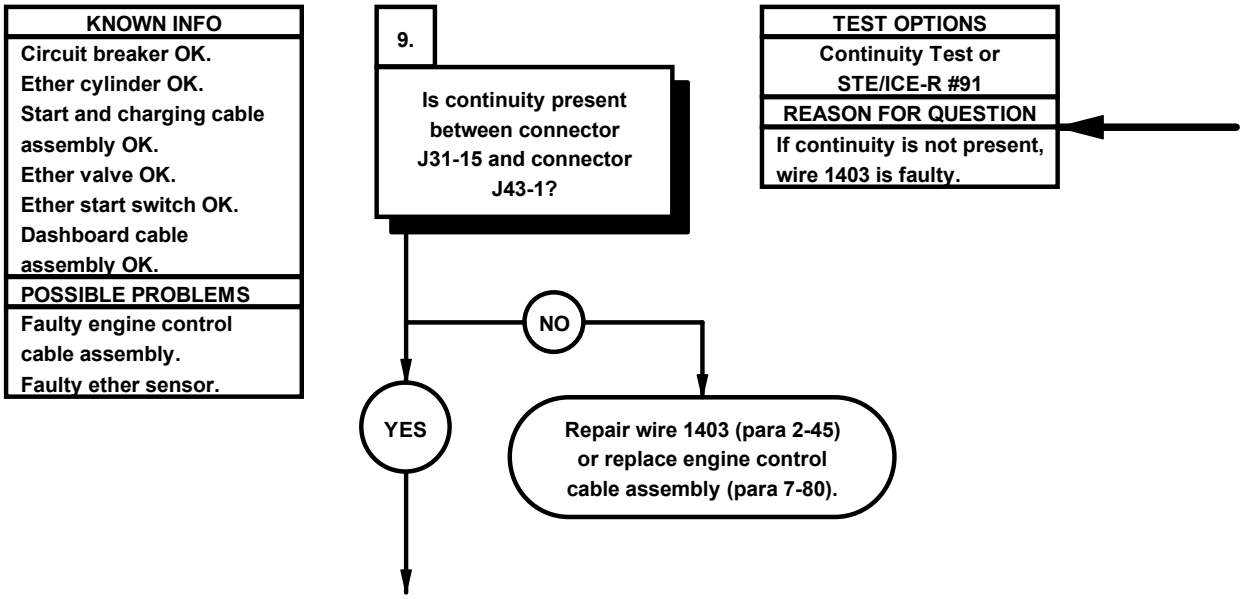


CONTINUITY TEST

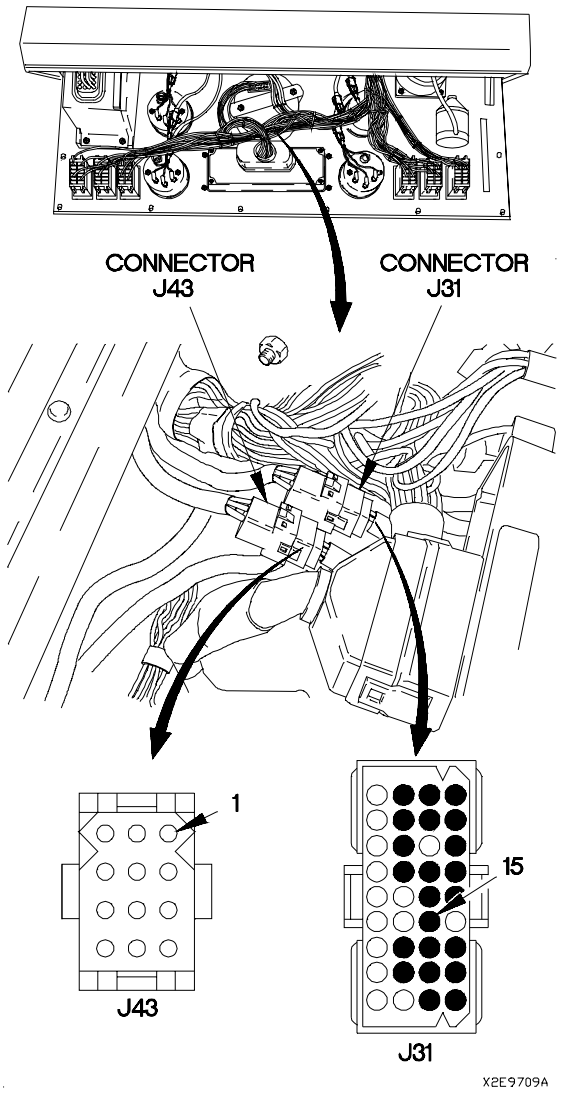
(1) Set multimeter to ohms.
(2) Connect jumper wire to connector P42-1.
(3) Lower cab (TM 9-2320-366-10-1).
(4) Connect positive (+) probe of multimeter to connector P31-15.
(5) Connect negative (-) probe of multimeter to jumper wire and note reading on multimeter.
(6) If continuity is not present, repair wire 1403 (para 2-45) or replace engine control cable assembly (para 7-80).
(7) Raise cab (TM 9-2320-366-10-1).
(8) Remove jumper wire from connector P42.
(9) Connect connector P42 to ether sensor connector.
(10) Connect connector clamp on ether sensor connector.
(11) Lower cab (TM 9-2320-366-10-1).



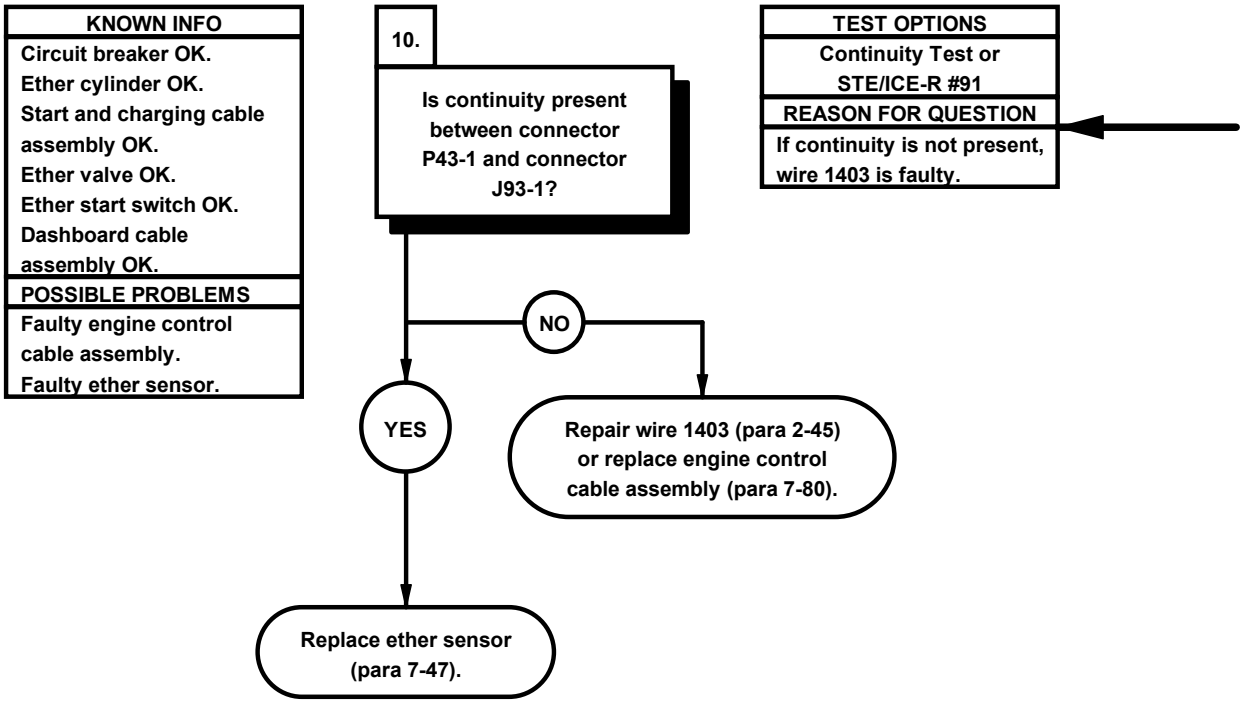
e97. ETHER START DOES NOT OPERATE (CONT)



CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector J31-15.
(3) Connect negative (-) probe of multimeter to connector J43-1 and note reading on multimeter.
(4) If continuity is not present, repair wire 1403 (para 2-45) or replace engine control cable assembly (para 7-80).

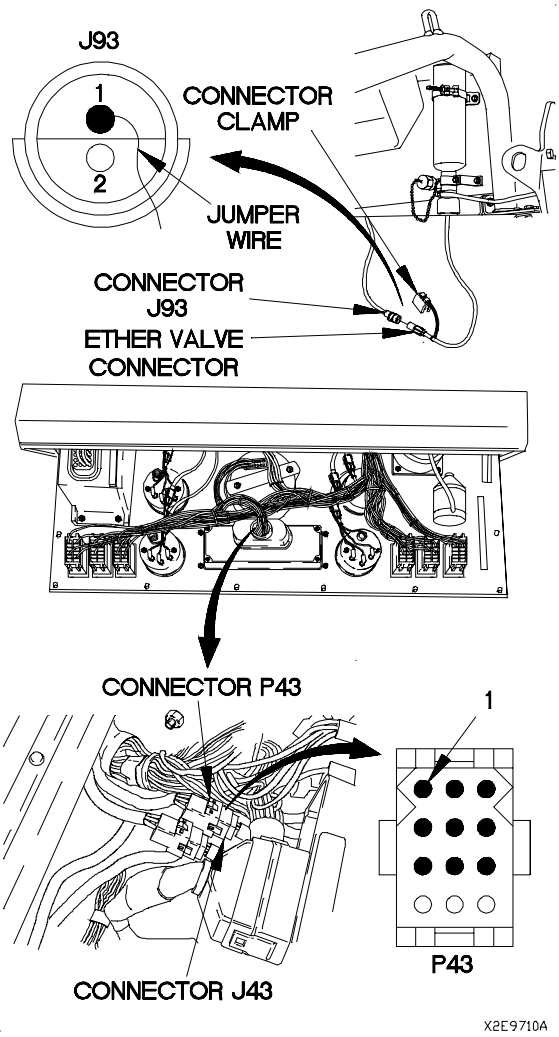


e97. ETHER START DOES NOT OPERATE (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect jumper wire to connector J93-1.
(3) Connect positive (+) probe of multimeter to connector P43-1.
(4) Connect negative (-) probe of multimeter to jumper wire and note reading on multimeter.
(5) If continuity is not present, repair wire 1403 (para 2-45) or replace engine control cable assembly (para 7-80).
(6) If continuity is present, replace ether sensor (para 7-47).
(7) Remove jumper wire from connector J93.
(8) Connect connector J93 to ether valve connector.
(9) Connect connector clamp to ether valve connector.
(10) Connect connector J43 to connector P43.
(11) Install instrument panel assembly (para 7-15).



e98. EXCESSIVE CONDENSATION IN FUEL

INITIAL SETUP

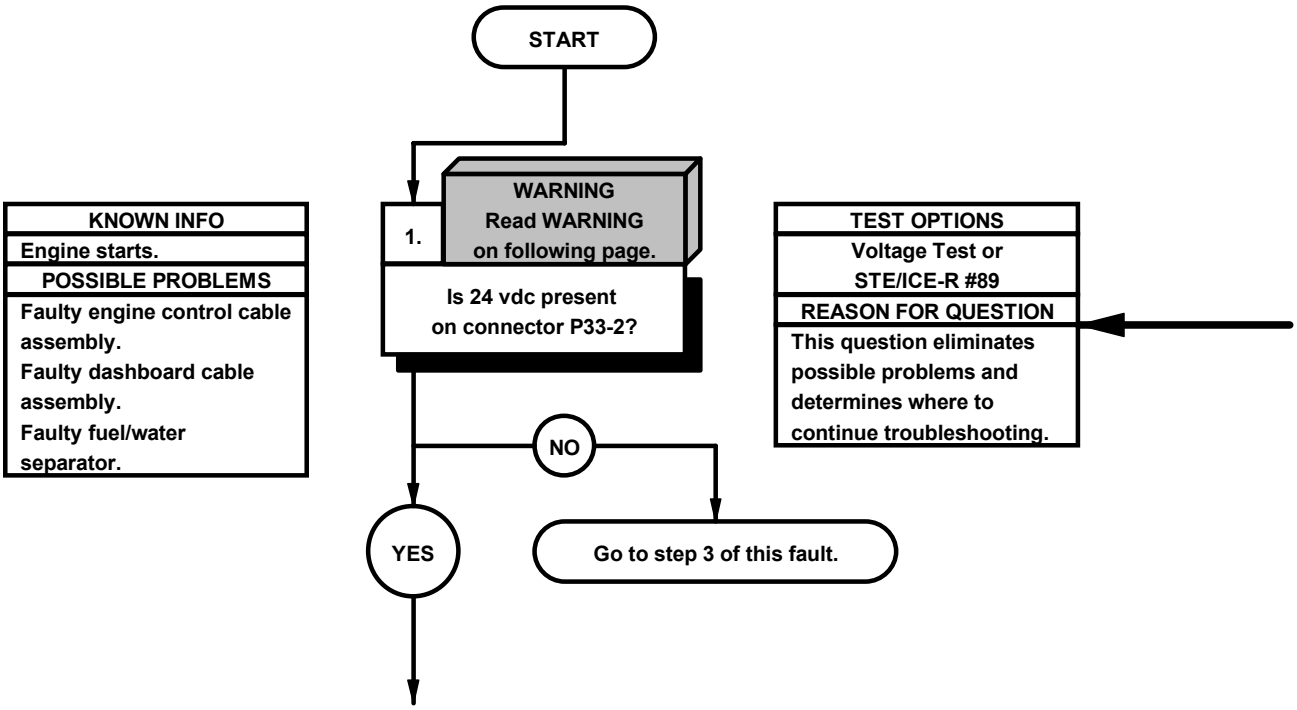
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).

Personnel Required
(2)

References
TM 9-4910-571-12&P

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

Materials/Parts
Wire, Elect, 50 ft (Item 71, Appendix D)

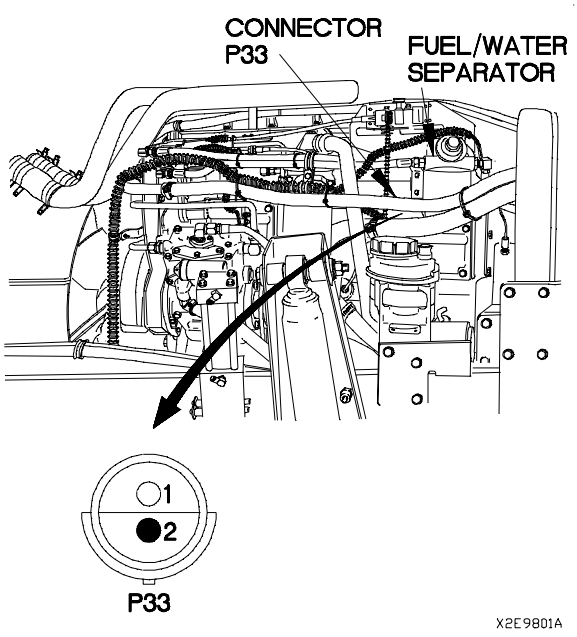


WARNING

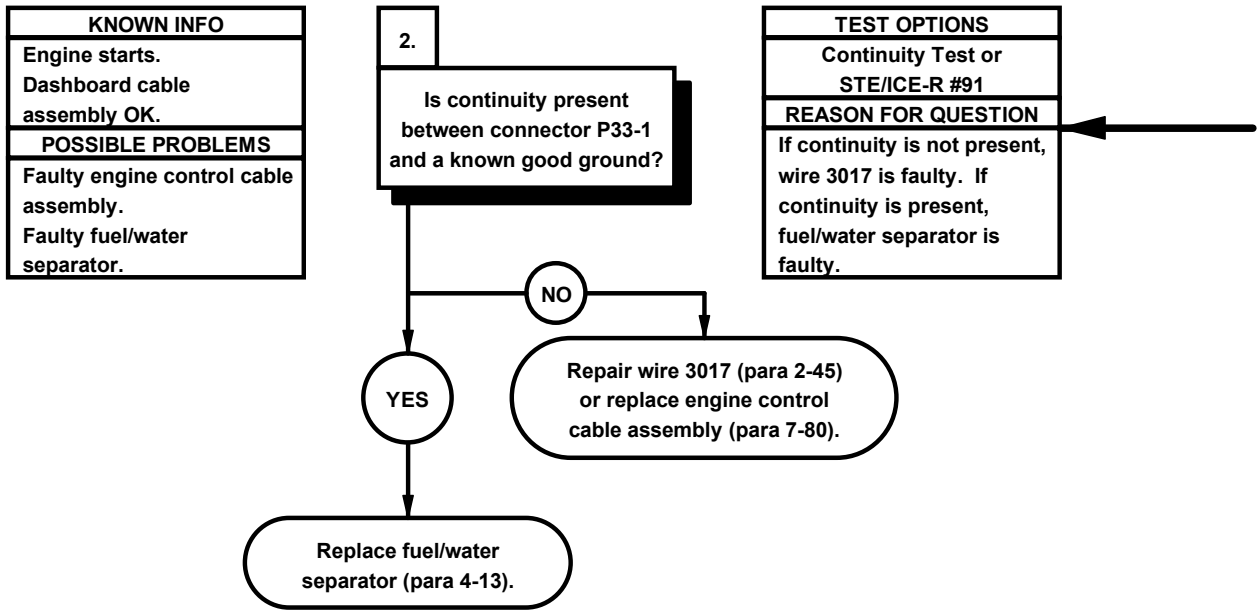
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

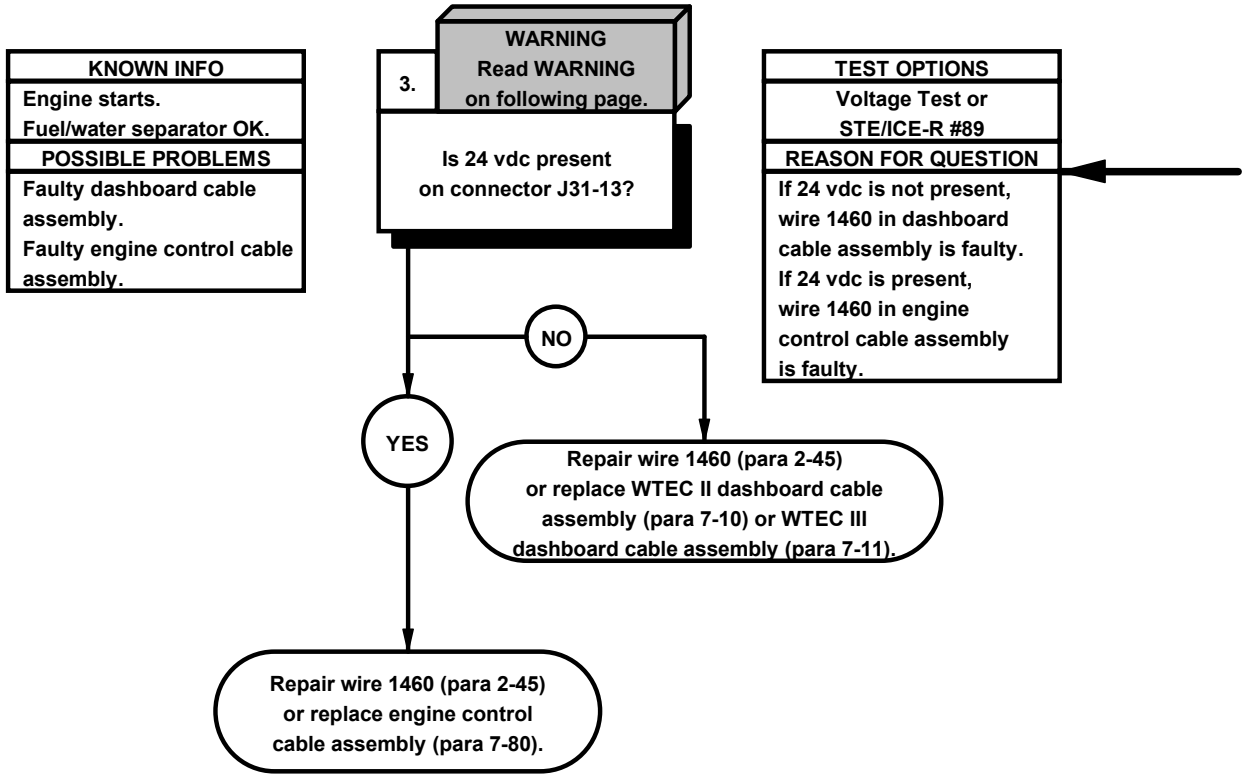
VOLTAGE TEST

(1) Raise cab (TM 9-2320-366-10-1).
(2) Disconnect connector clamp from fuel/water separator.
(3) Disconnect connector P33 from fuel/water separator.
(4) Set multimeter to volts dc.
(5) Connect positive (+) probe of multimeter to connector P33-2.
(6) Connect negative (-) probe of multimeter to ground.
(7) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(8) If 24 vdc is not present, go to step 3 of this fault.
(9) Position master power switch to off (TM 9-2320-366-10-1).



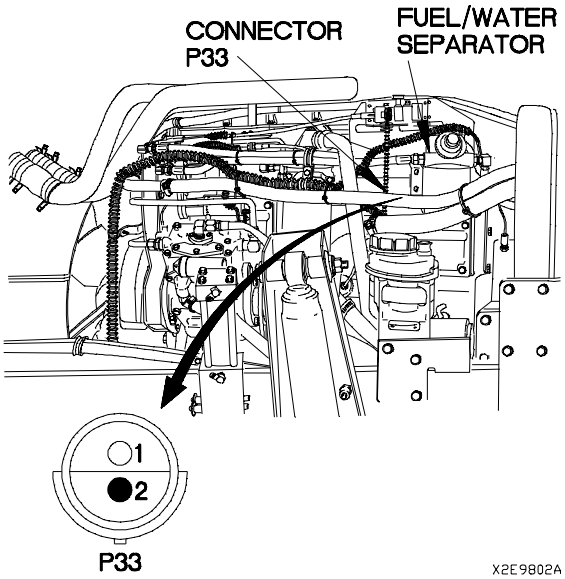
e98. EXCESSIVE CONDENSATION IN FUEL (CONT)





CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P33-1.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair wire 3017 (para 2-45) or replace engine control cable assembly (para 7-80).
(5) If continuity is present, replace fuel/water separator (para 4-13).
(6) Connect connector P33 to fuel/water separator.
(7) Connect connector clamp on fuel/water separator.
(8) Lower cab (TM 9-2320-366-10-1).

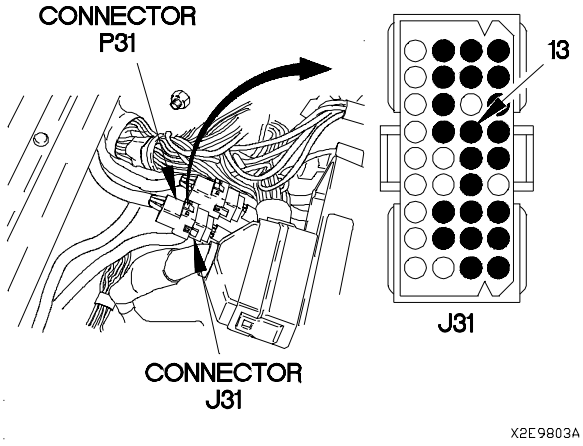


WARNING

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.

VOLTAGE TEST

(1) Remove instrument panel assembly for access (para 7-15).
(2) Disconnect connector P31 from connector J31.
(3) Set multimeter to volts dc.
(4) Connect positive (+) probe of multimeter to connector J31-13.
(5) Connect negative (-) probe of multimeter to ground.
(6) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(7) If 24 vdc is not present, repair wire 1460 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(8) If 24 vdc is present, repair wire 1460 (para 2-45) or replace engine control cable assembly (para 7-80).
(9) Position master power switch to off (TM 9-2320-366-10-1).
(10) Connect connector P31 to connector J31.
(11) Install instrument panel assembly on (para 7-15).



e99. RADIO DOES NOT OPERATE

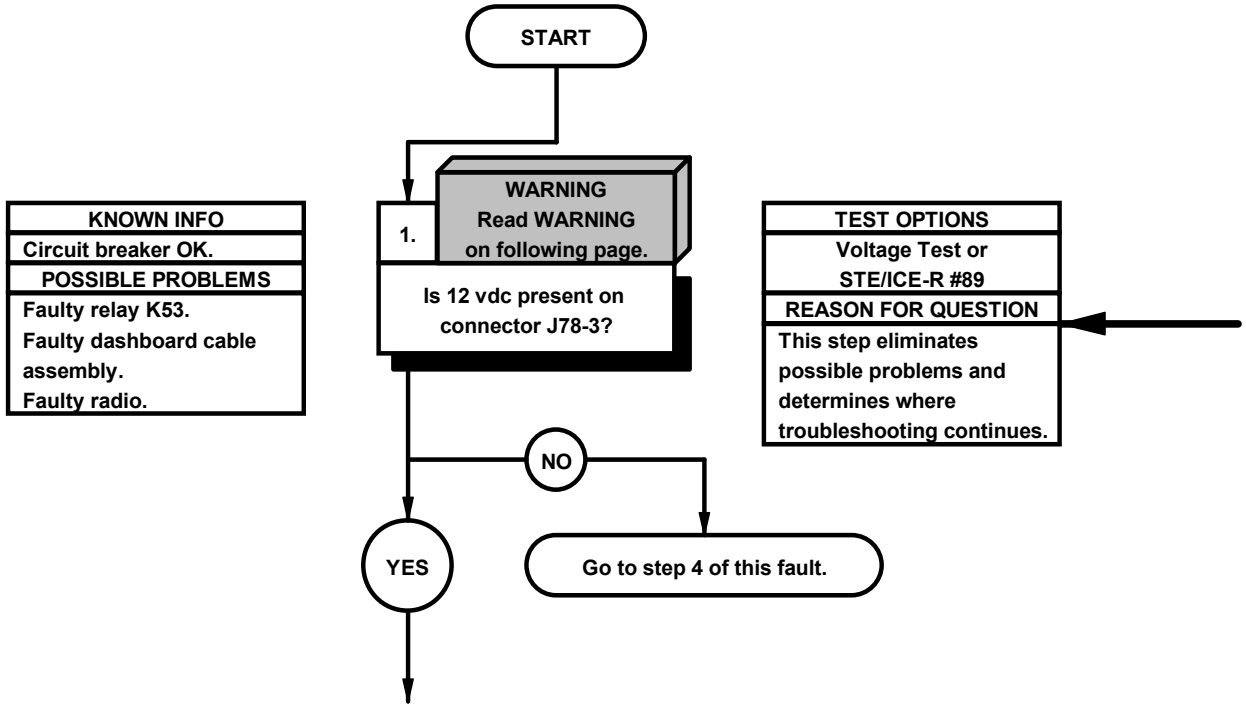
INITIAL SETUP

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

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

References
TM 9-4910-571-12&P

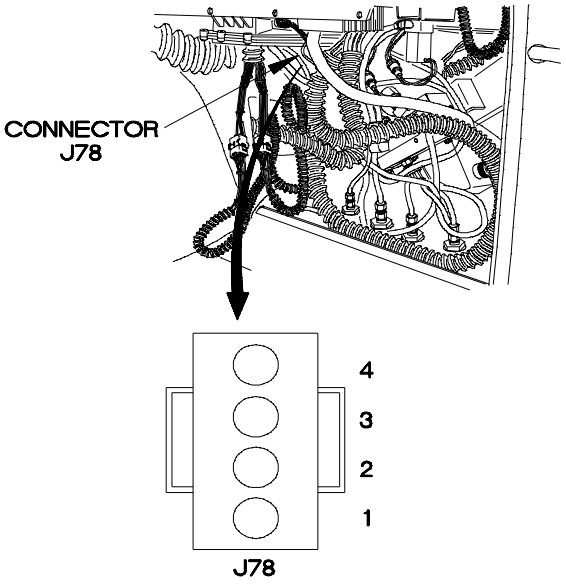


WARNING

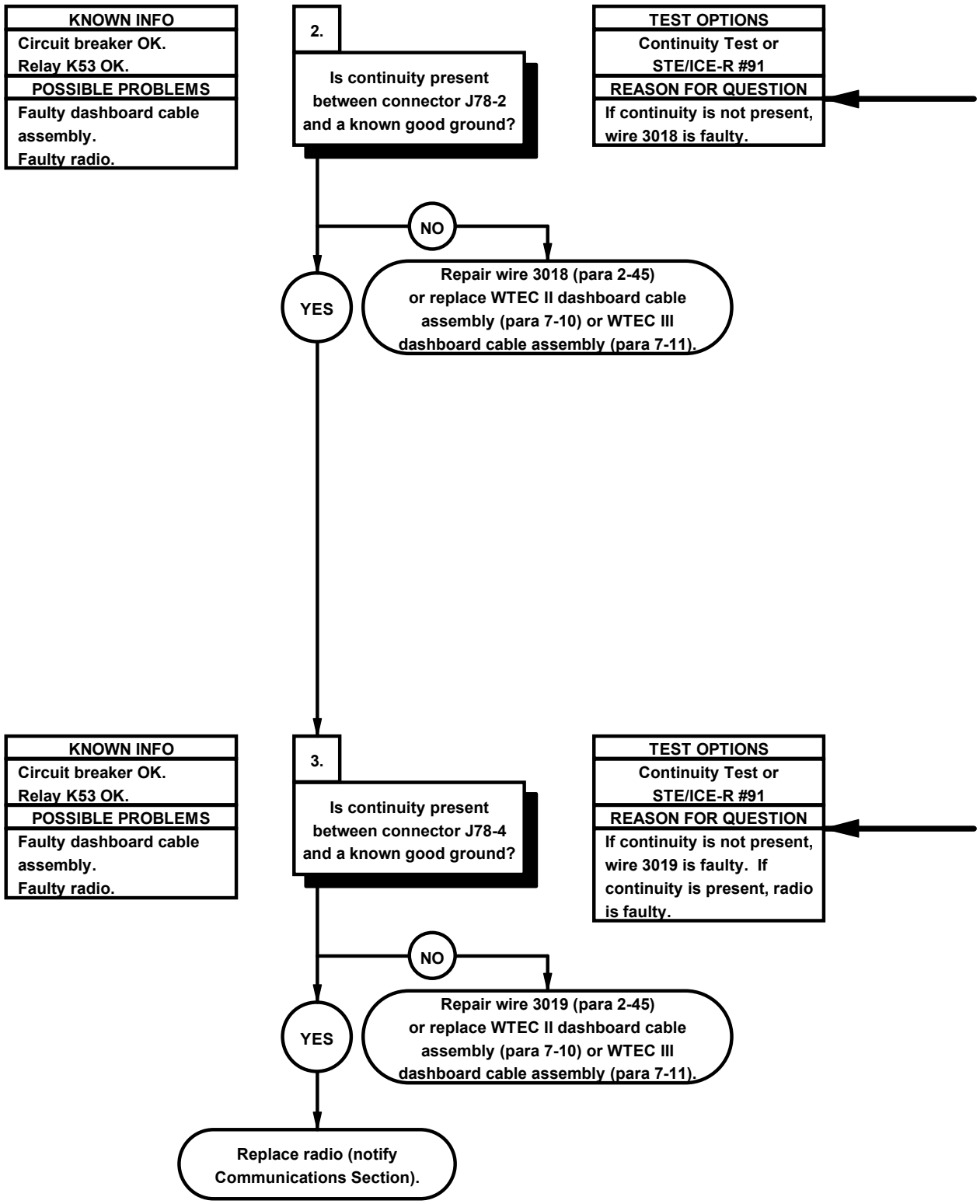
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

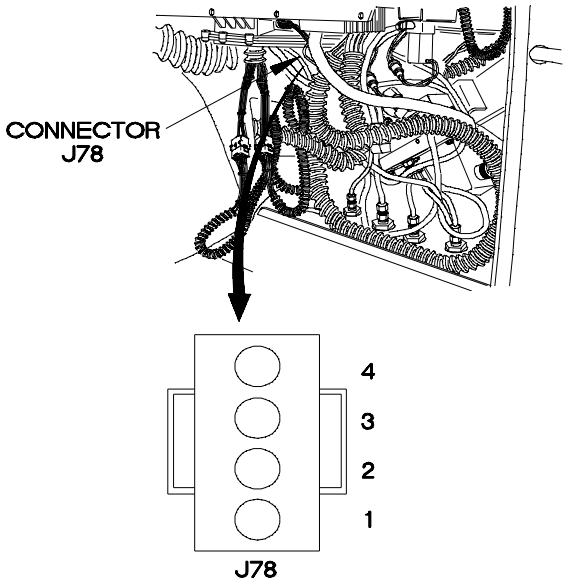
(1) Remove kick panel (para 16-3).
(2) Disconnect connector J78 from radio.
(3) Set multimeter to volts dc.
(4) Connect positive (+) probe of multimeter to connector J78-3.
(5) Connect negative (-) probe of multimeter to ground.
(6) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(7) If 12 vdc is not present, go to step 4 of this fault.
(8) Position master power switch to off (TM 9-2320-366-10-1).



e99. RADIO DOES NOT OPERATE (CONT)

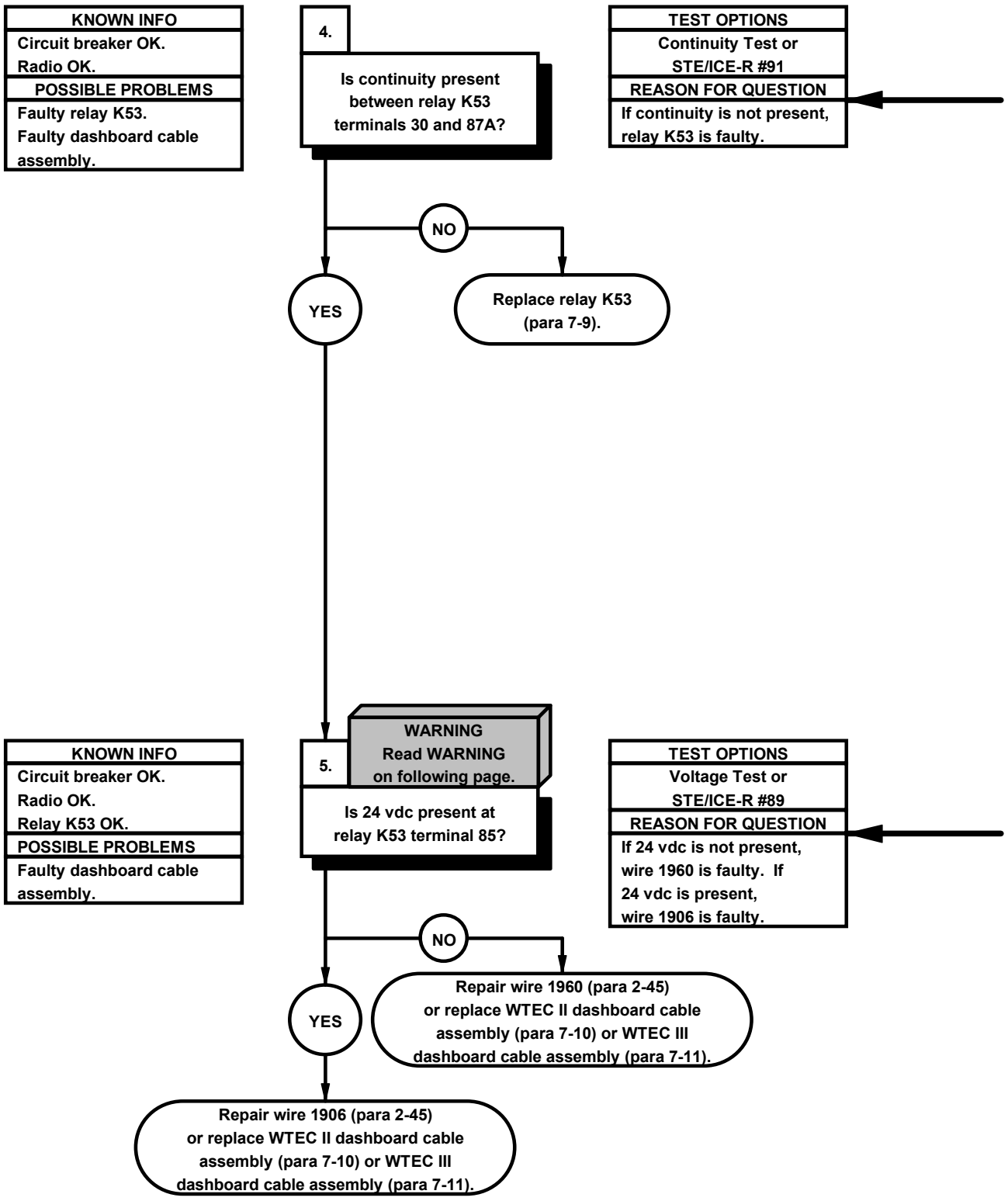


CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector J78-2.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair wire 3018 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).



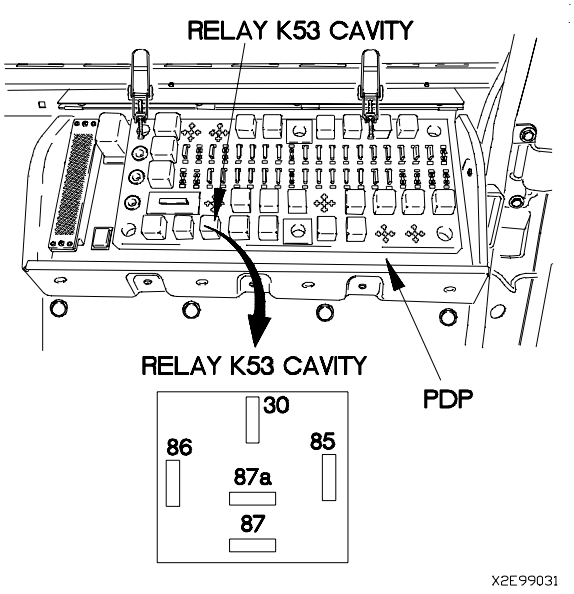
CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector J78-4.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair wire 3019 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(5) If continuity is present, replace radio (notify Communications Section).
(6) Connect connector J78 to radio.
(7) Install kick panel (para 16-3).

e99. RADIO DOES NOT OPERATE (CONT)



CONTINUITY TEST

(1) Remove relay K53 from PDP.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to relay K53 terminal 30.
(4) Connect negative (-) probe of multimeter to relay K53 terminal 87A and note reading on multimeter.
(5) If continuity is not present, replace relay K53 (para 7-9).



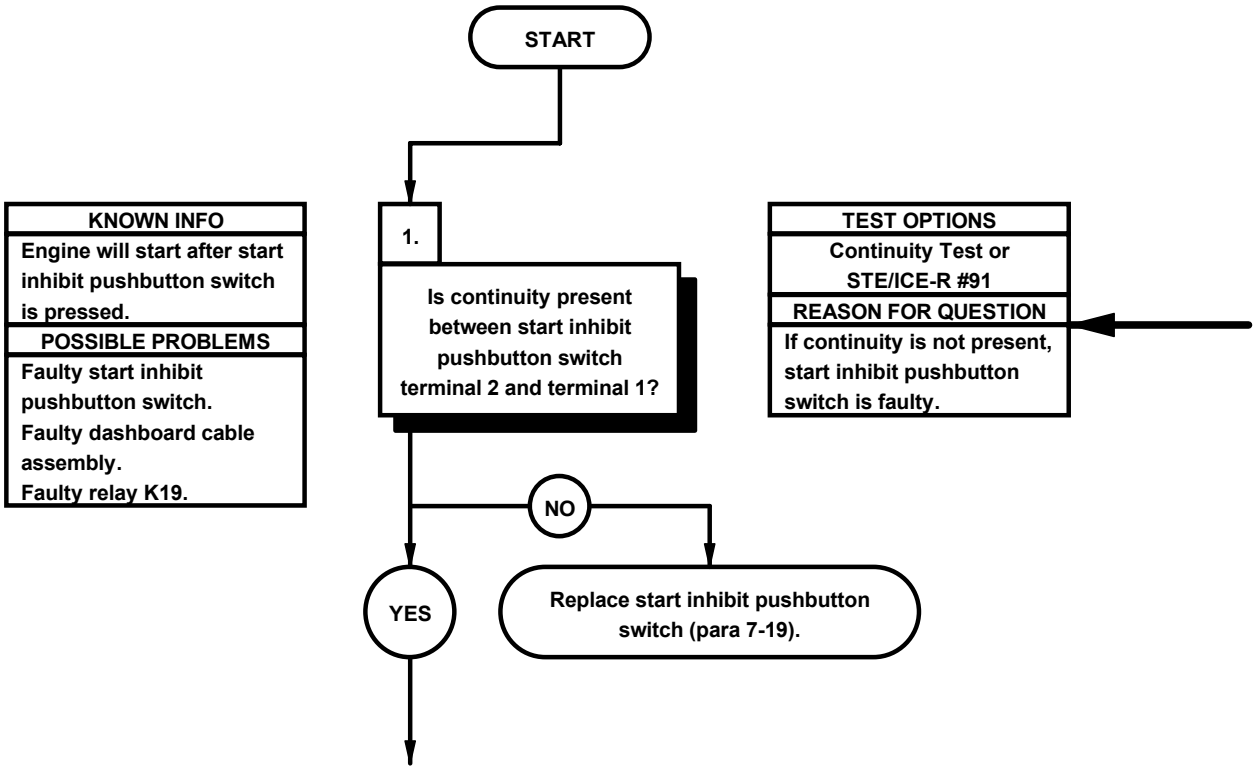
WARNING

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.

VOLTAGE TEST

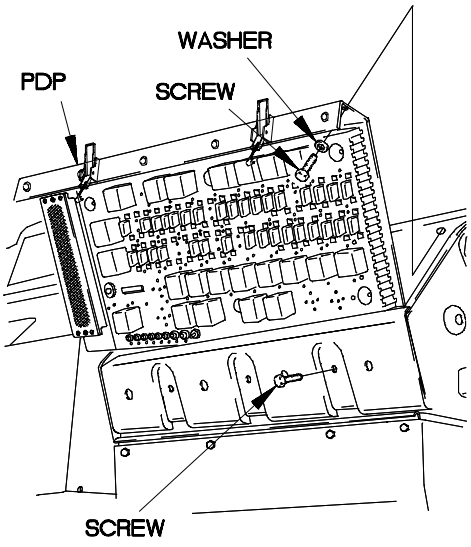
(1) Set multimeter to volts dc.
(2) Connect positive (+) probe of multimeter to PDP, terminal 85, where relay K53 was removed.
(3) Connect negative (-) probe of multimeter to ground.
(4) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(5) If 24 vdc is not present, repair wire 1960 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(6) If 24 vdc is present, repair wire 1906 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(7) Position master power switch to off (TM 9-2320-366-10-1).
(8) Install relay K53 in PDP.
(9) Connect connector J78 to radio.
(10) Install kick panel (para 16-3).

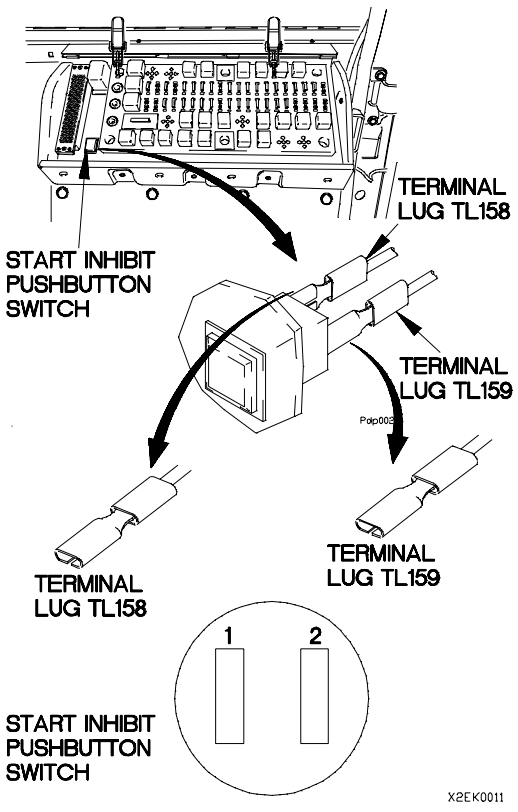
e100. START INHIBIT PUSHBUTTON DOES NOT OPERATE	
INITIAL SETUP	
Equipment Condition Engine shut down (TM 9-2320-366-10-1).	**Tools and Special Tools** Tool Kit, Genl Mech (Item 46, Appendix C) STE/ICE-R (Item 41, Appendix C) Multimeter, Digital (Item 22, Appendix C)
Personnel Required (2)	**References** TM 9-4910-571-12&P
Materials/Parts Wire, Elect, 50 ft (Item 71, Appendix D)	



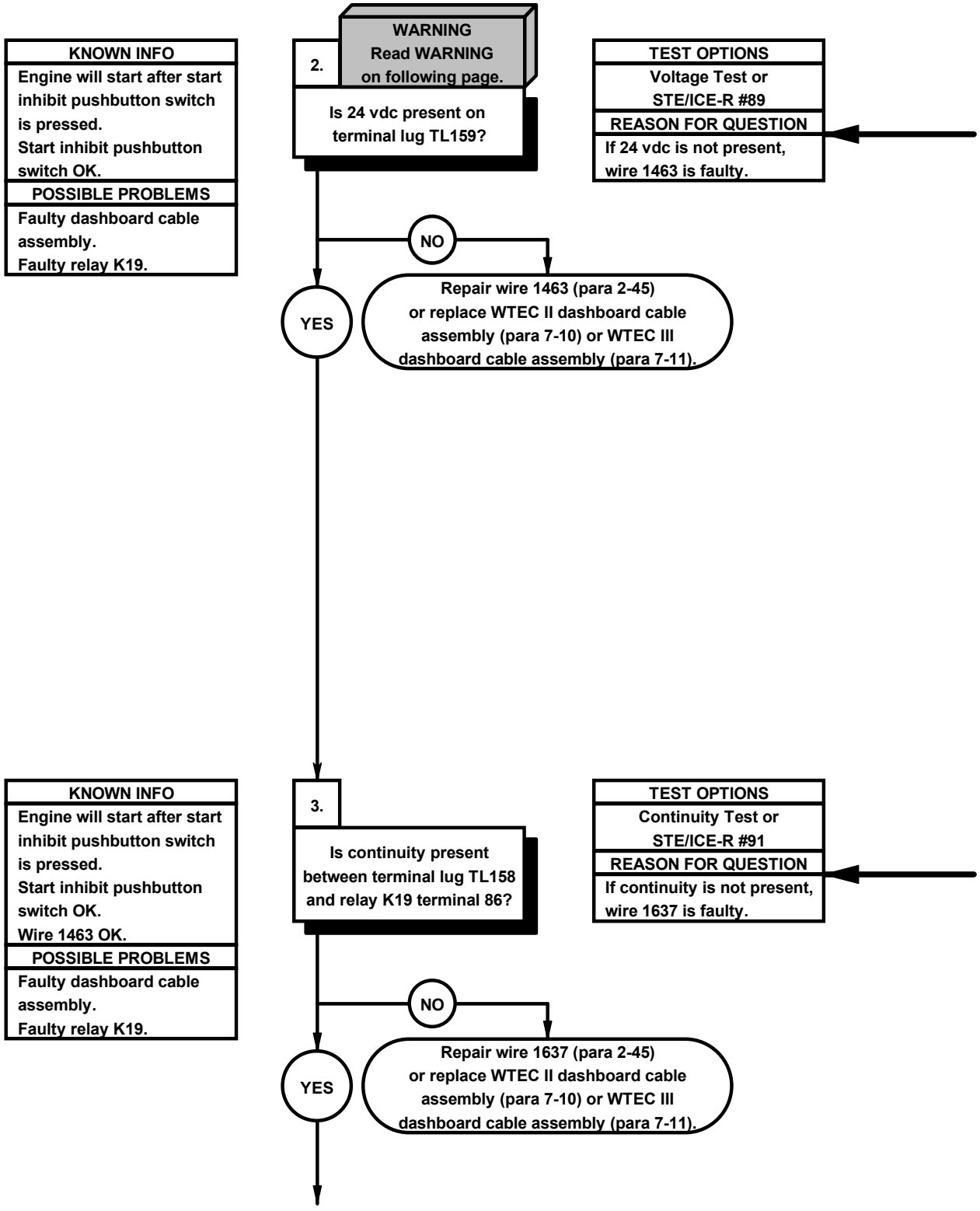
CONTINUITY TEST

(1) Remove PDP cover (para 16-2).
(2) Remove three screws and washers from PDP.
(3) Remove three screws from PDP.
(4) Lift PDP outward to gain access.
(5) Disconnect terminal lugs TL158 and TL159 from start inhibit pushbutton switch.
(6) Set multimeter to ohms.
(7) Connect positive (+) probe of multimeter to start inhibit pushbutton switch terminal 1.
(8) Connect negative (-) probe of multimeter to start inhibit pushbutton switch terminal 2.
(9) Press start inhibit pushbutton switch and hold (TM 9-2320-366-10-1) and note reading on multimeter.
(10) If continuity is not present, replace start inhibit pushbutton switch (para 7-19).
(11) Install PDP on dashboard with three screws.
(12) Install three washers and screws in PDP.





e100. START INHIBIT PUSHBUTTON DOES NOT OPERATE (CONT)



WARNING

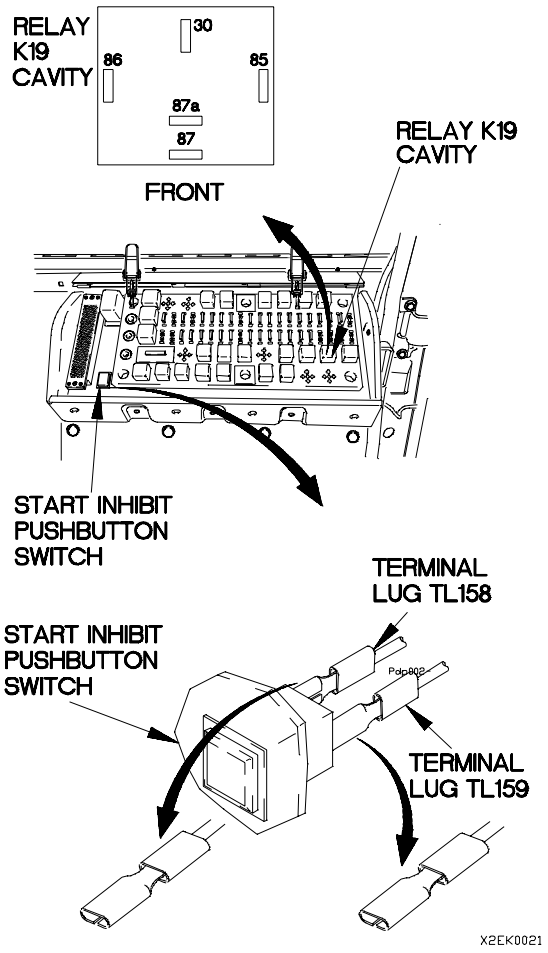
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

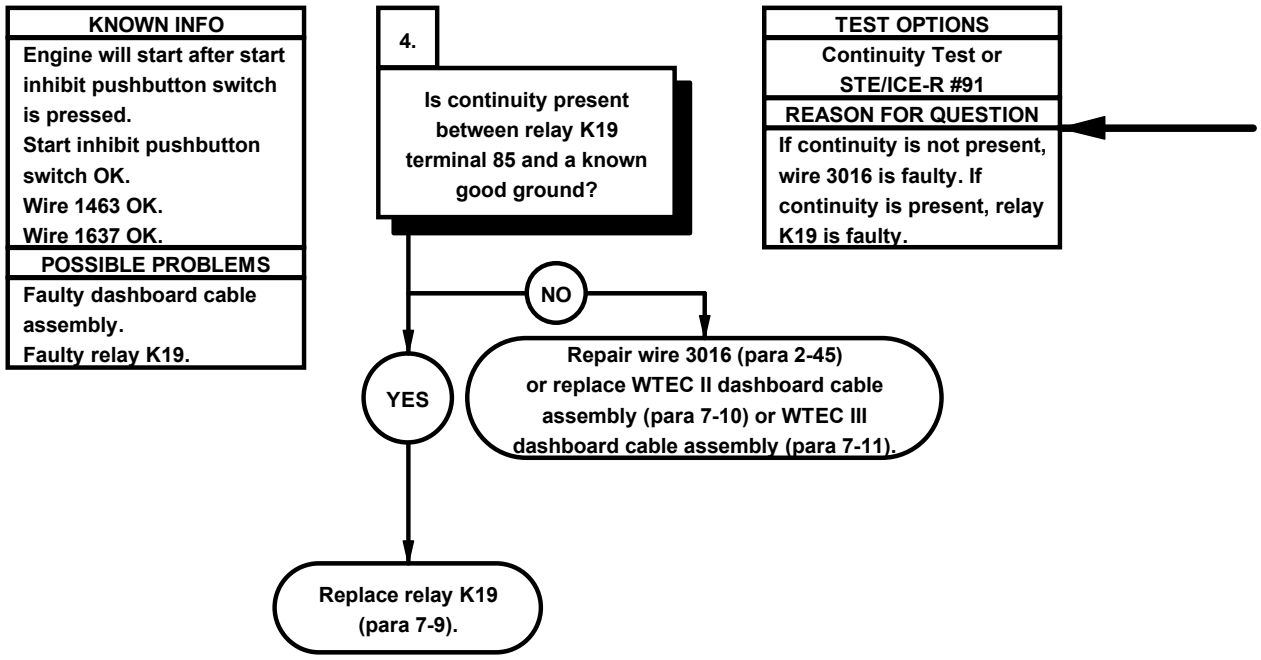
(1) Set multimeter to volts dc.
(2) Connect positive (+) probe of multimeter to terminal lug TL159.
(3) Connect negative (-) probe of multimeter to ground.
(4) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(5) If 24 vdc is not present, repair wire 1463 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(6) Position master power switch to off (TM 9-2320-366-10-1).

CONTINUITY TEST

(1) Remove relay K19 from PDP.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to terminal lug TL158.
(4) Connect negative (-) probe of multimeter to PDP, terminal 86, where relay K19 was removed, and note reading on multimeter.
(5) If continuity is not present, repair wire 1637 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(6) Connect terminal lugs TL158 and TL159 to start inhibit pushbutton switch.

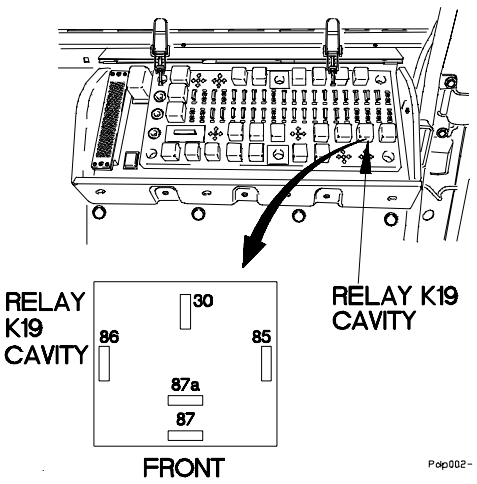


e100. START INHIBIT PUSHBUTTON DOES NOT OPERATE (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to PDP, terminal 85, where relay K19 was removed.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair wire 3016 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(5) If continuity is present, replace relay K19 (para 7-9).
(6) Install relay K19 in PDP.
(7) Install PDP cover (para 16-2).



X2EK0031

e101. AIR DRYER DOES NOT OPERATE (ALL MODELS EXCEPT M1090/M1094)

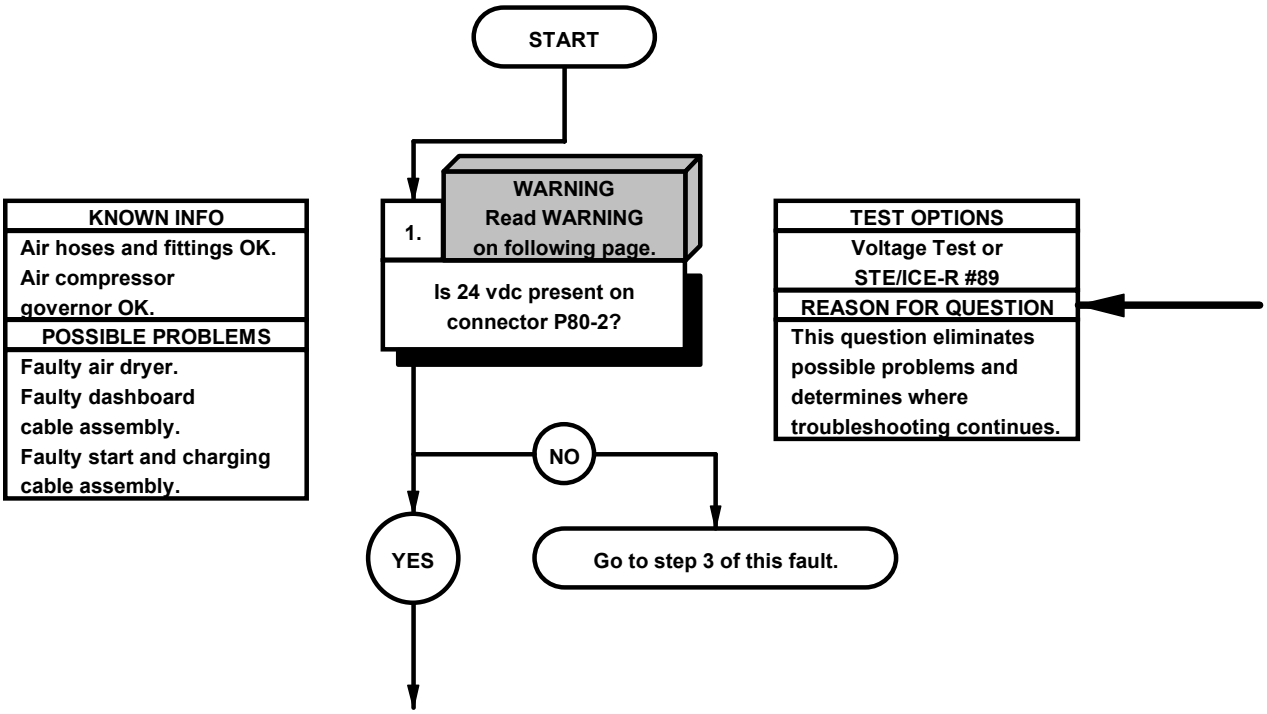
INITIAL SETUP

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

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

References
TM 9-4910-571-12&P

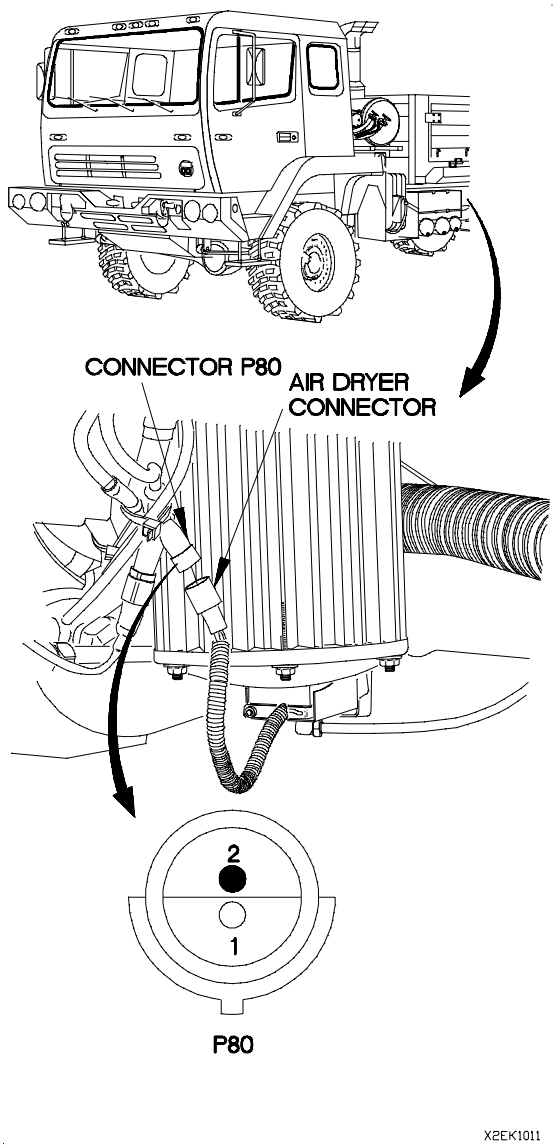


WARNING

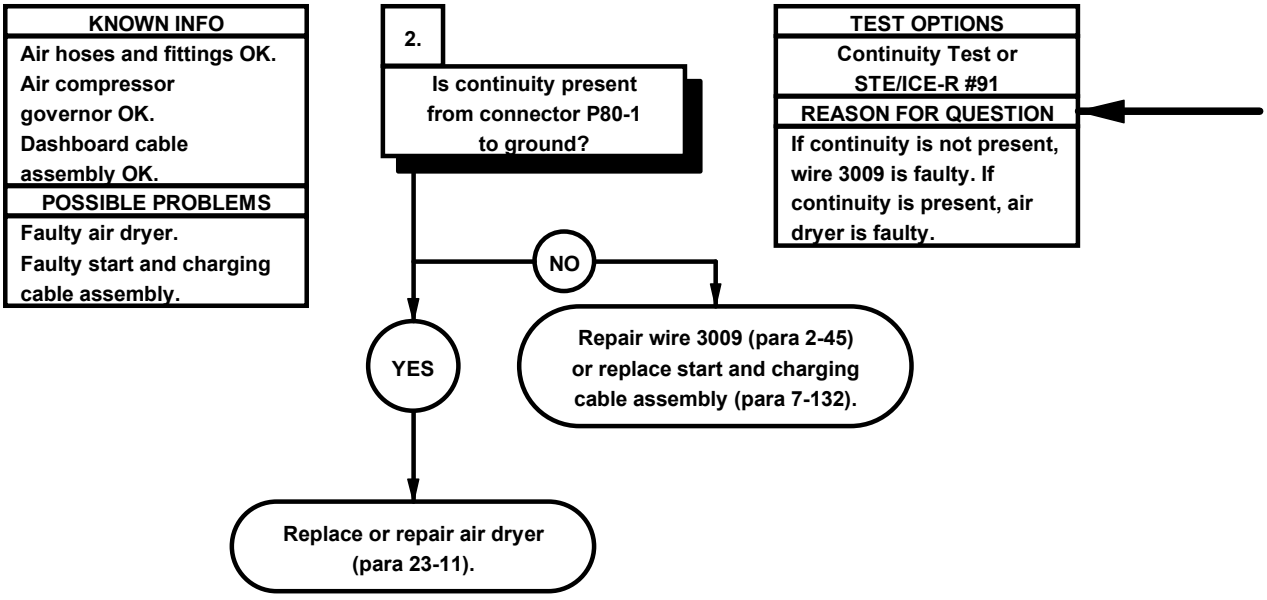
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

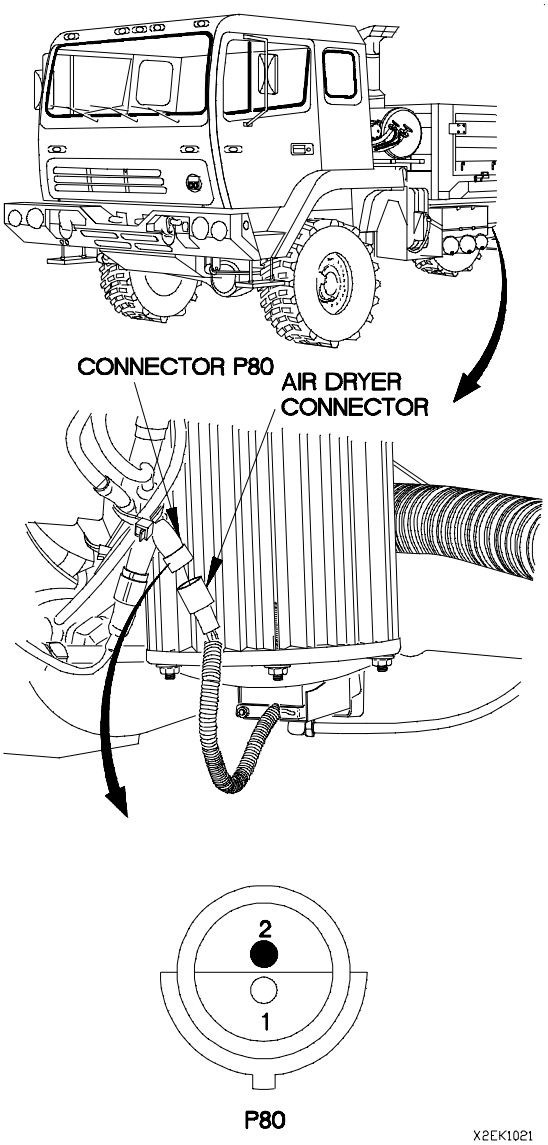
(1) Disconnect connector P80 from air dryer connector.
(2) Set multimeter to volts dc.
(3) Connect positive (+) probe of multimeter to connector P80-2.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(6) If 24 vdc is not present, go to step 3 of this fault.
(7) Position master power switch to off (TM 9-2320-366-10-1).



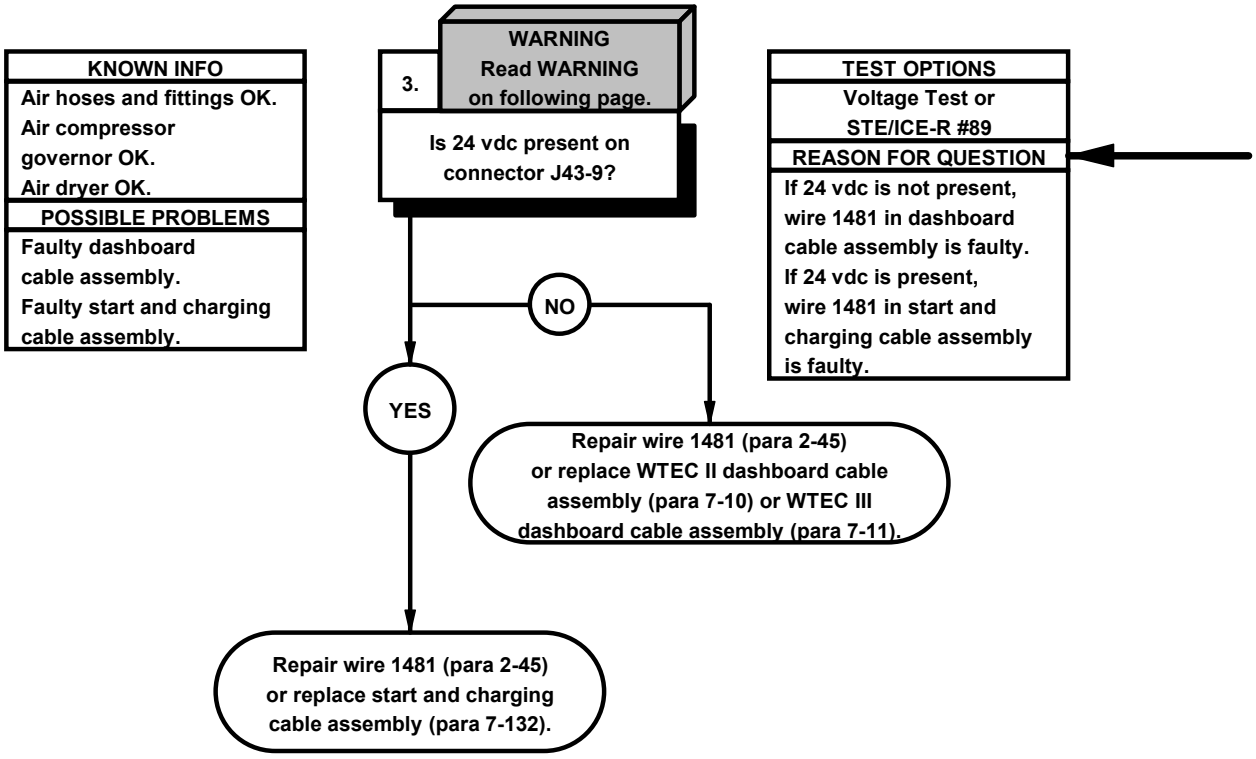
e101. AIR DRYER DOES NOT OPERATE (ALL MODELS EXCEPT M1090/M1094) (CONT)



CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P80-1.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair wire 3009 (para 2-45) or replace start and charging cable assembly (para 7-132).
(5) If continuity is present, replace or repair air dryer (para 23-11).
(6) Connect connector P80 to air dryer connector.



e101. AIR DRYER DOES NOT OPERATE (ALL MODELS EXCEPT M1090/M1094) (CONT)

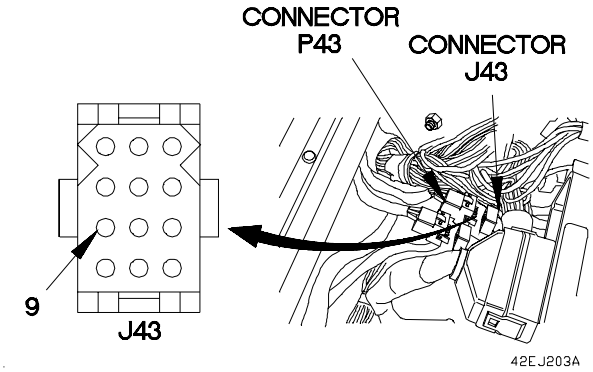


WARNING

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.

VOLTAGE TEST

(1) Remove instrument panel assembly for access (para 7-15).
(2) Disconnect connector J43 from connector P43.
(3) Set multimeter to volts dc.
(4) Connect positive (+) probe of multimeter to connector J43-9.
(5) Connect negative (-) probe of multimeter to ground.
(6) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(7) If 24 vdc is not present, repair wire 1481 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(8) If 24 vdc is present, repair wire 1481 (para 2-45) or replace start and charging cable assembly (para 7-132).
(9) Position master power switch to off (TM 9-2320-366-10-1).
(10) Connect connector J43 to connector P43.
(11) Install instrument panel assembly (para 7-15).



e102. M1090/M1094 AIR DRYER DOES NOT OPERATE

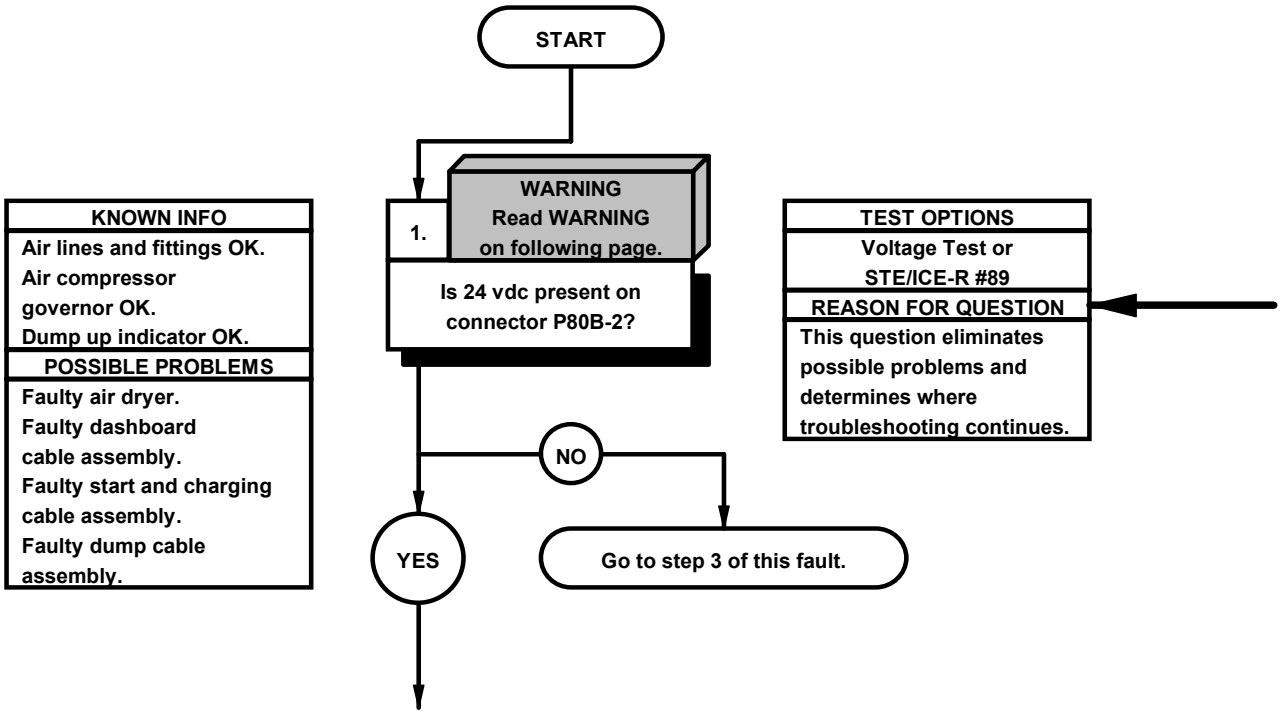
INITIAL SETUP

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

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

References
TM 9-4910-571-12&P

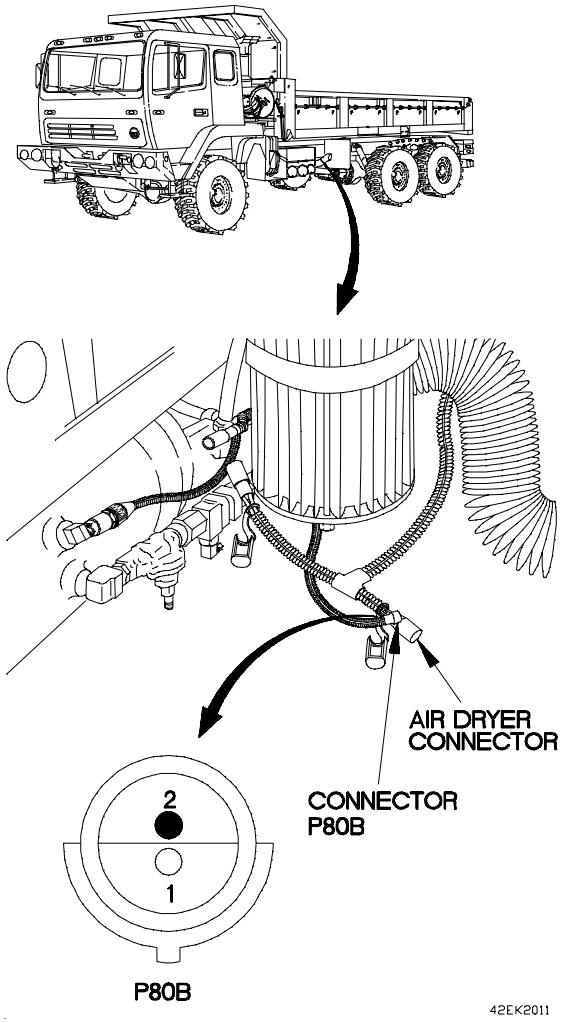


WARNING

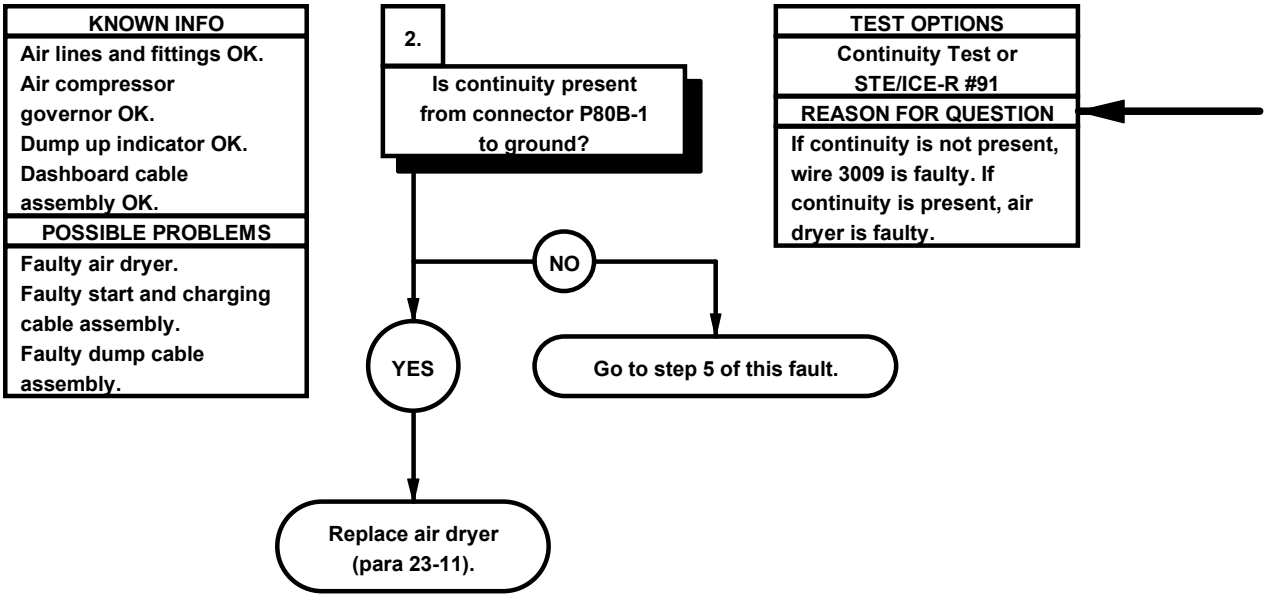
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

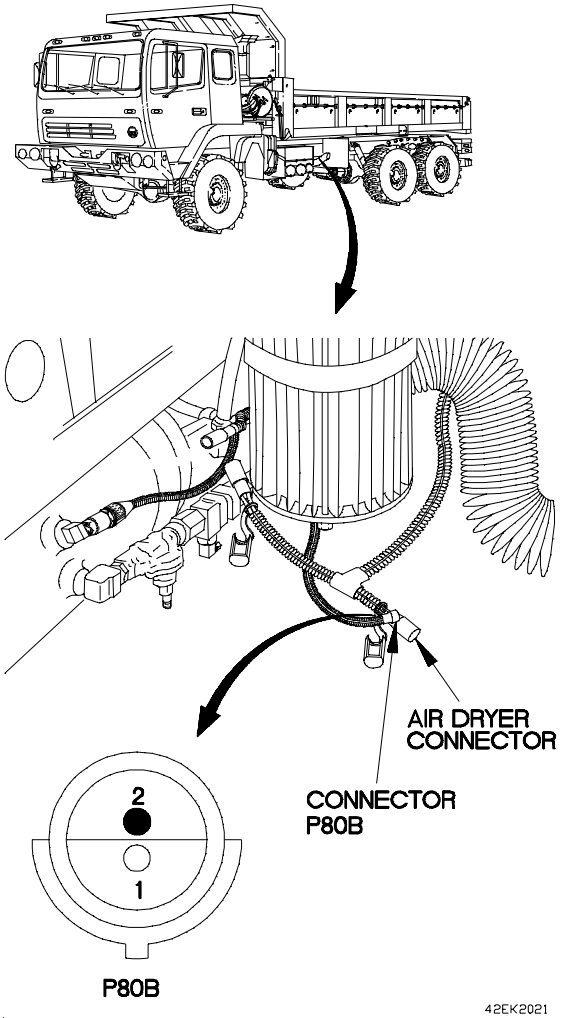
(1) Disconnect connector P80B from air dryer.
(2) Set multimeter to volts dc.
(3) Connect positive (+) probe of multimeter to connector P80B-2.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(6) If 24 vdc is not present, go to step 3 of this fault.
(7) Position master power switch to off (TM 9-2320-366-10-1).



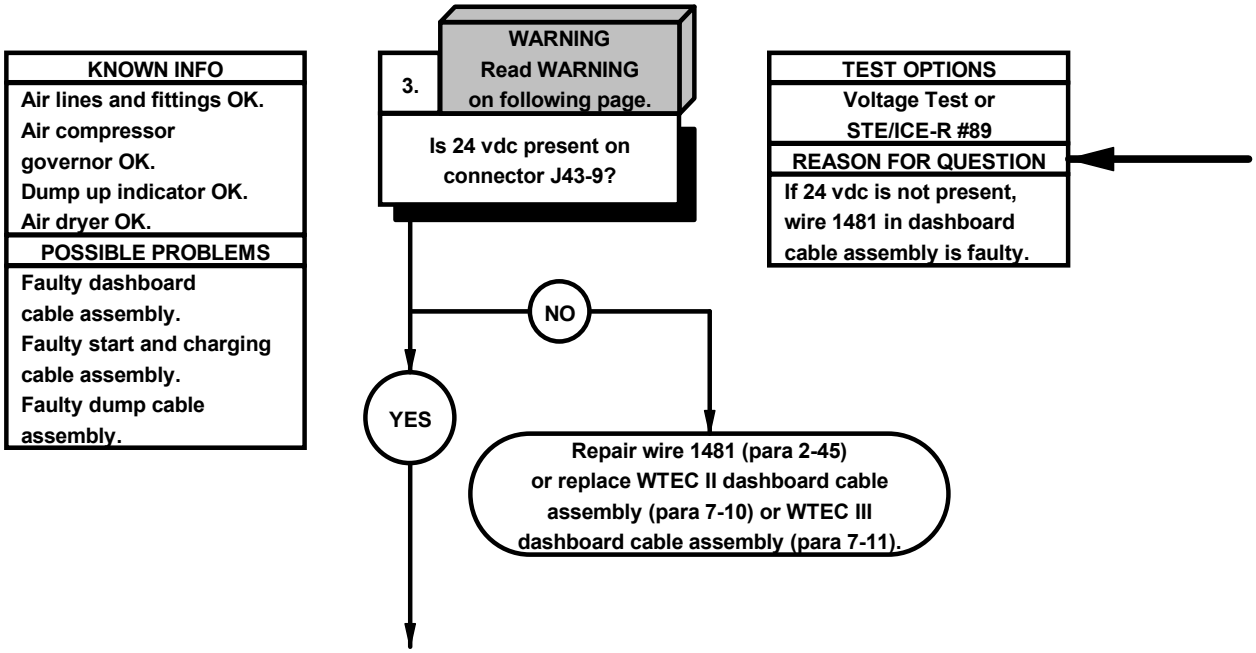
e102. M1090/M1094 AIR DRYER DOES NOT OPERATE (CONT)



CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P80B-1.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, go to step 5 of this fault.
(5) If continuity is present, replace air dryer (para 23-11).
(6) Connect connector P80B to air dryer.



e102. M1090/M1094 AIR DRYER DOES NOT OPERATE (CONT)

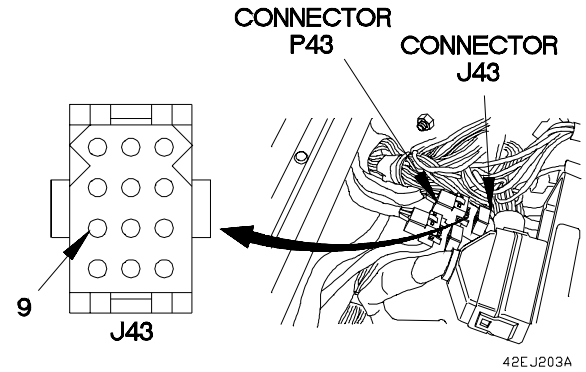


WARNING

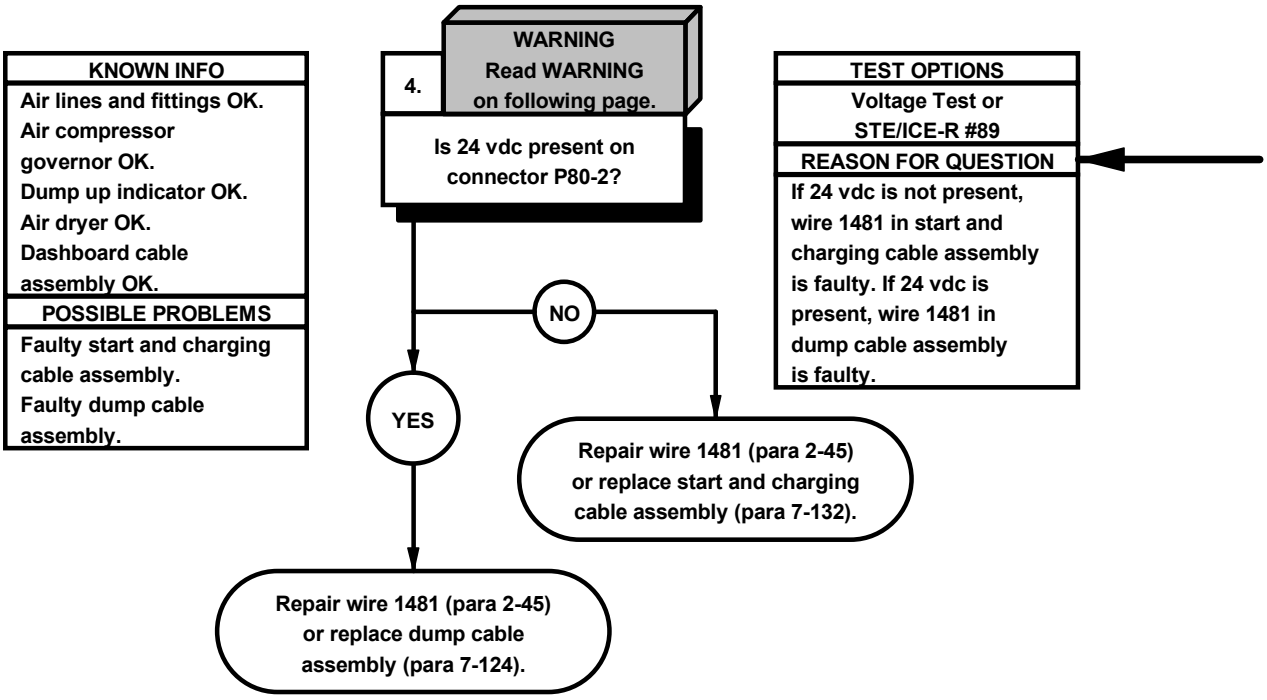
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Remove instrument panel assembly for access (para 7-15).
(2) Disconnect connector J43 from connector P43.
(3) Set multimeter to volts dc.
(4) Connect positive (+) probe of multimeter to connector J43-9.
(5) Connect negative (-) probe of multimeter to ground.
(6) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(7) If 24 vdc is not present, repair wire 1481 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(8) Position master power switch to off (TM 9-2320-366-10-1).
(9) Connect connector J43 to connector P43.
(10) Install instrument panel assembly (para 7-15).



e102. M1090/M1094 AIR DRYER DOES NOT OPERATE (CONT)

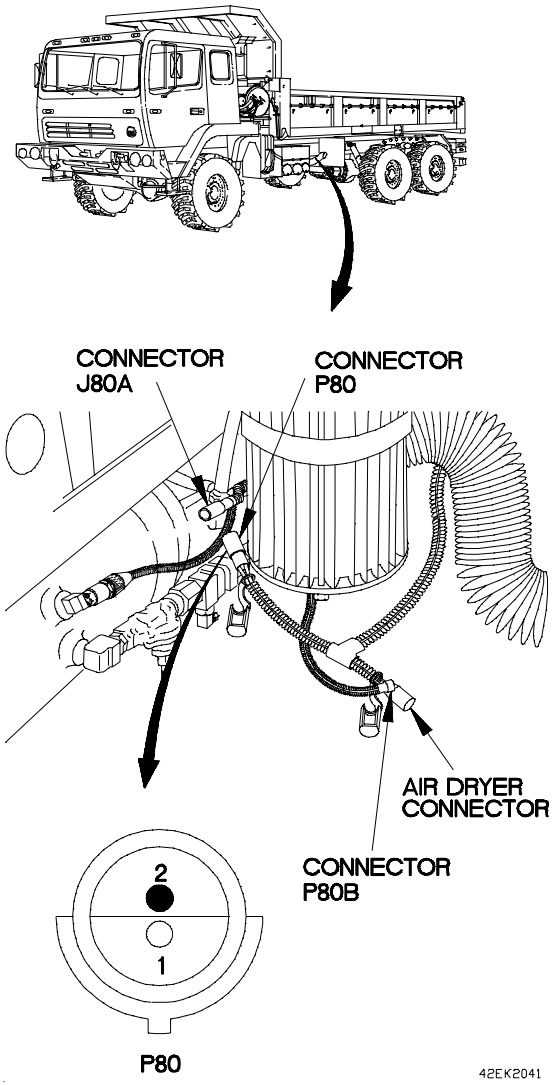


WARNING

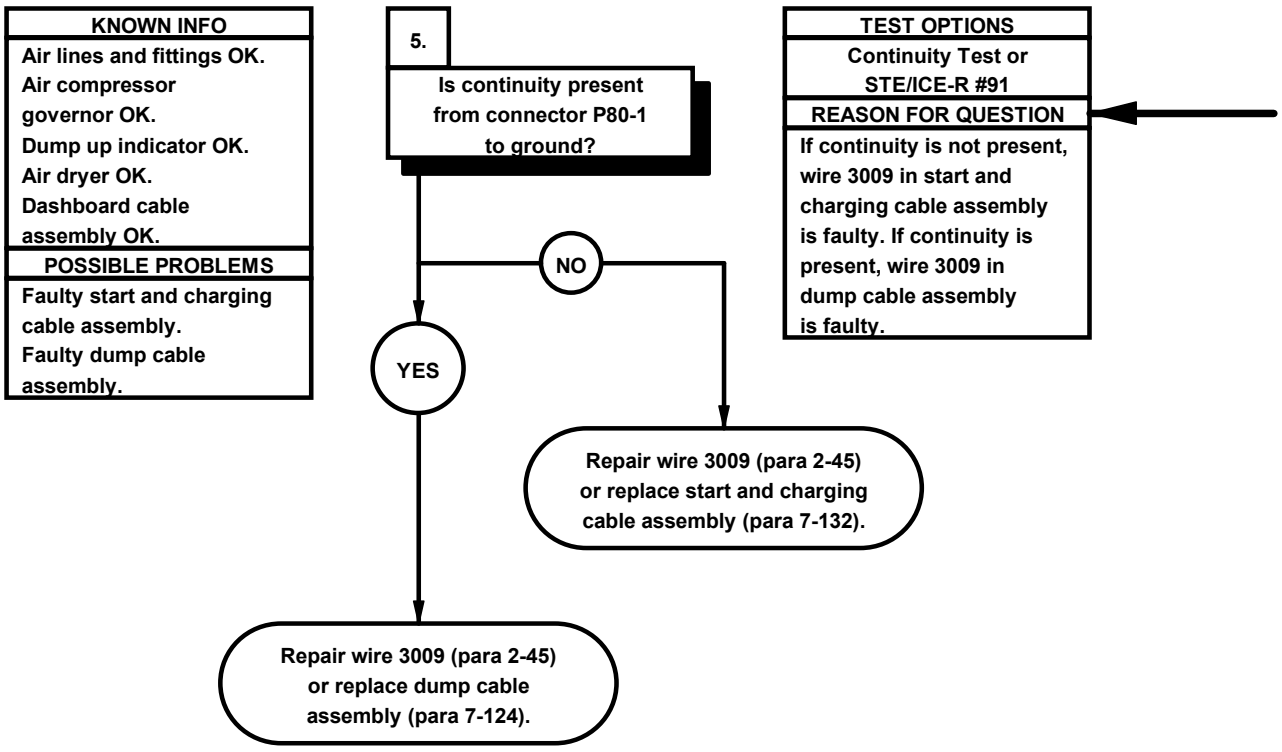
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

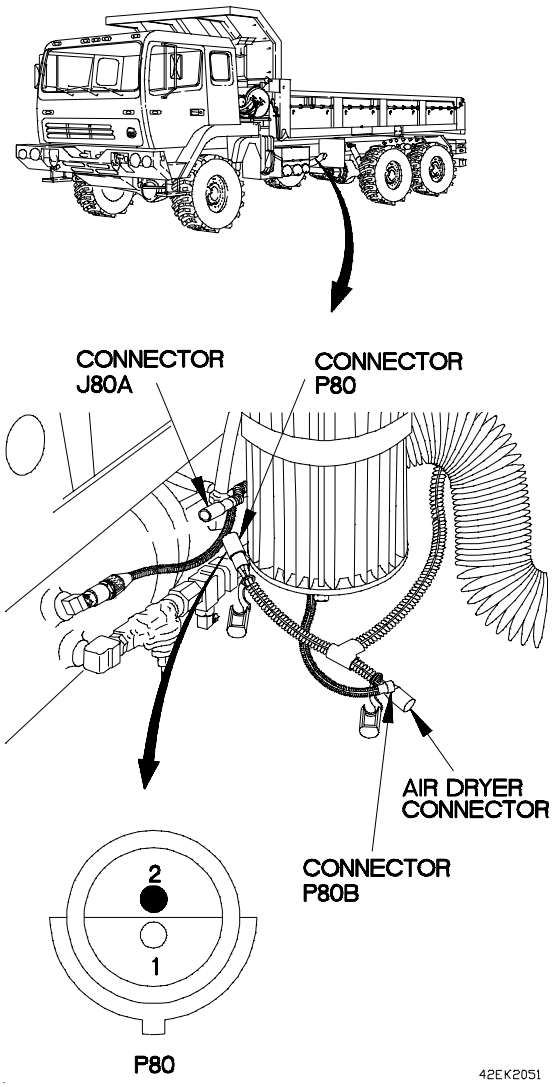
(1) Disconnect connector P80 from connector J80A.
(2) Set multimeter to volts dc.
(3) Connect positive (+) probe of multimeter to connector P80-2.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(6) If 24 vdc is not present, repair wire 1481 in start and charging cable assembly (para 2-45) or replace start and charging cable assembly (para 7-132).
(7) If 24 vdc is present, repair wire 1481 in dump cable assembly (para 2-45) or replace dump cable assembly (para 7-124).
(8) Position master power switch to off (TM 9-2320-366-10-1).
(9) Connect connector P80 to connector J80A.
(10) Connect connector P80B to air dryer.



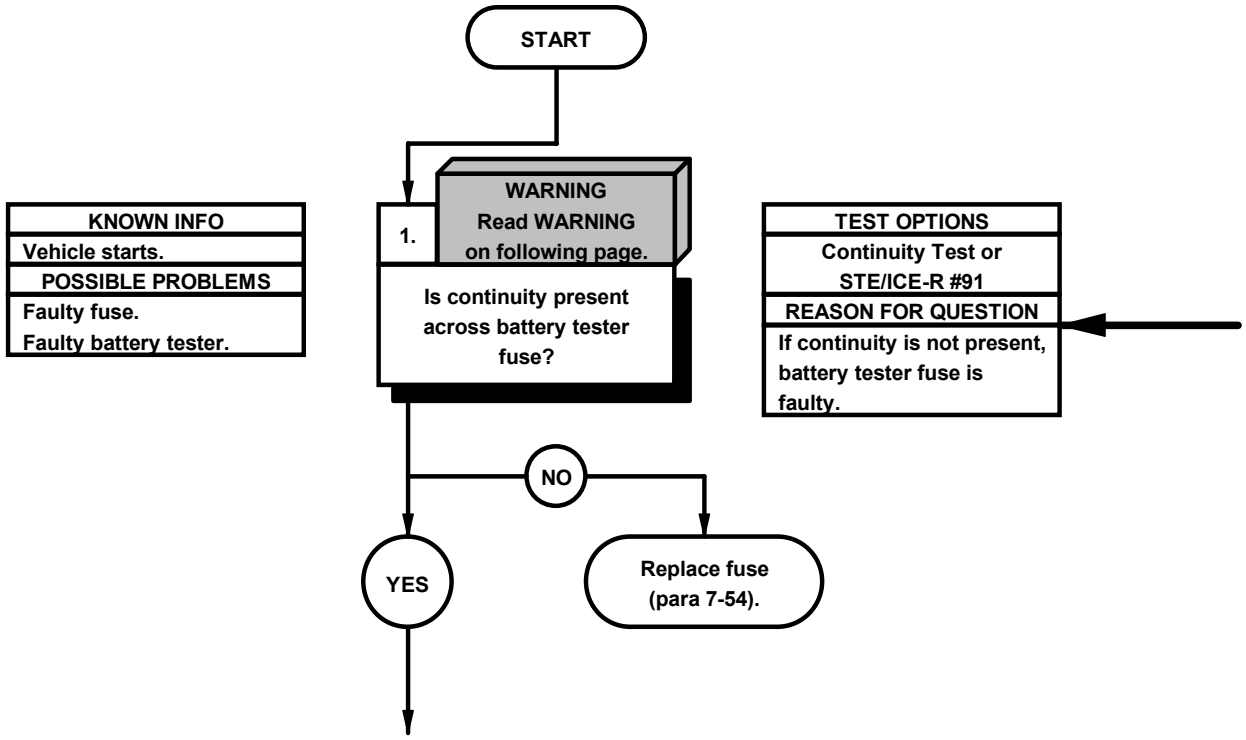
e102. M1090/M1094 AIR DRYER DOES NOT OPERATE (CONT)



CONTINUITY TEST
(1) Connect connector P80B to air dryer.
(2) Disconnect connector P80 from connector J80A.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector P80-1.
(5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(6) If continuity is not present, repair wire 3009 in start and charging cable assembly (para 2-45) or replace start and charging cable assembly (para 7-132).
(7) If continuity is present, repair wire 3009 in dump cable assembly (para 2-45) or replace dump cable assembly (para 7-124).
(8) Connect connector P80 to connector J80A.



e103. BATTERY TESTER DOES NOT OPERATE	
INITIAL SETUP	
Equipment Condition Engine shut down (TM 9-2320-366-10-1).	**Tools and Special Tools** STE/ICE-R (Item 41, Appendix C) Multimeter, Digital (Item 22, Appendix C) Goggles, Industrial (Item 15, Appendix C) Gloves, Rubber (Item 13, Appendix C) Apron, Rubber (Item 3, Appendix C)
Personnel Required (2)	
References TM 9-4910-571-12&P	

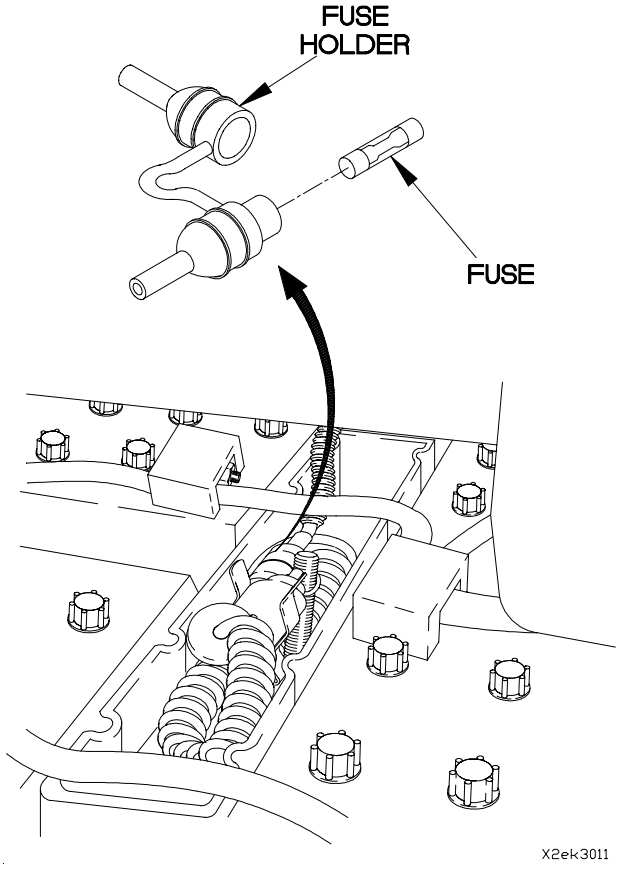


WARNING

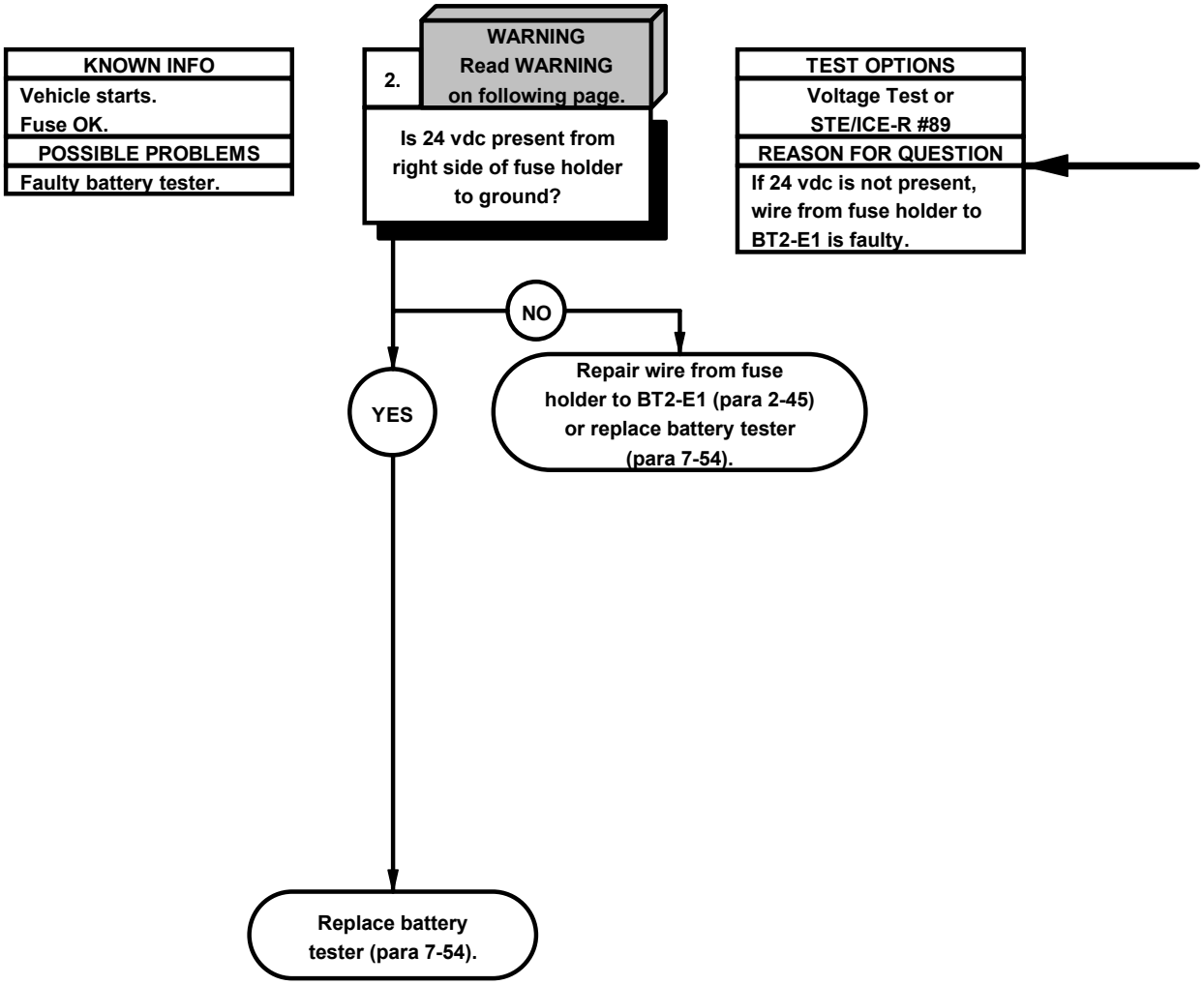
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock. Batteries can explode from a spark. Battery acid is harmful to skin and eyes.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

CONTINUITY TEST

(1) Remove battery box cover (TM 9-2320-366-10-2).
(2) Open fuse holder on battery tester.
(3) Remove fuse from fuse holder.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to one end of fuse.
(6) Connect negative (-) probe of multimeter to other end of fuse and note reading on multimeter.
(7) If continuity is not present, replace battery tester 3 milliamp fuse (para 7-54).



e103. BATTERY TESTER DOES NOT OPERATE (CONT)

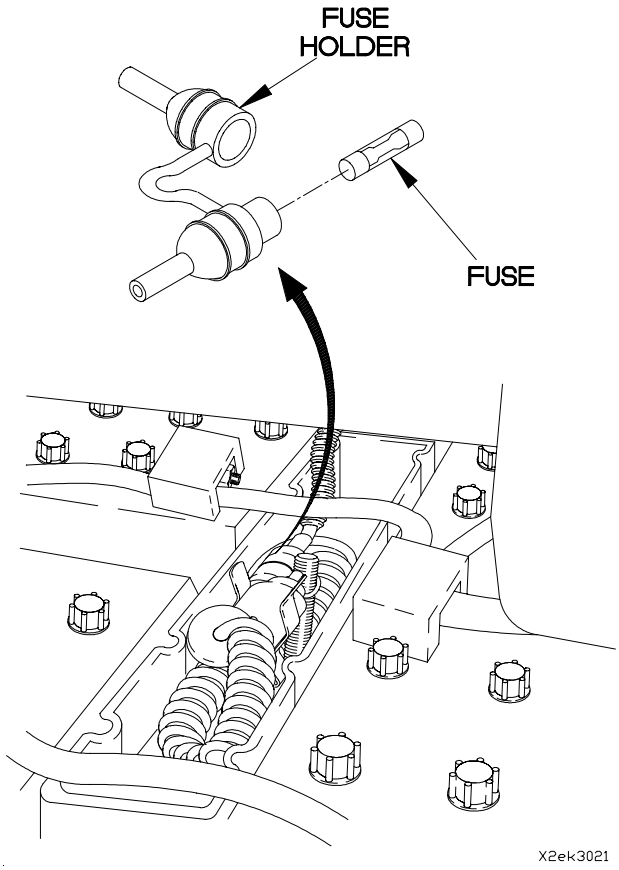


WARNING

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.

VOLTAGE TEST

(1) Set multimeter to volts dc.
(2) Connect positive (+) probe of multimeter to terminal in right side of fuse holder.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If 24 vdc is not present, repair wire from right side of fuse holder to BT2-E1 (para 2-45) or replace battery tester (para 7-54).
(5) If 24 vdc is present, replace battery tester (para 7-54).
(6) Install fuse in battery tester fuse holder.
(7) Close battery tester fuse holder.
(8) Install battery box cover (TM 9-2320-366-10-2).



e104. M1084/M1086 MATERIAL HANDLING CRANE (MHC) DOES NOT OPERATE

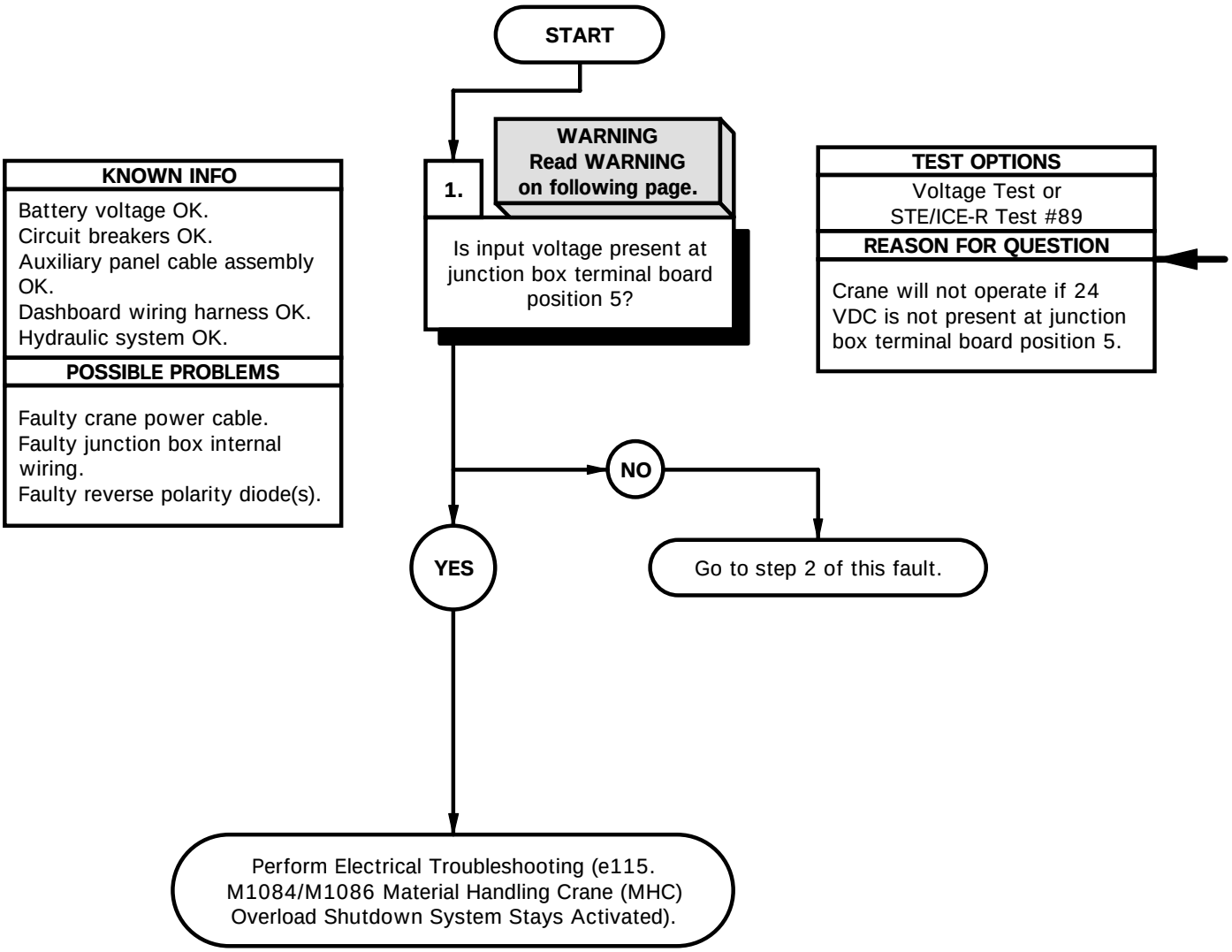
INITIAL SETUP

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

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

References
TM 9-4910-571-12&P

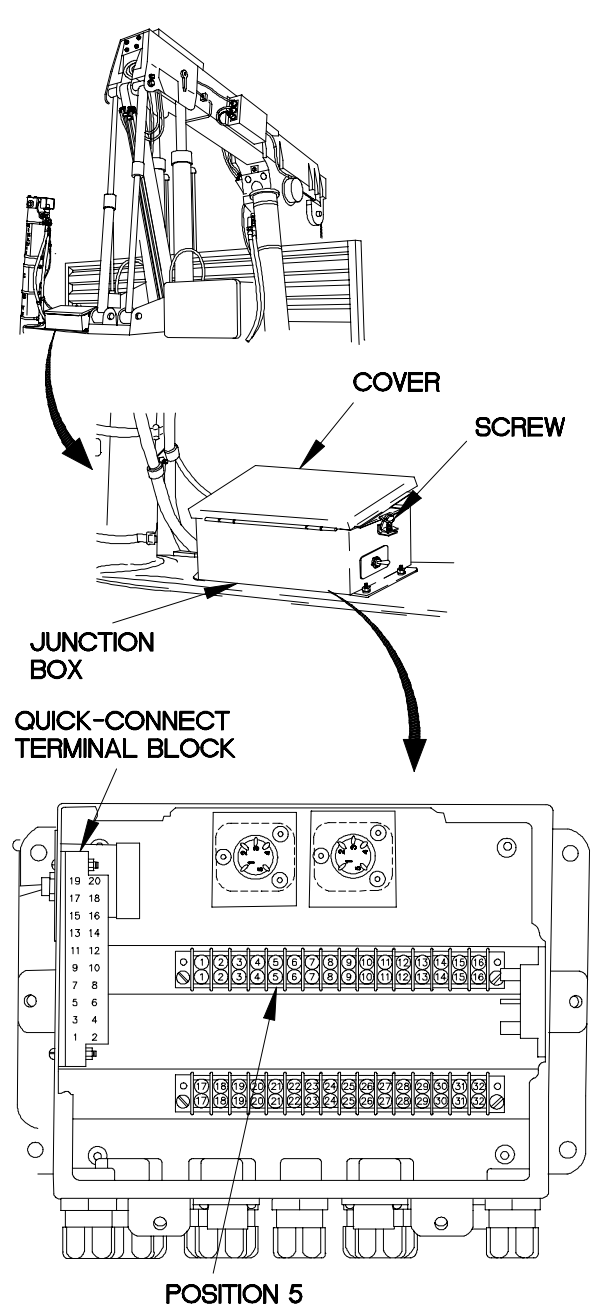


WARNING

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 circuits and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Loosen four screws on junction box cover.
(2) Open cover on junction box.
(3) Set multimeter to volts dc.
(4) Connect positive (+) probe of multimeter on terminal board position 5.
(5) Connect negative (-) probe of multimeter on ground quick-connect terminal block (above main power switch) and note reading on multimeter.
(6) If 24 VDC is not present, go to step 2 of this fault.
(7) If 24 VDC is present, perform Electrical System troubleshooting task e115. M1084/M1086 Material Handling Crane (MHC) Overload Shutdown System Stays Activated.



e104. M1084/M1086 MATERIAL HANDLING CRANE (MHC) DOES NOT OPERATE (CONT)

KNOWN INFO

Battery voltage OK.
Circuit breakers OK.
Auxiliary panel cable assembly OK.
Dashboard wiring harness OK.
Hydraulic system OK.

POSSIBLE PROBLEMS

Faulty crane power cable.
Faulty junction box internal wiring.
Faulty reverse polarity diode(s).

2.

Is continuity present between crane power cable connector pin B and terminal board position 5?

TEST OPTIONS

Continuity Test or
STE/ICE-R Test #91

REASON FOR QUESTION

If continuity is not present, crane power cable is faulty.

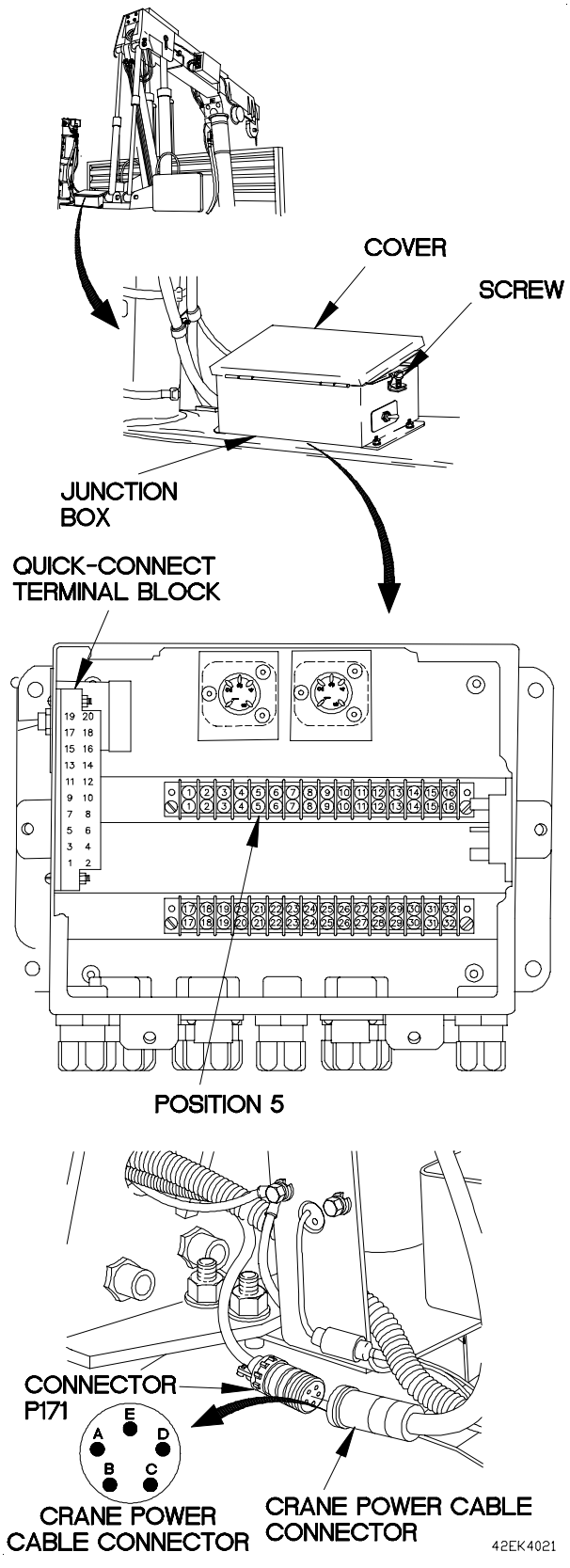
NO

Replace crane power cable (para 7-90).

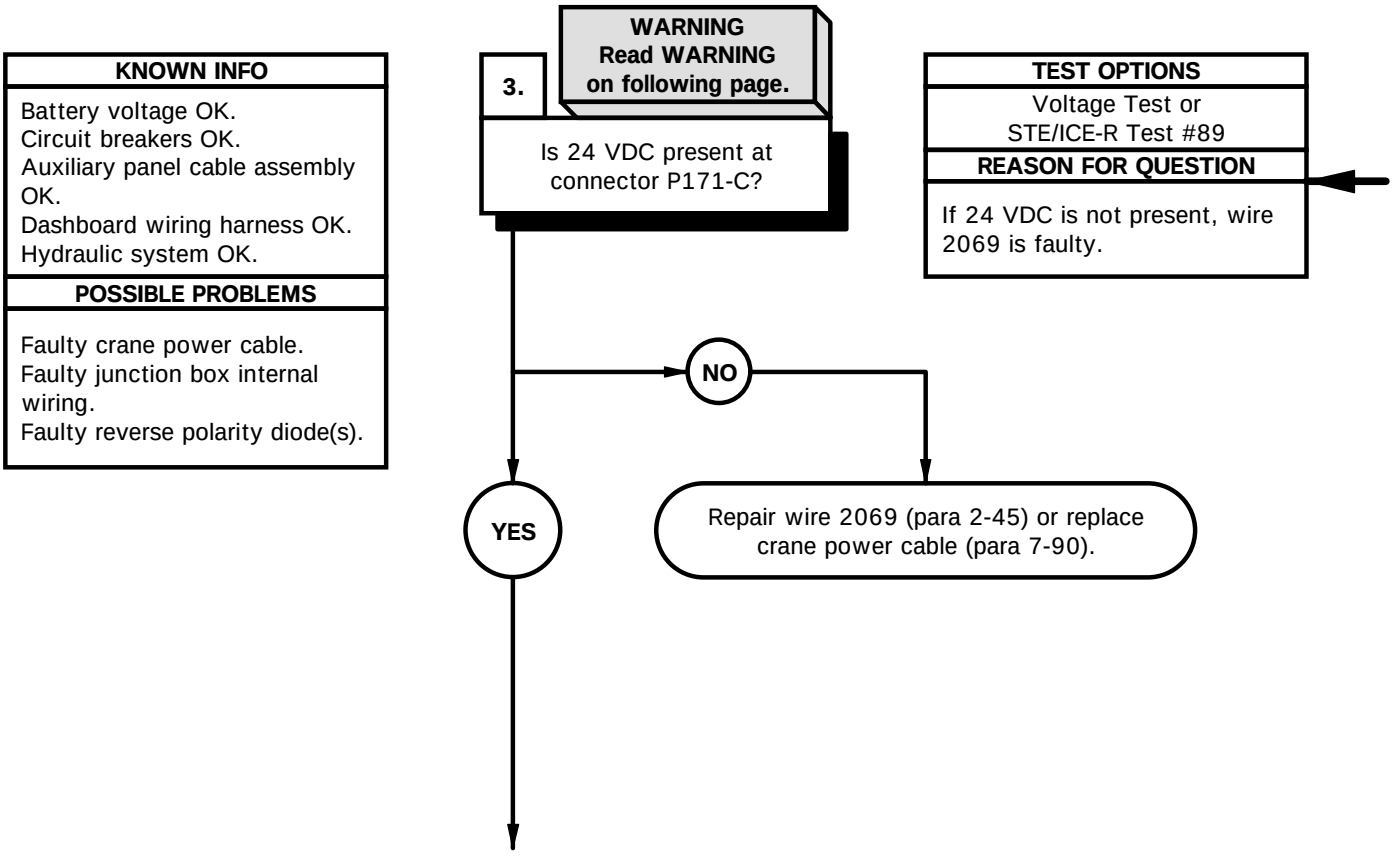
YES

CONTINUITY TEST

(1) Disconnect connector P171 from crane power cable connector.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to crane power cable connector pin B.
(4) Connect negative (-) probe of multimeter to ground quick-connect terminal block (above main power switch) and note reading on multimeter.
(5) If continuity is not present, replace crane power cable (para 7-90).
(6) Connect positive (+) probe of multimeter to crane power cable connector pin C.
(7) Connect negative (-) probe of multimeter to junction box terminal board position 5 and note reading on multimeter.
(8) If continuity is not present, replace crane power cable (para 7-90).
(9) Close cover on junction box.
(10) Tighten four screws on junction box.

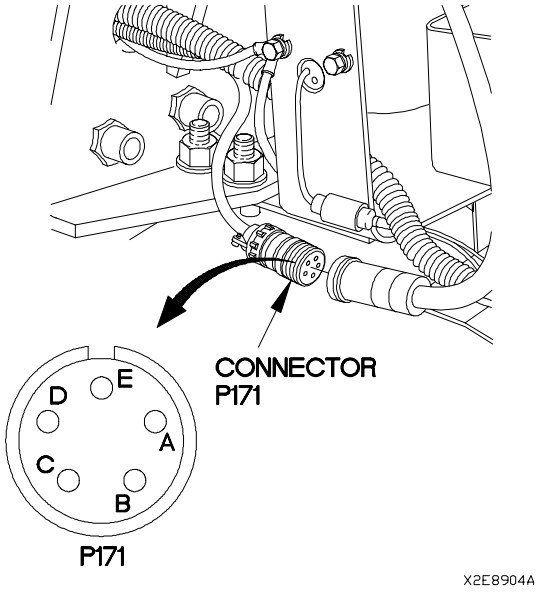


e104. MATERIAL HANDLING CRANE (MHC) DOES NOT OPERATE (CONT)

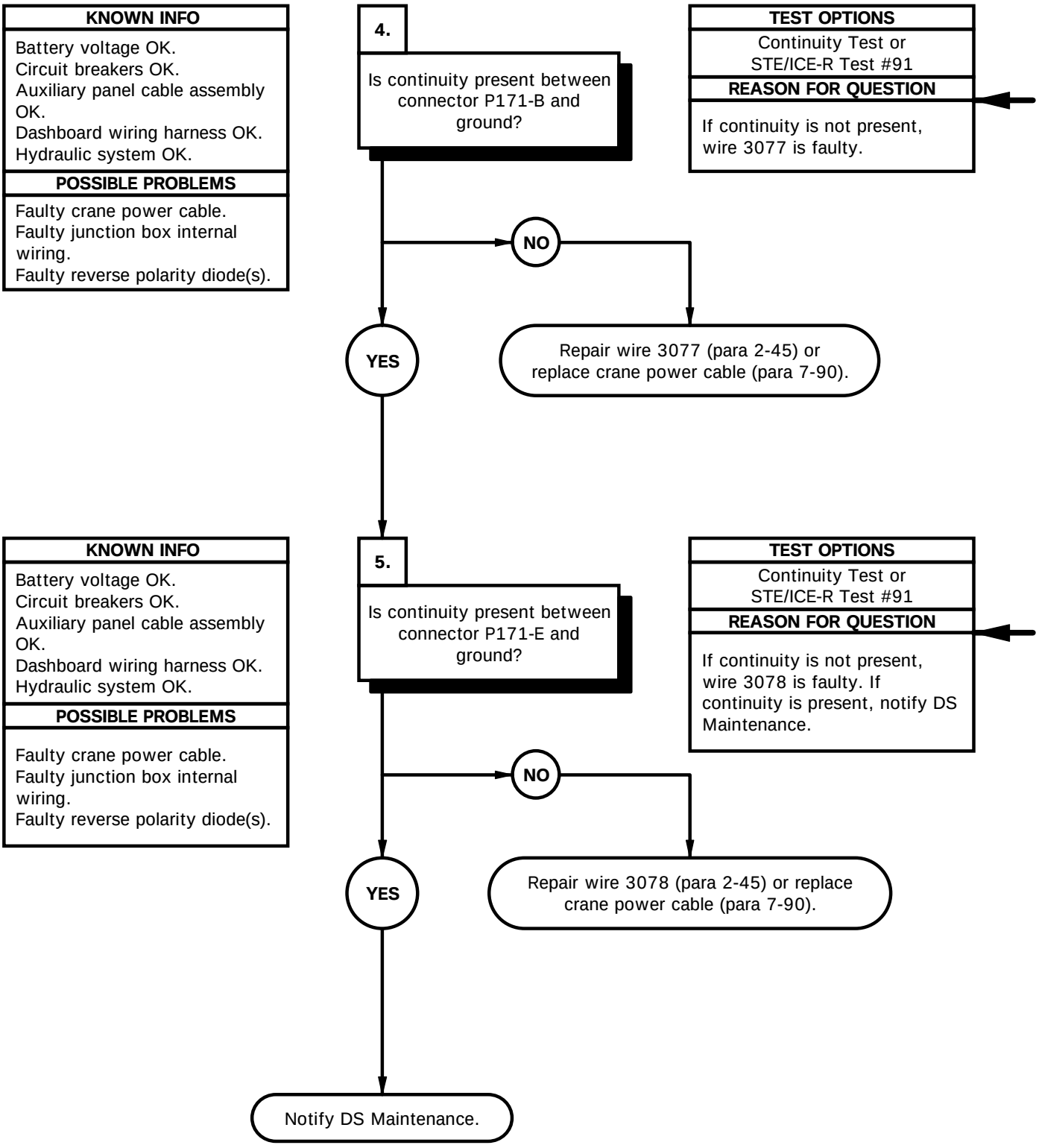


VOLTAGE TEST

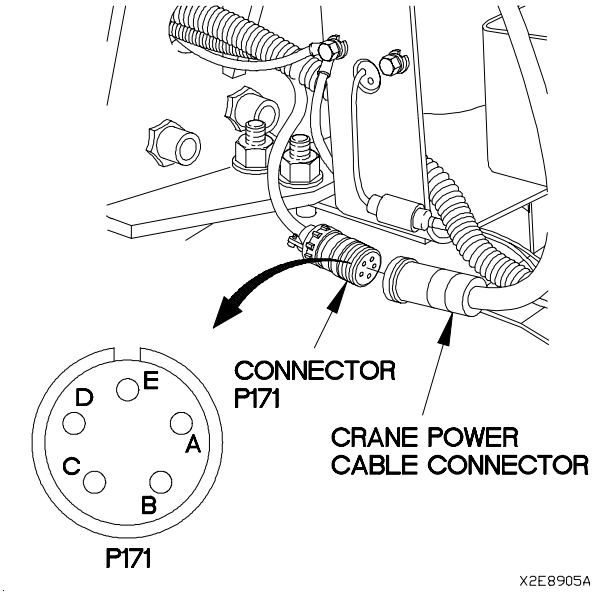
(1) Set multimeter to volts DC.
(2) Connect positive (+) probe of multimeter on connector P171-C.
(2) Connect negative (-) probe of multimeter on ground.
(3) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(4) If 24 VDC is not present, repair wire 2069 (para 2-45) or replace crane power cable (para 7-90).
(5) Position master power switch to off (TM 9-2320-366-10-1).



e104. MATERIAL HANDLING CRANE (MHC) DOES NOT OPERATE (CONT)



CONTINUITY TEST
(1) Set multimeter to ohms. (2) Connect positive (+) probe of multimeter to connector P171-B. (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter. (4) If continuity is not present, repair wire 3077 (para 2-45) or replace crane power cable (para 7-90).



CONTINUITY TEST
(1) Set multimeter to ohms. (2) Connect positive (+) probe of multimeter to connector P171-E. (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter. (4) If continuity is not present, repair wire 3078 (para 2-45) or replace crane power cable (para 7-90). (5) If continuity is present, notify DS Maintenance. (6) Connect connector P171 to crane power cable connector.

e105. M1084/M1086 MATERIAL HANDLING CRANE (MHC) DOES NOT OPERATE FROM REMOTE CONTROL

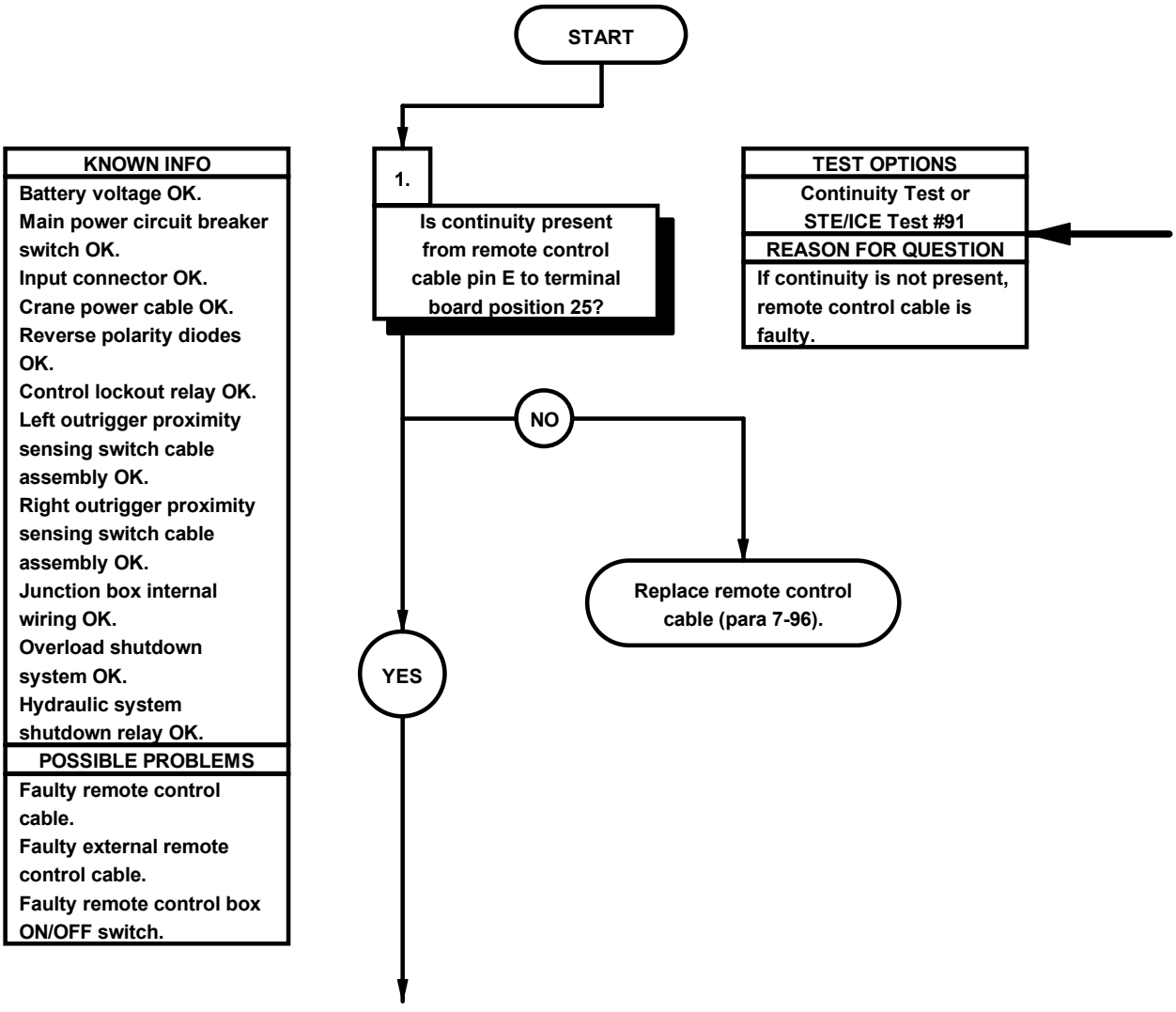
INITIAL SETUP

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

Personnel Required
(2)

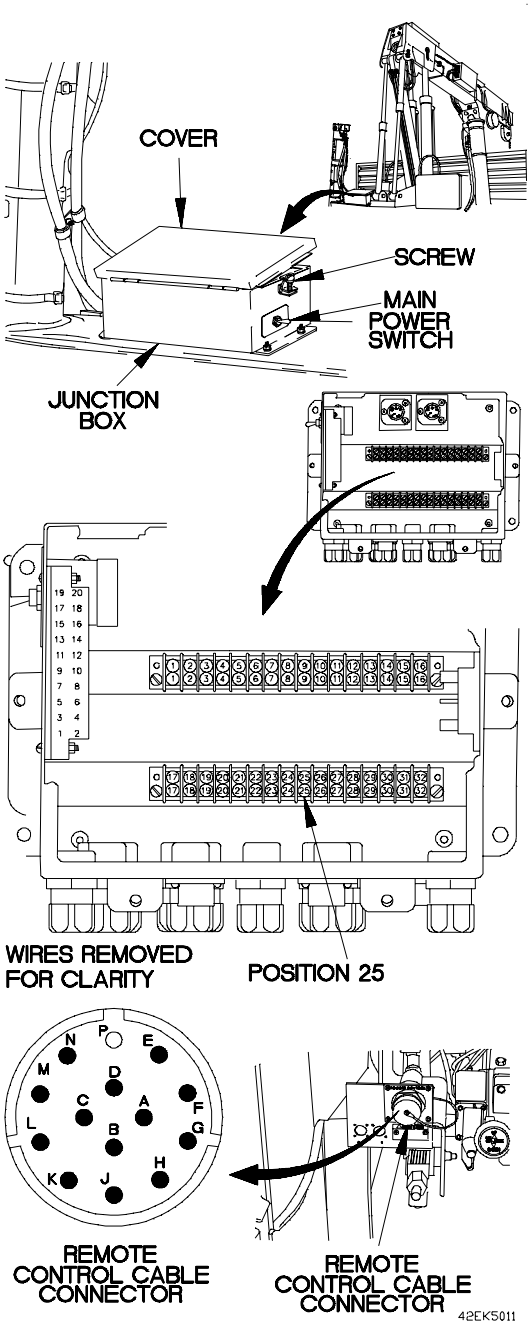
Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

References
TM 9-4910-571-12&P

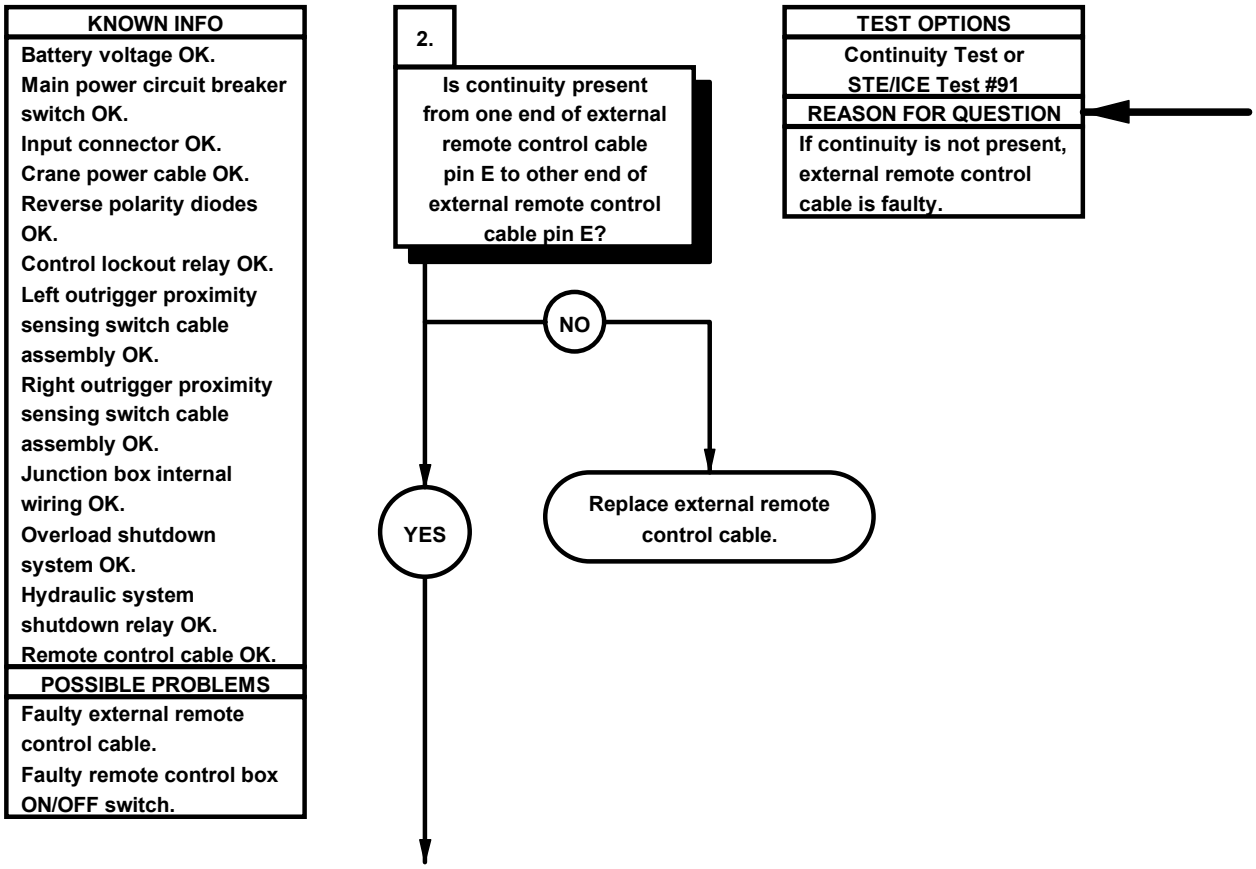


CONTINUITY TEST

(1) Loosen four screws on junction box cover.
(2) Open cover on juntion box.
(3) Disconnect remote control cable from remote control box.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter on pin E of connector on remote control cable.
(6) Connect negative (-) probe on junction box terminal board position 25 and note reading on multimeter.
(7) If continuity is not present, replace remote control cable (para 7-96).
(8) Close cover on junction box.
(9) Tighten four screws on junction box cover.

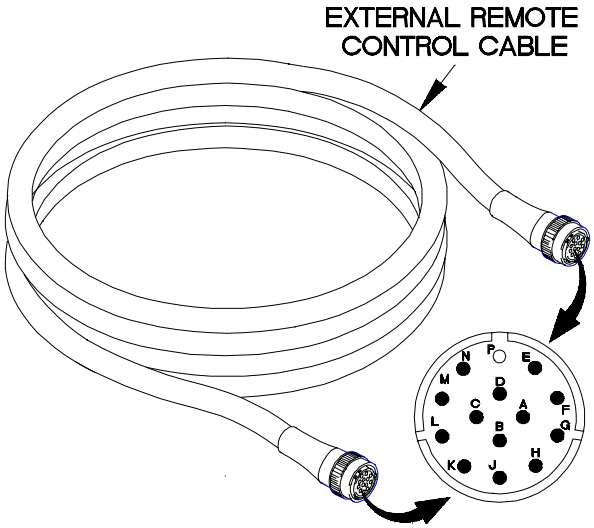


e105. M1084/M1086 MATERIAL HANDLING CRANE (MHC) DOES NOT OPERATE FROM REMOTE CONTROL (CONT)



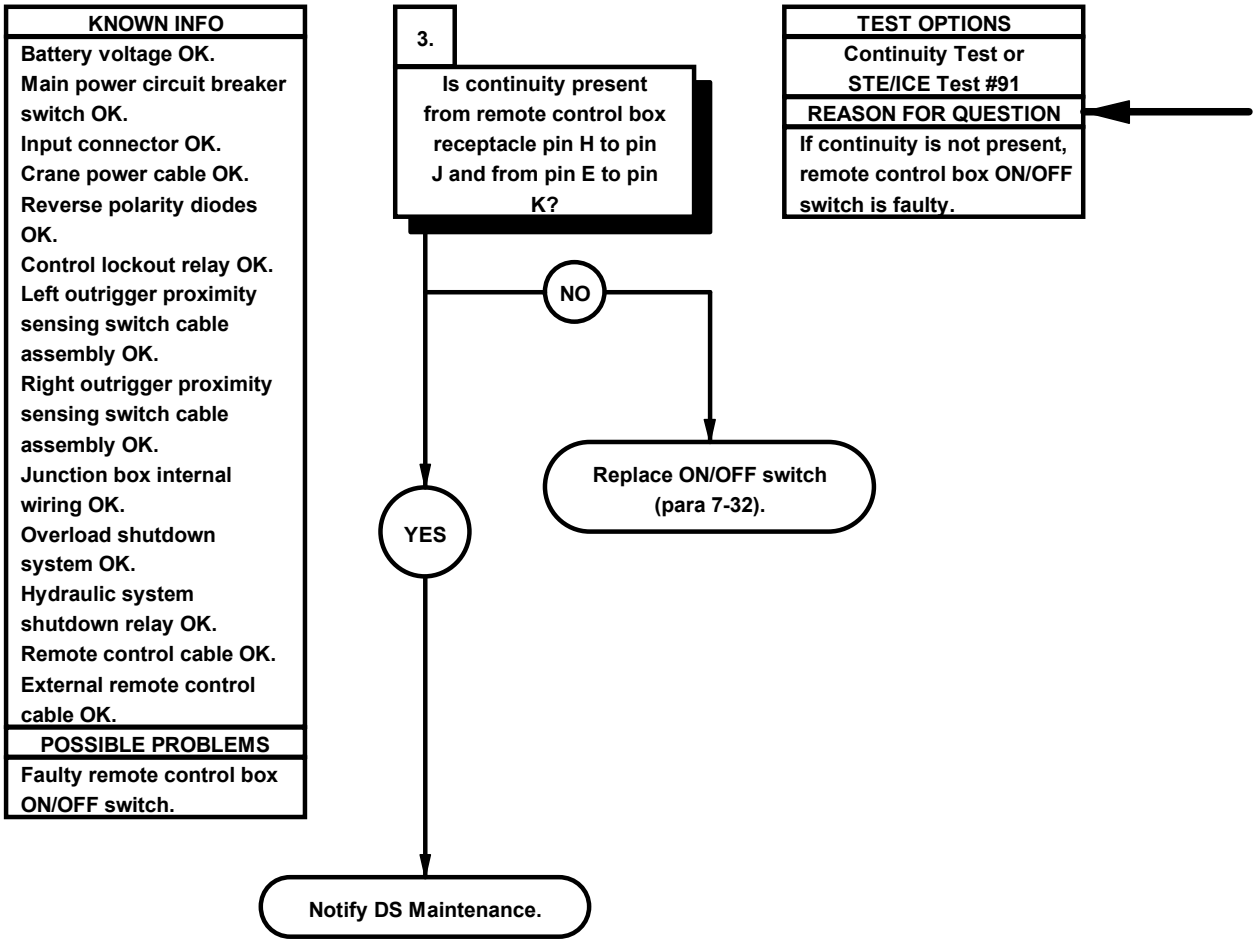
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin E of one end of external remote control cable connector.
(3) Connect negative (-) probe of multimeter on pin E of other end of external remote control cable and note reading on multimeter.
(4) If continuity is not present, replace external remote control cable.



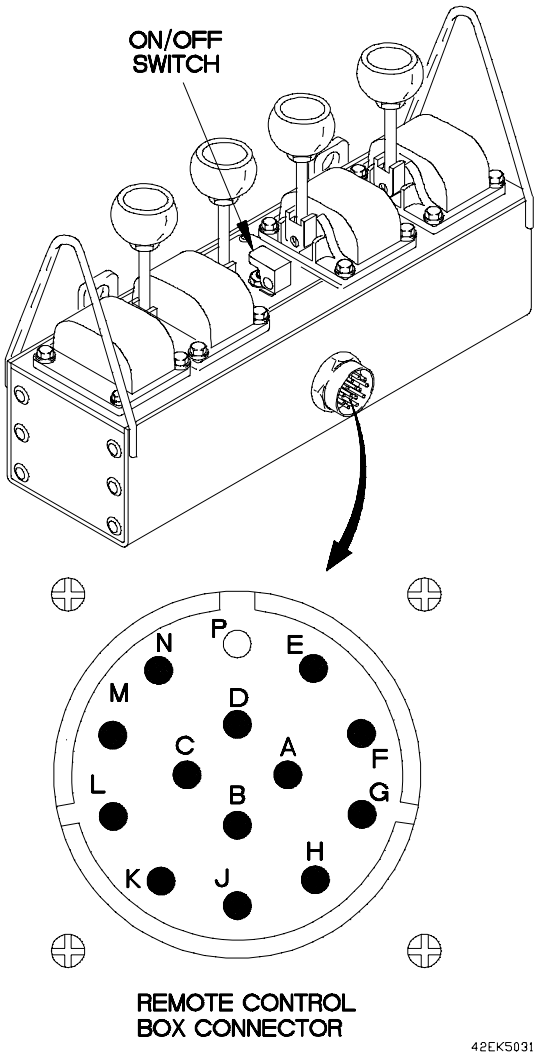
42E9002-

e105. M1084/M1086 MATERIAL HANDLING CRANE (MHC) DOES NOT OPERATE FROM REMOTE CONTROL (CONT)



CONTINUITY TEST

(1) Position ON/OFF switch to ON.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin H of remote control box receptacle.
(4) Connect negative (-) probe of multimeter on pin J of remote control box receptacle and note reading on multimeter.
(5) If continuity is not present, replace ON/OFF switch (para 7-32).
(6) Position ON/OFF switch to OFF.
(7) Connect positive (+) probe of multimeter on pin E of remote control box recptacle.
(8) Connect negative (-) probe of multimeter on pin K of remote control box receptacle and note reading on multimeter.
(9) If continuity is not present, replace ON/OFF switch (para 7-32).
(10) If continuity is present, notify DS Maintenance.



e106. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HOIST UP DOES NOT OPERATE FROM REMOTE STATION

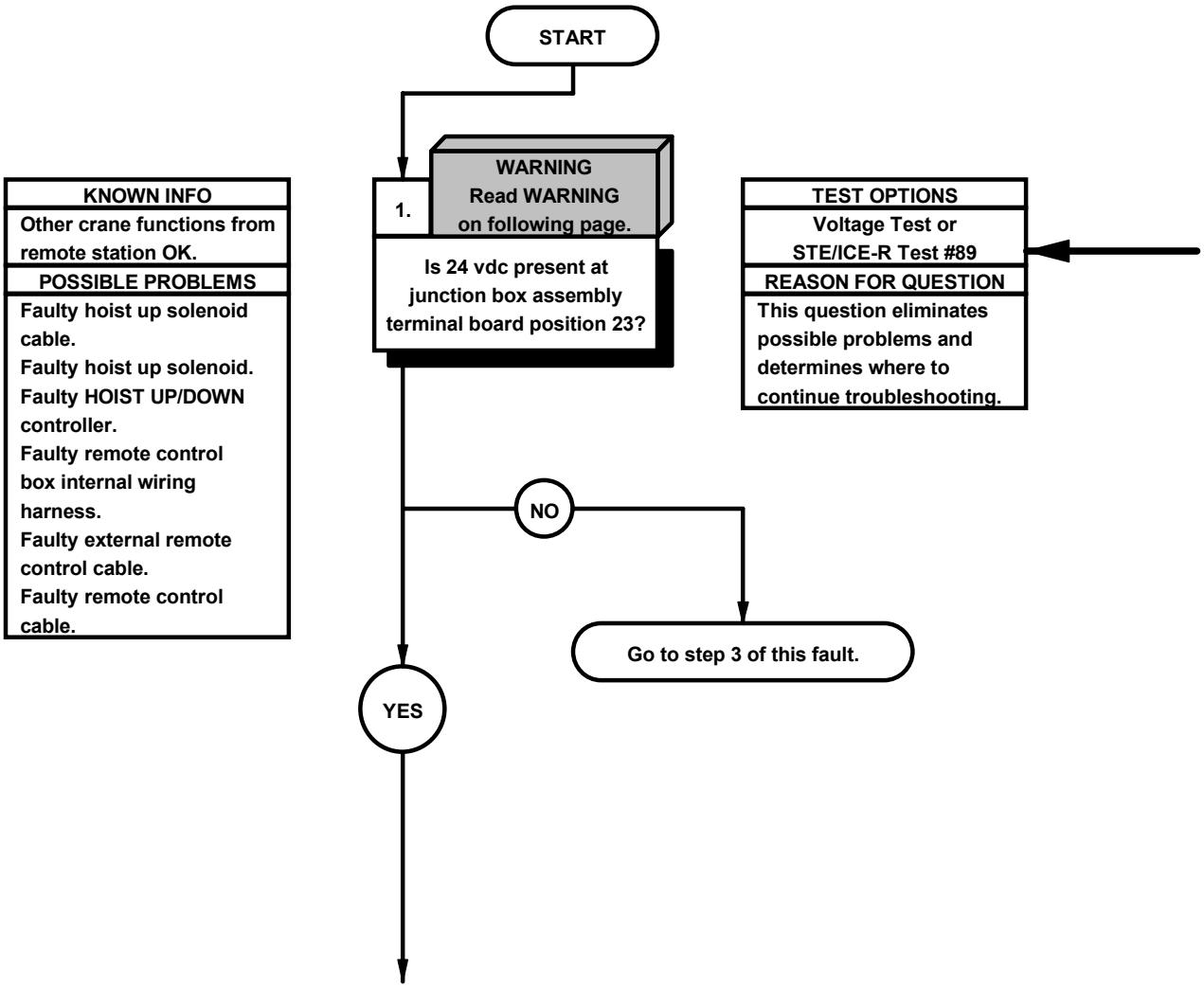
INITIAL SETUP

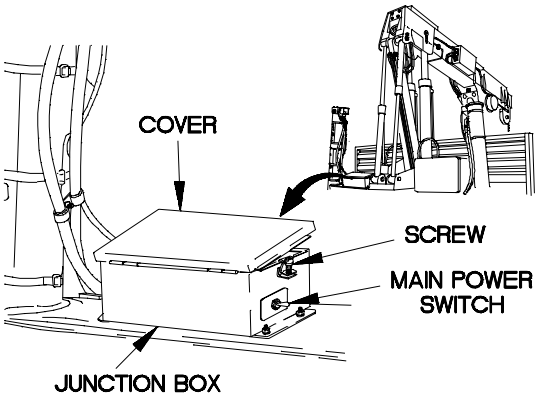
Equipment Conditions
Outriggers lowered (TM 9-2320-366-10-1).
Crane erected with approximately five feet of cable payed out (TM 9-2320-366-10-1).
Engine shut down (TM 9-2320-366-10-1).

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

References
TM 9-4910-571-12&P





WARNING

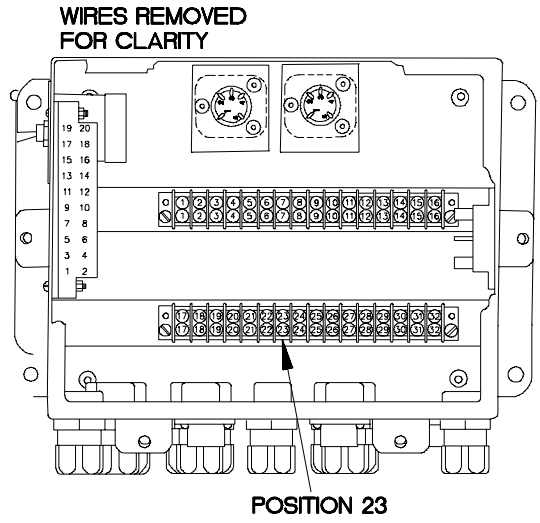
Remove rings, bracelets, watches, necklaces, and any other jewelry beffore working around vehicle. Jewelery can catch on equipment and cause injury or short circuit across electrical circuits and cause severe burns or electrical shock.

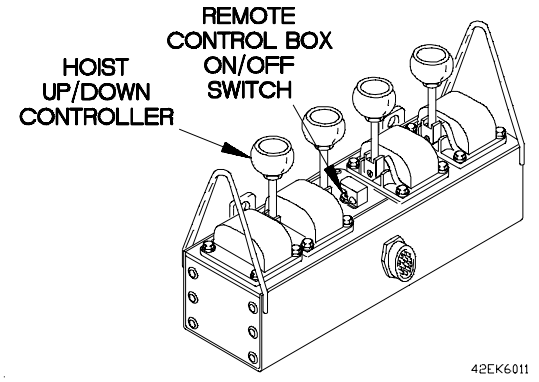
OUTPUT VOLTAGE TEST

(1) Connect external remote control cable to and remote control box (TM 9-2320-366-10-1).
(2) Loosen four screws on junction box.
(3) Open cover on junction box.
(4) Position MAIN POWER switch to ON.
(5) Lift guard and position remote control box ON/OFF switch to ON.
(6) Set multimeter to volts dc.
(7) Connect positive (+) probe of multimeter on terminal board lower position 23.
(8) Connect negative (-) probe of multimeter on ground quick-connect terminal board (above MAIN POWER switch).

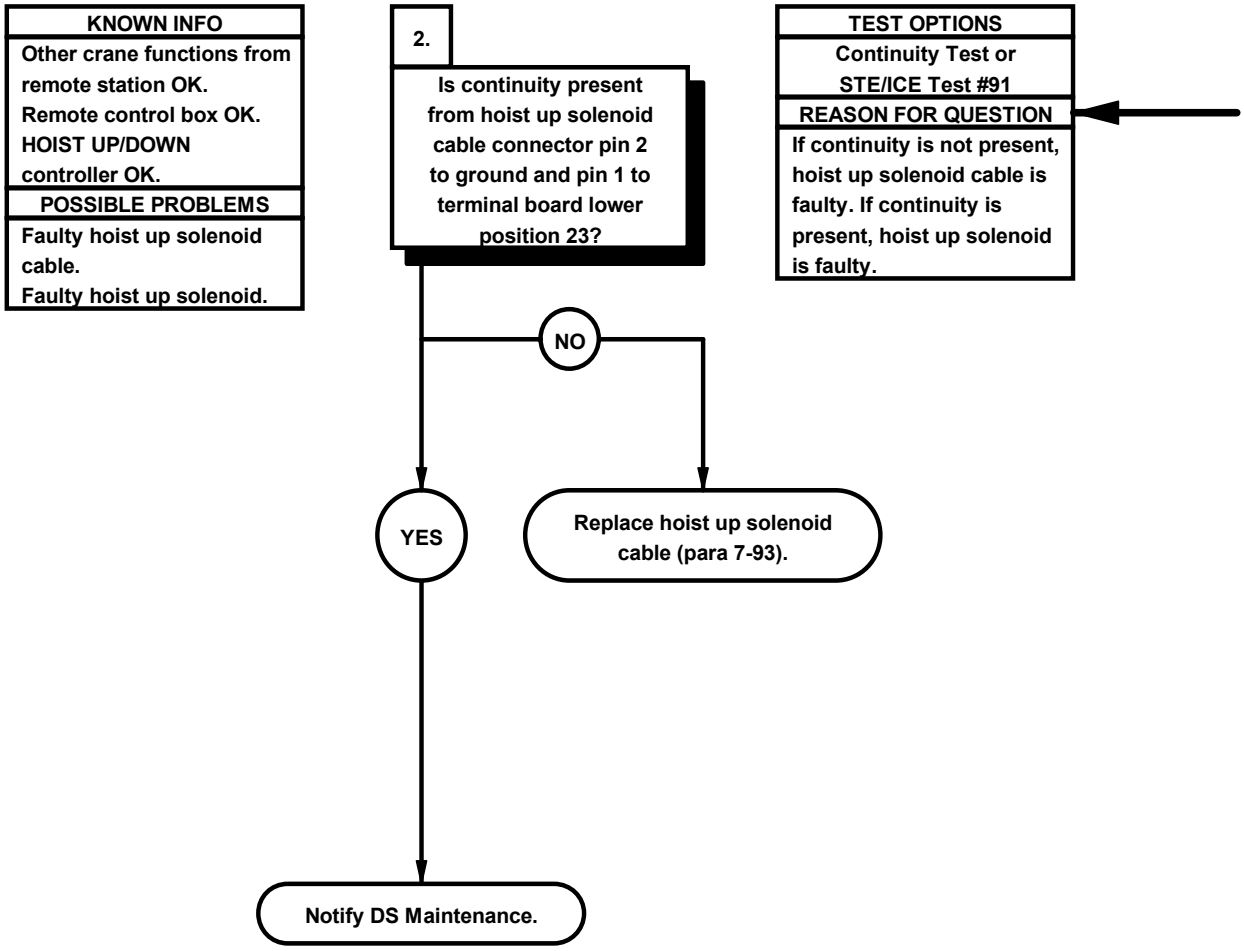
NOTE
Step (9) requires the aid of an assistant.

(9) Position HOIST UP/DOWN to UP and note reading on multimeter.
(10) If 24 volts dc is not present, go to step 3 of this fault.



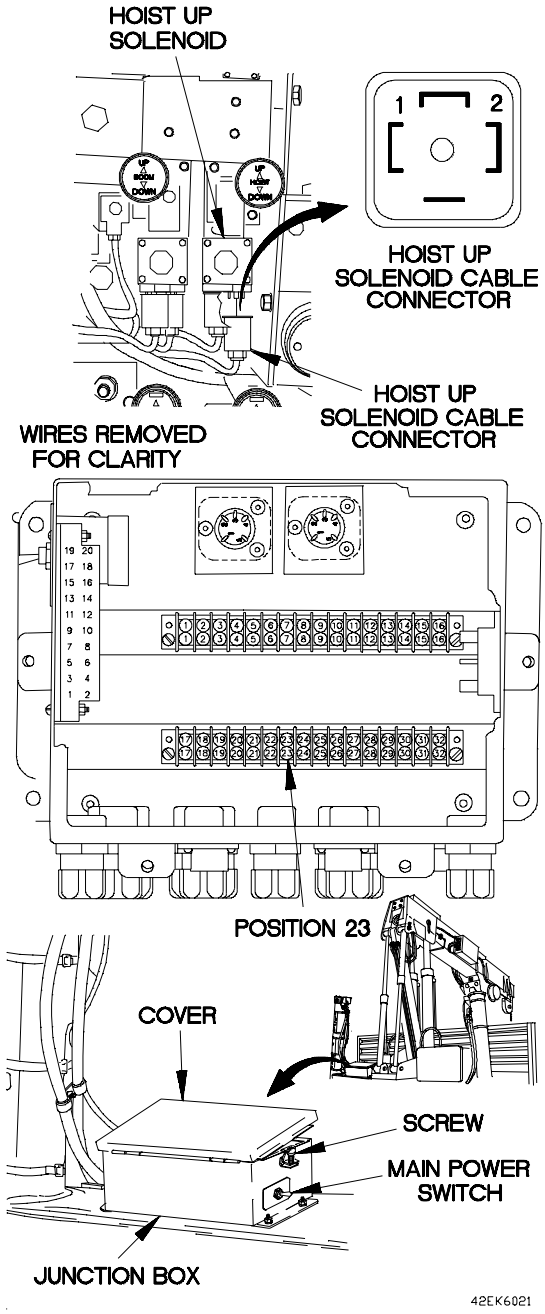


e106. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HOIST UP DOES NOT OPERATE FROM REMOTE STATION (CONT)

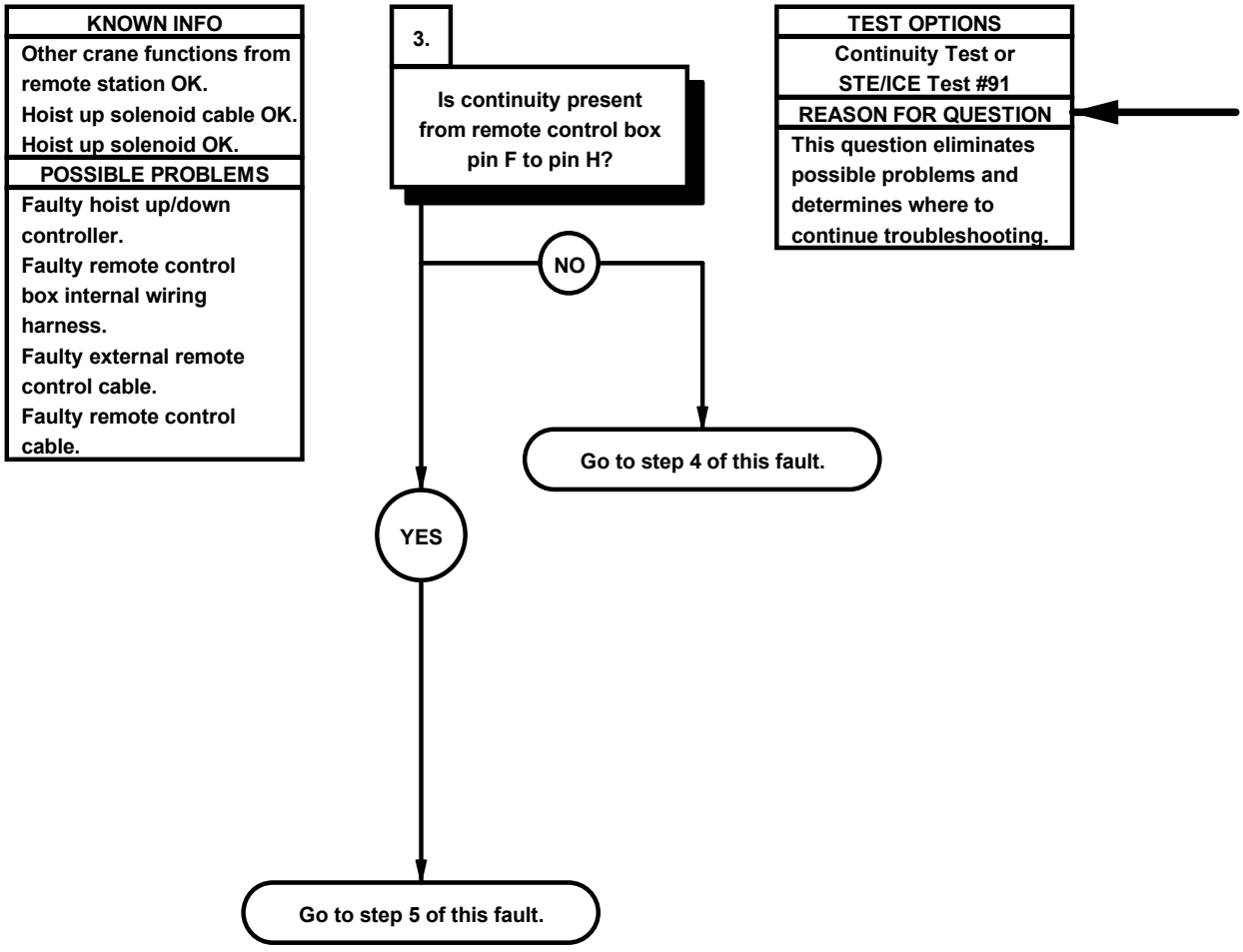


CONTINUITY TEST

(1) Disconnect hoist up solenoid connector from hoist up solenoid.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin 2 of hoist up solenoid cable connector.
(4) Connect negative (-) probe of multimeter on ground and note reading on multimeter.
(5) Connect positive (+) probe of multimeter on pin 1 of hoist up solenoid cable connector.
(6) Connect negative (-) probe of multimeter on terminal board lower position 23 and note reading on multimeter.
(7) If continuity is not present, replace hoist up solenoid cable (para 7-93).
(8) If continuity is present, notify DS Maintenance.
(9) Connect hoist up solenoid cable connector to hoist up solenoid.
(10) Close cover on junction box.
(11) Tighten four screws on junction box cover.
(12) Stow crane (TM 9-2320-366-10-1).



e106. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HOIST UP DOES NOT OPERATE FROM REMOTE STATION (CONT)



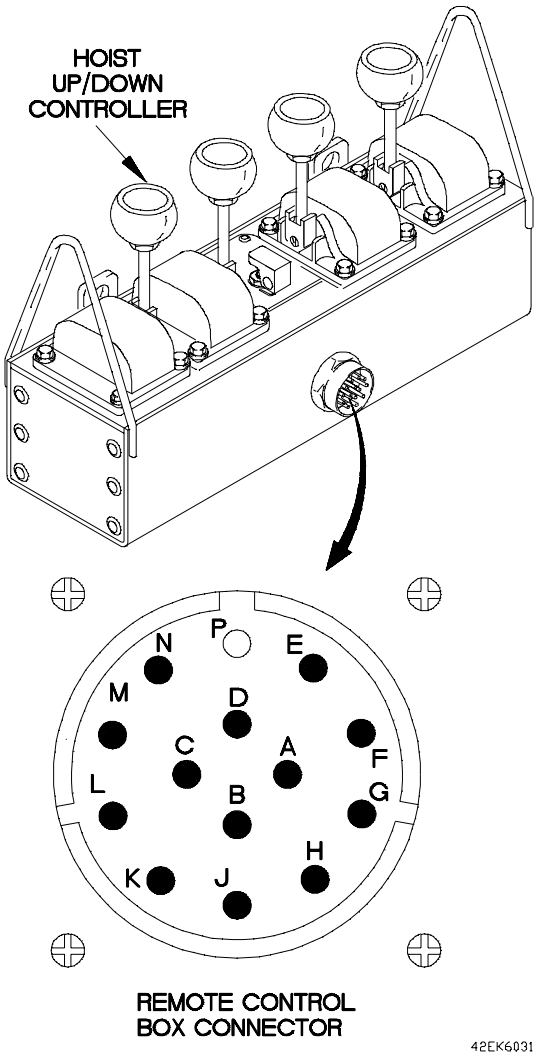
CONTINUITY TEST

(1) Disconnect external remote control cable from remote control box.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin F of connector on remote control box.
(4) Connect negative (-) probe of multimeter on pin H of connector on remote control box.

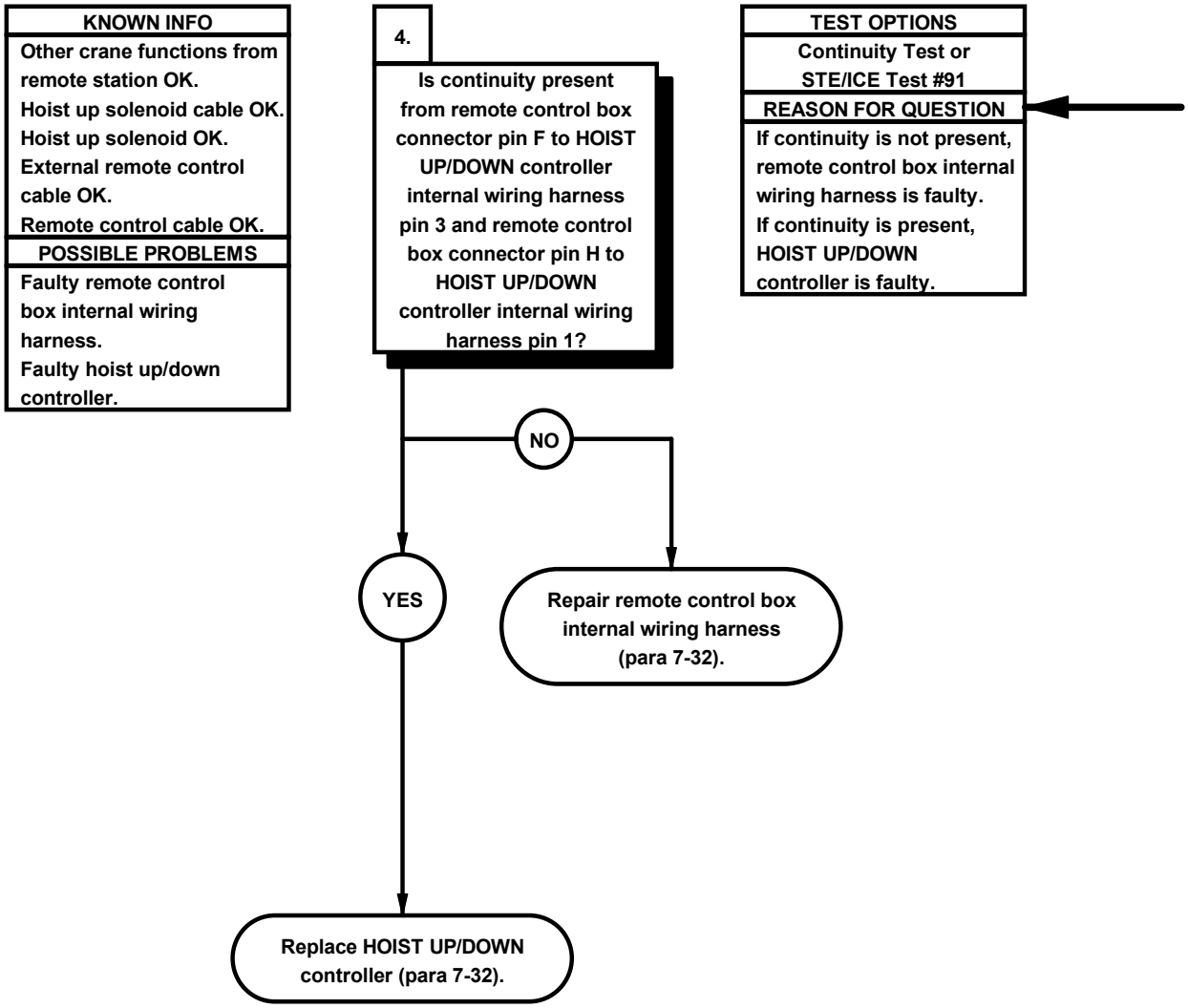
NOTE

Step (5) requires the aid of an assistant.

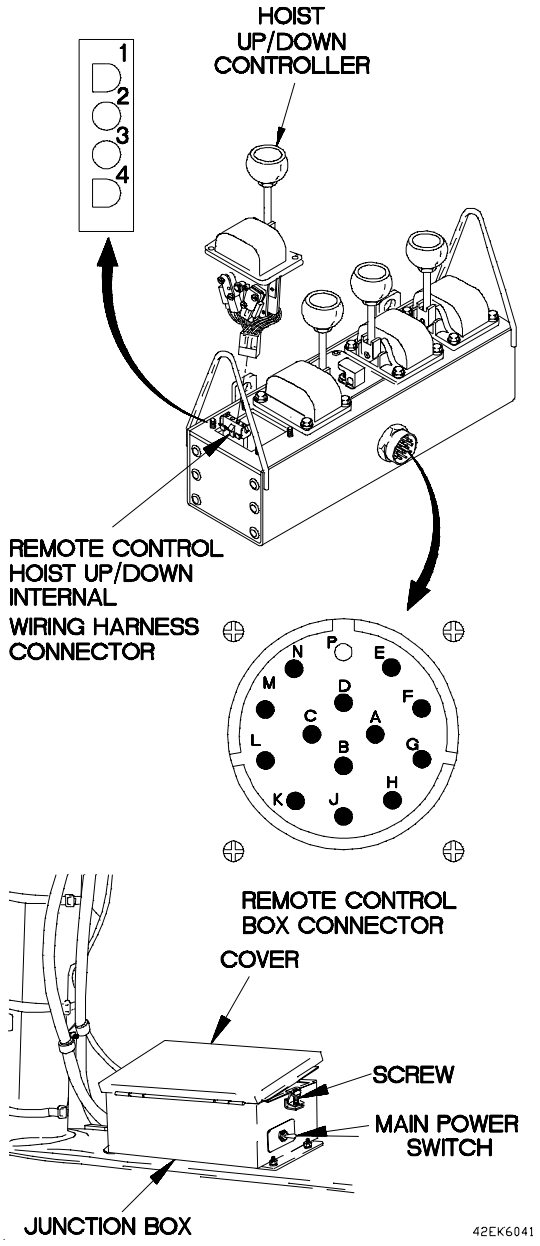
(5) Position HOIST UP/DOWN controller to UP and note reading on multimeter.
(6) If continuity is not present, go to step 4 of this fault.
(7) If continuity is present, go to step 5 of this fault.



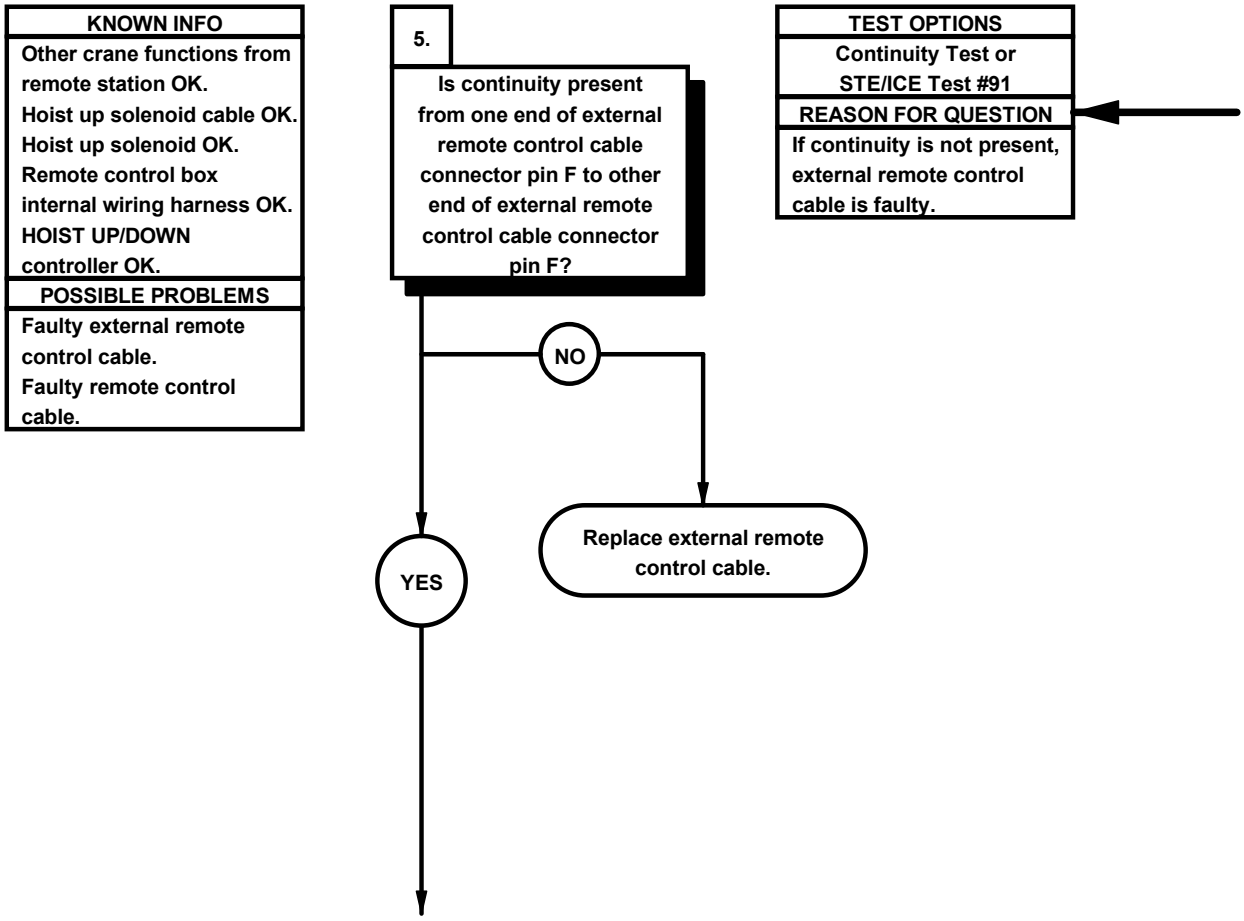
e106. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HOIST UP DOES NOT OPERATE FROM REMOTE STATION (CONT)



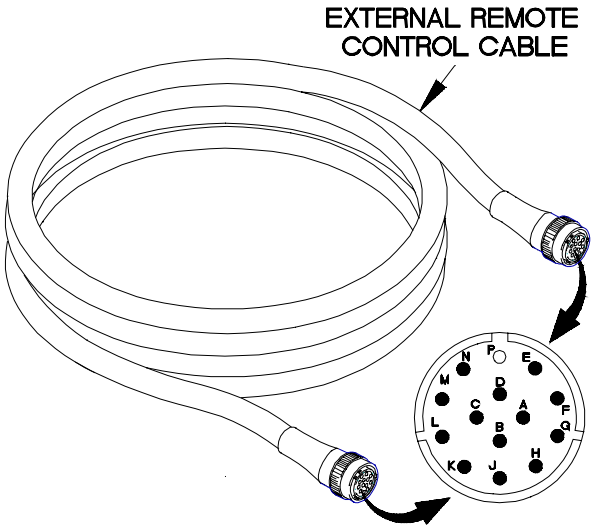
CONTINUITY TEST
(1) Remove HOIST UP/DOWN controller (para 7-32).
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin F of remote control box connector.
(4) Connect negative (-) probe of multimeter on pin 3 of HOIST UP/DOWN controller internal wiring harness and note reading on multimeter.
(5) Connect positive (+) probe of multimeter on pin H of remote control box connector.
(6) Connect negative (-) probe of multimeter on pin 1 of HOIST UP/DOWN controller internal wiring harness and note reading on multimeter.
(7) If continuity is not present, replace remote control box internal wiring harness (para 7-32).
(8) If continuity is present, replace HOIST UP/DOWN controller (para 7-32).
(9) Install HOIST UP/DOWN controller (para 7-32).
(10) Close cover on junction box.
(11) Tighten four screws on junction box cover.
(12) Stow crane (TM 9-2320-366-10-1).



e106. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HOIST UP DOES NOT OPERATE FROM REMOTE STATION (CONT)

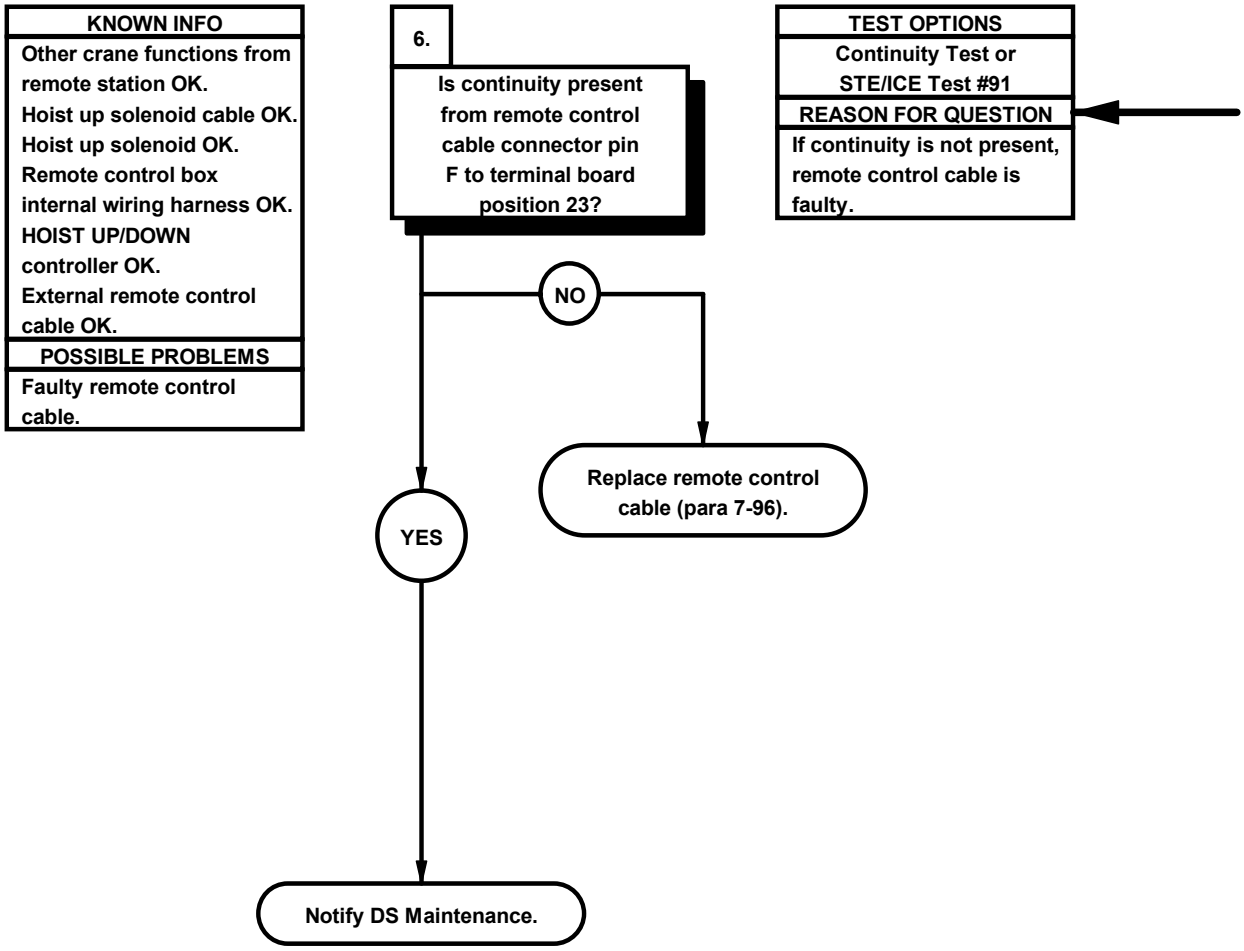


CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin F of one end of external remote control cable connector.
(4) Connect negative (-) probe of multimeter on pin F of other end of external remote control cable and note reading on multimeter.
(5) If continuity is not present, replace external remote control cable.



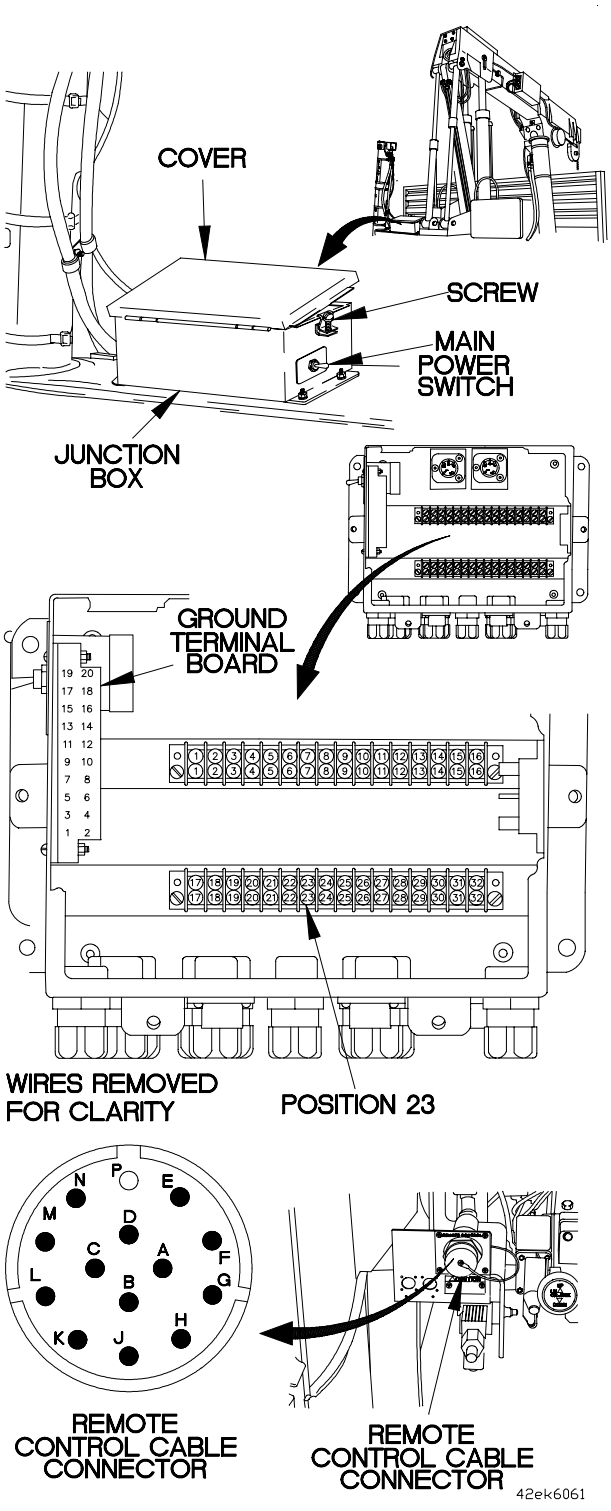
42E1365-

e106. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HOIST UP DOES NOT OPERATE FROM REMOTE STATION (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin F of remote control cable connector.
(3) Connect negative (-) probe of multimeter on terminal board lower position 23 and note reading on multimeter.
(4) If continuity is not present, replace remote control cable (para 7-96).
(5) If continuity is present, notify DS Maintenance.
(6) Close cover on junction box.
(7) Tighten four screws on junction box cover.
(8) Stow crane (TM 9-2320-366-10-1).



e107. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HOIST DOWN DOES NOT OPERATE FROM REMOTE STATION

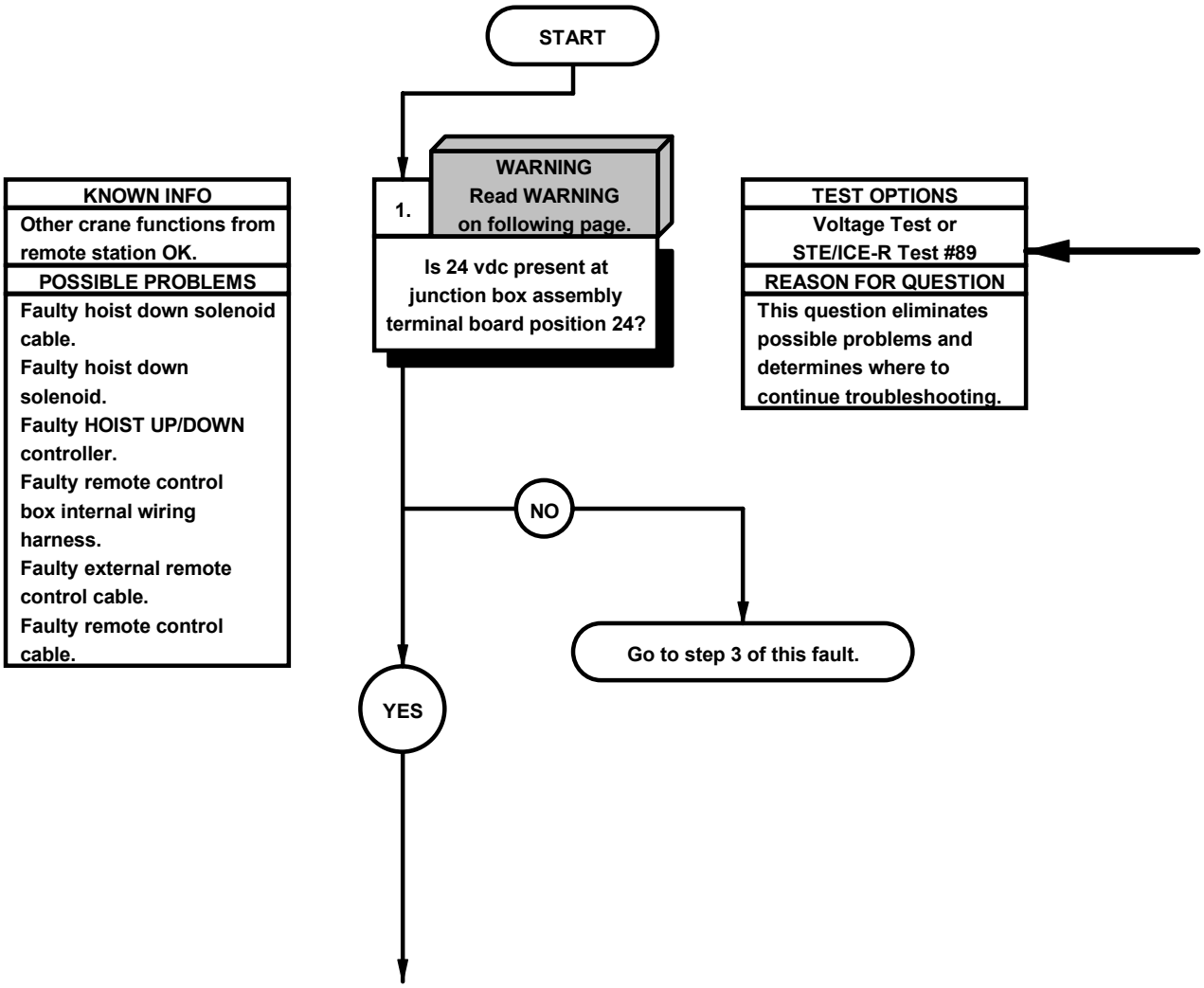
INITIAL SETUP

Equipment Conditions
Outriggers lowered (TM 9-2320-366-10-1).
Crane erected with approximately five feet of cable payed out (TM 9-2320-366-10-1).
Engine shut down (TM 9-2320-366-10-1).

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

References
TM 9-4910-571-12&P



WARNING

Remove rings, bracelets, watches, necklaces, and any other jewelry beffore working around vehicle. Jewelery can catch on equipment and cause injury or short circuit across electrical circuits and cause severe burns or electrical shock.

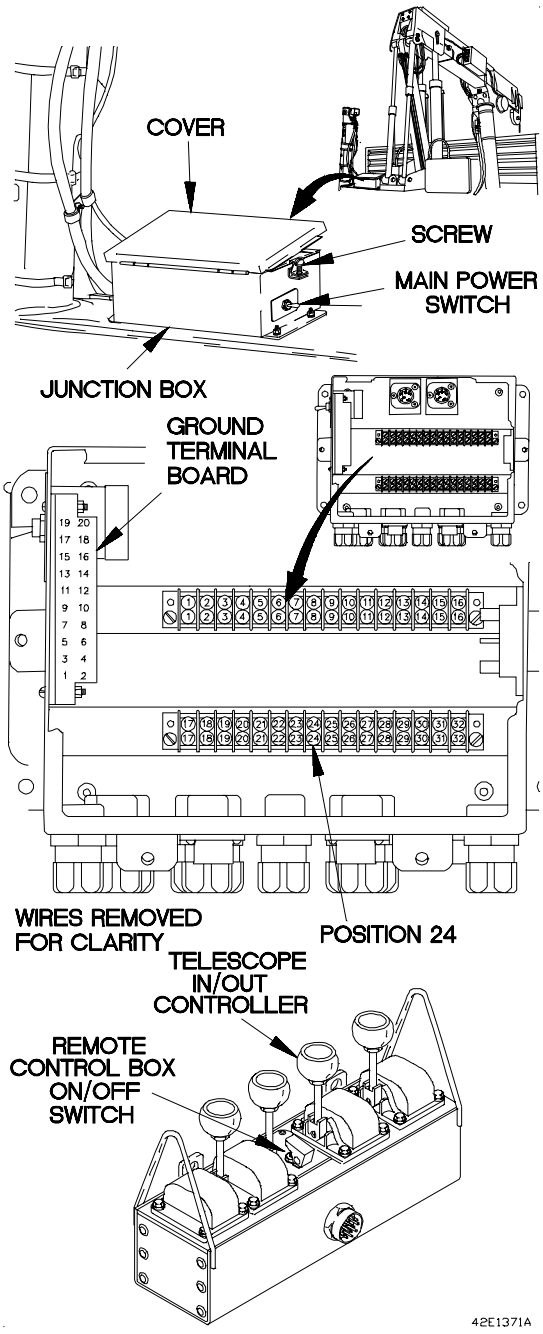
OUTPUT VOLTAGE TEST

(1) Connect external remote control cable to and remote control box (TM 9-2320-366-10-1).
(2) Loosen four screws on junction box.
(3) Open cover on junction box.
(4) Position MAIN POWER switch to ON.
(5) Lift guard and position remote control box ON/OFF switch to ON.
(6) Set multimeter to volts dc.
(7) Connect positive (+) probe of multimeter on terminal board lower position 24.
(8) Connect negative (-) probe of multimeter on ground quick-connect terminal board (above MAIN POWER switch).

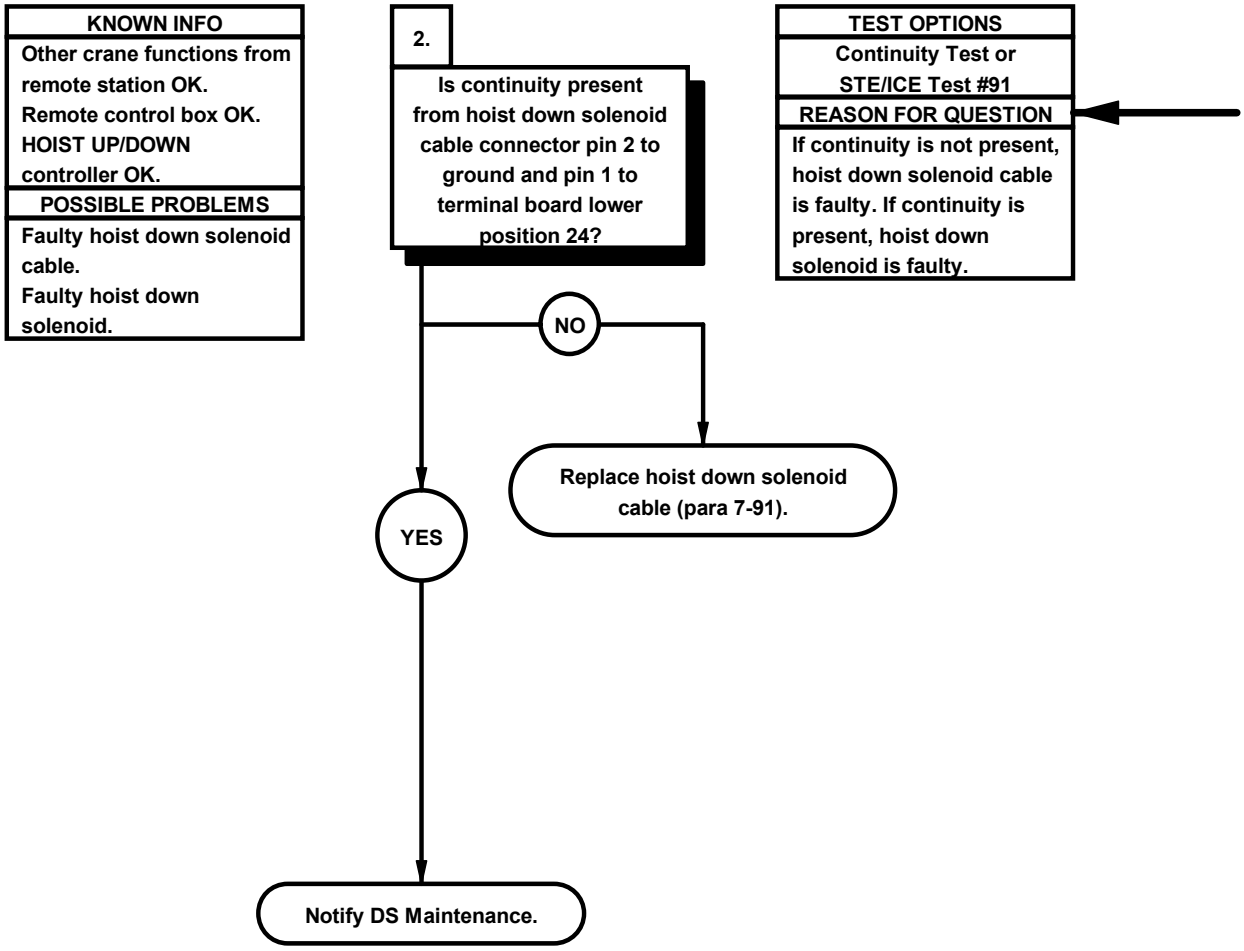
NOTE

Step (9) requires the aid of an assistant.

(9) Position HOIST UP/DOWN to DOWN and note reading on multimeter.
(10) If 24 volts dc is not present, go to step 3 of this fault.

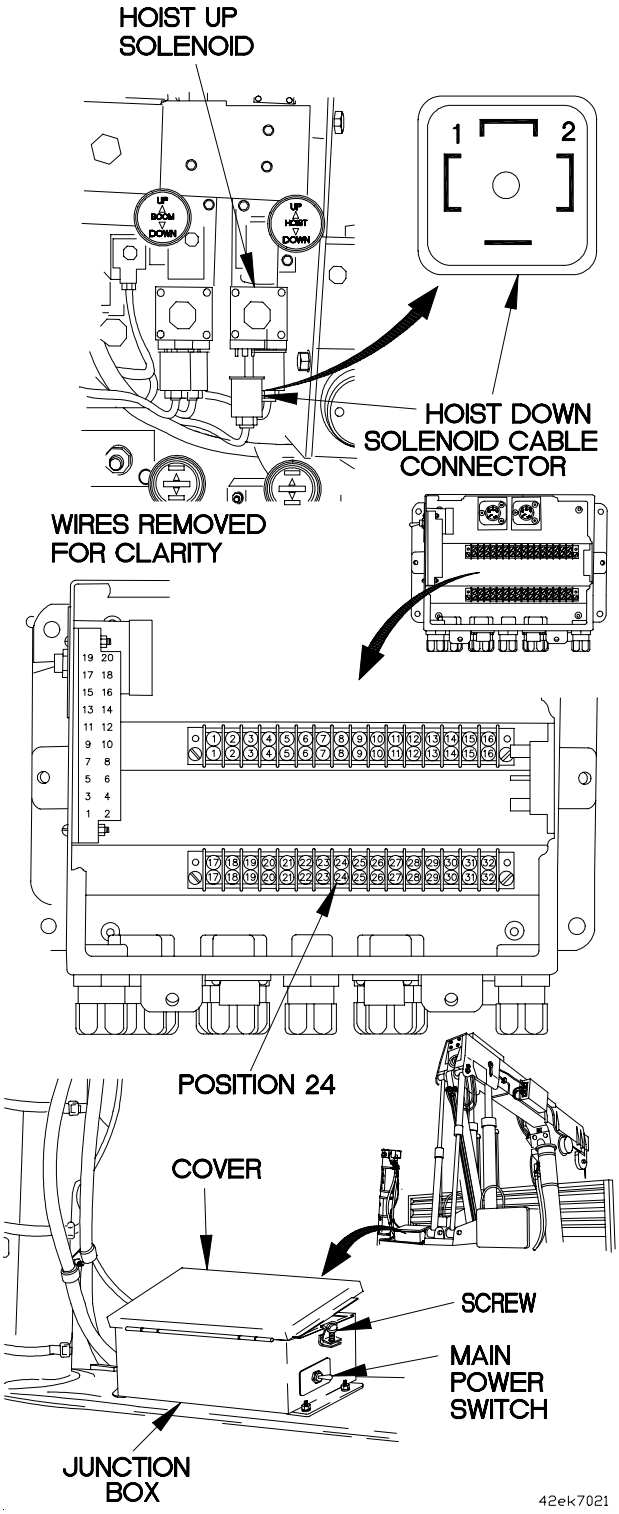


e107. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HOIST DOWN DOES NOT OPERATE FROM REMOTE STATION (CONT)

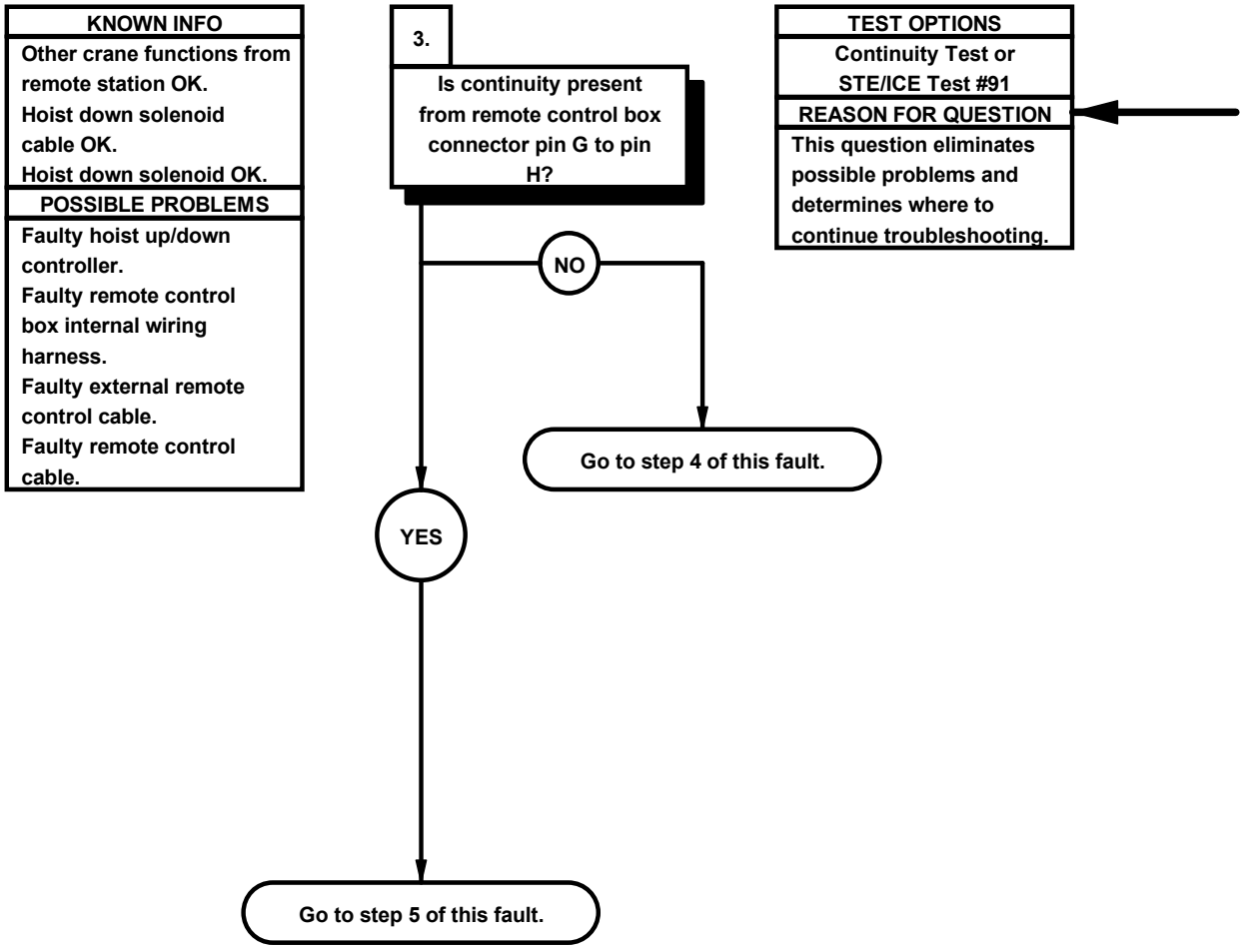


CONTINUITY TEST

(1) Disconnect hoist down solenoid connector from hoist up solenoid.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin 2 of hoist down solenoid cable connector.
(4) Connect negative (-) probe of multimeter on ground and note reading on multimeter.
(5) Connect positive (+) probe of multimeter on pin 1 of hoist down solenoid cable connector.
(6) Connect negative (-) probe of multimeter on terminal board lower position 24 and note reading on multimeter.
(7) If continuity is not present, replace hoist down solenoid cable (para 7-91).
(8) If continuity is present, notify DS Maintenance.
(9) Connect hoist down solenoid cable connector to hoist down solenoid.
(10) Close cover on junction box.
(11) Tighten four screws on junction box cover.
(12) Stow crane (TM 9-2320-366-10-1).



e107. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HOIST DOWN DOES NOT OPERATE FROM REMOTE STATION (CONT)



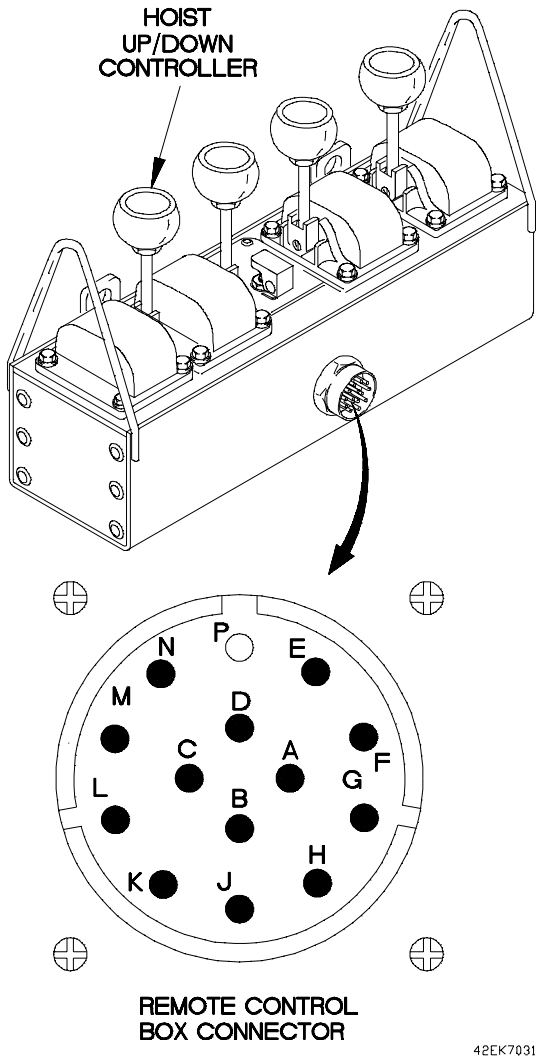
CONTINUITY TEST

(1) Disconnect external remote control cable from remote control box.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin G of connector on remote control box.
(4) Connect negative (-) probe of multimeter on pin H of connector on remote control box.

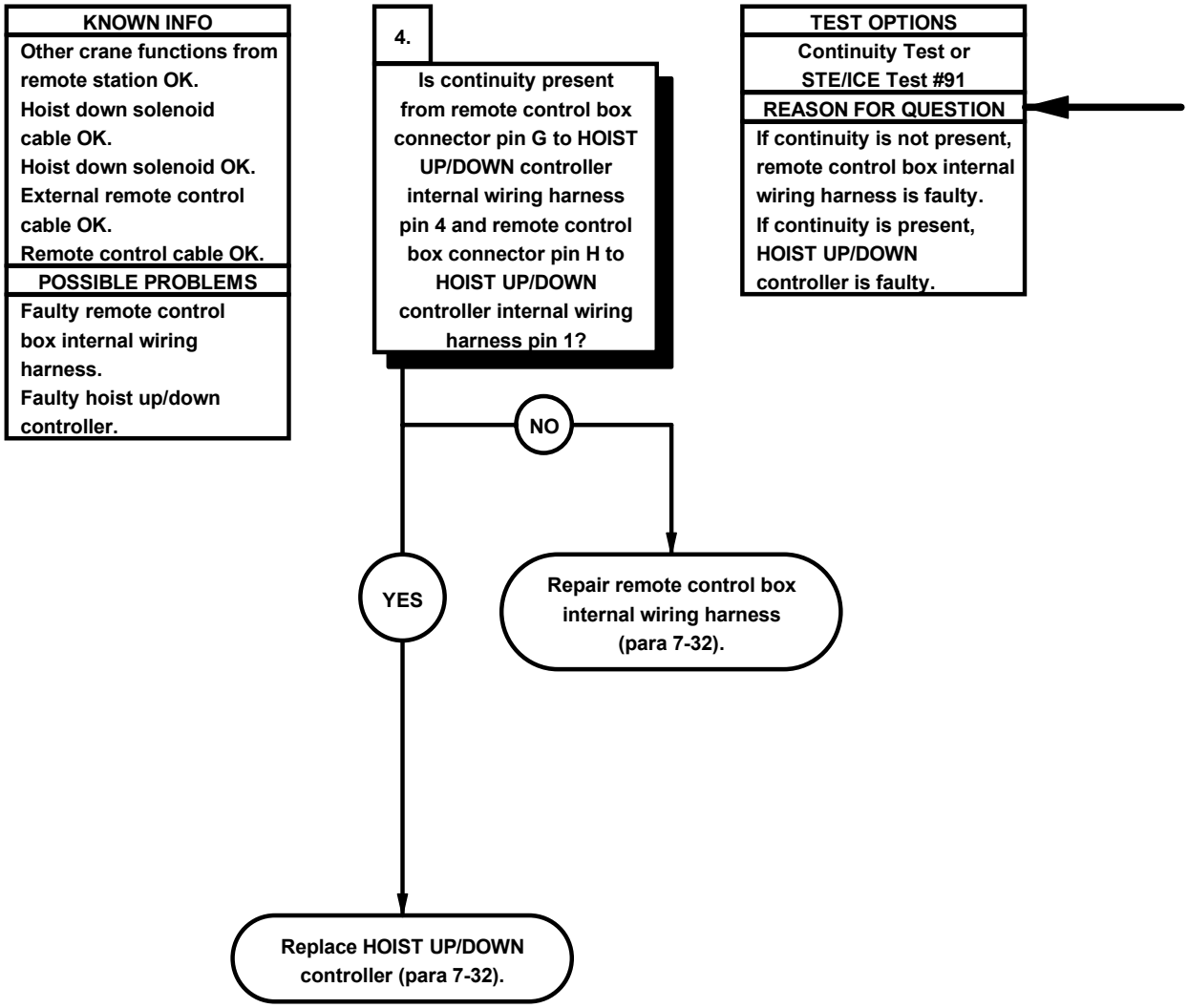
NOTE

Step (5) requires the aid of an assistant.

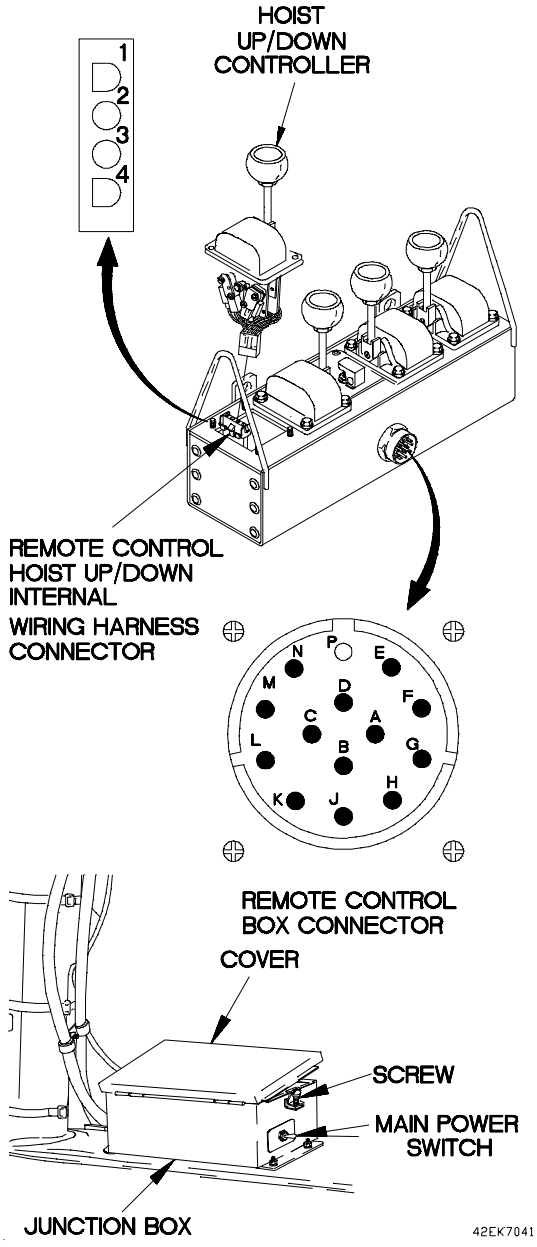
(5) Position HOIST UP/DOWN controller to DOWN and note reading on multimeter.
(6) If continuity is not present, go to step 4 of this fault.
(7) If continuity is present, go to step 5 of this fault.



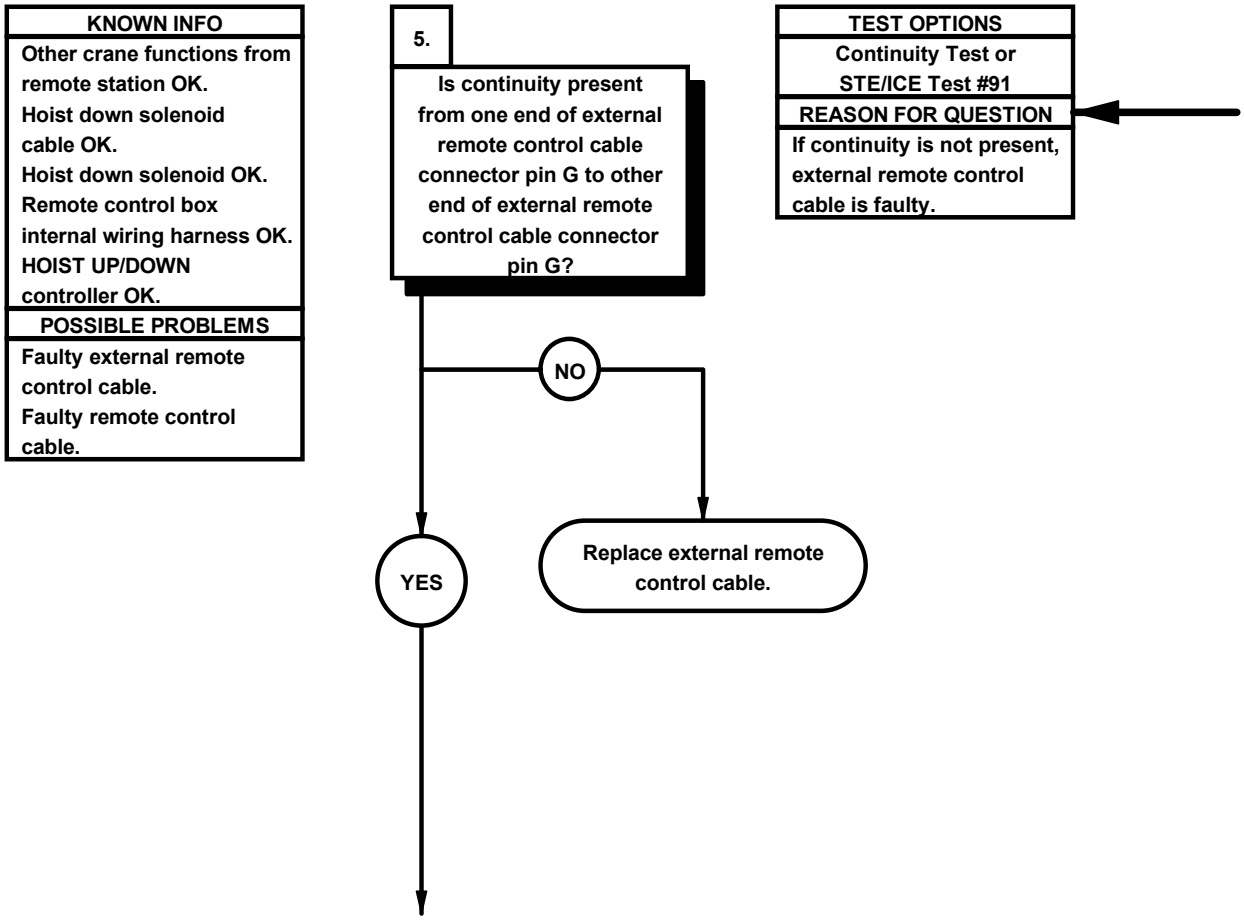
e107. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HOIST DOWN DOES NOT OPERATE FROM REMOTE STATION (CONT)



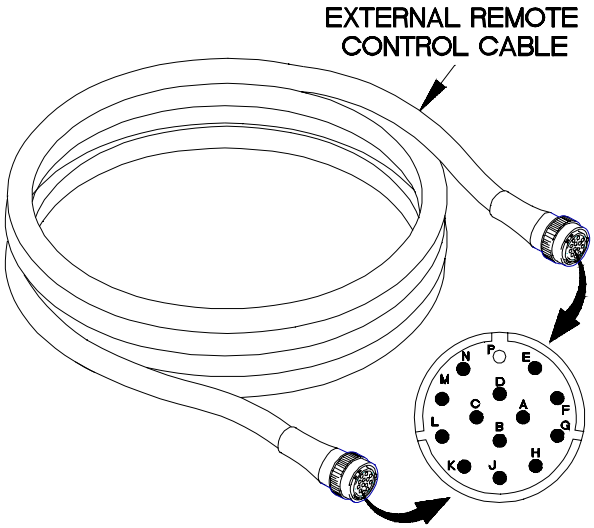
CONTINUITY TEST
(1) Remove HOIST UP/DOWN controller (para 7-32).
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin G of remote control box connector.
(4) Connect negative (-) probe of multimeter on pin 4 of HOIST UP/DOWN controller internal wiring harness and note reading on multimeter.
(5) Connect positive (+) probe of multimeter on pin H of remote control box connector.
(6) Connect negative (-) probe of multimeter on pin 1 of HOIST UP/DOWN controller internal wiring harness and note reading on multimeter.
(7) If continuity is not present, replace remote control box internal wiring harness (para 7-32).
(8) If continuity is present, replace HOIST UP/DOWN controller (para 7-32).
(9) Install HOIST UP/DOWN controller (para 7-32).
(10) Close cover on junction box.
(11) Tighten four screws on junction box cover.
(12) Stow crane (TM 9-2320-366-10-1).



e107. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HOIST DOWN DOES NOT OPERATE FROM REMOTE STATION (CONT)

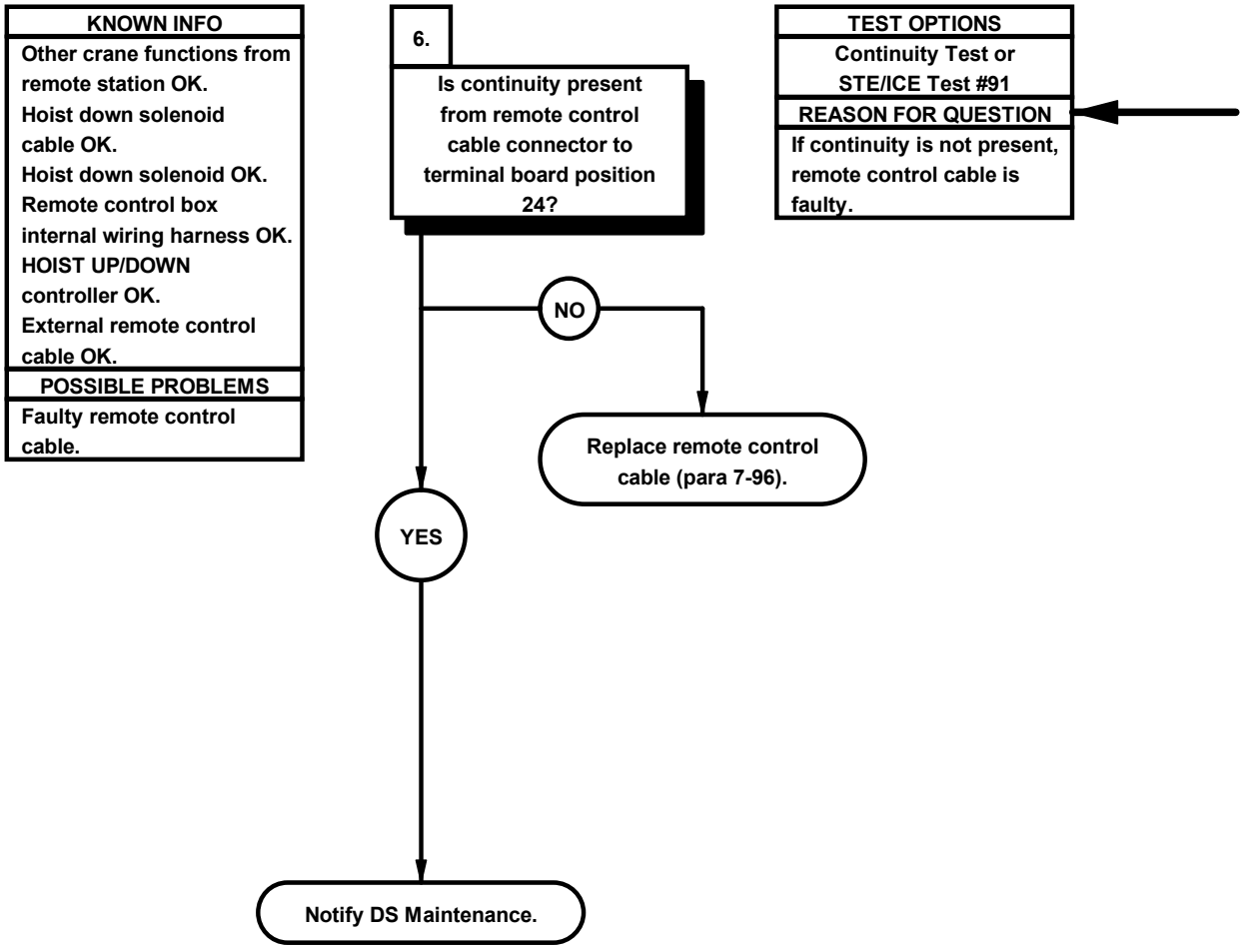


CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin G of one end of external remote control cable connector.
(3) Connect negative (-) probe of multimeter on pin G of other end of external remote control cable and note reading on multimeter.
(4) If continuity is not present, replace external remote control cable.



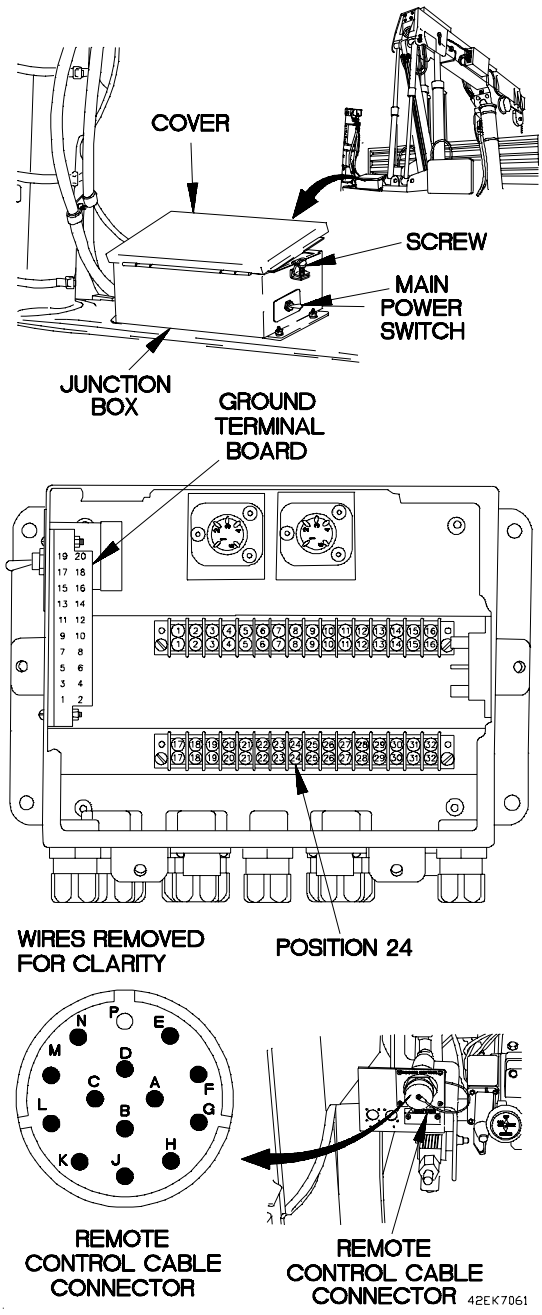
42E1375-

e107. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HOIST DOWN DOES NOT OPERATE FROM REMOTE STATION (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin G of remote control cable connector.
(3) Connect negative (-) probe of multimeter on terminal board lower position 24 and note reading on multimeter.
(4) If continuity is not present, replace remote control cable (para 7-96).
(5) If continuity is present, notify DS Maintenance.
(6) Close cover on junction box.
(7) Tighten four screws on junction box cover.
(8) Stow crane (TM 9-2320-366-10-1).



e108. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM UP DOES NOT OPERATE FROM REMOTE STATION

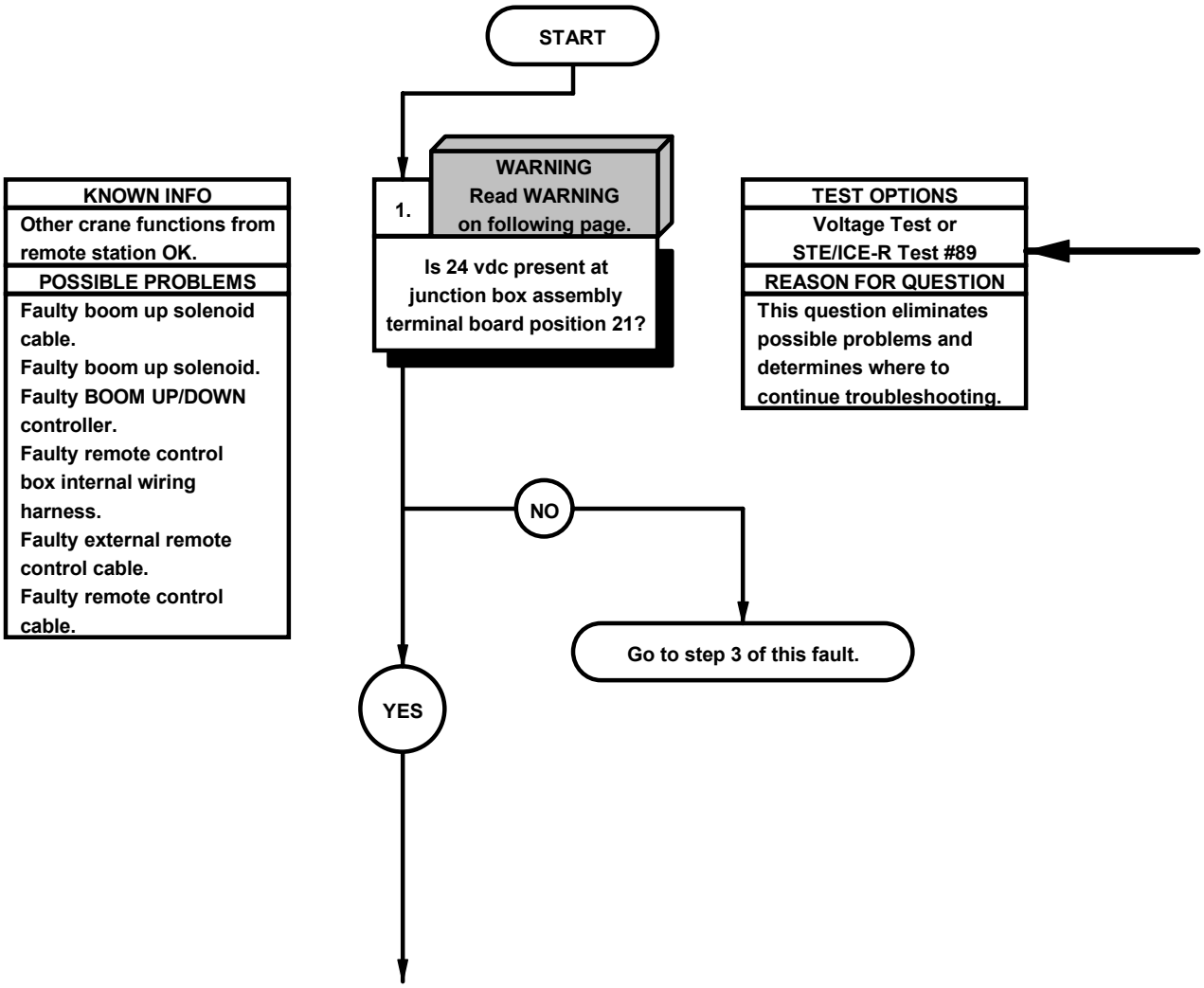
INITIAL SETUP

Equipment Conditions
Outriggers lowered (TM 9-2320-366-10-1).
Crane erected with approximately five feet of cable payed out (TM 9-2320-366-10-1).
Engine shut down (TM 9-2320-366-10-1).

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

References
TM 9-4910-571-12&P



WARNING

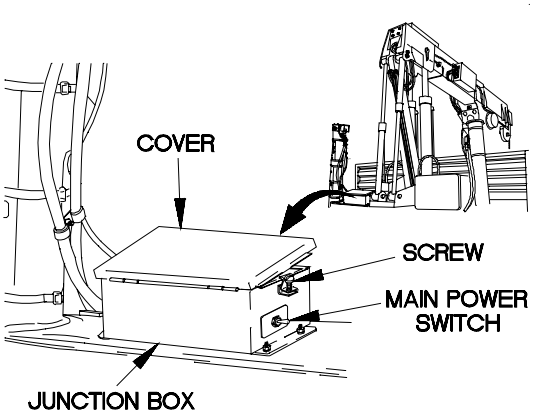
Remove rings, bracelets, watches, necklaces, and any other jewelry beffore working around vehicle. Jewelery can catch on equipment and cause injury or short circuit across electrical circuits and cause severe burns or electrical shock.

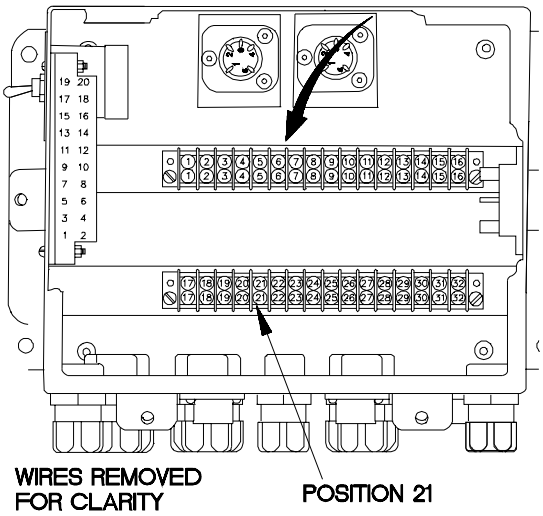
OUTPUT VOLTAGE TEST

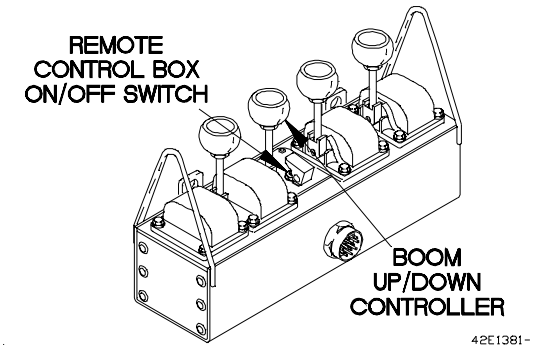
(1) Connect external remote control cable to remote control box (TM 9-2320-366-10-1).
(2) Loosen four screws on junction box.
(3) Open cover on junction box.
(4) Position MAIN POWER switch to ON.
(5) Lift guard and position remote control box ON/OFF switch to ON.
(6) Set multimeter to volts dc.
(7) Connect positive (+) probe of multimeter on terminal board lower position 21.
(8) Connect negative (-) probe of multimeter on ground quick-connect terminal board (above MAIN POWER switch).

NOTE
Step (9) requires the aid of an assistant.

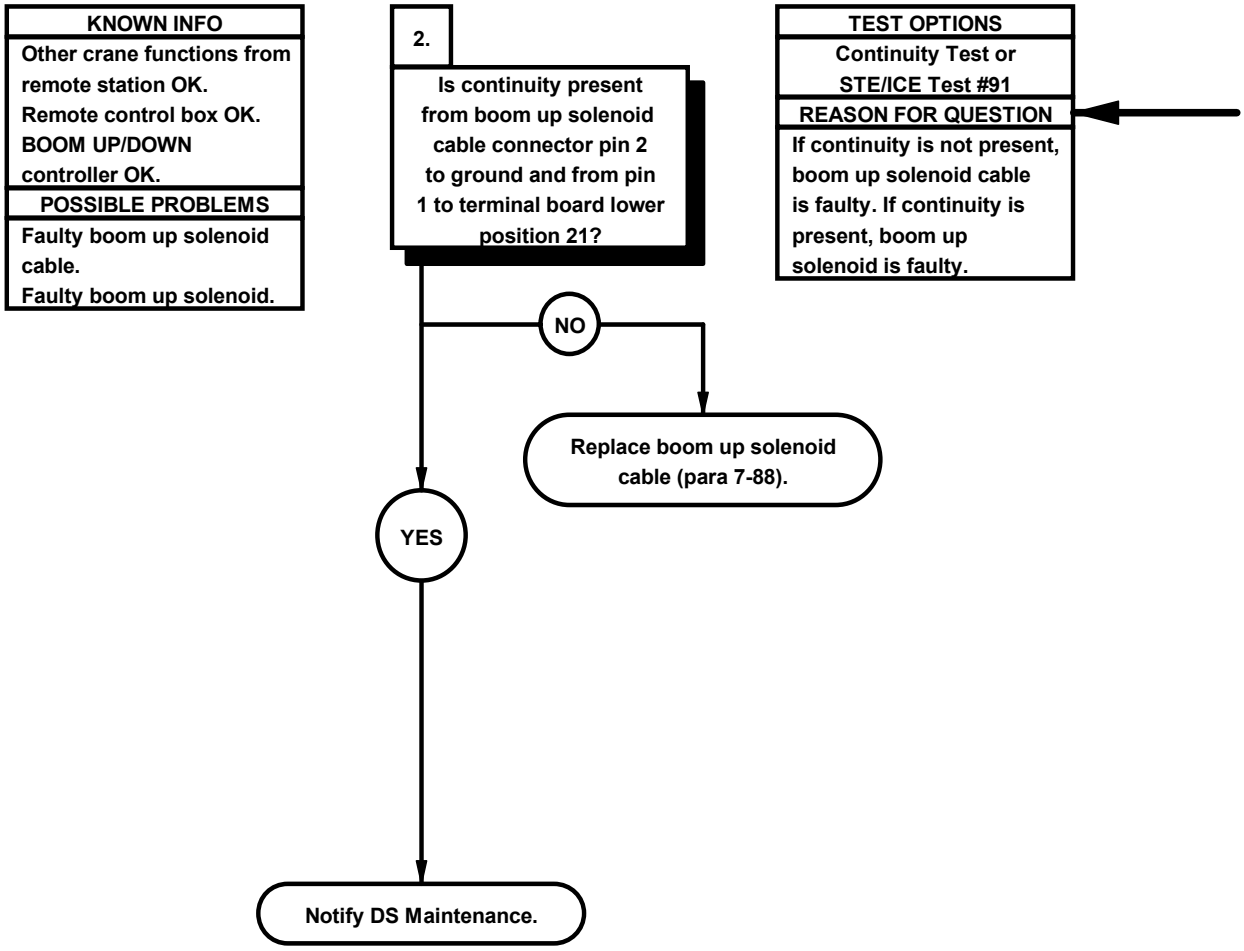
(9) Position BOOM UP/DOWN to UP and note reading on multimeter.
(10) If 24 volts dc is not present, go to step 3 of this fault.





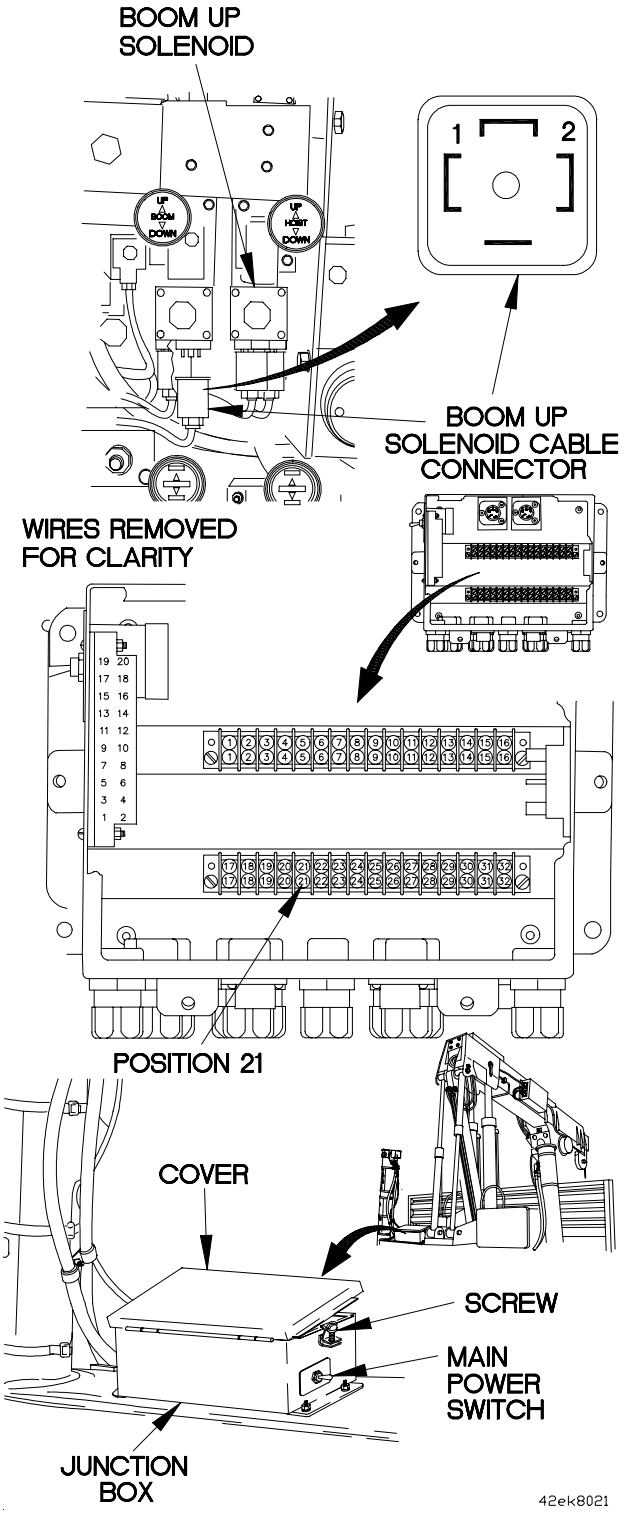


e108. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM UP DOES NOT OPERATE FROM REMOTE STATION (CONT)

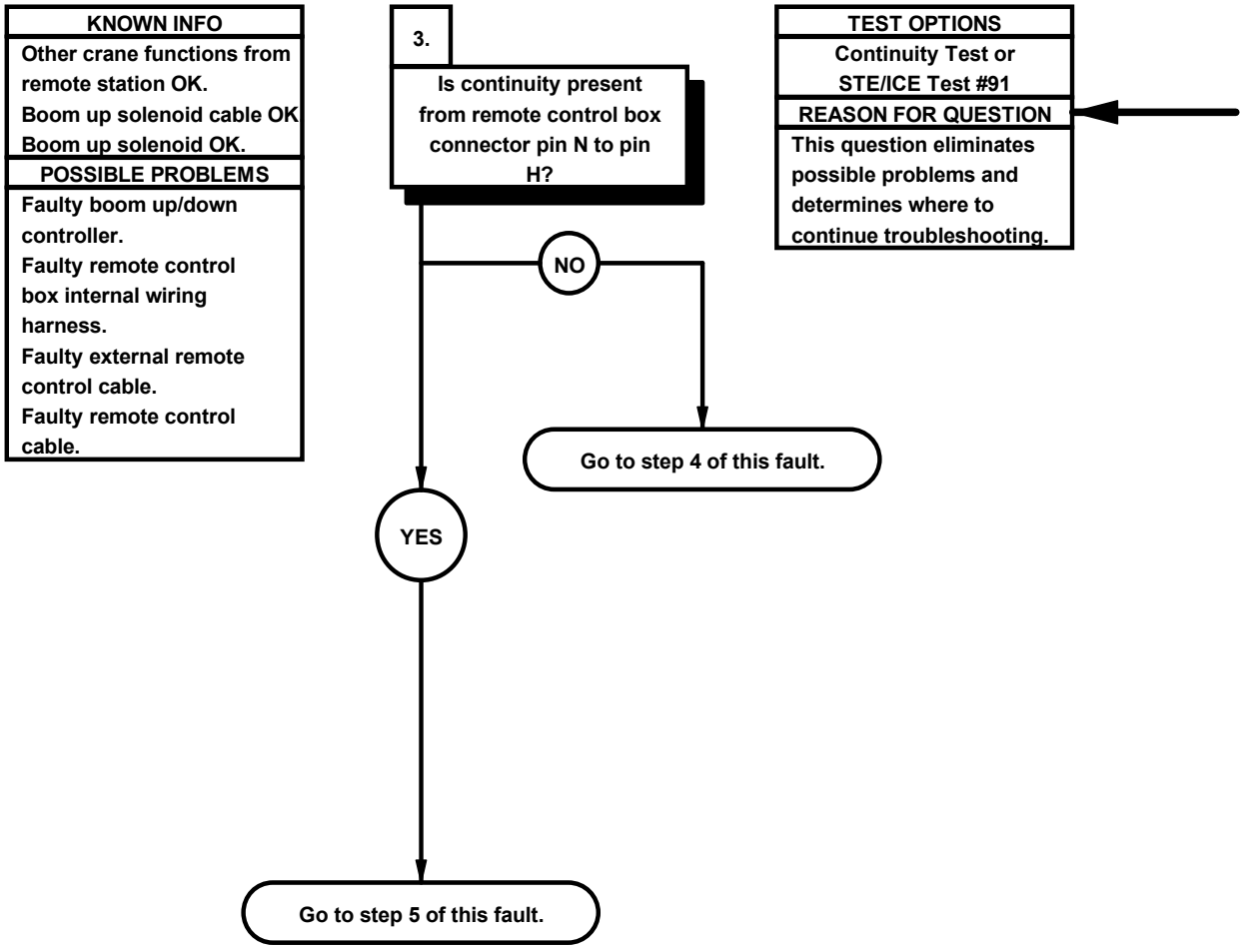


CONTINUITY TEST

(1) Disconnect boom up solenoid connector from boom up solenoid.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin 2 of boom up solenoid cable connector.
(4) Connect negative (-) probe of multimeter on ground and note reading on multimeter.
(5) Connect positive (+) probe of multimeter on pin 1 of boom up solenoid cable connector.
(6) Connect negative (-) probe of multimeter on terminal board lower position 21 and note reading on multimeter.
(7) If continuity is not present, replace boom up solenoid cable (para 7-88).
(8) If continuity is present, notify DS Maintenance.
(9) Connect boom up solenoid cable connector to boom up solenoid.
(10) Close cover on junction box.
(11) Tighten four screws on junction box cover.
(12) Stow crane (TM 9-2320-366-10-1).



e108. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM UP DOES NOT OPERATE FROM REMOTE STATION (CONT)



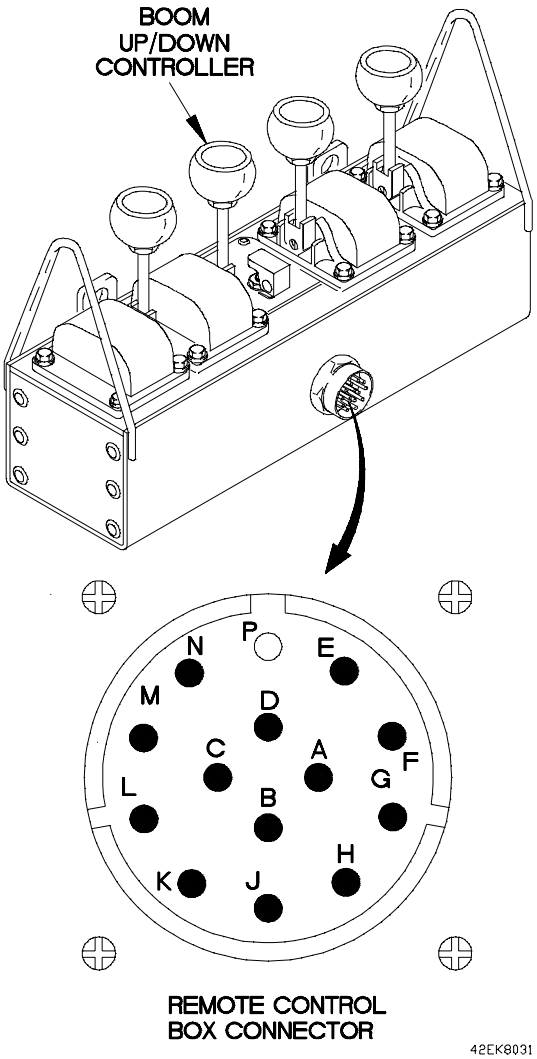
CONTINUITY TEST

(1) Disconnect external remote control cable from remote control box.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin N of connector on remote control box.
(4) Connect negative (-) probe of multimeter on pin H of connector on remote control box.

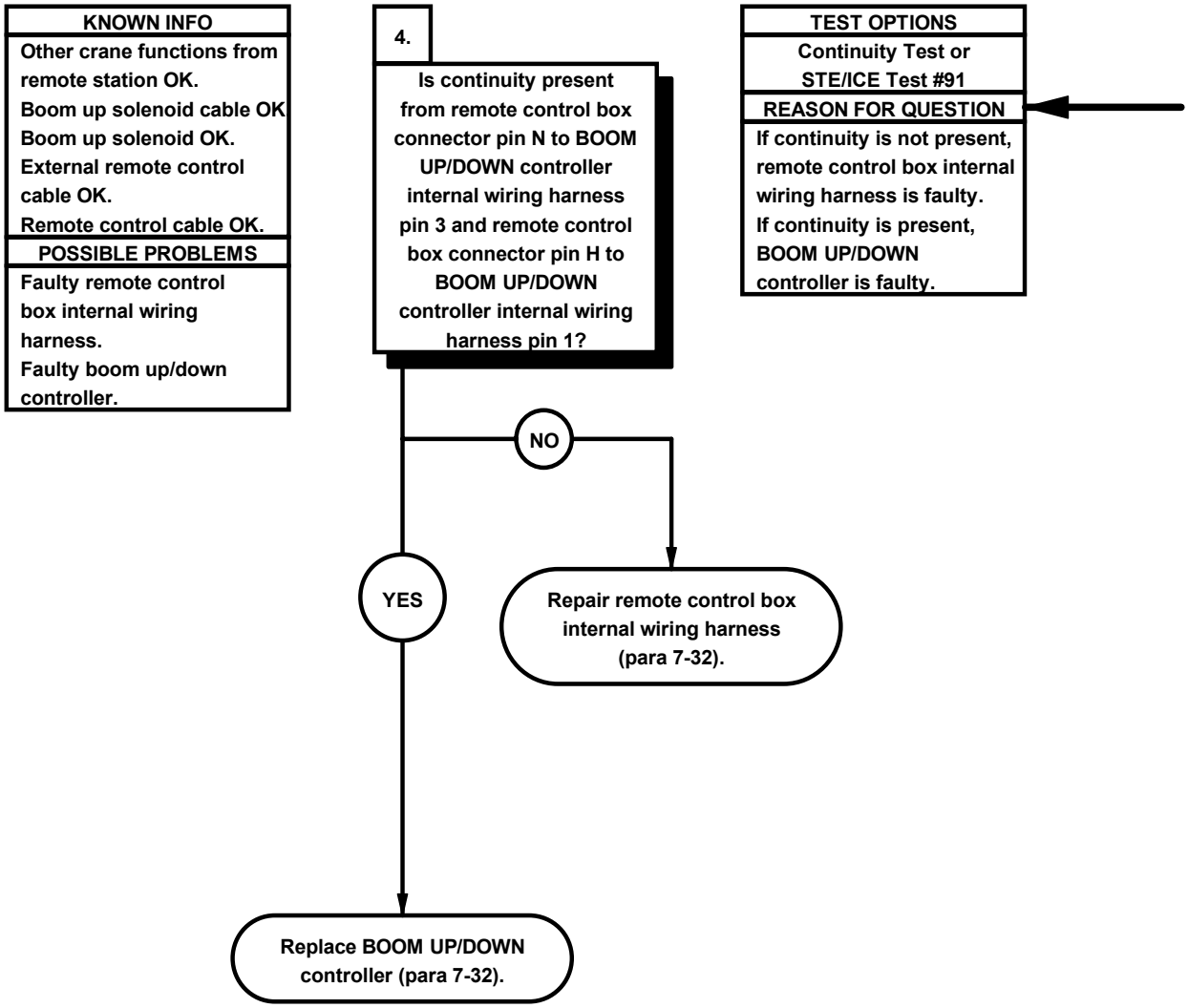
NOTE

Step (5) requires the aid of an assistant.

(5) Position BOOM UP/DOWN controller to UP and note reading on multimeter.
(6) If continuity is not present, go to step 4 of this fault.
(7) If continuity is present, go to step 5 of this fault.

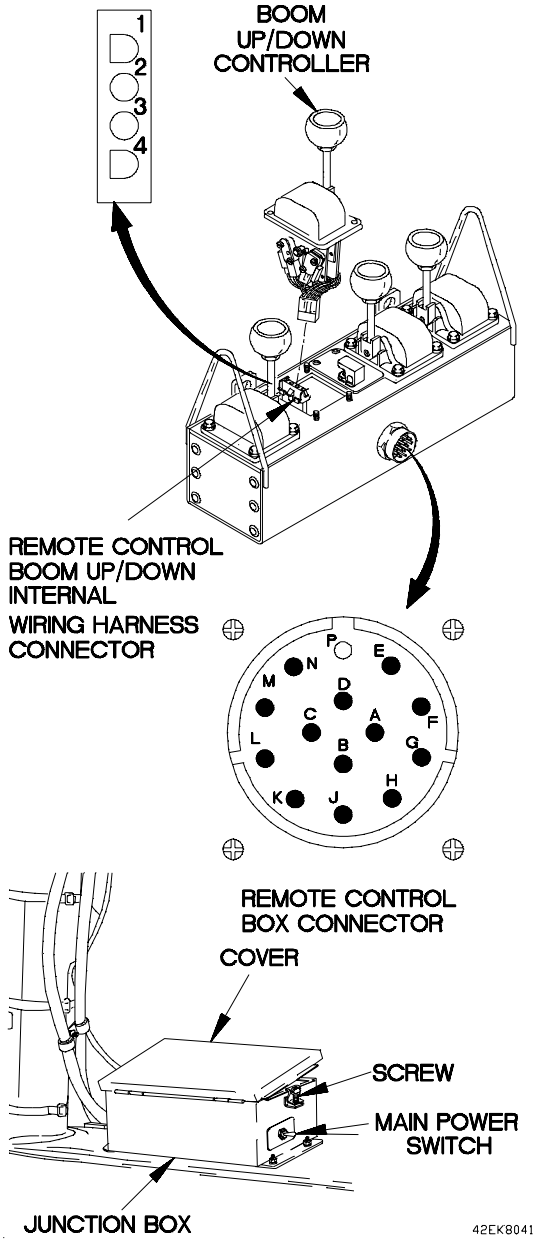


e108. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM UP DOES NOT OPERATE FROM REMOTE STATION (CONT)

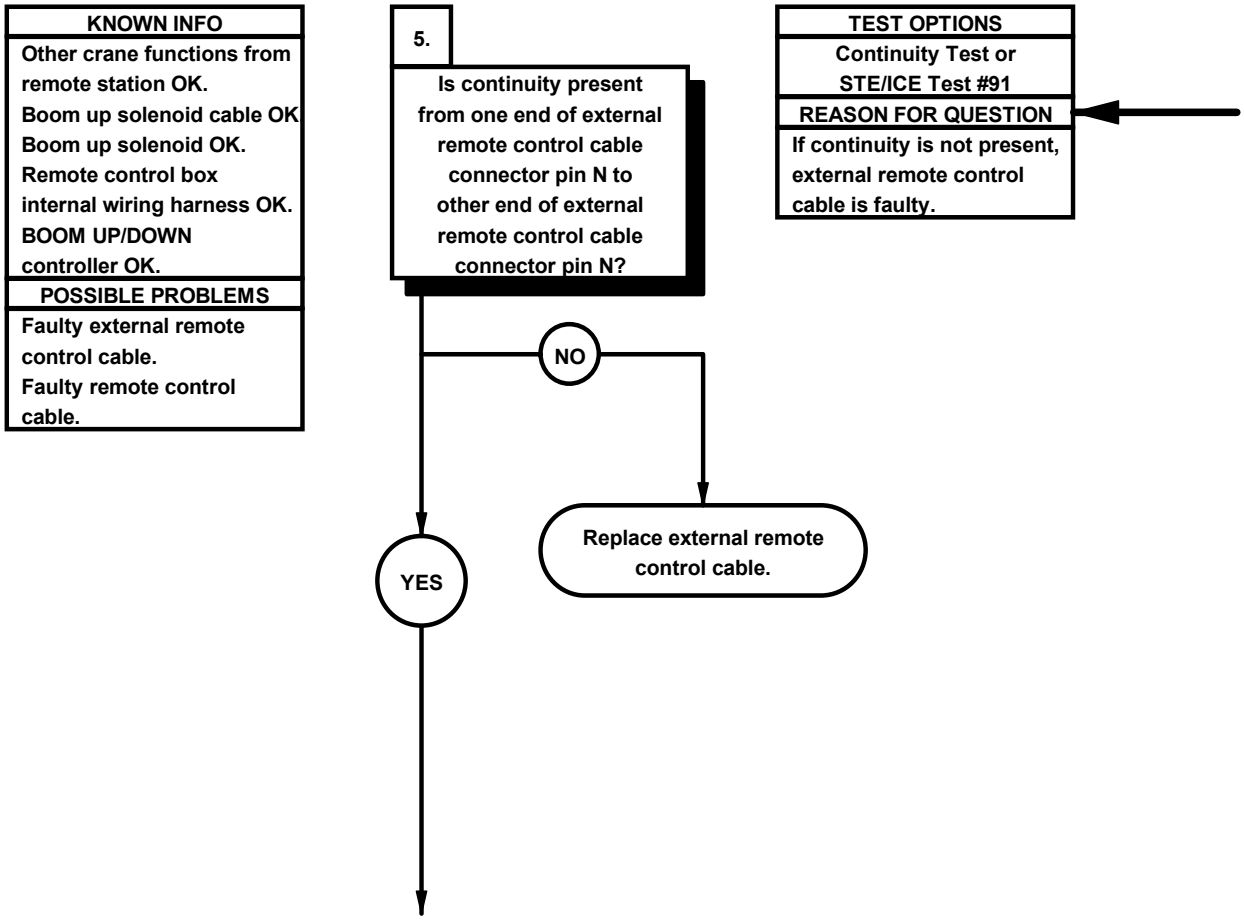


CONTINUITY TEST

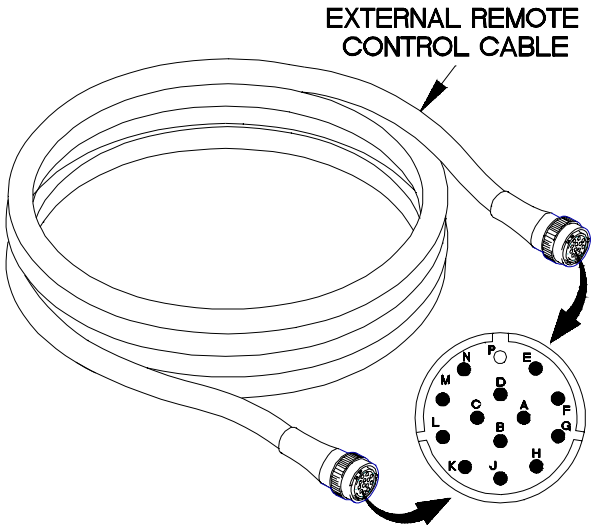
(1) Remove BOOM UP/DOWN controller (para 7-32).
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin N of remote control box connector.
(4) Connect negative (-) probe of multimeter on pin 3 of BOOM UP/DOWN controller internal wiring harness and note reading on multimeter.
(5) Connect positive (+) probe of multimeter on pin H of remote control box connector.
(6) Connect negative (-) probe of multimeter on pin 1 of BOOM UP/DOWN controller internal wiring harness and note reading on multimeter.
(7) If continuity is not present, replace remote control box internal wiring harness (para 7-32).
(8) If continuity is present, replace BOOM UP/DOWN controller (para 7-32).
(9) Install BOOM UP/DOWN controller (para 7-32).
(10) Close cover on junction box.
(11) Tighten four screws on junction box cover.
(12) Stow crane (TM 9-2320-366-10-1).



e108. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM UP DOES NOT OPERATE FROM REMOTE STATION (CONT)

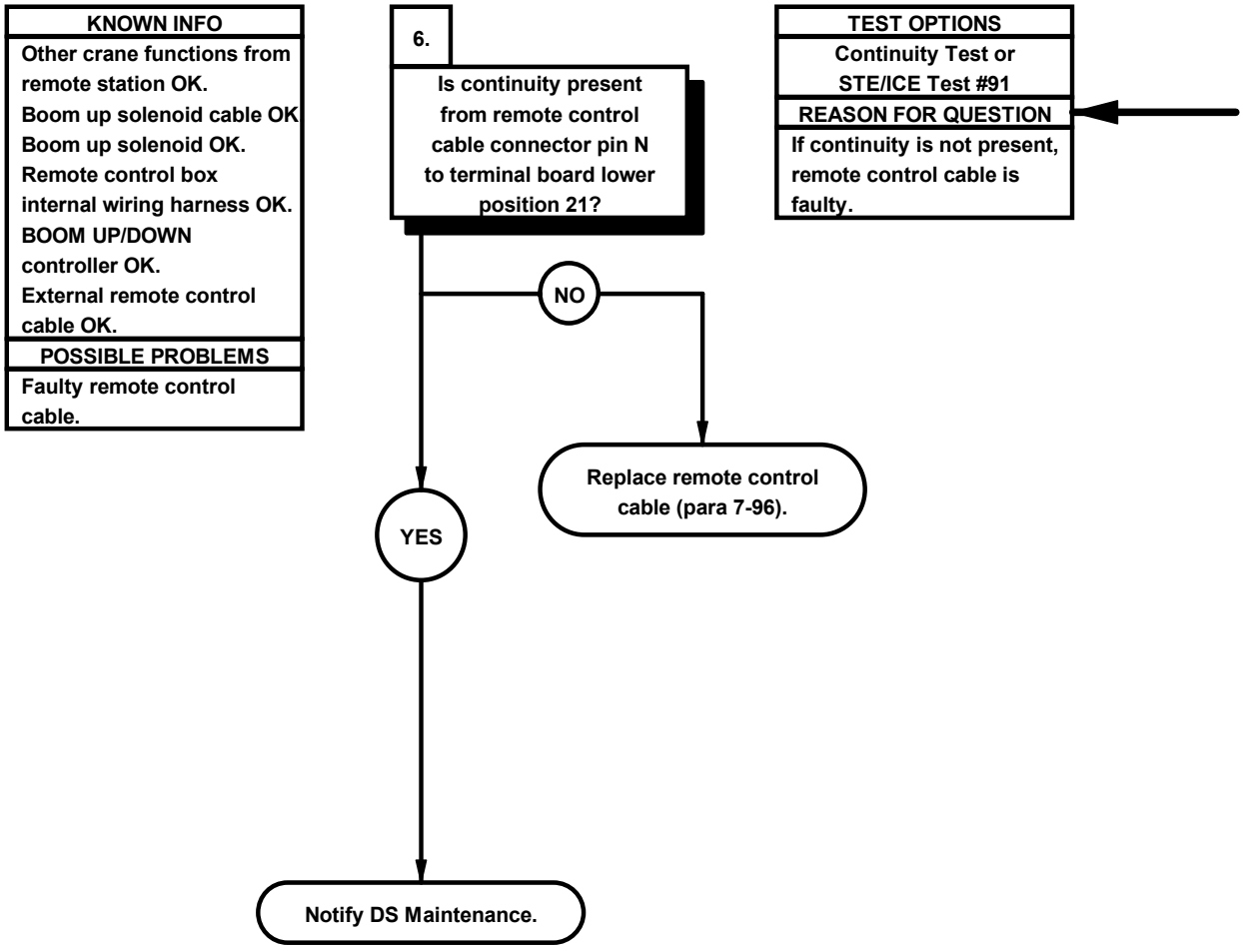


CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin N of one end of external remote control cable connector.
(3) Connect negative (-) probe of multimeter on pin N of other end of external remote control cable and note reading on multimeter.
(4) If continuity is not present, replace external remote control cable.



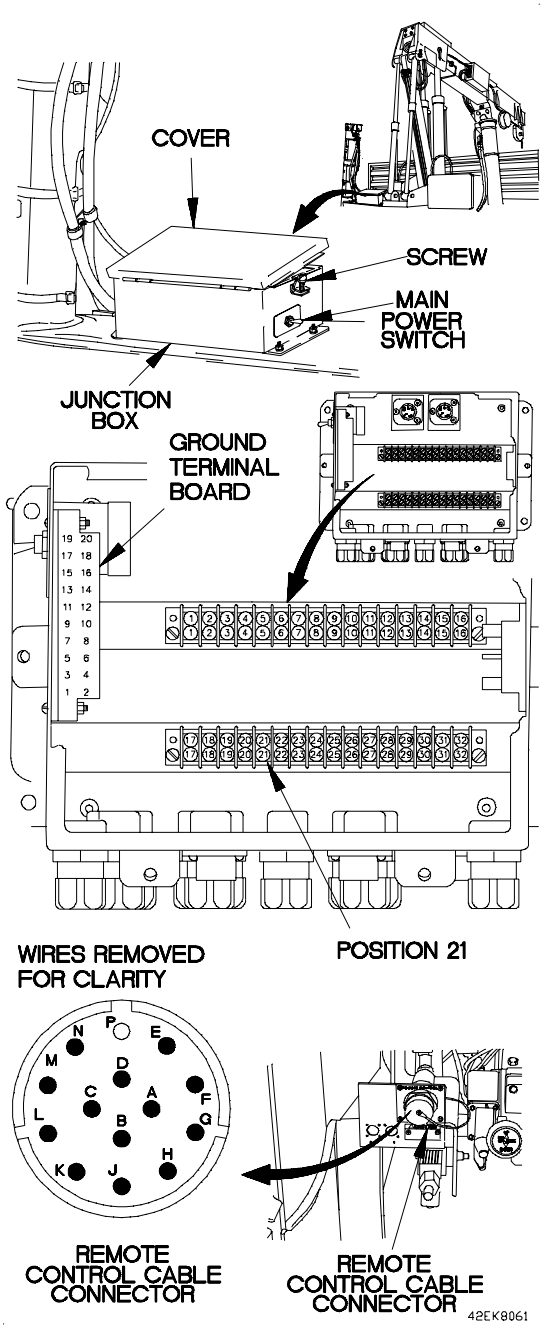
42E1385-

e108. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM UP DOES NOT OPERATE FROM REMOTE STATION (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin N of remote control cable connector.
(3) Connect negative (-) probe of multimeter on terminal board lower position 21 and note reading on multimeter.
(4) If continuity is not present, replace remote control cable (para 7-96).
(5) If continuity is present, notify DS Maintenance.
(6) Close cover on junction box.
(7) Tighten four screws on junction box cover.
(8) Stow crane (TM 9-2320-366-10-1).



e109. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM DOWN DOES NOT OPERATE FROM REMOTE STATION

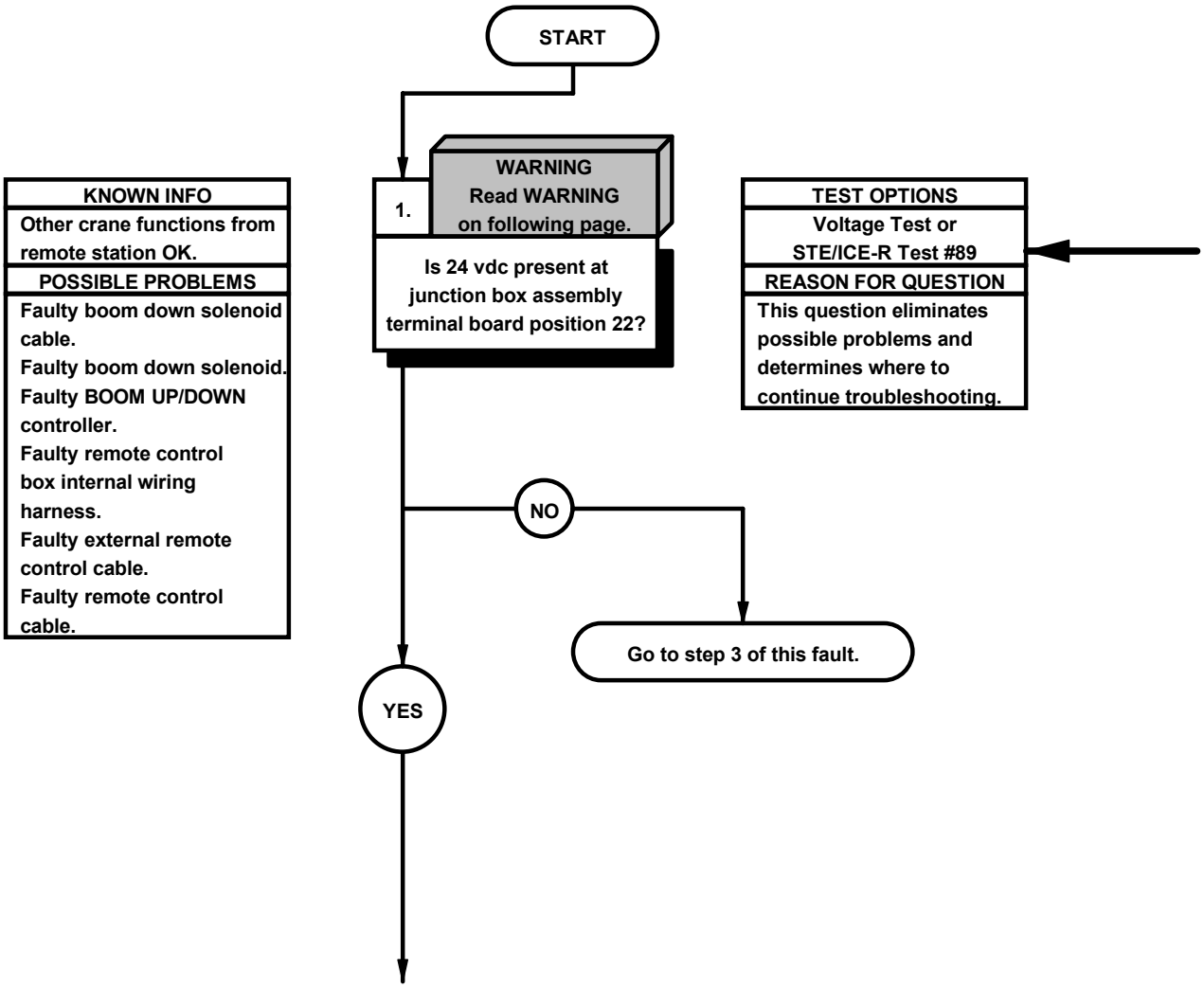
INITIAL SETUP

Equipment Conditions
Outriggers lowered (TM 9-2320-366-10-1).
Crane erected with approximately five feet of cable payed out (TM 9-2320-366-10-1).
Engine shut down (TM 9-2320-366-10-1).

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

References
TM 9-4910-571-12&P



WARNING

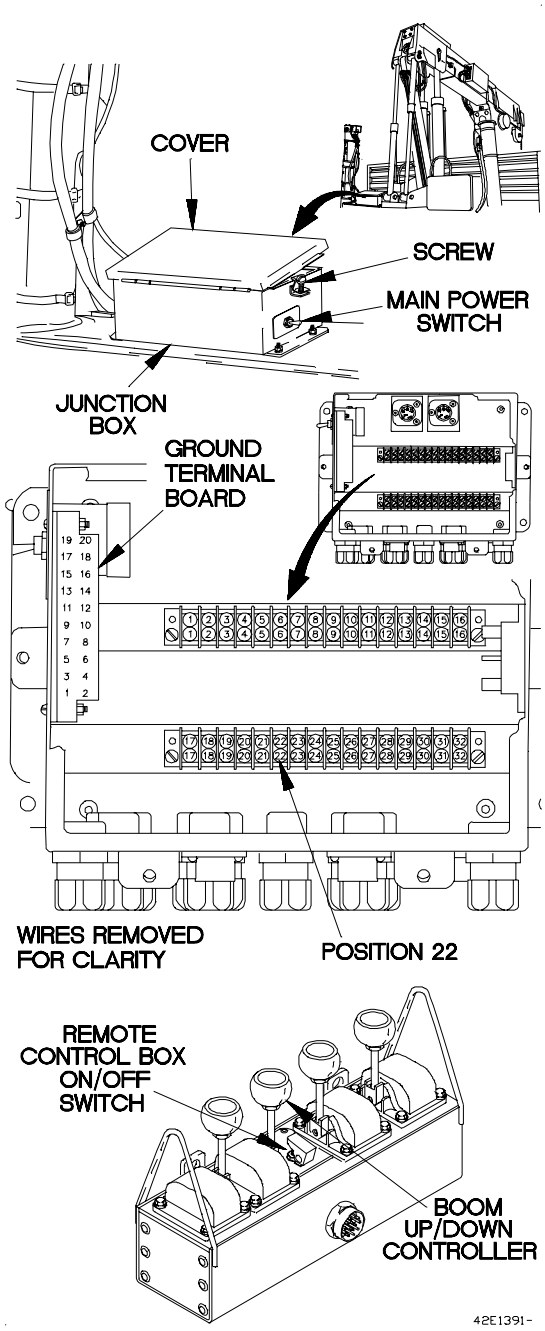
Remove rings, bracelets, watches, necklaces, and any other jewelry beffore working around vehicle. Jewelery can catch on equipment and cause injury or short circuit across electrical circuits and cause severe burns or electrical shock.

OUTPUT VOLTAGE TEST

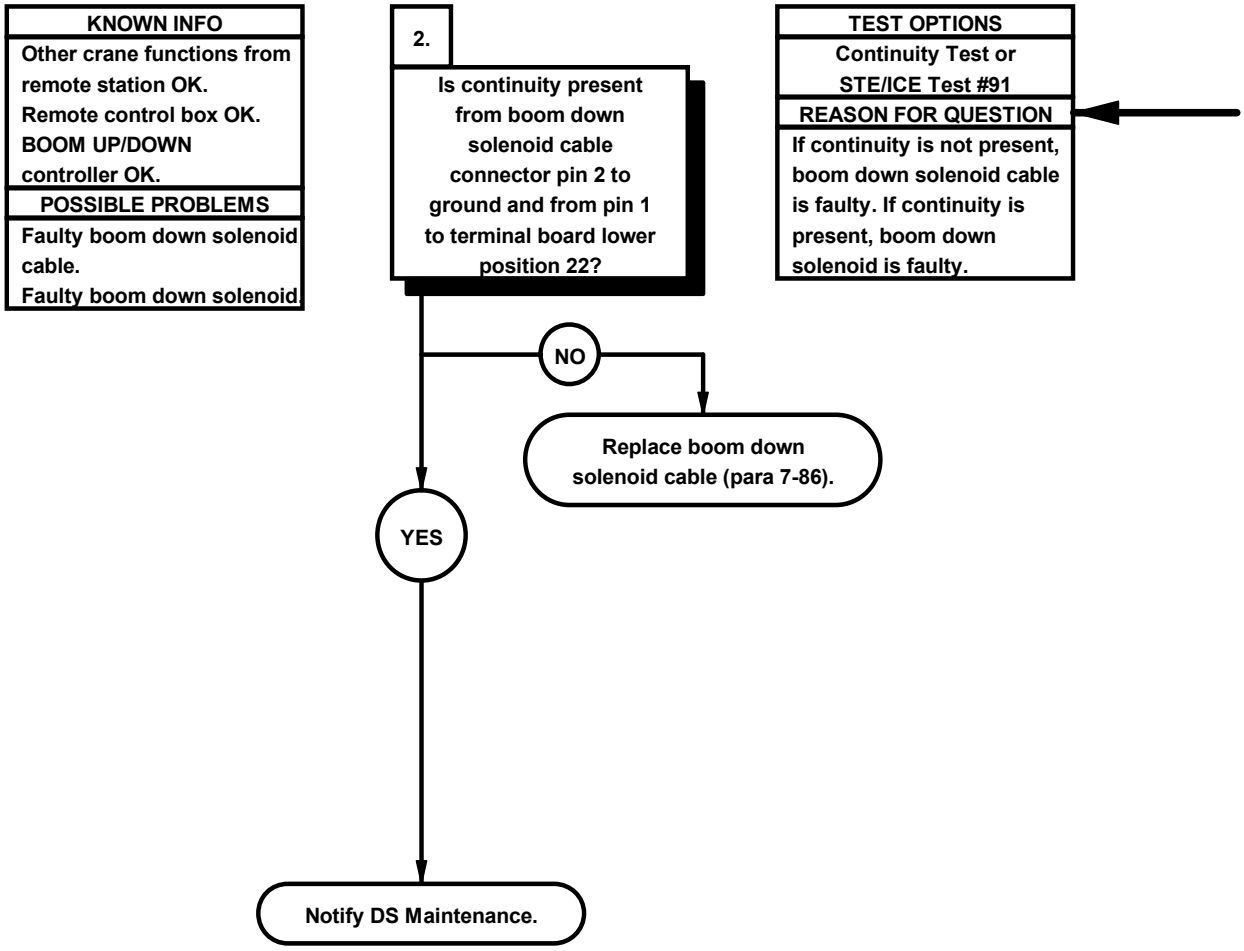
(1) Connect external remote control cable to remote control box (TM 9-2320-366-10-1).
(2) Loosen four screws on junction box.
(3) Open cover on junction box.
(4) Position MAIN POWER switch to ON.
(5) Lift guard and position remote control box ON/OFF switch to ON.
(6) Set multimeter to volts dc.
(7) Connect positive (+) probe of multimeter on terminal board lower position 22.
(8) Connect negative (-) probe of multimeter on ground quick-connect terminal board (above MAIN POWER switch).

NOTE
Step (9) requires the aid of an assistant.

(9) Position BOOM UP/DOWN to DOWN and note reading on multimeter.
(10) If 24 volts dc is not present, go to step 3 of this fault.

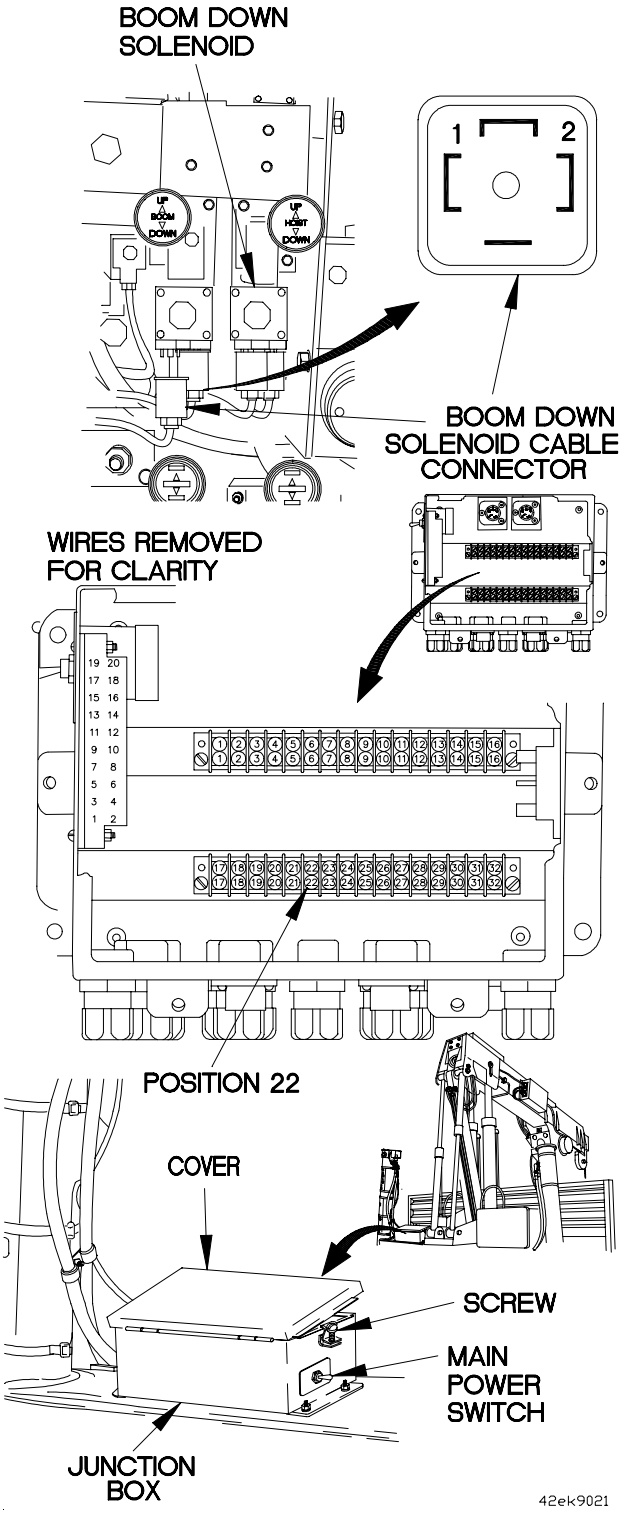


e109. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM DOWN DOES NOT OPERATE FROM REMOTE STATION (CONT)

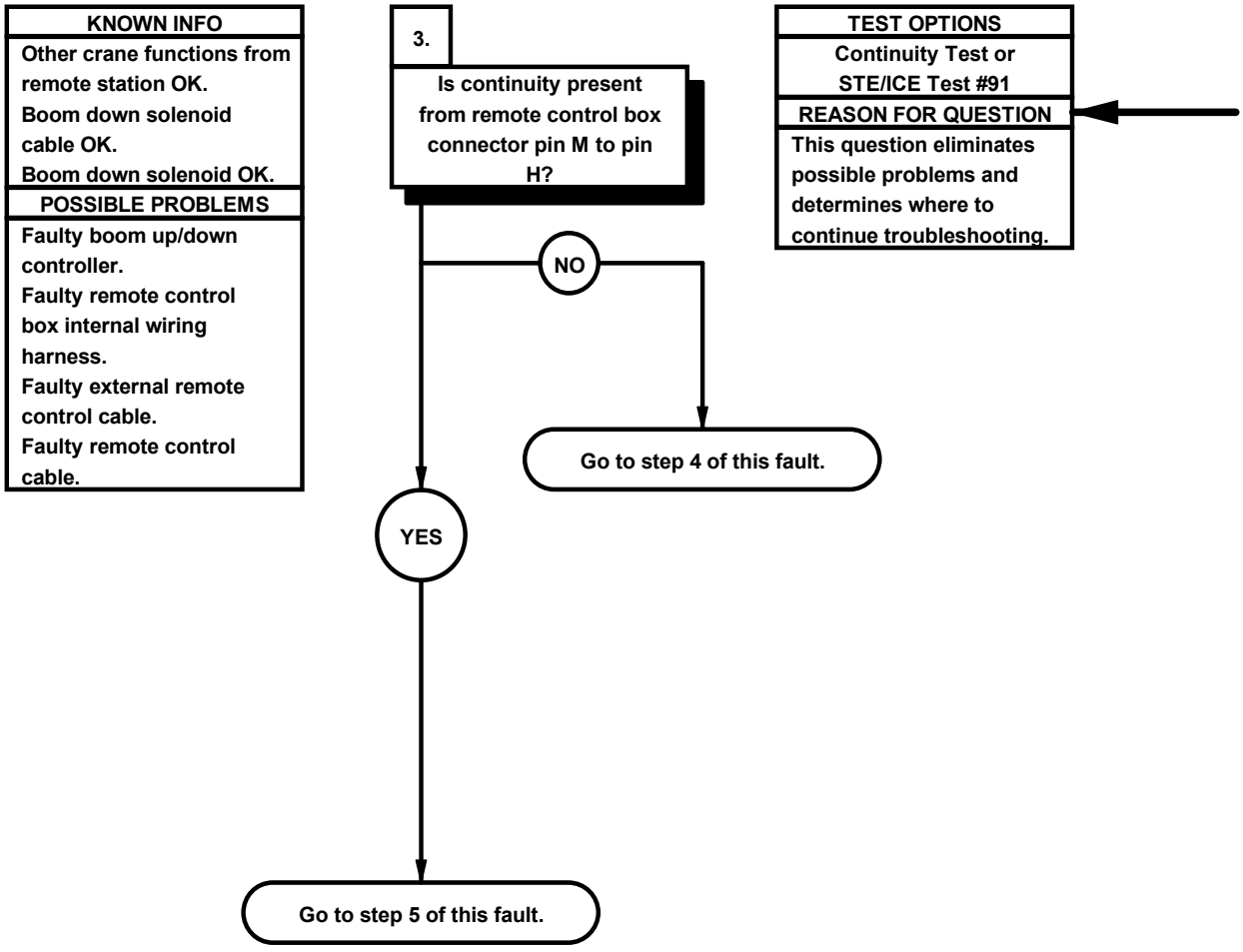


CONTINUITY TEST

(1) Disconnect boom down solenoid connector from boom down solenoid.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin 2 of boom down solenoid cable connector.
(4) Connect negative (-) probe of multimeter on ground and note reading on multimeter.
(5) Connect positive (+) probe of multimeter on pin 1 of boom down solenoid cable connector.
(6) Connect negative (-) probe of multimeter on terminal board lower position 22 and note reading on multimeter.
(7) If continuity is not present, replace boom down solenoid cable (para 7-86).
(8) If continuity is present, notify DS Maintenance.
(9) Connect boom down solenoid cable connector to boom down solenoid.
(10) Close cover on junction box.
(11) Tighten four screws on junction box cover.
(12) Stow crane (TM 9-2320-366-10-1).



e109. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM DOWN DOES NOT OPERATE FROM REMOTE STATION (CONT)



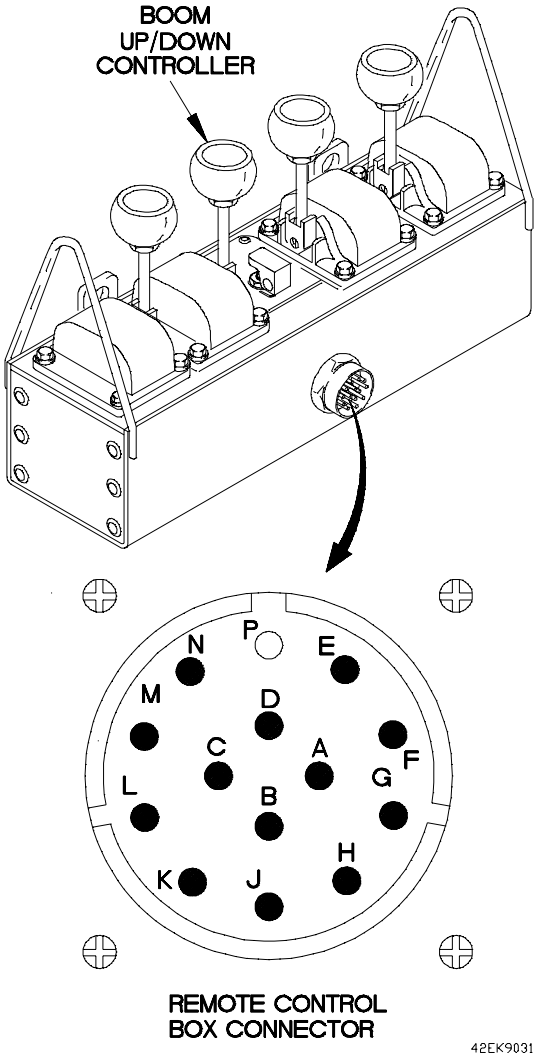
CONTINUITY TEST

(1) Disconnect external remote control cable from remote control box.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin M of connector on remote control box.
(4) Connect negative (-) probe of multimeter on pin H of connector on remote control box.

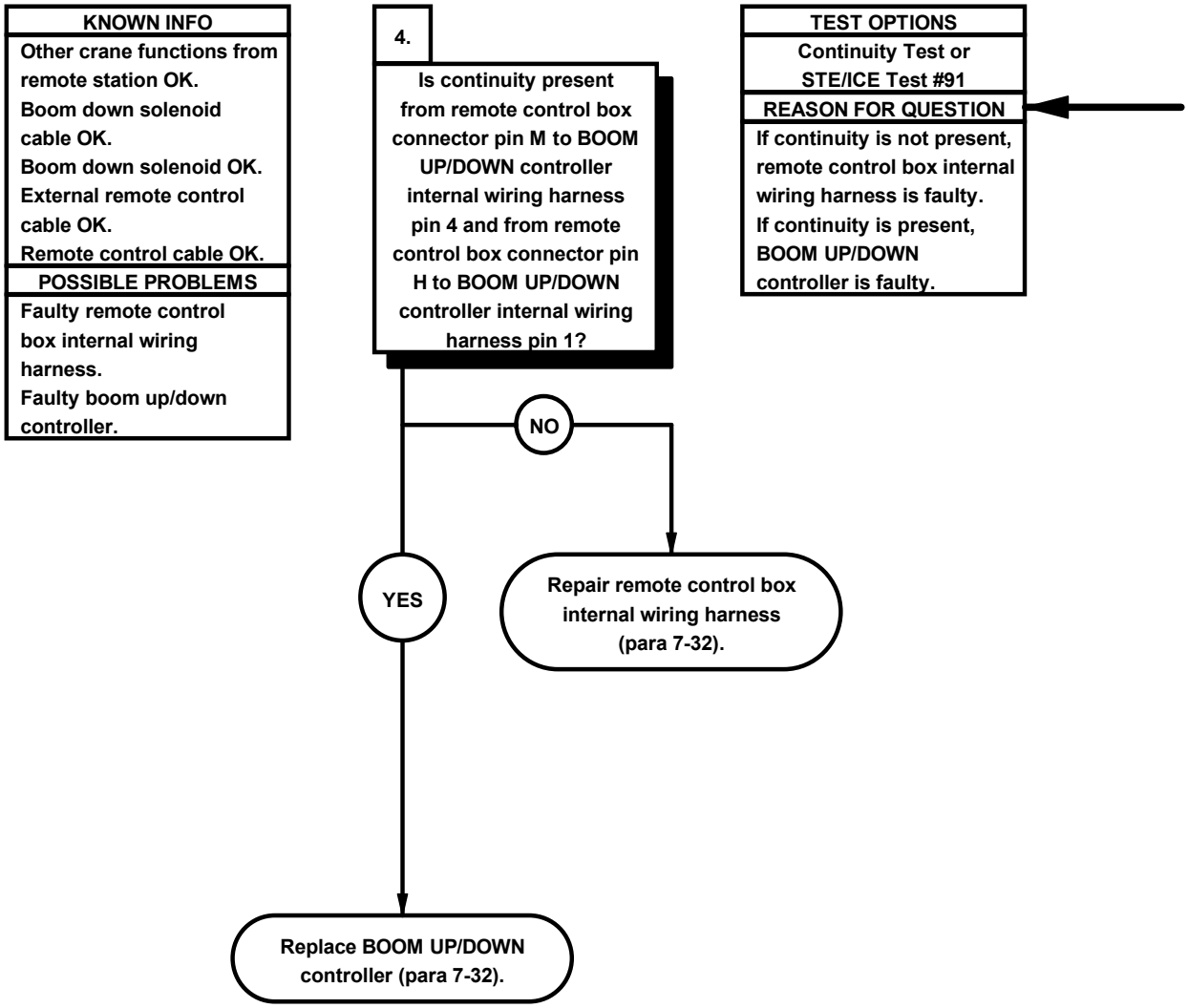
NOTE

Step (5) requires the aid of an assistant.

(5) Position BOOM UP/DOWN controller to DOWN and note reading on multimeter.
(6) If continuity is not present, go to step 4 of this fault.
(7) If continuity is present, go to step 5 of this fault.

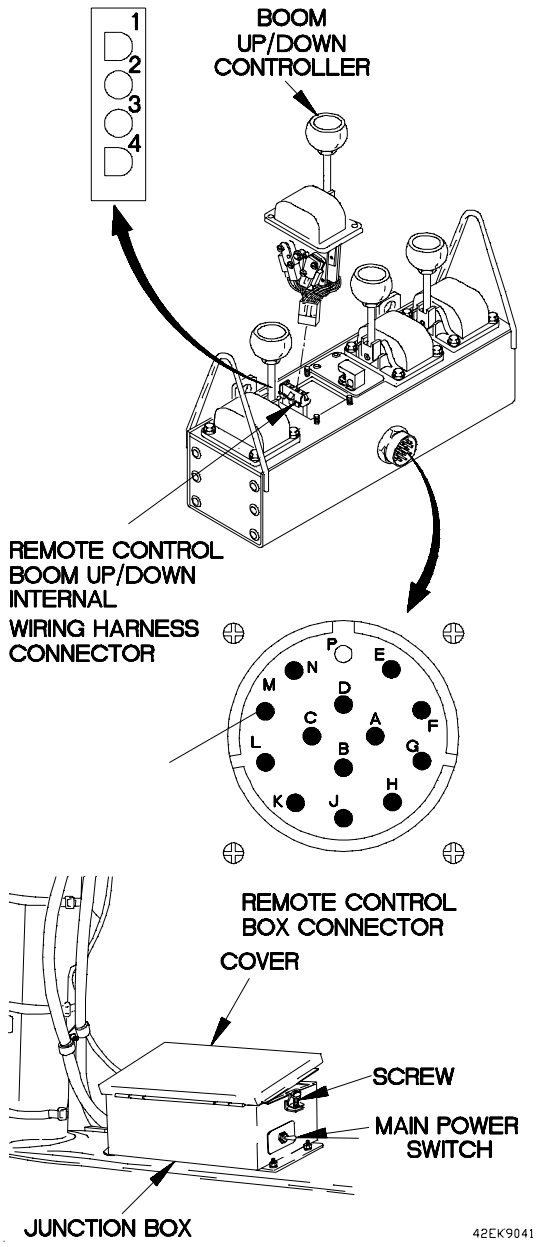


e109. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM DOWN DOES NOT OPERATE FROM REMOTE STATION (CONT)

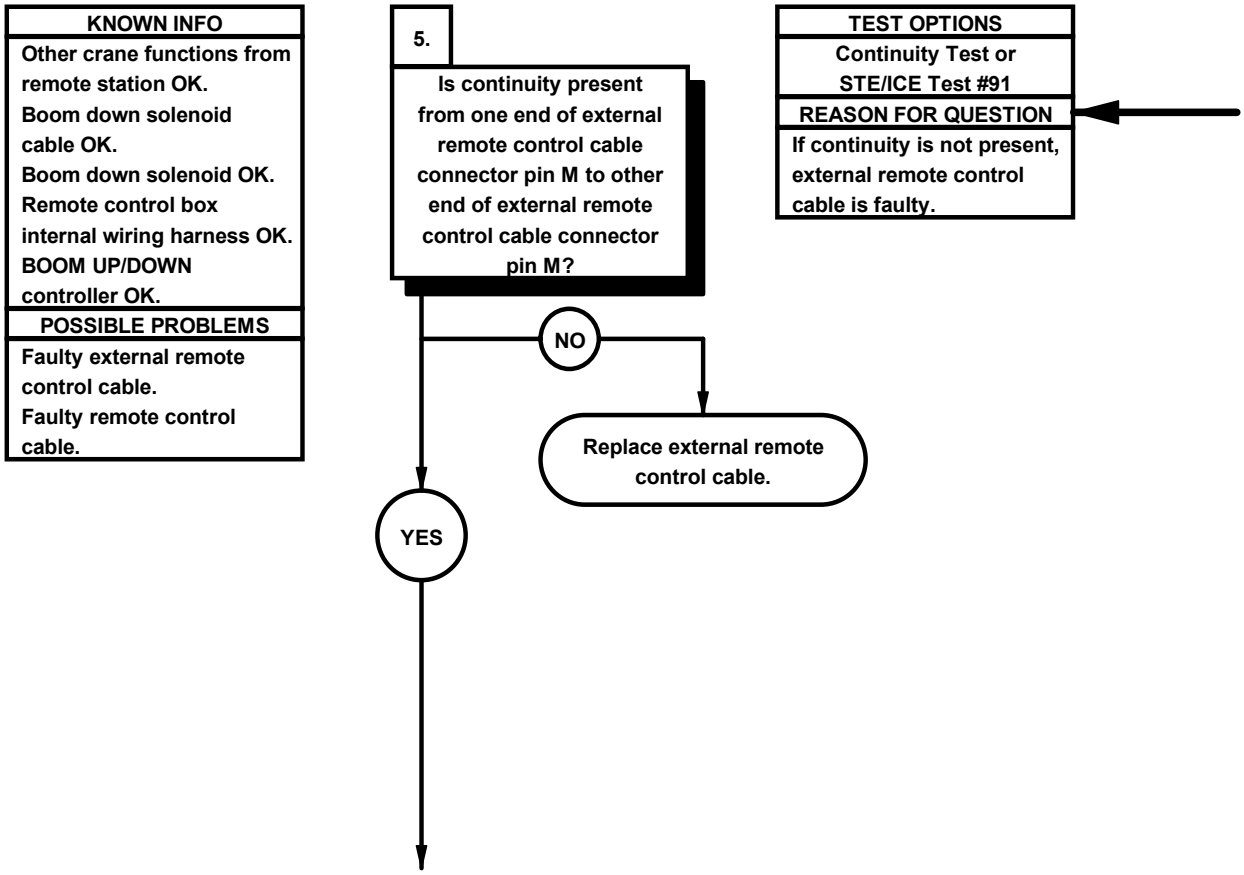


CONTINUITY TEST

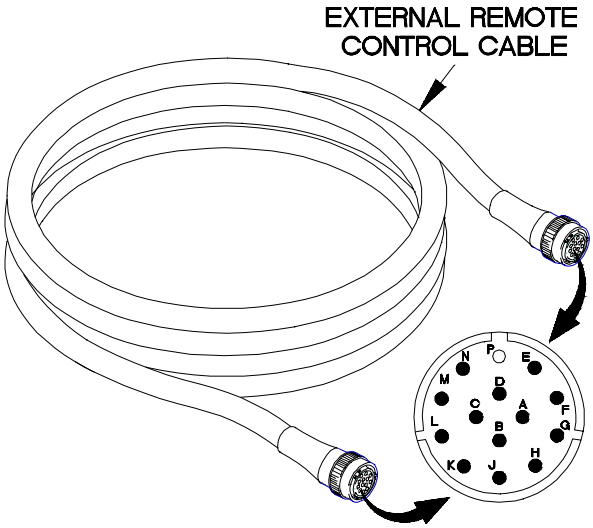
(1) Remove BOOM UP/DOWN controller (para 7-32).
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin M of remote control box connector.
(4) Connect negative (-) probe of multimeter on pin 4 of BOOM UP/DOWN controller internal wiring harness and note reading on multimeter.
(5) Connect positive (+) probe of multimeter on pin H of remote control box connector.
(6) Connect negative (-) probe of multimeter on pin 1 of BOOM UP/DOWN controller internal wiring harness and note reading on multimeter.
(7) If continuity is not present, replace remote control box internal wiring harness (para 7-32).
(8) If continuity is present, replace BOOM UP/DOWN controller (para 7-32).
(9) Install BOOM UP/DOWN controller (para 7-32).
(10) Close cover on junction box.
(11) Tighten four screws on junction box cover.
(12) Stow crane (TM 9-2320-366-10-1).



e109. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM DOWN DOES NOT OPERATE FROM REMOTE STATION (CONT)

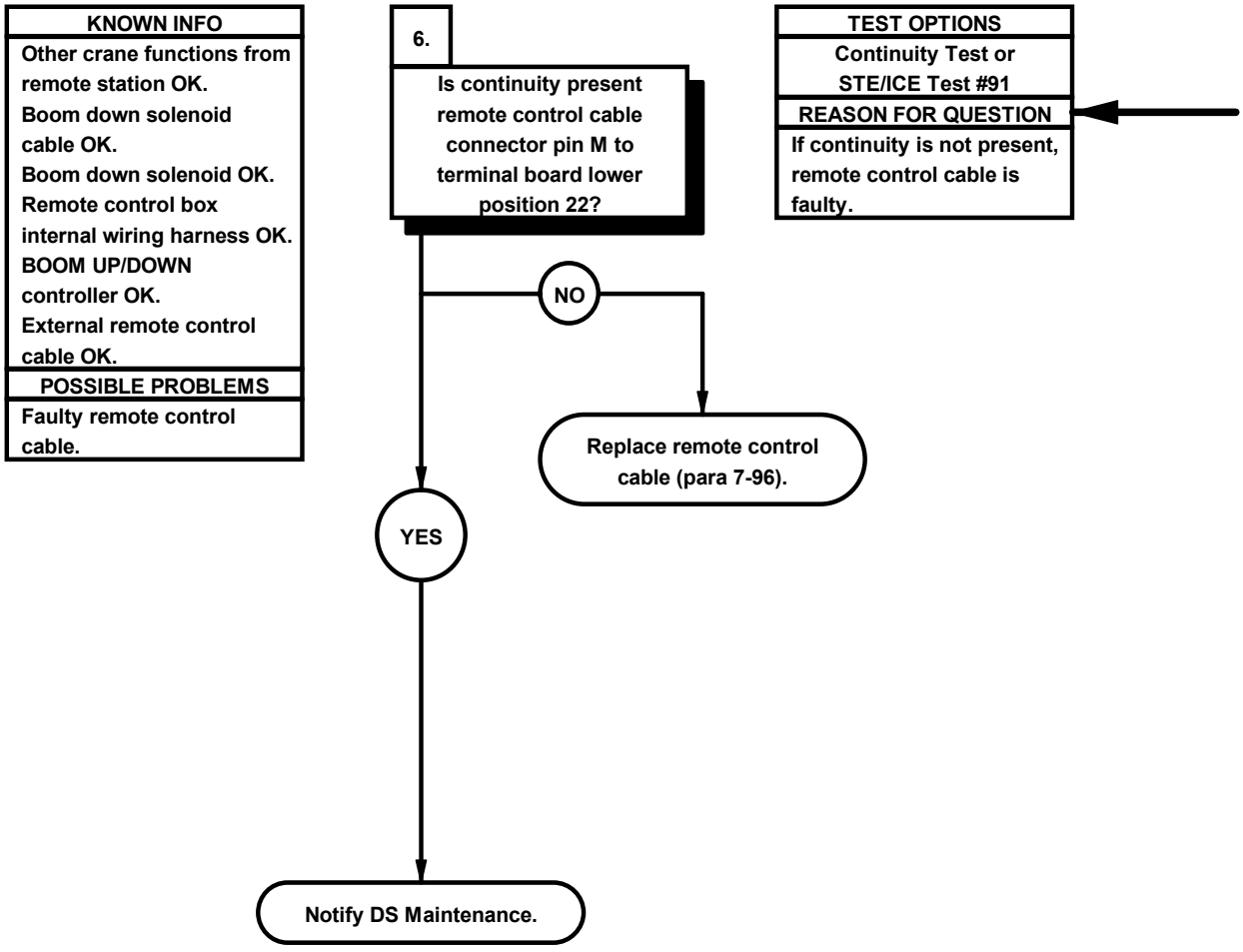


CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin M of one end of external remote control cable connector.
(3) Connect negative (-) probe of multimeter on pin M of other end of external remote control cable and note reading on multimeter.
(4) If continuity is not present, replace external remote control cable.



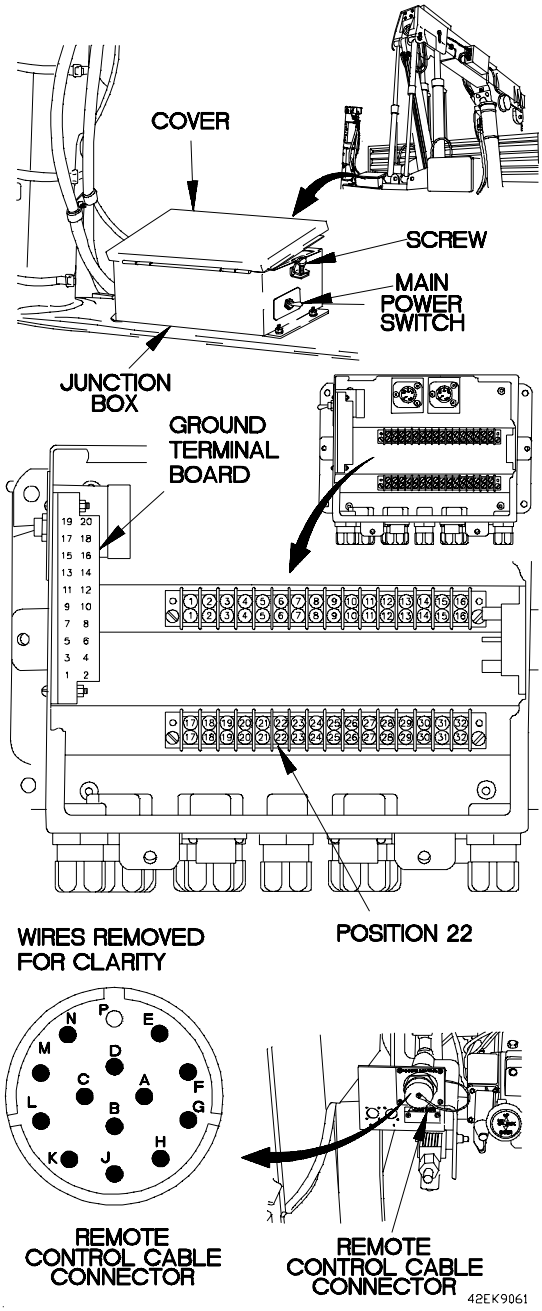
42E1395-

e109. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM DOWN DOES NOT OPERATE FROM REMOTE STATION (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin M of remote control cable connector.
(3) Connect negative (-) probe of multimeter on terminal board lower position 22 and note reading on multimeter.
(4) If continuity is not present, replace remote control cable (para 7-96).
(5) If continuity is present, notify DS Maintenance.
(6) Close cover on junction box.
(7) Tighten four screws on junction box cover.
(8) Stow crane (TM 9-2320-366-10-1).



e110. M1084/M1086 MATERIAL HANDLING CRANE (MHC) TELESCOPE IN DOES NOT OPERATE FROM REMOTE STATION

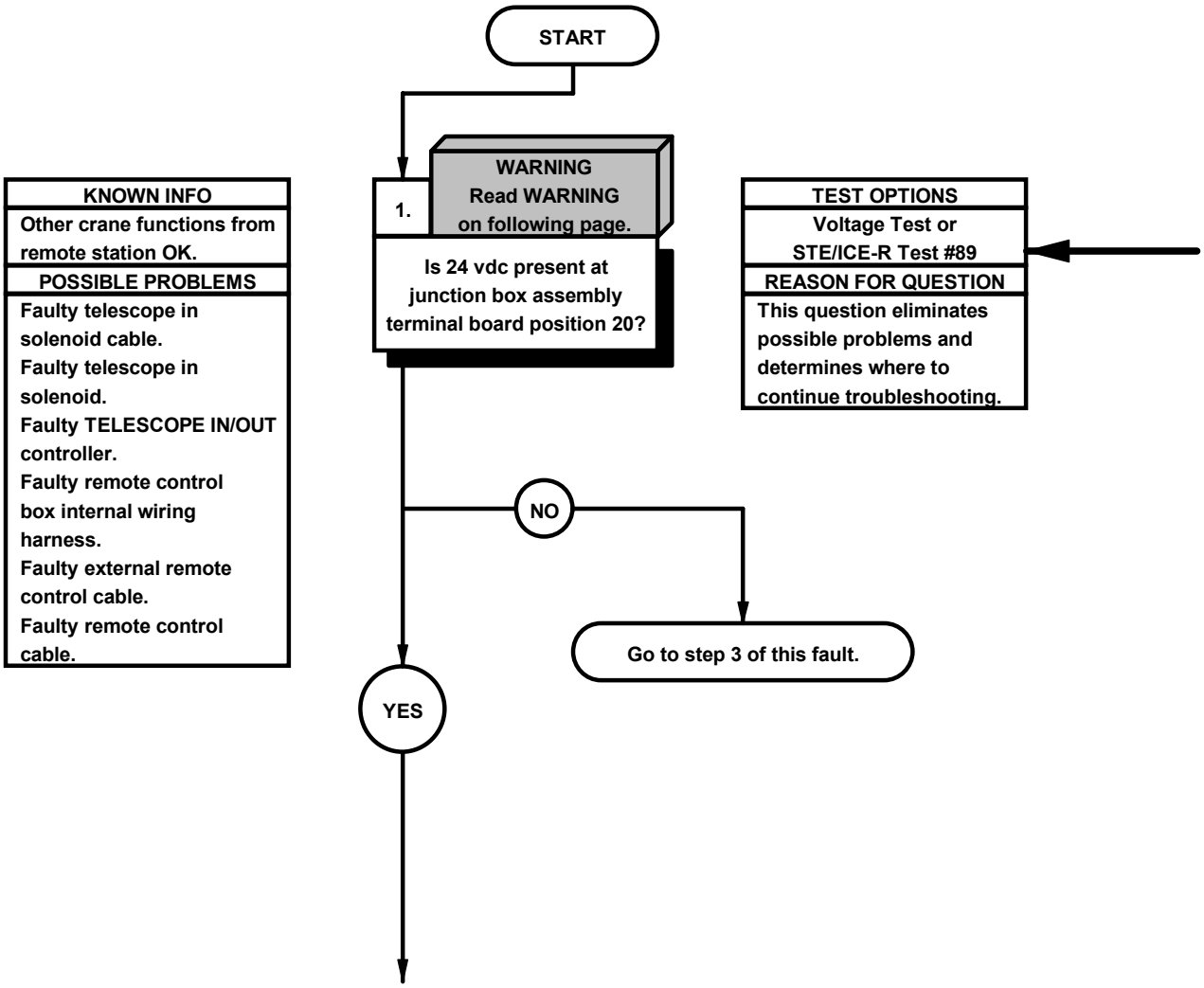
INITIAL SETUP

Equipment Conditions
Outriggers lowered (TM 9-2320-366-10-1).
Crane erected with approximately five feet of cable payed out (TM 9-2320-366-10-1).
Engine shut down (TM 9-2320-366-10-1).

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

References
TM 9-4910-571-12&P



WARNING

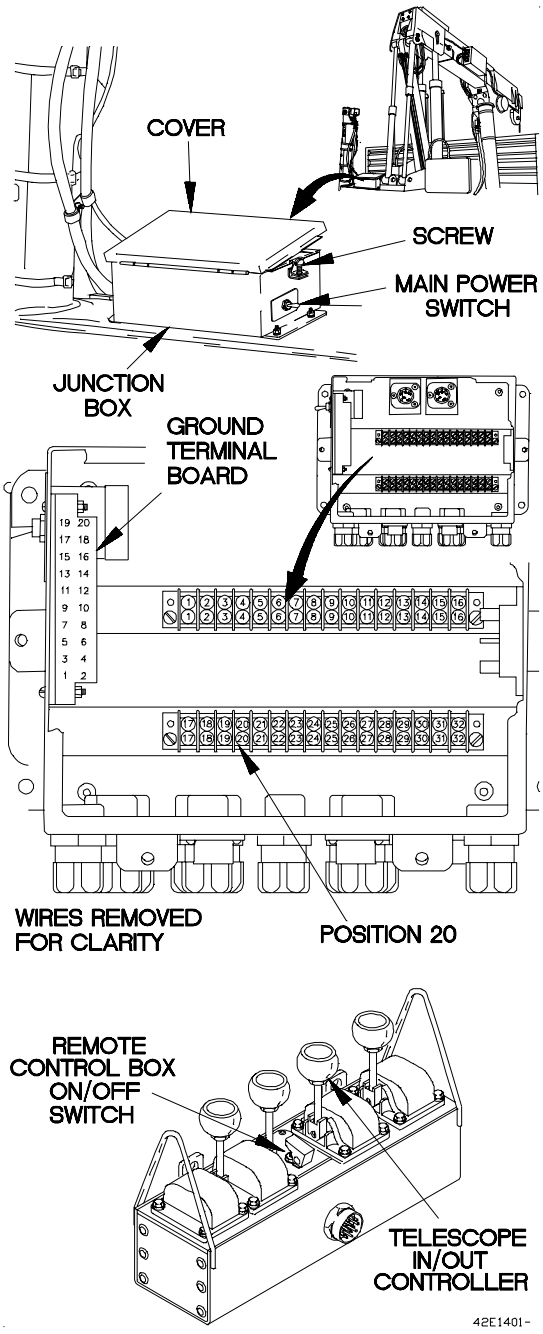
Remove rings, bracelets, watches, necklaces, and any other jewelry beffore working around vehicle. Jewelery can catch on equipment and cause injury or short circuit across electrical circuits and cause severe burns or electrical shock.

OUTPUT VOLTAGE TEST

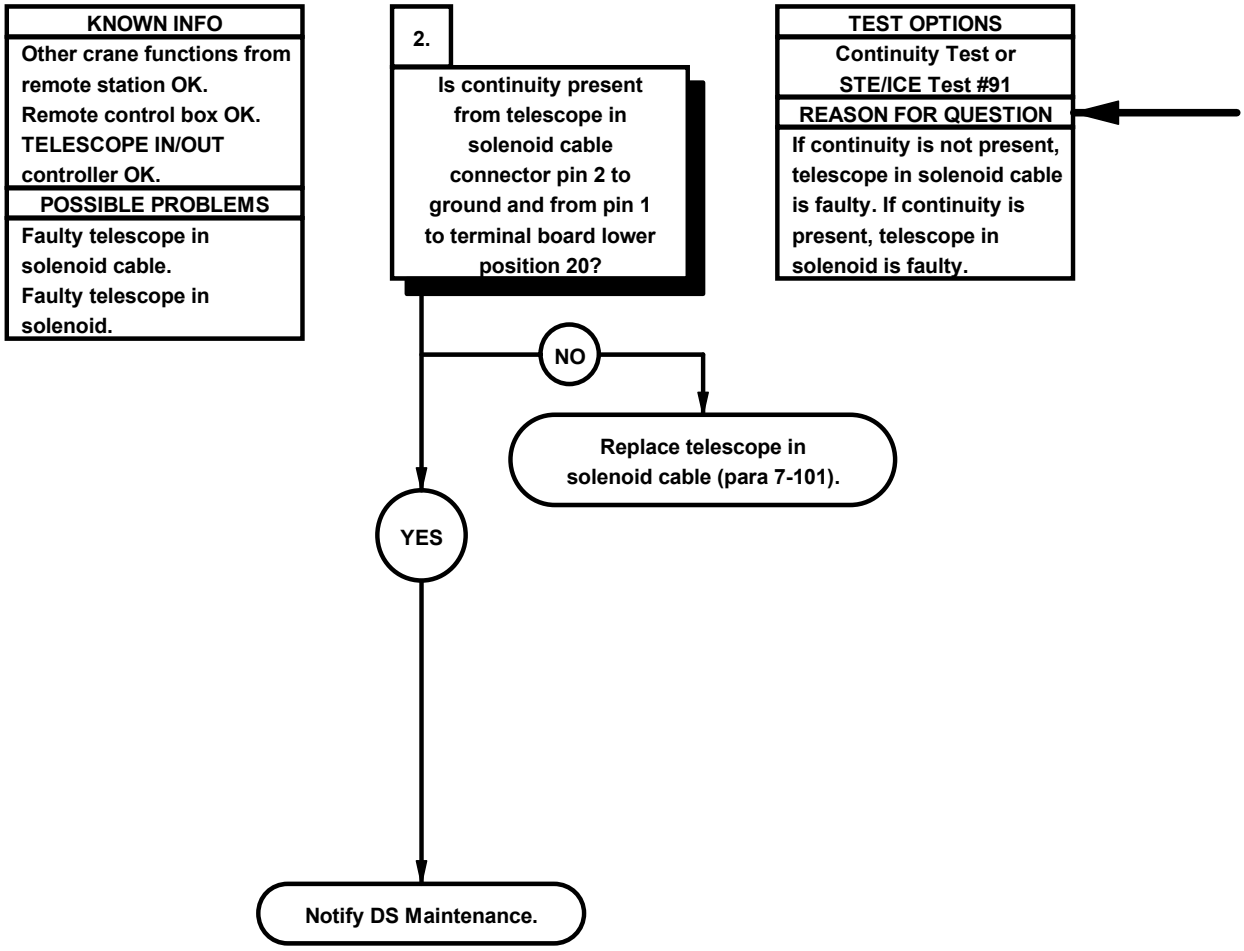
(1) Connect external remote control cable to remote control box (TM 9-2320-366-10-1).
(2) Loosen four screws on junction box.
(3) Open cover on junction box.
(4) Position MAIN POWER switch to ON.
(5) Lift guard and position remote control box ON/OFF switch to ON.
(6) Set multimeter to volts dc.
(7) Connect positive (+) probe of multimeter on terminal board lower position 20.
(8) Connect negative (-) probe of multimeter on ground quick-connect terminal board (above MAIN POWER switch).

NOTE
Step (9) requires the aid of an assistant.

(9) Position TELESCOPE IN/OUT to IN and note reading on multimeter.
(10) If 24 volts dc is not present, go to step 3 of this fault.

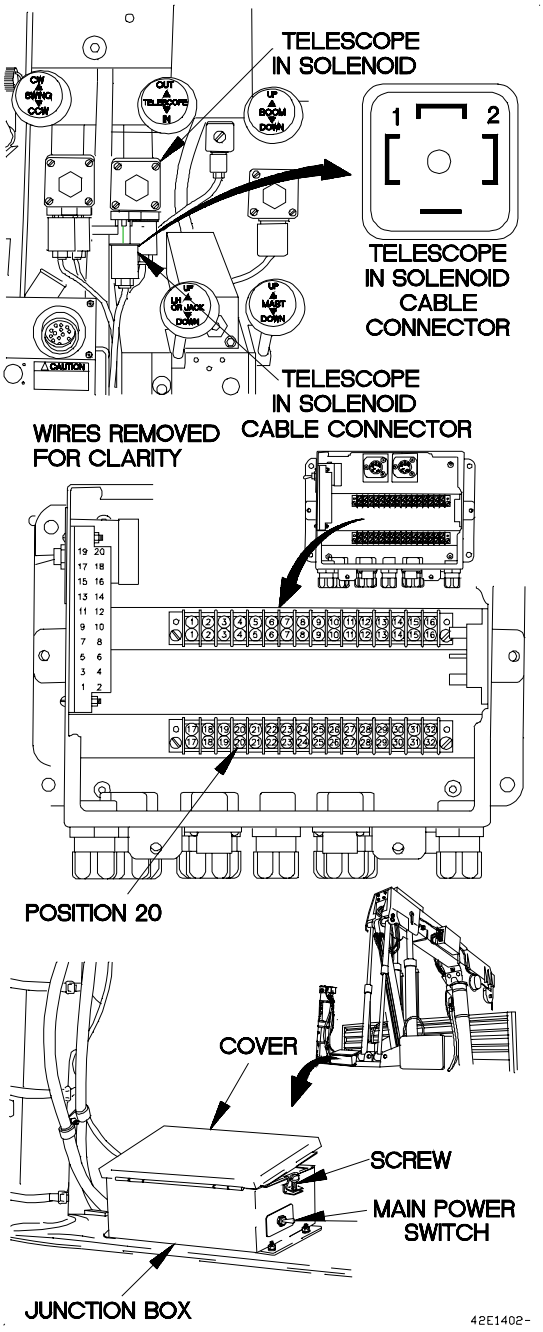


e110. M1084/M1086 MATERIAL HANDLING CRANE (MHC) TELESCOPE IN DOES NOT OPERATE FROM REMOTE STATION (CONT)

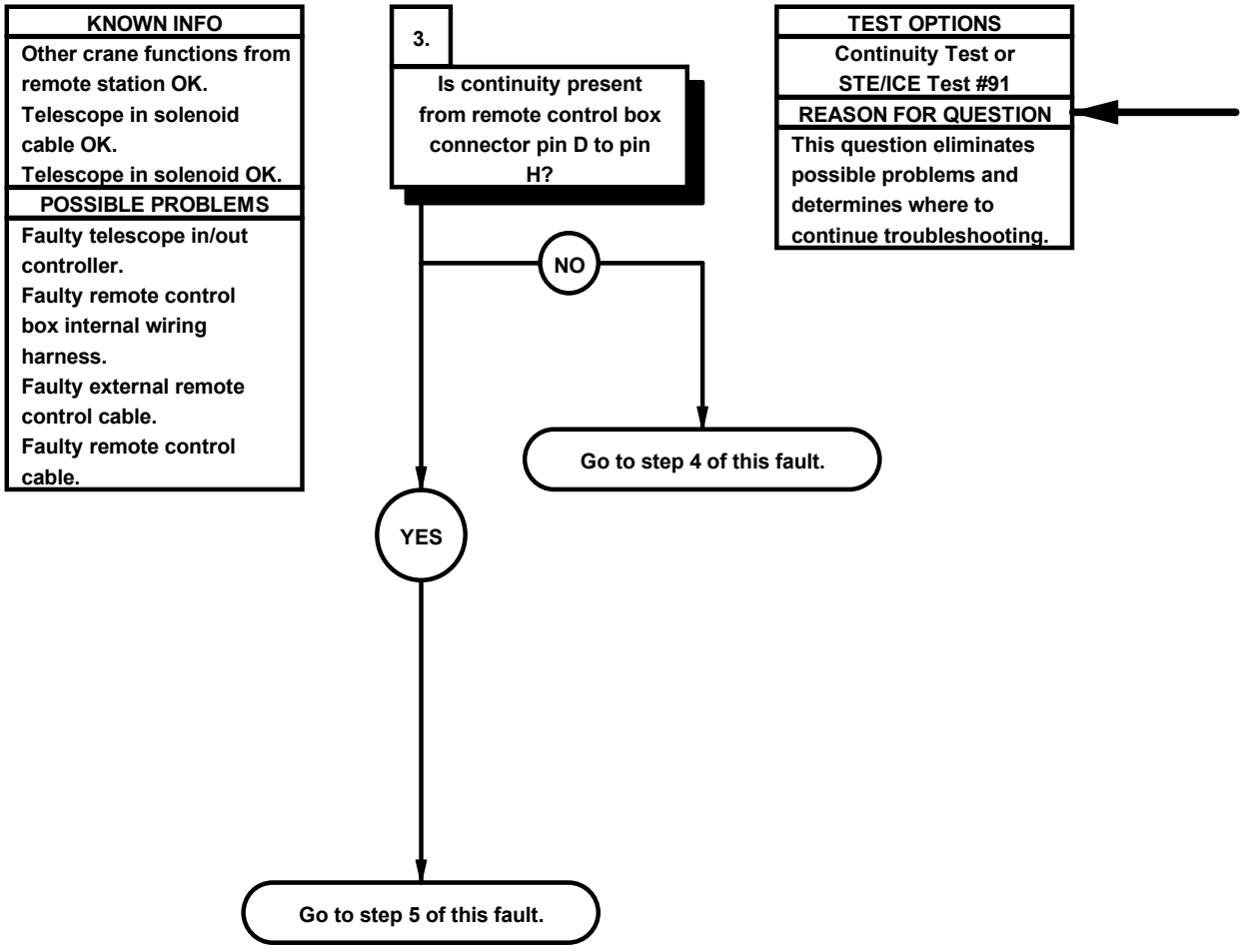


CONTINUITY TEST

(1) Disconnect telescope in solenoid connector from telescope in solenoid.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin 2 of telescope in solenoid cable connector.
(4) Connect negative (-) probe of multimeter on ground and note reading on multimeter.
(5) Connect positive (+) probe of multimeter on pin 1 of telescope in solenoid cable connector.
(6) Connect negative (-) probe of multimeter on terminal board lower position 20 and note reading on multimeter.
(7) If continuity is not present, replace telescope in solenoid cable (para 7-101).
(8) If continuity is present, notify DS Maintenance.
(9) Connect telescope in solenoid cable connector to telescope in solenoid.
(10) Close cover on junction box.
(11) Tighten four screws on junction box cover.
(12) Stow crane (TM 9-2320-366-10-1).



e110. M1084/M1086 MATERIAL HANDLING CRANE (MHC) TELESCOPE IN DOES NOT OPERATE FROM REMOTE STATION (CONT)



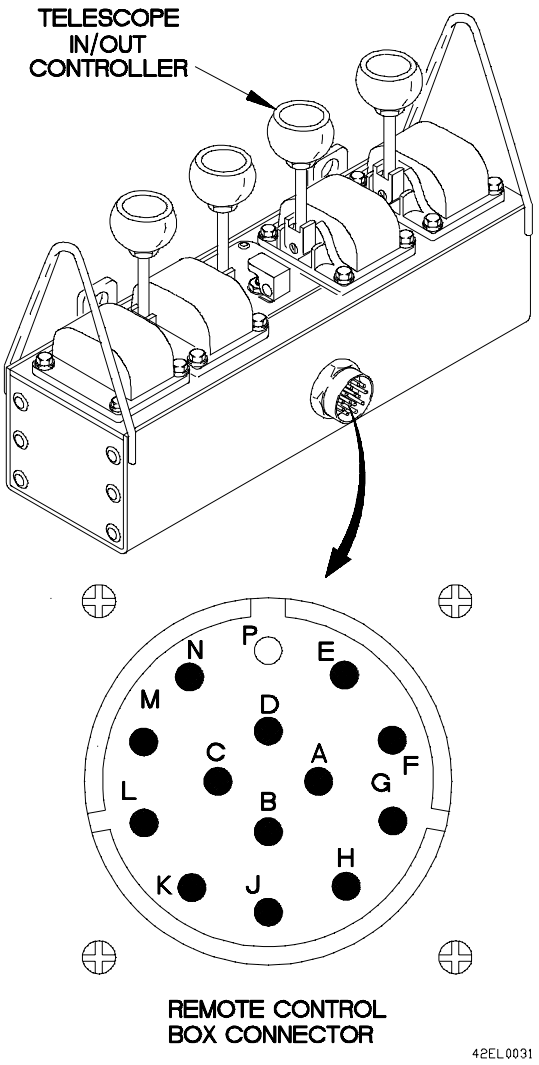
CONTINUITY TEST

(1) Disconnect external remote control cable from remote control box.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin D of connector on remote control box.
(4) Connect negative (-) probe of multimeter on pin H of connector on remote control box.

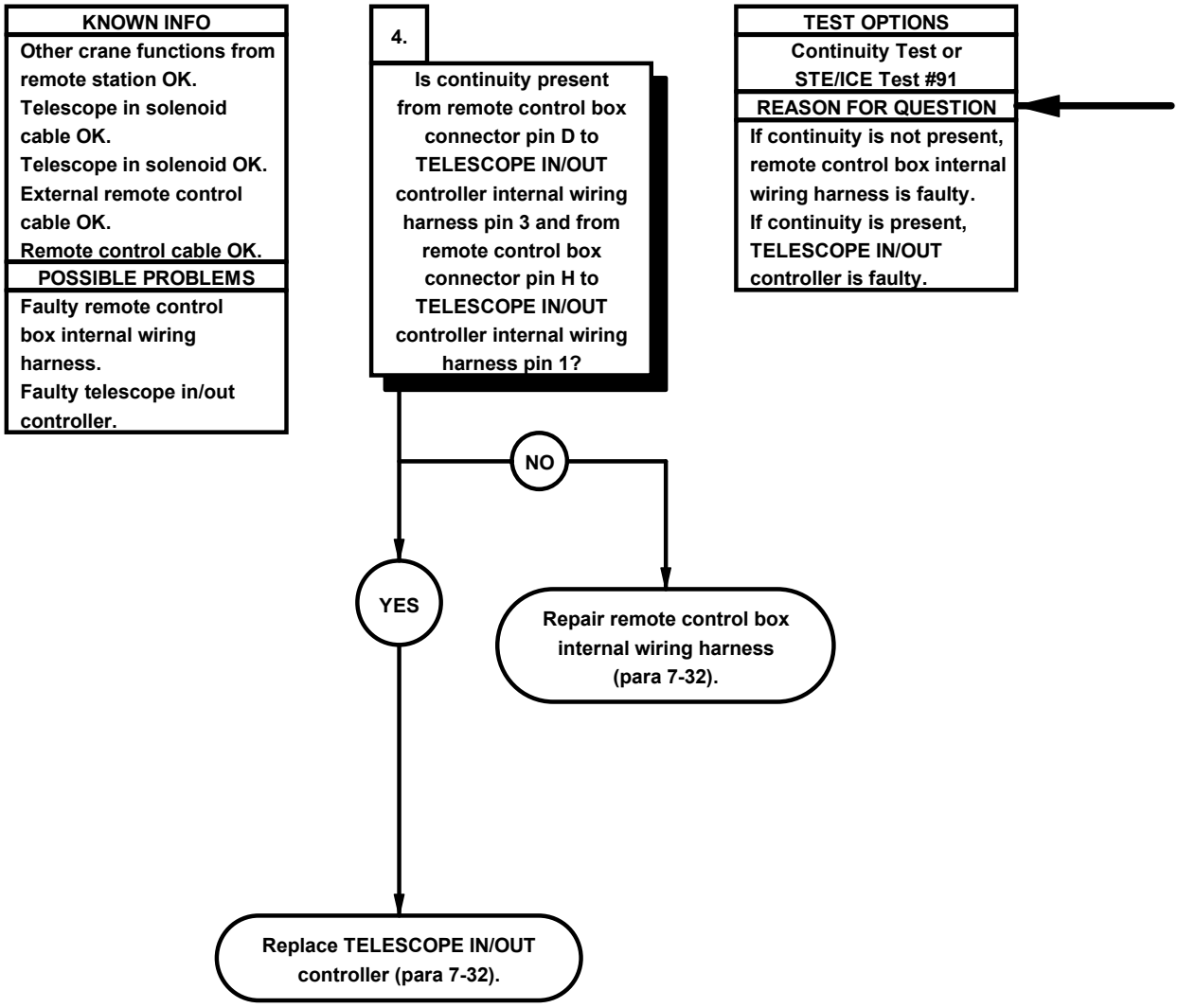
NOTE

Step (5) requires the aid of an assistant.

(5) Position TELESCOPE IN/OUT controller to IN and note reading on multimeter.
(6) If continuity is not present, go to step 4 of this fault.
(7) If continuity is present, go to step 5 of this fault.

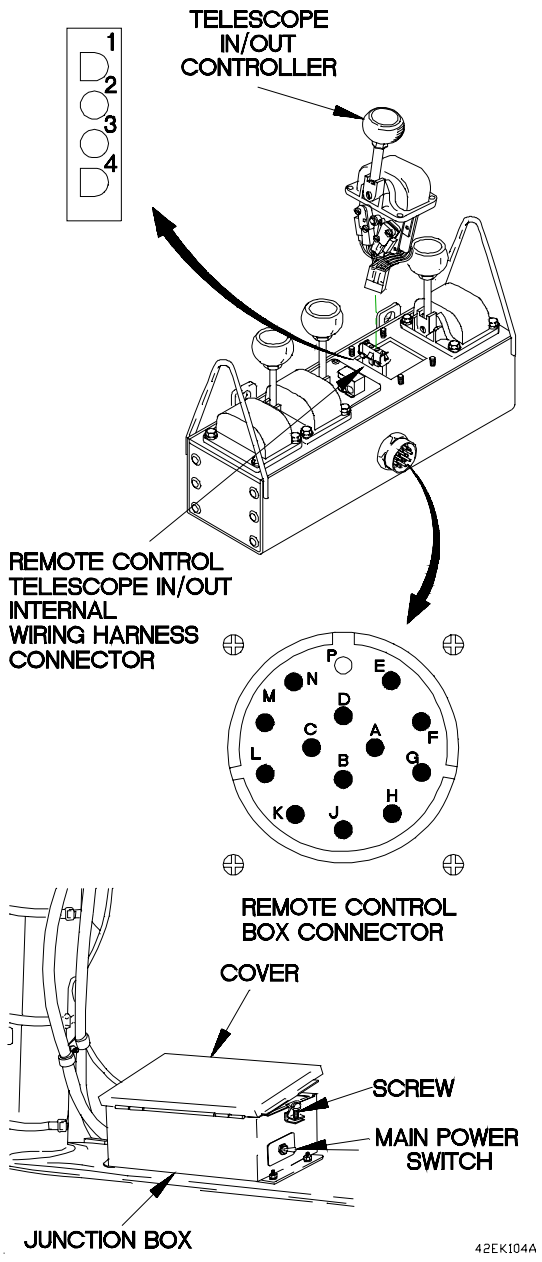


e110. M1084/M1086 MATERIAL HANDLING CRANE (MHC) TELESCOPE IN DOES NOT OPERATE FROM REMOTE STATION (CONT)

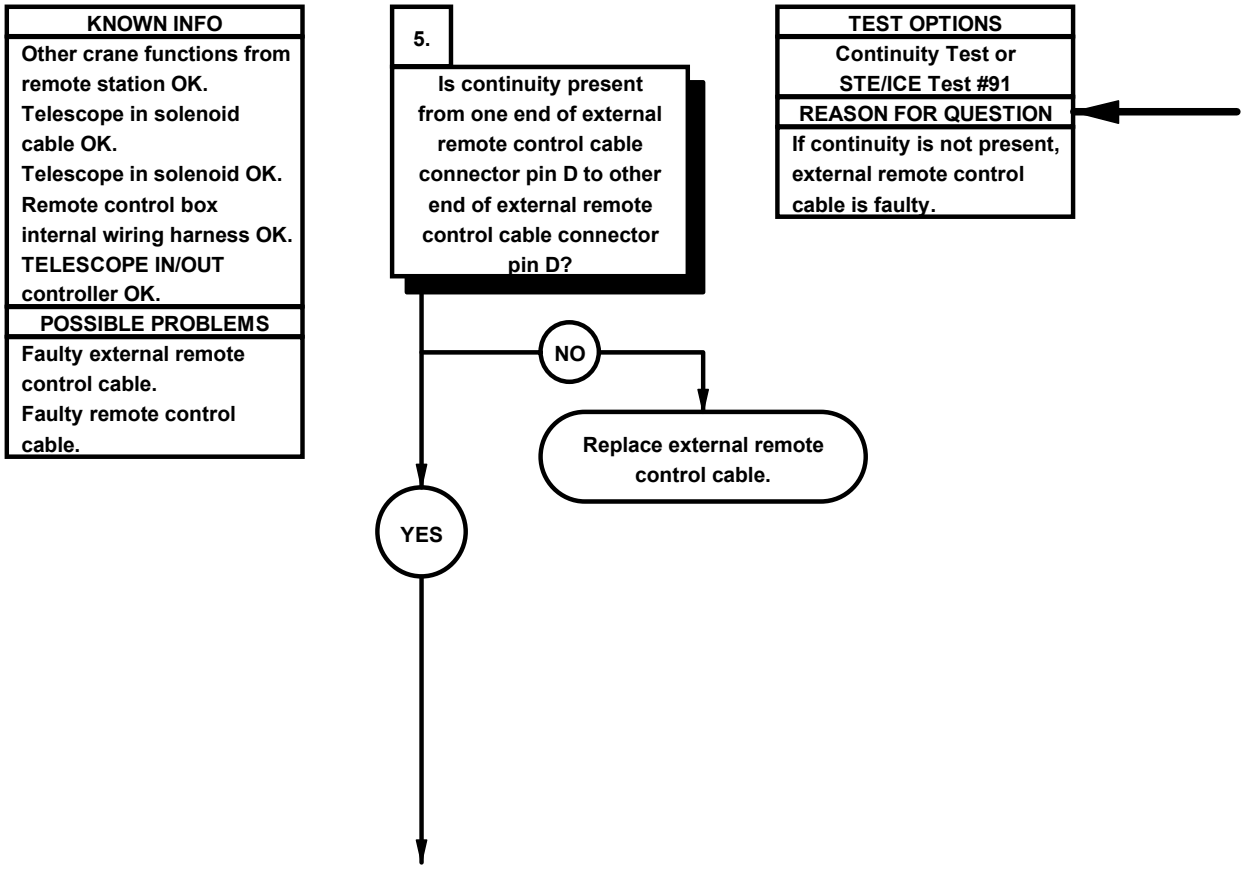


CONTINUITY TEST

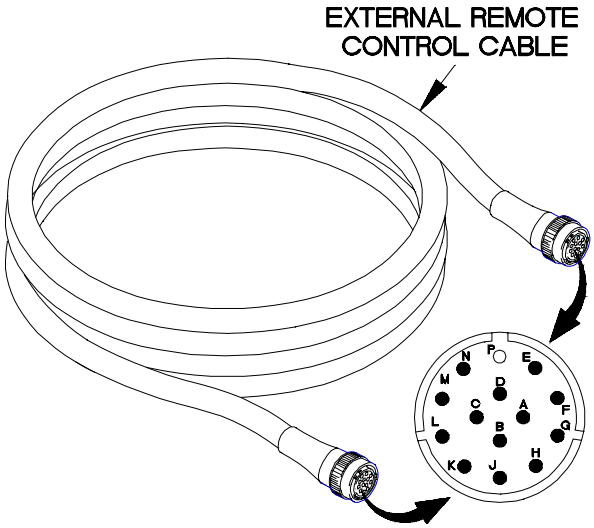
(1) Remove TELESCOPE IN/OUT controller (para 7-32).
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin D of remote control box connector.
(4) Connect negative (-) probe of multimeter on pin 3 of TELESCOPE IN/OUT controller internal wiring harness and note reading on multimeter.
(5) Connect positive (+) probe of multimeter on pin H of remote control box connector.
(6) Connect negative (-) probe of multimeter on pin 1 of TELESCOPE IN/OUT controller internal wiring harness and note reading on multimeter.
(7) If continuity is not present, replace remote control box internal wiring harness (para 7-32).
(8) If continuity is present, replace TELESCOPE IN/OUT controller (para 7-32).
(9) Install TELESCOPE IN/OUT controller (para 7-32).
(10) Close cover on junction box.
(11) Tighten four screws on junction box cover.
(12) Stow crane (TM 9-2320-366-10-1).



e110. M1084/M1086 MATERIAL HANDLING CRANE (MHC) TELESCOPE IN DOES NOT OPERATE FROM REMOTE STATION (CONT)

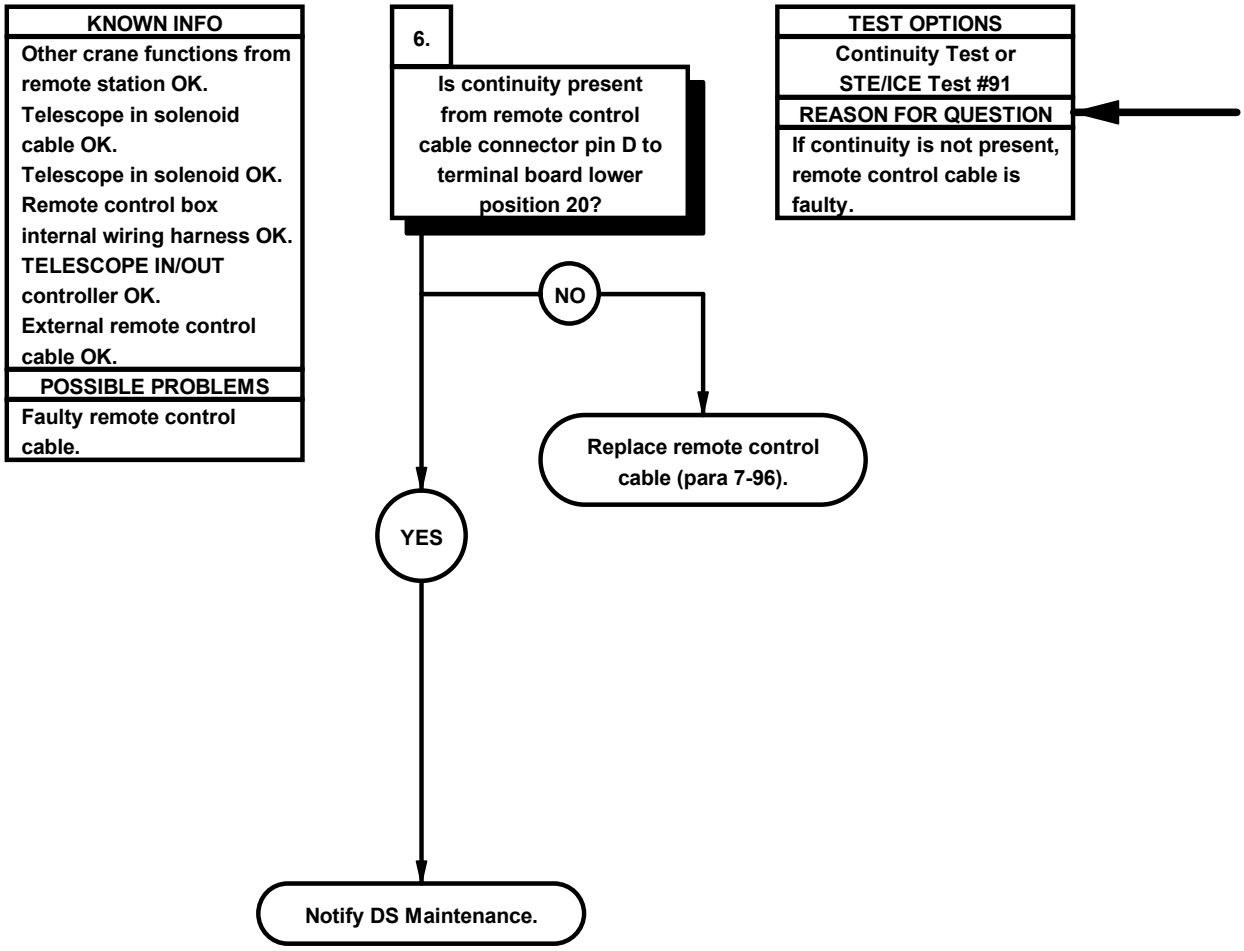


CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin D of one end of external remote control cable connector.
(3) Connect negative (-) probe of multimeter on pin D of other end of external remote control cable and note reading on multimeter.
(4) If continuity is not present, replace external remote control cable.



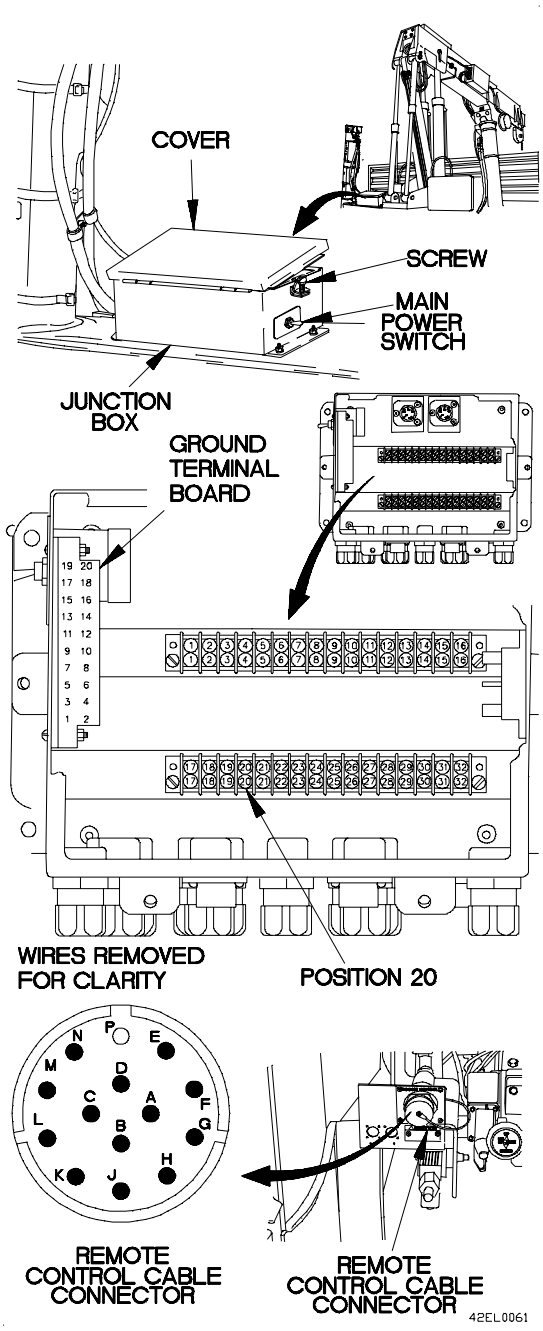
42E1405-

e110. M1084/M1086 MATERIAL HANDLING CRANE (MHC) TELESCOPE IN DOES NOT OPERATE FROM REMOTE STATION (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin D of remote control cable connector.
(3) Connect negative (-) probe of multimeter on terminal board lower position 20 and note reading on multimeter.
(4) If continuity is not present, replace remote control cable (para 7-96).
(5) If continuity is present, notify DS Maintenance.
(6) Close cover on junction box.
(7) Tighten four screws on junction box cover.
(8) Stow crane (TM 9-2320-366-10-1).



e111. M1084/M1086 MATERIAL HANDLING CRANE (MHC) TELESCOPE OUT DOES NOT OPERATE FROM REMOTE STATION

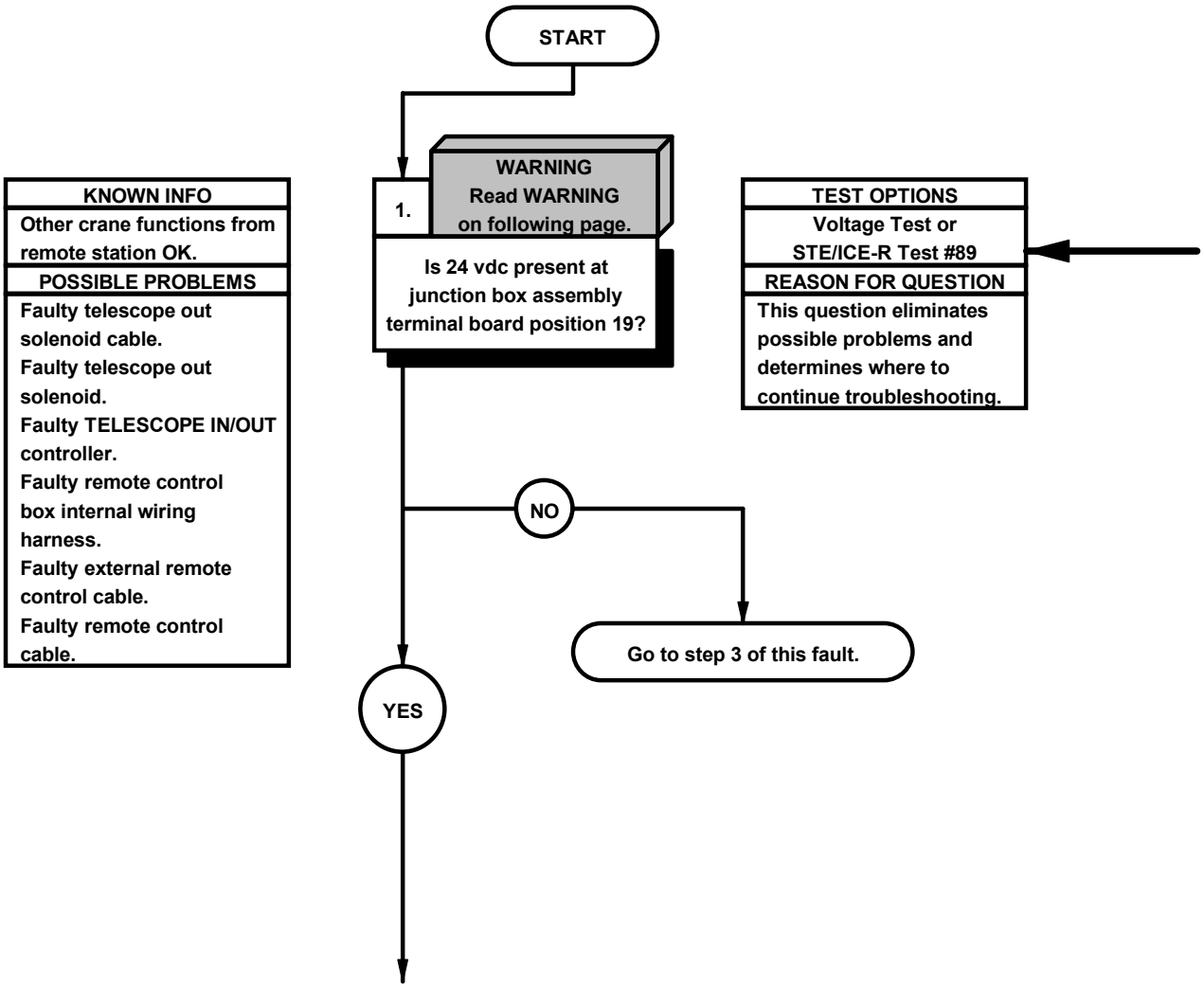
INITIAL SETUP

Equipment Conditions
Outriggers lowered (TM 9-2320-366-10-1).
Crane erected with approximately five feet of cable payed out (TM 9-2320-366-10-1).
Engine shut down (TM 9-2320-366-10-1).

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

References
TM 9-4910-571-12&P



WARNING

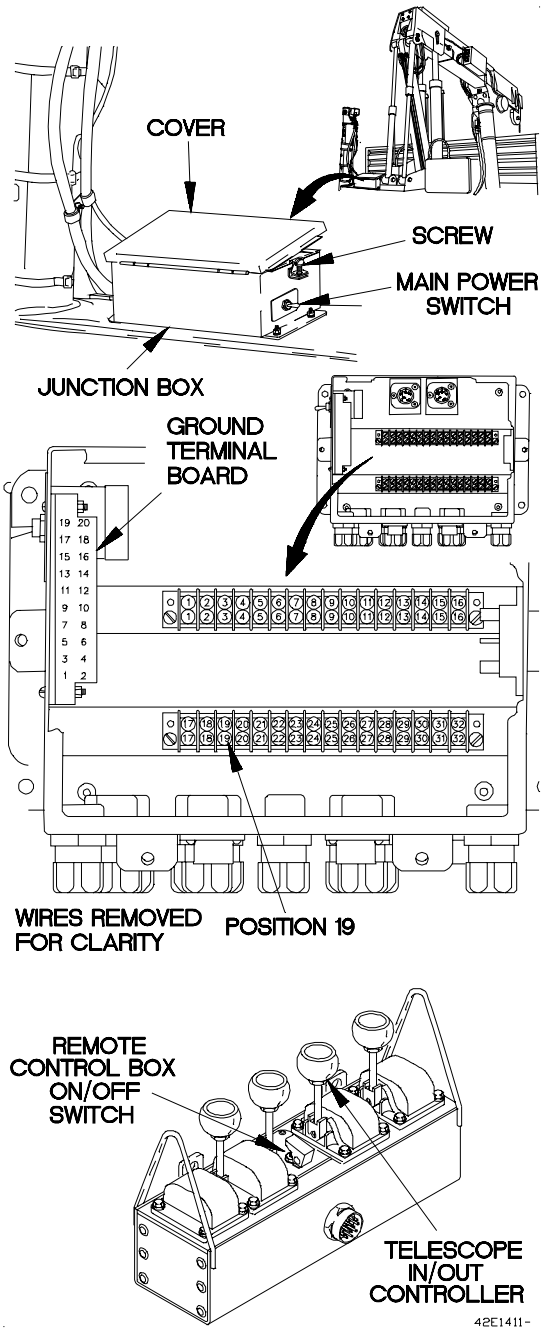
Remove rings, bracelets, watches, necklaces, and any other jewelry beffore working around vehicle. Jewelery can catch on equipment and cause injury or short circuit across electrical circuits and cause severe burns or electrical shock.

OUTPUT VOLTAGE TEST

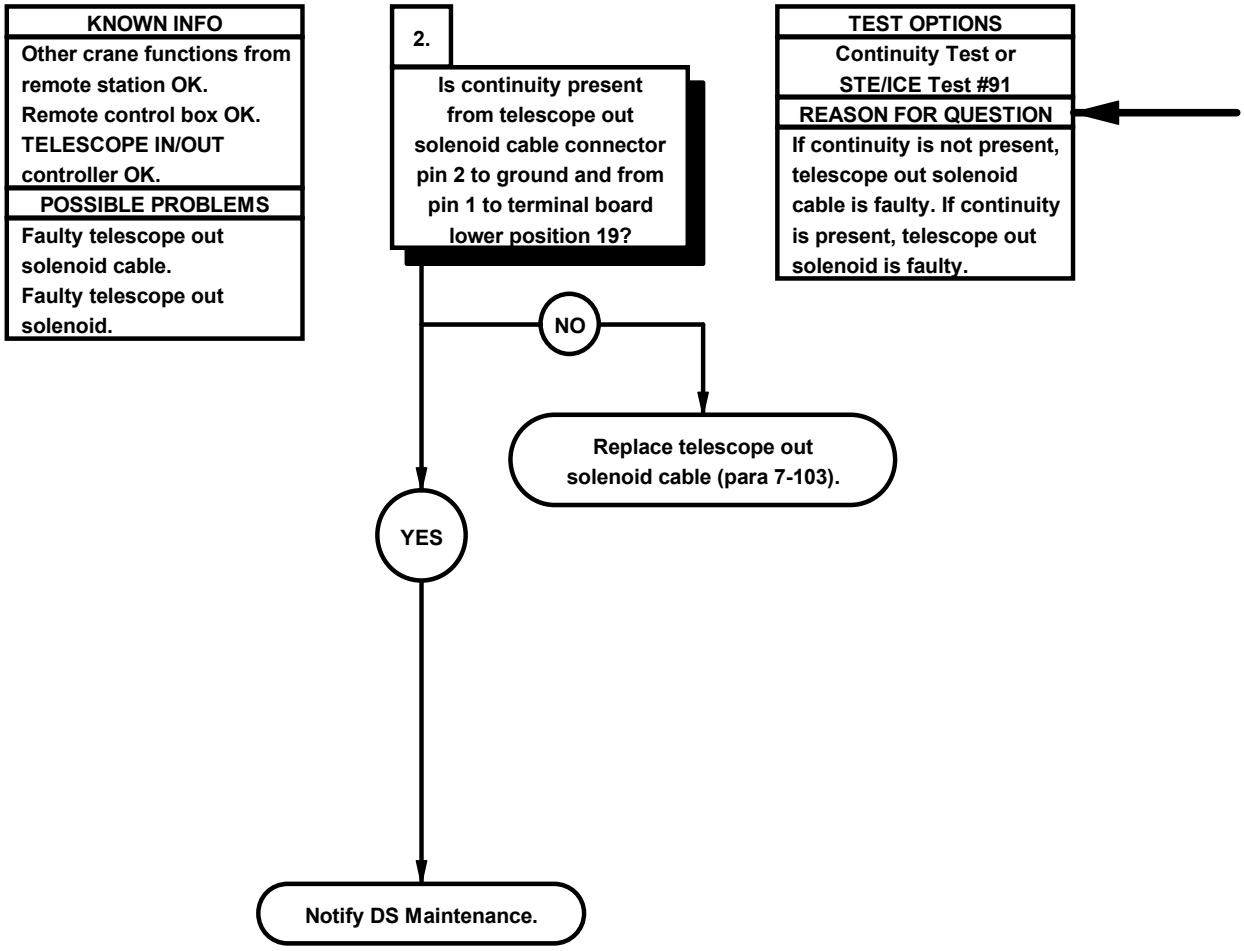
(1) Connect external remote control cable to remote control box (TM 9-2320-366-10-1).
(2) Loosen four screws on junction box.
(3) Open cover on junction box.
(4) Position MAIN POWER switch to ON.
(5) Lift guard and position remote control box ON/OFF switch to ON.
(6) Set multimeter to volts dc.
(7) Connect positive (+) probe of multimeter on terminal board lower position 19.
(8) Connect negative (-) probe of multimeter on ground quick-connect terminal board (above MAIN POWER switch).

NOTE
Step (9) requires the aid of an assistant.

(9) Position TELESCOPE IN/OUT to OUT and note reading on multimeter.
(10) If 24 volts dc is not present, go to step 3 of this fault.

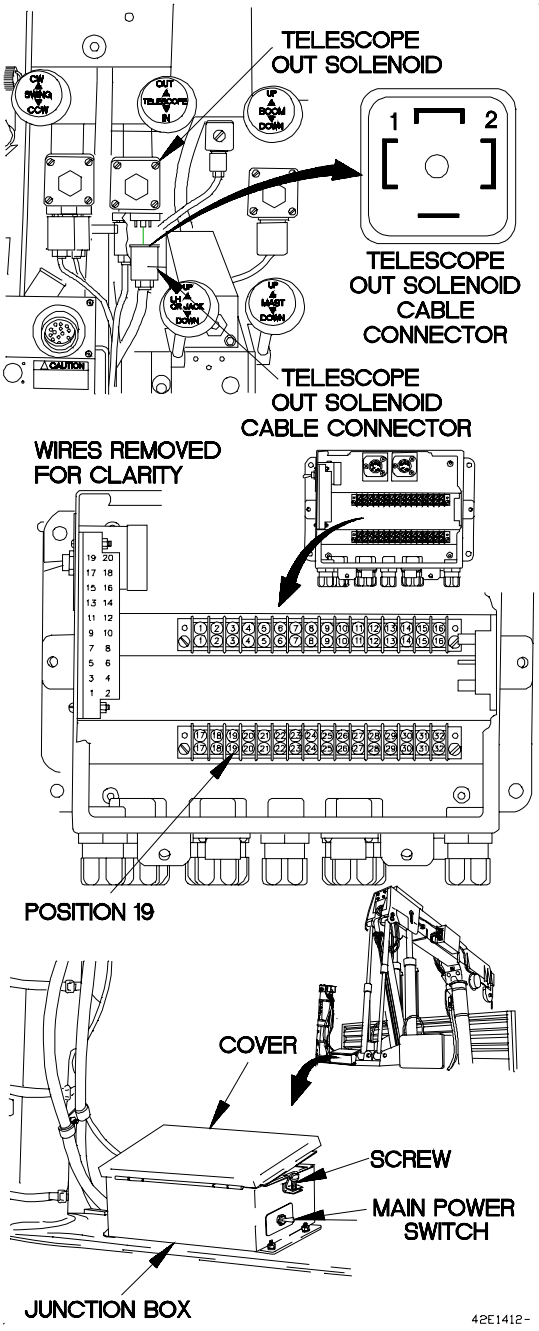


e111. M1084/M1086 MATERIAL HANDLING CRANE (MHC) TELESCOPE OUT DOES NOT OPERATE FROM REMOTE STATION (CONT)

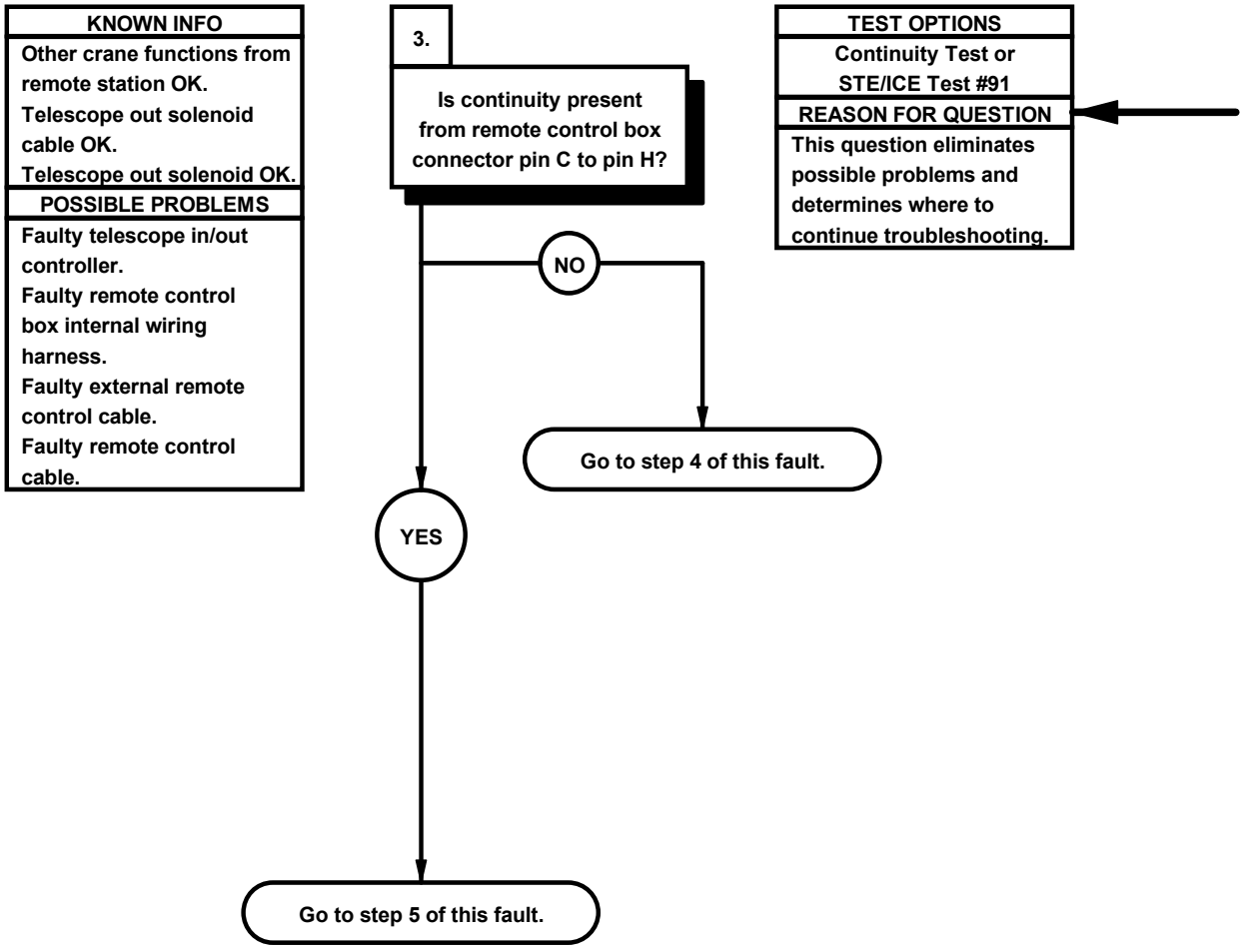


CONTINUITY TEST

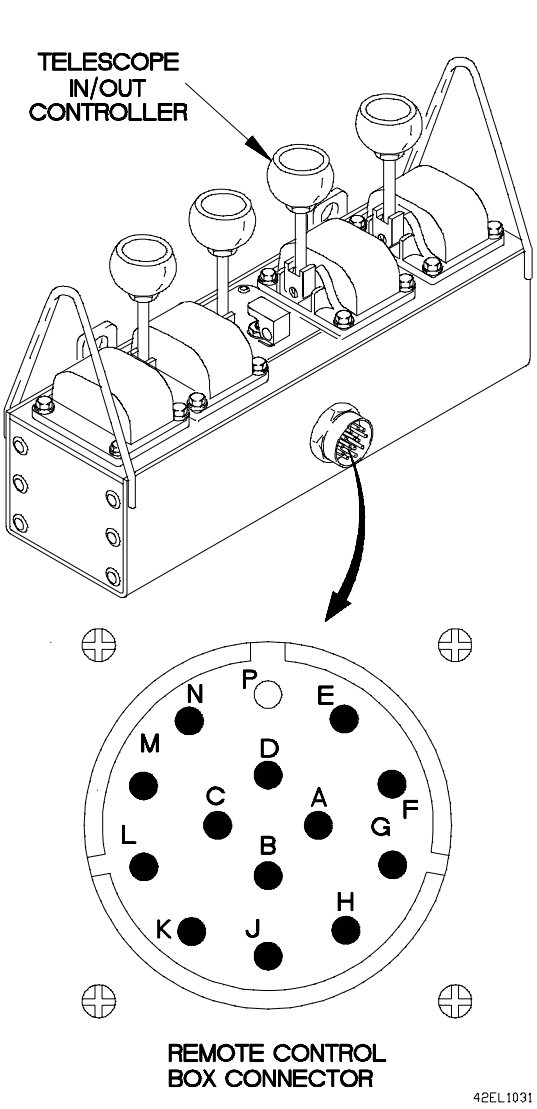
(1) Disconnect telescope out solenoid connector from telescope out solenoid.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin 2 of telescope out solenoid cable connector.
(4) Connect negative (-) probe of multimeter on ground and note reading on multimeter.
(5) Connect positive (+) probe of multimeter on pin 1 of telescope out solenoid cable connector.
(6) Connect negative (-) probe of multimeter on terminal board lower position 19 and note reading on multimeter.
(7) If continuity is not present, replace telescope out solenoid cable (para 7-103).
(8) If continuity is present, notify DS Maintenance.
(9) Connect telescope out solenoid cable connector to telescope out solenoid.
(10) Close cover on junction box.
(11) Tighten four screws on junction box cover.
(12) Stow crane (TM 9-2320-366-10-1).



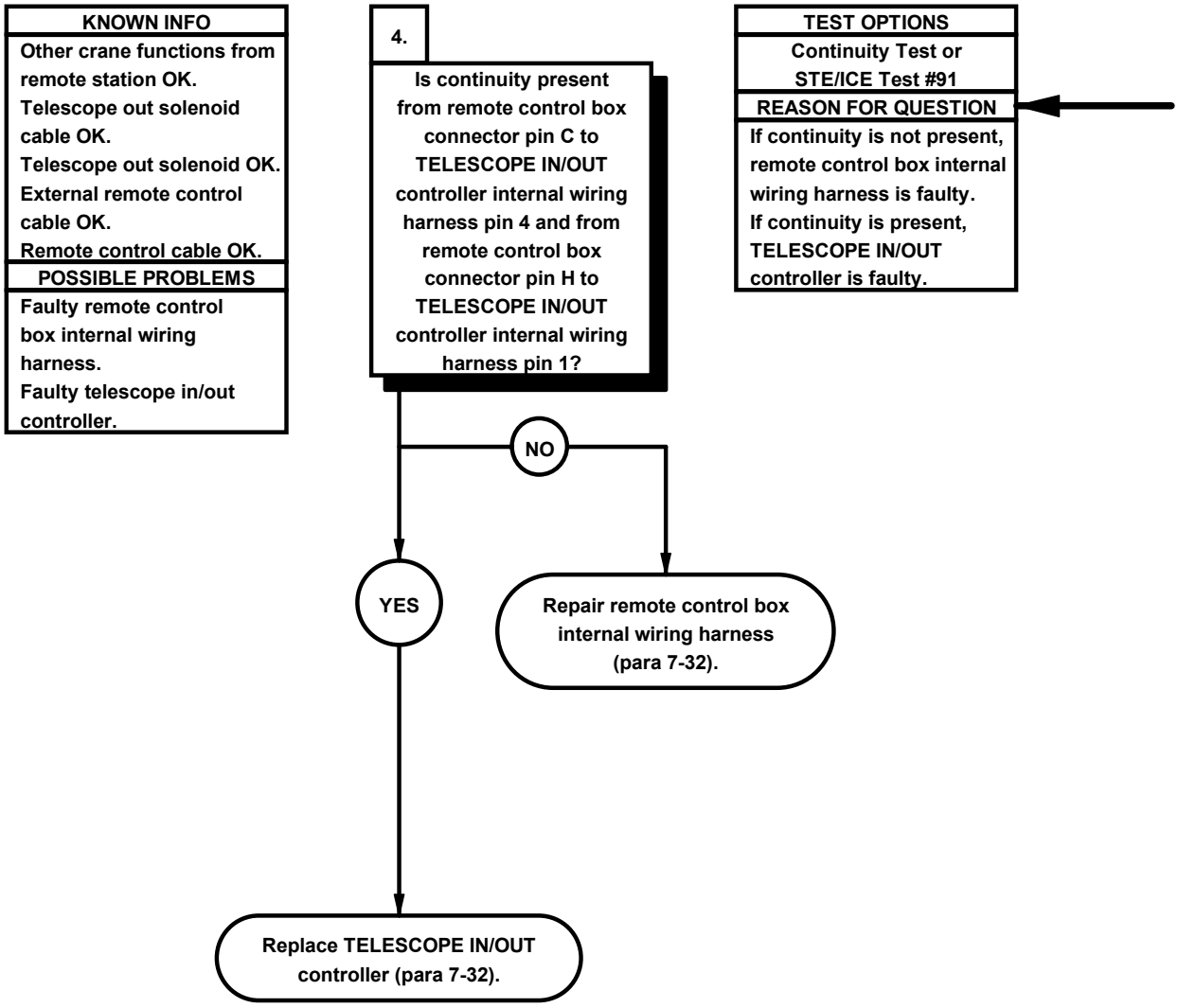
e111. M1084/M1086 MATERIAL HANDLING CRANE (MHC) TELESCOPE OUT DOES NOT OPERATE FROM REMOTE STATION (CONT)



CONTINUITY TEST
(1) Disconnect external remote control cable from remote control box.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin C of connector on remote control box.
(4) Connect negative (-) probe of multimeter on pin H of connector on remote control box.
NOTE Step (5) requires the aid of an assistant.
(5) Position TELESCOPE IN/OUT controller to OUT and note reading on multimeter.
(6) If continuity is not present, go to step 4 of this fault.
(7) If continuity is present, go to step 5 of this fault.

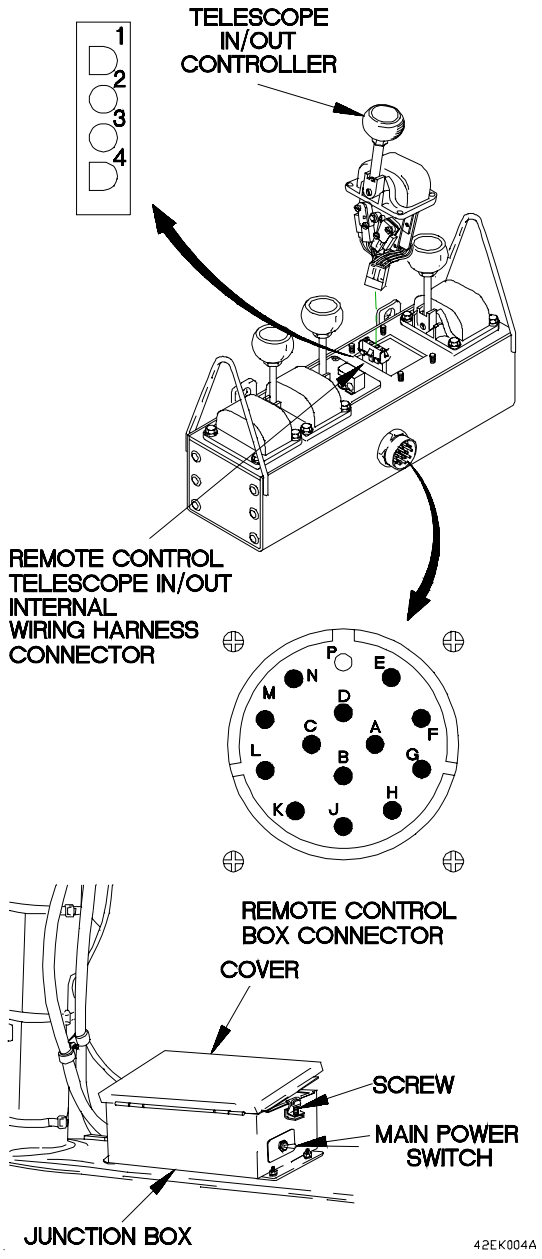


e111. M1084/M1086 MATERIAL HANDLING CRANE (MHC) TELESCOPE OUT DOES NOT OPERATE FROM REMOTE STATION (CONT)

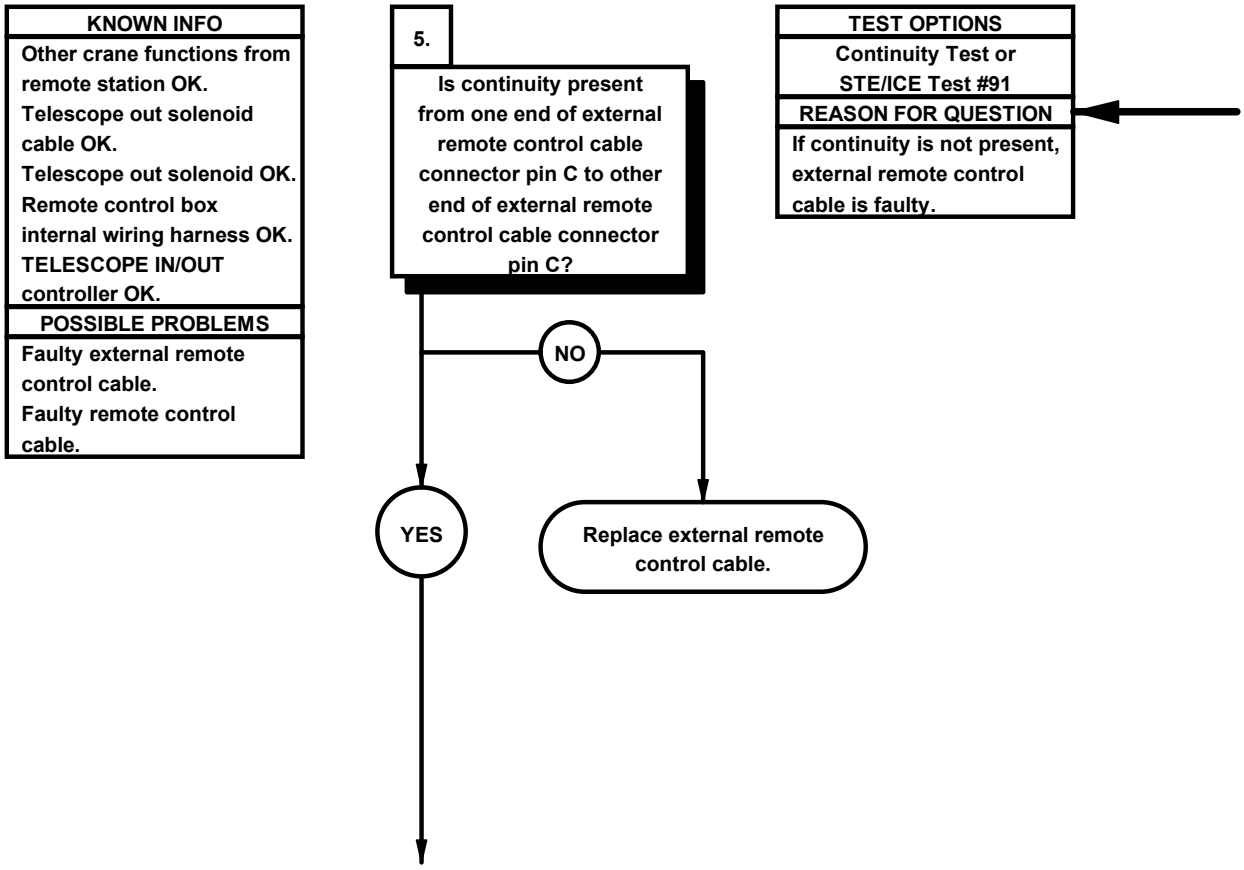


CONTINUITY TEST

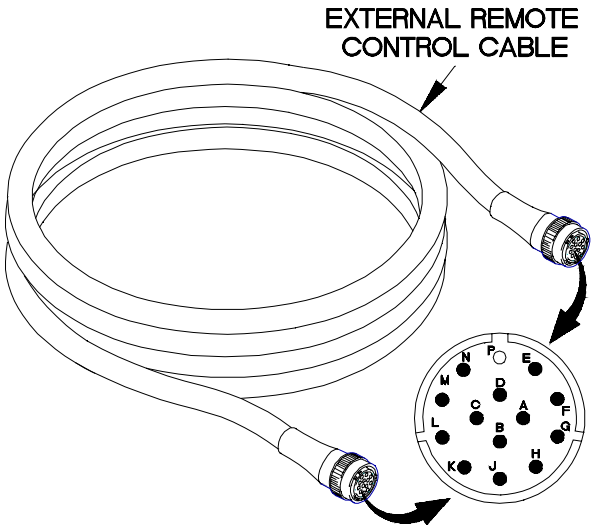
(1) Remove TELESCOPE IN/OUT controller (para 7-32).
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin C of remote control box connector.
(4) Connect negative (-) probe of multimeter on pin 4 of TELESCOPE IN/OUT controller internal wiring harness and note reading on multimeter.
(5) Connect positive (+) probe of multimeter on pin H of remote control box connector.
(6) Connect negative (-) probe of multimeter on pin 1 of TELESCOPE IN/OUT controller internal wiring harness and note reading on multimeter.
(7) If continuity is not present, replace remote control box internal wiring harness (para 7-32).
(8) If continuity is present, replace TELESCOPE IN/OUT controller (para 7-32).
(9) Install TELESCOPE IN/OUT controller (para 7-32).
(10) Close cover on junction box.
(11) Tighten four screws on junction box cover.
(12) Stow crane (TM 9-2320-366-10-1).



e111. M1084/M1086 MATERIAL HANDLING CRANE (MHC) TELESCOPE OUT DOES NOT OPERATE FROM REMOTE STATION (CONT)

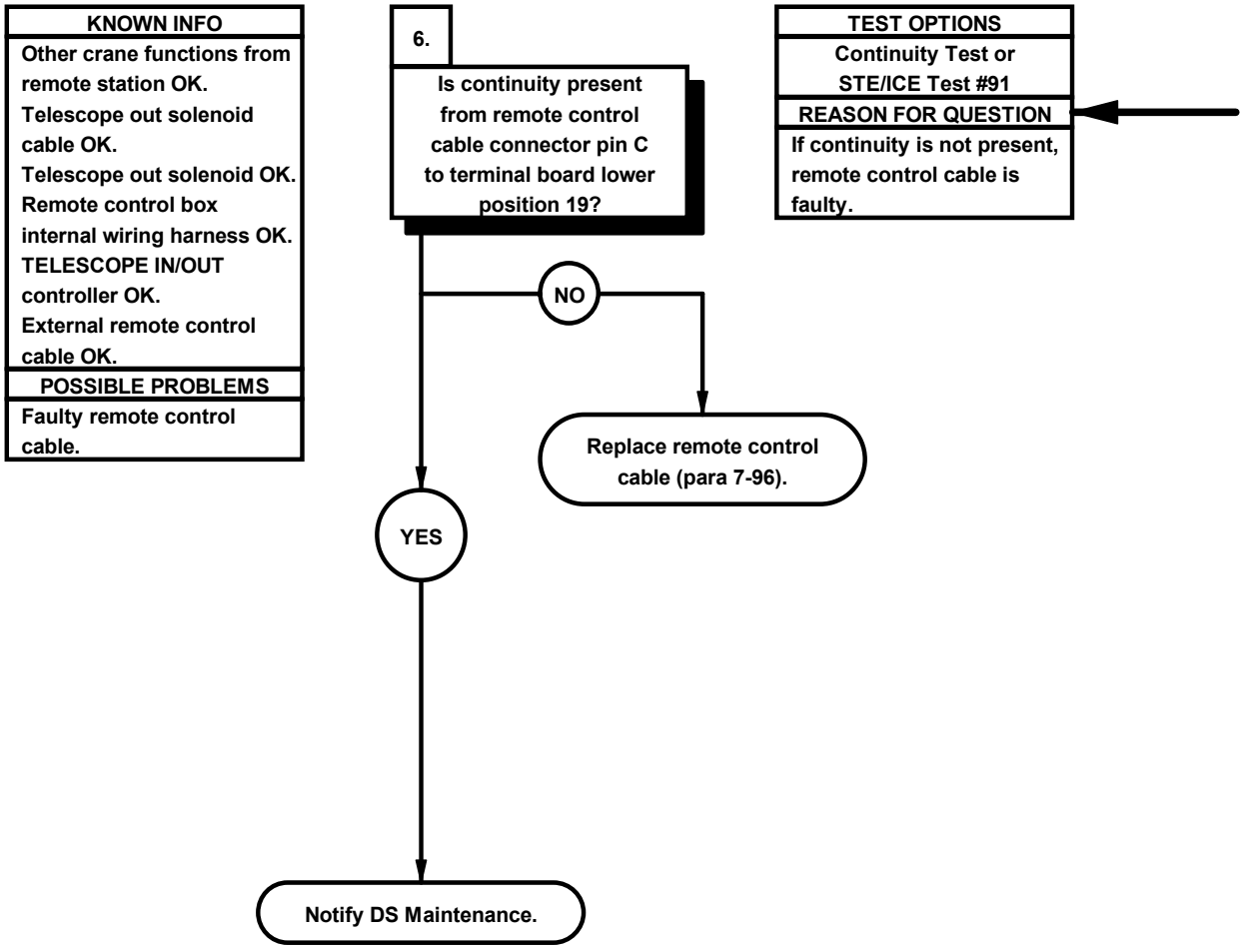


CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin C of one end of external remote control cable connector.
(3) Connect negative (-) probe of multimeter on pin C of other end of external remote control cable and note reading on multimeter.
(4) If continuity is not present, replace external remote control cable.



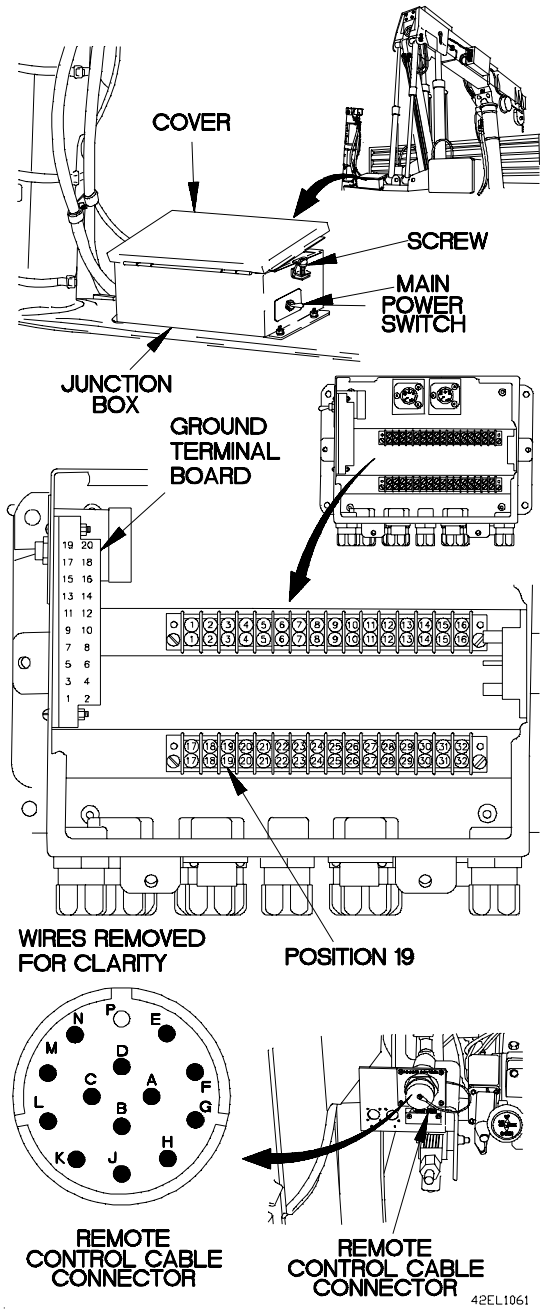
42E1415-

e111. M1084/M1086 MATERIAL HANDLING CRANE (MHC) TELESCOPE OUT DOES NOT OPERATE FROM REMOTE STATION (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin C of remote control cable connector.
(3) Connect negative (-) probe of multimeter on terminal board lower position 19 and note reading on multimeter.
(4) If continuity is not present, replace remote control cable (para 7-96).
(5) If continuity is present, notify DS Maintenance.
(6) Close cover on junction box.
(7) Tighten four screws on junction box cover.
(8) Stow crane (TM 9-2320-366-10-1).



e112. M1084/M1086 MATERIAL HANDLING CRANE (MHC) SWING CW DOES NOT OPERATE FROM REMOTE STATION

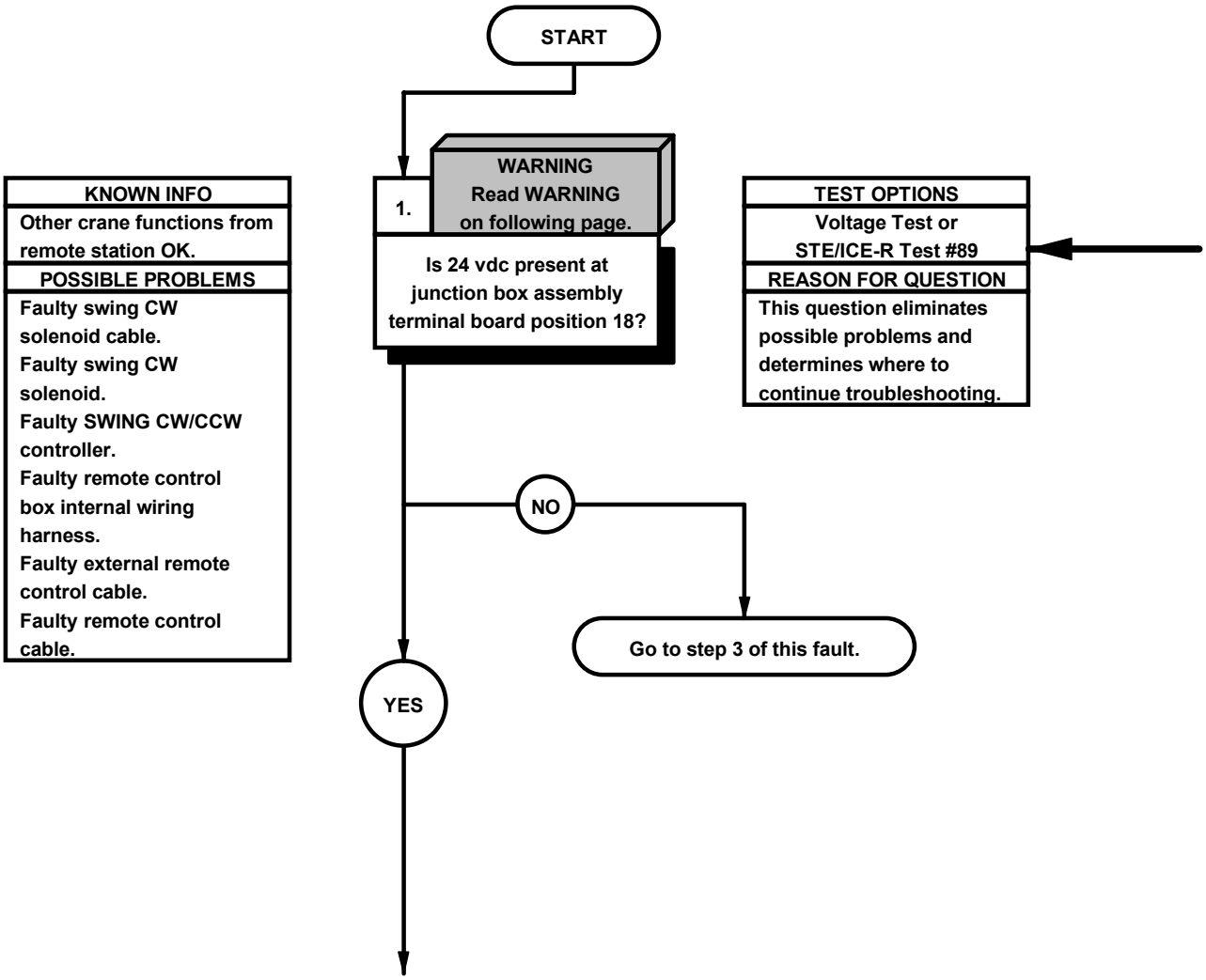
INITIAL SETUP

Equipment Conditions
Outriggers lowered (TM 9-2320-366-10-1).
Crane erected with approximately five feet of cable payed out (TM 9-2320-366-10-1).
Engine shut down (TM 9-2320-366-10-1).

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

References
TM 9-4910-571-12&P



WARNING

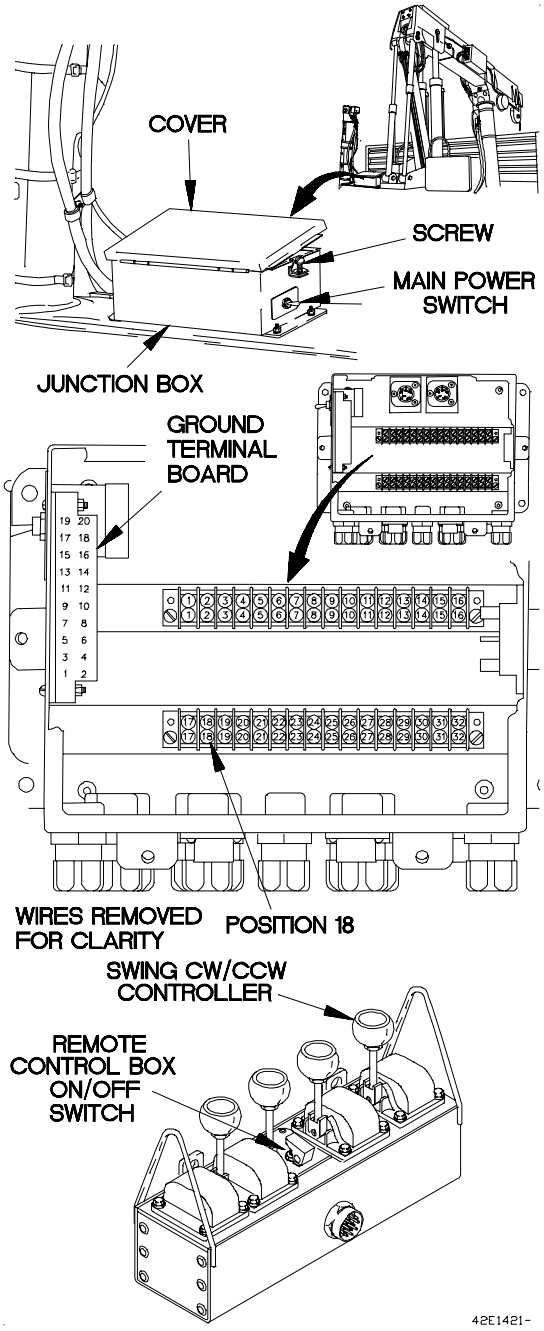
Remove rings, bracelets, watches, necklaces, and any other jewelry beffore working around vehicle. Jewelery can catch on equipment and cause injury or short circuit across electrical circuits and cause severe burns or electrical shock.

OUTPUT VOLTAGE TEST

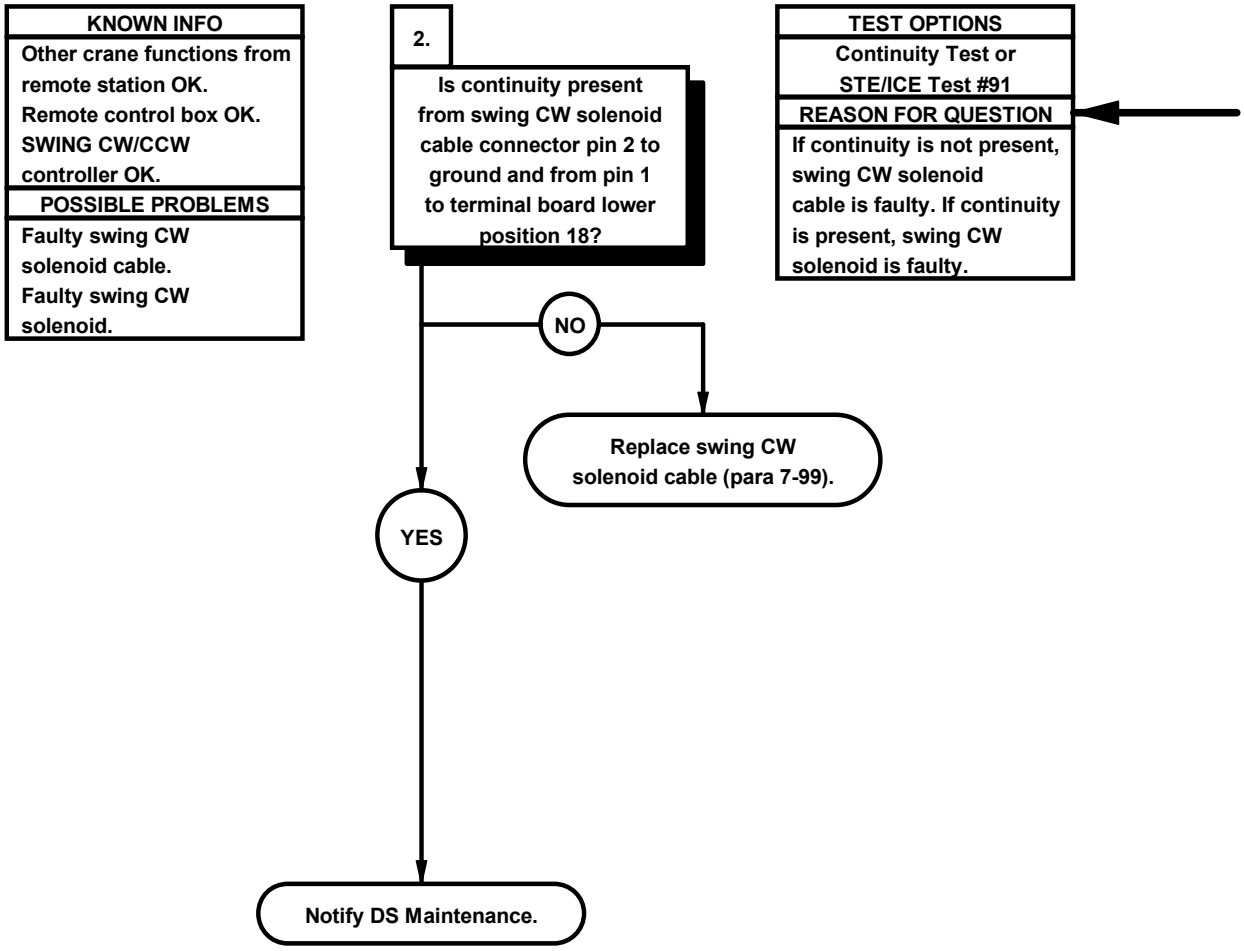
(1) Connect external remote control cable to remote control box (TM 9-2320-366-10-1).
(2) Loosen four screws on junction box.
(3) Open cover on junction box.
(4) Position MAIN POWER switch to ON.
(5) Lift guard and position remote control box ON/OFF switch to ON.
(6) Set multimeter to volts dc.
(7) Connect positive (+) probe of multimeter on terminal board lower position 18.
(8) Connect negative (-) probe of multimeter on ground quick-connect terminal board (above MAIN POWER switch).

NOTE
Step (9) requires the aid of an assistant.

(9) Position SWING CW/CCW to CW and note reading on multimeter.
(10) If 24 volts dc is not present, go to step 3 of this fault.

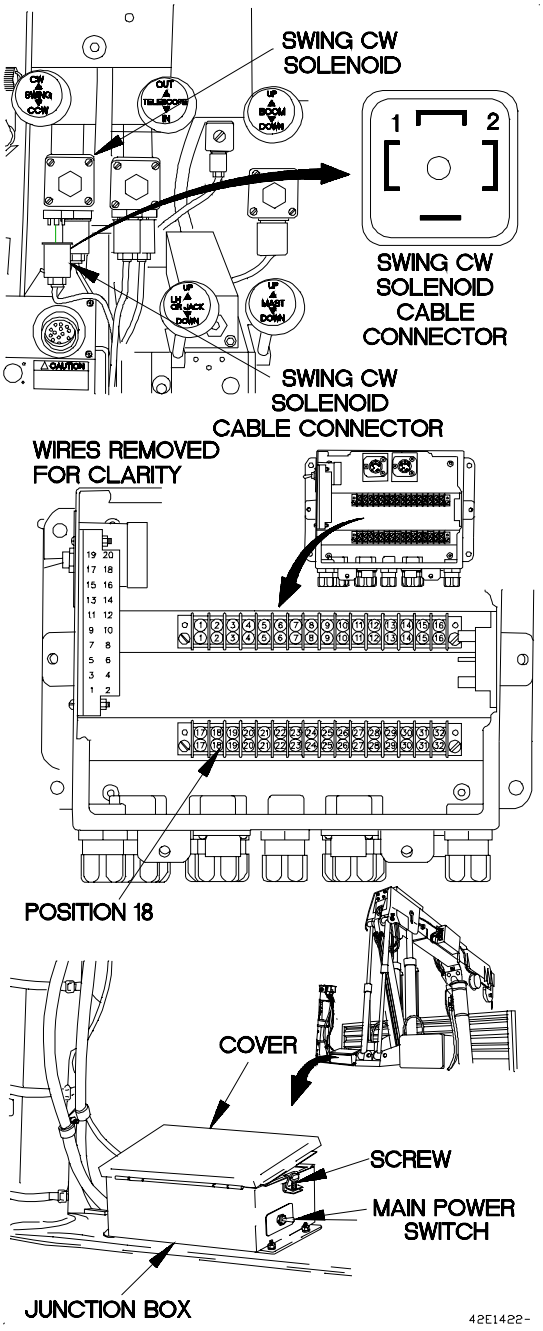


e112. M1084/M1086 MATERIAL HANDLING CRANE (MHC) SWING CW DOES NOT OPERATE FROM REMOTE STATION (CONT)

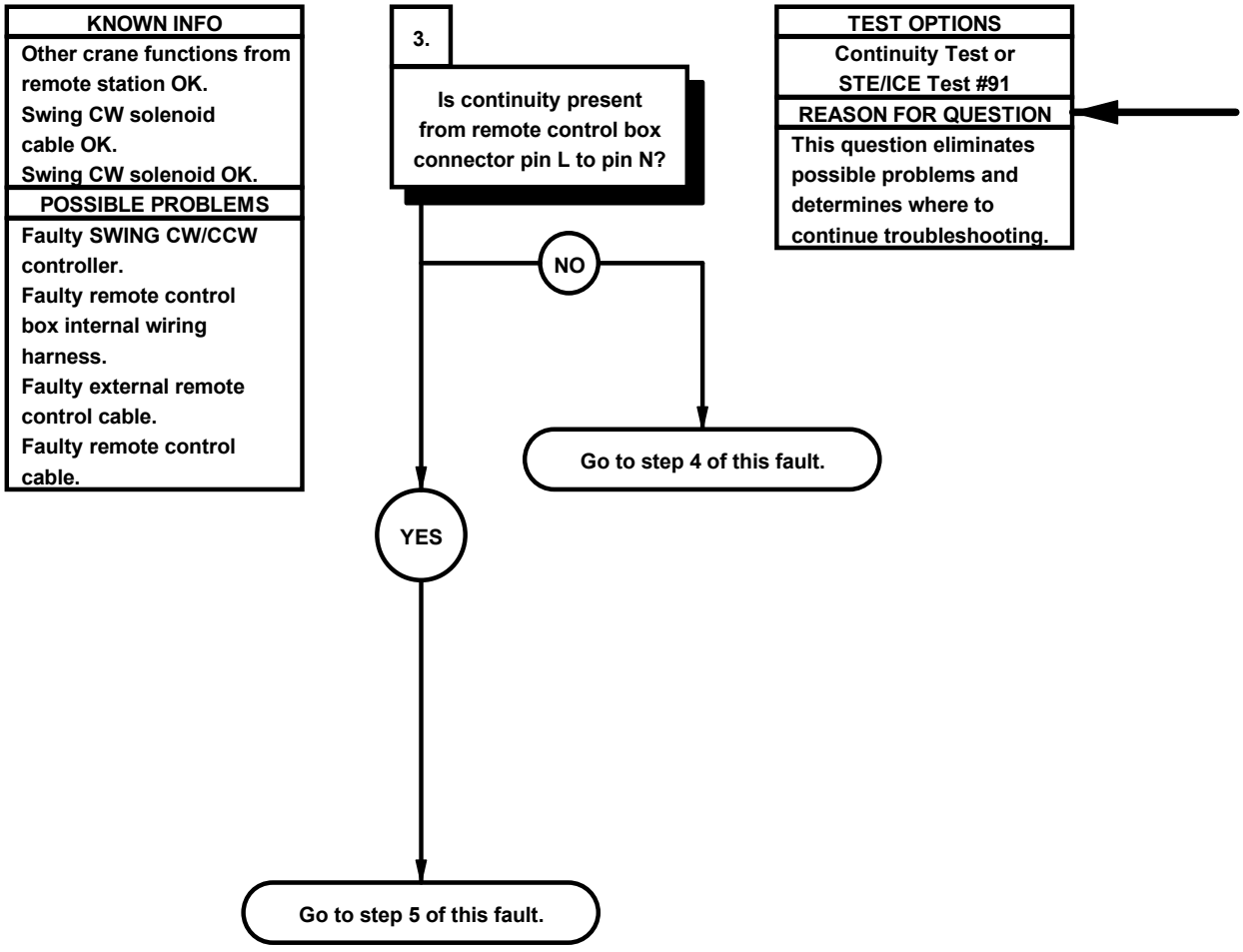


CONTINUITY TEST

(1) Disconnect swing CW solenoid connector from swing CW solenoid.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin 2 of swing CW solenoid cable connector.
(4) Connect negative (-) probe of multimeter on ground and note reading on multimeter.
(5) Connect positive (+) probe of multimeter on pin 1 of swing CW solenoid cable connector.
(6) Connect negative (-) probe of multimeter on terminal board lower position 18 and note reading on multimeter.
(7) If continuity is not present, replace swing CW solenoid cable (para 7-99).
(8) If continuity is present, notify DS Maintenance.
(9) Connect swing CW solenoid cable connector to swing CW solenoid.
(10) Close cover on junction box.
(11) Tighten four screws on junction box cover.
(12) Stow crane (TM 9-2320-366-10-1).



e112. M1084/M1086 MATERIAL HANDLING CRANE (MHC) SWING CW DOES NOT OPERATE FROM REMOTE STATION (CONT)



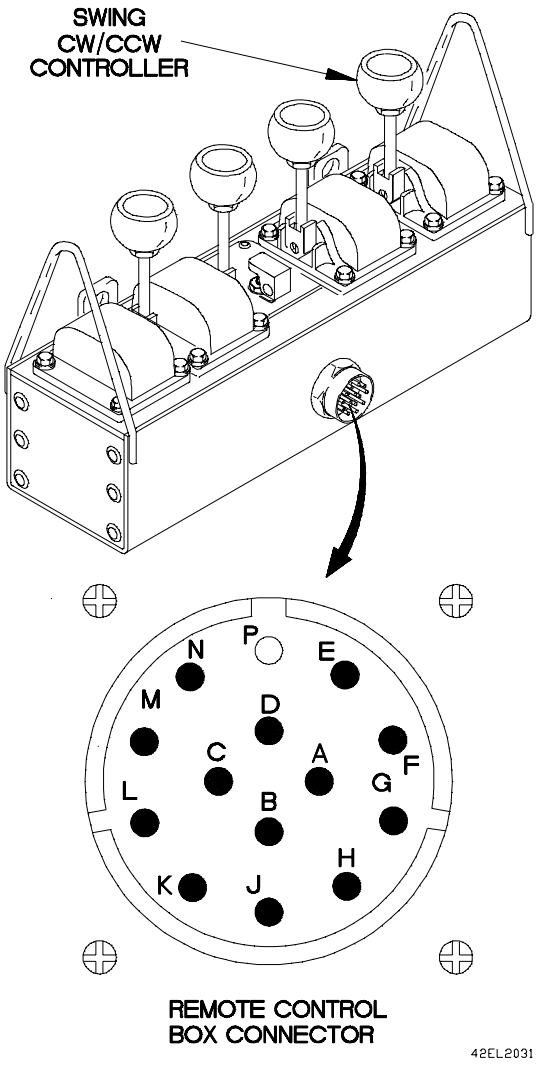
CONTINUITY TEST

(1) Disconnect external remote control cable from remote control box.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin L of connector on remote control box.
(4) Connect negative (-) probe of multimeter on pin H of connector on remote control box.

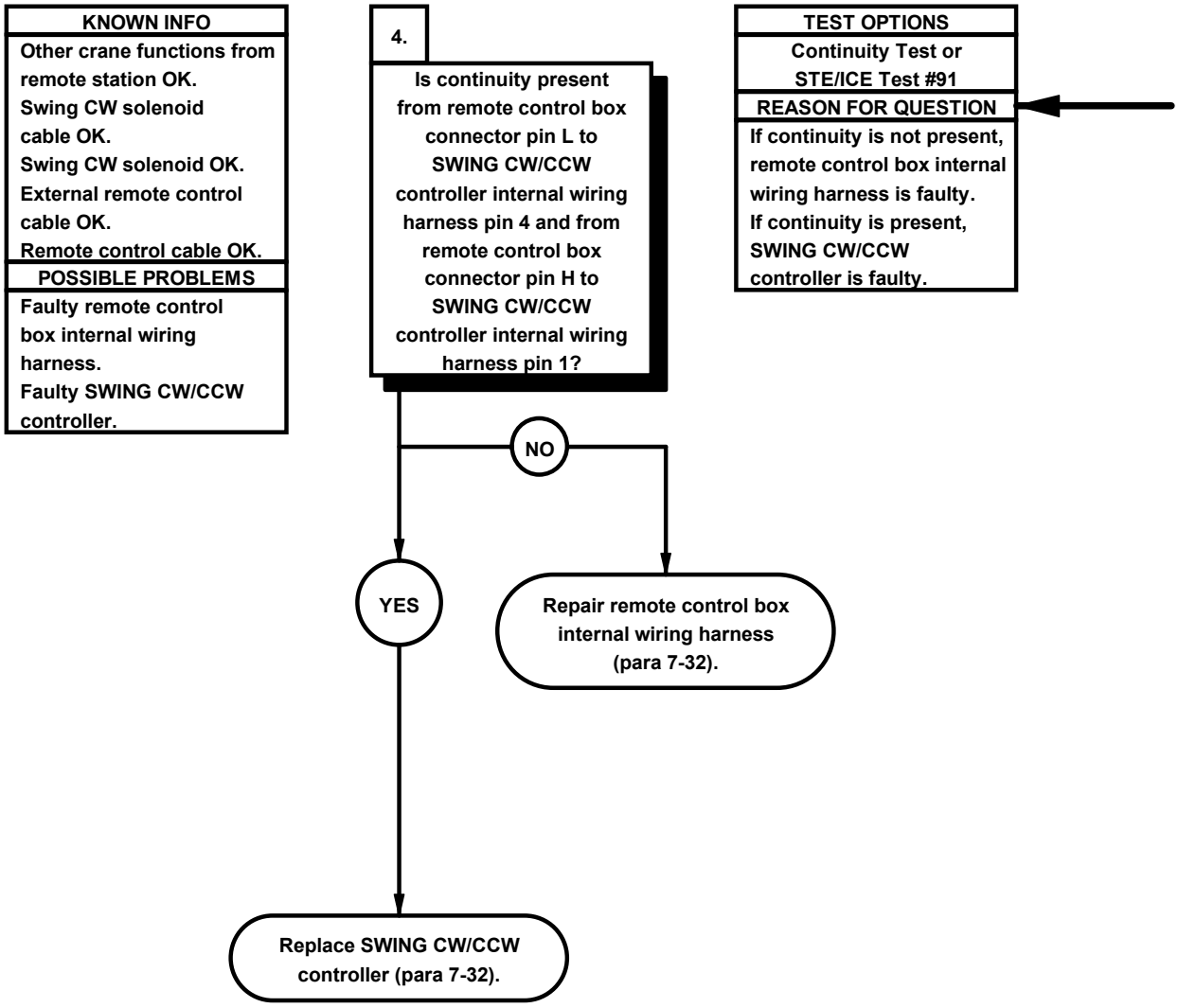
NOTE

Step (5) requires the aid of an assistant.

(5) Position SWING CW/CCW controller to CW and note reading on multimeter.
(6) If continuity is not present, go to step 4 of this fault.
(7) If continuity is present, go to step 5 of this fault.

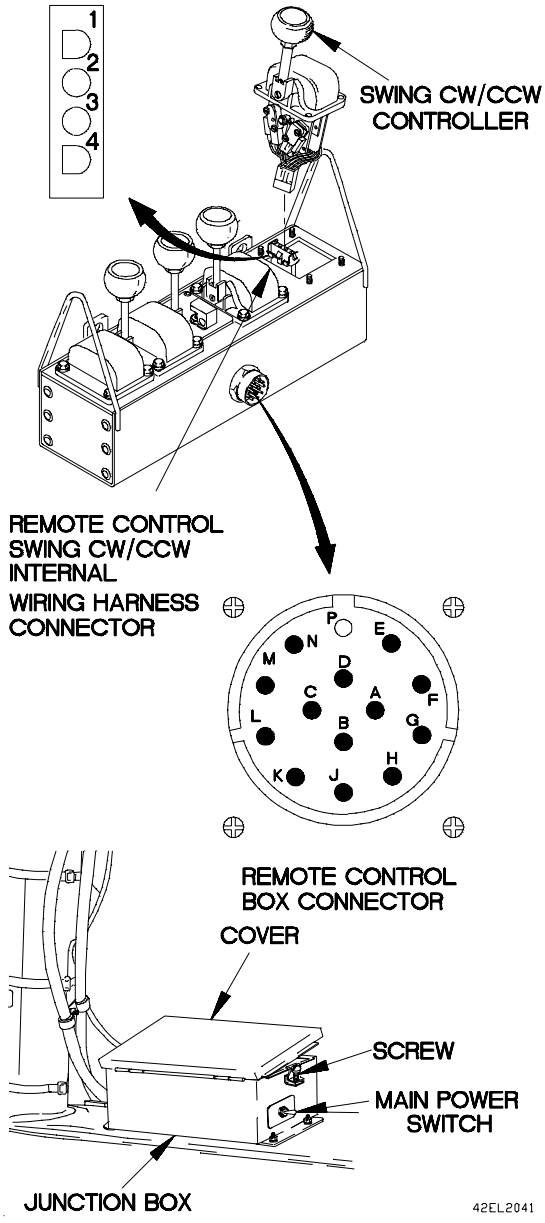


e112. M1084/M1086 MATERIAL HANDLING CRANE (MHC) SWING CW DOES NOT OPERATE FROM REMOTE STATION (CONT)

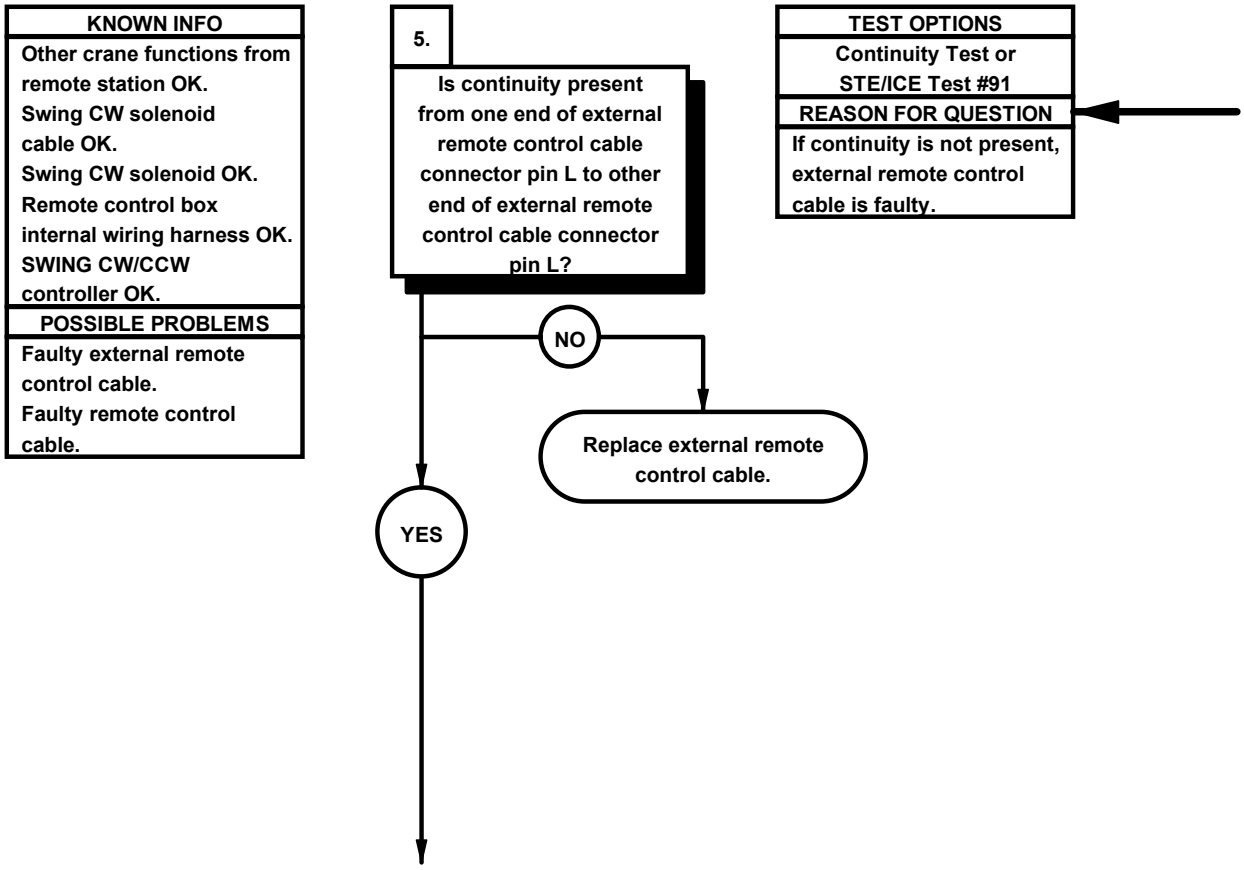


CONTINUITY TEST

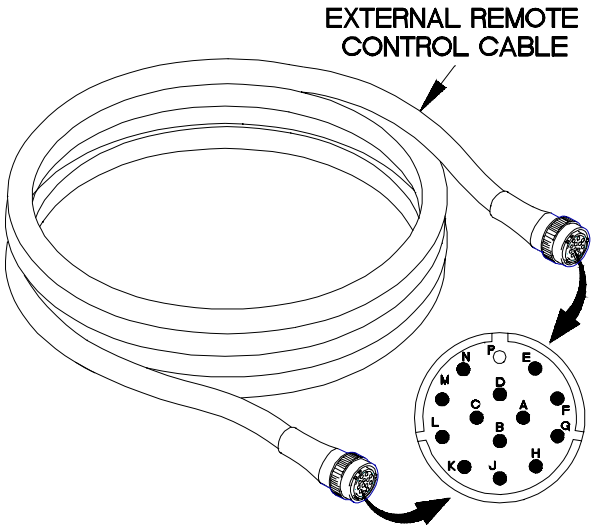
(1) Remove SWING CW/CCW controller (para 7-32).
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin L of remote control box connector.
(4) Connect negative (-) probe of multimeter on pin 4 of SWING CW/CCW controller internal wiring harness and note reading on multimeter.
(5) Connect positive (+) probe of multimeter on pin H of remote control box connector.
(6) Connect negative (-) probe of multimeter on pin 1 of SWING CW/CCW controller internal wiring harness and note reading on multimeter.
(7) If continuity is not present, replace remote control box internal wiring harness (para 7-32).
(8) If continuity is present, replace SWING CW/CCW controller (para 7-32).
(9) Install SWING CW/CCW controller (para 7-32).
(10) Close cover on junction box.
(11) Tighten four screws on junction box cover.
(12) Stow crane (TM 9-2320-366-10-1).



e112. M1084/M1086 MATERIAL HANDLING CRANE (MHC) SWING CW DOES NOT OPERATE FROM REMOTE STATION (CONT)

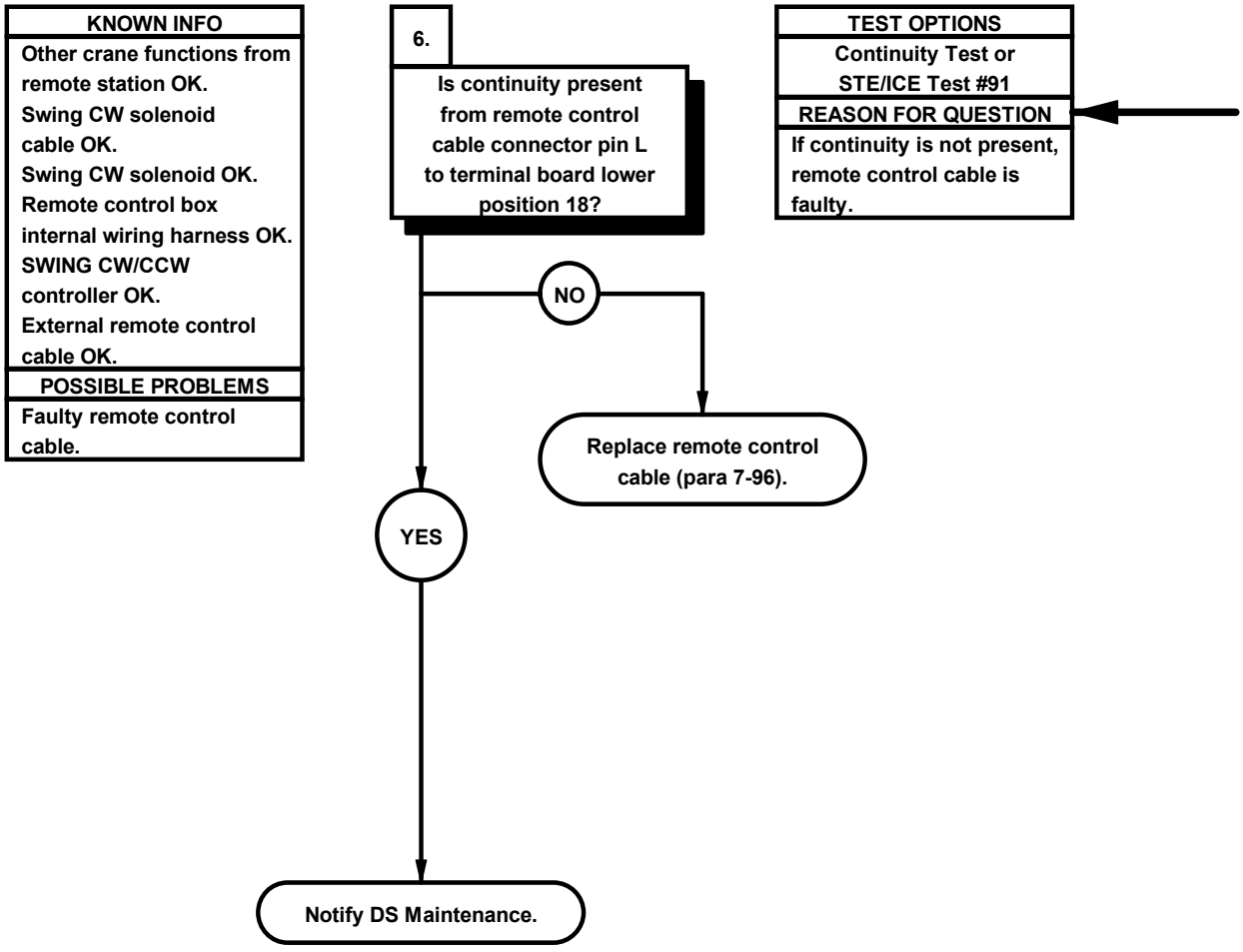


CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin L of one end of external remote control cable connector.
(3) Connect negative (-) probe of multimeter on pin L of other end of external remote control cable and note reading on multimeter.
(4) If continuity is not present, replace external remote control cable.



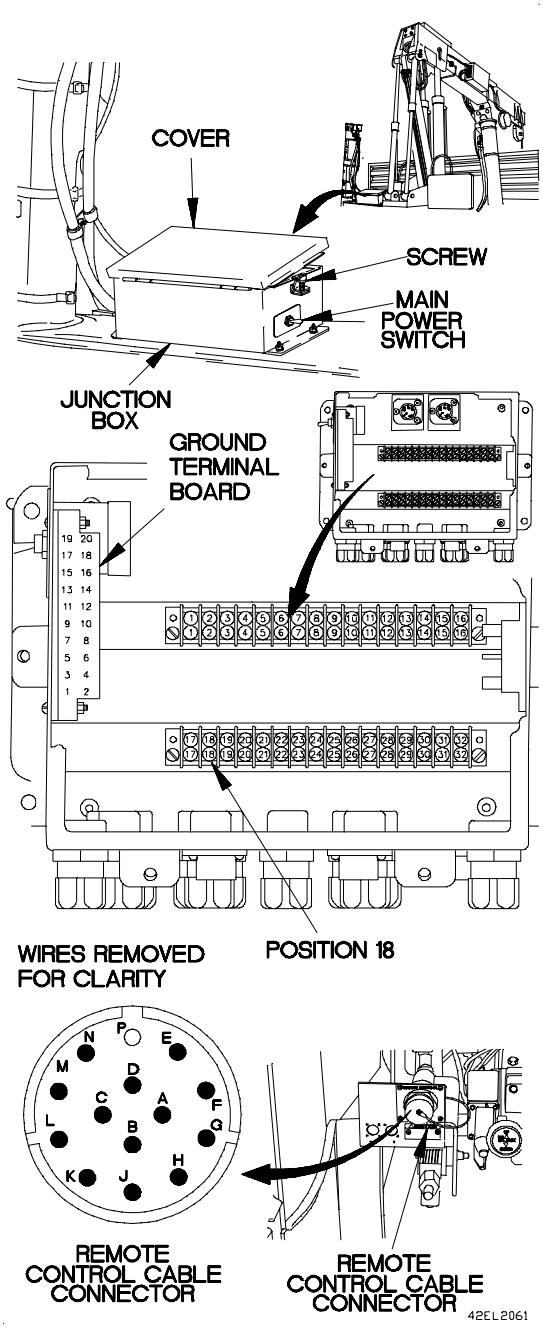
42E1425-

e112. M1084/M1086 MATERIAL HANDLING CRANE (MHC) SWING CW DOES NOT OPERATE FROM REMOTE STATION (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin L of remote control cable connector.
(3) Connect negative (-) probe of multimeter on terminal board lower position 18 and note reading on multimeter.
(4) If continuity is not present, replace remote control cable (para 7-96).
(5) If continuity is present, notify DS Maintenance.
(6) Close cover on junction box.
(7) Tighten four screws on junction box cover.
(8) Stow crane (TM 9-2320-366-10-1).



e113. M1084/M1086 MATERIAL HANDLING CRANE (MHC) SWING CCW DOES NOT OPERATE FROM REMOTE STATION

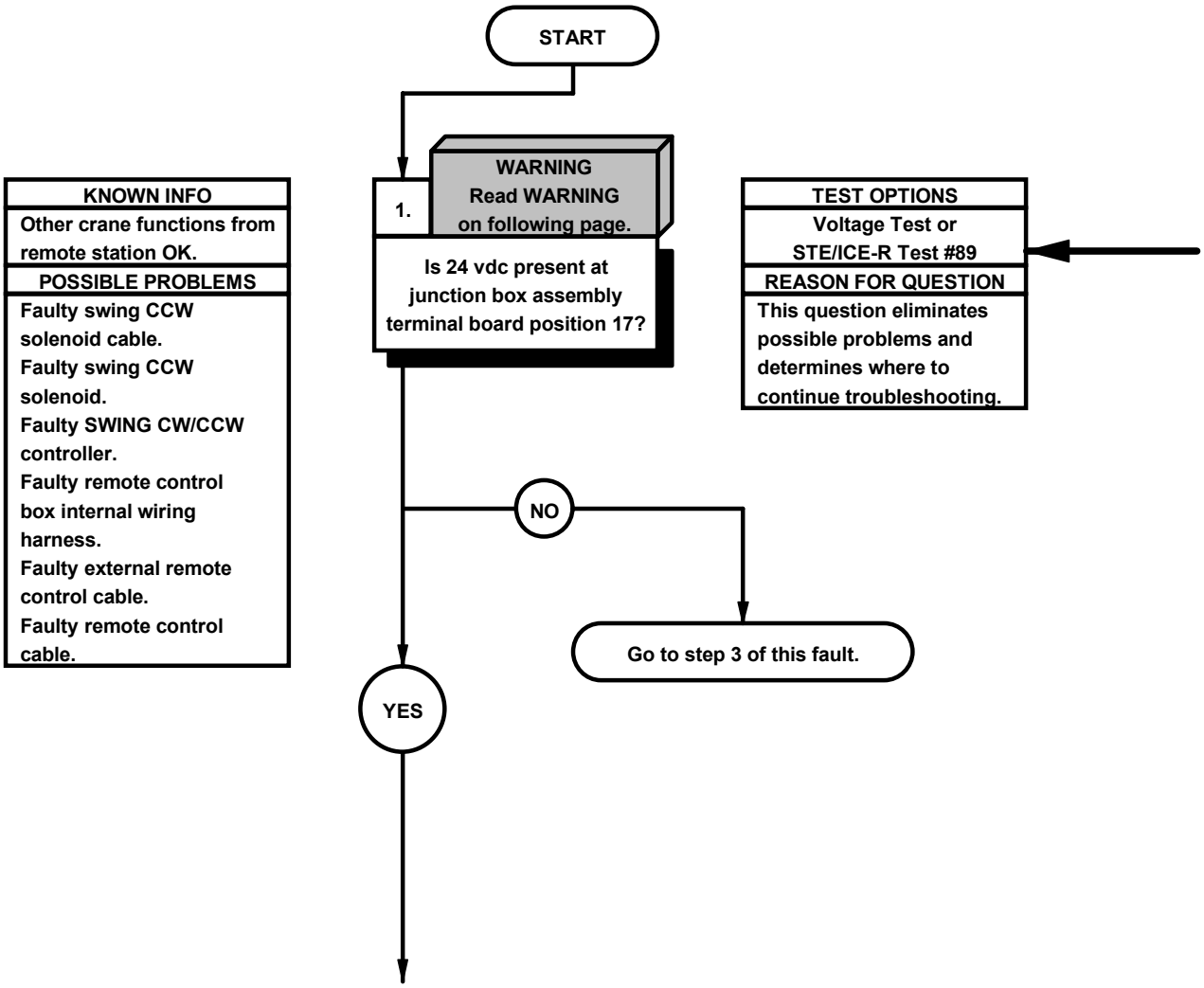
INITIAL SETUP

Equipment Conditions
Outriggers lowered (TM 9-2320-366-10-1).
Crane erected with approximately five feet of cable payed out (TM 9-2320-366-10-1).
Engine shut down (TM 9-2320-366-10-1).

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

References
TM 9-4910-571-12&P



WARNING

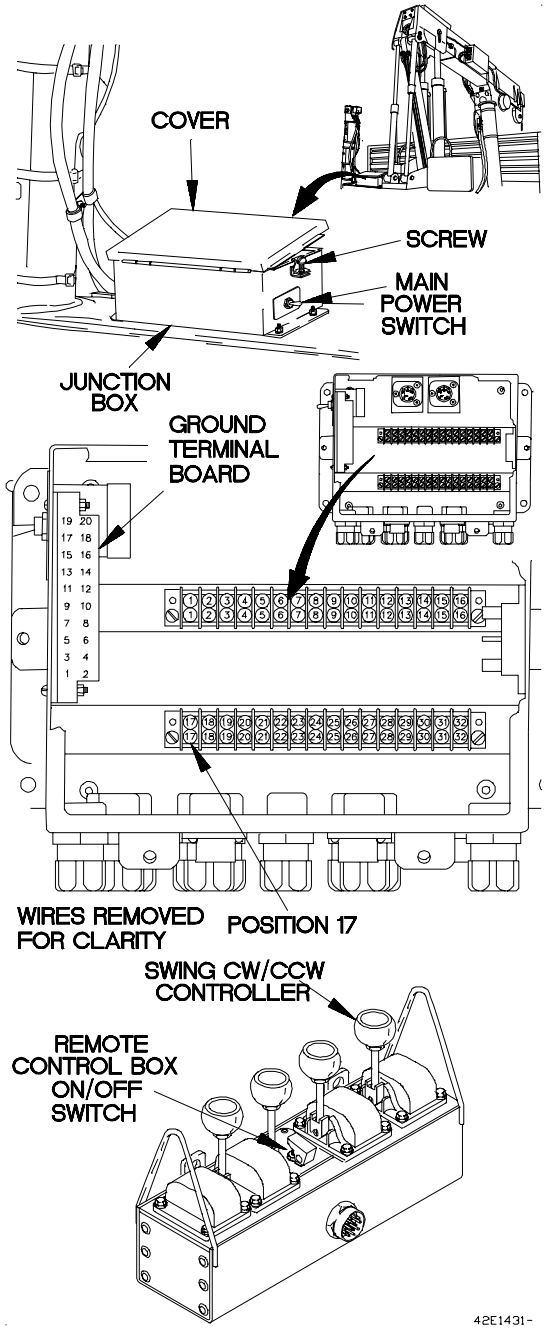
Remove rings, bracelets, watches, necklaces, and any other jewelry beffore working around vehicle. Jewelery can catch on equipment and cause injury or short circuit across electrical circuits and cause severe burns or electrical shock.

OUTPUT VOLTAGE TEST

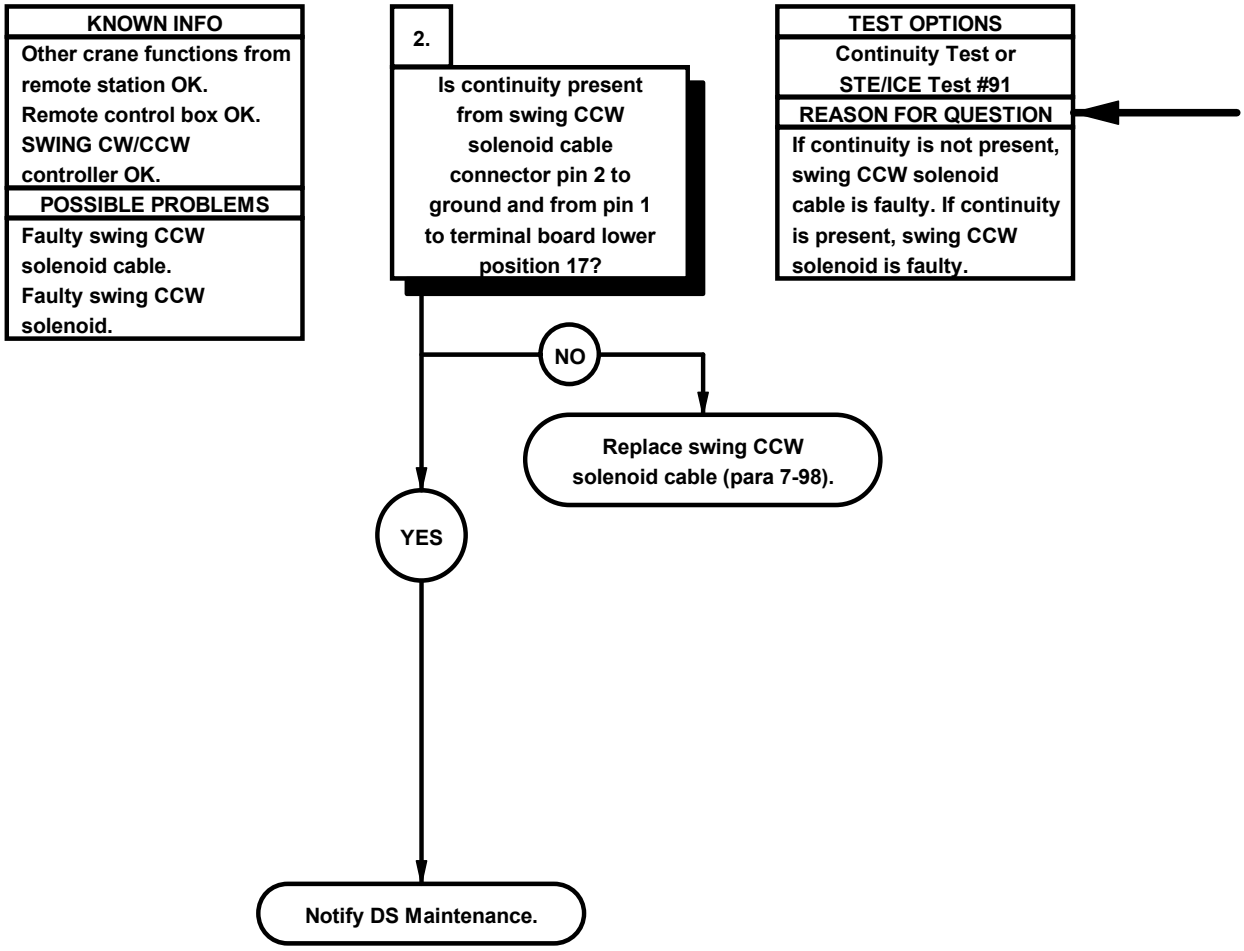
(1) Connect external remote control cable to remote control box (TM 9-2320-366-10-1).
(2) Loosen four screws on junction box.
(3) Open cover on junction box.
(4) Position MAIN POWER switch to ON.
(5) Lift guard and position remote control box ON/OFF switch to ON.
(6) Set multimeter to volts dc.
(7) Connect positive (+) probe of multimeter on terminal board lower position 17.
(8) Connect negative (-) probe of multimeter on ground quick-connect terminal board (above MAIN POWER switch).

NOTE
Step (9) requires the aid of an assistant.

(9) Position SWING CW/CCW controller to CCW and note reading on multimeter.
(10) If 24 volts dc is not present, go to step 3 of this fault.

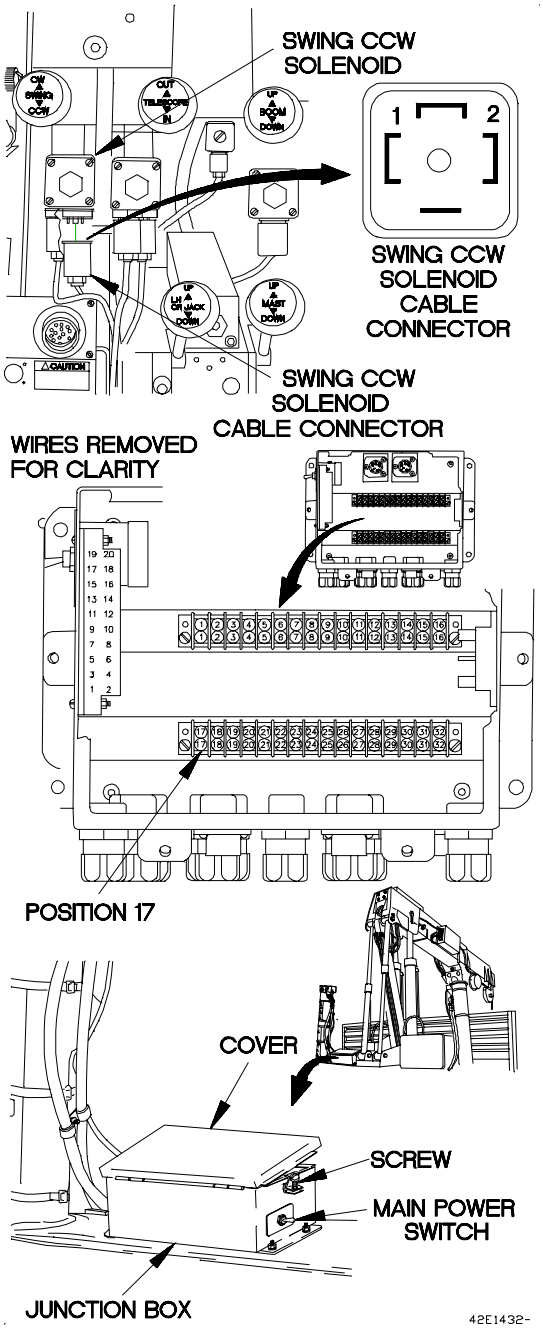


e113. M1084/M1086 MATERIAL HANDLING CRANE (MHC) SWING CCW DOES NOT OPERATE FROM REMOTE STATION (CONT)

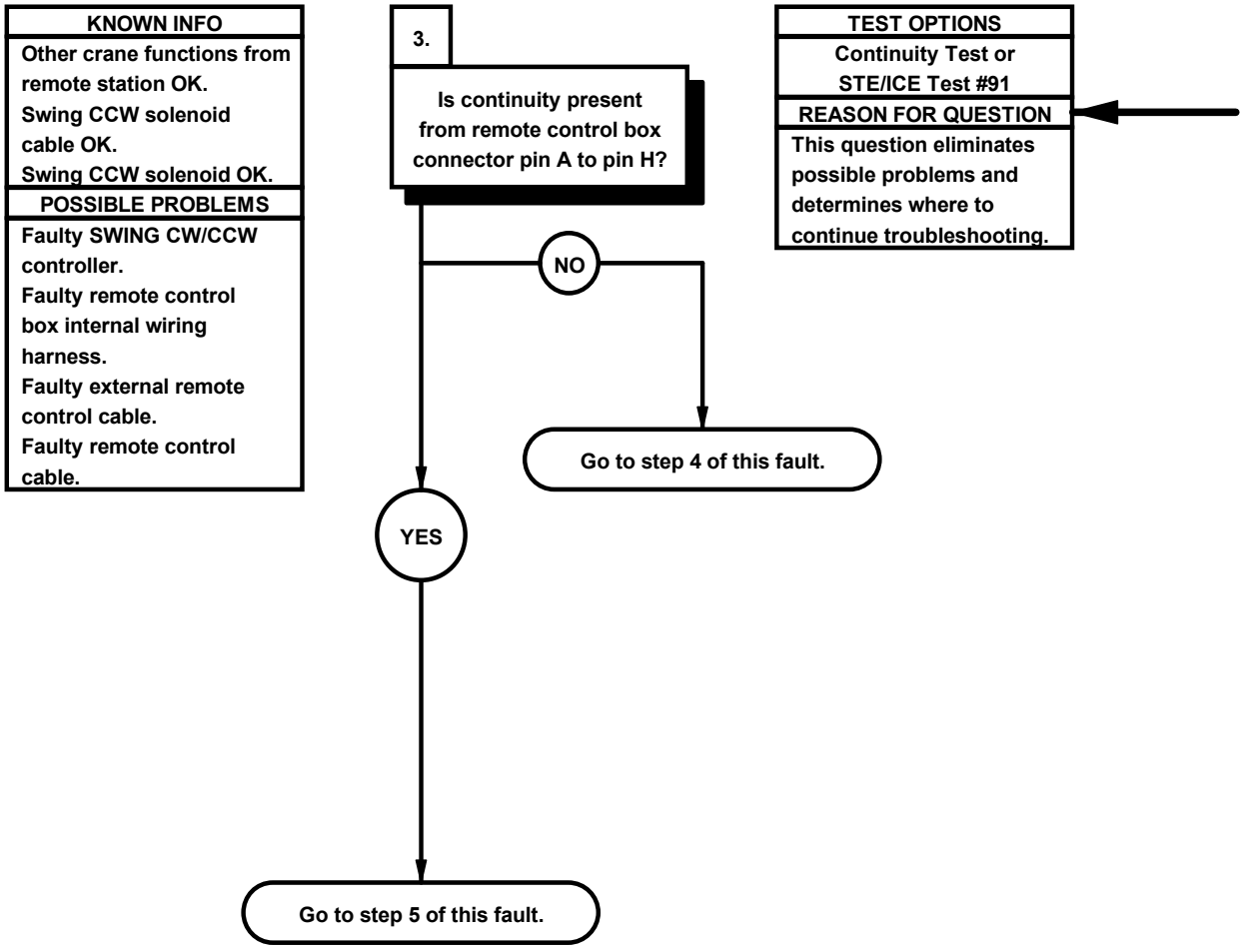


CONTINUITY TEST

(1) Disconnect swing CCW solenoid connector from swing CCW solenoid.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin 2 of swing CCW solenoid cable connector.
(4) Connect negative (-) probe of multimeter on ground and note reading on multimeter.
(5) Connect positive (+) probe of multimeter on pin 1 of swing CCW solenoid cable connector.
(6) Connect negative (-) probe of multimeter on terminal board lower position 17 and note reading on multimeter.
(7) If continuity is not present, replace swing CCW solenoid cable (para 7-98).
(8) If continuity is present, notify DS Maintenance.
(9) Connect swing CCW solenoid cable connector to swing CCW solenoid.
(10) Close cover on junction box.
(11) Tighten four screws on junction box cover.
(12) Stow crane (TM 9-2320-366-10-1).



e113. M1084/M1086 MATERIAL HANDLING CRANE (MHC) SWING CCW DOES NOT OPERATE FROM REMOTE STATION (CONT)



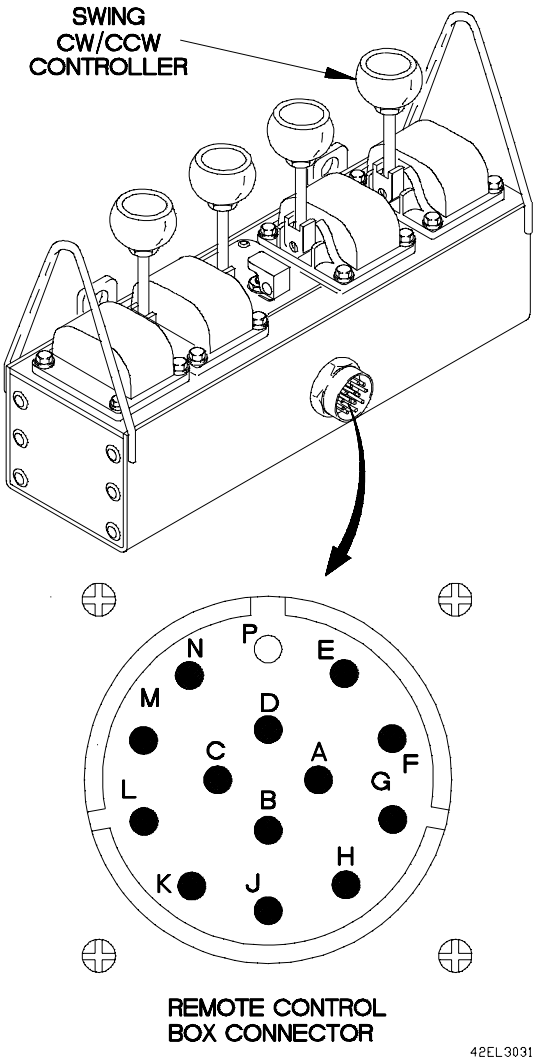
CONTINUITY TEST

(1) Disconnect external remote control cable from remote control box.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin A of connector on remote control box.
(4) Connect negative (-) probe of multimeter on pin H of connector on remote control box.

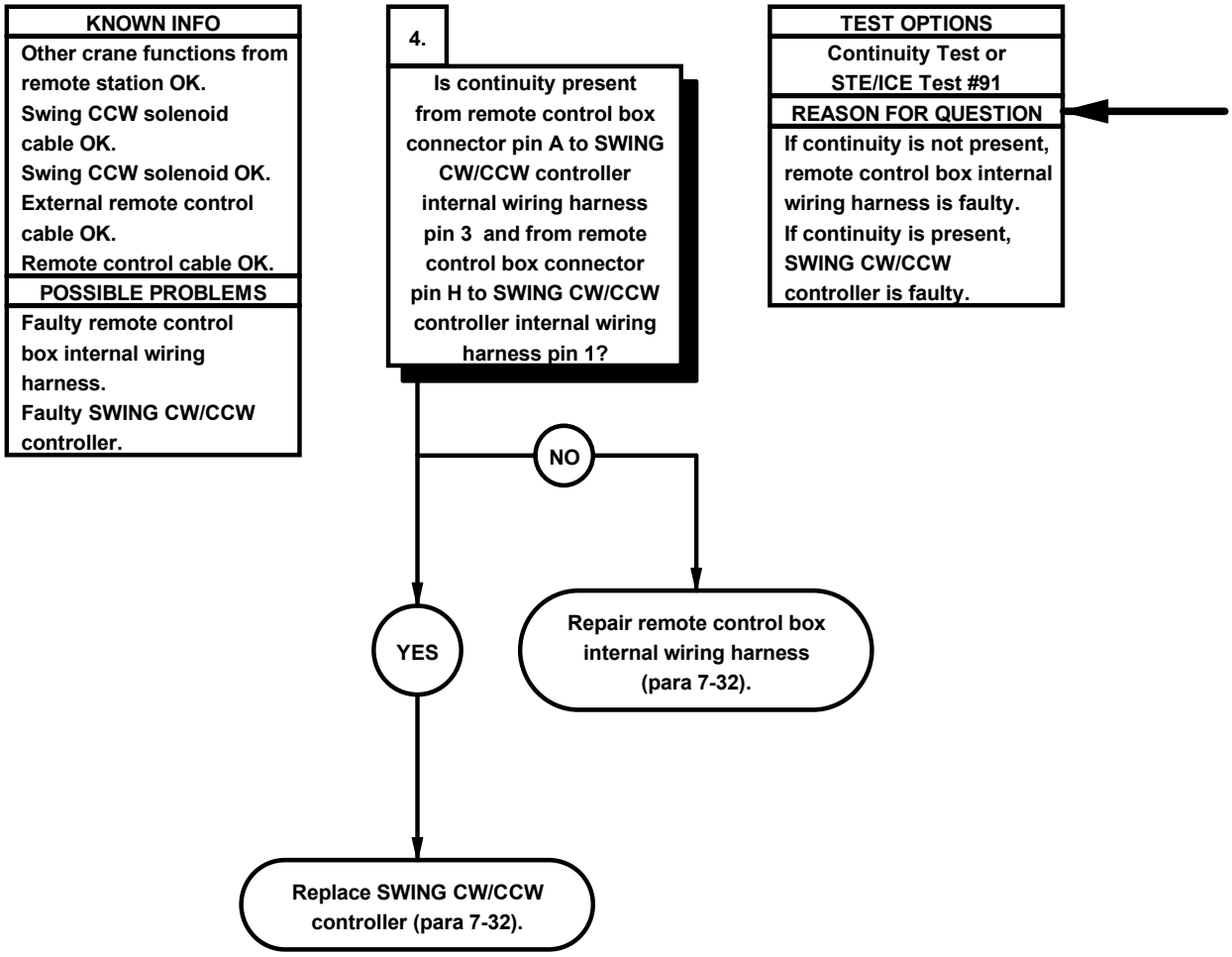
NOTE

Step (5) requires the aid of an assistant.

(5) Position SWING CW/CCW controller to CCW and note reading on multimeter.
(6) If continuity is not present, go to step 4 of this fault.
(7) If continuity is present, go to step 5 of this fault.

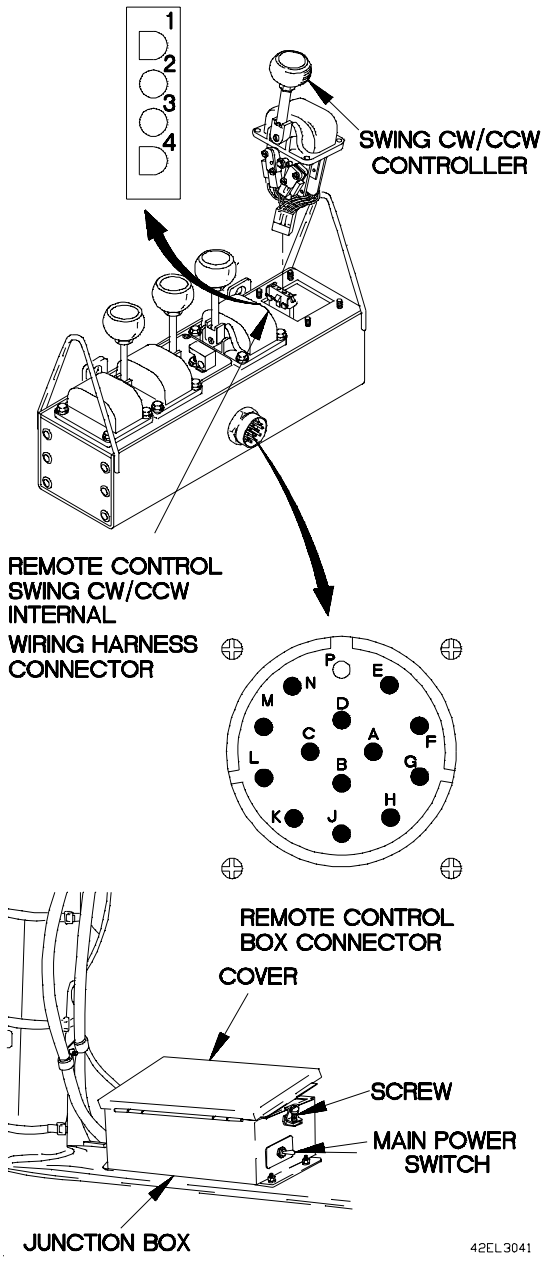


e113. M1084/M1086 MATERIAL HANDLING CRANE (MHC) SWING CCW DOES NOT OPERATE FROM REMOTE STATION (CONT)

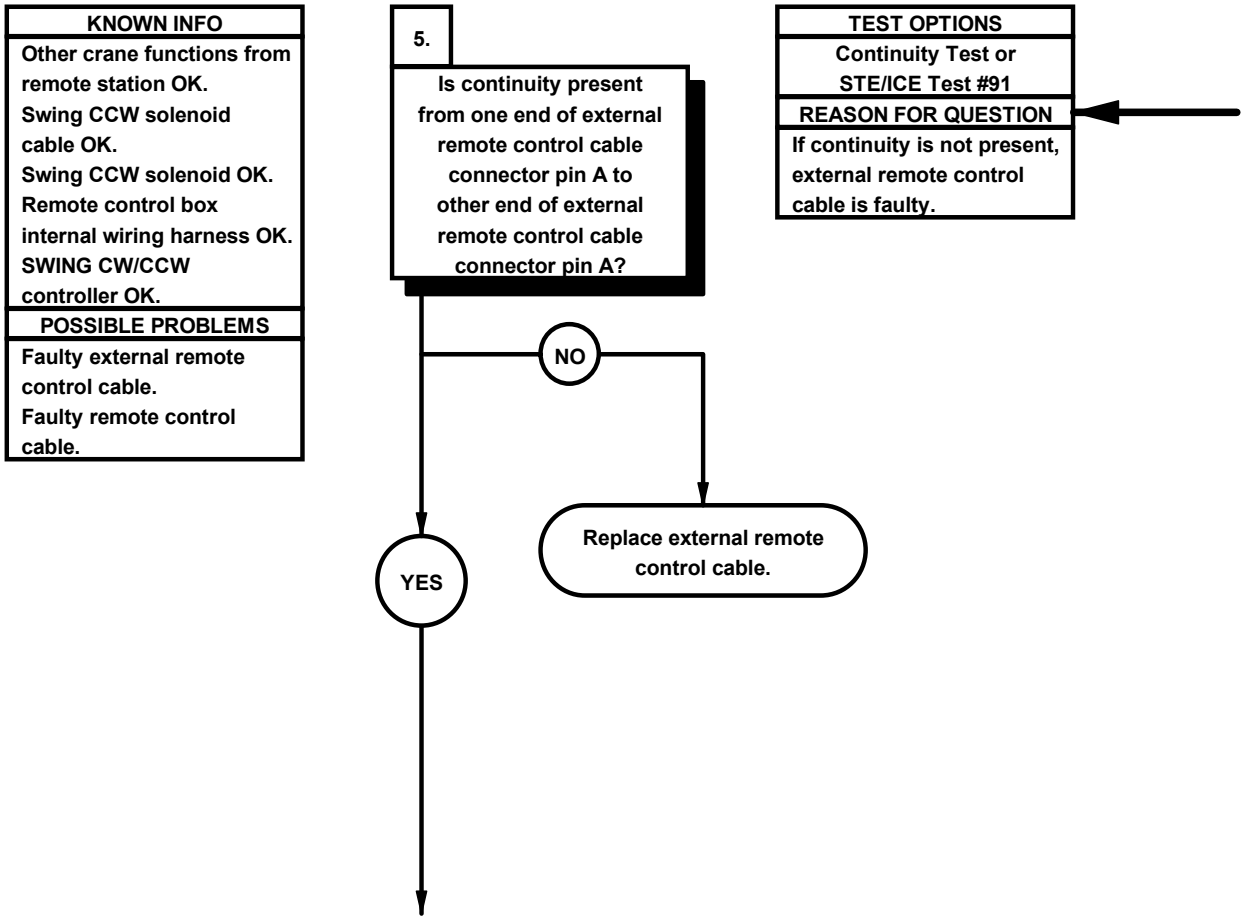


CONTINUITY TEST

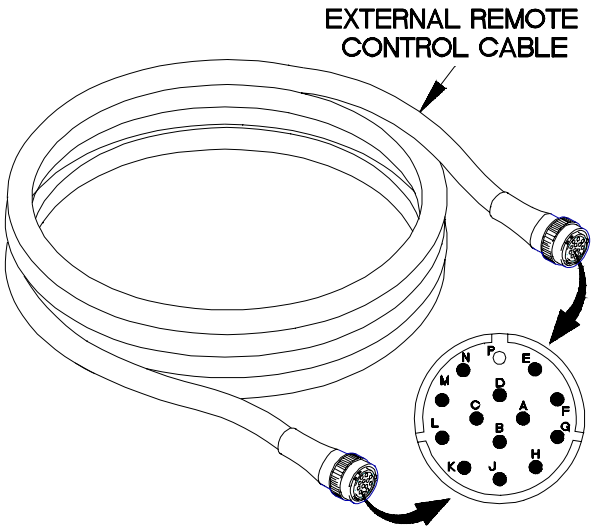
(1) Remove SWING CW/CCW controller (para 7-32).
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin A of remote control box connector.
(4) Connect negative (-) probe of multimeter on pin 3 of SWING CW/CCW controller internal wiring harness and note reading on multimeter.
(5) Connect positive (+) probe of multimeter on pin H of remote control box connector.
(6) Connect negative (-) probe of multimeter on pin 1 of SWING CW/CCW controller internal wiring harness and note reading on multimeter.
(7) If continuity is not present, replace remote control box internal wiring harness (para 7-32).
(8) If continuity is present, replace SWING CW/CCW controller (para 7-32).
(9) Install SWING CW/CCW controller (para 7-32).
(10) Close cover on junction box.
(11) Tighten four screws on junction box cover.
(12) Stow crane (TM 9-2320-366-10-1).



e113. M1084/M1086 MATERIAL HANDLING CRANE (MHC) SWING CCW DOES NOT OPERATE FROM REMOTE STATION (CONT)

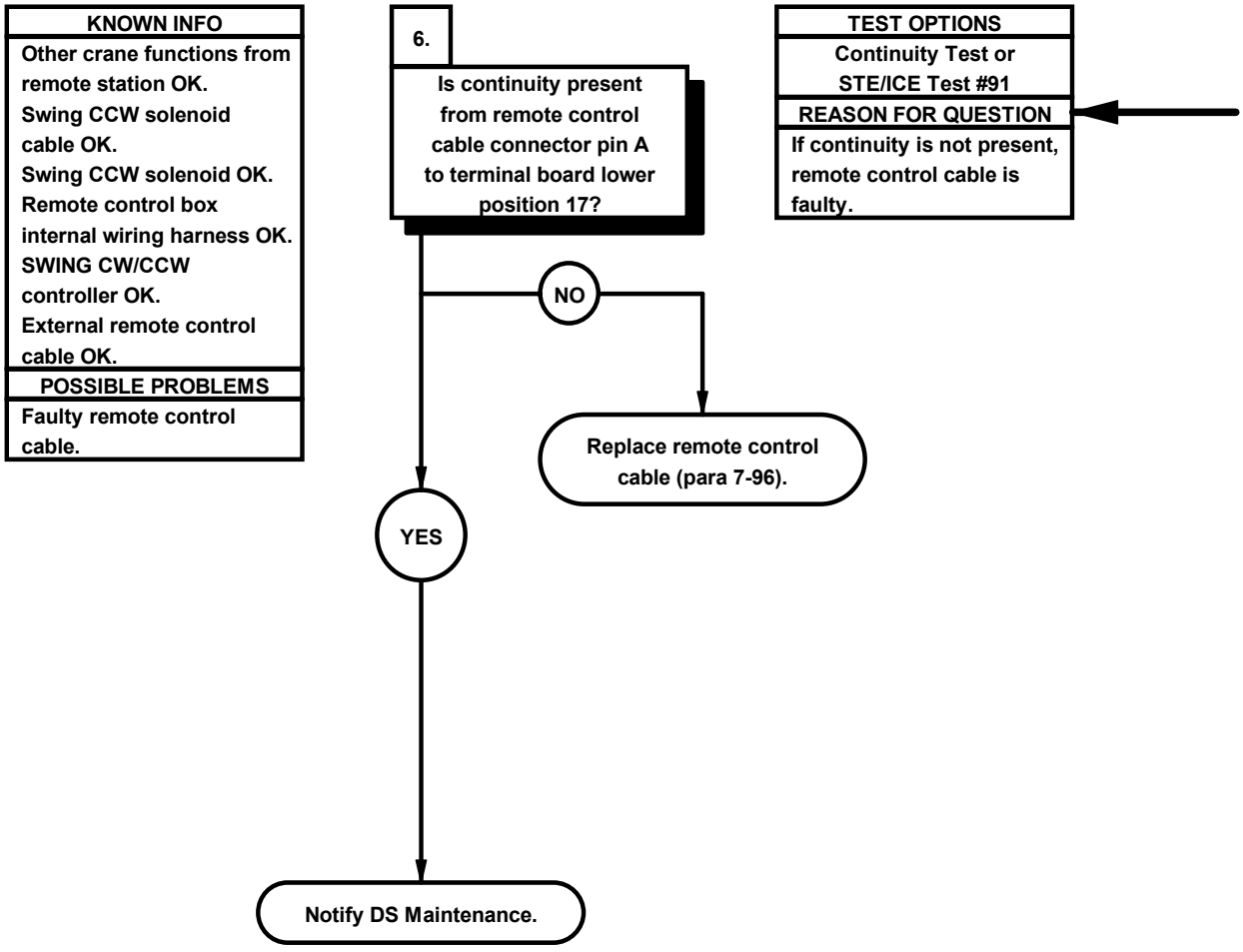


CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin A of one end of external remote control cable connector.
(3) Connect negative (-) probe of multimeter on pin A of other end of external remote control cable and note reading on multimeter.
(4) If continuity is not present, replace external remote control cable.



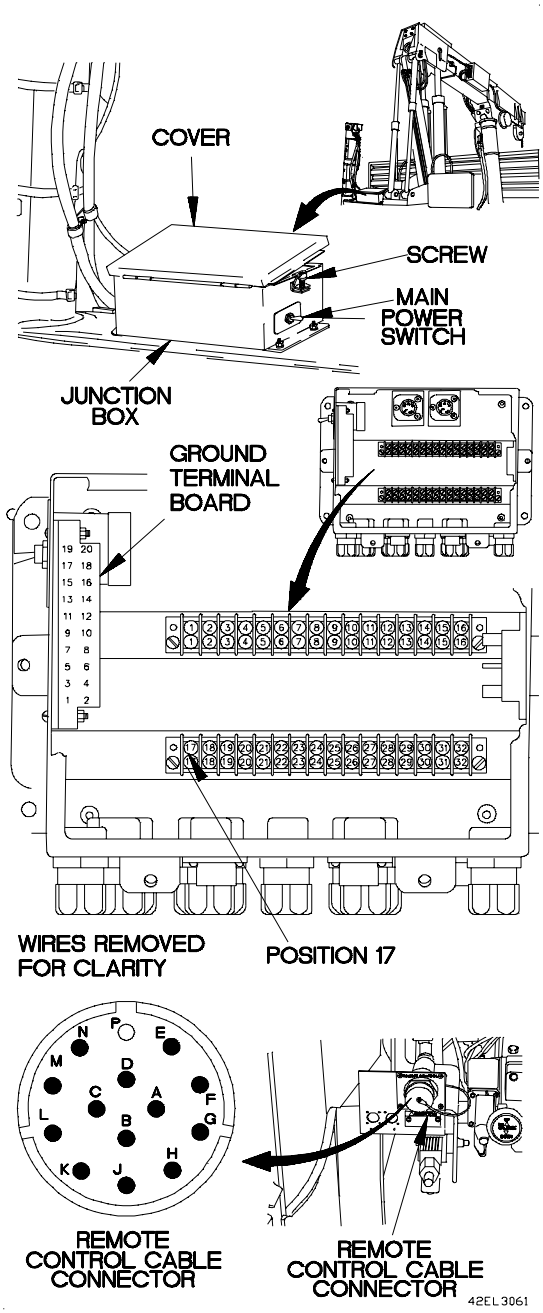
42E1435-

e113. M1084/M1086 MATERIAL HANDLING CRANE (MHC) SWING CCW DOES NOT OPERATE FROM REMOTE STATION (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin A of remote control cable connector.
(3) Connect negative (-) probe of multimeter on terminal board lower position 17 and note reading on multimeter.
(4) If continuity is not present, replace remote control cable (para 7-96).
(5) If continuity is present, notify DS Maintenance.
(6) Close cover on junction box.
(7) Tighten four screws on junction box cover.
(8) Stow crane (TM 9-2320-366-10-1).



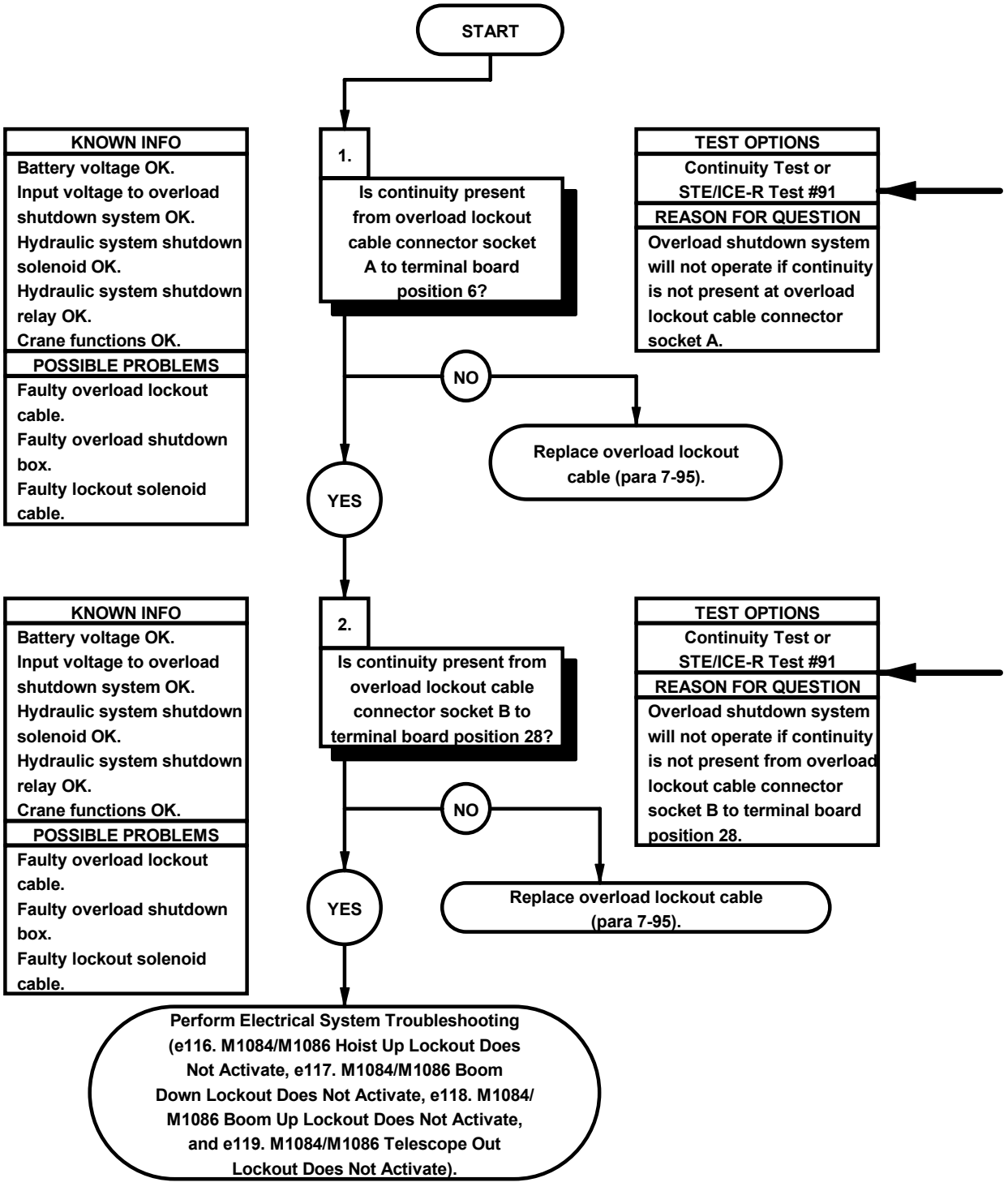
e114. M1084/M1086 MATERIAL HANDLING CRANE (MHC) OVERLOAD SHUTDOWN SYSTEM DOES NOT ACTIVATE

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-57).

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

References
TM 9-4910-571-12&P

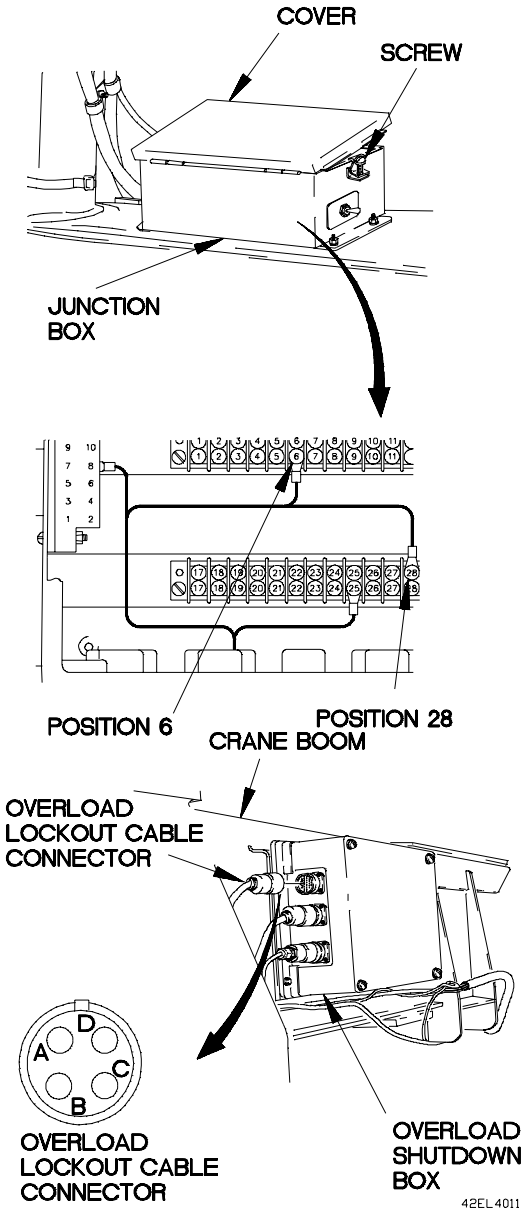


CONTINUITY TEST

(1) Loosen four screws on junction box.
(2) Open cover on junction box.
(3) Disconnect overload lockout cable connector from overload shutdown box.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter in socket A of overload lockout cable connector.
(6) Connect negative (-) probe of multimeter to terminal board position 6 and note reading on multimeter.
(7) If continuity is not present, replace overload lockout cable (para 7-95).

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter in socket B of overload lockout cable connector.
(3) Connect negative (-) probe of multimeter on terminal board position 28 and note reading on multimeter.
(4) If continuity is not present, replace overload lockout cable (para 7-95).
(5) If continuity is present, perform Electrical System Troubleshooting (e116. M1084/M1086 Hoist Up Lockout Does Not Activate, e117. M1084/M1086 Boom Down Lockout Does Not Activate, e118. M1084/M1086 Boom Up Lockout Does Not Activate, and e119. M1084/M1086 Telescope Out Lockout Does Not Activate).
(6) Connect overload lockout cable connector to overload shutdown box.
(7) Close cover on junction box.
(8) Tighten four screws on junction box.
(9) Connect batteries (para 7-57).



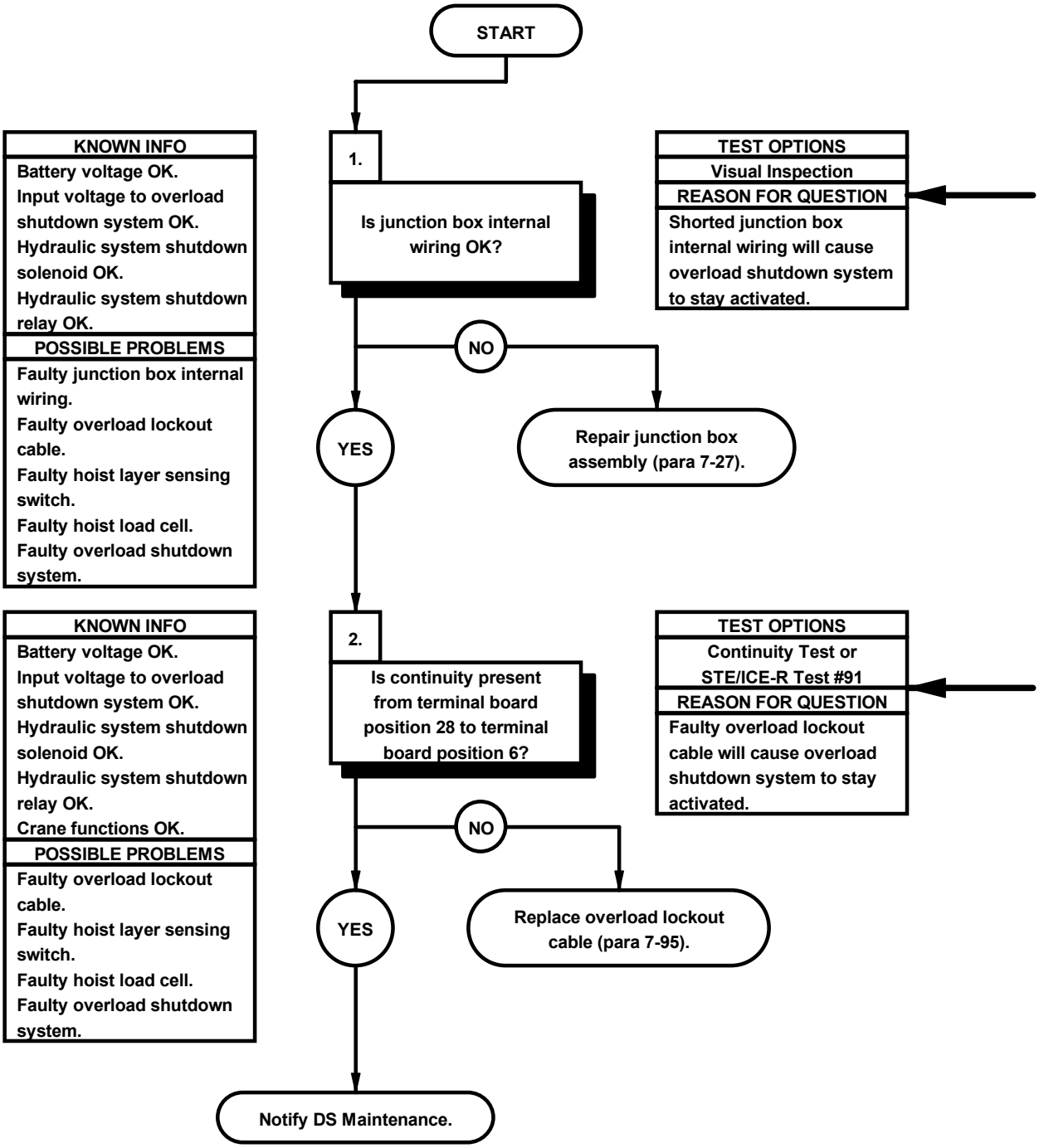
e115. M1084/M1086 MATERIAL HANDLING CRANE (MHC) OVERLOAD SHUTDOWN SYSTEM STAYS ACTIVATED

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-57).

References
TM 9-4910-571-12&P

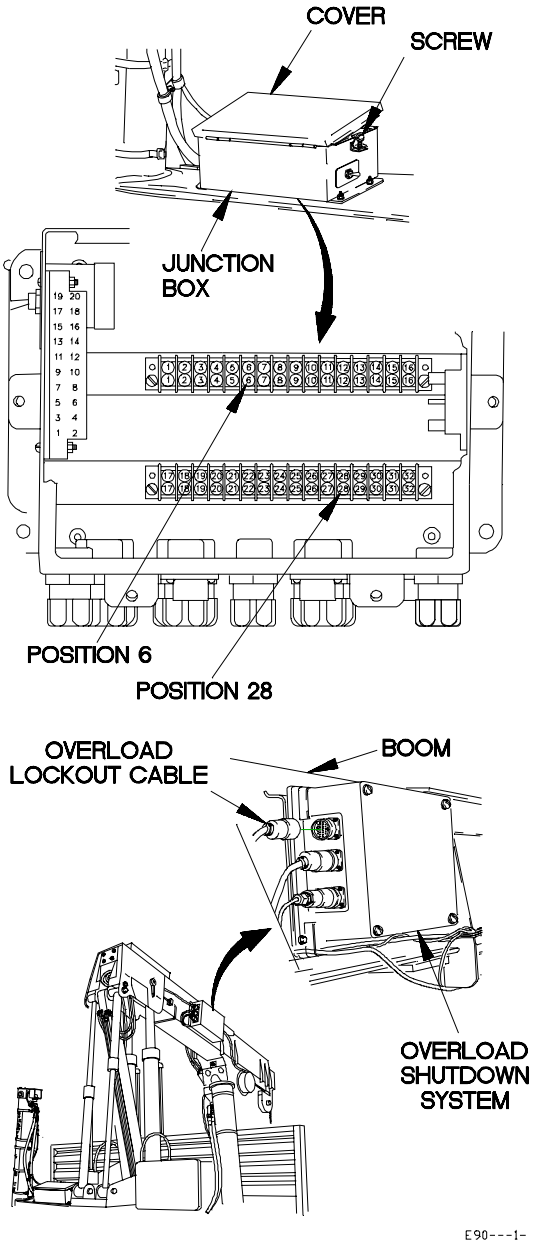
Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)



(1) Loosen four screws on junction box.
(2) Open cover on junction box.
(3) Visually inspect the wiring around terminal board position 28 for shorted wires that could put 24 vdc on position 28.

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to terminal board position 28.
(3) Connect negative (-) probe of multimeter to terminal board position 6 and note reading on multimeter.
(4) If continuity is not present, replace overload lockout cable (para 7-27).
(5) If continuity is present, notify DS Maintenance.
(6) Close cover on junction box.
(7) Tighten four screws on junction box.
(8) Connect batteries (para 7-57).



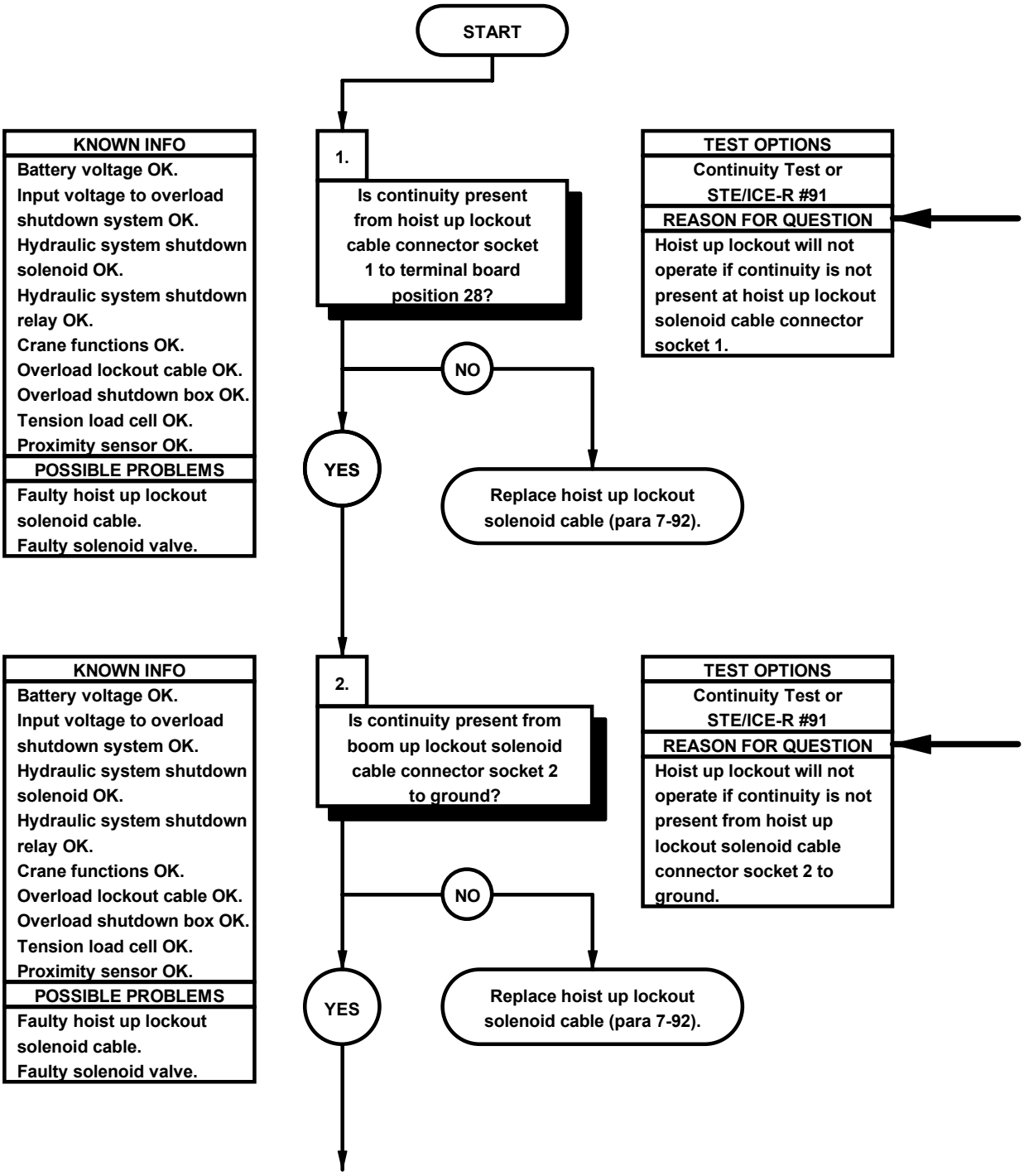
e116. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HOIST UP LOCKOUT DOES NOT ACTIVATE

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-57).

References
TM 9-4910-571-12&P

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

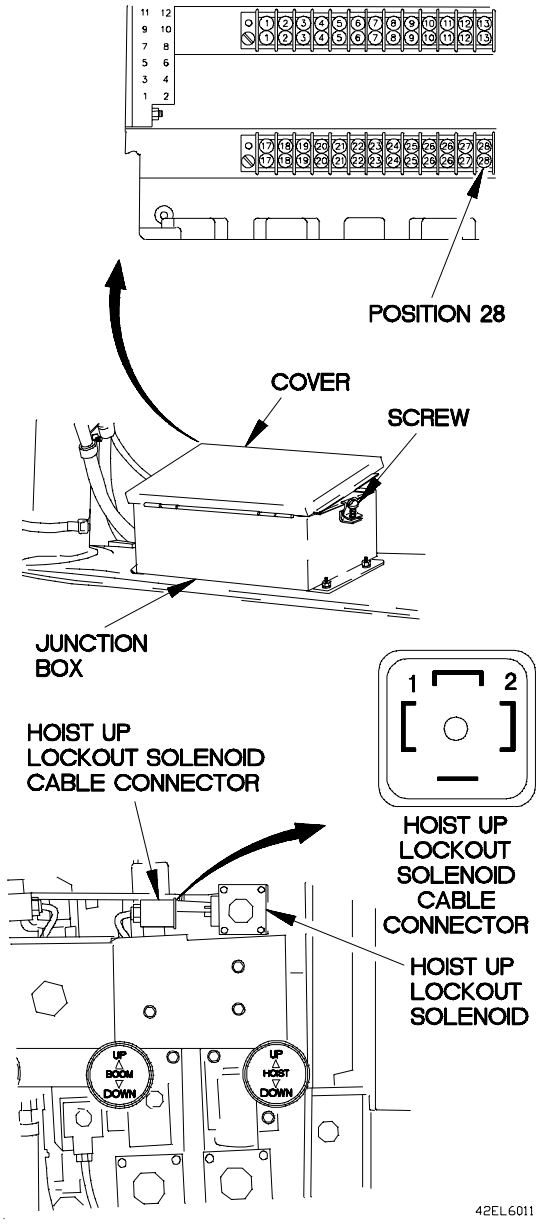


CONTINUITY TEST

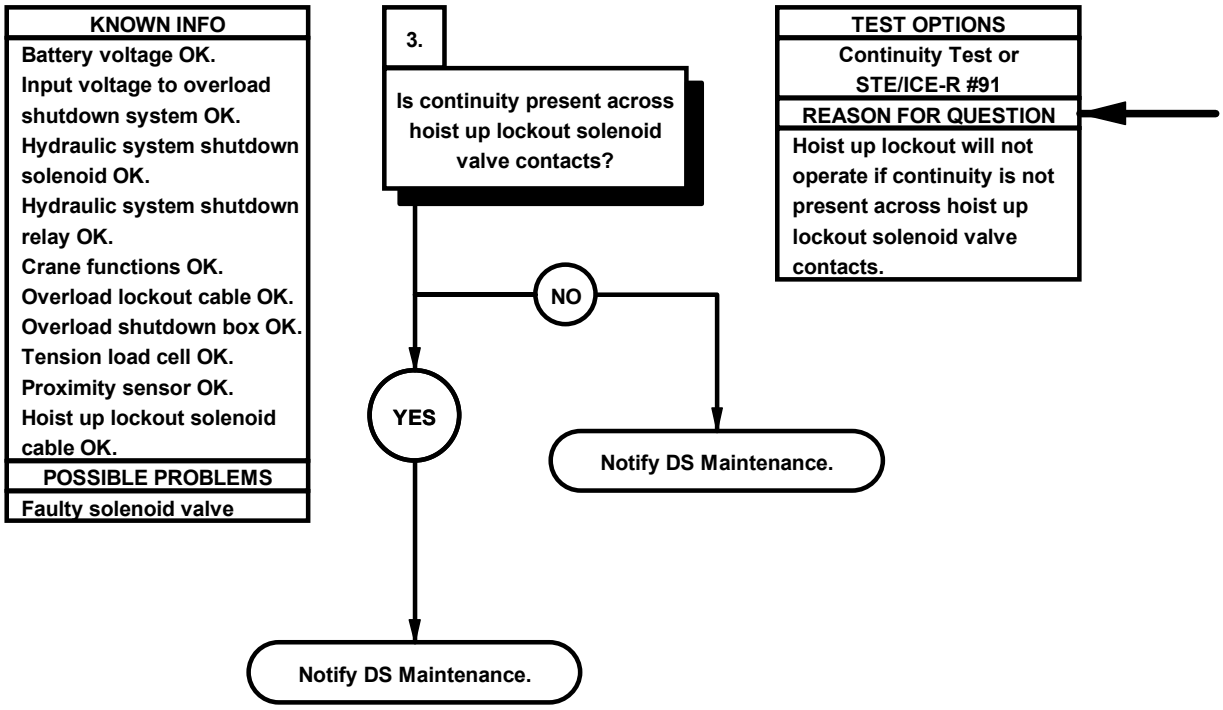
(1) Loosen four screws on junction box.
(2) Open cover on junction box.
(3) Disconnect hoist up lockout solenoid cable connector from hoist up lockout solenoid.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter in socket 1 of hoist up lockout solenoid cable connector.
(6) Connect negative (-) probe of multimeter to terminal board position 28 and note reading on multimeter.
(7) If continuity is not present, replace hoist up lockout solenoid cable (para 7-92).

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter in socket 2 of hoist up lockout solenoid cable connector.
(3) Connect negative (-) probe of multimeter on ground in junction box and note reading on multimeter.
(4) If continuity is not present, replace hoist up lockout solenoid cable (para 7-92).
(5) Connect hoist up lockout solenoid cable connector to hoist up lockout solenoid valve.
(6) Close cover on junction box.
(7) Tighten four screws on junction box cover.

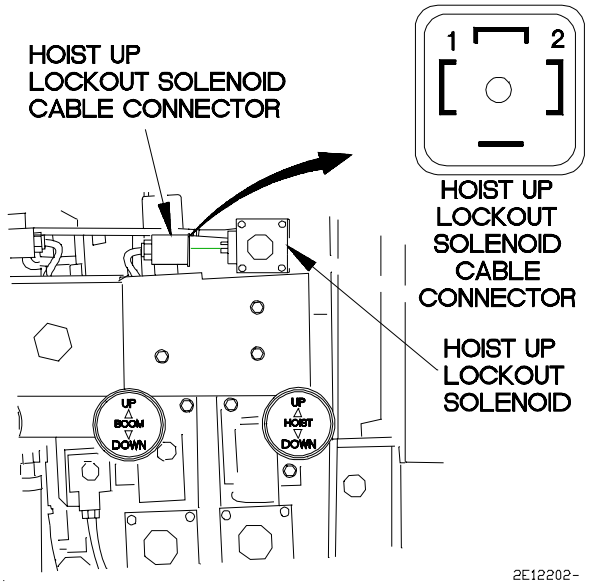


e116. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HOIST UP LOCKOUT DOES NOT ACTIVATE (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on contact two of hoist up lockout solenoid valve.
(3) Connect negative (-) probe of multimeter to contact one of hoist up lockout solenoid valve and note reading on multimeter.
(4) If continuity is not present, notify DS Maintenance.
(5) If continuity is present, notify DS Maintenance.
(6) Connect hoist up lockout solenoid cable to boom up lockout solenoid valve.
(7) Connect batteries (para 7-57).



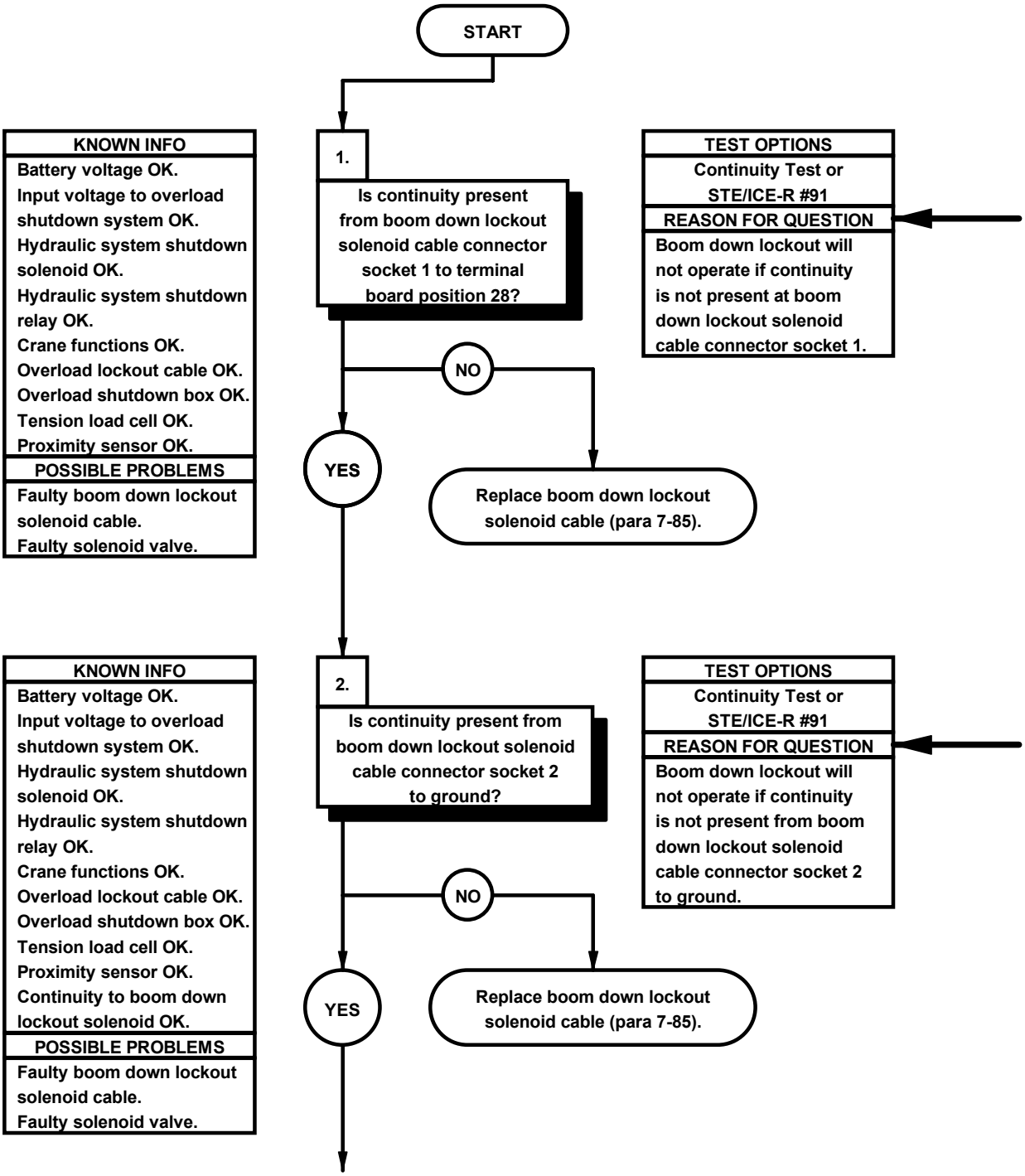
e117. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM DOWN LOCKOUT DOES NOT ACTIVATE

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-57).

References
TM 9-4910-571-12&P

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

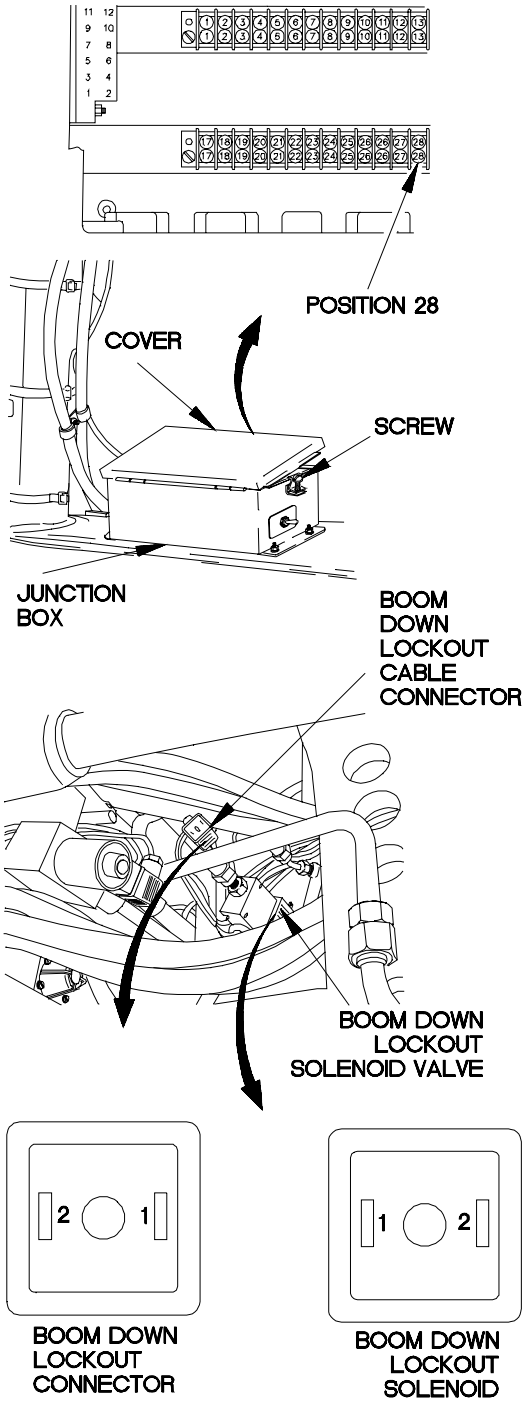


CONTINUITY TEST

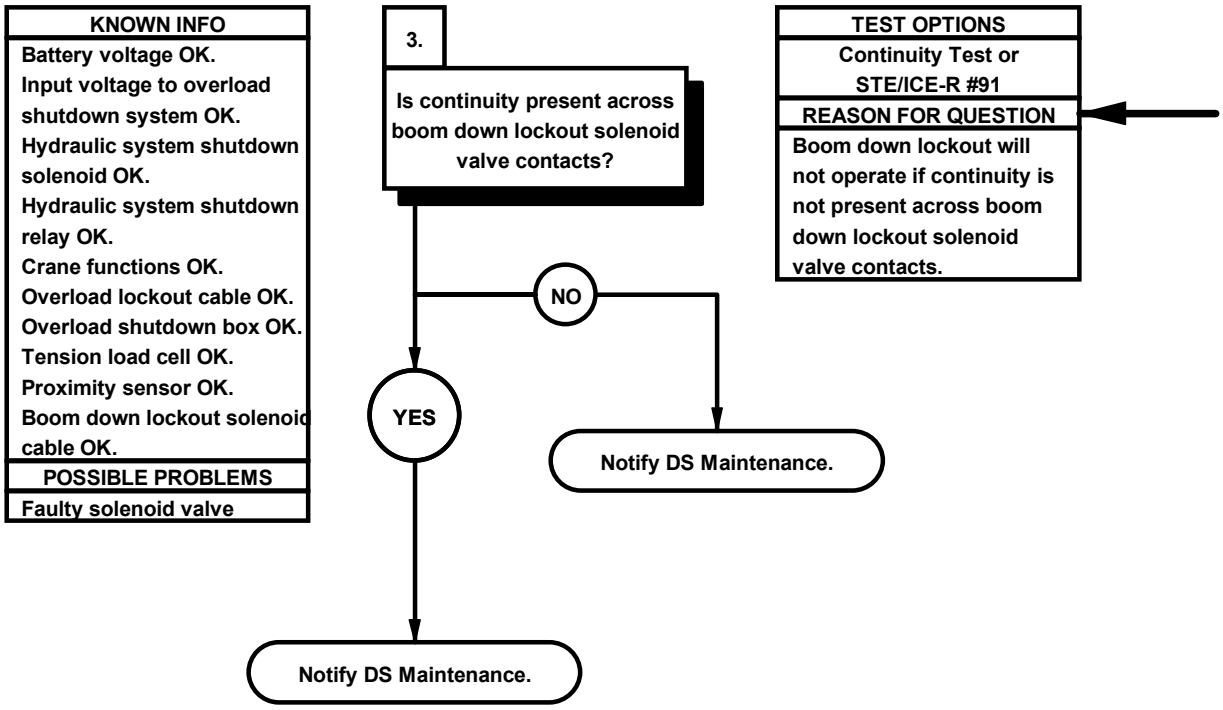
(1) Loosen four screws on junction box.
(2) Open cover on junction box.
(3) Disconnect boom down lockout solenoid cable connector from boom down lockout solenoid valve.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter in socket 1 of boom down lockout solenoid cable.
(6) Connect negative (-) probe of multimeter to terminal board position 28 and note reading on multimeter.
(7) If continuity is not present, replace boom down lockout solenoid cable (para 7-85).

CONTINUITY TEST

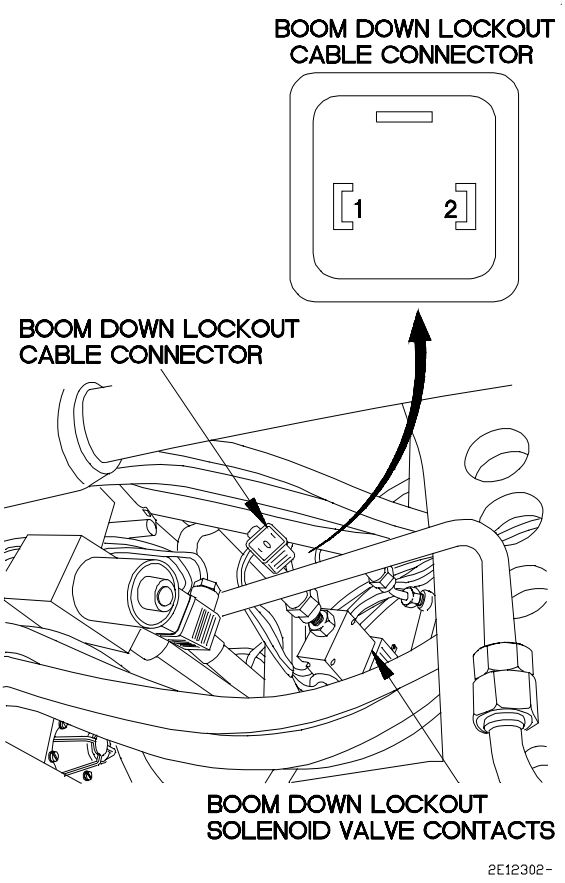
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter in socket 2 of boom down lockout solenoid cable connector.
(3) Connect negative (-) probe of multimeter on ground in junction box and note reading on multimeter.
(4) If continuity is not present, replace boom down lockout solenoid cable (para 7-85).
(5) Connect boom down lockout solenoid cable connector to boom down lockout solenoid valve.
(6) Close cover on junction box.
(7) Tighten four screws on junction box cover.



e117. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM DOWN LOCKOUT DOES NOT ACTIVATE (CONT)



CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on contact two of boom down lockout solenoid valve.
(3) Connect negative (-) probe of multimeter to contact one of boom down lockout solenoid valve and note reading on multimeter.
(4) If continuity is not present, notify DS Maintenance.
(5) If continuity is present, notify DS Maintenance.
(6) Connect boom down lockout solenoid cable to boom down lockout solenoid valve.
(7) Connect batteries (para 7-57).



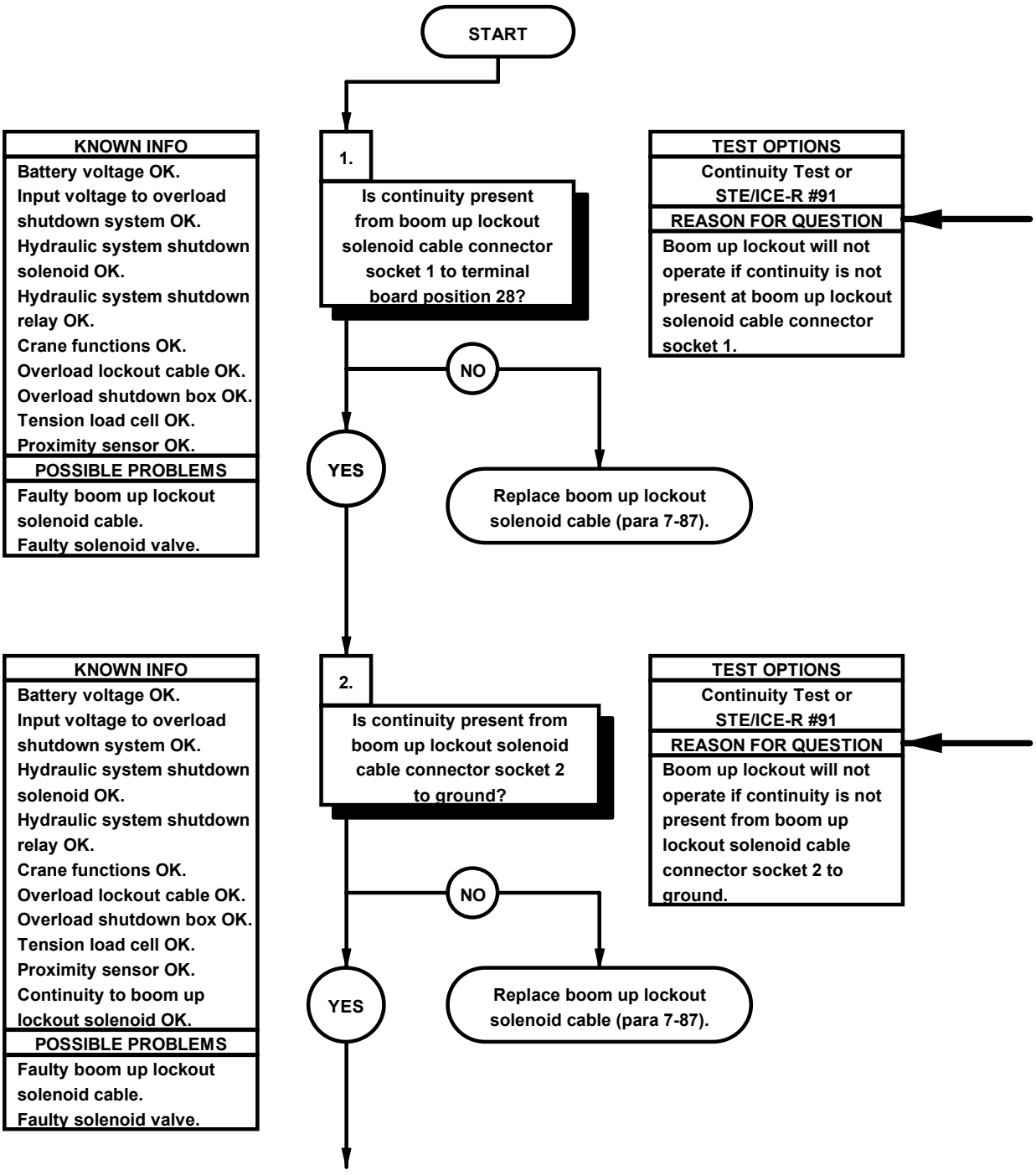
e118. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM UP LOCKOUT DOES NOT ACTIVATE

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-57).

References
TM 9-4910-571-12&P

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

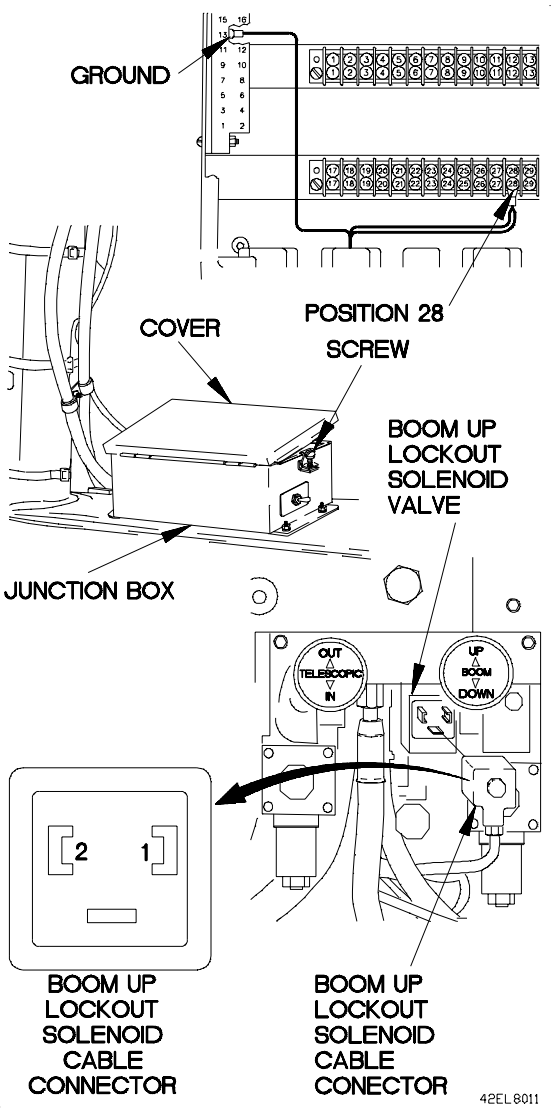


CONTINUITY TEST

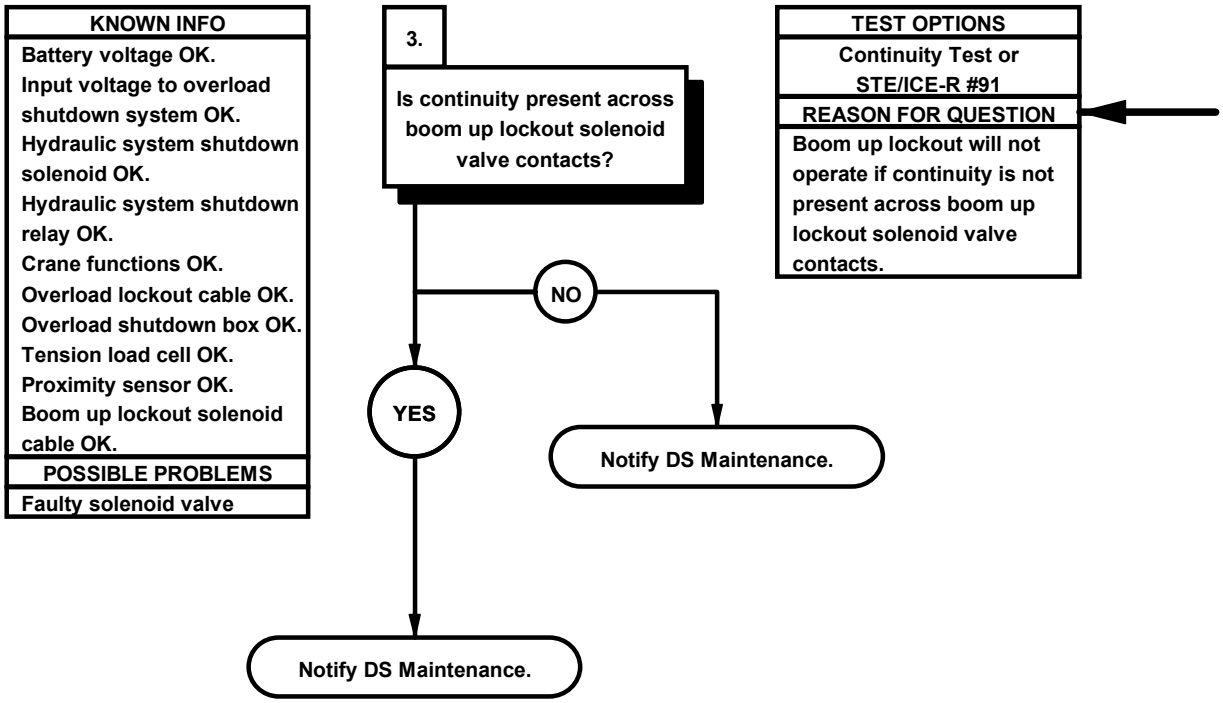
(1) Loosen four screws on junction box.
(2) Open cover on junction box.
(3) Disconnect boom up lockout solenoid cable connector from boom up lockout solenoid valve.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter in socket 1 of boom up lockout solenoid cable.
(6) Connect negative (-) probe of multimeter to terminal board terminal 28 and note reading on multimeter.
(7) If continuity is not present, replace boom up lockout solenoid cable (para 7-87).

CONTINUITY TEST

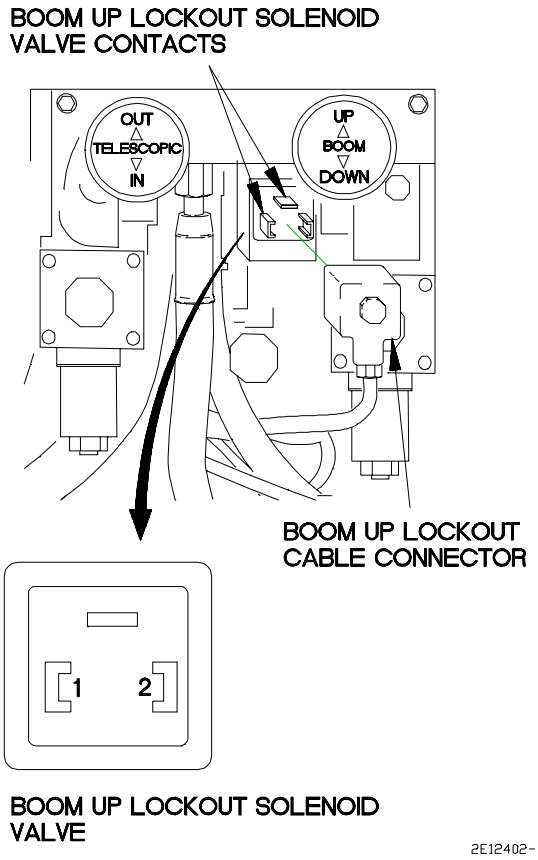
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter in socket 2 of boom up lockout solenoid cable connector.
(3) Connect negative (-) probe of multimeter on ground in junction box and note reading on multimeter.
(4) If continuity is not present, replace boom up lockout solenoid cable (para 7-87).
(5) Connect boom up lockout solenoid cable connector to boom up lockout solenoid valve.
(6) Close cover on junction box.
(7) Tighten four screws on junction box cover.



e118. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM UP LOCKOUT DOES NOT ACTIVATE (CONT)



CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on contact two of boom up lockout solenoid valve.
(3) Connect negative (-) probe of multimeter to contact one of boom up lockout solenoid valve and note reading on multimeter.
(4) If continuity is not present, notify DS Maintenance.
(5) If continuity is present, notify DS Maintenance.
(6) Connect boom up lockout solenoid cable to boom up lockout solenoid valve.
(7) Connect batteries (para 7-57).



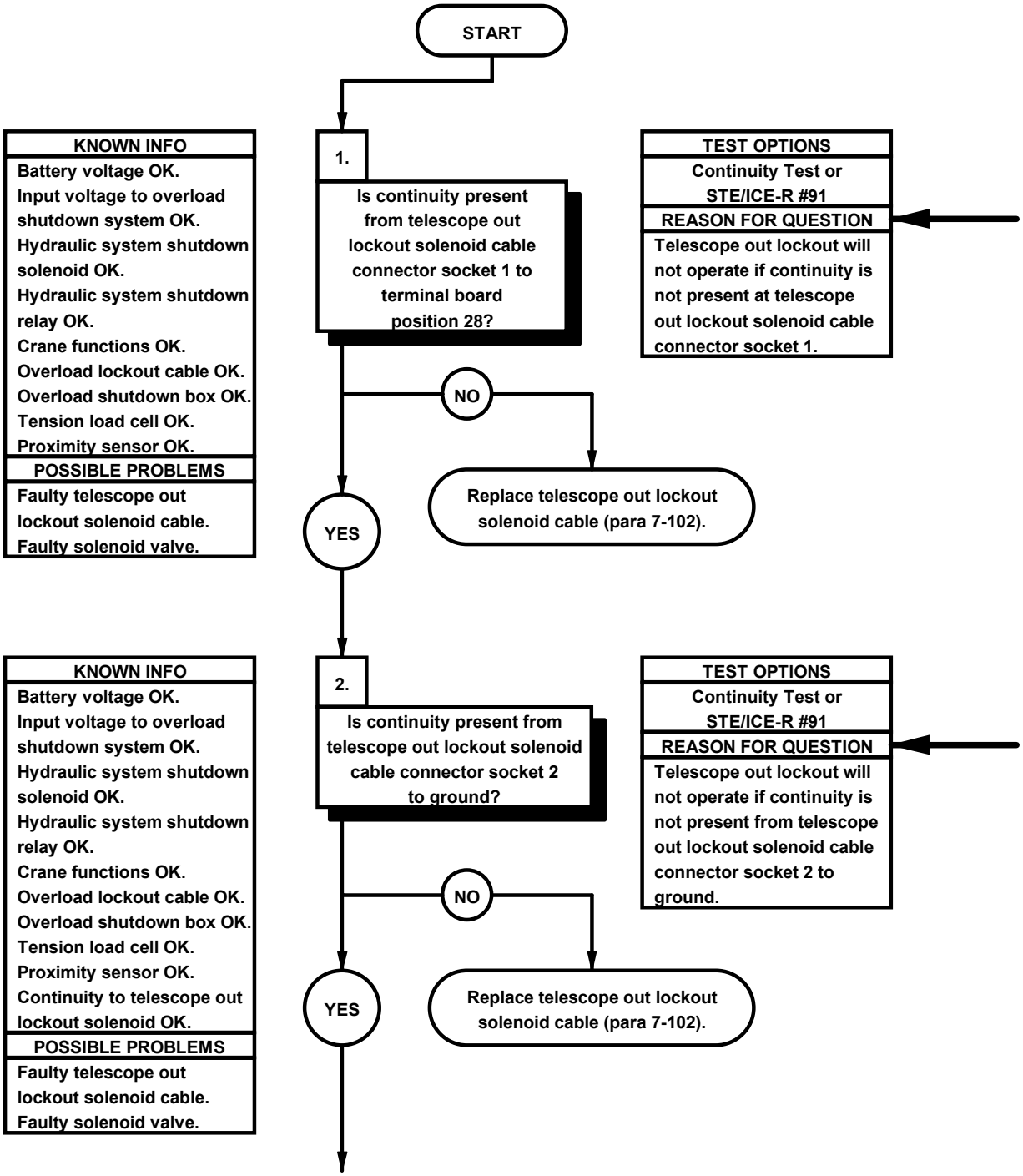
e119. M1084/M1086 MATERIAL HANDLING CRANE (MHC) TELESCOPE OUT LOCKOUT DOES NOT ACTIVATE

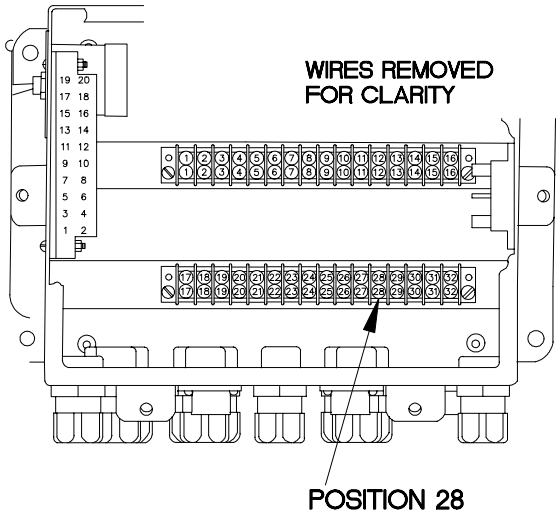
INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-57).

References
TM 9-4910-571-12&P

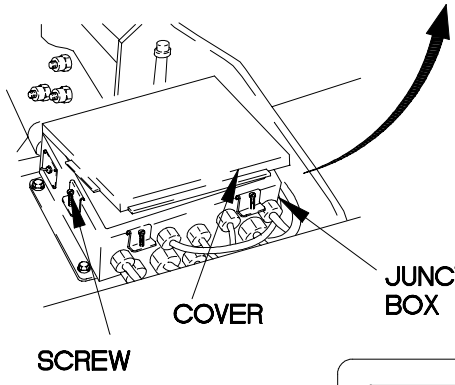
Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)





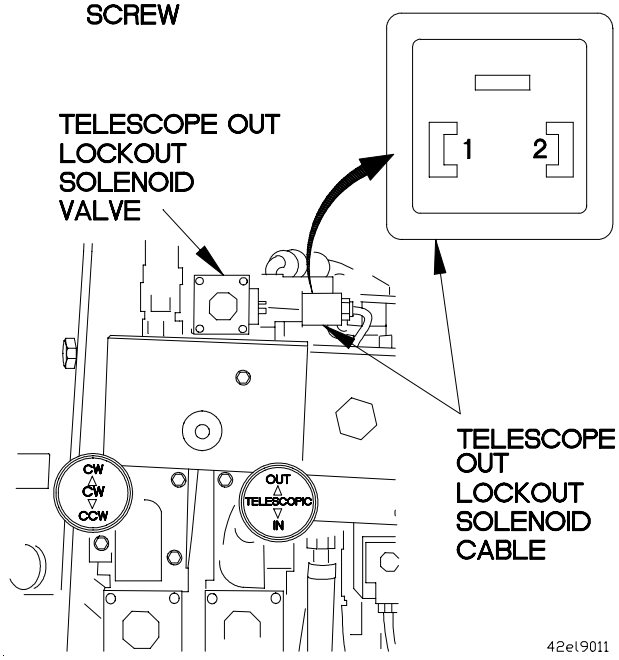
CONTINUITY TEST

(1) Loosen four screws on junction box.
(2) Open cover on junction box.
(3) Disconnect telescope out lockout solenoid cable connector from telescope out lockout solenoid valve.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter in socket 1 of telescope out lockout solenoid cable.
(6) Connect negative (-) probe of multimeter to terminal board terminal 28 and note reading on multimeter.
(7) If continuity is not present, replace telescope out lockout solenoid cable (para 7-102).

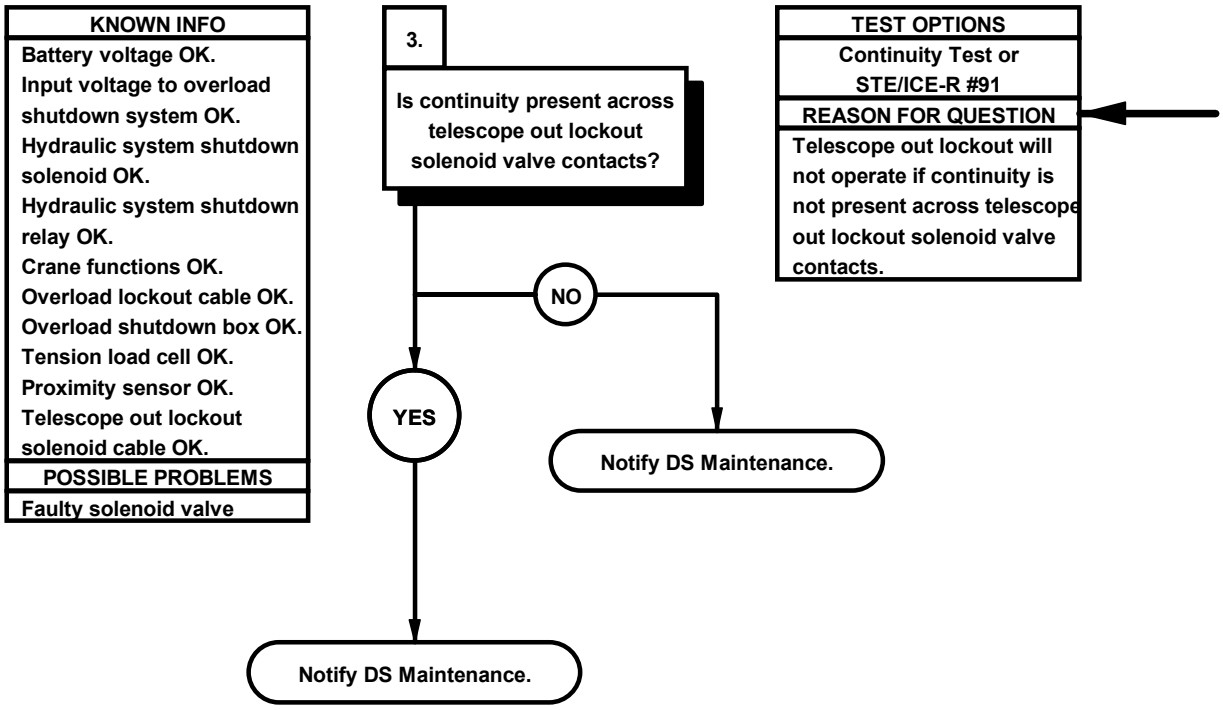


CONTINUITY TEST

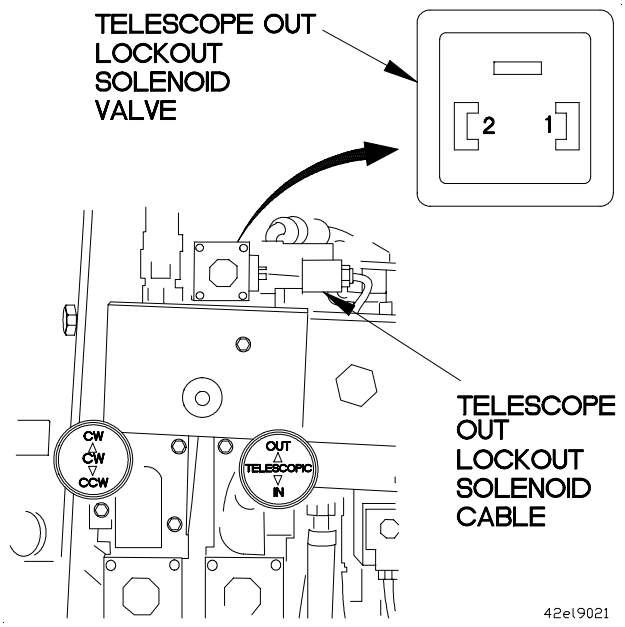
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter in socket 2 of telescope out lockout solenoid cable connector.
(3) Connect negative (-) probe of multimeter on ground in junction box and note reading on multimeter.
(4) If continuity is not present, replace telescope out lockout solenoid cable (para 7-102).
(5) Connect telescope out lockout solenoid cable connector to telescope out lockout solenoid valve.
(6) Close cover on junction box.
(7) Tighten four screws on junction box cover.



e119. M1084/M1086 MATERIAL HANDLING CRANE (MHC) TELESCOPE OUT LOCKOUT DOES NOT ACTIVATE (CONT)



CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on contact two of telescope out lockout solenoid valve.
(3) Connect negative (-) probe of multimeter to contact one of telescope out lockout solenoid valve and note reading on multimeter.
(4) If continuity is not present, notify DS Maintenance.
(5) If continuity is present, notify DS Maintenance.
(6) Connect telescope out lockout solenoid cable to telescope out lockout solenoid valve.
(7) Connect batteries (para 7-57).



e120. M1089 MATERIAL HANDLING CRANE (MHC) DOES NOT OPERATE

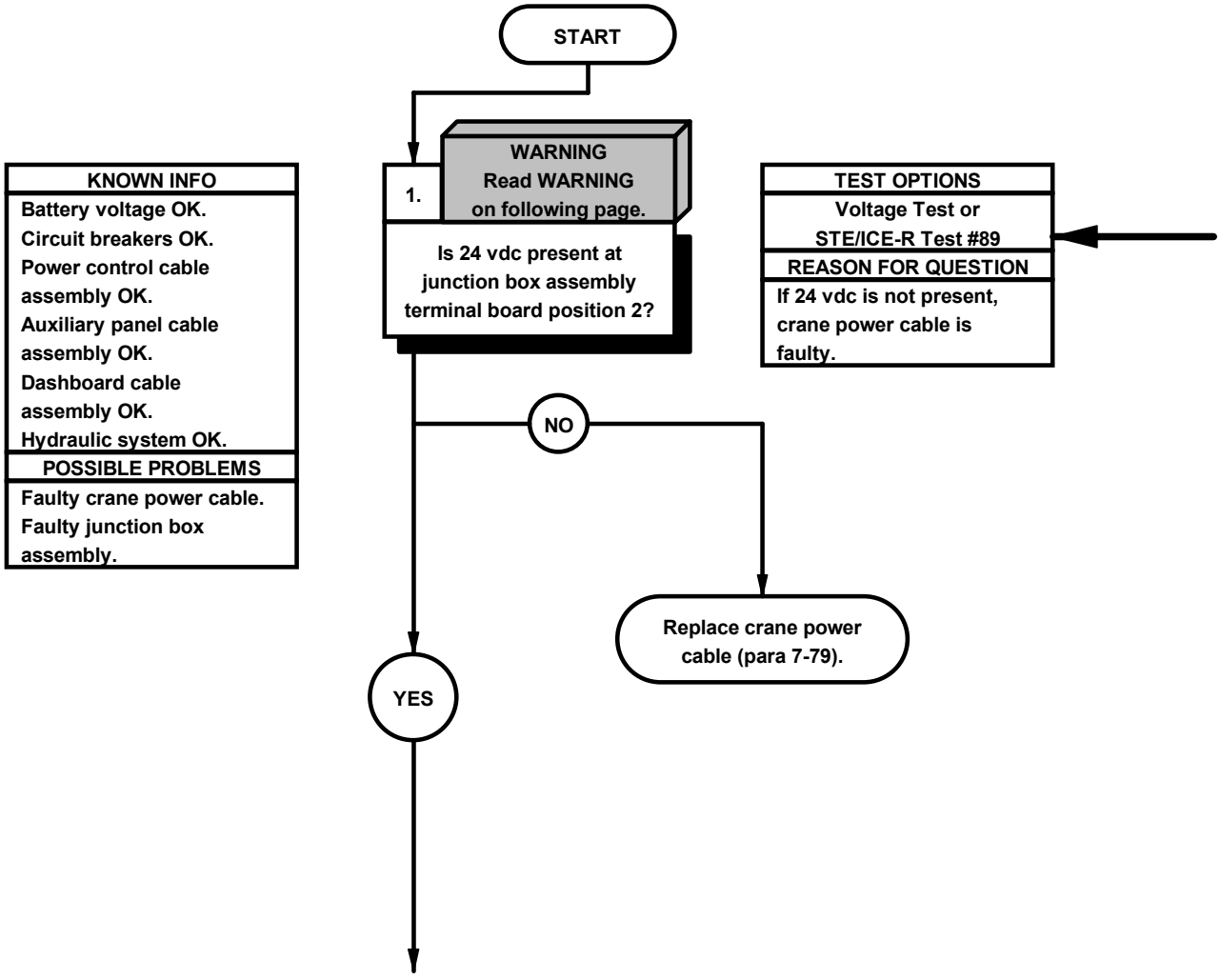
INITIAL SETUP

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

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

References
TM 9-491-571-12&P

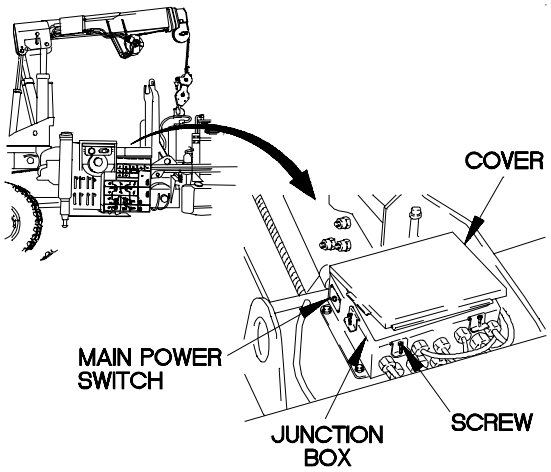


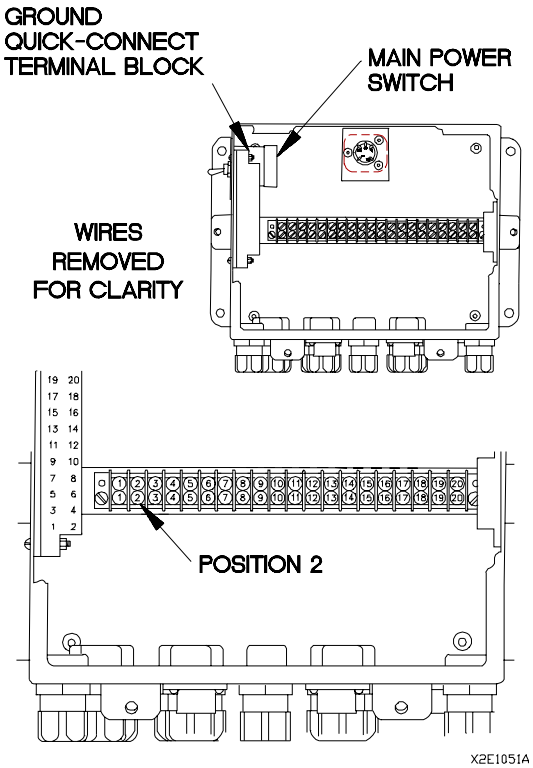
WARNING

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.

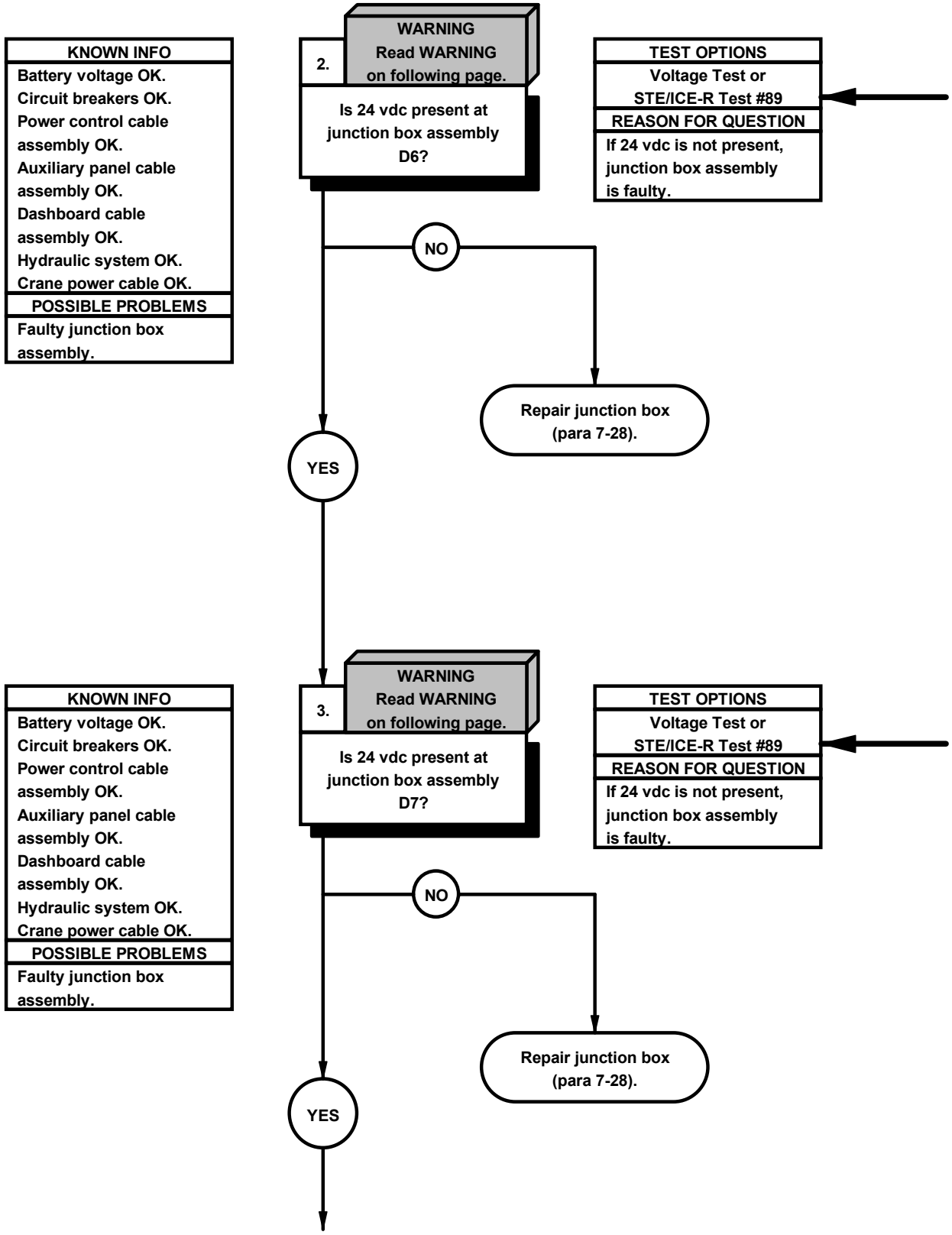
VOLTAGE TEST

(1) Loosen four screws on junction box cover.
(2) Open cover on junction box.
(3) Set multimeter to vdc.
(4) Connect positive (+) probe of multimeter to terminal board position 2.
(5) Connect negative (-) probe of multimeter to GROUND quick-connect terminal block (above main power switch) and note reading on multimeter.
(6) If 24 vdc is not present, replace crane power cable (para 7-79).





e120. M1089 MATERIAL HANDLING CRANE (MHC) DOES NOT OPERATE (CONT)



WARNING

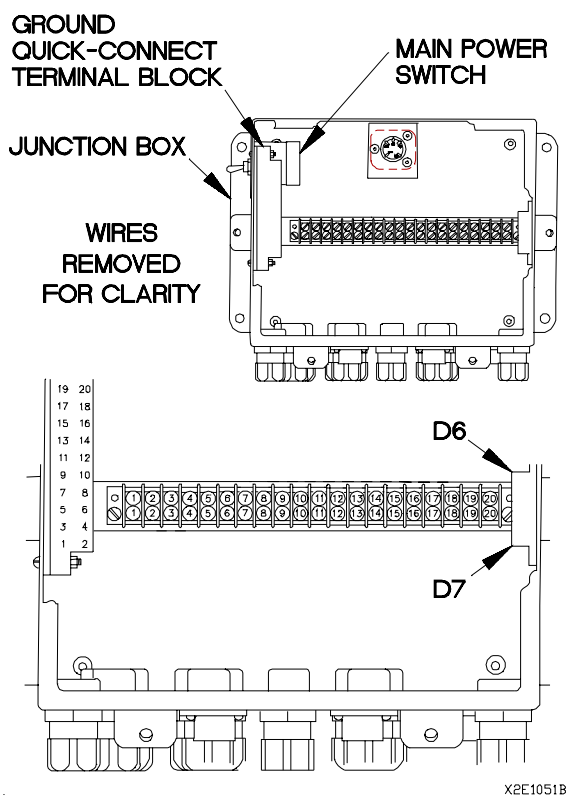
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

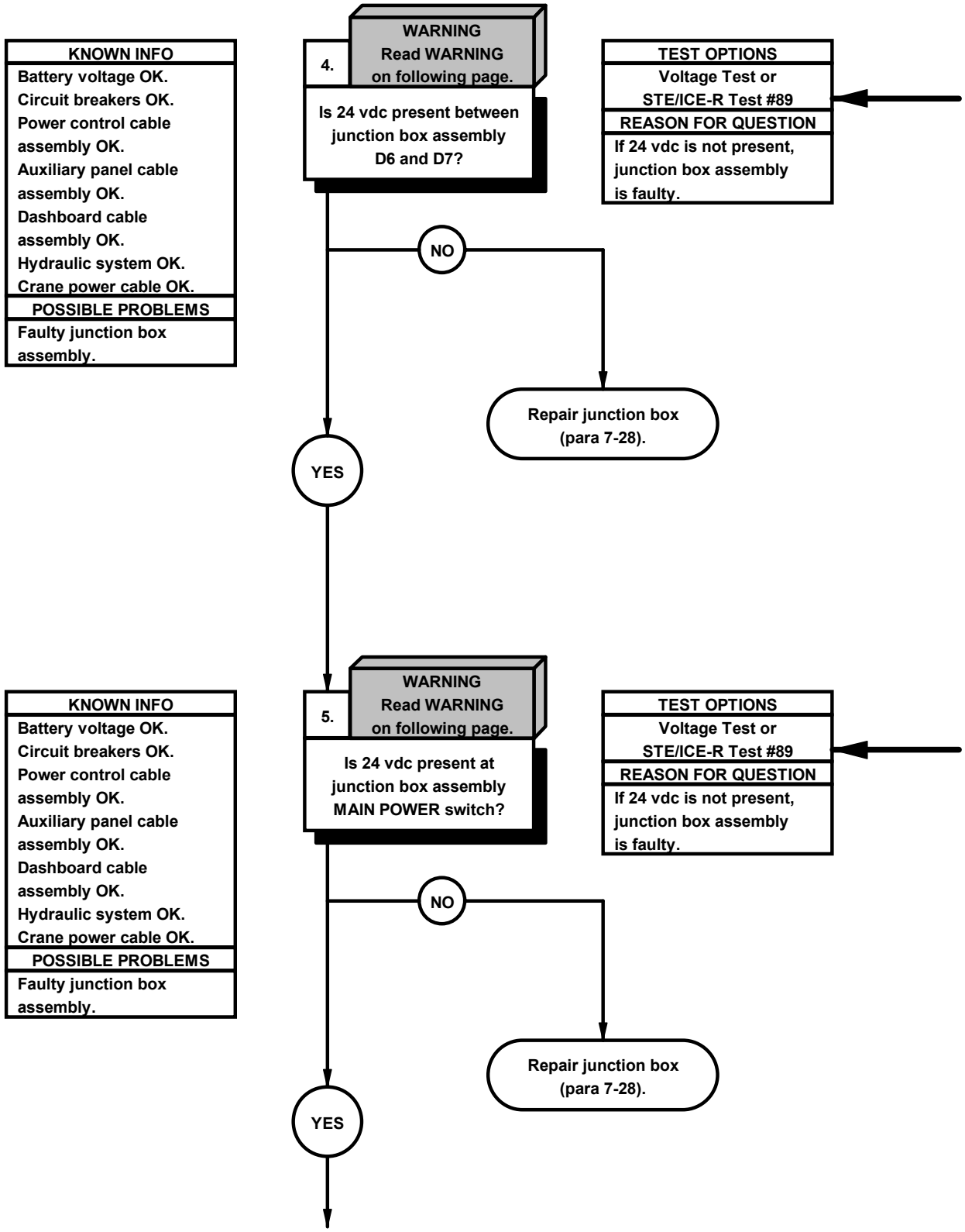
(1) Set multimeter to vdc.
(2) Connect positive (+) probe of multimeter to D6 of junction box.
(3) Connect negative (-) probe of multimeter to GROUND quick-connect terminal block (above main power switch) and note reading on multimeter.
(4) If 24 vdc is not present, repair junction box assembly (para 7-28).

VOLTAGE TEST

(1) Set multimeter to vdc.
(2) Connect positive (+) probe of multimeter to D7 of junction box.
(3) Connect negative (-) probe of multimeter to GROUND quick-connect terminal block (above main power switch) and note reading on multimeter.
(4) If 24 vdc is not present, repair junction box assembly (para 7-28).



e120. M1089 MATERIAL HANDLING CRANE (MHC) DOES NOT OPERATE (CONT)

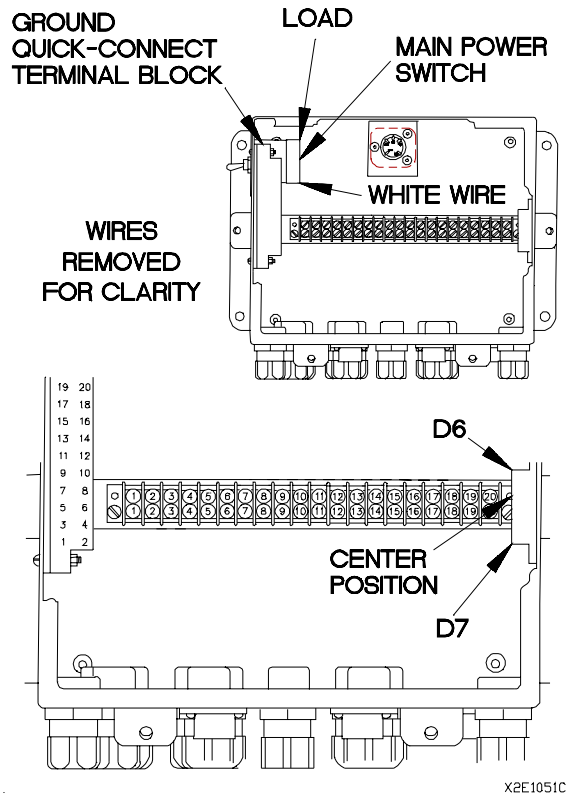


WARNING

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.

VOLTAGE TEST

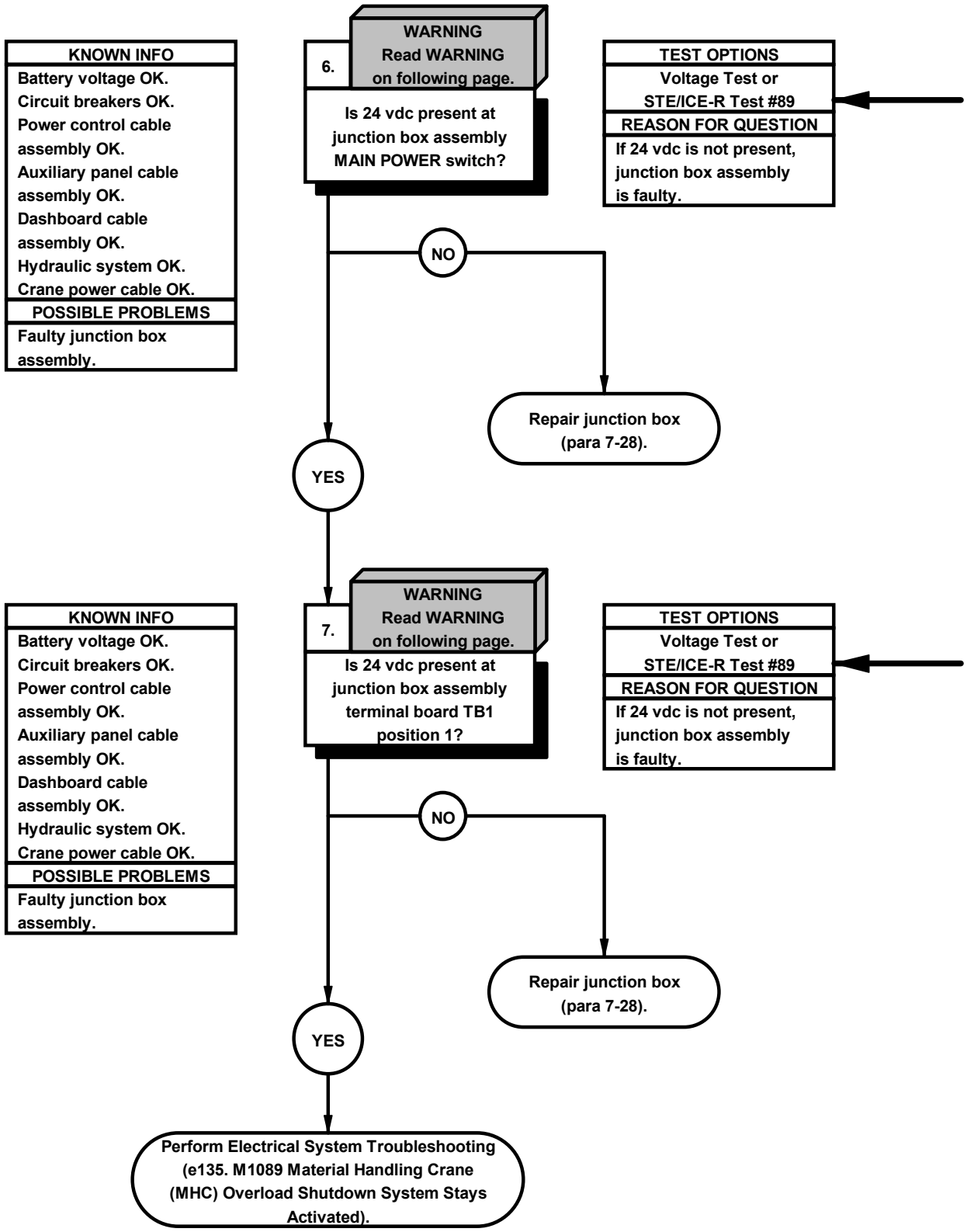
(1) Set multimeter to vdc.
(2) Connect positive (+) probe of multimeter to center position, between D6 and D7 of junction box.
(3) Connect negative (-) probe of multimeter to GROUND quick-connect terminal block (above main power switch) and note reading on multimeter.
(4) If 24 vdc is not present, repair junction box assembly (para 7-28).



VOLTAGE TEST

(1) Set multimeter to vdc.
(2) Connect positive (+) probe of multimeter to MAIN POWER switch line position (white wire).
(3) Connect negative (-) probe of multimeter to GROUND quick-connect terminal block (above main power switch) and note reading on multimeter.
(4) If 24 vdc is not present, repair junction box assembly (para 7-28).

e120. M1089 MATERIAL HANDLING CRANE (MHC) DOES NOT OPERATE (CONT)



WARNING

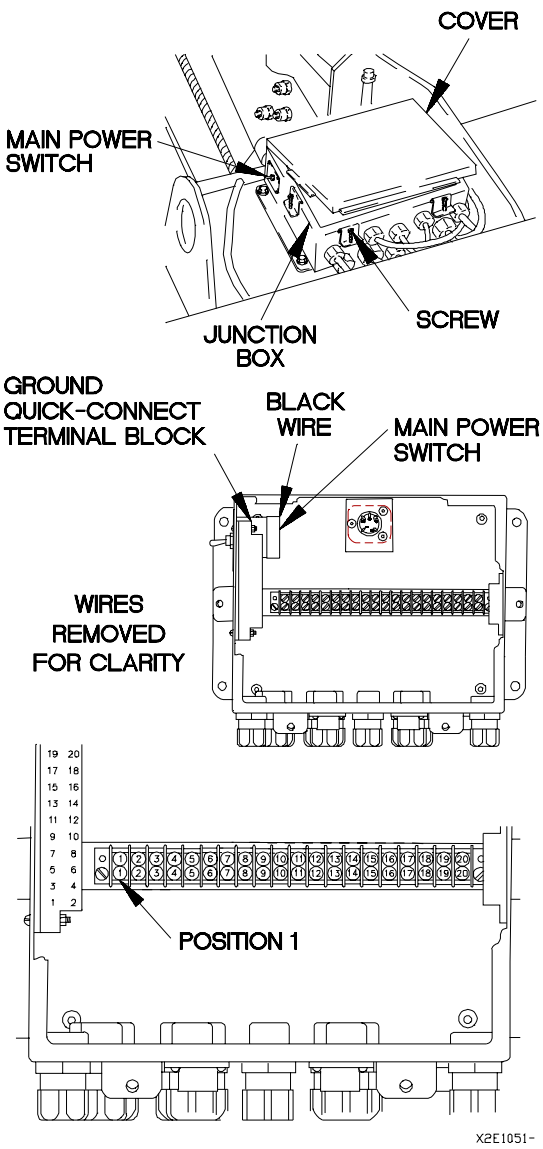
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Set multimeter to vdc.
(2) Connect positive (+) probe of multimeter to MAIN POWER switch load position (black wire).
(3) Connect negative (-) probe of multimeter to GROUND quick-connect terminal block (above main power switch).
(4) Position MAIN POWER switch to ON and note reading on multimeter.
(5) If 24 vdc is not present, repair junction box assembly (para 7-28).

VOLTAGE TEST

(1) Set multimeter to vdc.
(2) Connect positive (+) probe of multimeter to junction box terminal board TB1 position 1.
(3) Connect negative (-) probe of multimeter to GROUND quick-connect terminal block (above main power switch) and note reading on multimeter.
(4) If 24 vdc is not present, repair junction box assembly (para 7-28).
(5) Position MAIN POWER switch to OFF.
(6) Close cover on junction box.
(7) Tighten four screws on junction box cover.



e121. M1089 MATERIAL HANDLING CRANE (MHC) DOES NOT OPERATE FROM REMOTE CONTROL

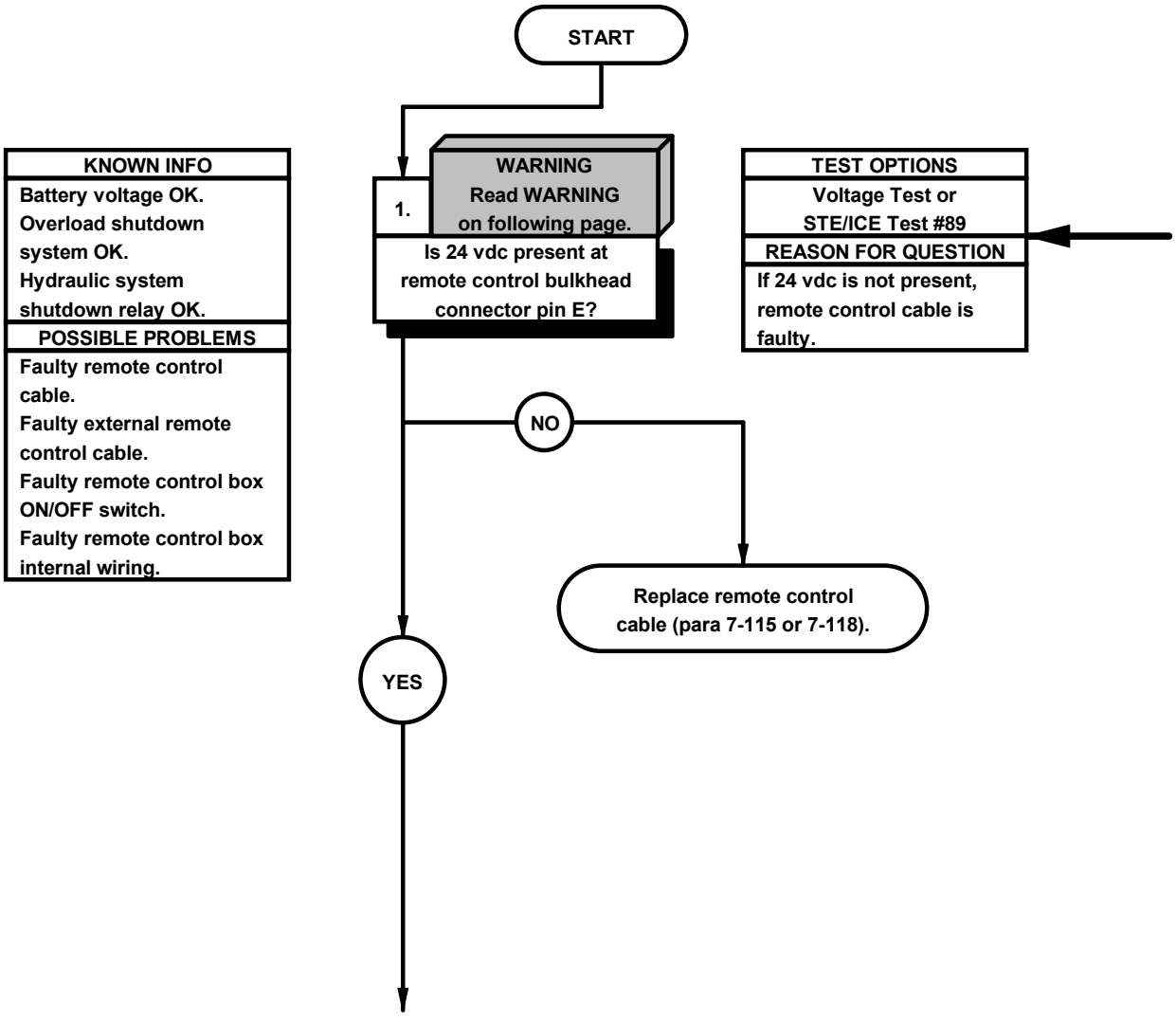
INITIAL SETUP

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

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

References
TM 9-4910-571-12&P

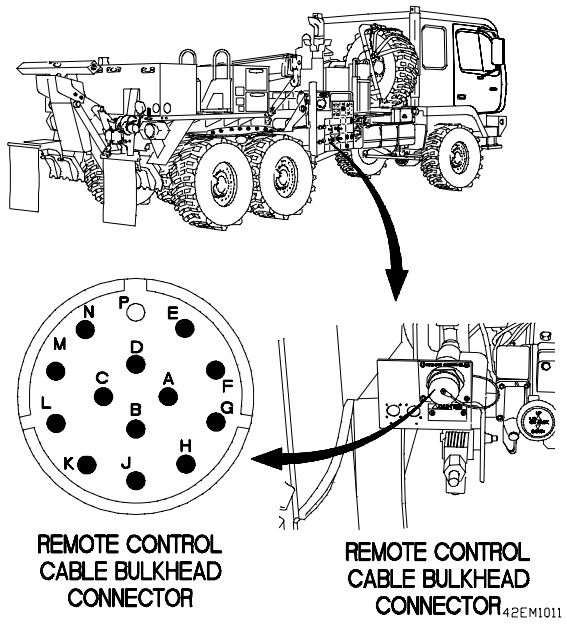


WARNING

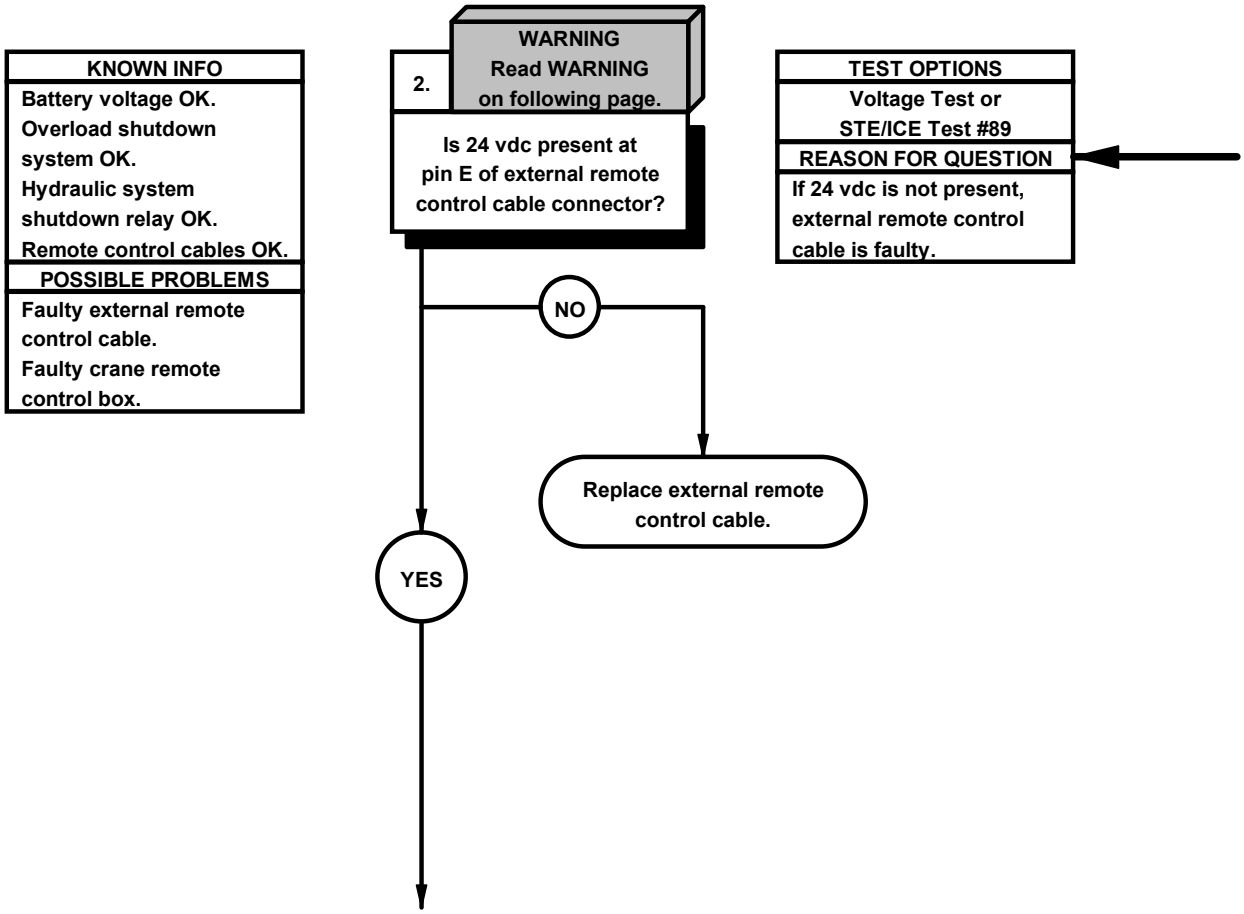
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Remove cover from left or right remote control cable bulkhead connector.
(2) Set multimeter to volts dc.
(3) Connect positive (+) probe of multimeter to pin E of remote control bulkhead connector.
(4) Connect negative (-) probe of multimeter to pin B of remote control bulkhead connector.
(5) Position MAIN POWER switch to ON (TM 9-2320-366-10-1) and note reading on multimeter.
(6) If 24 vdc is not present, relace left or right remote control cable (para 7-115 or 7-118).



e121. M1089 MATERIAL HANDLING CRANE (MHC) DOES NOT OPERATE FROM REMOTE CONTROL (CONT)

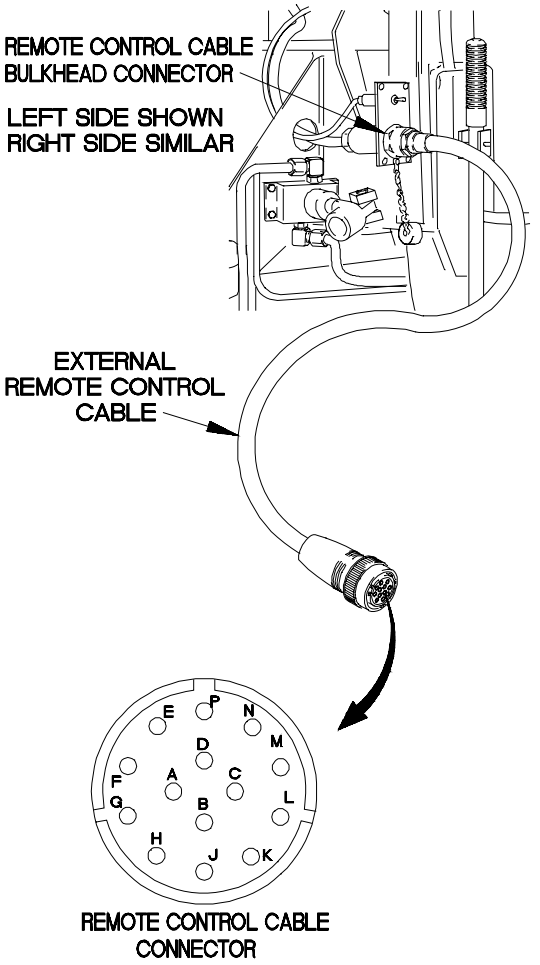


WARNING

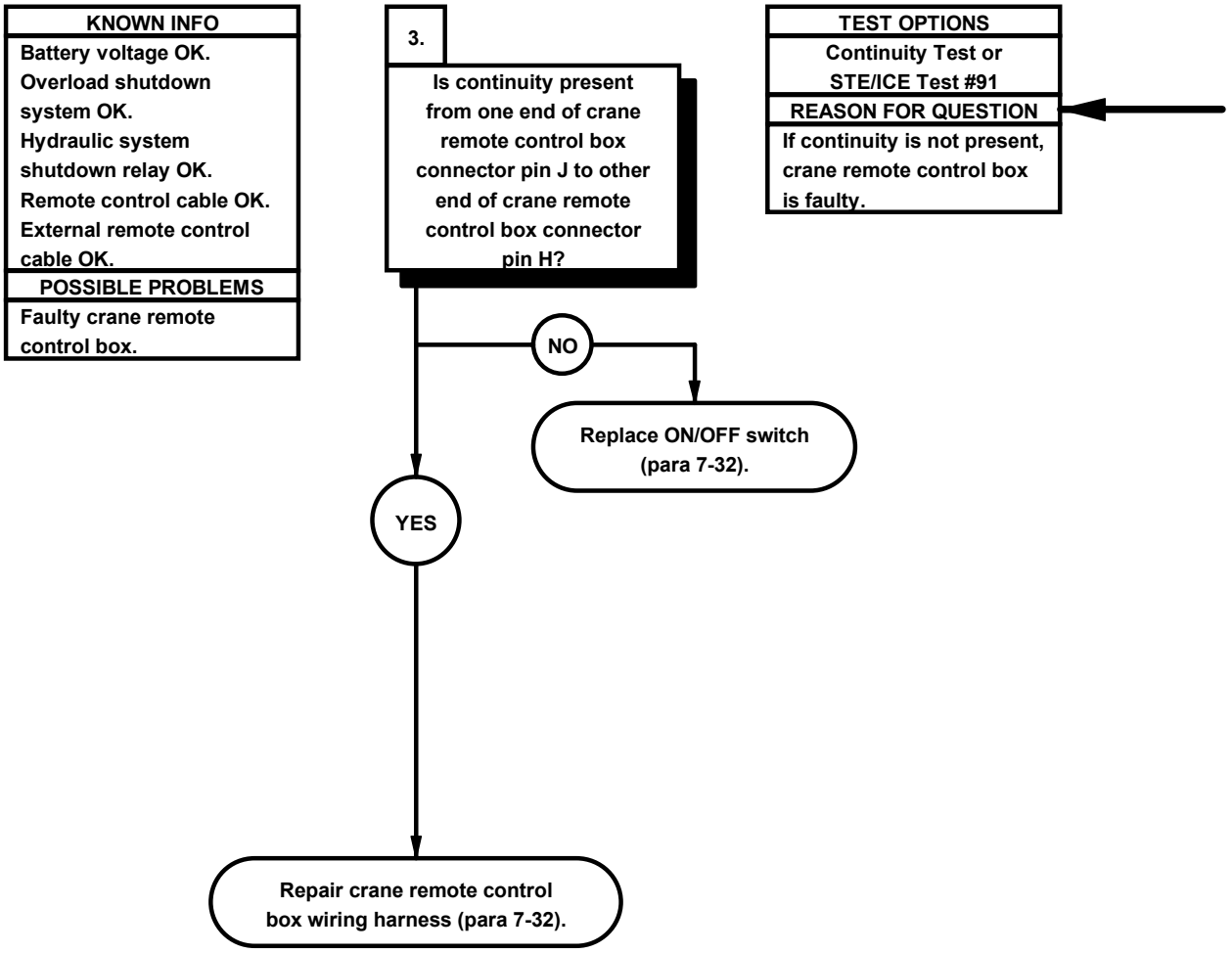
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

CONTINUITY TEST

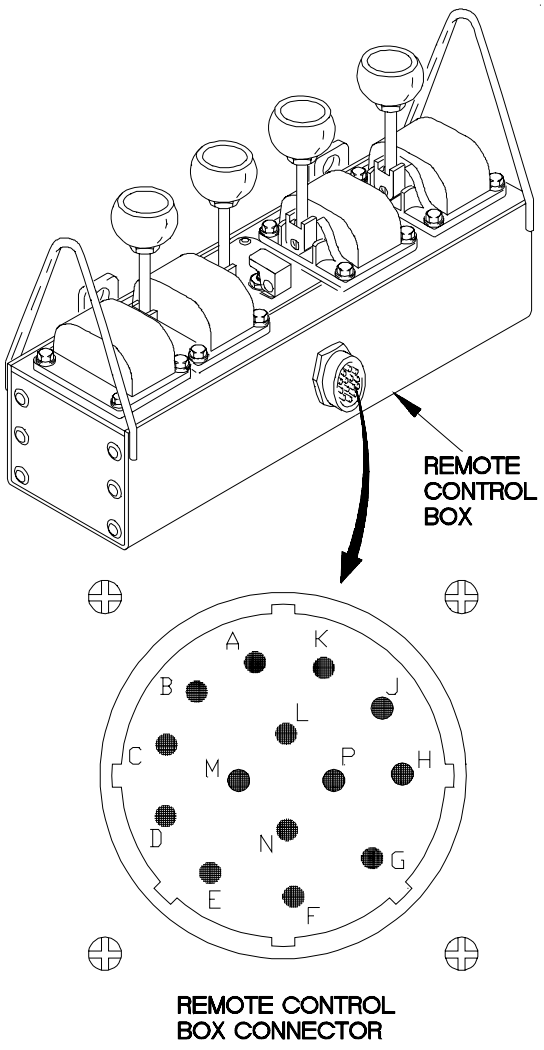
(1) Connect external remote control cable to left or right remote control cable bulkhead connector.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin E of remote control cable connector.
(4) Connect negative (-) probe of multimeter on pin B of remote control cable connector and note reading on multimeter.
(5) If 24 vdc is not present, replace external remote control cable.
(6) Disconnect external remote control cable from left or right remote control cable bulkhead connector.
(7) Install cover on left or right remote control cable bulkhead connector.



e121. M1089 MATERIAL HANDLING CRANE (MHC) DOES NOT OPERATE FROM REMOTE CONTROL (CONT)



CONTINUITY TEST
(1) Remove cover from crane remote control box connector.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin J of crane remote control box connector.
(4) Connect negative (-) probe of multimeter on pin H of crane remote control box connector and note reading on multimeter.
(5) If continuity is not present, replace ON/OFF switch (para 7-32).
(6) If continuity is present, repair crane remote control box internal wiring harness (para 7-32).
(7) Install cover on crane remote control box connector.



e122. M1089 MATERIAL HANDLING CRANE (MHC) HOIST UP DOES NOT OPERATE FROM REMOTE STATION

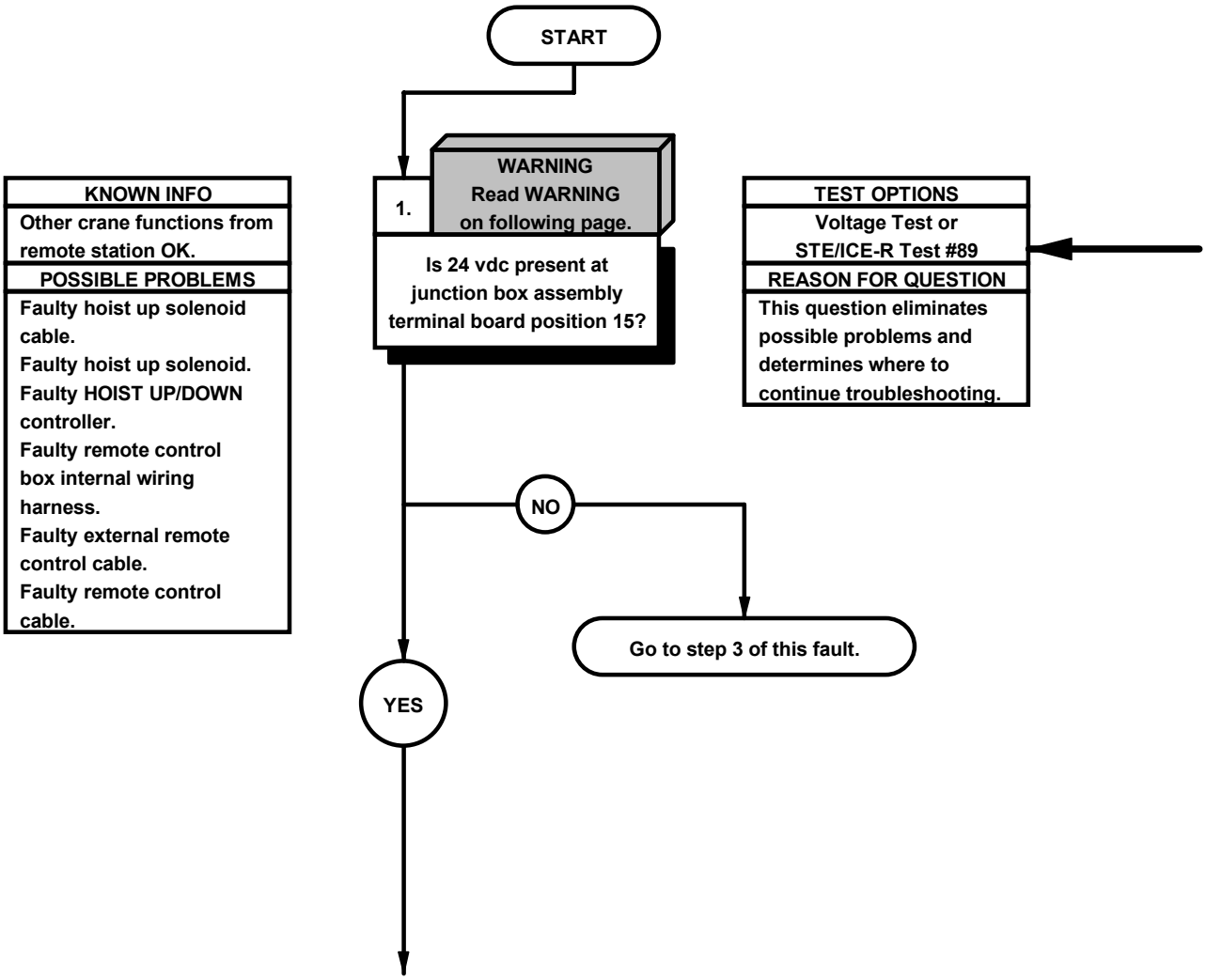
INITIAL SETUP

Equipment Conditions
Outriggers lowered (TM 9-2320-366-10-1).
Crane erected with approximately five feet of cable payed out (TM 9-2320-366-10-1).
Engine shut down (TM 9-2320-366-10-1).

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

References
TM 9-4910-571-12&P



WARNING

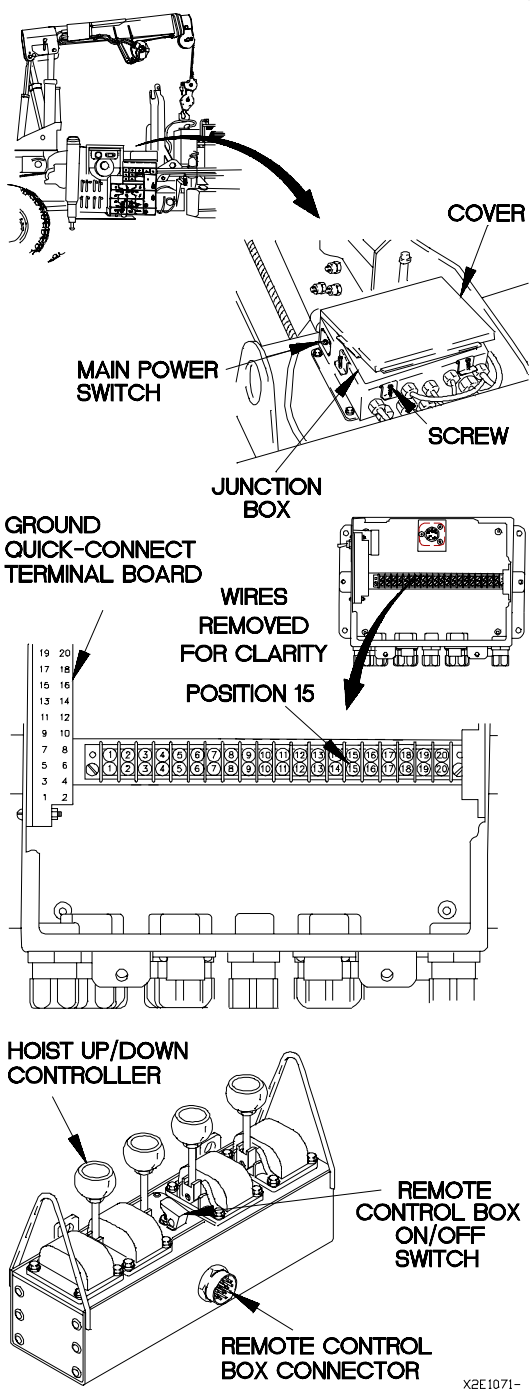
Remove rings, bracelets, watches, necklaces, and any other jewelry beffore working around vehicle. Jewelery can catch on equipment and cause injury or short circuit across electrical circuits and cause severe burns or electrical shock.

OUTPUT VOLTAGE TEST

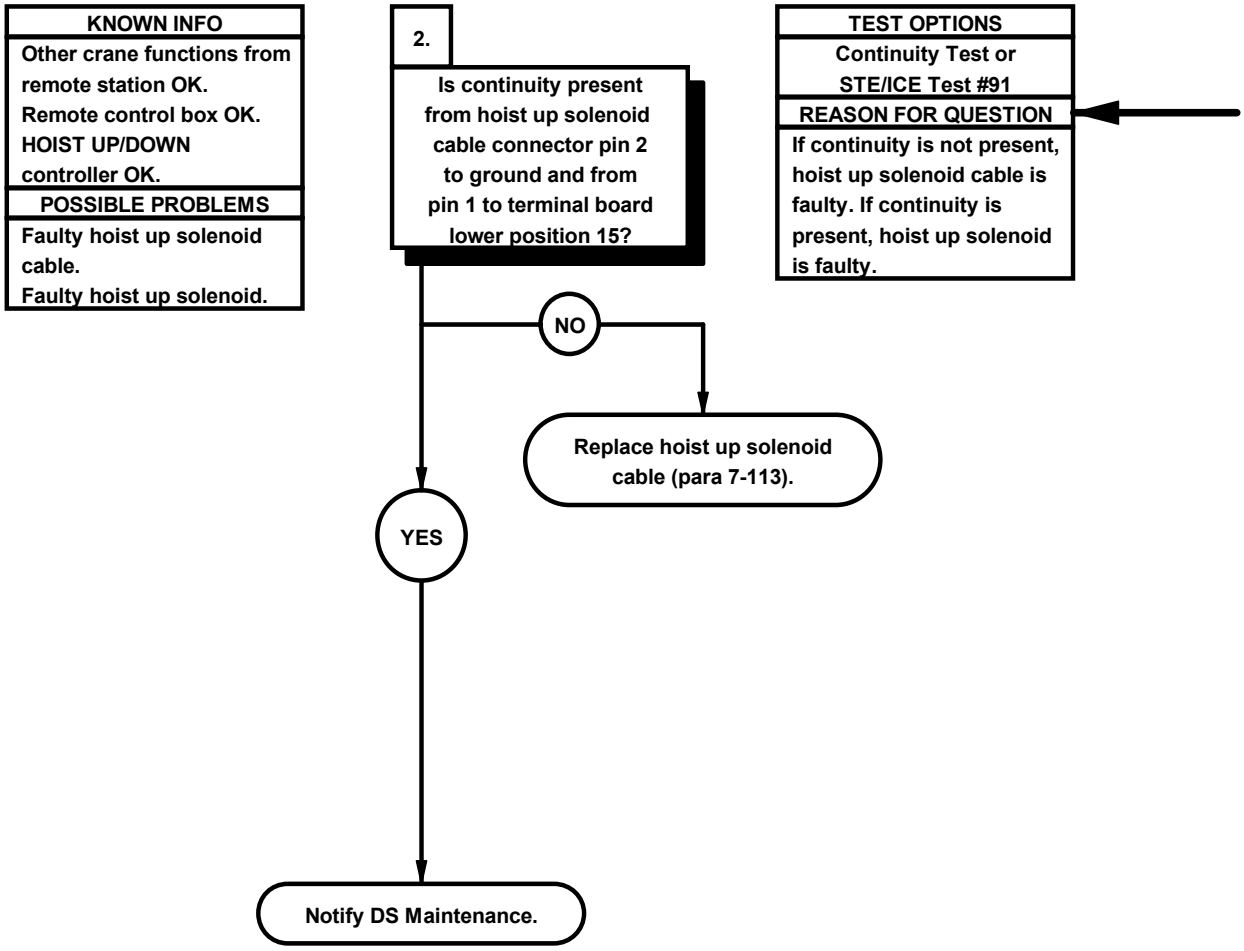
(1) Connect external remote control cable to and remote control box (TM 9-2320-366-10-1).
(2) Loosen four screws on junction box.
(3) Open cover on junction box.
(4) Position MAIN POWER switch to ON.
(5) Lift guard and position remote control box ON/OFF switch to ON.
(6) Set multimeter to volts dc.
(7) Connect positive (+) probe of multimeter on terminal board lower position 15.
(8) Connect negative (-) probe of multimeter on ground quick-connect terminal board (above MAIN POWER switch).

NOTE
Step (9) requires the aid of an assistant.

(9) Position HOIST UP/DOWN controller to UP and note reading on multimeter.
(10) If 24 volts dc is not present, go to step 3 of this fault.
(11) Position MAIN POWER switch to OFF.

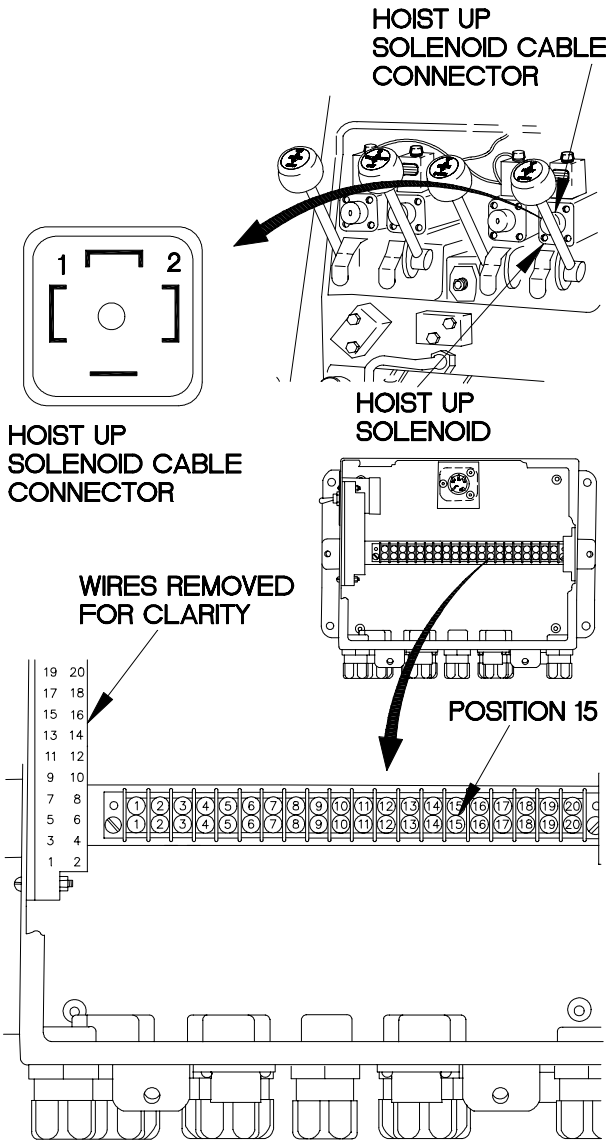


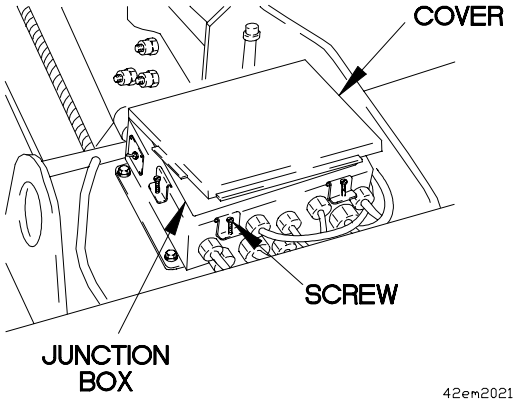
e122. M1089 MATERIAL HANDLING CRANE (MHC) HOIST UP DOES NOT OPERATE FROM REMOTE STATION (CONT)



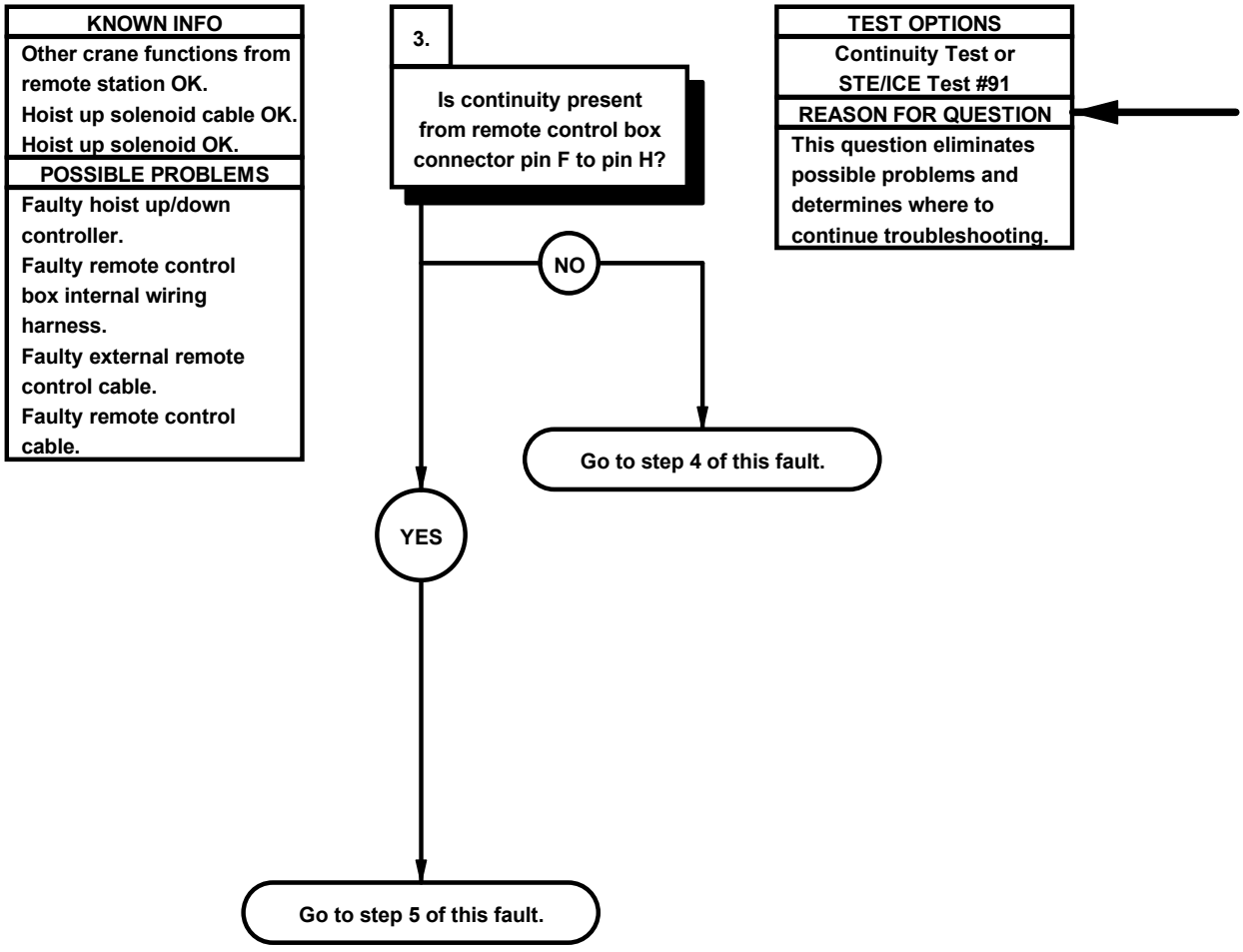
CONTINUITY TEST

(1) Disconnect hoist up solenoid connector from hoist up solenoid.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin 2 of hoist up solenoid cable connector.
(4) Connect negative (-) probe of multimeter on ground and note reading on multimeter.
(5) Connect positive (+) probe of multimeter on pin 1 of hoist up solenoid cable connector.
(6) Connect negative (-) probe of multimeter on terminal board lower position 15 and note reading on multimeter.
(7) If continuity is not present, replace hoist up solenoid cable (para 7-113).
(8) If continuity is present, notify DS Maintenance.
(9) Connect hoist up solenoid cable connector to hoist up solenoid.
(10) Close cover on junction box.
(11) Tighten four screws on junction box cover.
(12) Stow crane (TM 9-2320-366-10-1).





e122. M1089 MATERIAL HANDLING CRANE (MHC) HOIST UP DOES NOT OPERATE FROM REMOTE STATION (CONT)



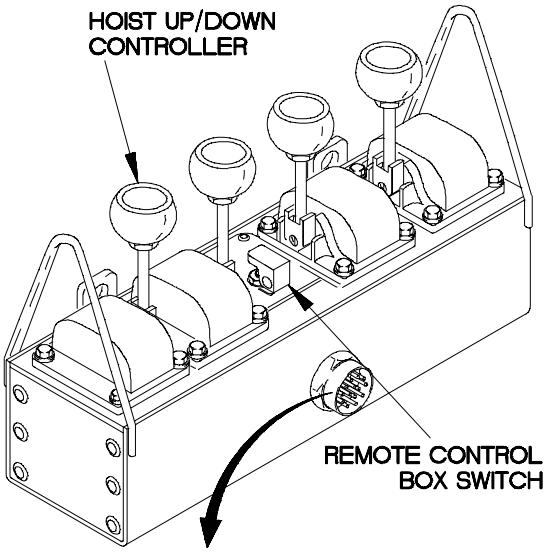
CONTINUITY TEST

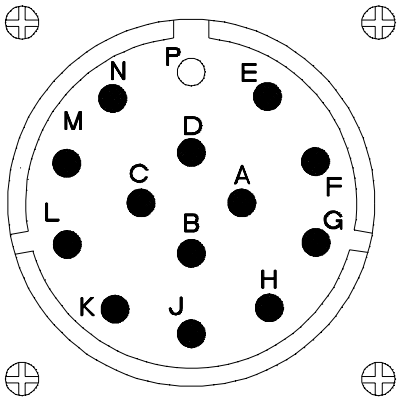
(1) Disconnect external remote control cable from remote control box.
(2) Position remote control box switch to ON.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter on pin F of connector on remote control box.
(5) Connect negative (-) probe of multimeter on pin H of connector on remote control box.

NOTE

Step (6) requires the aid of an assistant.

(6) Position HOIST UP/DOWN controller to UP and note reading on multimeter.
(7) If continuity is not present, go to step 4 of this fault.
(8) If continuity is present, go to step 5 of this fault.
(9) Position remote control box switch to OFF.

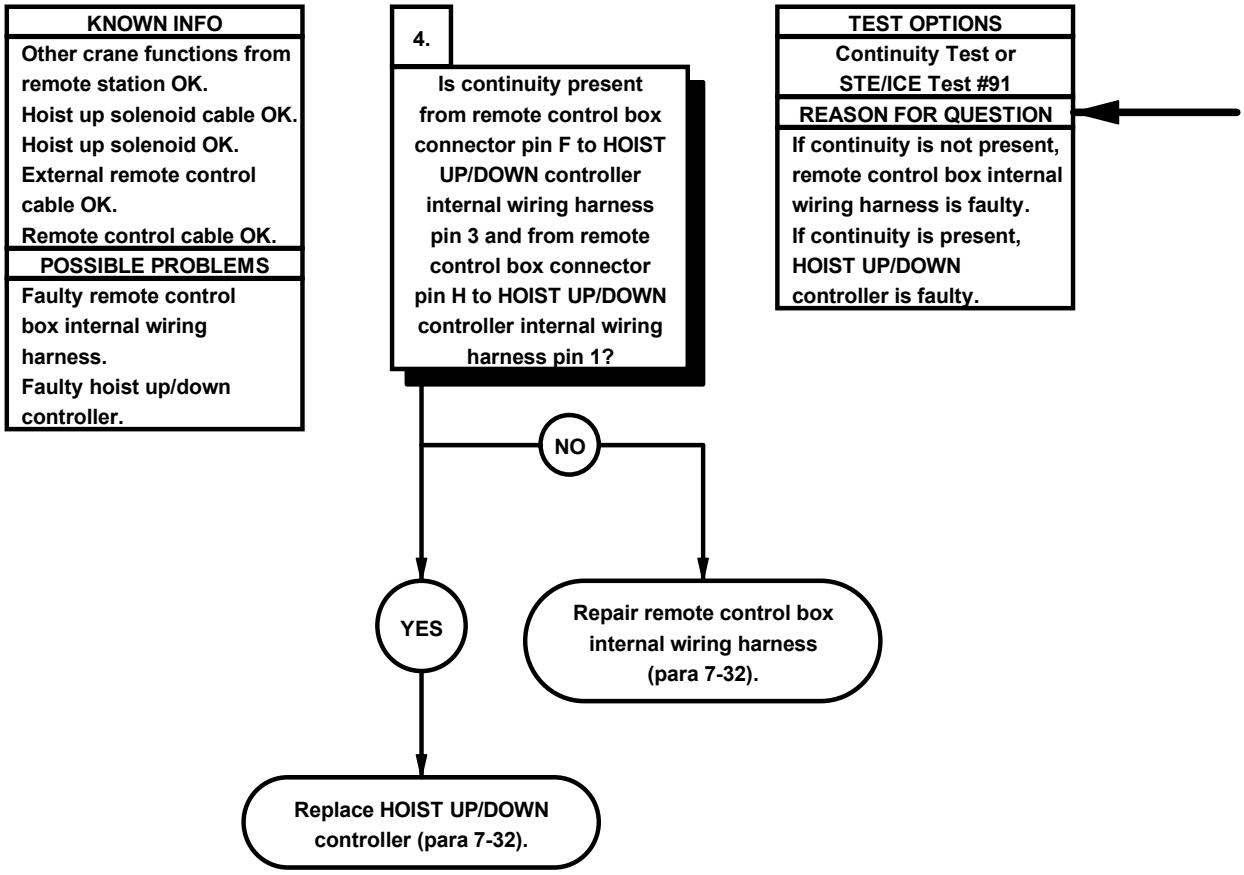




REMOTE CONTROL BOX CONNECTOR

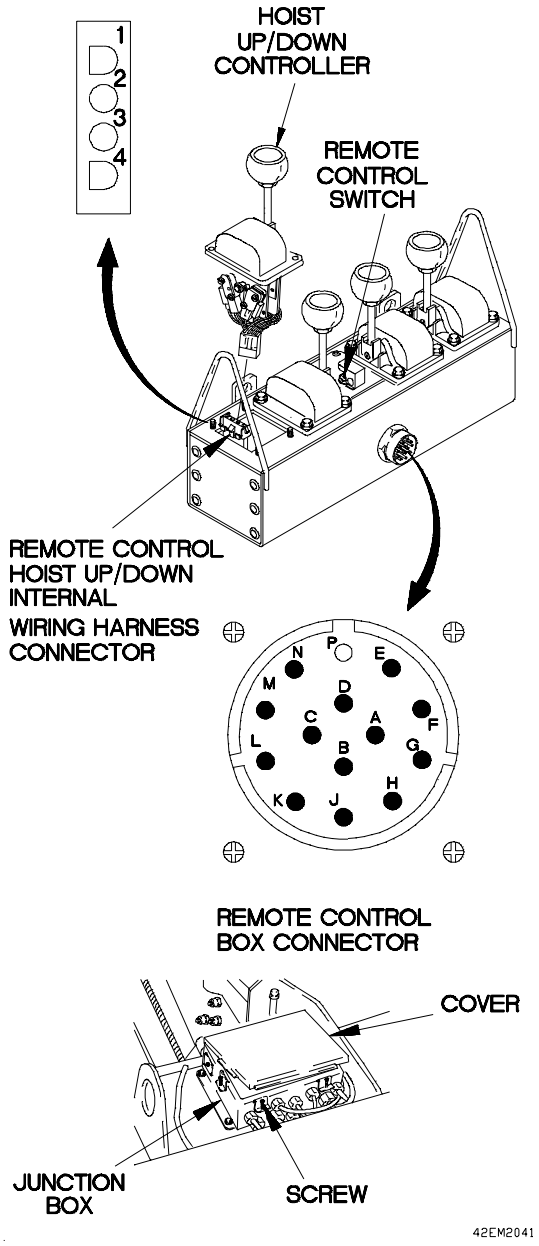
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e122. M1089 MATERIAL HANDLING CRANE (MHC) HOIST UP DOES NOT OPERATE FROM REMOTE STATION (CONT)

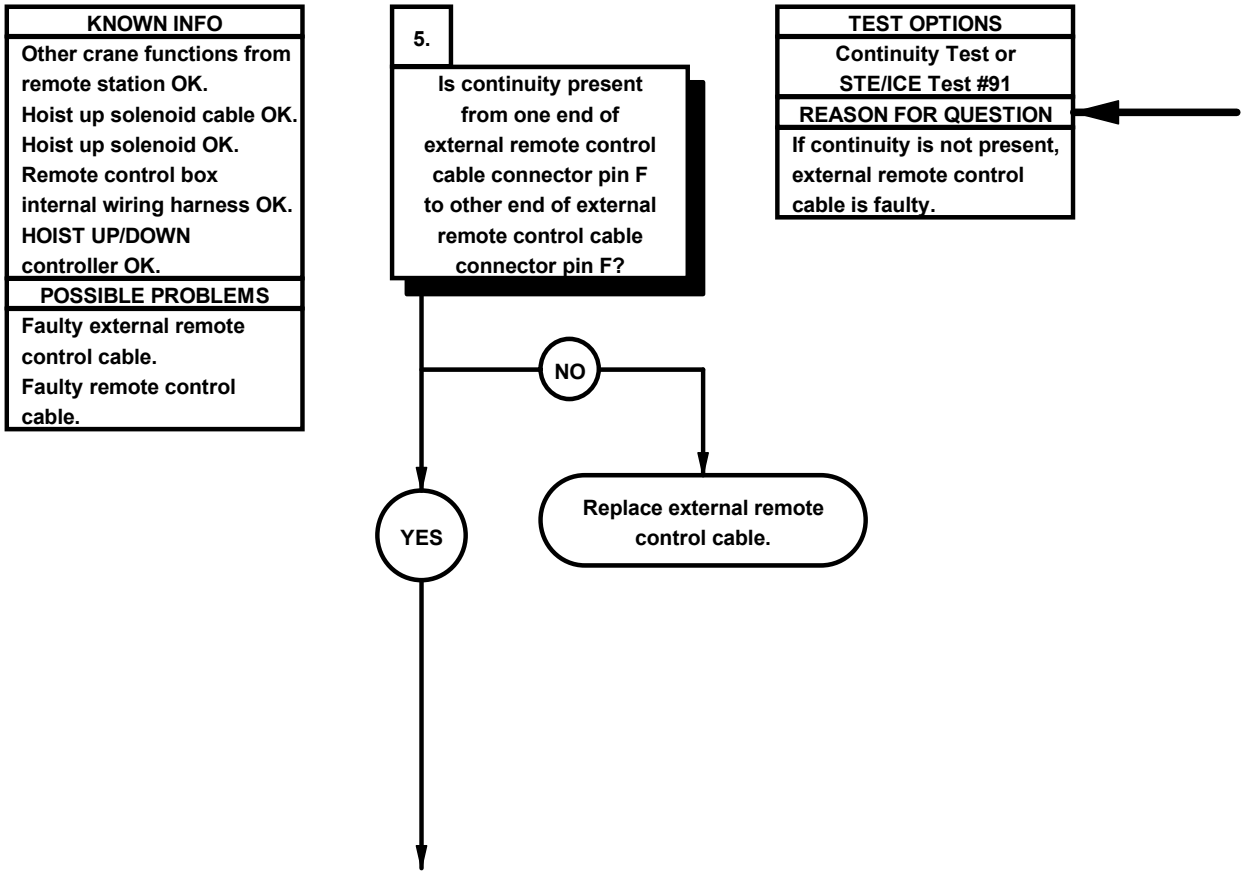


CONTINUITY TEST

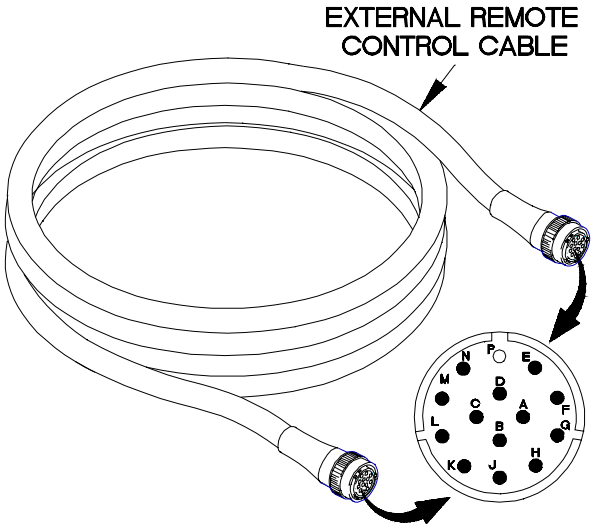
(1) Remove HOIST UP/DOWN controller (para 7-32).
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin F of remote control box connector.
(4) Connect negative (-) probe of multimeter on pin 3 of HOIST UP/DOWN controller internal wiring harness and note reading on multimeter.
(5) Position remote control box switch to ON.
(6) Connect positive (+) probe of multimeter on pin H of remote control box connector.
(7) Connect negative (-) probe of multimeter on pin 1 of HOIST UP/DOWN controller internal wiring harness and note reading on multimeter.
(8) If continuity is not present, replace remote control box internal wiring harness (para 7-32).
(9) If continuity is present, replace HOIST UP/DOWN controller (para 7-32).
(10) Position remote control box switch to OFF.
(11) Install HOIST UP/DOWN controller (para 7-32).
(12) Close cover on junction box.
(13) Tighten four screws on junction box cover.
(14) Stow crane (TM 9-2320-366-10-1).



e122. M1089 MATERIAL HANDLING CRANE (MHC) HOIST UP DOES NOT OPERATE FROM REMOTE STATION (CONT)

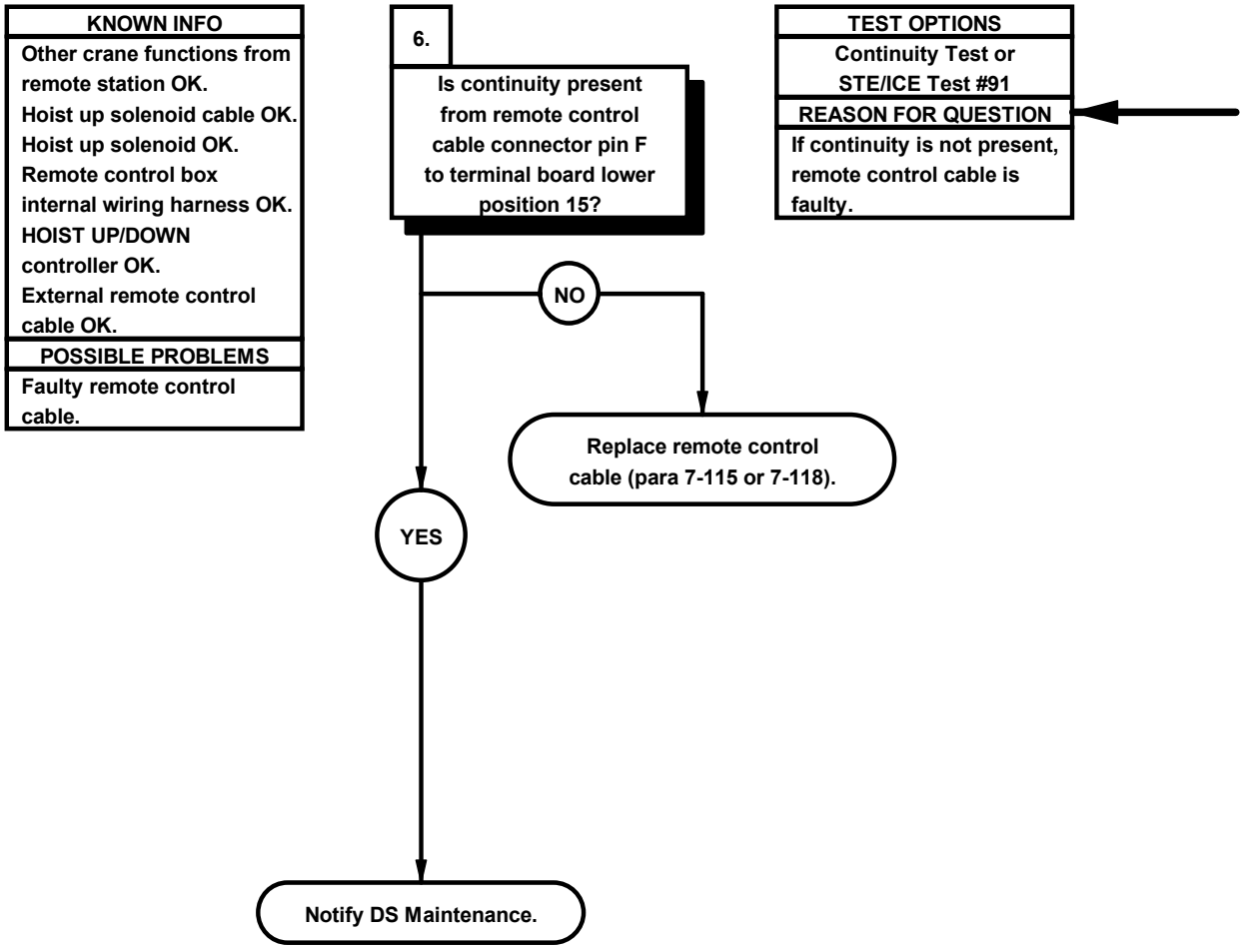


CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin F of one end of external remote control cable connector.
(4) Connect negative (-) probe of multimeter on pin F of other end of external remote control cable and note reading on multimeter.
(5) If continuity is not present, replace external remote control cable.



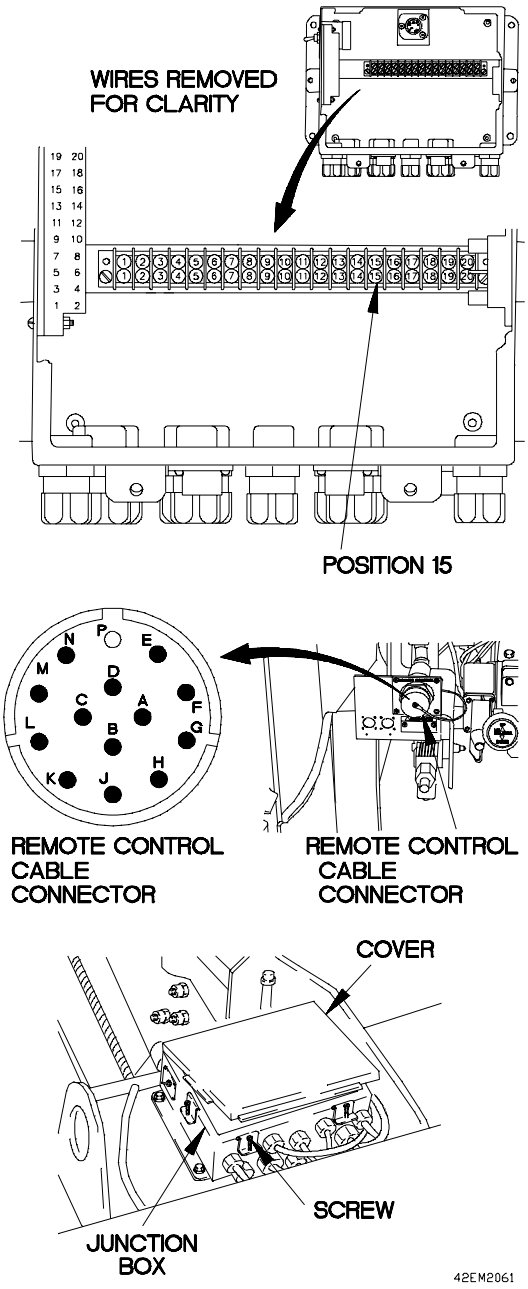
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e122. M1089 MATERIAL HANDLING CRANE (MHC) HOIST UP DOES NOT OPERATE FROM REMOTE STATION (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin F of remote control cable connector.
(3) Connect negative (-) probe of multimeter on terminal board lower position 15 and note reading on multimeter.
(4) If continuity is not present, replace remote control cable (para 7-115 or 7-118).
(5) If continuity is present, notify DS Maintenance.
(6) Close cover on junction box.
(7) Tighten four screws on junction box cover.
(8) Stow crane (TM 9-2320-366-10-1).



e123. M1089 MATERIAL HANDLING CRANE (MHC) HOIST DOWN DOES NOT OPERATE FROM REMOTE STATION

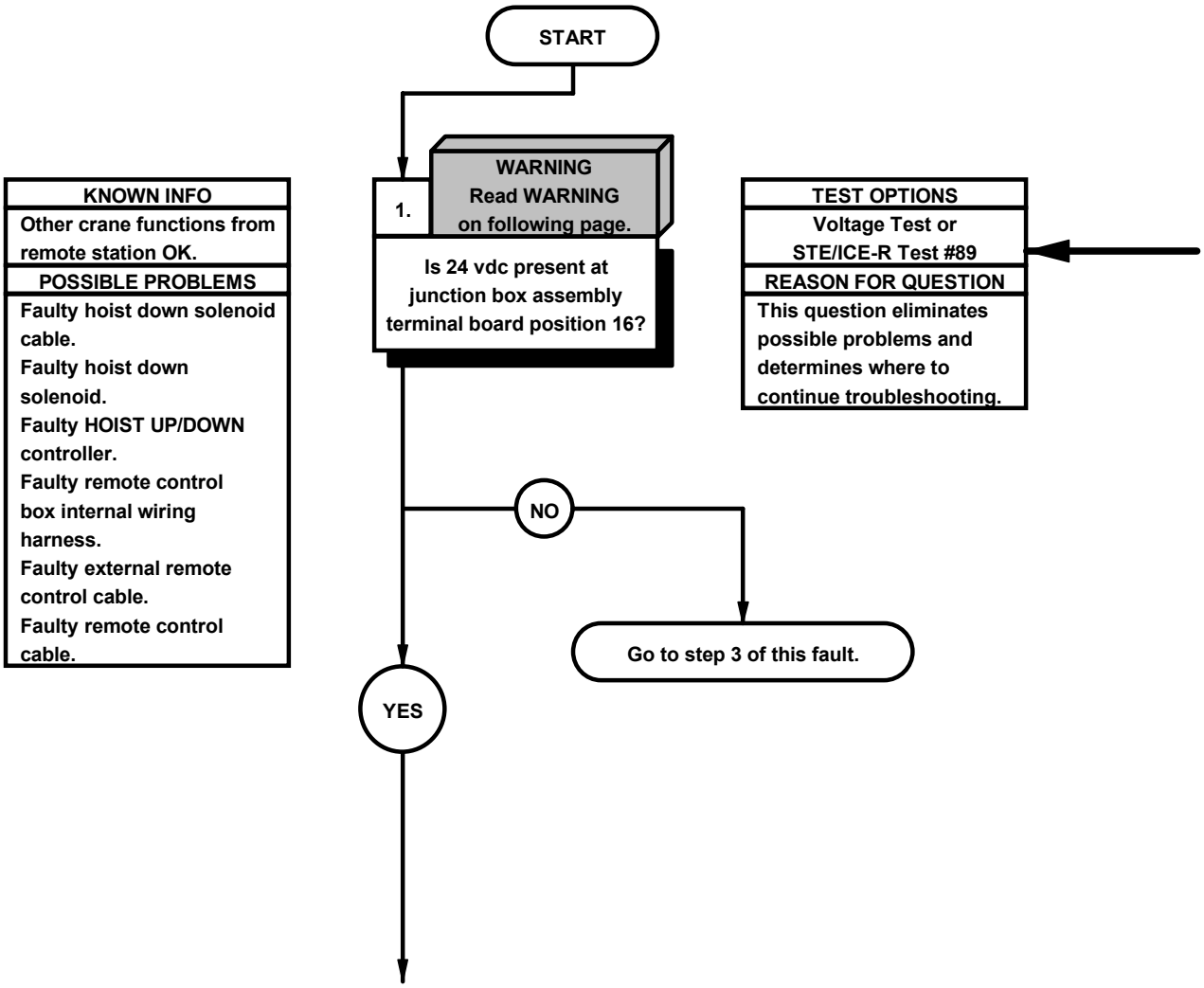
INITIAL SETUP

Equipment Conditions
Outriggers lowered (TM 9-2320-366-10-1).
Crane erected with approximately five feet of cable payed out (TM 9-2320-366-10-1).
Engine shut down (TM 9-2320-366-10-1).

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

References
TM 9-4910-571-12&P



WARNING

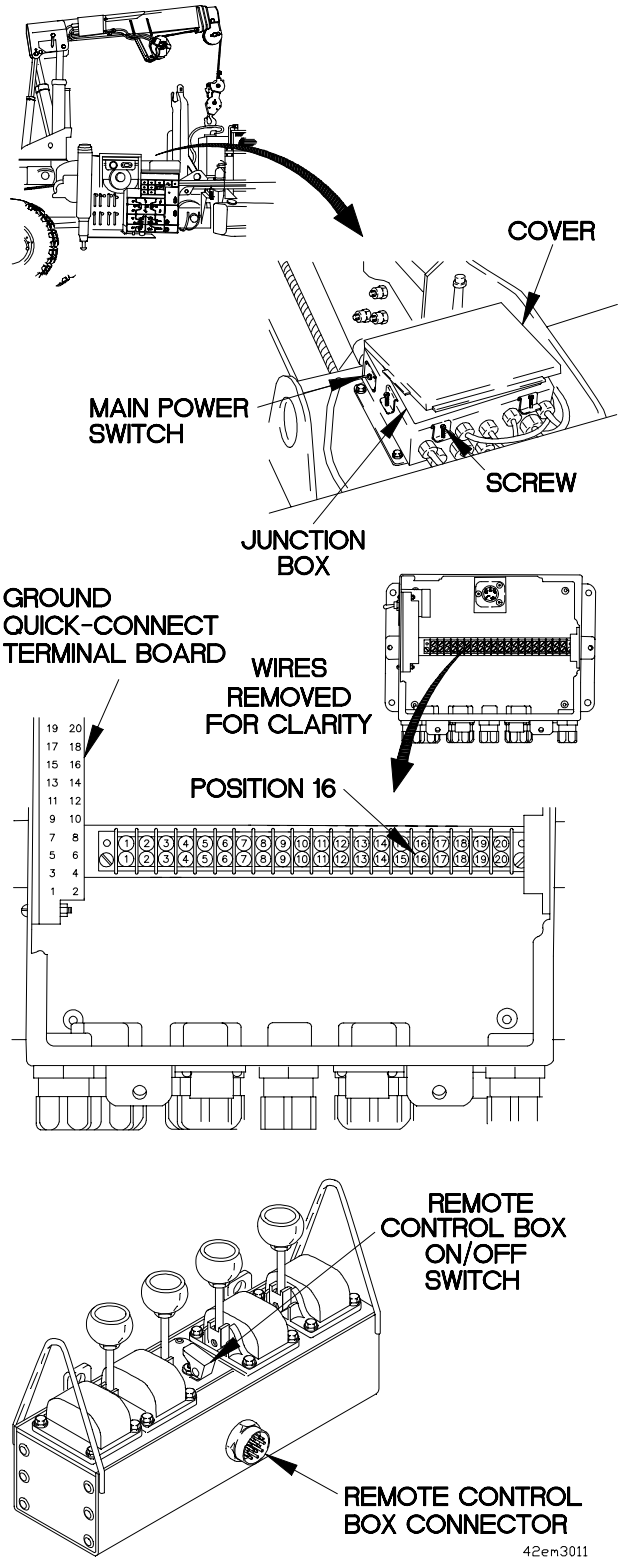
Remove rings, bracelets, watches, necklaces, and any other jewelry beffore working around vehicle. Jewelery can catch on equipment and cause injury or short circuit across electrical circuits and cause severe burns or electrical shock.

OUTPUT VOLTAGE TEST

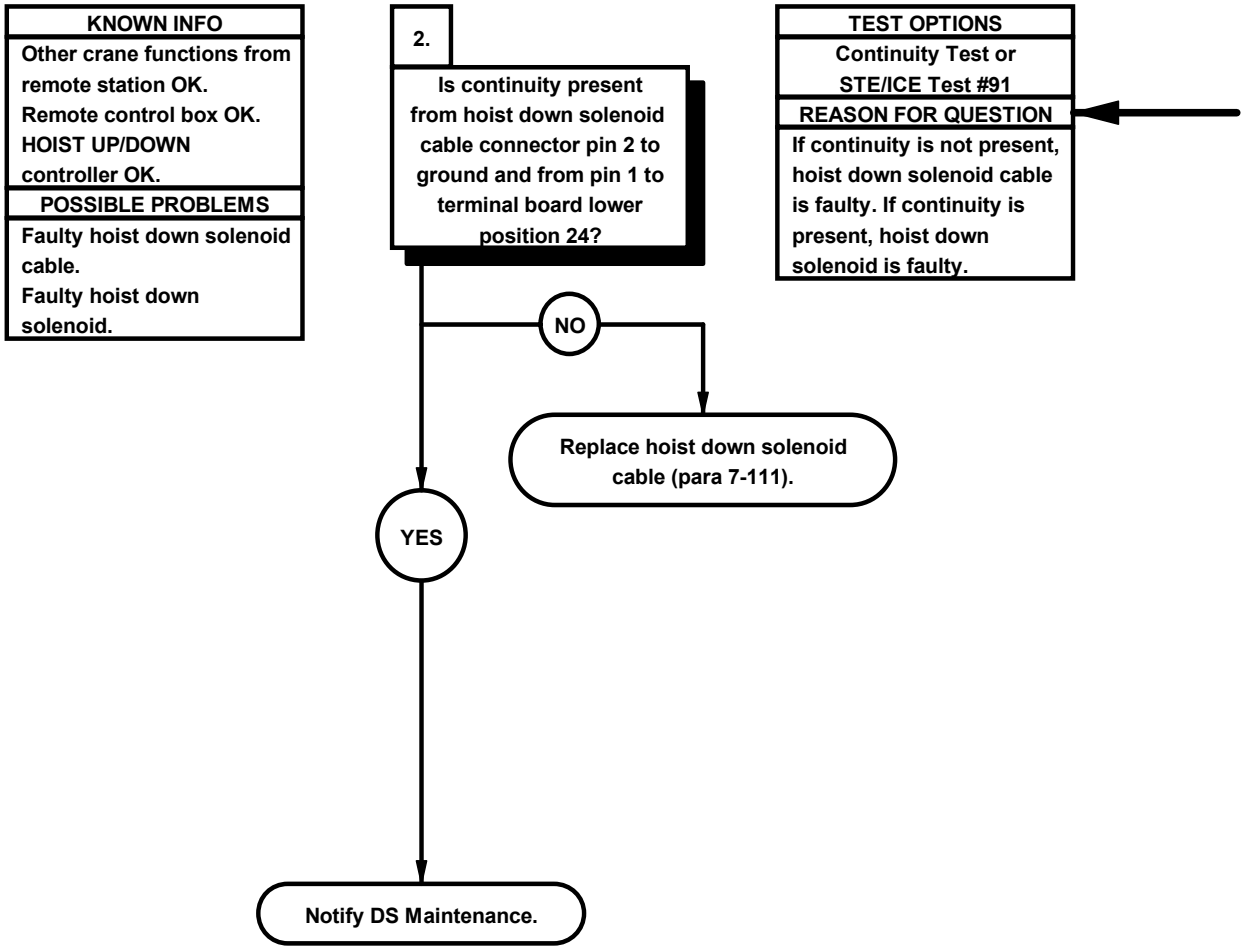
(1) Connect external remote control cable to and remote control box (TM 9-2320-366-10-1).
(2) Loosen four screws on junction box.
(3) Open cover on junction box.
(4) Position MAIN POWER switch to ON.
(5) Lift guard and position remote control box ON/OFF switch to ON.
(6) Set multimeter to volts dc.
(7) Connect positive (+) probe of multimeter on terminal board lower position 16.
(8) Connect negative (-) probe of multimeter on ground quick-connect terminal board (above MAIN POWER switch).

NOTE
Step (9) requires the aid of an assistant.

(9) Position HOIST UP/DOWN controller to DOWN and note reading on multimeter.
(10) If 24 volts dc is not present, go to step 3 of this fault.
(11) Position MAIN POWER switch to OFF.

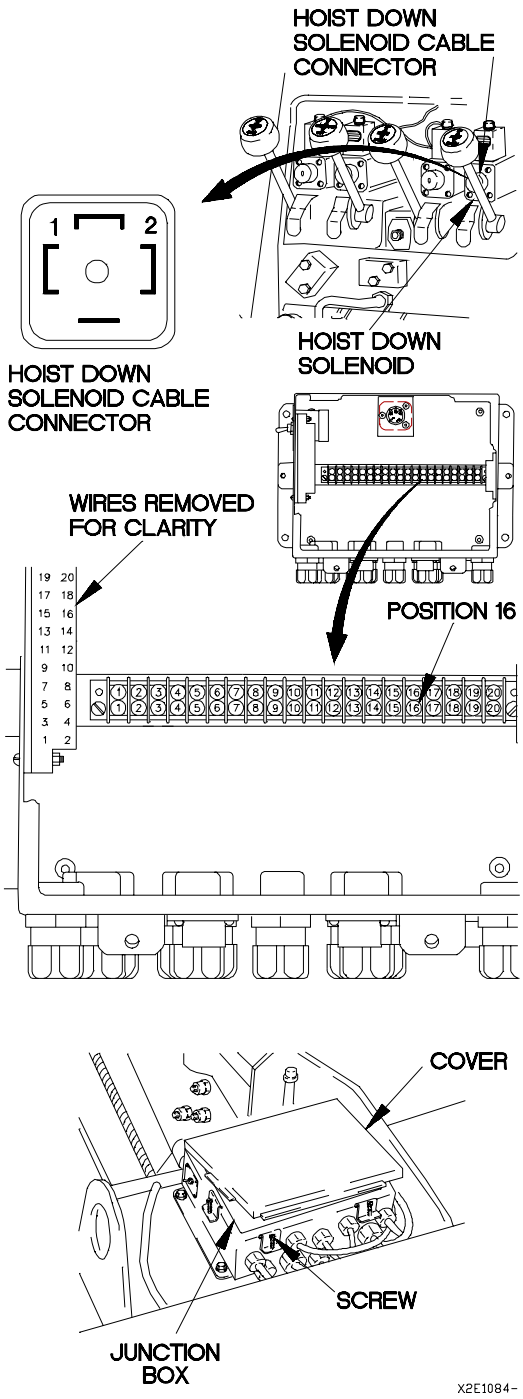


e123. M1089 MATERIAL HANDLING CRANE (MHC) HOIST DOWN DOES NOT OPERATE FROM REMOTE STATION (CONT)

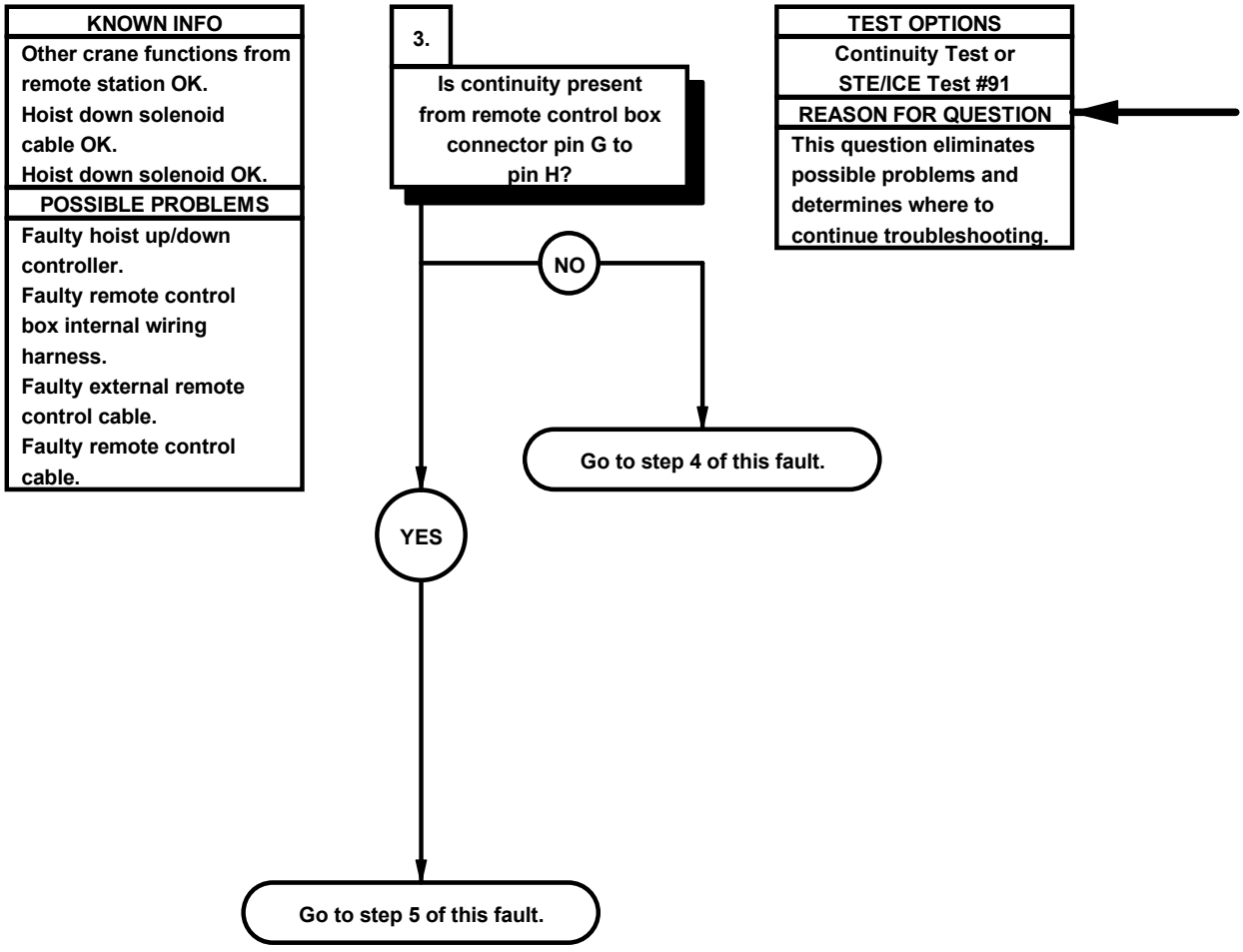


CONTINUITY TEST

(1) Disconnect hoist down solenoid connector from hoist down solenoid.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin 2 of hoist down solenoid cable connector.
(4) Connect negative (-) probe of multimeter on ground and note reading on multimeter.
(5) Connect positive (+) probe of multimeter on pin 1 of hoist down solenoid cable connector.
(6) Connect negative (-) probe of multimeter on terminal board lower position 24 and note reading on multimeter.
(7) If continuity is not present, replace hoist down solenoid cable (para 7-111).
(8) If continuity is present, notify DS Maintenance.
(9) Connect hoist down solenoid cable connector to hoist down solenoid.
(10) Close cover on junction box.
(11) Tighten four screws on junction box cover.
(12) Stow crane (TM 9-2320-366-10-1).



e123. M1089 MATERIAL HANDLING CRANE (MHC) HOIST DOWN DOES NOT OPERATE FROM REMOTE STATION (CONT)



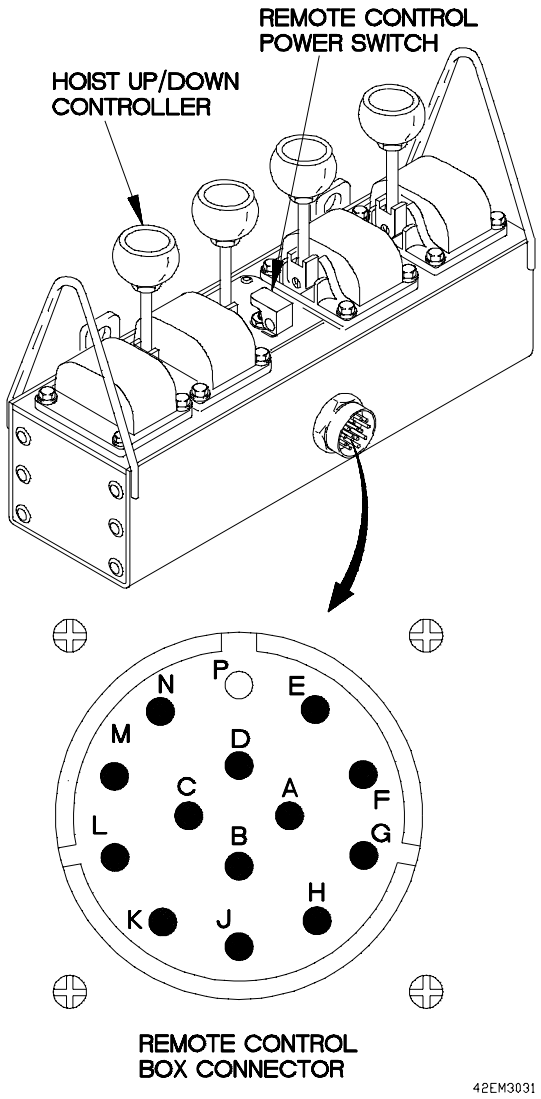
CONTINUITY TEST

(1) Disconnect external remote control cable from remote control box.
(2) Position remote control box switch to ON.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter on pin G of connector on remote control box.
(5) Connect negative (-) probe of multimeter on pin H of connector on remote control box.

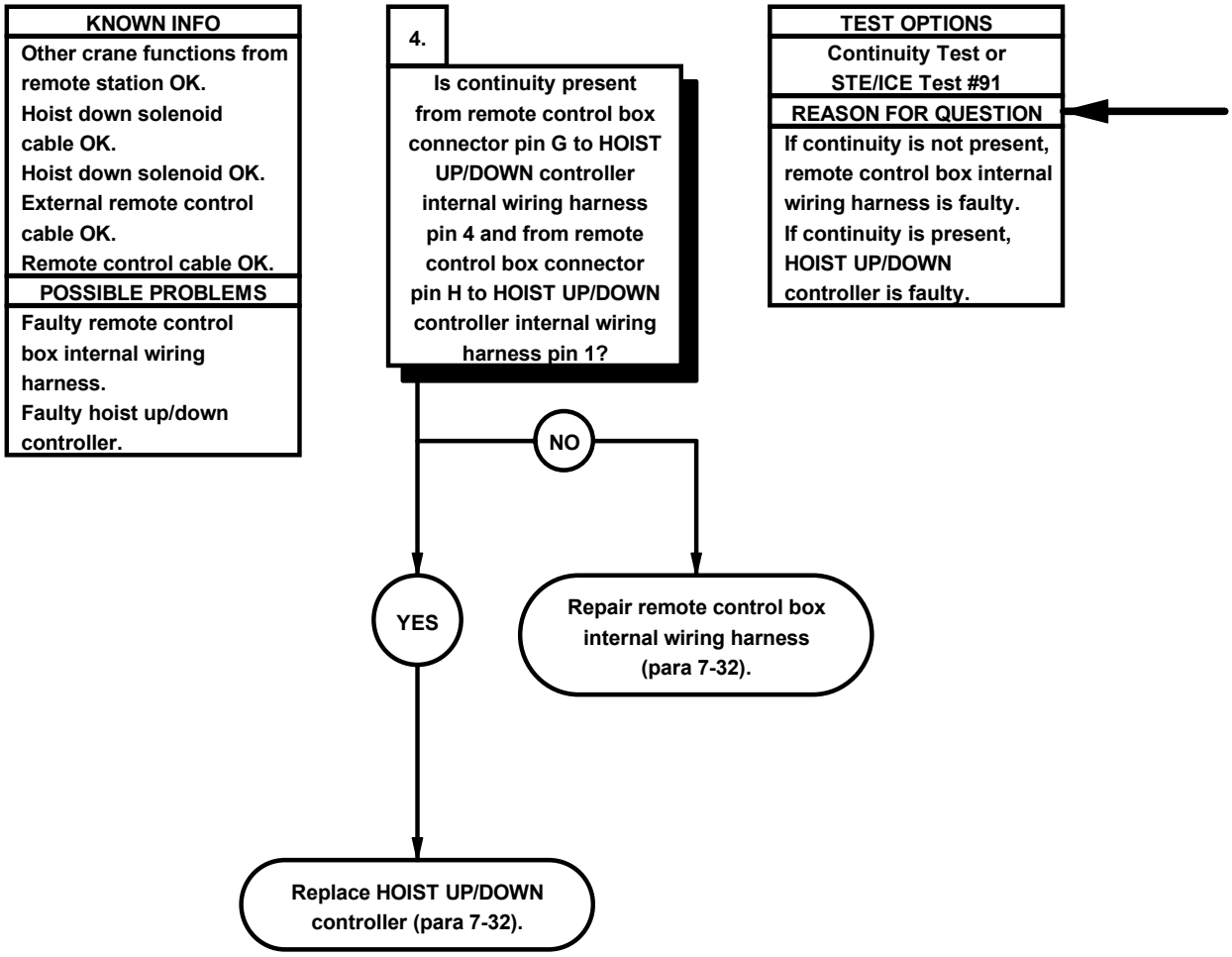
NOTE

Step (6) requires the aid of an assistant.

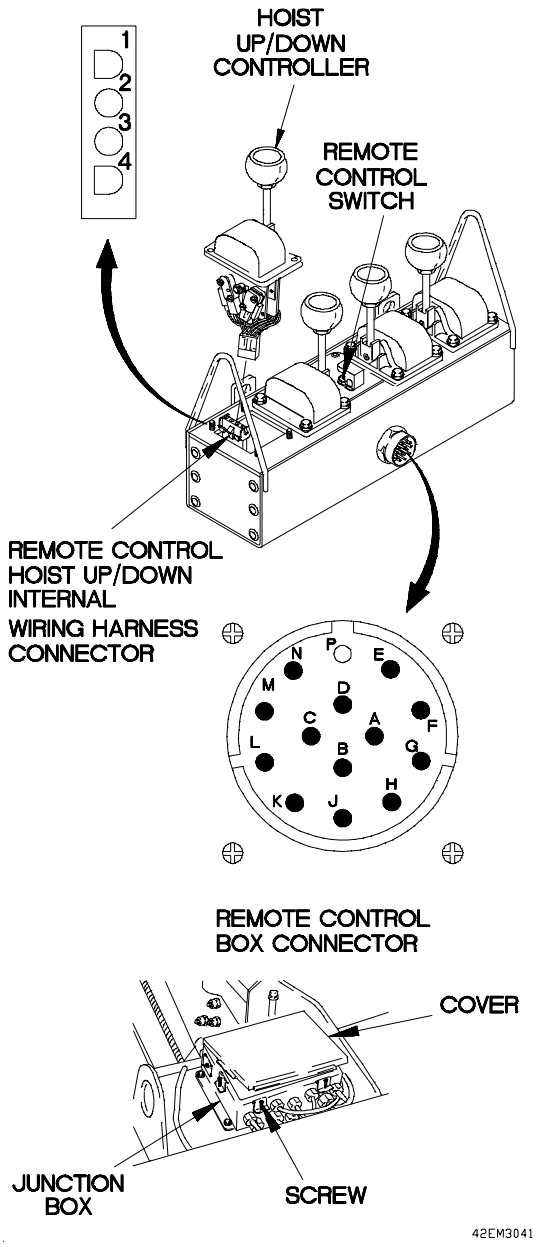
(6) Position HOIST UP/DOWN controller to DOWN and note reading on multimeter.
(7) If continuity is not present, go to step 4 of this fault.
(8) If continuity is present, go to step 5 of this fault.
(9) Position remote control box switch to OFF.



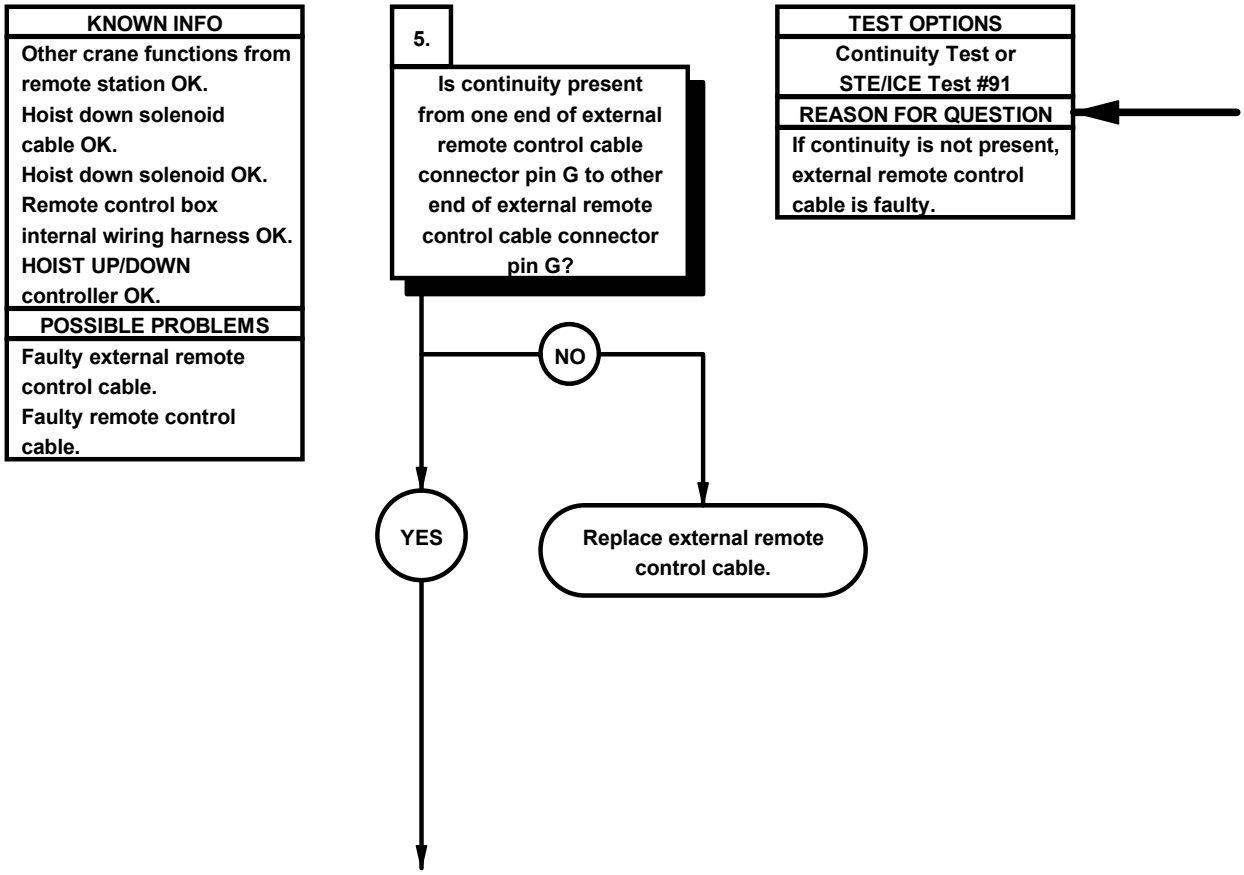
e123. M1089 MATERIAL HANDLING CRANE (MHC) HOIST DOWN DOES NOT OPERATE FROM REMOTE STATION (CONT)



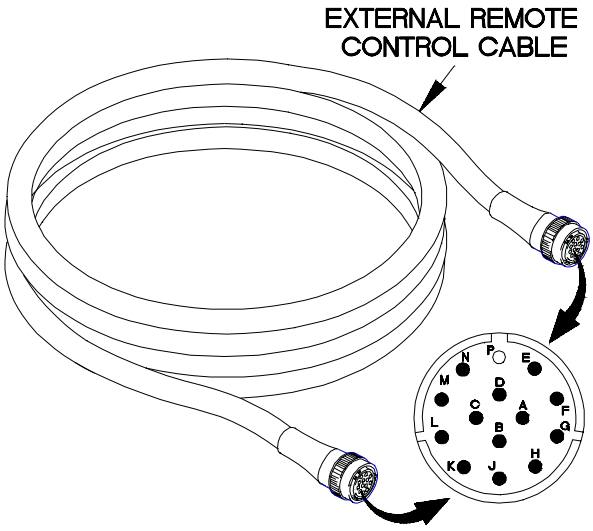
CONTINUITY TEST
(1) Remove HOIST UP/DOWN controller (para 7-32).
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin G of remote control box connector.
(4) Connect negative (-) probe of multimeter on pin 4 of HOIST UP/DOWN controller internal wiring harness and note reading on multimeter.
(5) Position remote control box switch to ON.
(6) Connect positive (+) probe of multimeter on pin H of remote control box connector.
(7) Connect negative (-) probe of multimeter on pin 1 of HOIST UP/DOWN controller internal wiring harness and note reading on multimeter.
(8) If continuity is not present, replace remote control box internal wiring harness (para 7-32).
(9) If continuity is present, replace HOIST UP/DOWN controller (para 7-32).
(10) Position remote control box switch to OFF.
(11) Install HOIST UP/DOWN controller (para 7-32).
(12) Close cover on junction box.
(13) Tighten four screws on junction box cover.
(14) Stow crane (TM 9-2320-366-10-1).



e123. M1089 MATERIAL HANDLING CRANE (MHC) HOIST DOWN DOES NOT OPERATE FROM REMOTE STATION (CONT)

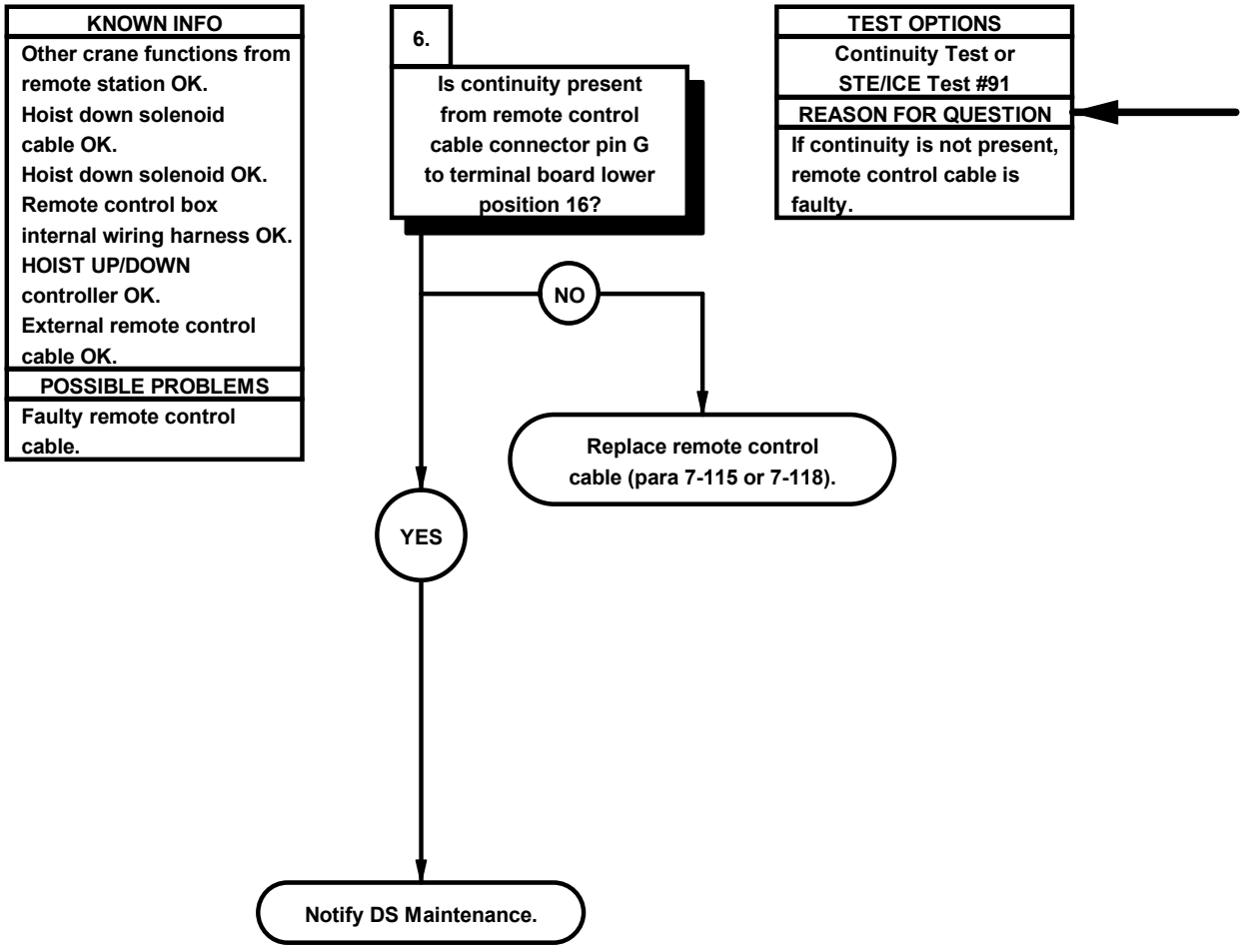


CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin G of one end of external remote control cable connector.
(3) Connect negative (-) probe of multimeter on pin G of other end of external remote control cable and note reading on multimeter.
(4) If continuity is not present, replace external remote control cable.



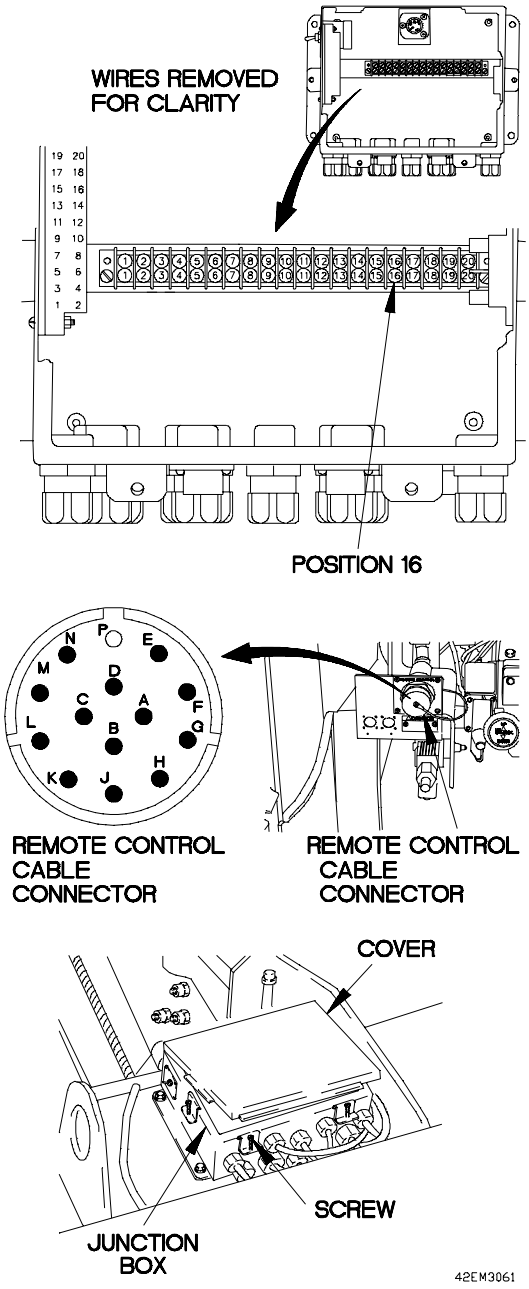
X2E1083-

e123. M1089 MATERIAL HANDLING CRANE (MHC) HOIST DOWN DOES NOT OPERATE FROM REMOTE STATION (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin G of remote control cable connector.
(3) Connect negative (-) probe of multimeter on terminal board lower position 16 and note reading on multimeter.
(4) If continuity is not present, replace remote control cable (para 7-115 or 7-118).
(5) If continuity is present, notify DS Maintenance.
(6) Close cover on junction box.
(7) Tighten four screws on junction box cover.
(8) Stow crane (TM 9-2320-366-10-1).



e124. M1089 MATERIAL HANDLING CRANE (MHC) BOOM UP DOES NOT OPERATE FROM REMOTE STATION

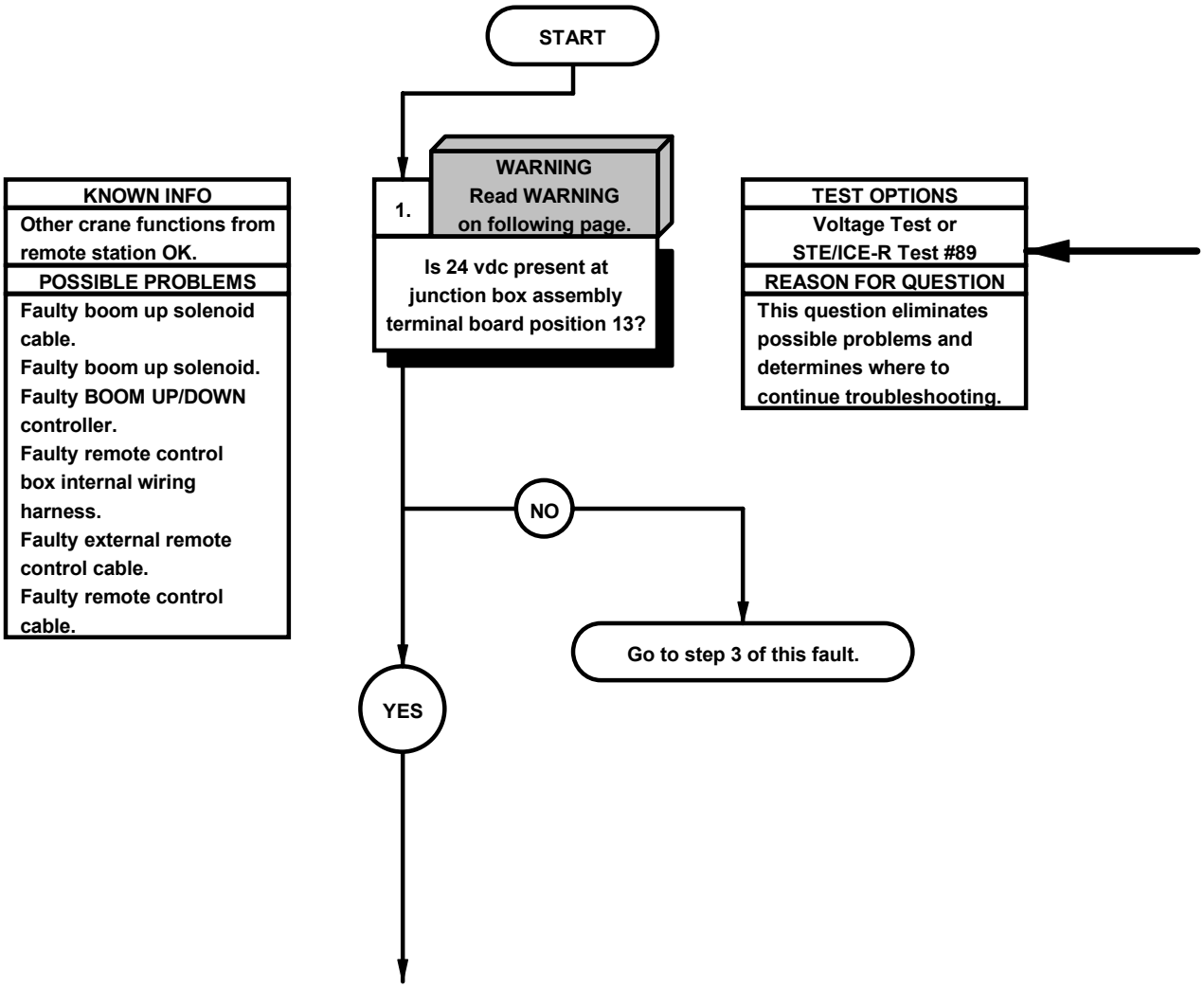
INITIAL SETUP

Equipment Conditions
Outriggers lowered (TM 9-2320-366-10-1).
Crane erected with approximately five feet of cable payed out (TM 9-2320-366-10-1).
Engine shut down (TM 9-2320-366-10-1).

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

References
TM 9-4910-571-12&P



WARNING

Remove rings, bracelets, watches, necklaces, and any other jewelry beffore working around vehicle. Jewelery can catch on equipment and cause injury or short circuit across electrical circuits and cause severe burns or electrical shock.

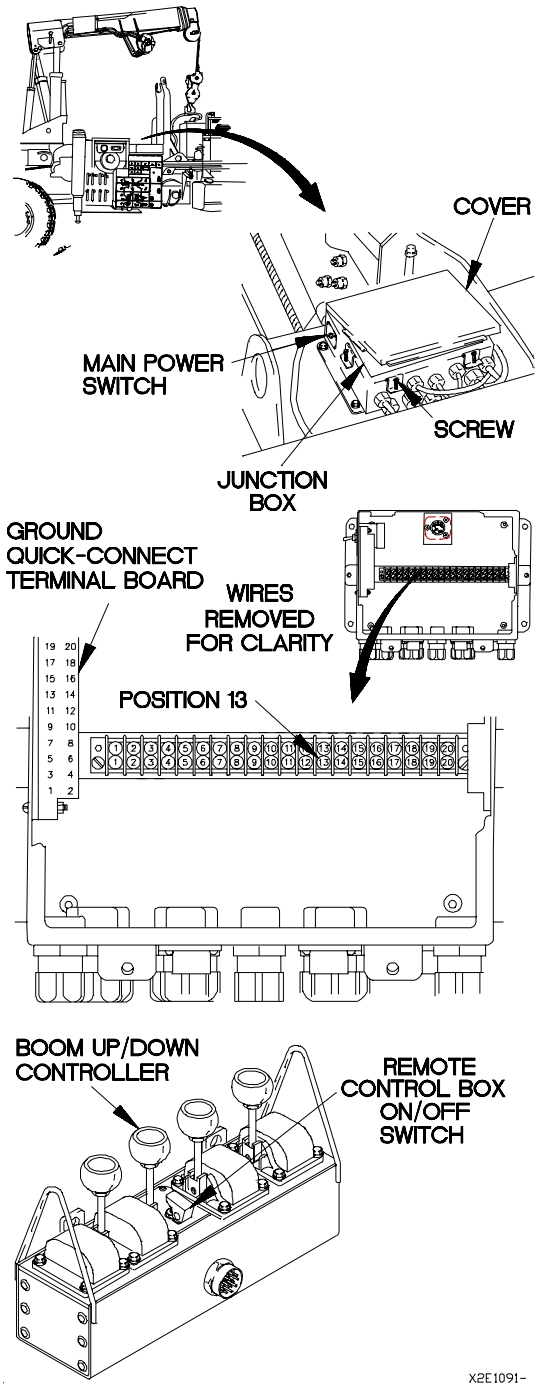
OUTPUT VOLTAGE TEST

(1) Connect external remote control cable to remote control box (TM 9-2320-366-10-1).
(2) Loosen four screws on junction box.
(3) Open cover on junction box.
(4) Position MAIN POWER switch to ON.
(5) Lift guard and position remote control box ON/OFF switch to ON.
(6) Set multimeter to volts dc.
(7) Connect positive (+) probe of multimeter on terminal board lower position 13.
(8) Connect negative (-) probe of multimeter on ground quick-connect terminal board (above MAIN POWER switch).

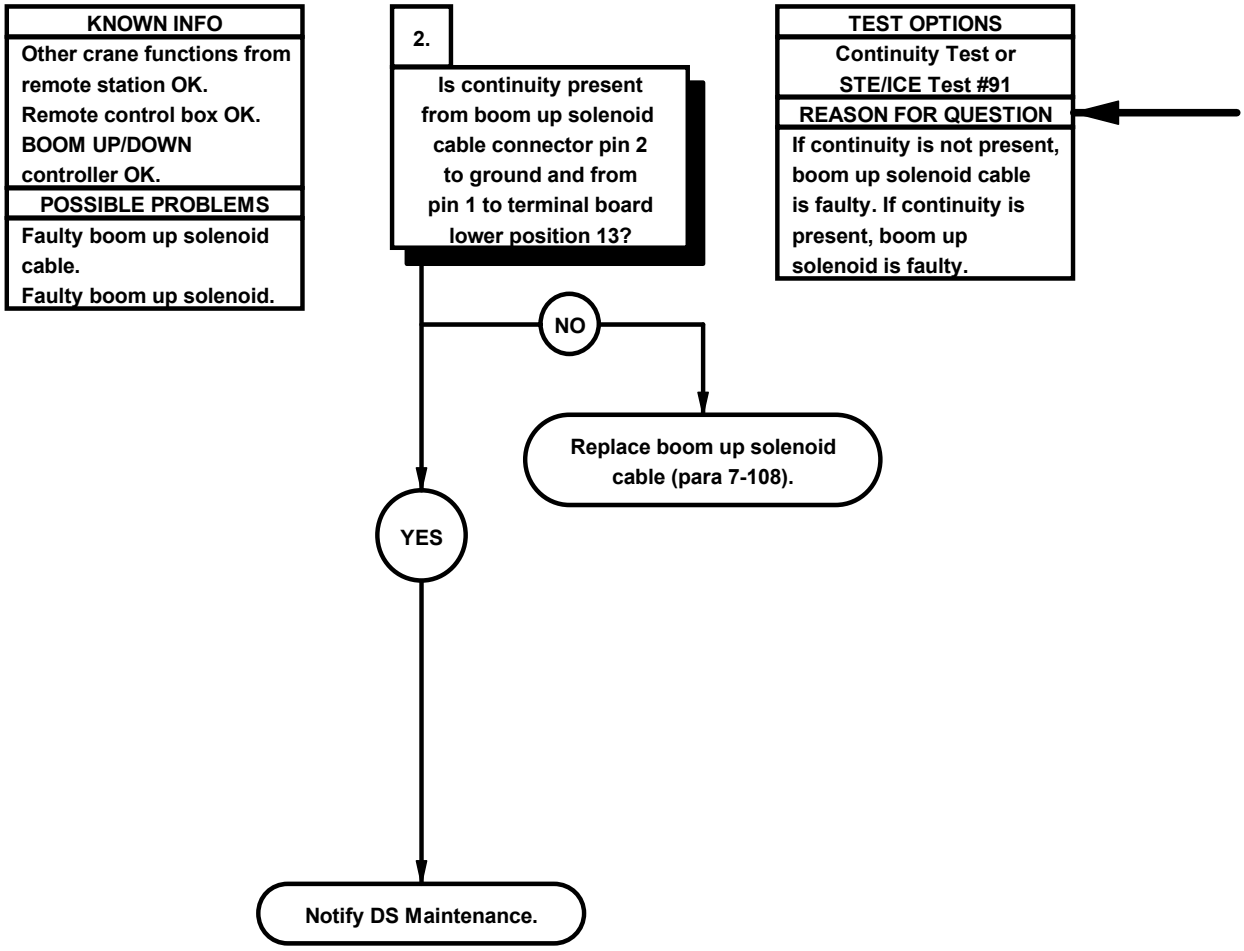
NOTE

Step (9) requires the aid of an assistant.

(9) Position BOOM UP/DOWN controller to UP and note reading on multimeter.
(10) If 24 volts dc is not present, go to step 3 of this fault.
(11) Position MAIN POWER switch to OFF.

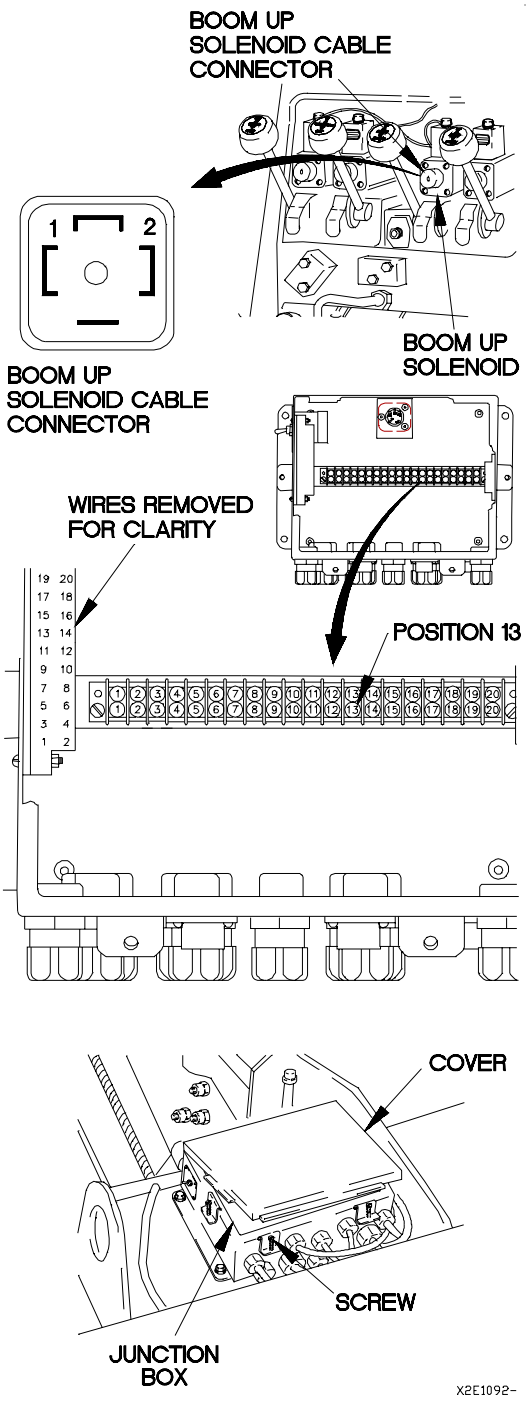


e124. M1089 MATERIAL HANDLING CRANE (MHC) BOOM UP DOES NOT OPERATE FROM REMOTE STATION (CONT)

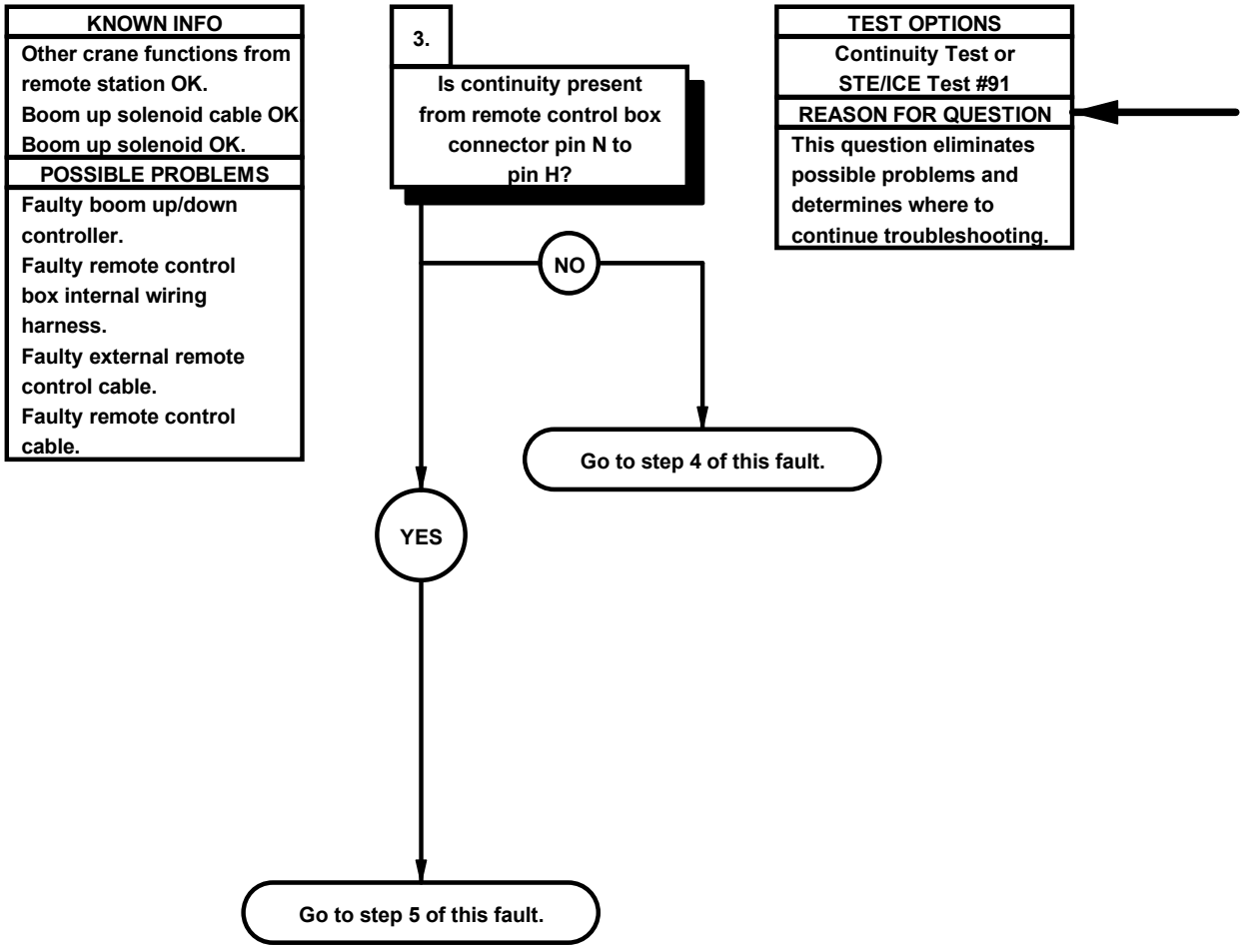


CONTINUITY TEST

(1) Disconnect boom up solenoid connector from boom up solenoid.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin 2 of boom up solenoid cable connector.
(4) Connect negative (-) probe of multimeter on ground and note reading on multimeter.
(5) Connect positive (+) probe of multimeter on pin 1 of boom up solenoid cable connector.
(6) Connect negative (-) probe of multimeter on terminal board lower position 13 and note reading on multimeter.
(7) If continuity is not present, replace boom up solenoid cable (para 7-108).
(8) If continuity is present, notify DS Maintenance.
(9) Connect boom up solenoid cable connector to boom up solenoid.
(10) Close cover on junction box.
(11) Tighten four screws on junction box cover.
(12) Stow crane (TM 9-2320-366-10-1).



e124. M1089 MATERIAL HANDLING CRANE (MHC) BOOM UP DOES NOT OPERATE FROM REMOTE STATION (CONT)



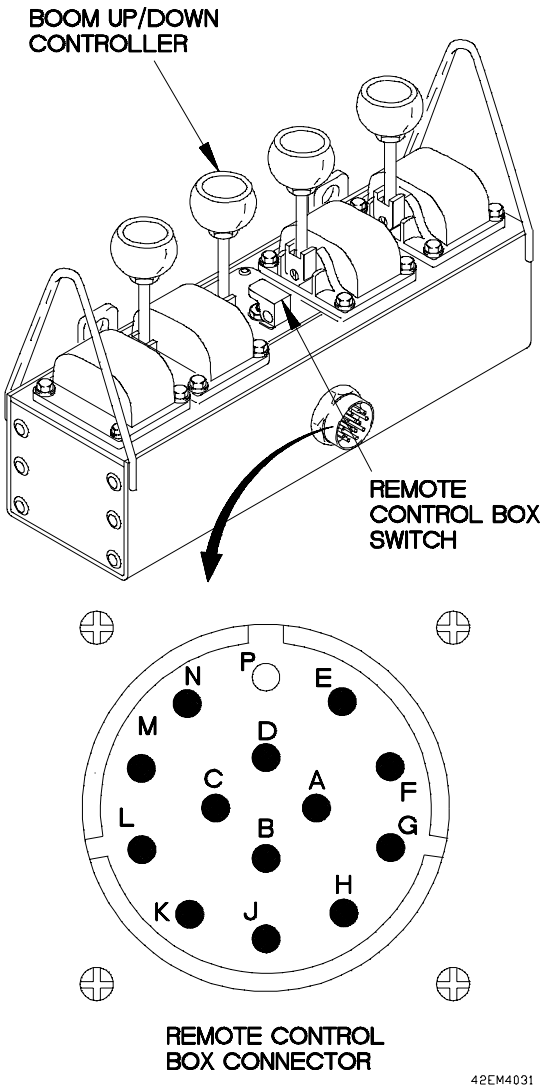
CONTINUITY TEST

(1) Disconnect external remote control cable from remote control box.
(2) Position remote control box switch to ON.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter on pin N of connector on remote control box.
(5) Connect negative (-) probe of multimeter on pin H of connector on remote control box.

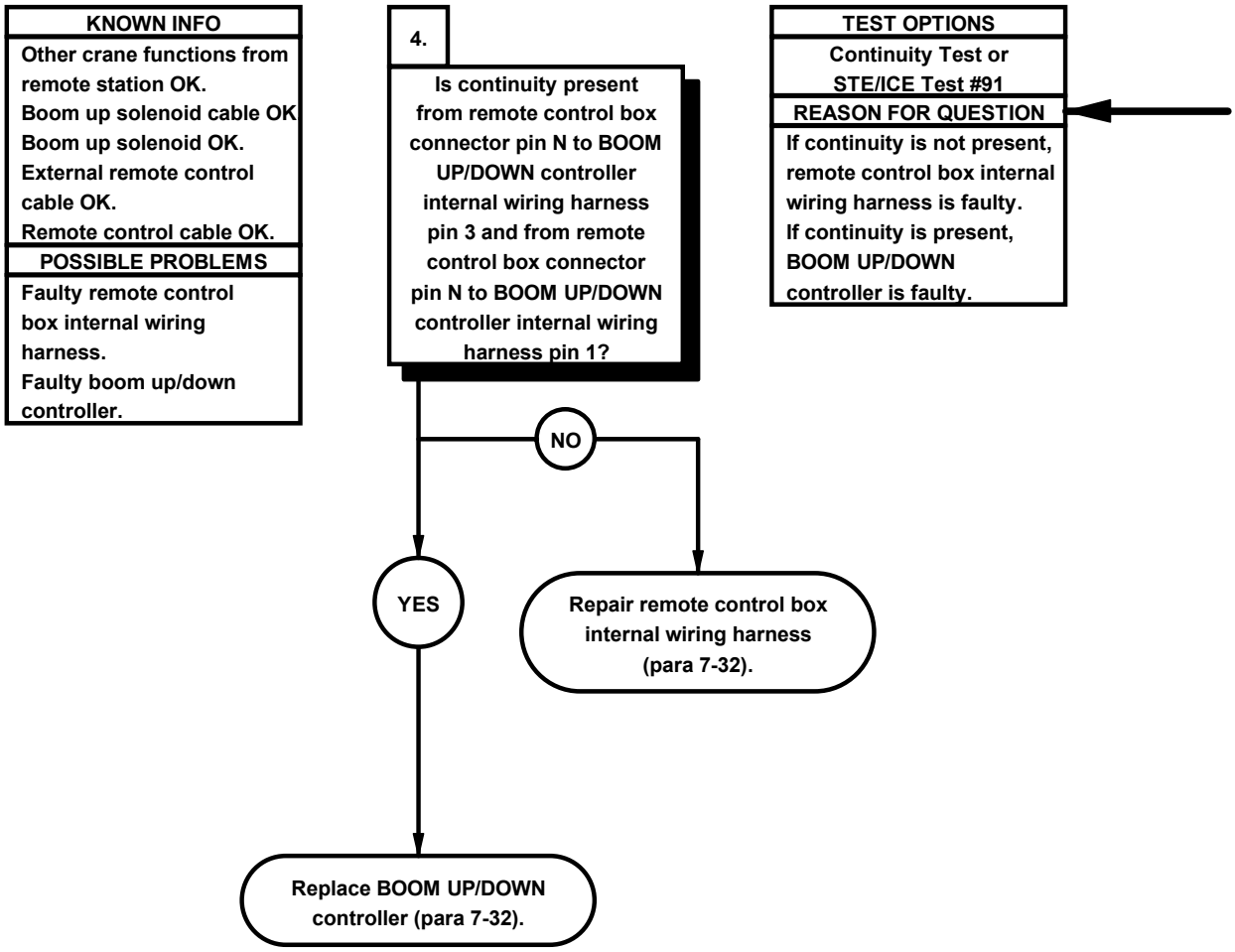
NOTE

Step (6) requires the aid of an assistant.

(6) Position BOOM UP/DOWN controller to UP and note reading on multimeter.
(7) If continuity is not present, go to step 4 of this fault.
(8) If continuity is present, go to step 5 of this fault.
(9) Position remote control box switch to OFF.

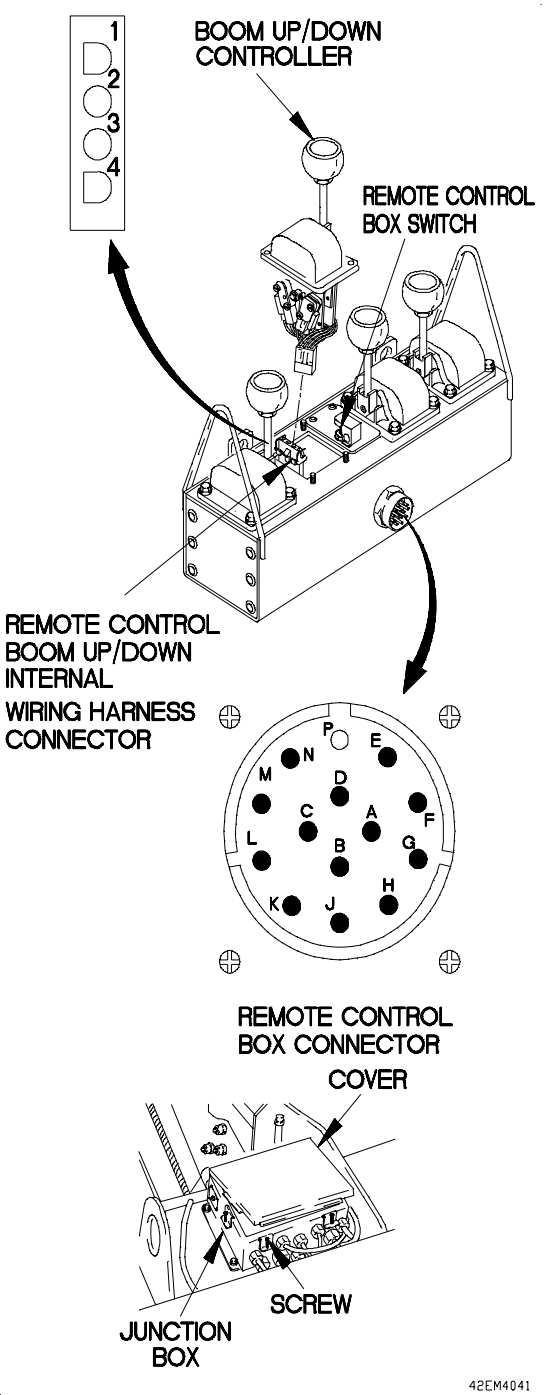


e124. M1089 MATERIAL HANDLING CRANE (MHC) BOOM UP DOES NOT OPERATE FROM REMOTE STATION (CONT)

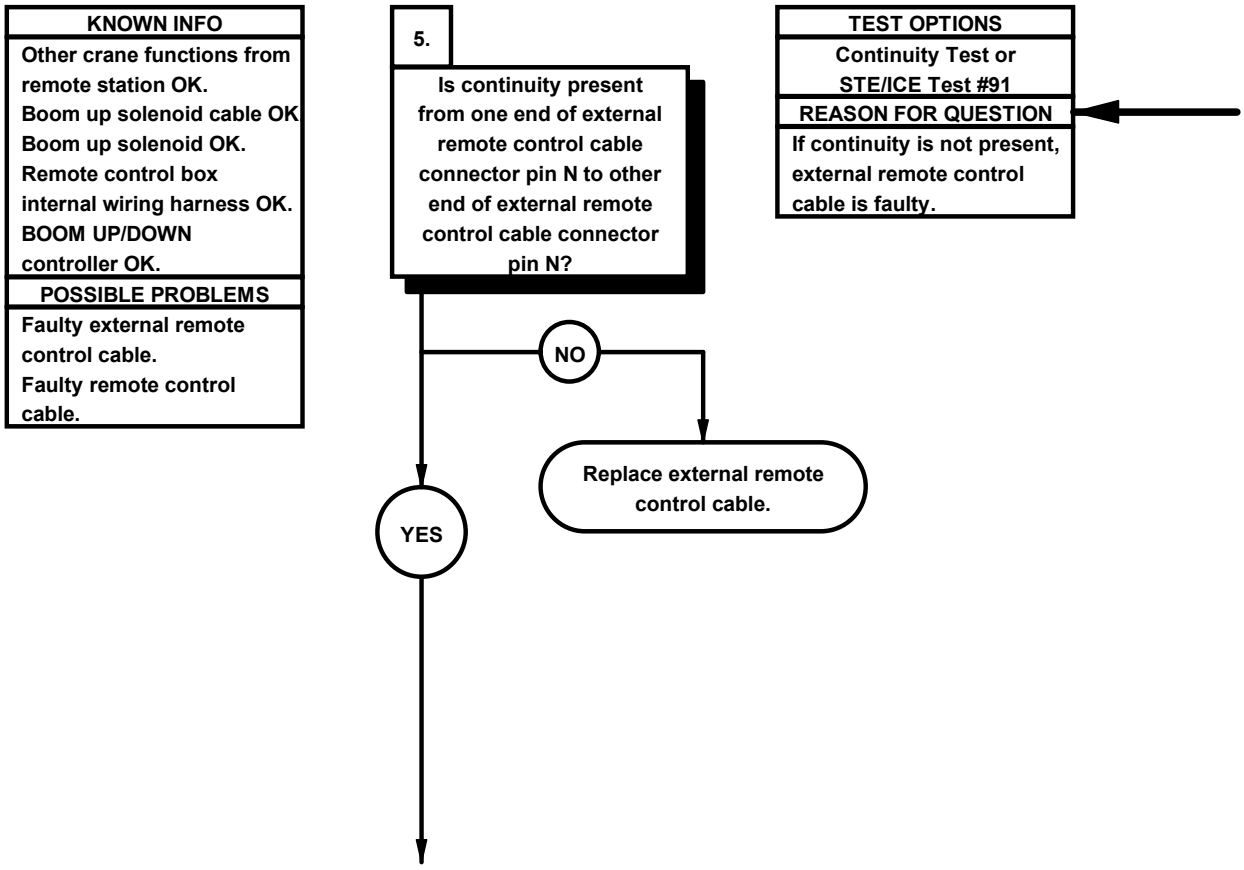


CONTINUITY TEST

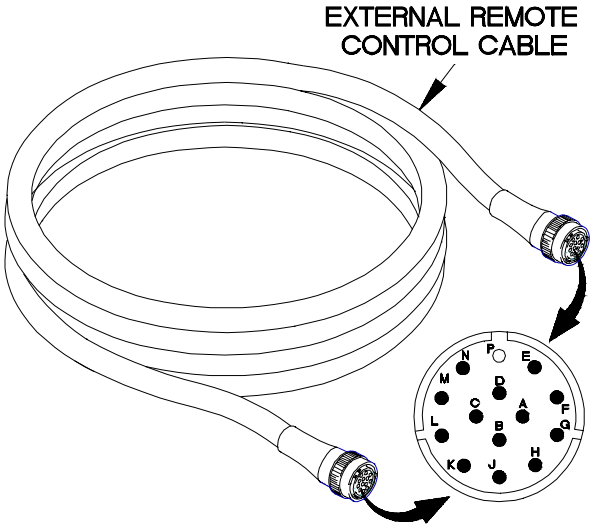
(1) Remove BOOM UP/DOWN controller (para 7-32).
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin N of remote control box connector.
(4) Connect negative (-) probe of multimeter on pin 3 of BOOM UP/DOWN controller internal wiring harness and note reading on multimeter.
(5) Position remote control box switch to ON.
(6) Connect positive (+) probe of multimeter on pin H of remote control box connector.
(7) Connect negative (-) probe of multimeter on pin 1 of BOOM UP/DOWN controller internal wiring harness and note reading on multimeter.
(8) If continuity is not present, replace remote control box internal wiring harness (para 7-32).
(9) If continuity is present, replace BOOM UP/DOWN controller (para 7-32).
(10) Position remote control box switch to OFF.
(11) Install BOOM UP/DOWN controller (para 7-32).
(12) Close cover on junction box.
(13) Tighten four screws on junction box cover.
(14) Stow crane (TM 9-2320-366-10-1).



e124. M1089 MATERIAL HANDLING CRANE (MHC) BOOM UP DOES NOT OPERATE FROM REMOTE STATION (CONT)

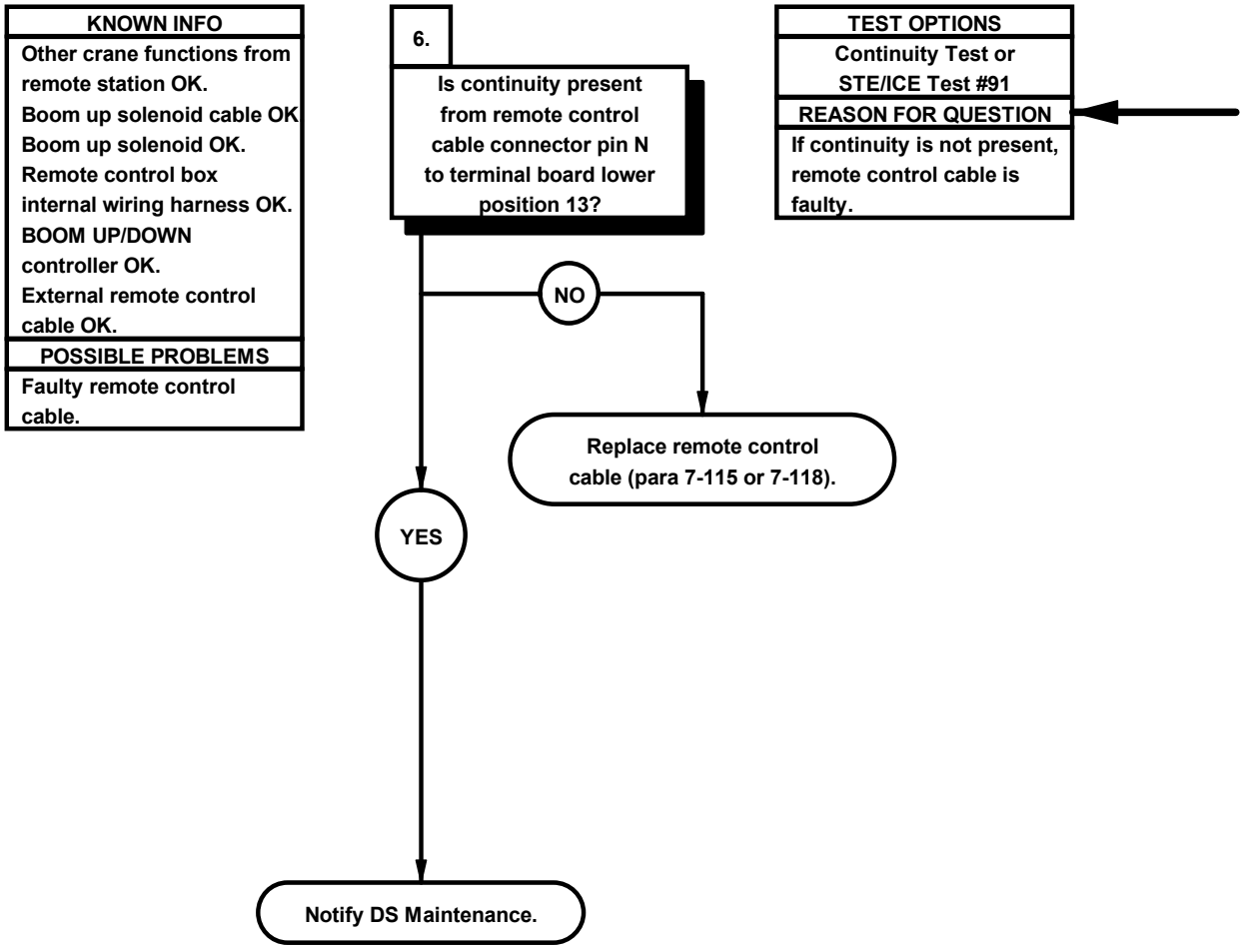


CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin N of one end of external remote control cable connector.
(3) Connect negative (-) probe of multimeter on pin N of other end of external remote control cable and note reading on multimeter.
(4) If continuity is not present, replace external remote control cable.



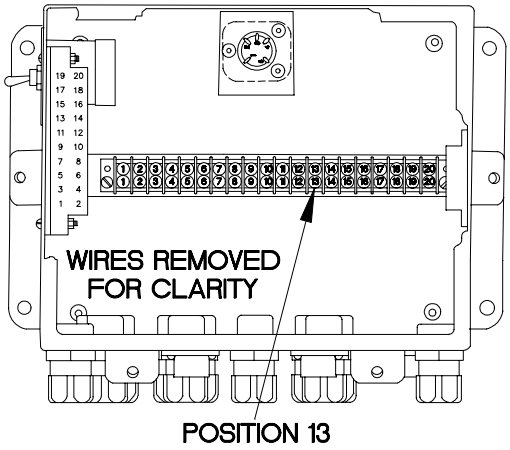
X2E1095-

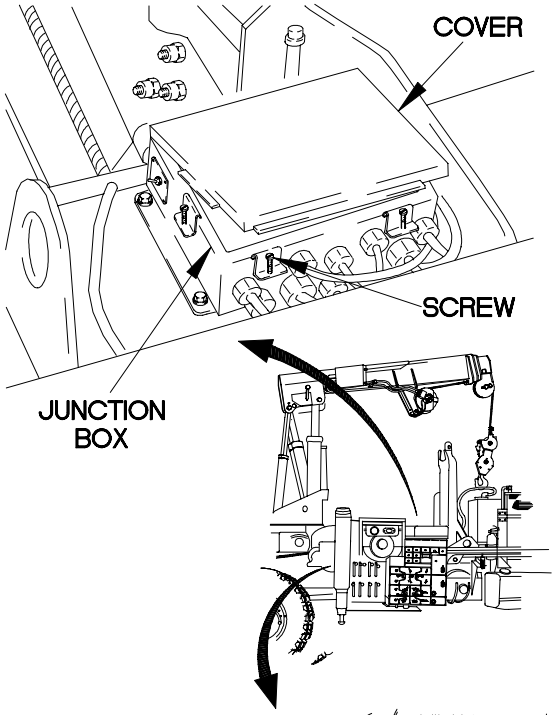
e124. M1089 MATERIAL HANDLING CRANE (MHC) BOOM UP DOES NOT OPERATE FROM REMOTE STATION (CONT)

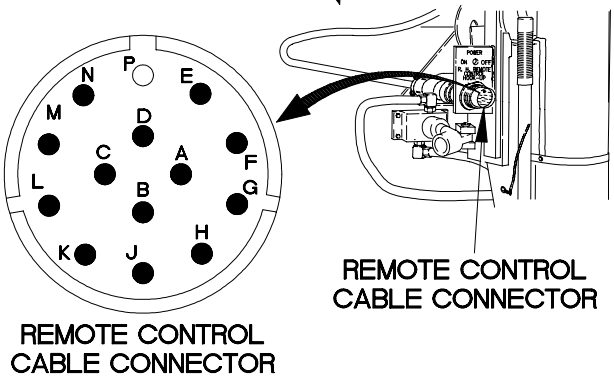


CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin N of remote control cable connector.
(3) Connect negative (-) probe of multimeter on terminal board lower position 13 and note reading on multimeter.
(4) If continuity is not present, replace remote control cable (para 7-115 or 7-118).
(5) If continuity is present, notify DS Maintenance.
(6) Close cover on junction box.
(7) Tighten four screws on junction box cover.
(8) Stow crane (TM 9-2320-366-10-1).







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e125. M1089 MATERIAL HANDLING CRANE (MHC) BOOM DOWN DOES NOT OPERATE FROM REMOTE STATION

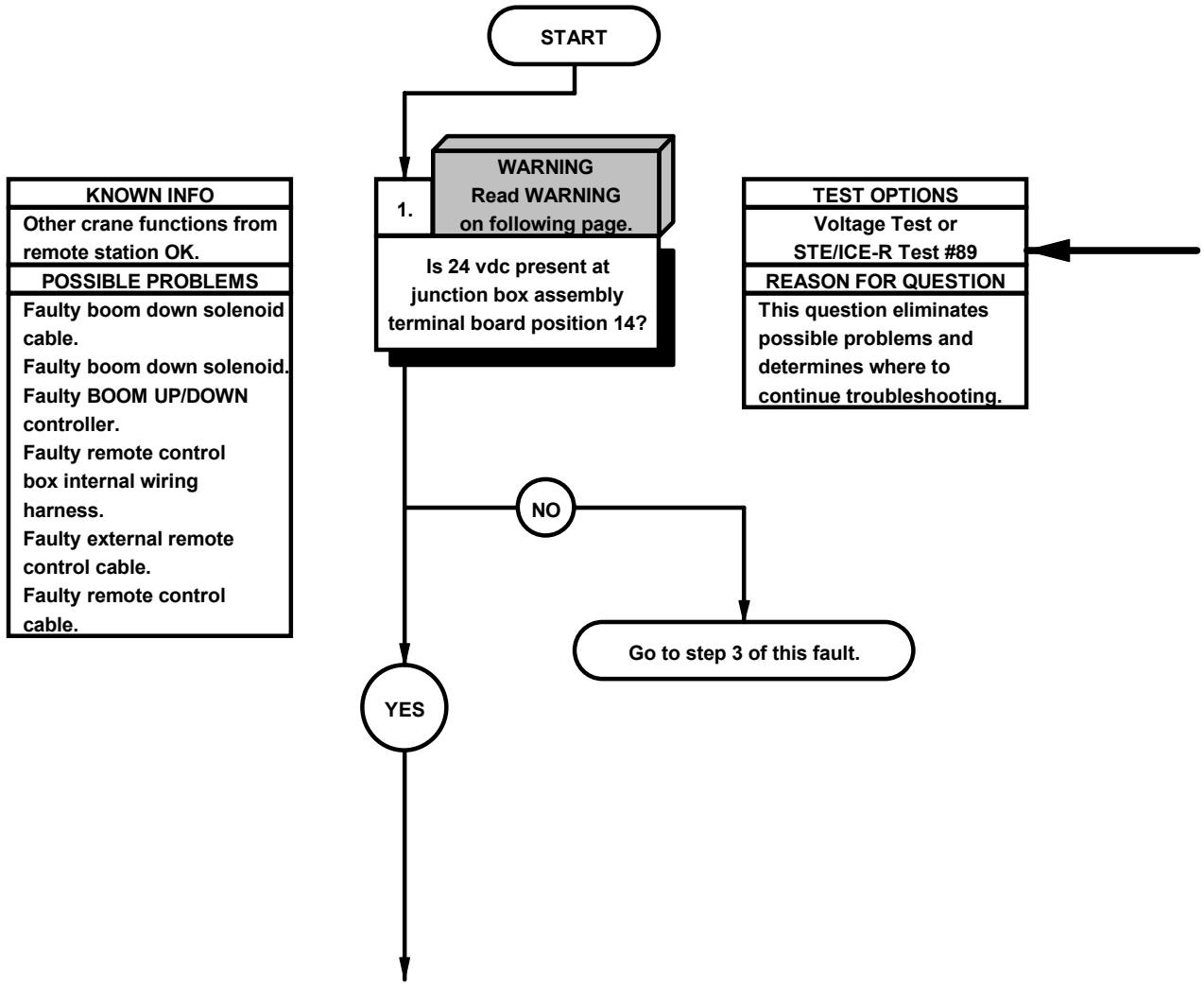
INITIAL SETUP

Equipment Conditions
Outriggers lowered (TM 9-2320-366-10-1).
Crane erected with approximately five feet of cable payed out (TM 9-2320-366-10-1).
Engine shut down (TM 9-2320-366-10-1).

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

References
TM 9-4910-571-12&P



WARNING

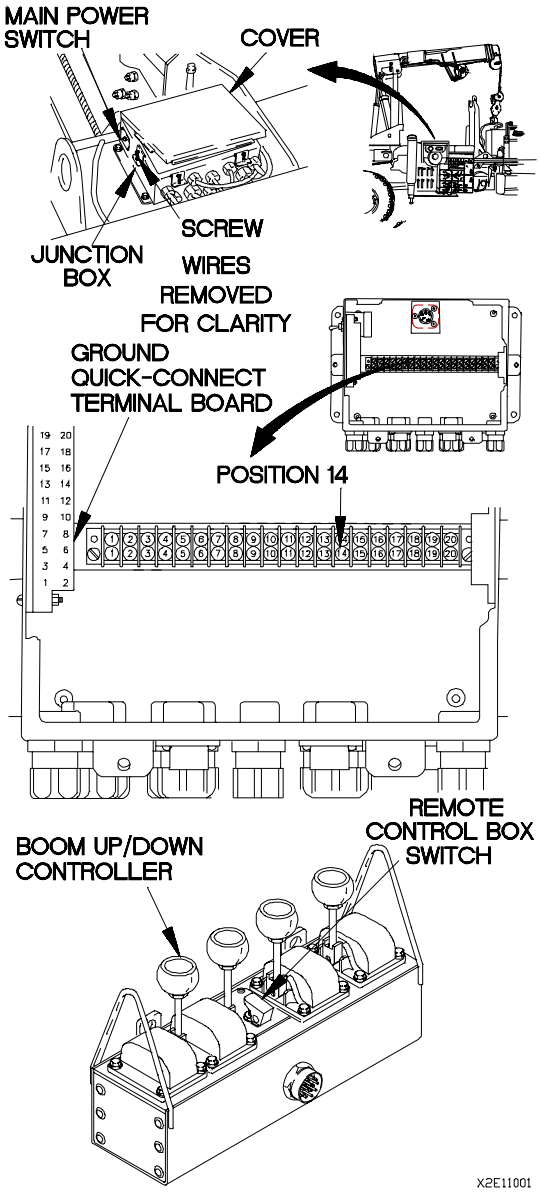
Remove rings, bracelets, watches, necklaces, and any other jewelry beffore working around vehicle. Jewelery can catch on equipment and cause injury or short circuit across electrical circuits and cause severe burns or electrical shock.

OUTPUT VOLTAGE TEST

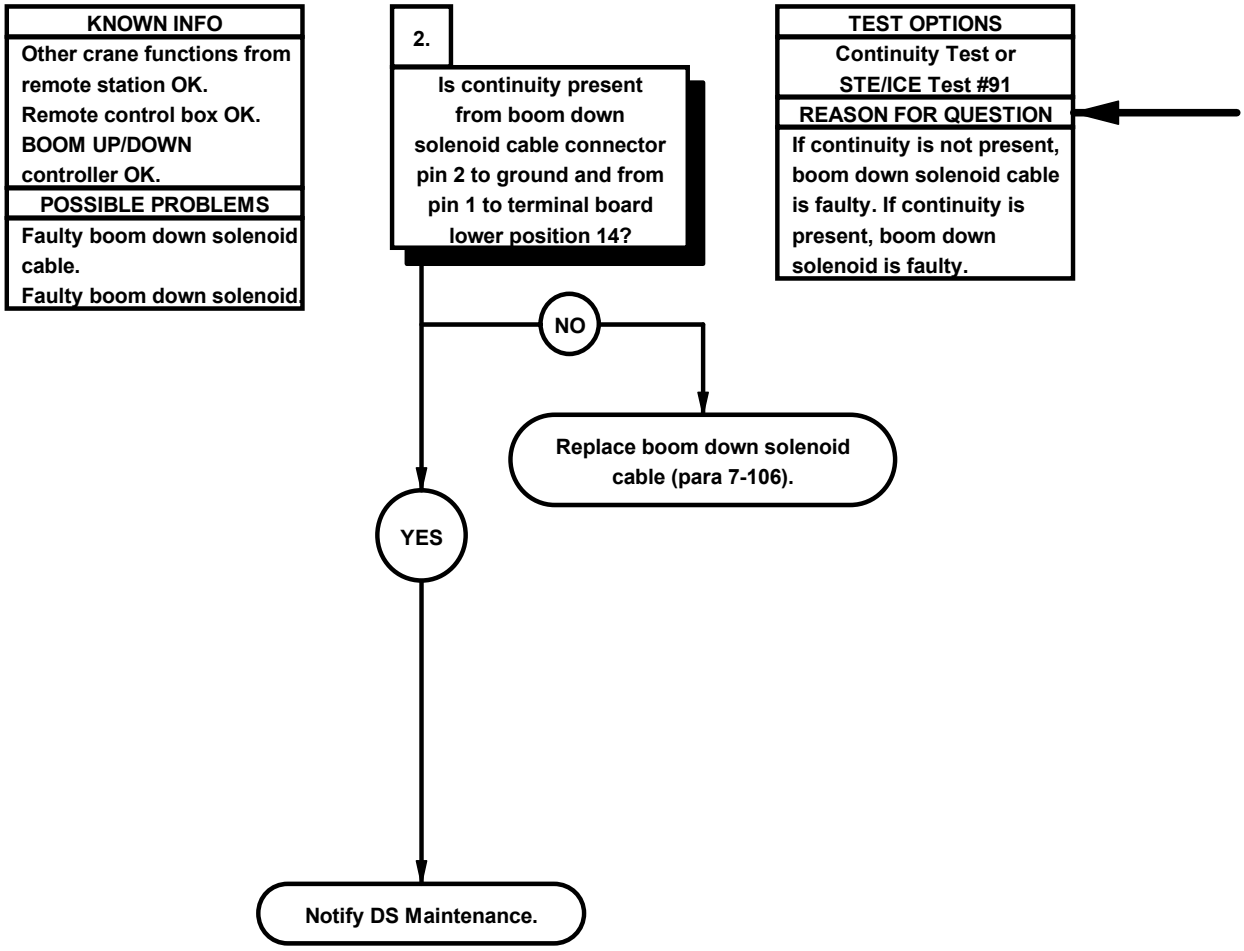
(1) Connect external remote control cable to remote control box (TM 9-2320-366-10-1).
(2) Loosen four screws on junction box.
(3) Open cover on junction box.
(4) Position MAIN POWER switch to ON.
(5) Lift guard and position remote control box ON/OFF switch to ON.
(6) Set multimeter to volts dc.
(7) Connect positive (+) probe of multimeter on terminal board lower position 14.
(8) Connect negative (-) probe of multimeter on ground quick-connect terminal board (above MAIN POWER switch).

NOTE
Step (9) requires the aid of an assistant.

(9) Position BOOM UP/DOWN controller to DOWN and note reading on multimeter.
(10) If 24 volts dc is not present, go to step 3 of this fault.
(11) Position MAIN POWER switch to OFF.

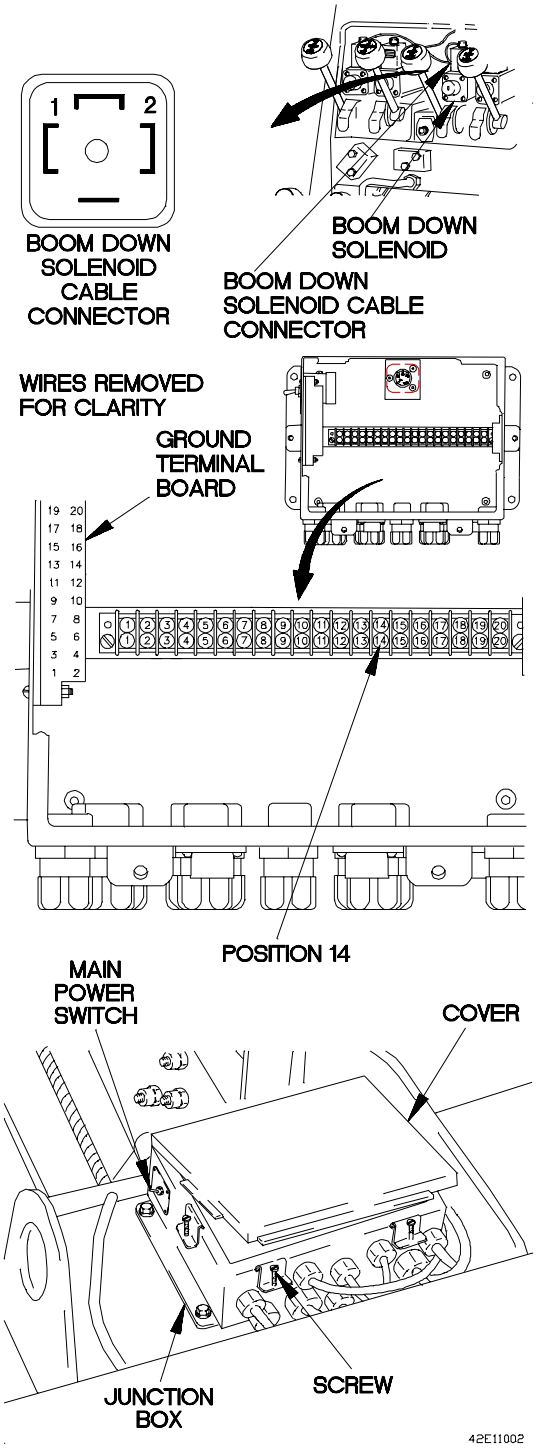


e125. M1089 MATERIAL HANDLING CRANE (MHC) BOOM DOWN DOES NOT OPERATE FROM REMOTE STATION (CONT)

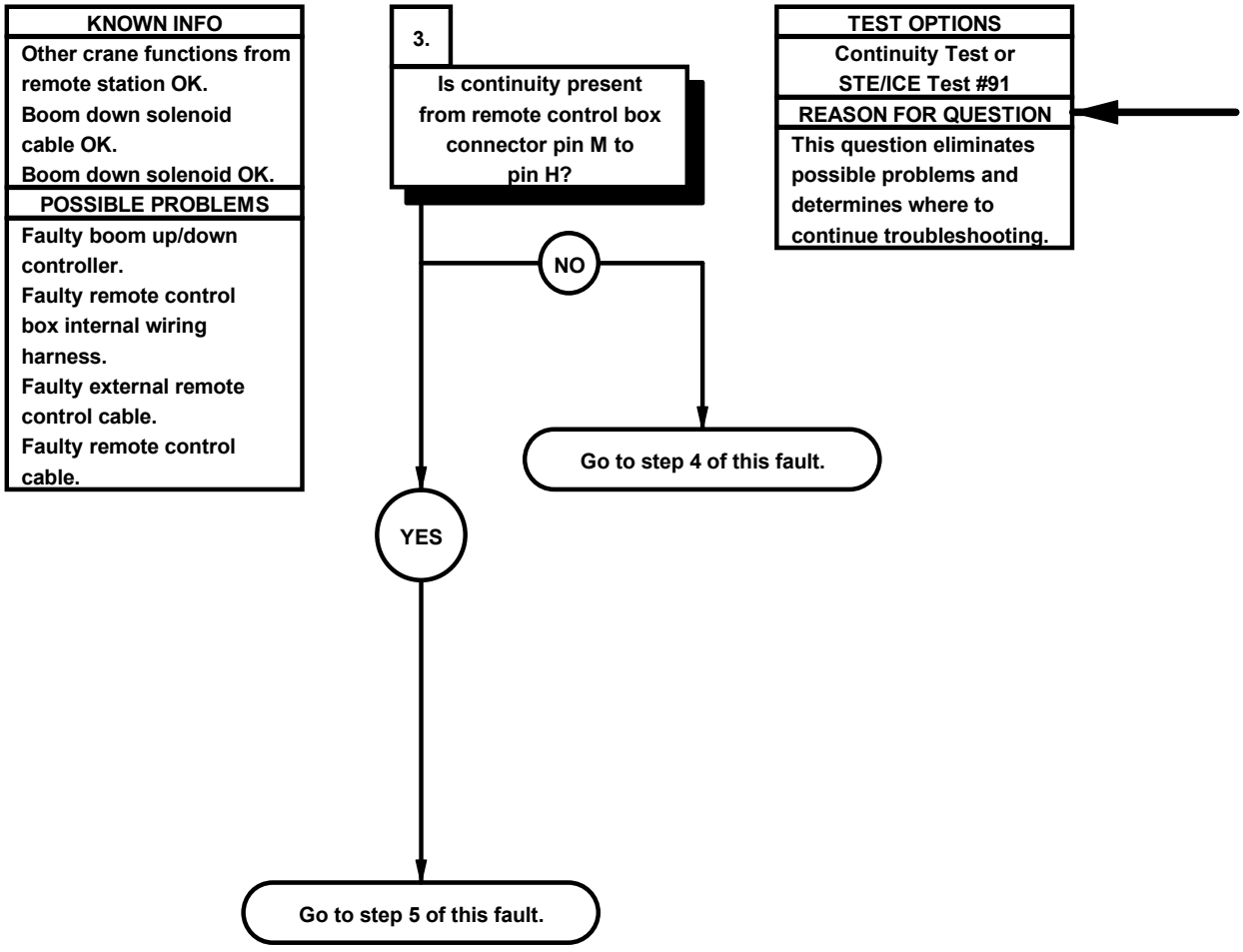


CONTINUITY TEST

(1) Disconnect boom down solenoid connector from boom down solenoid.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin 2 of boom down solenoid cable connector.
(4) Connect negative (-) probe of multimeter on ground and note reading on multimeter.
(5) Connect positive (+) probe of multimeter on pin 1 of boom down solenoid cable connector.
(6) Connect negative (-) probe of multimeter on terminal board lower position 14 and note reading on multimeter.
(7) If continuity is not present, replace boom down solenoid cable (para 7-106).
(8) If continuity is present, notify DS Maintenance.
(9) Connect boom down solenoid cable connector to boom down solenoid.
(10) Close cover on junction box.
(11) Tighten four screws on junction box cover.
(12) Stow crane (TM 9-2320-366-10-1).



e125. M1089 MATERIAL HANDLING CRANE (MHC) BOOM DOWN DOES NOT OPERATE FROM REMOTE STATION (CONT)



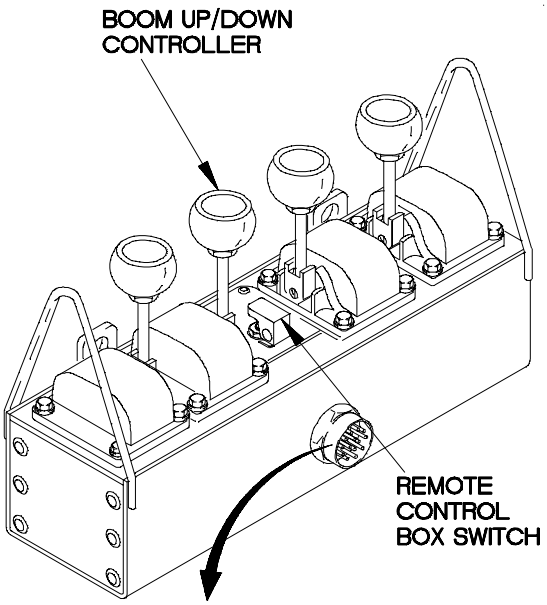
CONTINUITY TEST

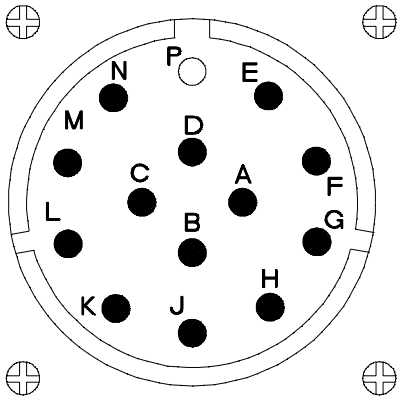
(1) Disconnect external remote control cable from remote control box.
(2) Position remote control box switch to ON.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter on pin M of connector on remote control box.
(5) Connect negative (-) probe of multimeter on pin H of connector on remote control box.

NOTE

Step (6) requires the aid of an assistant.

(6) Position BOOM UP/DOWN controller to DOWN and note reading on multimeter.
(7) If continuity is not present, go to step 4 of this fault.
(8) If continuity is present, go to step 5 of this fault.
(9) Position remote control box switch to OFF.

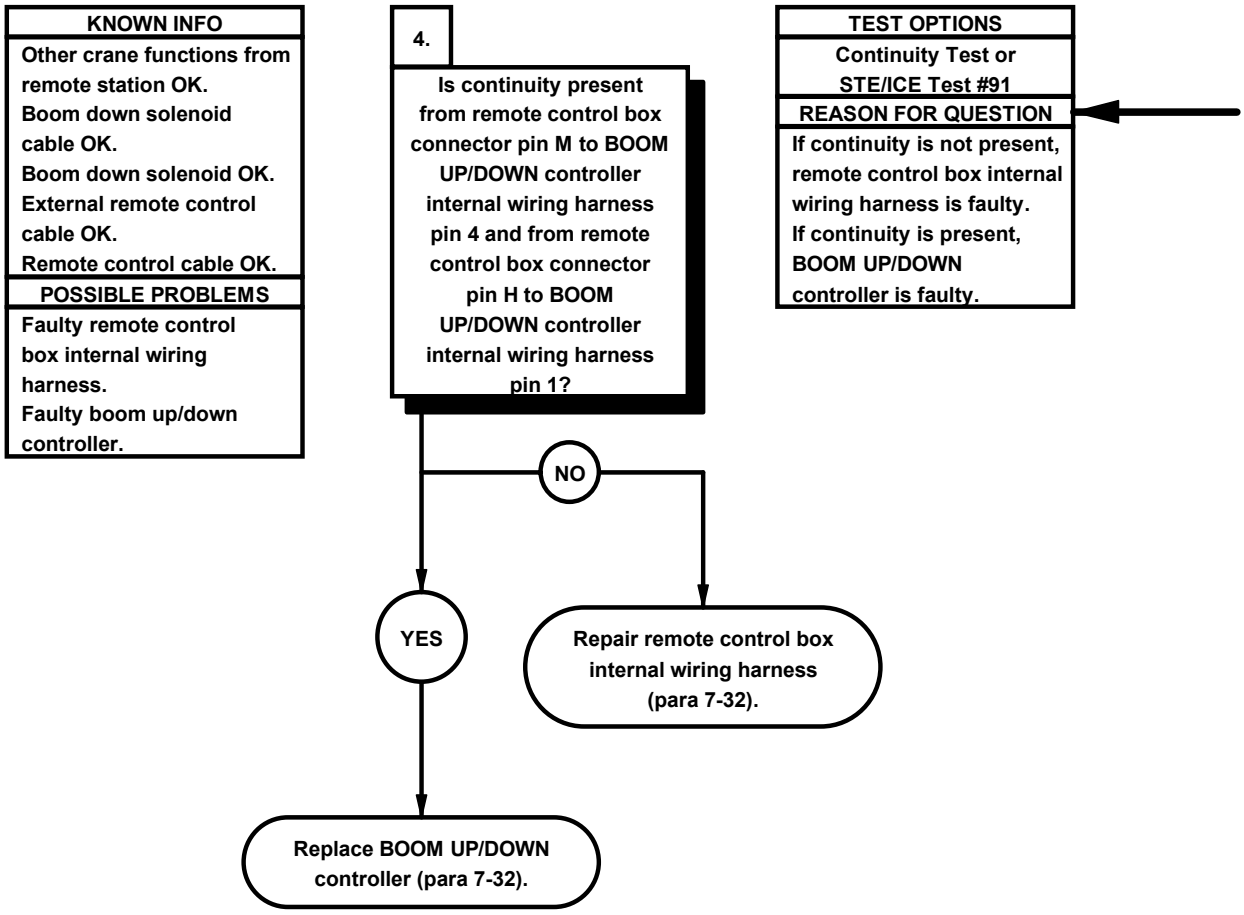




REMOTE CONTROL BOX CONNECTOR

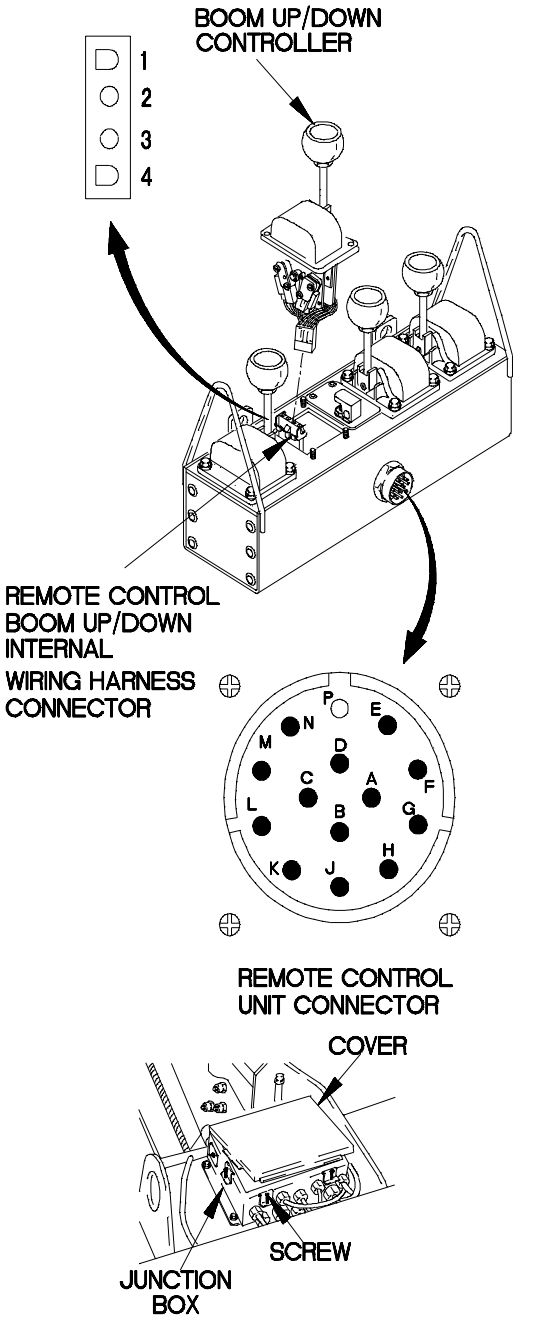
42EM5031

e125. M1089 MATERIAL HANDLING CRANE (MHC) BOOM DOWN DOES NOT OPERATE FROM REMOTE STATION (CONT)

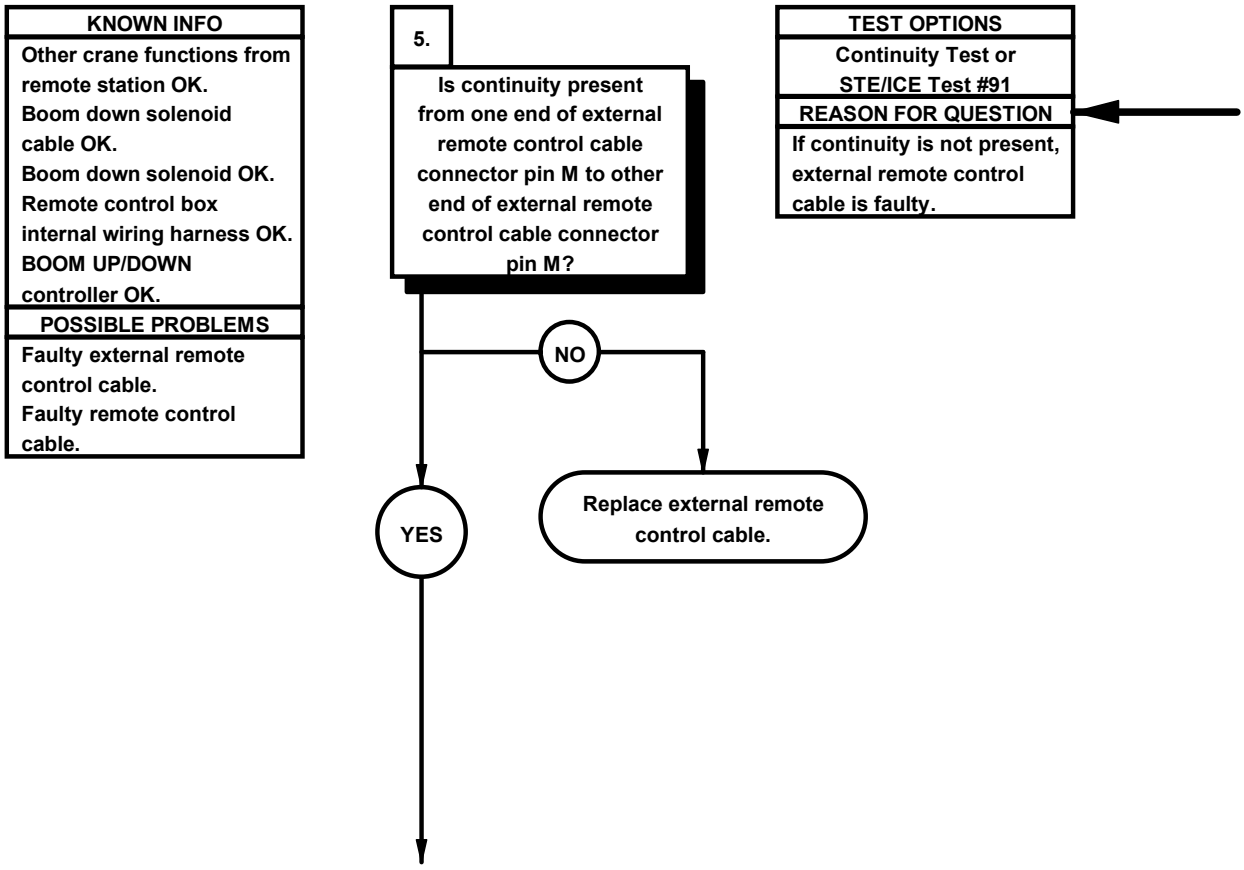


CONTINUITY TEST

(1) Remove BOOM UP/DOWN controller (para 7-32).
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin M of remote control box connector.
(4) Connect negative (-) probe of multimeter on pin 4 of BOOM UP/DOWN controller internal wiring harness and note reading on multimeter.
(5) Position remote control box switch to ON.
(6) Connect positive (+) probe of multimeter on pin H of remote control box connector.
(7) Connect negative (-) probe of multimeter on pin 1 of BOOM UP/DOWN controller internal wiring harness and note reading on multimeter.
(8) If continuity is not present, replace remote control box internal wiring harness (para 7-32).
(9) If continuity is present, replace BOOM UP/DOWN controller (para 7-32).
(10) Position remote control box switch to OFF.
(11) Install BOOM UP/DOWN controller (para 7-32).
(12) Close cover on junction box.
(13) Tighten four screws on junction box cover.
(14) Stow crane (TM 9-2320-366-10-1).

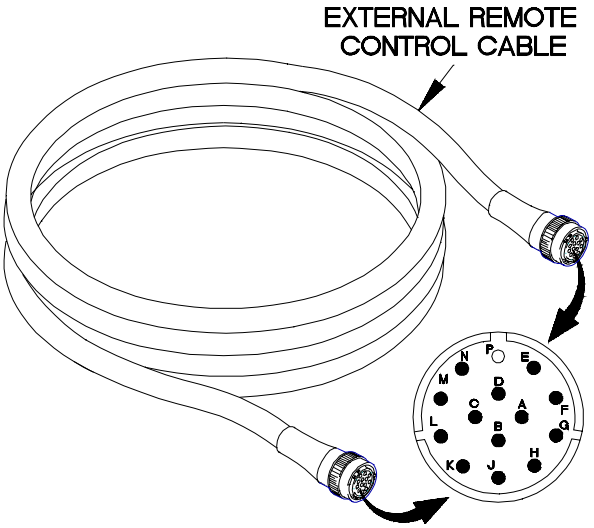


e125. M1089 MATERIAL HANDLING CRANE (MHC) BOOM DOWN DOES NOT OPERATE FROM REMOTE STATION (CONT)



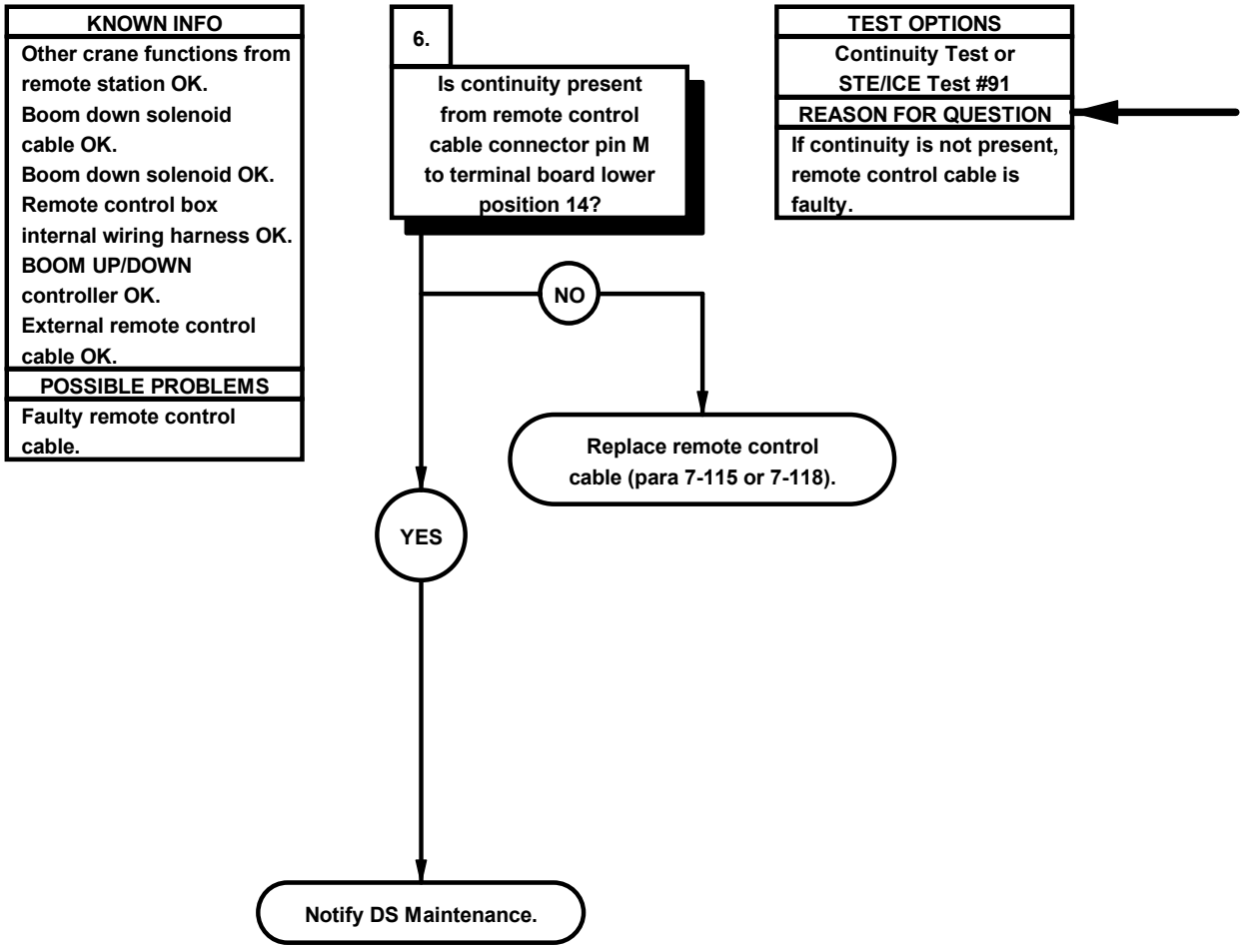
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin M of one end of external remote control cable connector.
(3) Connect negative (-) probe of multimeter on pin M of other end of external remote control cable and note reading on multimeter.
(4) If continuity is not present, replace external remote control cable.

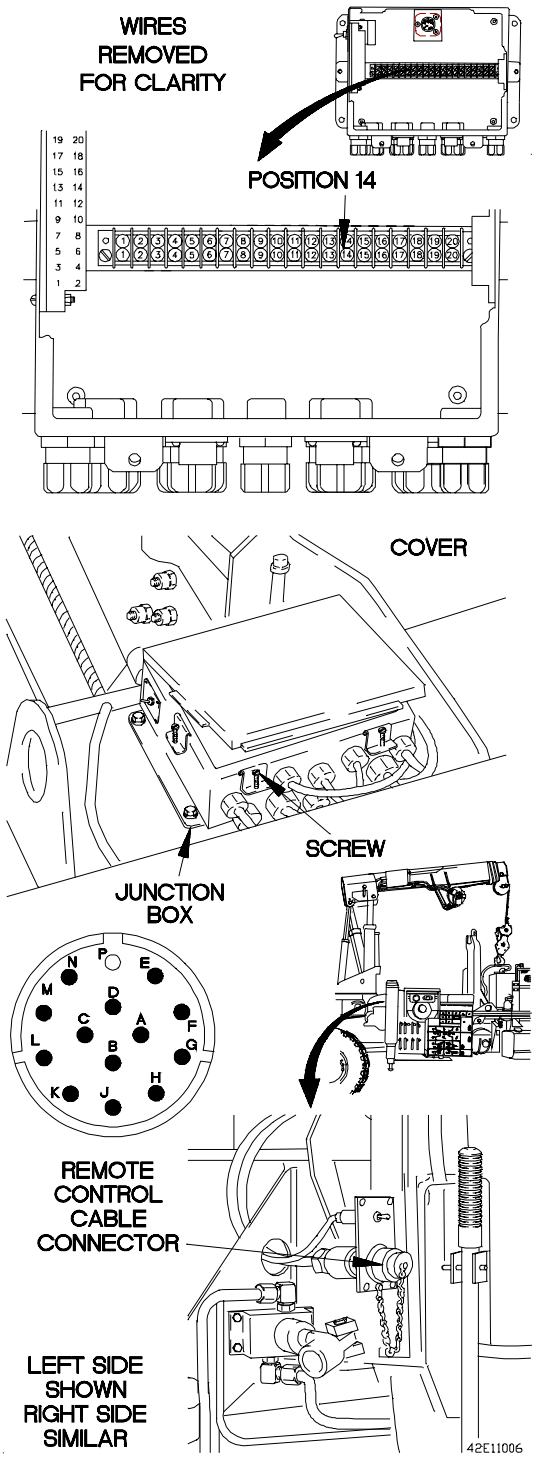


X2E11005

e125. M1089 MATERIAL HANDLING CRANE (MHC) BOOM DOWN DOES NOT OPERATE FROM REMOTE STATION (CONT)



CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin M of remote control cable connector.
(3) Connect negative (-) probe of multimeter on terminal board lower position 14 and note reading on multimeter.
(4) If continuity is not present, replace remote control cable (para 7-115 or 7-118).
(5) If continuity is present, notify DS Maintenance.
(6) Close cover on junction box.
(7) Tighten four screws on junction box cover.
(8) Stow crane (TM 9-2320-366-10-1).



e126. M1089 MATERIAL HANDLING CRANE (MHC) TELESCOPE IN DOES NOT OPERATE FROM REMOTE STATION

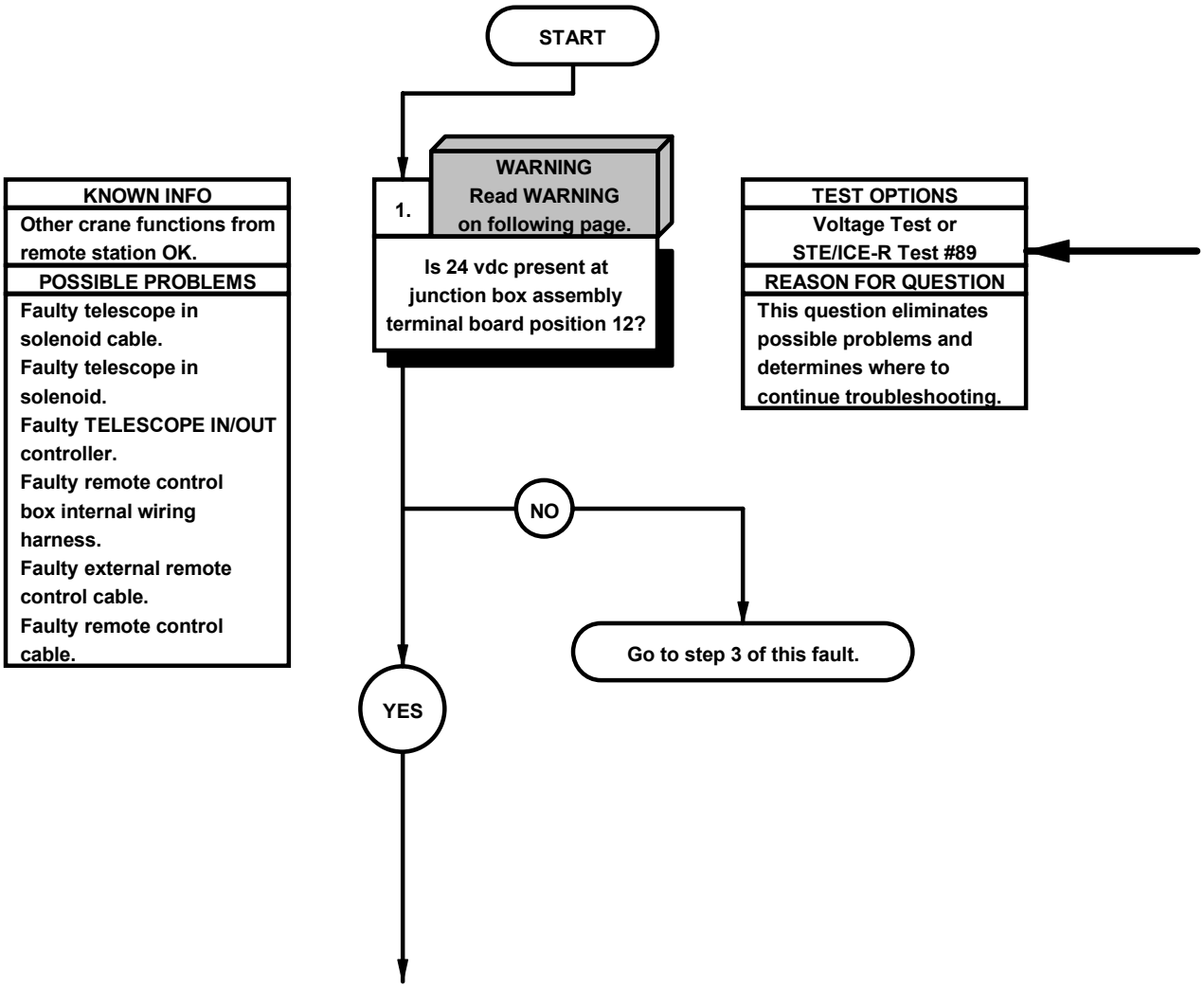
INITIAL SETUP

Equipment Conditions
Outriggers lowered (TM 9-2320-366-10-1).
Crane erected with approximately five feet of cable payed out (TM 9-2320-366-10-1).
Engine shut down (TM 9-2320-366-10-1).

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

References
TM 9-4910-571-12&P



WARNING

Remove rings, bracelets, watches, necklaces, and any other jewelry beffore working around vehicle. Jewelery can catch on equipment and cause injury or short circuit across electrical circuits and cause severe burns or electrical shock.

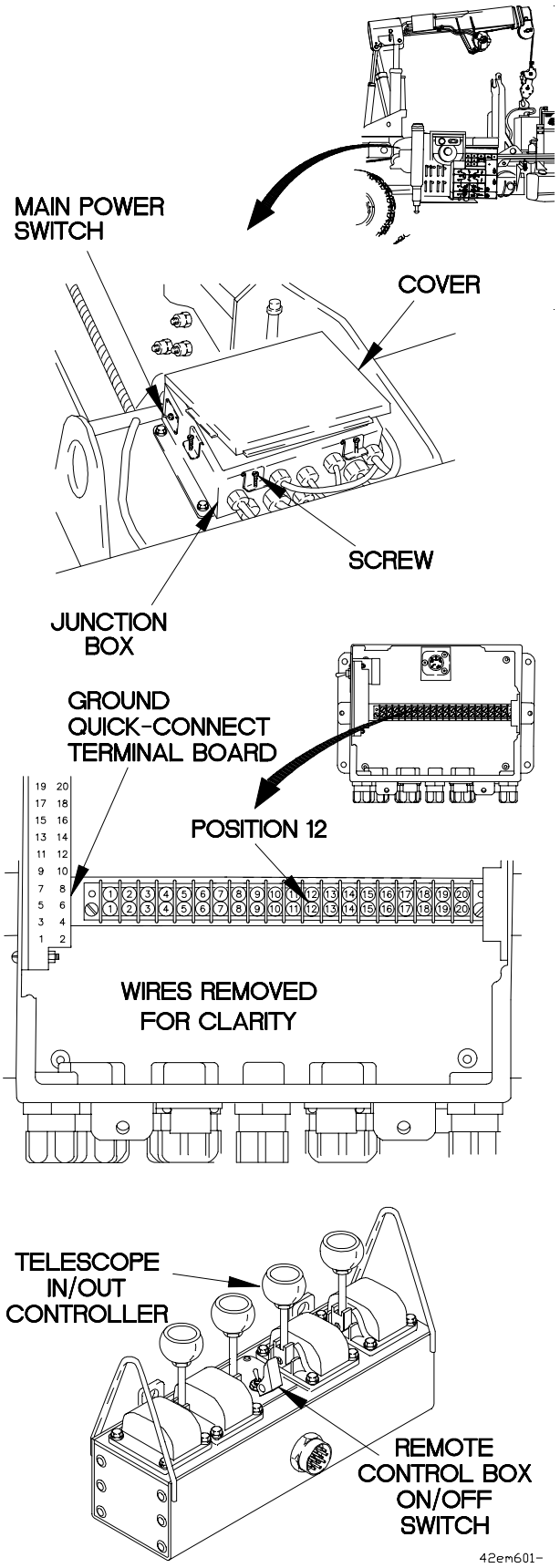
OUTPUT VOLTAGE TEST

(1) Connect external remote control cable to remote control box (TM 9-2320-366-10-1).
(2) Loosen four screws on junction box.
(3) Open cover on junction box.
(4) Position MAIN POWER switch to ON.
(5) Lift guard and position remote control box ON/OFF switch to ON.
(6) Set multimeter to volts dc.
(7) Connect positive (+) probe of multimeter on terminal board lower position 12.
(8) Connect negative (-) probe of multimeter on ground quick-connect terminal board (above MAIN POWER switch).

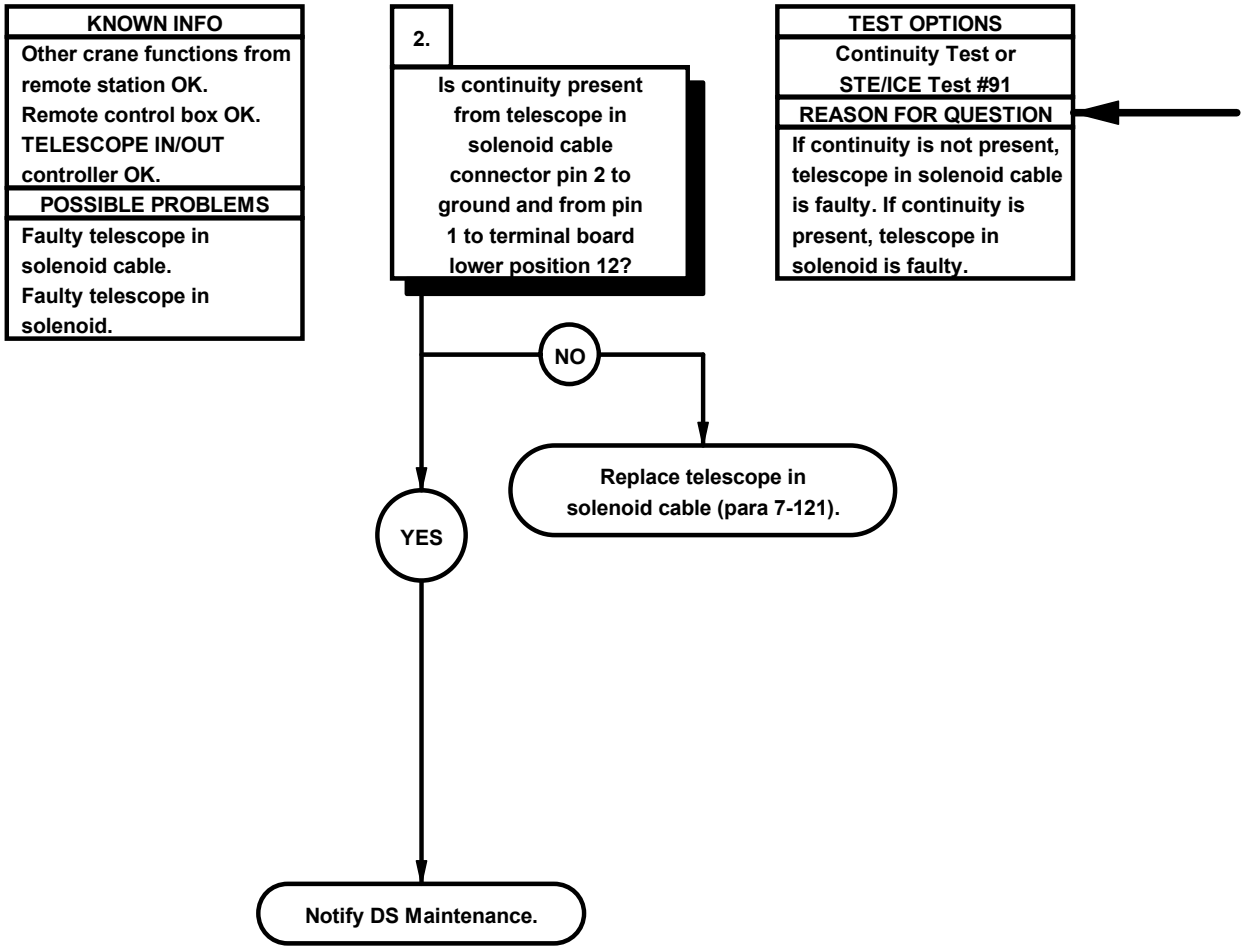
NOTE

Step (9) requires the aid of an assistant.

(9) Position TELESCOPE IN/OUT controller to IN and note reading on multimeter.
(10) If 24 volts dc is not present, go to step 3 of this fault.

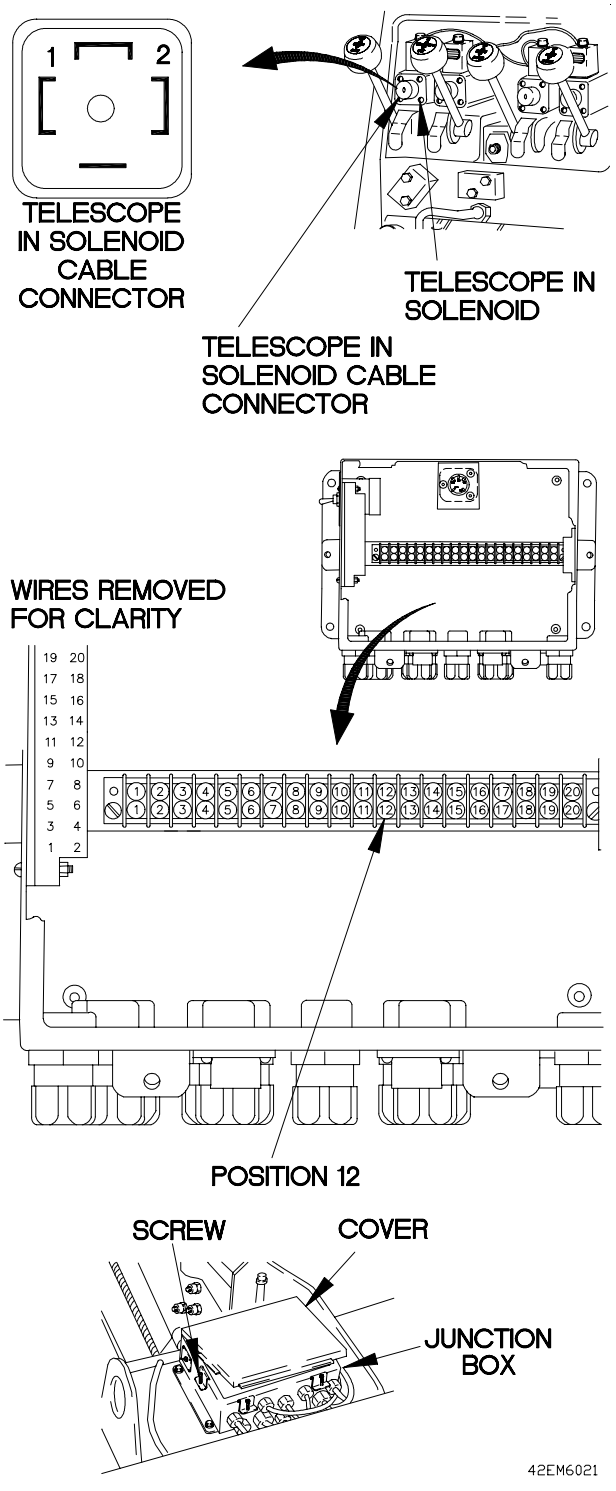


e126. M1089 MATERIAL HANDLING CRANE (MHC) TELESCOPE IN DOES NOT OPERATE FROM REMOTE STATION (CONT)

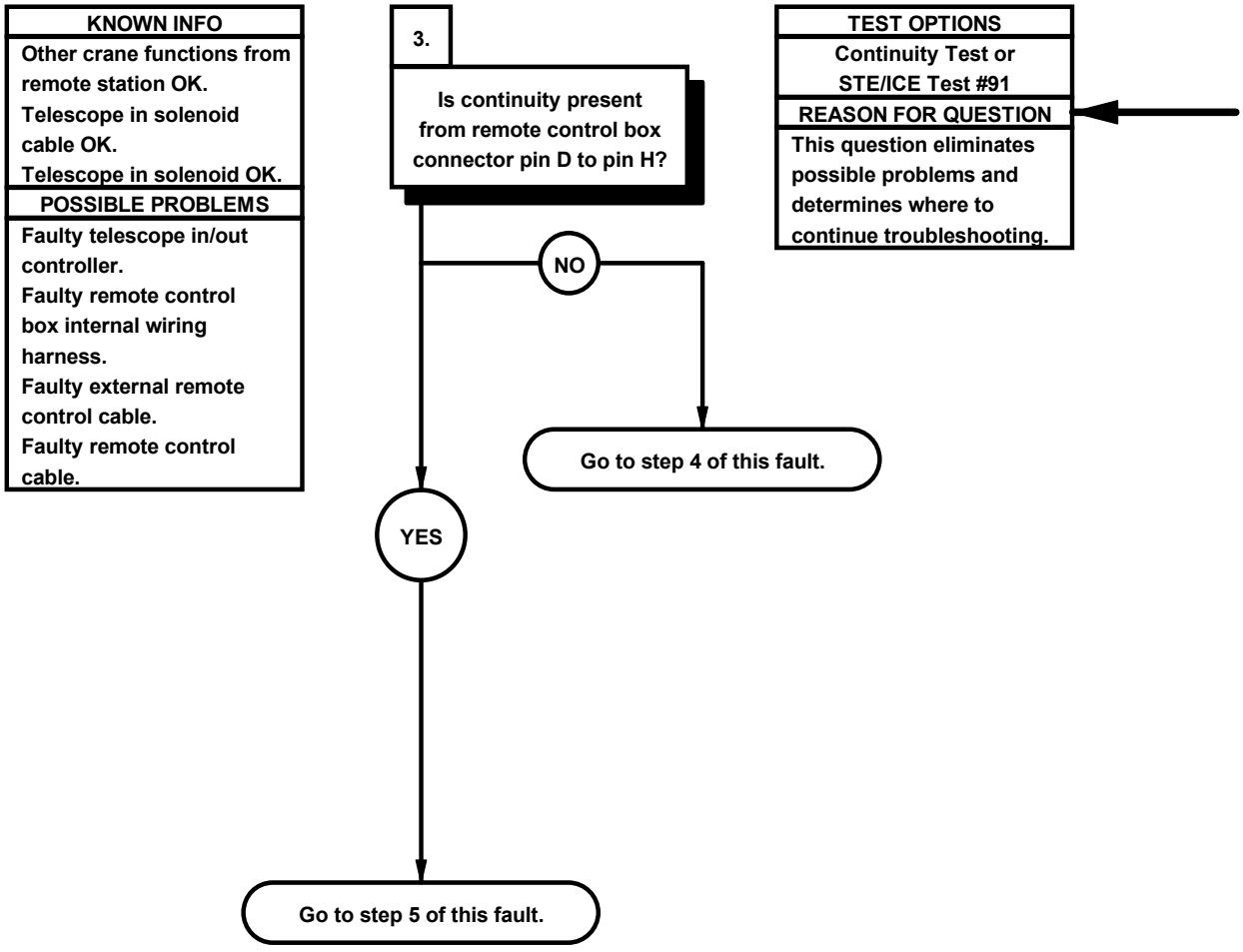


CONTINUITY TEST

(1) Disconnect telescope in solenoid connector from telescope in solenoid.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin 2 of telescope in solenoid cable connector.
(4) Connect negative (-) probe of multimeter on ground and note reading on multimeter.
(5) Connect positive (+) probe of multimeter on pin 1 of telescope in solenoid cable connector.
(6) Connect negative (-) probe of multimeter on terminal board lower position 12 and note reading on multimeter.
(7) If continuity is not present, replace telescope in solenoid cable (para 7-121).
(8) If continuity is present, notify DS Maintenance.
(9) Connect telescope in solenoid cable connector to telescope in solenoid.
(10) Close cover on junction box.
(11) Tighten four screws on junction box cover.
(12) Stow crane (TM 9-2320-366-10-1).



e126. M1089 MATERIAL HANDLING CRANE (MHC) TELESCOPE IN DOES NOT OPERATE FROM REMOTE STATION (CONT)



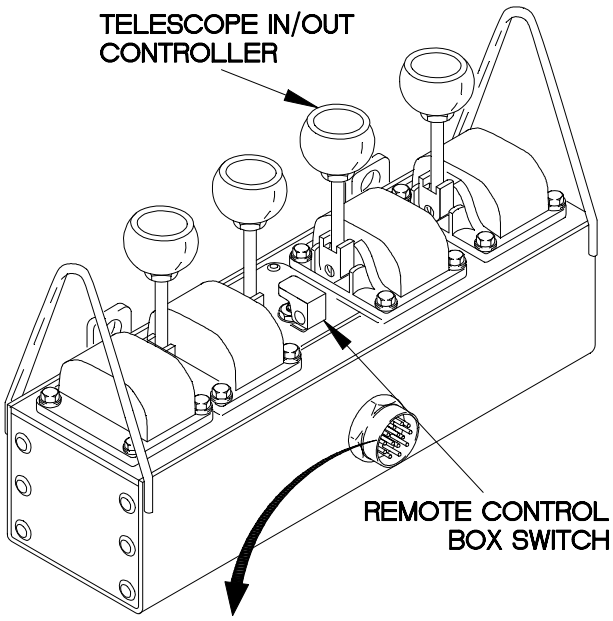
CONTINUITY TEST

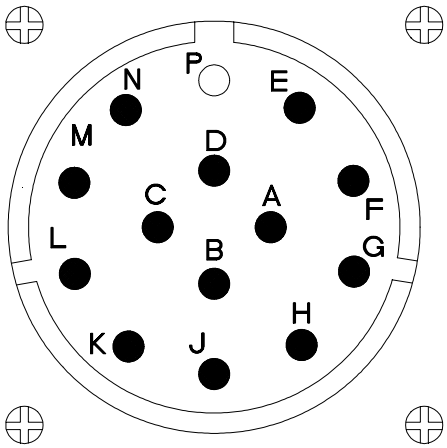
(1) Disconnect external remote control cable from remote control box.
(2) Position remote control box switch to ON.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter on pin D of connector on remote control box.
(5) Connect negative (-) probe of multimeter on pin H of connector on remote control box.

NOTE

Step (6) requires the aid of an assistant.

(6) Position TELESCOPE IN/OUT controller to IN and note reading on multimeter.
(7) If continuity is not present, go to step 4 of this fault.
(8) If continuity is present, go to step 5 of this fault.
(9) Position remote control box switch to OFF.

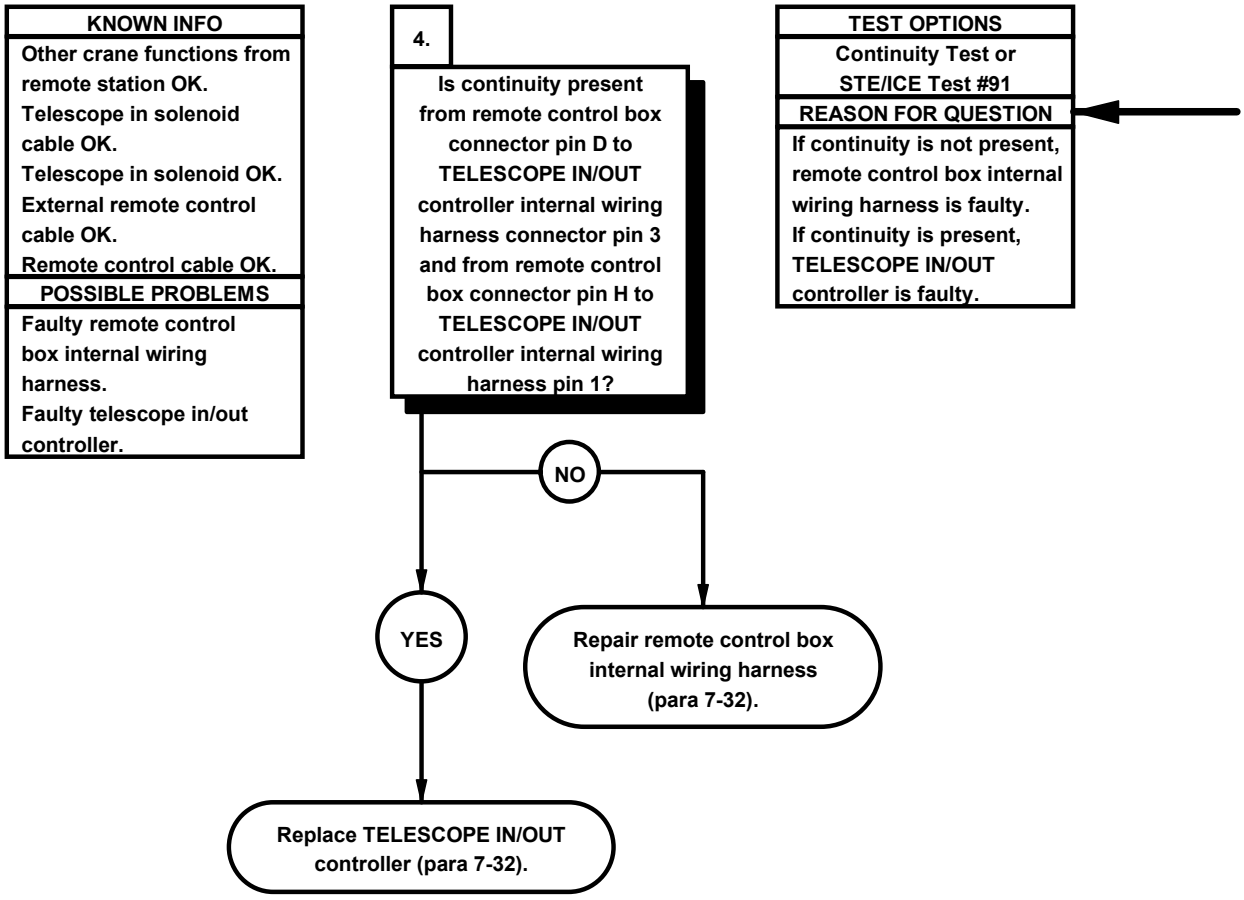




REMOTE CONTROL BOX CONNECTOR

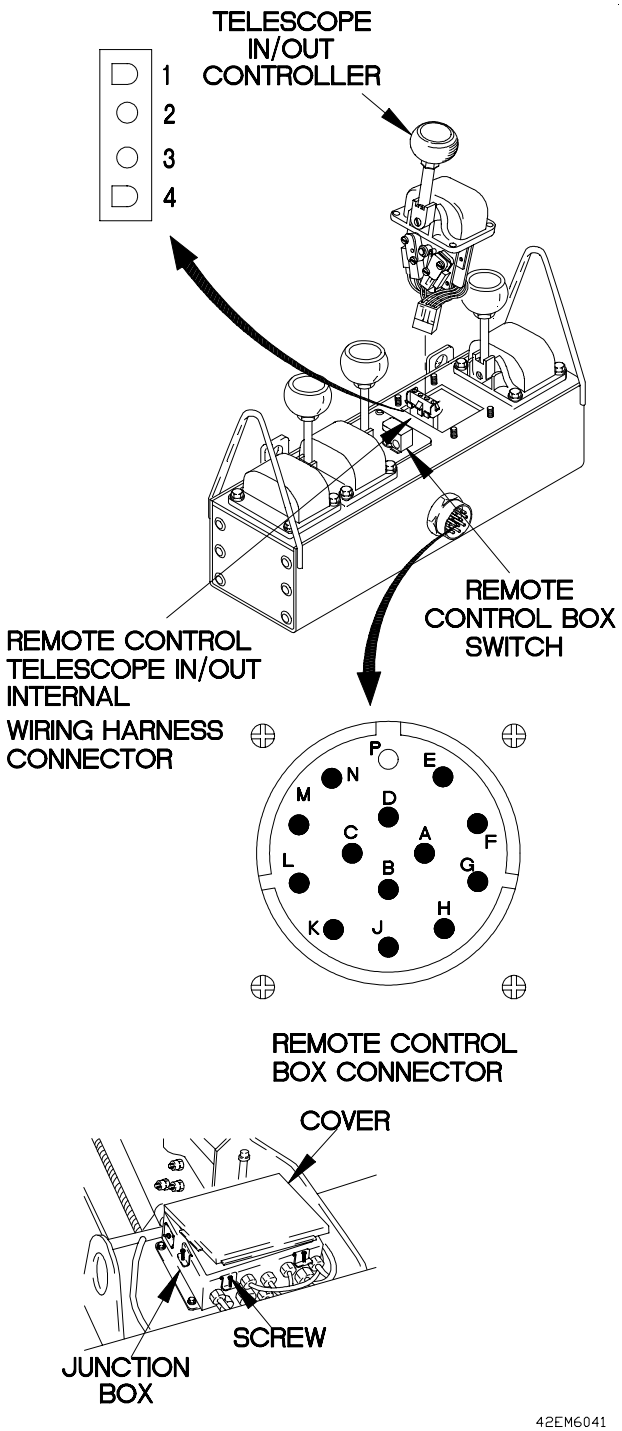
42EM6031

e126. M1089 MATERIAL HANDLING CRANE (MHC) TELESCOPE IN DOES NOT OPERATE FROM REMOTE STATION (CONT)

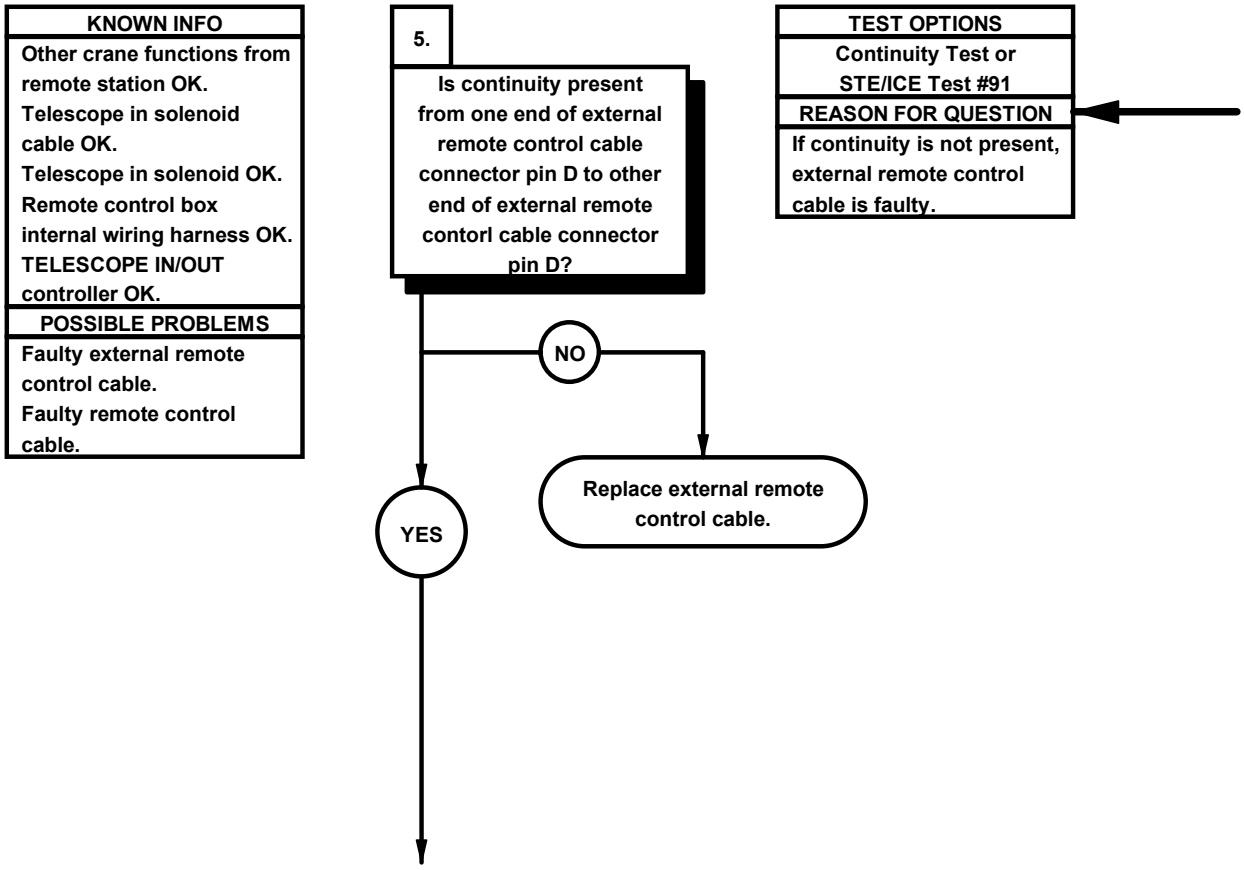


CONTINUITY TEST

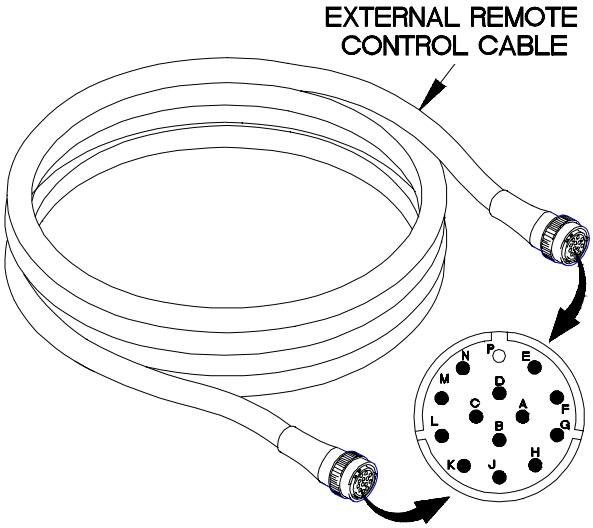
(1) Remove TELESCOPE IN/OUT controller (para 7-32).
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin D of remote control box connector.
(4) Connect negative (-) probe of multimeter on pin 3 of TELESCOPE IN/OUT controller internal wiring harness and note reading on multimeter.
(5) Position remote control box switch to ON.
(6) Connect positive (+) probe of multimeter on pin H of remote control box connector.
(7) Connect negative (-) probe of multimeter on pin 1 of TELESCOPE IN/OUT controller internal wiring harness and note reading on multimeter.
(8) If continuity is not present, replace remote control box internal wiring harness (para 7-32).
(9) If continuity is present, replace TELESCOPE IN/OUT controller (para 7-32).
(10) Position remote control box switch to OFF.
(11) Install TELESCOPE IN/OUT controller (para 7-32).
(12) Close cover on junction box.
(13) Tighten four screws on junction box cover.
(14) Stow crane (TM 9-2320-366-10-1).



e126. M1089 MATERIAL HANDLING CRANE (MHC) TELESCOPE IN DOES NOT OPERATE FROM REMOTE STATION (CONT)

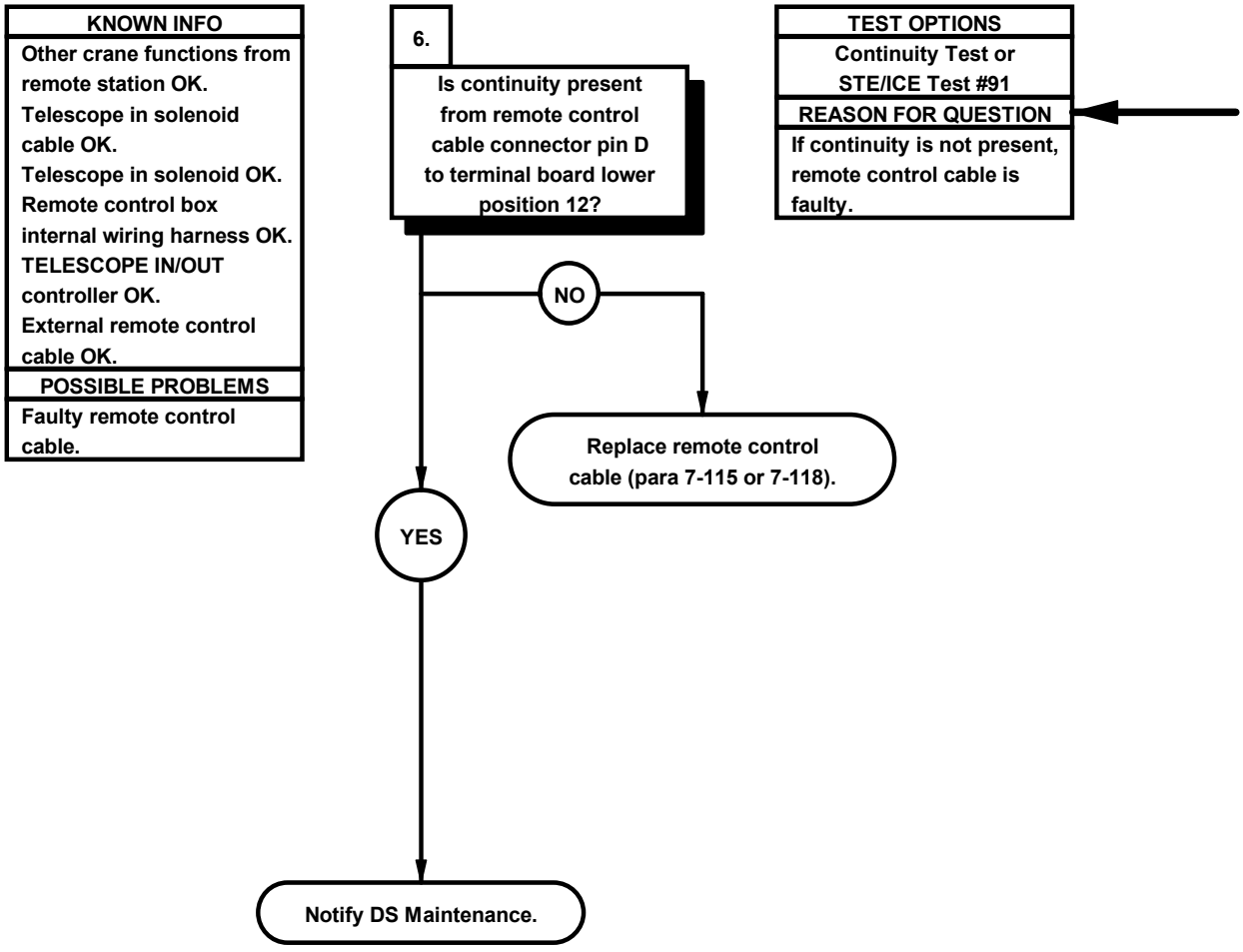


CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin D of one end of external remote control cable connector.
(3) Connect negative (-) probe of multimeter on pin D of other end of external remote control cable and note reading on multimeter.
(4) If continuity is not present, replace external remote control cable.



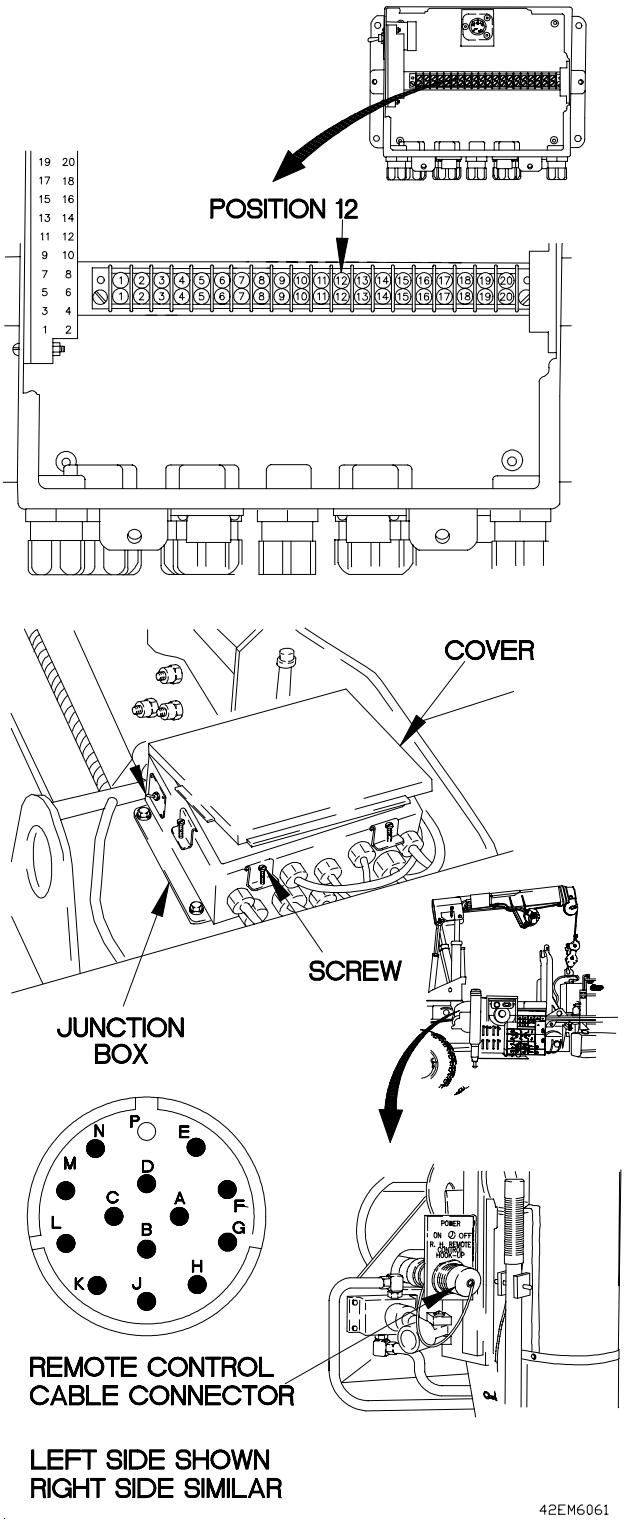
X2E1115-

e126. M1089 MATERIAL HANDLING CRANE (MHC) TELESCOPE IN DOES NOT OPERATE FROM REMOTE STATION (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin D of remote control cable connector.
(3) Connect negative (-) probe of multimeter on terminal board lower position 12 and note reading on multimeter.
(4) If continuity is not present, replace remote control cable (para 7-115 or 7-118).
(5) If continuity is present, notify DS Maintenance.
(6) Close cover on junction box.
(7) Tighten four screws on junction box cover.
(8) Stow crane (TM 9-2320-366-10-1).



e127. M1089 MATERIAL HANDLING CRANE (MHC) TELESCOPE OUT DOES NOT OPERATE FROM REMOTE STATION

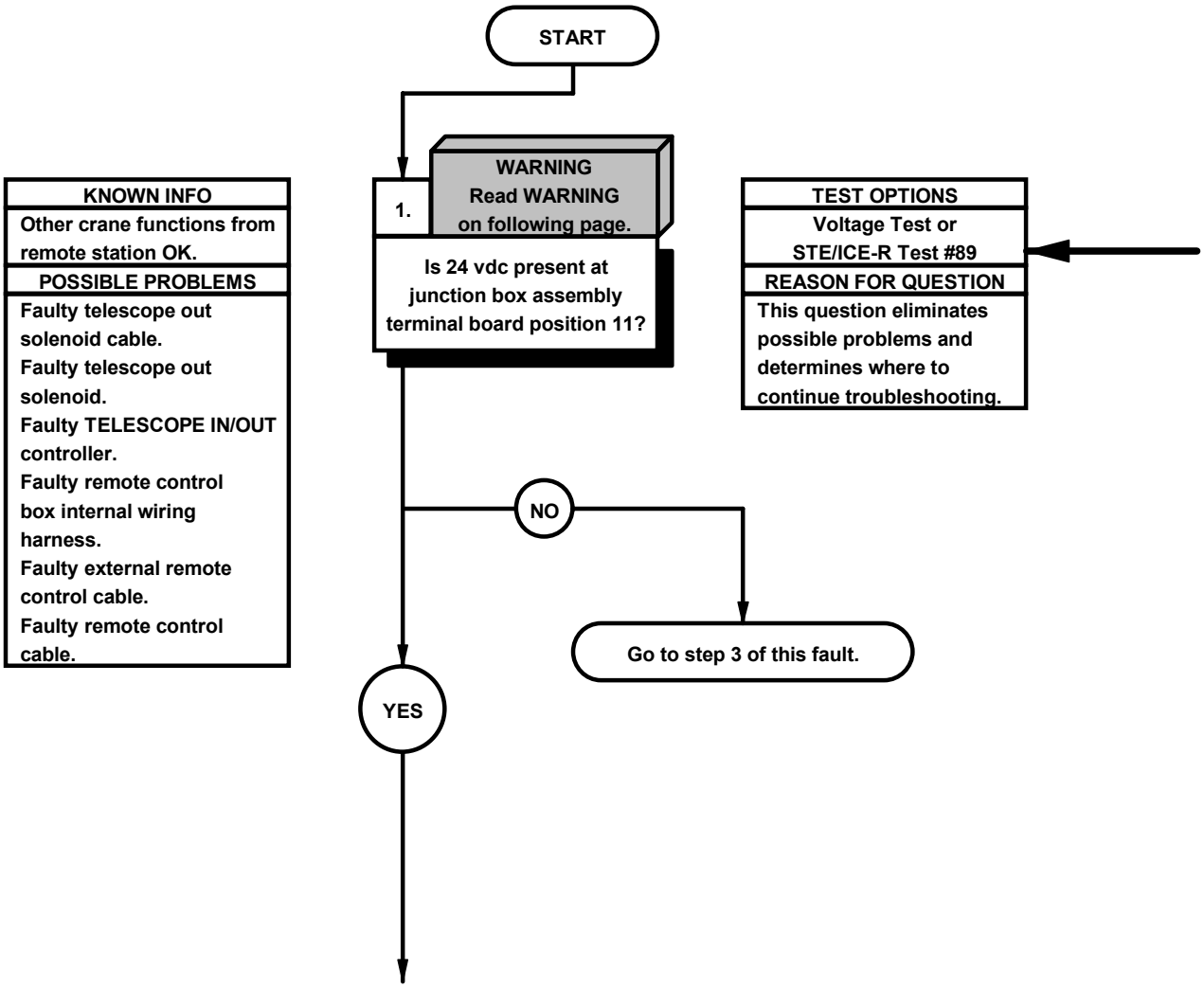
INITIAL SETUP

Equipment Conditions
Outriggers lowered (TM 9-2320-366-10-1).
Crane erected with approximately five feet of cable payed out (TM 9-2320-366-10-1).
Engine shut down (TM 9-2320-366-10-1).

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

References
TM 9-4910-571-12&P



WARNING

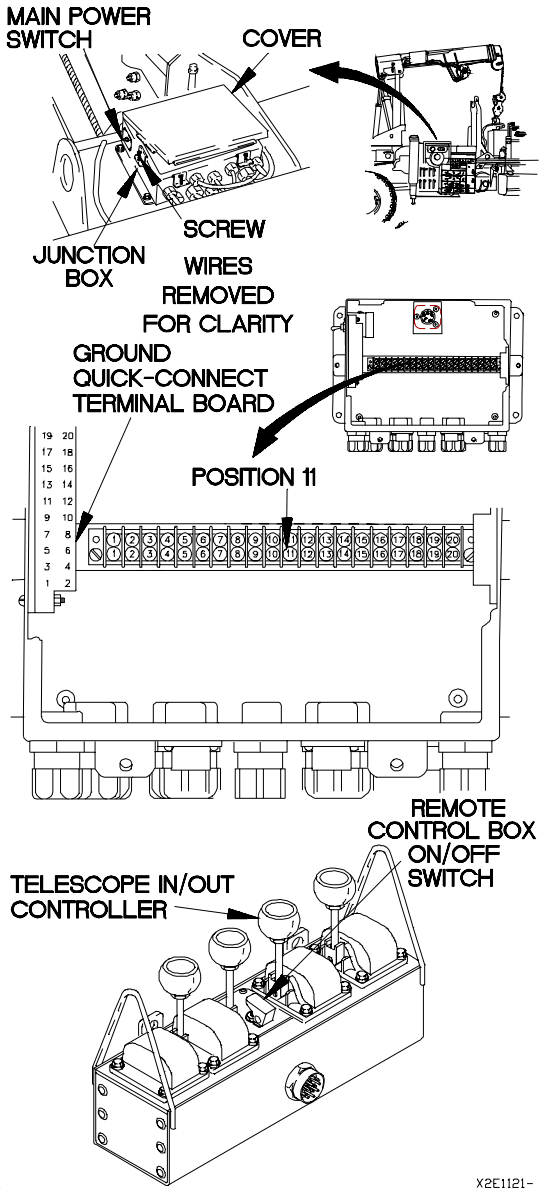
Remove rings, bracelets, watches, necklaces, and any other jewelry beffore working around vehicle. Jewelery can catch on equipment and cause injury or short circuit across electrical circuits and cause severe burns or electrical shock.

OUTPUT VOLTAGE TEST

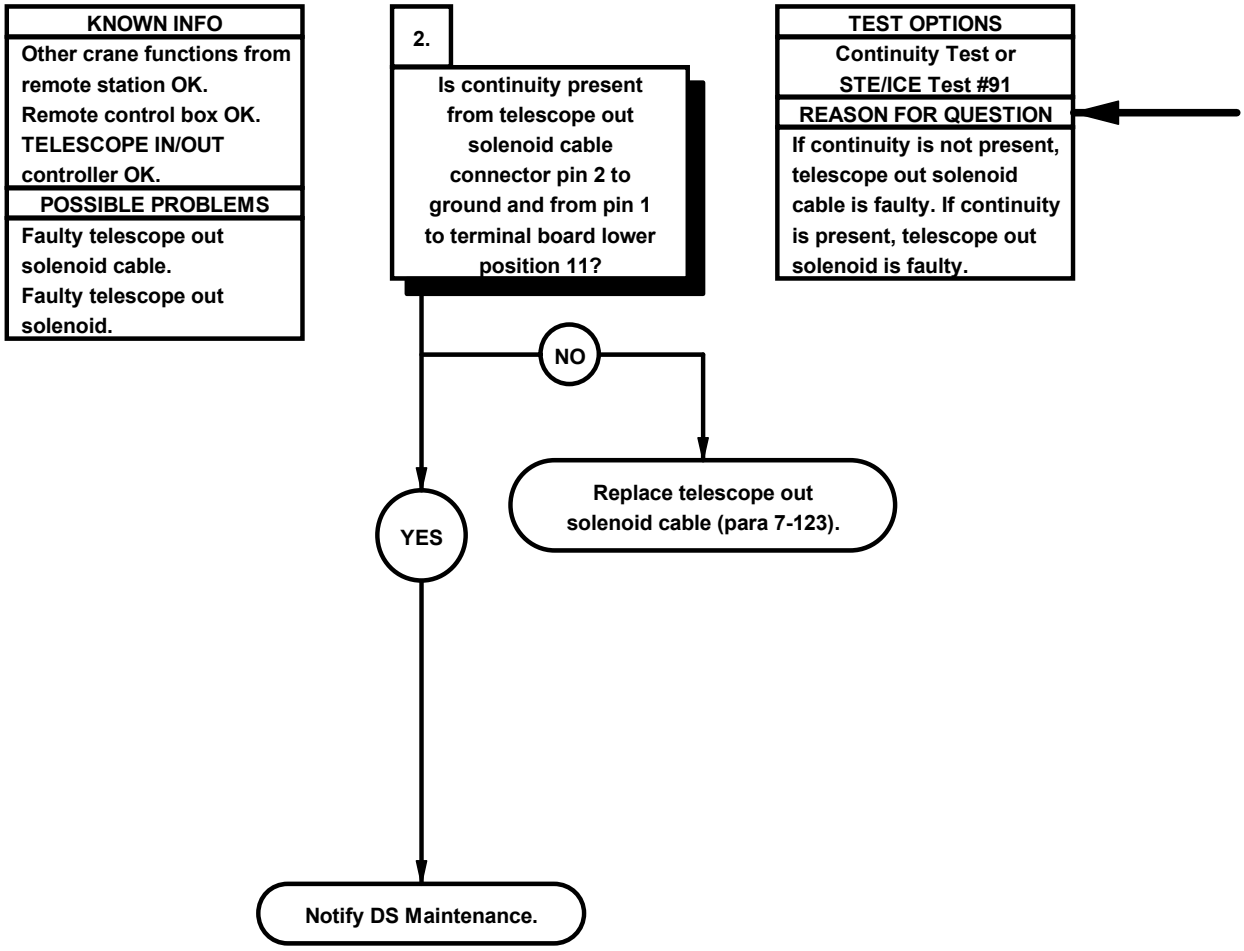
(1) Connect external remote control cable to remote control box (TM 9-2320-366-10-1).
(2) Loosen four screws on junction box.
(3) Open cover on junction box.
(4) Position MAIN POWER switch to ON.
(5) Lift guard and position remote control box ON/OFF switch to ON.
(6) Set multimeter to volts dc.
(7) Connect positive (+) probe of multimeter on terminal board lower position 11.
(8) Connect negative (-) probe of multimeter on ground quick-connect terminal board (above MAIN POWER switch).

NOTE
Step (9) requires the aid of an assistant.

(9) Position TELESCOPE IN/OUT controller to OUT and note reading on multimeter.
(10) If 24 volts dc is not present, go to step 3 of this fault.

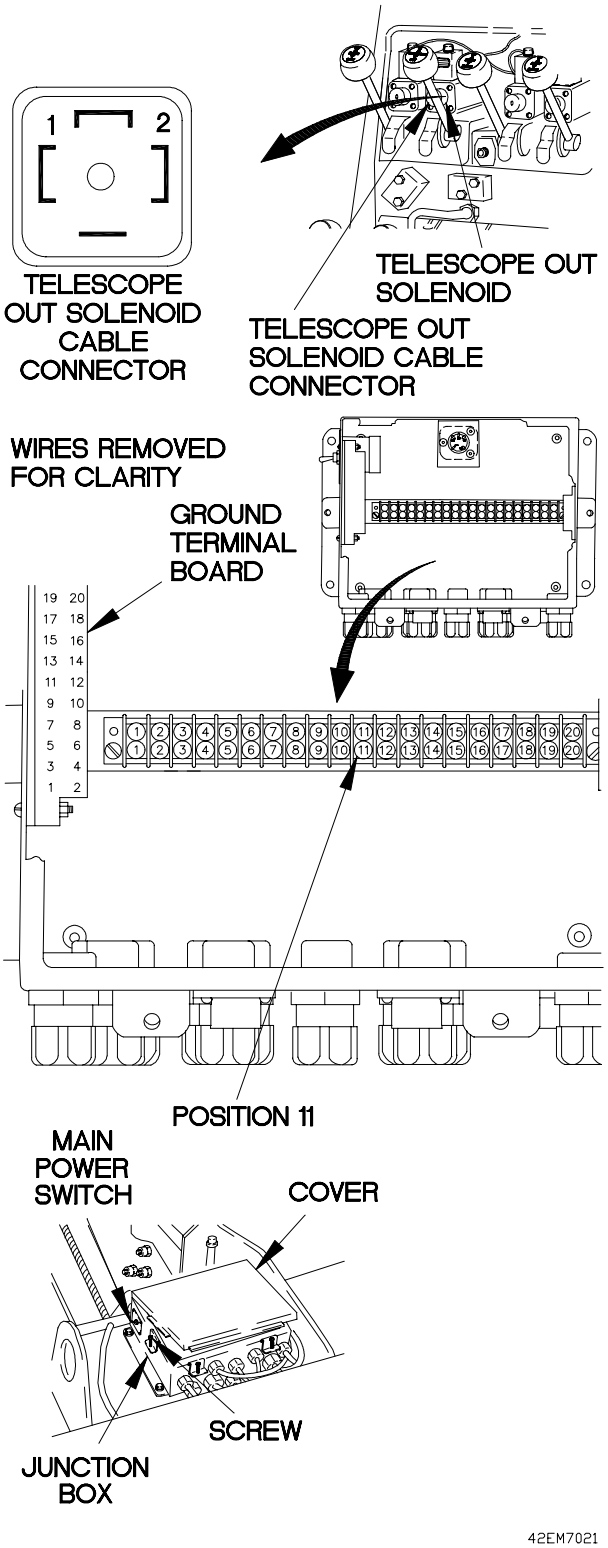


e127. M1089 MATERIAL HANDLING CRANE (MHC) TELESCOPE OUT DOES NOT OPERATE FROM REMOTE STATION (CONT)

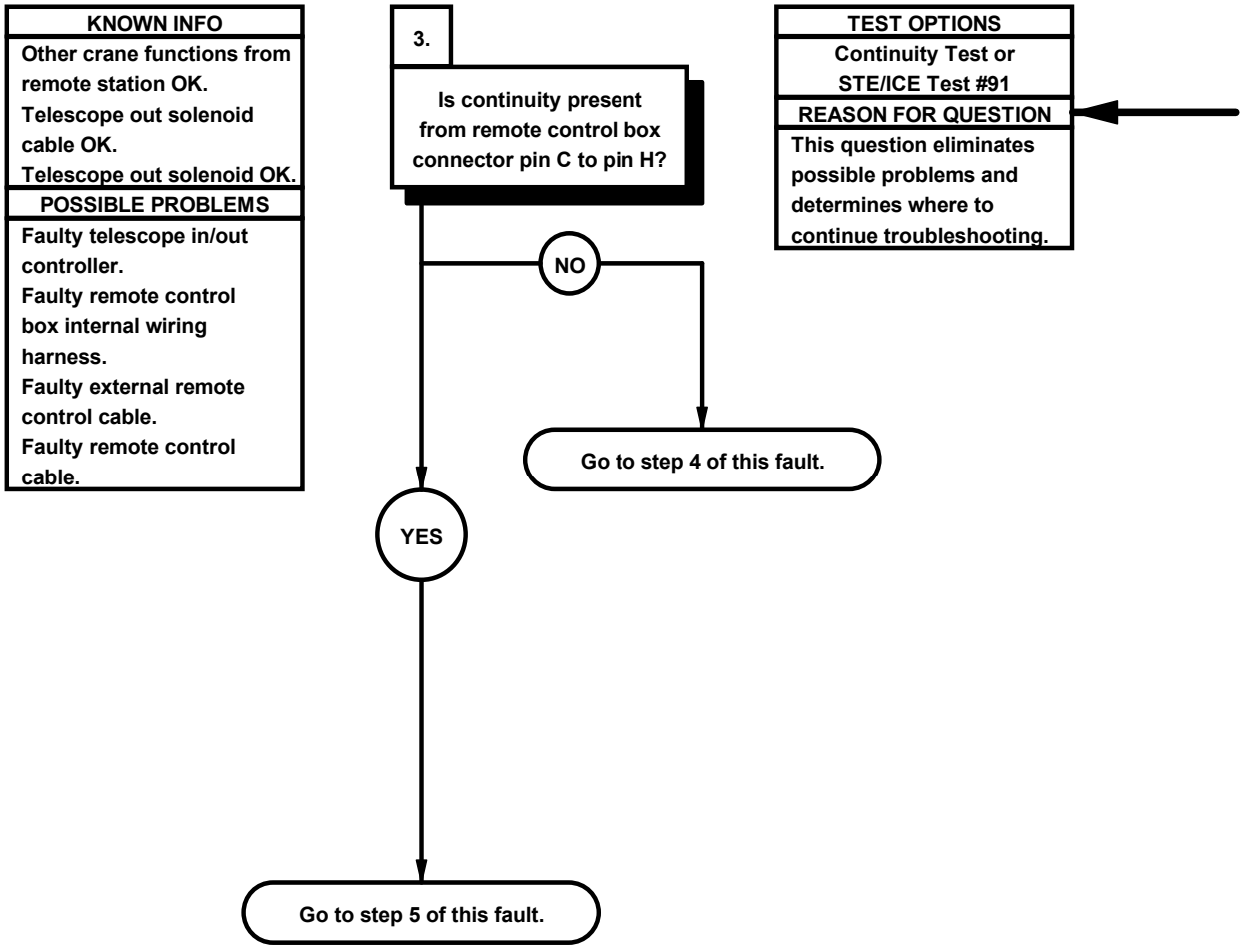


CONTINUITY TEST

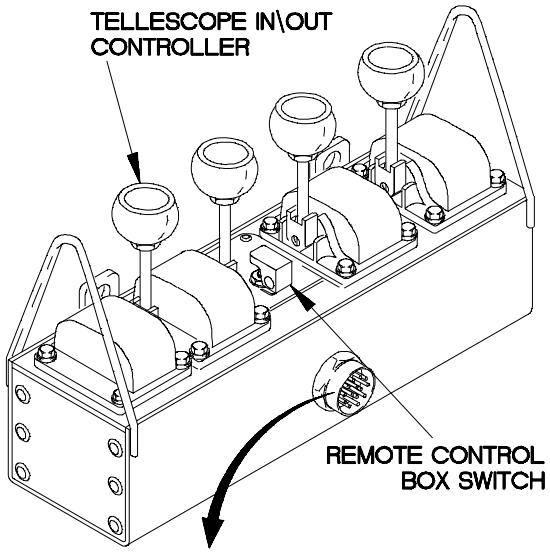
(1) Disconnect telescope out solenoid connector from telescope out solenoid.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin 2 of telescope out solenoid cable connector.
(4) Connect negative (-) probe of multimeter on ground and note reading on multimeter.
(5) Connect positive (+) probe of multimeter on pin 1 of telescope out solenoid cable connector.
(6) Connect negative (-) probe of multimeter on terminal board lower position 11 and note reading on multimeter.
(7) If continuity is not present, replace telescope out solenoid cable (para 7-123).
(8) If continuity is present, notify DS Maintenance.
(9) Connect telescope out solenoid cable connector to telescope out solenoid.
(10) Close cover on junction box.
(11) Tighten four screws on junction box cover.
(12) Stow crane (TM 9-2320-366-10-1).

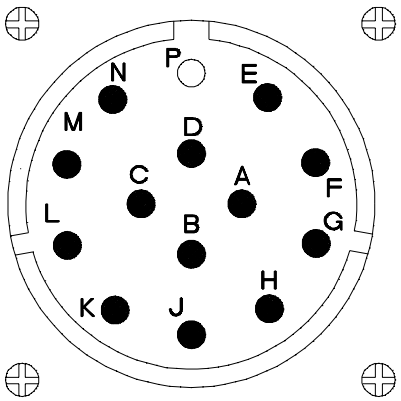


e127. M1089 MATERIAL HANDLING CRANE (MHC) TELESCOPE OUT DOES NOT OPERATE FROM REMOTE STATION (CONT)



CONTINUITY TEST
(1) Disconnect external remote control cable from remote control box.
(2) Position remote control box switch to ON.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter on pin C of connector on remote control box.
(5) Connect negative (-) probe of multimeter on pin H of connector on remote control box.
NOTE Step (6) requires the aid of an assistant.
(6) Position TELESCOPE IN/OUT controller to OUT and note reading on multimeter.
(7) If continuity is not present, go to step 4 of this fault.
(8) If continuity is present, go to step 5 of this fault.
(9) Position remote control box switch to OFF.

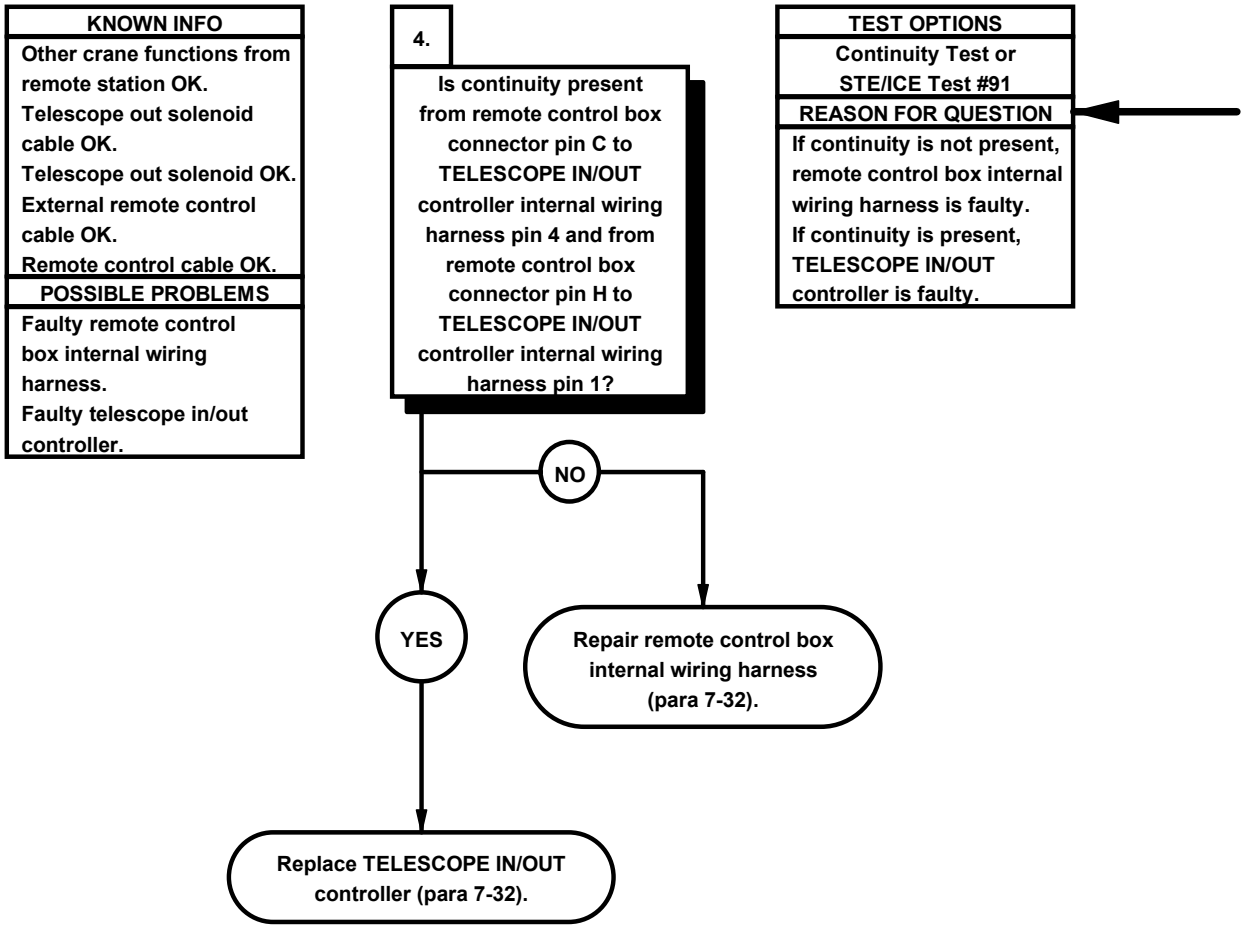




REMOTE CONTROL
BOX CONNECTOR

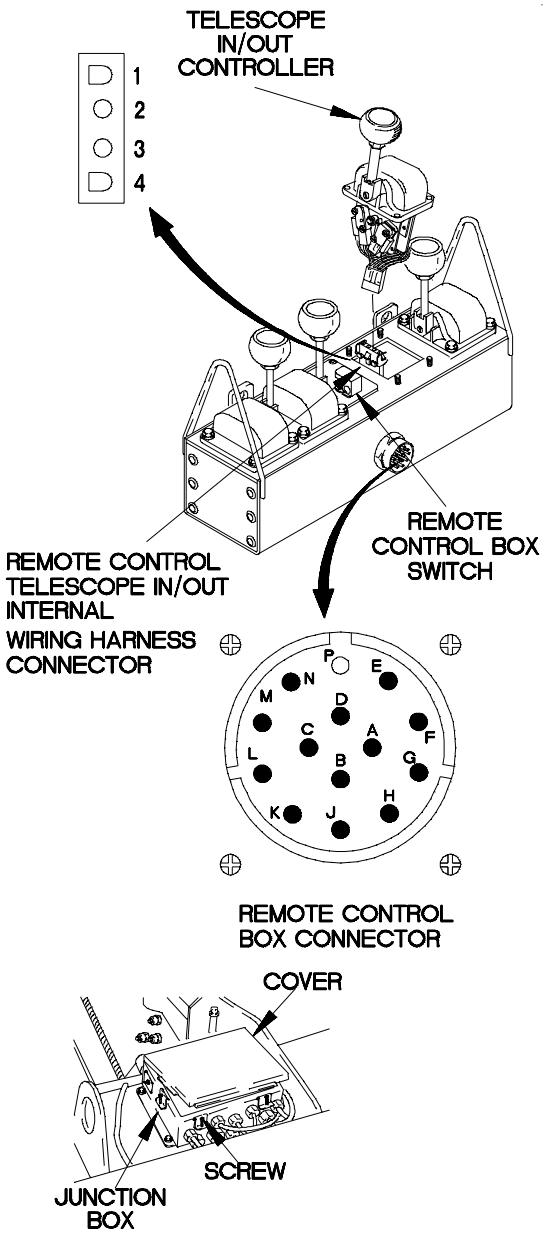
42EM7031

e127. M1089 MATERIAL HANDLING CRANE (MHC) TELESCOPE OUT DOES NOT OPERATE FROM REMOTE STATION (CONT)

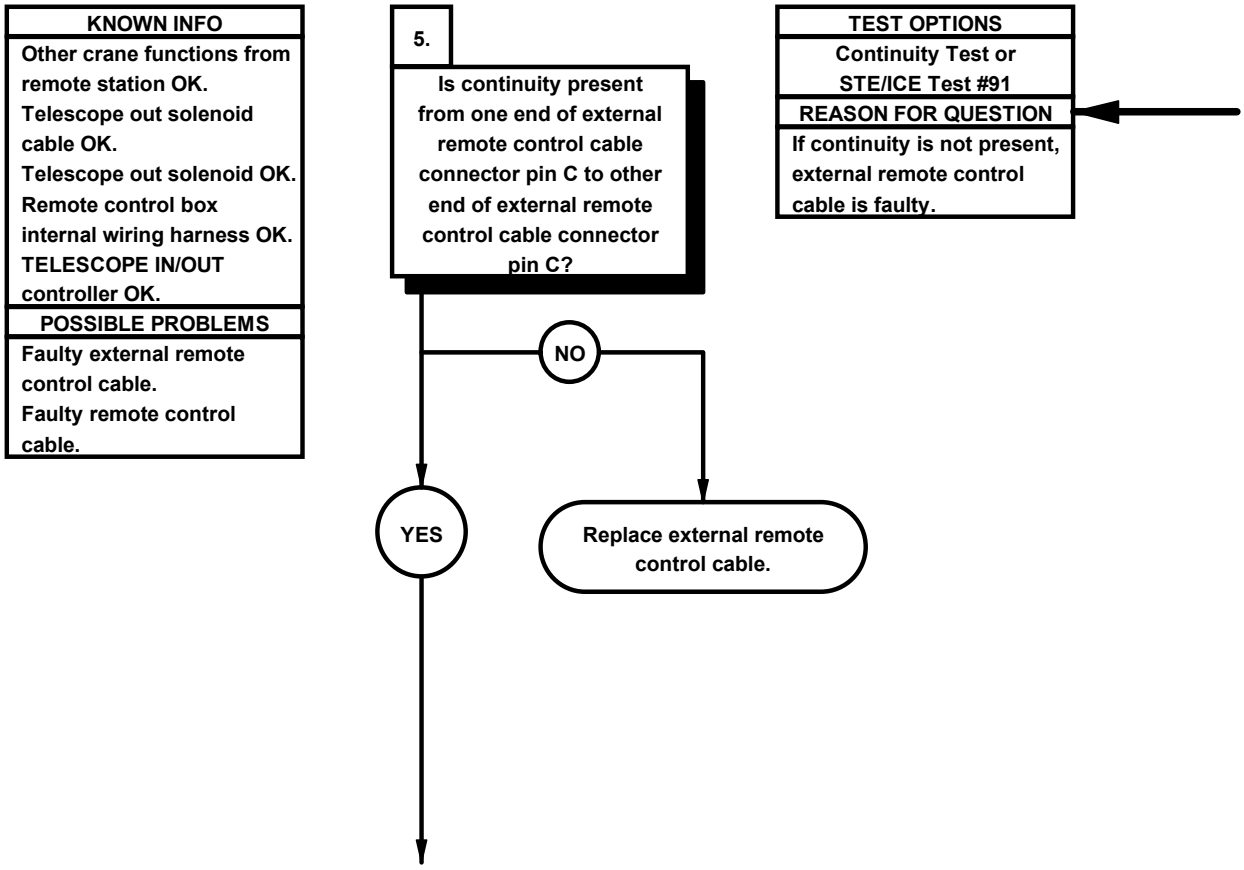


CONTINUITY TEST

(1) Remove TELESCOPE IN/OUT controller (para 7-32).
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin C of remote control box connector.
(4) Connect negative (-) probe of multimeter on pin 4 of TELESCOPE IN/OUT controller internal wiring harness and note reading on multimeter.
(5) Position remote control box switch to ON.
(6) Connect positive (+) probe of multimeter on pin H of remote control box connector.
(7) Connect negative (-) probe of multimeter on pin 1 of TELESCOPE IN/OUT controller internal wiring harness and note reading on multimeter.
(8) If continuity is not present, replace remote control box internal wiring harness (para 7-32).
(9) If continuity is present, replace TELESCOPE IN/OUT controller (para 7-32).
(10) Position remote control box switch to OFF.
(11) Install TELESCOPE IN/OUT controller (para 7-32).
(12) Close cover on junction box.
(13) Tighten four screws on junction box cover.
(14) Stow crane (TM 9-2320-366-10-1).

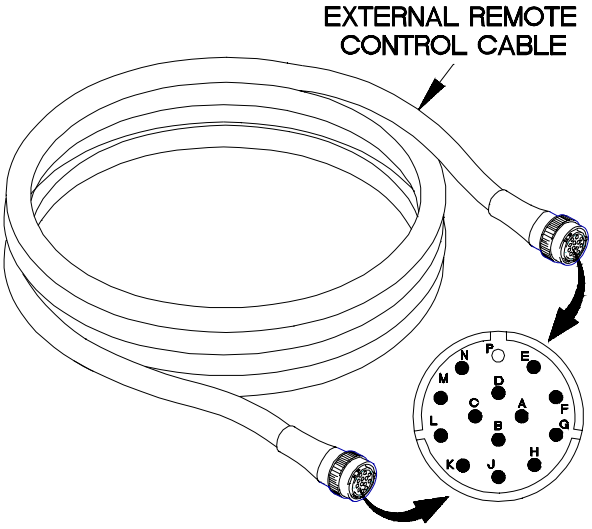


e127. M1089 MATERIAL HANDLING CRANE (MHC) TELESCOPE OUT DOES NOT OPERATE FROM REMOTE STATION (CONT)



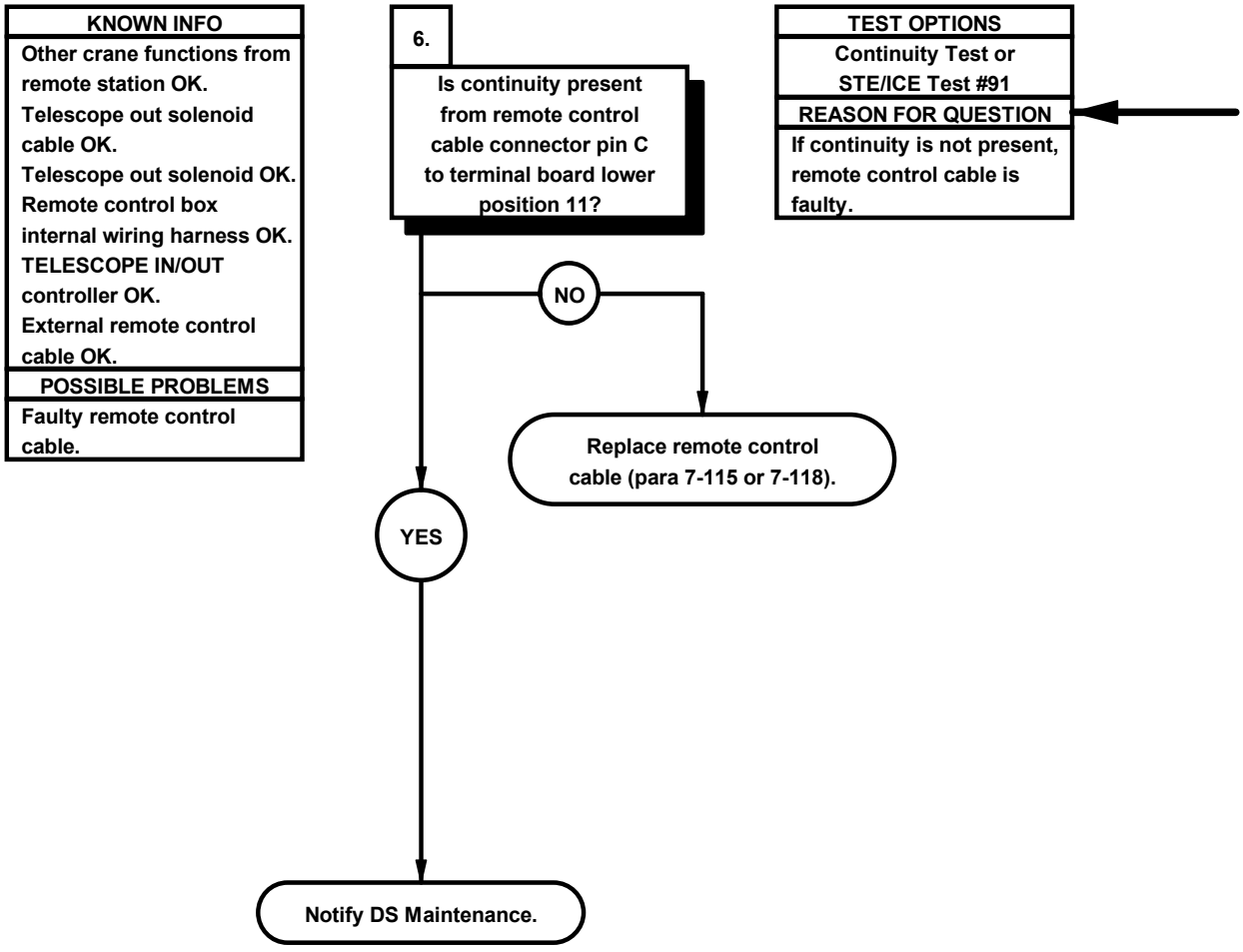
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin C of one end of external remote control cable connector.
(3) Connect negative (-) probe of multimeter on pin C of other end of external remote control cable and note reading on multimeter.
(4) If continuity is not present, replace external remote control cable.



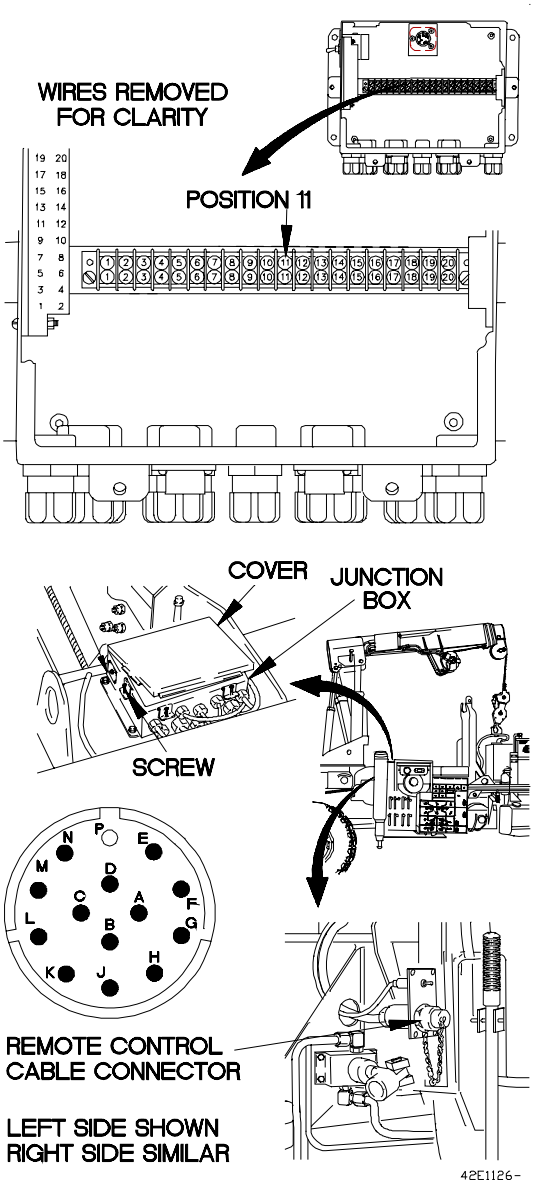
X2E1125-

e127. M1089 MATERIAL HANDLING CRANE (MHC) TELESCOPE OUT DOES NOT OPERATE FROM REMOTE STATION (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin C of remote control cable connector.
(3) Connect negative (-) probe of multimeter on terminal board lower position 11 and note reading on multimeter.
(4) If continuity is not present, replace remote control cable (para 7-115 or 7-118).
(5) If continuity is present, notify DS Maintenance.
(6) Close cover on junction box.
(7) Tighten four screws on junction box cover.
(8) Stow crane (TM 9-2320-366-10-1).



e128. M1089 MATERIAL HANDLING CRANE (MHC) SWING CW DOES NOT OPERATE FROM REMOTE STATION

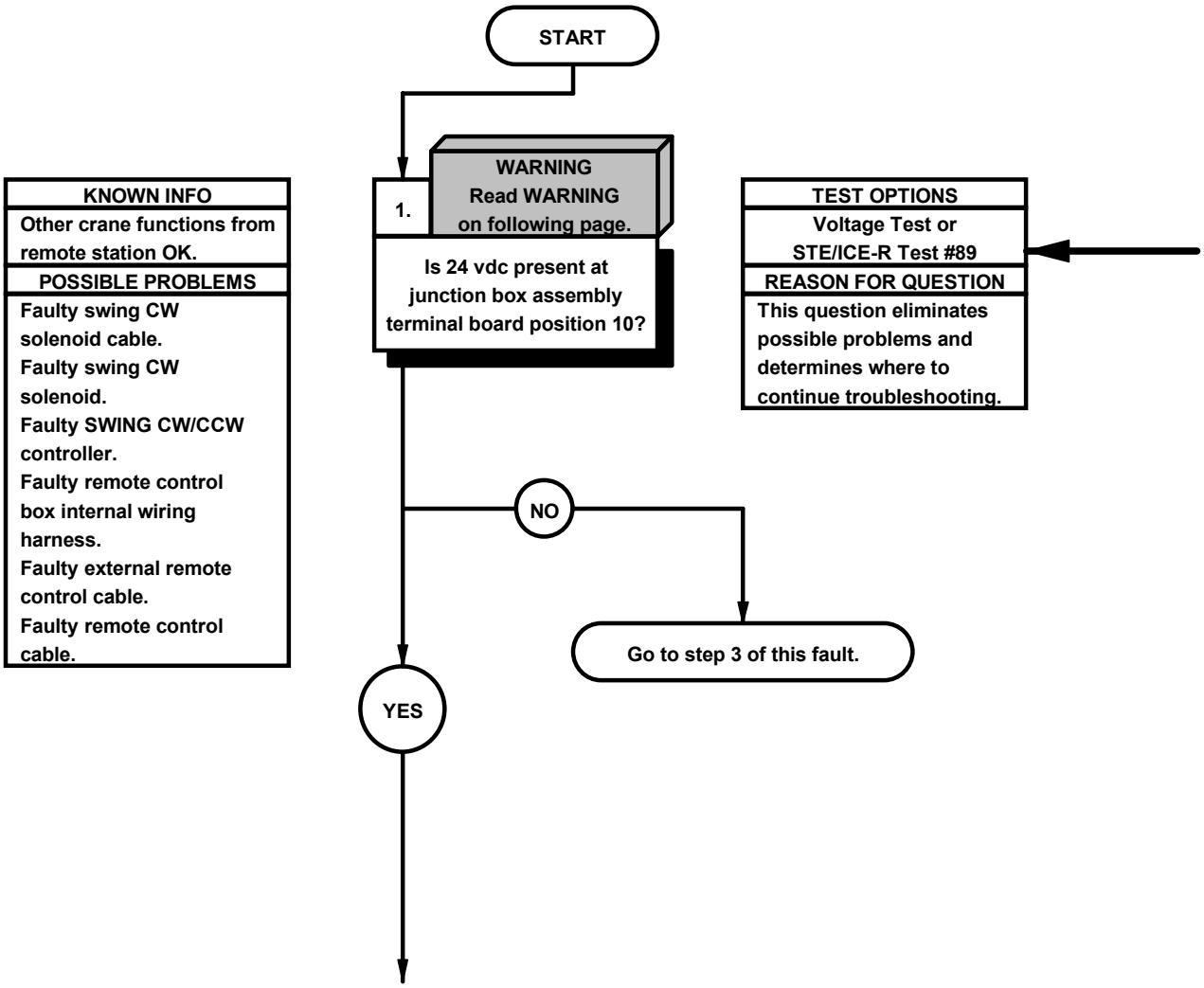
INITIAL SETUP

Equipment Conditions
Outriggers lowered (TM 9-2320-366-10-1).
Crane erected with approximately five feet of cable payed out (TM 9-2320-366-10-1).
Engine shut down (TM 9-2320-366-10-1).

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

References
TM 9-4910-571-12&P



WARNING

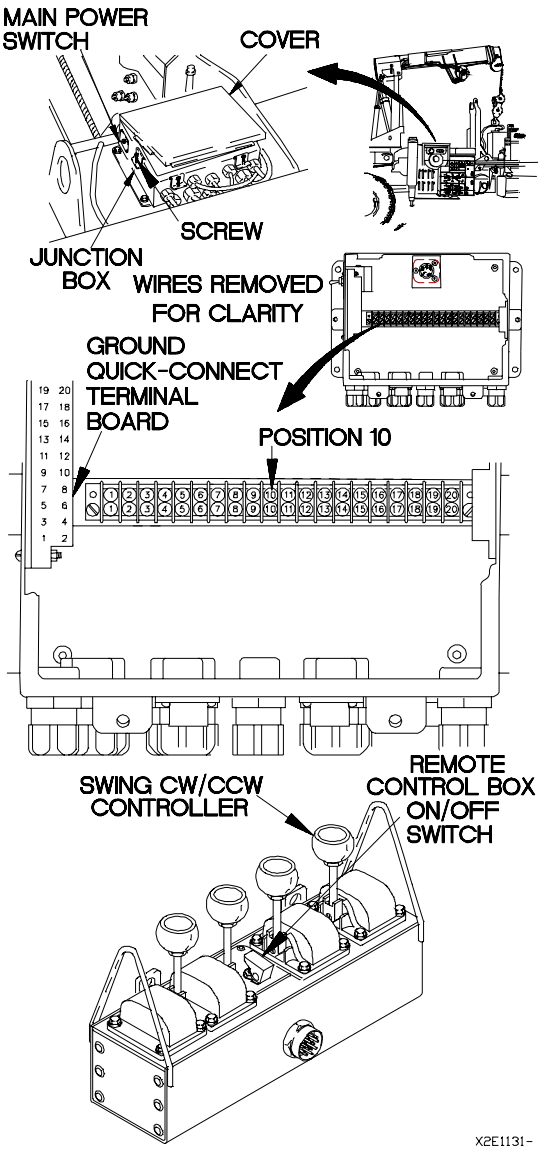
Remove rings, bracelets, watches, necklaces, and any other jewelry beffore working around vehicle. Jewelery can catch on equipment and cause injury or short circuit across electrical circuits and cause severe burns or electrical shock.

OUTPUT VOLTAGE TEST

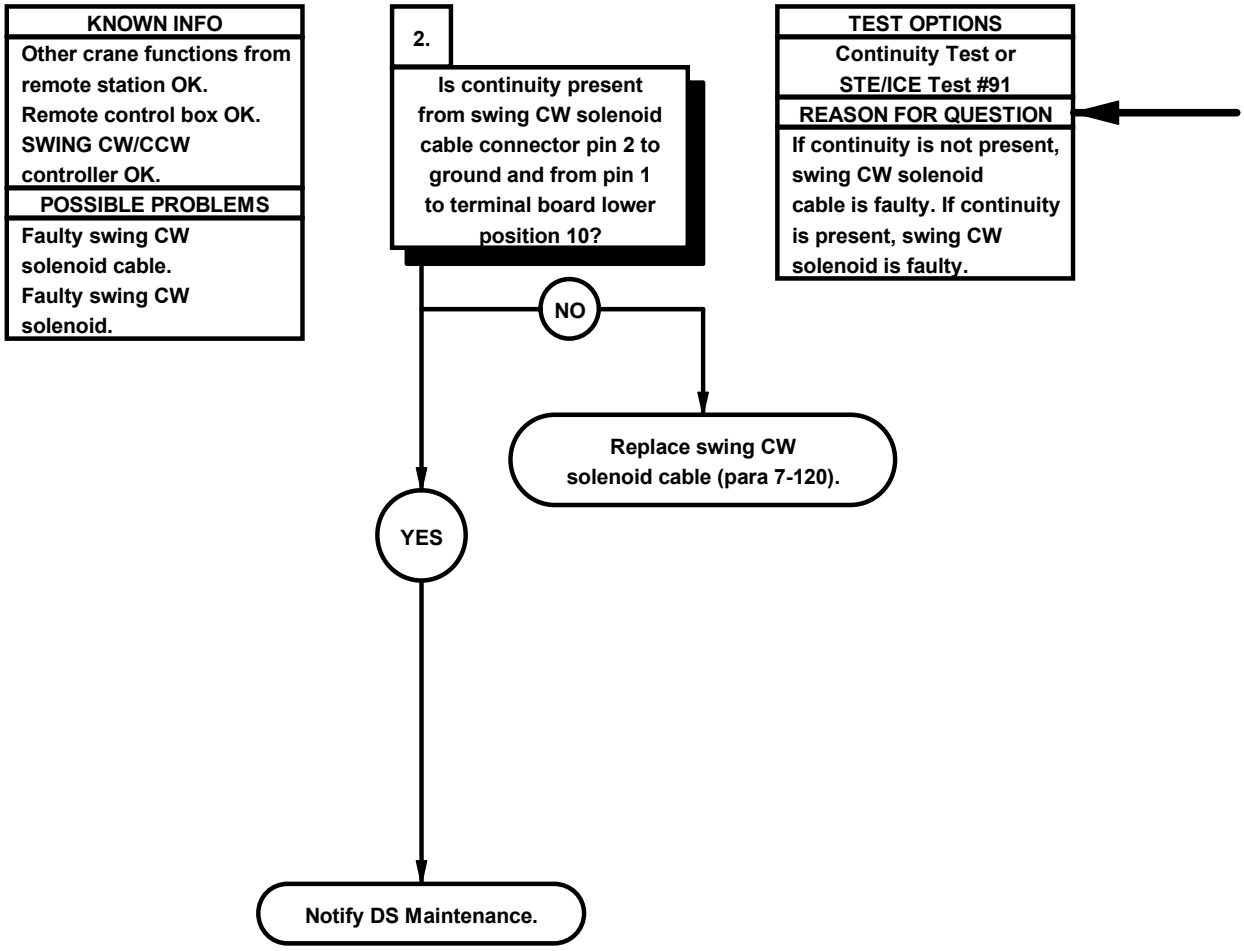
(1) Connect external remote control cable to remote control box (TM 9-2320-366-10-1).
(2) Loosen four screws on junction box.
(3) Open cover on junction box.
(4) Position MAIN POWER switch to ON.
(5) Lift guard and position remote control box ON/OFF switch to ON.
(6) Set multimeter to volts dc.
(7) Connect positive (+) probe of multimeter on terminal board lower position 10.
(8) Connect negative (-) probe of multimeter on ground quick-connect terminal board (above MAIN POWER switch).

NOTE
Step (9) requires the aid of an assistant.

(9) Position SWING CW/CCW controller to CW and note reading on multimeter.
(10) If 24 volts dc is not present, go to step 3 of this fault.

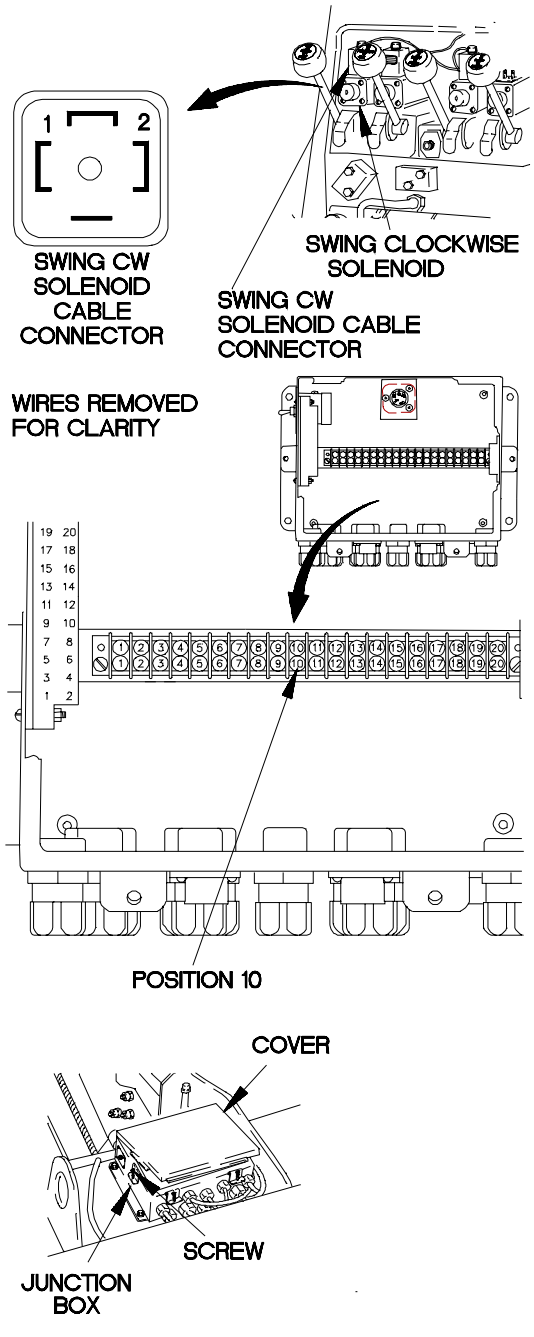


e128. M1089 MATERIAL HANDLING CRANE (MHC) SWING CW DOES NOT OPERATE FROM REMOTE STATION (CONT)

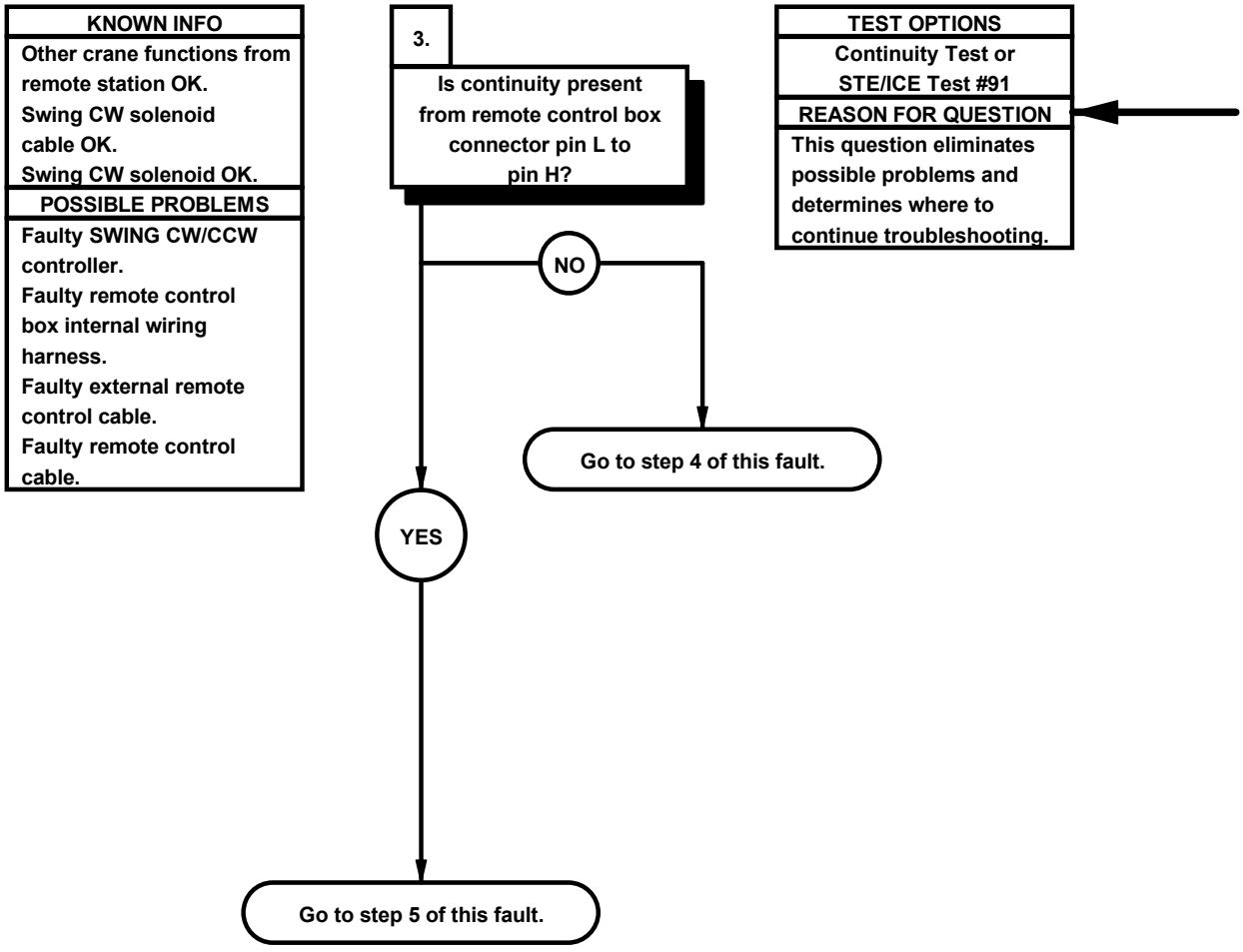


CONTINUITY TEST

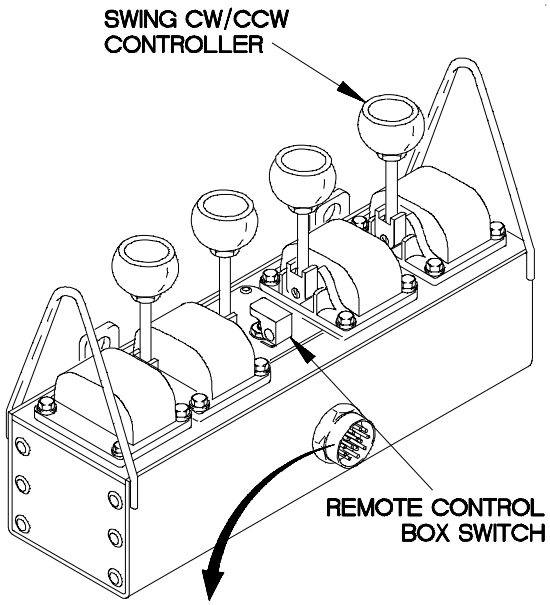
(1) Disconnect swing CW solenoid connector from swing CW solenoid.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin 2 of swing CW solenoid cable connector.
(4) Connect negative (-) probe of multimeter on ground and note reading on multimeter.
(5) Connect positive (+) probe of multimeter on pin 1 of swing CW solenoid cable connector.
(6) Connect negative (-) probe of multimeter on terminal board lower position 10 and note reading on multimeter.
(7) If continuity is not present, replace swing CW solenoid cable (para 7-120).
(8) If continuity is present, notify DS Maintenance.
(9) Connect swing CW solenoid cable connector to swing CW solenoid.
(10) Close cover on junction box.
(11) Tighten four screws on junction box cover.
(12) Stow crane (TM 9-2320-366-10-1).

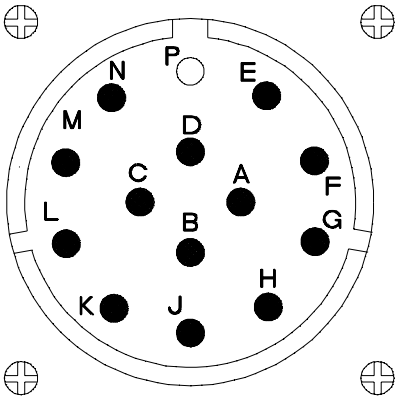


e128. M1089 MATERIAL HANDLING CRANE (MHC) SWING CW DOES NOT OPERATE FROM REMOTE STATION (CONT)



CONTINUITY TEST
(1) Disconnect external remote control cable from remote control box.
(2) Position remote control box switch to ON.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter on pin L of connector on remote control box.
(5) Connect negative (-) probe of multimeter on pin H of connector on remote control box.
NOTE Step (6) requires the aid of an assistant.
(6) Position SWING CW/CCW controller to CW and note reading on multimeter.
(7) If continuity is not present, go to step 4 of this fault.
(8) If continuity is present, go to step 5 of this fault.
(9) Position remote control box switch to OFF.

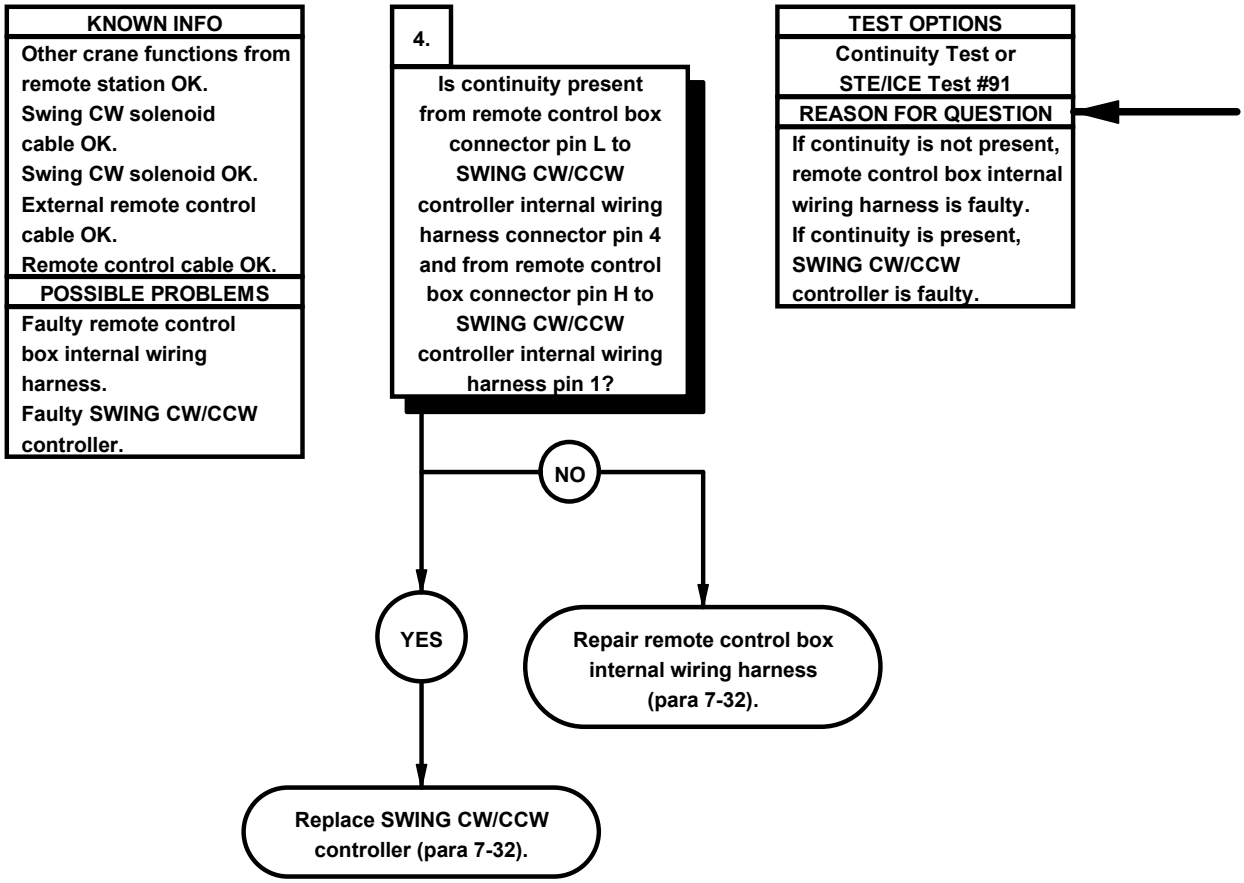




REMOTE CONTROL
BOX CONNECTOR

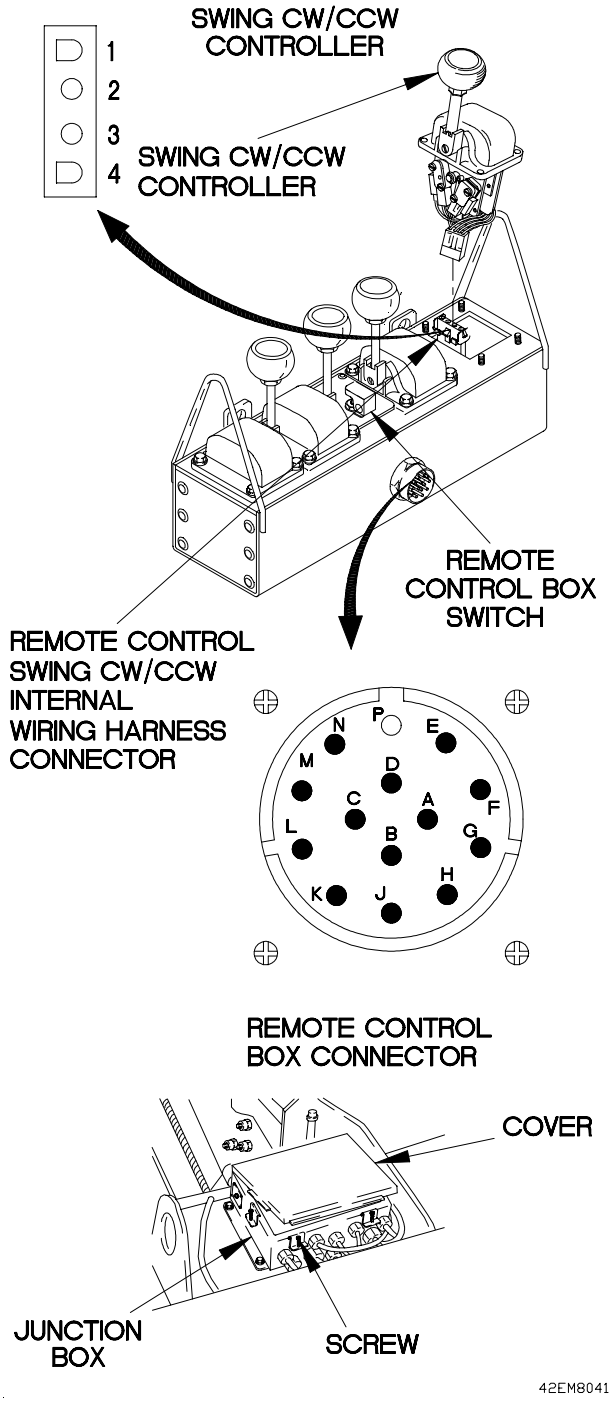
42EM8031

e128. M1089 MATERIAL HANDLING CRANE (MHC) SWING CW DOES NOT OPERATE FROM REMOTE STATION (CONT)

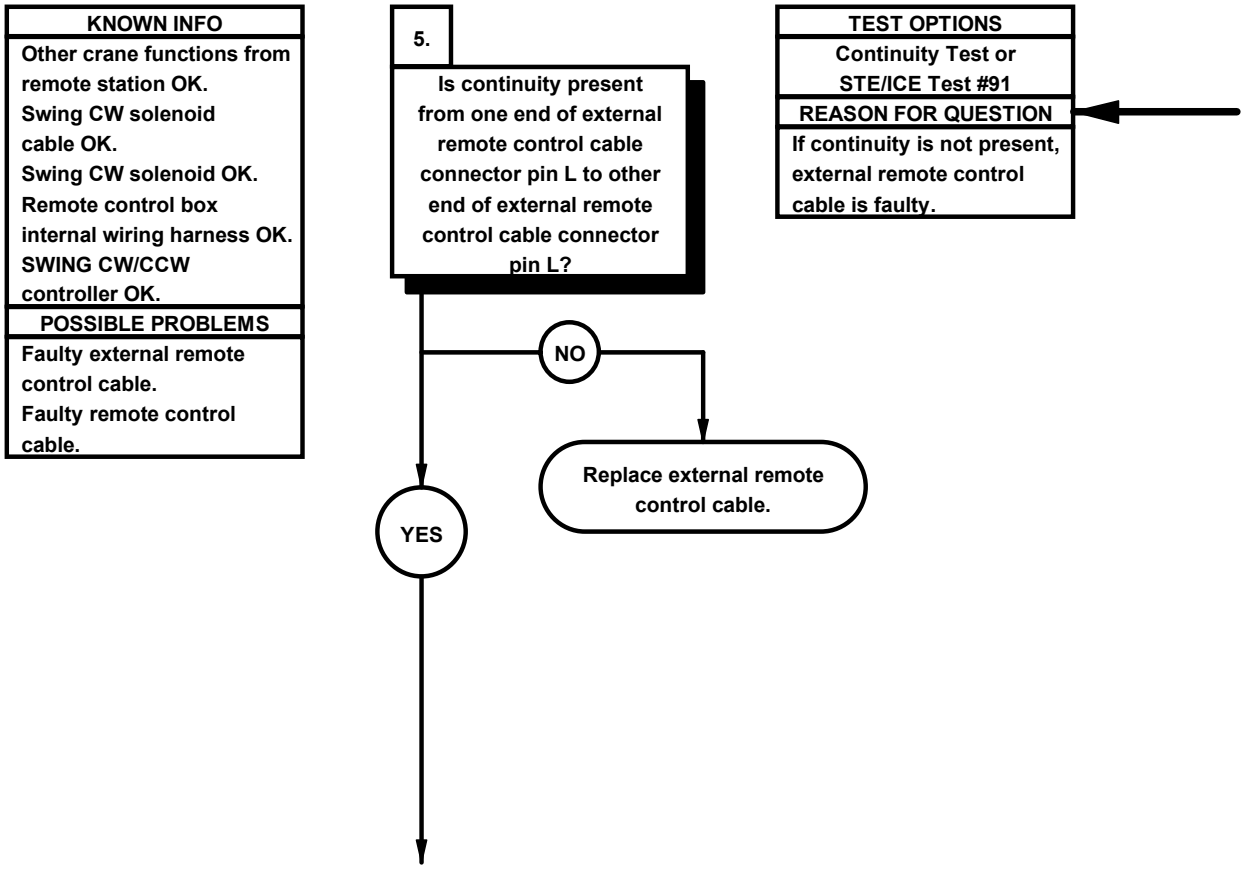


CONTINUITY TEST

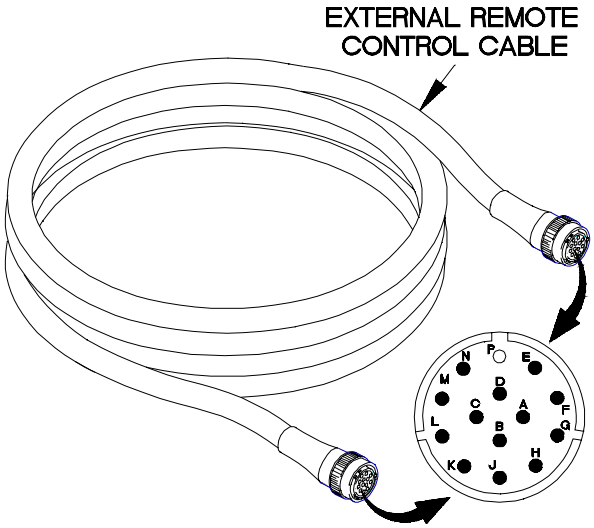
(1) Remove SWING CW/CCW controller (para 7-32).
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin L of remote control box connector.
(4) Connect negative (-) probe of multimeter on pin 4 of SWING CW/CCW controller internal wiring harness and note reading on multimeter.
(5) Position remote control box switch to ON.
(6) Connect positive (+) probe of multimeter on pin H of remote control box connector.
(7) Connect negative (-) probe of multimeter on pin 1 of SWING CW/CCW controller internal wiring harness and note reading on multimeter.
(8) If continuity is not present, replace remote control box internal wiring harness (para 7-32).
(9) If continuity is present, replace SWING CW/CCW controller (para 7-32).
(10) Position remote control box switch to OFF.
(11) Install SWING CW/CCW controller (para 7-32).
(12) Close cover on junction box.
(13) Tighten four screws on junction box cover.
(14) Stow crane (TM 9-2320-366-10-1).



e128. M1089 MATERIAL HANDLING CRANE (MHC) SWING CW DOES NOT OPERATE FROM REMOTE STATION (CONT)

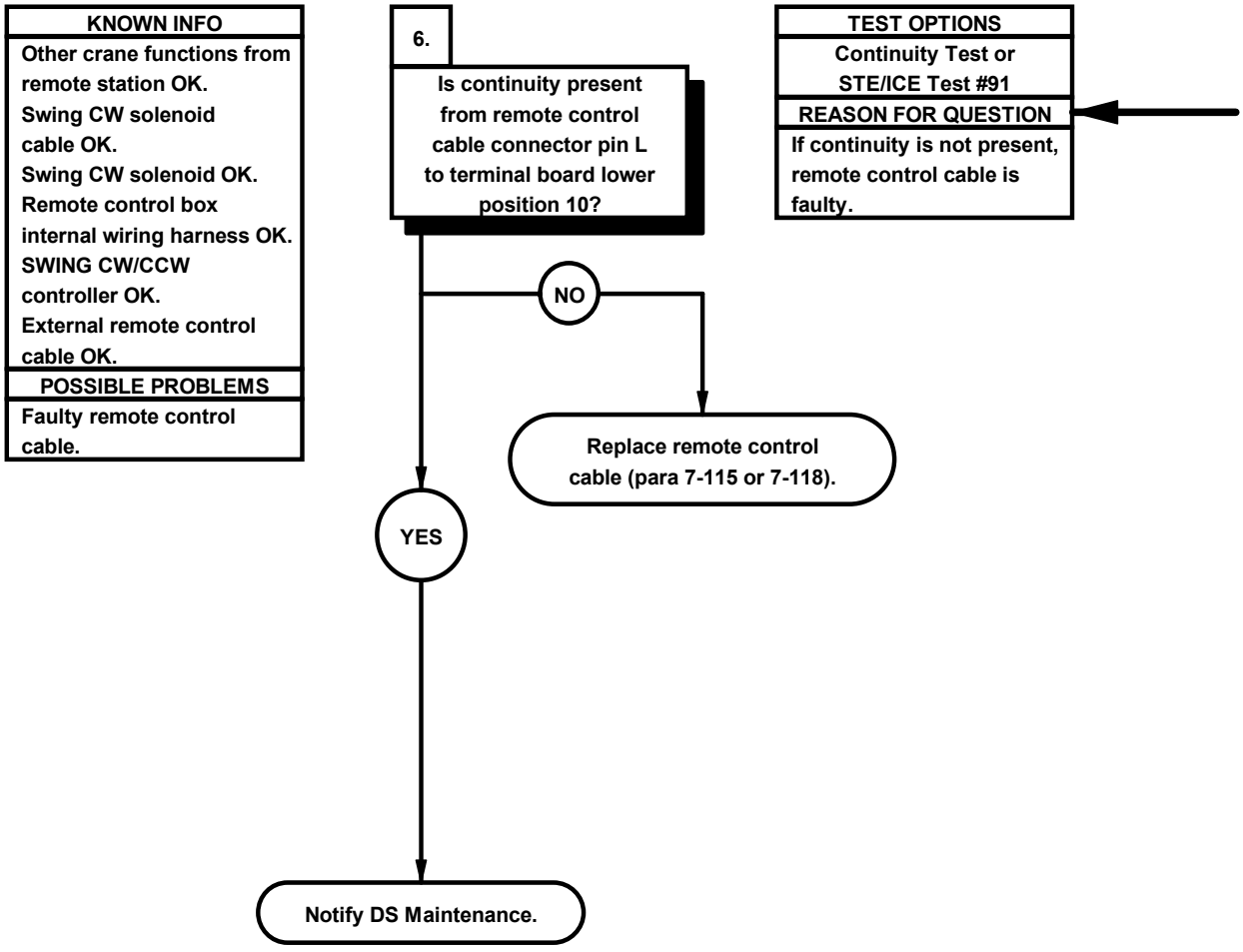


CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin L of one end of external remote control cable connector.
(3) Connect negative (-) probe of multimeter on pin L of other end of external remote control cable and note reading on multimeter.
(4) If continuity is not present, replace external remote control cable.



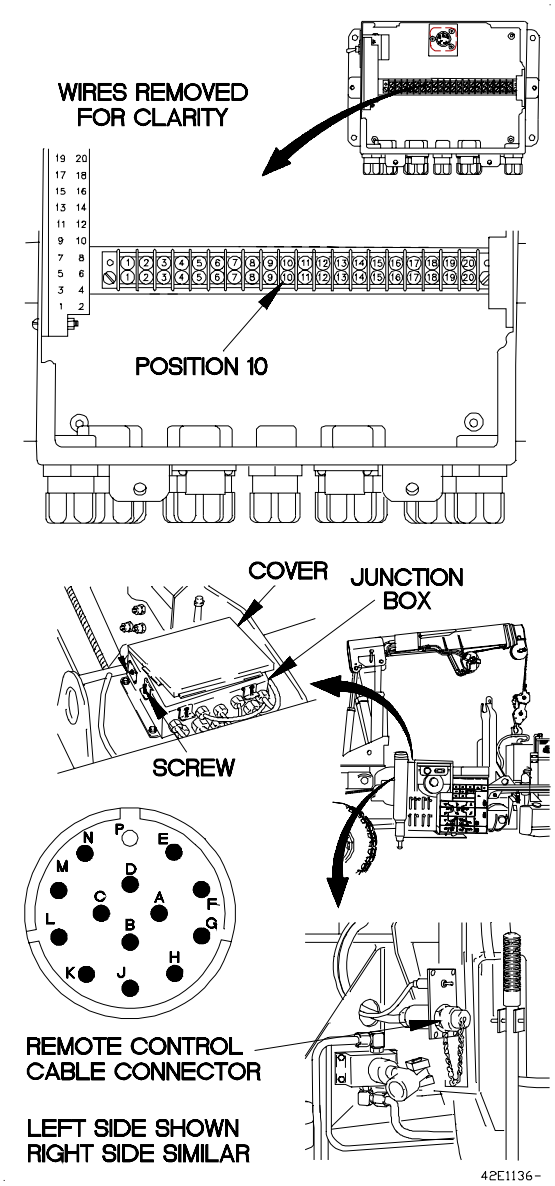
X2E1075-

e128. M1089 MATERIAL HANDLING CRANE (MHC) SWING CW DOES NOT OPERATE FROM REMOTE STATION (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin L of remote control cable connector.
(3) Connect negative (-) probe of multimeter on terminal board lower position 10 and note reading on multimeter.
(4) If continuity is not present, replace remote control cable (para 7-115 or 7-118).
(5) If continuity is present, notify DS Maintenance.
(6) Close cover on junction box.
(7) Tighten four screws on junction box cover.
(8) Stow crane (TM 9-2320-366-10-1).



e129. M1089 MATERIAL HANDLING CRANE (MHC) SWING CCW DOES NOT OPERATE FROM REMOTE STATION

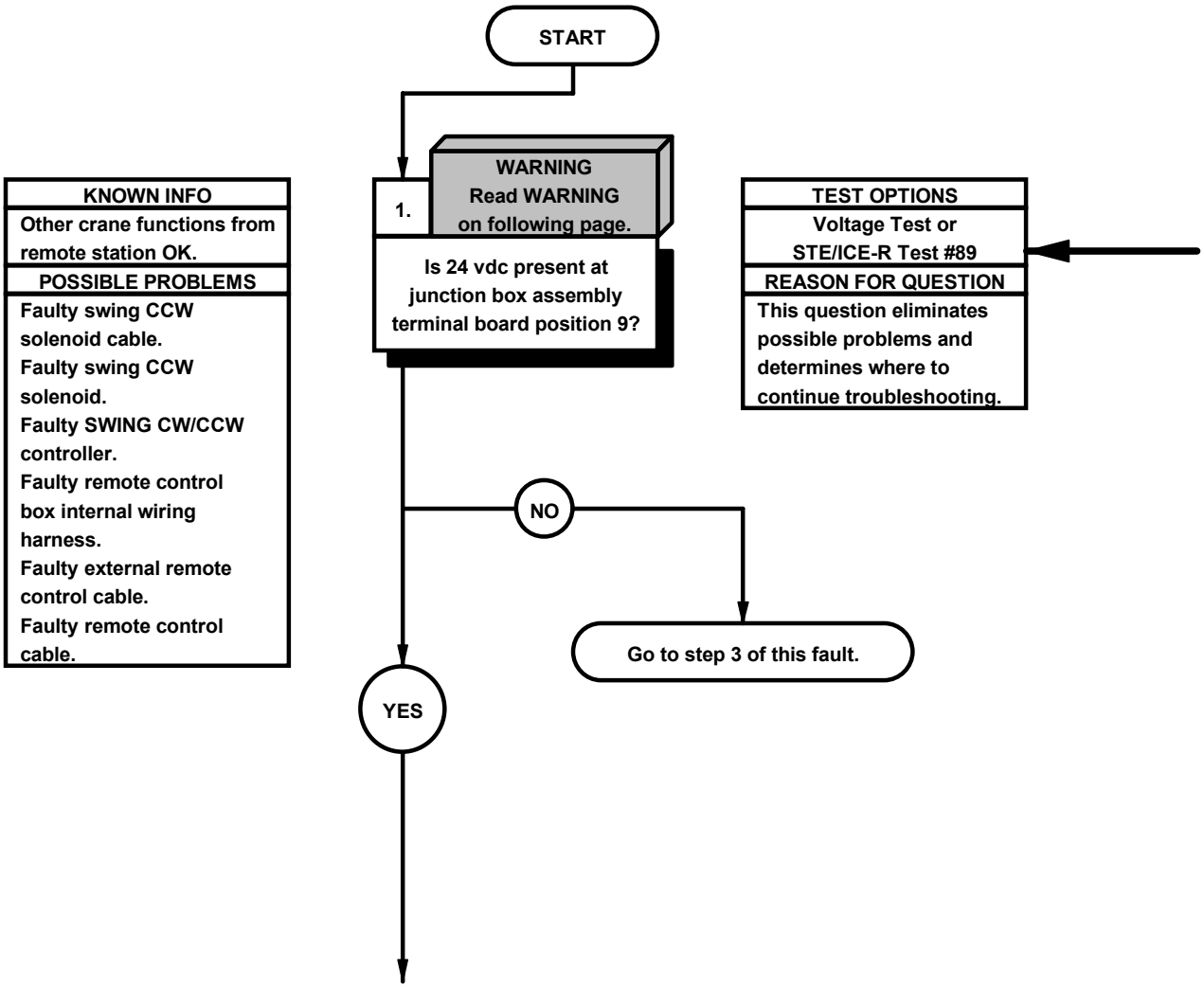
INITIAL SETUP

Equipment Conditions
Outriggers lowered (TM 9-2320-366-10-1).
Crane erected with approximately five feet of cable payed out (TM 9-2320-366-10-1).
Engine shut down (TM 9-2320-366-10-1).

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

References
TM 9-4910-571-12&P



WARNING

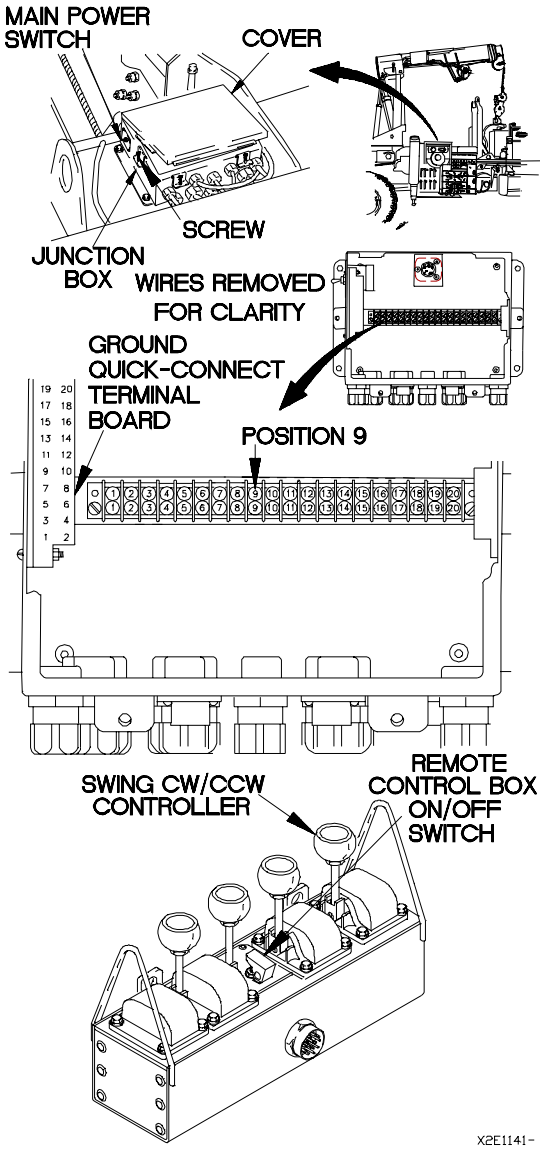
Remove rings, bracelets, watches, necklaces, and any other jewelry beffore working around vehicle. Jewelery can catch on equipment and cause injury or short circuit across electrical circuits and cause severe burns or electrical shock.

OUTPUT VOLTAGE TEST

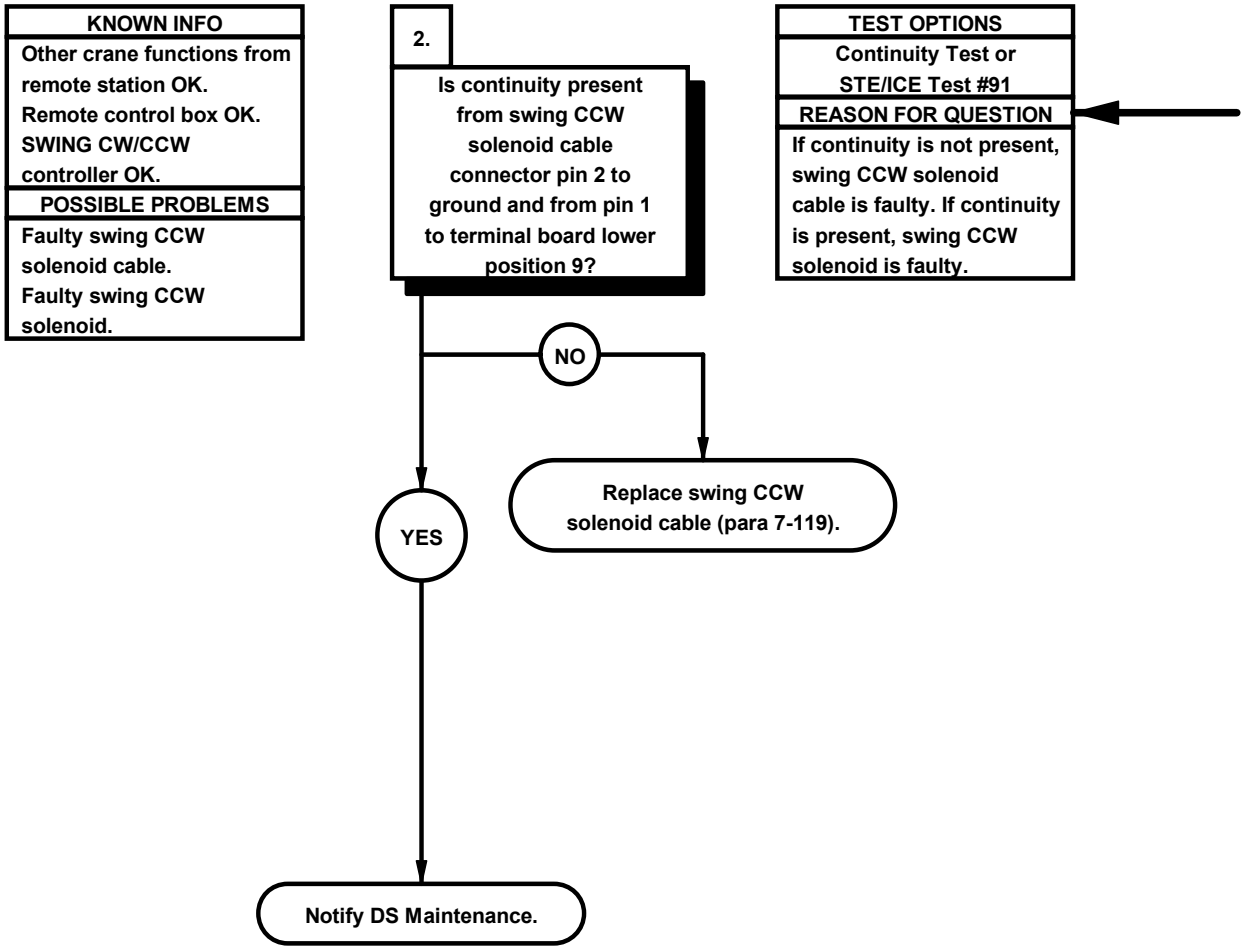
(1) Connect external remote control cable to remote control box (TM 9-2320-366-10-1).
(2) Loosen four screws on junction box.
(3) Open cover on junction box.
(4) Position MAIN POWER switch to ON.
(5) Lift guard and position remote control box ON/OFF switch to ON.
(6) Set multimeter to volts dc.
(7) Connect positive (+) probe of multimeter on terminal board lower position 9.
(8) Connect negative (-) probe of multimeter on ground quick-connect terminal board (above MAIN POWER switch).

NOTE
Step (9) requires the aid of an assistant.

(9) Position SWING CW/CCW controller to CCW and note reading on multimeter.
(10) If 24 volts dc is not present, go to step 3 of this fault.
(11) Position MAIN POWER switch to OFF.

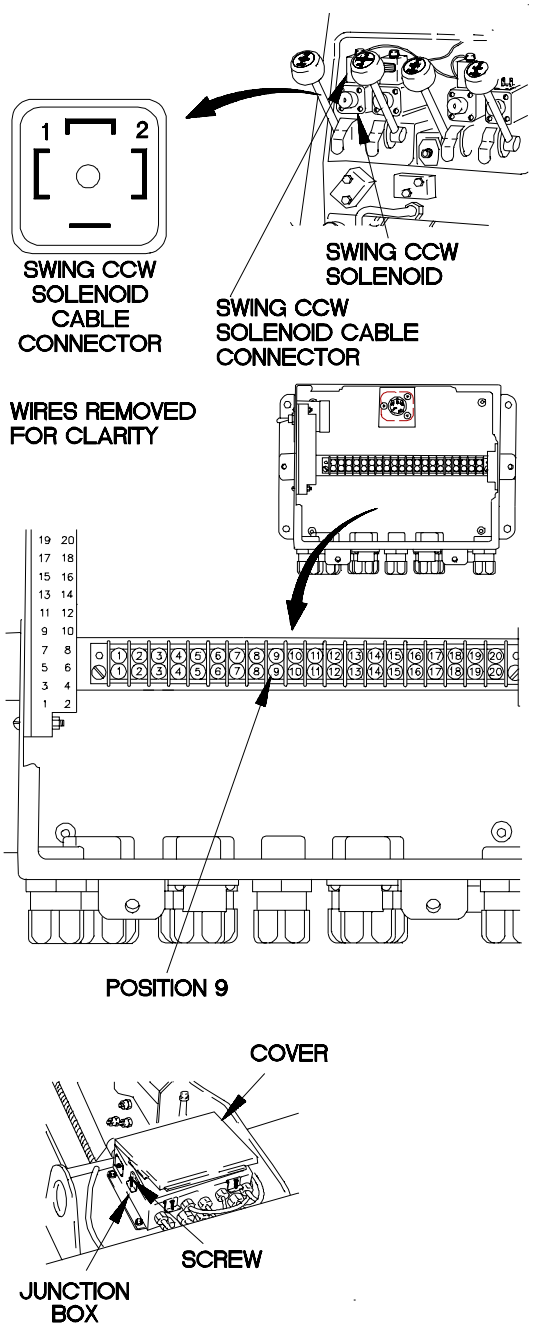


e129. M1089 MATERIAL HANDLING CRANE (MHC) SWING CCW DOES NOT OPERATE FROM REMOTE STATION (CONT)

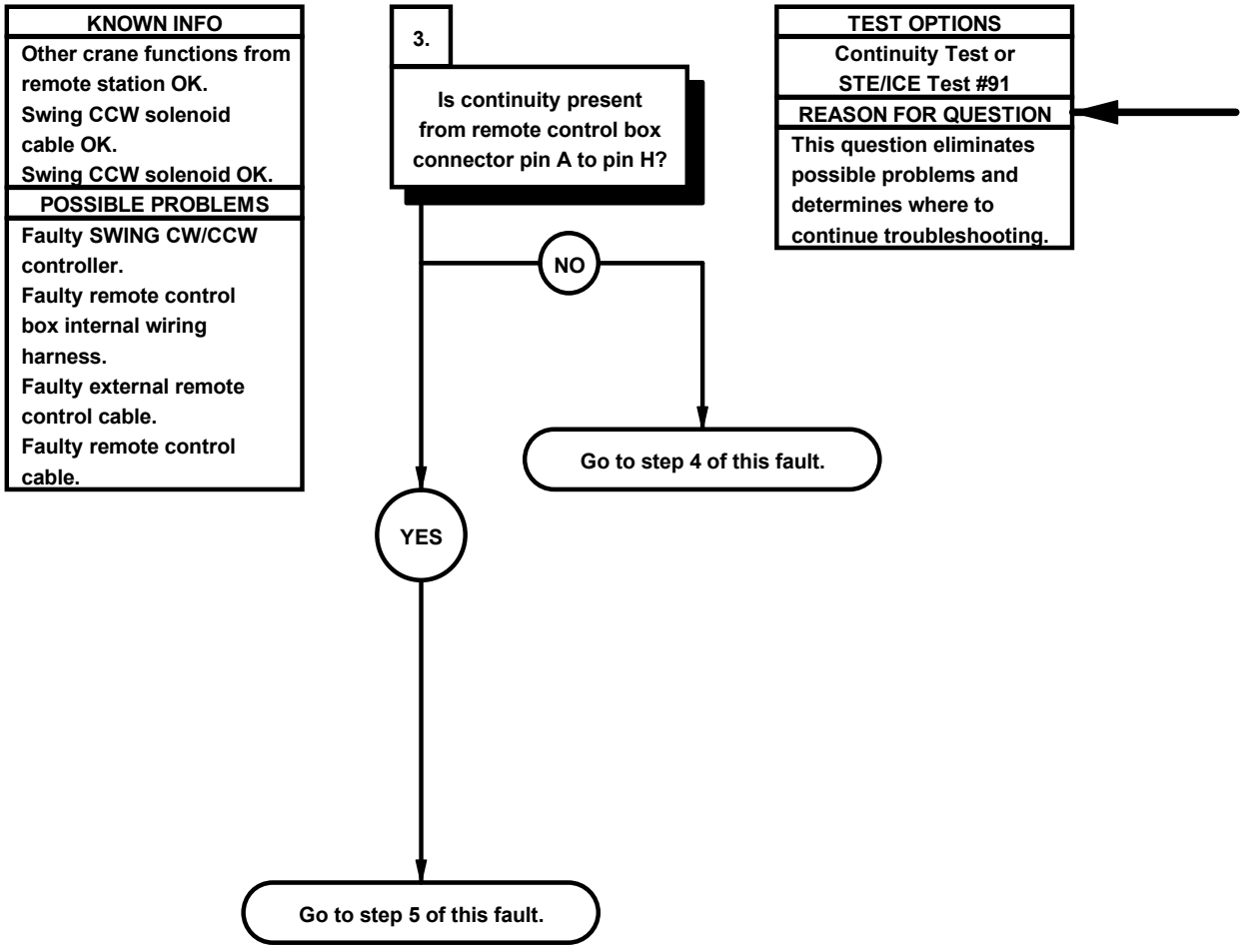


CONTINUITY TEST

(1) Disconnect swing CCW solenoid connector from swing CCW solenoid.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin 2 of swing CCW solenoid cable connector.
(4) Connect negative (-) probe of multimeter on ground and note reading on multimeter.
(5) Connect positive (+) probe of multimeter on pin 1 of swing CCW solenoid cable connector.
(6) Connect negative (-) probe of multimeter on terminal board lower position 9 and note reading on multimeter.
(7) If continuity is not present, replace swing CCW solenoid cable (para 7-119).
(8) If continuity is present, notify DS Maintenance.
(9) Connect swing CCW solenoid cable connector to swing CCW solenoid.
(10) Close cover on junction box.
(11) Tighten four screws on junction box cover.
(12) Stow crane (TM 9-2320-366-10-1).



e129. M1089 MATERIAL HANDLING CRANE (MHC) SWING CCW DOES NOT OPERATE FROM REMOTE STATION (CONT)



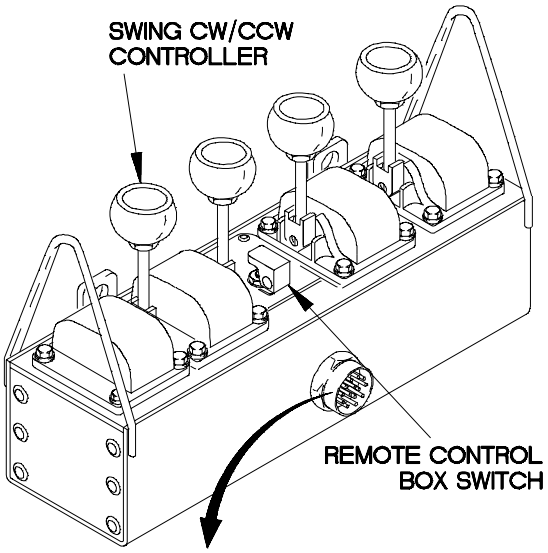
CONTINUITY TEST

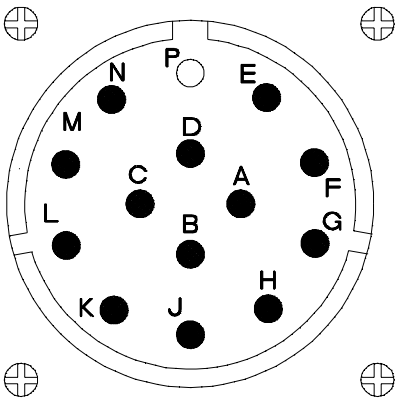
(1) Disconnect external remote control cable from remote control box.
(2) Position remote control box switch to ON.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter on pin A of connector on remote control box.
(5) Connect negative (-) probe of multimeter on pin H of connector on remote control box.

NOTE

Step (6) requires the aid of an assistant.

(6) Position SWING CW/CCW controller to CCW and note reading on multimeter.
(7) If continuity is not present, go to step 4 of this fault.
(8) If continuity is present, go to step 5 of this fault.
(9) Position remote control box switch to OFF.

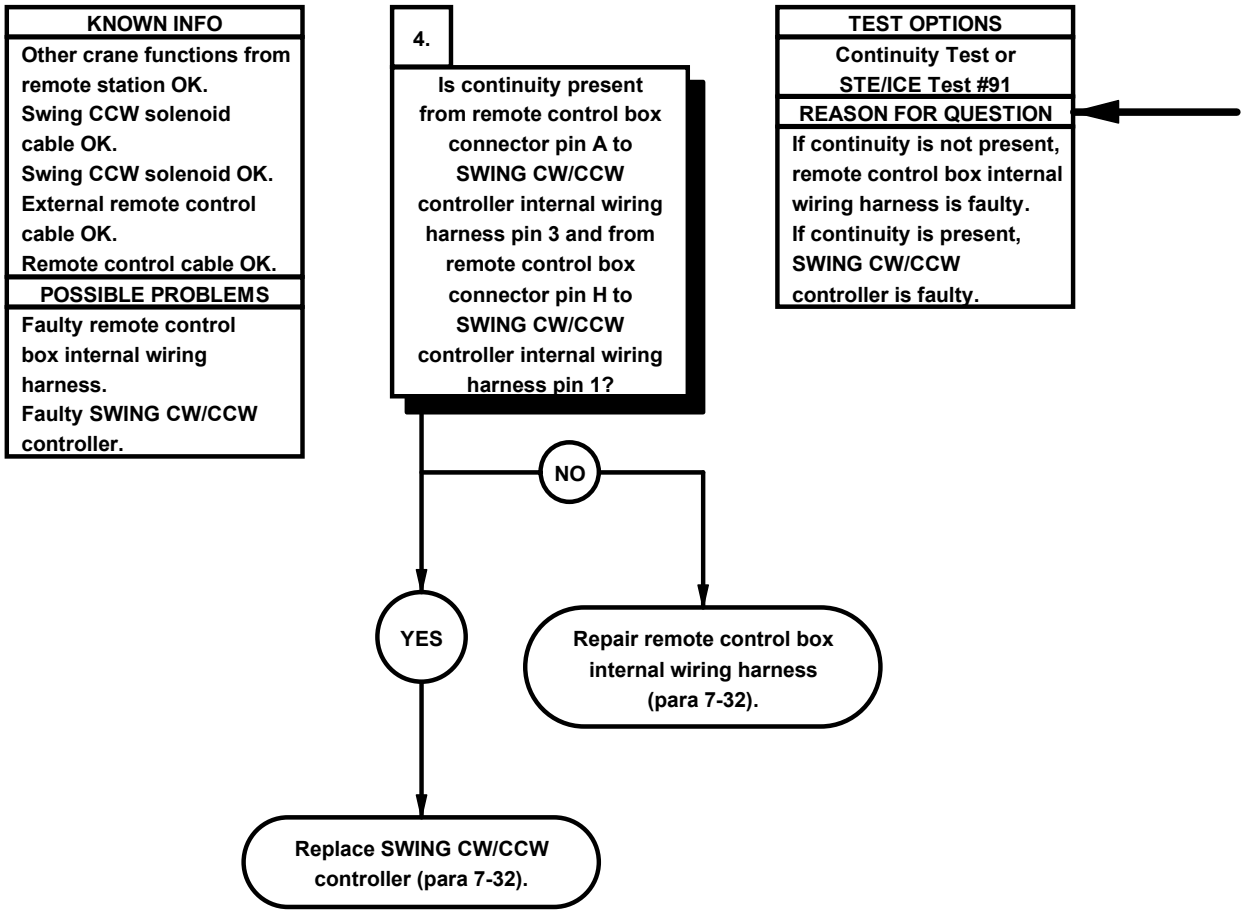




REMOTE CONTROL
BOX CONNECTOR

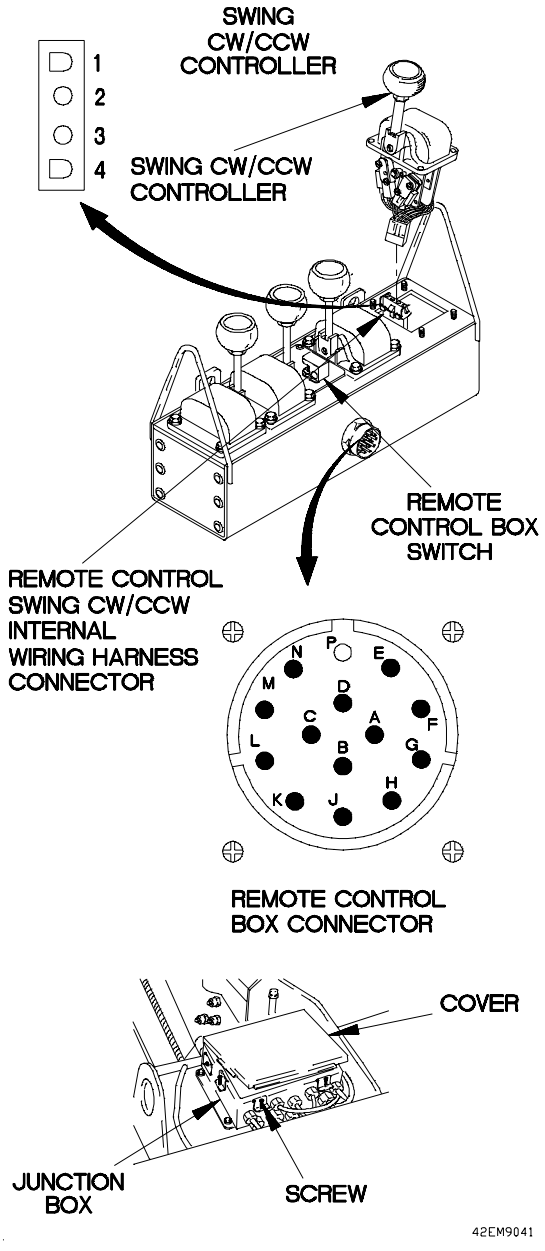
42em9031

e129. M1089 MATERIAL HANDLING CRANE (MHC) SWING CCW DOES NOT OPERATE FROM REMOTE STATION (CONT)

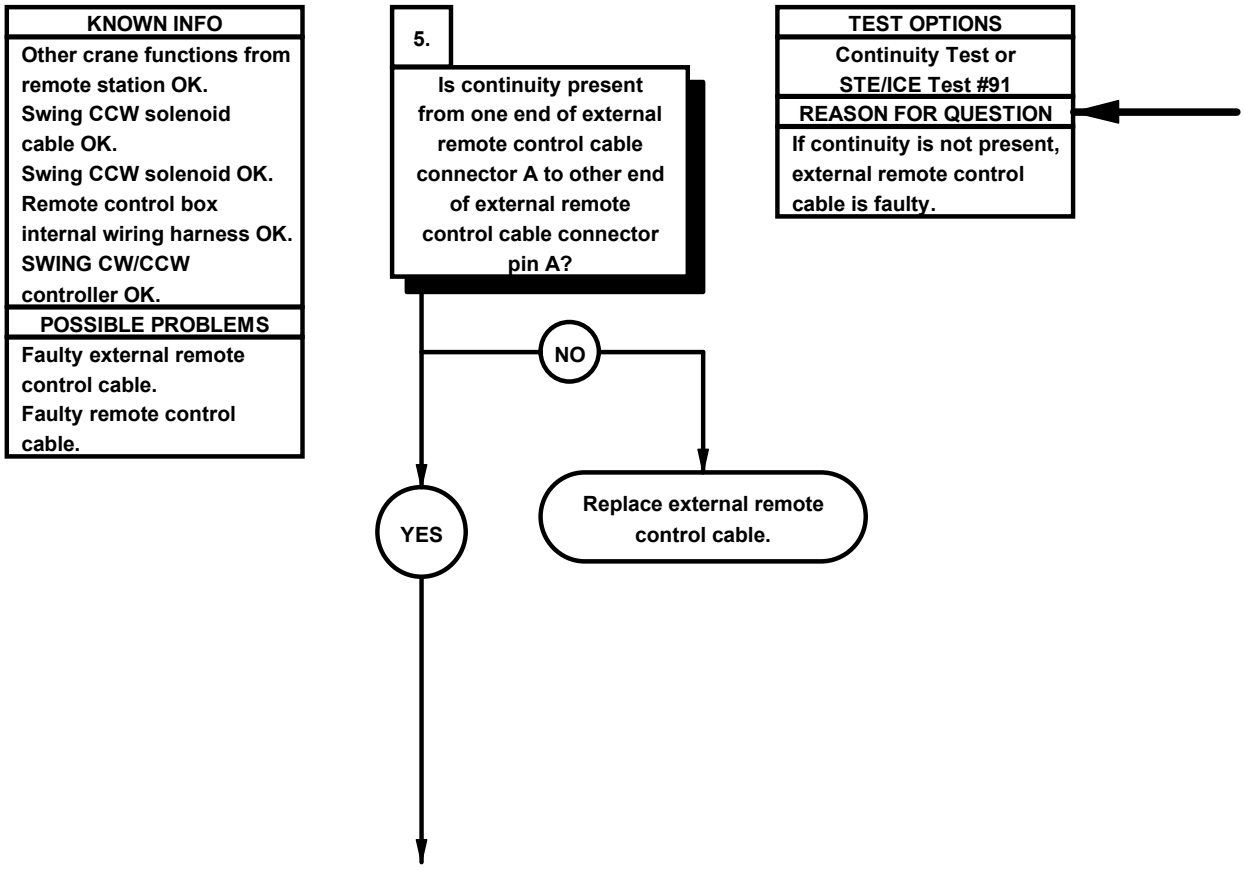


CONTINUITY TEST

(1) Remove SWING CW/CCW controller (para 7-32).
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter on pin A of remote control box connector.
(4) Connect negative (-) probe of multimeter on pin 3 of SWING CW/CCW controller internal wiring harness and note reading on multimeter.
(5) Position remote control box switch to ON.
(6) Connect positive (+) probe of multimeter on pin H of remote control box connector.
(7) Connect negative (-) probe of multimeter on pin 1 of SWING CW/CCW controller internal wiring harness and note reading on multimeter.
(8) If continuity is not present, replace remote control box internal wiring harness (para 7-32).
(9) If continuity is present, replace SWING CW/CCW controller (para 7-32).
(10) Position remote control box switch to OFF.
(11) Install SWING CW/CCW controller (para 7-32).
(12) Close cover on junction box.
(13) Tighten four screws on junction box cover.
(14) Stow crane (TM 9-2320-366-10-1).

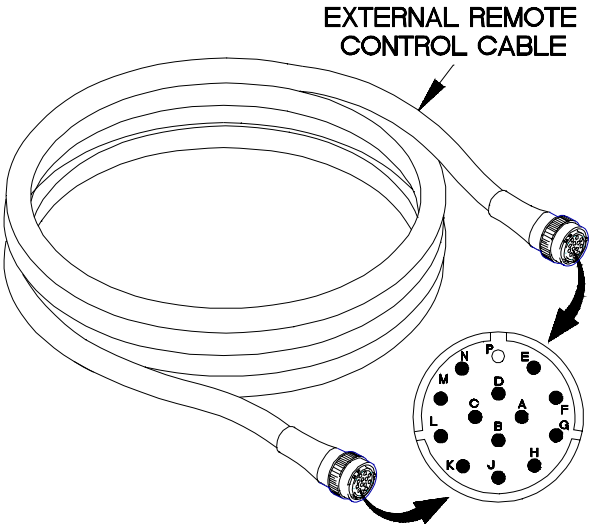


e129. M1089 MATERIAL HANDLING CRANE (MHC) SWING CCW DOES NOT OPERATE FROM REMOTE STATION (CONT)



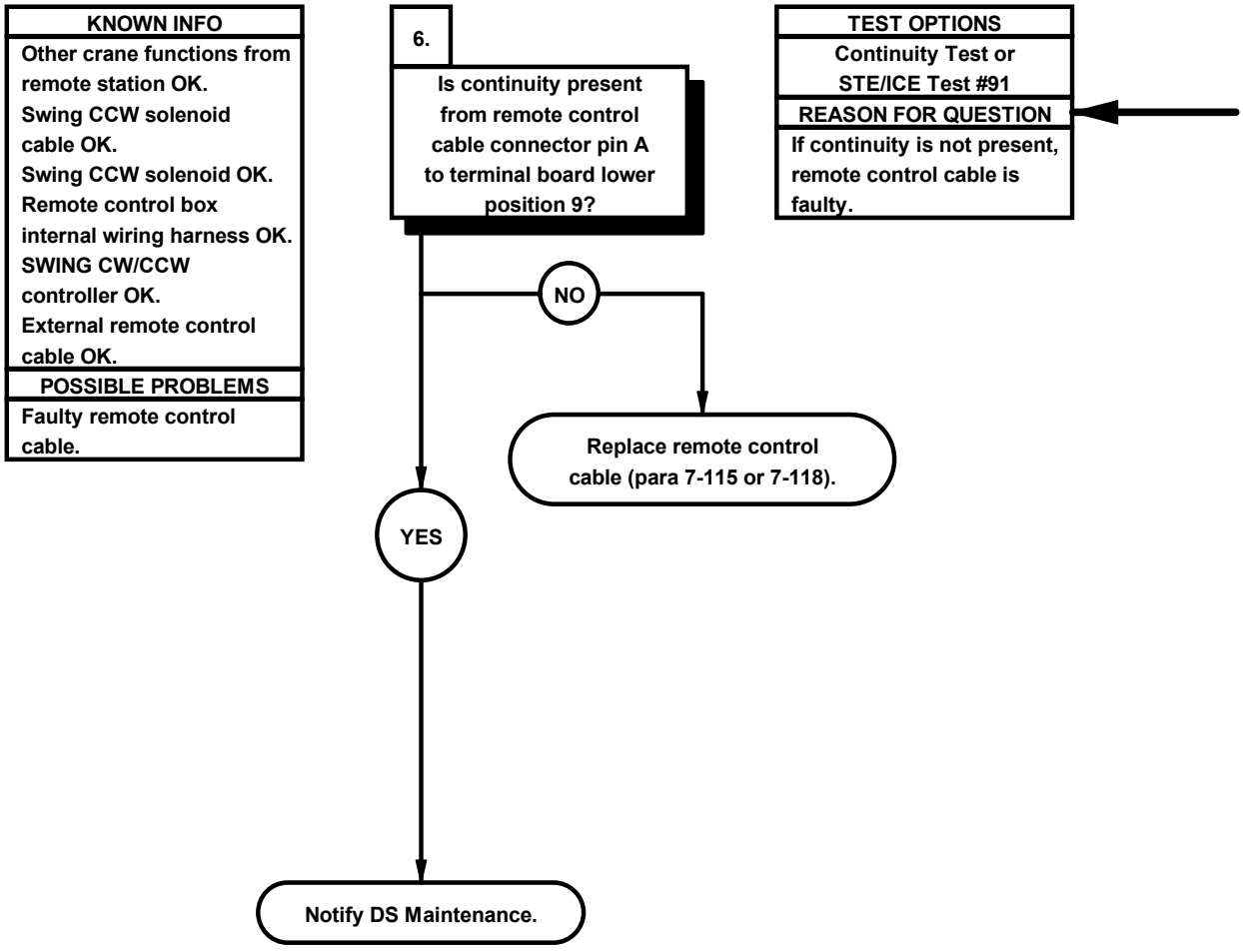
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin A of one end of external remote control cable connector.
(3) Connect negative (-) probe of multimeter on pin A of other end of external remote control cable and note reading on multimeter.
(4) If continuity is not present, replace external remote control cable.



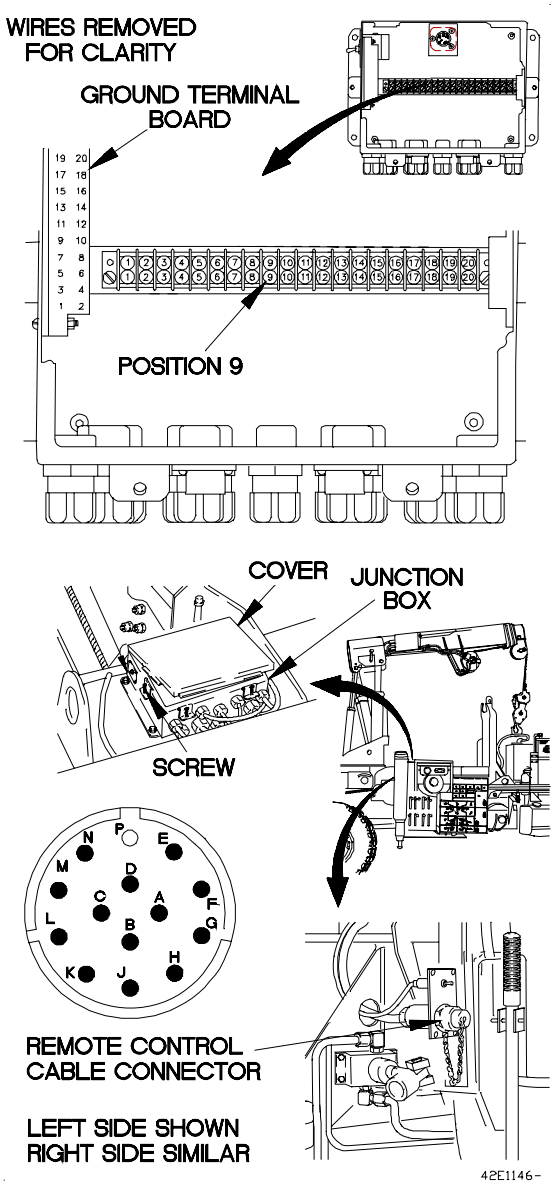
X2E1145-

e129. M1089 MATERIAL HANDLING CRANE (MHC) SWING CCW DOES NOT OPERATE FROM REMOTE STATION (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on pin A of remote control cable connector.
(3) Connect negative (-) probe of multimeter on terminal board lower position 9 and note reading on multimeter.
(4) If continuity is not present, replace remote control cable (para 7-115 or 7-118).
(5) If continuity is present, notify DS Maintenance.
(6) Close cover on junction box.
(7) Tighten four screws on junction box cover.
(8) Stow crane (TM 9-2320-366-10-1).



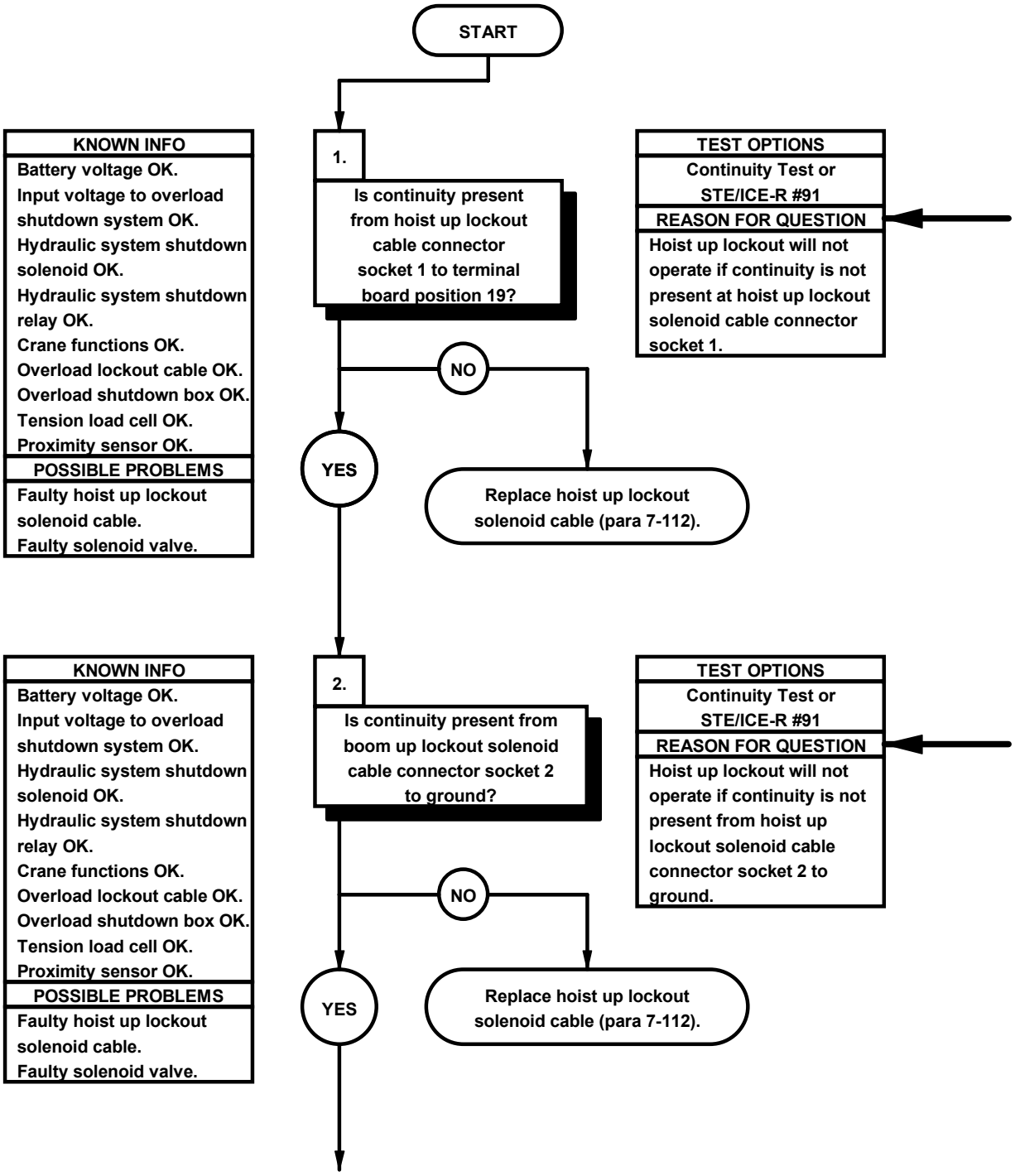
e130. M1089 MATERIAL HANDLING CRANE (MHC) HOIST UP LOCKOUT DOES NOT ACTIVATE

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-57).

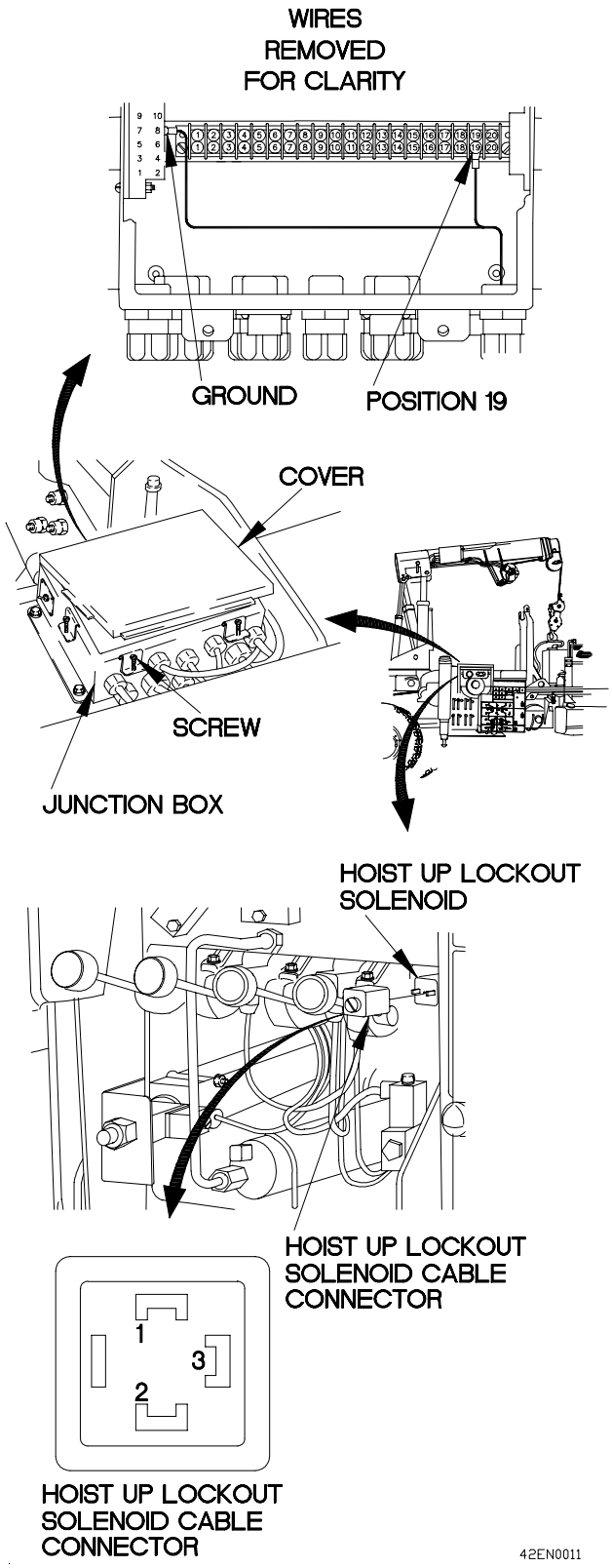
References
TM 9-4910-571-12&P

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

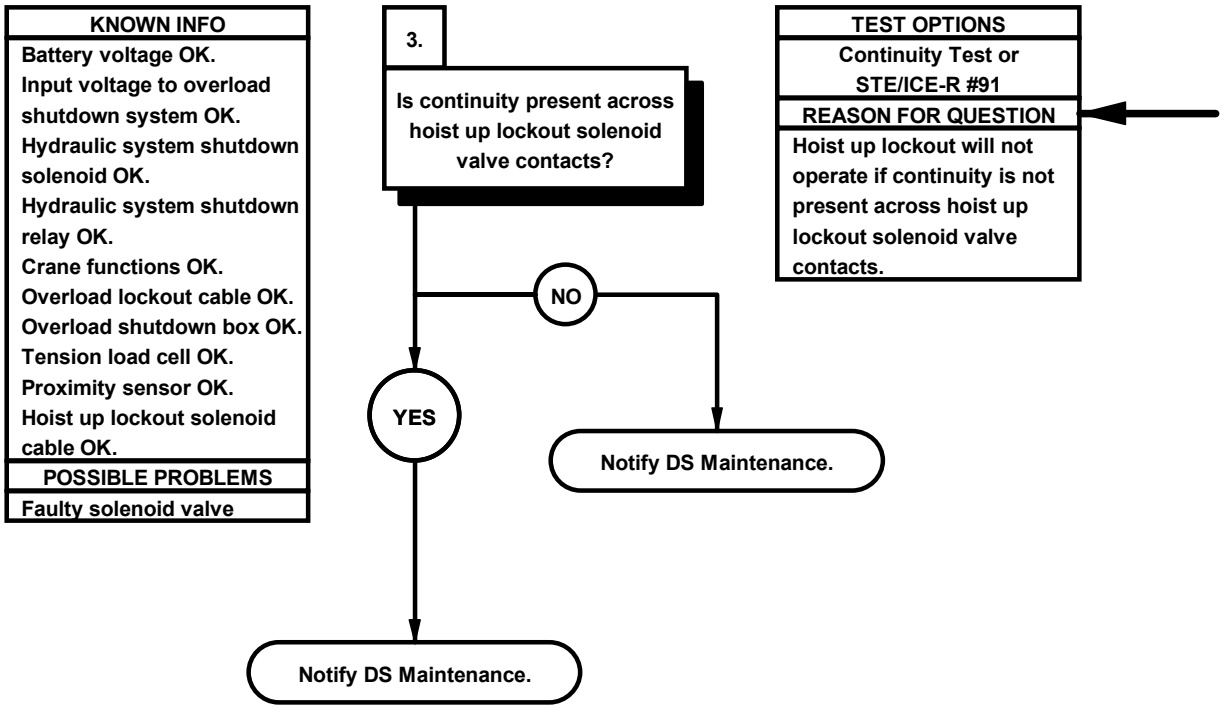


CONTINUITY TEST
(1) Loosen four screws on junction box.
(2) Open cover on junction box.
(3) Disconnect hoist up lockout solenoid cable connector from hoist up lockout solenoid.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter in socket 1 of hoist up lockout solenoid cable.
(6) Connect negative (-) probe of multimeter to terminal board position 19 and note reading on multimeter.
(7) If continuity is not present, replace hoist up lockout solenoid cable (para 7-112).

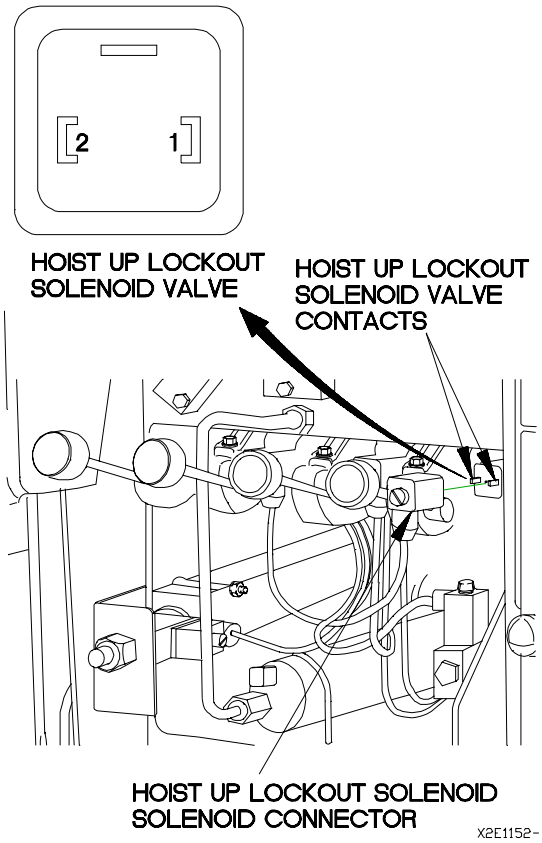
CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter in socket 2 of hoist up lockout solenoid cable connector.
(3) Connect negative (-) probe of multimeter on ground in junction box and note reading on multimeter.
(4) If continuity is not present, replace hoist up lockout solenoid cable (para 7-112).
(5) Connect hoist up lockout solenoid cable connector to hoist up lockout solenoid valve.
(6) Close cover on junction box.
(7) Tighten four screws on junction box cover.



e130. M1089 MATERIAL HANDLING CRANE (MHC) HOIST UP LOCKOUT DOES NOT ACTIVATE (CONT)



CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on contact two of hoist up lockout solenoid valve.
(3) Connect negative (-) probe of multimeter to contact one of hoist up lockout solenoid valve and note reading on multimeter.
(4) If continuity is not present, notify DS Maintenance.
(5) If continuity is present, notify DS Maintenance.
(6) Connect hoist up lockout solenoid cable to boom up lockout solenoid valve.
(7) Connect batteries (para 7-57).



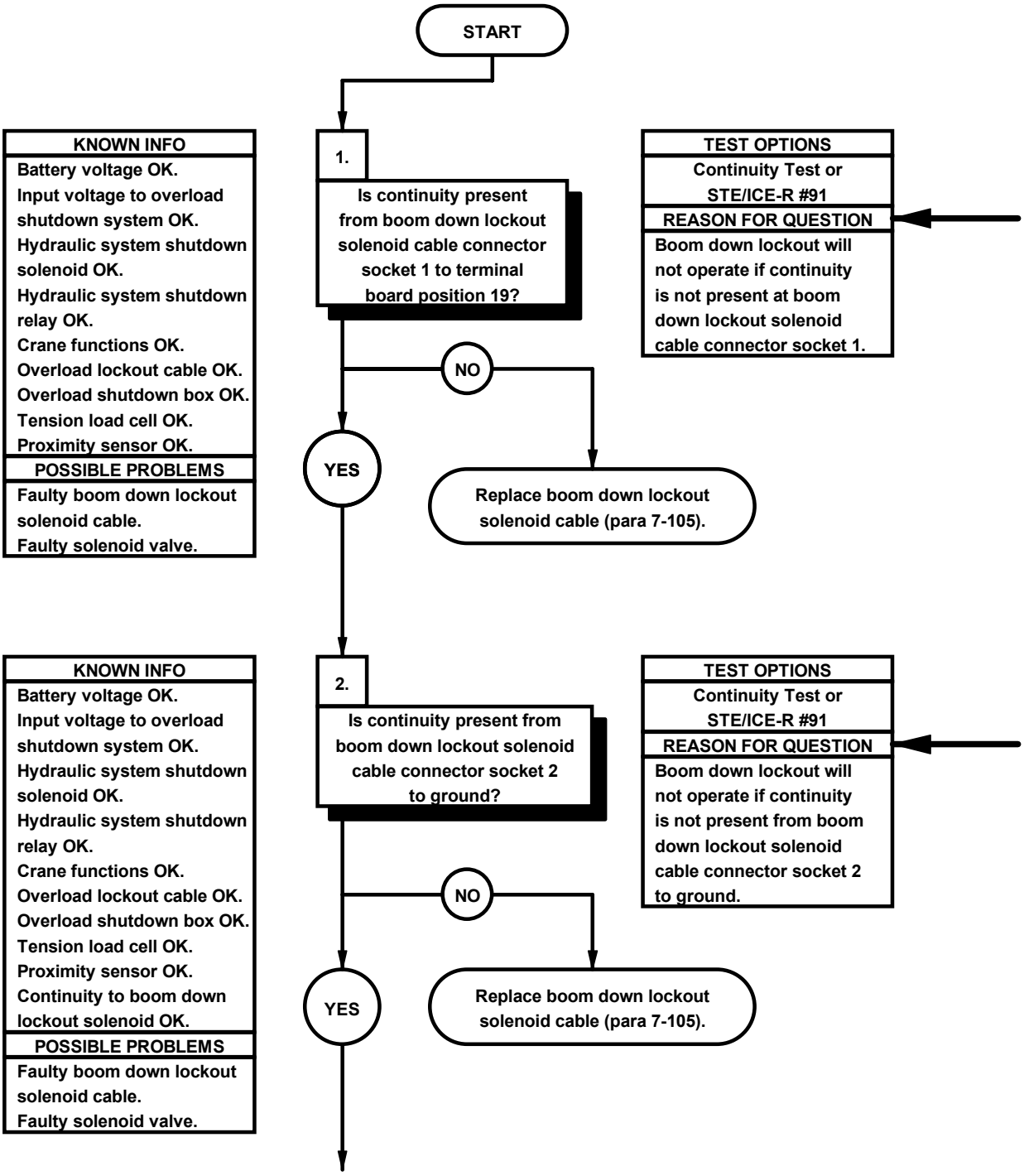
e131. M1089 MATERIAL HANDLING CRANE (MHC) BOOM DOWN LOCKOUT DOES NOT ACTIVATE

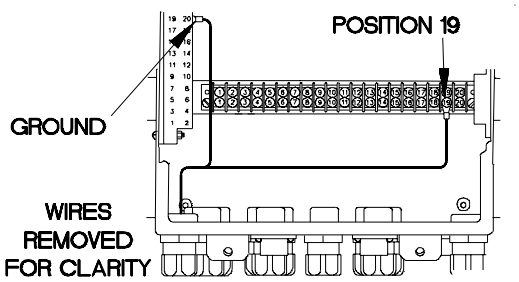
INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-57).

References
TM 9-4910-571-12&P

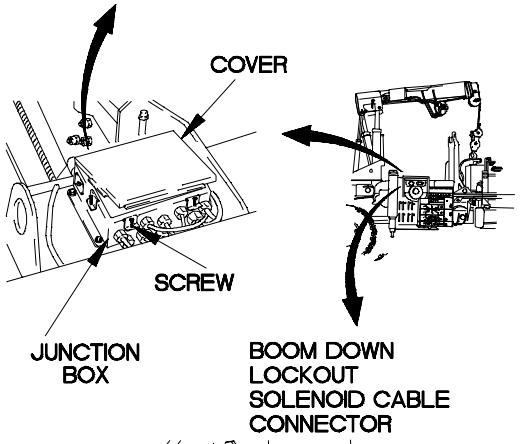
Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

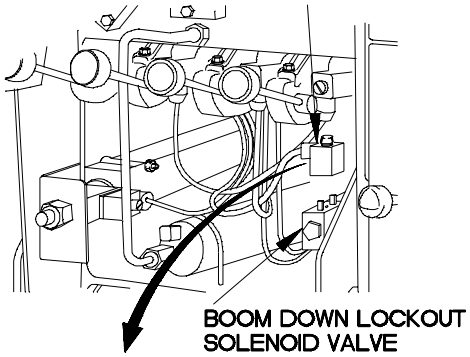




CONTINUITY TEST

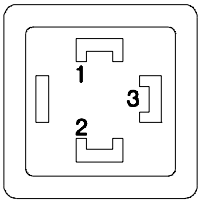
(1) Loosen four screws on junction box.
(2) Open cover on junction box.
(3) Disconnect boom down lockout solenoid cable connector from boom down lockout solenoid valve.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter in socket 1 of boom down lockout solenoid cable.
(6) Connect negative (-) probe of multimeter to terminal board position 19 and note reading on multimeter.
(7) If continuity is not present, replace boom down lockout solenoid cable (para 7-105).





CONTINUITY TEST

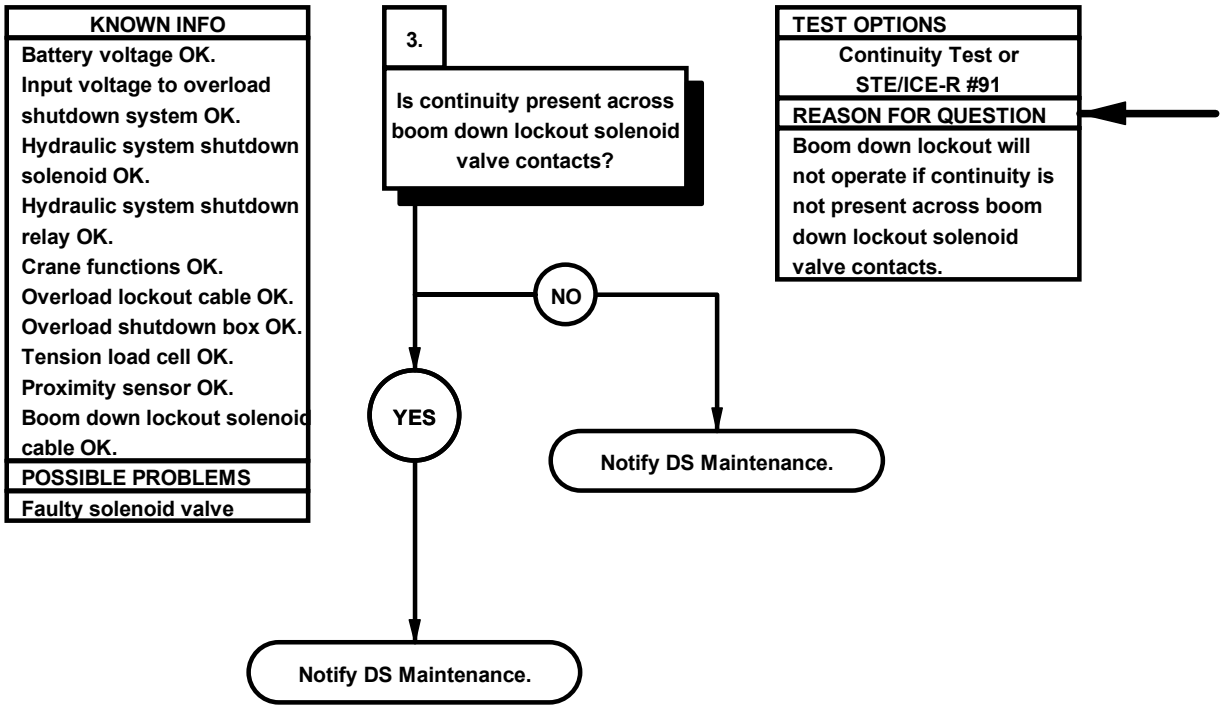
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter in socket 2 of boom down lockout solenoid cable connector.
(3) Connect negative (-) probe of multimeter on ground in junction box and note reading on multimeter.
(4) If continuity is not present, replace boom down lockout solenoid cable (para 7-105).
(5) Connect boom down lockout solenoid cable connector to boom down lockout solenoid valve.
(6) Close cover on junction box.
(7) Tighten four screws on junction box cover.



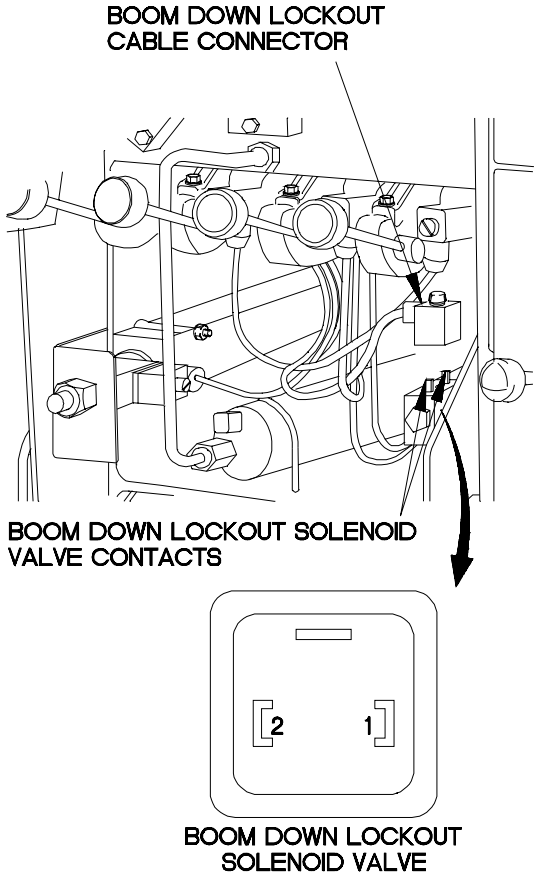
BOOM DOWN LOCKOUT
SOLENOID CABLE
CONNECTOR

42EN1011

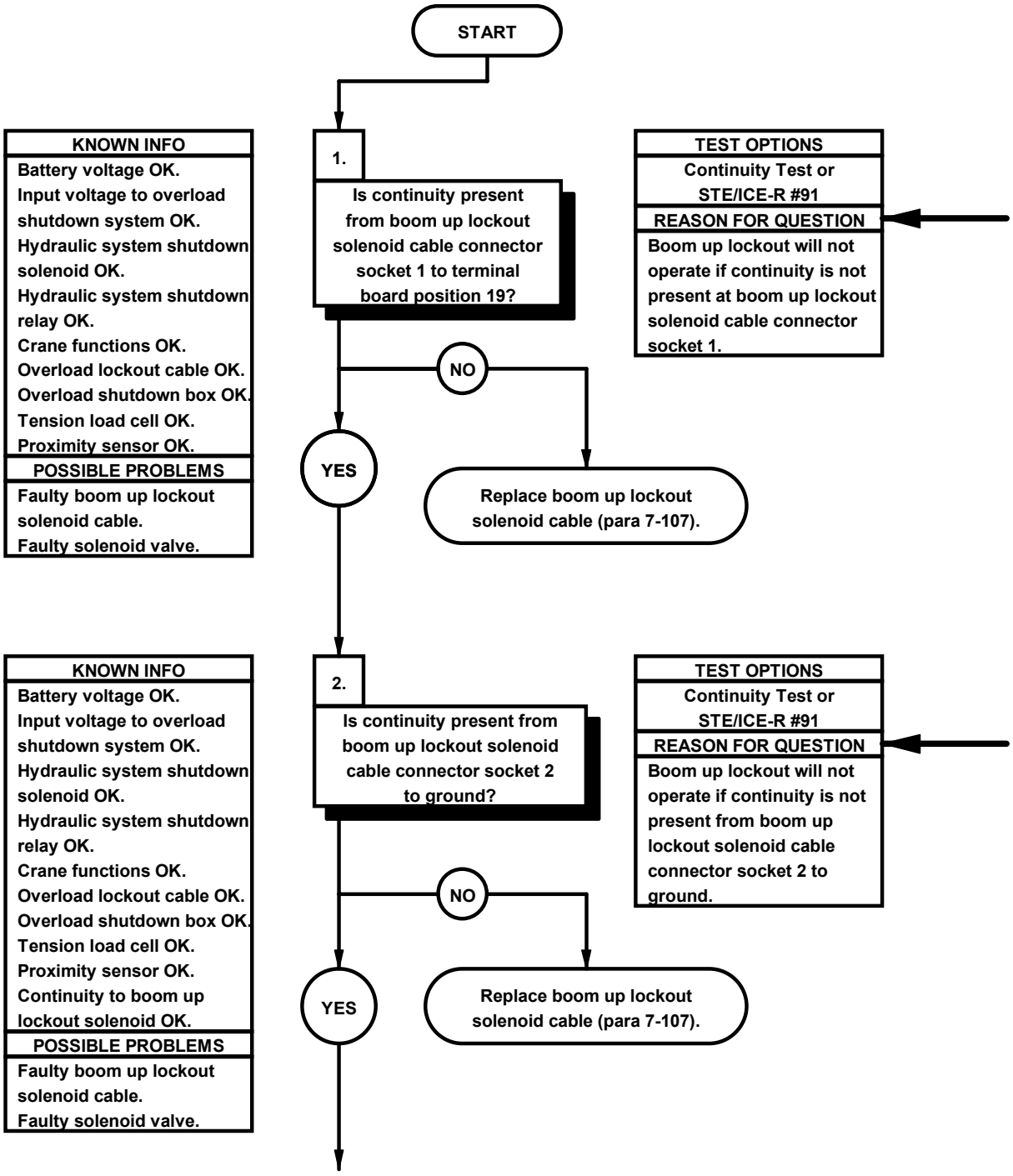
e131. M1089 MATERIAL HANDLING CRANE (MHC) BOOM DOWN LOCKOUT DOES NOT ACTIVATE (CONT)



CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on contact two of boom down lockout solenoid valve.
(3) Connect negative (-) probe of multimeter to contact one of boom down lockout solenoid valve and note reading on multimeter.
(4) If continuity is not present, notify DS Maintenance.
(5) If continuity is present, notify DS Maintenance.
(6) Connect boom down lockout solenoid cable to boom down lockout solenoid valve.
(7) Connect batteries (para 7-57).



e132. M1089 MATERIAL HANDLING CRANE (MHC) BOOM UP LOCKOUT DOES NOT ACTIVATE	
INITIAL SETUP	
Equipment Conditions Batteries disconnected (para 7-57).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/ICE-R (Item 41, Appendix C)
References TM 9-4910-571-12&P	

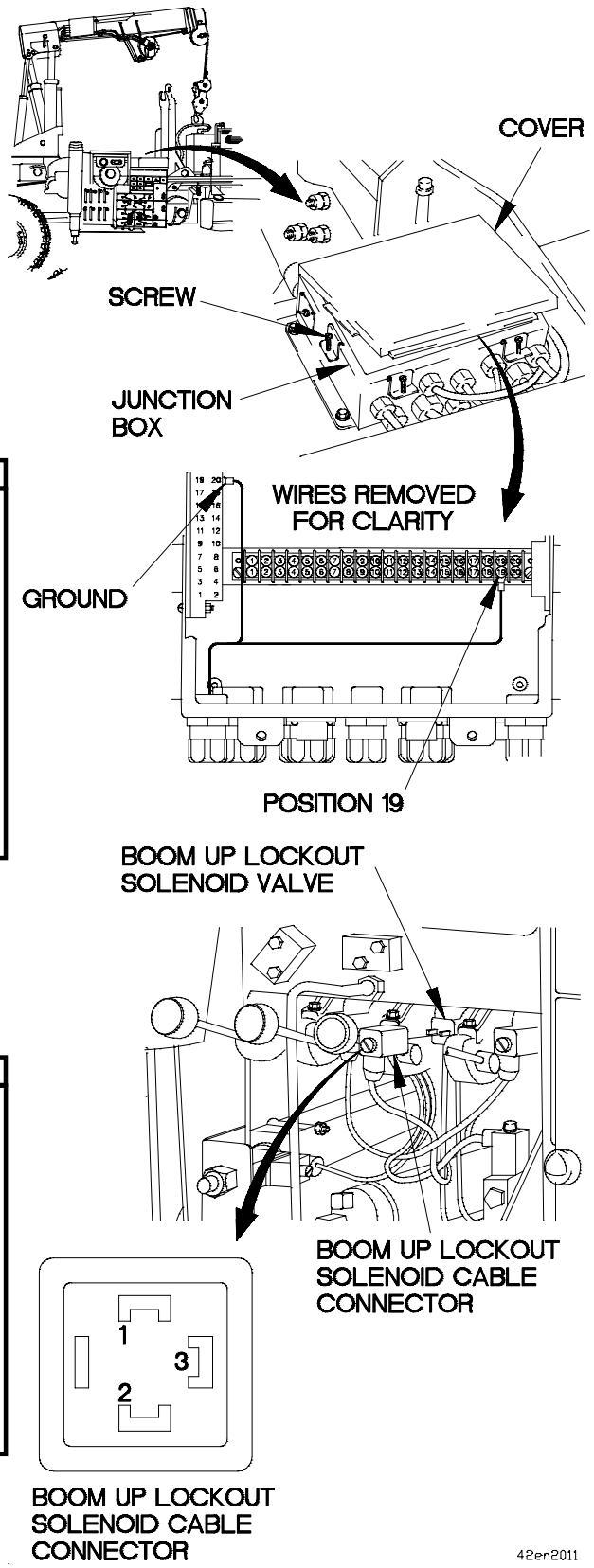


CONTINUITY TEST

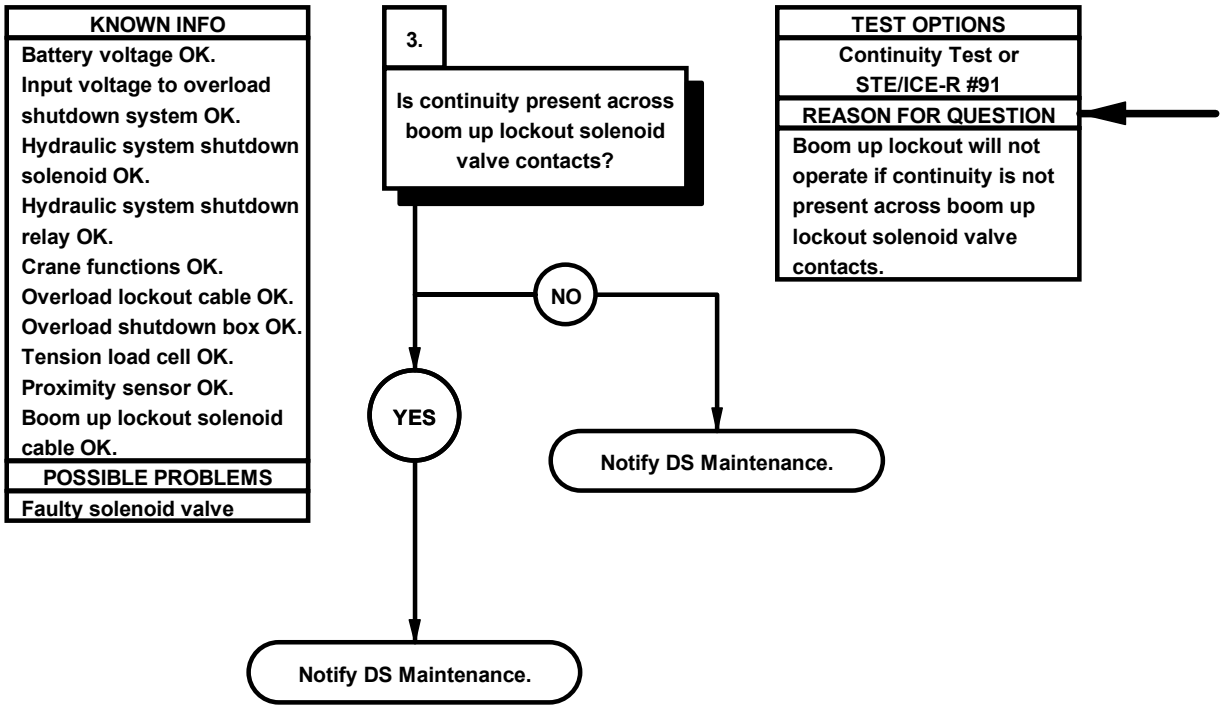
(1) Loosen four screws on junction box.
(2) Open cover on junction box.
(3) Disconnect boom up lockout solenoid cable connector from boom up lockout solenoid valve.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter in socket 1 of boom up lockout solenoid cable.
(6) Connect negative (-) probe of multimeter to terminal board position 19 and note reading on multimeter.
(7) If continuity is not present, replace boom up lockout solenoid cable (para 7-107).

CONTINUITY TEST

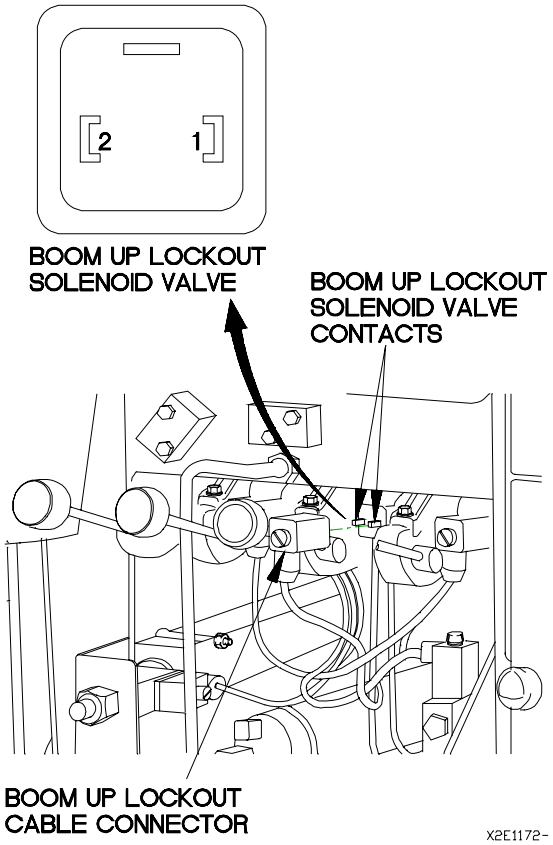
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter in socket 2 of boom up lockout solenoid cable connector.
(3) Connect negative (-) probe of multimeter on ground in junction box and note reading on multimeter.
(4) If continuity is not present, replace boom up lockout solenoid cable (para 7-107).
(5) Connect boom up lockout solenoid cable connector to boom up lockout solenoid valve.
(6) Close cover on junction box.
(7) Tighten four screws on junction box cover.



e132. M1089 MATERIAL HANDLING CRANE (MHC) BOOM UP LOCKOUT DOES NOT ACTIVATE (CONT)



CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on contact two of boom up lockout solenoid valve.
(3) Connect negative (-) probe of multimeter to contact one of boom up lockout solenoid valve and note reading on multimeter.
(4) If continuity is not present, notify DS Maintenance.
(5) If continuity is present, notify DS Maintenance.
(6) Connect boom up lockout solenoid cable to boom up lockout solenoid valve.
(7) Connect batteries (para 7-57).



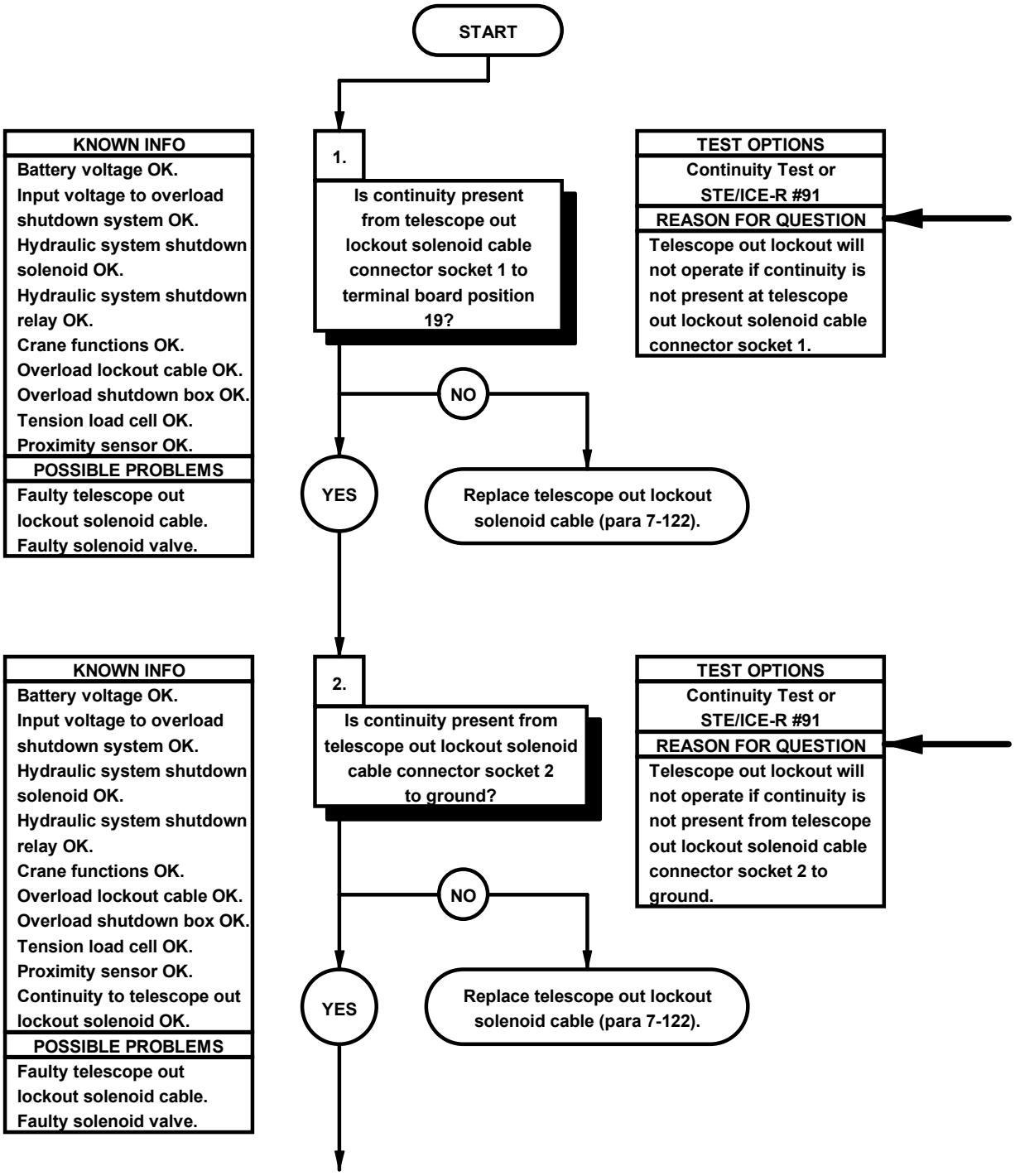
e133. M1089 MATERIAL HANDLING CRANE (MHC) TELESCOPE OUT LOCKOUT DOES NOT ACTIVATE

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-57).

References
TM 9-4910-571-12&P

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

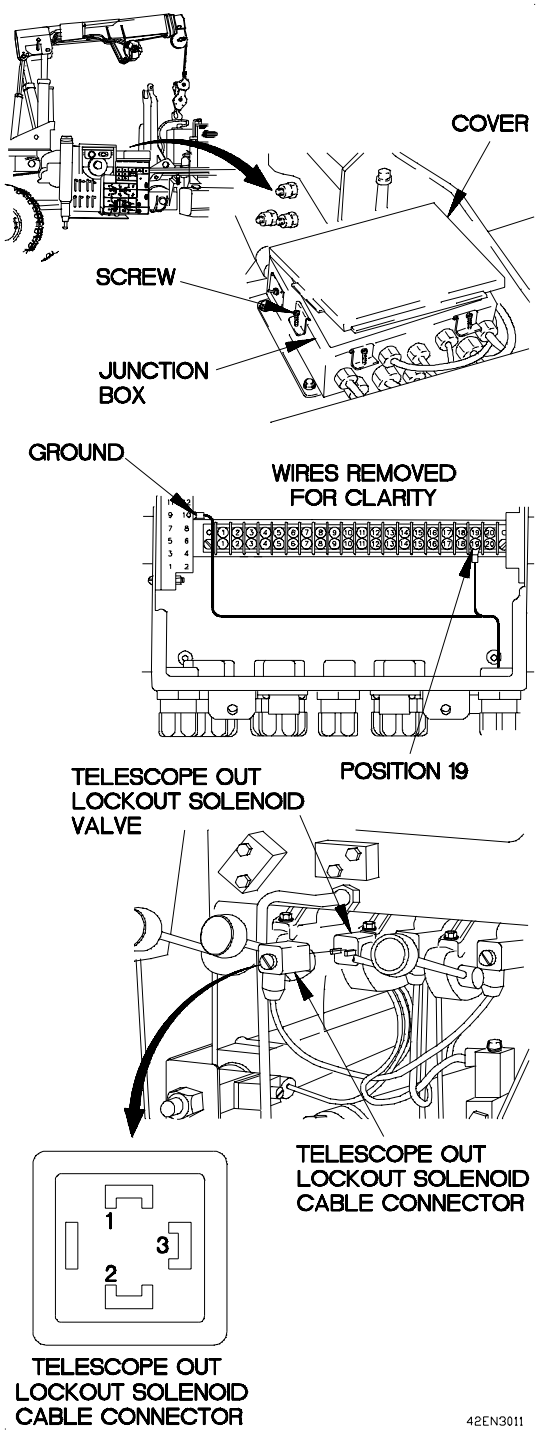


CONTINUITY TEST

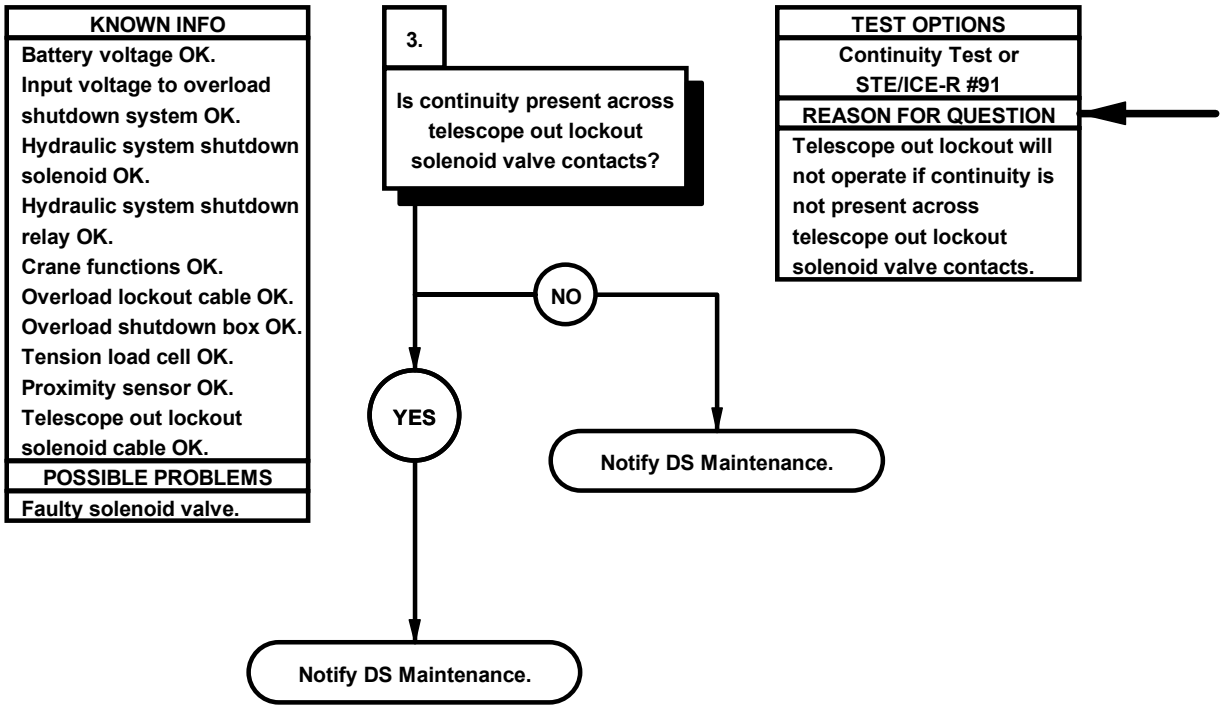
(1) Loosen four screws on junction box.
(2) Open cover on junction box.
(3) Disconnect telescope out lockout solenoid cable connector from telescope out lockout solenoid valve.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter in socket 1 of telescope out lockout solenoid cable.
(6) Connect negative (-) probe of multimeter to terminal board position 19 and note reading on multimeter.
(7) If continuity is not present, replace telescope out lockout solenoid cable (para 7-122).

CONTINUITY TEST

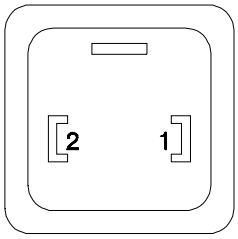
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter in socket 2 of telescope out lockout solenoid cable connector.
(3) Connect negative (-) probe of multimeter on ground in junction box and note reading on multimeter.
(4) If continuity is not present, replace telescope out lockout solenoid cable (para 7-122).
(5) Connect telescope out lockout solenoid cable connector to telescope out lockout solenoid valve.
(6) Close cover on junction box.
(7) Tighten four screws on junction box cover.



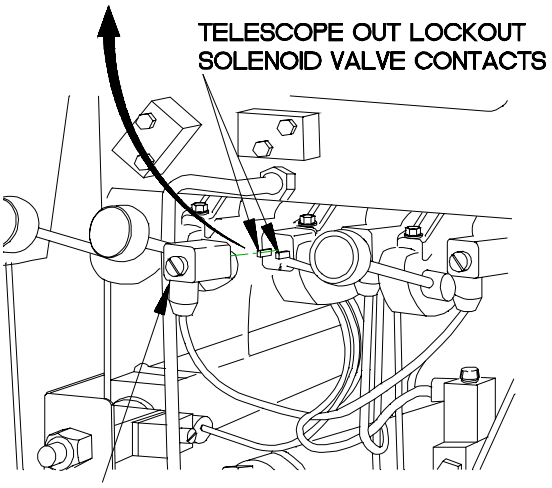
e133. M1089 MATERIAL HANDLING CRANE (MHC) TELESCOPE OUT LOCKOUT DOES NOT ACTIVATE (CONT)



CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter on contact two of telescope out lockout solenoid valve.
(3) Connect negative (-) probe of multimeter to contact one of telescope out lockout solenoid valve and note reading on multimeter.
(4) If continuity is not present, notify DS Maintenance.
(5) If continuity is present, notify DS Maintenance.
(6) Connect telescope out lockout solenoid cable to telescope out lockout solenoid valve.
(7) Connect batteries (para 7-57).



TELESCOPE OUT LOCKOUT SOLENOID VALVE



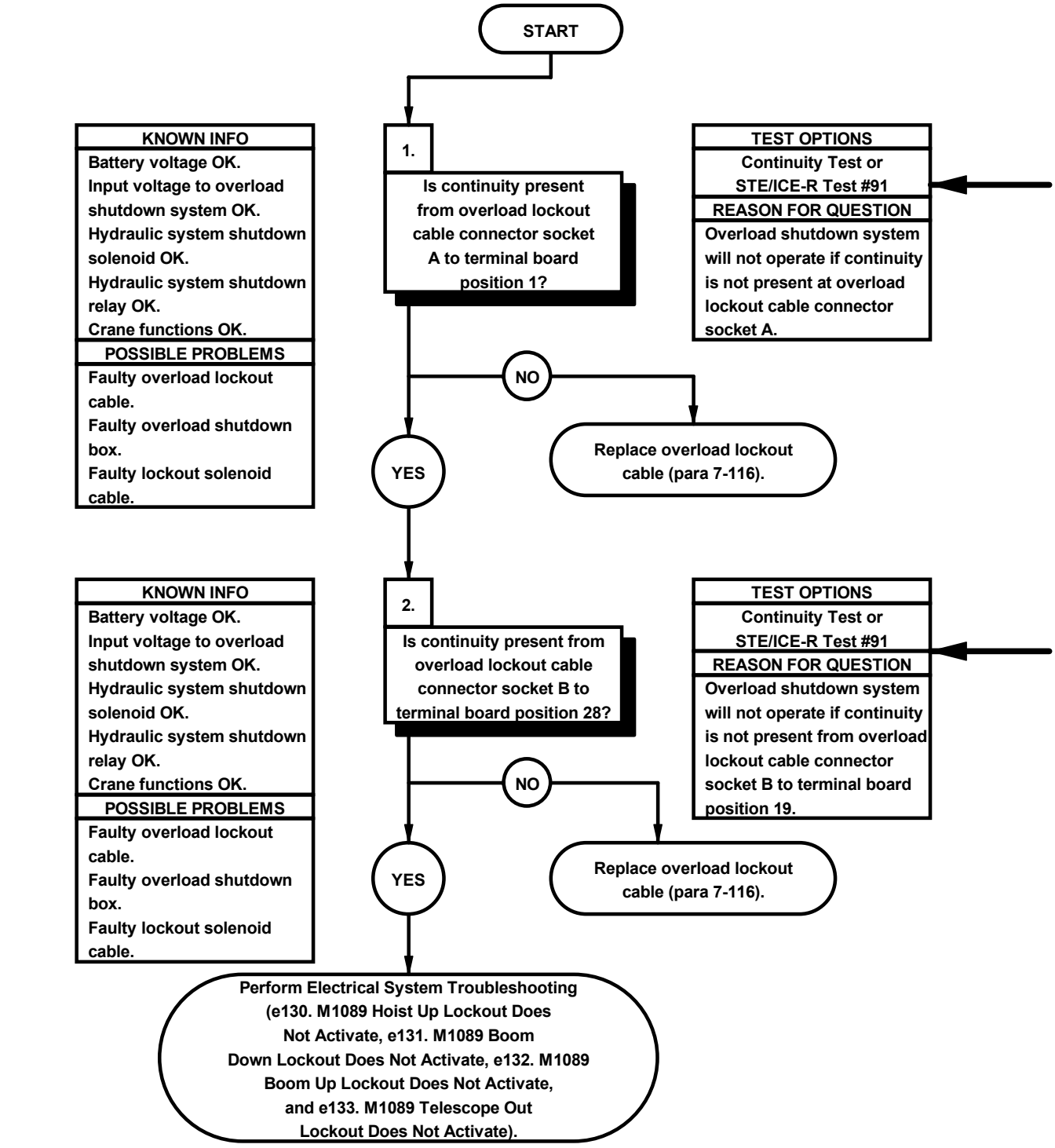
e134. M1089 MATERIAL HANDLING CRANE (MHC) OVERLOAD SHUTDOWN SYSTEM DOES NOT ACTIVATE

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-57).

References
TM 9-4910-471-12&P

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

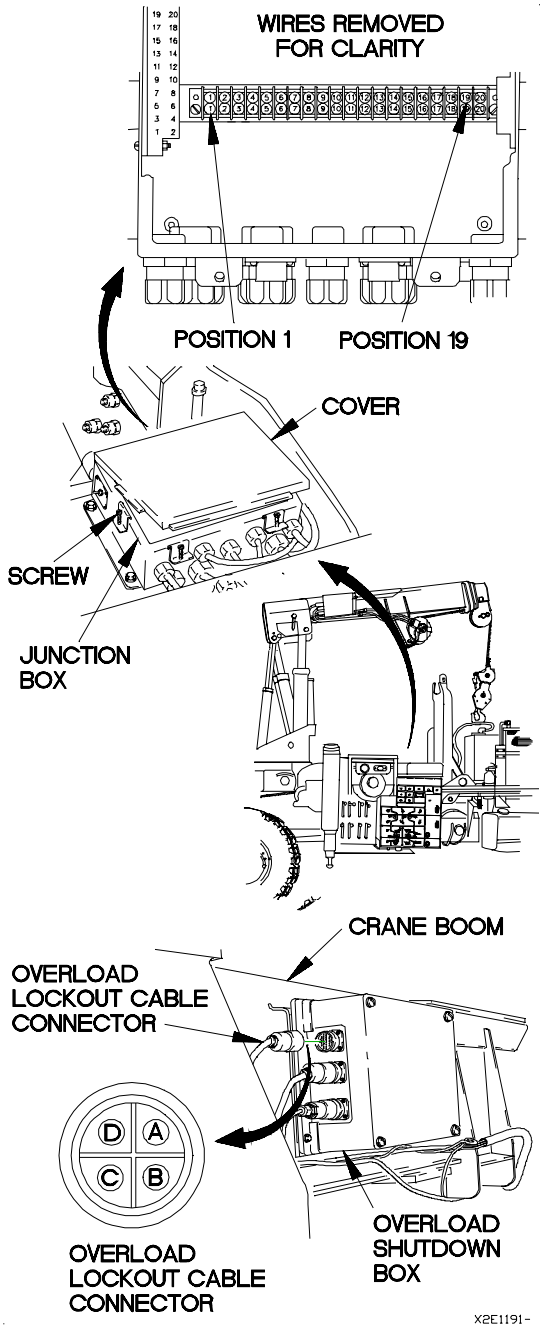


CONTINUITY TEST

(1) Loosen four screws on junction box.
(2) Open cover on junction box.
(3) Disconnect overload lockout cable connector from overload shutdown box.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter in socket A of overload lockout cable connector.
(6) Connect negative (-) probe of multimeter to terminal board position 1 and note reading on multimeter.
(7) If continuity is not present, replace overload lockout cable (para 7-116).

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter in socket B of overload lockout cable connector.
(3) Connect negative (-) probe of multimeter on terminal board position 19 and note reading on multimeter.
(4) If continuity is not present, replace overload lockout cable (para 7-116).
(5) If continuity is present, perform Electrical System Troubleshooting (e130. M1089 Hoist Up Lockout Does Not Activate, e131. M1089 Boom Down Lockout Does Not Activate, e132. M1089 Boom Up Lockout Does Not Activate, and e133. M1089 Telescope Out Lockout Does Not Activate).
(6) Connect overload lockout cable connector to overload shutdown box.
(7) Close cover on junction box.
(8) Tighten four screws on junction box.
(9) Connect batteries (para 7-57).



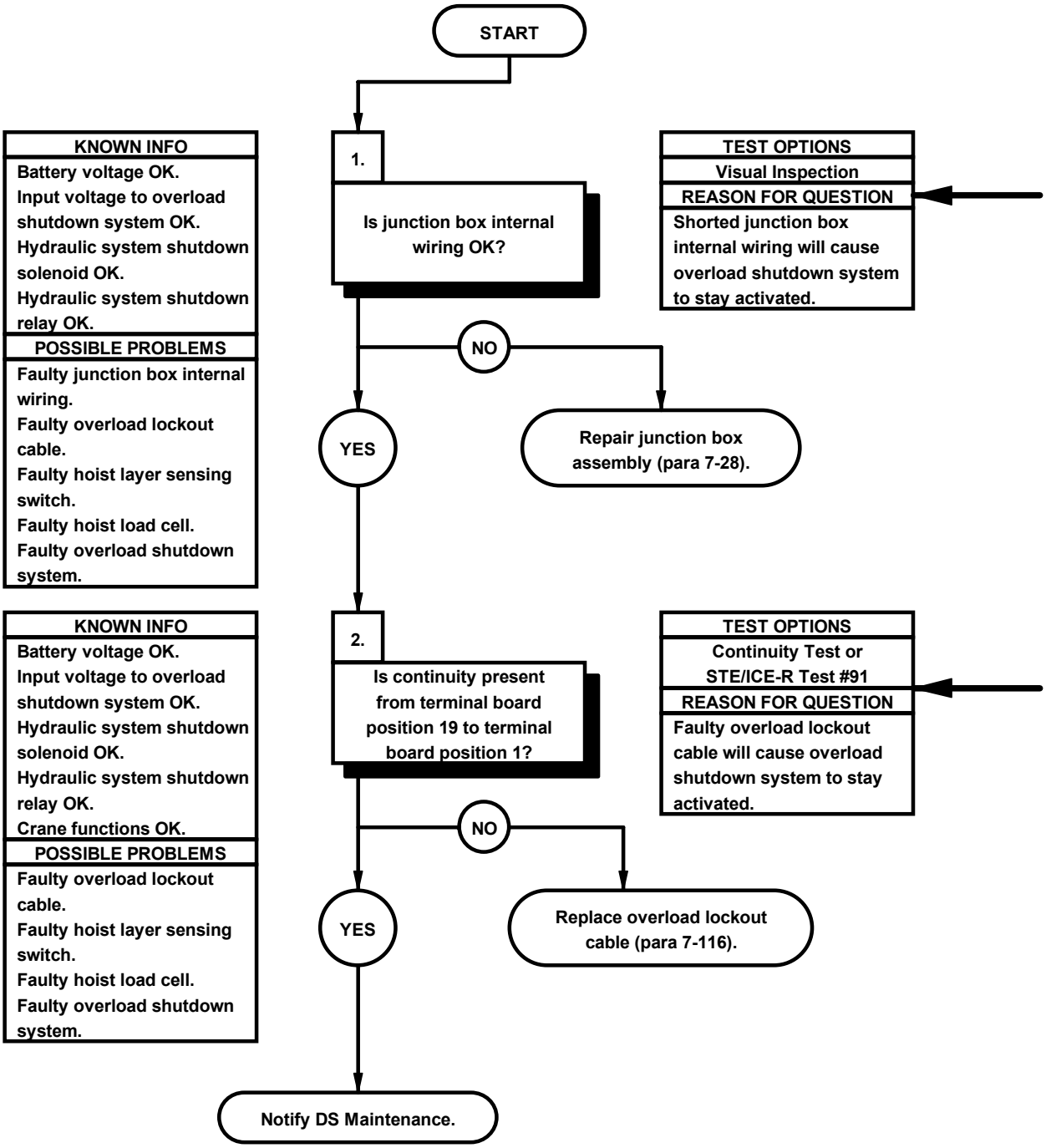
e135. M1089 MATERIAL HANDLING CRANE (MHC) OVERLOAD SHUTDOWN SYSTEM STAYS ACTIVATED

INITIAL SETUP

Equipment Conditions
Batteries disconnected (para 7-57).

References
TM 9-4910-571-12&P

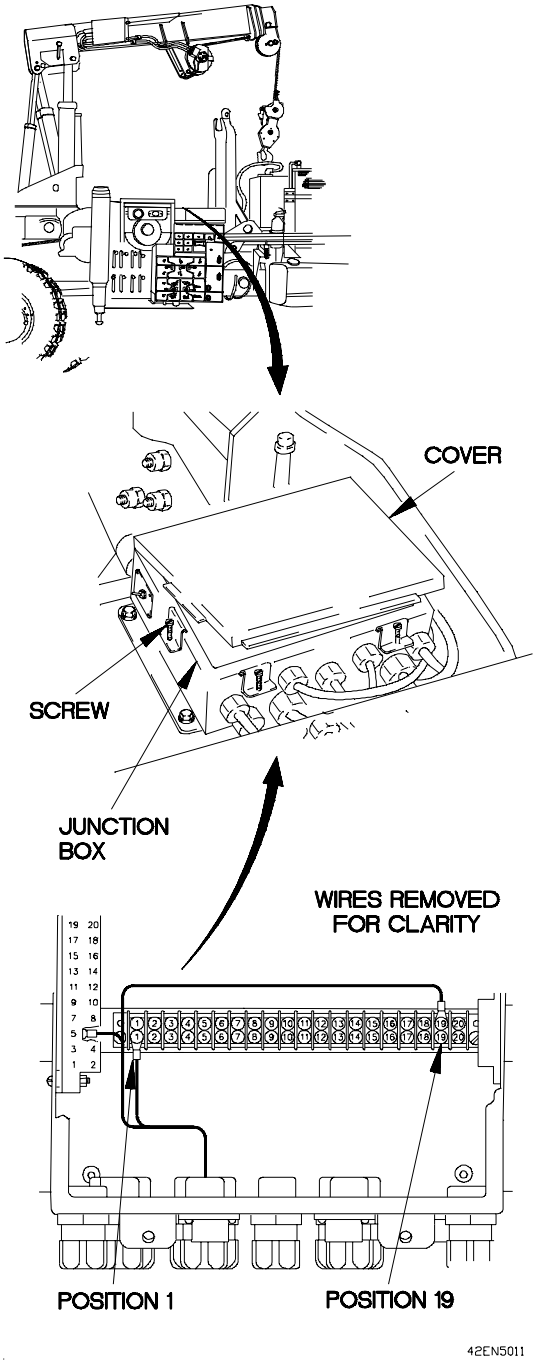
Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)



(1) Loosen four screws on junction box.
(2) Open cover on junction box.
(3) Visually inspect the wiring around terminal board position 28 for shorted wires that could put 24 vdc on position 28.

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to terminal board position 19.
(3) Connect negative (-) probe of multimeter to terminal board position 1 and note reading on multimeter.
(4) If continuity is not present, replace overload lockout cable (para 7-116).
(5) If continuity is present, notify DS Maintenance.
(6) Close cover on junction box.
(7) Tighten four screws on junction box.
(8) Connect batteries (para 7-57).



e136. ALL M1089 CONTROL FUNCTIONS DO NOT OPERATE FROM WRECKER CONTROL PANEL AND WRECKER REMOTE CONTROL

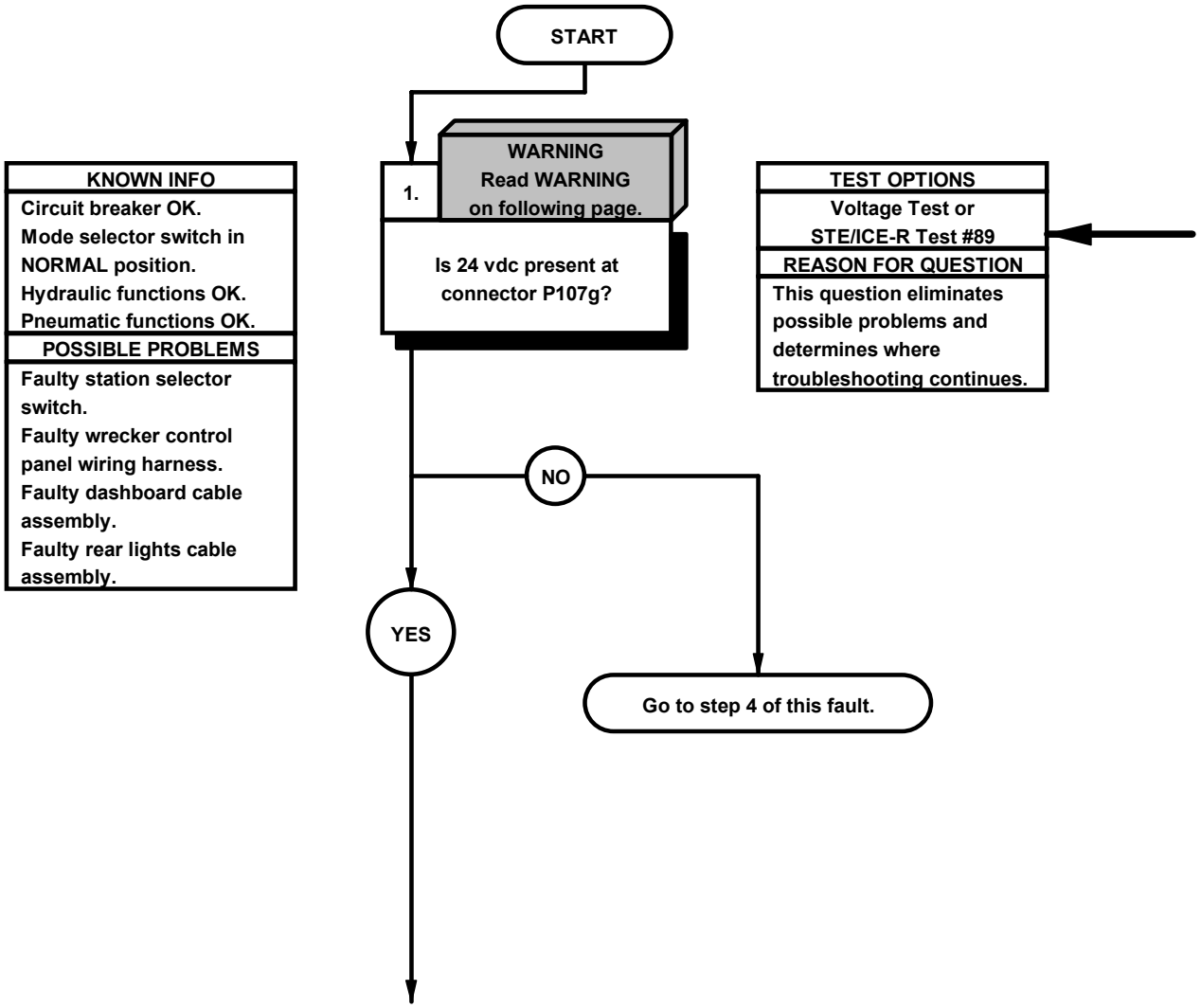
INITIAL SETUP

Equipment Conditions
Top control panel cover removed (para 17-20).

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

References
TM 9-4910-571-12&P

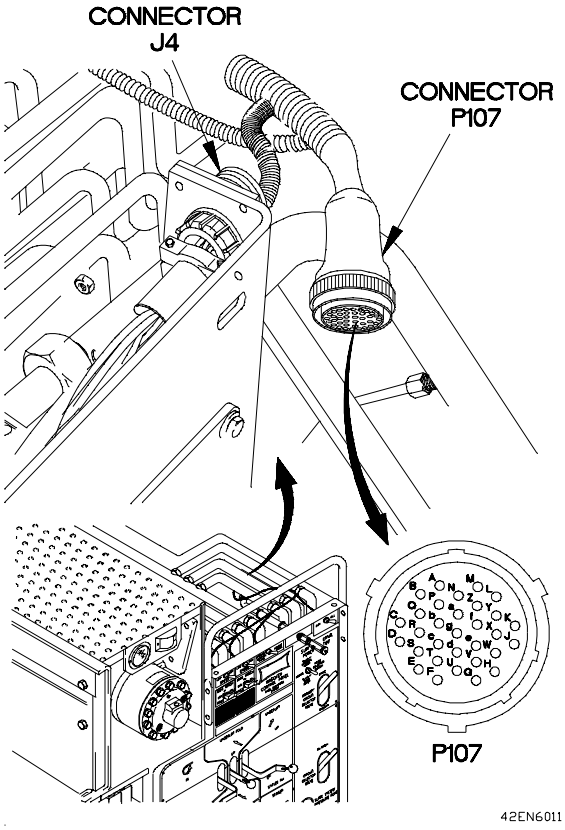


WARNING

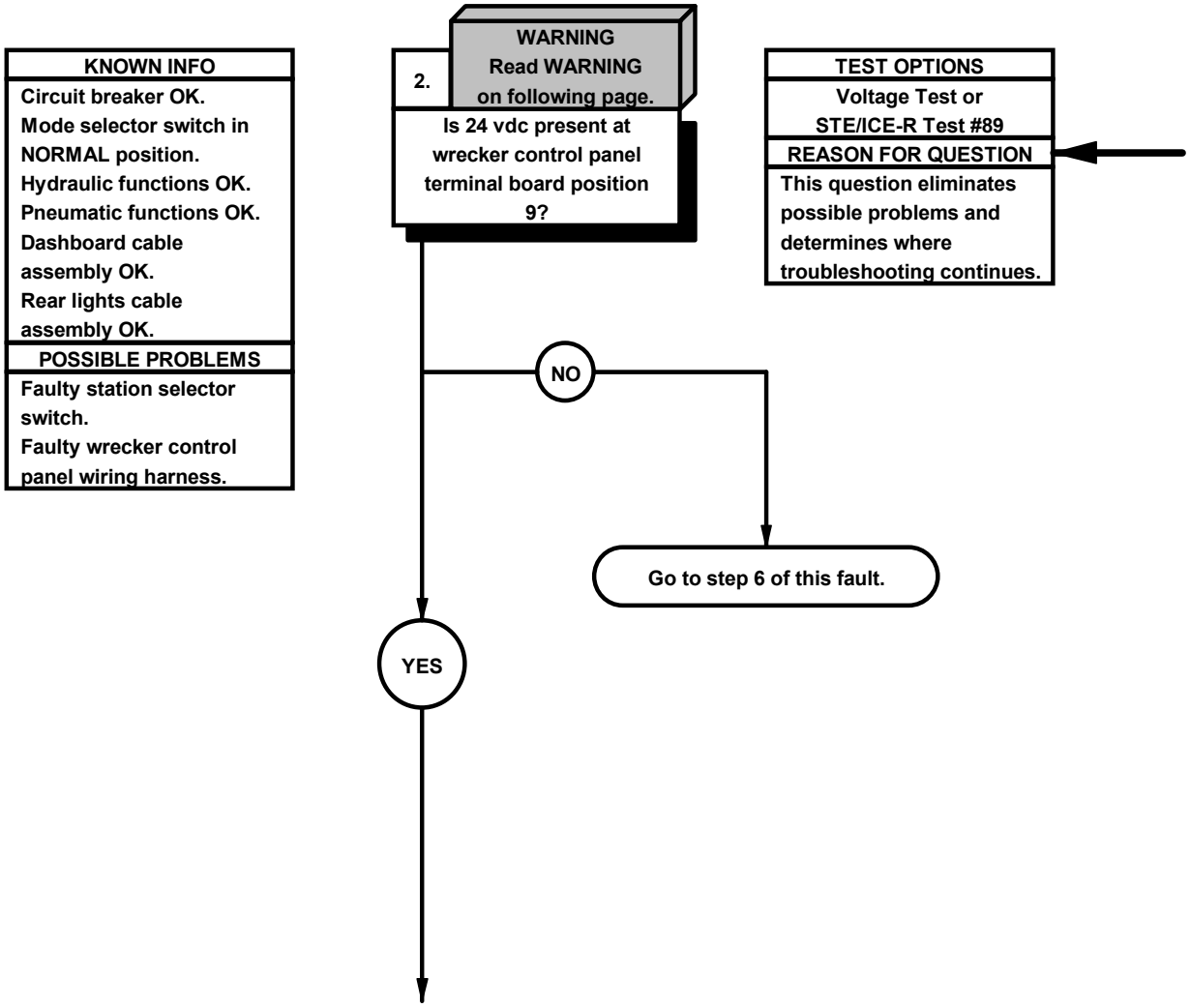
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Disconnect connector P107 from connector J4.
(2) Set multimeter to volts dc.
(3) Connect positive (+) probe of multimeter to connector P107g.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(6) If 24 vdc is not present, go to step 4 of this fault.
(7) Position master power switch to off (TM 9-2320-366-10-1).
(8) Connect connector P107 to connector J4.



e136. ALL M1089 CONTROL FUNCTIONS DO NOT OPERATE FROM WRECKER CONTROL PANEL AND WRECKER REMOTE CONTROL (CONT)

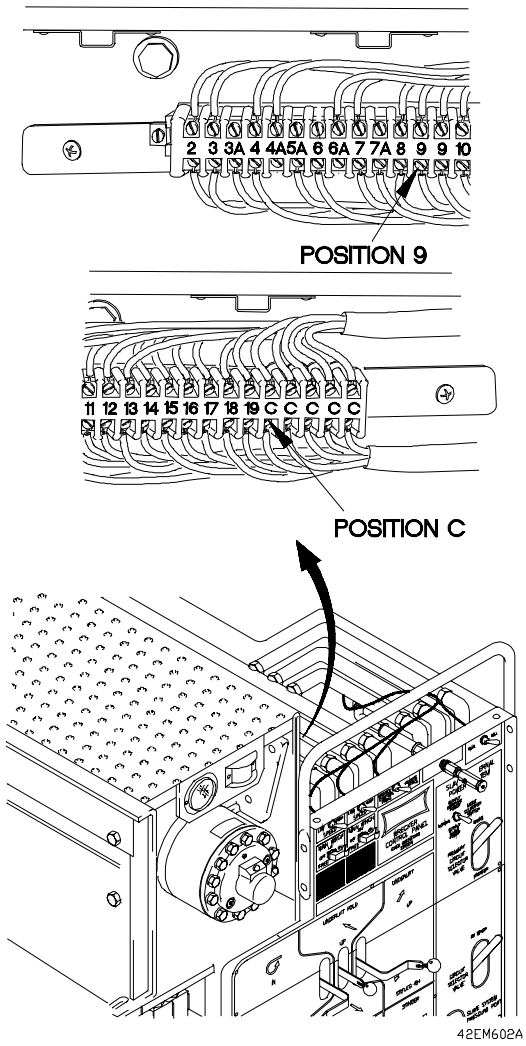


WARNING

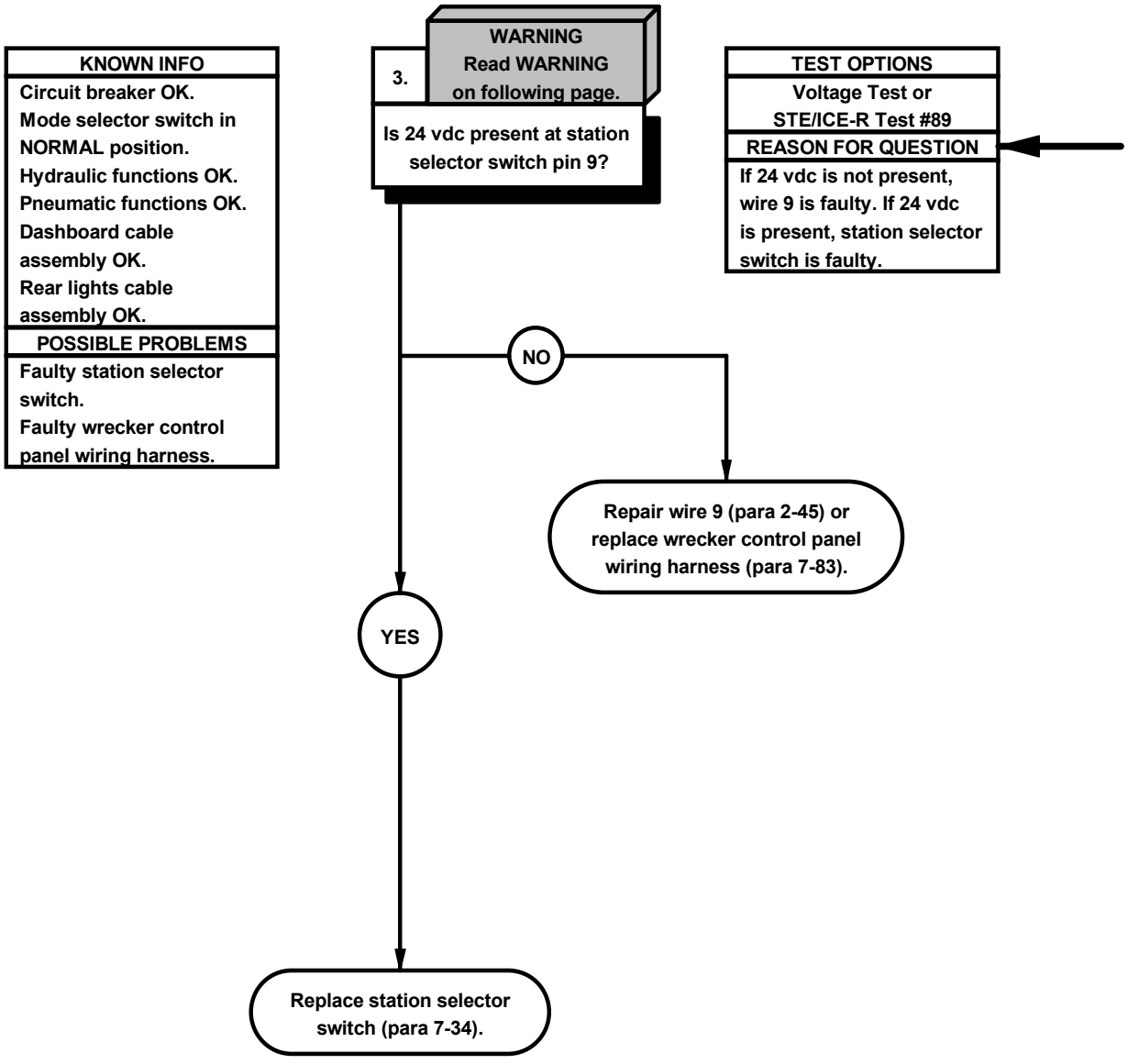
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

STATION SELECTOR SWITCH VOLTAGE TEST

(1) Set multimeter to volts dc.
(2) Connect positive (+) probe of multimeter to wrecker control panel terminal board position 9.
(3) Connect negative (-) probe of multimeter to wrecker control panel terminal board position C.
(4) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(5) If 24 vdc is not present, go to step 6 of this fault.
(6) Position master power switch to off (TM 9-2320-366-10-1).



e136. ALL M1089 CONTROL FUNCTIONS DO NOT OPERATE FROM WRECKER CONTROL PANEL AND WRECKER REMOTE CONTROL (CONT)

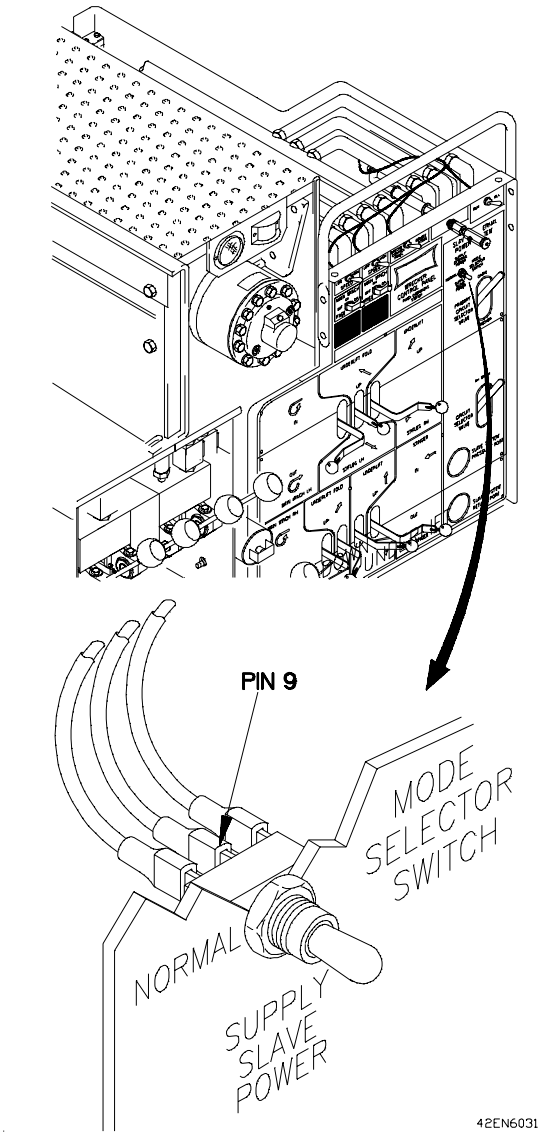


WARNING

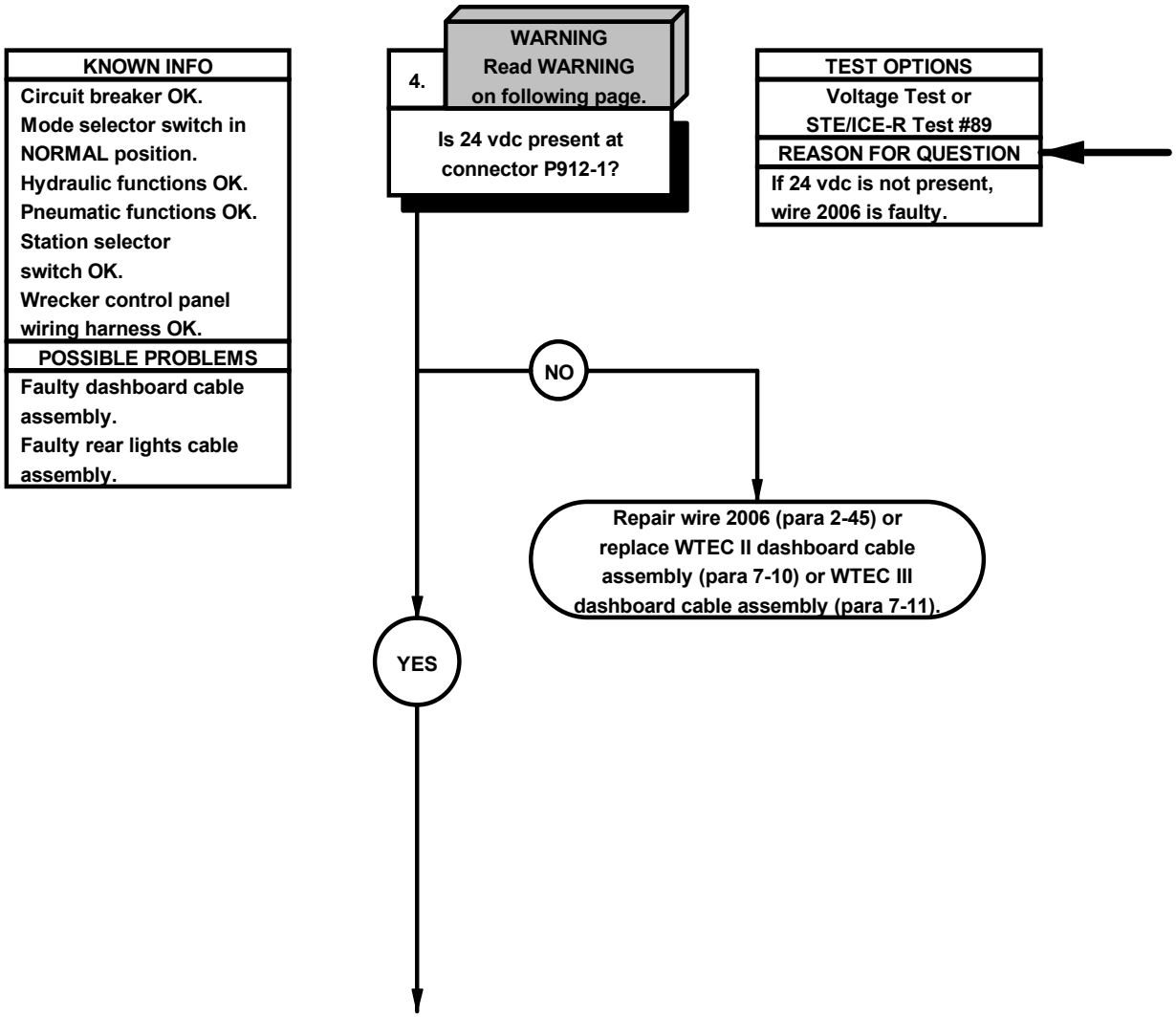
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

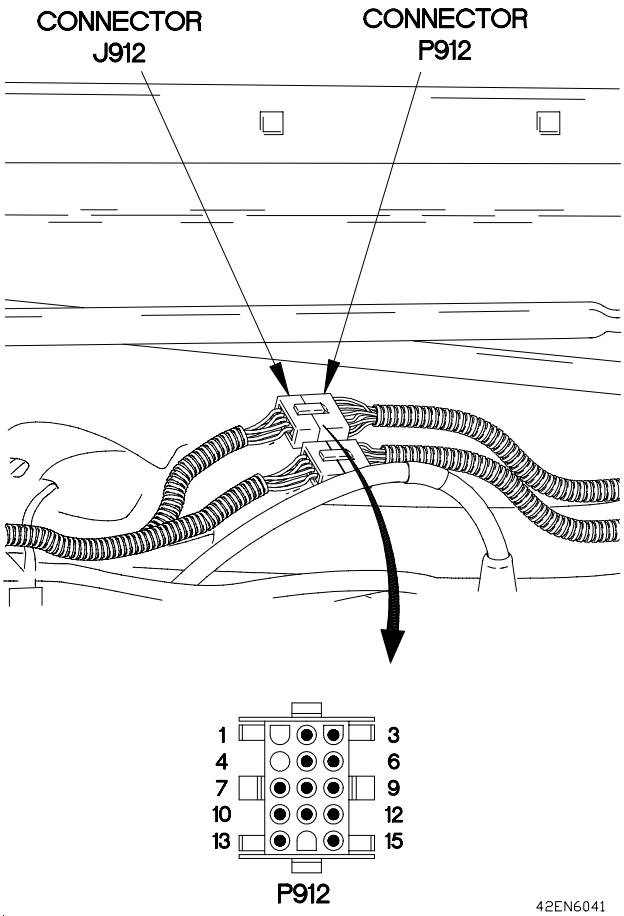
VOLTAGE TEST

(1) Set multimeter to volts dc.
(2) Connect positive (+) probe of multimeter to station selector switch center pin 9.
(3) Connect negative (-) probe of multimeter to ground.
(4) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(5) If 24 vdc is not present, repair wire 9 (para 2-45) or replace wrecker control panel wiring harness (para 7-83).
(6) If 24 vdc is present, replace station selector switch (para 7-34).
(7) Position master power switch to off (TM 9-2320-366-10-1).
(8) Install top control panel cover (para 17-20).



e136. ALL M1089 CONTROL FUNCTIONS DO NOT OPERATE FROM WRECKER CONTROL PANEL AND WRECKER REMOTE CONTROL (CONT)





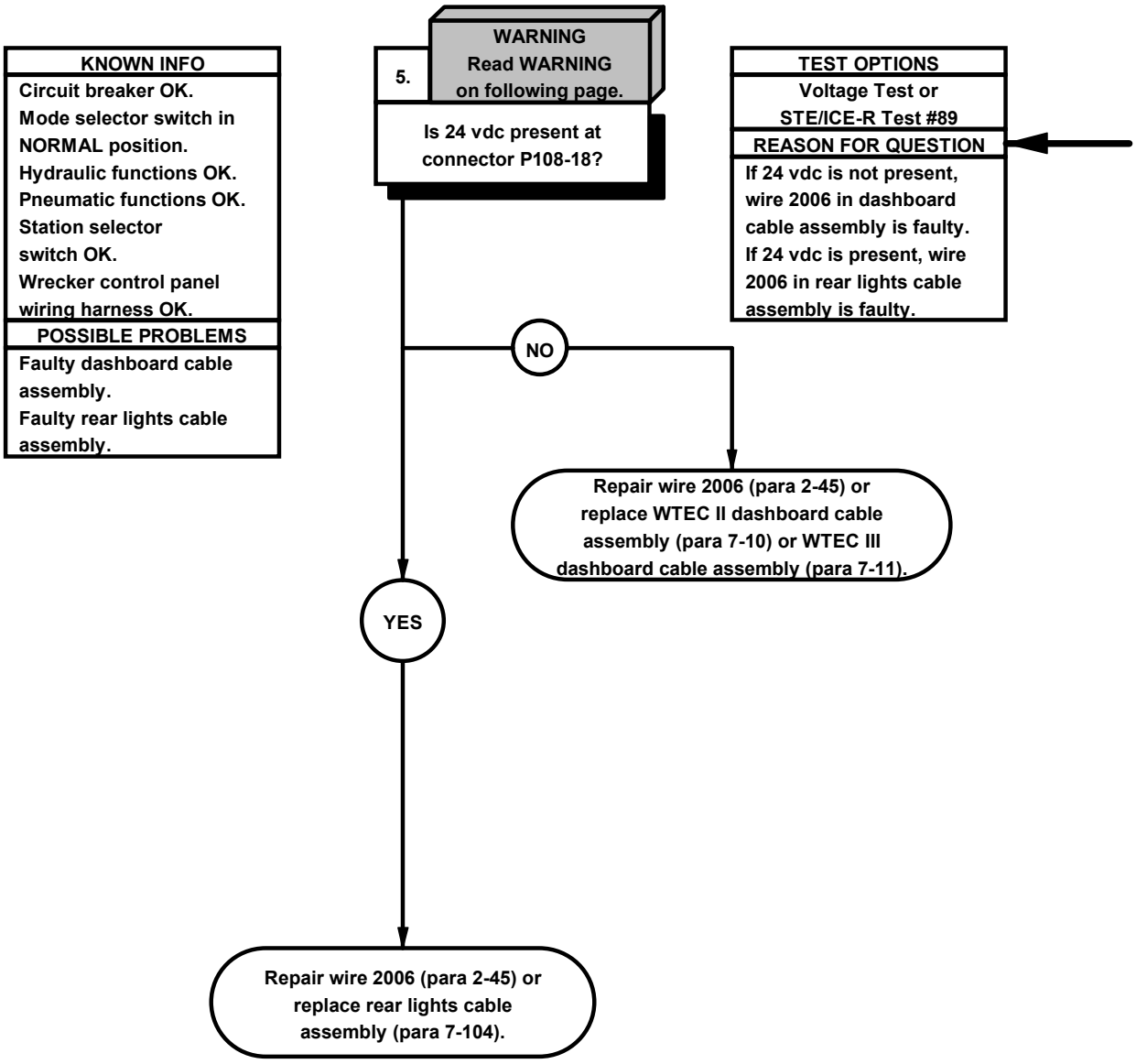
WARNING

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.

VOLTAGE TEST

(1) Remove personnel heater for access (para 18-9).
(2) Disconnect connector P912 from connector J912.
(3) Set multimeter to volts dc.
(4) Connect positive (+) probe of multimeter to connector P912-1.
(5) Connect negative (-) probe of multimeter to ground.
(6) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(7) If 24 vdc is not present, repair wire 2006 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(8) Position master power switch to off (TM 9-2320-366-10-1).
(9) Connect connector P912 to connector J912.

e136. ALL M1089 CONTROL FUNCTIONS DO NOT OPERATE FROM WRECKER CONTROL PANEL AND WRECKER REMOTE CONTROL (CONT)

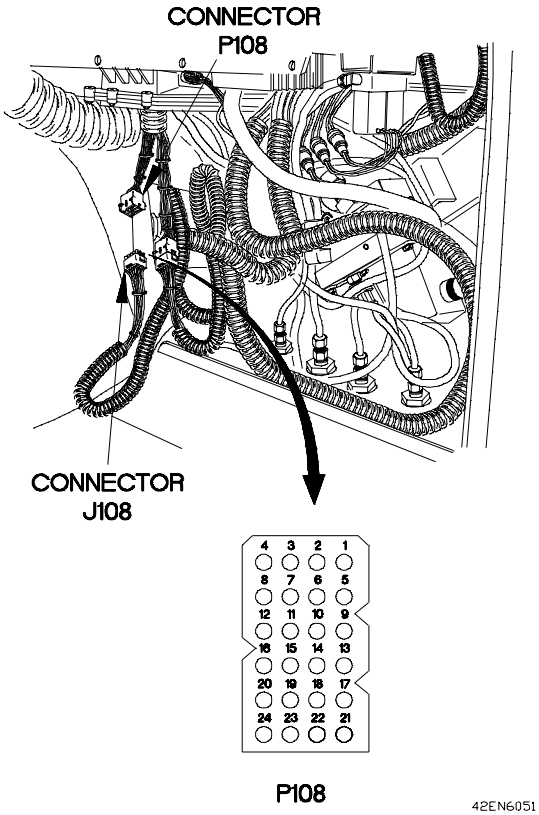


WARNING

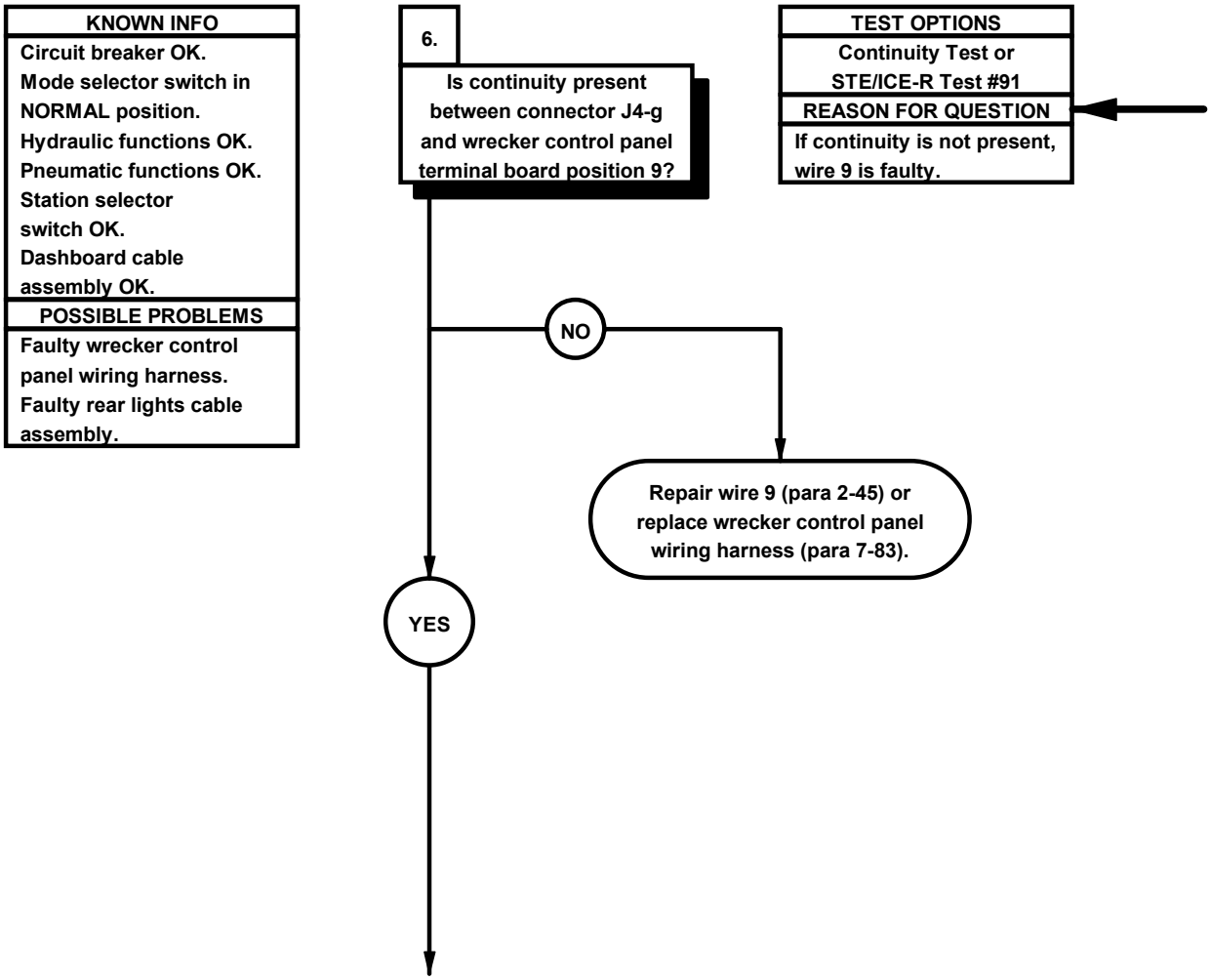
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

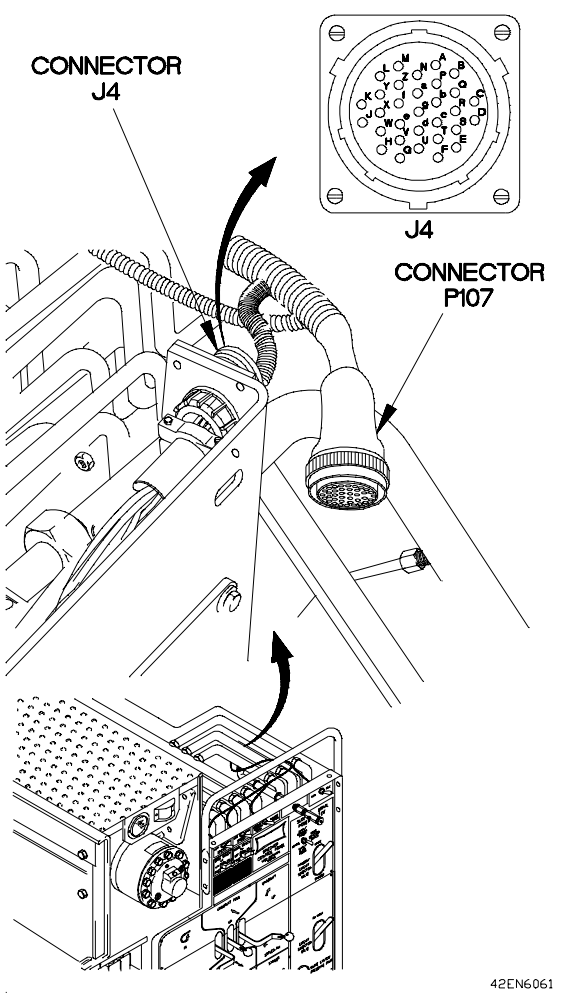
(1) Disconnect connector P108 from connector J108.
(2) Set multimeter to volts dc.
(3) Connect positive (+) probe of multimeter to connector P108-18.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(6) If 24 vdc is not present, repair wire 2006 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(7) If 24 vdc is present, repair wire 2006 (para 2-45) or replace rear lights cable assembly (para 7-104).
(8) Position master power switch to off (TM 9-2320-366-10-1).
(9) Connect connector P108 to connector J108.
(10) Install personnel heater (para 18-9).
(11) Install top control panel cover (para 17-20).



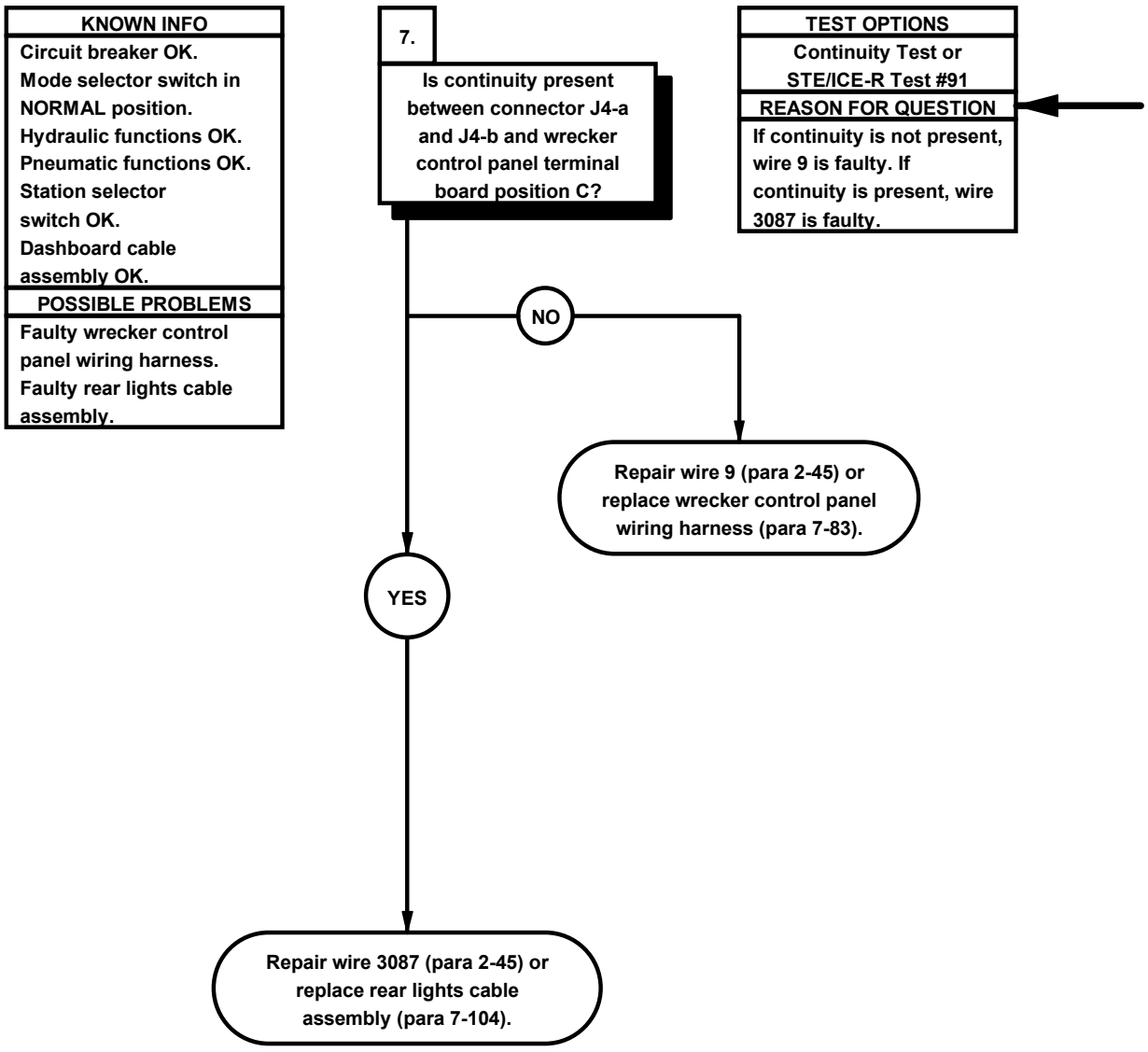
e136. ALL M1089 CONTROL FUNCTIONS DO NOT OPERATE FROM WRECKER CONTROL PANEL AND WRECKER REMOTE CONTROL (CONT)



CONTINUITY TEST
(1) Disconnect connector P107 from connector J4.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector J4-g.
(4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(5) If continuity is not present, repair wire 9 (para 2-45) or replace wrecker control panel wiring harness (para 7-83).

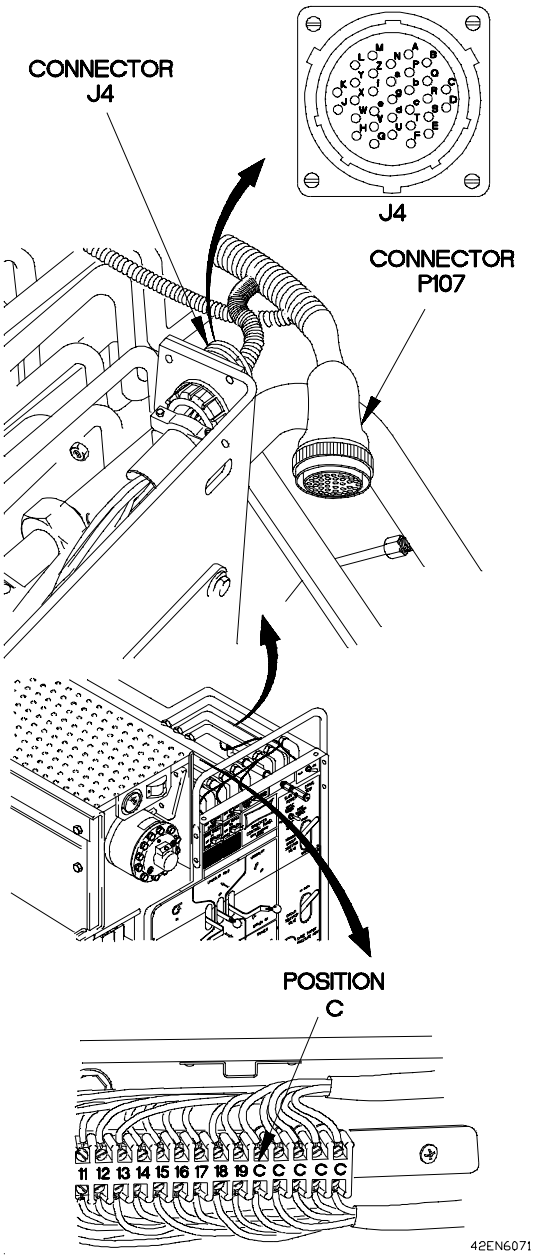


e136. ALL M1089 CONTROL FUNCTIONS DO NOT OPERATE FROM WRECKER CONTROL PANEL AND WRECKER REMOTE CONTROL (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector J4-a.
(3) Connect negative (-) probe of multimeter to wrecker control panel terminal board position C and note reading on multimeter.
(4) Connect positive (+) probe of multimeter to connector J4-b.
(5) Connect negative (-) probe of multimeter to wrecker control panel terminal board position C and note reading on multimeter.
(6) If continuity is not present at connector J4-a and/or J4-b, repair wire 9 (para 2-45) or replace wrecker control panel wiring harness (para 7-83).
(7) If continuity is present, repair wire 3087 (para 2-45) or replace rear lights cable assembly (para 7-104).
(8) Connect connector P107 to connector J4.
(9) Install top control panel cover (para 17-20).



e137. ALL WRECKER FUNCTIONS DO NOT OPERATE FROM WRECKER REMOTE CONTROL

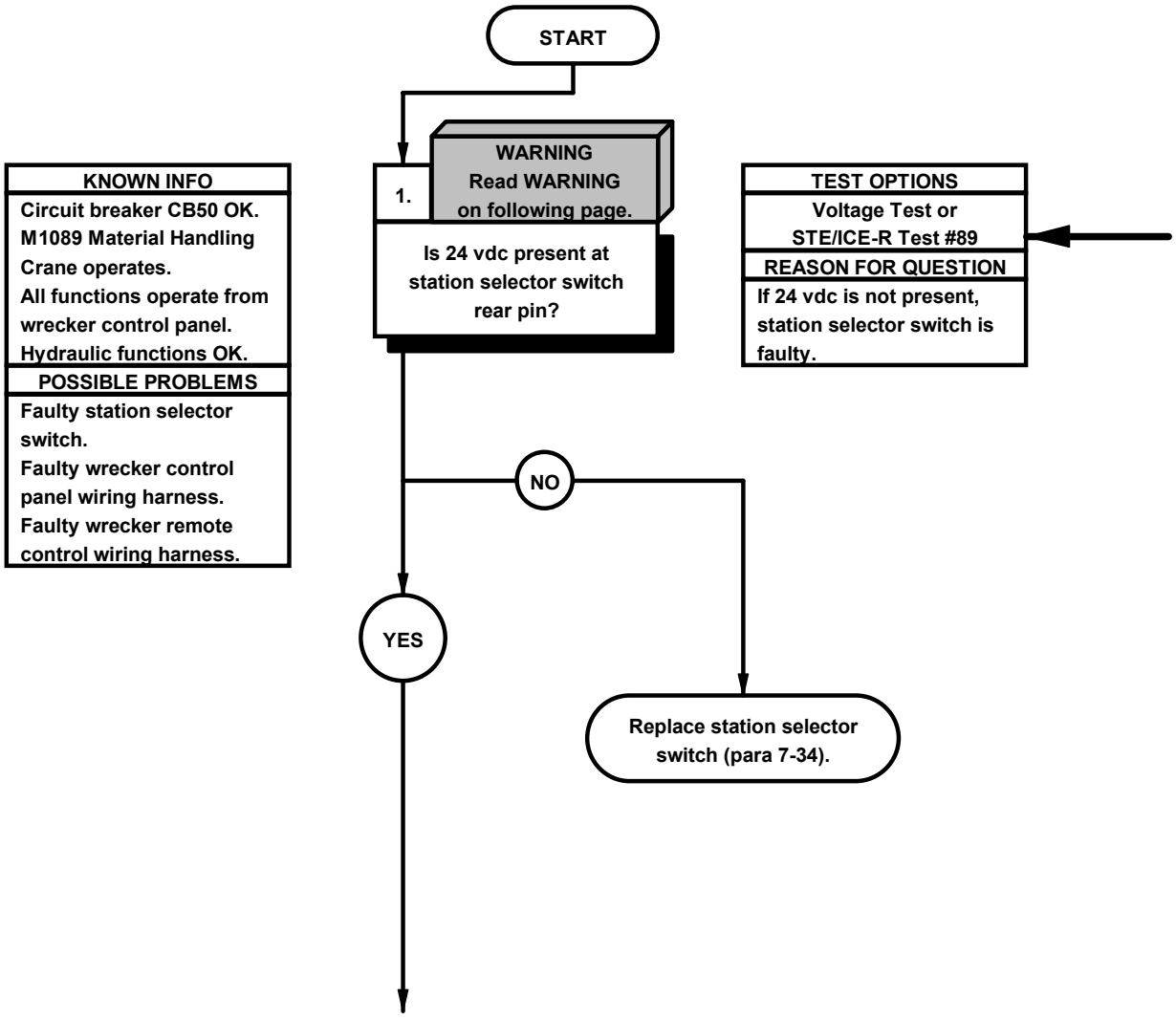
INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Top control panel cover removed (para 17-20).

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

References
TM 9-4910-571-12&P

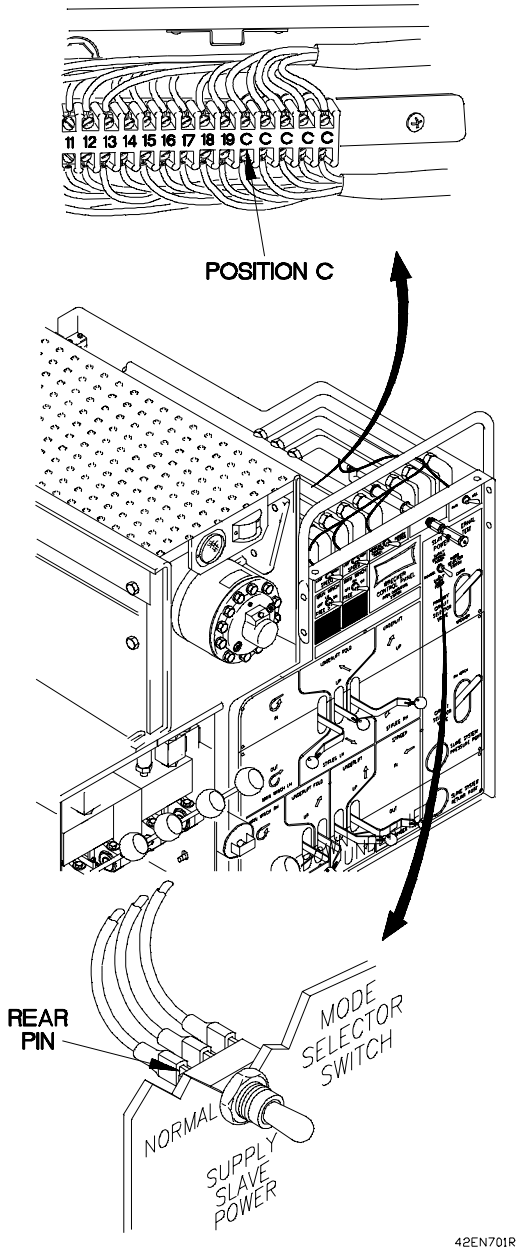


WARNING

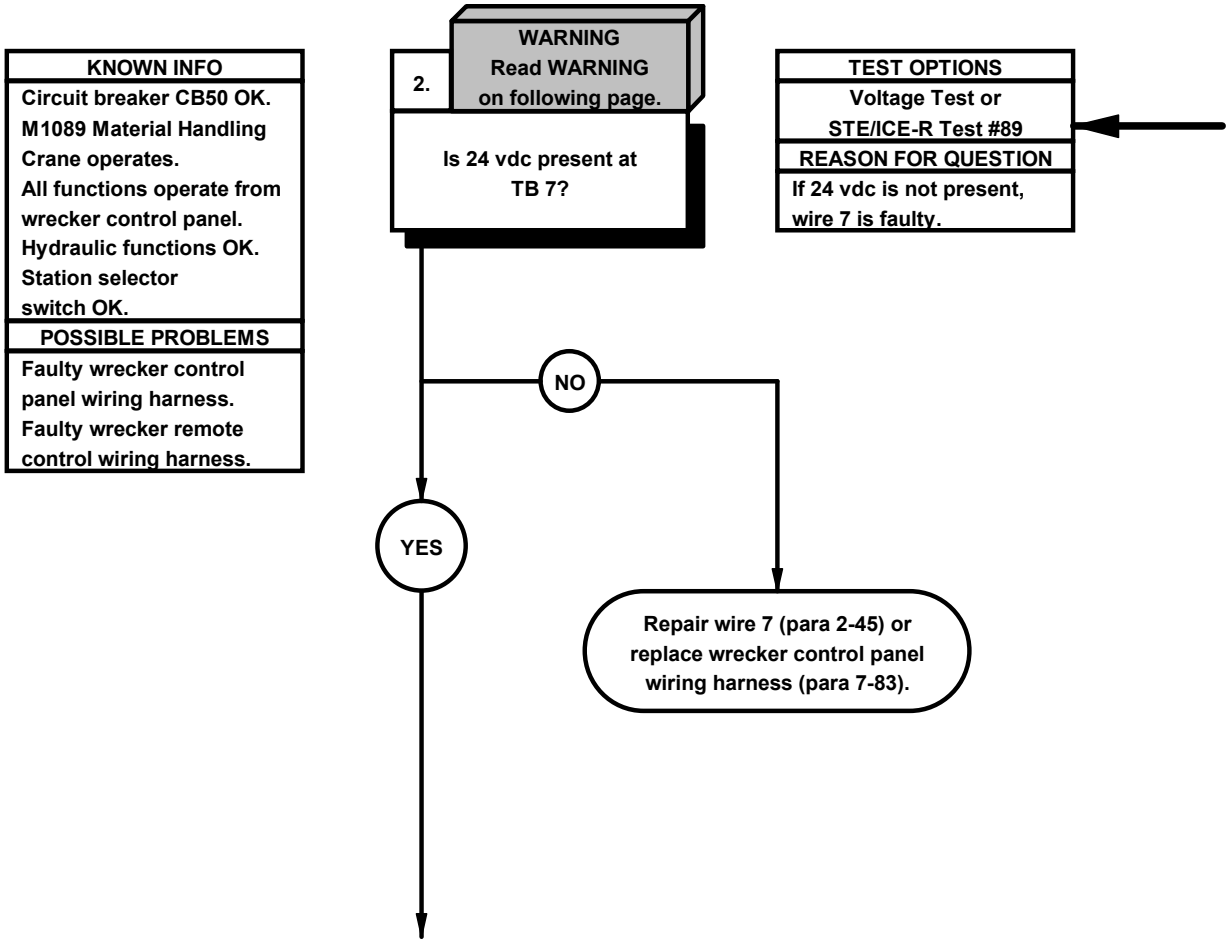
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Set multimeter to vdc.
(2) Connect positive (+) probe of multimeter to station selector switch rear pin.
(3) Connect negative (-) probe of multimeter to wrecker control panel terminal board position C.
(4) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(5) If 24 vdc is not present, replace station selector switch (para 7-34).
(6) Position master power switch to off (TM 9-2320-366-10-1).



e137. ALL WRECKER FUNCTIONS DO NOT OPERATE FROM WRECKER REMOTE CONTROL (CONT)

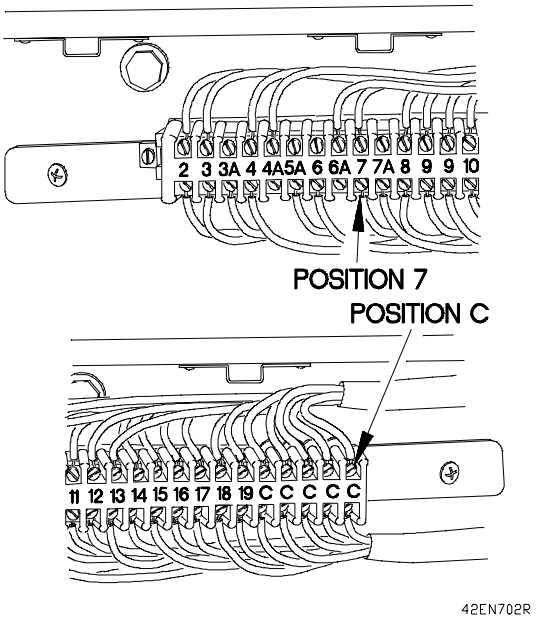


WARNING

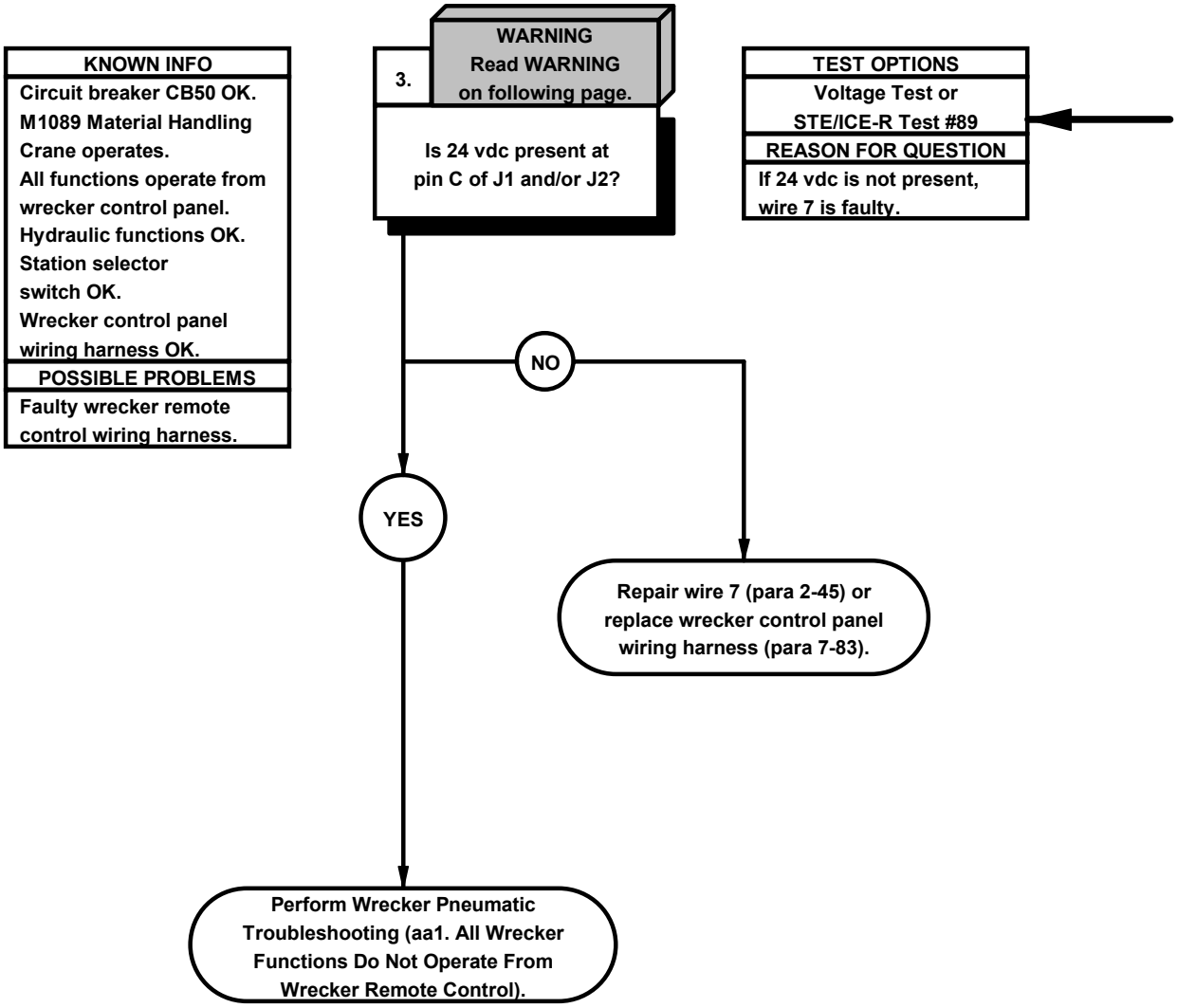
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Set multimeter to vdc.
(2) Connect positive (+) probe of multimeter to wrecker control panel terminal board position 7.
(3) Connect negative (-) probe of multimeter to wrecker control panel terminal board position C.
(4) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(5) If 24 vdc is not present, repair wire 7 (para 2-45), or replace wrecker control panel wiring harness (para 7-83).
(6) Position master power switch to off (TM 9-2320-366-10-1).
(7) Install wrecker control panel top cover (para 17-20).



e137. ALL WRECKER FUNCTIONS DO NOT OPERATE FROM WRECKER REMOTE CONTROL (CONT)

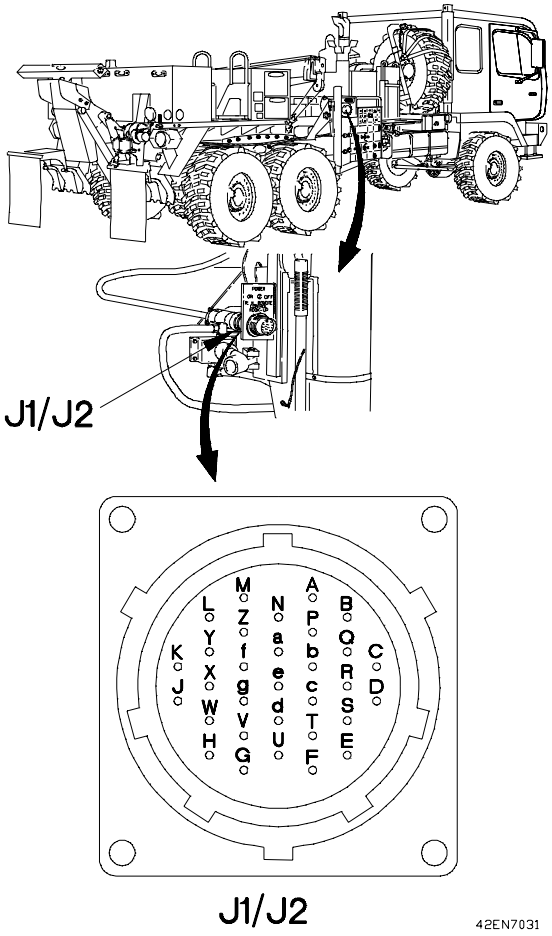


WARNING

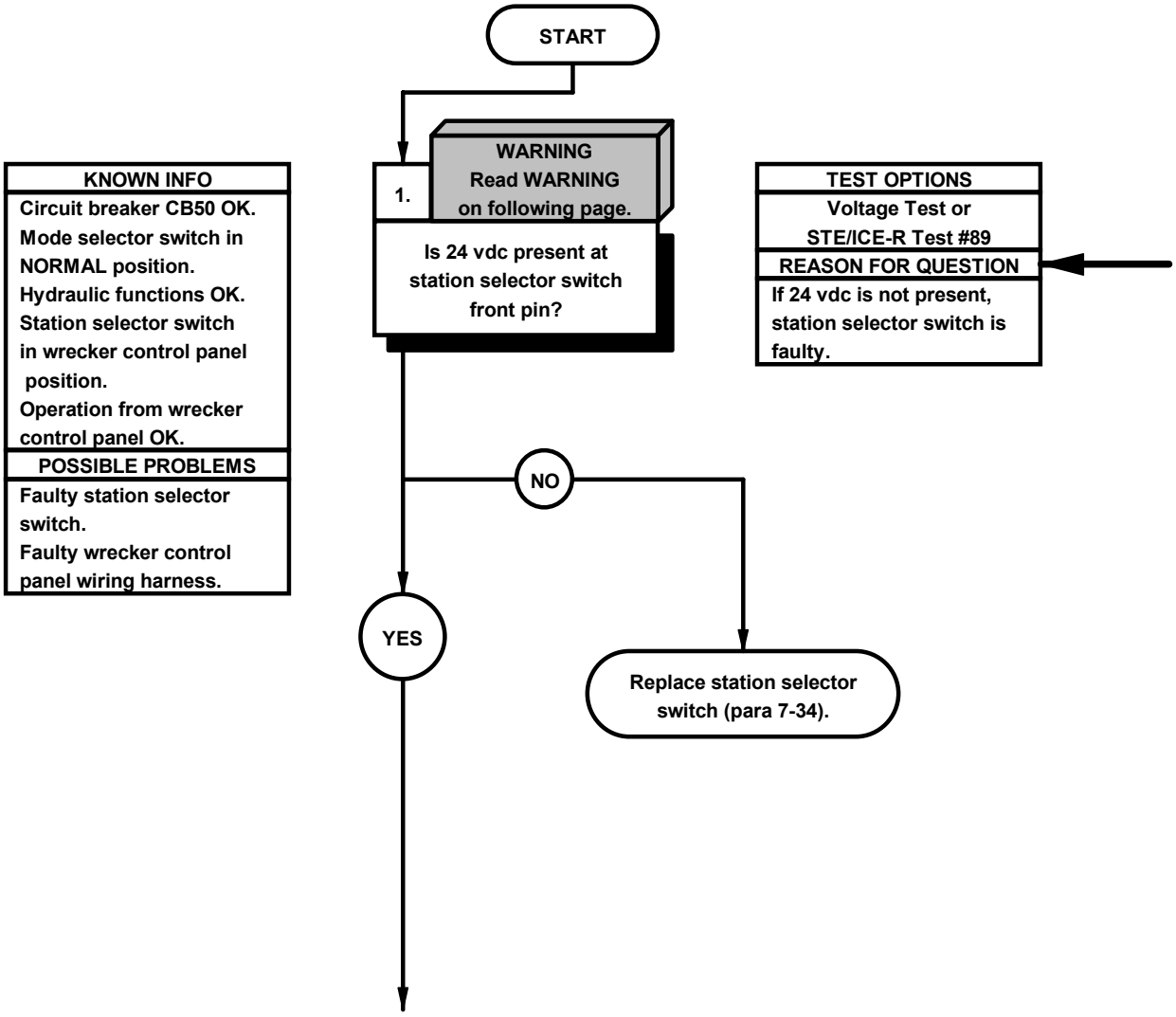
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Set multimeter to vdc.
(2) Position station selector switch to REMOTE CONTROL (TM 9-2320-366-10-1).
(3) Connect positive (+) probe of multimeter to pin C of connector J1 and/or J2.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(5) If 24 vdc is not present, repair wire 7 (para 2-45), or replace wrecker control panel wiring harness (para 7-83).
(6) If 24 vdc is present, perform Wrecker Pneumatic Troubleshooting (aa1. All Wrecker Functions Do Not Operate From Wrecker Remote Control).
(7) Position master power switch to off (TM 9-2320-366-10-1).



e138. ALL WRECKER FUNCTIONS DO NOT OPERATE FROM WRECKER CONTROL PANEL	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1). Wrecker control panel top cover removed (para 17-20).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/ICE-R (Item 41, Appendix C)
Personnel Required (2)	References TM 9-4910-571-12&P

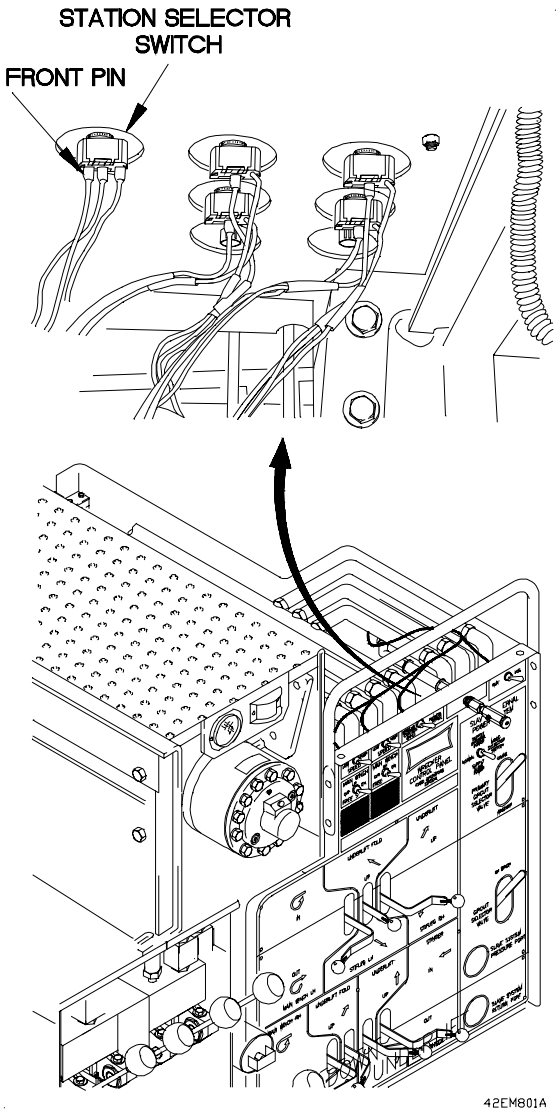


WARNING

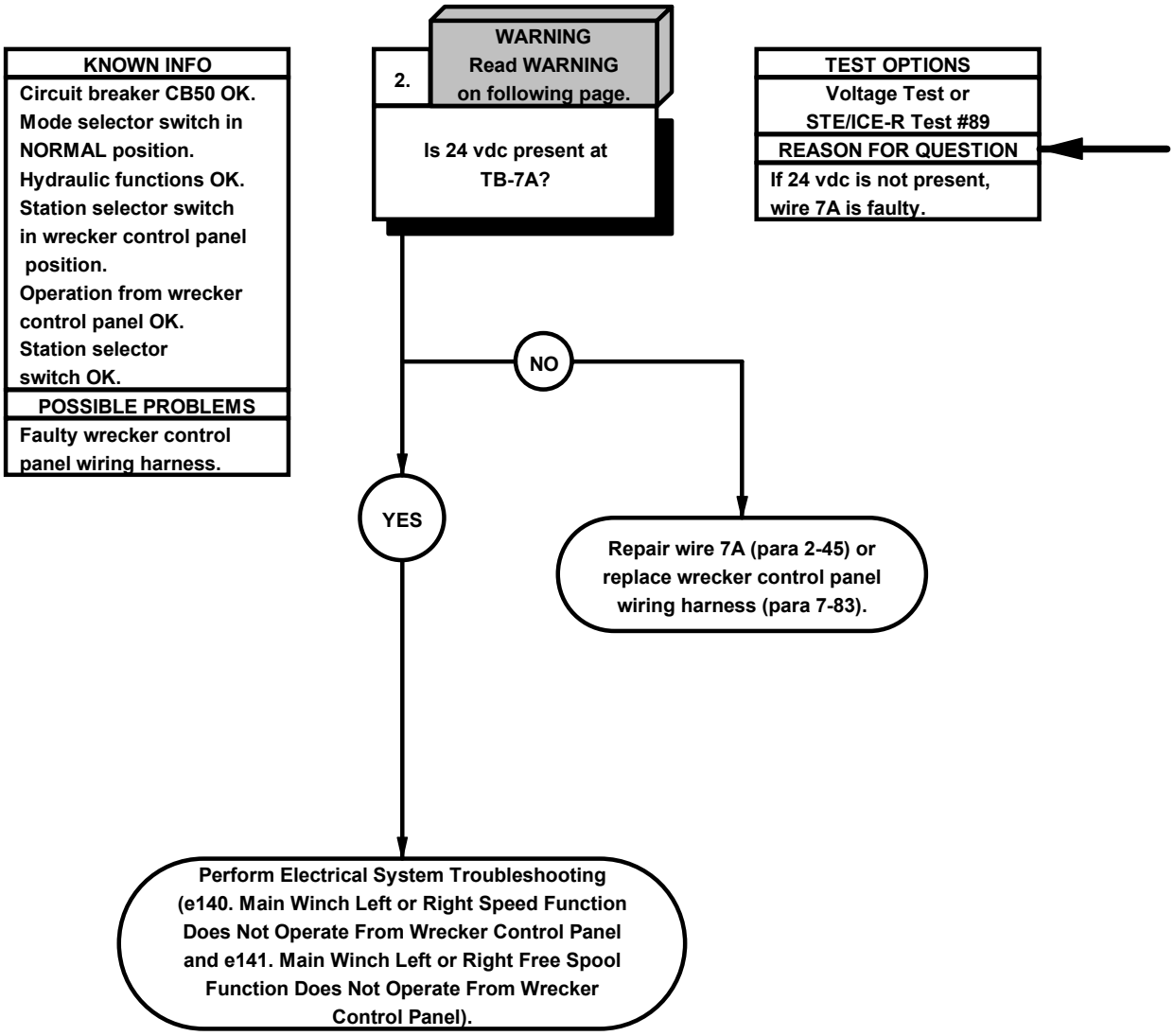
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Set multimeter to volts dc.
(2) Connect positive (+) probe of multimeter to station selector switch front pin.
(3) Connect negative (-) probe of multimeter to ground.
(4) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(5) If 24 vdc is not present, replace station selector switch (para 7-34).
(6) Position master power switch to off (TM 9-2320-366-10-1).



e138. ALL WRECKER FUNCTIONS DO NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)

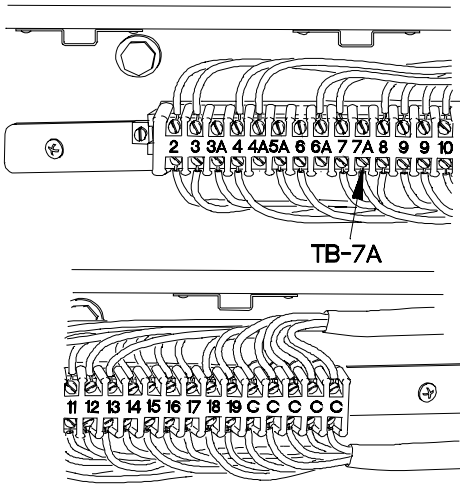


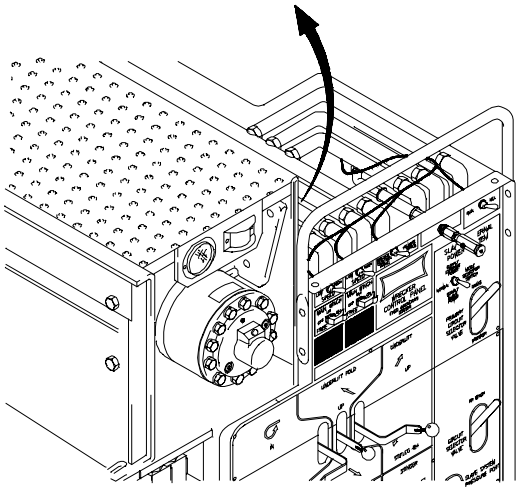
WARNING

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.

VOLTAGE TEST

(1) Set multimeter to volts dc.
(2) Connect positive (+) probe of multimeter to TB-7A.
(3) Connect negative (-) probe of multimeter to ground.
(4) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(5) If 24 vdc is not present, repair wire 7A (para 2-45) or replace wrecker control panel wiring harness (para 7-83).
(6) If 24 vdc is present, perform Electrical System Troubleshooting (e140. Main Winch Left or Right Speed Function Does Not Operate From Wrecker Control Panel or e141. Main Winch Left or Right Free Spool Function Does Not Operate From Wrecker Control Panel).
(7) Position master power switch to off (TM 9-2320-366-10-1).
(8) Install wrecker control panel top cover (para 17-20).





e138A. M1089 LH OR RH 30K WINCH DOES NOT PAY-IN

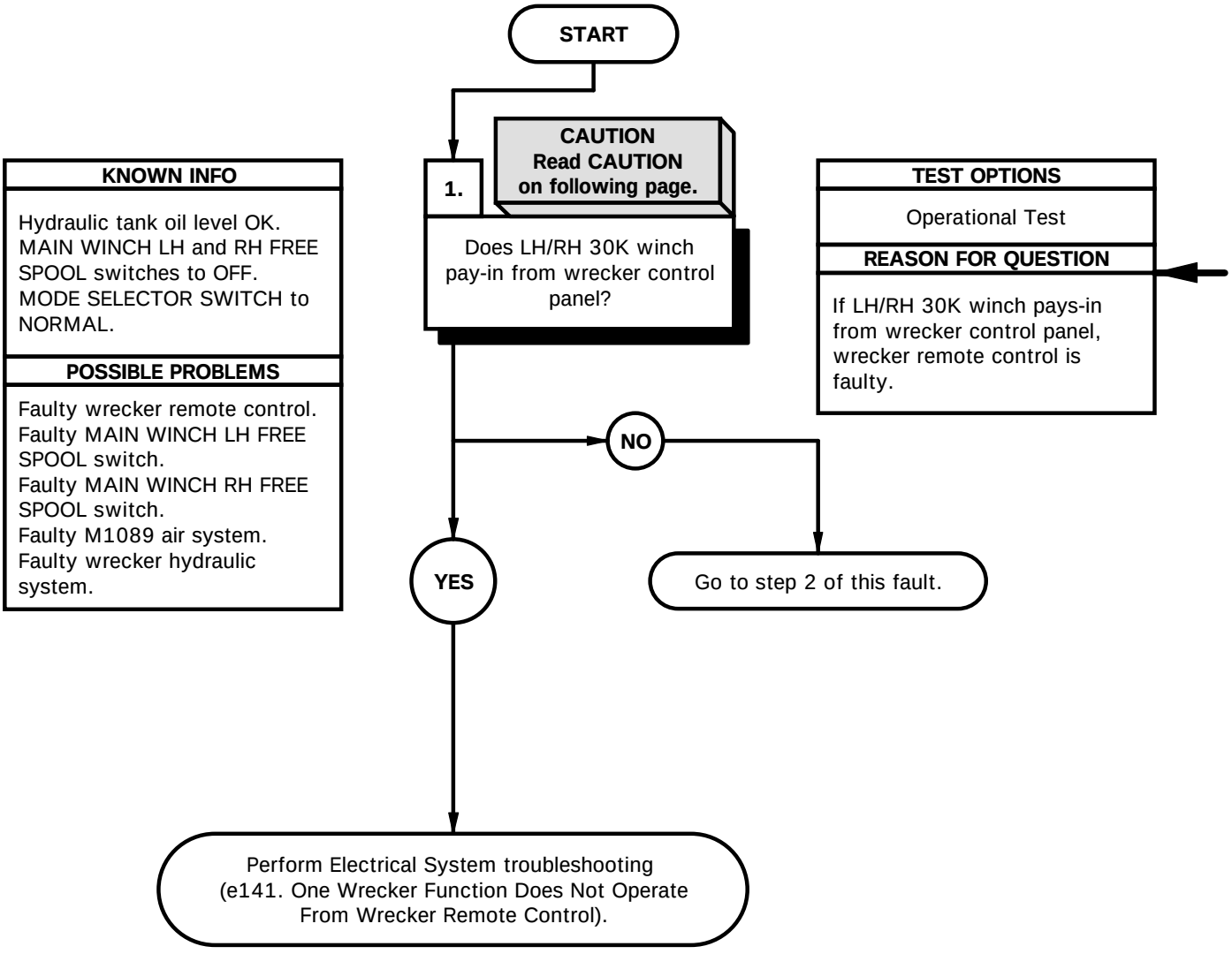
INITIAL SETUP

Equipment Conditions
Engine shut down (TM 902320-366-10-1).

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

References
TM 9-4910-571-12&P



OPERATIONAL TEST

(1) Start engine (TM 9-2320-366-10-1).
(2) Position PTO switch to on.

CAUTION

Keep tachometer within 1,250-1,450 rpm when Power Take-Off (PTO) is engaged. Do not exceed 1,450 rpm. Failure to comply may result in damage to equipment.

NOTE

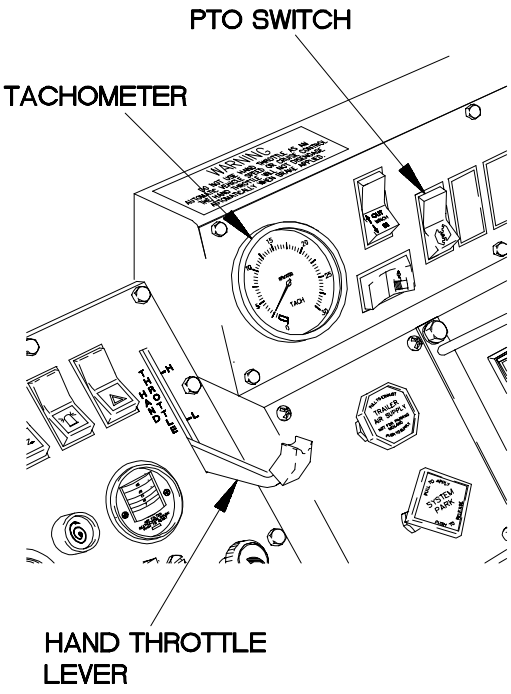
In the event of a tachometer failure a HAND THROTTLE lever positioned to L is approximately 1,250-1,450 rpm.

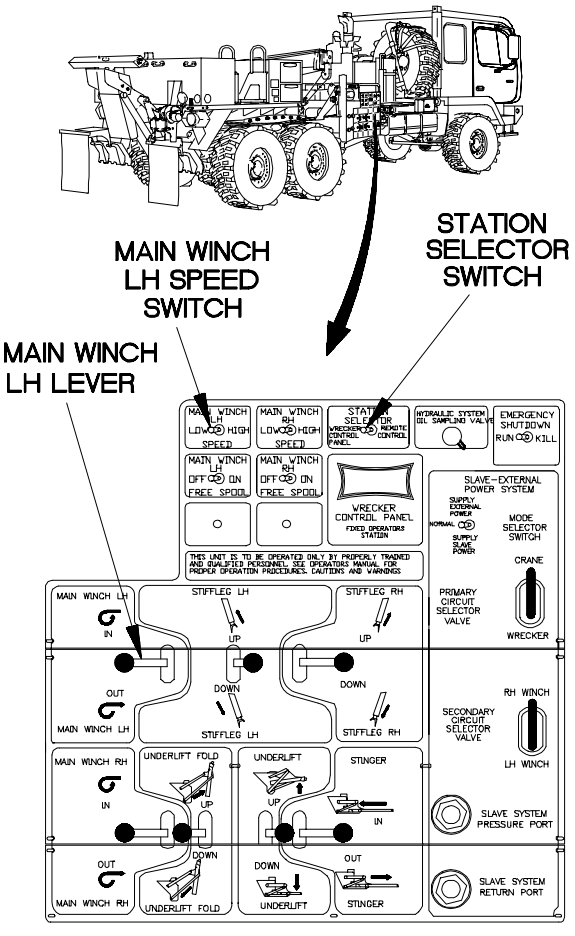
(3) Set engine speed by increasing HAND THROTTLE lever until tachometer reads 1,250-1,450 rpm.
(4) Position STATION SELECTOR switch to WRECKER CONTROL PANEL.

NOTE

The LH and RH 30K winches are operated the same way. LH shown.

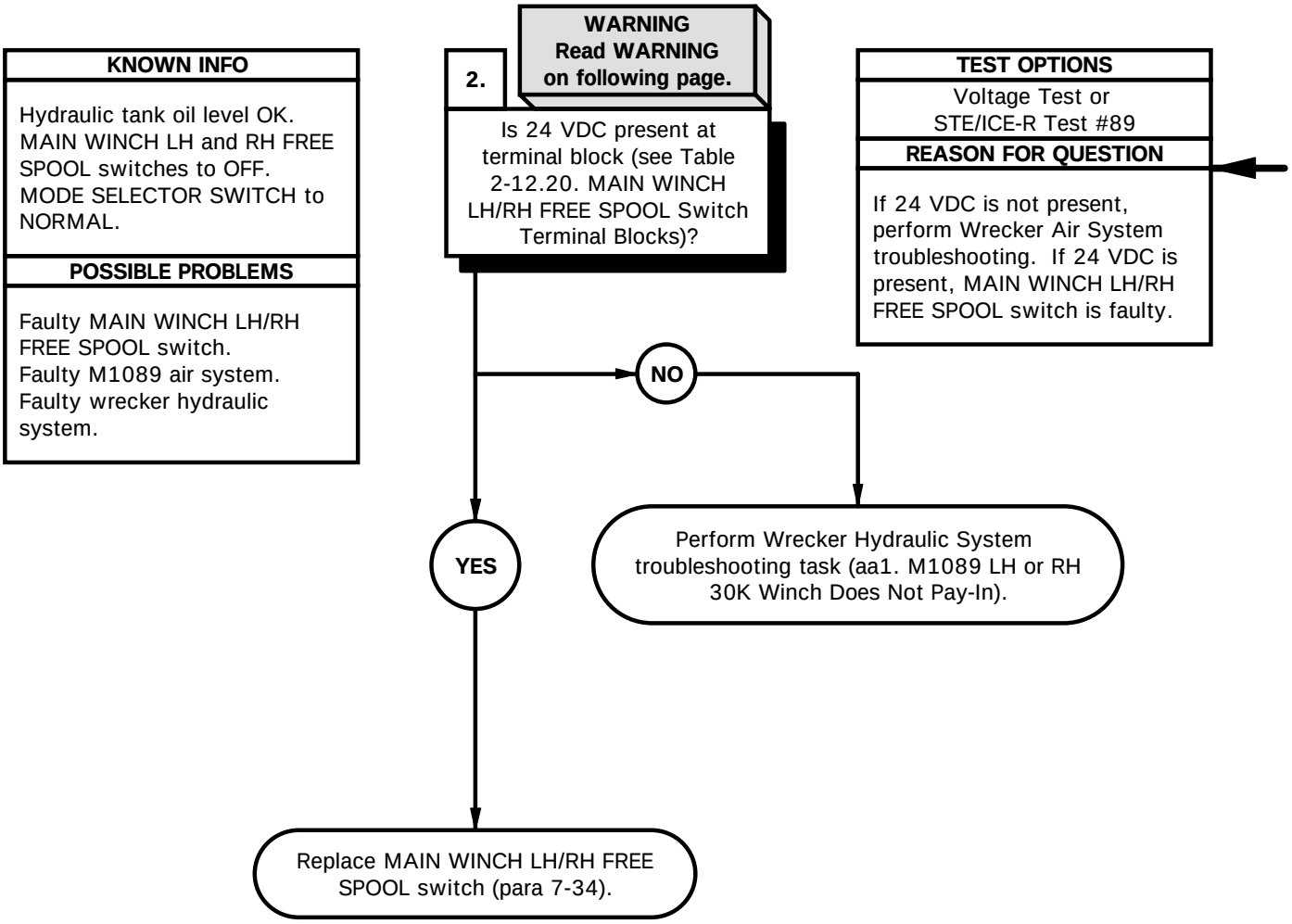
(5) Position MAIN WINCH LH SPEED switch to LOW.
(6) Position MAIN WINCH LH lever to IN until cable is fully recovered.
(7) If LH 30K winch does not pay-in, go to step 2 of this fault.
(8) If LH 30K winch does pay-in, perform Electrical System Troubleshooting task e141. One Wrecker Function Does Not Operate From Wrecker Remote Control.
(9) Set engine speed to idle (750 rpm) by decreasing HAND THROTTLE lever to full down position.
(10) Position PTO to off.
(11) Shut down engine (TM 9-2320-366-10-1).





X2EN8A1B

e138A. M1089 LH OR RH 30K WINCH DOES NOT PAY-IN (CONT)



WARNING

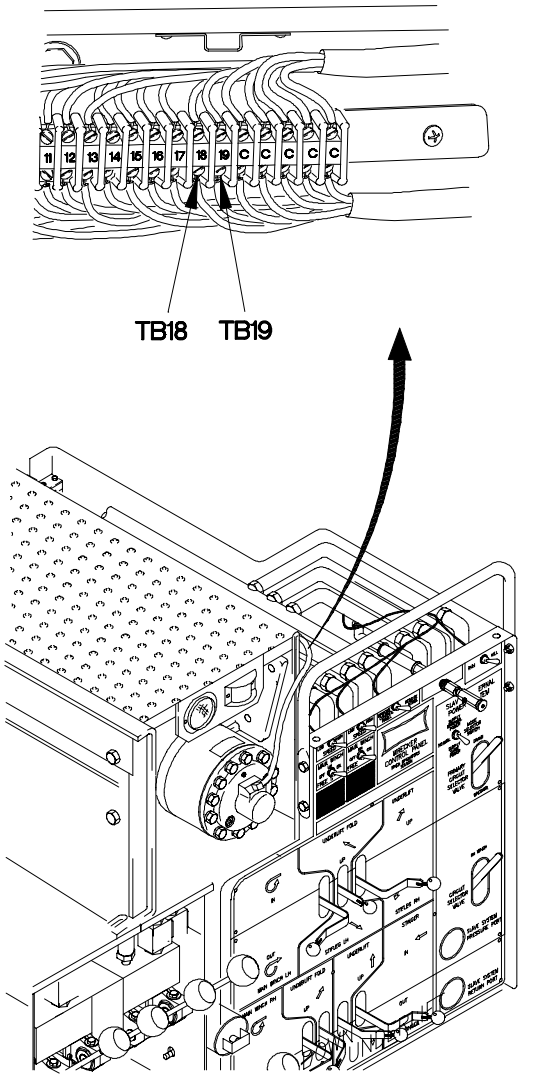
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Remove M1089 control panel top cover (para 14-4).
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to terminal block (see Table 2-12.20. MAIN WINCH LH/RH FREE SPOOL Switch Terminal Blocks).
(4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(5) If 24 VDC is not present, perform Wrecker Air System Troubleshooting task aa1. M1089 LH or Rh 30K Winch Does Not Pay-In.
(6) If 24 VDC is present, replace MAIN WINCH LH/RH FREE SPOOL switch (para 7-34).
(7) Install M1089 control panel top cover (para 14-4).

Table 2-12.20. MAIN WINCH LH/RH FREE SPOOL Switch Terminal Blocks

Side	Terminal Block
LH	TB19
RH	TB18



X2EN8A3B

e139. MAIN WINCH LH OR RH SPEED SWITCH DOES NOT OPERATE FROM WRECKER CONTROL PANEL

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Wrecker control panel top cover removed (para 14-4).

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

References
TM 9-4910-571-12&P

NOTE

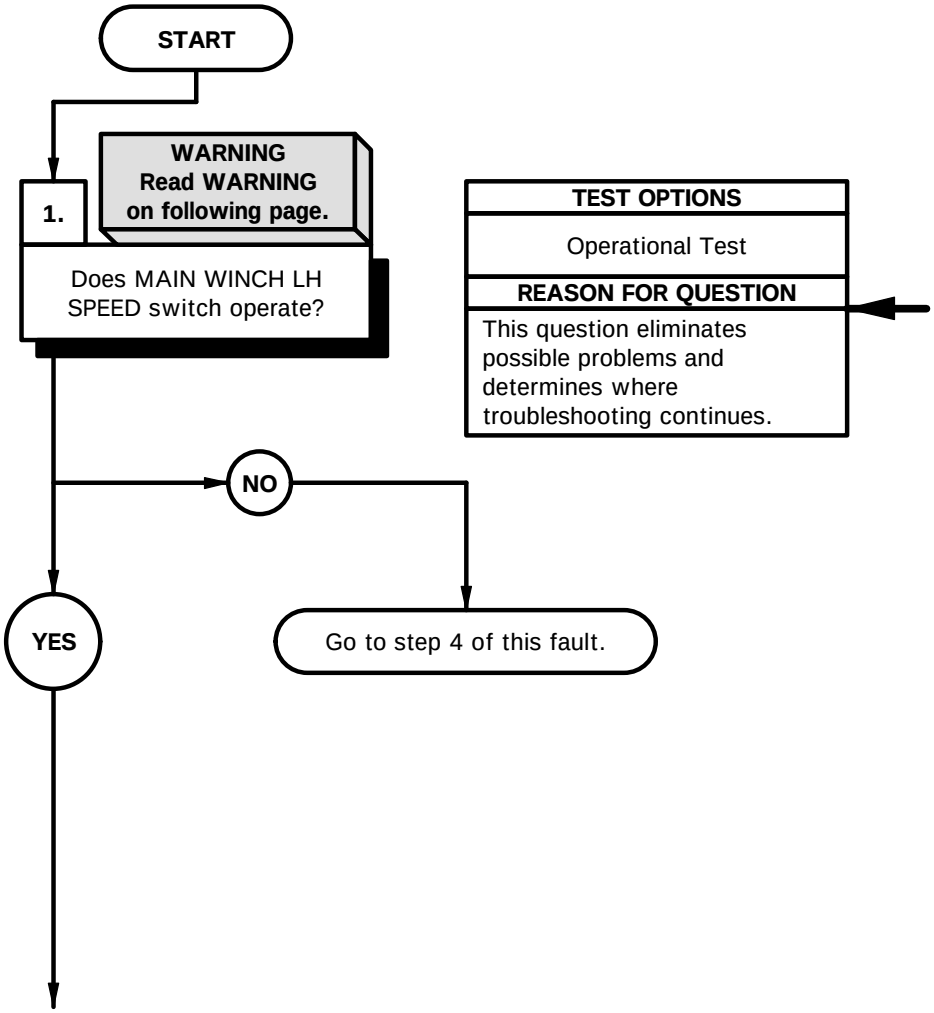
Perform Electrical System Troubleshooting task e1. Circuit Breaker Does Not Operate on circuit breaker CB50 prior to beginning this task.

KNOWN INFO

LH and RH winches operate from wrecker control panel.
Circuit breaker CB50 OK.
STATION SELECTOR switch to WRECKER CONTROL PANEL.
MODE SELECTOR SWITCH to NORMAL.

POSSIBLE PROBLEMS

Faulty STATION SELECTOR switch.
Faulty MAIN WINCH LH SPEED switch.
Faulty MAIN WINCH RH SPEED switch.
Faulty M1089 control panel wiring harness.
Faulty M1089 30K winch control wiring harness.
Faulty M1089 control panel power cable assembly.
Faulty M1089 rear lights cable assembly.
Faulty auxiliary panel cable assembly.
Faulty dashboard cable assembly.
Faulty jumper wire.
Faulty wrecker hydraulic system.



TEST OPTIONS

Operational Test

REASON FOR QUESTION

This question eliminates possible problems and determines where troubleshooting continues.

WARNING

Goggles must be worn while operating wrecker control panel. Blowing dust and debris may become airborne while engine is running. Failure to comply may result in injury to personnel.

OPERATIONAL TEST

(1) Start engine (TM 9-2320-366-10-1).
(2) Position PTO switch to on.

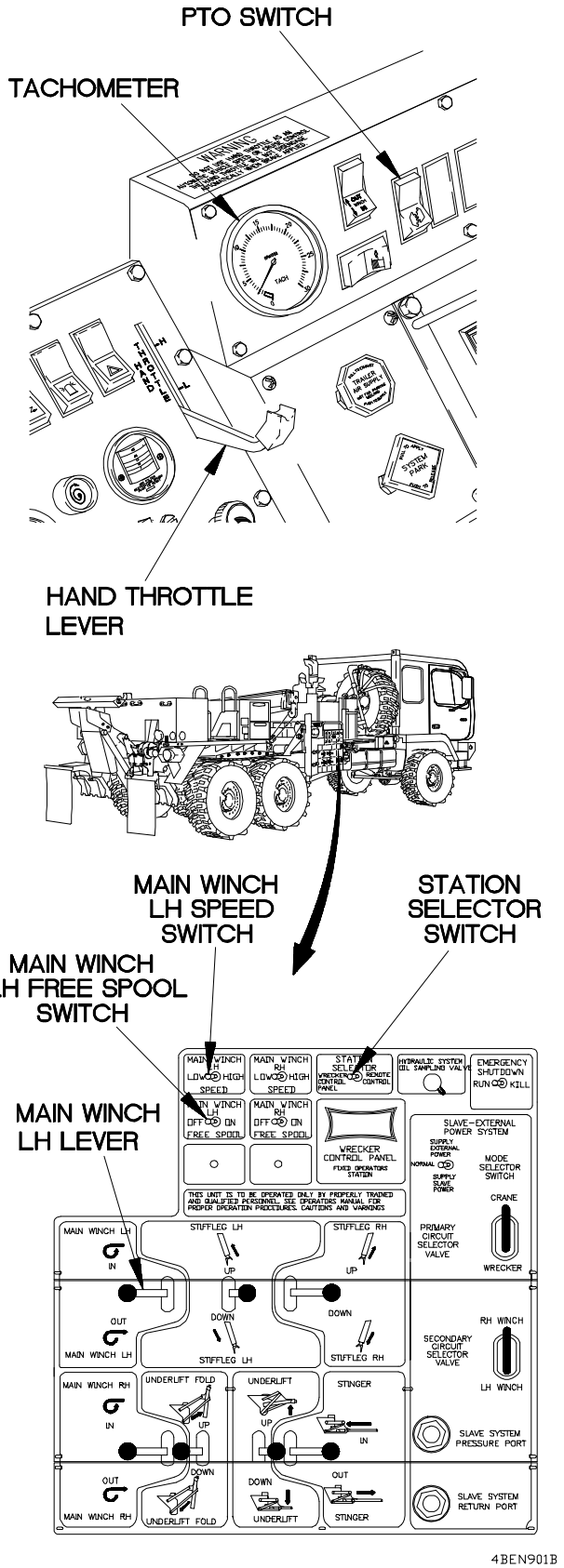
CAUTION

Keep tachometer within 1,250-1,450 rpm when Power Take-Off (PTO) is engaged. Do not exceed 1,450 rpm. Failure to comply may result in damage to equipment.

NOTE

In the event of a tachometer failure a HAND THROTTLE lever positioned to L is approximately 1,250-1,450 rpm.

(3) Set engine speed by increasing HAND THROTTLE lever until tachometer reads 1,250-1,450 rpm.
(4) Position MAIN WINCH LH SPEED switch to LOW.
(5) Position MAIN WINCH LH FREE SPOOL switch to OFF.
(6) Position MAIN WINCH LH lever to OUT until the first five wraps of cable have pay-out.
(7) Position MAIN WINCH LH SPEED switch to HIGH.
(8) Position MAIN WINCH LH lever to OUT and note speed of winch.
(9) If LH 30K winch does not operate at high speed, go to step 4 of this fault.



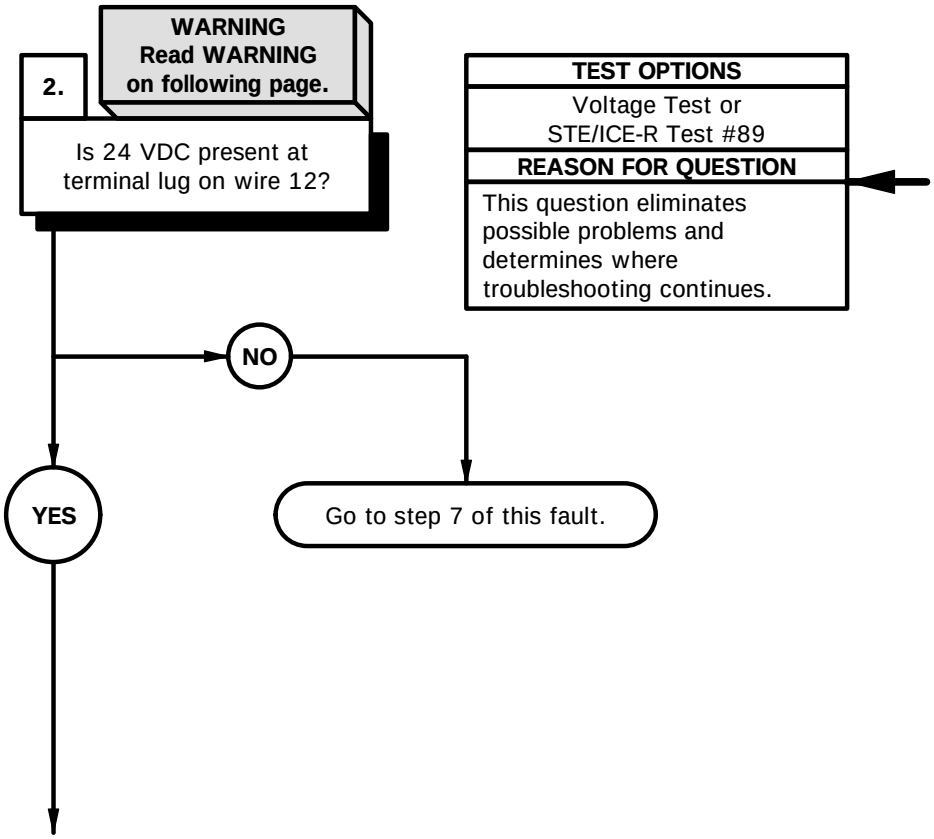
e139. MAIN WINCH LH OR RH SPEED SWITCH DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)

KNOWN INFO

LH and RH winches operate from wrecker control panel.
Circuit breaker CB50 OK.
STATION SELECTOR switch to WRECKER CONTROL PANEL.
MODE SELECTOR SWITCH to NORMAL.
STATION SELECTOR switch OK.
MAIN WINCH LH SPEED switch OK.
M1089 control panel power cable assembly OK.
M1089 rear lights cable assembly.
Auxiliary panel cable assembly OK.
Dashboard cable assembly OK.

POSSIBLE PROBLEMS

Faulty MAIN WINCH RH SPEED switch.
Faulty M1089 control panel wiring harness.
Faulty M1089 30K winch control wiring harness.
Faulty jumper wire.
Faulty wrecker hydraulic system.



TEST OPTIONS

Voltage Test or STE/ICE-R Test #89

REASON FOR QUESTION

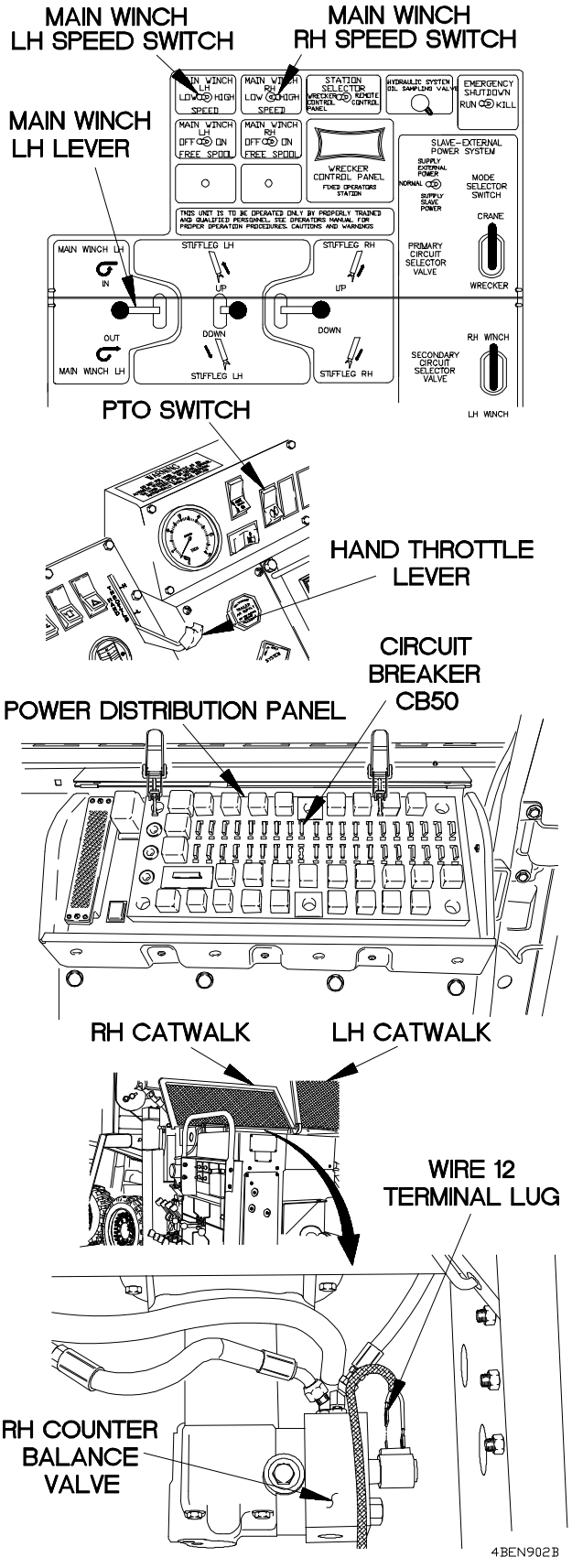
This question eliminates possible problems and determines where troubleshooting continues.

WARNING

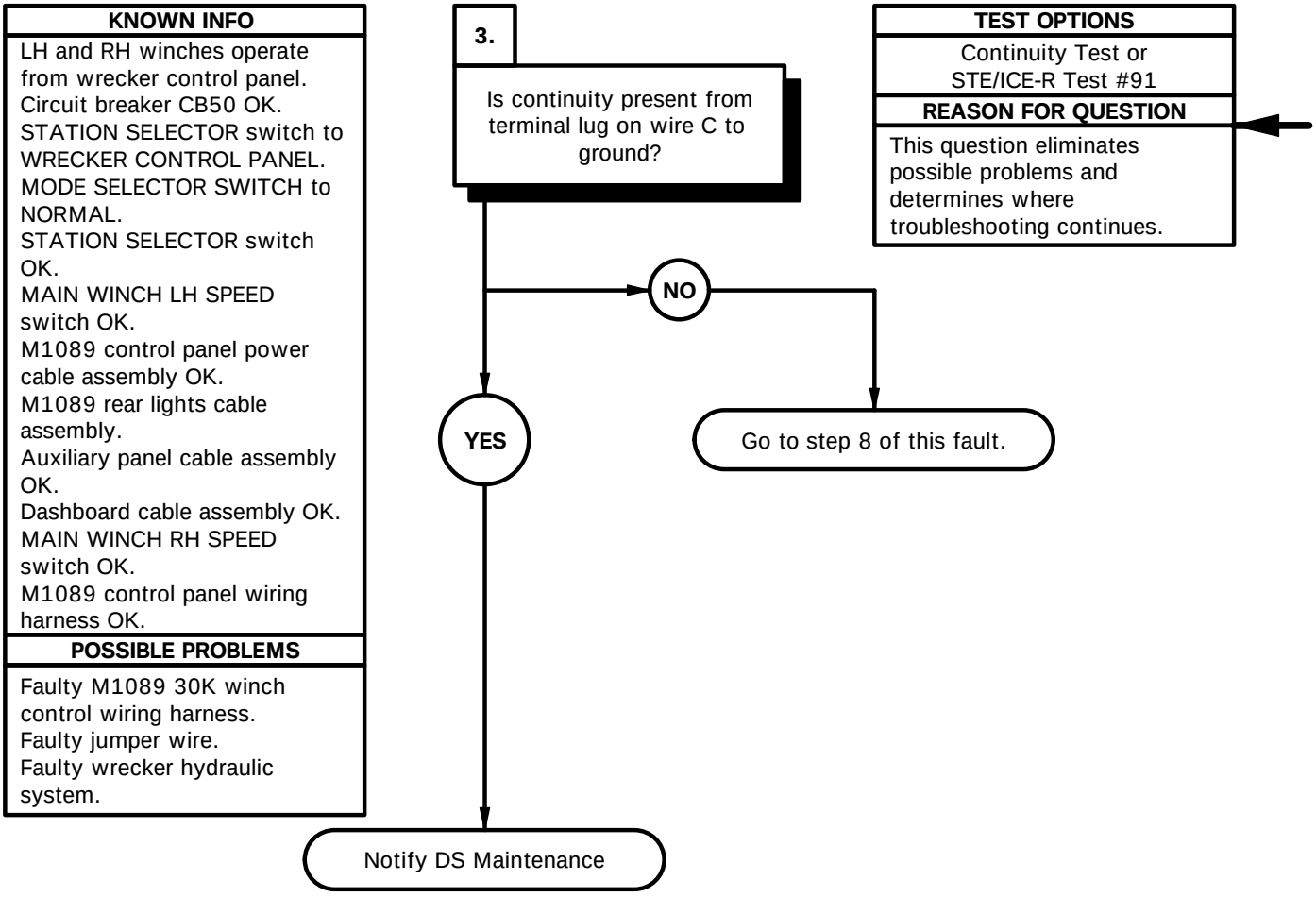
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Position MAIN WINCH LH SPEED switch to LOW.
(2) Position MAIN WINCH LH lever to IN until cable is fully recovered.
(3) Set engine speed to idle (750 rpm) by decreasing HAND THROTTLE lever to full down position.
(4) Position PTO switch to off.
(5) Shut down engine (TM 9-2320-366-10-1).
(6) Remove power distribution panel (PDP) cover (para 16-2).
(7) Remove circuit breaker CB50 from power distribution panel (PDP).
(8) Open LH and RH catwalks.
(9) Disconnect terminal lug on wire 12 from RH counter balance valve.
(10) Position MAIN WINCH RH SPEED switch to HIGH.
(11) Set multimeter to volts DC.
(12) Connect positive (+) probe of multimeter to terminal lug on wire 12.
(13) Connect negative (-) probe of multimeter to ground.
(14) Install circuit breaker CB50 in power distribution panel (PDP) and note reading on multimeter.
(15) If 24 VDC is not present go to step 7 of this fault.
(16) Remove circuit breaker CB50 from power distribution panel (PDP).
(17) Connect terminal lug on wire 12 to RH counter balance valve.
(18) Position MAIN WINCH RH SPEED switch to LOW.



e139. MAIN WINCH LH OR RH SPEED SWITCH DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)



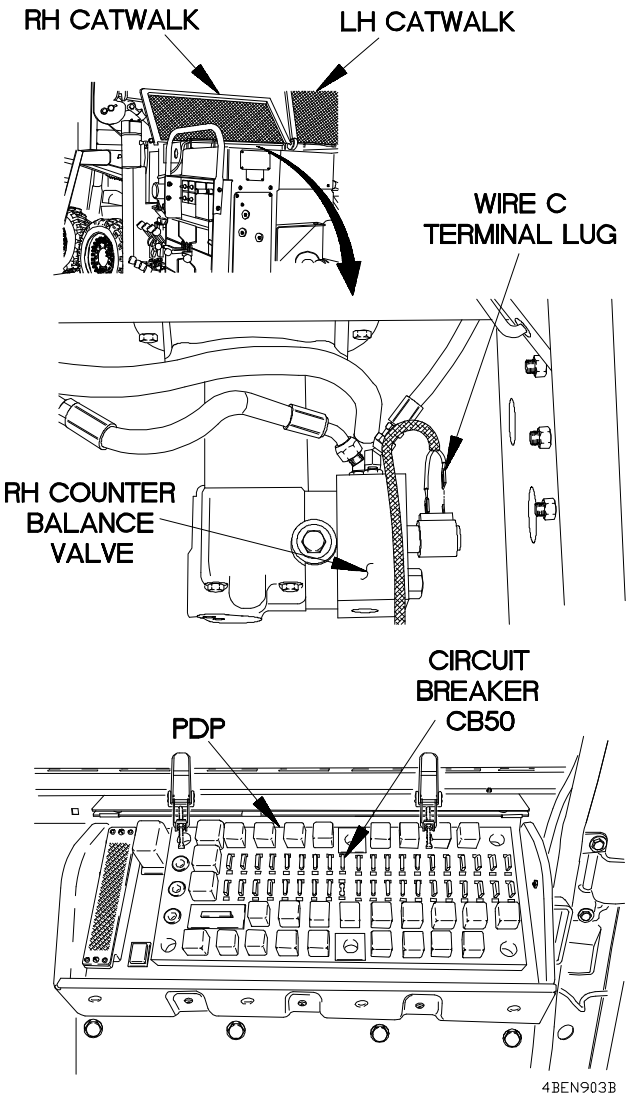
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Disconnect terminal lug on wire C from RH counter balance valve.
(3) Connect positive (+) probe of multimeter to terminal lug on wire C.
(4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(5) If continuity is not present, go to step 8 of this fault.
(6) If continuity is present, notify DS Maintenance.
(7) Connect terminal lug on wire C to RH counter balance valve.

NOTE

Perform steps (8) through (11) if continuity is present from terminal lug on wire C to ground.

(8) Close LH and RH catwalks.
(9) Install circuit breaker CB50 in PDP.
(10) Install PDP cover (para 16-2).
(11) Install wrecker control panel top cover (para 14-4).



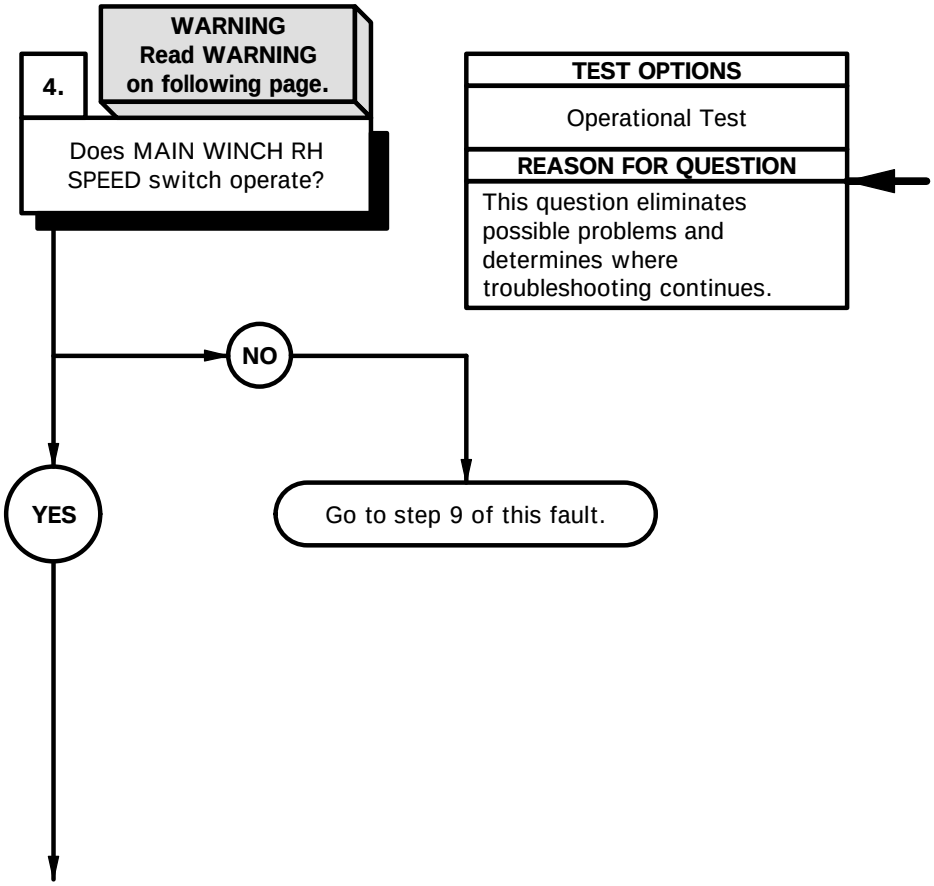
e139. MAIN WINCH LH OR RH SPEED SWITCH DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)

KNOWN INFO

LH and RH winches operate from wrecker control panel.
Circuit breaker CB50 OK.
STATION SELECTOR switch to WRECKER CONTROL PANEL.
MODE SELECTOR SWITCH to NORMAL.

POSSIBLE PROBLEMS

Faulty STATION SELECTOR switch.
Faulty MAIN WINCH LH SPEED switch.
Faulty MAIN WINCH RH SPEED switch.
Faulty M1089 control panel wiring harness.
Faulty M1089 30K winch control wiring harness.
Faulty M1089 control panel power cable assembly.
Faulty M1089 rear lights cable assembly.
Faulty auxiliary panel cable assembly.
Faulty dashboard cable assembly.
Faulty jumper wire.
Faulty wrecker hydraulic system.



TEST OPTIONS

Operational Test

REASON FOR QUESTION

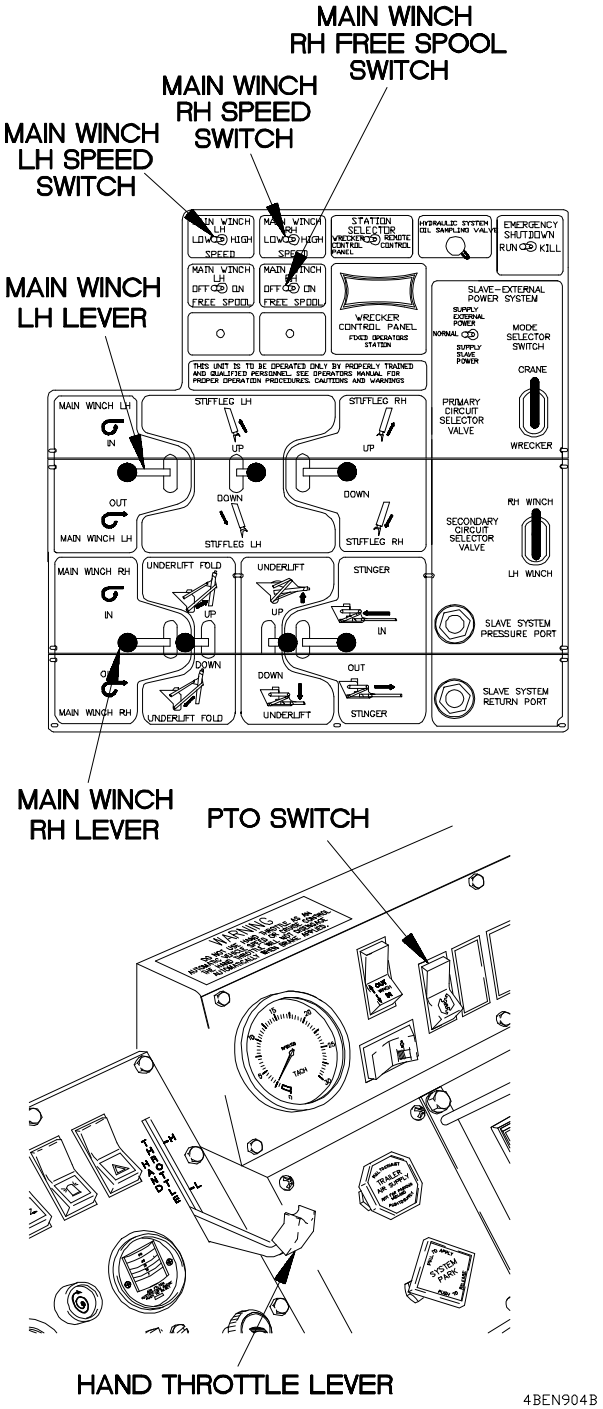
This question eliminates possible problems and determines where troubleshooting continues.

WARNING

Goggles must be worn while operating wrecker control panel. Blowing dust and debris may become airborne while engine is running. Failure to comply may result in injury to personnel.

OPERATIONAL TEST

(1) Position MAIN WINCH LH SPEED switch to LOW.
(2) Position MAIN WINCH LH lever to IN until cable is fully recovered.
(3) Position MAIN WINCH RH SPEED switch to LOW.
(4) Position MAIN WINCH RH FREE SPOOL switch to OFF.
(5) Position MAIN WINCH RH lever to OUT until the first five wraps of cable have pay-out.
(6) Position MAIN WINCH RH SPEED switch to HIGH.
(7) Position MAIN WINCH RH lever to OUT and note speed of winch.
(8) If RH 30K winch does not operate at high speed, go to step 9 of this fault.
(9) Position MAIN WINCH RH SPEED switch to LOW.
(10) Position MAIN WINCH RH lever to IN until cable is fully recovered.
(11) Set engine speed to idle (750 rpm) by decreasing HAND THROTTLE lever to the full down position.
(12) Position PTO switch to off.
(13) Shut down engine (TM 9-2320-366-10-1).



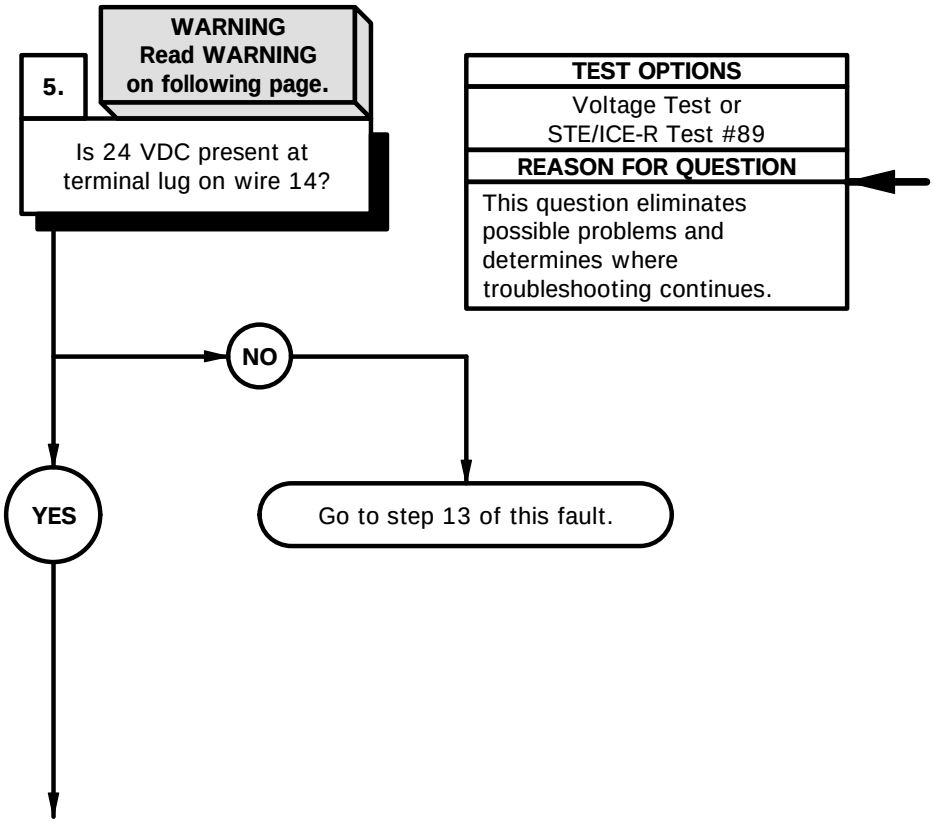
e139. MAIN WINCH LH OR RH SPEED SWITCH DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)

KNOWN INFO

LH and RH winches operate from wrecker control panel.
Circuit breaker CB50 OK.
STATION SELECTOR switch to WRECKER CONTROL PANEL.
MODE SELECTOR SWITCH to NORMAL.
STATION SELECTOR switch OK.
MAIN WINCH RH SPEED switch OK.
M1089 control panel power cable assembly OK.
M1089 rear lights cable assembly.
Auxiliary panel cable assembly OK.
Dashboard cable assembly OK.

POSSIBLE PROBLEMS

Faulty MAIN WINCH LH SPEED switch.
Faulty M1089 control panel wiring harness.
Faulty M1089 30K winch control wiring harness.
Faulty jumper wire.
Faulty wrecker hydraulic system.



TEST OPTIONS

Voltage Test or
STE/ICE-R Test #89

REASON FOR QUESTION

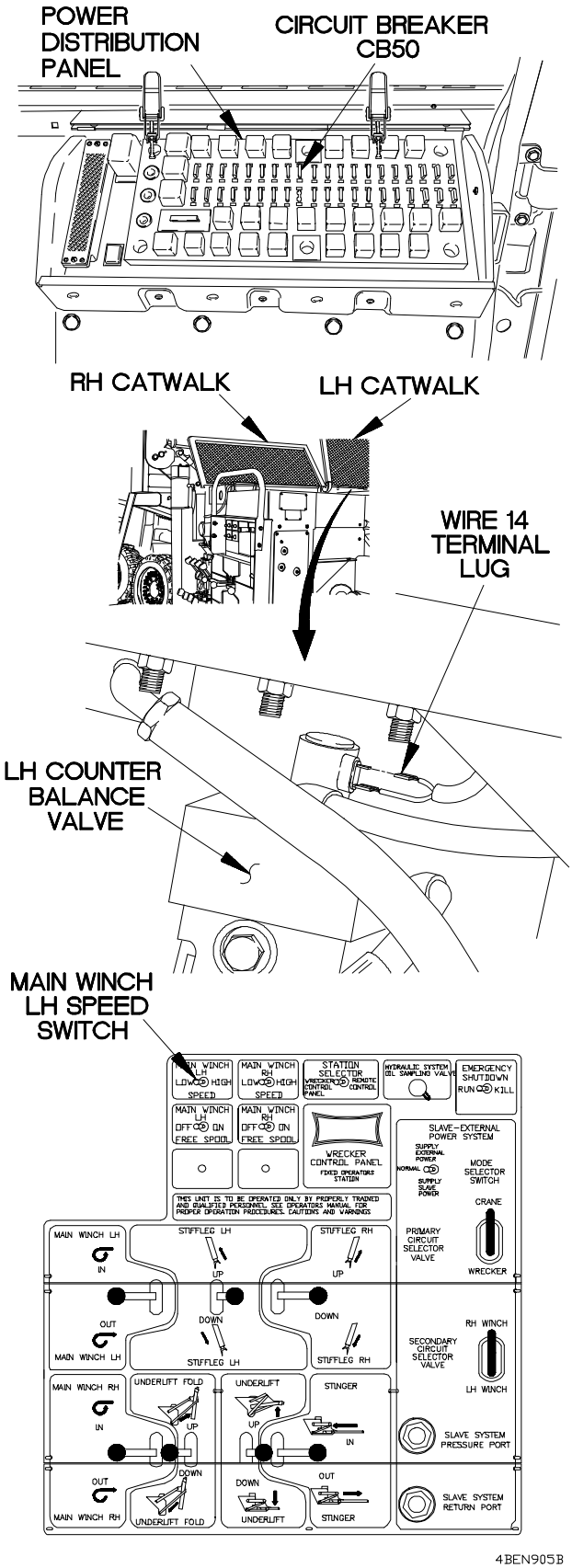
This question eliminates possible problems and determines where troubleshooting continues.

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 circuits and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Remove power distribution panel (PDP) cover (para 16-2).
(2) Remove circuit breaker CB50 from power distribution panel (PDP).
(3) Open LH and RH catwalks.
(4) Disconnect terminal lug on wire 14 from LH counter balance valve.
(5) Position MAIN WINCH LH SPEED switch to HIGH.
(6) Set multimeter to volts DC.
(7) Connect positive (+) probe of multimeter to terminal lug on wire 14.
(8) Connect negative (-) probe of multimeter to ground.
(9) Install circuit breaker CB50 in power distribution panel (PDP) and note reading on multimeter.
(10) If 24 VDC is not present go to step 13 of this fault.
(11) Remove circuit breaker CB50 from power distribution panel (PDP).
(12) Connect terminal lug on wire 14 to RH counter balance valve.
(13) Position MAIN WINCH LH SPEED switch to. LOW.



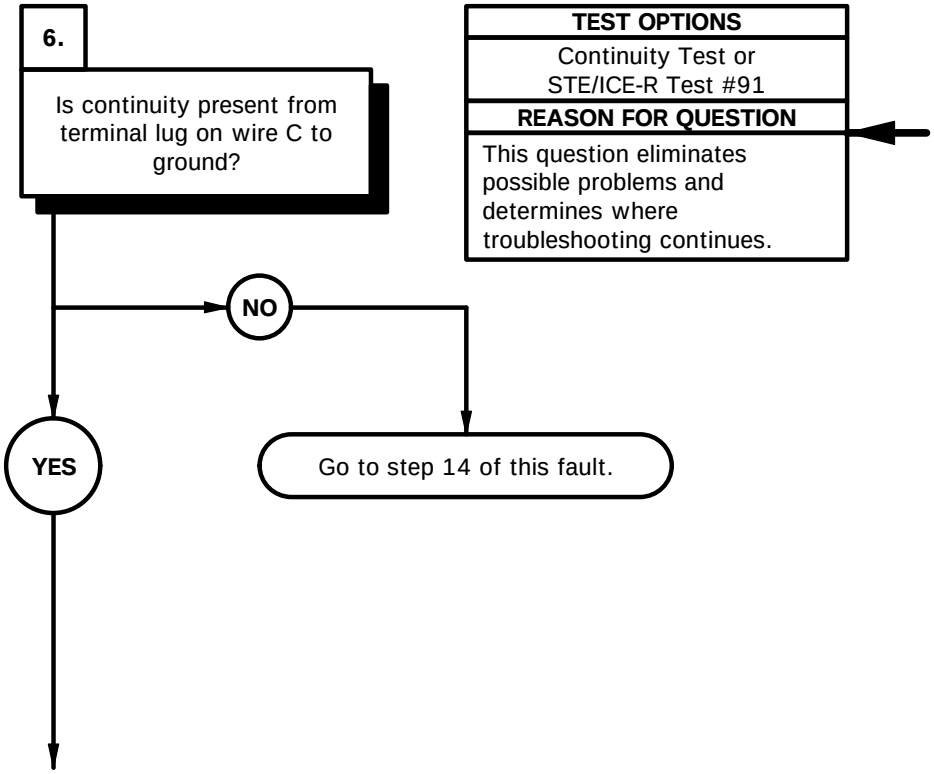
e139. MAIN WINCH LH OR RH SPEED SWITCH DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)

KNOWN INFO

LH and RH winches operate from wrecker control panel.
Circuit breaker CB50 OK.
STATION SELECTOR switch to WRECKER CONTROL PANEL.
MODE SELECTOR SWITCH to NORMAL.
STATION SELECTOR switch OK.
MAIN WINCH RH SPEED switch OK.
M1089 control panel power cable assembly OK.
M1089 rear lights cable assembly.
Auxiliary panel cable assembly OK.
Dashboard cable assembly OK.
MAIN WINCH LH SPEED switch OK.
M1089 control panel wiring harness OK.

POSSIBLE PROBLEMS

Faulty M1089 30K winch control wiring harness.
Faulty jumper wire.
Faulty wrecker hydraulic system.



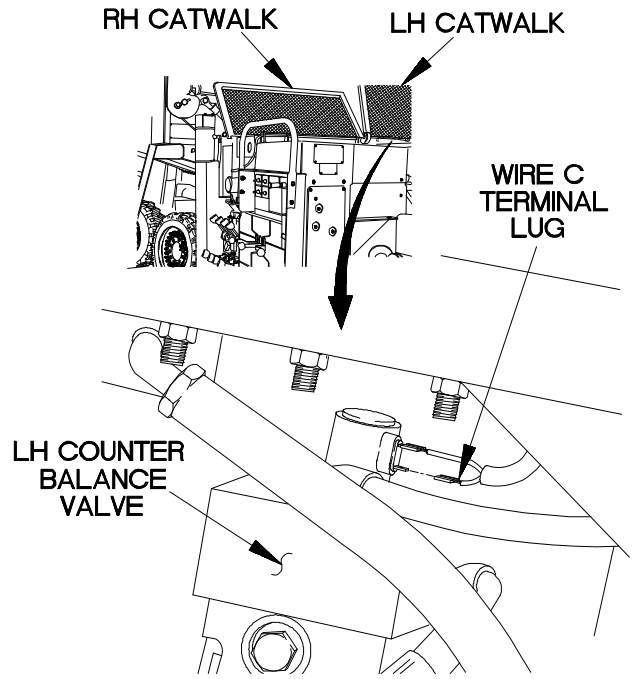
CONTINUITY TEST

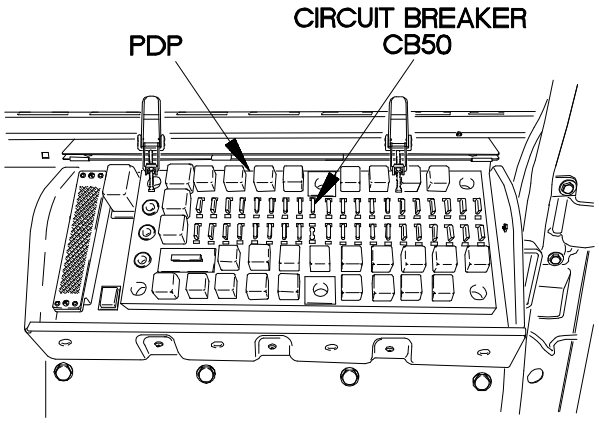
(1) Set multimeter to ohms.
(2) Disconnect terminal lug on wire C from RH counter balance valve.
(3) Connect positive (+) probe of multimeter to terminal lug on wire C.
(4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(5) If continuity is not present, go to step 14 of this fault.
(6) If continuity is present, notify DS Maintenance.
(7) Connect terminal lug on wire C to LH counter balance valve.

NOTE

Perform steps (8) through (11) if continuity is present from front/rear terminal lug of LH counter balance valve to ground.

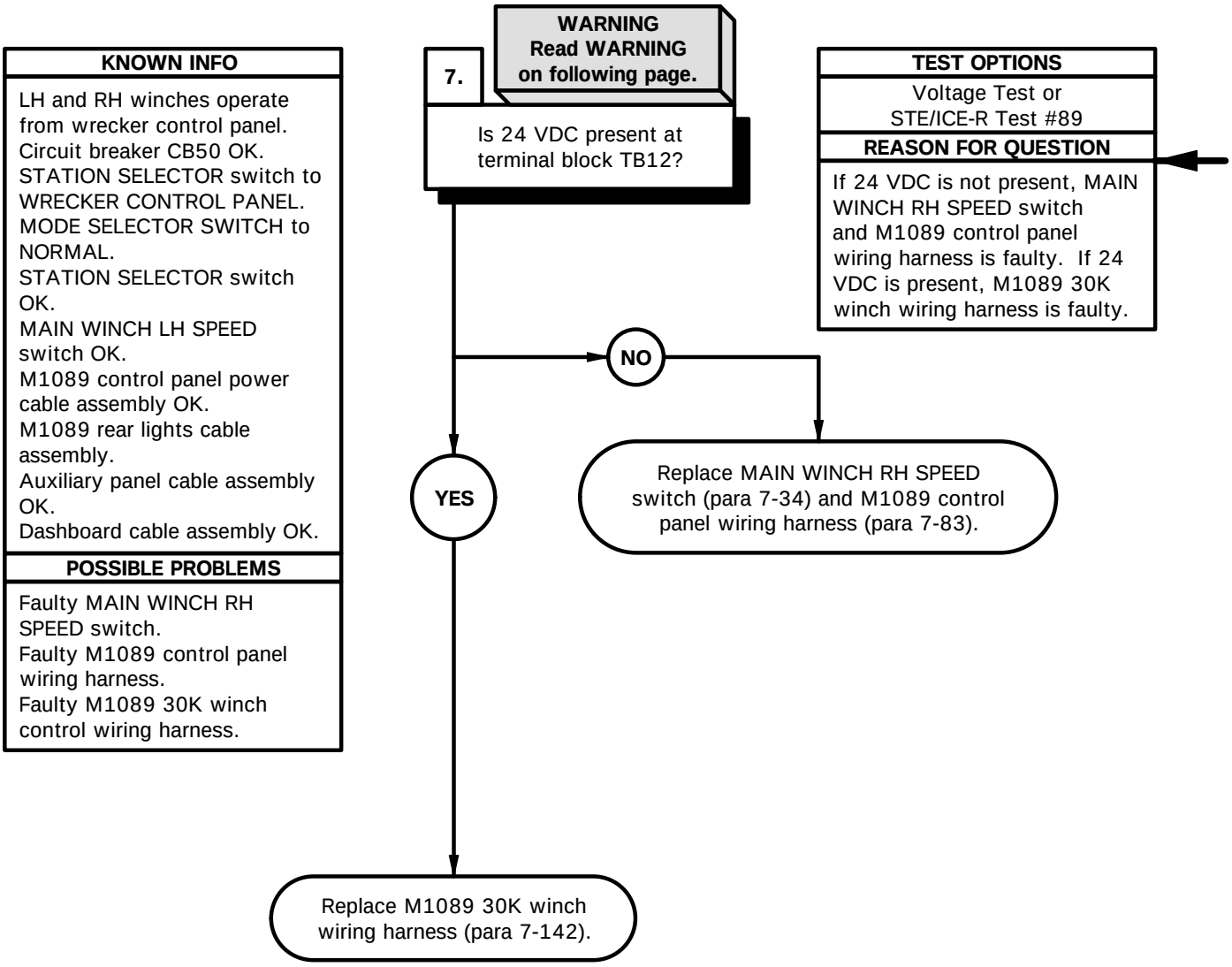
(8) Close LH and RH catwalks.
(9) Install circuit breaker CB50 in PDP.
(10) Install PDP cover (para 16-2).
(11) Install wrecker control panel top cover (para 14-4).





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e139. MAIN WINCH LH OR RH SPEED SWITCH DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)

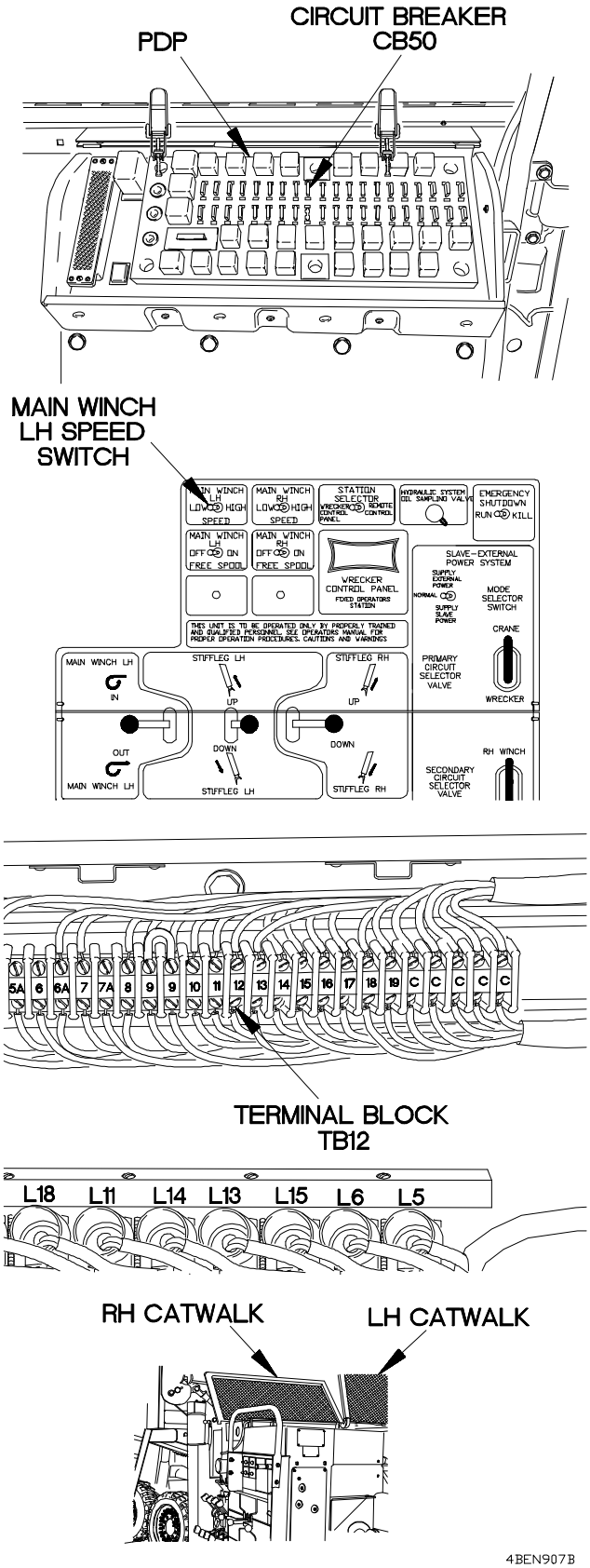


WARNING

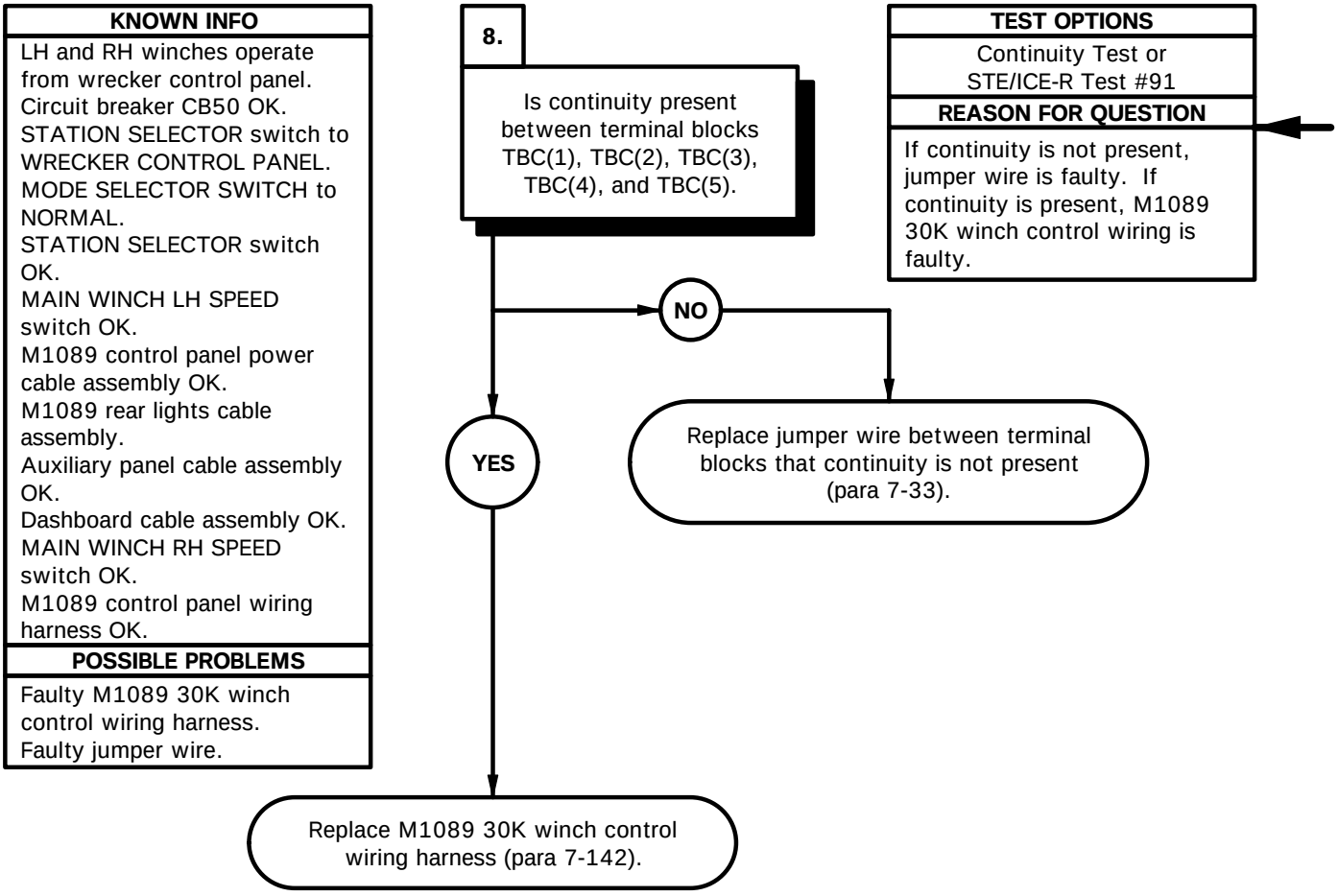
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Install circuit breaker CB50 in PDP.
(2) Position MAIN WINCH RH SPEED switch to HIGH.
(3) Set multimeter to volts DC.
(4) Connect positive (+) probe of multimeter to terminal block TB12.
(5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(6) If 24 VDC is not present, replace MAIN WINCH RH SPEED switch (para 7-34) and M1089 control panel wiring harness (para 7-83).
(7) If 24 VDC is present, replace M1089 30K winch control wiring harness (para 7-142).
(8) Position MAIN WINCH RH SPEED switch to LOW.
(9) Close LH and RH catwalks.
(10) Install PDP cover (para 16-2).
(11) Install wrecker control panel top cover (para 14-4).

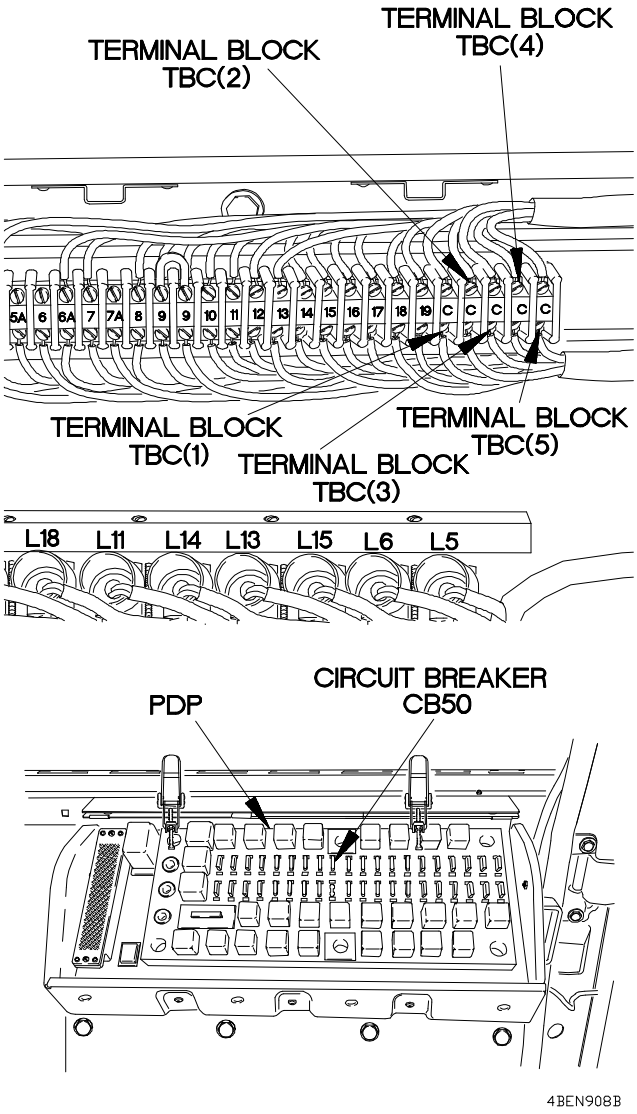


e139. MAIN WINCH LH OR RH SPEED SWITCH DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to terminal block TBC(1).
(3) Connect negative (-) probe of multimeter to to terminal block TBC(2) and note reading on multimeter.
(4) Connect positive (+) probe of multimeter to terminal block TBC(2).
(5) Connect negative (-) probe of multimeter to to terminal block TBC(3) and note reading on multimeter.
(6) Connect positive (+) probe of multimeter to terminal block TBC(3).
(7) Connect negative (-) probe of multimeter to to terminal block TBC(4) and note reading on multimeter.
(8) Connect positive (+) probe of multimeter to terminal block TBC(4).
(9) Connect negative (-) probe of multimeter to to terminal block TBC(5) and note reading on multimeter.
(10) If continuity is not present between two terminal blocks noted above, replace jumper wire between terminal blocks that continuity is not present (para 7-33).
(11) If continuity is present, replace M1089 winch control wiring harness (para 7-142).
(12) Close LH and RH catwalks.
(13) Install circuit breaker CB50 in PDP.
(14) Install wrecker control panel top cover (para 14-4).



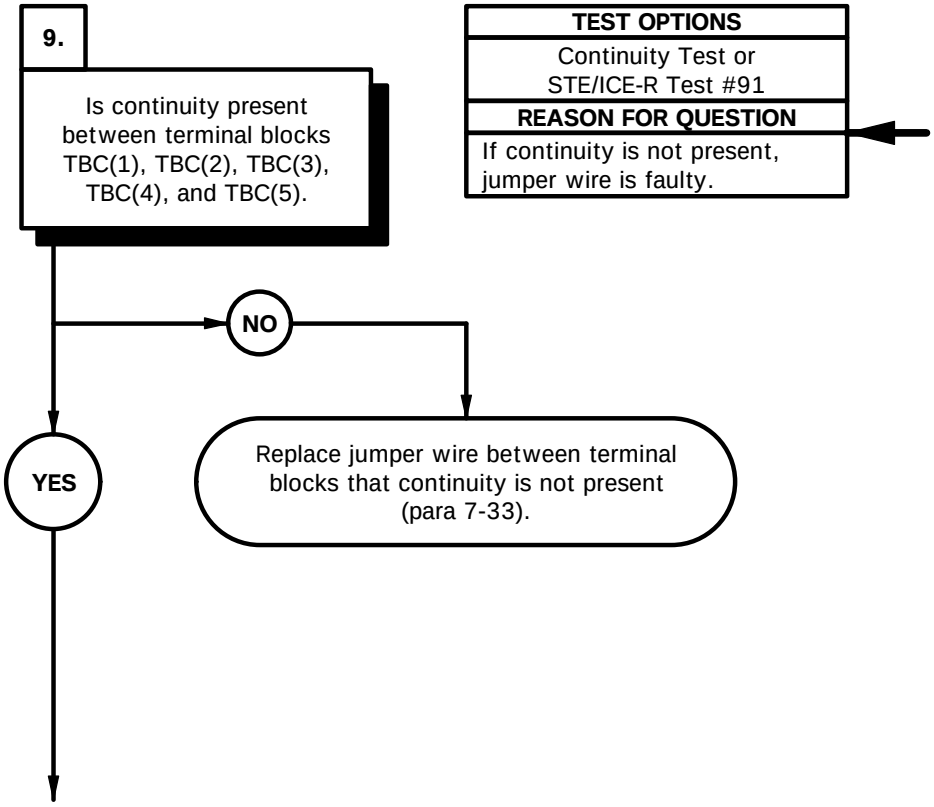
e139. MAIN WINCH LH OR RH SPEED SWITCH DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)

KNOWN INFO

LH and RH winches operate from wrecker control panel.
Circuit breaker CB50 OK.
STATION SELECTOR switch to WRECKER CONTROL PANEL.
MODE SELECTOR SWITCH to NORMAL.

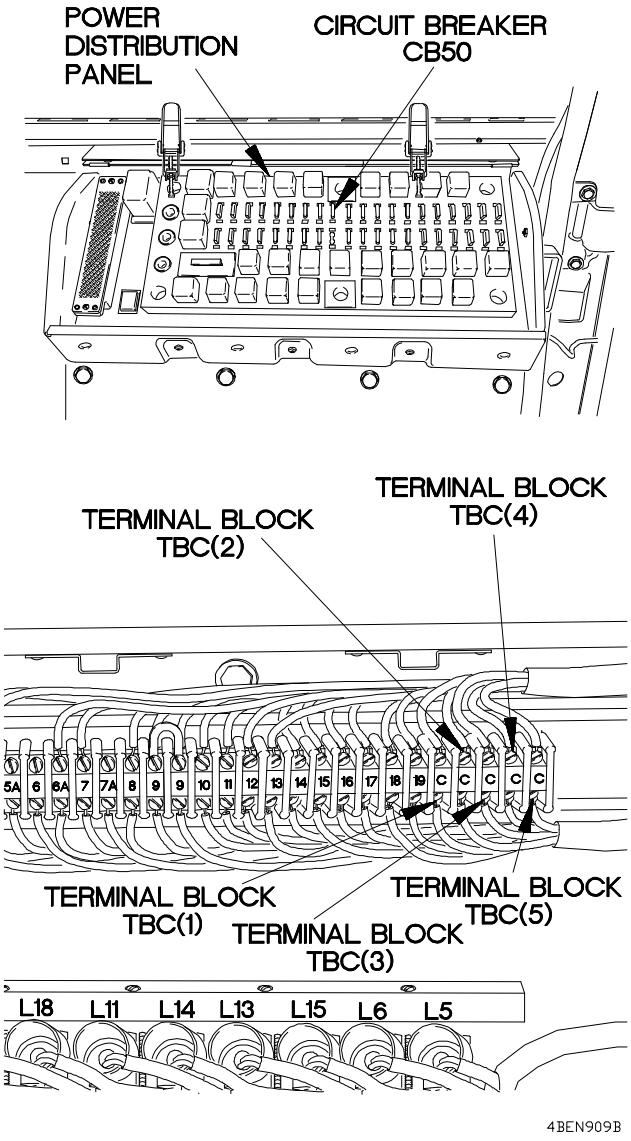
POSSIBLE PROBLEMS

Faulty STATION SELECTOR switch.
Faulty M1089 control panel wiring harness.
Faulty M1089 control panel power cable assembly.
Faulty M1089 rear lights cable assembly.
Faulty auxiliary panel cable assembly.
Faulty dashboard cable assembly.
Faulty jumper wire.



CONTINUITY TEST

(1) Remove power distribution panel (PDP) cover (para 16-2).
(2) Remover circuit breaker CB50 from power distribution panel (PDP).
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to terminal block TBC(1).
(5) Connect negative (-) probe of multimeter to to terminal block TBC(2) and note reading on multimeter.
(6) Connect positive (+) probe of multimeter to terminal block TBC(2).
(7) Connect negative (-) probe of multimeter to to terminal block TBC(3) and note reading on multimeter.
(8) Connect positive (+) probe of multimeter to terminal block TBC(3).
(9) Connect negative (-) probe of multimeter to to terminal block TBC(4) and note reading on multimeter.
(10) Connect positive (+) probe of multimeter to terminal block TBC(4).
(11) Connect negative (-) probe of multimeter to to terminal block TBC(5) and note reading on multimeter.
(12) If continuity is not present between two terminal blocks noted above, replace jumper wire between terminal blocks that continuity is not present (para 7-33).



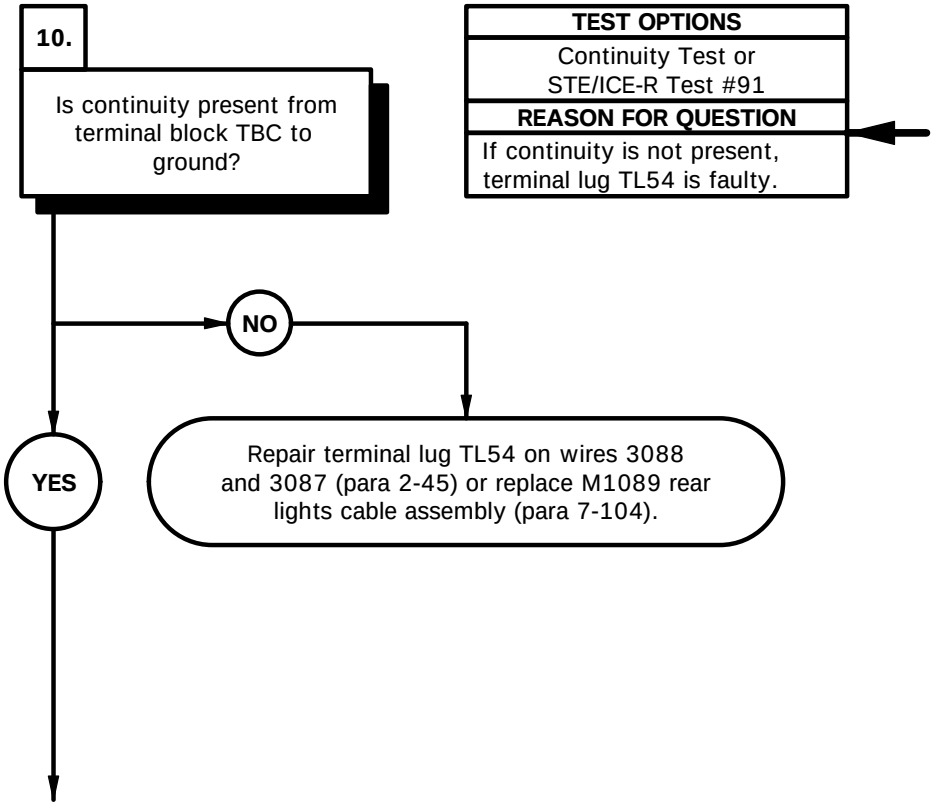
e139. MAIN WINCH LH OR RH SPEED SWITCH DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)

KNOWN INFO

LH and RH winches operate from wrecker control panel.
Circuit breaker CB50 OK.
STATION SELECTOR switch to WRECKER CONTROL PANEL.
MODE SELECTOR SWITCH to NORMAL.

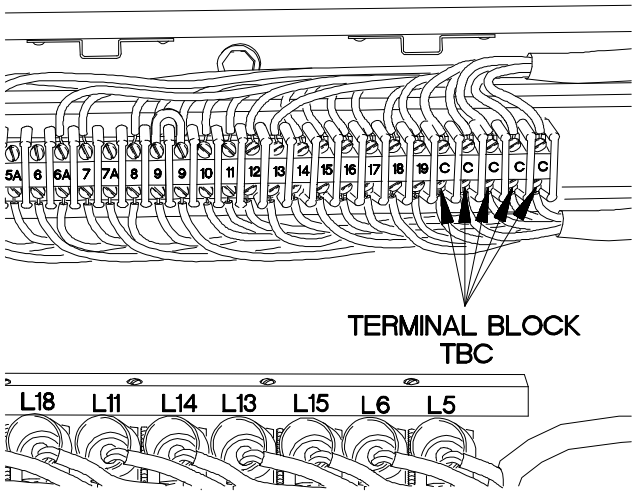
POSSIBLE PROBLEMS

Faulty STATION SELECTOR switch.
Faulty M1089 control panel wiring harness.
Faulty M1089 control panel power cable assembly.
Faulty M1089 rear lights cable assembly.
Faulty auxiliary panel cable assembly.
Faulty dashboard cable assembly.
Faulty jumper wire.



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to terminal block TBC.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair terminal lug TL54 on wires 3087 and 3088 (para 2-45) or replace M1089 rear lights cable assembly (para 7-104).



4BEN910B

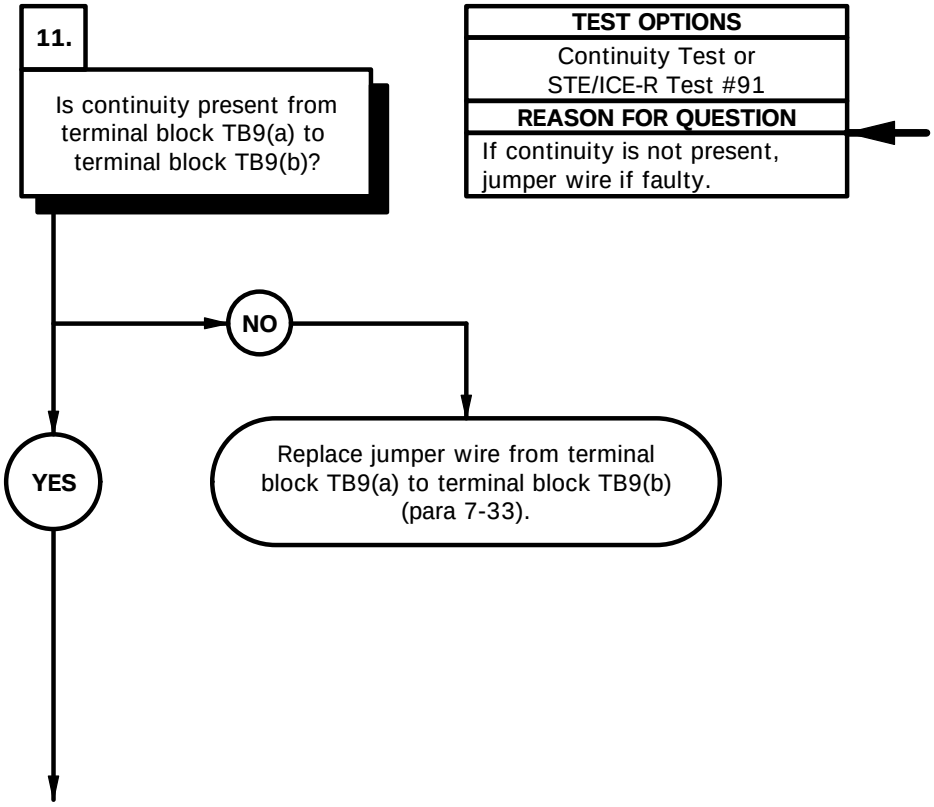
e139. MAIN WINCH LH OR RH SPEED SWITCH DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)

KNOWN INFO

LH and RH winches operate from wrecker control panel.
Circuit breaker CB50 OK.
STATION SELECTOR switch to WRECKER CONTROL PANEL.
MODE SELECTOR SWITCH to NORMAL.

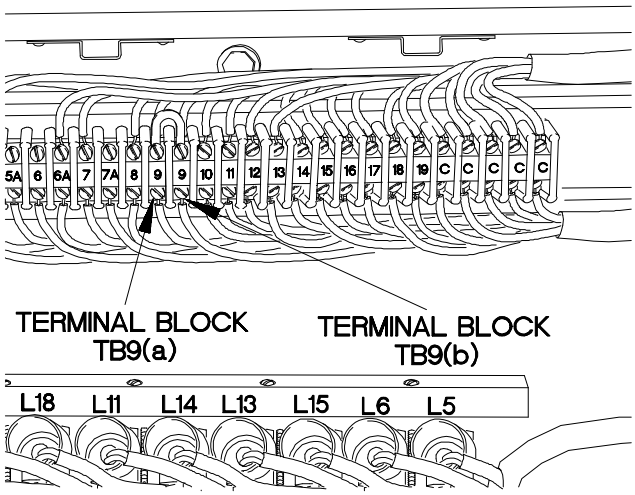
POSSIBLE PROBLEMS

Faulty STATION SELECTOR switch.
Faulty M1089 control panel wiring harness.
Faulty M1089 control panel power cable assembly.
Faulty M1089 rear lights cable assembly.
Faulty auxiliary panel cable assembly.
Faulty dashboard cable assembly.
Faulty jumper wire.



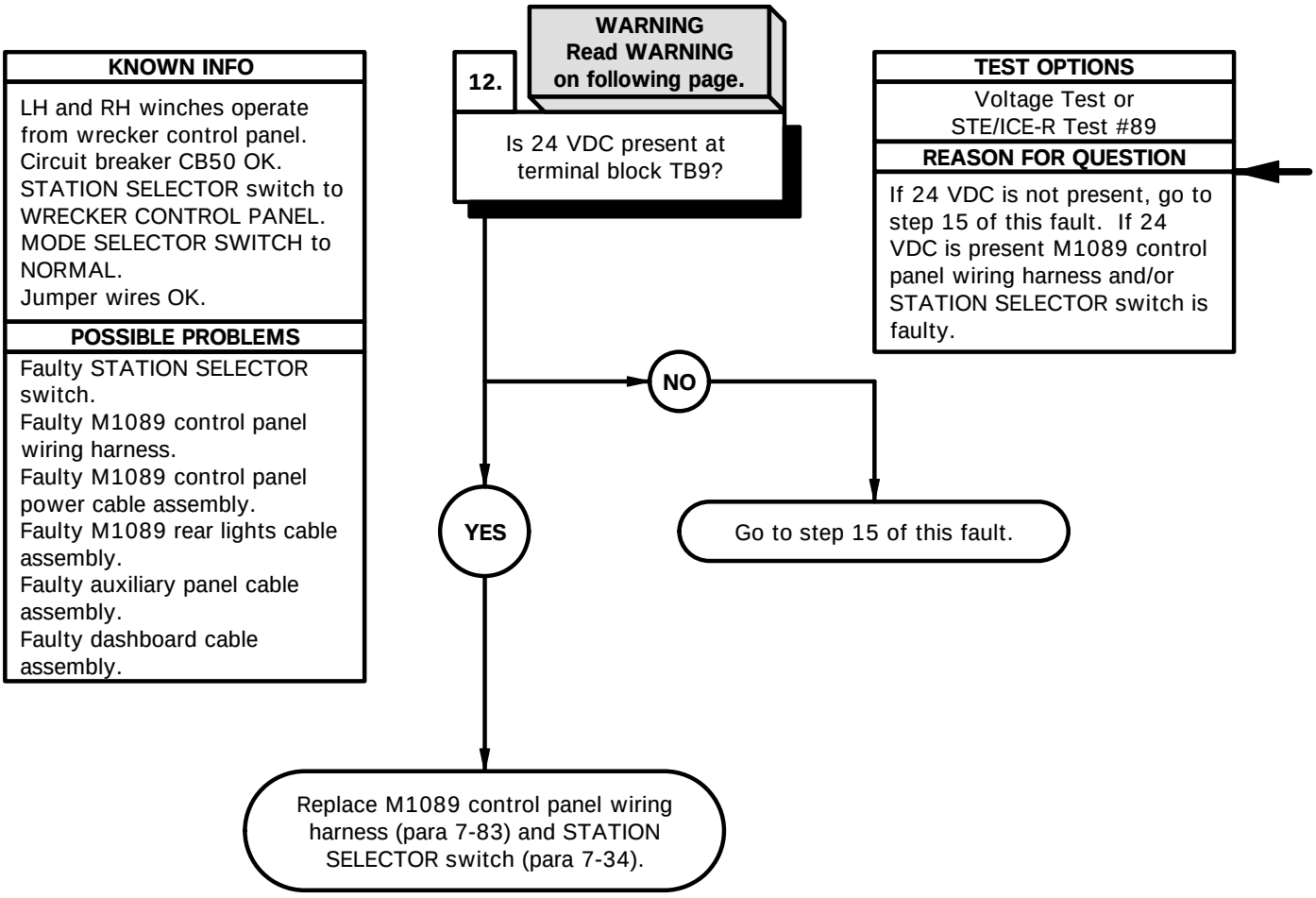
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to terminal block TB9(a).
(3) Connect negative (-) probe of multimeter to terminal block TB9(b) and note reading on multimeter.
(4) If continuity is not present, replace jumper wire from terminal block TB9(a) to terminal block TB9(b) (para 7-33).



4BEN911B

e139. MAIN WINCH LH OR RH SPEED SWITCH DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)



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 circuits and cause severe burns or electrical shock.

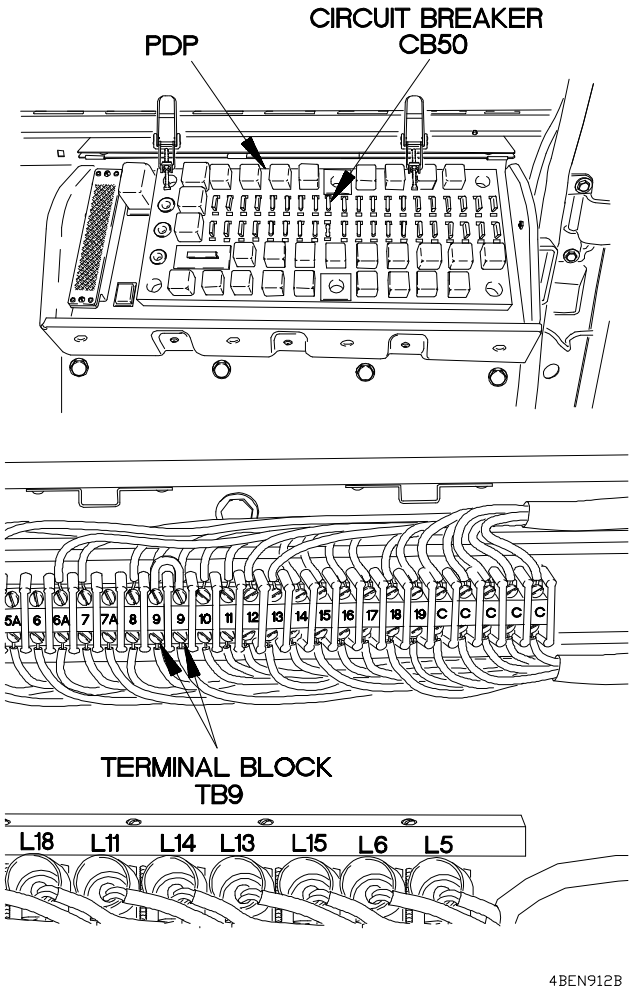
VOLTAGE TEST

(1) Install circuit breaker CB50 in PDP.
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to terminal block TB9.
(4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(5) If 24 VDC is not present, go to step 15 of this fault.
(6) If 24 VDC is present, replace M1089 control panel wiring harness (para 7-83) and STATION SELECTOR switch (para 7-34).

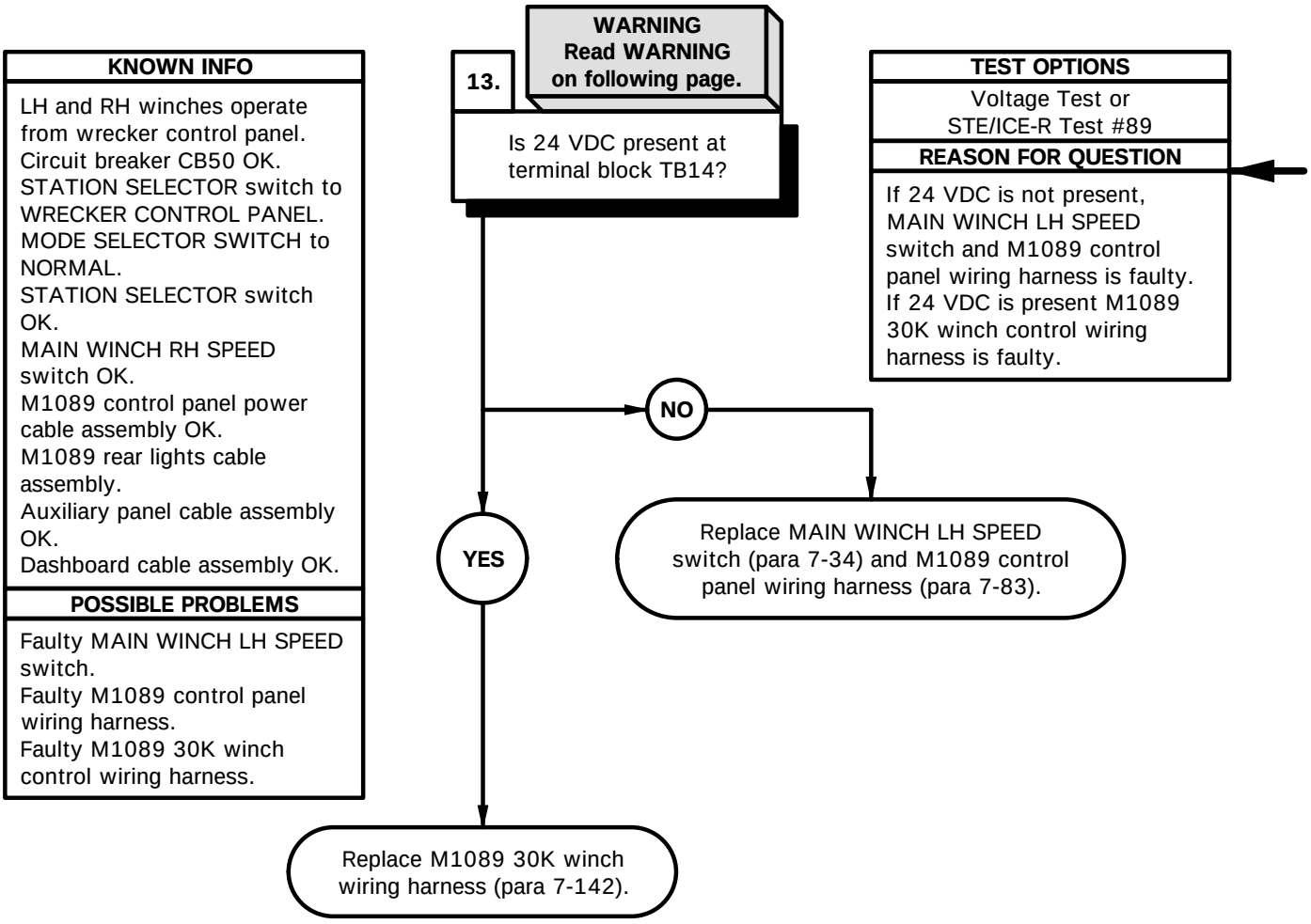
NOTE

Perform steps (7) and (8) if 24 VDC is present at terminal block TB9.

(7) Install PDP cover (para 16-2).
(8) Install wrecker control panel top cover (para 14-4).



e139. MAIN WINCH LH OR RH SPEED SWITCH DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)

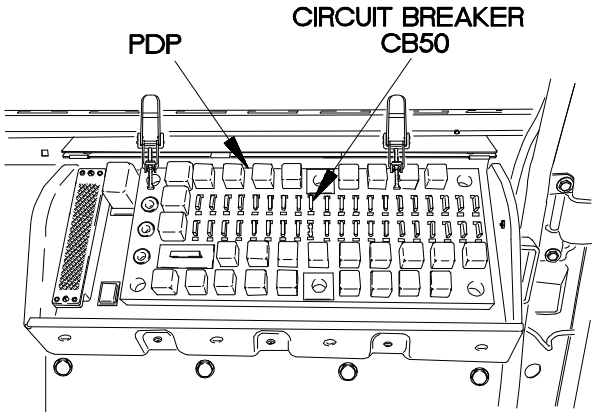


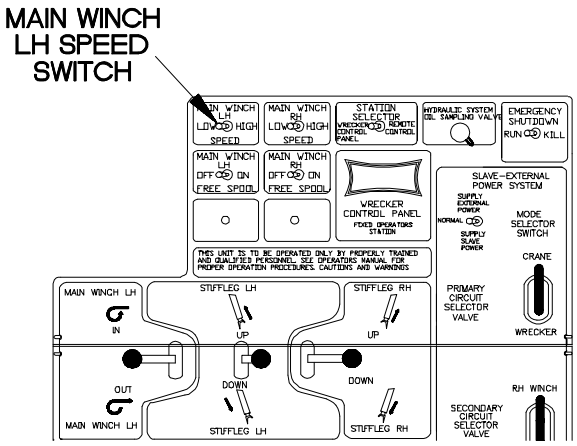
WARNING

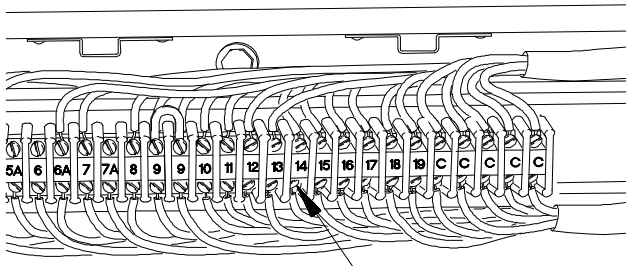
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

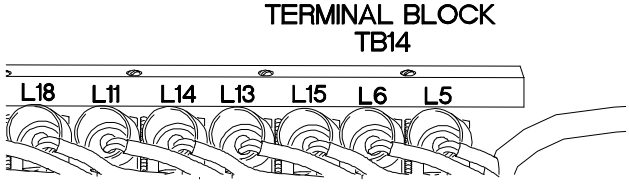
VOLTAGE TEST

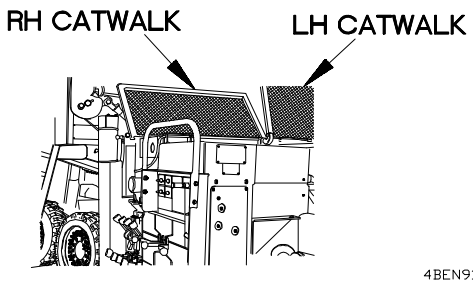
(1) Install circuit breaker CB50 in PDP.
(2) Position MAIN WINCH LH SPEED switch to HIGH.
(3) Set multimeter to volts DC.
(4) Connect positive (+) probe of multimeter to terminal block TB14.
(5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(6) If 24 VDC is not present, replace MAIN WINCH LH SPEED switch (para 7-34) and M1089 control panel wiring harness (para 7-83).
(7) If 24 VDC is present, replace M1089 30K winch control wiring harness (para 7-142).
(8) Position MAIN WINCH RH SPEED switch to LOW.
(9) Close LH and RH catwalks.
(10) Install PDP cover (para 16-2).
(11) Install wrecker control panel top cover (para 14-4).





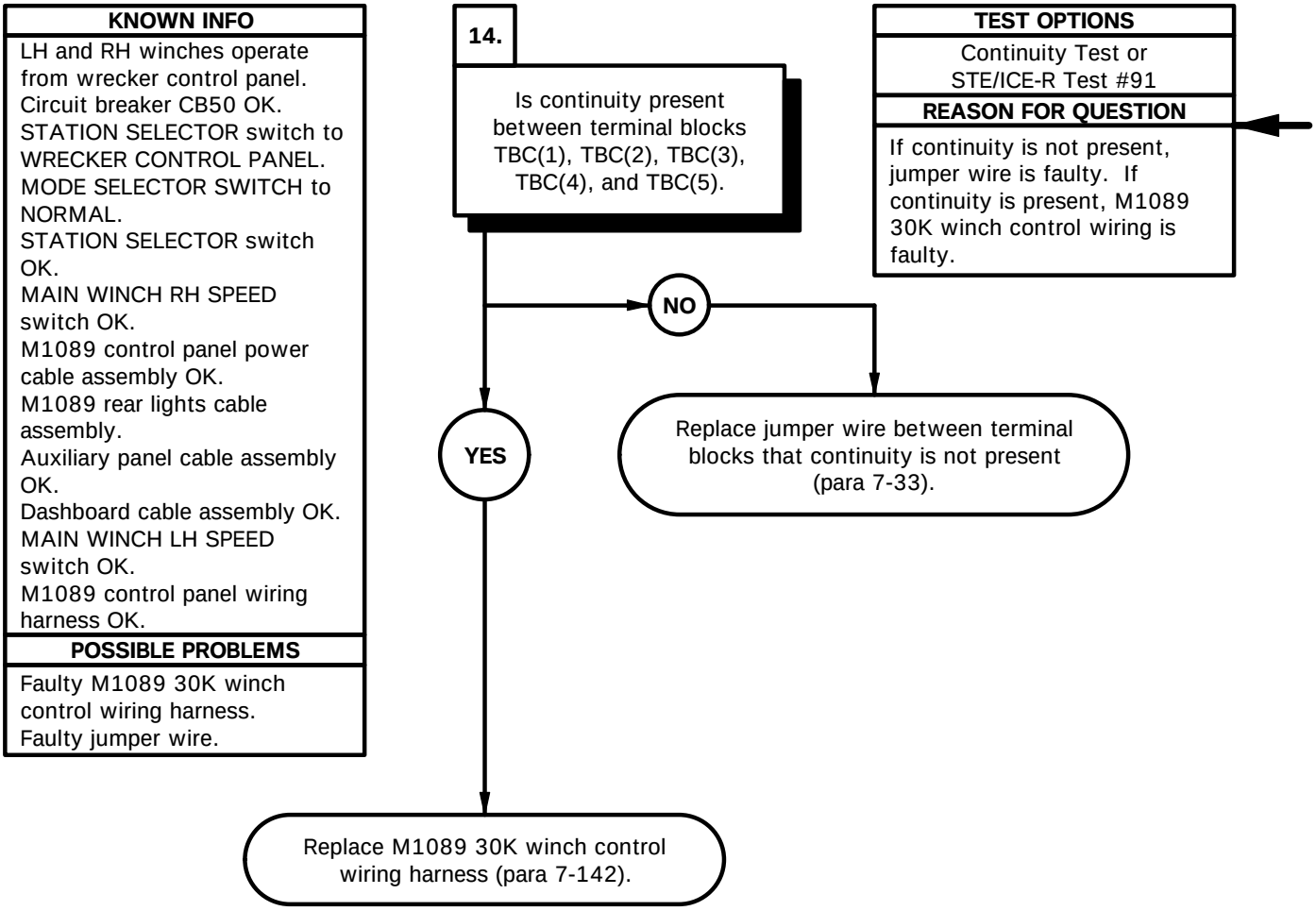






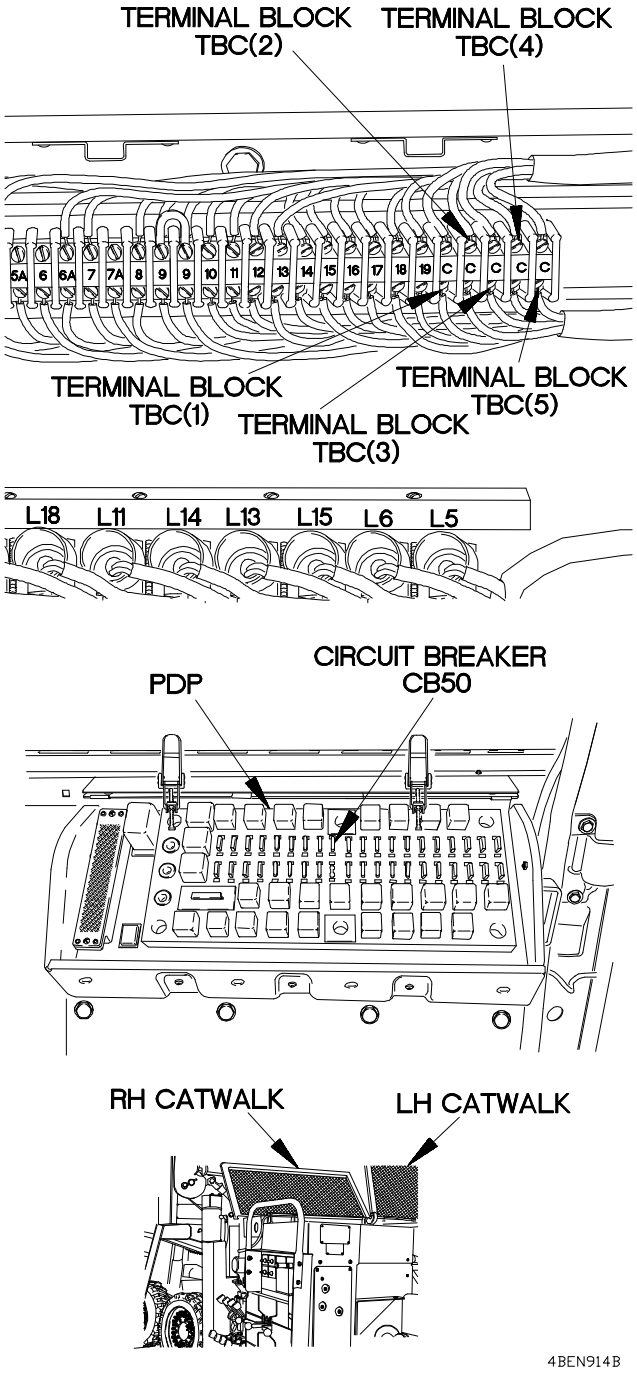
4BEN913B

e139. MAIN WINCH LH OR RH SPEED SWITCH DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to terminal block TBC(1).
(3) Connect negative (-) probe of multimeter to to terminal block TBC(2) and note reading on multimeter.
(4) Connect positive (+) probe of multimeter to terminal block TBC(2).
(5) Connect negative (-) probe of multimeter to to terminal block TBC(3) and note reading on multimeter.
(6) Connect positive (+) probe of multimeter to terminal block TBC(3).
(7) Connect negative (-) probe of multimeter to to terminal block TBC(4) and note reading on multimeter.
(8) Connect positive (+) probe of multimeter to terminal block TBC(4).
(9) Connect negative (-) probe of multimeter to to terminal block TBC(5) and note reading on multimeter.
(10) If continuity is not present between two terminal blocks noted above, replace jumper wire between terminal blocks that continuity is not present (para 7-33).
(11) If continuity is present, replace M1089 winch control wiring harness (para 7-142).
(12) Close LH and RH catwalks.
(13) Install circuit breaker CB50 in PDP.
(14) Install wrecker control panel top cover (para 14-4).



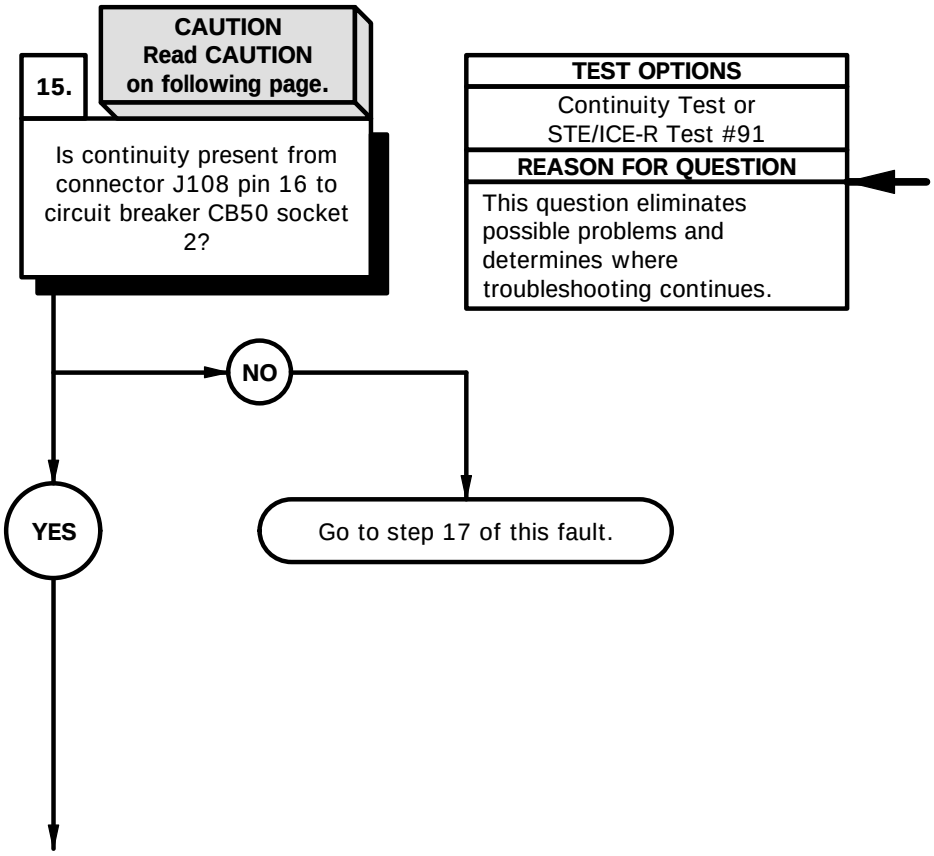
e139. MAIN WINCH LH OR RH SPEED SWITCH DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)

KNOWN INFO

LH and RH winches operate from wrecker control panel.
Circuit breaker CB50 OK.
STATION SELECTOR switch to WRECKER CONTROL PANEL.
MODE SELECTOR SWITCH to NORMAL.
Jumper wires OK.

POSSIBLE PROBLEMS

Faulty M1089 control panel power cable assembly.
Faulty M1089 rear lights cable assembly.
Faulty auxiliary panel cable assembly.
Faulty dashboard cable assembly.



TEST OPTIONS

Continuity Test or
STE/ICE-R Test #91

REASON FOR QUESTION

This question eliminates possible problems and determines where troubleshooting continues.

CAUTION

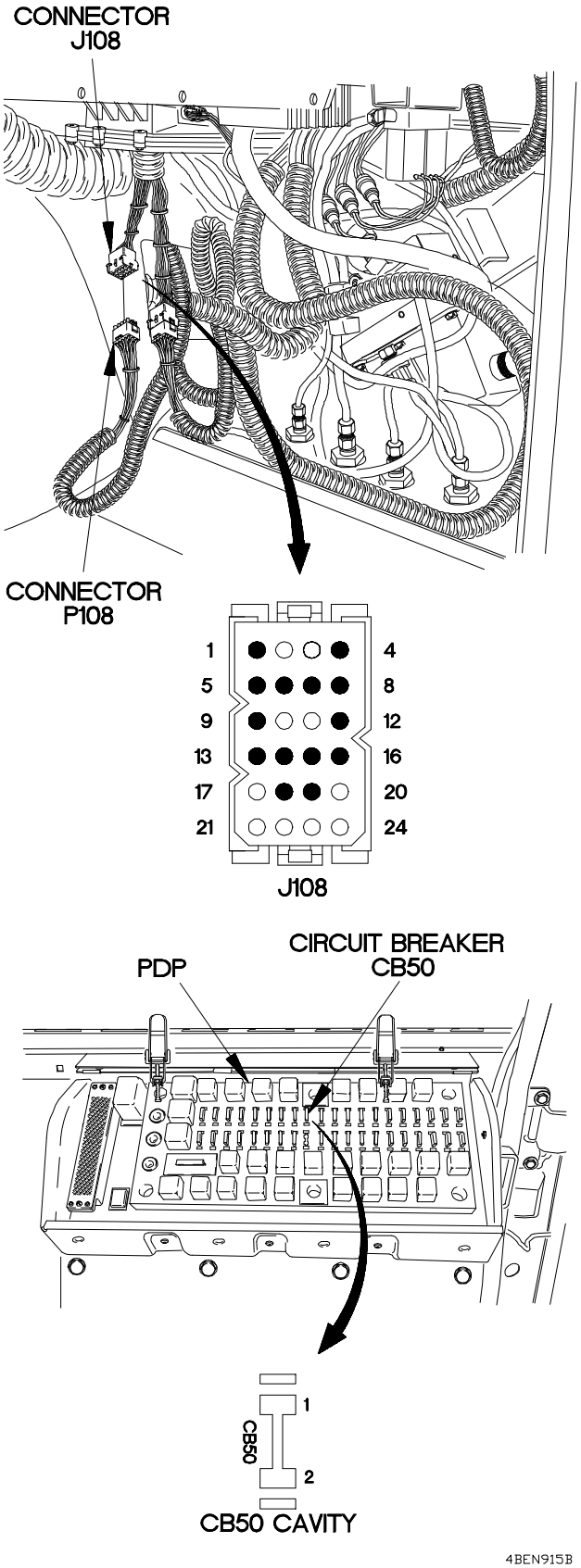
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

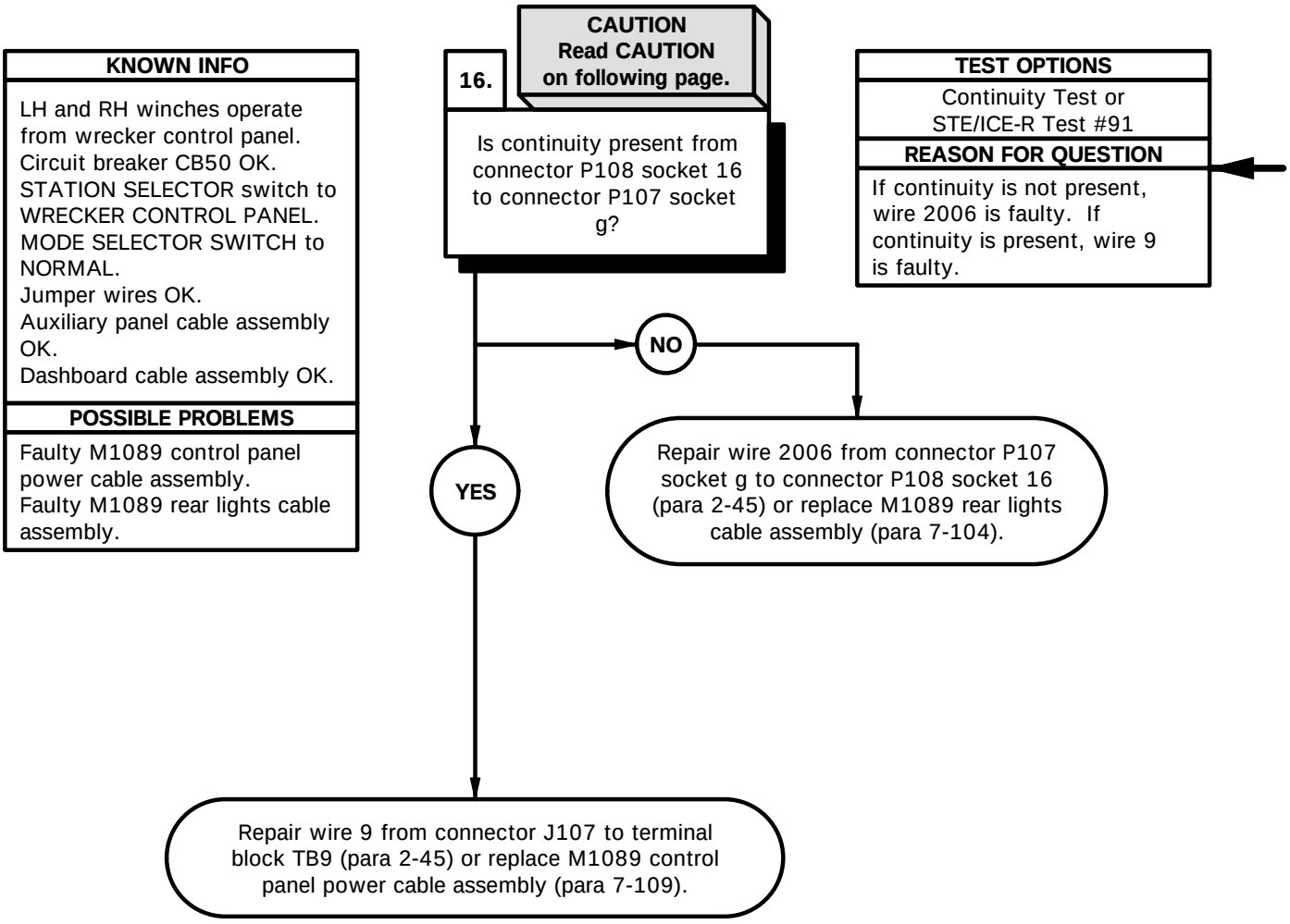
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Disconnect batteries (para 7-57).
(2) Remove kick panel (para 16-3).
(3) Disconnect connector J108 from connector P108.
(4) Remove circuit breaker CB50 from PDP.
(5) Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter to connector J108 pin 16.
(7) Connect negative (-) probe of multimeter to circuit breaker CB50 socket 2 and note reading on multimeter.
(8) If continuity is not present, go to step 17 of this fault.



e139. MAIN WINCH LH OR RH SPEED SWITCH DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)



CAUTION

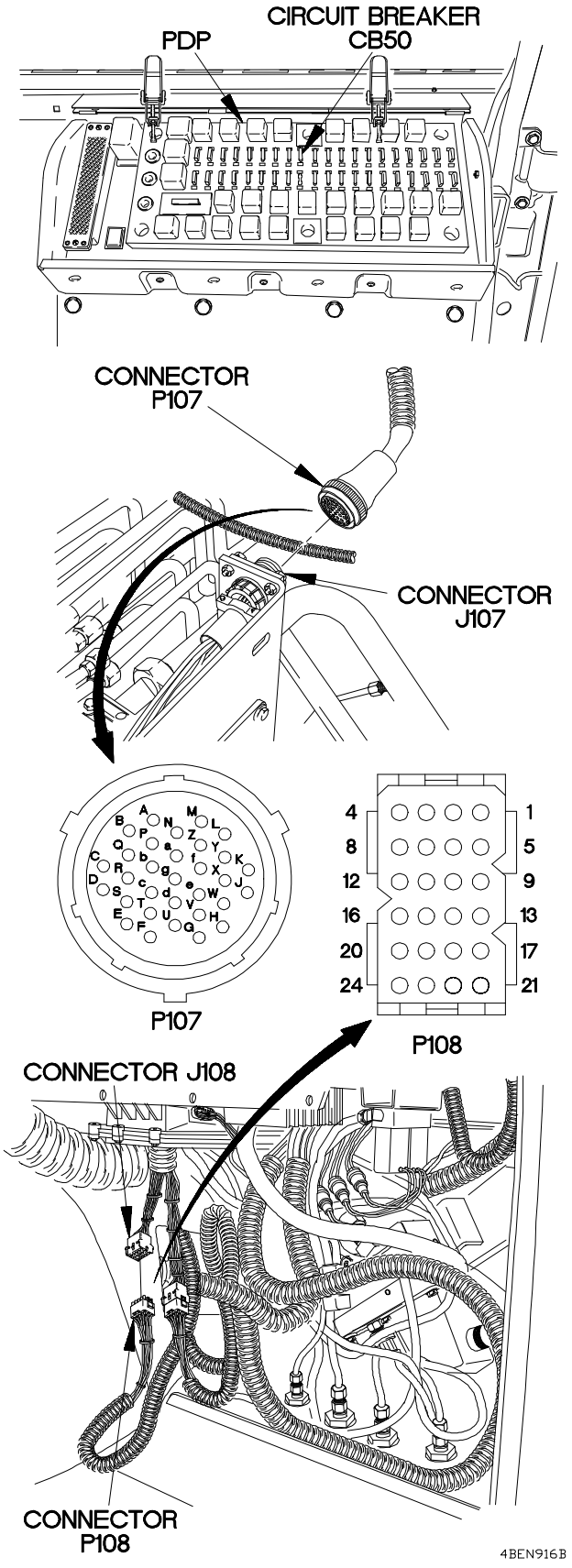
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

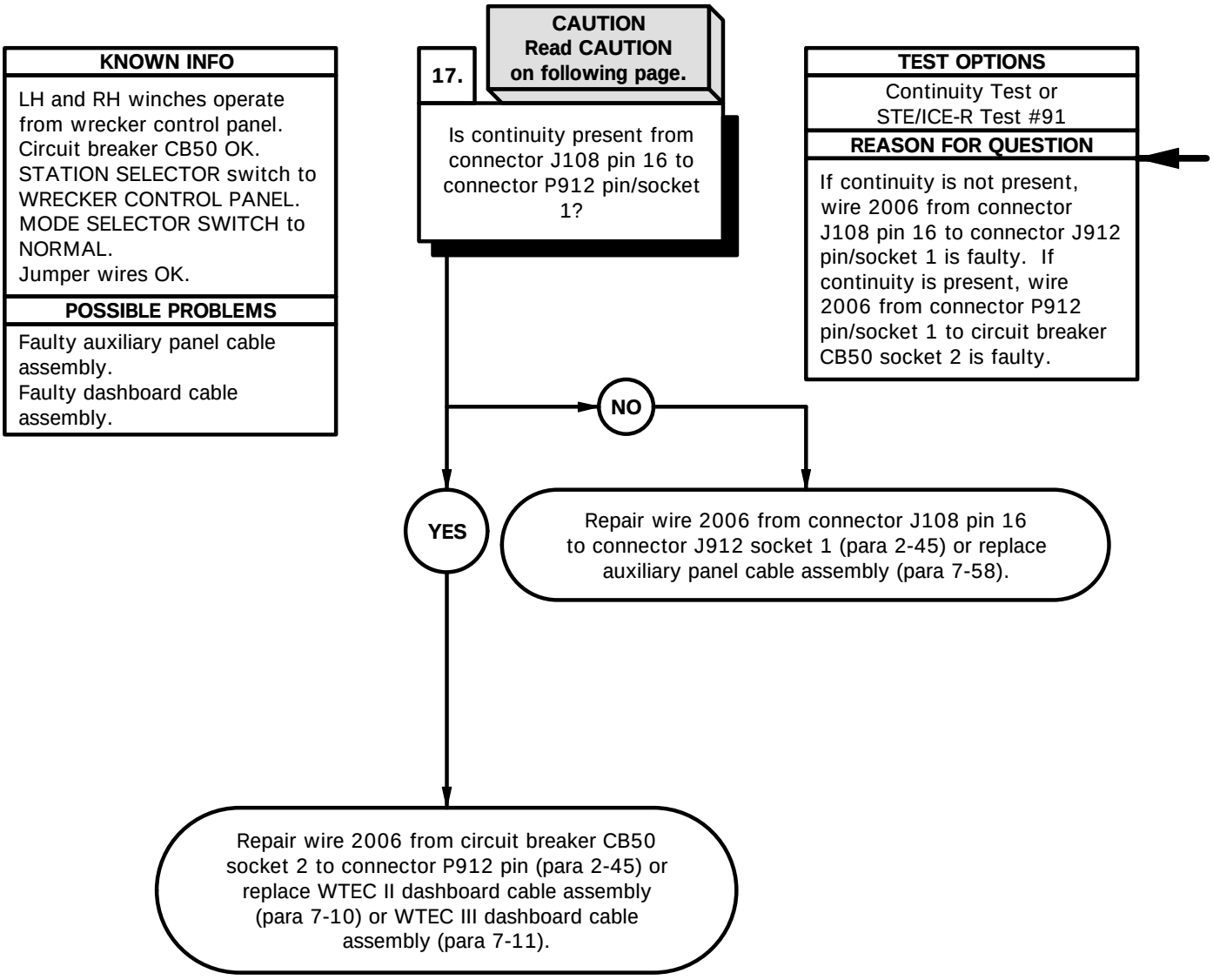
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Install circuit breaker CB50 in PDP.
(2) Disconnect connector P107 from connector J107.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector P108 socket 16.
(5) Connect negative (-) probe of multimeter to connector P107 socket g and note reading on multimeter.
(6) If continuity is not present, repair wire 2006 from connector P107 socket g to connector P108 socket 16 (para 2-45) or replace M1089 rear lights cable assembly (para 7-104).
(7) If continuity is present, repair wire 9 from connector J107 to terminal block TB9 (para 2-45) or replace M1089 control panel power cable assembly (para 7-109).
(8) Connect connector P108 to connector J108.
(9) Install kick panel (para 16-3).
(10) Connect connector P107 to connector J107.
(11) Install wrecker control panel top cover (para 14-4).
(12) Connect batteries (para 7-57).



e139. MAIN WINCH LH OR RH SPEED SWITCH DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)



CAUTION

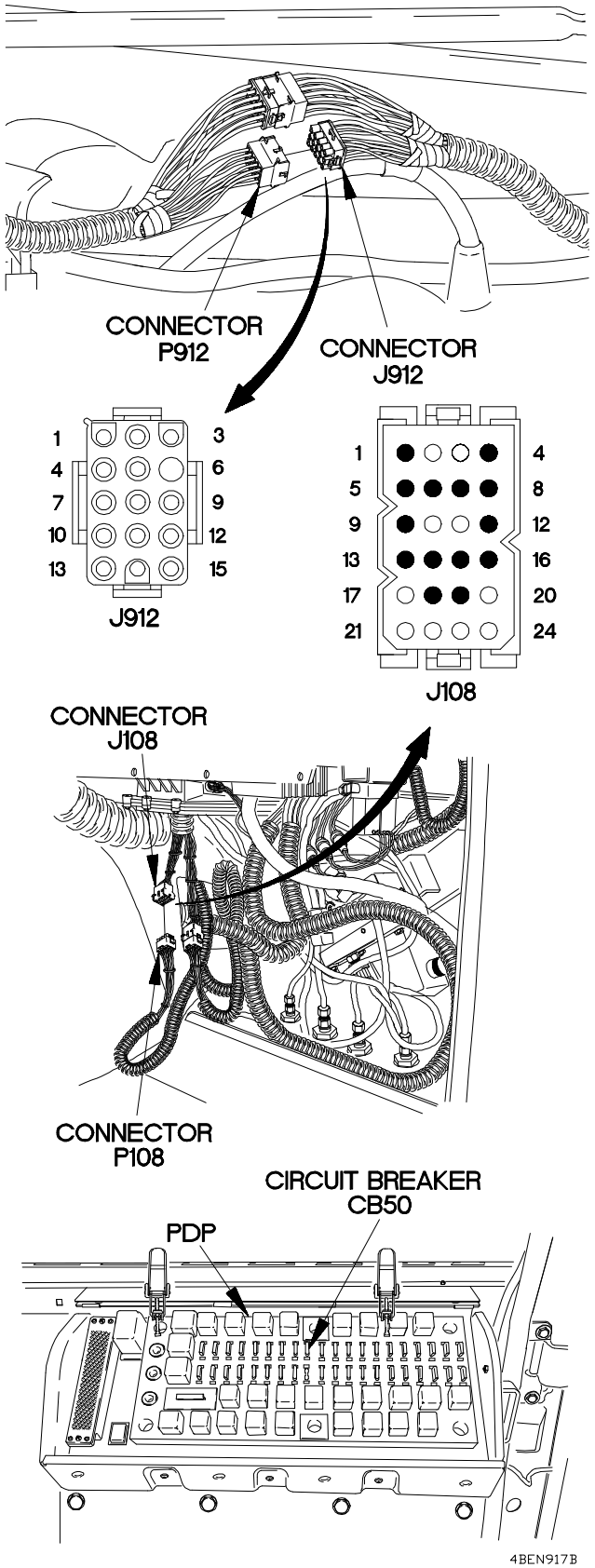
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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 personnel heater for access (para 18-9).
(2) Disconnect connector P912 from connector J912.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector J108 pin 16.
(5) Connect negative (-) probe of multimeter to connector J912 pin/socket 1 and note reading on multimeter.
(6) If continuity is not present, repair wire 2006 from connector J108 pin 16 to connector J912 socket 1 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
(7) If continuity is present, repair wire 2006 from circuit breaker CB50 socket 2 to connector P912 pin 1 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(8) Connect connector P912 to connector J912.
(9) Install personnel heater (para 18-9).
(10) Connect connector J108 to connector P108.
(11) Install circuit breaker CB50 in PDP.
(12) Install kick panel (para 16-3).
(13) Install wrecker control panel top cover (para 14-4).
(14) Connect batteries (para 7-57).



e140. MAIN WINCH LH OR RH FREESPOOL SWITCH DOES NOT OPERATE FROM WRECKER CONTROL PANEL

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Wrecker control panel top cover removed (para 14-4).

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Gloves, Welder's (Item 14, Appendix C)

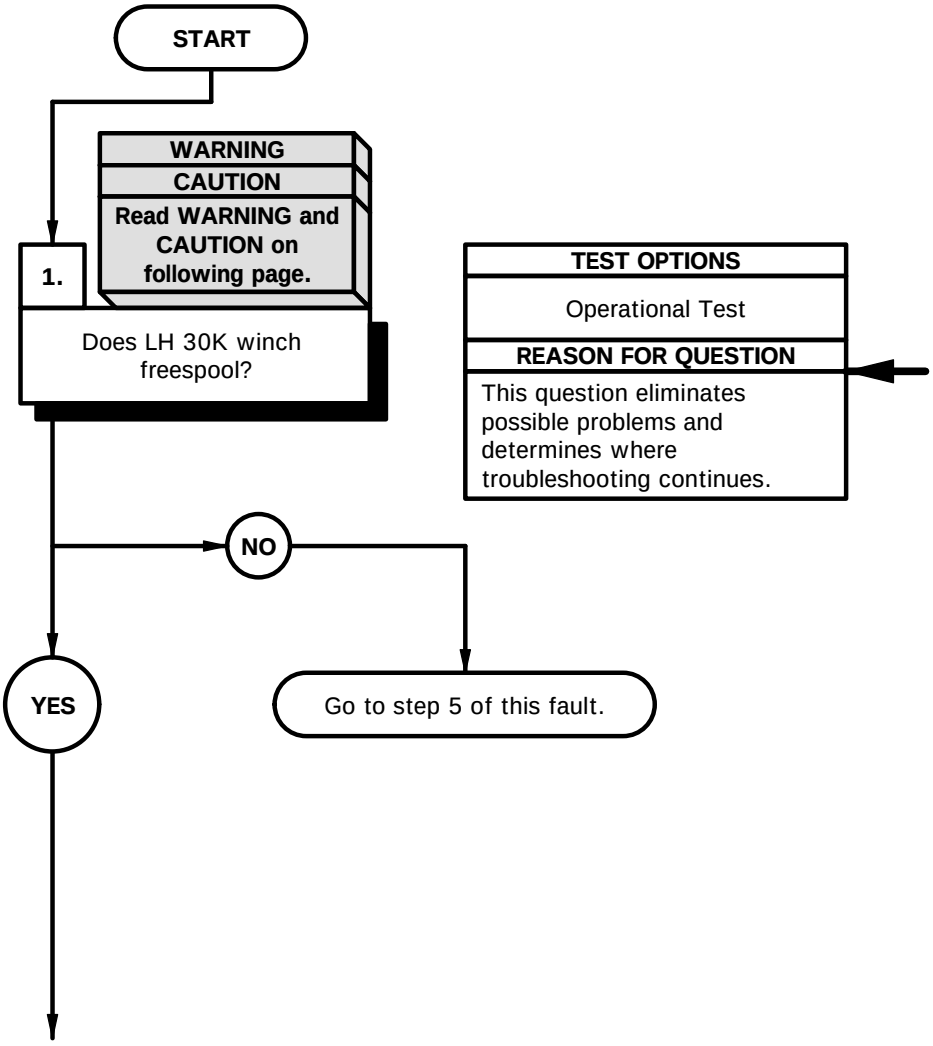
References
TM 9-4910-571-12&P

KNOWN INFO

LH and RH winches operate from wrecker control panel.
Circuit breaker CB50 OK.
STATION SELECTOR switch to WRECKER CONTROL PANEL.
MODE SELECTOR SWITCH to NORMAL.
MAIN WINCH LH and RH SPEED switches operate.

POSSIBLE PROBLEMS

Faulty MAIN WINCH LH FREESPOOL switch.
Faulty MAIN WINCH RH FREESPOOL switch.
Faulty M1089 control panel wiring harness.
Faulty M1089 30K winch control wiring harness.
Faulty jumper wire.
Faulty 30K winch pneumatic manifold solenoid L17.
Faulty 30K winch pneumatic manifold solenoid L19.
Faulty wrecker air system.



WARNING

Goggles must be worn while operating wrecker control panel. Blowing dust and debris may become airborne while engine is running. Failure to comply may result in injury to personnel.

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.

Never let moving cable slide through hands, even when wearing gloves. A broken wire could cut through gloves and cut hands. Failure to comply may result in injury to personnel.

OPERATIONAL TEST

(1) Start engine (TM 9-2320-366-10-1).
(2) Position PTO switch to on.

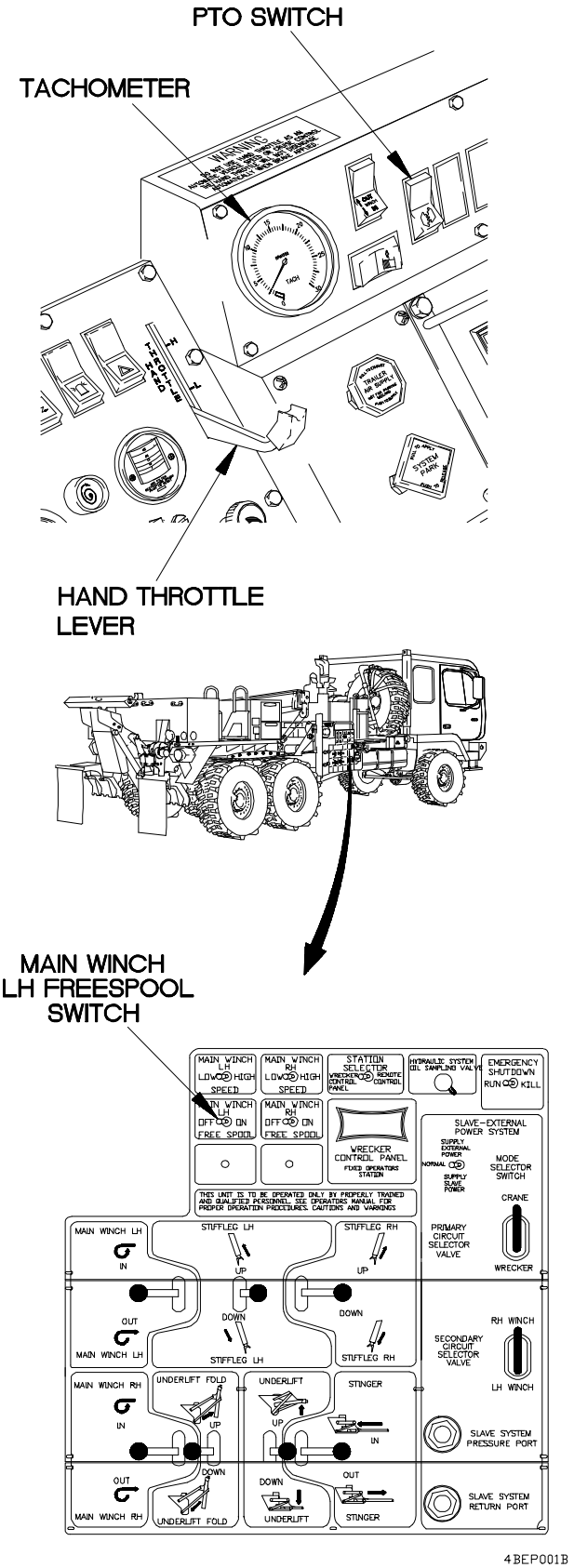
CAUTION

Keep tachometer within 1,250-1,450 rpm when Power Take-Off (PTO) is engaged. Do not exceed 1,450 rpm. Failure to comply may result in damage to equipment.

NOTE

In the event of a tachometer failure a HAND THROTTLE lever positioned to L is approximately 1,250-1,450 rpm.

(3) Set engine speed by increasing HAND THROTTLE lever until tachometer reads 1,250-1,450 rpm.
(4) Position MAIN WINCH LH FREESPOOL switch to ON.
(5) Pull cable to see if LH 30K winch drum FREESPOOLs.
(6) If LH 30K winch does not freespool, go to step 5 of this fault.



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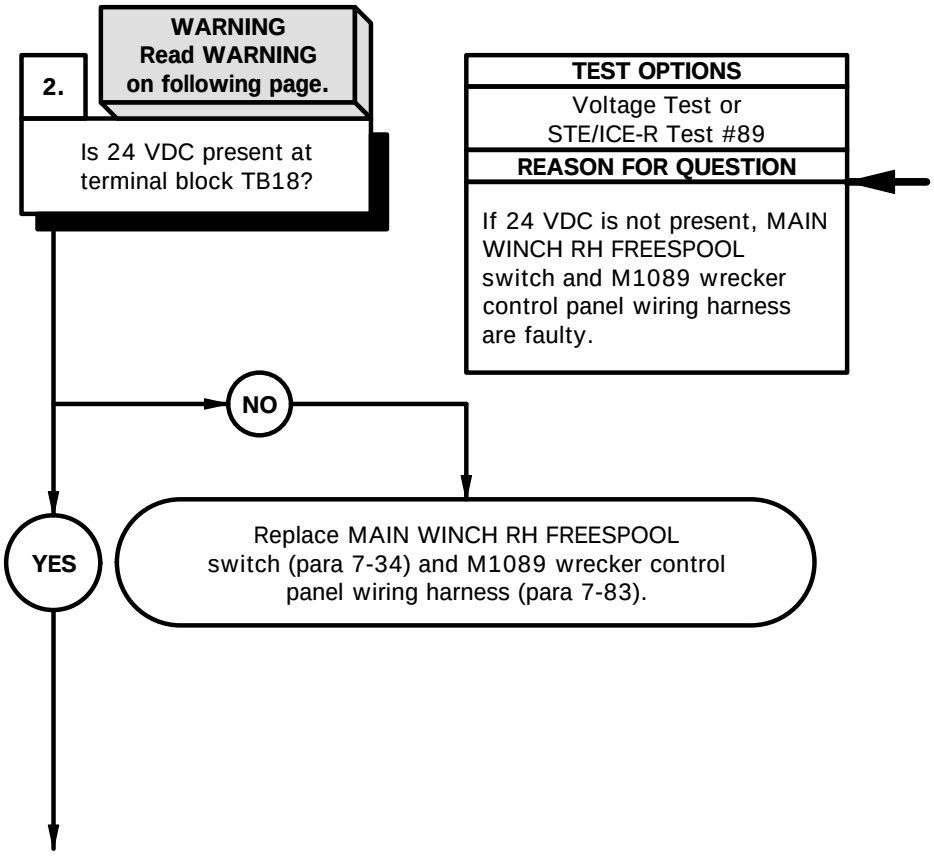
e140. MAIN WINCH LH OR RH FREESPOOL SWITCH DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)

KNOWN INFO

LH and RH winches operate from wrecker control panel.
Circuit breaker CB50 OK.
STATION SELECTOR switch to WRECKER CONTROL PANEL.
MODE SELECTOR SWITCH to NORMAL.
MAIN WINCH LH and RH SPEED switches operate.
LH 30K winch freespools.
MAIN WINCH LH FREESPOOL switch OK.
30K winch pneumatic manifold solenoid L19 OK.

POSSIBLE PROBLEMS

Faulty MAIN WINCH RH FREESPOOL switch.
Faulty M1089 control panel wiring harness.
Faulty M1089 30K winch control wiring harness.
Faulty jumper wire.
Faulty 30K winch pneumatic manifold solenoid L17.
Faulty wrecker air system.

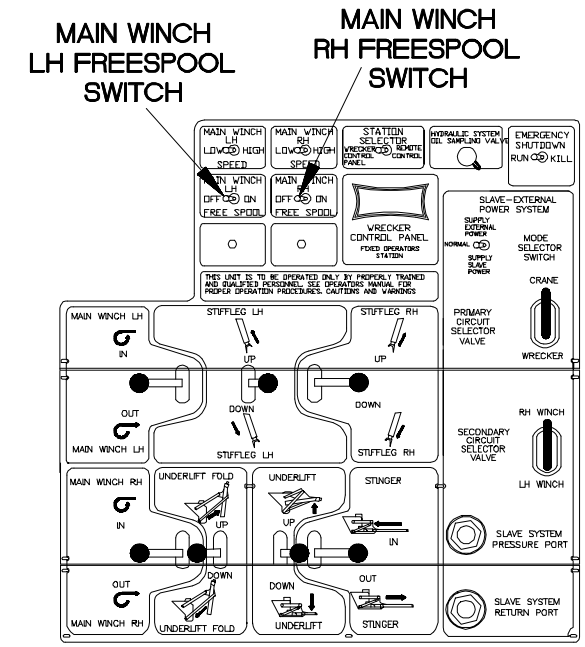


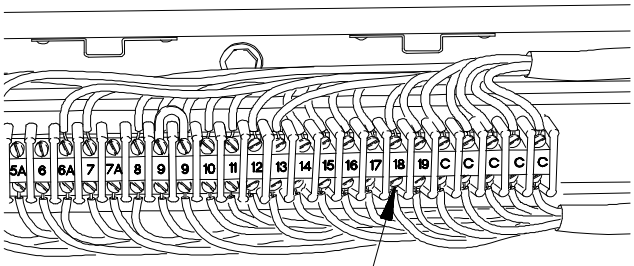
WARNING

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 circuits and cause severe burns or electrical shock.

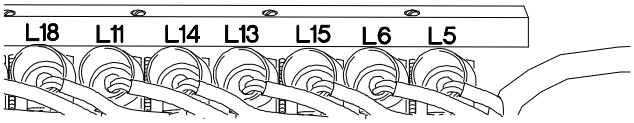
VOLTAGE TEST

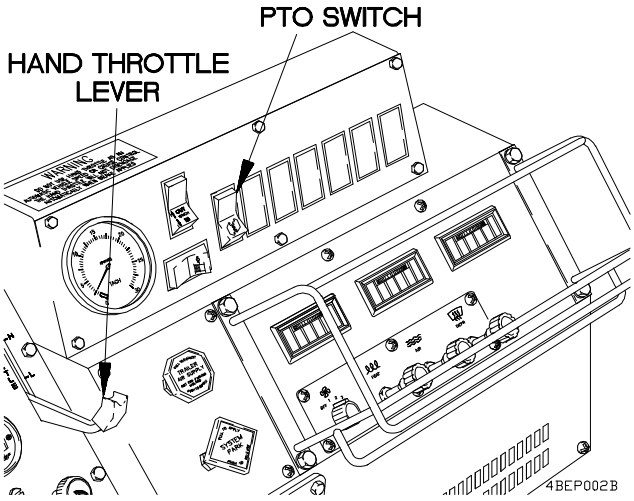
(1) Set engine speed to idle (750 rpm) by decreasing HAND THROTTLE lever to full down position.
(2) Position PTO switch to off.
(3) Shut down engine (TM 9-2320-366-10-1).
(4) Position MAIN WINCH LH FREESPOOL switch to OFF.
(5) Position MAIN WINCH RH FREESPOOL switch to ON.
(6) Set multimeter to volts DC.
(7) Connect positive (+) probe of multimeter to terminal block TB18.
(8) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(9) If 24 VDC is not present, replace MAIN WINCH RH FREESPOOL switch (para 7-34) and M1089 wrecker control panel wiring harness (para 7-83).
(10) Position MAIN WINCH RH FREESPOOL switch to OFF.





TERMINAL BLOCK TB18





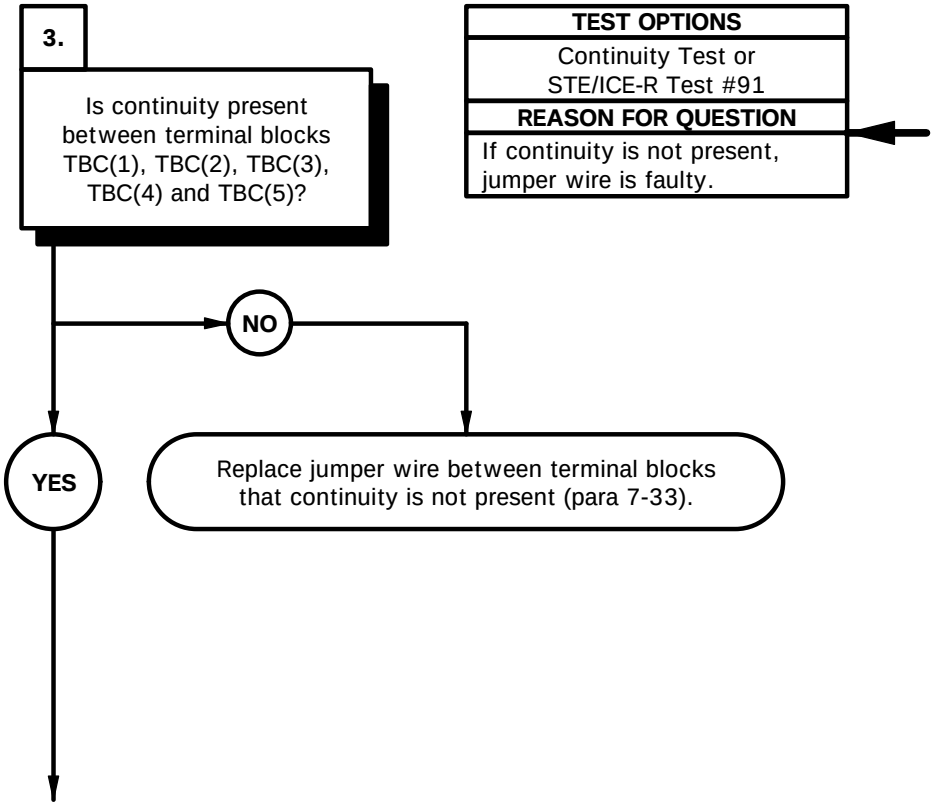
e140. MAIN WINCH LH OR RH FREESPOOL SWITCH DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)

KNOWN INFO

LH and RH winches operate from wrecker control panel.
Circuit breaker CB50 OK.
STATION SELECTOR switch to WRECKER CONTROL PANEL.
MODE SELECTOR SWITCH to NORMAL.
MAIN WINCH LH and RH SPEED switches operate.
LH 30K winch freespools.
MAIN WINCH LH FREESPOOL switch OK.
30K winch pneumatic manifold solenoid L19 OK.
MAIN WINCH RH FREESPOOL switch OK.
M1089 control panel wiring harness OK.

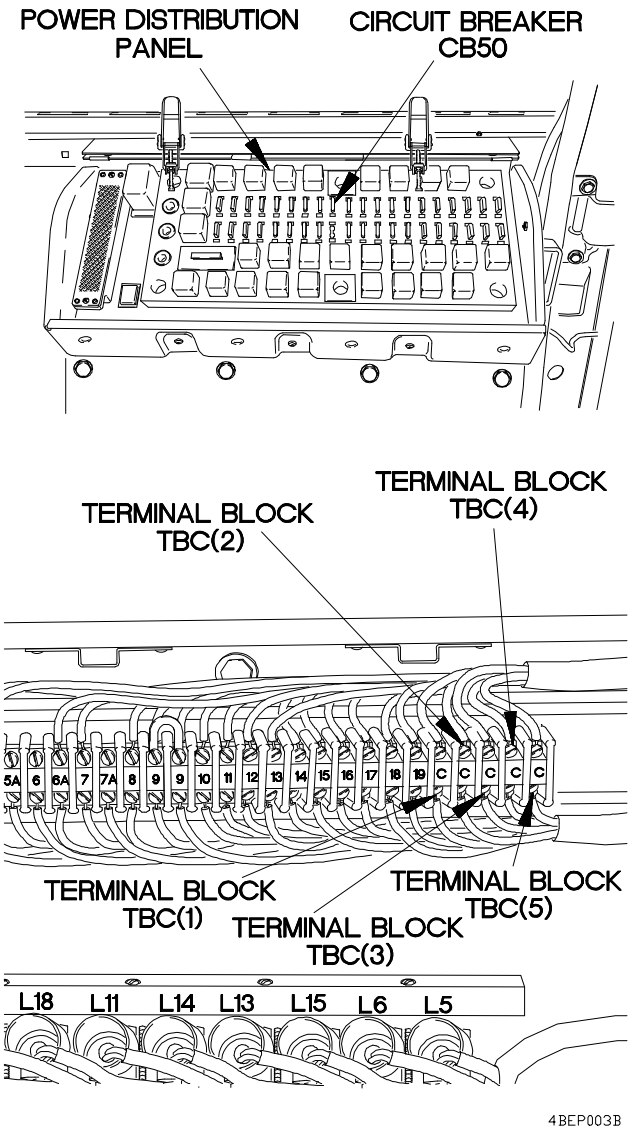
POSSIBLE PROBLEMS

Faulty M1089 30K winch control wiring harness.
Faulty jumper wire.
Faulty 30K winch pneumatic manifold solenoid L17.
Faulty wrecker air system.

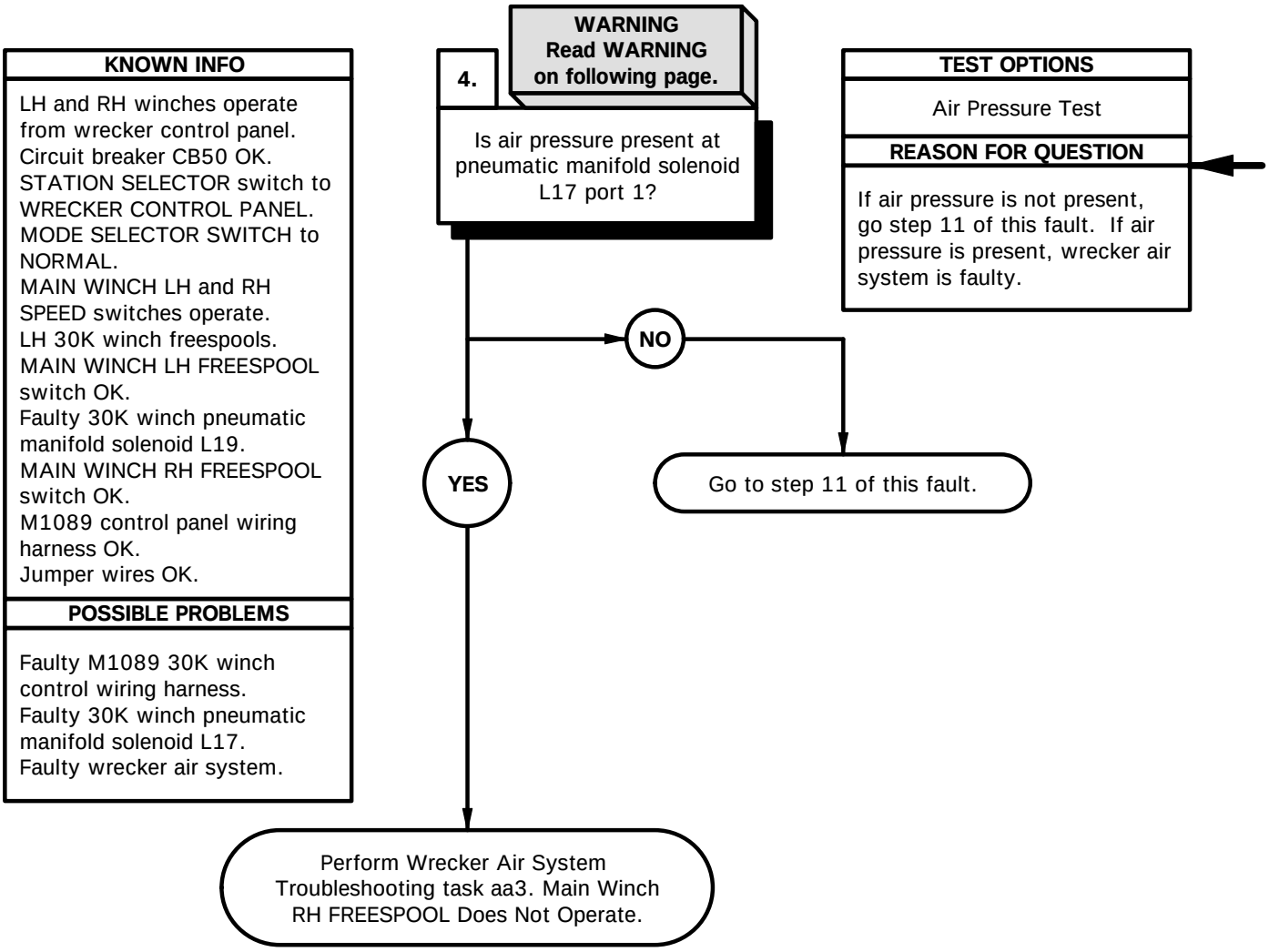


CONTINUITY TEST

(1) Remove power distribution panel (PDP) cover (para 16-2).
(2) Remove circuit breaker CB50 from power distribution panel (PDP).
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to terminal block TBC(1).
(5) Connect negative (-) probe of multimeter to to terminal block TBC(2) and note reading on multimeter.
(6) Connect positive (+) probe of multimeter to terminal block TBC(2).
(7) Connect negative (-) probe of multimeter to to terminal block TBC(3) and note reading on multimeter.
(8) Connect positive (+) probe of multimeter to terminal block TBC(3).
(9) Connect negative (-) probe of multimeter to to terminal block TBC(4) and note reading on multimeter.
(10) Connect positive (+) probe of multimeter to terminal block TBC(4).
(11) Connect negative (-) probe of multimeter to to terminal block TBC(5) and note reading on multimeter.
(12) If continuity is not present between two terminal blocks noted above, replace jumper wire between terminal blocks that continuity is not present (para 7-33).



e140. MAIN WINCH LH OR RH FREESPOOL SWITCH DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)



WARNING

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

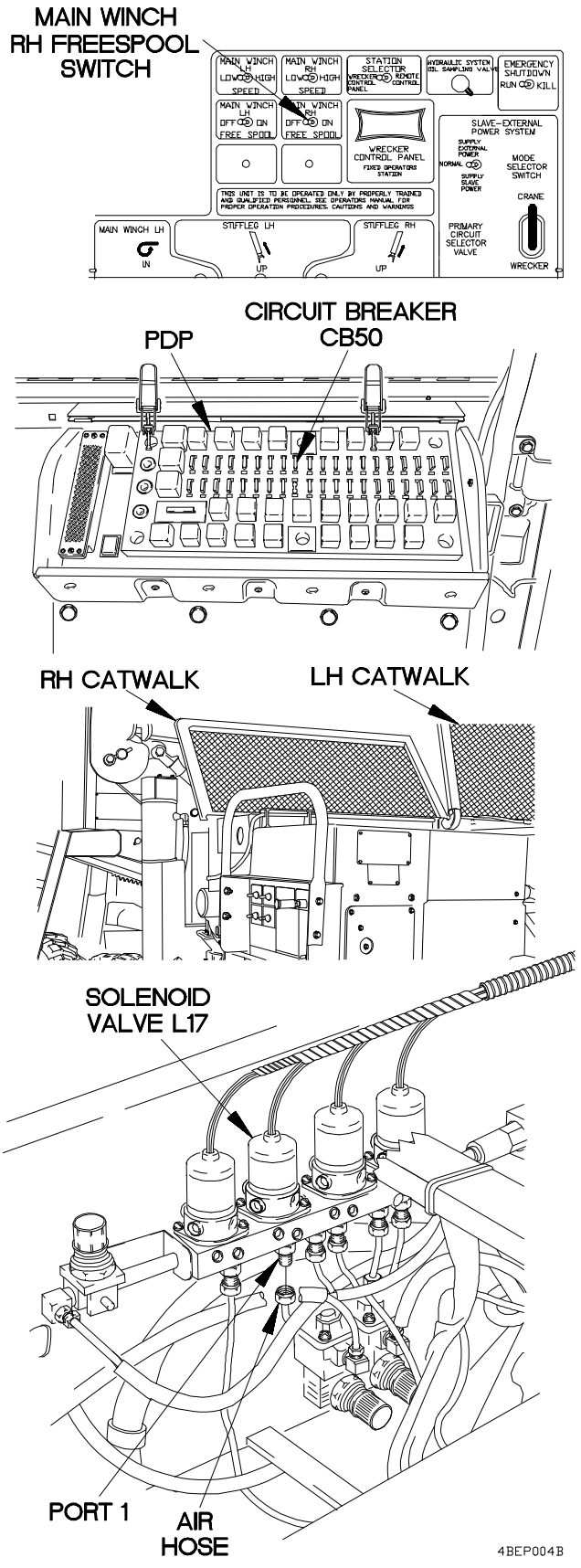
AIR PRESSURE TEST

(1) Install circuit breaker CB50 in PDP.
(2) Open LH and RH catwalks.
(3) Disconnect air hose from pneumatic manifold solenoid L17 port 1.
(4) Start engine (TM 9-2320-366-10-1).
(5) Position MAIN WINCH RH FREESPOOL switch to ON.
(6) If air pressure is not present at pneumatic manifold solenoid L17 port 1, go to step 11 of this fault.
(7) If air pressure is present at pneumatic manifold solenoid L17 port 1, perform Wrecker Air System Troubleshooting task aa3. Main Winch RH Freespool Does Not Operate.
(8) Position MAIN WINCH RH FREESPOOL switch to OFF.
(9) Shut down engine (TM 9-2320-366-10-1).
(10) Connect air hose to pneumatic manifold solenoid L17 port 1.

NOTE

Perform steps (11) and (13) if air pressure is present at air hose.

(11) Close LH and RH catwalks.
(12) Install PDP cover (para 16-2).
(13) Install wrecker control panel top cover (para 14-4).



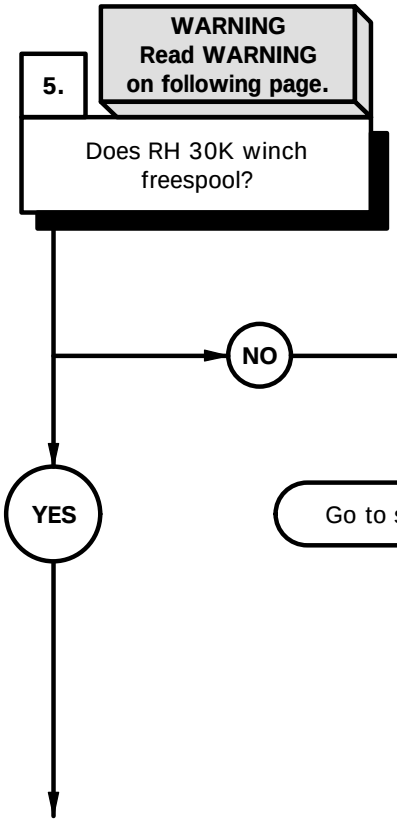
e140. MAIN WINCH LH OR RH FREESPOOL SWITCH DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)

KNOWN INFO

LH and RH winches operate from wrecker control panel.
Circuit breaker CB50 OK.
STATION SELECTOR switch to WRECKER CONTROL PANEL.
MODE SELECTOR SWITCH to NORMAL.
MAIN WINCH LH and RH SPEED switches operate.

POSSIBLE PROBLEMS

Faulty MAIN WINCH LH FREESPOOL switch.
Faulty MAIN WINCH RH FREESPOOL switch.
Faulty M1089 control panel wiring harness.
Faulty M1089 30K winch control wiring harness.
Faulty jumper wire.
Faulty 30K winch pneumatic manifold solenoid L17.
Faulty 30K winch pneumatic manifold solenoid L19.
Faulty wrecker air system.



TEST OPTIONS

Operational Test

REASON FOR QUESTION

This question eliminates possible problems and determines where troubleshooting continues.

WARNING

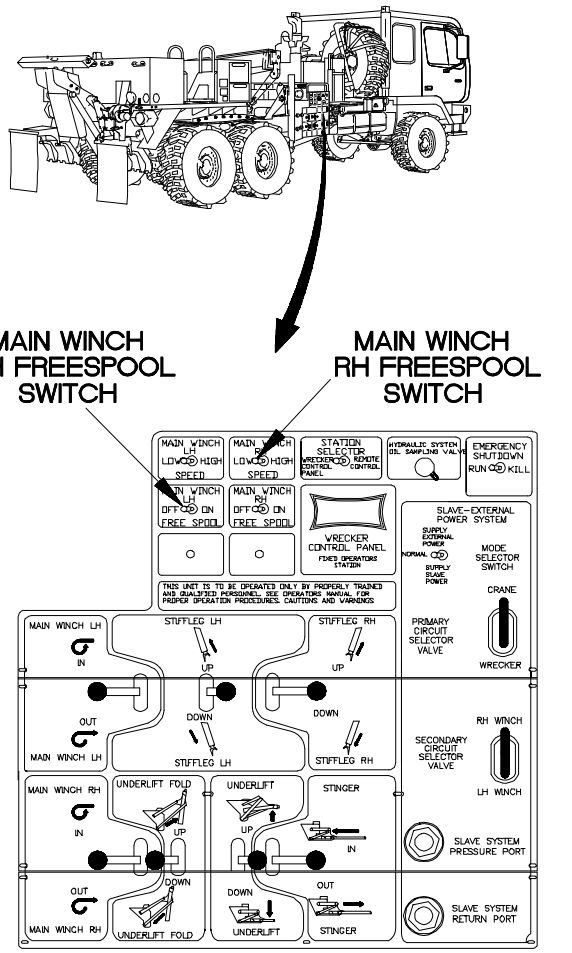
Goggles must be worn while operating wrecker control panel. Blowing dust and debris may become airborne while engine is running. Failure to comply may result in injury to personnel.

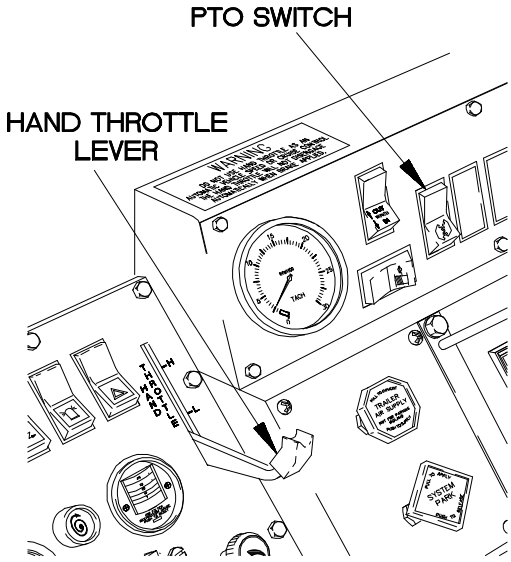
Wear leather gloves at all times when handling winch cable. Do not allow cable to slide through hands even with gloves on. Broken wires may cause injury.

Never let moving cable slide through hands, even when wearing gloves. A broken wire could cut through gloves and cut hands. Failure to comply may result in injury to personnel.

OPERATIONAL TEST

(1) Position MAIN WINCH LH FREESPOOL switch to OFF.
(2) Position MAIN WINCH RH FREESPOOL switch to ON.
(3) Pull cable to see if RH 30K winch drum free spools.
(4) If RH 30K winch does not freespool, go to step 9 of this fault.
(5) Position MAIN WINCH RH FREESPOOL switch to OFF.
(6) Set engine speed to idle (750 rpm) by decreasing HAND THROTTLE lever to full down position.
(7) Position PTO switch to off.
(8) Shut down engine (TM 9-2320-366-10-1).





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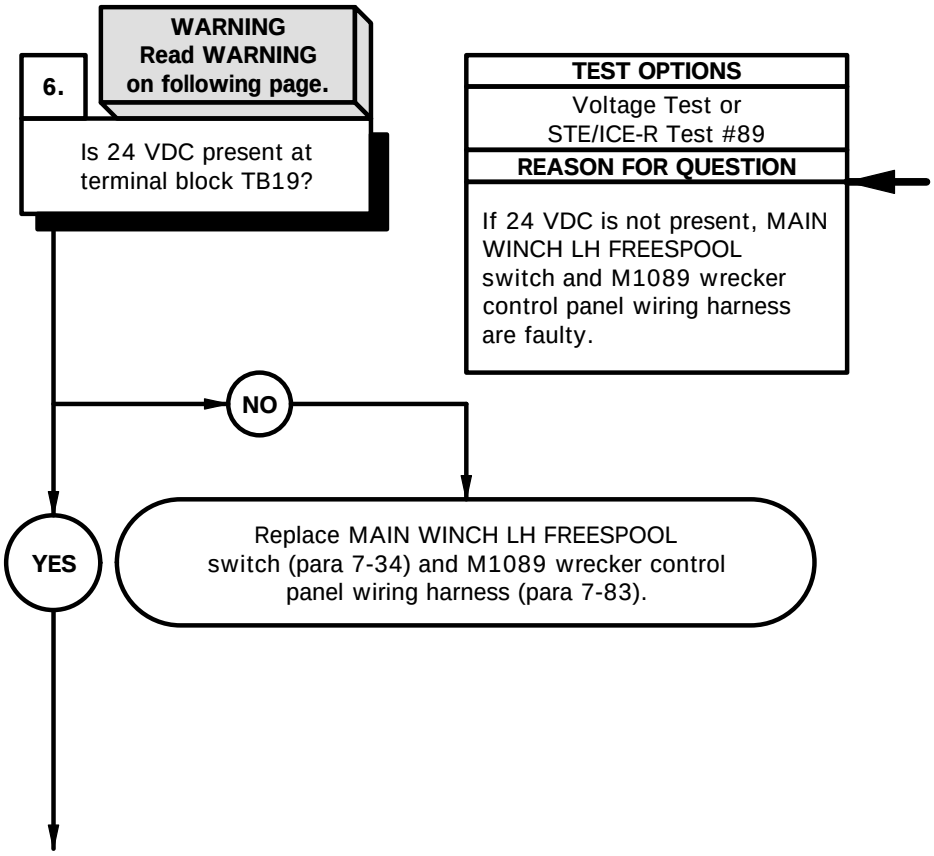
e140. MAIN WINCH LH OR RH FREESPOOL SWITCH DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)

KNOWN INFO

LH and RH winches operate from wrecker control panel.
Circuit breaker CB50 OK.
STATION SELECTOR switch to WRECKER CONTROL PANEL.
MODE SELECTOR SWITCH to NORMAL.
MAIN WINCH LH and RH SPEED switches operate.
RH 30K winch freespools.
MAIN WINCH LH FREESPOOL switch OK.
30K winch pneumatic manifold solenoid L17 OK.

POSSIBLE PROBLEMS

Faulty MAIN WINCH LH FREESPOOL switch.
Faulty M1089 control panel wiring harness.
Faulty M1089 30K winch control wiring harness.
Faulty jumper wire.
Faulty 30K winch pneumatic manifold solenoid L19.
Faulty wrecker air system.

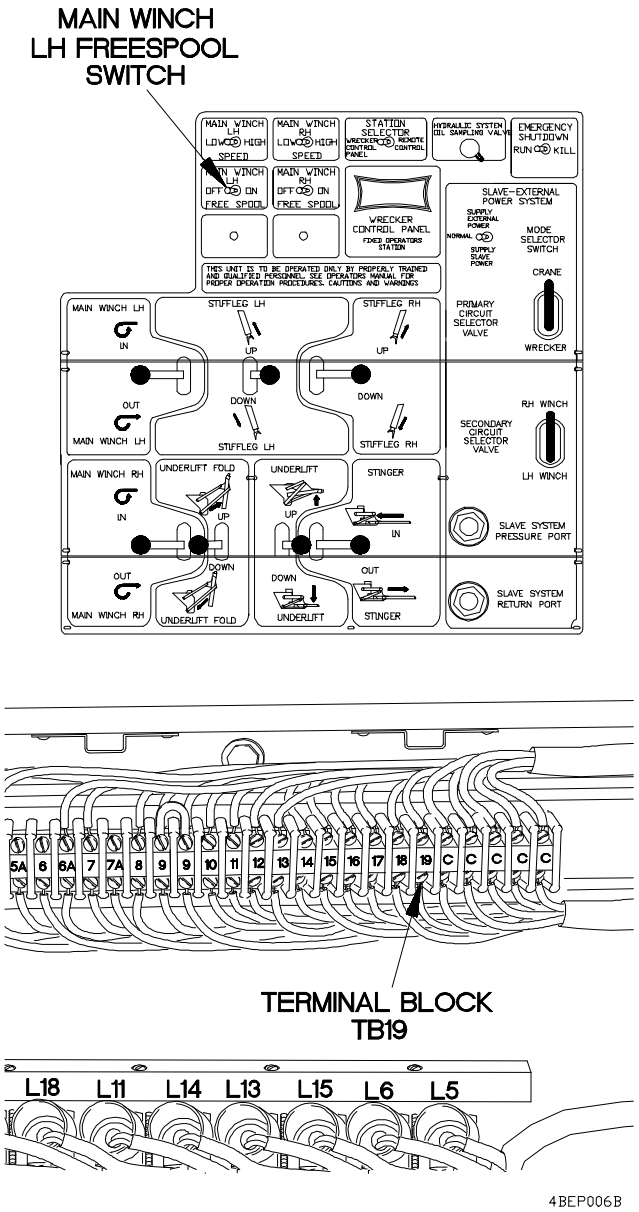


WARNING

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 circuits and cause severe burns or electrical shock.

CONTINUITY TEST

(1) Position MAIN WINCH LH FREESPOOL switch to ON.
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to terminal block TB19.
(4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(5) If 24 VDC is not present, replace MAIN WINCH LH FREESPOOL switch (para 7-34) and M1089 wrecker control panel wiring harness (para 7-83).
(6) Position MAIN WINCH LH FREESPOOL switch to OFF.



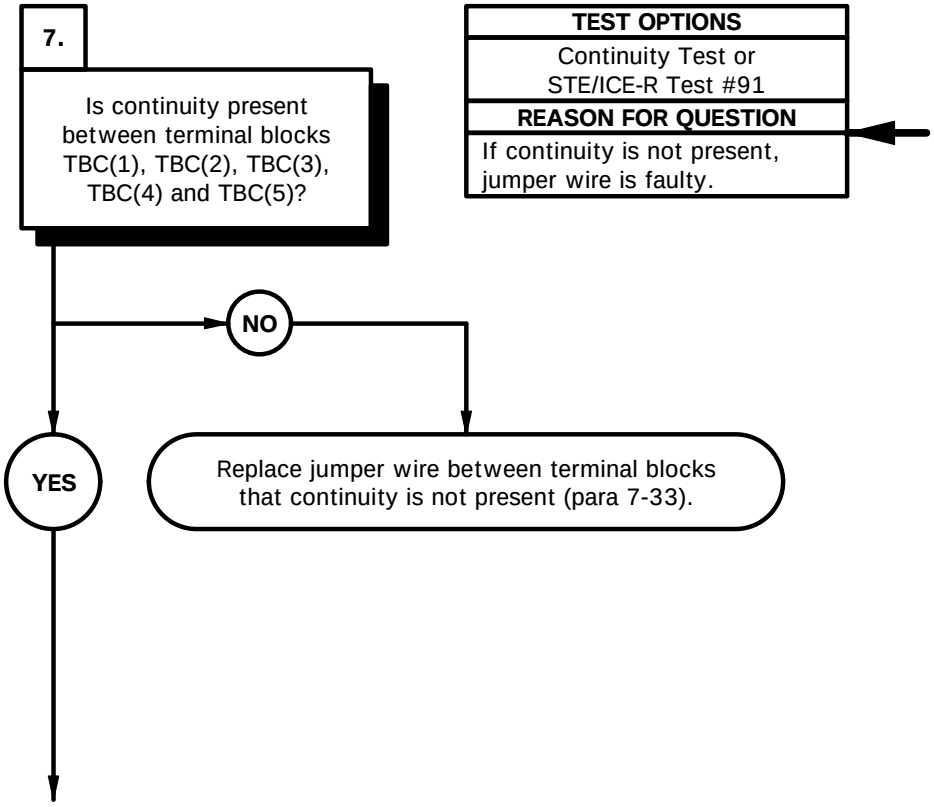
e140. MAIN WINCH LH OR RH FREESPOOL SWITCH DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)

KNOWN INFO

LH and RH winches operate from wrecker control panel.
Circuit breaker CB50 OK.
STATION SELECTOR switch to WRECKER CONTROL PANEL.
MODE SELECTOR SWITCH to NORMAL.
MAIN WINCH LH and RH SPEED switches operate.
RH 30K winch freespools.
MAIN WINCH RH FREESPOOL switch OK.
30K winch pneumatic manifold solenoid L17 OK.
MAIN WINCH LH FREESPOOL switch OK.
M1089 control panel wiring harness OK.

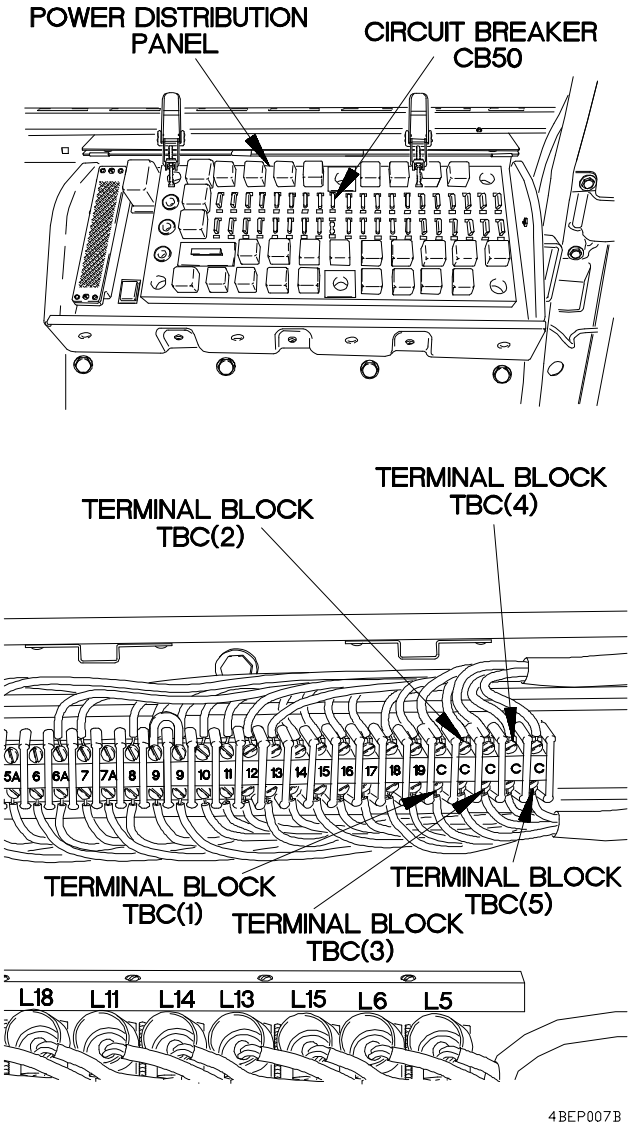
POSSIBLE PROBLEMS

Faulty M1089 30K winch control wiring harness.
Faulty jumper wire.
Faulty 30K winch pneumatic manifold solenoid L19.
Faulty wrecker air system.

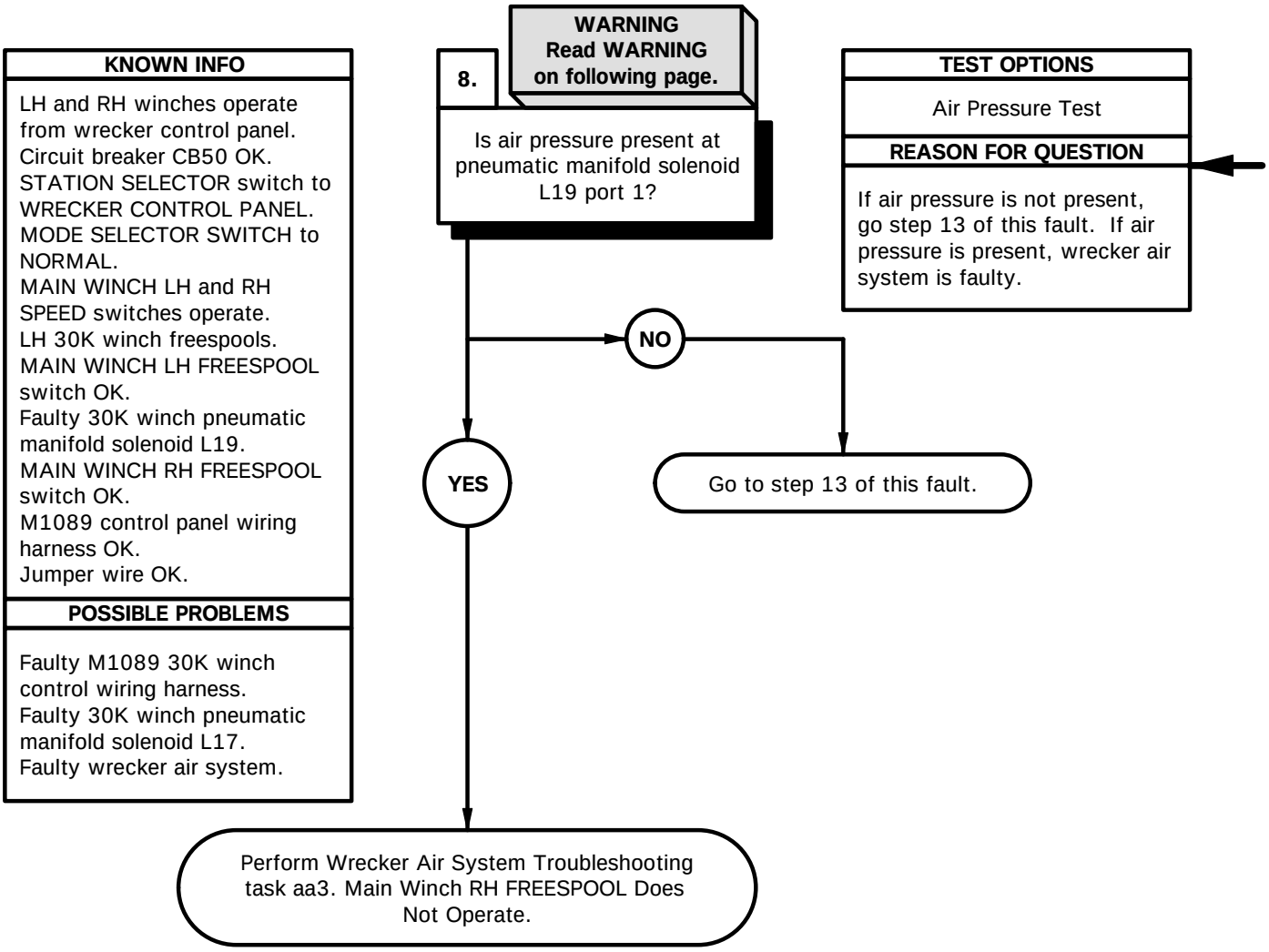


CONTINUITY TEST

(1) Remove power distribution panel (PDP) cover (para 16-2).
(2) Remove circuit breaker CB50 from power distribution panel (PDP).
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to terminal block TBC(1).
(5) Connect negative (-) probe of multimeter to to terminal block TBC(2) and note reading on multimeter.
(6) Connect positive (+) probe of multimeter to terminal block TBC(2).
(7) Connect negative (-) probe of multimeter to to terminal block TBC(3) and note reading on multimeter.
(8) Connect positive (+) probe of multimeter to terminal block TBC(3).
(9) Connect negative (-) probe of multimeter to to terminal block TBC(4) and note reading on multimeter.
(10) Connect positive (+) probe of multimeter to terminal block TBC(4).
(11) Connect negative (-) probe of multimeter to to terminal block TBC(5) and note reading on multimeter.
(12) If continuity is not present between two terminal blocks noted above, replace jumper wire between terminal blocks that continuity is not present (para 7-33).



e140. MAIN WINCH LH OR RH FREESPOOL SWITCH DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)



WARNING

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

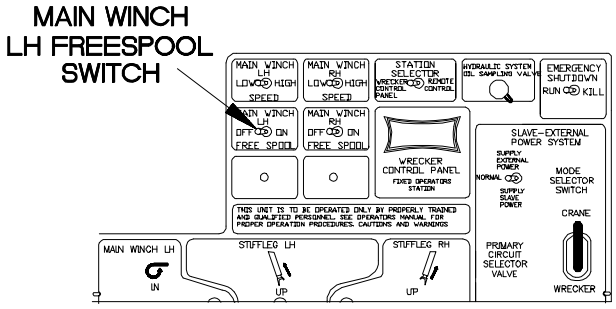
AIR PRESSURE TEST

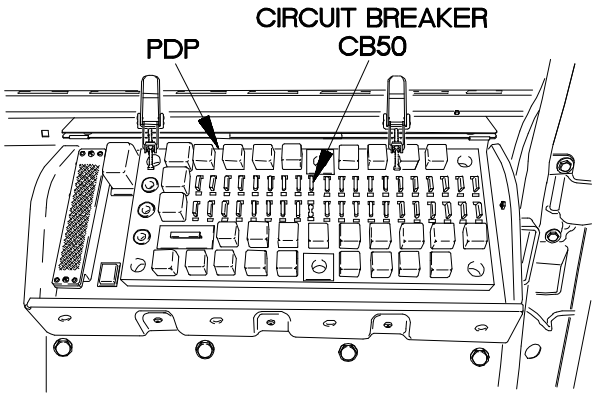
(1) Install circuit breaker CB50 in PDP.
(2) Open LH and RH catwalks.
(3) Disconnect air hose from pneumatic manifold solenoid L19 port 1.
(4) Start engine (TM 9-2320-366-10-1).
(5) Position MAIN WINCH LH FREESPOOL switch to ON.
(6) If air pressure is not present at pneumatic manifold solenoid L19 port 1, go to step 13 of this fault.
(7) If air pressure is present at pneumatic manifold solenoid L19 port 1, perform Wrecker Air System Troubleshooting task aa3. Main Winch RH Freespool Does Not Operate.
(8) Position MAIN WINCH LH FREESPOOL switch to OFF.
(9) Shut down engine (TM 9-2320-366-10-1).
(10) Connect air hose to pneumatic manifold solenoid L19 port 1.

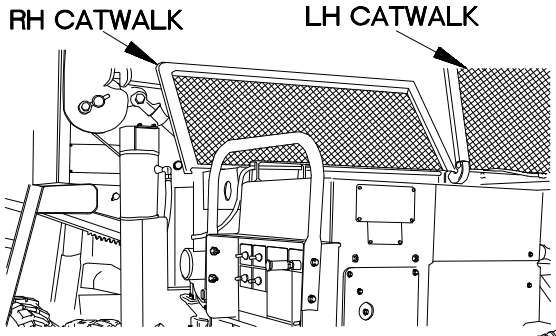
NOTE

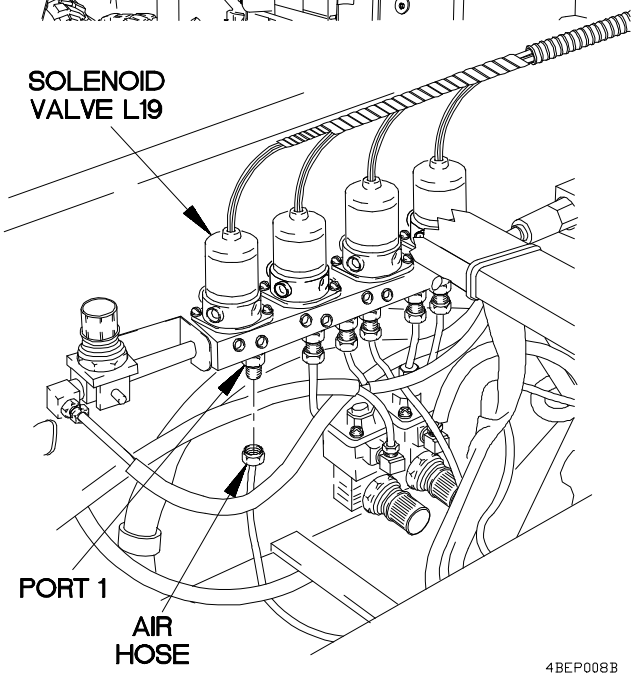
Perform steps (11) and (13) if air pressure is present at air hose.

(11) Close LH and RH catwalks.
(12) Install PDP cover (para 16-2).
(13) Install wrecker control panel top cover (para 14-4).

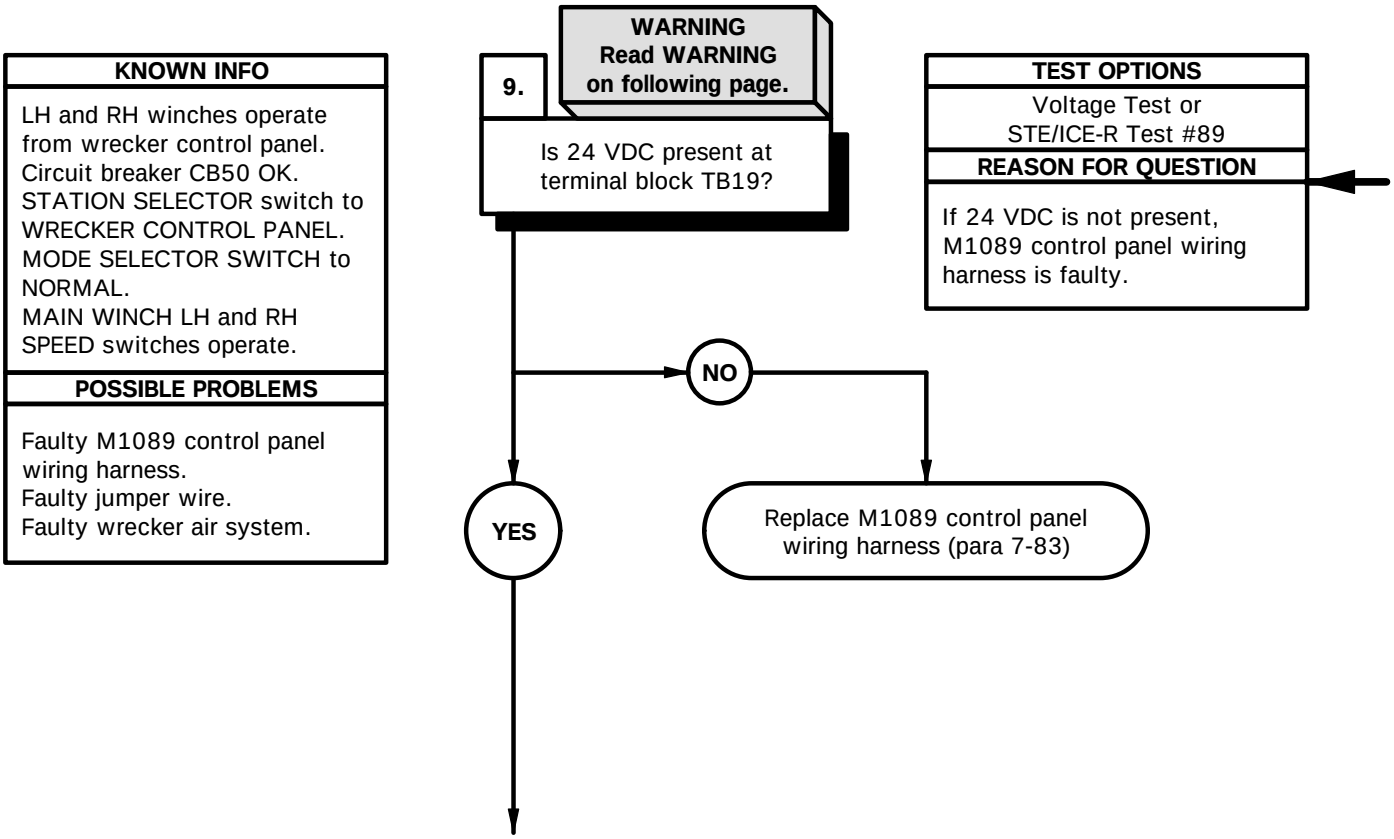








e140. MAIN WINCH LH OR RH FREESPOOL SWITCH DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)

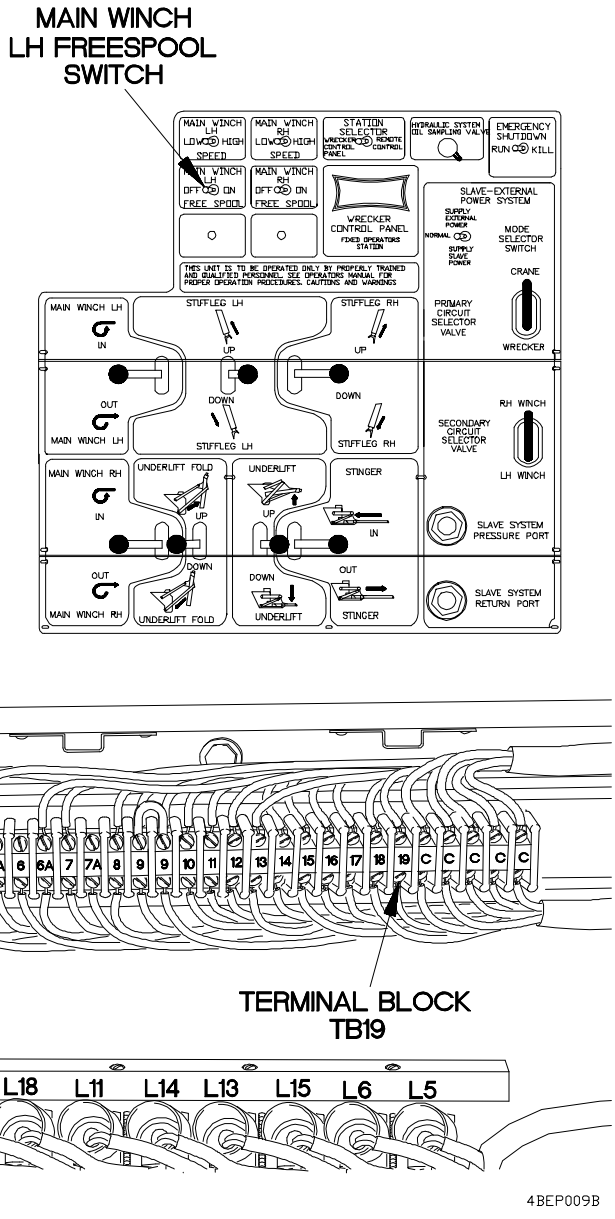


WARNING

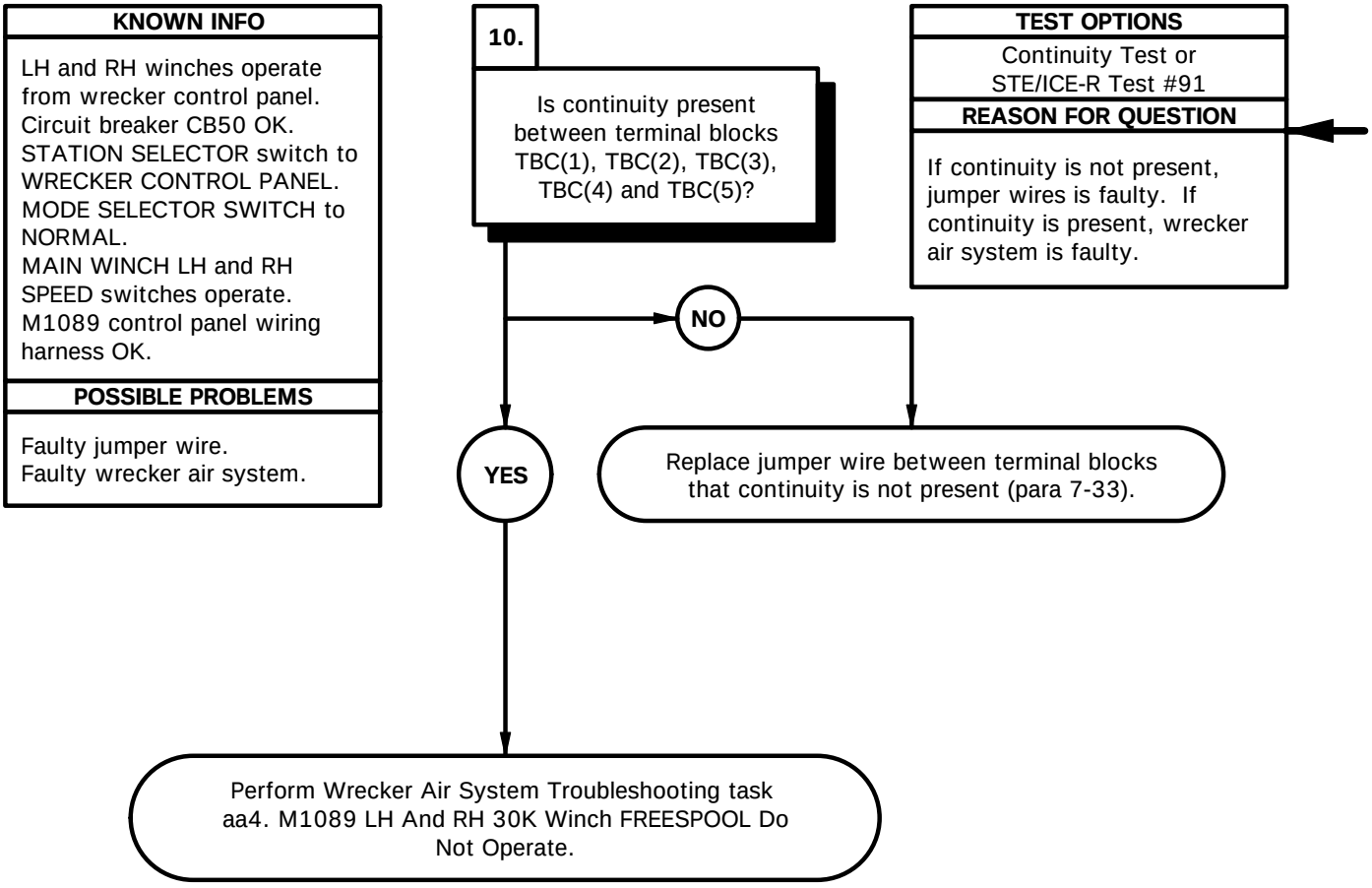
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Position MAIN WINCH LH FREESPOOL switch to ON.
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to terminal block TB19.
(4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(5) If 24 VDC is not present, replace M1089 control panel wiring harness (para 7-83).
(6) Position MAIN WINCH LH FREESPOOL switch to OFF.

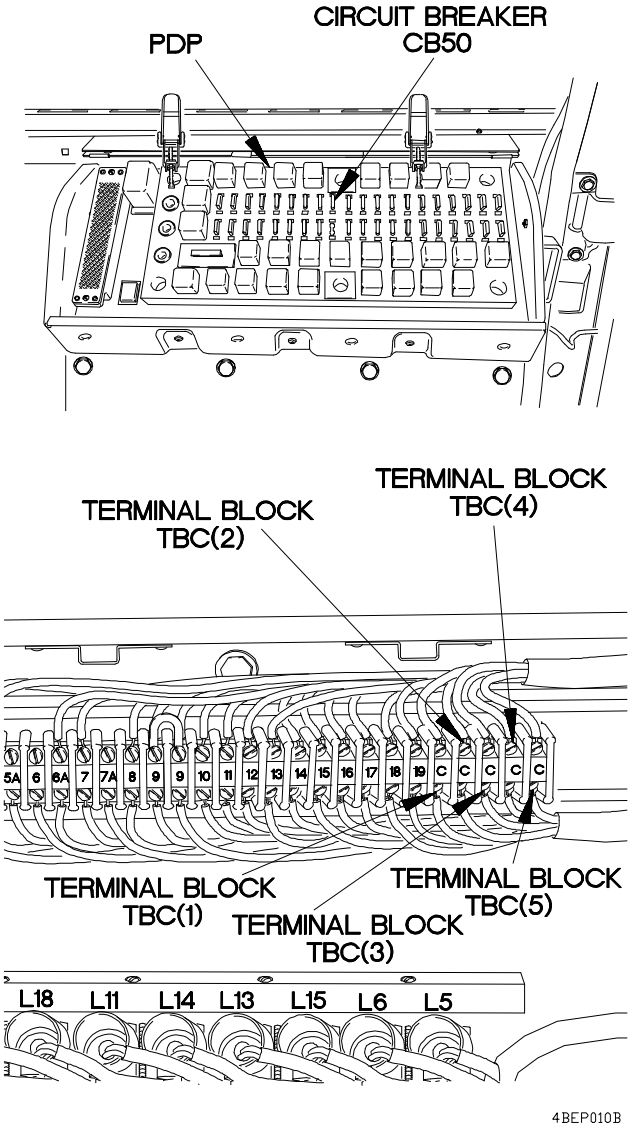


e140. MAIN WINCH LH OR RH FREESPOOL SWITCH DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)



CONTINUITY TEST

(1) Remove PDP cover (para 16-2).
(2) Remove circuit breaker CB50 from PDP.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to terminal block TBC(1).
(5) Connect negative (-) probe of multimeter to to terminal block TBC(2) and note reading on multimeter.
(6) Connect positive (+) probe of multimeter to terminal block TBC(2).
(7) Connect negative (-) probe of multimeter to to terminal block TBC(3) and note reading on multimeter.
(8) Connect positive (+) probe of multimeter to terminal block TBC(3).
(9) Connect negative (-) probe of multimeter to to terminal block TBC(4) and note reading on multimeter.
(10) Connect positive (+) probe of multimeter to terminal block TBC(4).
(11) Connect negative (-) probe of multimeter to to terminal block TBC(5) and note reading on multimeter.
(12) If continuity is not present between two terminal blocks noted above, replace jumper wire between terminal blocks that continuity is not present (para 7-33).
(13) If continuity is present, perform Wrecker Air System Troubleshooting task aa4. M1089 LH And RH 30K Winch FREESPOOL Do Not Operate.
(14) Install circuit breaker CB50 in PDP.
(15) Install PDP cover (para 16-2).
(16) Install wrecker control panel top cover (para 14-4).



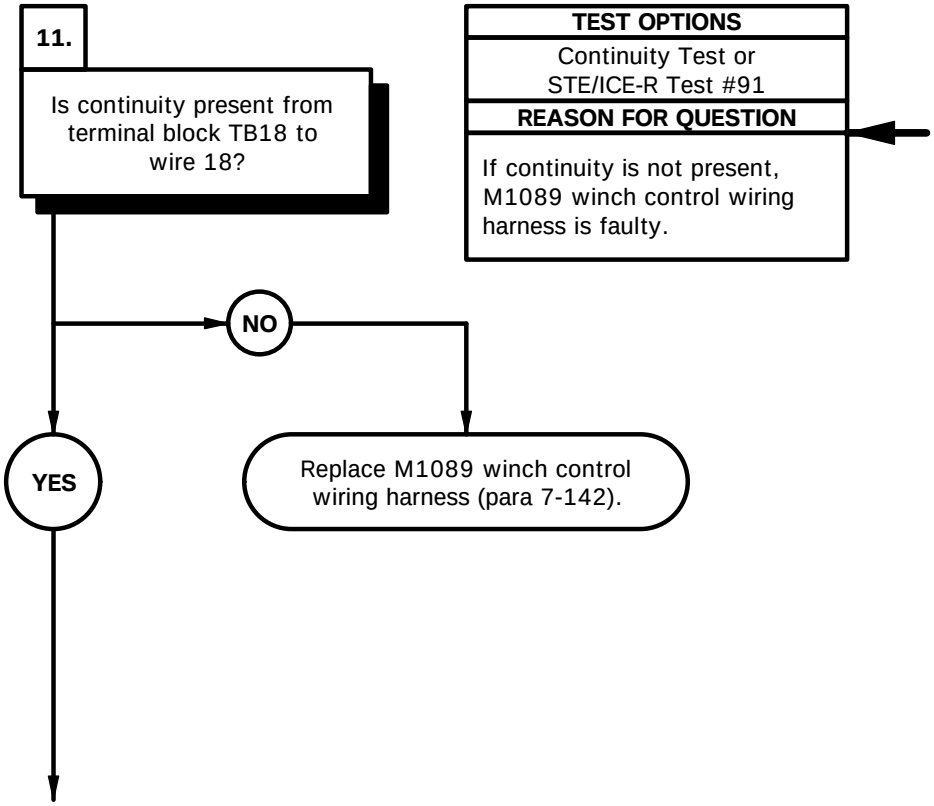
e140. MAIN WINCH LH OR RH FREESPOOL SWITCH DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)

KNOWN INFO

LH and RH winches operate from wrecker control panel.
Circuit breaker CB50 OK.
STATION SELECTOR switch to WRECKER CONTROL PANEL.
MODE SELECTOR SWITCH to NORMAL.
MAIN WINCH LH and RH SPEED switches operate.
LH 30K winch freespools.
MAIN WINCH LH FREESPOOL switch OK.
Faulty 30K winch pneumatic manifold solenoid L19.
MAIN WINCH RH FREESPOOL switch OK.
M1089 control panel wiring harness OK.
Faulty jumper wire.

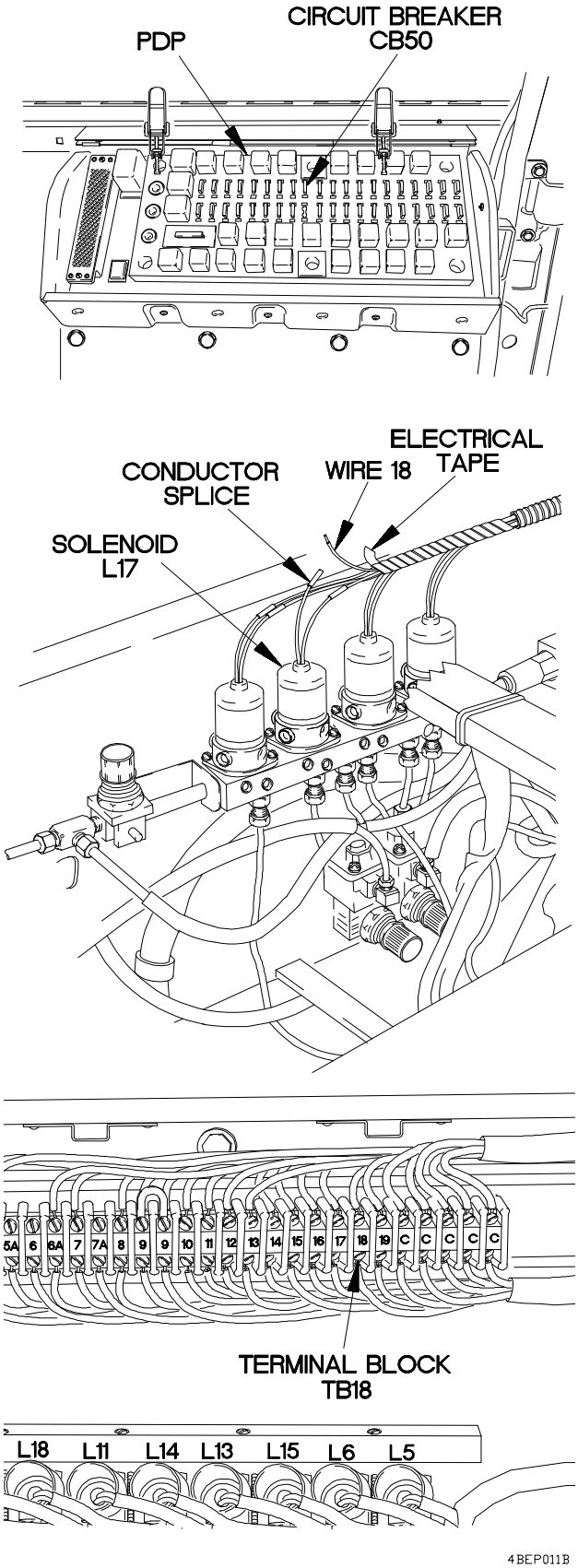
POSSIBLE PROBLEMS

Faulty M1089 30K winch control wiring harness.
Faulty 30K winch pneumatic manifold solenoid L17.
Faulty wrecker air system.

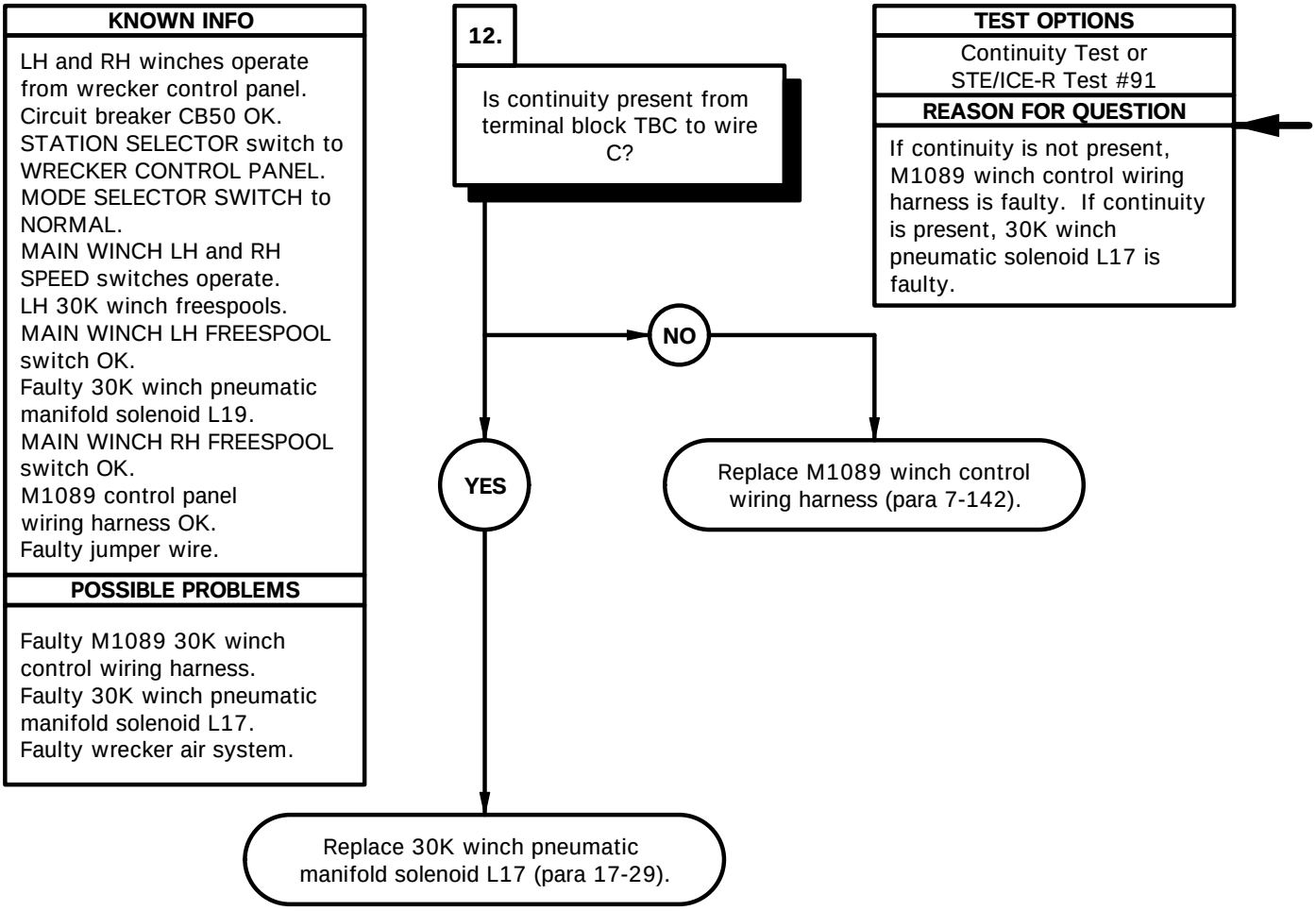


CONTINUITY TEST

(1) Remove circuit breaker CB50 from PDP.
(2) Remove electrical tape from conductor splice at pneumatic solenoid L17.
(3) Cut wire 18 from conductor splice at pneumatic solenoid L17.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to terminal block TB18.
(6) Connect negative (-) probe of multimeter to wire 18 and note reading on multimeter.
(7) If continuity is not present, replace M1089 winch control wiring harness (para 7-142).

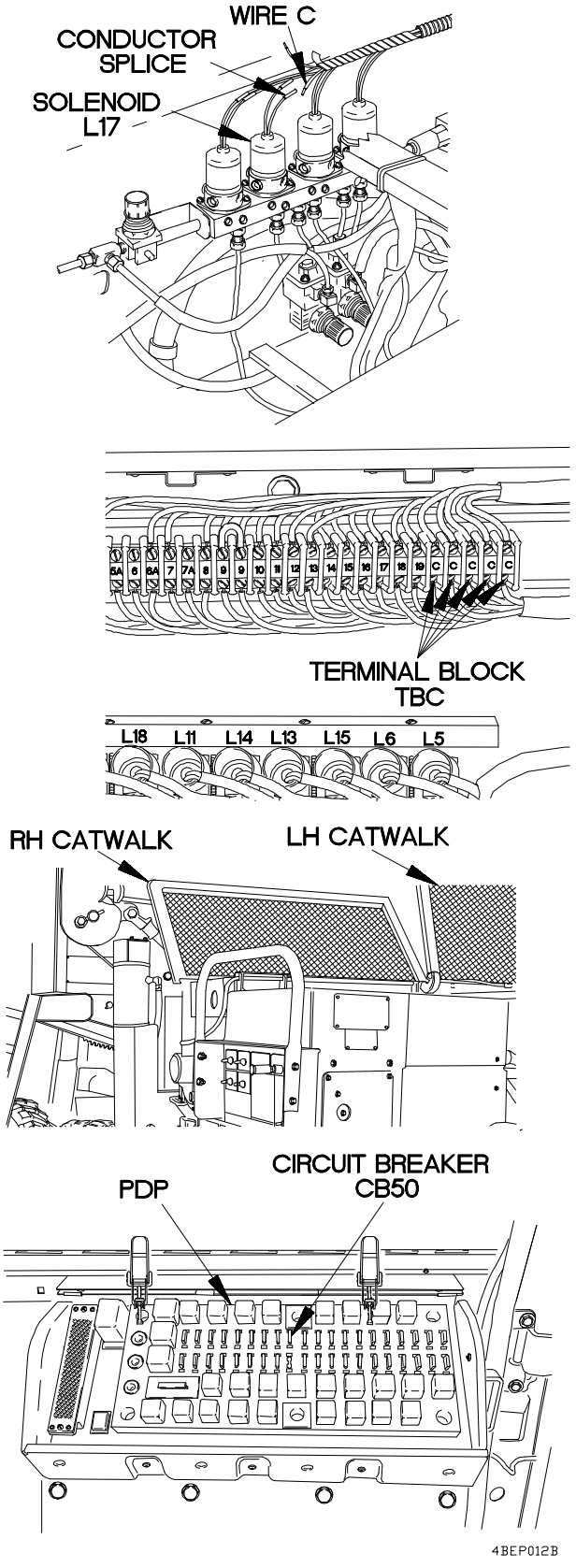


e140. MAIN WINCH LH OR RH FREESPOOL SWITCH DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)



CONTINUITY TEST

(1) Cut wire C from conductor splice at pneumatic solenoid L17.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to terminal block TBC.
(4) Connect negative (-) probe of multimeter to wire C and note reading on multimeter.
(5) If continuity is not present, replace M1089 winch control wiring harness (para 7-142).
(6) If continuity is present, replace 30K winch pneumatic manifold solenoid L17 (para 17-29).
(7) Install circuit breaker CB50 in PDP.
(8) Install PDP cover (para 16-2).
(9) Install wrecker control panel top cover (para 14-4).
(10) Close LH and RH catwalks.



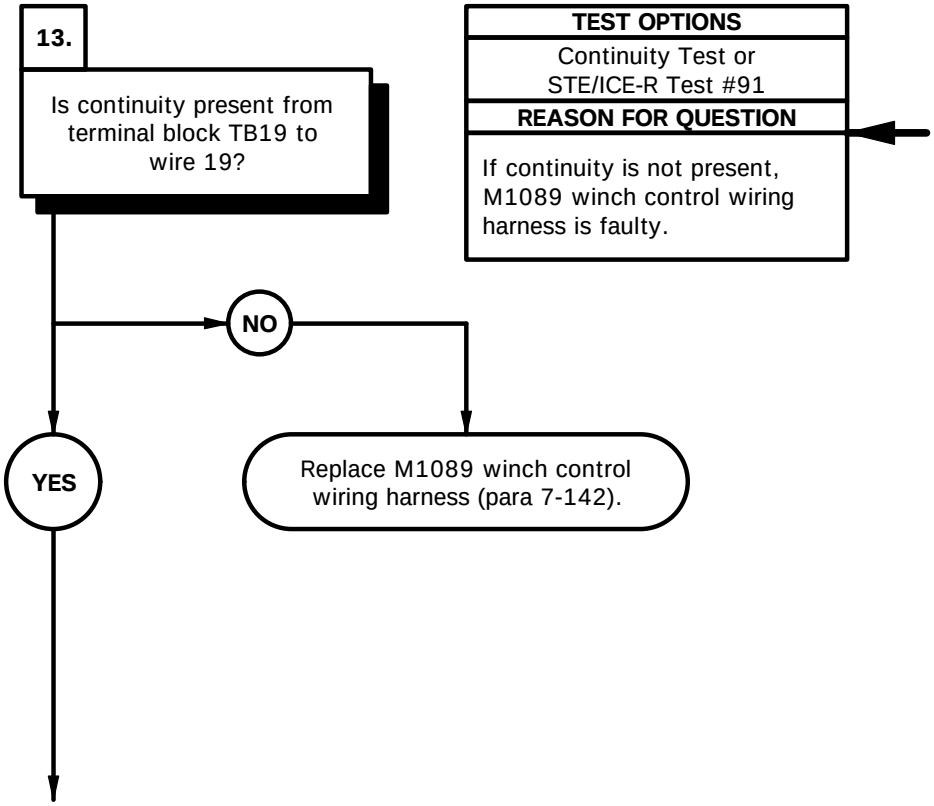
e140. MAIN WINCH LH OR RH FREESPOOL SWITCH DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)

KNOWN INFO

LH and RH winches operate from wrecker control panel.
Circuit breaker CB50 OK.
STATION SELECTOR switch to WRECKER CONTROL PANEL.
MODE SELECTOR SWITCH to NORMAL.
MAIN WINCH LH and RH SPEED switches operate.
RH 30K winch freespools.
MAIN WINCH RH FREESPOOL switch OK.
Faulty 30K winch pneumatic manifold solenoid L17.
MAIN WINCH LH FREESPOOL switch OK.
M1089 control panel wiring harness OK.
Faulty jumper wire.

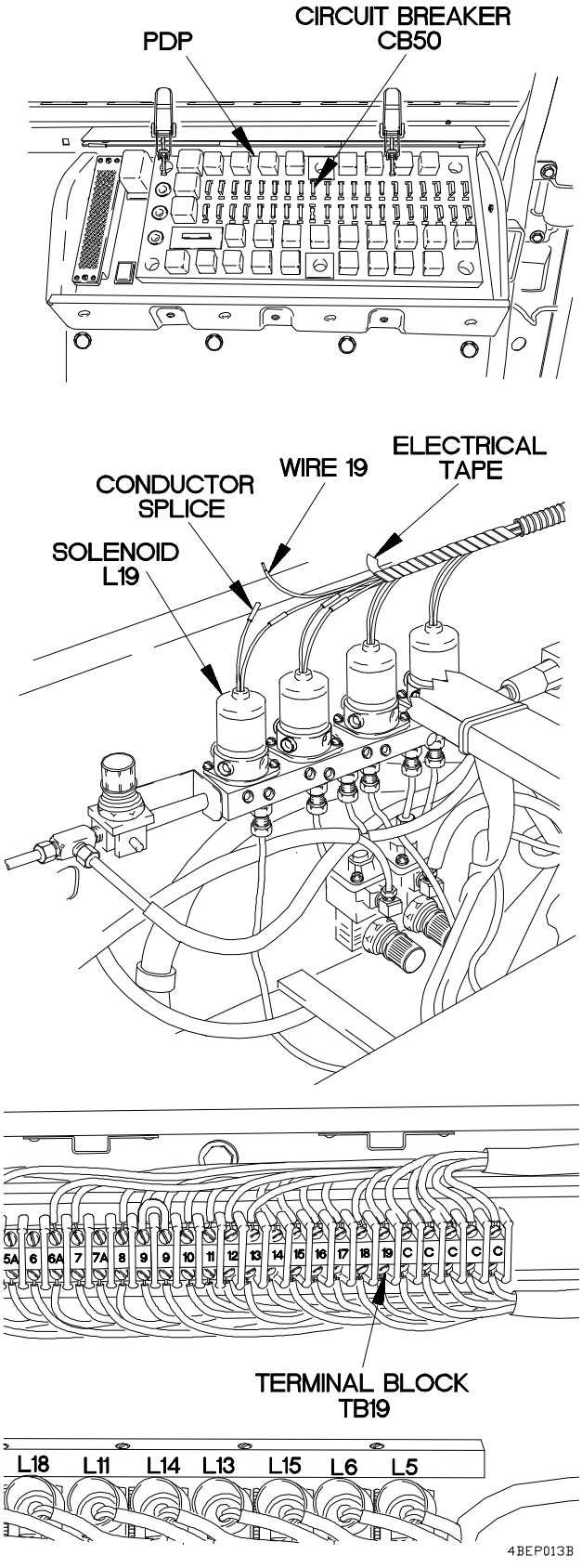
POSSIBLE PROBLEMS

Faulty M1089 30K winch control wiring harness.
Faulty 30K winch pneumatic manifold solenoid L19.
Faulty wrecker air system.

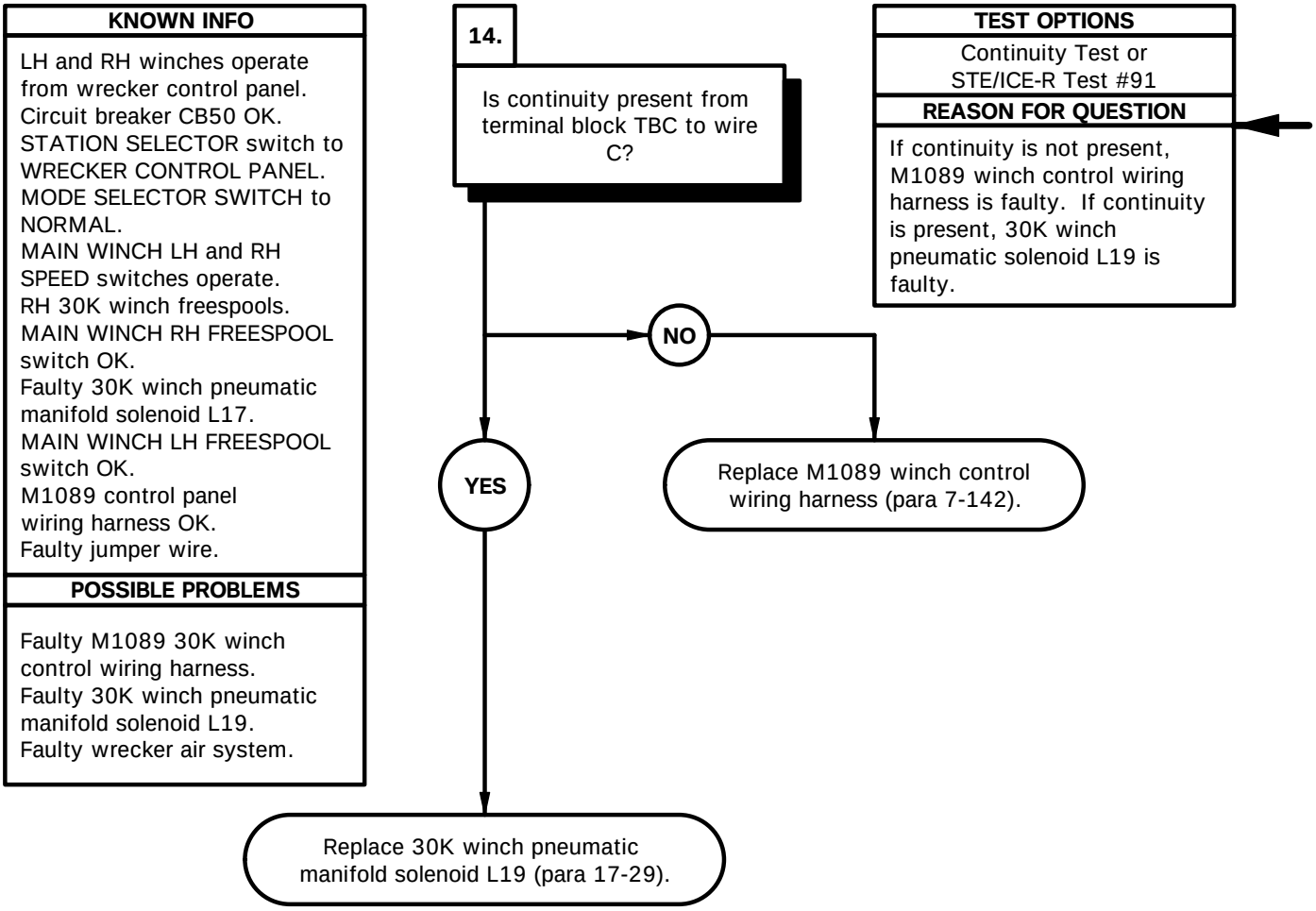


CONTINUITY TEST

(1) Remove circuit breaker CB50 from PDP.
(2) Remove electrical tape from conductor splice at pneumatic solenoid L19.
(3) Cut wire 19 from conductor splice at pneumatic solenoid L19.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to terminal block TB19.
(6) Connect negative (-) probe of multimeter to wire 19 and note reading on multimeter.
(7) If continuity is not present, replace M1089 winch control wiring harness (para 7-142).

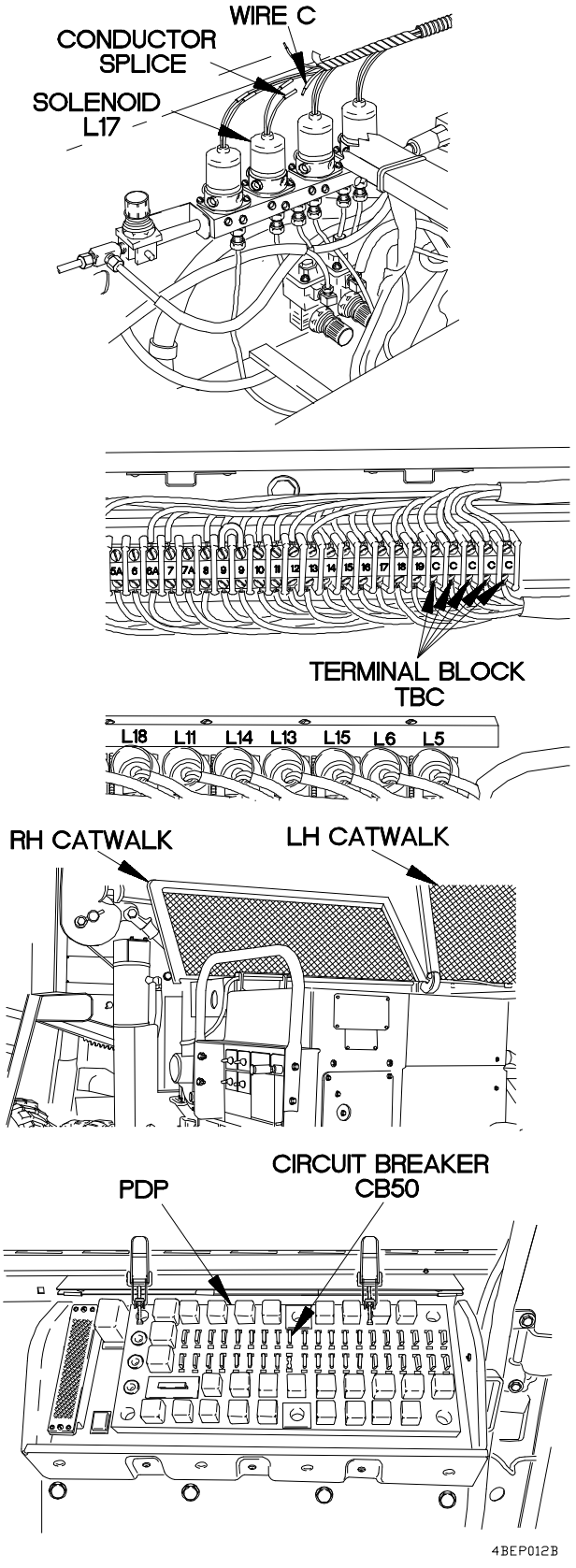


e140. MAIN WINCH LH OR RH FREESPOOL SWITCH DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)



CONTINUITY TEST

(1) Cut wire C from conductor splice at pneumatic solenoid L19.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to terminal block TBC.
(4) Connect negative (-) probe of multimeter to wire C and note reading on multimeter.
(5) If continuity is not present, replace M1089 winch control wiring harness (para 7-142).
(6) If continuity is present, replace 30K winch pneumatic manifold solenoid L19 (para 17-29).
(7) Install circuit breaker CB50 in PDP.
(8) Install PDP cover (para 16-2).
(9) Install wrecker control panel top cover (para 14-4).
(10) Close LH and RH catwalks.



e141. ONE WRECKER FUNCTION DOES NOT OPERATE FROM WRECKER REMOTE CONTROL

INITIAL SETUP

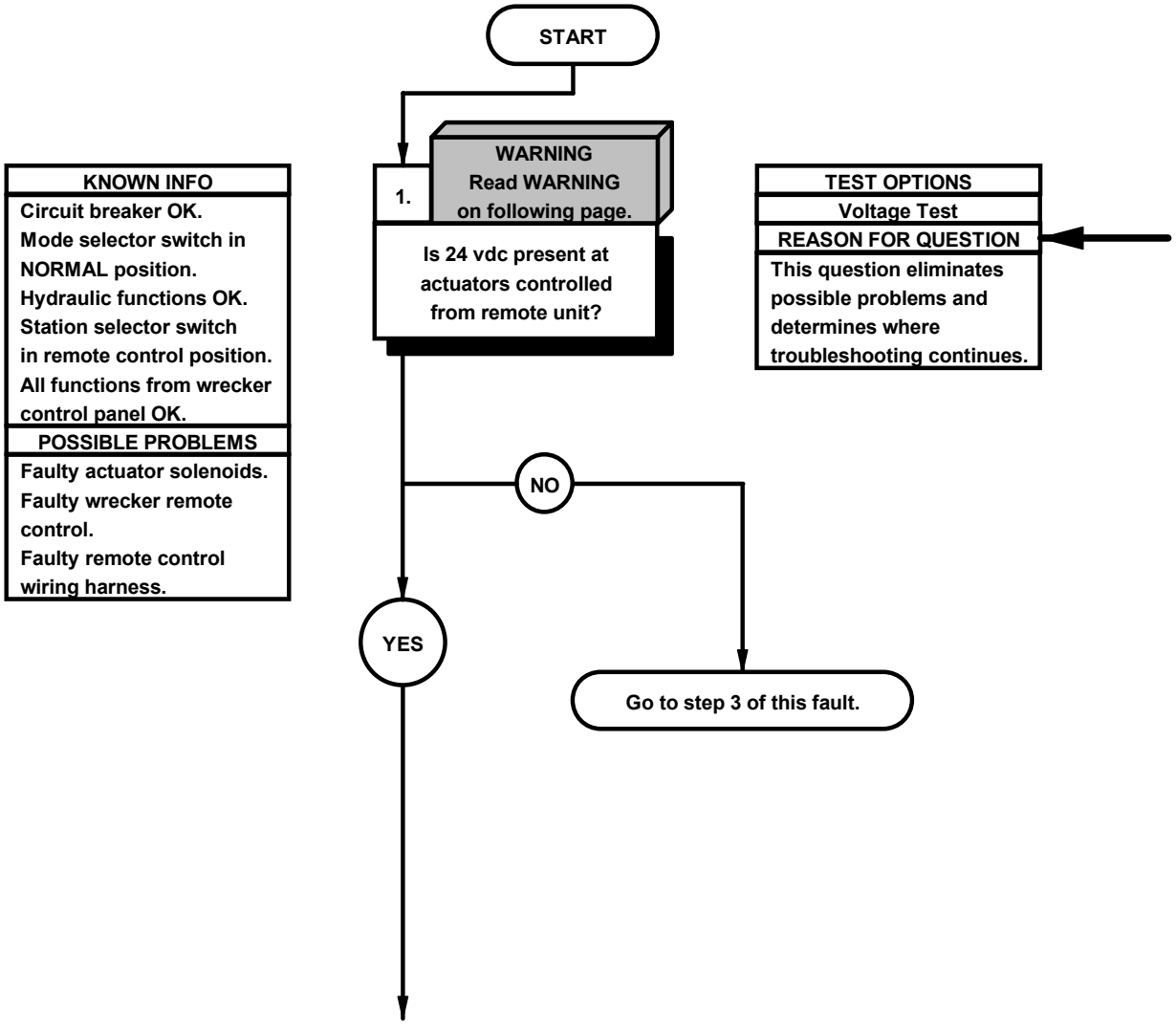
Equipment Conditions
Top control panel cover removed (para 17-20).

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

Materials/Parts
Wire, Electrical, 50 ft (Item 67, Appendix D)

References
TM 9-4910-571-12&P



WARNING

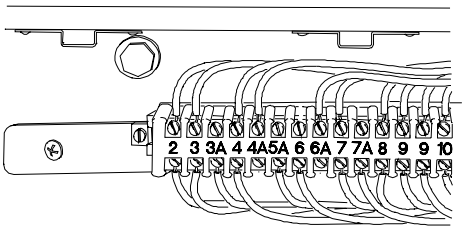
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

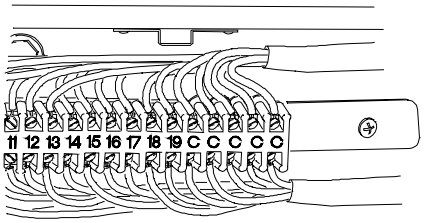
VOLTAGE TEST

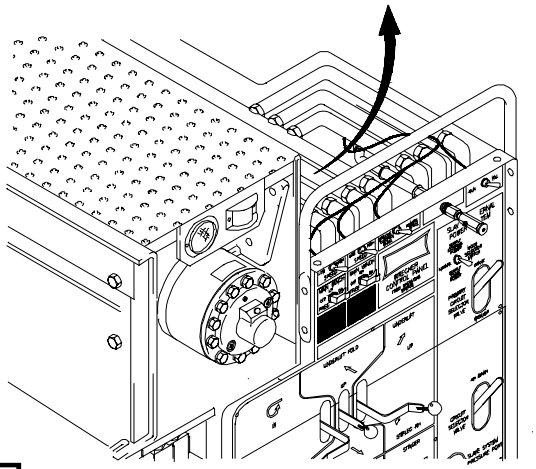
(1) Connect wrecker remote control cable to RH remote control bulkhead connector (TM 9-2320-366-10-1).
(2) Set multimeter to vdc.
(3) Connect positive (+) probe of multimeter to terminal listed in Table 2-13. Actuator Voltage Test.
(4) Connect negative (-) probe of multimeter on ground.
(5) Position master power switch to on (TM 9-2320-366-10-1).
(6) Position remote control box switch to position listed in Table 2-13. Actuator Voltage Test and note reading on multimeter.
(7) If 24 vdc is not present, go to step 3 of this fault.
(8) Position master power switch to off (TM 9-2320-366-10-1).
(9) Disconnect remote control cable from RH remote control bulkhead connector (TM 9-2320-366-10-1).

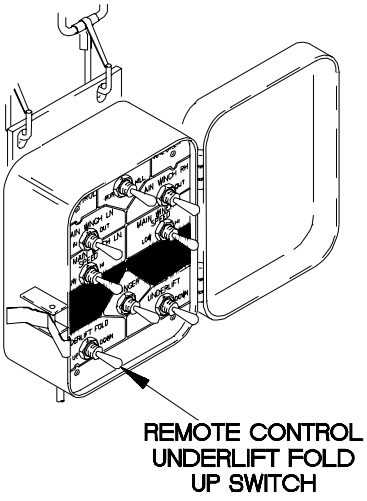
TABLE 2-13. ACTUATOR VOLTAGE TEST

TB No.	ACTUATOR NAME	Remote Control Box Switch Position
2	Underlift fold up	UP
3	Stinger in	IN
4	Underlift up	UP
6	Main winch LH in	IN
8	Main winch RH in	IN
11	Main winch RH out	OUT
12	Main winch speed RH high	HIGH
13	Main winch LH out	OUT
14	Main winch speed LH high	HIGH
15	Underlift down	DOWN
16	Stinger out	OUT
17	Underlift fold down	DOWN



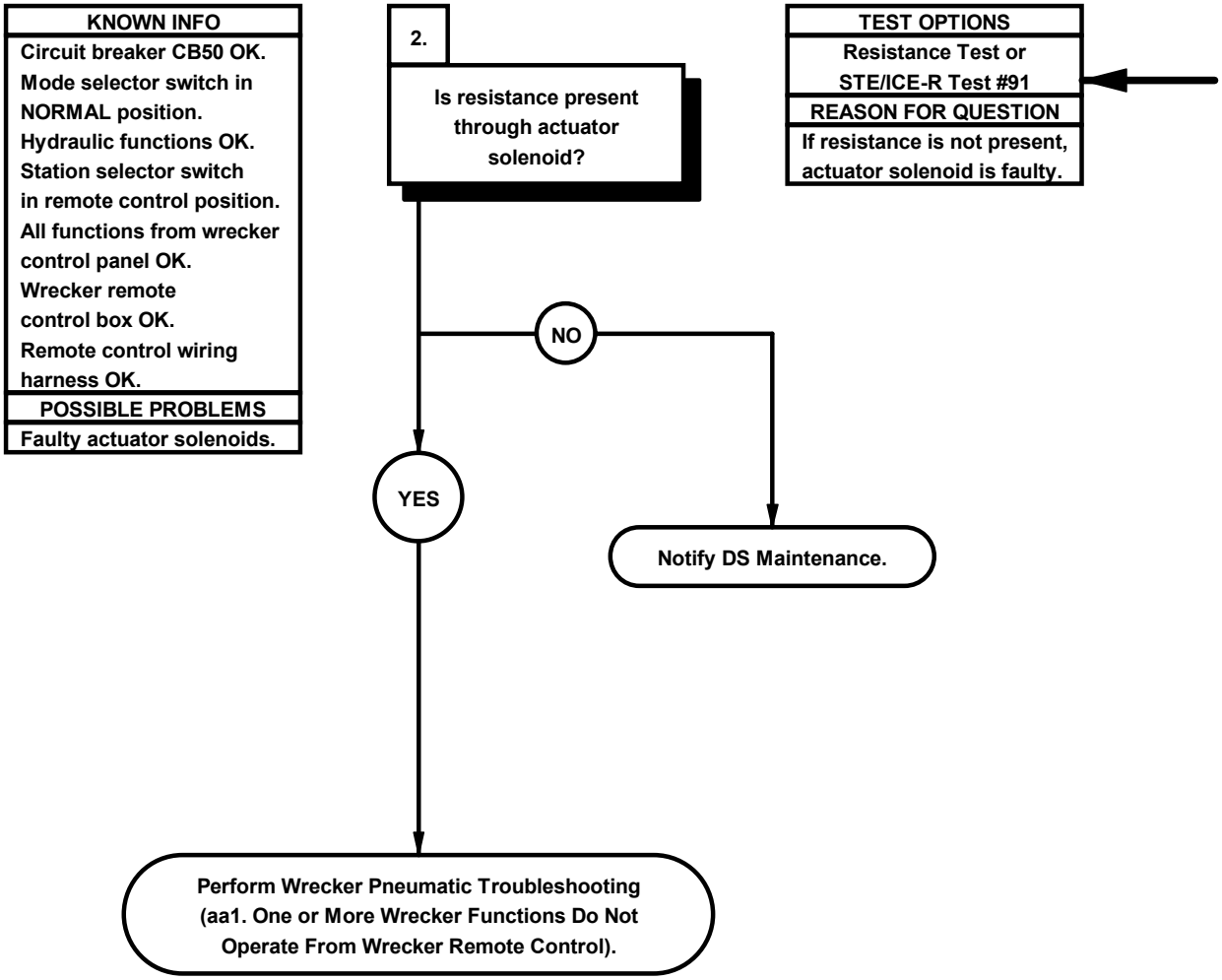






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e141. ONE WRECKER FUNCTION DOES NOT OPERATE FROM WRECKER REMOTE CONTROL (CONT)



CONTINUITY TEST
(1) Set multimeter to ohms. (2) Connect positive (+) probe of multimeter to terminal listed in Table 2-14. Actuator Solenoid Resistance Test. (3) Connect negative (-) probe of multimeter on terminal block TB-C and note reading on multimeter. (4) If resistance is less or greater than value listed in Table 2-14. Actuator Solenoid Resistance Test, notify DS Maintenance. (5) Install wrecker control panel top cover (para 17-20).

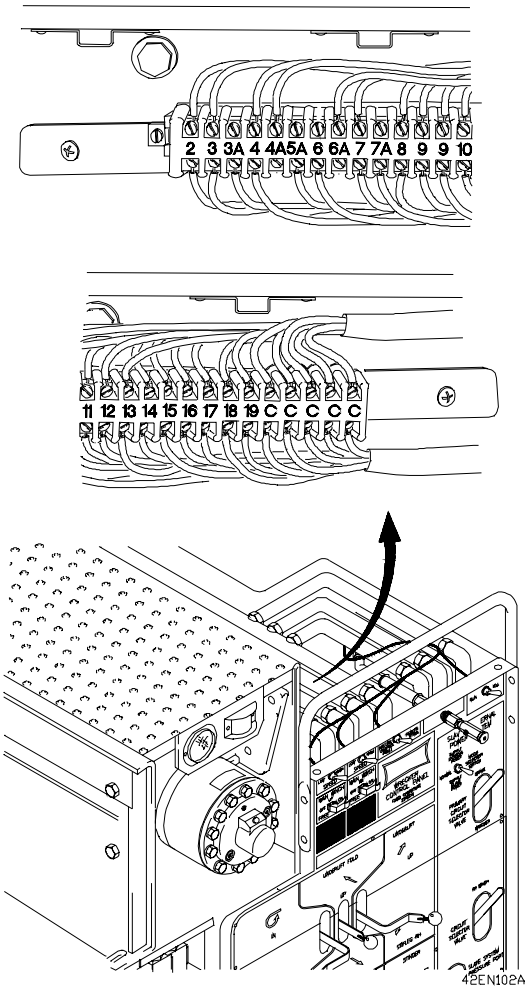
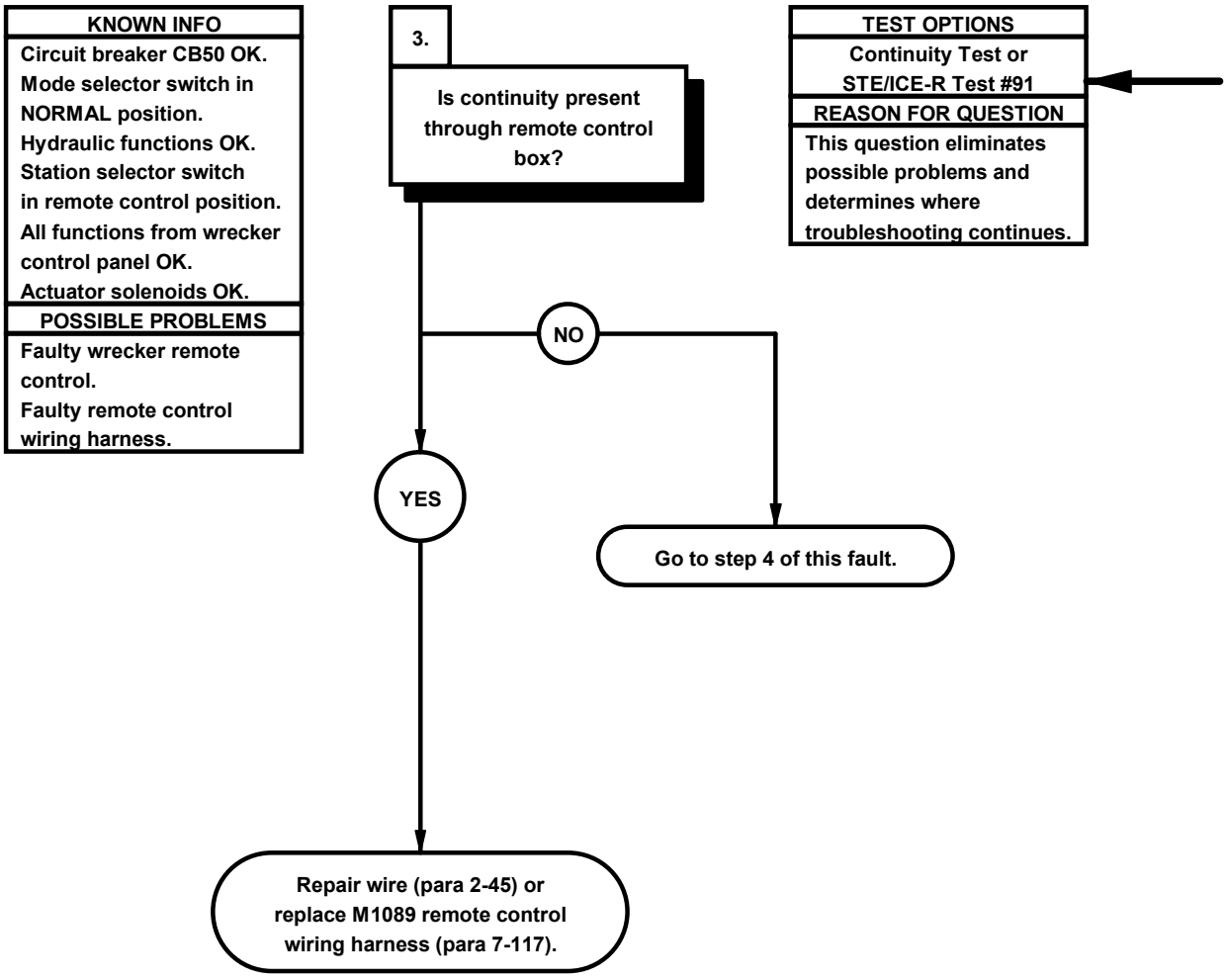


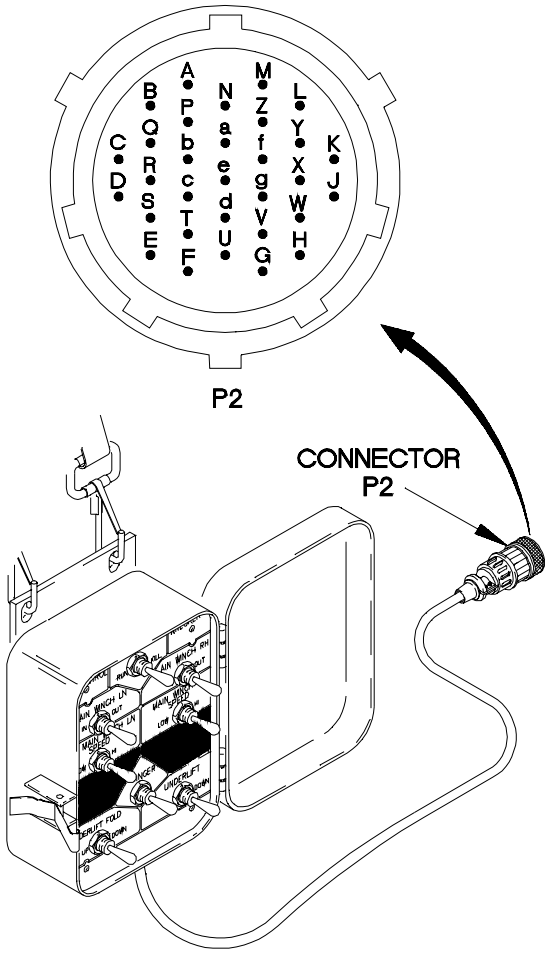
TABLE 2-14. ACTUATOR SOLENOID RESISTANCE TEST

Function/Solenoid	Terminal Board (+) Position	Solenoid Resistance in Ohms
Underlift fold up - L18	2	81-101
Stinger in - L13	3	81-101
Underlift up - L14	4	81-101
Main winch LH in - L6	6	81-101
Main winch RH in - L1	8	81-101
Main winch RH out - L2	11	81-101
Main winch speed RH high	12	35-45
Main winch LH out - L5	13	81-101
Main winch speed LH high	14	35-45
Underlift down - L11	15	81-101
Stinger out - L16	16	81-101
Underlift fold down - L15	17	81-101

e141. ONE WRECKER FUNCTION DOES NOT OPERATE FROM WRECKER REMOTE CONTROL (CONT)



CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to pin listed in Table 2-15. Remote Control Box Continuity Test.
(3) Connect negative (-) probe of multimeter to pin listed in Table 2-15. Remote Control Box Continuity Test.
(4) Position remote control box switch to position listed in Table 2-15. Remote Control Box Continuity Test and note reading on multimeter.
(5) If continuity is not present, go to step 4 of this fault.
(6) If continuity is present, repair wire (para 2-45) or replace M1089 remote control wiring harness (para 7-117).

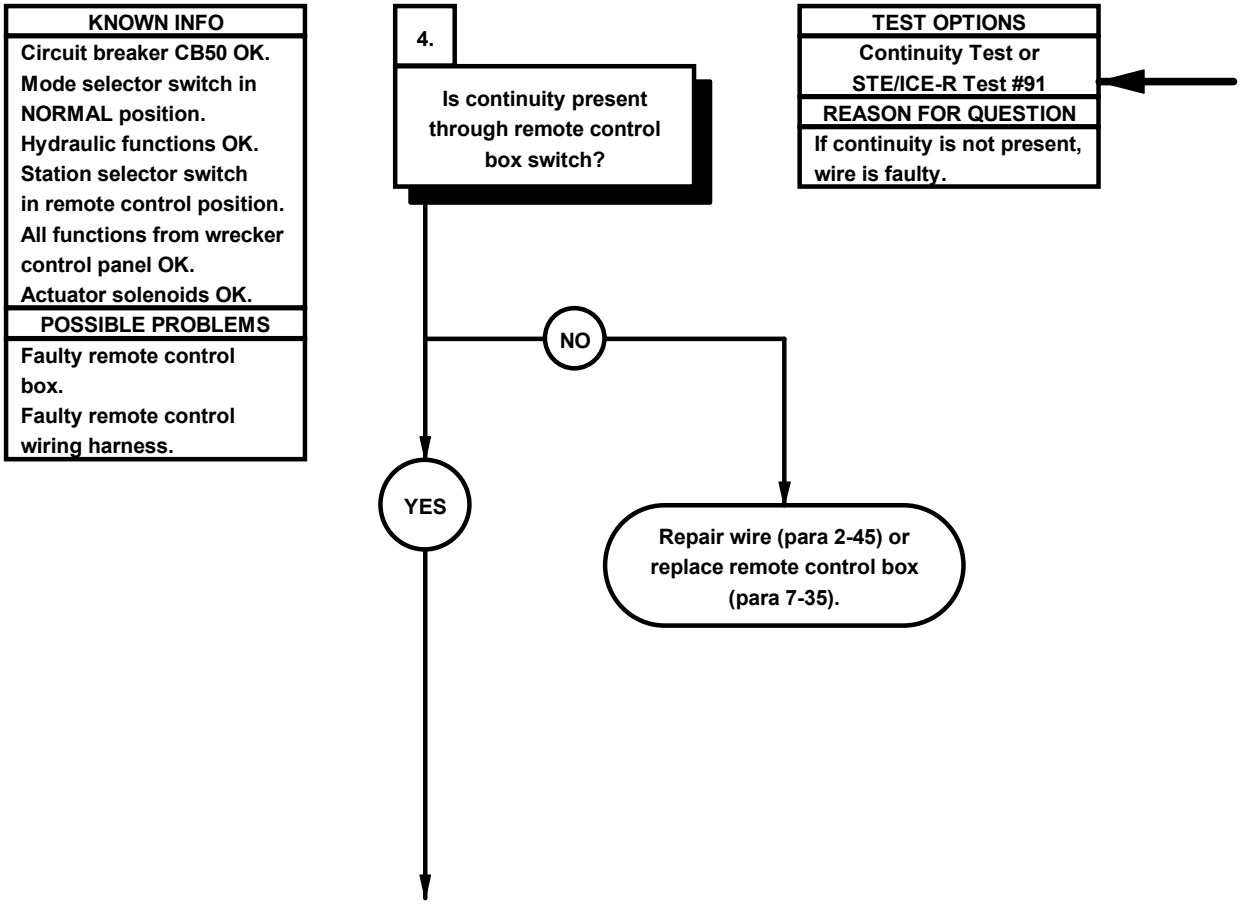


42EN103A

TABLE 2-15. REMOTE CONTROL BOX CONTINUITY TEST

Function	Remote Control Box Position	P2 Pin Positive (+)	P2 Pin Negative (-)
Underlift fold up	UP	c	e
Stinger in	IN	c	f
Underlift up	UP	c	g
Main winch LH in	IN	c	d
Main winch RH in	IN	c	b
Main winch RH out	OUT	c	Y
Main winch speed RH high	HIGH	c	X
Main winch LH out	OUT	c	W
Main winch speed LH high	HIGH	c	V
Underlift down	DOWN	c	U
Stinger out	OUT	c	T
Underlift fold down	DOWN	c	S
Emergency stop	KILL	a	Z

e141. ONE WRECKER FUNCTION DOES NOT OPERATE FROM WRECKER REMOTE CONTROL (CONT)



CONTINUITY TEST

(1) Open cover on remote control box.
(2) Remove four screws, washers, and panel from remote control box.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to pin listed in Table 2-16. Remote Control Box Switch Continuity Test.
(5) Connect negative (-) probe of multimeter to pin listed in Table 2-16. Remote Control Box Switch Continuity Test.
(6) Position remote control box switch to position listed in Table 2-16. Remote Control Box Switch Continuity Test and note reading on multimeter.
(7) If continuity is not present, repair wire (para 2-45) or replace remote control box switch (para 7-35).
(8) Install panel on remote control box with four washers and screws.

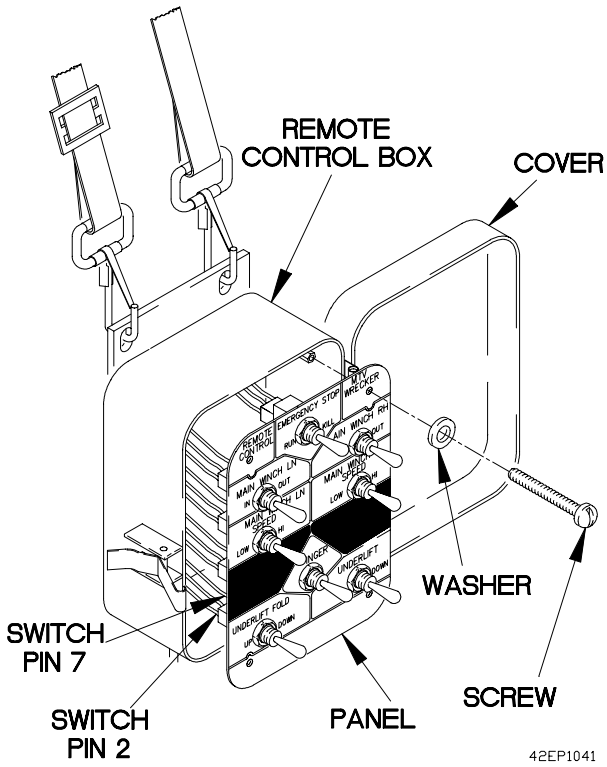
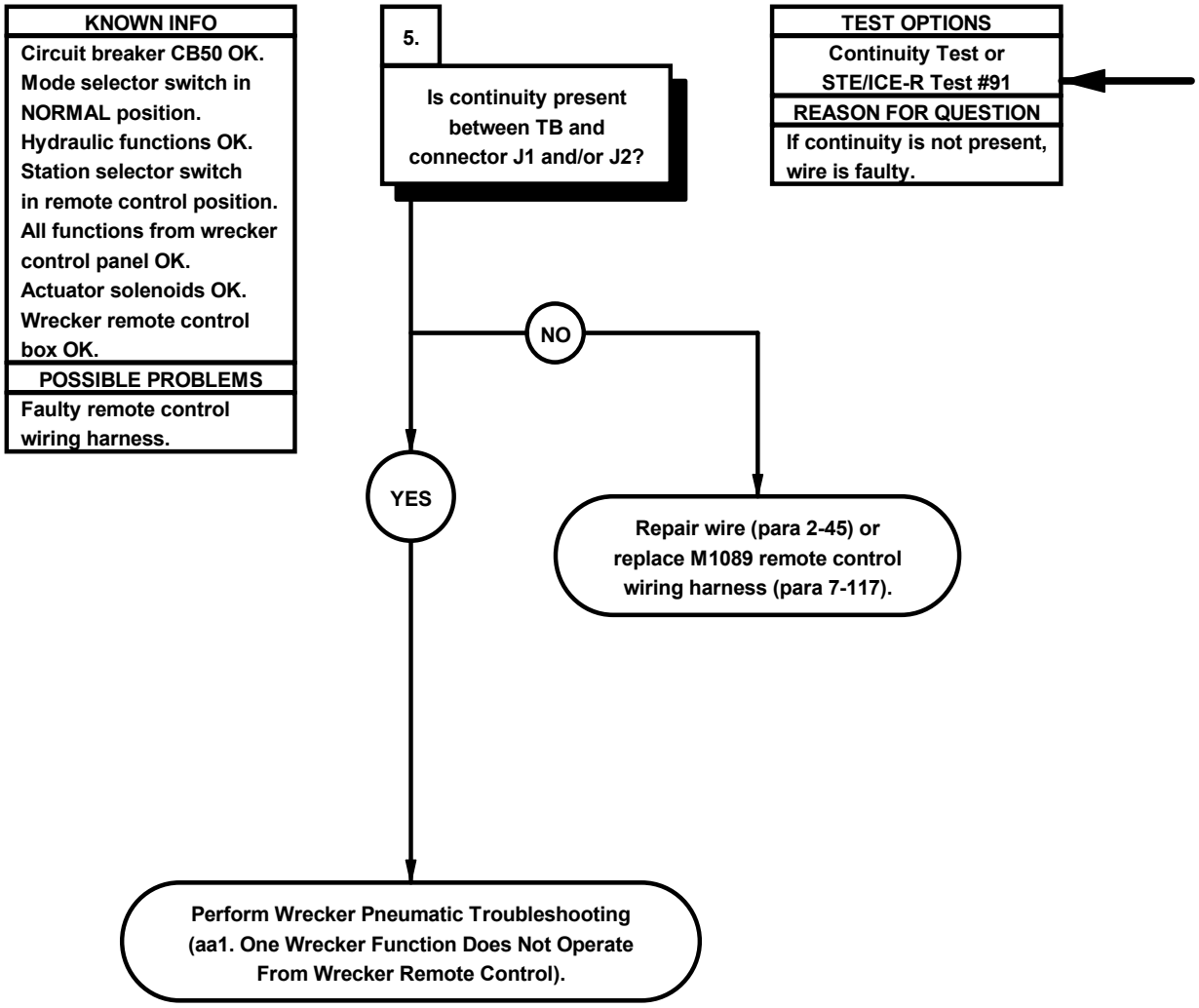


TABLE 2-16. REMOTE CONTROL BOX SWITCH CONTINUITY TEST

Function	REF DES	Remote Control Box Position and Switch Number	Switch Pin Positive (+)	Switch Pin Negative (-)
Underlift fold up	S15	UP	7	2
Stinger in	S14	IN	7	3
Underlift up	S13	UP	7	4
Main winch LH in	S10	IN	7	6
Main winch RH in	S8	IN	7	8
Main winch RH out	S8	OUT	7	11
Main winch speed RH high	S9	HIGH	7	12
Main winch LH out	S10	OUT	7	13
Main winch speed LH high	S11	HIGH	7	14
Underlift down	S13	DOWN	7	15
Stinger out	S14	OUT	7	16
Underlift fold down	S15	DOWN	7	17
Emergency stop	S7	KILL	9	10

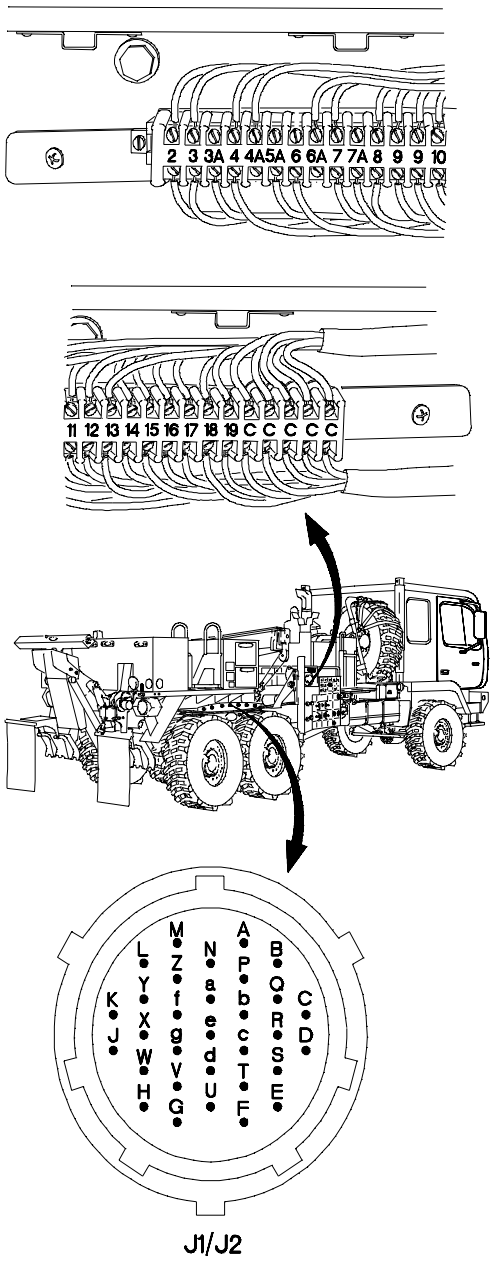
e141. ONE WRECKER FUNCTION DOES NOT OPERATE FROM WRECKER REMOTE CONTROL (CONT)



CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to terminal block position listed in Table 2-17. Continuity Table.
(3) Connect negative (-) probe of multimeter to J1/J2 pin listed in Table 2-17. Continuity Table and note reading on multimeter.
(4) If continuity is not present, repair wire (para 2-45) or replace remote control wiring harness (para 7-117).
(5) If continuity is present, perform Wrecker Pneumatic Troubleshooting (aa1. One Wrecker Function Does Not Operate From Wrecker Remote Control).
(6) Install wrecker control panel top cover (para 17-20).

TABLE 2-17. REMOTE CONTROL BOX SWITCH CONTINUITY TEST

Function	TB Position	J1/J2 Pin
Underlift fold up	2	g
Stinger in	3	f
Underlift up	4	e
Main winch LH in	6	d
Main winch RH in	8	b
Main winch RH out	11	Y
Main winch speed RH high	12	X
Main winch LH out	13	W
Main winch speed LH high	14	V
Underlift down	15	U
Stinger out	16	T
Underlift fold down	17	S
Emergency shutdown run	9	a
Emergency shutdown kill	10	Z
Remote control box power	7	c



e142. M1090/M1094 TAILGATE RELEASE DOES NOT OPERATE

INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)

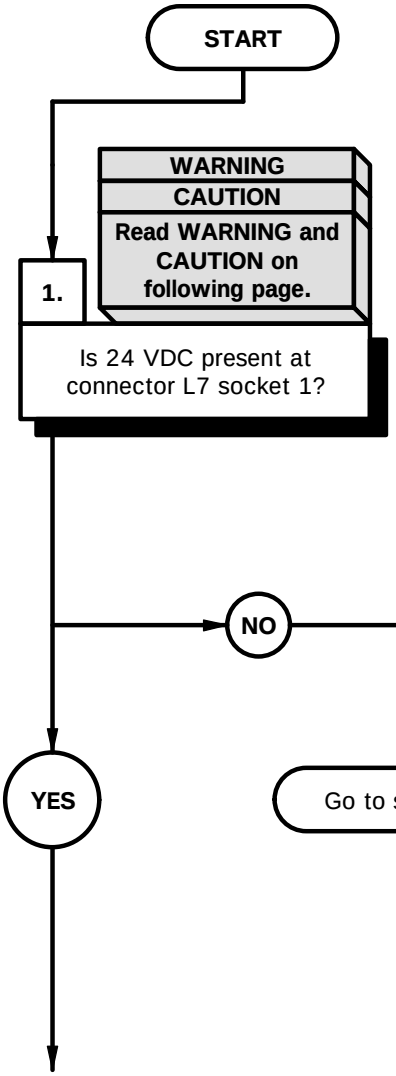
Materials/Parts
Wire, Elec, 50ft (Item 71, Appendix D)

Personnel Required
(2)

References
TM 9-4910-571-12&P

KNOWN INFO
Dump bed raises and lowers.
Pneumatics system OK.

POSSIBLE PROBLEMS
Faulty tailgate release solenoid.
Faulty tailgate release switch.
Faulty auxiliary panel cable assembly.
Faulty dump power cable assembly.
Faulty dump cable assembly.



TEST OPTIONS
Voltage Test or
STE/ICE-R Test #89

REASON FOR QUESTION
This question eliminates possible problems and determines where troubleshooting continues.

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.

Dump body weighs approximately 3,034 lbs (1,376 kgs). Attach a suitable lifting device prior to lifting. Failure to comply may result in injury to personnel or damage to equipment.

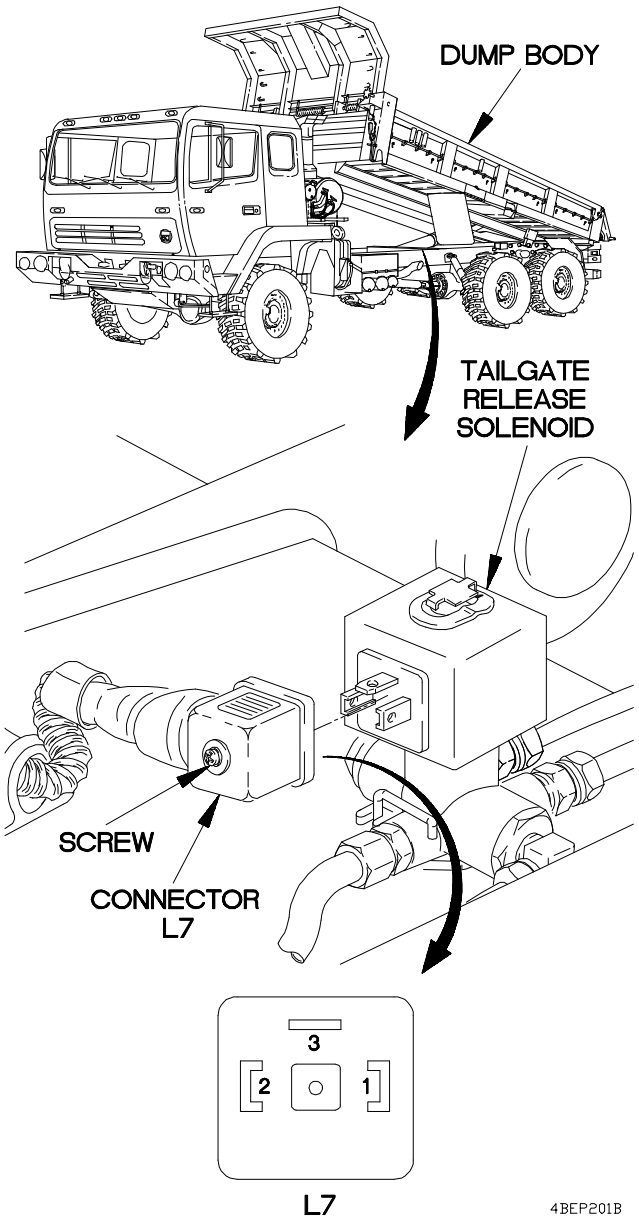
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

CAUTION

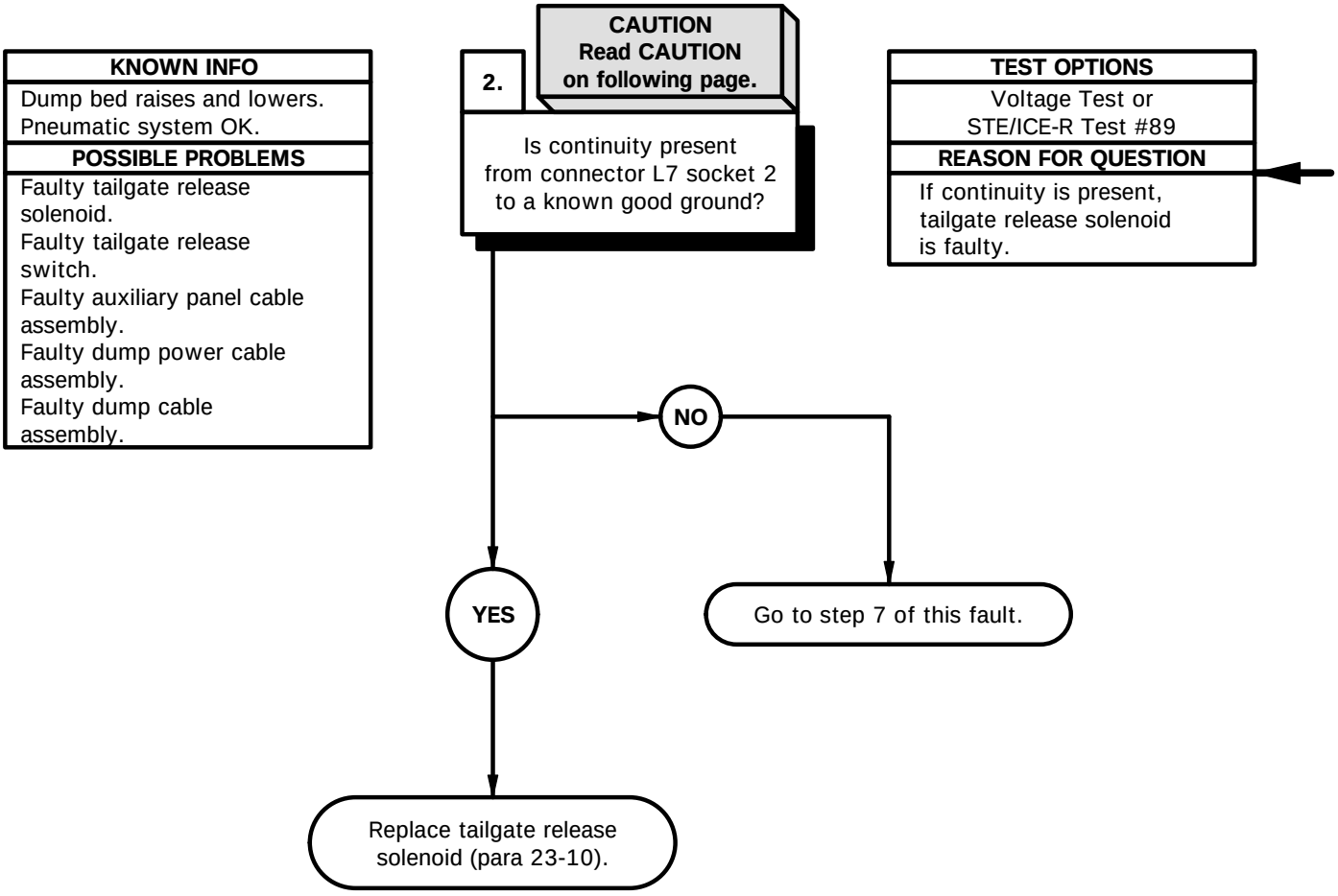
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

VOLTAGE TEST

(1) Raise dump bed (TM 9-2320-366-10-1).
(2) Loosen screw on connector L7.
(3) Disconnect connector L7 from tailgate release solenoid.
(4) Set multimeter to volts DC.
(5) Connect positive (+) probe of multimeter to connector L7 socket 1.
(6) Connect negative (-) probe of multimeter to ground.
(7) Press and hold tailgate release switch (TM 9-2320-366-10-1) and note reading on multimeter.
(8) If 24 VDC is not present, go to step 3 of this fault.



e142. M1090/1094 TAILGATE RELEASE DOES NOT OPERATE (CONT)

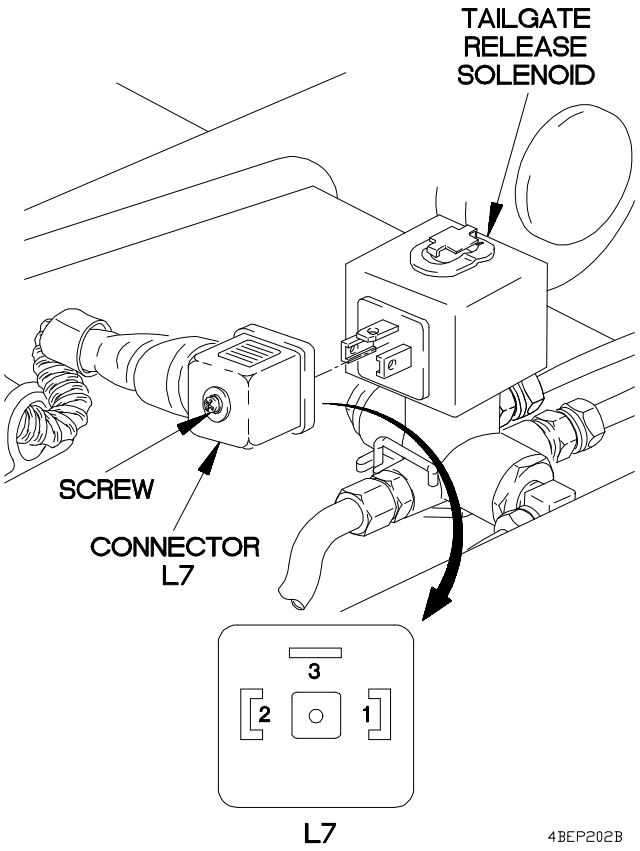


CAUTION

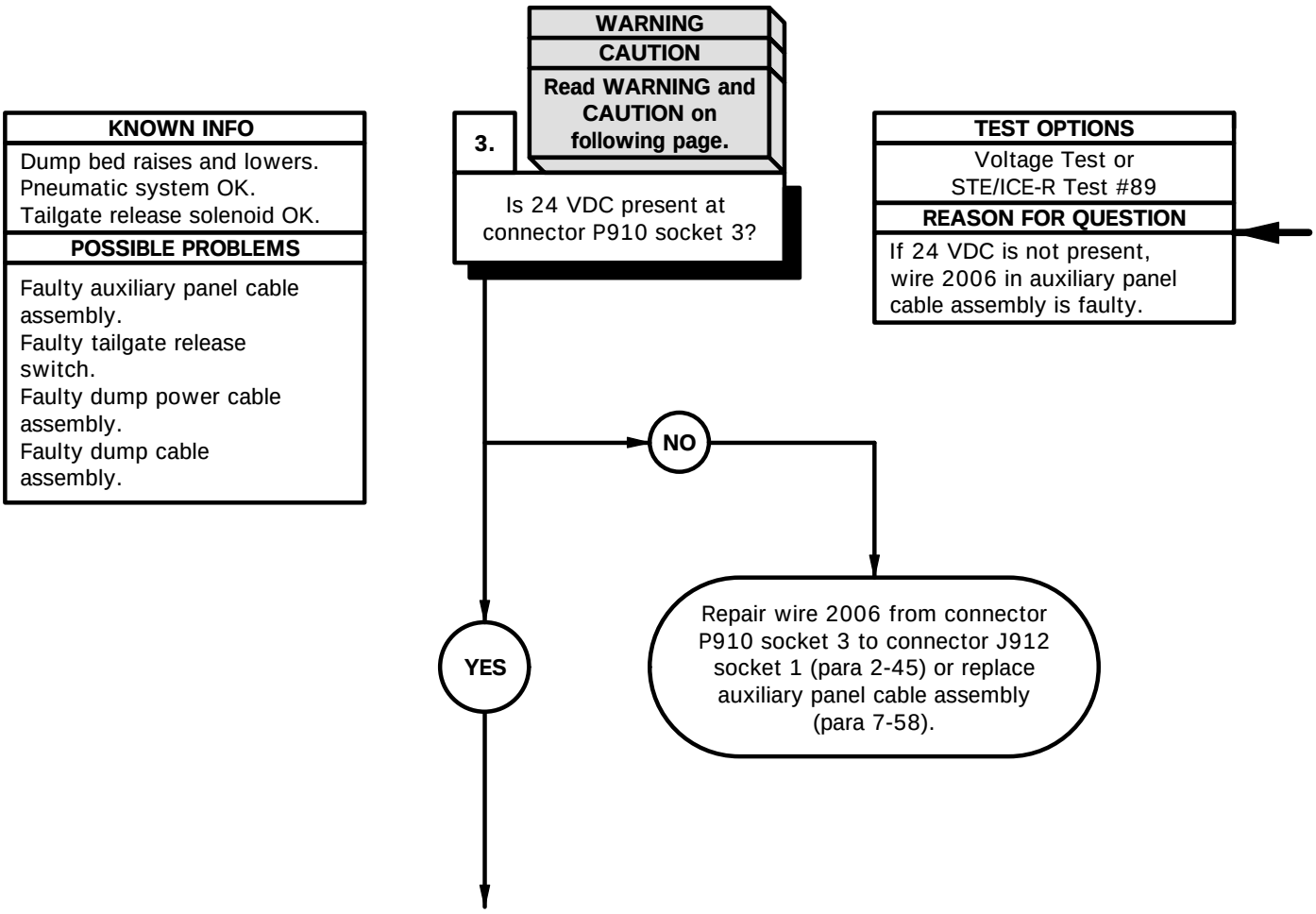
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector L7 socket 2.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, go to step 7 of this fault.
(5) If continuity is present, replace tailgate release solenoid (para 23-10).
(6) Connect connector L7 to tailgate release solenoid.
(7) Tighten screw in connector L7.



e142. M1090/M1094 TAILGATE RELEASE DOES NOT OPERATE (CONT)



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 circuits and cause severe burns or electrical shock.

CAUTION

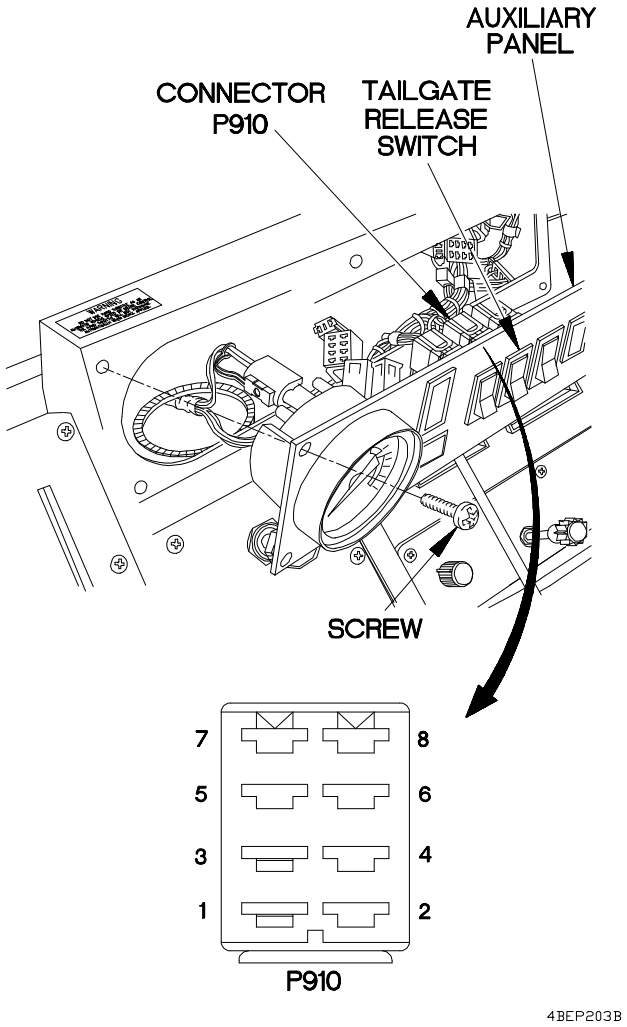
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

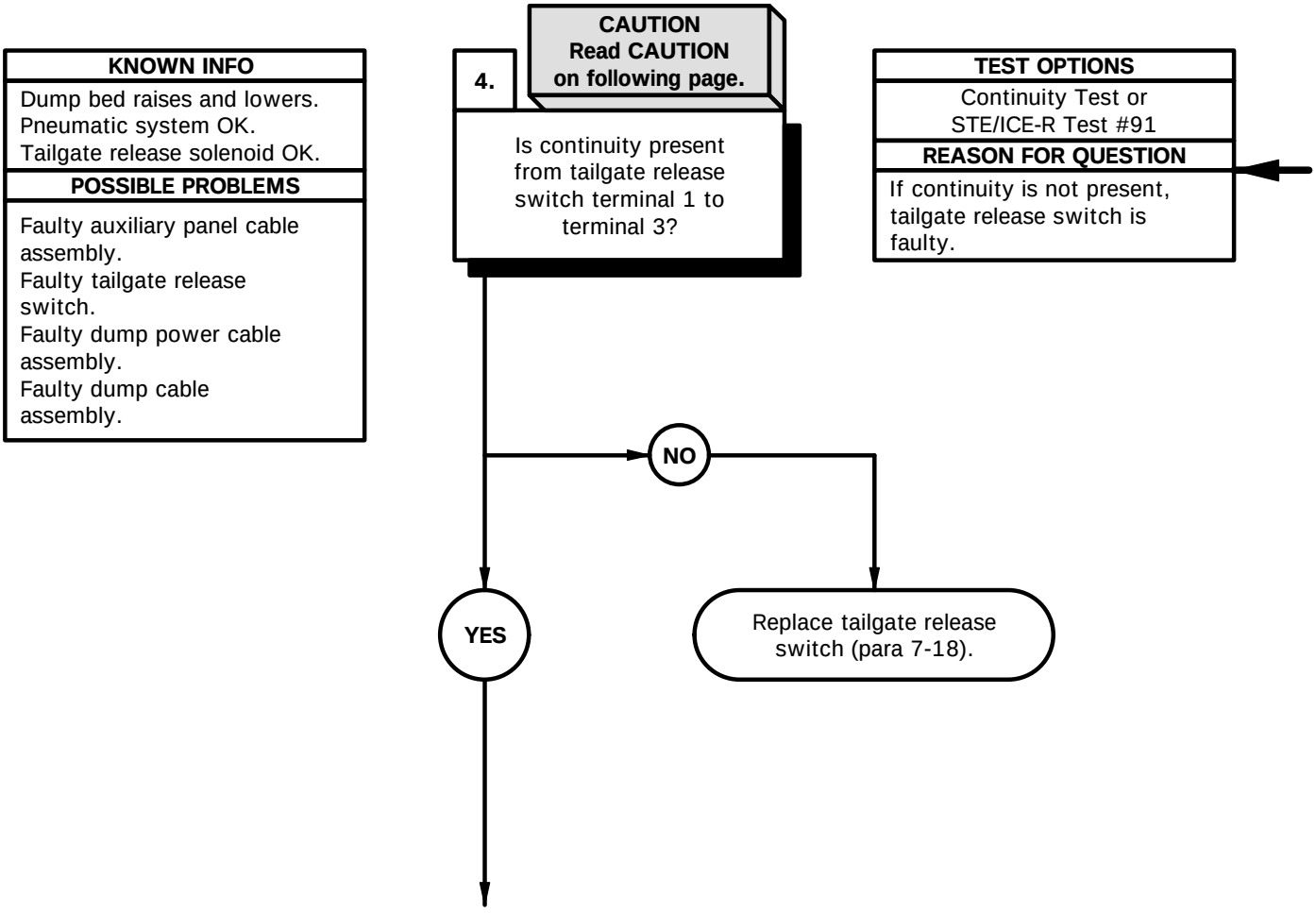
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

VOLTAGE TEST

(1) Remove six screws from auxiliary panel.
(2) Lift auxiliary panel outward to gain access.
(3) Disconnect connector P910 from tailgate release switch.
(4) Set multimeter to volts DC.
(5) Connect positive (+) probe of multimeter to connector P910 socket 3.
(6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(7) If 24 VDC is not present, repair wire 2006 from connector P910 socket 3 to connector P912 socket 1 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).



e142. M1090/M1094 TAILGATE RELEASE DOES NOT OPERATE (CONT)

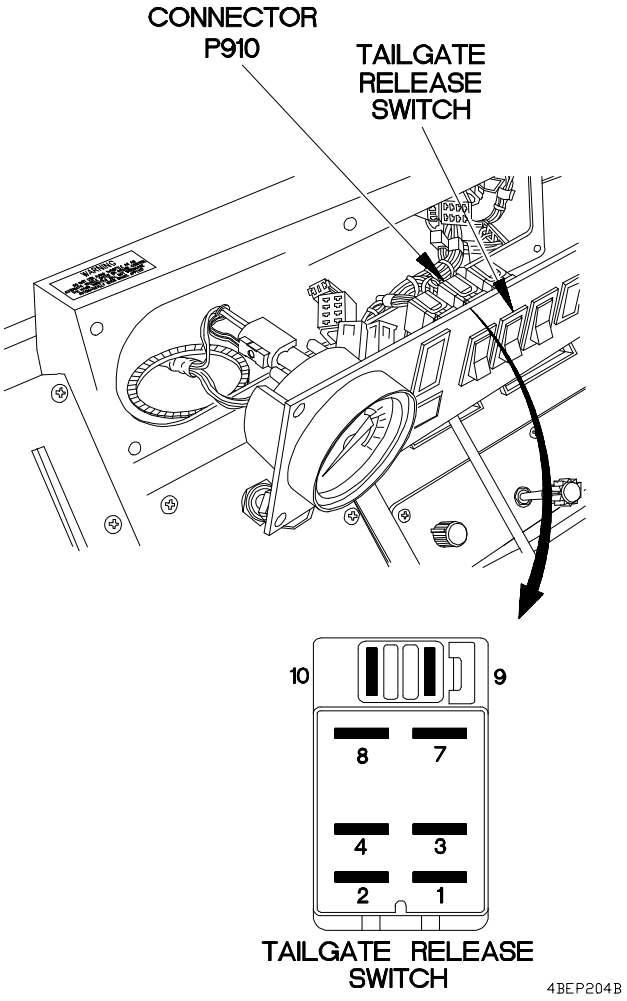


CAUTION

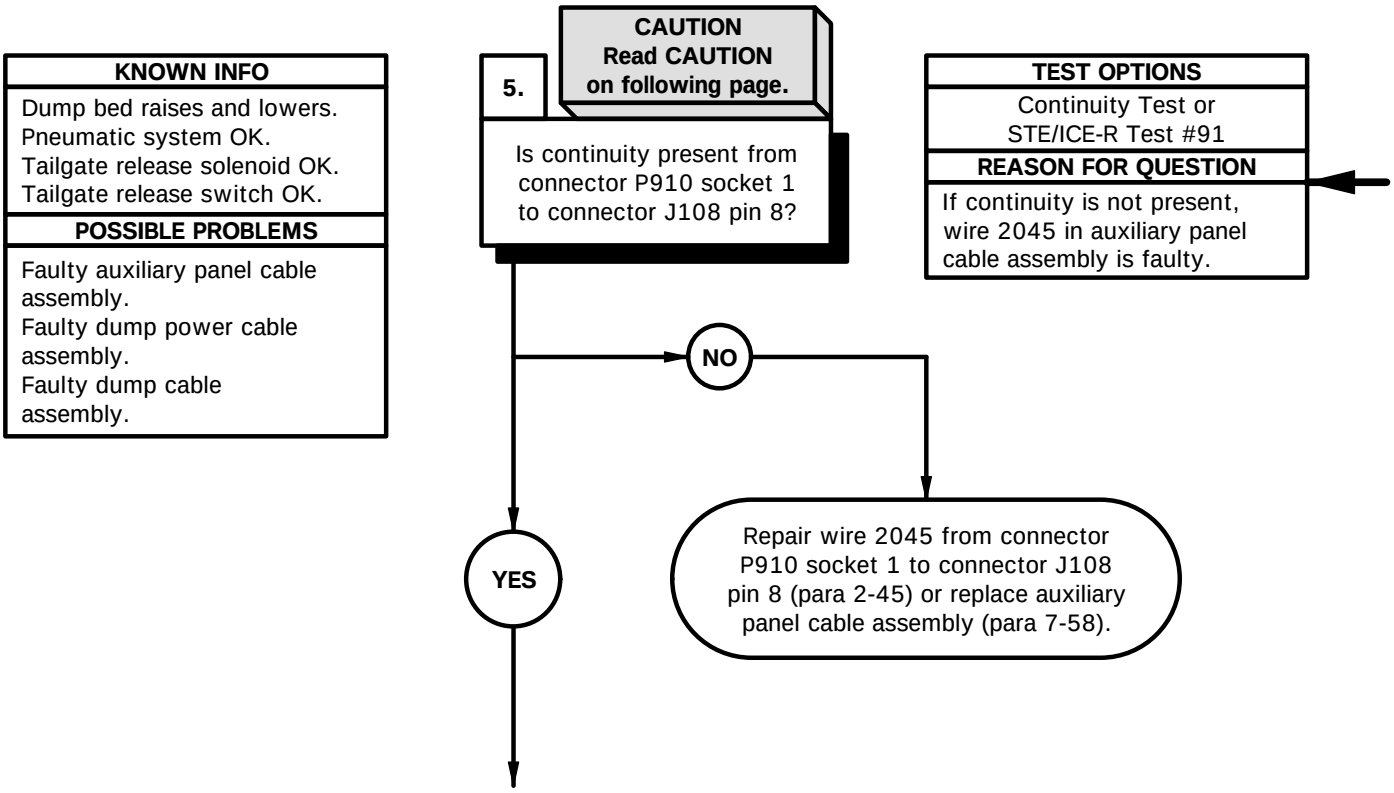
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to terminal 1 of tailgate release switch.
(3) Connect negative (-) probe of multimeter to terminal 3 of tailgate release switch.
(4) Push and hold tailgate release switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(5) If continuity is not present, replace tailgate release switch (para 7-18).



e142. M1090/M1094 TAILGATE RELEASE DOES NOT OPERATE (CONT)



CAUTION

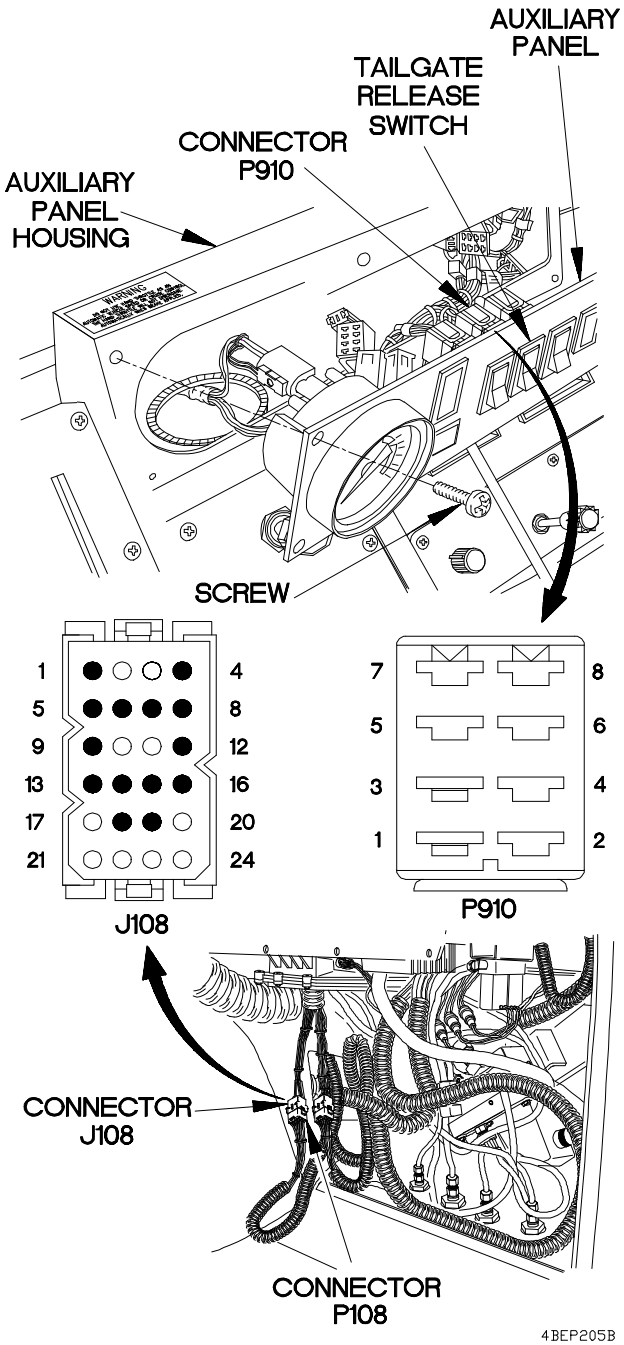
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

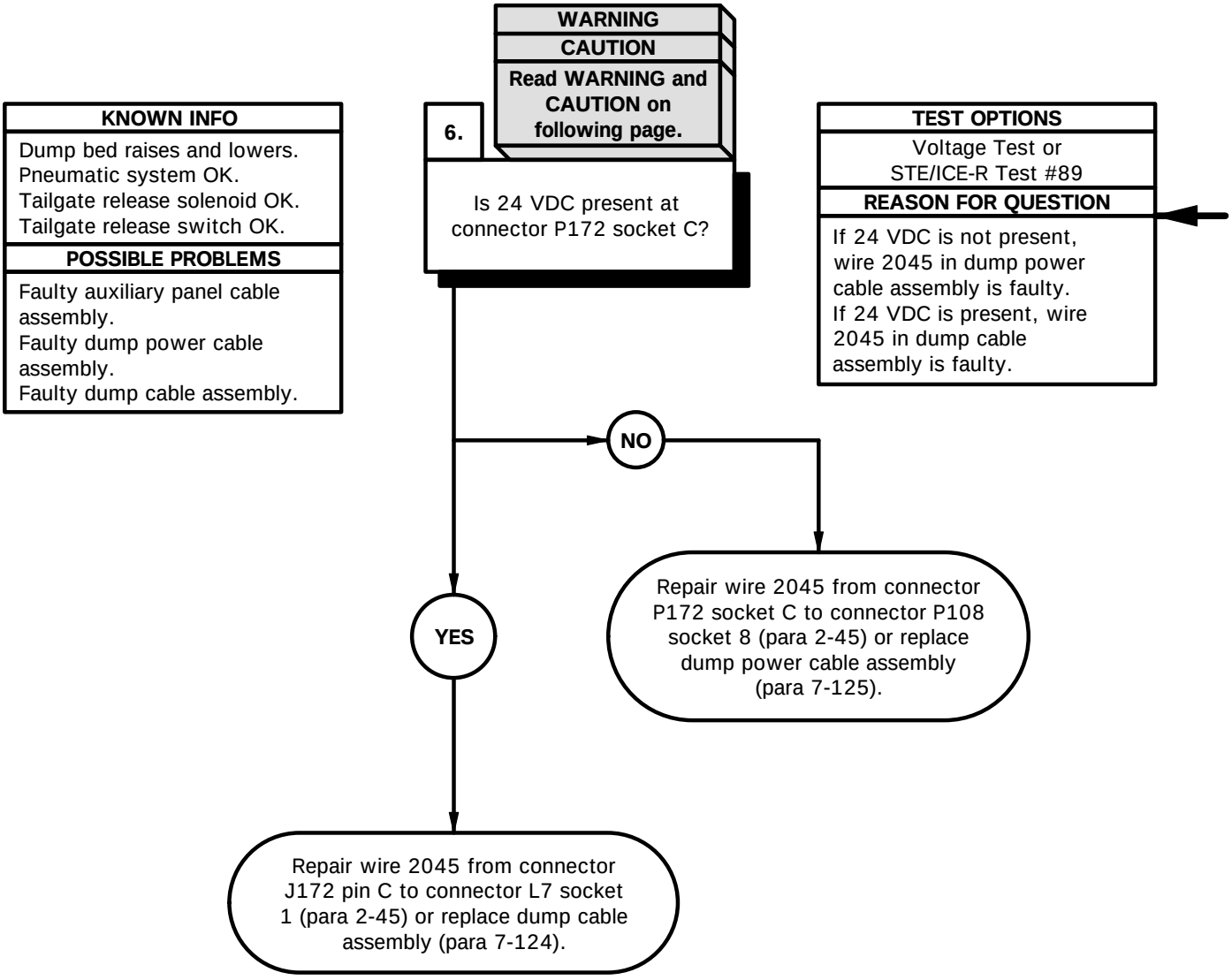
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Remove kick panel (para 16-3).
(2) Disconnect connector P108 from connector J108.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector P910 socket 1.
(5) Connect negative (-) probe of multimeter to connector J108 pin 8 and note reading on multimeter.
(6) If continuity is not present, repair wire 2045 from connector P910 socket 1 to connector J108 pin 8 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
(7) Connect connector P108 to connector J108.
(8) Install kick panel (para 16-3).
(9) Connect connector P910 to tailgate release switch.
(10) Position auxiliary panel on auxiliary panel housing with six screws.
(11) Tighten six screws to 24 lb-in. (3N.m).



e142. M1090/M1094 TAILGATE RELEASE DOES NOT OPERATE (CONT)



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 circuits and cause severe burns or electrical shock.

CAUTION

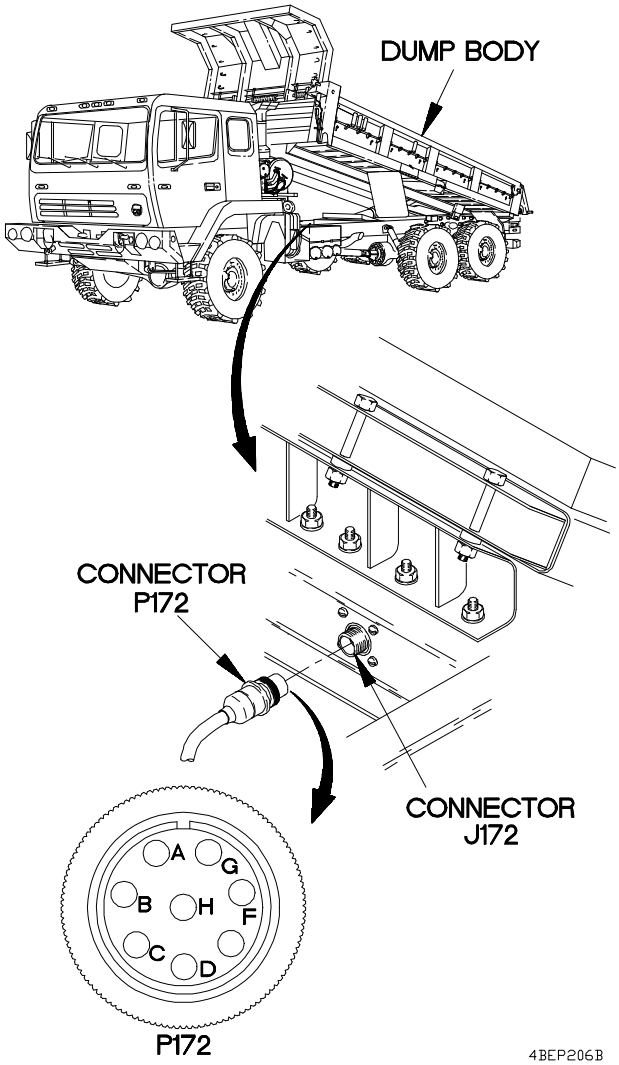
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

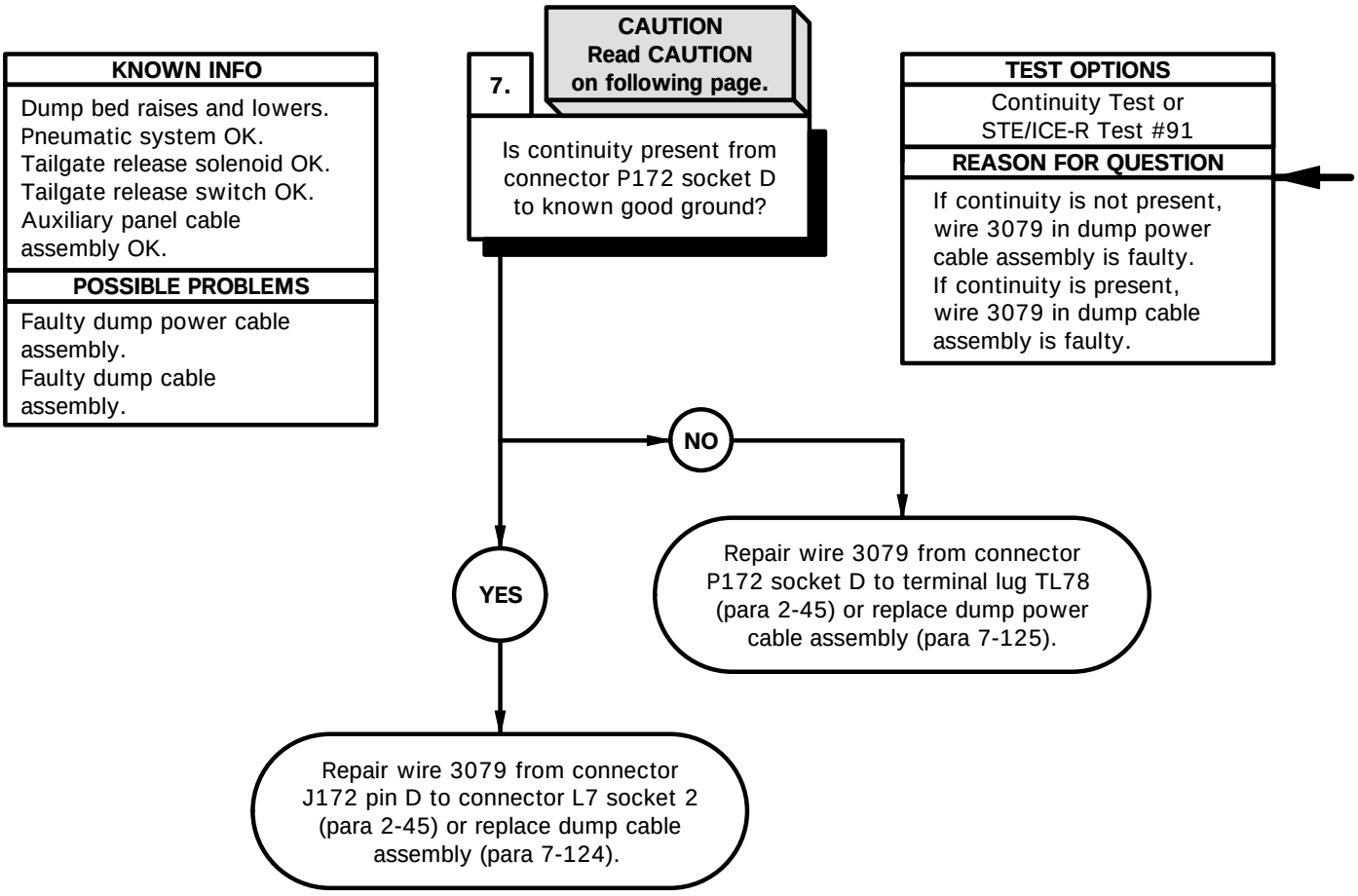
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

VOLTAGE TEST

(1) Disconnect connector P172 from connector J172.
(2) Set multimeter to volts DC.
(3) Connect positive (+) probe of multimeter to connector P172 socket C.
(4) Connect negative (-) probe of multimeter to ground.
(5) Press and hold tailgate release switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(6) If 24 VDC is not present, repair wire 2045 from connector P172 socket C to connector P108 socket 8 (para 2-45) or replace dump power cable assembly (para 7-125).
(7) If 24 VDC is present, repair wire 2045 from connector J172 pin C to connector L7 socket 1 (para 2-45) or replace dump cable assembly (para 2-124).
(8) Connect connector P172 to connector J172.



e142. M1090/M1094 TAILGATE RELEASE DOES NOT OPERATE (CONT)



CAUTION

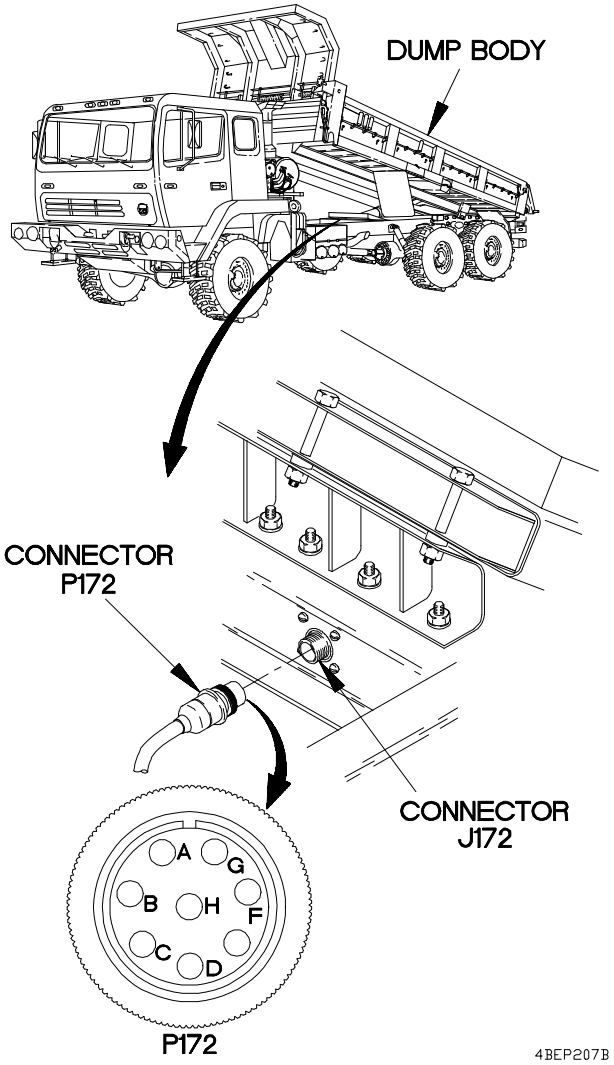
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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 P172 socket D.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair wire 3079 from connector P172 socket D to terminal lug TL78 (para 2-45) or replace dump power cable assembly (para 7-125).
(5) If continuity is present, repair wire 3079 from connector J172 pin D to connector L7 socket 2 (para 2-45) or replace dump cable assembly (para 7-124).
(6) Connect connector P172 to connector J172.
(7) Start engine (TM 9-2320-366-10-1).
(8) Engage PTO (TM 9-2320-366-10-1).
(9) Lower dump body (TM 9-2320-366-10-1).
(10) Disengage PTO (TM 9-2320-366-10-1).
(11) Shut down engine (TM 9-2320-366-10-1).



e143. M1090/M1094 DUMP BODY DOES NOT RAISE

INITIAL SETUP

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

Personnel Required
(2)

References
TM 9-4910-571-12&P

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Sling, Cargo (Item 31, Appendix C)
Lifting Bracket, Dump Body (2) (Item E-24, Appendix E)
Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Socket Set, Socket Wrench (Item 34, Appendix C)

Materials/Parts
Wire, Elec, 50 ft (Item 71, Appendix D)

NOTE

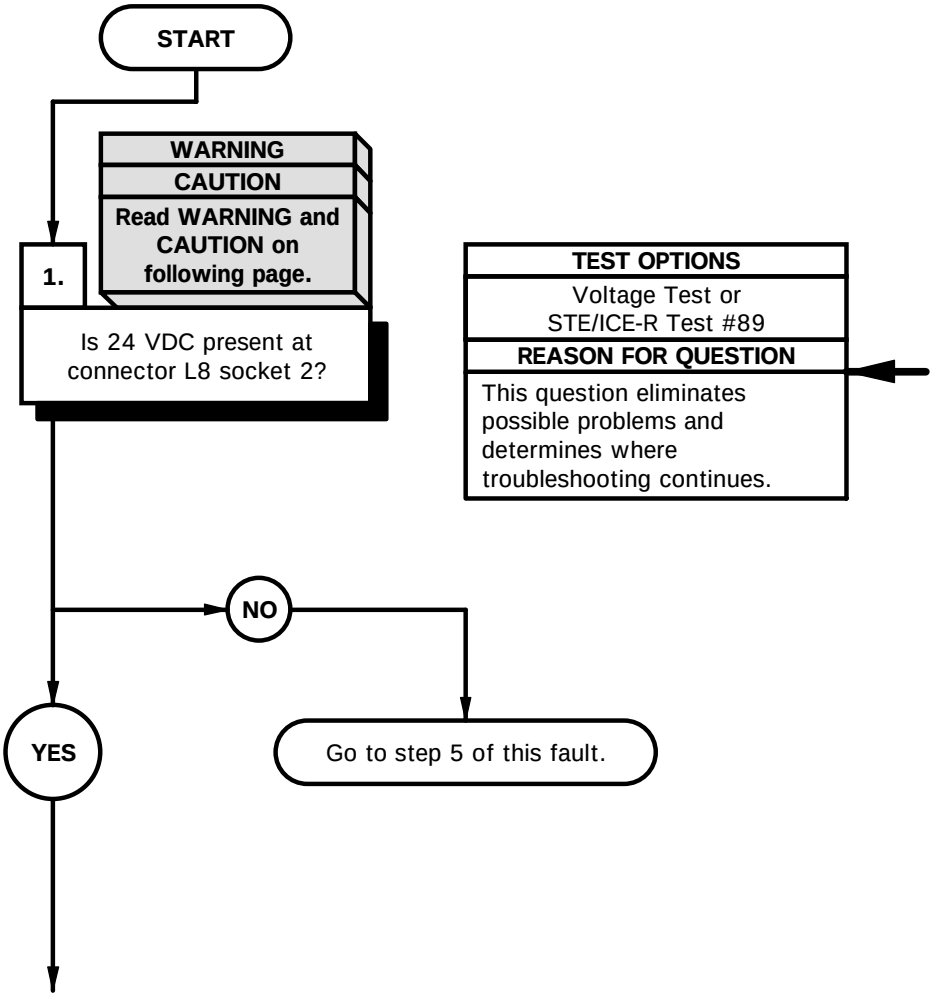
Perform Electrical System Troubleshooting e1. Circuit Breaker Does Not Operate on circuit breaker CB50 prior to beginning this task.

KNOWN INFO

Hydraulic oil level OK.
PTO OK.
Circuit breaker CB50 OK.

POSSIBLE PROBLEMS

Faulty dump body hydraulic system.
Faulty four-way relief valve.
Faulty solenoid valve.
Faulty DUMP BED UP/DOWN switch.
Faulty auxiliary panel cable assembly.
Faulty M1090/M1094 dump cable assembly.
Faulty M1090/M1094 dump power cable assembly.
Faulty dashboard cable assembly.



TEST OPTIONS

Voltage Test or
STE/ICE-R Test #89

REASON FOR QUESTION

This question eliminates possible problems and determines where troubleshooting continues.

WARNING

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

Dump body weighs approximately 3,030 lbs (1,376 kgs). Attach a suitable lifting device prior to lifting. Failure to comply may result in injury to personnel or damage to equipment.

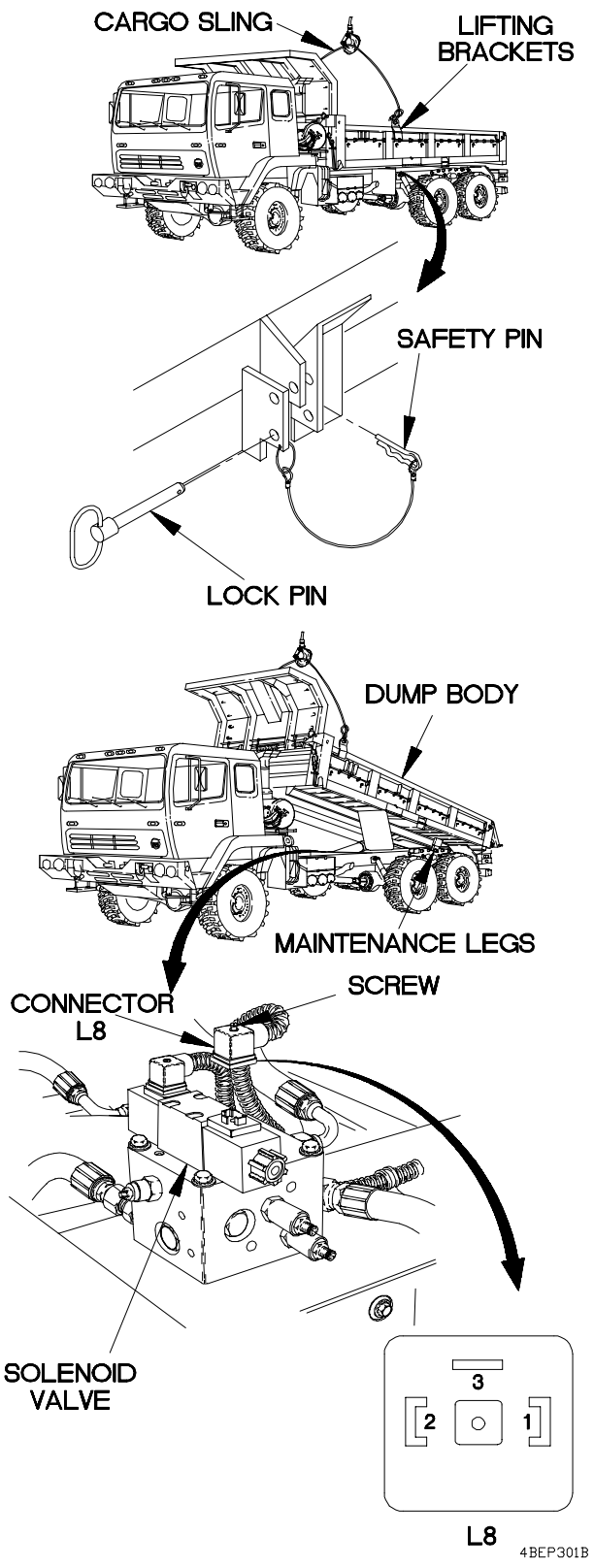
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

CAUTION

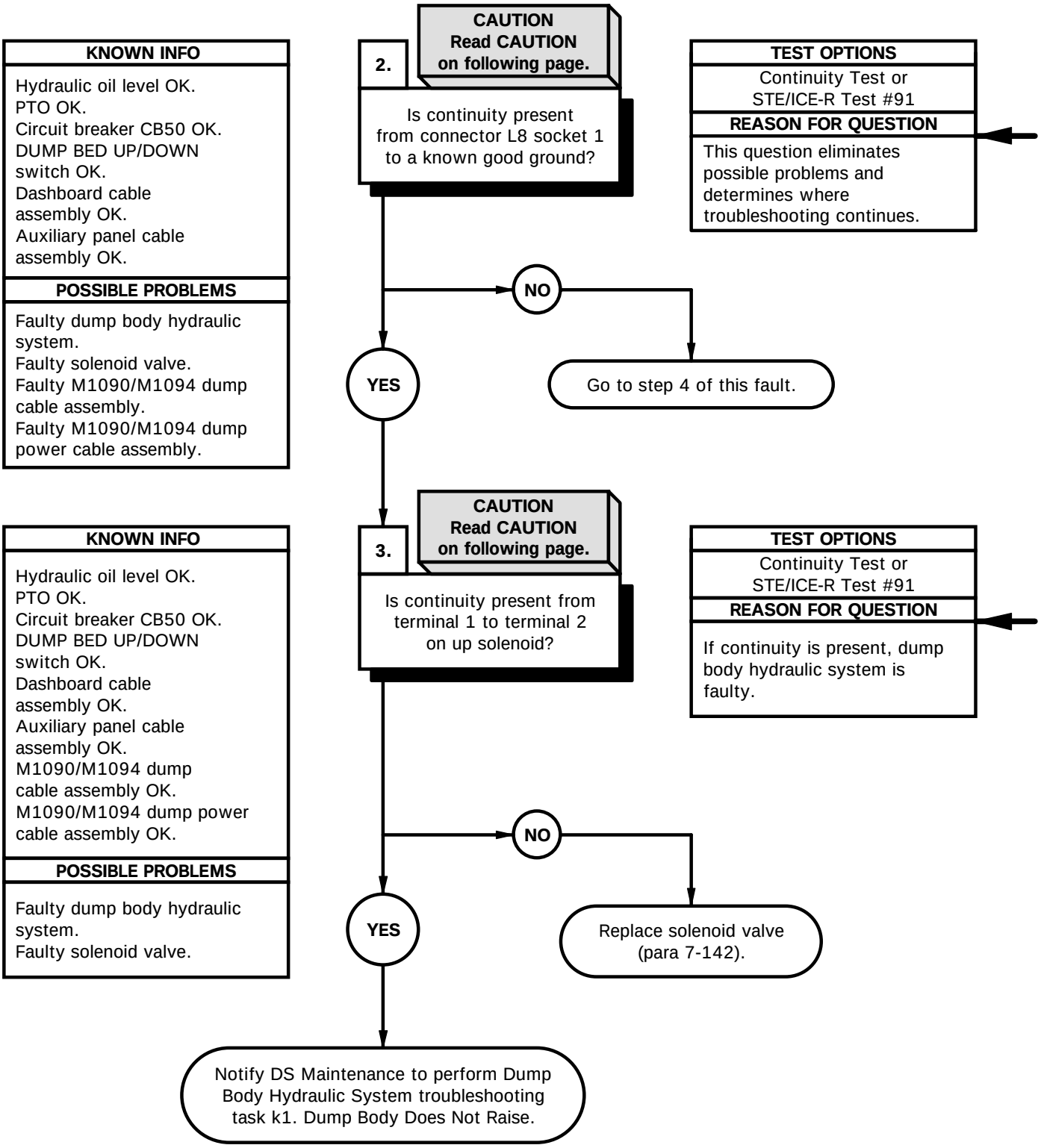
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

VOLTAGE TEST

(1) Remove safety pins from two locking pins.
(2) Remove two lock pins from dump body.
(3) Install two dump body lifting brackets in slots in dump body.
(4) Attach cargo sling to two dump body lifting brackets.
(5) Lift dump body.
(6) Raise two maintenance legs on frame.
(7) Lower dump body on maintenance legs.
(8) Loosen screw on connector L8.
(9) Disconnect connector L8 from solenoid valve.
(10) Set multimeter to volts DC.
(11) Connect positive (+) probe of multimeter to connector L8 socket 2.
(12) Connect negative (-) probe of multimeter to ground.
(13) Press and hold DUMP BED UP/DOWN switch to UP (TM 9-2320-366-10-1) and note reading on multimeter.
(14) If 24 VDC is not present, go to step 5, of this fault.
(15) Release DUMP BED UP/DOWN switch (TM 9-2320-366-10-1).



e143. M1090/M1094 DUMP BODY DOES NOT RAISE (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

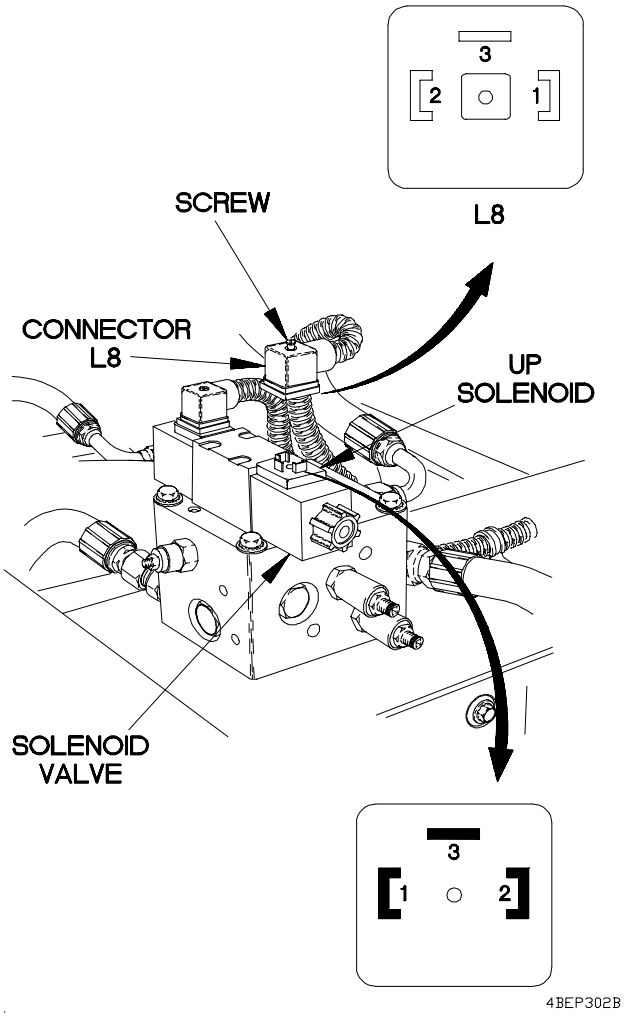
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

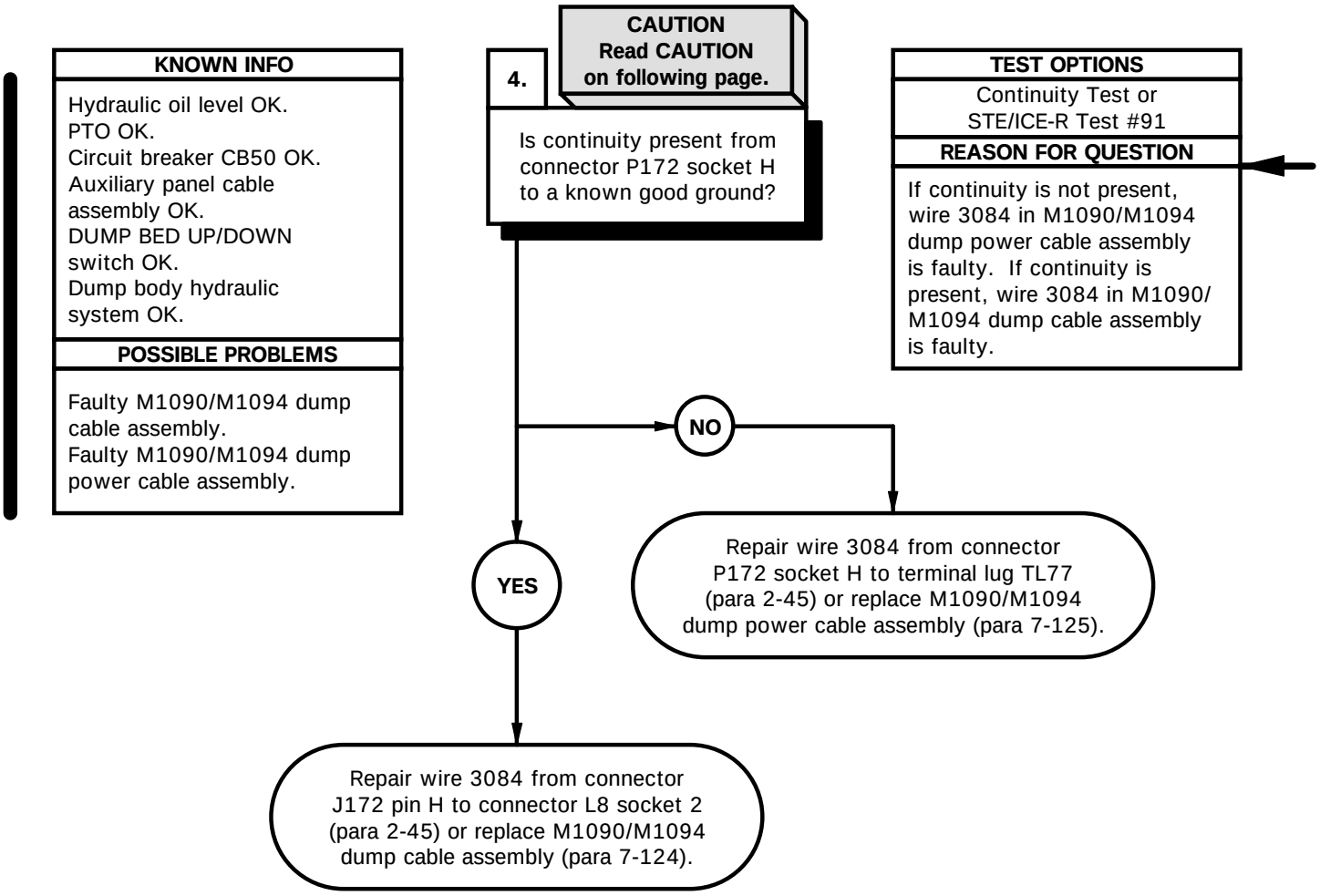
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector L8 socket 1.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, go to step 4 of this fault.

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to terminal 1 on up solenoid.
(3) Connect negative (-) probe of multimeter to terminal 2 on up solenoid and note reading on multimeter.
(4) If continuity is not present, replace solenoid valve (para 7-142).
(5) If continuity is present, notify DS Maintenance to perform Dump Body Hydraulic System troubleshooting task k1. Dump Body Does Not Raise.
(6) Connect connector L8 to solenoid valve.
(7) Tighten screw in connector L8.



e143. M1090/M1094 DUMP BODY DOES NOT RAISE (CONT)



CAUTION

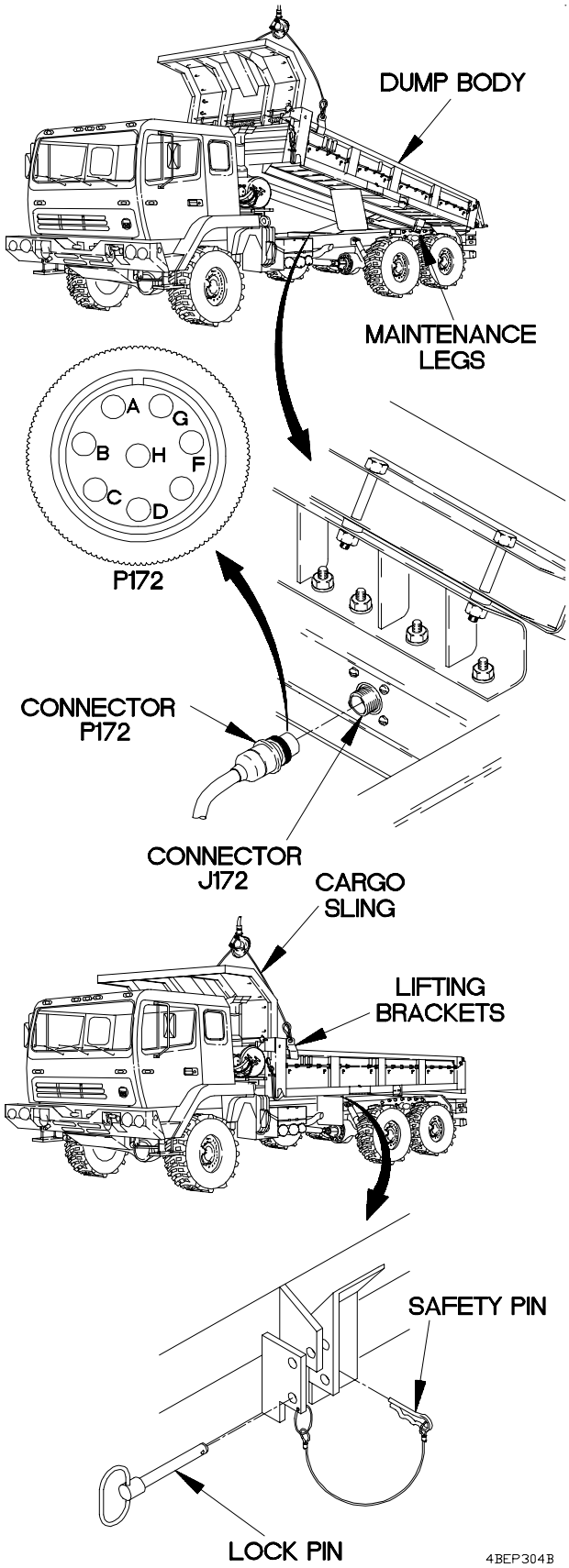
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

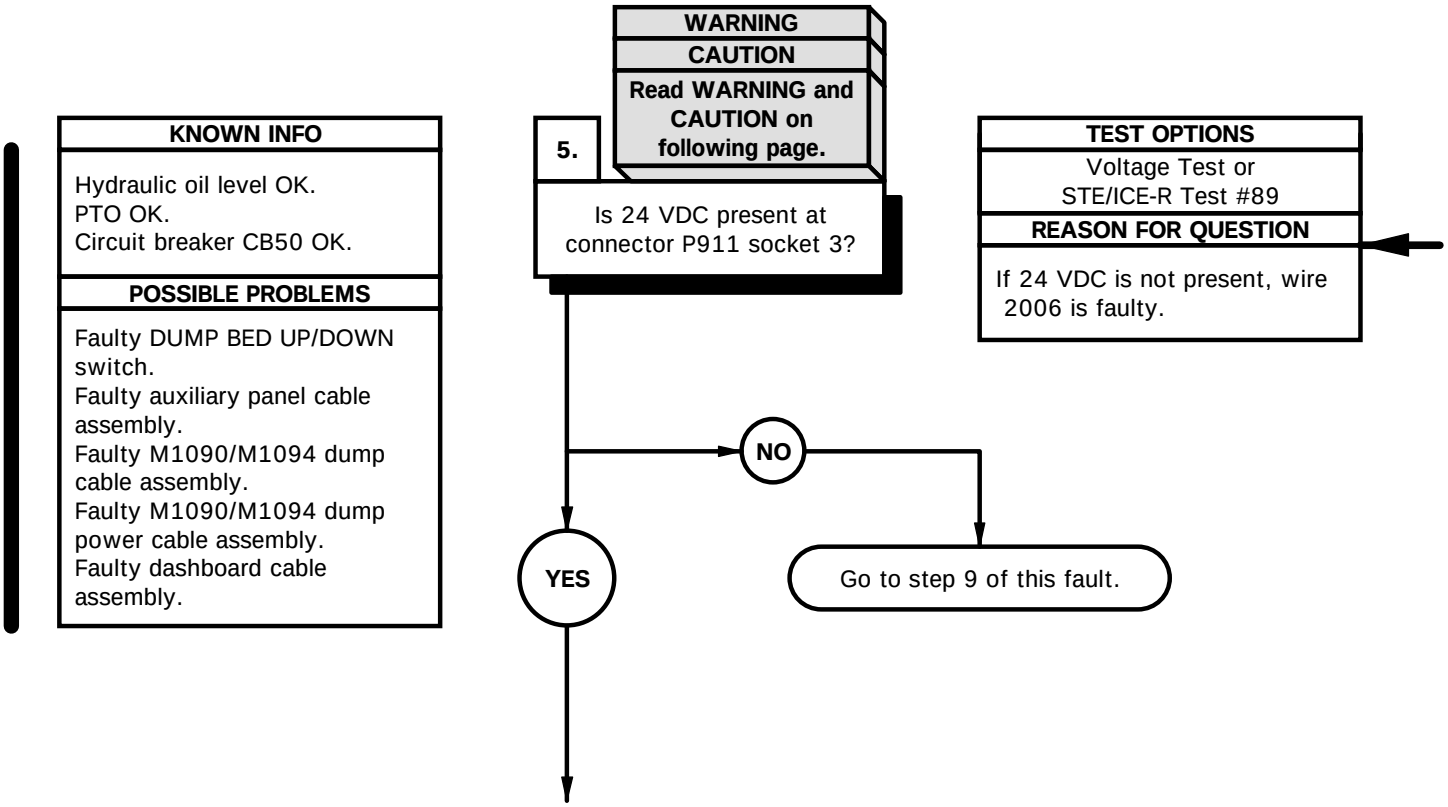
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Disconnect connector P172 from connector J172.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector P172 socket H.
(4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(5) If continuity is not present, repair wire 3084 from connector P172 socket H to terminal lug TL77 (para 2-45) or replace M1090/M1094 dump power cable assembly (para 7-125).
(6) If continuity is present, repair wire 3084 from connector J172 pin H to connector L8 socket 2 (para 2-45) or replace M1090/M1094 dump cable assembly (para 7-124).
(7) Connect connector P172 to connector J172.
(8) Connect connector L8 to solenoid valve.
(9) Tighten screw in connector L8.
(10) Lift dump body.
(11) Place maintenance legs in stowed position.
(12) Lower dump body.
(13) Remove cargo sling from two dump body lifting brackets.
(14) Remove two dump body lifting brackets from dump body.
(15) Position two locking pins in dump body.
(16) Install safety pin in two locking pins.



e143. M1090/M1094 DUMP BODY DOES NOT RAISE (CONT)



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 circuits and cause severe burns or electrical shock.

CAUTION

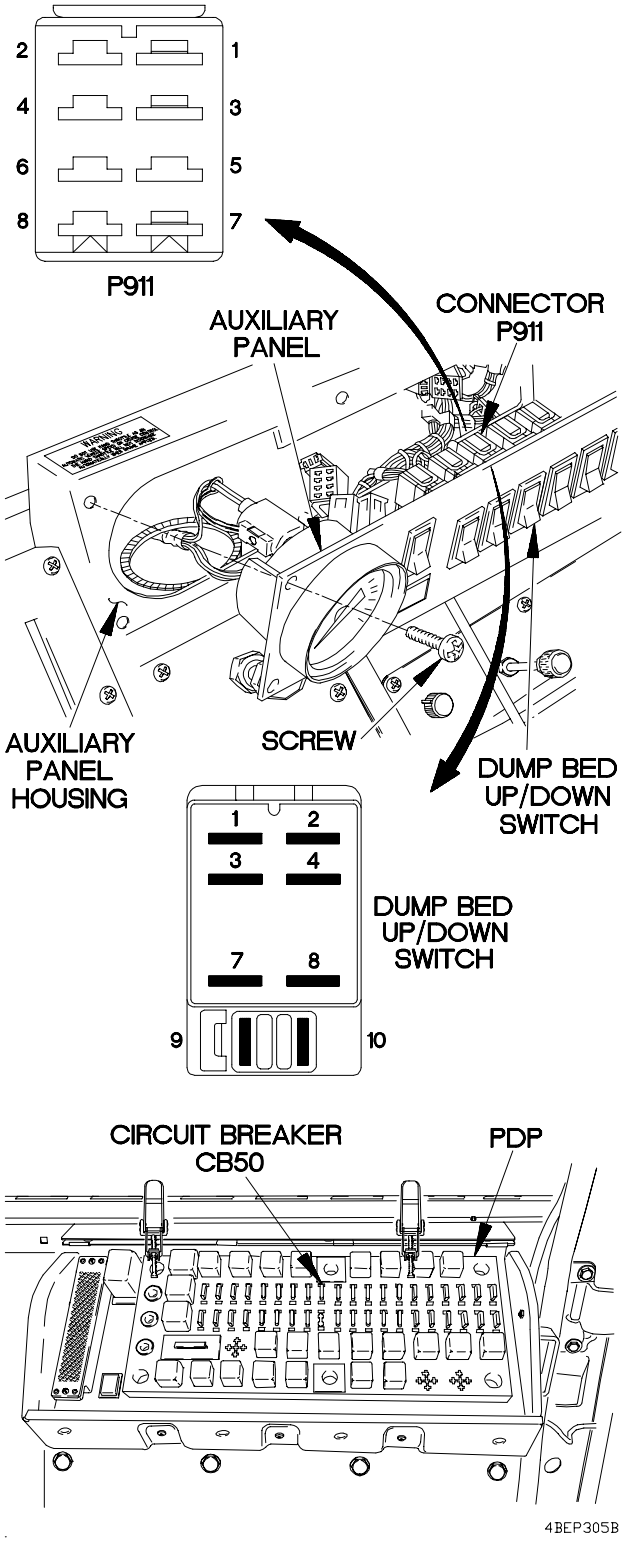
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

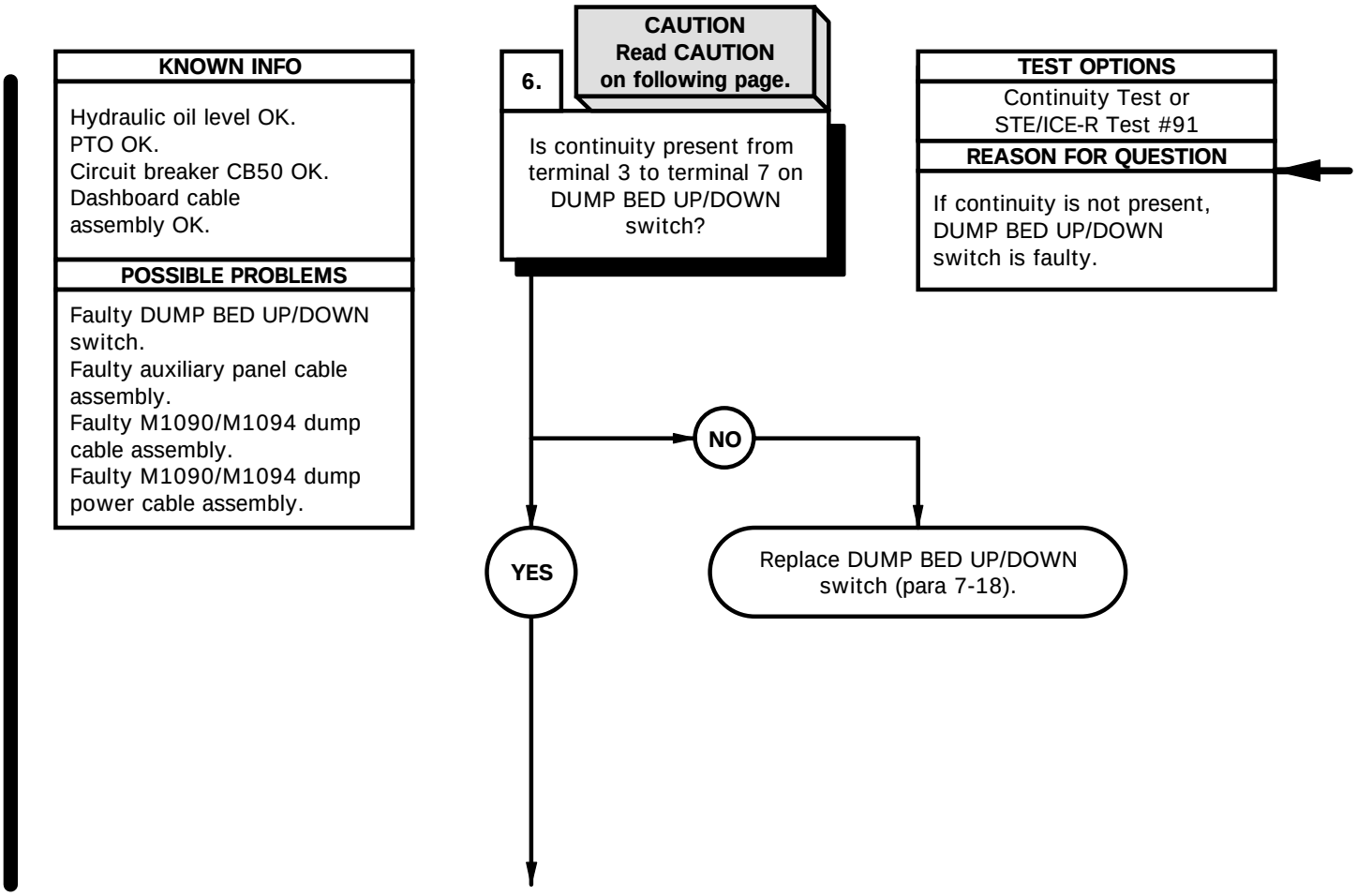
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

VOLTAGE TEST

(1) Connect connector L8 to solenoid valve.
(2) Tighten screw in connector L8.
(3) Remove six screws from auxiliary panel.
(4) Lift auxiliary panel outward to gain access.
(5) Remove PDP cover from PDP (para 16-2).
(6) Remove circuit breaker CB50 from PDP.
(7) Disconnect connector P911 from DUMP BED UP/DOWN switch connector.
(8) Set multimeter to volts DC.
(9) Connect positive (+) probe of multimeter to P911 socket 3.
(10) Connect negative (-) probe of multimeter to ground.
(11) Install circuit breaker CB50 in PDP and note reading on multimeter.
(12) If 24 VDC is not present, go to step 9 of this fault.
(13) Remove circuit breaker CB50 from PDP.



e143. M1090/M1094 DUMP BODY DOES NOT RAISE (CONT)



CAUTION

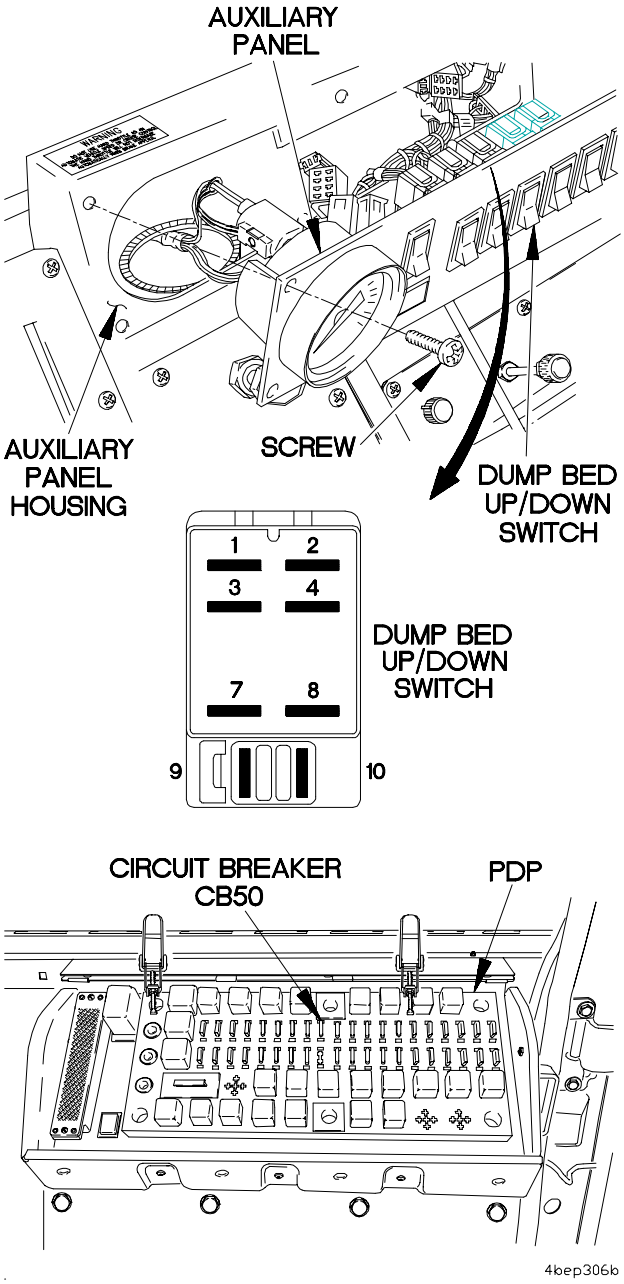
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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 DUMP BED UP/DOWN switch terminal 3.
(3) Connect negative (-) probe of multimeter to DUMP BED UP/DOWN switch terminal 7.
(4) Press and hold DUMP BED UP/DOWN switch to UP and note reading on multimeter.
(5) If continuity is not present, replace DUMP BED UP/DOWN switch (para 7-18).
(6) Release DUMP BED UP/DOWN switch.
(7) Install circuit breaker CB50 in PDP.



e143. M1090/M1094 DUMP BODY DOES NOT RAISE (CONT)

KNOWN INFO

Hydraulic oil level OK.
PTO OK.
Circuit breaker CB50 OK.
Dashboard cable assembly OK.
DUMP BED UP/DOWN switch OK.

POSSIBLE PROBLEMS

Faulty auxiliary panel cable assembly.
Faulty M1090/M1094 dump cable assembly.
Faulty M1090/M1094 dump power cable assembly.

CAUTION
Read CAUTION on following page.

7. Is continuity present from connector J108 pin 6 to connector P911 socket 7?

TEST OPTIONS

Continuity Test or STE/ICE-R Test #91

REASON FOR QUESTION

If continuity is not present, wire 2043 in auxiliary panel cable assembly is faulty.

NO → Repair wire 2043 from connector J108 pin 6 to connector P911 socket 7 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).

YES

CAUTION

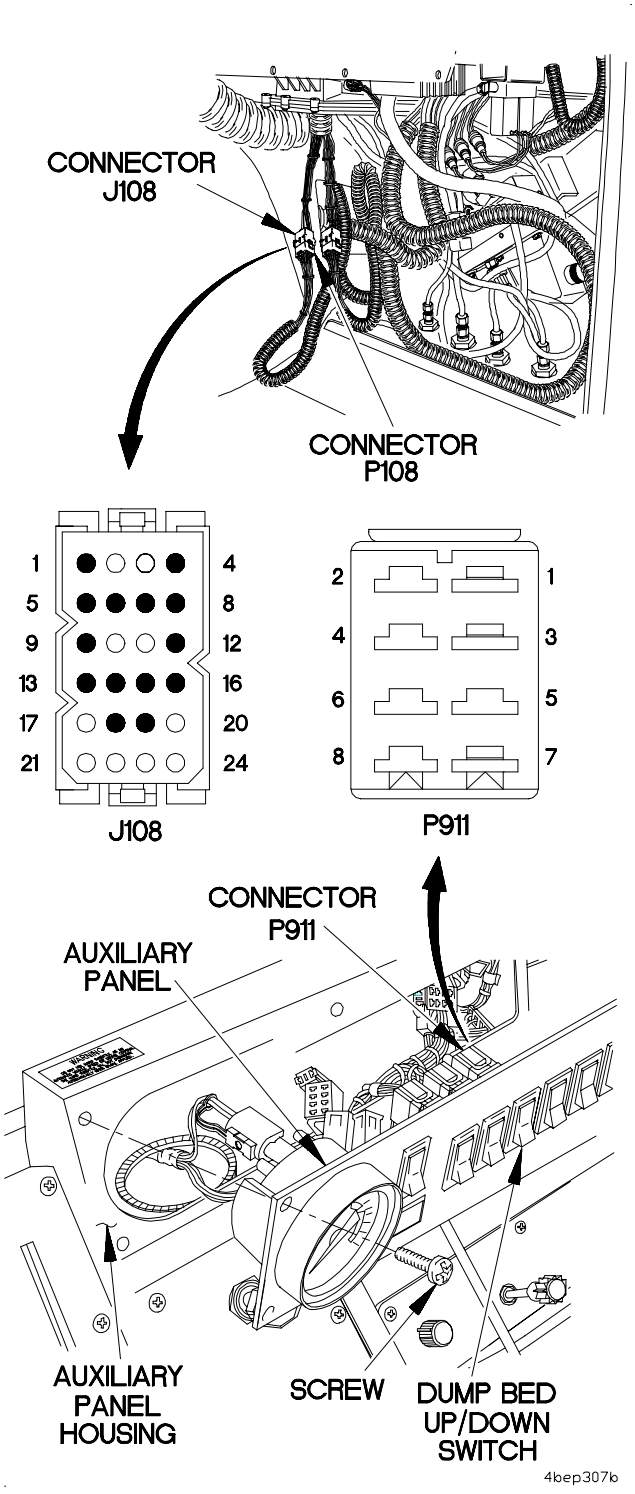
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

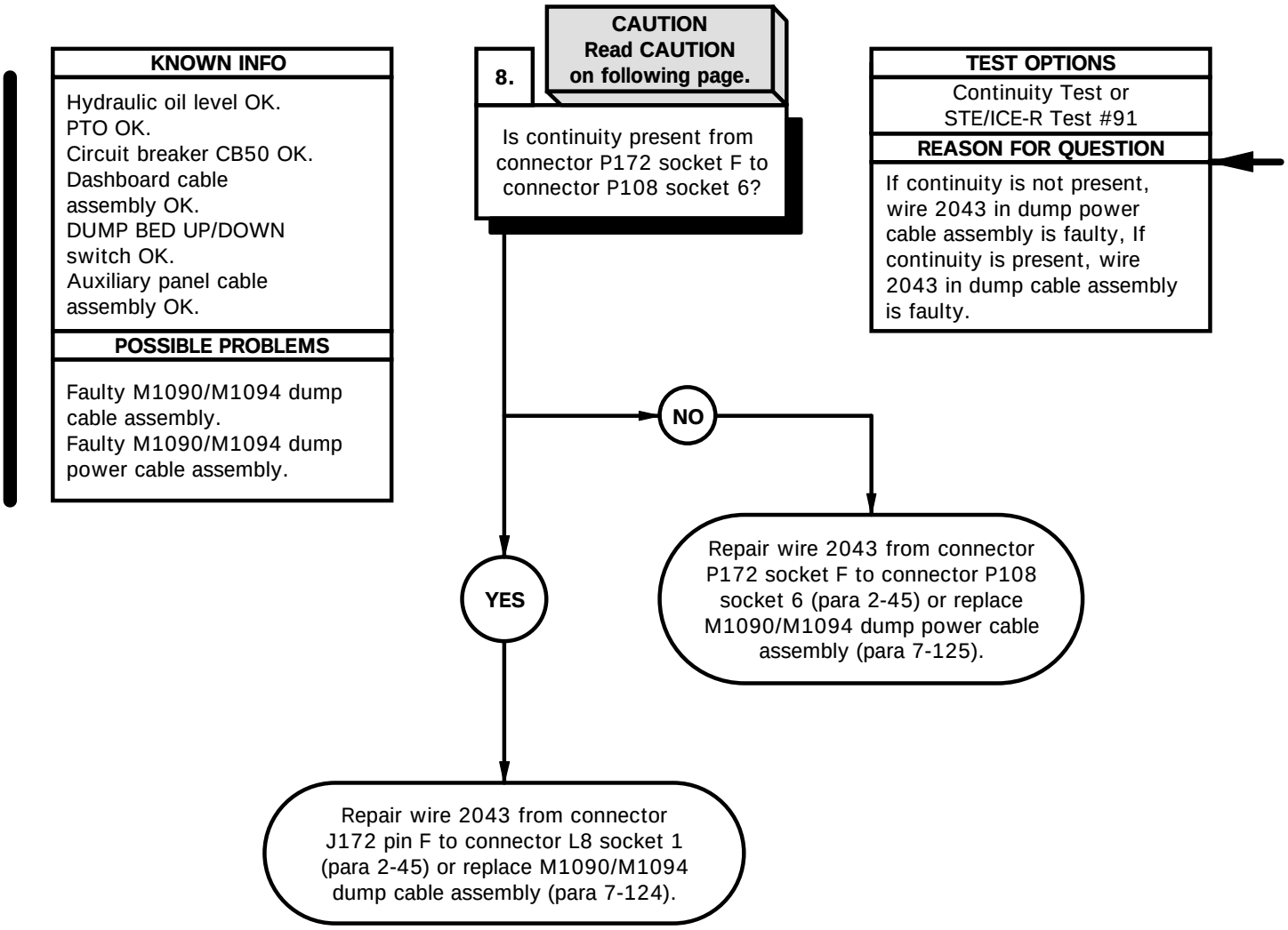
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Disconnect batteries (para 7-57).
(2) Remove kick panel (para 16-3).
(3) Disconnect connector P108 from connector J108.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to connector J108 pin 6.
(6) Connect negative (-) probe of multimeter to connector P911 socket 7 and note reading on multimeter.
(7) If continuity is not present, repair wire 2043 from connector J108 pin 6 to connector P911 socket 7 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
(8) Connect connector P911 to DUMP BED UP/DOWN switch.
(9) Position auxiliary panel on auxiliary panel housing with six screws.
(10) Tighten six screws to 24 lb-in. (3N.m).



e143. M1090/M1094 DUMP BODY DOES NOT RAISE (CONT)



CAUTION

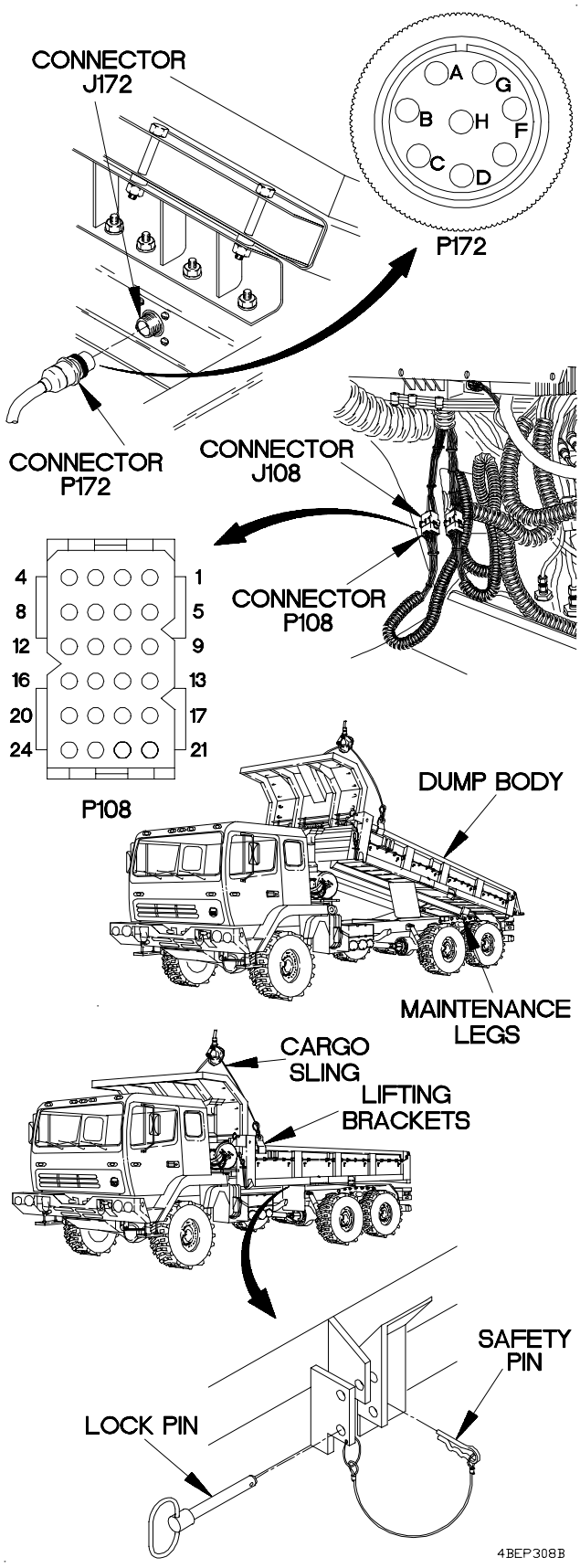
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

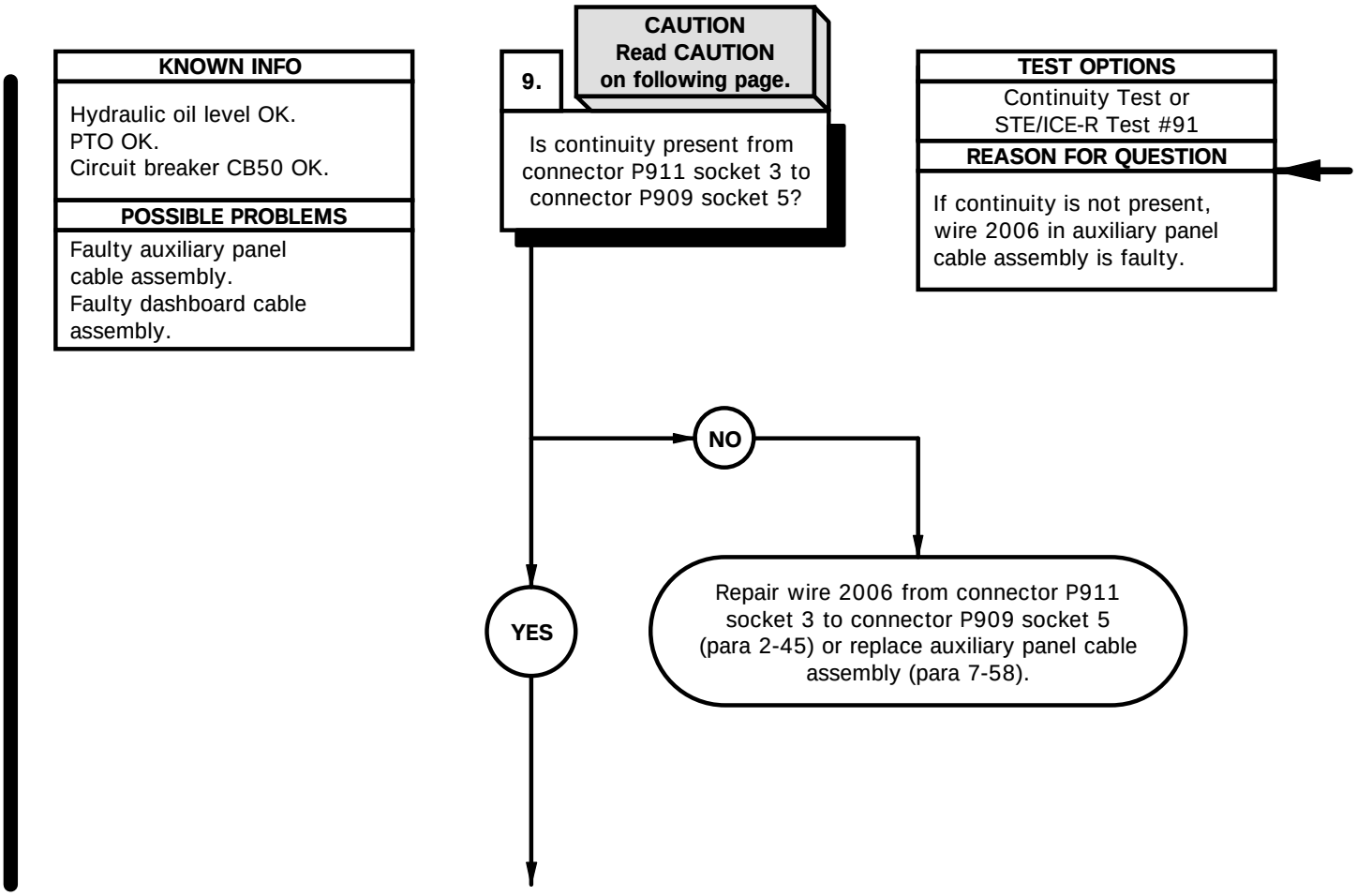
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Disconnect connector P172 from connector J172.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector P172 socket F.
(4) Connect negative (-) probe of multimeter to connector P108 socket 6 and note reading on multimeter.
(5) If continuity is not present, repair wire 2043 from connector P172 socket F to connector P108 socket 6 (para 2-45) or replace M1090/M1094 dump power cable assembly (para 7-125).
(6) If continuity is present, repair wire 2043 from connector J172 Pin F to connector L8 socket 1 (para 2-45) or replace M1090/M1094 dump cable assembly (para 7-124).
(7) Connect connector P172 to connector J172.
(8) Connect connector P108 to connector J108.
(9) Install kick panel (para 16-3).
(10) Connect batteries (para 7-57).
(11) Lift dump body.
(12) Place maintenance legs in stowed position.
(13) Lower dump body.
(14) Remove cargo sling from dump body lifting brackets.
(15) Remove two dump body lifting brackets from dump body.
(16) Position two locking pins in dump body.
(17) Install safety pin in two locking pins.



e143. M1090/M1094 DUMP BODY DOES NOT RAISE (CONT)



CAUTION

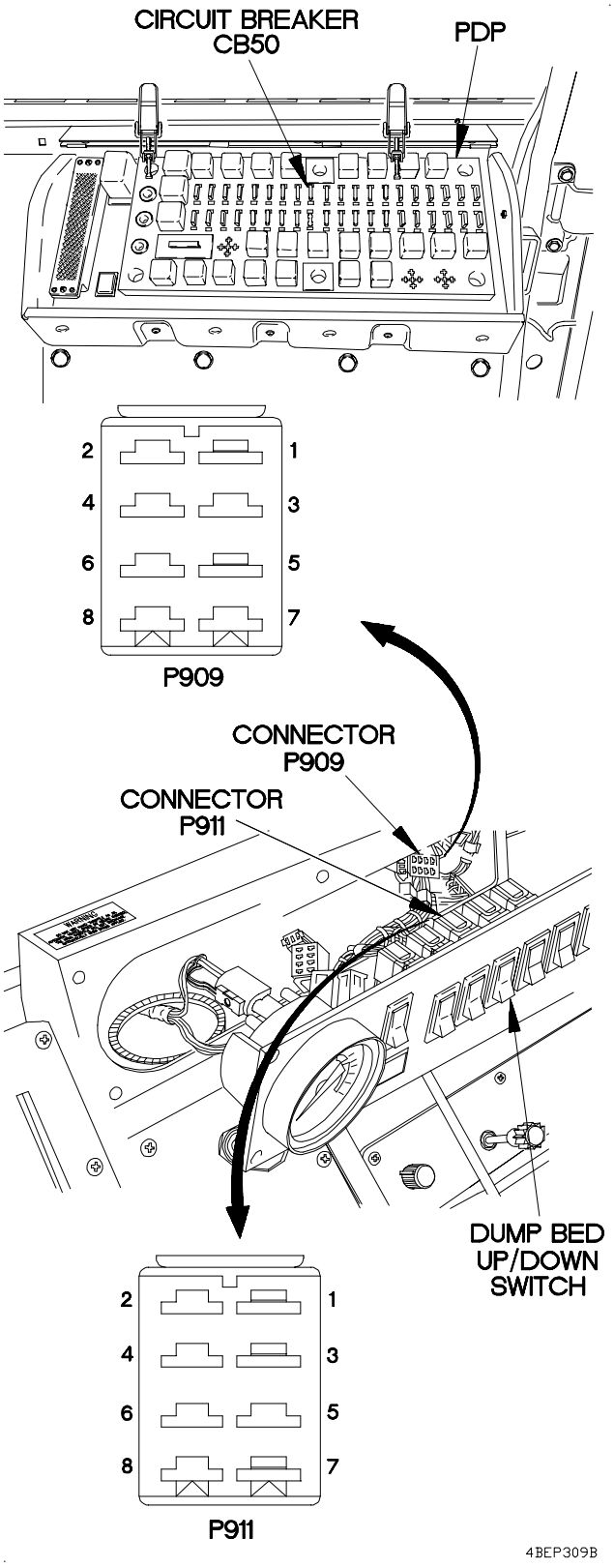
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

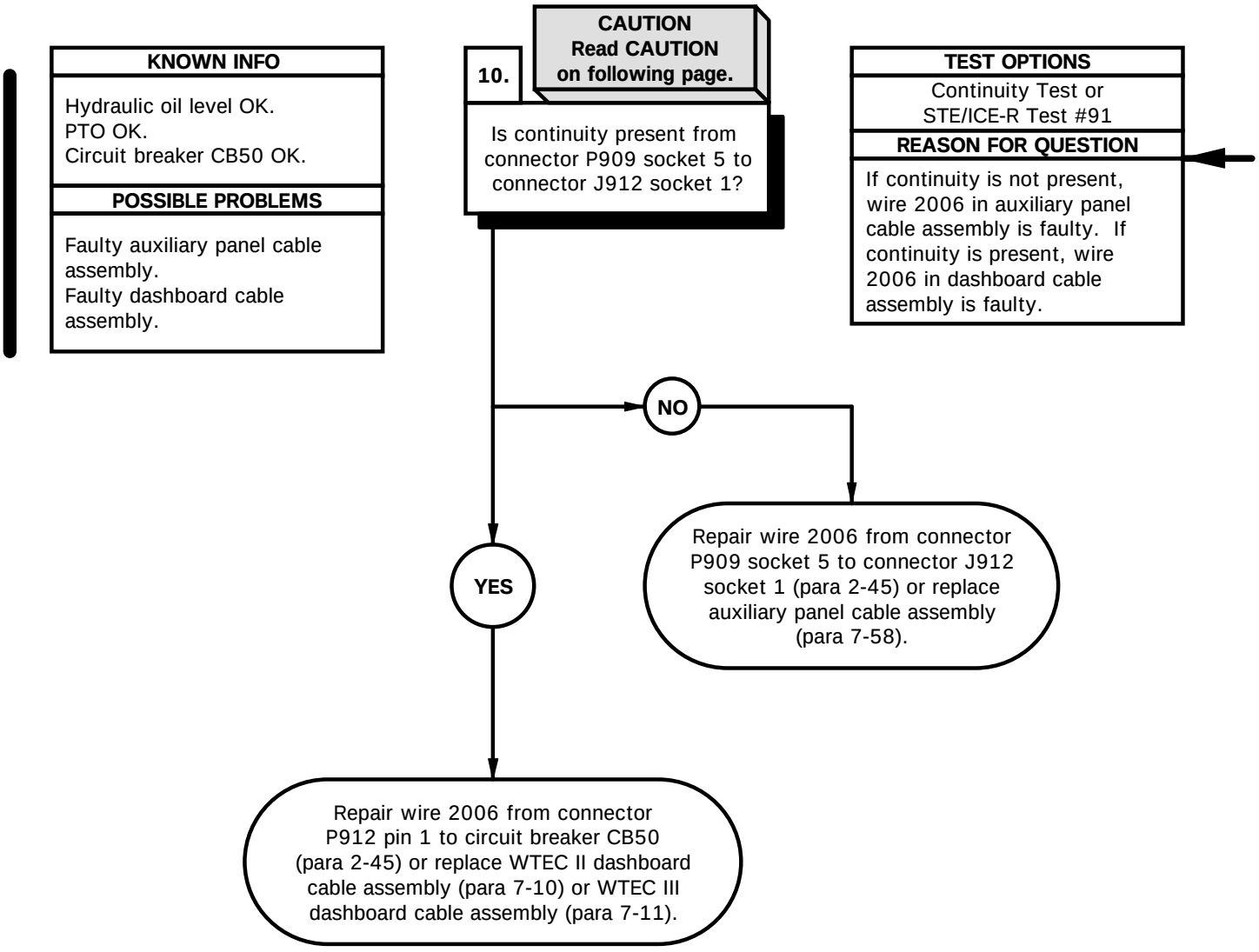
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Install circuit breaker CB 50 in PDP.
(2) Install PDP cover on PDP (para 16-2).
(3) Disconnect batteries (para 7-57).
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to connector P911 socket 3.
(6) Connect negative (-) probe of multimeter to connector P909 socket 5 and note reading on multimeter.
(7) If continuity is not present, repair wire 2006 from connector P911 socket 3 to connector P909 socket 5 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
(8) Connect connector P911 to DUMP BED UP/DOWN switch.



e143. M1090/M1094 DUMP BODY DOES NOT RAISE (CONT)



CAUTION

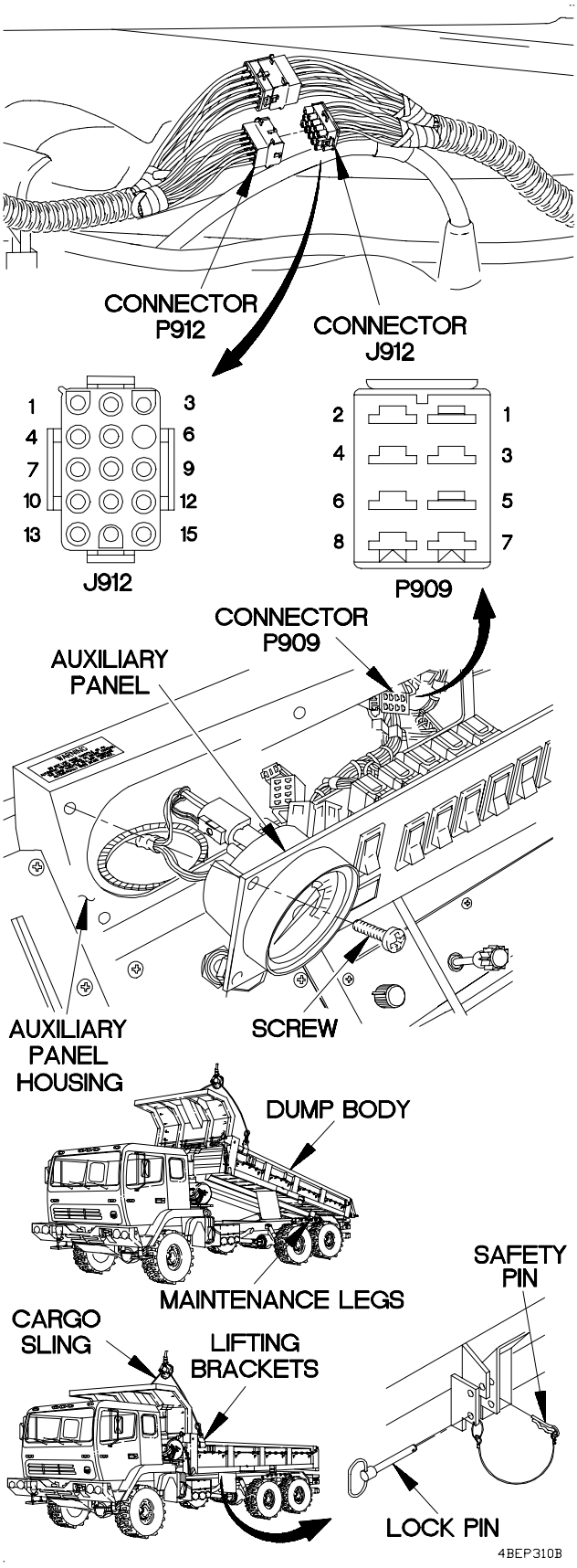
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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 personnel heater assembly for access (para 18-9).
(2) Disconnect connector J912 from P912.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector P909 socket 5.
(5) Connect negative (-) probe of multimeter to connector J912 socket 1 and note reading on multimeter.
(6) If continuity is not present, repair wire 2006 from connector P909 socket 5 to connector J912 socket 1 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
(7) If continuity is present, repair wire 2006 from connector P912 Pin 1 to circuit breaker CB50 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(8) Connect connector J912 to connector P912.
(9) Install personnel heater (para 18-9).
(10) Position auxiliary panel on auxiliary panel housing with six screws.
(11) Tighten six screws to 24 lb-in (3N.m).
(12) Connect batteries (para 7-57).
(13) Lift dump body.
(14) Place maintenance legs in stowed position.
(15) Lower dump body.
(16) Remove cargo sling from dump body lifting brackets.
(17) Remove two dump body lifting brackets from dump body.
(18) Position two locking pins in dump body.
(19) Install safety pins in two locking pins.



e144. M1090/M1094 DUMP BODY DOES NOT LOWER

INITIAL SETUP

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

Personnel Required
(2)

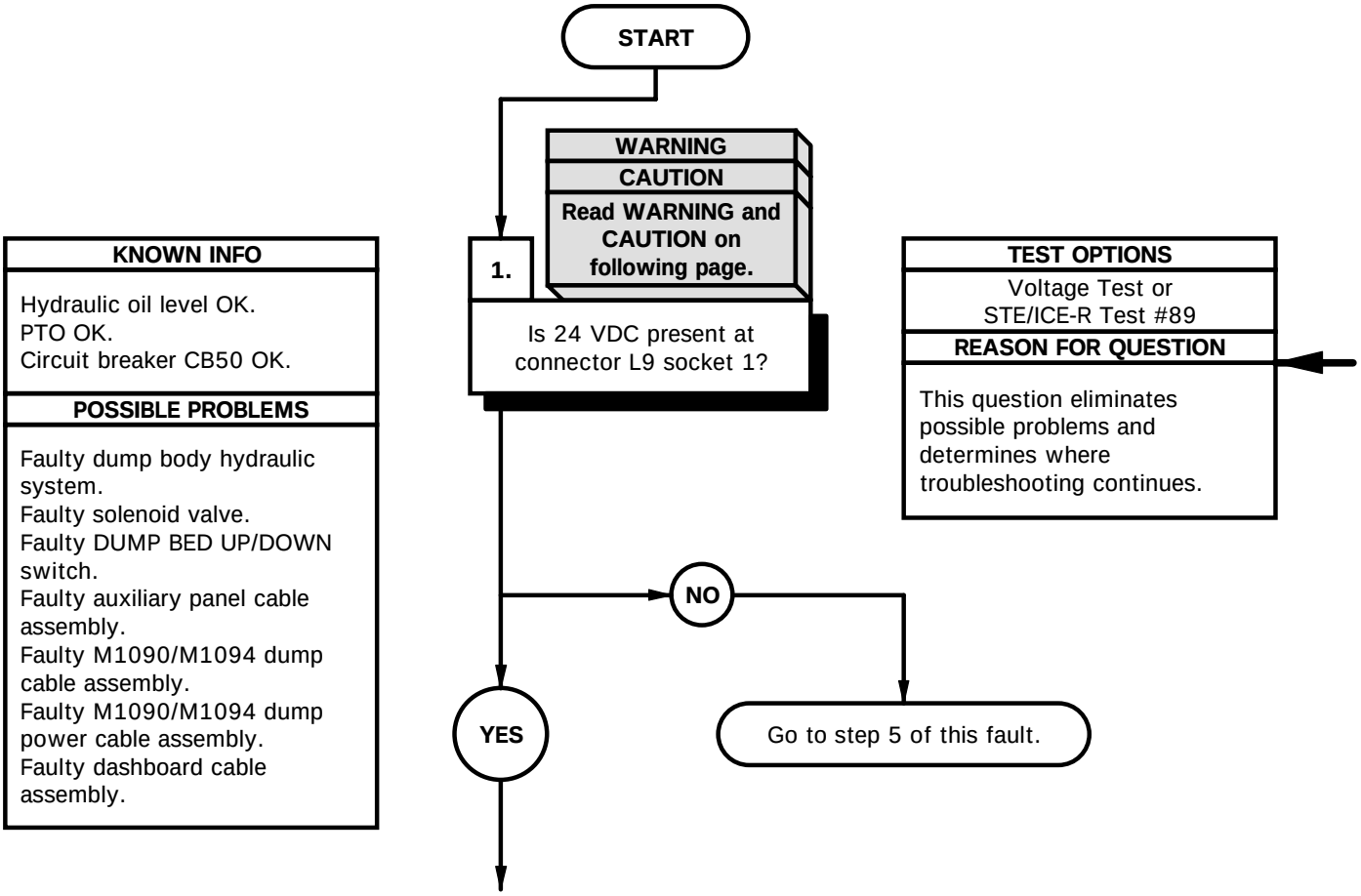
References
TM 9-4910-571-12&P

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Sling, Cargo (Item 31, Appendix C)
Lifting Bracket, Dump Body (2) (Item E-24, Appendix E)
Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Socket Set, Socket Wrench (Item 34, Appendix C)

Materials/Parts
Wire, Elec, 50 ft (Item 71, Appendix D)

NOTE

Perform Electrical System Troubleshooting e1. Circuit Breaker Does Not Operate on circuit breaker CB50 prior to beginning this task.



WARNING

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

Dump body weighs approximately 3,030 lbs (1,376 kgs). Attach a suitable lifting device prior to lifting. Failure to comply may result in injury to personnel or damage to equipment.

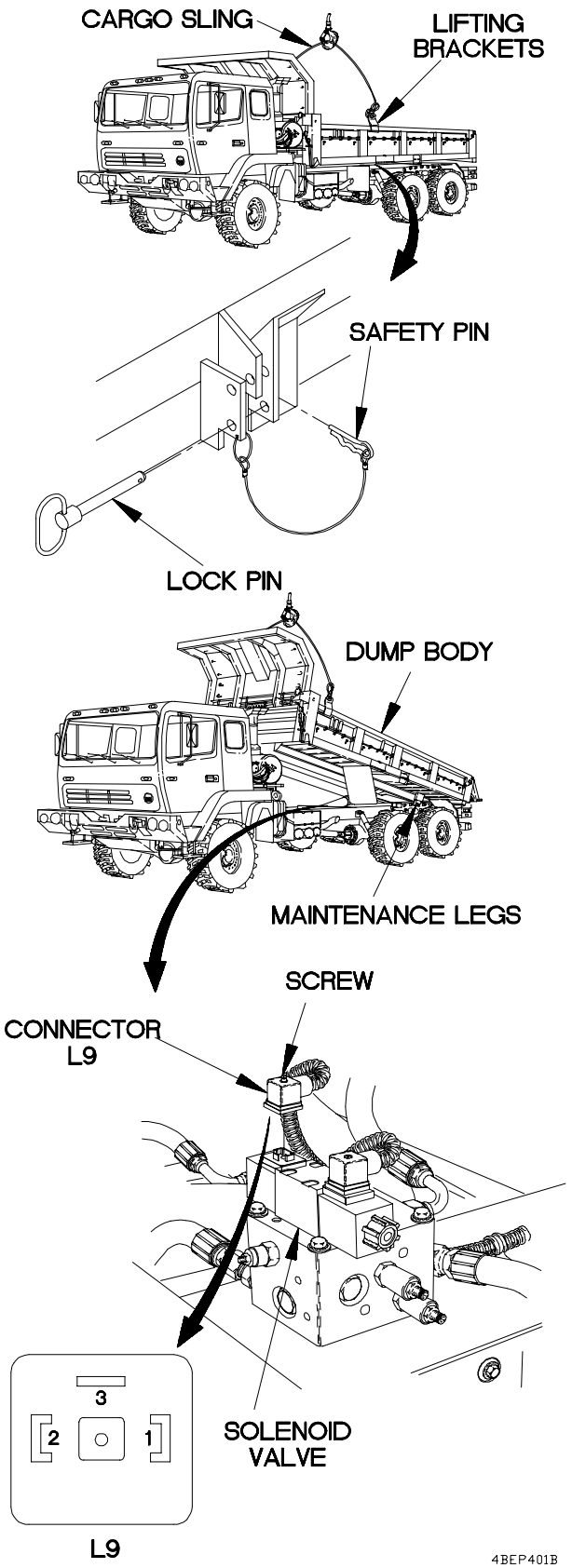
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

CAUTION

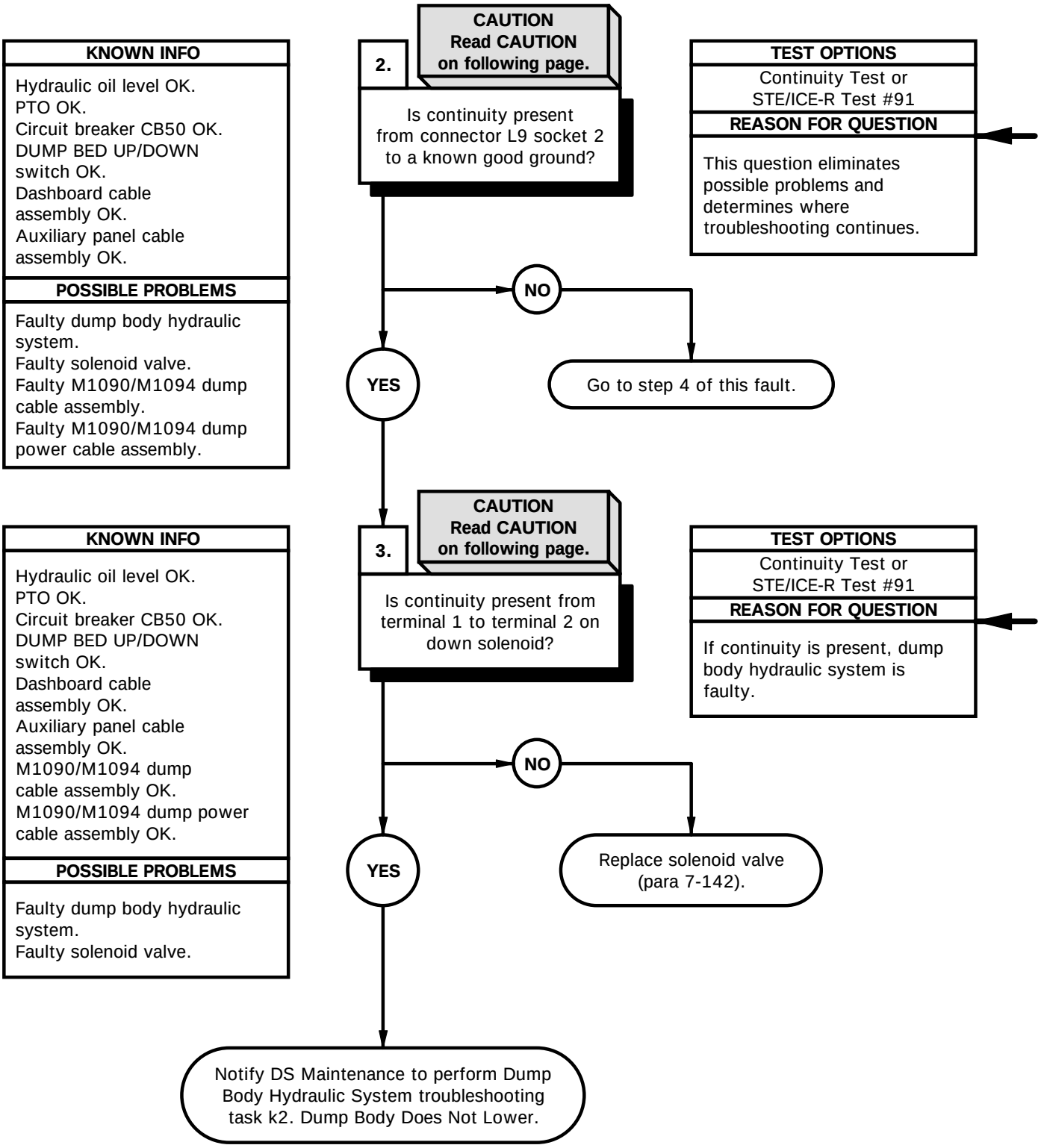
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

VOLTAGE TEST

(1) Remove safety pins from two locking pins.
(2) Remove two lock pins from dump body.
(3) Install two dump body lifting brackets in slots in dump body.
(4) Attach cargo sling to two dump body lifting brackets.
(5) Lift dump body.
(6) Raise two maintenance legs on frame.
(7) Lower dump body on maintenance legs.
(8) Loosen screw on connector L9.
(9) Disconnect connector L9 from solenoid valve.
(10) Set multimeter to volts DC.
(11) Connect positive (+) probe of multimeter to connector L9 socket 1.
(12) Connect negative (-) probe of multimeter to ground.
(13) Press and hold DUMP BED UP/DOWN switch to DOWN (TM 9-2320-366-10-1) and note reading on multimeter.
(14) If 24 VDC is not present, go to step 5, of this fault.
(15) Release DUMP BED UP/DOWN switch (TM 9-2320-366-10-1).



e144. M1090/M1094 DUMP BODY DOES NOT LOWER (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

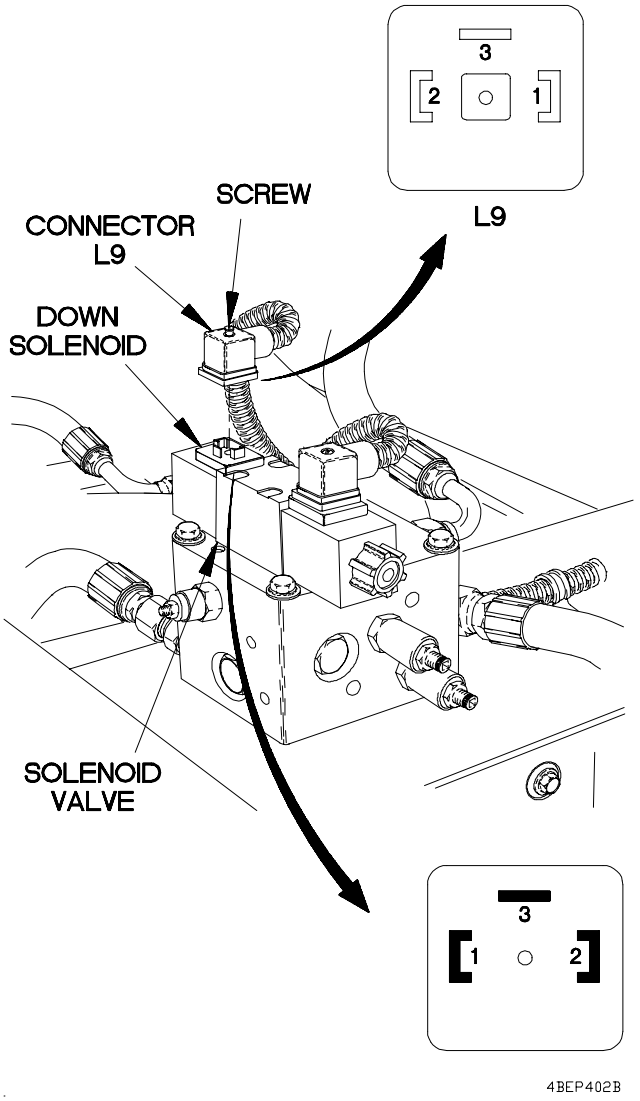
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

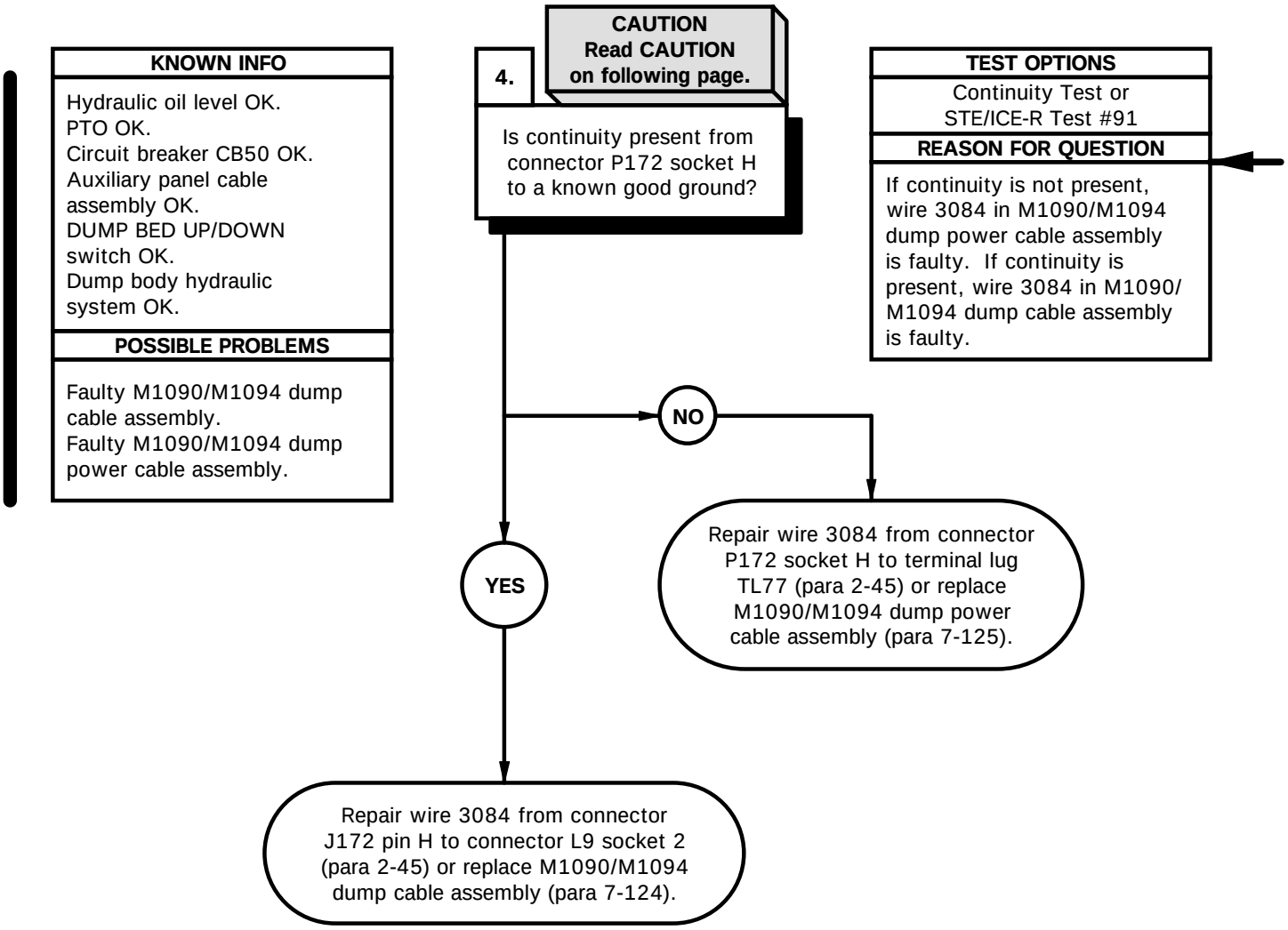
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector L9 socket 2.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, go to step 4 of this fault.

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to terminal 1 on down solenoid.
(3) Connect negative (-) probe of multimeter to terminal 2 on down solenoid and note reading on multimeter.
(4) If continuity is not present, replace solenoid valve (para 7-142).
(5) If continuity is present, notify DS Maintenance to perform Dump Body Hydraulic System troubleshooting task k2. Dump Body Does Not Lower.
(6) Connect connector L9 to solenoid valve.
(7) Tighten screw in connector L9.



e144. M1090/M1094 DUMP BODY DOES NOT LOWER (CONT)



CAUTION

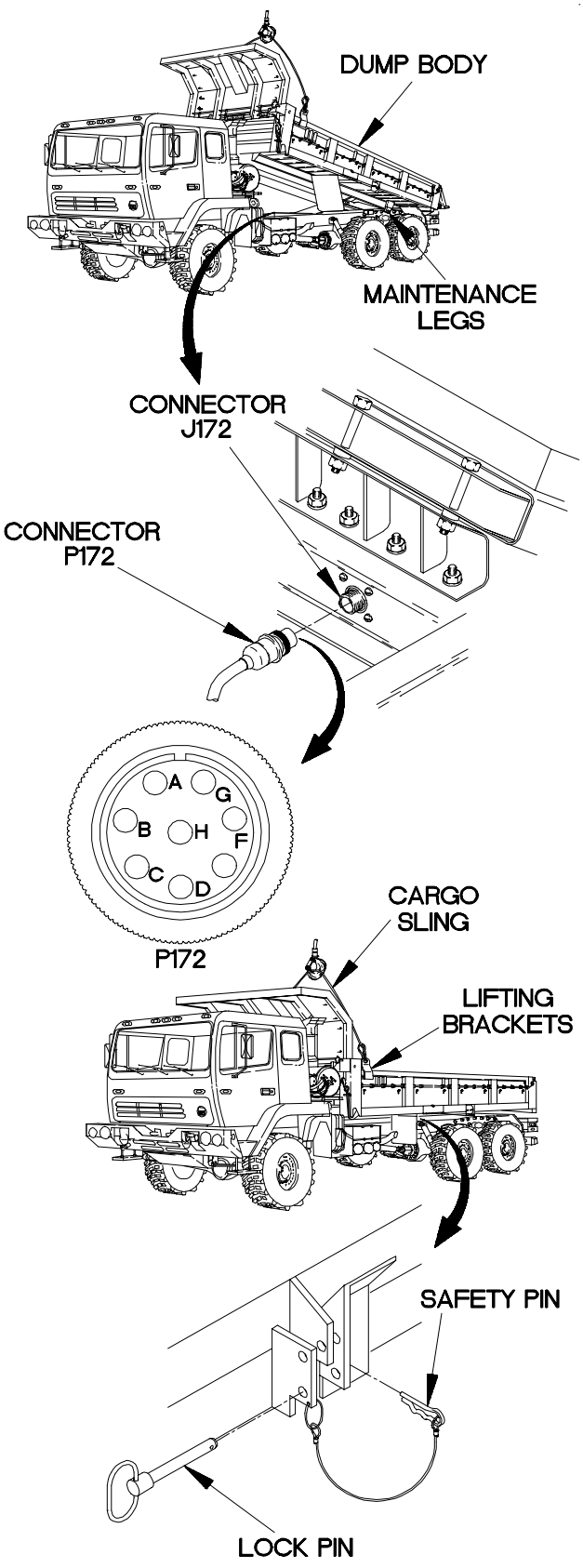
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

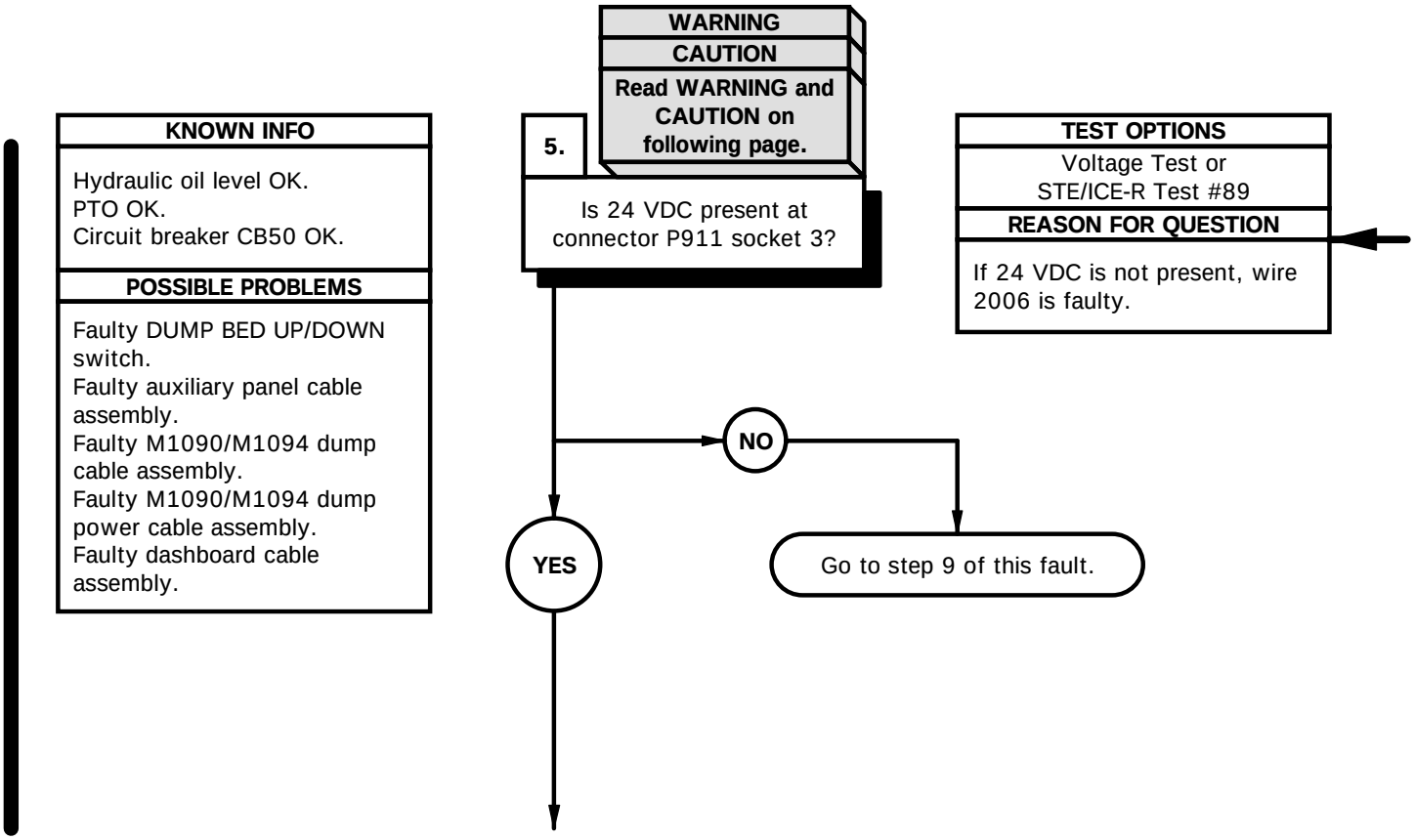
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Disconnect connector P172 from connector J172.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector P172 socket H.
(4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(5) If continuity is not present, repair wire 3084 from connector P172 socket H to terminal lug TL77 (para 2-45) or replace M1090/M1094 dump power cable assembly (para 7-125).
(6) If continuity is present, repair wire 3084 from connector J172 pin H to connector L9 socket 2 (para 2-45) or replace M1090/M1094 dump cable assembly (para 7-124).
(7) Connect connector P172 to connector J172.
(8) Connect connector L9 to solenoid valve.
(9) Tighten screw in connector L9.
(10) Lift dump body.
(11) Place maintenance legs in stowed position.
(12) Lower dump body.
(13) Remove cargo sling from two dump body lifting brackets.
(14) Remove two dump body lifting brackets from dump body.
(15) Position two locking pins in dump body.
(16) Install safety pin in two locking pins.



e144. M1090/M1094 DUMP BODY DOES NOT LOWER (CONT)



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 circuits and cause severe burns or electrical shock.

CAUTION

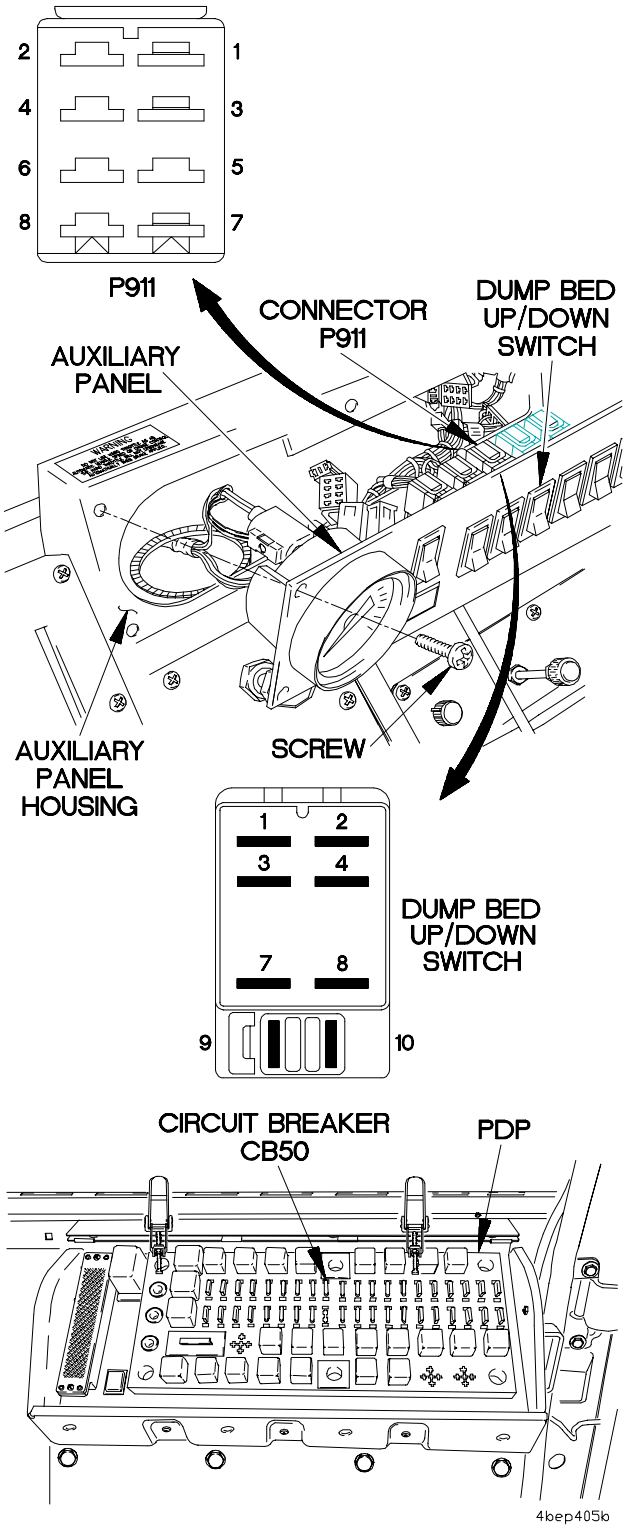
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

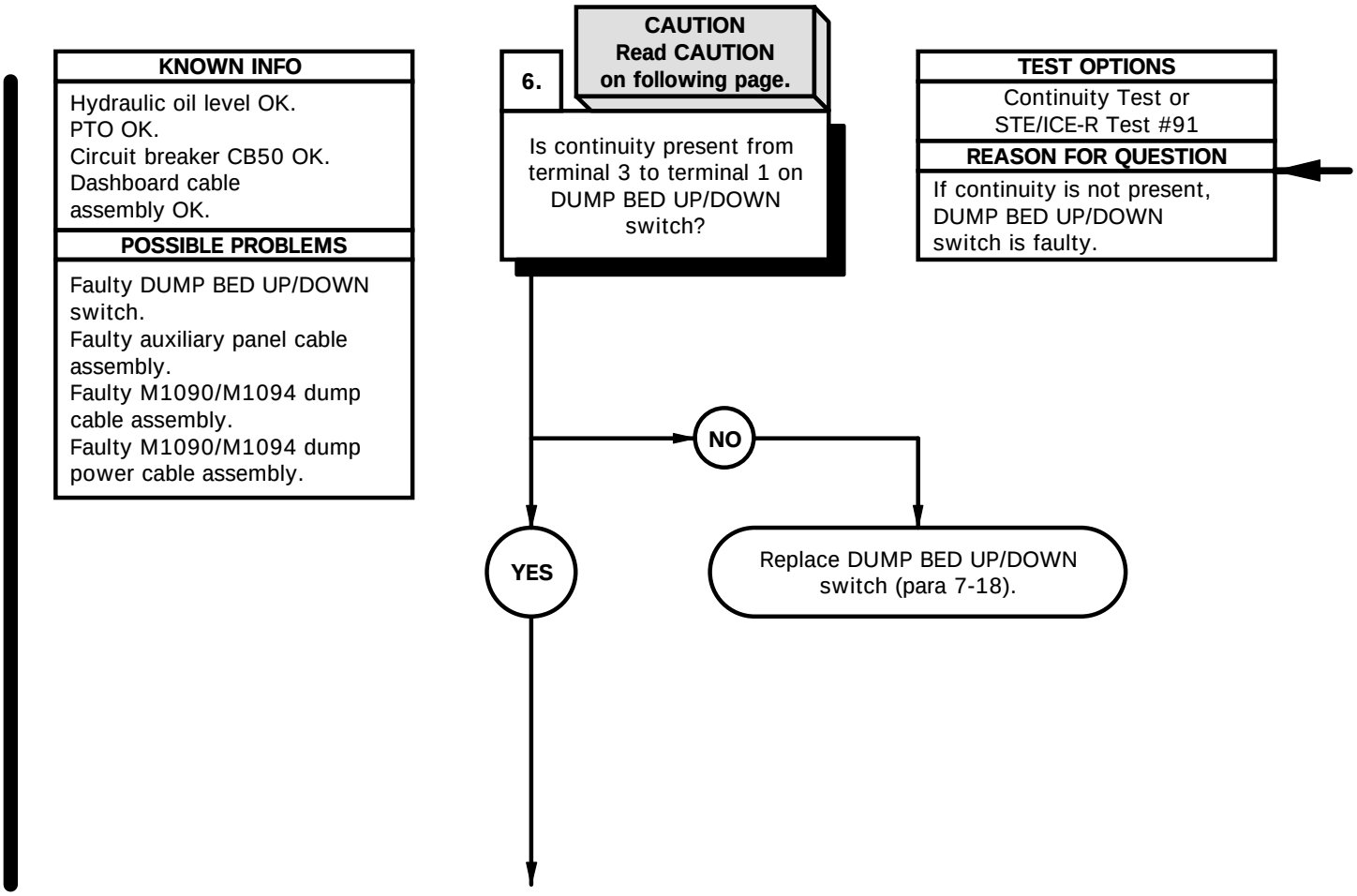
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

VOLTAGE TEST

(1) Connect connector L9 to solenoid valve.
(2) Tighten screw in connector L9.
(3) Remove six screws from auxiliary panel.
(4) Lift auxiliary panel outward to gain access.
(5) Remove PDP cover from PDP (para 16-2).
(6) Remove circuit breaker CB50 from PDP.
(7) Disconnect connector P911 from DUMP BED UP/DOWN switch connector.
(8) Set multimeter to volts DC.
(9) Connect positive (+) probe of multimeter to P911 socket 3.
(10) Connect negative (-) probe of multimeter to ground.
(11) Install circuit breaker CB50 in PDP and note reading on multimeter.
(12) If 24 VDC is not present, go to step 9 of this fault.
(13) Remove circuit breaker CB50 from PDP.



e144. M1090/M1094 DUMP BODY DOES NOT LOWER (CONT)



CAUTION

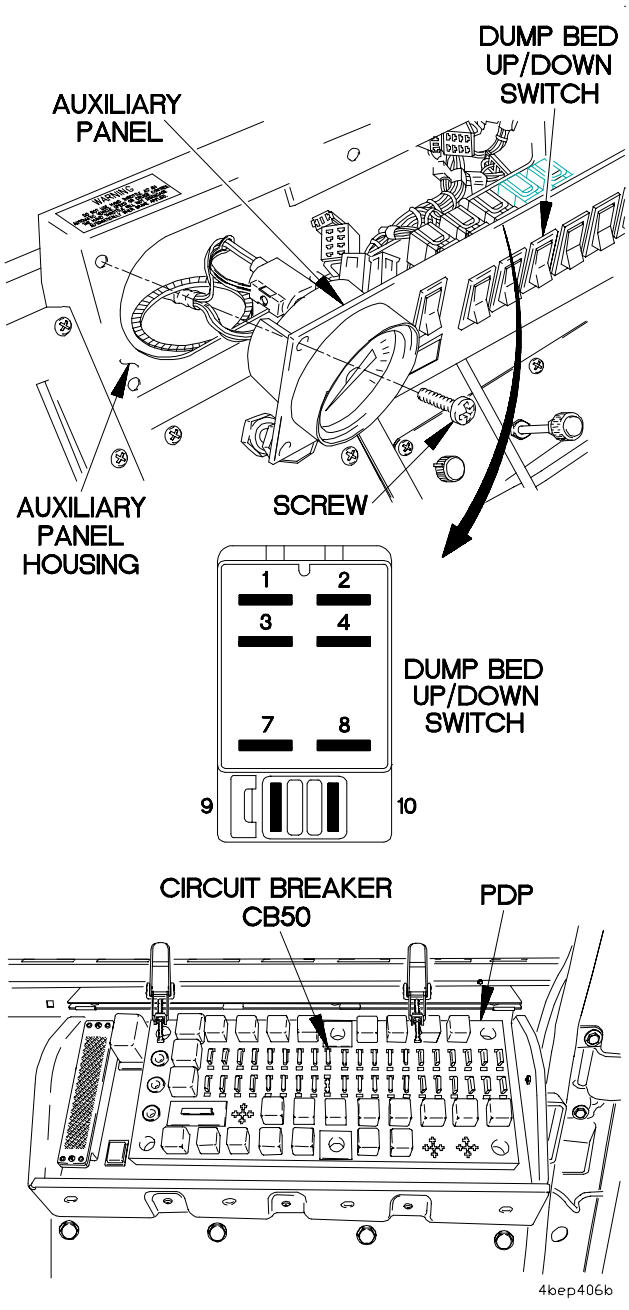
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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 DUMP BED UP/DOWN switch terminal 3.
(3) Connect negative (-) probe of multimeter to DUMP BED UP/DOWN switch terminal 1.
(4) Press and hold DUMP BED UP/DOWN switch to DOWN and note reading on multimeter.
(5) If continuity is not present, replace DUMP BED UP/DOWN switch (para 7-18).
(6) Release DUMP BED UP/DOWN switch.
(7) Install circuit breaker CB50 in PDP.



e144. M1090/M1094 DUMP BODY DOES NOT LOWER (CONT)

KNOWN INFO

Hydraulic oil level OK.
PTO OK.
Circuit breaker CB50 OK.
Dashboard cable assembly OK.
DUMP BED UP/DOWN switch OK.

POSSIBLE PROBLEMS

Faulty auxiliary panel cable assembly.
Faulty M1090/M1094 dump cable assembly.
Faulty M1090/M1094 dump power cable assembly.

CAUTION
Read CAUTION on following page.

7. Is continuity present from connector J108 pin 7 to connector P911 socket 1?

TEST OPTIONS

Continuity Test or STE/ICE-R Test #91

REASON FOR QUESTION

If continuity is not present, wire 2044 in auxiliary panel cable assembly is faulty.

NO → Repair wire 2044 from connector J108 pin 7 to connector P911 socket 1 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).

YES

CAUTION

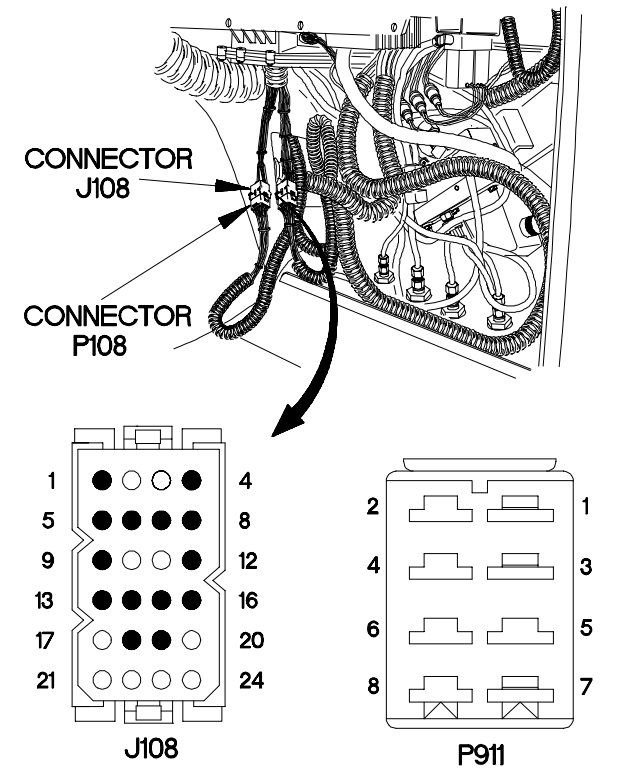
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

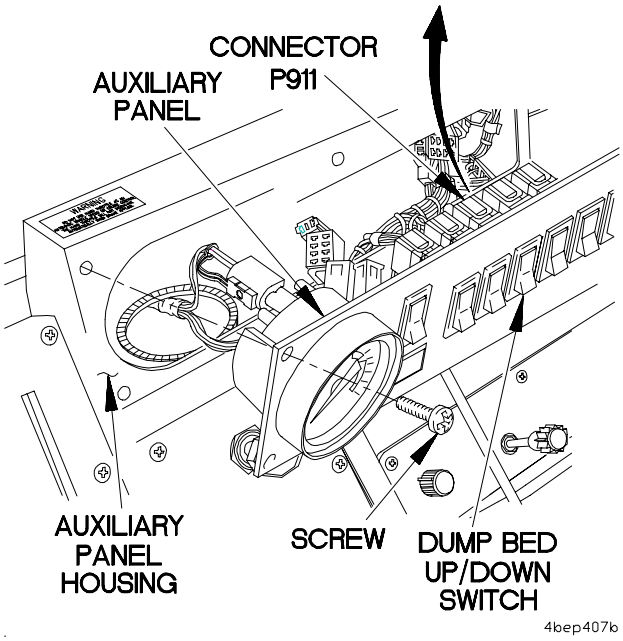
NOTE

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

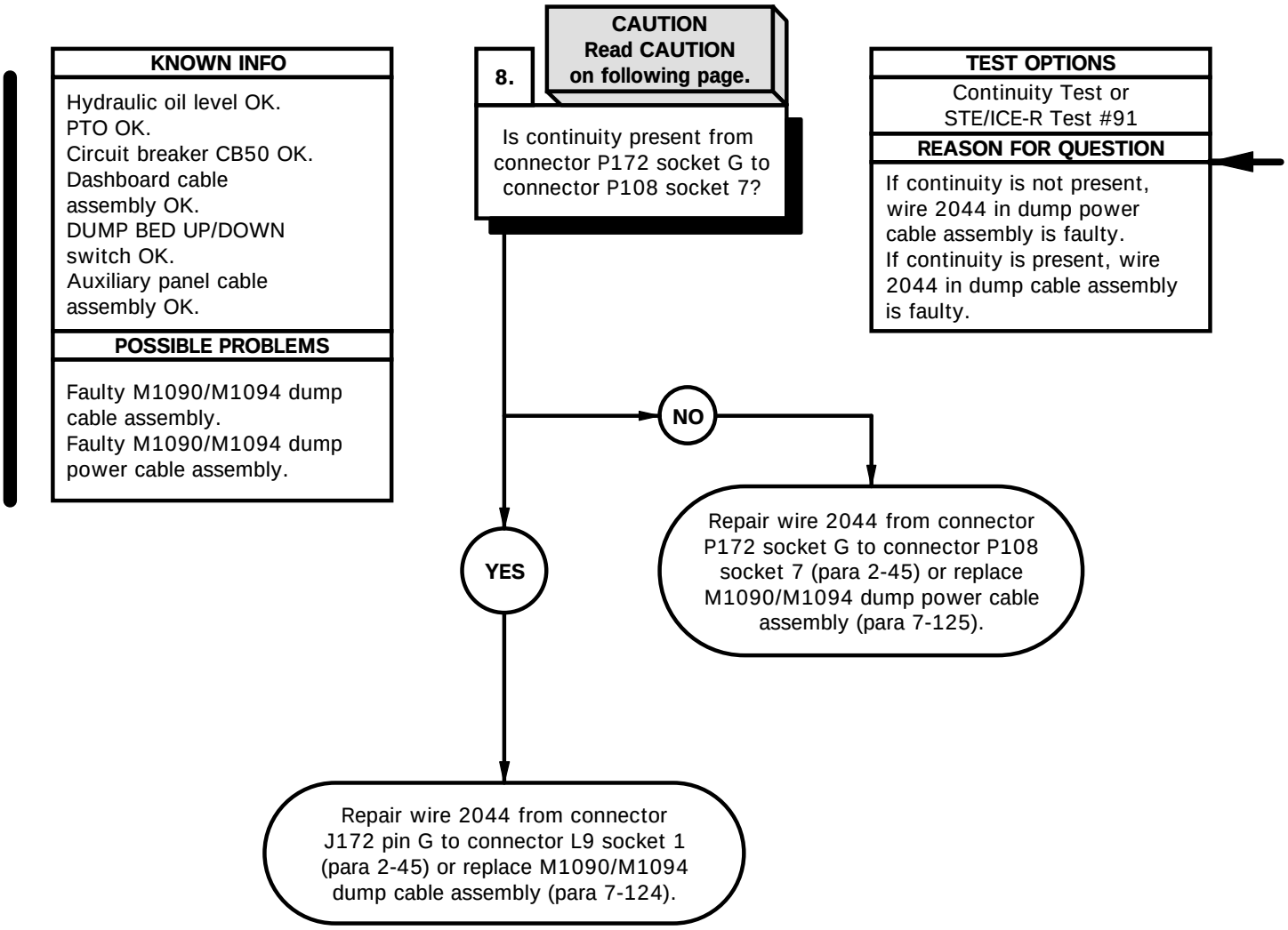
CONTINUITY TEST

(1 Disconnect batteries (para 7-57).
(2) Remove kick panel (para 16-3).
(3) Disconnect connector P108 from connector J108.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to connector J108 pin 7.
(6) Connect negative (-) probe of multimeter to connector P911 socket 1 and note reading on multimeter.
(7) If continuity is not present, repair wire 2044 from connector J108 pin 7 to connector P911 socket 1 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
(8) Connect connector P911 to DUMP BED UP/DOWN switch.
(9) Position auxiliary panel on auxiliary panel housing with six screws.
(10) Tighten six screws to 24 lb-in. (3N.m).





e144. M1090/M1094 DUMP BODY DOES NOT LOWER (CONT)



CAUTION

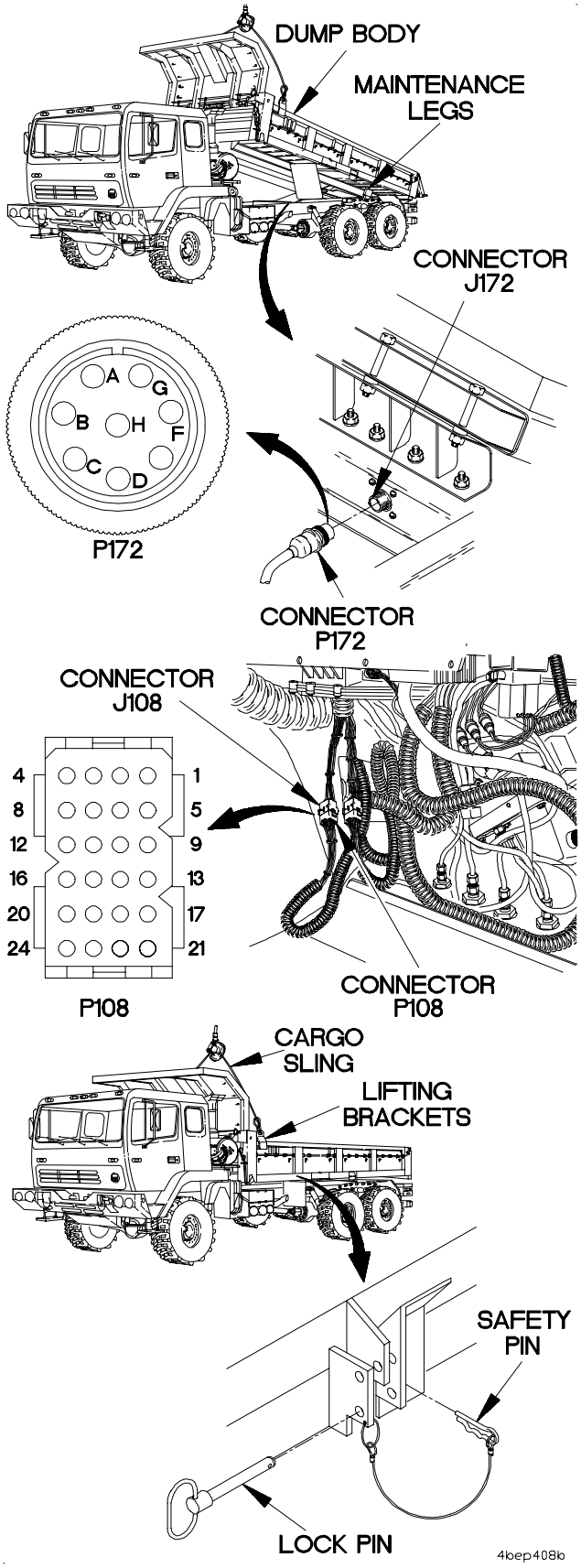
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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) Disconnect connector P172 from connector J172.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector P172 socket G.
(4) Connect negative (-) probe of multimeter to connector P108 socket 7 and note reading on multimeter.
(5) If continuity is not present, repair wire 2044 from connector P172 socket G to connector P108 socket 7 (para 2-45) or replace M1090/M1094 dump power cable assembly (para 7-125).
(6) If continuity is present, repair wire 2044 from connector J172 pin G to connector L9 socket 1 (para 2-45) or replace M1090/M1094 dump cable assembly (para 7-124).
(7) Connect connector P172 to connector J172.
(8) Connect connector P108 to connector J108.
(9) Install kick panel (para 16-3).
(10) Connect batteries (para 7-57).
(11) Lift dump body.
(12) Place maintenance legs in stowed position.
(13) Lower dump body.
(14) Remove cargo sling from dump body lifting brackets.
(15) Remove two dump body lifting brackets from dump body.
(16) Position two locking pins in dump body.
(17) Install safety pin in two locking pins.



e144. M1090/M1094 DUMP BODY DOES NOT LOWER (CONT)

KNOWN INFO

Hydraulic oil level OK.
PTO OK.
Circuit breaker CB50 OK.

POSSIBLE PROBLEMS

Faulty auxiliary panel cable assembly.
Faulty dashboard cable assembly.

CAUTION
Read CAUTION on following page.

9. Is continuity present from connector P911 socket 3 to connector P909 socket 5?

TEST OPTIONS

Continuity Test or
STE/ICE-R Test #91

REASON FOR QUESTION

If continuity is not present, wire 2006 in auxiliary panel cable assembly is faulty.

NO

Repair wire 2006 from connector P911 socket 3 to connector P909 socket 5 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).

YES

CAUTION

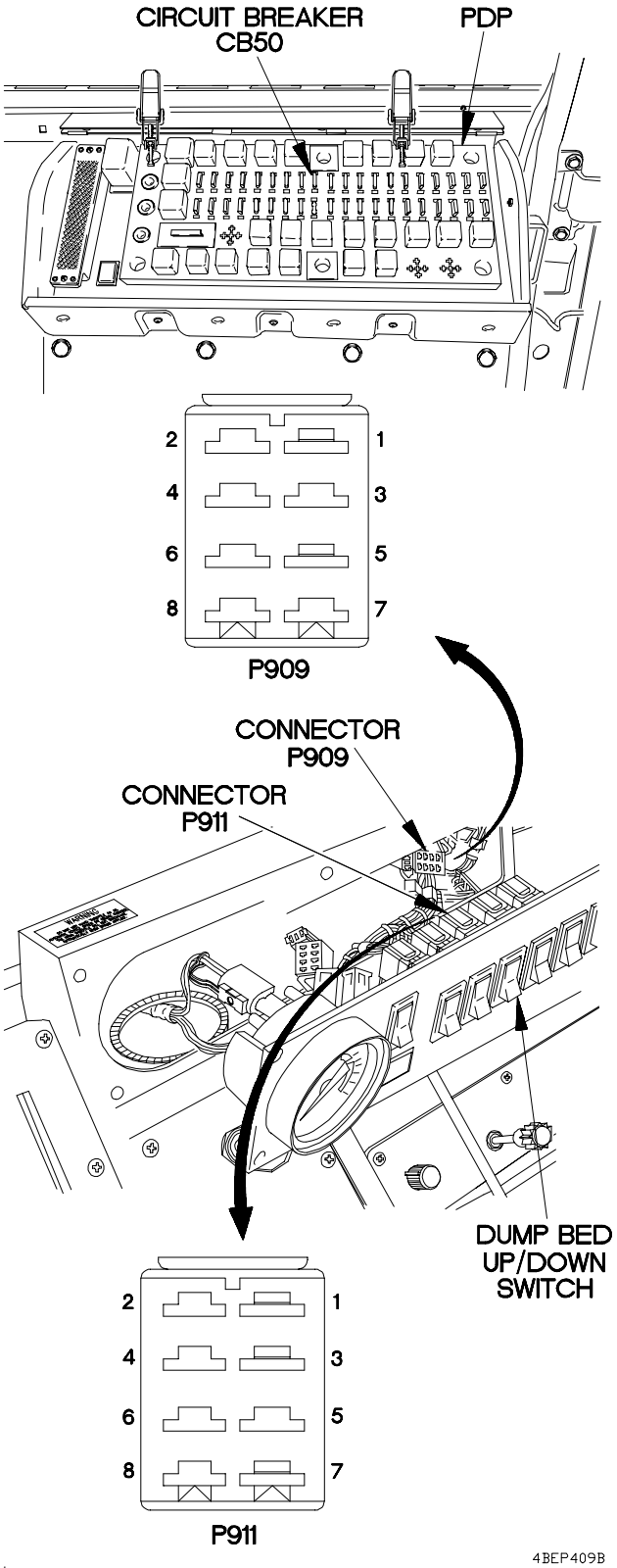
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

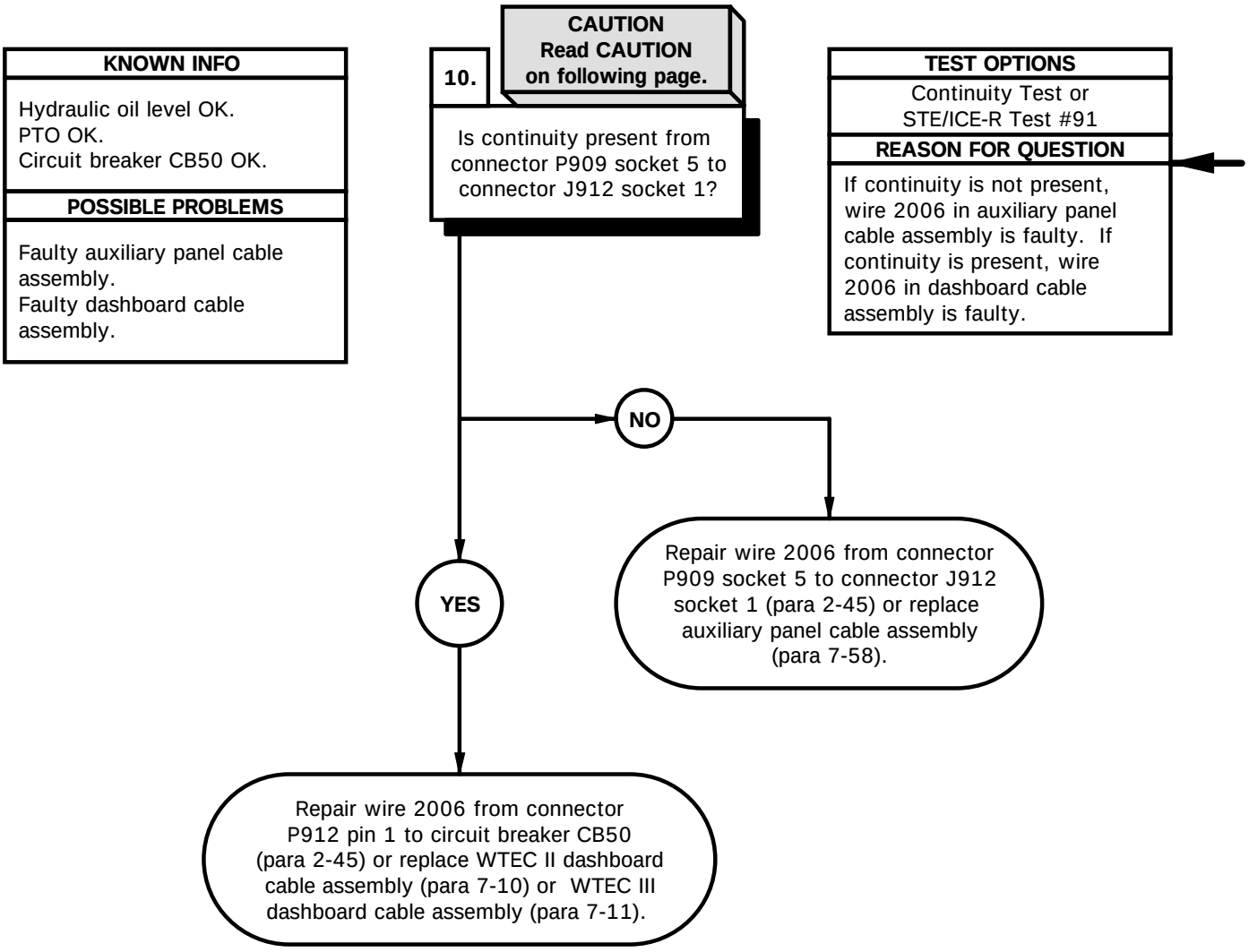
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Install circuit breaker CB50 in PDP.
(2) Install PDP cover on PDP (para 16-2).
(3) Disconnect batteries (para 7-57).
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to connector P911 socket 3.
(6) Connect negative (-) probe of multimeter to connector P909 socket 5 and note reading on multimeter.
(7) If continuity is not present, repair wire 2006 from connector P911 socket 3 to (para 2-45) connector P909 socket 5 or replace auxiliary panel cable assembly (para 7-58).
(8) Connect connector P911 to DUMP BED UP/DOWN switch.



e144. M1090/M1094 DUMP BODY DOES NOT LOWER (CONT)



CAUTION

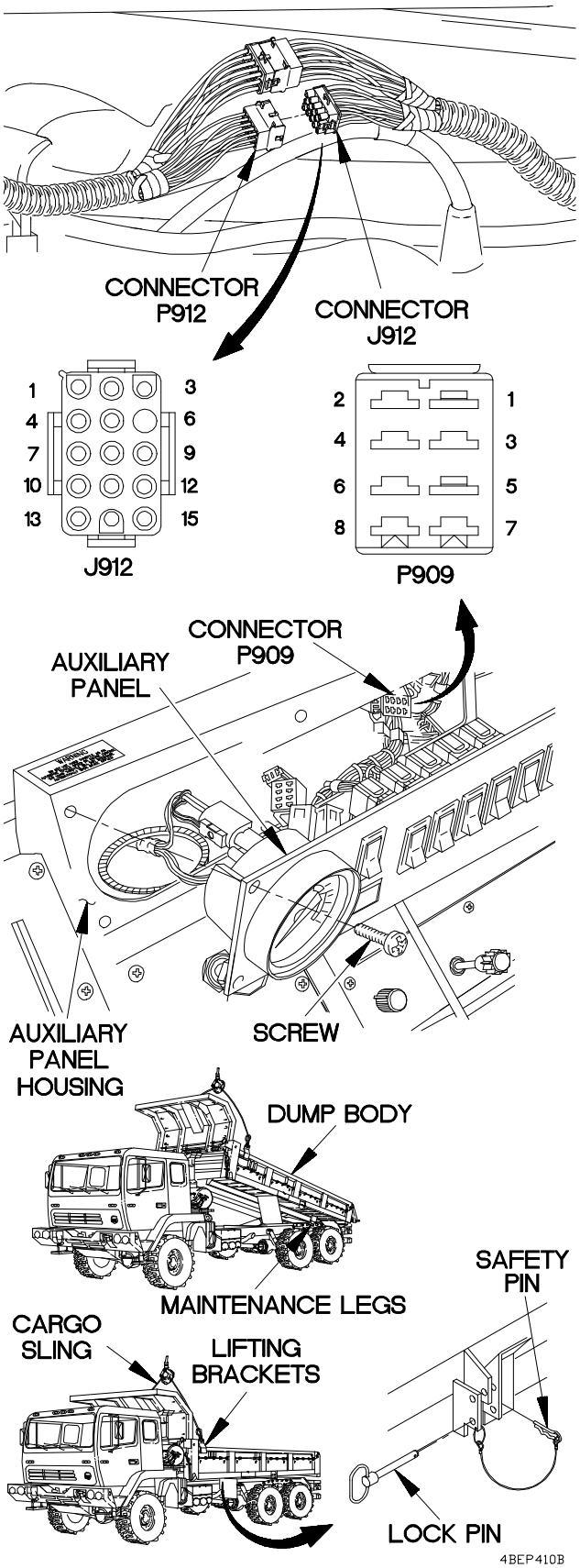
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

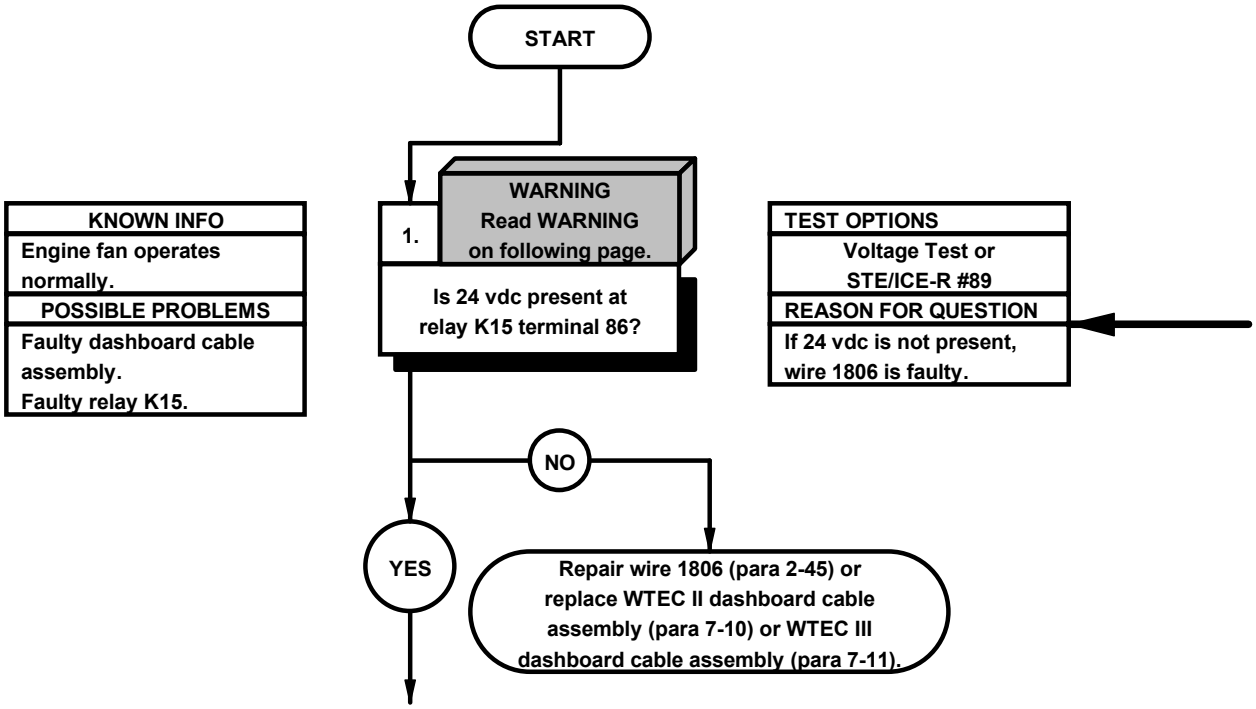
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Remove personnel heater assembly for access (para 18-9).
(2) Disconnect connector J912 from P912.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector P909 socket 5.
(5) Connect negative (-) probe of multimeter to connector J912 socket 1 and note reading on multimeter.
(6) If continuity is not present, repair wire 2006 from connector P909 socket 5 to connector J912 socket 1 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
(7) If continuity is present, repair wire 2006 from connector P912 pin 1 to circuit breaker CB50 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(8) Connect connector J912 to connector P912.
(9) Install personnel heater (para 18-9).
(10) Position auxiliary panel on auxiliary panel housing with six screws.
(11) Tighten six screws to 24 lb-in (3N.m).
(12) Connect batteries (para 7-57).
(13) Lift dump body.
(14) Place maintenance legs in stowed position.
(15) Lower dump body.
(16) Remove cargo sling from dump body lifting brackets.
(17) Remove two dump body lifting brackets from from dump body.
(18) Position two locking pins in dump body.
(19) Install safety pins in two locking pins.



e145. TRANSMISSION AUXILIARY OIL COOLER FAN(S) RUN CONSTANTLY	
INITIAL SETUP	
Equipment Condition Engine shut down (TM 9-2320-366-10-1). Personnel Required (2)	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) STE/ICE-R (Item 41, Appendix C) Multimeter, Digital (Item 22, Appendix C) References TM 9-4910-571-12&P

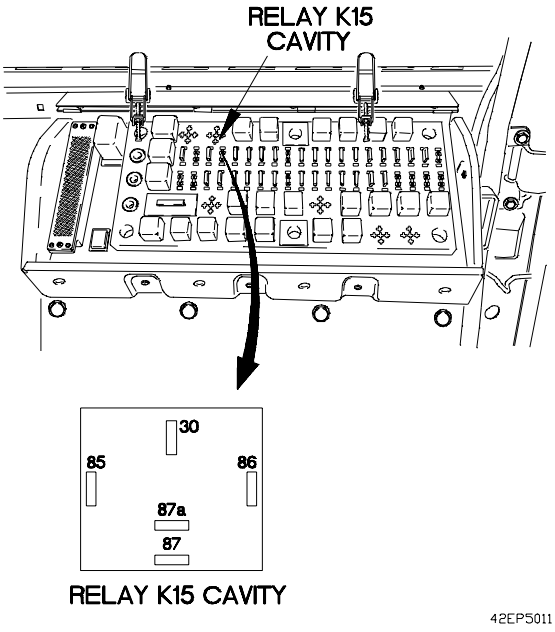


WARNING

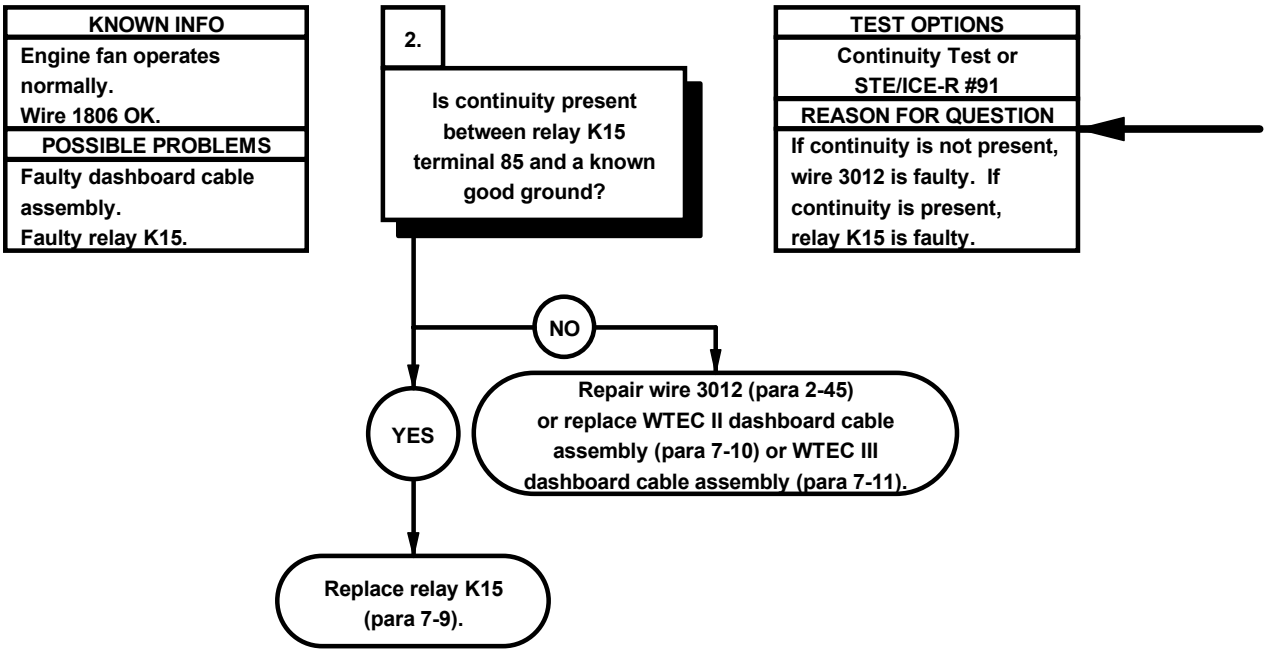
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Remove PDP cover (para 16-2).
(2) Remove relay K15 from PDP.
(3) Set multimeter to volts dc.
(4) Connect positive (+) probe of multimeter to PDP, where relay K15 terminal 86 was removed.
(5) Connect negative (-) probe of multimeter to ground.
(6) Position master power switch to on (TM 9-2320-366-10-1).
(7) Position radiator fan off switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(8) If 24 vdc is not present, repair wire 1806 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(9) Position master power switch to off (TM 9-2320-366-10-1).
(10) Position radiator fan off switch to off (TM 9-2320-366-10-1).

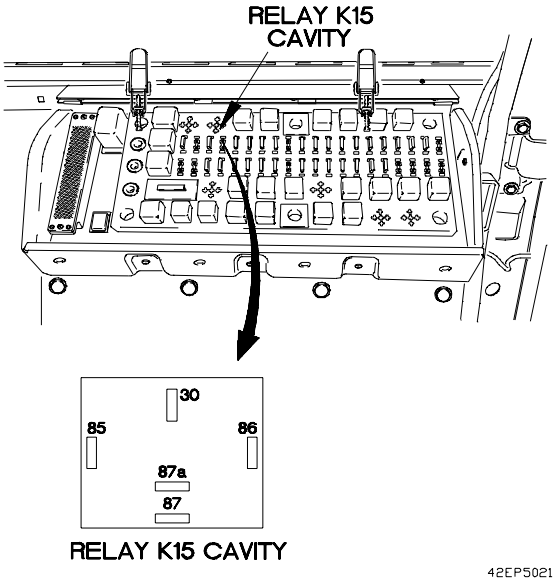


e145. TRANSMISSION AUXILIARY OIL COOLER FAN(S) RUN CONSTANTLY (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to PDP, where relay K15 terminal 85 was removed.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair wire 3012 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(5) If continuity is present, replace relay K15 (para 7-9).
(6) Install relay K15 in PDP.
(7) Install PDP cover (para 16-2).



e146. TRANSMISSION AUXILIARY OIL COOLER FAN DOES NOT OPERATE (ALL MODELS EXCEPT M1088/M1089)

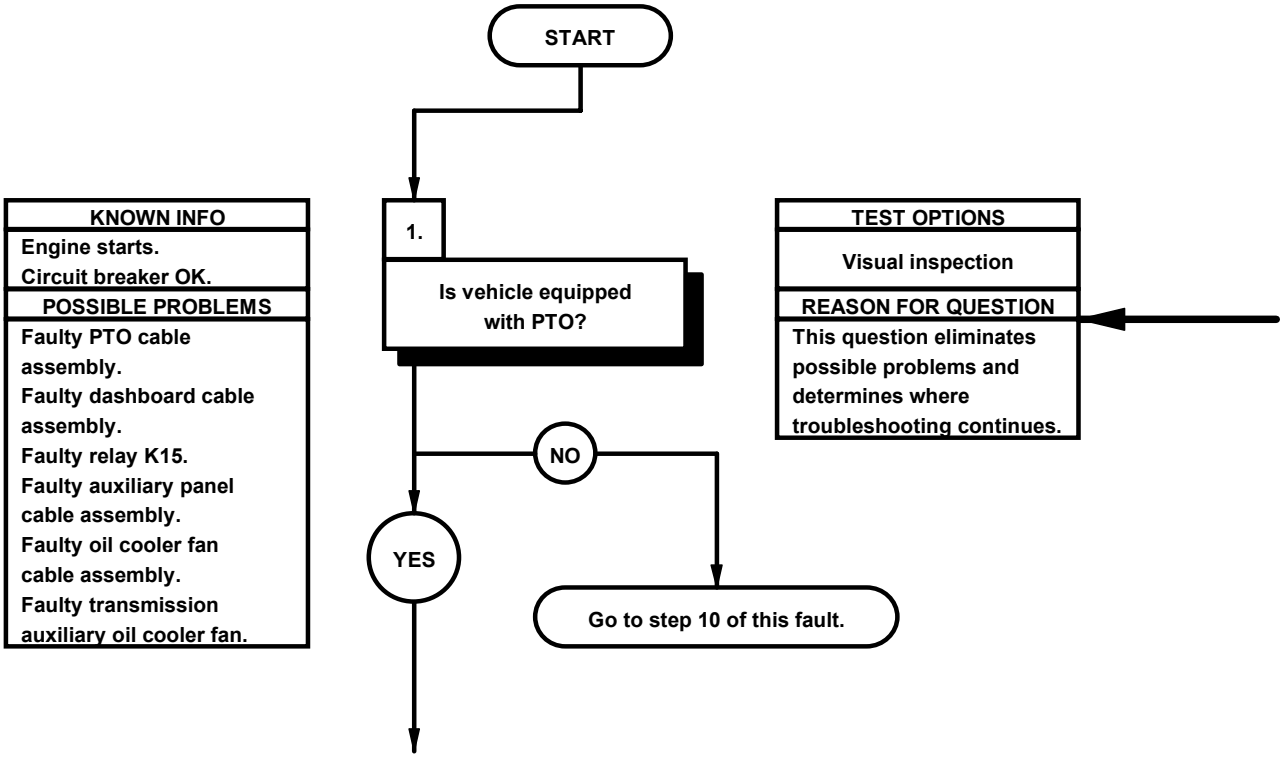
INITIAL SETUP

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

Personnel Required
(2)

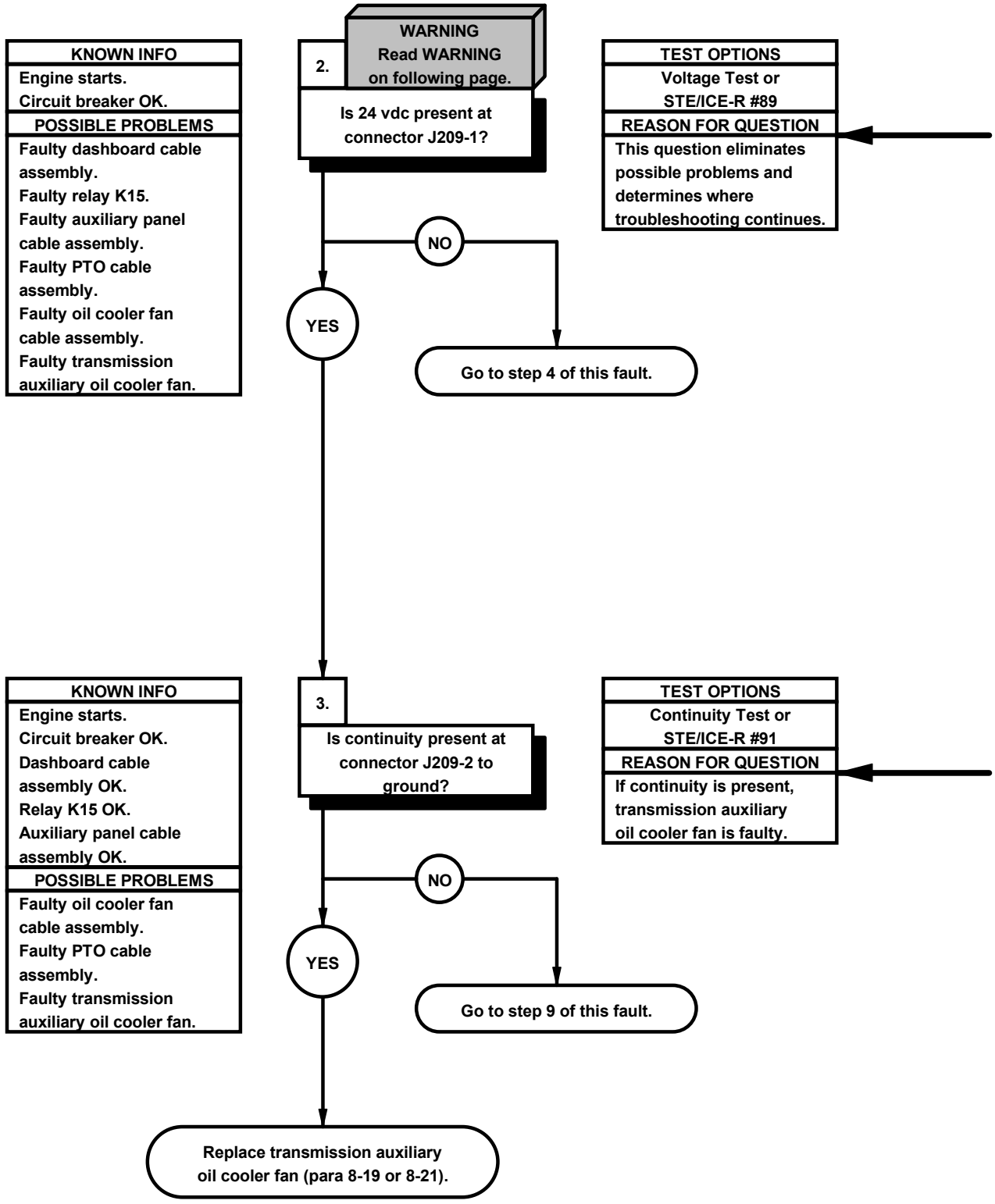
Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

References
TM 9-4910-571-12&P



(1) Check if vehicle is equipped with PTO.
(2) If vehicle is not equipped with PTO, go to step 10 of this fault.

e146. TRANSMISSION AUXILIARY OIL COOLER FAN DOES NOT OPERATE (ALL MODELS EXCEPT M1088/ M1089) (CONT)

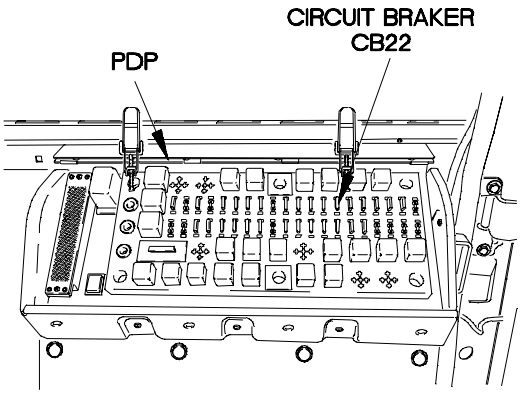


WARNING

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.

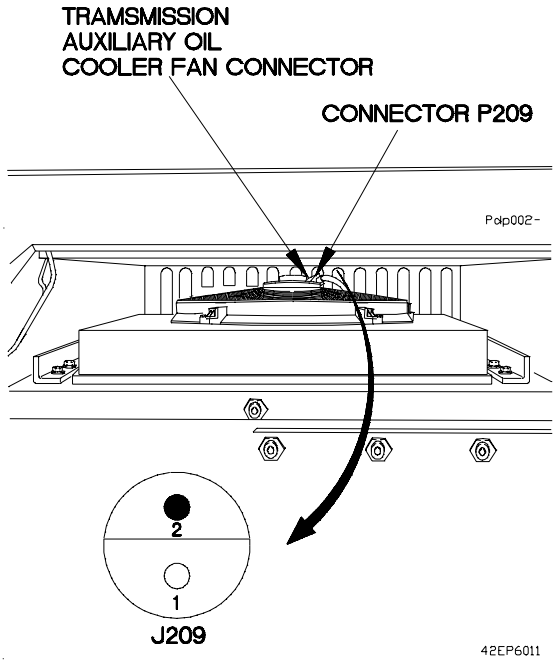
VOLTAGE TEST

(1) Remove PDP cover (para 16-2).
(2) Remove circuit breaker CB22 from PDP.
(3) Disconnect connector J209 from transmission auxiliary oil cooler fan connector.
(4) Set multimeter to volts dc.
(5) Connect positive (+) probe of multimeter to connector J209-1.
(6) Connect negative (-) probe of multimeter to ground.
(7) Start engine (TM 9-2320-366-10-1) and note reading on multimeter.
(8) If 24 vdc is not present, go to step 4 of this fault.
(9) Shut down engine (TM 9-2320-366-10-1).

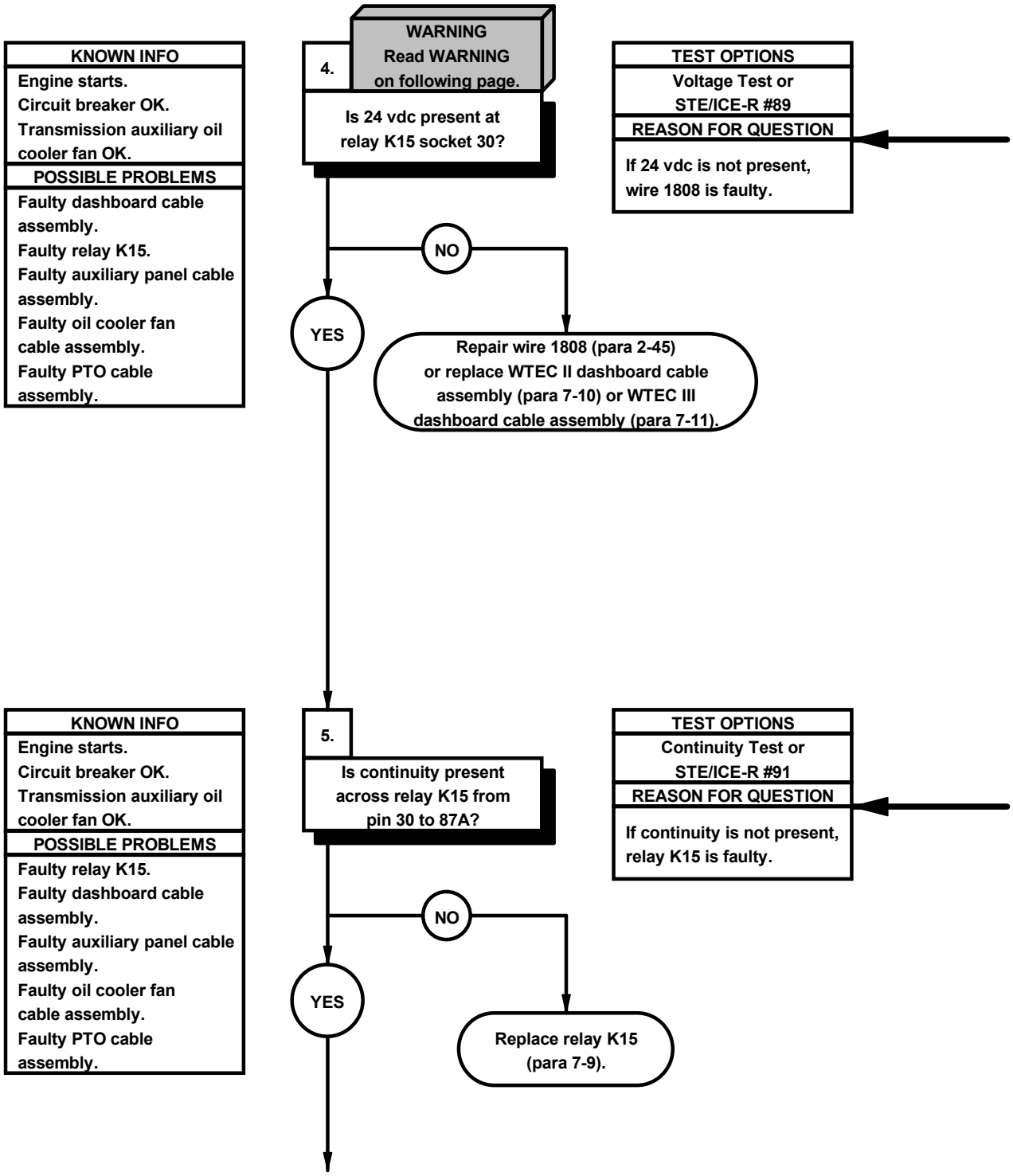


CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector J209-2.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, go to step 9 of this fault.
(5) If continuity is present, replace transmission auxiliary oil cooler fan (para 8-19 or 8-21).
(6) Connect connector J209 to transmission auxiliary oil cooler fan connector.
(7) Install circuit breaker CB22 in PDP.
(8) Install PDP cover (para 16-2).



e146. TRANSMISSION AUXILIARY OIL COOLER FAN DOES NOT OPERATE (ALL MODELS EXCEPT M1088/ M1089) (CONT)

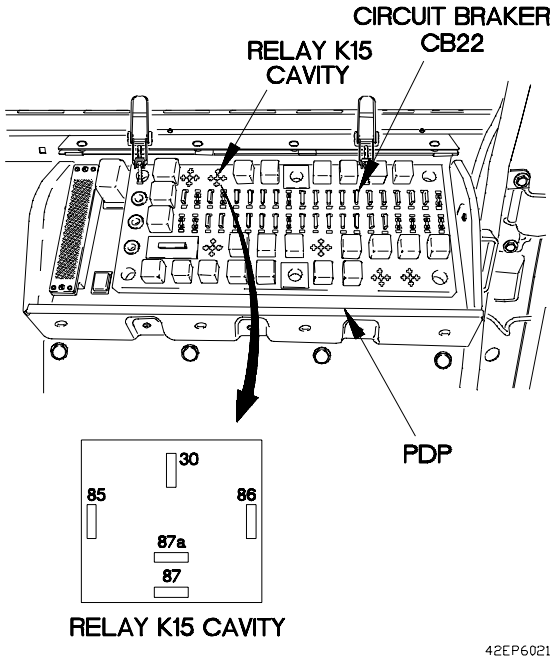


WARNING

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.

VOLTAGE TEST

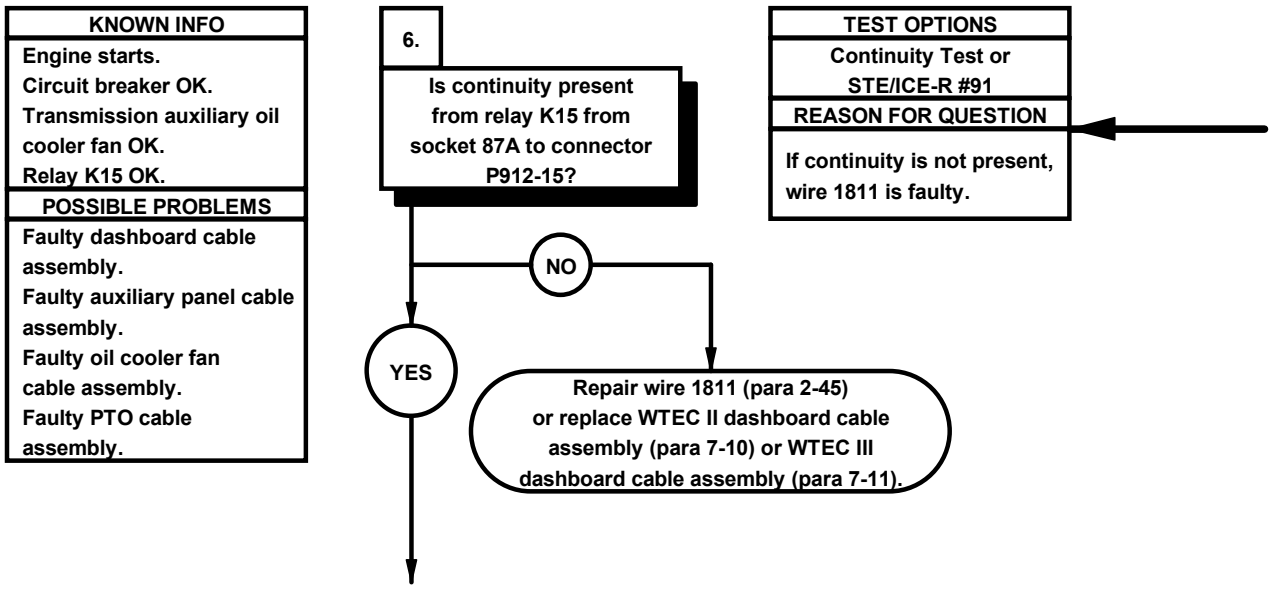
(1) Remove relay K15 from PDP.
(2) Set multimeter to volts dc.
(3) Connect positive (+) probe of multimeter to relay K15 socket 30.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(6) If 24 vdc is not present, repair wire 1808 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(7) Position master power switch to off (TM 9-2320-366-10-1).
(8) Install circuit breaker CB22 in PDP.



CONTINUITY TEST

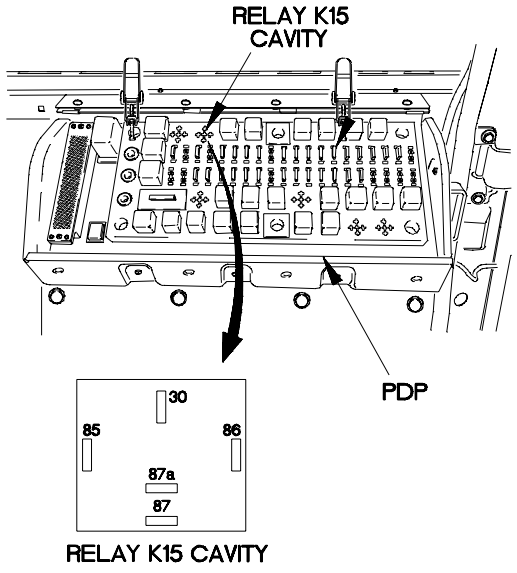
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to relay K15 pin 30.
(3) Connect negative (-) probe of multimeter to relay K15 pin 87A and note reading on multimeter.
(4) If continuity is not present, replace relay K15 (para 7-9).

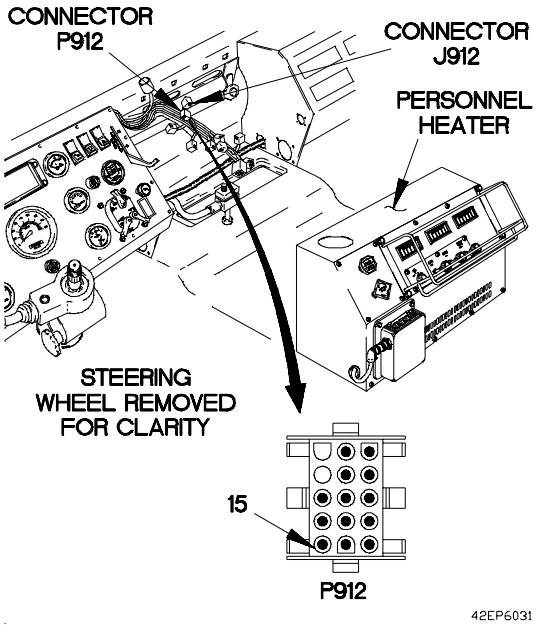
e146. TRANSMISSION AUXILIARY OIL COOLER FAN DOES NOT OPERATE (ALL MODELS EXCEPT M1088/ M1089) (CONT)



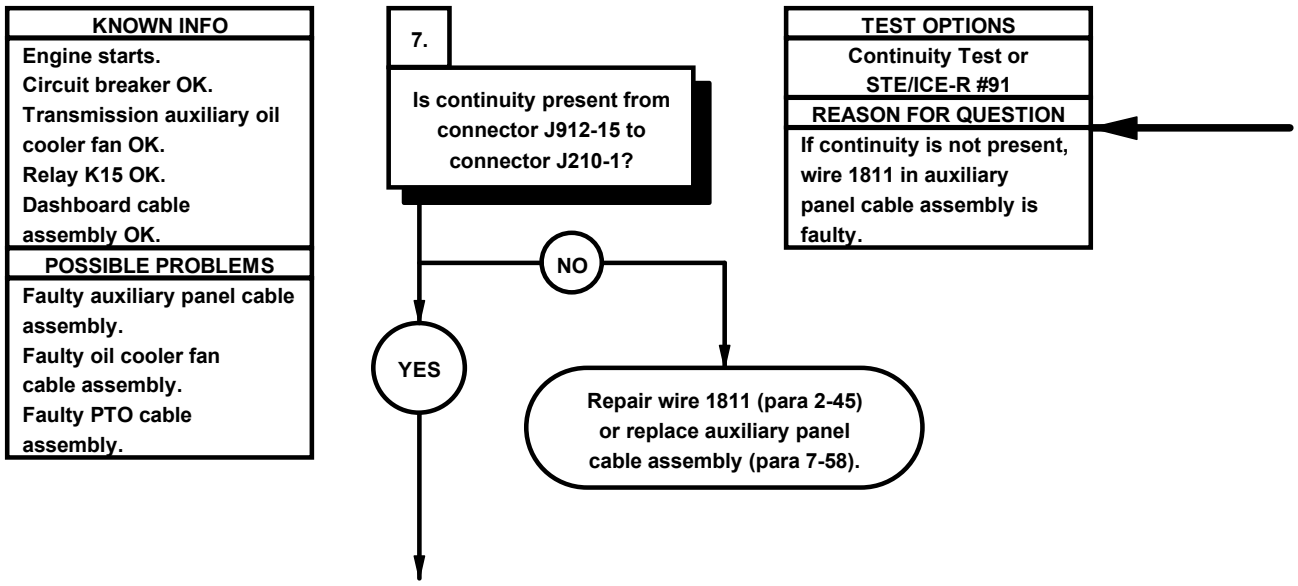
CONTINUITY TEST

(1) Remove personnel heater to gain access (para 18-9).
(2) Disconnect connector P912 from connector J912.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to relay K15 socket 87A.
(5) Connect negative (-) probe of multimeter to connector P912-15 and note reading on multimeter.
(6) If continuity is not present, repair wire 1811 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(7) Install relay K15 in PDP.



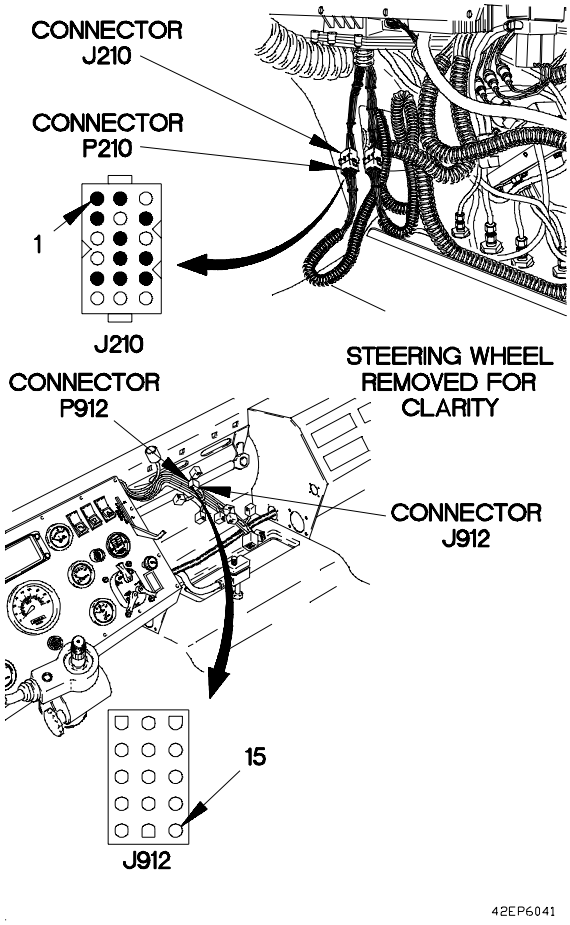


e146. TRANSMISSION AUXILIARY OIL COOLER FAN DOES NOT OPERATE (ALL MODELS EXCEPT M1088/ M1089) (CONT)

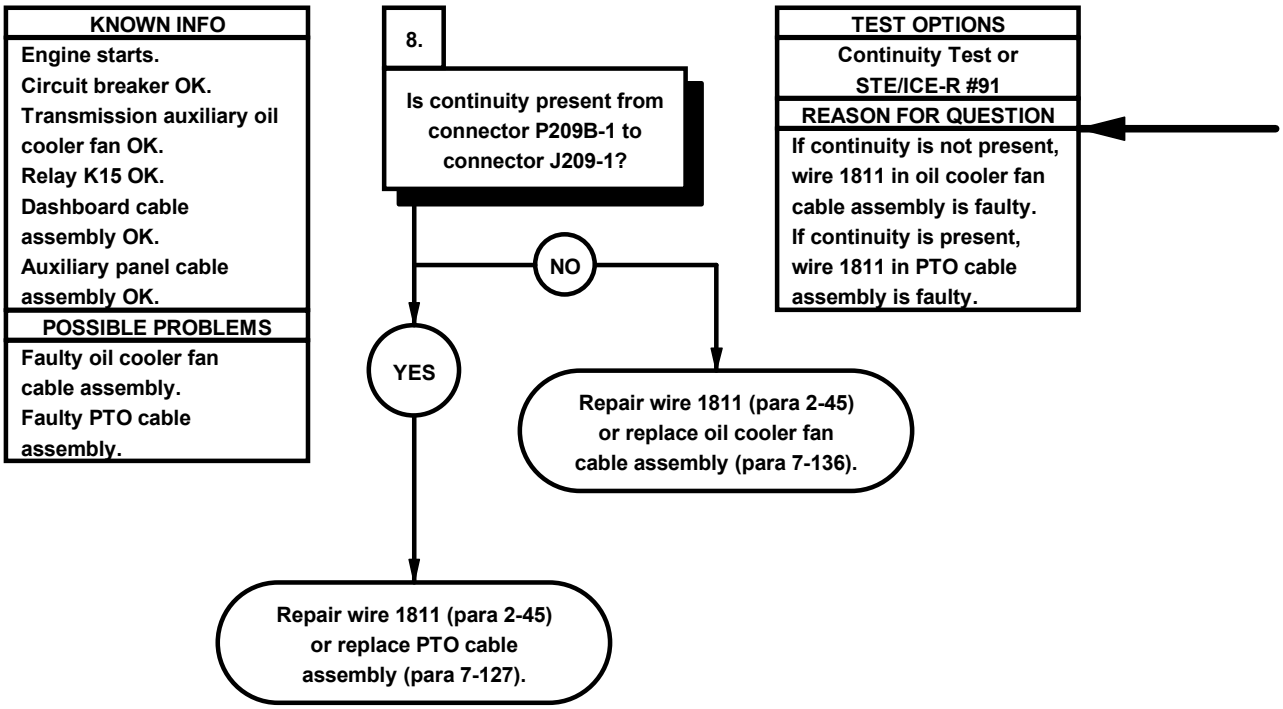


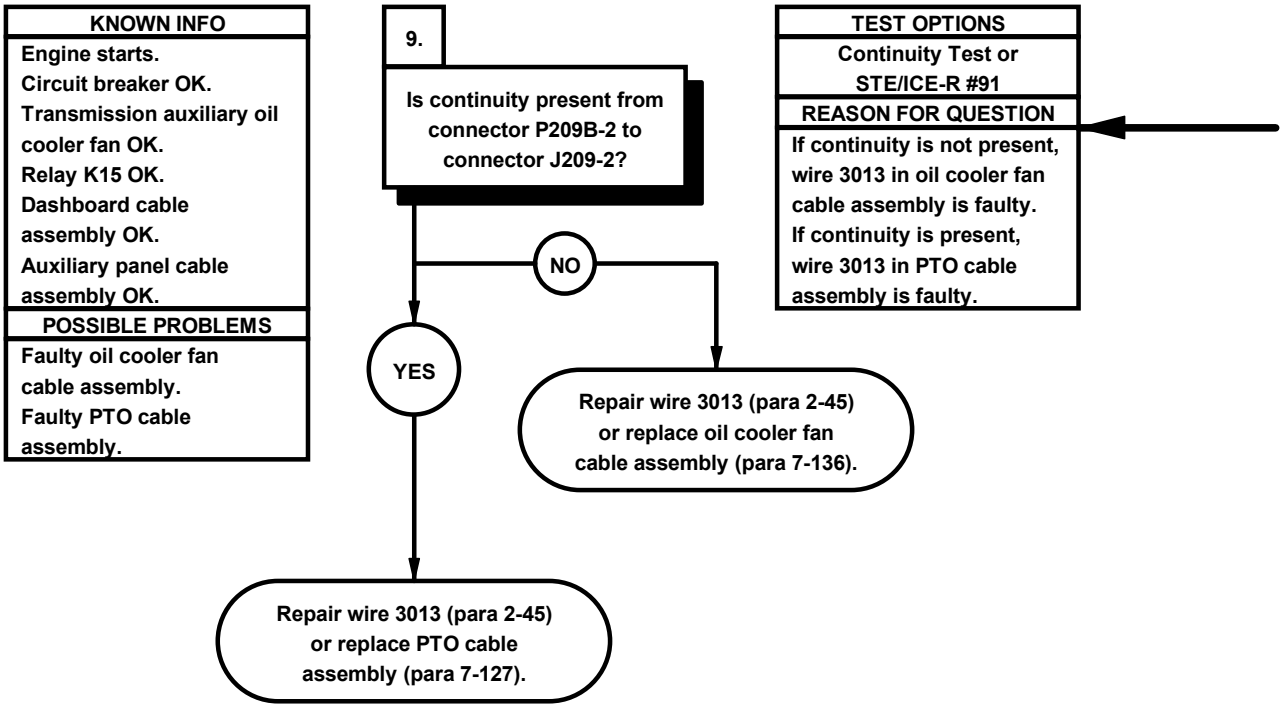
CONTINUITY TEST

(1) Disconnect connector P210 from connector J210.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector J912-15.
(4) Connect negative (-) probe of multimeter to connector J210-1 and note reading on multimeter.
(5) If continuity is not present, repair wire 1811 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
(6) Connect connector P210 to connector J210.
(7) Connect connector P912 to connector J912.
(8) Install personnel heater (para 18-9).



e146. TRANSMISSION AUXILIARY OIL COOLER FAN DOES NOT OPERATE (ALL MODELS EXCEPT M1088/ M1089) (CONT)



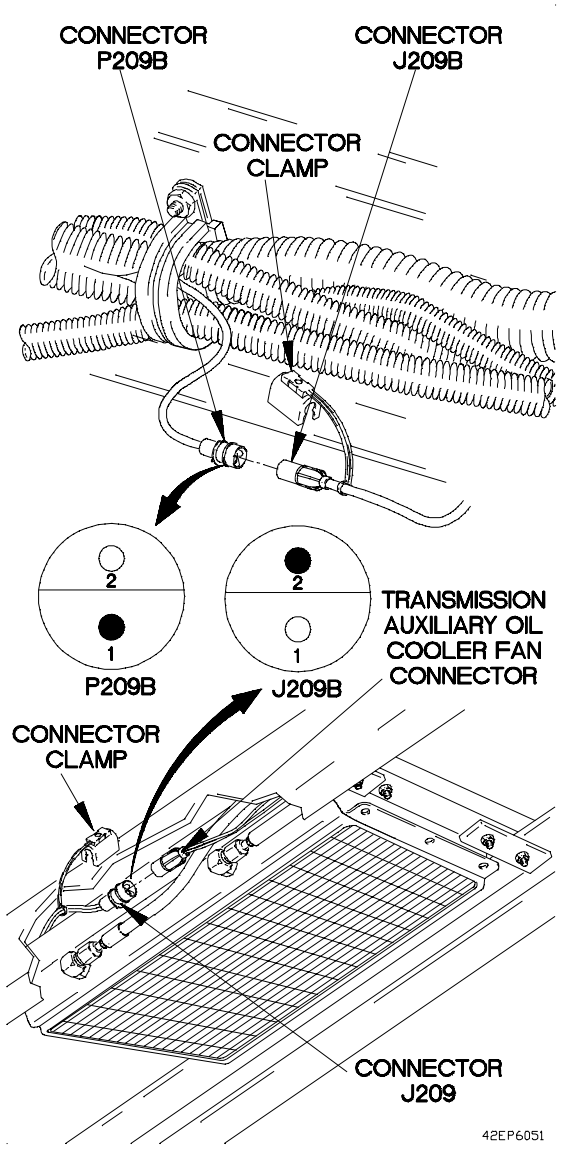


CONTINUITY TEST

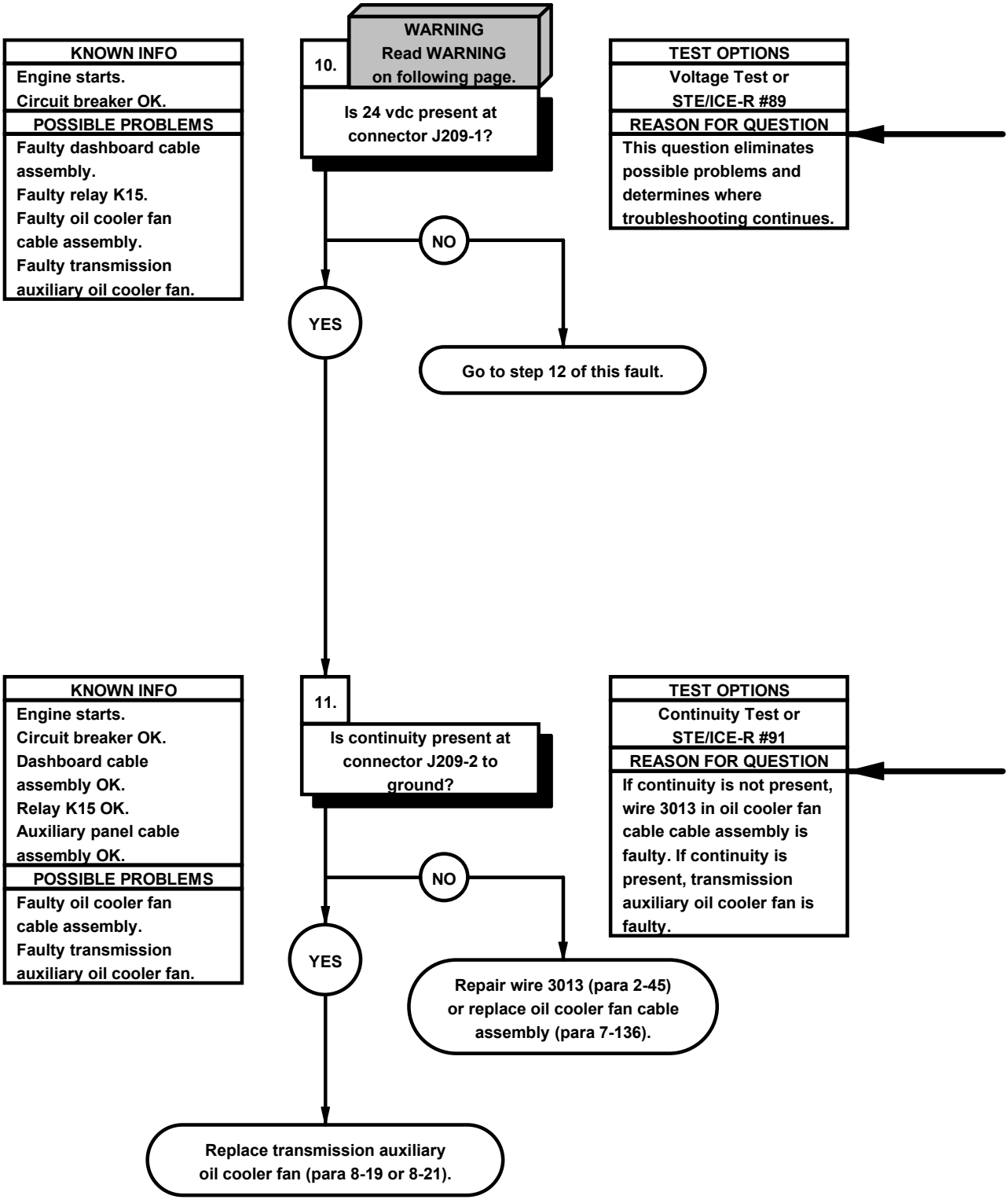
(1) Disconnect connector P209B from connector J209B.
(2) Disconnect connector J209 from transmission auxiliary oil cooler fan connector.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector P209B-1.
(5) Connect negative (-) probe of multimeter to connector J209-1 and note reading on multimeter.
(6) If continuity is not present, repair wire 1811 (para 2-45) or replace oil cooler fan cable assembly (para 7-136).
(7) If continuity is present, repair wire 1811 (para 2-45) or replace PTO cable assembly (para 7-127).
(8) Connect connector J209 to transmission auxiliary oil cooler fan connector.
(9) Connect connector P209B to connector J209B.

CONTINUITY TEST

(1) Disconnect connector P209B from connector J209B.
(2) Disconnect connector J209 from transmission auxiliary fan connector.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector P209B-2.
(5) Connect negative (-) probe of multimeter to connector J209-2 and note reading on multimeter.
(6) If continuity is not present, repair wire 3013 (para 2-45) or replace oil cooler fan cable assembly (para 7-136).
(7) If continuity is present, repair wire 3013 (para 2-45) or replace PTO cable assembly (para 7-127).
(8) Connect connector J209 to transmission auxiliary oil cooler fan connector.
(9) Connect connector P209B to connector J209B.



e146. TRANSMISSION AUXILIARY OIL COOLER FAN DOES NOT OPERATE (ALL MODELS EXCEPT M1088/ M1089) (CONT)



WARNING

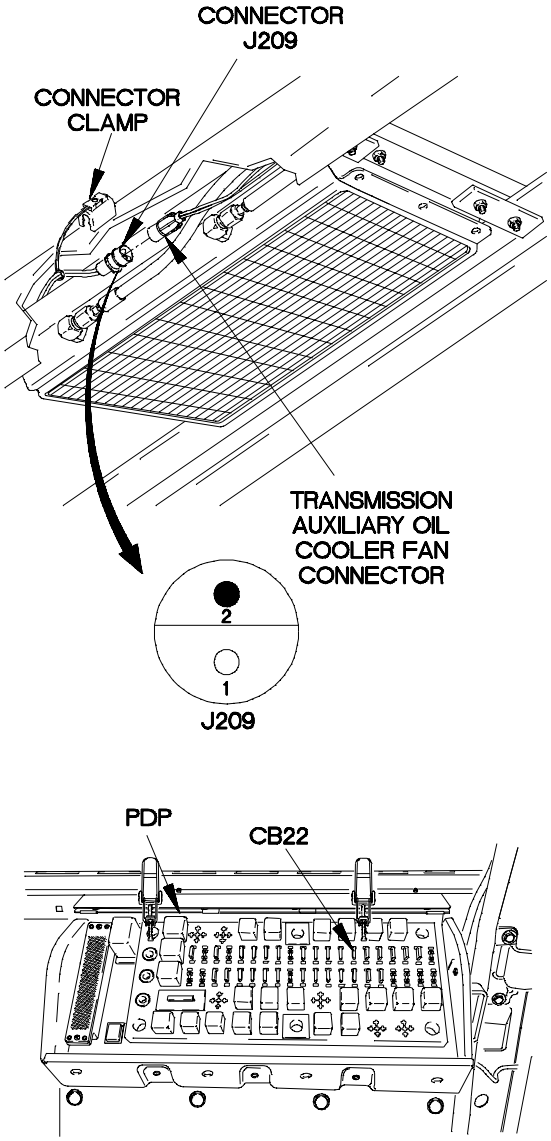
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

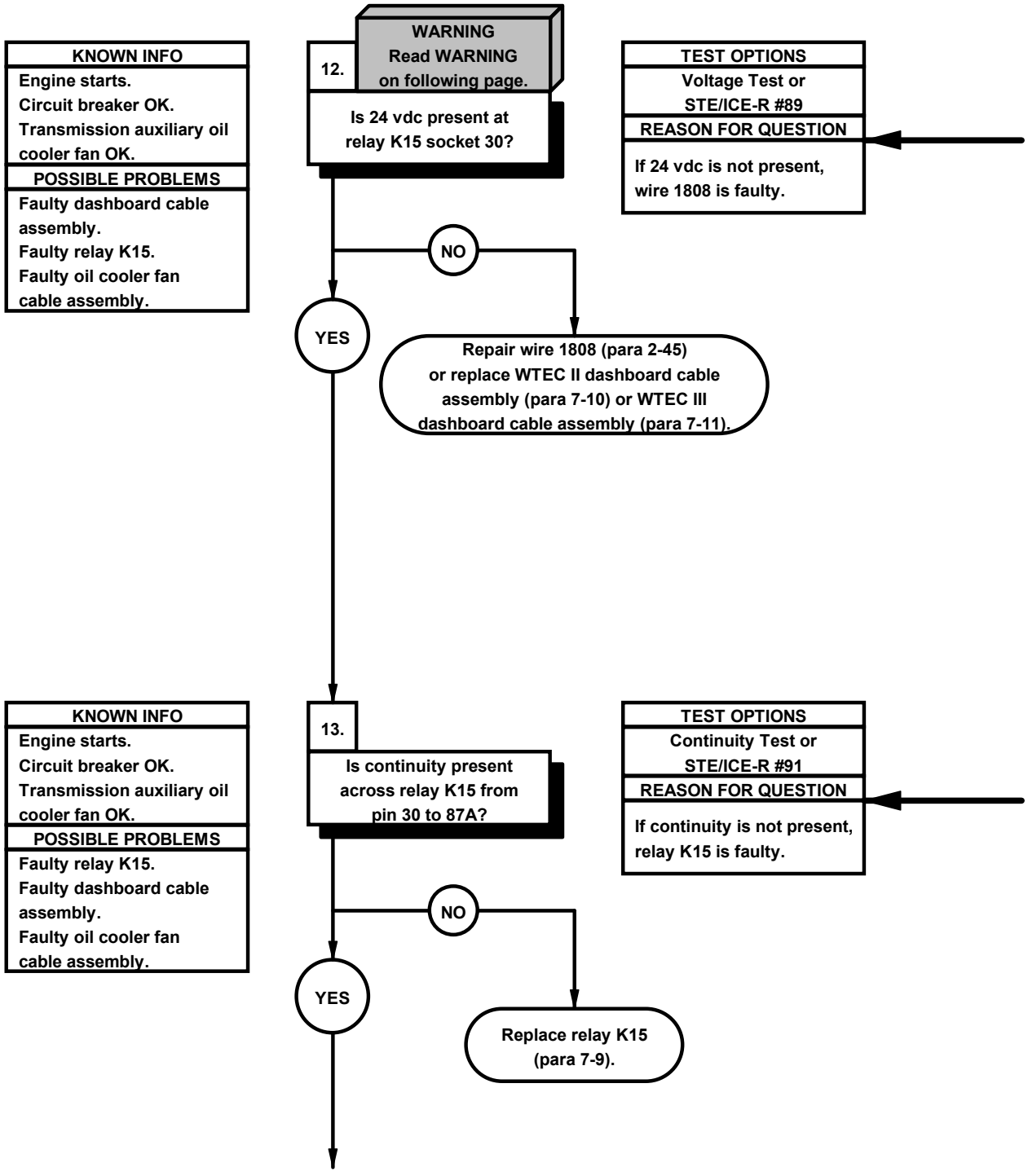
(1) Remove PDP cover (para 16-2).
(2) Remove circuit breaker CB22 from PDP.
(3) Disconnect connector J209 from transmission auxiliary oil cooler fan connector.
(4) Set multimeter to volts dc.
(5) Connect positive (+) probe of multimeter to connector J209-1.
(6) Connect negative (-) probe of multimeter to ground.
(7) Start engine (TM 9-2320-366-10-1) and note reading on multimeter.
(8) If 24 vdc is not present, go to step 12 of this fault.
(9) Shut down engine (TM 9-2320-366-10-1).

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector J209-2.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair wire 3013 (para 2-45) or replace oil cooler fan cable assembly (para 7-136).
(5) If continuity is present, replace transmission auxiliary oil cooler fan (para 8-19 or 8-21).
(6) Connect connector J209 to transmission auxiliary oil cooler fan connector.
(7) Install circuit breaker CB22 in PDP.
(8) Install PDP cover (para 16-2).



e146. TRANSMISSION AUXILIARY OIL COOLER FAN DOES NOT OPERATE (ALL MODELS EXCEPT M1088/ M1089) (CONT)



WARNING

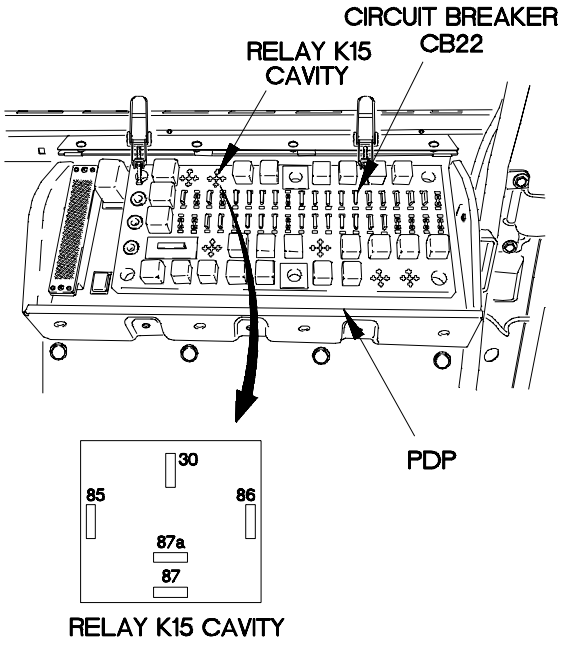
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

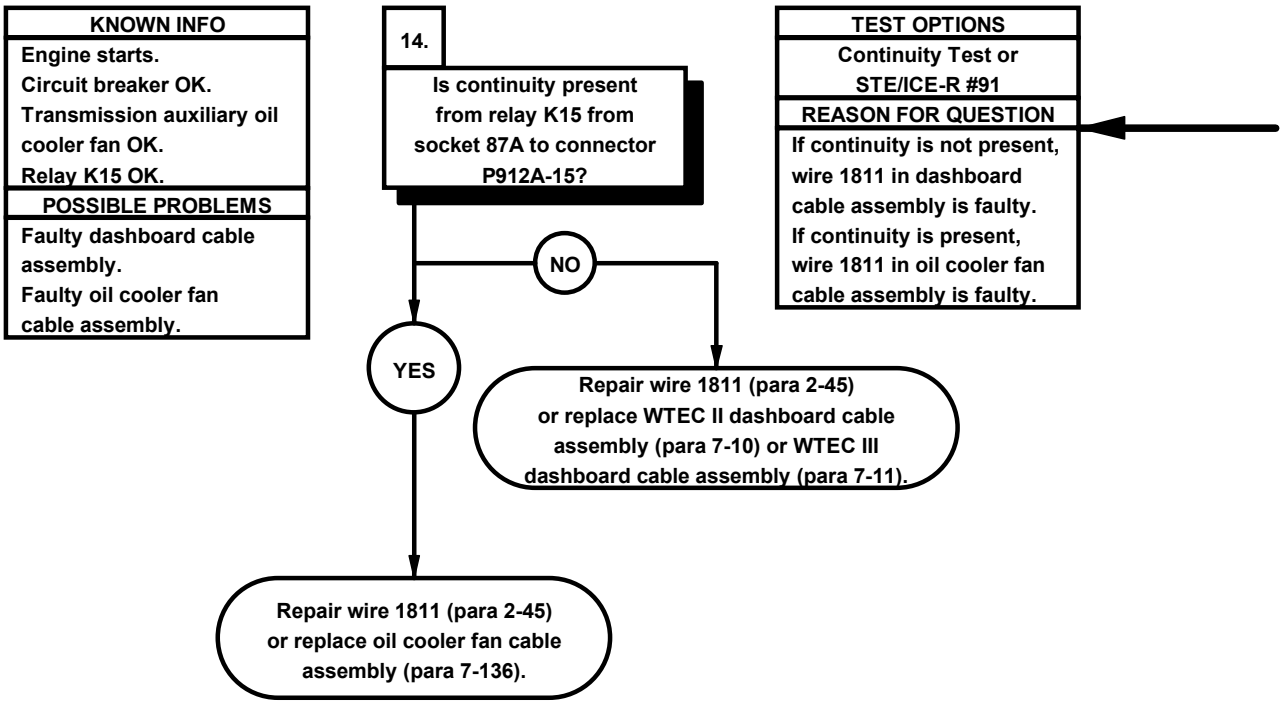
(1) Remove relay K15 from PDP.
(2) Set multimeter to volts dc.
(3) Connect positive (+) probe of multimeter to relay K15 socket 30.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(6) If 24 vdc is not present, repair wire 1808 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(7) Position master power switch to off (TM 9-2320-366-10-1).
(8) Install circuit breaker CB22 in PDP.

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to relay K15 pin 30.
(3) Connect negative (-) probe of multimeter to relay K15 pin 87A and note reading on multimeter.
(4) If continuity is not present, replace relay K15 (para 7-9).

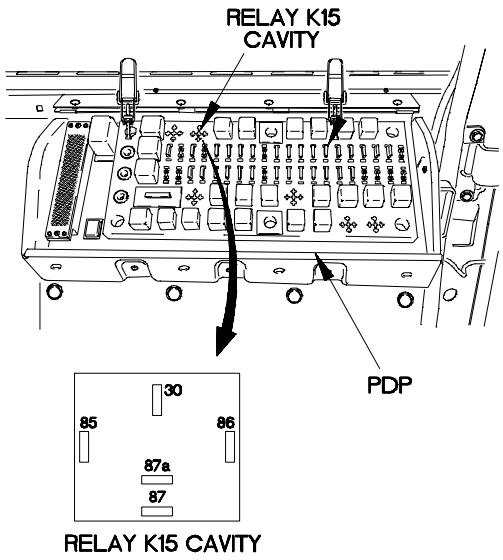


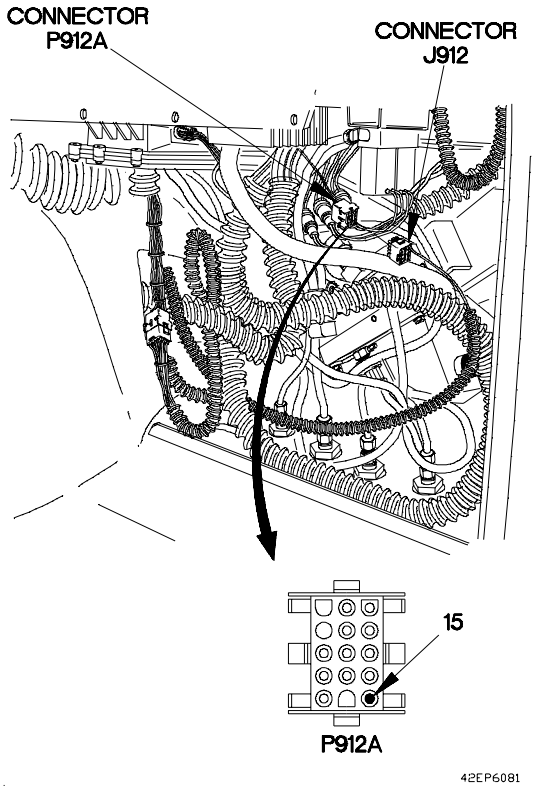
e146. TRANSMISSION AUXILIARY OIL COOLER FAN DOES NOT OPERATE (ALL MODELS EXCEPT M1088/ M1089) (CONT)



CONTINUITY TEST

(1) Remove personnel heater to gain access (para 18-9).
(2) Disconnect connector P912A from connector J912.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to relay K15 socket 87A.
(5) Connect negative (-) probe of multimeter to connector P912A-15 and note reading on multimeter.
(6) If continuity is not present, repair wire 1811 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(7) If continuity is present, repair wire 1811 (para 2-45) or replace oil cooler fan cable assembly (para 7-136).
(8) Install relay K15 in PDP.
(9) Connect connector P912A to connector J912.
(10) Install personnel heater (para 18-9).





e147. M1088/M1089 TRANSMISSION AUXILIARY OIL COOLER FAN DOES NOT OPERATE

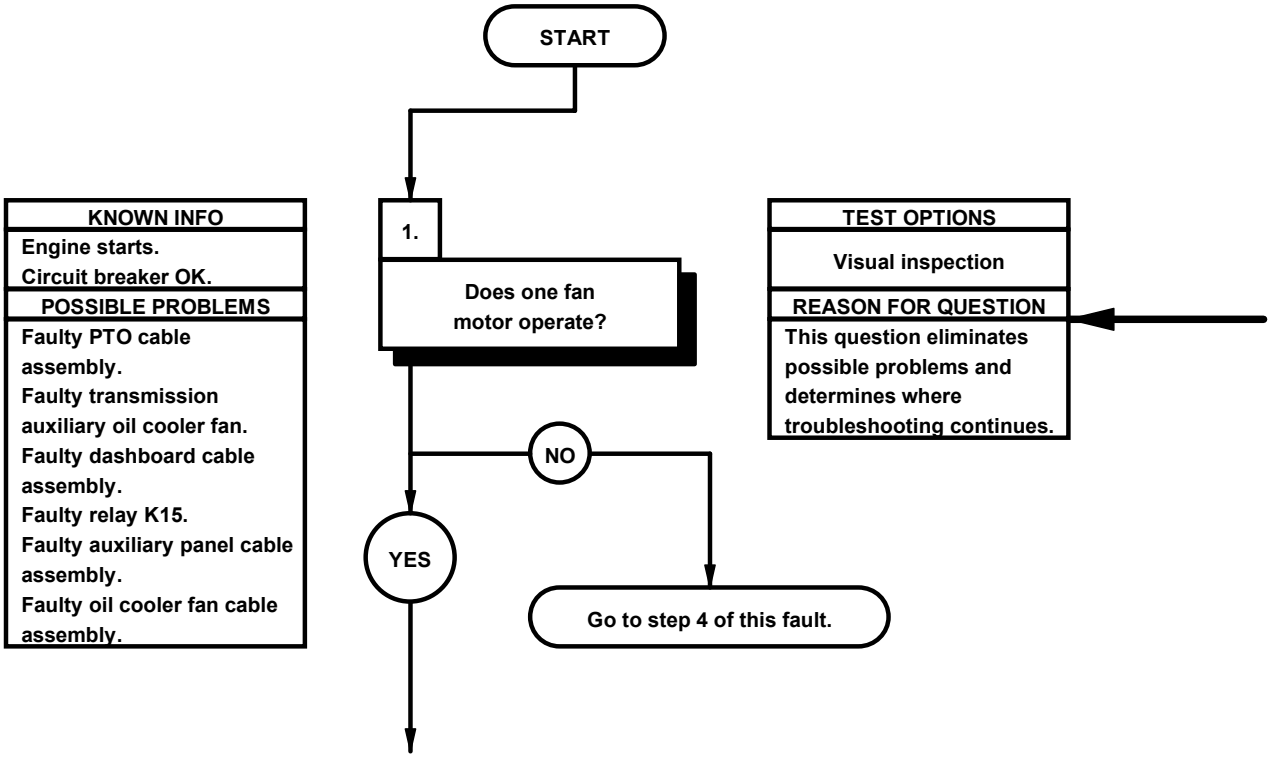
INITIAL SETUP

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

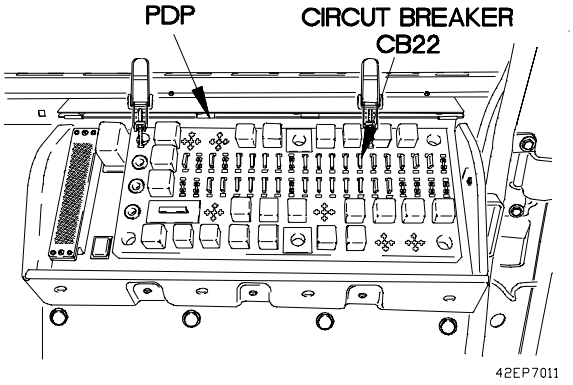
Personnel Required
(2)

References
TM 9-4910-571-12&P

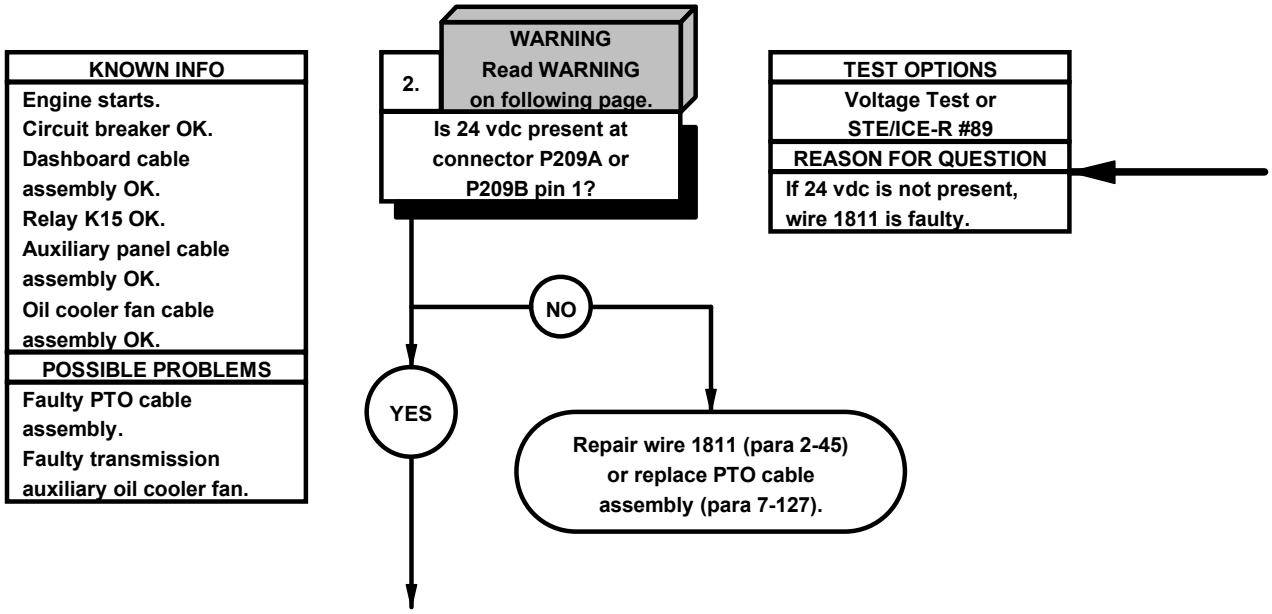
Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)



VOLTAGE TEST
(1) Remove PDP cover (para 16-2).
(2) Remove circuit breaker CB22 from PDP.
(3) Start engine (TM 9-2320-366-10-1).
(4) If both transmission auxiliary oil cooler fan motors do not operate, go to step 4 of this fault.
(5) Shut down engine (TM 9-2320-366-10-1).



e147. M1088/M1089 TRANSMISSION AUXILIARY OIL COOLER FAN DOES NOT OPERATE (CONT)

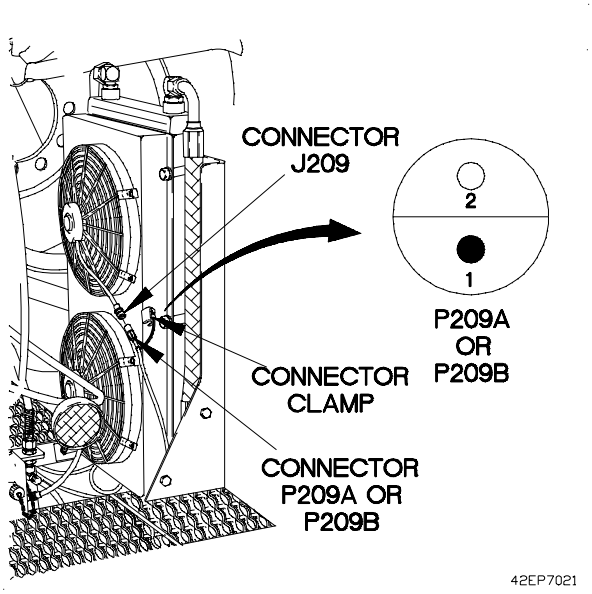


WARNING

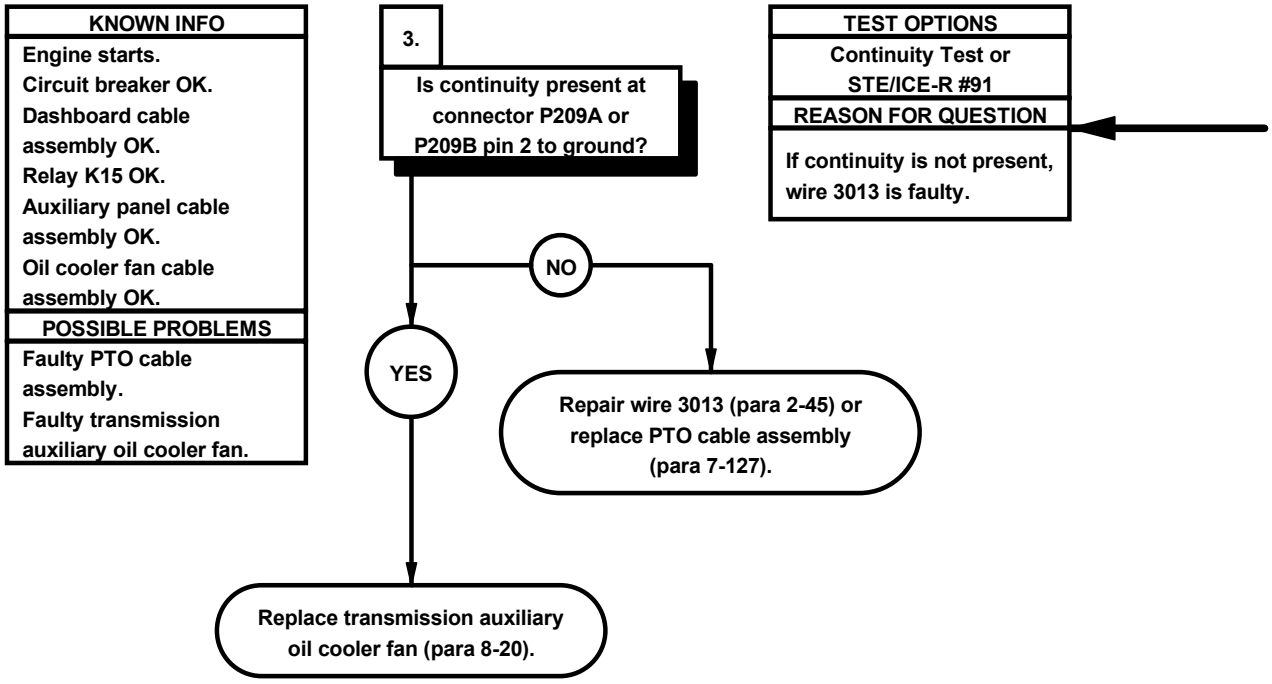
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

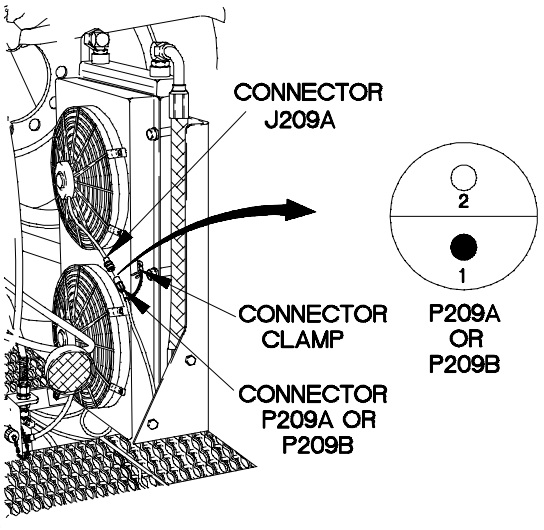
(1) Disconnect connector clamp from connector J209.
(2) Disconnect connector P209A or P209B from connector J209.
(3) Set multimeter to volts dc.
(4) Connect positive (+) probe of multimeter to connector P209A or P209B pin 1.
(5) Connect negative (-) probe of multimeter to ground.
(6) Start engine (TM 9-2320-366-10-1) and note reading on multimeter.
(7) If 24 vdc is not present, repair wire 1811 (para 2-45) or replace PTO cable assembly (para 7-127).
(8) Shut down engine (TM 9-2320-366-10-1).

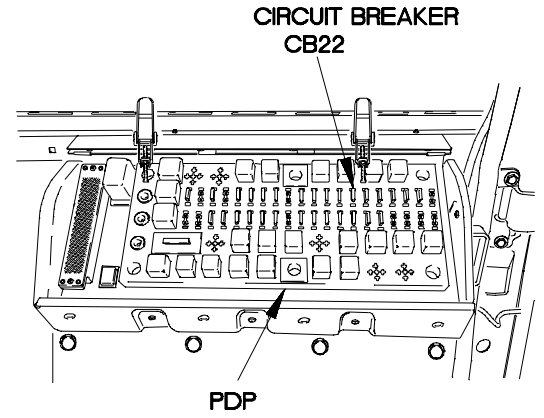


e147. M1088/M1089 TRANSMISSION AUXILIARY OIL COOLER FAN DOES NOT OPERATE (CONT)



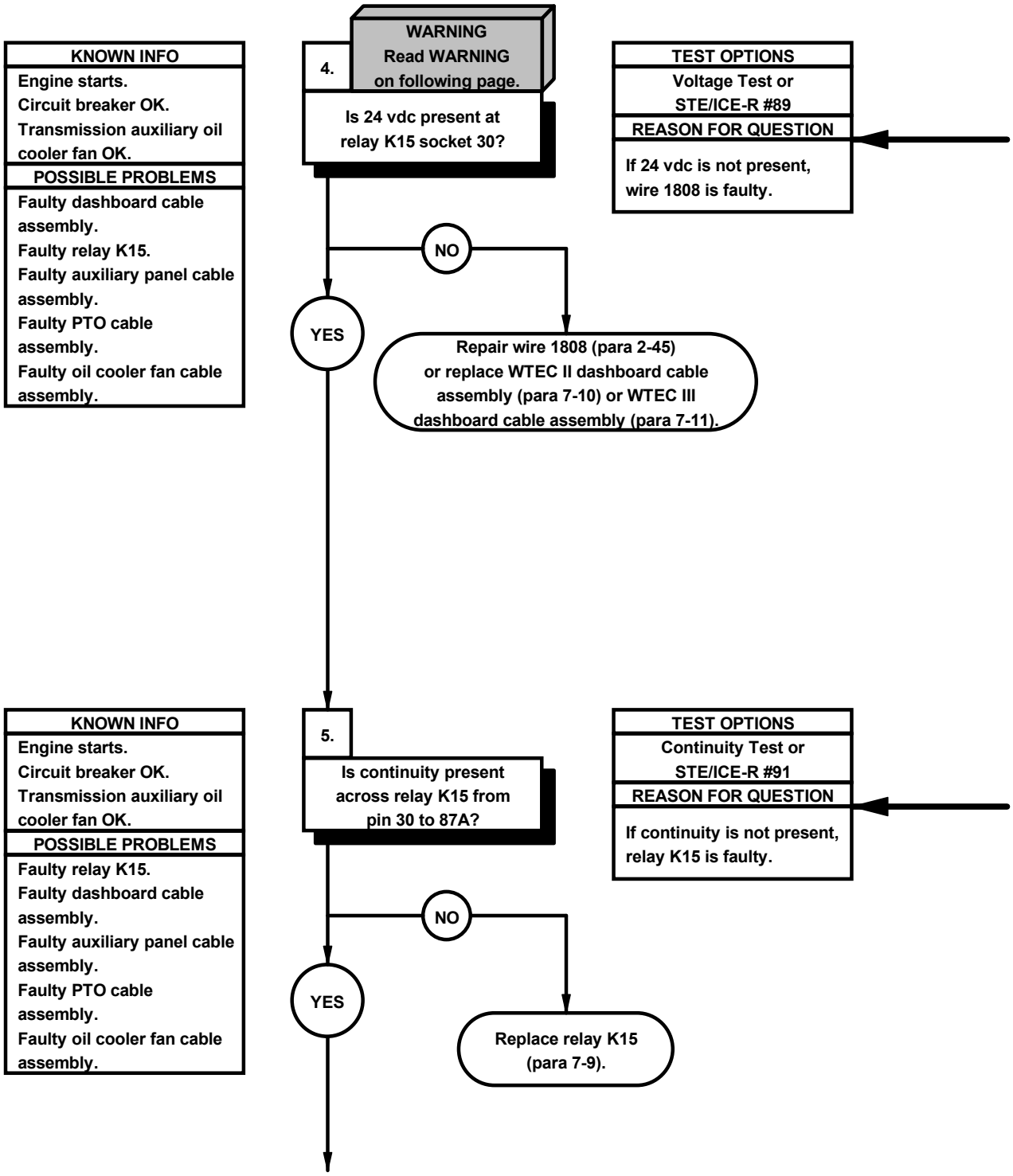
CONTINUITY TEST
(1) Set multimeter to volts dc.
(2) Connect positive (+) probe of multimeter to connector P209A or P209B pin 2.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair wire 3013 (para 2-45) or replace PTO cable assembly (para 7-127).
(5) If continuity is present, replace transmission auxiliary oil cooler fan (para 8-20).
(6) Connect connector P209A or P209B to transmission auxiliary oil cooler fan connector.
(7) Connect connector clamp to connector J209.
(8) Install circuit breaker CB22 in PDP.
(9) Install PDP cover (para 16-2).





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e147. M1088/M1089 TRANSMISSION AUXILIARY OIL COOLER FAN DOES NOT OPERATE (CONT)



WARNING

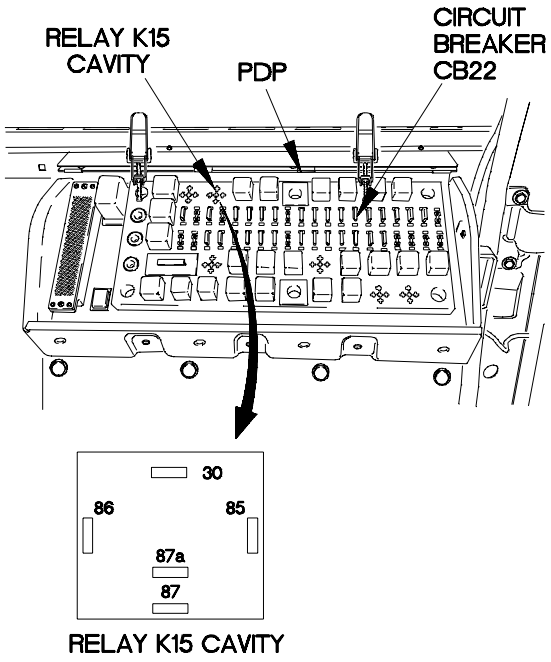
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

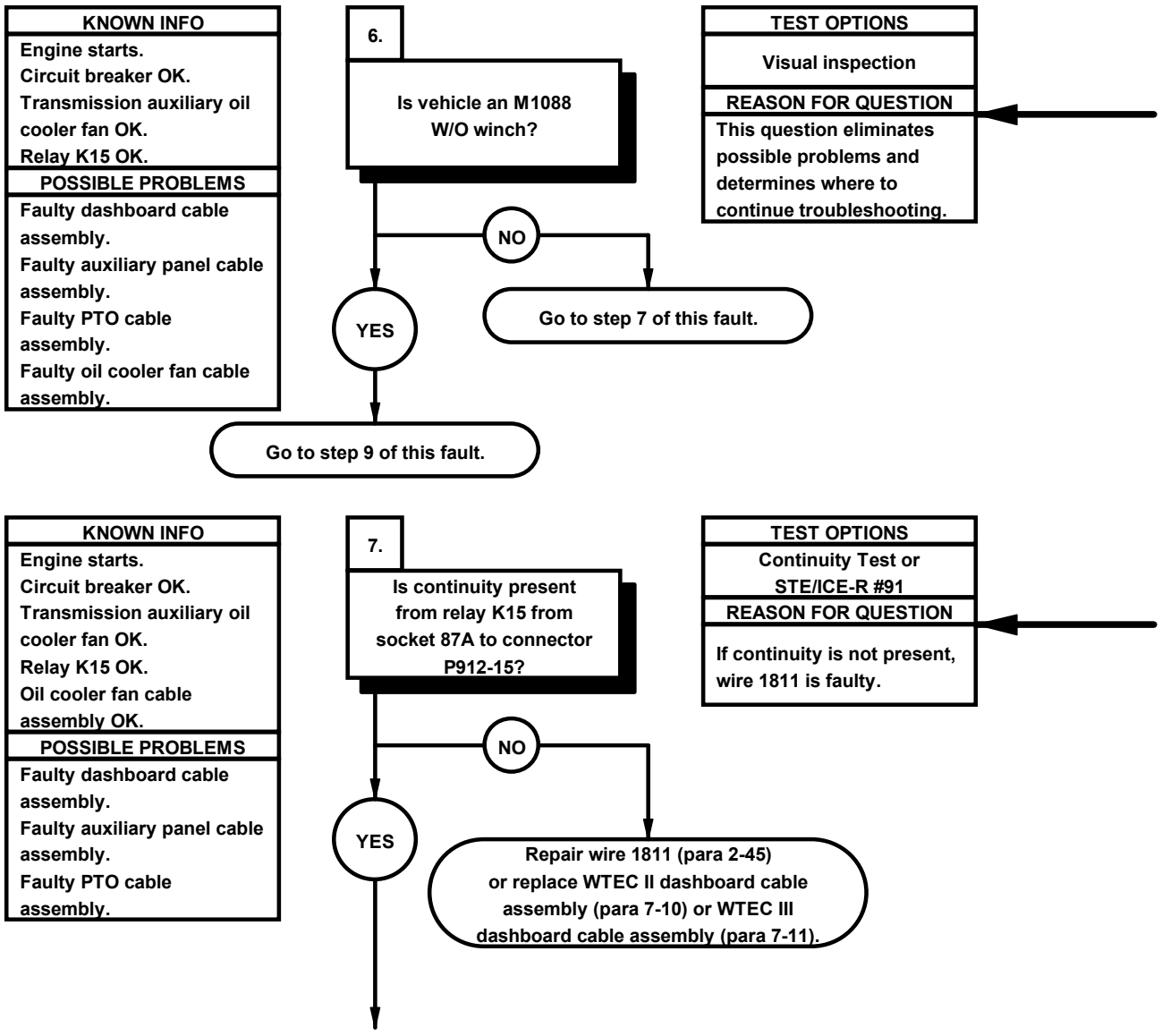
(1) Install circuit breaker CB22 in PDP.
(2) Remove relay K15 from PDP.
(3) Set multimeter to volts dc.
(4) Connect positive (+) probe of multimeter to relay K15 socket 30.
(5) Connect negative (-) probe of multimeter to ground.
(6) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(7) If 24 vdc is not present, repair wire 1808 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(8) Position master power switch to off (TM 9-2320-366-10-1).

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to relay K15 pin 30.
(3) Connect negative (-) probe of multimeter to relay K15 pin 87A and note reading on multimeter.
(4) If continuity is not present, replace relay K15 (para 7-9).



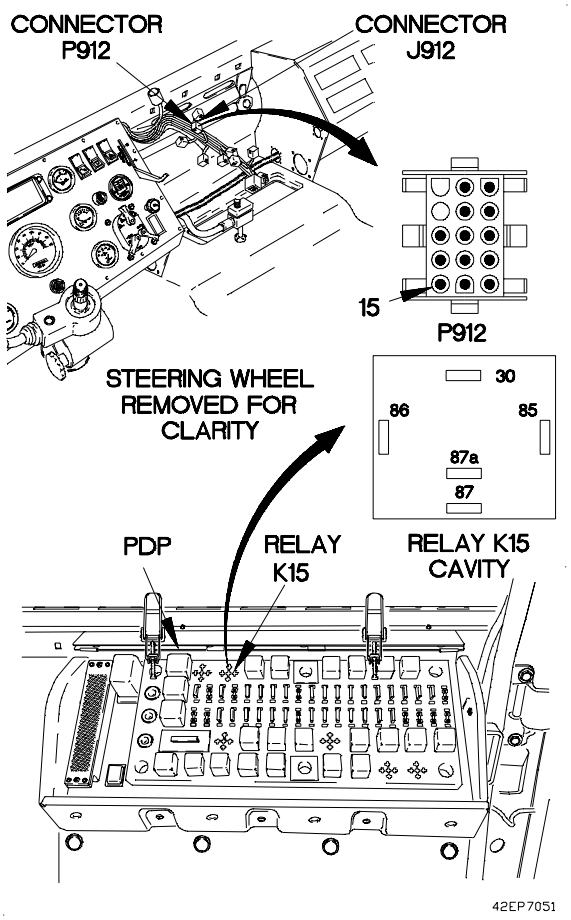
e147. M1088/M1089 TRANSMISSION AUXILIARY OIL COOLER FAN DOES NOT OPERATE (CONT)



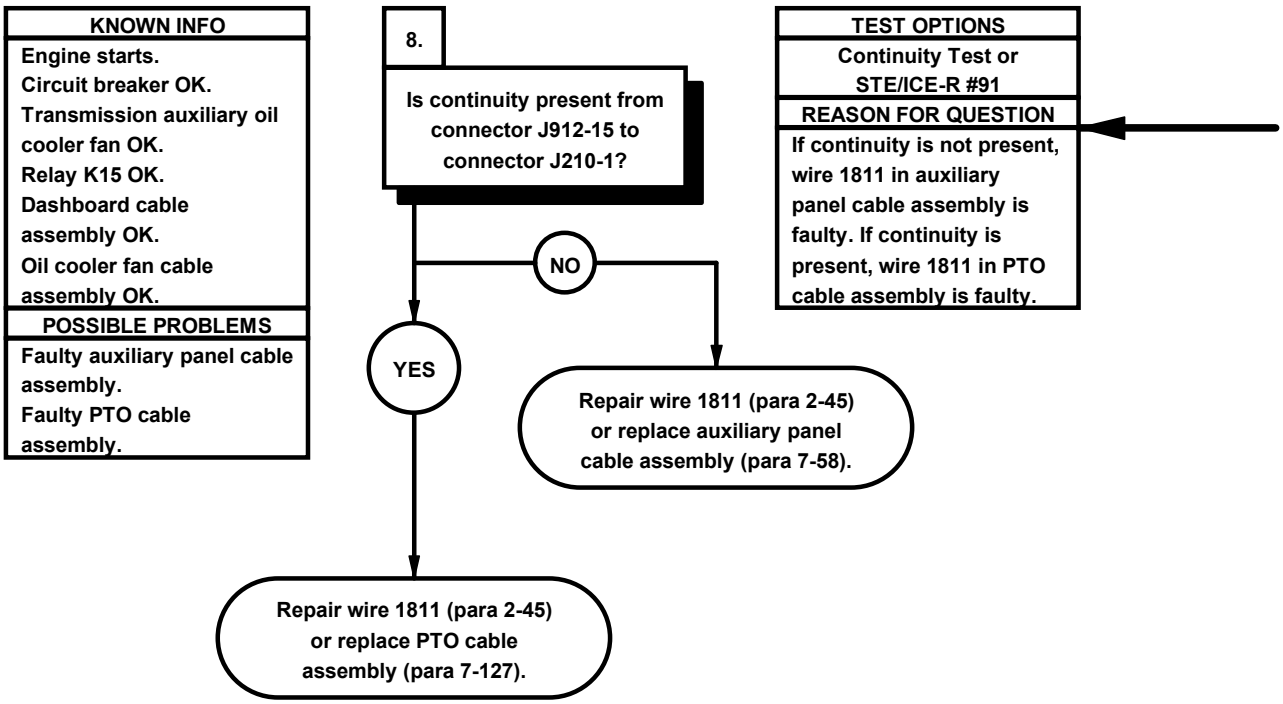
(1) Check if vehicle is M1088 W/O winch.
(2) If vehicle is not an M1088 W/O winch, go to step 7 of this fault.
(3) If vehicle is an M1088 W/O winch, go to step 9 of this fault.

CONTINUITY TEST

(1) Remove personnel heater for access (para 18-9).
(2) Disconnect connector P912 from connector J912.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to relay K15 socket 87A.
(5) Connect negative (-) probe of multimeter to connector P912-15 and note reading on multimeter.
(6) If continuity is not present, repair wire 1811 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(7) Install relay K15 in PDP.

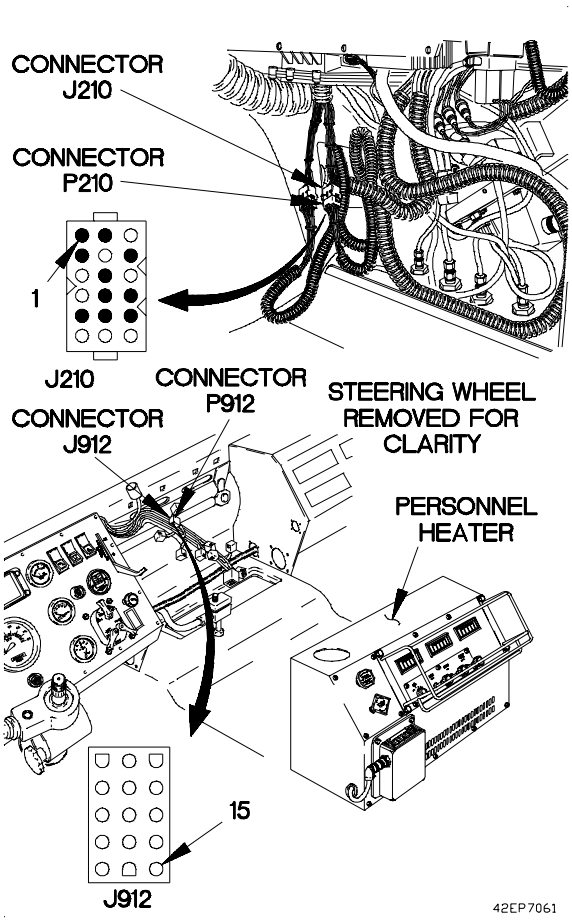


e147. M1088/M1089 TRANSMISSION AUXILIARY OIL COOLER FAN DOES NOT OPERATE (CONT)

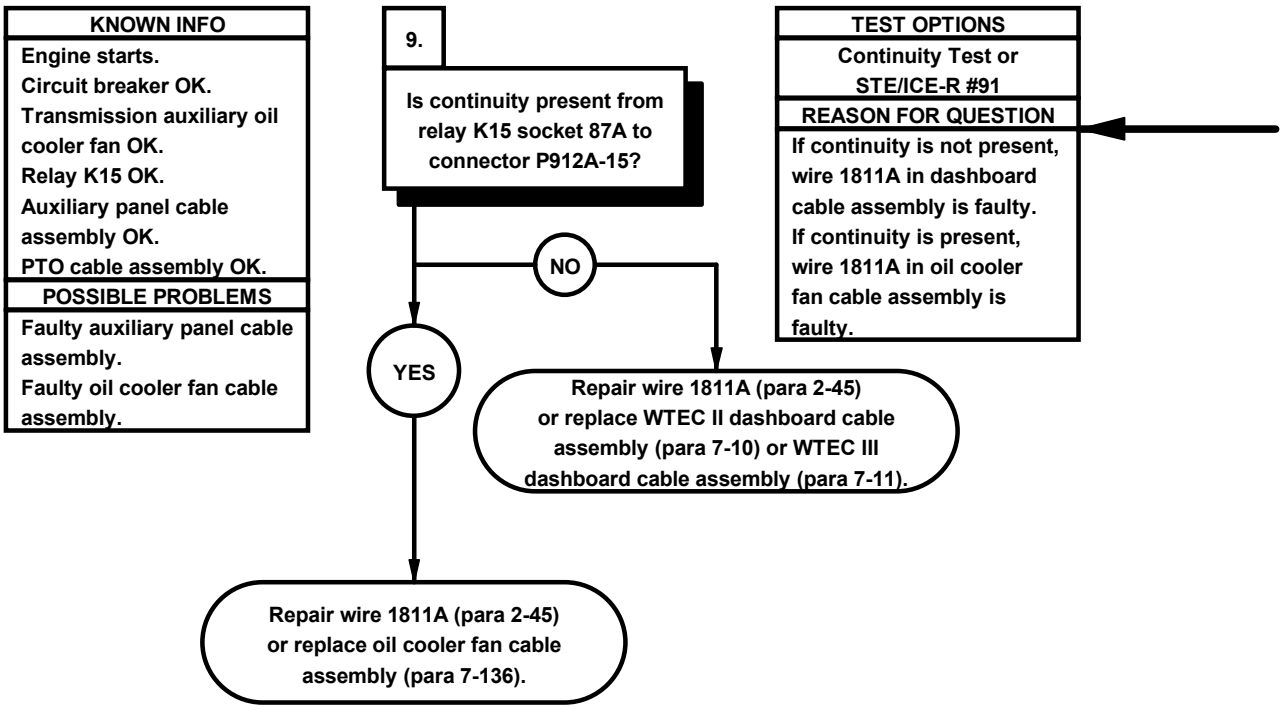


CONTINUITY TEST

(1) Disconnect connector P210 from connector J210.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector J912-15.
(4) Connect negative (-) probe of multimeter to connector J210-1 and note reading on multimeter.
(5) If continuity is not present, repair wire 1811 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
(6) If continuity is present, repair wire 1811 (para 2-45) or replace PTO cable assembly (para 7-127).
(7) Connect connector P210 to connector J210.
(8) Connect connector P912 to connector J912.
(9) Install personnel heater (para 18-9).

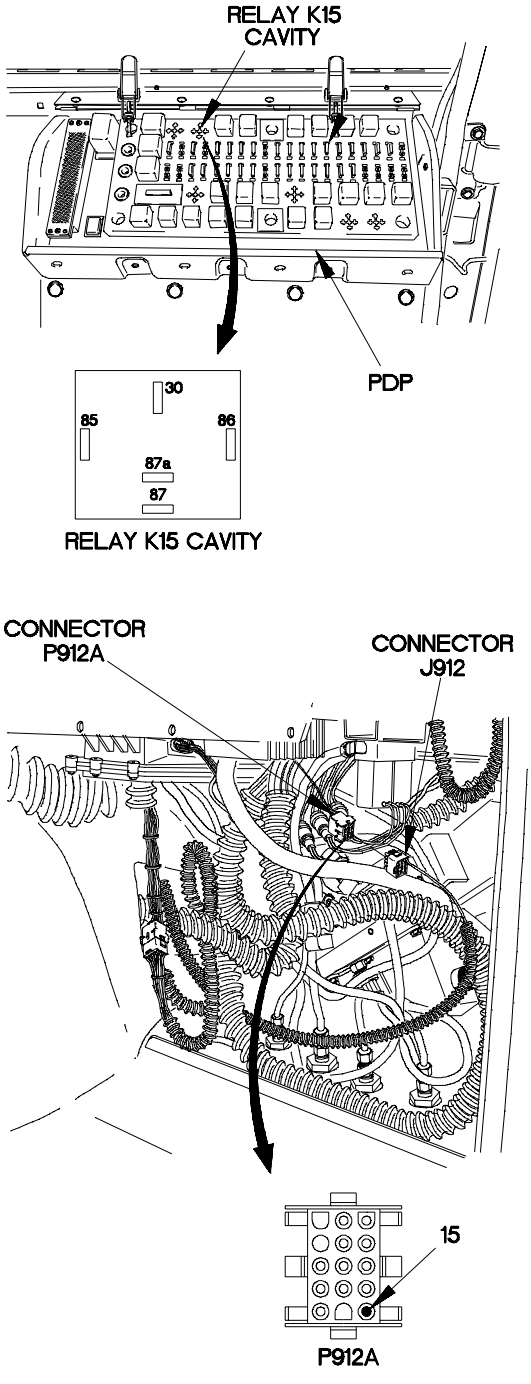


e147. M1088/M1089 TRANSMISSION AUXILIARY OIL COOLER FAN DOES NOT OPERATE (CONT)



CONTINUITY TEST

(1) Remove kick panel (para 16-3).
(2) Disconnect connector P912A from connector J912.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector P912A-15.
(5) Connect negative (-) probe of multimeter to relay K15 socket 87A and note reading on multimeter.
(6) If continuity is not present, repair wire 1811A (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(7) If continuity is present, repair wire 1811A (para 2-45) or replace oil cooler fan cable assembly (para 7-136).
(8) Connect connector P912A to connector J912.
(9) Install kick panel (para 16-3).



e148. M1088/M1089 WORKLIGHTS DO NOT ILLUMINATE

INITIAL SETUP

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

Personnel Required
(2)

Material/Parts
Wire, Elect, 50 ft (Item 71, Appendix D)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Wrench, Torque, 0-200 lb-in (Item 59, Appendix C)

References
TM 9-4910-571-12&P

NOTE

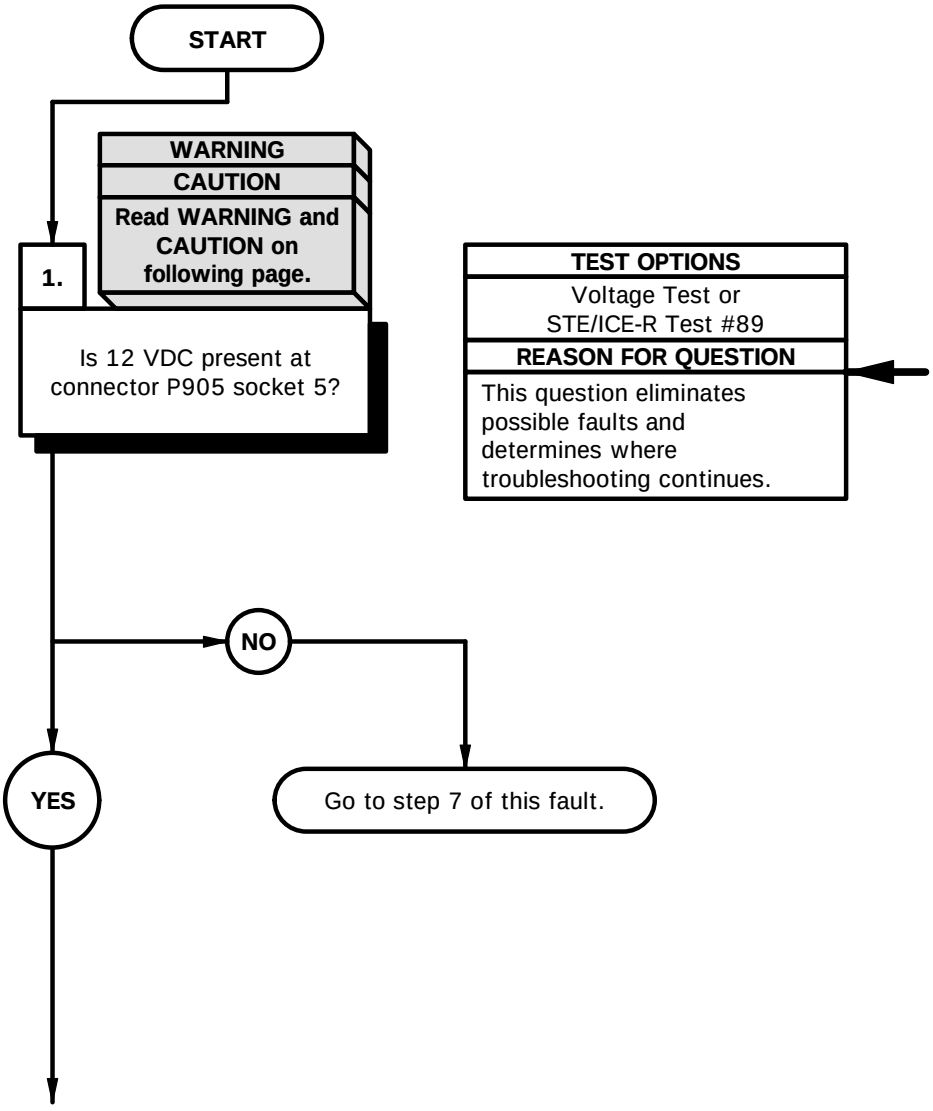
Perform Electrical System Troubleshooting e1. Circuit Breaker Does Not Operate on circuit breakers CB71, CB72, and CB74 prior to beginning this task.

KNOWN INFO

Circuit breakers CB71, CB72, and CB74 OK.
Hazard lights illuminate.
Light bulb OK.

POSSIBLE PROBLEMS

Faulty worklights switch.
Faulty dashboard cable assembly.
Faulty relay K12.
Faulty auxiliary panel cable assembly.
Faulty diode D2B.
Faulty relay K9.



TEST OPTIONS

Voltage Test or
STE/ICE-R Test #89

REASON FOR QUESTION

This question eliminates possible faults and determines where troubleshooting continues.

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 circuits and cause severe burns or electrical shock.

CAUTION

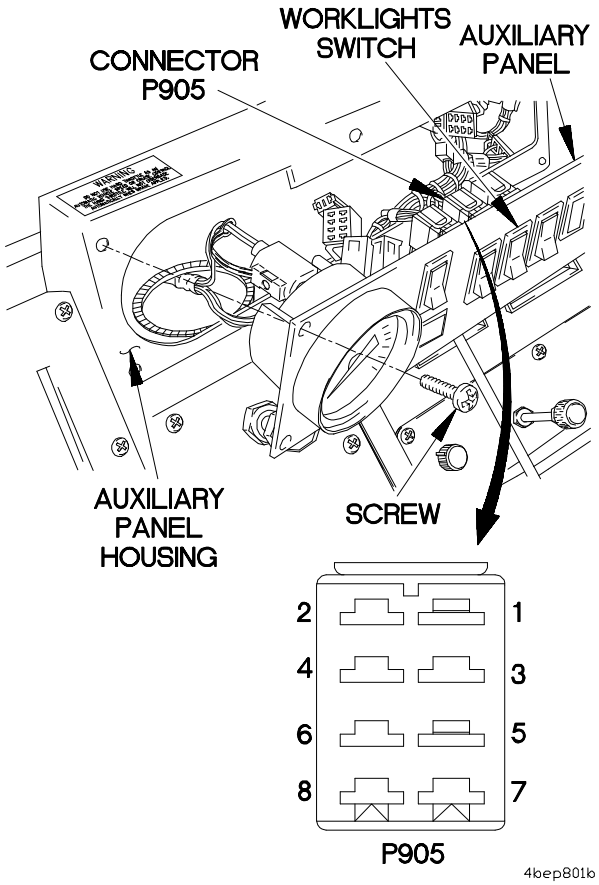
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

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

VOLTAGE TEST

(1) Remove six screws from auxiliary panel.
(2) Lift auxiliary panel from auxiliary panel housing to gain access.
(3) Disconnect connector P905 from worklights switch.
(4) Set multimeter to volts DC.
(5) Connect positive (+) probe of multimeter to connector P905 socket 5.
(6) Connect negative (-) probe of multimeter to ground.
(7) Position main light switch to STOP LIGHT (TM 9-2320-366-10-1) and note reading on multimeter.
(8) If 12 VDC is not present, go to step 7 of this fault.
(9) Position main light switch to OFF (TM 9-2320-366-10-1).



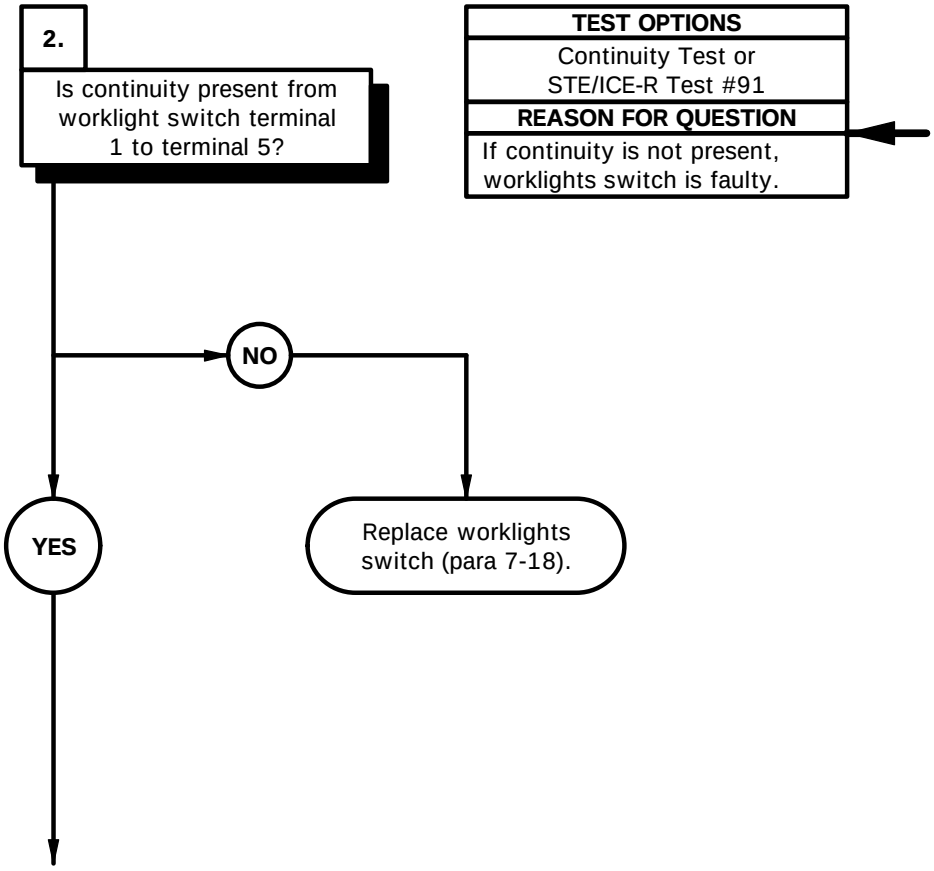
e148. M1088/M1089 WORKLIGHTS DO NOT ILLUMINATE (CONT)

KNOWN INFO

Circuit breakers CB71, CB72, and CB74 OK.
Hazard lights illuminate.
Light bulb OK.
Auxiliary panel cable assembly OK.
Relay K9 OK.
Diode D2B OK.

POSSIBLE PROBLEMS

Faulty worklights switch.
Faulty dashboard cable assembly.
Faulty relay K12.



TEST OPTIONS

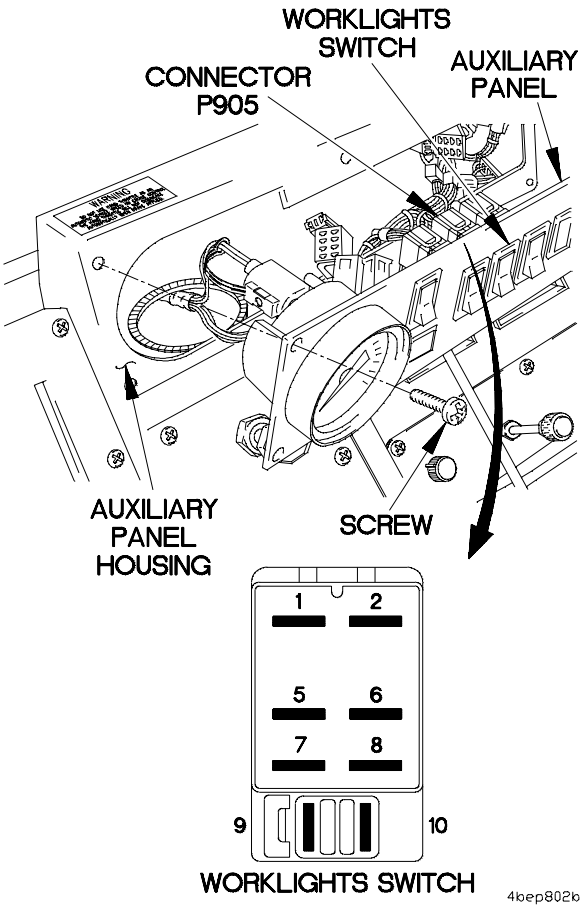
Continuity Test or STE/ICE-R Test #91

REASON FOR QUESTION

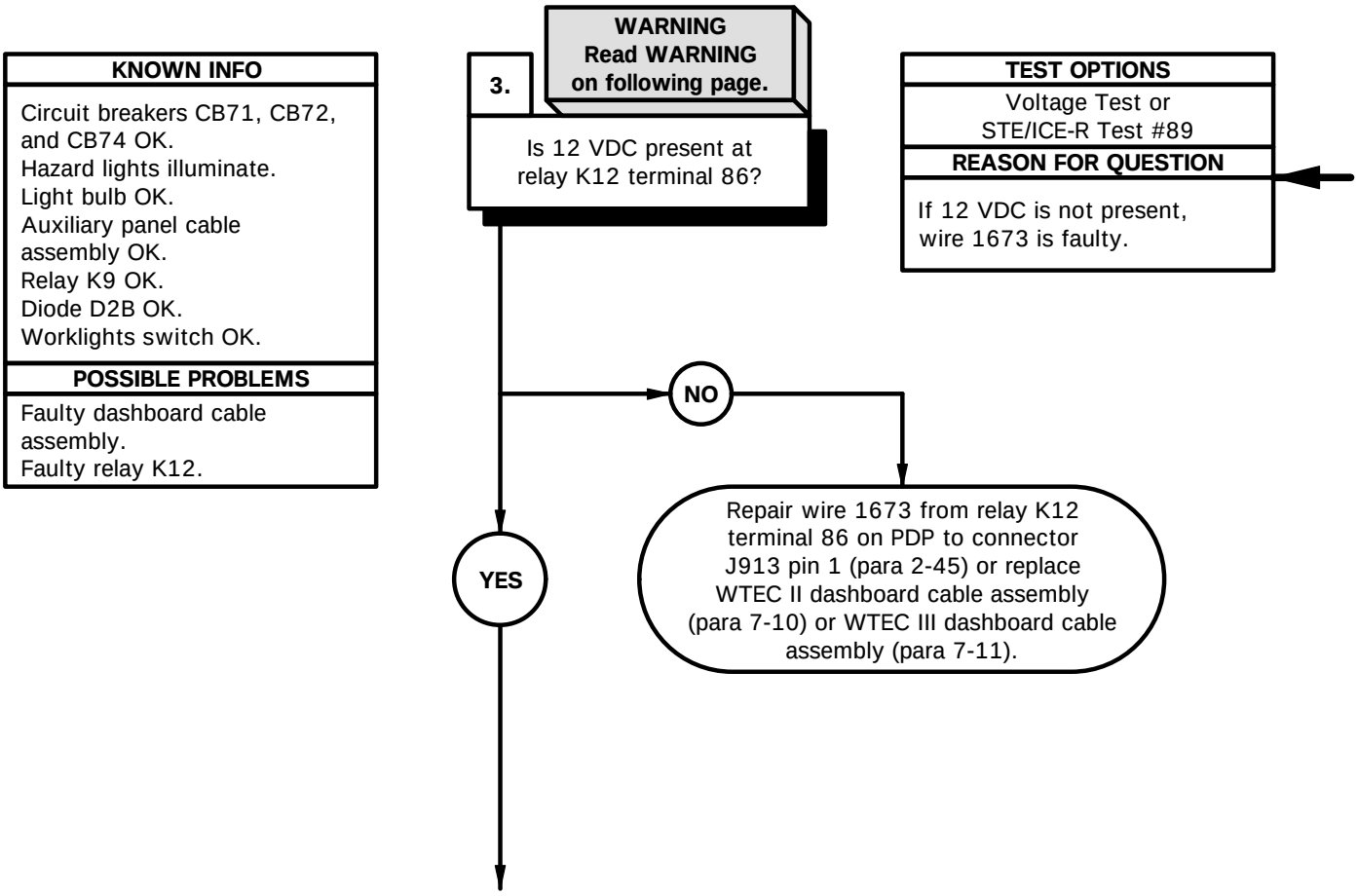
If continuity is not present, worklights switch is faulty.

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to worklights switch terminal 1.
(3) Connect negative (-) probe of multimeter to worklights switch terminal 5.
(4) Position worklights switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(5) If continuity is not present, replace worklights switch (para 7-18).
(6) Connect connector P905 to worklights switch.
(7) Position auxiliary panel on auxiliary panel housing with six screws.
(8) Tighten six screws to 24 lb-in. (3 N·m).



e148. M1088/M1089 WORKLIGHTS DO NOT ILLUMINATE (CONT)

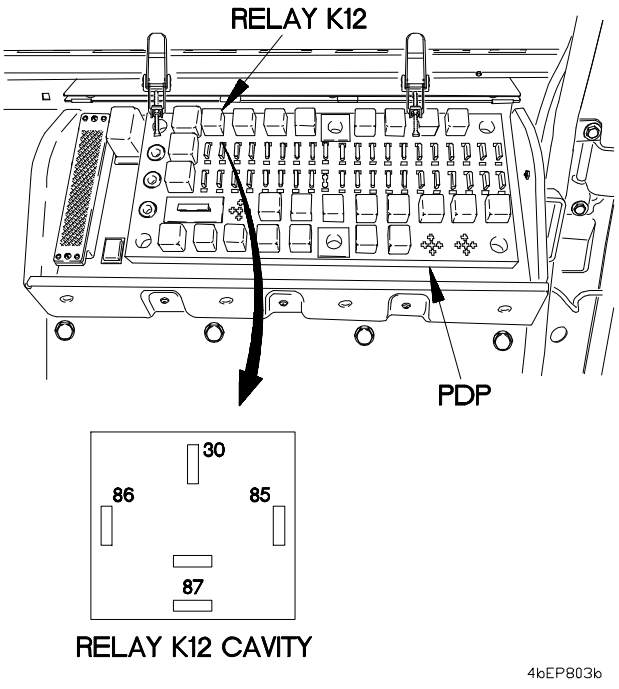


WARNING

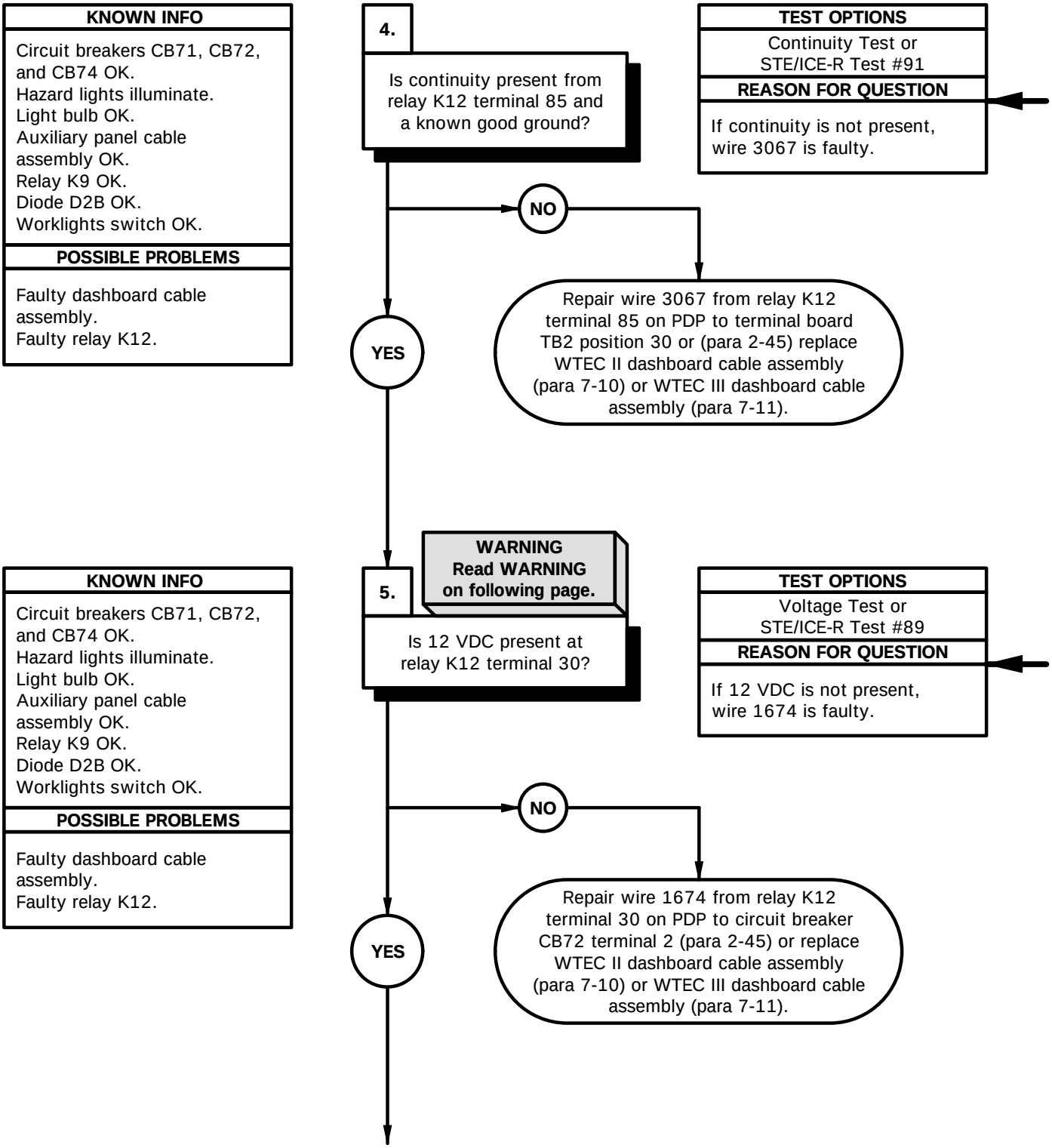
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Remove PDP cover (para 16-2).
(2) Remove relay K12 from PDP.
(3) Set multimeter to volts DC.
(4) Connect positive (+) probe of multimeter to PDP, where relay K12 terminal 86 was removed.
(5) Connect negative (-) probe of multimeter to ground.
(6) Position main light switch to STOP LIGHT (TM 9-2320-366-10-1) and note reading on multimeter.
(7) If 12 VDC is not present, repair wire 1673 from relay K12 terminal 86 on PDP to connector J913 pin 1 (para 2-45) or replace WTEC II dashboard cable (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(8) Position main light switch to OFF (TM 9-2320-366-10-1).

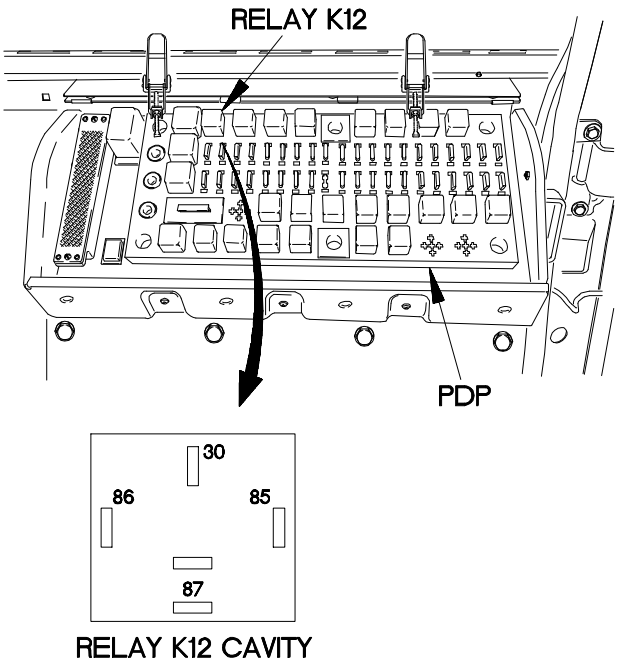


e148. M1088/M1089 WORKLIGHTS DO NOT ILLUMINATE (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to PDP, where relay K12 terminal 85 was removed.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair wire 3067 from relay K12 terminal 85 on PDP to terminal board TB2 position 30 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).



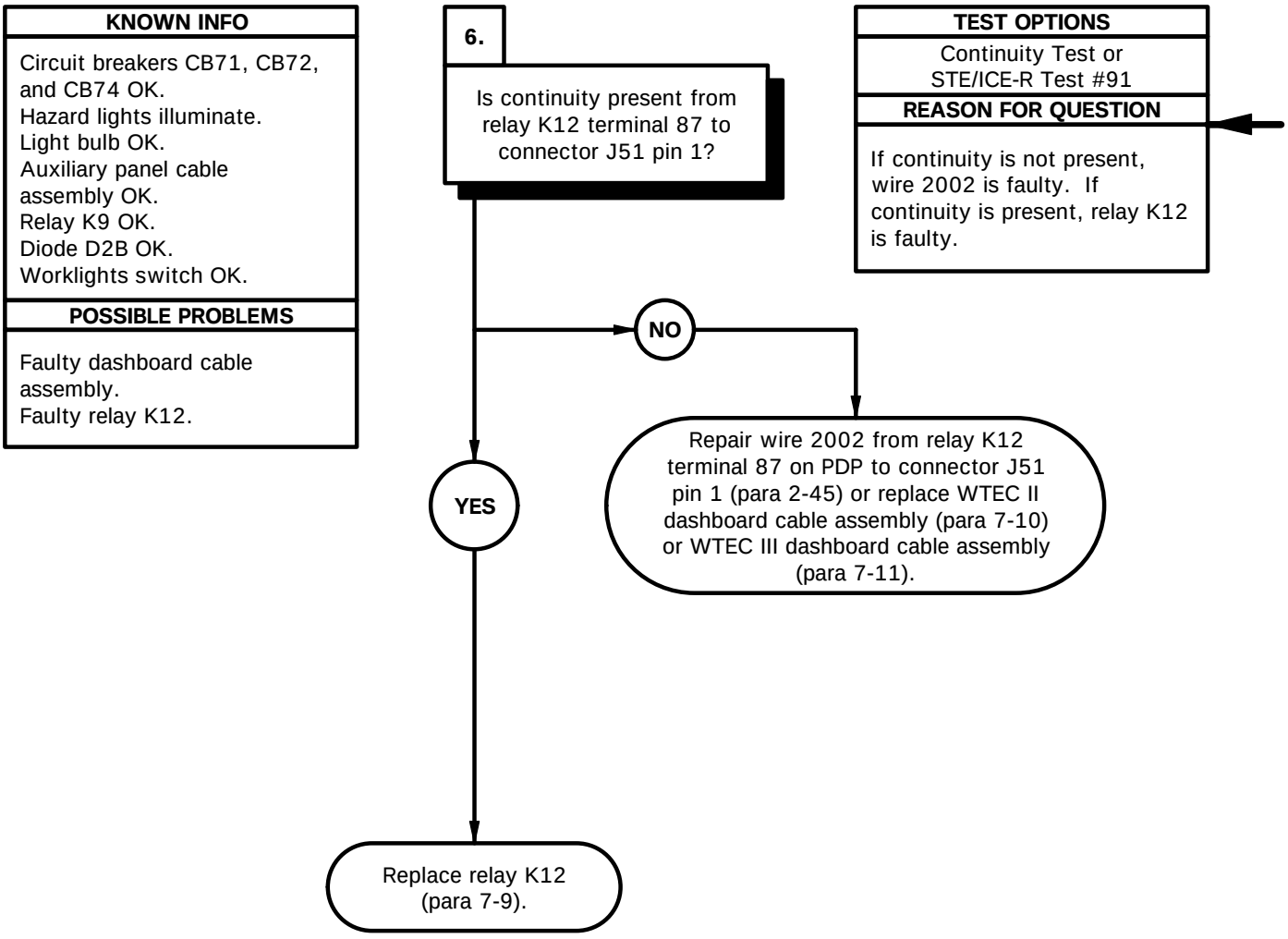
WARNING

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 circuits and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Set multimeter to volts DC.
(2) Connect positive (+) probe of multimeter to PDP, where relay K12 terminal 30 was removed.
(3) Connect negative (-) probe of multimeter to ground.
(4) Position main light switch to STOP LIGHT (TM 9-2320-366-10-1) and note reading on multimeter.
(5) If 12 VDC is not present, repair wire 1674 from relay K12 terminal 30 on PDP to circuit breaker CB72 terminal 2 (para 2-45) or replace WTEC II dashboard cable (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(6) Position main light switch to OFF (TM 9-2320-366-10-1).

e148. M1088/M1089 WORKLIGHTS DO NOT ILLUMINATE (CONT)



CAUTION

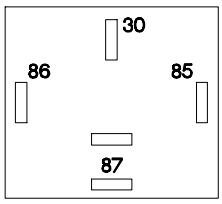
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

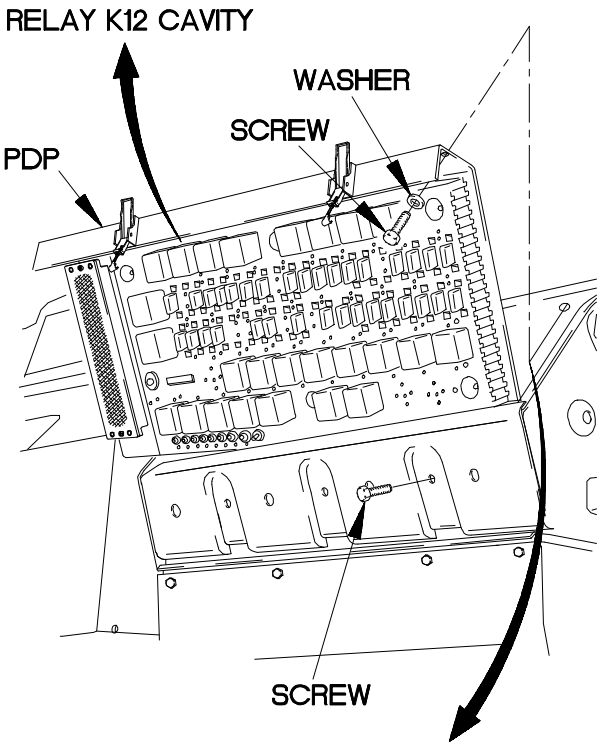
NOTE

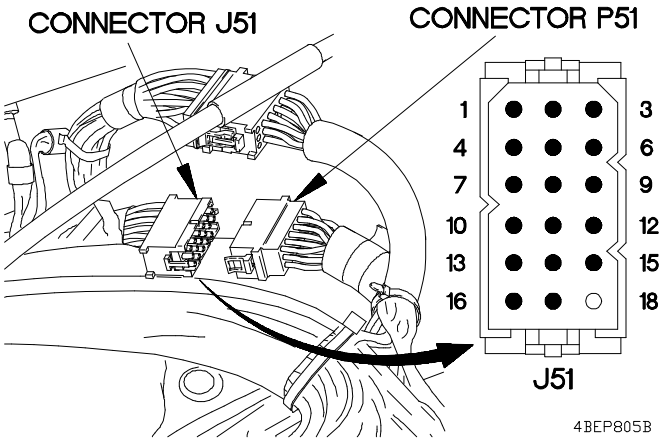
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

VOLTAGE TEST

(1) Set multimeter to ohms.
(2) Remove three screws and washers from PDP.
(3) Remove three screws from PDP.
(4) Lift PDP outward to gain access.
(5) Disconnect connector P51 from connector J51.
(6) Connect positive (+) probe of multimeter to PDP, where relay K12 terminal 87 was removed.
(7) Connect negative (-) probe of multimeter to connector J51 pin 1 and note reading on multimeter.
(8) If continuity is not present, repair wire 2002 from relay K12 terminal 87 to connector J51 pin 1 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(9) If continuity is present, replace relay K12 (para 7-9).
(10) Install relay K12 in PDP.
(11) Install PDP on dashboard with three screws.
(12) Install three washers and screws in PDP.
(13) Install PDP cover (para 16-2).







e148. M1088/M1089 WORKLIGHTS DO NOT ILLUMINATE (CONT)

KNOWN INFO

Circuit breakers CB71, CB72, and CB74 OK.
Hazard lights illuminate.
Light bulb OK.
Auxiliary panel cable assembly OK.
Worklights switch OK.
Relay K12 OK.

POSSIBLE PROBLEMS

Faulty dashboard cable assembly.
Faulty diode D2B.
Faulty relay K9.

WARNING
Read WARNING on following page.

7. Is 12 VDC present at diode D2B terminal 4?

TEST OPTIONS

Voltage Test or
STE/ICE-R Test #89

REASON FOR QUESTION

This question eliminates possible problems and determines where troubleshooting continues.

NO → Go to step 8 of this fault.

YES → Go to step 12 of this fault.

KNOWN INFO

Circuit breakers CB71, CB72, and CB74 OK.
Hazard lights illuminate.
Light bulb OK.
Auxiliary panel cable assembly OK.
Diode D2B OK.
Worklights switch OK.
Relay K12 OK.

POSSIBLE PROBLEMS

Faulty dashboard cable assembly.
Faulty relay K9.

WARNING
Read WARNING on following page.

8. Is 12 VDC present at relay K9 terminal 86?

TEST OPTIONS

Voltage Test or
STE/ICE-R Test #89

REASON FOR QUESTION

If 12 VDC is not present, wire 1514 is faulty.

NO → Repair wire 1514 from relay K9 terminal 86 on PDP to circuit breaker CB74 terminal 6 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

YES

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 circuits and cause severe burns or electrical shock.

CONTINUITY TEST

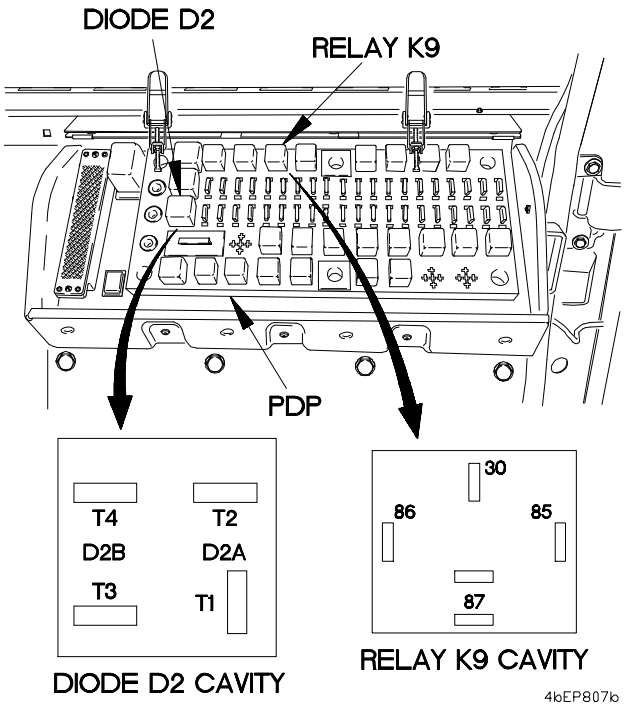
(1) Remove PDP cover (para 16-2).
(2) Remove diode D2B from PDP.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to PDP, where diode D2B terminal 4 was removed.
(5) Connect negative (-) probe of multimeter to ground.
(6) Position main light switch to STOP LIGHT (TM 9-2320-366-10-1) and note reading on multimeter.
(7) If 12 VDC is not present, go to step 8 of this fault.
(8) If 12 VDC is present, go to step 12 of this fault.
(9) Position main light switch to OFF (TM 9-2320-366-10-1).

WARNING

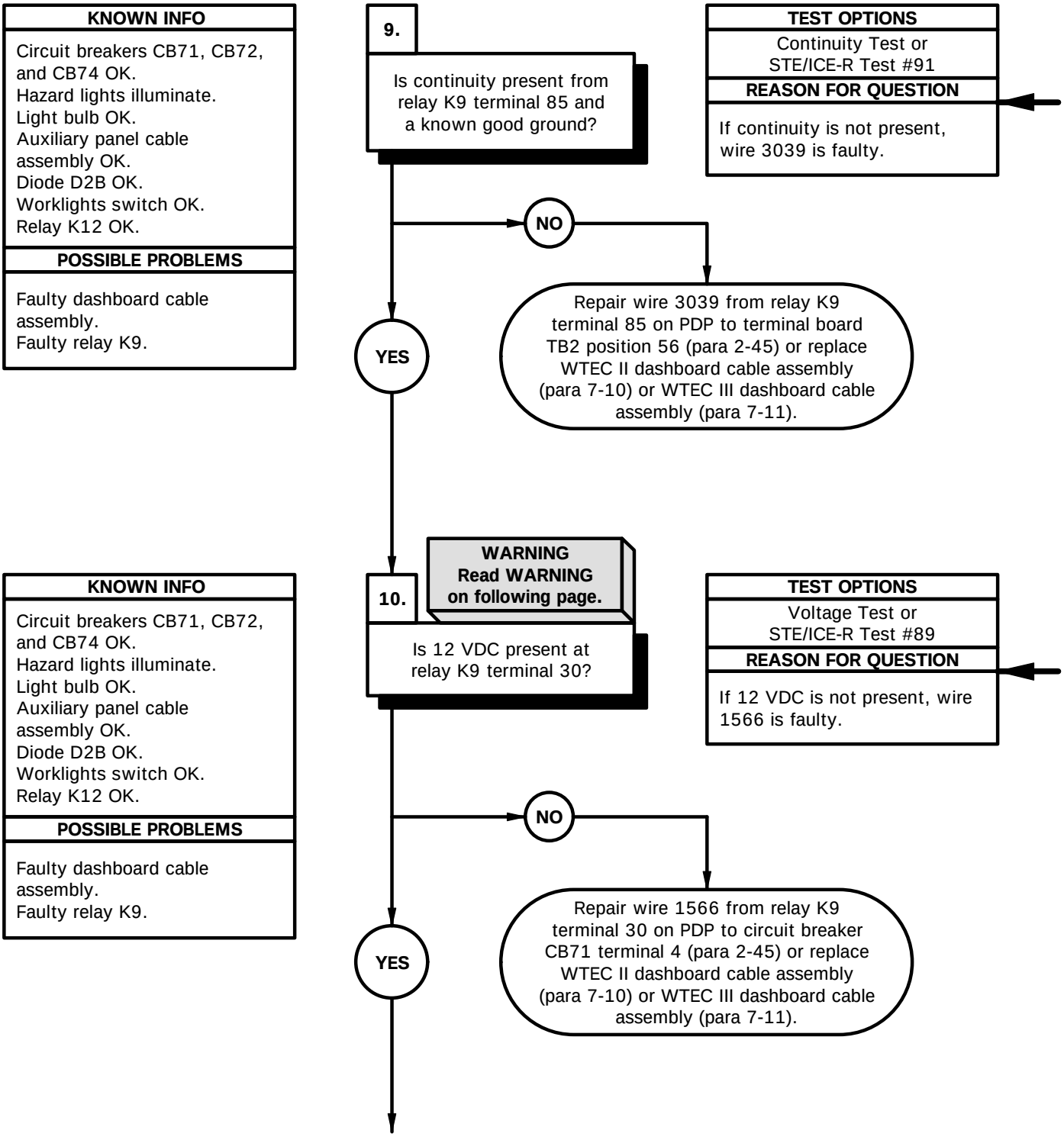
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Install diode D2B in PDP.
(2) Remove relay K9 from PDP.
(3) Set multimeter to volts DC.
(4) Connect positive (+) probe of multimeter to PDP, where relay K9 terminal 86 was removed.
(5) Connect negative (-) probe of multimeter to ground.
(6) Position main light switch to STOP LIGHT (TM 9-232-366-10-1) and note reading on multimeter.
(7) If 12 VDC is not present repair wire 1514 relay K9 terminal 86 to circuit breaker CB74 terminal 6 (para 2-45) or replace WTEC II dashboard cable (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(8) Position main light switch to OFF (TM 9-2320-366-10-1).

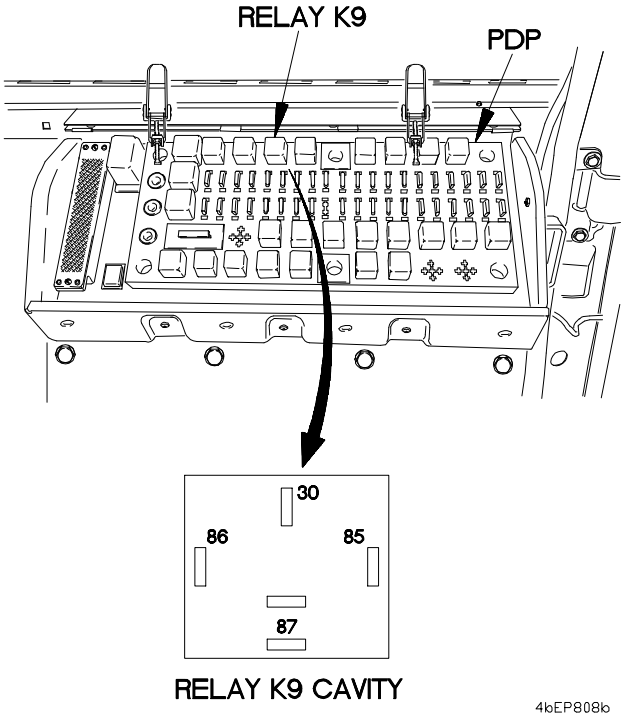


e148. M1088/M1089 WORKLIGHTS DO NOT ILLUMINATE (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to PDP, where relay K9 terminal 85 was removed.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair wire 3039 from relay K9 terminal 85 on PDP to terminal board TB2 position 56 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).



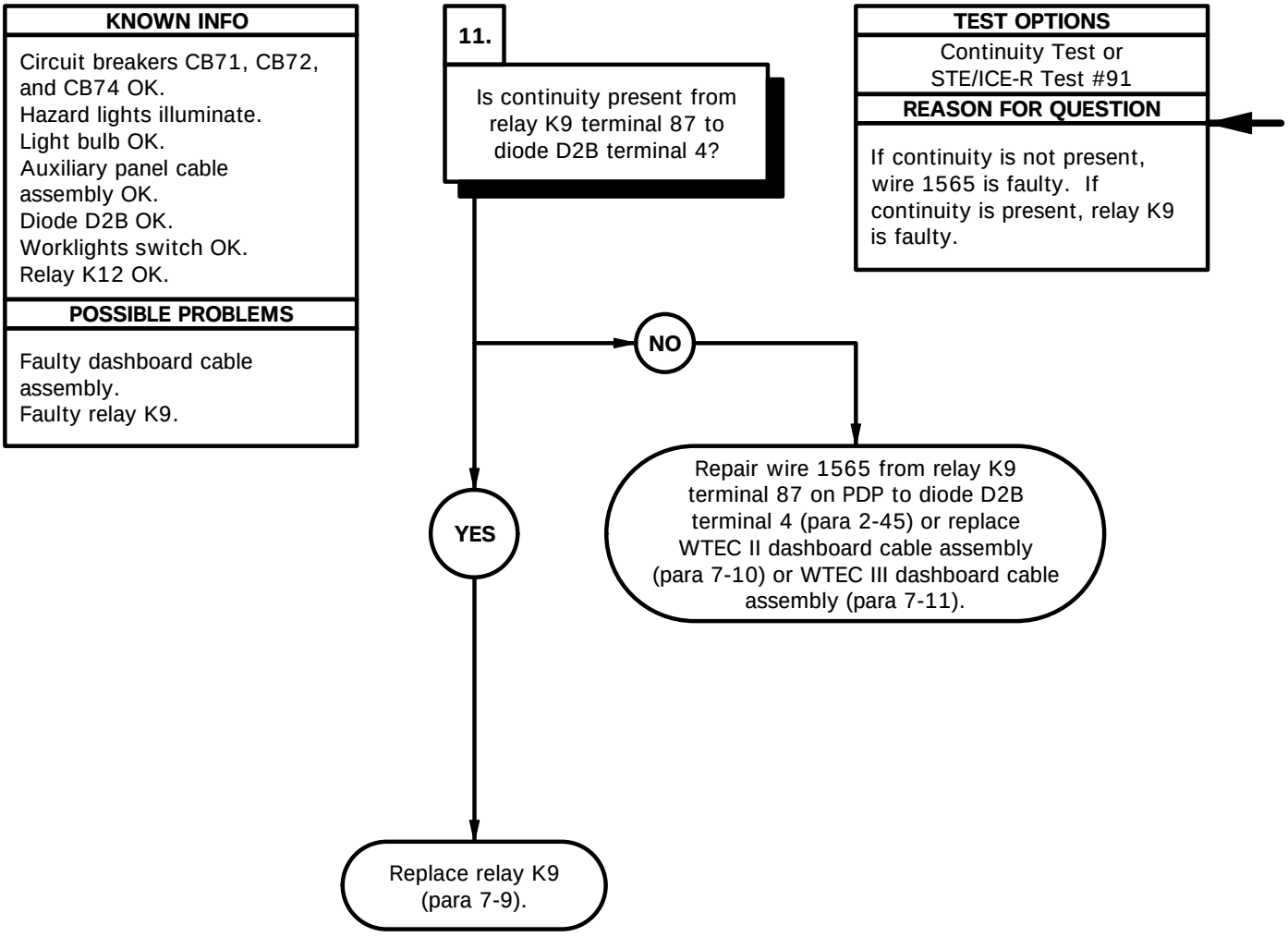
WARNING

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 circuits and cause severe burns or electrical shock.

VOLTAGE TEST

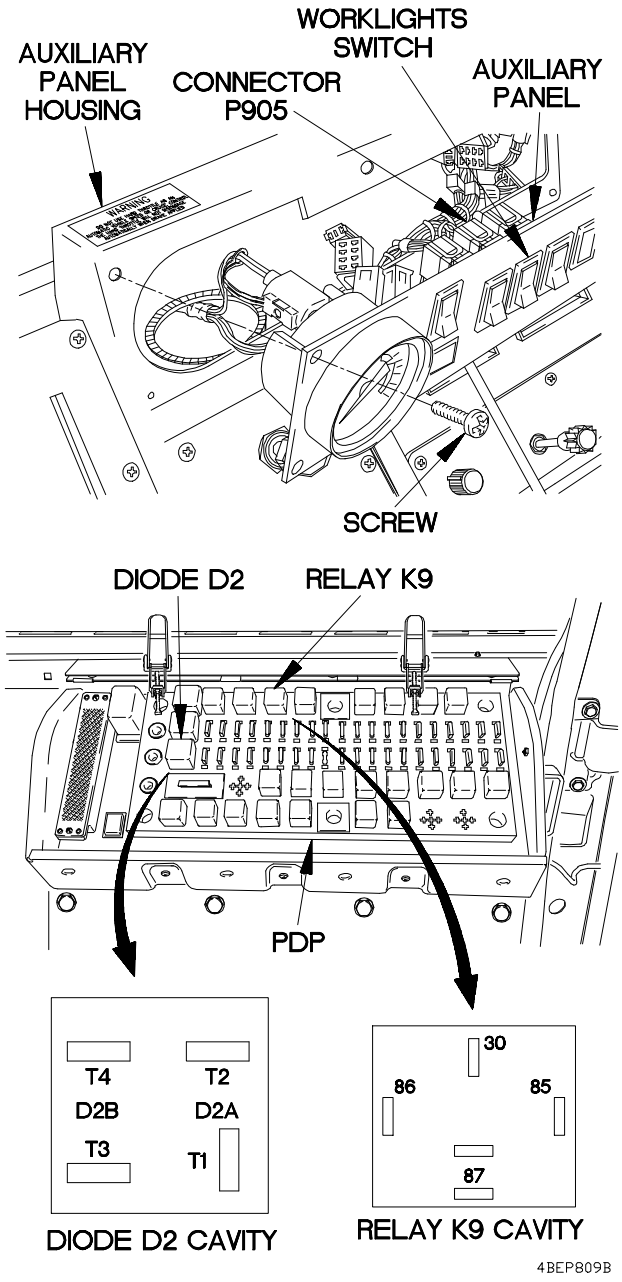
(1) Set multimeter to volts DC.
(2) Connect positive (+) probe of multimeter to PDP, where relay K9 terminal 30 was removed.
(3) Connect negative (-) probe of multimeter to ground.
(4) Position main light switch to STOP LIGHT (TM 9-2320-366-10-1) and note reading on multimeter.
(5) If 12 VDC is not present, repair wire 1566 from relay K9 terminal 30 on PDP to circuit breaker CB71 terminal 4 (para 2-45) or replace WTEC II dashboard cable (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(6) Position main light switch to OFF (TM 9-2320-366-10-1).

e148. M1088/M1089 WORKLIGHTS DO NOT ILLUMINATE (CONT)

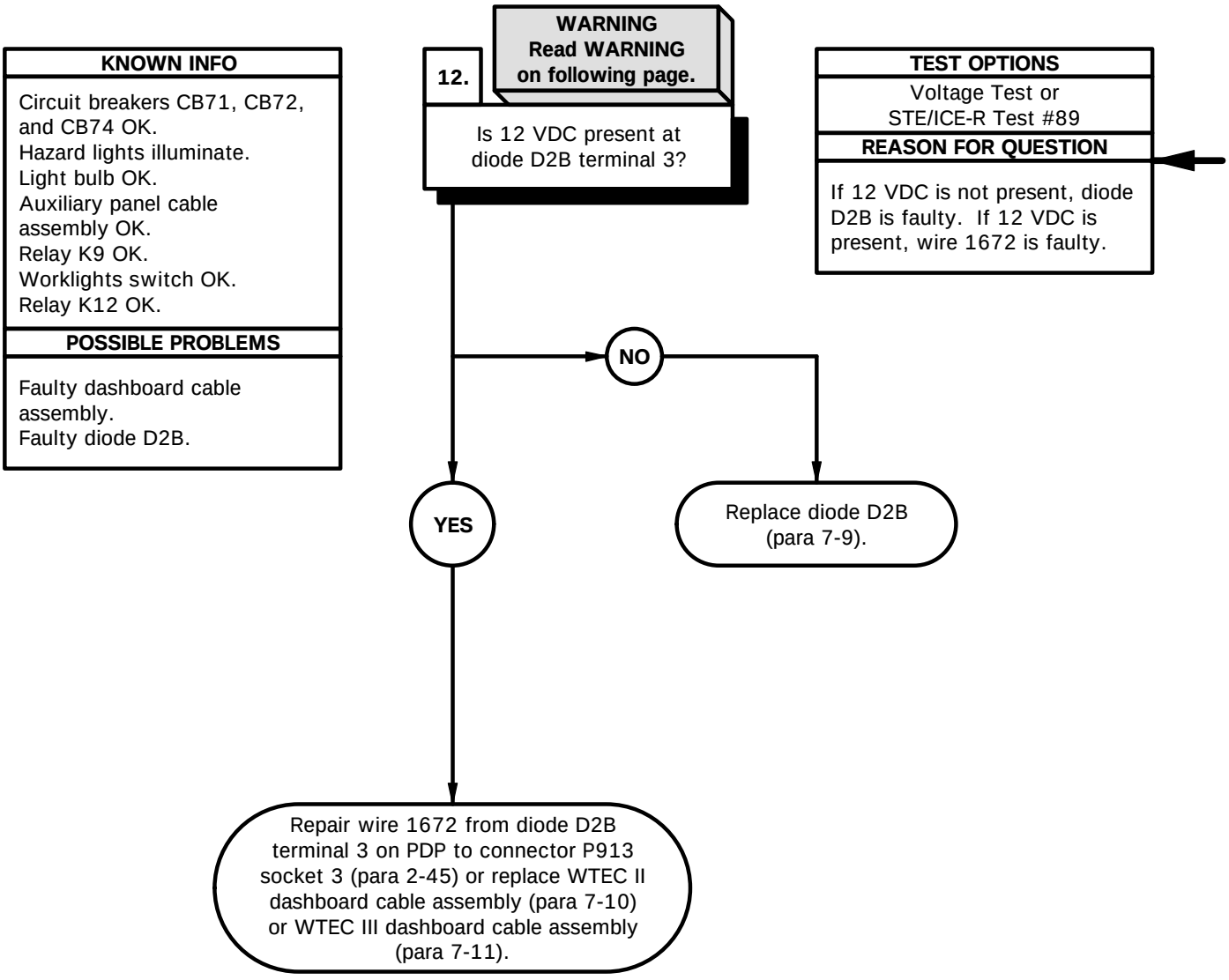


VOLTAGE TEST

(1) Set multimeter to ohms.
(2) Remove diode D2B from PDP.
(3) Connect positive (+) probe of multimeter to PDP, where relay K9 terminal 87 was removed.
(4) Connect negative (-) probe of multimeter to PDP, where diode D2B terminal 4 was removed and note reading on multimeter.
(5) If continuity is not present, repair wire 1565 from relay K9 terminal 87 to diode D2B terminal 4 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(6) If continuity is present, replace relay K9 (para 7-9).
(7) Install relay K9 in PDP.
(8) Install diode D2B in PDP.
(9) Install PDP cover (para 16-2).
(10) Connect connector P905 to worklights switch.
(11) Position auxiliary panel on auxiliary panel housing with six screws.
(12) Tighten six screws to 24 lb-in. (3 N·m).



e148. M1088/M1089 WORKLIGHTS DO NOT ILLUMINATE (CONT)

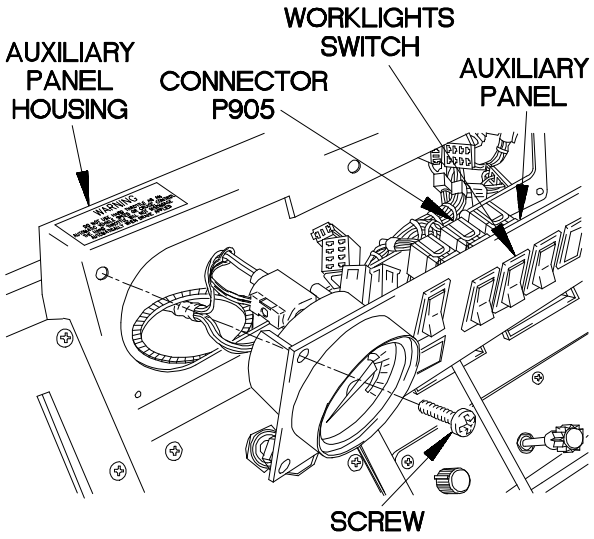


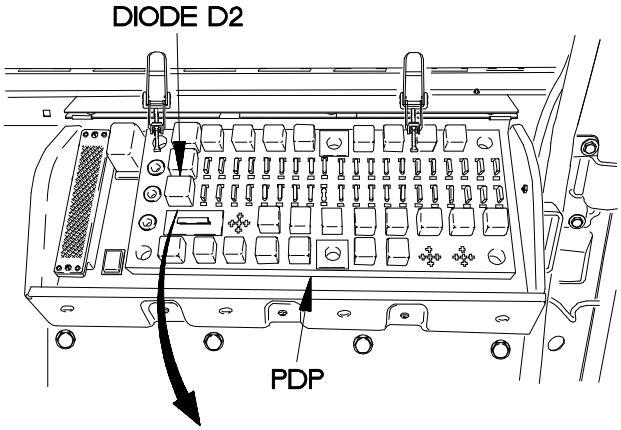
WARNING

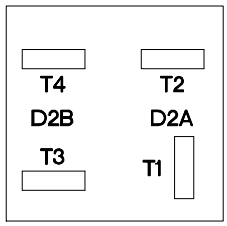
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Set multimeter to volts DC.
(2) Connect positive (+) probe of multimeter to PDP, where diode D2B terminal 3 was removed.
(3) Connect negative (-) probe of multimeter to ground.
(4) Position main light switch to STOP LIGHT (TM 9-2320-366-10-1) and note reading on multimeter.
(5) If 12 VDC is not present, replace diode D2B (para 7-9).
(6) If 12 VDC is present, repair wire 1672 from diode D2B terminal 3 on PDP to connector P913 socket 3 (para 2-45) or replace WTEC II dashboard cable (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(7) Position main light switch to OFF (TM 9-2320-366-10-1).
(8) Install diode D2B in PDP.
(9) Install PDP cover (para 16-2).
(10) Connect connector P905 to worklights switch.
(11) Position auxiliary panel on auxiliary panel housing with six screws.
(12) Tighten six screws to 24 lb-in. (3 N·m).



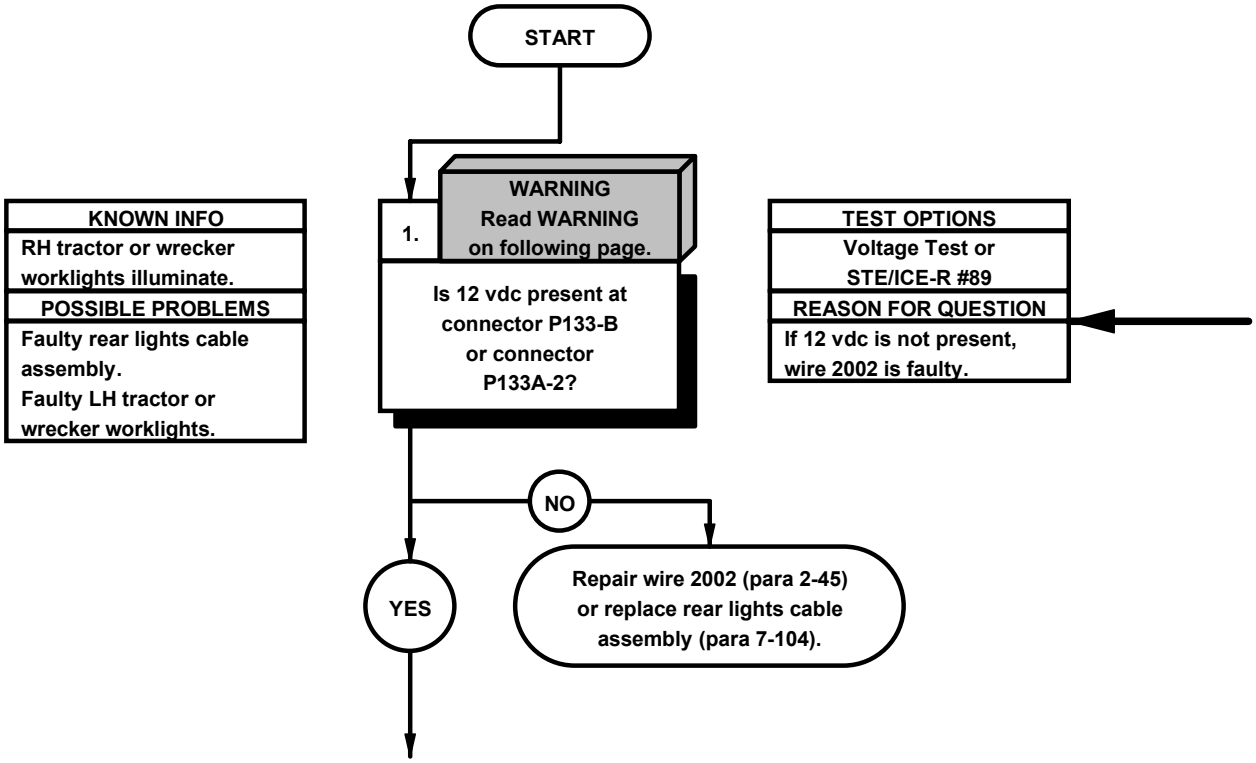




DIODE D2 CAVITY

4BEP810B

e149. M1088/M1089 (LH) WORKLIGHTS DO NOT ILLUMINATE	
INITIAL SETUP	
Equipment Condition Engine shut down (TM 9-2320-366-10-1). **Personnel Required** (2) **Materials/Parts** Wire, Elect, 50 ft (Item 71, Appendix D)	**Tools and Special Tools** Tool Kit, Genl Mech (Item 46, Appendix C) STE/ICE-R (Item 41, Appendix C) Multimeter, Digital (Item 22, Appendix C) **References** TM 9-4910-571-12&P

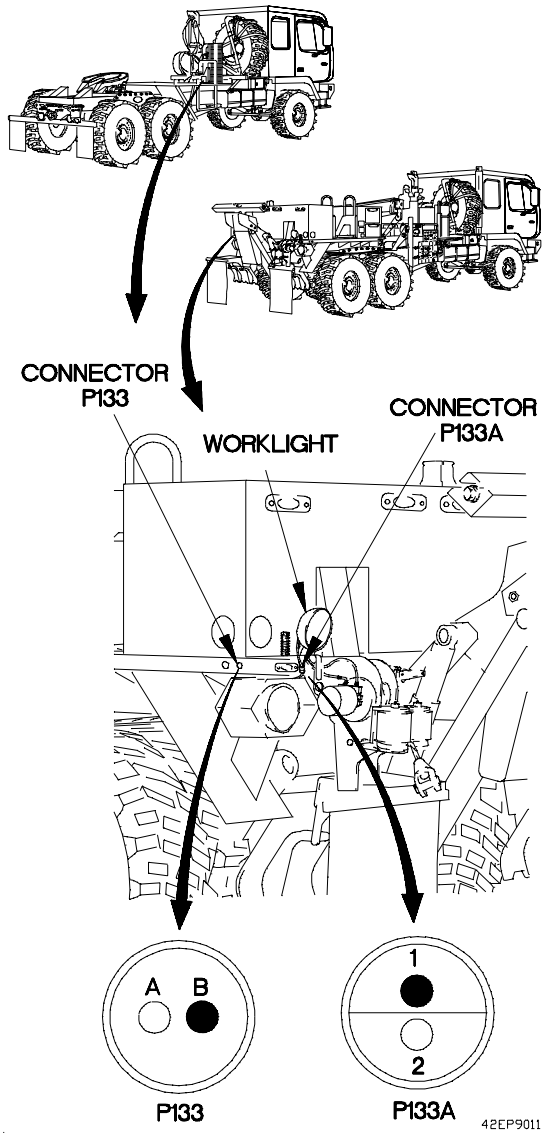


WARNING

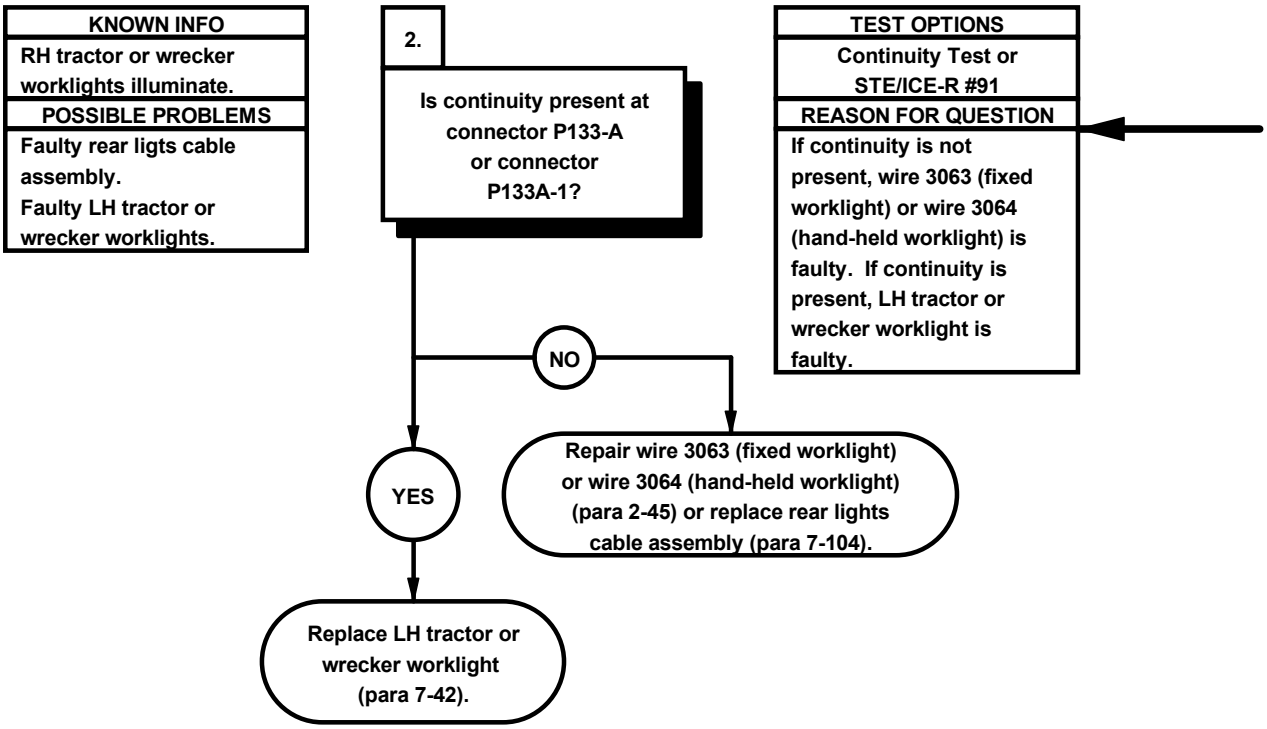
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

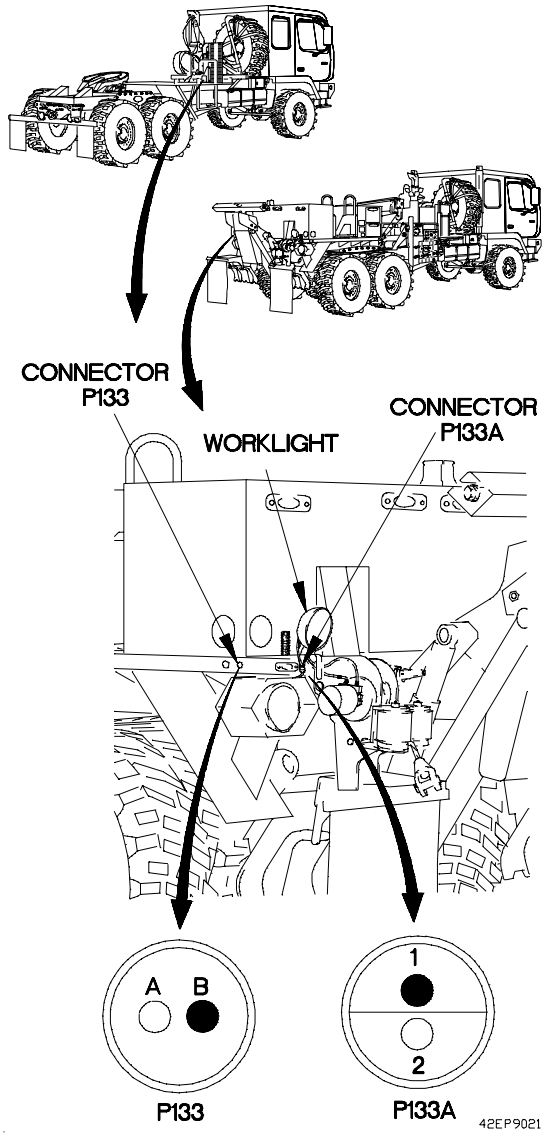
(1) Disconnect LH tractor or wrecker worklight from connector P133 or connector P133A.
(2) Set multimeter to volts dc.
(3) Connect positive (+) probe of multimeter to connector P133-B or connector P133A-2.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position main light switch to STOP/PARK (TM 9-2320-366-10-1).
(6) Position work light switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(7) If 12 vdc is not present, repair wire 2002 (para 2-45) or replace rear lights cable assembly (para 7-104).
(8) Position work light switch to off (TM 9-2320-366-10-1).
(9) Position main light switch to OFF (TM 9-2320-366-10-1).



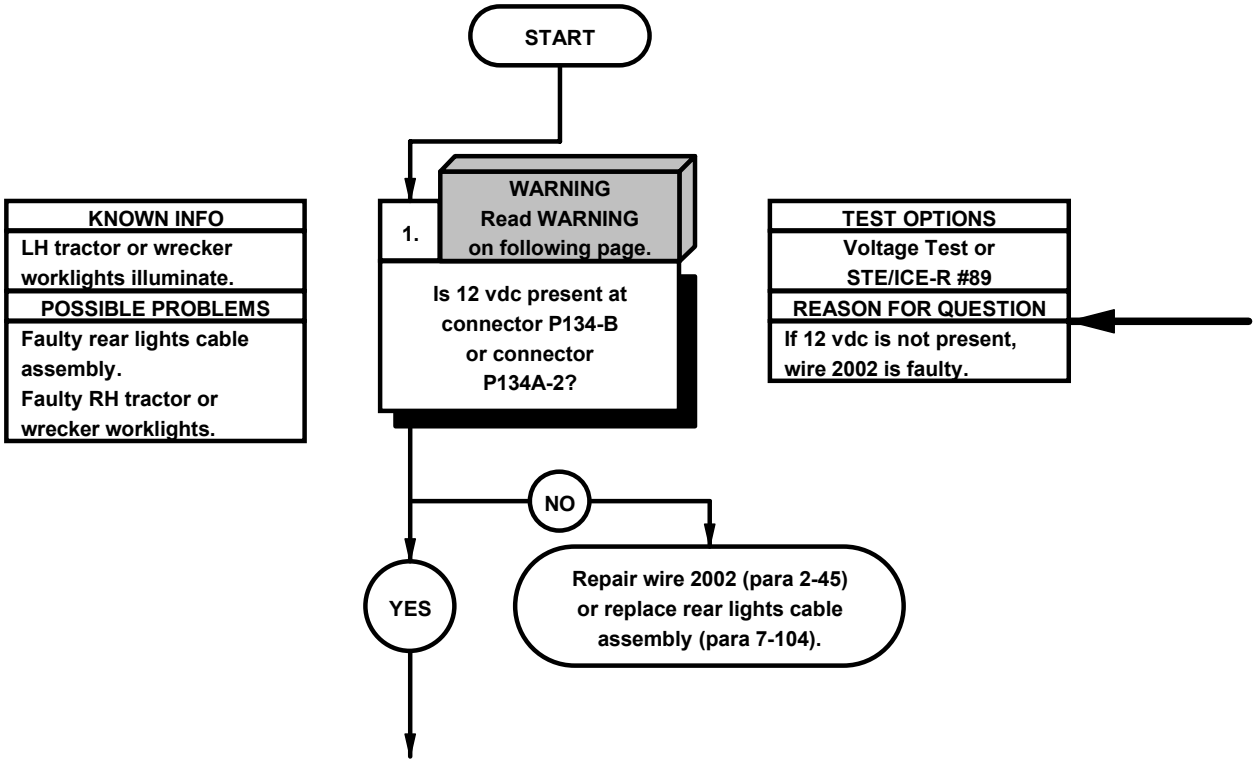
e149. M1088/M1089 (LH) WORKLIGHTS DO NOT ILLUMINATE (CONT)



CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P133-A or connector P133A-1.
(4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(5) If continuity is not present, repair wire 3063 (fixed worklight) or wire 3064 (hand-held worklight) (para 2-45) or replace rear lights cable assembly (para 7-104).
(6) If continuity is present, replace LH tractor or wrecker worklight (para 7-42).
(7) Connect worklight to connector P133 or P133A on LH tractor or wrecker.



e150. M1088/M1089 (RH) WORKLIGHTS DO NOT ILLUMINATE	
INITIAL SETUP	
Equipment Condition Engine shut down (TM 9-2320-366-10-1). **Personnel Required** (2) **Materials/Parts** Wire, Elect, 50 ft (Item 71, Appendix D)	**Tools and Special Tools** Tool Kit, Genl Mech (Item 46, Appendix C) STE/ICE-R (Item 41, Appendix C) Multimeter, Digital (Item 22, Appendix C) **References** TM 9-4910-571-12&P

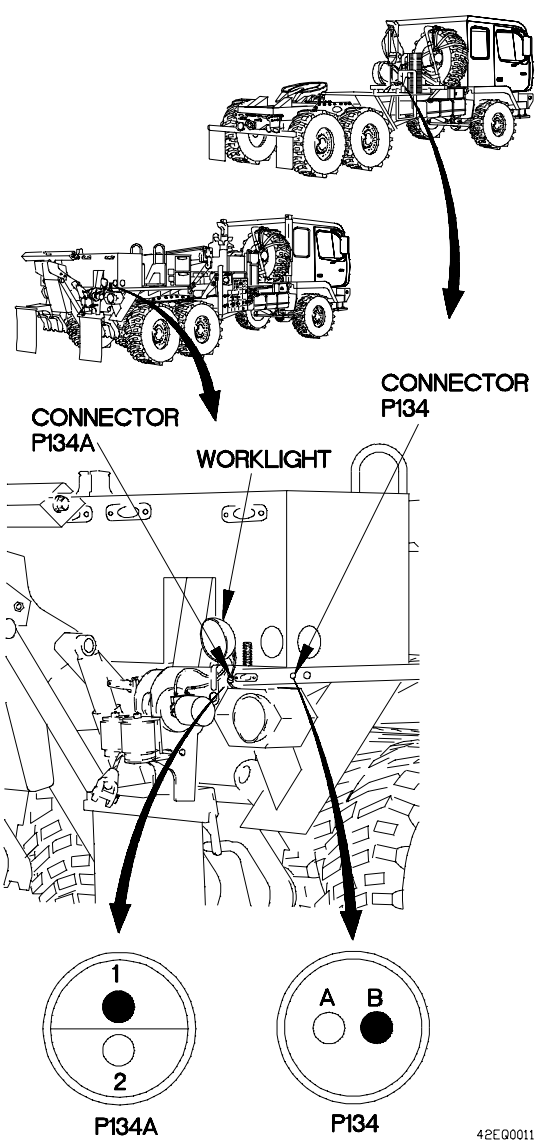


WARNING

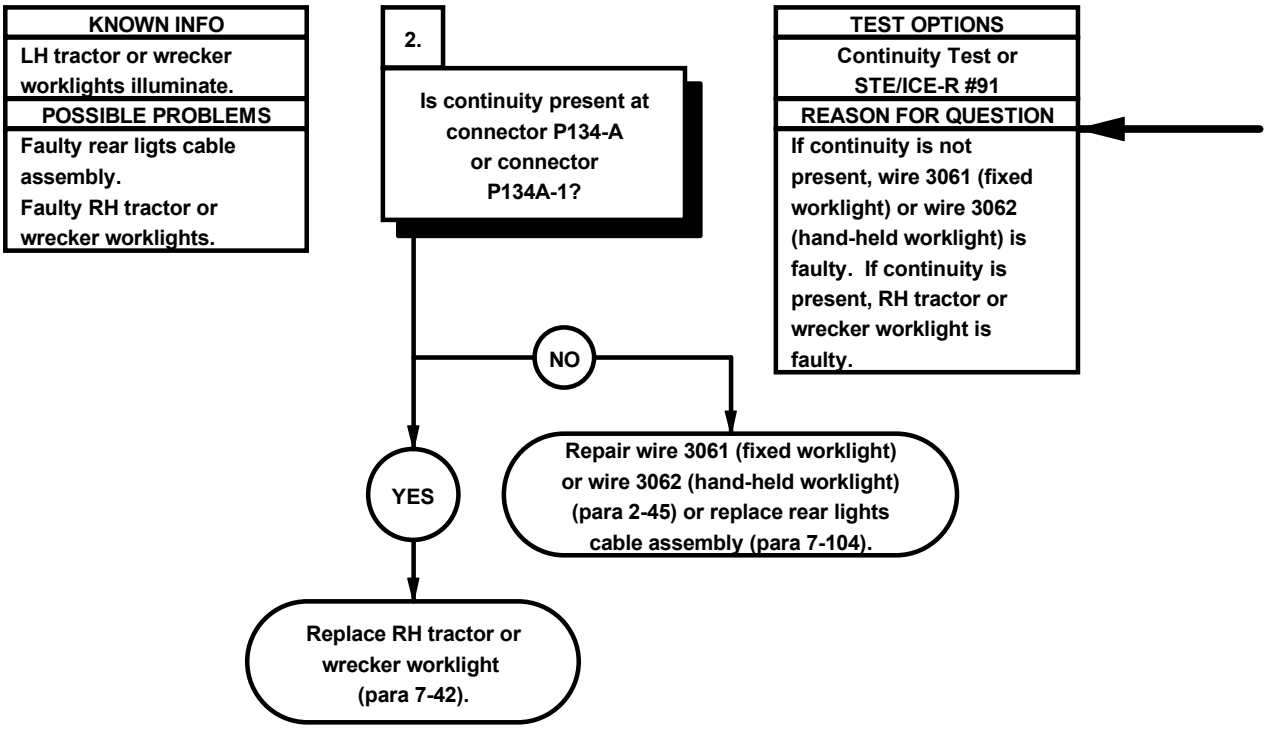
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

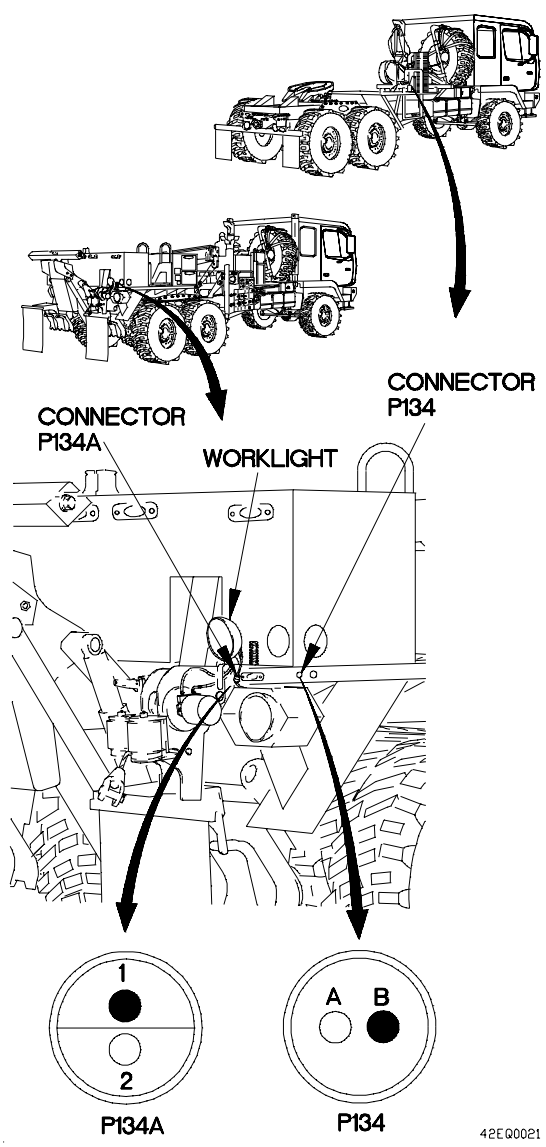
(1) Disconnect RH tractor or wrecker worklight from connector P134 or connector P134A.
(2) Set multimeter to volts dc.
(3) Connect positive (+) probe of multimeter to connector P134-B or connector P134A-2.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position main light switch to STOP/PARK (TM 9-2320-366-10-1).
(6) Position work light switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(7) If 12 vdc is not present, repair wire 2002 (para 2-45) or replace rear lights cable assembly (para 7-104).
(8) Position work light switch to off (TM 9-2320-366-10-1).
(9) Position main light switch to OFF (TM 9-2320-366-10-1).



e150. M1088/M1089 (RH) WORKLIGHTS DO NOT ILLUMINATE (CONT)



CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P134-A or connector P134A-1.
(4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(5) If continuity is not present, repair wire 3061 (fixed worklight) or wire 3062 (hand-held worklight) (para 2-45) or replace rear lights cable assembly (para 7-104).
(6) If continuity is present, replace RH tractor or wrecker worklight (para 7-42).
(7) Connect worklight to connector P134 or P134A on RH tractor or wrecker.



e151. M1088/M1089 WORKLIGHTS DO NOT ILLUMINATE IN BLACKOUT MODE WITH BLACKOUT OVERRIDE SWITCH ON

INITIAL SETUP

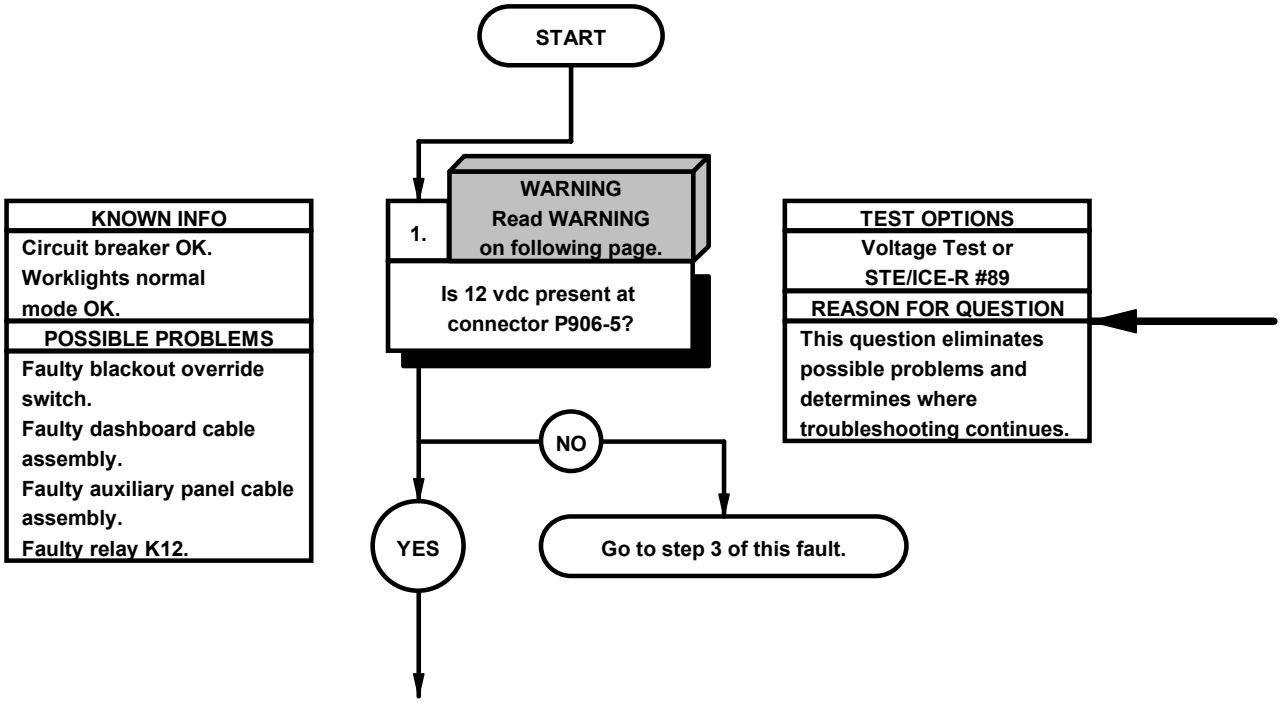
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).

Personnel Required
(2)

References
TM 9-4910-571-12&P

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)

Materials/Parts
Wire, Elect, 50 ft (Item 71, Appendix D)

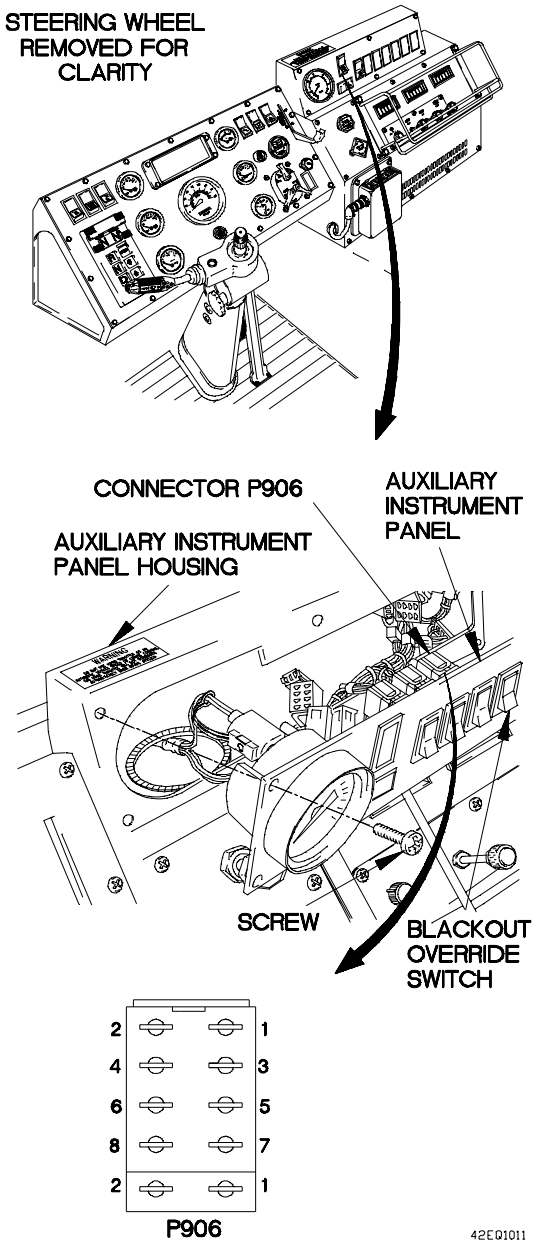


WARNING

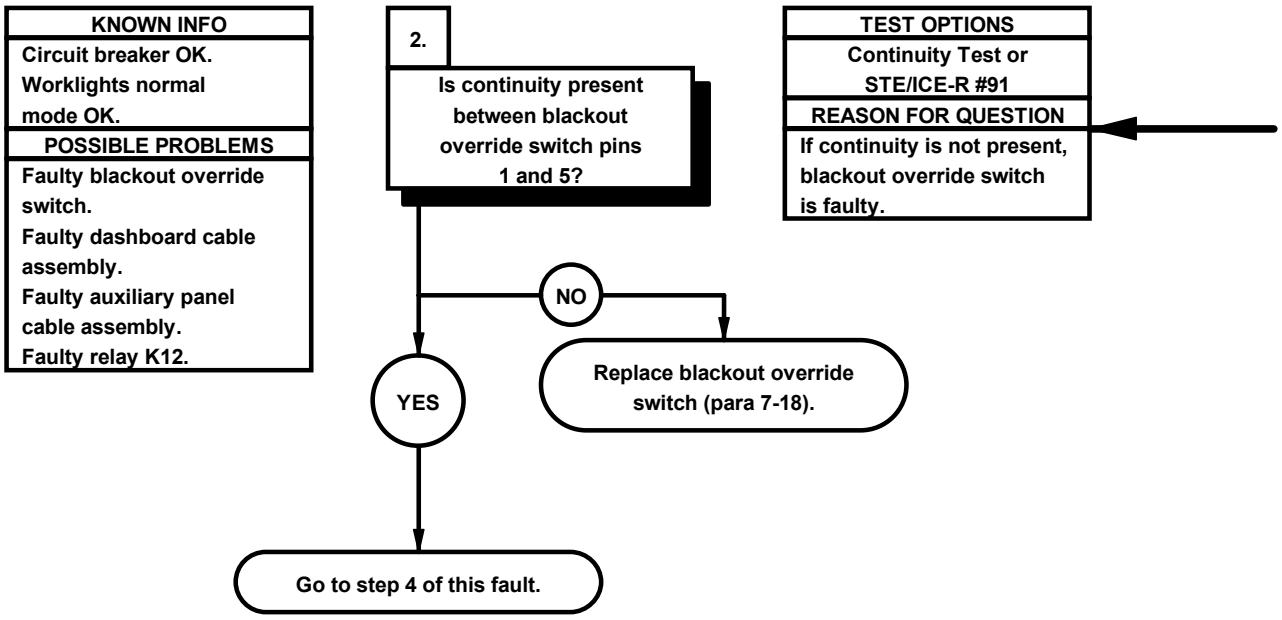
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

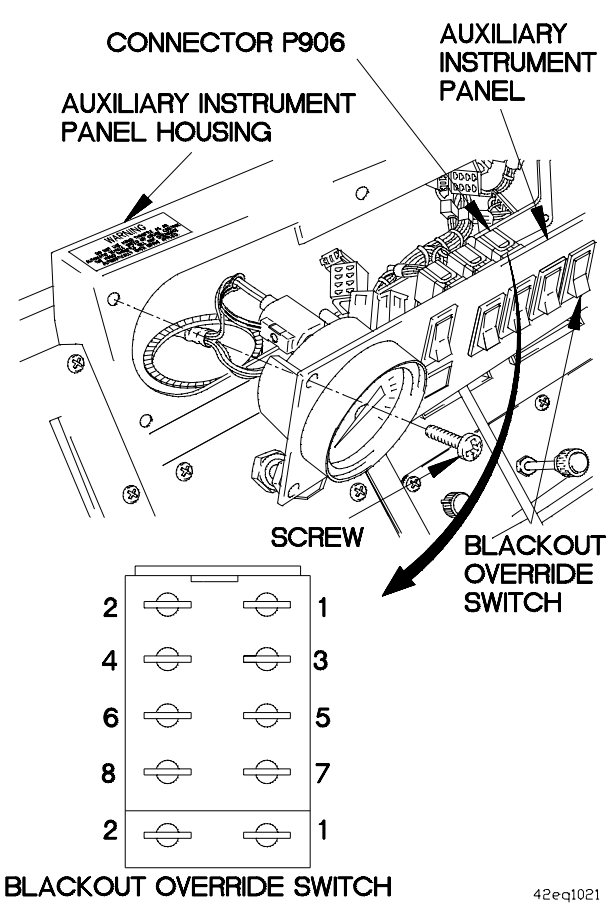
(1) Remove six screws from auxiliary panel.
(2) Lift auxiliary panel from auxiliary panel housing outward to gain access.
(3) Disconnect connector P906 from blackout override switch.
(4) Set multimeter to volts dc.
(5) Connect positive (+) probe of multimeter to connector P906-5.
(6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(7) If 12 vdc is not present, go to step 3 of this fault.



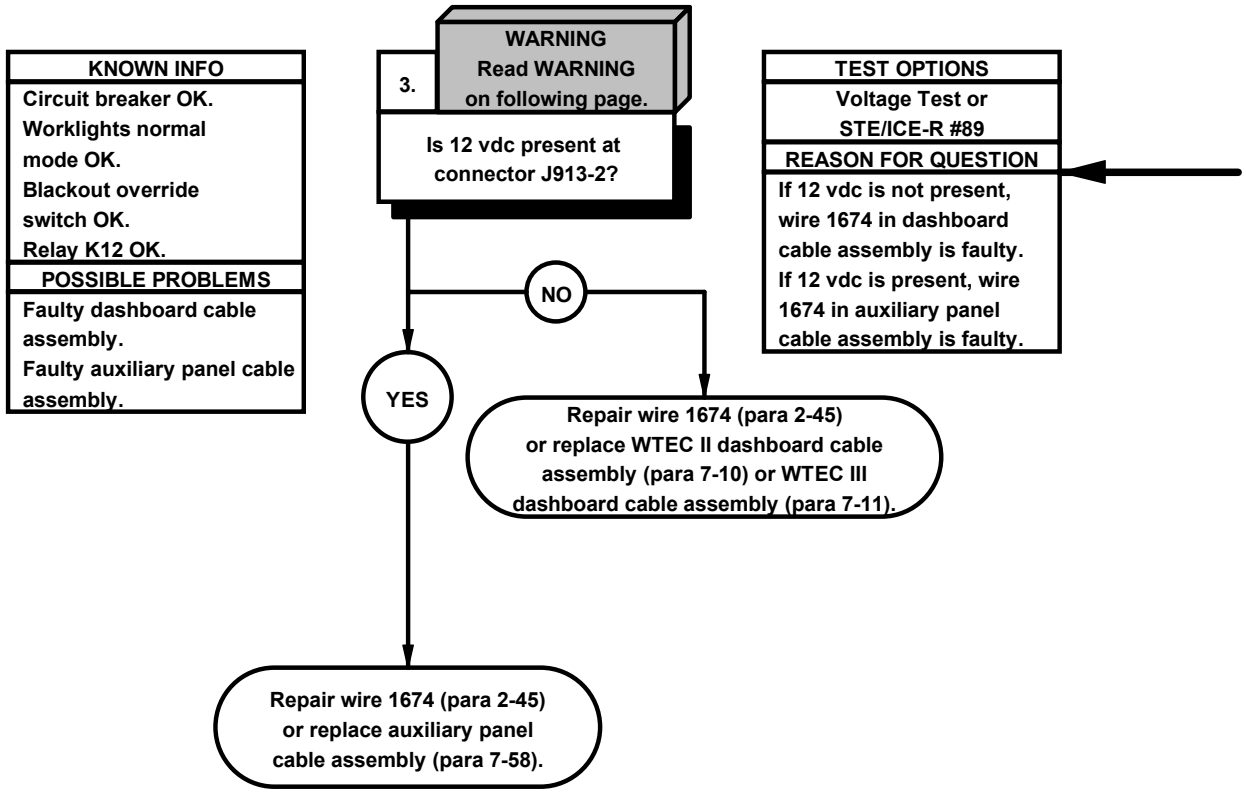
e151. M1088/M1089 WORKLIGHTS DO NOT ILLUMINATE IN BLACKOUT MODE WITH BLACKOUT OVERRIDE SWITCH ON (CONT)



CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Position blackout override switch to on.
(3) Connect positive (+) probe of multimeter to blackout override switch pin 5.
(4) Connect negative (-) probe of multimeter to blackout override switch pin 1and note reading on multimeter.
(5) If continuity is not present, replace blackout override switch (para 7-18).
(6) If continuity is present, go to step 4 of this fault.
(7) Position blackout override switch to off.



e151. M1088/M1089 WORKLIGHTS DO NOT ILLUMINATE IN BLACKOUT MODE WITH BLACKOUT OVERRIDE SWITCH ON (CONT)

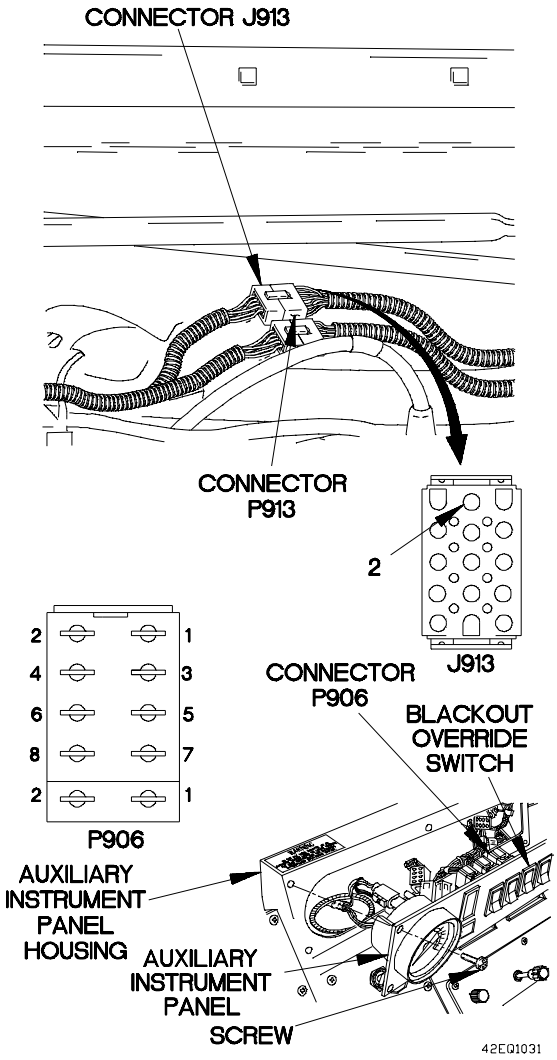


WARNING

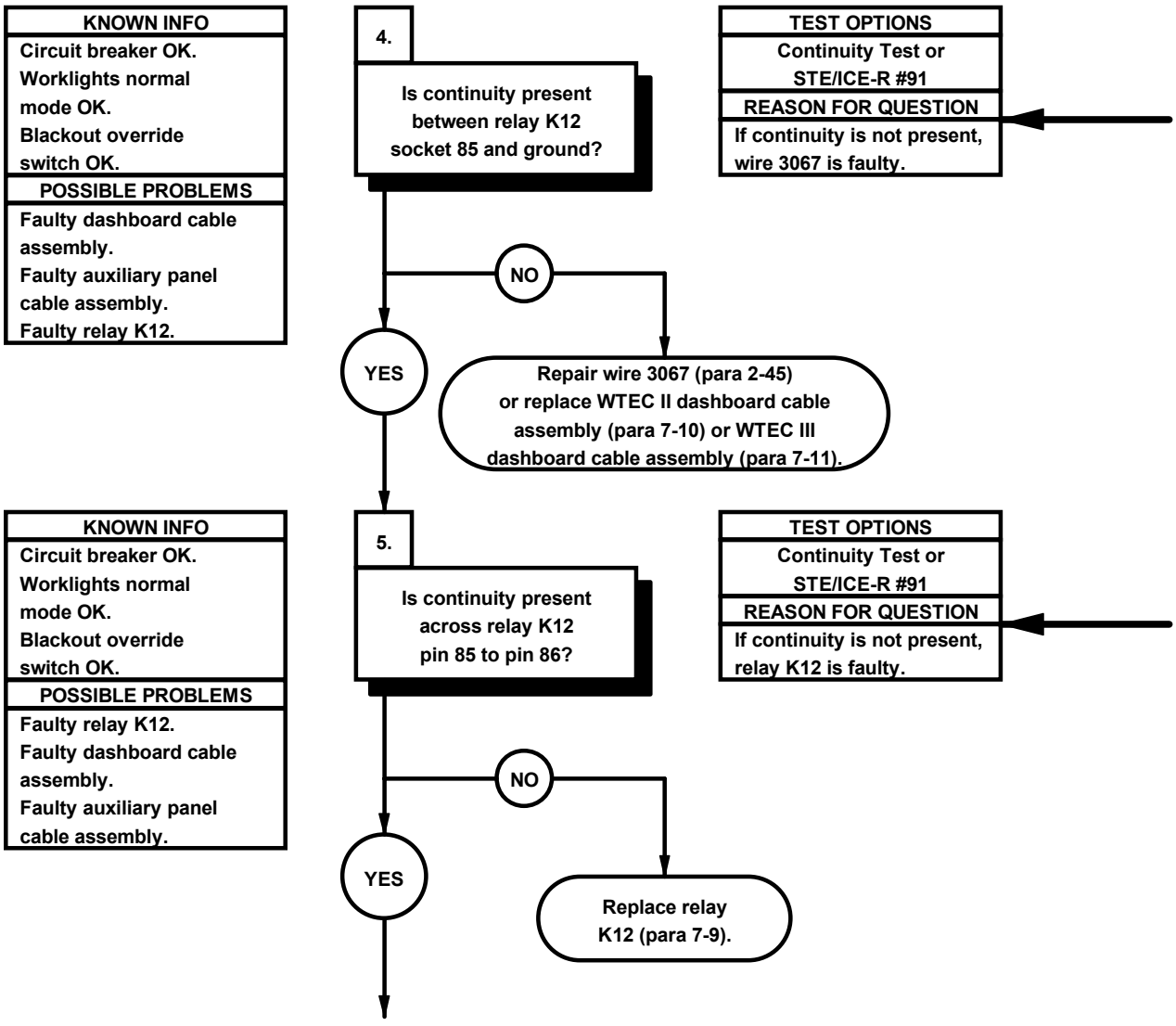
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

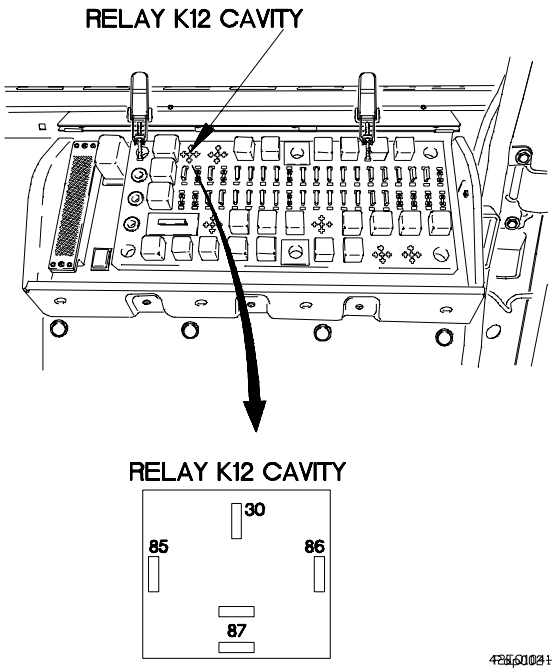
(1) Remove personnel heater to gain access (para 18-9).
(2) Disconnect connector P913 from connector J913.
(3) Set multimeter to volts dc.
(4) Connect positive (+) probe of multimeter to connector J913-2.
(5) Connect negative (-) probe of multimeter to ground.
(6) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(7) If 12 vdc is not present, repair wire 1674 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(8) If 12 vdc is present, repair wire 1674 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
(9) Position master power switch to off (TM 9-2320-366-10-1).
(10) Connect connector P913 to connector J913.
(11) Install personnel heater (para 18-9).
(12) Connect connector P906 to blackout override switch.
(13) Position auxiliary panel on auxiliary panel housing with six screws.
(14) Tighten six screws to 24 lb-in. (3 N·m).



e151. M1088/M1089 WORKLIGHTS DO NOT ILLUMINATE IN BLACKOUT MODE WITH BLACKOUT OVERRIDE SWITCH ON (CONT)

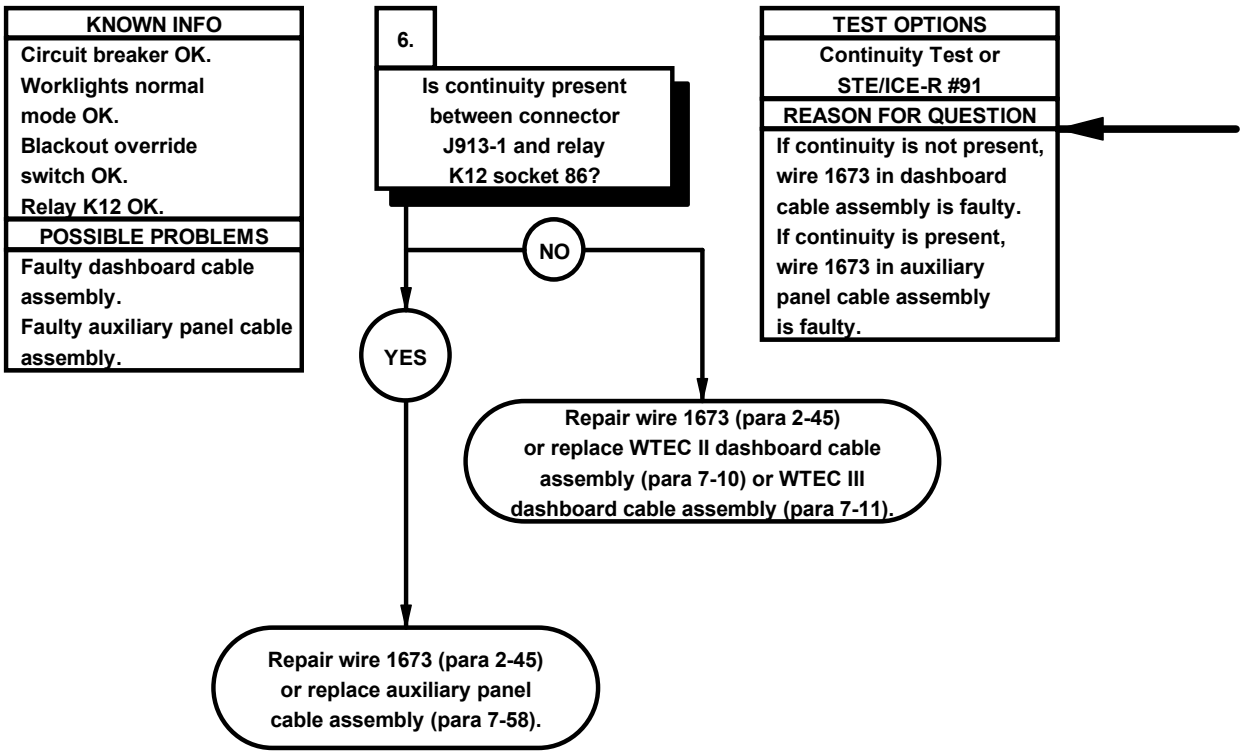


CONTINUITY TEST
(1) Remove PDP cover (para 16-2).
(2) Remove relay K12 from PDP.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to relay K12 socket 85.
(5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(6) If continuity is not present, repair wire 3067 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).



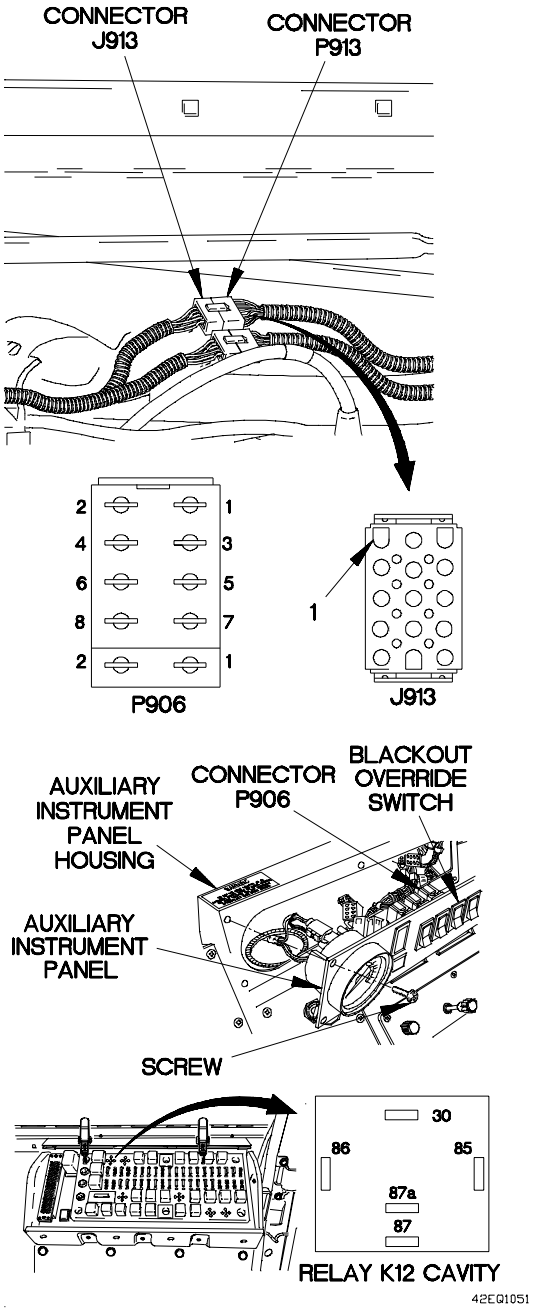
CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to relay K12 pin 85.
(3) Connect negative (-) probe of multimeter to relay K12 pin 86 and note reading on multimeter.
(4) If continuity is not present, replace relay K12 (para 7-9).

e151. M1088/M1089 WORKLIGHTS DO NOT ILLUMINATE IN BLACKOUT MODE WITH BLACKOUT OVERRIDE SWITCH ON (CONT)



VOLTAGE TEST

(1) Remove personnel heater to gain access (para 18-9).
(2) Disconnect connector P913 from connector J913.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector J913-1.
(5) Connect negative (-) probe of multimeter to PDP, relay K12 socket 86 and note reading on multimeter.
(6) If continuity is not present, repair wire 1673 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(7) If continuity is present, repair wire 1673 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
(8) Connect connector P913 to connector J913.
(9) Install relay K12 in PDP.
(10) Install personnel heater (para 18-9).
(11) Connect connector P906 to blackout override switch.
(12) Position auxiliary panel on auxiliary panel housing with six screws.
(13) Tighten six screws to 24 lb-in. (3 N·m).



e152. M1084/M1086 WORKLIGHTS DO NOT ILLUMINATE

INITIAL SETUP

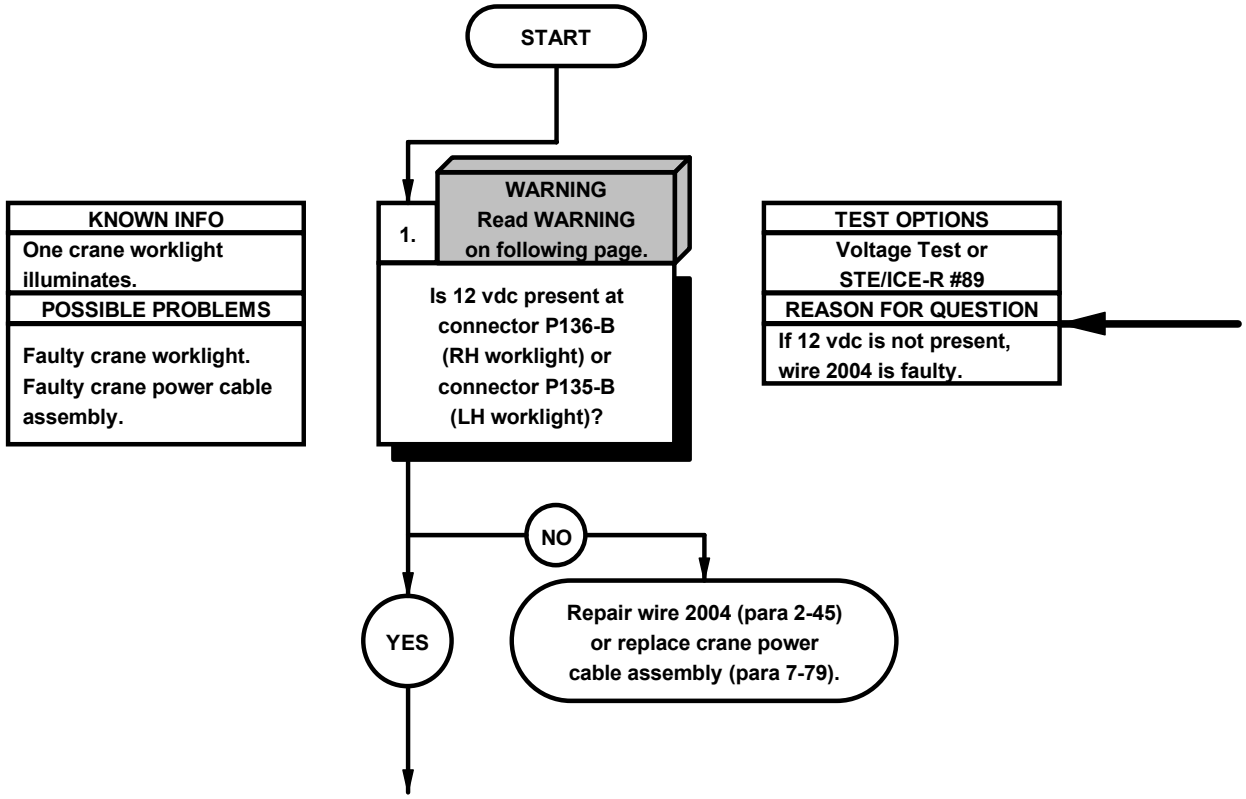
Equipment Condition
Engine shut down (TM 9-2320-366-10-1).

Personnel Required
(2)

Materials/Parts
Wire, Elect, 50 ft (Item 71, Appendix D)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

References
TM 9-4910-571-12&P

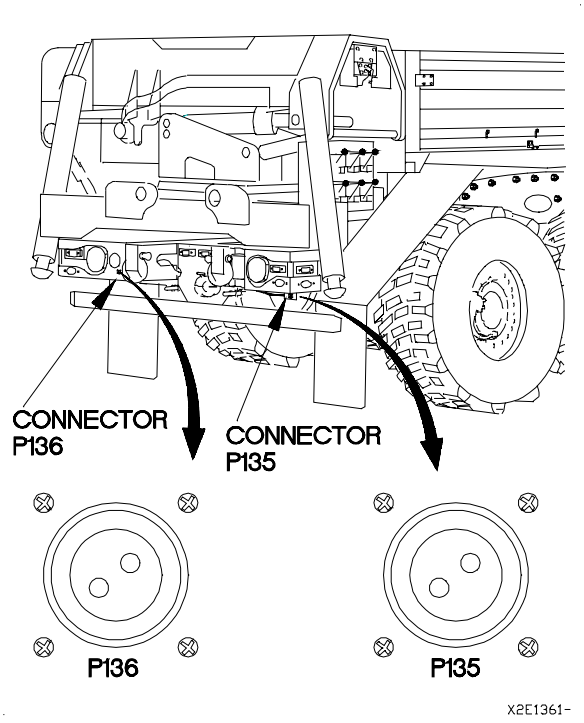


WARNING

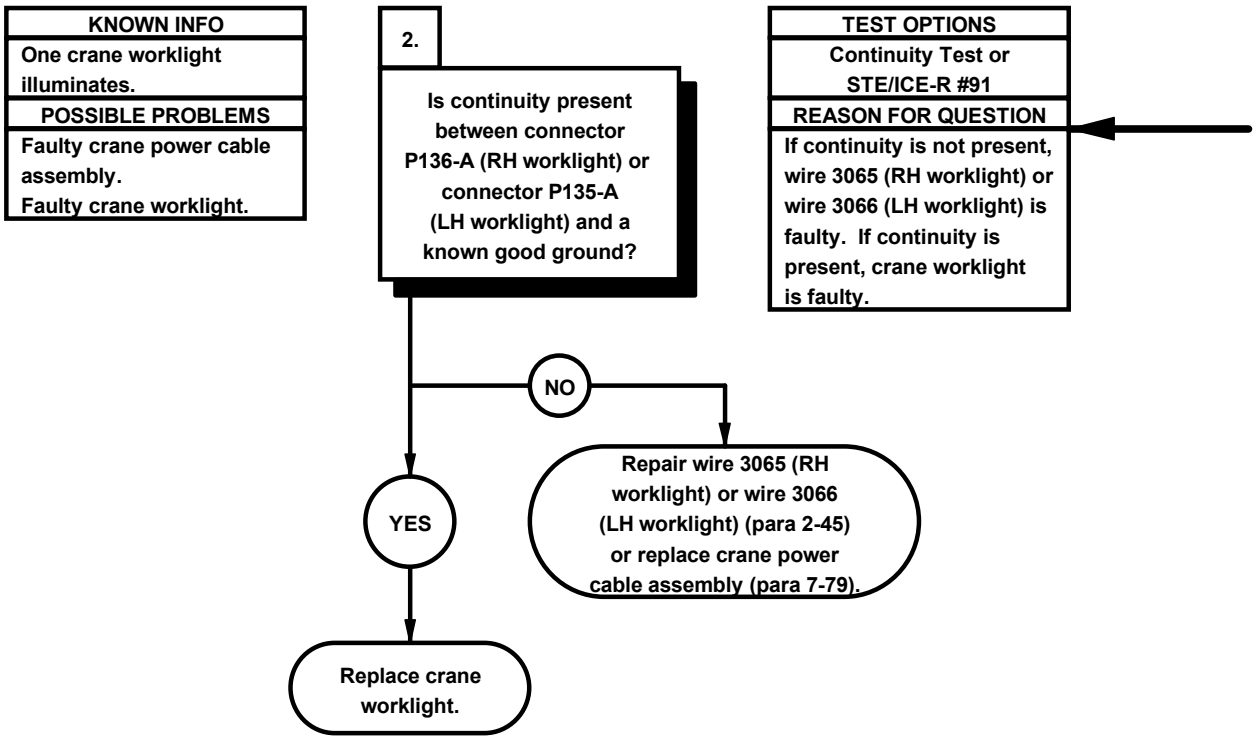
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Disconnect connector P136 (RH worklight) or P135 (LH worklight).
(2) Set multimeter to volts dc.
(3) Connect positive (+) probe of multimeter to connector P136-B (RH) or P135-B (LH).
(4) Connect negative (-) probe of multimeter to ground.
(5) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(6) If 12 vdc is not present, repair wire 2004 (para 2-45) or replace crane power cable assembly (para 7-79).
(7) Position master power switch to off (TM 9-2320-366-10-1).

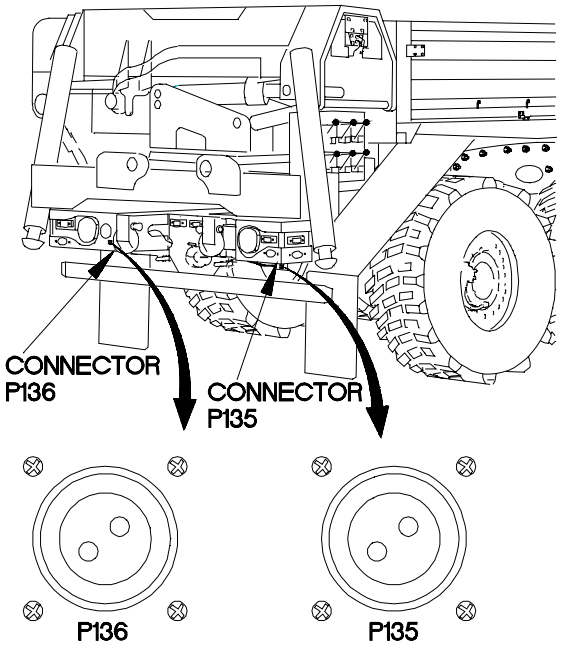


e152. M1084/M1086 WORKLIGHTS DO NOT ILLUMINATE (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to (RH) connector P136-A or (LH) connector P135-A.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair wire 3065 (RH) or wire 3066 (LH) (para 2-45) or replace crane power cable assembly (para 7-79).
(5) If continuity is present, replace crane worklight.
(6) Connect connector P136 (RH) or P135 (LH) crane worklight connector.



X2E1362-

2-17. TRANSMISSION SYSTEM TROUBLESHOOTING

This paragraph covers Transmission System Troubleshooting. The Transmission System Fault Index, Table 2-18, lists faults for the transmission system of the vehicle.

Table 2-18. Transmission System Fault Index

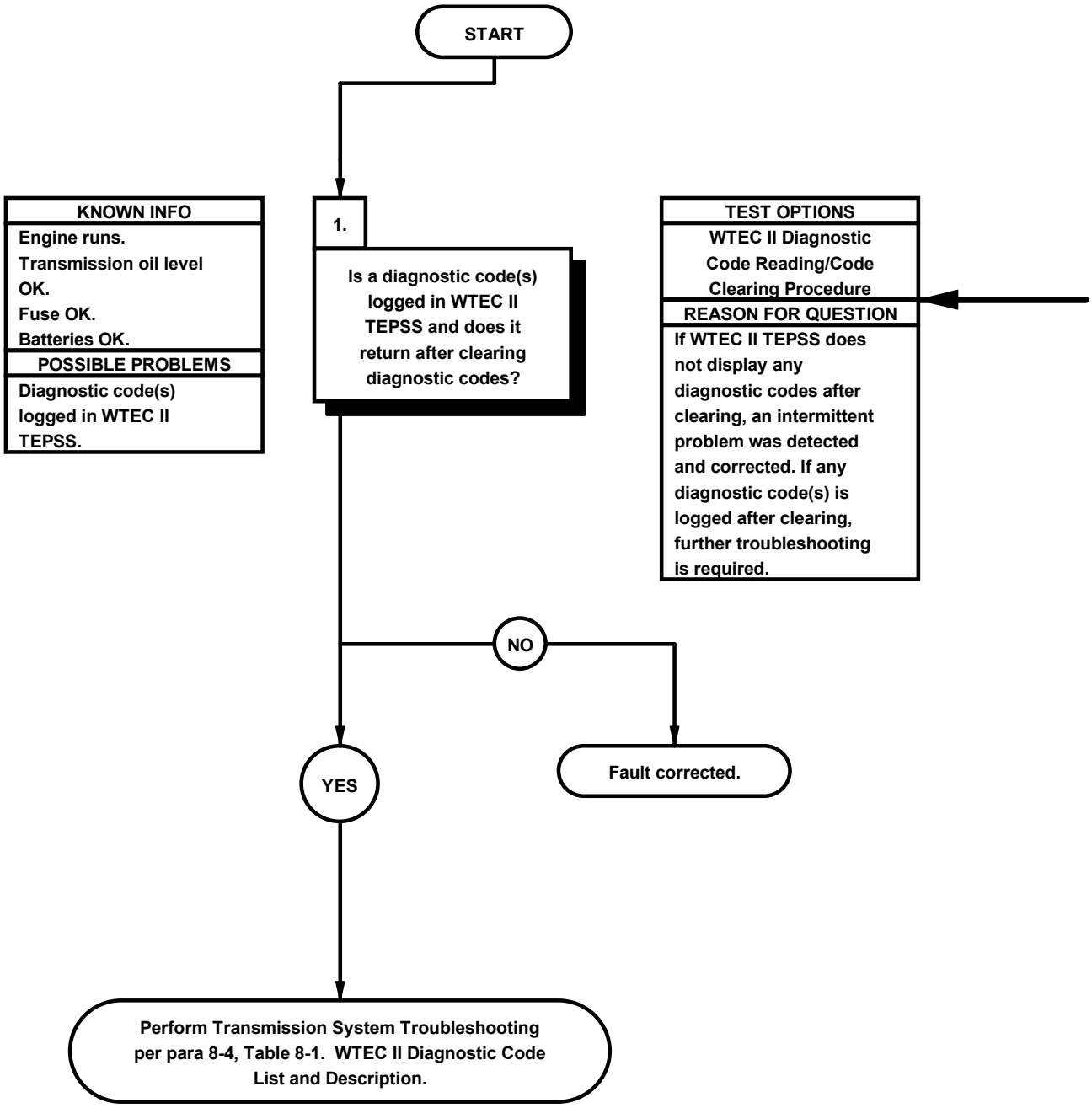
Fault No.	Description	Page
f1.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Emits Eight Seconds of Beeps and/or Transmission Does Not Shift Gears	2-1584
f2.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 14	2-1586
f3.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 15	2-1594
f4.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 16	2-1600
f5.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 24 and/or 33 and Any Sub Code	2-1606
f6.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 32 and Any Sub Code	2-1620
f7.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45, 66, and/or 69 and Any Sub Code	2-1624
f8.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 43 and Any Sub Code	2-1628
f9.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 52 and Any Sub Code	2-1634
f10.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 57 and Any Sub Code	2-1640
f11.	Transmission Unusually Noisy When Operating	2-1644
f12.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 21 and Any Sub Code	2-1654
f13.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 51 Sub Code 10, 12, 21, 43, 45, or 65	2-1668
f14.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 25 and Any Sub Code	2-1672
f15.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 53 and Any Sub Code	2-1676
f16.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 54 Sub Code 01, 07, 10, 12, 17, 21, 23, 27, 32, 34, 43, 45, 54, 56, 65, 70, 71, 72, 80, 81, 82, 83, 85, 86, 92, 93, 95, 96, or 97	2-1680
f17.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 55 and Any Sub Code	2-1686
f18.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 56 and Any Sub Code	2-1692
f19.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 13 and Any Sub Code	2-1698
f19A.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 23 and Any Sub Code	2-1706.2
f19B.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Does Not Illuminate	2-1706.16
f20.	Metal Particles Found During Transmission Oil Change	2-1708
f21.	Transmission Does Not Shift or Is Slow to Shift When Cold	2-1710

2-17. TRANSMISSION SYSTEM TROUBLESHOOTING (CONT)

Table 2-18. Transmission System Fault Index (Cont)

Fault No.	Description	Page
f22.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 14	2-1712
f23.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 15	2-1718
f24.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 16	2-1722
f25.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 24 and/or 33 and Any Sub Code	2-1728
f26.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 32 and Any Sub Code	2-1742
f27.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, 45, 46, 66, and/or 69 and Any Sub Code	2-1748
f28.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 52 and Any Sub Code	2-1752
f29.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 57 and Any Sub Code	2-1758
f30.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 21 and Any Sub Code	2-1762
f31.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 51 and Any Sub Code	2-1776
f32.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 25 and Any Sub Code	2-1780
f33.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 53 and Any Sub Code	2-1784
f34.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 54 and Any Sub Code	2-1788
f35.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 55 and Any Sub Code	2-1794
f36.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 56 and Any Sub Code	2-1800
f37.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 13 and Any Sub Code	2-1806
f38.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Indicator Displays "--" and/or Transmission Does Not Shift Gears	2-1820
f39.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 23 and Any Sub Code	2-1822
f40.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Does Not Illuminate	2-1822.12

f1. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) EMITS EIGHT SECONDS OF BEEPS AND/OR TRANSMISSION DOES NOT SHIFT GEARS
INITIAL SETUP **Equipment Conditions** Engine running (TM 9-2320-366-10-1).



(1) Perform WTEC II Code Reading and Code Clearing (para 8-4).
(2) If no diagnostic codes are logged after clearing, fault is corrected.
(3) If diagnostic codes are still logged, perform Transmission System Troubleshooting of active diagnostic codes per para 8-4, Table 8-1. WTEC II Diagnostic Code List and Description.

f2. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 14

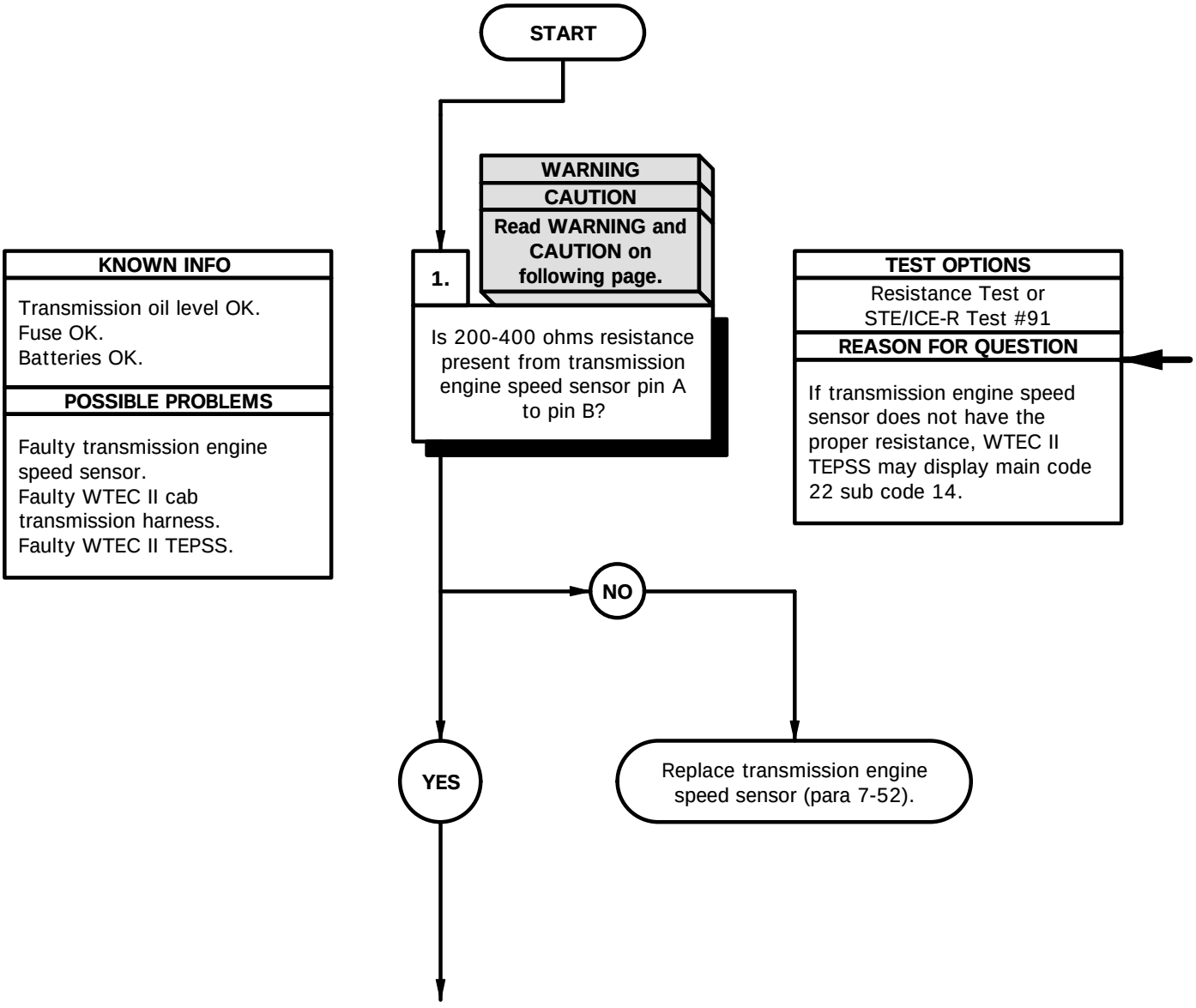
INITIAL SETUP

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

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

Tools and Special Tools (Cont)
Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Wrench Set, Socket (Item 51, Appendix C)
STE/ICE-R (Item 41, Appendix C)

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

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.

RESISTANCE TEST

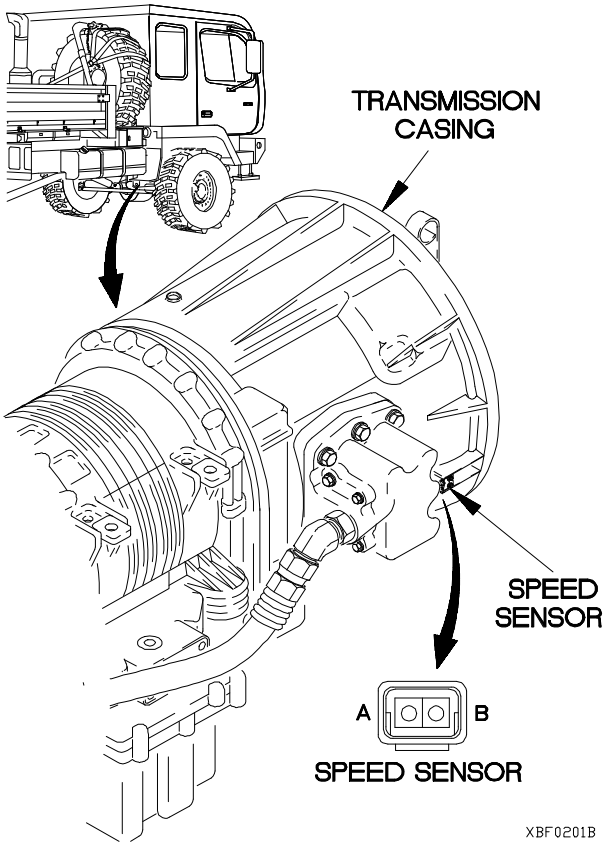
(1) Disconnect transmission engine speed sensor connector from transmission engine speed sensor.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to terminal A of transmission engine speed sensor.
(4) Connect negative (-) probe of multimeter to terminal B of transmission engine speed sensor and note reading on multimeter.

NOTE

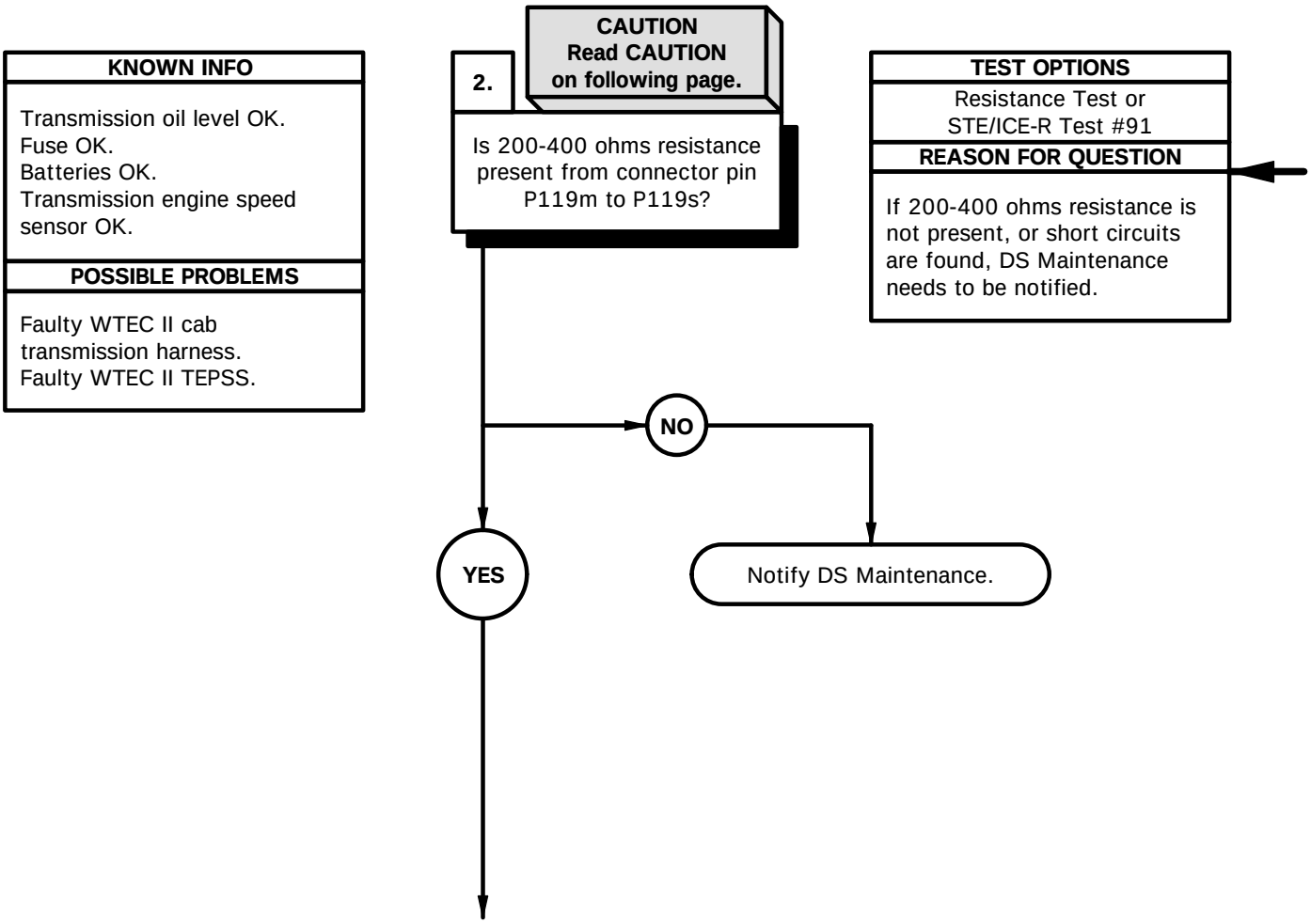
A good transmission engine speed sensor will return a reading of 200-400 ohms resistance as follows:

a. 200 ohms at -40°F (-40°C).
b. 300 ohms at 68°F (20°C).
c. 400 ohms at 230°F (110°C).

(5) If resistance is not 200-400 ohms, replace transmission engine speed sensor (para 7-52).
(6) Connect transmission engine speed sensor connector to transmission engine speed sensor.



f2. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 14 (CONT)



CAUTION

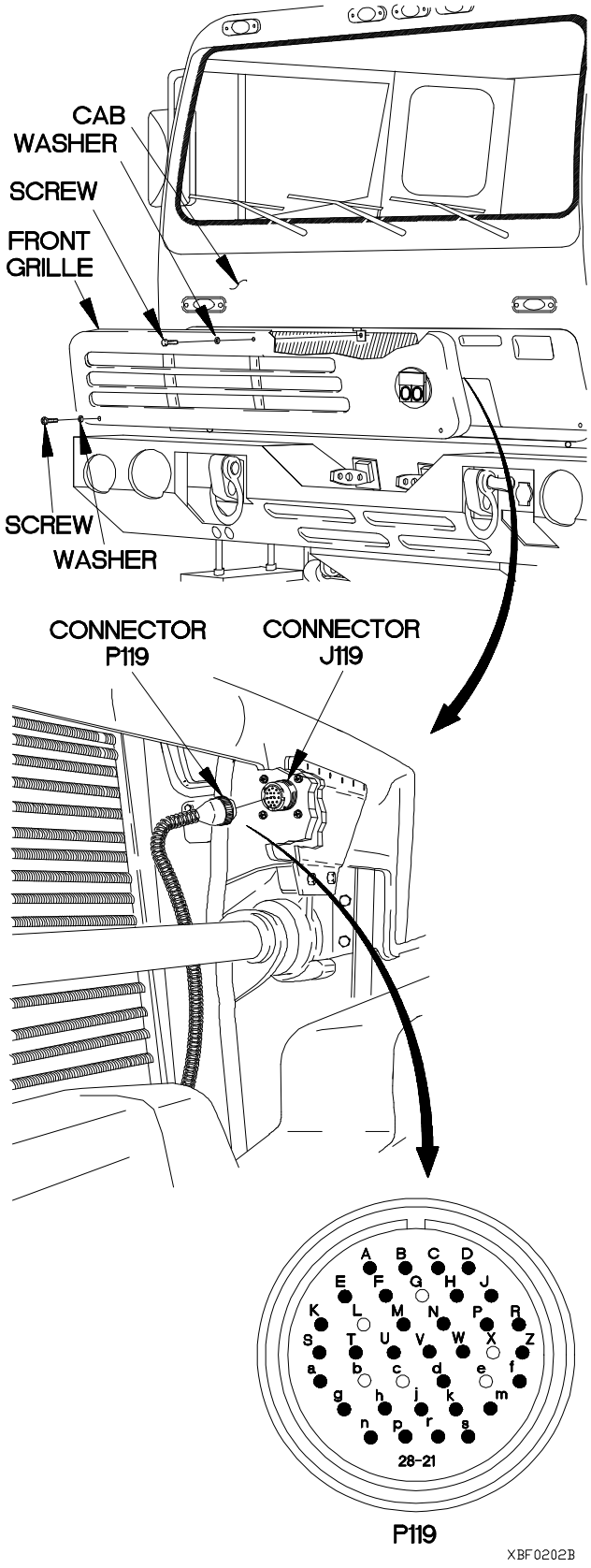
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

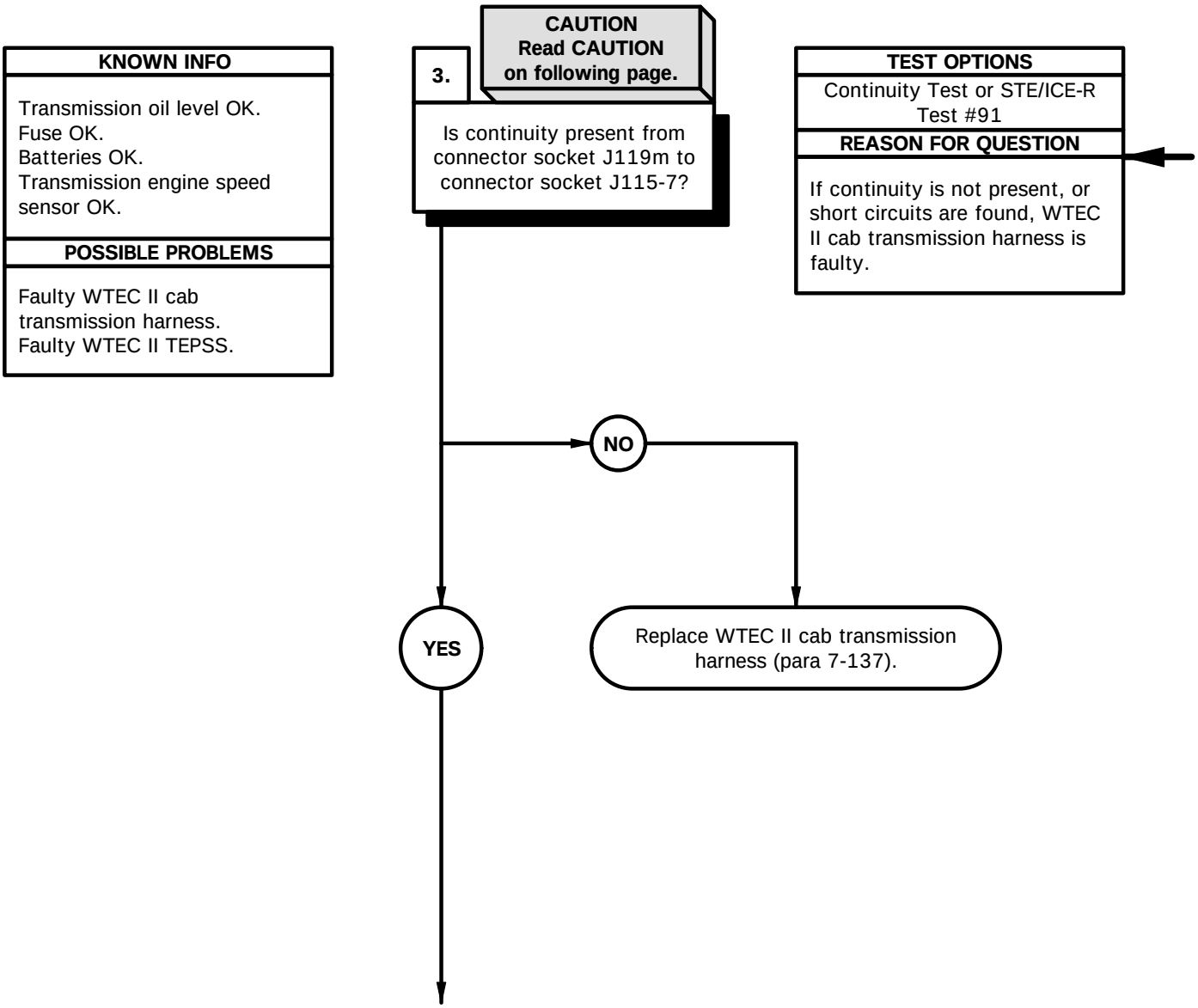
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

RESISTANCE TEST

(1) 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) Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter to connector P119 pin m.
(7) Connect negative (-) probe of multimeter to connector P119 pin s and note reading on multimeter.
(8) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
(9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(10) If 200-400 ohms resistance is not present in step 7, or continuity is present in step 8 or step 9, notify DS Maintenance.



f2. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 14 (CONT)



CAUTION

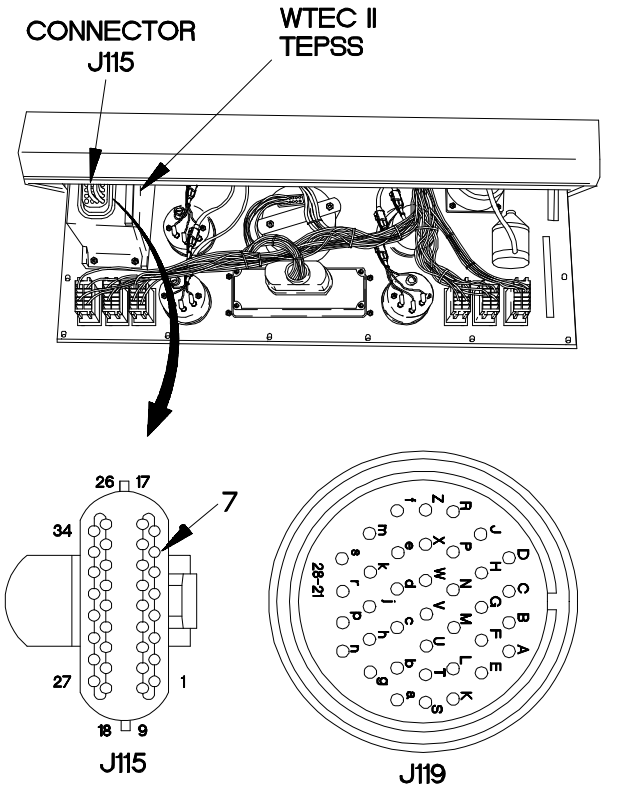
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

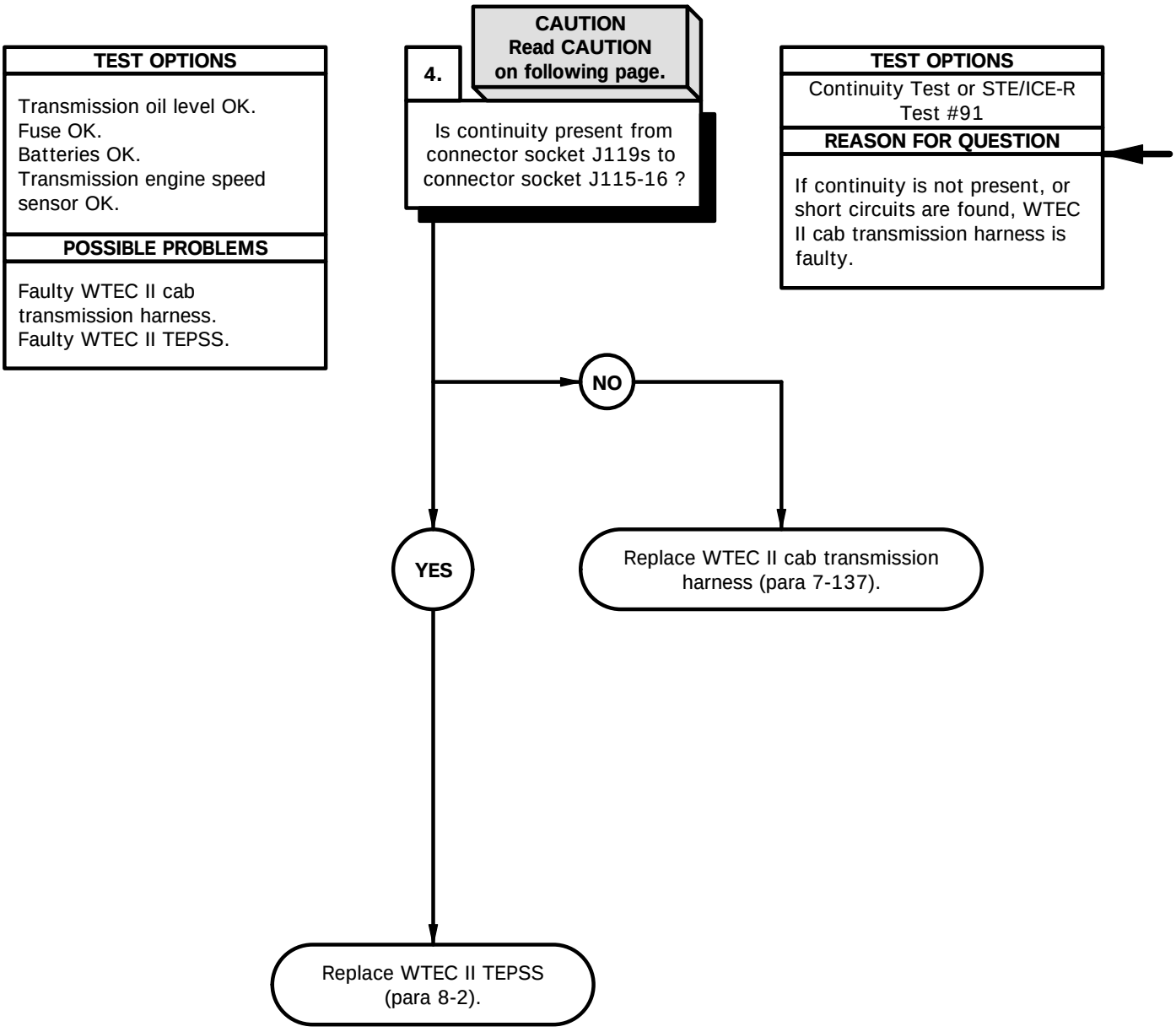
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Remove instrument panel assembly for access (para 7-15).
(2) Disconnect connector J115 (top connector) from WTEC II TEPSS.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector socket J115-7.
(5) Connect negative (-) probe of multimeter to connector socket J119m and note reading on multimeter.
(6) Connect negative (-) probe of multimeter to all other sockets in connector J119 and note reading on multimeter.
(7) Connect negative (-) probe of multimeter to ground to and note reading on multimeter.
(8) If continuity is not present in step 5, or continuity is present in step 6 or step 7, replace WTEC II cab transmission harness (para 7-137).



f2. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 14 (CONT)



CAUTION

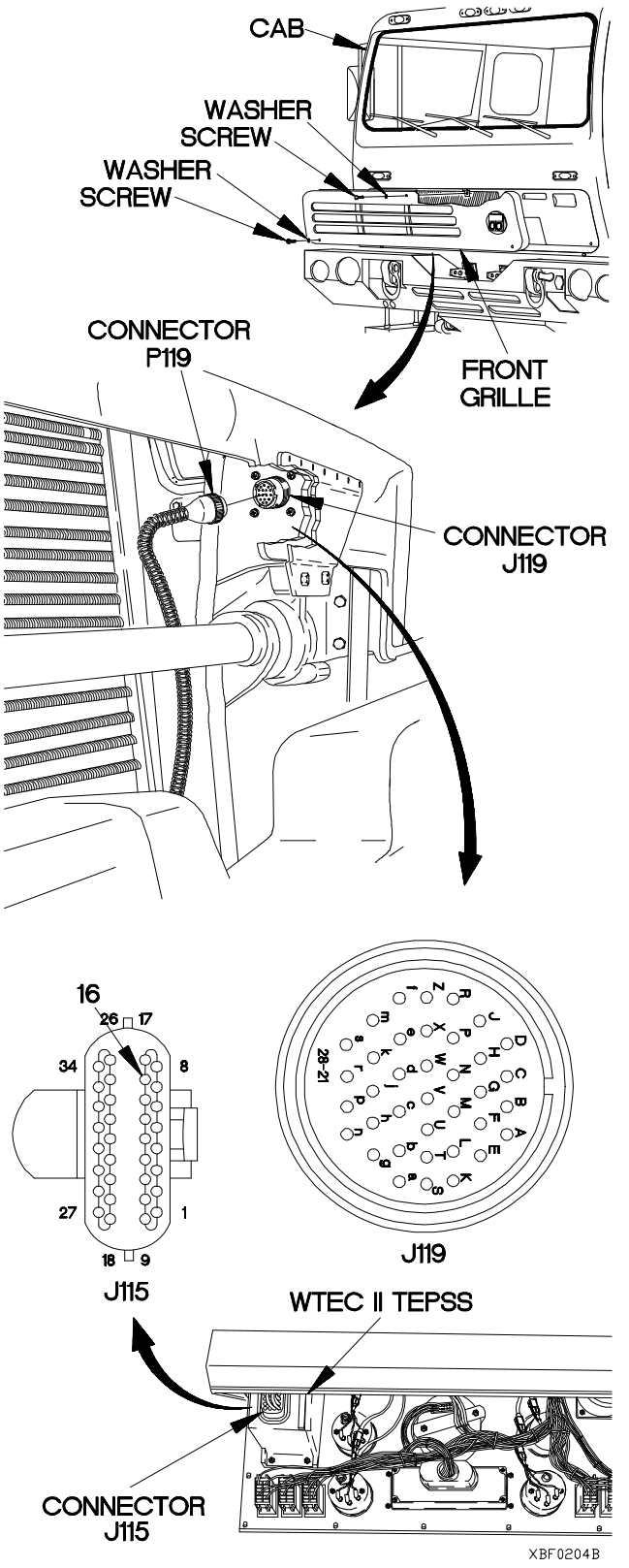
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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 position.
(2) Connect positive (+) probe of multimeter to connector socket J115-16.
(3) Connect negative (-) probe of multimeter to connector socket J119s and note reading on multimeter.
(4) Connect negative (-) probe of multimeter to all other sockets in connector J119 and note reading on multimeter.
(5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(6) If continuity is not present in step 3, or continuity is present in step 4 or step 5, replace WTEC II cab transmission harness (para 7-137).
(7) If continuity is present in step 3 and no shorts circuits are found, replace WTEC II TEPSS (para 8-2).
(8) Connect connector J115 to WTEC II TEPSS.
(9) Install instrument panel assembly (para 7-15).
(10) Connect connector P119 to connector J119.
(11) Position front grille on cab with washer and screw.
(12) Position two washers and screws in front grille.
(13) Tighten screw to 48-60 lb-in. (5-7 N·m).
(14) Tighten two screws to 24 lb-in. (3 N·m).
(15) Clear diagnostic codes (para 8-4).



f3. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15

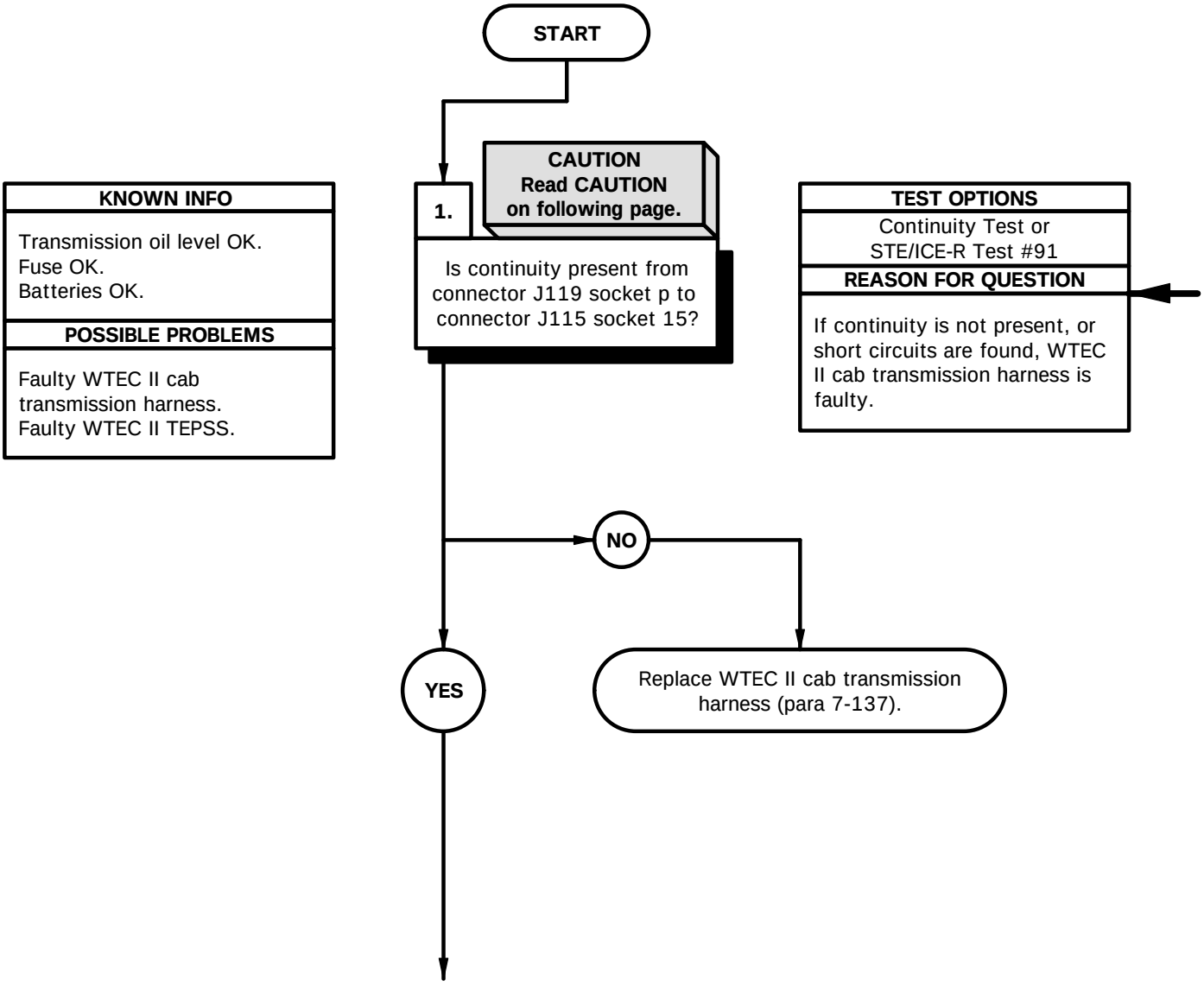
INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

Tools and Special Tools (Cont)
Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Wrench Set, Socket (Item 51, Appendix C)
STE/ICE-R (Item 41, Appendix C)

References
TM 9-4910-571-12&P



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.

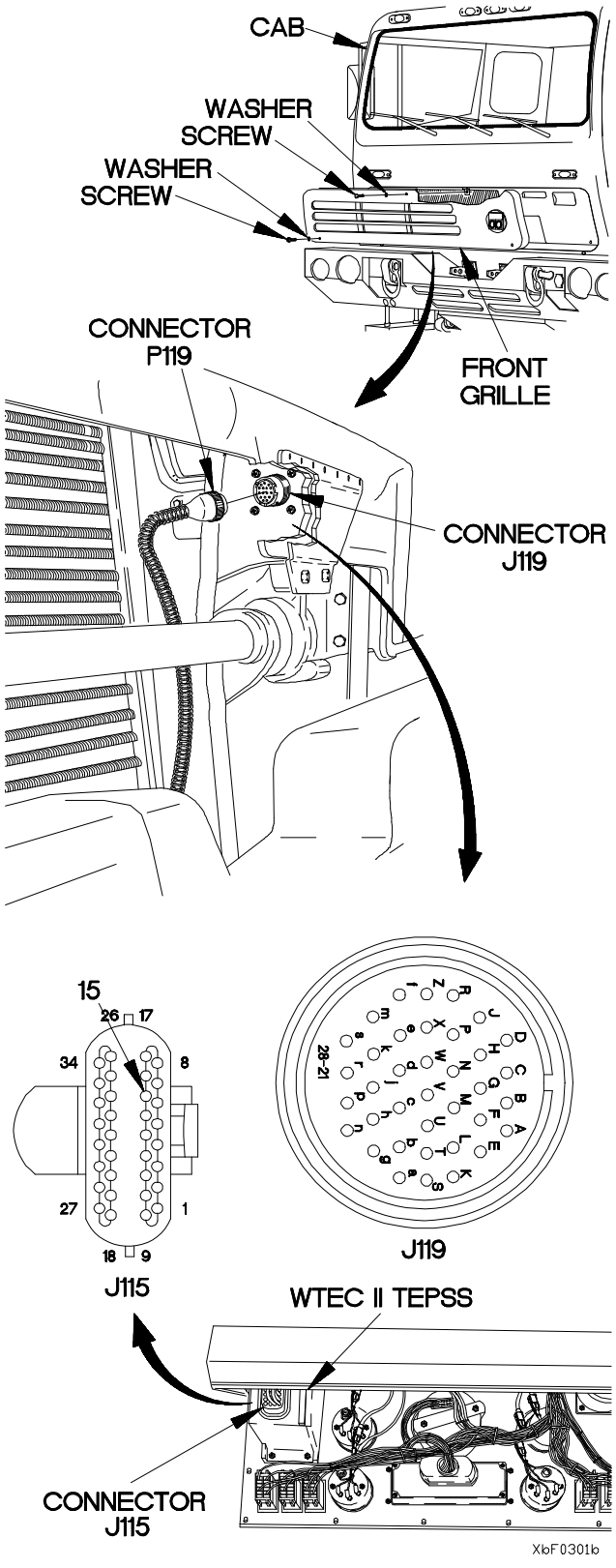
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

NOTE

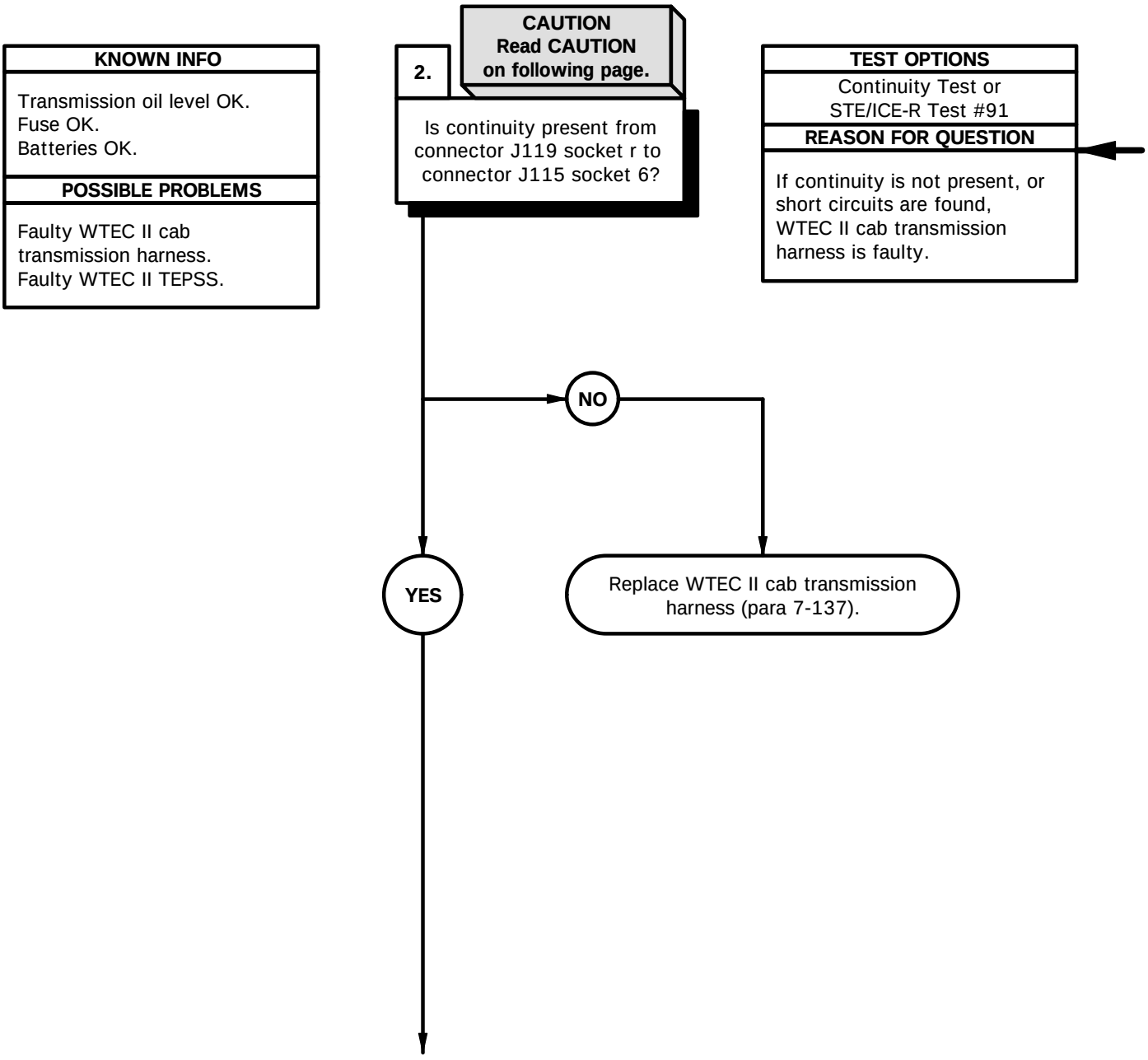
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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) Remove instrument panel assembly for access (para 7-15).
(6) Disconnect connector J115 (top connector) from WTEC II TEPSS.
(7) Set multimeter to ohms.
(8) Connect positive (+) probe of multimeter to connector J115-15.
(9) Connect negative (-) probe of multimeter to connector J119p and note reading on multimeter.
(10) Connect negative (-) probe of multimeter to all other sockets in connector J119 and note reading on multimeter.
(11) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(12) If continuity is not present in step 9, or continuity is present in step 10 or step 11, replace WTEC II cab transmission harness (para 7-137).



f3. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (CONT)



CAUTION

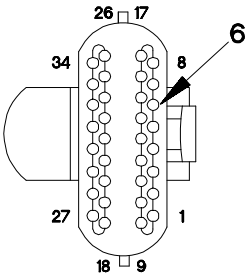
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

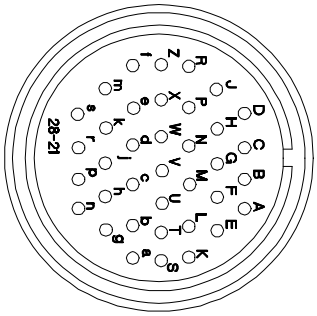
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector J115 socket 6.
(3) Connect negative (-) probe of multimeter to connector J119 socket r and note reading on multimeter.
(4) Connect negative (-) probe of multimeter to all other sockets in connector J119 and note reading on multimeter.
(5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(6) If continuity is not present in step 3, or continuity is present in step 4 or step 5, replace WTEC II cab transmission harness (para 7-137).



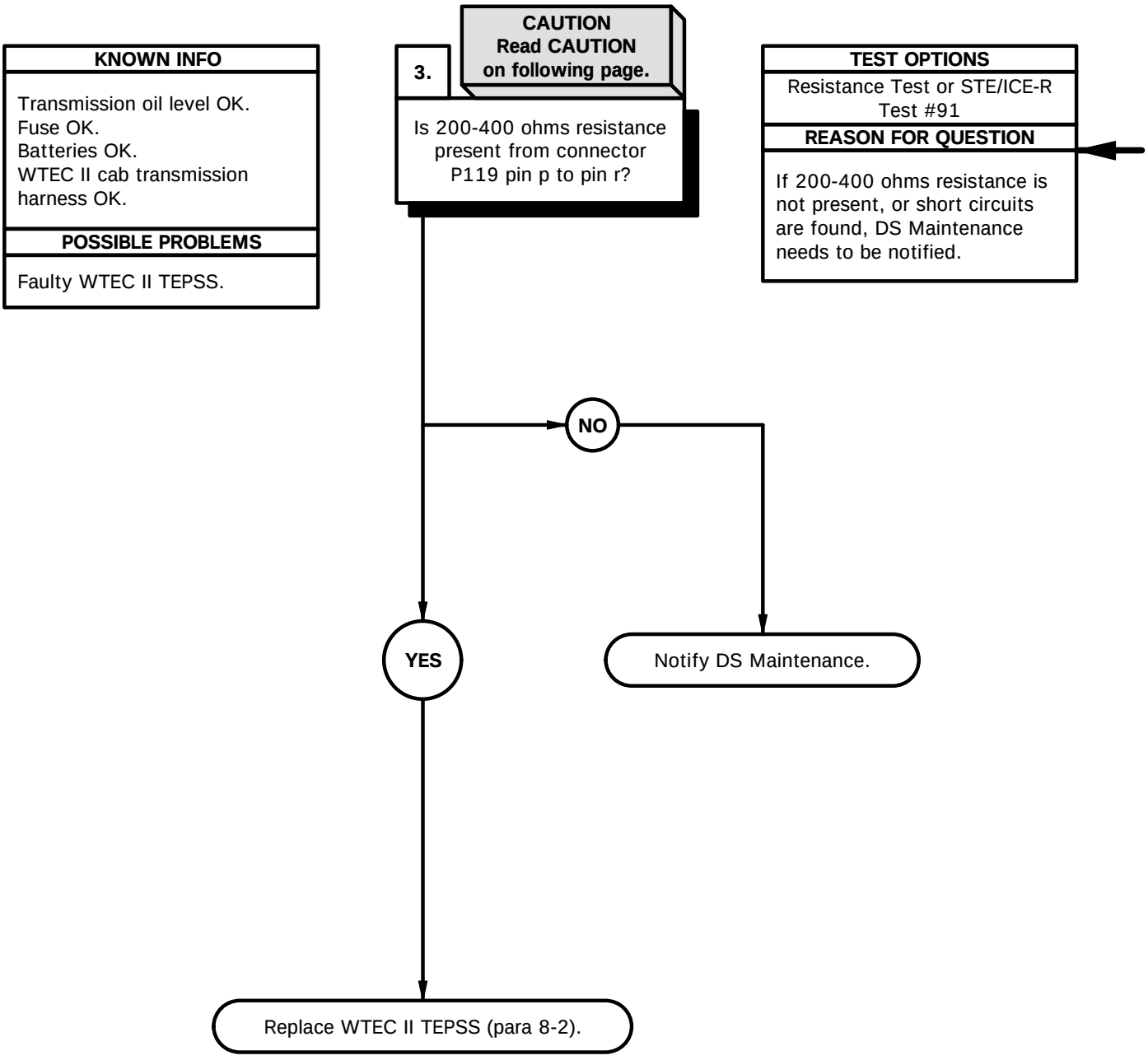
J115



J119

XBF0302B

f3. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (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

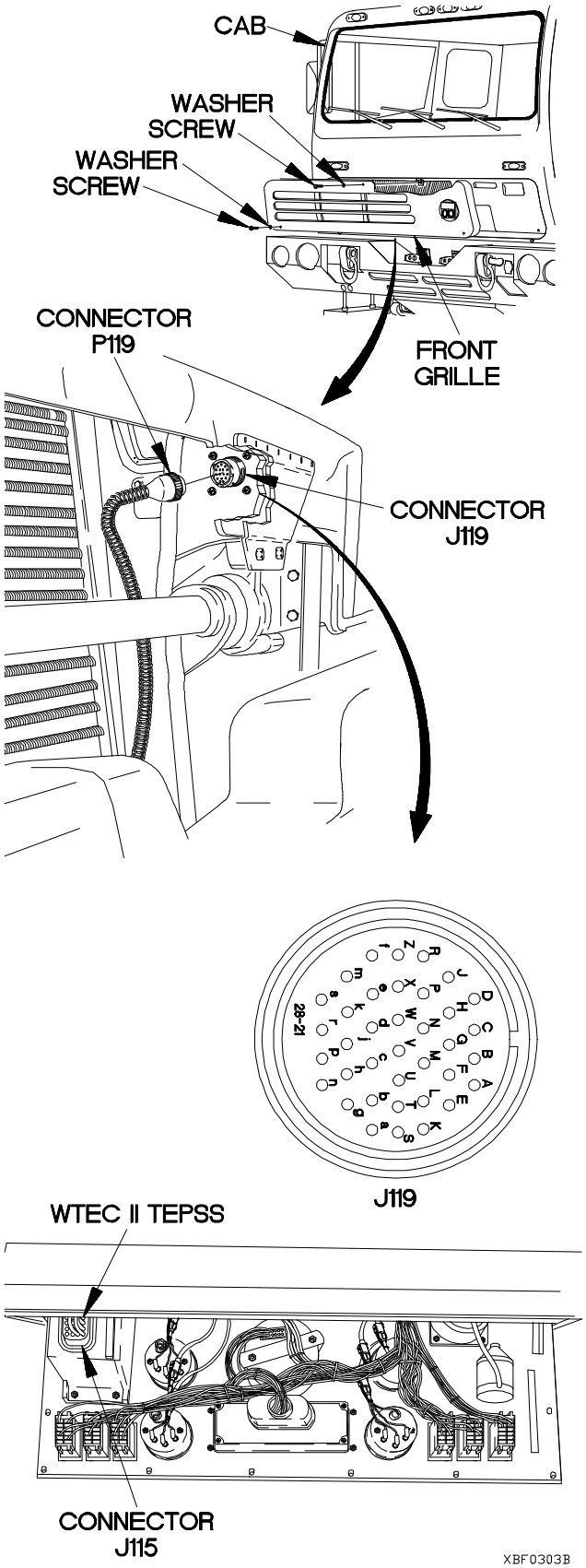
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P119 pin p.
(3) Connect negative (-) probe of multimeter to connector P119 pin r and note reading on multimeter.

NOTE

A good turbine speed sensor will return a reading of 200-400 ohms resistance as follows:

a. 200 ohms at -40°F (-40°C).
b. 300 ohms at 68°F (20°C).
c. 400 ohms at 230°F (110°C).

(4) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
(5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(6) If 200-400 ohms resistance is not present in step 4, or continuity is present in step 5 or step 6, notify DS Maintenance.
(7) If 200-400 ohms resistance is present in step 3, and continuity is not present in step 5 or step 6, replace WTEC II TEPSS (para 8-2).
(8) Connect connector J115 to WTEC II TEPSS.
(9) Install instrument panel assembly (para 7-15).
(10) Connect connector P119 to connector J119.
(11) Position front grille on cab with washer and screw.
(12) Position two washers and screws in front grille.
(13) Tighten screw to 48-60 lb-in. (5-7 N·m).
(14) Tighten two screws to 24 lb-in. (3 N·m).
(15) Clear diagnostic codes (para 8-4).



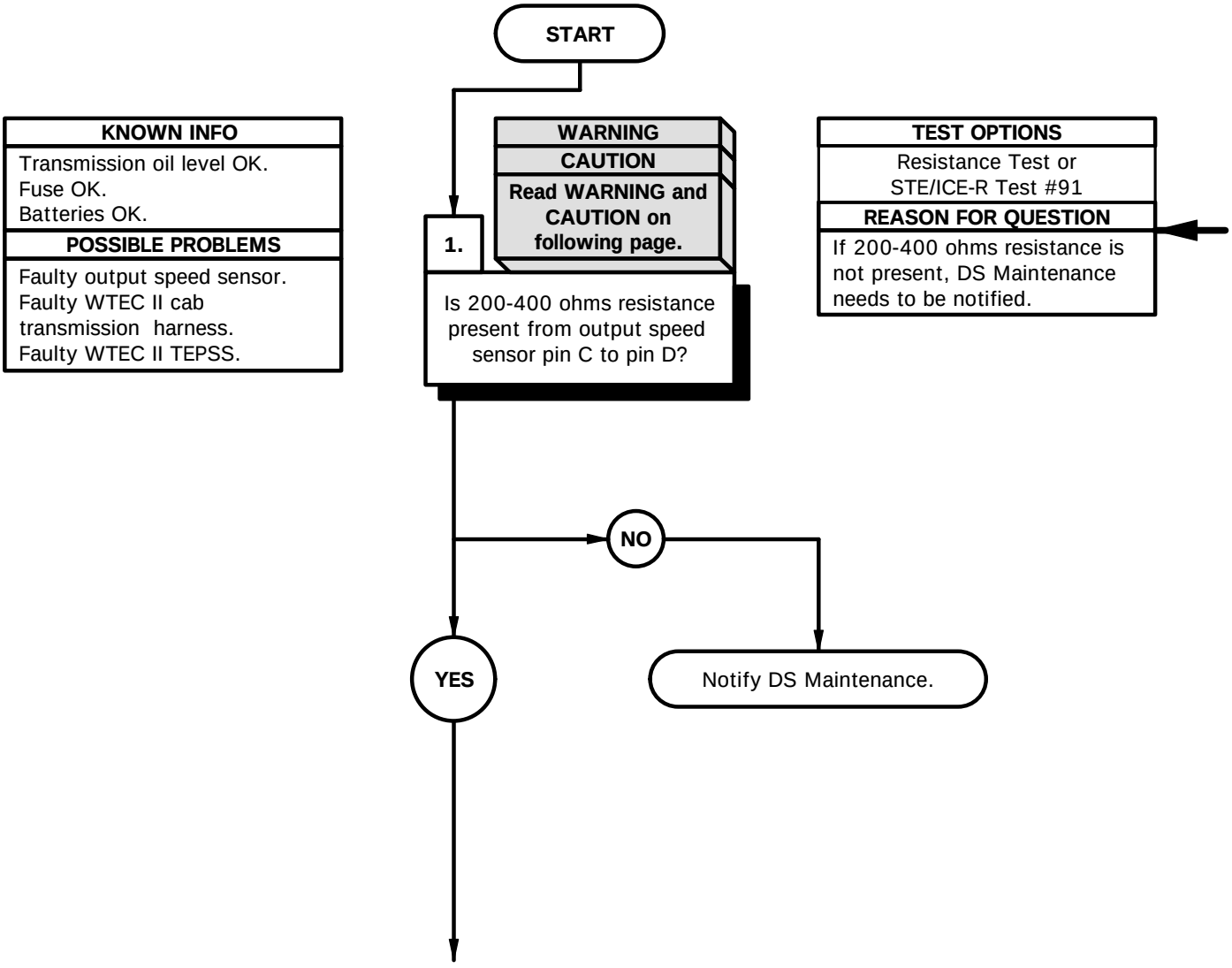
f4. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 16

INITIAL SETUP

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

References
TM 9-4910-571-12&P

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B)
STE/ICE-R (Item 41, Appendix C)



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.

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

NOTE

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

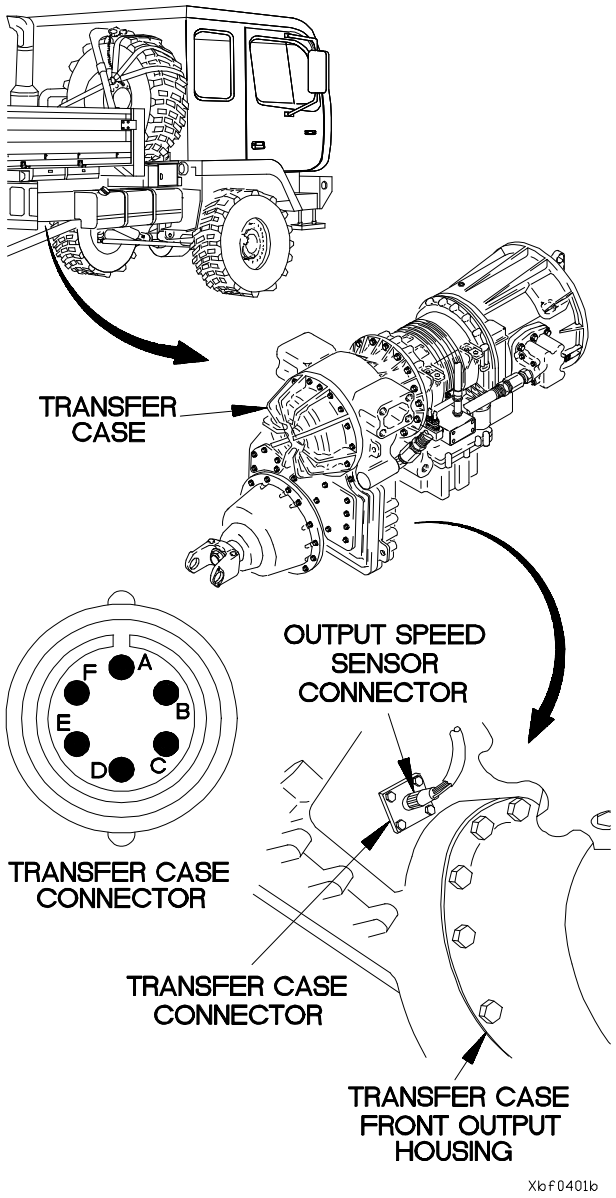
(1) Disconnect output speed sensor connector from transfer case connector.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to pin C of transfer case connector.

NOTE

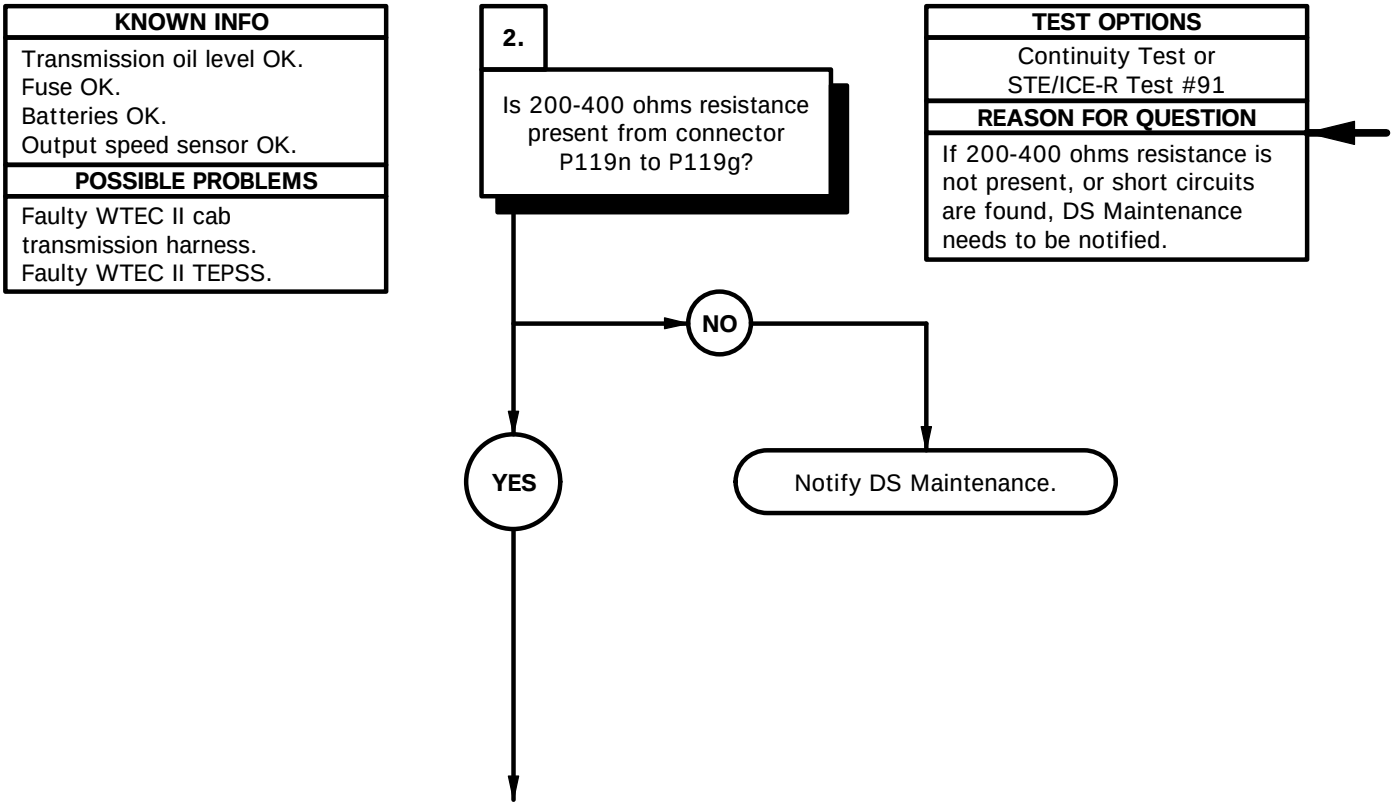
A good output speed sensor will return a reading of 200-400 ohms resistance as follows:

a. 200 ohms at -40°F (-40°C)
b. 300 ohms at 68°F (20°C)
c. 400 ohms at 230°F (110°C)

(4) Connect negative (-) probe of multimeter to pin D of transfer case connector and note reading on multimeter.
(5) If good resistance is not noted, notify DS Maintenance.
(6) Connect output speed sensor connector to transfer case connector.

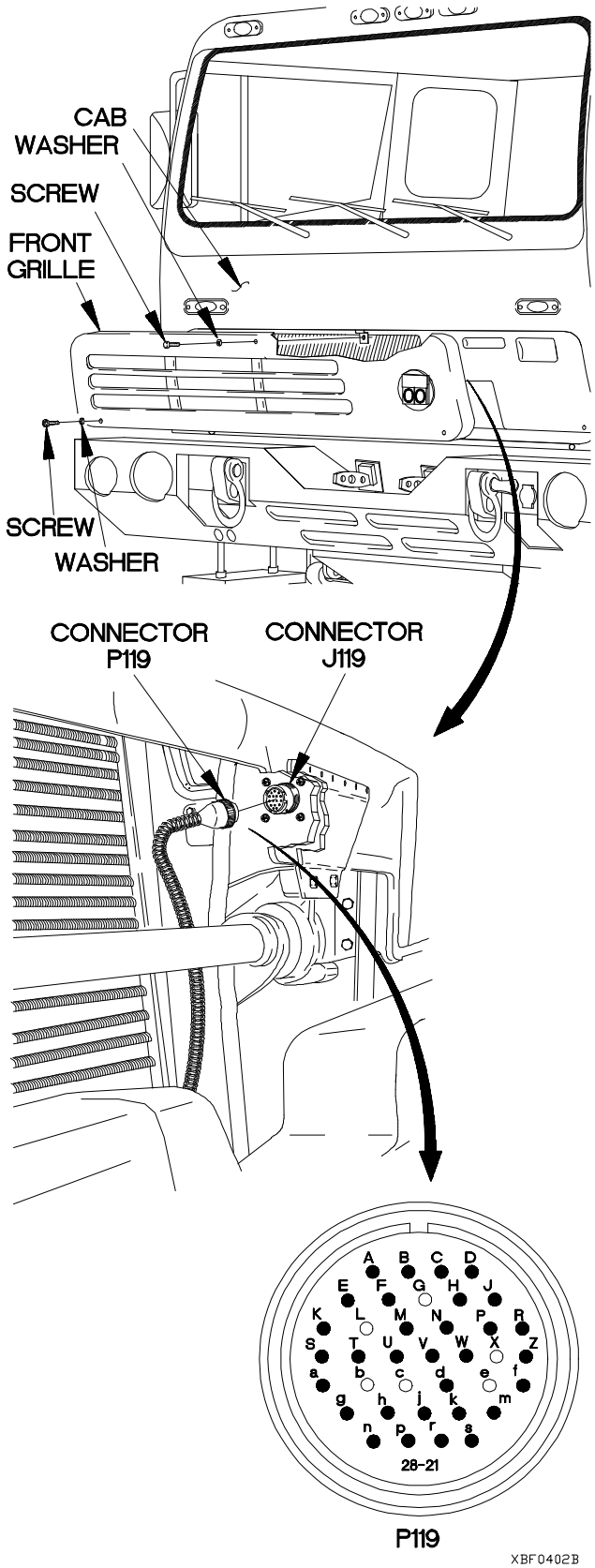


f4. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 16 (CONT)

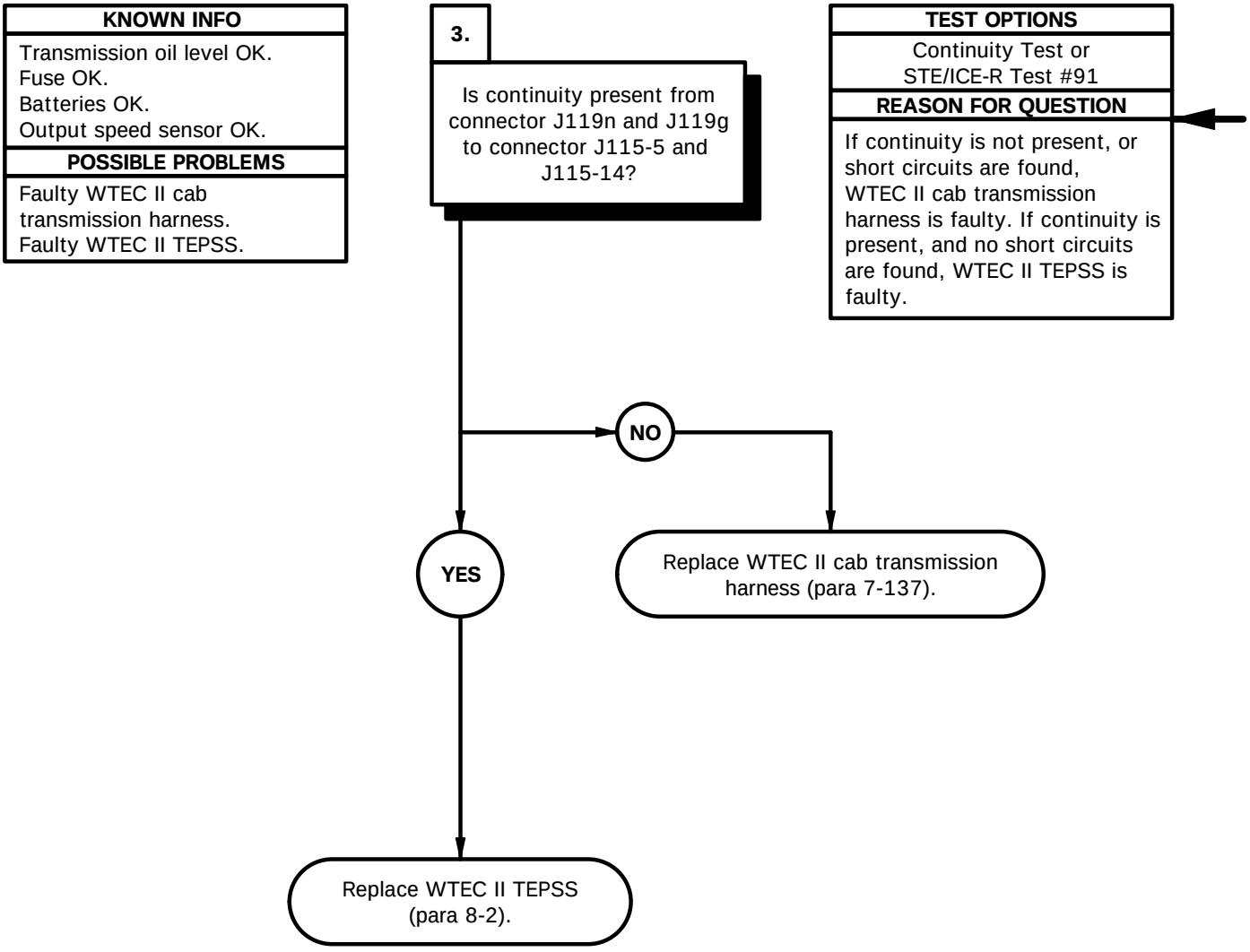


CONTINUITY TEST

(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 Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter to connector P119n.
(7) Connect negative (-) probe of multimeter to connector P119g and note reading on multimeter.
(8) Connect negative (-) probe of multimeter to all other pins in connector P119, one at a time, and note reading on multimeter.
(9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(10) Connect positive (+) probe of multimeter to connector P119g.
(11) Connect negative (-) probe of multimeter to all other pins in connector P119 (except P119n), one at a time, and note reading on multimeter.
(12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(13) If continuity 200-400 ohms resistance is not present in step 7, or continuity is present in step 8, 9, 11, or 12, notify DS Maintenance.

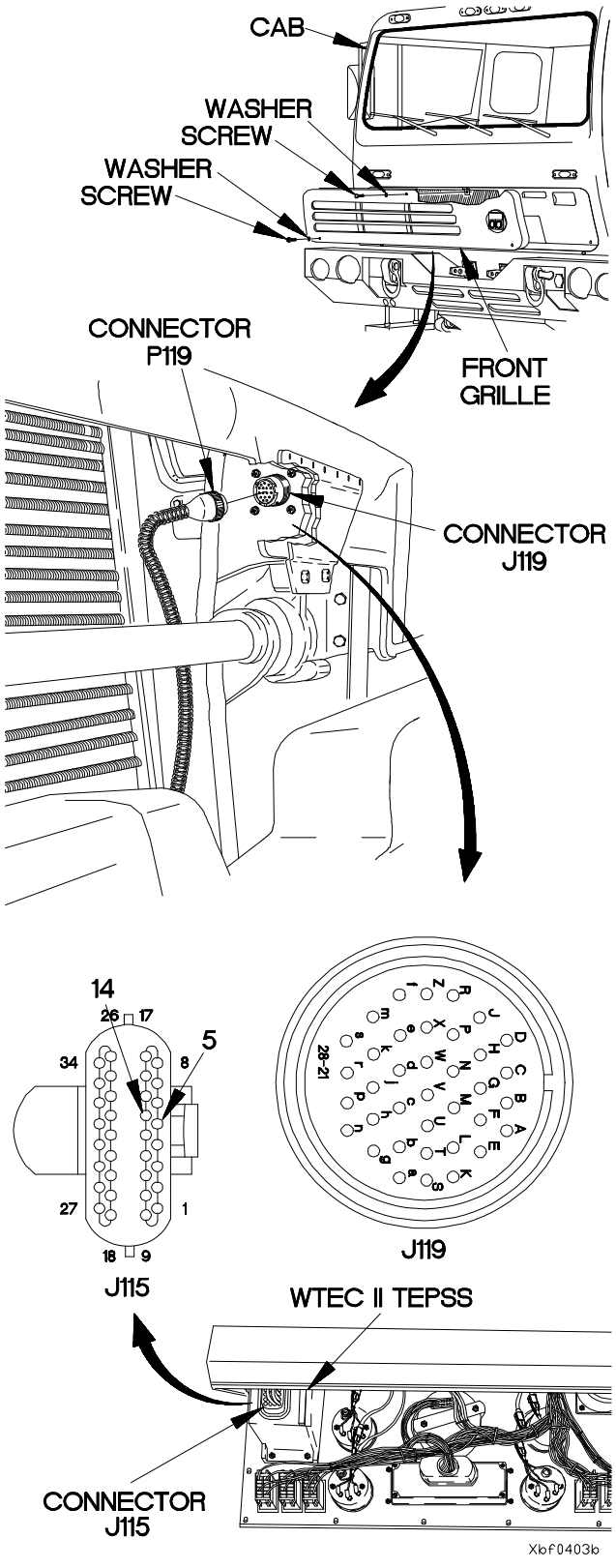


f4. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 16 (CONT)



CONTINUITY TEST

(1) Remove instrument panel assembly for access (para 7-15).
(2) Disconnect connector J115 (top connector) from WTEC II TEPSS.
(3) Install jumper wire from connector J119g to J119n.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to connector J115-5.
(6) Connect negative (-) probe of multimeter to connector J115-14 and note reading on multimeter.
(7) Connect negative (-) probe of multimeter to all other sockets in connector J115, one at a time, and note reading on multimeter.
(8) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(9) Connect positive (+) probe of multimeter to connector J115-14.
(10) Connect negative (-) probe of multimeter to all other sockets in connector J115 (except J115-5), one at a time, and note reading on multimeter.
(11) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(12) If continuity is not present in step 6, or continuity is present in step 7, 8, 10, or 11, replace WTEC II cab transmission harness (para 7-137).
(13) If continuity is present in step 6, and continuity is not present in steps 7, 8, 10, and 11, replace WTEC II TEPSS (para 8-2).
(14) Remove jumper wire from connector J119.
(15) Connect connector J115 to WTEC II TEPSS.
(16) Install instrument panel assembly (para 7-15).
(17) Connect connector P119 to connector J119.
(18) Position front grille on cab with washer and screw.
(19) Position two washers and screws in front grille.
(20) Tighten screw to 48-60 lb-in. (5-7 N·m).
(21) Tighten two screws to 24 lb-in. (3 N·m).
(22) Clear diagnostic codes (para 8-4).



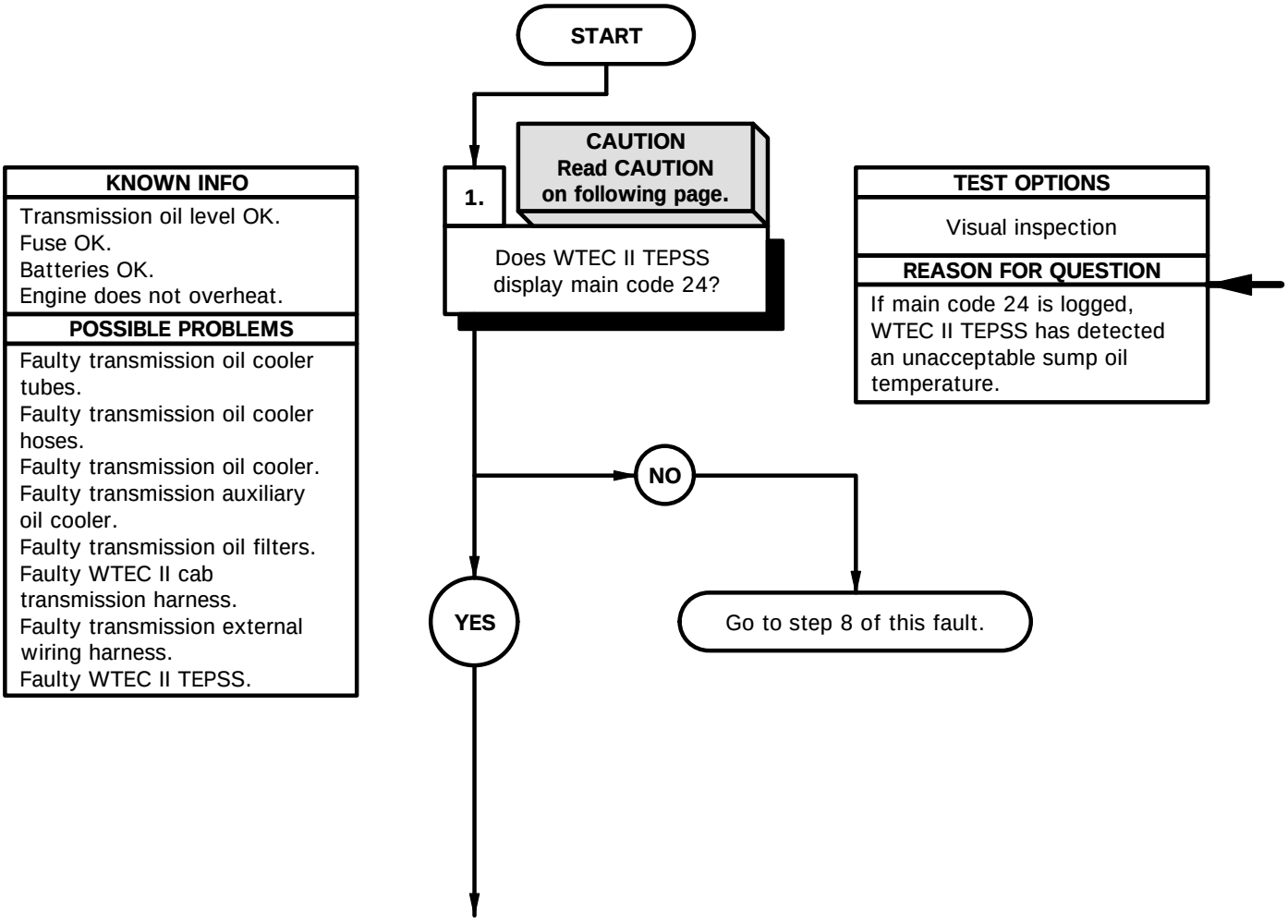
f5. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 AND/OR 33 AND ANY SUB CODE

INITIAL SETUP

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

References
TM 9-4910-571-12&P

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Pan, Drain (Item 24, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
STE/ICE-R (Item 41, Appendix C)

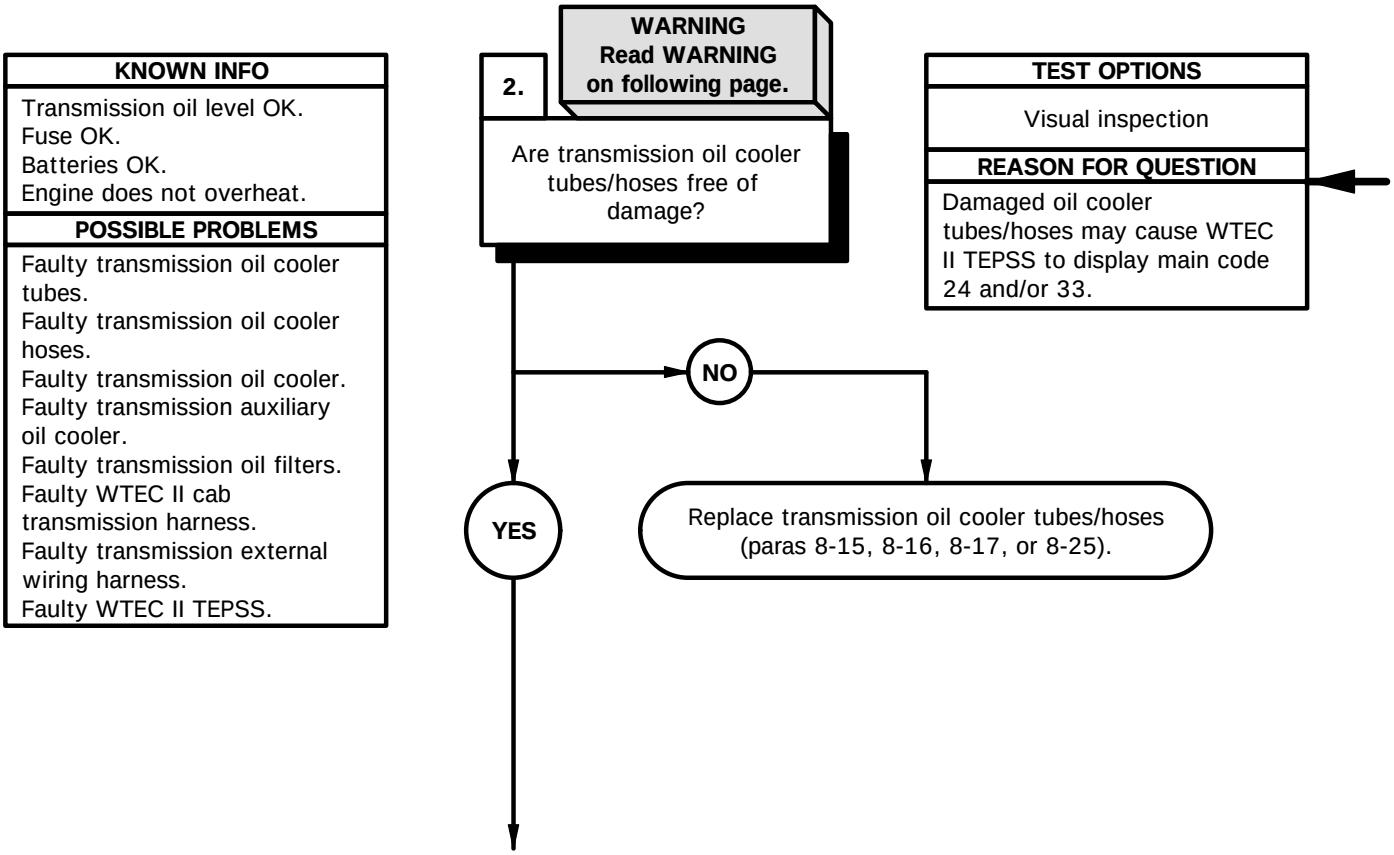


CAUTION

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) Position master power switch to on (TM 9-2320-366-10-1).
(2) Check to see if main code 24 or main code 33 is logged in WTEC II TEPSS (para 8-4).
(3) If main code 24 is logged:
    (a) WTEC II TEPSS has detected a sump oil temperature above (subcode 23) or below (subcode 12) operating limits.
    (b) Troubleshoot oil cooling system followed by sump oil temperature sensor and circuits.
(4) If main code 33 is logged:
    (a) WTEC II TEPSS has detected a fault with sump oil temperature sensor or its circuit.
    (b) Go to step 8 of this fault.
(5) Position master power switch to off (TM 9-2320-366-10-1).

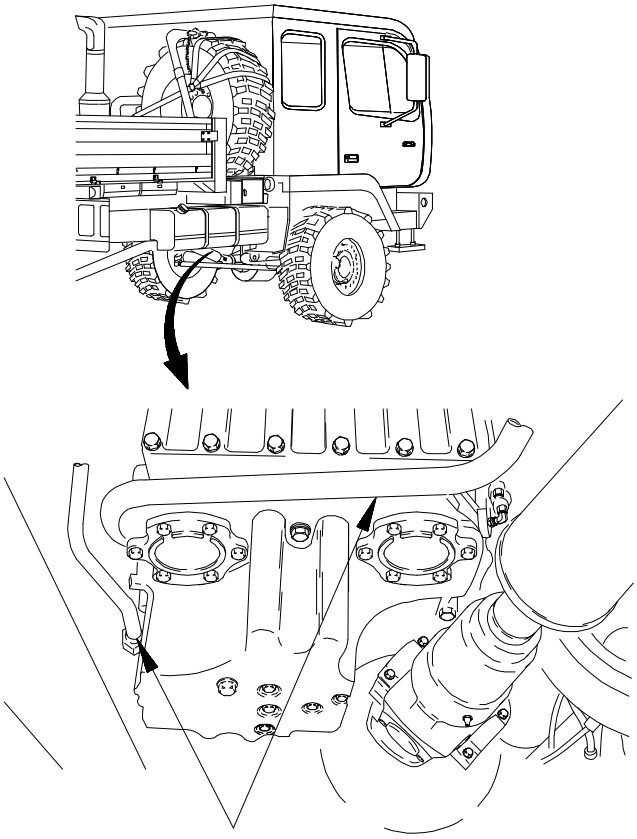
f5. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 AND/OR 33 AND ANY SUB CODE (CONT)



WARNING

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

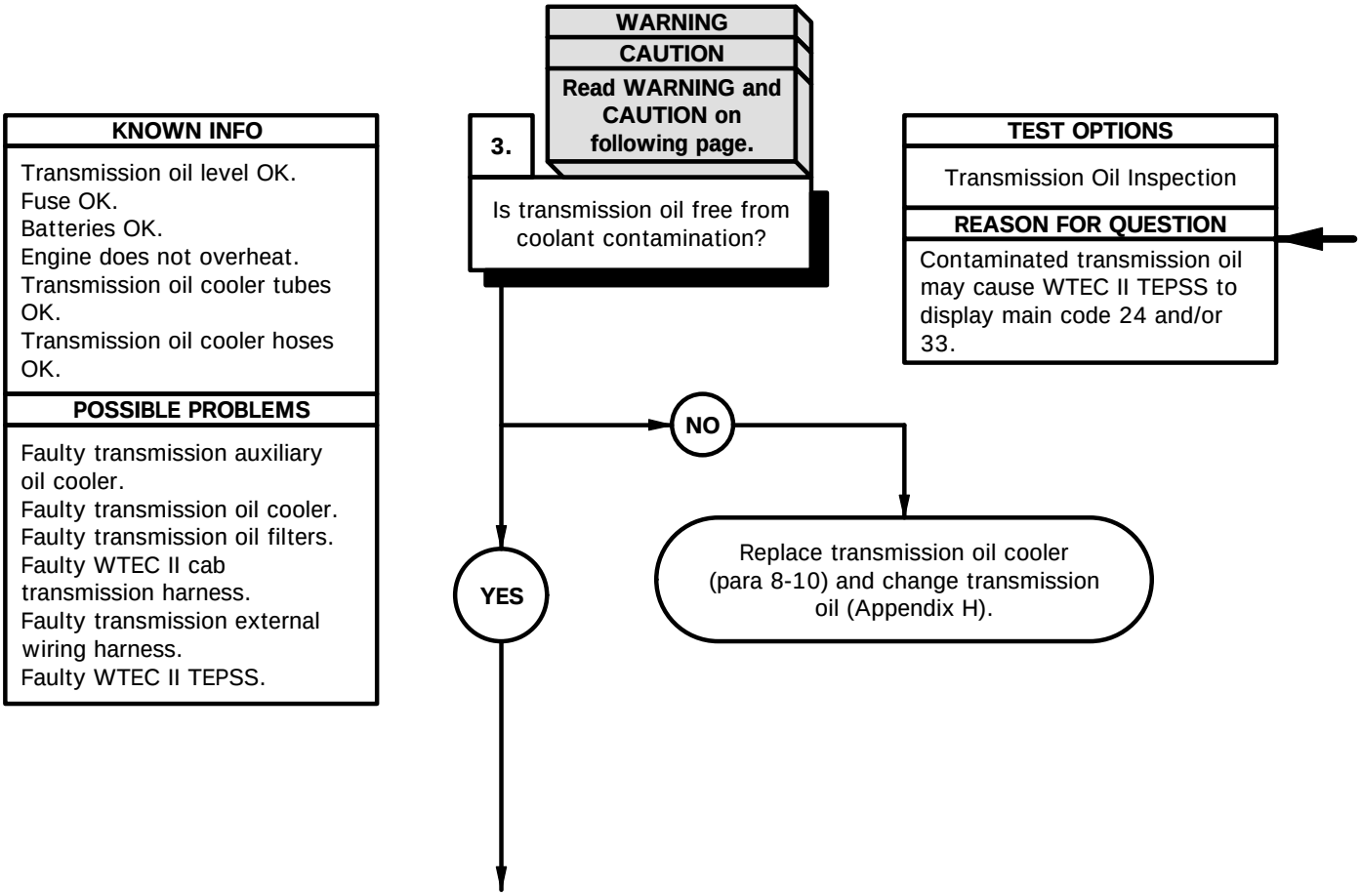
(1) Check transmission oil cooler tubes/hoses for damage and restrictions.
(2) If damage or restriction are present, replace transmission oil cooler tubes/hose (paras 8-15, 8-16, 8-17, or 8-25).



TRANSMISSION OIL COOLER TUBES

XBf0501B

f5. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 AND/OR 33 AND ANY SUB CODE (CONT)



WARNING

Do not drain transmission oil when transmission is hot. Failure to comply may result in injury to personnel.

CAUTION

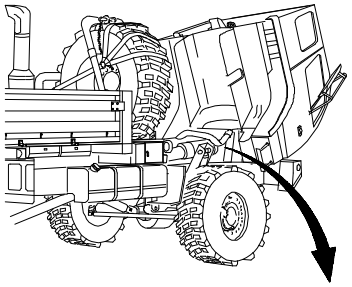
Transmission oil must be changed whenever there is evidence of oil breakdown or contamination. Oil breakdown or contamination may be caused from overheating transmission and/or oil cooler internal failure and is indicated by discoloration, strong odor, or oil analysis.

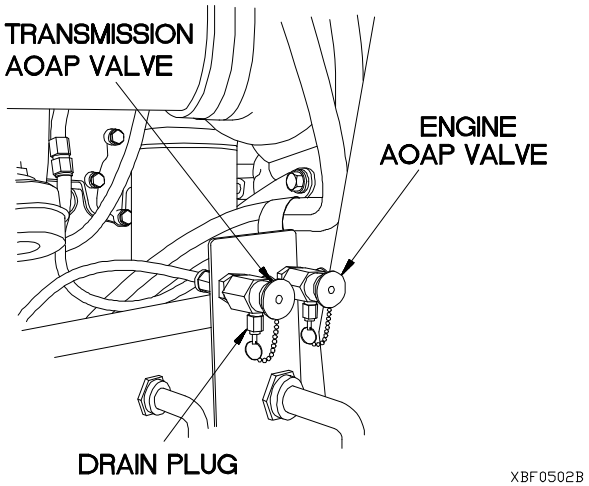
TRANSMISSION OIL INSPECTION

Note

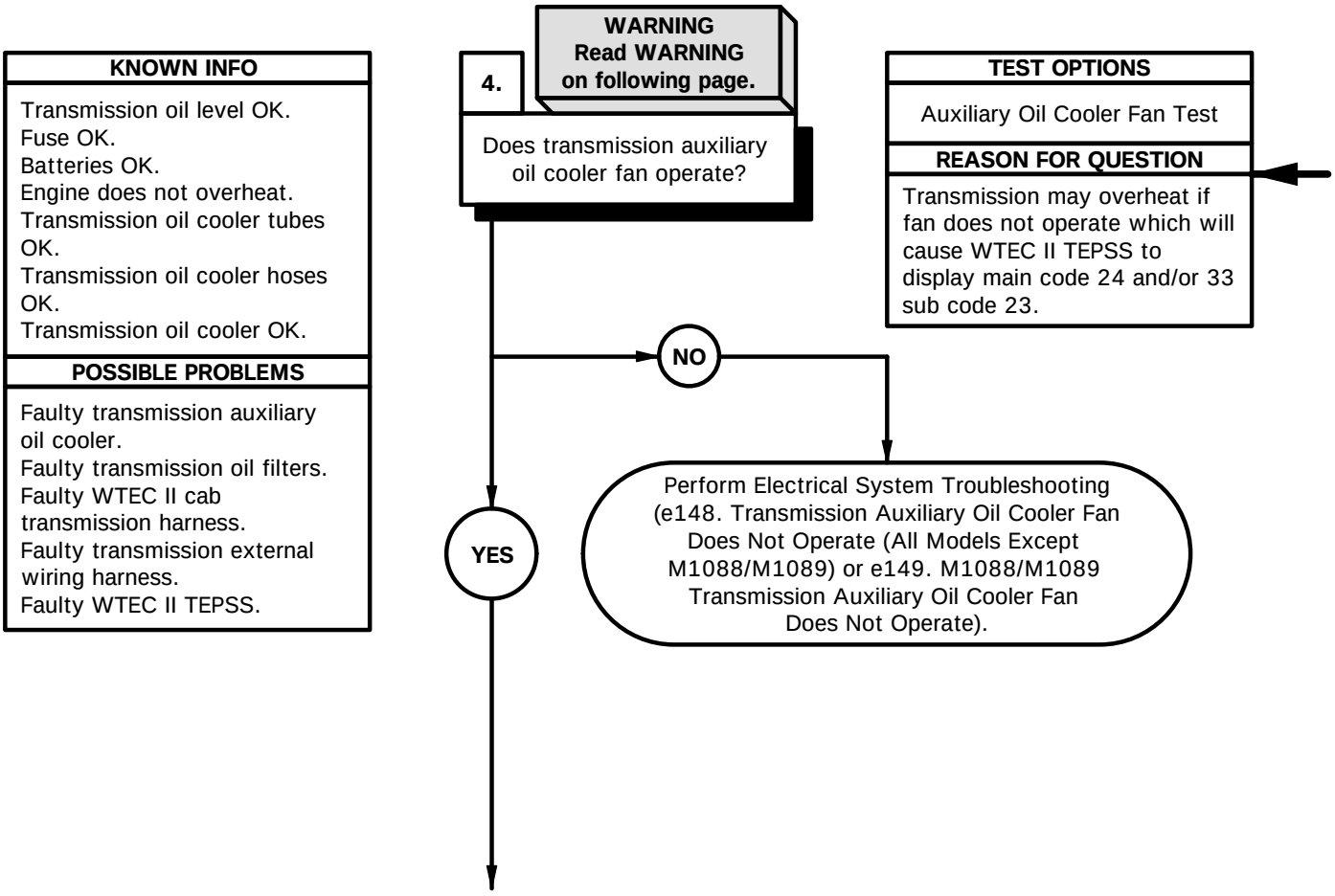
Transmission fluid capacity is 42.3 qt (40 L).

(1) Start engine (TM 9-2320-366-10-1).
(2) Allow oil to circulate for a few minutes.
(3) Position drain pan under transmission AOAP valve.
(4) Remove drain plug from transmission AOAP valve and press plunger to extract oil from system.
(5) Allow approximately 1 qt (0.9 L) of oil to drain into drain pan. Release plunger.
(6) Install drain plug on transmission AOAP valve.
(7) Inspect oil for coolant contamination.
(8) If oil is contaminated, replace transmission oil cooler (para 8-10).
(9) Shut down engine (TM 9-2320-366-10-1).
(10) Add oil to transmission (Appendix H).





f5. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 AND/OR 33 AND ANY SUB CODE (CONT)



WARNING

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

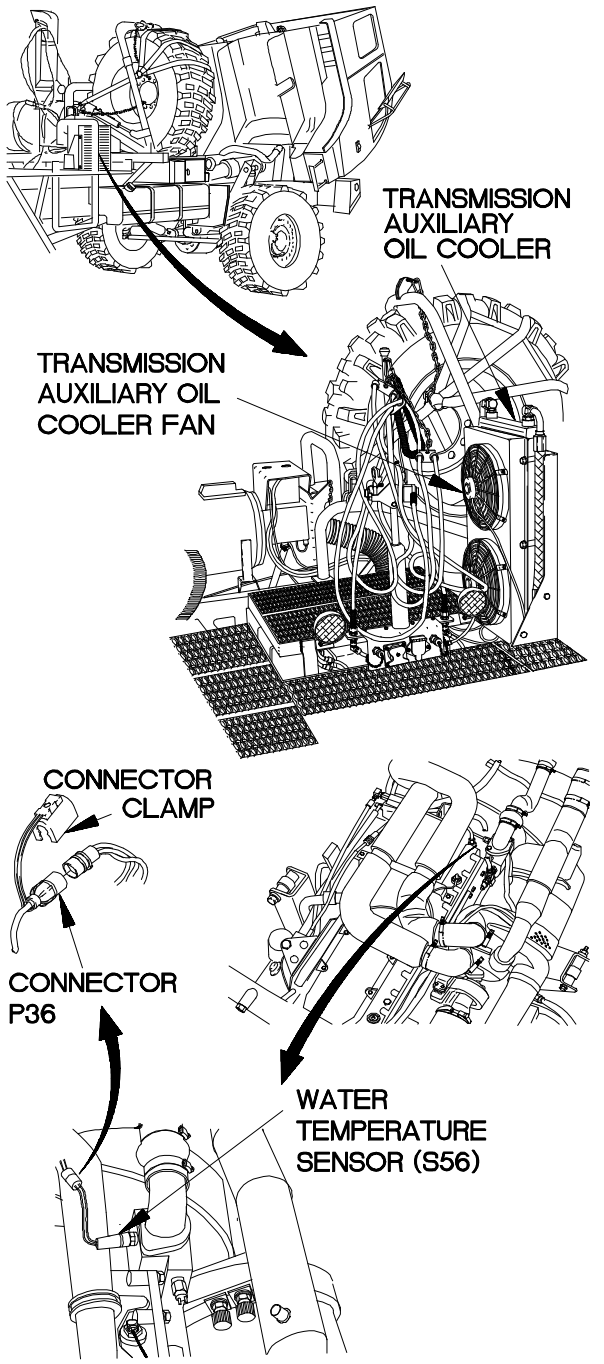
AUXILIARY OIL COOLER FAN TEST

(1) Raise cab (TM 9-2320-366-10-1).
(2) Disconnect connector clamp from water temperature sensor.
(3) Disconnect connector P36 from water temperature sensor (S56) to de-energize relay K15 and provide power to auxiliary oil cooler fan.
(4) Position master power switch to on (TM 9-2320-366-10-1).

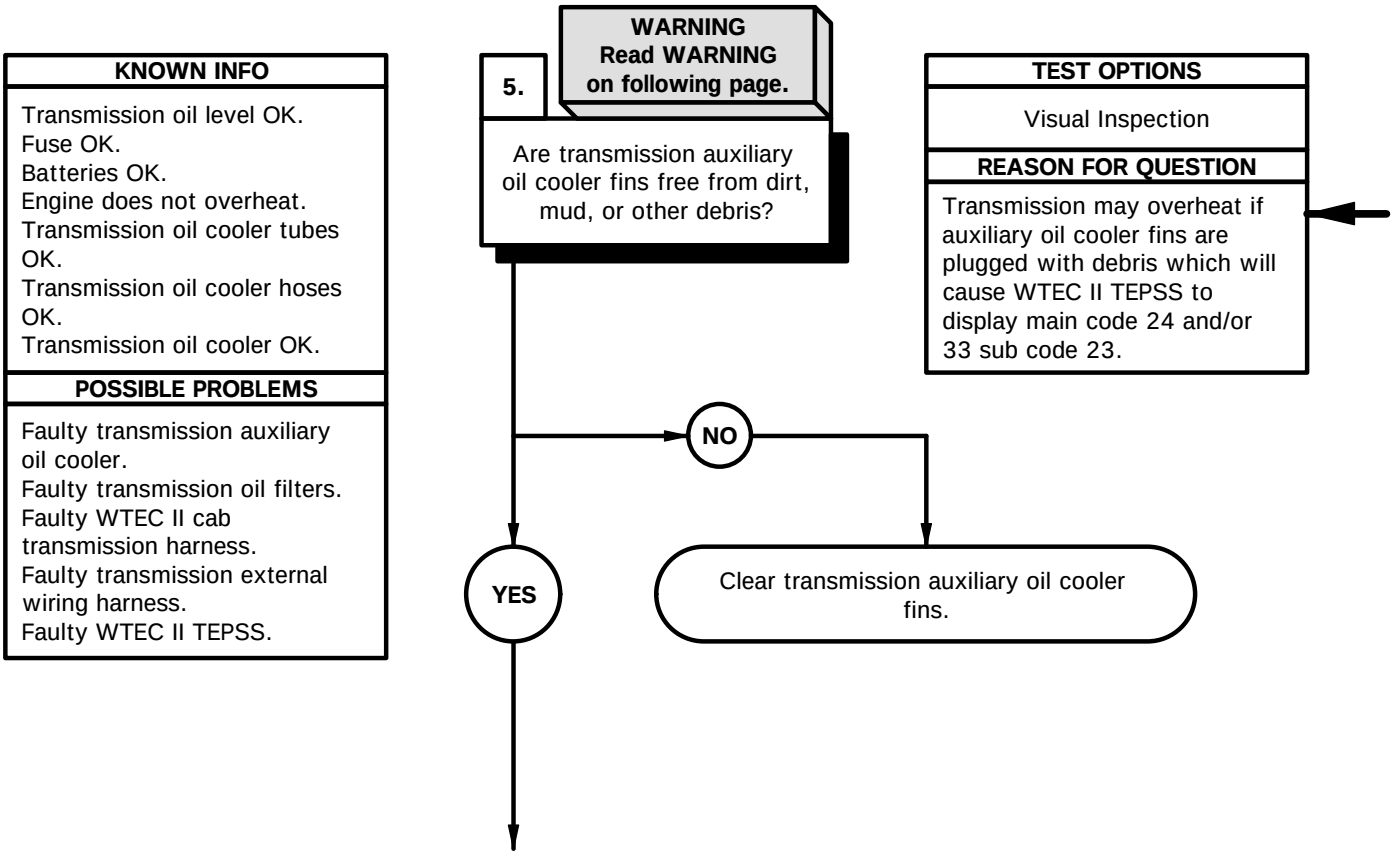
NOTE

M1088/M1089 are equipped with two transmission auxiliary oil cooler fans.

(5) Check if auxiliary oil cooler fan comes on.
(6) If fan does not come on, perform Electrical System Troubleshooting (e148. Transmission Auxiliary Oil Cooler Fan Does Not Operate (All Models Except M1088/M1089) or e149. M1088/M1089 Transmission Auxiliary Oil Cooler Fan Does Not Operate).
(7) Position master power switch to off (TM 9-2320-366-10-1).
(8) Connect connector P36 to water temperature sensor (S56).
(9) Connect connector clamp on water temperature sensor.
(10) Lower cab (TM 9-2320-366-10-1).



f5. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 AND/OR 33 AND ANY SUB CODE (CONT)



WARNING

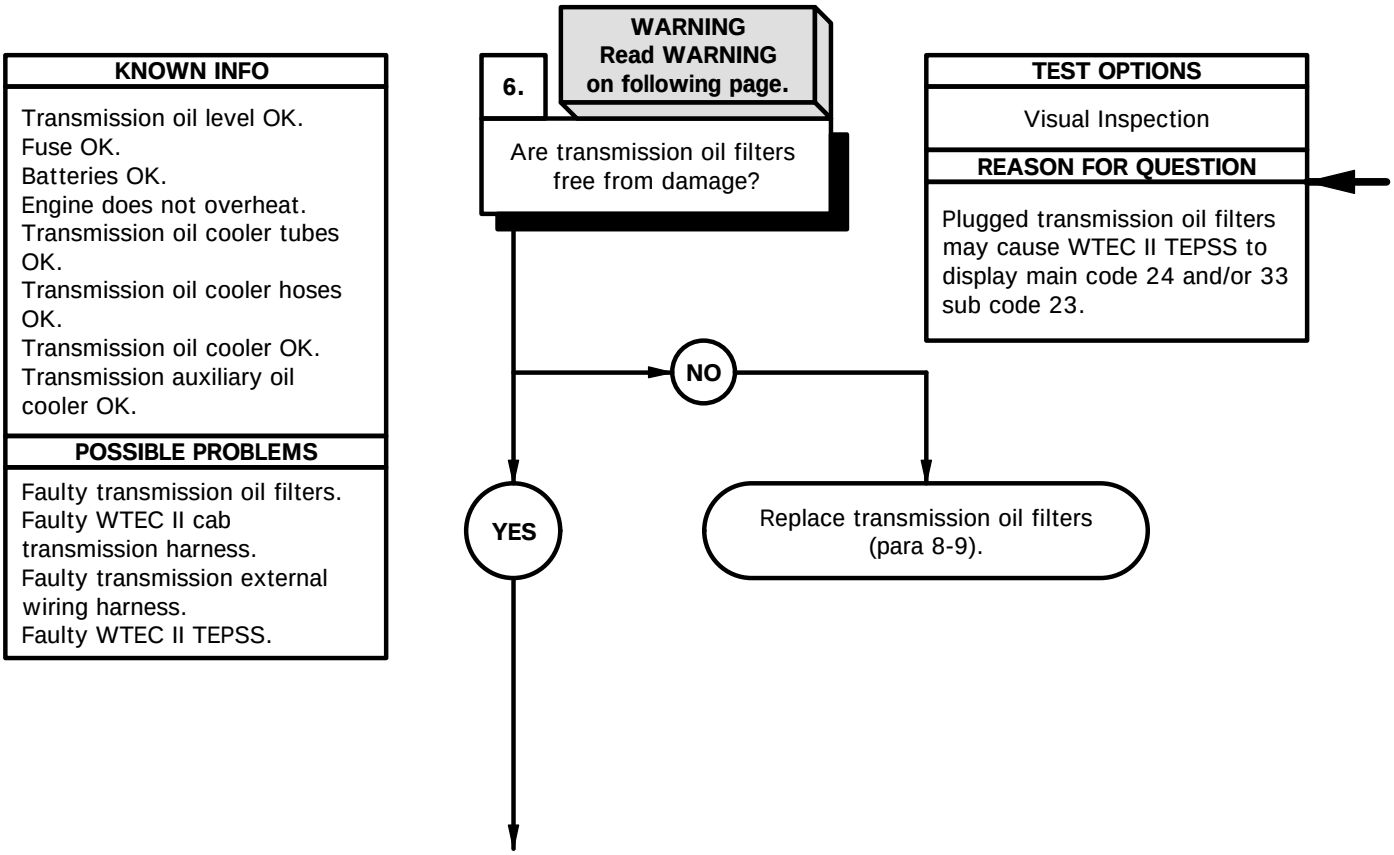
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

NOTE

M1088/M1089 are equipped with two transmission auxiliary oil cooler fans.

(1) Check if transmission auxiliary oil cooler fins are plugged with dirt, mud, or other debris.
(2) If fins are plugged with dirt, mud or other debris, clear transmission auxiliary oil cooler fins.

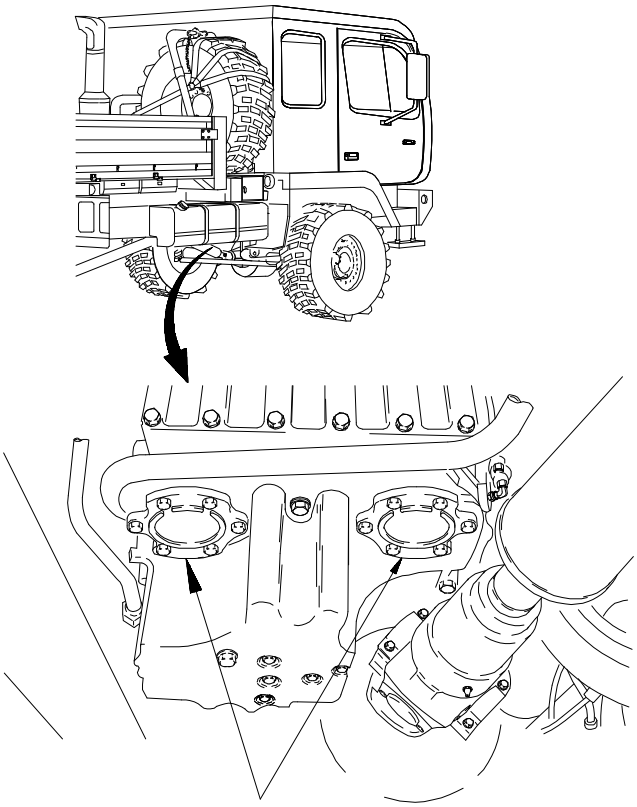
f5. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 AND/OR 33 AND ANY SUB CODE (CONT)



WARNING

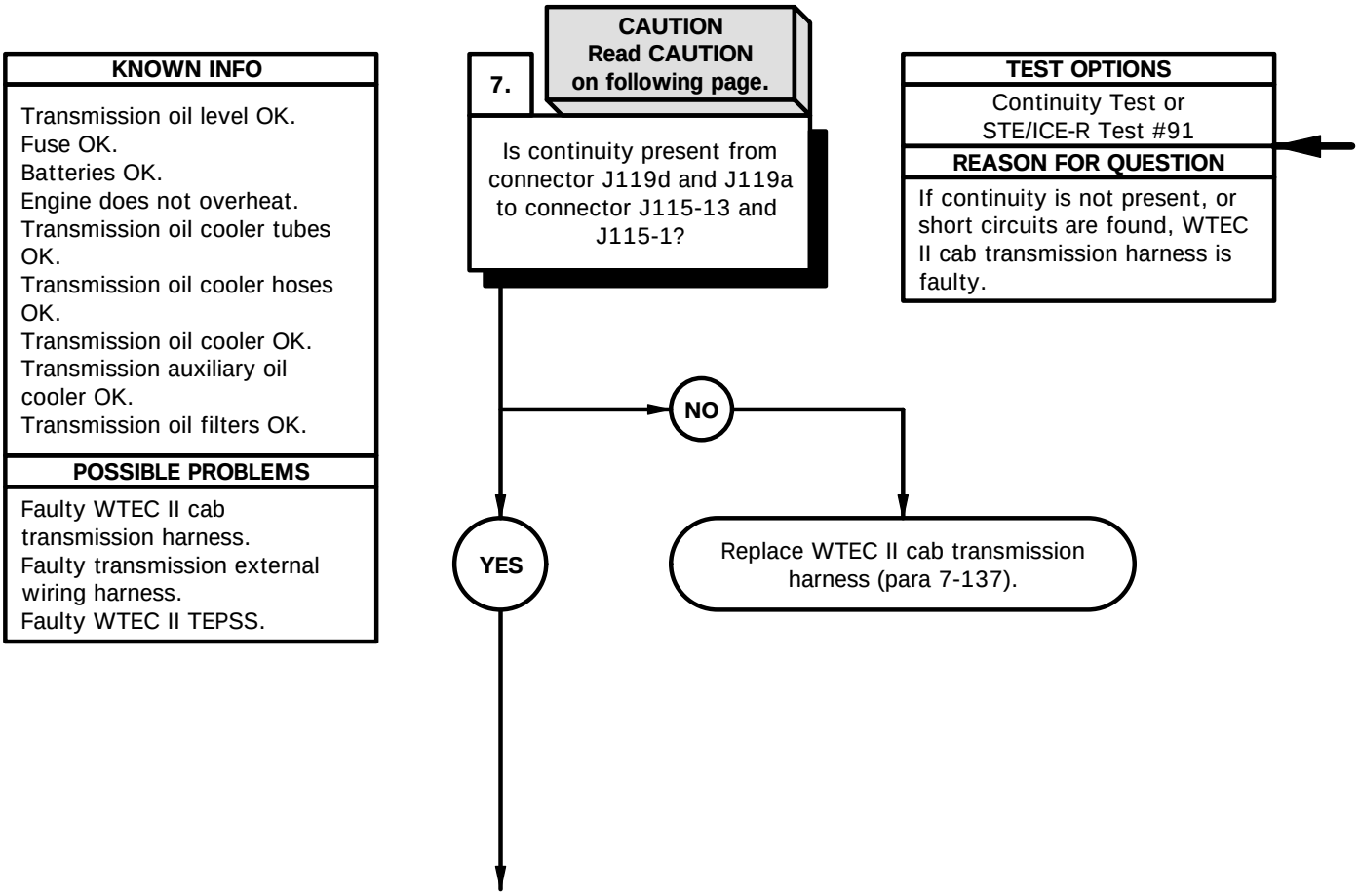
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Check transmission oil filters for damage (para 8-9).



TRANSMISSION OIL FILTERS XBF0504B

f5. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 AND/OR 33 AND ANY SUB CODE (CONT)



CAUTION

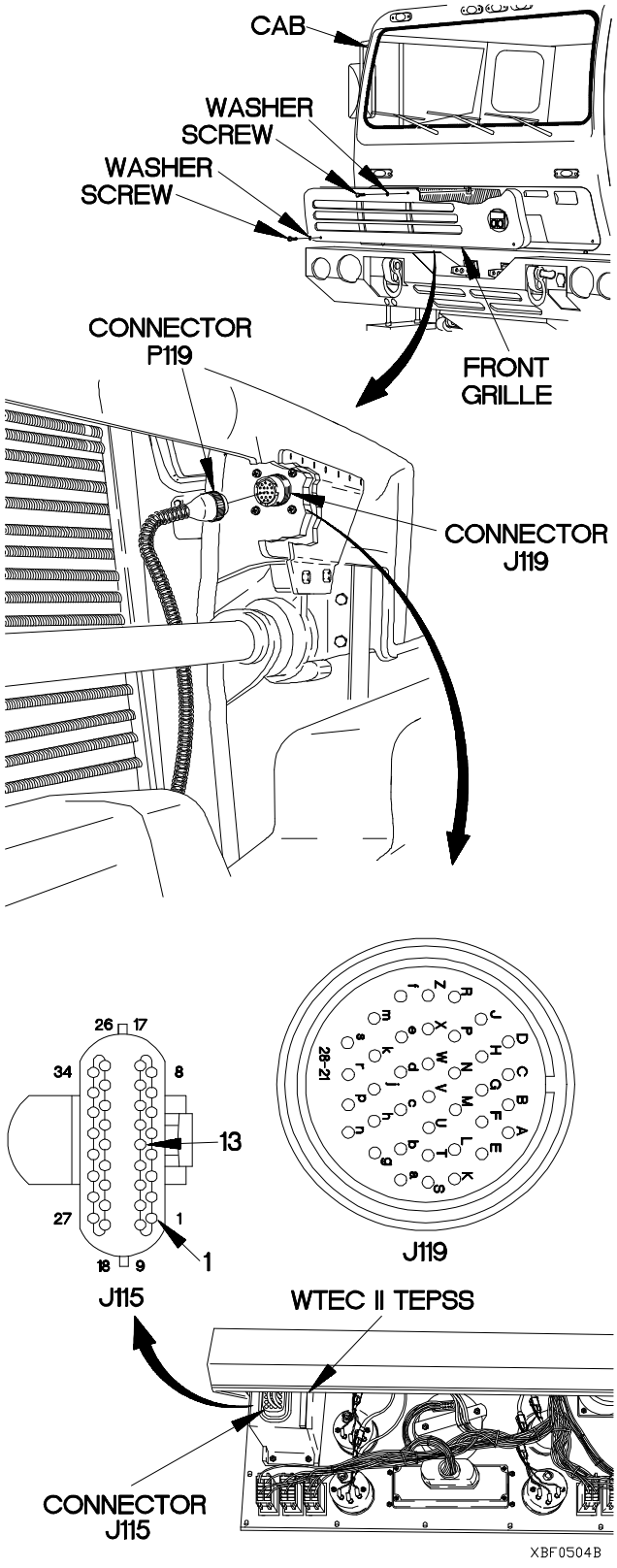
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

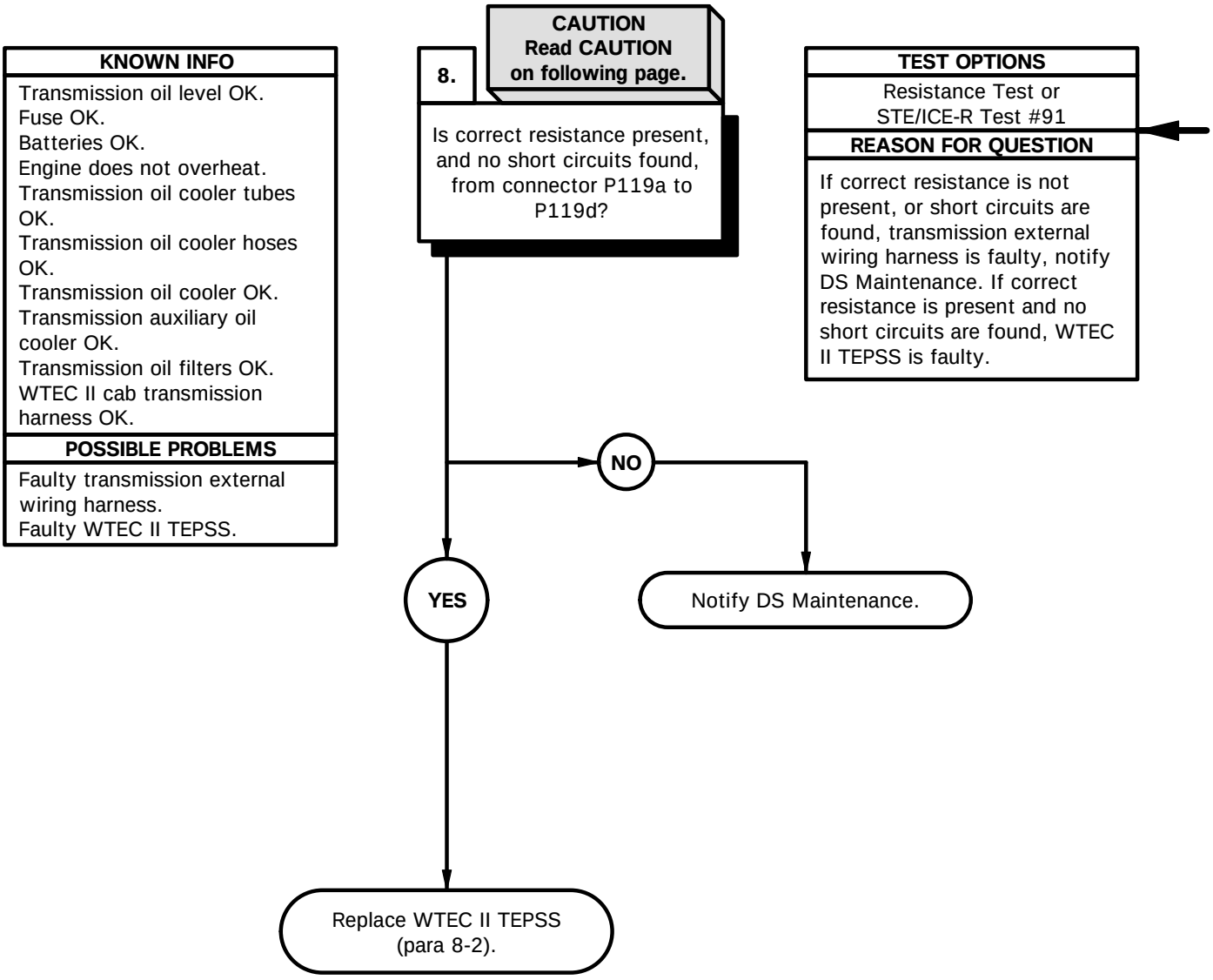
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Remove two screws and washers from front grille.
(2) Remove screw, washer and front grille from cab.
(3) Disconnect connector P119 from connector J119.
(4) Remove instrument panel assembly for access (para 7-15).
(5) Disconnect connector J115 (top connector) from WTEC II TEPSS.
(6) Install jumper wire from connector J119d to J119a.
(7) Set multimeter to ohms.
(8) Connect positive (+) probe of multimeter to connector J115-13.
(9) Connect negative (-) probe of multimeter on J115-1 and note reading on multimeter.
(10) Connect negative (-) probe of multimeter to all other sockets in connector J115, one at a time, and note reading on multimeter.
(11) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(12) Connect positive (+) probe of multimeter to connector J115-1.
(13) Connect negative (-) probe of multimeter to all other pins in connector J115 (except J115-13), one at a time, and note reading on multimeter.
(14) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(15) If continuity is not present in step 9, or continuity is present in step 10, 11, 13, or 14, replace WTEC II cab transmission harness (para 7-137).
(16) Remove jumper wire from connector J119d to connector J119a.
(17) Connect connector J115 to WTEC II TEPSS.
(18) Install instrument panel assembly (para 7-15).



f5. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 AND/OR 33 AND ANY SUB CODE (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 on P119a.

NOTE

Transmission sump oil temperature sensor resistance reading is affected by temperature. Refer to Table 2-19. Transmission Sump Oil Temperature Sensor Resistance Readings for details.

(3) Connect negative (-) prove of multimeter on P119d and note reading on multimeter.
(4) Connect negative (-) probe of multimeter to all other pins in connector P119, one at a time, and note reading on multimeter.
(5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(6) Connect positive (+) probe of multimeter to connector P119d.
(7) Connect negative (-) probe of multimeter to all other pins in connector P119 (except (P119a), one at a time, and note reading on multimeter.
(8) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(9) If correct resistance is not present in step 3, or continuity is present in step 4, 5, 7, or 8, notify DS Maintenance.
(10) If correct resistance is present in step 3 and continuity is not present in step 4, 5, 7, or 8, replace WTEC II TEPSS (para 8-2).
(11) Connect connector P119 to connector J119.
(12) Position front grille on cab with washer and screw.
(13) Position two washers and screws in front grille.
(14) Tighten screw to 48-60 lb-in. (5-7 N·m).
(15) Tighten two screws to 24 lb-in. (3 N·m).
(16) Clear diagnostic codes (para 8-4).

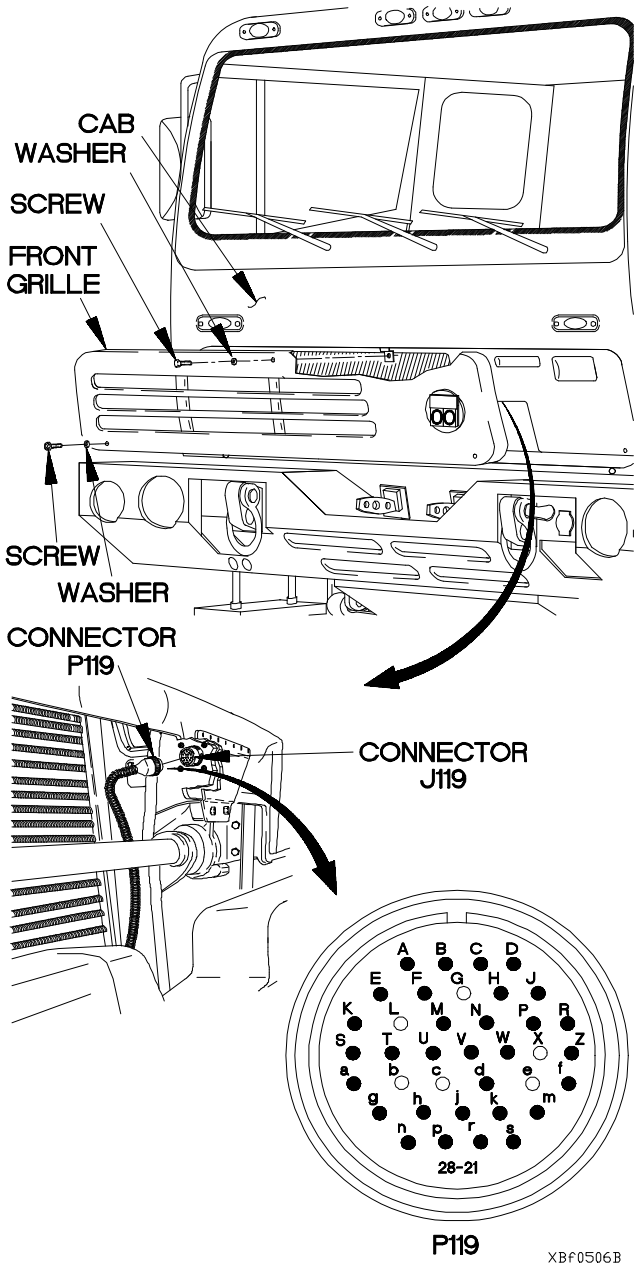


Table 2-19. Transmission Sump Oil Temperature Sensor Resistance Readings

Temperature	Resistance
-4° to 14°F (-20° to -10°C)	691-754 ohms
14° to 32°F (-10° to 0°C)	754-820 ohms
32° to 50°F (0° to 10°C)	820-889 ohms
50° to 68°F (10° to 20°C)	889-962 ohms
68° to 86°F (20° to 30°C)	962-1039 ohms
86° to 104°F (30° to 40°C)	1039-1118 ohms
104° to 122°F (40° to 50°C)	1118-1202 ohms
122° to 140°F (50° to 60°C)	1202-1286 ohms

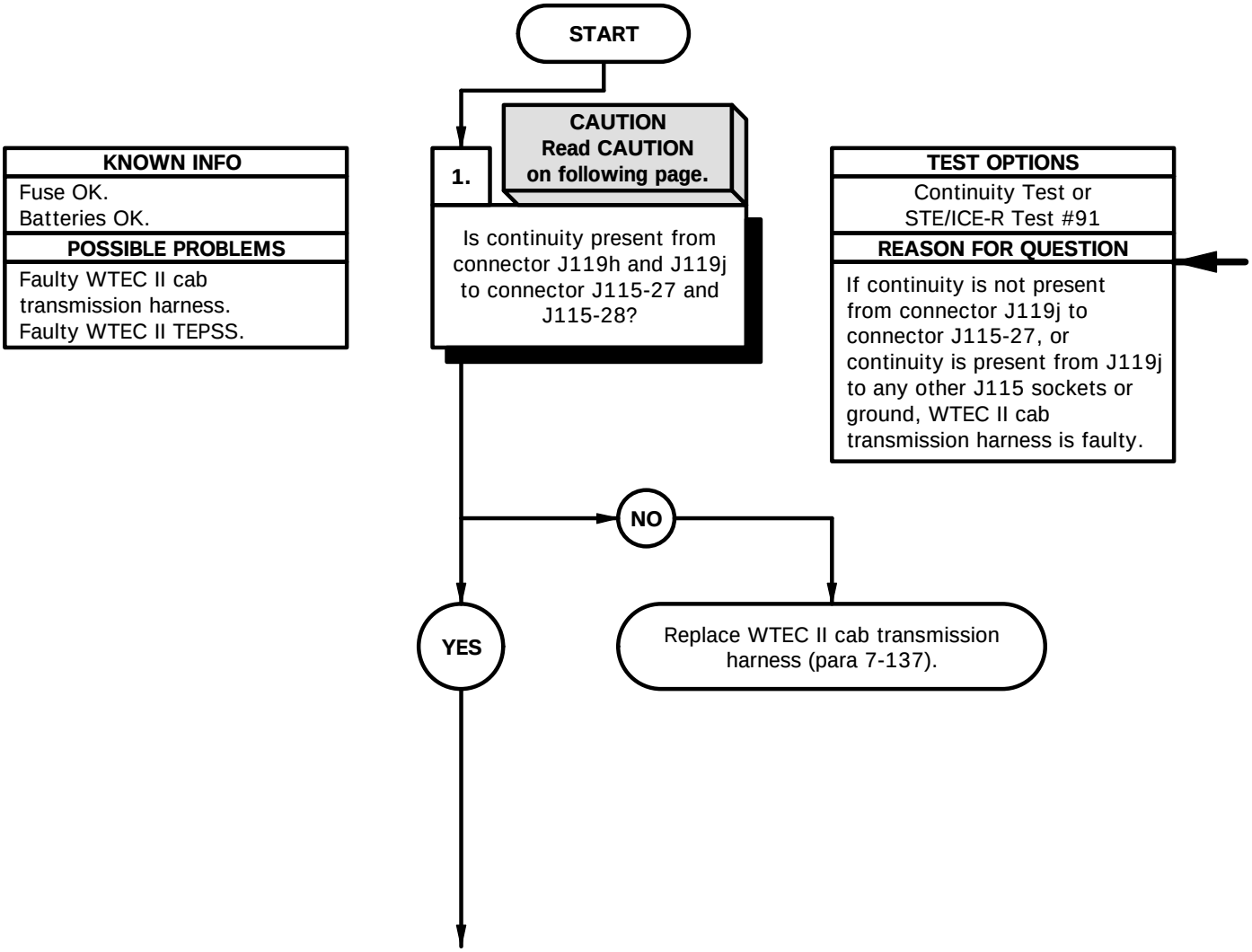
f6. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND ANY SUBCODE

INITIAL SETUP

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

References
TM 9-4910-571-12&P

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
STE/ICE-R (Item 41, Appendix C)



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.

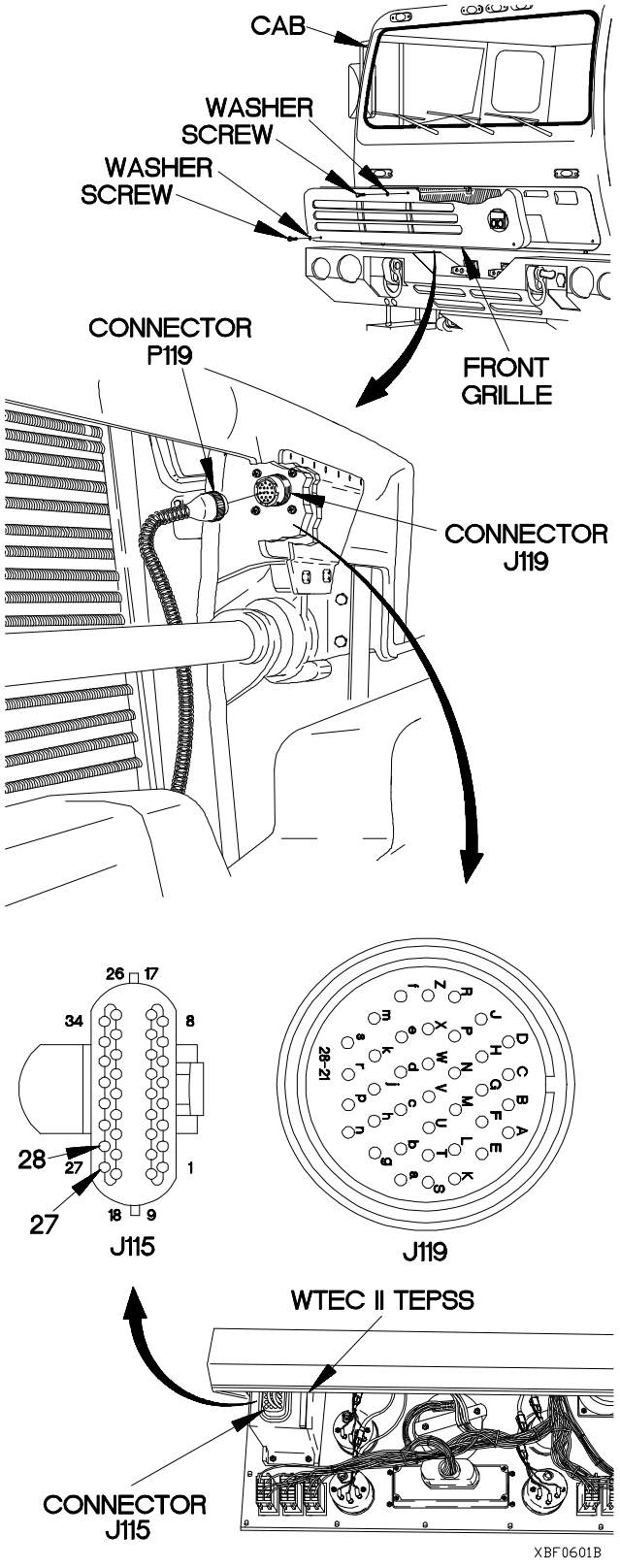
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

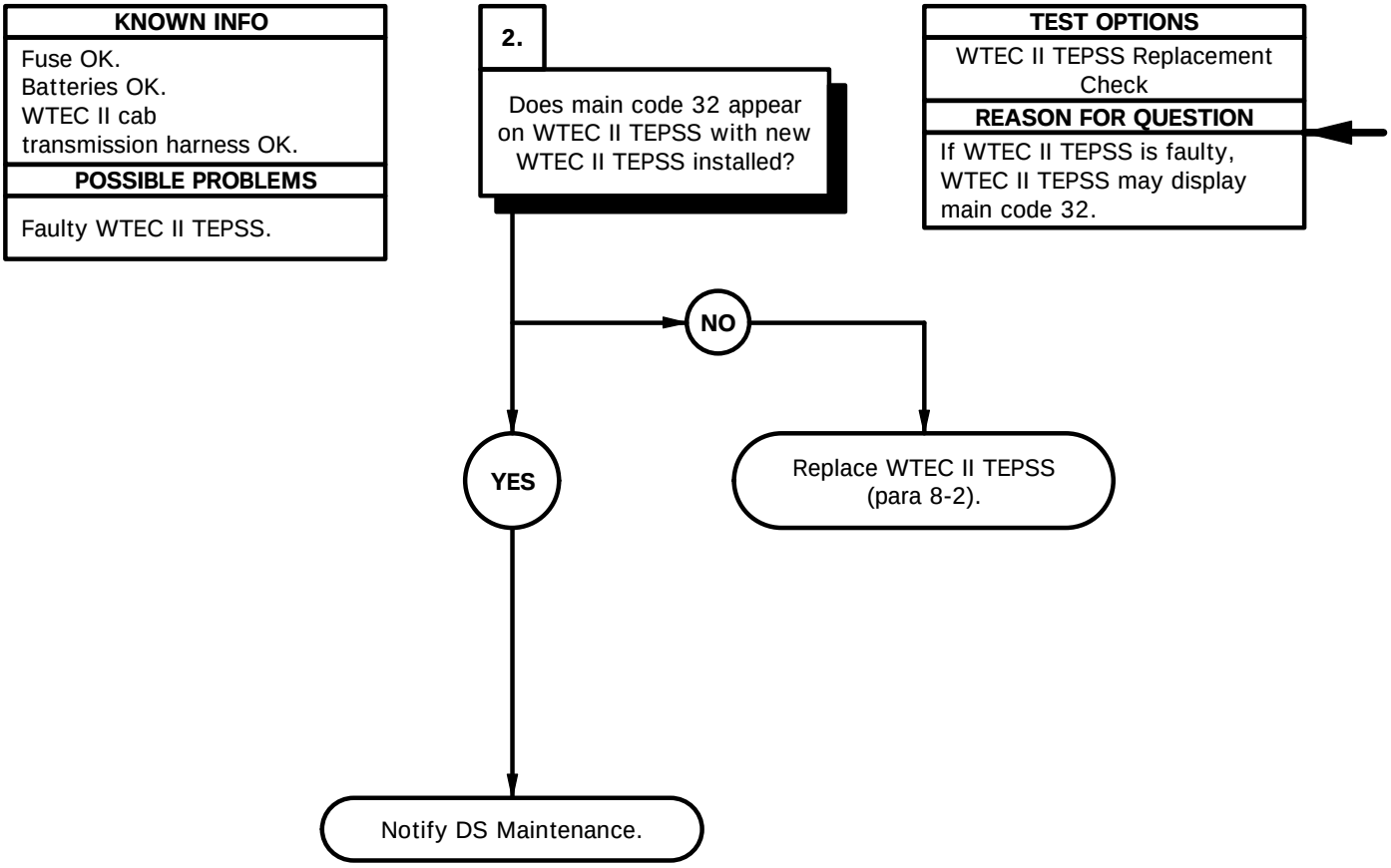
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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) Remove instrument panel assembly for access (para 7-15).
(6) Disconnect connector J115 (top connector) from WTEC II TEPSS.
(7) Install jumper wire from connector J119h to J119j.
(8) Set multimeter to ohms.
(9) Connect positive (+) probe of multimeter to connector J115-27.
(10) Connect negative (-) probe of multimeter to connector J115-28 and note reading on multimeter.
(11) Connect negative (-) probe of multimeter to all other sockets in connector J115, one at a time, and note reading on multimeter.
(12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(13) If continuity is not present in step 10, or continuity is present in step 11 or step 12, replace WTEC II cab transmission harness (para 7-137).
(14) Connect connector P119 to connector J119.
(15) Position front grille on cab with washer and screw.
(16) Position two washers and screws in front grille.
(17) Tighten screw to 48-60 lb-in. (5-7 N·m).
(18) Tighten two screws to 24 lb-in. (3 N·m).

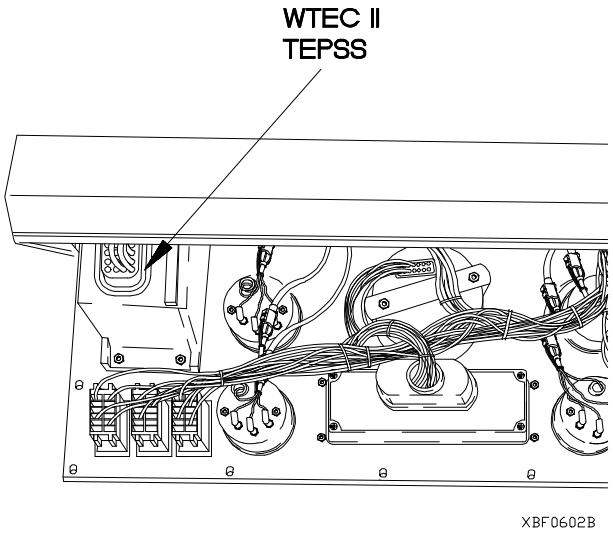


f6. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND ANY SUBCODE (CONT)



WTEC II TEPSS REPLACEMENT CHECK

(1) Remove original WTEC II TEPSS (para 8-2).
(2) Install replacement WTEC II TEPSS (para 8-2).
(3) Install instrument panel assembly (para 7-15).
(4) Start engine (TM 9-2320-366-10-1).
(5) Road test vehicle and read WTEC II TEPSS codes (para 8-4).
(6) If main code 32 does not appear with replacement WTEC II TEPSS installed, replace original WTEC II TEPSS (para 8-2).
(7) If main code 32 appears with replacement WTEC II TEPSS installed, notify DS Maintenance.
(8) Shut down engine (TM 9-2320-366-10-1).
(9) Clear diagnostic codes (para 8-4).



f7. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, 66, AND/OR 69 ANY SUB CODE

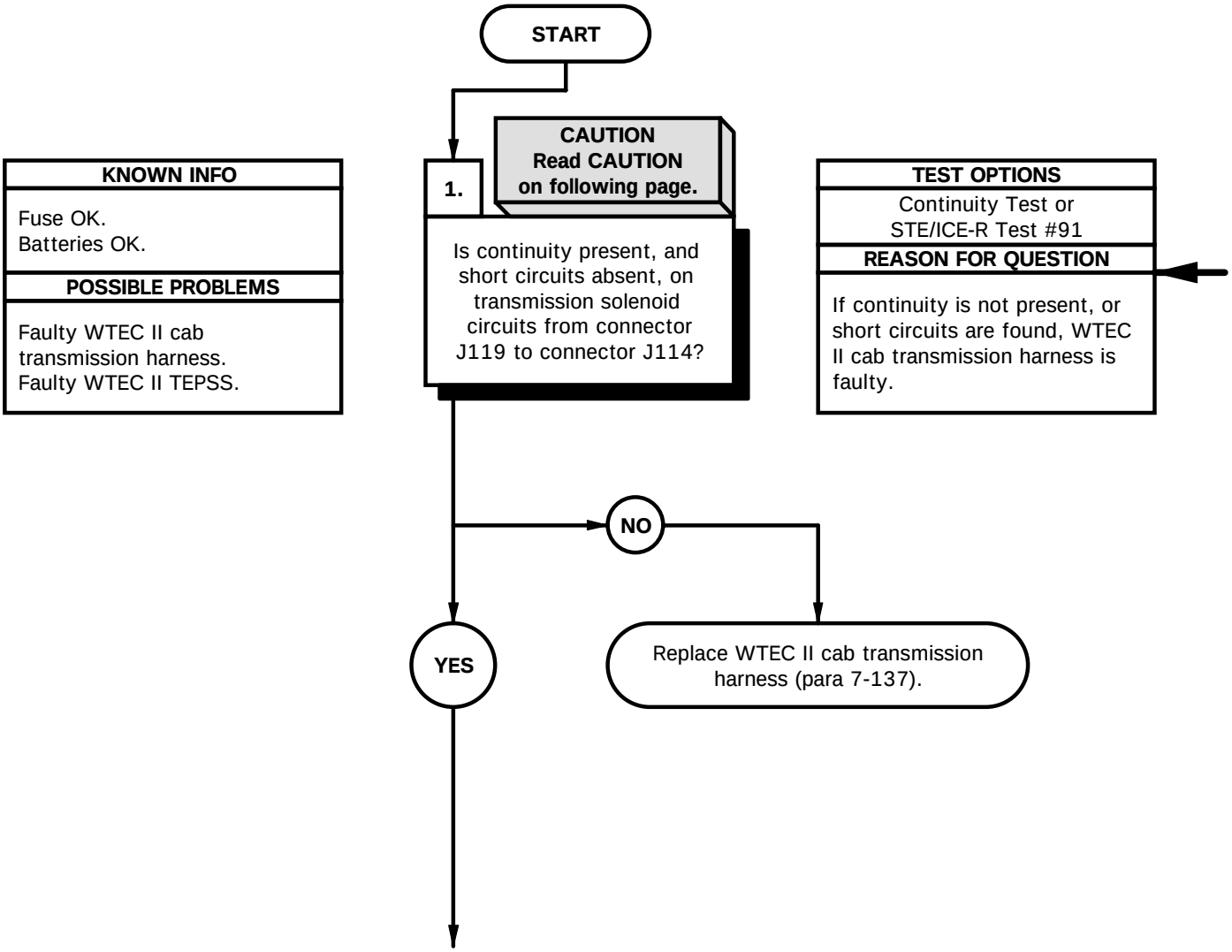
INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B)

Tools and Special Tools (Cont)
STE/ICE-R (Item 41, Appendix C)

References
TM 9-4910-571-12&P



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) Remove instrument panel assembly for access (para 7-15).
(6) Disconnect connector J114 (bottom connector) from WTEC II TEPSS.
(7) Install jumper wire on connector J119 for appropriate sub code. Refer to Table 2-20. WTEC II Cab Transmission Harness Transmission Solenoid Test Points.
(8) Set multimeter to ohms.
(9) Connect positive (+) probe of multimeter to connector J114. Refer to Table 2-20. WTEC II Cab Transmission Harness Transmission Solenoid Test Points.
(10) Connect negative (-) probe of multimeter to connector J114 and note reading on multimeter. Refer to Table 2-20. WTEC II Cab Transmission Harness Transmission Solenoid Test Points.
(11) Connect negative (-) probe of multimeter to all other sockets in connector J115, one at a time, and note reading on multimeter.
(12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(13) If continuity is not present in step 10, or continuity is present in step 11 or step 12, replace WTEC II cab transmission harness (para 7-137).
(14) Connect connector J114 to WTEC II TEPSS.
(15) Install instrument panel assembly (para 7-15).

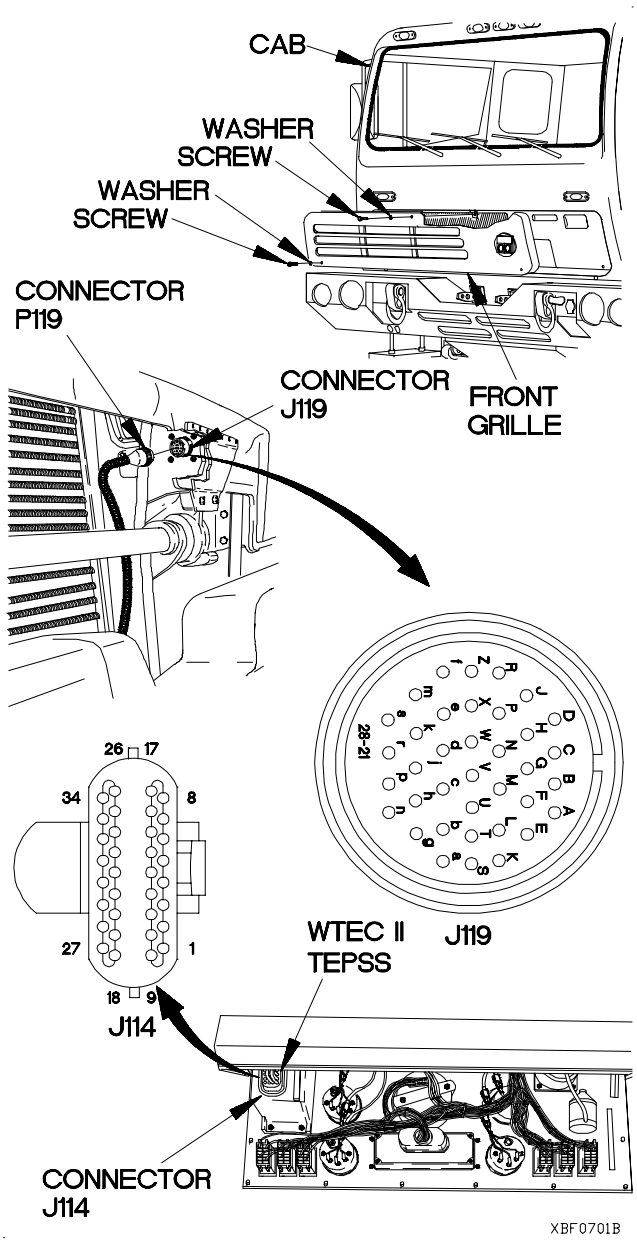
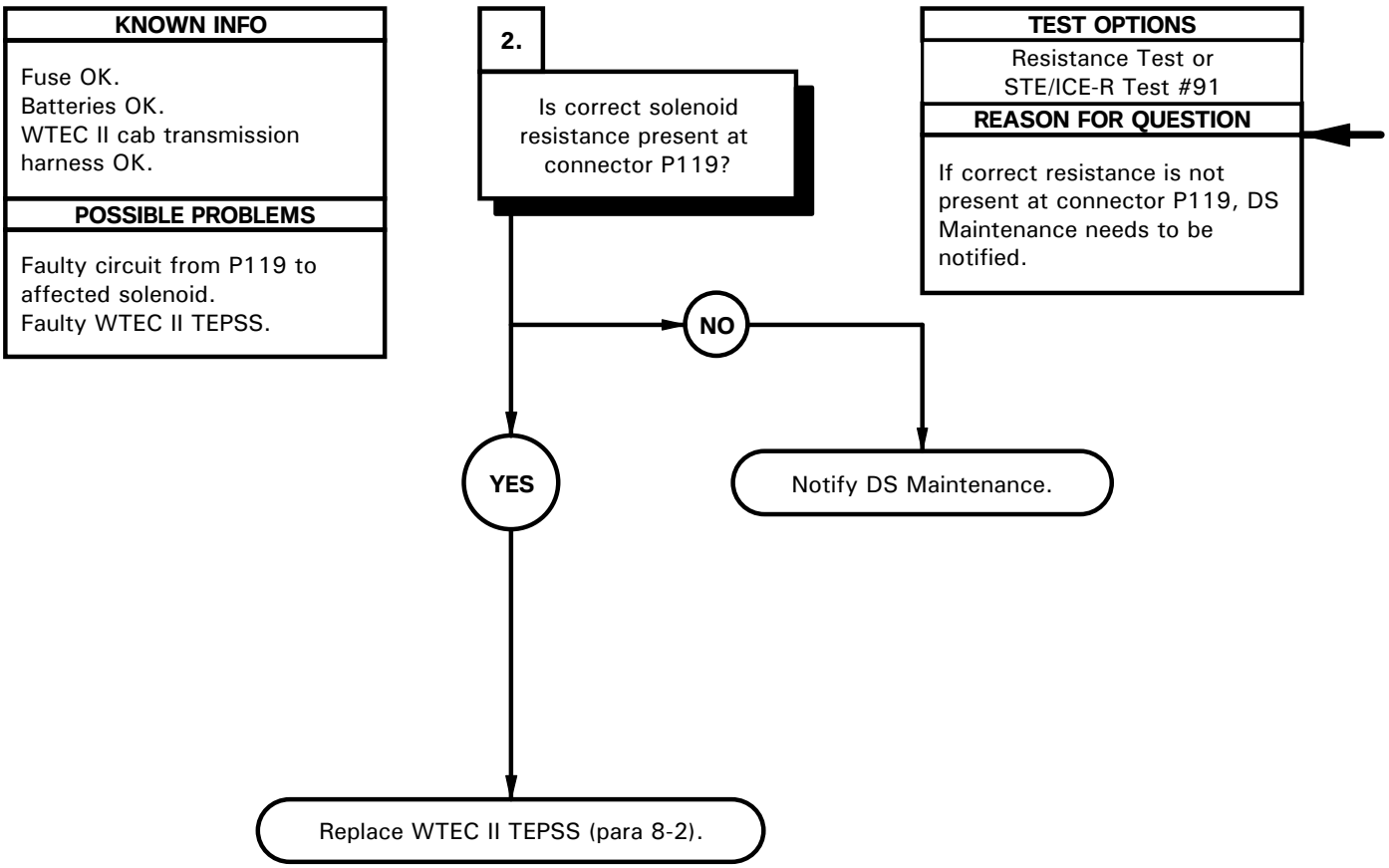


Table 2-20. WTEC II Cab Transmission Harness Transmission Solenoid Test Points

Sub Code	Jumper Across	Connector J114	
		Positive (+) Probe	Negative (-) Probe
12	J119M to J119B	J114-2	J114-20
13	J119T to J119N	J114-21	J114-28
14	J119C to J119V	J114-30	J114-3
15	J119W to J119B	J114-2	J114-31
16	J119U to J119N	J114-21	J114-29
21	J119F to J119H	J114-10	J114-7
22	J119D to J119V	J114-30	J114-4
23	J119P to J119S	J114-22	J114-27
24	J119J to J119B	J114-2	J114-11
26	J119K to J119A	J114-1	J114-16

f7. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, 66, AND/OR 69 ANY SUB CODE (CONT)



RESISTANCE TEST

(1) Disconnect connector P119 from connector J119.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector P119. Refer to Table 2-21. Connector P119 Transmission Solenoid Resistance Test Points for appropriate sub code(s) and connector P119 pin(s).
(4) Connect negative (-) probe of multimeter to connector P119 and note reading on multimeter. Refer to Table 2-21. Connector P119 Transmission Solenoid Resistance Test Points for appropriate sub code(s) and connector P119 pin(s).

NOTE

Transmission solenoid resistance is affected by temperature. Refer to Table 2-22. Transmission Solenoid Resistance Readings.

(5) If resistance reading indicates transmission solenoid is good, replace WTEC II TEPSS (para 8-2).
(6) If resistance reading indicates transmission solenoid is faulty, notify DS Maintenance.
(7) Connect connector P119 to connector J119.
(8) Position front grille on cab with washer and screw.
(9) Position two washers and screws in front grille.
(10) Tighten screw to 48-60 lb-in. (5-7 N·m).
(11) Tighten two screws to 24 lb-in. (3 N·m).
(12) Clear diagnostic codes (para 8-4).

Table 2-21. Connector P119 Transmission Solenoid Resistance Test Points

Sub Code	Connector P119	
	Positive (+) Probe	Negative (-) Probe
12	P119M	P119B
13	P119T	P119N
14	P119C	P119V
15	P119W	P119B
16	P119U	P119N
21	P119F	P119H
22	P119D	P119V
23	P119P	P119S
24	P119J	P119B
26	P119K	P119A

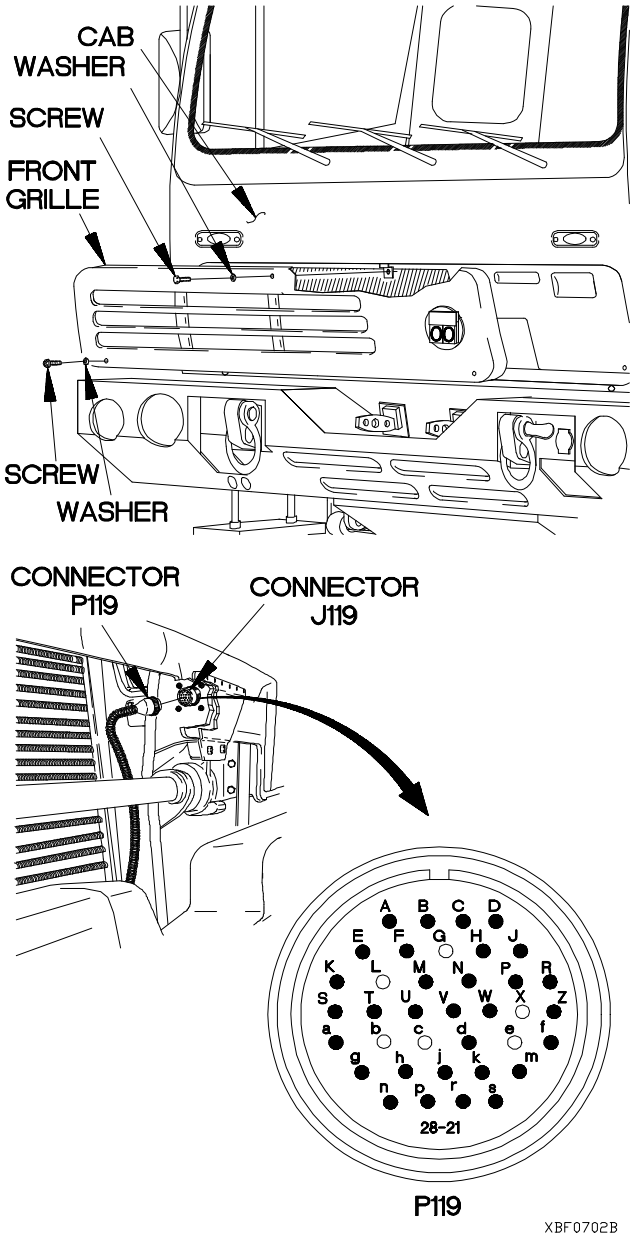


Table 2-22. Transmission Solenoid Resistance Readings

Temperature	Resistance
4° to 16°F (-20° to -10°C)	2.50-3.12 ohms
16° to 32°F (-10° to 0°C)	2.62-3.25 ohms
32° to 50°F (0° to 10°C)	2.74-3.38 ohms
50° to 68°F (10° to 20°C)	2.86-3.50 ohms
68° to 86°F (20° to 30°C)	2.98-3.62 ohms
86° to 104°F (30° to 40°C)	3.09-3.75 ohms
104° to 122°F (40° to 50°C)	3.21-3.88 ohms
122° to 140°F (50° to 60°C)	3.33-4.00 ohms

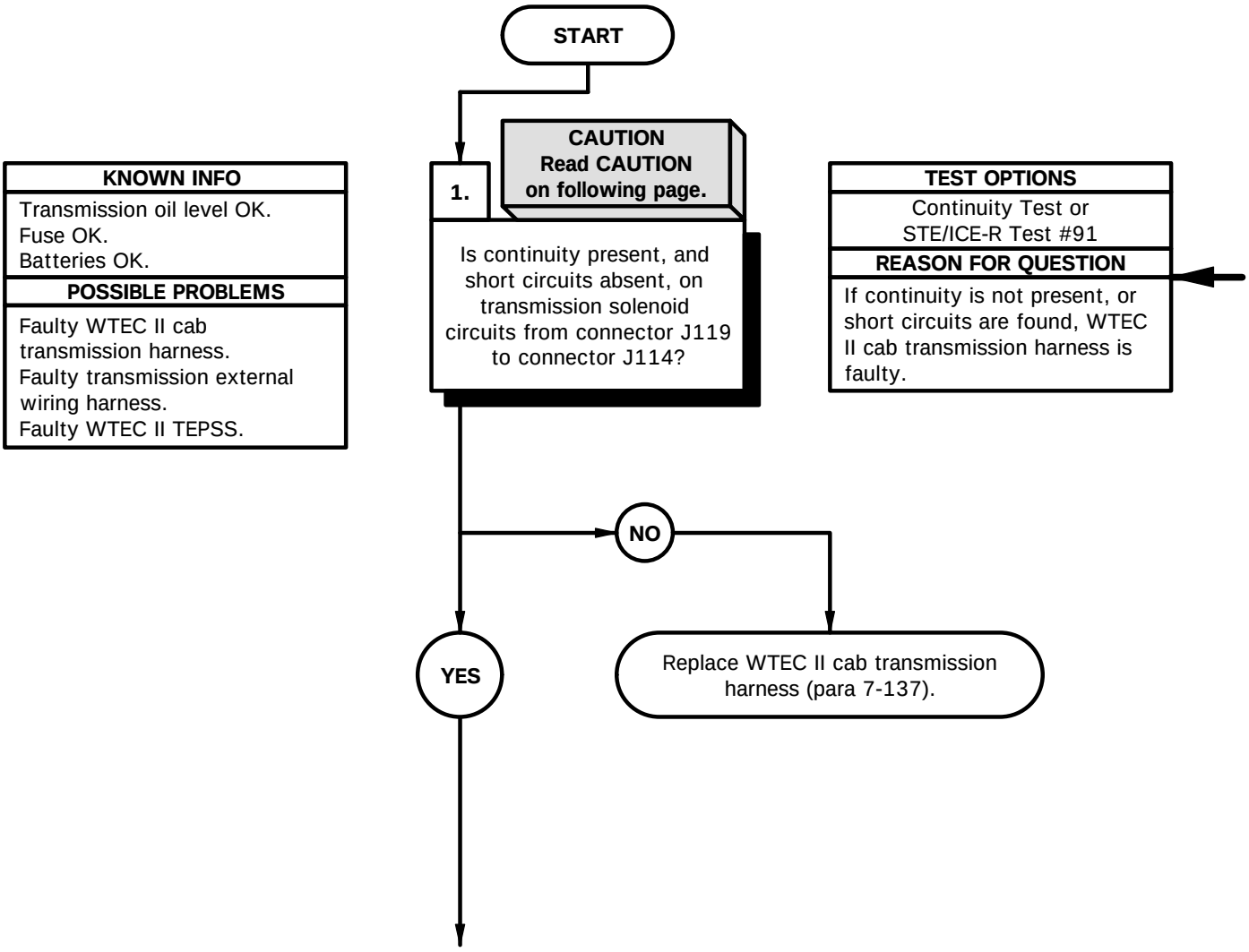
f8. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 AND ANY SUB CODE

INITIAL SETUP

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

References
TM 9-4910-571-12&P

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
STE/ICE-R (Item 41, Appendix C)



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

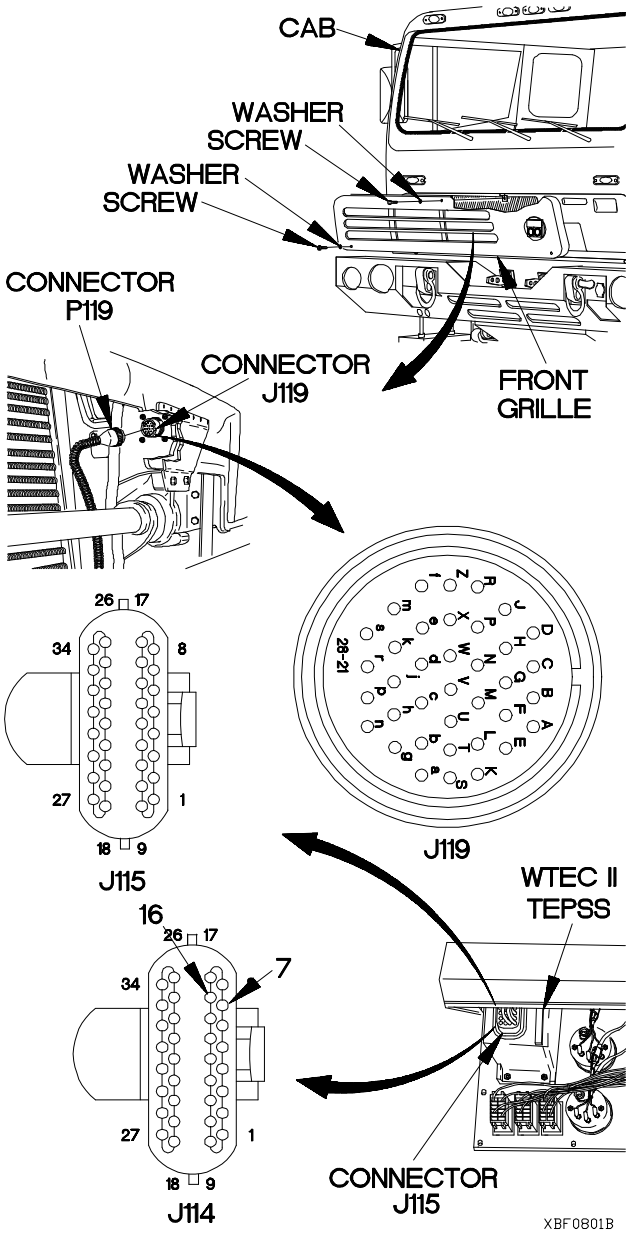
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

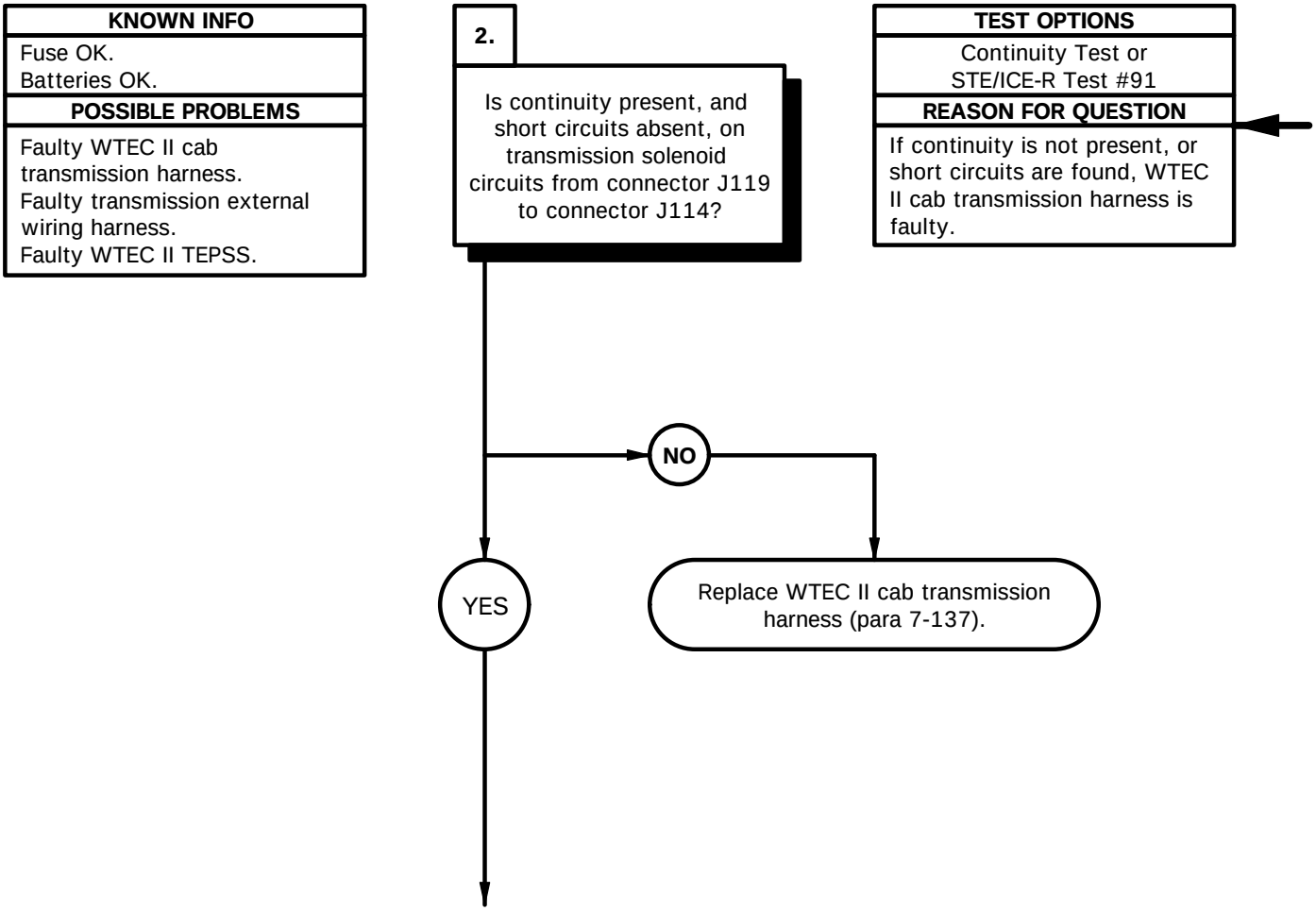
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Remove instrument panel assembly for access (para 7-15).
(6) Disconnect connectors J114 and J115 from WTEC II TEPSS.
(7) Set multimeter to ohms.
(8) Connect positive (+) probe of multimeter to High side socket of connector J119. Refer to Table 2-23. Main Code 43 Sub Code 21 and 26 High Side Test Points.
(9) Connect negative (-) probe of multimeter to High side socket of connector J114 and note reading on multimeter. Refer to Table 2-23. Main Code 43 Sub Code 21 and 26 High Side Test Points.
(10) Connect negative (-) probe of multimeter to all other sockets in connector J114, one at a time, and note reading on multimeter.
(11) Connect negative (-) probe of multimeter to all sockets in connector J115, one at a time, and note reading on multimeter.
(12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(13) If continuity is not present in step 9, or continuity is present in step 10, 11, or 12, replace WTEC II cab transmission harness (para 7-137).

Table 2-23. Main Code 43 Sub Code 21 and 26 High Side Test Points

Sub Code	Connector J114	Connector J119
21	7	F
26	16	K



f8. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 AND ANY SUB CODE (CONT)

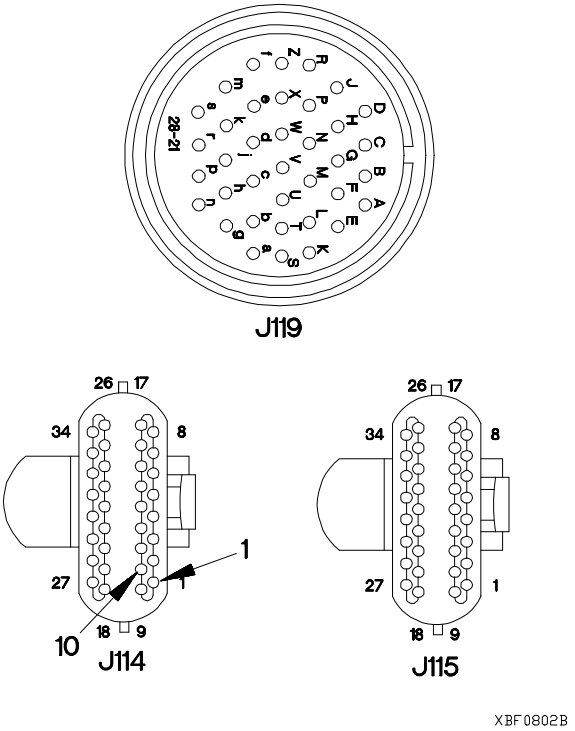


CONTINUITY TEST

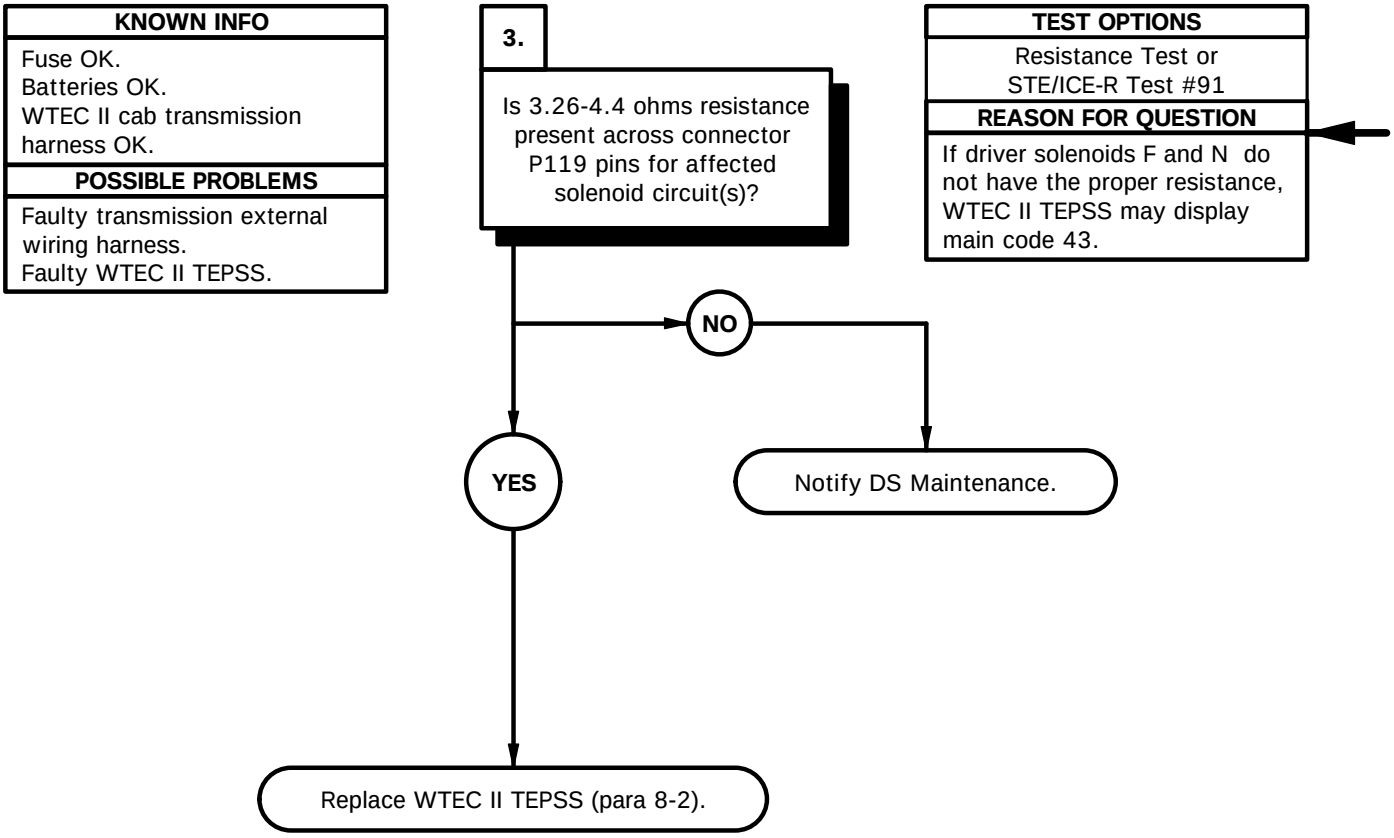
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector J119. Refer to Table 2-24. Main Code 43 Sub Code 21 and 26 Low Side Test Points.
(3) Connect negative (-) probe of multimeter to connector J114 and note reading on multimeter. Refer to Table 2-24. Main Code 43 Sub Code 21 and 26 Low Side Test Points.
(4) Connect negative (-) probe of multimeter to all other sockets in connector J114, one at a time, and note reading on multimeter.
(5) Connect negative (-) probe of multimeter to all sockets in connector J115, one at a time, and note reading on multimeter.
(6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(7) If continuity is not present in step 3, or continuity is present in step 4, 5, or 6, replace WTEC II cab transmission harness (para 7-137).

Table 2-24. Main Code 43 Sub Code 21 and 26 Low Side Test Points

Sub Code	Connector J114	Connector J119
21	10	H
26	1	A



f8. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 AND ANY SUB CODE (CONT)

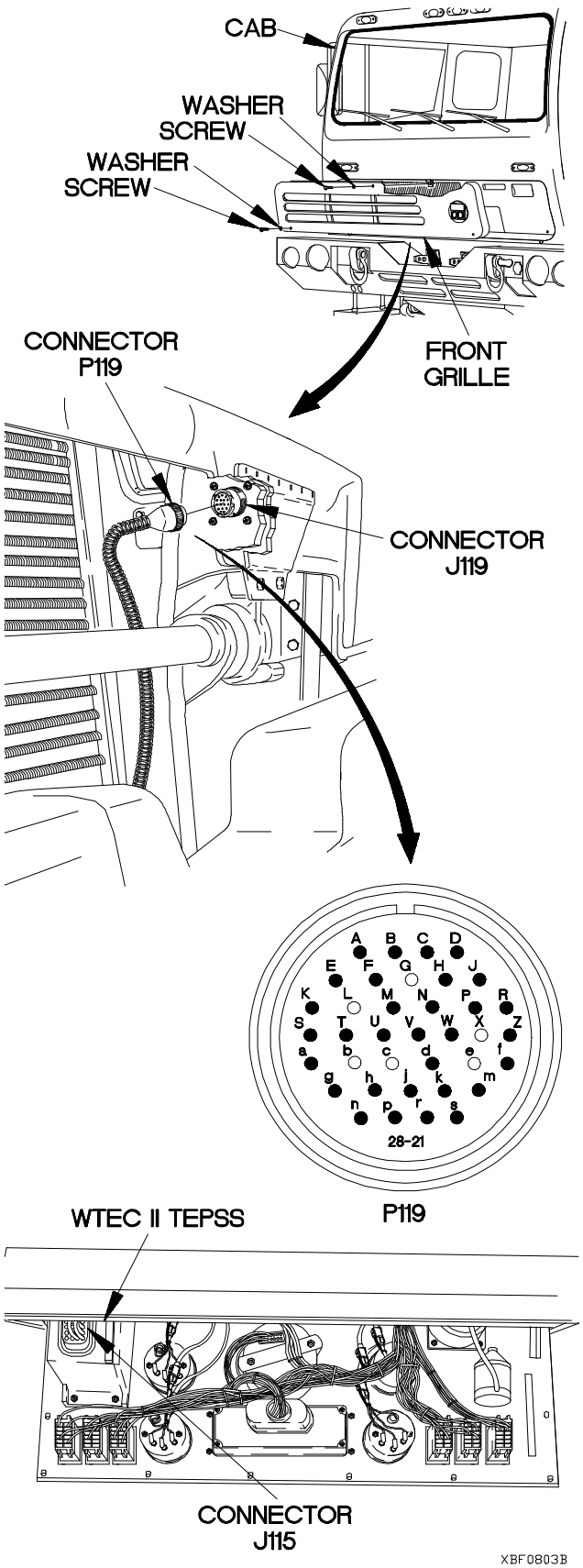


RESISTANCE TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P119. Refer to Table 2-25. Transmission Solenoid F and G Resistance Test Points.
(3) Connect negative (-) probe of multimeter to connector P119 and note reading on multimeter. Refer to Table 2-25. Transmission Solenoid F and G Resistance Test Points.
(4) Connect negative (-) probe of multimeter to all other pins in connector P119, one at a time, and note reading on multimeter.
(5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(6) If good resistance is not noted in step 3, or continuity is present in step 4 or step 5, transmission harness external wiring harness may be faulty, notify DS Maintenance.
(7) If good resistance is noted in step 3, and continuity is not present in step 4 or step 5, replace WTEC II TEPSS (para 8-2).
(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).
(13) Connect connectors J114 and J115 to WTEC II TEPSS.
(14) Install instrument panel assembly (para 7-15).
(15) Clear diagnostic codes (para 8-4).

Table 2-25. Transmission Solenoids F and G Resistance Test Points

Sub Code	Affected Solenoid	Connector P119 High	Connector P119 Low
21	F	F	H
26	N	K	A



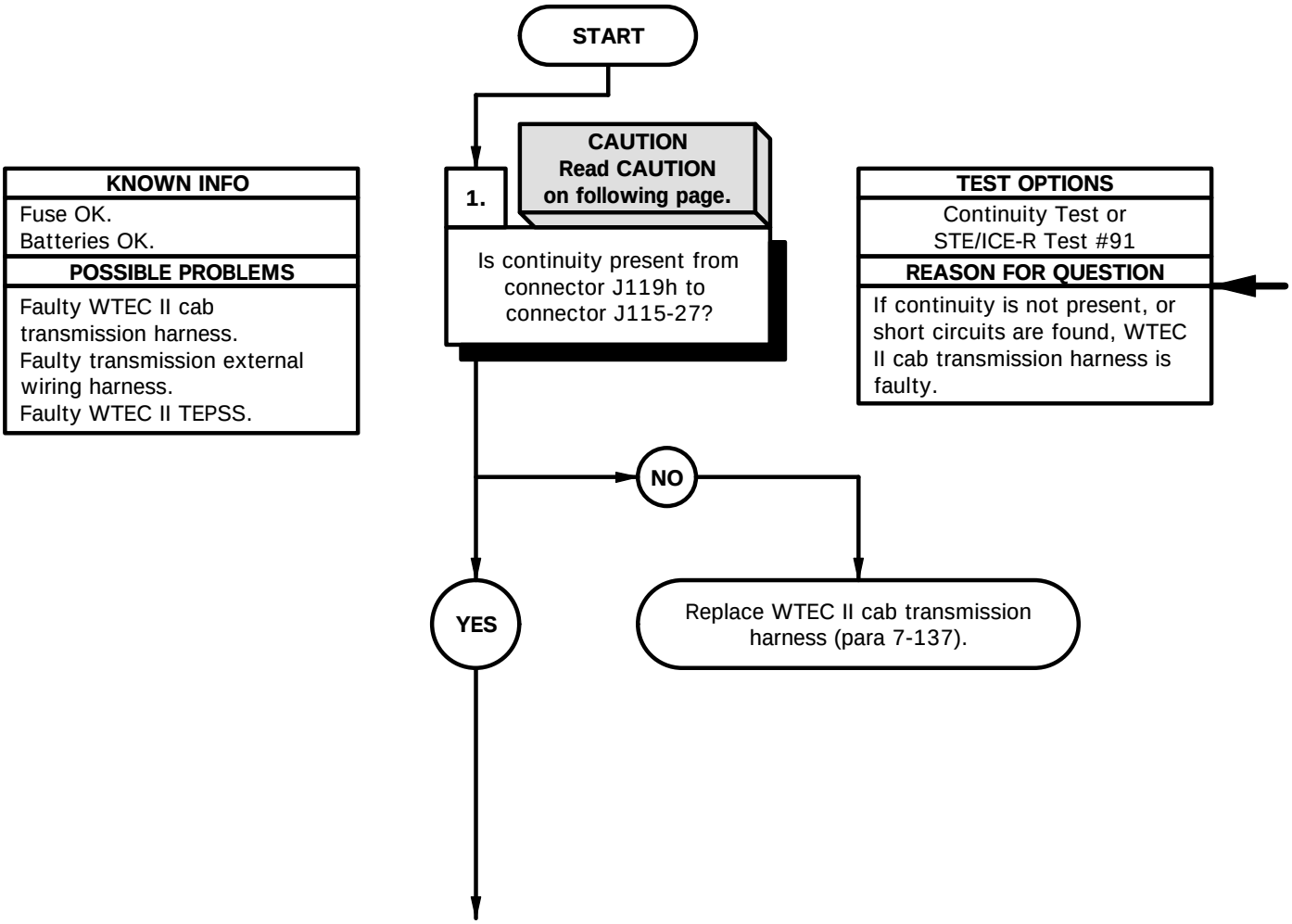
f9. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE

INITIAL SETUP

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

References
TM 9-4910-571-12&P

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B)
STE/ICE-R (Item 41, Appendix C)



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.

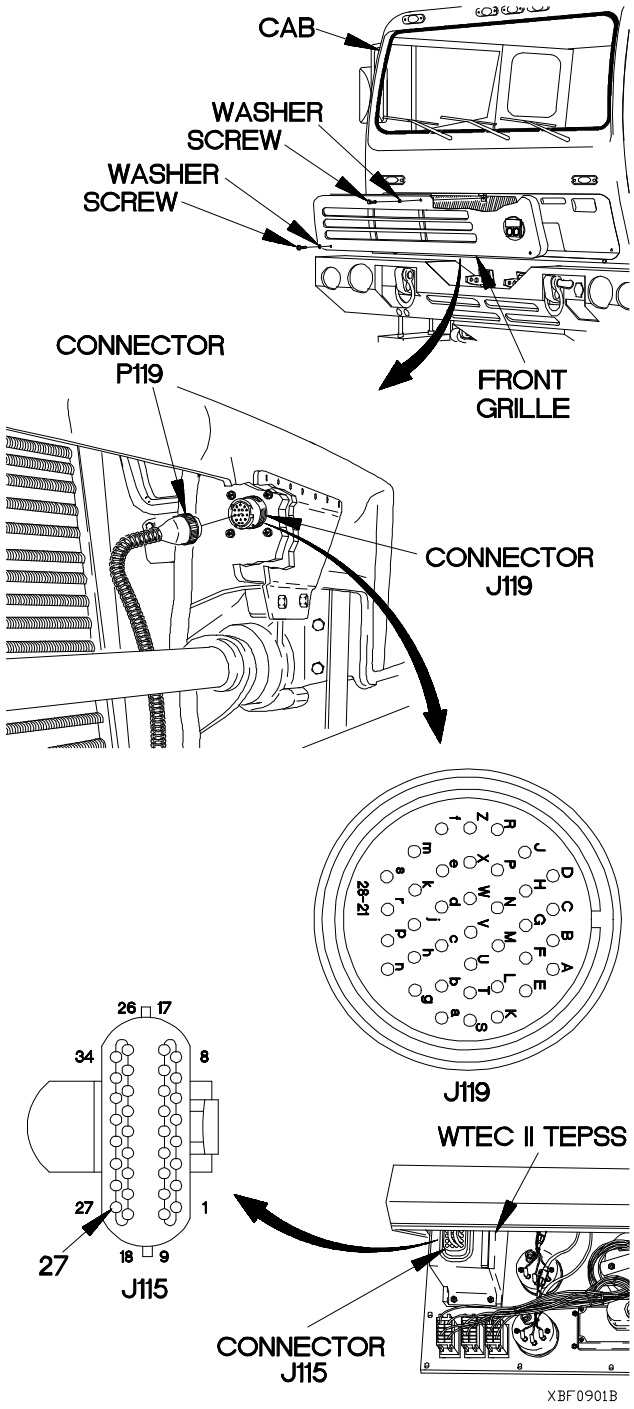
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

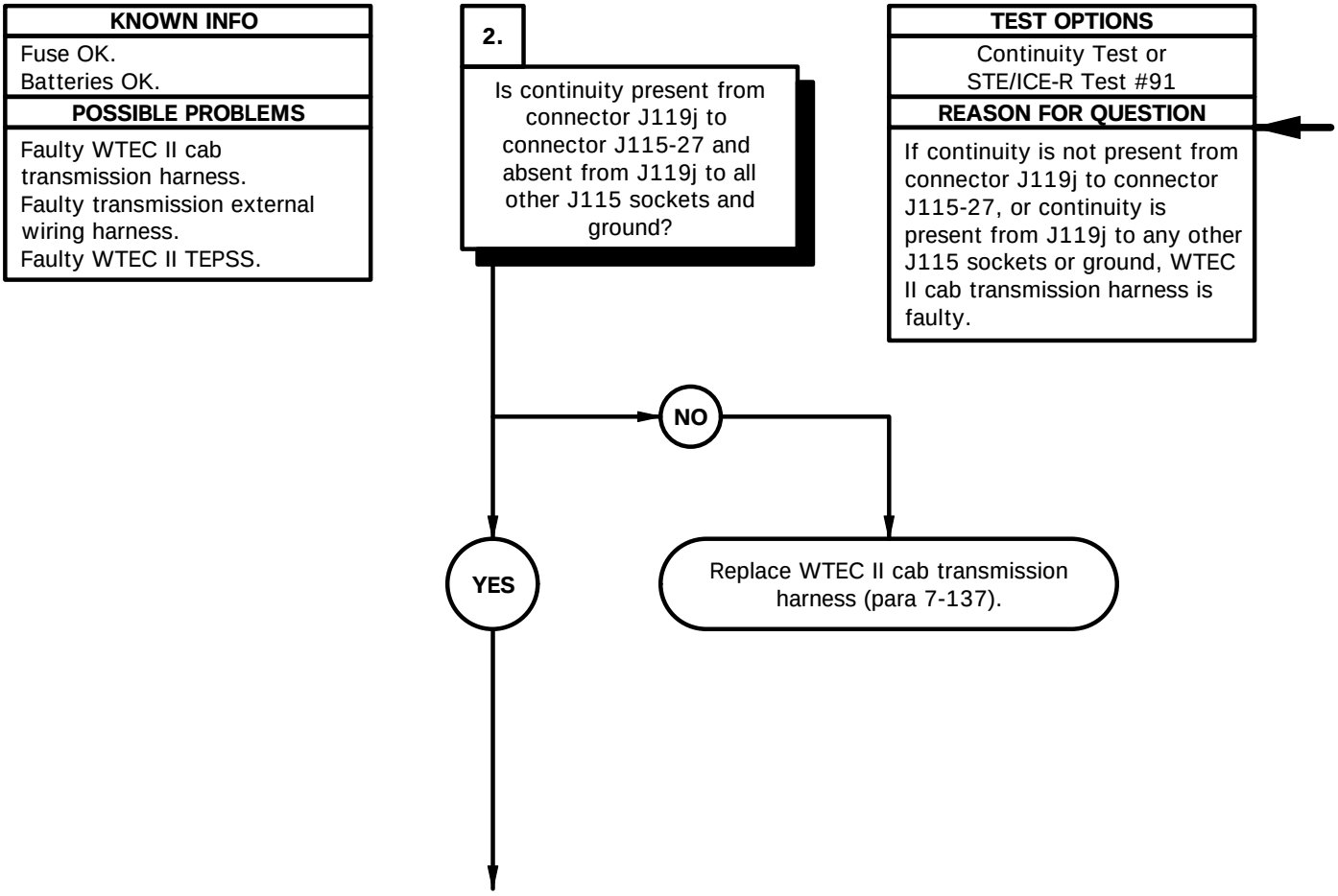
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille on cab.
(4) Disconnect connector P119 from connector J119.
(5) Remove instrument panel assembly for access (para 7-15).
(6) Disconnect connector J115 (top connector) from WTEC II TEPSS.
(7) Set multimeter to ohms.
(8) Connect positive (+) probe of multimeter to connector J119h.
(9) Connect negative (-) probe of multimeter to connector J115-27 and note reading on multimeter.
(10) Connect negative (-) probe of multimeter to all other sockets in connector J115, one at a time, and note reading on multimeter.
(11) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(12) If continuity is not present in step 9, or continuity is present in step 10 or step 11, replace WTEC II cab transmission harness (para 7-137).

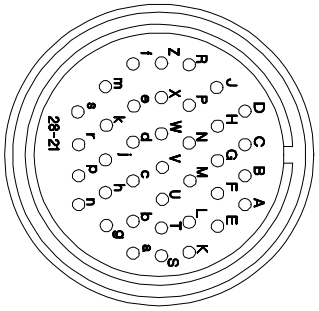


f9. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (CONT)

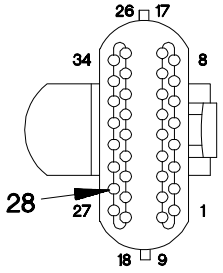


CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector J119j.
(3) Connect negative (-) probe of multimeter to connector J115-28 and note reading on multimeter.
(4) Connect negative (-) probe of multimeter to all other sockets in connector J115, one at a time, and note reading on multimeter.
(5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(6) If continuity is not present in step 3, or continuity is present in step 4 or step 5, replace WTEC II cab transmission harness (para 7-137).



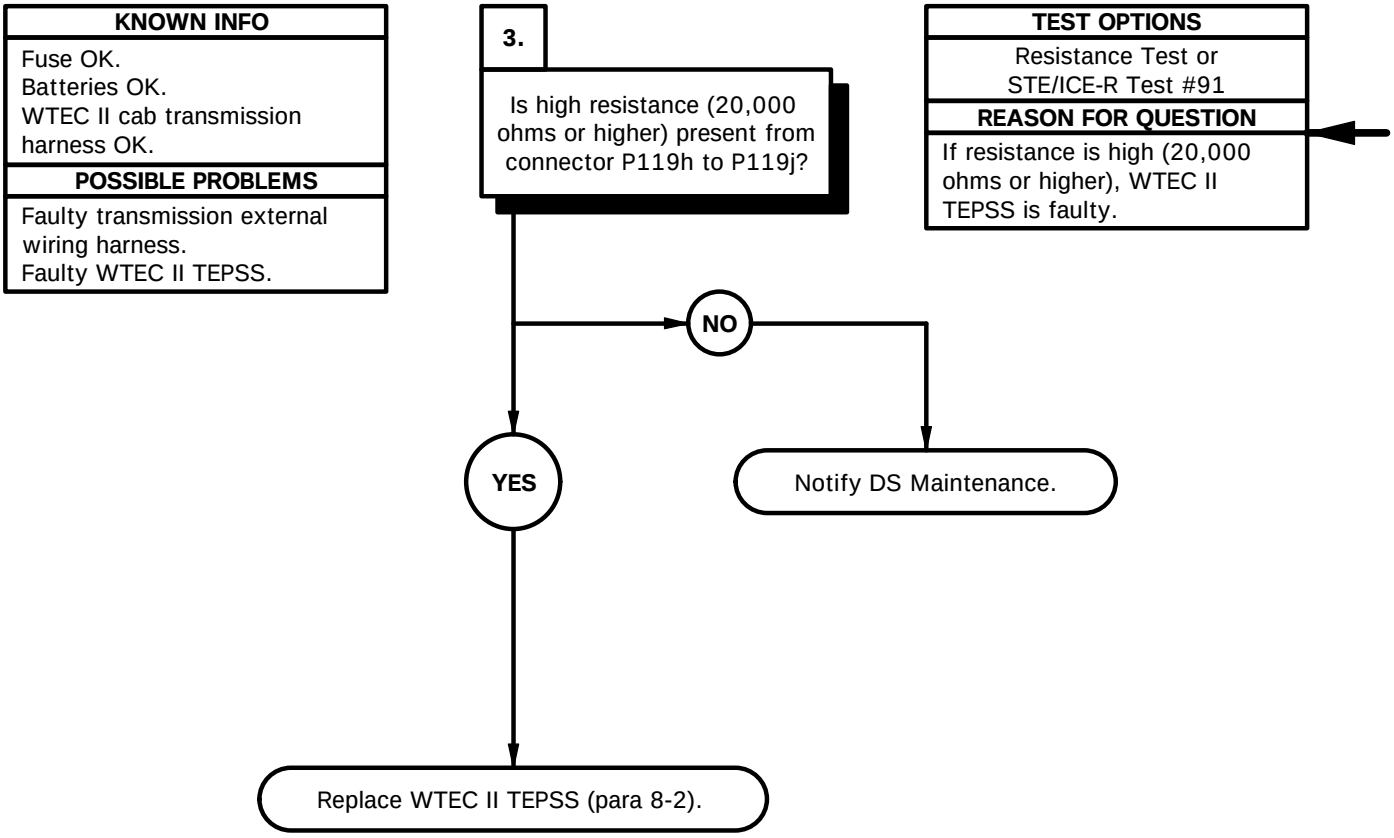
J119



J115

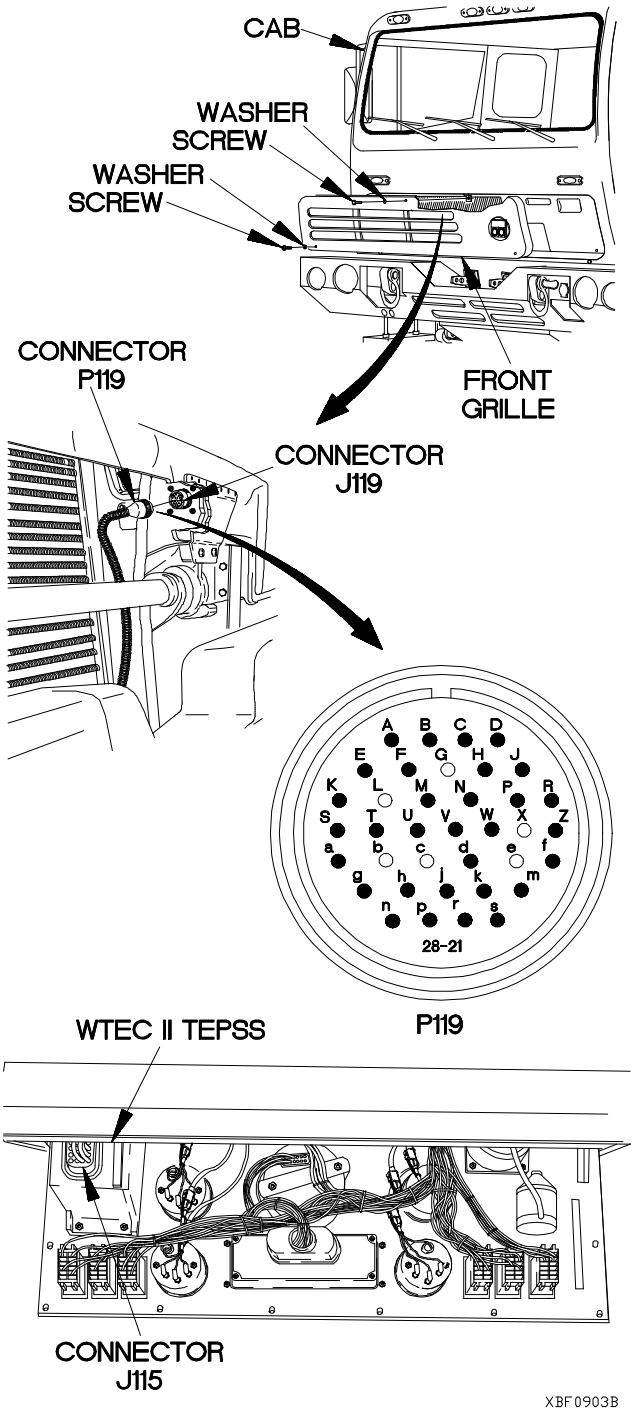
XBF0902B

f9. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (CONT)



RESISTANCE TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) prove of multimeter to connector P119h.
(3) Connect negative (-) probe of multimeter to connector P119j and note reading on multimeter.
(4) If resistance is high (20,000 ohms or higher), replace WTEC II TEPSS (para 8-2).
(5) If resistance is low (less than 20,000 ohms), notify DS Maintenance.
(6) Connect connector J115 to WTEC II TEPSS.
(7) Install instrument panel assembly (para 7-15).
(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).
(13) Clear diagnostic codes (para 8-4).



f10. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 57 AND ANY SUB CODE

INITIAL SETUP

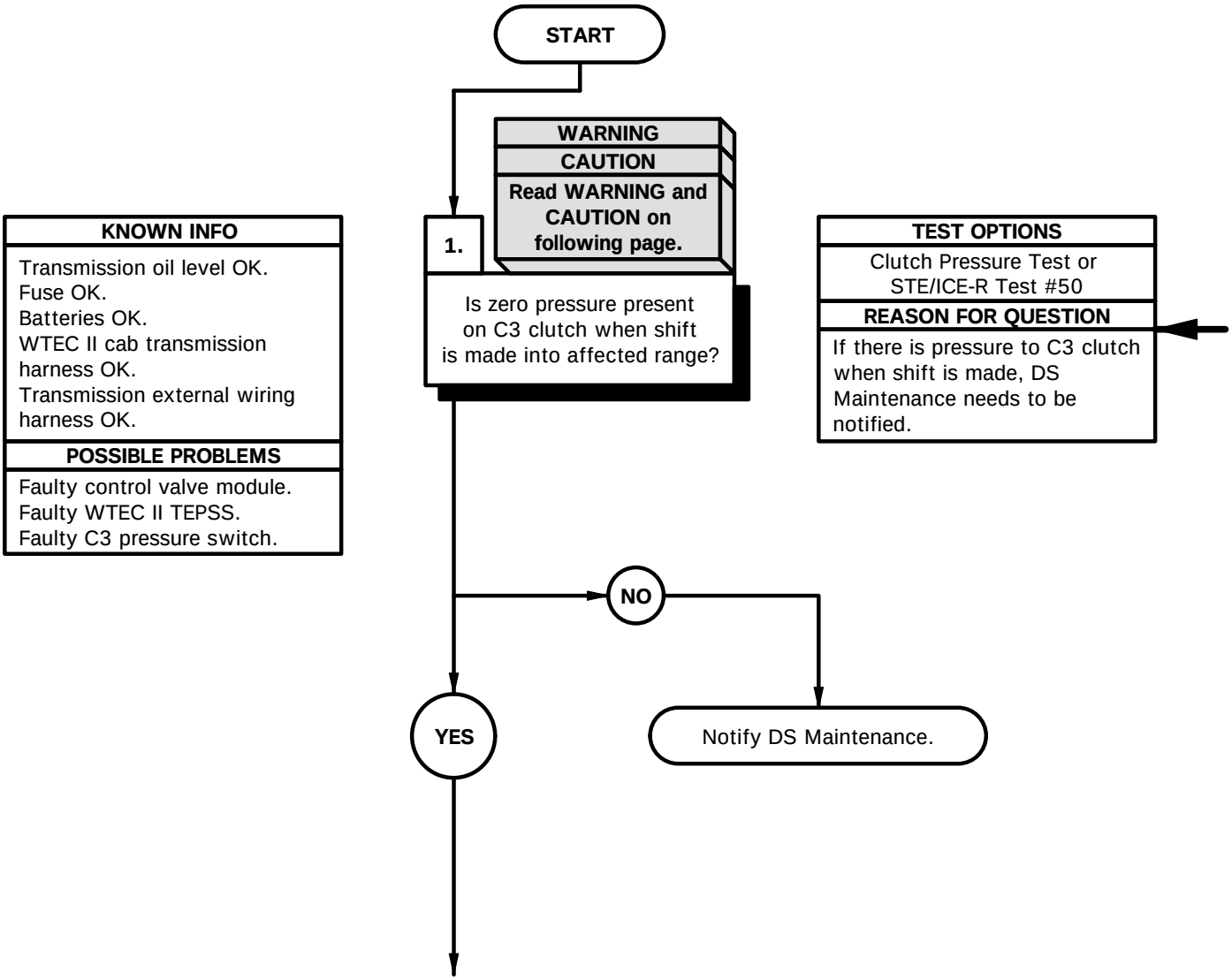
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Pan, Drain (Item 24, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Wrench Set, Socket (Item 51, Appendix C)

Materials/Parts
Packing, Preformed (Item 197, Appendix G)
Adapter, Straight, Pipe to Tube (Item 1.2, Appendix D)
Adapter, Straight, Tube to Boss (Item 1.3, Appendix D)
Hose Assembly, Nonmetallic (Item 24.13, Appendix D)

Personnel Required
(2)

References
TM 9-491-571-12&P



WARNING

Wear approved eye protection when performing transmission pressure checks. If oil contacts eyes, seek medical attention immediately. 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.

CLUTCH PRESSURE TEST

(1) Remove front and intermediate propeller shafts (para 9-2).
(2) Position drain pan under C3 pressure tap plug.
(3) Remove C3 pressure tap plug and preformed packing from control valve module. Discard preformed packing.
(4) Connect tube to boss adapter, hose, and pipe to tube adapter to C3 pressure tap.
(5) Perform STE/ICE-R Test # 50 (TM 9-4910-571-12&P).
(6) Start engine (TM 9-2320-366-10-1) and run at idle.
(7) With parking brake applied, make shift indicated by sub code while assistant notes reading on STE/ICE-R.
(8) If pressure does not drop to zero in selected range indicated by code values, gaskets or C solenoid may be faulty in control valve module, notify DS Maintenance.
(9) Shut down engine (TM 9-2320-366-10-1).
(10) Remove pipe to tube adapter, hose, and tube to boss adapter from C3 pressure tap.
(11) Position preformed packing and C3 pressure tap plug in control valve module.
(12) Tighten C3 pressure tap plug to 84-120 lb-in. (9-14 N·m).
(13) Remove drain pan under C3 pressure tap.
(14) Install front and intermediate propeller shafts (para 9-2).

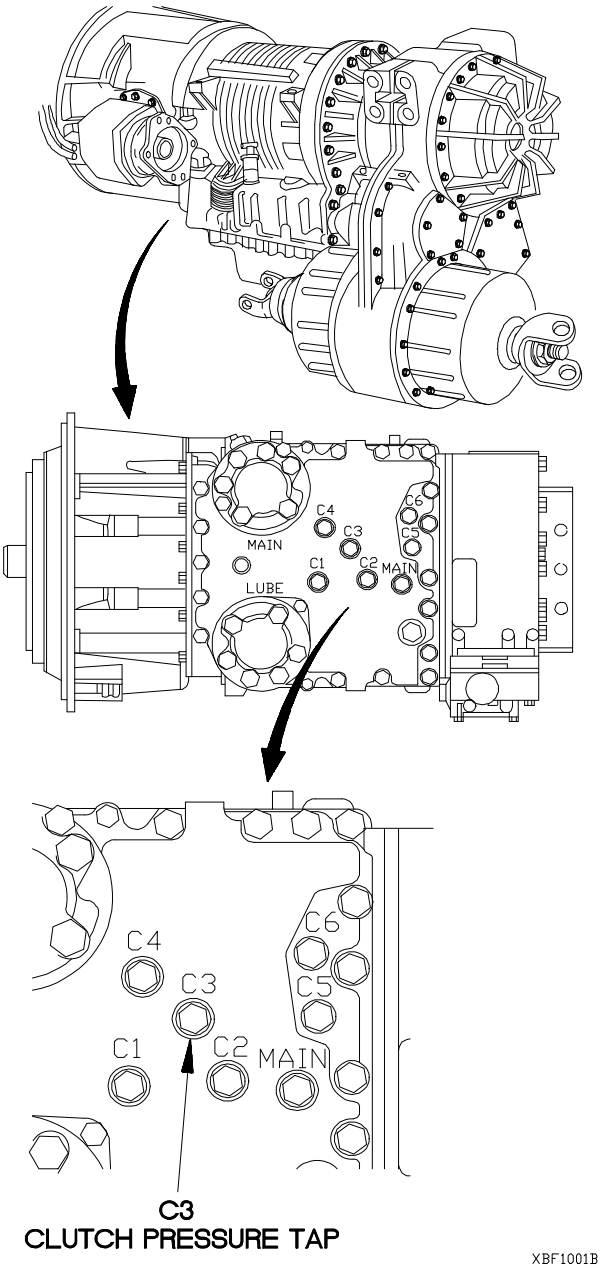
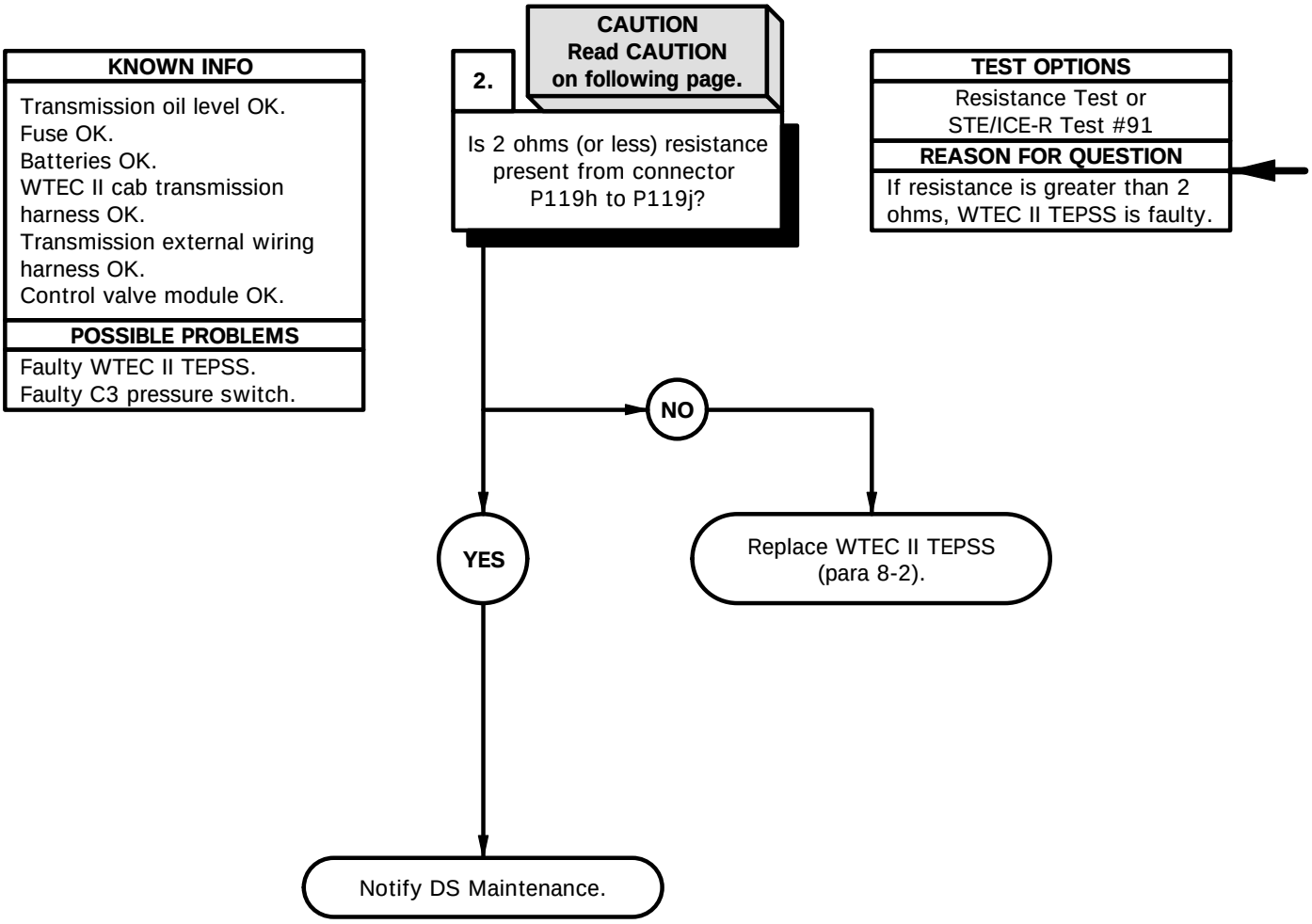


Table 2-26. Sub Code Range

Sub Code	Sub Code Meaning	
11	1st	Range VER
22	2nd	Range VER
44	4th	Range VER
66	6th	Range VER
88	N1	Range VER
99	N2/N4	Range VER

f10. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 57 AND ANY SUB CODE



CAUTION

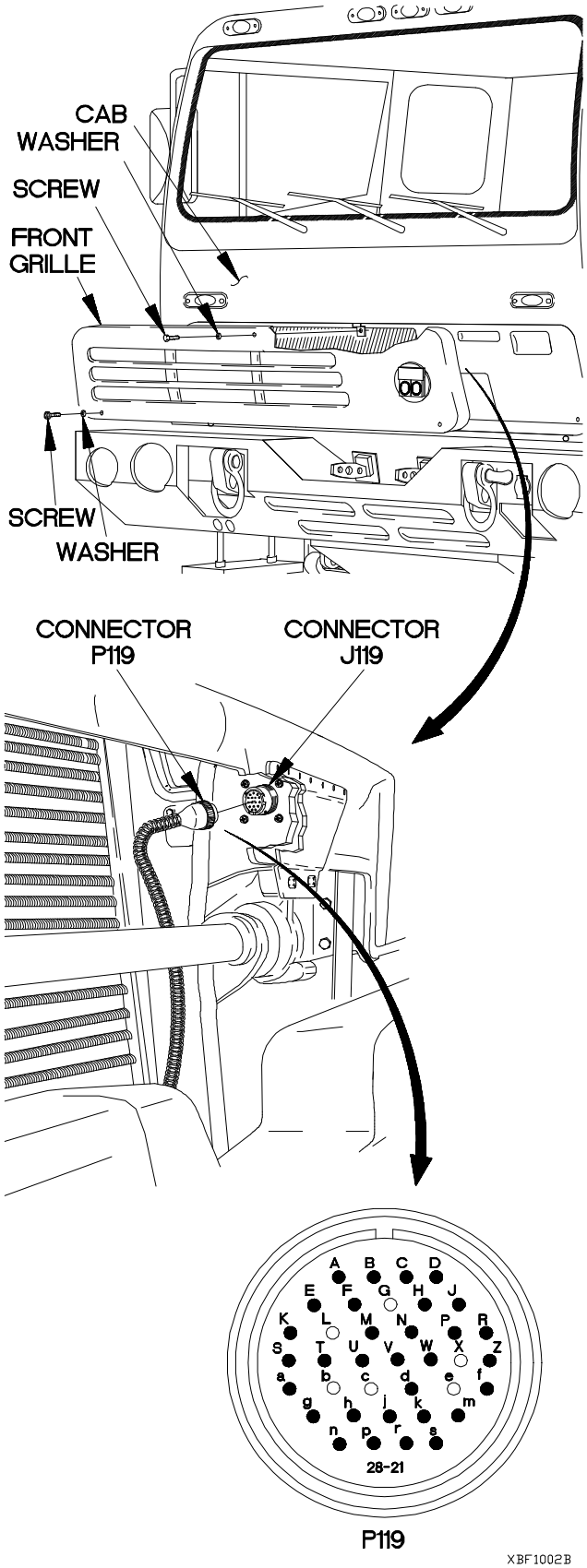
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

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) 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) Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter to connector P119h.
(7) Connect negative (-) probe of multimeter to connector P119j and note reading on multimeter.
(8) If 2 ohms (or less) resistance is present, the C3 pressure switch may be faulty, notify DS Maintenance.
(9) If resistance is greater than 2 ohms, replace WTEC II TEPSS (para 8-2).
(10) Connect connector P119 to connector J119.
(11) Position front grille on cab with washer and screw.
(12) Position two washers and screws in front grille.
(13) Tighten screw to 48-60 lb-in. (5-7 N·m).
(14) Tighten two screws to 24 lb-in. (3 N·m).
(15) Clear diagnostic codes (para 8-4).



f11. TRANSMISSION UNUSUALLY NOISY WHEN OPERATING

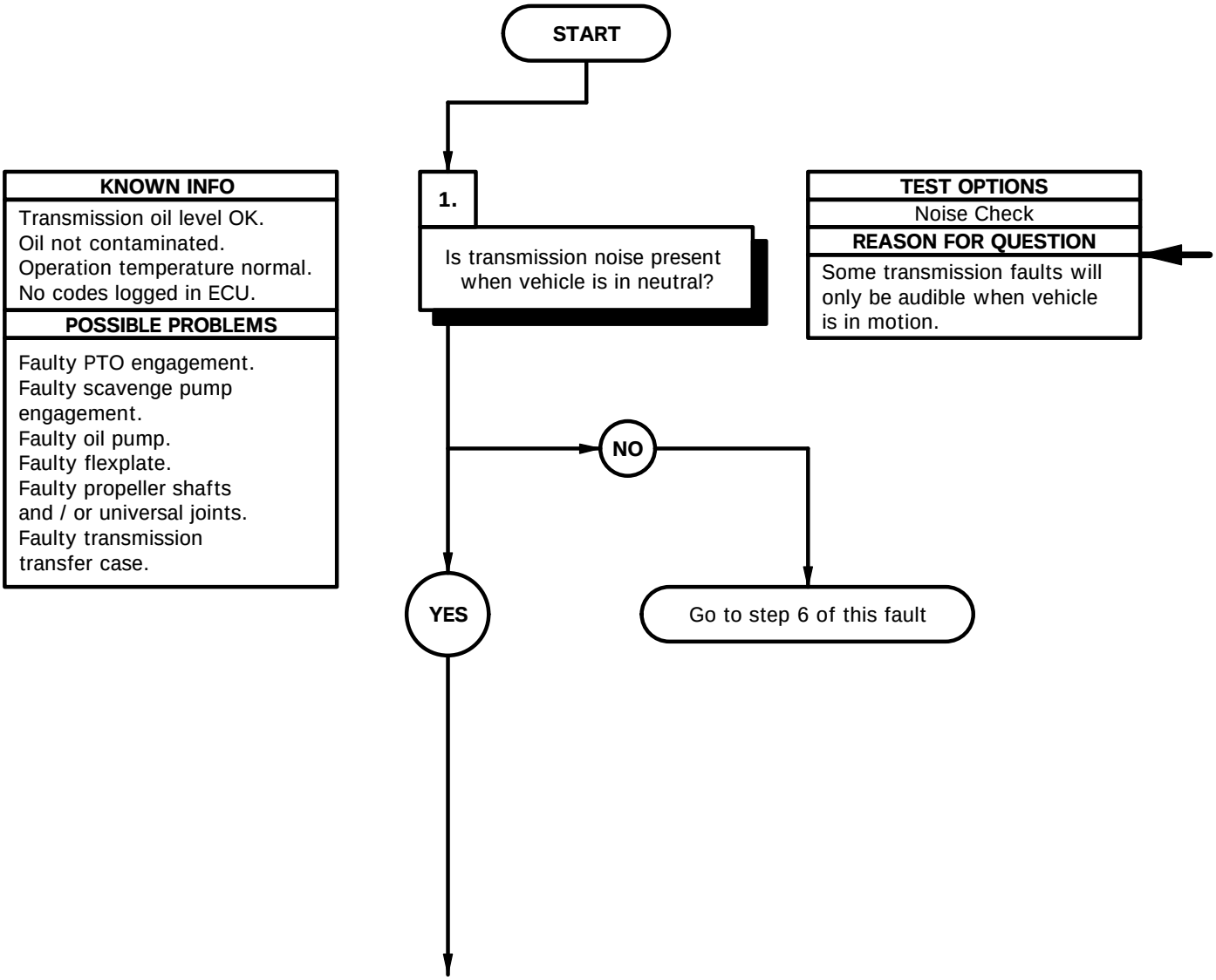
INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Wrench Set, Socket (Item 51, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Wrench, Torque, 0-175 lb ft (Item 58, Appendix C)
STE/ICE-R (Item 41, Appendix C)

Materials/Parts
Packing, Preformed (Item 197, Appendix G)
Adapter, Straight, Pipe to Tube (Item 1.2, Appendix D)
Adapter, Straight, Tube to Boss (Item 1.3, Appendix D)
Hose Assembly, Nonmetallic (Item 24.13, Appendix D)

References
TM 9-4910-571-12&P



NOISE CHECK
(1) Check if noise is heard when transmission is in neutral. (2) If noise is present when vehicle is in motion, probable causes are faulty propeller drive shafts, or faulty transfer case bearings.

f11. TRANSMISSION UNUSUALLY NOISY WHEN OPERATING (CONT)

KNOWN INFO

Transmission oil level OK.
Oil not contaminated.
Operating temperature normal.
No codes logged in ECU.

POSSIBLE PROBLEMS

Faulty PTO engagement.
Faulty scavenge pump engagement.
Faulty oil pump.
Faulty flexplate bolts.
Faulty flexplate.
Faulty propeller shafts and / or universal joints.
Faulty transmission transfer case,

2. Does operating noise increase when PTO is engaged?

TEST OPTIONS

Noise Check

REASON FOR QUESTION

Worn transmission gear teeth and / or PTO gear teeth will cause a noisy transmission.

NO → Notify DS Maintenance.

YES

KNOWN INFO

Transmission oil level OK.
Oil not contaminated.
Operating temperature normal.
No codes logged in ECU.
PTO engagement OK.

POSSIBLE PROBLEMS

Faulty scavenge pump engagement.
Faulty oil pump.
Faulty flexplate bolts.
Faulty flexplate.
Faulty propeller shafts and / or universal joints.
Faulty transmission transfer case,

CAUTION
Read CAUTION on following page.

3. Is scavenge pump free from damage?

TEST OPTIONS

Visual Inspection and Scavenge Pump Suction Test

REASON FOR QUESTION

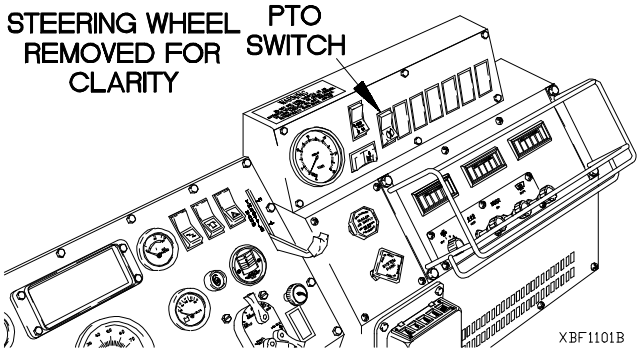
Worn transmission gear teeth and / or scavenge pump gear will cause a noisy transmission.

NO → Notify DS Maintenance.

YES

NOISE CHECK

(1) Engage PTO (TM 9-2320-366-10-1).
(2) Listen for unusual noise or increase in noise from PTO.
(3) If transmission is noisy when PTO is engaged, transmission gear teeth are faulty and / or PTO gear teeth are faulty. Notify DS Maintenance.
(4) Disengage PTO (TM 9-2320-366-10-1).
(5) Shut down engine (TM 9-2320-366-10-1).



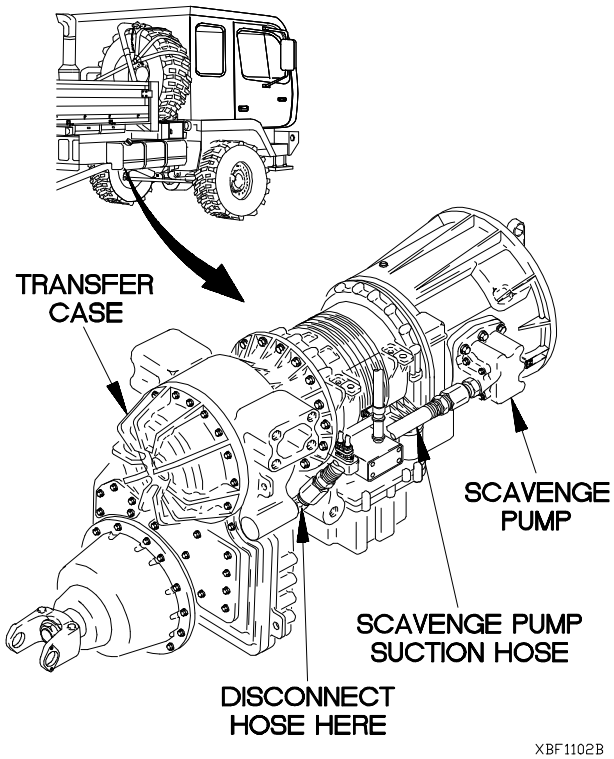
(1) Place drain pan under transfer case.
(2) Disconnect scavenge pump suction hose at transfer case.
(3) Start engine (TM 9 -2320-366-10-1).
(4) If oil drips or runs from fitting on transfer case, scavenge is not picking up oil from transmission transfer case causing it to overflow.
(5) Perform scavenge pump suction test.
(6) Shut down engine (TM 9-2320-366-10-1).

CAUTION

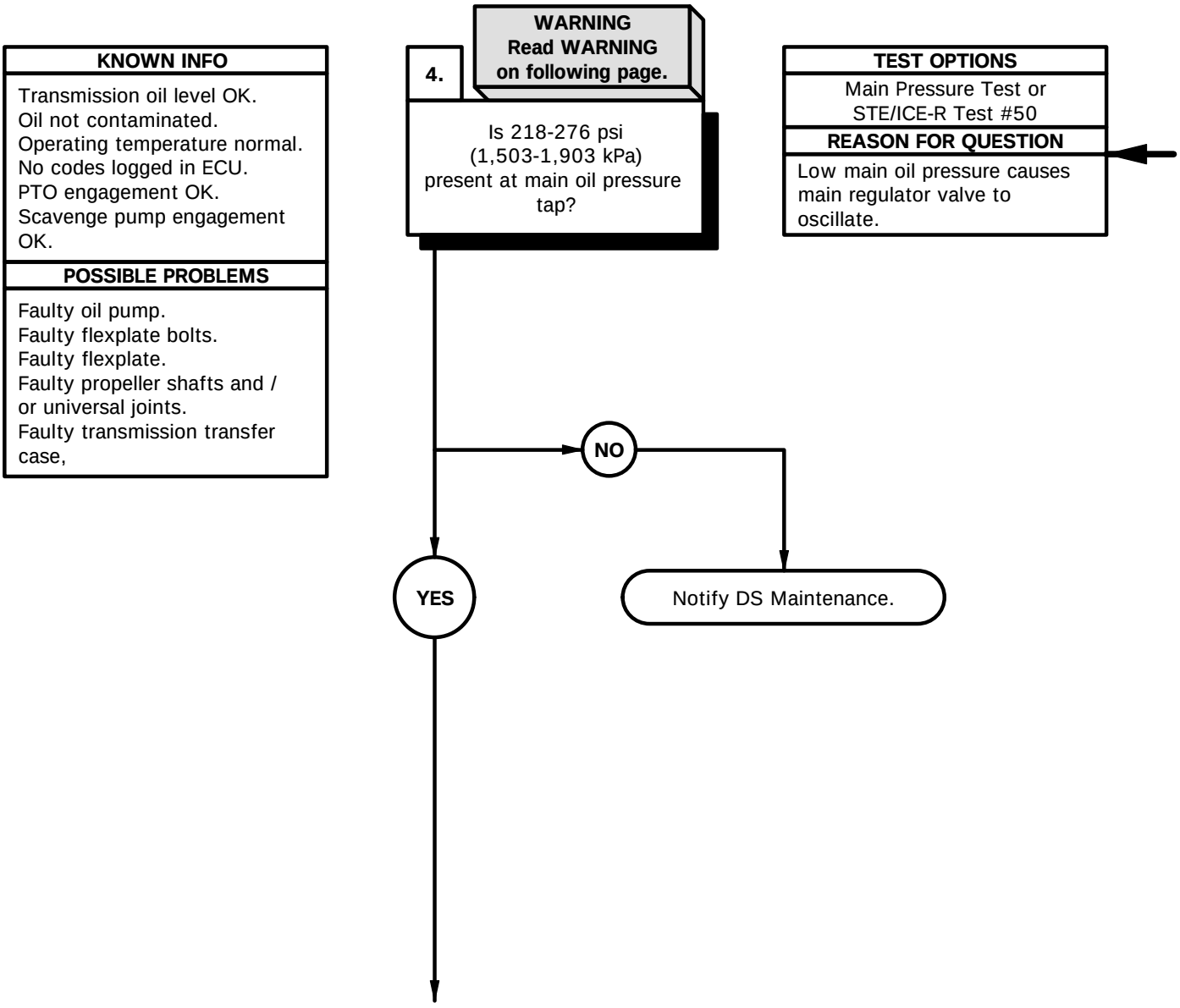
Be sure to shut down engine immediately after test has been completed. Failure to comply may result in damage to transmission.

SCAVENGE PUMP SUCTION TEST

(1) Place end of hose in cup containing approximately one pint of oil.
(2) Start engine (TM 9-2320-366-10-1).
(3) Select neutral at pushbutton shift selector (TM 9-2320-366-10-1) and check if oil is immediately sucked into hose by scavenge pump.
(4) Shut down engine (TM 9-2320-366-10-1).
(5) If oil is not immediately removed from cup by scavenge pump, scavenge pump is faulty due to worn gears. Notify DS Maintenance.
(6) Connect scavenge pump suction hose to transfer case.
(7) Remove drain pan under transfer case.



f11. TRANSMISSION UNUSUALLY NOISY WHEN OPERATING (CONT)

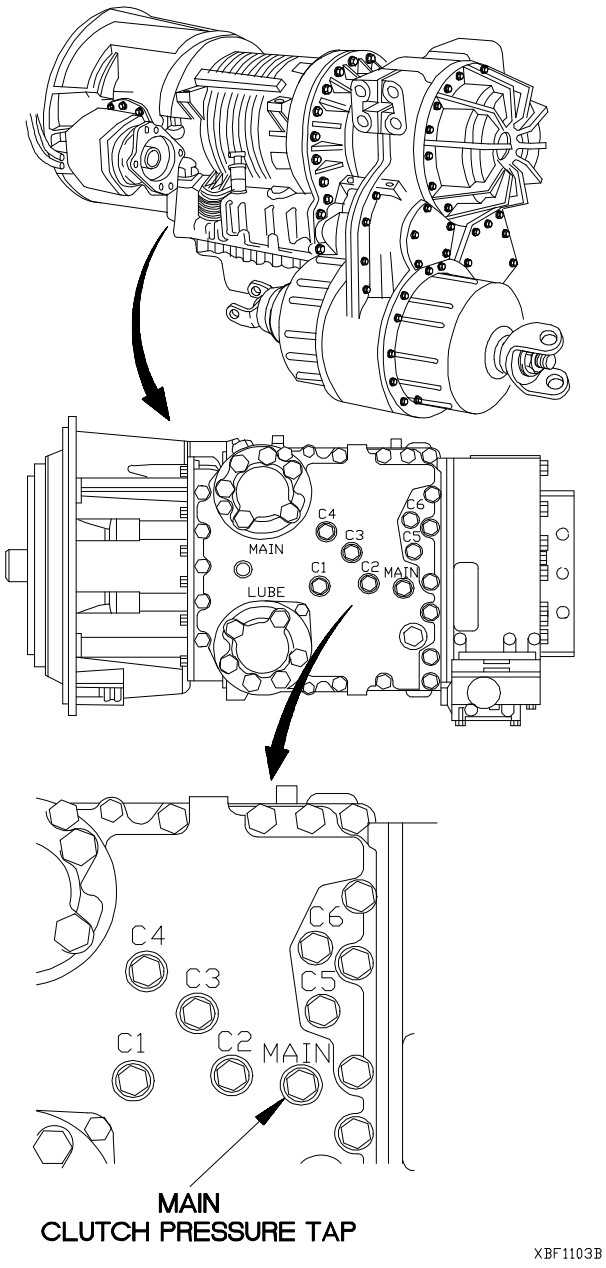


WARNING

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

MAIN OIL PRESSURE TEST

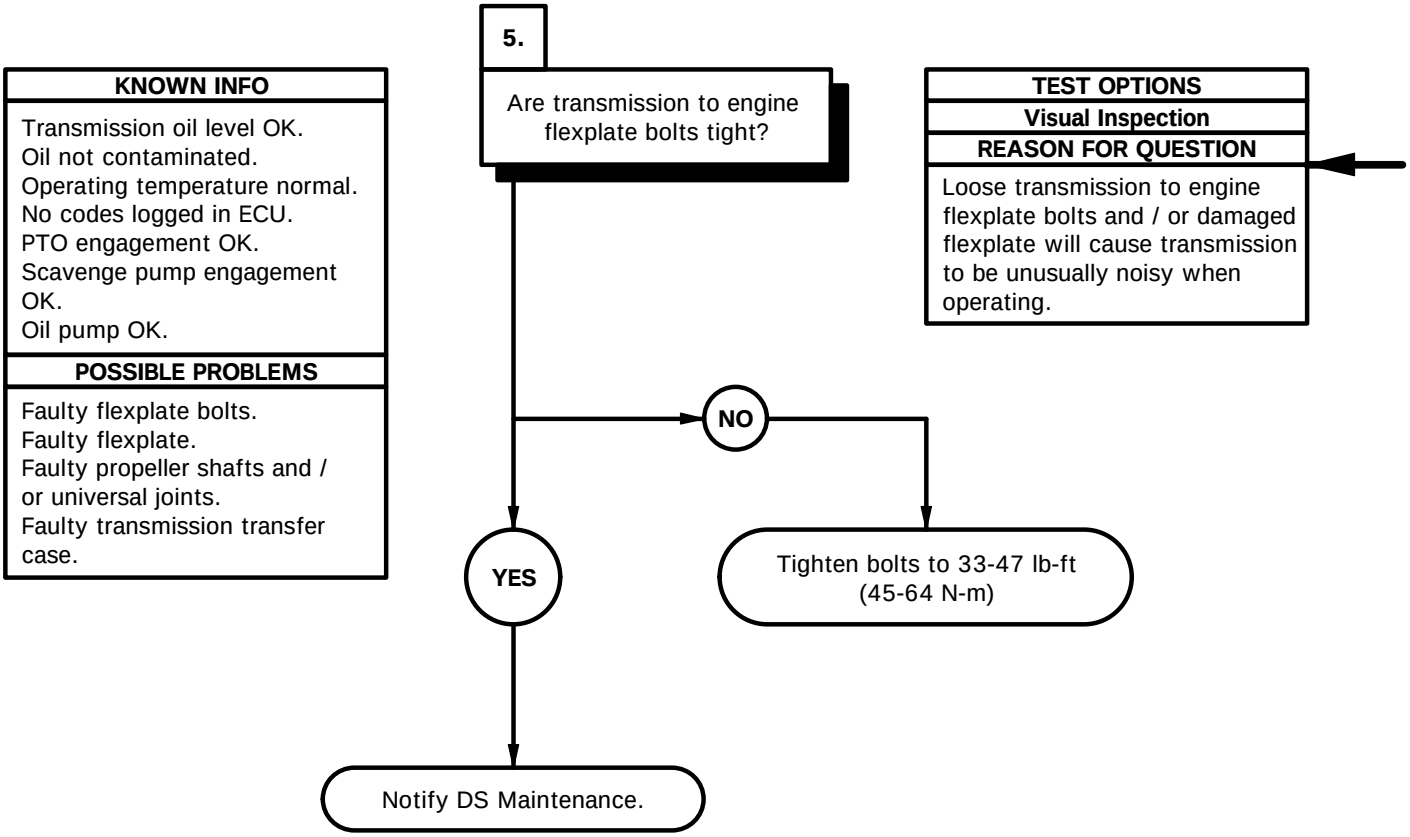
(1) Position drain pan under pressure tap.
(2) Remove main pressure tap plug and preformed packing from control valve module. Discard preformed packing.
(3) Connect tube to boss adapter, hose, and pipe to tube adapter to main pressure tap.
(4) Perform STE/ICE-R Test # 50 (TM 9-4910-571-12&P).
(5) Start engine (TM 9-2320-366-10-1) and run at idle.
(6) With parking brake applied, position WTEC II TEPSS to R position then to N position while assistant notes reading on STE/ICE-R.
(7) Shut down engine (TM 9-2320-366-10-1).
(8) If main oil pressure is low, oil pump is faulty. Notify DS Maintenance.
(9) If oil pressure is good, moving components in transmission are faulty. Notify DS Maintenance.
(10) Remove pipe to tube adapter, hose, and tube to boss adapter from main pressure tap.
(11) Position preformed packing and main pressure tap plug in control valve module.
(12) Tighten pressure tap plug to 84-120 lb-in. (9-14 N·m).
(13) Remove drain pan under pressure tap.



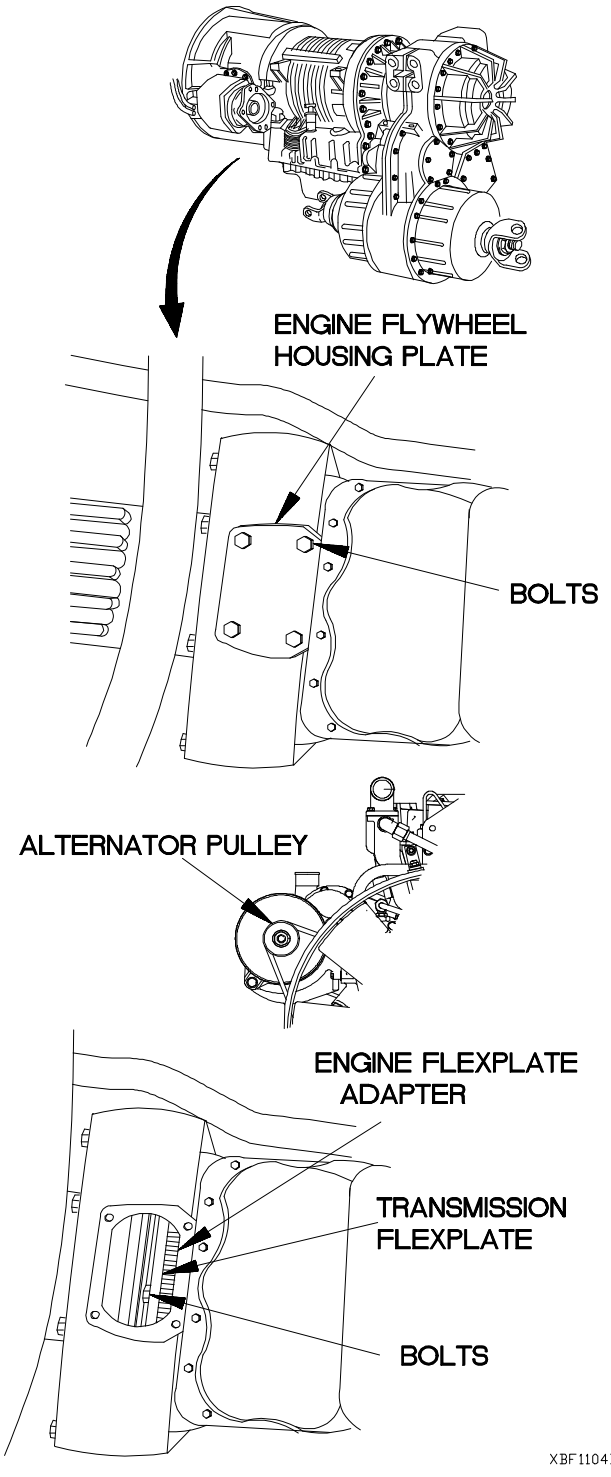
MAIN
CLUTCH PRESSURE TAP

XBF1103B

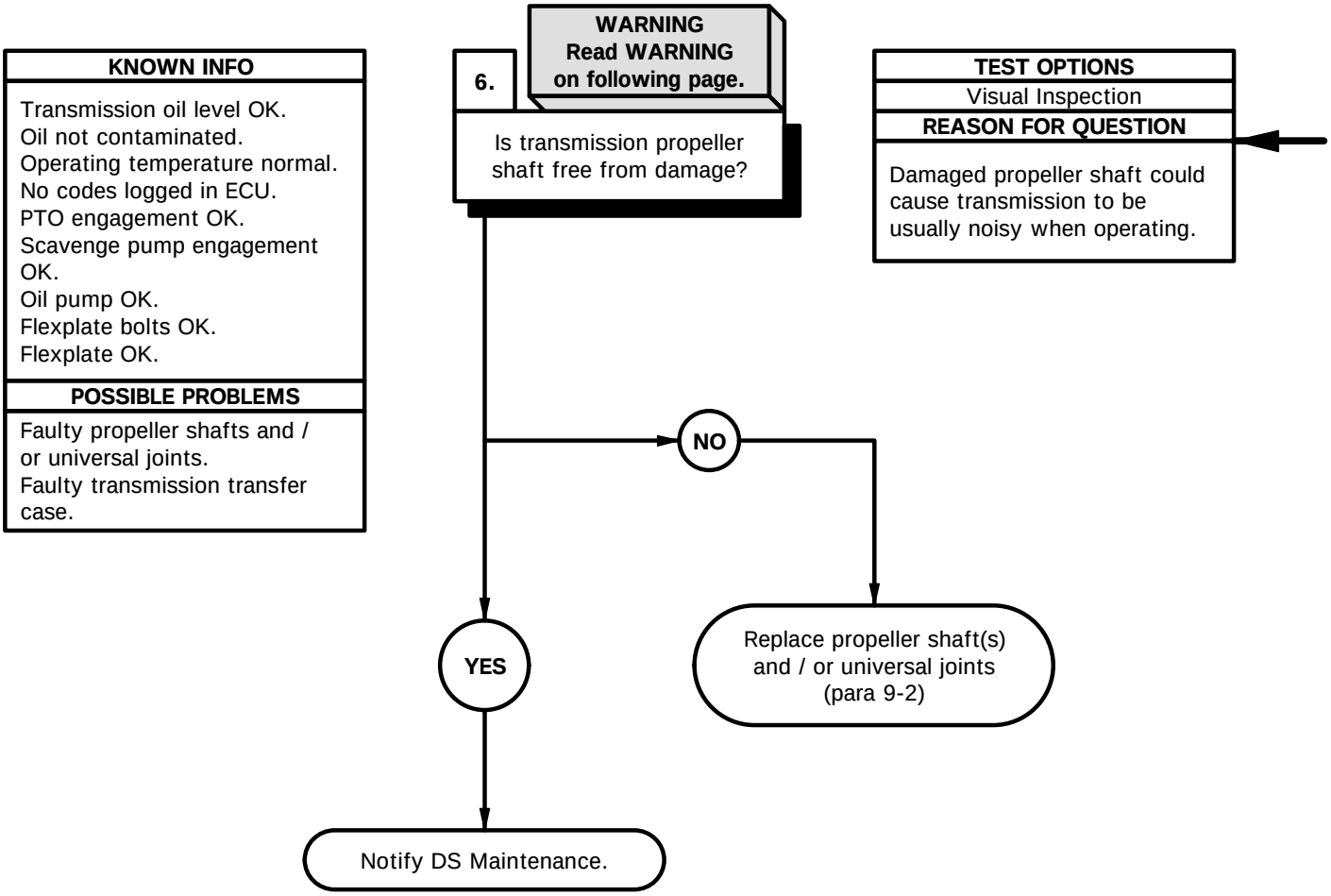
f11. TRANSMISSION UNUSUALLY NOISY WHEN OPERATING (CONT)



(1) Remove four bolts from engine flywheel housing plate.
(2) Turn engine alternator pulley in clockwise direction to reposition transmission flexplate for transmission to engine flexplate bolt inspection.
(3) Inspect bolts in flexplate for looseness.
(4) Inspect flexplate for play or damage.
(5) If bolts are loose, transmission will make noise.
(6) Tighten bolts in flexplate.
(7) If flexplate has play or visible signs of damage, flexplate is faulty.



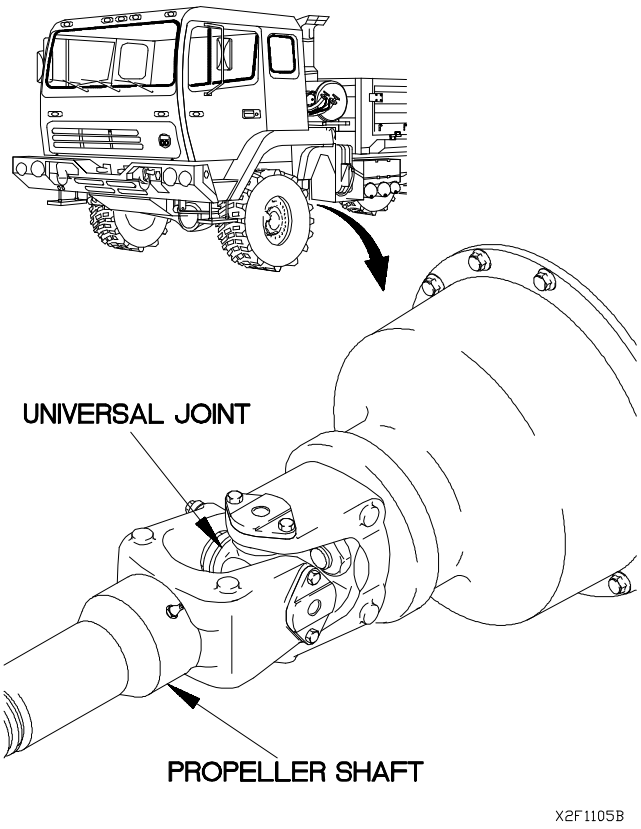
f11. TRANSMISSION UNUSUALLY NOISY WHEN OPERATING (CONT)



WARNING

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

(1) Inspect propeller shaft for loose universal joints, bent tubing, or missing balance weights.
(2) If propeller shafts and universal joints are undamaged, bearings in transmission transfer case are faulty. Notify DS Maintenance.



f12. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 21 AND ANY SUB CODE

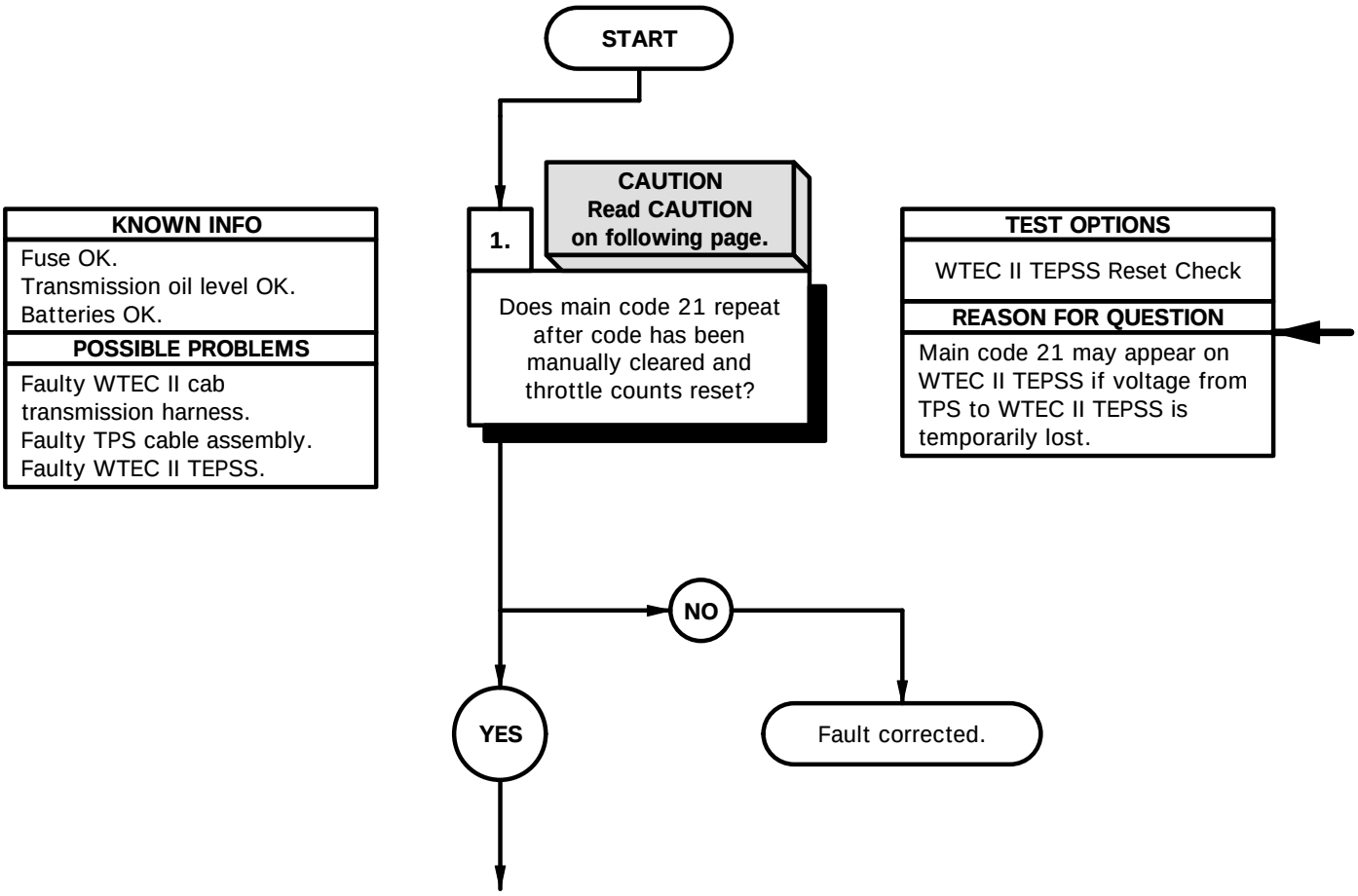
INITIAL SETUP

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 44, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 39, Appendix C)

Personnel Required
(2)



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.

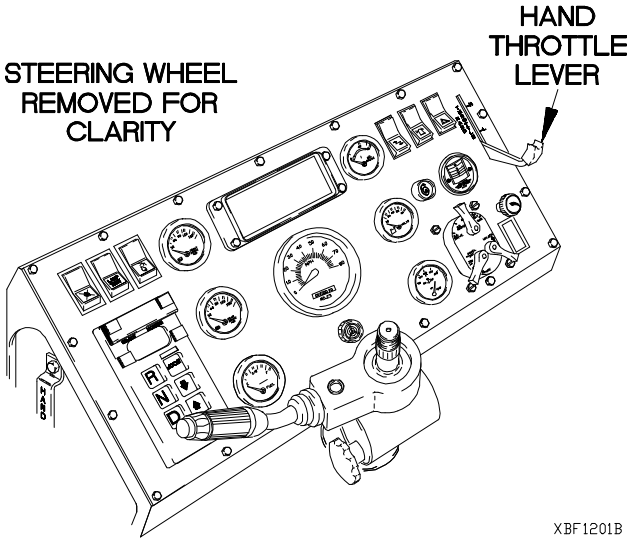
NOTE

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

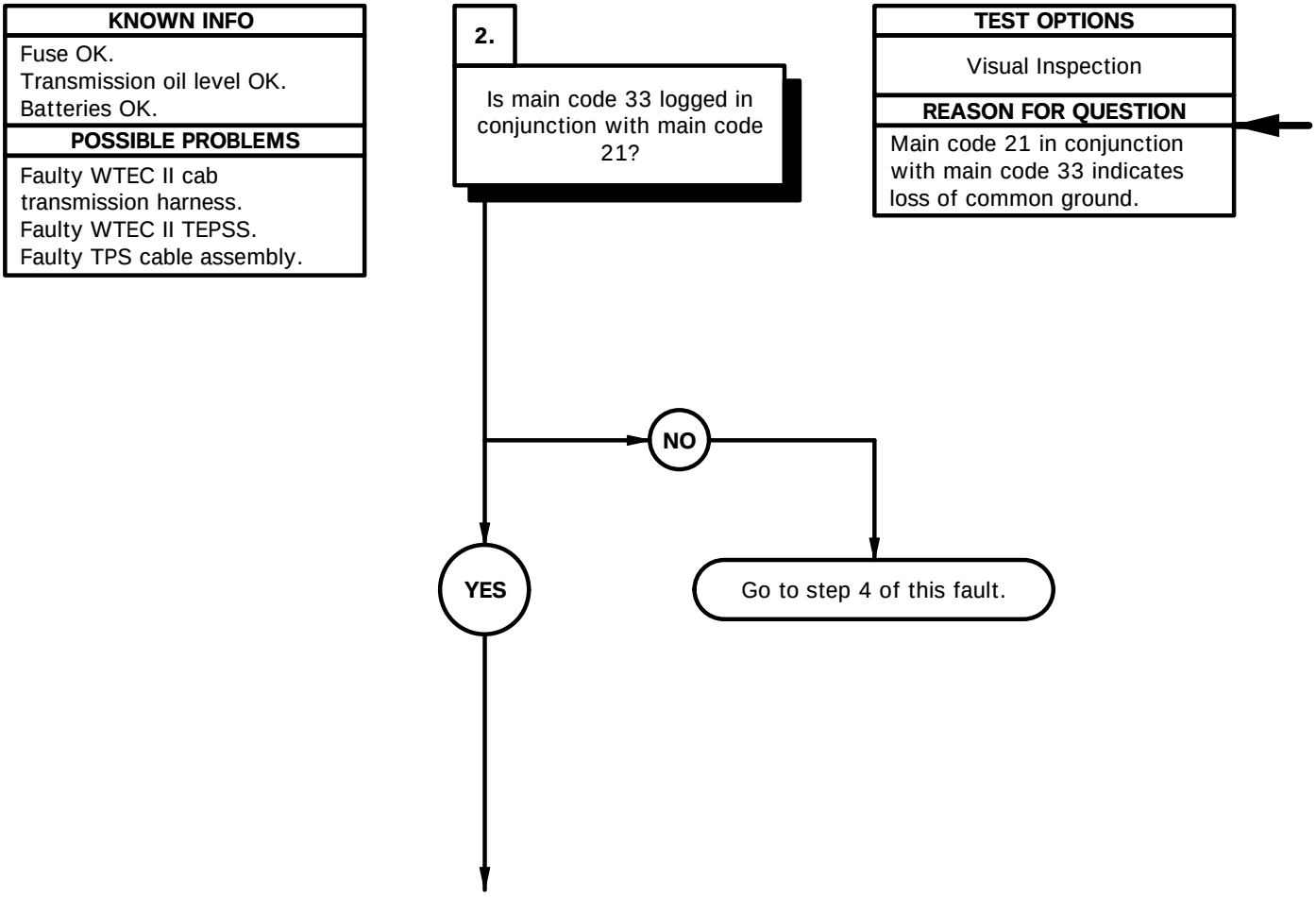
Main display code 21 needs to be cleared manually from WTEC II TEPSS after a maintenance task has been performed and before vehicle is returned to service (para 8-4).

WTEC II TEPSS RESET CHECK

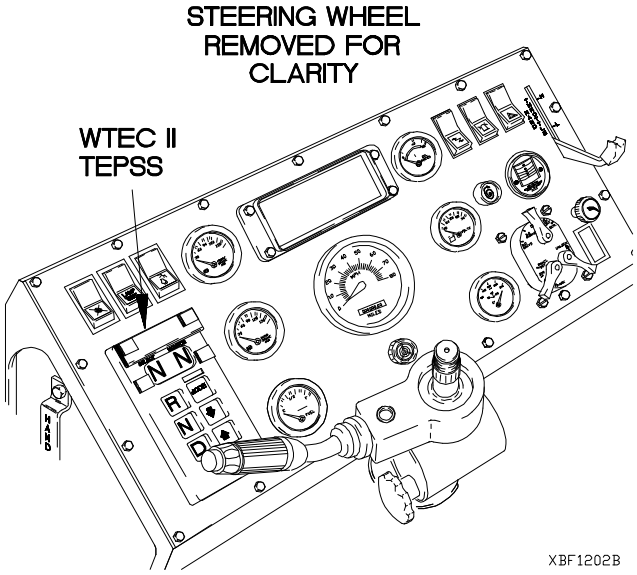
(1) Cycle master power switch to on (TM 9-2320-365-10), then to off five times to clear existing throttle count settings.
(2) Position master power switch to on (TM 9-2320-365-10).
(3) Depress accelerator pedal from idle position to full throttle position (TM 9-2320-365-10) to set new 0% and 100% throttle count values in WTEC II TEPSS.
(4) Clear diagnostic code from WTEC II TEPSS (para 8-4).
(5) If main code 21 does not reappear, electrical communication between WTEC II TEPSS and TPS may be faulty.
(6) If main code 21 reappears, TPS may be faulty.
(7) Position master power switch to off (TM 9-2320-365-10).



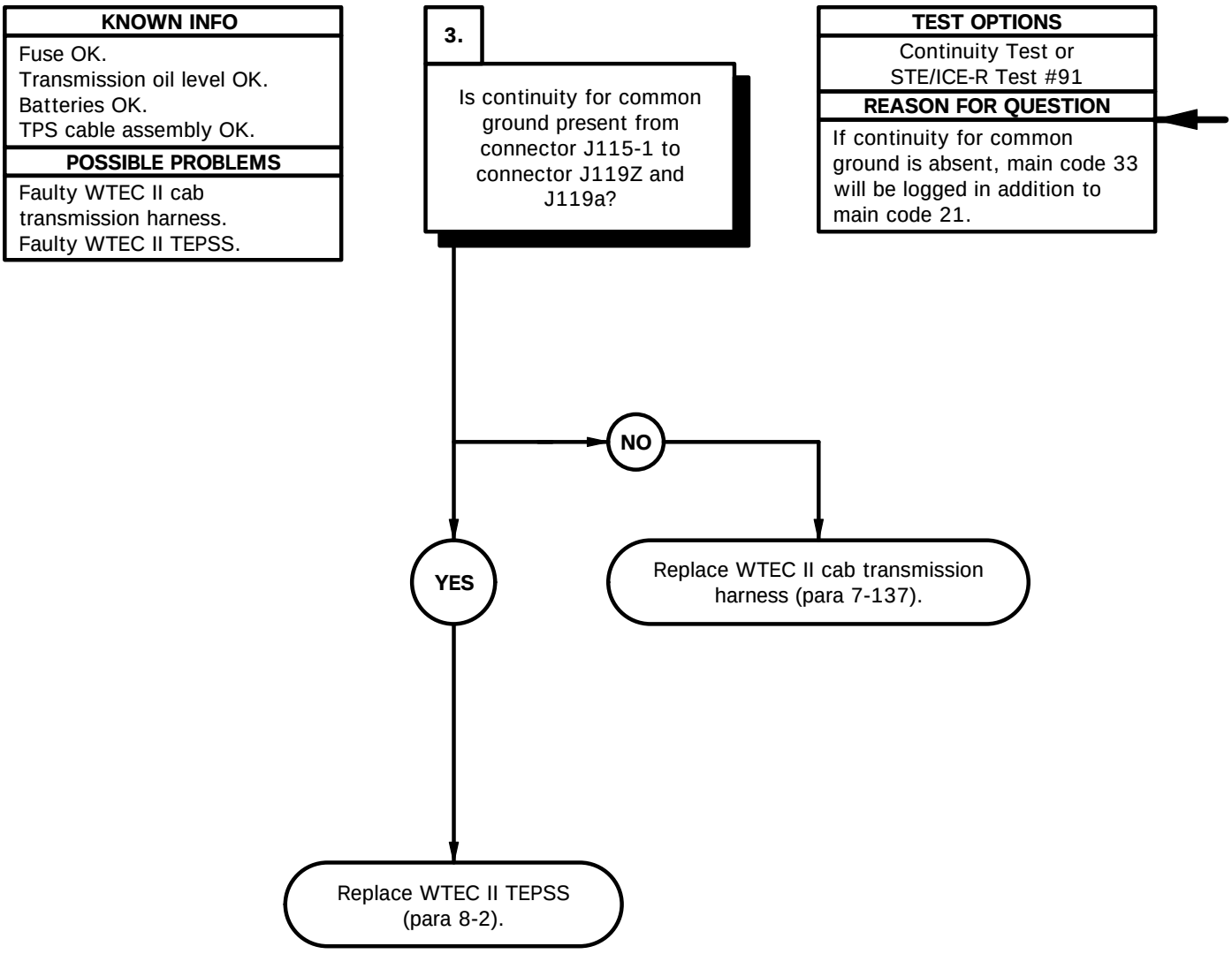
f12. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 21 AND ANY SUB CODE (CONT)



(1) Position master power switch to on (TM 9-2320-365-10).
(2) Press MODE button on WTEC II TEPSS to bring up second code (if any).
(3) If main code 33 displays at WTEC II TEPSS, common ground may have been lost.
(4) If main code 21 is the only code displayed TPS may be faulty. Go to step 4 of this fault.
(5) Position master power switch to off (TM 9-2320-365-10).

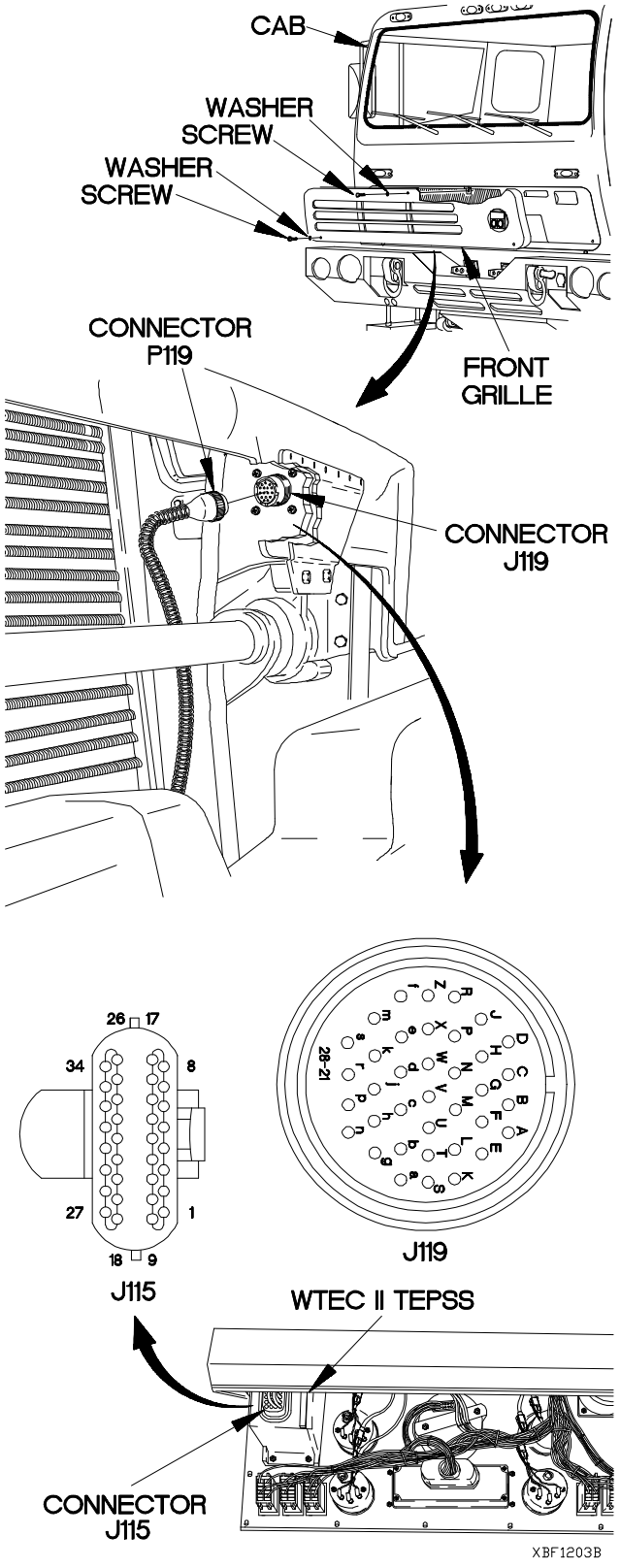


f12. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 21 AND ANY SUB CODE (CONT)

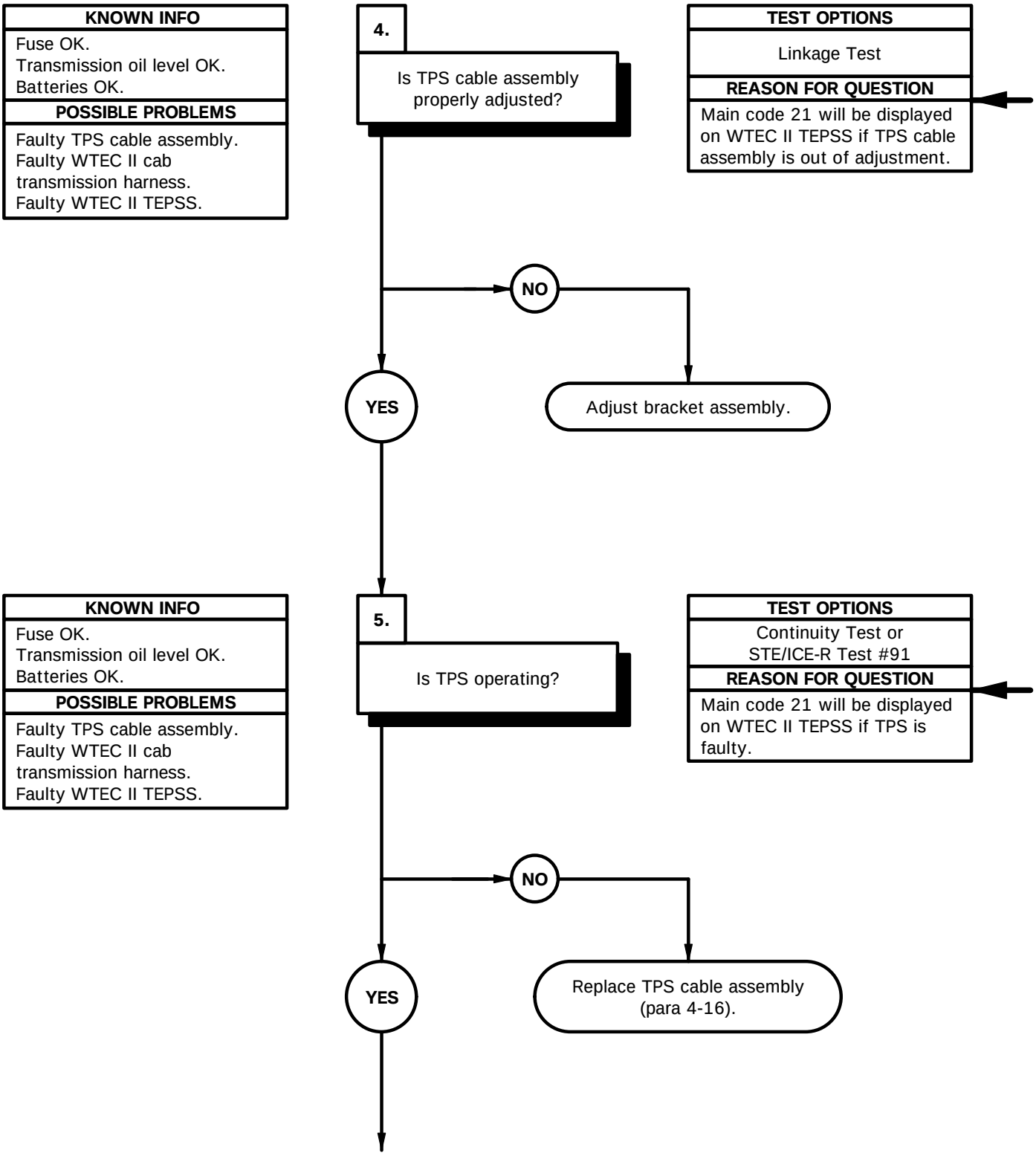


CONTINUITY TEST

(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) Remove instrument panel assembly for access (para 7-15).
(6) Disconnect connector J115 (top connector) from WTEC II TEPSS.
(7) Set multimeter to ohms.
(8) Connect positive (+) probe of multimeter to connector J115-1.
(9) Connect negative (-) probe of multimeter to connector J119a and note reading on multimeter.
(10) Connect negative (-) probe of multimeter to connector J119Z and note reading on multimeter.
(11) If continuity is not present from connector J115-1 to connector J119a and J119Z, replace WTEC II cab transmission harness (para 7-137).
(12) If continuity is present, replace WTEC II TEPSS (para 8-2).
(13) Install instrument panel assembly (para 7-15).
(14) Connect connector P119 to connector J119.
(15) Position front grille on cab with washer and screw.
(16) Position two washers and screws in front grille.
(17) Tighten screw to 48-60 lb-in. (5-7 N·m).
(18) Tighten two screws to 24 lb-in. (3 N·m).
(19) Clear diagnostic codes (para 8-4).



f12. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 21 AND ANY SUB CODE (CONT)

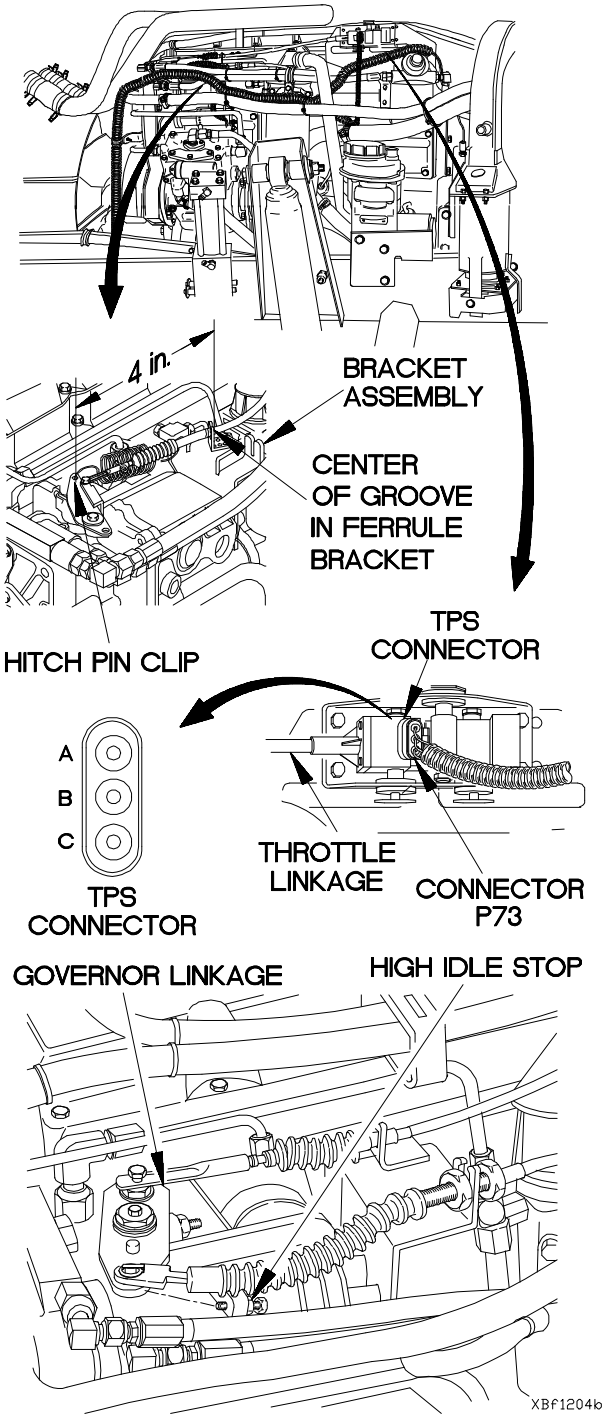


LINKAGE TEST

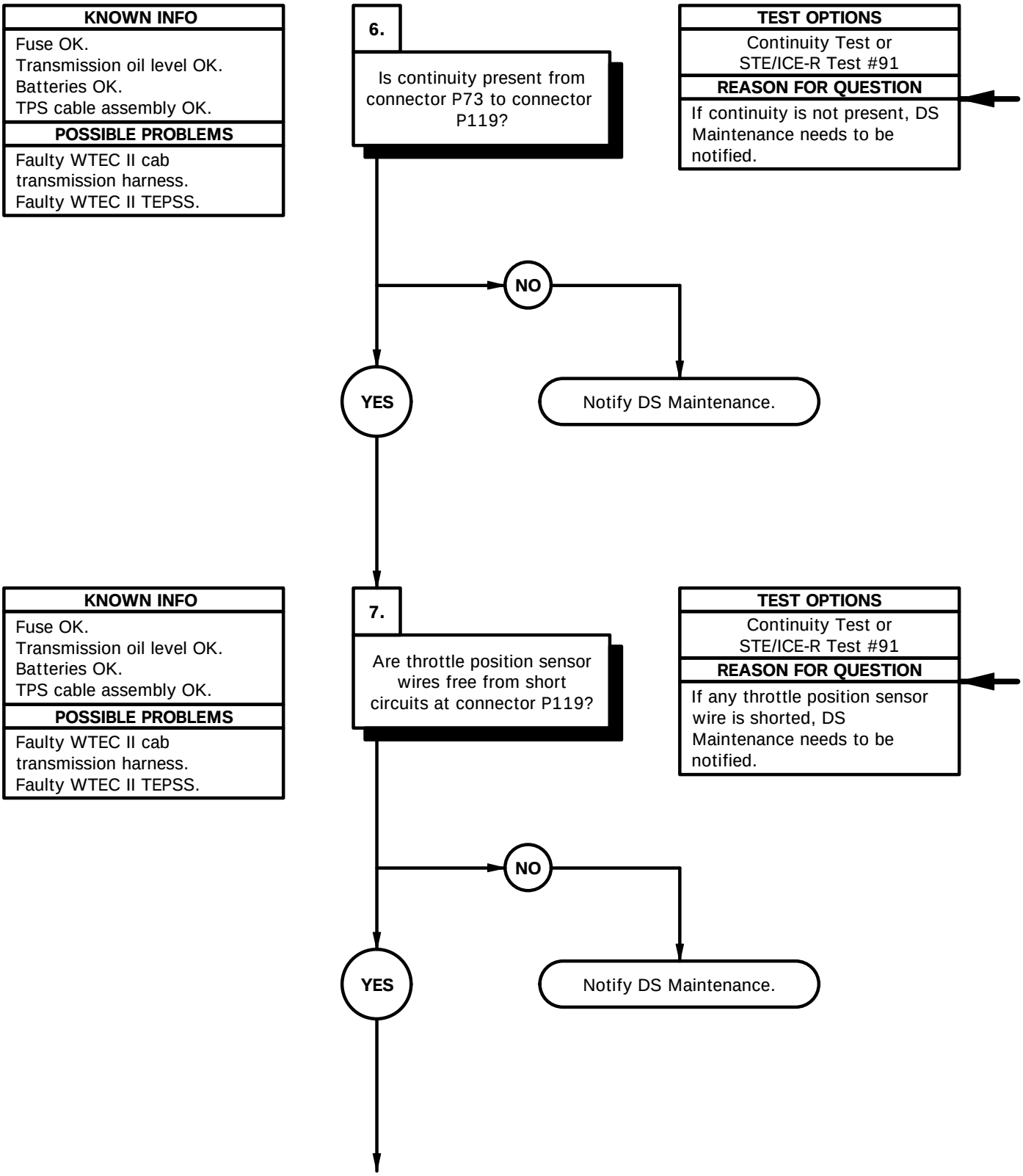
(1) Raise cab (TM 9-2320-366-10-1).
(2) Verify distance between hitch pin clip on end of sensor rod and center of cable groove in ferrule is 4 in. (10 cm).
(3) If distance is not 4 in. (10 cm), adjust bracket assembly to obtain correct measurement.

RESISTANCE TEST

(1) Disconnect connector P73 from TPS connector.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to TPS terminal A.
(4) Connect negative (-) probe of multimeter to TPS terminal C and verify multimeter reads between 9,000-15,000 ohms across terminals A and C.
(5) Disconnect negative (-) probe of multimeter from terminal C.
(6) Connect negative (-) probe of multimeter to TPS terminal B and note record on multimeter.
(7) Move governor linkage to high idle stop and record reading on multimeter.
(8) Return governor linkage to low idle stop.
(9) Verify that difference between highest (high idle) reading and lowest (low idle) reading is between 4,000 and 6,000 ohms.
(10) Verify that highest (high idle) reading does not exceed 15,000 ohms.
(11) If resistance readings are not within limits, replace TPS cable assembly (para 4-16).



f12. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 21 AND ANY SUB CODE (CONT)

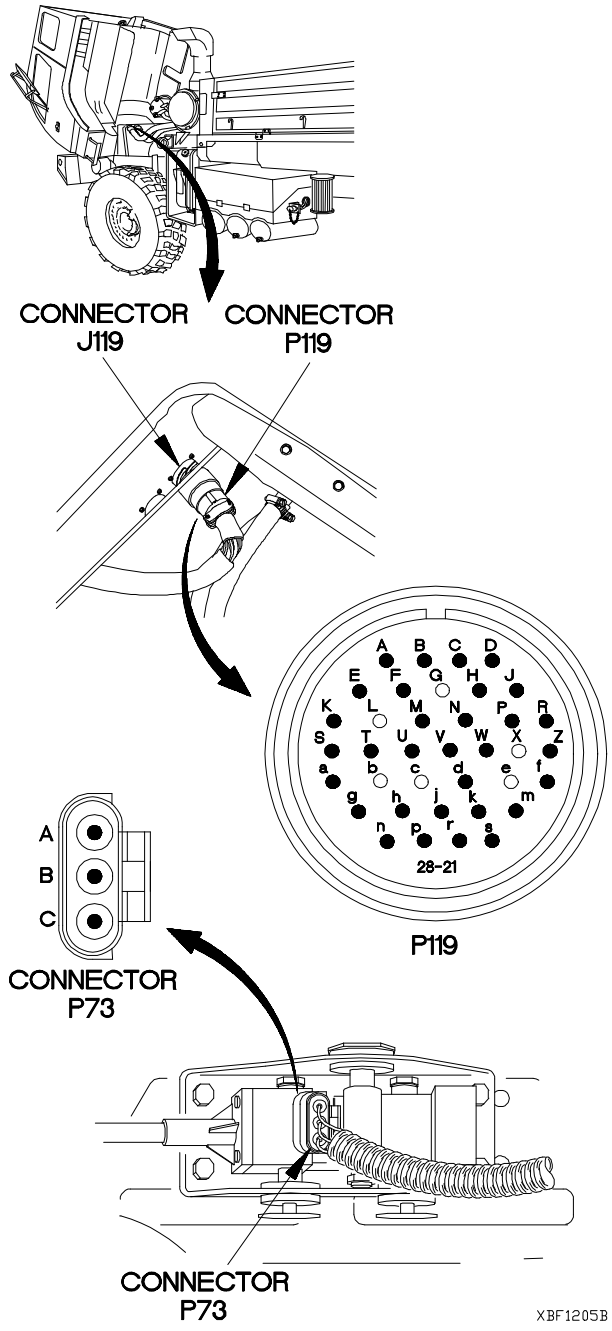


CONTINUITY TEST

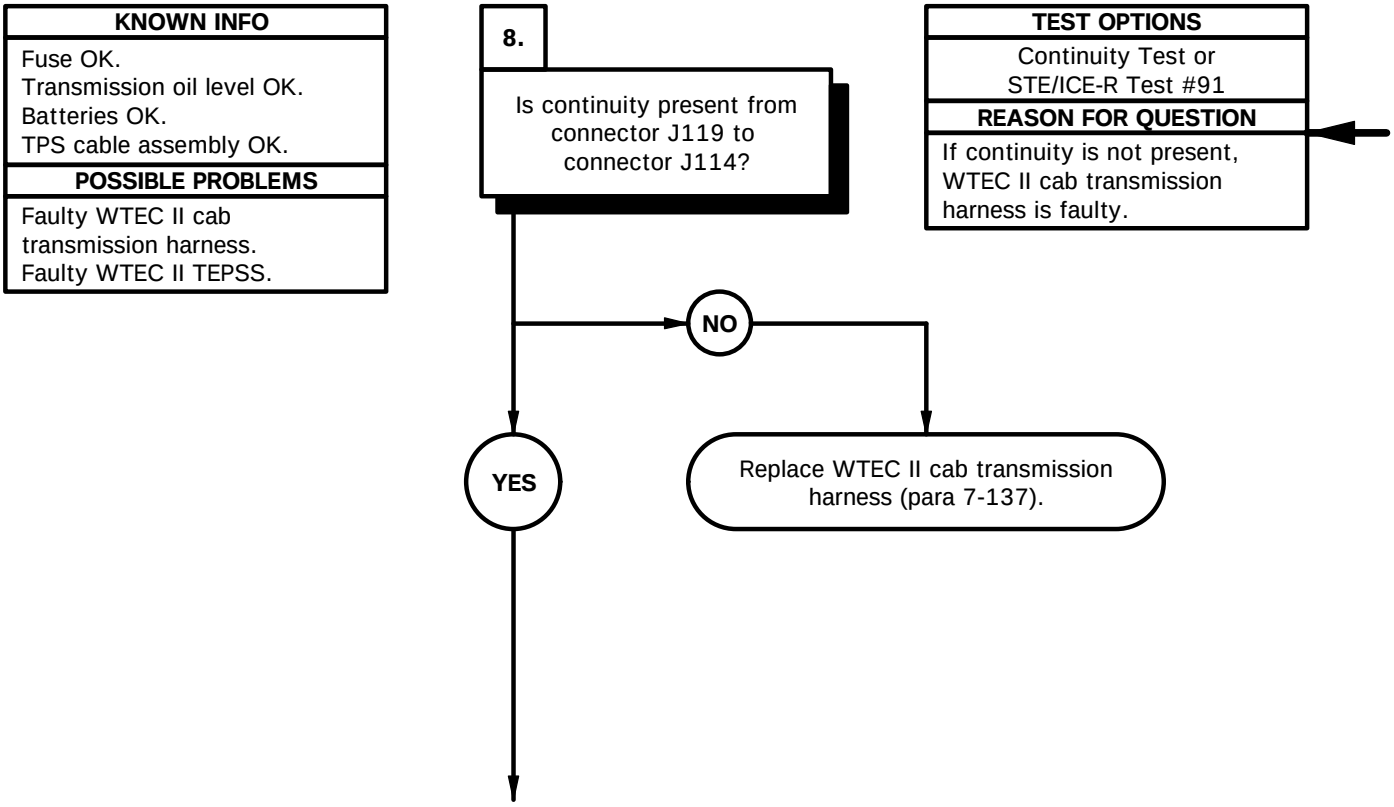
(1) Disconnect connector P119 from connector J119.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector P119R.
(4) Connect negative (-) probe of multimeter to connector P73 pin C and note reading on multimeter.
(5) Connect positive (+) probe of multimeter to connector P119f.
(6) Connect negative (-) probe of multimeter to connector P73 pin B and note reading on multimeter.
(7) Connect positive (+) probe of multimeter to connector P119Z.
(8) Connect negative (-) probe of multimeter to connector P73 pin A and note reading on multimeter.
(9) If continuity is not present on one or more wires, notify DS Maintenance.

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P119R.
(3) Connect negative (-) probe of multimeter to all other pins in connector P119, one at a time, and note reading on multimeter.
(4) If continuity is found between pin R and any other pin, notify DS Maintenance.
(5) Perform steps (2) and (3) for P119f and P119Z.
(6) If continuity is found between pin f and any other pin, or between pin Z and any other pin, notify DS Maintenance.
(7) Connect connector P73 to TPS connector.



f12. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 21 AND ANY SUB CODE (CONT)

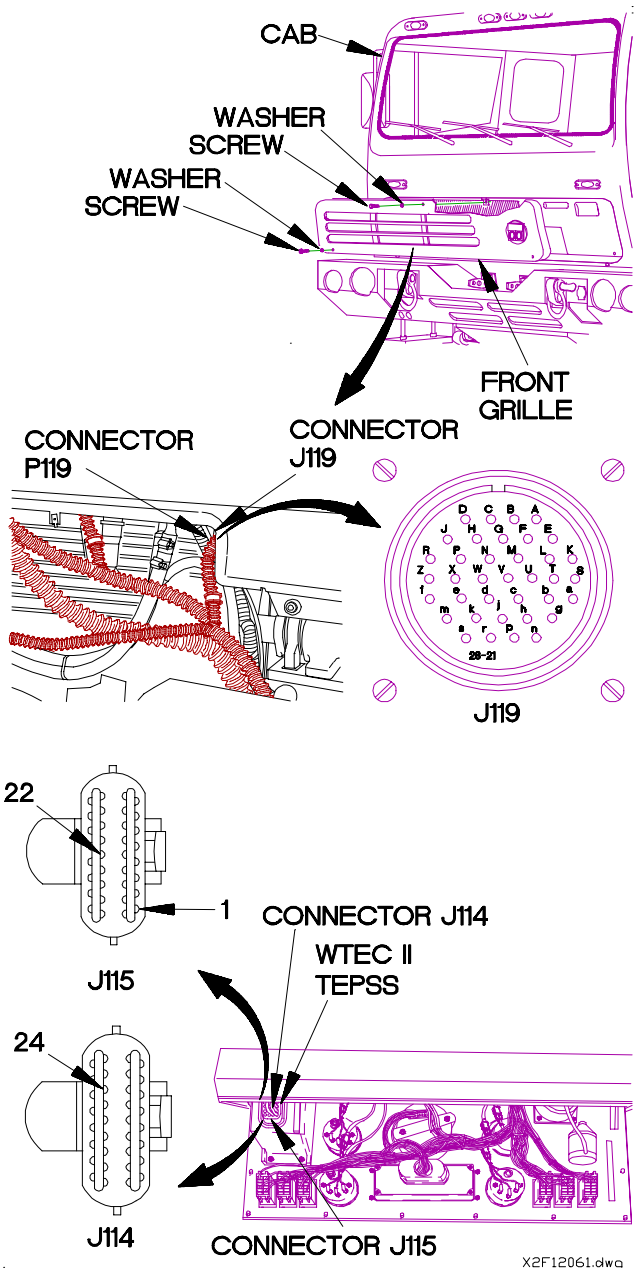


CONTINUITY TEST

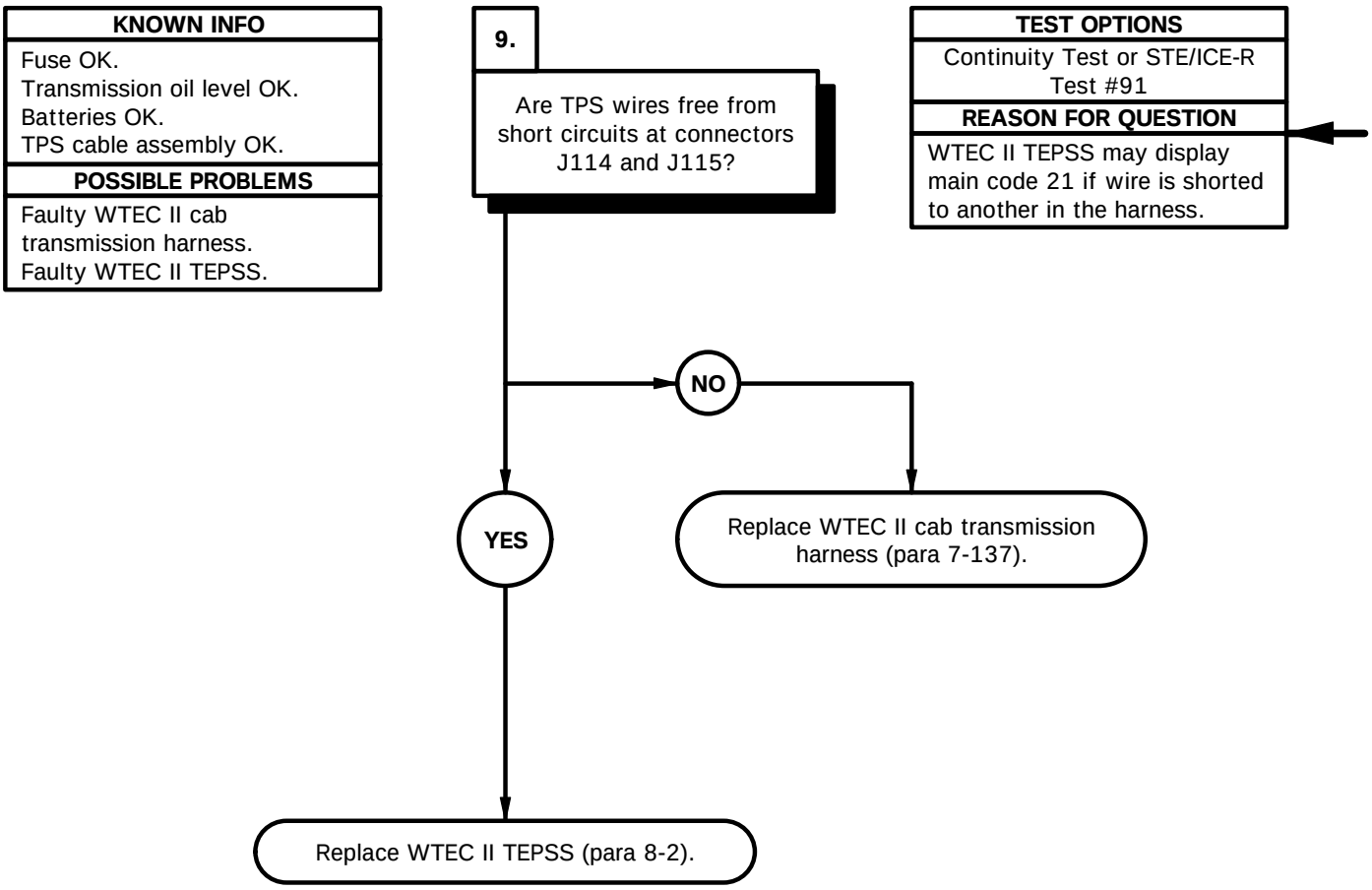
(1) Lower cab (TM 9-2320-366-10-1).
(2) Remove two screws and washers from front grille.
(3) Remove screw and washer from front grille.
(4) Remove front grille from cab.
(5) Remove instrument panel assembly for access (para 7-15).
(6) Disconnect connector J114 (bottom connector) at WTEC II TEPSS.
(7) Set multimeter to ohms.
(8) For each line of Table 2-27. WTEC II Cab Transmission Harness Continuity Check:
  (a) Install jumper wire across sockets in column 1.
  (b) Connect positive (+) probe of multimeter to socket in column 2.
  (c) Connect negative (-) probe of multimeter to socket in column 3 and note reading on multimeter.
(9) If continuity is not present on any wire in Table 2-27. WTEC II Cab Transmission Harness Continuity Check, replace WTEC II cab transmission harness (para 7-137).
(10) Remove jumper wire from connector J119.

Table 2-27. WTEC II Cab Transmission Harness Continuity Check

Column 1 Jumper Across:	Column 2 Positive (+) Probe to:	COLUMN 3 Negative (-) probe to:
J119f to J119Z	J115-1	J115-22
J119Z to J119R	J115-1	J114-24
J119f to J119R	J115-22	J114-24

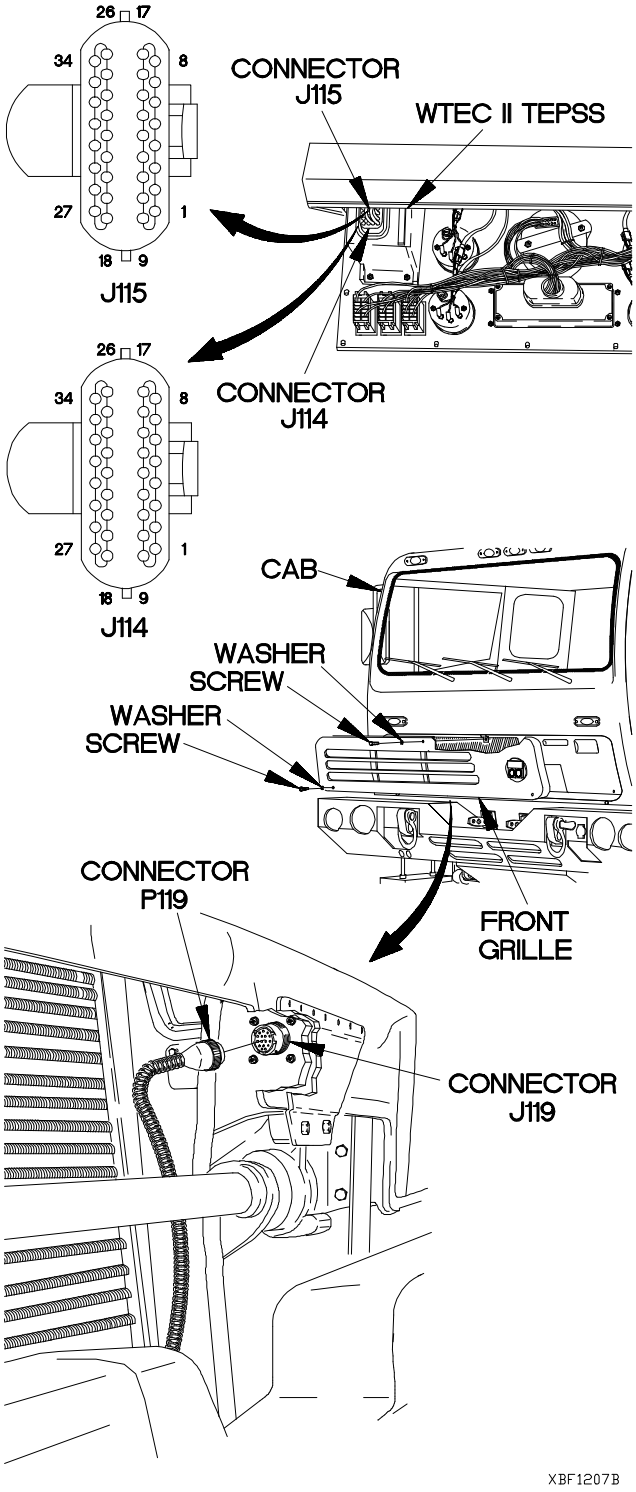


f12. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 21 AND ANY SUB CODE (CONT)



CONTINUITY TEST

(1) Disconnect connector J115 (top connector) from WTEC II TEPSS.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector J114-24.
(4) Connect negative (-) probe of multimeter to all other sockets in connector J114, one at a time, and all sockets in connector J115, one at a time, and note readings on multimeter.
(5) Connect positive (+) probe of multimeter to connector J115-1.
(6) Connect negative (-) probe of multimeter to all other sockets in connector J115, one at a time, and all sockets in connector J114, one at a time, and note readings on multimeter.
(7) Connect positive (+) probe of multimeter to connector J115-22.
(8) Connect negative (-) probe of multimeter to all other sockets in connector J115, one at a time, and all sockets in connector J114, one at a time, note readings on multimeter.
(9) If continuity is present in step 4, 6, or 8, replace WTEC II cab transmission harness (para 7-137).
(10) If continuity is not present in step 4, 6, and 8, replace WTEC II TEPSS (para 8-2).
(11) Connect connector J114 (bottom connector) to WTEC II TEPSS.
(12) Connect connector J115 (top connector) to WTEC II TEPSS.
(13) Install instrument panel assembly (para 7-15).
(14) Connect connector P119 to connector J119.
(15) Position front grille on cab with washer and screw.
(16) Position two washer and screws in front grille.
(17) Tighten screw to 48-60 lb-in. (5-7 N·m).
(18) Tighten two screws to 24 lb-in. (3 N·m).
(19) Clear diagnostic codes (para 8-4).



f13. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 51 SUB CODE 10, 12, 21, 43, 45, or 65

INITIAL SETUP

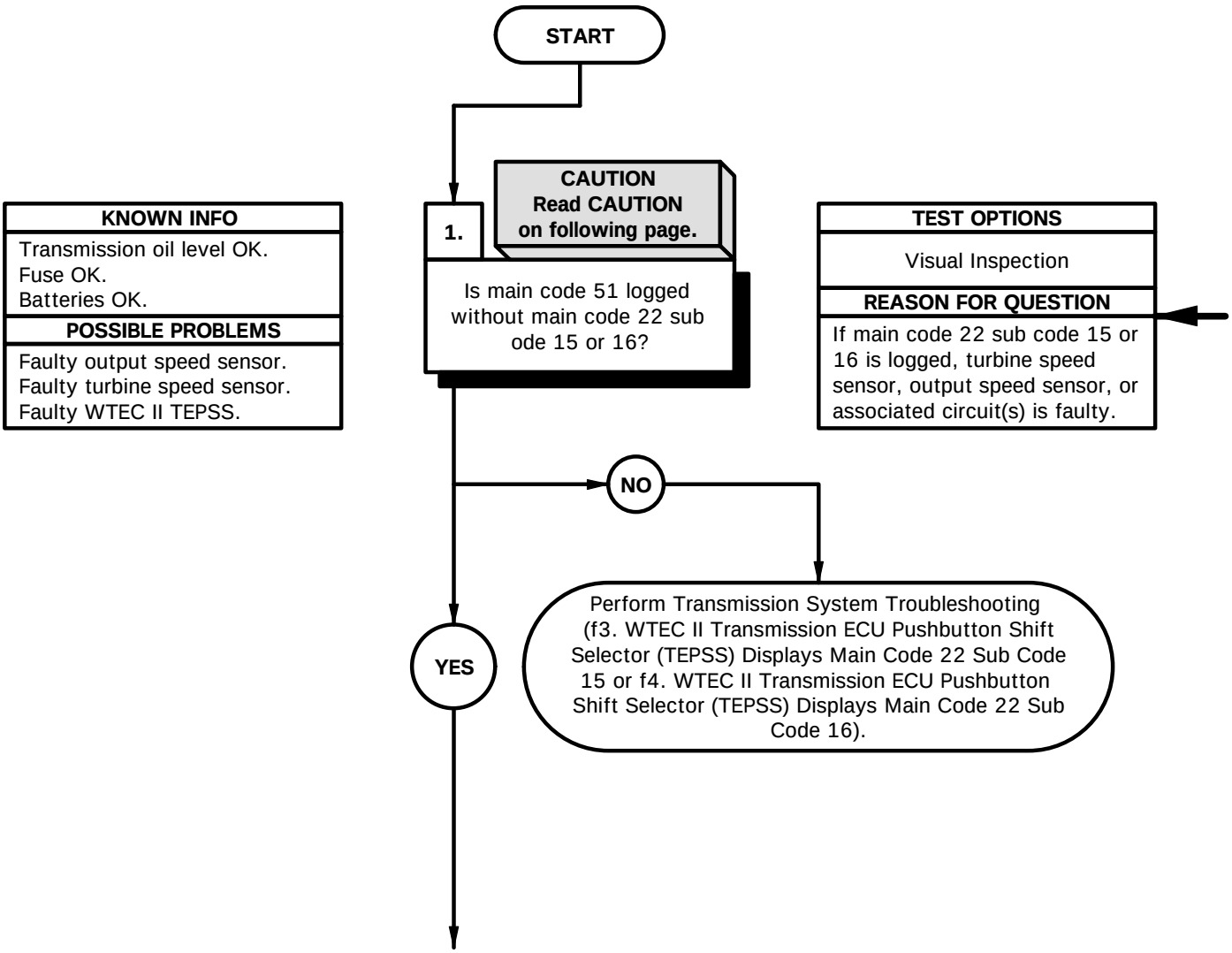
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Pan, Drain (Item 24, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)

Materials/Parts
Packing, Preformed (Item 197, Appendix G)
Adapter, Straight, Pipe to Tube (Item 1.2, Appendix D)
Adapter, Straight, Tube to Boss (Item 1.3, Appendix D)
Hose Assembly, Nonmetallic (Item 24.13, Appendix D)

Personnel Required
(2)

References
TM 9-4910-571-12&P

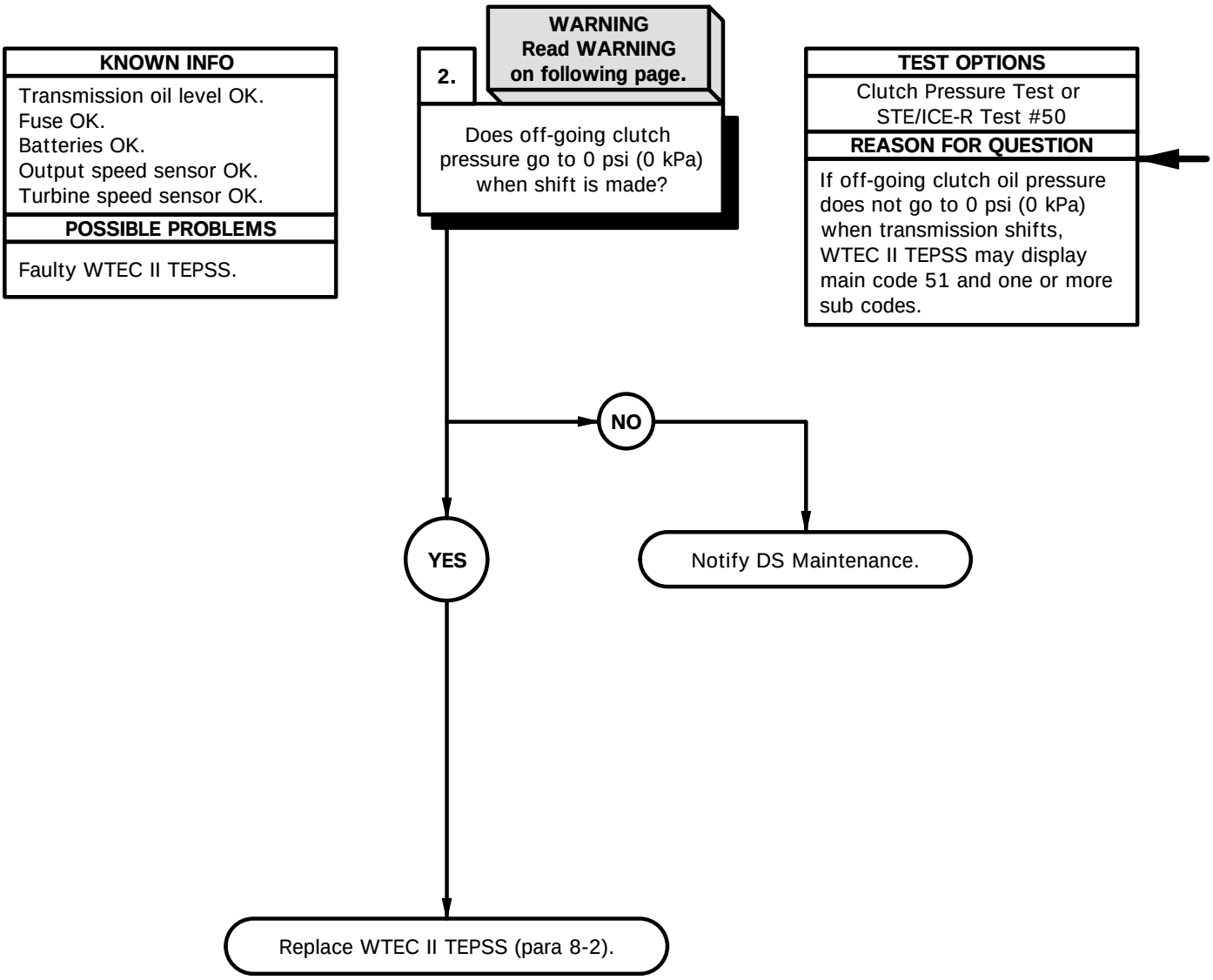


CAUTION

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) Check if main code 22 sub code 15 or 16 is logged in WTEC II TEPSS (para 8-4).
(2) If main code 22 sub code 15 or 16 is logged, WTEC II TEPSS has sensed a fault with the turbine speed sensor, output speed sensor, or associated circuits. Perform Transmission System Troubleshooting (f3. WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 15 or f4. WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 16).

f13. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 51 SUB CODE 10, 12, 21, 43, 45, or 65 (CONT)

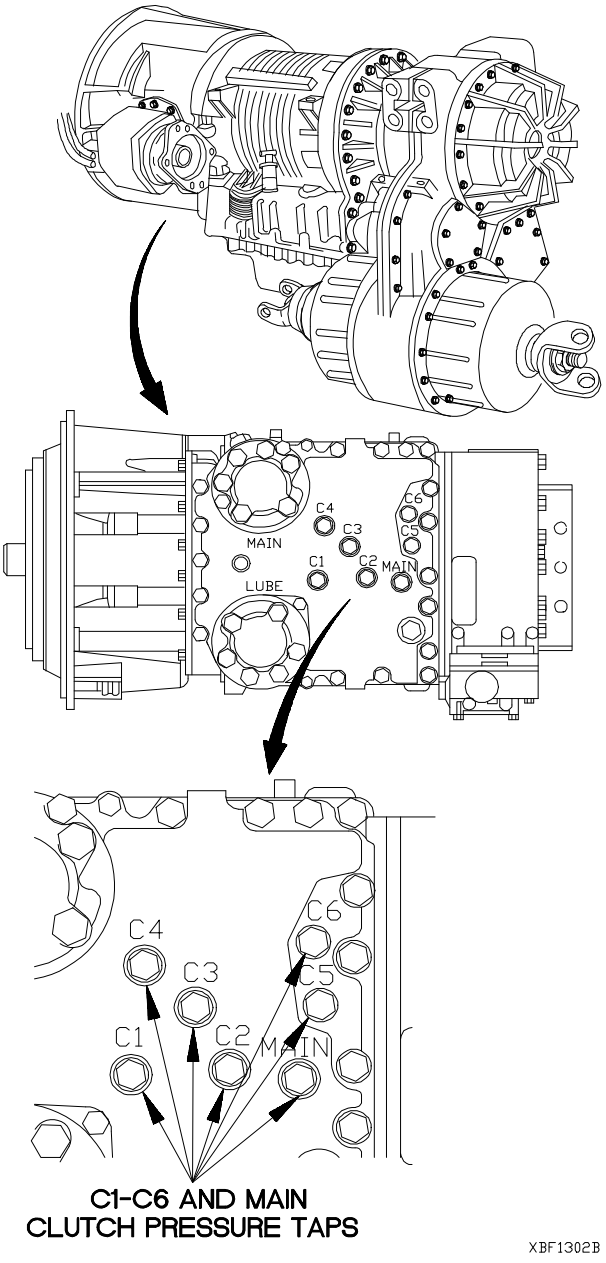


WARNING

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

CLUTCH PRESSURE TEST

(1) Remove front and intermediate propeller shafts (para 9-2).
(2) Position drain pan under pressure tap.
(3) Remove pressure tap plug and preformed packing from off-going clutch indicated by the sub code, refer to Table 2-28. Off-Going Clutch Pressure Tap. Discard preformed packing.
(4) Connect tube to boss adapter, hose, and pipe to tube adapter to clutch pressure tap.
(5) Perform STE/ICE-R Test # 50 (TM 9-4910-571-12&P).
(6) Start engine (TM 9-2320-366-10-1) and run at idle.
(7) With parking brake applied, make shift indicated by sub code while assistant notes reading on STE/ICE-R.
(8) If one or more off-going clutches fail to loose pressure, notify DS Maintenance.
(9) Shut down engine (TM 9-2320-366-10-1).
(10) Remove pipe to tube adapter, hose, and tube to boss adapter from clutch pressure tap.
(11) Position preformed packing and pressure tap plug in control valve module.
(12) Tighten pressure tap plug to 84-120 lb-in. (9-14 N·m).
(13) Remove drain pan under pressure tap.
(14) Install front and intermediate propeller shafts (para 9-2).
(15) Clear diagnostic codes (para 8-4).



C1-C6 AND MAIN CLUTCH PRESSURE TAPS

Table 2-28. Off-Going Clutch Pressure Tap

Sub Code	Sub Code Meaning	Off-Going Clutch	Solenoid Location
10	2-1 Downshift	C5	Stationary Clutch
12	2-3 Upshift	C5	Stationary Clutch
21	3-2 Downshift	C4	Stationary Clutch
23	3-4 Upshift	C4	Stationary Clutch
43	5-4 Downshift	C2	Rotating Clutch
45	5-6 Upshift	C1	Rotating Clutch
65	7-6 Downshift	C4	Stationary Clutch

f14. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 25 AND ANY SUB CODE

INITIAL SETUP

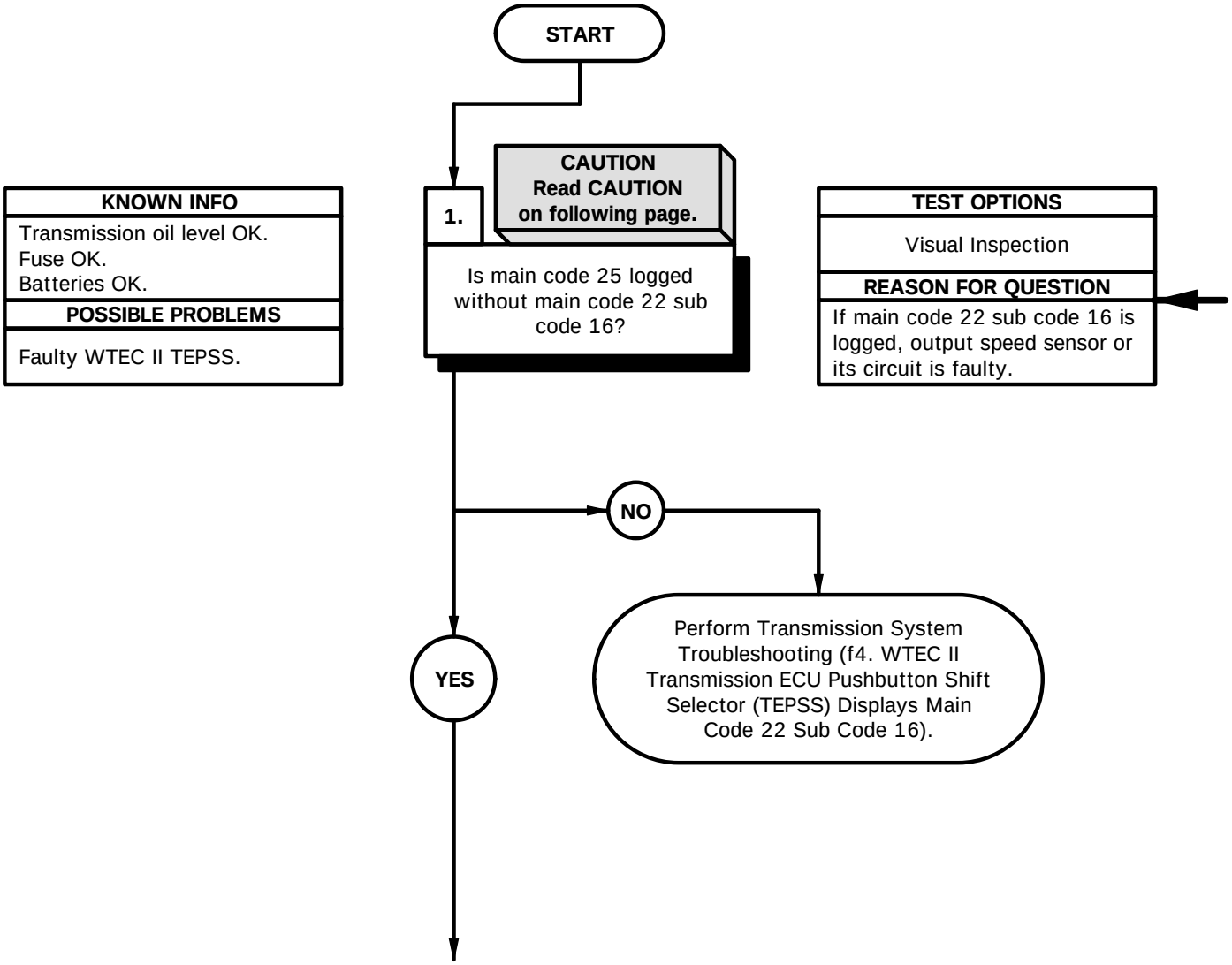
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Pan, Drain (Item 24, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Wrench Set, Socket (Item 51, Appendix C)

Materials/Parts
Packing, Preformed (Item 197, Appendix G)
Adapter, Straight, Pipe to Tube (Item 1.2, Appendix D)
Adapter, Straight, Tube to Boss (Item 1.3, Appendix D)
Hose Assembly, Nonmetallic (Item 24.13, Appendix D)

Personnel Required
(2)

Reference
TM 9-4910-571-12&P

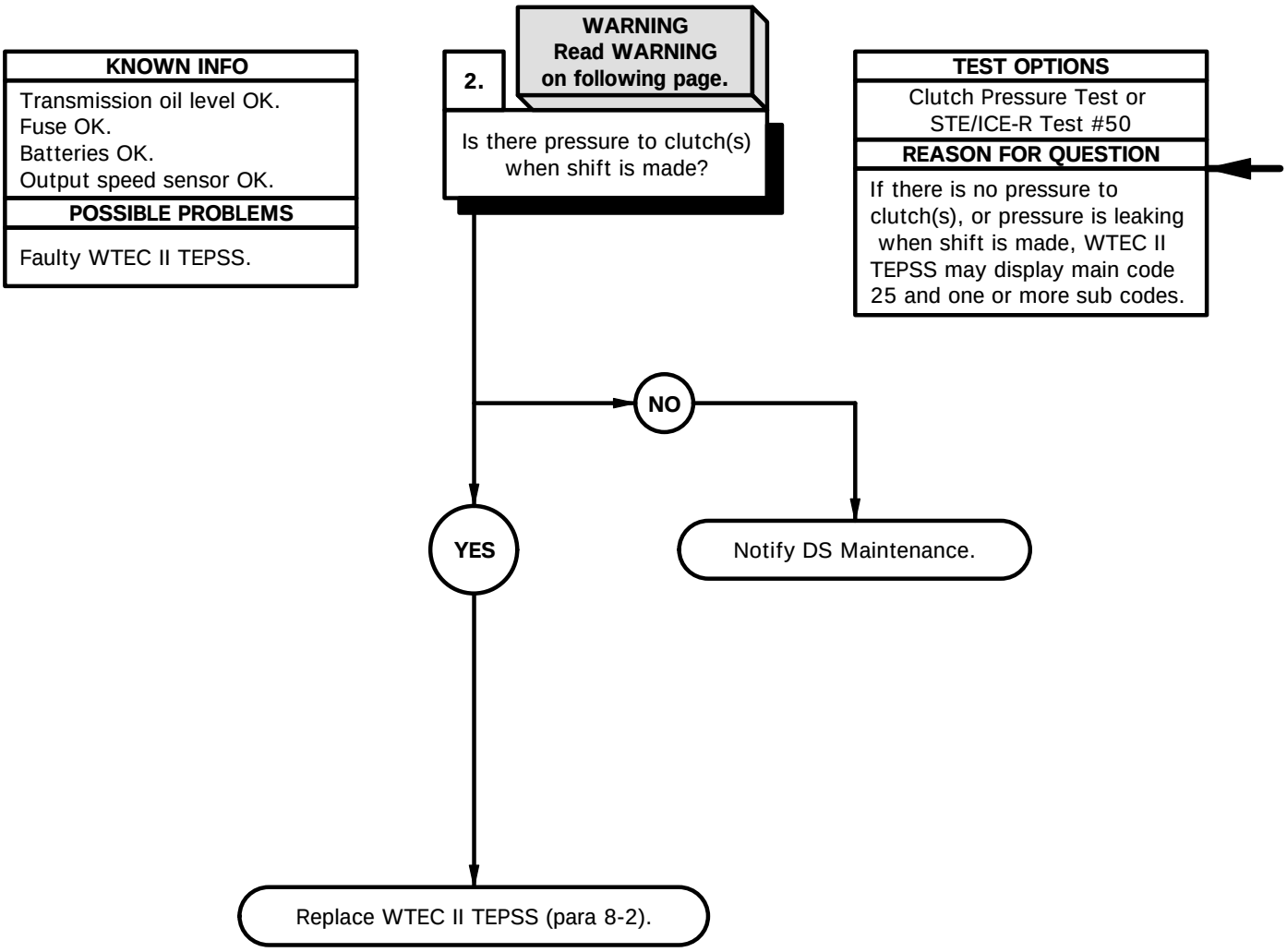


CAUTION

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) Check if main code 22 sub code 16 is logged in WTEC II TEPSS (para 8-4).
(2) If main code 22 sub code 16 is logged, WTEC II TEPSS has sensed a fault with the output sensor or its circuit. Perform Transmission System Troubleshooting (f4. WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 16).

f14. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 25 AND ANY SUB CODE (CONT)



WARNING

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

CLUTCH PRESSURE TEST

(1) Remove front and intermediate propeller shafts (para 9-2).
(2) Position drain pan under pressure tap.
(3) Remove pressure tap plug and preformed packing from clutch pressure tap indicated by the sub code. Refer to Table 2-29. Clutch Pressure Tap. Discard preformed packing.
(4) Connect tube to boss adapter, hose, and pipe to tube adapter to clutch pressure tap.
(5) Perform STE/ICE-R Test # 50 (TM 9-4910-571-12&P).
(6) Start engine (TM 9-2320-366-10-1).
(7) With brake applied, make shift indicated by sub code. Refer to Table 2-29. Clutch Pressure Tap.
(8) Accelerate engine until WTEC II TEPSS displays desired range. Refer to Table 2-29. Clutch Pressure Tap.
(9) Maintain engine speed to keep desired transmission range while assistant notes reading on STE/ICE-R.
(10) Let engine return to idle.
(11) Shift transmission into neutral.
(12) Shut down engine (TM 9-2320-366-10-1).
(13) Remove pipe to tube adapter, hose, and tube to boss adapter from clutch pressure tap.
(14) Position preformed packing and pressure tap plug in control valve module.
(15) Tighten pressure tap plug to 84-120 lb-in. (9-14 N·m).
(16) Remove drain pan.
(17) Install front and intermediate propeller shafts (para 9-2).
(18) If one or more clutches failed to indicate proper pressure, notify DS Maintenance.

CLUTCH PRESSURE TEST (CONT)

(19) If all clutches indicate proper pressure, replace WTEC II TEPSS (para 8-2).
(20) Clear diagnostic codes (para 8-4).

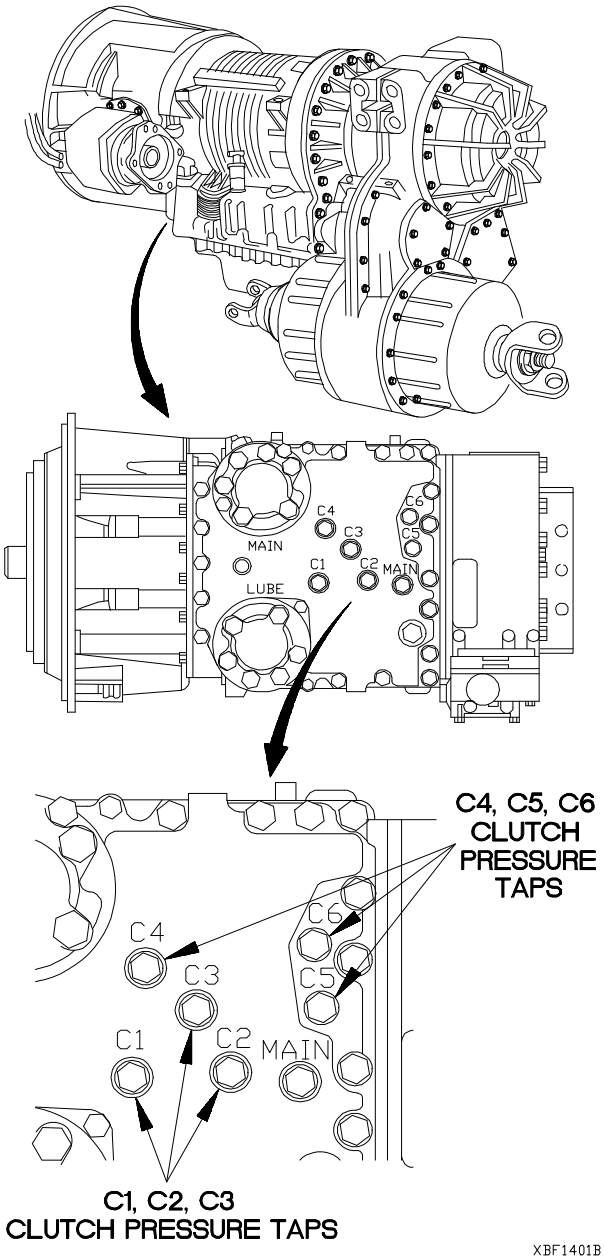


Table 2-29. Clutch Pressure Tap

Sub Code	Sub Code Meaning	Pressure at Clutches(s)	Pressure Readings at Taps
00	Speed Zero in 1st	C3 & C6	215-334 psi (1480-2300 kPa)
11	Speed Zero in 2nd	C1& C5	215-305 psi (1480-2103 kPa)
22	Speed Zero in 3rd	C1 & C4	142-203 psi (980-1400 kPa)
33	Speed Zero in 4th	C1 & C3	142-203 psi (980-1400 kPa)
44	Speed Zero in 5th	C1 & C2	142-203 psi (980-1400 kPa)
55	Speed Zero in 6th	C2 & C3	128-189 psi (880-1300 kPa)
66	Speed Zero in 7th	C2 & C4	128-189 psi (880-1300 kPa)
77	Speed Zero in R	C3 & C5	215-334 psi (1480-2300 kPa)

f15. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 53 AND ANY SUB CODE

INITIAL SETUP

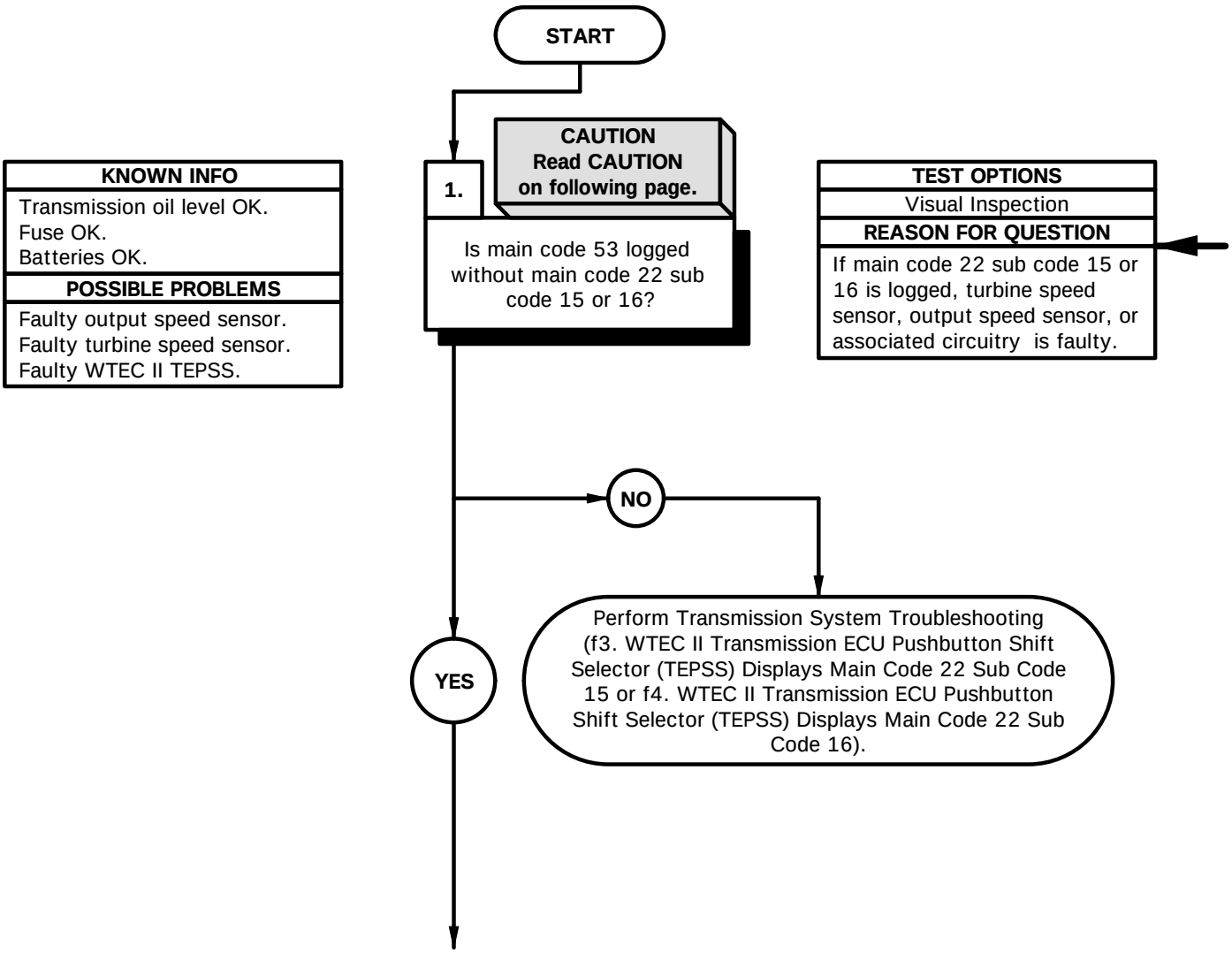
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Pan, Drain (Item 24, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Wrench Set, Socket (Item 51, Appendix C)

Materials/Parts
Packing, Preformed (Item 197, Appendix G)
Adapter, Straight, Pipe to Tube (Item 1.2, Appendix D)
Adapter, Straight, Tube to Boss (Item 1.3, Appendix D)
Hose Assembly, Nonmetallic (Item 24.13, Appendix D)

Personnel Required
(2)

Reference
TM 9-4910-571-12&P

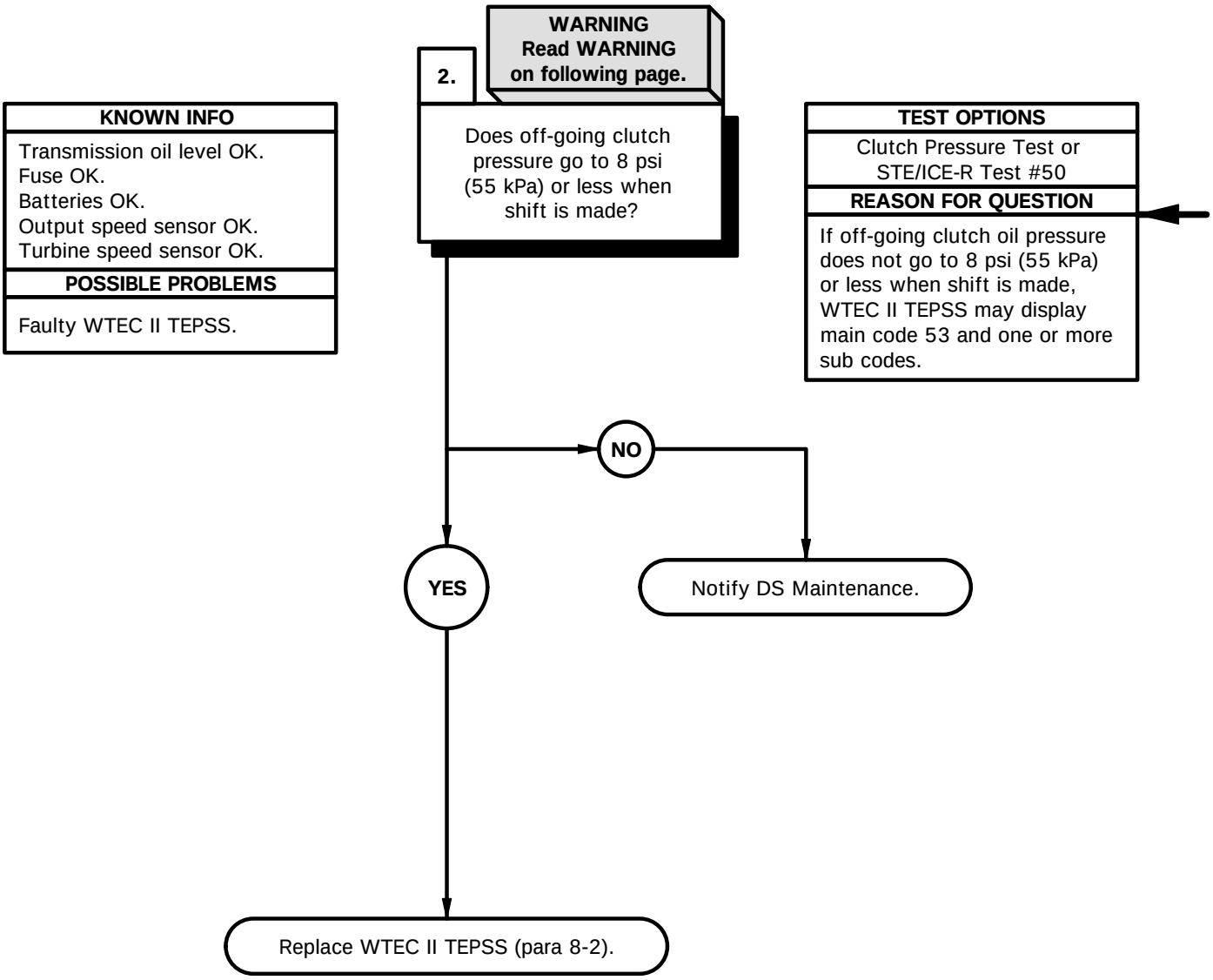


CAUTION

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) Check if main code 22 sub code 15 or 16 is logged in WTEC II TEPSS (para 8-4).
(2) If main code 22 sub code 15 or 16 is logged, WTEC II TEPSS has sensed a fault with the turbine speed sensor, output speed sensor, or associated circuits. Perform Transmission System Troubleshooting (f3. WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 15 or f4. WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 16).

f15. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 53 AND ANY SUB CODE (CONT)



WARNING

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

CLUTCH PRESSURE TEST

(1) Remove front and intermediate propeller shafts (para 9-2).
(2) Position drain pan under pressure tap.
(3) Remove pressure tap plug and preformed packing from off-going clutch indicated by the sub code. Refer to Table 2-30. Off-Going Clutch Pressure Tap. Discard preformed packing.
(4) Connect tube to boss adapter, hose, and pipe to tube adapter to clutch pressure tap.
(5) Perform STE/ICE-R Test # 50 (TM 9-4910-571-12&P).
(6) Start engine (TM 9-2320-366-10-1) and run at idle.
(7) With parking brake applied, make shift indicated by sub code while assistant notes reading on STE/ICE-R.
(8) If off-going clutch pressure does not go to 8 psi (55 kPa) or less when shift is made, notify DS Maintenance.
(9) If off-going clutch pressure does go to 8 psi (55 kPa) or less when shift is made, replace WTEC III TEPSS (para 8-2).
(10) Shut down engine (TM 9-2320-366-10-1).
(11) Remove pipe to tube adapter, hose, and tube to boss adapter from clutch pressure tap.
(12) Position preformed packing and pressure tap plug in control valve module.
(13) Tighten pressure tap plug to 84-120 lb-in. (9-14 N·m).
(14) Remove drain pan under pressure tap.
(15) Install front and intermediate propeller shafts (para 9-2).
(16) Clear diagnostic codes (para 8-4).

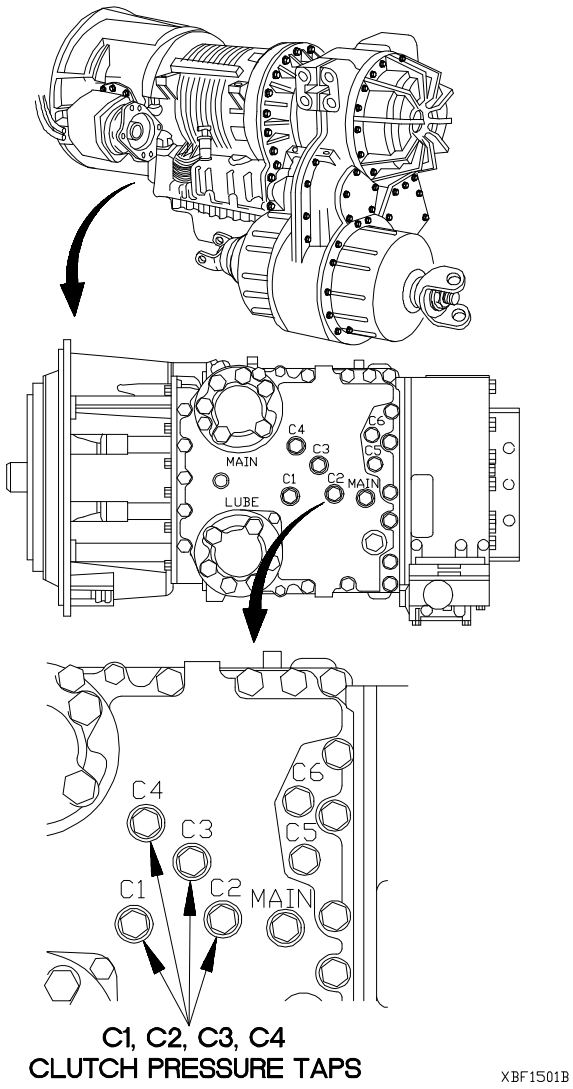


Table 2-30. Off-Going Clutch Pressure Tap

Sub Code	Sub Code Meaning	Off-Going Clutch(s)
08	L-N1 Shift	C3
18	1-N1 Shift	C1
28	2-N1 Shift	C1 & C4
29	2-N2 Shift	C1
38	3-N1 Shift	C1 & C3
39	3-N3 Shift	C1
48	4-N1 Shift	C1 & C2
49	4-N3 Shift	C1 & C2
58	5-N1 Shift	C2 & C3
59	5-N3 Shift	C2
68	6-N1 Shift	C2 & C4
69	6-N4 Shift	C2
78	R-N1 Shift	C3
99	N3-N2 or N2-N3 Shift	C2 & C4

f16. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 54 SUB CODE 01, 07, 10, 12, 17, 21, 23, 27, 32, 34, 43, 45, 54, 56, 65, 70, 71, 72, 80, 81, 82, 83, 85, 86, 92, 93, 95, 96, or 97

INITIAL SETUP

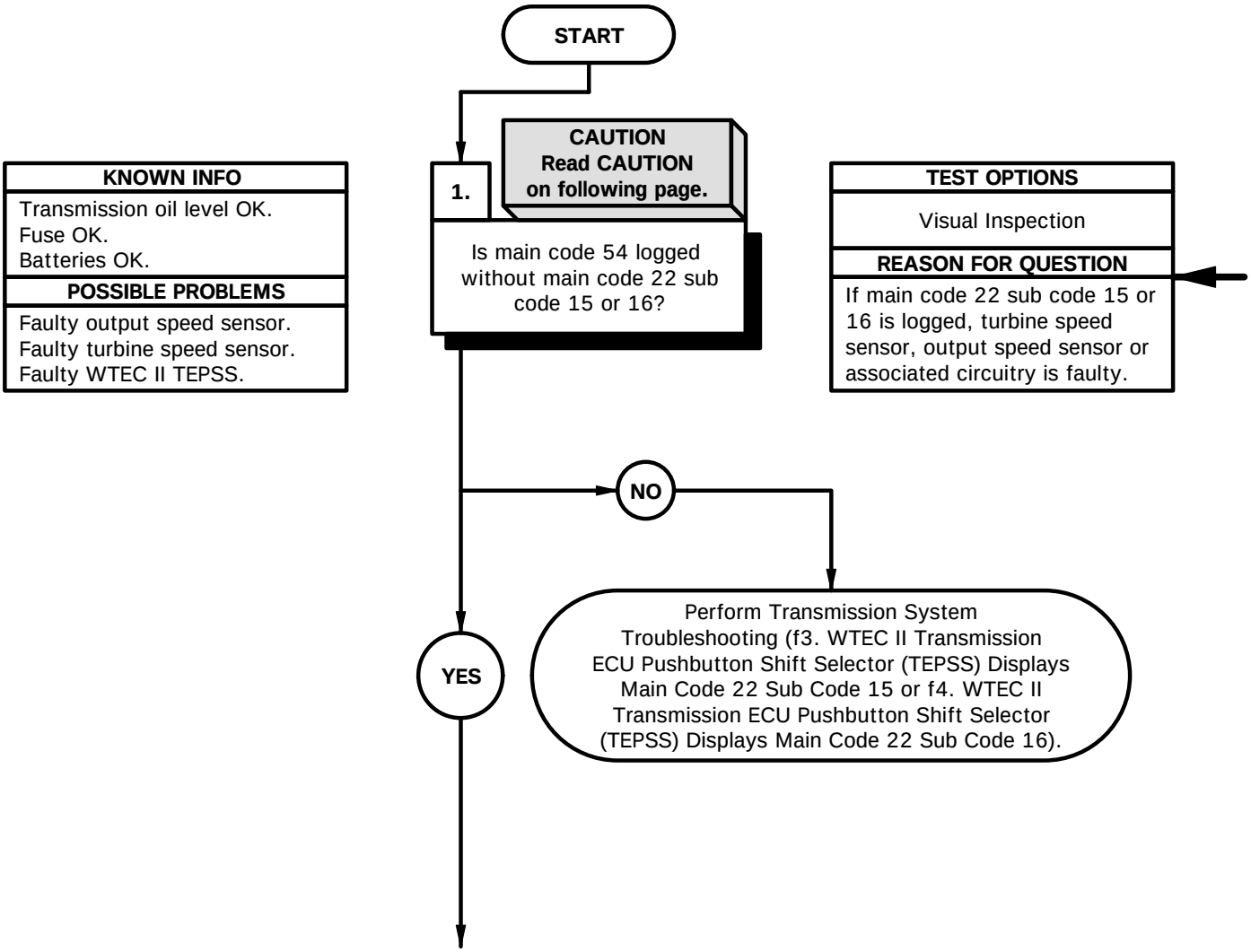
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Pan, Drain (Item 24, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Wrench Set, Socket (Item 51, Appendix C)

Materials/Parts
Packing, Preformed (Item 197, Appendix G)
Adapter, Straight, Pipe to Tube (Item 1.2, Appendix D)
Adapter, Straight, Tube to Boss (Item 1.3, Appendix D)
Hose Assembly, Nonmetallic (Item 24.13, Appendix D)

Personnel Required
(2)

Reference
TM 9-4910-571-12&P

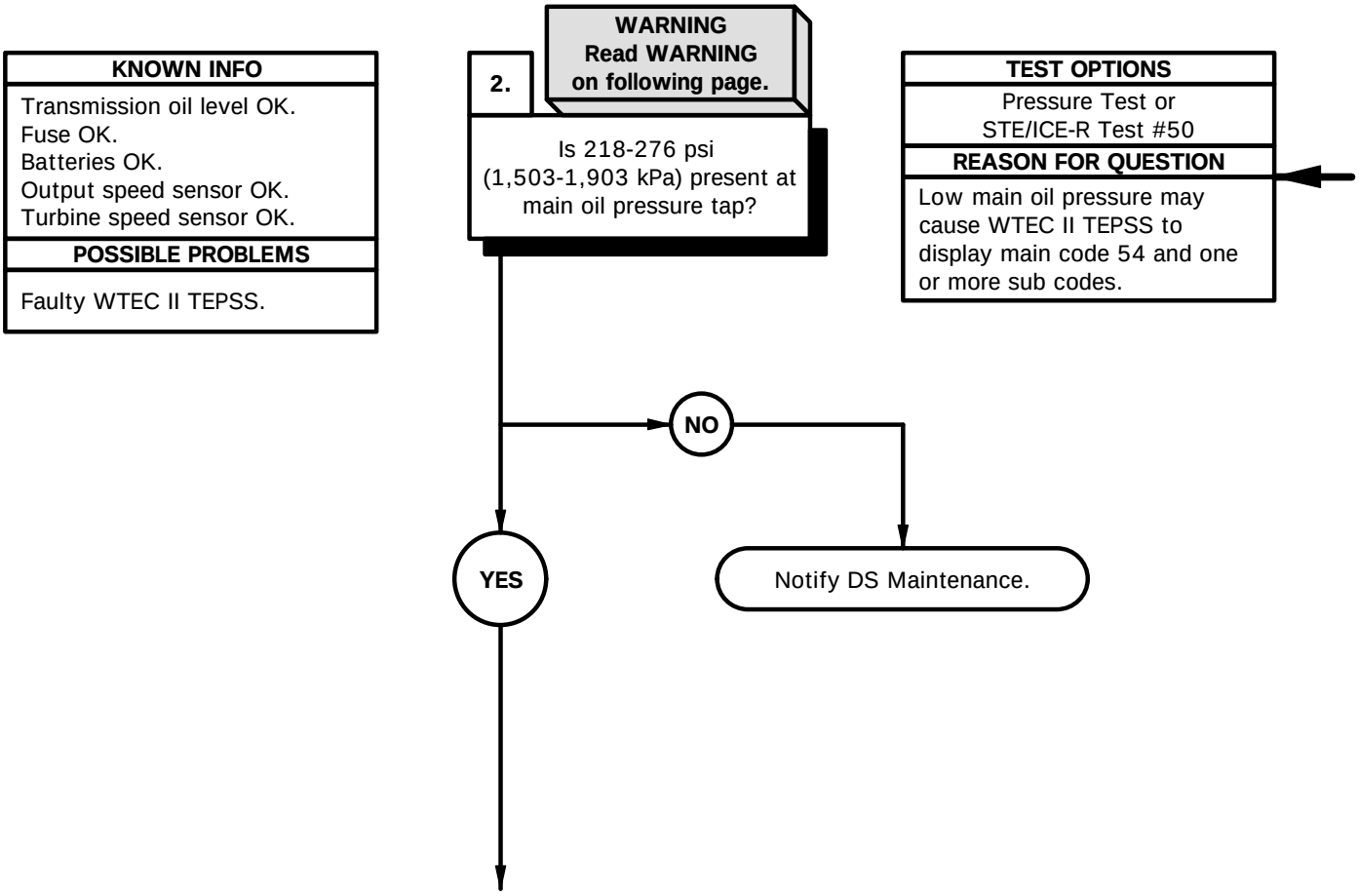


CAUTION

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) Check if main code 22 sub code 15 or 16 is logged in the WTEC II TEPSS (para 8-4).
(2) If main code 22 sub code 15 or 16 is logged, WTEC II TEPSS has sensed a fault with the turbine speed sensor, output sensor or associated circuits. Perform Transmission System Troubleshooting (f3. WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 15 or f4. WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 16).

f16. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 54 SUB CODE 01, 07, 10, 12, 17, 21, 23, 27, 32, 34, 43, 45, 54, 56, 65, 70, 71, 72, 80, 81, 82, 83, 85, 86, 92, 93, 95, 96, or 97 (CONT)

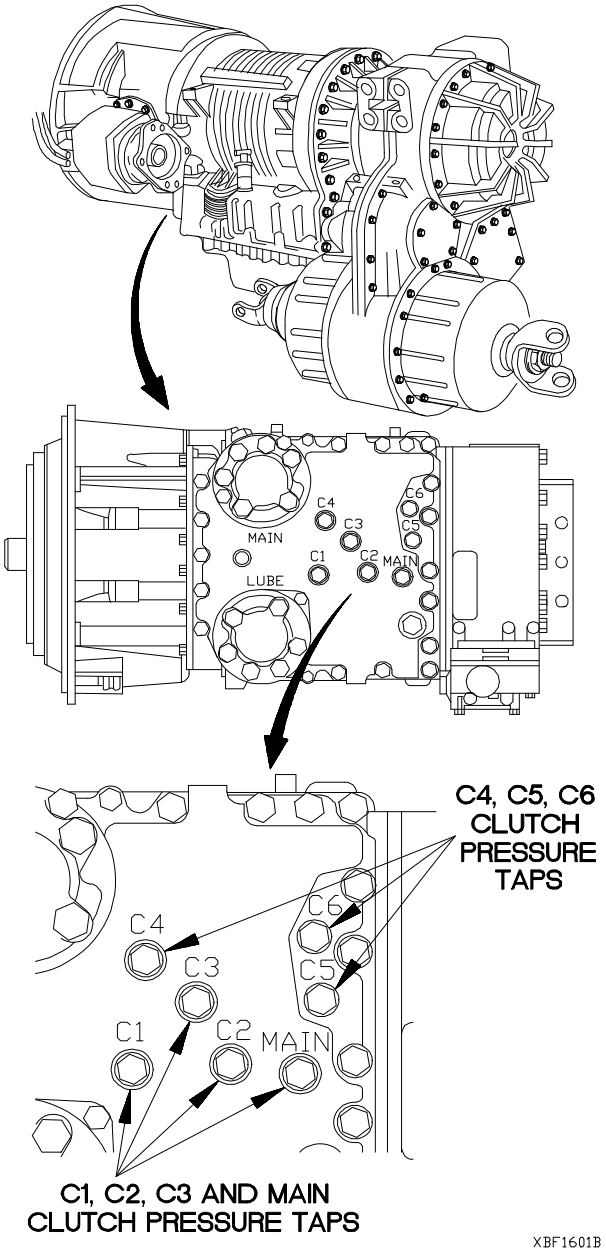


WARNING

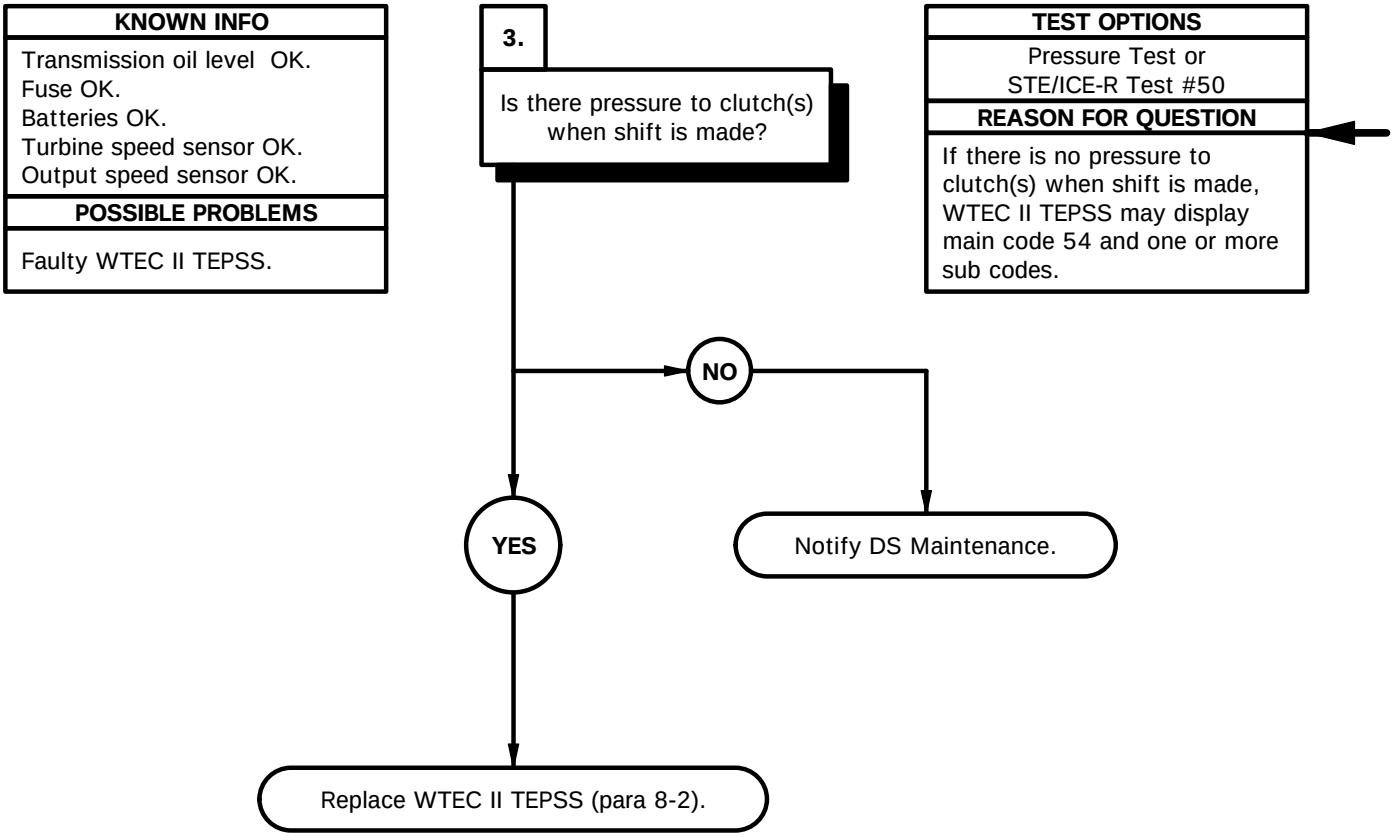
Wear approved eye protection when performing transmission pressure checks. If oil contacts eyes, seek medical attention immediately. Failure to comply may result in injury to personnel.

PRESSURE TEST

(1) Position drain pan under pressure tap.
(2) Remove main pressure tap plug and preformed packing from control valve module.
(3) Connect tube to boss adapter, hose, and pipe to tube adapter to main pressure tap.
(4) Perform STE/ICE-R Test # 50 (TM 9-4910-571-12&P).
(5) Start engine (TM 9-2320-366-10-1) and run at idle.
(6) With parking brake applied, position WTEC II TEPSS to R position then to N position while assistant checks reading on STE/ICE-R.
(7) Shut down engine (TM 9-2320-366-10-1).
(8) If main oil pressure is low, notify DS Maintenance.
(9) Remove pipe to tube adapter, hose, and tube to boss adapter from main pressure tap.
(10) Position preformed packing and main pressure tap plug in control valve module.
(11) Tighten main pressure tap plug to 84-120 lb-in. (9-14 N·m).
(12) Remove drain pan under main pressure tap.



f16. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 54 SUB CODE 01, 07, 10, 12, 17, 21, 23, 27, 32, 34, 43, 45, 54, 56, 65, 70, 71, 72, 80, 81, 82, 83, 85, 86, 92, 93, 95, 96, or 97 (CONT)



CLUTCH PRESSURE TEST

(1) Remove front and intermediate propeller shafts (para 9-2).
(2) Position drain pan under pressure tap.
(3) Remove pressure tap plug and preformed packing from clutch pressure tap indicated by the sub code. Refer to Table 2-31. Clutch Pressure Tap.
(4) Connect tube to boss adapter, hose, and pipe to tube adapter to clutch pressure tap.
(5) Start engine (TM 9-2320-366-10-1).
(6) Perform STE/ICE-R Test # 50 (TM 9-4910-571-12&P).
(7) With parking brake applied, make shift indicated by sub code. Refer to Table 2-31. Clutch Pressure Tap.
(8) Accelerate engine until WTEC II TEPSS displays denied range. Refer to Table 2-31. Clutch Pressure Tap.
(9) Maintain sufficient engine speed to keep desired transmission range while assistant notes reading on STE/ICE-R.
(10) Let engine return to idle.
(11) Shift WTEC II TEPSS into neutral.
(12) If one or more clutches failed to indicate proper pressure, notify DS Maintenance.
(13) If all clutches indicate proper pressure, replace WTEC II TEPSS (para 8-2).
(14) Shut down engine (TM 9-2320-366-10-1).
(15) Remove pipe to tube adapter, hose, and tube to boss adapter from clutch pressure tap.
(16) Position preformed packing and pressure tap plug in control valve module.
(17) Tighten pressure tap plug to 84-120 lb-in. (9-14 N·m).
(18) Remove drain pan under pressure tap.
(19) Install front and intermediate propeller shafts (para 9-2).
(20) Clear diagnostic codes (para 8-4).

Table 2-31. Clutch Pressure Tap

Sub Code	Sub Code Meaning	Pressure at Clutch(s)	Pressure Readings at Taps
01	L-1 Upshift	C1 & C5	187-305 psi (1280-2100 kPa)
07	L-R Shift	C3 & C5	215-276 psi (1480-1900 kPa)
10	1-L Downshift	C3 & C6	215-334 psi (1480-2300 kPa)
12	1-2 Upshift	C1 & C4	142-203 psi (980-1400 kPa)
17	1-R Shift	C3 & C5	215-276 psi (1480-1900 kPa)
21	2-1 Downshift	C1 & C5	186-305 psi (1280-2100 kPa)
23	2-3 Upshift	C1 & C3	142-203 psi (980-1400 kPa)
27	2-R Shift	C3 & C5	215-334 psi (1480-2300 kPa)
32	3-2 Downshift	C1 & C4	142-203 psi (980-1400 kPa)
34	3-4 Upshift	C1 & C2	142-203 psi (980-1400 kPa)
43	4-3 Downshift	C1 & C3	142-203 psi (980-1400 kPa)
45	4-5 Upshift	C2 & C3	128-189 psi (880-1300 kPa)
54	5-4 Downshift	C1 & C2	142-203 psi (980-1400 kPa)
56	5-6 Upshift	C2 & C4	128-189 psi (880-1300 kPa)
65	6-5 Downshift	C2 & C3	128-189 psi (880-1300 kPa)
70	R-L Shift	C3 & C6	215-276 psi (1480-1900 kPa)
71	R-1 Shift	C1 & C5	186-305 psi (1280-2100 kPa)
72	R-2 Shift	C1 & C4	142-203 psi (980-1400 kPa)
80	N1-L Shift	C3 & C6	215-276 psi (1480-1900 kPa)
81	N1-1 Shift	C1 & C5	215-305 psi (1480-1900 kPa)
82	N1-2 Shift	C1 & C4	186-305 psi (1280-2100 kPa)
83	N1-3 Shift	C1 & C3	215-305 psi (1480-1900 kPa)
85	N1-5 Shift	C2 & C3	164-239 psi (1130-1650 kPa)
86	N1-6 Shift	C2 & C4	164-239 psi (1130-1650 kPa)
92	N2-2 Shift	C1 & C4	215-305 psi (1480-1900 kPa)
93	N3-3 Shift	C1 & C3	215-305 psi (1480-1900 kPa)
95	N3-5 Shift	C2 & C3	164-239 psi (1130-1650 kPa)
96	N4-6 Shift	C2 & C4	164-239 psi (1130-1650 kPa)
97	2-R Shift	C3 & C5	215-305 psi (1480-1900 kPa)

f17. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 55 AND ANY SUB CODE

INITIAL SETUP

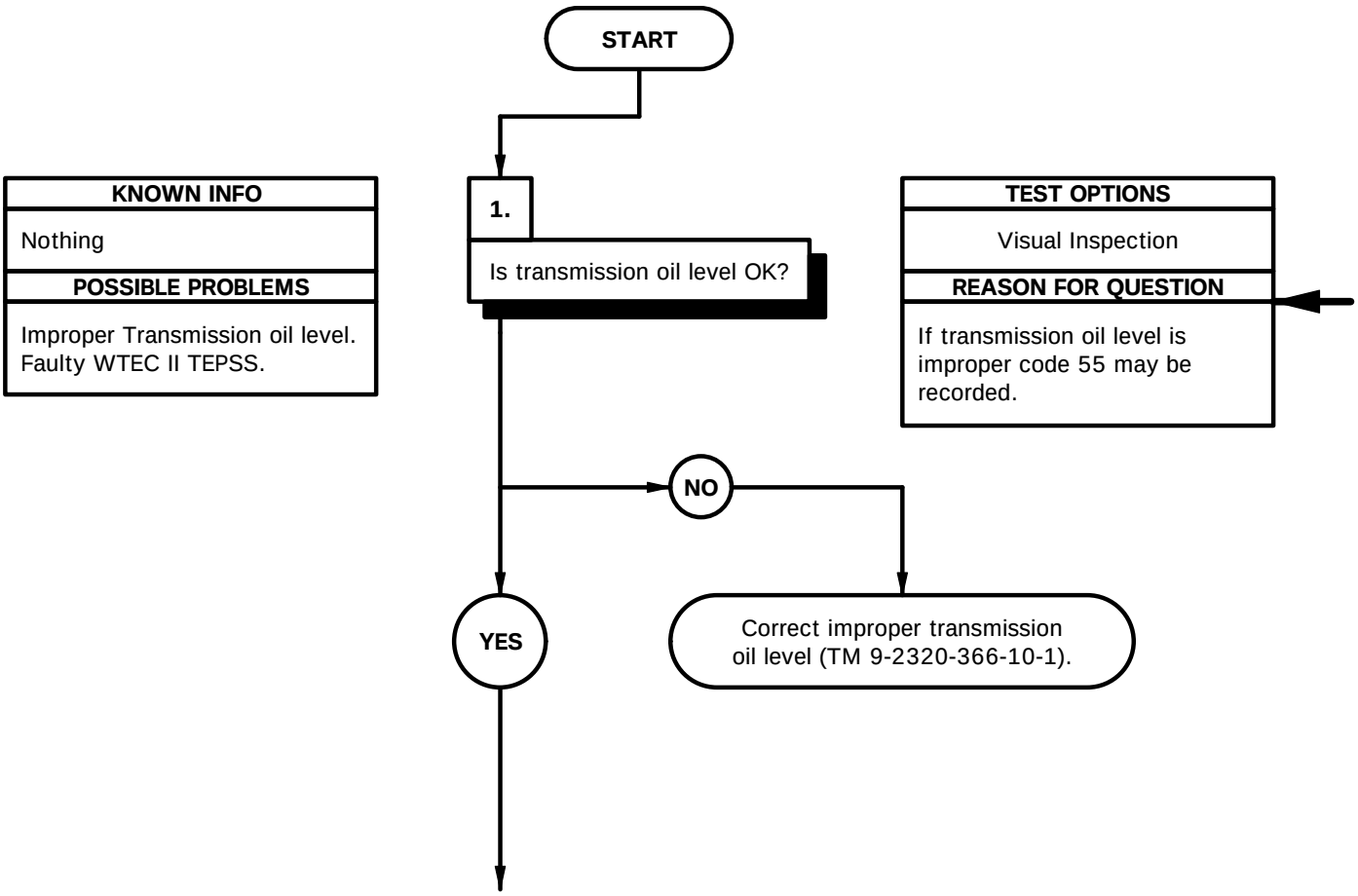
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Pan, Drain (Item 24, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Wrench Set, Socket (Item 51, Appendix C)

Materials/Parts
Packing, Preformed (Item 199, Appendix G)
Adapter, Straight, Pipe to Tube (Item 1.2, Appendix D)
Adapter, Straight, Tube to Boss (Item 1.3, Appendix D)
Hose Assembly, Nonmetallic (Item 24.13, Appendix D)

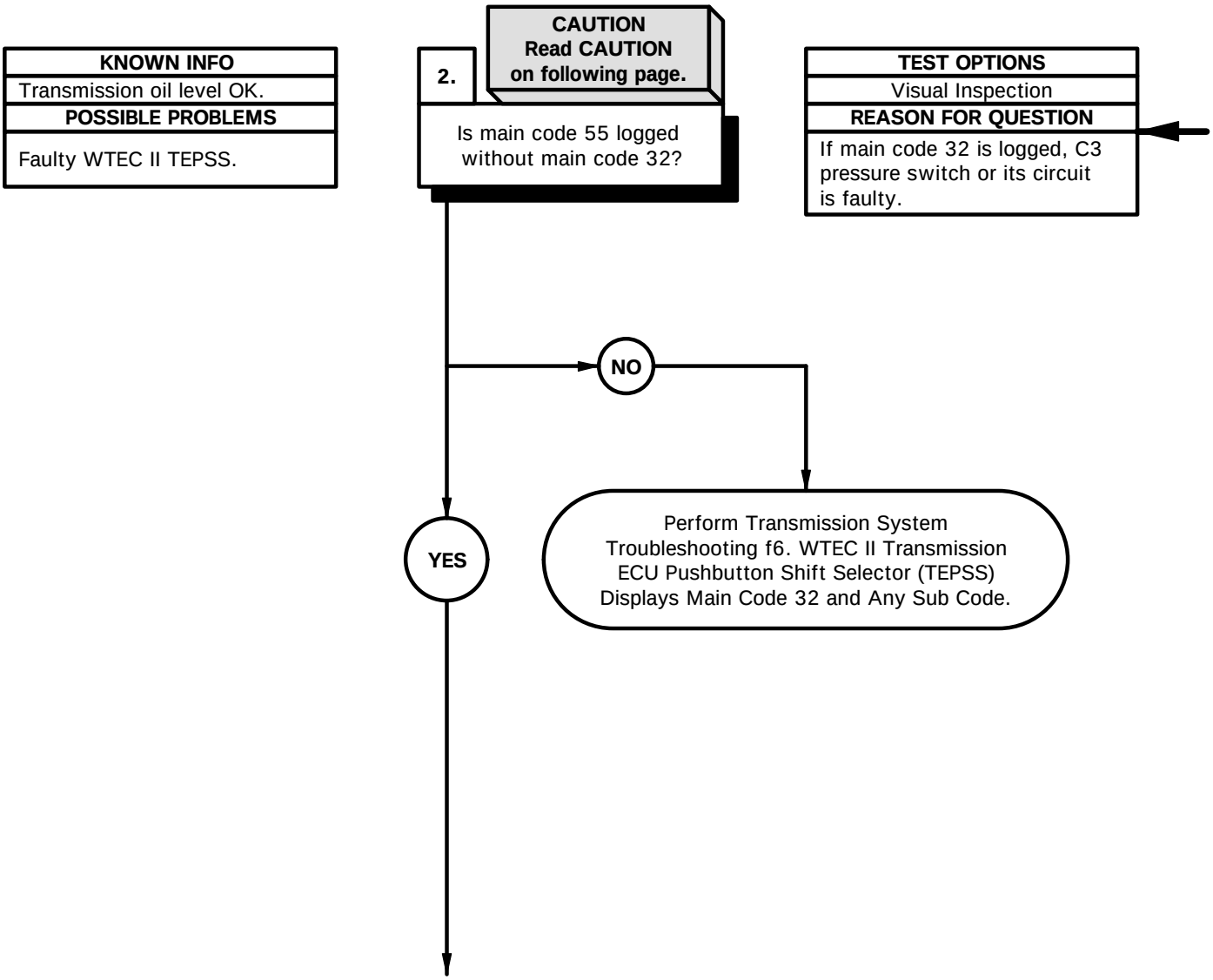
References
TM 9-4910-571-12&P

Personnel Required
(2)



(1) Check transmission oil level (TM 9-2320-366-10-1).
(2) If transmission oil level is improper, correct as required (TM 9-2320-366-10-1).

f17. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 55 AND ANY SUB CODE (CONT)

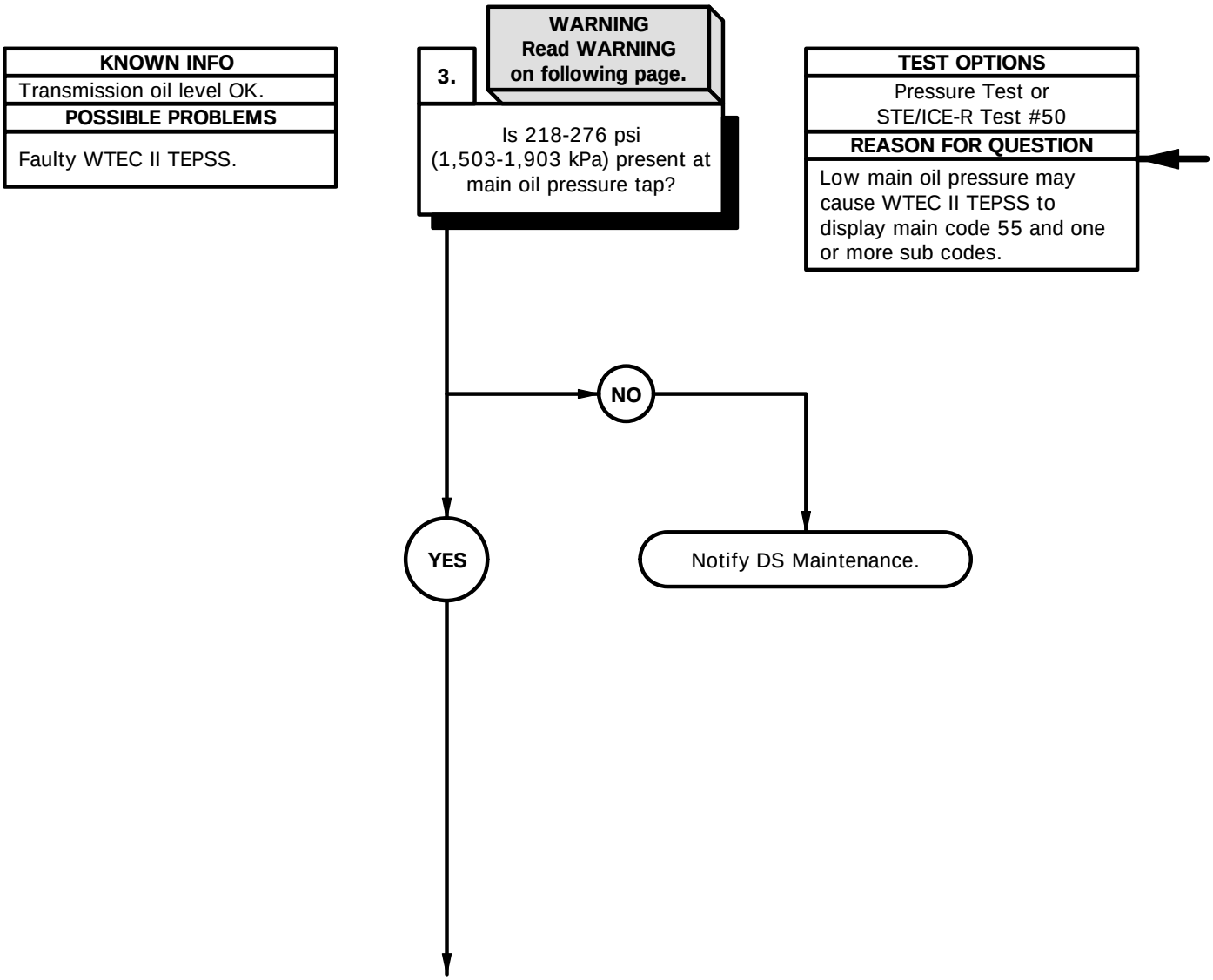


CAUTION

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) Check if main code 32 is logged in WTEC II TEPSS (para 8-4).
(2) If main code 32 is logged, WTEC II TEPSS has sensed a fault C3 pressure switch or its circuit. Perform Transmission System Troubleshooting (f6. WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 32 and Any Sub Code).

f17. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 55 AND ANY SUB CODE (CONT)

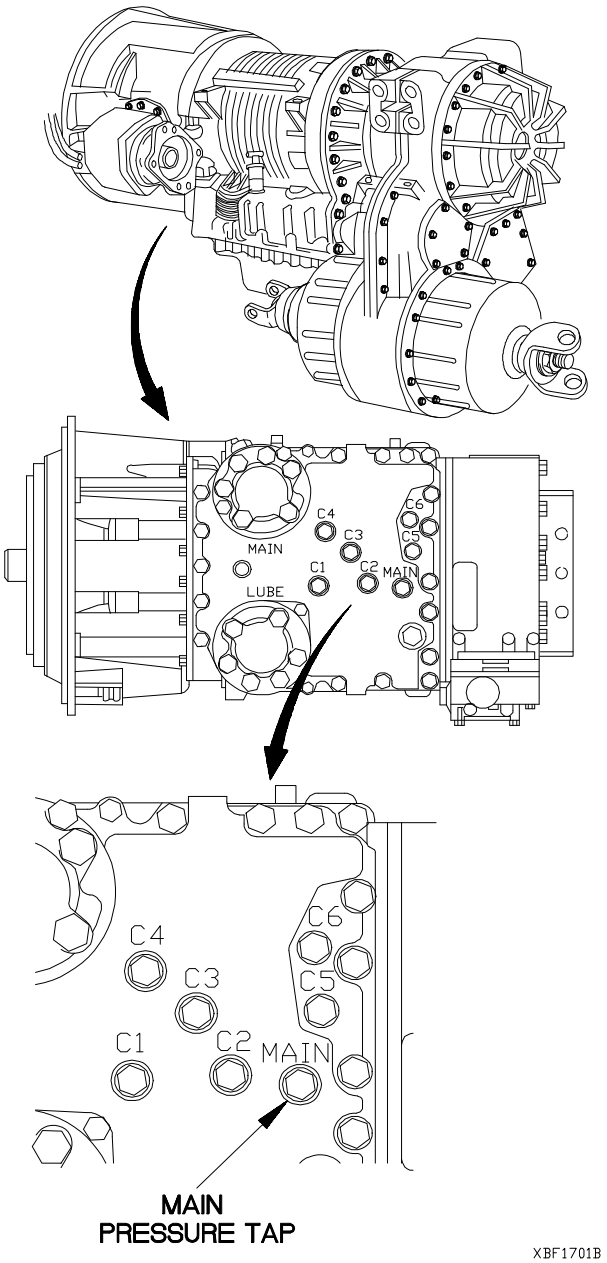


WARNING

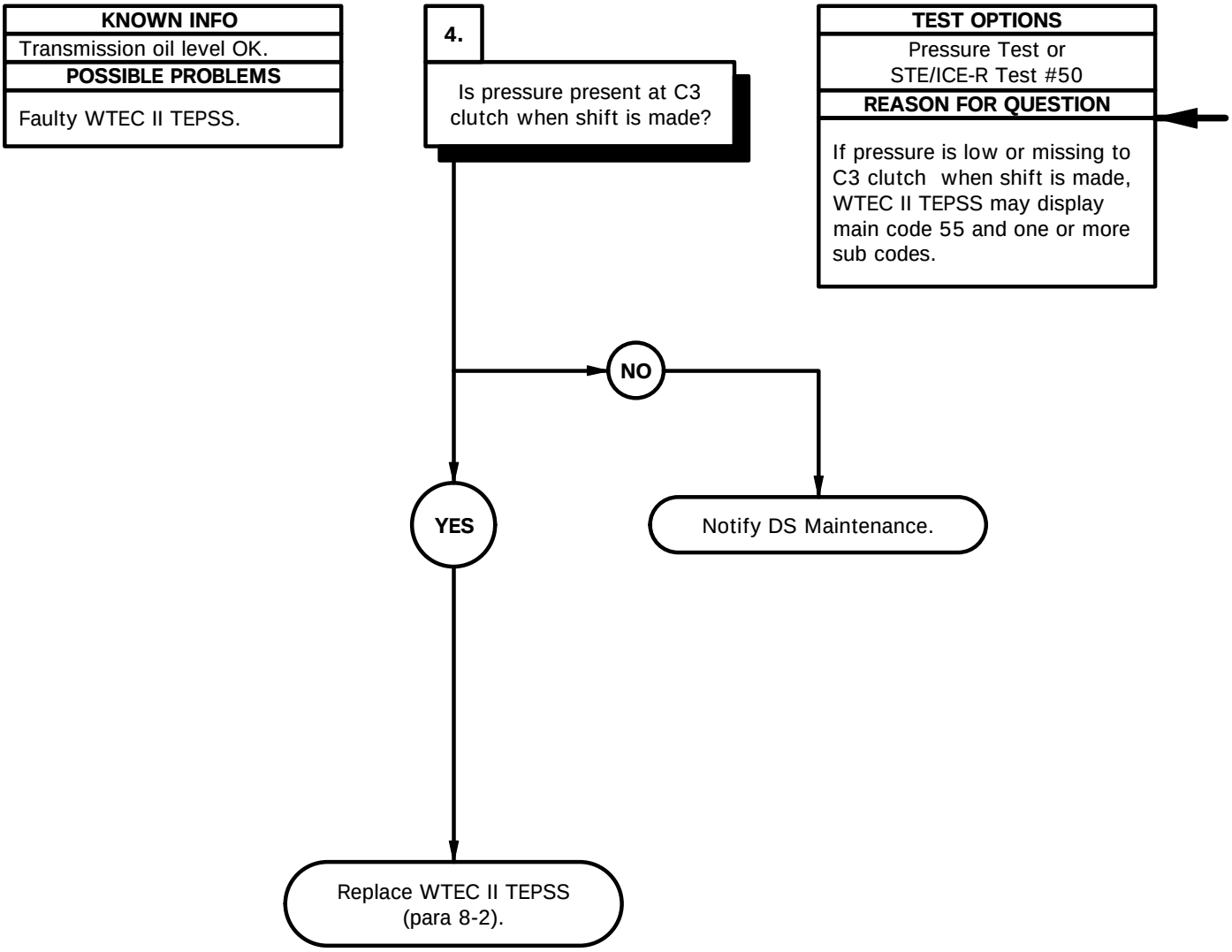
Wear approved eye protection when performing transmission pressure checks. If oil contacts eyes, seek medical attention immediately. Failure to comply may result in injury to personnel.

PRESSURE TEST

(1) Position drain pan under pressure tap.
(2) Remove main pressure tap plug and preformed packing from control valve module.
(3) Connect tube to boss adapter, hose, and pipe to tube adapter to clutch pressure tap.
(4) Perform STE/ICE-R Test # 50 (TM 9-4910-571-12&P).
(5) Start engine (TM 9-2320-366-10-1) and run at idle.
(6) With parking brake applied, position WTEC II TEPSS to R position then to N position while assistant checks reading on STE/ICE-R.
(7) Shut down engine (TM 9-2320-366-10-1).
(8) If main oil pressure is low, notify DS Maintenance.
(9) Remove pipe to tube adapter, hose, and tube to boss adapter from main pressure tap.
(10) Position preformed packing and main pressure tap plug in control valve module.
(11) Tighten main pressure tap plug to 84-120 lb-in. (9-14 N·m).
(12) Remove drain pan under pressure tap.



f17. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 55 AND ANY SUB CODE (CONT)

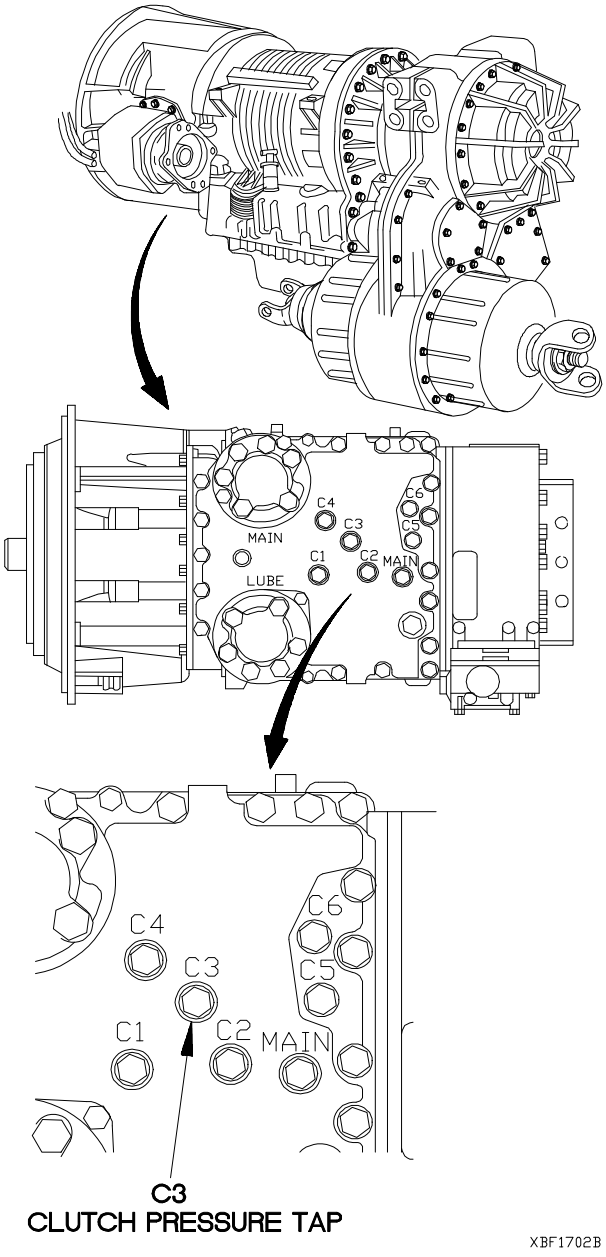


PRESSURE TEST

(1) Remove front and intermediate propeller shafts (para 9-2).
(2) Position drain pan under C3 pressure tap.
(3) Remove C3 pressure tap plug and preformed packing from control valve module.
(4) Connect tube to boss adapter, hose, and pipe to tube adapter to C3 pressure tap.
(5) Perform STE/ICE-R test # 50 (TM 9-4910-571-12&P).
(6) Start engine (TM 9-2320-366-10-1) and run at idle.
(7) With parking brake applied, make shift indicated by sub code while assistant notes reading on STE/ICE-R. Refer to Table 2-32. Clutch Pressure Tap.
(8) Shut down engine (TM 9-2320-366-10-1).
(9) If 215-276 psi pressure is not obtained for affected code, notify DS Maintenance.
(10) If 215-276 psi pressure is obtained, replace WTEC II TEPSS (para 8-2).
(11) Remove pipe to tube adapter, hose, and tube to boss adapter from C3 pressure tap.
(12) Position preformed packing and C3 pressure tap plug in control valve module.
(13) Tighten C3 pressure tap plug to 84-120 lb-in. (9-14 N·m).
(14) Remove drain pan under pressure tap.
(15) Install front and intermediate propeller shafts (para 9-2).
(16) Clear diagnostic codes (para 8-4).

Table 2-32. Clutch Pressure Tap

Sub Code	Sub Code Meaning	Pressure Readings C3 Tap
17	1-R Shift	215-276 psi (1480-1900 kPa)
27	2-R Shift	215-276 psi (1480-1900 kPa)
80	N1-L Shift	215-276 psi (1480-1900 kPa)
87	N1-R Shift	215-276 psi (1480-1900 kPa)
97	2-R Shift	215-276 psi (1480-1900 kPa)



f18. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 56 AND ANY SUB CODE

INITIAL SETUP

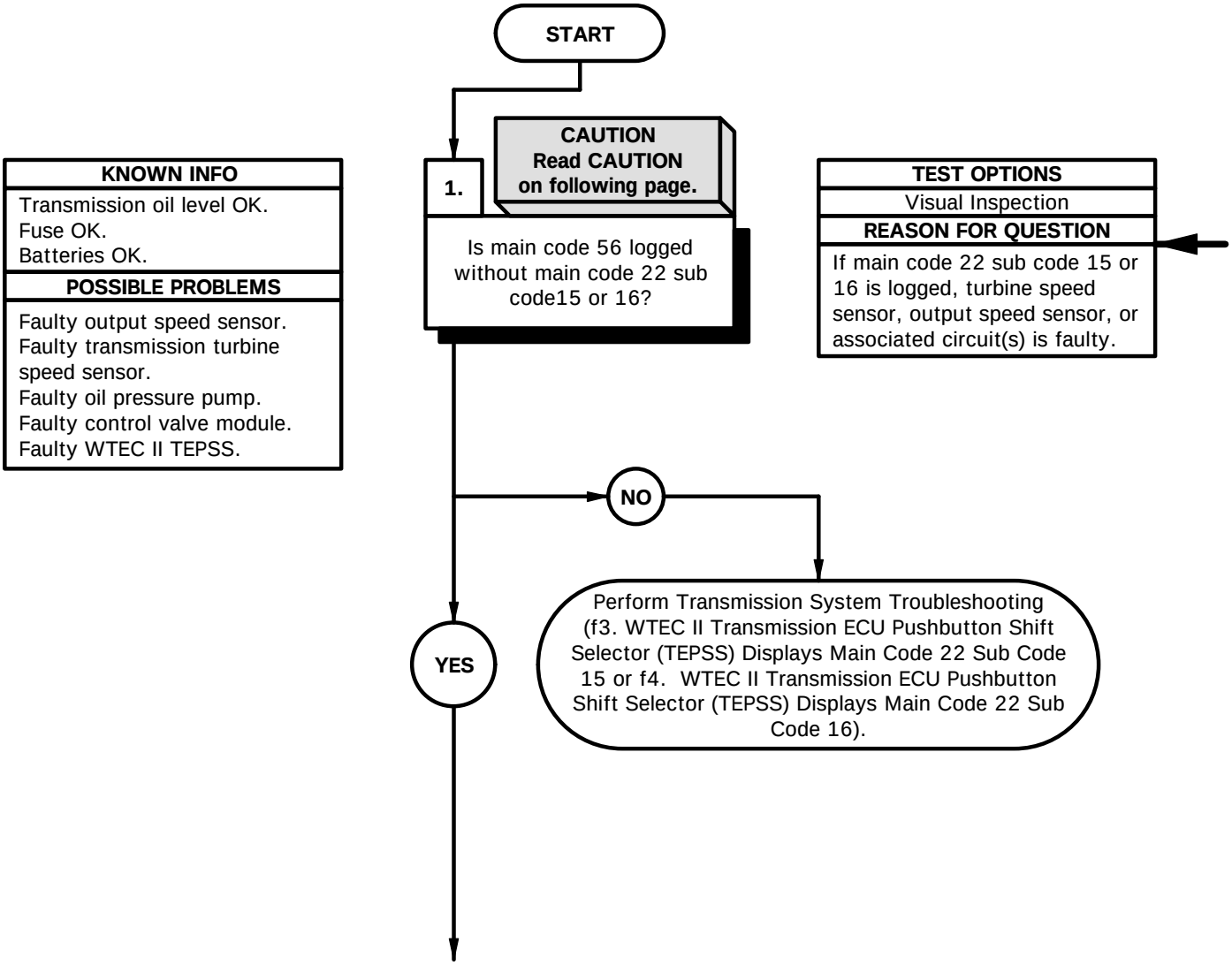
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Pan, Drain (Item 24, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Wrench Set, Socket (Item 51, Appendix C)

Materials/Parts
Packing, Preformed (Item 197, Appendix G)
Adapter, Straight, Pipe to Tube (Item 1.2, Appendix D)
Adapter, Straight, Tube to Boss (Item 1.3, Appendix D)
Hose Assembly, Nonmetallic (Item 24.13, Appendix D)

Personnel Required
(2)

Reference
TM 9-4910-571-12&P

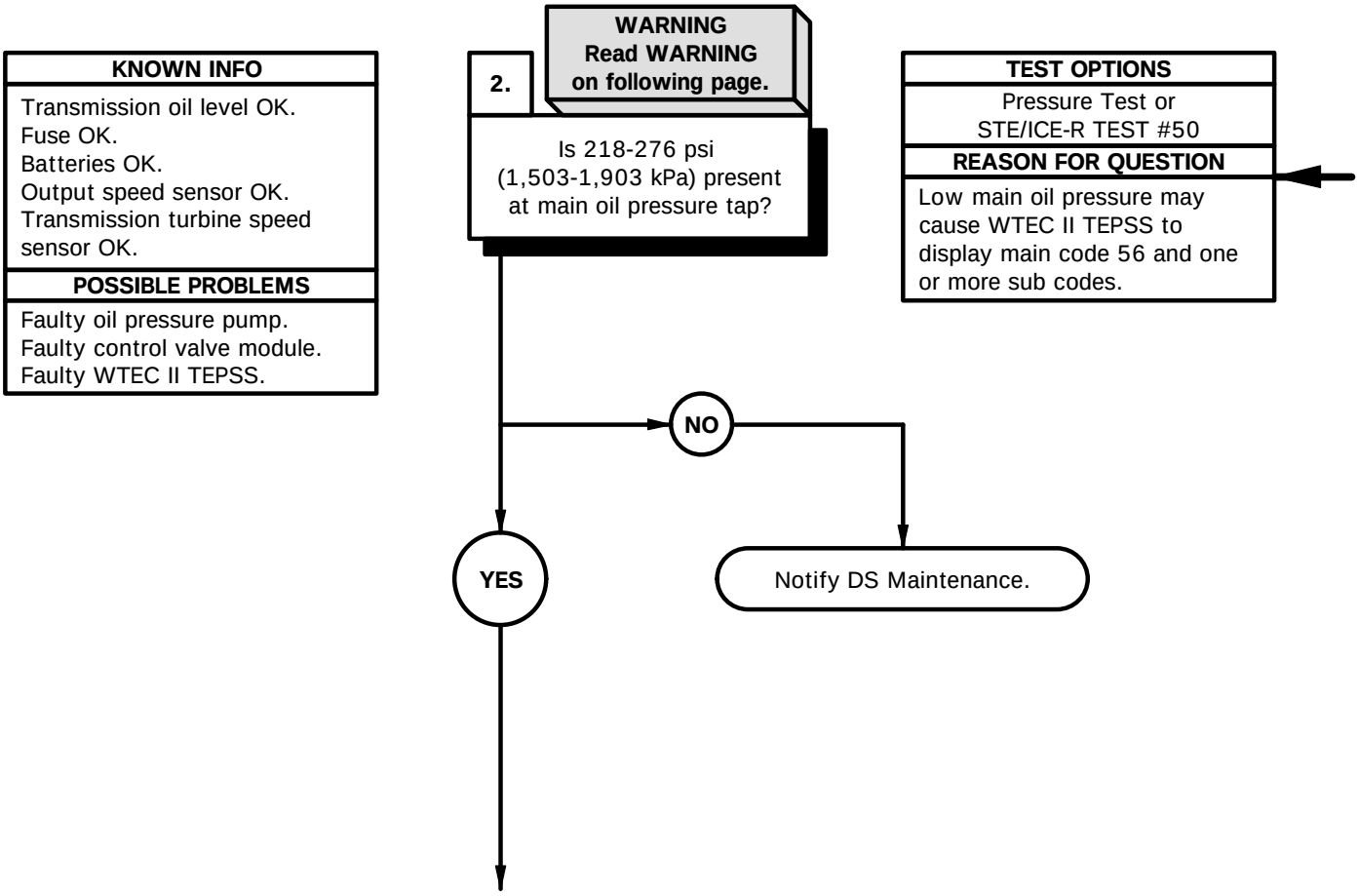


CAUTION

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) Check if main code 22 sub code 15 or 16 is logged in WTEC II TEPSS (para 8-4).
(2) If main code 22 sub code 15 or 16 is logged, WTEC II TEPSS has sensed a fault with the turbine speed sensor, output speed sensor, or associated circuit(s). Perform Transmission System Troubleshooting (f3. WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 15 or f4. WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 16).

f18. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 56 AND ANY SUB CODE (CONT)

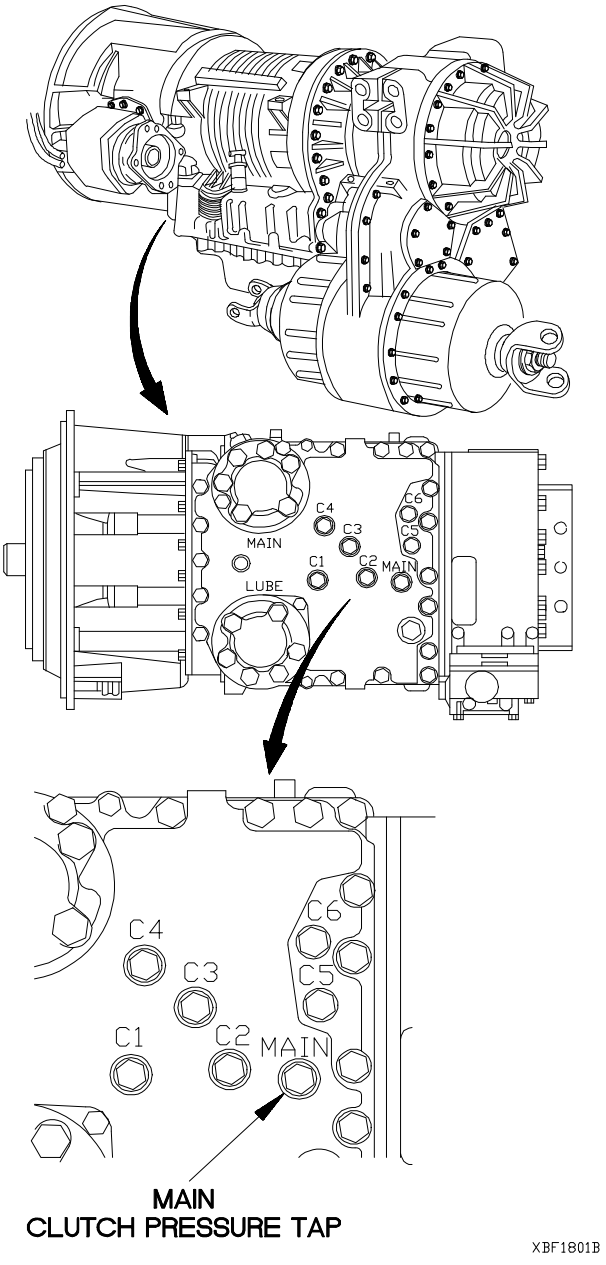


WARNING

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

PRESSURE TEST

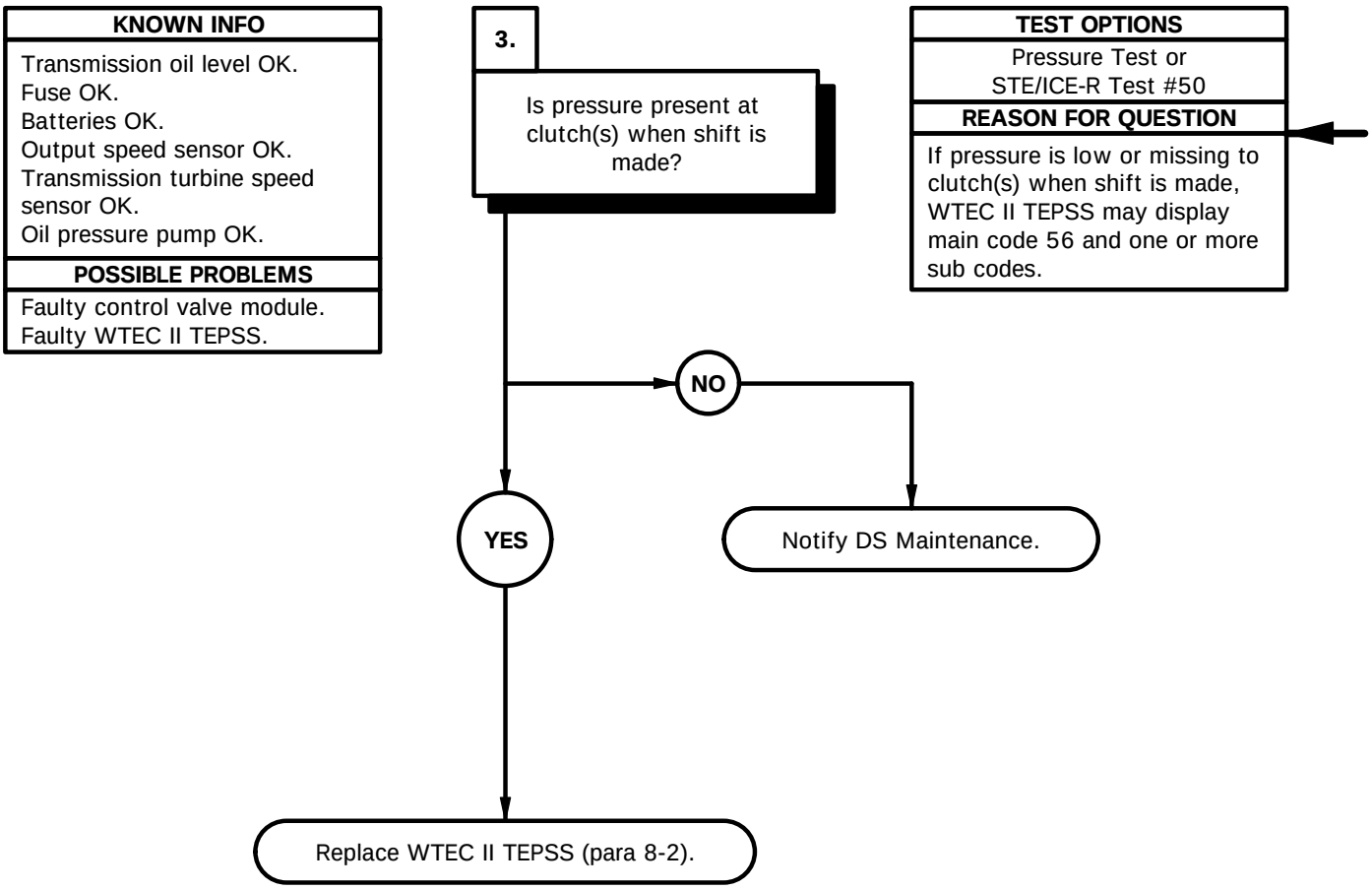
(1) Position drain pan under pressure tap.
(2) Remove main pressure tap plug and preformed packing from control valve module.
(3) Connect tube to boss adapter, hose, and pipe to tube adapter to main pressure tap.
(4) Perform STE/ICE-R test #50 (TM 9-4910-571-12&P).
(5) Start engine (TM 9-2320-366-10-1) and run at idle.
(6) With parking brake applied, position WTEC II TEPSS to R position then to N position while assistant checks reading on STE/ICE-R.
(7) Shut down engine (TM 9-2320-366-10-1).
(8) If main oil pressure is low, notify DS Maintenance.
(9) Remove pipe to tube adapter, hose, and tube to boss adapter from main pressure tap.
(10) Position preformed packing and main pressure tap plug in control valve module.
(11) Tighten main pressure tap plug to 84-120 lb-in. (9-14 N·m).
(12) Remove drain pan under pressure tap.



MAIN
CLUTCH PRESSURE TAP

XBF1801B

f18. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 56 AND ANY SUB CODE (CONT)



PRESSURE TEST

(1) Remove front and intermediate propeller shafts (para 9-2).
(2) Position drain pan under pressure tap.
(3) Remove pressure tap plug and preformed packing from clutch pressure tap indicated by the sub code. Refer to Table 2-33. Clutch Pressure Tap.
(4) Connect tube to boss adapter, hose, and pipe to tube adapter to clutch pressure tap.
(5) Perform STE/ICE-R test #50 (TM 9-4910-571-12&P).
(6) Start engine (TM 9-2320-366-10-1).
(7) Make shift indicated by sub code. Refer to Table 2-33. Clutch Pressure Tap.
(8) Accelerate engine until WTEC II TEPSS displays desired range. Refer to Table 2-33. Clutch Pressure Tap.
(9) Maintain sufficient engine speed to keep desired transmission range while assistant notes reading on STE/ICE-R.
(10) Let engine return to idle.
(11) Shift transmission into neutral (TM 9-2320-366-10-1).
(12) Shut down engine (TM 9-2320-366-10-1).
(13) If one or more of clutches failed to indicate proper pressure, notify DS Maintenance.
(14) If all clutches indicate proper pressure, replace WTEC II TEPSS (para 8-2).
(15) Remove pipe to tube adapter, hose, and tube to boss adapter from clutch pressure tap.
(16) Position preformed packing and pressure tap plug in control valve module.
(17) Tighten pressure tap plug to 84-120 lb-in. (9-14 N·m).
(18) Remove drain pan under pressure tap.
(19) Install front and intermediate propeller shafts (para 9-2).
(20) Clear diagnostic codes (para 8-4).

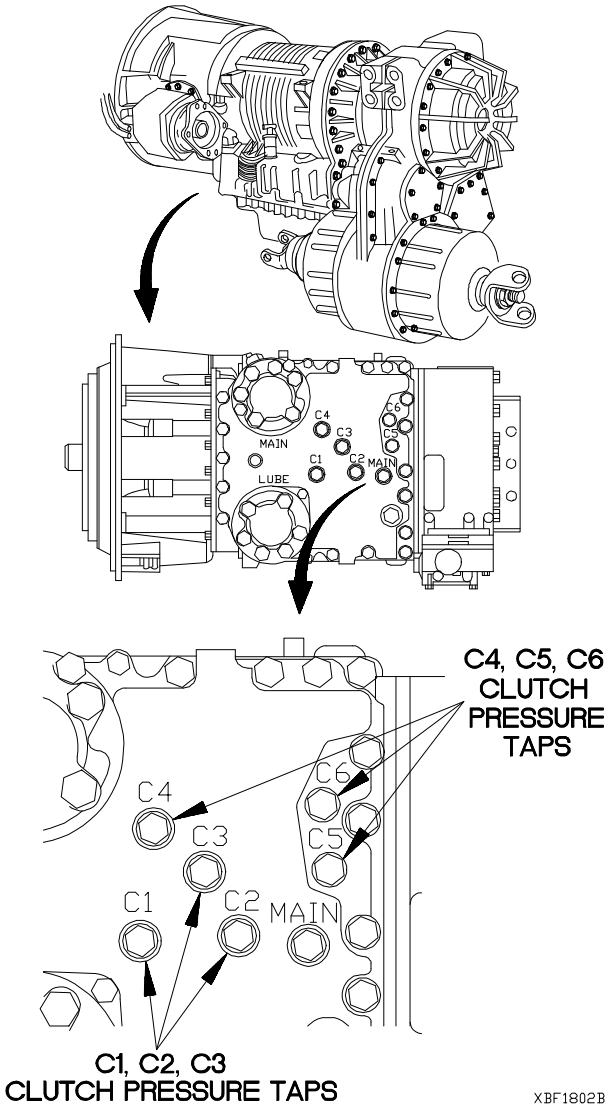


Table 2-33. Clutch Pressure Tap

Sub Code	Sub Code Meaning	Pressure at Clutch(s)	Pressure Readings at Taps
00	L Range Test	C3 & C6	215-334 psi (1480-2300 kPa)
11	1 Range Test	C1 & C5	215-305 psi (1480-2100 kPa)
22	2 Range Test	C1 & C4	142-203 psi (980-1400 kPa)
33	3 Range Test	C1 & C3	142-203 psi (980-1400 kPa)
44	4 Range Test	C1 & C2	142-203 psi (980-1400 kPa)
55	5 Range Test	C2 & C3	128-189 psi (880-1300 kPa)
66	6 Range Test	C2 & C4	128-189 psi (880-1300 kPa)
77	R Range Test	C3 & C5	215-276 psi (1480-1900 kPa)

f19. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 13 AND ANY SUB CODE

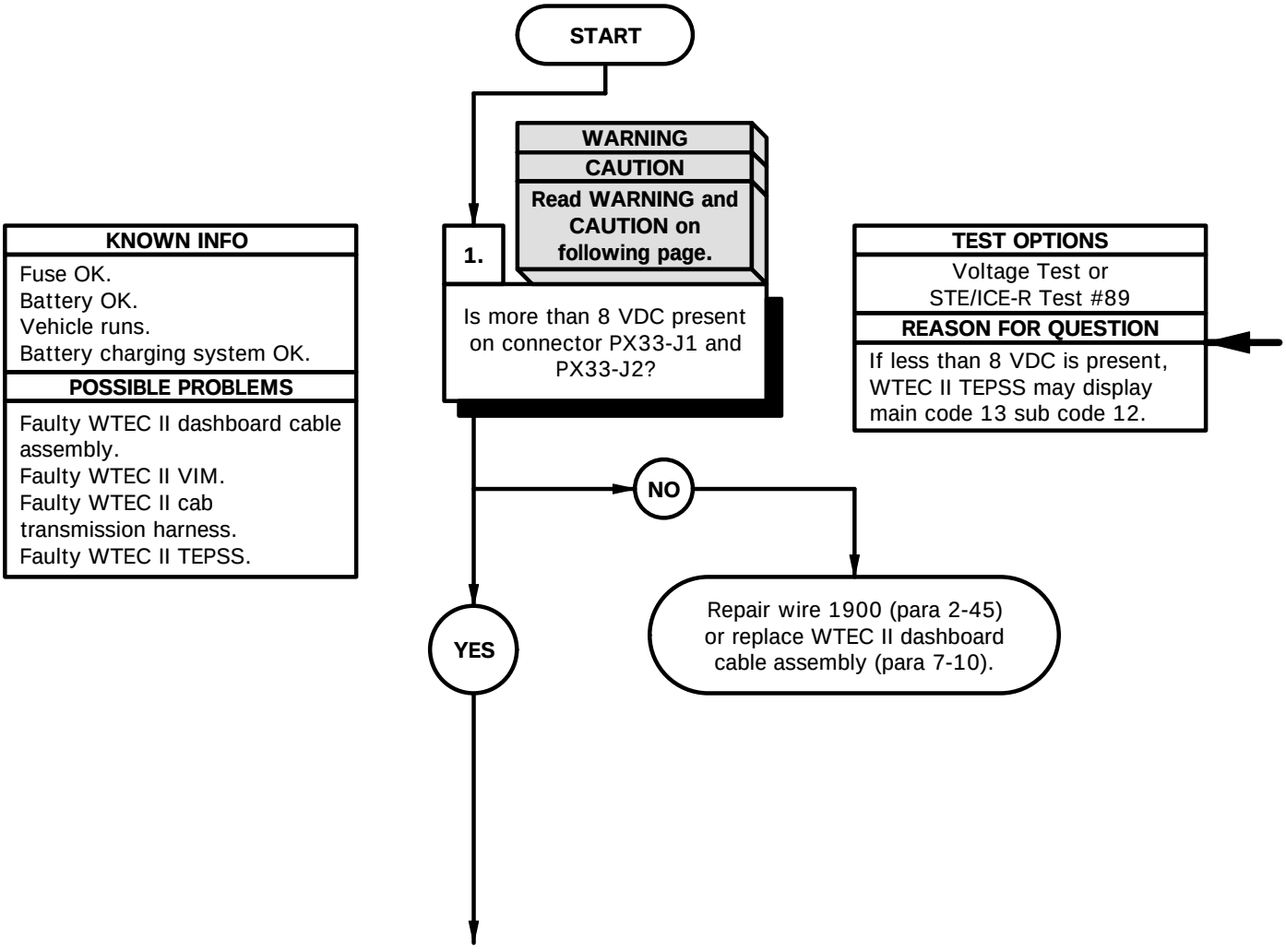
INITIAL SETUP

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

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
STE/ICE-R (Item 41, Appendix C)

References
TM 9-4910-571-12&P



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 circuits and cause severe burns or electrical shock.

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.

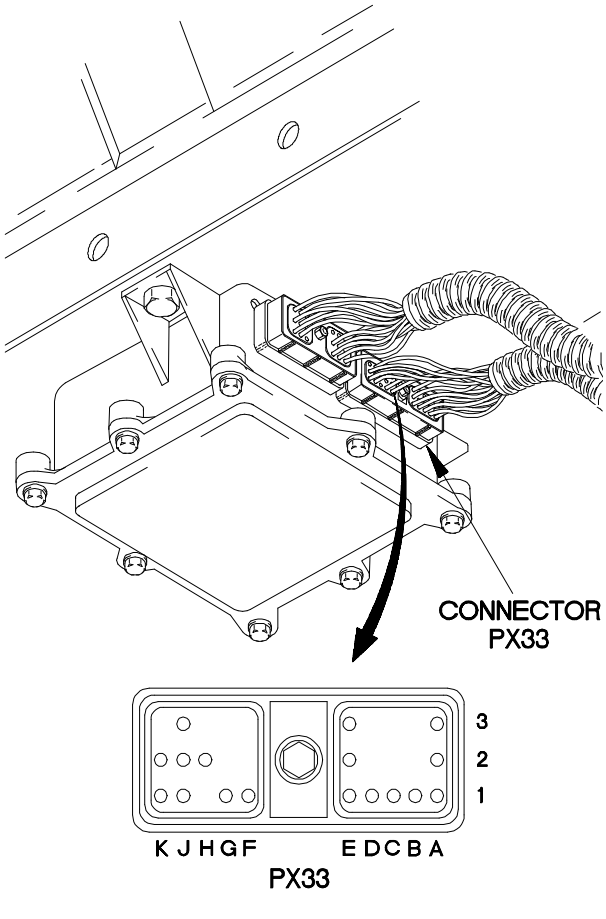
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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.

VOLTAGE TEST

(1) Remove kick panel (para 16-3).
(2) Set multimeter to volts DC.
(3) Start engine (TM 9-2320-366-10-1).
(4) Connect positive (+) probe of multimeter to connector PX33-J1.
(5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(6) Connect positive (+) probe of multimeter to connector PX33-J2.
(7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(8) If 12 to 14.5 VDC is not verified, repair wire 1900 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).
(9) Shut down engine (TM 9-2320-366-10-1).



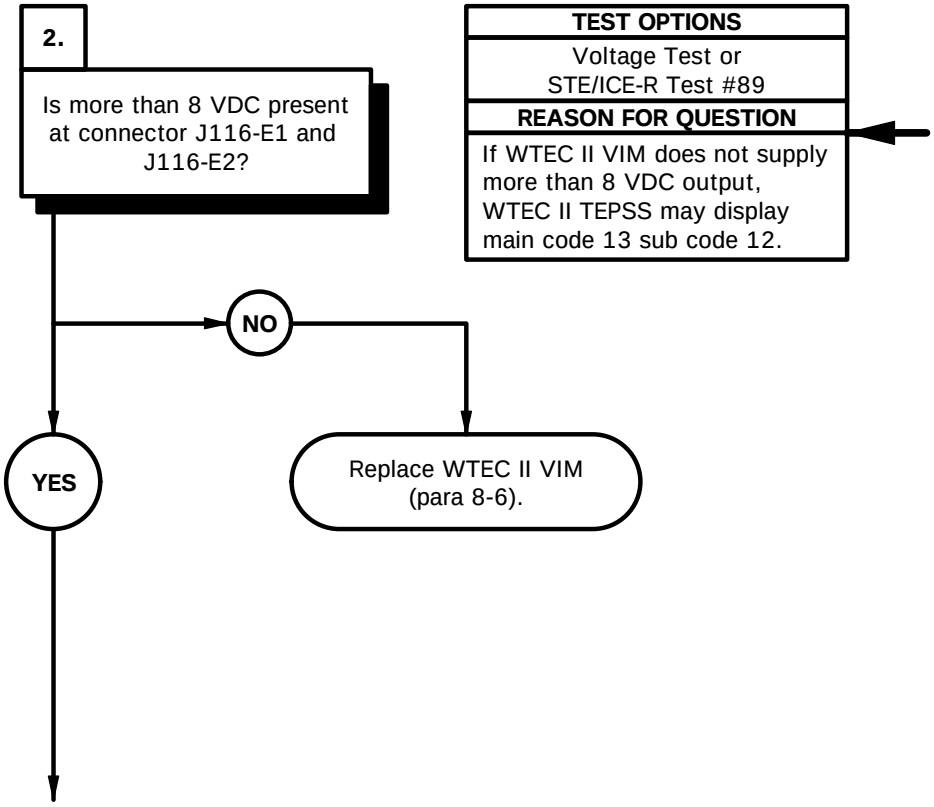
f19. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 13 AND ANY SUB CODE (CONT)

KNOWN INFO

Fuse OK.
Battery OK.
Vehicle runs.
Battery charging system OK.

POSSIBLE PROBLEMS

Faulty WTEC II VIM.
Faulty WTEC II cab transmission harness.
Faulty WTEC II dashboard cable assembly.
Faulty WTEC II TEPSS.



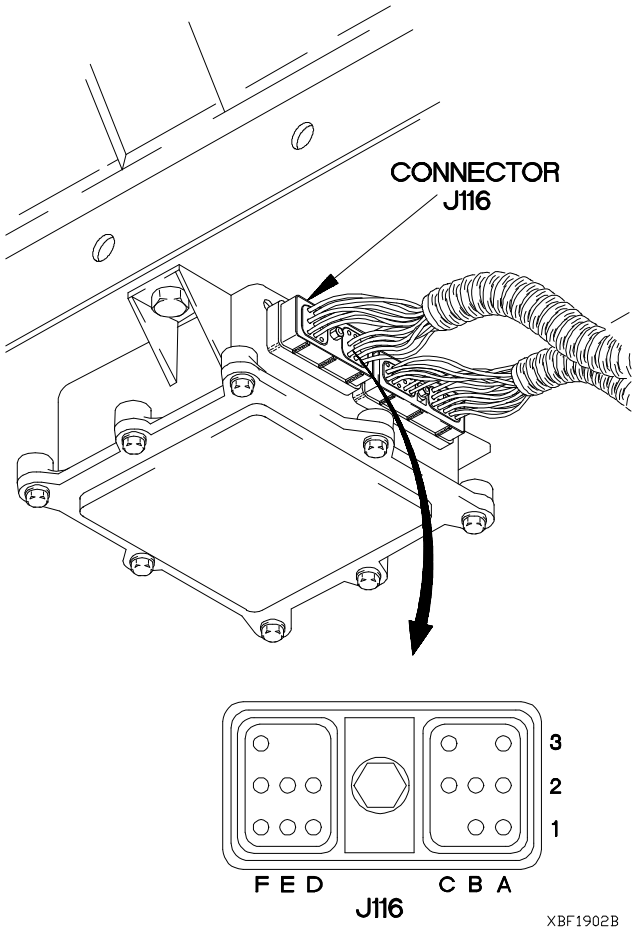
TEST OPTIONS

Voltage Test or
STE/ICE-R Test #89

REASON FOR QUESTION

If WTEC II VIM does not supply more than 8 VDC output, WTEC II TEPSS may display main code 13 sub code 12.

VOLTAGE TEST
(1) Start engine (TM 9-2320-366-10-1). (2) Set multimeter to volts DC. (3) Connect positive (+) probe of multimeter to connector J116-E1. (4) Connect negative (-) probe of multimeter to ground and note reading on multimeter. (5) Connect positive (+) probe of multimeter to connector J116-E2. (6) Connect negative (-) probe of multimeter to ground and note reading on multimeter. (7) If 12 to 14.5 VDC is not present, replace WTEC II VIM (para 8-6). (8) Shut down engine (TM 9-2320-366-10-1).



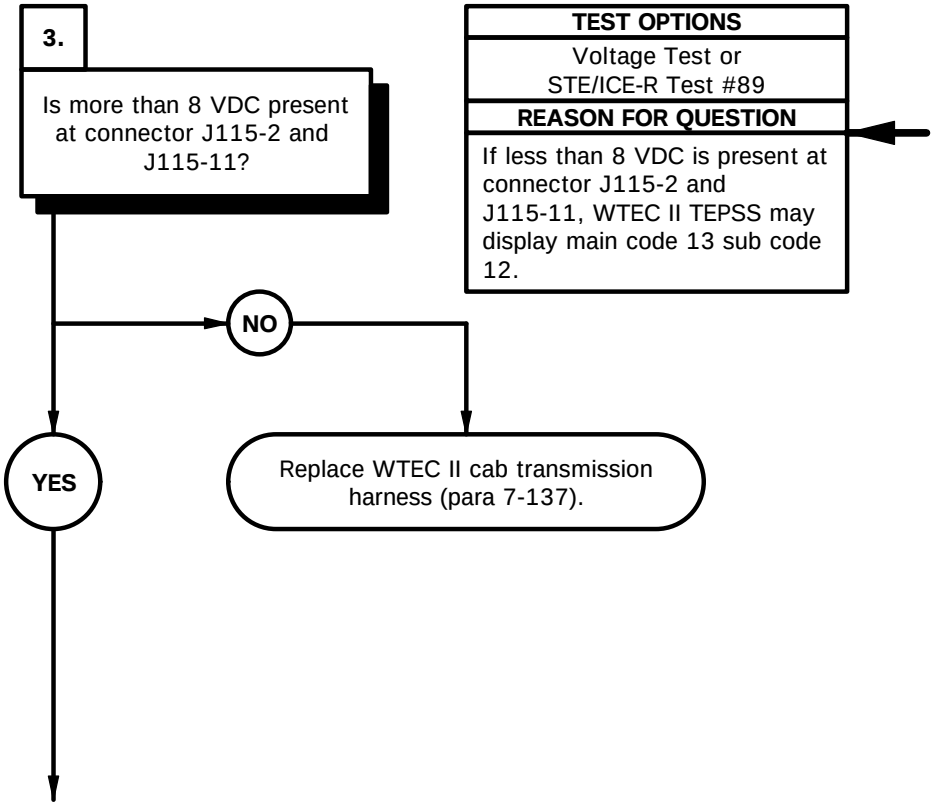
f19. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 13 AND ANY SUB CODE (CONT)

KNOWN INFO

Fuse OK.
Battery OK.
Vehicle runs.
Battery charging system OK.

POSSIBLE PROBLEMS

Faulty WTEC II cab transmission harness.
Faulty WTEC II dashboard cable assembly.
Faulty WTEC II VIM.
Faulty WTEC II TEPSS.



TEST OPTIONS

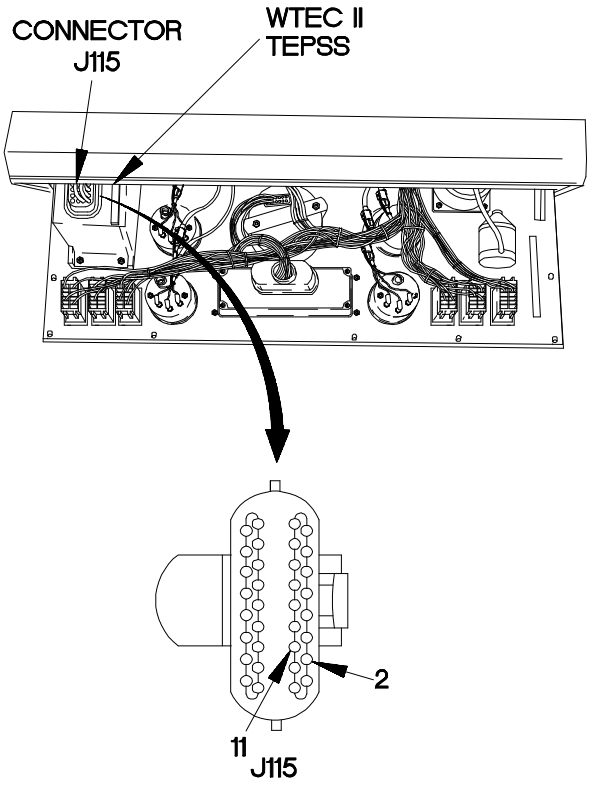
Voltage Test or
STE/ICE-R Test #89

REASON FOR QUESTION

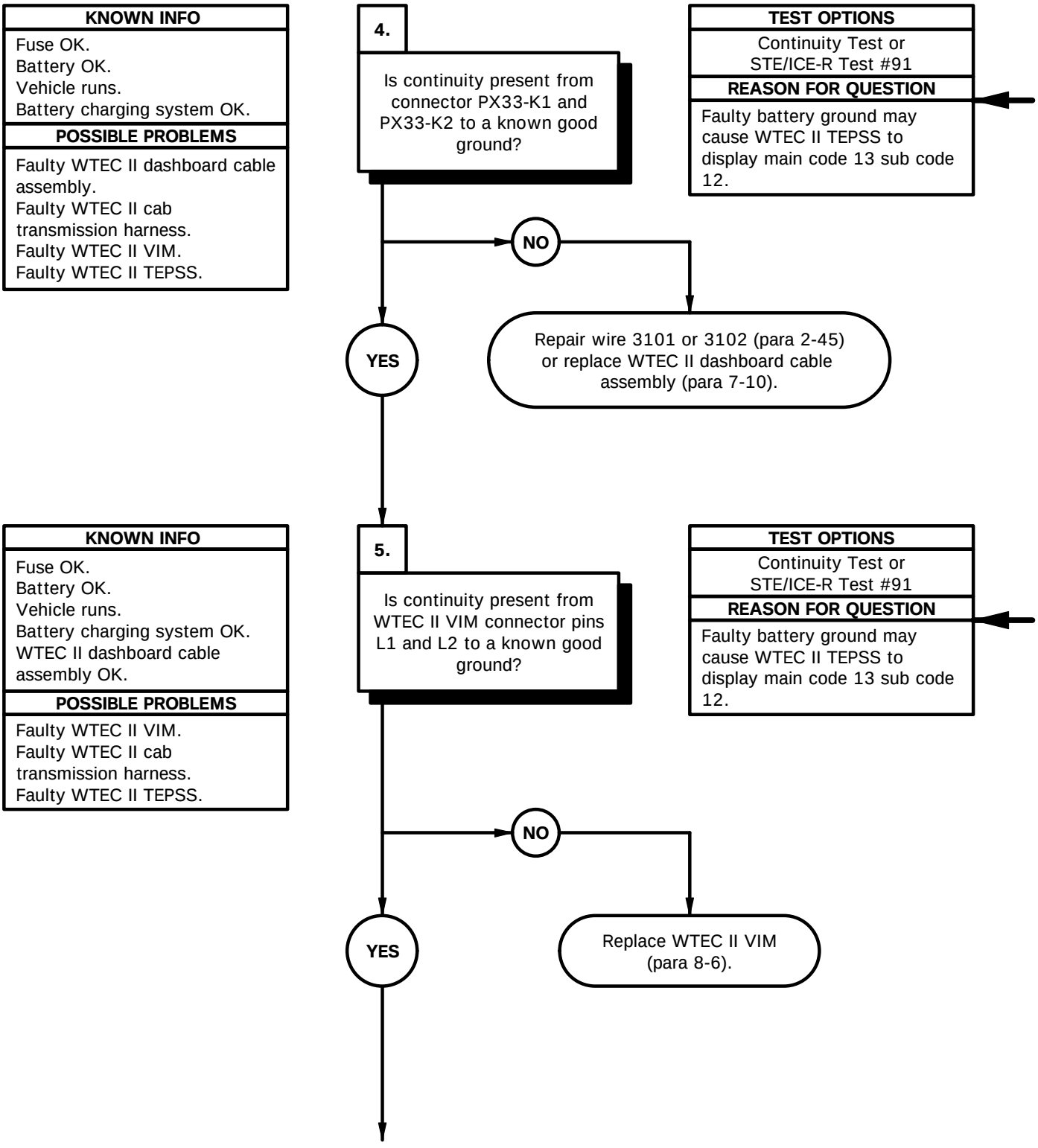
If less than 8 VDC is present at connector J115-2 and J115-11, WTEC II TEPSS may display main code 13 sub code 12.

VOLTAGE TEST

(1) Remove instrument panel assembly for access (para 7-15).
(2) Start engine (TM 9-2320-366-10-1).
(3) Set multimeter to volts DC.
(4) Disconnect connector J115 (top connector) from WTEC II TEPSS.
(5) Connect positive (+) probe of multimeter to connector J115-2.
(6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(7) Connect positive (+) probe of multimeter to connector J115-11.
(8) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(9) If 12 to 14.5 VDC is not present at connector J115-2 and J115-11, replace WTEC II cab transmission harness (para 7-137).
(10) Shut down engine (TM 9-2320-366-10-1).



f19. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 13 AND ANY SUB CODE (CONT)

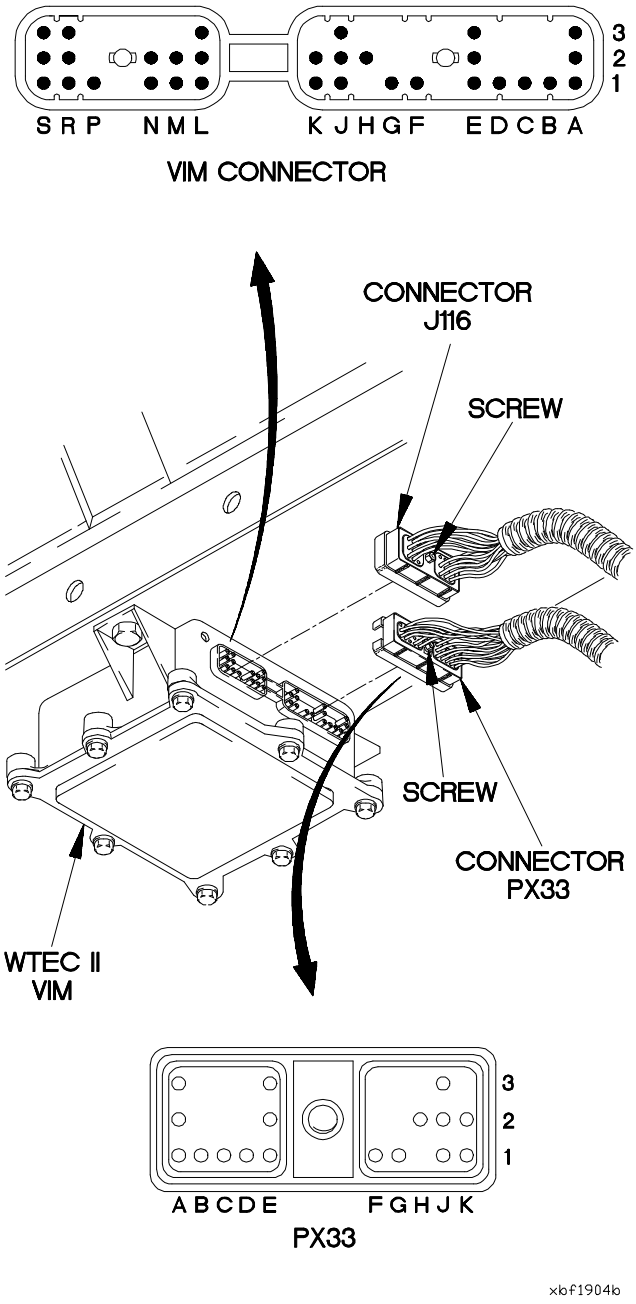


CONTINUITY TEST

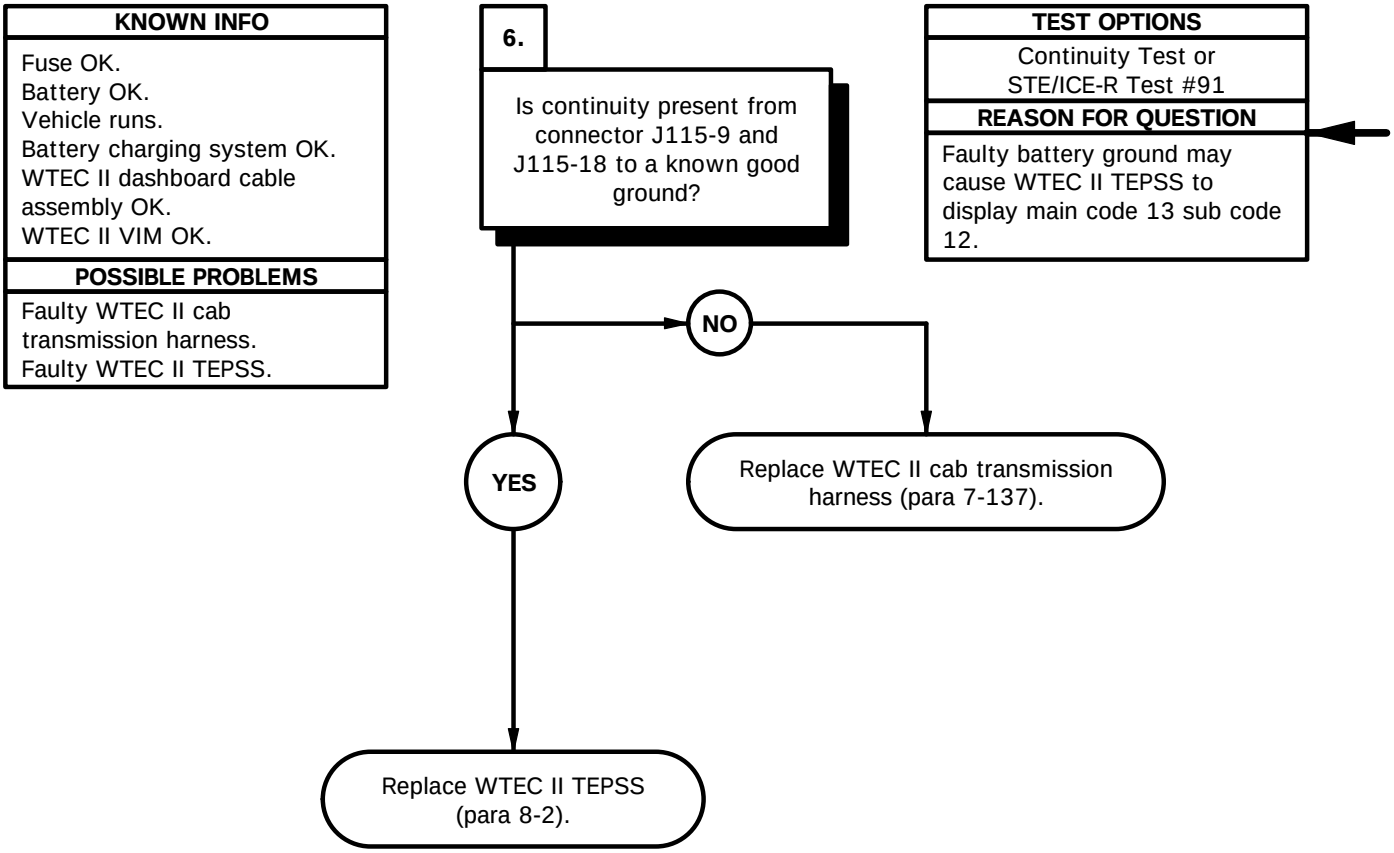
(1) Loosen screw in connector PX33.
(2) Disconnect connector PX33 from WTEC II VIM.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector PX33-K1.
(5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(6) Connect positive (+) probe of multimeter to connector PX33-K2.
(7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(8) If continuity is not present on connector PX33-K1, repair wire 3101 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).
(9) If continuity is not present on connector PX33-K2, repair wire 3102 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).
(10) Connect connector PX33 to WTEC II VIM.
(11) Tighten screw in connector PX33.

CONTINUITY TEST

(1) Loosen screw in connector J116.
(2) Disconnect connector J116 from WTEC II VIM.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to WTEC II VIM connector pin L1.
(5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(6) Connect positive (+) probe of multimeter to WTEC II VIM connector pin L2.
(7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(8) If continuity is not present in steps (5) and (7), replace WTEC II VIM (para 8-6).
(9) Connect connector J116 to WTEC II VIM.
(10) Tighten screw in connector J116.
(11) Install kick panel (para 16-3).

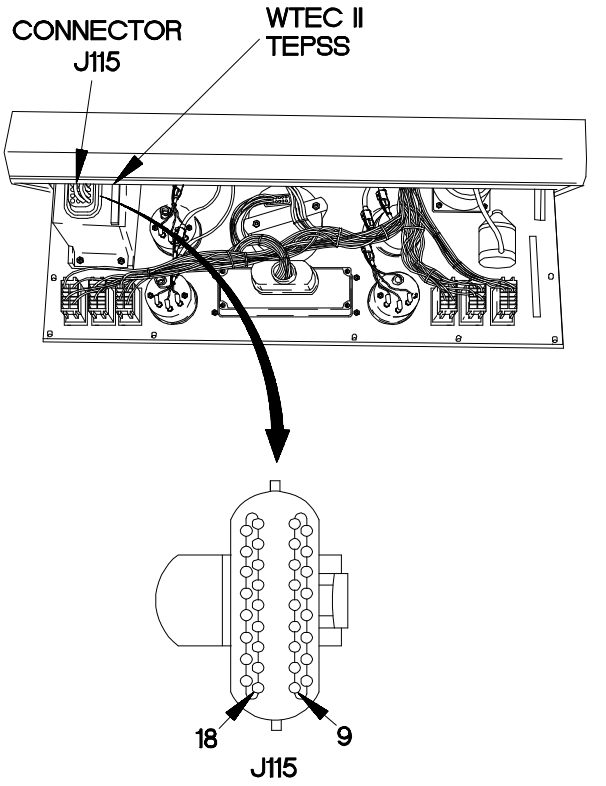


f19. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 13 AND ANY SUB CODE (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector J115-9.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) Connect positive (+) probe of multimeter to connector J115-18.
(5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(6) If continuity is not present, replace WTEC II cab transmission harness (para 7-137).
(7) If continuity is present, replace WTEC II TEPSS (para 8-2).
(8) Connect connector J115 (top connector) to WTEC II TEPSS.
(9) Install instrument panel assembly (para 7-15).
(10) Clear diagnostic codes (para 8-4).



f19A. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 23 AND ANY SUB CODE

INITIAL SETUP

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

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

References
TM 9-4910-571-12&P

NOTE

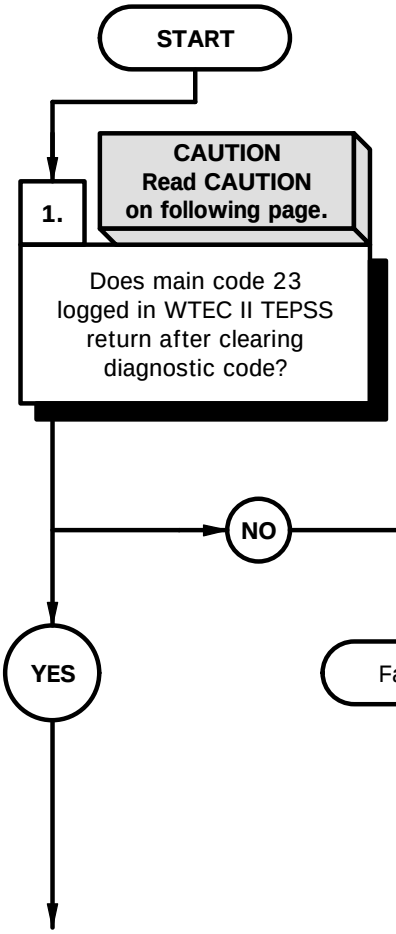
Perform Electrical System Troubleshooting e1. Circuit Breaker Does Not Operate on circuit breaker C35 prior to begining this task.

KNOWN INFO

Circuit breaker CB35 OK.

POSSIBLE PROBLEMS

Faulty WTEC II dashboard cable assembly.
Faulty 10 AMP MAIN POWER fuse.
Faulty WTEC II vehicle interface module (VIM).
Faulty WTEC II cab transmission harness.
Faulty WTEC II TEPSS.



TEST OPTIONS

WTEC II Diagnostic Code Clearing procedure.

REASON FOR QUESTION

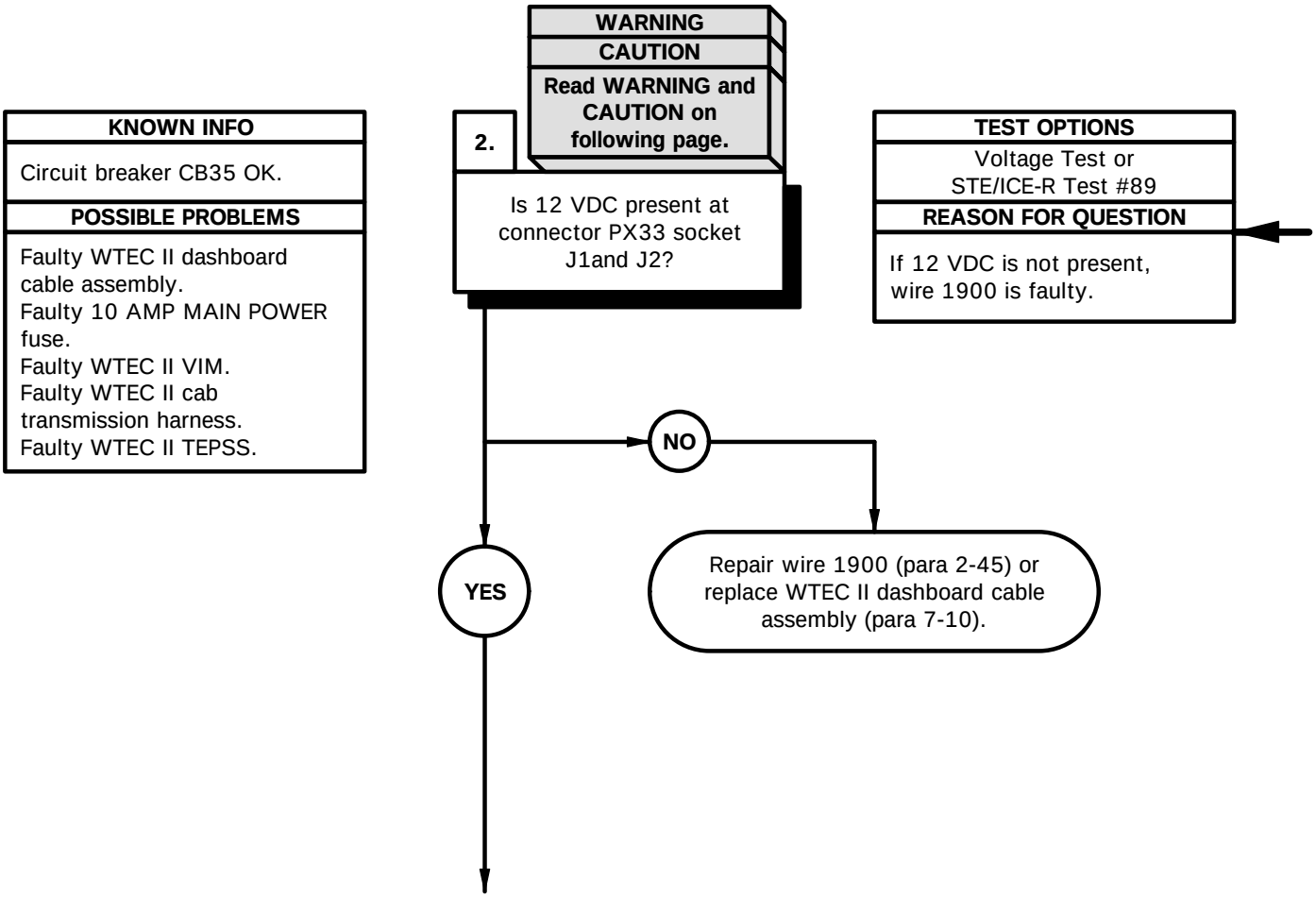
If WTEC II TEPSS does not display any diagnostic code after clearing, an intermittent problem was detected and corrected. If diagnostic code is logged after clearing, further troubleshooting is required.

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) Perform WTEC II Code Reading and Code Clearing (para 8-4).
(2) If diagnostic code 23 is not logged after clearing, fault is corrected.
(3) If diagnostic code 23 is logged after clearing, further troubleshooting is required.

f19A. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 23 AND ANY SUB CODE (CONT)



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 circuits and cause severe burns or electrical shock.

CAUTION

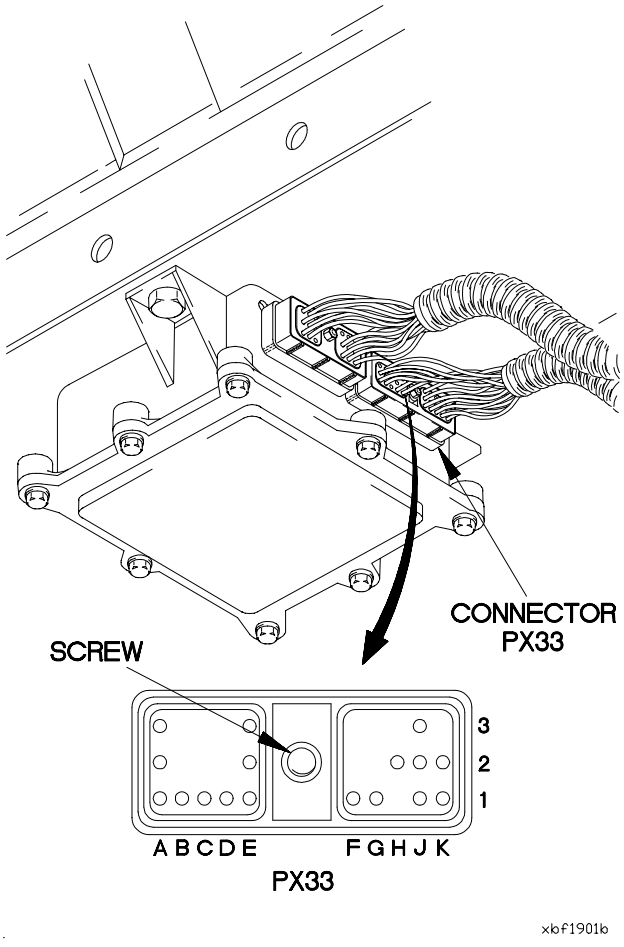
Use care when testing electrical connectors not to bend connector pins or damage connector sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

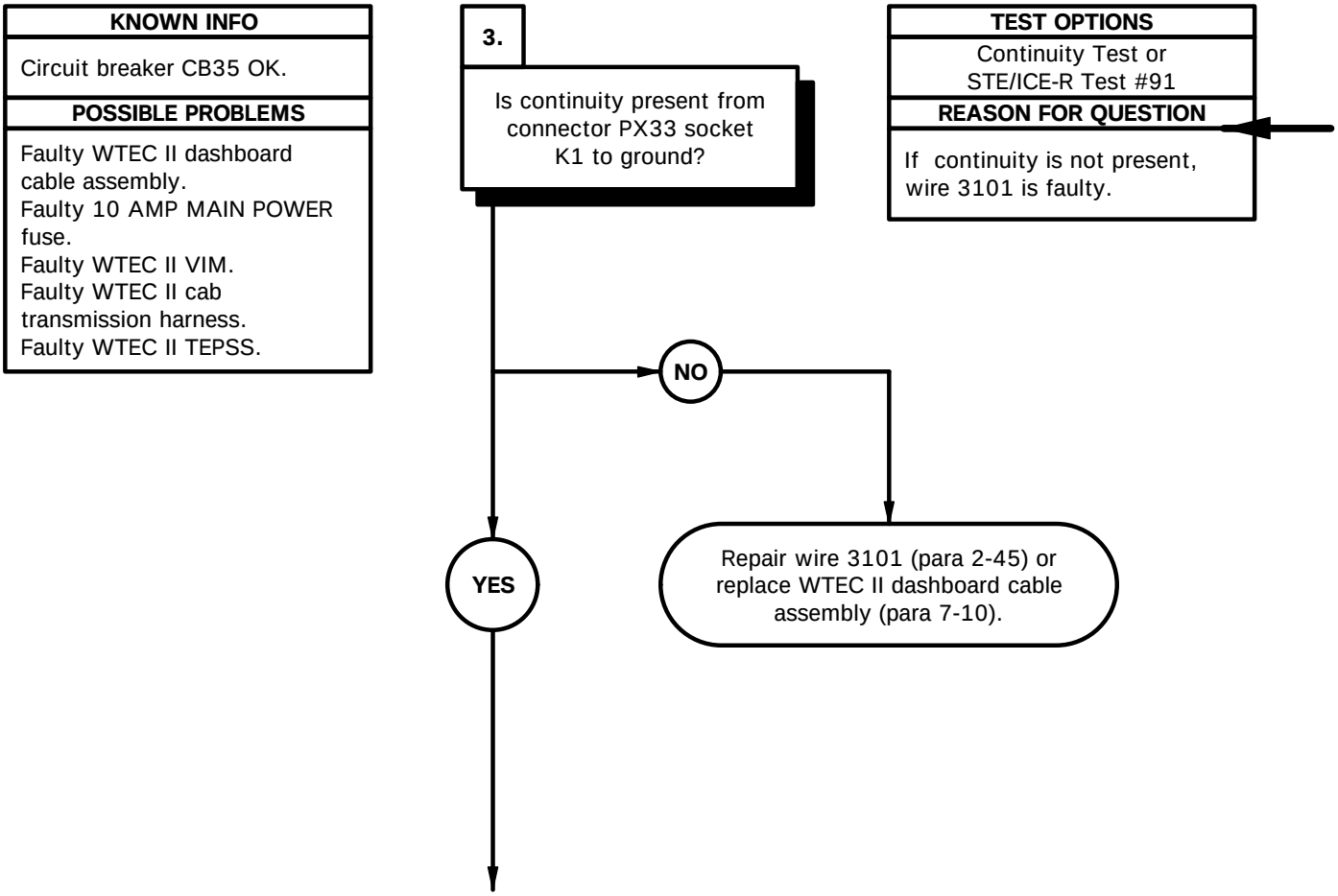
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Remove kick panel (para 16-3).
(2) Loosen screw in PX33 connector.
(3) Disconnect connector PX33 from VIM connector.
(4) Set multimeter to volts DC.
(5) Connect positive (+) probe of multimeter to connector PX33 socket J1.
(6) Connect negative (-) probe of multimeter to a known good ground and note reading on multimeter.
(7) Connect positive (+) probe of multimeter to connector PX33 socket J2.
(8) Connect negative (-) probe of multimeter to a known good ground and note reading on multimeter.
(9) If 12 VDC is not present in steps (5) and (7), repair wire 1900 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).

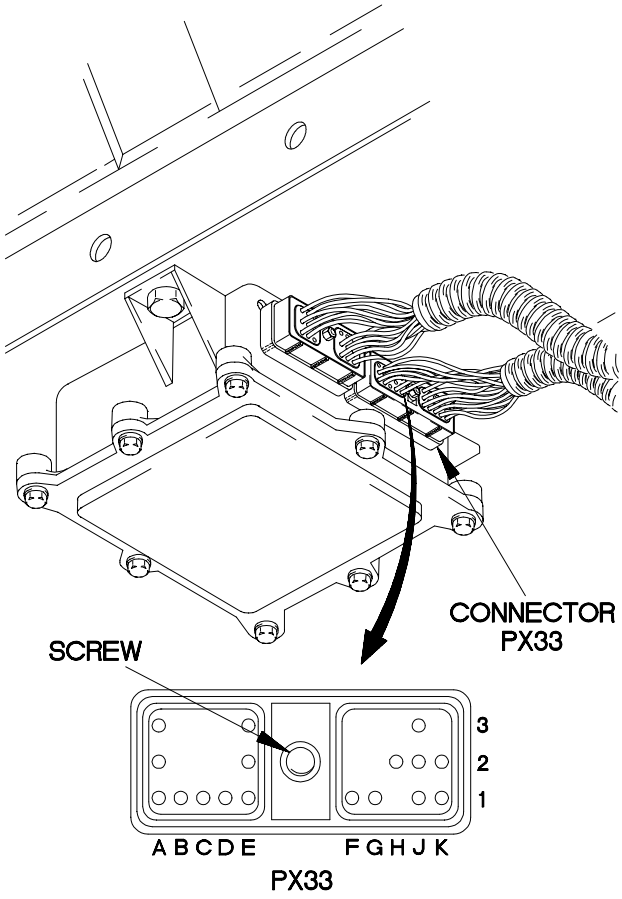


f19A. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 23 AND ANY SUB CODE (CONT)

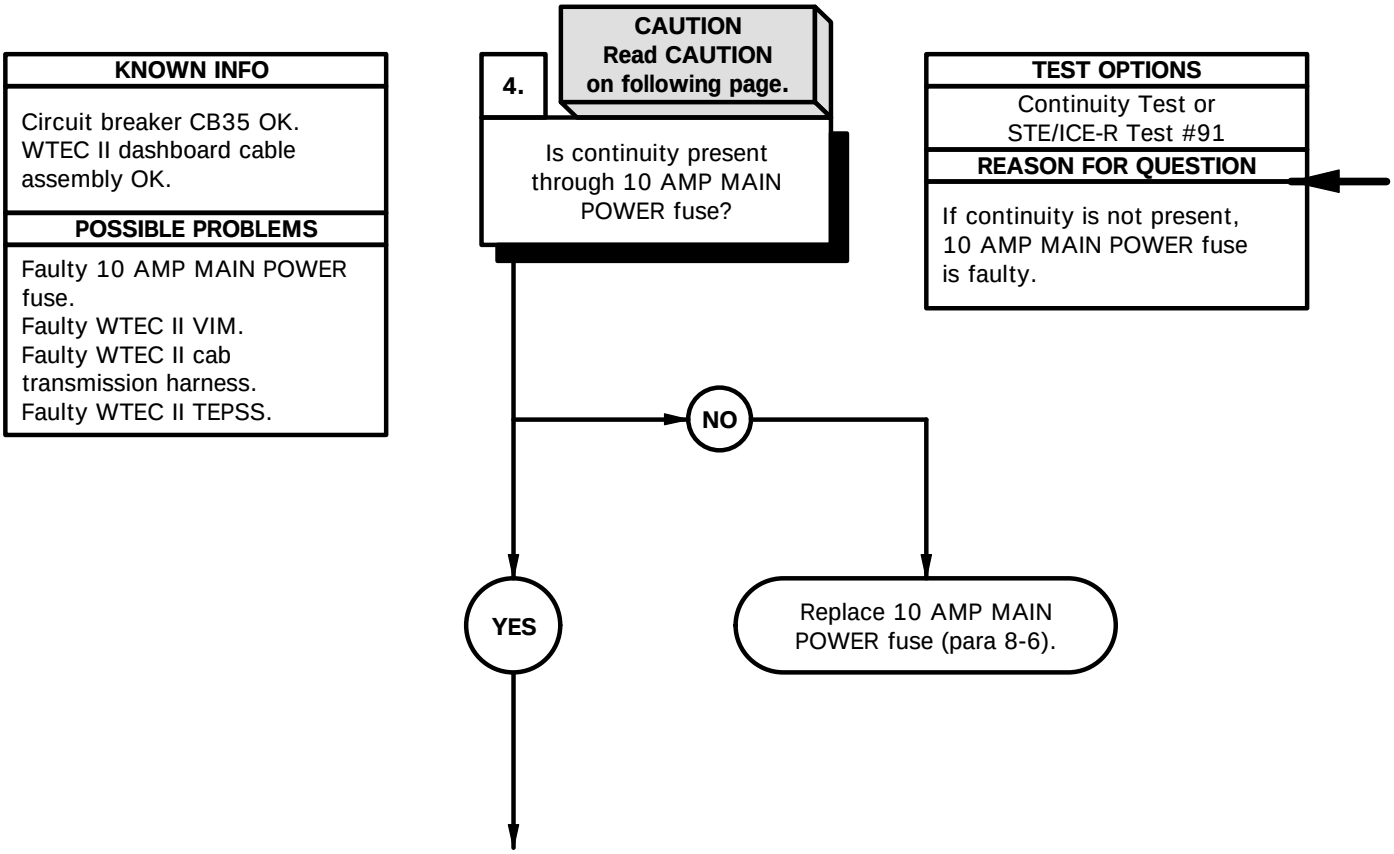


CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector PX33 socket K1.
(3) Connect negative (-) probe of multimeter to a known good ground and note reading on multimeter.
(4) If continuity is not present, repair wire 3101 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).



f19A. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 23 AND ANY SUB CODE (CONT)



CAUTION

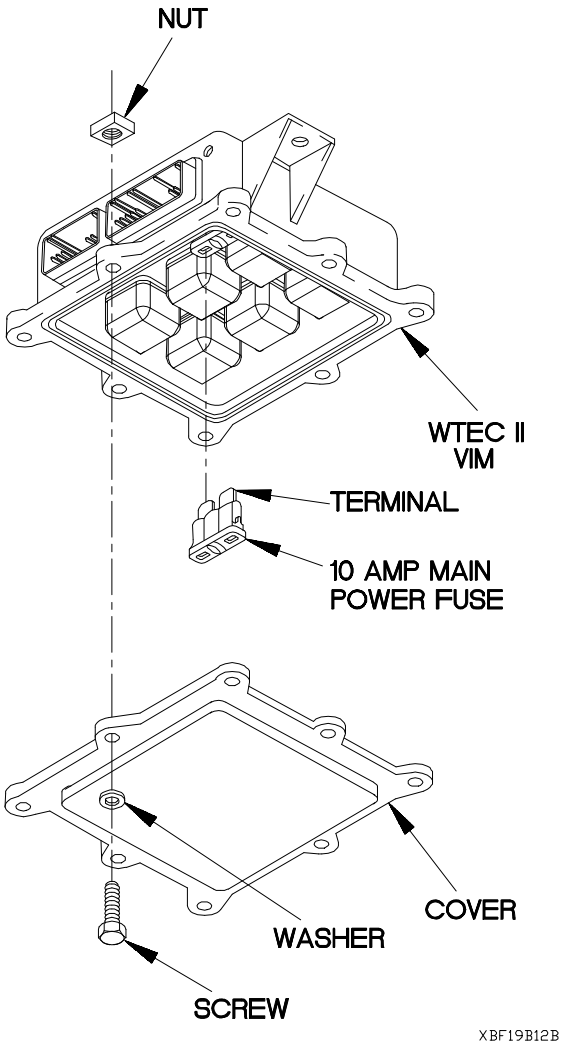
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

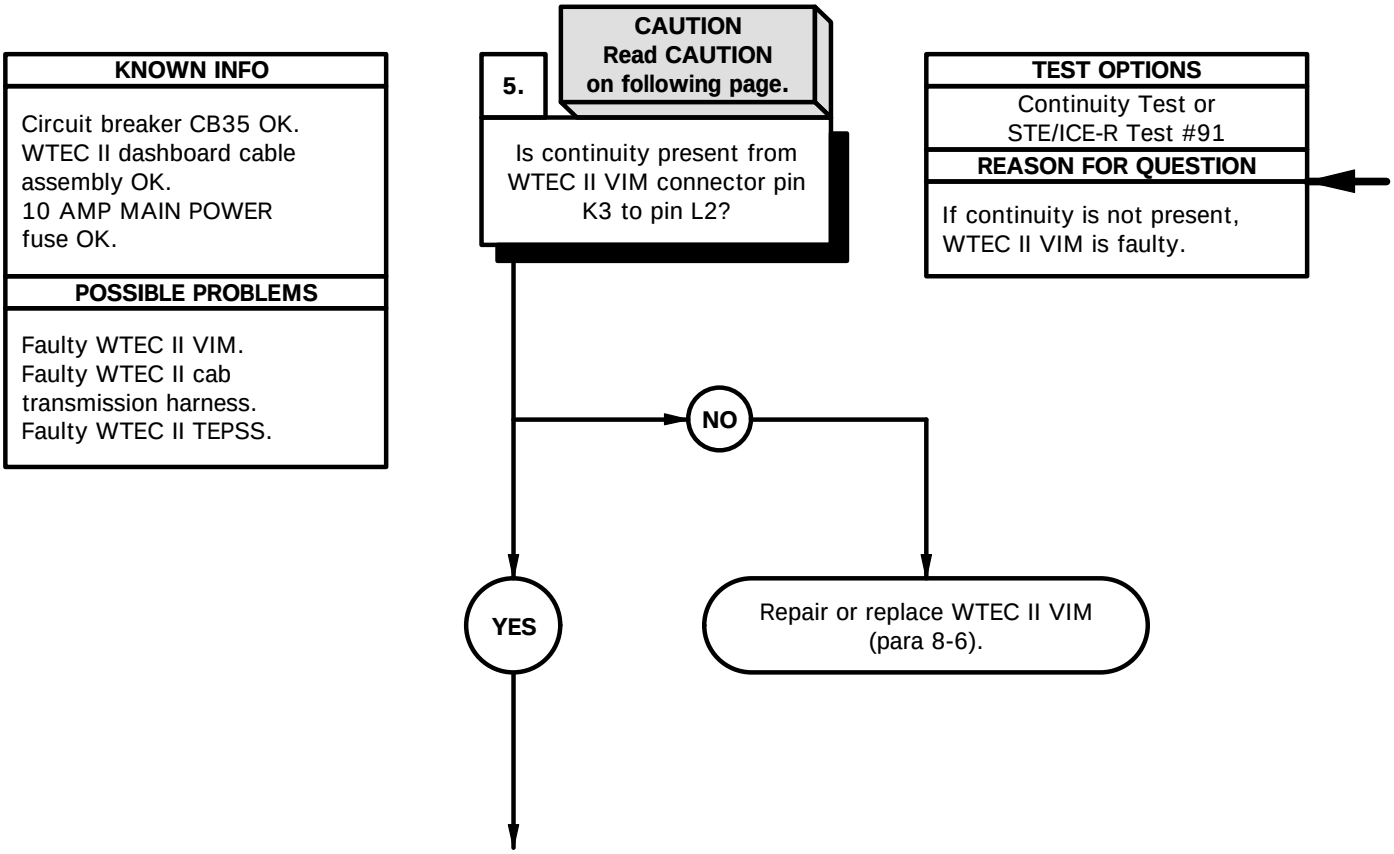
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Remove seven screws and washers from WTEC II VIM cover.
(2) Remove screw, washer, WTEC II VIM cover, and nut from WTEC II VIM.
(3) Remove 10 AMP MAIN POWER fuse from WTEC II VIM.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to one terminal on 10 AMP MAIN POWER fuse.
(6) Connect negative (-) probe of multimeter to other terminal on 10 AMP MAIN POWER fuse and note reading on multimeter.
(7) If continuity is not present, replace 10 AMP MAIN POWER fuse (para 8-6).
(8) Position WTEC II VIM cover on WTEC II VIM with washer, screw, and nut.
(9) Install seven washers, and screws in WTEC II VIM cover.



f19A. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 23 AND ANY SUB CODE (CONT)



CAUTION

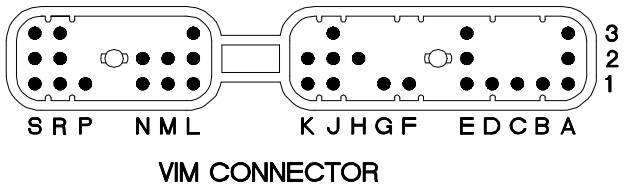
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

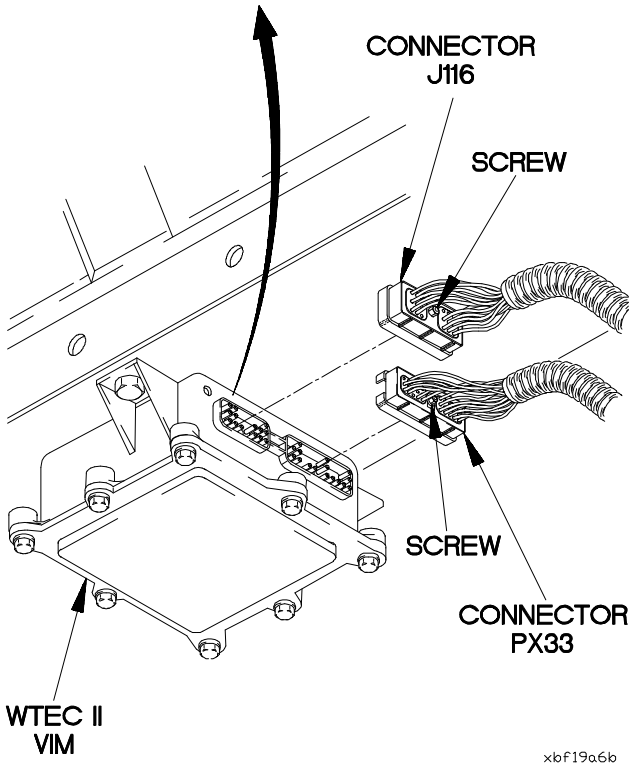
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

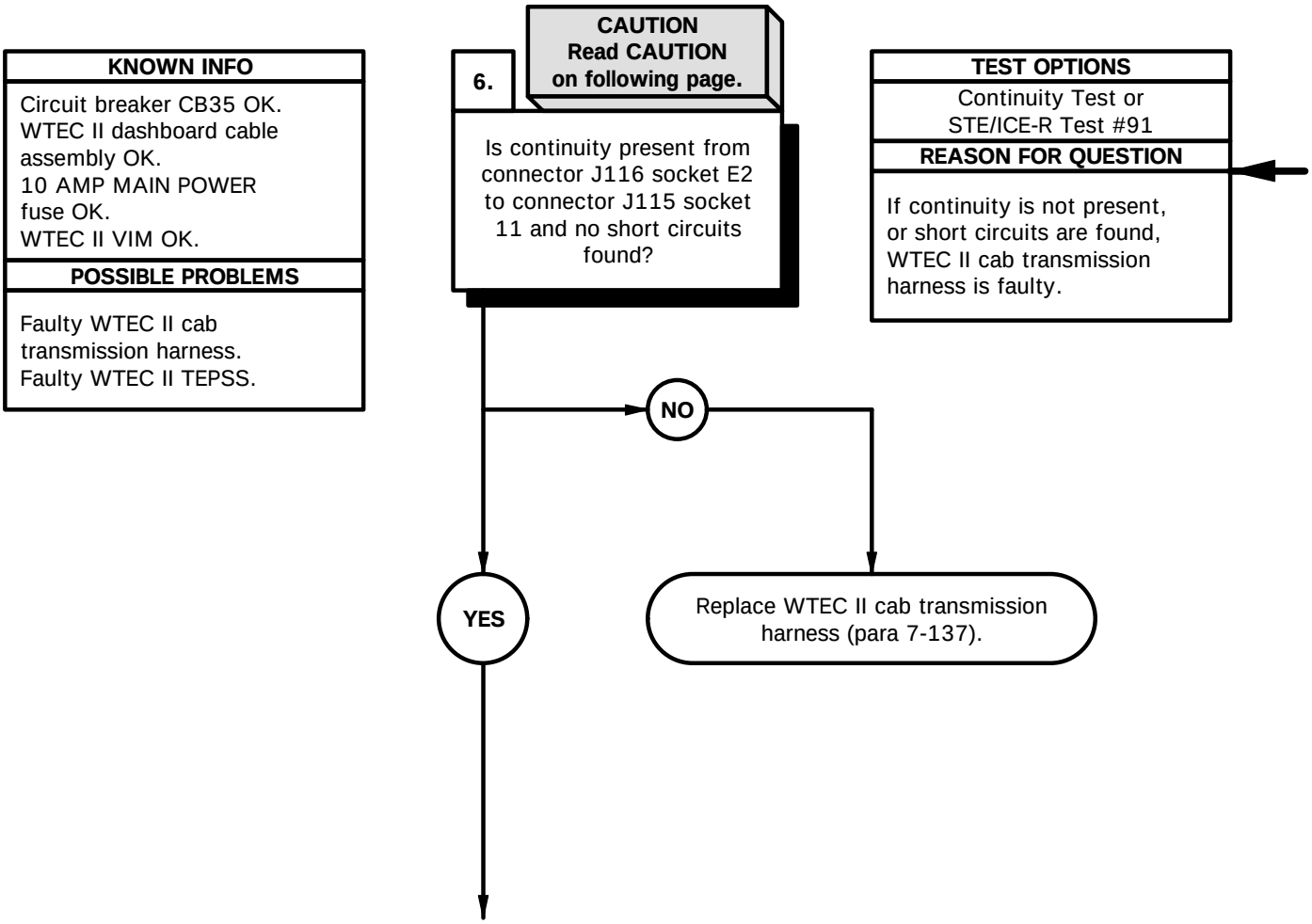
(1) Loosen screw in connector J116.
(2) Disconnect connector J116 from WTEC II VIM.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to WTEC II VIM connector pin K3.
(5) Connect negative (-) probe of multimeter to WTEC II VIM connector pin L2 and note reading on multimeter.
(6) If continuity is not present, repair or replace WTEC II VIM (para 8-6).
(7) Connect connector PX33 to WTEC II VIM connector.
(8) Tighten screw in connector PX33.



VIM CONNECTOR



f19A. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 23 AND ANY SUB CODE (CONT)



CAUTION

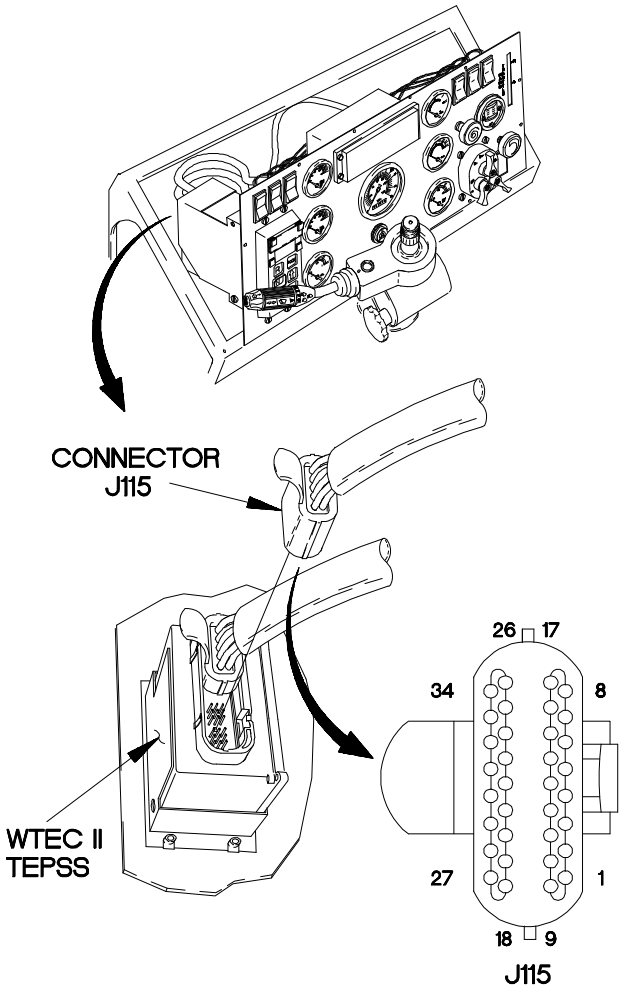
Use care when testing electrical connectors not to bend connector pins or damage connector sockets with multimeter probes. Failure to comply may result in damage to equipment.

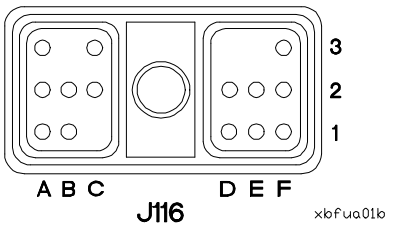
NOTE

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

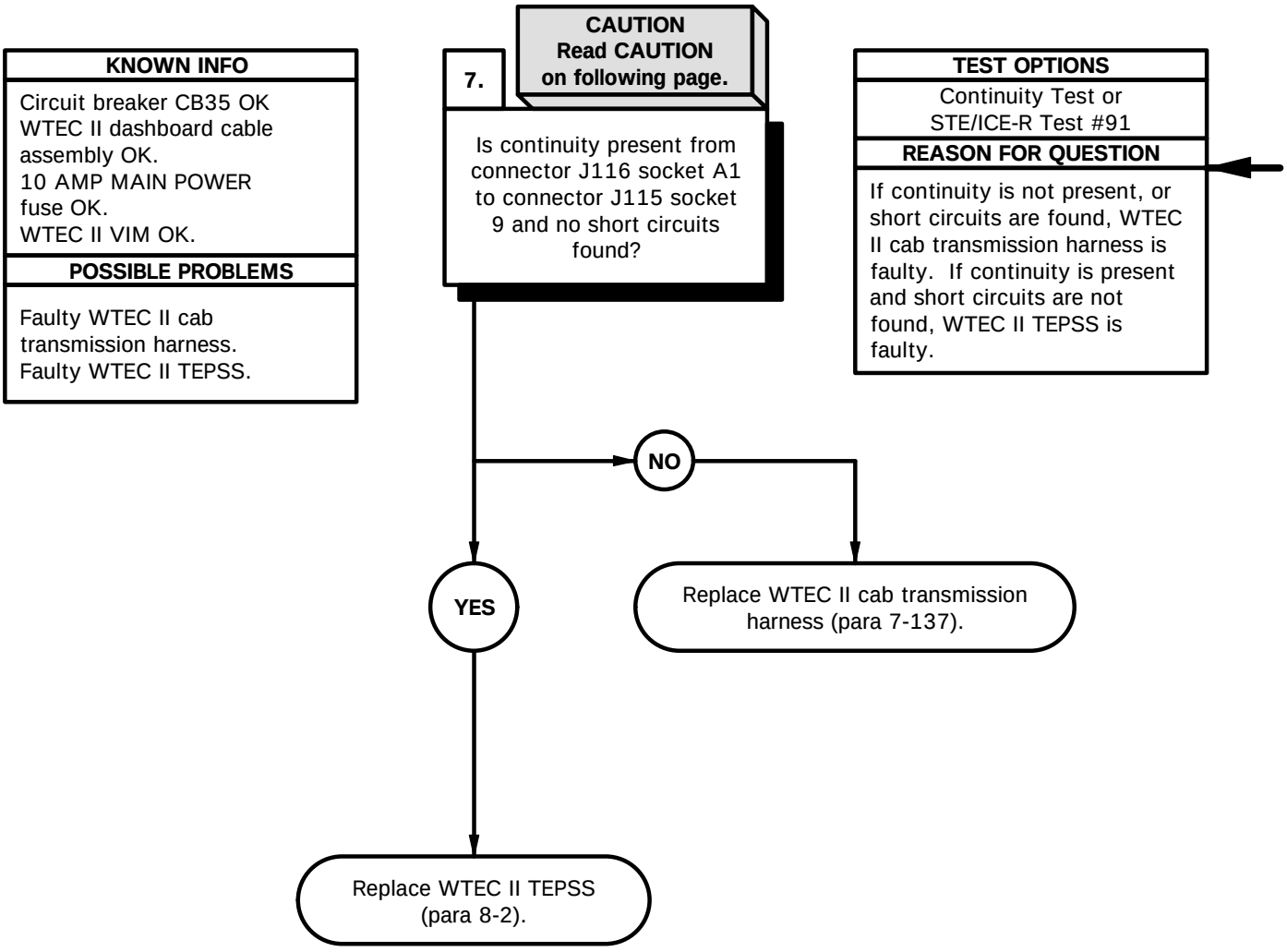
CONTINUITY TEST

(1) Remove instrument panel assembly for access (para 7-15).
(2) Disconnect connector J115 from WTEC II TEPSS connector.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector J116 socket E2.
(5) Connect negative (-) probe of multimeter to connector J115 socket 11 and note reading on multimeter.
(6) Connect negative probe (-) of multimeter to all other sockets in connector J115 and note reading on multimeter.
(7) Connect negative probe (-) of multimeter to ground and note reading on multimeter.
(8) If continuity is not present in step (5), or continuity is present in step (6) or step (7), replace WTEC II cab transmission harness (para 7-137).





f19A. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 23 AND ANY SUB CODE (CONT)



CAUTION

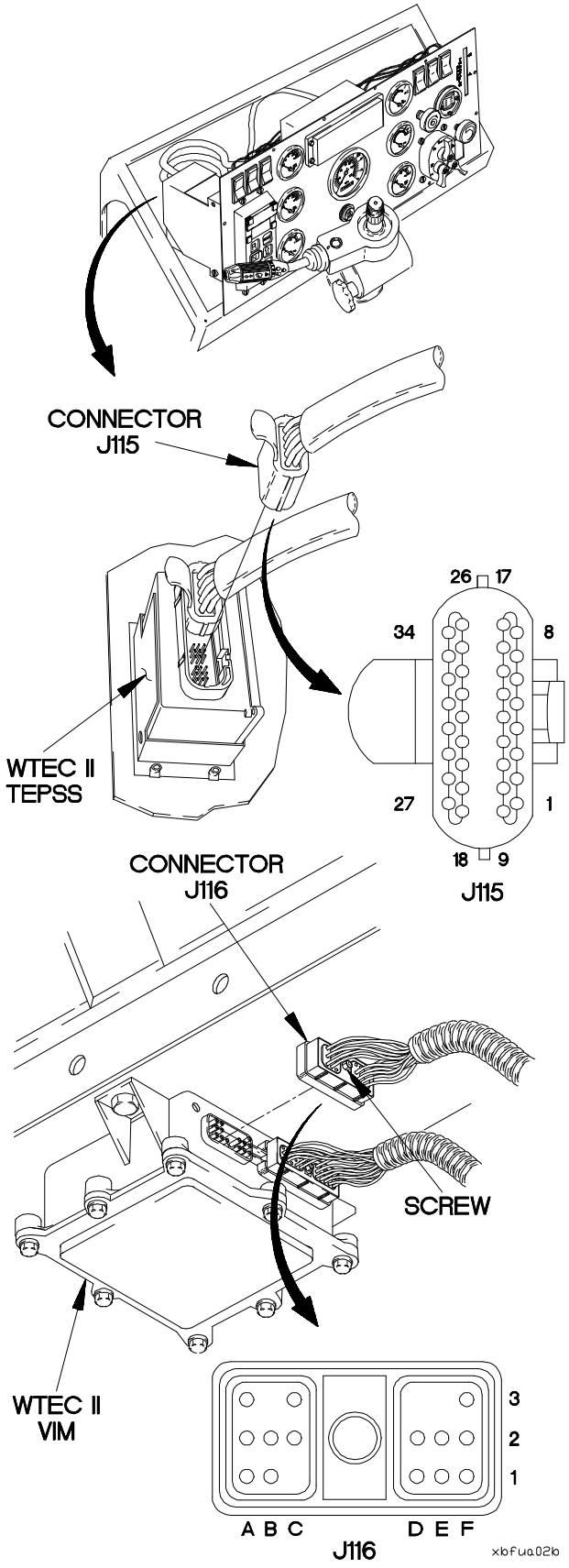
Use care when testing electrical connectors not to bend connector pins or damage connector sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

Inspect connector pins/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 J116 socket A1.
(3) Connect negative (-) probe of multimeter to connector J115 socket 9 and note reading on multimeter.
(4) Connect negative probe (-) of multimeter to all other sockets in connector J115 and note reading on multimeter.
(5) Connect negative probe (-) of multimeter to ground and note reading on multimeter.
(6) If continuity is not present in step (3), or continuity is present in step (4) or step (5), replace WTEC II cab transmission harness (para 7-137).
(7) If continuity is present in step (3) and continuity is not present in step (4) or (5), replace WTEC II TEPSS (para 8-2).
(8) Connect connector J116 to VIM connector.
(9) Tighten screw in connector J116.
(10) Connect connector J115 to WTEC II TEPSS connector.
(11) Install kick panel (para 16-3).
(12) Install instrument panel assembly (para 7-15).
(13) Clear diagnostic codes (para 8-4).



f19B. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DOES NOT ILLUMINATE

INITAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Kick panel removed (para 16-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

Personnel Required
(2)

References
TM 9-4910-571-12&P

NOTE

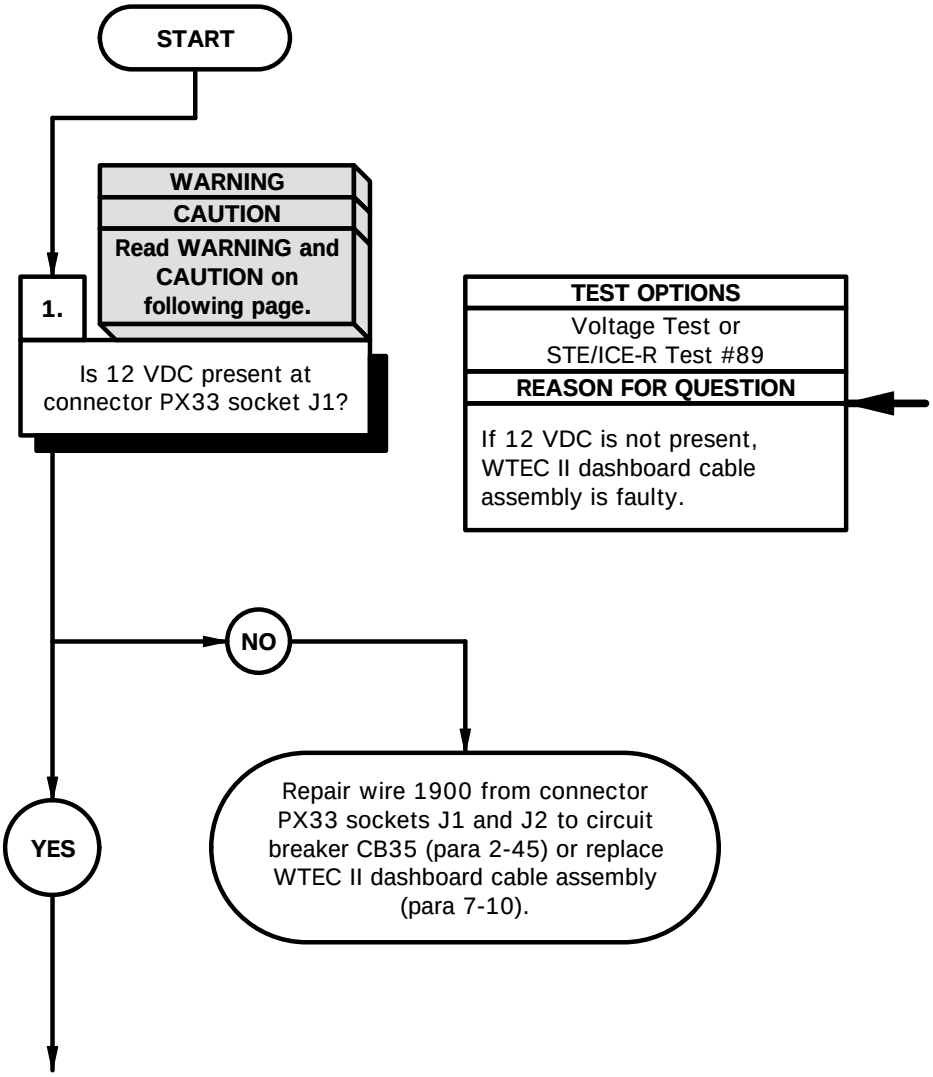
Perform Electrical System Troubleshooting e1. CIRCUIT BREAKER DOES NOT OPERATE on circuit breakers CB35 and CB79 prior to beginning this task.

KNOWN INFO

12 VDC and 24 VDC circuits operate.
Circuit breaker CB35 OK.
Circuit breaker CB79 OK.

POSSIBLE PROBLEMS

Faulty WTEC II dashboard cable assembly.
Faulty terminal board TB1.
Faulty 10 AMP MAIN POWER fuse.
Faulty 10 AMP IGNITION fuse.
Faulty WTEC II VIM.
Faulty WTEC II cab transmission harness.
Faulty WTEC II TEPSS.



TEST OPTIONS

Voltage Test or
STE/ICE-R Test #89

REASON FOR QUESTION

If 12 VDC is not present, WTEC II dashboard cable assembly is faulty.

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 circuits and cause severe burns or electrical shock.

CAUTION

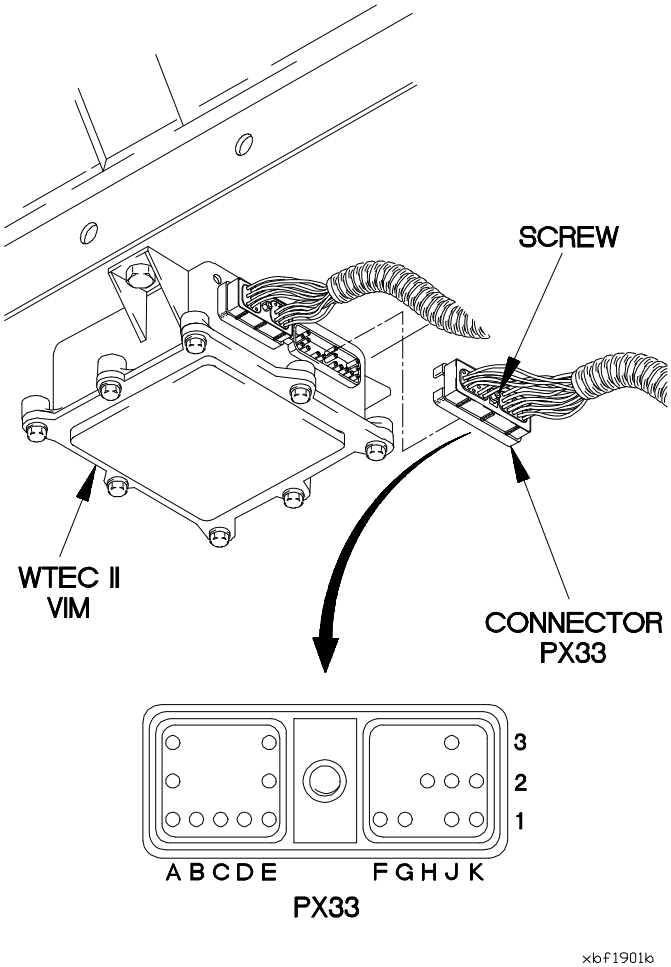
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

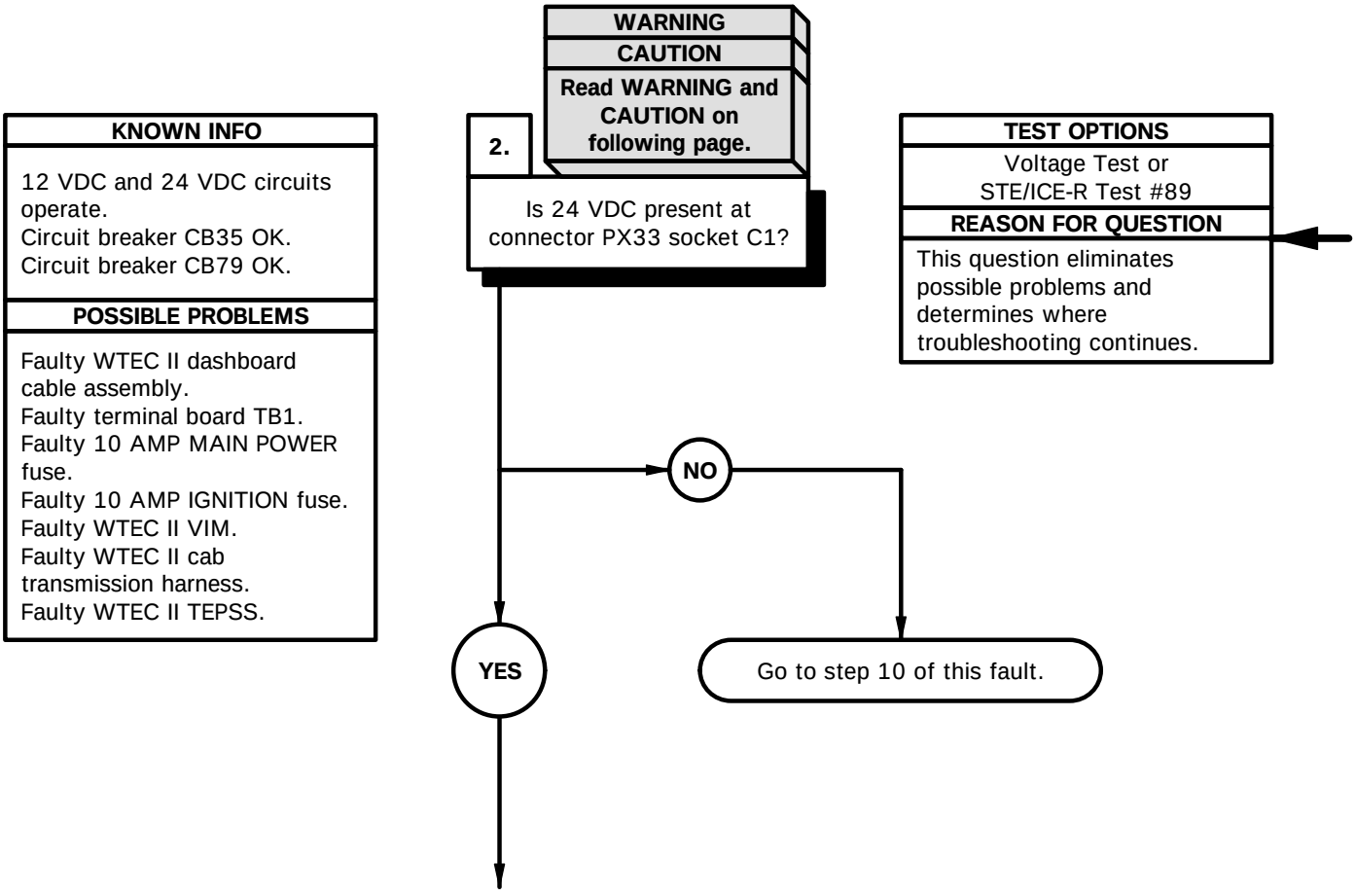
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

VOLTAGE TEST

(1) Loosen screw in connector PX33.
(2) Disconnect connector PX33 from WTEC II VIM.
(3) Set multimeter to volts DC.
(4) Connect positive (+) probe of multimeter to connector PX33 socket J1.
(5) Connect negative (-) probe of multimeter to ground.
(6) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(7) Position master power switch to off (TM 9-2320-366-10-1).
(8) If 12 VDC is not present, repair wire 1900 from connector PX33 sockets J1 and J2 to circuit breaker CB35 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).



f19B. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DOES NOT ILLUMINATE (CONT)



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 circuits and cause severe burns or electrical shock.

CAUTION

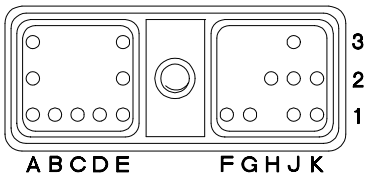
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

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

VOLTAGE TEST

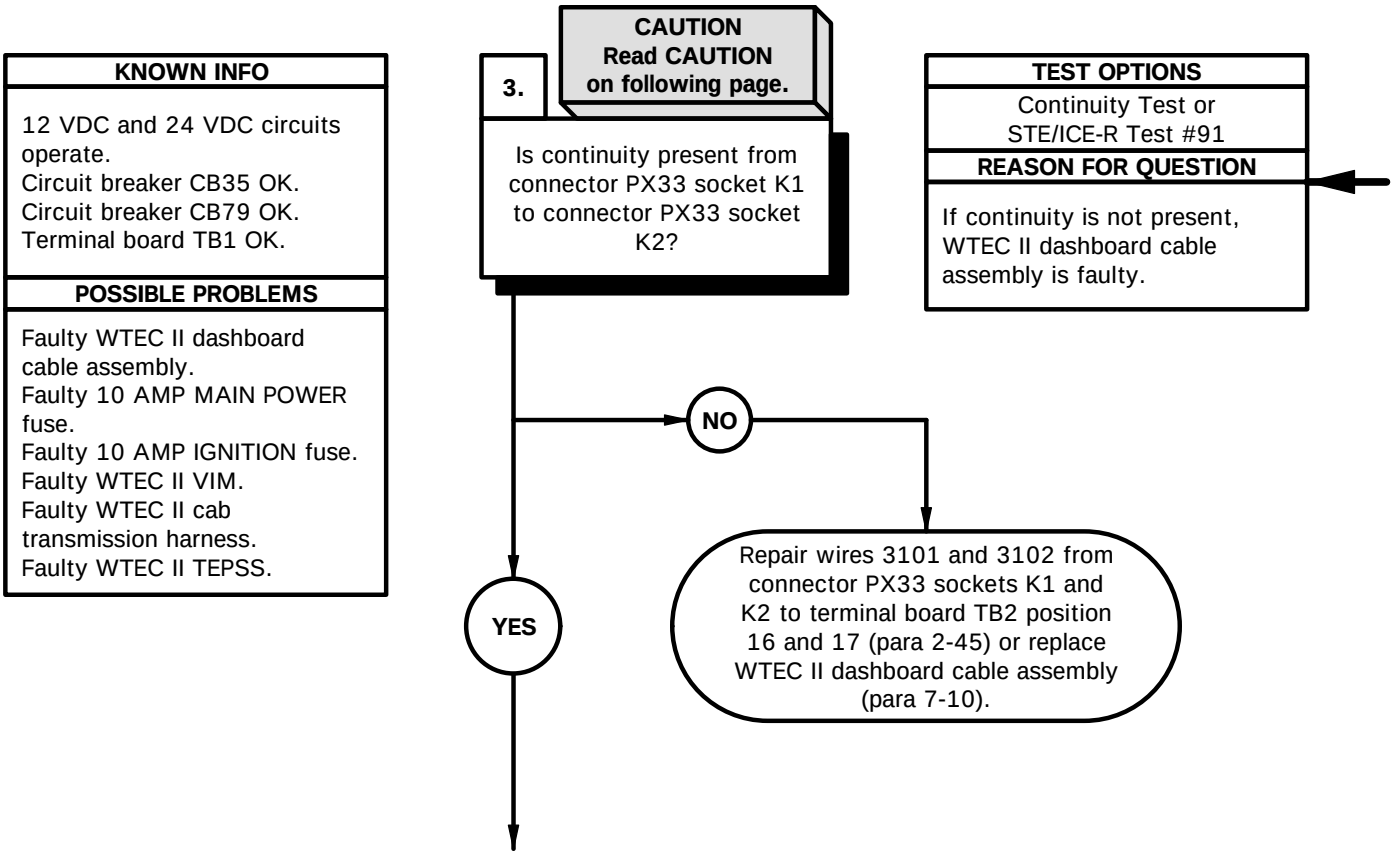
(1) Set multimeter to volts DC.
(2) Connect positive (+) probe of multimeter to connector PX33 socket C1.
(3) Connect negative (-) probe of multimeter to ground.
(4) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(5) Position master power switch to off (TM 9-2320-366-10-1).
(6) If 24 VDC is not present, go to step 10 of this fault.



PX33

XBF19B02B

f19B. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DOES NOT ILLUMINATE (CONT)



CAUTION

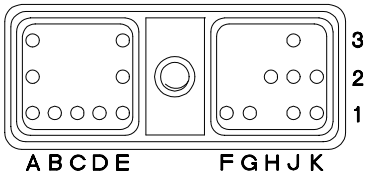
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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

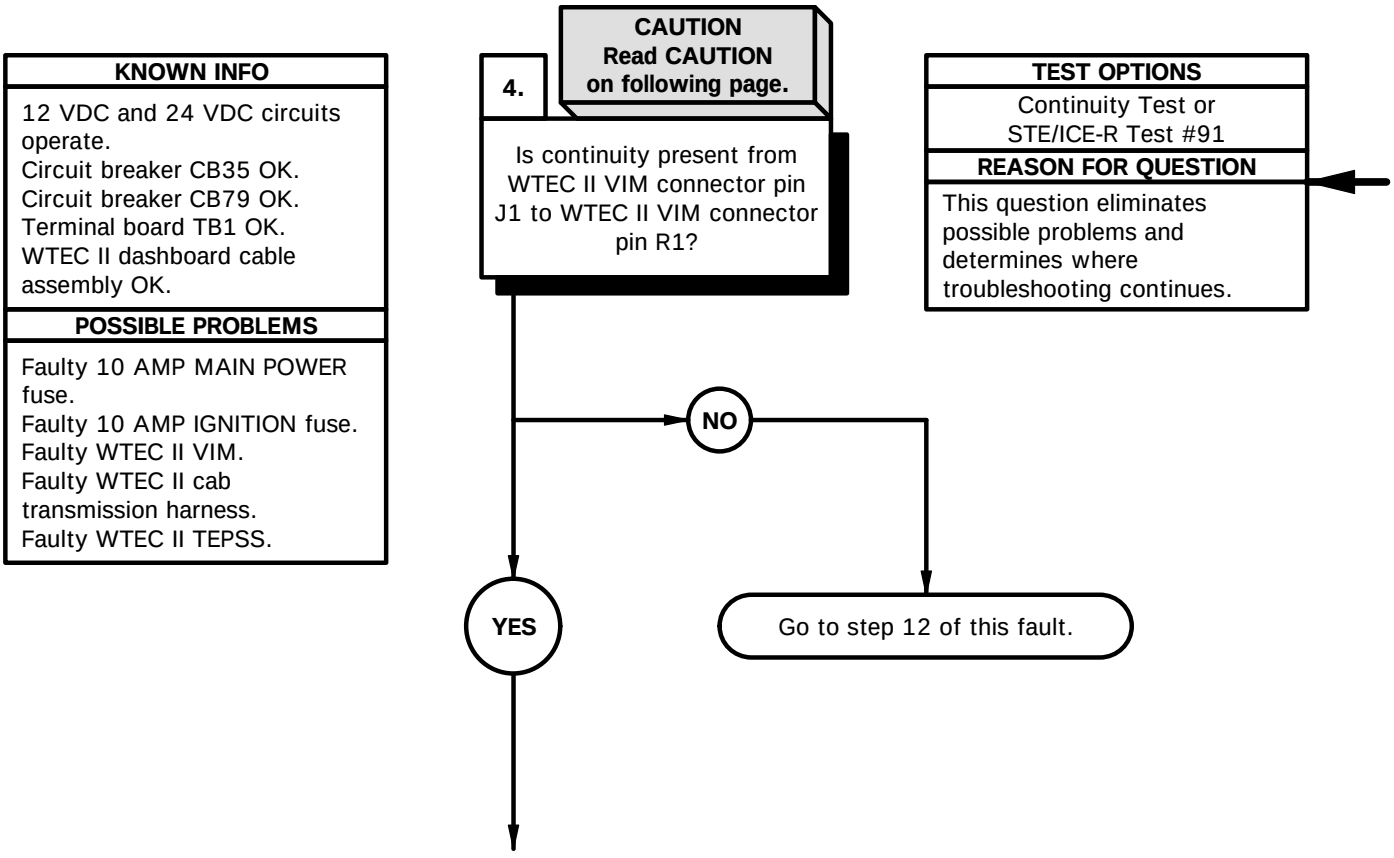
(1) Disconnect batteries (para 7-57).
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector PX33 socket K1.
(4) Connect negative (-) probe of multimeter to connector PX33 socket K2 and note reading on multimeter.
(5) If continuity is not present, Repair wires 3101 and 3102 from connector PX33 sockets K1 and K2 to terminal board TB2 position 16 and 17 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).



PX33

XBF19B02B

f19B. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DOES NOT ILLUMINATE (CONT)



CAUTION

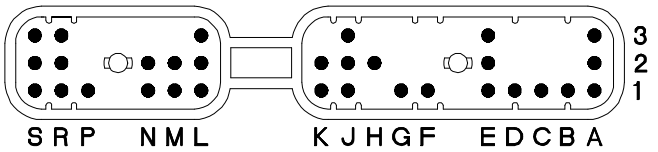
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

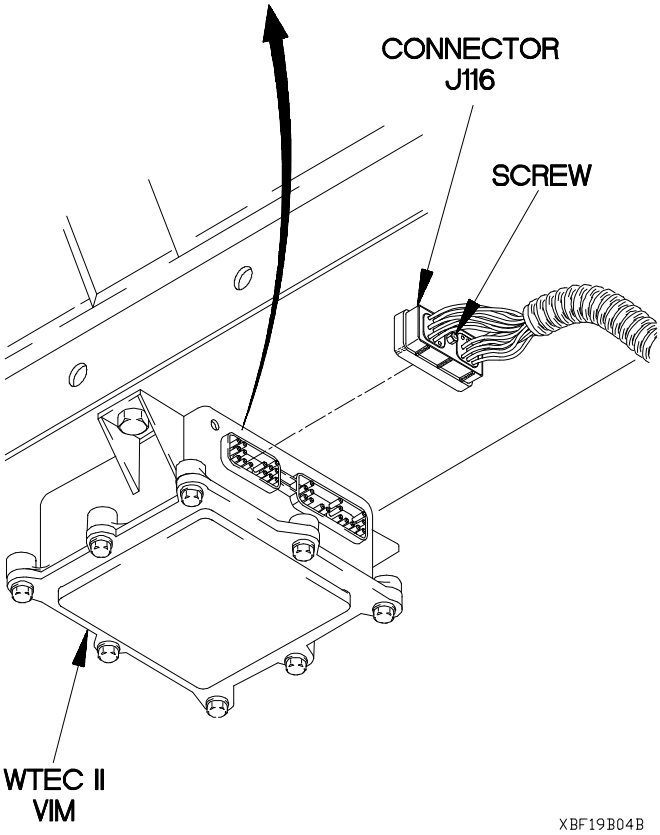
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

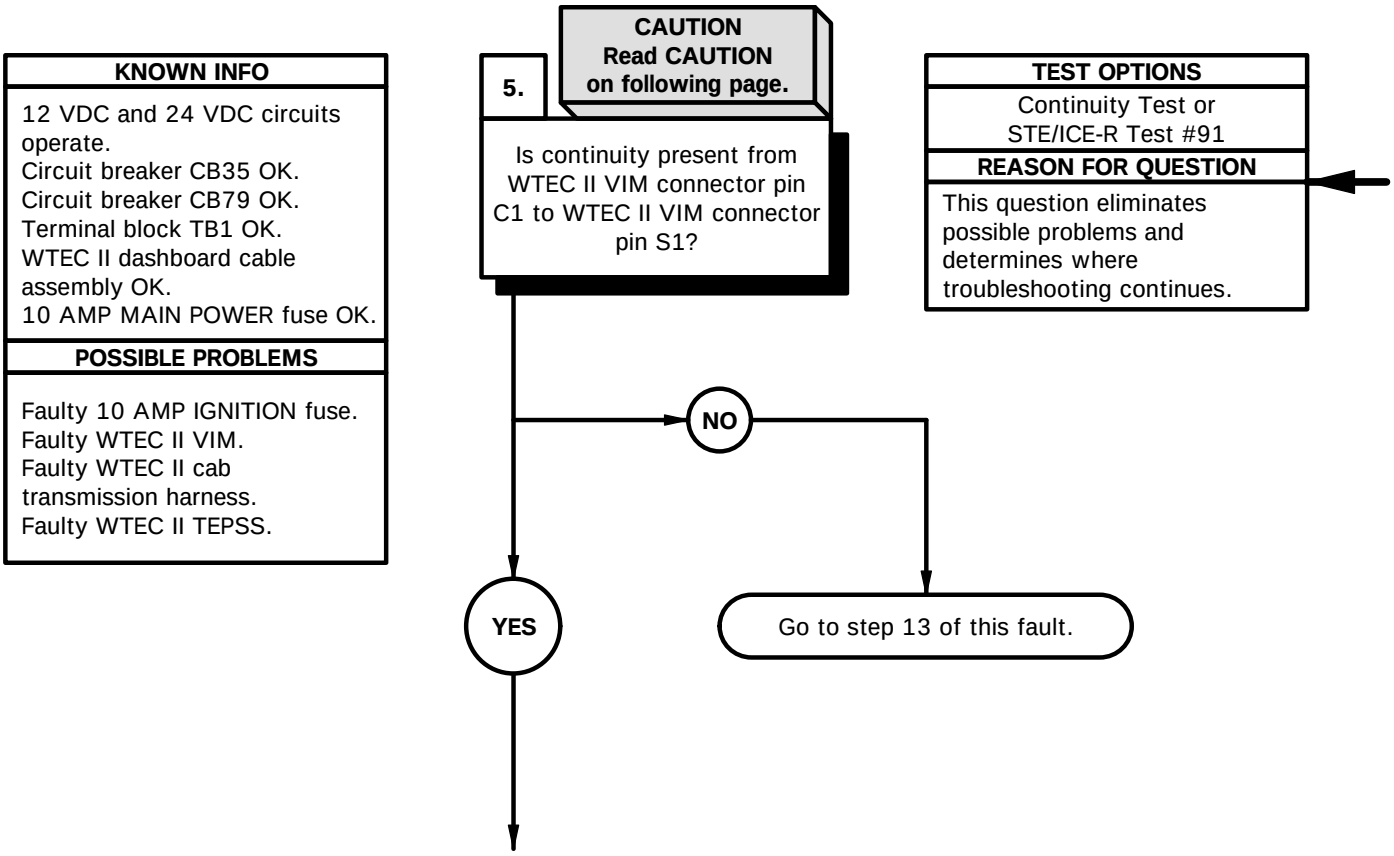
(1) Loosen screw in connector J116.
(2) Disconnect connector J116 from WTEC II VIM.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to WTEC II connector pin J1.
(5) Connect negative (-) probe of multimeter to WTEC II connector pin R1 and note reading on multimeter.
(6) If continuity is not present, go to step 12 of this fault.



VIM CONNECTOR



f19B. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DOES NOT ILLUMINATE (CONT)



CAUTION

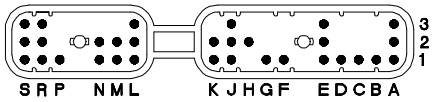
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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

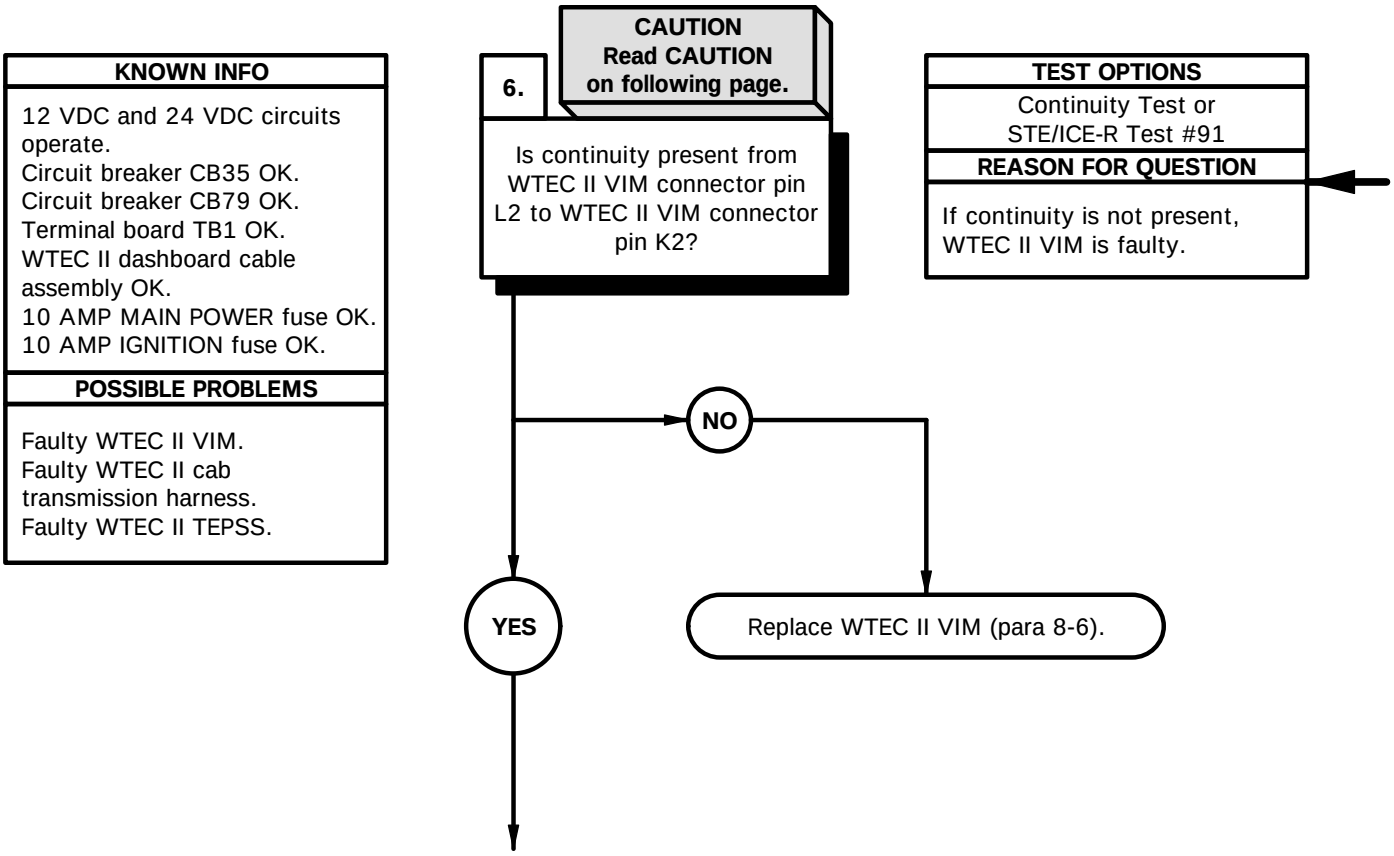
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to WTEC II connector pin C1.
(3) Connect negative (-) probe of multimeter to WTEC II connector pin S1 and note reading on multimeter.
(4) If continuity is not present, go to step 13 of this fault.



VIM CONNECTOR PINS

XBF19B05B

f19B. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DOES NOT ILLUMINATE (CONT)



CAUTION

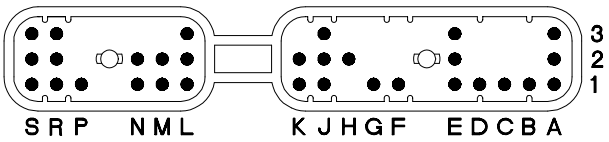
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

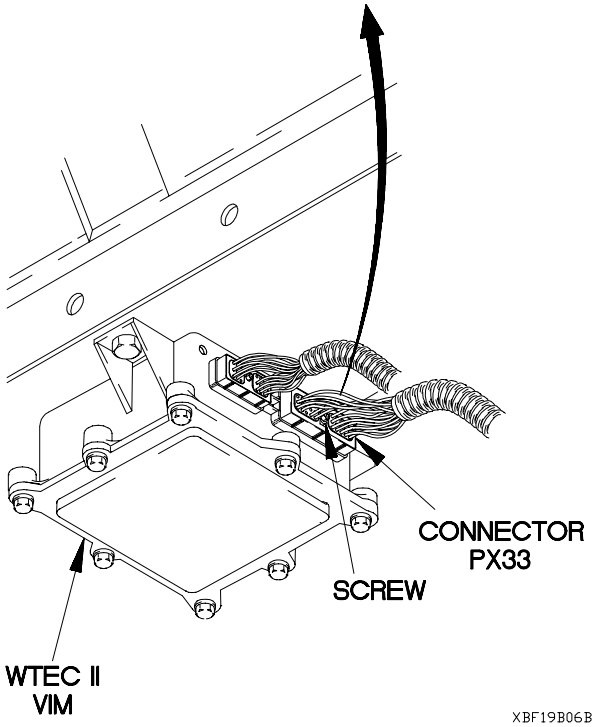
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

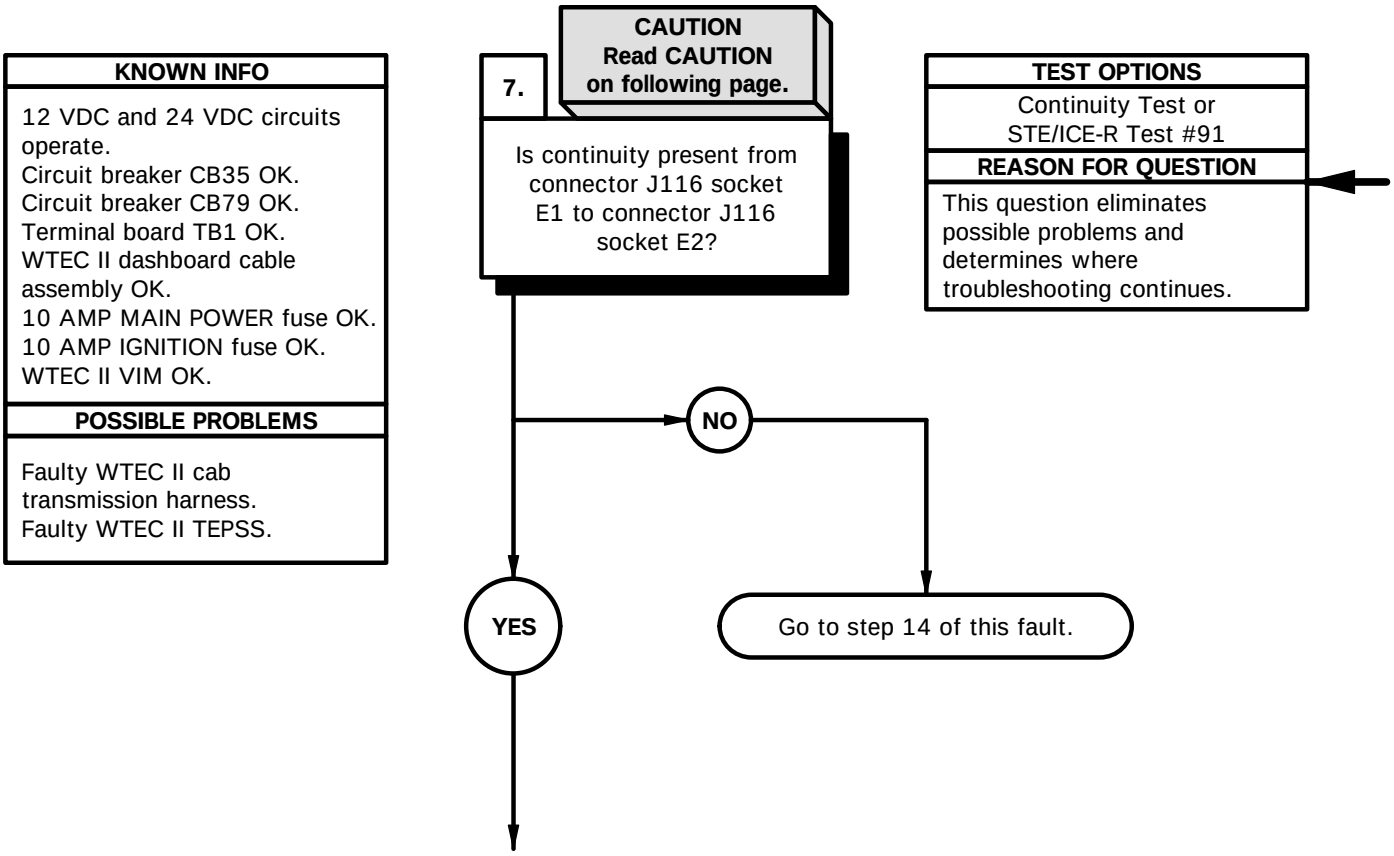
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to WTEC II connector pin L2.
(3) Connect negative (-) probe of multimeter to WTEC II connector pin K2 and note reading on multimeter.
(4) If continuity is not present, replace WTEC II VIM (para 8-6).
(5) Connect connector PX33 to WTEC II VIM.
(6) Tighten screw in connector PX33.

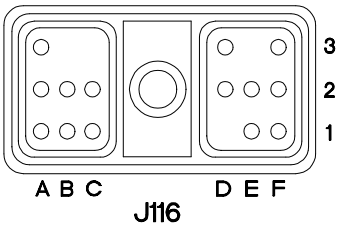


VIM CONNECTOR



f19B. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DOES NOT ILLUMINATE (CONT)





CAUTION

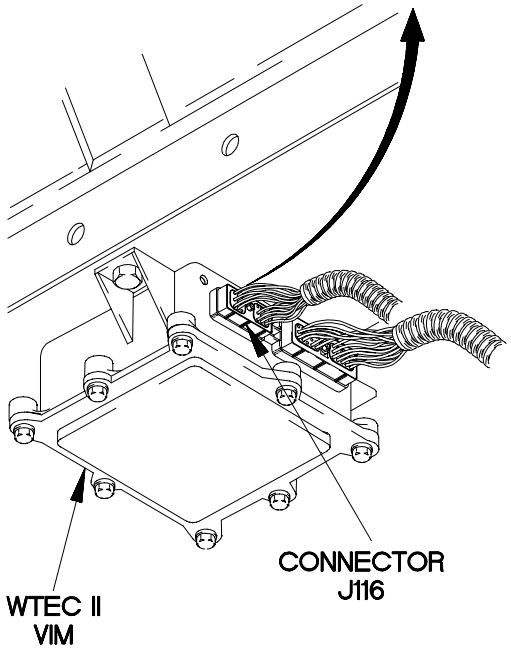
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

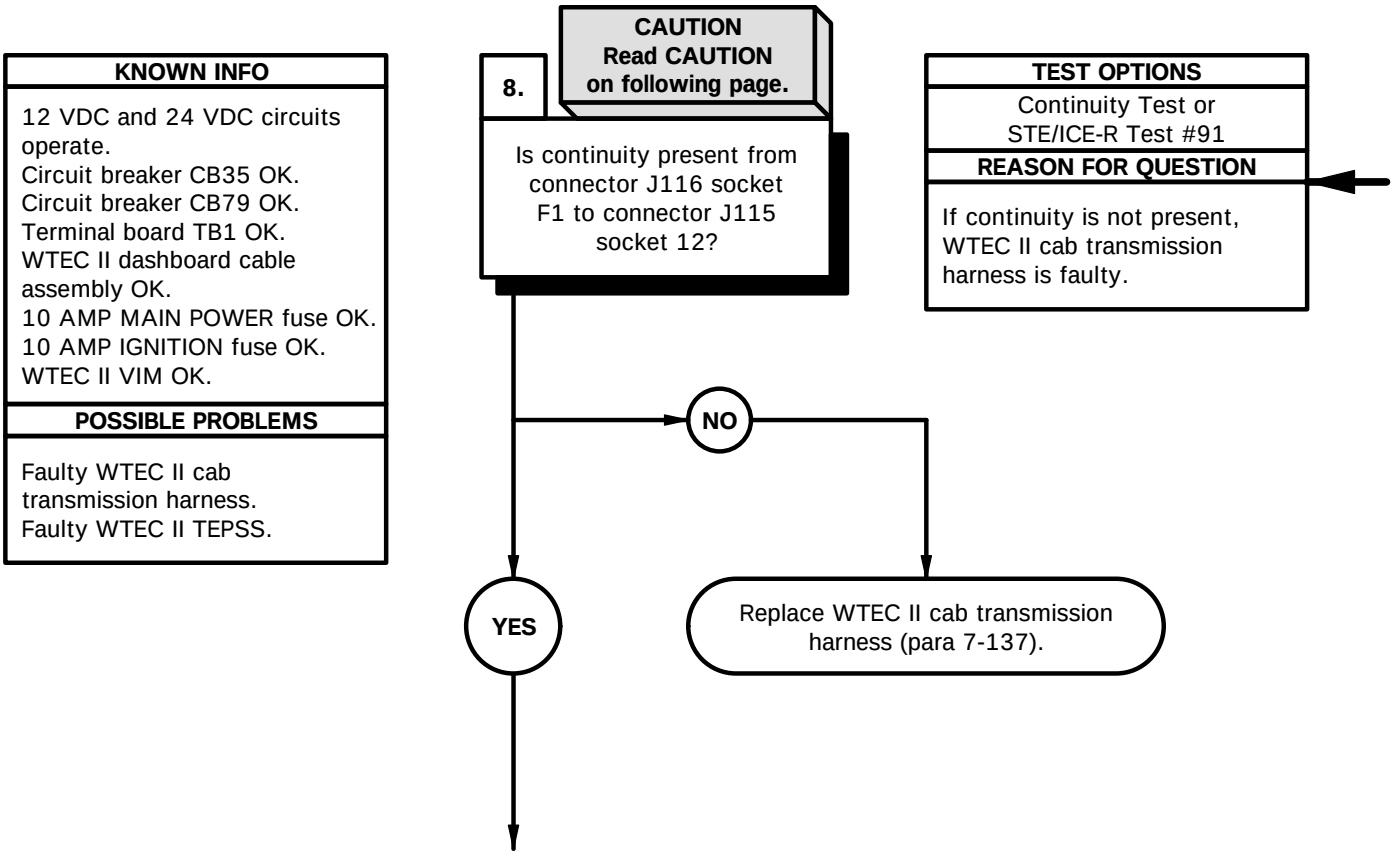
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector J116 socket E1.
(3) Connect negative (-) probe of multimeter to connector J116 socket E2 and note reading on multimeter.
(4) If continuity is not present, go to step 14 of this fault.



f19B. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DOES NOT ILLUMINATE (CONT)



CAUTION

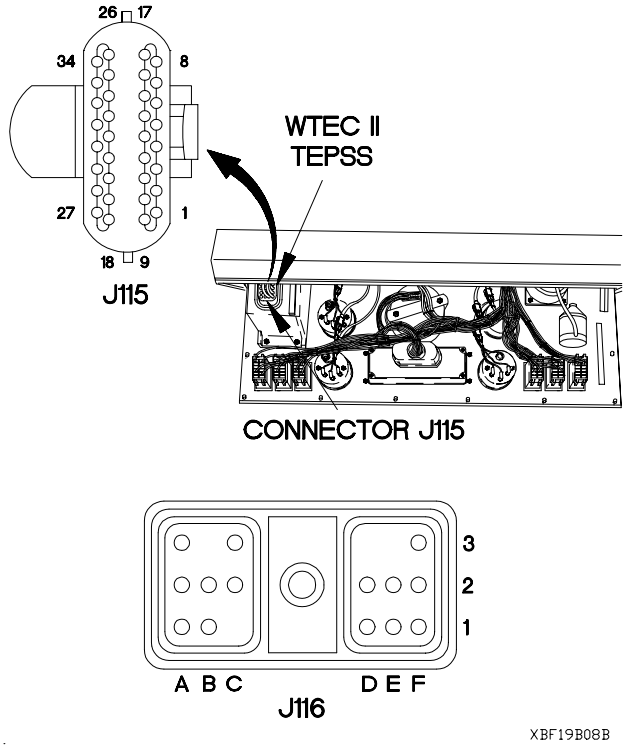
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

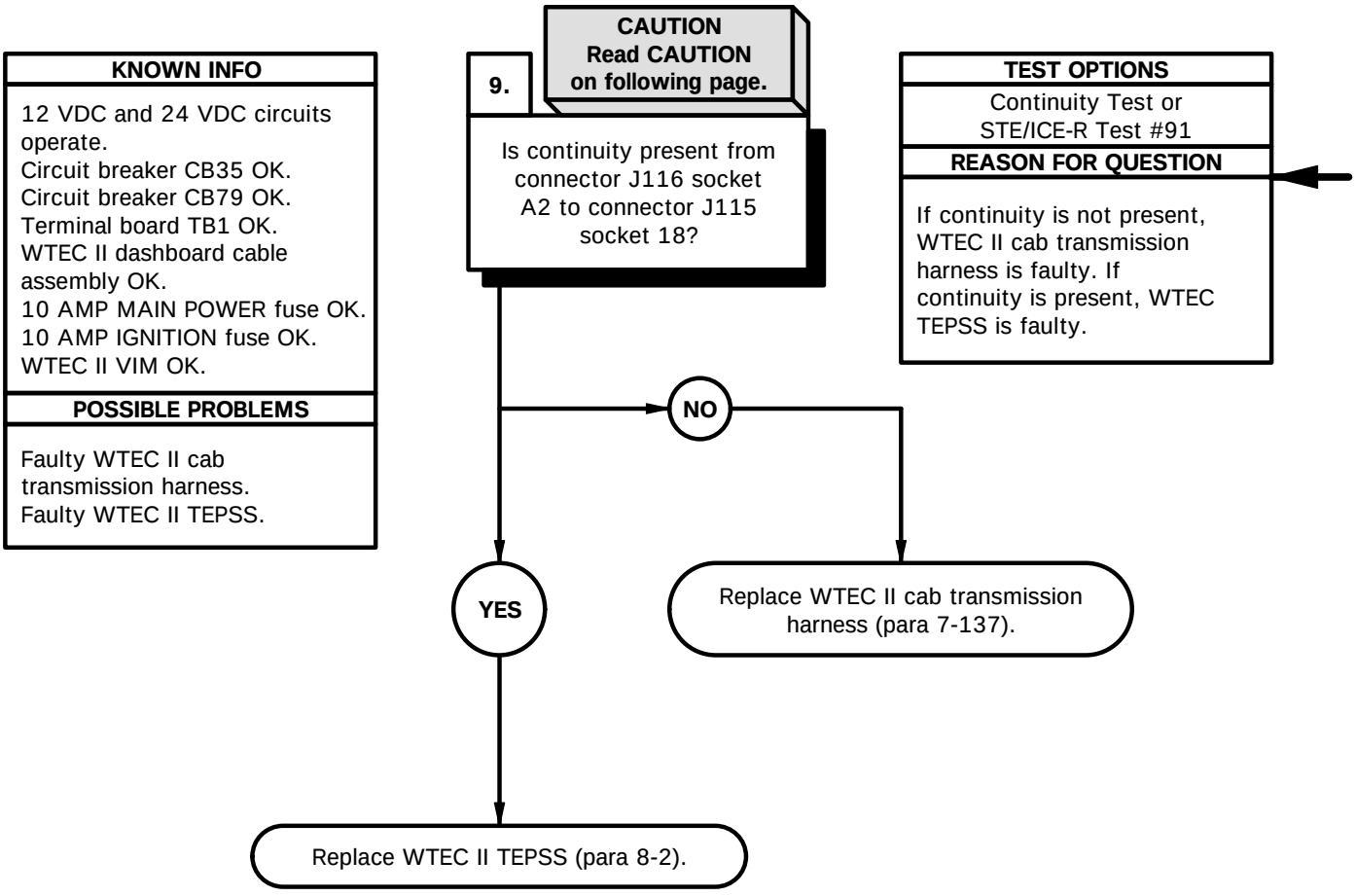
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Remove instrument panel assembly for access (para 7-15).
(2) Disconnect connector J115 from WTEC II TEPSS.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector J116 socket F1.
(5) Connect negative (-) probe of multimeter to connector J115 socket 12 and note reading on multimeter.
(6) If continuity is not present, replace WTEC II cab transmission harness (para 7-137).



f19B. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DOES NOT ILLUMINATE (CONT)



CAUTION

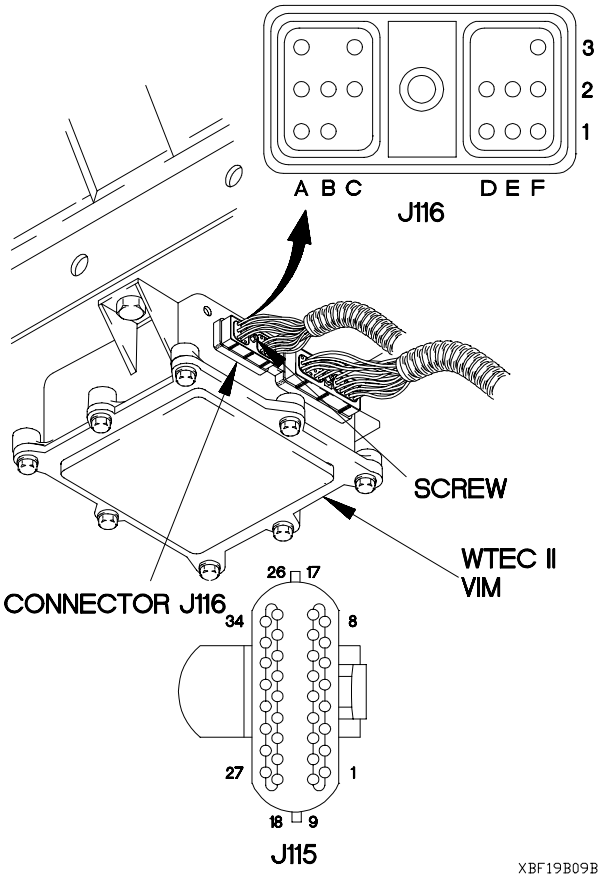
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

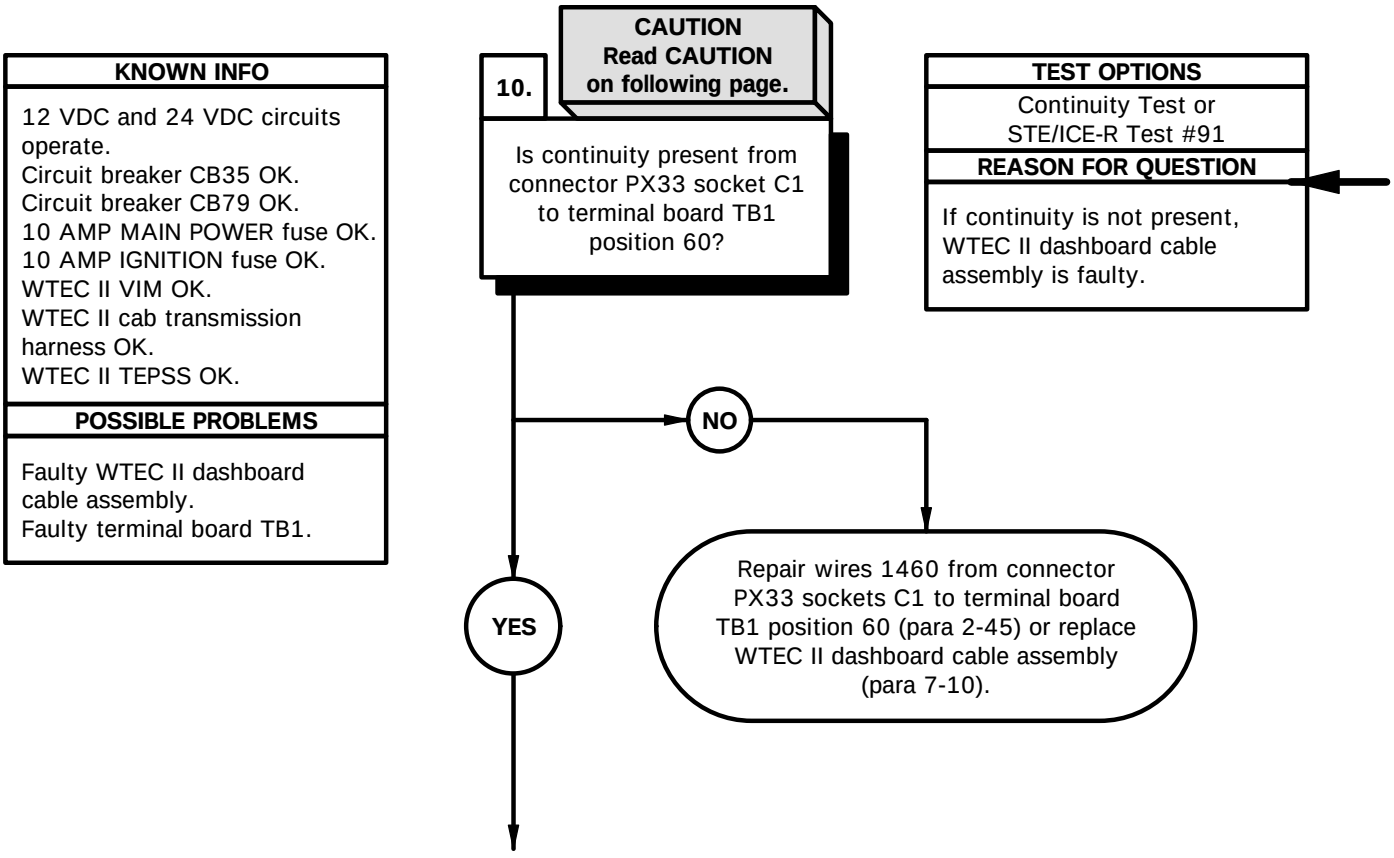
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector J116 socket A2.
(3) Connect negative (-) probe of multimeter to connector J115 socket 18 and note reading on multimeter.
(4) If continuity is not present, replace WTEC II cab transmission harness (para 7-137).
(5) If continuity is present, replace WTEC II TEPSS (para 8-2).
(6) Connect connector J116 to WTEC II VIM connector.
(7) Tighten screw in connector J116.
(8) Install kick panel (para 16-3).



f19B. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DOES NOT ILLUMINATE (CONT)



CAUTION

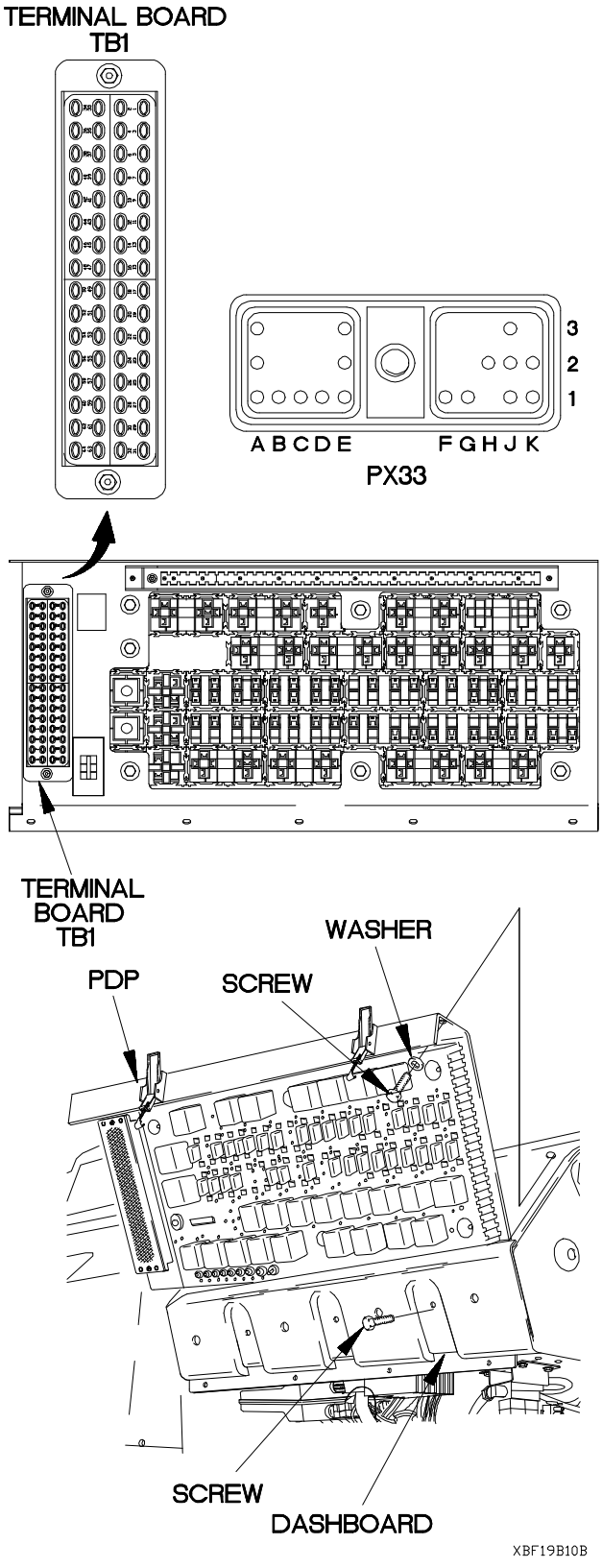
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

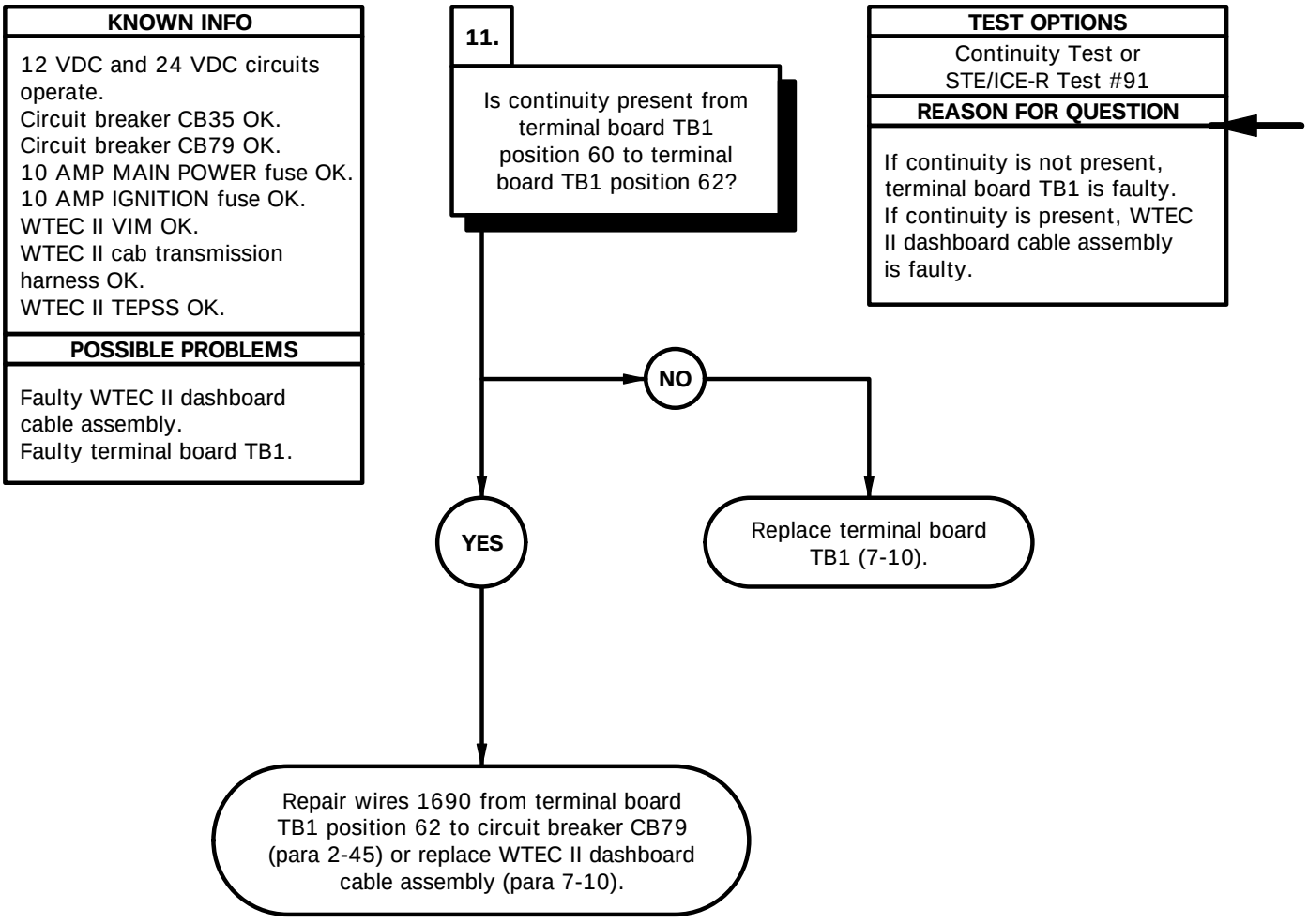
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Disconnect batteries (para 7-57).
(2) Remove PDP cover (para 16-2).
(3) Remove three screws from PDP.
(4) Remove three screws and washers from PDP.
(5) Lift PDP outward to gain access.
(6) Set multimeter to ohms.
(7) Connect positive (+) probe of multimeter to connector PX33 socket C1.
(8) Connect negative (-) probe of multimeter to terminal board TB1 position 60 and not reading on multimeter.
(9) If continuity is not present, Repair wire 1460 from connector PX33 sockets C1 to terminal board TB1 position 60 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).
(10) Connect connector PX33 to WTEC II VIM.
(11) Tighten screw in connector PX33.
(12) Install kick panel (para 16-3).

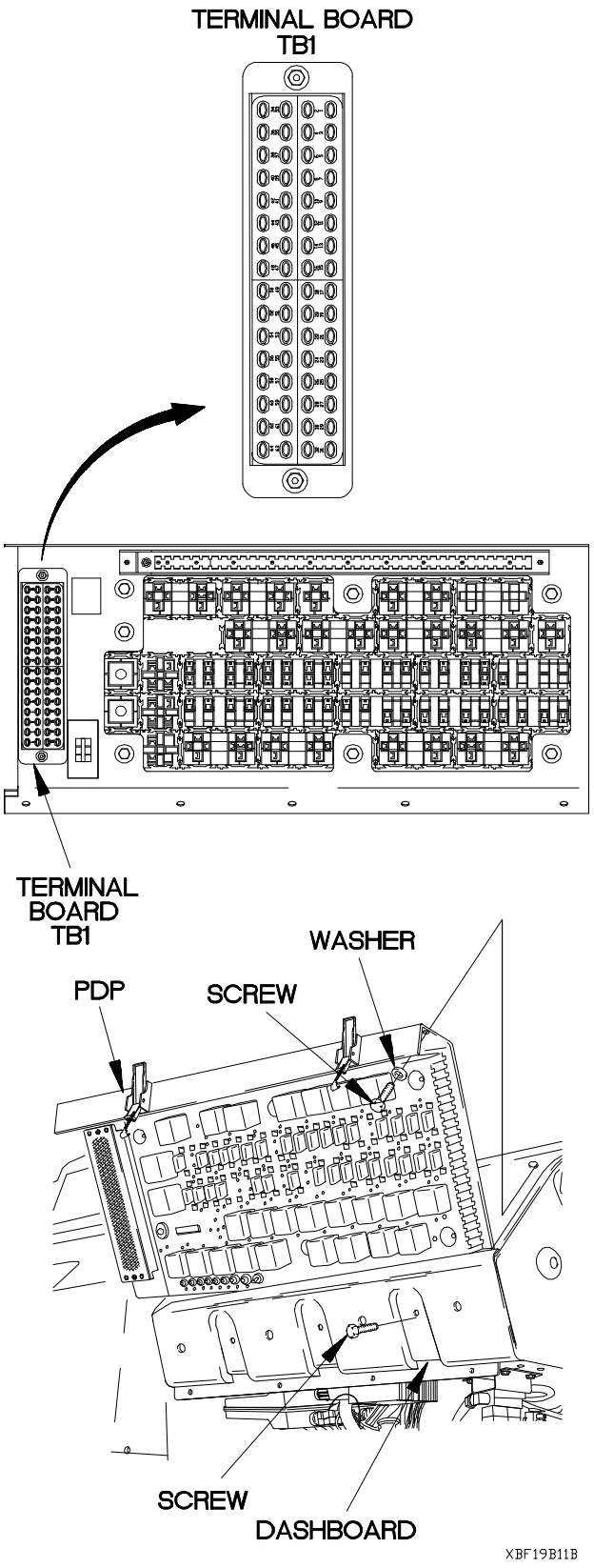


f19B. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DOES NOT ILLUMINATE (CONT)

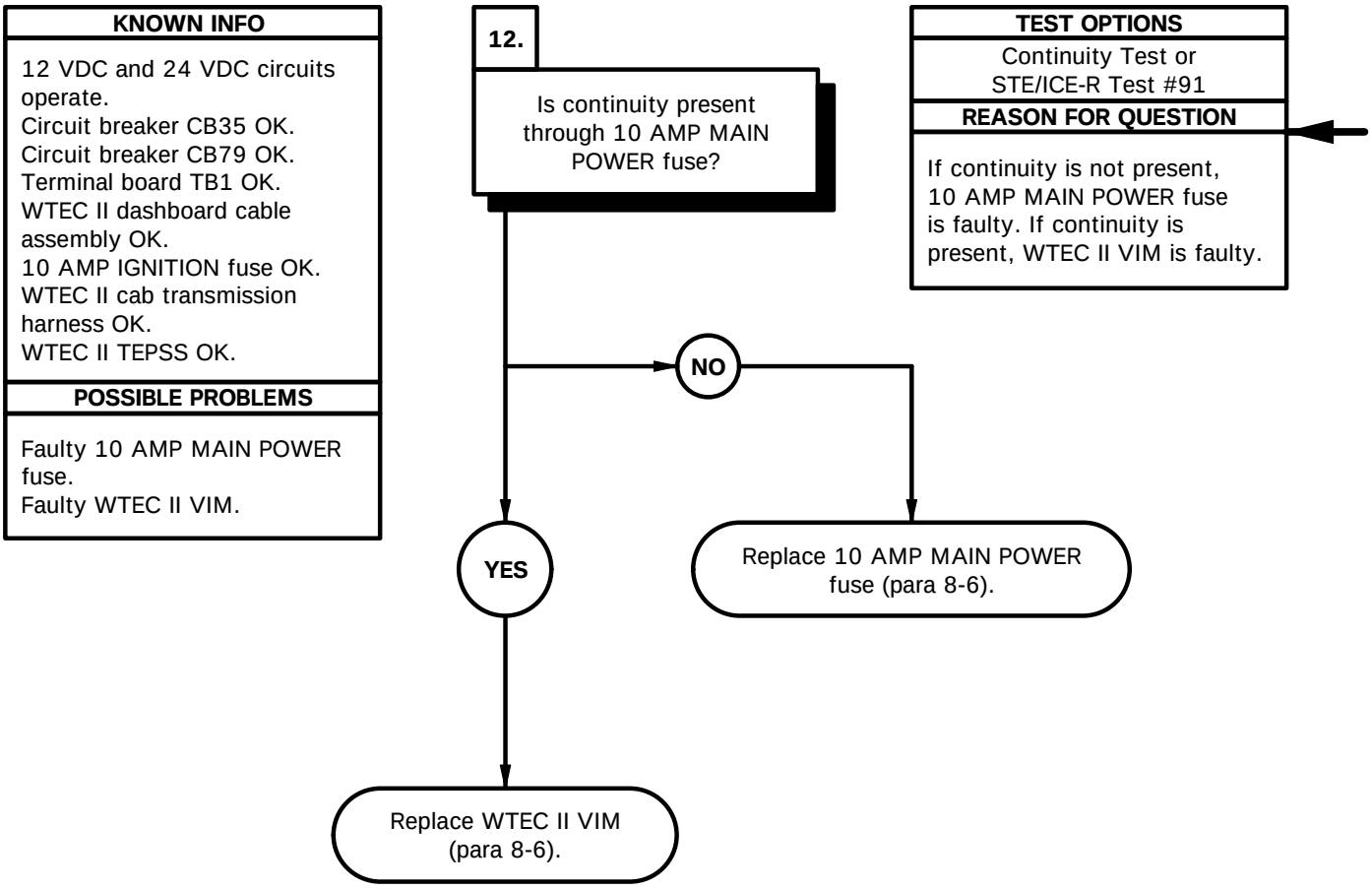


CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to terminal board TB1 position 60.
(3) Connect negative (-) probe of multimeter to terminal board TB1 position 62 and note reading on multimeter.
(4) If continuity is not present, replace terminal board TB1 (para 7-10).
(5) If continuity is present, Repair wire 1690 from terminal board TB1 position 62 to circuit breaker CB79 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).
(6) Install PDP on dashboard with three screws.
(7) Install three washers and screws in PDP.
(8) Install PDP cover (para 16-2).
(9) Connect batteries (para 7-57).

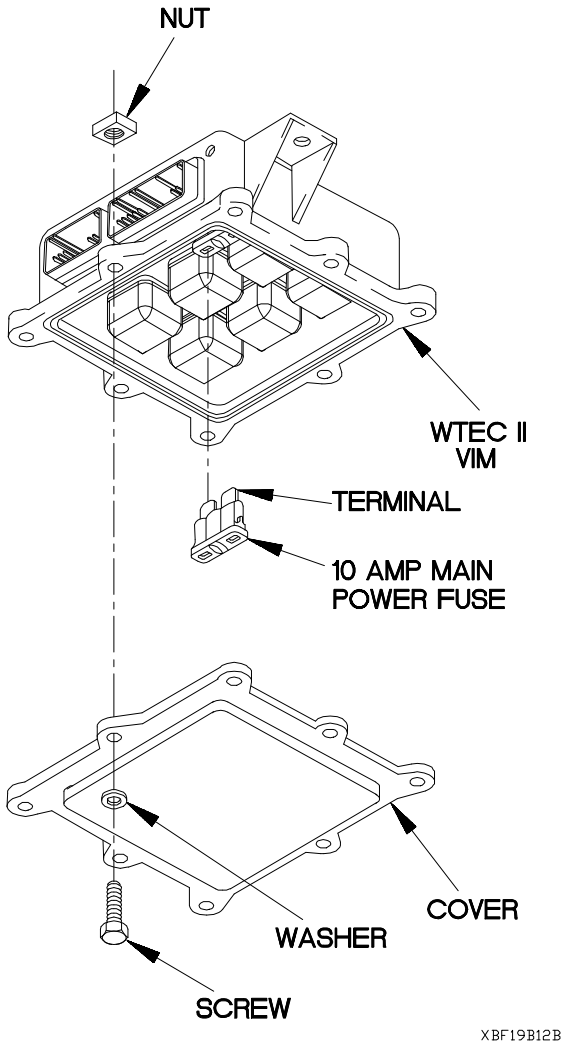


f19B. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DOES NOT ILLUMINATE (CONT)

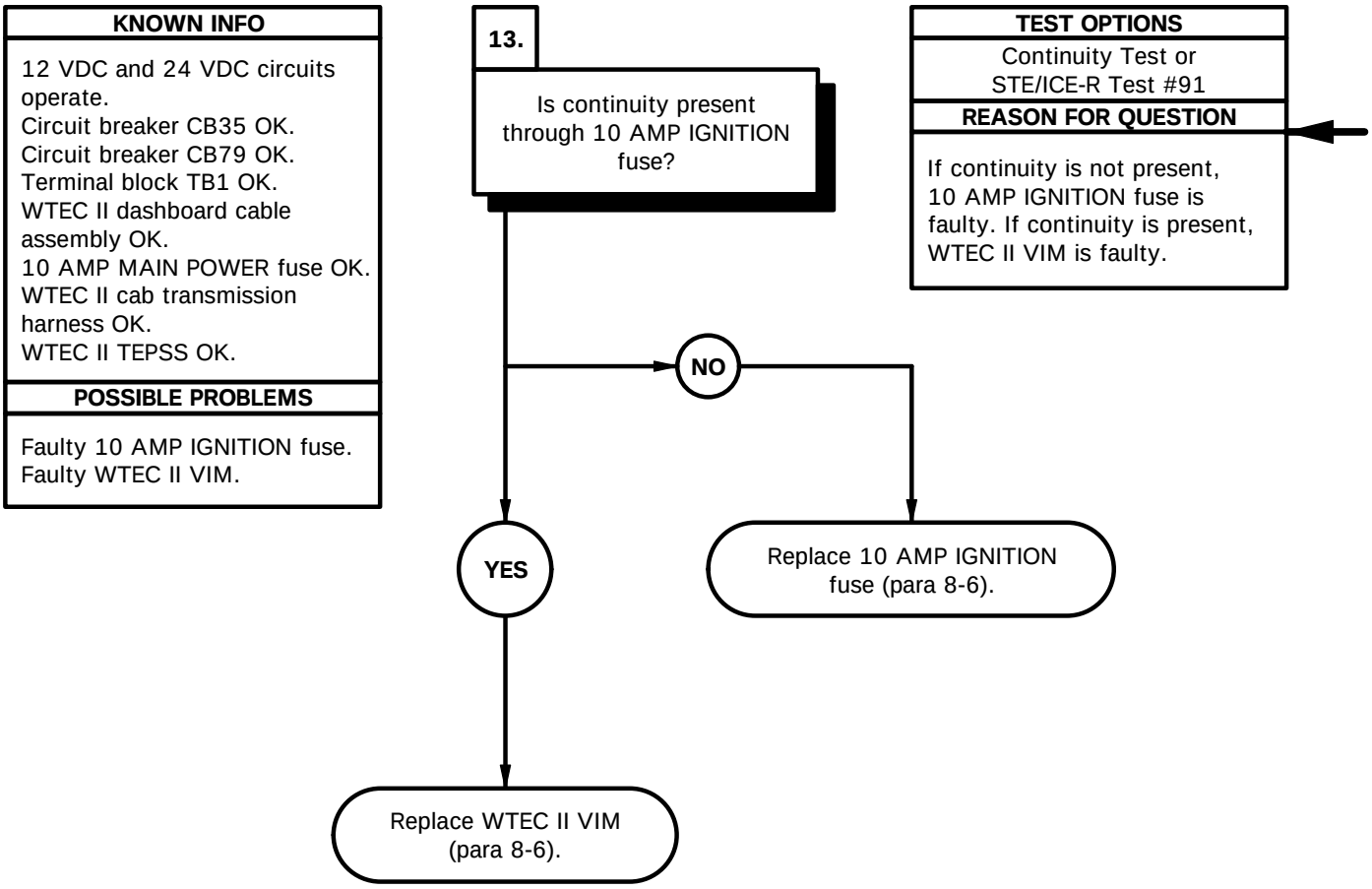


CONTINUITY TEST

(1) Remove seven screws and washers from WTEC II VIM cover.
(2) Remove screw, washer, cover, and nut from WTEC II VIM.
(3) Remove 10 AMP MAIN POWER fuse from WTEC II VIM.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to one terminal on 10 AMP MAIN POWER fuse.
(6) Connect negative (-) probe of multimeter to other terminal on 10 AMP MAIN POWER fuse and note reading on multimeter.
(7) If continuity is not present, replace 10 AMP MAIN POWER fuse (para 8-6).
(8) If continuity is present replace WTEC II VIM (para 8-6).

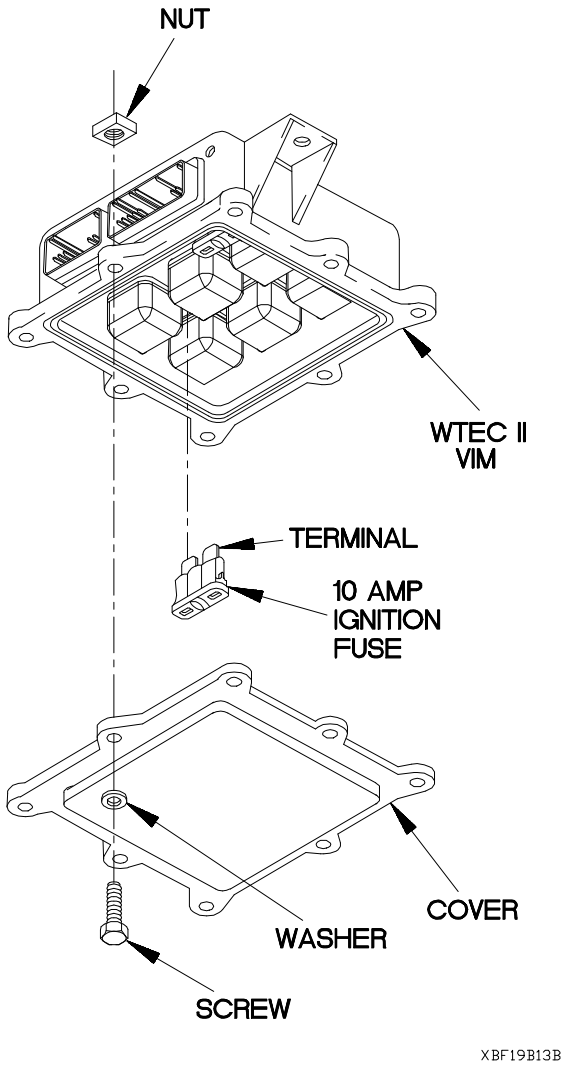


f19B. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DOES NOT ILLUMINATE (CONT)

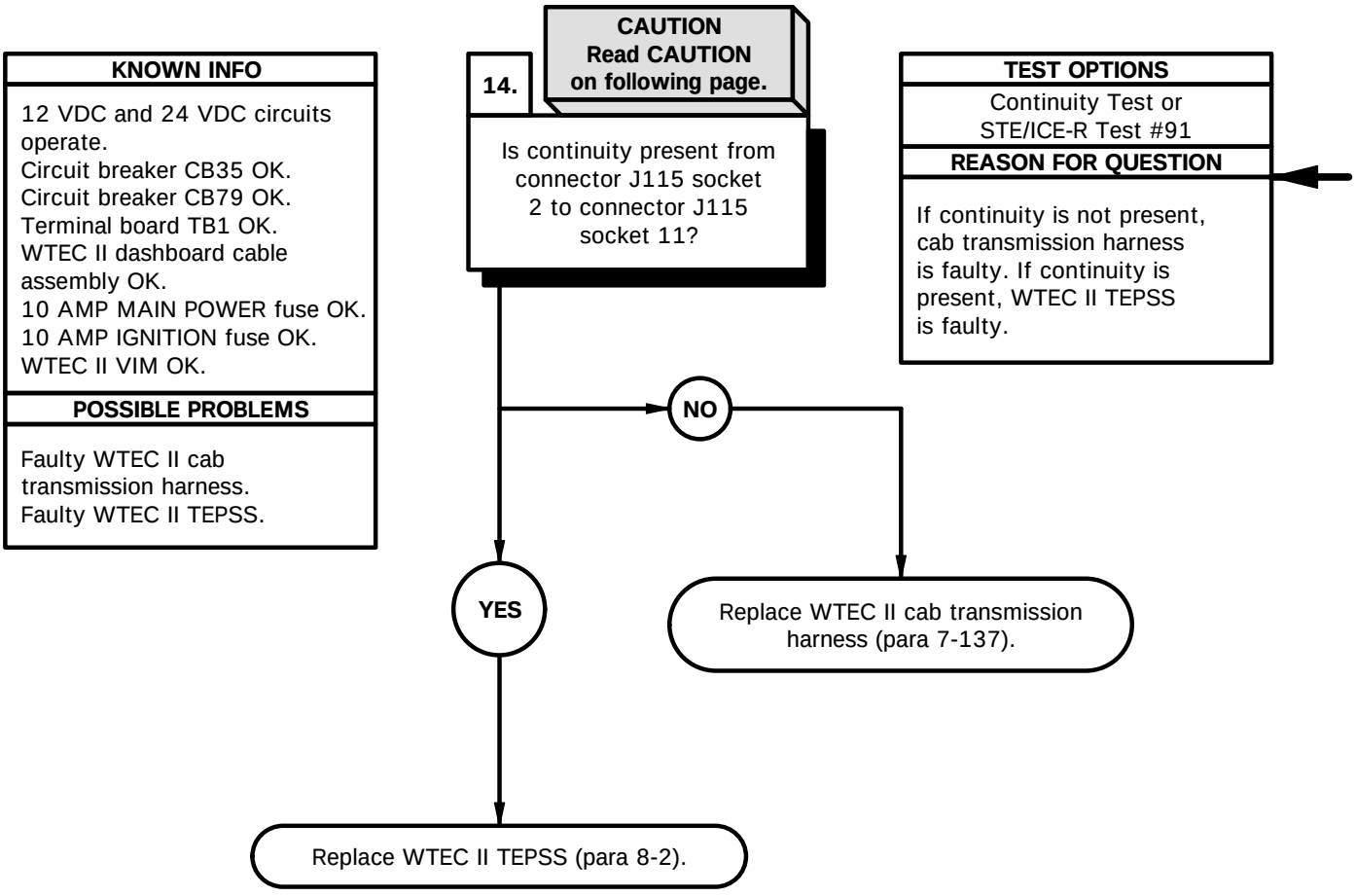


CONTINUITY TEST

(1) Remove seven screws and washers from WTEC II VIM cover.
(2) Remove screw, washer, cover, and nut from WTEC II VIM.
(3) Remove 10 AMP IGNITION fuse from WTEC II VIM.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to one terminal on 10 AMP IGNITION fuse.
(6) Connect negative (-) probe of multimeter to other terminal on 10 AMP IGNITION fuse and note reading on multimeter.
(7) If continuity is not present, replace 10 AMP IGNITION fuse (para 8-6).
(8) If continuity is present replace WTEC II VIM (para 8-6).



f19B. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DOES NOT ILLUMINATE (CONT)



CAUTION

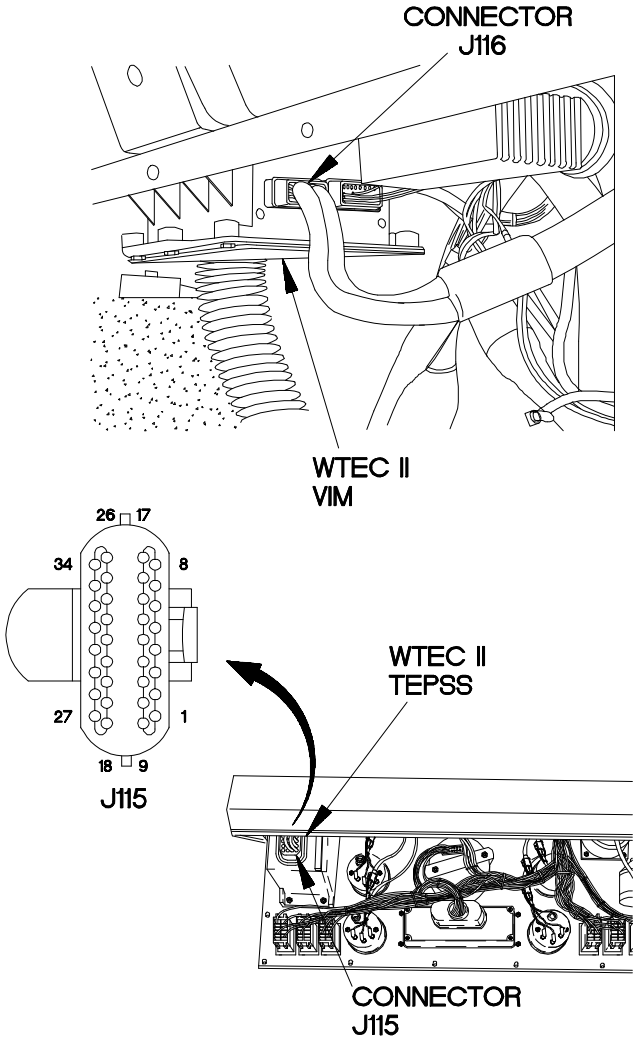
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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) Connect connector J116 to WTEC II VIM.
(2) Tighten screw in connector J116.
(3) Remove instrument panel assembly for access (para 7-15).
(4) Disconnect connector J115 from WTEC II TEPSS.
(5) Set multimeter ohms.
(6) Connect positive (+) probe of multimeter to connector J115 socket 2.
(7) Connect negative (-) probe of multimeter to connector J115 socket 11 and note reading on multimeter.
(8) If continuity is not present, replace WTEC II cab transmission harness (para 7-137).
(9) If continuity is present, replace WTEC II TEPSS (para 8-2).
(10) Install kick panel (para 16-3).
(11) Connect batteries (para 7-57).

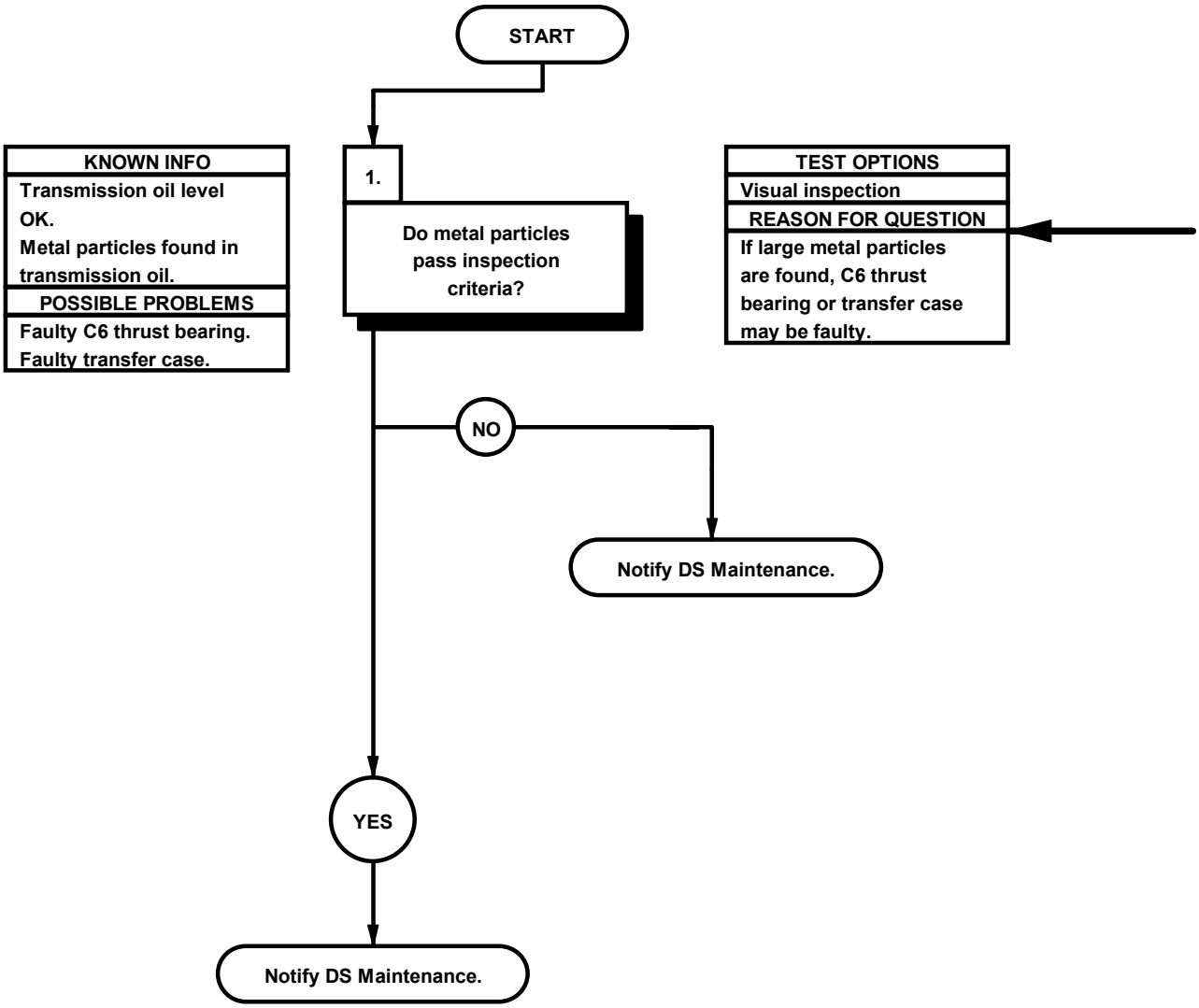


f20. METAL PARTICLES FOUND DURING TRANSMISSION OIL CHANGE

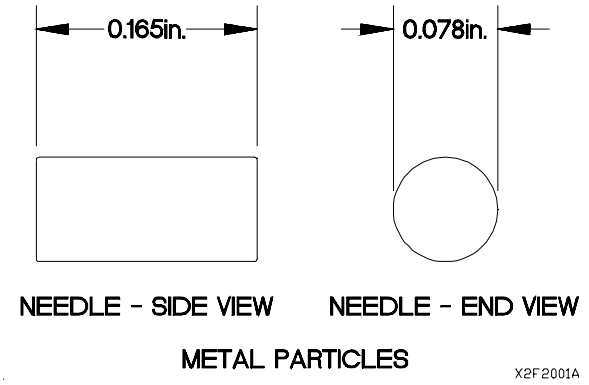
INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)



If metal particles are found on transfer case drain plug that are 0.165 in. (4.19 mm) x 0.078 in. (1.98 mm) or larger, C6 thrust bearing may be faulty. Notify DS Maintenance.



f21. TRANSMISSION DOES NOT SHIFT OR IS SLOW TO SHIFT WHEN COLD

INITIAL SETUP

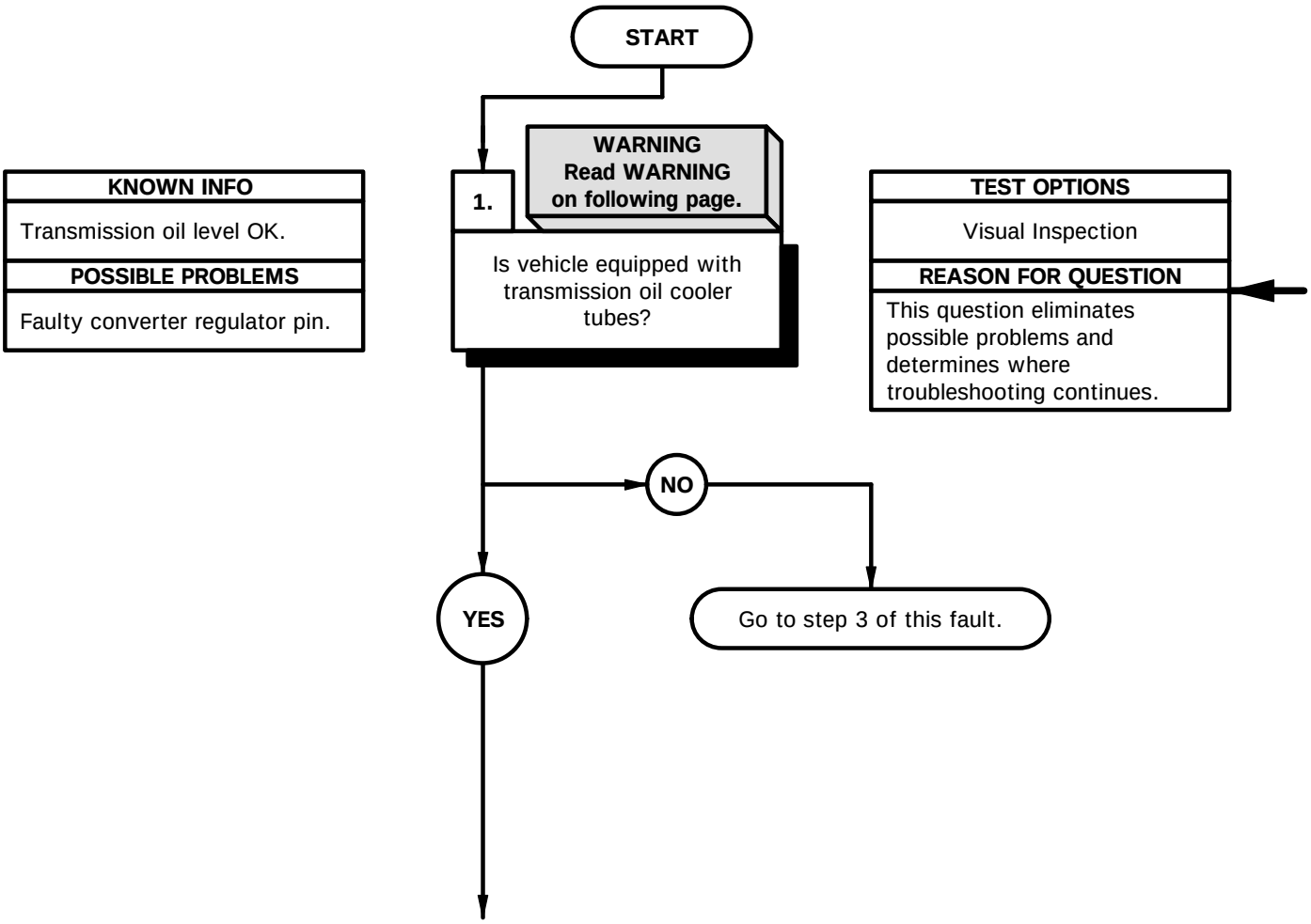
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).

Personnel Required
(2)

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

Tools and Special Tools
Tool Kit, Genl, Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Goggles, Industrial (Item 15, Appendix C)

Materials/Parts
Adapter, Pipe to Tube (Item 1, Appendix D)
Packing, Preformed (Item 184, Appendix G)

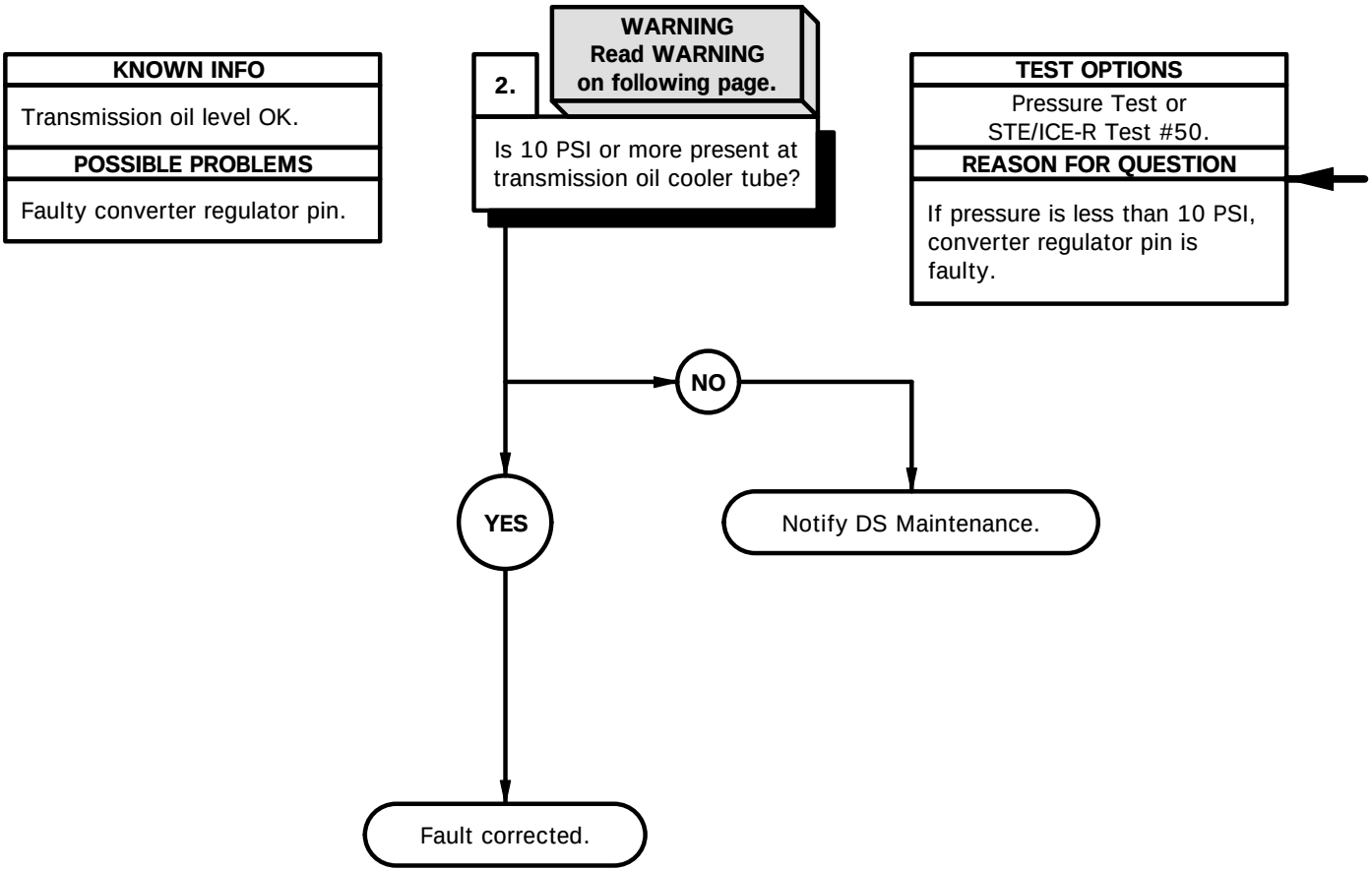


WARNING

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

(1) Check to see if vehicle is equipped with transmission oil cooler tubes.
(2) If vehicle is not equipped with transmission oil cooler tubes, go to step 3 of this fault.

f21. TRANSMISSION DOES NOT SHIFT OR IS SLOW TO SHIFT WHEN COLD (CONT)



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.

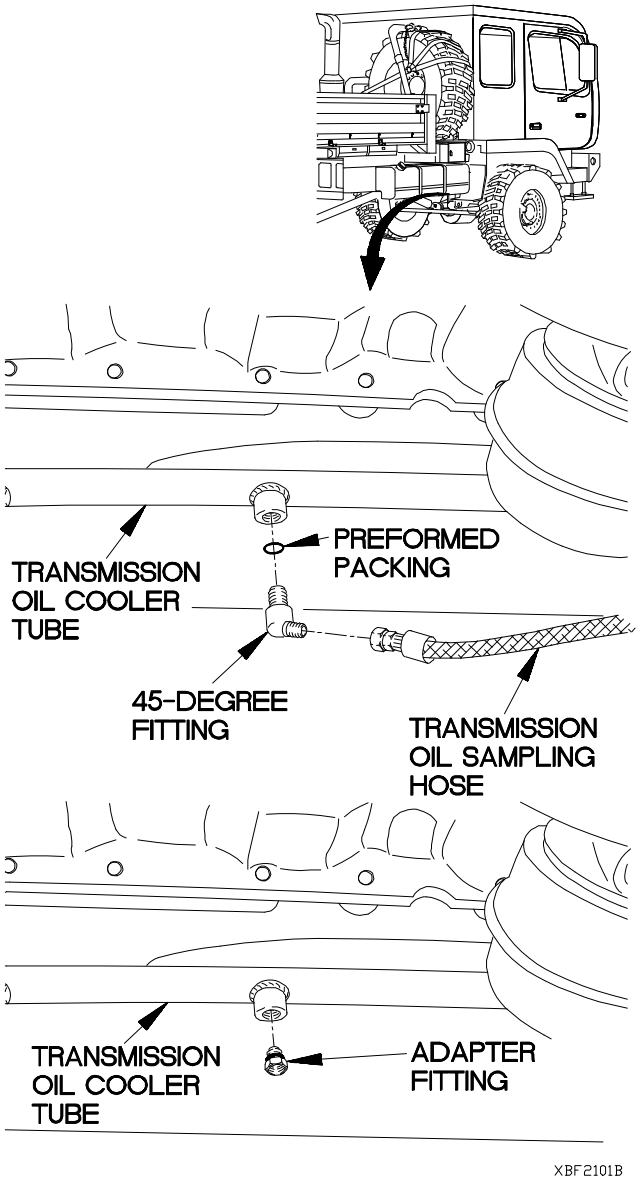
PRESSURE TEST

(1) Place drain pan under transmission oil cooler tube.
(2) Disconnect transmission oil sampling hose from 45 degree fitting.

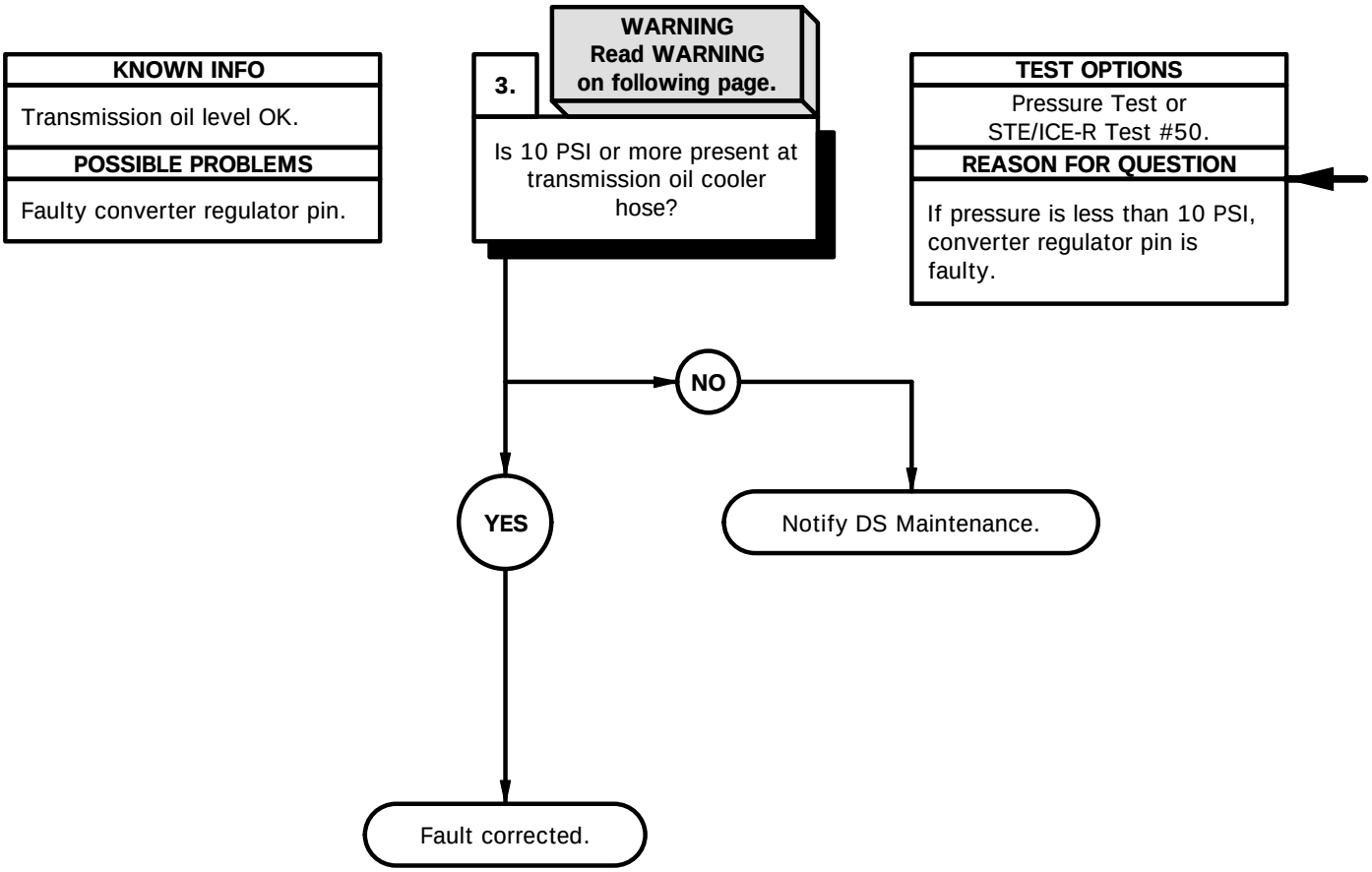
NOTE

Note orientation of 45 degree fitting prior to removal.

(3) Remove 45 degree fitting from transmission oil cooler tube.
(4) Remove preformed packing from 45 degree fitting. Discard preformed packing.
(5) Install adapter fitting in transmission oil cooler tube.
(6) Install STE/ICE-R 0-1000 PSI transducer in adapter fitting.
(7) Start engine (TM 9-2320-366-10-1).
(8) Perform STE/ICE-R Test # 50 and note reading on STE/ICE-R.
(9) If pressure is less than 10 PSI, notify DS Maintenance.
(10) Shut down engine (TM 9-2320-366-10-1).
(11) Remove STE/ICE-R 0-1000 PSI transducer from adapter fitting.
(12) Remove adapter fitting from transmission oil cooler tube.
(13) Install preformed packing on 45 degree fitting.
(14) Install 45 degree fitting in transmission oil cooler tube.
(15) Connect transmission oil sampling hose to 45 degree fitting.
(16) Remove drain pan from under oil cooler tube.



f21. TRANSMISSION DOES NOT SHIFT OR IS SLOW TO SHIFT WHEN COLD (CONT)



WARNING

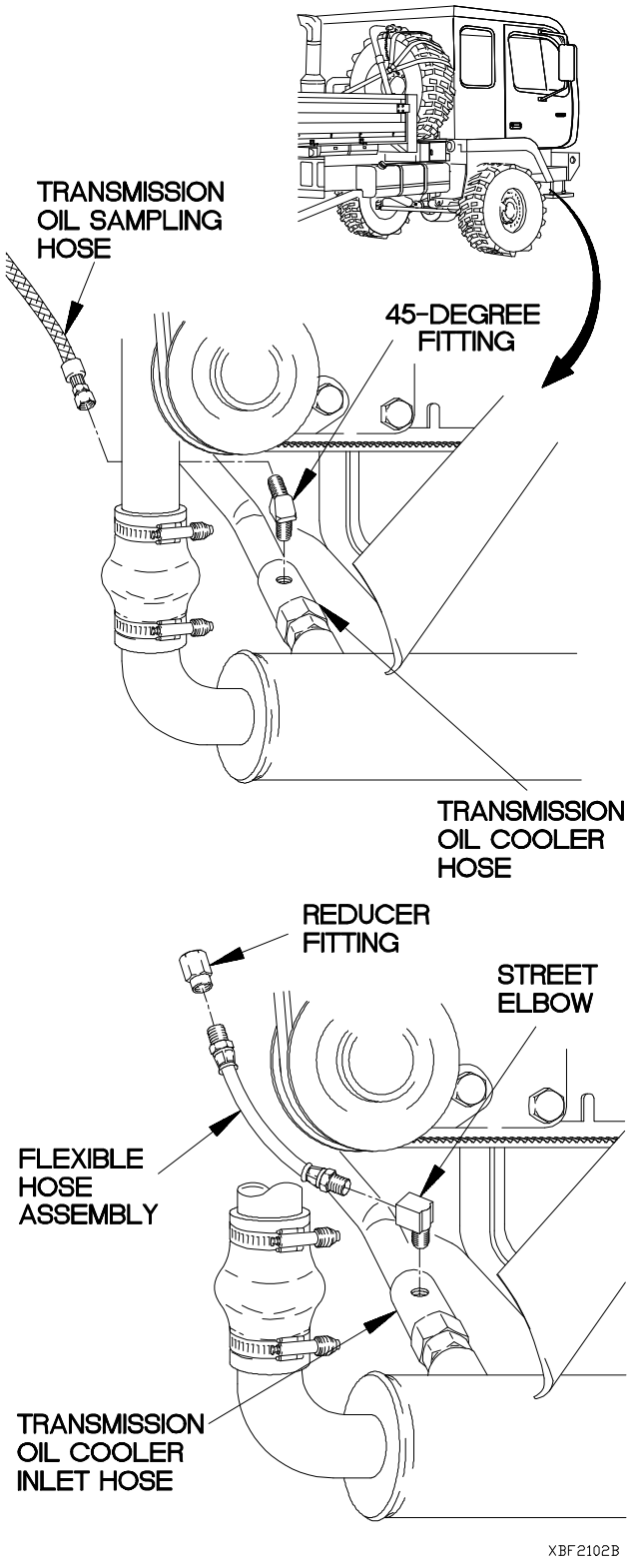
Prolonged contact with lubricating oil (MIL-L-2104) may cause a skin rash. Skin and clothing that come in contact with lubricating oil should be thoroughly washed immediately. Saturated clothing should be removed immediately. Areas in which lubricating oil is used should be well ventilated to keep fumes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

PRESSURE TEST

(1) Place drain pan under transmission oil cooler hose.
(2) Disconnect transmission oil sampling hose from 45 degree fitting.

NOTE
Note orientation of 45 degree fitting prior to removal.

(3) Remove 45 degree fitting from transmission oil cooler hose.
(4) Install street elbow on transmission oil cooler hose.
(5) Connect flexible hose assembly to street elbow.
(6) Install reducer fitting on flexible hose assembly.
(7) Install STE/ICE-R 0-1000 PSI transducer on reducer fitting.
(8) Start engine (TM 9-2320-366-10-1).
(9) Perform STE/ICE-R Test # 50 and note reading on STE/ICE-R.
(10) If pressure is less than 10 PSI, notify DS Maintenance.
(11) Shut down engine (TM 9-2320-366-10-1).
(12) Remove STE/ICE-R 0-1000 PSI transducer from reducer fitting.
(13) Remove reducer fitting from flexible hose assembly.
(14) Disconnect flexible hose assembly from street elbow.
(15) Remove street elbow from transmission oil cooler hose.
(16) Install 45 degree fitting on transmission oil cooler hose.
(17) Connect transmission oil sampling hose to 45 degree fitting.
(18) Remove drain pan from under oil cooler hose.



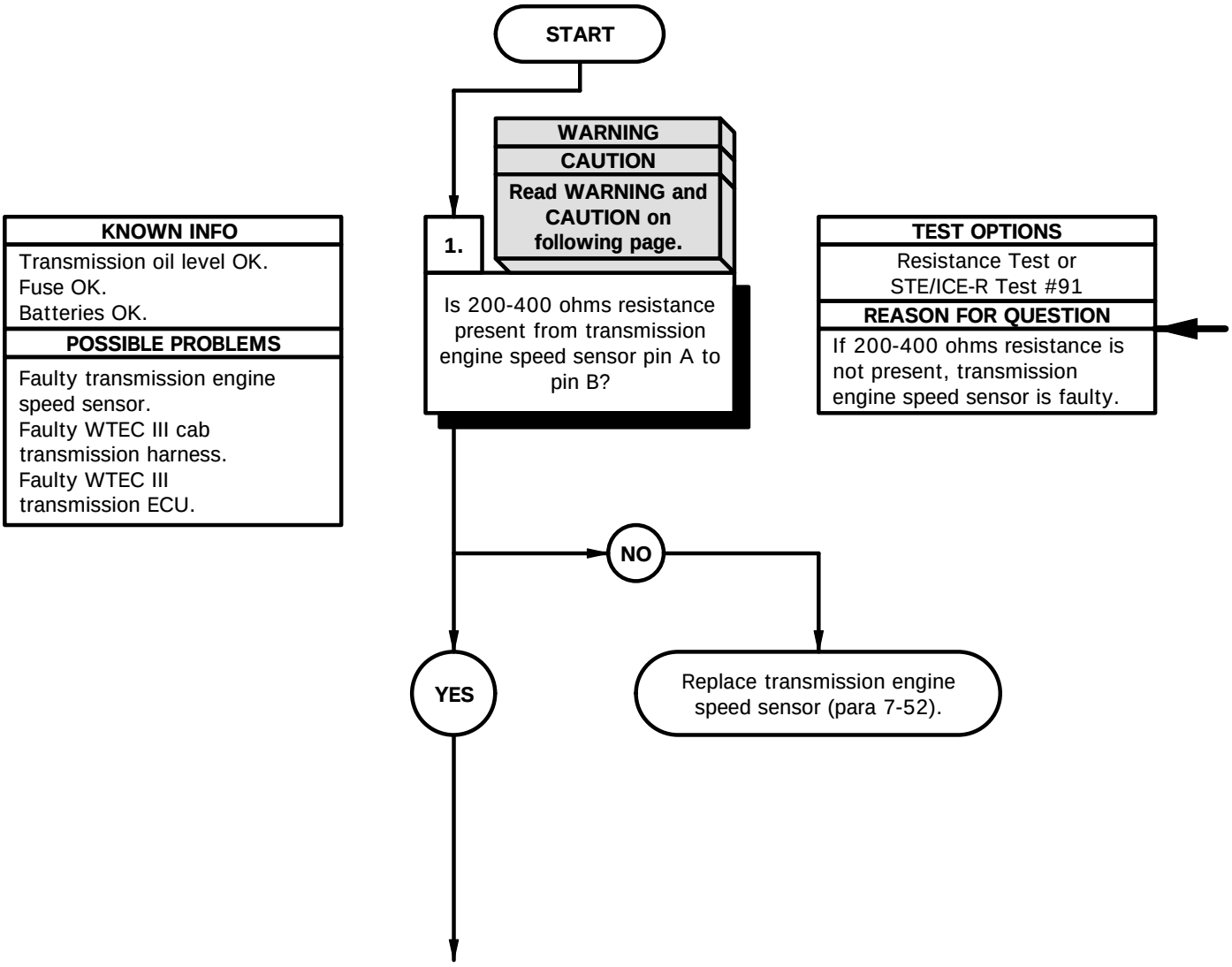
f22. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 14

INITIAL SETUP

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

References
TM 9-4910-571-12&P

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B)
STE/ICE-R (Item 41, Appendix C)



WARNING

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

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.

RESISTANCE TEST

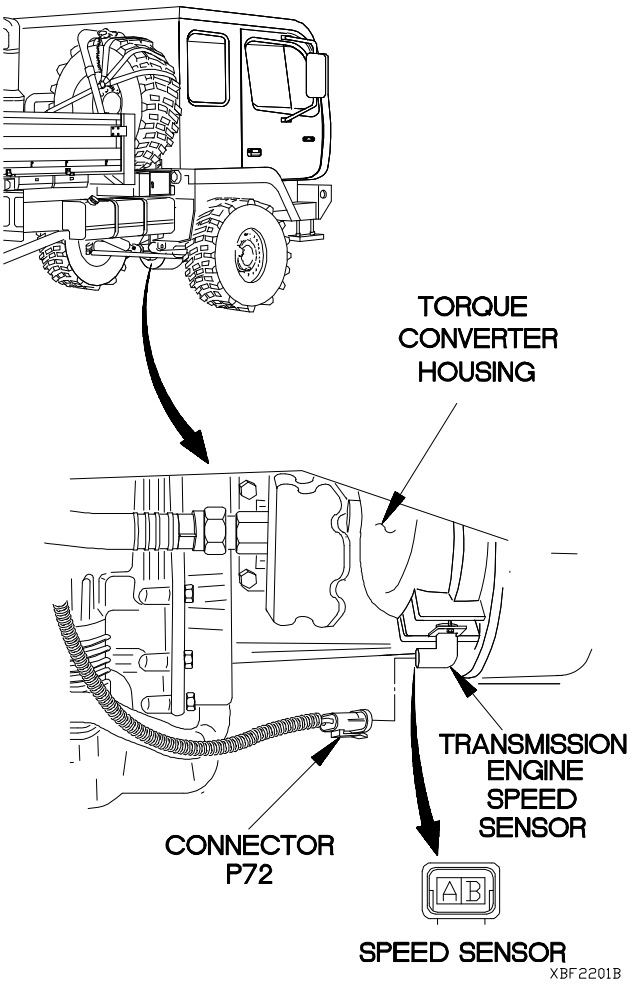
(1) Disconnect connector P72 from transmission engine speed sensor.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to pin A of transmission engine speed sensor.

NOTE

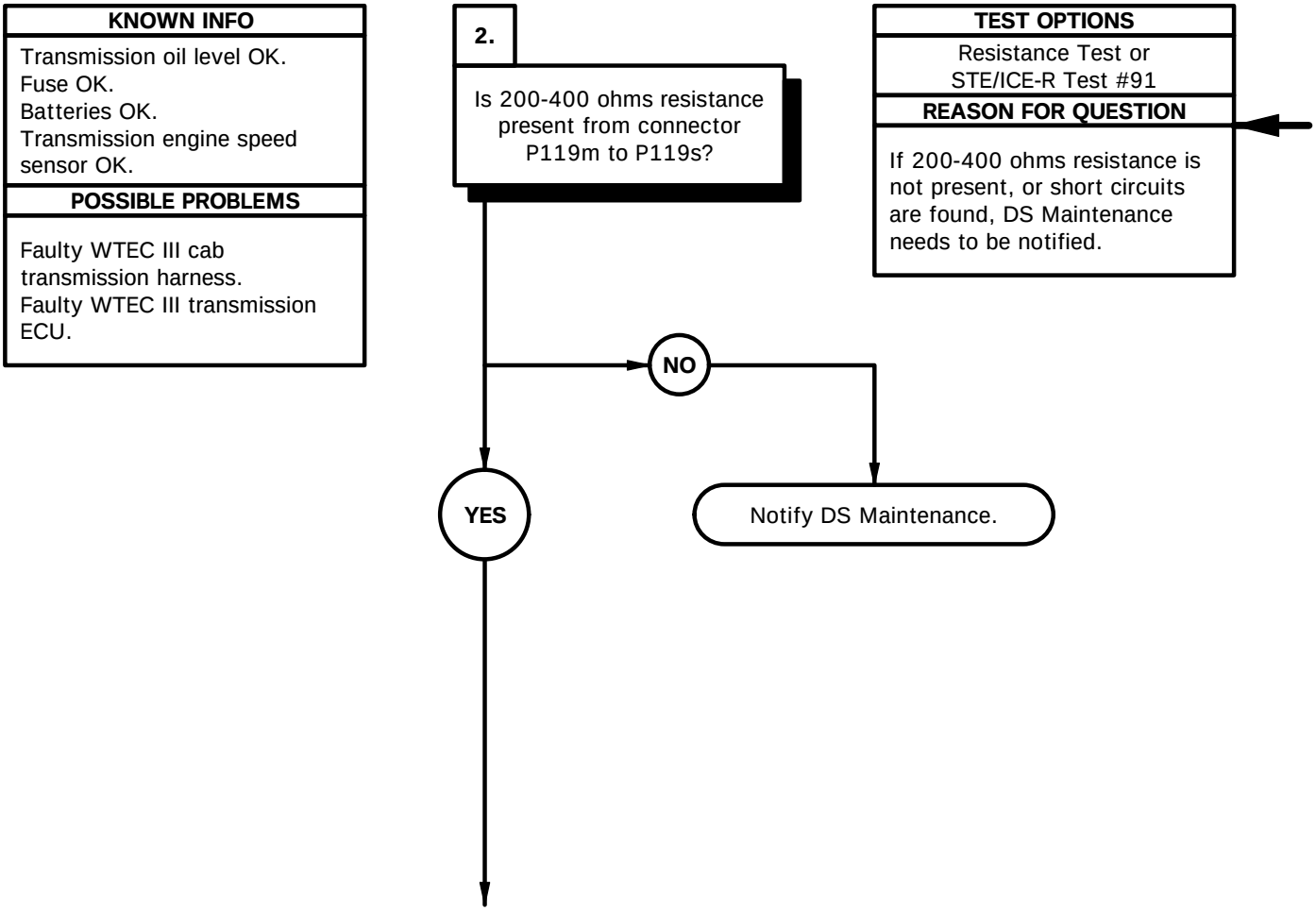
A good transmission engine speed sensor will return a reading of 200-400 ohms resistance as follows:

a. 200 ohms at - 40° F (- 40° C)
b. 300 ohms at 68° F (20° C)
c. 400 0ohms at 230° F (110° C)

(4) Connect negative (-) probe of multimeter to pin B of transmission engine speed sensor and note reading on multimeter.
(5) If good resistance is not noted, replace transmission engine speed sensor (para 7-52).
(6) Connect connector P72 to transmission engine speed sensor.

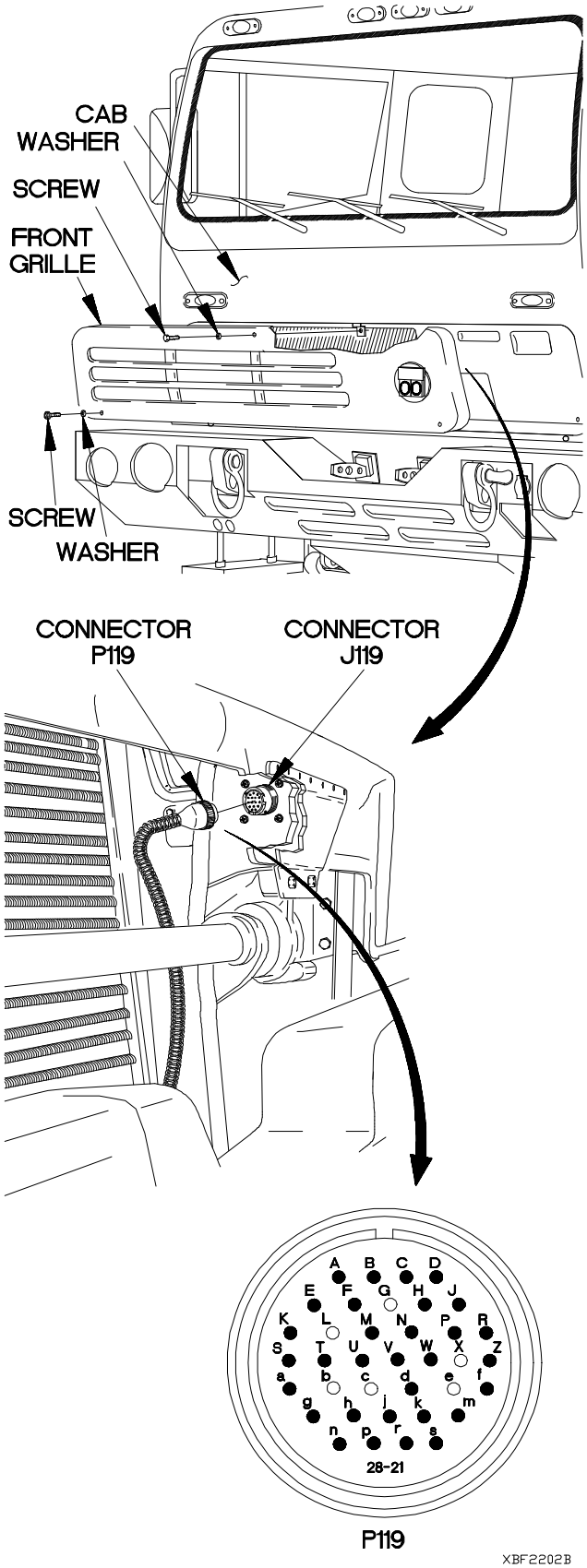


f22. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 14 (CONT)

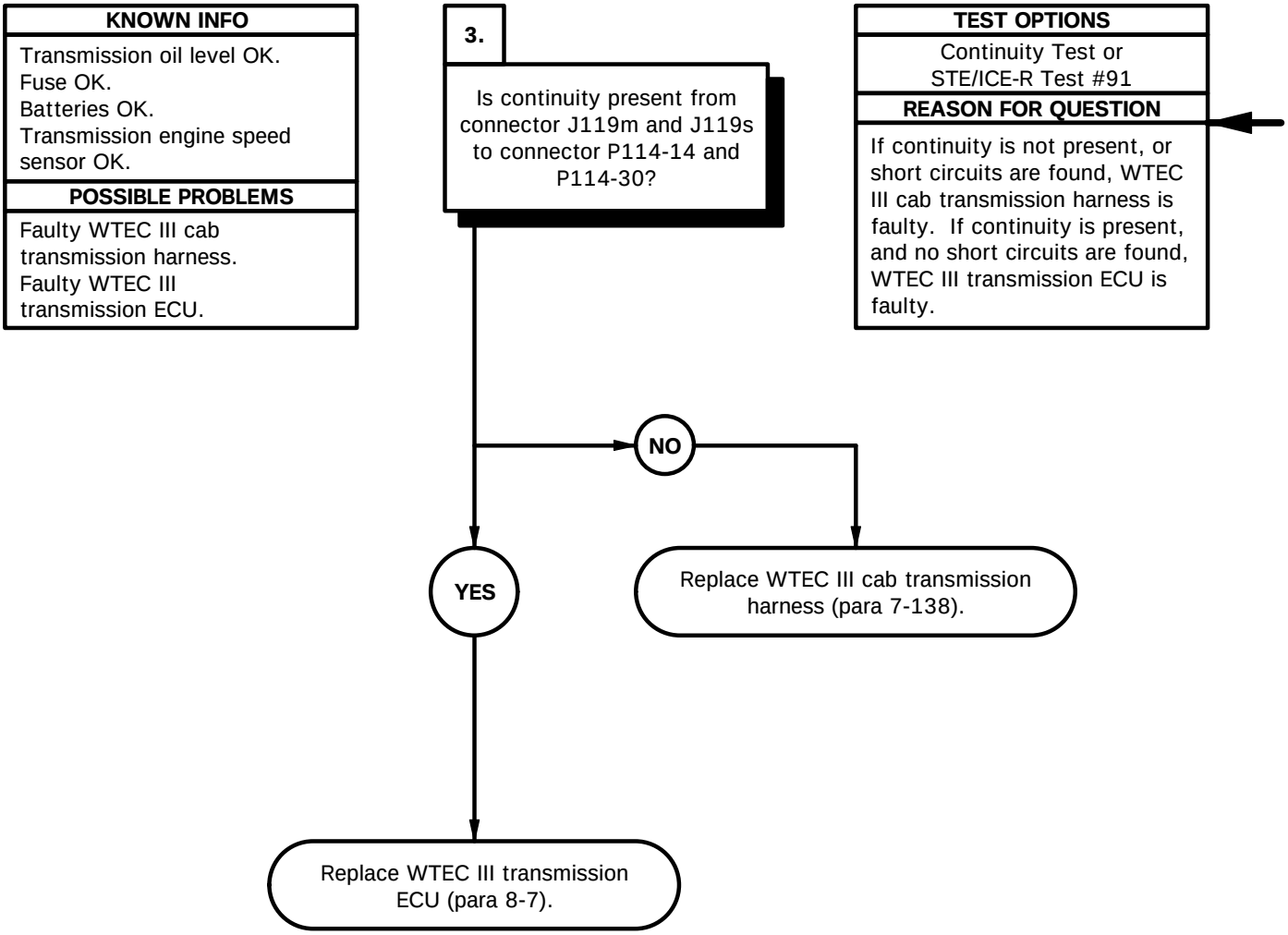


RESISTANCE TEST

(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) Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter to connector P119m.
(7) Connect negative (-) probe of multimeter to connector P119s and note reading on multimeter.
(8) Connect negative (-) probe of multimeter to all other pins in connector P119, one at a time, and note reading on multimeter.
(9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(10) Connect positive (+) probe of multimeter to connector P119s.
(11) Connect negative (-) probe of multimeter to all other pins in connector P119 (except P119m), one at a time, and note reading on multimeter.
(12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(13) If 200-400 ohms resistance in not present in step 7, or continuity is present in step 8, 9, 11, or 12, notify DS Maintenance.

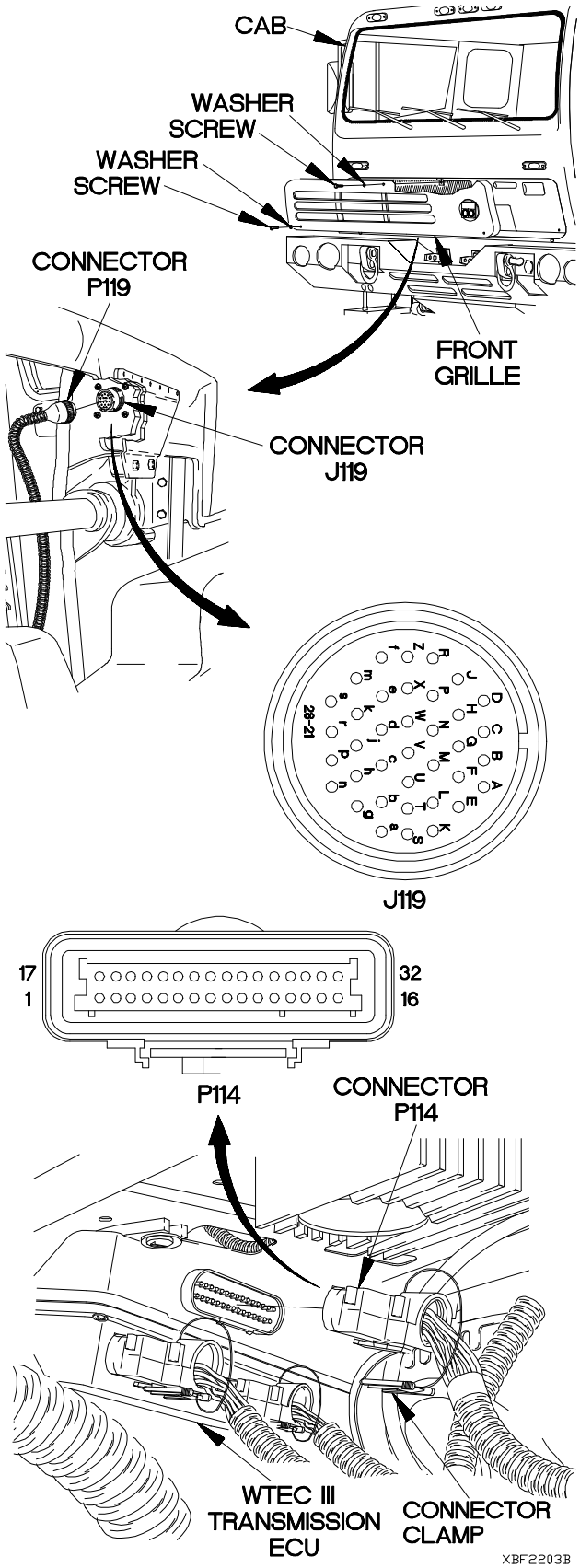


f22. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 14 (CONT)



CONTINUITY TEST

(1) Remove kick panel (para 16-3).
(2) Disconnect connector clamp from connector P114.
(3) Disconnect connector P114 from WTEC III transmission ECU.
(4) Install jumper wire from connector J119m to J119s.
(5) Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter to connector P114-14.
(7) Connect negative (-) probe of multimeter to connector P114-30 and note reading on multimeter.
(8) Connect negative (-) probe of multimeter to all other sockets in connector P114, one at a time, and note reading on multimeter.
(9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(10) Connect positive (+) probe of multimeter to connector P114-30.
(11) Connect negative (-) probe of multimeter to all other sockets in connector P114 (except P114-14), one at a time, and note reading on multimeter.
(12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(13) If continuity is not present in step 7, or continuity is present in step 8, 9, 11, or 12, replace WTEC III cab transmission harness (para 7-138).
(14) If continuity is present in step 7, and continuity is not present in step 8, 9, 11, and 12, replace WTEC III transmission ECU (para 8-7).
(15) Remove jumper wire from connector J119s and J119m.
(16) Connect connector P119 to connector J119.
(17) Position front grille on cab with washer and screw.
(18) Position two washers and screws in front grille.
(19) Tighten screw to 48-60 lb-in. (5-7 N·m).
(20) Tighten two screws to 24 lb-in. (3 N·m).
(21) Connect connector P114 to WTEC III transmission ECU.
(22) Connect connector clamp to connector P114.
(23) Install kick panel (para 16-3).
(24) Clear diagnostic codes (para 8-5).



f23. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 15

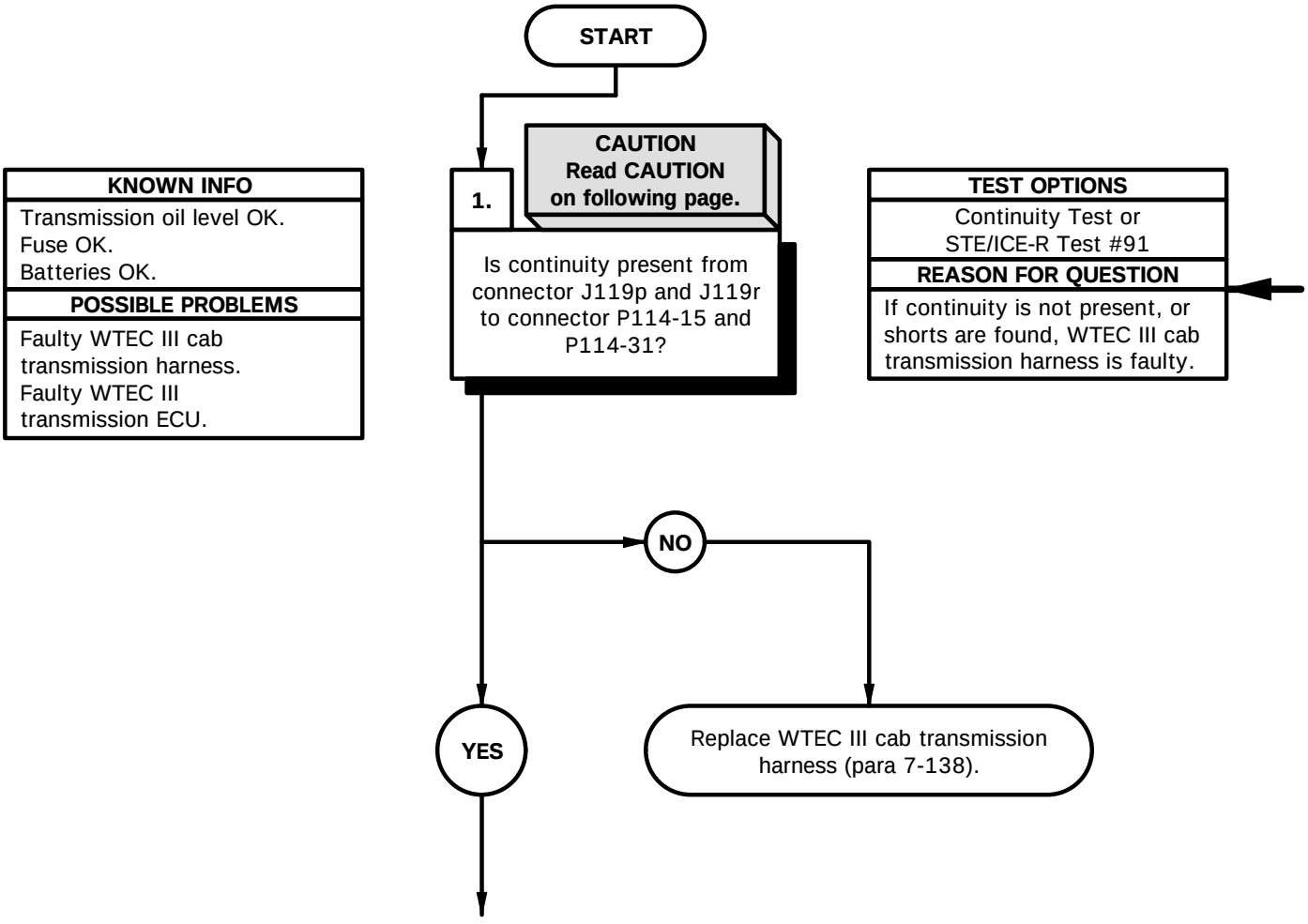
INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

Tools and Special Tools (Cont)
Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B)
STE/ICE-R (Item 41, Appendix C)

References
TM 9-4910-571-12&P



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

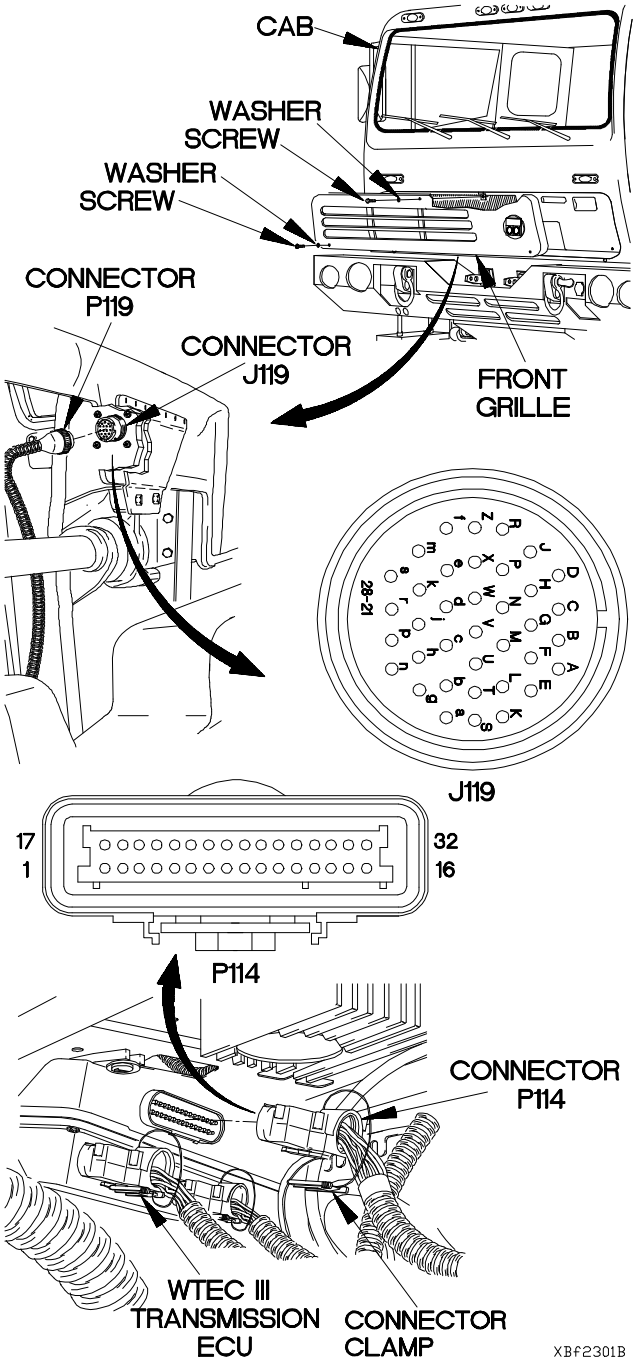
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

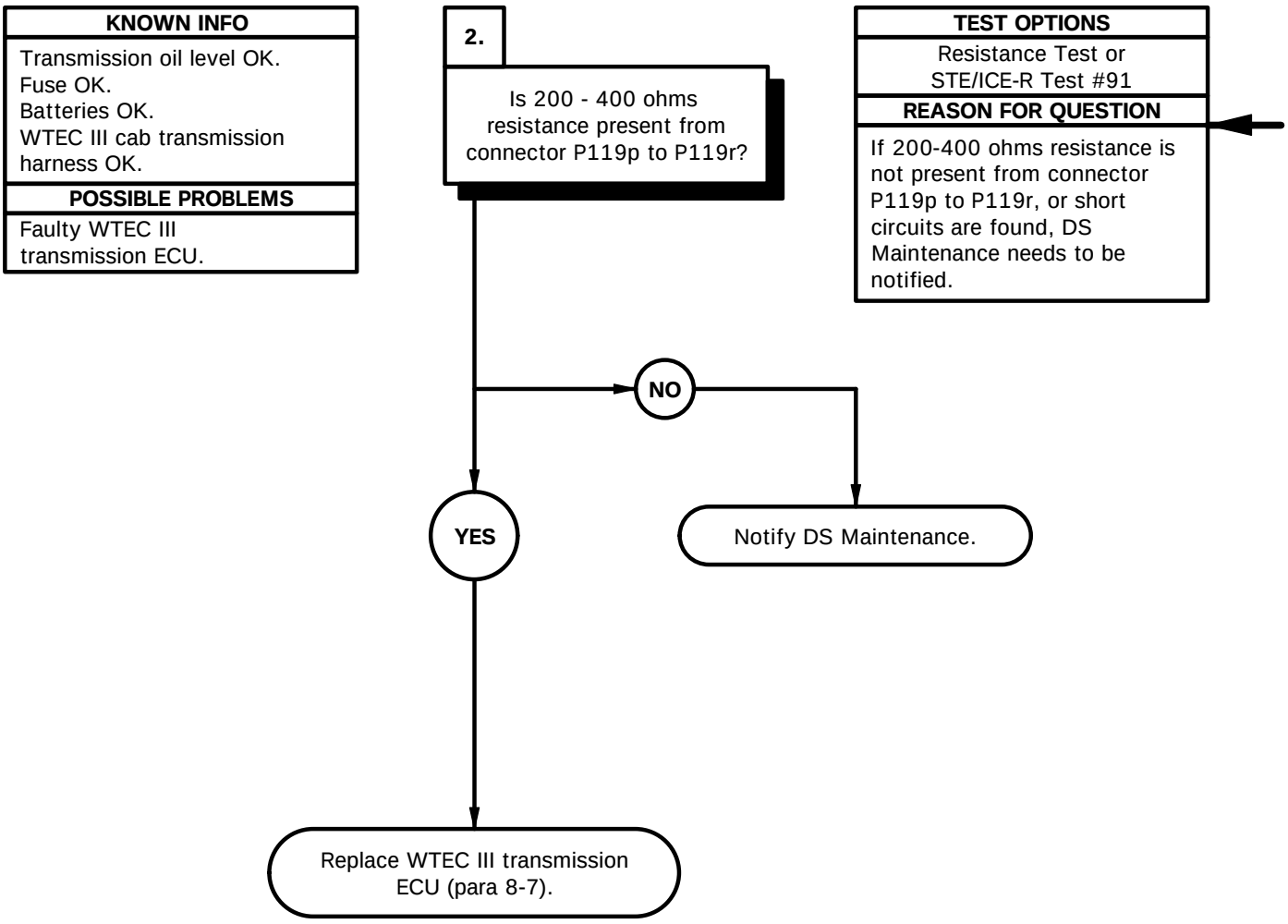
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Remove kick panel (para 16-3).
(6) Disconnect connector clamp from connector P114.
(7) Disconnect connector P114 from WTEC III transmission ECU.
(8) Install jumper wire from connector J119p to J119r.
(9) Set multimeter to ohms.
(10) Connect positive (+) probe of multimeter to connector P114-15.
(11) Connect negative (-) probe of multimeter to connector P114-31 and note reading on multimeter.
(12) Connect negative (-) probe of multimeter to all other sockets in connector P114, one at a time, and note reading on multimeter.
(13) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(14) Remove jumper wire from connector J119r and J119p.
(15) Connect positive (+) probe of multimeter to connector P114-31.
(16) Connect negative (-) probe of multimeter to all sockets in connector P114 (except P114-15), one at a time, and note reading on multimeter.
(17) Connect negative (-) probe of multimeter to ground and note reading on multimeter.

CONTINUITY TEST (Cont)

(18) If continuity is not present in step 11, or continuity is present in step 12, 13, 16, or 17, replace WTEC III cab transmission harness (para 7-138).
(19) Connect connector P114 to WTEC III transmission ECU.
(20) Connect connector clamp to connector P114.
(21) Install kick panel (para 16-3).



f23. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (CONT)



RESISTANCE TEST

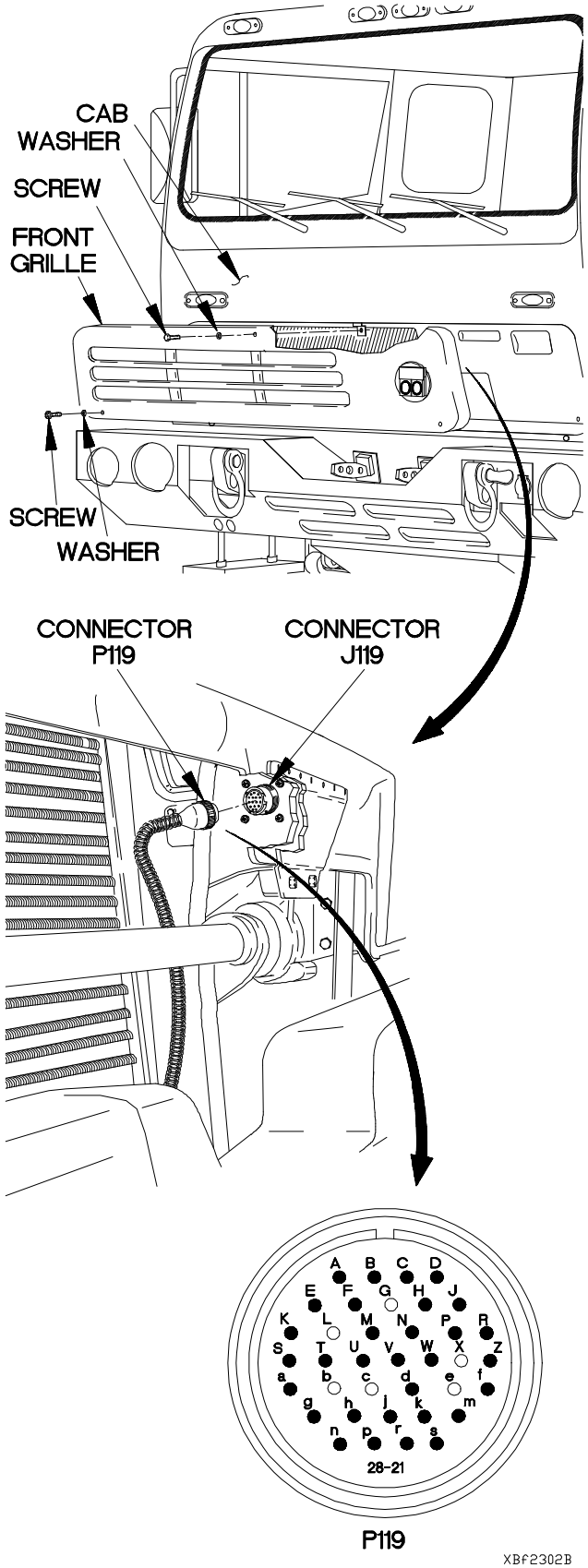
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P119p.
(3) Connect negative (-) probe of multimeter to connector P119r and note reading on multimeter.

NOTE

A good turbine speed sensor will return a reading of 200-400 ohms resistance as follows:

a. 200 ohms at -40°F (-40°C).
b. 300 ohms at 68°F (20°C).
c. 400 ohms at 230°F (110°C).

(4) Connect negative (-) probe of multimeter to all other pins in connector P119, one at a time, and note reading on multimeter.
(5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(6) Connect positive (+) probe of multimeter to connector P119r.
(7) Connect negative (-) probe of multimeter to all pins in connector P119 (except P119p), one at a time, and note reading on multimeter.
(8) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(9) If good resistance is not noted in step 3, or continuity is present in step 4, 5, 7, or 8, notify DS Maintenance.
(10) If good resistance is noted in step 3 and continuity is not present in step 4, 5, 7, or 8, replace WTEC III transmission ECU (para 8-7).
(11) Connect connector P119 to connector J119.
(12) Position front grille on cab with washer and screw.
(13) Position two washers and screws in front grille.
(14) Tighten screw to 48-60 lb-in. (5-7 N·m).
(15) Tighten two screws to 24 lb-in. (3 N·m).
(16) Clear diagnostic codes (para 8-5).



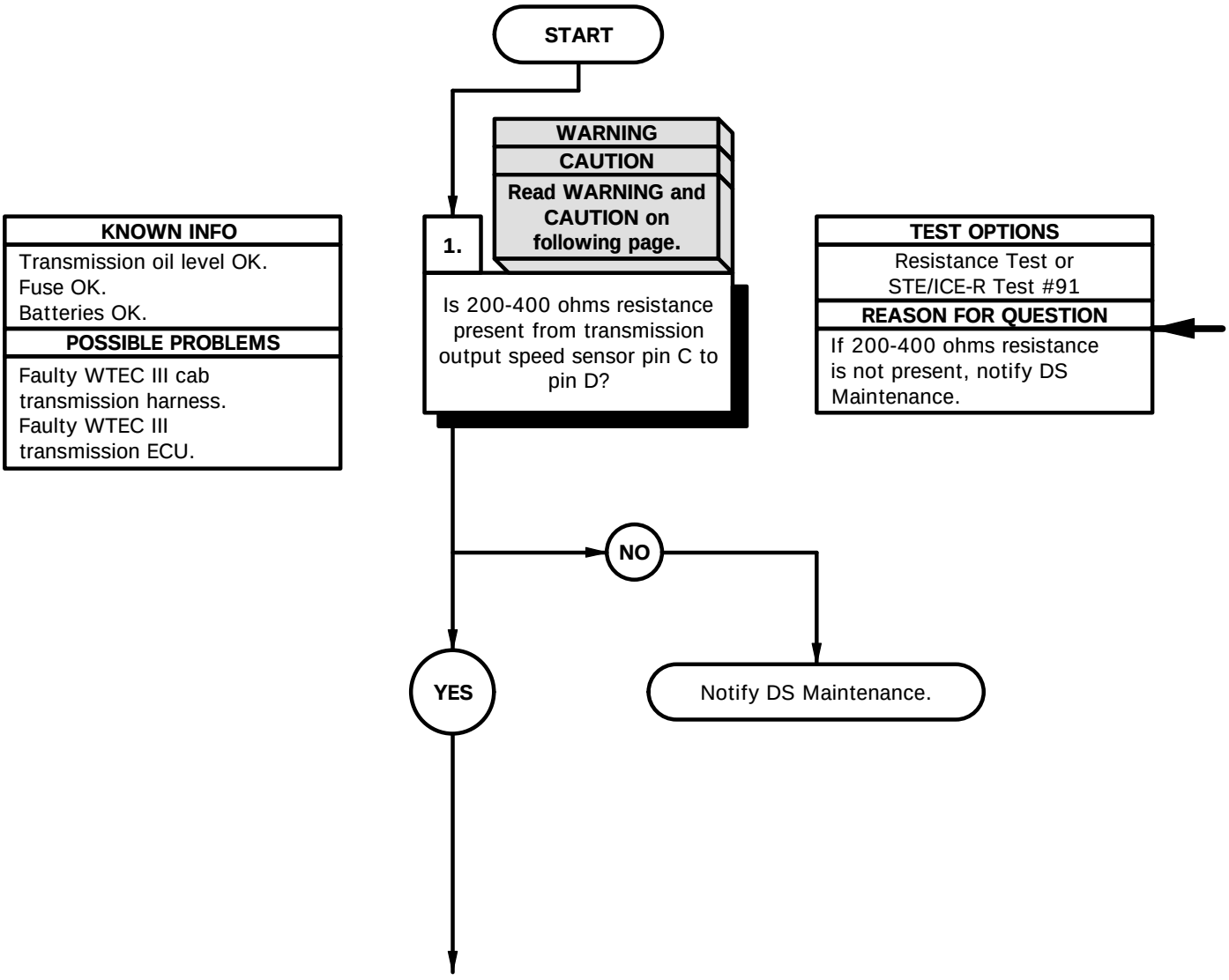
f24. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 16

INITIAL SETUP

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

References
TM 9-4910-571-12&P

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B)
STE/ICE-R (Item 41, Appendix C)



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.

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.

NOTE

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

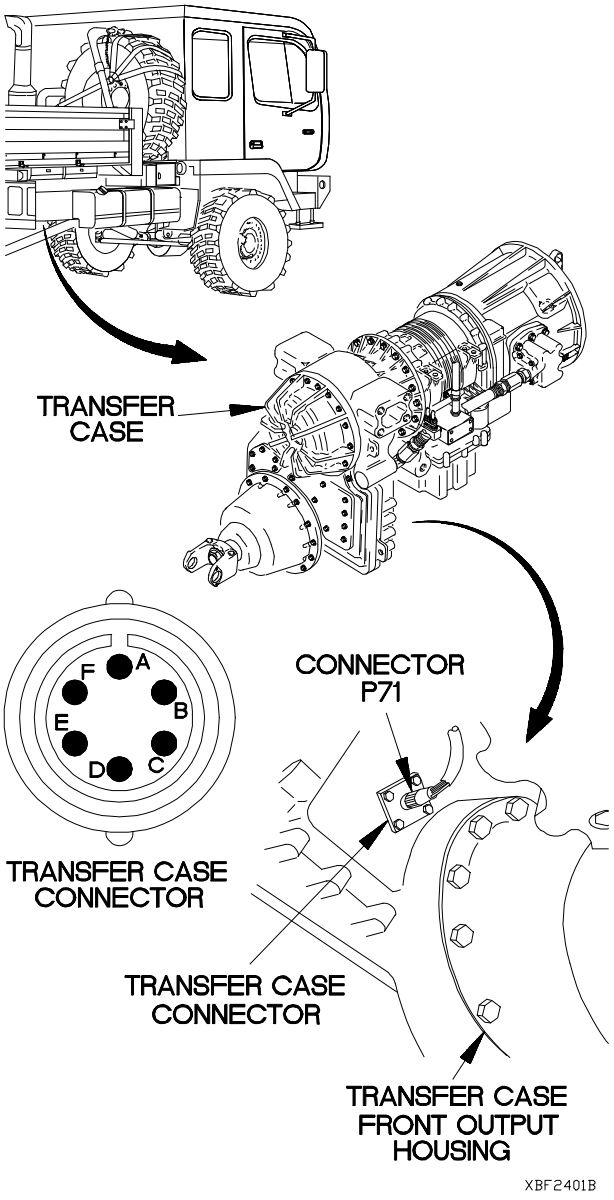
(1) Disconnect output speed sensor connector from transfer case connector.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to pin C of transfer case connector.

NOTE

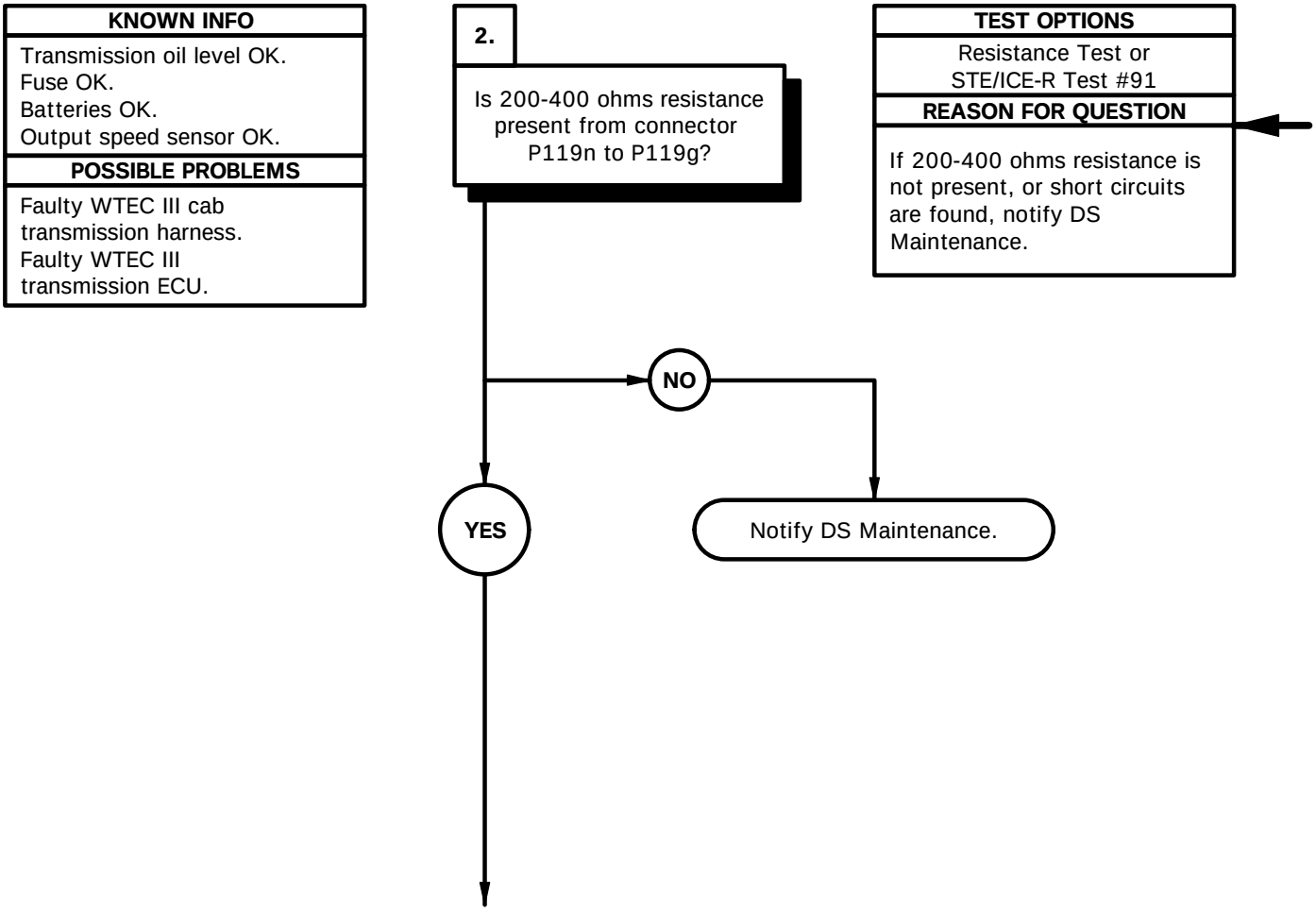
A good output speed sensor will return a reading of 200-400 ohms resistance as follows:

a. 200 ohms at -40° F (-40° C)
b. 300 ohms at 68° F (20° C)
c. 400 ohms at 230° F (110° C)

(4) Connect negative (-) probe of multimeter to pin D of transfer case connector and note reading on multimeter.
(5) If good resistance is not noted, notify DS Maintenance.
(6) Connect output speed sensor connector to transfer case connector.

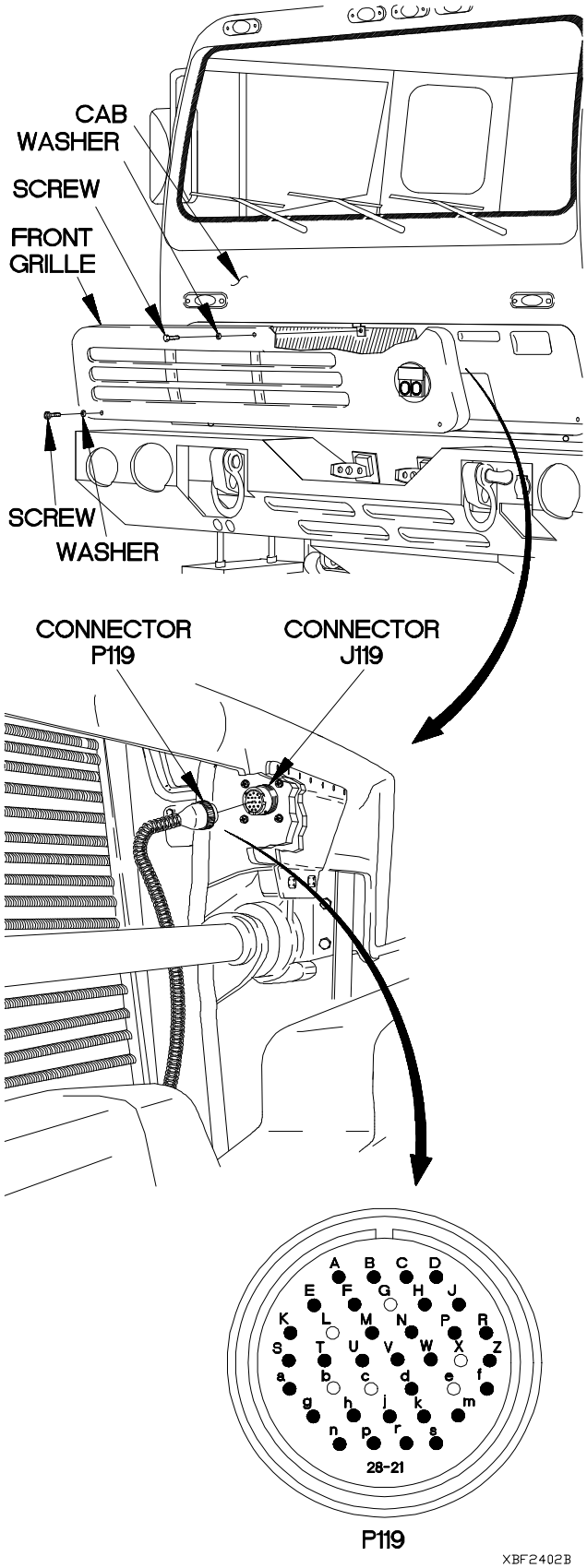


f24. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 16 (CONT)

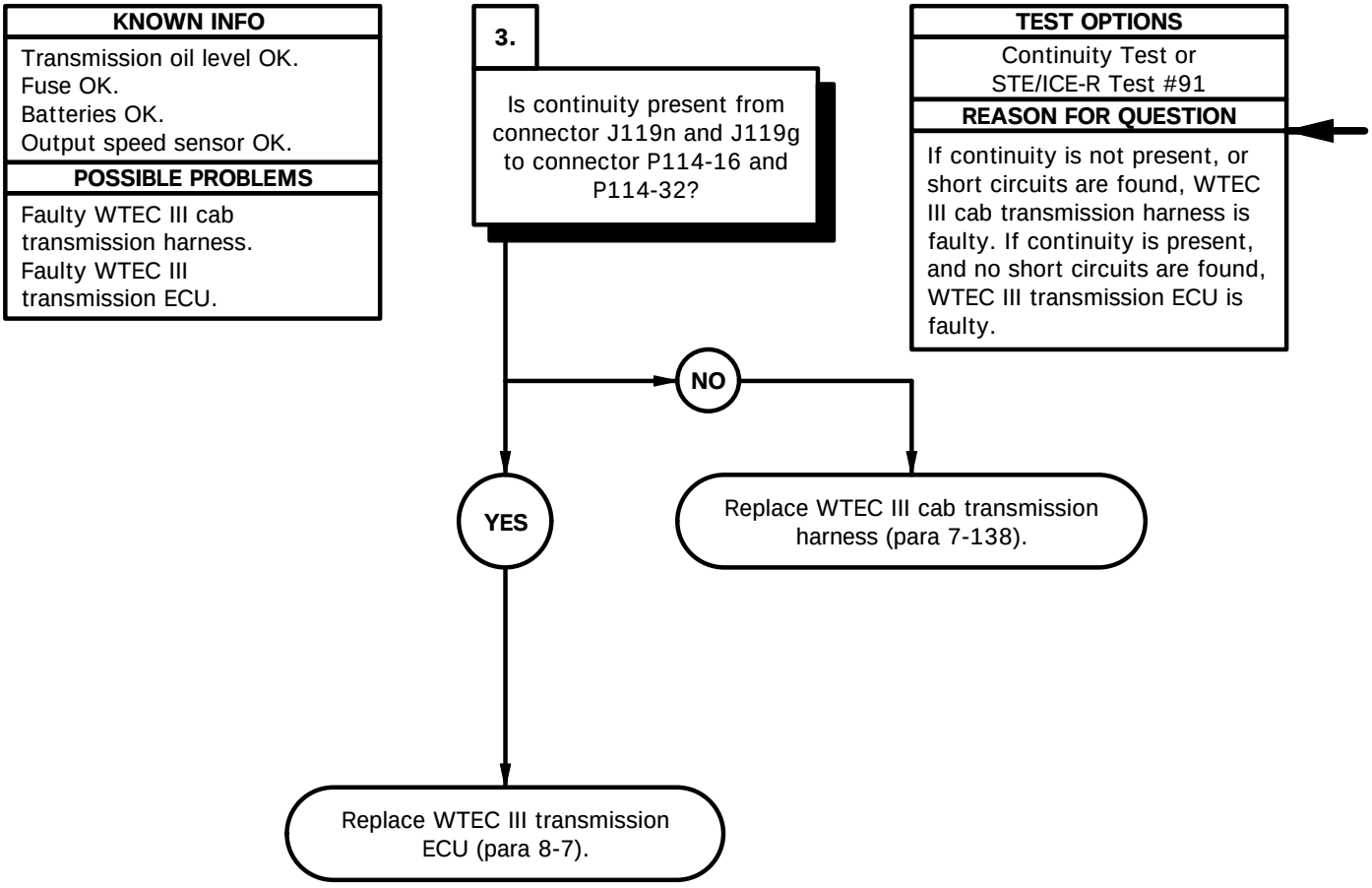


RESISTANCE TEST

(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) Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter to connector P119n.
(7) Connect negative (-) probe of multimeter to connector P119g and note reading on multimeter.
(8) Connect negative (-) probe of multimeter to all other pins in connector P119, one at a time, and note reading on multimeter.
(9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(10) Connect positive (+) probe of multimeter to connector P119g.
(11) Connect negative (-) probe of multimeter to all other pins in connector P119 (except P119n), one at a time, and note reading on multimeter.
(12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(13) If 200-400 ohms resistance is not present in step 7, or continuity is present in step 8, 9, 11, or 12, notify DS Maintenance.

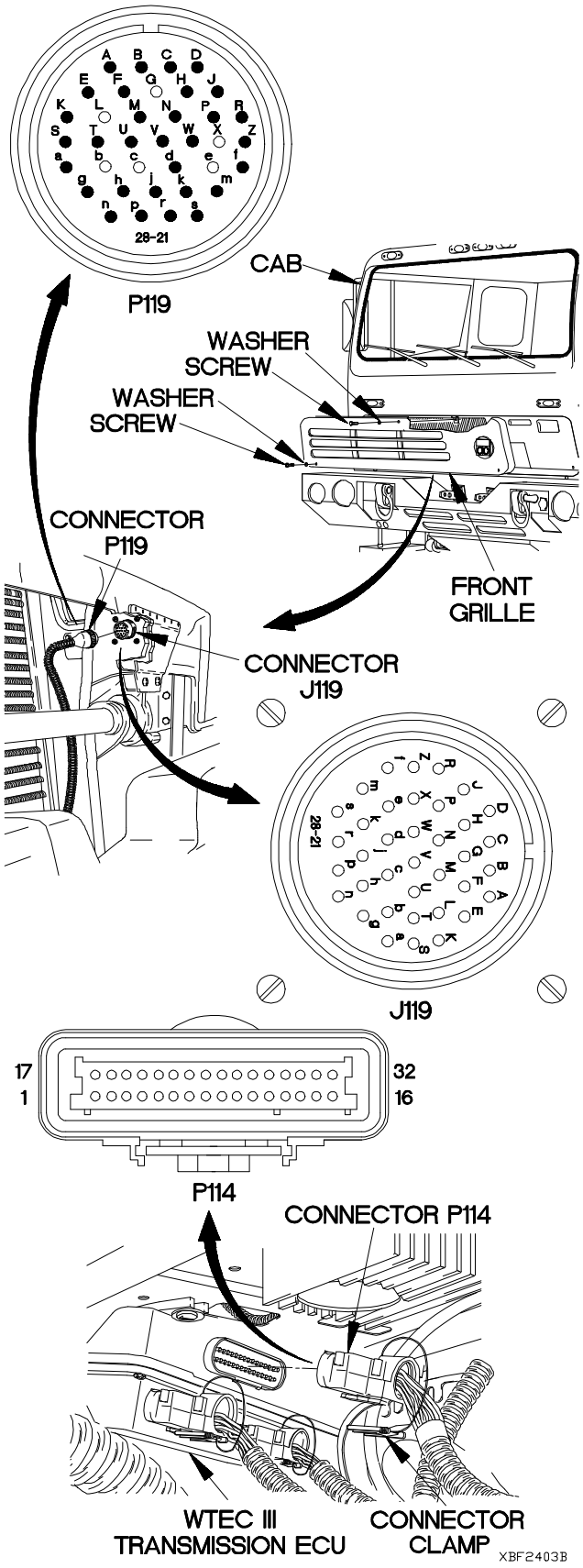


f24. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 16 (CONT)



CONTINUITY TEST

(1) Remove kick panel (para 16-3).
(2) Disconnect connector clamp from connector P114.
(3) Disconnect connector P114 from WTEC III transmission ECU.
(4) Install jumper wire from connector J119g to J119n.
(5) Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter to connector P114-32.
(7) Connect negative (-) probe of multimeter to connector P114-16 and note reading on multimeter.
(8) Connect negative (-) probe of multimeter to all other sockets in connector P114, one at a time, and note reading on multimeter.
(9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(10) Connect positive (+) probe of multimeter to connector P114-16.
(11) Connect negative (-) probe of multimeter to all other sockets in connector P114 (except P114-32), one at a time, and note reading on multimeter.
(12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(13) If continuity is not present in step 7, or continuity is present in step 8, 9, 11, or 12, replace WTEC III cab transmission harness (para 7-138).
(14) If continuity is present in step 7, and continuity is not present in step 8, 9, 11, and 12, replace WTEC III transmission ECU (para 8-7).
(15) Remove jumper wire from connector J119n and J119g.
(16) Connect connector P119 to connector J119.
(17) Position front grille on cab with washer and screw.
(18) Position two washers and screws in front grille.
(19) Tighten screw to 48-60 lb-in. (5-7 N·m).
(20) Tighten two screws to 24 lb-in. (3 N·m).
(21) Connect connector P114 to WTEC III transmission ECU.
(22) Connect connector clamp to connector P114.
(23) Install kick panel (para 16-3).
(24) Clear diagnostic codes (para 8-5).



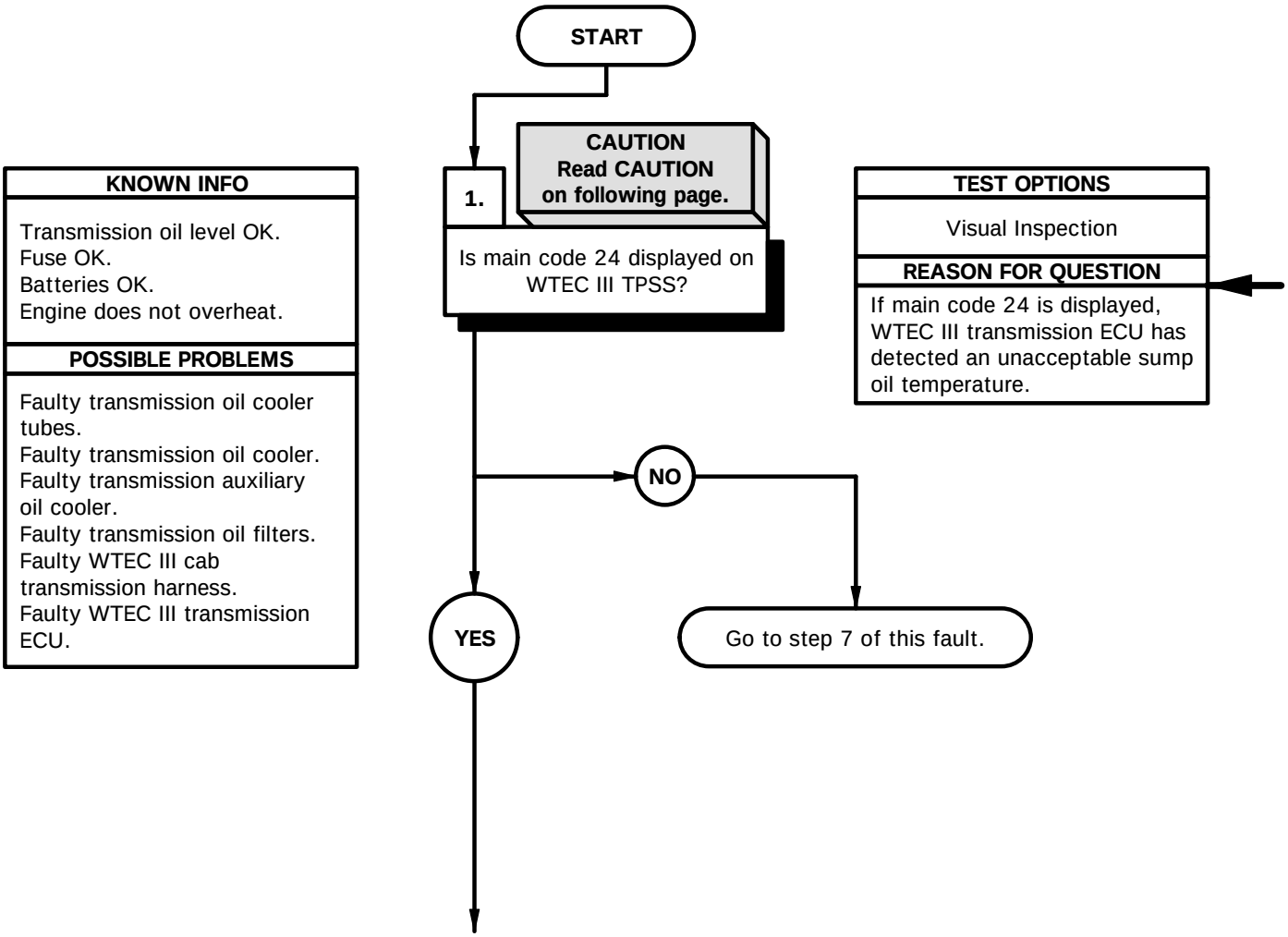
f25. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 AND/OR 33 AND ANY SUB CODE

INITIAL SETUP

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

References
TM 9-4910-571-12&P

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Pan, Drain (Item 24, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
STE/ICE-R (Item 41, Appendix C)

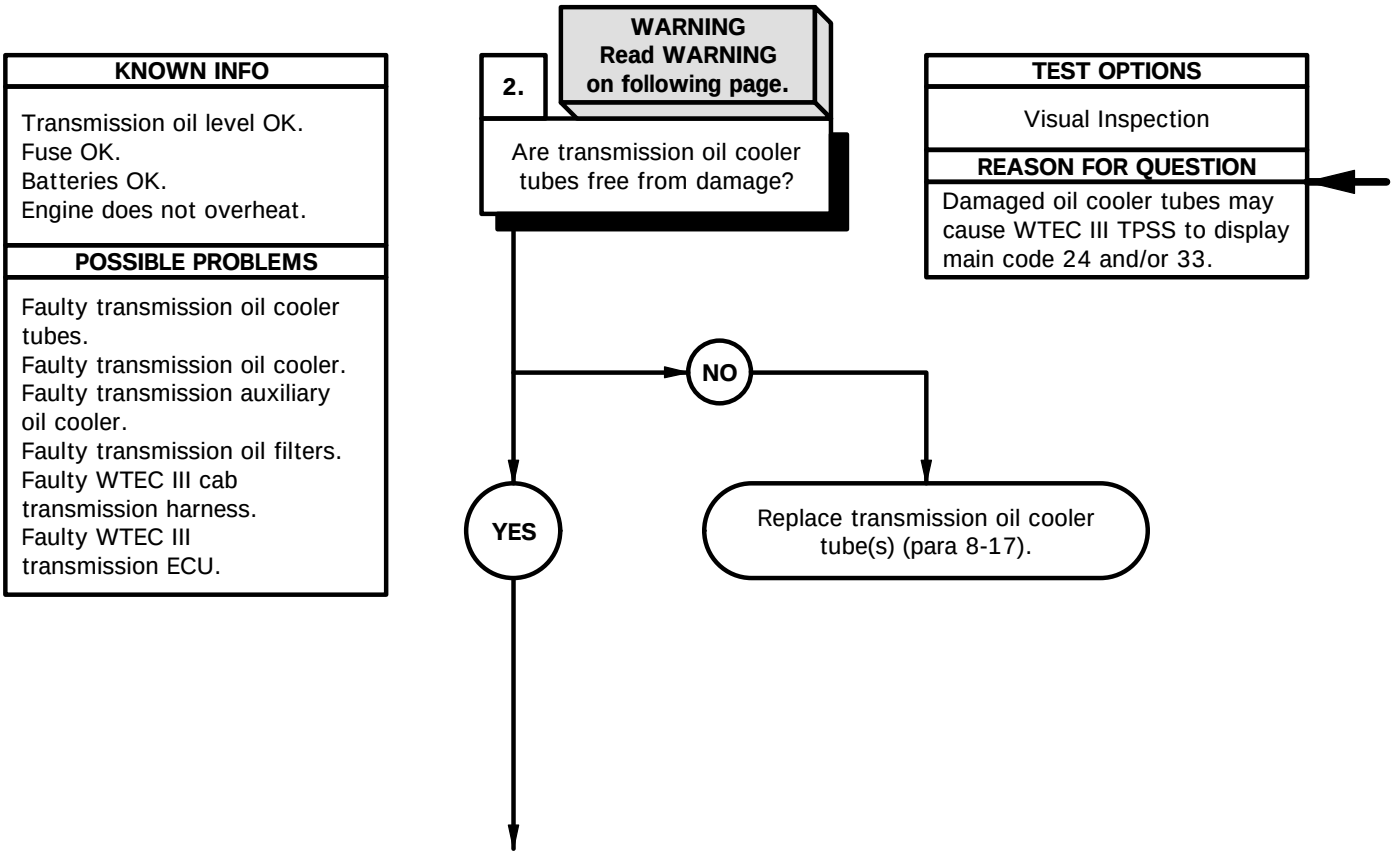


CAUTION

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) Position master power switch to on (TM 9-2320-366-10-1).
(2) Check to see if main code 24 or main code 33 is displayed on WTEC III TPSS (para 8-5).
(3) If main code 24 is displayed:
    (a) WTEC III transmission ECU has detected a sump oil temperature above (sub code 23) or below (sub code 12) operating limits.
    (b) Troubleshoot oil cooling system followed by sump oil temperature sensor and circuits.
(4) If main code 33 is displayed:
    (a) WTEC III transmission ECU has detected a fault with sump oil temperature sensor or its circuit.
    (b) Troubleshoot electrical system.
(5) Position master power switch to off (TM 9-2320-366-10-1).

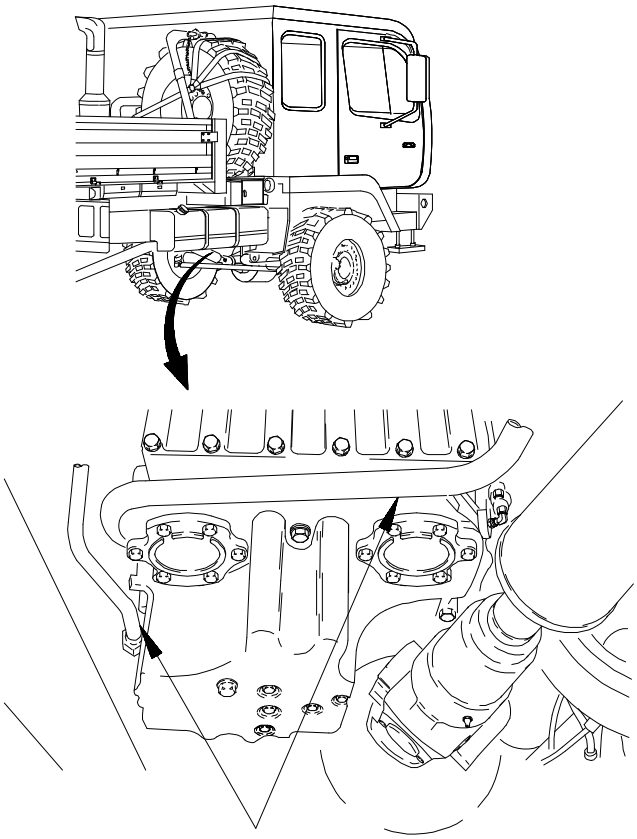
f25. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 AND/OR 33 AND ANY SUB CODE (CONT)



WARNING

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

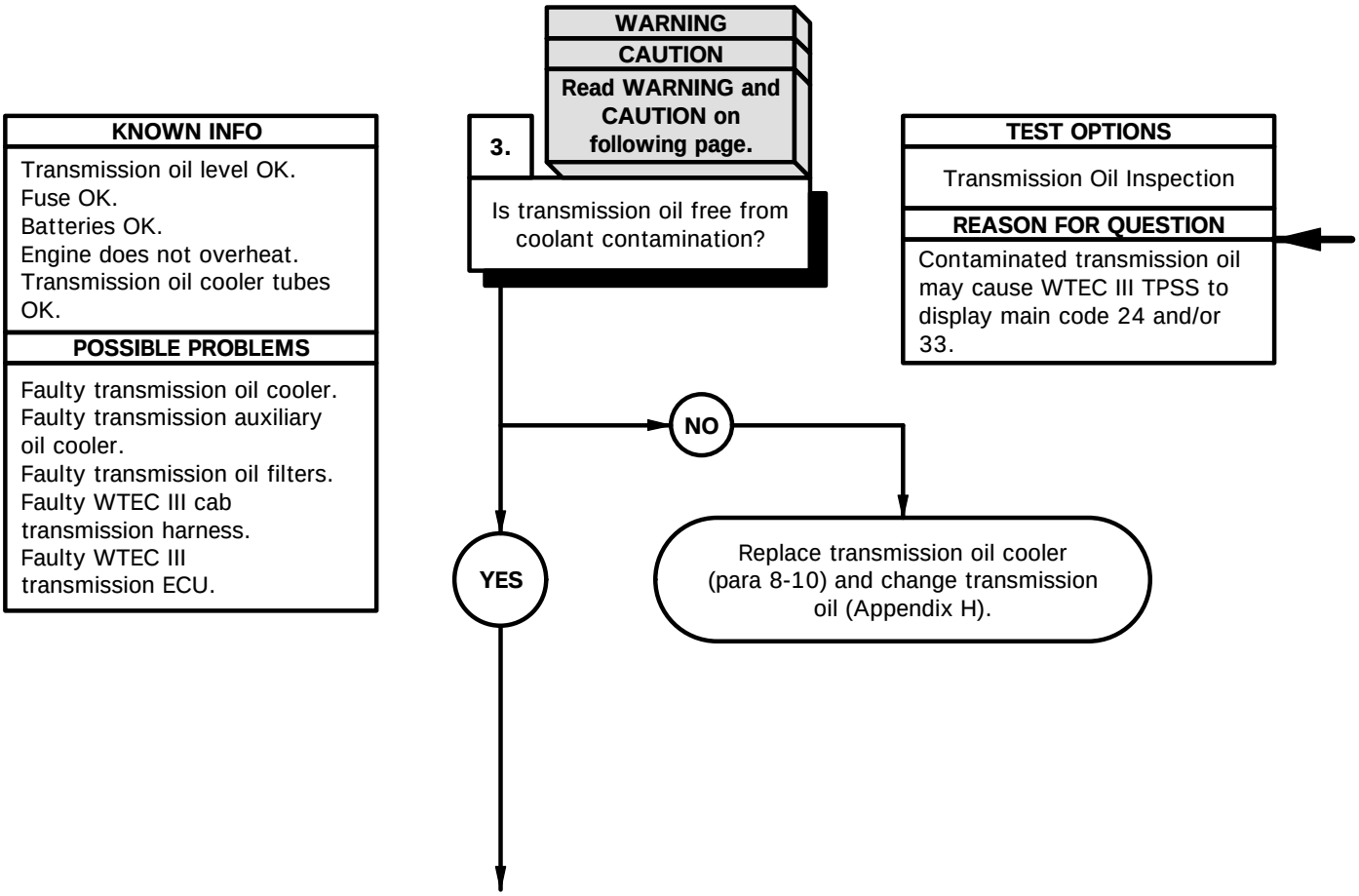
(1) Check transmission oil cooler tubes for damage and restrictions.
(2) If damage or restrictions are found, replace transmission oil cooler tube(s) (para 8-17).



TRANSMISSION OIL COOLER TUBES

XBF2501B

f25. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 AND/OR 33 AND ANY SUB CODE (CONT)



TRANSMISSION OIL INSPECTION

WARNING

Do not drain transmission oil when transmission is hot. Failure to comply may cause severe injury to personnel.

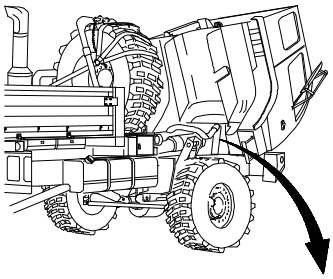
CAUTION

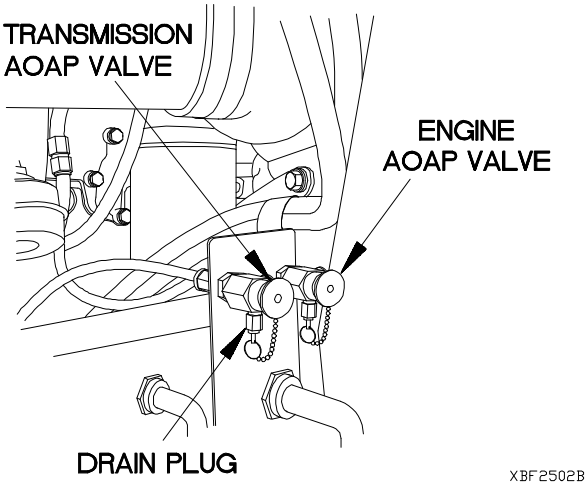
Transmission oil must be changed whenever there is evidence of oil breakdown or contamination. Oil breakdown or contamination may be caused from overheating transmission and/or oil cooler internal failure and is indicated by discoloration, strong odor, or oil analysis.

NOTE

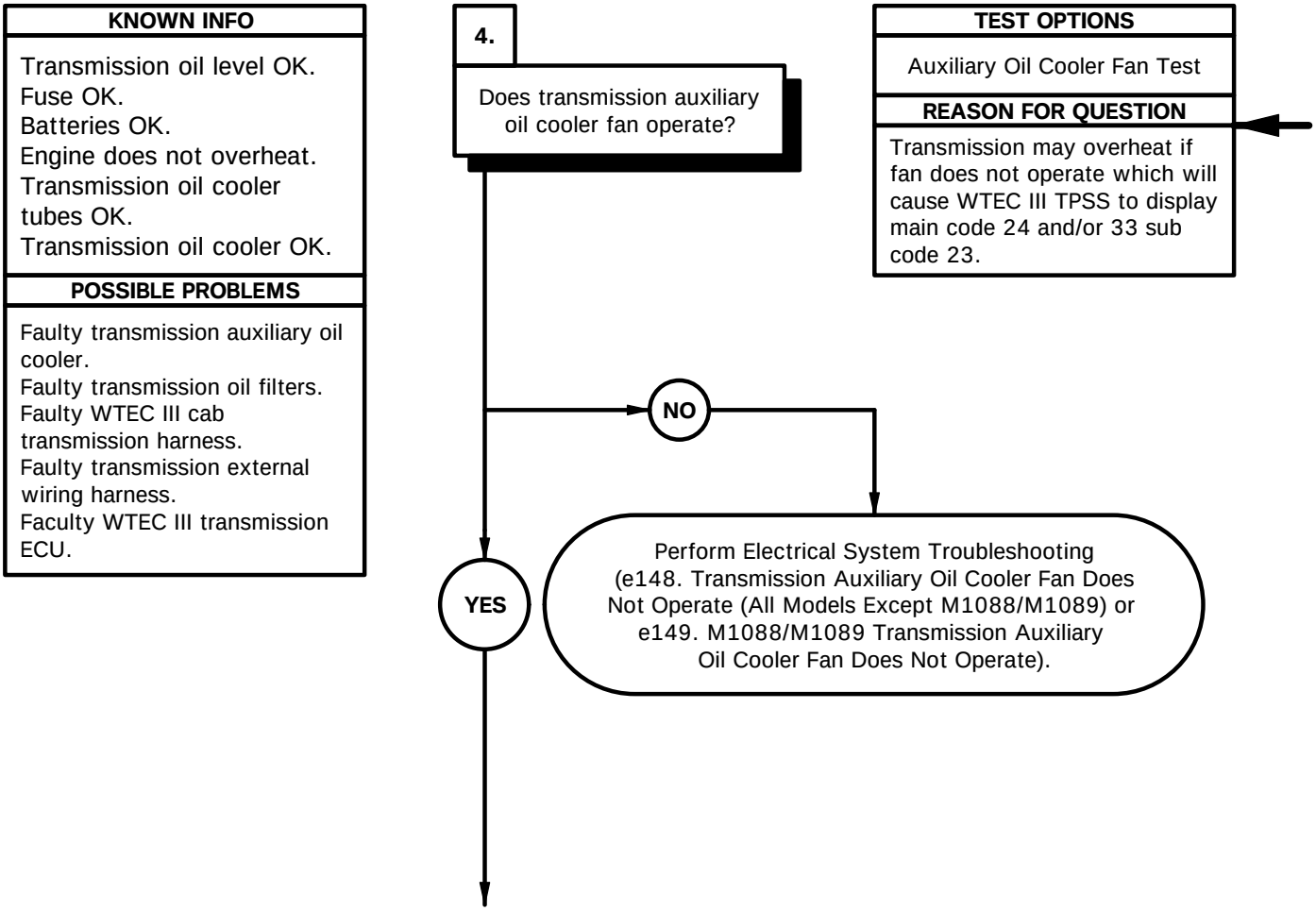
Transmission fluid capacity is 42.3 qt (40 L).

(1) Start engine (TM 9-2320-366-10-1).
(2) Allow oil to circulate for a few minutes.
(3) Place drain pan under transmission AOAP valve.
(4) Remove drain plug from transmission AOAP valve and press plunger to extract oil from system.
(5) Allow approximately 1 qt (0.9 L) of oil to drain into drain pan. Release plunger.
(6) Install drain plug on transmission AOAP valve.
(7) Inspect oil for coolant contamination.
(8) If oil is contaminated, replace transmission oil cooler (para 8-10).
(9) Shut down engine (TM 9-2320-366-10-1).
(10) Fill transmission (Appendix H).



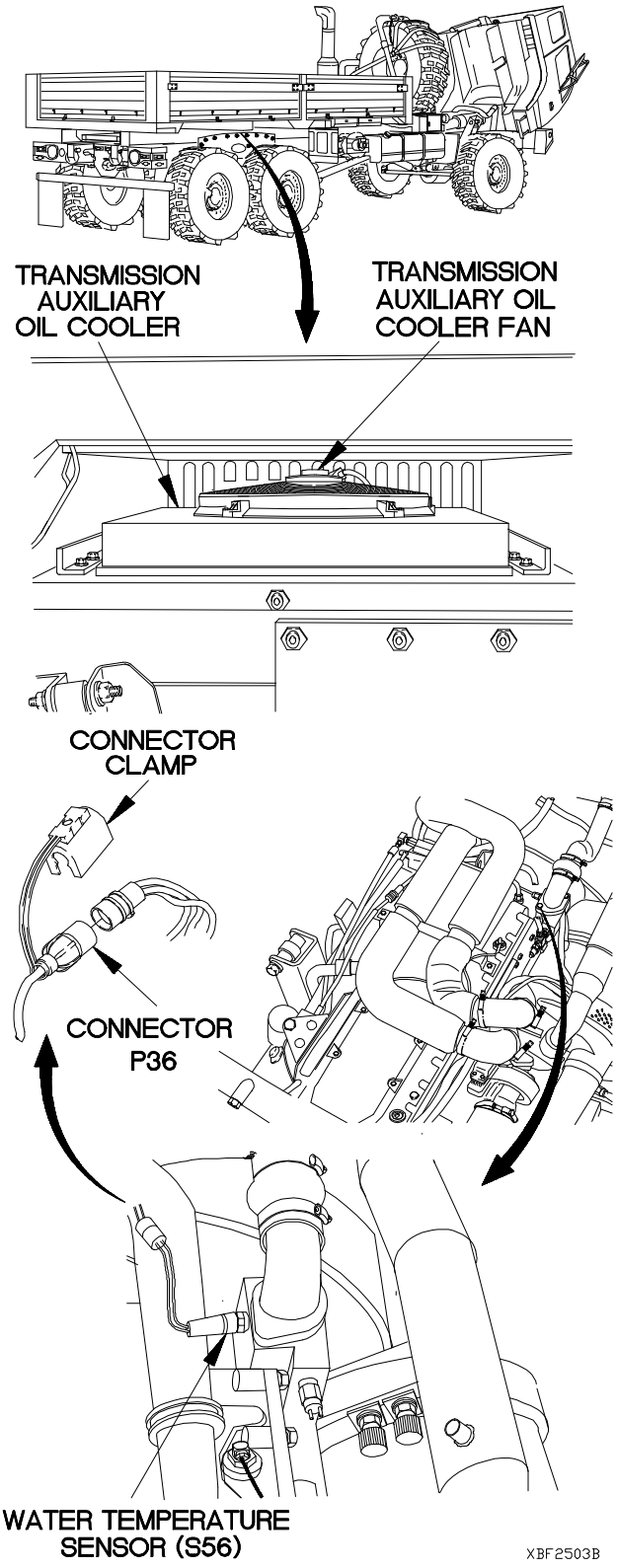


f25. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 AND/OR 33 AND ANY SUB CODE (CONT)

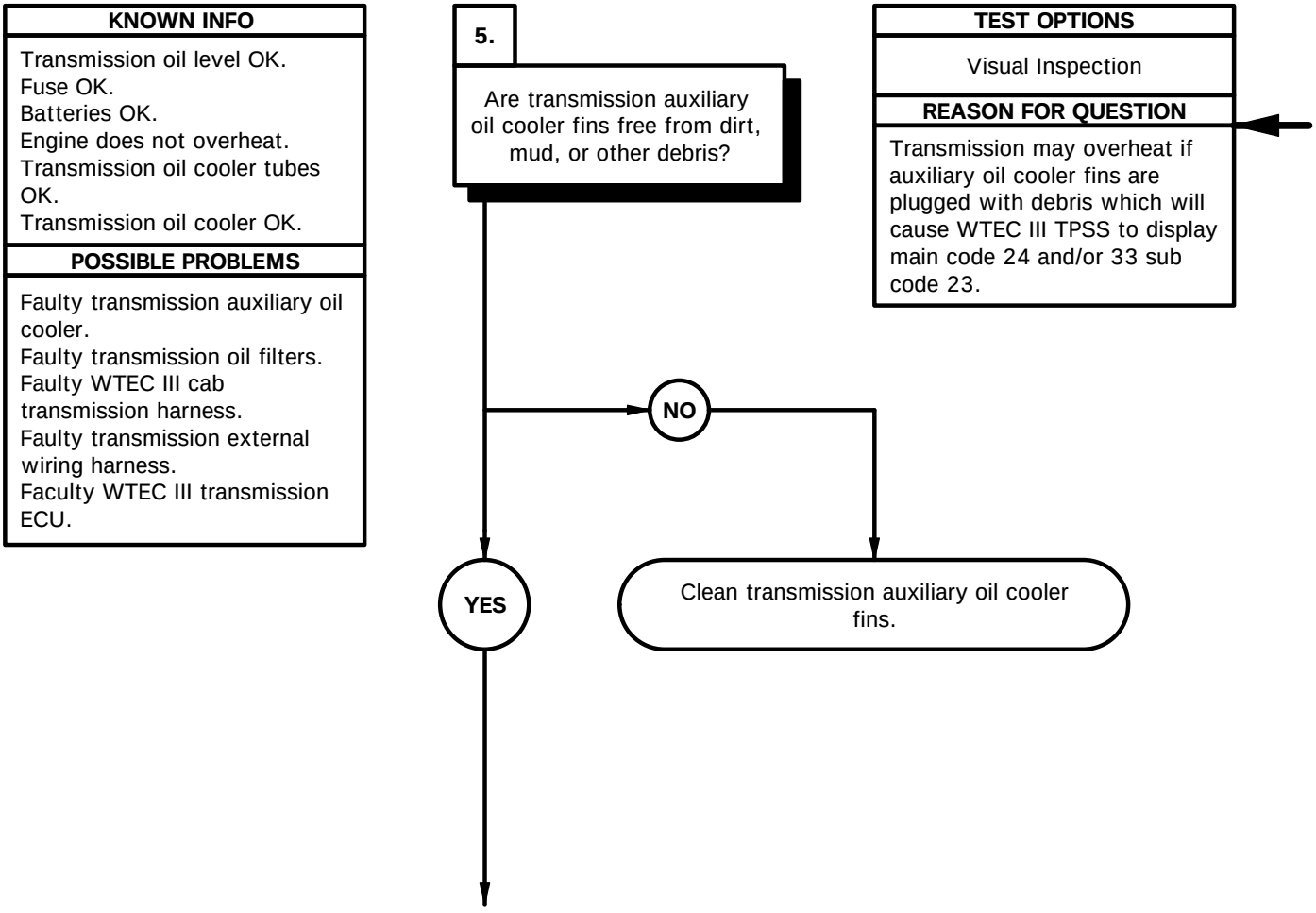


AUXILIARY OIL COOLER FAN TEST

(1) Raise cab (TM 9-2320-366-10-1).
(2) Disconnect connector clamp from water temperature sensor.
(3) Disconnect connector P36 from water temperature sensor (S56) to de-energize relay K15 and provide power to auxiliary oil cooler fan.
(4) Position master power switch to on (TM 9-2320-366-10-1).
(5) Check if auxiliary oil cooler fan comes on.
(6) If fan does not come on, perform Electrical System Troubleshooting (e148. Transmission Auxiliary Oil Cooler Fan Does Not Operate (All Models Except M1088/M1089) or e149. M1088/M1089 Transmission Auxiliary Oil Cooler Fan Does Not Operate).
(7) Position master power switch to off (TM 9-2320-366-10-1).
(8) Connect connector P36 to water temperature sensor (S56).
(9) Connect connector clamp on water temperature sensor.
(10) Lower cab (TM 9-2320-366-10-1).



f25. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 AND/OR 33 AND ANY SUB CODE (CONT)

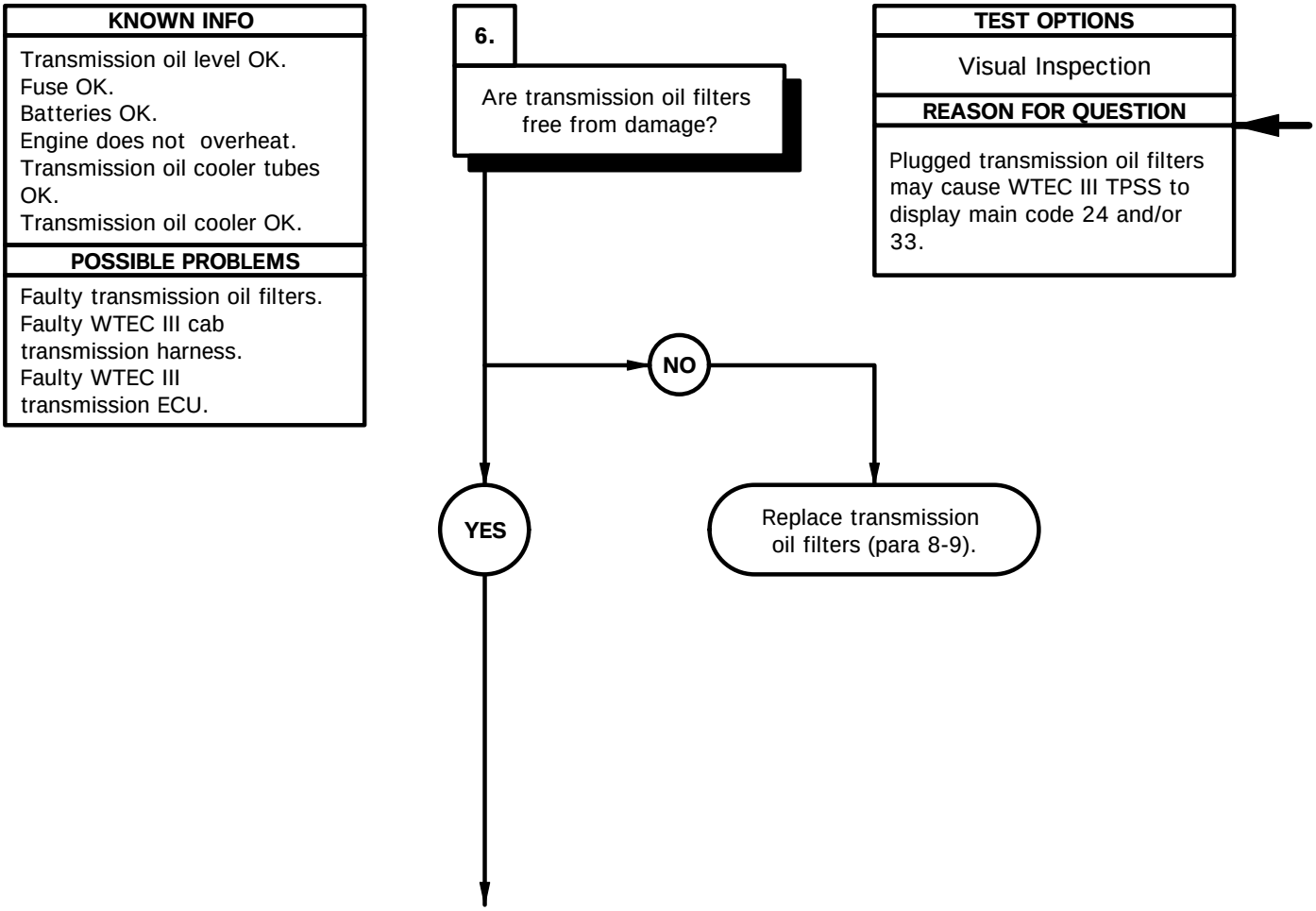


NOTE

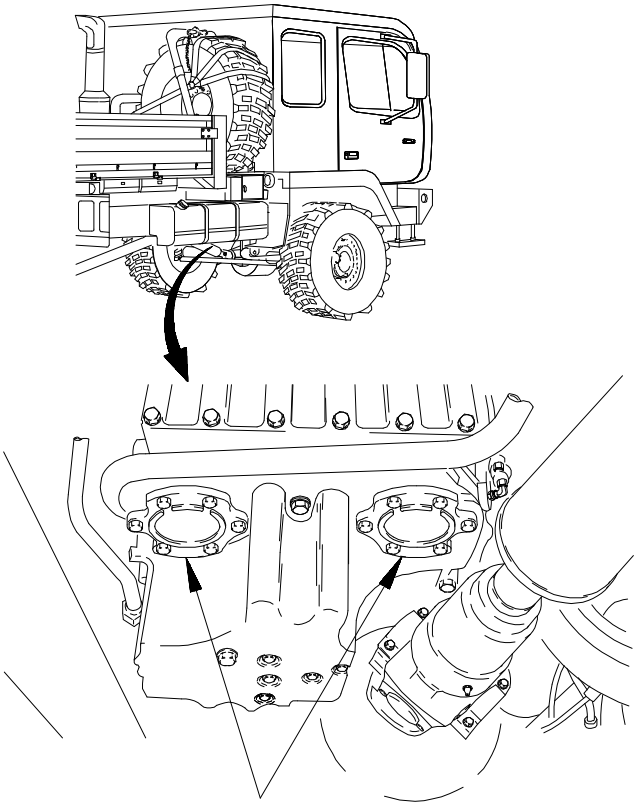
M1088/M1089 are equipped with two transmission auxiliary oil cooler fans.

(1) Check if transmission auxiliary oil cooler fins are plugged with dirt, mud, or other debris.
(2) If fins are plugged with dirt, mud or other debris, clean transmission auxiliary oil cooler fins.

f25. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 AND/OR 33 AND ANY SUB CODE (CONT)

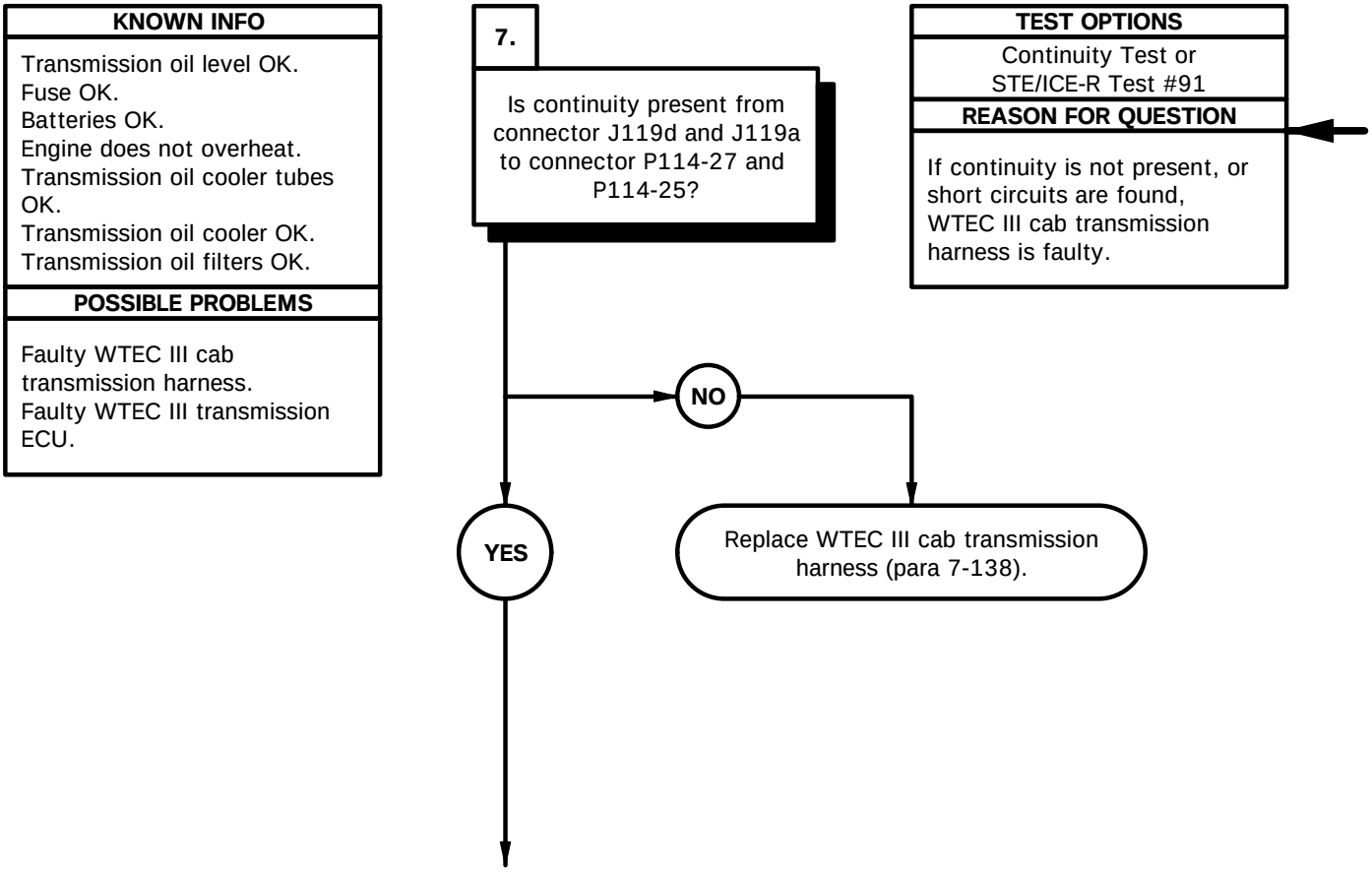


+ Check transmission oil filters for damage (para 8-9).



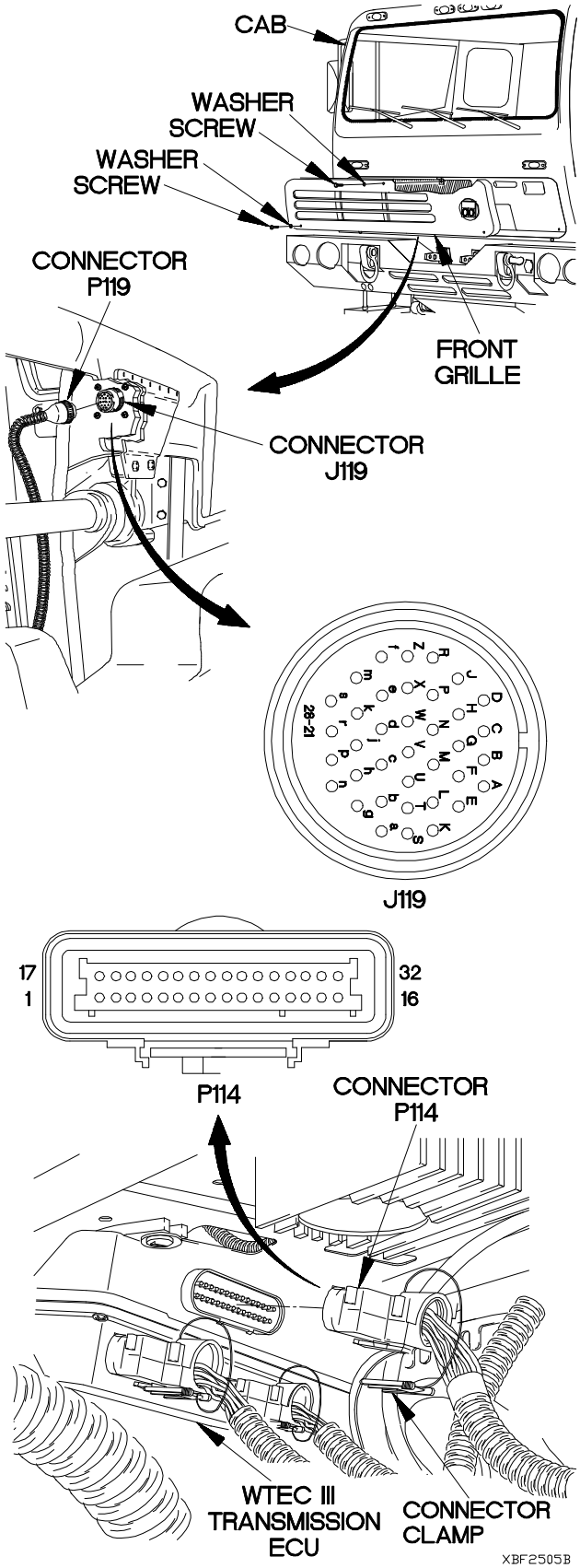
TRANSMISSION OIL FILTERS XBF2504B

f25. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 AND/OR 33 AND ANY SUB CODE (CONT)

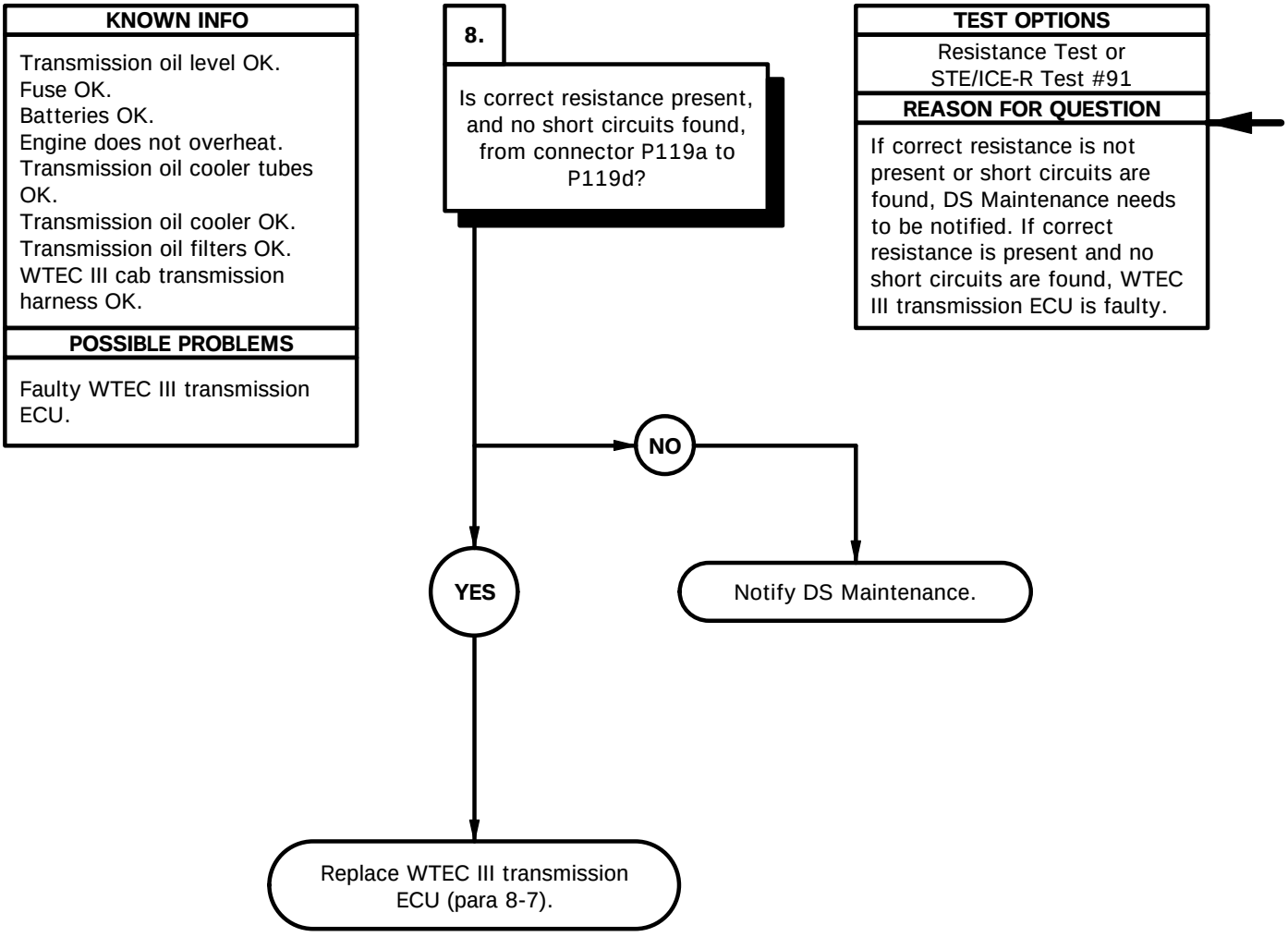


CONTINUITY TEST

(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) Remove kick panel (para 16-3).
(6) Disconnect connector clamp from connector P114.
(7) Disconnect connector P114 from WTEC III transmission ECU.
(8) Install jumper wire from connector J119d to connector J119a.
(9) Set multimeter to ohms.
(10) Connect positive (+) probe of multimeter to P114-27.
(11) Connect negative (-) probe of multimeter to connector P114-25 and note reading on multimeter.
(12) Connect negative (-) probe of multimeter to all other sockets in connector P114, one at a time, and note reading on multimeter.
(13) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(14) Connect positive (+) probe of multimeter to connector P114-25.
(15) Connect negative (-) probe of multimeter to all sockets in connector P114 (except P114-27), one at a time, and note reading on multimeter.
(16) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(17) If continuity is not present in step 11, or continuity is present in step 12, 13, 15, or 16, replace WTEC III cab transmission harness (para 7-138).
(18) Remove jumper wire from connector J119.
(19) Connect connector P114 to WTEC III transmission ECU.
(20) Connect connector clamp on connector P114.
(21) Install kick panel (para 16-3).



f25. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 AND/OR 33 AND ANY SUB CODE (CONT)



RESISTANCE TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P119a.

NOTE
Transmission sump oil temperature sensor resistance reading is affected by temperature. Refer to Table 2-34. Transmission Sump Oil Temperature Sensor Resistance Readings for details.

(3) Connect negative (-) probe of multimeter to connector P119d and note reading on multimeter.
(4) Connect negative (-) probe of multimeter to all other pins in connector P119, one at a time, and note reading on multimeter.
(5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(6) Connect positive (+) probe of multimeter to connector P119d.
(7) Connect negative (-) probe of multimeter to all other pins in connector P119 (except P119a), one at a time, and note reading on multimeter.
(8) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(9) If correct resistance is not present in step 3, or continuity is present in step 4, 5, 7, or 8, notify DS Maintenance.
(10) If correct resistance is present in step 3 and continuity is not present in step 4, 5, 7, or 8, replace WTEC III transmission ECU (para 8-7).
(11) Connect connector P119 to connector J119.
(12) Position front grille on cab with washer and screw.
(13) Position two washers and screws in front grille.
(14) Tighten screw to 48-60 lb-in. (5-7 N·m).
(15) Tighten two screws to 24 lb-in. (3 N·m).
(16) Clear diagnostic codes (para 8-5).

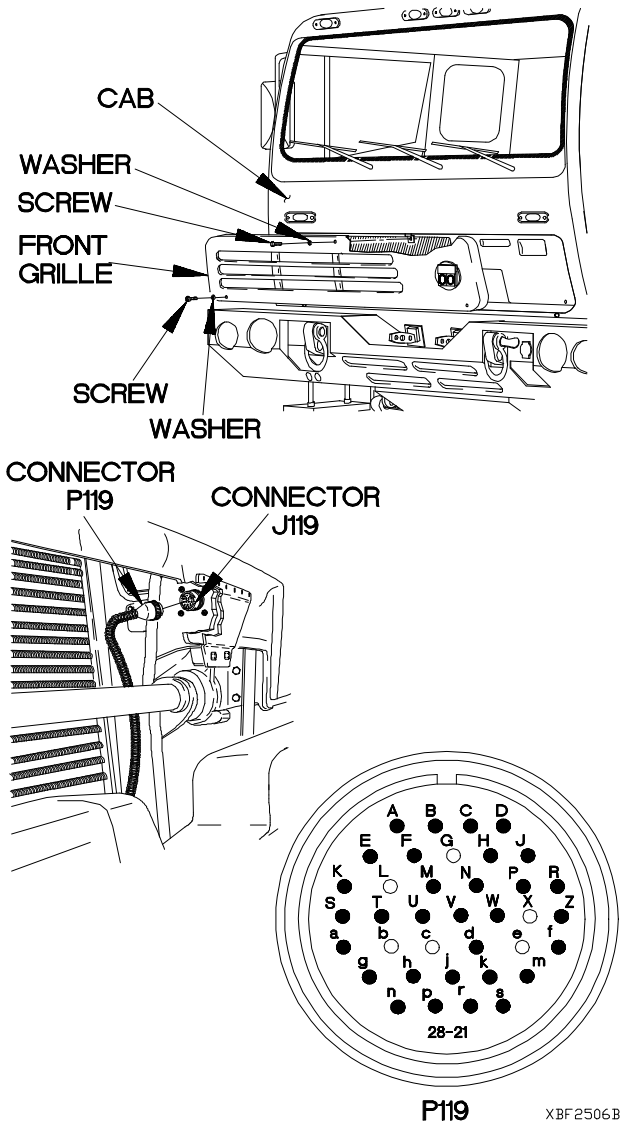


Table 2-34. Transmission Sump Oil Temperature Sensor Resistance Readings

Temperature	Resistance
-4° to 14°F (-20° to -10°C)	691-754 ohms
14° to 32°F (-10° to 0°C)	754-820 ohms
32° to 50°F (0° to 10°C)	820-889 ohms
50° to 68°F (10° to 20°C)	889-962 ohms
68° to 86°F (20° to 30°C)	962-1039 ohms
86° to 104°F (30° to 40°C)	1039-1118 ohms
104° to 122°F (40° to 50°C)	1118-1202 ohms
122° to 140°F (50° to 60°C)	1202-1286 ohms

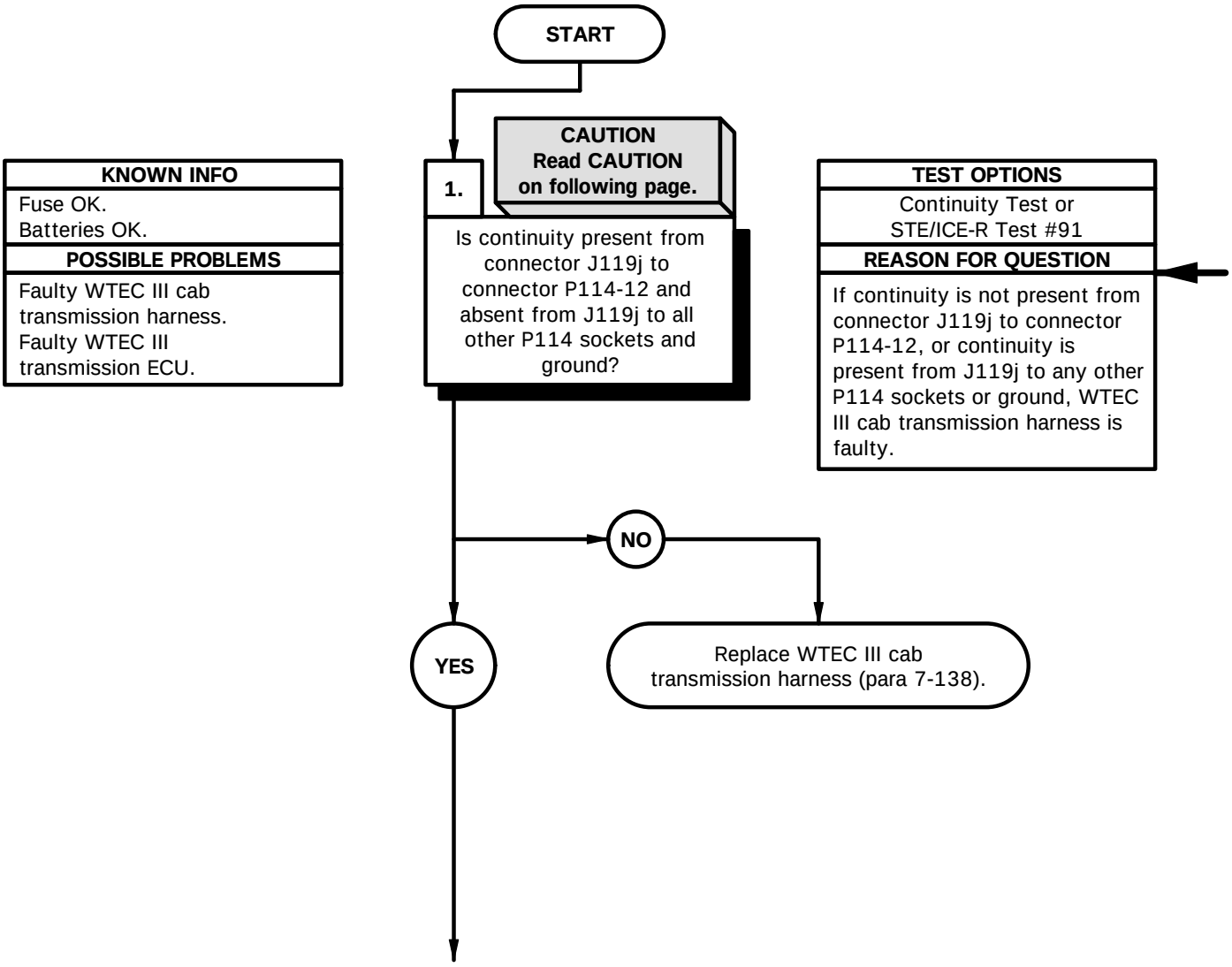
f26. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE

INITIAL SETUP

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

References
TM 9-4910-571-12&P

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
STE/ICE-R (Item 41, Appendix C)



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.

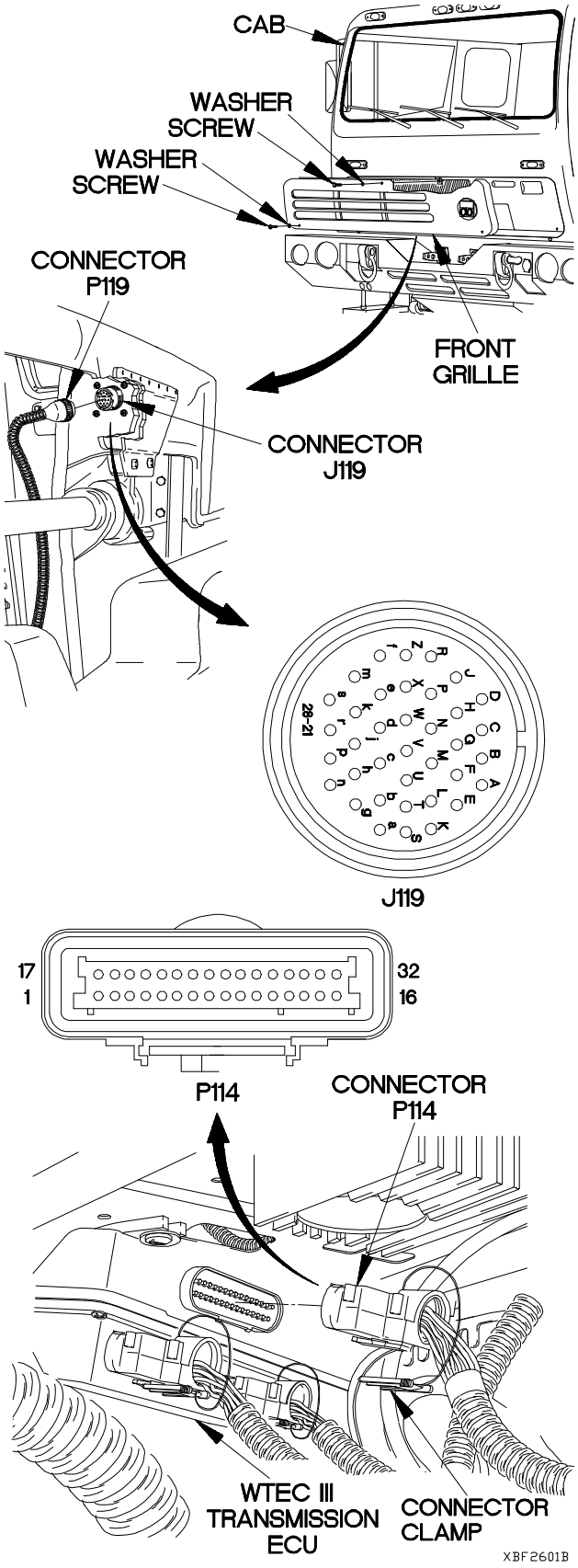
NOTE

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

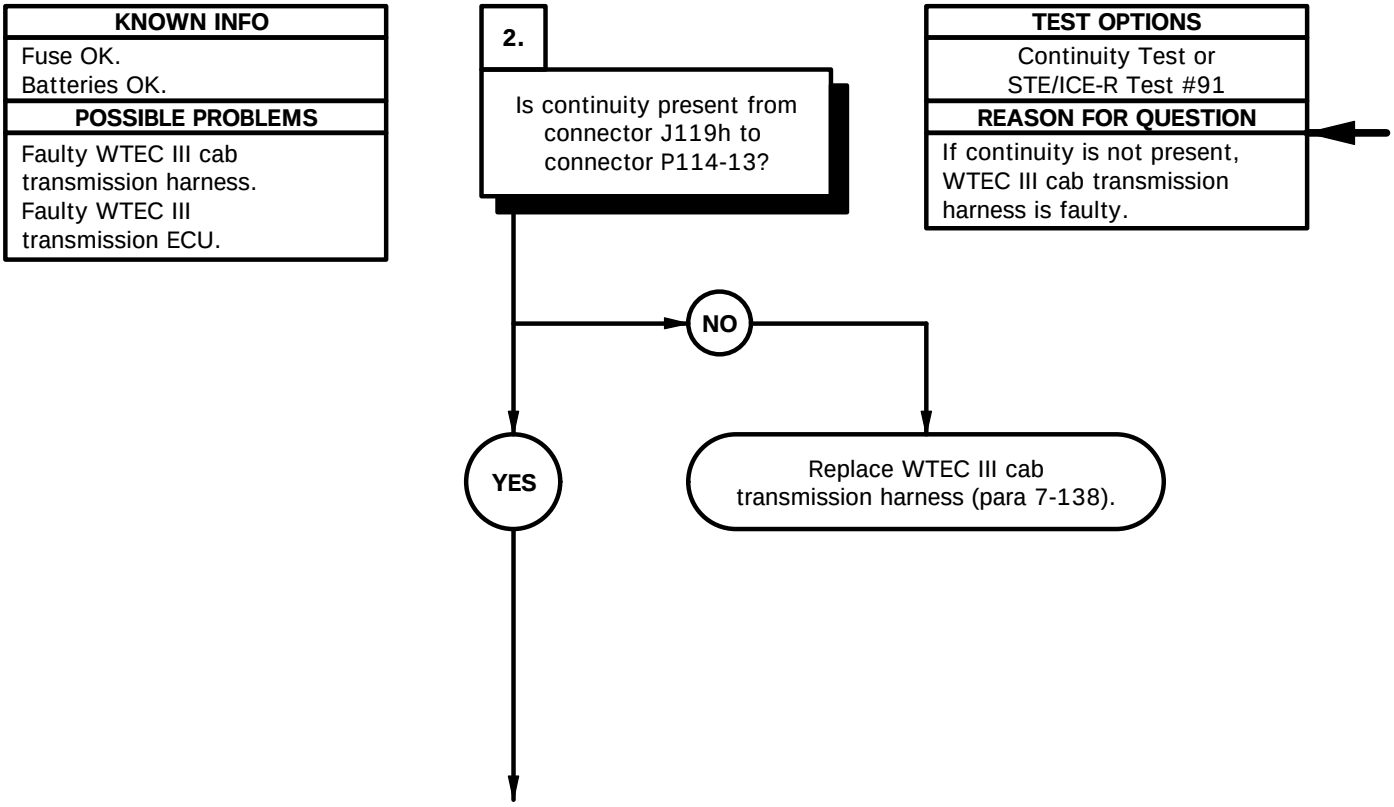
CONTINUITY TEST

(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) Remove kick panel (para 16-3).
(6) Disconnect connector clamp from connector P114.
(7) Disconnect connector P114 from WTEC III transmission ECU.
(8) Set multimeter to ohms.
(9) Connect positive (+) probe of multimeter to connector J119j.
(10) Connect negative (-) probe of multimeter to connector P114-12 and note reading on multimeter.
(11) Connect negative (-) probe of multimeter to all other sockets in connector P114, one at a time, and note reading on multimeter.
(12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.

(13) If continuity is not present in step 10, or continuity is present in step 11 or 12, replace WTEC III cab transmission harness (para 7-138).

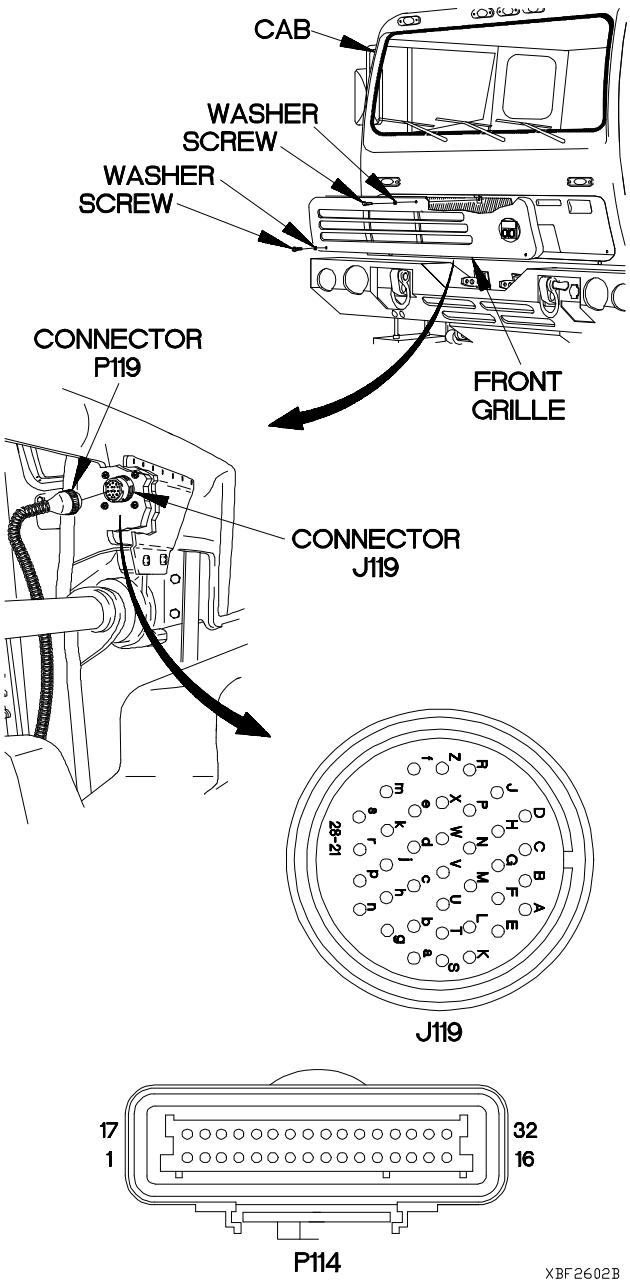


f26. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (CONT)

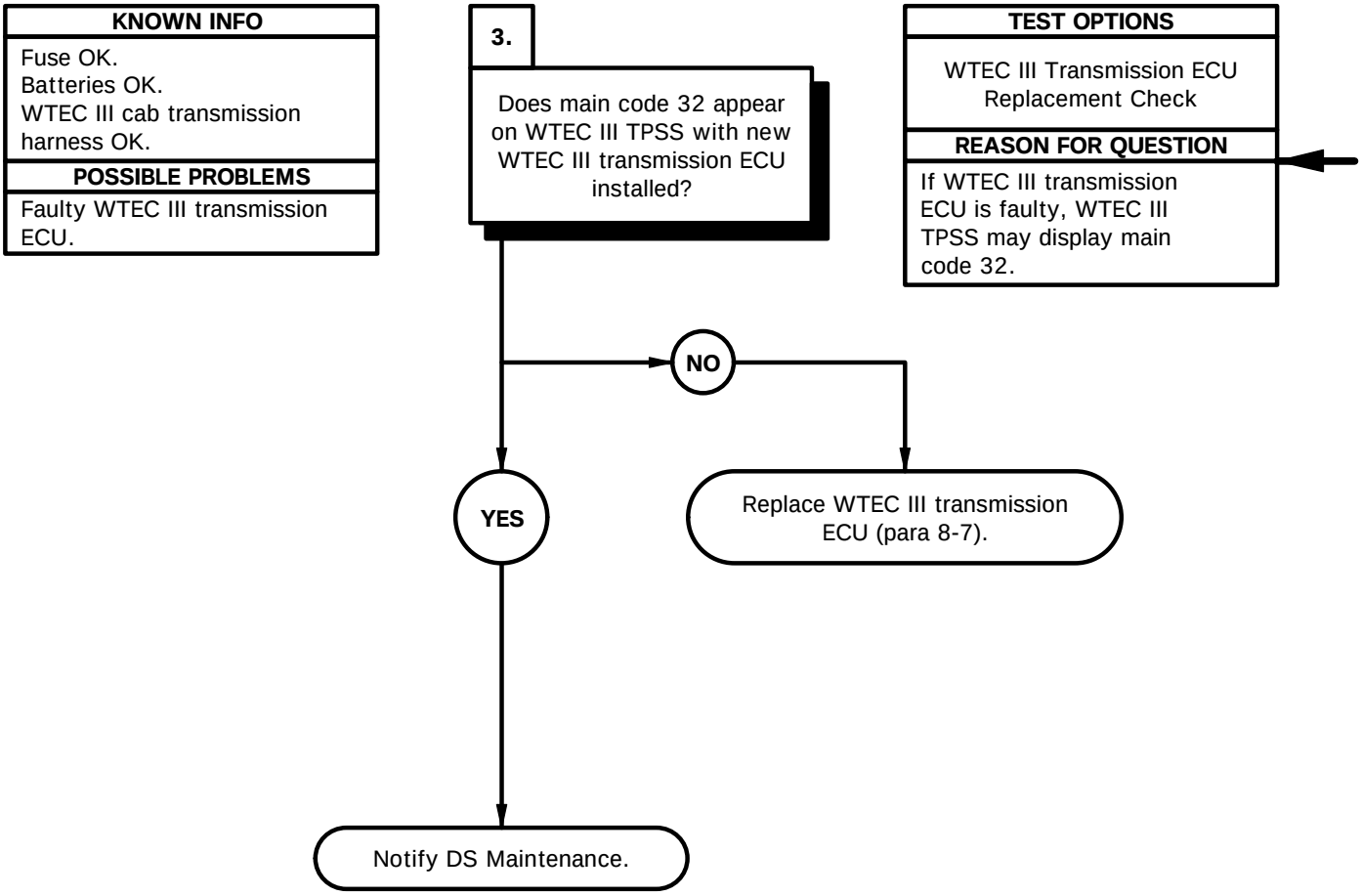


CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector J119h.
(3) Connect negative (-) probe of multimeter to connector P114-13 and note reading on multimeter.
(4) If continuity is not present, replace WTEC III cab transmission harness (para 7-138).
(5) Connect connector P119 to connector J119.
(6) Position front grille on cab with washer and screw.
(7) Position two washers and screws in front grille.
(8) Tighten screw to 48-60 lb-in. (5-7 N·m).
(9) Tighten two screws to 24 lb-in. (3 N·m).



f26. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (CONT)



WTEC III TRANSMISSION ECU REPLACEMENT CHECK

(1) Remove original WTEC III transmission ECU (para 8-7).
(2) Install replacement WTEC III transmission ECU (para 8-7).
(3) Install kick panel (para 16-3).
(4) Start engine (TM 9-2320-366-10-1).
(5) Road test vehicle and read WTEC III transmission ECU codes (para 8-5).
(6) If main code 32 does not appear with new WTEC III transmission ECU, replace WTEC III transmission ECU (para 8-7).
(7) If main code 32 does appear with new WTEC III transmission ECU, notify DS Maintenance.
(8) Shut down engine (TM 9-2320-366-10-1).
(9) Install original WTEC III transmission ECU (para 8-7).
(10) Clear diagnostic codes (para 8-5).

f27. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, 66, AND/OR 69 AND ANY SUB CODE

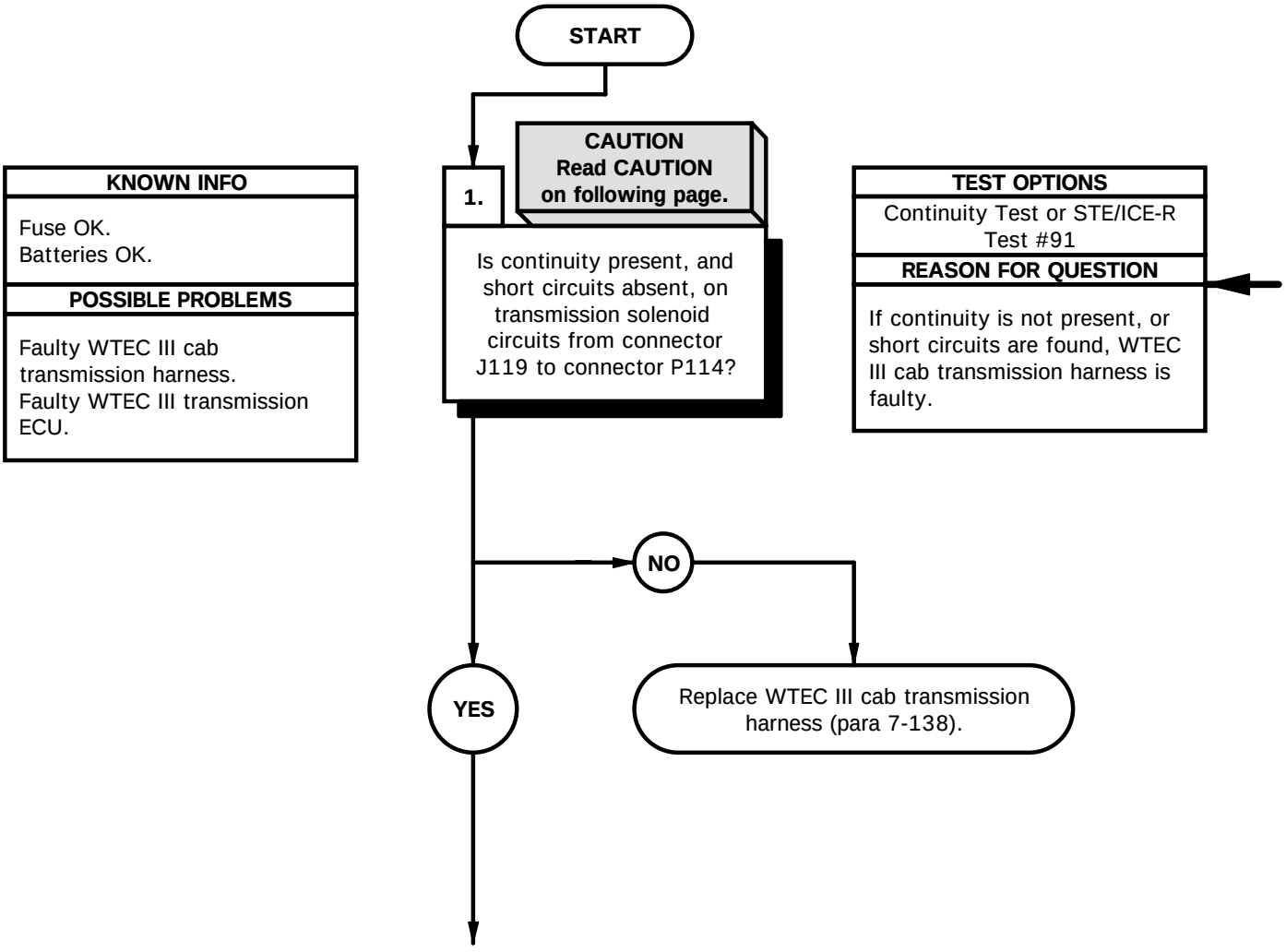
INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

Tools and Special Tools (Cont)
Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B)
STE/ICE-R (Item 41, Appendix C)

References
TM 9-4910-571-12&P



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) Remove kick panel (para 16-3).
(6) Disconnect connector clamp from connector P114.
(7) Disconnect connector P114 from WTEC III transmission ECU.
(8) Install jumper wire on connector J119 for appropriate sub code. Refer to Table 2-35. WTEC III Cab Transmission Harness Transmission Solenoid Test Points.
(9) Set multimeter to ohms.
(10) Connect positive (+) probe of multimeter to connector P114. Refer to Table 2-35. WTEC III Cab Transmission Harness Transmission Solenoid Test Points.
(11) Connect negative (-) probe of multimeter to connector P114 and note reading on multimeter. Refer to Table 2-35. WTEC III Cab Transmission Harness Transmission Solenoid Test Points.
(12) Connect negative (-) probe of multimeter to all other sockets in connector P114, one at a time, and note reading on multimeter.
(13) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(14) If continuity is not present, in step 11, or continuity is present in step 12 or 13, replace WTEC III cab transmission harness (para 7-138).
(15) Remove jumper wire from connector J119.
(16) Connect connector P119 to connector J119.

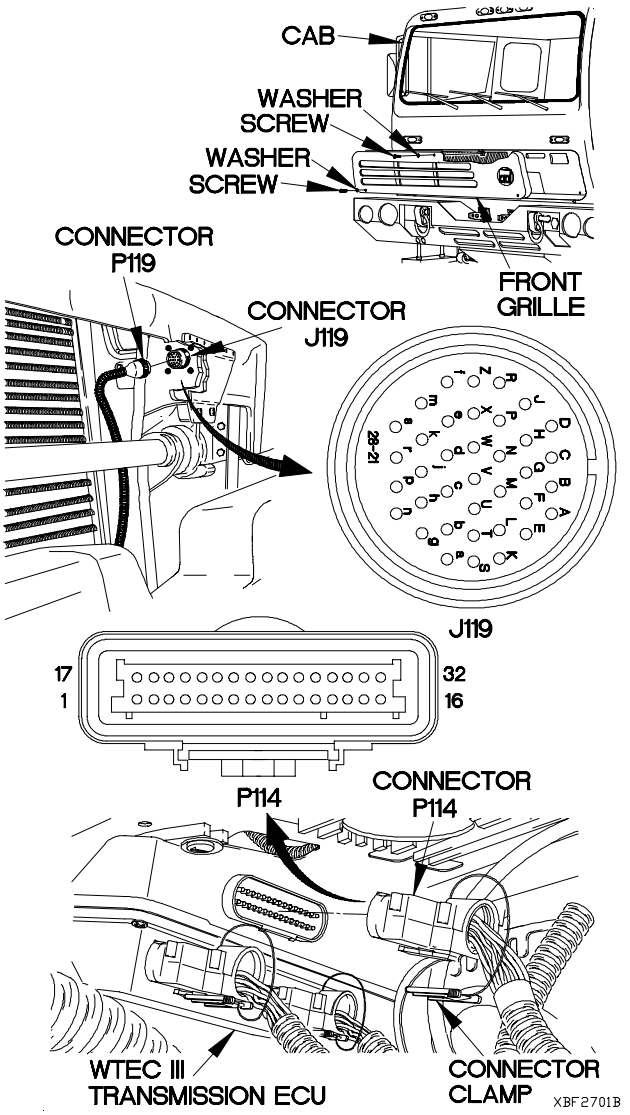
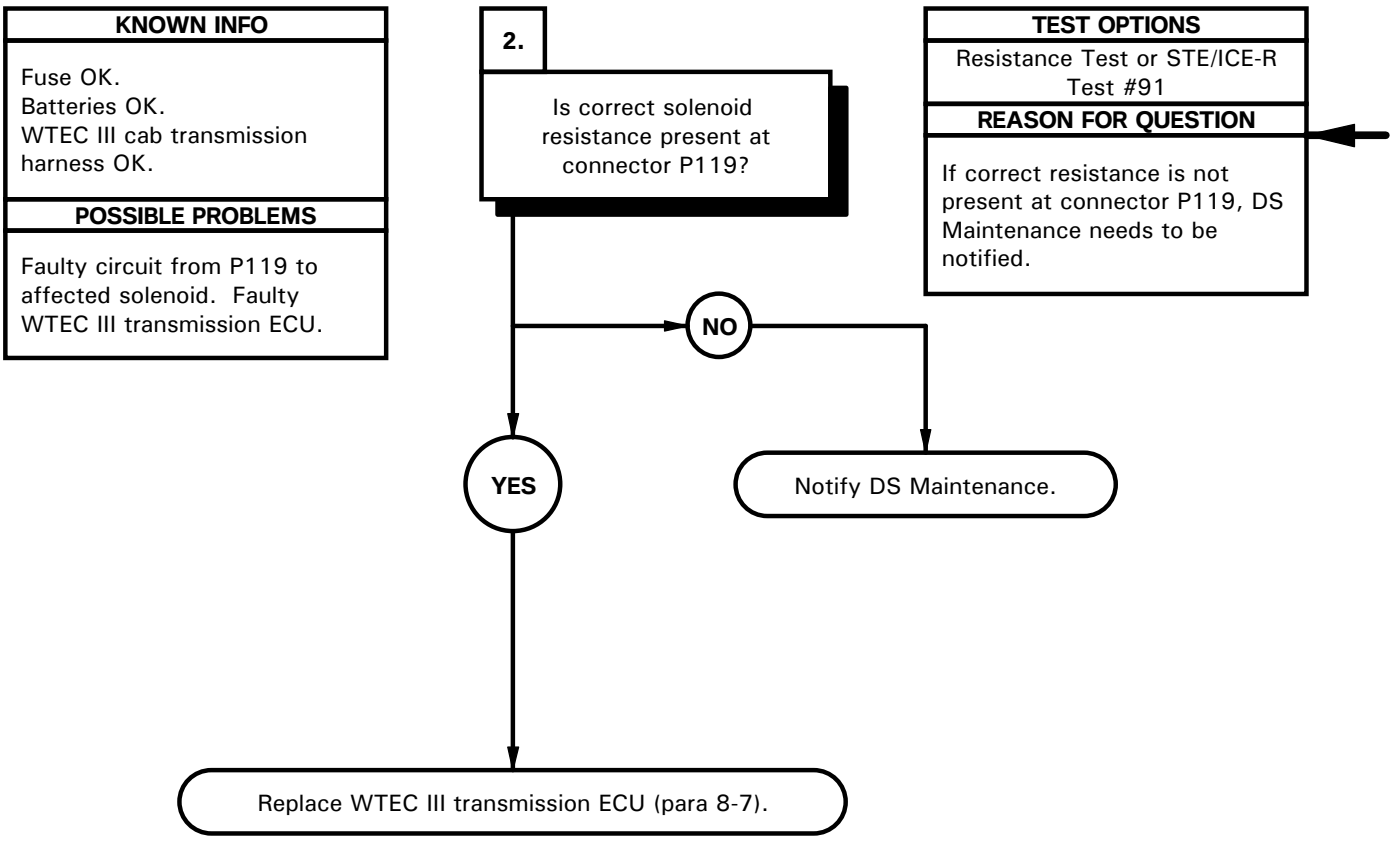


Table 2-35. WTEC III Cab Transmission Harness Transmission Solenoid Test Points

Sub Code	Jumper Across	Connector P114	
		Positive (+) Probe	Negative (-) Probe
12	J119M to J119B	P114-1	P114-4
13	J119Tto J119N	P114-2	P114-20
14	J119C to J119V	P114-5	P114-17
15	J119W to J119B	P114-1	P114-21
16	J119U to J119N	P114-2	P114-6
21	J119F to J119H	P114-3	P114-22
22	J119D to J119V	P114-7	P114-17
23	J119P to J119S	P114-19	P114-23
24	J119J to J119B	P114-1	P114-8
26	J119K to J119A	P114-19	P114-24
27	J119M to J119B	P114-1	P114-4

f27. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 46, 66, AND/OR 69 AND ANY SUB CODE (CONT)



RESISTANCE TEST

(1) Disconnect connector P119 from connector J119.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector P119. Refer to Table 2-36. Connector P119 Transmission Solenoid Resistance Test Points for appropriate sub code(s) and connector P119 pin(s).
(4) Connect negative (-) probe of multimeter to connector P119 and note reading on multimeter. Refer to Table 2-36. Connector P119 Transmission Solenoid Resistance Test Points for appropriate sub code(s) and connector P119 pin(s).

NOTE

Transmission solenoid resistance is affected by temperature. Refer to Table 2-37. Transmission Solenoid Resistance Readings.

(5) If resistance reading indicates transmission solenoid is good, replace WTEC III transmission ECU (para 8-7).
(6) If resistance reading indicates transmission solenoid is faulty, notify DS Maintenance.
(7) Connect connector P119 to connector J119.
(8) Position front grille on cab with washer and screw.
(9) Position two washers and screws in front grille.
(10) Tighten screw to 48-60 lb-in. (5-7 N·m).
(11) Tighten two screws to 24 lb-in. (3 N·m).
(12) Clear diagnostic codes (para 8-5).

Table 2-36. Connector P119 Transmission Solenoid Resistance Test Points

Sub Code	Connector P119	
	Positive (+) Probe	Negative (-) Probe
12	P119M	P119B
13	P119T	P119N
14	P119C	P119V
15	P119W	P119B
16	P119U	P119N
21	P119F	P119H
22	P119D	P119V
23	P119P	P119S
24	P119J	P119B
26	P119K	P119A
27	P119M	P119B

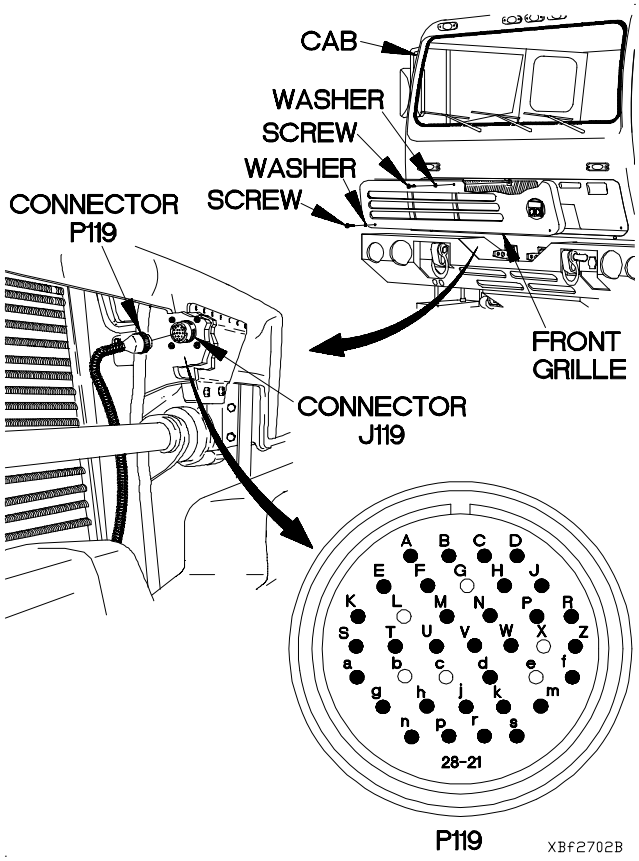


Table 2-37. Transmission Solenoid Resistance Readings

Temperature	Resistance
4° to 16°F (-20° to -10°C)	2.50-3.12 ohms
16° to 32°F (-10° to 0°C)	2.62-3.25 ohms
32° to 50°F (0° to 10°C)	2.74-3.38 ohms
50° to 68°F (10° to 20°C)	2.86-3.50 ohms
68° to 86°F (20° to 30°C)	2.98-3.62 ohms
86° to 104°F (30° to 40°C)	3.09-3.75 ohms
104° to 122°F (40° to 50°C)	3.21-3.88 ohms
122° to 140°F (50° to 60°C)	3.33-4.00 ohms

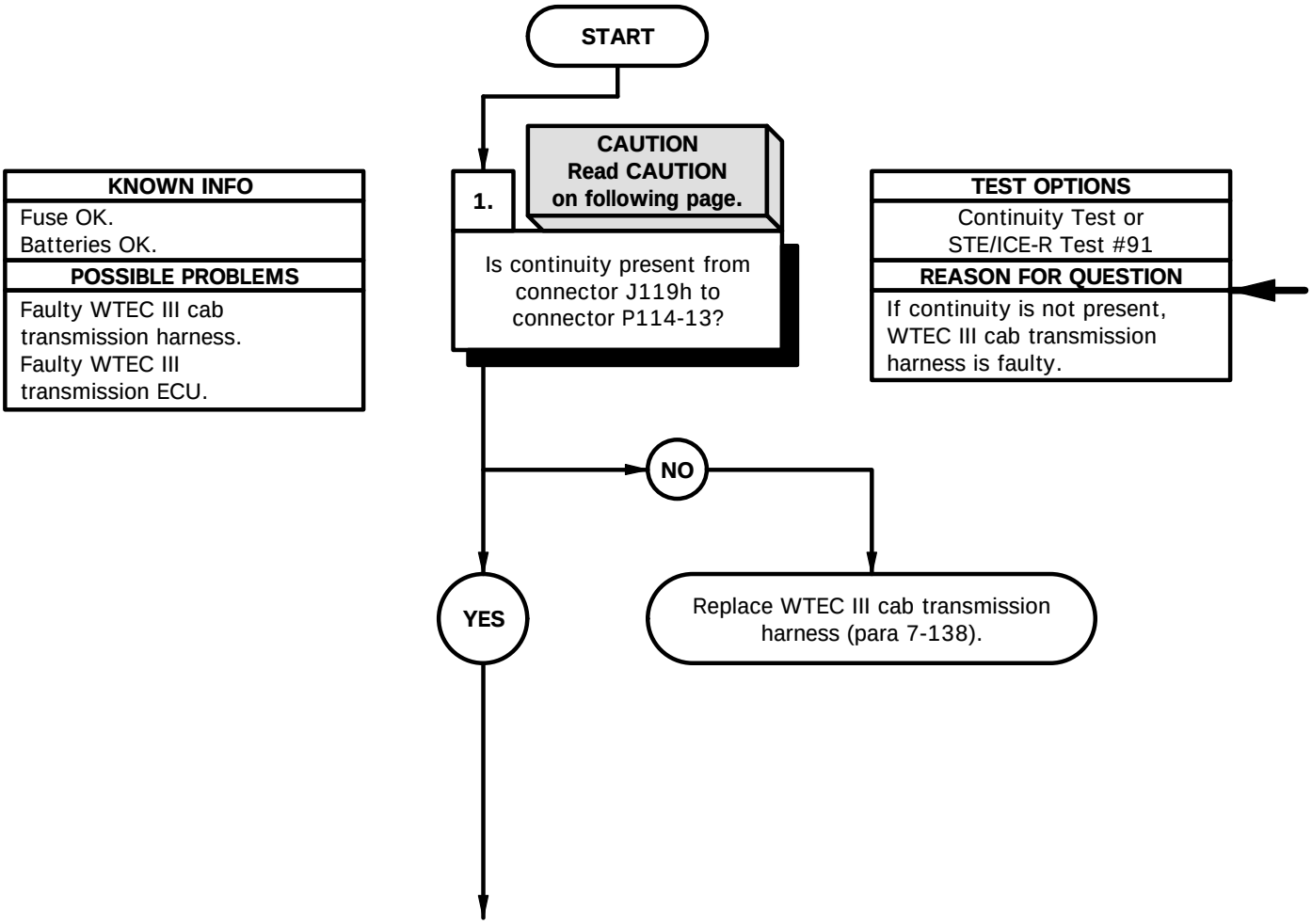
f28. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE

INITIAL SETUP

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

References
TM 9-4910-571-12&P

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
STE/ICE-R (Item 41, Appendix C)



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.

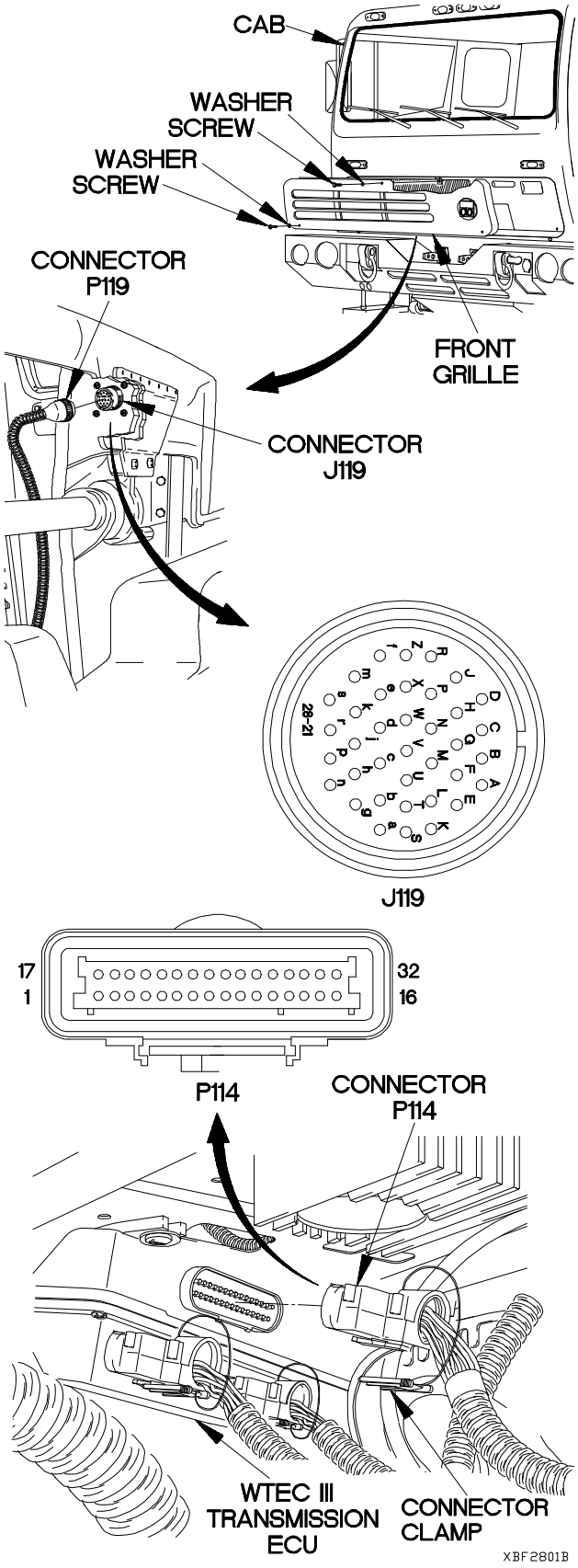
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

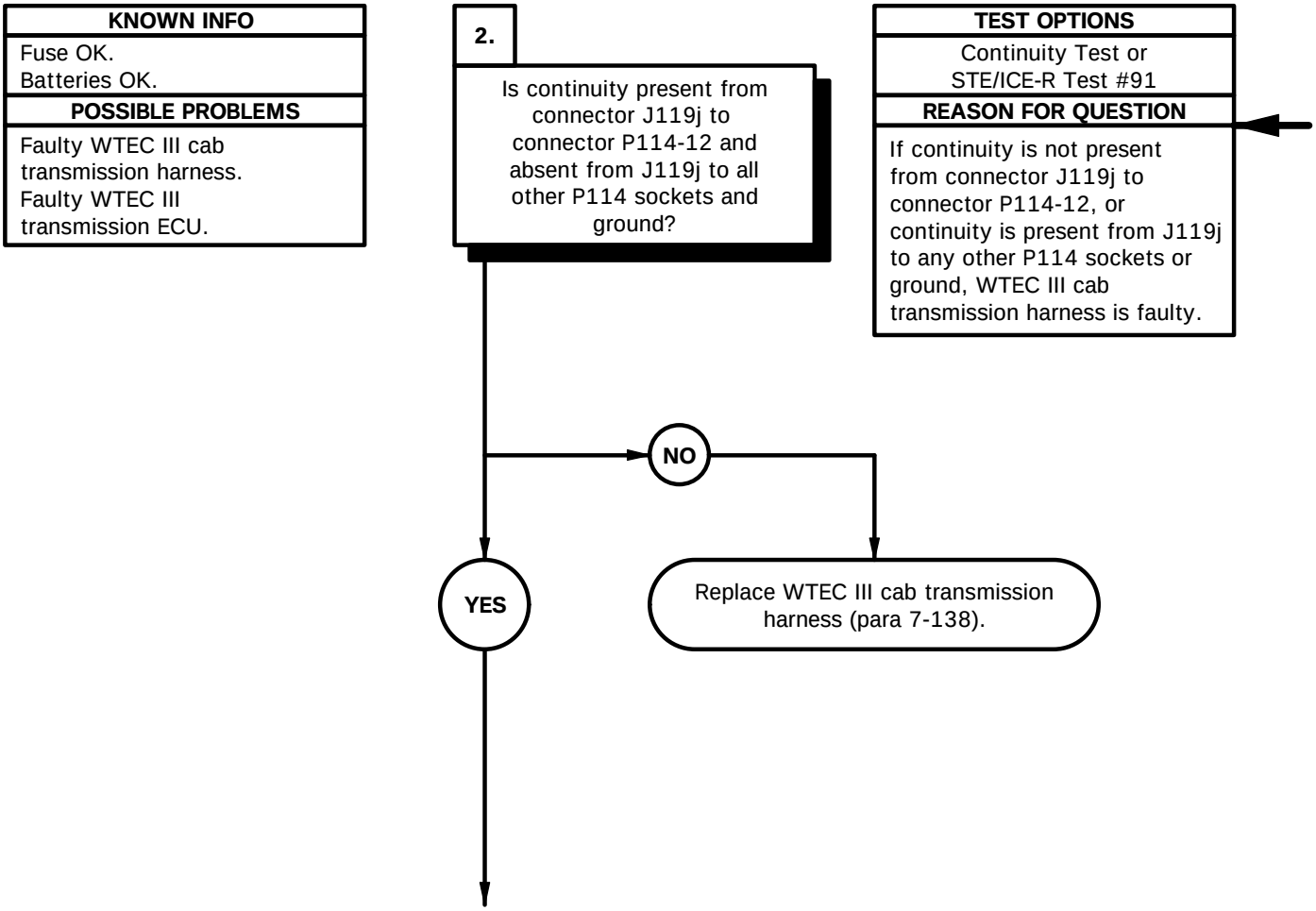
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille on cab.
(4) Disconnect connector P119 from connector J119.
(5) Remove kick panel (para 16-3).
(6) Disconnect connector clamp from connector P114.
(7) Disconnect connector P114 from WTEC III transmission ECU.
(8) Set multimeter to ohms.
(9) Connect positive (+) probe of multimeter to connector J199h.
(10) Connect negative (-) probe of multimeter to connector P114-13 and note reading on multimeter.
(11) If continuity is not present, replace WTEC III cab transmission harness (para 7-138).

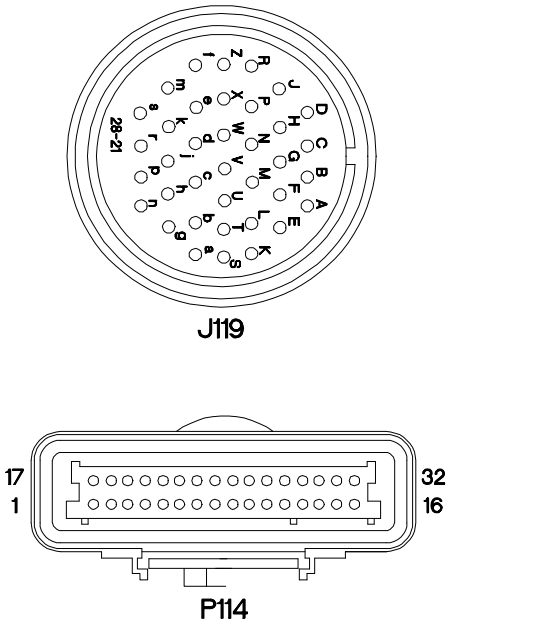


f28. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (CONT)

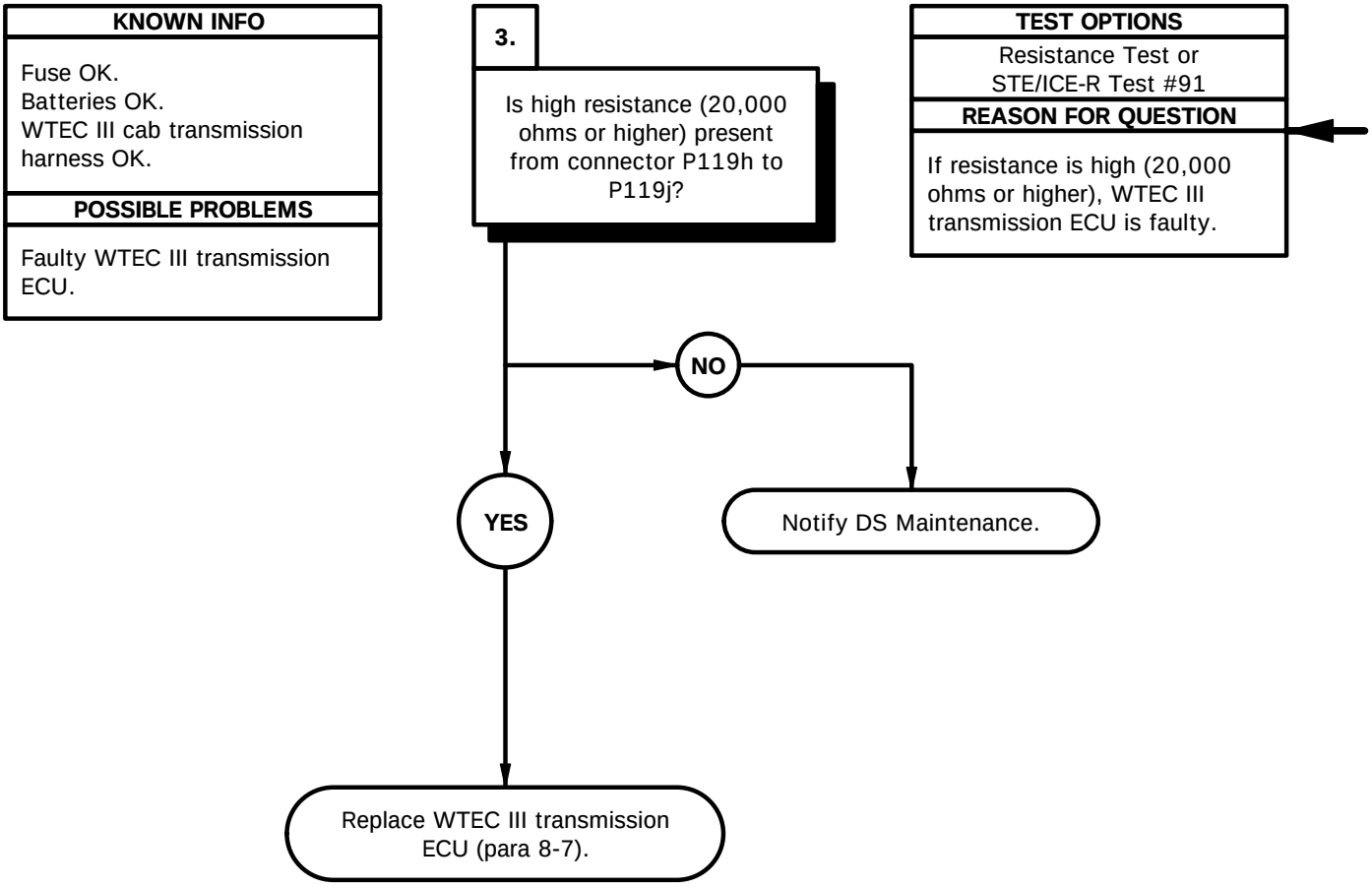


CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector J119j.
(3) Connect negative (-) probe of multimeter to connector P114-12 and note reading on multimeter.
(4) Connect negative (-) probe of multimeter to all other sockets in connector P114, one at a time, and note reading on multimeter.
(5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(6) If continuity is not present in step 3, or continuity is present in step 4 or 5, replace WTEC III cab transmission harness (para 7-138).

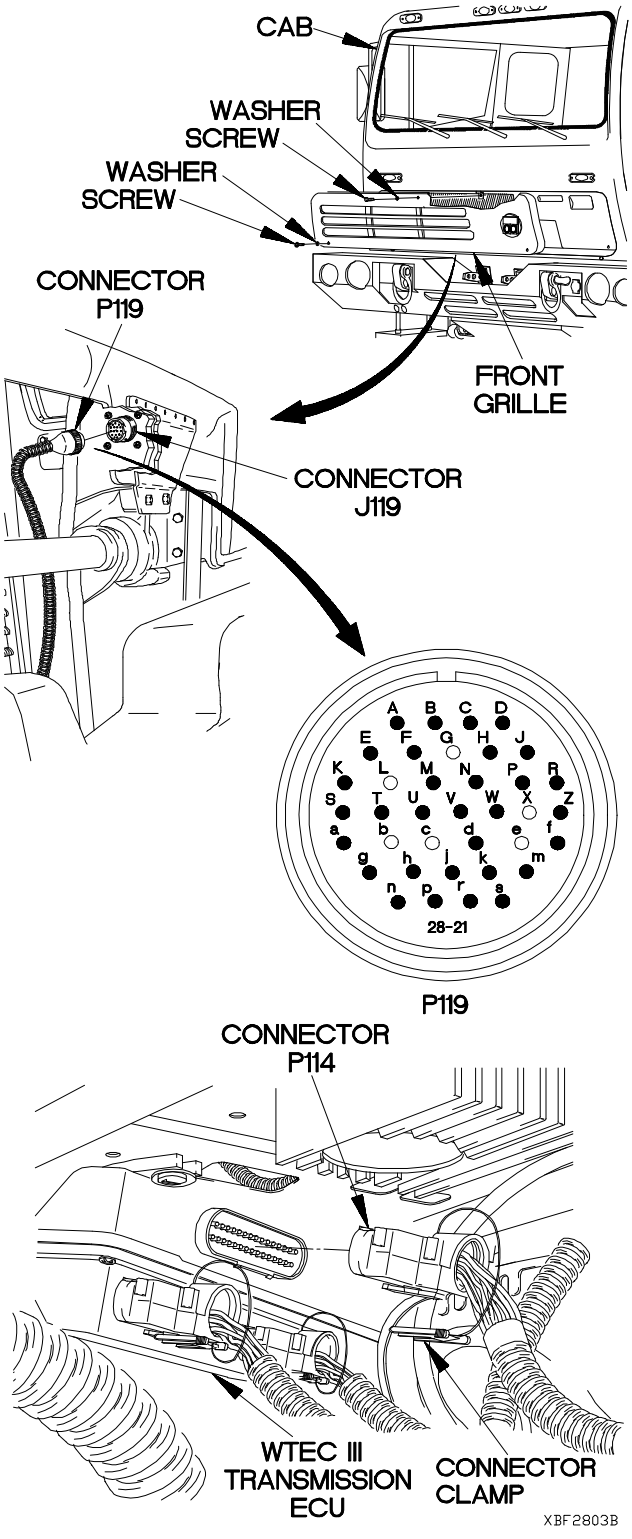


f28. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (CONT)



RESISTANCE TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) prove of multimeter to connector P119h.
(3) Connect negative (-) probe of multimeter to connector P119j and note reading on multimeter.
(4) If resistance is high (20,000 ohms or higher), replace WTEC III transmission ECU (para 8-7).
(5) If resistance is low (less than 20,000 ohms), notify DS maintenance.
(6) Install instrument panel assembly (para 7-15).
(7) Connect connector P119 to connector J119.
(8) Position front grille on cab with washer and screw.
(9) Position two washers and screws in front grille.
(10) Tighten screw to 48-60 lb-in. (5-7 N·m).
(11) Tighten two screws to 24 lb-in. (3 N·m).
(12) Connect connector P114 to WTEC III transmission ECU.
(13) Connect connector clamp on connector P114.
(14) Install kick panel (para 16-3).
(15) Clear diagnostic codes (para 8-5).



f29. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 57 AND ANY SUB CODE

INITIAL SETUP

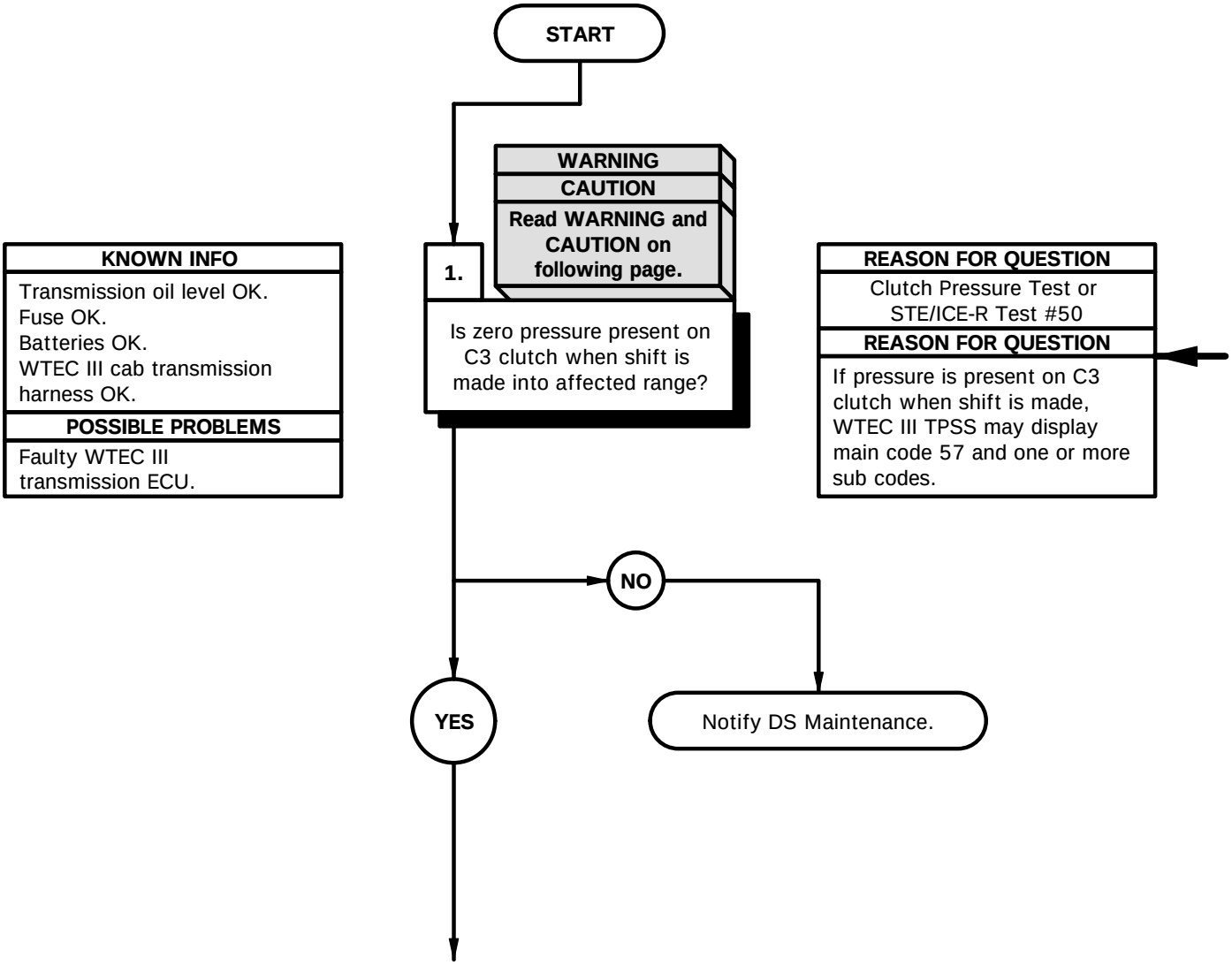
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Pan, Drain (Item 24, Appendix C)
Wrench Set, Socket (Item 51, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)

Materials/Parts
Packing, Preformed (Item 197, Appendix G)
Adapter, Straight, Pipe to Tube (Item 1.2, Appendix D)
Adapter, Straight, Tube to Boss (Item 1.3, Appendix D)
Hose Assembly, Nonmetallic (Item 24.13, Appendix D)

Personnel Required
(2)

References
TM 9-491-571-12&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

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.

CLUTCH PRESSURE TEST

(1) Remove front and intermediate propeller shafts (para 9-2).
(2) Position drain pan under C3 pressure tap plug.
(3) Remove C3 pressure tap plug and preformed packing from control valve module. Discard preformed packing.
(4) Connect tube to boss adapter, hose, and pipe to tube adapter to C3 pressure tap.
(5) Perform STE/ICE-R Test # 50 (TM 9-4910-571-12&P).
(6) Start engine (TM 9-2320-366-10-1) and run at idle.
(7) With parking brake applied, make shift indicated by sub code while assistant notes reading on STE/ICE-R. Refer to Table 2-38. Sub Code Range.
(8) If pressure does not drop to zero in selected range indicated by code values, notify DS Maintenance.
(9) Shut down engine (TM 9-2320-366-10-1).
(10) Remove pipe to tube adapter, hose, and tube to boss adapter from C3 pressure tap.
(11) Position preformed packing and C3 pressure tap plug in control valve module.
(12) Tighten C3 pressure tap plug to 84-120 lb-in. (9-14 N·m).
(13) Remove drain pan under C3 pressure tap plug.
(14) Install front and intermediate propeller shafts (para 9-2).

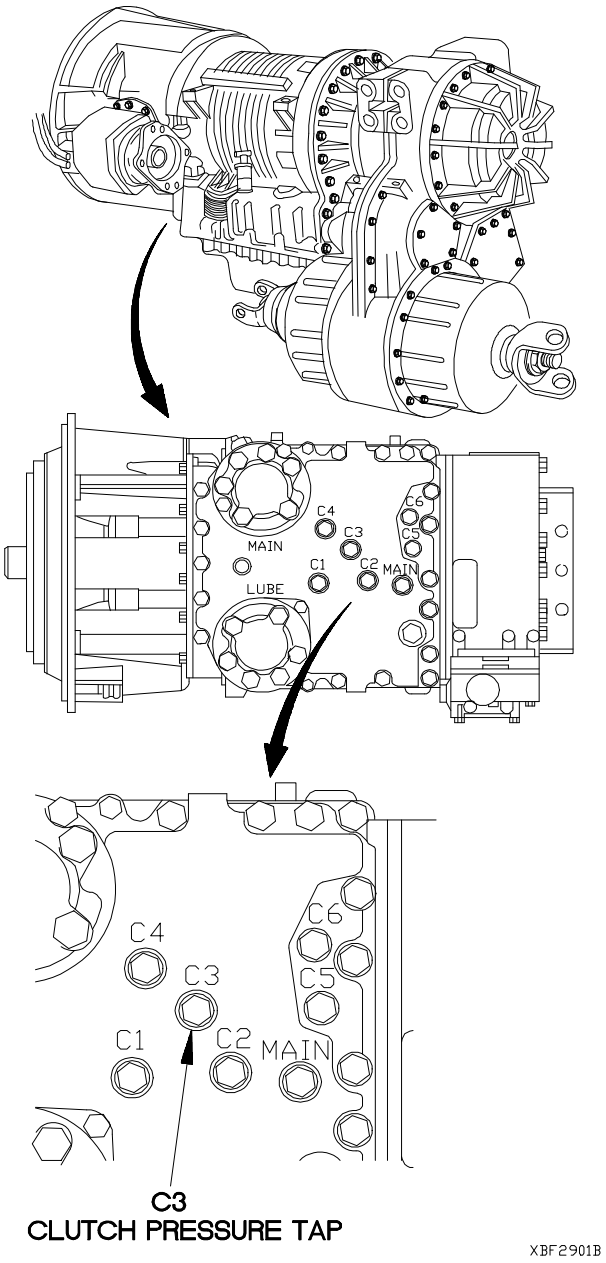
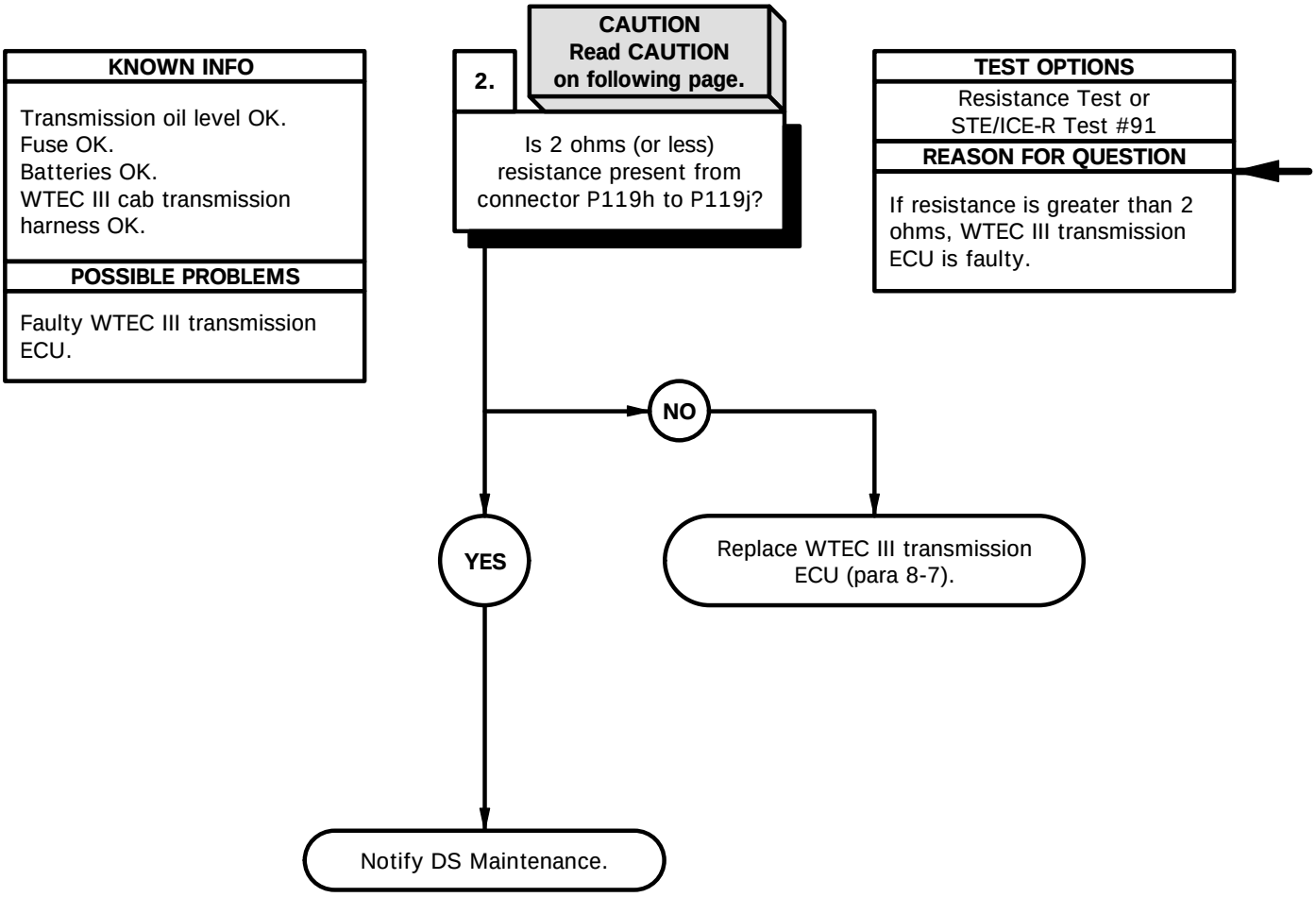


Table 2-38. Sub Code Range

Sub Code	Sub Code Meaning	
11	1st	Range VER
22	2nd	Range VER
44	4th	Range VER
66	6th	Range VER
88	N1	Range VER
99	N2/N4	Range VER

f29. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 57 AND ANY SUB CODE (CONT)



CAUTION

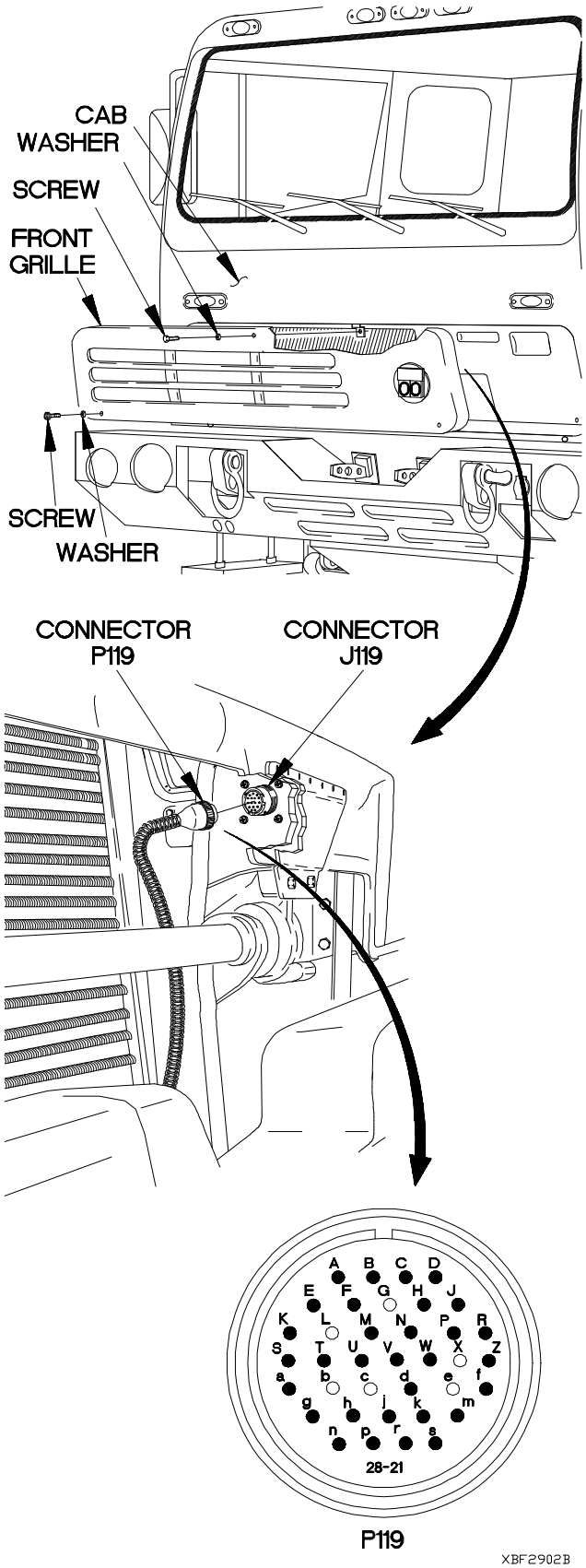
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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) 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) Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter on P119h.
(7) Connect negative (-) probe of multimeter on P119j and note reading on multimeter.
(8) If 2 ohms (or less) resistance is present, notify DS Maintenance.
(9) If resistance is greater than 2 ohms, replace WTEC III transmission ECU (para 8-7).
(10) Connect connector P119 to connector J119.
(11) Position front grille on cab with washer and screw.
(12) Position two washers and screws in front grille.
(13) Tighten screw to 48-60 lb-in. (5-7 N·m).
(14) Tighten two screws to 24 lb-in. (3 N·m).
(15) Clear diagnostic codes (para 8-5).



f30. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 21 AND ANY SUB CODE

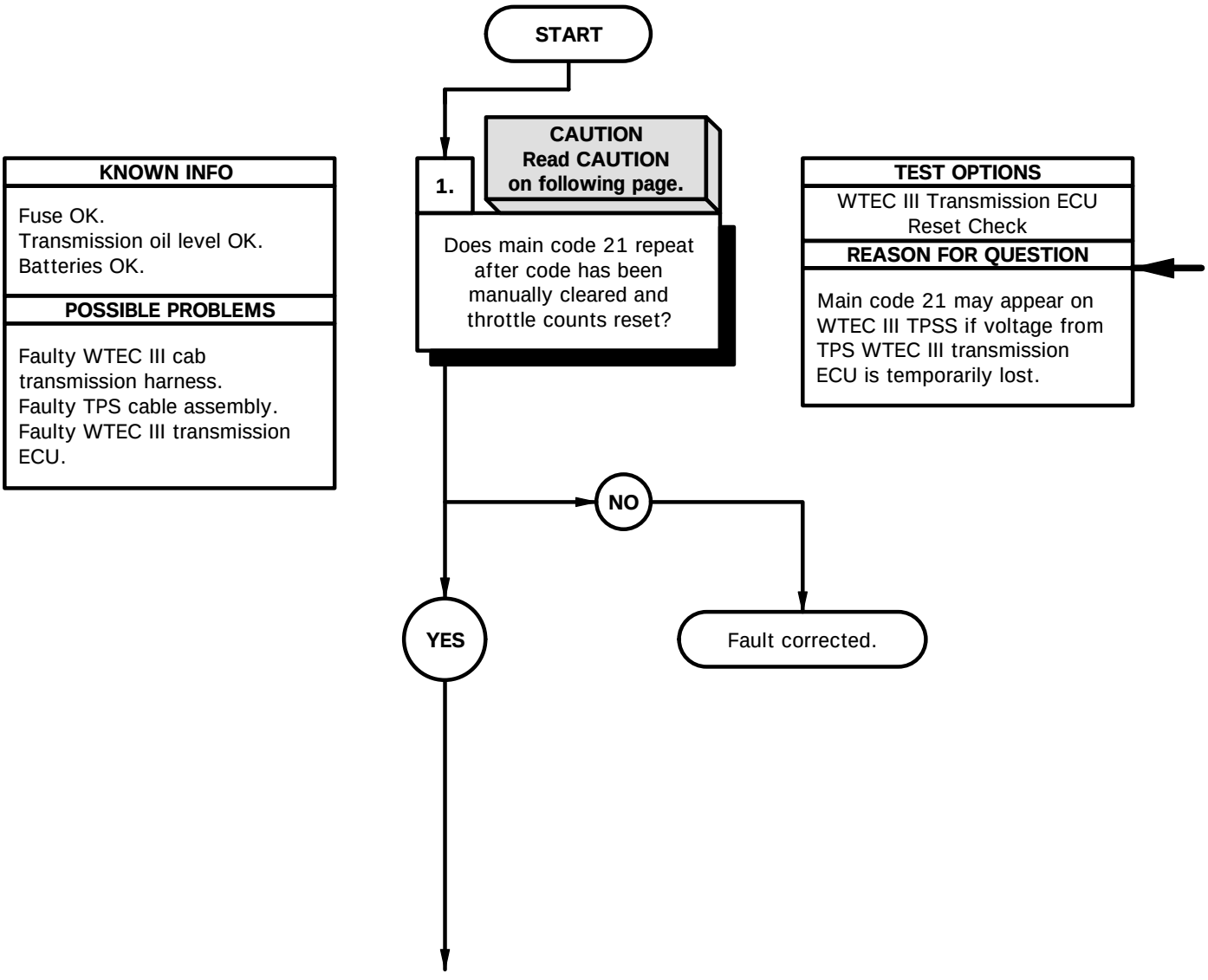
INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

References
TM 9-4910-571-12&P

Personnel Required
(2)



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

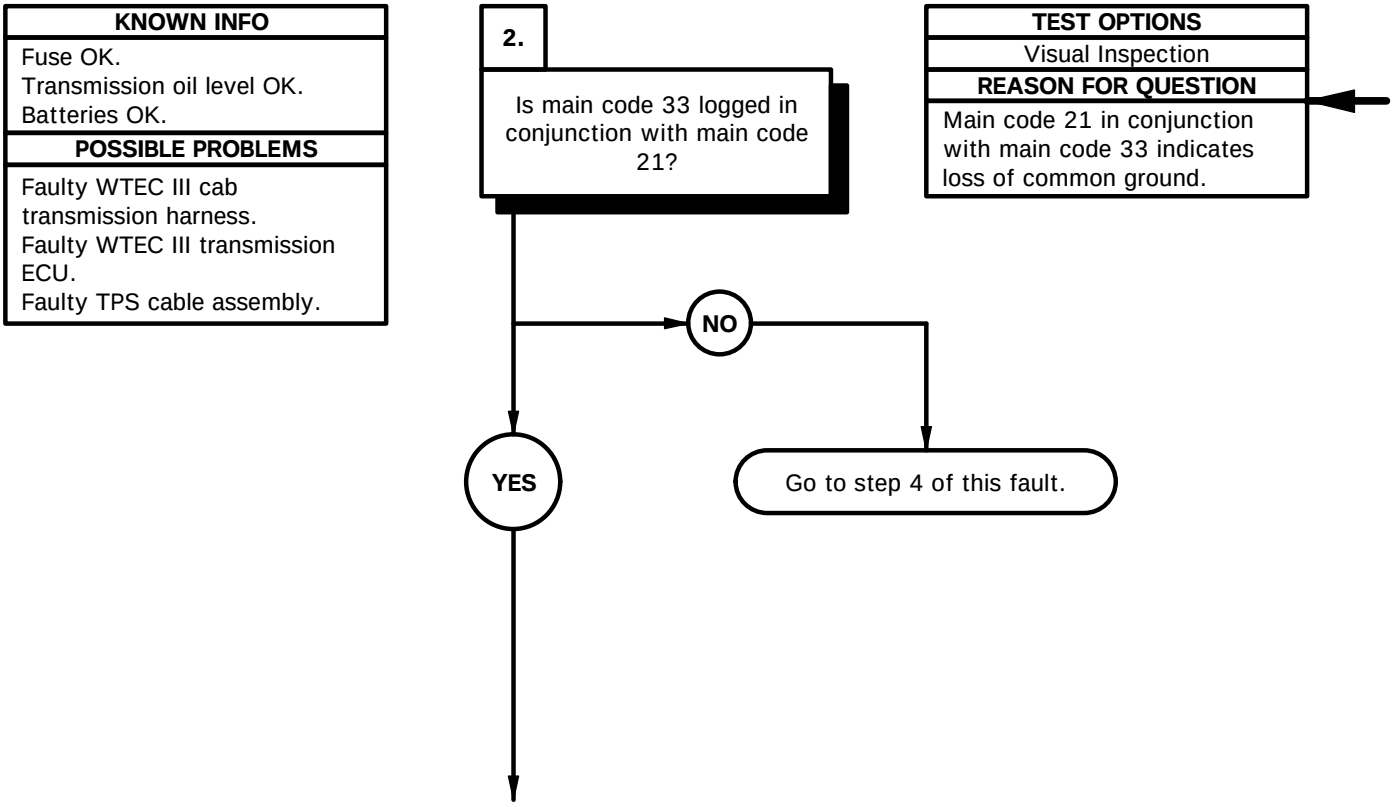
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

Main display code 21 needs to be cleared manually from WTEC III transmission ECU after a maintenance task has been performed and before vehicle is returned to service (para 8-5).

WTEC III TRANSMISSION ECU RESET CHECK

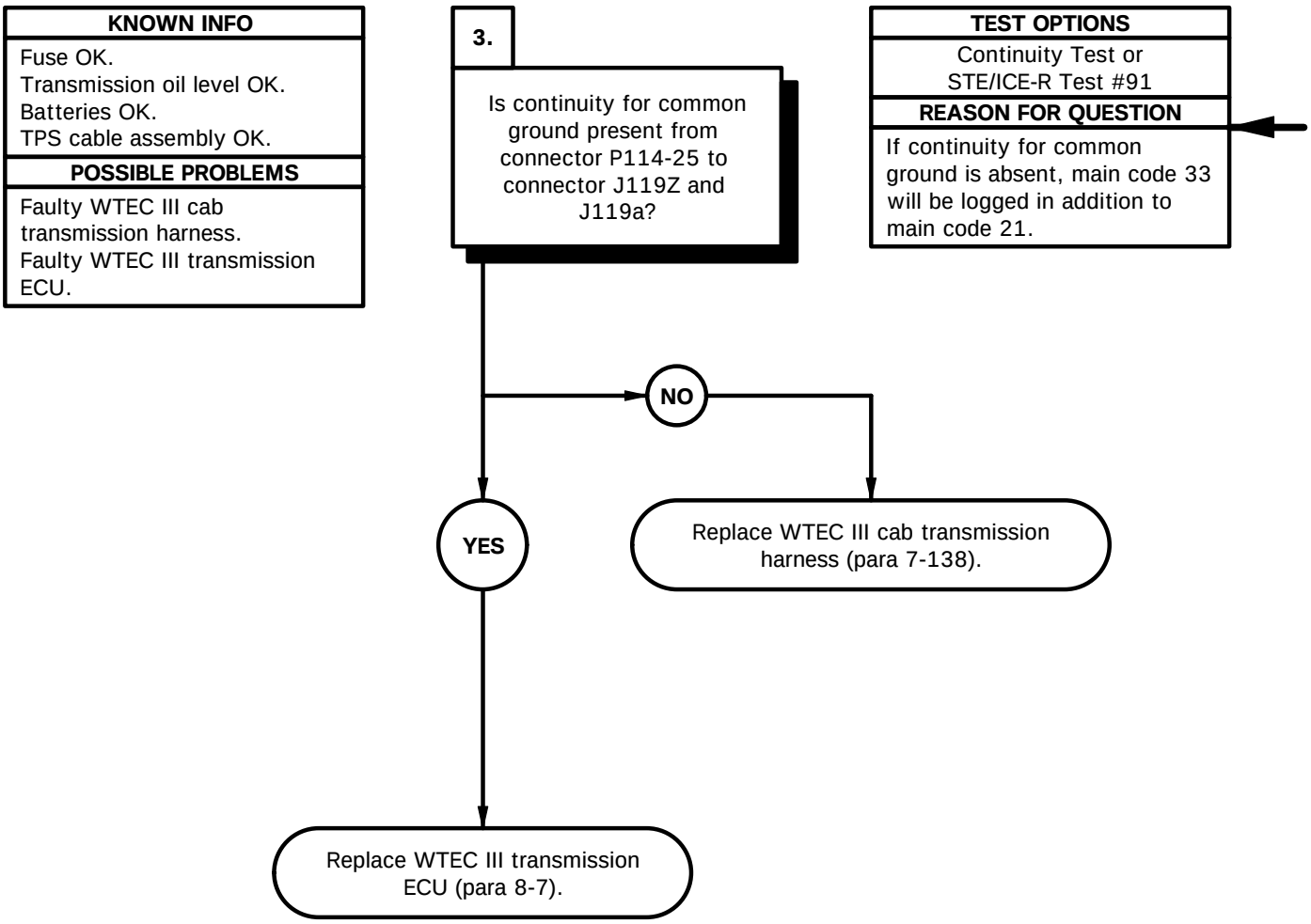
(1) Cycle master power switch to on (TM 9-2320-366-10-1), then to off five times to clear existing throttle count settings.
(2) Position master power switch to on (TM 9-2320-366-10-1).
(3) Depress accelerator pedal from idle position to full throttle position (TM 9-2320-366-10-1) to set new 0% and 100% throttle count values in WTEC III transmission ECU.
(4) Clear diagnostic code from WTEC III transmission ECU display (para 8-5).
(5) If main code 21 does not reappear, electrical communication between WTEC III transmission ECU and TPS may be faulty. If main code 21 reappears, TPS may be faulty.
(6) Position master power switch to off (TM 9-2320-366-10-1).

f30. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 21 AND ANY SUB CODE (CONT)



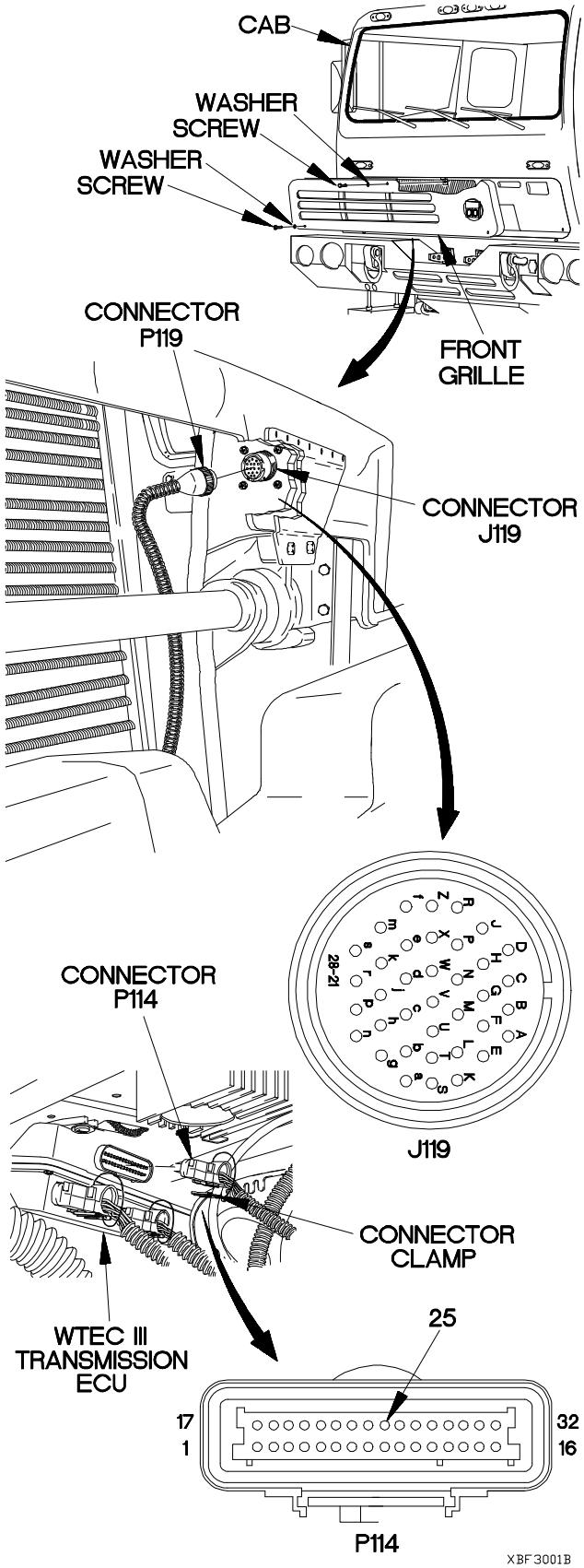
(1) Position master power switch to on (TM 9-2320-366-10-1).
(2) Press MODE button on WTEC III TPSS to bring up second code (if any) (para 8-5).
(3) If main code 33 displays on WTEC III TPSS, common ground may have been lost. If main code 21 is the only code displayed, TPS may be faulty. Go to step 4 of this fault.
(4) Position master power switch to off (TM 9-2320-366-10-1).

f30. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 21 AND ANY SUB CODE (CONT)

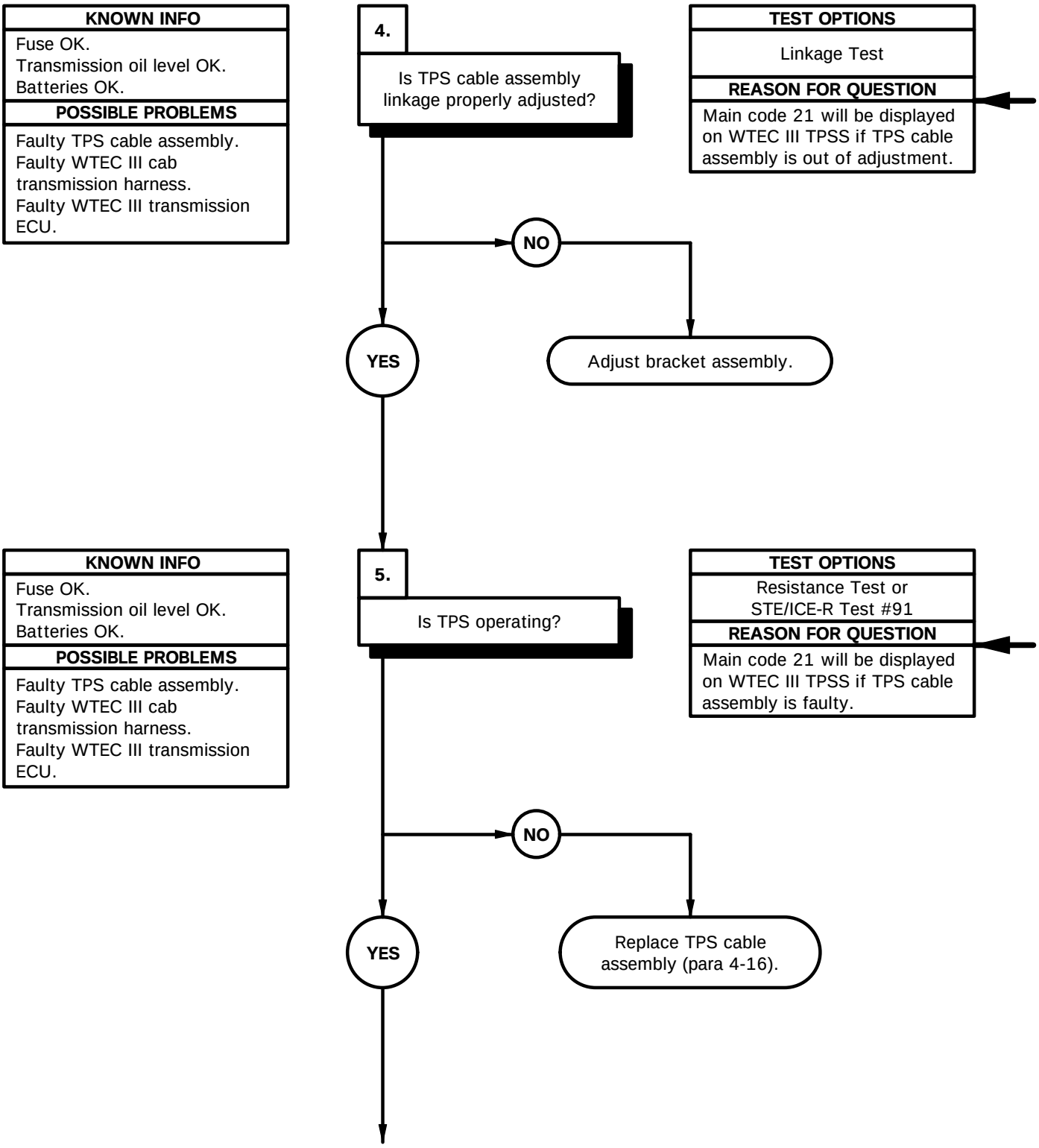


CONTINUITY TEST

(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) Remove kick panel (para 16-3).
(6) Disconnect connector clamp from connector P114.
(7) Disconnect connector P114 from WTEC III transmission ECU.
(8) Set multimeter to ohms.
(9) Connect positive (+) probe of multimeter to connector P114-25.
(10) Connect negative (-) probe of multimeter to connector J119a and note reading on multimeter.
(11) Connect negative (-) probe of multimeter to connector J119Z and note reading on multimeter.
(12) If continuity is not present from connector P114-25 to connector J119a and J119Z, replace WTEC III cab transmission harness (para 7-138).
(13) If continuity is present, replace WTEC III transmission ECU (para 8-7).
(14) Connect connector P114 to WTEC III transmission ECU.
(15) Connect connector clamp on connector P114.
(16) Install kick panel (para 16-3).
(17) Connect connector P119 to connector J119.
(18) Position front grille on cab with washer and screw.
(19) Position two washers and screws in front grille.
(20) Tighten screw to 48-60 lb-in. (5-7 N·m).
(21) Tighten two screws to 24 lb-in. (3 N·m).
(22) Clear diagnostic codes (para 8-5).



f30. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 21 AND ANY SUB CODE (CONT)

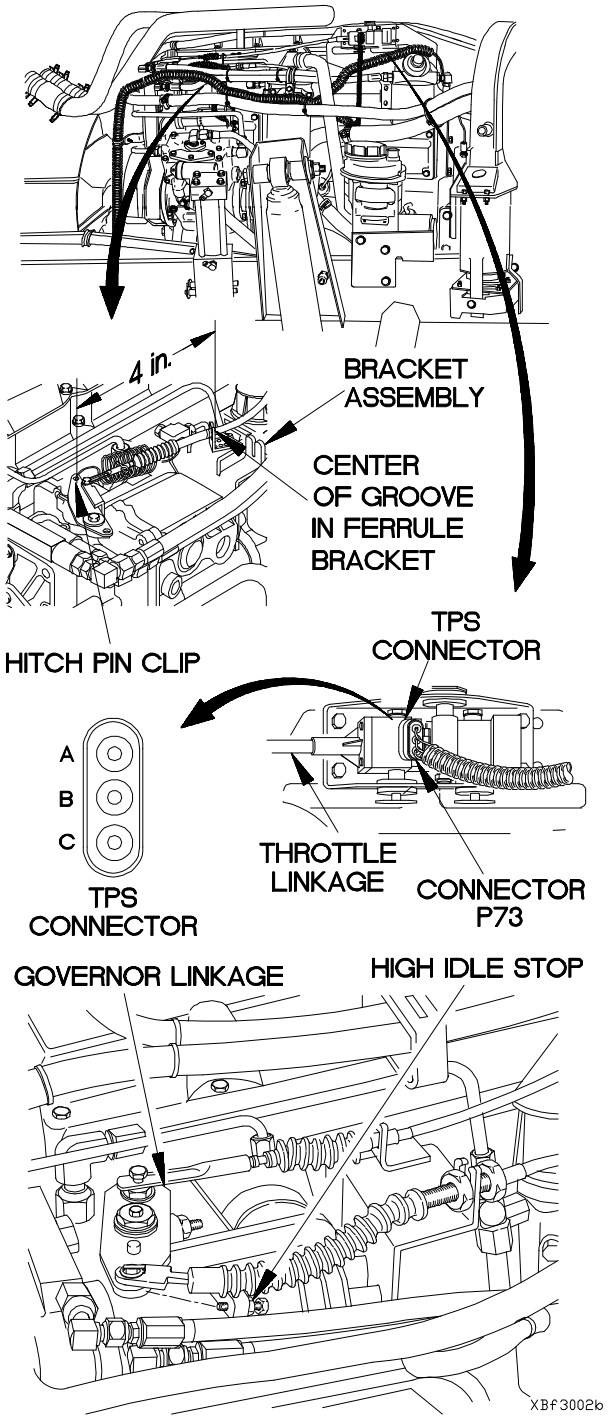


LINKAGE TEST

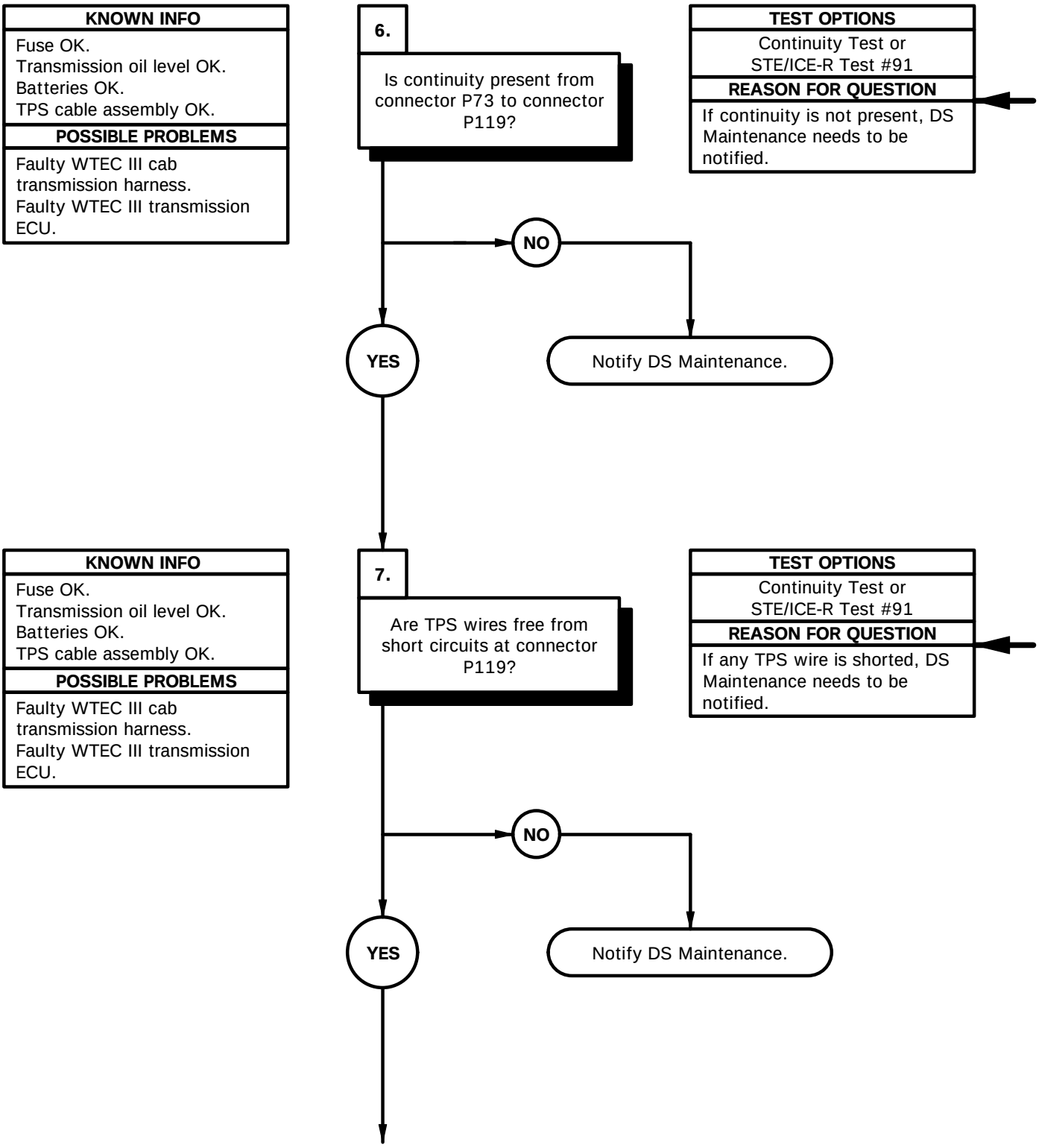
(1) Raise cab (TM 9-2320-366-10-1).
(2) Verify distance between hitch pin clip on end of sensor rod and center of cable groove in ferrule is 4 in. (10 cm).
(3) If distance is not 4 in. (10 cm), adjust bracket assembly to obtain correct measurement.

RESISTANCE TEST

(1) Disconnect connector P73 from TPS connector.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to TPS terminal A.
(4) Connect negative (-) probe of multimeter to TPS terminal C and verify multimeter reads between 9,000-15,000 ohms across terminals A and C.
(5) Disconnect negative (-) probe of multimeter from terminal C.
(6) Connect negative (-) probe of multimeter to TPS terminal B and note record on multimeter.
(7) Move governor linkage to high idle stop and record reading on multimeter.
(8) Return governor linkage to low idle stop.
(9) Verify that difference between highest (high idle) reading and lowest (low idle) reading is between 4,000 and 6,000 ohms.
(10) Verify that highest (high idle) reading does not exceed 15,000 ohms.
(11) If resistance readings are not within limits, replace TPS cable assembly (para 4-16).



f30. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 21 AND ANY SUB CODE (CONT)

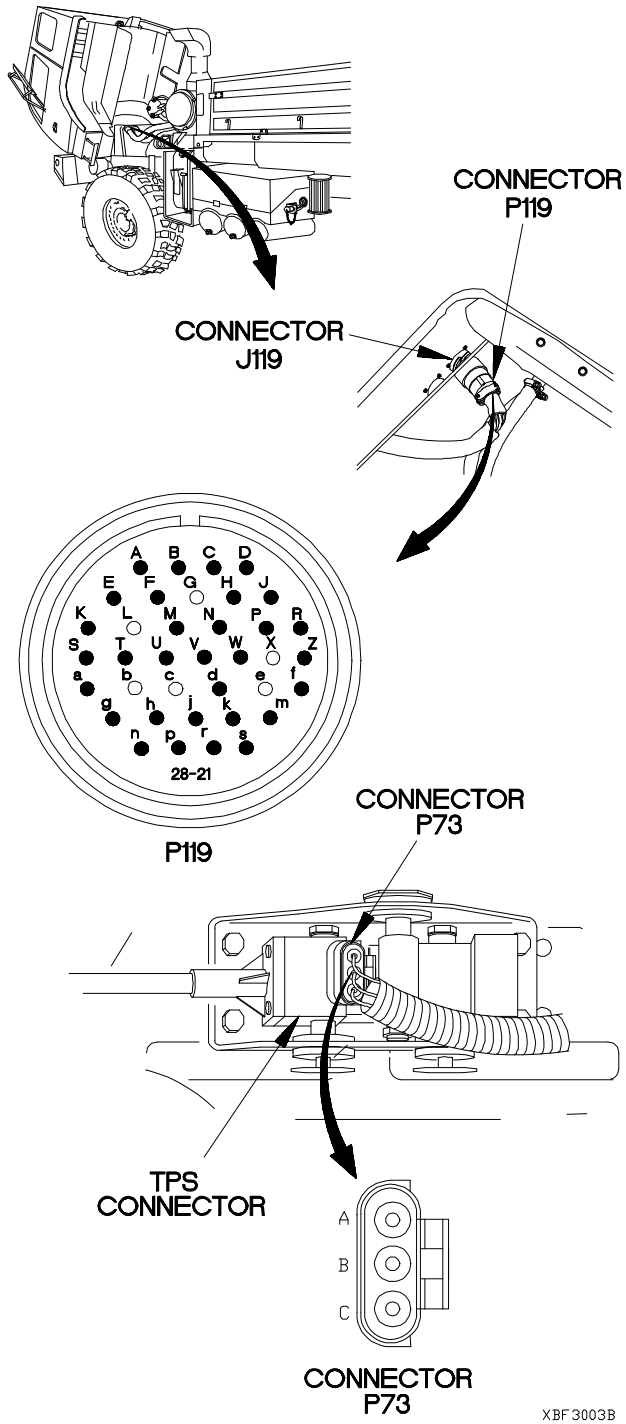


CONTINUITY TEST

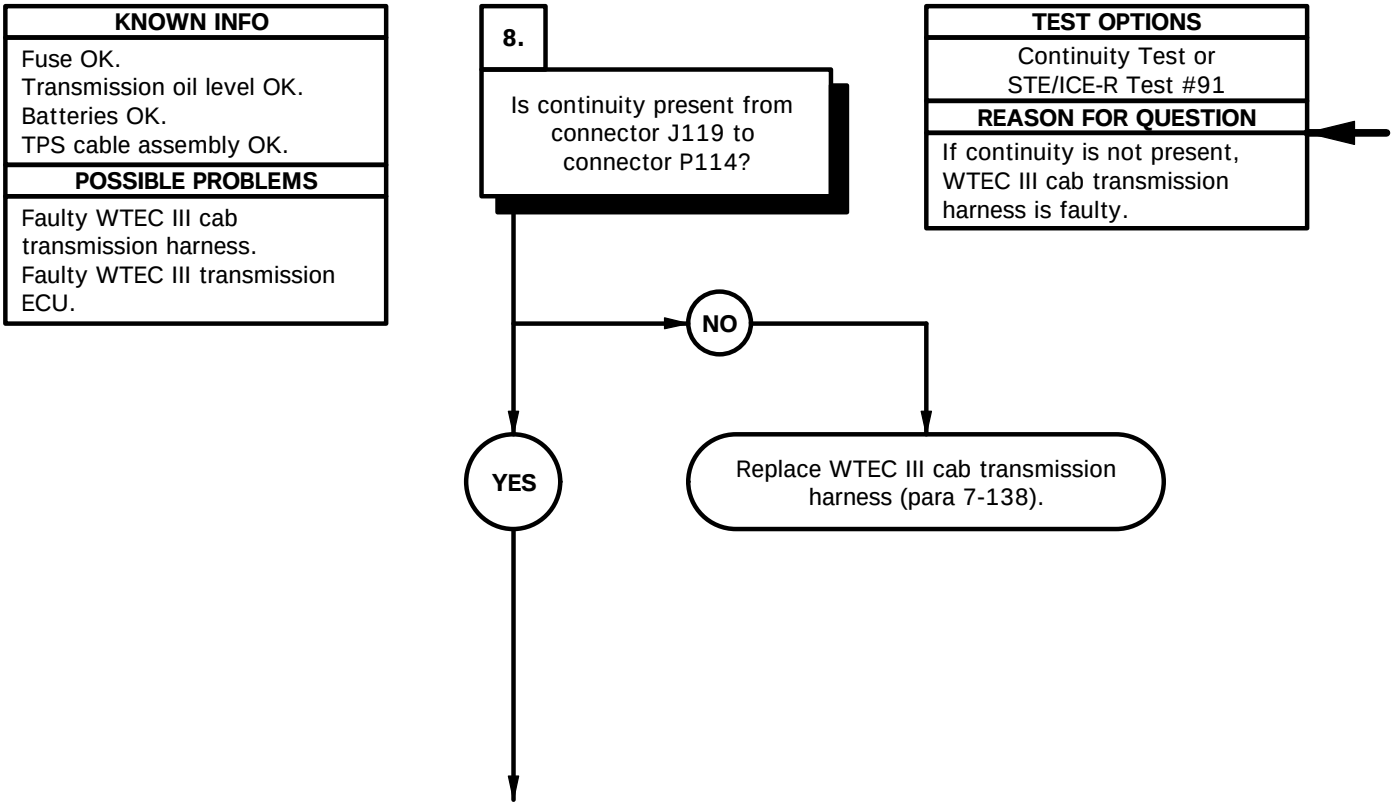
(1) Disconnect connector P119 from connector J119.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector P119R.
(4) Connect negative (-) probe of multimeter to connector P73 pin C and note reading on multimeter.
(5) Connect positive (+) probe of multimeter to connector P119f.
(6) Connect negative (-) probe of multimeter to connector P73 pin B and note reading on multimeter.
(7) Connect positive (+) probe of multimeter to connector P119Z.
(8) Connect negative (-) probe of multimeter to connector P73 pin A and note reading on multimeter.
(9) If continuity is not present on one or more wires, notify DS Maintenance.

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P119R.
(3) Connect negative (-) probe of multimeter to all other pins in connector P119, one at a time, and note reading on multimeter.
(4) If continuity is found between pin R and any other pin, notify DS Maintenance.
(5) Perform steps (2) and (3) for P119f and P119Z.
(6) If continuity is found between pin f and any other pin, or between pin Z and any other pin, notify DS Maintenance.
(7) Connect connector P73 to TPS connector.



f30. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 21 AND ANY SUB CODE (CONT)

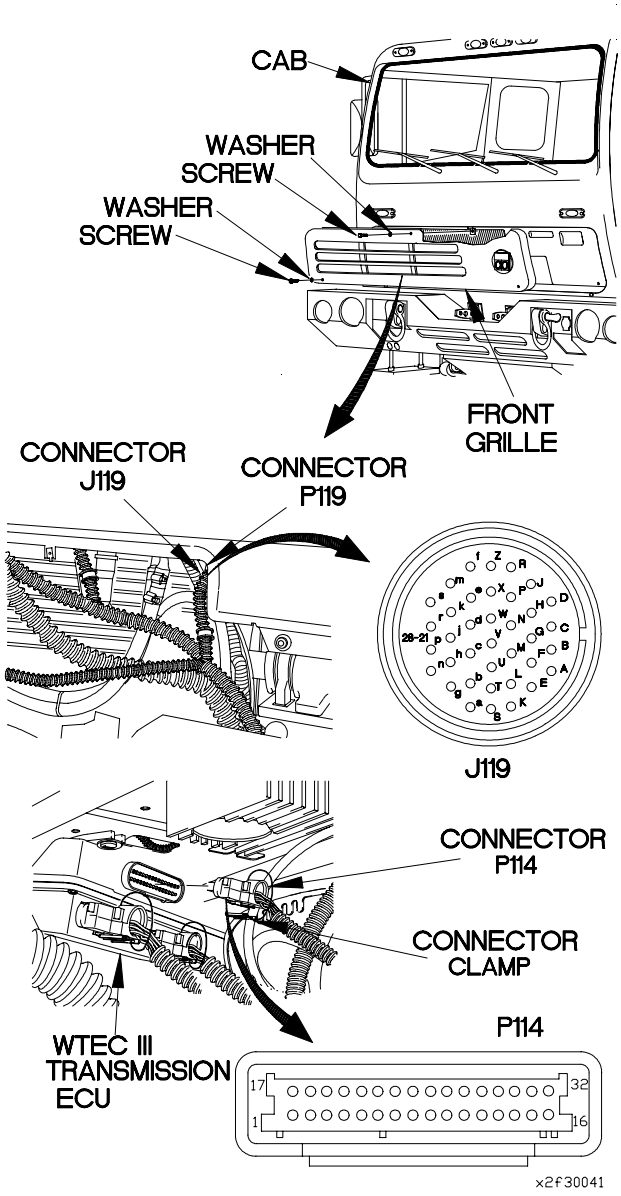


CONTINUITY TEST

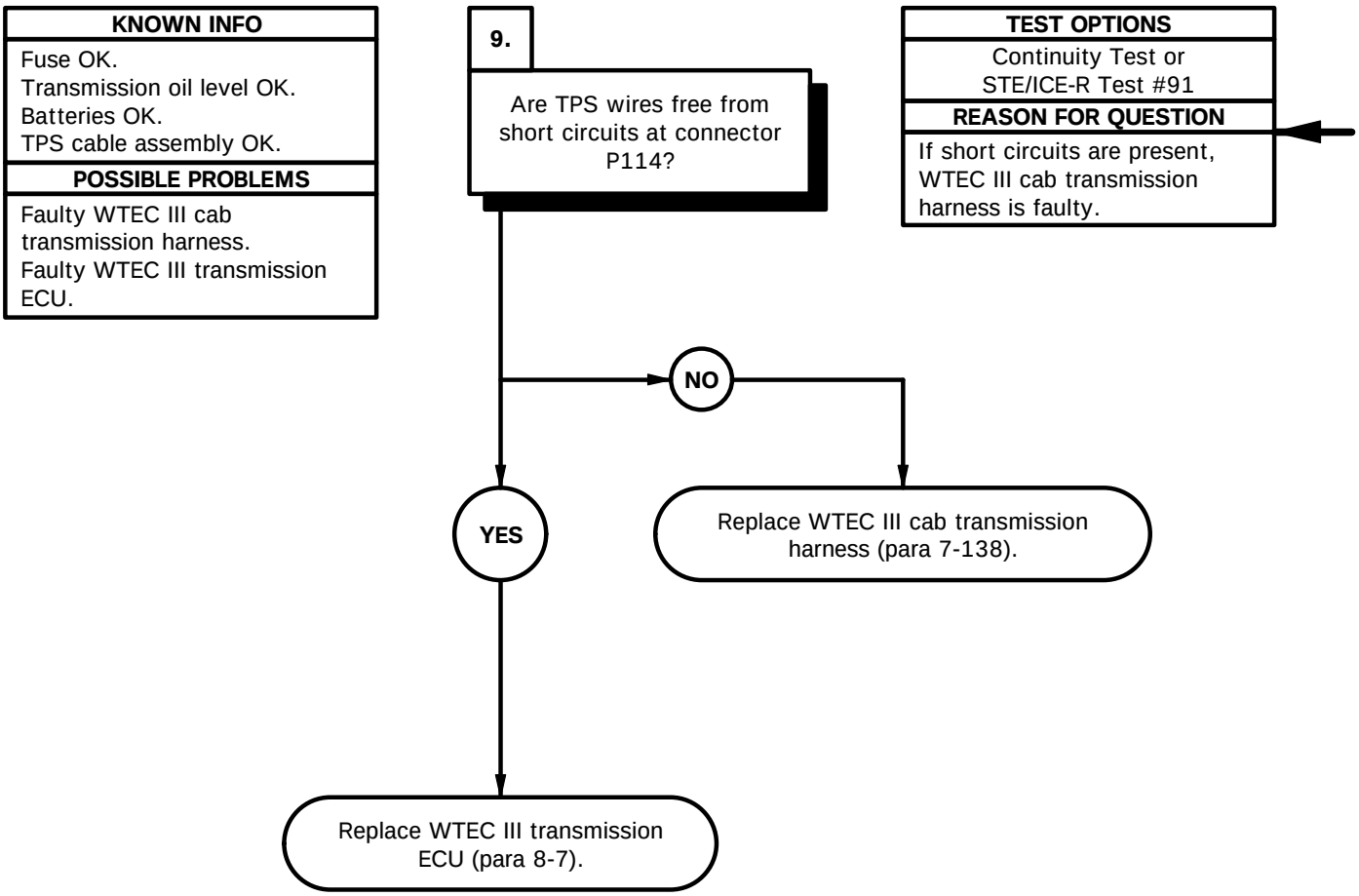
(1) Lower cab (TM 9-2320-366-10-1).
(2) Remove two screws and washers from front grille.
(3) Remove screw and washer from front grille.
(4) Remove front grille from cab.
(5) Remove kick panel (para 16-3).
(6) Disconnect connector clamp from connector P114.
(7) Disconnect connector P114 from WTEC III transmission ECU.
(8) Set multimeter to ohms.
(9) For each line of Table 2-39. Cab Transmission Harness Continuity Check:
  (a) Install jumper wire across sockets in column 1.
  (b) Connect positive (+) probe of multimeter to socket in column 2.
  (c) Connect negative (-) probe of multimeter to socket in column 3 and note reading on multimeter.
(10) If continuity is not present on any wire in Table 2-39. Cab Transmission Harness Continuity Check, replace WTEC III cab transmission harness (para 7-138).
(11) Remove jumper wire from connector J119.

Table 2-39. Cab Transmission Harness Continuity Check

COLUMN 1 Jumper Across:	Column 2 Positive (+) Probe to:	Column 3 Negative (-) Probe to:
J119f to J119Z	P114-10	P114-25
J119f to J119R	P114-10	P114-9
J119R to J119Z	P114-25	P114-9

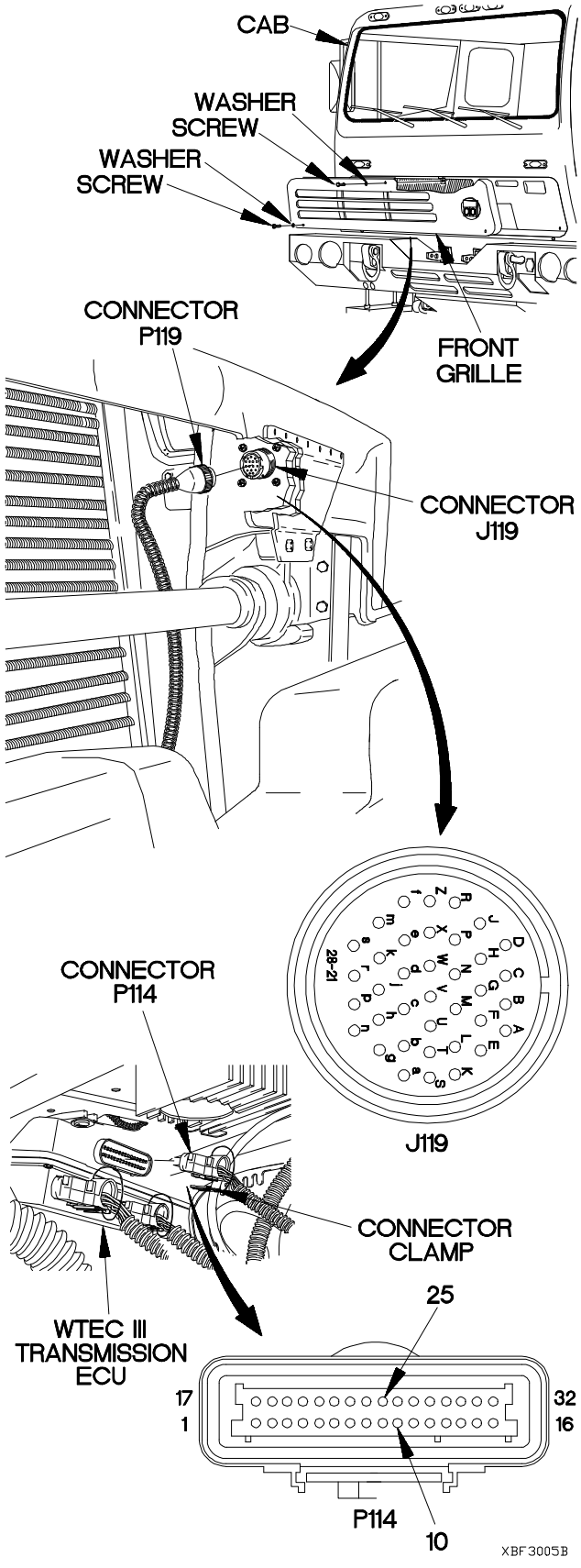


f30. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 21 AND ANY SUB CODE (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P114-9.
(3) Connect negative (-) probe of multimeter to all other sockets of connector P114, one at a time, and note reading on multimeter.
(4) Connect positive (+) probe of multimeter to connector P114-10.
(5) Connect negative (-) probe of multimeter to all other sockets of connector P114, one at a time, and note reading on multimeter.
(6) Connect positive (+) probe of multimeter to connector P114-25.
(7) Connect negative (-) probe of multimeter to all other sockets of connector P114 (except P114-13), one at a time, and note reading on multimeter.
(8) If continuity is present in step 3, 5, or 7, replace WTEC III cab transmission harness (para 7-138).
(9) If no short circuits are found, replace WTEC III transmission ECU (para 8-7).
(10) Connect connector P114 to WTEC III transmission ECU.
(11) Connect connector clamp on connector P114.
(12) Install kick panel (para 16-3).
(13) Connect connector P119 to connector J119.
(14) Position front grille on cab with washer and screw.
(15) Position two washers and screws in front grille.
(16) Tighten screw to 48-60 lb-in. (5-7 N·m).
(17) Tighten two screws to 24 lb-in. (3 N·m).
(18) Clear diagnostic codes (para 8-5).



f31. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 51 AND ANY SUB CODE

INITIAL SETUP

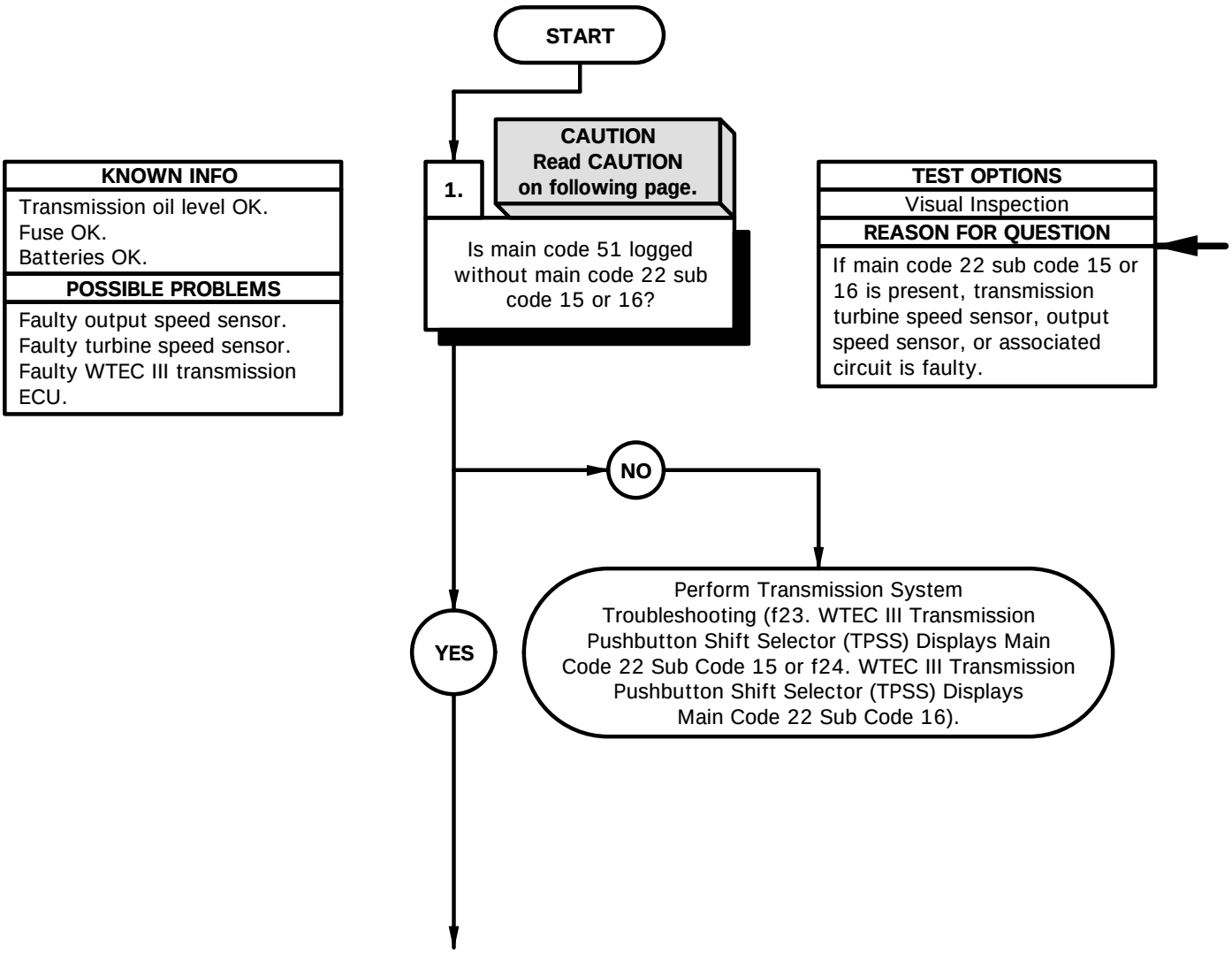
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Pan, Drain (Item 24, Appendix C)
Wrench, Torque 0-200 lb in. (Item 59, Appendix C)
Wrench Set, Socket (Item 51, Appendix C)

Materials/Parts
Packing, Preformed (Item 197, Appendix G)
Adapter, Straight, Pipe to Tube (Item 1.2, Appendix D)
Adapter, Straight, Tube to Boss (Item 1.3, Appendix D)
Hose Assembly, Nonmetallic (Item 24.13, Appendix D)

Personnel Required
(2)

References
TM 9-4910-571-12&P

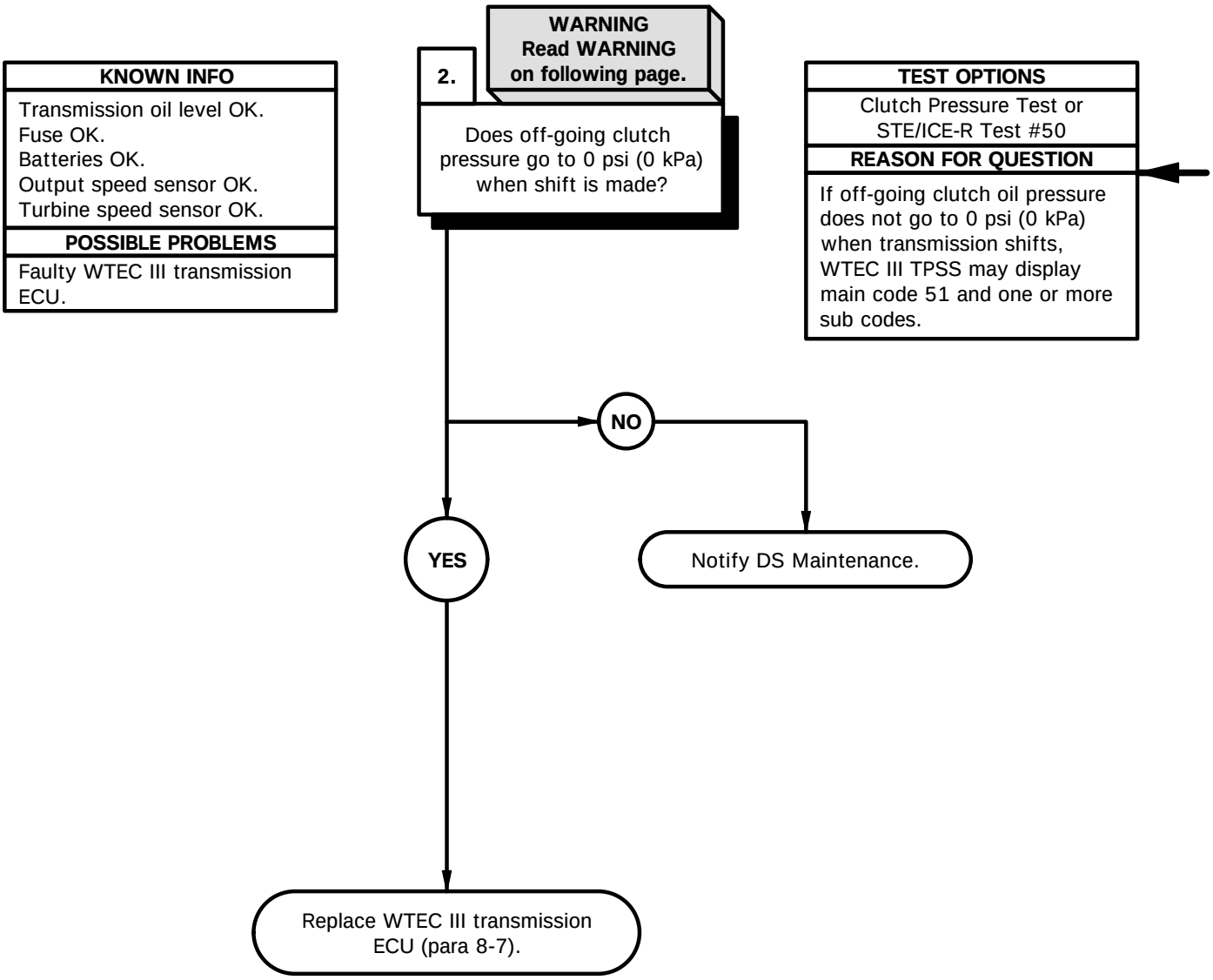


CAUTION

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) Check if main code 22 sub code 15 or 16 is logged in WTEC III TPSS (para 8-5).
(2) If main code 22 sub code 15 or 16 is logged, WTEC III transmission ECU has sensed a fault with the turbine speed sensor, output sensor, or associated circuits. Perform Transmission System Troubleshooting (f23. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 15 or f24. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code16).

f31. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 51 AND ANY SUB CODE (CONT)



WARNING

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

CLUTCH PRESSURE TEST

(1) Remove front and intermediate propeller shafts (para 9-2).
(2) Position drain pan under pressure tap.
(3) Remove pressure tap plug and preformed packing from off-going clutch indicated by the sub code, refer to Table 2-40. Off-Going Clutch Pressure Tap. Discard preformed packing.
(4) Connect tube to boss adapter, hose, and pipe to tube adapter to clutch pressure tap.
(5) Perform STE/ICE-R Test # 50 (TM 9-4910-571-12&P).
(6) Start engine (TM 9-2320-366-10-1) and run at idle.
(7) With parking brake applied, make shift indicated by sub code while assistant notes reading on STE/ICE-R. Refer to Table 2-40. Off-Going Clutch Pressure Tap.
(8) If one or more off-going clutches fail to loose pressure, notify DS Maintenance.
(9) Shut down engine (TM 9-2320-366-10-1).
(10) Remove pipe to tube adapter, hose, and tube to boss adapter from clutch pressure tap.
(11) Position preformed packing and pressure tap plug in control valve module.
(12) Tighten pressure tap plug to 84-120 lb-in. (9-14 N·m).
(13) Remove drain pan under pressure tap.
(14) Install front and intermediate propeller shafts (para 9-2).
(15) Clear diagnostic codes (para 8-5).

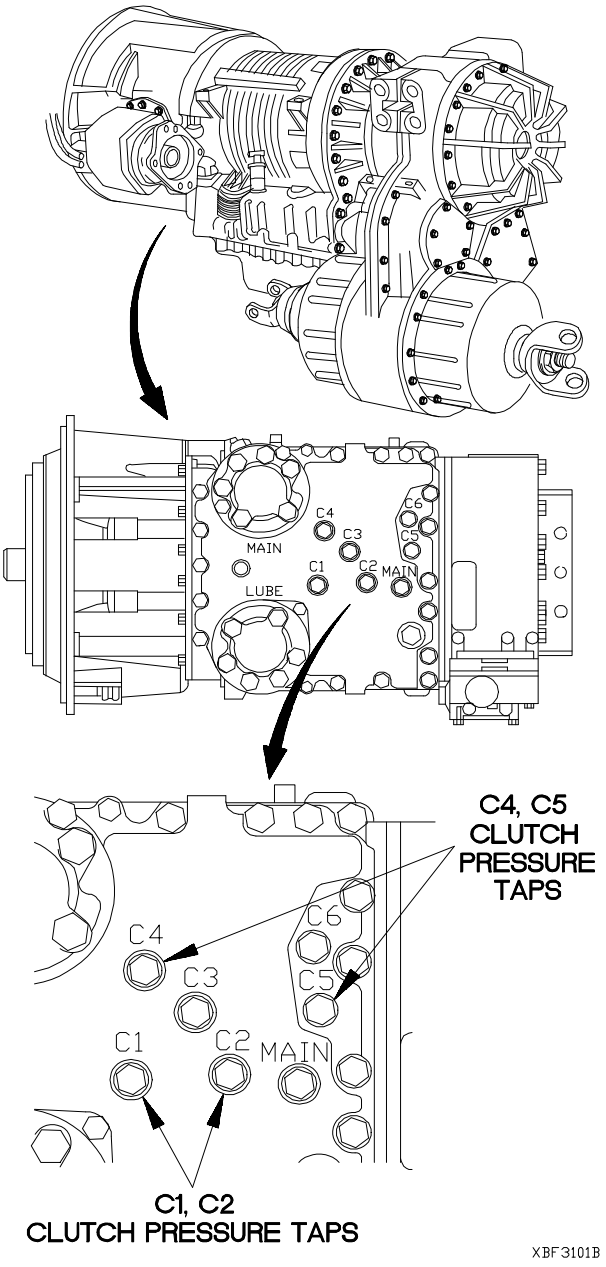


Table 2-40. Off-Going Clutch Pressure Tap

Sub Code	Sub Code Meaning	Off-Going Clutch	Solenoid Assembly Location
10	2-1 Downshift	C5	Stationary Clutch
12	2-3 Upshift	C5	Stationary Clutch
21	3-2 Downshift	C4	Stationary Clutch
23	3-4 Upshift	C4	Stationary Clutch
43	5-4 Downshift	C2	Rotating Clutch
45	5-6 Upshift	C1	Rotating Clutch
65	7-6 Downshift	C4	Stationary Clutch

f32. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 25 AND ANY SUB CODE

INITIAL SETUP

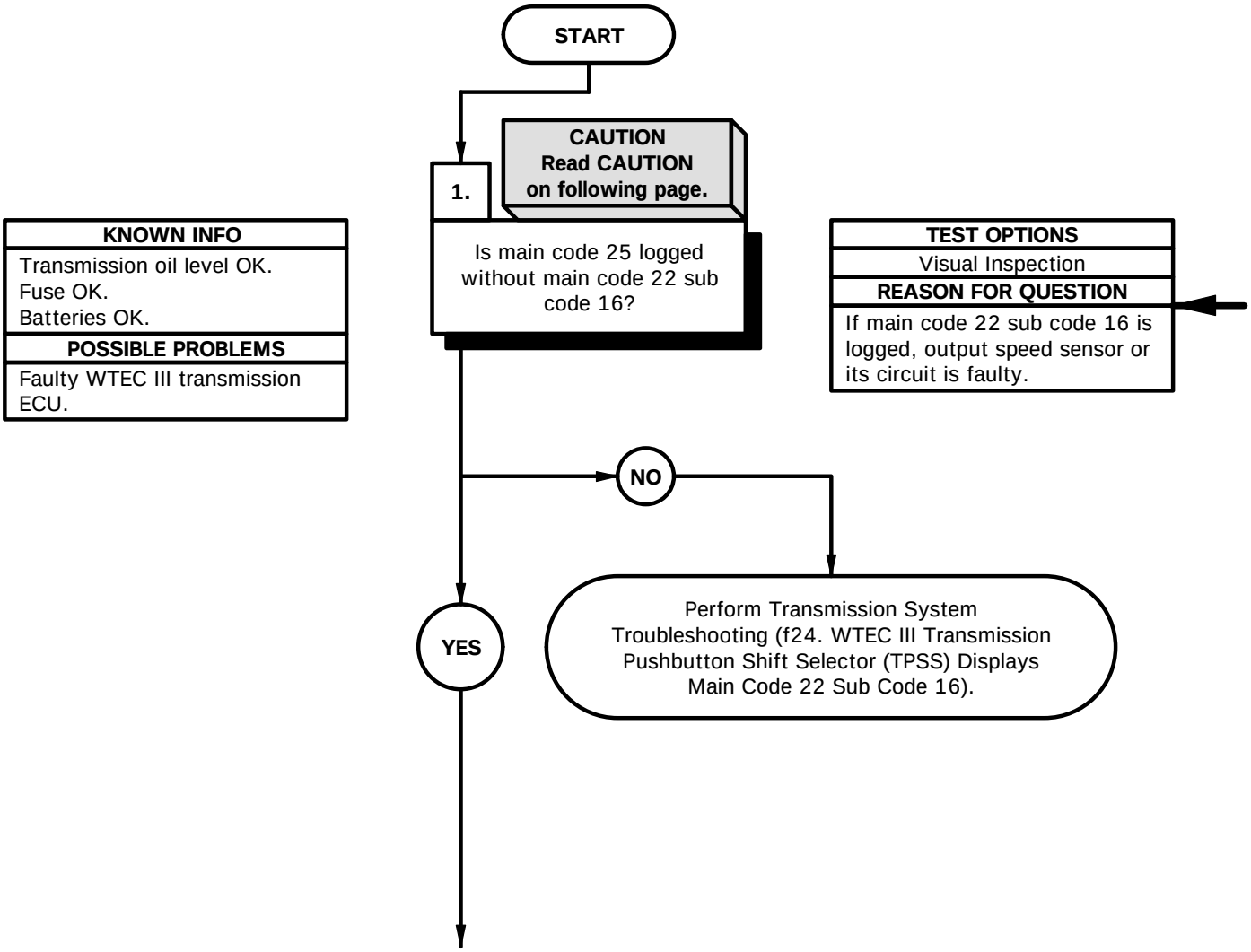
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Pan, Drain (Item 24, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Wrench Set, Socket (Item 51, Appendix C)

Materials/Parts
Packing, Preformed (Item 197, Appendix G)
Adapter, Straight, Pipe to Tube (Item 1.2, Appendix D)
Adapter, Straight, Tube to Boss (Item 1.3, Appendix D)
Hose Assembly, Nonmetallic (Item 24.13, Appendix D)

Personnel Required
(2)

References
TM 9-4910-571-12&P

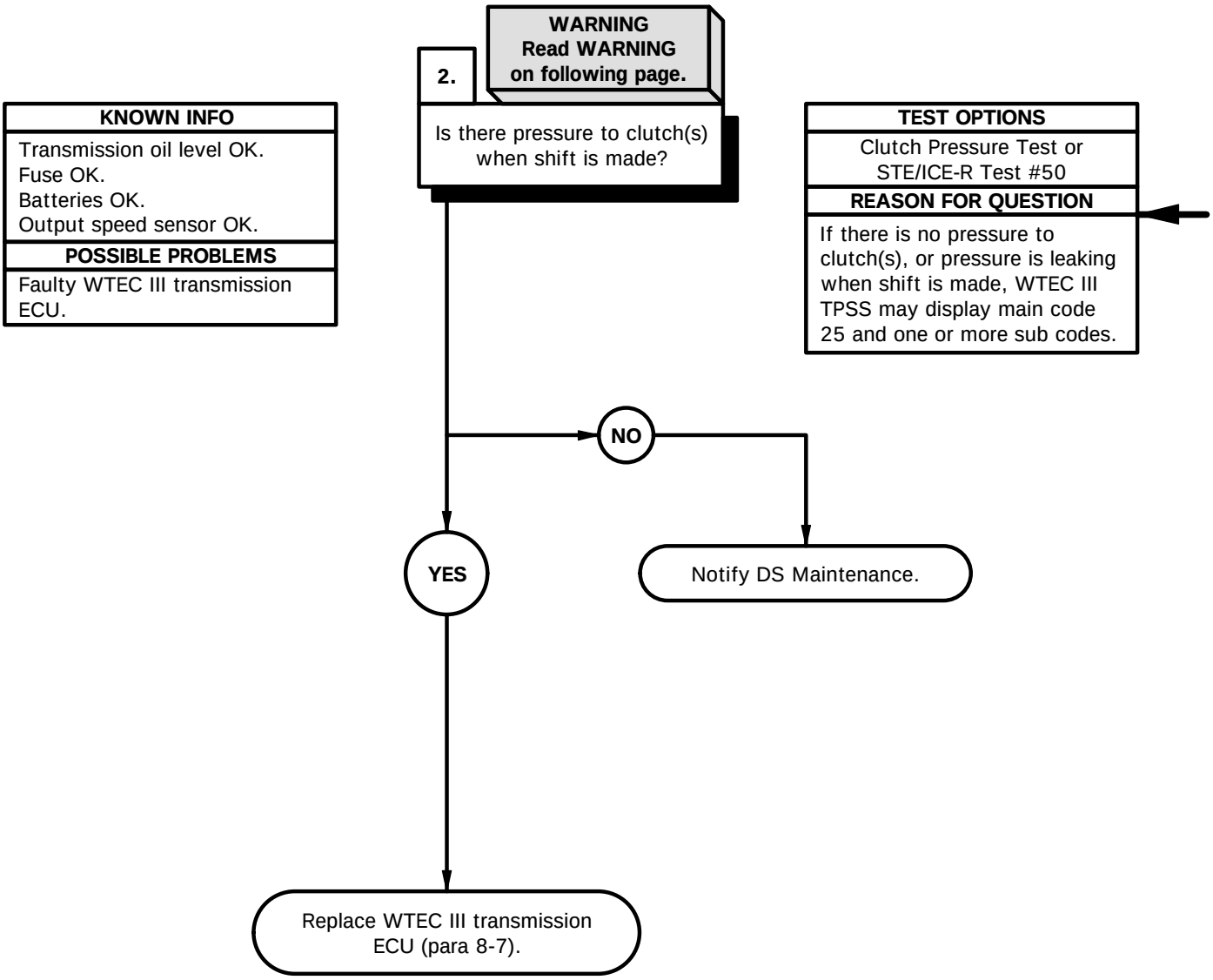


CAUTION

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) Check if main code 22 sub code 16 is logged in the WTEC III TPSS (para 8-5).
(2) If main code 22 sub code 16 is logged, WTEC III transmission ECU has sensed a fault with the output speed sensor or its circuit. Perform Transmission System Troubleshooting (f24. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 16).

f32. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 25 AND ANY SUB CODE (CONT)



WARNING

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

CLUTCH PRESSURE TEST

(1) Remove front and intermediate propeller shafts (para 9-2).
(2) Position drain pan under pressure tap.
(3) Remove pressure tap plug and preformed packing from clutch pressure tap indicated by the sub code. Refer to Table 2-41. Clutch Pressure Tap. Discard preformed packing.
(4) Connect tube to boss adapter, hose, and pipe to tube adapter to clutch pressure tap.
(5) Perform STE/ICE-R Test # 50 (TM 9-4910-571-12&P).
(6) Start engine (TM 9-2320-366-10-1).
(7) With brake applied, make shift indicated by sub code. Refer to Table 2-41. Clutch Pressure Tap.
(8) Accelerate engine until WTEC III TPSS displays desired range. Refer to Table 2-41. Clutch Pressure Tap.
(9) Maintain engine speed to keep desired transmission range while assistant notes reading on STE/ICE-R.
(10) Let engine return to idle.
(11) Shift transmission into neutral (TM 9-2320-366-10-1).
(12) Shut down engine (TM 9-2320-366-10-1).
(13) Remove pipe to tube adapter, hose, and tube to boss adapter from pressure tap.
(14) Position preformed packing and pressure tap plug in control valve module.
(15) Tighten pressure tap plug to 84-120 lb-in. (9-14 N·m).
(16) Remove drain pan under pressure tap.
(17) Install front and intermediate propeller shafts (para 9-2).
(18) If one or more clutches fail to indicate proper pressure, notify DS Maintenance.

CLUTCH PRESSURE TEST (CONT)

(19) If all clutches indicate proper pressure, replace WTEC III transmission ECU (para 8-7).
(20) Clear diagnostic codes (para 8-5).

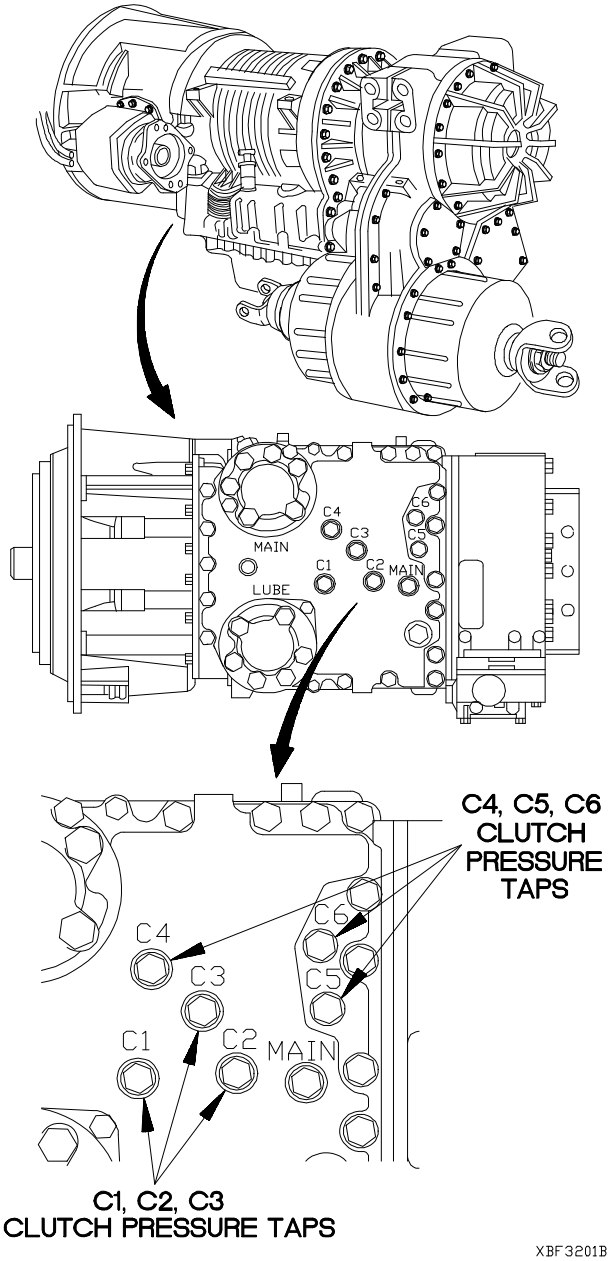


Table 2-41. Clutch Pressure Tap

Sub Code	Sub Code Meaning	Pressure at Clutch(s)	Pressure Readings at Taps
00	Speed Zero in 1st	C3 & C6	215-334 psi (1480-2300 kPa)
11	Speed Zero in 2nd	C1 & C5	215-305 psi (1480-2103 kPa)
22	Speed Zero in 3rd	C1 & C4	142-203 psi (980-1400 kPa)
33	Speed Zero in 4th	C1 & C3	142-203 psi (980-1400 kPa)
44	Speed Zero in 5th	C1 & C2	142-203 psi (980-1400 kPa)
55	Speed Zero in 6th	C2 & C3	128-189 psi (880-1300 kPa)
66	Speed Zero in 7th	C2 & C4	128-189 psi (880-1300 kPa)
77	Speed Zero in R	C3 & C5	215-334 psi (1480-2300 kPa)

f33. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 53 AND ANY SUB CODE

INITIAL SETUP

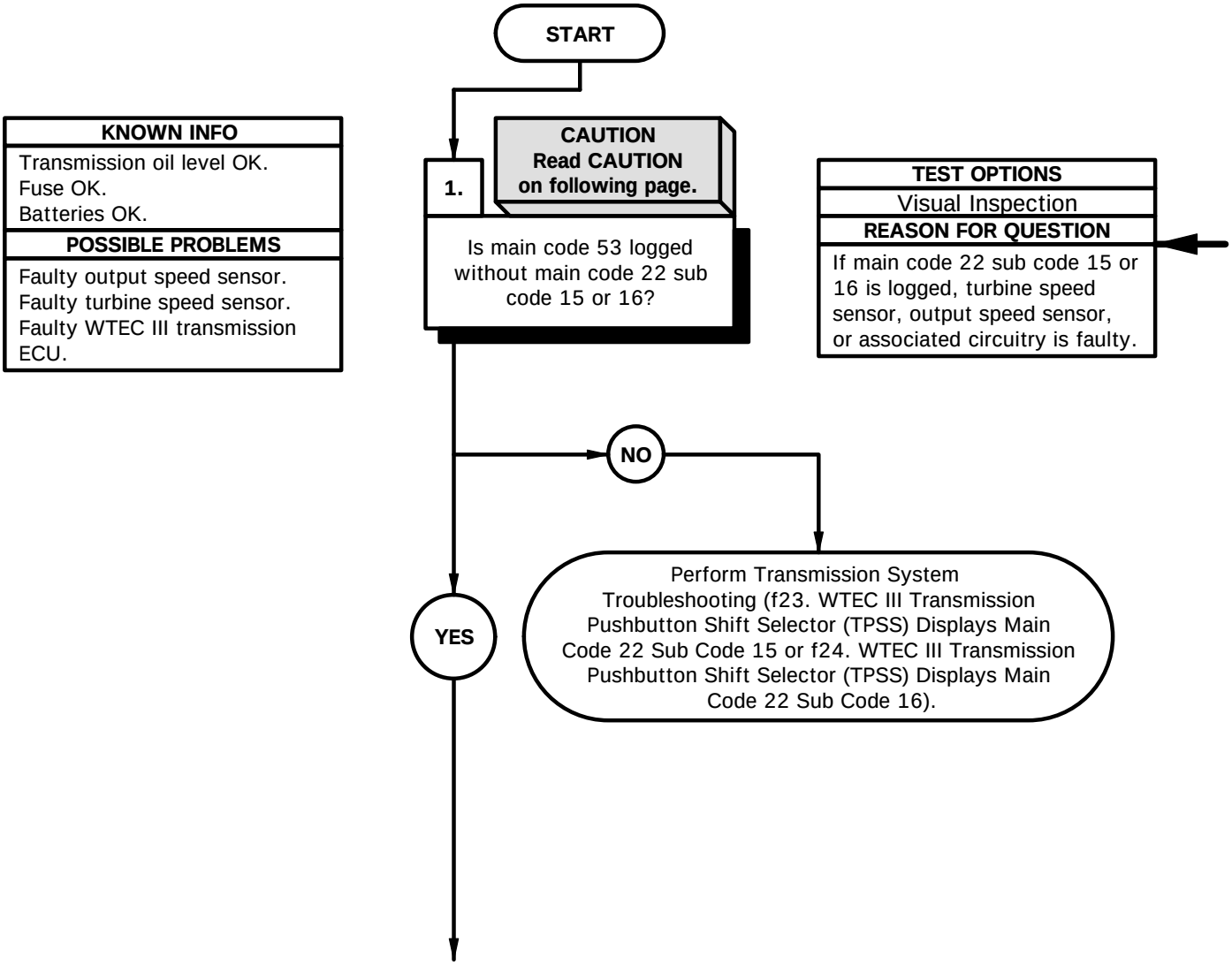
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Pan, Drain (Item 24, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Wrench Set, Socket (Item 51, Appendix C)

Materials/Parts
Packing, Preformed (Item 197, Appendix G)
Adapter, Straight, Pipe to Tube (Item 1.2, Appendix D)
Adapter, Straight, Tube to Boss (Item 1.3, Appendix D)
Hose Assembly, Nonmetallic (Item 24.13, Appendix D)

Personnel Required
(2)

References
TM 9-4910-571-12&P

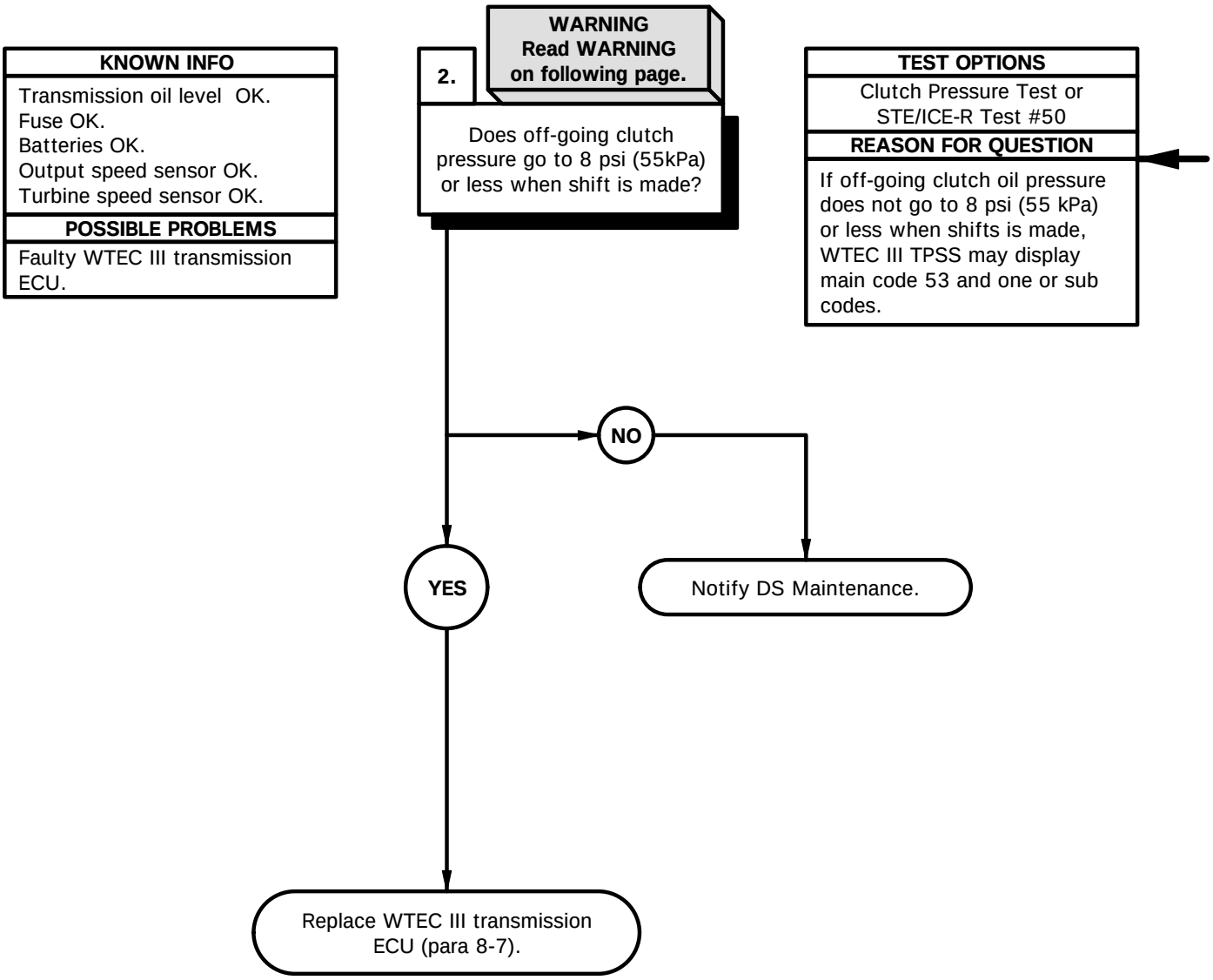


CAUTION

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) Check if main code 22 sub code 15 or 16 is logged in WTEC III TPSS (para 8-5).
(2) If main code 22 sub code 15 or 16 is logged, WTEC III transmission ECU has sensed a fault with turbine speed sensor, output speed sensor, or associated circuits. Perform Transmission System Troubleshooting (f23. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 15 or f24. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 16).

f33. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 53 AND ANY SUB CODE (CONT)



WARNING

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

CLUTCH PRESSURE TEST

(1) Remove front and intermediate propeller shafts (para 9-2).
(2) Position drain pan under pressure tap.
(3) Remove pressure tap plug and preformed packing from off-going clutch indicated by the sub code. Refer to Table 2-42. Off-Going Clutch Pressure Tap. Discard preformed packing.
(4) Connect tube to boss adapter, hose, and pipe to tube adapter to clutch pressure tap.
(5) Perform STE/ICE-R Test # 50 (TM 9-4910-571-12&P).
(6) Start engine (TM 9-2320-366-10-1) and run at idle.
(7) With parking brake applied, make shift indicated by sub code while assistant notes reading on STE/ICE-R. Refer to Table 2-42. Off-Going Clutch Pressure Tap.
(8) If off-going clutch pressure does not go to 8 psi (55 kPa) or less when shift is made, notify DS Maintenance.
(9) If off-going clutch pressure does go to 8 psi (55 kPa) or less when shift is made, replace WTEC III transmission ECU (para 8-7).
(10) Shut down engine (TM 9-2320-366-10-1).
(11) Remove pipe to tube adapter, hose, and tube to boss adapter from clutch pressure tap.
(12) Position preformed packing and pressure tap plug in control valve module.
(13) Tighten pressure tap plug to 84-120 lb-in. (9-14 N·m).
(14) Remove drain pan under pressure tap.
(15) Install front and intermediate propeller shafts (para 9-2).
(16) Clear diagnostic codes (para 8-5).

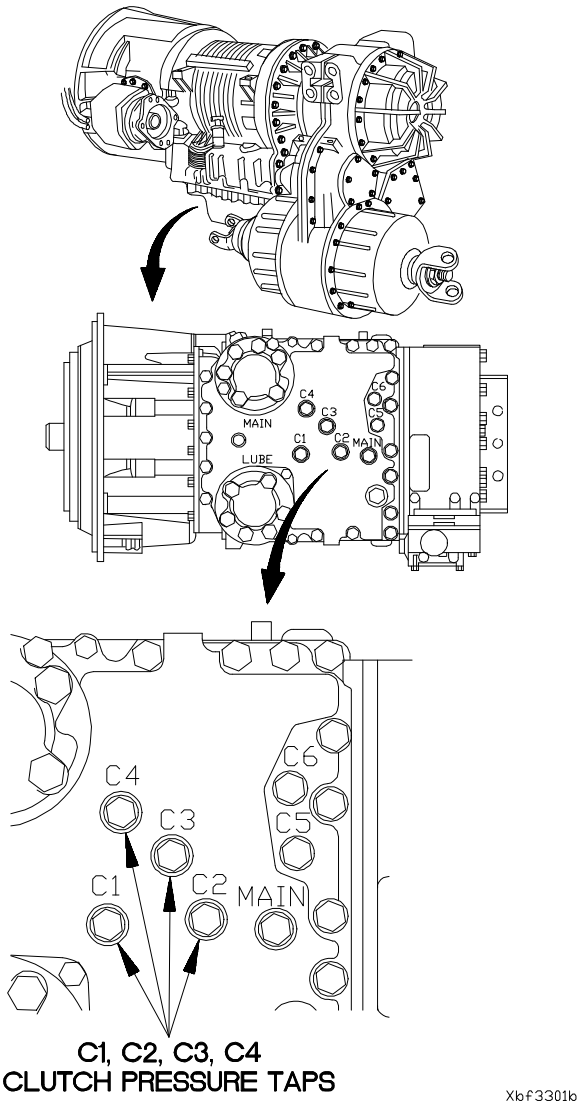


Table 2-42. Off-Going Clutch Pressure Tap

Sub Code	Sub Code Meaning	Off-Going Clutch(s)
08	L-N1 Shift	C3
18	1-N1 Shift	C1
28	2-N1 Shift	C1 & C4
29	2-N2 Shift	C1
38	3-N1 Shift	C1 & C3
39	3-N3 Shift	C1
48	4-N1 Shift	C1 & C2
49	4-N3 Shift	C1 & C2
58	5-N1 Shift	C2 & C3
59	5-N3 Shift	C2
68	6-N1 Shift	C2 & C4
69	6-N4 Shift	C2
78	R-N1 Shift	C2 or C4
79	N3-N2 or N2-N3 Shift	C3

f34. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 54 AND ANY SUB CODE

INITIAL SETUP

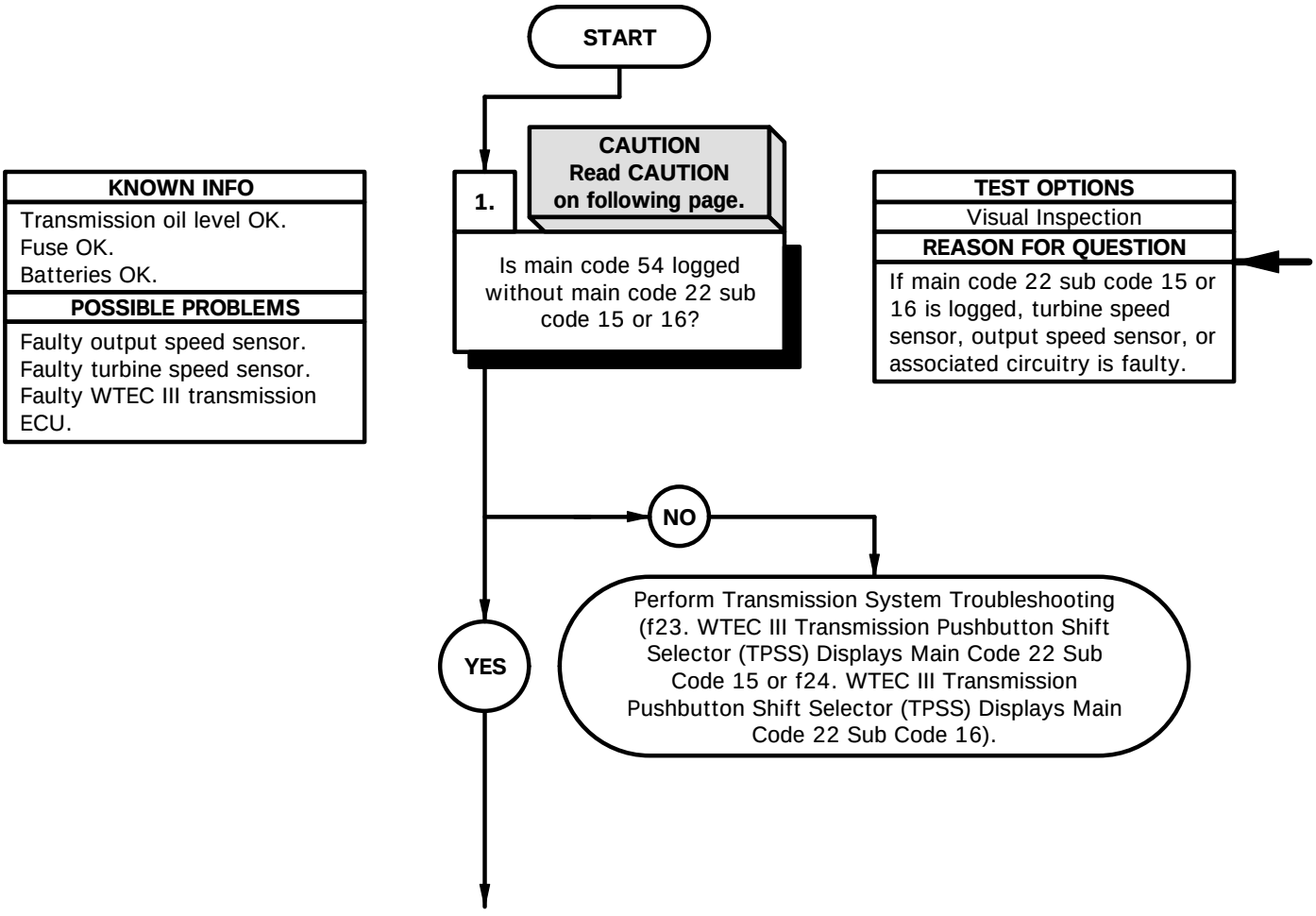
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Pan, Drain (Item 24, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Wrench Set, Socket (Item 51, Appendix C)

Materials/Parts
Packing, Preformed (Item 197, Appendix G)
Adapter, Straight, Pipe to Tube (Item 1.2, Appendix D)
Adapter, Straight, Tube to Boss (Item 1.3, Appendix D)
Hose Assembly, Nonmetallic (Item 24.13, Appendix D)

Personnel Required
(2)

Reference
TM 9-4910-571-12&P

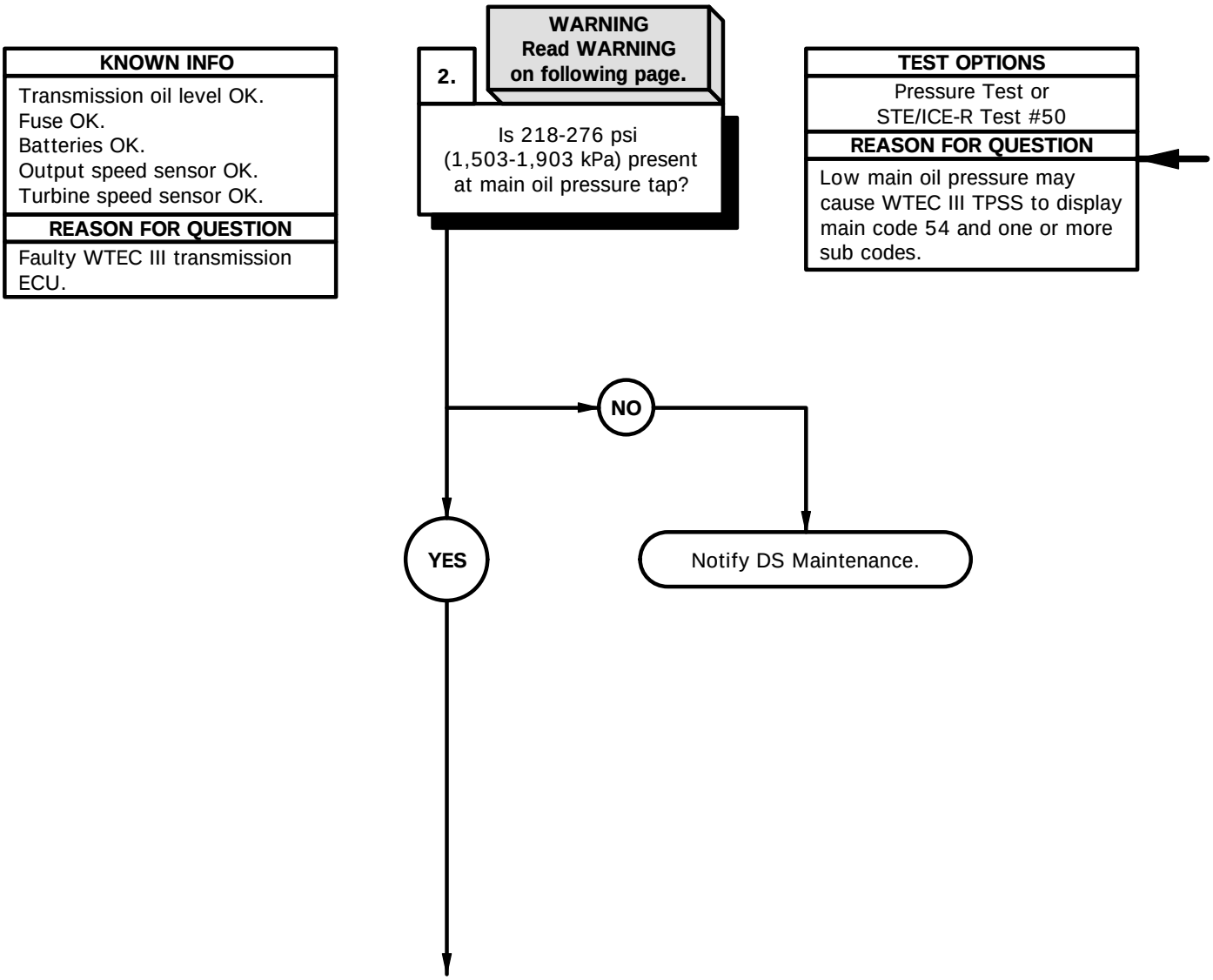


CAUTION

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) Check if main code 22 sub code 15 or 16 is logged in WTEC III TPSS (para 8-5).
(2) If main code 22 sub code 15 or 16 is logged, WTEC III transmission ECU has sensed a fault with the turbine speed sensor, output speed sensor, or associated circuits. Perform Transmission System Troubleshooting (f23. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 15 or f24. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 16).

f34. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 54 AND ANY SUB CODE (CONT)

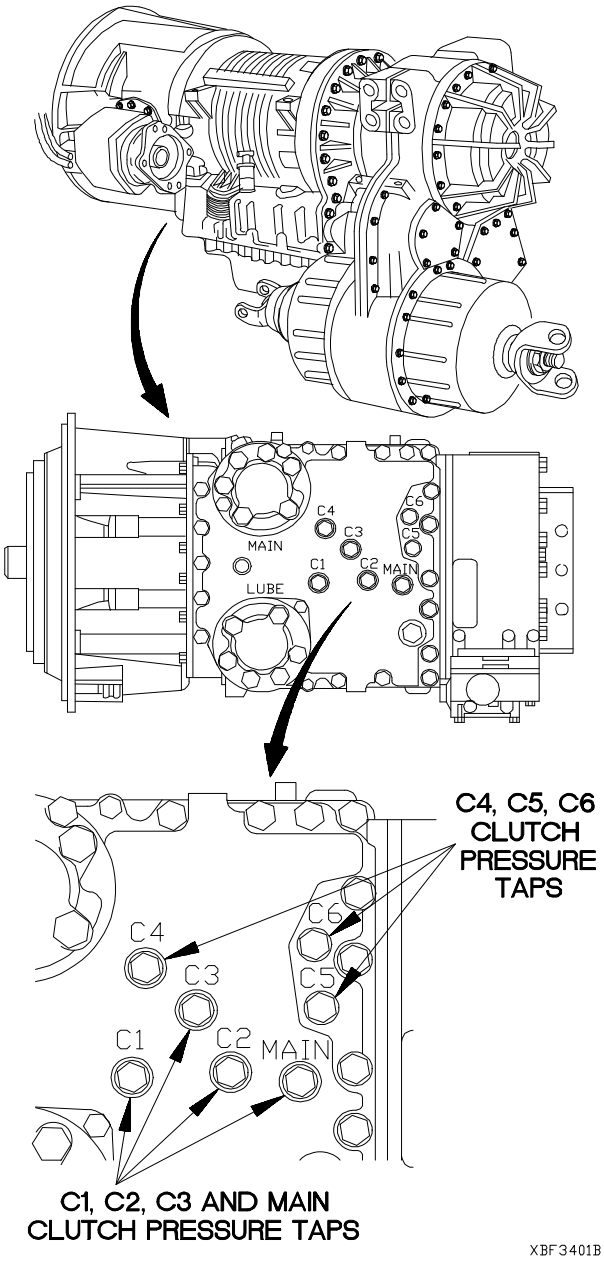


WARNING

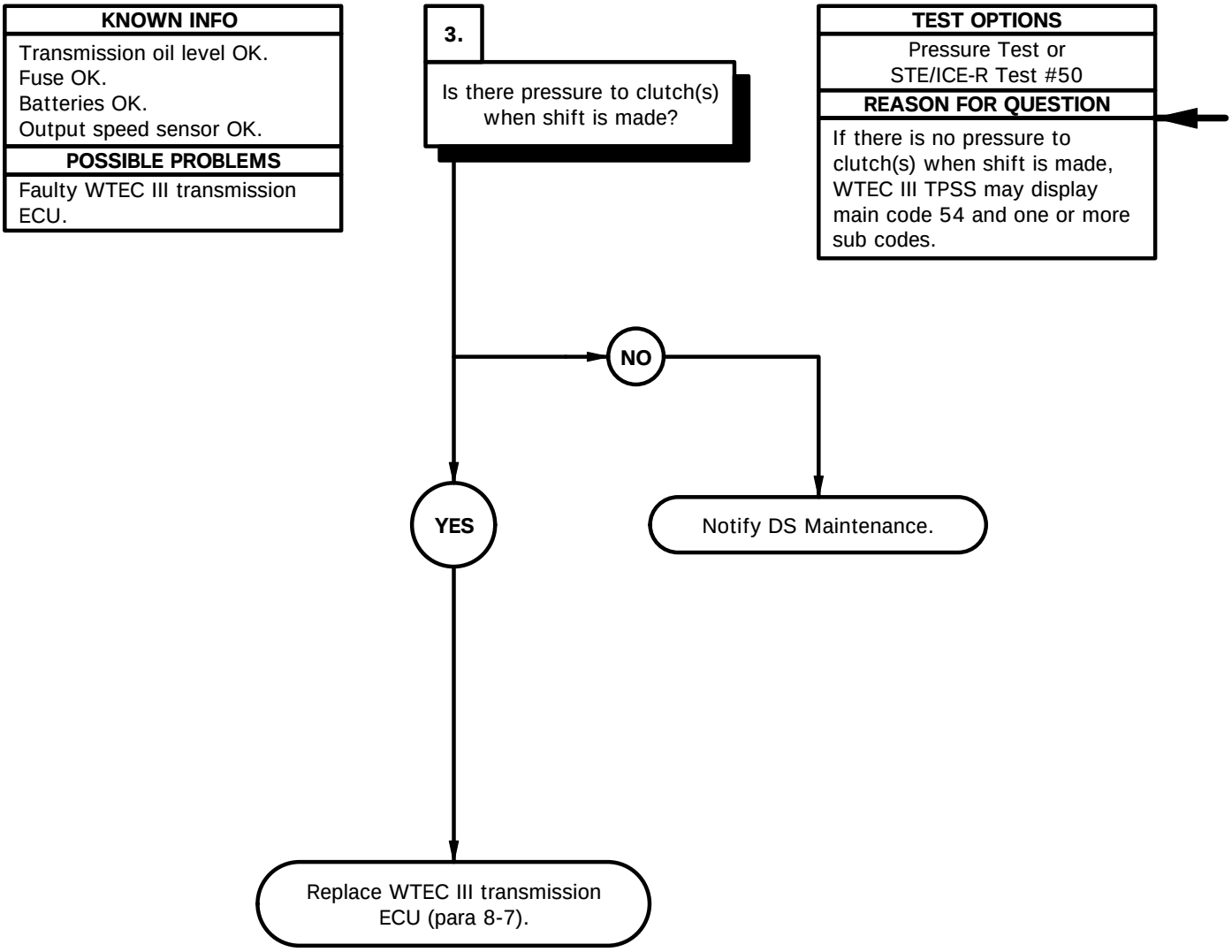
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

PRESSURE TEST

(1) Position drain pan under pressure tap.
(2) Remove main pressure tap plug and preformed packing from control valve assembly.
(3) Connect tube to boss adapter, hose, and pipe to tube adapter to main pressure tap.
(4) Perform STE/ICE-R Test #50 (TM 9-4910-571-12&P).
(5) Start engine (TM 9-2320-366-10-1) and run at idle.
(6) With parking brake applied, position WTEC III TPSS to R position then to N position while assistant checks reading on STE/ICE-R.
(7) Shut down engine (TM 9-2320-366-10-1).
(8) If main oil pressure is low, notify DS Maintenance.
(9) Remove pipe to tube adapter, hose, and tube to boss adapter from main pressure tap.
(10) Position preformed packing and main pressure tap plug in control valve module.
(11) Tighten main pressure tap plug to 84-120 lb-in. (9-14 N·m).



f34. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 54 AND ANY SUB CODE (CONT)



CLUTCH PRESSURE TEST

(1) Remove front and intermediate propeller shafts (para 9-2).
(2) Position drain pan under pressure tap.
(3) Remove pressure tap plug and preformed packing from clutch pressure tap indicated by the sub code. Refer to Table 2-43. Clutch Pressure Tap.
(4) Connect tube to boss adapter, hose, and pipe to tube adapter to clutch pressure tap.
(5) Start engine (TM 9-2320-366-10-1).
(6) Perform STE/ICE-R Test #50 (TM 9-4910-571-12&P).
(7) With parking brake applied, make shift indicated by sub code. Refer to Table 2-43. Clutch Pressure Tap.
(8) Accelerate engine until WTEC III TPSS displays denied range. Refer to Table 2-43. Clutch Pressure Tap.
(9) Maintain sufficient engine speed to keep desired transmission range while assistant notes reading on STE/ICE-R.
(10) Let engine return to idle.
(11) Shift WTEC III TPSS into neutral.
(12) If one or more clutches failed to indicate proper pressure, notify DS Maintenance.
(13) If all clutches indicate proper pressure, replace WTEC III transmission ECU (para 8-7).
(14) Shut down engine (TM 9-2320-366-10-1).
(15) Remove pipe to tube adapter, hose, and tube to boss adapter from clutch pressure tap.
(16) Position preformed packing and pressure tap plug in control valve module.
(17) Tighten pressure tap plug to 84-120 lb-in. (9-14 N·m).
(18) Remove drain pan under pressure tap.
(19) Install front and intermediate propeller shafts (para 9-2).
(20) Clear diagnostic codes (para 8-5).

Table 2-43. Clutch Pressure Tap

Sub Code	Sub Code Meaning	Pressure at Clutch(s)	Pressure Readings at Taps
01	L-1 Upshift	C1 & C5	187-305 psi (1280-2100 kPa)
07	L-R Shift	C3 & C5	215-276 psi (1480-1900 kPa)
10	1-L Downshift	C3 & C6	215-334 psi (1480-2300 kPa)
12	1-2 Upshift	C1 & C4	142-203 psi (980-1400 kPa)
17	1-R Shift	C3 & C5	215-276 psi (1480-1900 kPa)
21	2-1 Downshift	C1 & C5	186-305 psi (1280-2100 kPa)
23	2-3 Upshift	C1 & C3	142-203 psi (980-1400 kPa)
27	2-R Shift	C3 & C5	215-334 psi (1480-2300 kPa)
32	3-2 Downshift	C1 & C4	142-203 psi (980-1400 kPa)
34	3-4 Upshift	C1 & C2	142-203 psi (980-1400 kPa)
43	4-3 Downshift	C1 & C3	142-203 psi (980-1400 kPa)
45	4-5 Upshift	C2 & C3	128-189 psi (880-1300 kPa)
54	5-4 Downshift	C1 & C2	142-203 psi (980-1400 kPa)
56	5-6 Upshift	C2 & C4	128-189 psi (880-1300 kPa)
65	6-5 Downshift	C2 & C3	128-189 psi (880-1300 kPa)
70	R-L Shift	C3 & C6	142-203 psi (980-1400 kPa)
71	R-1 Shift	C1 & C5	186-305 psi (1280-2100 kPa)
72	R-2 Shift	C1 & C4	142-203 psi (980-1400 kPa)
80	N1-L Shift	C3 & C6	215-276 psi (1480-1900 kPa)
81	N1-1 Shift	C1 & C5	215-305 psi (1480-2100 kPa)
82	N1-2 Shift	C1 & C4	186-305 psi (1280-2100 kPa)
83	N1-3 Shift	C1 & C3	215-305 psi (1480-2100 kPa)
85	N1-5 Shift	C2 & C3	164-239 psi (1130-1650 kPa)
86	N1-6 Shift	C2 & C4	164-239 psi (1130-1650 kPa)
92	N2-2 Shift	C1 & C4	215-305 psi (1480-2100 kPa)
93	N3-3 Shift	C1 & C3	215-305 psi (1480-2100 kPa)
95	N3-5 Shift	C2 & C3	164-239 psi (1130-1650 kPa)
96	N4-6 Shift	C2 & C4	164-239 psi (1130-1650 kPa)
97	2-R Shift	C3 & C5	215-305 psi (1480-2100 kPa)

f35. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 55 AND ANY SUB CODE

INITIAL SETUP

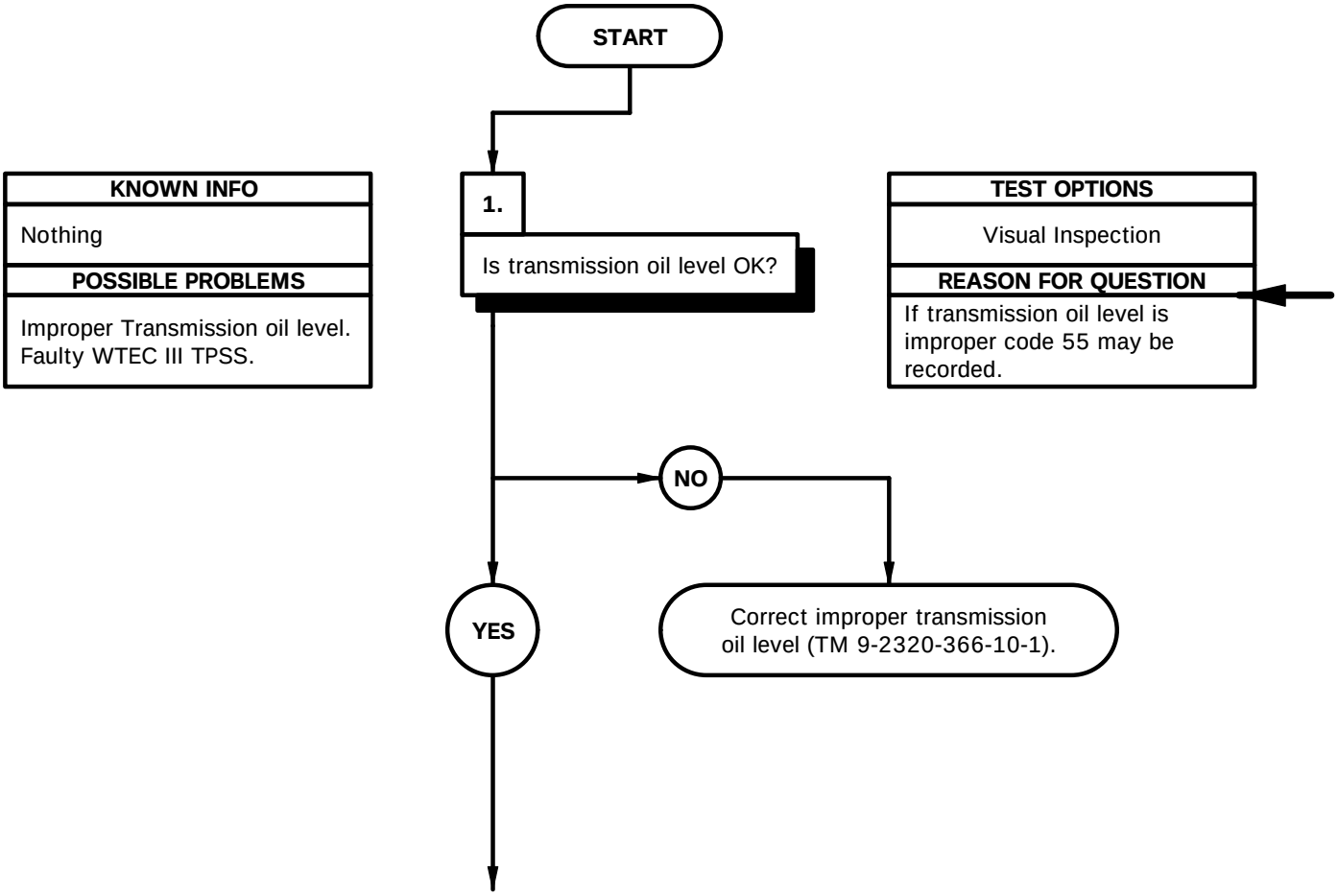
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Pan, Drain (Item 24, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Wrench Set, Socket (Item 51, Appendix C)

Materials/Parts
Packing, Preformed (Item 197, Appendix G)
Adapter, Straight, Pipe to Tube (Item 1.2, Appendix D)
Adapter, Straight, Tube to Boss (Item 1.3, Appendix D)
Hose Assembly, Nonmetallic (Item 24.13, Appendix D)

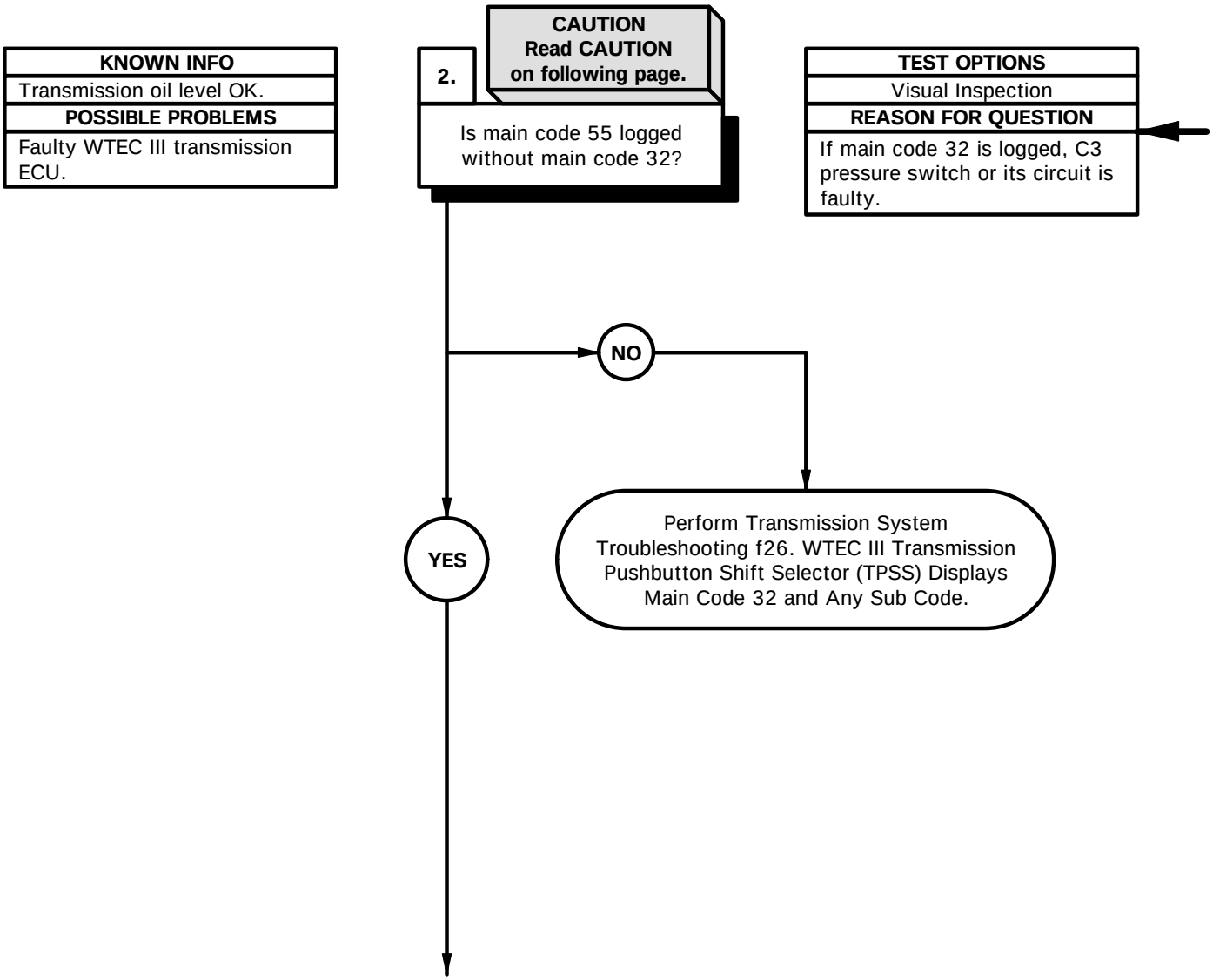
Personnel Required
(2)

References
TM 9-4910-571-12&P



(1) Check transmission oil level (TM 9-2320-366-10-1).
(2) If transmission oil level is improper, correct as required (TM 9-2320-366-10-1).

f35. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 55 AND ANY SUB CODE (CONT)

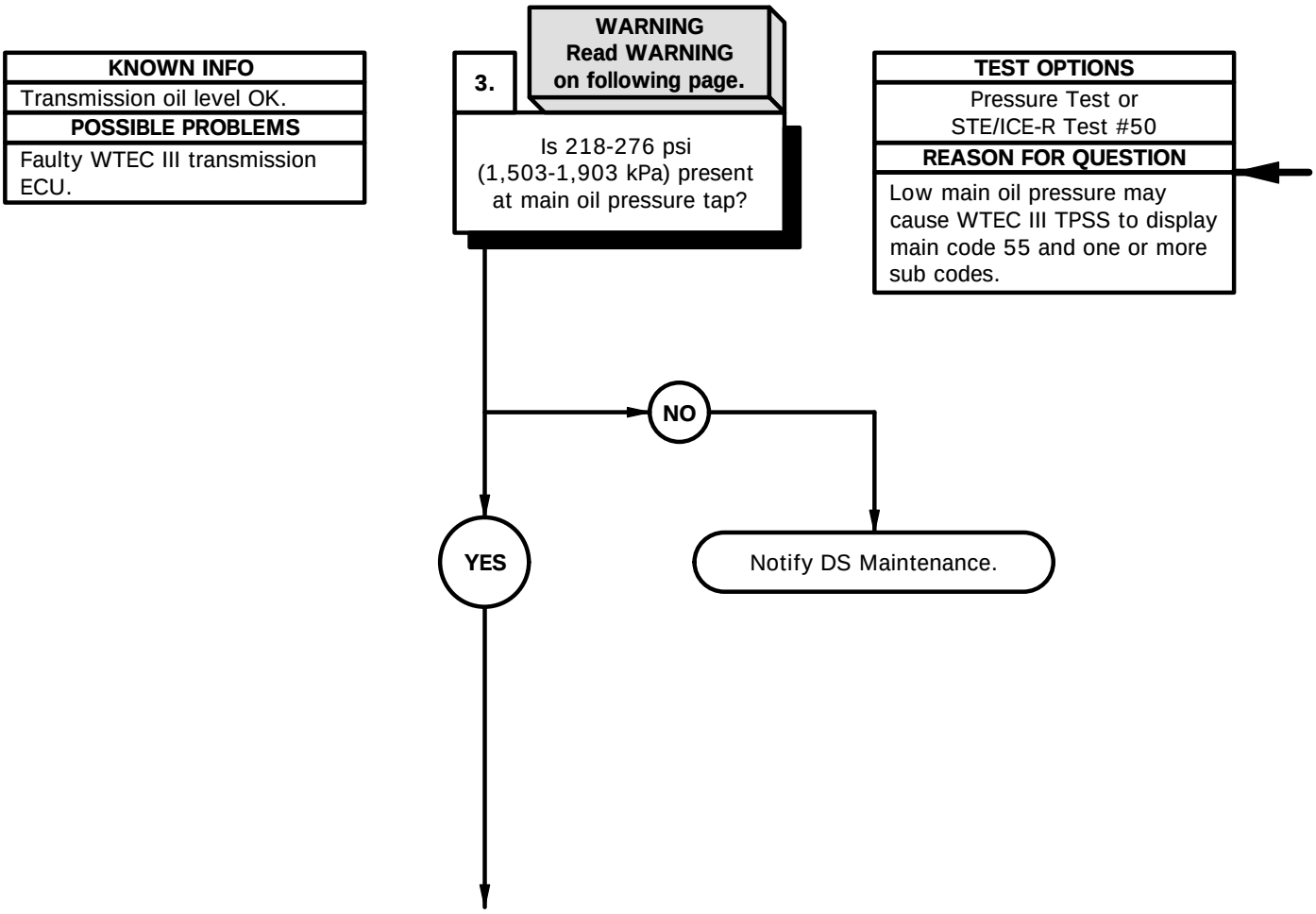


CAUTION

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) Check if main code 32 is logged in WTEC III TPSS (para 8-5).
(2) If main code 32 is logged, WTEC III transmission ECU has sensed a fault with the C3 pressure switch or its circuit. Perform Transmission System Troubleshooting (f26. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 32 and Any Sub Code).

f35. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 55 AND ANY SUB CODE (CONT)

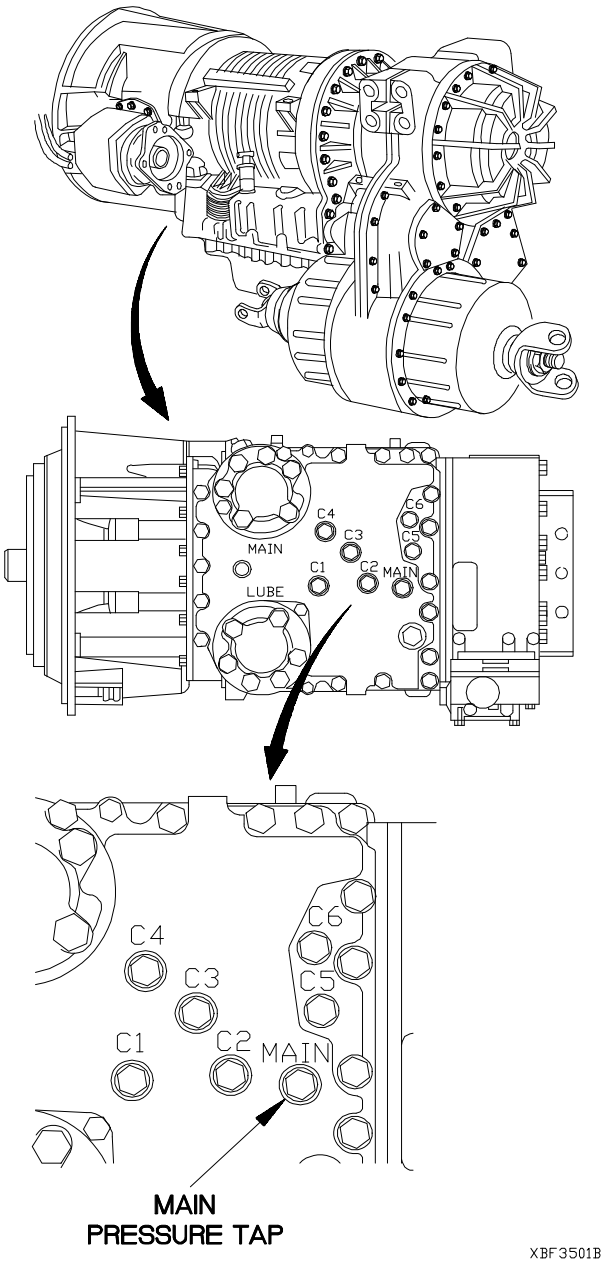


WARNING

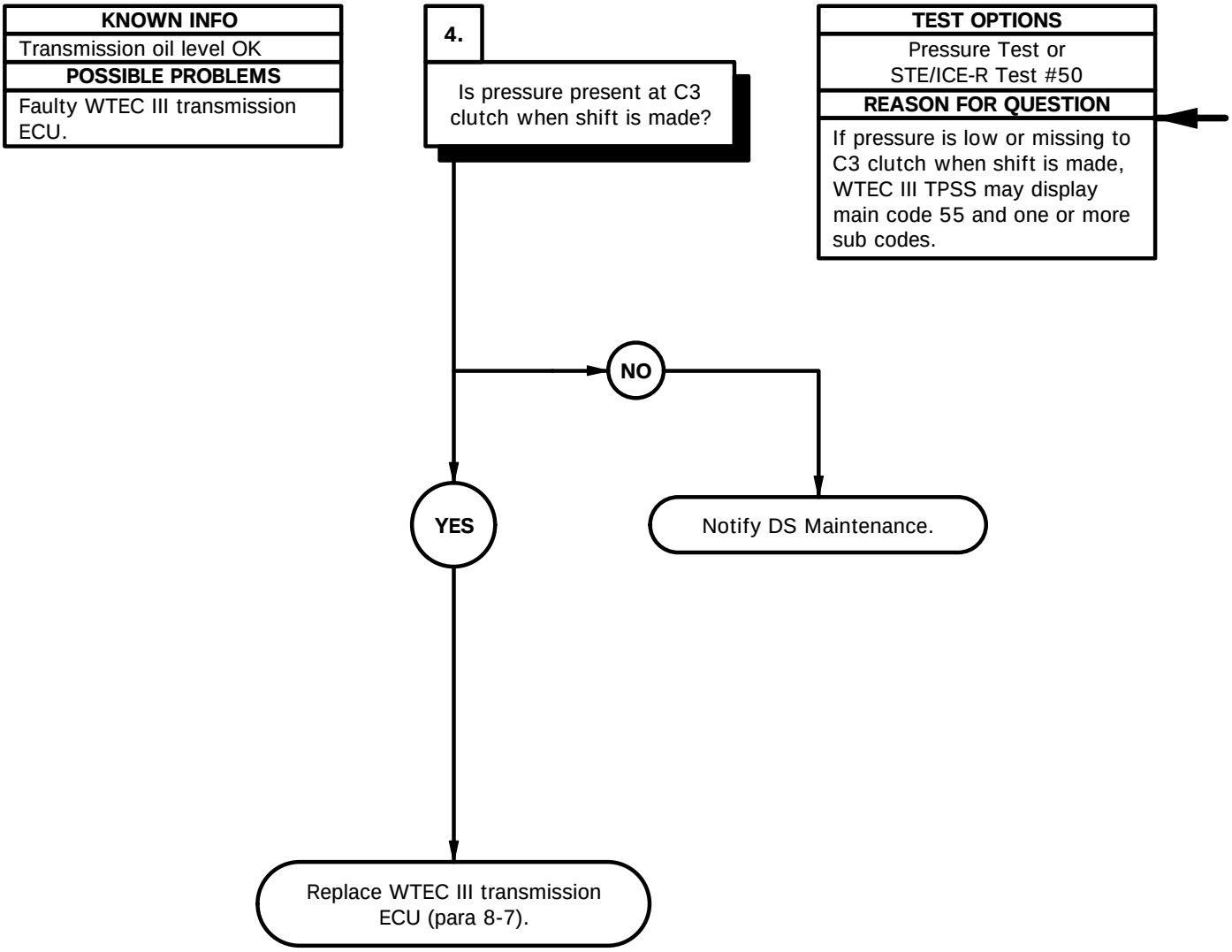
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

PRESSURE TEST

(1) Position drain pan under pressure tap.
(2) Remove main pressure tap plug and preformed packing from control valve module.
(3) Connect tube to boss adapter, hose, and pipe to tube adapter to main pressure tap.
(4) Perform STE/ICE-R Test #50 (TM 9-4910-571-12&P).
(5) Start engine (TM 9-2320-366-10-1) and run at idle.
(6) With parking brake applied, position WTEC III TPSS to R position then to N position while assistant checks reading on STE/ICE-R.
(7) Shut down engine (TM 9-2320-366-10-1).
(8) If main oil pressure is low, notify DS Maintenance.
(9) Remove pipe to tube adapter, hose, and tube to boss adapter from main pressure tap.
(10) Position preformed packing and main pressure tap plug in control valve module.
(11) Tighten main pressure tap plug to 84-120 lb-in. (9-14 N·m).
(12) Remove drain pan under pressure tap.



f35. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 55 AND ANY SUB CODE (CONT)

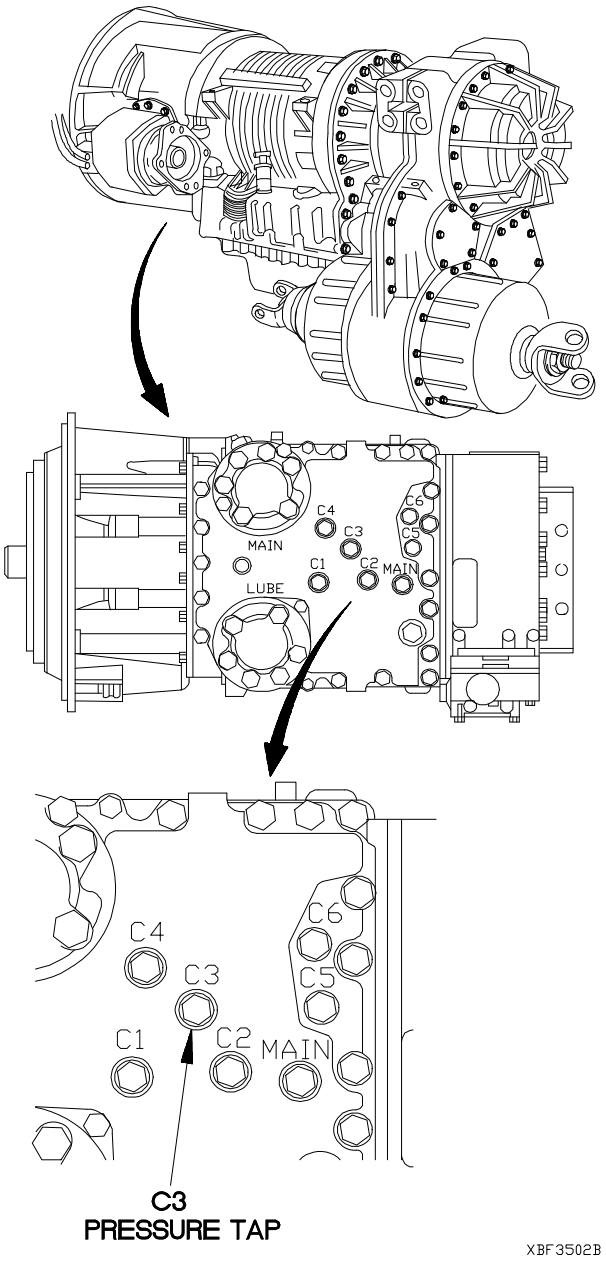


PRESSURE TEST

(1) Remove front and intermediate propeller shafts (para 9-2).
(2) Position drain pan under C3 pressure tap.
(3) Remove C3 pressure tap plug and preformed packing from control valve module.
(4) Connect tube to boss adapter, hose, and pipe to tube adapter to C3 pressure tap.
(5) Perform STE/ICE-R test #50 (TM 9-4910-571-12&P).
(6) Start engine (TM 9-2320-366-10-1) and run at idle.
(7) With parking brake applied, make shift indicated by sub code while assistant notes reading on STE/ICE-R.
(8) Shut down engine (TM 9-2320-366-10-1).
(9) If 215-276 psi (1480-1900 kPa) pressure is not obtained for affected code, notify DS Maintenance.
(10) If 215-276 psi (1480-1900 kPa) pressure is obtained, replace WTEC transmission ECU (para 8-7).
(11) Remove pipe to tube adapter, hose, and tube to boss adapter from C3 pressure tap.
(12) Position performed packing and C3 pressure tap plug on control valve module.
(13) Tighten C3 pressure tap plug to 84-120 lb-in. (9-14 N·m).
(14) Remove drain pan under pressure tap.
(15) Install front and intermediate propeller shafts (para 9-2).
(16) Clear diagnostic codes (para 8-5).

Table 2-44. Clutch Pressure Tap

Sub Code	Sub Code Meaning	Pressure Readings C3 Tap
17	1-R Shift	215-276 psi (1480-1900 kPa)
27	2-R Shift	215-276 psi (1480-1900 kPa)
80	N1-L Shift	215-276 psi (1480-1900 kPa)
87	N1-R Shift	215-276 psi (1480-1900 kPa)
97	2-R Shift	215-276 psi (1480-1900 kPa)



f36. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 56 AND ANY SUB CODE

INITIAL SETUP

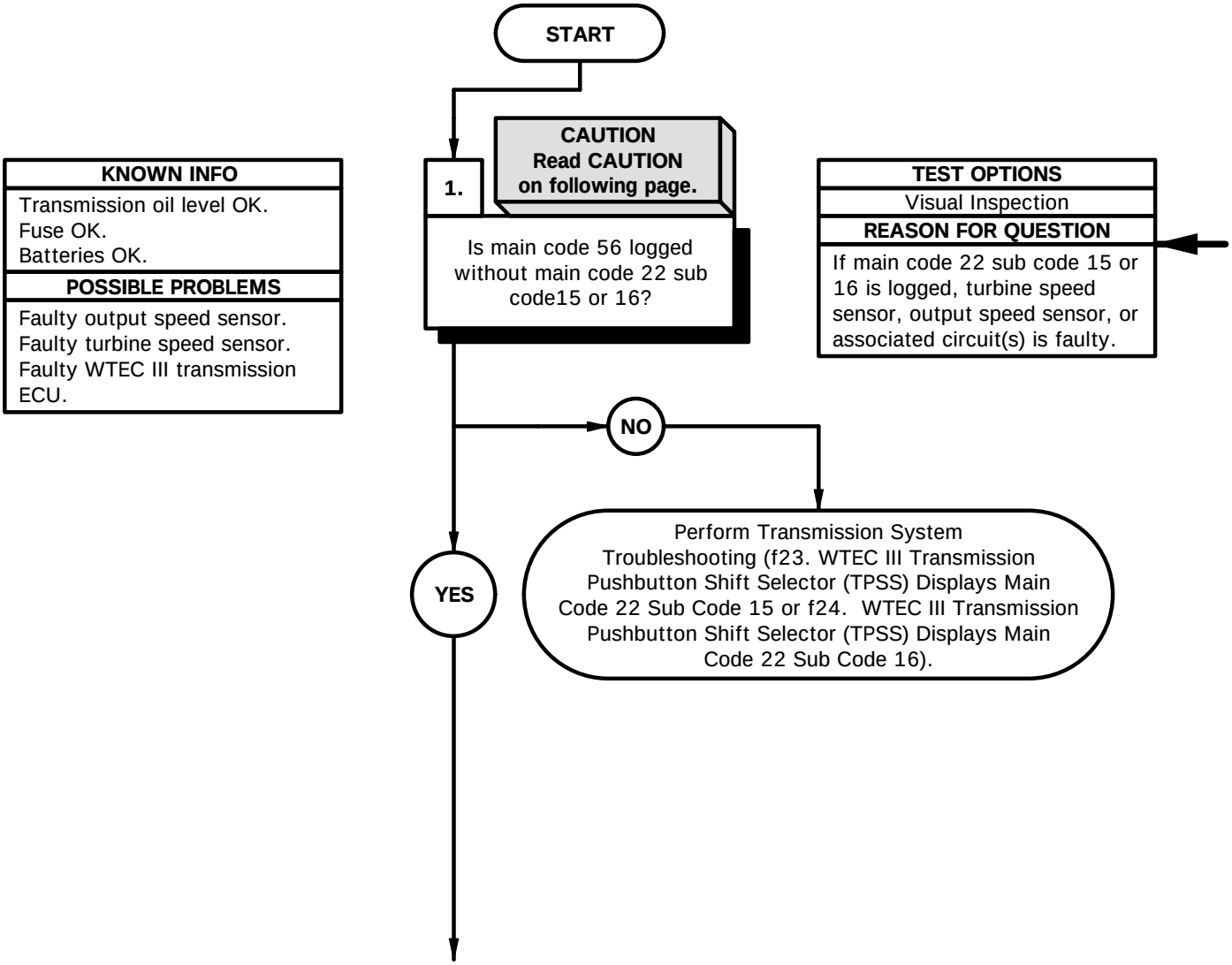
Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Pan, Drain (Item 24, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Wrench Set, Socket (Item 51, Appendix C)

Materials/Parts
Packing, Preformed (Item 197, Appendix G)
Adapter, Straight, Pipe to Tube (Item 1.2, Appendix D)
Adapter, Straight, Tube to Boss (Item 1.3, Appendix D)
Hose Assembly, Nonmetallic (Item 24.13, Appendix D)

Personnel Required
(2)

References
TM 9-4910-571-12&P

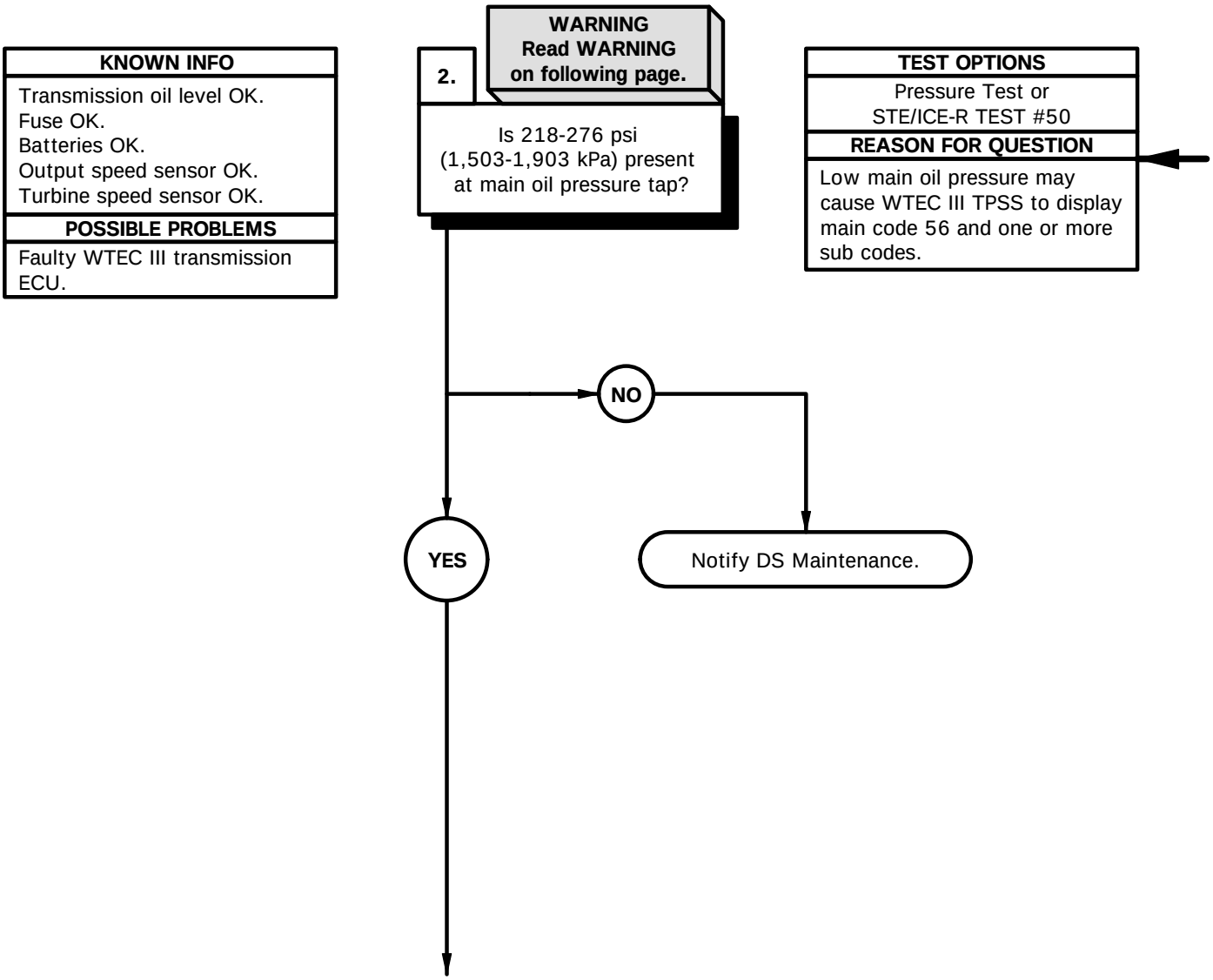


CAUTION

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) Check if main code 22 code 15 or 16 is logged in WTEC III TPSS (para 8-5).
(2) If main code 22 sub code 15 or 16 is logged, WTEC III transmission ECU has sensed a fault with the turbine speed sensor, output speed sensor, or associated circuit(s). Perform Transmission System Troubleshooting (f23. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 15 or f24. WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 16).

f36. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 56 AND ANY SUB CODE (CONT)

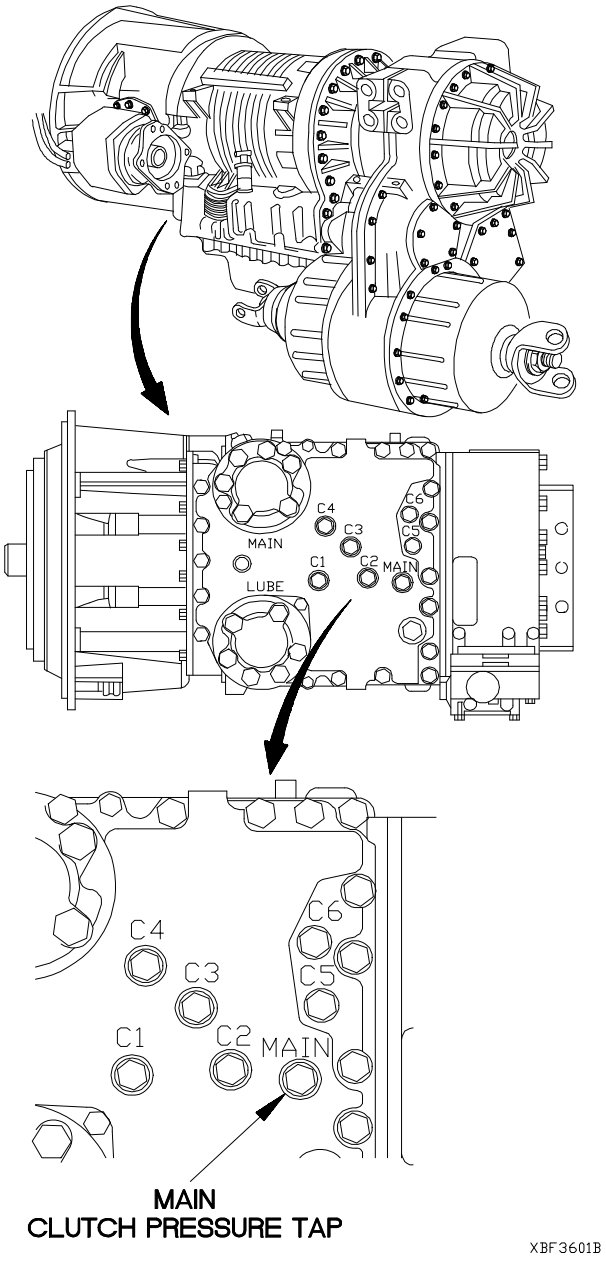


WARNING

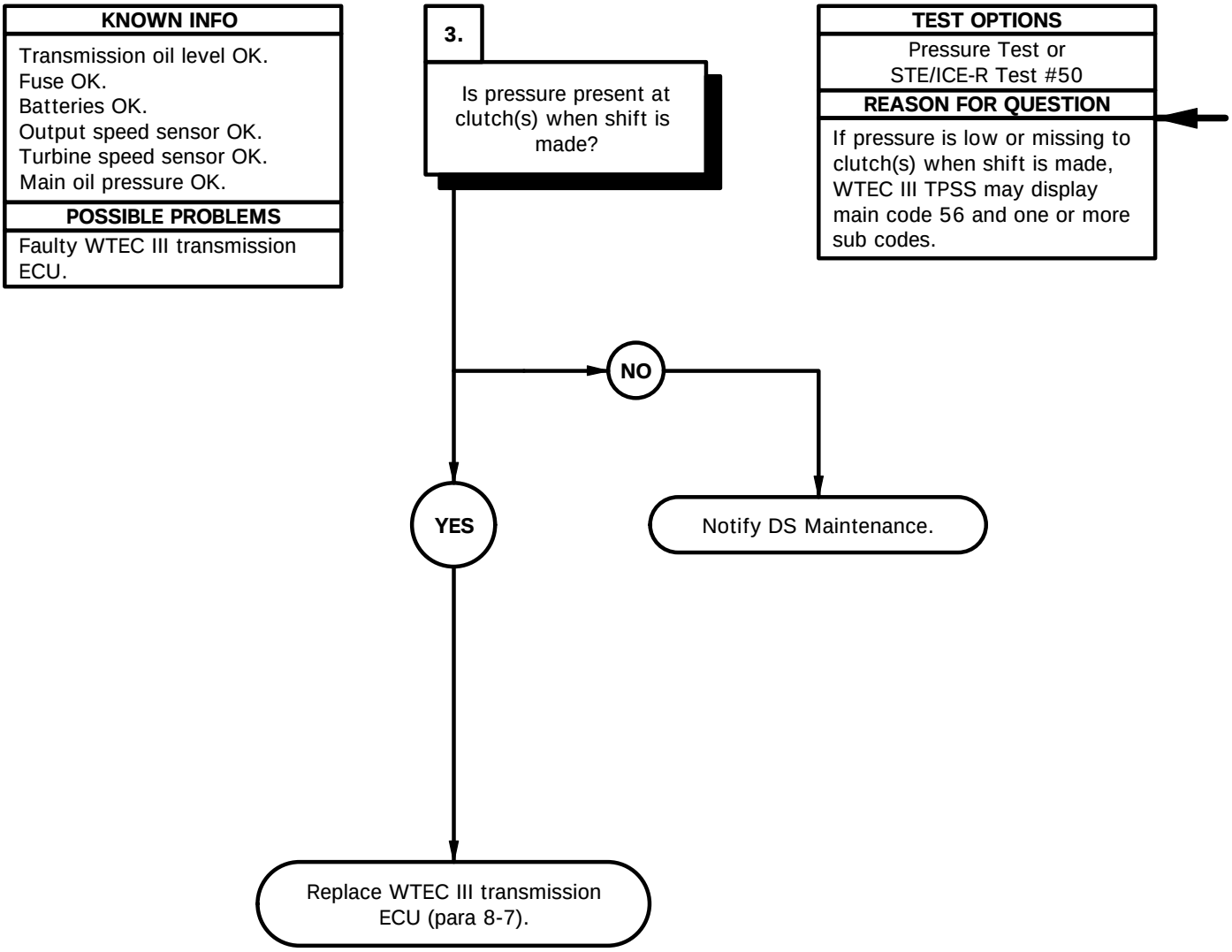
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

PRESSURE TEST

(1) Position drain pan under pressure tap.
(2) Remove main pressure tap plug and preformed packing from control valve module.
(3) Connect tube to boss adapter, hose, and pipe to tube adapter to main pressure tap.
(4) Perform STE/ICE-R test #50 (TM 9-4910-571-12&P).
(5) Start engine (TM 9-2320-366-10-1) and run at idle.
(6) With parking brake applied, position WTEC III TPSS to R position then to N position while assistant checks reading on STE/ICE-R.
(7) Shut down engine (TM 9-2320-366-10-1).
(8) If main oil pressure is low, notify DS Maintenance.
(9) Remove pipe to tube adapter, hose, and tube to boss adapter from main pressure tap.
(10) Position preformed packing and main pressure tap plug in control valve module.
(11) Tighten main pressure tap plug to 84-120 lb-in. (9-14 N·m).
(12) Remove drain pan under pressure tap.



f36. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 56 AND ANY SUB CODE (CONT)



PRESSURE TEST

(1) Remove front and intermediate propeller shafts (para 9-2).
(2) Position drain pan under pressure tap.
(3) Remove pressure tap plug and preformed packing from clutch pressure tap indicated by the sub code. Refer to Table 2-45. Clutch Pressure Tap.
(4) Connect tube to boss adapter, hose, and pipe to tube adapter to clutch pressure tap.
(5) Perform STE/ICE-R test #50 (TM 9-4910-571-12&P).
(6) Start engine (TM 9-2320-366-10-1).
(7) Make shift indicated by sub code. Refer to Table 2-45. Clutch Pressure Tap.
(8) Accelerate engine until WTEC III TPSS displays desired range. Refer to Table 2-45. Clutch Pressure Tap.
(9) Maintain sufficient engine speed to keep desired transmission range while assistant notes reading on STE/ICE-R.
(10) Let engine return to idle.
(11) Shift transmission into neutral (TM 9-2320-366-10-1).
(12) Shut down engine (TM 9-2320-366-10-1).
(13) If one or more of clutches failed to indicate proper pressure, notify DS Maintenance.
(14) If all clutches indicate proper pressure, replace WTEC III transmission ECU (para 8-7).
(15) Remove pipe to tube adapter, hose, and tube to boss adapter from clutch pressure tap.
(16) Position preformed packing and pressure tap plug in control valve module.
(17) Tighten pressure tap plug to 84-120 lb-in. (9-14 N·m).
(18) Remove drain pan under pressure tap.
(19) Install front and intermediate propeller shafts (para 9-2).
(20) Clear diagnostic codes (para 8-5).

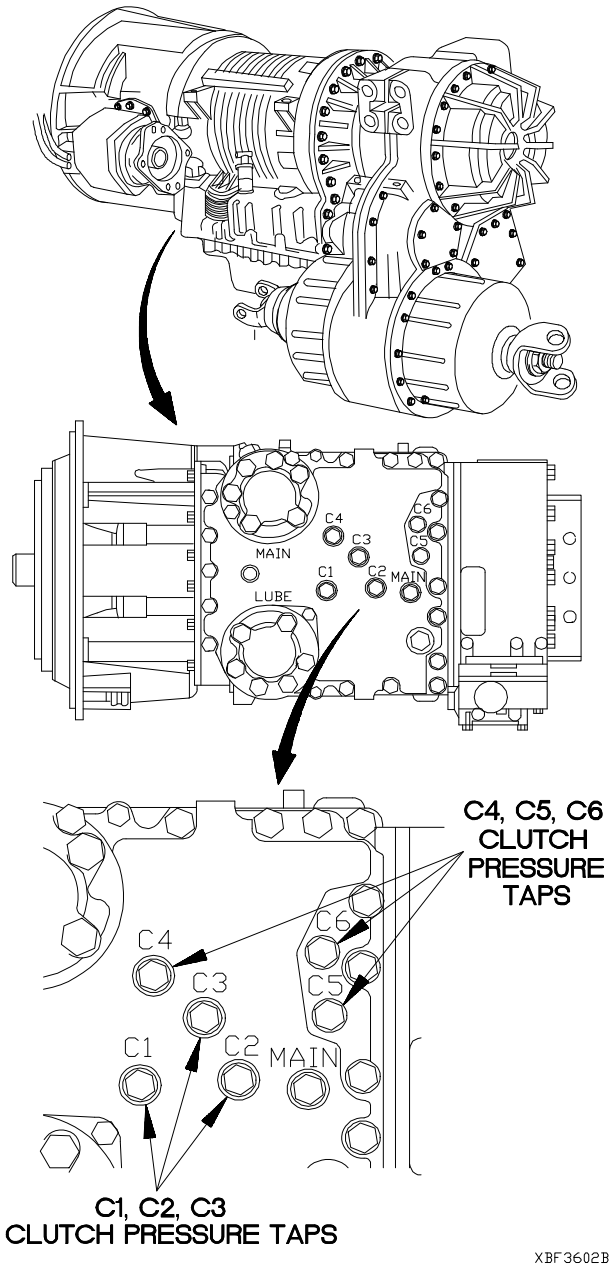


Table 2-45. Clutch Pressure Tap

Sub Code	Sub Code Meaning	Pressure at Clutch(s)	Pressure Readings at Taps
00	L Range Test	C3 & C6	215-334 psi (1480-2300 kPa)
11	1 Range Test	C1 & C5	215-305 psi (1480-2100 kPa)
22	2 Range Test	C1 & C4	142-203 psi (980-1400 kPa)
33	3 Range Test	C1 & C3	142-203 psi (980-1400 kPa)
44	4 Range Test	C1 & C2	142-203 psi (980-1400 kPa)
55	5 Range Test	C2 & C3	128-189 psi (880-1300 kPa)
66	6 Range Test	C2 & C4	128-189 psi (880-1300 kPa)
77	R Range Test	C3 & C5	215-276 psi (1480-1900 kPa)

f37. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 13 AND ANY SUB CODE

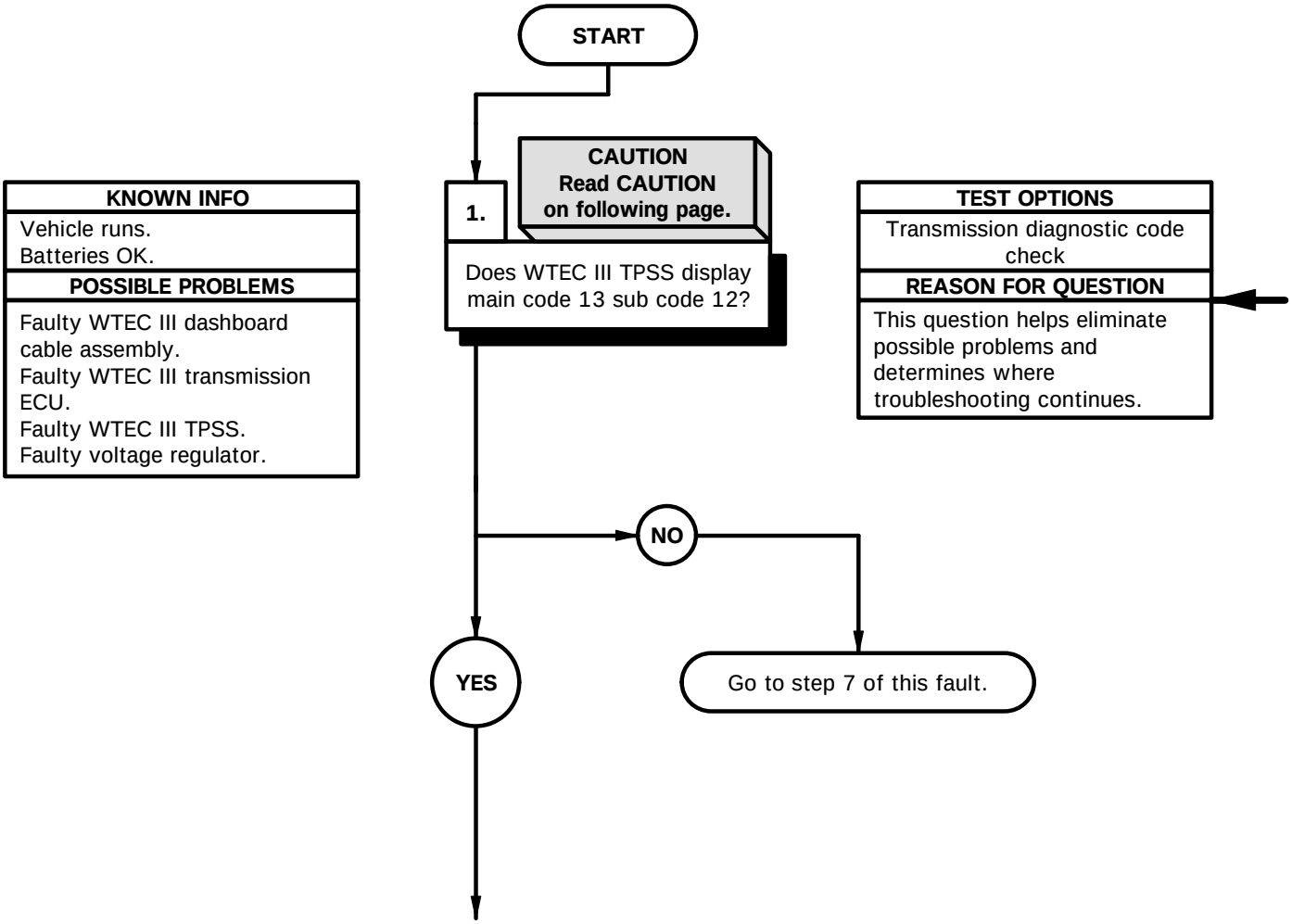
INITIAL SETUP

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

References
TM 9-4910-571-12&P

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

Personnel Required
(2)



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.

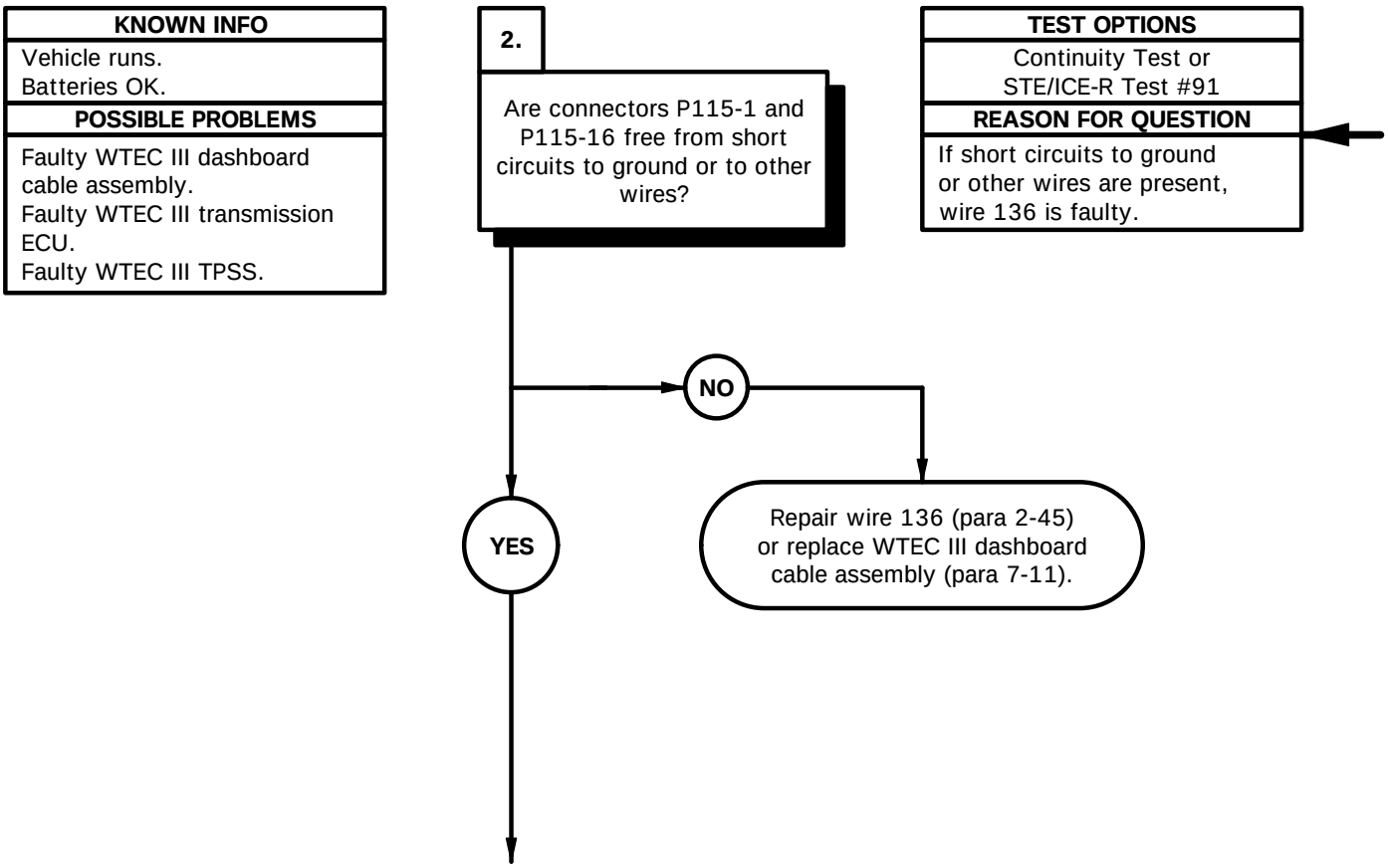
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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.

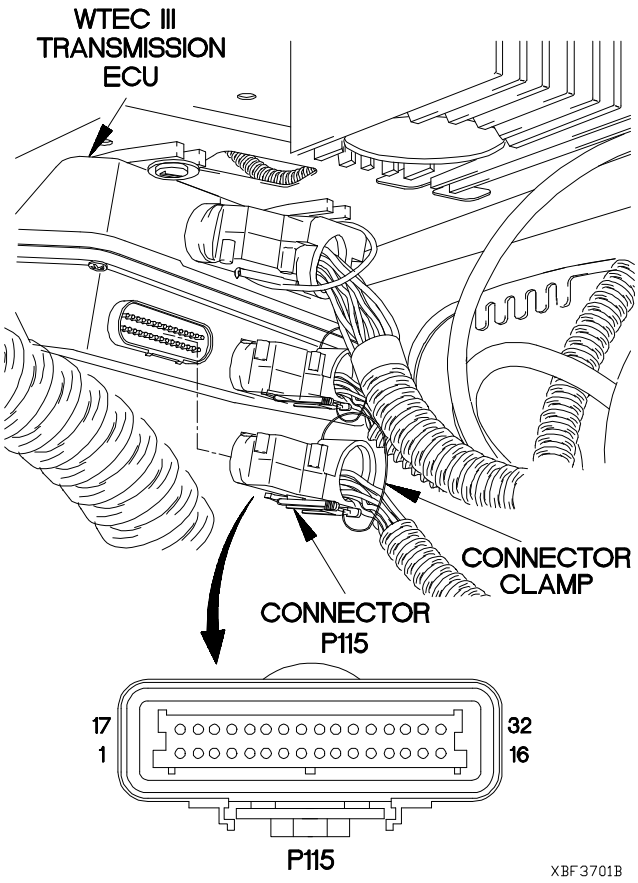
(1) Check to see if main code 13 sub code 12 is active in WTEC III TPSS (para 8-5).
(2) If main code 13 sub code 12 is not active in WTEC III TPSS, go to step 7 of this fault.

f37. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 13 AND ANY SUB CODE (CONT)

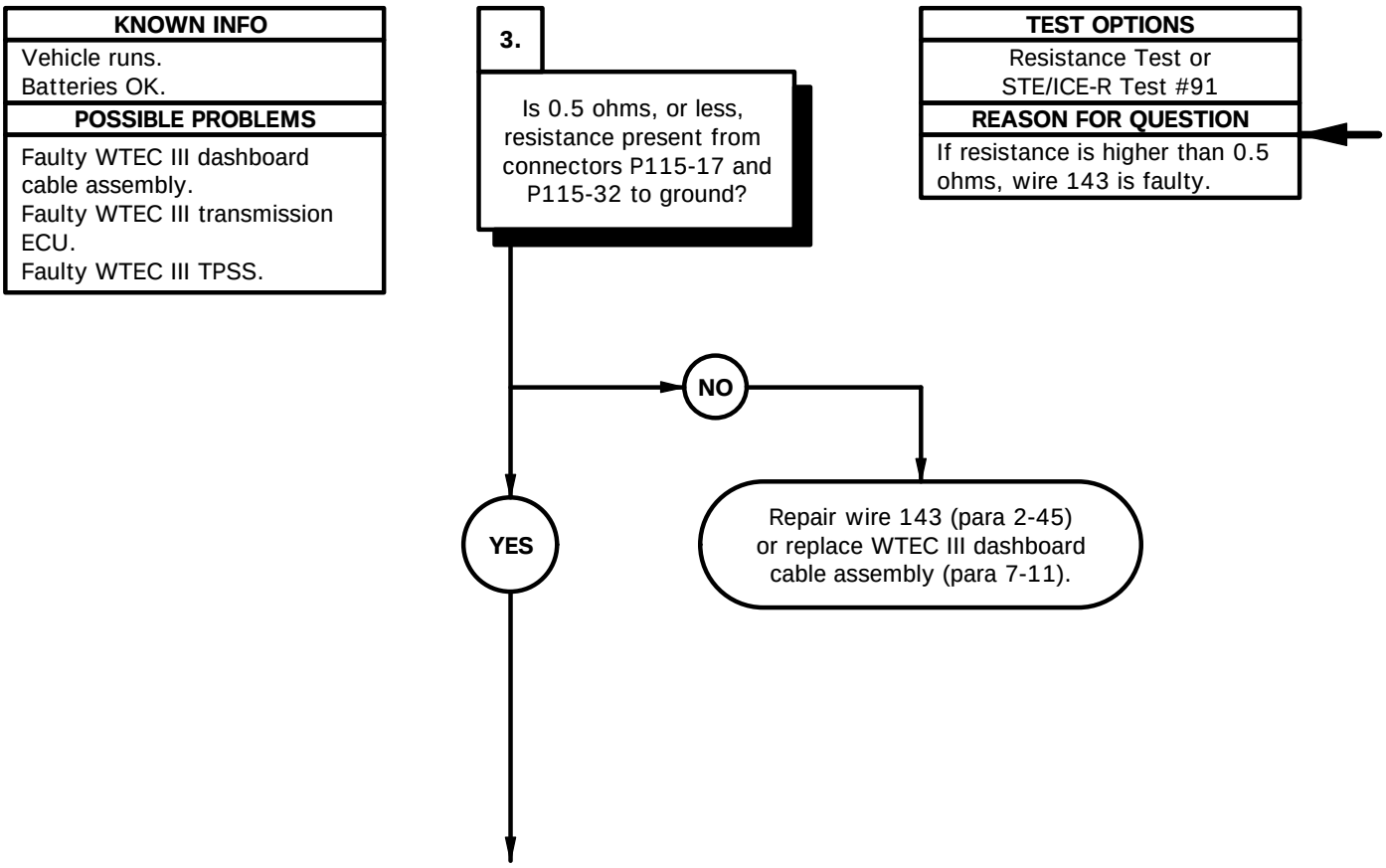


CONTINUITY TEST

(1) Remove kick panel (para 16-3).
(2) Disconnect connector clamp from connector P115.
(3) Disconnect connector P115 from WTEC III transmission ECU.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to connector P115-1.
(6) Connect negative (-) probe of multimeter to all other sockets in connector P115 (except P115-16), one at a time, and note reading on multimeter.
(7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(8) Connect positive (+) probe of multimeter to connector P115-16.
(9) Connect negative (-) probe of multimeter to all other sockets in connector P115 (except P115-1), one at a time, and note reading on multimeter.
(10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(11) If continuity is present repair wire 136 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).

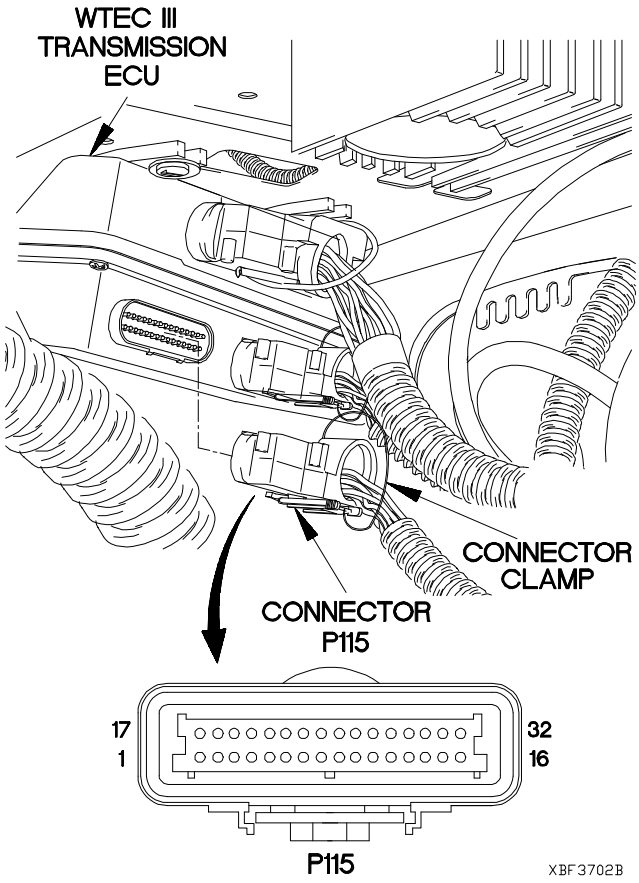


f37. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 13 AND ANY SUB CODE (CONT)

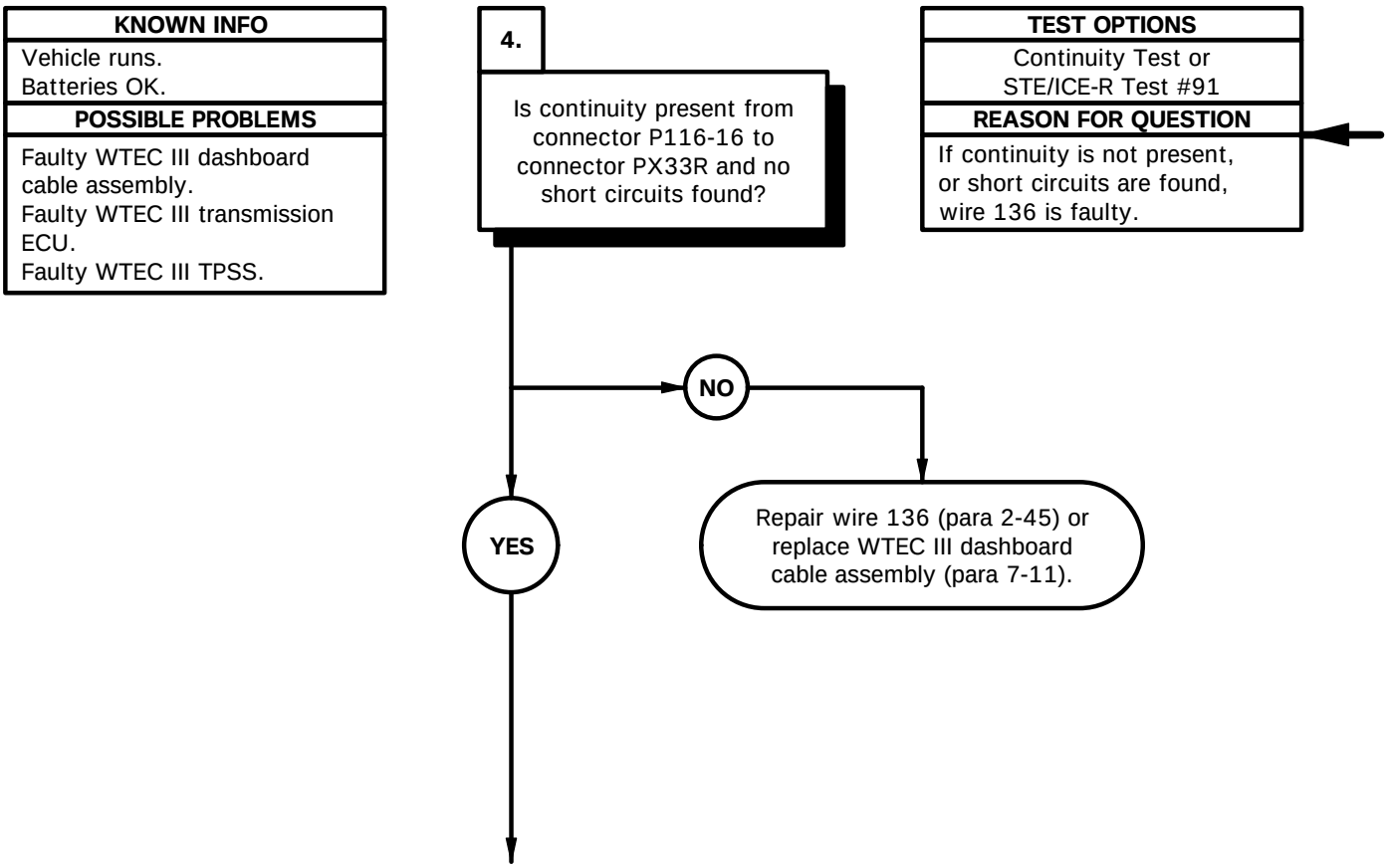


RESISTANCE TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P115-17.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) Connect positive (+) probe of multimeter to connector P115-32.
(5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(6) If resistance noted in step 3 or step 5 is higher than 0.5 ohms, repair wire 143 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).
(7) Connect connector P115 to WTEC III transmission ECU.
(8) Connect connector clamp on connector P115.

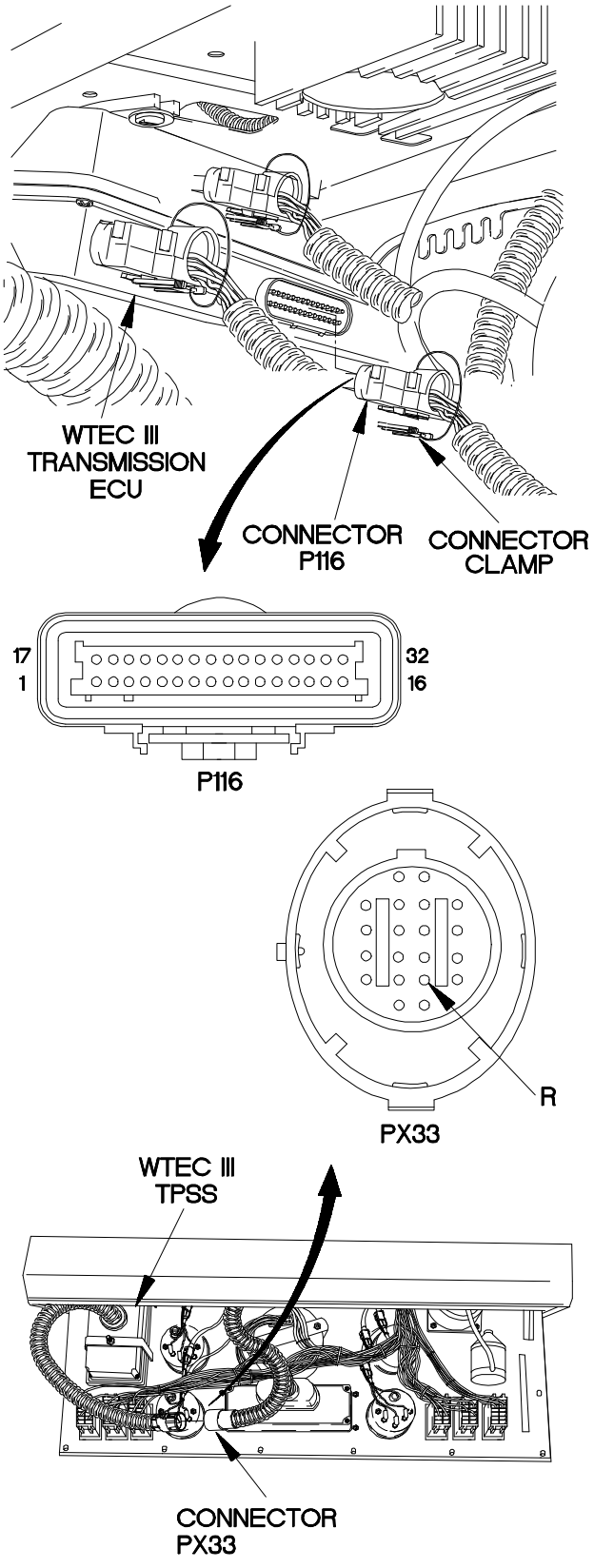


f37. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 13 AND ANY SUB CODE (CONT)

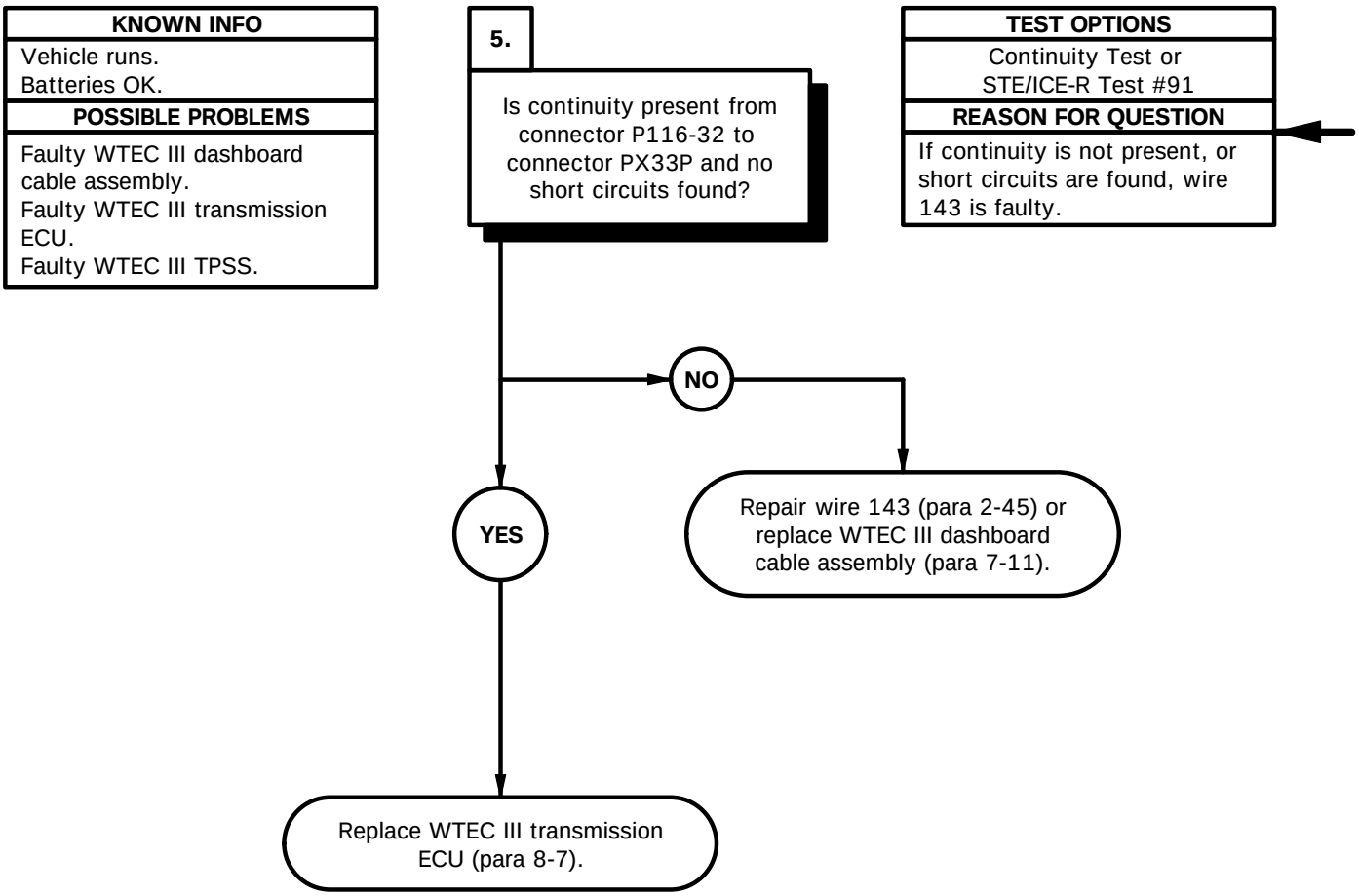


CONTINUITY TEST

(1) Disconnect connector clamp from connector P116.
(2) Disconnect connector P116 from WTEC III transmission ECU.
(3) Remove instrument panel assembly for access (para 7-15).
(4) Disconnect connector PX33 from WTEC III TPSS.
(5) Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter to connector P116-16.
(7) Connect negative (-) probe of multimeter to connector PX33R and note reading on multimeter.
(8) Connect negative (-) probe of multimeter to all other sockets in connector PX33, one at a time, and note reading on multimeter.
(9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(10) If continuity is not present in step 7, or continuity is present in step 8 or step 9, repair wire 136 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).

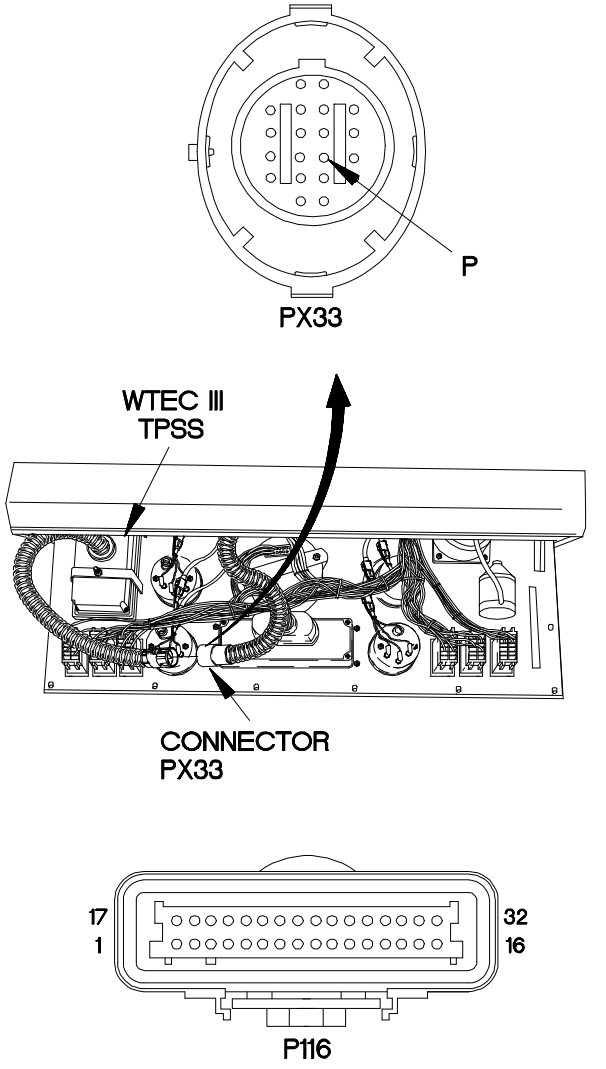


f37. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 13 AND ANY SUB CODE (CONT)

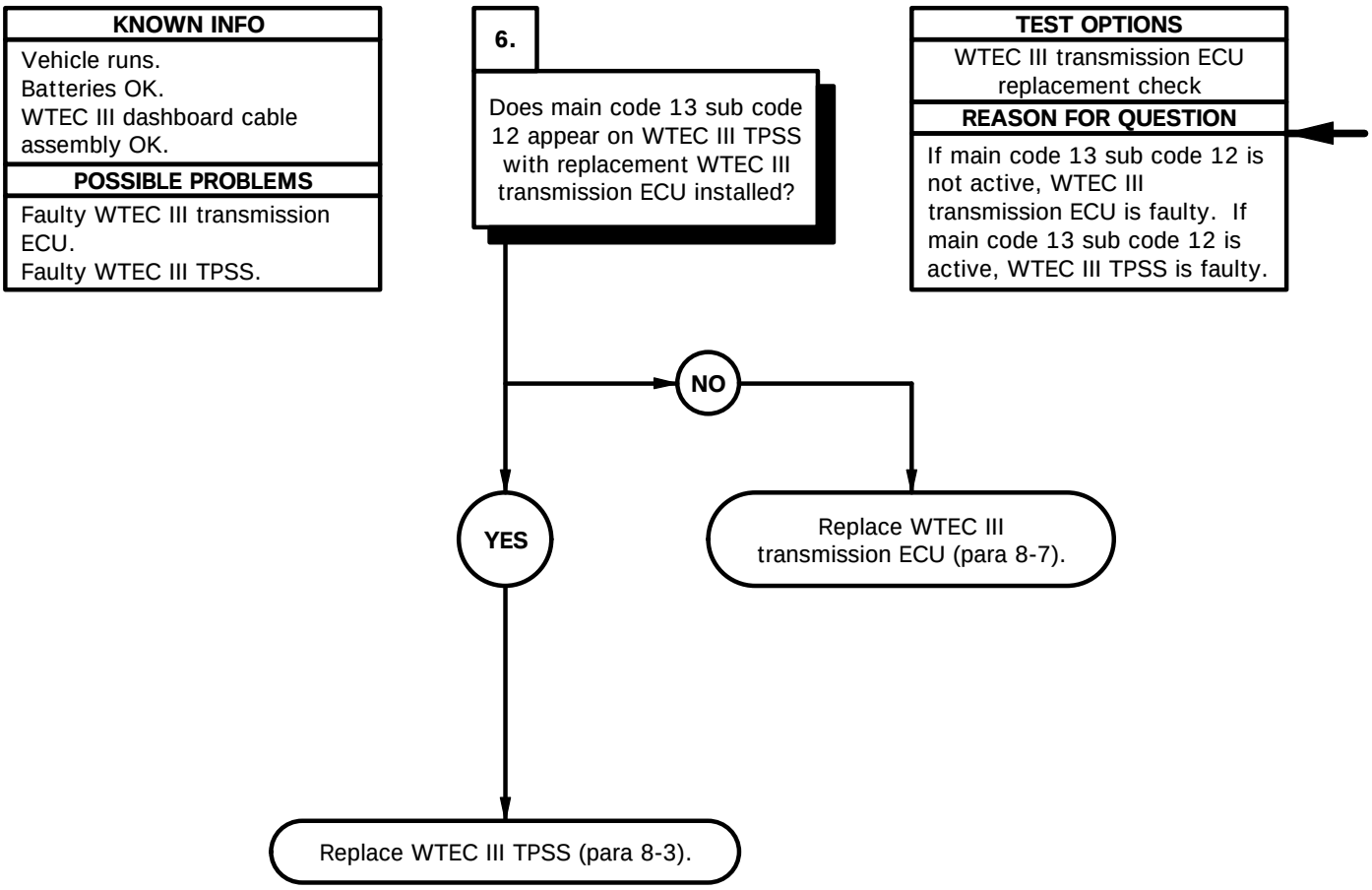


CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P116-32.
(3) Connect negative (-) probe of multimeter to connector PX33P and note reading on multimeter.
(4) Connect negative (-) probe of multimeter to all other sockets in connector PX33, one at a time, and note reading on multimeter.
(5) If continuity is not present in step 3, or continuity is present in step 4, repair wire 143 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).
(6) Connect connector PX33 to WTEC III TPSS.
(7) Install instrument panel assembly (para 7-15).
(8) Clear diagnostic codes (para 8-5).



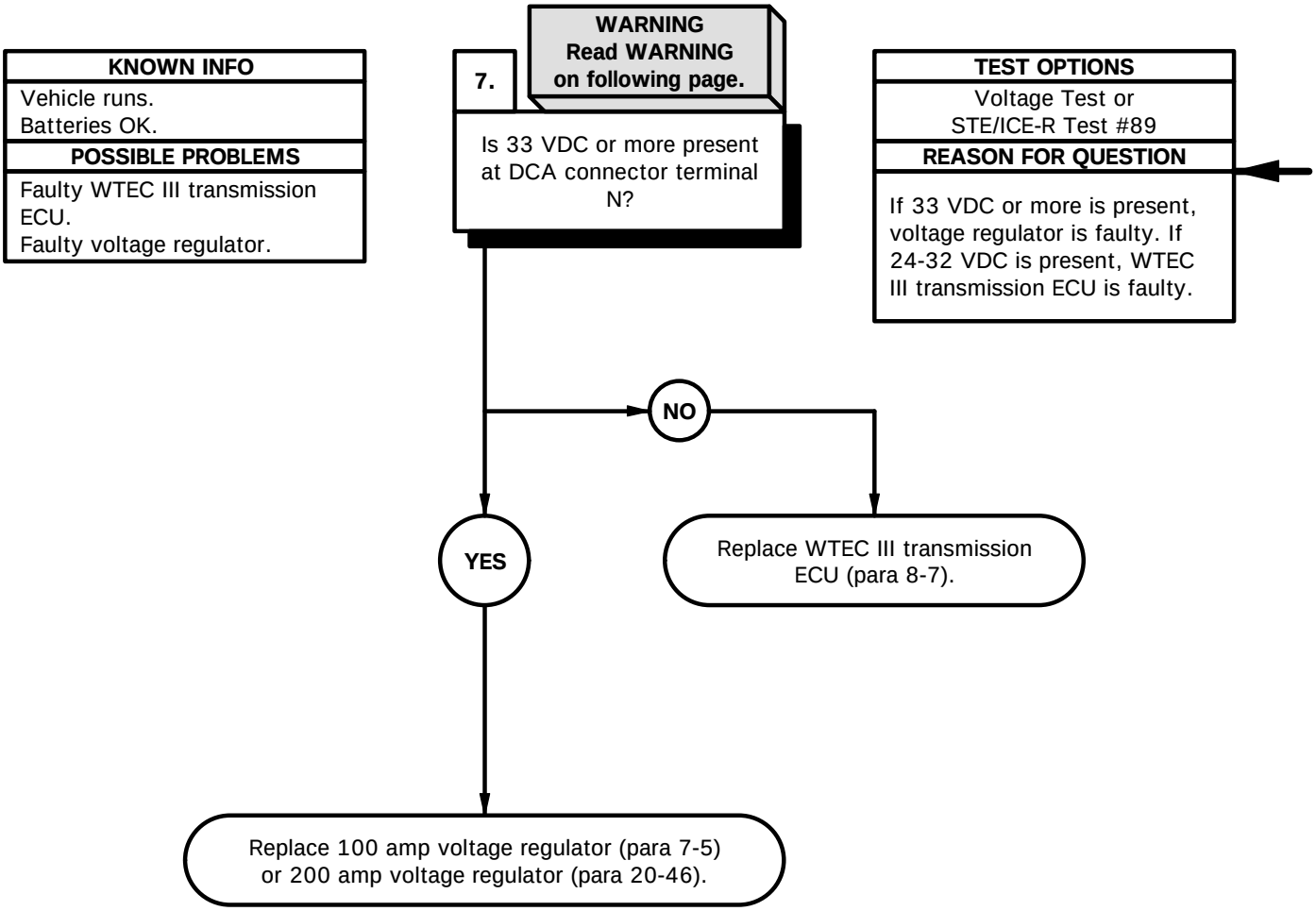
f37. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 13 AND ANY SUB CODE (CONT)



WTEC III TRANSMISSION ECU REPLACEMENT CHECK

(1) Install replacement WTEC III transmission ECU (para 8-7).
(2) Start engine (TM 9-2320-366-10-1).
(3) Check to see if main code 13 sub code 12 appears on WTEC III TPSS (para 8-5).
(4) If main code 13 sub code 12 does not appear, replace WTEC III transmission ECU (para 8-7).
(5) If main code 13 sub code 12 does appear, replace WTEC III TPSS (para 8-3).
(6) Shut down engine (TM 9-2320-366-10-1).
(7) Install original WTEC III transmission ECU (para 8-7).
(8) Clear diagnostic codes (para 8-5).

f37. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 13 AND ANY SUB CODE (CONT)

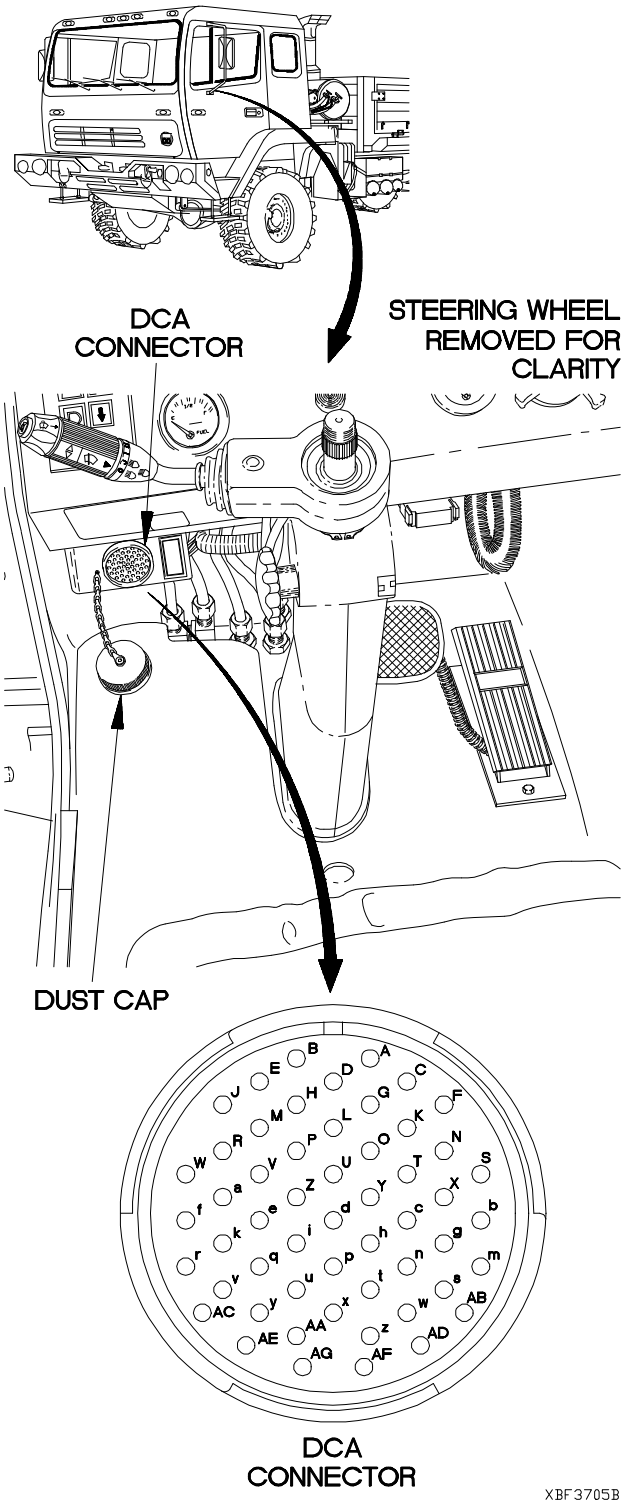


WARNING

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.

VOLTAGE TEST

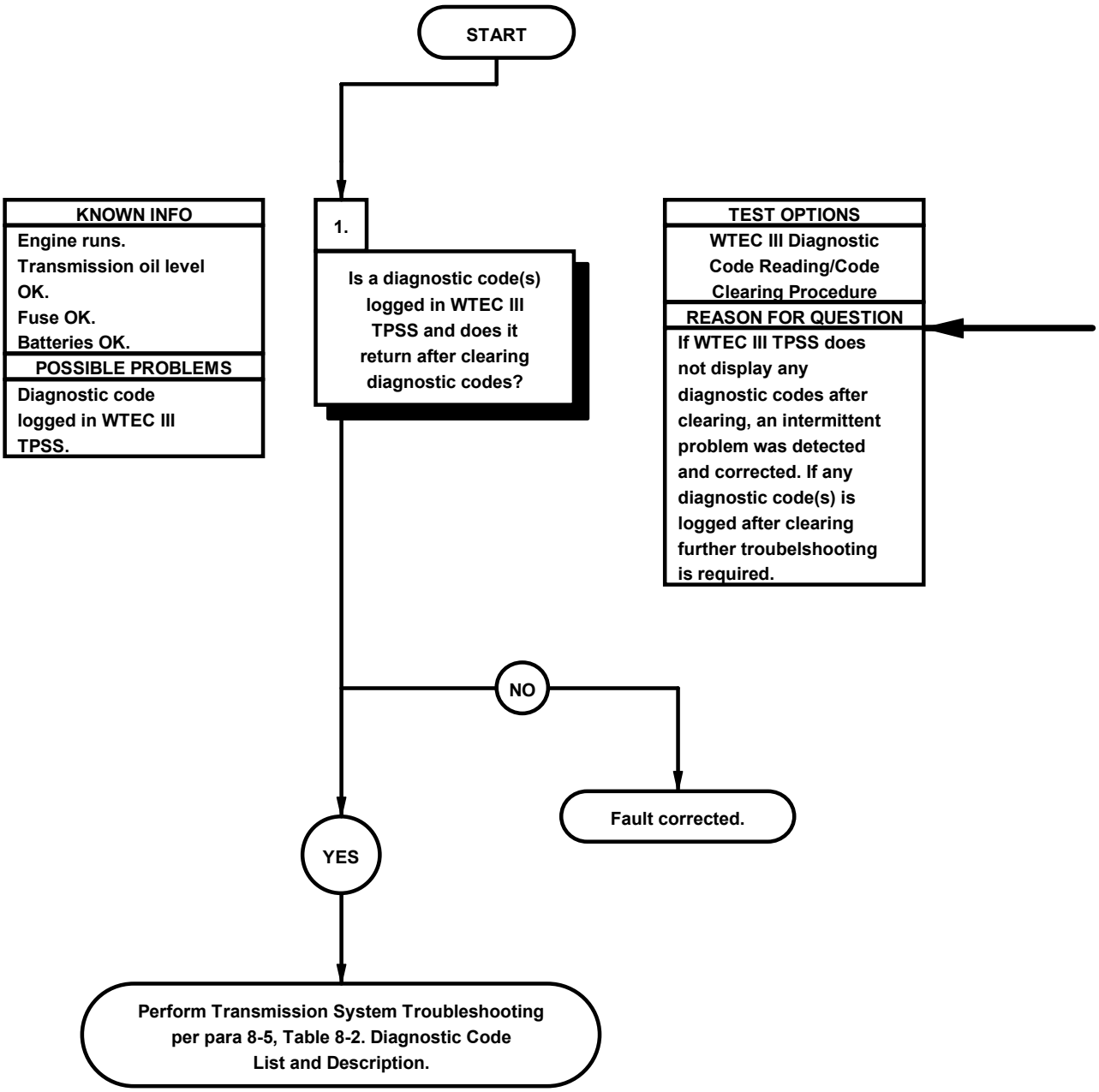
(1) Start engine (TM 9-2320-366-10-1).
(2) Remove dust cap from DCA connector.
(3) Set multimeter to volts dc.
(4) Connect positive (+) probe of multimeter to DCA connector terminal N.
(5) Connect negative (-) probe of multimeter to DCA connector terminal P and note reading on multimeter.
(6) If 33 VDC or more is present, replace 100 amp voltage regulator (para 7-5) or 200 amp voltage regulator (para 20-46).
(7) If 24-32 is present, replace WTEC III transmission ECU (para 8-7).
(8) Install dust cap on DCA connector.
(9) Clear diagnostic codes (para 8-5).
(10) Shut down engine (TM 9-2320-366-10-1).



f38. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) LED DISPLAYS "- -" AND/OR TRANSMISSION DOES NOT SHIFT GEARS

INITIAL SETUP

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



(1) Perform WTEC III Code Reading and Code Clearing (para 8-5).
(2) If no diagnostic codes are logged after clearing, fault is corrected.
(3) If diagnostic codes are still logged, perform Transmission System Troubleshooting of active diagnostic codes per para 8-25, Table 8-2. WTEC III Diagnostic Code List and Description.

f39. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 23 AND ANY SUB CODE

INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)

Tools and Special Tools (Cont)
Wrench Set, Socket (Item 51, Appendix C)

Personnel Required
(2)

References
TM 9-4910-571-12&P

NOTE

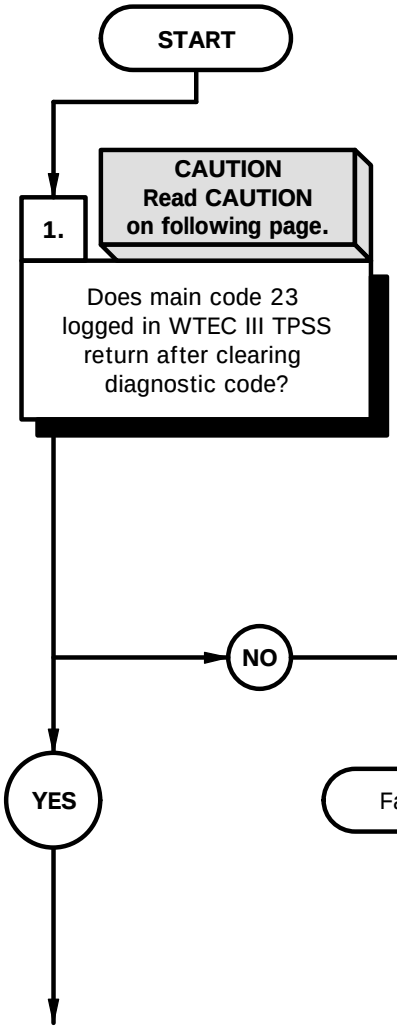
Perform electrical system troubleshooting e1. Circuit Breaker Does Not Operate on circuit breakers C43 and CB79 prior to begining this task.

KNOWN INFO

Circuit Breakers CB43 and CB79 OK.

POSSIBLE PROBLEMS

Faulty WTEC III dashboard cable assembly.
Faulty WTEC III TPSS.
Faulty WTEC III transmission ECU.



TEST OPTIONS

WTEC III Diagnostic Code Clearing procedure.

REASON FOR QUESTION

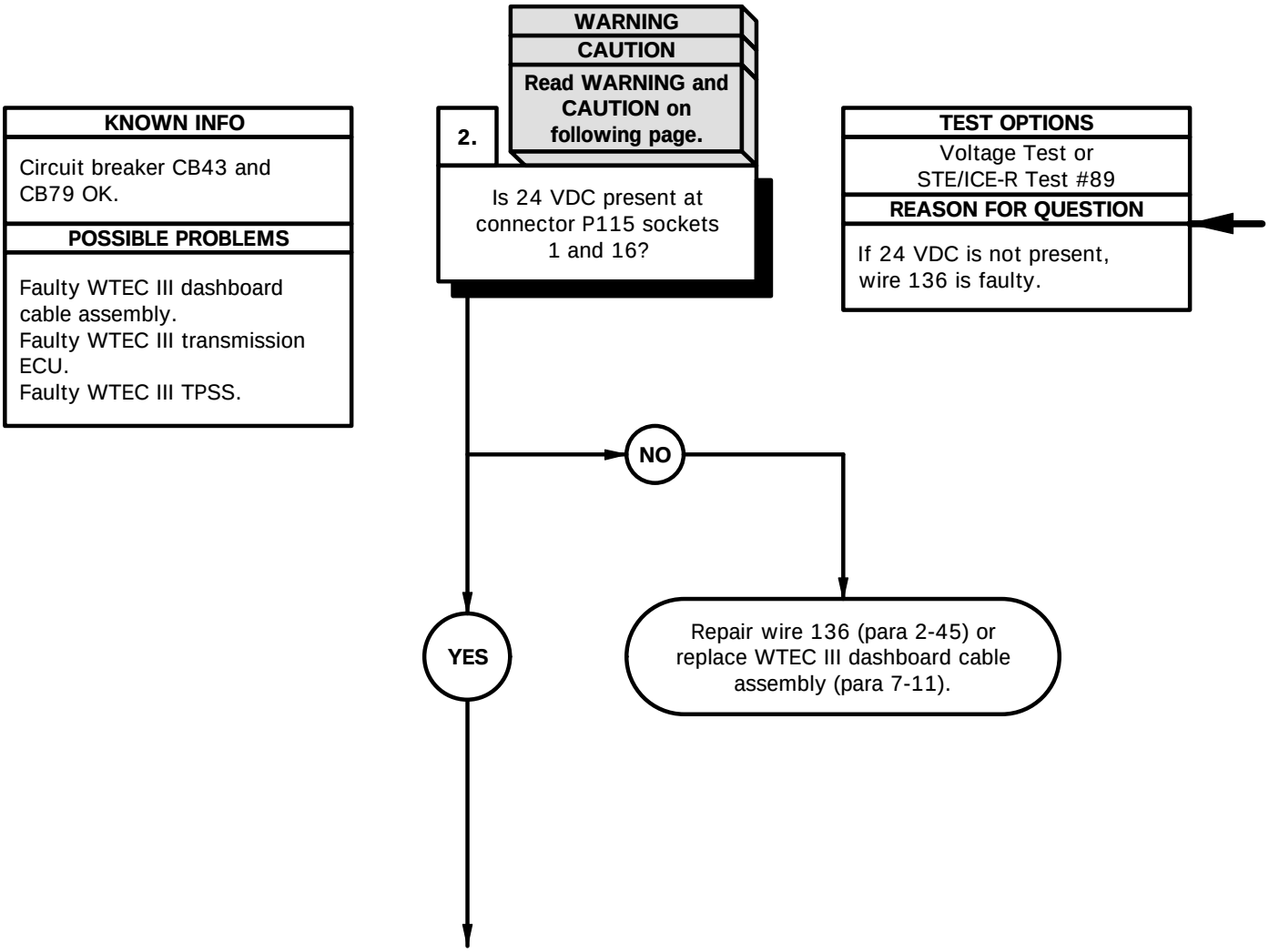
If WTEC III TPSS does not display any diagnostic code after clearing, an intermittent problem was detected and corrected. If diagnostic code is logged after clearing, further troubleshooting is required.

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) Perform WTEC III Code Reading and Code Clearing (para 8-5).
(2) If diagnostic code 23 is not logged after clearing, fault is corrected.
(3) If diagnostic code 23 is logged after clearing, further troubleshooting is required.

f39. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 23 AND ANY SUB CODE (CONT)



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 circuits and cause severe burns or electrical shock.

CAUTION

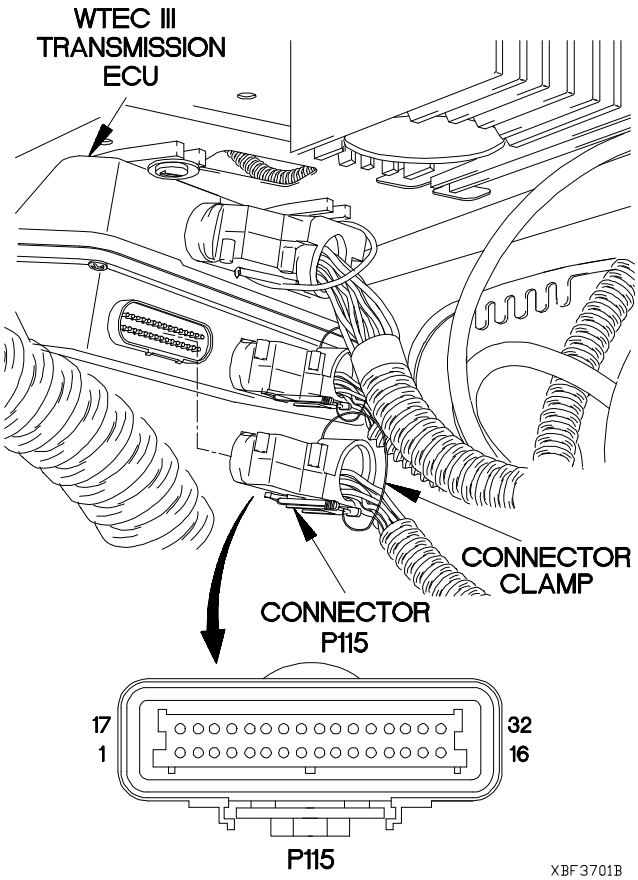
Use care when testing electrical connectors not to bend connector pins or damage connector sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

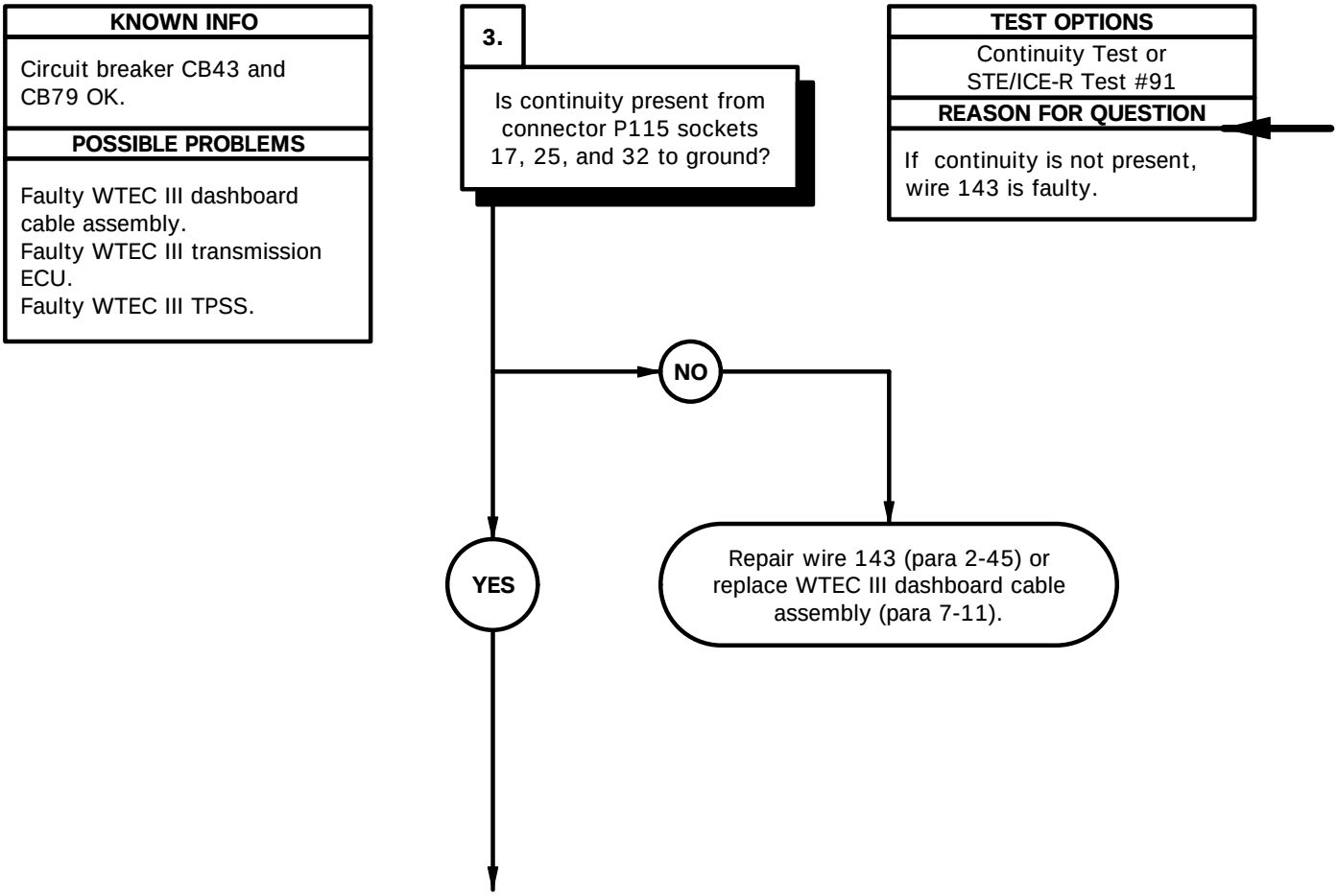
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Remove kick panel (para 16-3).
(2) Disconnect connector clamp from connector P115
(3) Disconnect connector P115 from WTEC III transmission ECU connector.
(4) Set multimeter to volts DC.
(5) Connect positive (+) probe of multimeter to connector P115 socket 1.
(6) Connect negative (-) probe of multimeter to a known good ground and note reading on multimeter.
(7) Connect positive (+) probe of multimeter to connector P115 socket 16.
(8) Connect negative (-) probe of multimeter to a known good ground and note reading on multimeter.
(9) If 24 VDC is not present in steps (6) and (8), repair wire 136 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).

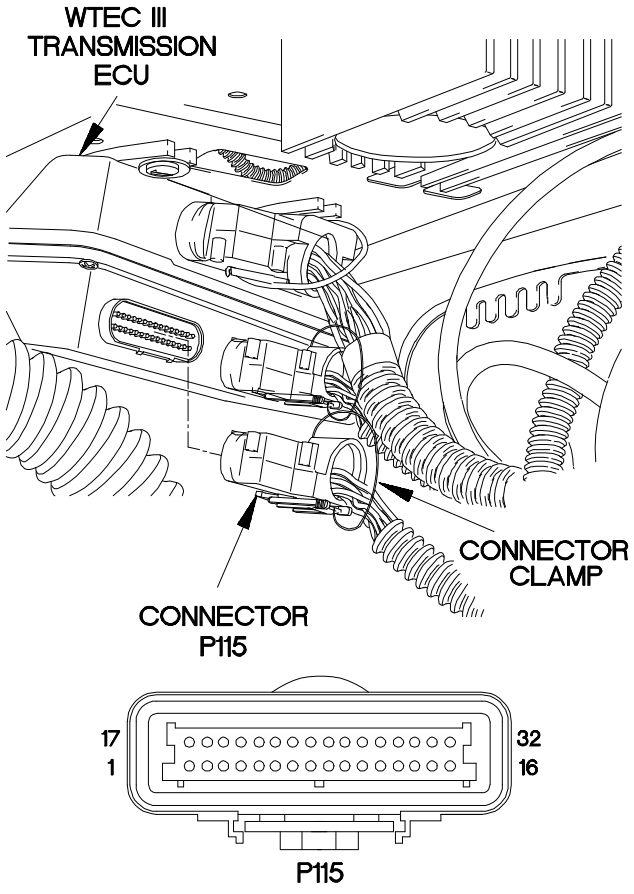


f39. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 23 AND ANY SUB CODE (CONT)

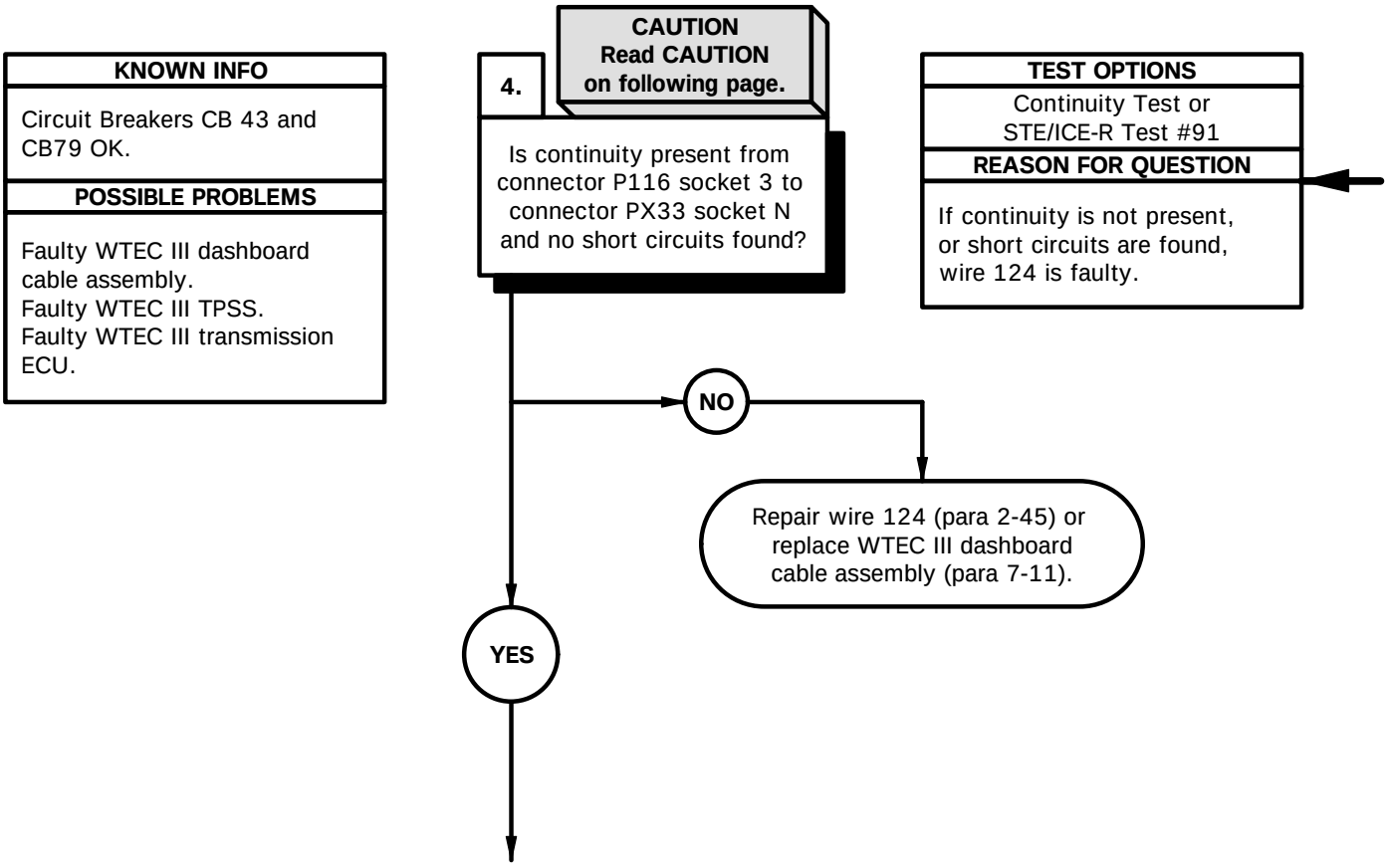


CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P115 socket 17.
(3) Connect negative (-) probe of multimeter to a known good ground and note reading on multimeter.
(4) If continuity is not present in step (3), repair wire 143 from connector P115-17 to terminal board 2 pin 27 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).
(5) Connect positive (+) probe of multimeter to connector P115 socket 25.
(6) Connect negative (-) probe of multimeter to a known good ground and note reading on multimeter.
(7) If continuity is not present in step (6), repair wire 144 from connector P115-25 to chassis ground (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).
(8) Connect positive (+) probe of multimeter to connector P115 socket 32.
(9) Connect negative (-) probe of multimeter to a known good ground and note reading on multimeter.
(10) If continuity is not present in step (9), repair wire 143 from connector P115-32 to terminal board 2 pin 16 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).
(11) Connect connector P115 to WTEC III Transmission ECU.
(12) Connect connector clamp on connector P115.



f39. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 23 AND ANY SUB CODE (CONT)



CAUTION

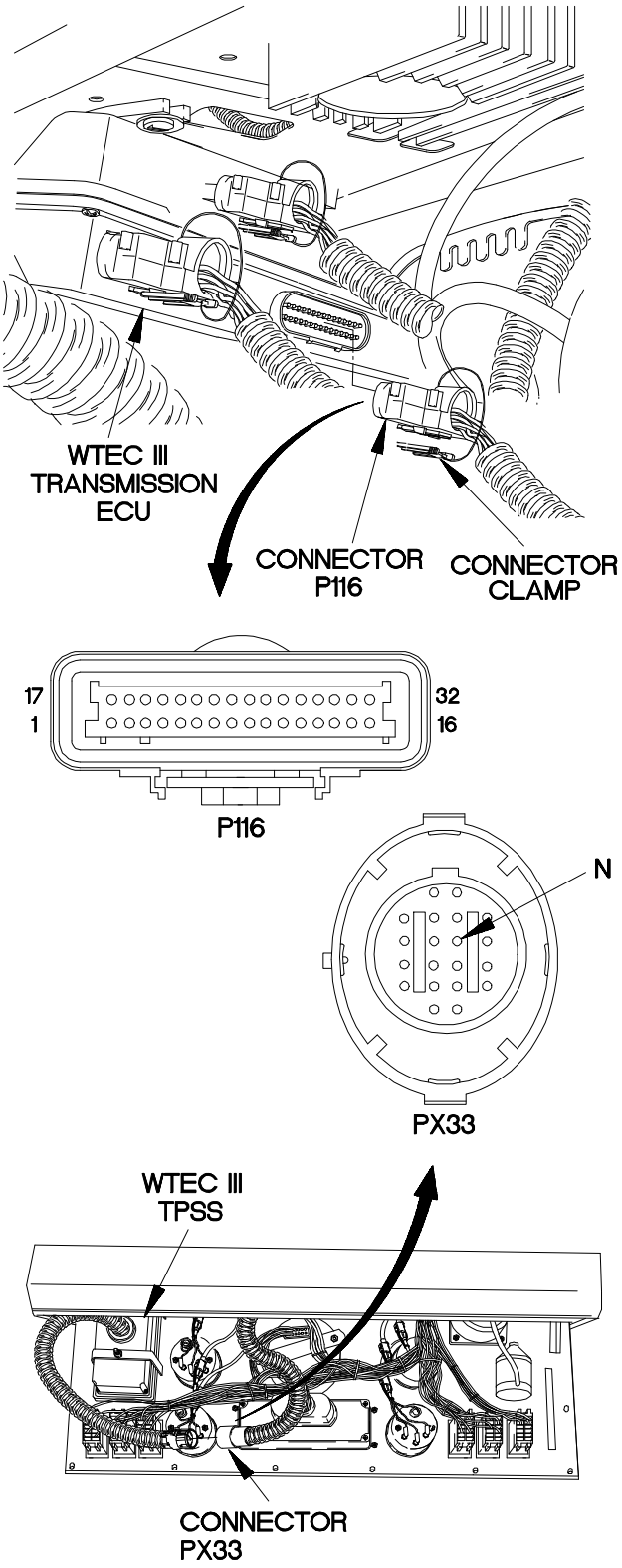
Use care when testing electrical connectors not to bend connector pins or damage connector sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

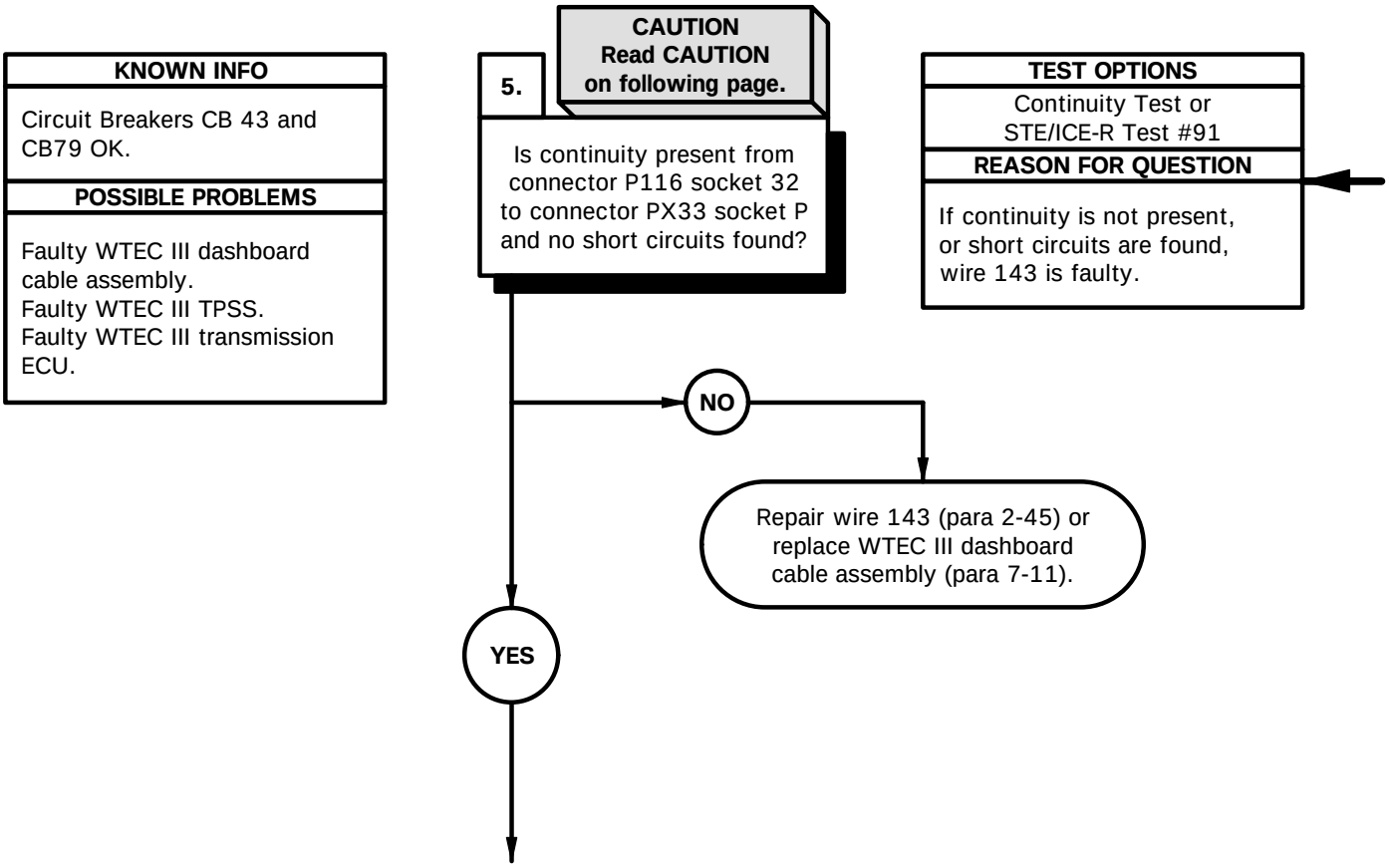
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Disconnect connector clamp from connector P116.
(2) Disconnect connector P116 from WTEC III transmission ECU.
(3) Remove instrument panel assembly for access (para 7-15).
(4) Disconnect connector PX33 from WTEC III TPSS.
(5) Connect positive (+) probe of multimeter to connector P116 socket 3.
(6) Connect negative (-) probe of multimeter to connector PX33 socket N and note reading on multimeter.
(7) Connect negative probe (-) of multimeter to all other sockets in connector PX33, one at a time, and note reading on multimeter.
(8) Connect negative probe (-) of multimeter to ground and note reading on multimeter.
(9) If continuity is not present in step 6, or continuity is present in step 7 or step 8, repair wire 124 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).



f39. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 23 AND ANY SUB CODE (CONT)



CAUTION

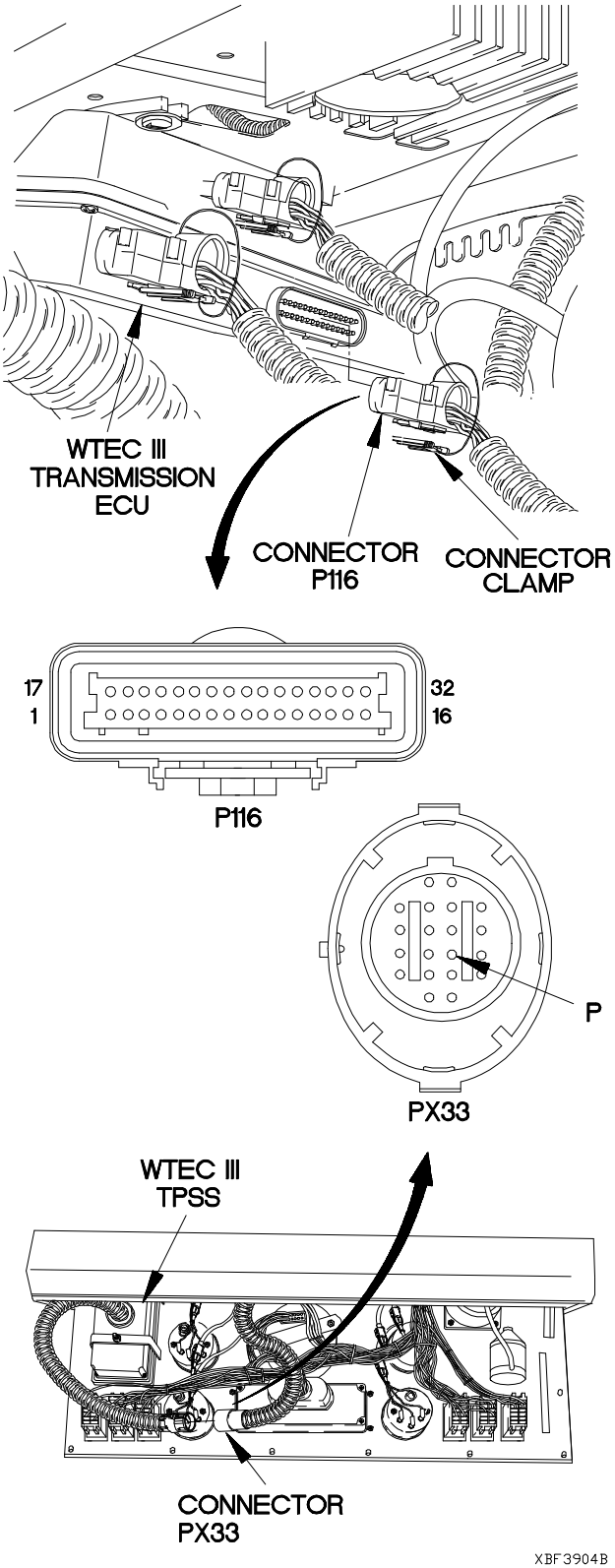
Use care when testing electrical connectors not to bend connector pins or damage connector sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

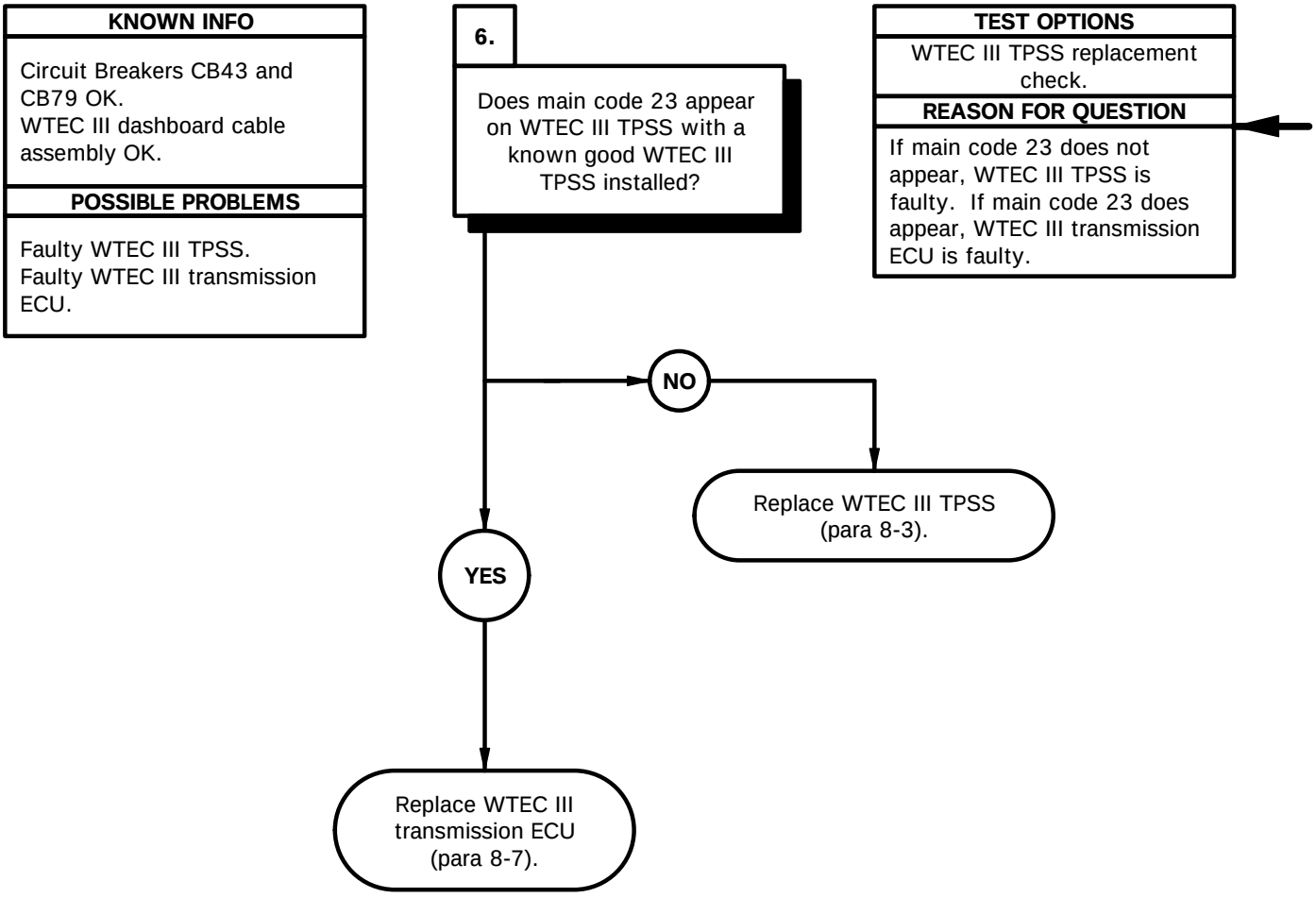
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Connect positive (+) probe of multimeter to connector P116 socket 32.
(2) Connect negative (-) probe of multimeter to connector PX33 socket P and note reading on multimeter.
(3) Connect negative probe (-) of multimeter to all other sockets in connector PX33, one at a time, and note reading on multimeter.
(4) Connect negative probe (-) of multimeter to ground and note reading on multimeter.
(5) If continuity is not present in step 2, or continuity is present in step 3 or step 4, repair wire 143 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).
(6) Connect connector P116 to WTEC III transmission ECU.
(7) Connect connector clamp on connector P116.

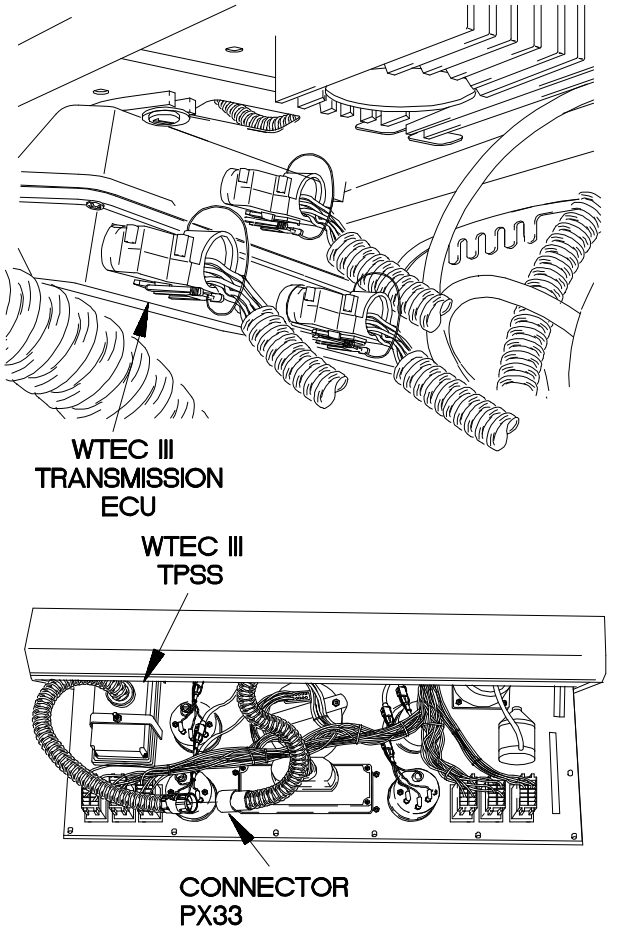


f39. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 23 AND ANY SUB CODE (CONT)



WTEC III TPSS REPLACEMENT CHECK

(1) Replace WTEC III TPSS with a known good WTEC III TPSS (para 8-3).
(2) Start engine (TM 9-2320-365-10).
(3) Observe if main code 23 appears on WTEC III TPSS (para 8-5).
(4) If main code 23 does not appear, replace WTEC III TPSS (para 8-3).
(5) If main code 23 does appear, replace WTEC III transmission ECU (para 8-7).
(6) Shut down engine (TM 9-2320-365-10).
(7) Install original WTEC III TPSS (para 8-3).
(8) Connect connector PX33 to WTEC III TPSS.
(9) Install instrument panel assembly (para 7-15).
(10) Install kick panel (para 16-3).
(11) Clear diagnostic codes (para 8-5).



f40. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DOES NOT ILLUMINATE

INITAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Kick panel removed (para 16-3).

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

Personnel Required
(2)

References
TM 9-4910-571-12&P

NOTE

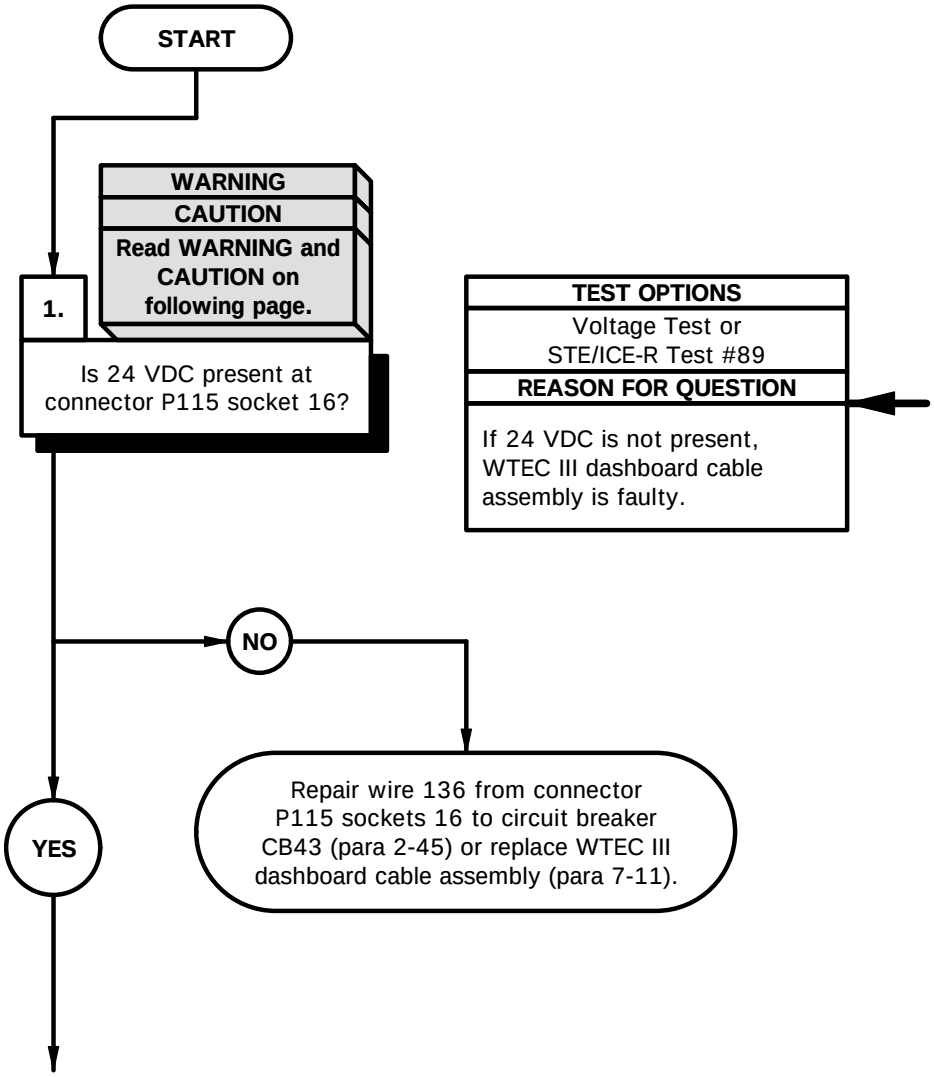
Perform Electrical System Troubleshooting e1. CIRCUIT BREAKER DOES NOT OPERATE on circuit breakers CB43 and CB79 prior to beginning this task.

KNOWN INFO

12 VDC and 24 VDC circuits operate.
Circuit breaker CB43 OK.
Circuit breaker CB79 OK.

POSSIBLE PROBLEMS

Faulty WTEC III dashboard cable assembly.
Faulty terminal board TB1.
Faulty WTEC III ECU.
Faulty WTEC III TPSS.



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 circuits and cause severe burns or electrical shock.

CAUTION

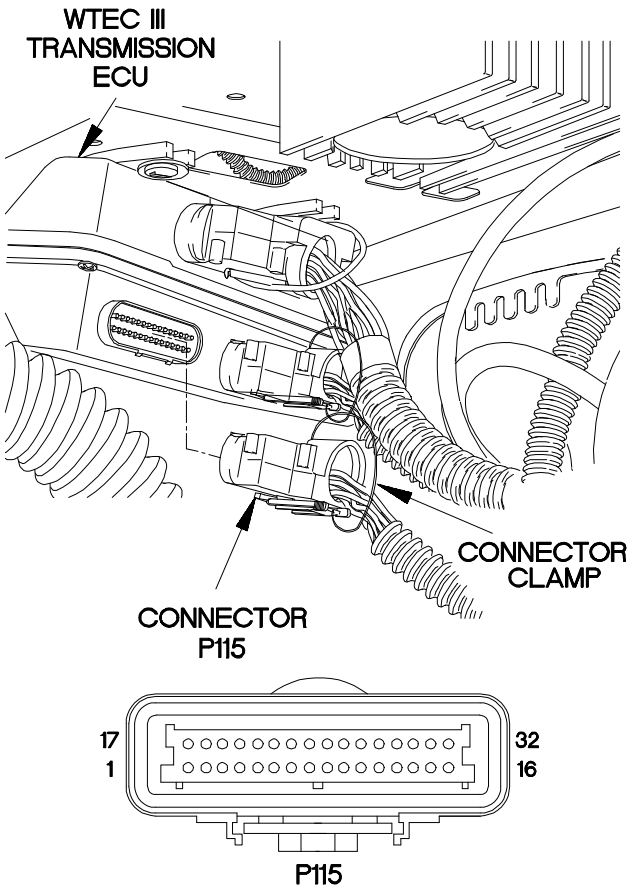
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

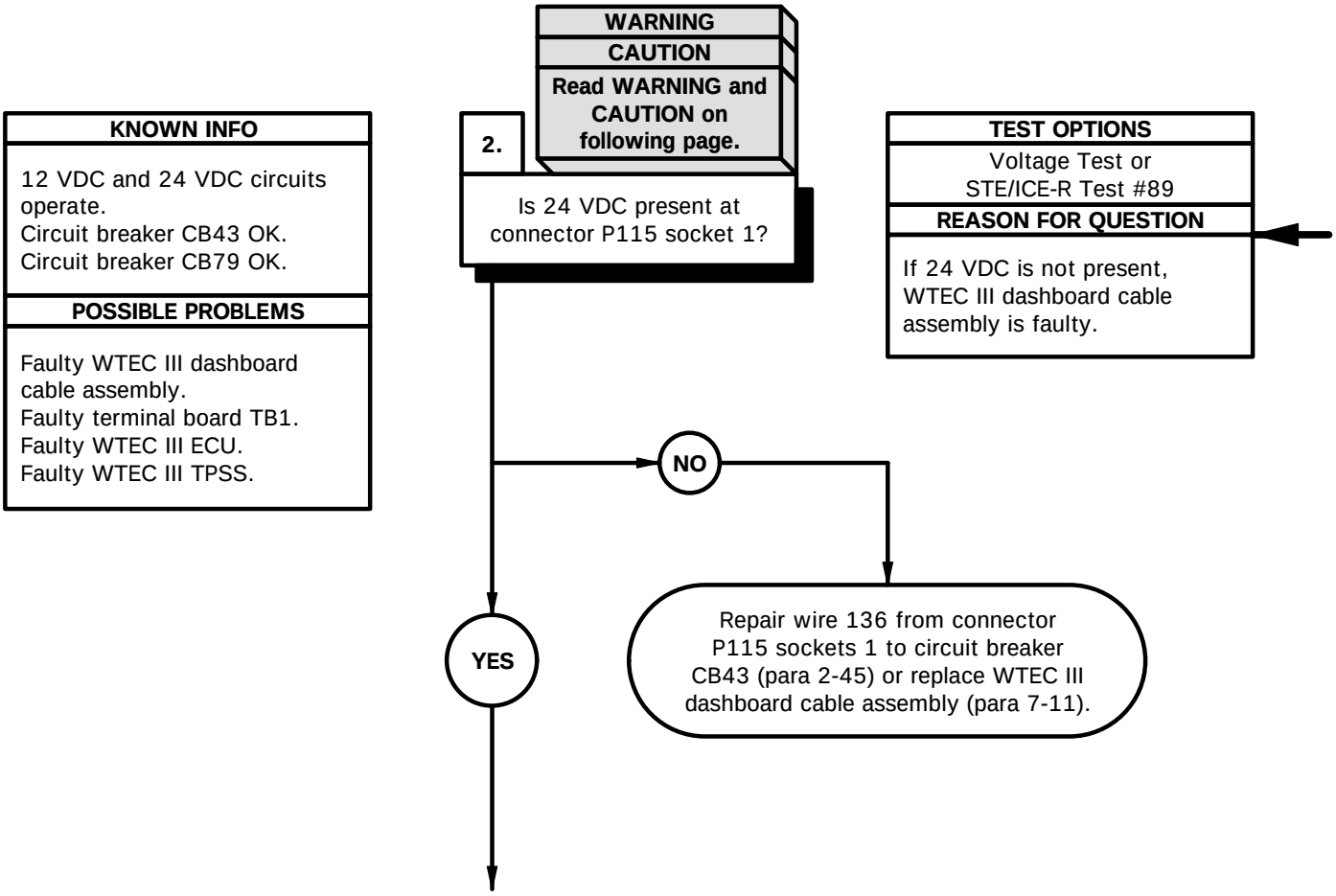
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

VOLTAGE TEST

(1) Disconnect connector clamp from connector P115.
(2) Disconnect connector P115 from WTEC III ECU.
(3) Set multimeter to volts DC.
(4) Connect positive (+) probe of multimeter to connector P115 socket 16.
(5) Connect negative (-) probe of multimeter to ground note reading on multimeter.
(6) If 24 VDC is not present, repair wire 136 from connector P115 sockets 16 to circuit breaker CB43 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).



f40. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DOES NOT ILLUMINATE (CONT)



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 circuits and cause severe burns or electrical shock.

CAUTION

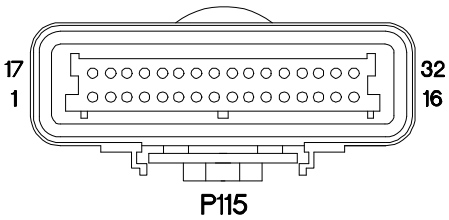
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

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

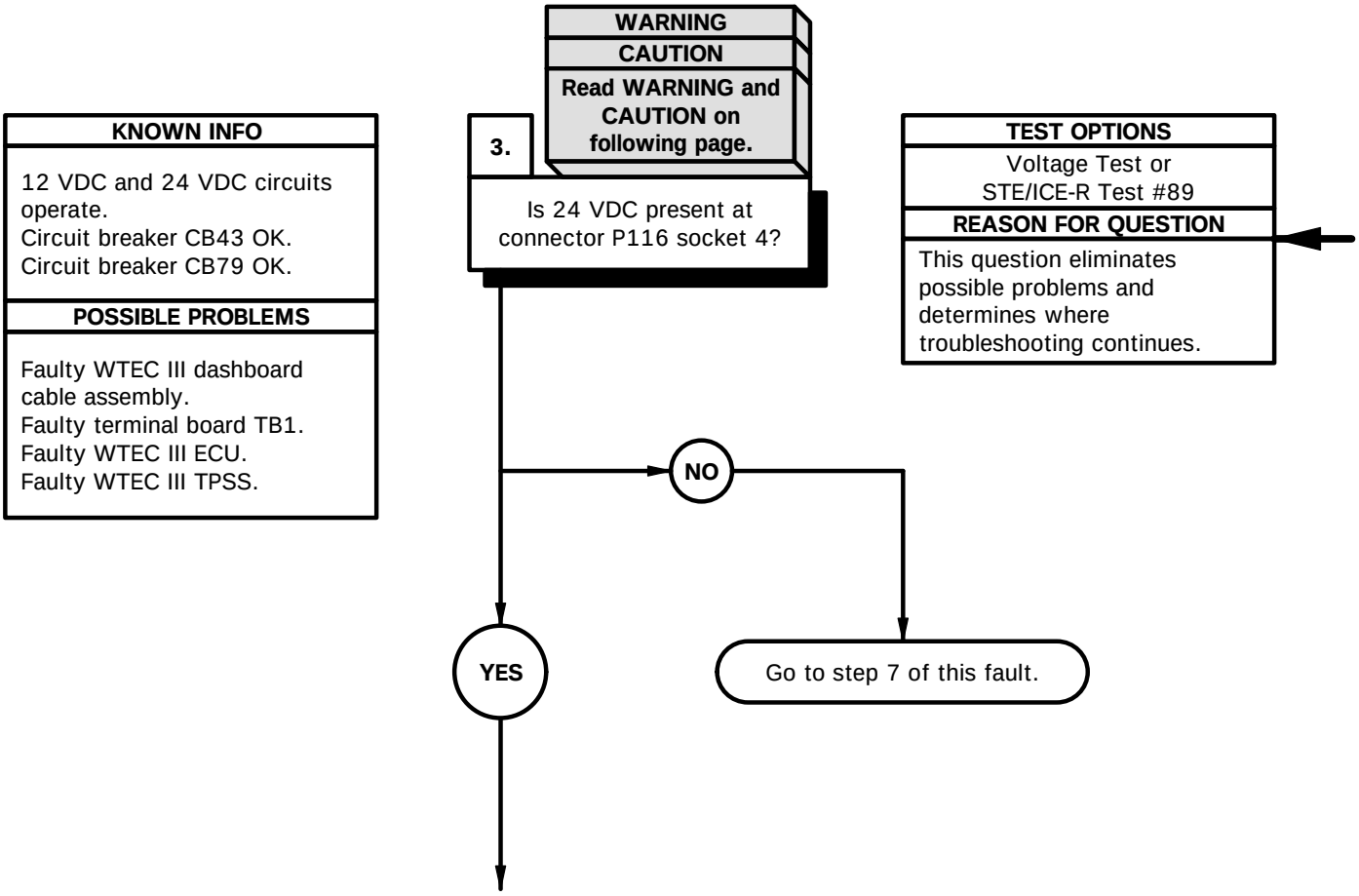
VOLTAGE TEST

(1) Set multimeter to volts DC.
(2) Connect positive (+) probe of multimeter to connector P115 socket 1.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If 24 VDC is not present, repair wire 136 from connector P115 sockets 1 to circuit breaker CB43 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).



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f40. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DOES NOT ILLUMINATE (CONT)



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 circuits and cause severe burns or electrical shock.

CAUTION

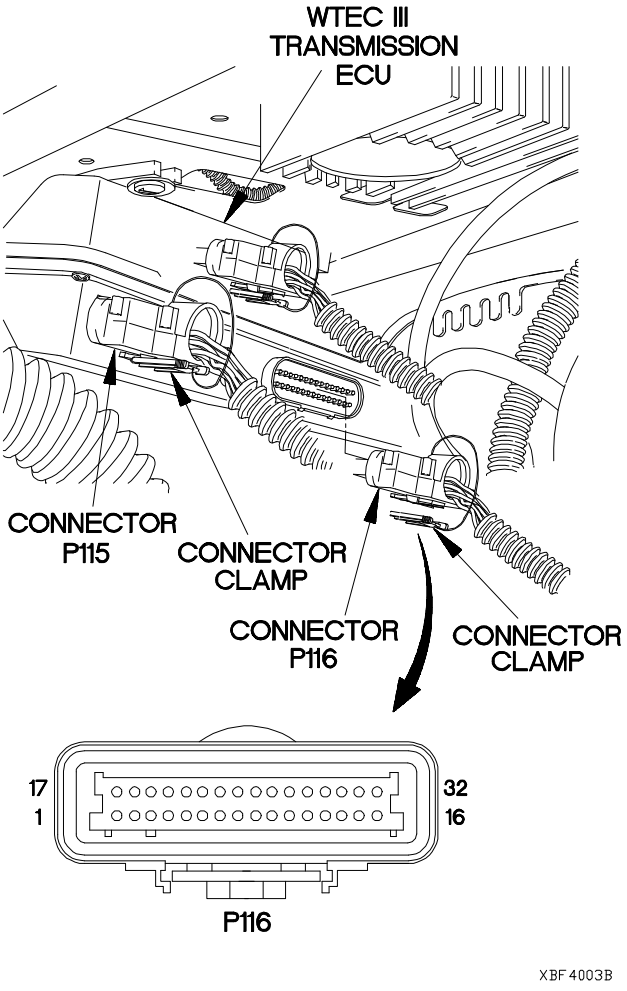
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

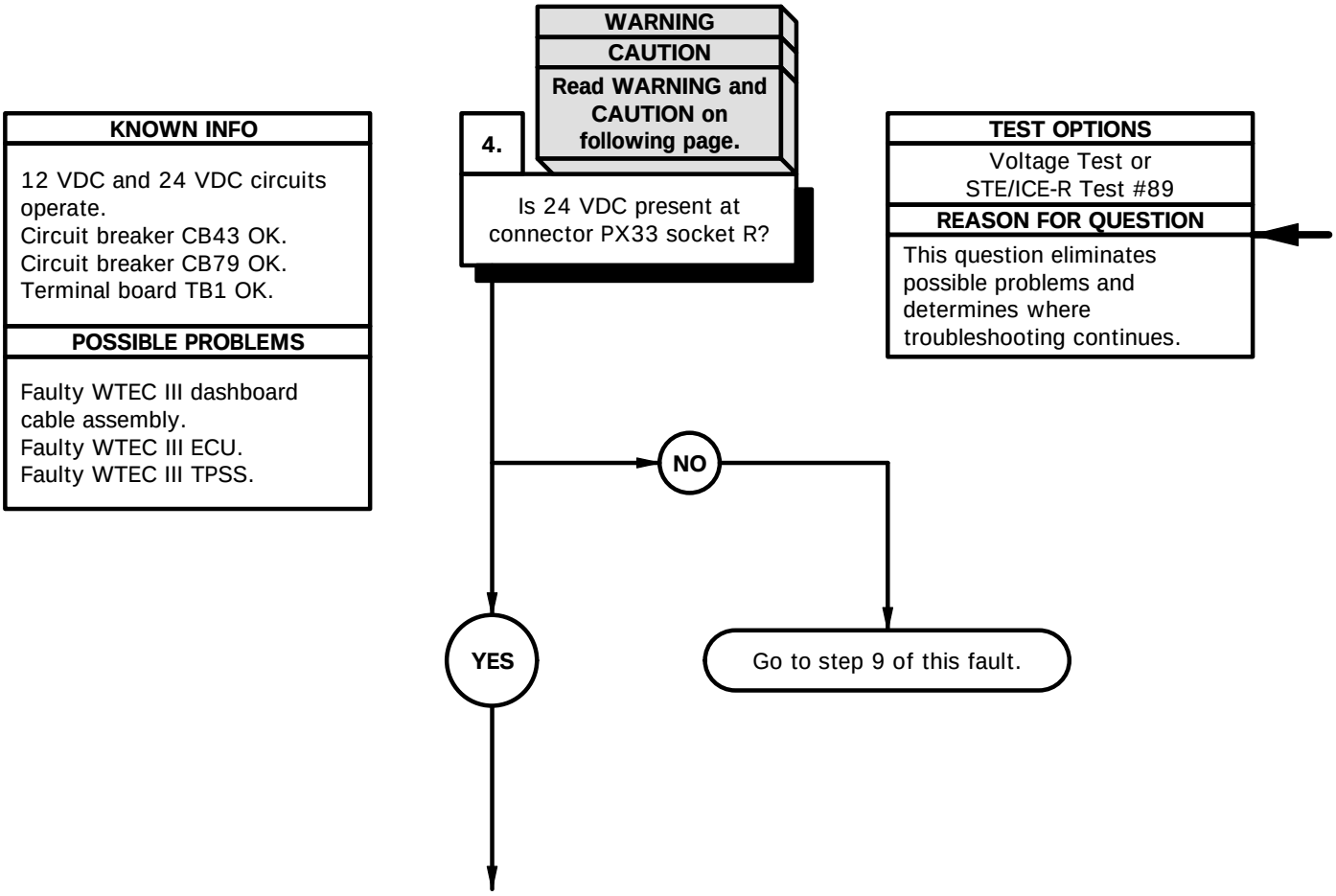
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

VOLTAGE TEST

(1) Connect connector P115 to WTEC III ECU.
(2) Connect connector clamp to connector P115.
(3) Disconnect connector clamp from connector P116.
(4) Disconnect connector P116 from WTEC III ECU.
(5) Set multimeter to volts DC.
(6) Connect positive (+) probe of multimeter to connector P116 socket 4.
(7) Connect negative (-) probe of multimeter to ground.
(8) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(9) Position master power switch to off (TM 9-2320-366-10-1).
(10) If 24 VDC is not present, go to step 7 of this fault.



f40. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DOES NOT ILLUMINATE (CONT)



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 circuits and cause severe burns or electrical shock.

CAUTION

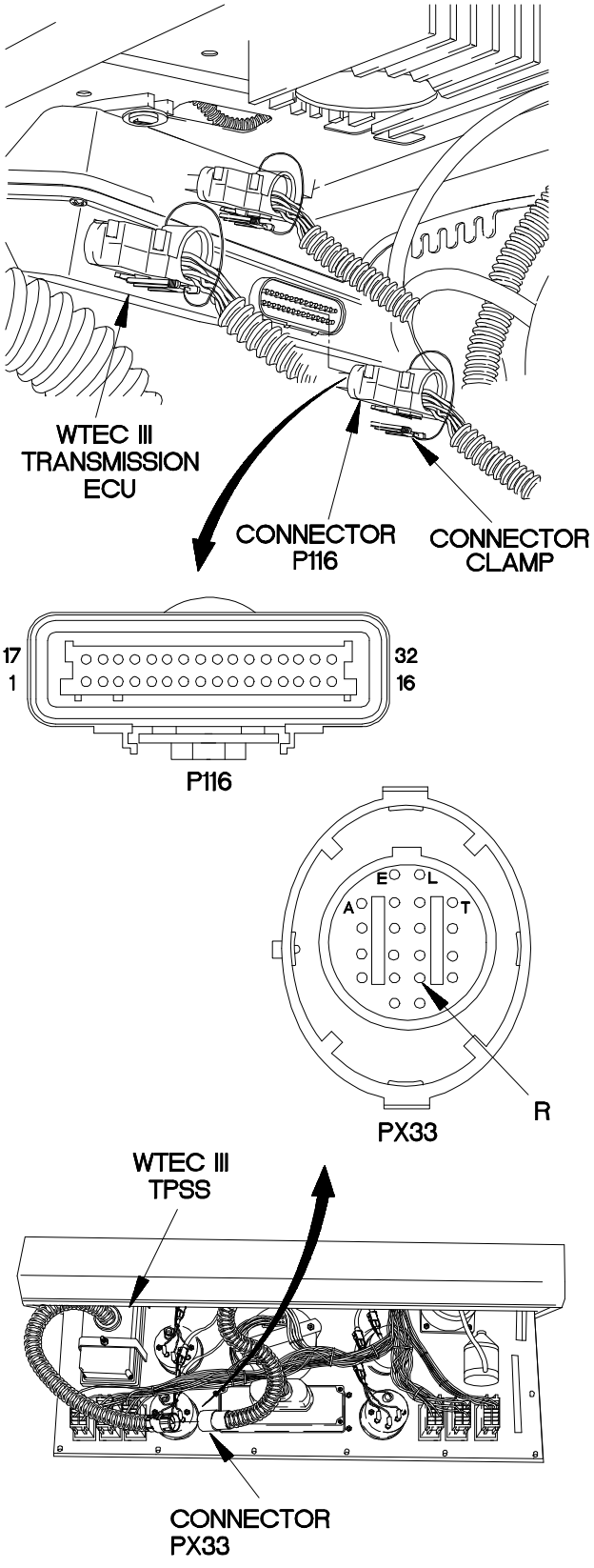
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

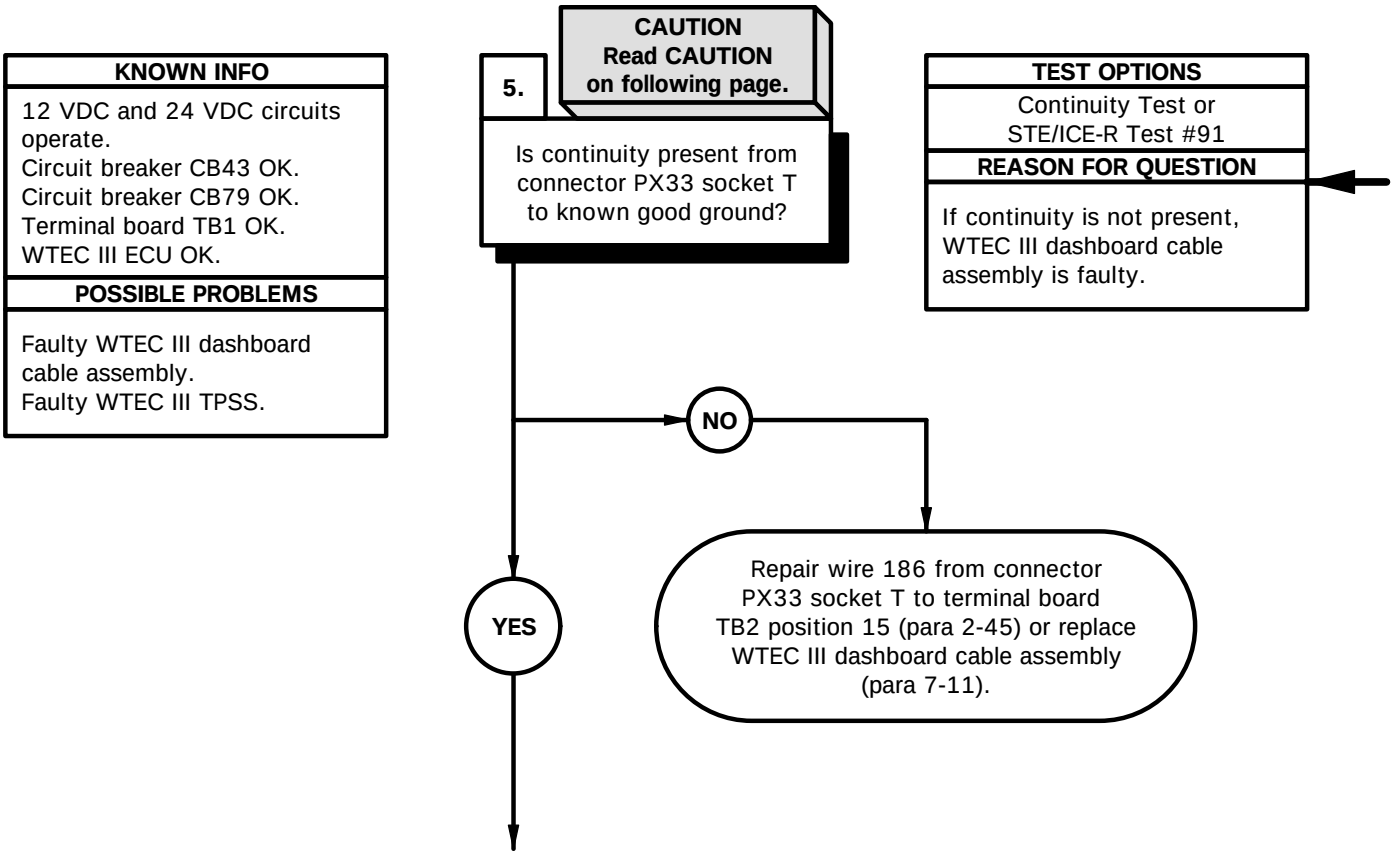
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

VOLTAGE TEST

(1) Connect connector P116 to WTEC III ECU.
(2) Connect connector clamp to connector P116.
(3) Remove instrument panel for access (para 7-15).
(4) Disconnect connector PX33 from WTEC III TPSS.
(5) Set multimeter to volts DC.
(6) Connect positive (+) probe of multimeter to connector PX33 socket R.
(7) Connect negative (-) probe of multimeter to ground.
(8) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
(9) Position master power switch to off (TM 9-2320-366-10-1).
(10) If 24 VDC is not present, go to step 9 of this fault.



f40. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DOES NOT ILLUMINATE (CONT)



CAUTION

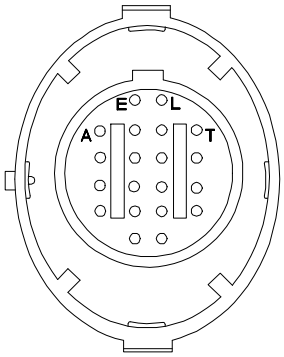
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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

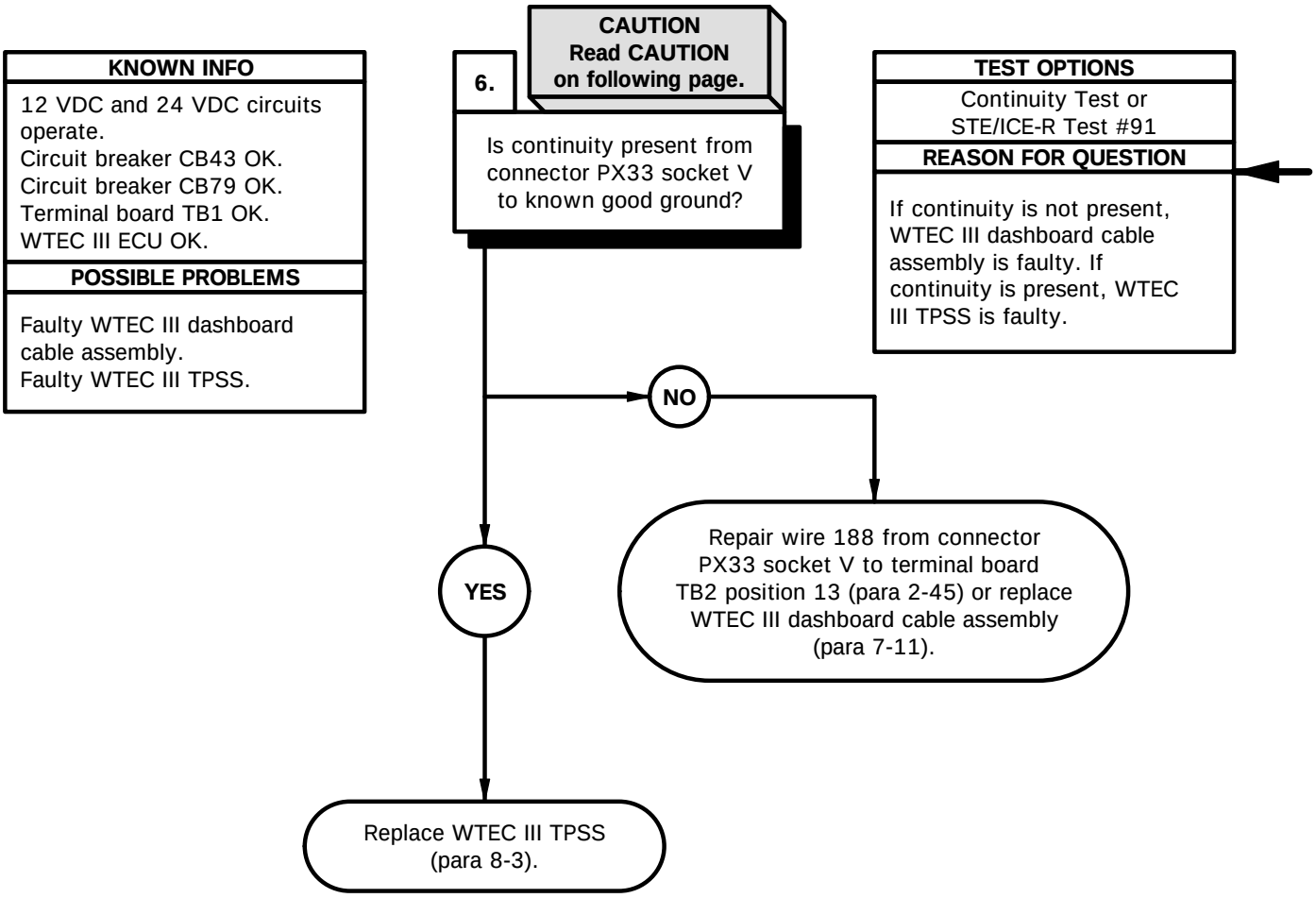
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector PX33 socket T.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, Repair wire 186 from connector PX33 socket T to terminal board TB2 position 15 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).



PX33

XBF4005B

f40. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DOES NOT ILLUMINATE (CONT)



CAUTION

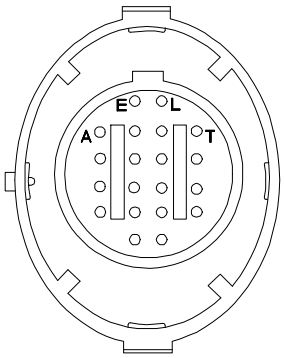
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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

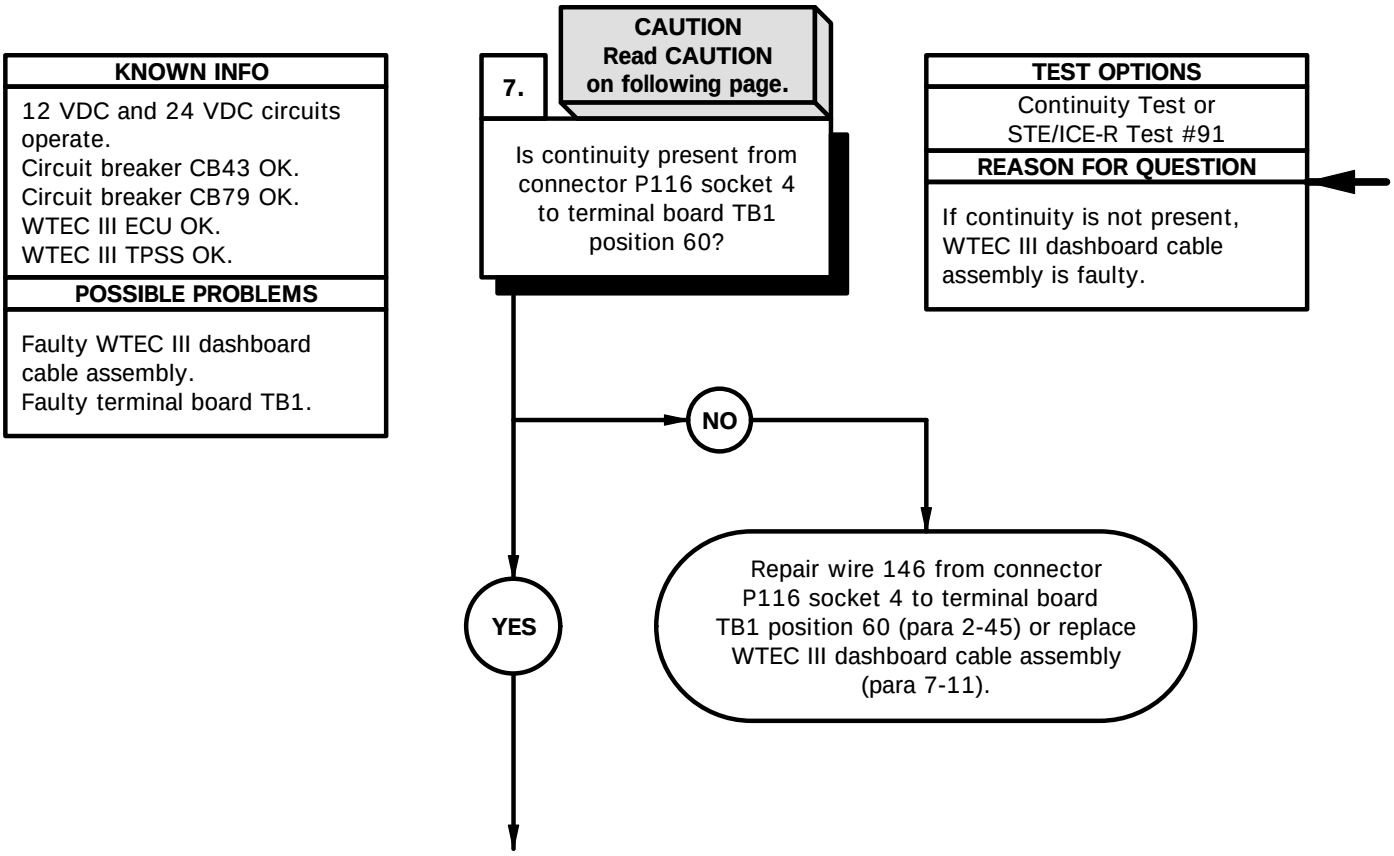
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector PX33 socket V.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, Repair wire 188 from connector PX33 socket V to terminal board TB2 position 13 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).
(5) If continuity is present, replace WTEC III TPSS (para 8-3).



PX33

XBf4006B

f40. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DOES NOT ILLUMINATE (CONT)



CAUTION

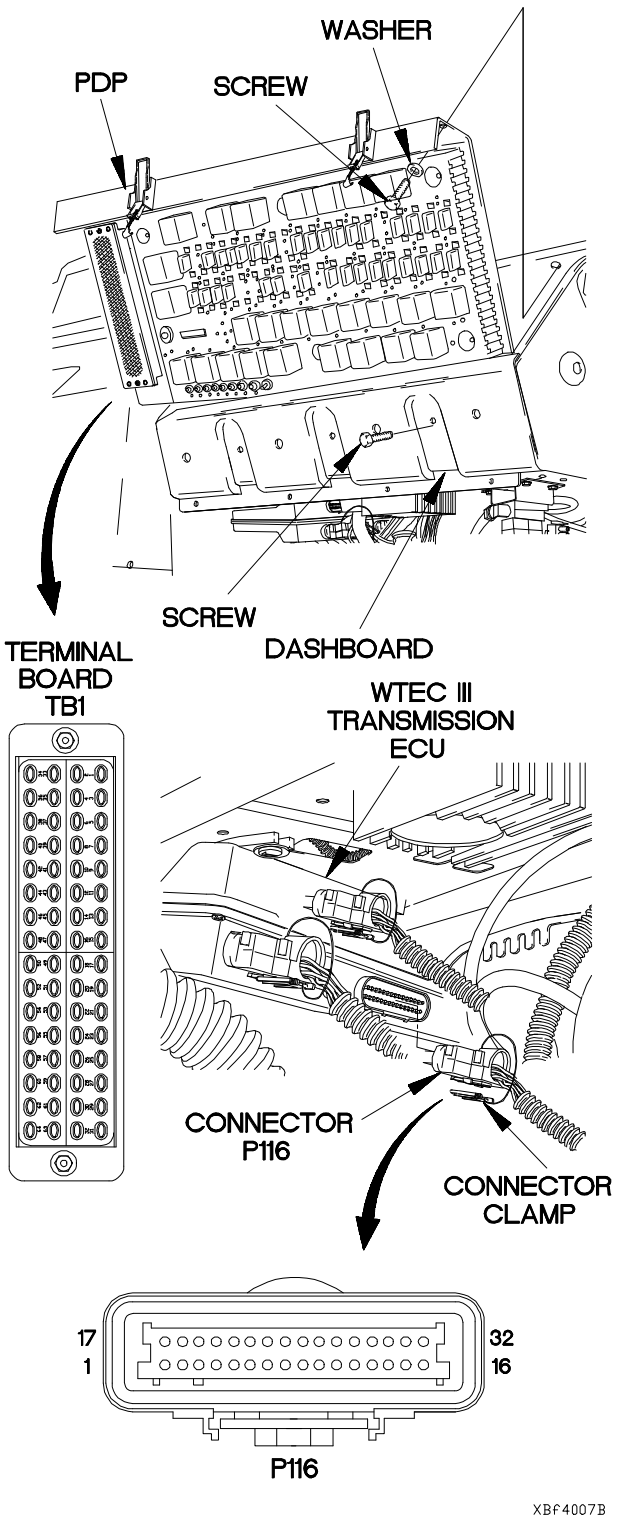
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

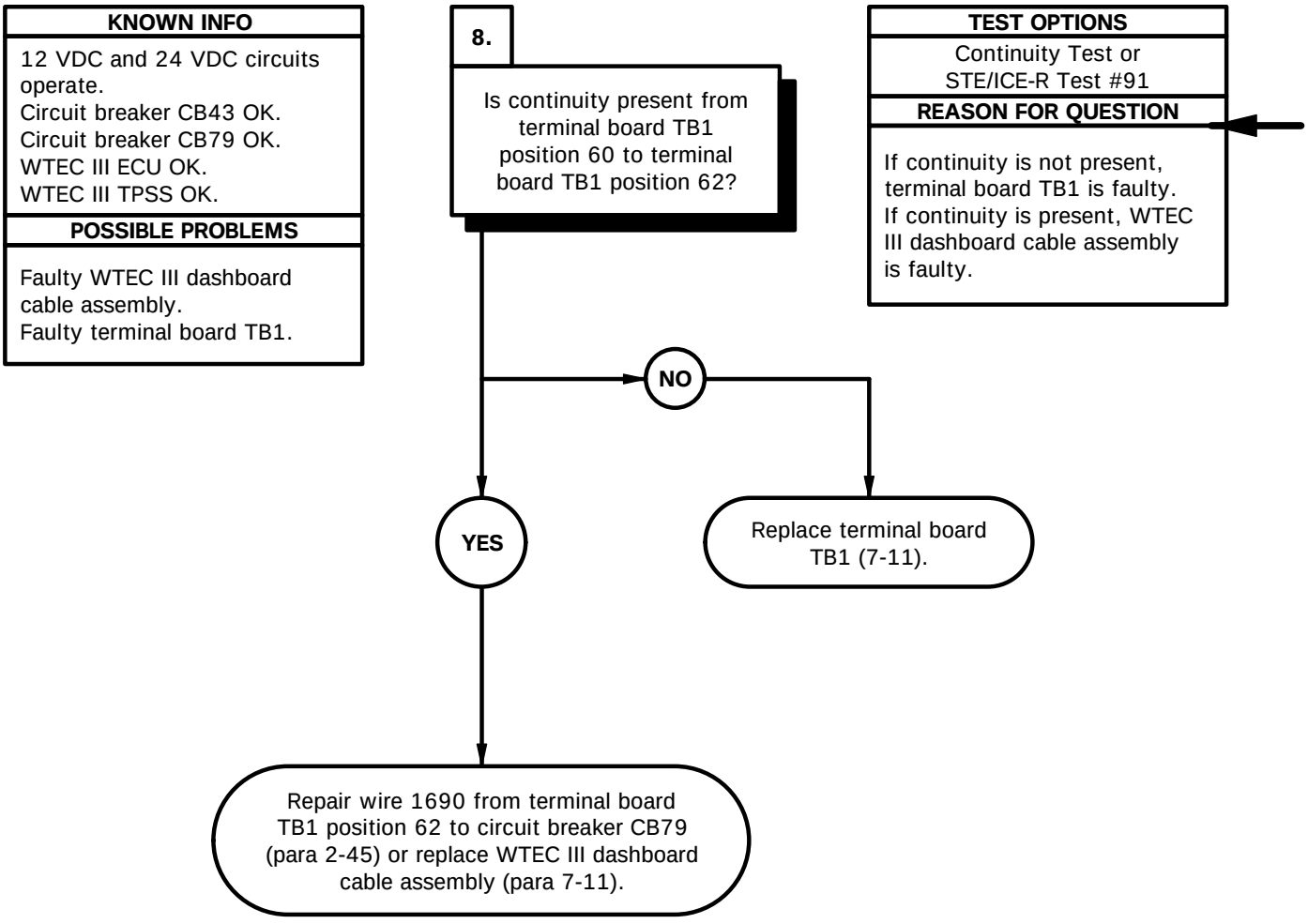
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Disconnect batteries (para 7-57).
(2) Remove PDP cover (para 16-2).
(3) Remove three screws from PDP.
(4) Remove three screws and washers from PDP.
(5) Lift PDP outward to gain access.
(6) Set multimeter to ohms.
(7) Connect positive (+) probe of multimeter to connector P116 socket 4.
(8) Connect negative (-) probe of multimeter to terminal board TB1 position 60 and note reading on multimeter.
(9) If continuity is not present, Repair wire 146 from connector P116 socket 4 to terminal board TB1 position 60 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).
(10) Connect connector P116 to WTEC III ECU.
(11) Connect connector clamp to connector P116.
(12) Install kick panel (para 16-3).

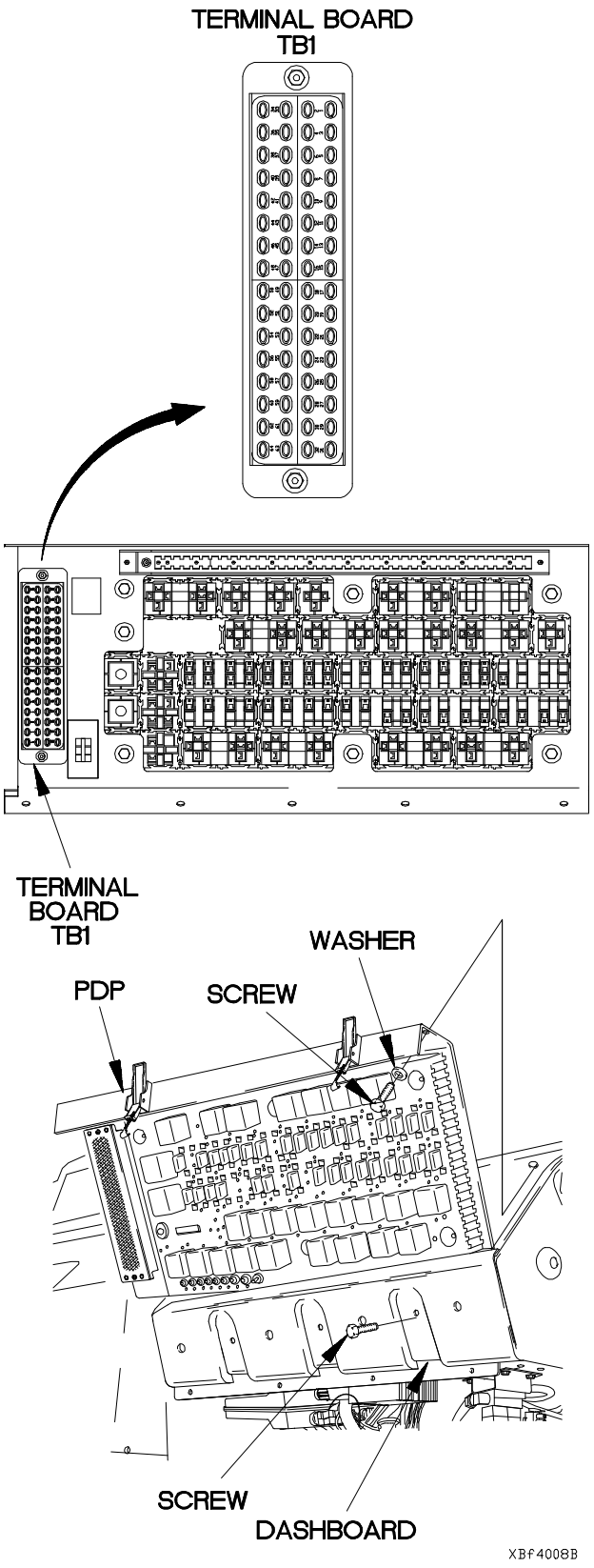


f40. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DOES NOT ILLUMINATE (CONT)

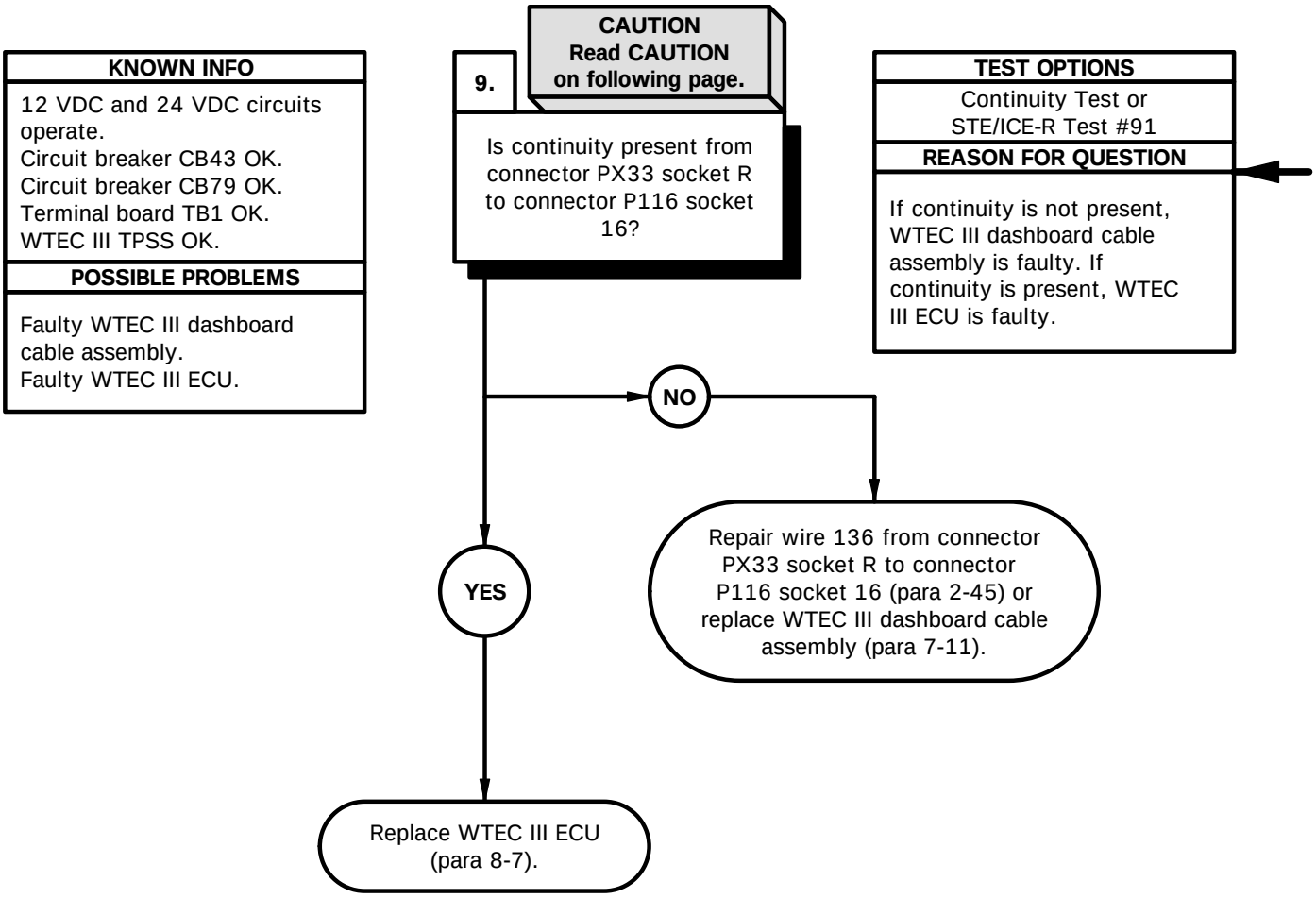


CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to terminal board TB1 position 60.
(3) Connect negative (-) probe of multimeter to terminal board TB1 position 62 and note reading on multimeter.
(4) If continuity is not present, replace terminal board TB1 (para 7-11).
(5) If continuity is present, Repair wire 1690 from terminal board TB1 position 62 to circuit breaker CB79 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-11).
(6) Install PDP on dashboard with three screws.
(7) Install three washers and screws in PDP.
(8) Install PDP cover (para 16-2).
(9) Connect batteries (para 7-57).



f40. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DOES NOT ILLUMINATE (CONT)



CAUTION

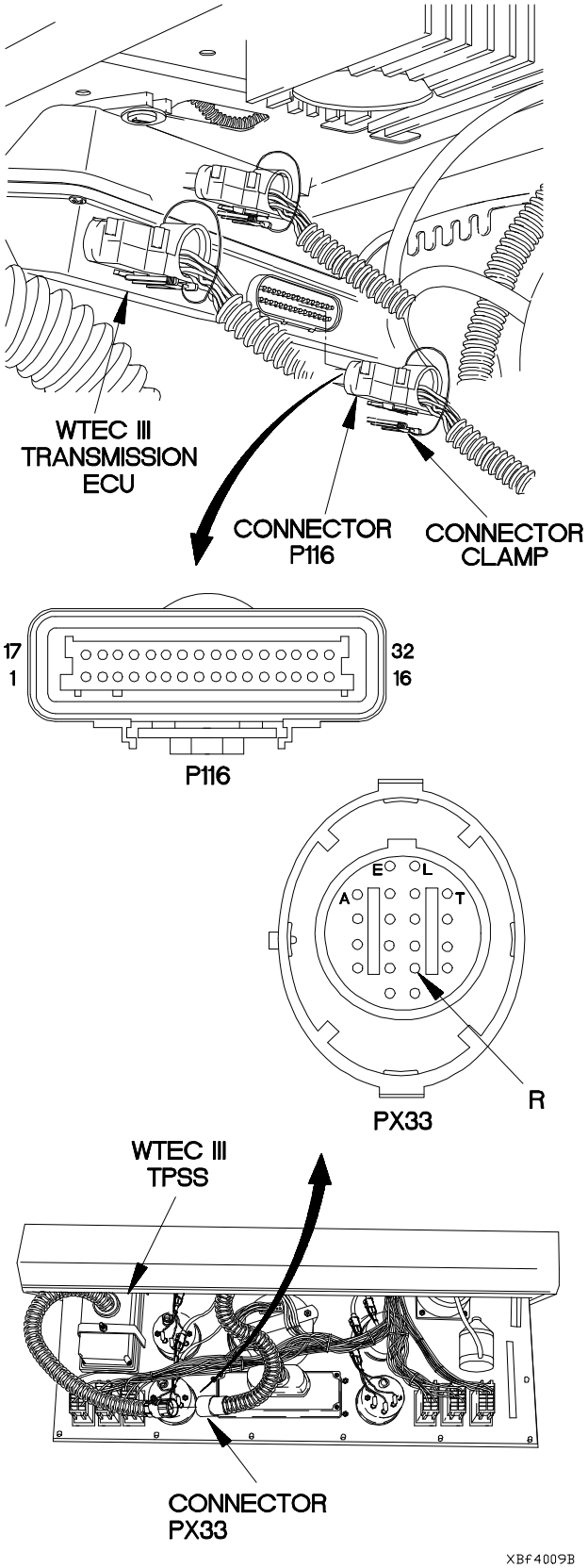
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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) Disconnect connector clamp from connector P116.
(2) Disconnect connector P116 from WTEC III ECU.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector PX33 socket R.
(5) Connect negative (-) probe of multimeter to connector P116 socket 16 and note reading on multimeter.
(6) If continuity is not present, repair wire 136 from connector PX33 socket R to connector P116 socket 16 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).
(7) If continuity is present, replace WTEC III ECU (para 8-7).
(8) Connect connector PX33 to WTEC III TPSS.
(9) Install instrument panel assembly (para 7-15).



2-18. PROPELLER SHAFT TROUBLESHOOTING

This paragraph covers Propeller Shaft Troubleshooting. The Propeller Shaft Fault Index, Table 2-46, lists faults for the drive shafts of the vehicle.

Table 2-46. Propeller Shaft Fault Index

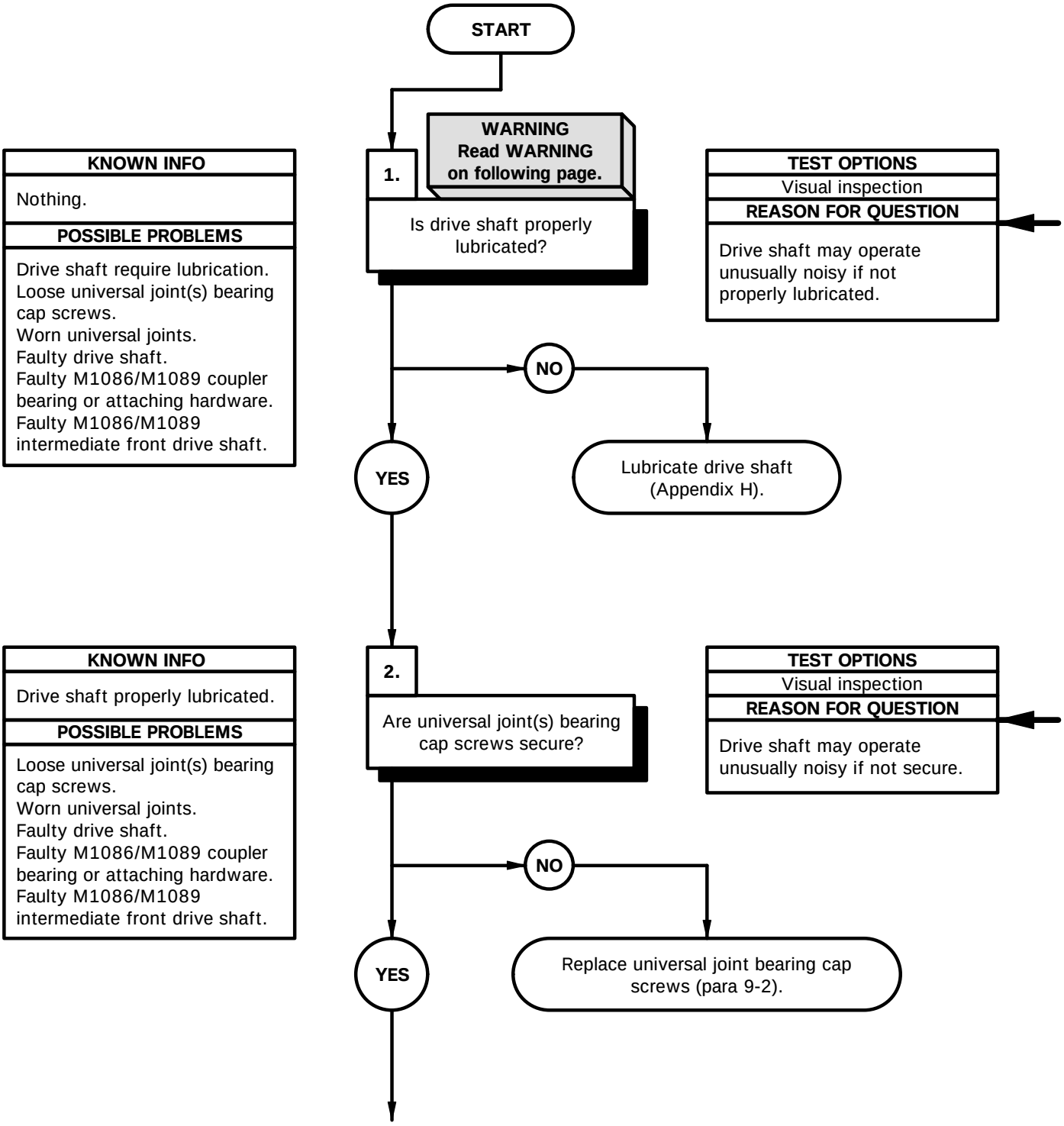
Fault No.	Description	Page
g1.	Drive Shaft or Universal Joint Unusually Noisy When Operating	2-1824

g1. DRIVE SHAFT OR UNIVERSAL JOINT UNUSUALLY NOISY WHEN OPERATING

INITIAL SETUP

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

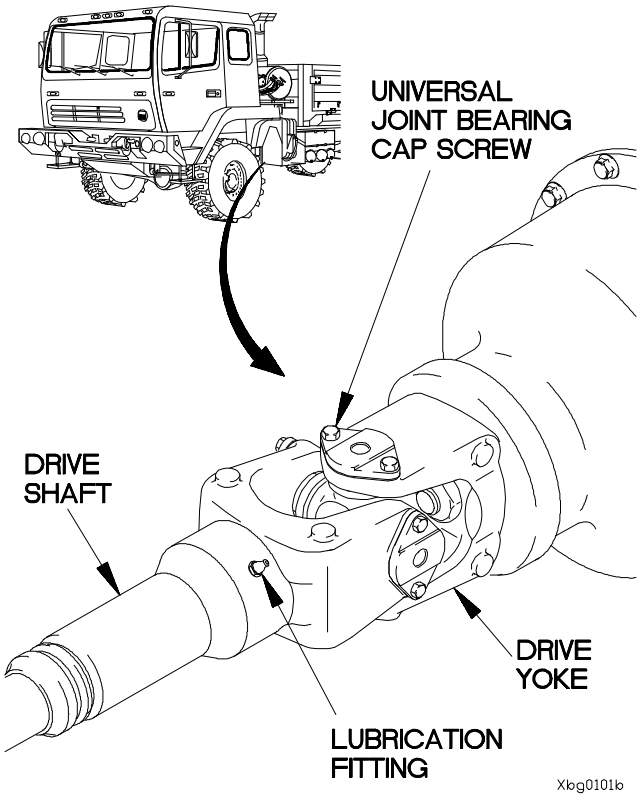
Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Goggles, Industrial (Item 15, Appendix C)



WARNING

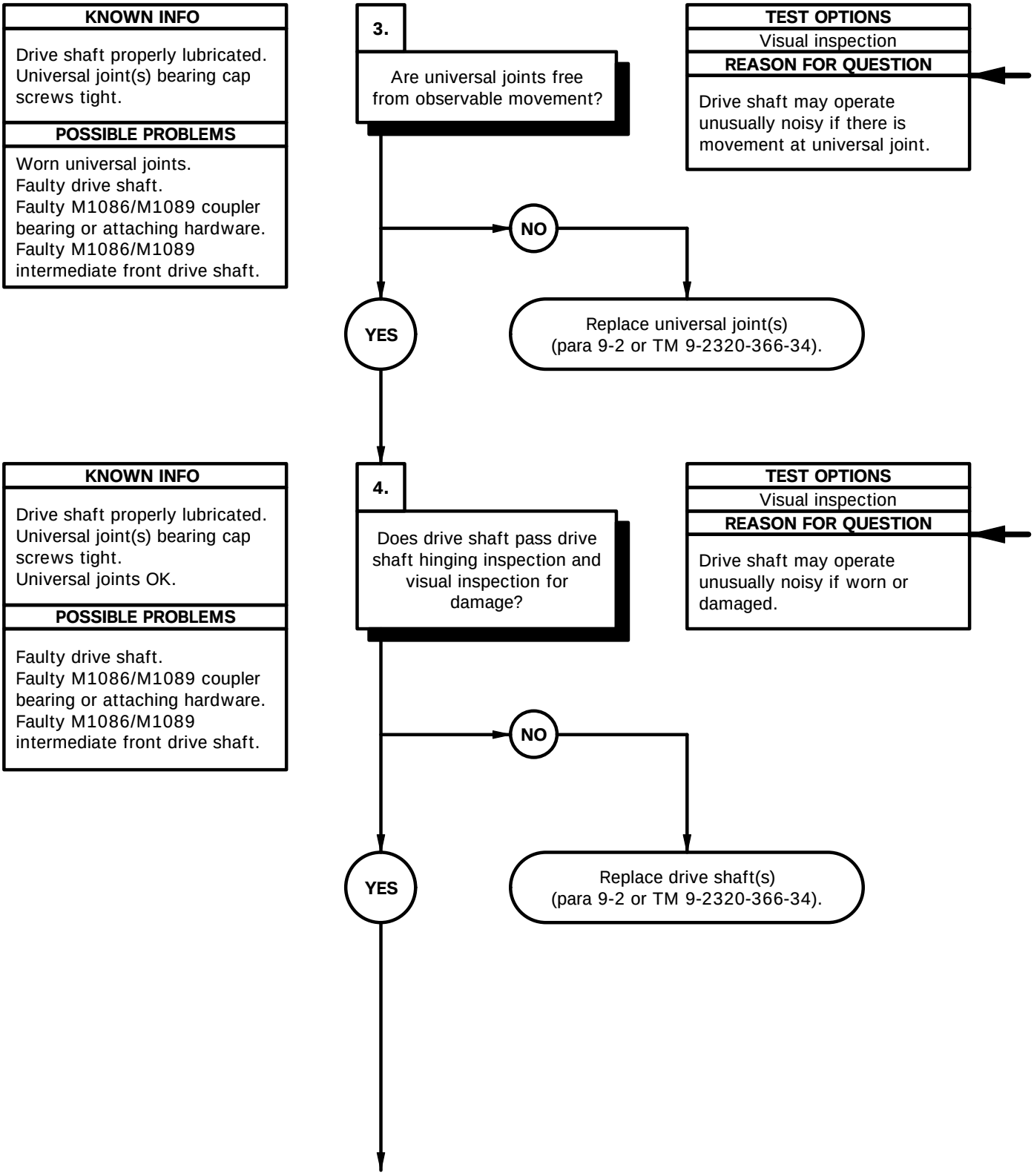
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Lubricate drive shaft lubrication fittings (Appendix H).

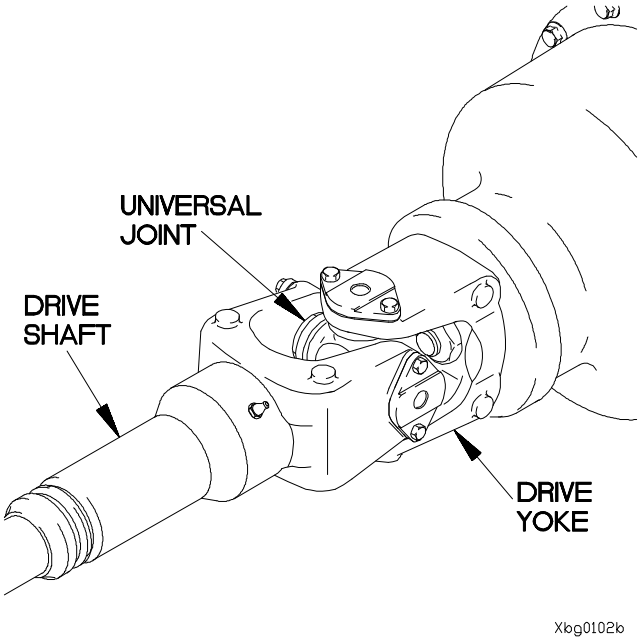


(1) Visually inspect universal joint(s) bearing cap screws for tightness.
(2) Replace any screw(s) that appears to be loose (para 9-2).

g1. DRIVE SHAFT OR UNIVERSAL JOINT UNUSUALLY NOISY WHEN OPERATING (CONT)

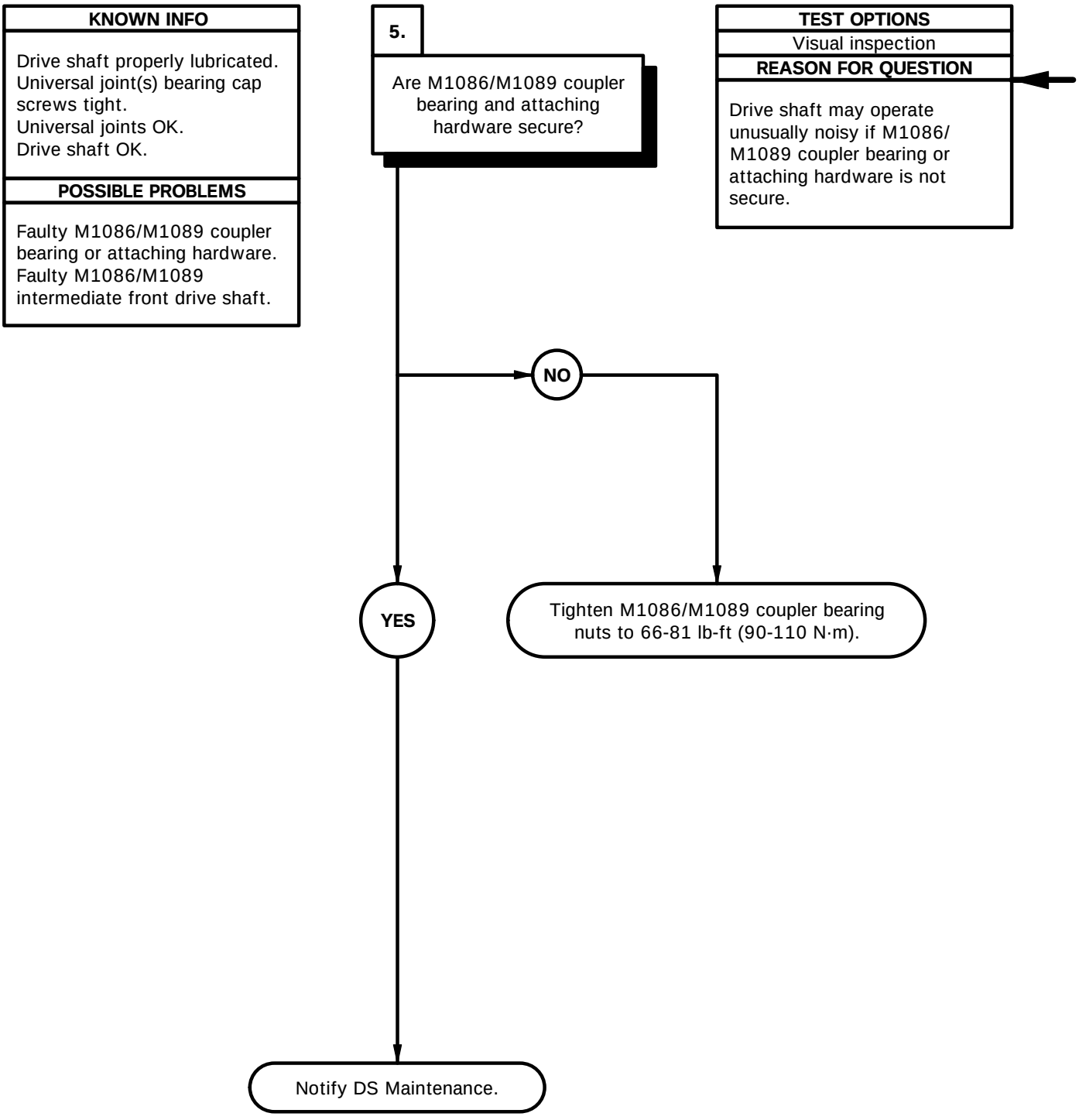


(1) Check drive shaft for excessive movement at universal joints.
(2) If universal joint(s) shows any movement, replace universal joint (para 9-2 or TM 9-2320-366-34).

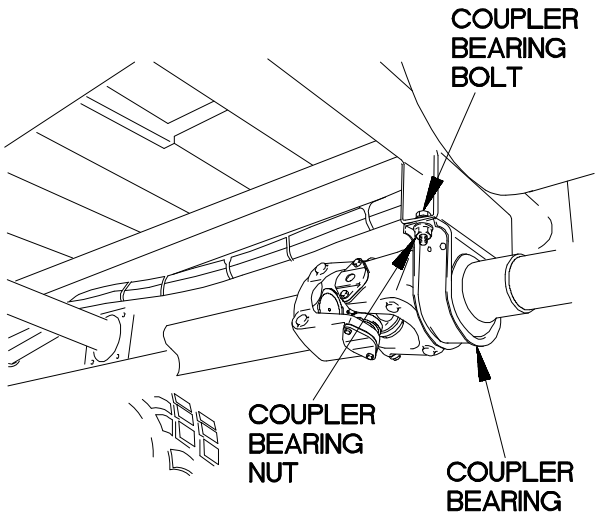


(1) Perform drive shaft hinging inspection (para 9-4).
(2) Visually inspect drive shaft for damaged slip yoke, bent tubing, or missing balance weights.
(3) If drive shaft does not pass hinging inspection or visual inspection, replace drive shaft (para 9-2 or TM 9-2320-366-34).

g1. DRIVE SHAFT OR UNIVERSAL JOINT UNUSUALLY NOISY WHEN OPERATING (CONT)



(1) Inspect M1086/M1089 coupler bearing attaching bolts and nuts for tightness. Tighten nuts to 66-81 lb-ft (90-110 N·m).
(2) Inspect M1086/M1089 coupler bearing for any observable movement.
(3) If any movement is observed at M1086/M1089 coupler bearing, notify DS Maintenance.



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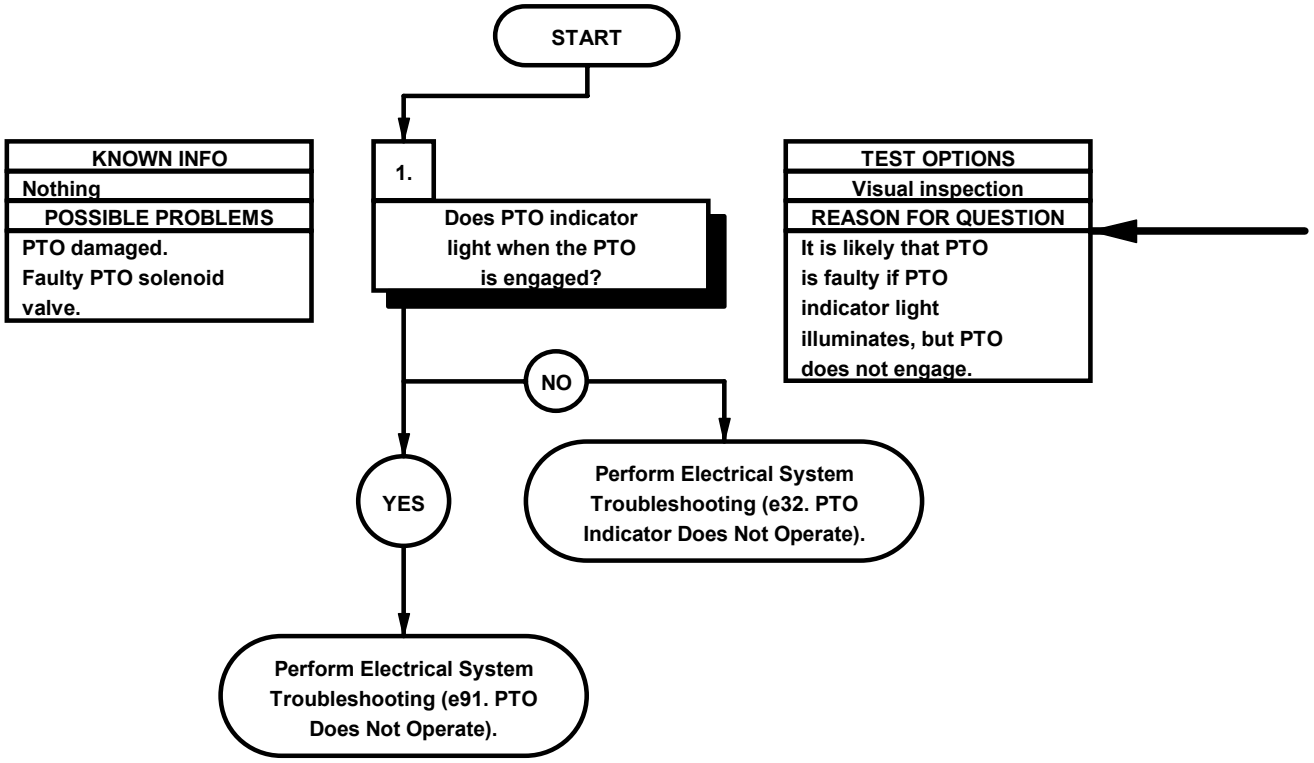
2-19. POWER TAKE-OFF (PTO) TROUBLESHOOTING

This paragraph covers Power Take-Off (PTO) Troubleshooting. The PTO Fault Index, Table 2-47, lists faults for the PTO.

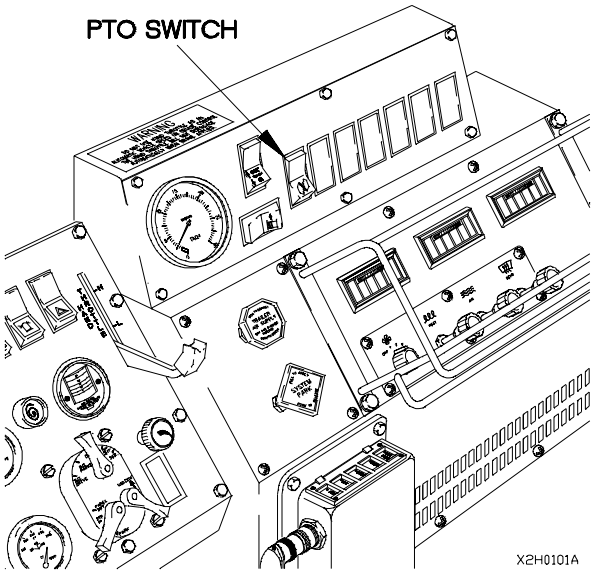
Table 2-47. PTO Fault Index

Fault No.	Description	Page
h1.	Power Take-Off (PTO) Does Not Engage	2-1832

h1. POWER TAKE-OFF (PTO) DOES NOT ENGAGE	
INITIAL SETUP	
Equipment Conditions Engine running (TM 9-2320-366-10-1). Parking brake on (TM 9-2320-366-10-1). Wheels chocked (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C)



(1) Engage PTO (TM 9-2320-366-10-1).
(2) Check if PTO indicator lights.
(3) If PTO indicator does not light, perform Electrical System Troubleshooting (e32. PTO Indicator Does Not Operate).
(4) If PTO indicator does light, perform Electrical System Troubleshooting (e91. PTO Does Not Operate).
(5) Disengage PTO (TM 9-2320-366-10-1).
(6) Shut down engine (TM 9-2320-366-10-1).



2-20. BRAKE SYSTEM TROUBLESHOOTING

This paragraph covers Brake System Troubleshooting. The Brake System Fault Index, Table 2-48, lists faults for the Brake System of the vehicle.

Table 2-48. Brake System Fault Index

Fault No.	Description	Page
i1.	Excessive Braking Distance	2-1836
i2.	Rear Brakes Do Not Apply	2-1848
i3.	Parking Brake Does Not Release	2-1878
i4.	Front Brakes Overheat and/or Do Not Release	2-1904
i5.	Vehicle Brakes Unevenly, Brakes Pull to One Side or Grab	2-1910
i6.	Front Brakes Do Not Apply	2-1924
i7.	Rear Brakes Overheat	2-1934
i8.	Parking Brake Does Not Apply	2-1942
i9.	Brake System Loses Air When Service Brakes Are Applied	2-1946

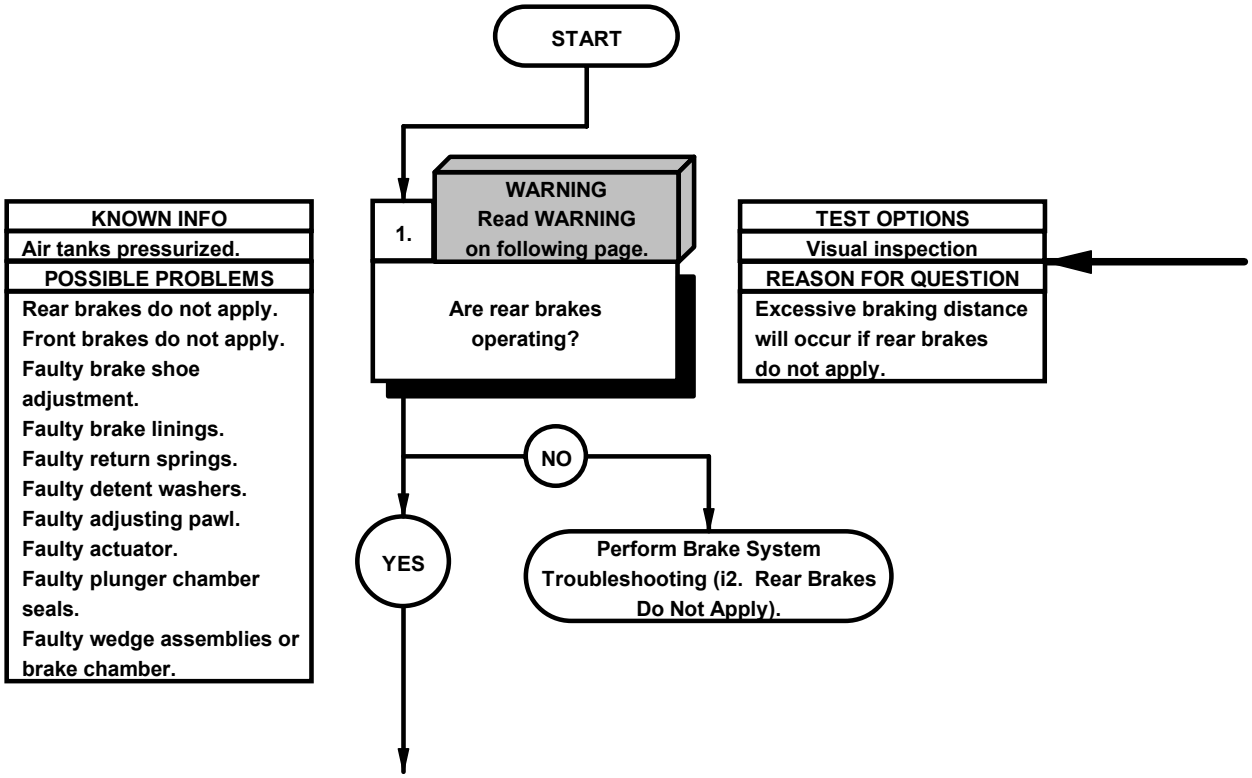
i1. EXCESSIVE BRAKING DISTANCE

INITIAL SETUP

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

Personnel Required
(2)

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 46, Appendix C)
Jack, Hydraulic, Hand (Item 21, Appendix C)
Trestle, Motor Vehicle Maintenance (2) (Item 47, Appendix C)
Tool, Spring Removal (Item 85, Appendix B)

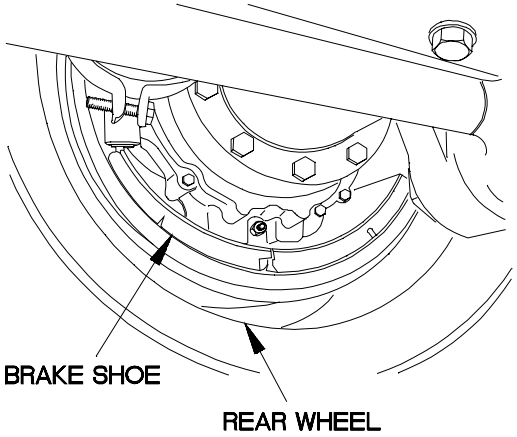


WARNING

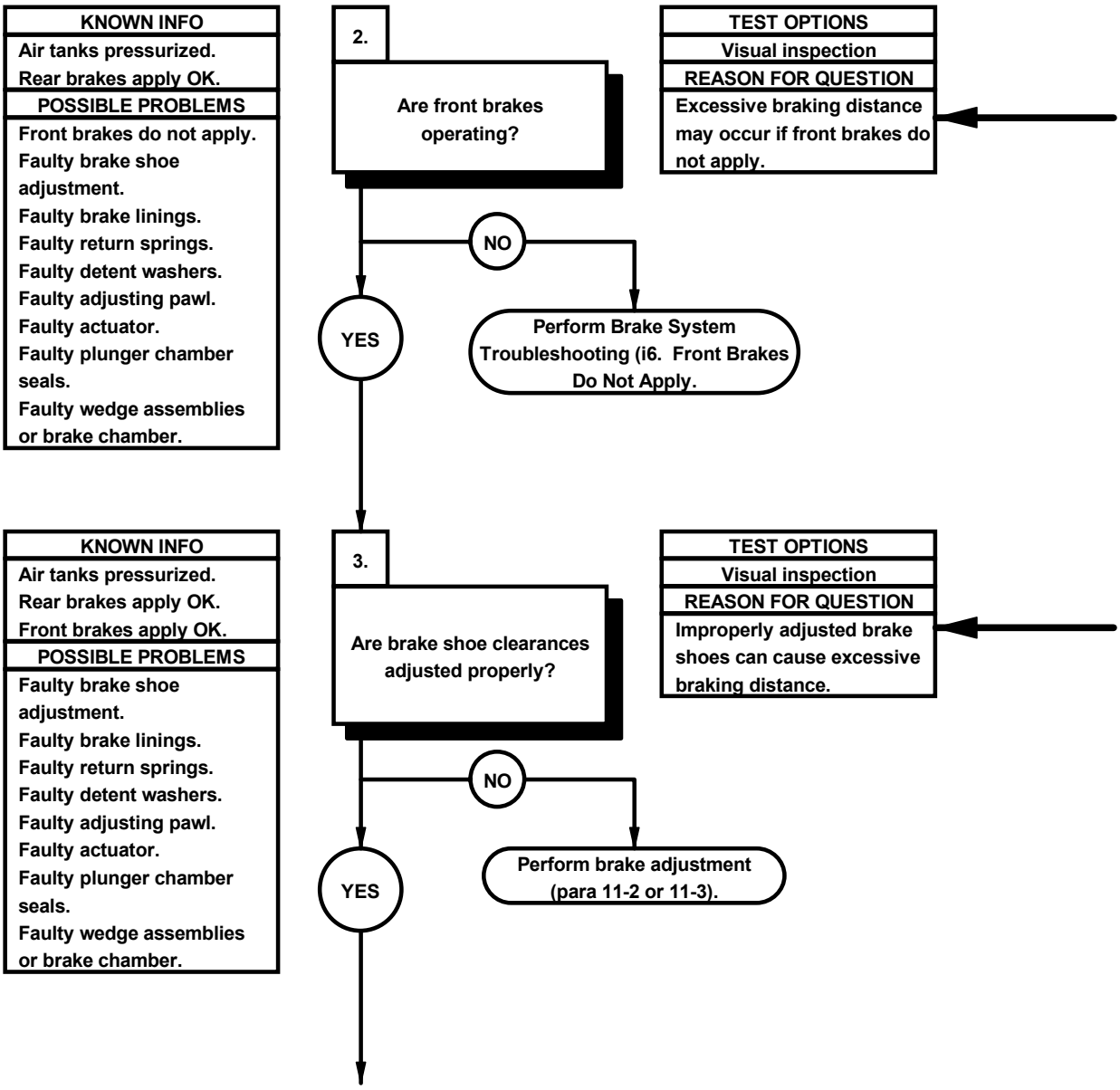
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

(1) Apply brakes and observe operation of brake shoes at all rear wheels.

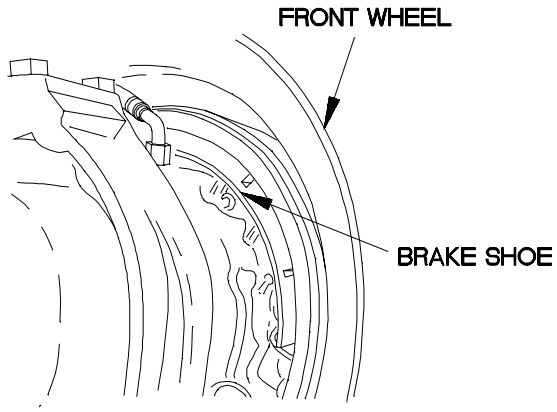
(2) If brake shoes fail to apply at all rear wheels, rear brake system is faulty. Perform Brake System Troubleshooting (i2. Rear Brakes Do Not Apply).



i1. EXCESSIVE BRAKING DISTANCE (CONT)



(1) Apply brakes and observe operation of brake shoes at each front wheel.
(2) If all shoes at front wheels fail to apply, front brake system is faulty. Perform Brake System Troubleshooting (i6. Front Brakes Do Not Apply).



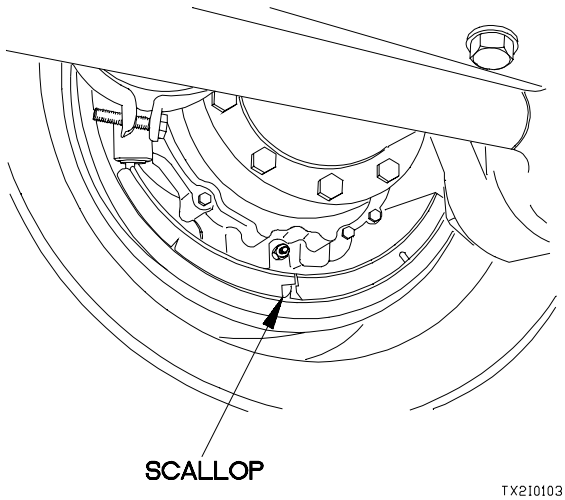
(1) Jack up axle with affected brakes and support with trestles.
(2) Make periodic brake applications to position floating shoes.

NOTE

Over time a ridge will form on the outer edge of the brake shoes. This is normal and does not affect brake shoe serviceability.

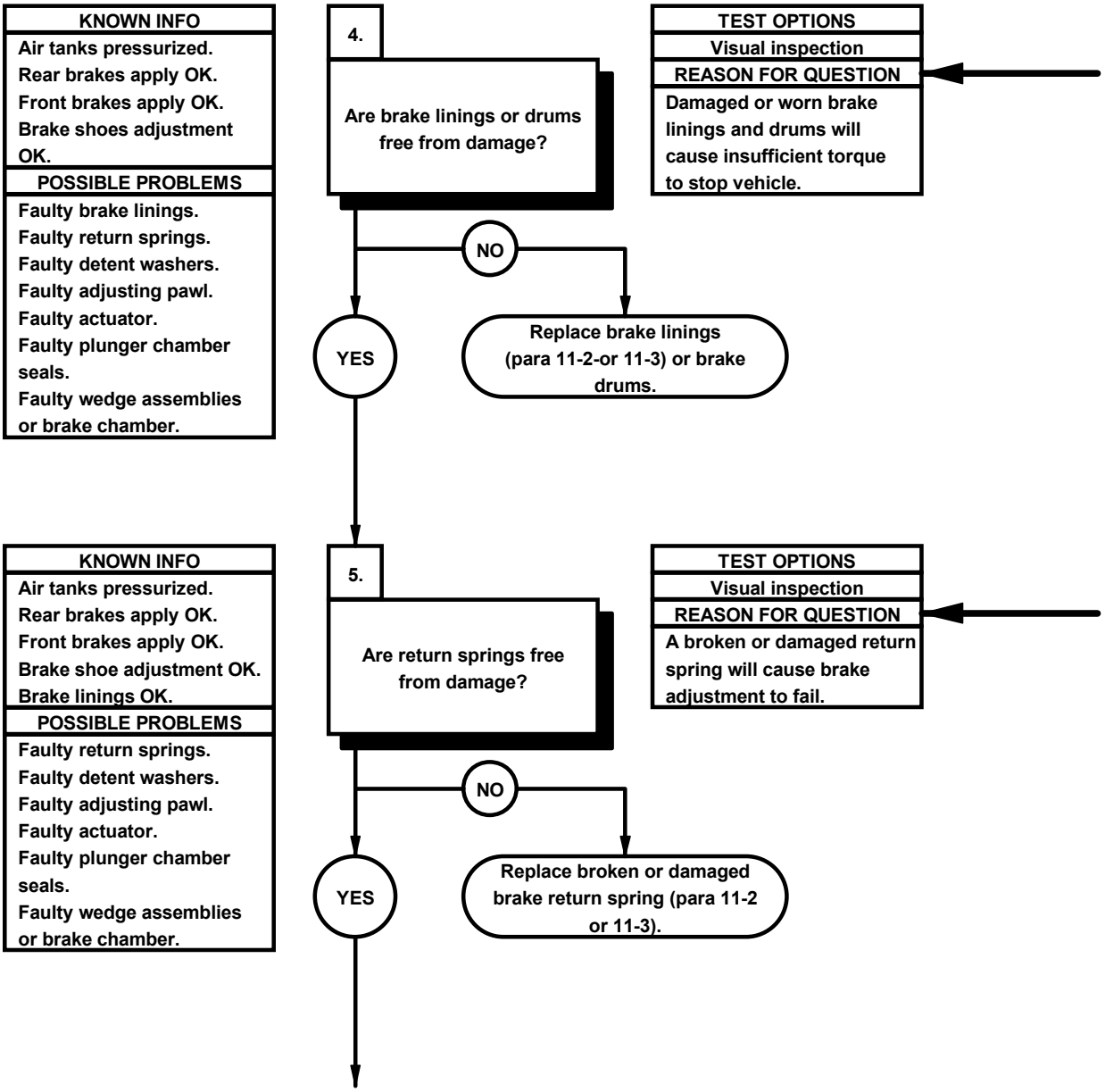
(3) Measure shoe clearance checking along centerline of shoe at scallop. Rotate wheel during check.
(4) If clearance is not between .020" and .040", adjust brakes (para 11-2 or 11-3).

X2I0102-

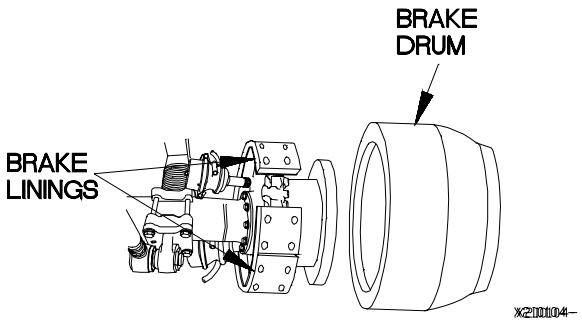


TX2I0103

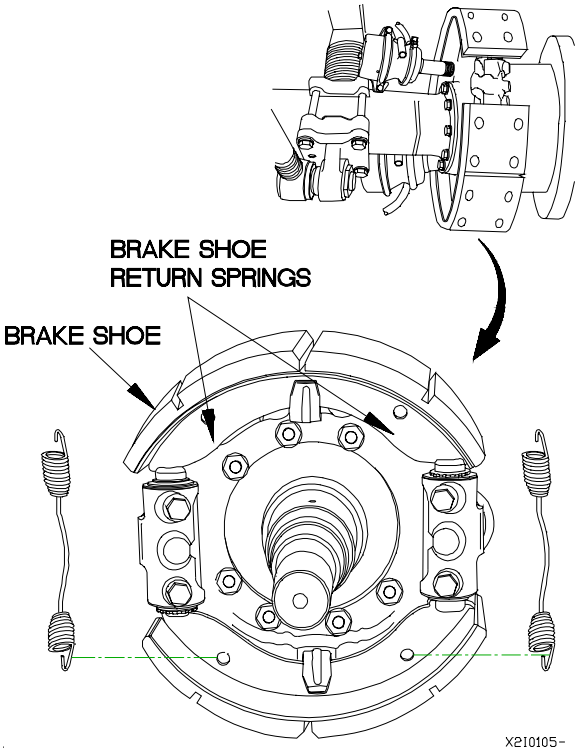
i1. EXCESSIVE BRAKING DISTANCE (CONT)



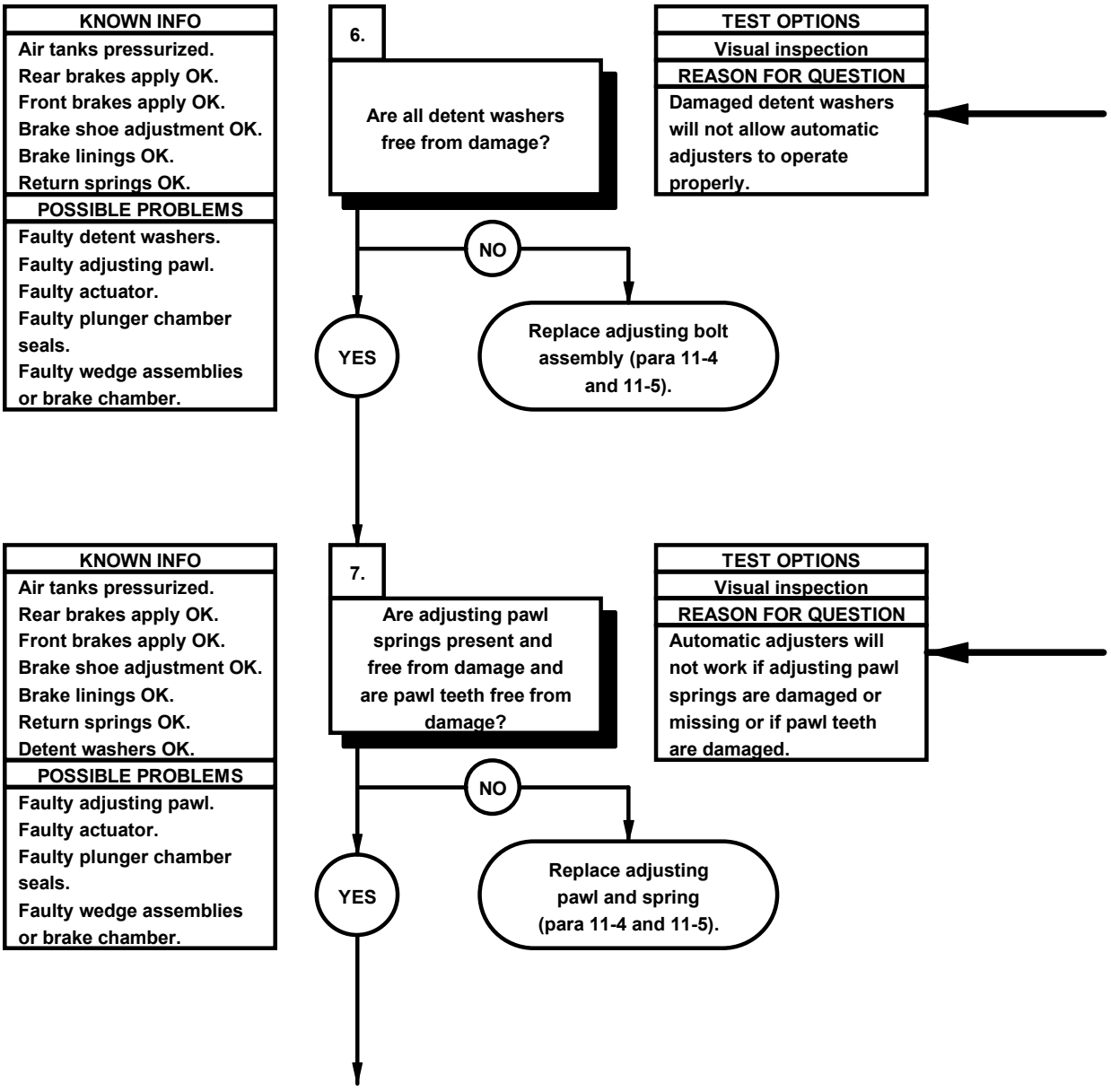
(1) Remove lugnuts and lift off wheel.
(2) Slide brake drum off axle.
(3) Inspect brake linings for worn, glazed, damaged condition, or contamination (para 11-2).
(4) Inspect brake drum for, out of round, scoring, pitting, heat cracks, and blue scorch marks.



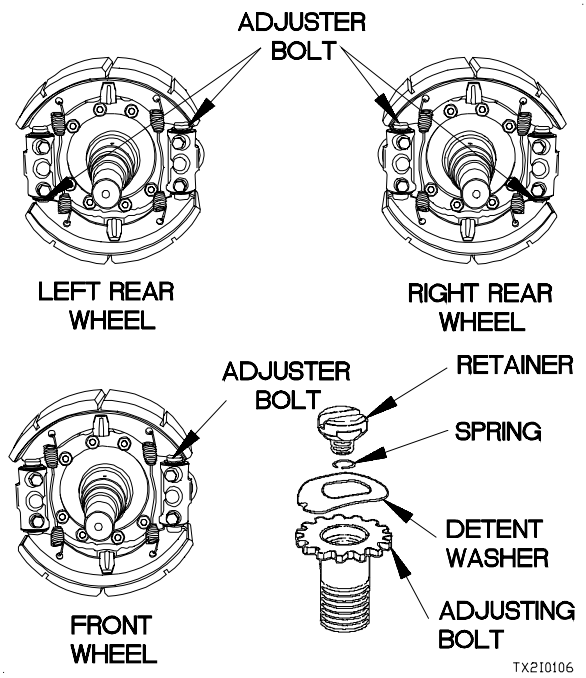
(1) Detach each return spring from brake shoe.
(2) Examine return spring for stretching, bluing, damage or breakage.
(3) If return spring(s) is damaged, replace broken or damaged return spring (s) (para 11-2 or 11-3).



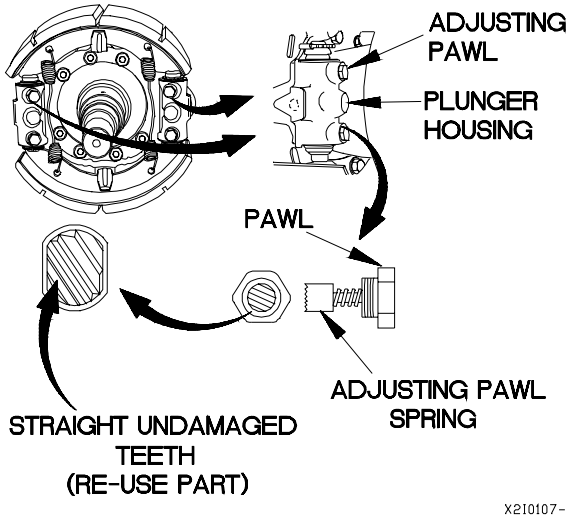
i1. EXCESSIVE BRAKING DISTANCE (CONT)



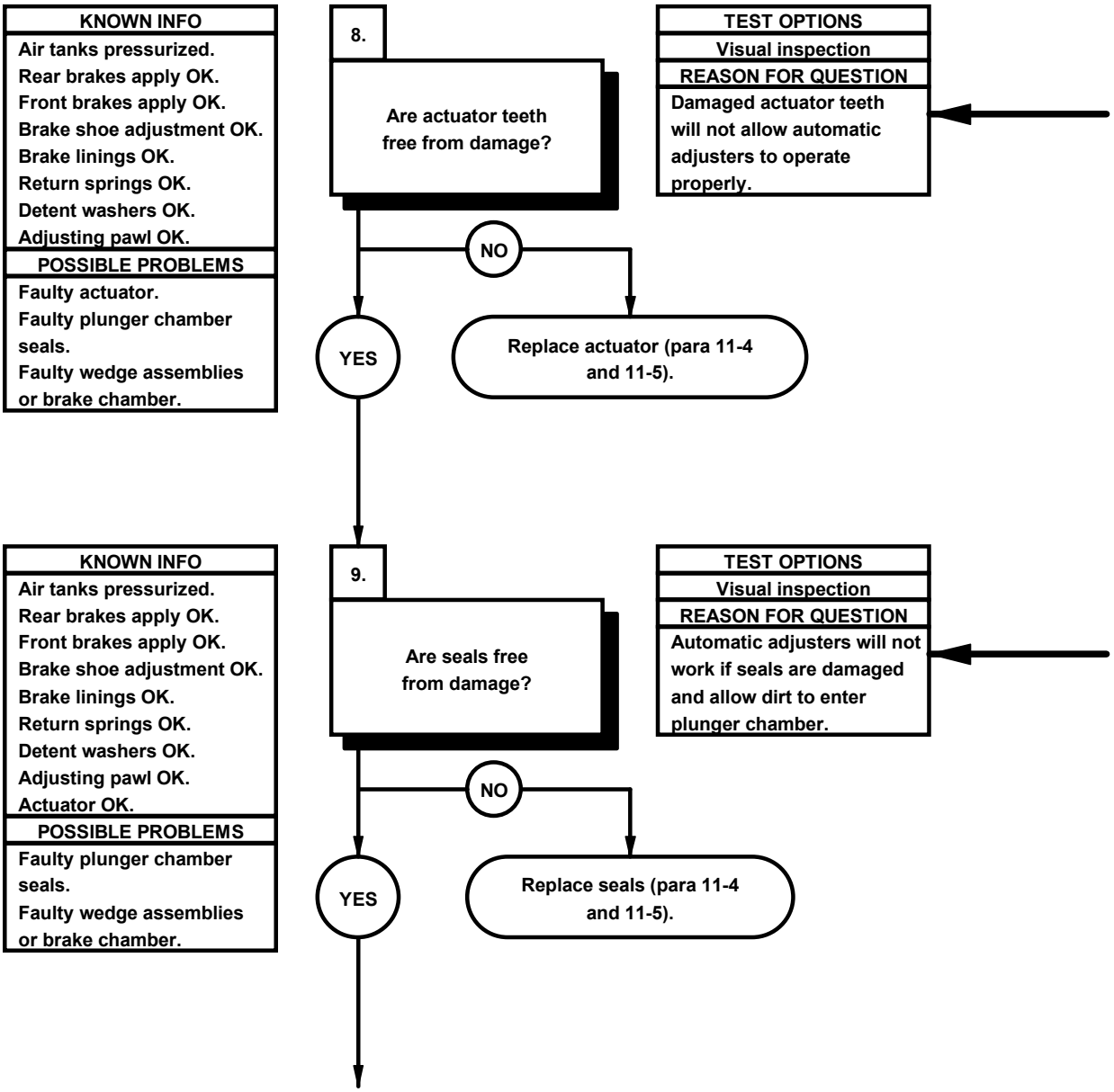
(1) Remove brake shoes from clips on wheel hub.
(2) Screw adjuster bolt out of plunger housing.
(3) Check if detent washer is damaged or broken.
(4) If detent washer is damaged, replace adjusting bolt assembly (para 11-4 or 11-5).



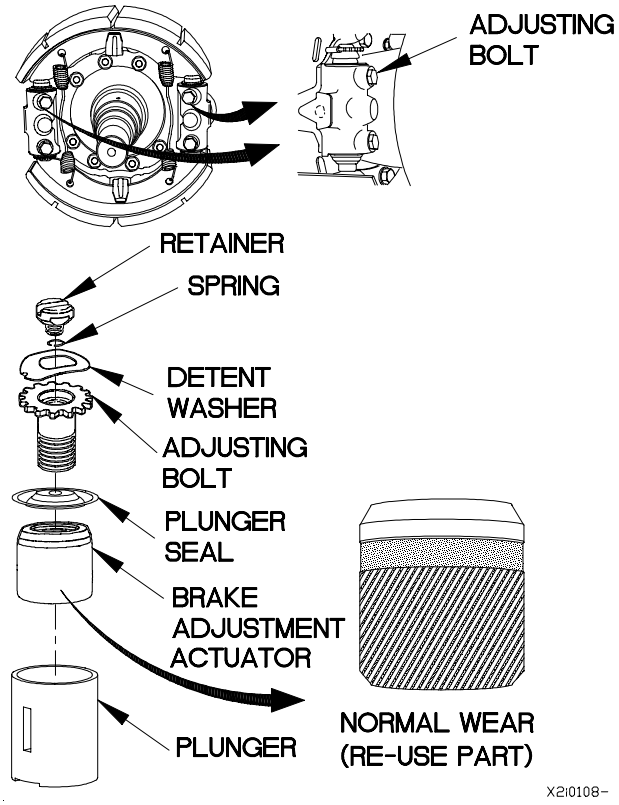
(1) Unscrew adjusting pawl from plunger housing.
(2) Check adjusting pawl springs for damage. Ensure that springs are not missing or broken.
(3) Check adjusting pawl teeth for damage and abrasion.



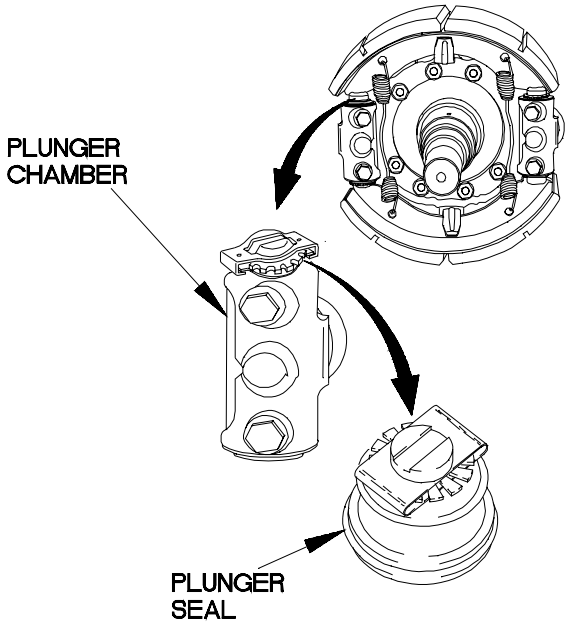
i1. EXCESSIVE BRAKING DISTANCE (CONT)



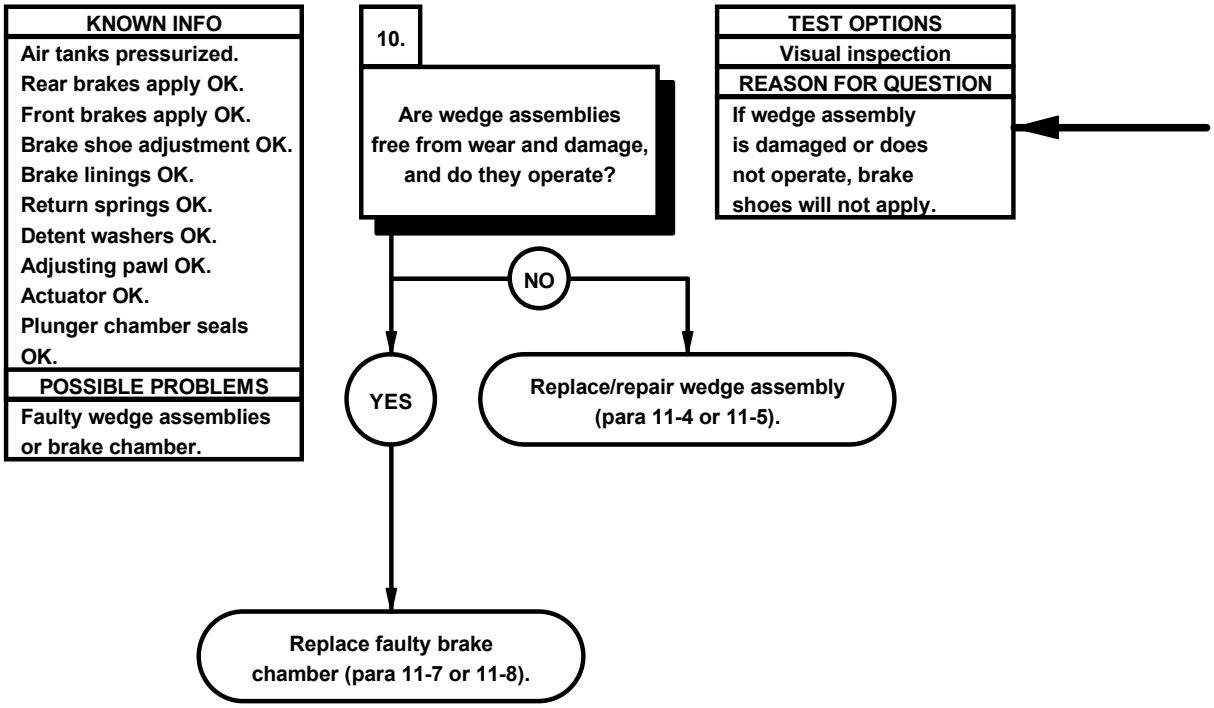
(1) Lift actuator from plunger housing.
(2) Check actuator teeth for damage.



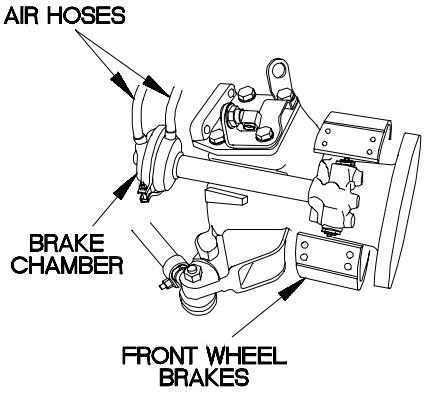
(1) Check that seal elements are not damaged or broken.
(2) A damaged seal may permit dirt to enter plunger chamber and interfere with adjustment.

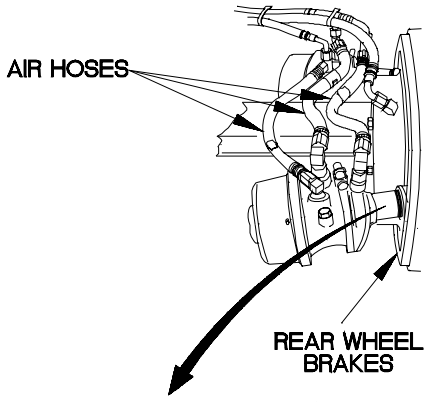


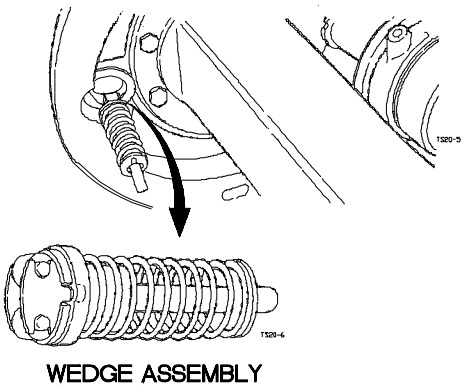
i1. EXCESSIVE BRAKING DISTANCE (CONT)



(1) Disconnect and tag air hoses to brake chambers at wheel.
(2) Cage spring brakes on rear wheels (para 11-6).
(3) Unscrew brake chamber(s) from hub.
(4) Remove wedge assembly from wheel.
(5) Inspect wedge spring for damage.
(6) Inspect rollers for flattening or damage.
(7) Manually check operation of wedge assembly in plunger chamber.
(8) Insert wedge assembly into plunger chamber.
(9) Screw brake chamber onto wheel hub (para 11-7 or 11-8).
(10) Attach air hoses to brake chamber.
(11) Uncage rear spring brakes (para 11-6).
(12) Install plunger into plunger housing, open end up.
(13) Align slot to accept pawl (para 11-4 or 11-5).
(14) Install pawl and pawl spring into side of plunger housing.
(15) Install actuator, seal, and adjustment bolt into head of plunger housing (para 11-4 or 11-5).
(16) Install brake shoes into clips on wheel hub with leading (toe) edge of shoe fitting slot on head of adjusting bolt. Arrow stamped on shoe should point away from adjusting plunger (para 11-2 or 11-3).
(17) Install return springs on brake shoes (para 11-2 or 11-3).
(18) Install brake drum.
(19) Adjust brake shoes (para 11-2 or 11-3).
(20) Install wheel.
(21) Raise vehicle and remove trestle.







WEDGE ASSEMBLY

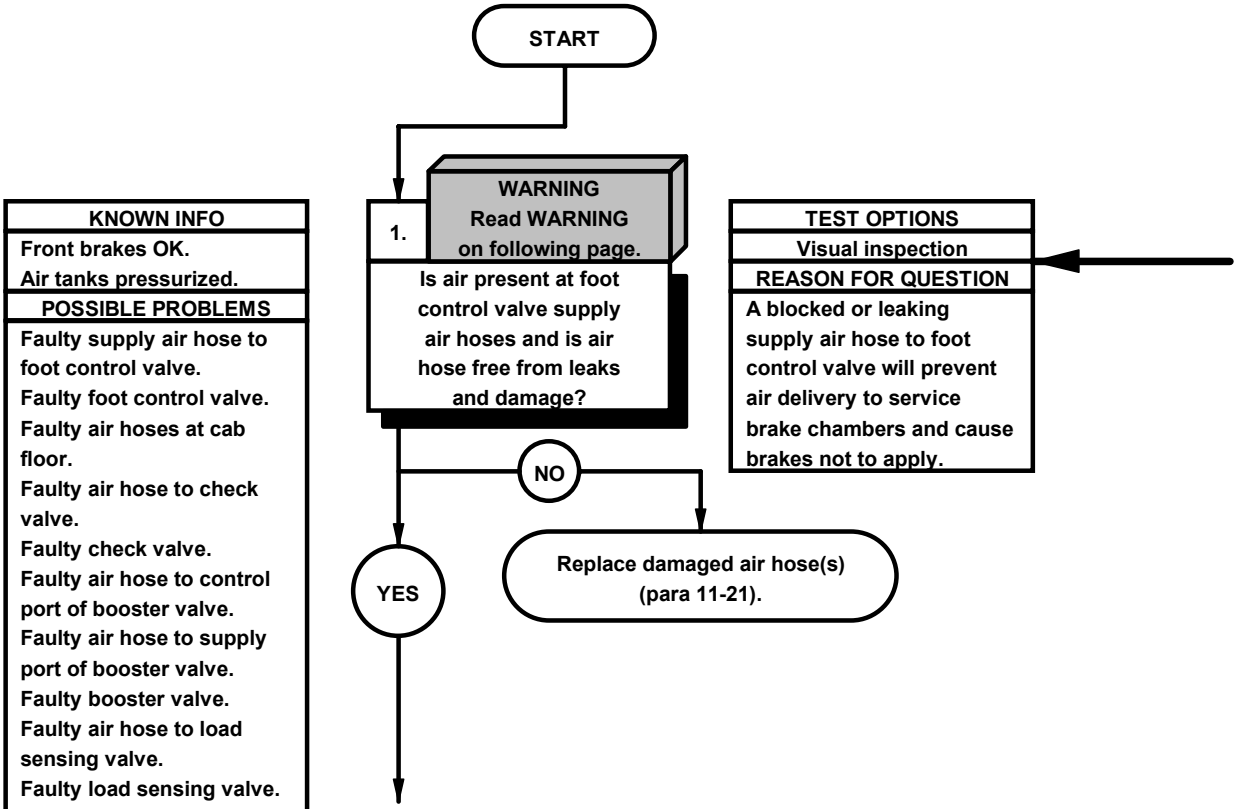
i2. REAR BRAKES DO NOT APPLY

INITIAL SETUP

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

Personnel Required
(2)

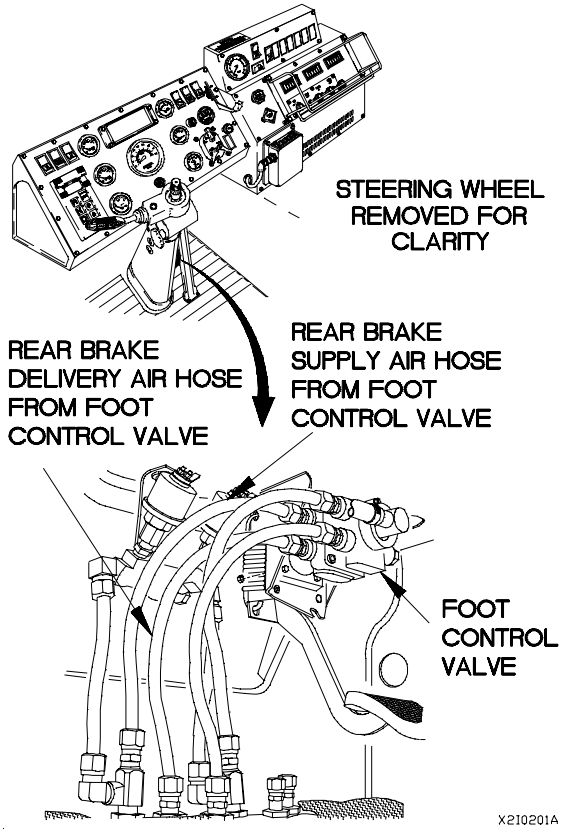
Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Goggles, Industrial (Item 15, Appendix C)



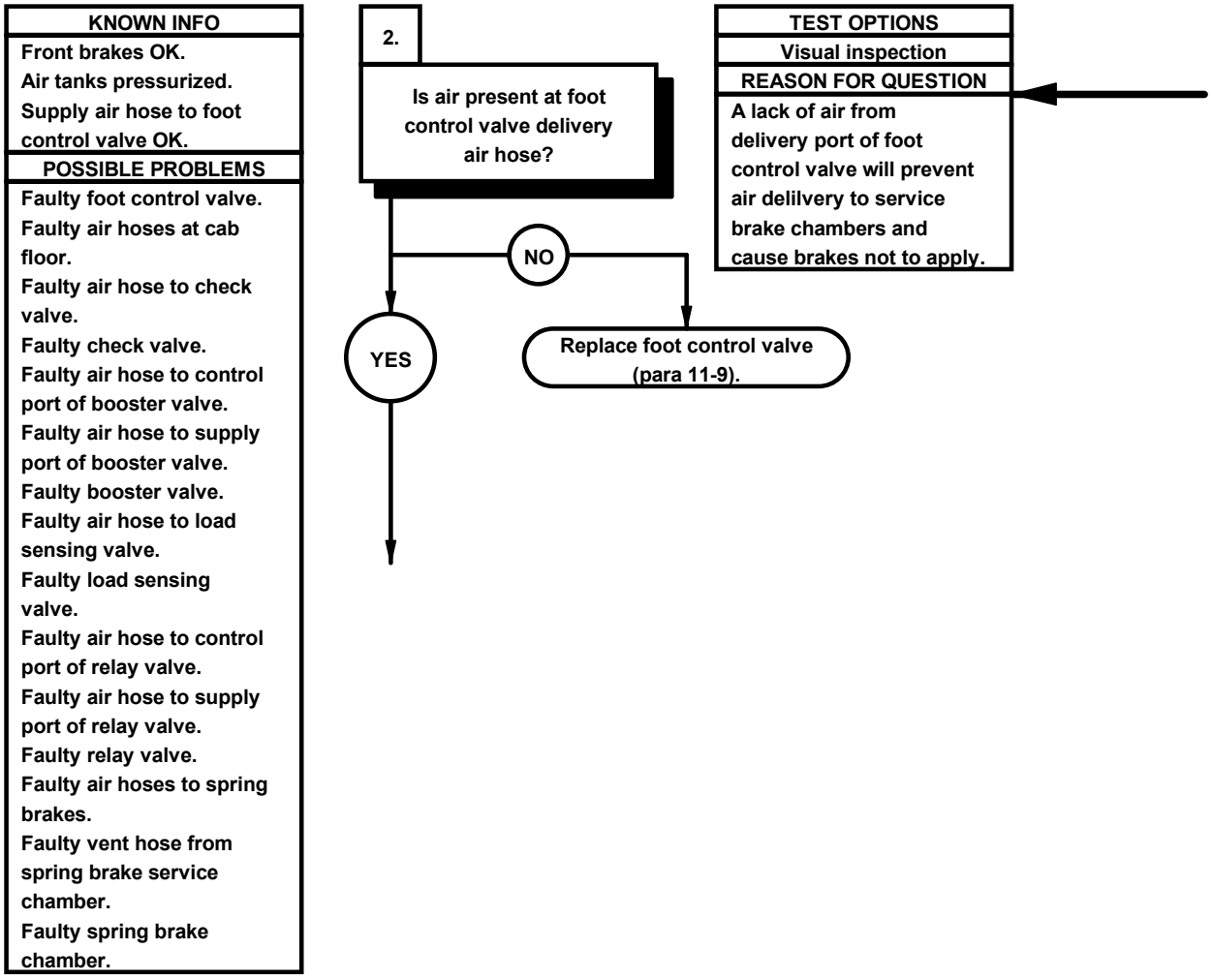
WARNING

- **When working on parking brake control system vehicle may roll. Wheel shocks must be positioned in front of and behind one of the rear wheels to prevent it from rolling. Failure to comply may cause serious injury or death 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.**

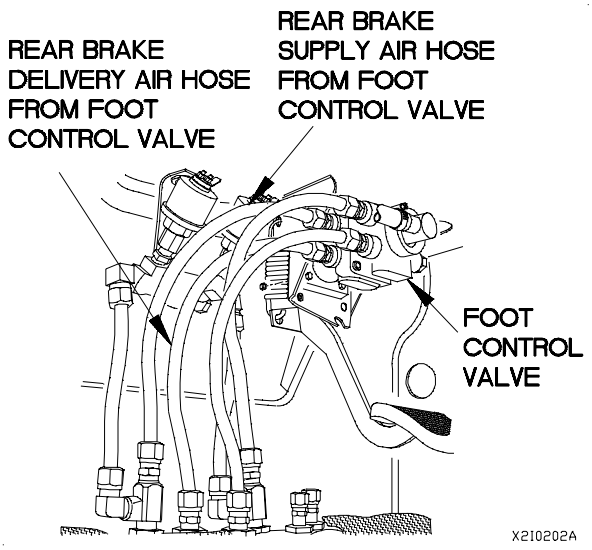
(1) Loosen supply air hose at foot control valve.
(2) Check for presence of air. If no air is present, replace air hose (para 11-21).
(3) Tighten supply air hose to foot control valve.



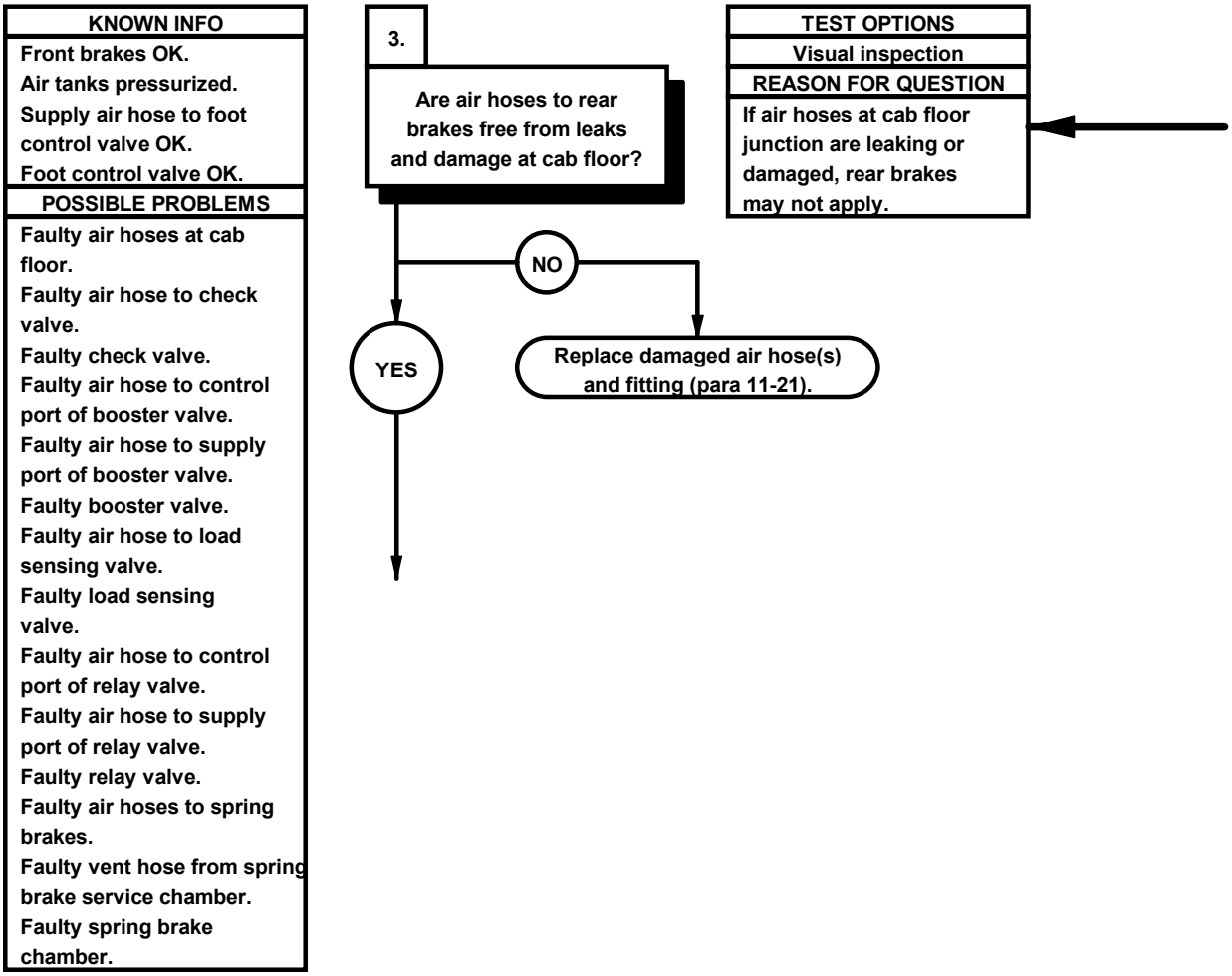
i2. REAR BRAKES DO NOT APPLY (CONT)



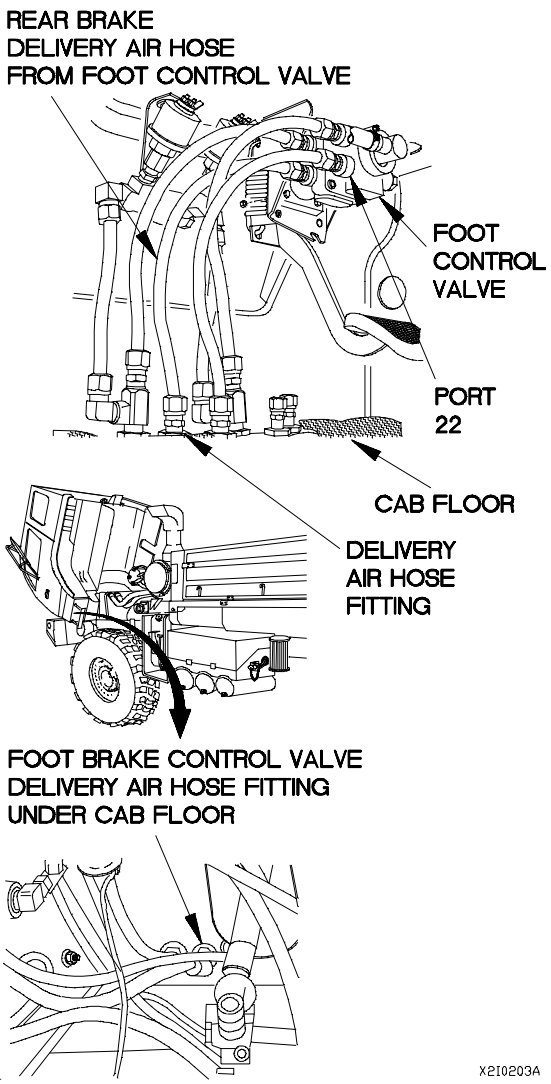
(1) Loosen delivery air hose at foot control valve.
(2) Apply brake and check for presence of air.
(3) If no air is present, replace foot control valve (para 11-9).
(3) Tighten delivery air hose on foot control valve.



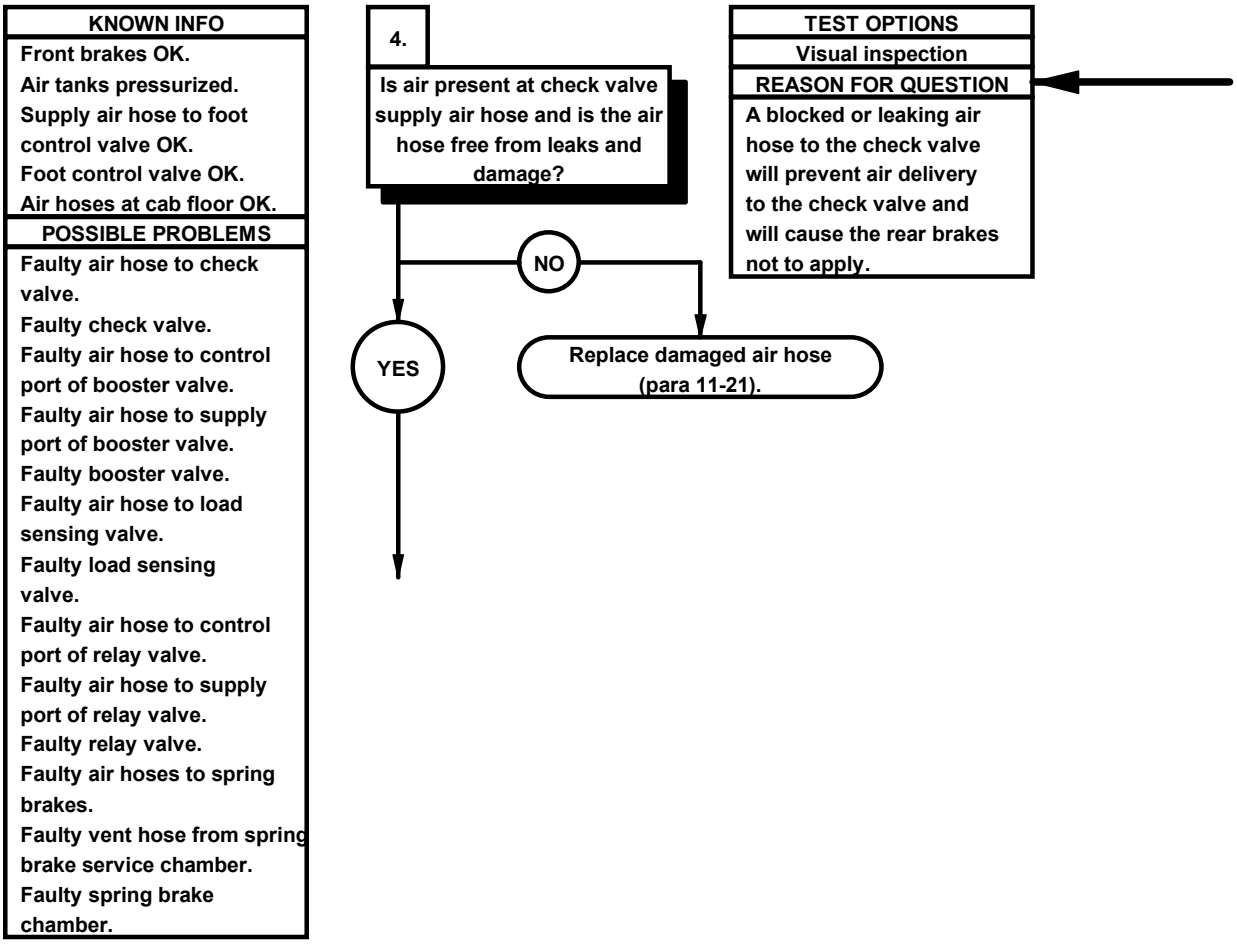
i2. REAR BRAKES DO NOT APPLY (CONT)



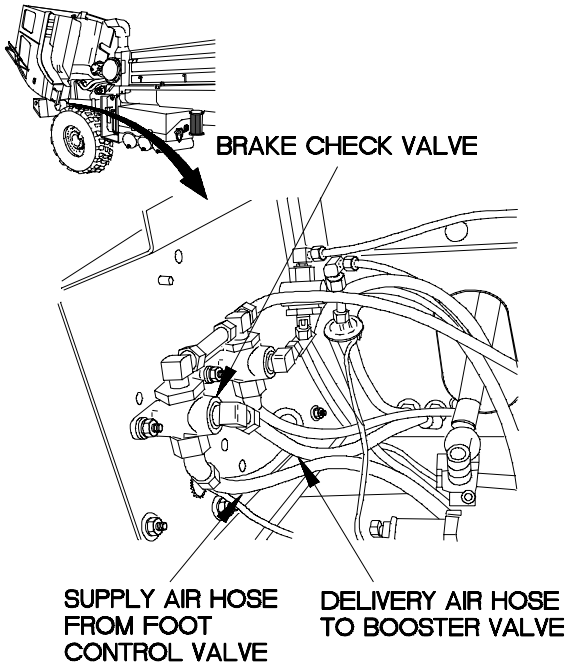
(1) Loosen delivery air hose at cab floor.
(2) Apply brakes.
(3) Check for presence of air from air hose when brake is applied.
(4) If no air is present, replace air hose (para 11-21).
(5) Tighten air hose at cab floor.
(6) Raise cab (TM 9-2320-366-10-1).
(7) Loosen delivery air hose under cab floor.
(8) Apply foot brake.
(9) Check for presence of air from fitting when brake is applied.
(10) If no air is present, replace air hose and fitting (para 11-21).
(11) Tighten air hose and fitting.



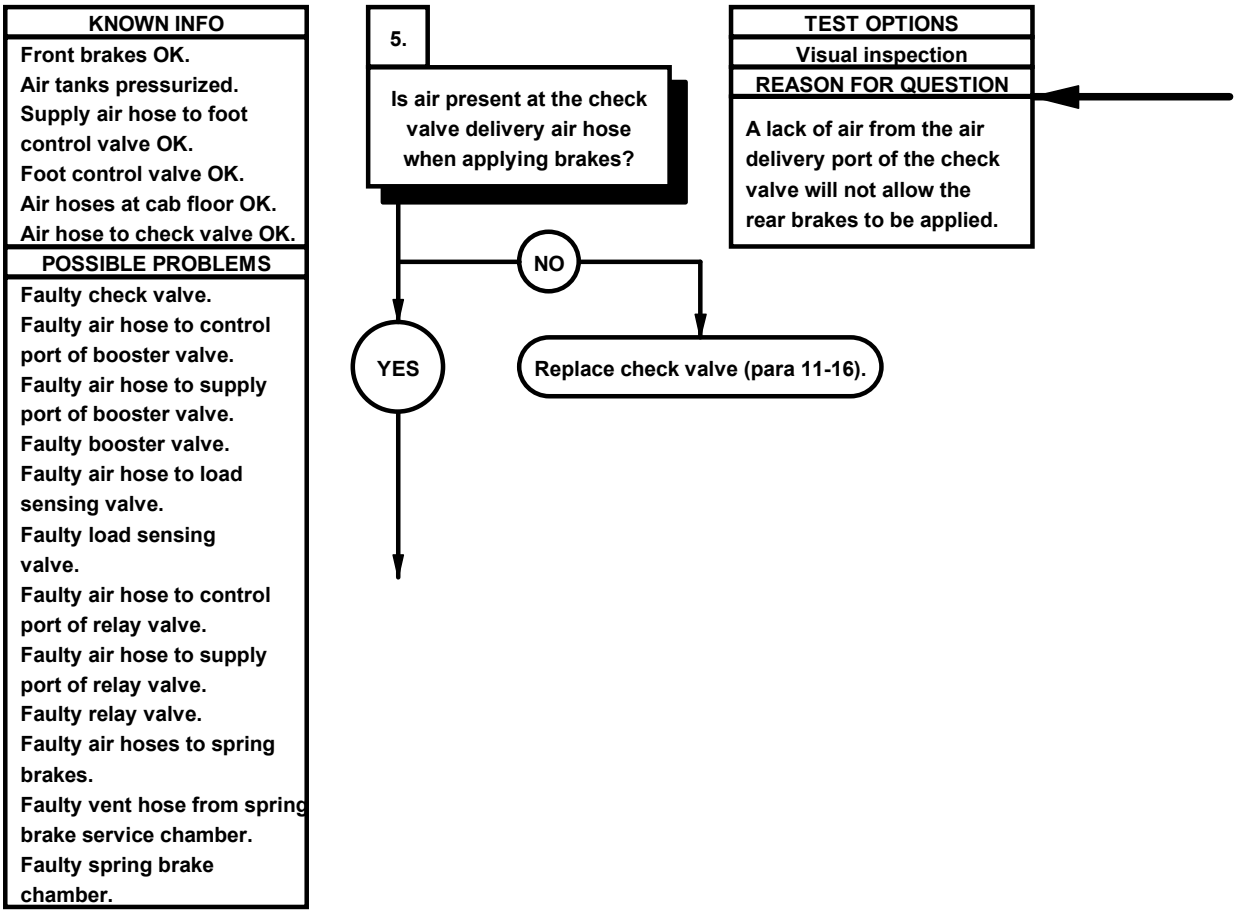
i2. REAR BRAKES DO NOT APPLY (CONT)



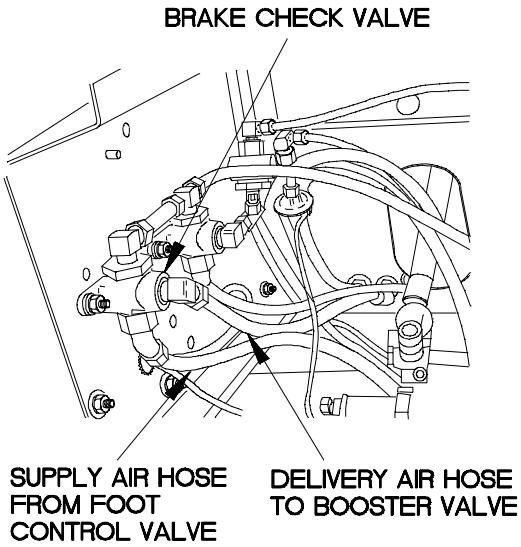
(1) Loosen supply air hose at check valve.
(2) Apply brakes.
(3) Check for presence of air at air hose when brake is applied.
(4) If no air is present, replace air hose (para 11-21).
(5) Tighten air hose at supply port of check valve.



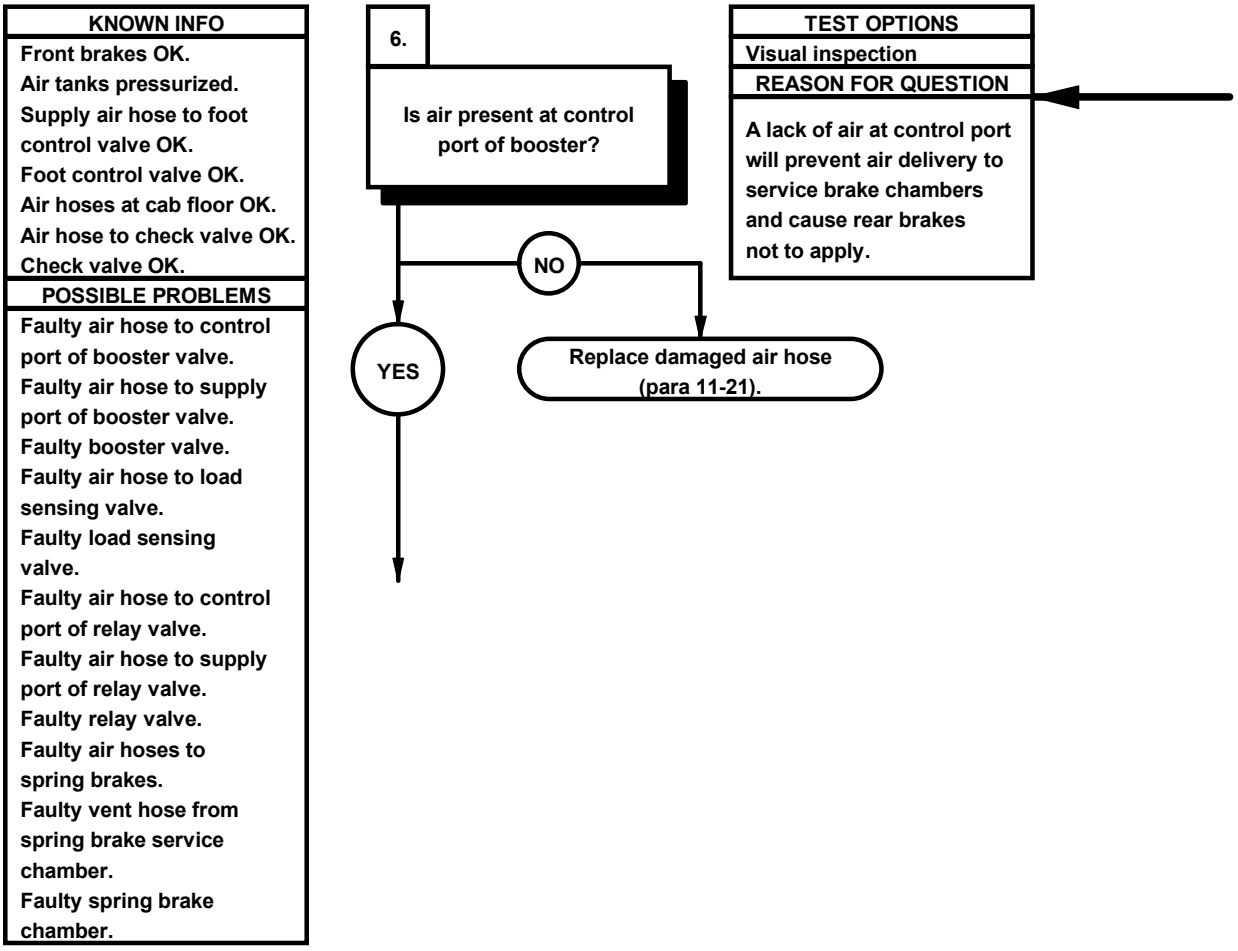
i2. REAR BRAKES DO NOT APPLY (CONT)



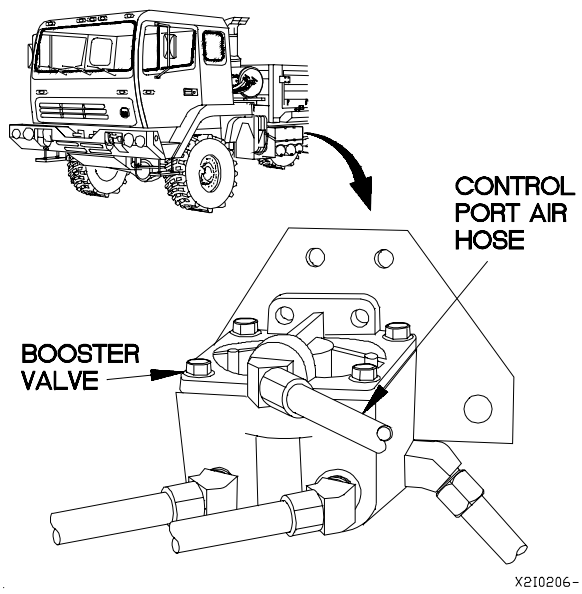
(1) Loosen delivery air hose on check valve.
(2) Apply brakes.
(3) Check for presence of air from air hose when brake is applied.
(4) If no air is present, replace check valve (para 11-16).
(5) Tighten delivery air hose on check valve.



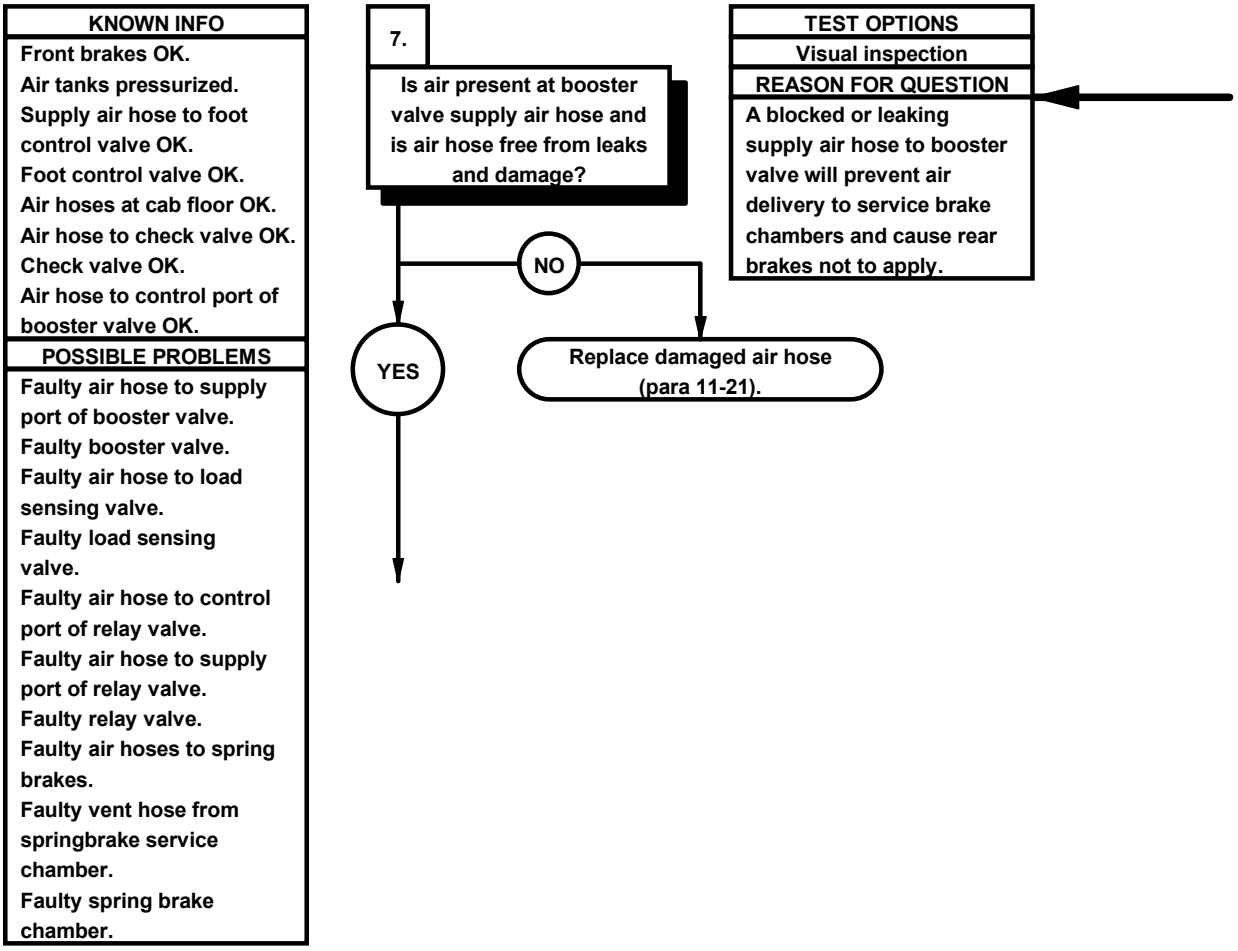
i2. REAR BRAKES DO NOT APPLY (CONT)



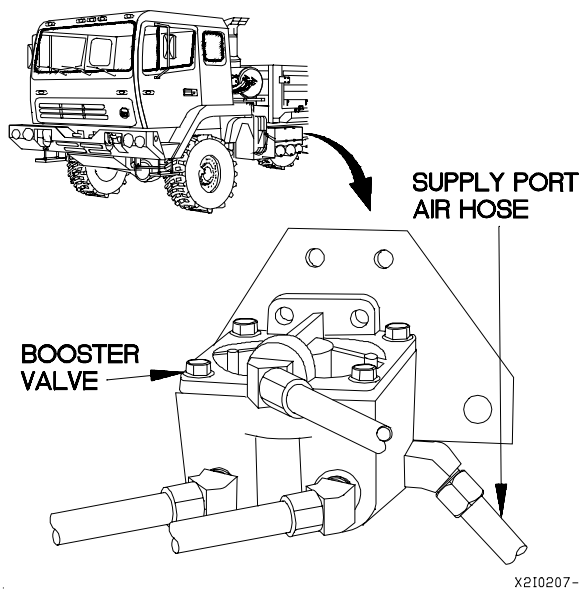
(1) Loosen control port air hose at booster valve
(2) Apply brakes.
(3) Check for presence of air.
(4) If no air is present, replace damaged air hose (para 11-21).
(5) Tighten control port air hose on booster valve.



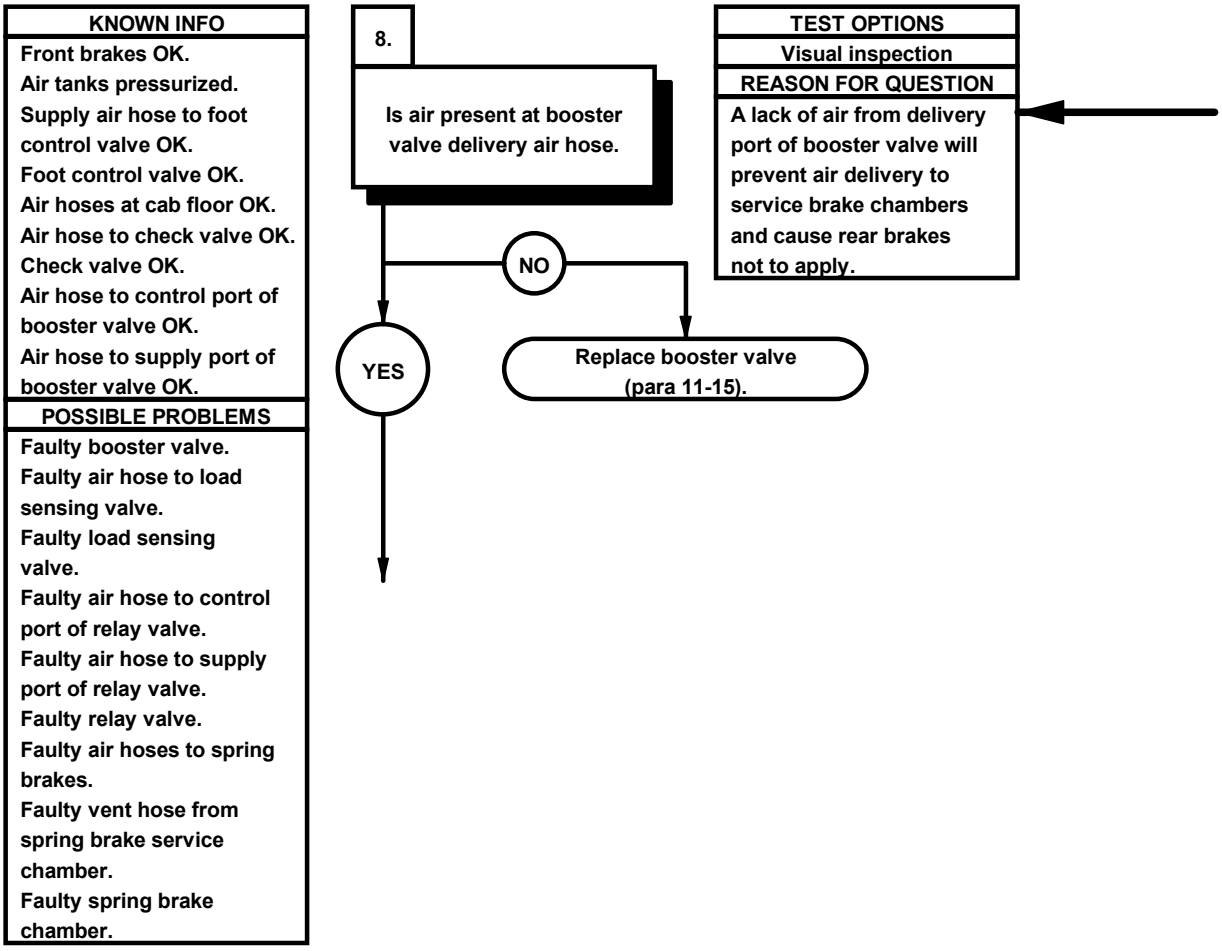
i2. REAR BRAKES DO NOT APPLY (CONT)



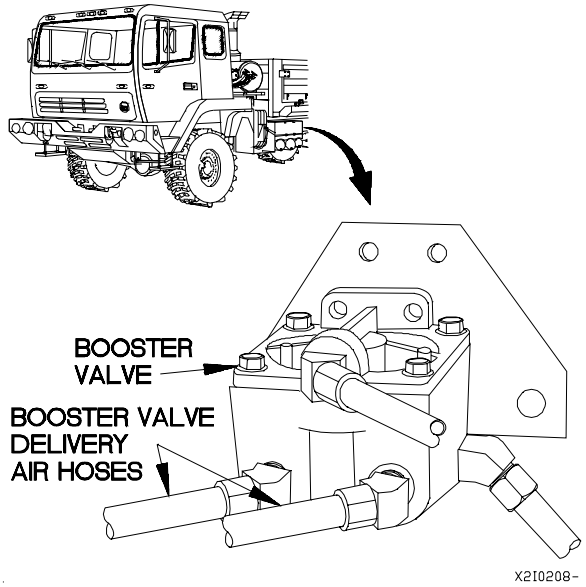
(1) Loosen supply air hose at booster valve.
(2) Check for presence of air.
(3) If no air is present, replace air hose (para 11-21).
(4) Tighten supply air hose to booster valve.



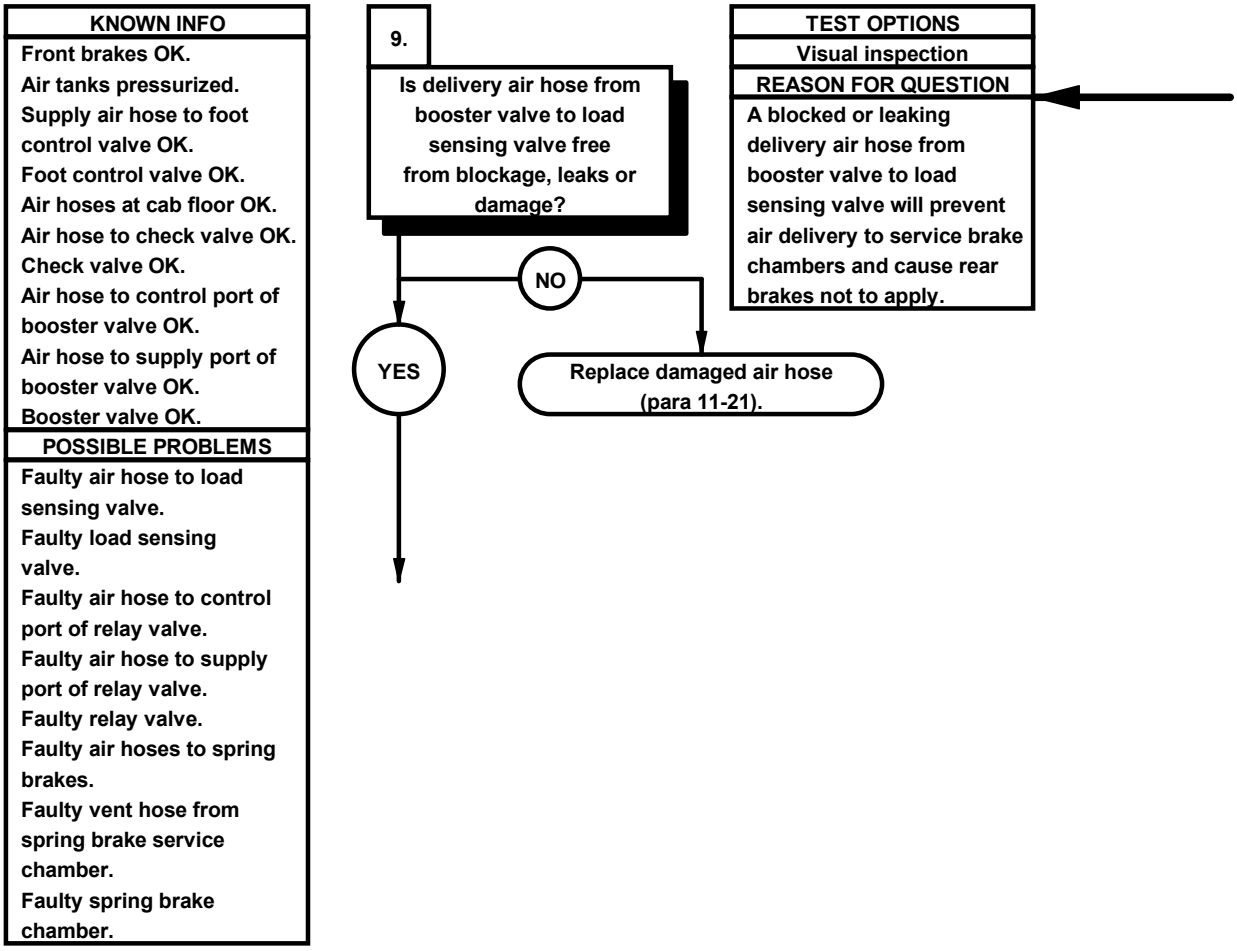
i2. REAR BRAKES DO NOT APPLY (CONT)



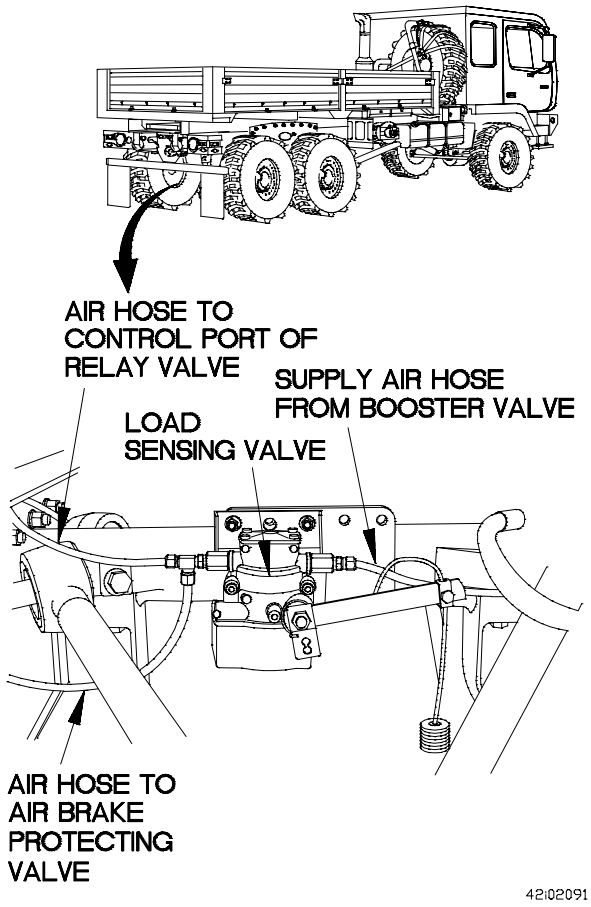
(1) Loosen booster valve delivery air hose at booster valve.
(2) Apply brakes.
(3) Check for presence of air.
(4) If no air is present, replace booster valve (para 11-15).
(5) Tighten delivery air hose on booster valve.



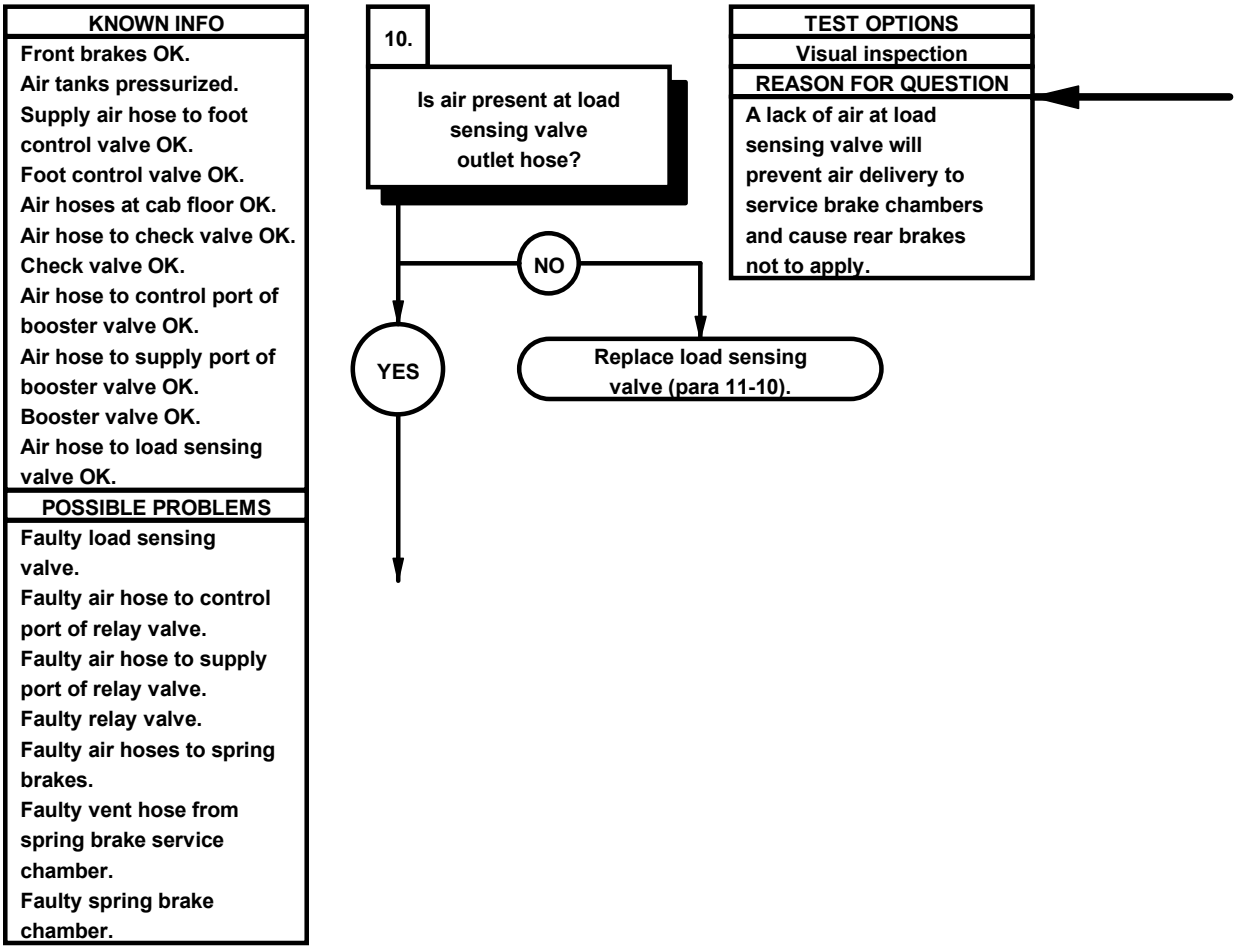
i2. REAR BRAKES DO NOT APPLY (CONT)



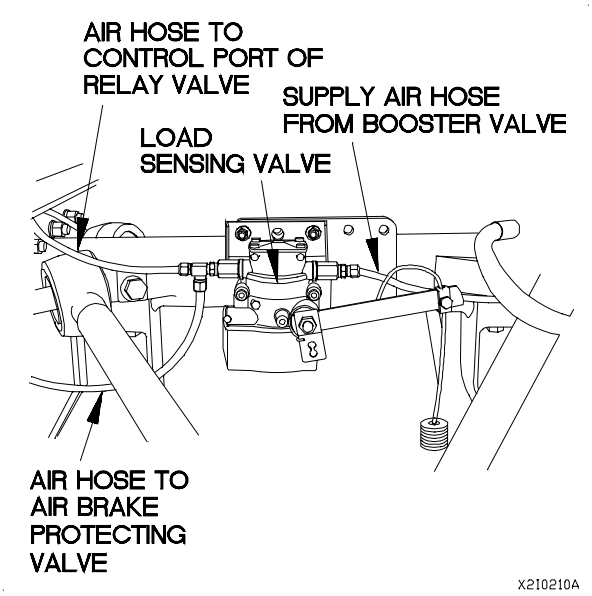
(1) Loosen delivery air hose at load sensing valve.
(2) Apply brakes.
(3) Check for presence of air.
(4) If no air is present, replace air hose (para 11-21).
(5) Tighten delivery air hose on load sensing valve.



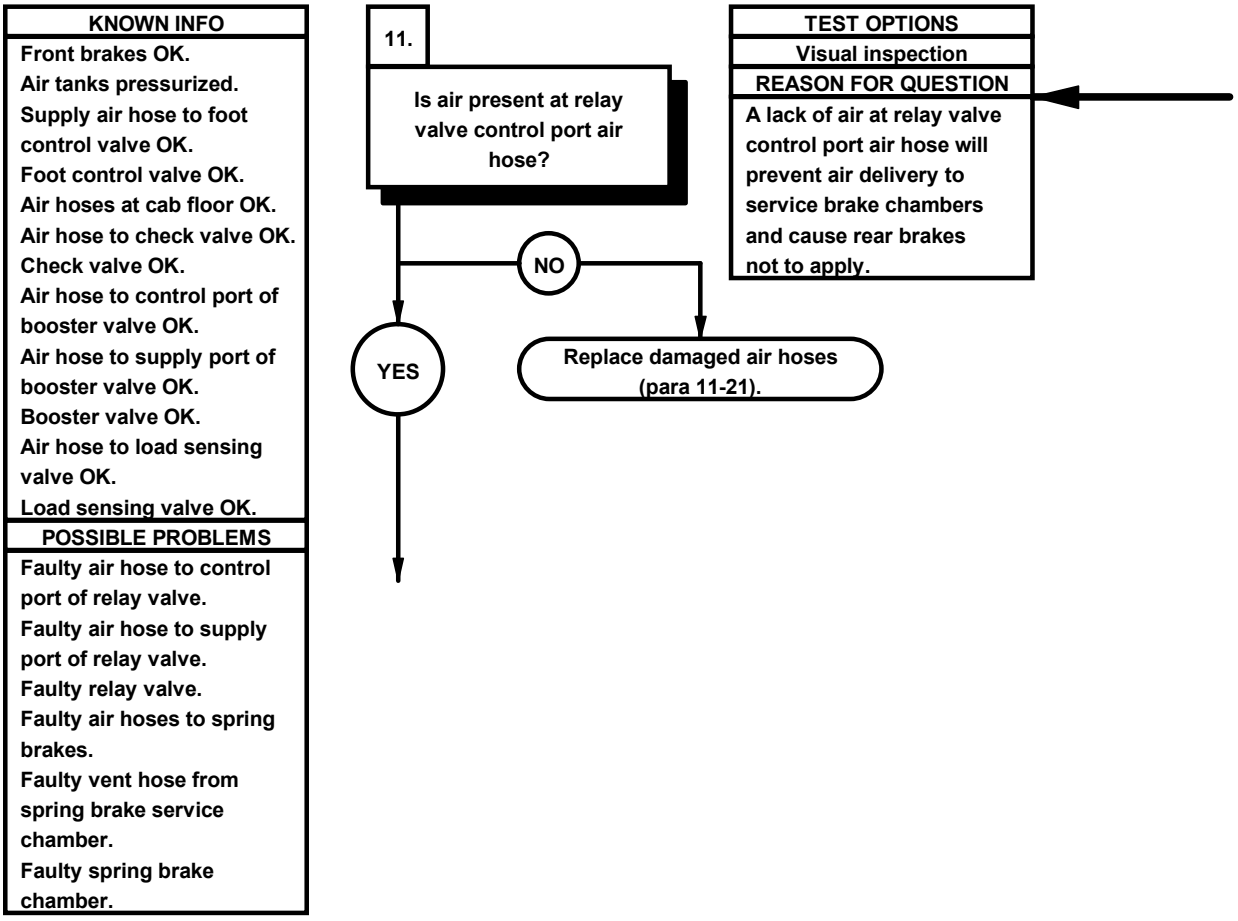
i2. REAR BRAKES DO NOT APPLY (CONT)



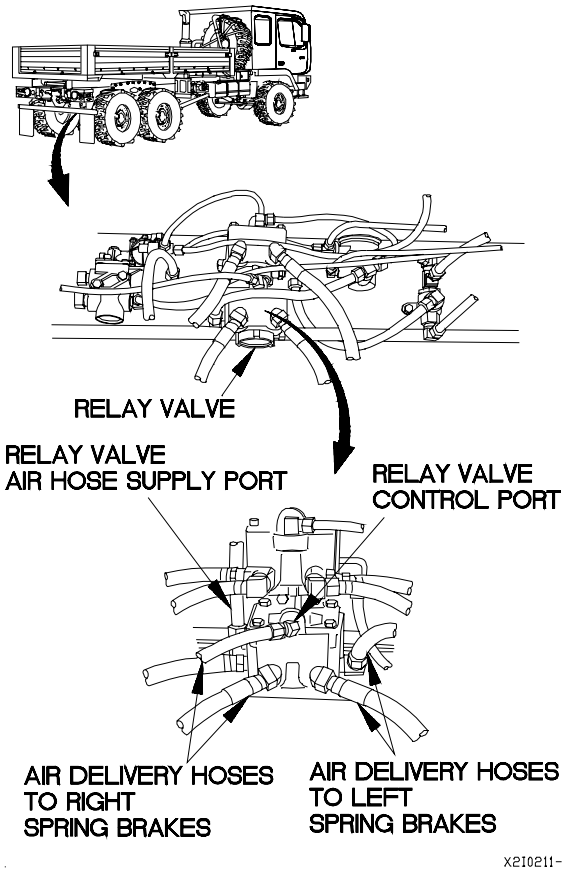
(1) Loosen outlet air hose at load sensing valve.
(2) Apply brakes.
(3) Check for presence of air.
(4) If no air is present, replace load sensing valve (para 11-10).
(5) Tighten outlet air hose on load sensing valve.



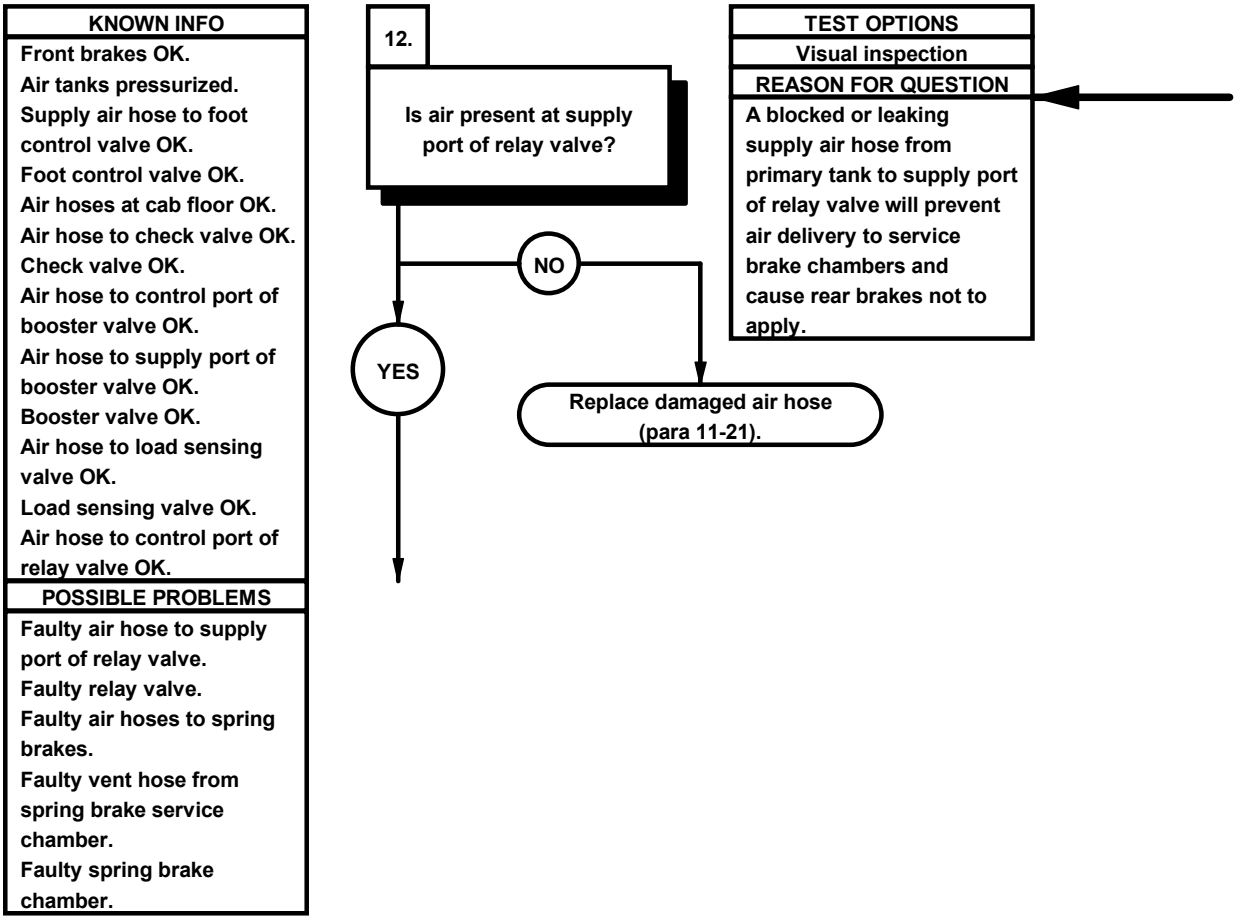
i2. REAR BRAKES DO NOT APPLY (CONT)



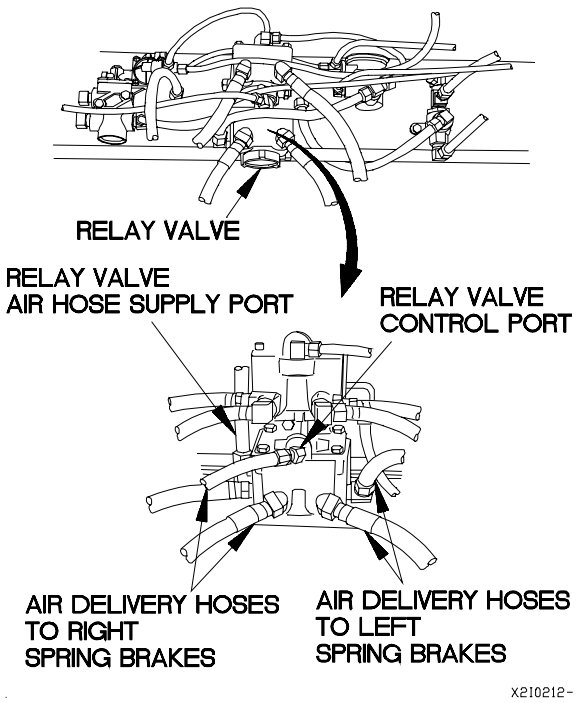
(1) Loosen control port air hoses at relay valve.
(2) Apply brakes.
(3) Check for presence of air.
(4) If no air is present, replace air hose(s) (para 11-21).
(5) Tighten inlet air hoses on relay valve.



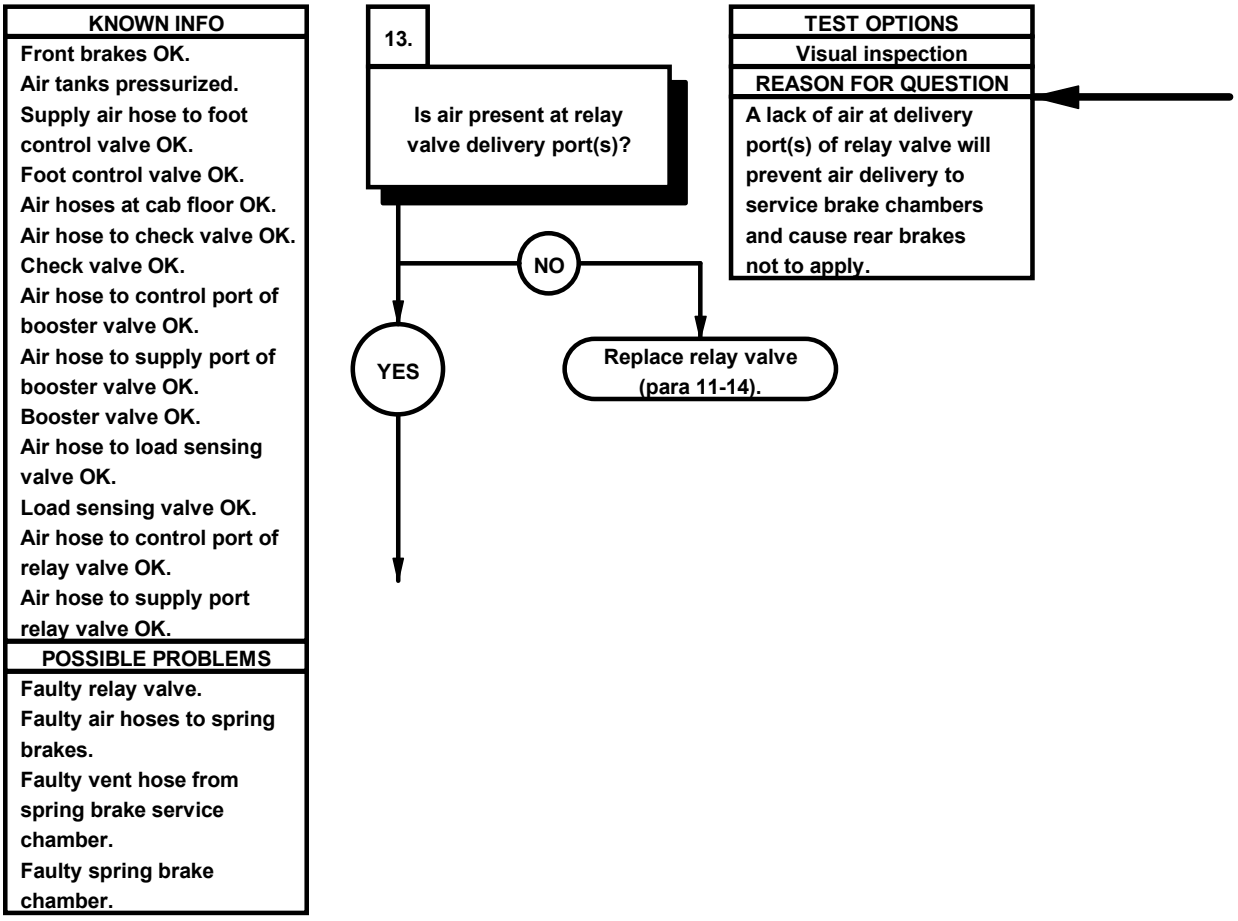
i2. REAR BRAKES DO NOT APPLY (CONT)



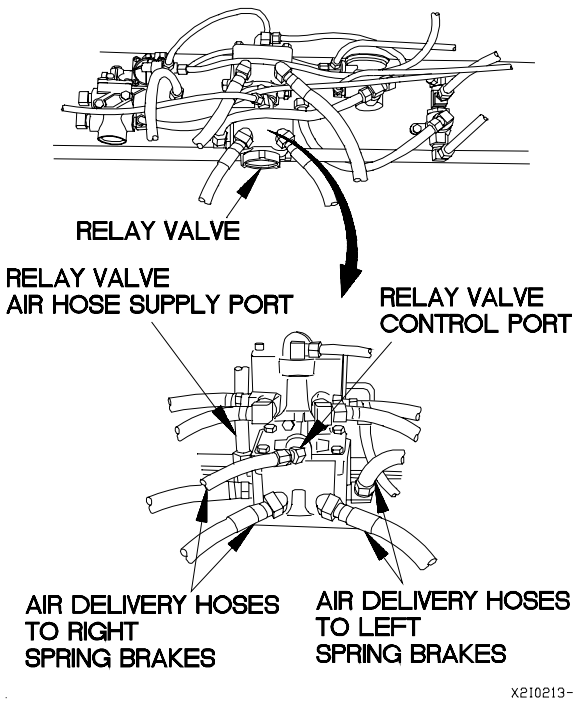
(1) Loosen supply air hose at supply port of relay valve.
(2) Apply brakes.
(3) Check for presence of air.
(4) If no air is present, replace air hose (para 11-21).
(5) Tighten supply air hose to relay valve.



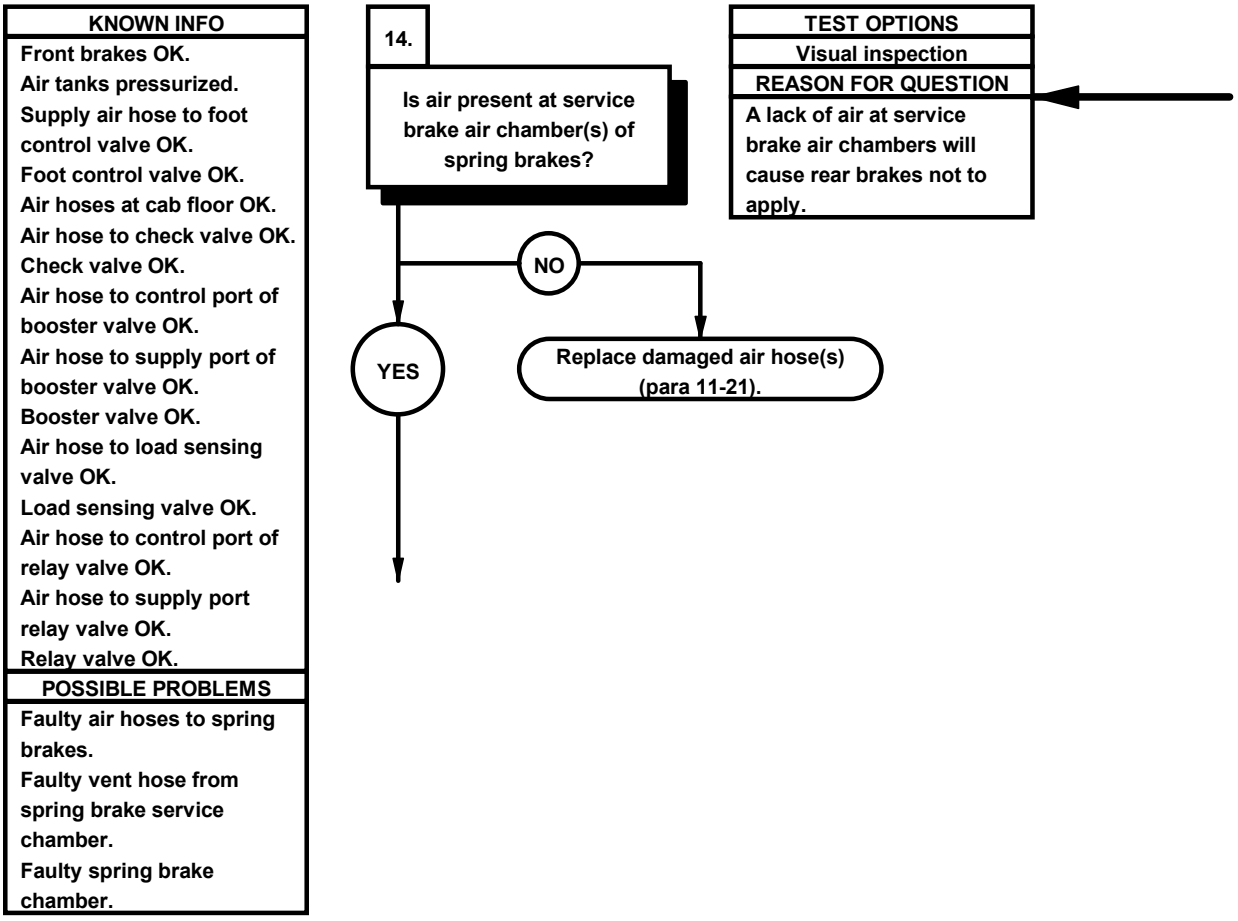
i2. REAR BRAKES DO NOT APPLY (CONT)



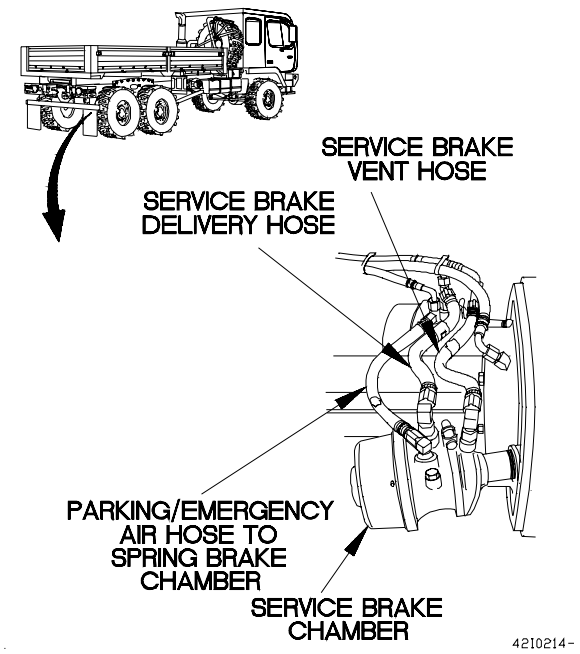
(1) Loosen delivery air hose(s) at relay valve.
(2) Apply brakes.
(3) Check for presence of air.
(4) If no air is present, replace relay valve (para 11-14).
(5) Tighten delivery air hose(s) to relay valve.



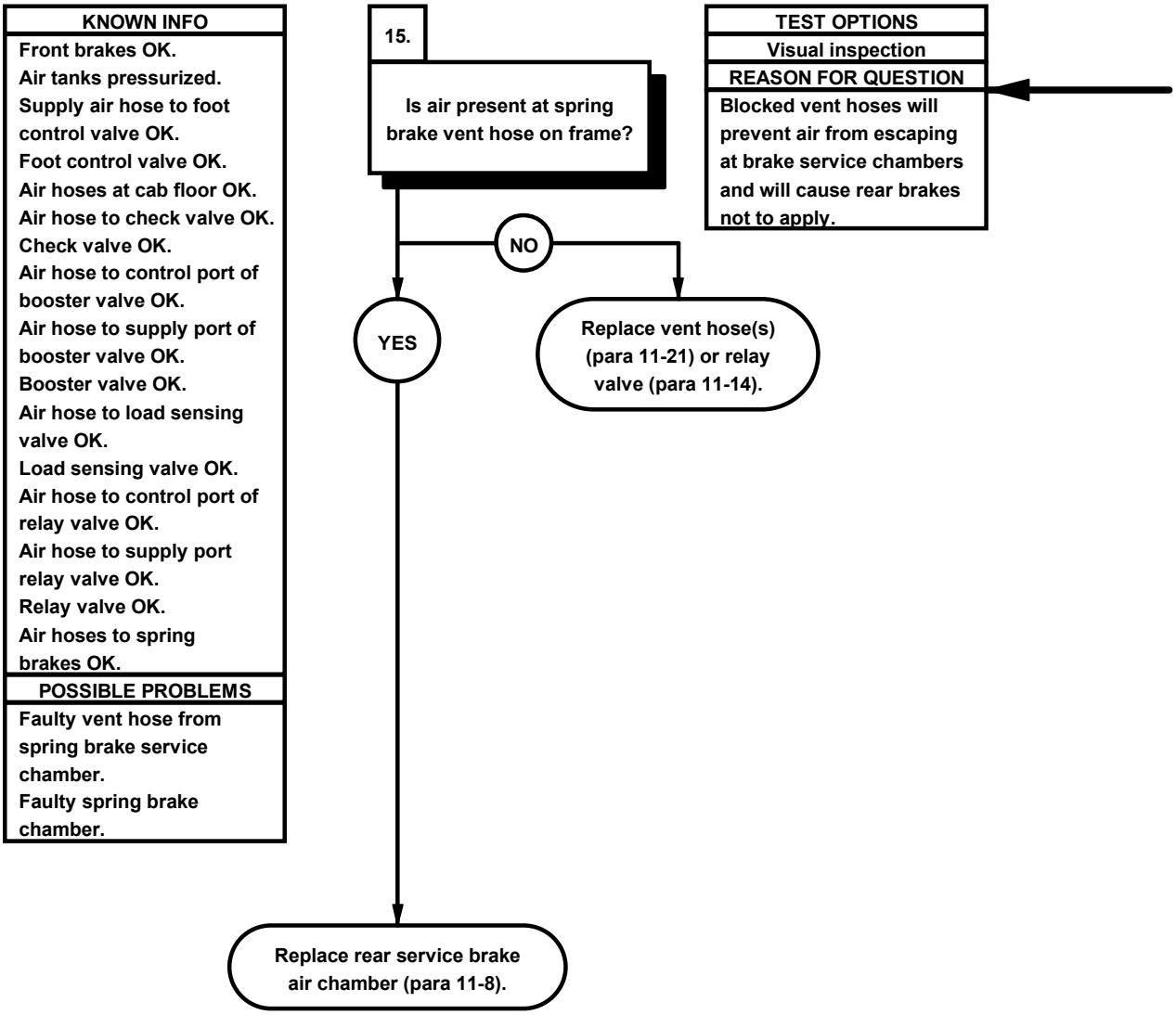
i2. REAR BRAKES DO NOT APPLY (CONT)



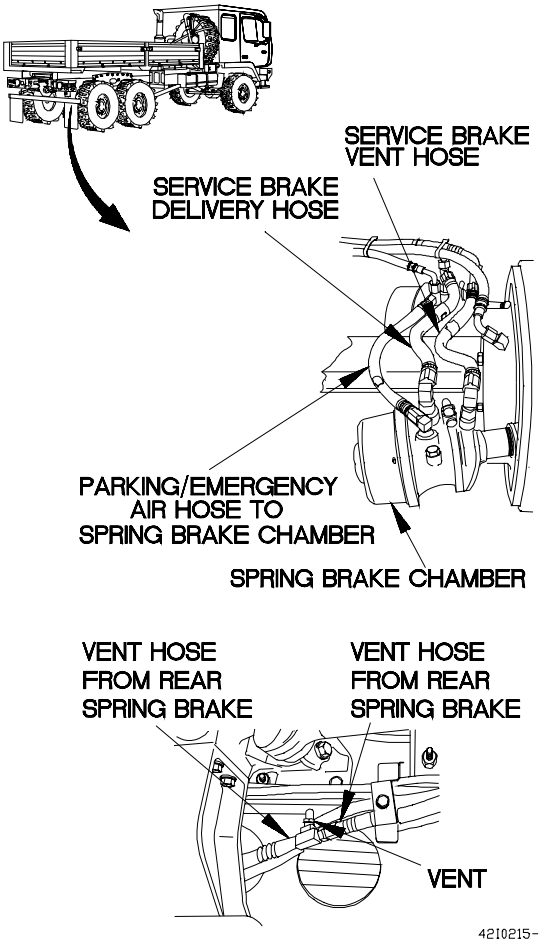
(1) Loosen service brake air hose at spring brake chamber.
(2) Apply brakes.
(3) Check for presence of air.
(4) If no air is present, replace air hose (para 11-21).
(5) Tighten service brake air hose on spring brake chamber.



i2. REAR BRAKES DO NOT APPLY (CONT)



(1) Disconnect vent hose(s) at brake chamber(s).
(2) Blow compressed air through vent hoses.
(3) Check for air escaping at vent valve.
(4) If air does not escape from vent hose, replace vent hose(s) (para 11-21) or relay valve (para 11-14).
(5) If air does escape from vent hose, replace rear service brake air chamber (para 11-8).
(6) Connect vent hose(s) at brake chamber(s).
(7) Lower cab (TM 9-2320-366-10-1).

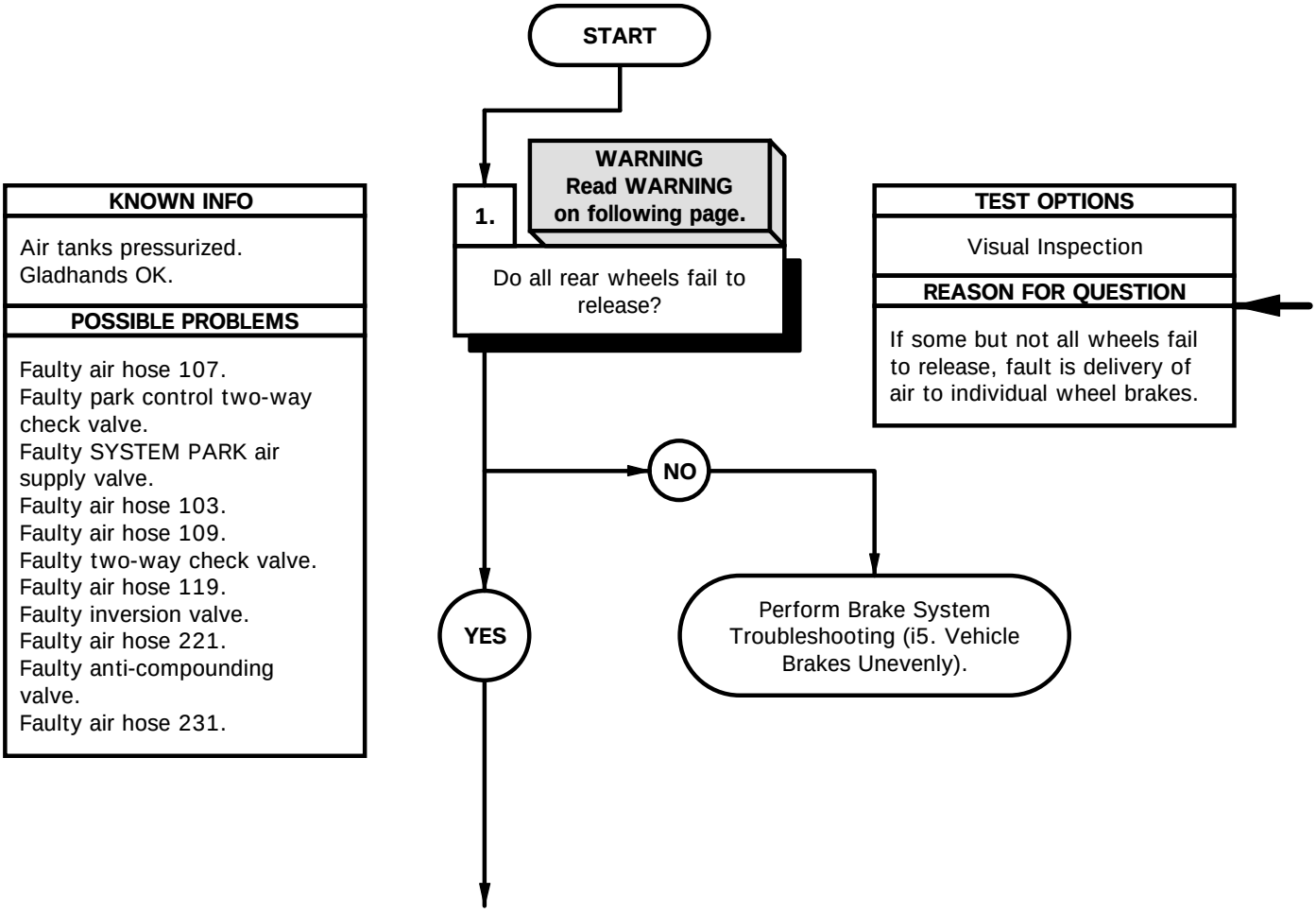


i3. PARKING BRAKE DOES NOT RELEASE

INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Goggles, Industrial (Item 15, Appendix C)



KNOWN INFO

Air tanks pressurized.
Gladhands OK.

POSSIBLE PROBLEMS

Faulty air hose 107.
Faulty park control two-way check valve.
Faulty SYSTEM PARK air supply valve.
Faulty air hose 103.
Faulty air hose 109.
Faulty two-way check valve.
Faulty air hose 119.
Faulty inversion valve.
Faulty air hose 221.
Faulty anti-compounding valve.
Faulty air hose 231.

TEST OPTIONS

Visual Inspection

REASON FOR QUESTION

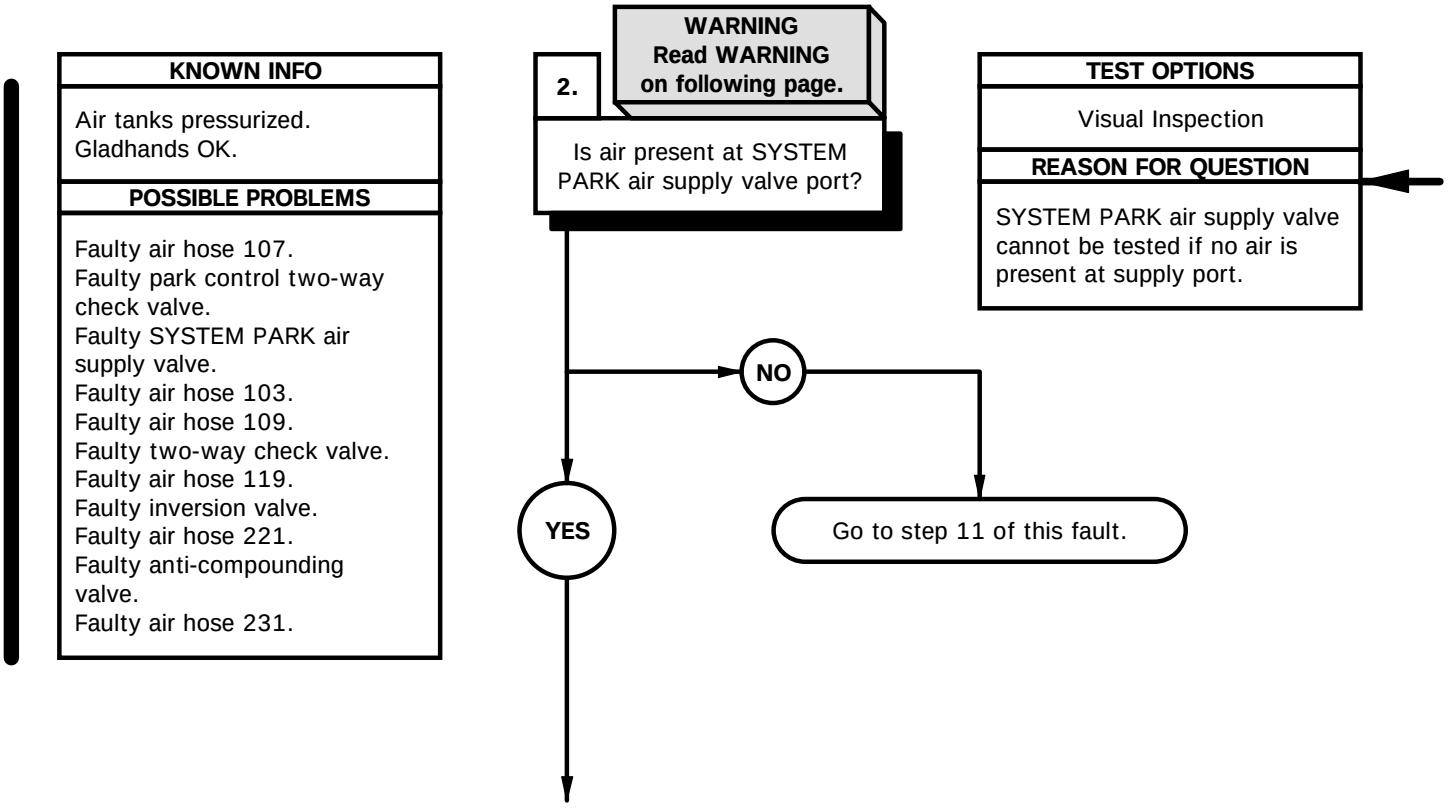
If some but not all wheels fail to release, fault is delivery of air to individual wheel brakes.

WARNING

When working on parking brake control system, vehicle may roll. Wheel chocks must be positioned in front of and behind one of the rear wheels to keep it from rolling. Failure to comply may result in serious injury or death to personnel.

(1) Start engine (TM 9-2320-366-10-1).
(2) Release SYSTEM PARK control (TM 9-2320-366-10-1).
(3) Check if vehicle moves.
(4) If vehicle moves, locate locked wheel(s) and troubleshoot individual wheel(s).
(5) Shut down engine (TM 9-2320-366-10-1).

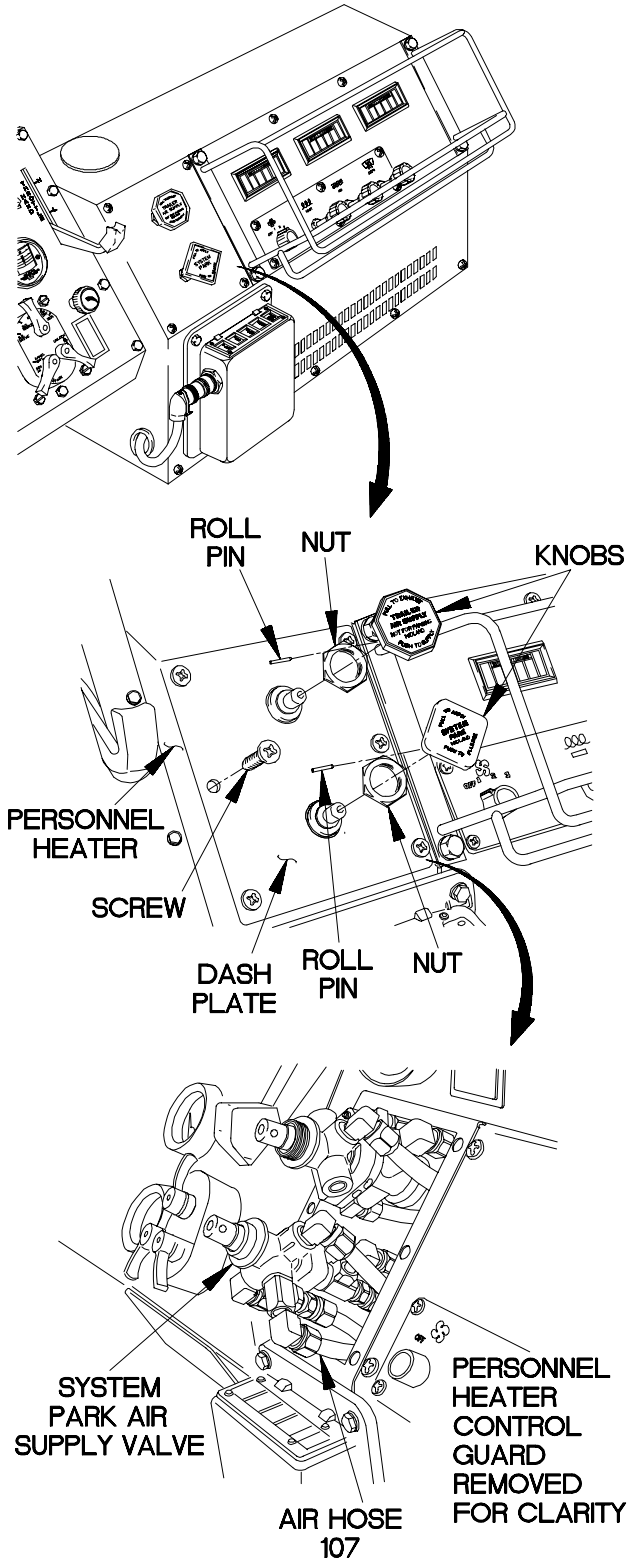
i3. PARKING BRAKE DOES NOT RELEASE (CONT)



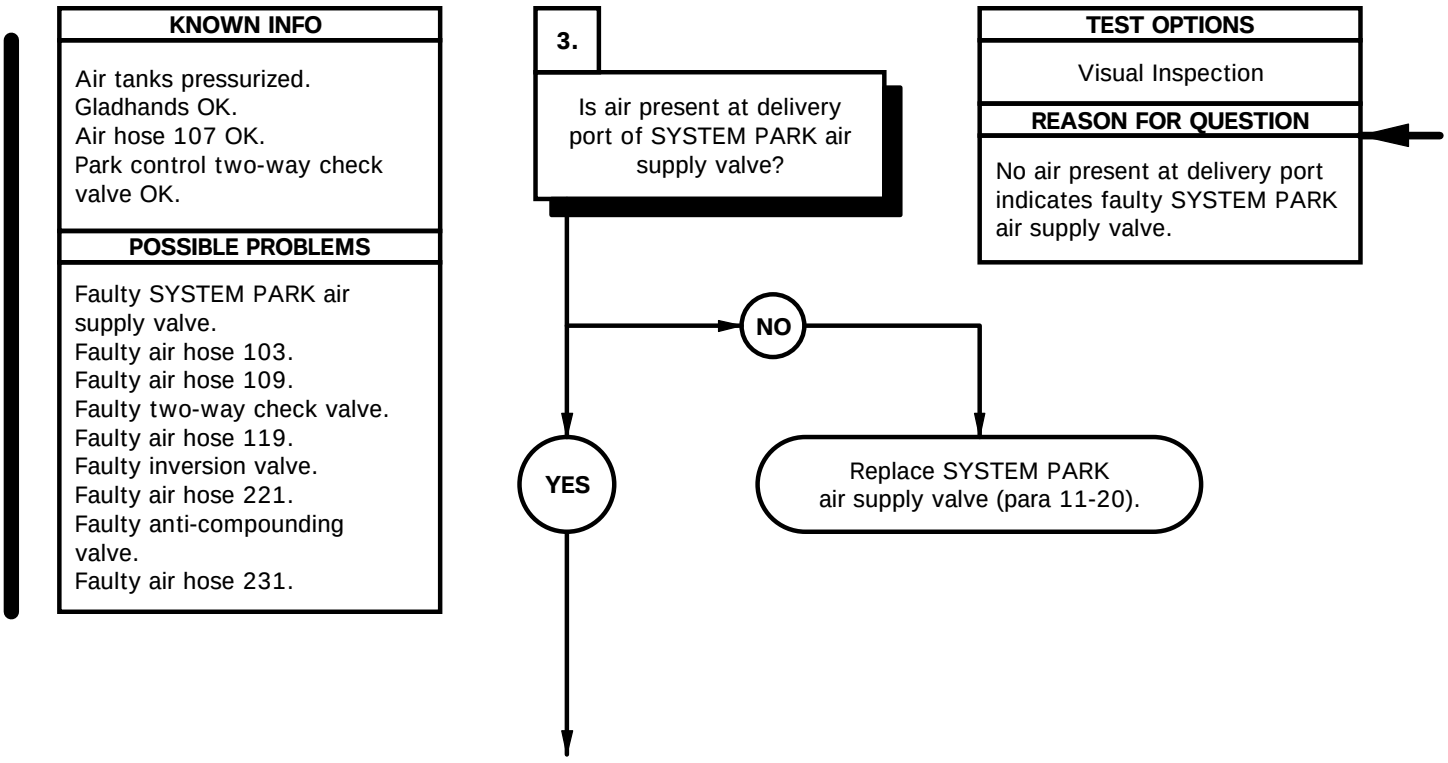
WARNING

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

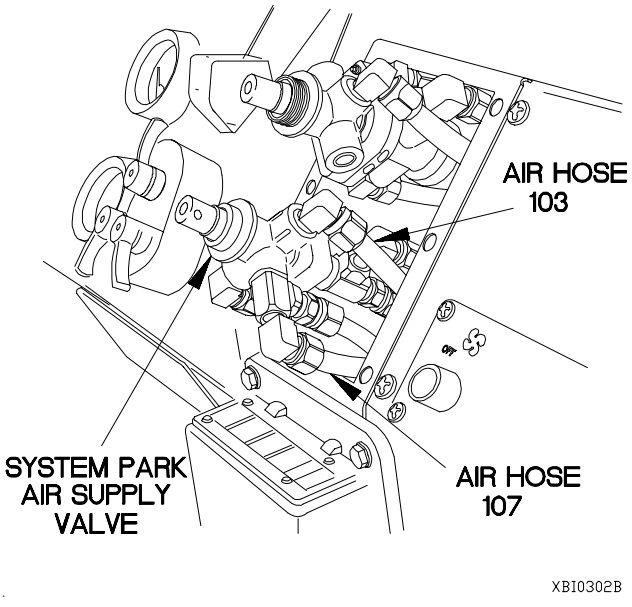
(1) Remove roll pins from knobs of SYSTEM PARK and TRAILER AIR SUPPLY valves.
(2) Remove SYSTEM PARK and TRAILER AIR SUPPLY valve knobs.
(3) Unscrew nuts at base of knob stem on each valve.
(4) Remove six screws from dash plate.
(5) Remove dash plate from personnel heater.
(6) Pull out SYSTEM PARK air supply valve from personnel heater.
(7) Loosen air hose 107 at SYSTEM PARK air supply valve supply port.
(8) Check air hose 107 for escaping air.
(9) If no air escapes from air hose 107, go to step 11 of this fault.



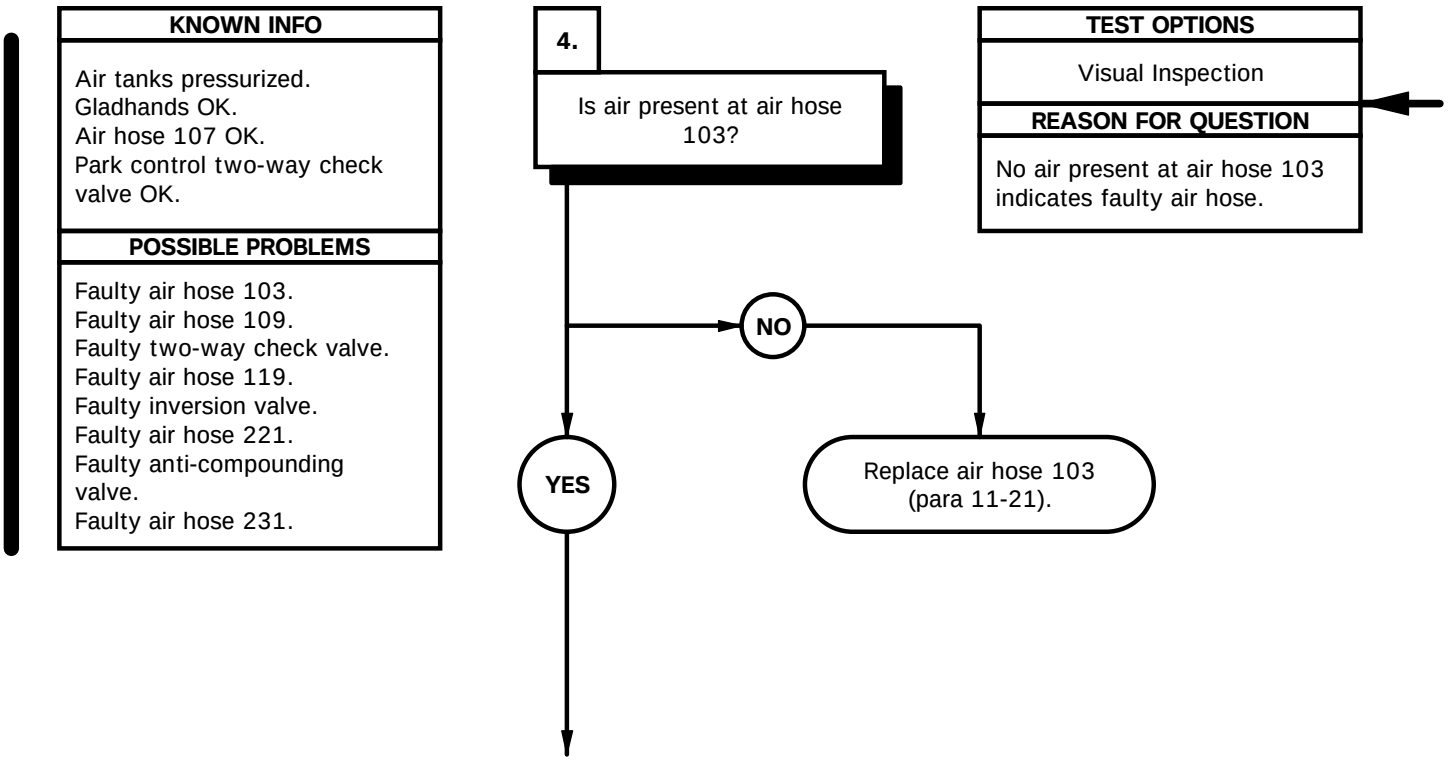
i3. PARKING BRAKE DOES NOT RELEASE (CONT)



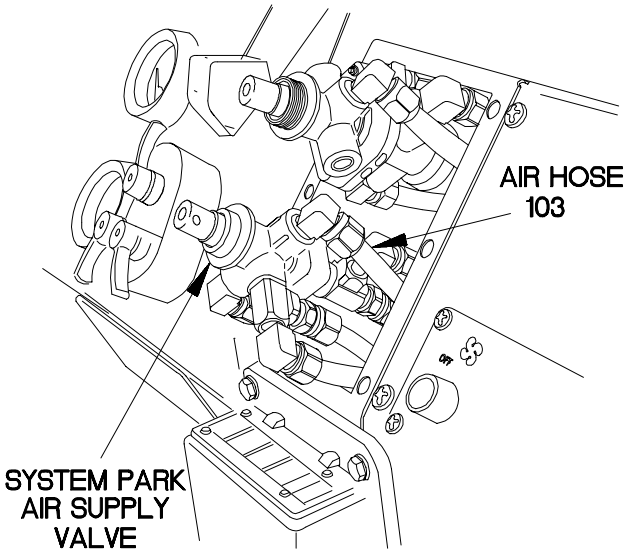
(1) Tighten air hose 107 at SYSTEM PARK air supply valve supply port.
(2) Loosen air hose 103 at SYSTEM PARK air supply valve delivery port.
(3) Check for presence of air from SYSTEM PARK air supply valve.
(4) If no air is present, replace SYSTEM PARK air supply valve (para 11-20).



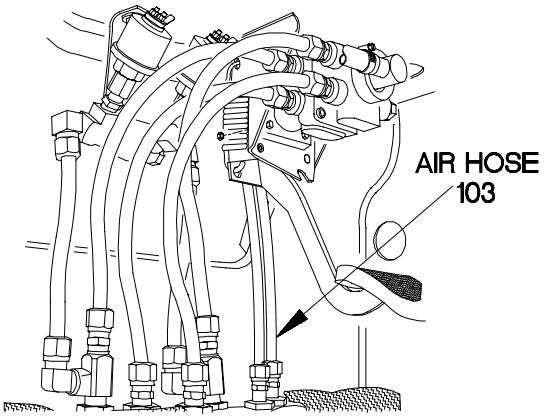
i3. PARKING BRAKE DOES NOT RELEASE (CONT)



(1) Tighten air hose 103 at SYSTEM PARK air supply valve delivery port.
(2) Loosen air hose 103 at cab floor fitting.
(3) Check for presence of air from air hose 103.
(4) If no air is present, replace air hose 103 (para 11-21).

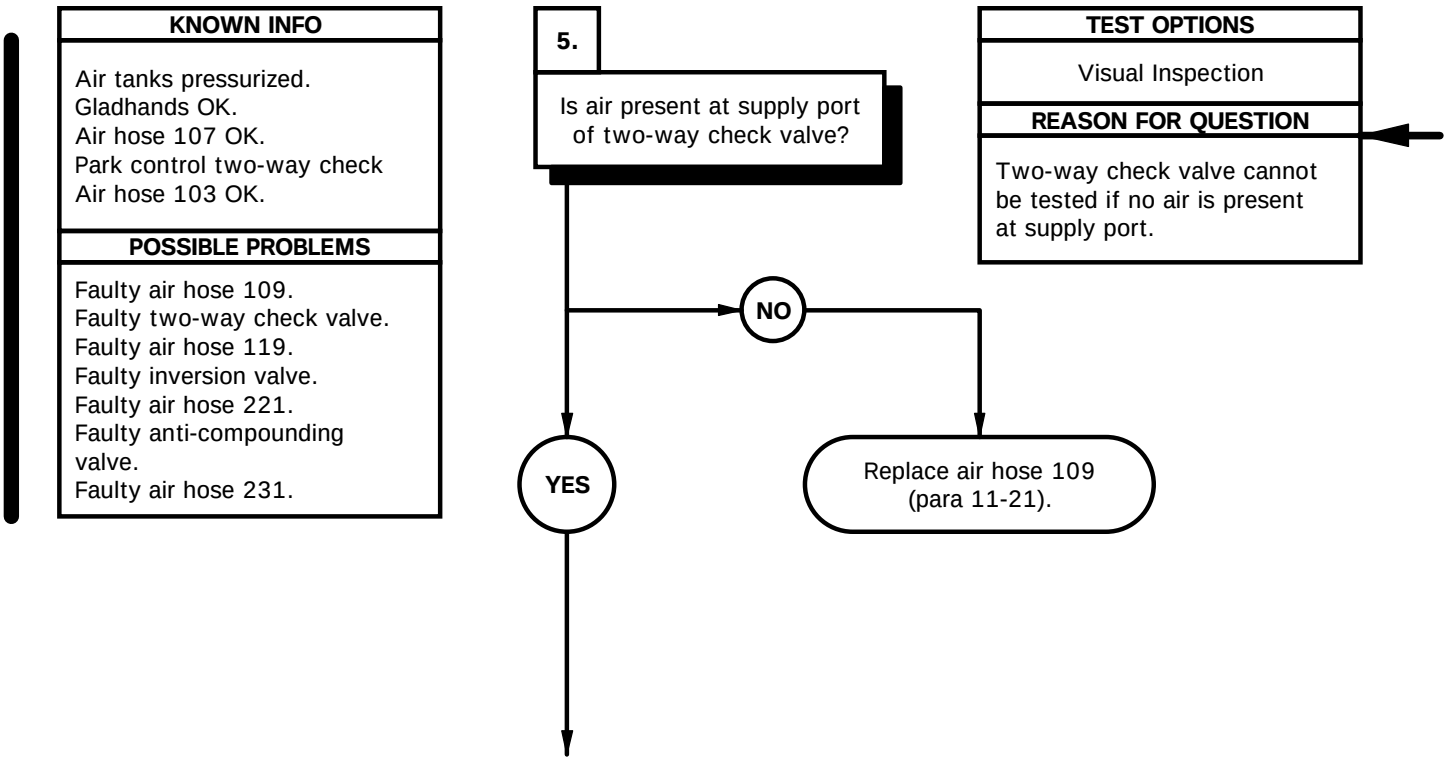


STEERING COLUMN
REMOVED FOR CLARITY

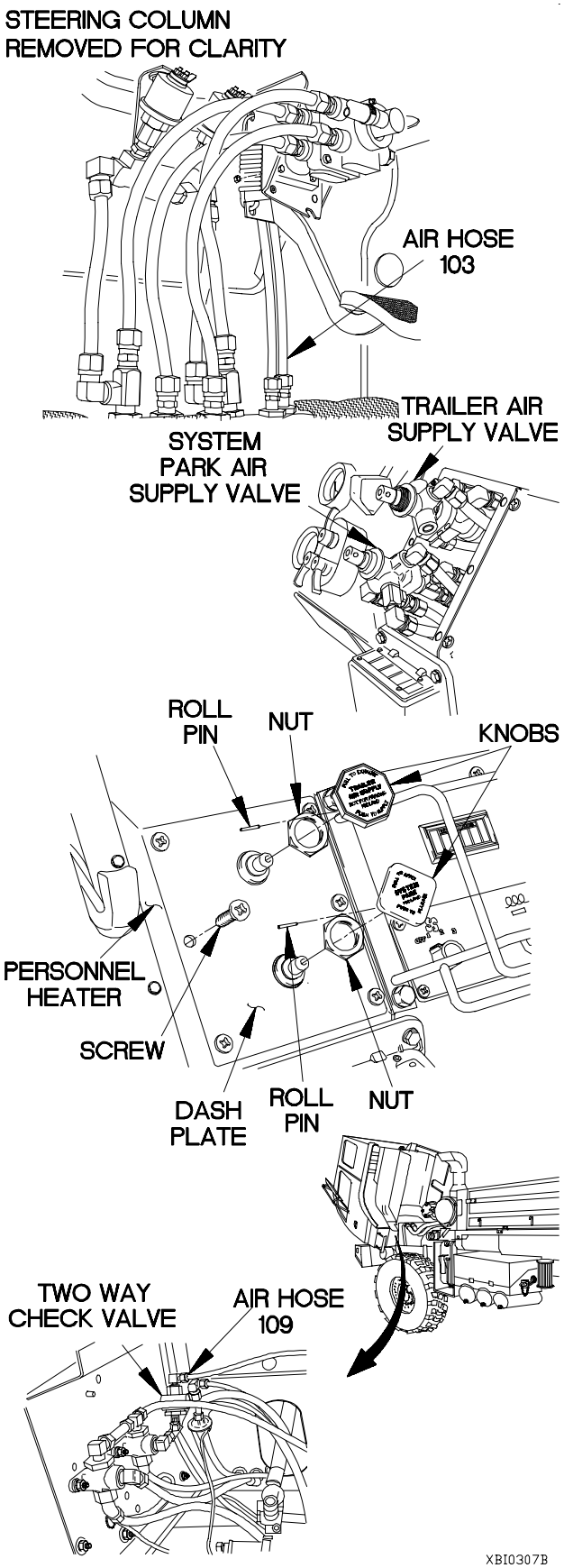


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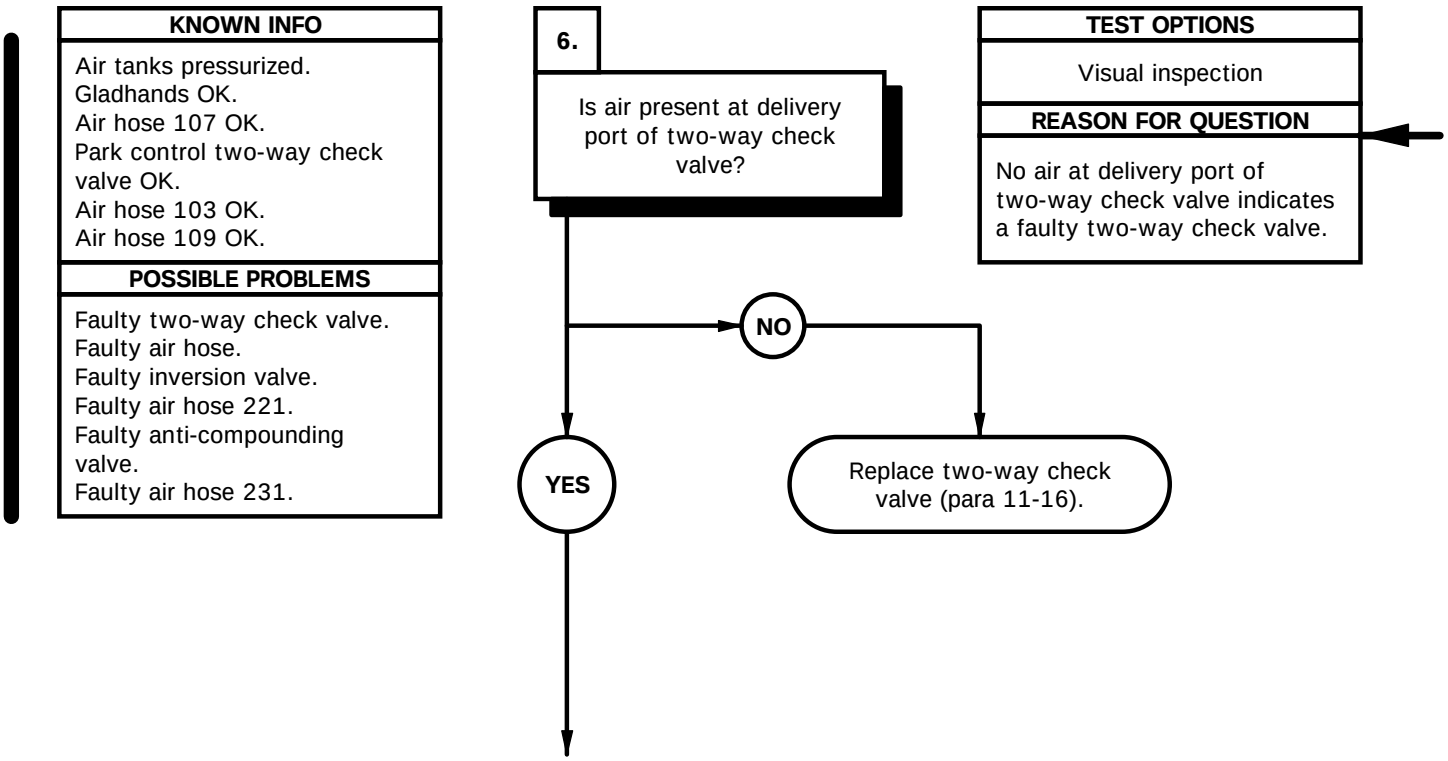
i3. PARKING BRAKE DOES NOT RELEASE (CONT)



(1) Tighten air hose 103 at cab floor fitting.
(2) Push SYSTEM PARK and TRAILER AIR SUPPLY valves back into personnel heater.
(3) Install dash plate over valve stems with six screws.
(4) Install nuts on knob stems.
(5) Install SYSTEM PARK and TRAILER AIR SUPPLY knobs on stems with roll pins.
(6) Raise cab (TM 9-2320-366-10-1).
(7) Loosen air hose 109 at supply port of two-way check valve.
(8) Check for presence of air at air hose 109.
(9) If no air is present, replace air hose 109 (para 11-21).



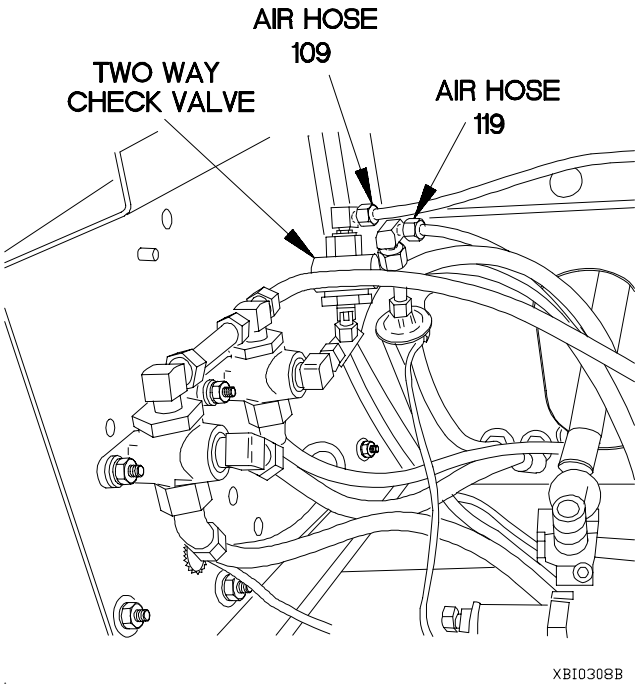
i3. PARKING BRAKE DOES NOT RELEASE (CONT)



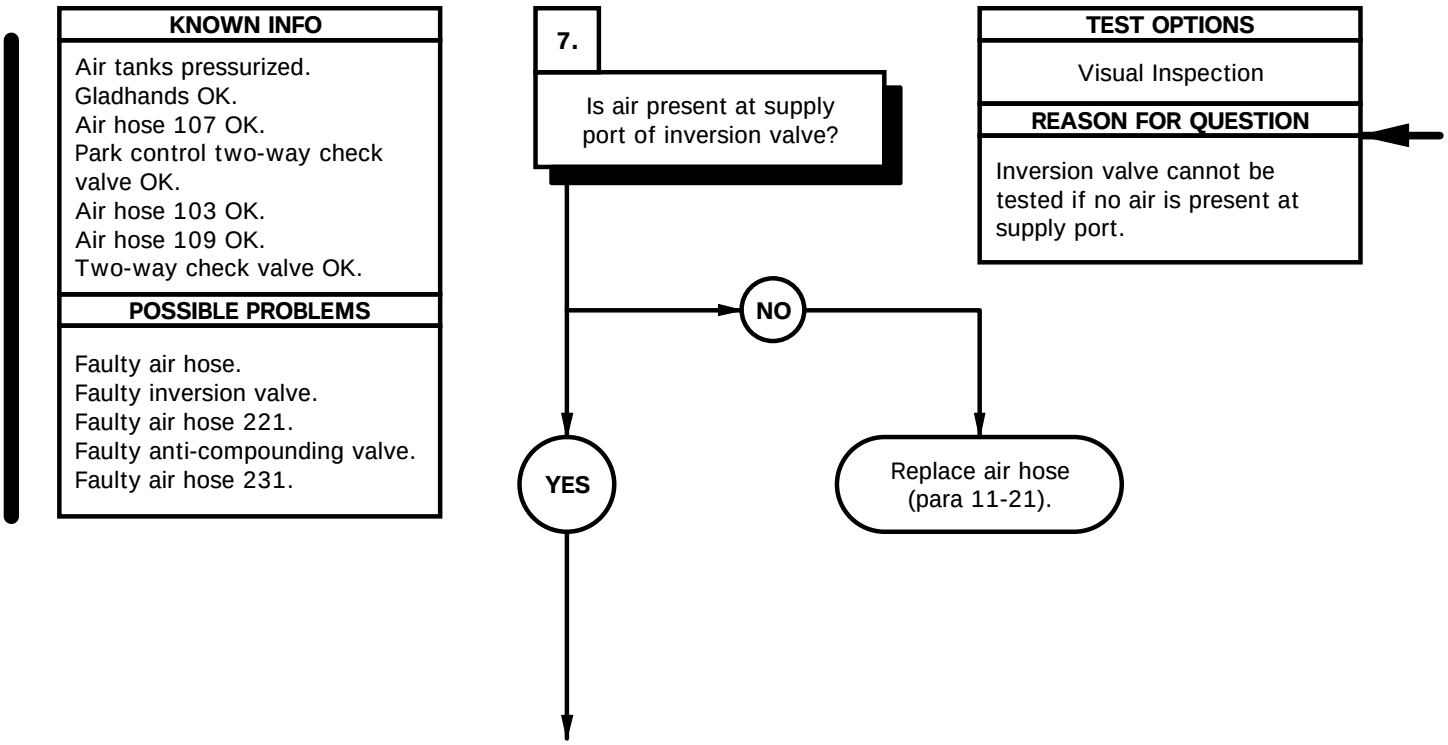
(1) Tighten air hose 109 at two-way check valve supply port.
(2) Loosen air hose (refer to Table 2-48.1. Air Hose Numbers) at delivery port of two-way check valve.
(3) Release SYSTEM PARK (TM 9-2320-366-10-1) and check for presence of air at air hose (refer to Table 2-48.1. Air Hose Numbers).
(4) If no air is present, replace two-way check valve (para 11-16).

Table 2-48.1. Air Hose Numbers

Air Hose Number	Model Used On
131	M1089
133	M1083/M1088/M1090/ M1094/M1092
136	M1086/M1096
138	M1085/M1084



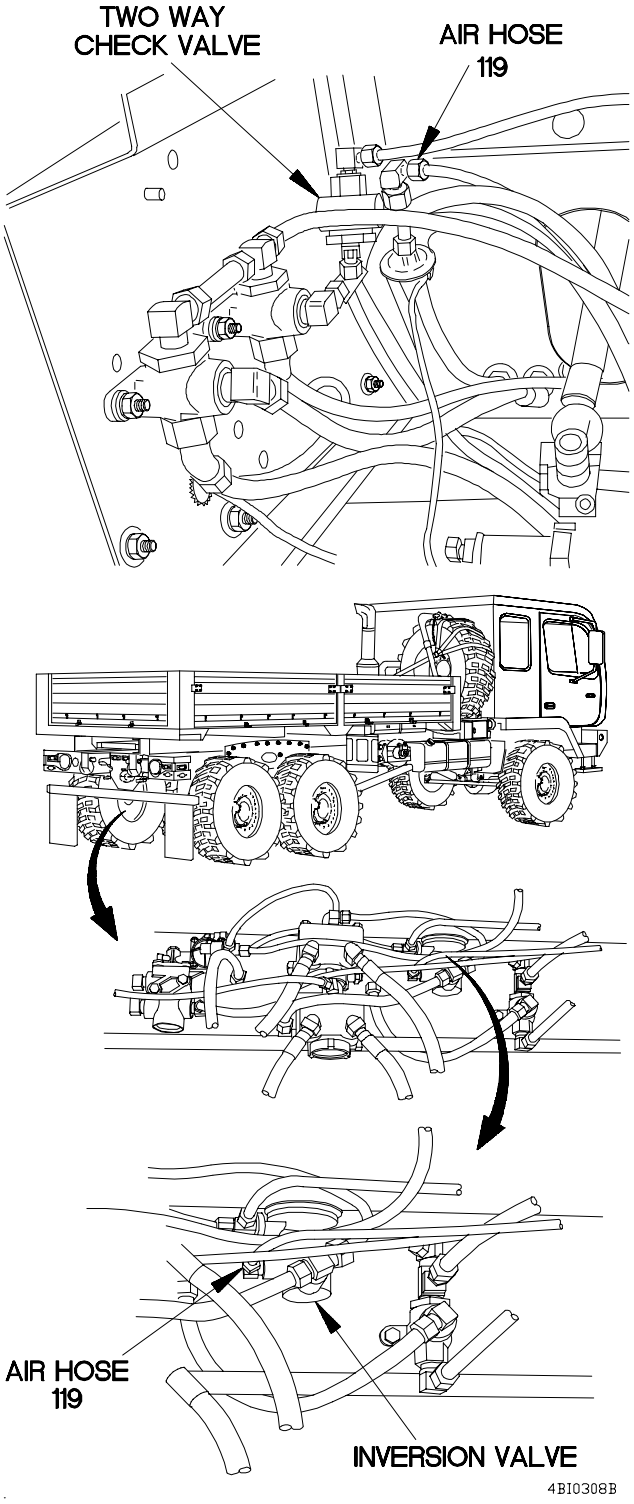
i3. PARKING BRAKE DOES NOT RELEASE (CONT)



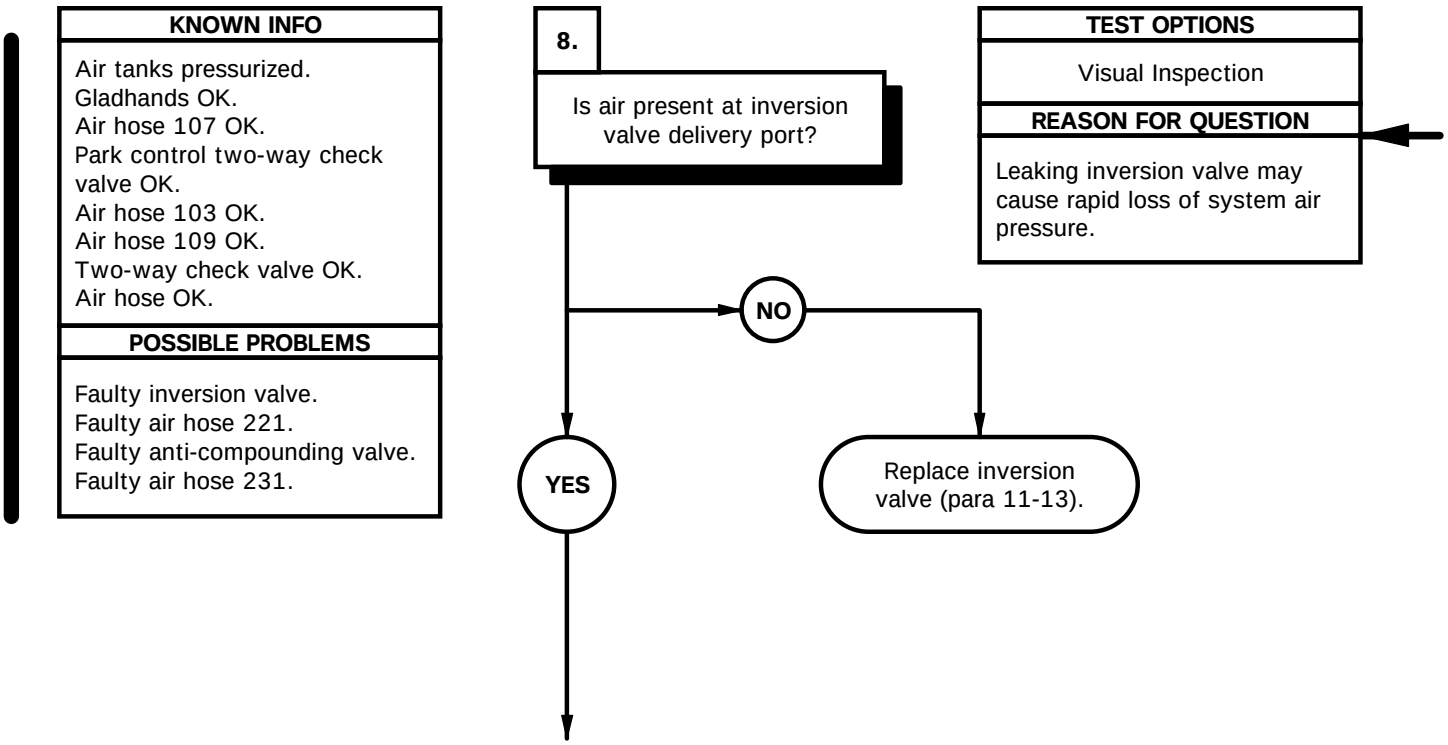
(1) Tighten air hose (refer to Table 2-48.2. Air Hose Numbers) at two-way check valve delivery port.
(2) Lower cab (TM 9-2320-366-10-1).
(3) Loosen air hose (refer to Table 2-48.2. Air Hoses Numbers) at inversion valve supply port.
(4) Check for presence of air at air hose (refer to Table 2-48.2. Air Hose Numbers).
(5) If no air is present, replace air hose (para 11-21).

Table 2-48.2. Air Hose Numbers

Air Hose Number	Model Used On
131	M1089
133	M1083/M1088/M1090/ M1094/M1092
136	M1086/M1096
138	M1085/M1084



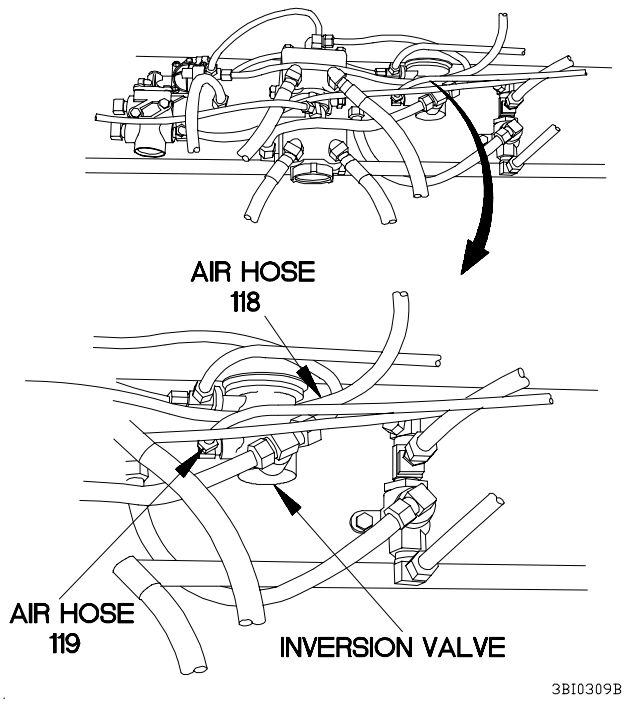
i3. PARKING BRAKE DOES NOT RELEASE (CONT)



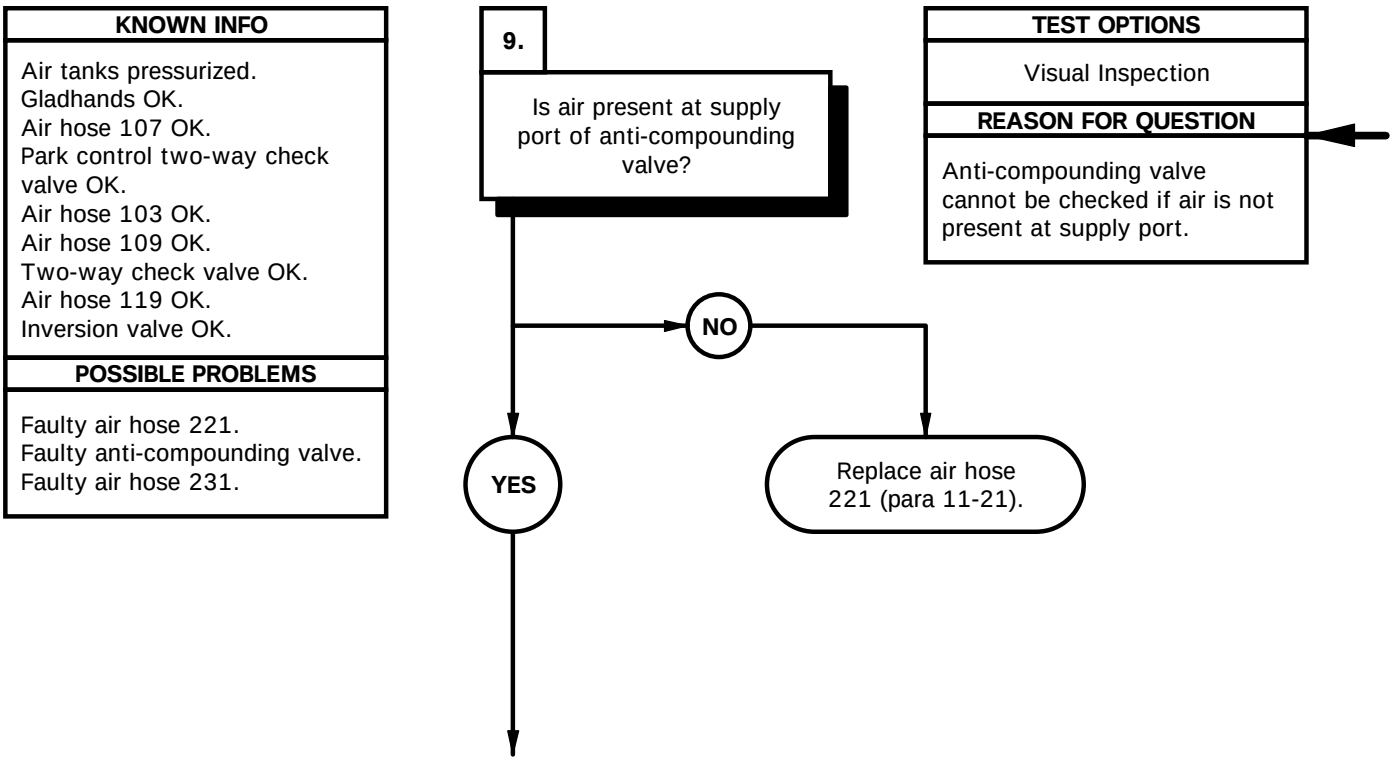
(1) Tighten air hose (refer to Table 2-48.3. Air Hose Numbers) at inversion valve supply port.
(2) Loosen air hose 118 at inversion valve delivery port.
(3) Check for presence of air at air hose 118.
(4) If no air is present, replace inversion valve (para 11-13).

Table 2-48.3. Air Hose Numbers

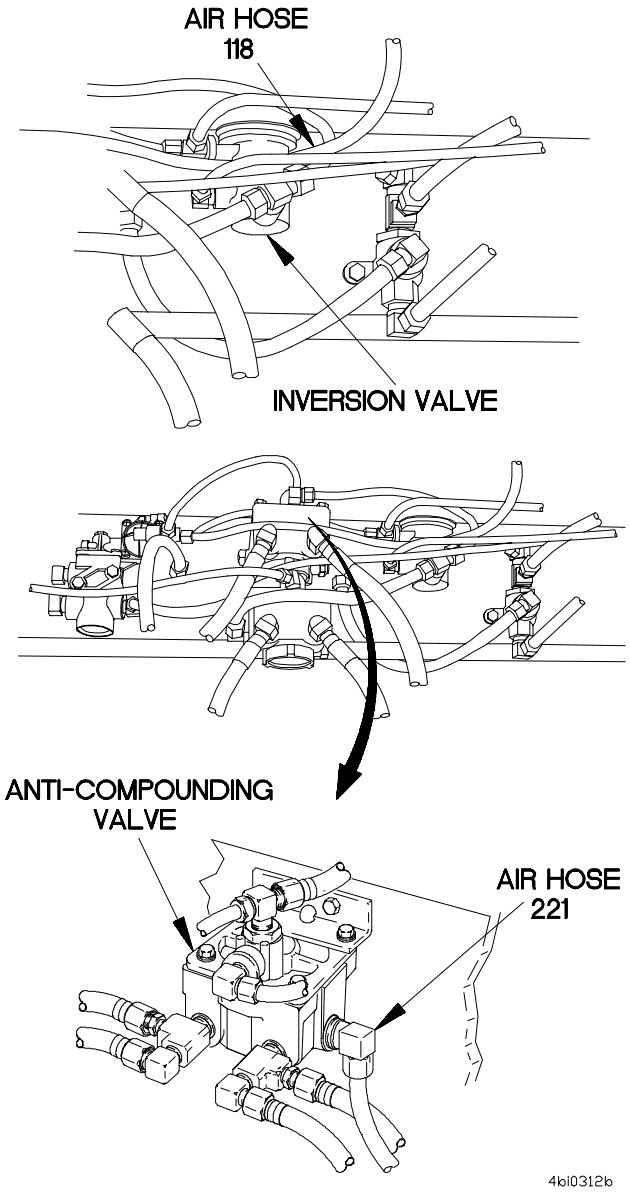
Air Hose Number	Model Used On
131	M1089
133	M1083/M1088/M1090/ M1094/M1092
136	M1086/M1096
138	M1085/M1084



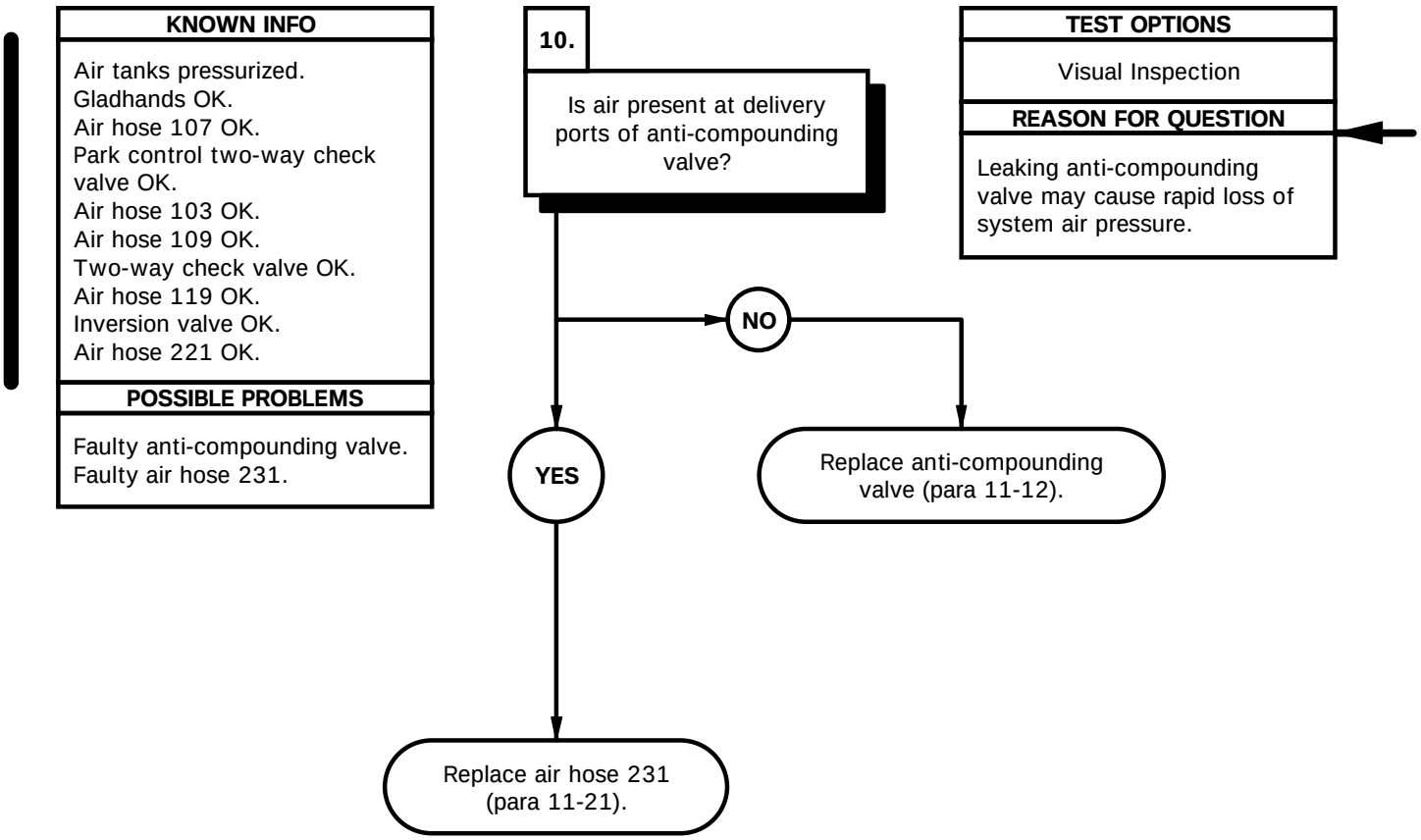
i3. PARKING BRAKE DOES NOT RELEASE (CONT)



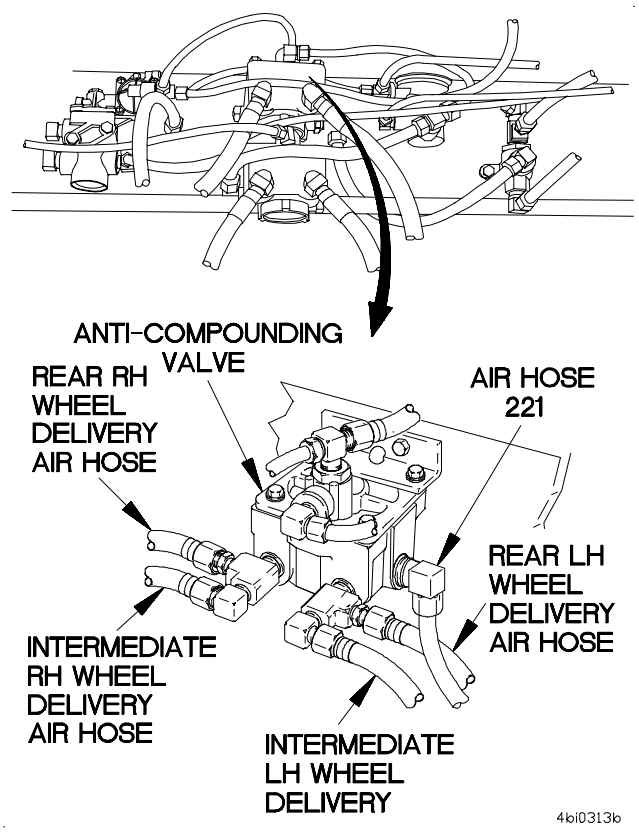
(1) Tighten air hose 118 at inversion valve delivery port.
(2) Loosen air hose 221 at supply port of anti-compounding valve.
(3) Check for presence of air at air hose 221.
(4) If no air is present, replace air hose 221 (para 11-21).



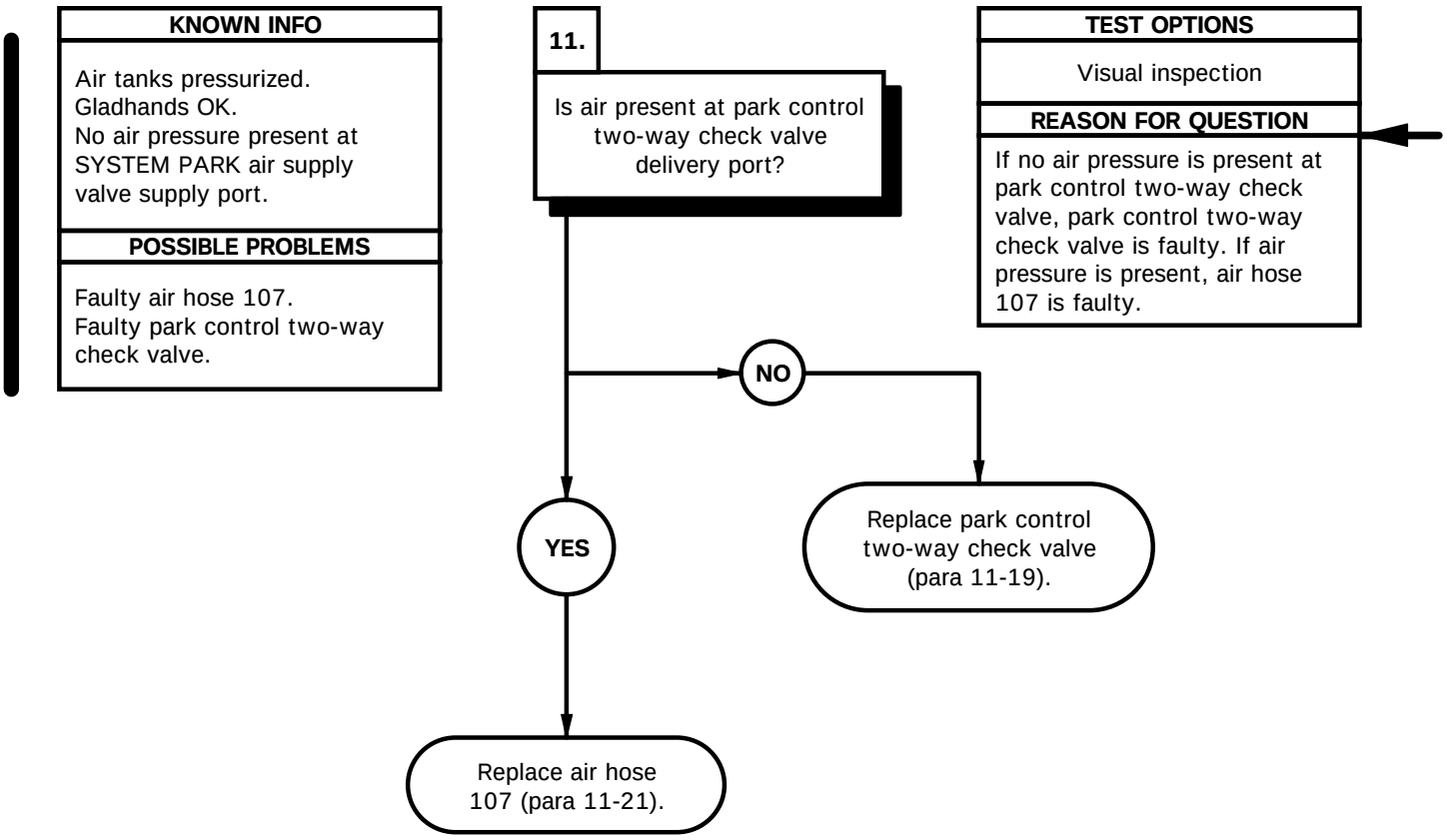
i3. PARKING BRAKE DOES NOT RELEASE (CONT)



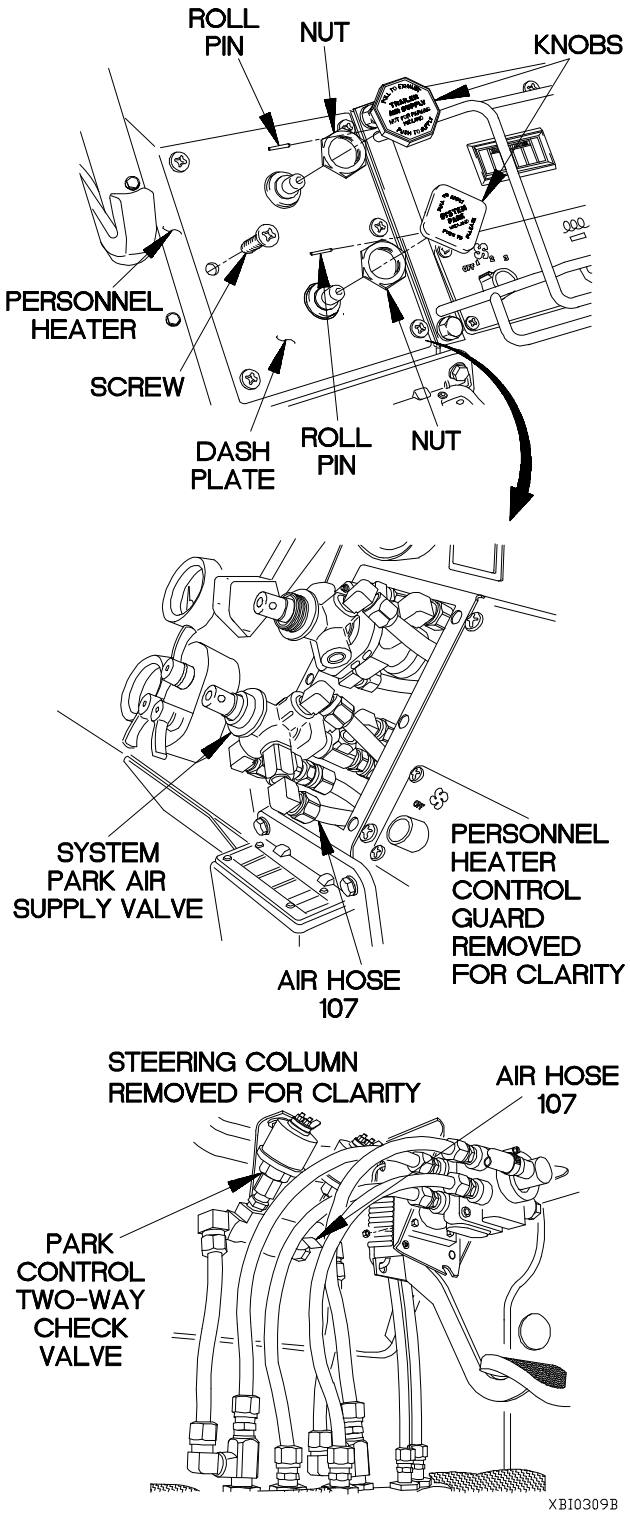
(1) Tighten air hose 221 at anti-compounding valve supply port.
(2) Loosen air delivery hoses at delivery ports of anti-compounding valve.
(3) Check for presence of air at anti-compounding valve air hoses.
(4) If no air is present, replace anti-compounding valve (para 11-12).
(5) If air is present, replace air hose 231 (para 11-21).
(6) Tighten air delivery hoses at delivery ports of anti-compounding valve.



i3. PARKING BRAKE DOES NOT RELEASE (CONT)



(1) Tighten air hose 107 at SYSTEM PARK air supply valve supply port.
(2) Push SYSTEM PARK and TRAILER AIR SUPPLY valves back into personnel heater.
(3) Install dash plate over valve stems with six screws.
(4) Install nuts on knob stems.
(5) Install SYSTEM PARK and TRAILER AIR SUPPLY knobs on stems with roll pins.
(6) Loosen air hose 107 at park control two-way check valve delivery port.
(7) Check for presence of air at air hose 107.
(8) If no air is present, replace park control two-way check valve (para 11-19).
(9) If air is present, replace air hose (para 11-21).
(10) Tighten air hose 107 at park control two-way check valve.



All data on pages 2-1900 through 2-1903, including pages 2-1901 and 2-1902 deleted.

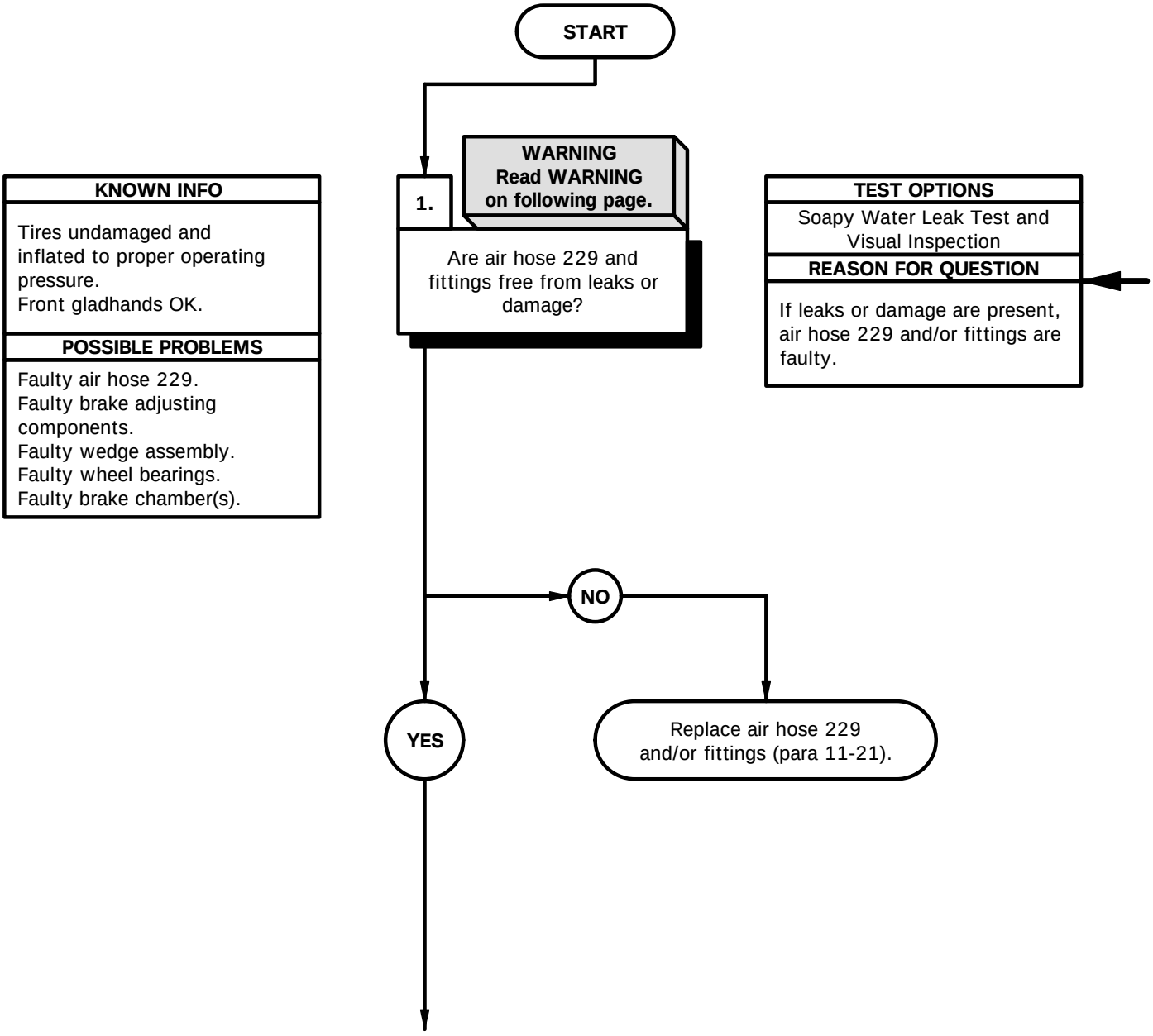
i4. FRONT BRAKES OVERHEAT AND/OR DO NOT RELEASE

INITIAL SETUP

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

Personnel
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Trestle, Motor Vehicle Maintenance (2)
(Item 47, Appendix C)
Adjusting Tool, Brake Shoe (Item 2, Appendix C)



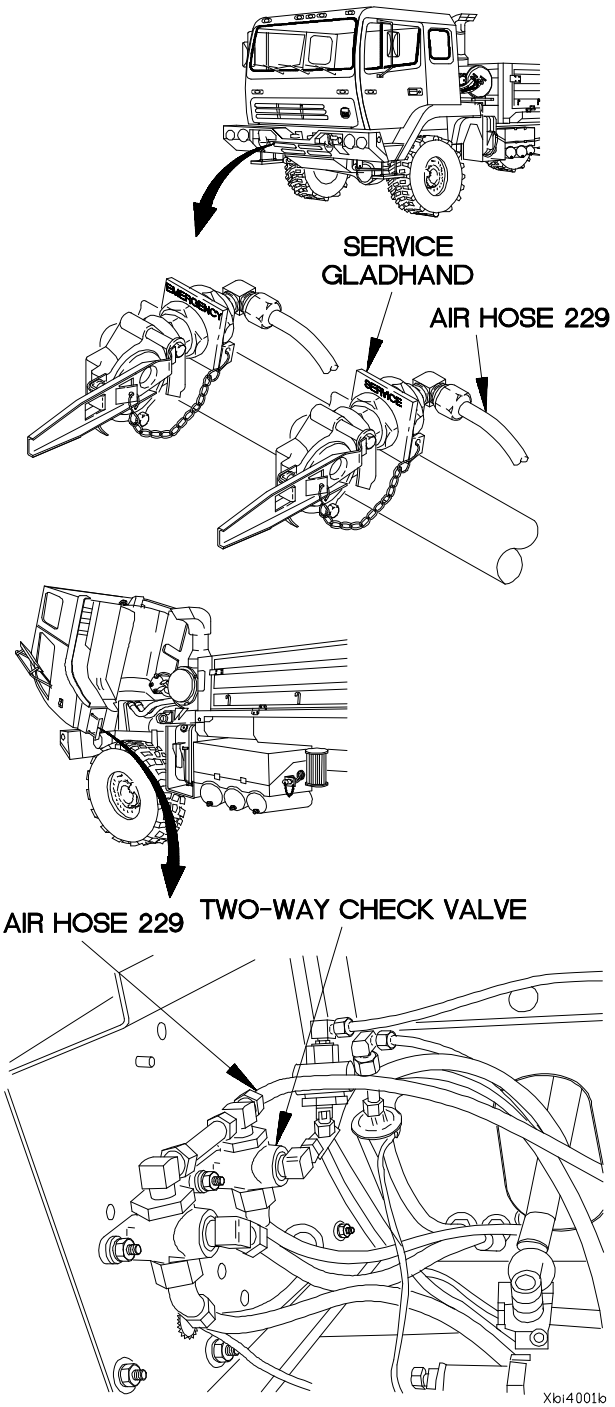
WARNING

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

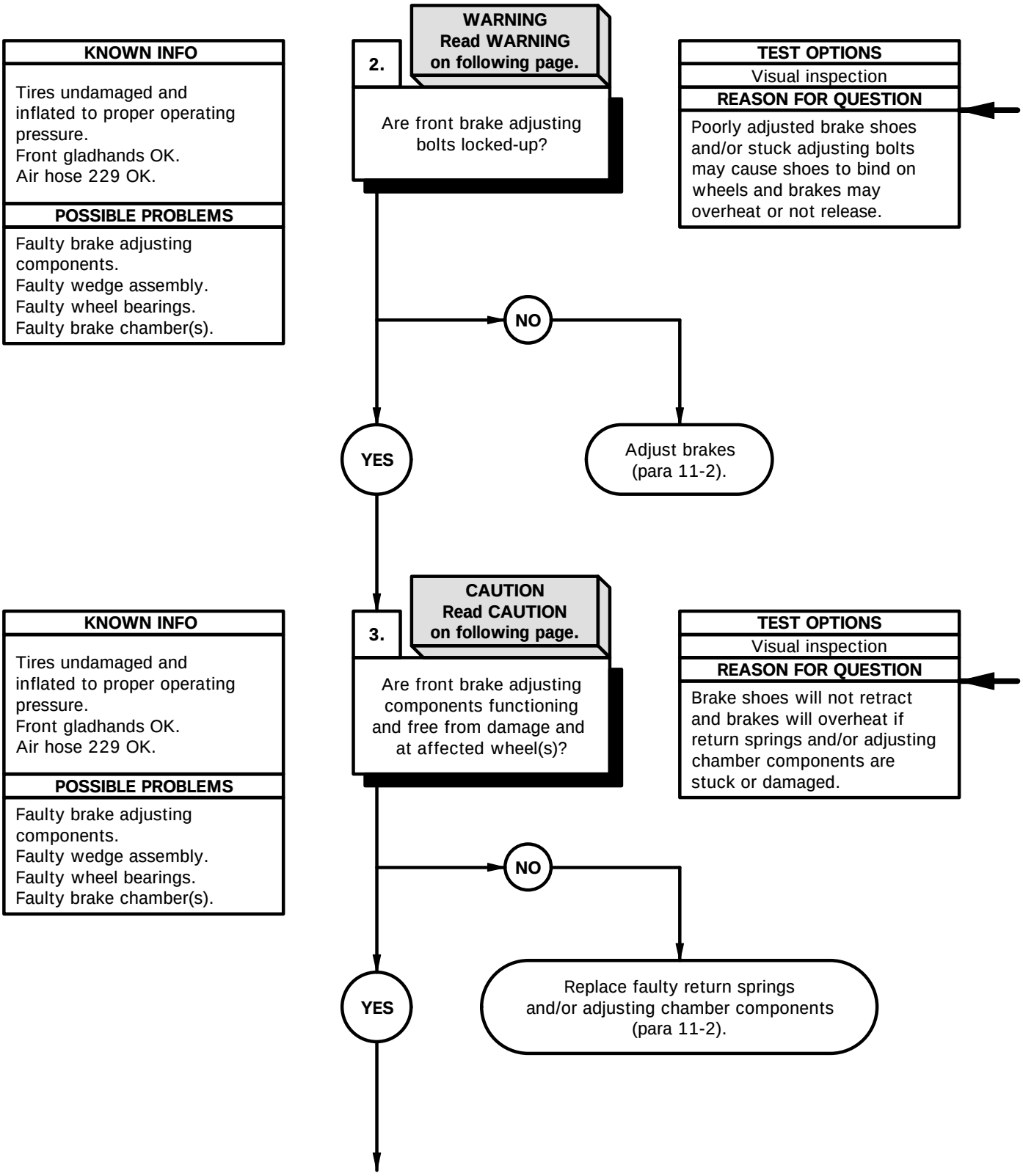
SOAPY WATER LEAK TEST

(1) Apply soapy water solution to air hose 229 and fittings.
(2) Check air hose 229 and fittings for bubbles, indicating leaks.

(1) Check air hose 229 from front service gladhand to two-way check valve for leaks and damage.
(2) If air hose 229 and/or fittings are faulty, replace damaged air hose 229 and/or fittings (para 11-21).



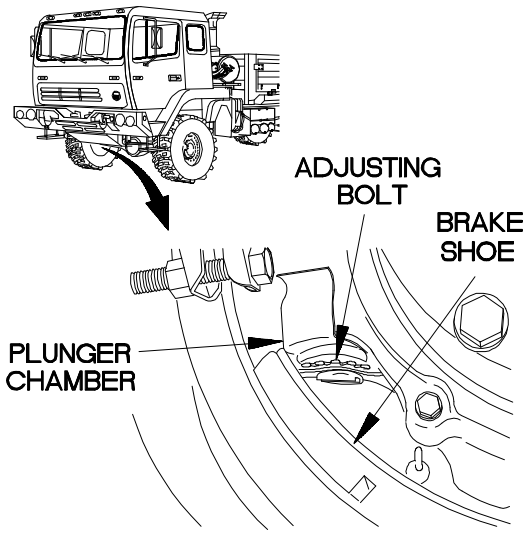
i4. FRONT BRAKES OVERHEAT AND/OR DO NOT RELEASE (CONT)



WARNING

Overheated brakes can cause severe burns. Perform task only when brakes have cooled. Failure to comply may result in injury to personnel.

(1) Jack up side with overheated or non-releasing brakes, and support with trestle stands.
(2) Turn adjusting bolt clockwise with adjusting tool.
(3) If bolt will not turn or if brake shoes do not move away from wheel when adjuster is turned, adjust brakes (para 11-2).

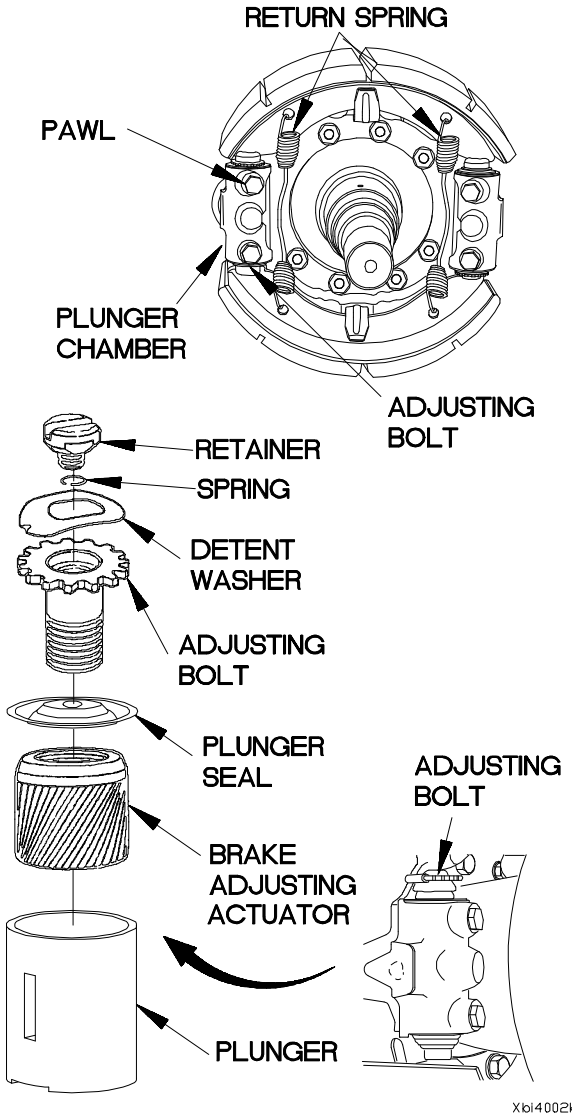


(1) Remove wheel(s) with affected brakes and disassemble brake components (para 11-2).
(2) Inspect return springs for stretching, bluing, damage, or breakage.
(3) If spring(s) is damaged, replace spring(s) (para 11-2).
(4) Check adjusting pawl spring for damage.
(5) Ensure adjusting pawl spring is not missing or broken.
(6) Check adjusting pawl teeth for damage and abrasion.
(7) Ensure seal elements are not damaged or broken.

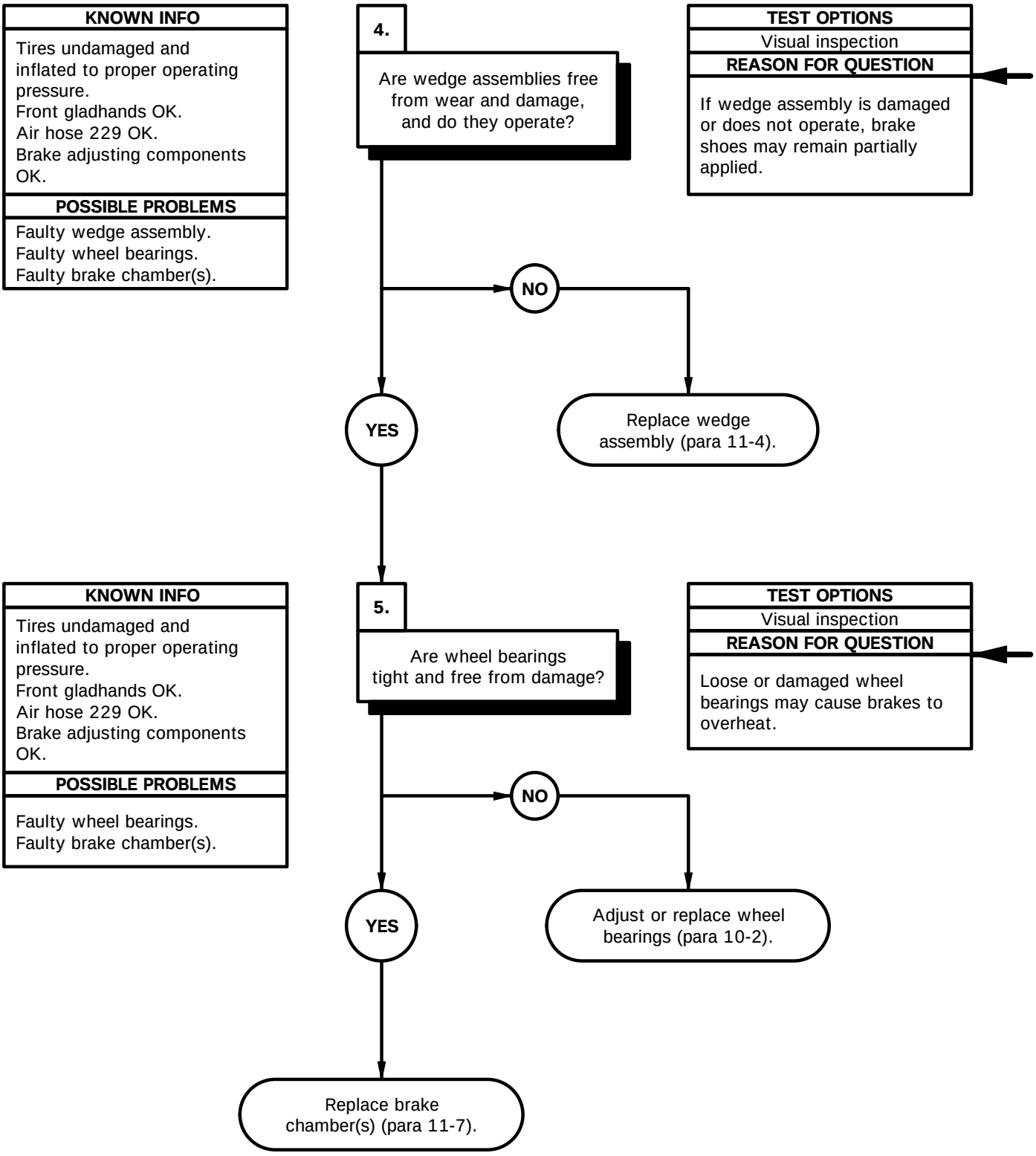
CAUTION

Ensure seal is free from damage. Failure to comply may result in dirt entering plunger chamber and interfering with adjustment.

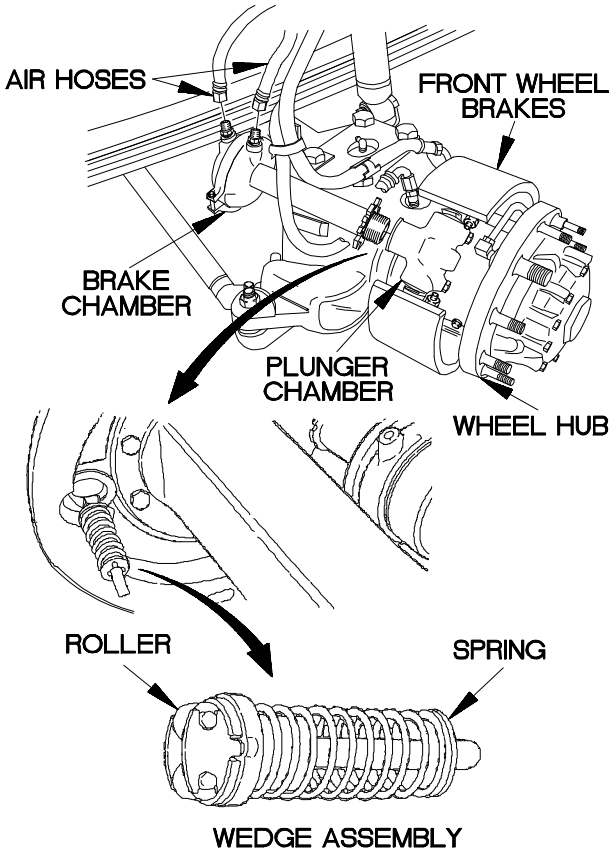
(8) Check actuator teeth for damage.
(9) Check plunger for freedom of movement inside plunger housing.



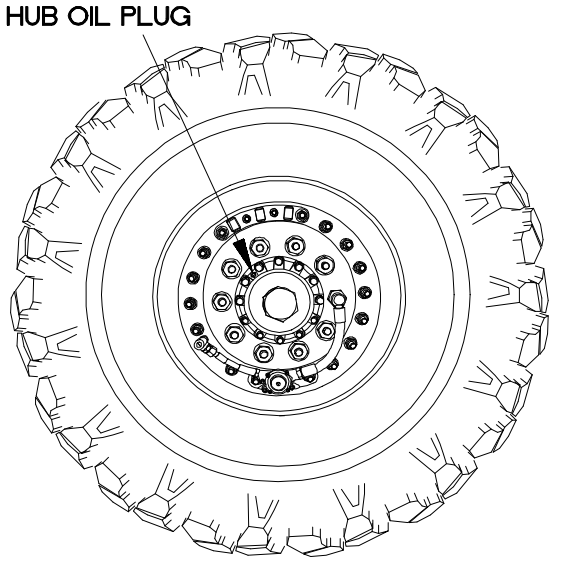
i4. FRONT BRAKES OVERHEAT AND/OR DO NOT RELEASE (CONT)



(1) Disconnect and tag air hoses from brake chambers at affected wheel(s).
(2) Unscrew brake chambers from hub and remove wedge assembly from wheels (para 11-4).
(3) Inspect wedge spring for damage.
(4) Inspect rollers for flattening or damage.
(5) Manually check operation of wedge assembly in plunger chamber.
(6) Install wedge assembly and brake chamber (para 11-4).
(7) Install front wheel brake components and adjust brakes (para 11-2).



(1) Install wheel(s) (TM 9-2320-366-10-1).
(2) Rotate affected wheel(s) by hand and listen for loose or damaged bearings.
(3) If wheel makes grinding sound during rotation, replace wheel bearings (para 10-2).
(4) Grasp wheel on opposite sides of top and bottom and pull in and out.
(5) If wheel has excessive play on the axle, replace wheel bearings (para 10-2).
(6) Check wheel hub oil level (Appendix H).
(7) If oil level is low, replace wheel bearings (para 10-2).
(8) Lower wheels to ground and remove trestle stands.



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i5. VEHICLE BRAKES UNEVENLY, BRAKES PULL TO ONE SIDE OR GRAB

INITIAL SETUP

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

Personnel Required
(2)

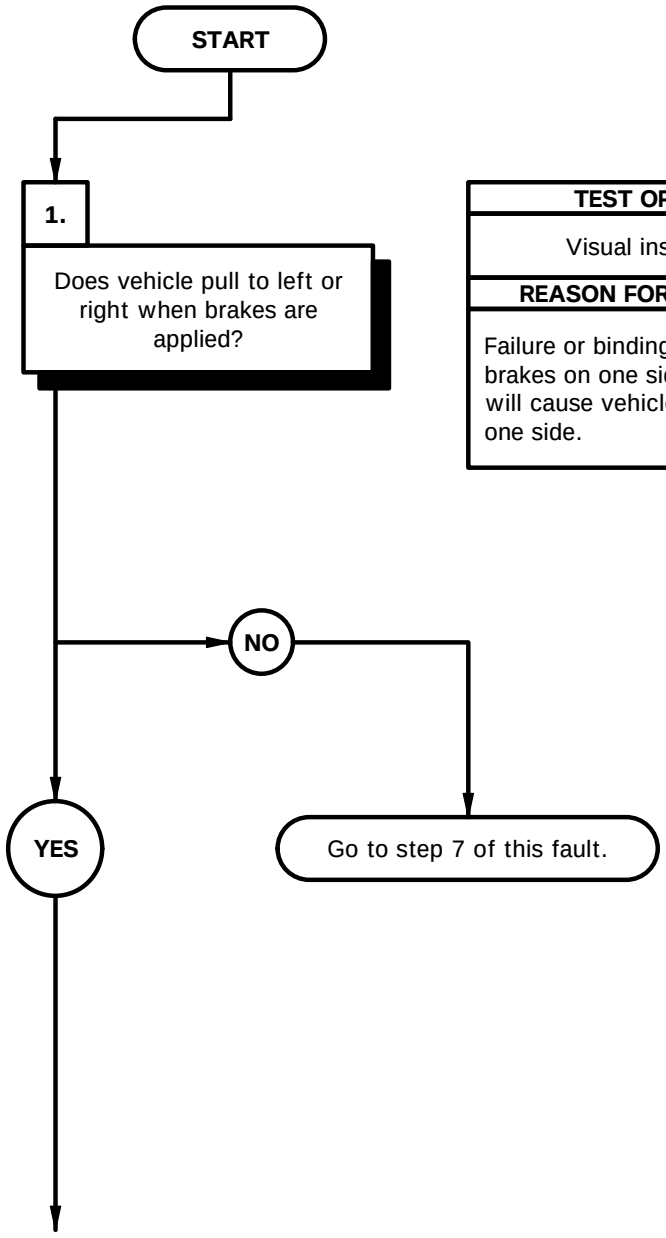
Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 46, Appendix C)
Trestle, Motor Vehicle Maintenance (2) (Item 47, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 58, Appendix C)

KNOWN INFO

Air tanks pressurized.

POSSIBLE PROBLEMS

Contaminated front wheel brake shoes.
Faulty front wheel brake adjustment.
Faulty front axle quick release valve.
Faulty air hose to front brake air chamber.
Faulty front brake vent hose.
Faulty front brake air chamber.
Faulty load sensing valve.
Contaminated rear brake shoes.
Faulty rear wheel brake adjustment.
Faulty relay valve.
Faulty air hose to rear brake air chamber.
Faulty rear brake vent hose or vent valve.
Faulty rear brake air chamber(s).



TEST OPTIONS

Visual inspection

REASON FOR QUESTION

Failure or binding of front brakes on one side of vehicle will cause vehicle to pull to one side.

(1) Start engine (TM 9-2320-366-10-1).
(2) Test drive unloaded vehicle and apply brakes.
(3) Note response of brakes on both sides of vehicle and on each axle.
(4) Shut down engine (TM 9-2320-366-10-1).
(5) If vehicle pulls to one side when brakes are applied, front brakes are faulty.
(6) If all rear wheels lock up before front wheels, load sensing valve may need adjustment or is faulty.
(7) If individual rear wheel(s) lock up or drag, individual rear wheel brakes may need adjustment or are faulty.

i5. VEHICLE BRAKES UNEVENLY, BRAKES PULL TO ONE SIDE OR GRAB (CONT)

KNOWN INFO

Air tanks pressurized.

POSSIBLE PROBLEMS

Contaminated front wheel brake shoes.
Faulty front wheel brake adjustment.
Faulty front axle quick release valve.
Faulty air hose to front brake air chamber.
Faulty front brake vent hose.
Faulty front brake air chamber.
Faulty load sensing valve.
Contaminated rear brake shoes.
Faulty rear wheel brake adjustment.
Faulty relay valve.
Faulty air hose to rear brake air chamber.
Faulty rear brake vent hose or vent valve.
Faulty rear brake air chamber(s).

WARNING
Read WARNING on following page.

2. Are front wheel brake shoes free from contamination, oil, and grease?

TEST OPTIONS

Visual inspection

REASON FOR QUESTION

Brakes will slip or bind if brake shoes are contaminated.

NO → Clean brake shoes (para 2-43) and replace wheel bearing seals (para 10-2).

YES

KNOWN INFO

Air tanks pressurized.
Front wheel brake shoes OK.

POSSIBLE PROBLEMS

Faulty front wheel brake adjustment.
Faulty front axle quick release valve.
Faulty air hose to front brake air chamber.
Faulty front brake vent hose.
Faulty front brake air chamber.
Faulty load sensing valve.
Contaminated rear brake shoes.
Faulty rear wheel brake adjustment.
Faulty relay valve.
Faulty air hose to rear brake air chamber.
Faulty rear brake vent hose or vent valve.
Faulty rear brake air chamber(s).

3. Do brakes at one front wheel fail to apply?

TEST OPTIONS

Visual inspection

REASON FOR QUESTION

If one front wheel brake does not apply, vehicle will pull to other side when brakes are applied.

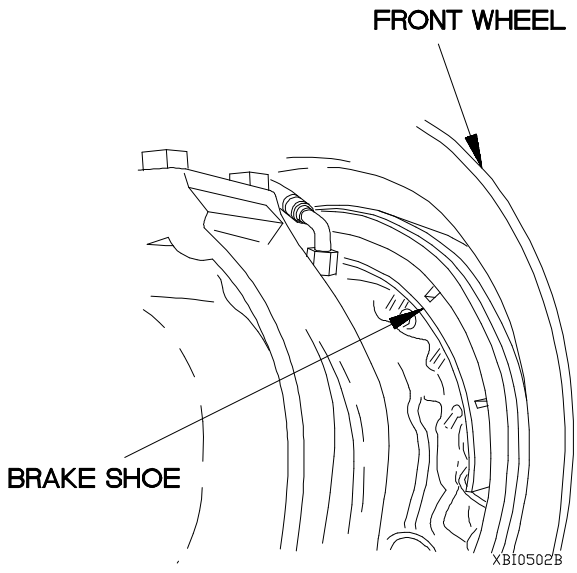
NO → Perform brake shoe clearance adjustment (para 11-2).

YES

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.

(1) Lift front axle so that front wheels are off the ground and support with maintenance trestles.
(2) Rotate wheel and check for contamination, oil, or grease at brake shoe linings.
(3) If oil contamination is present replace wheel bearing seals (para 10-2).



(1) Apply brakes and observe operation of brake shoes at both front wheels.
(2) If brake shoes fail to apply on one side, brake air delivery system or brake air chamber is faulty on that side.
(3) If both wheel brakes apply, adjust brake shoe clearance (para 11-2).
(4) Rotate wheel on affected side by hand and check if wheel grabs or is hard to turn.
(5) If wheel resists turning by hand, adjust brake shoe clearance (para 11-2).

i5. VEHICLE BRAKES UNEVENLY, BRAKES PULL TO ONE SIDE OR GRAB (CONT)

KNOWN INFO

Air tanks pressurized.
Front wheel brake shoes OK.
Front wheel brake adjustment OK.

POSSIBLE PROBLEMS

Faulty front axle quick release valve.
Faulty air hose to front brake air chamber.
Faulty front brake vent hose.
Faulty front brake air chamber.
Faulty load sensing valve.
Contaminated rear brake shoes.
Faulty rear wheel brake adjustment.
Faulty relay valve.
Faulty air hose to rear brake air chamber.
Faulty rear brake vent hose or vent valve.
Faulty rear brake air chamber(s).

4. When brakes are applied, is air present at front axle quick release valve delivery port to failed brake?

TEST OPTIONS

Audible and Visual inspection

REASON FOR QUESTION

If front axle quick release valve is providing air to only one delivery hose, front brakes will only apply on one side.

NO → Replace front axle quick release valve (para 11-17).

YES

KNOWN INFO

Air tanks pressurized.
Front wheel brake shoes OK.
Front wheel brake adjustment OK.
Front axle quick release valve OK.

POSSIBLE PROBLEMS

Faulty air hose to front brake air chamber.
Faulty front brake vent hose.
Faulty front brake air chamber.
Faulty load sensing valve.
Contaminated rear brake shoes.
Faulty rear wheel brake adjustment.
Faulty relay valve.
Faulty air hose to rear brake air chamber.
Faulty rear brake vent hose or vent valve.
Faulty rear brake air chamber(s).

5. Is air present at front brake air chamber on affected side of vehicle when brakes are applied?

TEST OPTIONS

Audible and Visual inspection

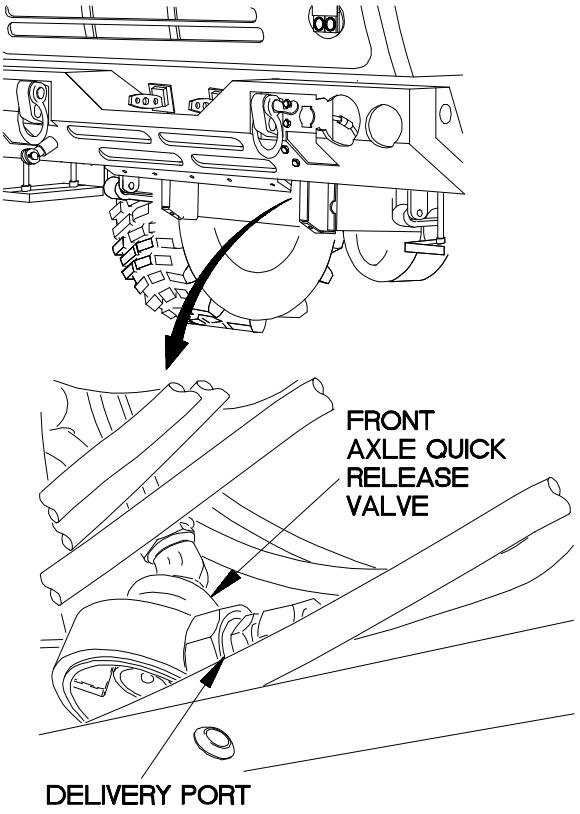
REASON FOR QUESTION

If air hose to front brake(s) is damaged or blocked, brakes will not operate on affected side of vehicle.

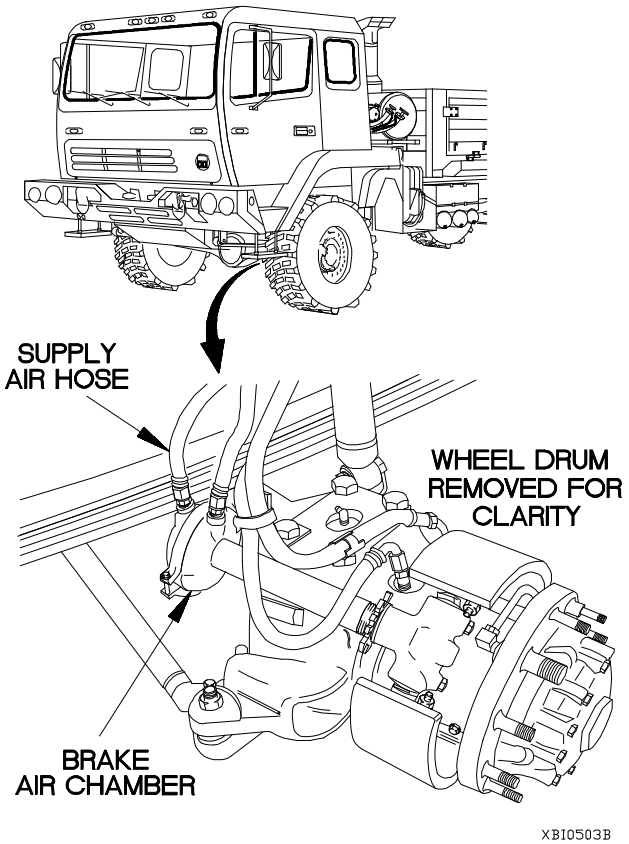
NO → Replace damaged air hose(s) (para 11-21).

YES

(1) Remove gravel deflector extension and gravel deflector (para 14-13).
(2) Loosen delivery air hose on affected side of front axle quick release valve.
(3) Apply brakes.
(4) Listen for escaping air at delivery port of front axle quick release valve when brake is applied.
(5) If escaping air cannot be heard at delivery port for affected side, replace front axle quick release valve (para 11-17).
(6) Tighten delivery air hose at front axle quick release valve.
(7) Install gravel deflector and gravel deflector extension (para 14-13).



(1) Loosen supply air hose(s) at front brake air chamber(s).
(2) Apply brakes.
(3) Listen for escaping air at supply air hose(s) when brakes are applied.
(4) If escaping air cannot be heard, replace supply air hose(s) (para 11-21).
(5) Tighten supply air hose(s) at front brake air chamber(s).



i5. VEHICLE BRAKES UNEVENLY, BRAKES PULL TO ONE SIDE OR GRAB (CONT)

KNOWN INFO

Air tanks pressurized.
Front wheel brake shoes OK.
Front wheel brake adjustment OK.
Front axle quick release valve OK.
Air hose to front brake air chamber OK.

POSSIBLE PROBLEMS

Faulty front brake vent hose.
Faulty front brake air chamber.
Faulty load sensing valve.
Contaminated rear brake shoes.
Faulty rear wheel brake adjustment.
Faulty relay valve.
Faulty air hose to rear brake air chamber.
Faulty rear brake vent hose or vent valve.
Faulty rear brake air chamber(s).

6. Is vent hose at affected wheel brake free from obstructions?

TEST OPTIONS

Audible and Visual inspection

REASON FOR QUESTION

If vent hose is plugged, brakes will not apply on affected side of vehicle.

NO → Blow vent hose clear of obstruction or replace damaged vent hose (para 11-21).

YES → Replace front brake air chamber (para 11-7).

KNOWN INFO

Air tanks pressurized.
Front wheel brake shoes OK.
Front wheel brake adjustment OK.
Front axle quick release valve OK.
Air hose to front brake air chamber OK.
Front brake vent hose OK.
Front brake air chamber OK.

POSSIBLE PROBLEMS

Faulty load sensing valve.
Contaminated rear brake shoes.
Faulty rear wheel brake adjustment.
Faulty relay valve.
Faulty air line to rear brake air chamber.
Faulty rear brake vent line or vent valve.
Faulty rear brake air chamber(s).

7. Did rear brakes lock up before front brakes during road test?

TEST OPTIONS

Visual inspection

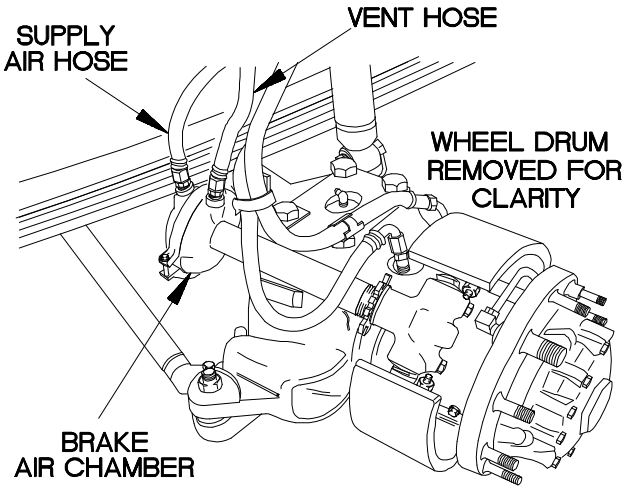
REASON FOR QUESTION

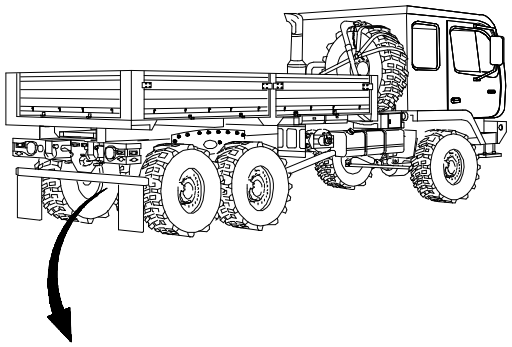
If rear brakes lock up or grab before front brakes on unloaded vehicle, load sensing valve needs adjustment or is faulty.

NO → Adjust or replace load sensing valve (para 11-10).

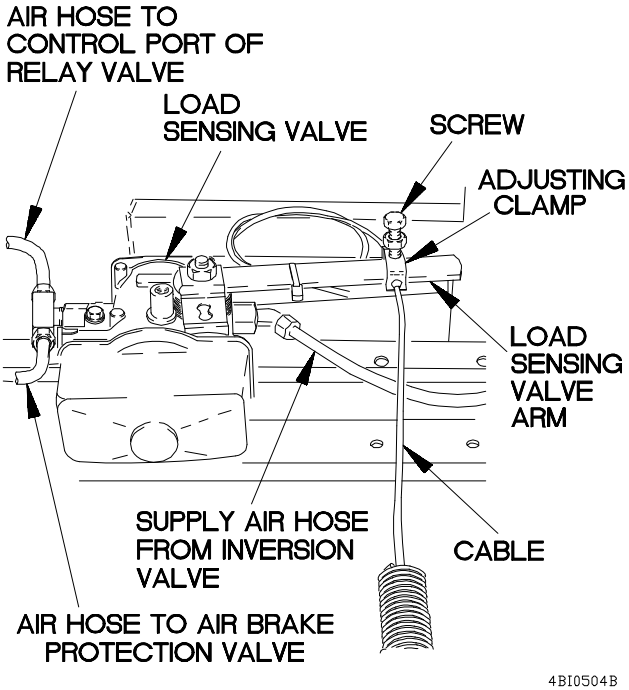
YES

(1) Disconnect vent hose at front brake air chamber.
(2) Blow compressed air through vent hose.
(3) Check for air escaping at vent.
(4) Attach vent hose at front brake air chamber.
(5) Raise front axle off maintenance trestles.
(6) Remove maintenance trestles and lower front wheels to ground.





(1) If rear brakes locked up before front brakes on road test of unloaded vehicle, check load sensing valve hardware, arm position, adjusting clamp, and cable.
(2) If valve arm is in full up position (valve spring rest position), adjust or replace load sensing valve (para 11-10).



i5. VEHICLE BRAKES UNEVENLY, BRAKES PULL TO ONE SIDE OR GRAB (CONT)

KNOWN INFO

Air tanks pressurized.
Front wheel brake shoes OK.
Front wheel brake adjustment OK.
Front axle quick release valve OK.
Air hose to front brake air chamber OK.
Front brake vent hose OK.
Front brake air chamber OK.
Load sensing valve OK.

POSSIBLE PROBLEMS

Contaminated rear brake shoes.
Faulty rear wheel brake adjustment.
Faulty relay valve.
Faulty air hose to rear brake air chamber.
Faulty rear brake vent hose or vent valve.
Faulty rear brake air chamber(s).

8. Are rear brake shoes on affected wheel(s) free from contamination, oil, and grease?

TEST OPTIONS

Visual inspection

REASON FOR QUESTION

Rear brakes will slip or bind on affected wheels if brake shoes are contaminated.

NO → Clean brake shoes (para 2-43) and replace wheel bearing seals (para 10-2).

YES

KNOWN INFO

Air tanks pressurized.
Front wheel brake shoes OK.
Front wheel brake adjustment OK.
Front axle quick release valve OK.
Air hose to front brake air chamber OK.
Front brake vent hose OK.
Front brake air chamber OK.
Load sensing valve OK.
Rear brake shoes OK.

POSSIBLE PROBLEMS

Faulty rear wheel brake adjustment.
Faulty relay valve.
Faulty air hose to rear brake air chamber.
Faulty rear brake vent hose or vent valve.
Faulty rear brake air chamber(s).

9. Do brakes at one or more rear wheels fail to apply?

TEST OPTIONS

Visual inspection

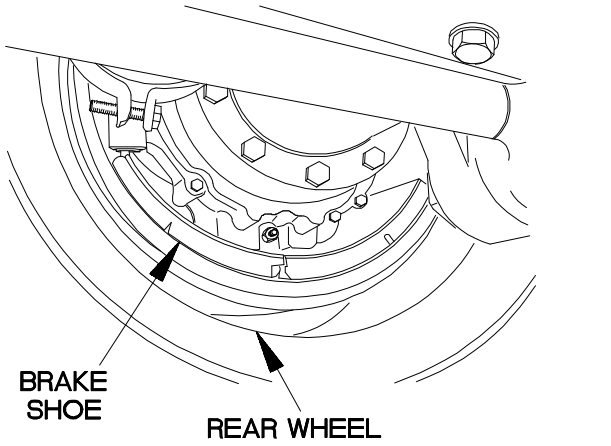
REASON FOR QUESTION

If one rear or more rear wheel brakes do not apply, vehicle will drag or swerve when brakes are applied.

NO → Perform brake shoe clearance adjustment (para 11-3).

YES

(1) Lift axle of each affected rear wheel so that rear wheels are off the ground and support with maintenance trestles.
(2) Rotate affected wheel(s) and check for signs of contamination, oil, or grease at brake shoe linings.
(3) If oil contamination is present, replace wheel bearing seals (para 10-2).
(4) Lift affected axle off maintenance trestles.
(5) Remove maintenance trestles and lower wheels to ground.



(1) Chock wheels.
(2) Release parking brake (TM 9-2320-366-10-1).
(3) Apply brakes and observe operation of brake shoes at rear wheels.
(4) If brake shoes fail to apply on one side or at one wheel, brake air delivery system or brake air chamber is faulty on that side or at that wheel.
(5) If all rear wheel brakes apply, adjust brake shoe clearance (para 11-3).

i5. VEHICLE BRAKES UNEVENLY, BRAKES PULL TO ONE SIDE OR GRAB (CONT)

KNOWN INFO

Air tanks pressurized.
Front wheel brake shoes OK.
Front wheel brake adjustment OK.
Front axle quick release valve OK.
Air hose to front brake air chamber OK.
Front brake vent hose OK.
Front brake air chamber OK.
Load sensing valve OK.
Rear brake shoes OK.
Rear wheel brake adjustment OK.

POSSIBLE PROBLEMS

Faulty relay valve.
Faulty air hose to rear brake air chamber.
Faulty rear brake vent hose or vent valve.
Faulty rear brake air chamber(s).

10. Is air present at relay valve delivery port(s) to affected wheel(s)?

TEST OPTIONS

Audible and Visual inspection

REASON FOR QUESTION

If relay valve does not supply air to all rear brake air chambers, braking will be uneven.

NO → Replace relay valve (para 11-14).

YES

KNOWN INFO

Air tanks pressurized.
Front wheel brake shoes OK.
Front wheel brake adjustment OK.
Front axle quick release valve OK.
Air hose to front brake air chamber OK.
Front brake vent hose OK.
Front brake air chamber OK.
Load sensing valve OK.
Rear brake shoes OK.
Rear wheel brake adjustment OK.
Relay valve OK.

POSSIBLE PROBLEMS

Faulty air hose to rear brake air chamber.
Faulty rear brake vent hose or vent valve.
Faulty rear brake air chamber(s).

11. Is air present at brake air chamber of affected wheel(s) when brakes are applied?

TEST OPTIONS

Audible and Visual inspection

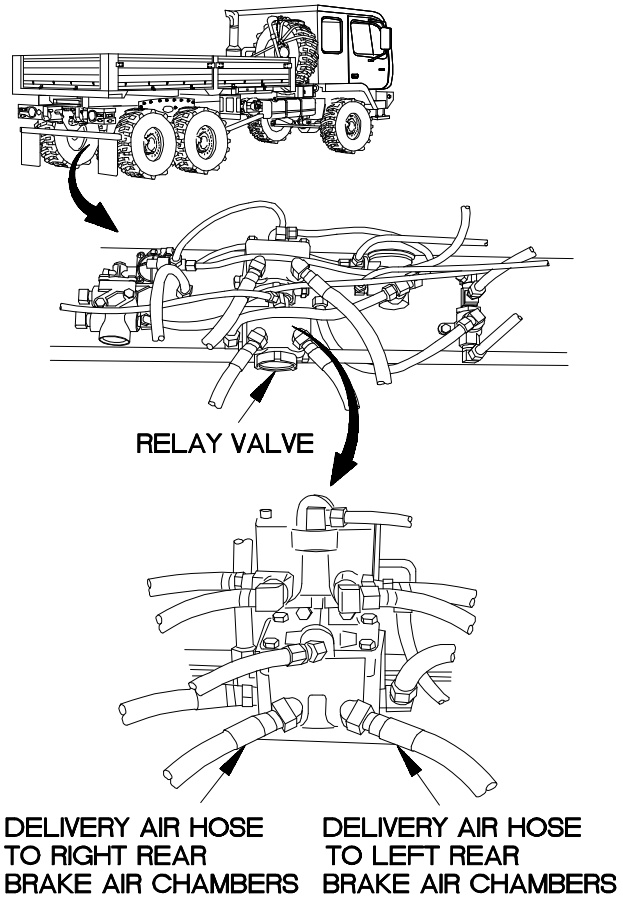
REASON FOR QUESTION

If air hose(s) to affected brake(s) is damaged or blocked, brakes will not operate at affected wheel(s).

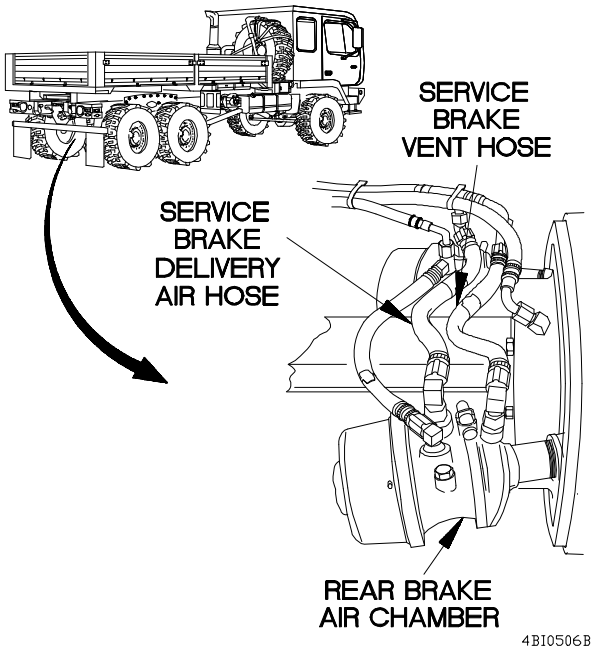
NO → Replace damaged air hose(s) (para 11-21).

YES

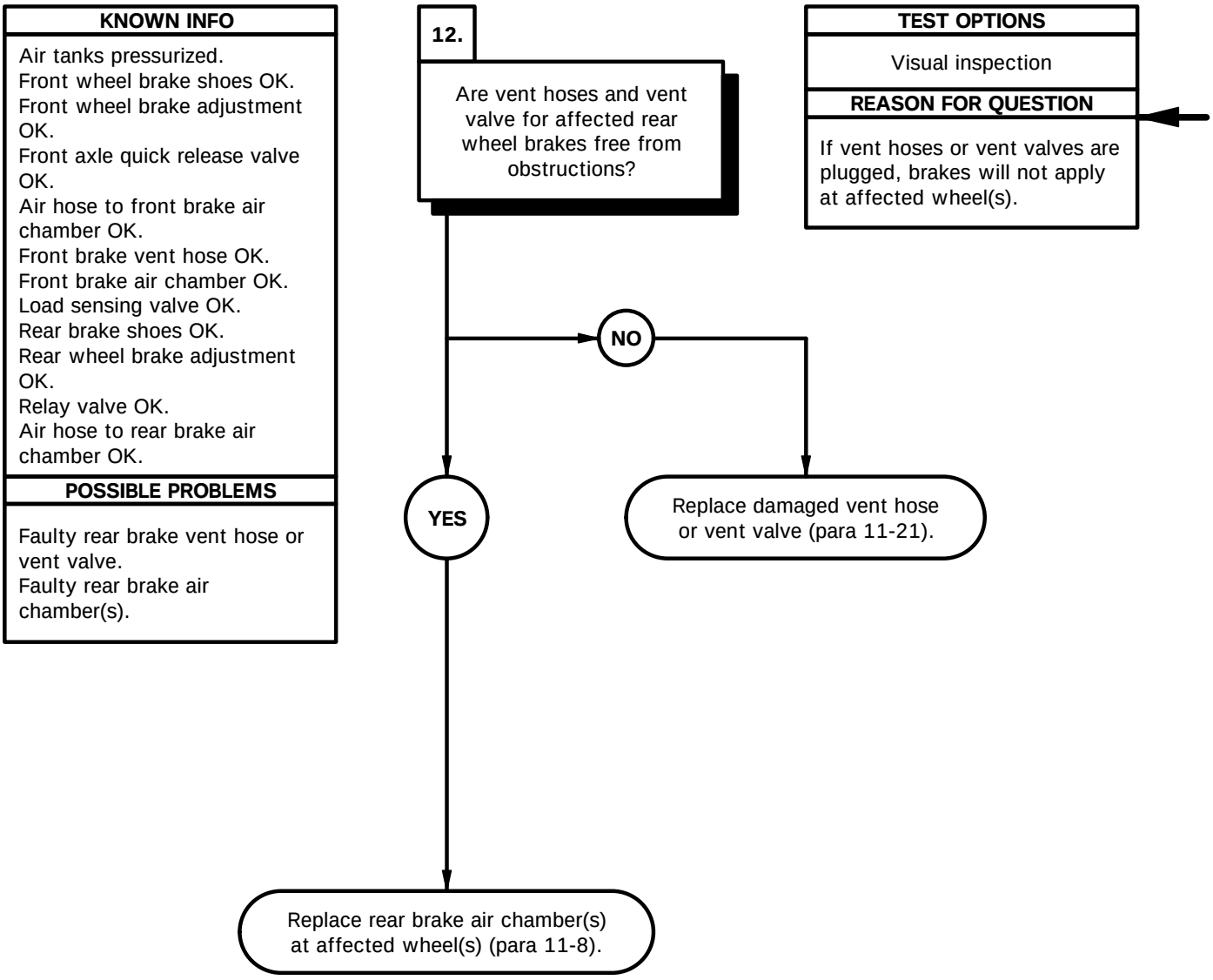
(1) Loosen delivery air hoses on relay valve delivery ports.
(2) Apply brakes.
(3) Listen for escaping air from relay valve delivery ports when brakes are applied.
(4) If escaping air cannot be heard, replace relay valve (para 11-14).
(5) Tighten delivery air hoses on relay valve delivery ports.



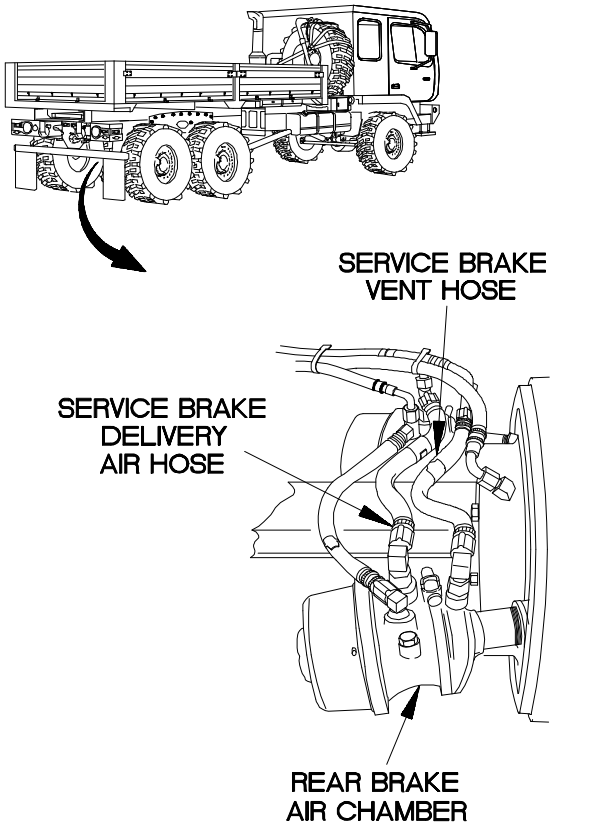
(1) Loosen service brake air hose on rear brake air chamber.
(2) Apply brakes.
(3) Listen for escaping air from service brake air hose when brakes are applied.
(4) If escaping air cannot be heard, replace air hose (para 11-21).
(5) Tighten service brake air hose on rear brake air chamber.
(6) Apply parking brake (TM 9-2320-366-10-1).



i5. VEHICLE BRAKES UNEVENLY, BRAKES PULL TO ONE SIDE OR GRAB (CONT)



(1) Disconnect vent hose(s) on rear brake air chamber(s).
(2) Blow compressed air through vent hoses.
(3) Check for presence of air at vent valve.
(4) Connect vent hose(s) on rear brake air chamber(s).
(5) Remove wheel chocks (TM 9-2320-366-10-1).



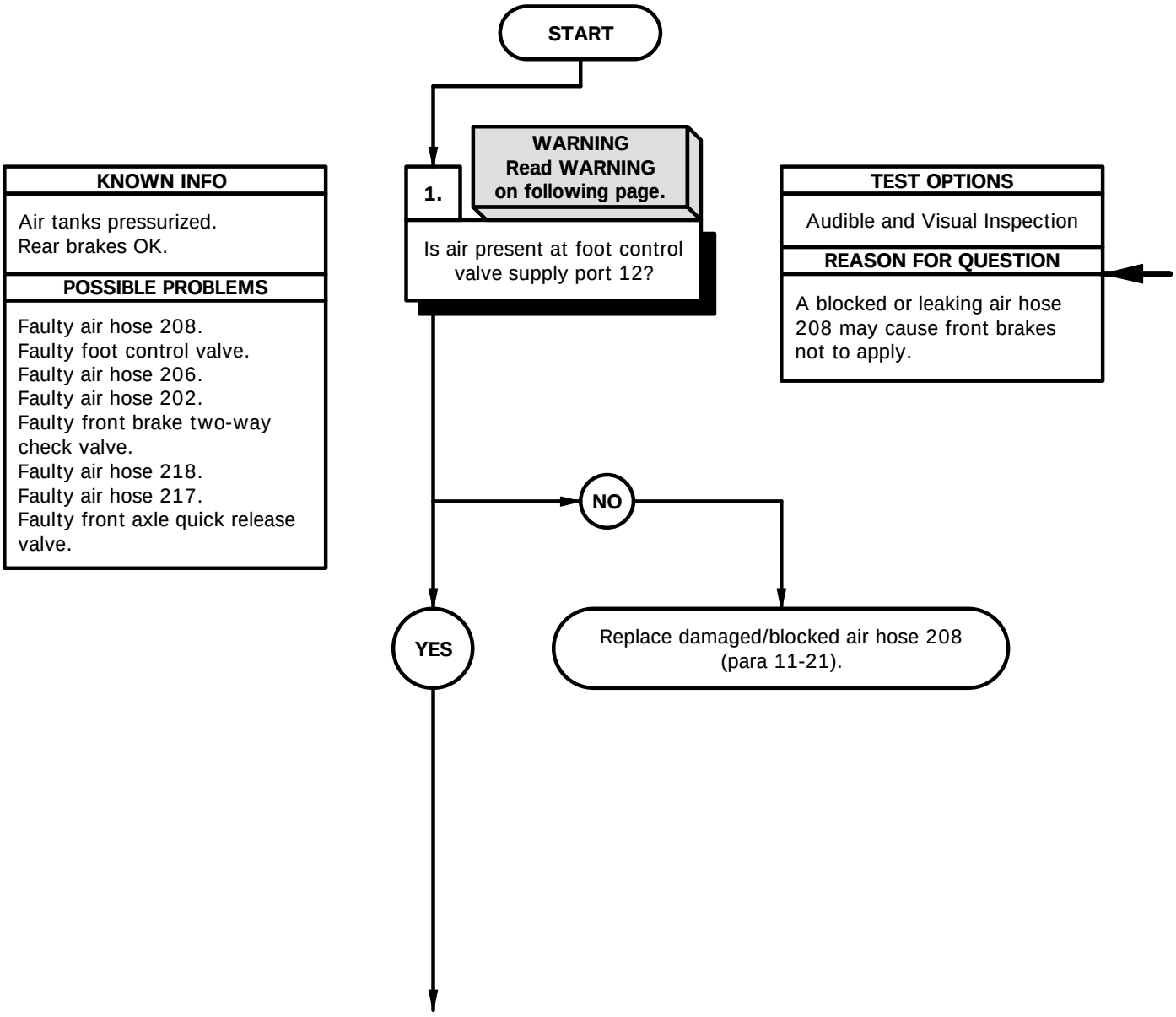
i6. FRONT BRAKES DO NOT APPLY

INITIAL SETUP

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

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Goggles, Industrial (Item 15, Appendix C)



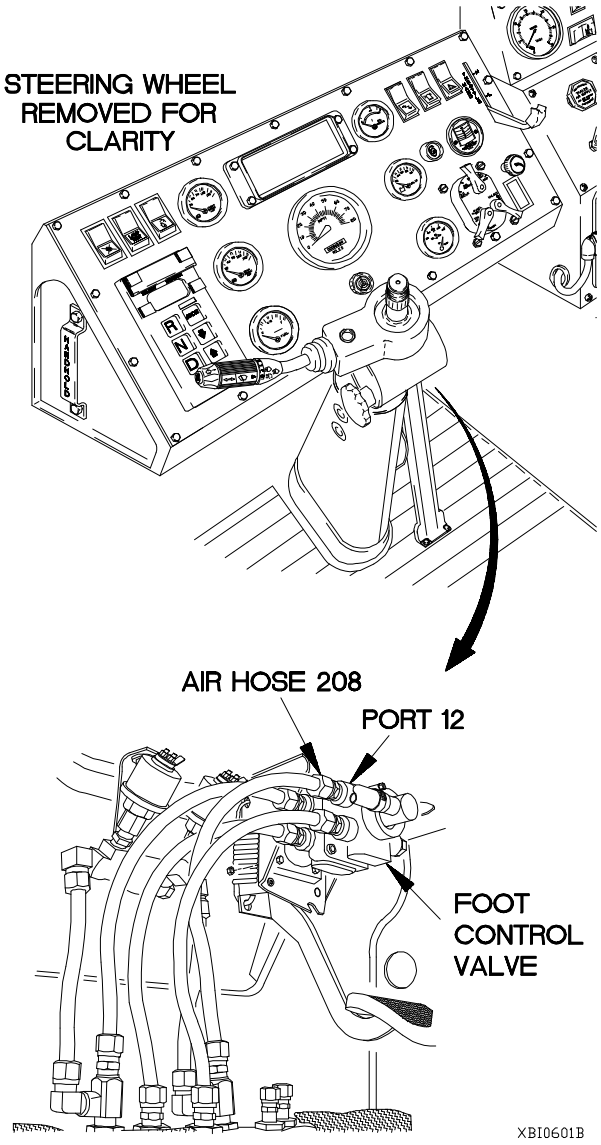
WARNING

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

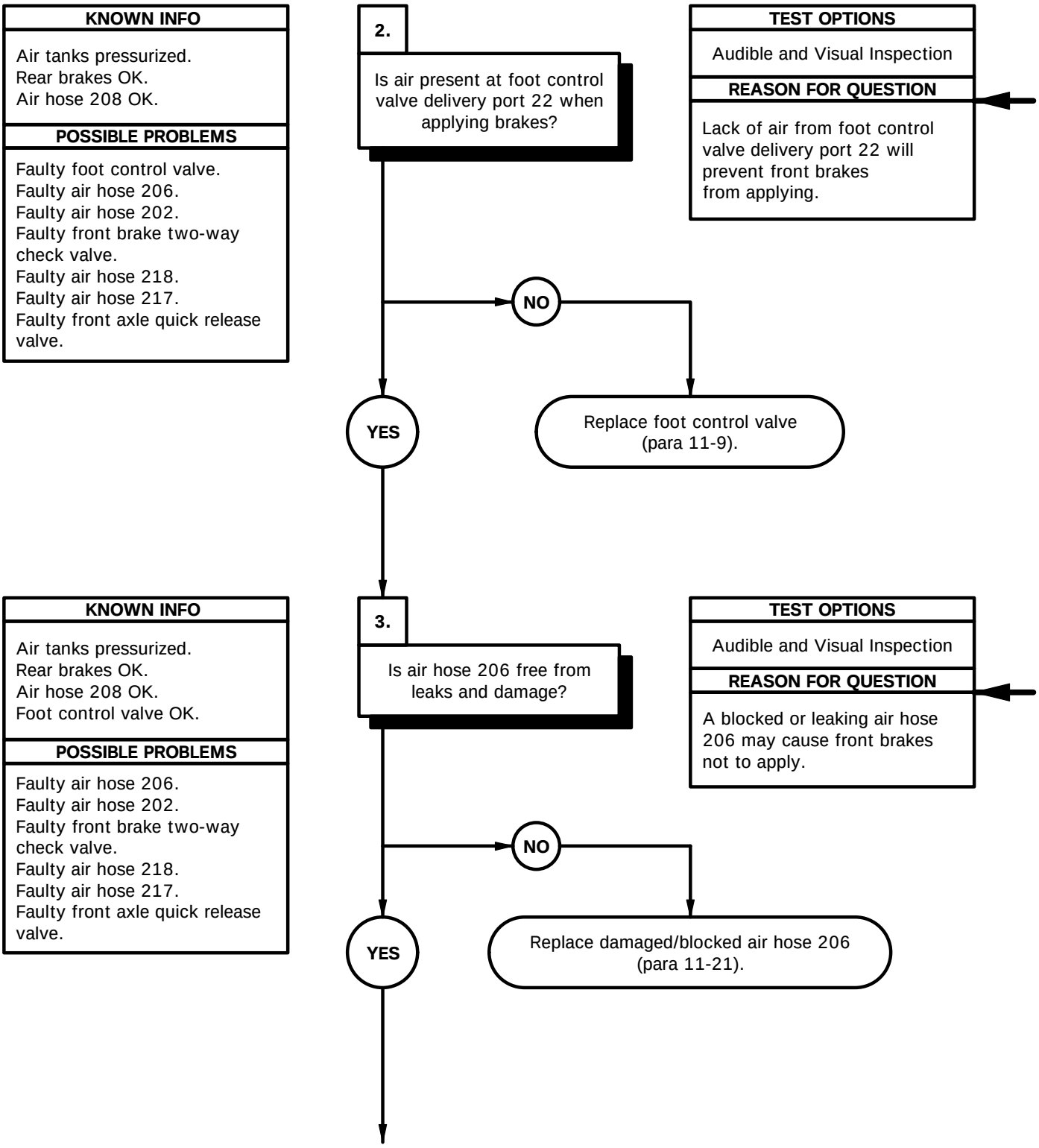
NOTE

Air system pressure must be in the 90-120 psi operating range to begin brake system troubleshooting. If air pressure cannot be maintained within operating range, proceed to Air System Troubleshooting.

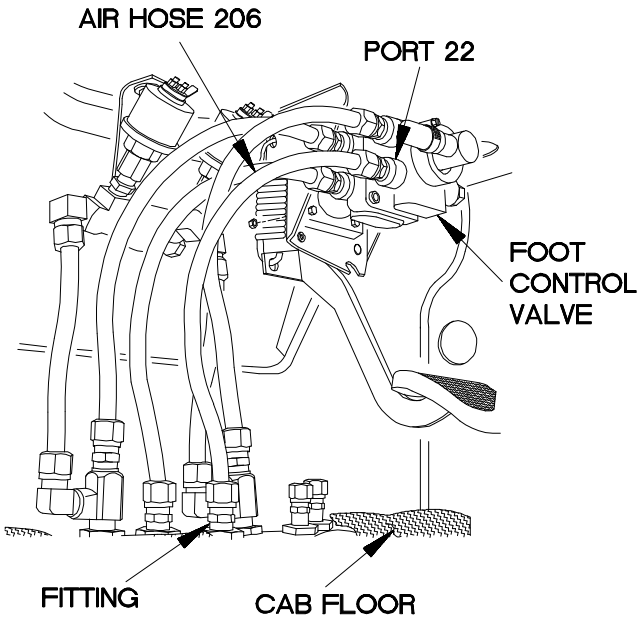
(1) Loosen air hose 208 at foot control valve supply port 12 and listen for presence of escaping air.
(2) If escaping air cannot be heard, replace air hose 208 (para 11-21).
(3) Tighten air hose 208 on foot control valve supply port 12.



i6. FRONT BRAKES DO NOT APPLY (CONT)

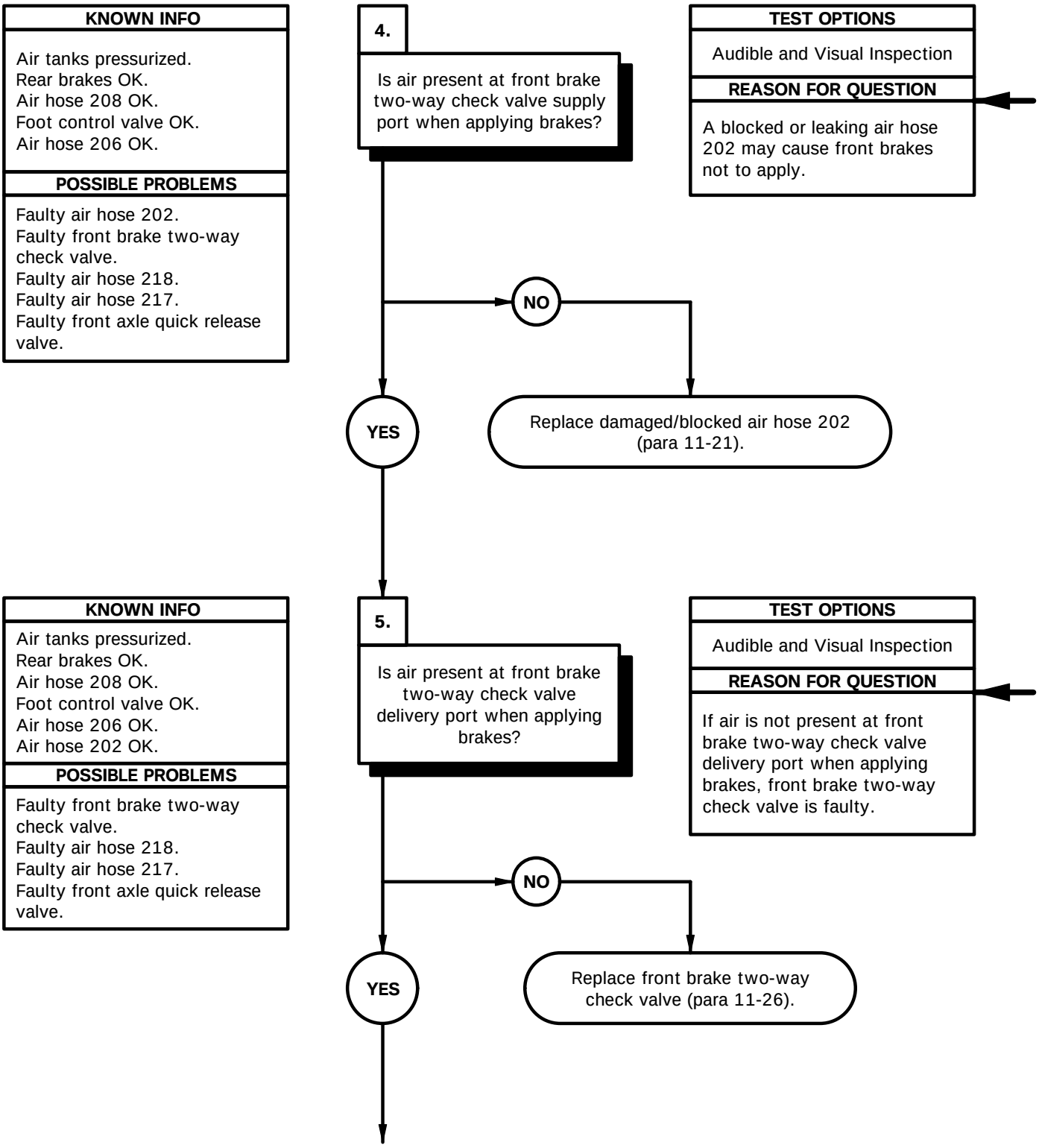


(1) Loosen air hose 206 on foot control valve delivery port 22.
(2) Apply foot brake.
(3) Listen for escaping air from air hose 206 when brakes are applied.
(4) If escaping air cannot be heard when brakes are applied, replace foot control valve (para 11-9).
(5) Tighten air hose 206 on foot control valve delivery port 22.



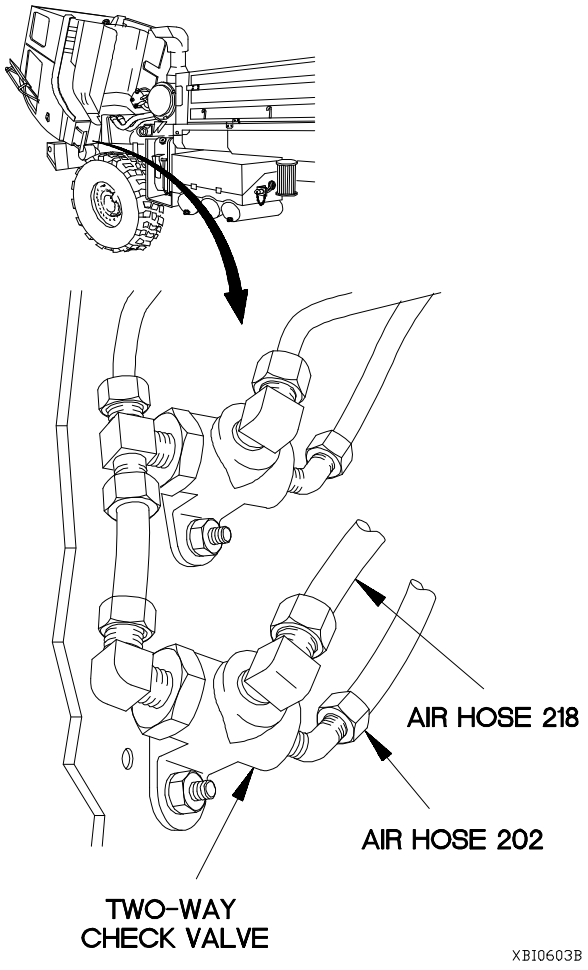
(1) Loosen air hose 206 at fitting on cab floor.
(2) Apply foot brake.
(3) Listen for air escaping from air hose 206 when brakes are applied.
(4) If escaping air cannot be heard when brakes are applied, replace air hose 206 (para 11-21).
(5) Tighten air hose 206 at fitting on cab floor.

i6. FRONT BRAKES DO NOT APPLY (CONT)

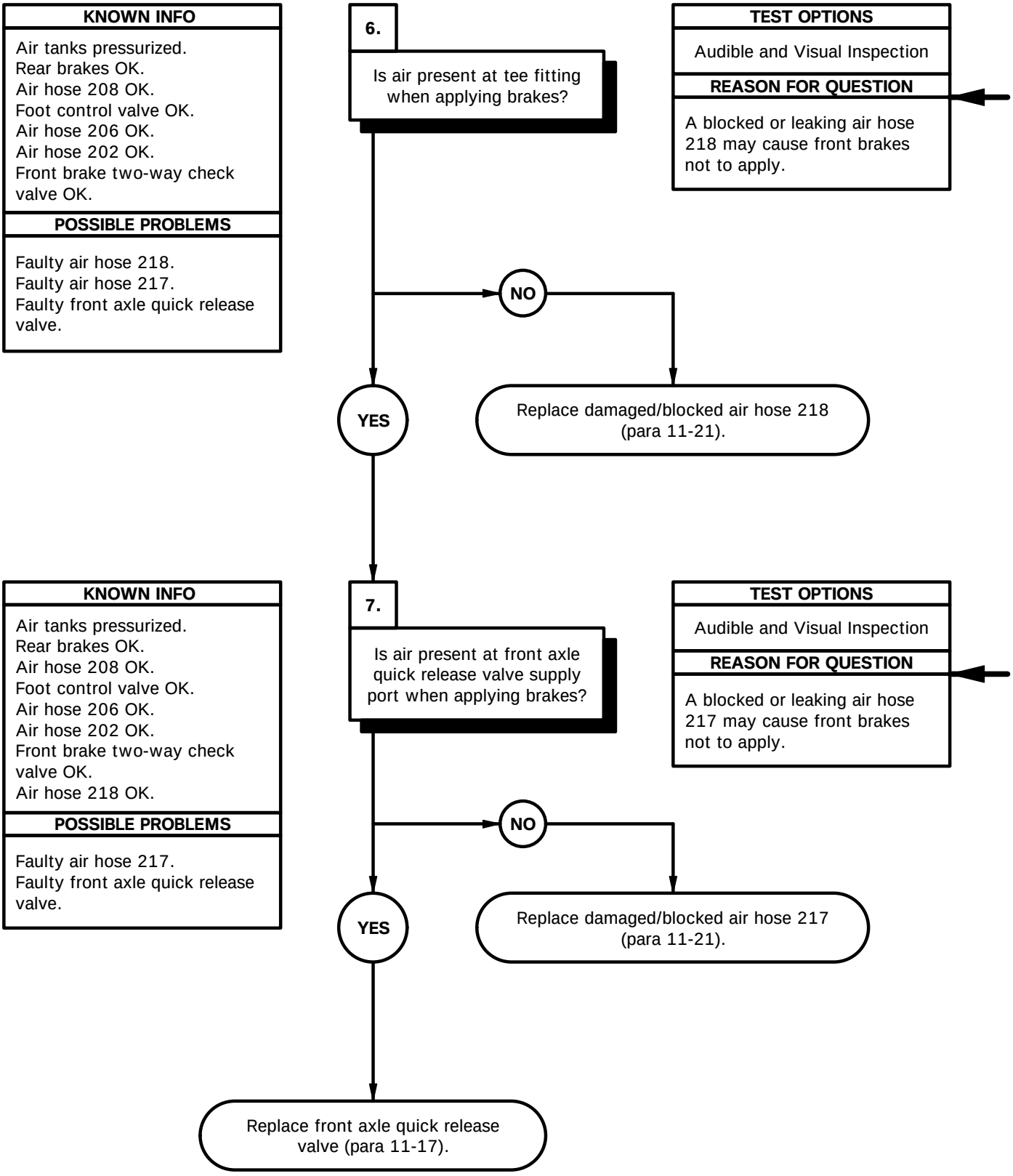


(1) Loosen air hose 202 on front brake two-way check valve supply port.
(2) Apply foot brake.
(3) Listen for escaping air from air hose 202 when brakes are applied.
(4) If escaping air cannot be heard when brakes are applied, replace air hose 202 (para 11-21).
(5) Tighten air hose 202 on front brake two-way check valve supply port.

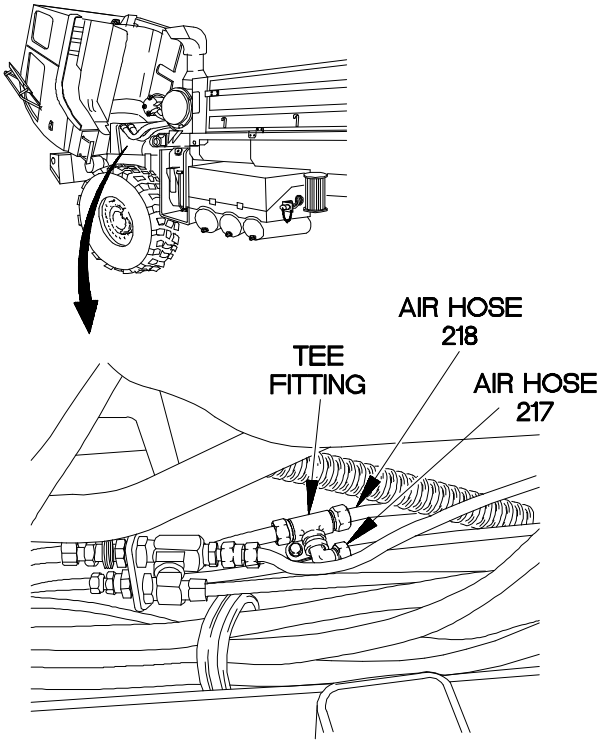
(1) Loosen air hose 218 on front brake two-way check valve delivery port.
(2) Apply foot brake.
(3) Listen for air escaping from front brake two-way check valve delivery port when brakes are applied.
(4) If escaping air cannot be heard when brakes are applied, replace front brake two-way check valve (para 11-26).
(5) Tighten air hose 218 on front brake two-way check valve delivery port.



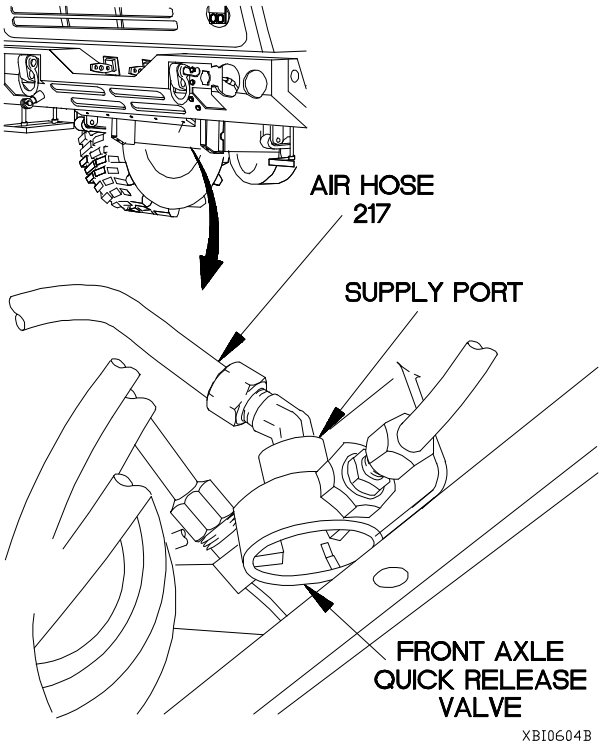
i6. FRONT BRAKES DO NOT APPLY (CONT)



(1) Loosen air hose 218 on tee fitting.
(2) Apply foot brake.
(3) Listen for escaping air from air hose 218 when brakes are applied.
(4) If escaping air cannot be heard when brakes are applied, replace air hose 218 (para 11-21).
(5) Tighten air hose 218 on tee fitting.



(1) Remove gravel deflector extension and gravel deflector (para 14-13).
(2) Loosen air hose 217 on front axle quick release valve supply port.
(3) Apply foot brake.
(4) Listen for air escaping from air hose 217 when brakes are applied.
(5) If escaping air cannot be heard when brakes are applied, replace air hose 217 (para 11-21).
(6) If air can be heard escaping when brakes are applied, replace front axle quick release valve (para 11-17).
(7) Tighten air hose 217 on front axle quick release valve supply port.
(8) Install gravel deflector and gravel deflector extension (para 14-13).



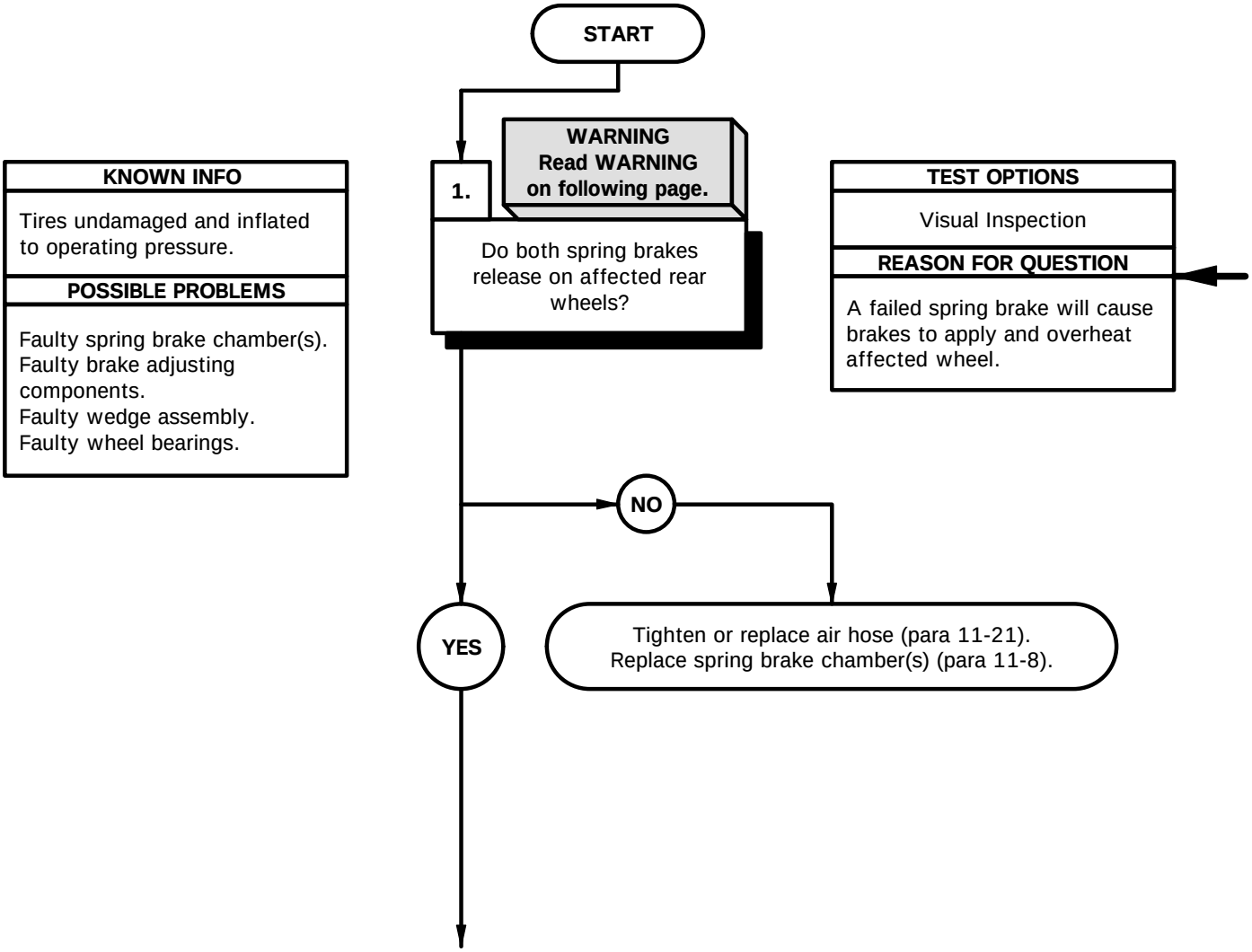
i7. REAR BRAKES OVERHEAT

INITIAL SETUP

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

Personnel Required
(2)

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 46, Appendix C)
Trestle, Motor Vehicle Maintenance (2) (Item 47, Appendix C)
Adjusting Tool, Brake Shoe (Item 2, Appendix C)



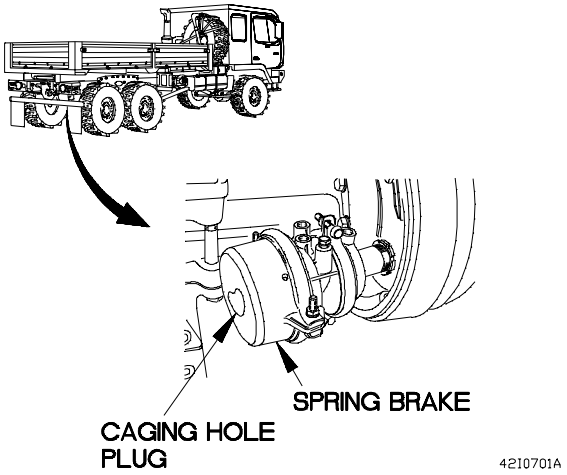
WARNING

- **Overheated brakes can cause severe burns. Perform task only when brakes have cooled. 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.**

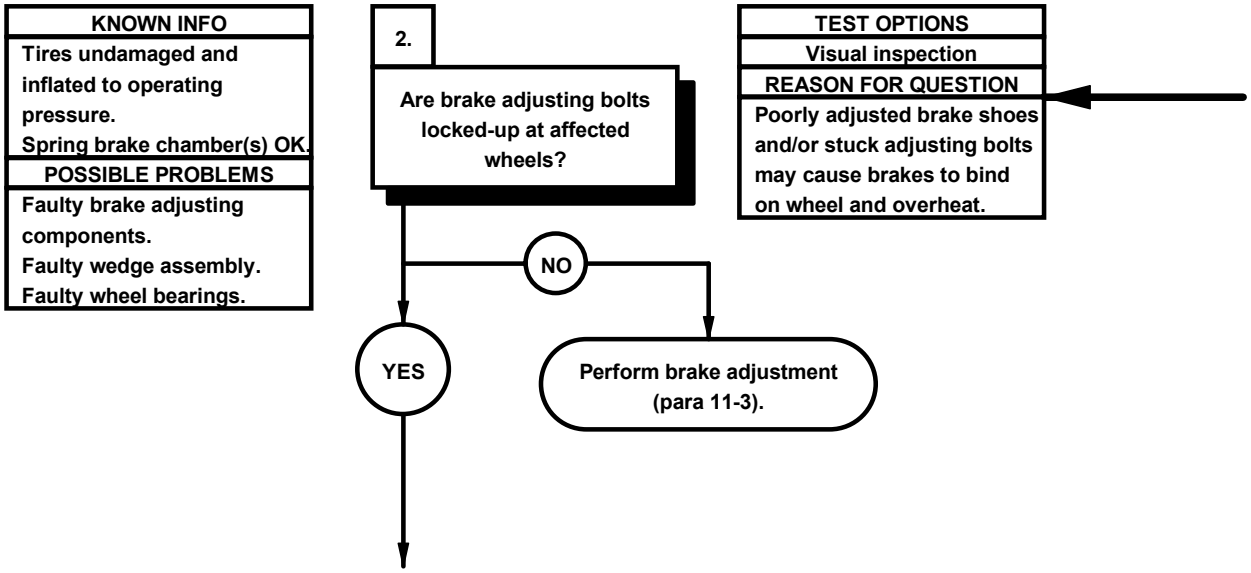
NOTE

If wheel drums are too hot for hand touch after road test of vehicle, brakes are overheated.

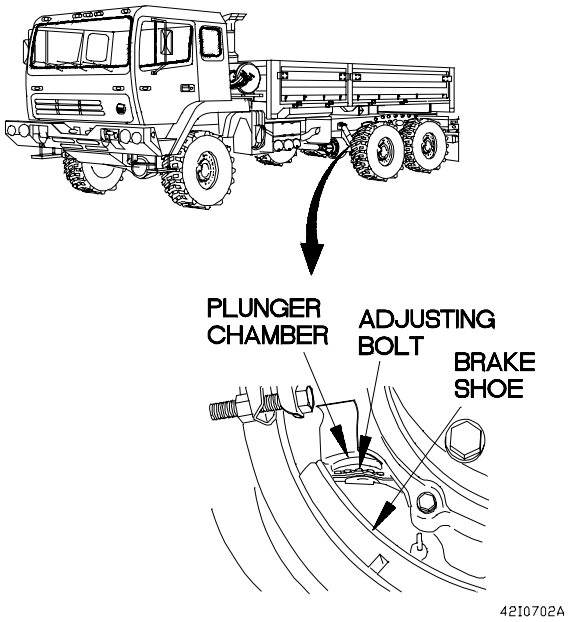
(1) Release parking brake (TM 9-2320-366-10-1).
(2) Check for presence of air at air hose to spring brake chamber. If air is present at spring brake chamber, replace fittings or air hose (para 11-21).
(3) Remove cover plug from caging hole at back of spring brake chamber (TM 9-2320-366-10-2).
(4) With flashlight directed at caging hole, apply and release parking brake. Check if spring retracts when air is supplied by releasing parking brake. If brake does not cage (retract) when air is supplied to spring brake chamber, replace spring brake chamber (para 11-8).
(5) Replace plug in caging hole of spring brake chamber (TM 9-2320-366-10-2).
(6) Apply parking brake (TM 9-2320-366-10-1).



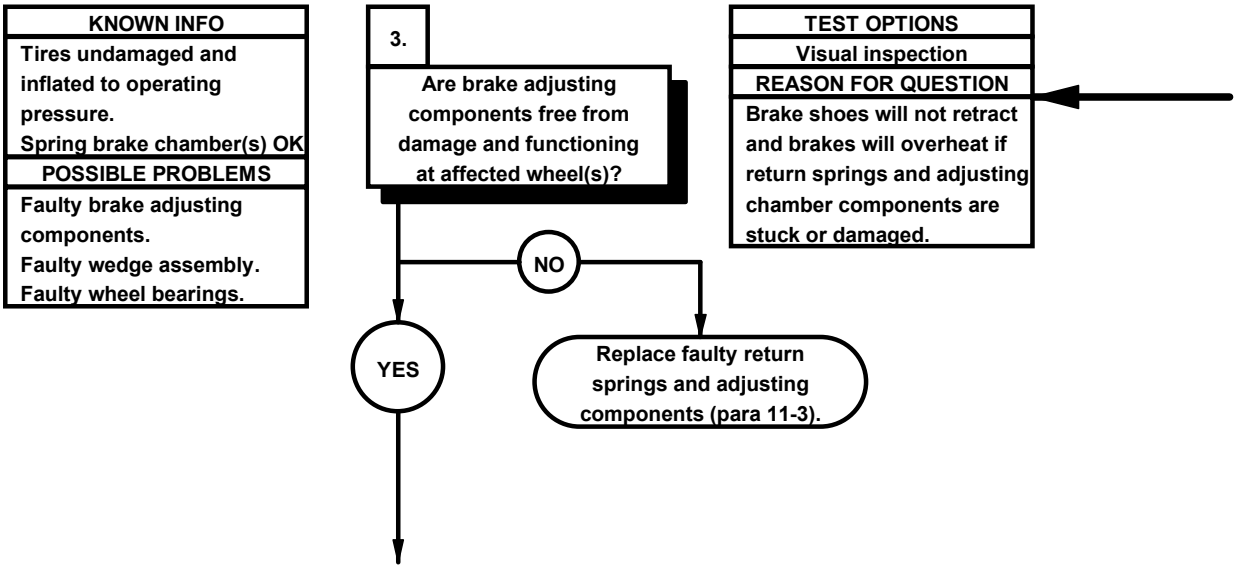
i7. REAR BRAKES OVERHEAT (CONT)



(1) Jack up axle with overheated brakes, and support with trestle stands.
(2) Release parking brake (TM 9-2320-366-10-1).
(3) Turn adjusting bolt clockwise with adjusting tool. If bolt will not turn or if brake shoes do not move away from wheel when adjuster is turned, perform brake adjustment (para 11-3).



i7. REAR BRAKES OVERHEAT (CONT)

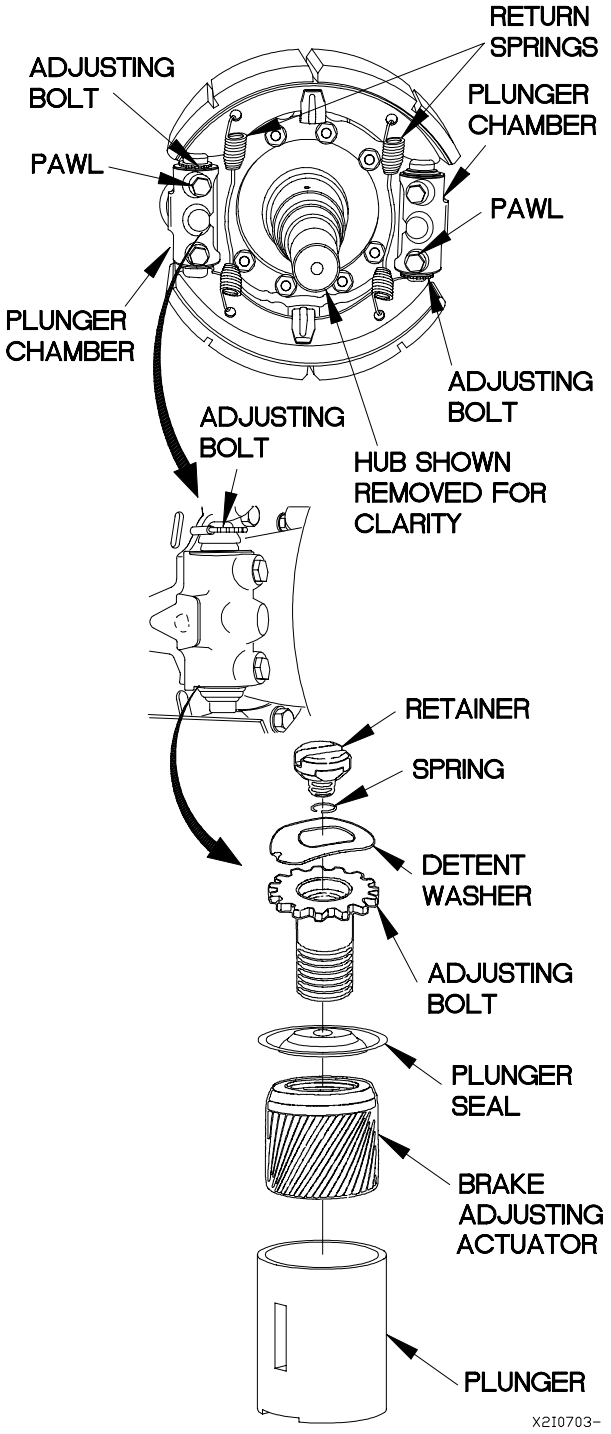


(1) Remove wheel(s) with affected brakes (TM 9-2320-366-10-1).
(2) Disassemble brakes (para 11-3).
(3) Inspect spring for stretching, bluing, damage, or breakage. If spring(s) is damaged, brake shoes will not retract from wheel.
(4) Check adjusting pawl spring for damage. Ensure springs are not missing or broken.
(5) Check adjusting pawl teeth for damage and abrasion.

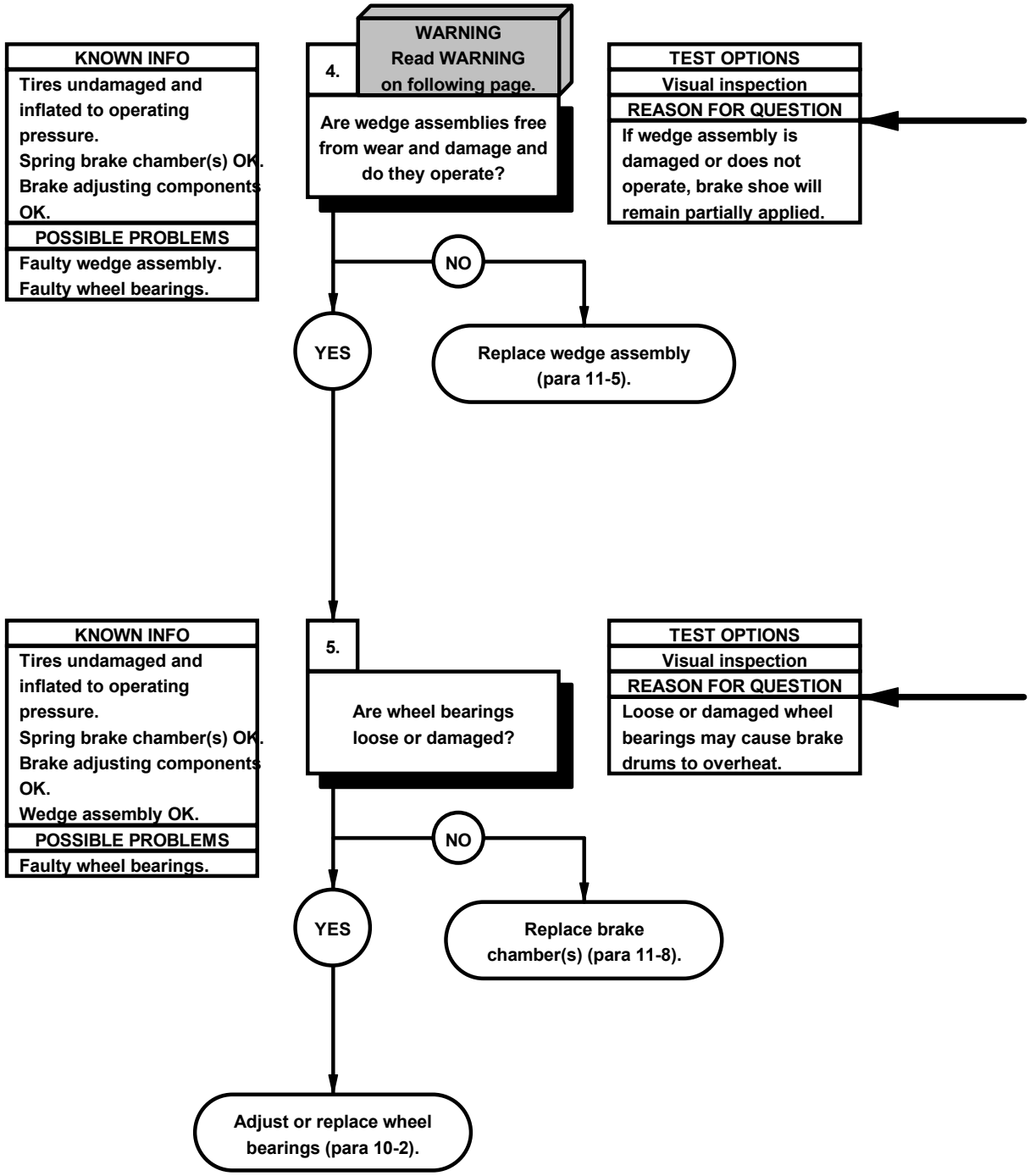
NOTE

A damaged seal may permit dirt to enter plunger chamber and interfere with adjustment.

(6) Ensure seal elements are not damaged or broken.
(7) Check actuator teeth for damage.
(8) Check plunger for freedom of movement inside plunger housing.



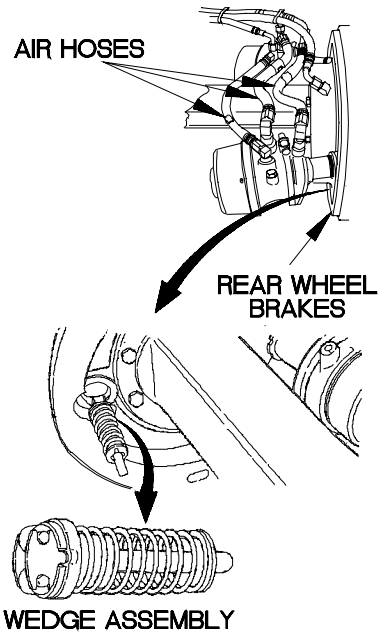
i7. REAR BRAKES OVERHEAT (CONT)



WARNING

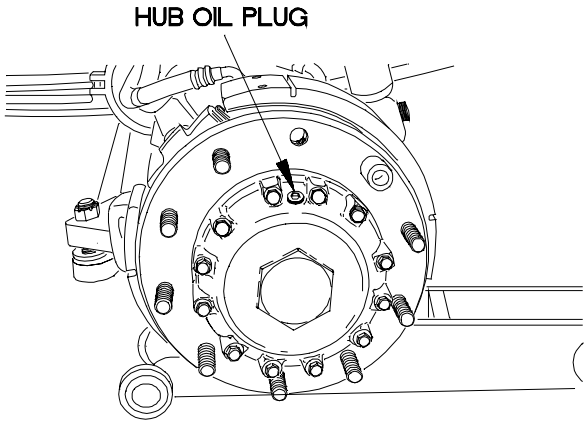
Spring brake chambers are very powerful. Cage spring brakes before removing chambers. Failure to comply may result in injury to personnel.

(1) Disconnect and tag air lines to spring brake chambers at wheel.
(2) Cage spring brakes on rear wheels (para 11-6).
(3) Unscrew brake chamber(s) from hub and remove wedge assembly from wheel (para 11-5).
(4) Inspect wedge spring for damage.
(5) Inspect rollers for flattening or damage.
(6) Manually check operation of wedge assembly in plunger chamber.
(7) Install wedge assembly and brake chambers (para 11-5).
(8) Install wheel brake components and adjust brakes (para 11-3).



X210704A

(1) Install wheels (TM 9-2320-366-10-1).
(2) Rotate affected wheel and listen for loose or damaged wheel bearings. If wheel makes grinding sound during rotation, adjust or replace wheel bearings (para 10-2).
(3) Grasp wheel on opposite sides, top and bottom, and pull in and out. If wheel has excessive play on the axle, adjust or replace wheel bearings (para 10-2).
(4) If wheel bearings are good, replace brake chamber(s) (para 11-8).
(5) Check wheel hub oil level (Appendix H). If oil level is low, replace wheel bearings (para 10-2).
(6) Set parking brake (TM 9-2320-366-10-1).
(7) Remove trestle stands and lower wheels to ground.



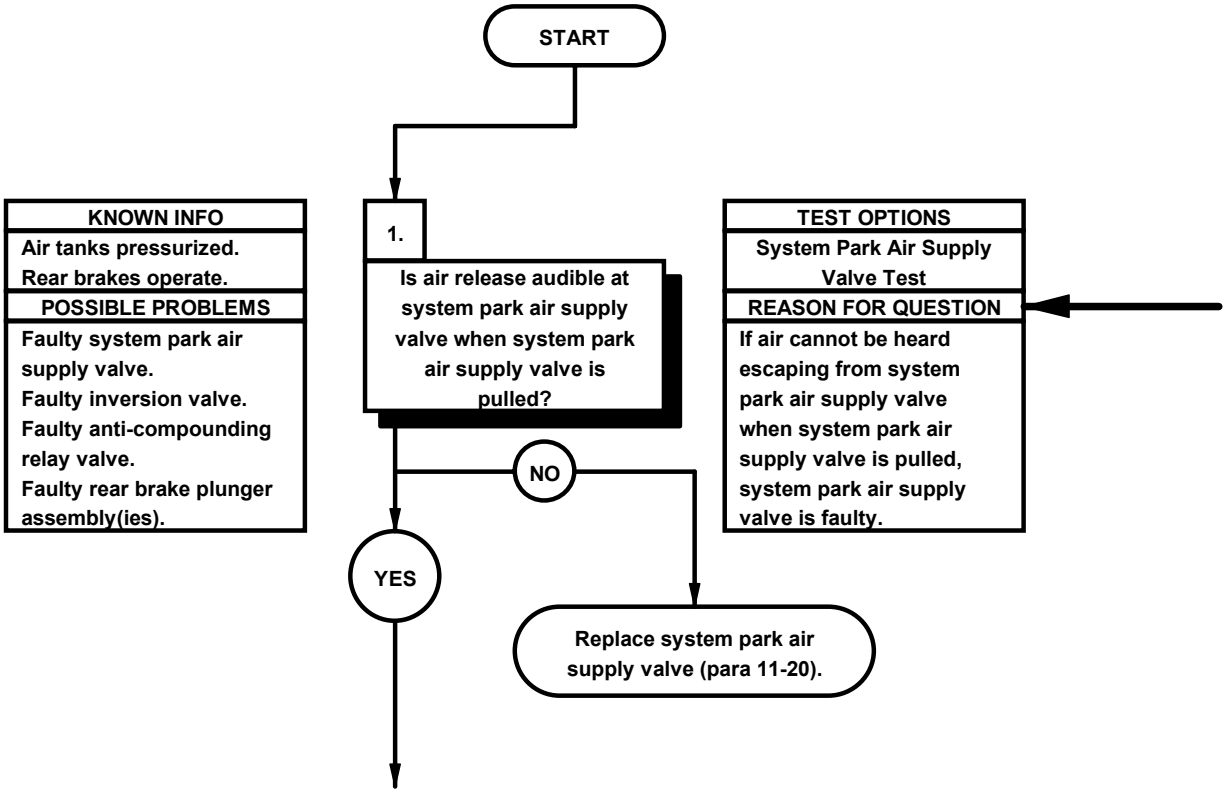
i8. PARKING BRAKE DOES NOT APPLY

INITIAL SETUP

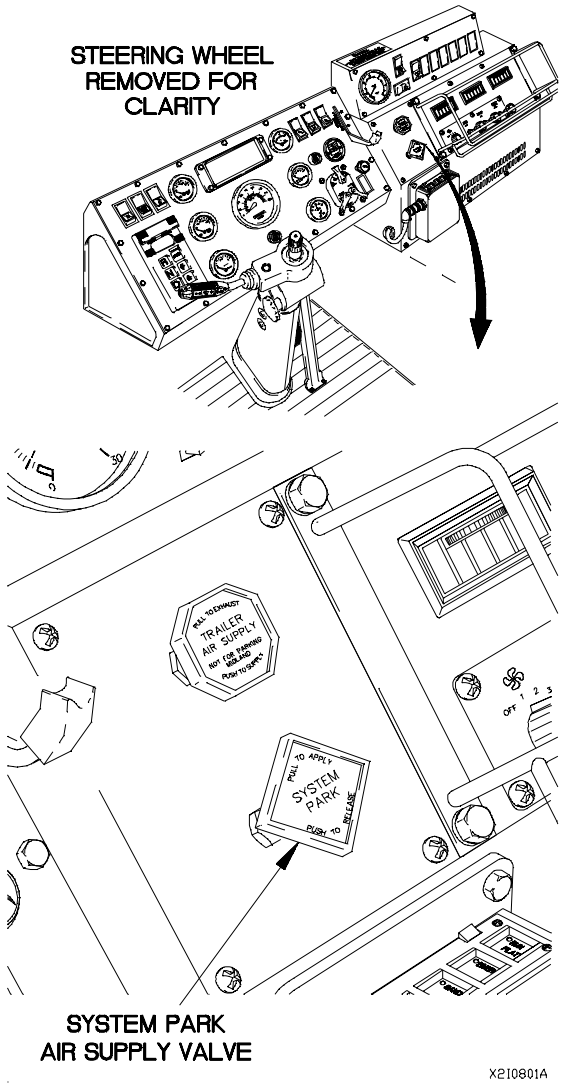
Equipment Conditions
Air tanks pressurized (TM 9-2320-366-10-1).
Engine shut down (TM 9-2320-366-10-1).

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Goggles, Industrial (Item 15, Appendix C)

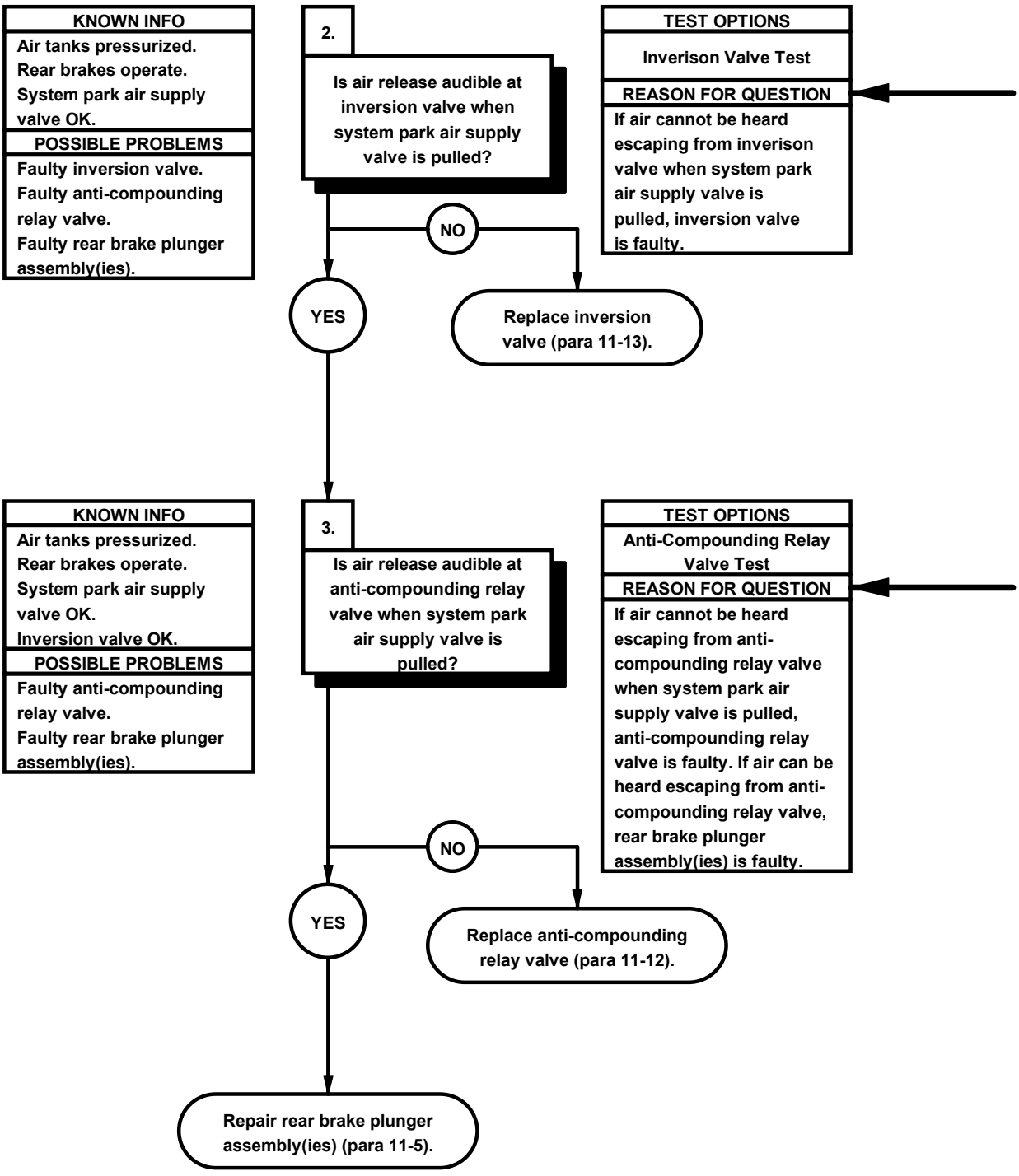
Personnel Required
(2)



SYSTEM PARK AIR SUPPLY VALVE TEST
(1) Push in system park air supply valve.
(2) Pull system park air supply valve out and note release of air.
(3) If air is not heard escaping from system park air supply valve, replace system park air supply valve (para 11-20).

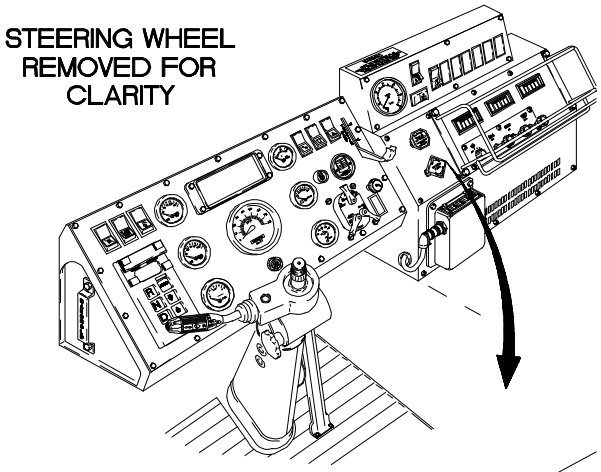


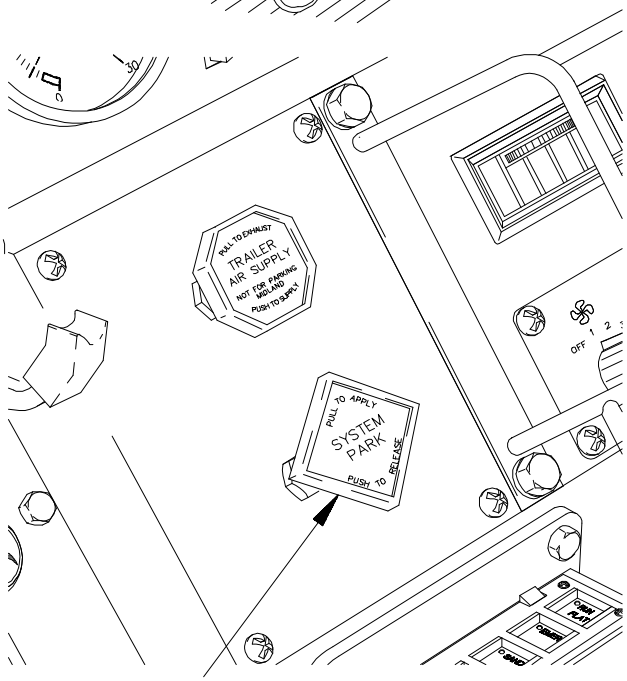
i8. PARKING BRAKE DOES NOT APPLY (CONT)

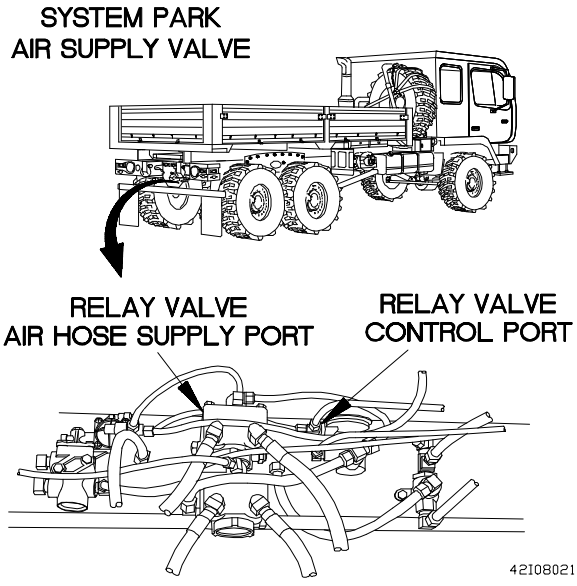


(1) Push in SYSTEM PARK air supply valve.
(2) Pull SYSTEM PARK air supply valve out and note release of air.
(3) If air is not heard escaping from inversion valve, replace inversion valve (para 11-13).

(1) Push in SYSTEM PARK air supply valve.
(2) Pull SYSTEM PARK air supply valve out and note release of air.
(3) If air is not heard escaping from anti-compounding relay valve, replace anti-compounding relay valve (para 11-12).
(4) If air is heard escaping from anti-compounding relay valve, repair rear brake plunger assembly(ies) (para 11-5).
(5) Pull SYSTEM PARK air supply valve out.





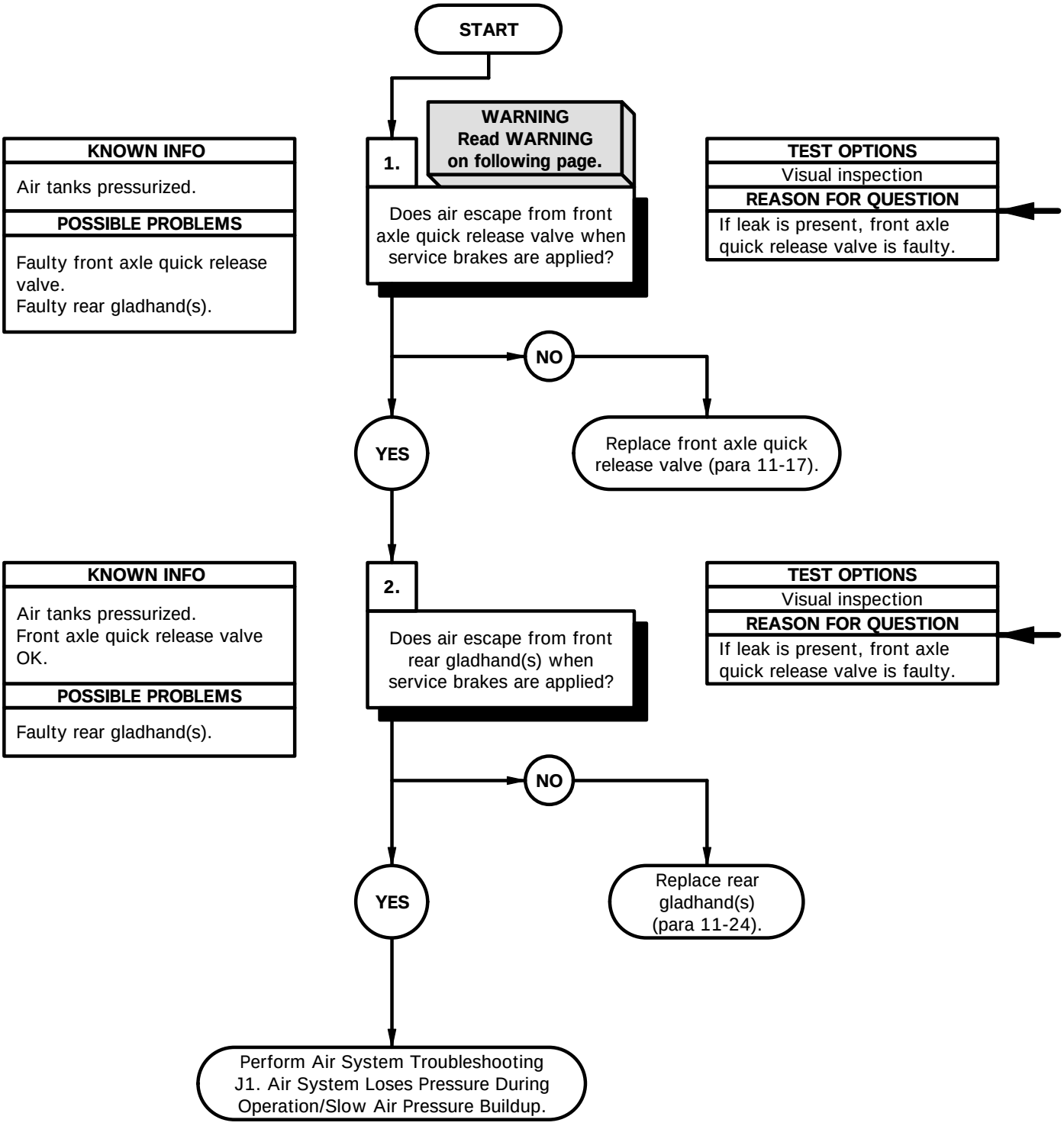


i9. BRAKE SYSTEM LOSES AIR WHEN SERVICE BRAKES ARE APPLIED

INITIAL SETUP

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

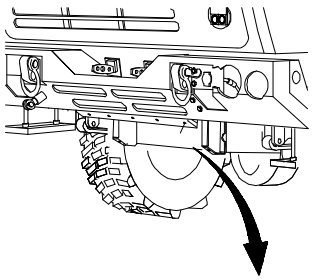
Tools and Special Tools
Tool Kit, Genl Mech (Item 46 Appendix C)
Goggles, Industrial (Item 15, Appendix C)

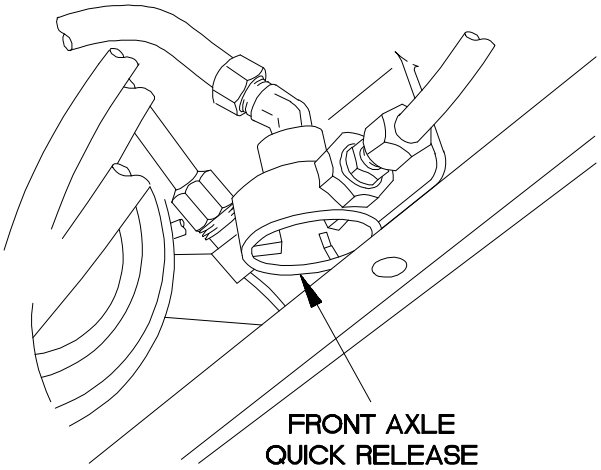


WARNING

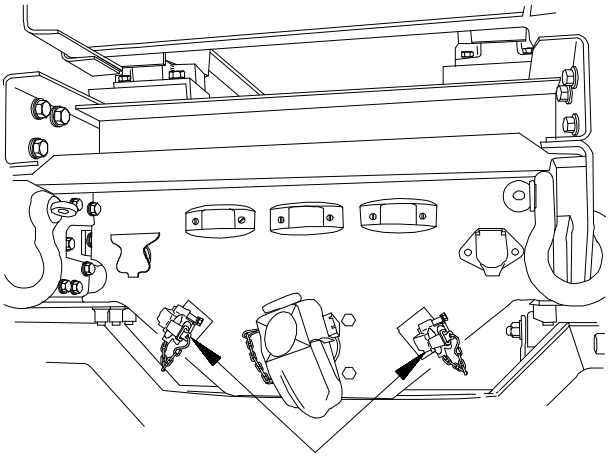
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

(1) Have assistant apply service brakes (TM 9-2320-366-10-1).
(2) Listen for air escaping from front axle quick release valve.
(3) If air leak is present, replace front axle quick release valve (para 11-17).





(1) Have assistant apply service brakes (TM 9-2320-366-10-1).
(2) Listen for air escaping from rear gladhand(s).
(3) If air leak is present, replace rear gladhand(s) (para 11-17).
(4) If air leak is not present, perform Air System Troubleshooting J1. Air System Loses Pressure During Operation/Slow Air Pressure Buildup.



2-21. AIR SYSTEM TROUBLESHOOTING

This paragraph covers Air System Troubleshooting. The Air System Fault Index, Table 2-49, lists faults for the Air System of the vehicle.

Table 2-49. Air System Fault Index

Fault No.	Description	Page
j1.	Air System Loses Pressure During Operation/Slow, No, or Incorrect Air Pressure Buildup	2-1948
j2.	Large Quantity of Moisture Expelled From Air Reservoirs	2-1964
j3.	Air Dryer Purges Constantly	2-1968
j4.	No Air Pressure Present at Rear Gladhand(s) (All Models Except M1088)	2-1972
j4A.	No Air Pressure Present at All M1088 Rear and Fifth Wheel Gladhands	2-1976.36
j4B.	No Air Pressure Present at M1088 Rear and/or Fifth Wheel EMERGENCY Gladhand(s)	2-1976.42
j4C.	No Air Pressure Present at M1088 Rear and/or Fifth Wheel SERVICE Gladhand(s)	2-1976.48
j4D.	M1088 Trailer Handbrake Control Does Not Operate	2-1976.60
j5.	Air System Pressure Builds Up More Than 120 psi (827 kPa) (Compressor Fails to Unload)	2-1978
j6.	Noisy Air Compressor Operation	2-1982
j7.	M1088 Rear Gladhand(s) Leaks or Does Not Operate	2-1986
j8.	M1091/M1094 Tailgate Release Does Not Operate	2-1988

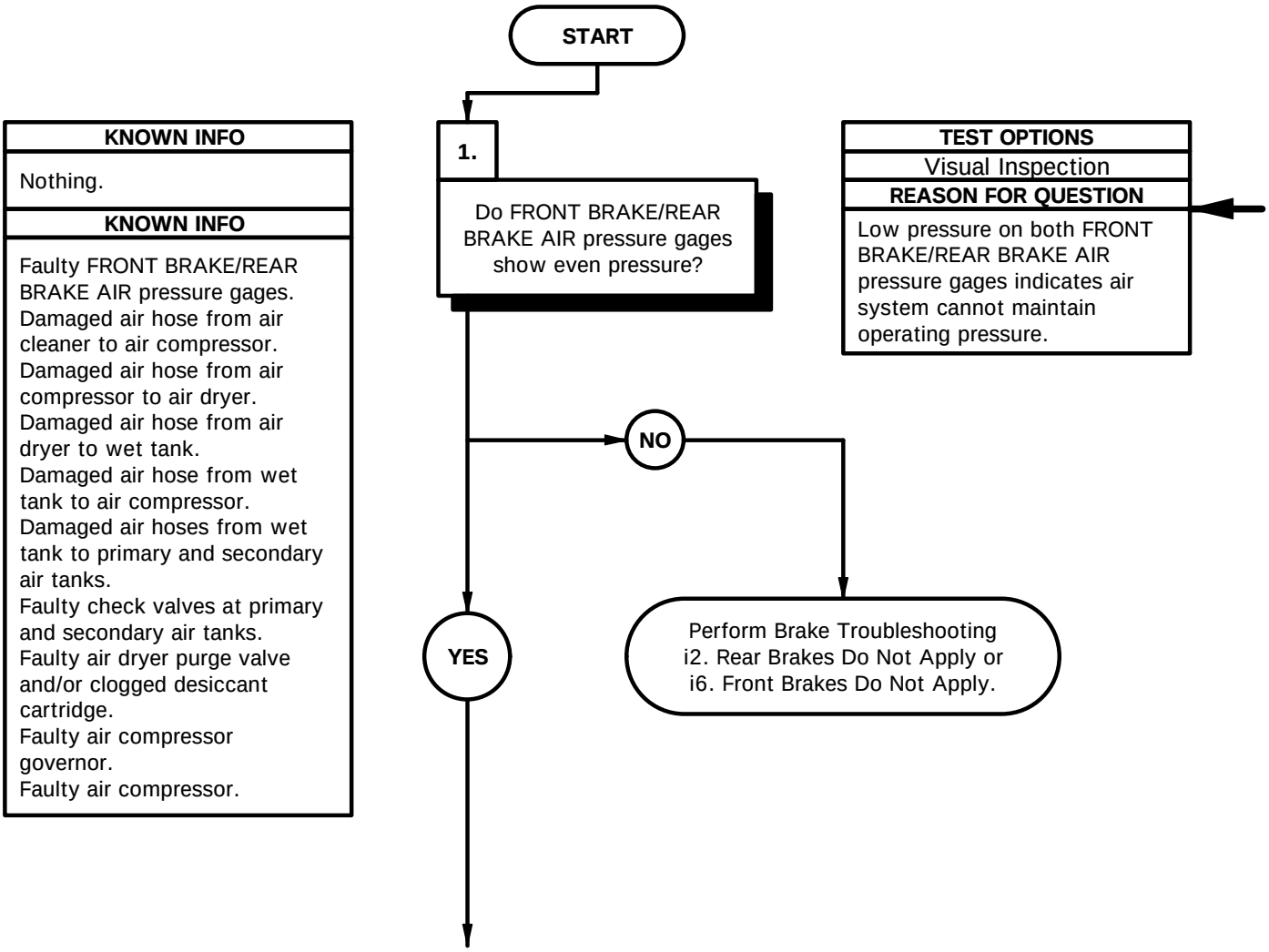
j1. AIR SYSTEM LOSES PRESSURE DURING OPERATION/SLOW, NO, OR INCORRECT AIR PRESSURE BUILDUP

INITIAL SETUP

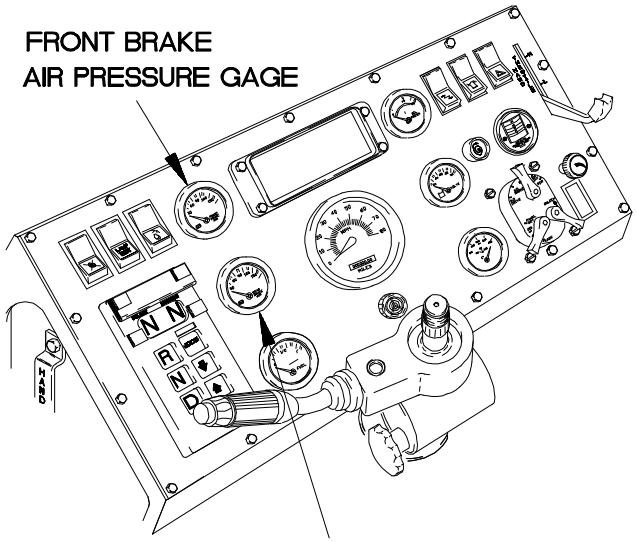
Equipment Conditions
Engine running (TM 9-2320-366-10-1).
Parking brake on (TM 9-2320-366-10-1).
Wheels chocked (TM 9-2320-366-10-1).

Materials/Parts
Soap, Laundry (Item 63, Appendix D).

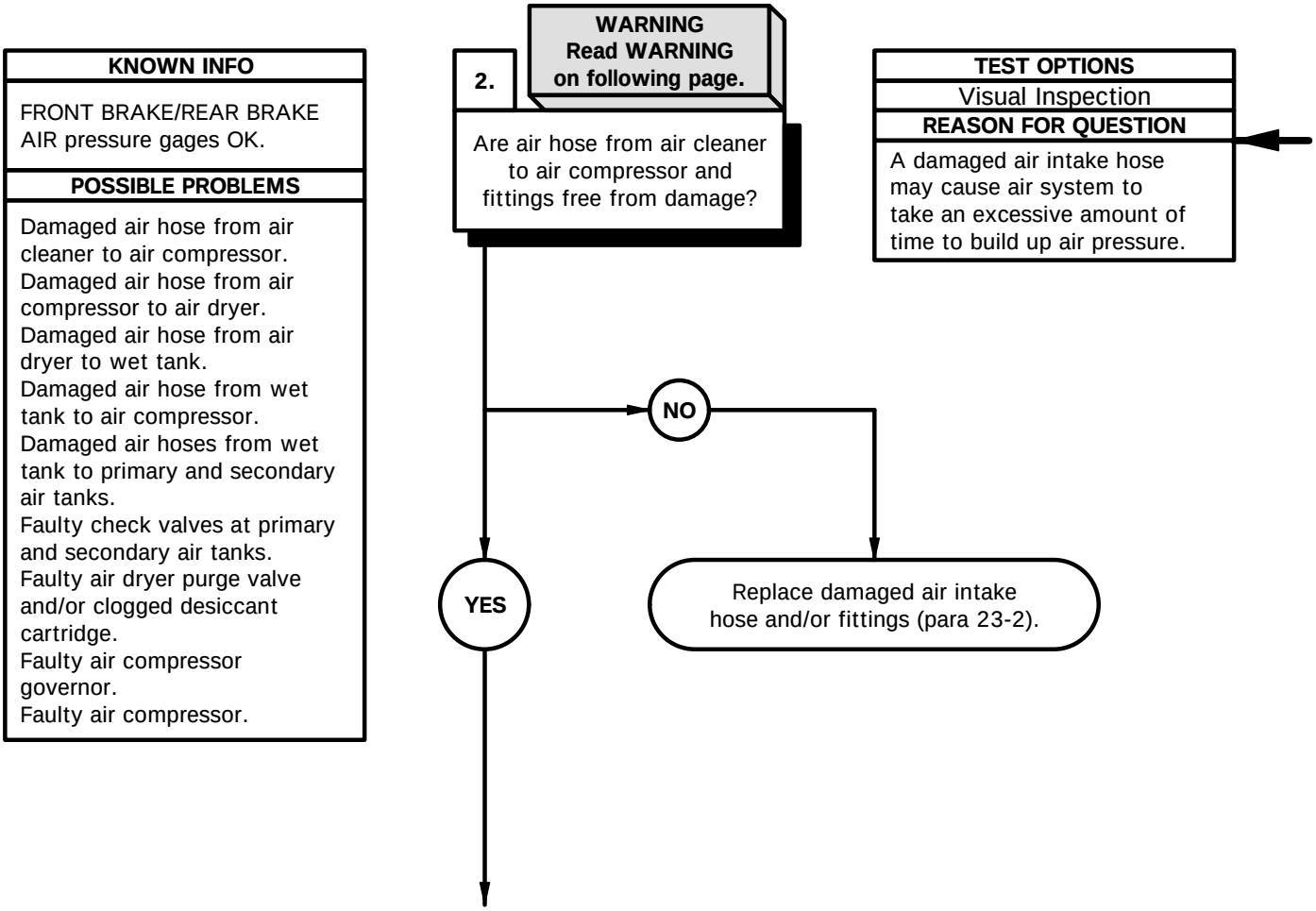
Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Pan, Wash (Item 25, Appendix C)



(1) Check to see if both FRONT BRAKE/REAR BRAKE AIR pressure gages indicate less than 120 psi.
(2) If only FRONT BRAKE AIR pressure gage indicates less than 120 psi, perform Brake Troubleshooting i6. Front Brakes Do Not Apply.
(3) If only REAR BRAKE AIR pressure gage indicates less than 120 psi, perform Brake Troubleshooting i2. Rear Brakes Do Not Apply.



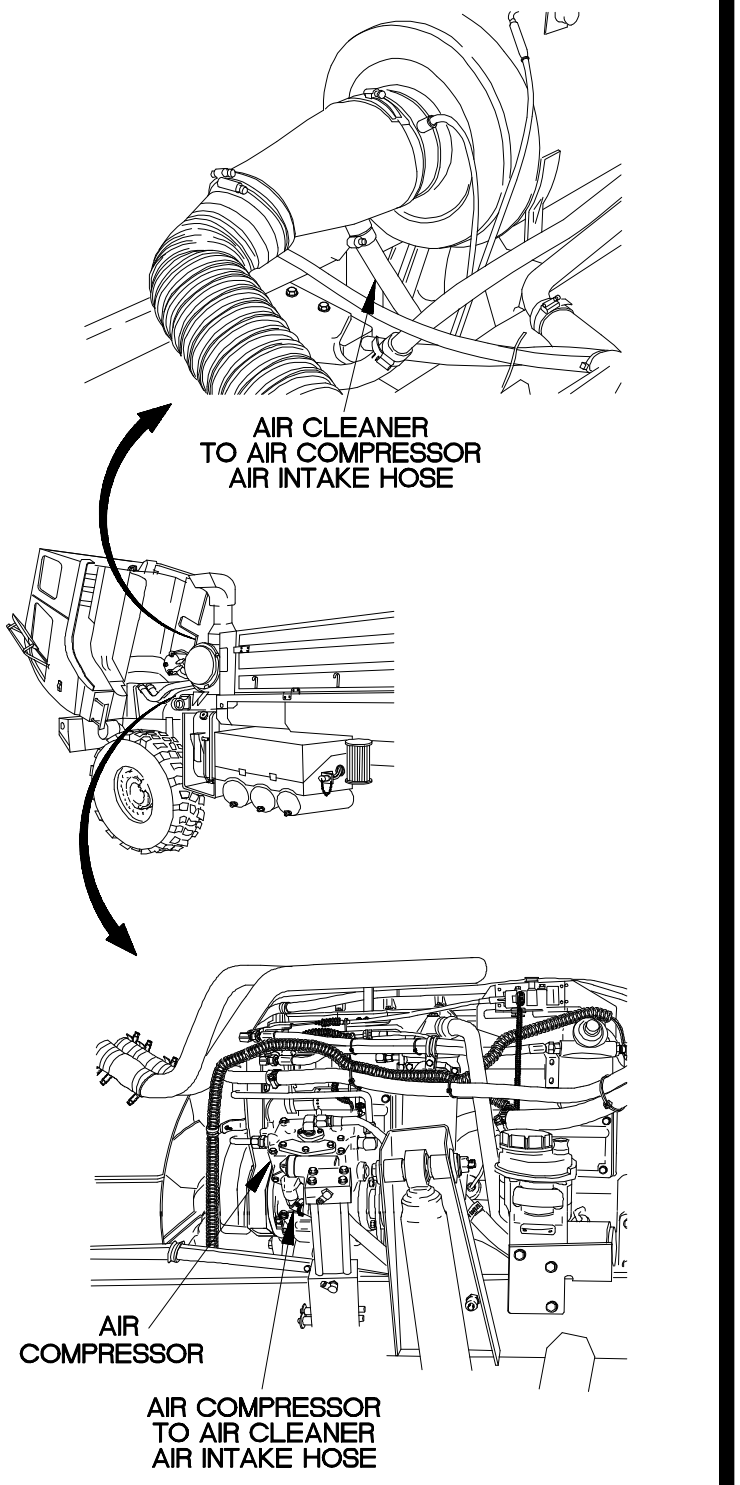
j1. AIR SYSTEM LOSES PRESSURE DURING OPERATION/SLOW, NO, OR INCORRECT AIR PRESSURE BUILDUP (CONT)



WARNING

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

(1) Raise cab (TM 9-2320-366-10-1).
(2) Check air intake hose from air cleaner to air compressor and fittings for damage.
(3) If air intake hose and/or fittings are faulty, replace damaged air intake hose and/or fittings (para 23-2).



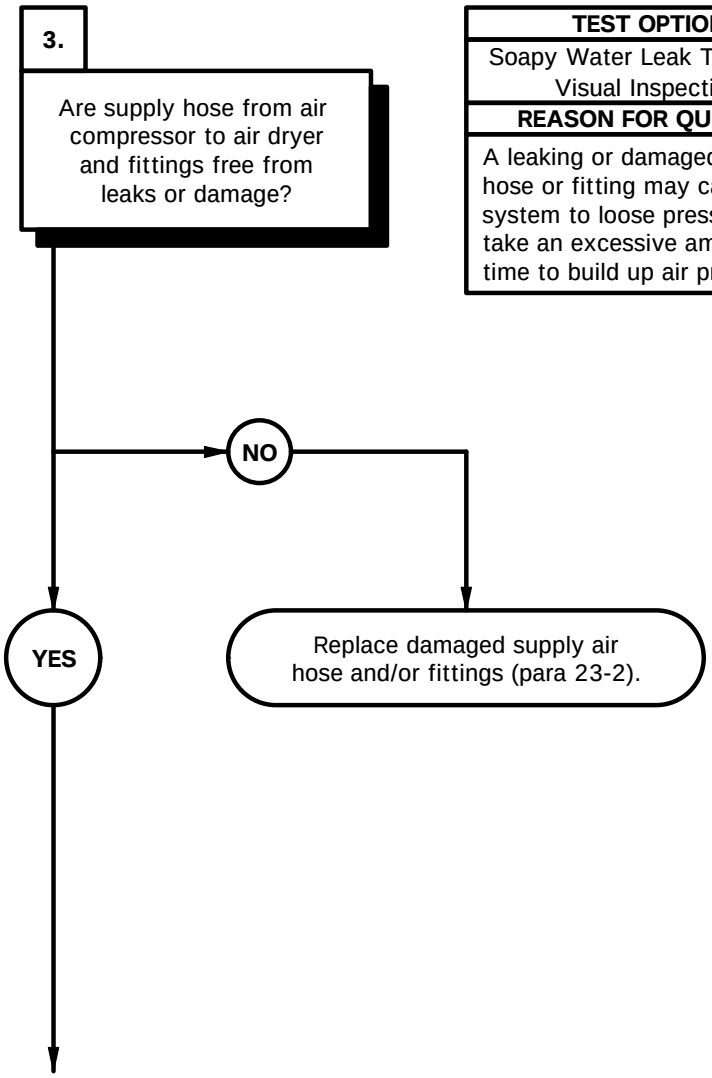
j1. AIR SYSTEM LOSES PRESSURE DURING OPERATION/SLOW, NO, OR INCORRECT AIR PRESSURE BUILDUP (CONT)

KNOWN INFO

FRONT BRAKE/REAR BRAKE AIR pressure gages OK.
Air hoses and fittings from air cleaner to air compressor OK.

POSSIBLE PROBLEMS

Damaged air hose from air compressor to air dryer.
Damaged air hose from air dryer to wet tank.
Damaged air hose from wet tank to air compressor.
Damaged air hoses from wet tank to primary and secondary air tanks.
Faulty check valves at primary and secondary air tanks.
Faulty air dryer purge valve and/or clogged desiccant cartridge.
Faulty air compressor governor.
Faulty air compressor.



TEST OPTIONS

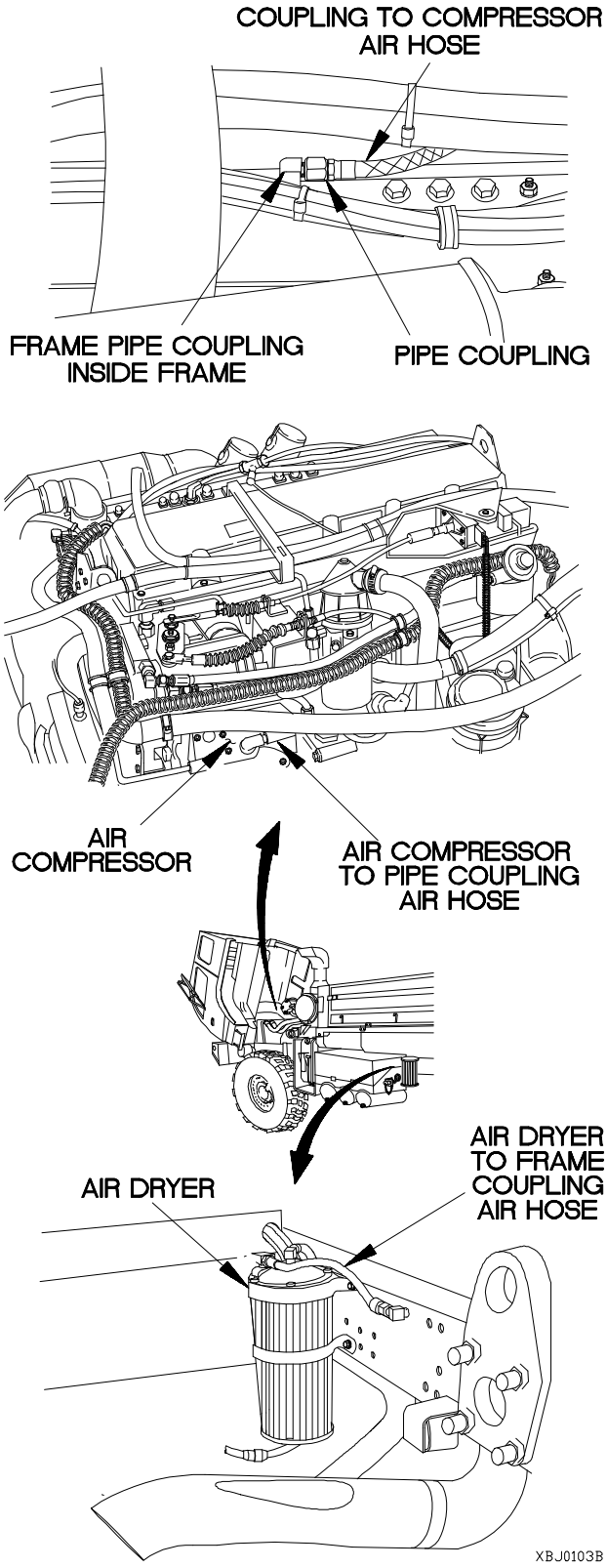
Soapy Water Leak Test and Visual Inspection

REASON FOR QUESTION

A leaking or damaged supply hose or fitting may cause air system to loose pressure or take an excessive amount of time to build up air pressure.

SOAPY WATER LEAK TEST
(1) Apply soapy water solution to hoses, fittings, and couplings. (2) Check hoses and fittings for bubbles, indicating leaks.

(1) Check air hose from air compressor to pipe coupling and fittings for leaks or damage.
(2) Check air hose from pipe coupling to frame pipe coupling and fittings for leaks or damage.
(3) Check air hose from frame pipe coupling to air dryer and fittings for leaks or damage.
(4) If supply air hose and/or fittings are faulty, replace damaged supply air hose and/or fittings (para 23-2).



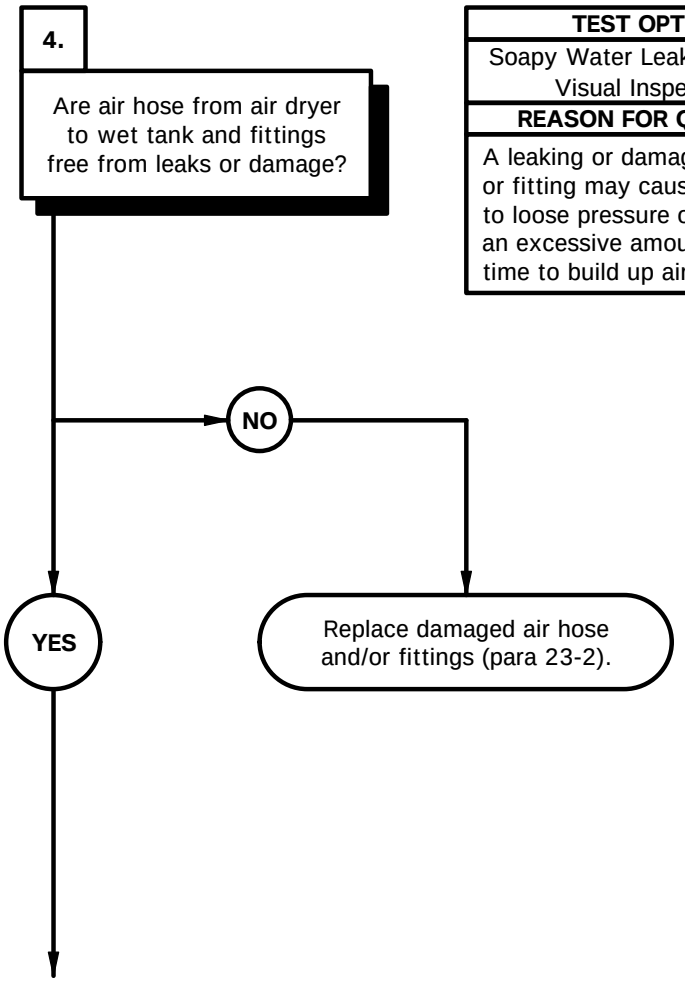
j1. AIR SYSTEM LOSES PRESSURE DURING OPERATION/SLOW, NO, OR INCORRECT AIR PRESSURE BUILDUP (CONT)

KNOWN INFO

FRONT BRAKE/REAR BRAKE AIR pressure gages OK.
Air hoses and fittings from air cleaner to air compressor OK.
Air hoses and fittings from air compressor to air dryer OK.

POSSIBLE PROBLEMS

Damaged air hose from air dryer to wet tank.
Damaged air hose from wet tank to air compressor.
Damaged air hoses from wet tank to primary and secondary air tanks.
Faulty check valves at primary and secondary air tanks.
Faulty air dryer purge valve and/or clogged desiccant cartridge.
Faulty air compressor governor.
Faulty air compressor.



TEST OPTIONS

Soapy Water Leak Test and Visual Inspection

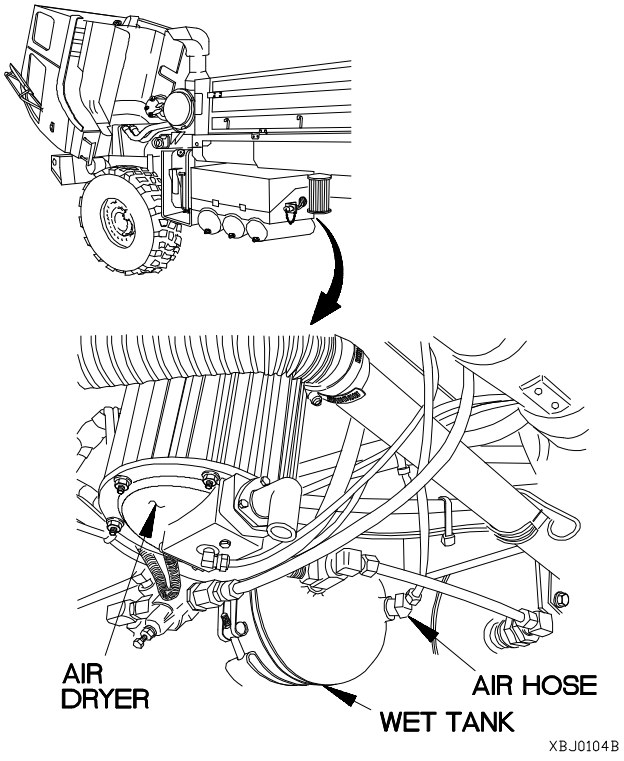
REASON FOR QUESTION

A leaking or damaged hose or fitting may cause air system to loose pressure or take an excessive amount of time to build up air pressure.

SOAPY WATER LEAK TEST

(1) Apply soapy water solution to hoses, fittings, and couplings.
(2) Check hoses and fittings for bubbles, indicating leaks.

(1) Check air hose from air dryer to wet tank and fittings for leaks or damage.
(2) If air hose and/or fittings are faulty, replace damaged air hose and/or fittings (para 23-2).



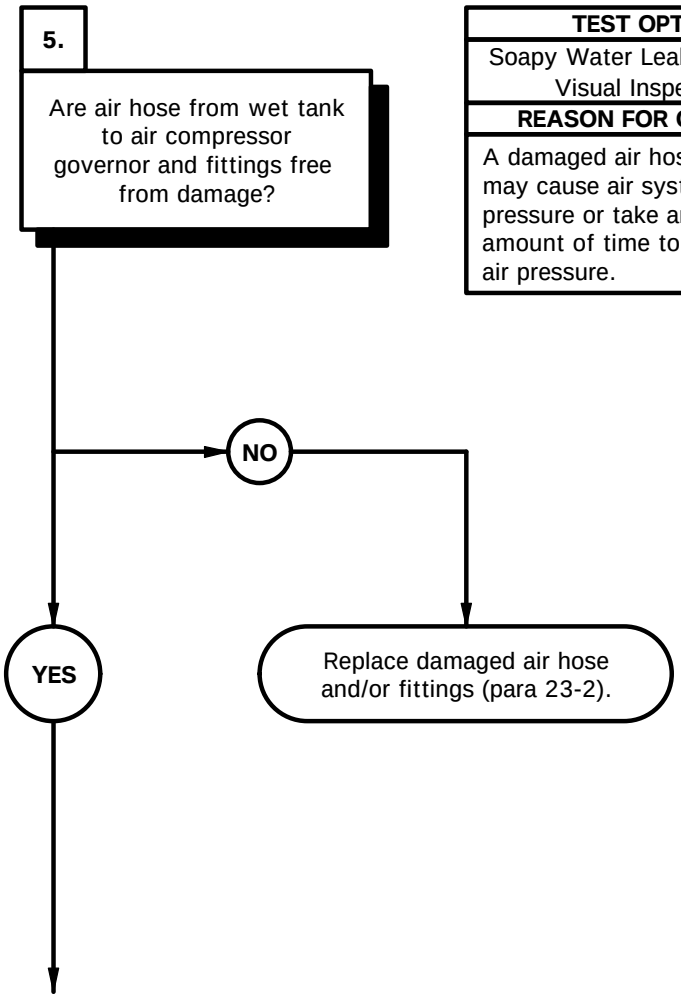
j1. AIR SYSTEM LOSES PRESSURE DURING OPERATION/SLOW, NO, OR INCORRECT AIR PRESSURE BUILDUP (CONT)

KNOWN INFO

FRONT BRAKE/REAR BRAKE AIR pressure gages OK.
Air hoses and fittings from air cleaner to air compressor OK.
Air hoses and fittings from air compressor to air dryer OK.
Air hose and fittings from air dryer to wet tank OK.

POSSIBLE PROBLEMS

Damaged air hose from wet tank to air compressor.
Damaged air hoses from wet tank to primary and secondary air tanks.
Faulty check valves at primary and secondary air tanks.
Faulty air dryer purge valve and/or clogged desiccant cartridge.
Faulty air compressor governor.
Faulty air compressor.



TEST OPTIONS

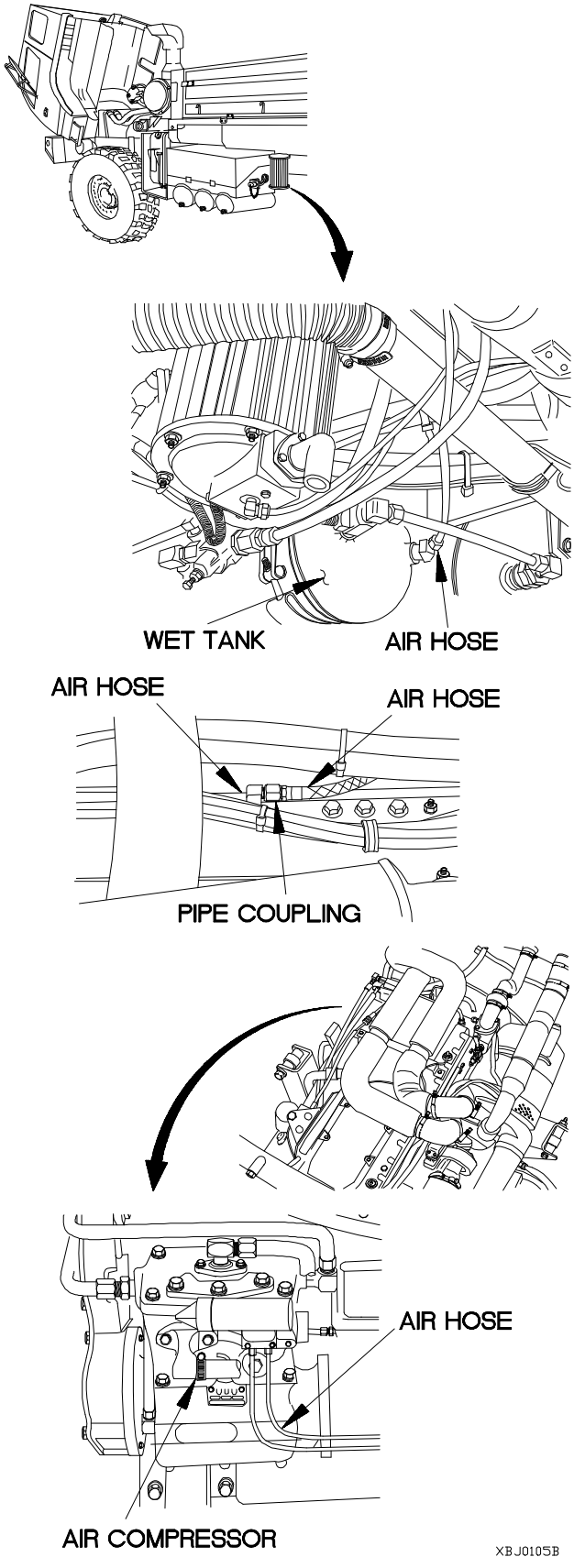
Soapy Water Leak Test and Visual Inspection

REASON FOR QUESTION

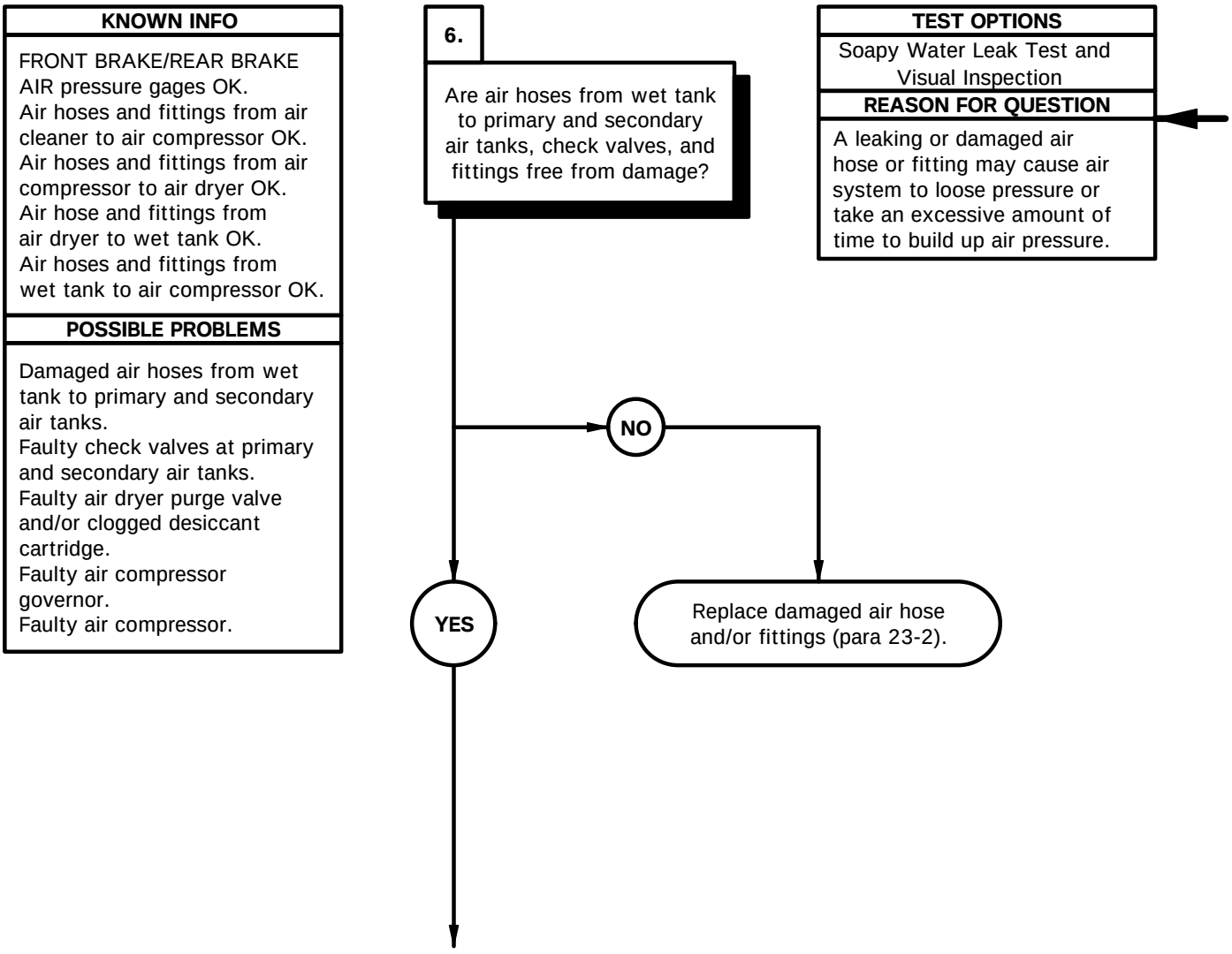
A damaged air hose or fitting may cause air system to loose pressure or take an excessive amount of time to build up air pressure.

SOAPY WATER LEAK TEST
(1) Apply soapy water solution to hoses, fittings, and couplings. (2) Check hoses and fittings for bubbles, indicating leaks.

(1) Check air hose from wet tank to pipe coupling and fittings for leaks and damage.
(2) Check air hose from pipe coupling to air compressor and fittings for leaks and damage.
(3) If air hose and/or fittings are faulty, replace damaged air hose and/or fittings (para 23-2).
(4) Lower cab (TM 9-2320-366-10-1).



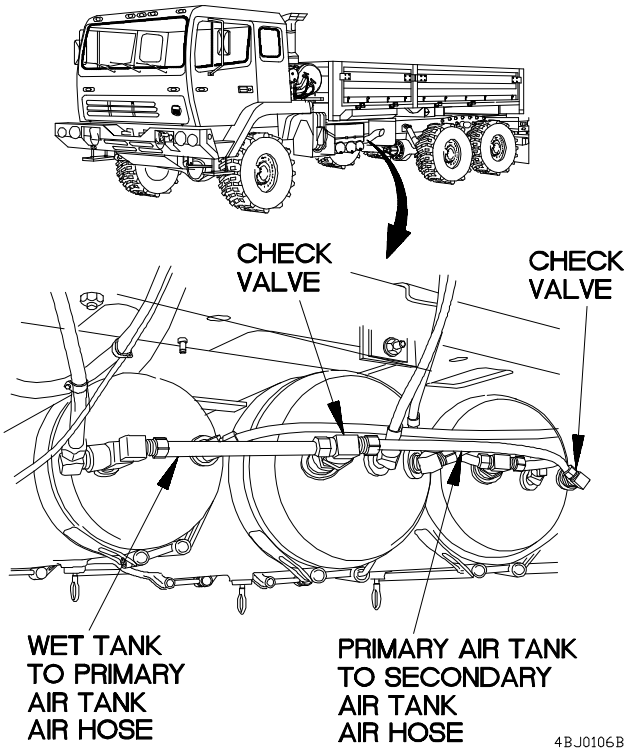
j1. AIR SYSTEM LOSES PRESSURE DURING OPERATION/SLOW, NO, OR INCORRECT AIR PRESSURE BUILDUP (CONT)



SOAPY WATER LEAK TEST

(1) Apply soapy water solution to hoses, fittings, and couplings.
(2) Check hoses and fittings for bubbles, indicating leaks.

(1) Check air hose from wet tank to primary air tank check valve, and fittings for leaks and damage.
(2) Check air hose from primary air tank check valve to secondary air tank check valve, and fittings for leaks and damage.
(3) If air hose and/or fittings are faulty, replace damaged air hose and/or fittings (para 23-2).



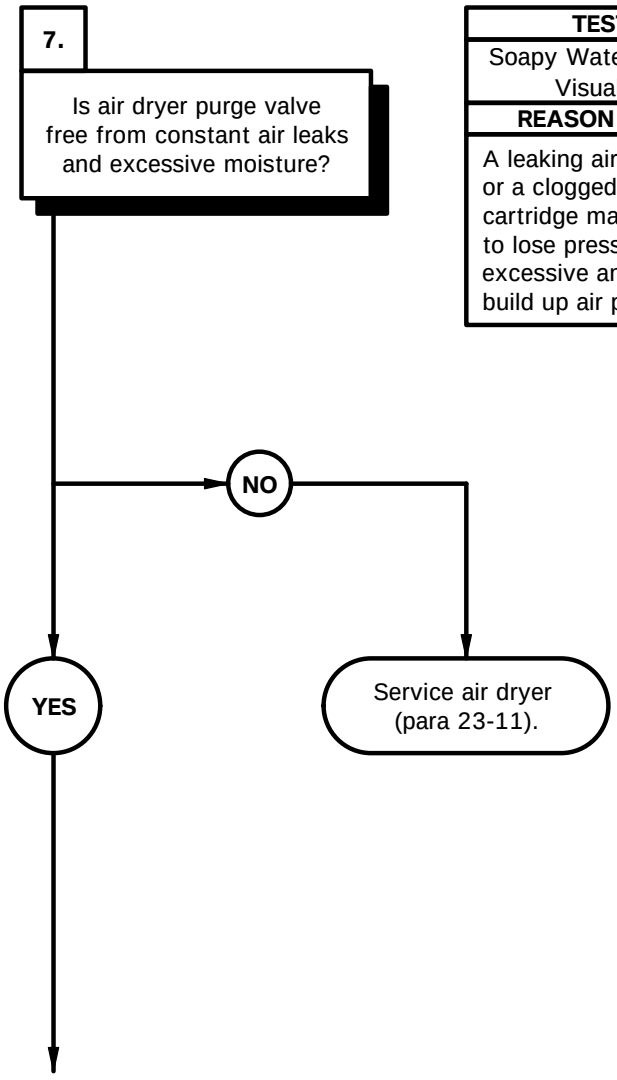
j1. AIR SYSTEM LOSES PRESSURE DURING OPERATION/SLOW, NO, OR INCORRECT AIR PRESSURE BUILDUP (CONT)

KNOWN INFO

FRONT BRAKE/REAR BRAKE AIR pressure gages OK.
Air hoses and fittings from air cleaner to air compressor OK.
Air hoses and fittings from air compressor to air dryer OK.
Air hose and fittings from air dryer to wet tank OK.
Air hoses and fittings from wet tank to air compressor OK.
Air hoses, check valves, and fittings from wet tank to primary and secondary air tanks OK.

POSSIBLE PROBLEMS

Faulty air dryer purge valve and/or clogged desiccant cartridge.
Faulty air compressor governor.
Faulty air compressor.



TEST OPTIONS

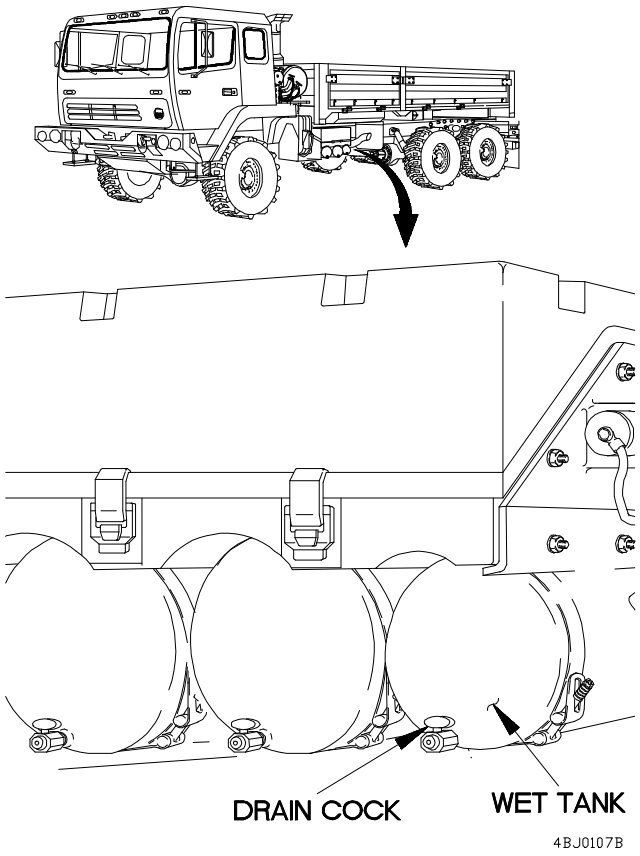
Soapy Water Leak Test and Visual Insepction

REASON FOR QUESTION

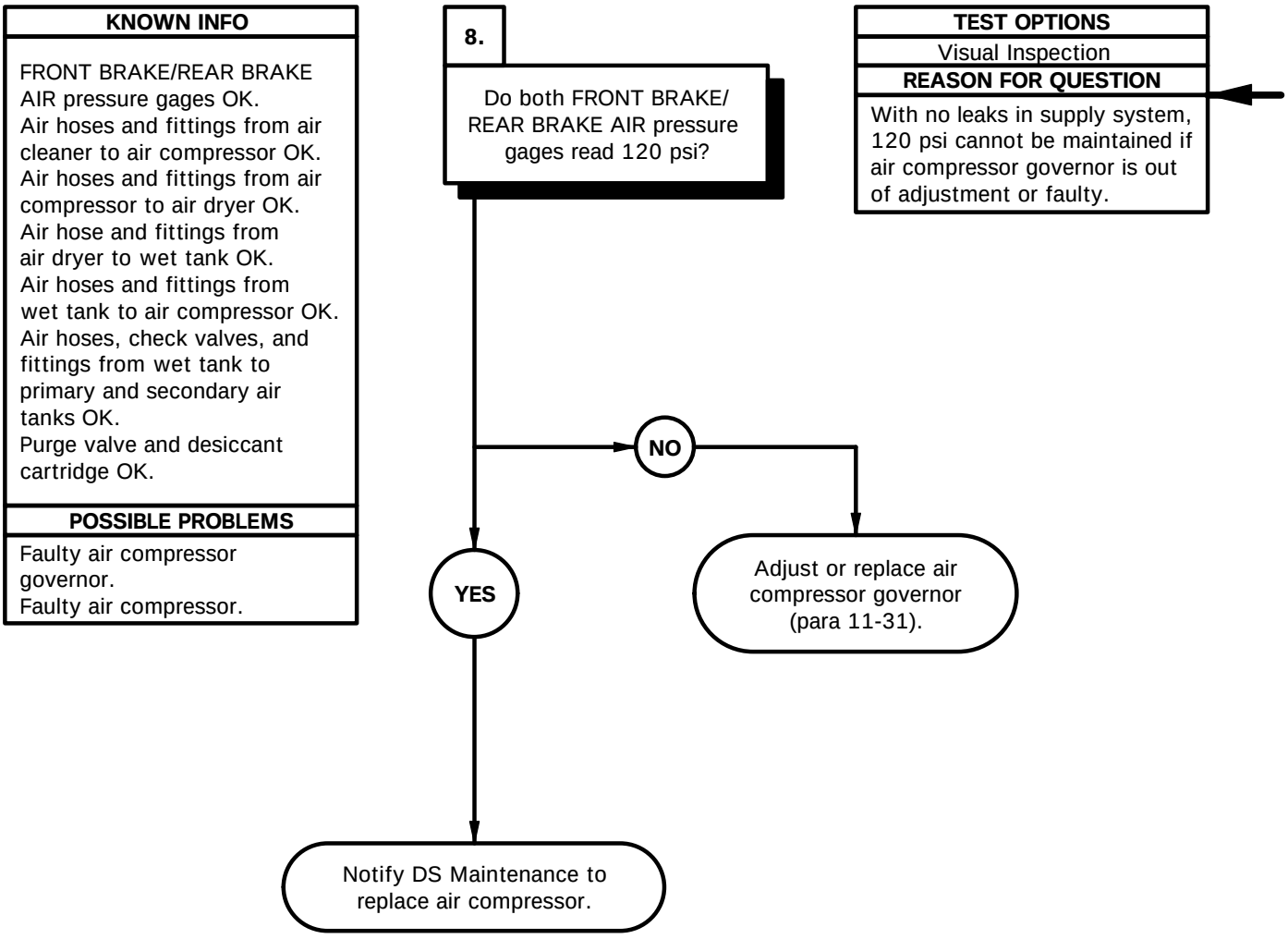
A leaking air dryer purge valve or a clogged air dryer desiccant cartridge may cause air system to lose pressure or take an excessive amount of time to build up air pressure.

SOAPY WATER LEAK TEST
(1) Apply soapy water solution to hoses, fittings, and couplings. (2) Check hoses and fittings for bubbles, indicating leaks.

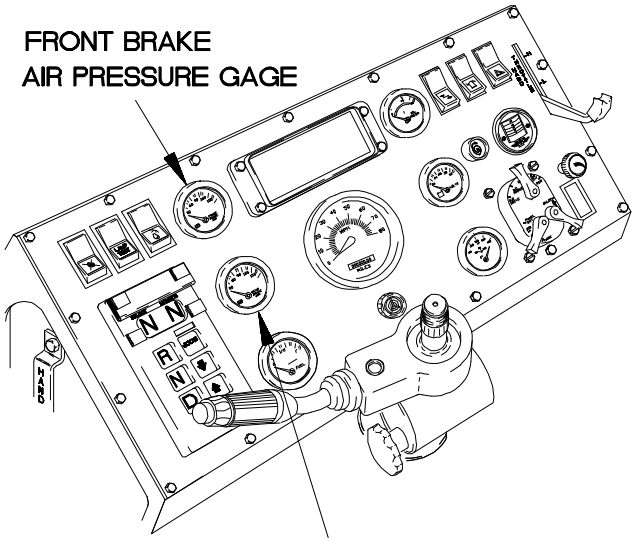
(1) Open wet tank drain cock and check for excessive amounts of moisture.
(2) If moisture exists in wet tank, service air dryer desiccant cartridge (para 23-11).
(3) Close wet tank drain cock.



j1. AIR SYSTEM LOSES PRESSURE DURING OPERATION/SLOW, NO, OR INCORRECT AIR PRESSURE BUILDUP (CONT)



(1) Allow pneumatic system to build pressure and observe FRONT BRAKE/REAR BRAKE AIR pressure gages without applying brakes or operating air system.
(2) Check to see if air pressure stabilizes at 120 psi.
(3) If air pressure remains below 120 psi, adjust or replace air compressor governor (para 11-31).
(4) If air pressure continues to remain below 120 psi, notify DS Maintenance to replace air compressor.
(5) Shut down engine (TM 9-2320-366-10-1).

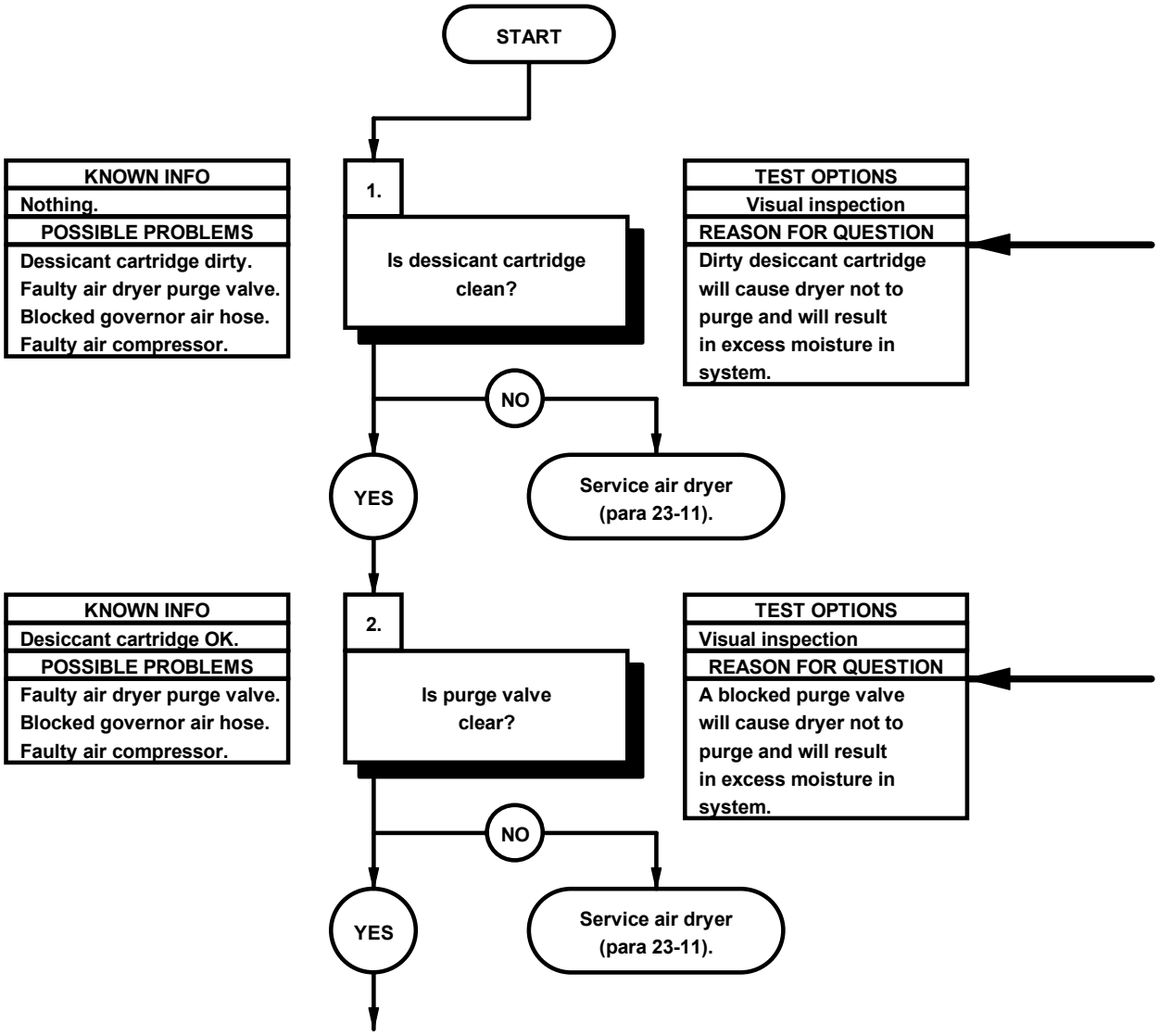


j2. LARGE QUANTITY OF MOISTURE EXPELLED FROM AIR RESERVOIRS

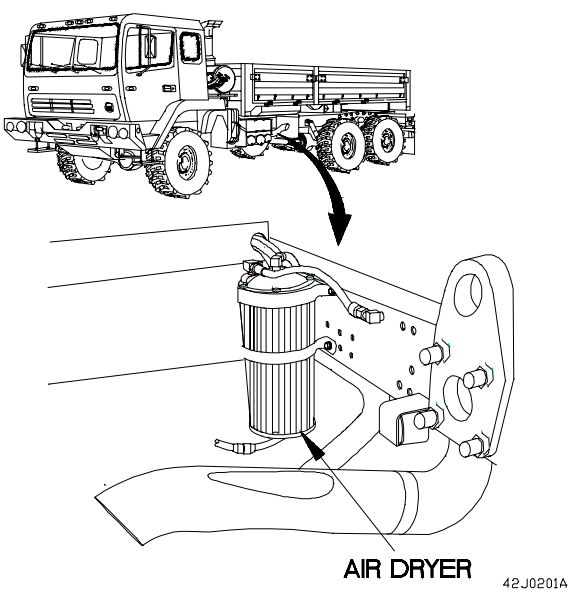
INITIAL SETUP

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

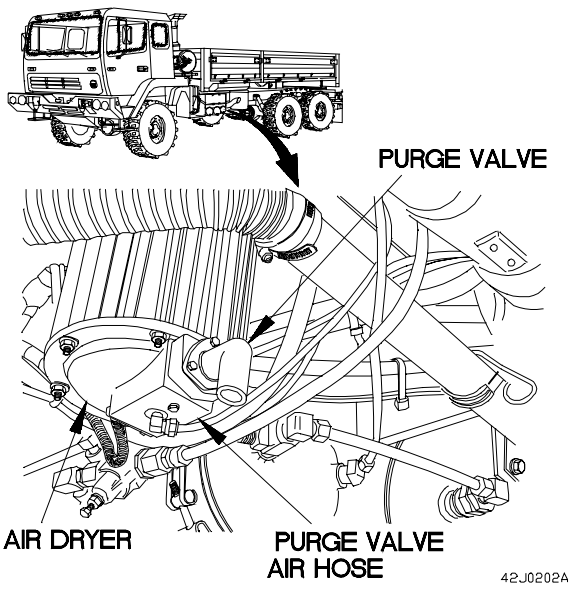
Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Goggles, Industrial (Item 15, Appendix C)



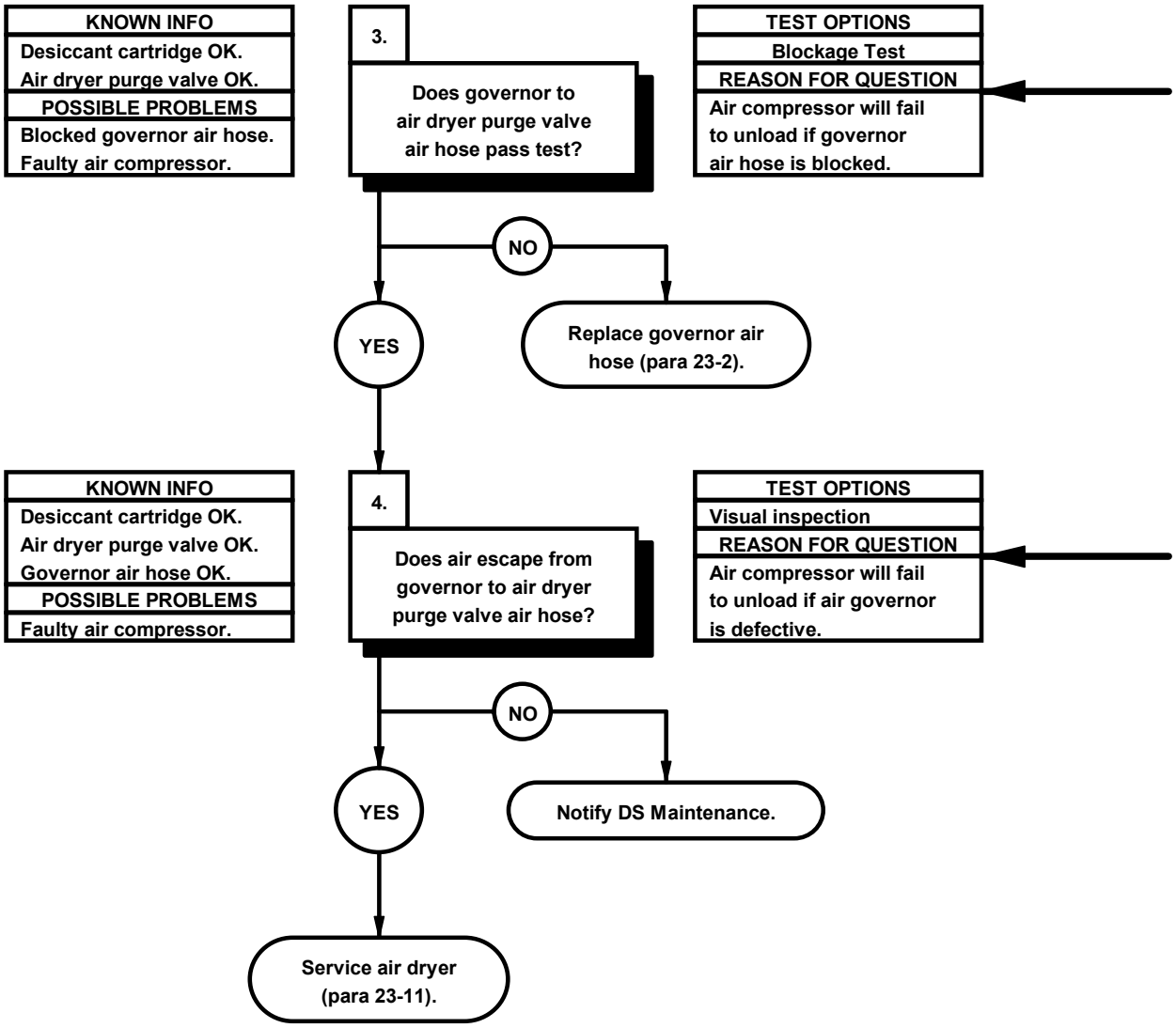
(1) Remove desiccant cartridge from air dryer (para 23-11).
(2) Inspect the desiccant cartridge for cleanhosess.



(1) Remove three screws, purge valve, and exhaust boot.
(2) Check purge valve for blockage. If blocked, purge valve is faulty.
(3) Install exhaust boot, purge valve, and three screws.

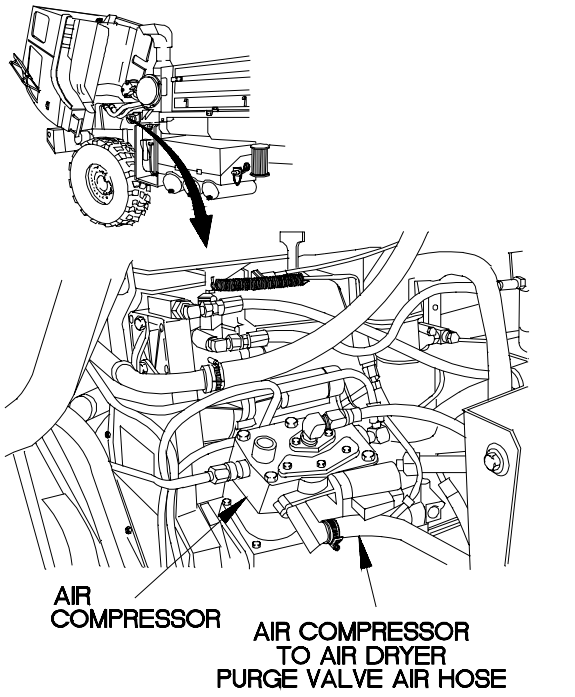


j2. LARGE QUANTITY OF MOISTURE EXPELLED FROM AIR RESERVOIRS (CONT)

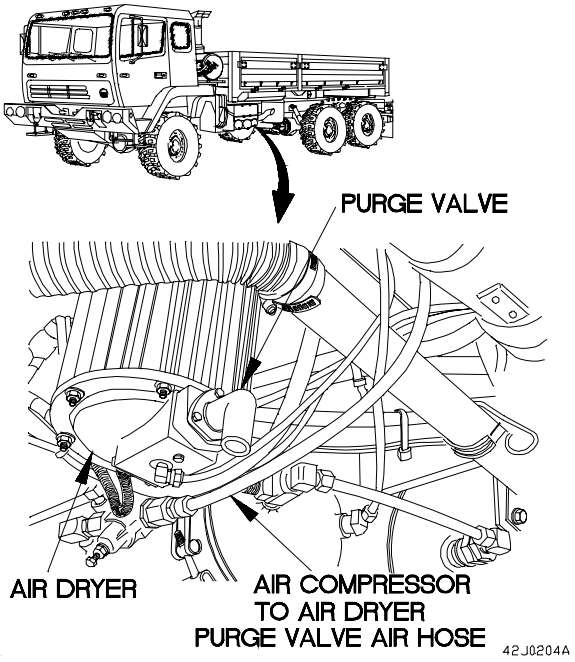


BLOCKAGE TEST

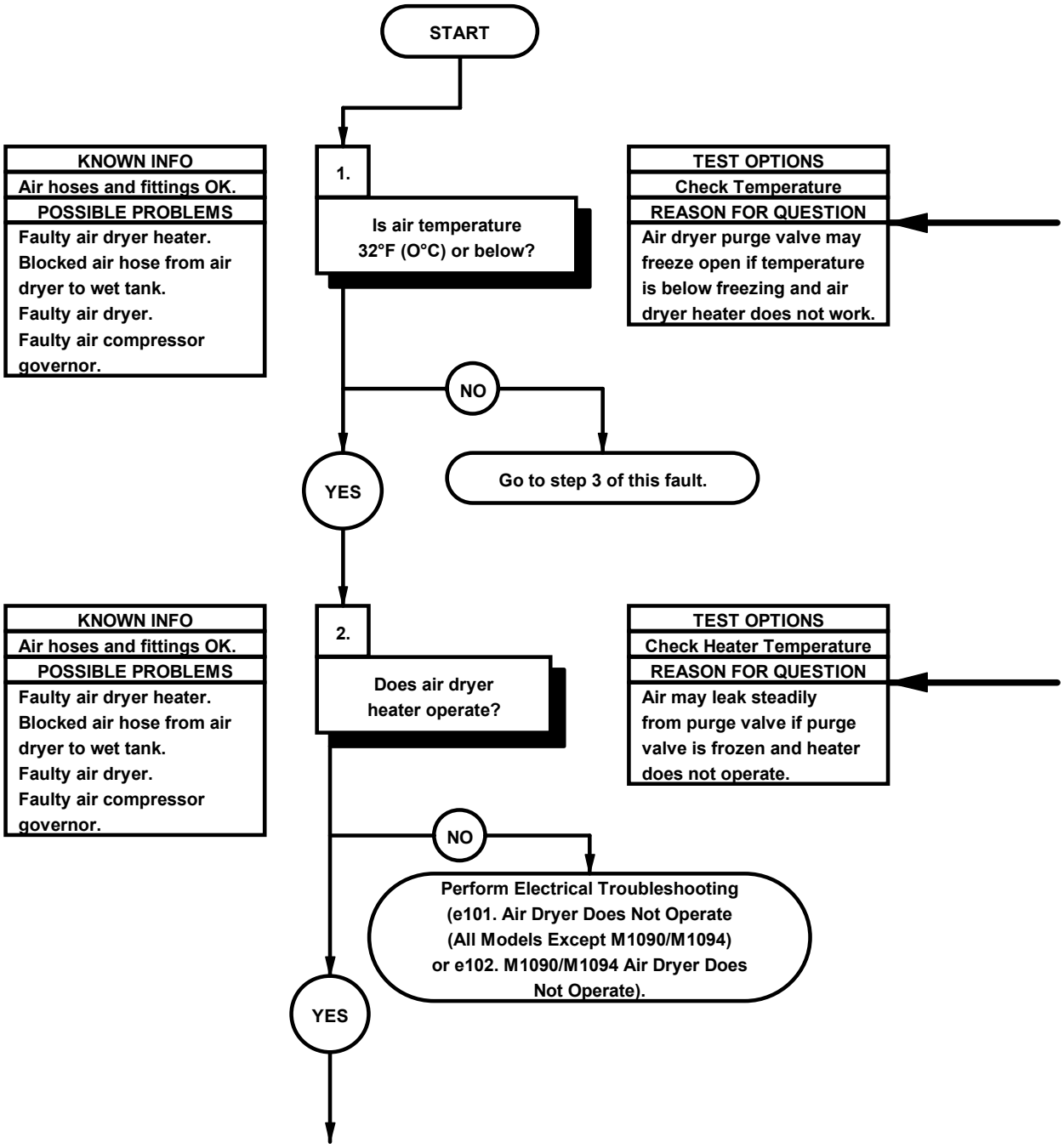
(1) Disconnect governor to air dryer air hose at governor and at purge valve.
(2) Blow through one end of air hose. If no air escapes from other end of air hose, air hose is blocked.
(3) Connect governor to air dryer air hose to governor and purge valve.



(1) Disconnect governor air hose at air dryer purge valve.
(2) Start engine (TM 9-2320-366-10-1).
(3) Check for presence of air at air hose. If no air escapes from air hose air compressor is defective. If air escapes, service air dryer for faulty purge valve.
(4) Shut down engine (TM 9-2320-366-10-1).
(5) Connect air compressor to air dryer air hose to air dryer.
(6) Install desiccant cartridge in air dryer (para 23-11).



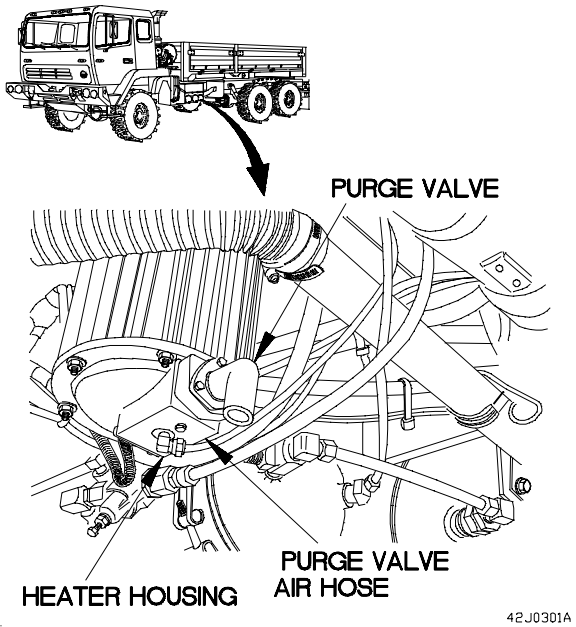
j3. AIR DRYER CONTINUALLY PURGES	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Goggles, Industrial (Item 15, Appendix C)



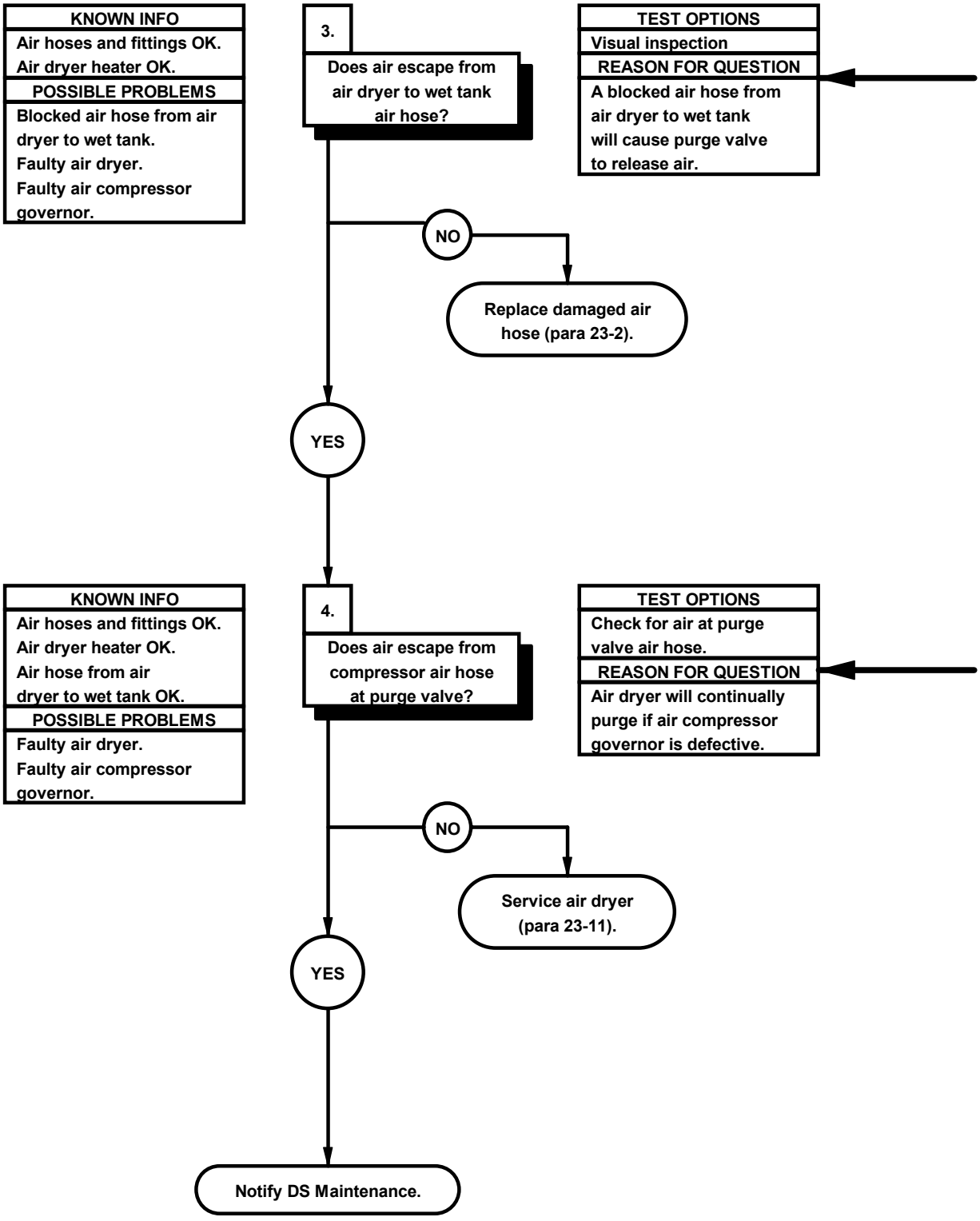
NOTE

- **Air dryer heater cuts in at 32°F (0°C) and shuts off between 55-75°F (31-42°C).**
- **A failed air dryer heater will not affect operation of purge valve if vehicle is operating at temperature above freezing.**

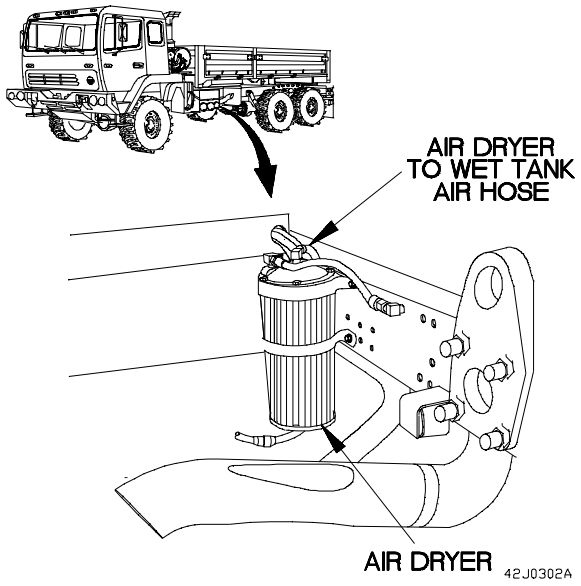
(1) Start engine (TM 9-2320-366-10-1).
(2) Bring engine to operating temperature.
(3) Check bottom (heater) housing on air dryer.
(4) If housing is not warm, heater is not receiving power or is faulty.
(5) Shut down engine (TM 9-2320-366-10-1).



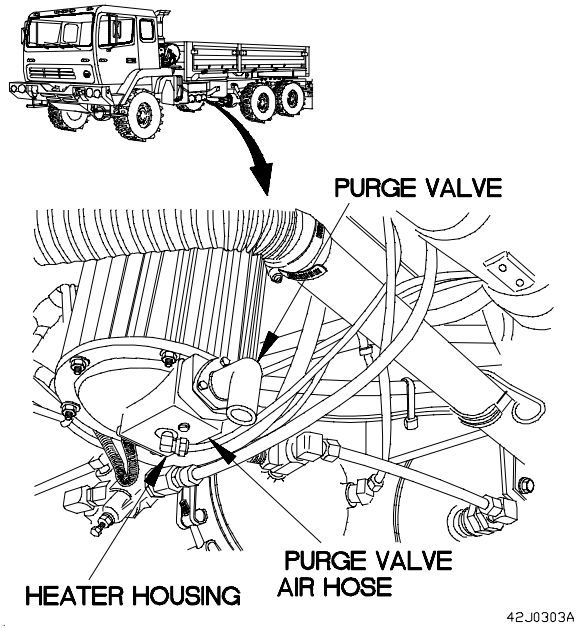
j3. AIR DRYER CONTINUALLY PURGES (CONT)



(1) Disconnect air hose on wet tank coming from air dryer.
(2) Start engine (TM 9-2320-366-10-1).
(3) Check for presence of air at air hose. If no air escapes from air hose, air hose is faulty.
(4) If air escapes, service air dryer (para 23-11).
(5) Shut down engine (TM 9-2320-366-10-1).



(1) Disconnect air hose from purge valve on air dryer.
(2) Start engine (TM 9-2320-366-10-1).
(3) Check for presence of air from air hose.
(4) If air is steadily present from air hose and purge valve air has stopped, air compressor governor is defective.
(5) Shut down engine (TM 9-2320-366-10-1).
(6) Connect air hose to purge valve on air dryer.



j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (ALL MODELS EXCEPT M1088)

INITIAL SETUP

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

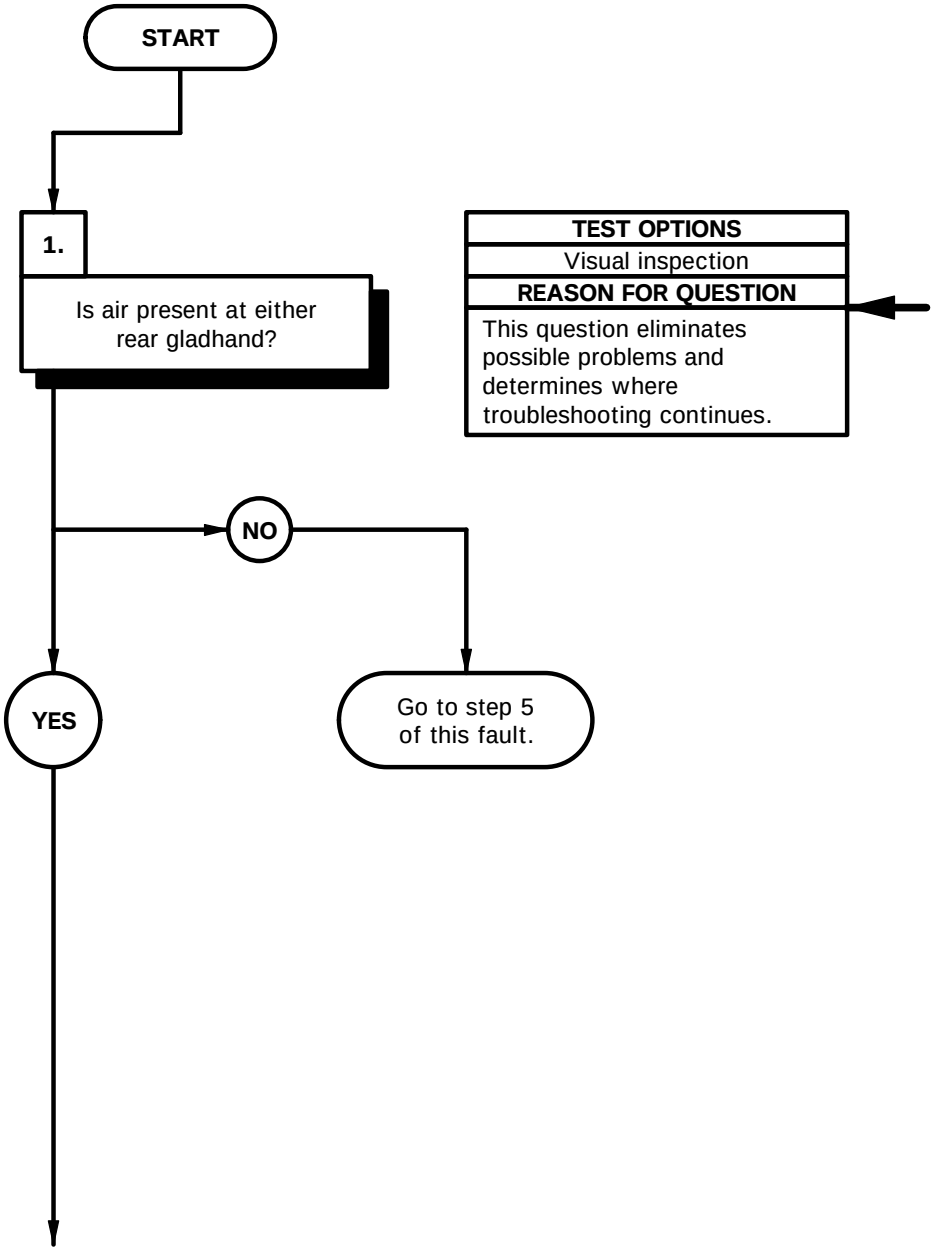
Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Goggles, Industrial (Item 15, Appendix C)

KNOWN INFO

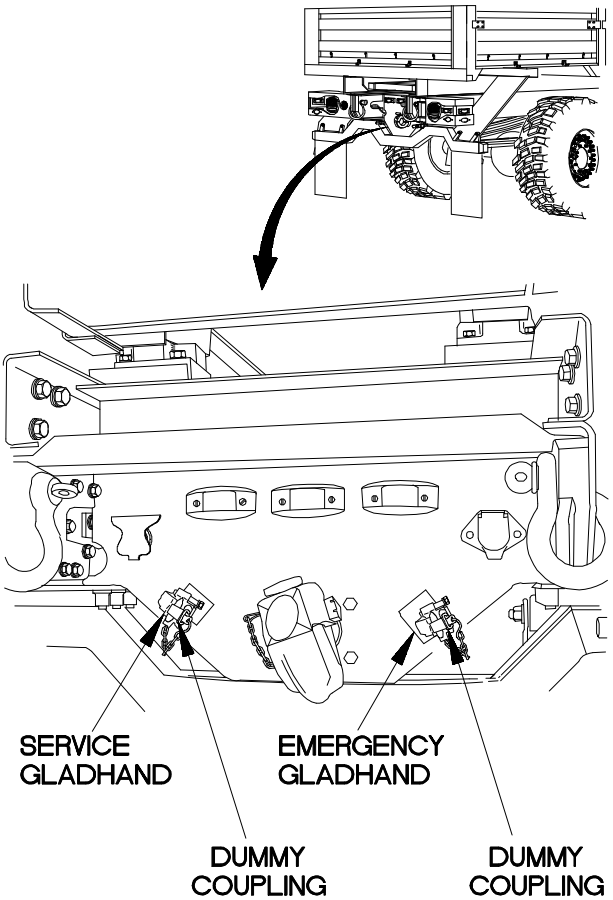
Vehicle park and service brakes OK.
Air hoses free from kinks.

POSSIBLE PROBLEMS

Faulty emergency gladhand.
Faulty air hose 155, 157, or 167.
Faulty air hose 149, 150, or 151.
Faulty air hose 102.
Faulty air hose 108.
Faulty TRAILER AIR SUPPLY valve.
Faulty air hose 104.
Faulty service gladhand.
Faulty air hose 241, 253, or 254.
Faulty air brake protecting valve.
Faulty air hose 230 or 256.
Faulty load sensing valve control port tee fitting.
Faulty air hose 240 or 243.
Faulty booster valve.
Faulty service gladhand two-way check valve.
Faulty air hose 145.
Faulty air hose 120.
Faulty inversion valve control port 90-degree fitting.
Faulty air hose 128, 130, or 132.



(1) Disconnect dummy coupling from emergency gladhand.
(2) Start engine (TM 9-2320-366-10-1).
(3) Push in TRAILER AIR SUPPLY control (TM 9-2320-366-10-1).
(4) Check for presence of air at emergency gladhand.
(5) Connect dummy coupling to emergency gladhand.
(6) Disconnect dummy coupling from service gladhand.
(7) Apply service brakes (TM 9-2320-366-10-1).
(8) Check for presence of air at service gladhand.
(9) Shut down engine (TM 9-2320-366-10-1).
(10) Connect dummy coupling to service gladhand.
(11) If air is not present at both rear gladhands, go to step 5 of this fault.



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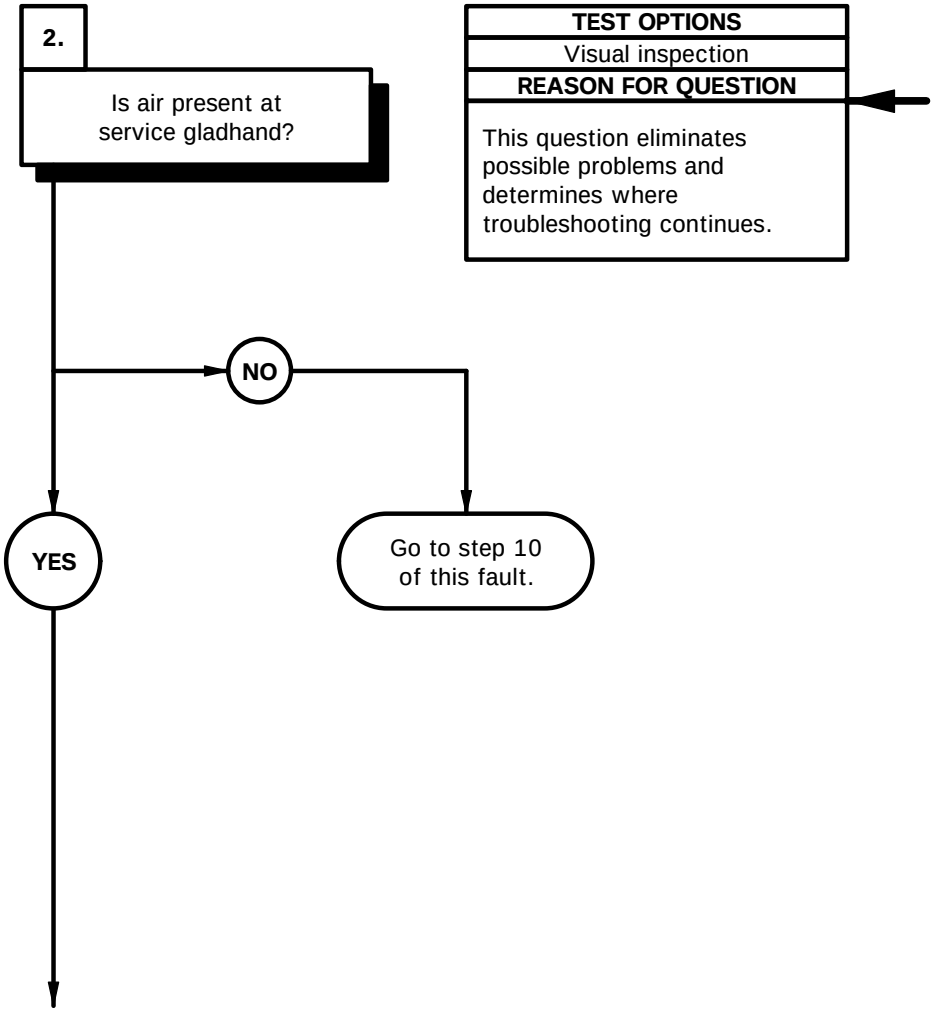
j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (ALL MODELS EXCEPT M1088) (CONT)

KNOWN INFO

Vehicle park and service brakes OK.
Air hoses free from kinks.
Air hose 149, 150, or 151 OK.
Air hose 102 OK.
Air hose 108 OK.
TRAILER AIR SUPPLY valve OK.
Air hose 104 OK.

POSSIBLE PROBLEMS

Faulty emergency gladhand.
Faulty air hose 155, 157, or 167.
Faulty service gladhand.
Faulty air hose 241, 253, or 254.
Faulty air brake protecting valve.
Faulty air hose 230 or 256.
Faulty load sensing valve control port tee fitting.
Faulty air hose 240 or 243.
Faulty booster valve.
Faulty service gladhand two-way check valve.
Faulty air hose 145.
Faulty air hose 120.
Faulty inversion valve control port 90-degree fitting.
Faulty air hose 128, 130, or 132.



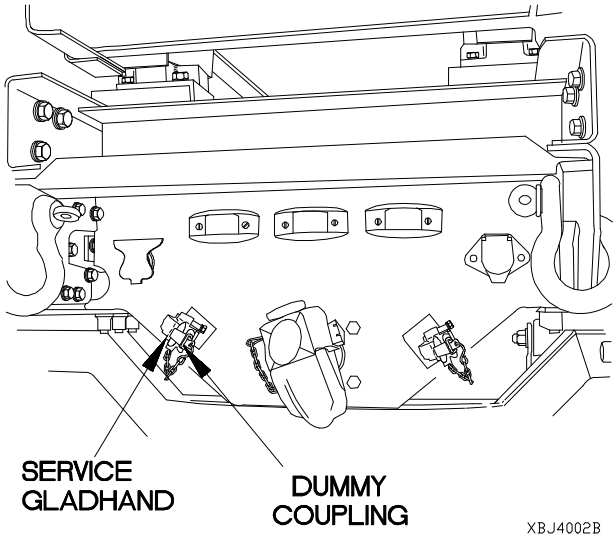
TEST OPTIONS

Visual inspection

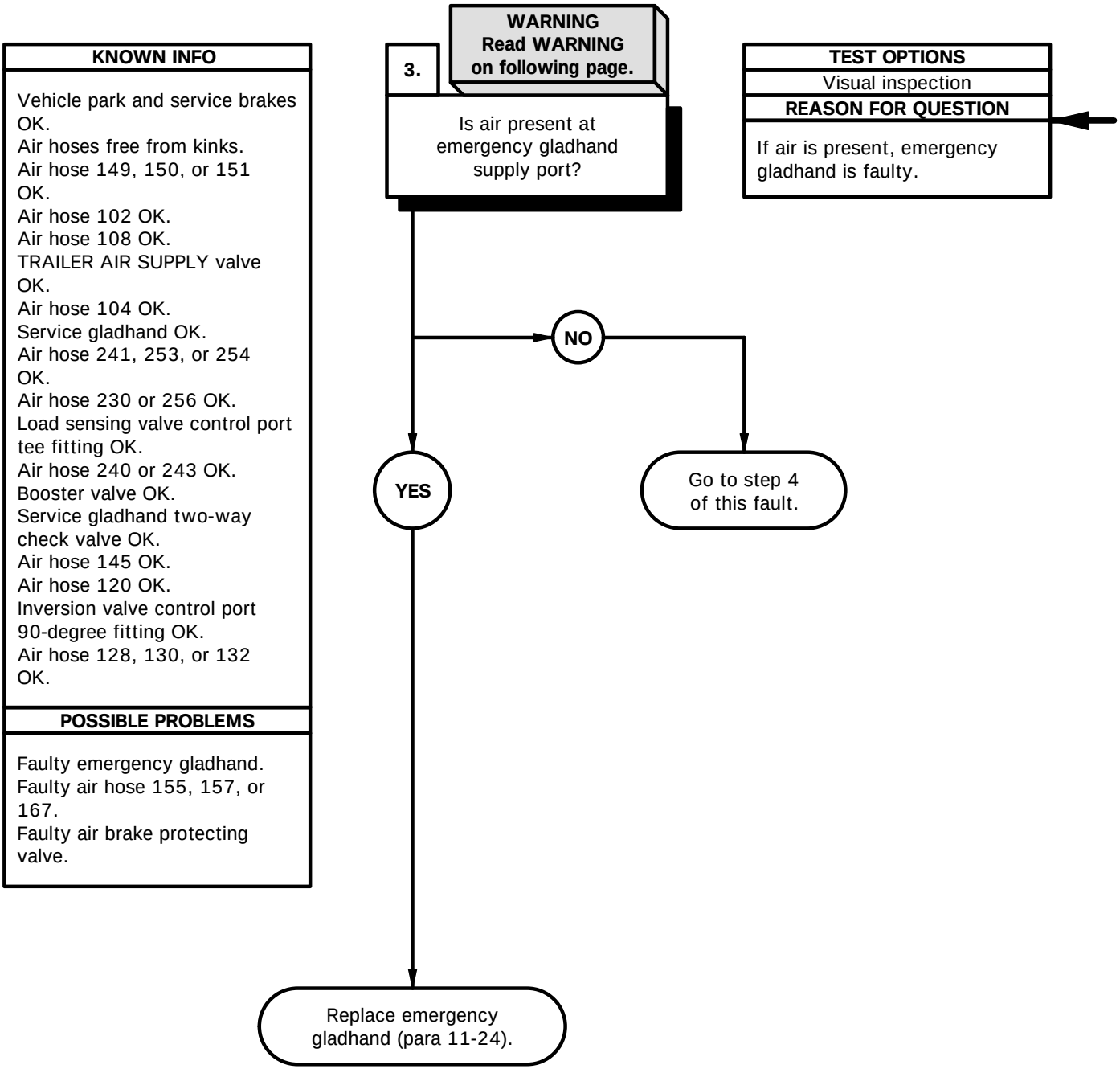
REASON FOR QUESTION

This question eliminates possible problems and determines where troubleshooting continues.

(1) Disconnect dummy coupling from service gladhand.
(2) Start engine (TM 9-2320-366-10-1).
(3) Push in TRAILER AIR SUPPLY control (TM 9-2320-366-10-1).
(4) Apply service brakes (TM 9-2320-366-10-1).
(5) Check for presence of air at service gladhand.
(6) Shut down engine (TM 9-2320-366-10-1).
(7) Connect dummy coupling to service gladhand.
(8) If air is not present, go to step 10 of this fault.



j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (ALL MODELS EXCEPT M1088) (CONT)



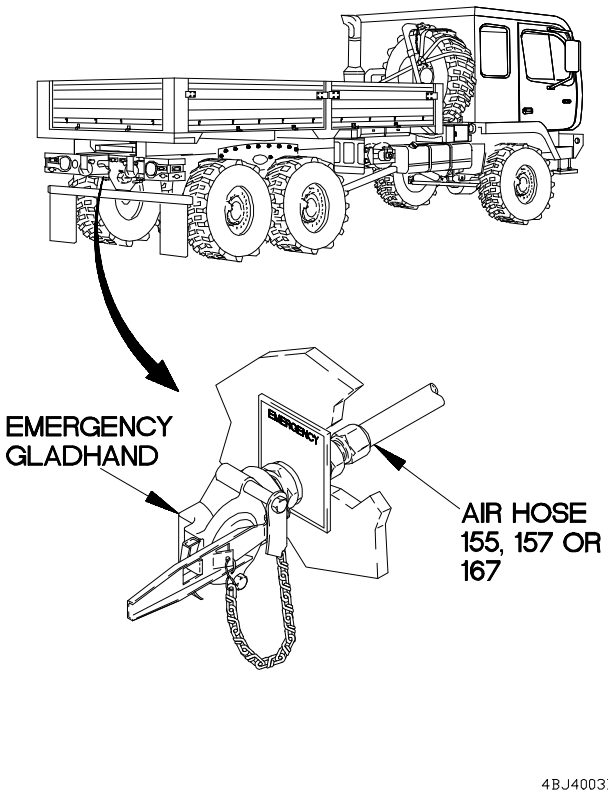
WARNING

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

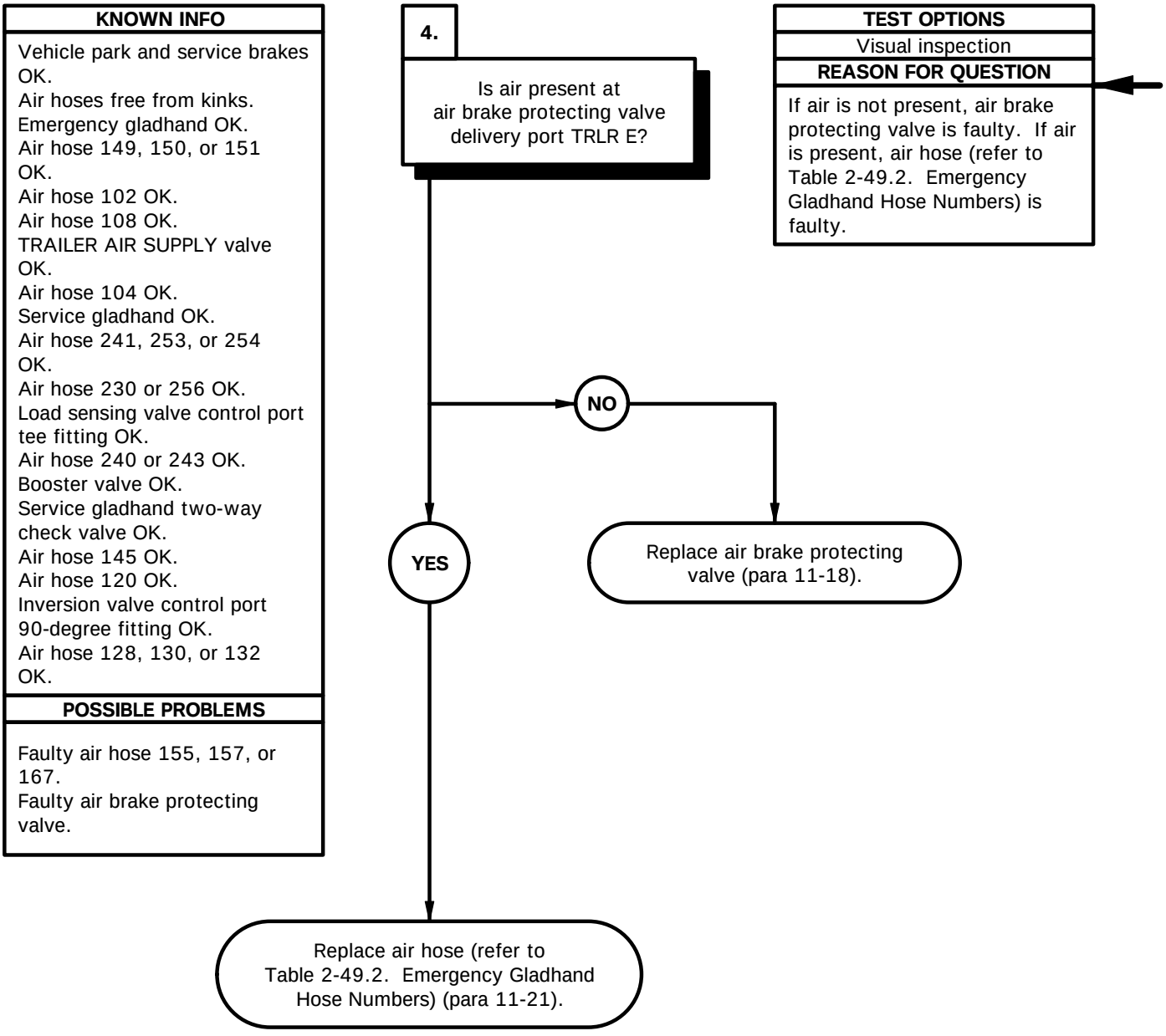
(1) Loosen air hose (refer to Table 2-49.1 Emergency Gladhand Hose Numbers) at emergency gladhand.
(2) Start engine (TM 9-2320-366-10-1).
(3) Push in TRAILER AIR SUPPLY control (TM 9-2320-366-10-1).
(4) Check for presence of air at air hose (refer to Table 2-49.1. Emergency Gladhand Hose Numbers).
(5) Shut down engine (TM 9-2320-366-10-1).
(6) If air is not present, go to step 4 of this fault.
(7) If air is present, replace emergency gladhand (para 11-24).
(8) Tighten air hose (refer to Table 2-49.1. Emergency Gladhand Hose Numbers) at emergency gladhand.

Table 2-49.1. Emergency Gladhand Hose Numbers

Model	Hose
All Except M1086 and M1089	157
M1086	167
M1089	155



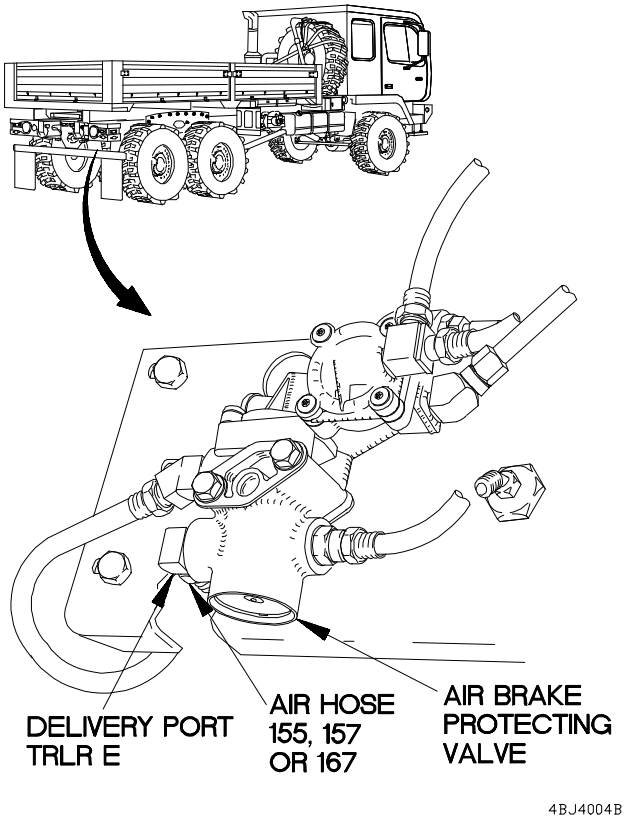
j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (ALL MODELS EXCEPT M1088) (CONT)



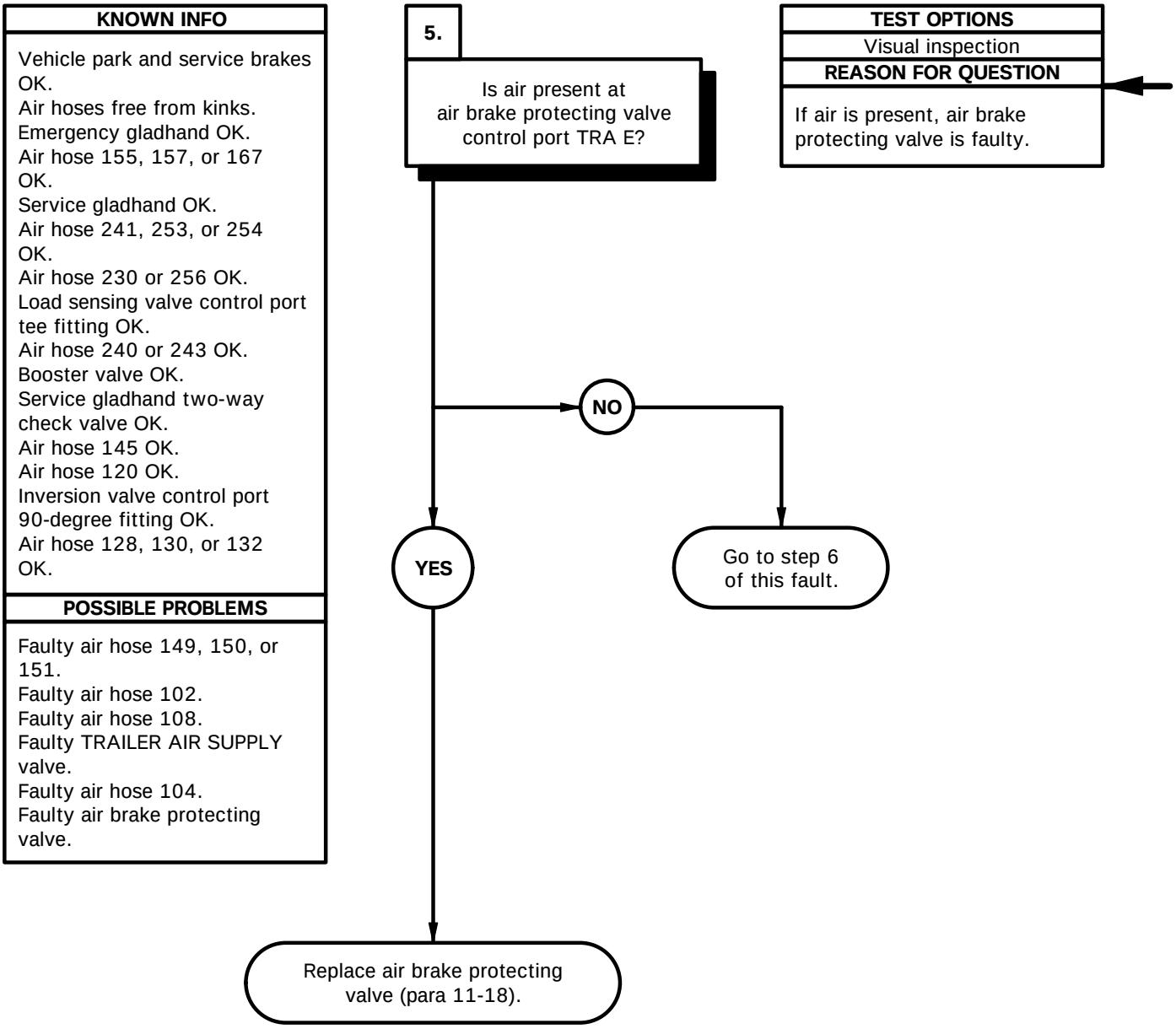
(1) Loosen air hose (refer to Table 2-49.2. Emergency Gladhand Hose Numbers) at air brake protecting valve delivery port TRLR E.
(2) Start engine (TM 9-2320-366-10-1).
(3) Push in TRAILER AIR SUPPLY control (TM 9-2320-366-10-1).
(4) Check for presence of air at air brake protecting valve delivery port TRLR E.
(5) Shut down engine (TM 9-2320-366-10-1).
(6) If air is not present, replace air brake protecting valve (para 11-18).
(7) If air is present, replace air hose (refer to Table 2-49.2. Emergency Gladhand Hose Numbers) (para 11-21).
(8) Tighten air hose (refer to Table 2-49.2 Emergency Gladhand Hose Numbers) at air brake protecting valve delivery port TRLR E.

Table 2-49.2. Emergency Gladhand Hose Numbers

Model	Hose
All Except M1086 and M1089	157
M1086	167
M1089	155



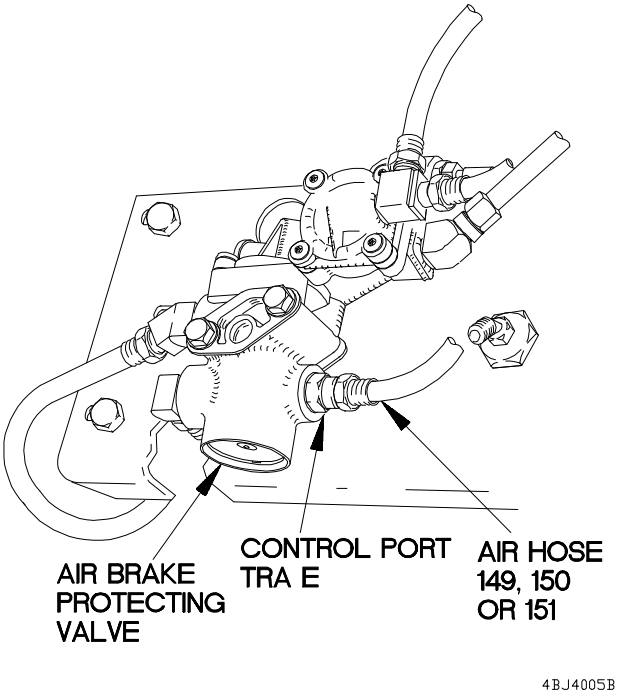
j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (ALL MODELS EXCEPT M1088) (CONT)



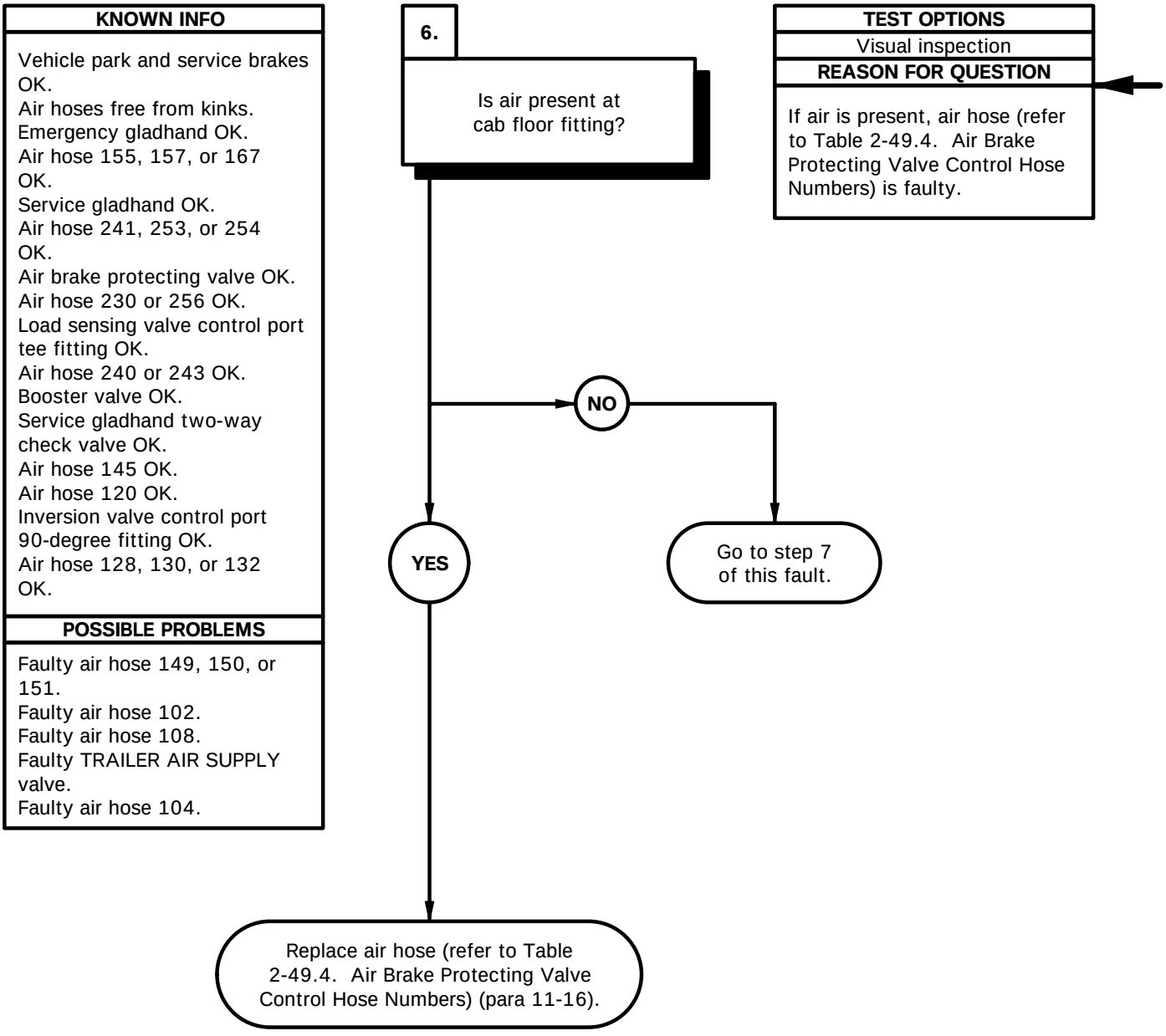
(1) Loosen air hose (refer to Table 2-49.3. Air Brake Protecting Valve Control Hose Numbers) at air brake protecting valve control port TRA E.
(2) Start engine (TM 9-2320-366-10-1).
(3) Push in TRAILER AIR SUPPLY control (TM 9-2320-366-10-1).
(4) Check for presence of air at air hose (refer to Table 2-49.3. Air Brake Protecting Valve Control Hose Numbers).
(5) Shut down engine (TM 9-2320-366-10-1).
(6) If air is not present, go to step 6 of this fault.
(7) If air is present, replace air brake protecting valve (para 11-18).
(8) Tighten air hose (refer to Table 2-49.3. Air Brake Protecting Valve Hose Numbers) at air brake protecting valve control port TRA E.

Table 2-49.3. Air Brake Protecting Valve Control Hose Numbers

Model	Hose
All Except M1086 and M1089	149
M1086	150
M1089	151



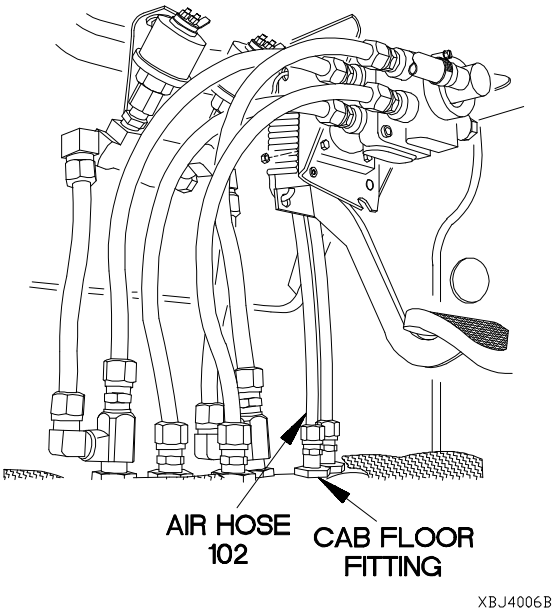
j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (ALL MODELS EXCEPT M1088) (CONT)



(1) Loosen air hose 102 at cab floor fitting.
(2) Start engine (TM 9-2320-366-10-1).
(3) Push in TRAILER AIR SUPPLY control (TM 9-2320-366-10-1).
(4) Check for presence of air at air hose 102.
(5) Shut down engine (TM 9-2320-366-10-1).
(6) If air is not present, go to step 7 of this fault.
(7) If air is present, replace air hose (refer to Table 2-49.4. Air Brake Protecting Valve Control Hose Numbers) (para 11-21).
(8) Tighten air hose 102 at cab floor fitting.

Table 2-49.4. Air Brake Protecting Valve Control Hose Numbers

Model	Hose
All Except M1086 and M1089	149
M1086	150
M1089	151



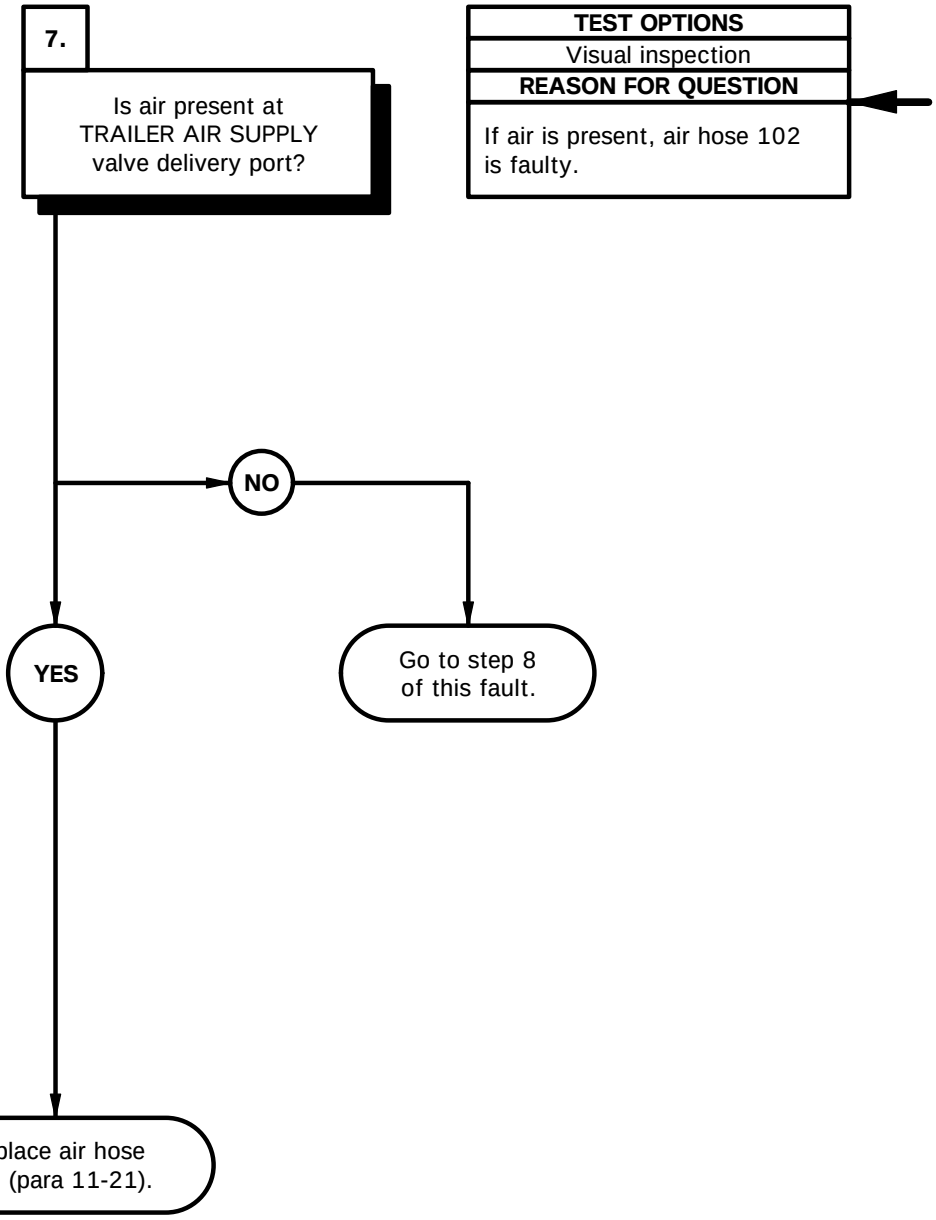
j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (ALL MODELS EXCEPT M1088) (CONT)

KNOWN INFO

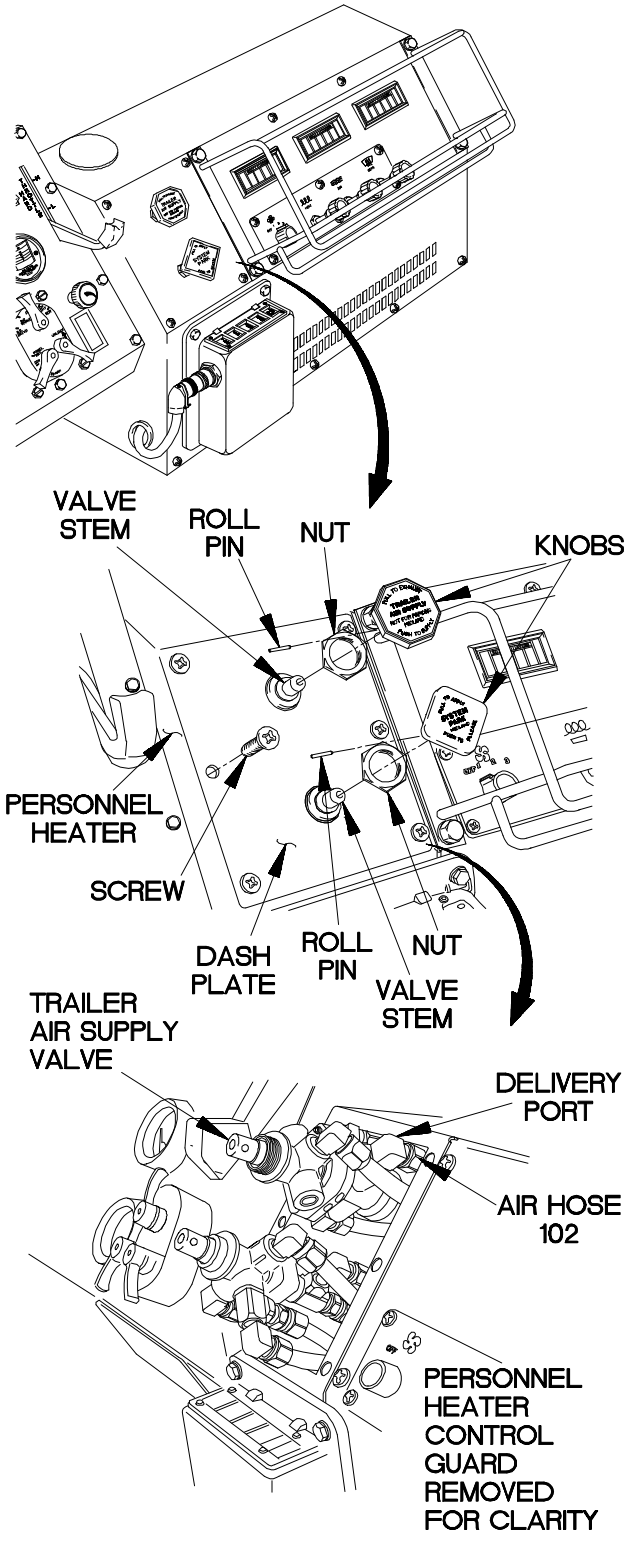
Vehicle park and service brakes OK.
Air hoses free from kinks.
Emergency gladhand OK.
Air hose 155, 157, or 167 OK.
Air hose 149, 150, or 151 OK.
Service gladhand OK.
Air hose 241, 253, or 254 OK.
Air brake protecting valve OK.
Air hose 230 or 256 OK.
Load sensing valve control port tee fitting OK.
Air hose 240 or 243 OK.
Booster valve OK.
Service gladhand two-way check valve OK.
Air hose 145 OK.
Air hose 120 OK.
Inversion valve control port 90-degree fitting OK.
Air hose 128, 130, or 132 OK.

POSSIBLE PROBLEMS

Faulty air hose 102.
Faulty air hose 108.
Faulty TRAILER AIR SUPPLY valve.
Faulty air hose 104.



(1) Remove roll pins from knobs of SYSTEM PARK and TRAILER AIR SUPPLY valves.
(2) Remove SYSTEM PARK and TRAILER AIR SUPPLY valve knobs.
(3) Unscrew nuts at base of valve stem on each valve.
(4) Remove six screws and dash plate from personnel heater.
(5) Pull out TRAILER AIR SUPPLY valve from personnel heater.
(6) Loosen air hose 102 at TRAILER AIR SUPPLY valve delivery port.
(7) Start engine (TM 9-2320-366-10-1).
(8) Push in SYSTEM PARK control (TM 9-2320-366-10-1).
(9) Push in TRAILER AIR SUPPLY valve stem.
(10) Check for presence of air at TRAILER AIR SUPPLY valve delivery port.
(11) If air is not present, go to step 8 of this fault.
(12) If air is present, replace air hose 102 (para 11-21).
(13) Shut down engine (TM 9-2320-366-10-1).
(14) Tighten air hose 102 at TRAILER AIR SUPPLY valve delivery port.



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j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (ALL MODELS EXCEPT M1088) (CONT)

KNOWN INFO

Vehicle park and service brakes OK.
Air hoses free from kinks.
Emergency gladhand OK.
Air hose 155, 157, or 167 OK.
Air hose 149, 150, or 151 OK.
Air hose 102 OK.
Service gladhand OK.
Air hose 241, 253, or 254 OK.
Air brake protecting valve OK.
Air hose 230 or 256 OK.
Load sensing valve control port tee fitting OK.
Air hose 240 or 243 OK.
Booster valve OK.
Service gladhand two-way check valve OK.
Air hose 145 OK.
Air hose 120 OK.
Inversion valve control port 90-degree fitting OK.
Air hose 128, 130, or 132 OK.

POSSIBLE PROBLEMS

Faulty air hose 108.
Faulty TRAILER AIR SUPPLY valve.
Faulty air hose 104.

8. Is air present at TRAILER AIR SUPPLY valve control port?

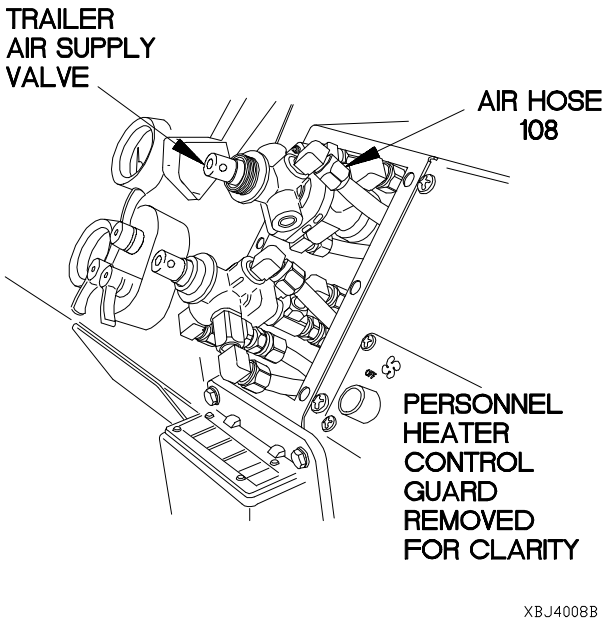
TEST OPTIONS
Visual inspection

REASON FOR QUESTION
If air is not present, air hose 108 is faulty.

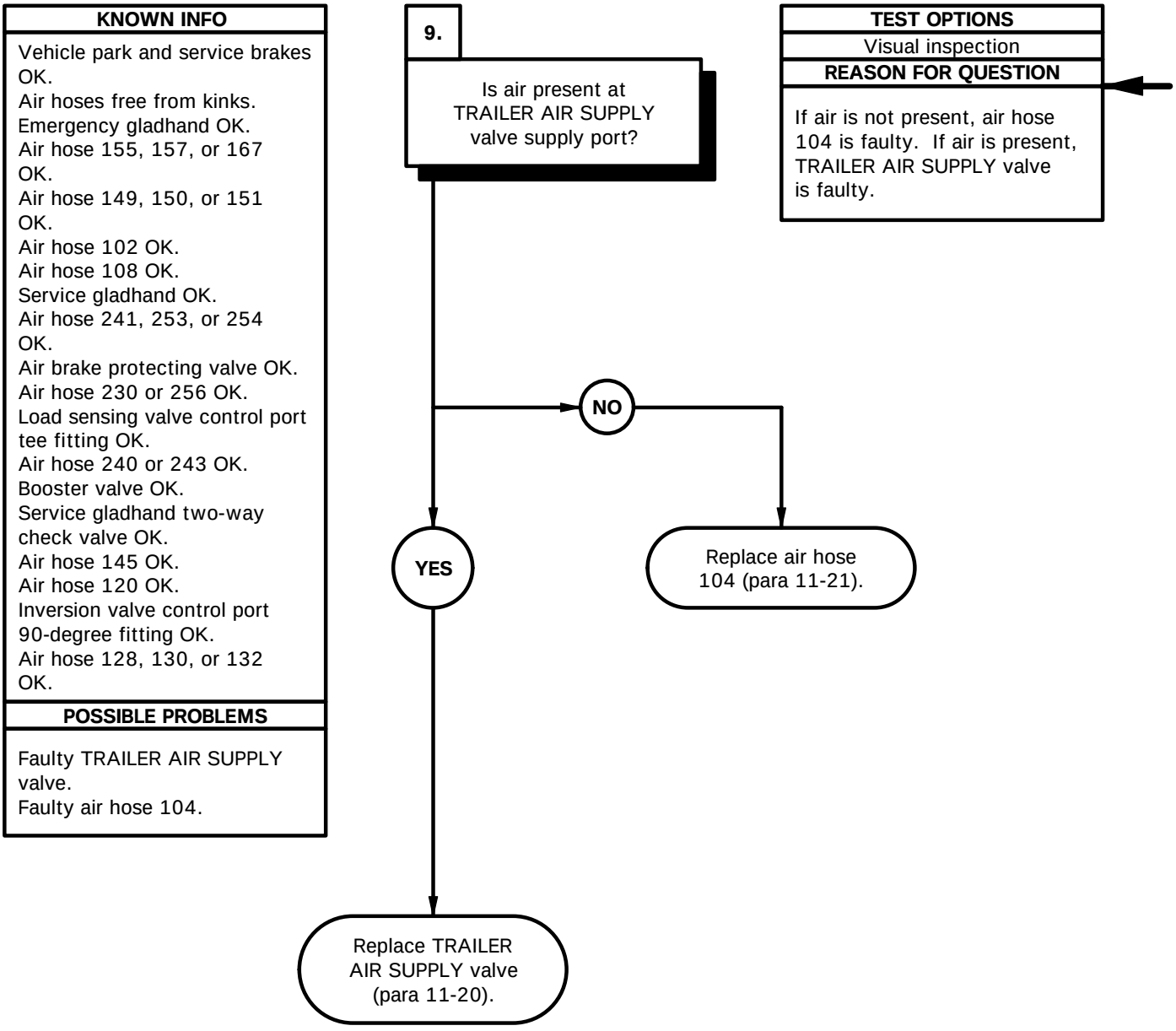
NO → Replace air hose 108 (para 11-21).

YES

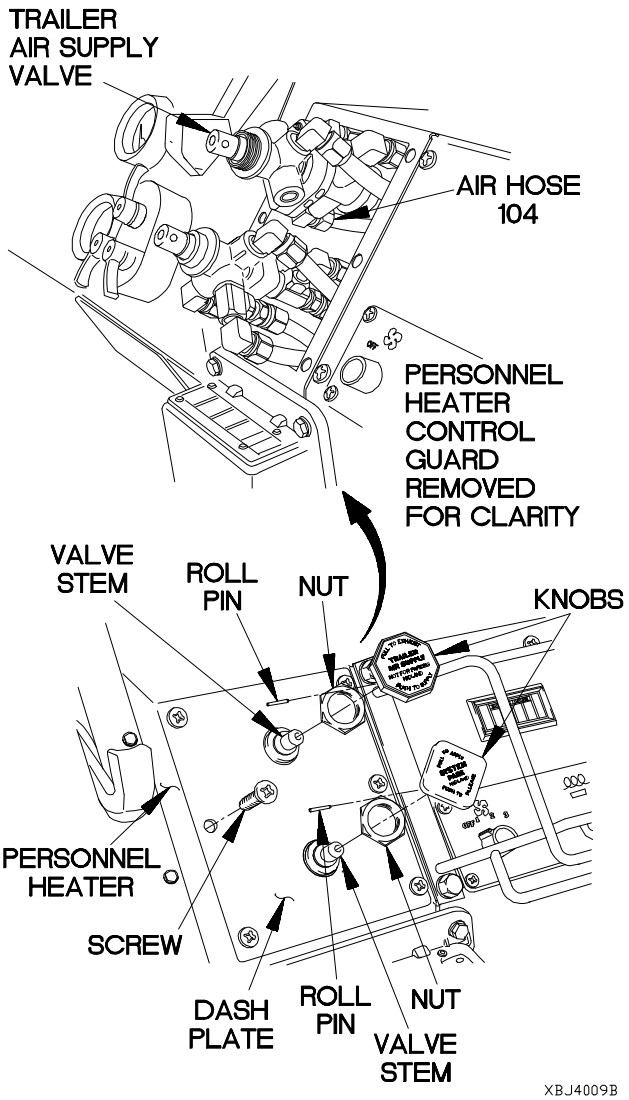
(1) Loosen air hose 108 at TRAILER AIR SUPPLY valve control port.
(2) Start engine (TM 9-2320-366-10-1).
(3) Push in SYSTEM PARK control (TM 9-2320-366-10-1).
(4) Check for presence of air at air hose 108.
(5) If air is not present, replace air hose 108 (para 11-21).
(6) Shut down engine (TM 9-2320-366-10-1).
(7) Tighten air hose 108 at TRAILER AIR SUPPLY valve control port.



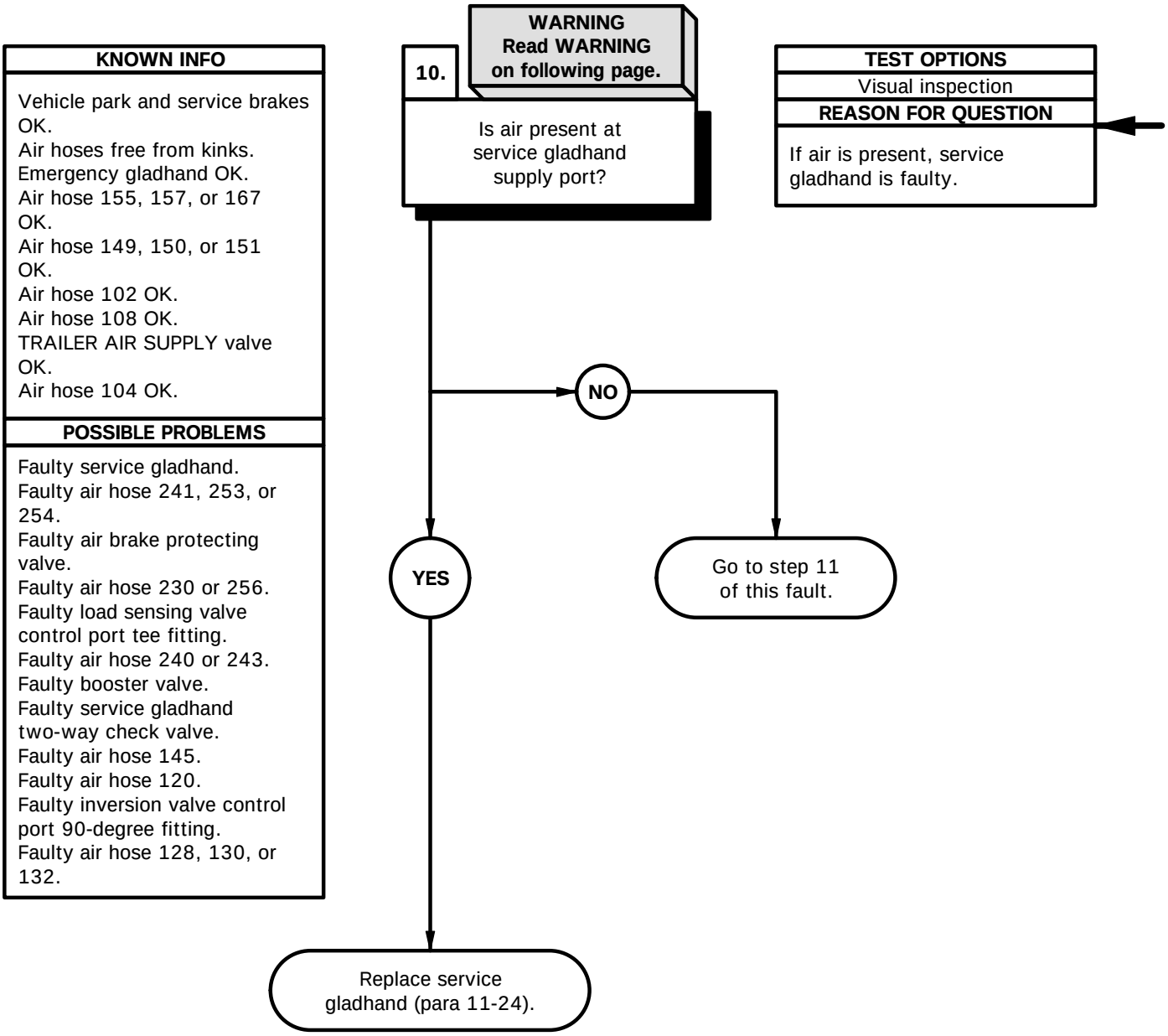
j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (ALL MODELS EXCEPT M1088) (CONT)



(1) Loosen air hose 104 at TRAILER AIR SUPPLY valve supply port.
(2) Start engine (TM 9-2320-366-10-1).
(3) Push in SYSTEM PARK control (TM 9-2320-366-10-1).
(4) Check for presence of air at air hose 104.
(5) If air is not present, replace air hose 104 (para 11-21).
(6) If air is present, replace TRAILER AIR SUPPLY valve (para 11-20).
(7) Shut down engine (TM 9-2320-366-10-1).
(8) Tighten air hose 104 at TRAILER AIR SUPPLY valve supply port.
(9) Push SYSTEM PARK and TRAILER AIR SUPPLY valves back into personnel heater.
(10) Install dash plate on personnel heater with six screws.
(11) Install nuts on valve stems.
(12) Install SYSTEM PARK and TRAILER AIR SUPPLY knobs.



j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (ALL MODELS EXCEPT M1088) (CONT)



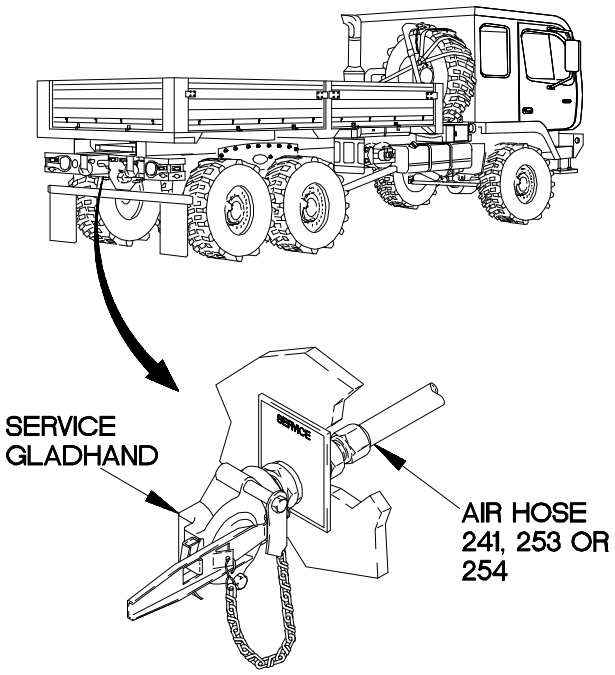
WARNING

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

(1) Loosen air hose (refer to Table 2-49.5. Service Gladhand Hose Numbers) at service gladhand.
(2) Start engine (TM 9-2320-366-10-1).
(3) Push in TRAILER AIR SUPPLY control (TM 9-2320-366-10-1).
(4) Apply service brakes (TM 9-2320-366-10-1).
(5) Check for presence of air at air hose (refer to Table 2-49.5. Service Gladhand Hose Numbers).
(6) Shut down engine (TM 9-2320-366-10-1).
(7) If air is not present, go to step 11 of this fault.
(8) If air is present, replace service gladhand (para 11-24).
(9) Tighten air hose (refer to Table 2-49.5. Service Gladhand Hose Numbers) at service gladhand.

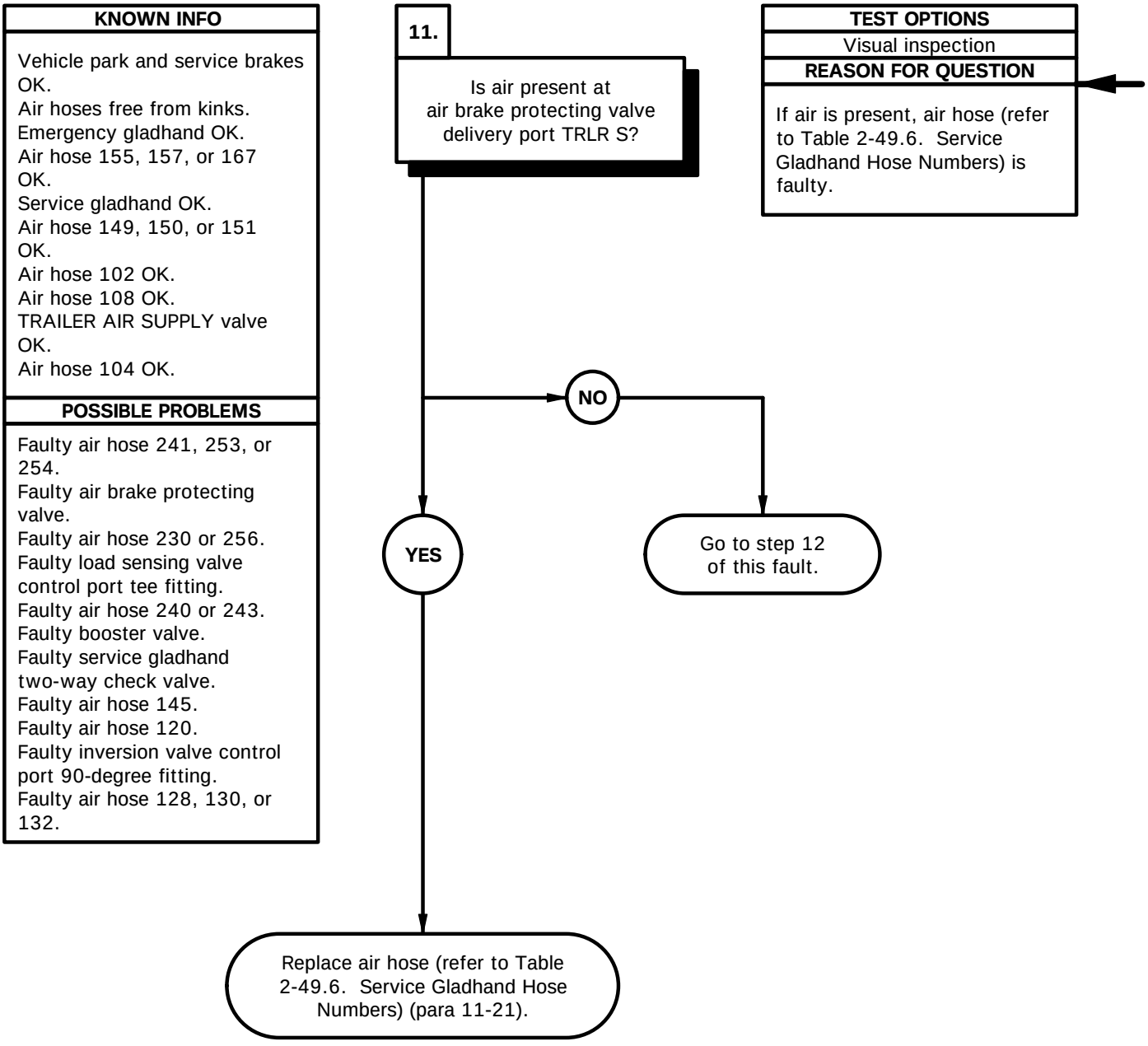
Table 2-49.5. Service Gladhand Hose Numbers

Model	Hose
All Except M1086 and M1089	241
M1086	254
M1089	253



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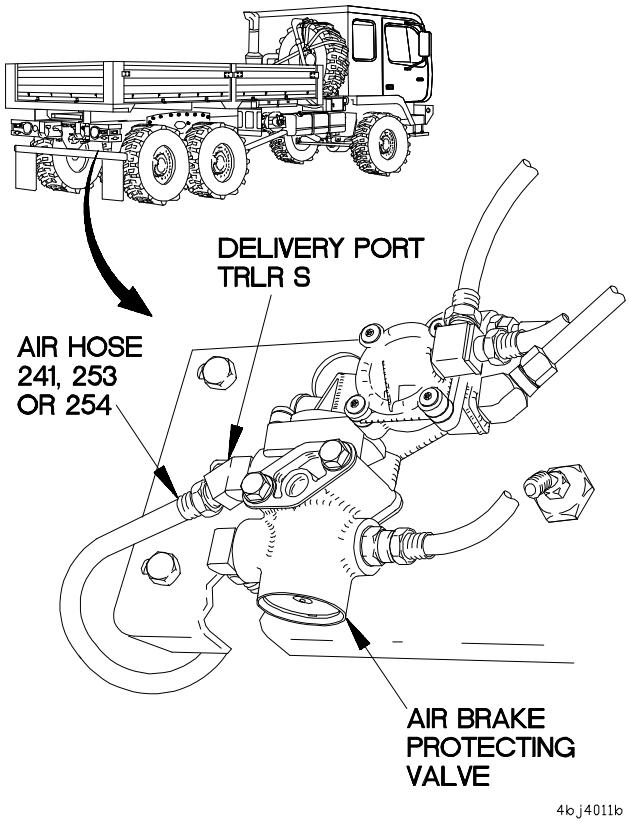
j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (ALL MODELS EXCEPT M1088) (CONT)



(1) Loosen air hose (refer to Table 2-49.6. Service Gladhand Hose Numbers) at air brake protecting valve delivery port TRLR S.
(2) Start engine (TM 9-2320-366-10-1).
(3) Push in TRAILER AIR SUPPLY control (TM 9-2320-366-10-1).
(4) Apply service brakes (TM 9-2320-366-10-1).
(5) Check for presence of air at air brake protecting valve delivery port TRLR S.
(6) Shut down engine (TM 9-2320-366-10-1).
(7) If air is not present, go to step 12 of this fault.
(8) If air is present, replace air hose (refer to Table 2-49.6. Service Gladhand Hose Numbers) (para 11-21).
(9) Tighten air hose (refer to Table 2-49.6. Service Gladhand Hose Numbers) at air brake protecting valve delivery port TRLR S.

Table 2-49.6. Service Gladhand Hose Numbers

Model	Hose
All Except M1086 and M1089	241
M1086	254
M1089	253



j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (ALL MODELS EXCEPT M1088) (CONT)

KNOWN INFO

Vehicle park and service brakes OK.
Air hoses free from kinks.
Emergency gladhand OK.
Air hose 155, 157, or 167 OK.
Service gladhand OK.
Air hose 149, 150, or 151 OK.
Air hose 102 OK.
Air hose 108 OK.
TRAILER AIR SUPPLY valve OK.
Air hose 104 OK.
Air hose 241, 253, or 254 OK.

POSSIBLE PROBLEMS

Faulty air brake protecting valve.
Faulty air hose 230 or 256.
Faulty load sensing valve control port tee fitting.
Faulty air hose 240 or 243.
Faulty booster valve.
Faulty service gladhand two-way check valve.
Faulty air hose 145.
Faulty air hose 120.
Faulty inversion valve control port 90-degree fitting.
Faulty air hose 128, 130, or 132.

12.

Is air present at air brake protecting valve supply port FV1?

NO → Go to step 14 of this fault (all models except M1089) or step 16 of this fault (M1089).

YES

TEST OPTIONS

Visual inspection

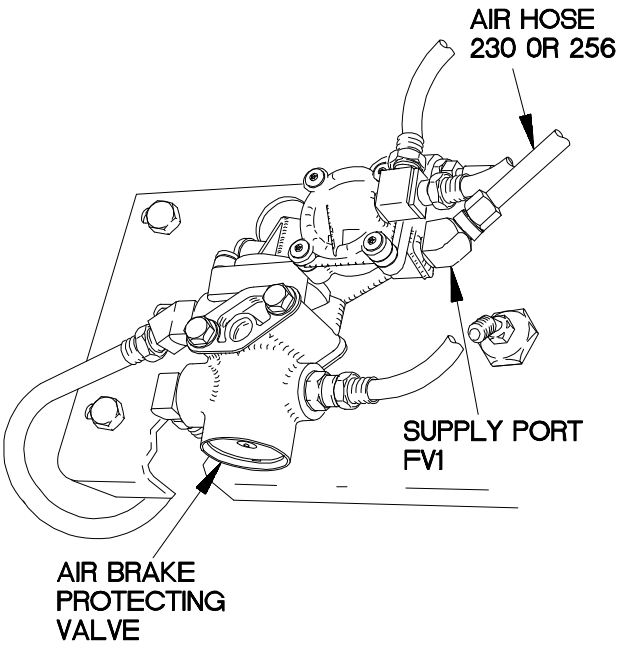
REASON FOR QUESTION

This question eliminates possible problems and determines where troubleshooting continues.

(1) Loosen air hose (refer to Table 2-49.7. Air Brake Protecting Valve Supply Hose Numbers) at air brake protecting valve supply port FV1.
(2) Start engine (TM 9-2320-366-10-1).
(3) Apply service brakes (TM 9-2320-366-10-1).
(4) Check for presence of air at air hose (refer to Table 2-49.7 Air Brake Protecting Valve Supply Hose Numbers).
(5) Shut down engine (TM 9-2320-366-10-1).
(6) If air is not present, go to step 14 of this fault (all models except M1089) or step 16 of this fault (M1089).
(7) Tighten air hose (refer to Table 2-49.7. Air Brake Protecting Valve Supply Hose Numbers) at air brake protecting valve supply port FV1.

Table 2-49.7. Air Brake Protecting Valve Supply Hose Numbers

Model	Hose
All Except M1089	230
M1089	256



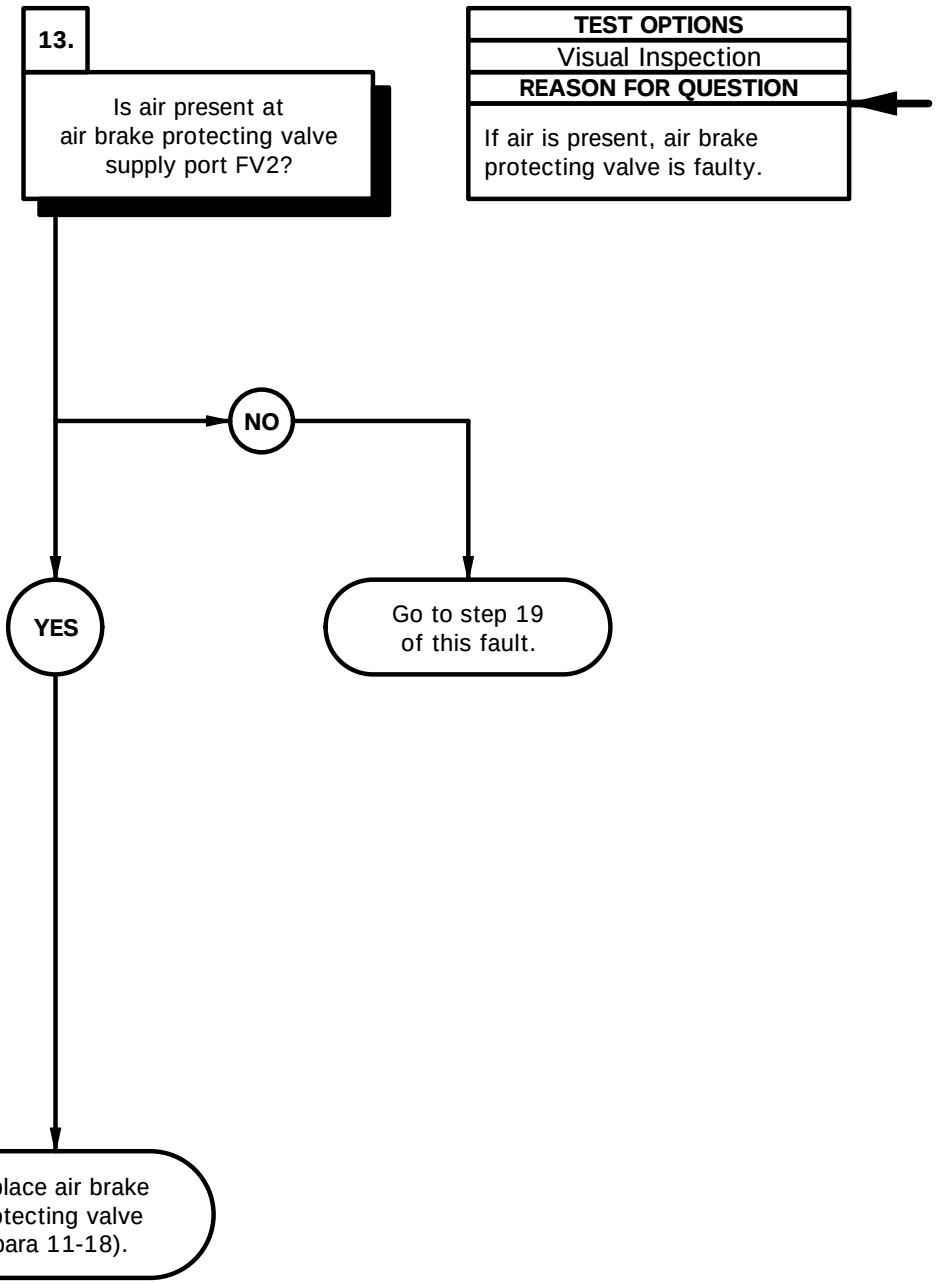
j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (ALL MODELS EXCEPT M1088) (CONT)

KNOWN INFO

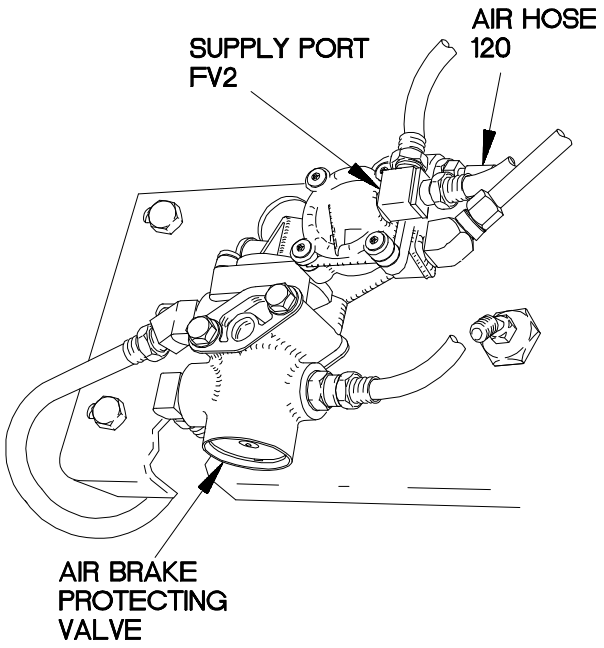
Vehicle park and service brakes OK.
Air hoses free from kinks.
Emergency gladhand OK.
Air hose 155, 157, or 167 OK.
Service gladhand OK.
Air hose 149, 150, or 151 OK.
Air hose 102 OK.
Air hose 108 OK.
TRAILER AIR SUPPLY valve OK.
Air hose 104 OK.
Air hose 241, 253, or 254 OK.
Air hose 230 or 256 OK.
Load sensing valve control port tee fitting OK.
Air hose 240 or 243 OK.
Booster valve OK.
Service gladhand two-way check valve OK.
Air hose 145 OK.

POSSIBLE PROBLEMS

Faulty air brake protecting valve.
Faulty air hose 120.
Faulty inversion valve control port 90-degree fitting.
Faulty air hose 128, 130, or 132.



(1) Loosen air hose 120 at air brake protecting valve supply port FV2.
(2) Start engine (TM 9-2320-366-10-1).
(3) Apply service brakes (TM 9-2320-366-10-1).
(4) Check for presence of air at air hose 120.
(5) Shut down engine (TM 9-2320-366-10-1).
(6) If air is not present, go to step 19 of this fault.
(7) If air is present, replace air brake protecting valve (para 11-18).
(8) Tighten air hose 120 at air brake protecting valve supply port FV2.



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j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (ALL MODELS EXCEPT M1088) (CONT)

KNOWN INFO

Vehicle park and service brakes OK.
Air hoses free from kinks.
Emergency gladhand OK.
Air hose 155, 157, or 167 OK.
Service gladhand OK.
Air hose 149, 150, or 151 OK.
Air hose 102 OK.
Air hose 108 OK.
TRAILER AIR SUPPLY valve OK.
Air hose 104 OK.
Air hose 241, 253, or 254 OK.
Air brake protecting valve OK.
Air hose 120 OK.
Inversion valve control port 90-degree fitting OK.
Air hose 128, 130, or 132 OK.

POSSIBLE PROBLEMS

Faulty air hose 230.
Faulty load sensing valve control port tee fitting.
Faulty air hose 240 or 243.
Faulty booster valve.
Faulty service gladhand two-way check valve.
Faulty air hose 145.

14. Is air present at load sensing valve control port tee fitting delivery port?

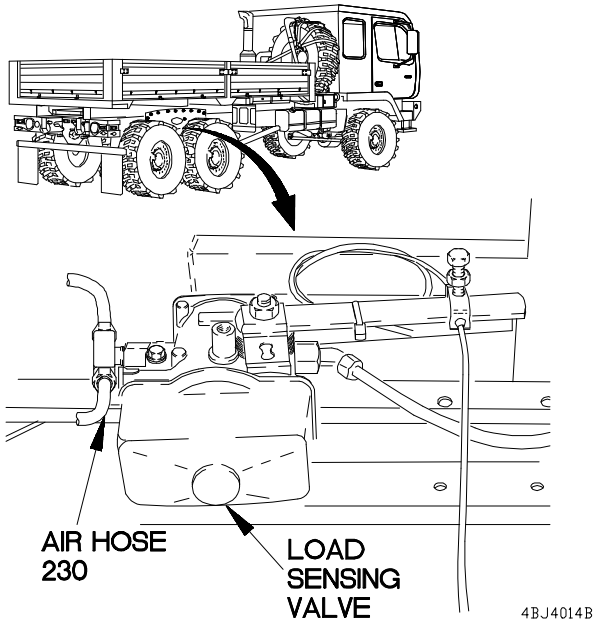
TEST OPTIONS
Visual inspection

REASON FOR QUESTION
If air is present, air hose 230 is faulty.

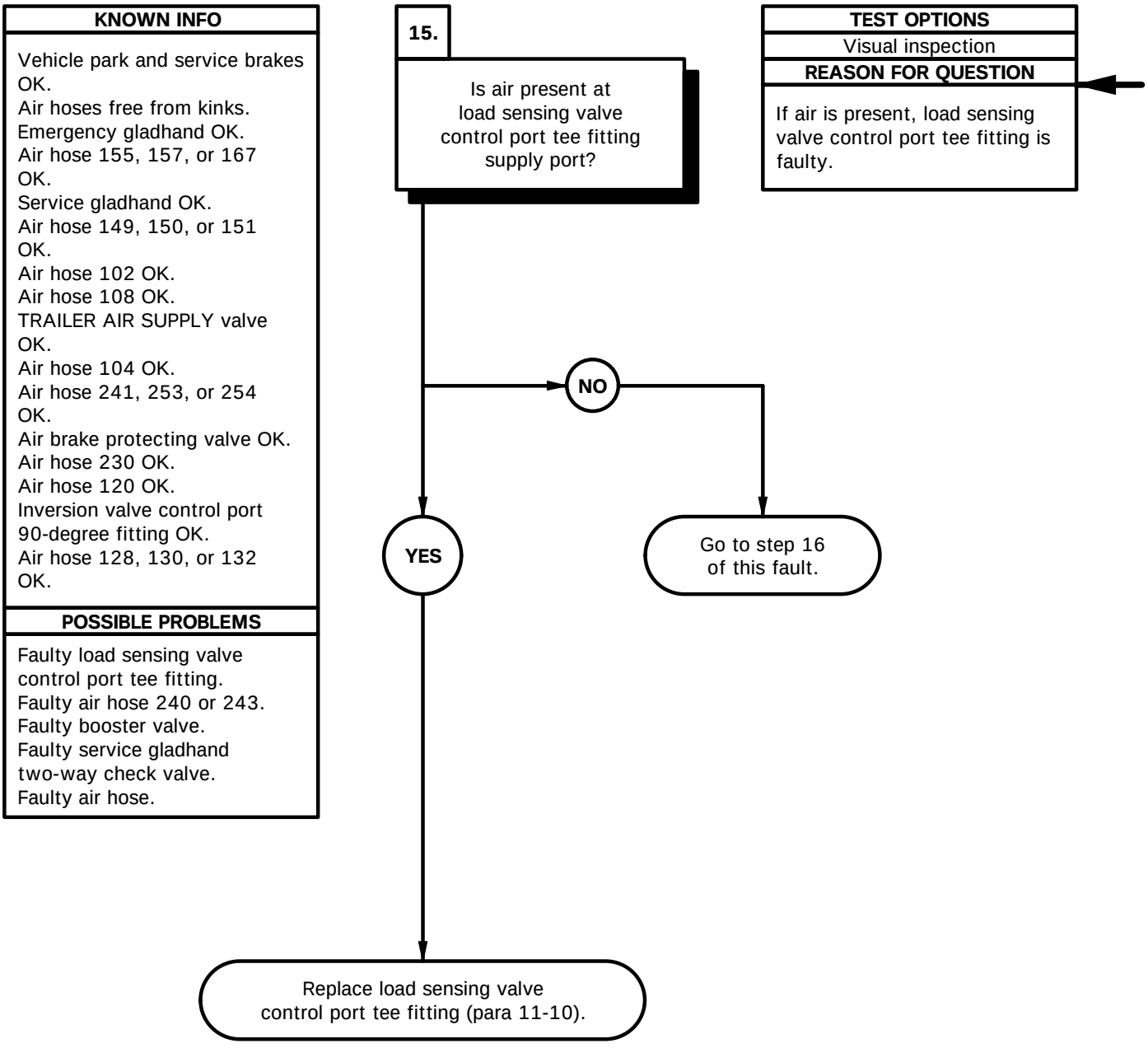
NO → Go to step 15 of this fault.

YES → Replace air hose 230 (para 11-21).

(1) Loosen air hose 230 at load sensing valve control port tee fitting delivery port.
(2) Start engine (TM 9-2320-366-10-1).
(3) Apply service brakes (TM 9-2320-366-10-1).
(4) Check for presence of air at load sensing valve control port tee fitting delivery port.
(5) Shut down engine (TM 9-2320-366-10-1).
(6) If air is not present, go to step 15 of this fault.
(7) If air is present, replace air hose 230 (para 11-21).
(8) Tighten air hose 230 at load sensing valve control port tee fitting delivery port.



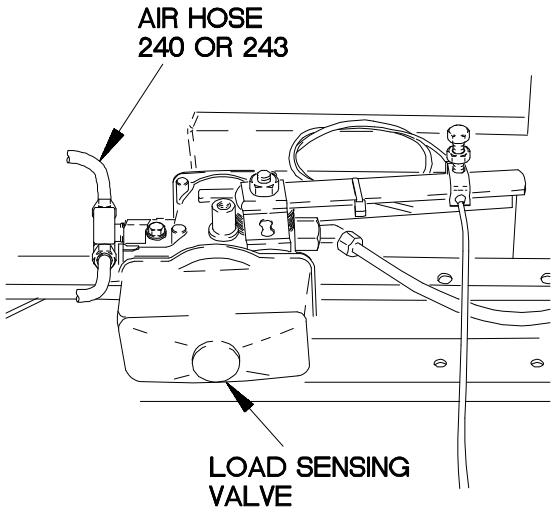
j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (ALL MODELS EXCEPT M1088) (CONT)



(1) Loosen air hose (refer to Table 2-49.8. Load Sensing Valve Control Port Tee Hose Numbers) at load sensing valve control port tee fitting supply port.
(2) Start engine (TM 9-2320-366-10-1).
(3) Apply service brakes (TM 9-2320-366-10-1).
(4) Check for presence of air at air hose (refer to Table 2-49.8. Load Sensing Valve Control Port Tee Hose Numbers) .
(5) Shut down engine (TM 9-2320-366-10-1).
(6) If air is not present, go to step 16 of this fault.
(7) If air is present, replace load sensing valve control port tee fitting (para 11-10).
(8) Tighten air hose (refer to Table 2-49.8. Load Sensing Valve Control Port Tee Hose Numbers) at load sensing valve control port tee fitting supply port.

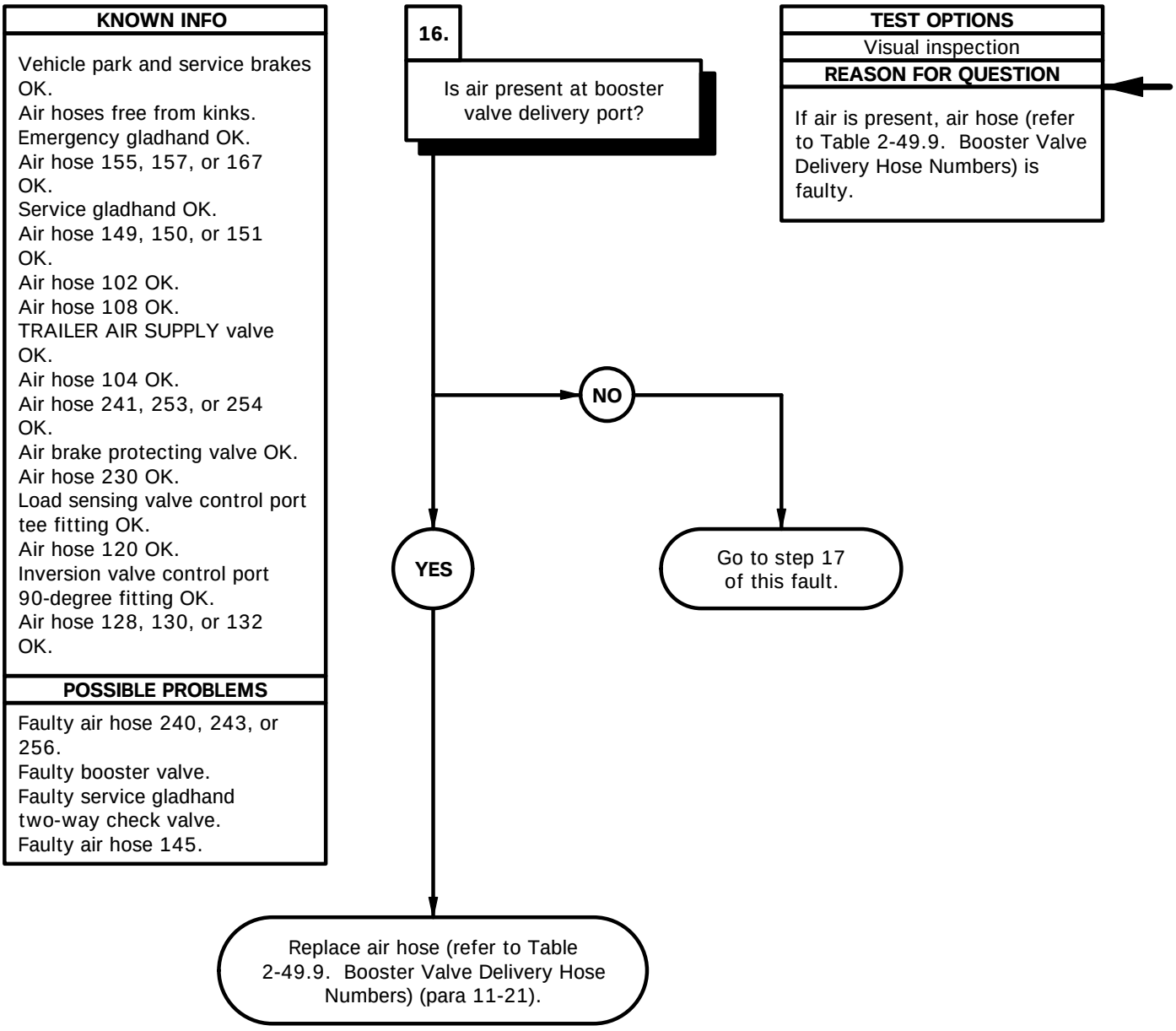
Table 2-49.8. Load Sensing Valve Control Port Tee Hose Numbers

Model	Hose
All Except M1086	240
M1086	243



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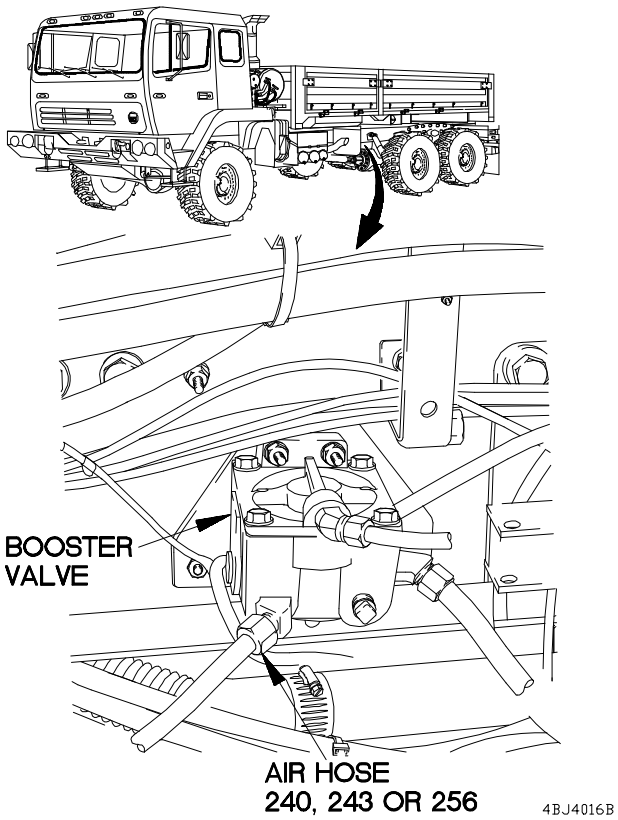
j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (ALL MODELS EXCEPT M1088) (CONT)



(1) Loosen air hose (refer to Table 2-49.9. Booster Valve Delivery Hose Numbers) at booster valve delivery port.
(2) Start engine (TM 9-2320-366-10-1).
(3) Apply service brakes (TM 9-2320-366-10-1).
(4) Check for presence of air at booster valve delivery port.
(5) Shut down engine (TM 9-2320-366-10-1).
(6) If air is not present, go to step 17 of this fault.
(7) If air is present, replace air hose (refer to Table 2-49.9. Booster Valve Delivery Hose Numbers) (para 11-21).
(8) Tighten air hose (refer to Table 2-49.9. Booster Valve Delivery Hose Numbers) at booster valve delivery port.

Table 2-49.9. Booster Valve Delivery Hose Numbers

Model	Hose
All Except M1086 and M1089	240
M1086	243
M1089	256



j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (ALL MODELS EXCEPT M1088) (CONT)

KNOWN INFO

Vehicle park and service brakes OK.
Air hoses free from kinks.
Emergency gladhand OK.
Air hose 155, 157, or 167 OK.
Service gladhand OK.
Air hose 149, 150, or 151 OK.
Air hose 102 OK.
Air hose 108 OK.
TRAILER AIR SUPPLY valve OK.
Air hose 104 OK.
Air hose 241, 253, or 254 OK.
Air brake protecting valve OK.
Air hose 230 or 256 OK.
Load sensing valve control port tee fitting OK.
Air hose 240 or 243 OK.
Air hose 120 OK.
Inversion valve control port 90-degree fitting OK.
Air hose 128, 130, or 132 OK.

POSSIBLE PROBLEMS

Faulty booster valve.
Faulty service gladhand two-way check valve.
Faulty air hose 145.

17. Is air present at booster valve supply port?

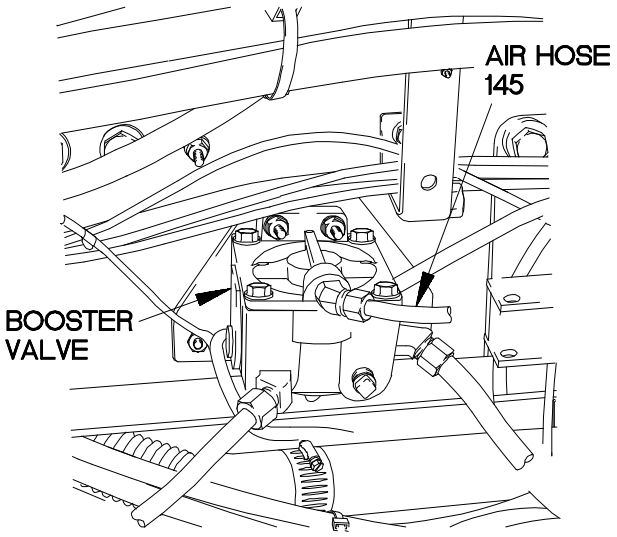
TEST OPTIONS
Visual inspection

REASON FOR QUESTION
If air is present, booster valve is faulty.

NO → Go to step 18 of this fault.

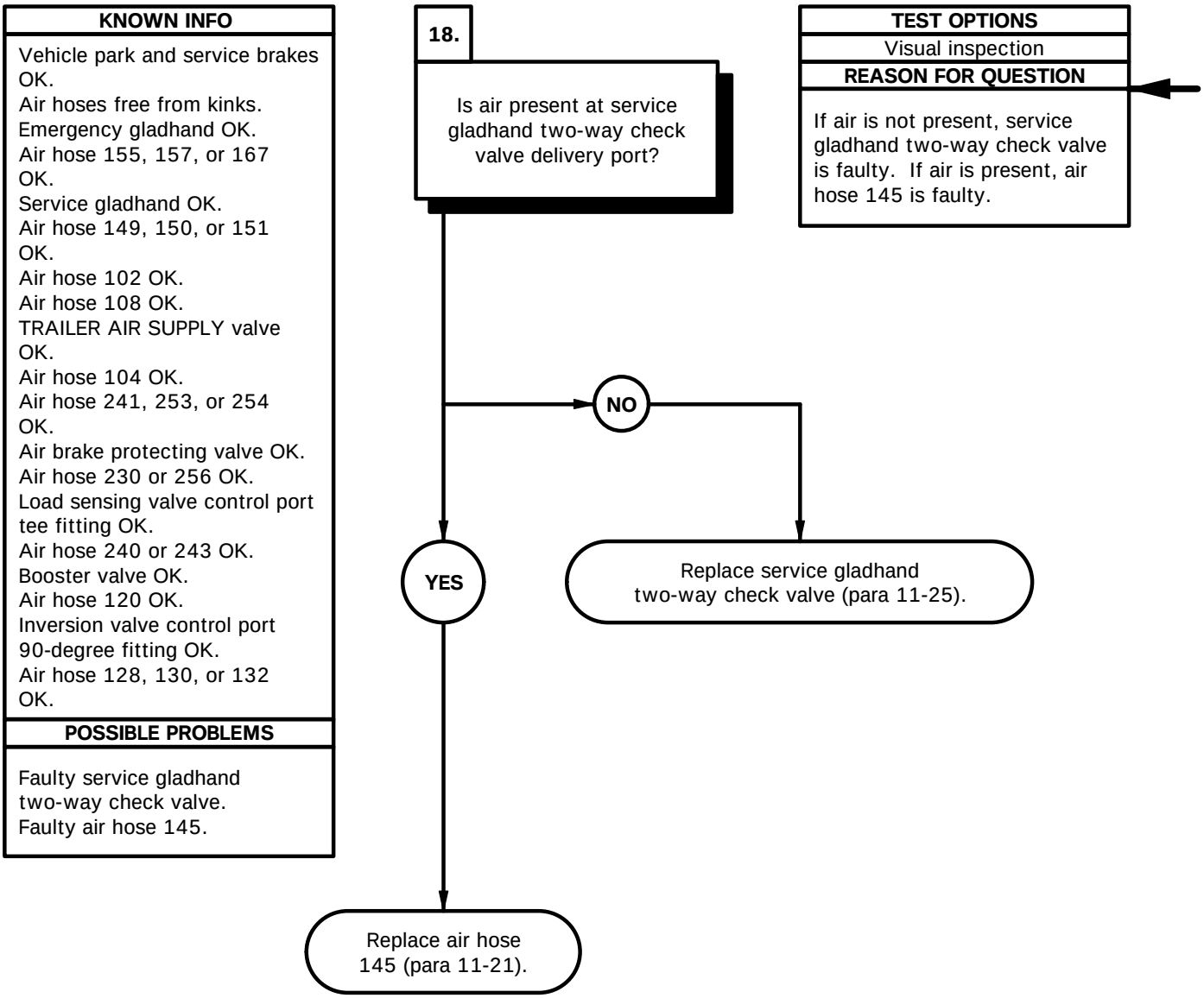
YES → Replace booster valve (para 11-15).

(1) Loosen air hose 145 at booster valve supply port.
(2) Start engine (TM 9-2320-366-10-1).
(3) Apply service brakes (TM 9-2320-366-10-1).
(4) Check for presence of air at air hose 145.
(5) Shut down engine (TM 9-2320-366-10-1).
(6) If air is not present, go to step 18 of this fault.
(7) If air is present, replace booster valve (para 11-15).
(8) Tighten air hose 145 at booster valve supply port.

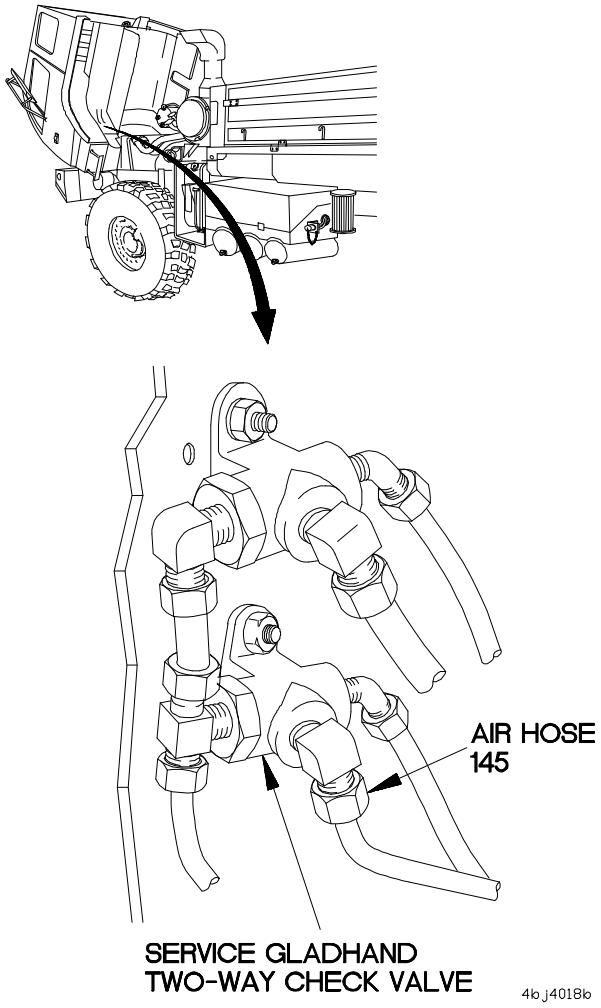


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j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (ALL MODELS EXCEPT M1088) (CONT)



(1) Raise cab (TM 9-2320-366-10-1).
(2) Loosen air hose 145 at service gladhand two-way check valve delivery port.
(3) Start engine (TM 9-2320-366-10-1).
(4) Apply service brakes (TM 9-2320-366-10-1).
(5) Check for presence of air at service gladhand two-way check valve delivery port.
(6) Shut down engine (TM 9-2320-366-10-1).
(7) If air is not present, replace service gladhand two-way check valve (para 11-25).
(8) If air is present, replace air hose 145 (para 11-21).
(9) Tighten air hose 145 at service gladhand two-way check valve delivery port.
(10) Lower cab (TM 9-2320-366-10-1).



j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (ALL MODELS EXCEPT M1088) (CONT)

KNOWN INFO

Vehicle park and service brakes OK.
Air hoses free from kinks.
Emergency gladhand OK.
Air hose 155, 157, or 167 OK.
Service gladhand OK.
Air hose 149, 150, or 151 OK.
Air hose 102 OK.
Air hose 108 OK.
TRAILER AIR SUPPLY valve OK.
Air hose 104 OK.
Air hose 241, 253, or 254 OK.
Air hose 230 or 256 OK.
Load sensing valve control port tee fitting OK.
Air hose 240 or 243 OK.
Booster valve OK.
Service gladhand two-way check valve OK.
Air hose 145 OK.
Air brake protecting valve OK.

POSSIBLE PROBLEMS

Faulty air hose 120.
Faulty inversion valve control port 90-degree fitting.
Faulty air hose 128, 130, or 132.

19.

Is air present at inversion valve control port 90-degree fitting delivery port?

TEST OPTIONS

Visual Inspection

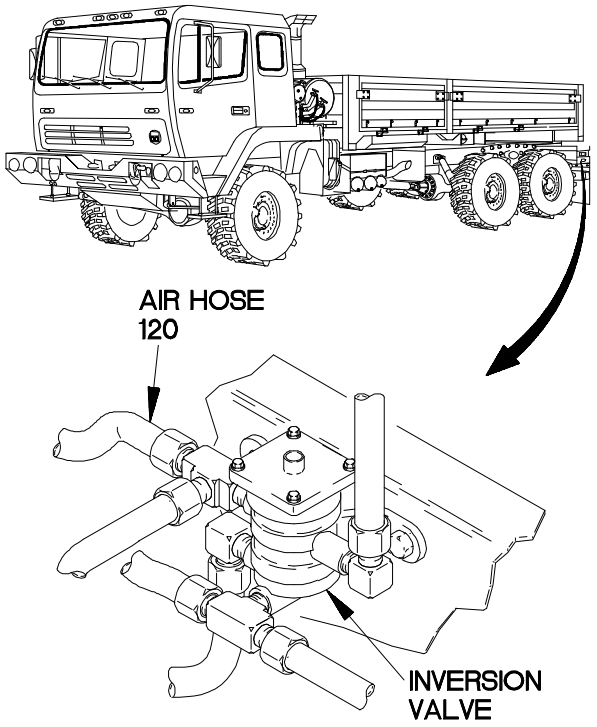
REASON FOR QUESTION

If air is present, air hose 120 is faulty.

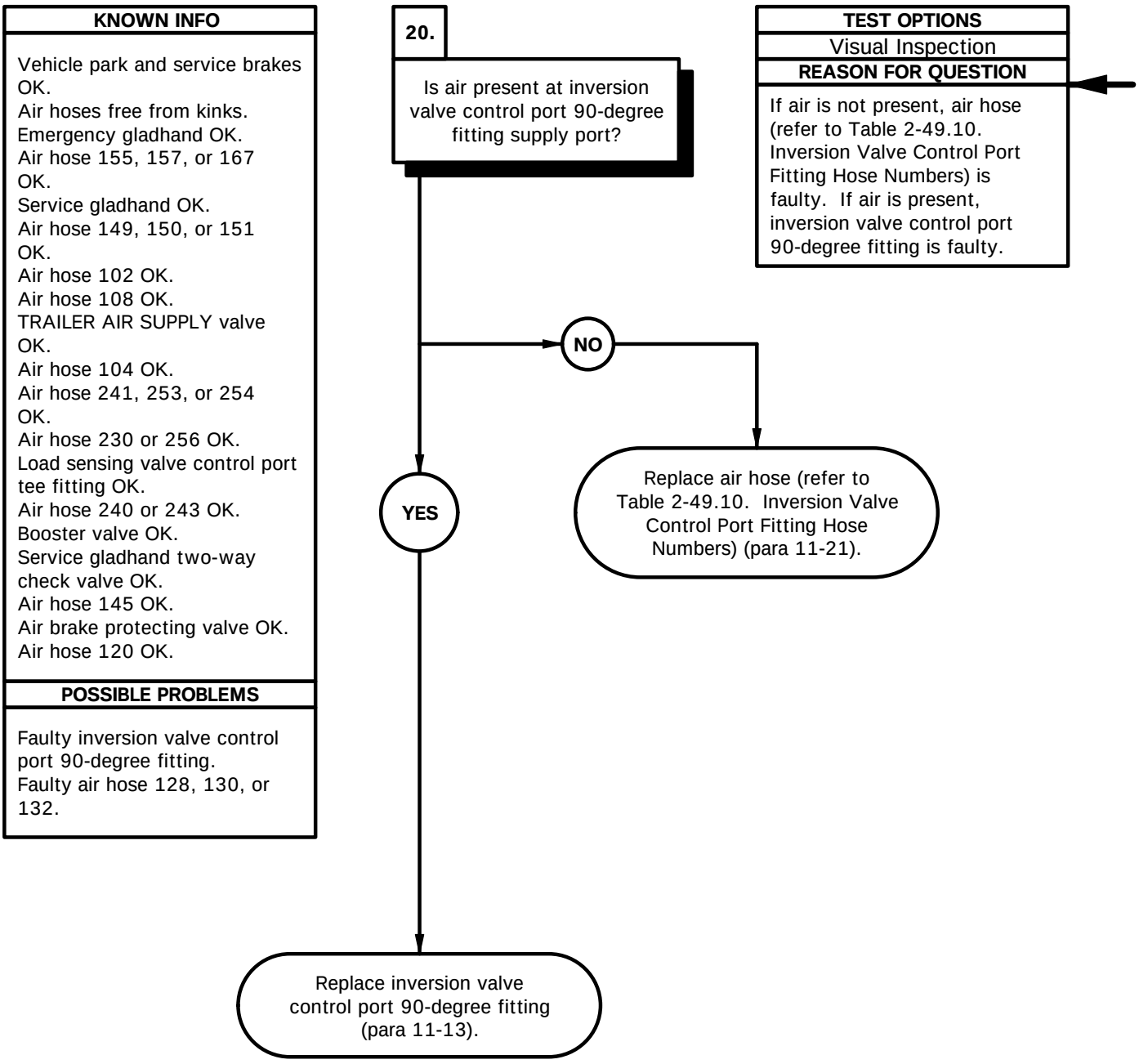
NO → Go to step 20 of this fault.

YES → Replace air hose 120 (para 11-21).

(1) Loosen air hose 120 at inversion valve control port 90-degree fitting delivery port.
(2) Start engine (TM 9-2320-366-10-1).
(3) Apply service brakes (TM 9-2320-366-10-1).
(4) Check for presence of air at inversion valve control port 90-degree fitting delivery port.
(5) Shut down engine (TM 9-2320-366-10-1).
(6) If air is not present, go to step 20 of this fault.
(7) If air is present, replace air hose 120 (para 11-21).
(8) Tighten air hose 120 at inversion valve control port 90-degree fitting delivery port.



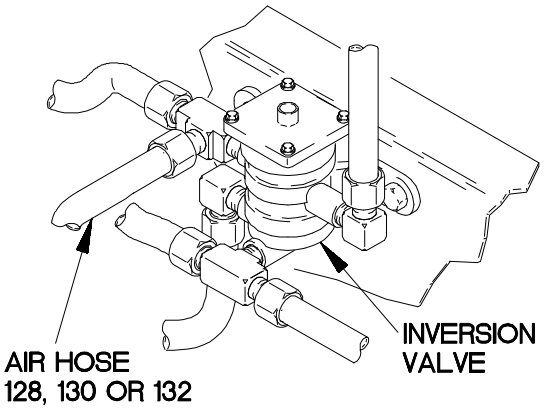
j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (ALL MODELS EXCEPT M1088) (CONT)



(1) Loosen air hose (refer to Table 2-49.10. Inversion Valve Control Port Fitting Hose Numbers) at inversion valve control port 90-degree fitting supply port.
(2) Start engine (TM 9-2320-366-10-1).
(3) Apply service brakes (TM 9-2320-366-10-1).
(4) Check for presence of air at air hose (refer to Table 2-49.10. Inversion Valve Control Port Fitting Hose Numbers).
(5) Shut down engine (TM 9-2320-366-10-1).
(6) If air is not present, replace air hose (refer to Table 2-49.10. Inversion Valve Control Port Fitting Hose Numbers) (para 11-21).
(7) If air is present, replace inversion valve control port 90-degree fitting (para 11-13).
(8) Tighten air hose (refer to Table 2-49.10. Inversion Valve Control Port Fitting Hose Numbers) at inversion valve control port 90-degree fitting supply port.

Table 2-49.10. Inversion Valve Control Port Fitting Hose Numbers

Model	Hose
All Except M1086 and M1089	130
M1086	132
M1089	128



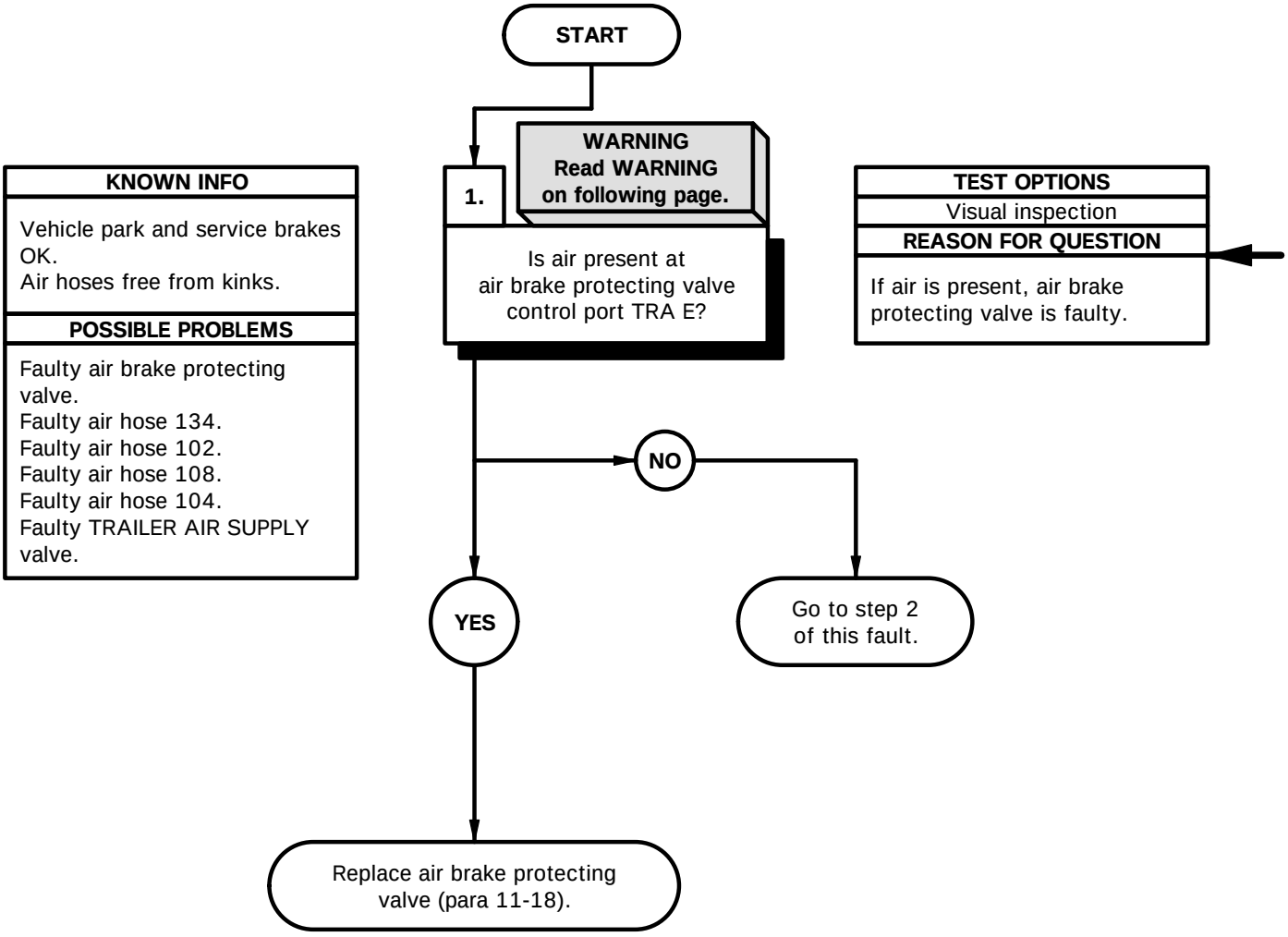
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j4A. NO AIR PRESSURE PRESENT AT ALL M1088 REAR AND FIFTH WHEEL GLADHANDS

INITIAL SETUP

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

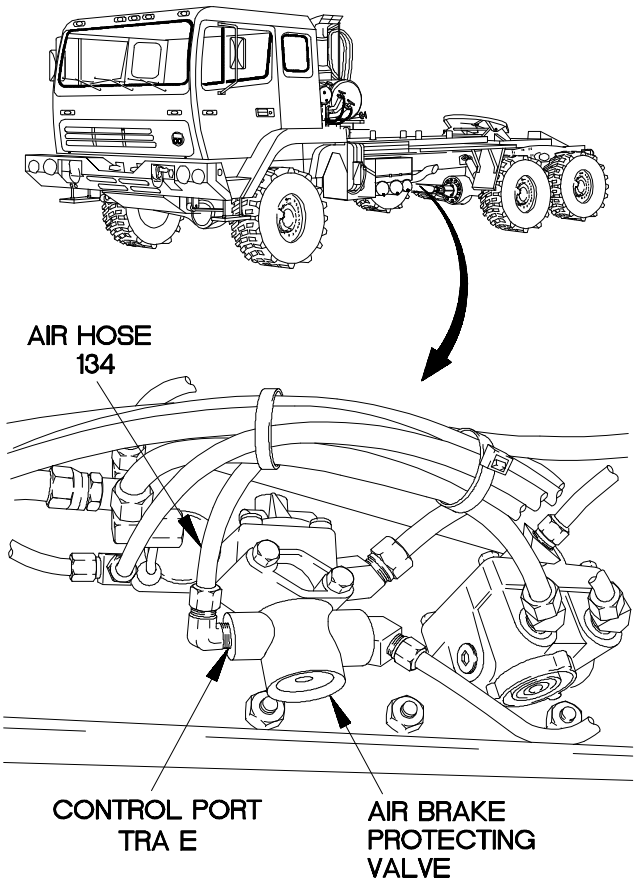
Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Goggles, Industrial (Item 15, Appendix C)



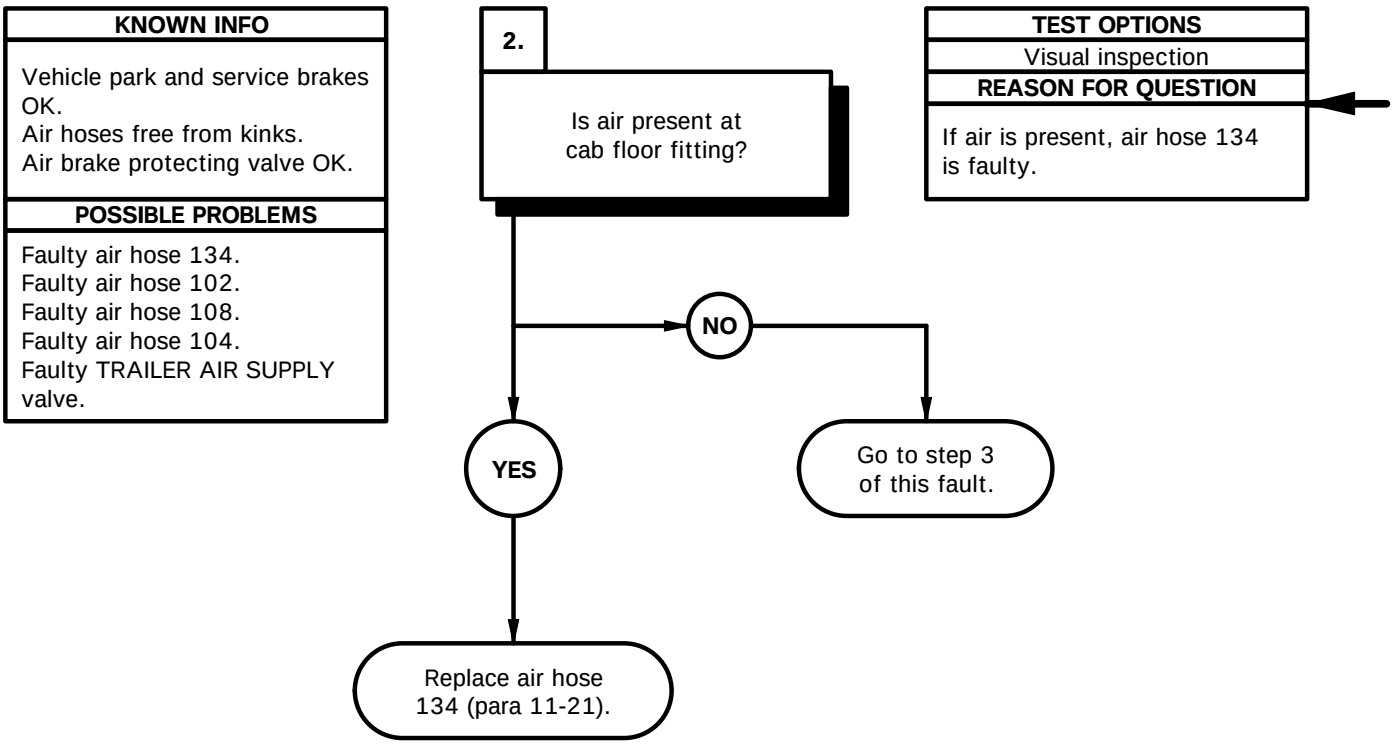
WARNING

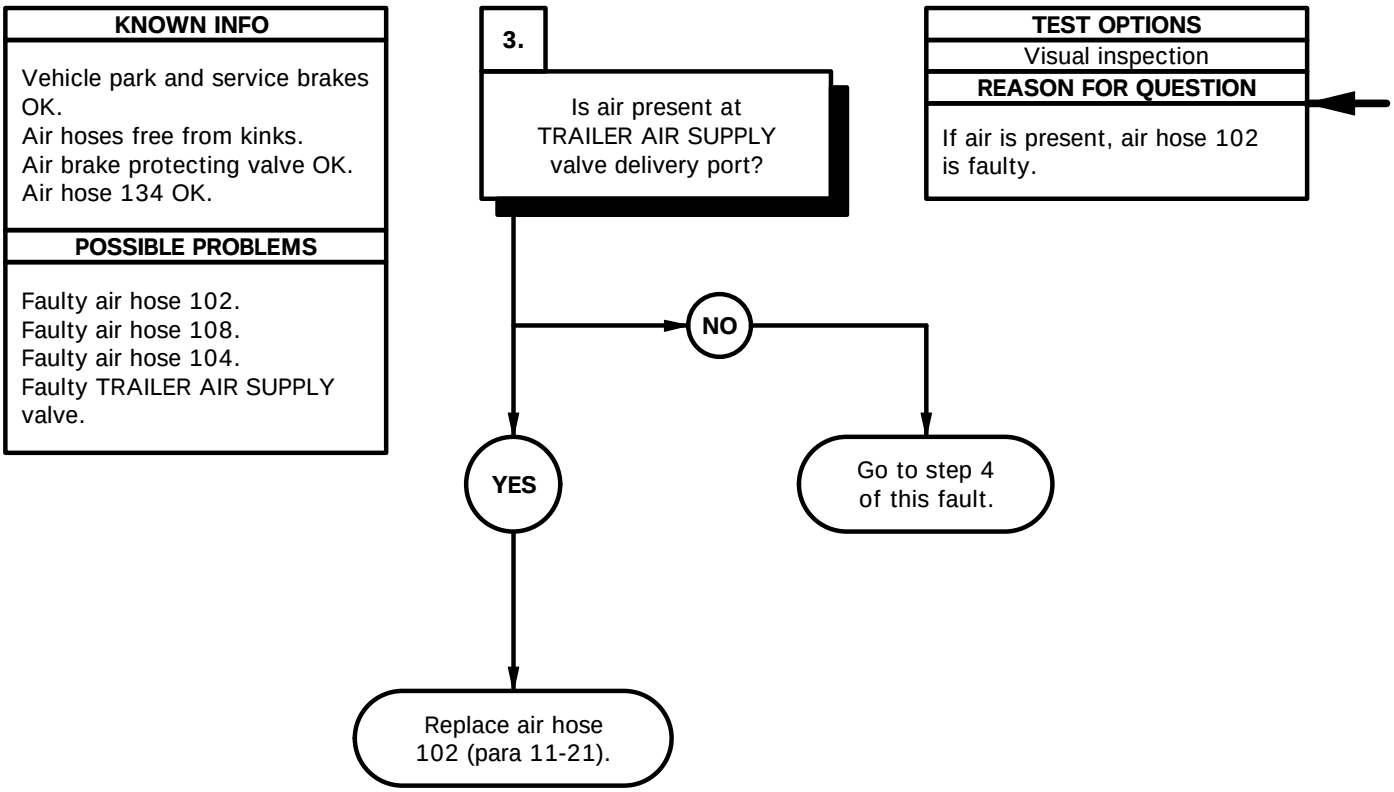
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

(1) Loosen air hose 134 at air brake protecting valve control port TRA E.
(2) Start engine (TM 9-2320-366-10-1).
(3) Push in TRAILER AIR SUPPLY control (TM 9-2320-366-10-1).
(4) Check for presence of air at air hose 134.
(5) Shut down engine (TM 9-2320-366-10-1).
(6) If air is not present, go to step 2 of this fault.
(7) If air is present, replace air brake protecting valve (para 11-18).
(8) Tighten air hose 134 at air brake protecting valve control port TRA E.

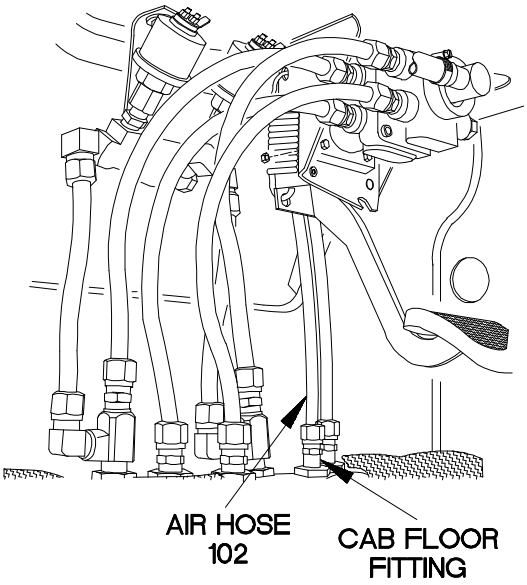


j4A. NO AIR PRESSURE PRESENT AT ALL M1088 REAR AND FIFTH WHEEL GLADHANDS (CONT)



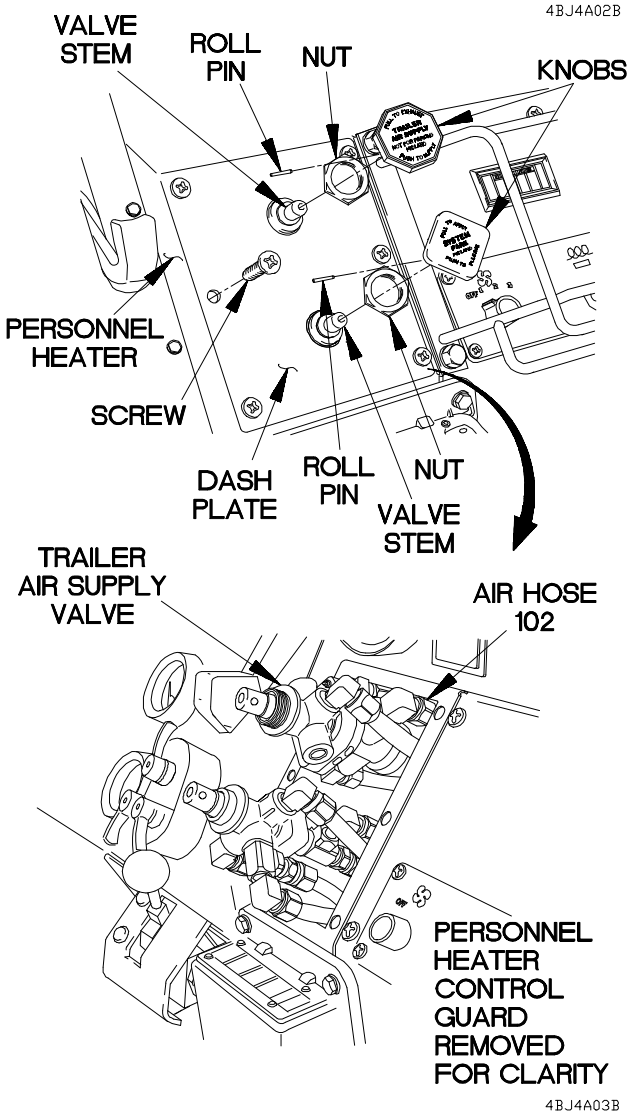


(1) Loosen air hose 102 at cab floor fitting.
(2) Start engine (TM 9-2320-366-10-1).
(3) Push in TRAILER AIR SUPPLY control (TM 9-2320-366-10-1).
(4) Check for presence of air at air hose 102.
(5) Shut down engine (TM 9-2320-366-10-1).
(6) If air is not present, go to step 3 of this fault.
(7) If air is present, replace air hose134 (para 11-21).
(8) Tighten air hose 102 at cab floor fitting.



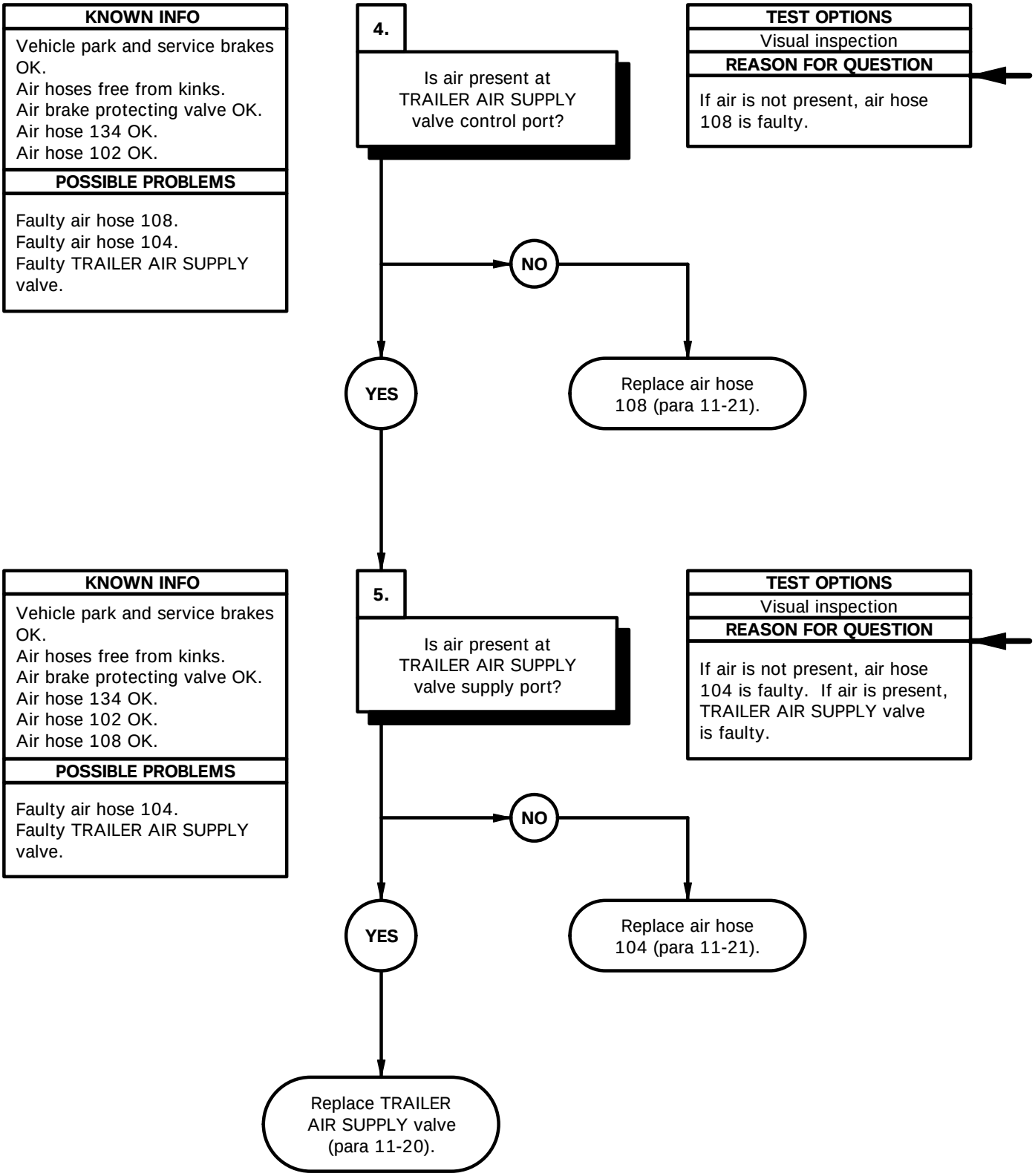
4BJ4A02B

(1) Remove roll pins from knobs of SYSTEM PARK and TRAILER AIR SUPPLY valves.
(2) Remove SYSTEM PARK and TRAILER AIR SUPPLY valve knobs.
(3) Unscrew nuts at base of valve stem on each valve.
(4) Remove six screws and dash plate from personnel heater.
(5) Pull out TRAILER AIR SUPPLY valve from personnel heater.
(6) Loosen air hose 102 at TRAILER AIR SUPPLY valve delivery port.
(7) Start engine (TM 9-2320-366-10-1).
(8) Push in SYSTEM PARK control (TM 9-2320-366-10-1).
(9) Push in TRAILER AIR SUPPLY valve stem.
(10) Check for presence of air at TRAILER AIR SUPPLY valve delivery port.
(11) If air is not present, go to step 4 of this fault.
(12) If air is present, replace air hose 102 (para 11-21).
(13) Shut down engine (TM 9-2320-366-10-1).
(14) Tighten air hose 102 at TRAILER AIR SUPPLY valve delivery port.



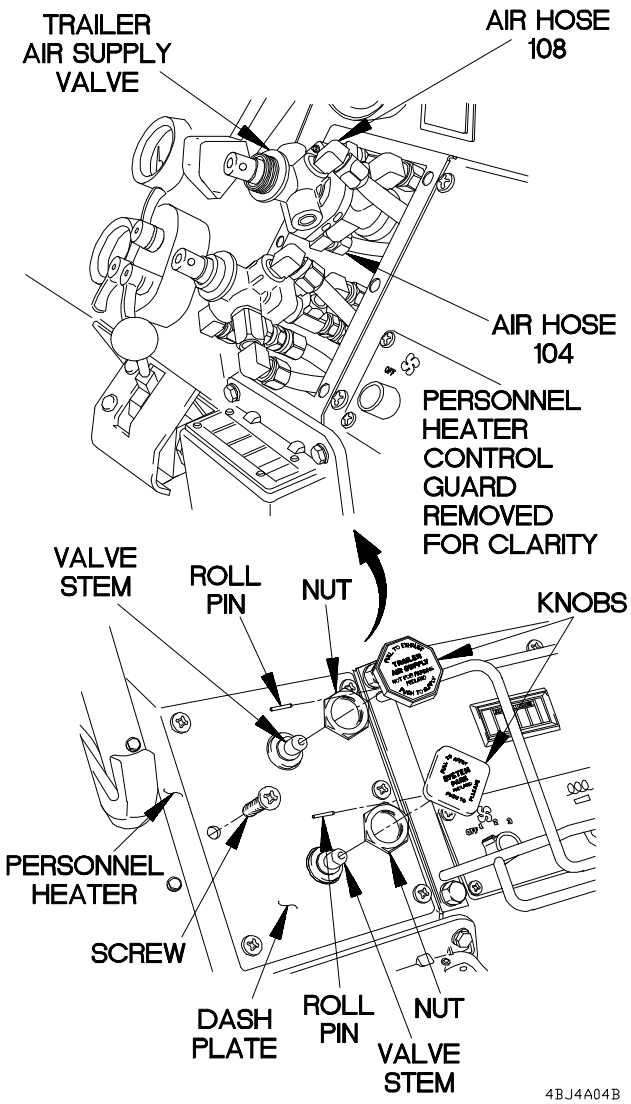
4BJ4A03B

j4A. NO AIR PRESSURE PRESENT AT ALL M1088 REAR AND FIFTH WHEEL GLADHANDS (CONT)



(1) Loosen air hose 108 at TRAILER AIR SUPPLY valve control port.
(2) Start engine (TM 9-2320-366-10-1).
(3) Push in SYSTEM PARK control (TM 9-2320-366-10-1).
(4) Check for presence of air at air hose 108.
(5) If air is not present, replace air hose 108 (para 11-21).
(6) Shut down engine (TM 9-2320-366-10-1).
(7) Tighten air hose 108 at TRAILER AIR SUPPLY valve control port.

(1) Loosen air hose 104 at TRAILER AIR SUPPLY valve supply port.
(2) Start engine (TM 9-2320-366-10-1).
(3) Push in SYSTEM PARK control (TM 9-2320-366-10-1).
(4) Check for presence of air at air hose 104.
(5) If air is not present, replace air hose 104 (para 11-21).
(6) If air is present, replace TRAILER AIR SUPPLY valve (para 11-20).
(7) Shut down engine (TM 9-2320-366-10-1).
(8) Tighten air hose 104 at TRAILER AIR SUPPLY valve supply port.
(9) Push SYSTEM PARK and TRAILER AIR SUPPLY valves back into personnel heater.
(10) Install dash plate on personnel heater with six screws.
(11) Install nuts on valve stems.
(12) Install SYSTEM PARK and TRAILER AIR SUPPLY knobs.



j4B. NO AIR PRESSURE PRESENT AT M1088 REAR AND/OR FIFTH WHEEL EMERGENCY GLADHAND(S)

INITIAL SETUP

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

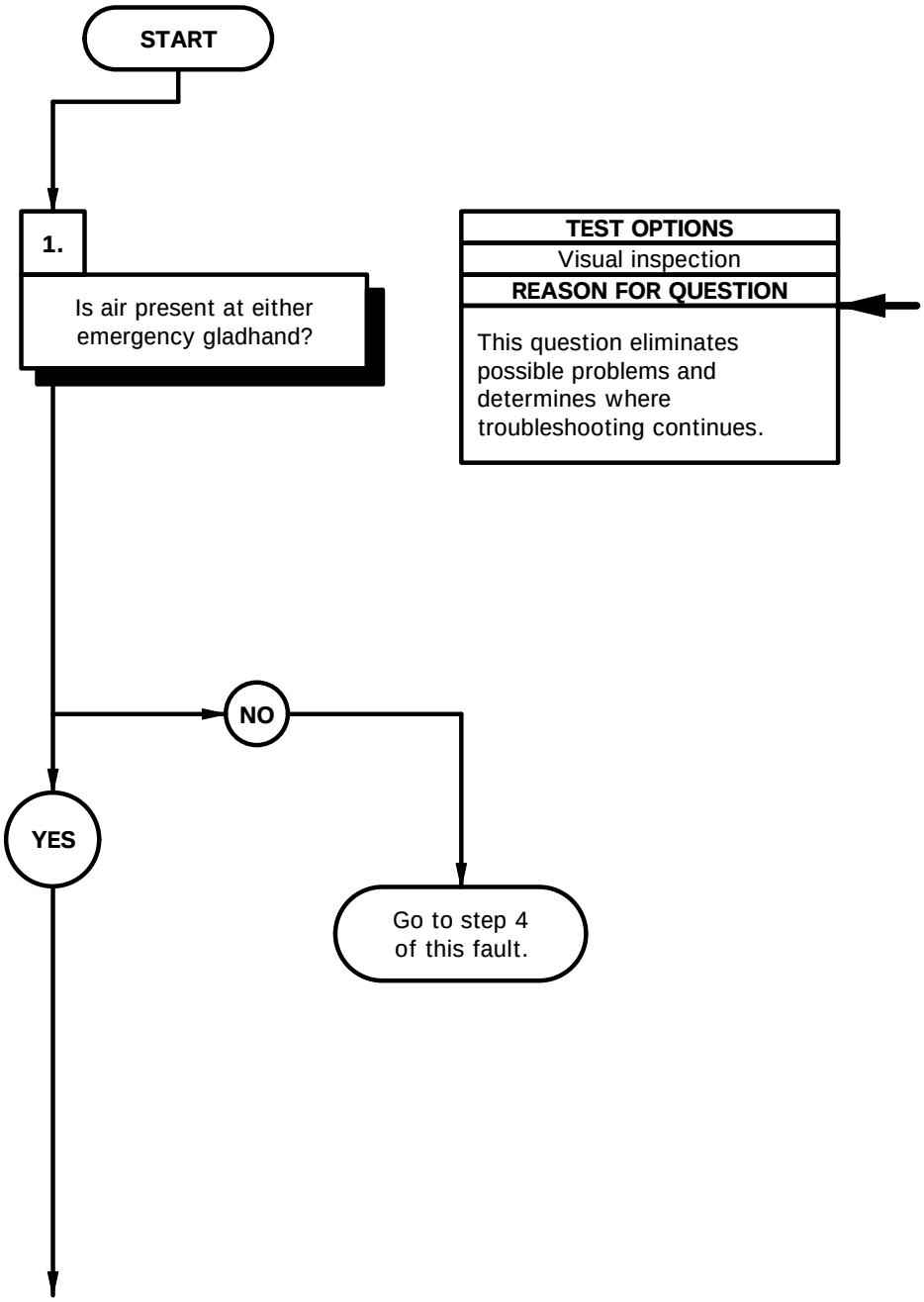
Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Goggles, Industrial (Item 15, Appendix C)

KNOWN INFO

Vehicle park and service brakes OK.
Air hoses free from kinks.
Air present at rear and fifth wheel service gladhands.

POSSIBLE PROBLEMS

Faulty rear or fifth wheel emergency gladhand.
Faulty air hose 163 or 170.
Faulty emergency gladhand selector valve.
Faulty air hose 165.
Faulty air brake protecting valve.

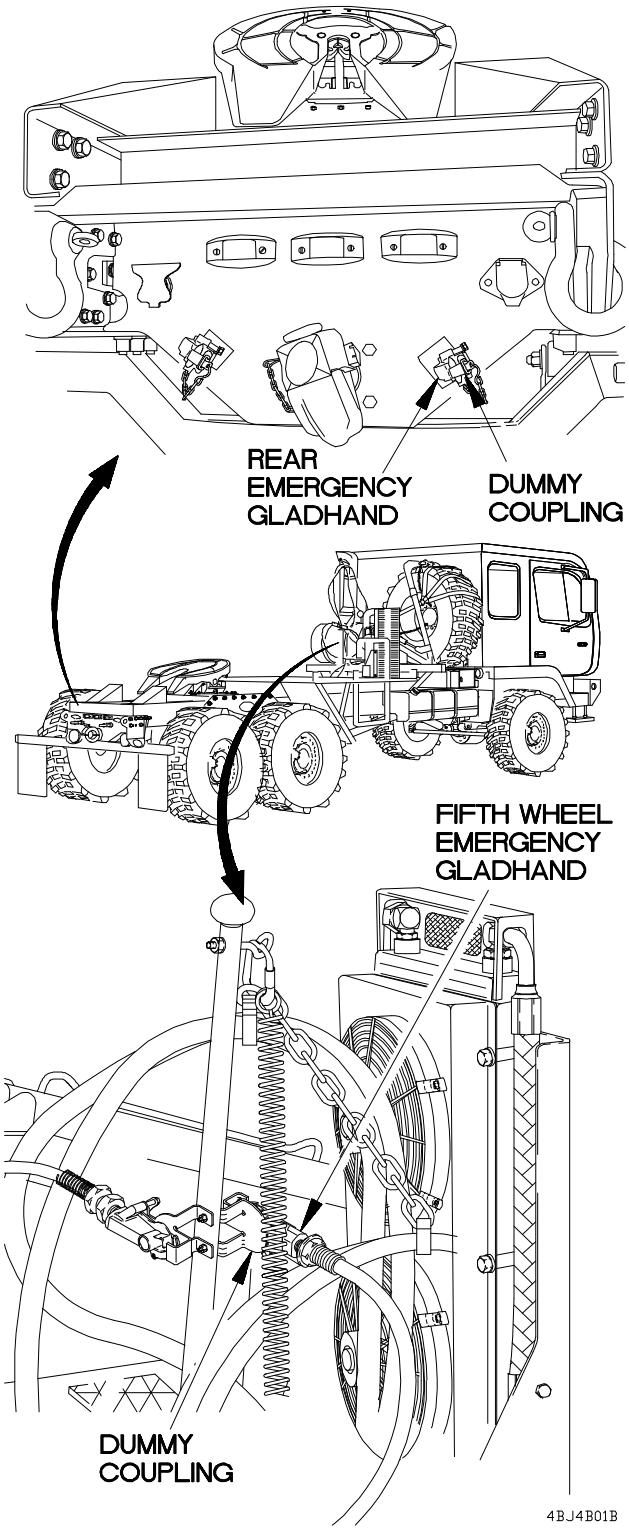


TEST OPTIONS
Visual inspection

REASON FOR QUESTION

This question eliminates possible problems and determines where troubleshooting continues.

(1) Disconnect dummy coupling from rear emergency gladhand.
(2) Position emergency gladhand selector valve handle to rear position (TM 9-232-366-10-1).
(3) Start engine (TM 9-2320-366-10-1).
(4) Push in TRAILER AIR SUPPLY control (TM 9-2320-366-10-1).
(5) Check for presence of air at rear emergency gladhand.
(6) Shut down engine (TM 9-2320-366-10-1).
(7) Connect dummy coupling to rear emergency gladhand.
(8) Disconnect fifth wheel emergency gladhand from dummy coupling.
(9) Position emergency gladhand selector valve handle to fifth wheel position (TM 9-232-366-10-1).
(10) Start engine (TM 9-2320-366-10-1).
(11) Push in TRAILER AIR SUPPLY control (TM 9-2320-366-10-1).
(12) Check for presence of air at fifth wheel emergency gladhand.
(13) Shut down engine (TM 9-2320-366-10-1).
(14) Connect fifth wheel emergency gladhand to dummy coupling.
(15) If air is not present at both emergency gladhands, go to step 4 of this fault.



j4B. NO AIR PRESSURE PRESENT AT M1088 REAR AND/OR FIFTH WHEEL EMERGENCY GLADHAND(S) (CONT)

KNOWN INFO

Vehicle park and service brakes OK.
Air hoses free from kinks.
Air present at rear and fifth wheel service gladhands.
Air hose 165 OK.
Air brake protecting valve OK.

POSSIBLE PROBLEMS

Faulty rear or fifth wheel emergency gladhand.
Faulty air hose 163 or 170.
Faulty emergency gladhand selector valve.

2. Is air present at affected emergency gladhand supply port?

TEST OPTIONS
Visual inspection

REASON FOR QUESTION
If air is present, affected emergency gladhand is faulty.

NO → Go to step 3 of this fault.

YES → Replace rear emergency gladhand (para 11-24) or fifth wheel emergency gladhand (para 11-33).

KNOWN INFO

Vehicle park and service brakes OK.
Air hoses free from kinks.
Air present at rear and fifth wheel service gladhands.
Rear and fifth wheel emergency gladhands OK.
Air hose 165 OK.
Air brake protecting valve OK.

POSSIBLE PROBLEMS

Faulty air hose 163 or 170.
Faulty emergency gladhand selector valve.

3. Is air present at emergency gladhand selector valve output to affected emergency gladhand?

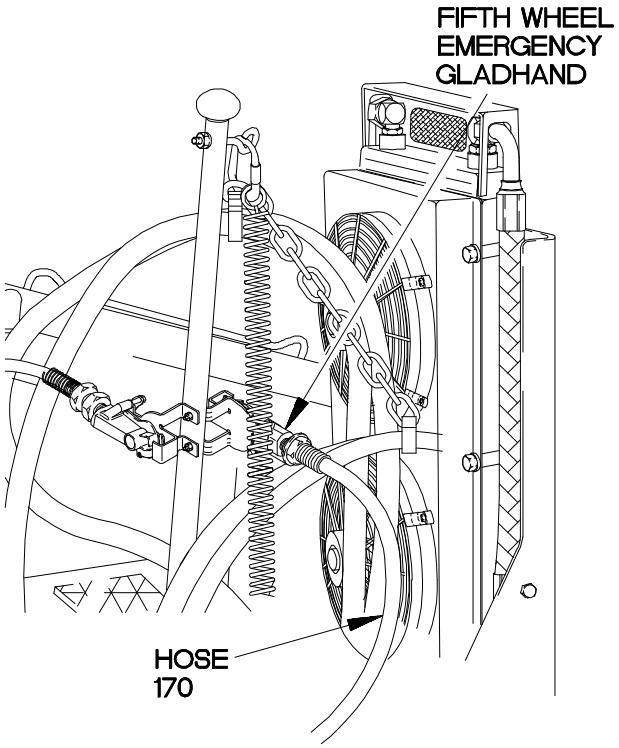
TEST OPTIONS
Visual inspection

REASON FOR QUESTION
If air is not present, emergency gladhand selector valve is faulty. If air is present, air hose 163 or 170 is faulty.

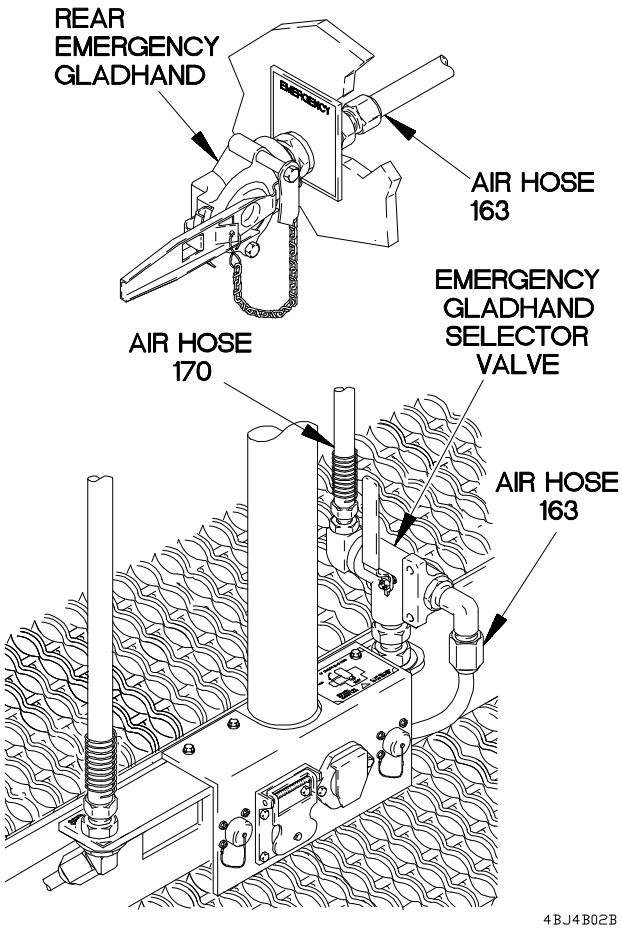
NO → Replace emergency gladhand selector valve (para 11-33).

YES → Replace air hose 163 or 170 (para 11-21).

(1) Loosen air hose 163 at rear emergency gladhand or air hose 170 at fifth wheel emergency gladhand.
(2) Position emergency gladhand selector valve to affected gladhand (TM 9-2320-366-10-1).
(3) Start engine (TM 9-2320-366-10-1).
(4) Push in TRAILER AIR SUPPLY control (TM 9-2320-366-10-1).
(5) Check for presence of air at air hose 163 or 170.
(6) Shut down engine (TM 9-2320-366-10-1).
(7) If air is not present, go to step 3 of this fault.
(8) If air is present, replace rear emergency gladhand (para 11-24) or fifth wheel emergency gladhand (para 11-33).
(9) Tighten air hose 163 at rear emergency gladhand or air hose 170 at fifth wheel emergency gladhand.



(1) Loosen air hose 163 (rear emergency gladhand) or 170 (fifth wheel emergency gladhand) at emergency gladhand selector valve output to affected gladhand.
(2) Position emergency gladhand selector valve to affected gladhand (TM 9-2320-366-10-1).
(3) Start engine (TM 9-2320-366-10-1).
(4) Push in TRAILER AIR SUPPLY control (TM 9-2320-366-10-1).
(5) Check for presence of air at emergency gladhand selector valve output to affected emergency gladhand.
(6) Shut down engine (TM 9-2320-366-10-1).
(7) If air is not present, replace emergency gladhand selector valve (para 11-33).
(8) If air is present, replace air hose 163 or 170 (para 11-21).
(9) Tighten air hose 163 (rear emergency gladhand) or 170 (fifth wheel emergency gladhand) at emergency gladhand selector valve output to affected gladhand.



j4B. NO AIR PRESSURE PRESENT AT M1088 REAR AND/OR FIFTH WHEEL EMERGENCY GLADHAND(S) (CONT)

KNOWN INFO

Vehicle park and service brakes OK.
Air hoses free from kinks.
Air present at rear and fifth wheel service gladhands.
Rear and fifth wheel emergency gladhands OK.
Air hoses 163 and 170 OK.

POSSIBLE PROBLEMS

Faulty emergency gladhand selector valve.
Faulty air hose 165.
Faulty air brake protecting valve.

4. Is air present at emergency gladhand selector valve supply port?

TEST OPTIONS
Visual inspection
REASON FOR QUESTION
If air is present, emergency gladhand selector valve is faulty.

NO → Go to step 5 of this fault.

YES → Replace emergency gladhand selector valve (para 11-33).

KNOWN INFO

Vehicle park and service brakes OK.
Air hoses free from kinks.
Air present at rear and fifth wheel service gladhands.
Rear and fifth wheel emergency gladhands OK.
Air hoses 163 and 170 OK.
Emergency gladhand selector valve OK.

POSSIBLE PROBLEMS

Faulty air hose 165.
Faulty air brake protecting valve.

5. Is air present at air brake protecting valve delivery port TRLR E?

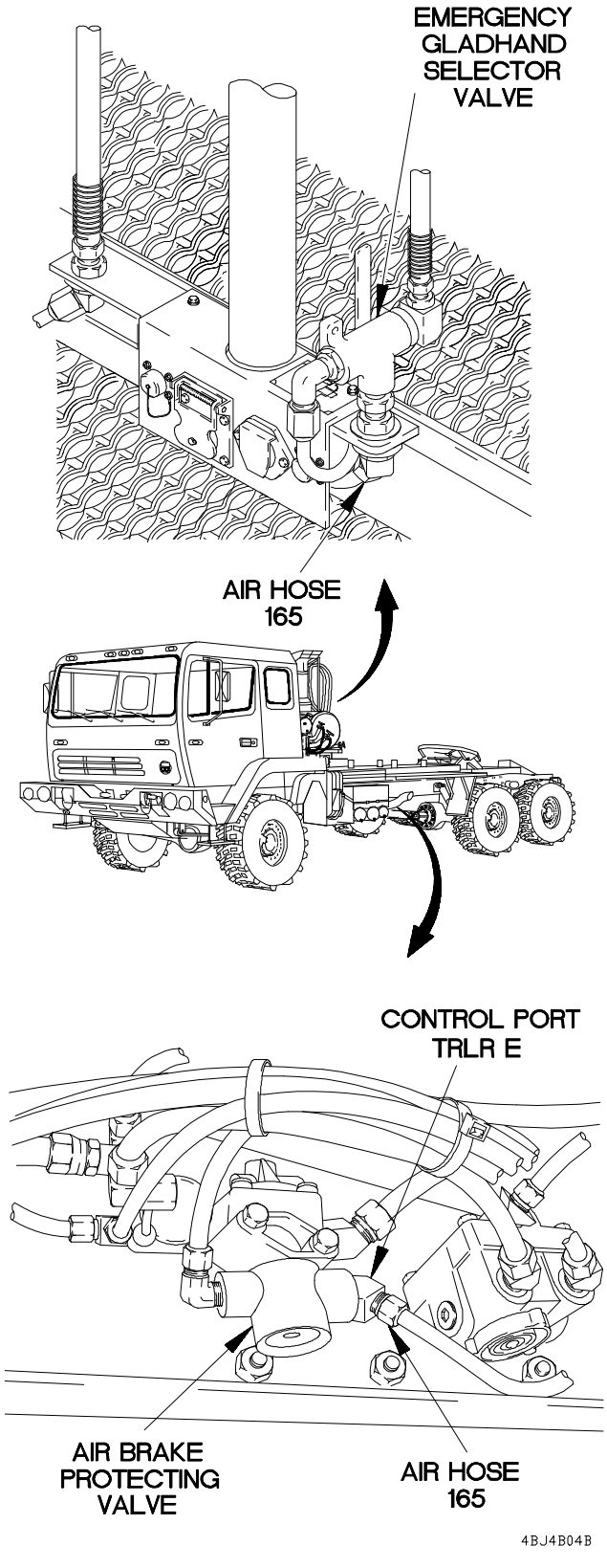
TEST OPTIONS
Visual inspection
REASON FOR QUESTION
If air is not present, air brake protecting valve is faulty. If air is present, air hose 165 is faulty.

NO → Replace air brake protecting valve (para 11-18).

YES → Replace air hose 165 (para 11-21).

(1) Loosen air hose 165 at emergency gladhand selector valve supply port.
(2) Start engine (TM 9-2320-366-10-1).
(3) Push in TRAILER AIR SUPPLY control (TM 9-2320-366-10-1).
(4) Check for presence of air at air hose 165.
(5) Shut down engine (TM 9-2320-366-10-1).
(6) If air is not present, go to step 5 of this fault.
(7) If air is present, replace emergency gladhand selector valve (para 11-33).
(8) Tighten air hose 165 at emergency gladhand selector valve supply port.

(1) Loosen air hose 165 at air brake protecting valve delivery port TRLR E.
(2) Start engine (TM 9-2320-366-10-1).
(3) Push in TRAILER AIR SUPPLY control (TM 9-2320-366-10-1).
(4) Check for presence of air at air brake protecting valve delivery port TRLR E.
(5) Shut down engine (TM 9-2320-366-10-1).
(6) If air is not present, replace air brake protecting valve (para 11-18).
(7) If air is present, replace air hose 165 (para 11-21).
(8) Tighten air hose 165 at air brake protecting valve delivery port TRLR E.



j4C. NO AIR PRESSURE PRESENT AT M1088 REAR AND/OR FIFTH WHEEL SERVICE GLADHAND(S)

INITIAL SETUP

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

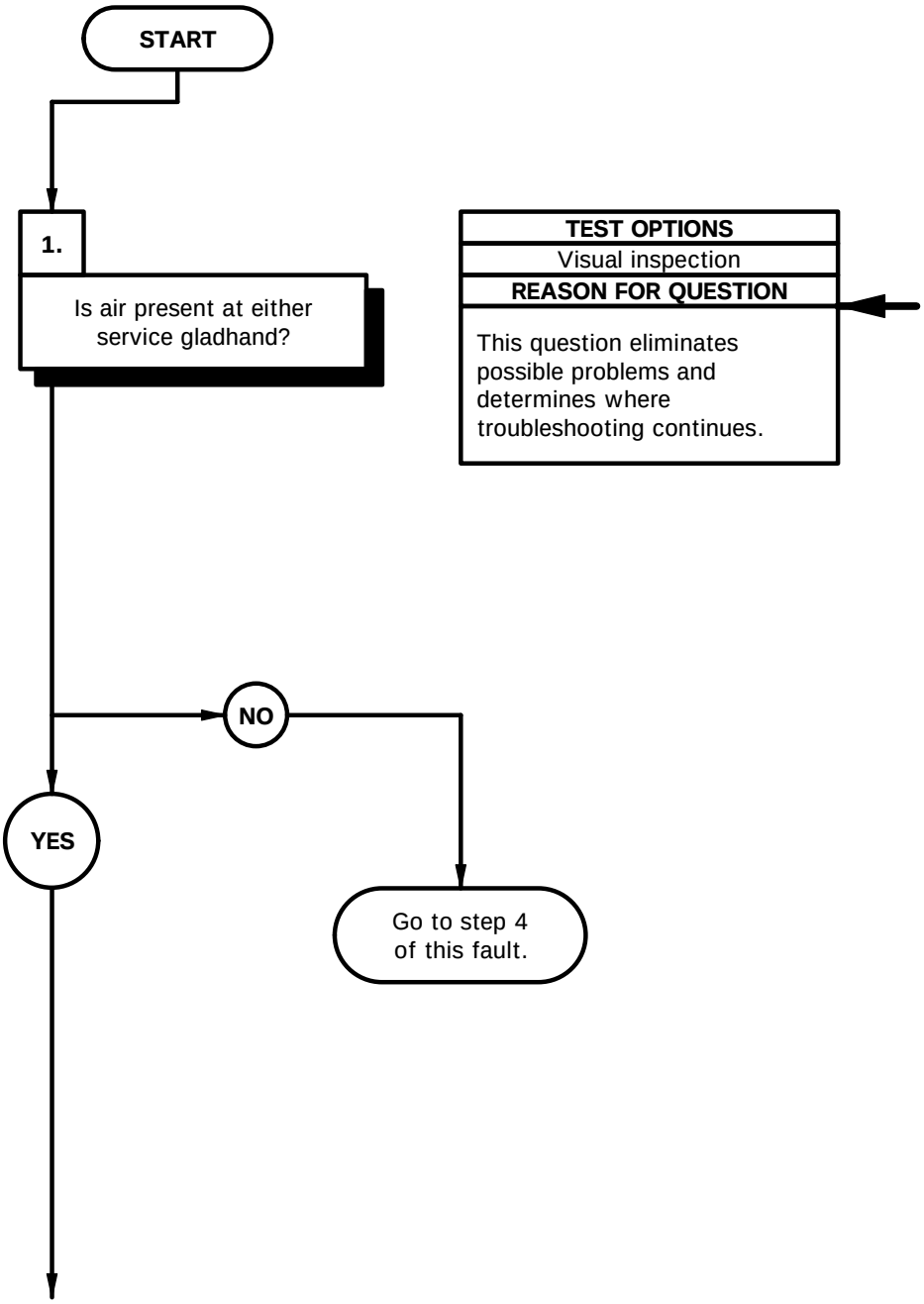
Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Goggles, Industrial (Item 15, Appendix C)

KNOWN INFO

Vehicle park and service brakes OK.
Air hoses free from kinks.
Air present at rear and fifth wheel emergency gladhands.

POSSIBLE PROBLEMS

Faulty rear or fifth wheel service gladhand.
Faulty air hose 257 or 263.
Faulty service gladhand selector valve.
Faulty air hose 258.
Faulty air hose 135.
Faulty air brake protecting valve.
Faulty air hose 256.
Faulty booster valve.
Faulty service gladhand two-way check valve.
Faulty air hose 145.

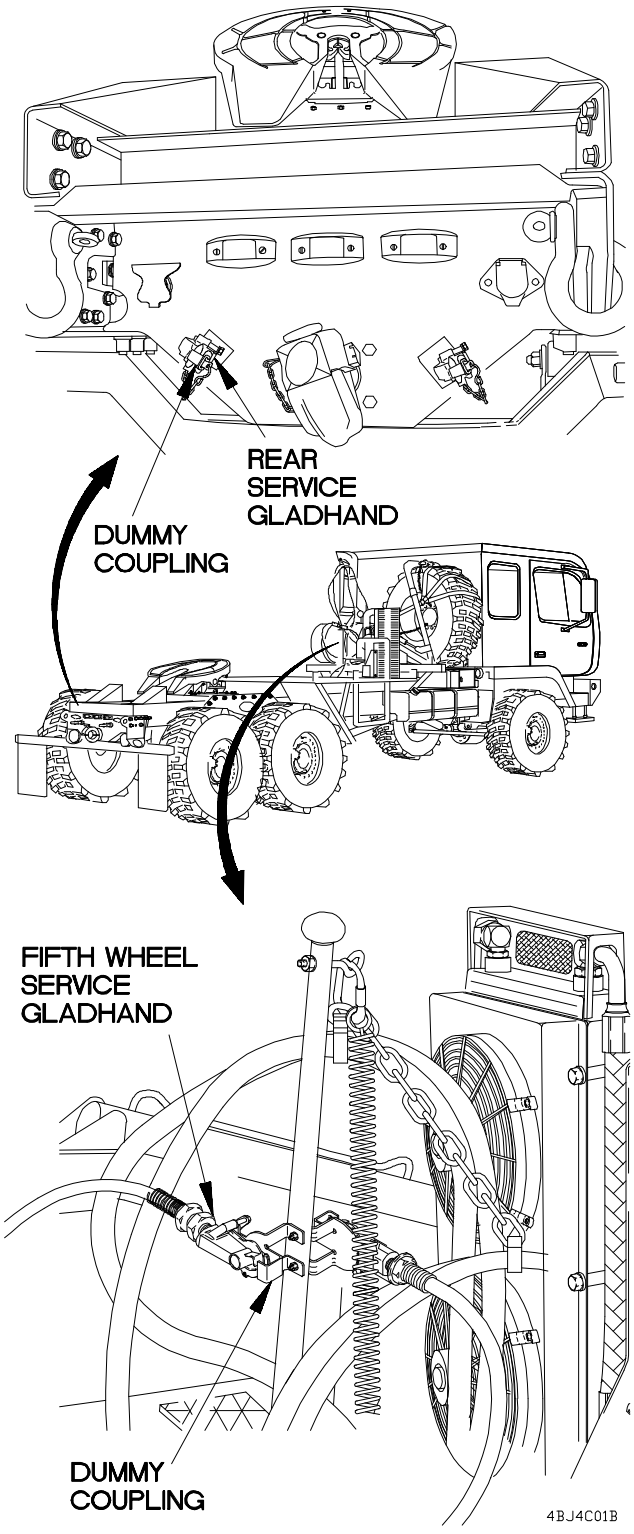


TEST OPTIONS
Visual inspection

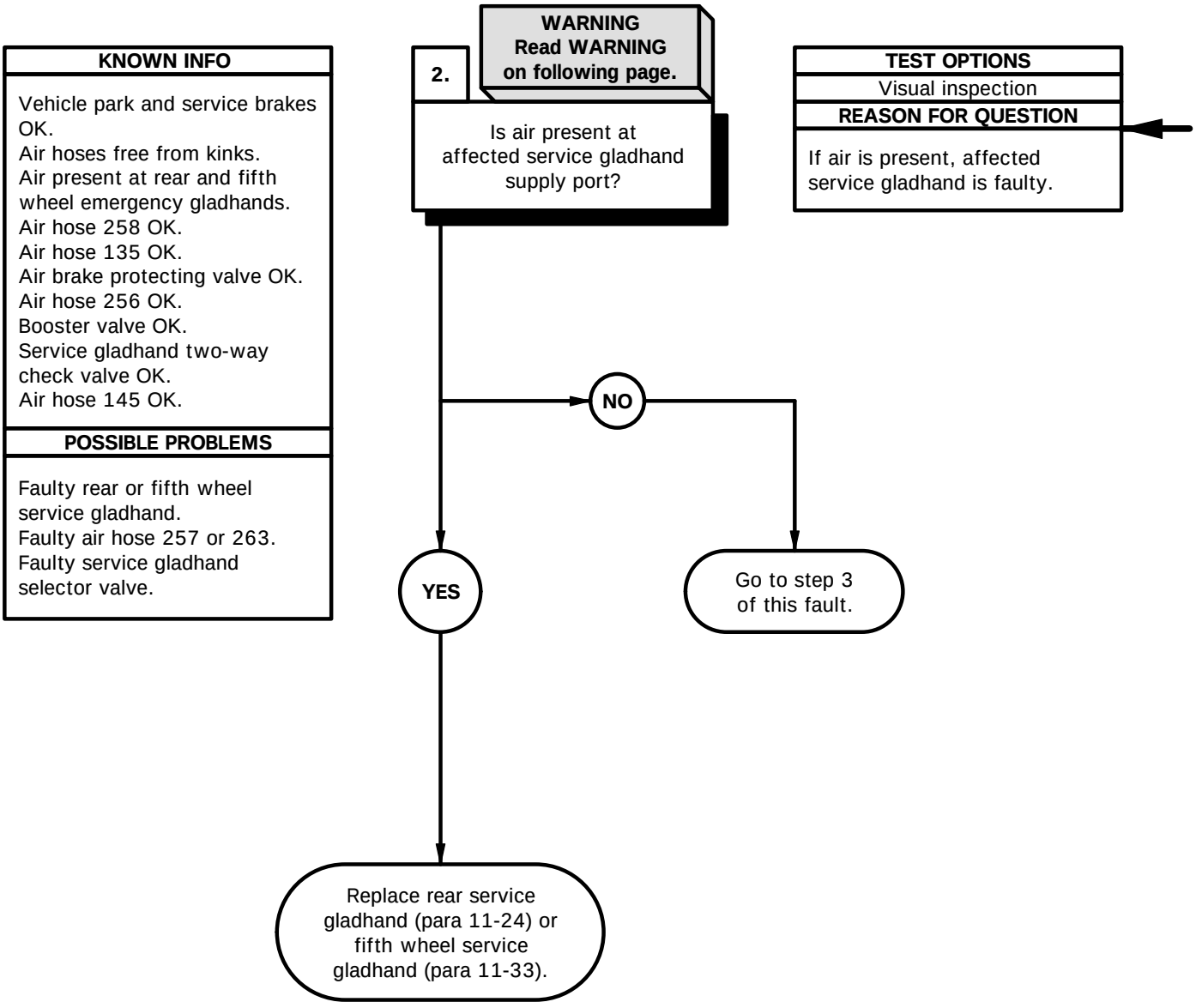
REASON FOR QUESTION

This question eliminates possible problems and determines where troubleshooting continues.

(1) Disconnect dummy coupling from rear service gladhand.
(2) Position service gladhand selector valve handle to rear position (TM 9-232-366-10-1).
(3) Start engine (TM 9-2320-366-10-1).
(4) Push in TRAILER AIR SUPPLY control (TM 9-2320-366-10-1).
(5) Apply service brakes (TM 9-2320-366-10-1).
(6) Check for presence of air at rear service gladhand.
(7) Shut down engine (TM 9-2320-366-10-1).
(8) Connect dummy coupling to rear service gladhand.
(9) Disconnect fifth wheel service gladhand from dummy coupling.
(10) Position service gladhand selector valve handle to fifth wheel position (TM 9-232-366-10-1).
(11) Start engine (TM 9-2320-366-10-1).
(12) Push in TRAILER AIR SUPPLY control (TM 9-2320-366-10-1).
(13) Apply service brakes (TM 9-2320-366-10-1).
(14) Check for presence of air at fifth wheel service gladhand.
(15) Shut down engine (TM 9-2320-366-10-1).
(16) Connect fifth wheel service gladhand to dummy coupling.
(17) If air is not present at both service gladhands, go to step 4 of this fault.



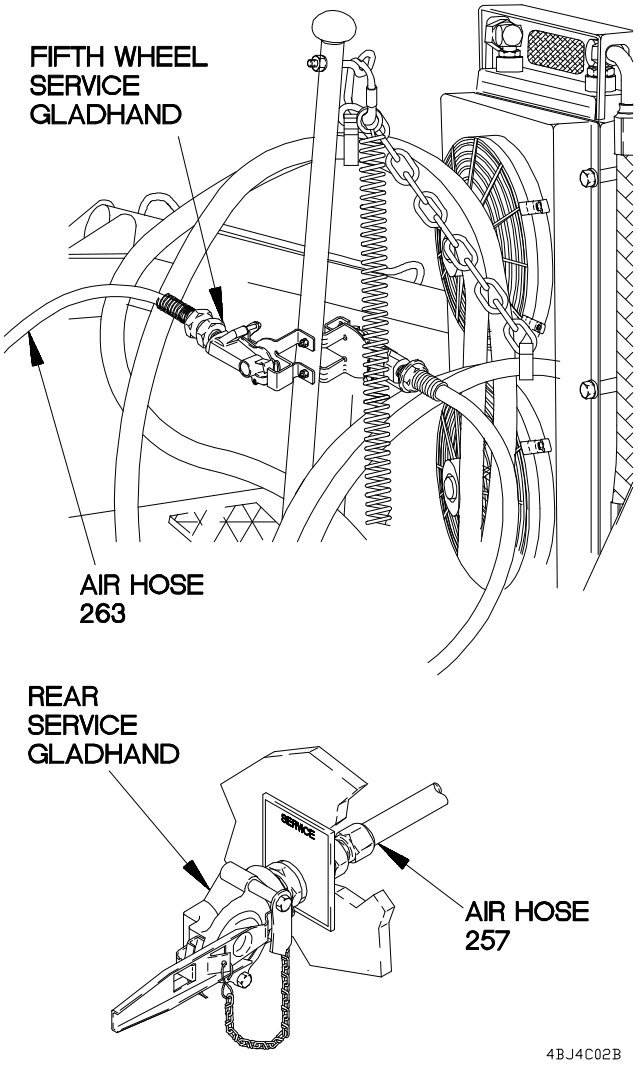
j4C. NO AIR PRESSURE PRESENT AT M1088 REAR AND/OR FIFTH WHEEL SERVICE GLADHAND(S) (CONT)



WARNING

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

(1) Loosen air hose 257 at rear service gladhand or air hose 263 at fifth wheel service gladhand.
(2) Position service gladhand selector valve to to affected gladhand (TM 9-2320-366-10-1).
(3) Start engine (TM 9-2320-366-10-1).
(4) Push in TRAILER AIR SUPPLY control (TM 9-2320-366-10-1).
(5) Apply service brakes (TM 9-2320-366-10-1).
(6) Check for presence of air at air hose 257 or 263.
(7) Shut down engine (TM 9-2320-366-10-1).
(8) If air is not present, go to step 3 of this fault.
(9) If air is present, replace rear service gladhand (para 11-24) or fifth wheel service gladhand (para 11-33).
(10) Tighten air hose 257 at rear service gladhand or air hose 263 at fifth wheel service gladhand.



j4C. NO AIR PRESSURE PRESENT AT M1088 REAR AND/OR FIFTH WHEEL SERVICE GLADHAND(S) (CONT)

KNOWN INFO

Vehicle park and service brakes OK.
Air hoses free from kinks.
Air present at rear and fifth wheel emergency gladhands.
Rear and fifth wheel service gladhands OK.
Air hose 258 OK.
Air hose 135 OK.
Air brake protecting valve OK.
Air hose 256 OK.
Booster valve OK.
Service gladhand two-way check valve OK.
Air hose 145 OK.

POSSIBLE PROBLEMS

Faulty air hose 257 or 263.
Faulty service gladhand selector valve.

3. Is air present at service gladhand selector valve output to affected service gladhand?

TEST OPTIONS
Visual inspection
REASON FOR QUESTION
If air is not present, service gladhand selector valve is faulty. If air is present, air hose 257 or 263 is faulty.

NO → Replace service gladhand selector valve (para 11-33).

YES → Replace air hose 257 or 263 (para 11-21).

KNOWN INFO

Vehicle park and service brakes OK.
Air hoses free from kinks.
Air present at rear and fifth wheel emergency gladhands.
Rear and fifth wheel service gladhands OK.
Air hoses 257 and 263 OK.

POSSIBLE PROBLEMS

Faulty service gladhand selector valve.
Faulty air hose 258.
Faulty air hose 135.
Faulty air brake protecting valve.
Faulty air hose 256.
Faulty booster valve.
Faulty service gladhand two-way check valve.
Faulty air hose 145.

4. Is air present at service gladhand selector valve supply port?

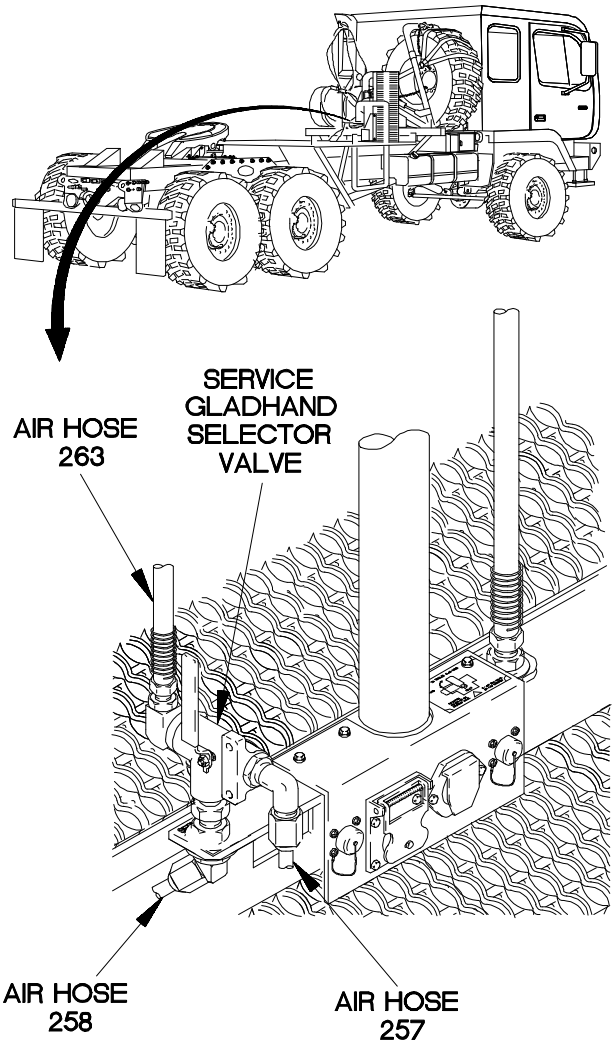
TEST OPTIONS
Visual inspection
REASON FOR QUESTION
If air is present, service gladhand selector valve is faulty.

NO → Go to step 5 of this fault.

YES → Replace service gladhand selector valve (para 11-33).

(1) Loosen air hose 257 (rear service gladhand) or 263 (fifth wheel service gladhand) at service gladhand selector valve output to affected service gladhand.
(2) Position service gladhand selector valve to to affected gladhand (TM 9-2320-366-10-1).
(3) Start engine (TM 9-2320-366-10-1).
(4) Push in TRAILER AIR SUPPLY control (TM 9-2320-366-10-1).
(5) Apply service brakes (TM 9-2320-366-10-1).
(6) Check for presence of air at service gladhand selector valve output to affected service gladhand.
(7) Shut down engine (TM 9-2320-366-10-1).
(8) If air is not present, replace service gladhand selector valve (para 11-33).
(9) If air is present, replace air hose 257 or 263 (para 11-21).
(10) Tighten air hose 257 (rear service gladhand) or 263 (fifth wheel service gladhand) at service gladhand selector valve output to affected service gladhand.

(1) Loosen air hose 258 at service gladhand selector valve supply port.
(2) Start engine (TM 9-2320-366-10-1).
(3) Push in TRAILER AIR SUPPLY control (TM 9-2320-366-10-1).
(4) Apply service brakes (TM 9-2320-366-10-1).
(5) Check for presence of air at air hose 258.
(6) Shut down engine (TM 9-2320-366-10-1).
(7) If air is not present, go to step 5 of this fault.
(8) If air is present, replace service gladhand selector valve (para 11-33).
(9) Tighten air hose 258 at service gladhand selector valve supply port.



j4C. NO AIR PRESSURE PRESENT AT M1088 REAR AND/OR FIFTH WHEEL SERVICE GLADHAND(S) (CONT)

KNOWN INFO

Vehicle park and service brakes OK.
Air hoses free from kinks.
Air present at rear and fifth wheel emergency gladhands.
Rear and fifth wheel service gladhands OK.
Air hoses 257 and 263 OK.
Service gladhand selector valve OK.

POSSIBLE PROBLEMS

Faulty air hose 258.
Faulty air hose 135.
Faulty air brake protecting valve.
Faulty air hose 256.
Faulty booster valve.
Faulty service gladhand two-way check valve.
Faulty air hose 145.

5. Is air present at air brake protecting valve delivery port TRLR S?

TEST OPTIONS
Visual inspection

REASON FOR QUESTION
If air is present, air hose 258 is faulty.

NO → Go to step 6 of this fault.

YES → Replace air hose 258 (para 11-21).

KNOWN INFO

Vehicle park and service brakes OK.
Air hoses free from kinks.
Air present at rear and fifth wheel emergency gladhands.
Rear and fifth wheel service gladhands OK.
Air hoses 257 and 263 OK.
Service gladhand selector valve OK.
Air hose 258 OK.

POSSIBLE PROBLEMS

Faulty air hose 135.
Faulty air brake protecting valve.
Faulty air hose 256.
Faulty booster valve.
Faulty service gladhand two-way check valve.
Faulty air hose 145.

6. Is air present at air brake protecting valve supply port FV1?

TEST OPTIONS
Visual inspection

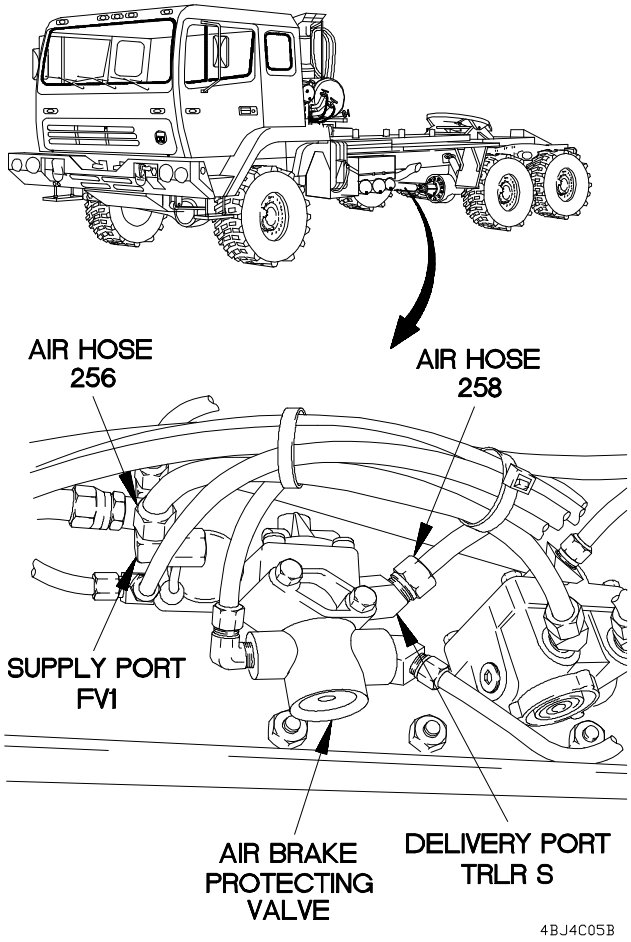
REASON FOR QUESTION
This question eliminates possible problems and determines where troubleshooting continues.

NO → Go to step 8 of this fault.

YES →

(1) Loosen air hose 258 at air brake protecting valve delivery port TRLR S.
(2) Start engine (TM 9-2320-366-10-1).
(3) Push in TRAILER AIR SUPPLY control (TM 9-2320-366-10-1).
(4) Apply service brakes (TM 9-2320-366-10-1).
(5) Check for presence of air at air brake protecting valve delivery port TRLR S.
(6) Shut down engine (TM 9-2320-366-10-1).
(7) If air is not present, go to step 6 of this fault.
(8) If air is present, replace air hose 258 (para 11-21).
(9) Tighten air hose 258 at air brake protecting valve delivery port TRLR S.

(1) Loosen air hose 256 at air brake protecting valve supply port FV1.
(2) Start engine (TM 9-2320-366-10-1).
(3) Apply service brakes (TM 9-2320-366-10-1).
(4) Check for presence of air at air hose 256.
(5) Shut down engine (TM 9-2320-366-10-1).
(6) If air is not present, go to step 8 of this fault.
(7) Tighten air hose 256 at air brake protecting valve supply port FV1.



j4C. NO AIR PRESSURE PRESENT AT M1088 REAR AND/OR FIFTH WHEEL SERVICE GLADHAND(S) (CONT)

KNOWN INFO

Vehicle park and service brakes OK.
Air hoses free from kinks.
Air present at rear and fifth wheel emergency gladhands.
Rear and fifth wheel service gladhands OK.
Air hoses 257 and 263 OK.
Service gladhand selector valve OK.
Air hose 258 OK.
Air hose 256 OK.
Booster valve OK.
Service gladhand two-way check valve OK.
Air hose 145 OK.

POSSIBLE PROBLEMS

Faulty air hose 135.
Faulty air brake protecting valve.

7. Is air present at air brake protecting valve supply port FV2?

TEST OPTIONS
Visual Inspection

REASON FOR QUESTION
If air is not present, air hose 135 is faulty. If air is present, air brake protecting valve is faulty.

NO → Replace air hose 135 (para 11-21).

YES → Replace air brake protecting valve (para 11-18).

KNOWN INFO

Vehicle park and service brakes OK.
Air hoses free from kinks.
Air present at rear and fifth wheel emergency gladhands.
Rear and fifth wheel service gladhands OK.
Air hoses 257 and 263 OK.
Service gladhand selector valve OK.
Air hose 258 OK.
Air hose 135 OK.
Air brake protecting valve OK.

POSSIBLE PROBLEMS

Faulty air hose 256.
Faulty booster valve.
Faulty service gladhand two-way check valve.
Faulty air hose 145.

8. Is air present at booster valve delivery port?

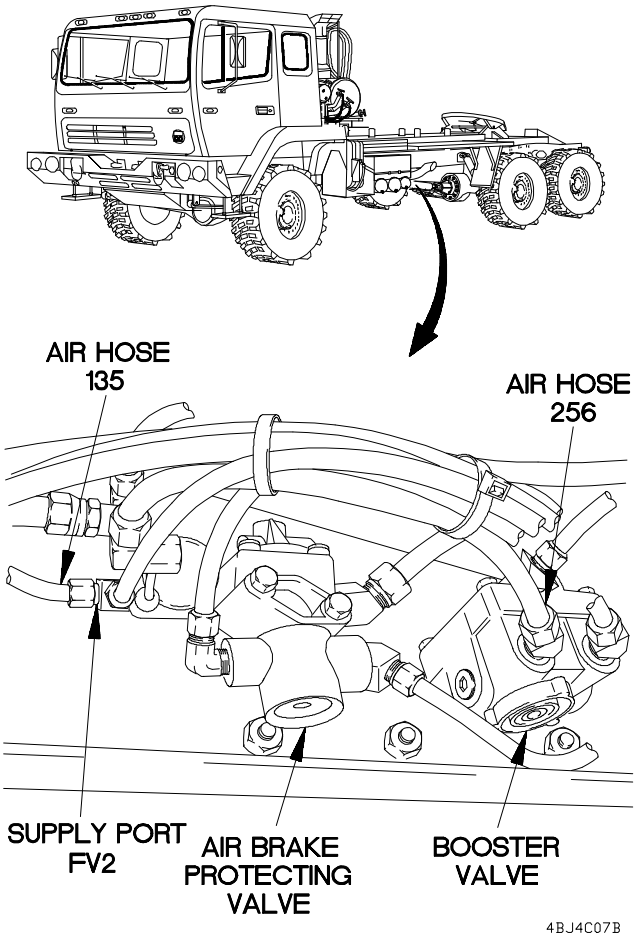
TEST OPTIONS
Visual inspection

REASON FOR QUESTION
If air is present, air hose 256 is faulty.

NO → Go to step 9 of this fault.

YES → Replace air hose 256 (para 11-21).

(1) Loosen air hose 135 at air brake protecting valve supply port FV2.
(2) Start engine (TM 9-2320-366-10-1).
(3) Apply service brakes (TM 9-2320-366-10-1).
(4) Check for presence of air at air hose 135.
(5) Shut down engine (TM 9-2320-366-10-1).
(6) If air is not present, replace air hose 135 (para 11-21).
(7) If air is present, replace air brake protecting valve (para 11-18).
(8) Tighten air hose 135 at air brake protecting valve supply port FV2.



(1) Loosen air hose 256 at booster valve delivery port.
(2) Start engine (TM 9-2320-366-10-1).
(3) Apply service brakes (TM 9-2320-366-10-1).
(4) Check for presence of air at booster valve delivery port.
(5) Shut down engine (TM 9-2320-366-10-1).
(6) If air is not present, go to step 9 of this fault.
(7) If air is present, replace air hose 256 (para 11-21).
(8) Tighten air hose 256 at booster valve delivery port.

j4C. NO AIR PRESSURE PRESENT AT M1088 REAR AND/OR FIFTH WHEEL SERVICE GLADHAND(S) (CONT)

KNOWN INFO

Vehicle park and service brakes OK.
Air hoses free from kinks.
Air present at rear and fifth wheel emergency gladhands.
Rear and fifth wheel service gladhands OK.
Air hoses 257 and 263 OK.
Service gladhand selector valve OK.
Air hose 258 OK.
Air hose 135 OK.
Air brake protecting valve OK.
Air hose 256 OK.

POSSIBLE PROBLEMS

Faulty booster valve.
Faulty service gladhand two-way check valve.
Faulty air hose 145.

9. Is air present at booster valve supply port?

TEST OPTIONS
Visual inspection
REASON FOR QUESTION
If air is present, booster valve is faulty.

NO → Go to step 10 of this fault.

YES → Replace booster valve (para 11-15).

KNOWN INFO

Vehicle park and service brakes OK.
Air hoses free from kinks.
Air present at rear and fifth wheel emergency gladhands.
Rear and fifth wheel service gladhands OK.
Air hoses 257 and 263 OK.
Service gladhand selector valve OK.
Air hose 258 OK.
Air hose 135 OK.
Air brake protecting valve OK.
Air hose 256 OK.
Booster valve OK.

POSSIBLE PROBLEMS

Faulty service gladhand two-way check valve.
Faulty air hose 145.

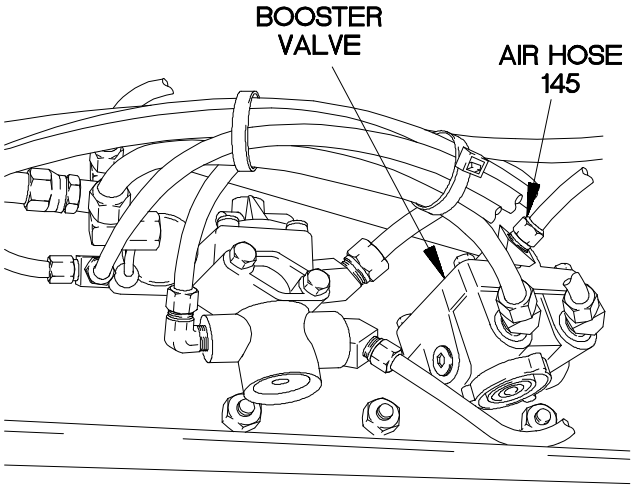
10. Is air present at service gladhand two-way check valve delivery port?

TEST OPTIONS
Visual inspection
REASON FOR QUESTION
If air is not present, service gladhand two-way check valve is faulty. If air is present, air hose 145 is faulty.

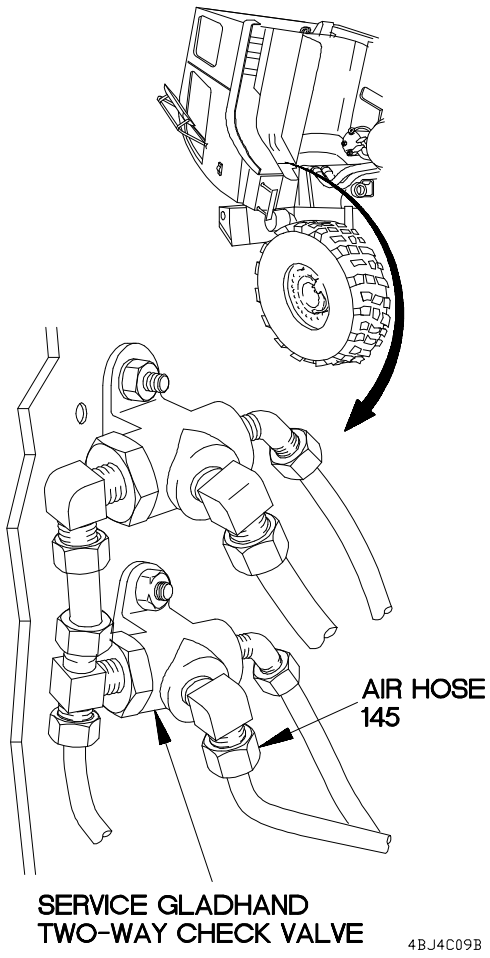
NO → Replace service gladhand two-way check valve (para 11-25).

YES → Replace air hose 145 (para 11-21).

(1) Loosen air hose 145 at booster valve supply port.
(2) Start engine (TM 9-2320-366-10-1).
(3) Apply service brakes (TM 9-2320-366-10-1).
(4) Check for presence of air at air hose 145.
(5) Shut down engine (TM 9-2320-366-10-1).
(6) If air is not present, go to step 10 of this fault.
(7) If air is present, replace booster valve (para 11-15).
(8) Tighten air hose 145 at booster valve supply port.



(1) Raise cab (TM 9-2320-366-10-1).
(2) Loosen air hose 145 at service gladhand two-way check valve delivery port.
(3) Start engine (TM 9-2320-366-10-1).
(4) Apply service brakes (TM 9-2320-366-10-1).
(5) Check for presence of air at service gladhand two-way check valve delivery port.
(6) Shut down engine (TM 9-2320-366-10-1).
(7) If air is not present, replace service gladhand two-way check valve (para 11-25).
(8) If air is present, replace air hose 145 (para 11-21).
(9) Tighten air hose 145 at service gladhand two-way check valve delivery port.
(10) Lower cab (TM 9-2320-366-10-1).

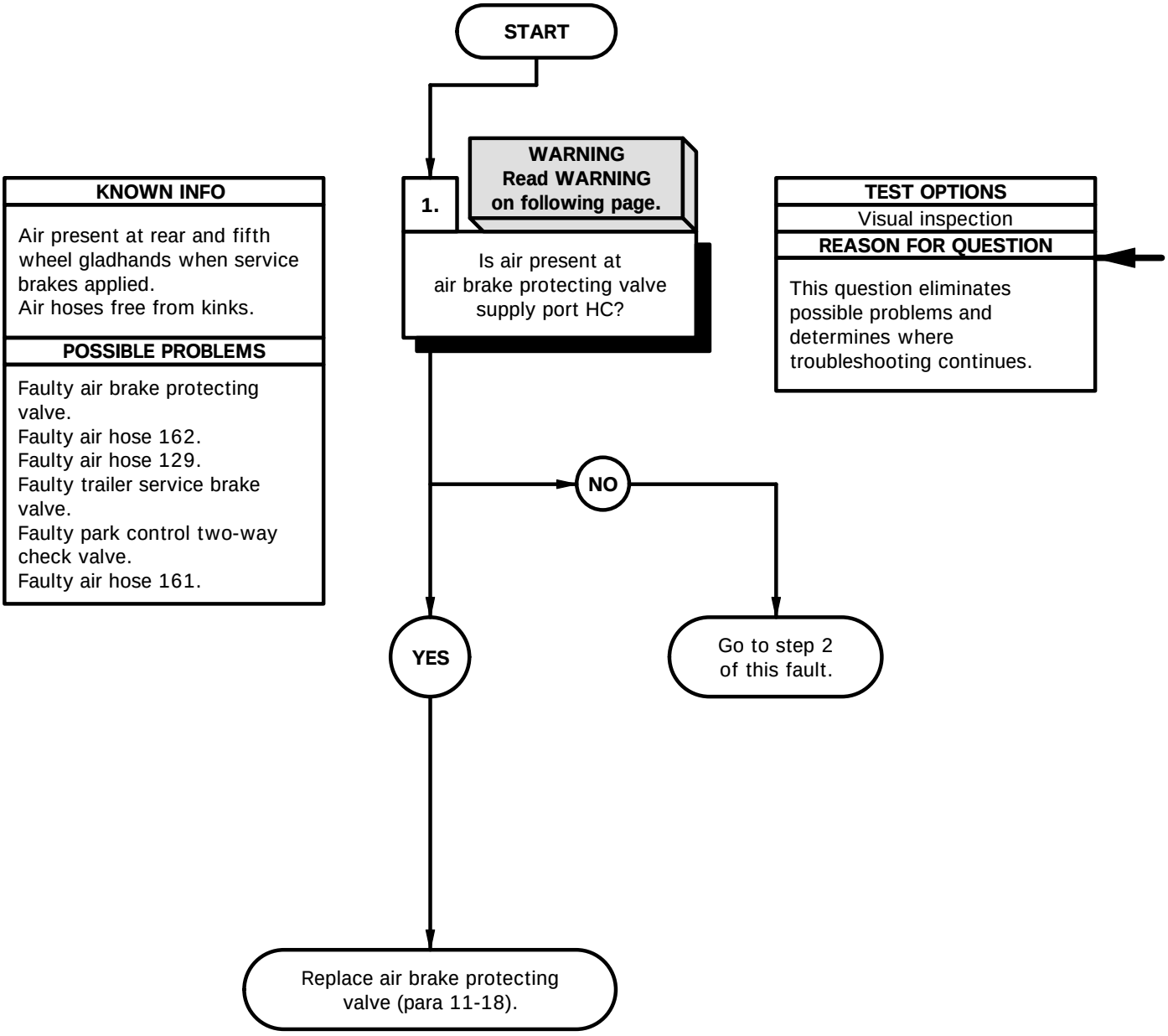


j4D. M1088 TRAILER HANDBRAKE DOES NOT OPERATE

INITIAL SETUP

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

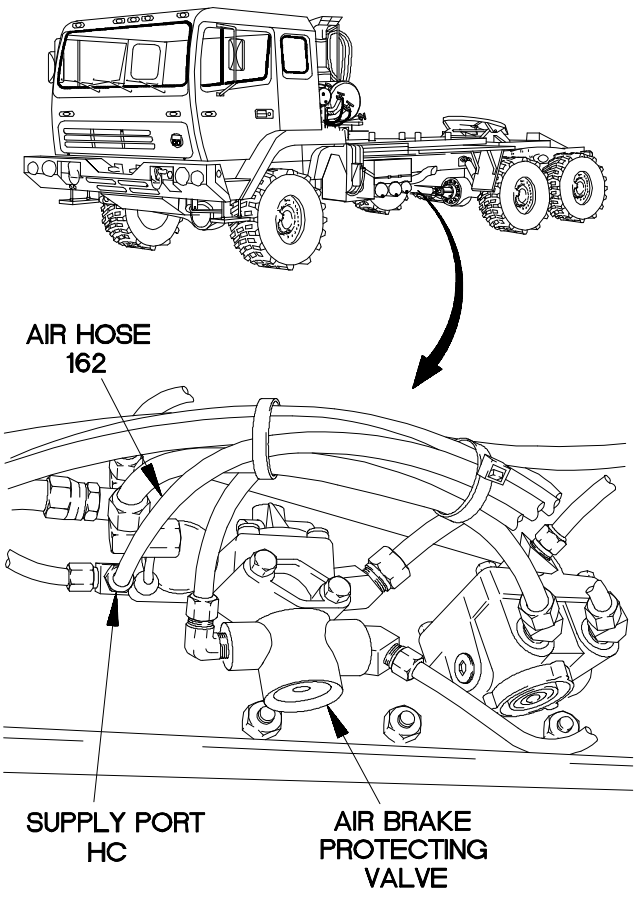
Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Goggles, Industrial (Item 15, Appendix C)



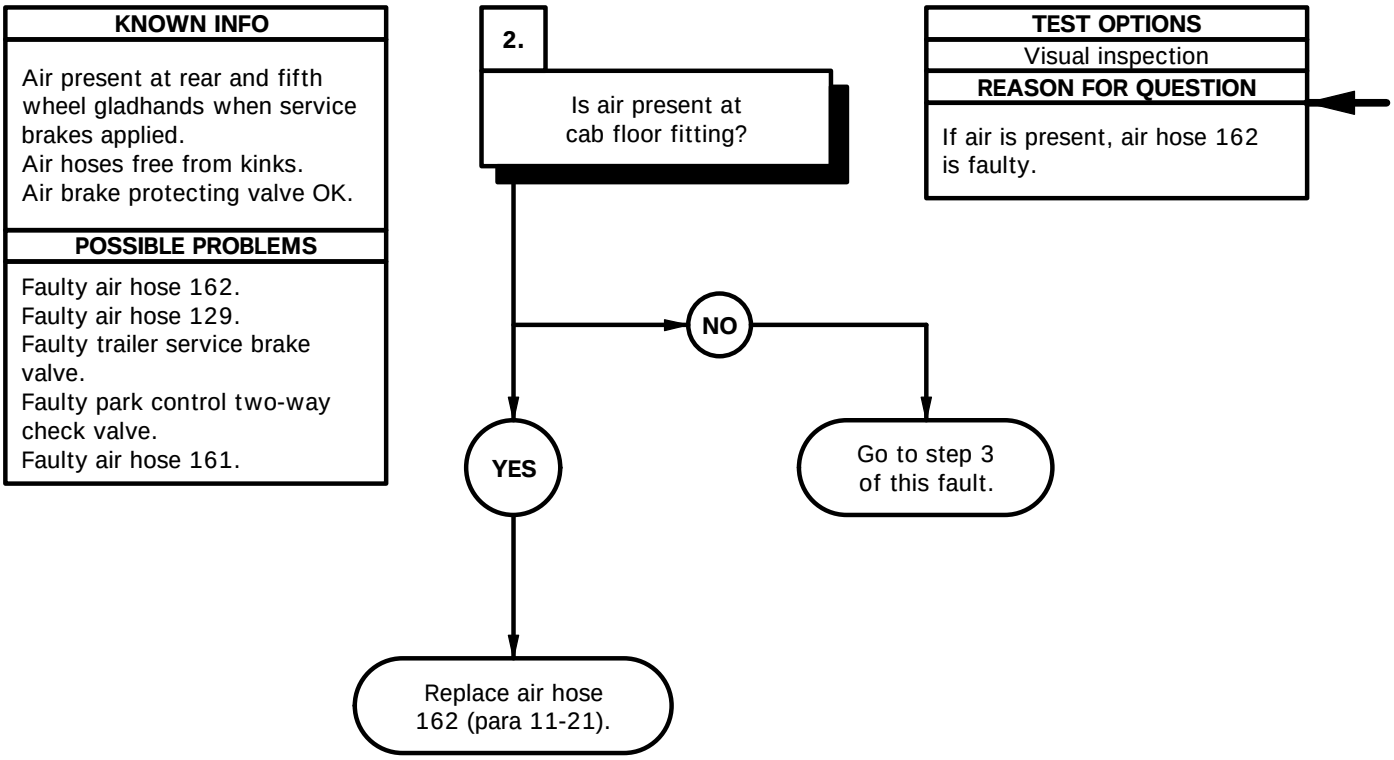
WARNING

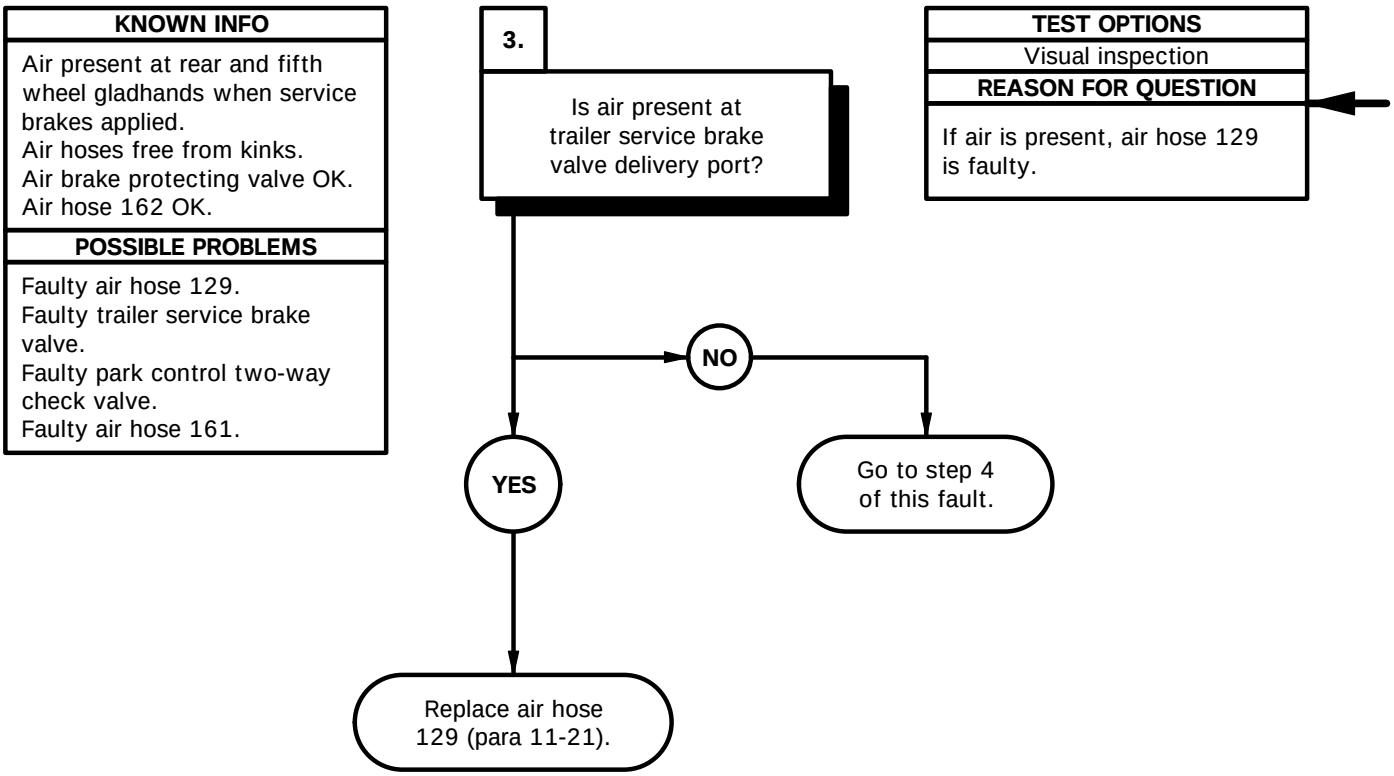
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

(1) Loosen air hose 162 at air brake protecting valve supply port HC.
(2) Start engine (TM 9-2320-366-10-1).
(3) Apply trailer handbrake control (TM 9-2320-366-10-1).
(4) Check for presence of air at air hose 162.
(5) Shut down engine (TM 9-2320-366-10-1).
(6) If air is not present, go to step 2 of this fault.
(7) Tighten air hose 162 at air brake protecting valve supply port HC.



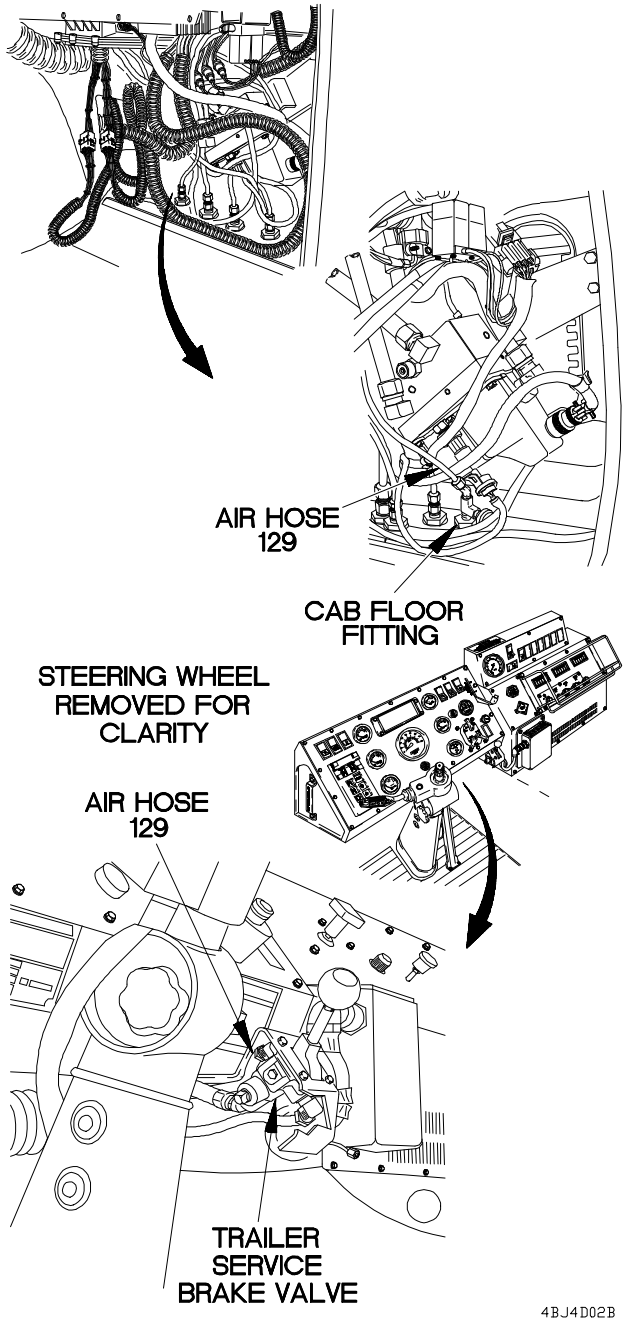
j4D. M1088 TRAILER HANDBRAKE DOES NOT OPERATE (CONT)



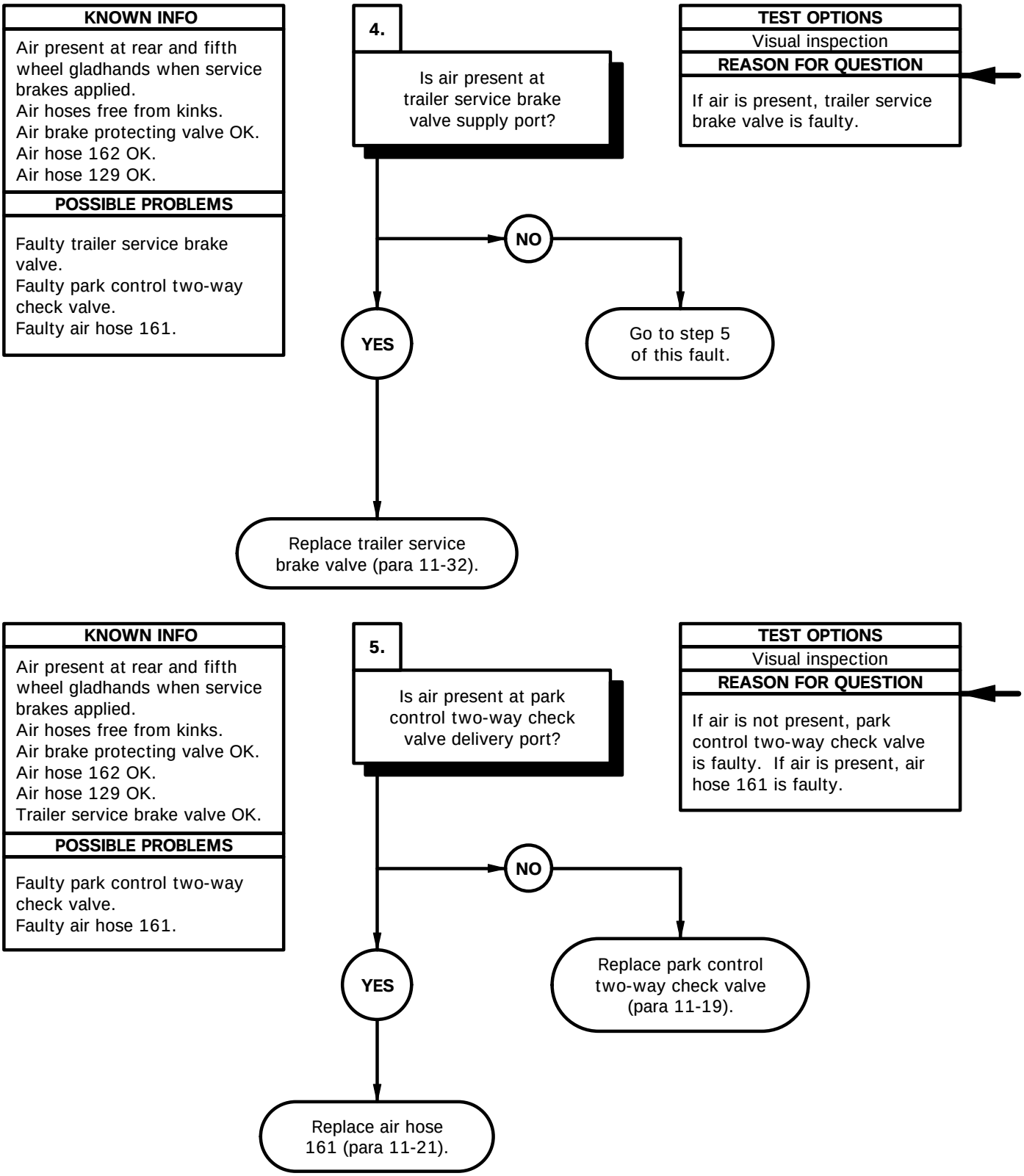


(1) Remove kick panel (para 16-3).
(2) Loosen air hose 129 at cab floor fitting.
(3) Start engine (TM 9-2320-366-10-1).
(4) Apply trailer service brake (TM 9-2320-366-10-1).
(5) Check for presence of air at air hose 129.
(6) Shut down engine (TM 9-2320-366-10-1).
(7) If air is not present, go to step 3 of this fault.
(8) If air is present, replace air hose 162 (para 11-21).
(9) Tighten air hose 129 at cab floor fitting.
(10) Install kick panel (para 16-3).

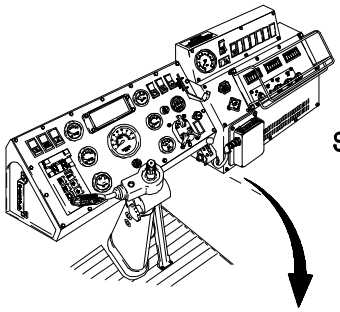
(1) Loosen air hose 129 at trailer service brake valve delivery port.
(2) Start engine (TM 9-2320-366-10-1).
(3) Apply trailer service brake (TM 9-2320-366-10-1).
(4) Check for presence of air at trailer service brake valve delivery port.
(5) Shut down engine (TM 9-2320-366-10-1).
(6) If air is not present, replace trailer service brake valve (para 11-32).
(7) If air is present, replace air hose 129 (para 11-21).
(8) Tighten air hose 129 at trailer service brake valve delivery port.

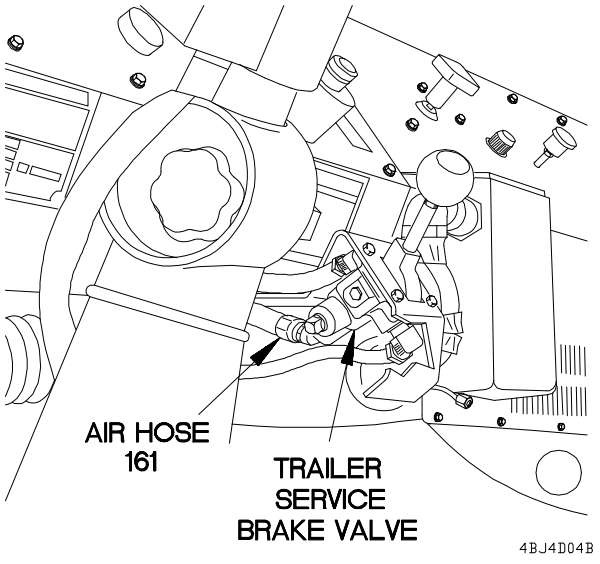


j4D. M1088 TRAILER HANDBRAKE DOES NOT OPERATE (CONT)

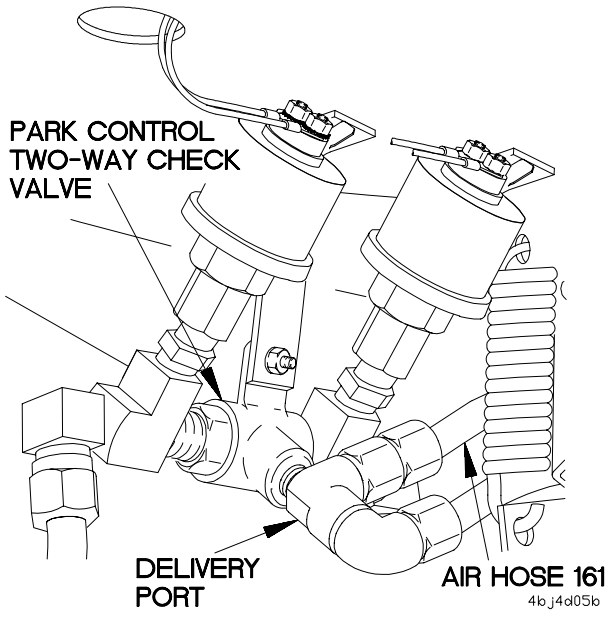


(1) Loosen air hose 161 at trailer service brake valve supply port.
(2) Start engine (TM 9-2320-366-10-1).
(3) Check for presence of air at air hose 161.
(4) Shut down engine (TM 9-2320-366-10-1).
(5) If air is not present, go to step 5 of this fault.
(6) If air is present, replace trailer service brake valve (para 11-32).
(7) Tighten air hose 161 at trailer service brake valve supply port.





(1) Loosen air hose 161 at park control two-way check valve delivery port.
(2) Start engine (TM 9-2320-366-10-1).
(3) Check for presence of air at park control two-way check valve delivery port.
(4) Shut down engine (TM 9-2320-366-10-1).
(5) If air is not present, replace park control two-way check valve (para 11-19).
(6) If air is present, replace air hose 161 (para 11-21).
(7) Tighten air hose 161 at park control two-way check valve delivery port.

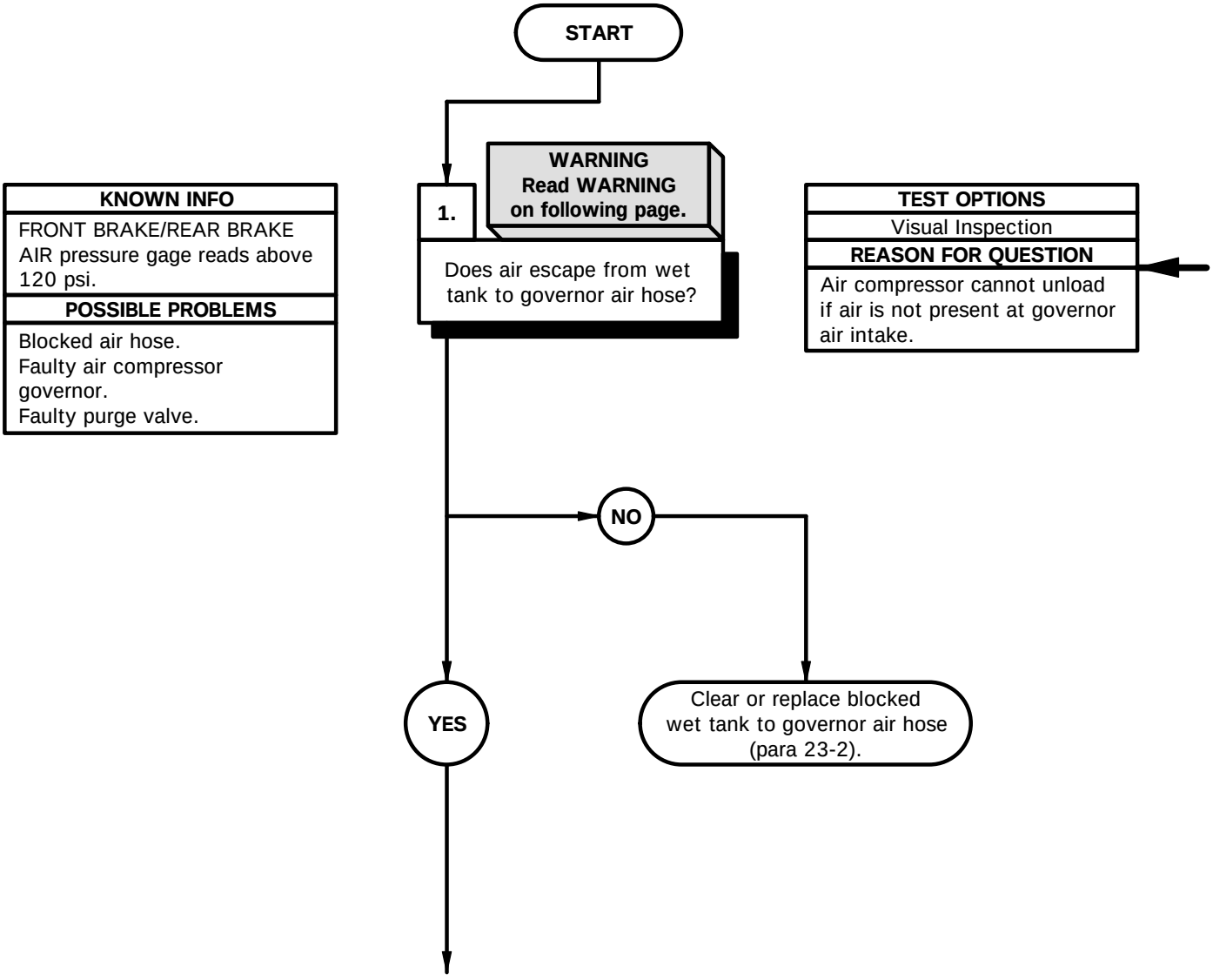


j5. AIR SYSTEM PRESSURE BUILDS UP MORE THAN 120 PSI (827 KPA) (COMPRESSOR FAILS TO UNLOAD)

INITIAL SETUP

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

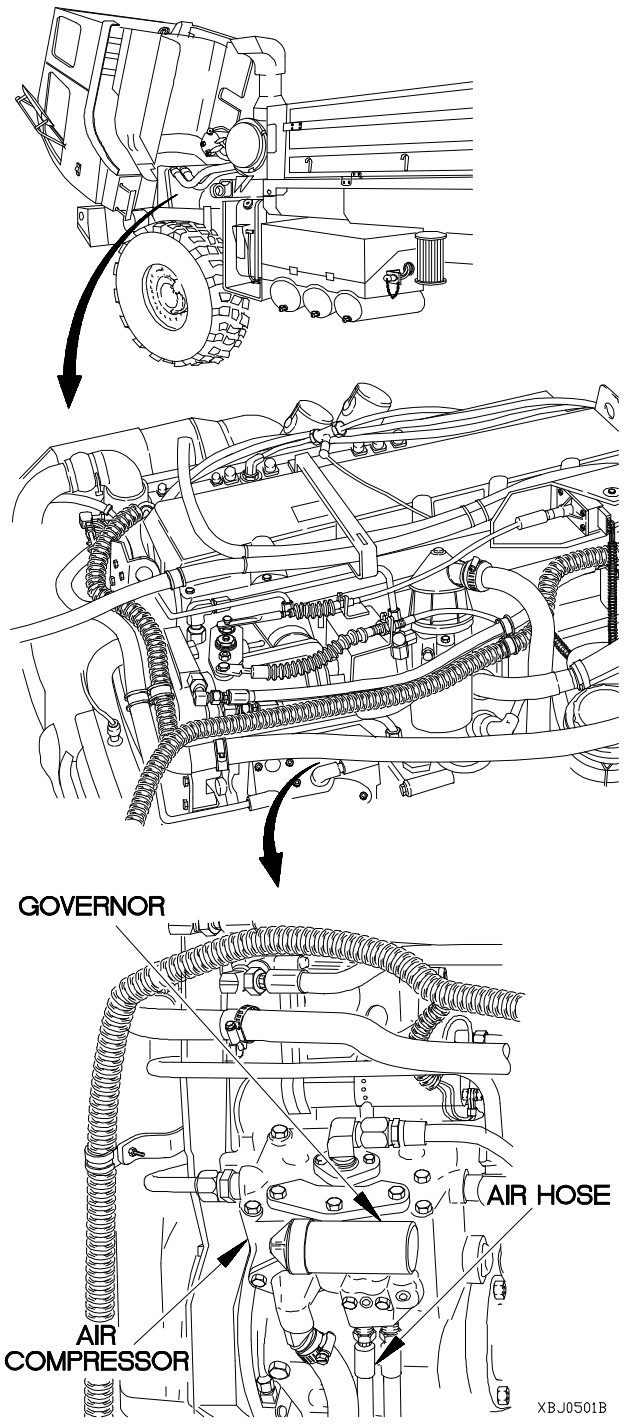
Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Goggles, Industrial (Item 15, Appendix C)



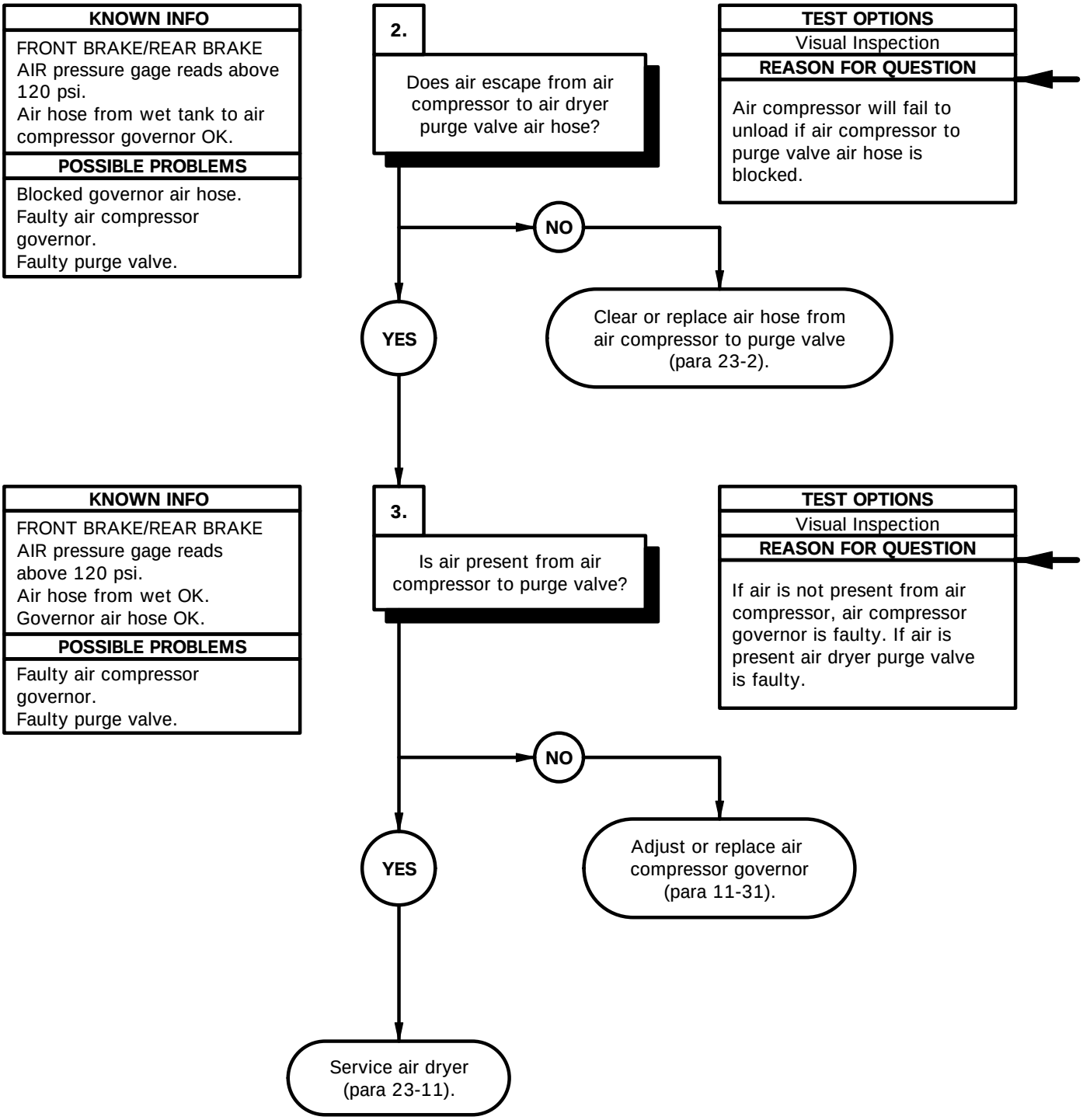
WARNING

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.

(1) Raise cab (TM 9-2320-366-10-1).
(2) Disconnect (wet tank to governor) air hose from air compressor governor.
(3) Lower cab (TM 9-2320-366-10-1).
(4) Start engine (TM 9-2320-366-10-1).
(5) Raise cab (TM 9-2320-366-10-1).
(6) Check for air escaping from (wet tank to to governor) air hose.
(7) If no air escapes, clear or replace air hose from wet tank to air compressor governor (para 23-2).
(8) Lower cab (TM 9-2320-366-10-1).
(9) Shut down engine (TM 9-2320-366-10-1).
(10) Raise cab (TM 9-2320-366-10-1).
(11) Connect (wet tank to governor) air hose to air compressor governor.

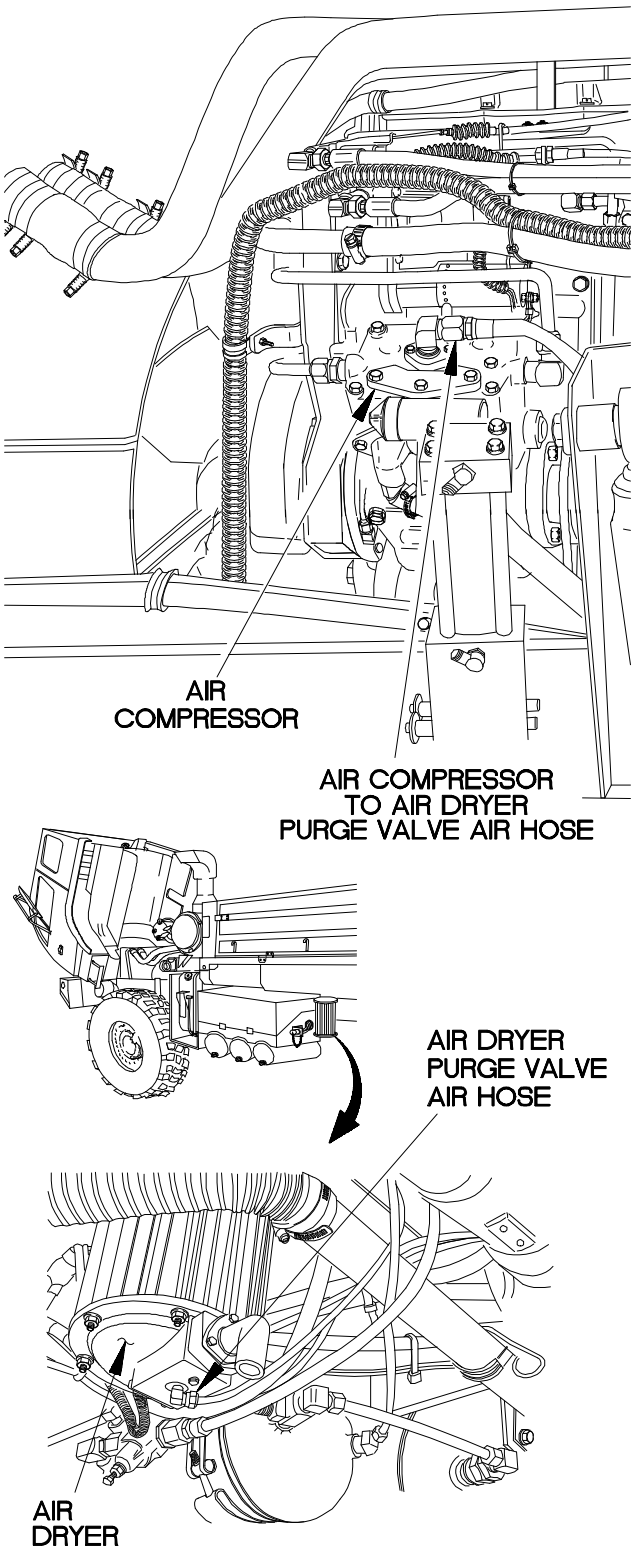


j5. AIR SYSTEM PRESSURE BUILDS UP MORE THAN 120 PSI (827 KPA) (COMPRESSOR FAILS TO UNLOAD) (CONT)



(1) Disconnect (air compressor to purge valve) air hose form air compressor and purge valve.
(2) Blow through one end of air hose. If no air escapes from other end of air hose, air hose is blocked.
(3) Connect (air compressor to purge valve) air hose to air compressor.
(4) Lower cab (TM 9-2320-366-10-1).

(1) Start engine (TM 9-2320-366-10-1).
(2) Check for presence of air at (air compressor to purge valve) air hose.
(3) If no air escapes from air hose, Adjust or replace air compressor governor (para 11-31).
(4) If air escapes from air hose, service air dryer for faulty purge valve (para 23-11).
(5) Shut down engine (TM 9-2320-366-10-1).
(6) Connect (air compressor to purge valve) air hose to air dryer purge valve.

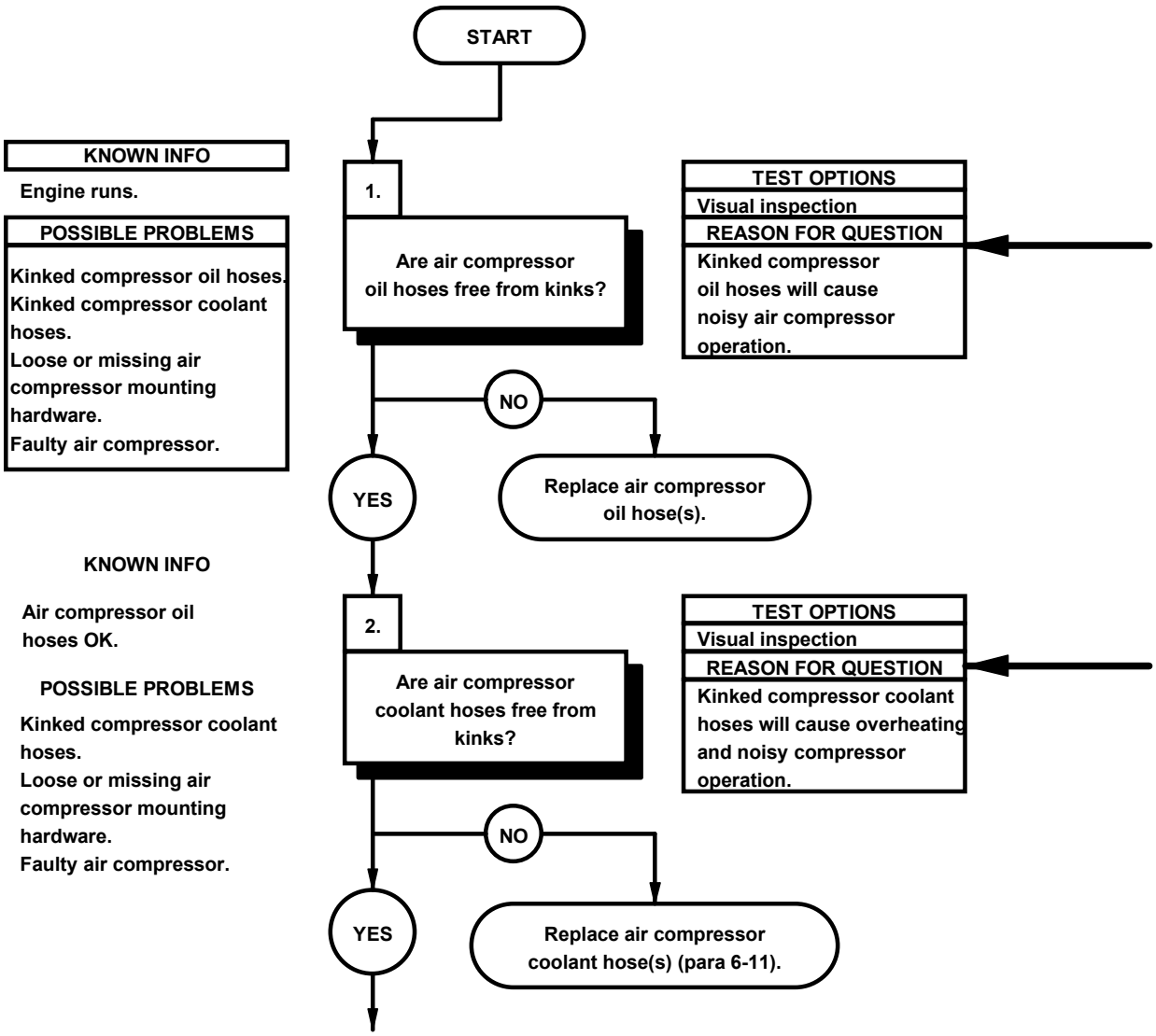


j6. NOISY AIR COMPRESSOR OPERATION

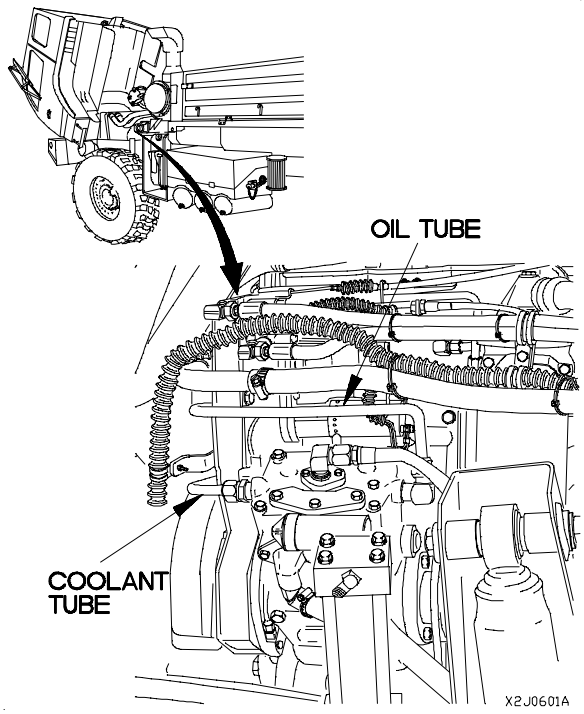
INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)

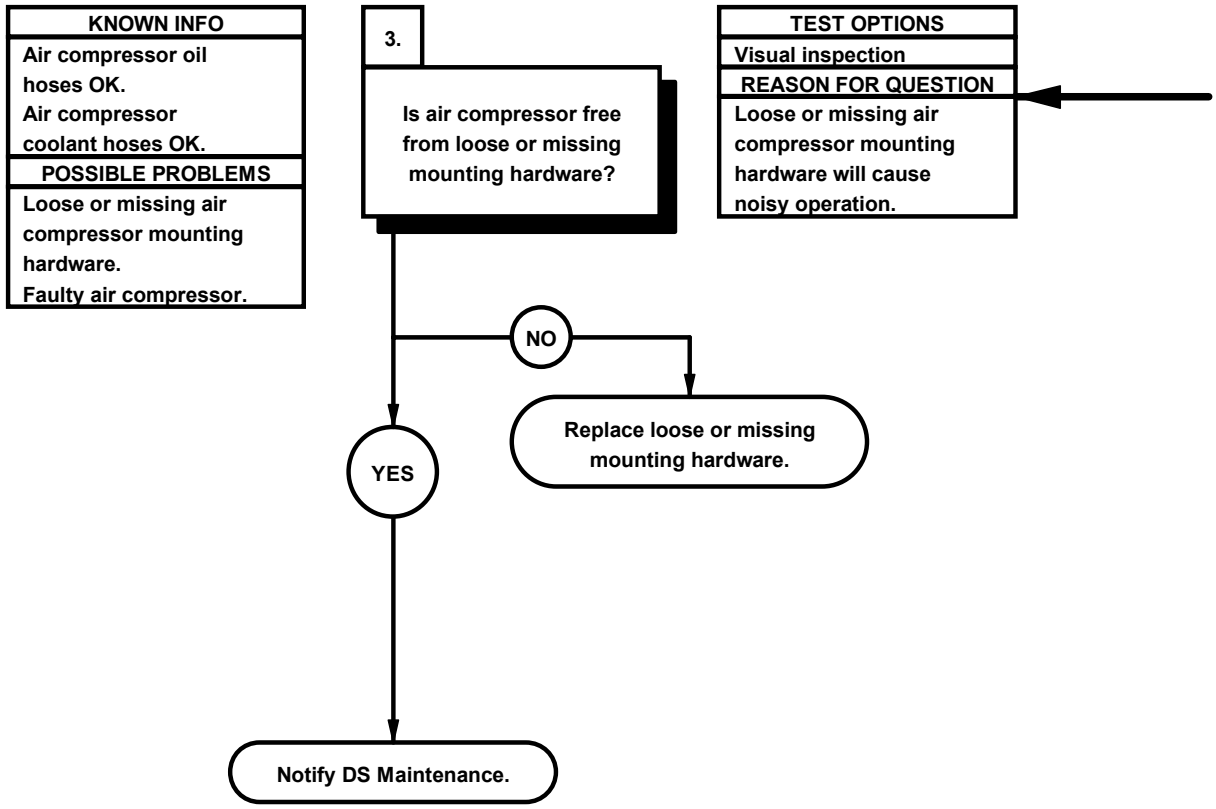


(1) Raise cab (TM 9-2320-366-10-1).
(2) Check air compressor oil hoses for kinks.

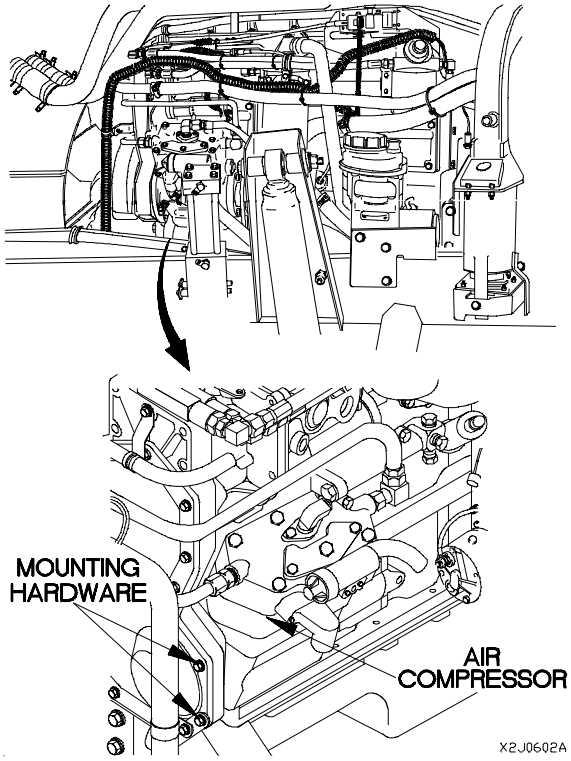


Check air compressor coolant hoses.

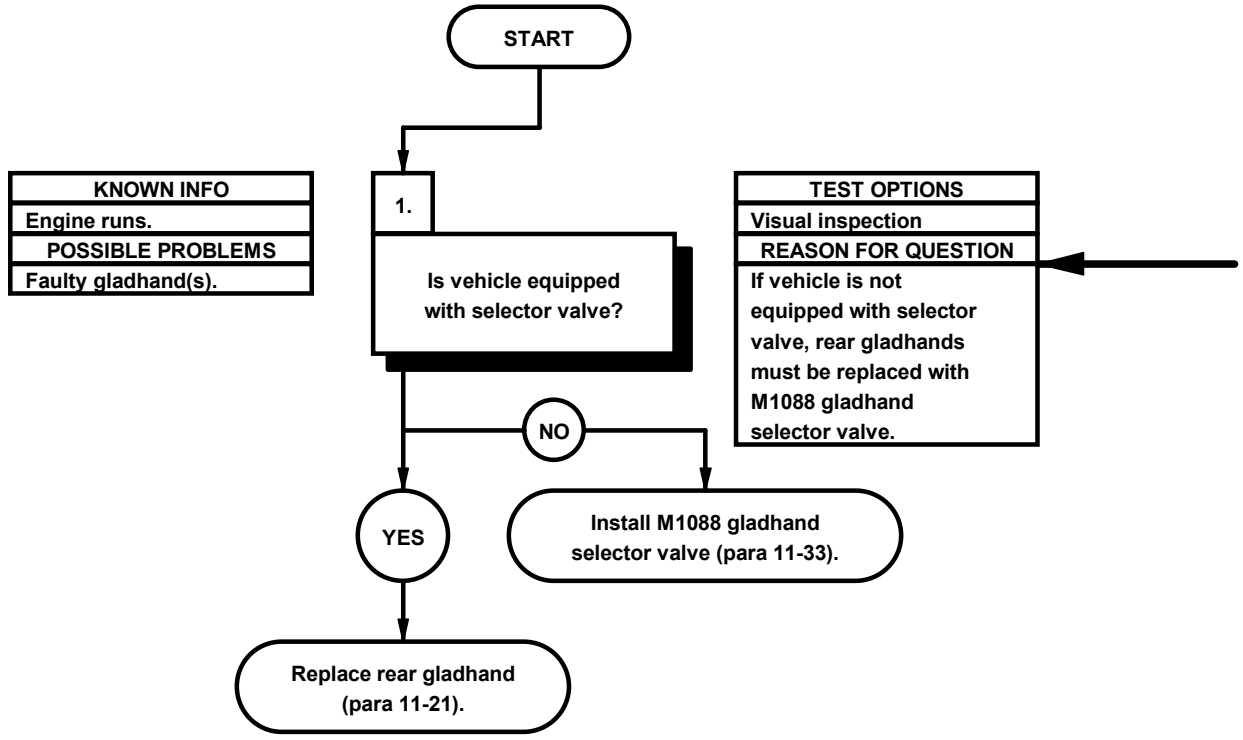
j6. NOISY AIR COMPRESSOR OPERATION (CONT)



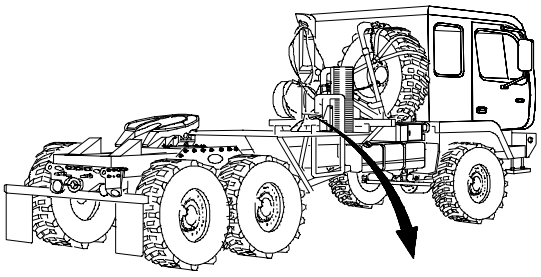
(1) Check air compressor for loose or missing mounting hardware.
(2) Lower cab (TM 9-2320-366-10-1).

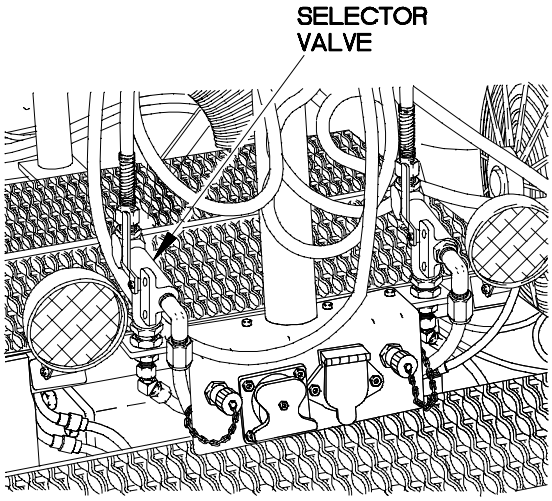


j7. M1088 REAR GLADHAND(S) LEAKS OR DOES NOT OPERATE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C)



(1) Check if vehicle is equipped with selector valve.
(2) If vehicle is not equipped with selector valve, install M1088 gladhand selector valve (para 11-33).
(3) If vehicle is equipped with selector valve, replace rear gladhand (para 11-21).





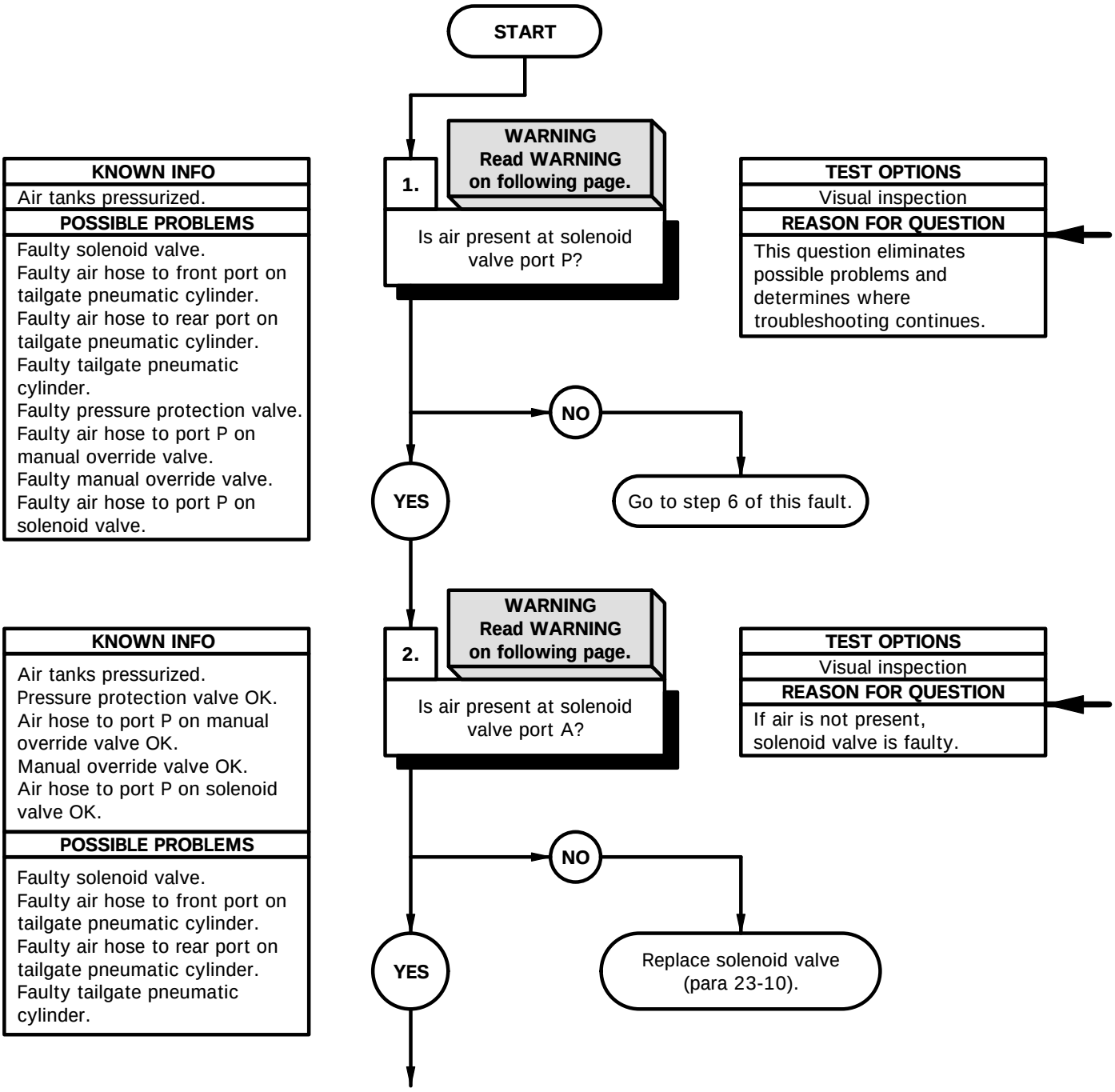
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j8. M1090/M1094 TAILGATE RELEASE DOES NOT OPERATE

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-366-10-1).
Dump body raised to maintenance position (TM 9-2320-366-10-1).

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Goggles, Industrial (Item 15, Appendix C)



WARNING

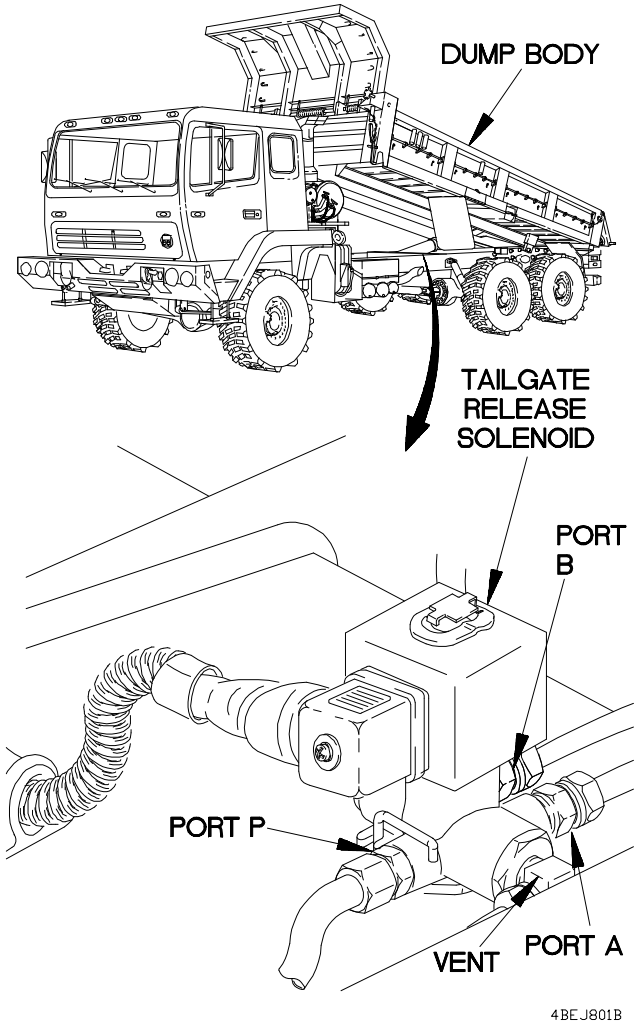
Wear protective goggles to protect against possible injury from release of high pressure air. failure to comply may result in injury to personnel.

NOTE

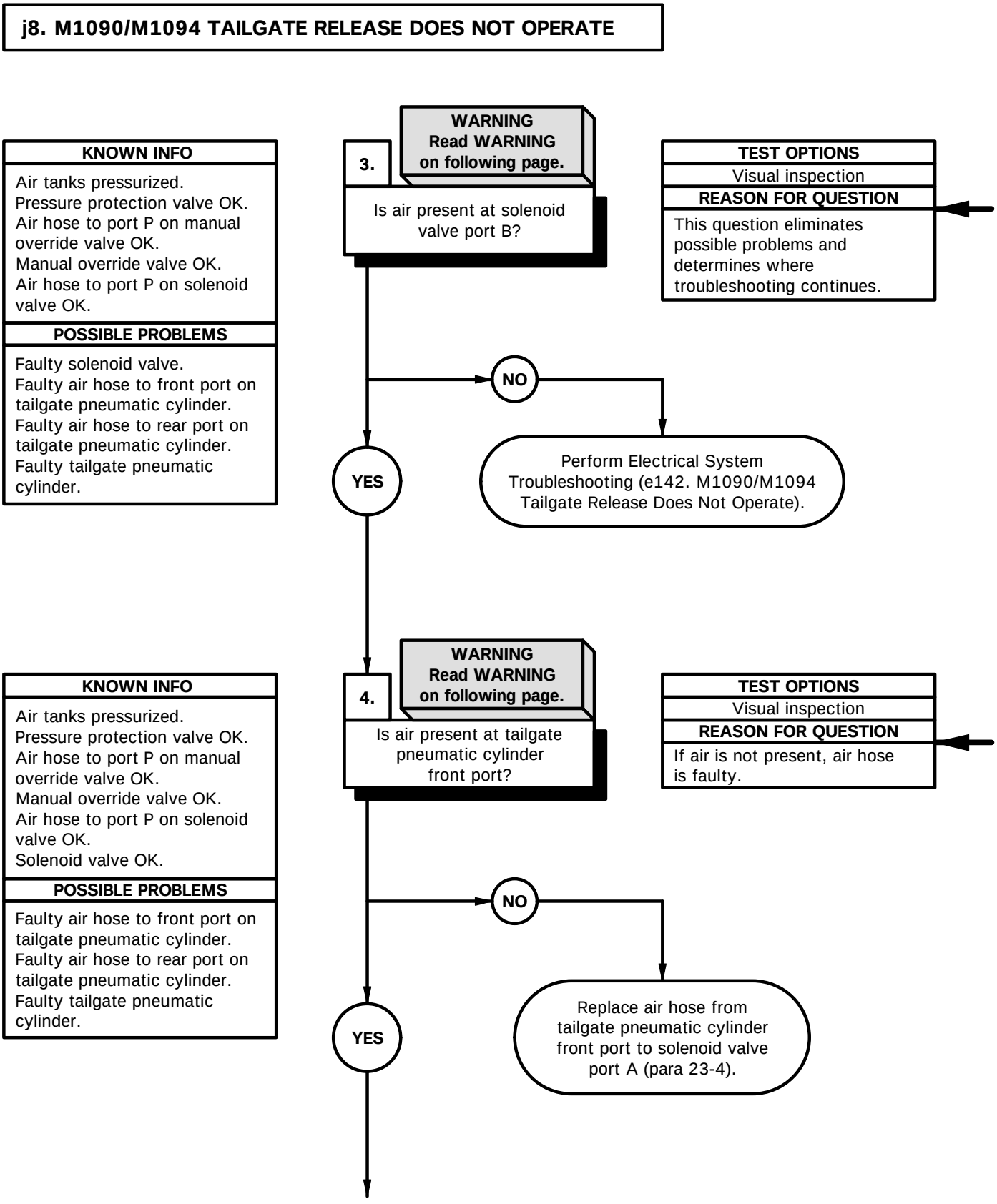
Inspect air hoses and fittings for cracks, kinks, nicks, stripped threads, and cuts.

(1) Loosen air hose at solenoid valve port P.
(2) Check for presents of air at port P.
(3) If air is not present, go to step 6 of this fault.
(4) Tighten air hose on solenoid valve.

(1) Loosen air hose at solenoid valve port A.
(2) Check for presents of air at port A.
(3) If air is not present, replace solenoid valve (para 32-10).
(4) Tighten air hose on solenoid valve.



j8. M1090/M1094 TAILGATE RELEASE DOES NOT OPERATE



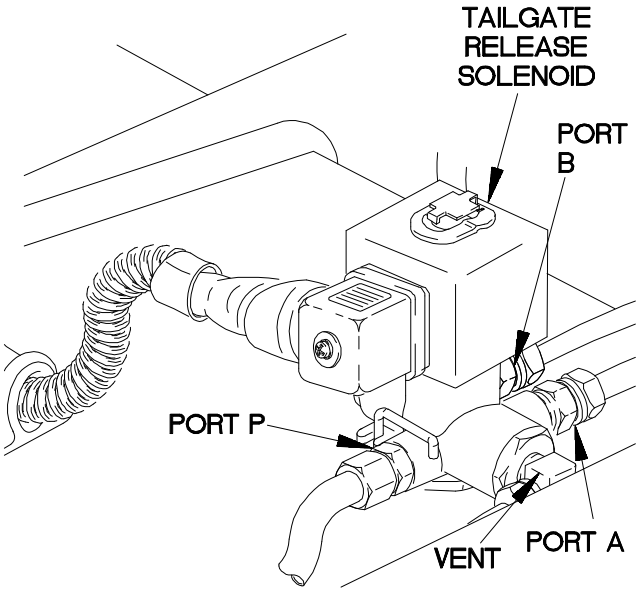
WARNING

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

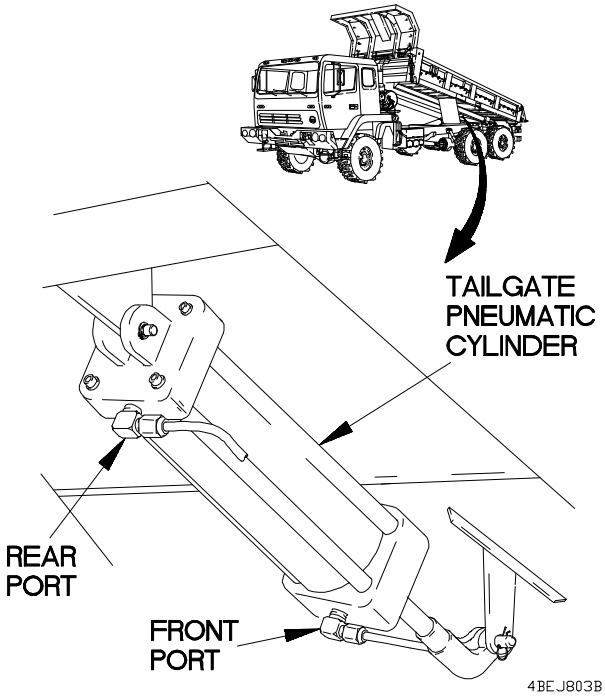
NOTE

Inspect air hoses and fittings for cracks, kinks, nicks, stripped threads, and cuts.

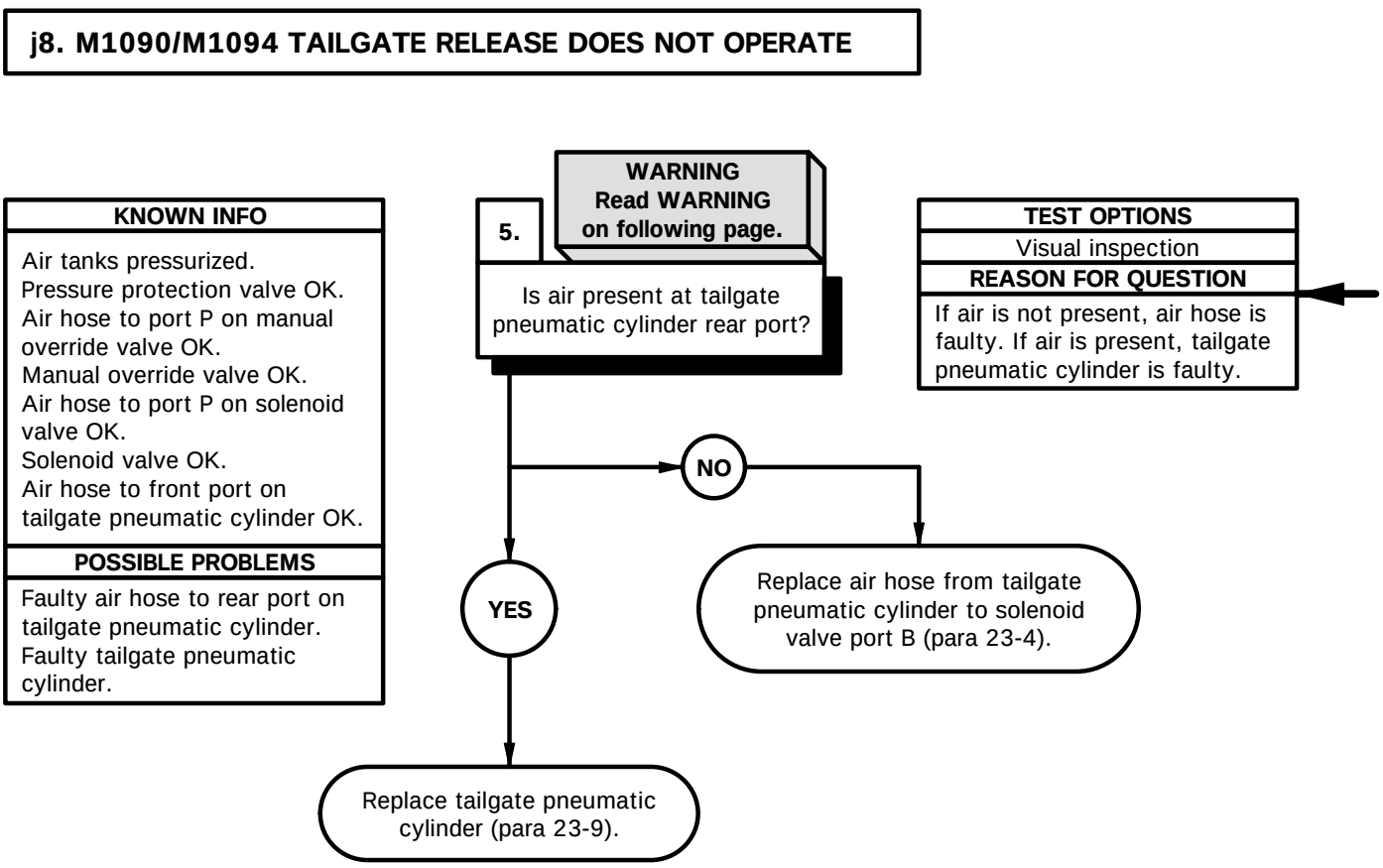
(1) Loosen air hose at solenoid valve port B.
(2) Press and hold tailgate release switch (TM 9-2320-366-10-1).
(3) Check for presence of air at solenoid valve Port B.
(4) If air is not present, perform Electrical System Troubleshooting (e142. M1090/M1094 Tailgate Release Does Not Operate).
(5) Release tailgate switch.
(6) Tighten air hose on solenoid valve.

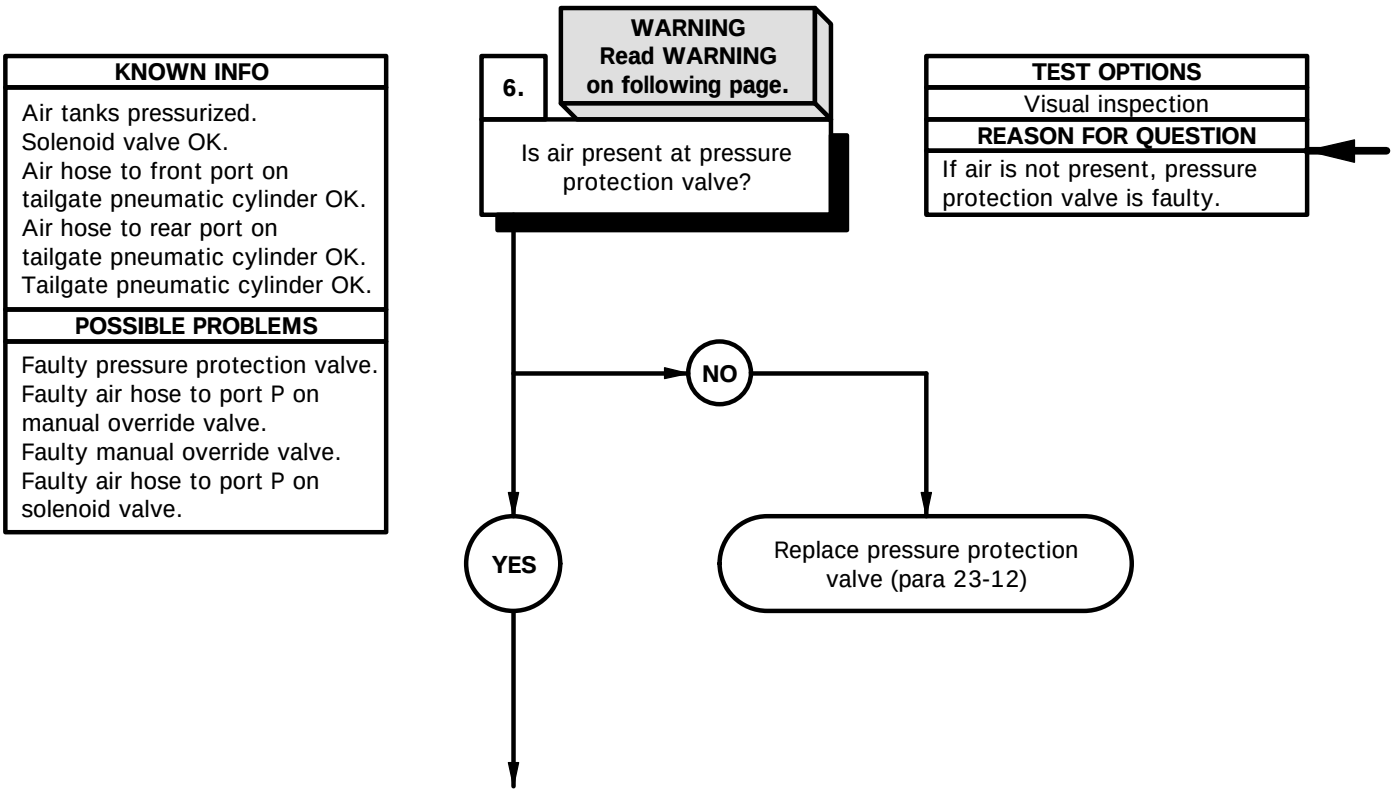


(1) Loosen air hose at tailgate pneumatic cylinder front port.
(2) Check for presence of air at front port.
(3) If air is not present, replace air hose from tailgate pneumatic cylinder front port to solenoid valve port A (para 23-4).
(4) Tighten air hose on tailgate pneumatic cylinder.



j8. M1090/M1094 TAILGATE RELEASE DOES NOT OPERATE





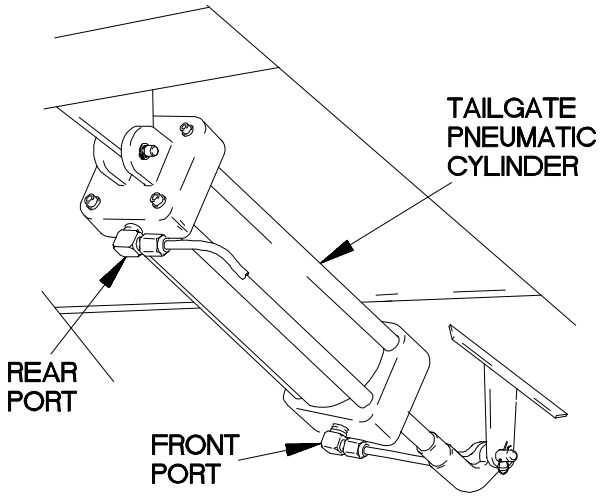
WARNING

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

NOTE

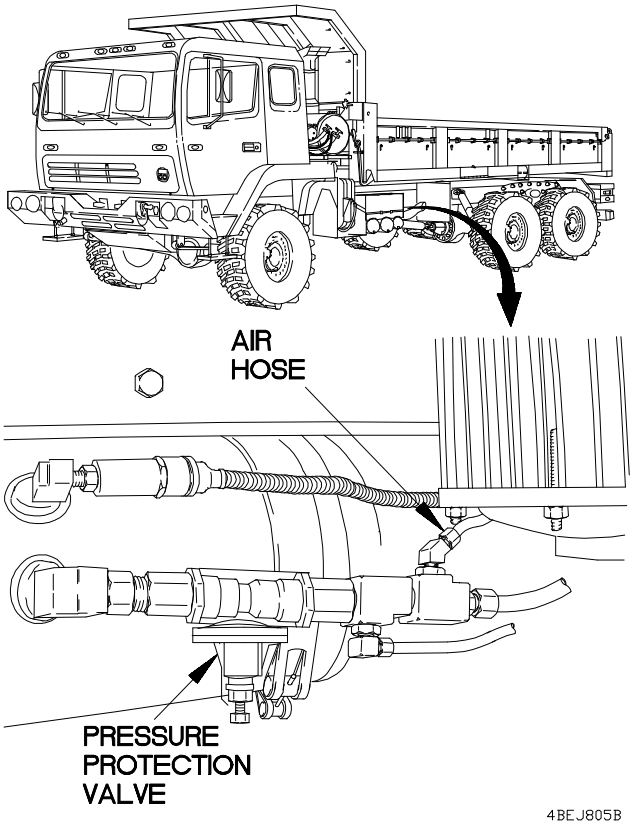
Inspect air hoses and fittings for cracks, kinks, nicks, stripped threads, and cuts.

(1) Loosen air hose at tailgate pneumatic cylinder rear port.
(2) Check for presence of air at rear port.
(3) If air is not present, replace air hose from tailgate pneumatic cylinder rear port to solenoid valve port B (para 23-4).
(4) If air is present, replace tailgate pneumatic cylinder (para 23-9).
(5) Tighten air hose on tailgate pneumatic cylinder.



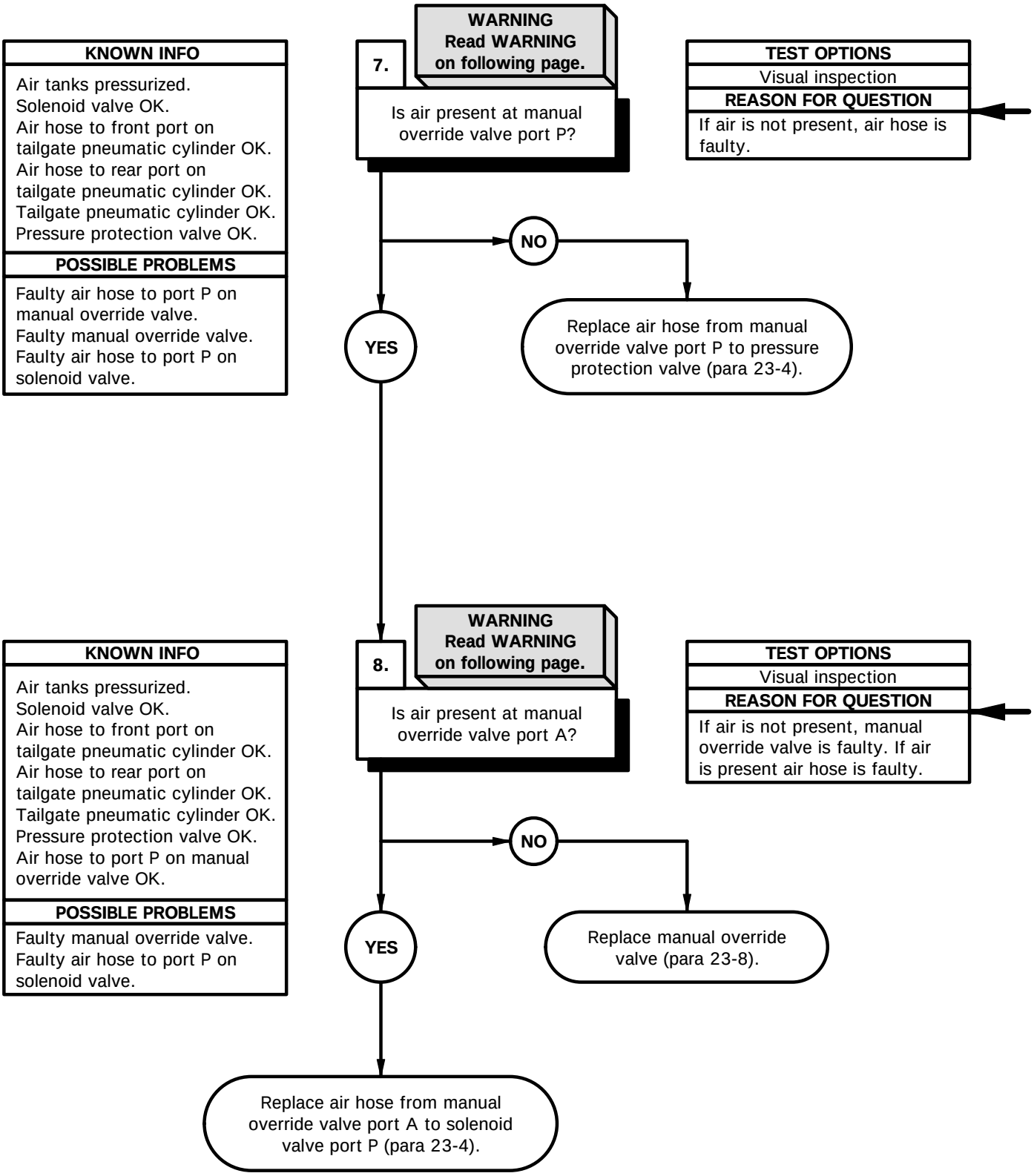
4BEJ804B

(1) Loosen air hose at pressure protection valve.
(2) Check for presence of air at pressure protection valve.
(3) If air is not present, replace pressure protection valve (para 23-12).
(4) Tighten air hose on pressure protection valve.



4BEJ805B

j8. M1090/M1094 TAILGATE RELEASE DOES NOT OPERATE



WARNING

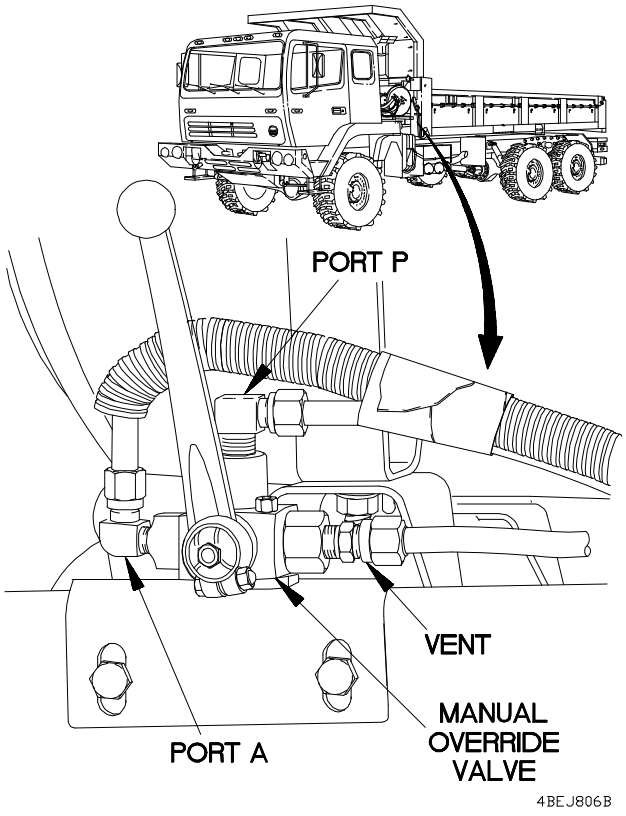
Wear protective goggles to protect against possible injury from release of high pressure air. failure to comply may result in injury to personnel.

NOTE

Inspect air hoses and fittings for cracks, kinks, nicks, stripped threads, and cuts.

(1) Loosen air hose at manual override valve port P.
(2) Check for presence of air at port P on manual override valve.
(3) If air is not present, replace air hose from manual override valve port P to pressure protection valve (para 23-4).
(4) Tighten air hose on manual override valve.

(1) Loosen air hose at manual override valve port A.
(2) Check for presence of air at port A.
(3) If air is not present, replace manual override valve (para 23-8).
(4) If air is present, replace air hose from manual override valve port A to solenoid valve port P (para 23-4).
(5) Tighten air hose on manual override valve.



2-22. WHEEL TROUBLESHOOTING

This paragraph covers Wheel Troubleshooting. The Wheel Fault Index, Table 2-50, lists faults for the Wheel of the vehicle.

Table 2-50. Wheel Fault Index

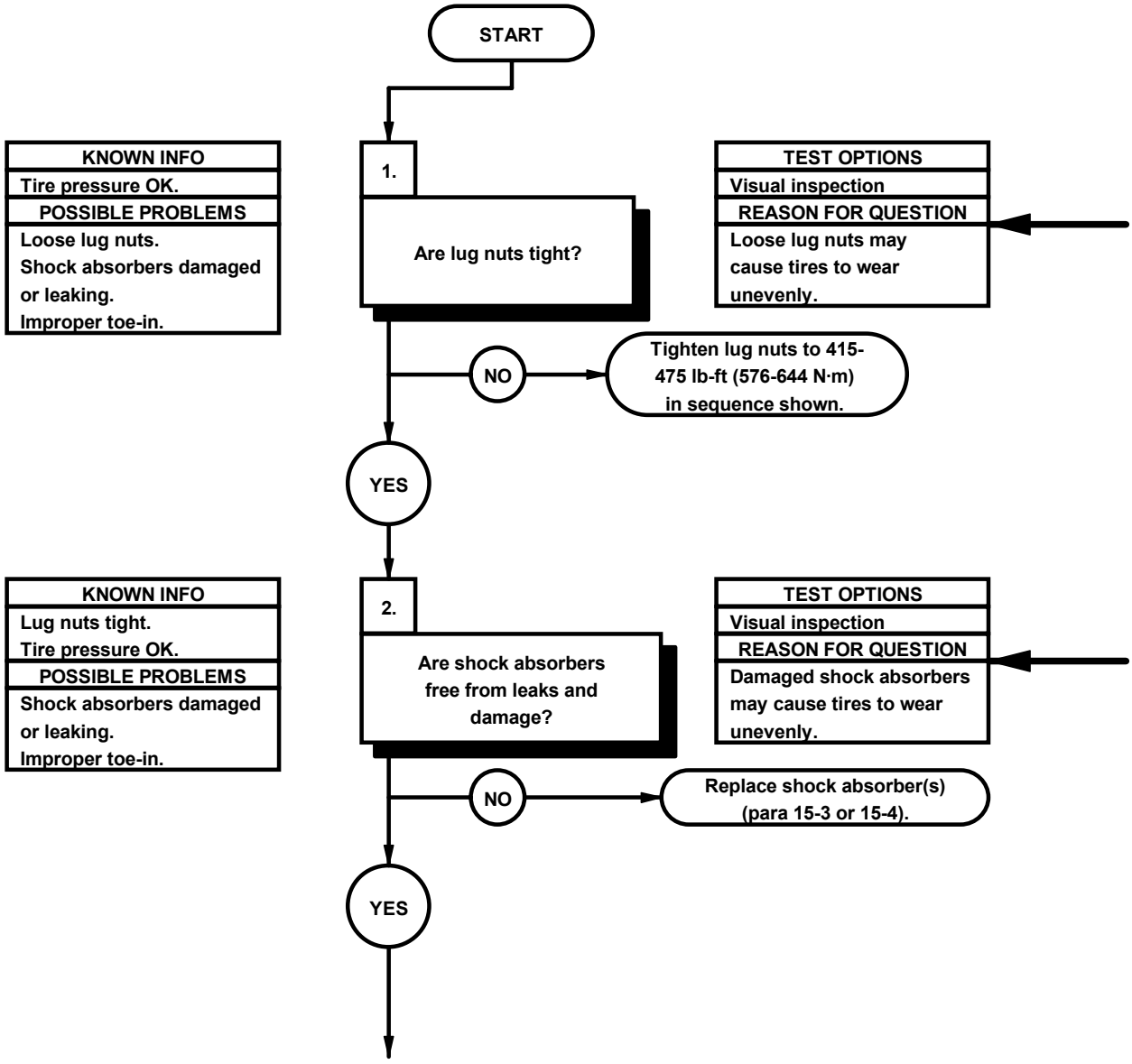
Fault No.	Description	Page
k1.	Tires Wear Unevenly or Excessively	2-1990
k2.	Wheel Wobbles or Shimmies	2-1994

k1. TIRES WEAR UNEVENLY OR EXCESSIVELY

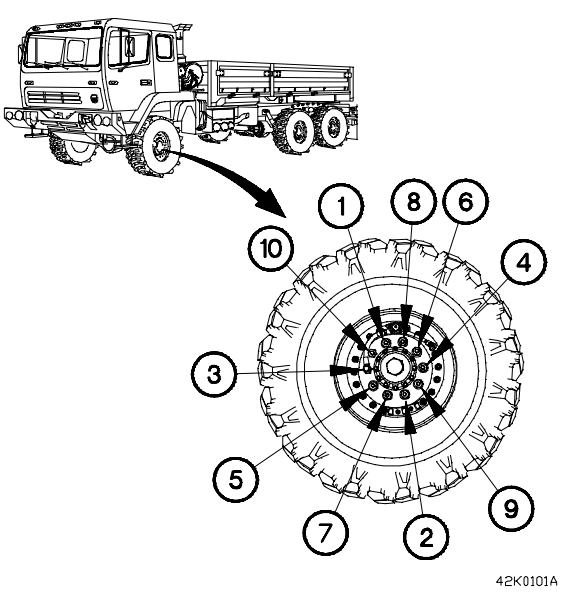
INITIAL SETUP

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

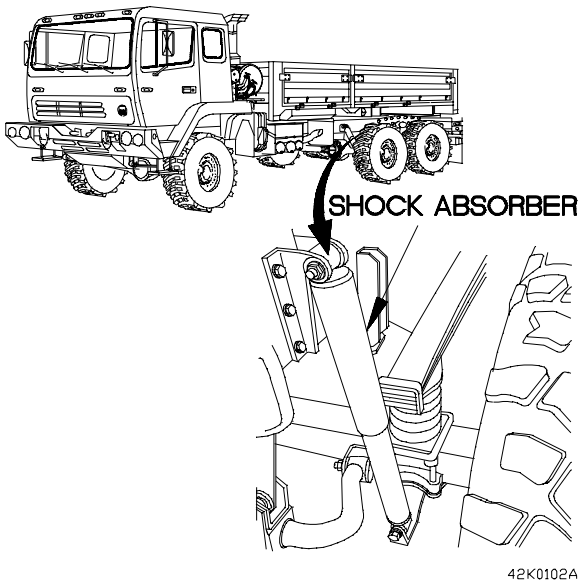
Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Multiplier, Torque Wrench (Item 23, Appendix C)
Wrench, Torque, 0-600 lb-ft (Item 60, Appendix C)



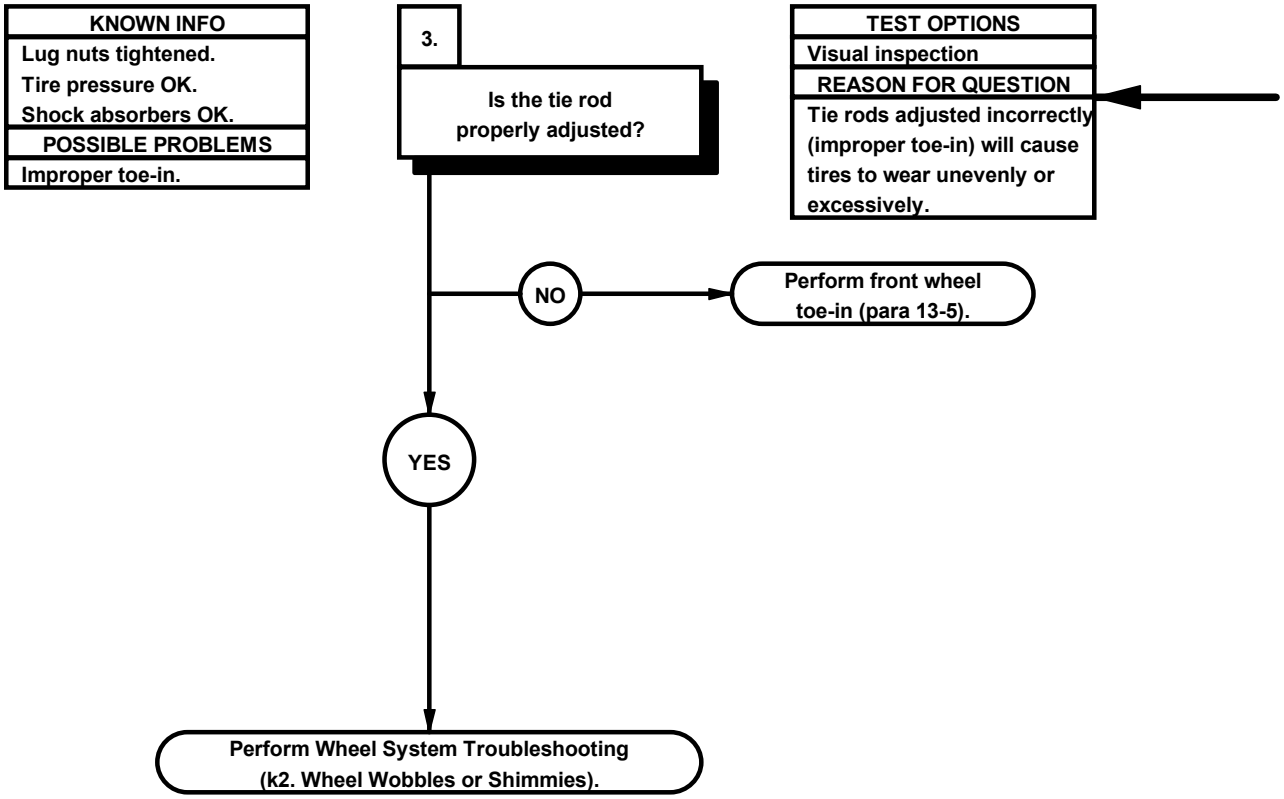
Inspect tires for excessive wear and for spacing between lug nuts and wheels. Tires that are worn unevenly may indicate that lug nuts need tightening.

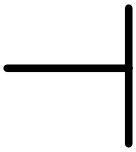


Inspect tires for excessive wear. Tires that have flat spots may indicate a defective shock absorber. Inspect shock absorbers for leaks or damage.



k1. TIRES WEAR UNEVENLY OR EXCESSIVELY (CONT)





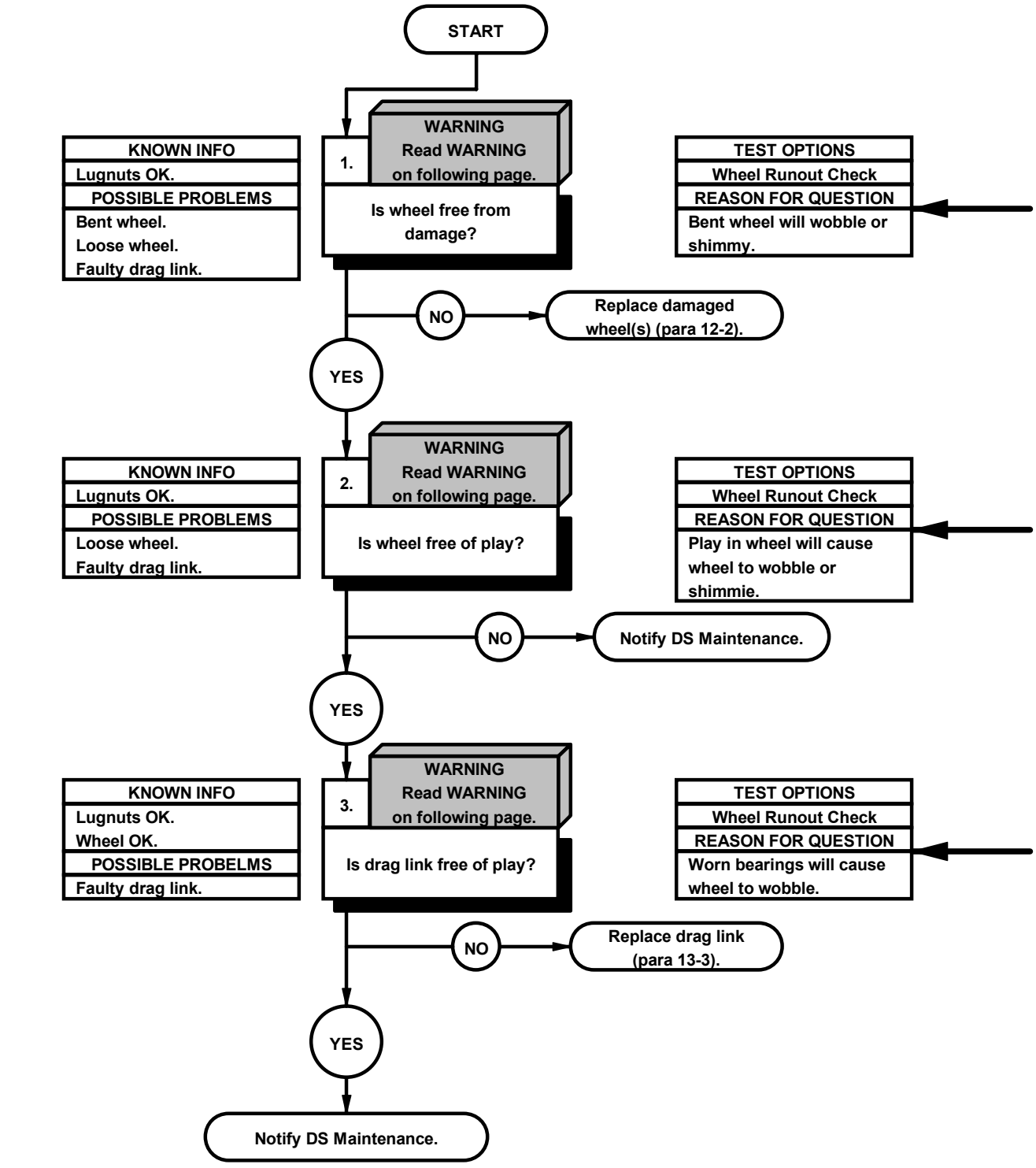
Check front wheel toe-in (para 13-5).

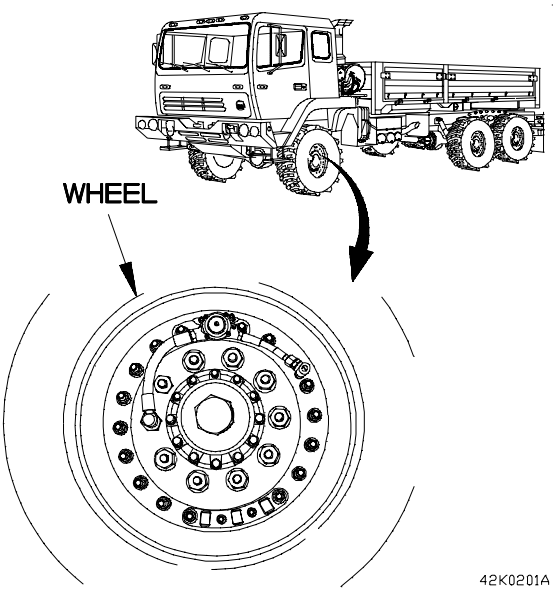
k2. WHEEL WOBBLES OR SHIMMIES

INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
Trestle, Motor Vehicle Maintenance (2) (Item 47, Appendix C)



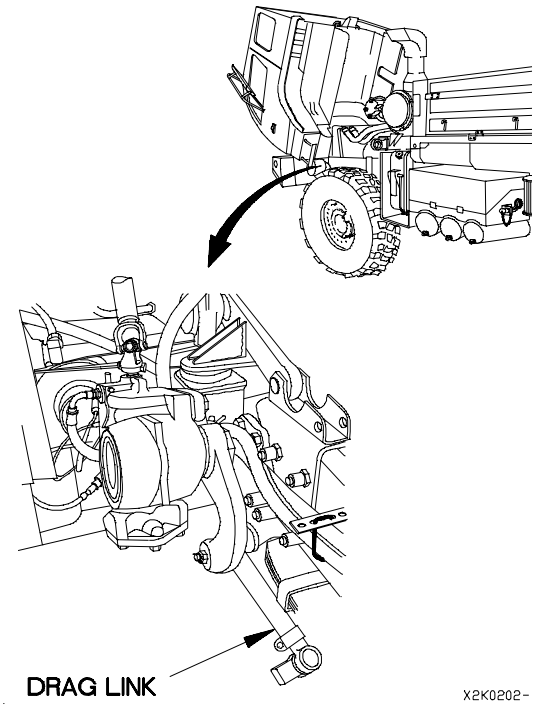


WHEEL RUNOUT CHECK

WARNING

Vehicle must be on level ground and wheels must be chocked. Failure to comply may result in injury to personnel.

(1) Jack up vehicle (TM 9-2320-366-10-1) one wheel at a time.
(2) Rotate tire to check for bent wheel.
(3) Insert pry bar under tire and lift while observing wheel play.
(4) Check drag link play.
(5) Lower vehicle (TM 9-2320-366-10-1).



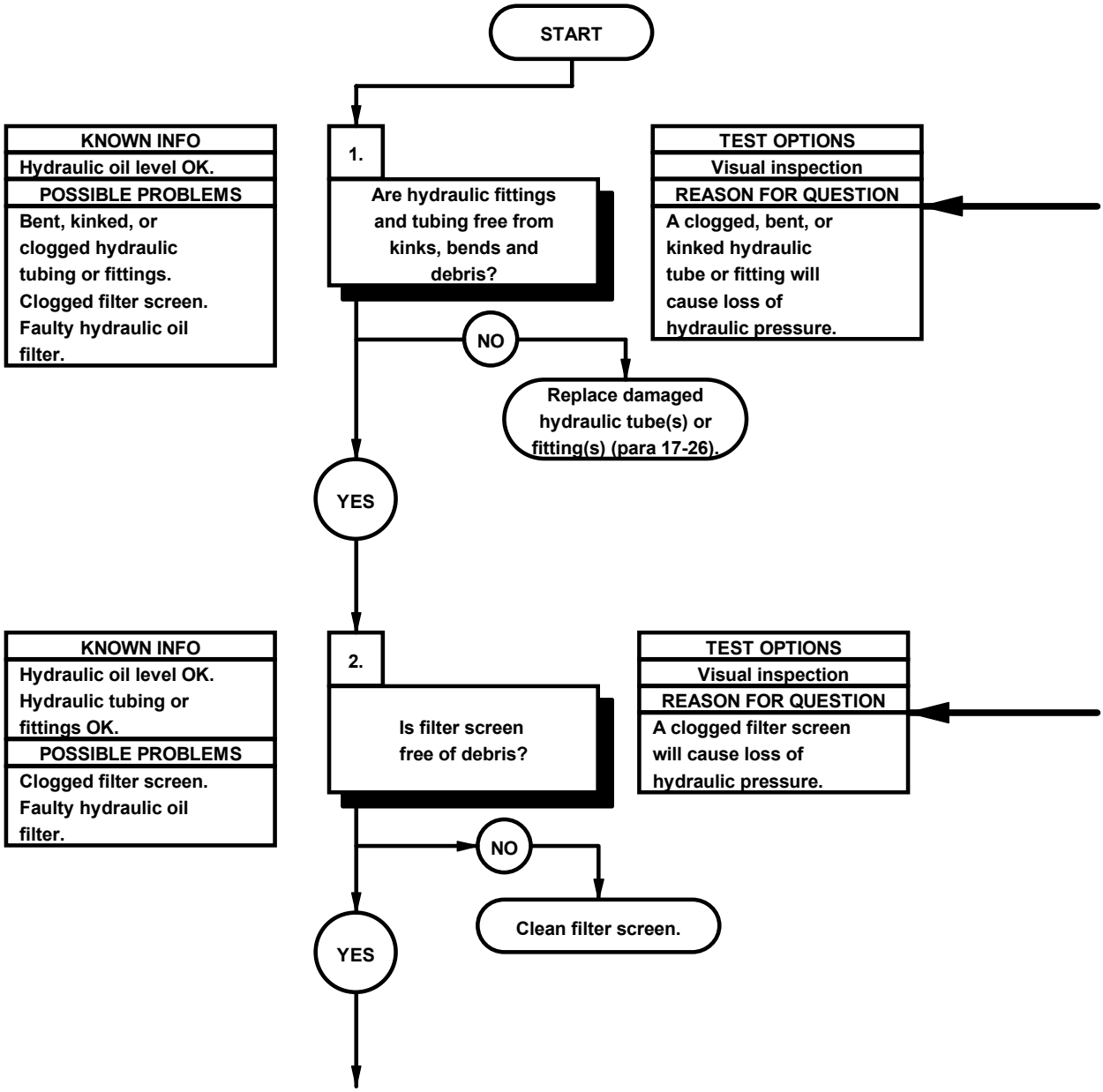
2-23. HYDRAULIC SYSTEM TROUBLESHOOTING

This paragraph covers Hydraulic System Troubleshooting. The Hydraulic System Fault Index, Table 2-51, lists faults for the Hydraulic System of the vehicle.

Table 2-51. Hydraulic System Fault Index

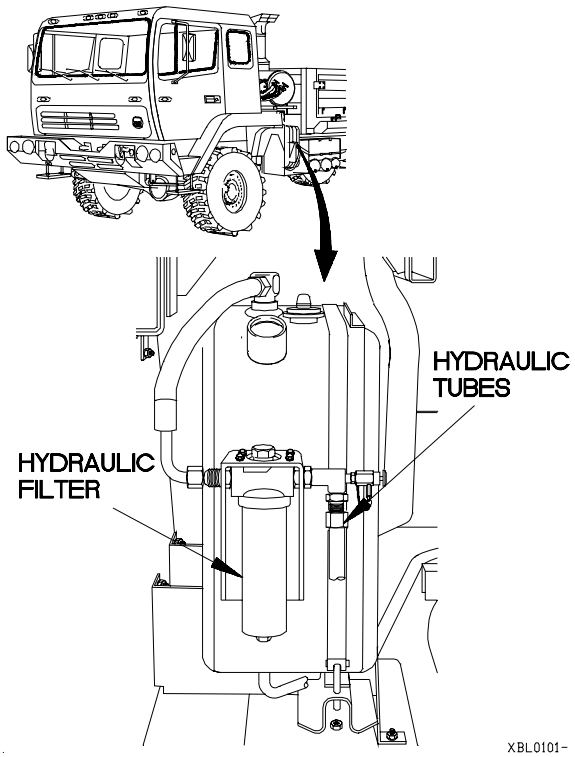
Fault No.	Description	Page
l1.	Loss of Hydraulic Pressure (Single Stage Pump)	2-1998
l2.	Loss of Hydraulic Pressure (Three Stage Pump)	2-2002

I1. LOSS OF HYDRAULIC PRESSURE (SINGLE STAGE PUMP)	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C)

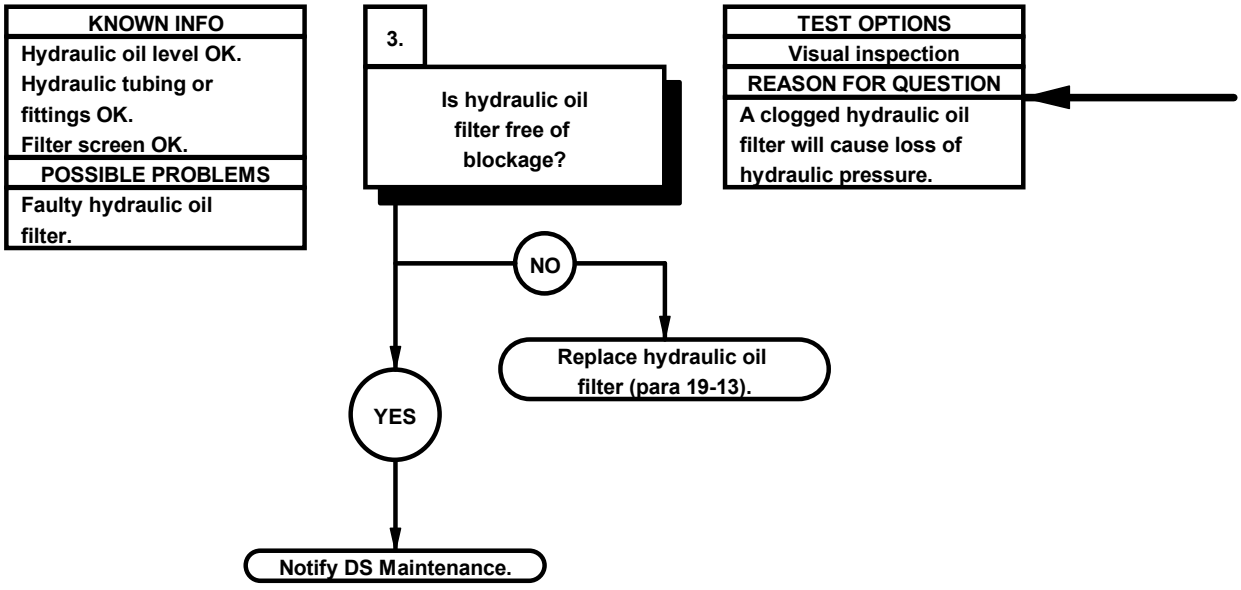


Check hydraulic tubes and fittings for kinks, bends, and debris.

Check filter screen for debris.

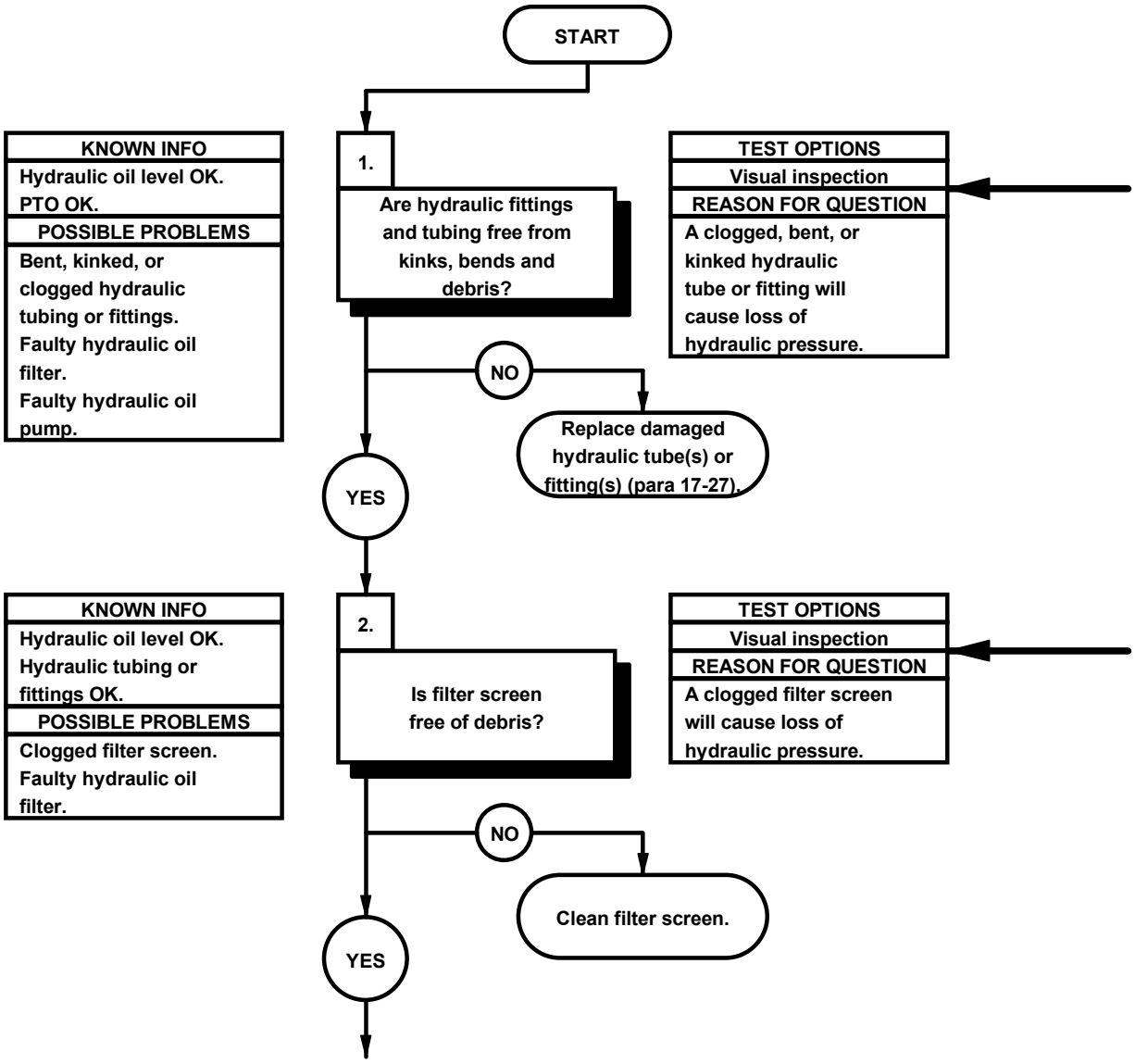


I1. LOSS OF HYDRAULIC PRESSURE (SINGLE STAGE PUMP) (CONT)



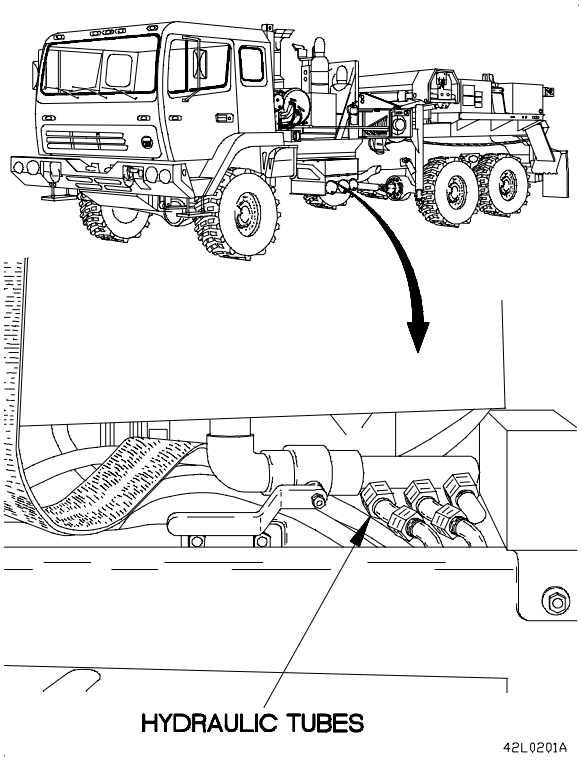
(1) Remove hydraulic oil filter (para 19-13).
(2) Check hydraulic oil filter for blockage.
(3) Install hydraulic oil filter (para 19-13).

I2. LOSS OF HYDRAULIC PRESSURE (Three Stage Pump)	
INITIAL SETUP	
Equipment Conditions	Tools and Special Tools
Engine shut down (TM 9-2320-366-10-1).	Tool Kit, Genl Mech (Item 46, Appendix C)

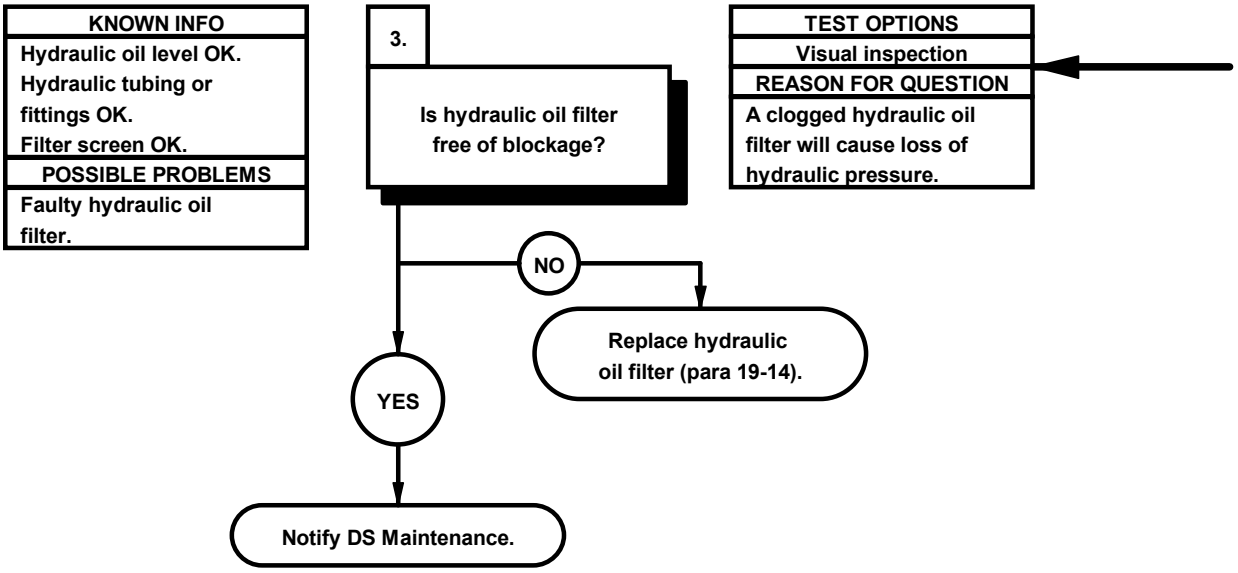


Check hydraulic tubes and fittings for kinks, bends, and debris.

Check filter screen for debris.



I2. LOSS OF HYDRAULIC PRESSURE (THREE STAGE PUMP) (CONT)



(1) Remove hydraulic oil filter (para 19-14).
(2) Check hydraulic oil filter for blockage.
(3) Install hydraulic oil filter (para 19-14).

APPENDIX A
REFERENCES

A-1. SCOPE

This appendix lists all forms, field manuals, technical manuals, and other publications referenced in this manual. Those publications that should be consulted for additional information about vehicle operations are also listed.

A-2. PUBLICATIONS INDEX

The following index should be consulted frequently for latest changes or revisions and for new publications relating to material covered in this technical manual.

Consolidated Index of Army Publications and Blank Forms . . . . . DA Pam 25-30

A-3. FORMS

The following forms pertain to this manual. See DA Pam 25-30 for index of blank forms. See DA Pam 738-750, The Army Maintenance Management System (TAMMS), for instructions on the use of maintenance forms pertaining to this material.

Recommended Changes to DA Publications and Blank Forms . . . . . DA Form 2028-2
Equipment Inspection and Maintenance Worksheet . . . . . DA Form 2404
Maintenance Request . . . . . DA Form 2407
Equipment Control Record . . . . . DA Form 2408-9
Processing and Deprocessing Record of Shipping, Storage, and Issue of Vehicles and Spare Engines . . . . . DD Form 1397
Packaging Improvement Report . . . . . DD Form 6
Report of Item Discrepancy (ROID) . . . . . SF 364
Product Quality Deficiency Report . . . . . SF 368

A-4. OTHER PUBLICATIONS

The following publications contain information pertinent to the MTV and associated equipment.

a. Safety.

First Aid for Soldiers . . . . . FM 21-11
Security of Tactical Wheeled Vehicles . . . . . TB 9-2300-422-20
Safety Inspection and Testing of Lifting Devices . . . . . TB 43-0142

A-4. OTHER PUBLICATIONS (CONT)

b. MTV.

Direct Support and General Support Maintenance Manual for M1083 Series, 5-Ton, 6x6, Medium Tactical Vehicle (MTV) . . . . . TM 9-2320-366-34
Hand Receipt Covering Contents of Components of End Item (COEI), Basic Issue Items (BII), and Additional Authorization List (AAL), for M1083 Series, 5-Ton, 6x6, Medium Tactical Vehicles (MTV) . . . . . TM 9-2320-366-10-HR
Operator's Manual for M1083 Series, 5-Ton, 6x6, Medium Tactical Vehicle (MTV) . . . . . TM 9-2320-366-10
Unit, Direct Support, and General Support Repair Parts and Special Tools List for M1083 Series, 5-Ton, 6x6, Medium Tactical Vehicle (MTV) . . . . . TM 9-2320-366-24P
Warranty Program for M1083 Series, 5-Ton, 6x6, Medium Tactical Vehicle (MTV) . . . . . TB 9-2300-366-15

c. General Vehicle Operation.

Army Motor Transport Units and Operations . . . . . FM 55-30
Deleted
Manual for the Wheeled Vehicle Driver . . . . . FM 21-305
Petroleum Tank Vehicle Operations . . . . . FM 10-71
Safety Prevention of Motor Vehicle Accidents . . . . . AR 385-557
Vehicle Recovery Operations . . . . . FM 20-22

d. General Maintenance and Repair.

Army Oil Analysis Program . . . . . TB 43-0211
Camouflage Pattern Painting . . . . . FM 5-20
Charging System Troubleshooting . . . . . DA Pam 750-33
Color, Marking, and Camouflage Painting of Military Vehicles . . . . . TB 43-0209
Cooling Systems: Tactical Vehicles . . . . . TM 750-254
Corrosion Prevention and Control Including Rustproofing Procedures for Tactical Vehicles and Trailers . . . . . TB 43-0213
Description, Use, Bonding Techniques, and Properties of Adhesives . . . . . TB ORD 1032
Equipment Improvement Report and Maintenance Digest: TACOM Equipment . . . . . TB 43-0001-39-1
Equipment Improvement Report and Maintenance Summary . . . . . TM 43-0143
Installation Instructions for Installation Kit, Electronic Equipment, MK-2700/VRC (NSN 5895-01-421-0814) (EIC: N/A) to Permit Installation of Radio Set AN/VRC-87/88/90 Series into M1078, M1080, M1081, M1083-M1086, M1088-M1094 and M1096 Family of Medium Tactical Vehicles . . . . . TB 11-5820-890-20-101
Installation Instructions for Installation Kit, Electronic Equipment, MK-2715/VRC (NSN 5895-01-421-0812) (EIC: N/A) to Permit Installation of Radio Set AN/VRC-89/91/92 Series into M1078, M1080, M1081, M1083-M1086, M1088-M1094 and M1096 Family of Medium Tactical Vehicles . . . . . TB 11-5820-890-20-92
Materials Used for Cleaning, Preserving, Abrading, and Cementing Ordnance Materiel and Related Materials Including Chemicals . . . . . TM 9-247
Metal Body Repair and Related Operations . . . . . FM 43-2
Operator's and Organizational Maintenance Manual for Radio Sets . . . . . TM 11-5820-498-12
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 9-4910-571-12&P
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, Unit, Direct Support, and General Support Maintenance Manual for Lead-Acid Storage Batteries . . . . . TM 9-6140-200-14

Ordnance Tracked and Wheeled Vehicle Hull and Chassis Wiring, Repair of . . . . . TB ORD 650
Organizational Care, Maintenance, and Repair of Pneumatic Tires and Inner Tubes . . . . . TM 9-2610-200-14
Painting Instructions for Field Use . . . . . TM 43-0139
Purging, Cleaning, and Coating Interior Ferrous and Terne Sheet Vehicle Fuel Tanks . . . . . TB 43-0212
Repair of Tents, Canvas, and Webbing . . . . . FM 10-16
Rigging Techniques, Procedures, and Applications . . . . . FM 5-125
Use and Care of Hand Tools and Measuring Tools . . . . . TM 9-243
Use of Antifreeze Solutions and Cleaning Compounds in Engine Cooling Systems . . . . . TB 750-651
Welding Theory and Application . . . . . TM 9-237

e. Cold Weather Operation.

Basic Cold Weather Manual . . . . . FM 31-70
Northern Operations . . . . . FM 31-71
Operation and Maintenance of Ordnance Materiel in Cold Weather (0° to -65°F) . . . . . FM 9-207

f. Decontamination.

Decontamination Operations Facilities & Equipment . . . . . TB 700-4
NBC Decontamination . . . . . FM 3-5
NBC Protection . . . . . FM 3-4

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.

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
Principles of Automotive Vehicles . . . . . TM 9-8000
Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use (US Army Tank-automotive and Armaments Command) . . . . . TM 750-244-6
Route Reconnaissance and Classification . . . . . FM 5-36
Soldier's Manual MOS 88M Motor Transport Operator, Skill Levels 1/2 . . . . . STP 55-88-M12-SM

i. Land, Sea, and Air Shipment.

Airdrop of Supplies and Equipment: Rigging 5-Ton Trucks . . . . . FM 10-526
Containerization of Military Vehicles . . . . . MTMCTEA Ref 95-55-23
Lifting and Tiedown of U.S. Military Helicopters . . . . . MTMCTEA Ref 95-55-21
Marine Lifting and Lashing Handbook . . . . . MTMCTEA Ref 95-55-22
Marine Terminal Lifting Guidance . . . . . MTMCTEA Pam 56-1

A-4. OTHER PUBLICATIONS (CONT)

i. Land, Sea, and Air Shipment (Cont).

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

APPENDIX B
MAINTENANCE ALLOCATION CHART (MAC)

SECTION I

INTRODUCTION

B-1. The Army Maintenance System MAC.

a. This introduction (Section I) provides a general explanation of all maintenance and repair functions authorized at various maintenance levels under the standard Army Maintenance System concept.

b. The Maintenance Allocation Chart (MAC) in Section II designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component will be consistent with the capacities and capabilities of the designated maintenance levels, which are shown on the MAC in column (4) as:

Unit - includes two subcolumns, C (Operator/Crew) and O (Unit) maintenance.

Direct Support - includes an F subcolumn.

General Support - includes an H subcolumn.

Depot - includes a D subcolumn.

c. Section III lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from Section II.

d. Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

B-2. Maintenance Functions. Maintenance functions are limited to and defined as follows:

a. **Inspect**. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g. by sight, sound, or feel).

b. **Test**. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. **Service**. Operations required periodically to keep an item in proper operating condition; e.g. to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemicals fluids, or gases.

d. **Adjust**. To maintain or regulate, within prescribed limits, by bringing into proper position, or by setting the operating characteristics to specified parameters.

e. **Align**. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. **Calibrate**. To determine and cause corrections to be made or to be adjusted on instruments or Test, Measurement, and Diagnostic Equipment (TMDE) used in precision measurement. Consists of comparison of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. **Remove/Install**. To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. **Replace**. To remove an unserviceable item and install a serviceable counterpart in its place. "Replace " is authorized by the MAC and assigned maintenance level is shown as the 3d position code of the SMR code.

i. **Repair**. The application of maintenance services[1] including fault location/troubleshooting[2], removal/installation, and disassembly/assembly[3] procedures, and maintenance actions[4] to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

j. **Overhaul**. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications (i.e., DMWR). Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. **Rebuild**. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (e.g., hours/miles) considered in classifying Army equipment/components.

B-3. Explanation of Columns in the MAC, Section II.

a. **Column 1, Group Number.** Column 1 lists functional group code numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the next higher assembly.

b. **Column 2, Component/Assembly.** Column 2 contains the item names of components , assemblies, subassemblies, and modules for which maintenance is authorized.

c. **Column 3, Maintenance Function.** Column 3 lists the functions to be performed on the items listed in Column 2. (For detailed explanation of these functions, see Paragraph B-2.)

d. **Column 4, Maintenance Level.** Column 4 specifies each level of maintenance authorized to perform each function listed in Column 3, by indicating work time required (expressed in man-hours in whole hours or decimals) in the appropriate subcolumn. This work-time figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance levels, appropriate work-time figures are to be shown for each level. The work-time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions.

---

[1]Services - Inspect, test, service, adjust, align calibrate, and/or replace.

[2]Fault location/troubleshooting - The process of investigating and detecting the cause of equipment malfunction; the act of isolating a fault within a system or Unit Under Test (UUT).

[3]Disassembly/assembly - The step-by-step breakdown (taking apart) of a spare/functional group coded item, to the level of its least component, that is assigned an SMR code for the level of maintenance under consideration (i.e., identified as maintenance significant).

[4]Actions - Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.

This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance levels are as follows:

C . . . . . Operator or crew maintenance
O . . . . . Unit maintenance
F . . . . . Direct Support maintenance
L . . . . . Specialized Repair Activity (SRA)[5]
H . . . . . General Support maintenance
D . . . . . Depot maintenance

e. **Column 5, Tools and Test Equipment Reference Code.** Column 5 specifies, by code, those common tools sets (not individual tools), common TMDE, and special tools, special TMDE, and special support equipment required to perform the designated functions. Codes are keyed to tools and test equipment in Section III.

f. **Column 6, Remarks.** When applicable, this column contains a letter code, in alphabetical order, which is keyed to the remarks contained in Section IV.

B-4. Explanation of Columns in Tool and Test Equipment Requirements, Section III.

a. **Column 1, Reference Code.** The tool and test equipment reference code correlates with a code used in the MAC, Section II column 5.

b. **Column 2, Maintenance Level.** The lowest level of maintenance authorized to use the tool or test equipment.

c. **Column 3, Nomenclature.** Name or identification of the tool or test equipment.

d. **Column 4, National Stock Number.** The National Stock Number of tool or test equipment.

e. **Column 5, Tool Number.** The manufacturer's part number, model number, or type number.

B-5. Explanation of Columns in Remarks, Section IV.

a. **Column 1, Remarks Code.** The code recorded in column 6, Section II.

b. **Column 2, Remarks.** This column lists information pertinent to the maintenance function being performed as indicated in the MAC, Section II.

[5]This maintenance level is not included in Section II, Column (4) of the Maintenance Allocation Chart. Functions to this level of maintenance are identified by a work-time figure in the "H" column of Section II, Column (4), and an associated reference code is used in the Remarks column (6). This code is keyed to Section IV, Remarks, and the SRA complete repair application is explained there.

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE

(1)	(2)	(3)	(4) Maintenance Level					(5)	(6)
			Unit		Direct Support	General Support	Depot	Tools and Equipment	
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D	Ref Code	Remarks Code
0100	ENGINE ASSEMBLY	Inspect		0.1				80	
		Test		1.5	0.3			80,81	
		Adjust			3.0			58,62,80,82	
		Service		0.8				59,61,80	
		Replace			7.0			19,58,61,63,80,81	
		Repair		0.4	1.6	3.3		19,35,36,46,58,61,62,63,80,81	
0101	CYLINDER HEAD ASSEMBLY	Inspect			0.1			80	
		Replace			2.0			46,58,61,62,80	
		Repair				2.5		58,61,62,63,64,80,83	
0102	CRANKSHAFT	Replace				16.0		58,59,62,73,80	
		Repair			3.8	16.0		19,35,36,58,61,62,63,80	
0103	FLEXPLATE, ENGINE	Replace			6.5			58,61,80	
		Repair			1.0			58,61,80	
0104	PISTON ASSEMBLY	Replace				9.0		58,59,61,62,64,80,81	
		Repair				0.6		80	
0105	CAMSHAFT ASSEMBLY	Replace				3.1		17,58,59,61,62,80	
		Repair				1.2		58,80	
0105	ROCKER ARM AND PUSH RODS	Replace			2.0			46,61,62,63,80	
		Repair			0.3			59,80	
0106	COOLER, ENGINE OIL	Replace			1.3			58,80	
		Repair			0.3			58,80	
0108	MANIFOLDS, INLET AND EXHAUST	Replace			1.5			58,62,63,80,81	
0301	INJECTOR ASSEMBLY, FUEL	Replace			2.1			46,59,80,82	
		Adjust			1.6			58,80,81,82	
0304	AIR INTAKE SYSTEM	Service		0.3					
		Repair		0.3				48,59,	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE

(1)	(2)	(3)	(4) Maintenance Level					(5)	(6)
			Unit		Direct Support	General Support	Depot		
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D	Tools and Equipment Ref Code	Remarks Code
0304	INTAKE AIR CLEANER	Service		0.2					
		Replace		0.8				6,48,59, 80	
		Repair		0.4				59,80	
0305	TURBOCHARGER	Replace			0.8			58,63,80,81	
0306	FUEL TANK	Inspect	0.1						
		Replace		1.5				59,61,80	
0308	GOVERNOR, ENGINE SPEED	Replace			1.0			59,62,78,80,81	
		Repair		0.5	0.7			59,80	
0309	FILTER, FUEL/WATER SEPARATOR	Inspect	0.2						
		Service	0.2	0.3				80	
		Replace		0.5				59,80	
0311	ETHER STARTING AID	Replace		0.6				59,61,80	
0312	ACCELERATOR/HAND THROTTLE	Replace		0.5				59,80	
		Adjust		0.2				59,80	
0401	EXHAUST MUFFLER/PIPES	Inspect	0.1	0.2					
		Replace		0.9				59,61,80	
0501	RADIATOR/CHARGE AIR COOLER	Inspect	0.1						
		Replace		2.5				2,31,55, 61,80	
		Service		1.5				61,80	
		Repair		0.6	2.0			2,31,55, 61,80	
0501	RADIATOR OVERFLOW TANK	Replace		0.5				48,59,80	
		Repair		0.3				80	
0502	SHROUD, FAN	Replace		1.0				59,61,80,90	
0503	HOSES, WATER	Replace		0.5				59,61,80,90	
0504	PUMP, WATER	Replace		0.8				18,59,61,80,90	
0505	CLUTCH, ENGINE FAN	Inspect		1.0				59	
		Replace		1.5				2,55,59, 80	
		Repair			1.2			58,61,62,63,80,81	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1)	(2)	(3)	(4) Maintenance Level					(5)	(6)
			Unit		Direct Support	General Support	Depot	Tools and Equipment	
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D	Ref Code	Remarks Code
0601	ALTERNATOR, 100 AMP	Inspect		0.2					
		Test		0.5	1.5			61,65,80	
		Replace		1.0				61,80	
		Repair		0.2	0.5			40,58,59,61,65,80,81	
0603	STARTING MOTOR, ENGINE	Inspect		0.1					
		Test		0.5	0.5			59,65	
		Replace		1.5				2,8,59, 61,80	
		Repair			2.1			54,58,61,62,78,80	
0606	SOLENOID, FUEL SHUTOFF	Replace			1.0			62,80,82	
0607	CABLE ASSEMBLY, DASHBOARD	Test		0.5				58	
		Replace		2.9				59,61,78,80	
		Repair		1.0	0.6			58,59,63,80	
0607	DISPLAY, LIGHTED INDICATOR	Test		0.3					
		Replace		0.5				80,90	
		Repair		0.3				80	
0608	JUNCTION BOX ASSEMBLY, M1084/M1086	Inspect	0.1						
		Replace		1.5				59,61,80,90	
		Repair		1.5				59,61,65,80	
0608	JUNCTION BOX ASSEMBLY, M1089	Inspect	0.1						
		Replace		1.5				59,61,80,90	
		Repair		1.5				59,61,65,80	
0609	LIGHT ASSEMBLY, BACKUP	Inspect	0.1						
		Replace		0.8				59,80	
		Repair		0.3				80	
0609	LIGHT, BLACKOUT DRIVE	Inspect	0.1						
		Replace		0.8				59,61,80	
		Repair		0.5				80	
0609	TAILLIGHT ASSEMBLY, COMPOSITE	Inspect	0.1						
		Replace		0.8				59,61,80	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1)	(2)	(3)	(4) Maintenance Level					(5)	(6)
			Unit		Direct Support	General Support	Depot	Tools and Equipment	
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D	Ref Code	Remarks Code
		Repair		0.5				80	
0609	LIGHT ASSEMBLY, FRONT TURN SIGNAL AND PARK	Inspect	0.1						
		Replace		0.8				59,61,80	
		Repair		0.5				80	
0609	HEADLIGHT	Inspect	0.1						
		Adjust		0.4					
		Replace		1.0				59,61,80	
0609	WORKLIGHT ASSEMBLY, M1088/M1089 STATIONARY	Inspect	0.1						
		Replace		0.8				80	
		Repair		0.3				80	
0610	AUDIBLE ALARM	Inspect	0.1						
		Replace		0.6				80	
0611	HORN, CAB	Inspect	0.1						
		Replace		0.4				59,80	
0612	BOX ASSEMBLY, BATTERY	Inspect	0.1						
		Test		0.5				59,80	
		Service		0.3				59	A
		Replace		1.0				59,61,80	
		Repair		0.2				65	
0613	CABLE ASSEMBLY, LH/RH CAB AND DOOR MARKER LIGHTS	Inspect	0.1						
		Replace		0.8				80	
		Repair		0.7				65	
0613	CABLE ASSEMBLY, LOWER, CAB MARKER LIGHTS, M1093/M1094	Inspect	0.1						
		Replace		0.6				80,90	
		Repair		0.5				65	
0613	CABLE ASSEMBLY, UPPER, CAB CLEARANCE AND MARKER LIGHTS, M1093/M1094	Inspect	0.1						
		Replace		0.8				80,90	
		Repair		0.5				65	
0613	CABLE ASSEMBLY, STE/ICE-R	Replace		1.0				80	
		Repair		0.5	0.8			65	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
0613	CABLE ASSEMBLY, CAB CLEARANCE AND MARKER LIGHTS	Inspect	0.1						
		Replace		1.2				59,80	
		Repair		0.5	0.8			65	
0613	CABLE ASSEMBLY, WARNING LIGHT	Replace		0.5				50,80,90	
		Repair		0.3	0.5			65	
0613	CABLE ASSEMBLY, WINDSHIELD WASHER PUMP/EMI	Replace		0.5				80	
		Repair		0.3				65	
Deleted									
		Repair		0.5	0.5			65	
0613	CABLE ASSEMBLY, CRANE POWER	Inspect	0.1						
		Replace		1.2				80	
		Repair		0.5	0.5			65	
0613	BOX ASSEMBLY, CRANE REMOTE CONTROL	Test		0.5					
		Repair		0.7				80,90	
0613	CABLE ASSEMBLY, ENGINE CONTROL	Inspect	0.1						
		Replace		2.3				59,80	
		Repair		0.5	0.5			65	
0613	CABLE ASSEMBLY, FRONT INTERVEHICULAR, 12 VDC	Replace		0.8				61,80	
0613	CABLE ASSEMBLY, FRONT LIGHTS	Replace		2.0				59,61,80,90	
		Repair		0.5	0.5			65	
0613	CABLE ASSEMBLY, REAR LIGHTS	Replace		2.8				59,61,80	
		Repair		0.5	0.5			65	
0613	CABLE, M1084/M1086 BOOM DOWN LOCKOUT SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1084/M1086 BOOM DOWN SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1)	(2)	(3)	(4) Maintenance Level					(5)	(6)
			Unit		Direct Support	General Support	Depot	Tools and Equipment	
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D	Ref Code	Remarks Code
0613	CABLE, M1084/M1086 BOOM UP LOCKOUT SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1084/M1086 BOOM UP SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1084/M1086 CONTROL LOCKOUT SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1084/M1086 CRANE POWER	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1084/M1086 HOIST DOWN SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1084/M1086 HOIST UP LOCKOUT SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1084/M1086 HOIST UP SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1084/M1086 LEFT JACK CYLINDER PROXIMITY SENSOR	Replace		1.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1084/M1086 OVERLOAD LOCKOUT	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1084/M1086 REMOTE CONTROL	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1084/M1086 SWING CCW SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1084/M1086 SWING CW SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1084/M1086 SYSTEM SHUTDOWN SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1)	(2)	(3)	(4) Maintenance Level					(5)	(6)
			Unit		Direct Support	General Support	Depot	Tools and Equipment	
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D	Ref Code	Remarks Code
0613	CABLE, M1084/M1086 TELESCOPE IN SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1084/M1086 TELESCOPE OUT LOCKOUT SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1084/M1086 TELESCOPE OUT SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1089 BOOM DOWN LOCKOUT SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1089 BOOM DOWN SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1089 BOOM UP LOCKOUT SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1089 BOOM UP SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE ASSEMBLY, M1089 CONTROL PANEL POWER	Replace		2.0				80	
		Repair		0.5	0.8			65	
0613	CABLE, M1089 CRANE POWER	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1089 HOIST DOWN SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1089 HOIST UP LOCKOUT SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1089 HOIST UP SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1089 HYDRAULIC SYSTEM SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1089 LEFT SIDE REMOTE CONTROL	Replace		2.0				59,80	
		Repair		0.5	0.8			65	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1)	(2)	(3)	(4) Maintenance Level					(5)	(6)
			Unit		Direct Support	General Support	Depot		
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D	Tools and Equipment Ref Code	Remarks Code
0613	CABLE, M1089 OVERLOAD LOCKOUT	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	WIRING HARNESS, M1089 REMOTE CONTROL	Replace		2.0				80	
		Repair		0.5	0.8			65	
0613	CABLE, M1089 RIGHT SIDE REMOTE CONTROL	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1089 SWING CCW SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1089 SWING CW SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1089 TELESCOPE IN SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1089 TELESCOPE OUT LOCKOUT SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1089 TELESCOPE OUT SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	BOX ASSEMBLY, WRECKER REMOTE CONTROL	Repair		1.6				59,80	
0613	CABLE ASSEMBLY, M1090/M1094 DUMP	Replace		0.8				59,61,80	
		Repair		0.5	0.8			65	
0613	CABLE ASSEMBLY, M1090/M1094 DUMP POWER	Replace		1.2				59,61,80	
		Repair		0.5	0.8			65	
0613	CABLE ASSEMBLY, PTO	Replace		1.6				59,61,80	
		Repair		0.5	0.8			65	
0613	CABLE ASSEMBLY, REAR INTERVEHICULAR, 24 VDC	Replace		0.6				61,80	
		Repair		0.5	0.8			65	
0613	CABLE ASSEMBLY, START AND CHARGING	Replace		2.0				59,80	
		Repair		0.5	0.8			65	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1)	(2)	(3)	(4) Maintenance Level					(5)	(6)
			Unit		Direct Support	General Support	Depot		
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D	Tools and Equipment Ref Code	Remarks Code
0613	CABLE ASSEMBLY, WINCH CONTROL VALVE	Replace		1.8				59,61,80	
		Repair		0.5	0.8			65	
0613	CABLE ASSEMBLY, TRANSMISSION AUXILIARY OIL COOLER FAN	Replace		1.8				59,61,80	
		Repair		0.5				65	
0705	VEHICLE INTERFACE MODULE	Replace		0.6				80	
		Repair		0.8				80	
0708	TORQUE CONVERTER	Adjust			0.9			22,61,62,80	
		Remove/ Install			0.8			48,61,62,64, 80	
		Repair			1.3			34,58,61,62, 64,80	
0710	TRANSMISSION	Inspect		0.4				80	
		Service		1.5				59,61,80	
		Replace			7.0			58,61,62,63, 80,81,87	
		Repair		0.4	2.7	1.9		3,22,23, 28,29,31,43, 58,59,61,62, 63,80,81,87	
0710	MODULE, FRONT SUPPORT	Remove/ Install				2.0		58,59,61,62, 63,80	
		Repair				0.7		34,58,59,61, 62,63,80	
0710	MODULE, PLANETARY GEAR (P1)	Remove/ Install				2.0		61,62,73,80	
		Repair				1.5		61,62,73,80	
0710	MODULE, PLANETARY (P2)	Remove/ Install				2.0		3,58,61, 62,63,80	
		Repair				1.9		3,23,58, 61,62,63,73, 80	
0710	PLANETARY CARRIER (P3)	Remove/ Install				2.0		3,58,62, 80	
		Repair				1.9		3,31,58, 62,80	
0710	MODULE, MAIN SHAFT	Remove/ Install				2.0		61,62,80	
		Repair				0.4		61,62,80	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1)	(2)	(3)	(4) Maintenance Level					(5)	(6)
			Unit		Direct Support	General Support	Depot	Tools and Equipment	
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D	Ref Code	Remarks Code
0710	MODULE, CONVERTER HOUSING	Remove/ Install				4.3		3,58,59, 61,62,80	
		Repair				2.0		3,23,29, 58,59,61,6 2,80	
0713	CLUTCH ASSEMBLY, C3/C4/C5, TRANSMISSION	Remove/ Install				2.0		58,59,61,6 2,80	
		Repair				1.0		43,58,59,6 1,62,80	
0713	MODULE, ROTATING CLUTCH	Remove/ Install				2.0		3,58,61, 62,80	
		Repair				2.4		3,23,28, 58,61,62,8 0	
0714	VALVE ASSEMBLY, CONTROL MODULE	Remove/ Install			2.0			58,61,62,6 3,80,81	
		Repair		1.0	2.5			61,63,80,8 1	
0714	BODY ASSEMBLY, MAIN VALVE	Service		1.5				59,61,80	
		Remove/ Install			2.0			58,61,62,6 3,80,81	
		Repair		1.5	2.5			58,61,62,6 3,80,81	
0801	MODULE, TRANSFER CASE	Adjust				1.0			
		Remove/ Install				2.0		25,58,59,6 1,62,63,73, 76,80,81	
		Repair				1.1		27,31,37,5 2,58,59,62, 80	
0802	HOUSING ASSEMBLY, C6 AND C7 CLUTCH	Remove/ Install				2.0		58,61,62,6 3,80	
		Repair				0.8		23,27,30,3 1,32,33,58, 61,62,63,6 4,73,80	
0802	CONTROL VALVE ASSEMBLY	Remove/ Install				2.0		58,61,63,8 0,81	
		Repair				1.0		58,61,63,8 0,81	
0804	PUMP ASSEMBLY, OIL	Replace				1.0		81	
		Repair				0.8		81	
0900	PROPELLER SHAFT	Inspect		0.1					

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1)	(2)	(3)	(4) Maintenance Level					(5)	(6)
			Unit		Direct Support	General Support	Depot		
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D	Tools and Equipment Ref Code	Remarks Code
		Service		0.5				61	
		Repair		0.6				59,61,80	
		Replace		0.5				59,61,80	
1000	AXLE ASSEMBLY, FRONT	Inspect	0.1	0.3	0.7			80	
		Adjust			1.0			59,81	
		Service		0.5				61,80	
		Replace			4.5			58,59,61,62,63,72,80	
		Repair		2.3	2.2	6.0		58,59,61,62,63,80	
1002	CARRIER ASSEMBLY, DIFFERENTIAL	Inspect		0.1	0.1	0.1		80,81	
		Service			0.3			80	
		Replace				4.6		25,58,59,61,62,80,81	
		Repair				2.7		58,59,61,62,80,81	
1004	STEERING KNUCKLE, AXLE	Inspect			0.2				
		Adjust			2.5			81	
		Service			0.3			81	
		Replace			5.1			58,59,61,62,73,80	
1100	AXLE ASSEMBLY, INTERMEDIATE	Inspect	0.1	0.4	0.7				
		Service		0.8				59,61,80	
		Replace			4.5			58,59,61,62,63,80,87	
		Repair			1.6	6.0		25,58,59,61,62,69,80	
1100	AXLE ASSEMBLY, REAR	Inspect	0.1	0.4	0.7				
		Service		0.8				59,61,80	
		Replace			4.5			38,58,59,61,62,80,87	
		Repair			0.9	6.0		25,58,59,61,62,80,87,88	
1102	CARRIER ASSEMBLY, DIFFERENTIAL, INTERMEDIATE AXLE	Inspect		0.1	0.1	1.0		80,81	
		Service			0.3			80	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1)	(2)	(3)	(4) Maintenance Level					(5)	(6)
			Unit		Direct Support	General Support	Depot		
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D	Tools and Equipment Ref Code	Remarks Code
		Replace				4.6		25,58,59,61,62,69,80	
		Repair				2.7		25,58,59,61,62,63,69,75,80	
1102	CARRIER ASSEMBLY, DIFFERENTIAL, REAR AXLE	Inspect		0.1	0.1	1.0		80,81	
		Service			0.3			80	
		Replace				4.6		25,58,59,61,62,80,81,88	
		Repair				2.7		25,39,58,59,61,62,73,75,80	
1202	BRAKE ASSEMBLY, FRONT AXLE	Inspect		0.1	1.0			61,80,81	
		Adjust		0.4				59,61,80	
		Repair		1.5	0.5			59,61,80,85	
1202	BRAKE ASSEMBLY, INTERMEDIATE AND REAR AXLE	Inspect		0.1	1.0			61,80,81	
		Adjust		0.4				59,61,80	
		Repair		1.5	0.5			59,61,80,85	
1208	AIR DRYER, BRAKE SYSTEM	Replace		0.5				59,61,80	
		Repair		1.0				59,61,80	
1209	AIR COMPRESSOR	Adjust		0.6				61,80	
		Replace			1.2			58,62,63,80,81	
1311	WHEEL ASSEMBLY, PNEUMATIC TIRE	Inspect	0.1					59	B
		Replace	1.0	1.2				59,61	
		Repair		2.0				59,61	
1313	TIRE, PNEUMATIC	Replace		2.0				59,61	
1401	STEERING SYSTEM	Inspect		0.2					
		Adjust			1.0			58,62,80	
		Repair		1.0	1.5			56,58,59,61,62,63,80,81	
1407	STEERING GEAR ASSEMBLY	Replace			4.0			58,62,80	
1410	PUMP, POWER STEERING	Replace			1.5			49,58,61,62,80	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1)	(2)	(3)	(4) Maintenance Level					(5)	(6)
			Unit		Direct Support	General Support	Depot	Tools and Equipment	
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D	Ref Code	Remarks Code
1411	HOSES, POWER STEERING	Replace		0.3				59,61,80,90	
1413	HYDRAULIC RESERVOIR, POWER STEERING	Service	0.1	0.5				80	
		Replace		0.8				61,80,90	
1501	FRAME ASSEMBLY	Inspect	0.1	0.3					
		Repair		0.8	14.0			58,59,61,62,63,80,81	
1501	BOOM REST ASSEMBLY, CRANE	Inspect	0.1						
		Replace			2.0			58,59,61,62,80,81,87	
		Repair			0.7			58,59,61,62,80,81,87	
1504	RETAINER, SPARE TIRE	Inspect	0.1	0.1					
		Replace		3.0				59,61,80	
		Repair		0.6				59,61,80	
1506	FIFTH WHEEL ASSEMBLY	Inspect	0.1						
		Service		0.5				21,80	
		Replace			4.0			58,61,62,80,81	
		Repair			2.5			21,58,61,62,66,80,81	
1601	LEAF SPRING ASSEMBLIES	Inspect	0.1	0.2					
		Service		0.3				59	
		Replace			2.7			58,59,61,62,80,81	
1604	SHOCK ABSORBERS	Inspect	0.1	0.3					
		Replace		0.5				59,61,80	
1605	STABILIZER BAR, REAR	Inspect		0.2					
		Replace		2.0				59,61,70,80	
		Repair		1.5				59,80	
1801	CAB BODY, STANDARD	Inspect	0.1						
		Replace			60.0			58,59,62,63,80,81	
		Repair		0.6				59,61,80	
1801	CAB BODY, AIR DROP	Inspect	0.1						
		Replace			60.0			58,59,62,63,80,81	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1)	(2)	(3)	(4) Maintenance Level					(5)	(6)
			Unit		Direct Support	General Support	Depot		
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D	Tools and Equipment Ref Code	Remarks Code
		Repair		0.6				59,61,80	
1801	CAB DOORS, STANDARD	Inspect	0.1						
		Replace			1.0			57,61,80	
		Repair		2.7				51,59,80	
1801	CAB DOORS, AIR DROP	Inspect	0.1						
		Replace			1.0			57,61,80	
		Repair		2.7				51,59,80	
1801	SUPPORT ASSEMBLY, CAB FRONT	Inspect	0.1						
		Repair		1.1				59,61,80	
		Replace			3.0			7,15,59, 61,62,80, 81	
1801	SUPPORT ASSEMBLY, CAB REAR	Inspect	0.1						
		Replace		1.0				59,61,80	
		Repair		0.8				59,80	
1802	WINDSHIELD	Replace			0.6			57,61,80	
1802	FENDER, VEHICULAR, FRONT	Inspect	0.1						
		Replace		2.0				59,61,80	
		Repair		0.5				59,80	
1803	ROOF, CAB, M1093/M1094	Replace		1.0				47,52,59,6 1,80	
1805	STEP ASSEMBLY, CAB	Replace		1.0				59,80	
		Repair		0.7				59,80	
1808	TOOL BOX ASSEMBLY	Inspect	0.1						
		Replace		0.5				49,59,61,8 0	
		Repair		0.5				59,61,80	
1808	STOWAGE BOX, CAB	Replace		0.8				59,80	
		Repair		0.5				59,80	
1810	BODY, CARGO, (W/MHC, LWB AND LWB W/MHC)	Inspect	0.1						
		Replace			4.0			58,59,61,6 2,80	
		Repair		0.5				59,61,80	
1810	DUMP BODY ASSEMBLY	Inspect	0.1						
		Replace			4.0			58,61,62,8 0	
		Repair		0.5	4.0			58,59,61,6 2,80	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1)	(2)	(3)	(4) Maintenance Level					(5)	(6)
			Unit		Direct Support	General Support	Depot	Tools and Equipment	
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D	Ref Code	Remarks Code
1810	DUMP HYDRAULIC CYLINDER	Inspect	0.1						
		Replace			1.0			59,62,80	
		Repair				2.5		59,61,62,80,89	
1810	DUMP TAILGATE ASSEMBLY	Inspect	0.1						
		Replace		1.5				80	
		Repair		0.8				80	
1812	BOX ASSEMBLY, TOOL, M1089	Inspect	0.1						
		Remove/ Install		1.0				59,61,80	
		Repair		0.8				59,61,80	
2001	UNDERLIFT ASSEMBLY, M1089	Inspect	0.1						
		Test		0.5	0.1				
		Service		0.5				61	
		Replace			6.0			58,59,61,62,80,87	
		Repair			1.0			54,58,59,61,62,80,81,86,87	
2001	CROSSBAR ASSEMBLY, M1089	Inspect			0.1				
		Replace			0.5			58,59,61,62,80,81,86	
		Repair			1.0			58,59,61,62,81,86	
2001	LOWER ARM, UNDERLIFT	Inspect			0.1				
		Replace			2.0			58,59,61,62,80,87	
		Repair			0.5			58,59,61,62,80,87	
2001	CYLINDER, TELESCOPIC LIFT	Replace			1.5			59,61,80	
		Repair				1.0		61,62,63,80	
2001	STIFFLEG ASSEMBLY	Inspect			0.1				
		Replace			2.0			59,61,62,80,87	
		Repair			1.6	1.0		58,59,61,62,63,68,80,87	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1)	(2)	(3)	(4) Maintenance Level					(5)	(6)
			Unit		Direct Support	General Support	Depot	Tools and Equipment	
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D	Ref Code	Remarks Code
2001	BOOM FRAME, FOLDING, UNDERLIFT	Inspect			0.1				
		Repair			2.5			61,80	
2001	ARM ASSEMBLY, UPPER, UNDERLIFT	Repair			2.5			58,59,61,62,80	
2001	CYLINDER, UNDERLIFT FOLD	Replace			0.5			59,61,80,87	
		Repair				0.5		59,61,62,63,80	
2001	CYLINDER, UNDERLIFT STINGER	Replace			0.5			59,61,62,80,87	
		Repair				0.5		58,61,62,63,68,80,81	
2001	WINCH, 15K SELF-RECOVERY	Inspect	0.1	4.0					
		Service		0.2				61	
		Replace			1.0			61,62,80	
		Repair			0.9			61,62,80	
2001	MOTOR, HYDRAULIC, SELF-RECOVERY WINCH	Replace			0.5			59,80	
2001	MATERIAL HANDLING CRANE (MHC), M1089	Inspect	0.1	0.5				80	
		Test	0.2		0.3			59	
		Service		0.5				61	
		Replace			6.0			59,61,62,80,87	
		Repair		0.5				9,58,59,61,62,80	
2001	CYLINDER, LIFT, M1089 MHC	Inspect	0.1						
		Test			0.2			61	
		Replace			4.0			58,62,80	
		Repair				2.0		59,61,62,63,80	
2001	CYLINDER, ERECTION, M1089 MHC	Inspect	0.1						
		Test			0.2			61	
		Replace			4.0			58,62,80	
		Repair				2.0		59,61,62,63,80,81	
2001	HOIST ASSEMBLY, M1089 MHC	Inspect	0.1						
		Test			0.2			61	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1)	(2)	(3)	(4) Maintenance Level					(5)	(6)
			Unit		Direct Support	General Support	Depot	Tools and Equipment	
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D	Ref Code	Remarks Code
		Replace			6.0			61,62,80	
		Repair			3.0			59,61,62,80	
2001	HYDRAULIC MOTOR, HOIST, M1089 MHC	Inspect	0.1						
		Test			0.1			59,65	
		Replace			2.0			59,80	
		Repair				4.2		58,59,61,62,63,80	
2001	GEAR SET, M1089 MHC	Inspect		0.2					
		Test			0.2			61	
		Repair			1.7			61,62,80	
2001	BOOM ASSEMBLY, M1089 MHC	Inspect	0.1						
		Test			0.2				
		Replace			8.0			58,62,80	
		Repair			2.0			58,61,62,80	
2001	CYLINDER, TELESCOPIC, BOOM, M1089 MHC	Inspect	0.1						
		Test			0.2			61	
		Replace			6.0			58,61,62,80	
		Repair				2.0		59,61,62,80	
2001	SWING DRIVE ASSEMBLY, M1089 MHC	Inspect	0.1	0.5					
		Test			0.2			61	
		Service		0.3					
		Replace			4.0			59,61,62,80	
		Repair			4.0			59,61,62,80	
2001	MOTOR, ORBIT, HYDRAULIC, M1089 MHC	Inspect	0.1						
		Test			0.2				
		Replace			1.0			59,61,62,80	
		Repair				3.0		59,61,62,63,80,81	
2001	CYLINDER ASSEMBLY, EXTENSION, OUTRIGGER, M1089 MHC	Inspect	0.1						
		Test			0.2			61	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1)	(2)	(3)	(4) Maintenance Level					(5)	(6)
			Unit		Direct Support	General Support	Depot	Tools and Equipment	
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D	Ref Code	Remarks Code
		Replace			3.0			80	
		Repair				5.0		61,62,80	
2001	CYLINDER ASSEMBLY, JACK, M1089 MHC	Inspect	0.1						
		Test			0.2			61	
		Replace			3.0			62,80	
		Repair				5.0		59,61,62,80	
2001	VALVE ASSEMBLY, EIGHT-BANK, M1089 MHC	Inspect	0.1						
		Replace			0.5			58,59,61,80	
		Repair			2.0			58,59,61,80	
2001	WINCH ASSEMBLY, M1089 (30K)	Inspect	0.1						
		Test		0.5	0.2			63	
		Replace			9.0			20,59,61,62,80,81	
		Repair			0.5			59,61,62,63,73,80,81	
2001	MOTOR ASSEMBLY, DRIVE, (30K) WINCH	Replace			0.5			59,61,62,63,73,80,81	
		Repair			8.0			59,61,62,63,73,80,81	
2001	VALVE ASSEMBLY, MAIN, UPPER, M1089	Replace			0.5			61,62,80	
		Repair			0.5			61,62,80	
2001	VALVE ASSEMBLY, MAIN, LOWER, M1089	Replace			0.5			61,62,80	
		Repair			0.5			61,62,80	
2001	VALVE ASSEMBLY, MONO, M1089	Replace			1.5			59,61,62,80,87	
		Repair			1.0			59,61,62,80,87	
2001	MATERIAL HANDLING CRANE (MHC), M1084/M1086	Inspect	0.1						
		Test			0.2			81	
		Service		2.0				61	
		Replace			4.0			58,59,61,62,80	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1)	(2)	(3)	(4) Maintenance Level					(5)	(6)
			Unit		Direct Support	General Support	Depot		
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D	Tools and Equipment Ref Code	Remarks Code
		Repair				0.5		58,59,61,62,63,73,80,81	
2001	CYLINDER, LIFT, M1084/M1086 MHC	Inspect	0.1						
		Test			2.0			65,81	
		Replace			2.0			58,59,62,80	
		Repair				4.0		58,59,62,80	
2001	CYLINDER, ERECTION, M1084/M1086 MHC	Inspect	0.1						
		Test			0.2			65,81	
		Replace			4.0			58,62,80	
		Repair				4.0		59,61,63,80,81	
2001	HOIST ASSEMBLY, M1084/M1086 MHC	Inspect	0.1						
		Test			0.2			65,81	
		Replace			6.0			61,62,80	
		Repair				3.5		59,61,62,80	
2001	MOTOR, HYDRAULIC, HOIST, M1084/M1086 MHC	Inspect	0.1						
		Test			0.1			65,81	
		Replace			2.0			59,80	
		Repair				4.2		58,59,61,62,63,80	
2001	GEAR SET, M1084/M1086 MHC	Inspect		0.2					
		Test			0.2				
		Repair			4.5			61,62,80	
2001	CYLINDER, TELESCOPIC, BOOM, M1084/M1086 MHC	Inspect	0.1						
		Test			0.1			65,81	
		Replace			2.0			58,61,62,80	
		Repair				4.0		59,61,62,80	
2001	SWING DRIVE ASSEMBLY, M1084/M1086 MHC	Inspect	0.1	0.5				61	
		Test			0.1			65,81	
		Service		0.3					

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1)	(2)	(3)	(4) Maintenance Level					(5)	(6)
			Unit		Direct Support	General Support	Depot	Tools and Equipment	
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D	Ref Code	Remarks Code
		Replace			4.0			59,61,62,80	
		Repair			3.5	4.2		59,61,62,80	
2001	MOTOR, ORBIT, HYDRAULIC, M1084/M1086 MHC	Inspect	0.1					61	
		Test			0.1			65,81	
		Replace			2.0			59,61,80	
		Repair				4.2		59,61,63,73,80,81	
2001	VALVE ASSEMBLY, CONTROL, FOUR WAY, M1084/M1086 MHC	Replace			0.8			59,61,62,80	
		Repair			1.1			59,61,62,80	
2001	VALVE ASSEMBLY, CONTROL, THREE WAY, M1084/M1086 MHC	Replace			0.8			59,61,62,80,81	
		Repair			1.1			59,61,62,80,81	
2001	CYLINDER, JACK, M1084/M1086 MHC	Inspect	0.1						
		Test			0.2			81	
		Replace			2.0			62,80	
		Repair				4.0		59,61,62,80	
2004	POWER TAKEOFF ASSEMBLY (PTO)	Inspect	0.1						
		Replace			1.0			58,59,61,62,80	
		Repair			0.8			58,59,61,62,80	
2201	CAB PROTECTOR, M1090/M1094	Inspect	0.1						
		Replace			2.0			58,80	
2202	MOTOR, WIPER, WINDSHIELD	Test		0.5					
		Replace		1.0				80	
2207	HEATER ASSEMBLY, PERSONNEL	Replace		2.0				59,61,80	
		Repair		1.0				59,61,80	
2210	DECALS	Inspect	0.1						
		Replace		1.0				80	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1)	(2)	(3)	(4) Maintenance Level					(5)	(6)
			Unit		Direct Support	General Support	Depot	Tools and Equipment	
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D	Ref Code	Remarks Code
2401	POWER UNIT, AIR/HYDRAULIC	Inspect	0.1						
		Test		0.2					
		Service		1.0					
		Replace		3.0				59,61,80	
		Repair			2.0			59,61,62,71,80,81	
2402	MANIFOLD, HYDRAULIC	Inspect	0.1						
		Test		0.2					
		Replace		1.5				53,59,61,80	
		Repair		1.0				53,59,61,80	
2406	FILTER, HYDRAULIC	Service		0.3				61,80	
		Replace		0.2				61,80	
2407	LATCH, HYDRAULIC, CAB	Inspect	0.1						
		Adjust		0.5				59,61,80	
		Replace		0.5				59,61,80	
2408	RESERVOIR, HYDRAULIC	Replace		1.0				59,61,80	
		Repair		0.5				59,61,80	
2408	TANK ASSEMBLY, HYDRAULIC, M1089	Inspect	0.1						
		Service		2.0				59,61,80	
		Replace		2.0				6,9,59, 61,80	
		Repair		0.5				59,61,80	
3307	ALTERNATOR KIT, 200 AMP	Inspect	0.1	0.2					
		Test		0.5					
		Remove/ Install		2.0				59,61,80	
		Replace		1.0				59,61,80	
		Repair			0.5			58,59,62,63,80	
3307	ALTERNATOR, 200 AMP	Inspect		0.2					
		Test		0.5	1.5			61,65,80	
		Replace		1.0				59,61,80	
		Repair		0.2	0.5			58,59,62,63,65,80	
3307	CRANE (LMHC), MATERIAL HANDLING, LIGHT	Inspect	0.1	0.1					
		Replace		0.5				61,78,80	
		Repair		0.5					
		Test		0.5					

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1)	(2)	(3)	(4) Maintenance Level					(5)	(6)
			Unit		Direct Support	General Support	Depot	Tools and Equipment	
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D	Ref Code	Remarks Code
3307	WEIGHT BLOCK AND WIRE ROPE, LMHC	Inspect	0.1						
		Replace		0.1				61,80	
		Repair		0.5				61,80	
		Test			0.5				
3307	WINCH, LMHC	Inspect	0.1						
		Replace		0.5				61,80	
		Repair		1.0				61,80	
		Test		0.5					
3307	MAST/SWING ASSEMBLY, LMHC	Inspect	0.1						
		Repair		1.0				61,80	
		Test		0.5					
3307	CONTROL BOX, LMHC	Inspect	0.1						
		Replace		0.1					
		Repair		0.5				78,80	
		Test	0.1	0.5					
3307	TROOPSEAT KIT	Remove/ Install	1.0						
		Inspect	0.1						
		Replace		1.0					
		Repair		0.5				80	
3307	COVER KIT, CARGO SOFT TOP	Remove/ Install	1.5						
		Inspect	0.1						
		Replace		2.0					
		Repair		0.5					
3307	WARNING LIGHT ASSEMBLY, AMBER	Inspect	0.1						
		Repair		0.4				80	
		Test		0.2					
3401	MACHINE GUN RING KIT	Inspect	0.1						
		Remove/ Install			4.0			58,59,62, 80,81,87	
		Repair		1.1				10,59,80	
3402	MOUNT, SMALL ARMS	Inspect	0.1						
		Replace		0.3				80	
3901	WARNING LIGHT ASSEMBLY, AMBER, M1089	Repair		0.8				59,61,80	
3903	MAST, WARNING LIGHT, AMBER, M1089	Replace		0.6				59,61,80	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1)	(2)	(3)	(4) Maintenance Level					(5)	(6)
			Unit		Direct Support	General Support	Depot	Tools and Equipment	
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D	Ref Code	Remarks Code
3909	CABLE ASSEMBLY, WARNING LIGHT	Inspect	0.1						
		Replace		0.5				80	
4316	AIR HOSE, CTIS	Inspect	0.1						
		Replace		0.4				61,80	
4317	VALVE, INVERSION	Replace		0.5				61,80	
4318	CYLINDER, PNEUMATIC, TAILGATE, M1090/M1094	Replace		0.4				61,80	
4321	AIR DRYER	Inspect	0.1	0.1					
		Replace		1.0				59,61,80	
		Repair		0.6				59,61,80	
4702	GAUGE, AIR FILTER RESTRICTION	Replace		0.5				80	

Section III. TOOLS AND TEST EQUIPMENT FOR MTV VEHICLES

Tool or Test Equipment REF Code	Maintenance Level	Nomenclature	National Stock Number	Tool Number
1	O,F	ADAPTER, RADIATOR	4910-01-170-4928	J29003-A
2	O	ADAPTER, SOCKET WRENCH	5120-00-240-8702	11655788-2
2.1	O	BASE, MAGNETIC		P5646
3	H	BUSHING DRIVER SET	5120-01-391-3541	J35922
4	O	CRIMPING TOOL, TERMINAL, HAND	5120-00-165-3912	M22520/1-01
5	O	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-00-078-3809	10935497
6	O	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-00-293-1010	5120-293-1282
7	F	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-074-7557	FCOM19
8	O	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-236-9996	FCOM15
9	O	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-335-1089	FCO28
10	O	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-335-1091	FCO32
11	O	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-335-1119	SCO34
12	O	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-335-1122	SCO40
12.1	O	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-335-1126	SCO48

Section III. TOOLS AND TEST EQUIPMENT FOR MTV VEHICLES

Tool or Test Equipment REF Code	Maintenance Level	Nomenclature	National Stock Number	Tool Number
13	O	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-335-1153	FCO20
14	O	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-335-1156	FCO26
15	F	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-348-9473	AN8508-19A
16	O	CUTTER, BOLT	5110-00-224-7057	GGG-C-740
16.1	O	DISPENSER, SEALANT	5120-00-061-1283	45RCT
16.2	F	DRILL SET, STOPCOLLAR	5133-01-383-7665	1955
17	H	DRIVER KIT, BEARING	4910-01-032-3128	8S0602
18		DELETED		
19	O,F	GAGE, BELT TENSION	6635-01-143-2237	GA-424
20	O,F	GAGE, PRESSURE, 0-150 psi	6685-00-474-5721	111T1D05A01
21	O	GAGE, PROFILE	5220-01-357-4913	TF-0237
22	F,H	GAGE, PROFILE	5220-01-388-1460	J-38548-1
23	H	HANDLE, DRIVE	5120-00-377-2259	J8092
24	O	HEATER, GUN TYPE, ELECTRIC	4940-00-561-1002	500A
25	F,H	HOLDING BAR, PINION	5120-01-166-0573	J3453
25.1	O	INDICATOR, DIAL		P36491
26	O	INSERTER AND REMOVER, ELECTRICAL CONTACT	5120-00-915-4588	MS3447-16
27	H	INSERTER AND REMOVER, SPRING	5120-01-388-3660	J38573
28	H	INSERTER AND REMOVER, SPRING	5120-01-388-4436	J35923
29	H	INSERTER, BEARING AND BUSHING	5120-01-388-7841	J-38565
30	H	INSERTER, BEARING AND BUSHING	5120-01-389-0658	J35921-1
31	H	INSERTER, BEARING AND BUSHING	5120-01-390-1104	J 38569
32	H	INSERTER, BEARING AND BUSHING	5120-01-390-1105	J 38568-3
33	H	INSERTER, BEARING AND BUSHING	5120-01-391-5133	J 38579
34	F,H	INSERTER, BEARING AND BUSHING	5120-01-414-7398	J38566
35	F	INSERTER, SEAL	5120-01-362-2026	1U7430
36	F	INSERTER, SEAL	5120-01-362-2027	1U7598
37	F	INSTALLER, SEAL	N/A	J38574
37.1	F	JACK, DOLLY TYPE HYDRAULIC	4910-01-396-5044	TTJ3
38	F	JACK, LEVELING SUPPORT, VEHICLE	2590-00-231-7418	10876244
38.1	O	KEY, SOCKET HEAD SCREW	5120-01-355-1670	AWML2.5
38.2	F	NOSE ASSEMBLY		99-3307
38.3	O	PLIERS, HOG RING STAPLE	5120-01-413-8837	0012
38.4	F	LIFTING SADDLE ASSEMBLY		TTJ-ZIFA
39	H	PULLER KIT, UNIVERSAL	5180-00-089-3660	A57QB
40	F	PULLER KIT, UNIVERSAL	5180-01-124-1903	1P3075
41	O	REMOVER, ELECTRICAL CONTACT	5120-00-148-9844	MS3448-001B
42	F	RIVETER, BLIND, HAND	5120-01-289-4310	HP-2
42.1	F	RIVETER, BLIND, PNEUMATIC	5130-01-232-4042	245
43	H	RIVETER, YOKE, HAND	5120-01-415-3558	J-39354

Section III. TOOLS AND TEST EQUIPMENT FOR MTV VEHICLES (CONT)

Tool or Test Equipment REF Code	Maintenance Level	Nomenclature	National Stock Number	Tool Number
44	F	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-00-601-6934	LAW120A
45	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-053-4158	FAM5A
46	O,F,H	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-055-1308	ANSIB18.3.2M
47	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-079-8032	SAM8A
48	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-160-8862	S 6 HBS
49	O,F	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3462	SA10A
49.1	O,F	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3483	FA5LE
50	O,F	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3497	TMP12A
51	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3519	F23D
52	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3526	FP24
53	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3527	FP32A
54	F,H	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3536	FTX40A
55	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3574	GFA8A
56	O	SEPARATOR, BALL JOINT	5120-01-255-8238	2287
57	F	SETTING TOOL, WINDSHIELD	5120-01-316-4995	CRL216
58	O,F	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-348-7696	SC4910-95CLA02
59	O,F,H	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-754-0650	SC4910-95CLA72
60	O	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-754-0653	SC4910-95CLA73
61	O,F,H	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-754-0654	SC4910-95CLA74
62	F,H	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-754-0705	SC4910-95CLA31
63	F,H	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-754-0706	SC4910-95CLA62
64	O,F,H	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-754-0707	SC4910-95CLA63
65	O,F	SHOP EQUIPMENT, FUEL AND ELECTRICAL	4910-00-754-0714	SC4910-95CLA01
66	F	SLIDER, SPRING COMPRESSOR	4910-01-165-6015	TF-TUN-J500
67	F	SLING, MULTIPLE LEG	3940-00-777-5744	A170
68	H	SOCKET SET, SOCKET WRENCH	5120-01-195-0640	208FA

Section III. TOOLS AND TEST EQUIPMENT FOR MTV VEHICLES

Tool or Test Equipment REF Code	Maintenance Level	Nomenclature	National Stock Number	Tool Number
69	F,H	SOCKET, SOCKET WRENCH	5120-01-068-5643	5555M
70	O	SOCKET, SOCKET WRENCH	5120-01-161-5907	GLDH382
71	F	SOCKET, SOCKET WRENCH	5120-01-335-0784	TW321
72	O	SOCKET, SOCKET WRENCH	5120-01-144-5324	ANS 1913A
73	F	SOLDERING AND BRAZING OUTFIT, RESISTANCE HEATING	3439-00-460-7198	SC4940-95-CLB20
74	O	SOLDERING IRON, ELECTRIC	3439-01-036-3308	3112-S3-40W
75	H	STAND, DIFFERENTIAL CARRIER REPAIR	4910-01-085-7729	J3409-D
76	H	STAND, MAINTENANCE, AUTOMOTIVE ENGINE	4910-00-808-3372	J29109
77	F	TOOL, DISTORTER	5120-01-119-1748	5P-7312
78	O,F	TOOL KIT, AUTO FUEL AND ELECTRICAL SYSTEM REPAIR	5180-00-754-0655	SC4910-95CLA50
79	F	TOOL KIT, BODY AND FENDER	5180-00-754-0643	SC5180-90-N34
80	O,F,H	TOOL KIT, GENERAL MECHANIC'S	5180-00-177-7033	SC5180-90-CL-N26
81	F,H	TOOL KIT, GENERAL MECHANIC'S	5180-00-699-5273	SC5180-90-CL-N05
82	F	TOOL KIT, INTERNAL COMBUSTION ENGINE	5180-01-356-8155	1U6680
83	H	TOOL KIT, DIESEL INJECTOR	5180-01-466-3966	143-2099
84	F	TOOL OUTFIT, HYDRAULIC	4940-01-036-5784	SC4940-95-CL-B07
85	O	TOOL, SPRING REMOVAL	5120-01-360-1918	TV940010
86	F	WIRE TWISTER, PLIER	5120-00-542-4171	GGG-W-340
87	F	WRENCH SET, CROWFOOT, RATCHETING	5120-00-293-0013	GGG-W-646
88	F	WRENCH SET, SOCKET	5120-00-148-3706	ANSI-B107.5
89	H	WRENCH SET, SPANNER	5120-00-215-1882	46D7578
90	O	WRENCH, TORQUE, 0-75 LB-IN.	5120-01-112-9532	TQSC6A

Section IV. REMARKS FOR THE MTV VEHICLE

Remarks Code	Remarks
A	Battery service will be in accordance with TM 9-6140-200-14.
B	Repair of tires will be in accordance with TM 9-2610-200-14.

APPENDIX C
TOOLS IDENTIFICATION LIST

Section I. INTRODUCTION

C-1. INTRODUCTION

This appendix lists common tools, supplements, and special tools/fixtures that are suggested for maintenance tasks performed at the Unit Maintenance level.

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., "Bar, Pry (Item 1, Appendix C)."

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.

APPENDIX C
Section II. TOOLS IDENTIFICATION LIST

(1) ITEM NUMBER	(2) ITEM NAME	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) REFERENCE
1	ADAPTER, SOCKET WRENCH	5120-00-227-8088	A-A-2172	SC 4910-95-CL-A74
2	ADJUSTING TOOL, BRAKE SHOE	5120-01-154-3029	J34061	SC 4910-95-CL-A74
3	APRON, RUBBER	8145-00-082-6108	MIL-A-41829	SC 4910-95-CL-A74
4	CAPS, VISE JAW	5120-00-221-1506	GGG-C-137	SC 4910-95-CL-A74
5	DISPENSING PUMP, HAND DRIVEN	4930-00-263-9886	43D15069	SC 4910-95-CL-A74
6	DRILL SET, TWIST	5130-00-293-0983	58	SC 4910-95-CL-A74
7	DRILL, PORTABLE, ELECTRIC	5130-00-293-1849	W-D-661	SC 4910-95-CL-A74
8	DRILL, TWIST	5133-01-120-3519		SC 4910-95-CL-A72

Section II. TOOLS IDENTIFICATION LIST (CONT)

(1) ITEM NUMBER	(2) ITEM NAME	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) REFERENCE
9	FISHING TOOL, PNEUMATIC TIRE VALVE	5120-00-516-4220	991	SC 4910-95-CL-A74
10	GAGE, DEPTH, MICROMETER	5210-00-619-4045	445BZ-6RL	CTA 50-909
11	GAGE, TIRE PRESSURE	4910-01-117-2994	955	SC 4910-95-CL-A72
12	GAGE, WHEEL ALIGNMENT	5210-01-223-3701	WA361	SC 4910-95-CL-A72
13	GLOVES, RUBBER	8415-00-641-4601	ZZ-G-381	SC 4910-95-CL-A74
14	GLOVES, WELDER'S	8415-00-268-7859	A-A-50022	SC 4910-95-CL-A72
15	GOGGLES, INDUSTRIAL	4240-00-052-3776	A-A-1110	SC 4910-95-CL-A74
16	GUN, LUBRICATING	4930-00-253-2478	1142	SC 4910-95-CL-A74
17	HAMMER, HAND	5120-00-224-4130	A-A-1292	SC 4910-95-CL-A74
18	HAMMER, HAND	5120-01-065-9037	57-533	SC 4910-95-CL-A72
19	HOSE ASSEMBLY, NONMETALLIC	4720-00-356-8557	ZZ-H-461	SC 4910-95-CL-A74
20	IRON, TIRE	5120-00-765-8536	T48A	SC 4910-95-CL-A74
21	JACK, HYDRAULIC, HAND	5120-00-224-7330	D120	SC 4910-95-CL-A74
22	MULTIMETER, DIGITAL	6625-01-139-2512	T00377	SC 4910-95-CL-A74
23	MULTIPLIER, TORQUE WRENCH	5120-00-574-9318	292	SC 4910-95-CL-A72
24	PAN, DRAIN	4910-00-387-9592	450	SC 4910-95-CL-A74
25	PAN, WASH	4940-00-617-9859	5582281	SC 4910-95-CL-A72
26	PRESSURE TESTER, RADIATOR	4910-01-170-4929	J24460-01	SC 4910-95-CL-A74
27	PULLER KIT, MECHANICAL	5120-00-313-9496	1178	SC 4910-95-CL-A74
28	PULLER, BATTERY TERMINAL	5120-00-944-4268	21	SC 4910-95-CL-A74
29	RESPIRATOR, AIR FILTER	4240-00-022-2524	GGG-M-125/6	SC 4910-95-CL-A72
30	SCALE, WEIGHING	6670-00-254-4634	AAA-S-133	SC 4910-95-CL-A74
31	SLING, CARGO	1670-00-823-5043	63J4261-13	CTA 50-970
32	SLING, ENDLESS	3940-00-675-5003	PD101-96	CTA 50-970
33	SOCKET SET, IMPACT	5120-01-117-0466	4151MMY	SC 4910-95-CL-A74
34	SOCKET SET, SOCKET WRENCH	5120-01-073-2821	217FMY	SC 4910-95-CL-A74

Section II. TOOLS IDENTIFICATION LIST (CONT)

(1) ITEM NUMBER	(2) ITEM NAME	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) REFERENCE
35	SOCKET SET, SOCKET WRENCH	5120-01-115-1149	315SIMMY	SC 4910-95-CL-A74
36	SOCKET SET, SOCKET WRENCH	5120-01-117-3876	221FSMY	SC 4910-95-CL-A72
37	SOCKET, SOCKET WRENCH	5120-00-181-6813	5530	SC 4910-95-CL-A74
38	SOCKET, SOCKET WRENCH	5120-00-232-5681	1242	SC 4910-95-CL-A74
39	SOCKET, SOCKET WRENCH	5120-00-243-7351	5316	SC 4910-95-CL-A74
40	SOCKET, SOCKET WRENCH	5120-01-112-0581	SIMM190	SC 4910-95-CL-A74
41	STE/ICE-R	4910-01-222-6589	12259266	SC 4910-95-CL-A74
41.1	TEST KIT, RADIATOR	4910-00-728-8227		SC 4910-95-CL-A74
41.2	TAP AND DIE SET	5136-01-119-0005	TDM99117	SC 4910-95-CL-A72
42.3	TAP, THREAD, CUTTING	5136-00-729-5692	B94.9 ½-13 UNCHSGH3	SC 4910-95-CL-A72
42	TESTER, ANTIFREEZE AND BATTERY	6630-00-105-1418	10425	SC 4910-95-CL-A74
43	TOOL KIT, AUTO FUEL	5180-00-754-0655		SC 5180-95-CL-A50
44	TOOL KIT, BLIND RIVET	5180-01-201-4978	D-100-MIL-1	SC 4910-95-CL-A74
45	TOOL KIT, ELECTRICAL	5180-00-876-9336	7550526	SC 4910-95-CL-A72
46	TOOL KIT, GENERAL MECHANIC'S	5180-00-177-7033		SC 5180-90-N26
47	TRESTLE, MOTOR VEHICLE MAINTENANCE	4910-00-251-8013	306	SC 4910-95-CL-A74
48	VISE, MACHINIST	5120-00-293-1439	504M2	SC 4910-95-CL-A74
49	WRENCH SET, SOCKET	5120-00-081-2305	GGG-W-641	SC 4910-95-CL-A74
50	WRENCH SET, SOCKET	5120-00-204-1999	GGG-W-641	SC 4910-95-CL-A74
51	WRENCH SET, SOCKET	5120-00-322-6231	51200017510	SC 4910-95-CL-A74
52	WRENCH, ADJUSTABLE	5120-00-264-3793	2117080	SC 4910-95-CL-A74
53	WRENCH, ADJUSTABLE, AUTOMOTIVE	5120-00-449-8083	1B7536	SC 4910-95-CL-A74
54	WRENCH, BOX AND OPEN END	5120-00-277-8833	1244	SC 4910-95-CL-A74
55	WRENCH, BOX AND OPEN END	5120-00-277-8834	GGG-W-636	SC 4910-95-CL-A74
56	WRENCH, PIPE	5120-00-277-1485		SC 4910-95-CL-A74

Section II. TOOLS IDENTIFICATION LIST (CONT)

(1) ITEM NUMBER	(2) ITEM NAME	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) REFERENCE
57	WRENCH, STRAP, ADJUSTABLE	5120-00-020-2947	A91C	SC 4910-95-CL-A74
58	WRENCH, TORQUE, 0-175 lb-ft	5120-00-640-6364	1753LDF	SC 4910-95-CL-A74
59	WRENCH, TORQUE, 0-200 lb-in.	5120-00-853-4538	F2001	SC 4910-95-CL-A72
59.1	WRENCH, TORQUE, 0-300 lb-in.	5120-00-776-1841	2163993	SC 4910-95-CL-A74
60	WRENCH, TORQUE, 0-600 lb-ft	5120-00-221-7983	SW130-301	SC 4910-95-CL-A72

APPENDIX D
EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

D-1. SCOPE

This appendix lists expendable and durable items that you will need to operate and maintain the MTV vehicle. 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.

D-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., "Oil, Lubricating (Item 25, 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	O	4730-00-248-9340	Adapter, Pipe to Tube (81343) 4-4 010103B	ea
1.1	O	4730-01-453-9651	Adapter, Straight, Pipe to Boss (19207) 12421890-001	ea
1.2	O	4730-01-457-4025	Adapter, Straight, Pipe to Tube (96906) MS51503B4-4	ea
1.3	O	4730-00-760-3525	Adapter, Straight, Tube to Boss (81361) C116-3-71	ea
2	O	8040-00-273-8717	Adhesive (81348) MMM-A-121	pt
3	O	8040-00-152-0063	Adhesive (81348) MMM-A-1617 TY3	bt
4	O	8040-01-250-3969	Adhesive (05972) 242	ea
5	O	8040-00-117-8510	Adhesive (71984) 3145 RTV Clear	tu
6	O	8040-00-776-9602	Adhesive (73168) 80055-31	kt
7	O	8040-00-522-3429	Adhesive (81349) (MIL-A-46106)	oz

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
8	O	8040-00-118-2695	Adhesive (72799) RTV162	kt
9	O	8040-01-331-7473	Adhesive (81349) (MIL-A-46106 GP3TY1)	tu
10	O	8040-01-331-7470	Adhesive (81349) MIL-A-46106 5 oz tube	oz
10.1	O	8040-01-446-7842	Adhesive (01139) RTV123	ca
10.2	O	8040-00-728-3088	Adhesive (78500) 1199-T-3842 6 oz	kt
11	C	6850-00-174-1806	Antifreeze, Arctic Type (81349) (MIL-A-11755) 55 gl drum	dr
12	C		Antifreeze, Multi-Engine Type (58536) (A-A-52624A)	dr
		6850-01-441-3218	Type I (Green) – 1 gal	gal
		6850-01-441-3221	Type I (Green) - 5 gal	co
		6850-01-441-3257	Type II (Purple) - 5 gal	co
13	O	8030-00-597-5367	Antiseize Compound (81349) (MIL-A-907)	lb
13.1	O	5340-01-454-4336	Bracket, Angle (0FW39) 12421859-001	ea
14	O	5340-00-450-5718	Cap and Plug Set (19207) 10935405	ea
14.1	O	5340-01-423-0972	Clamp, Loop (18076) S630H-20	ea
14.2	O	5340-01-377-6171	Clamp, Loop (18076) 5630H-24	ea
15	O	6850-00-926-2275	Cleaning Compound, Windshield (81349) O-C-1901 16 oz bottle	bt
16	O	7920-00-044-9281	Cloth, Cleaning (81349) (MIL-C-85043)	bx
17	O		Corrosion Preventive Compound (81349) (MIL-C-16173)	
		8030-00-062-6950	Grade 1 - 1 qt can	qt
		8030-01-149-1731	Grade 2 - 1 qt can	qt
		8030-00-837-6557	Grade 3 - 1 pt can	pt
		8030-00-903-0931	Grade 4 - 1 pt can	pt
18	O	8030-00-033-4291	Corrosion Preventive Compound (81349) (MIL-C-82594) 8 oz can	bt
18.1	O	2540-01-460-8048	Cover, Seat, Vehicular (27797) WM1058	ea
18.2	O	2540-01-463-8394	Cover, Seat, Vehicular (0FW39) WM1059	ea
19	C	9150-00-024-9621	Damping Fluid (81348) VV-D-1078	pt
20	O	7520-01-209-1152	Dispenser, Pressure Sensitive Adhesive Tape (75037) STD-0-9	ea
20.1	O	4730-01-454-1233	Elbow, Pipe to Boss (19207) 12421891-001	ea
20.2	O	4730-00-863-9098	Elbow, Pipe to Tube (30780) 4VBTXB	ea
21	O	5330-01-325-6993	Gasket Forming Compound (05972) 515	ea
21.1	O		Gasket Maker, RTV Silicone (05972) 5699	ea

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
22	O		Grease, Automotive and Artillery (GAA) (81349) (MIL-G-10924)	
		9150-01-197-7688	2-1/4 oz tube	tu
		9150-01-197-7690	1.75 lb can	cn
		9150-01-197-7689	6.5 lb can	cn
		9150-01-197-7692	35 lb can	cn
23	O	9150-00-180-6382	Grease, General Purpose (81349) MIL-T-24139 6.5 lb can	lb
24	O	9150-00-935-4018	Grease, Molybenum Disulfide (81349) (MIL-G-21164)	ca
24.1	O	4720-01-469-9208	Hose Assembly, Nonmetallic (0FW39) 12418004-002	ea
24.2	O		Hose Assembly (0FW39) 12421278-003	ea
24.3	O		Hose Assembly (0FW39) 12421858-002	ea
24.4	O		Hose Assembly (0FW39) 12421858-003	ea
24.5	O		Hose Assembly (0FW39) 12421858-004	ea
24.6	O		Hose Assembly (0FW39) 12421858-005	ea
24.7	O	4720-01-384-0995	Hose Assembly, Nonmetallic (19207) 12421858-006	ea
24.8	O		Hose Assembly (0FW39) 12421927-001	ea
24.9	O		Hose Assembly (0FW39) 12421927-002	ea
24.10	O		Hose Assembly (0FW39) 12421927-003	ea
24.11	O	4720-01-469-9266	Hose Assembly, Nonmetallic (0FW39) 12421927-004	ea
24.12	O		Hose Assembly (0FW39) 12421991	ea
24.13	O	4720-00-988-3842	Hose Assembly, Nonmetallic (50599) R25679-1	ea
25	C		Hydraulic Fluid A (81349) (MIL-H-5606)	
		9150-00-252-6383	1 qt can	cn
		9150-00-223-4134	1 gl can	cn
26	O	7510-00-145-0559	Ink, Marking Stencil (81349) (MIL-I-43553)	oz
27	O	7510-01-386-0787	Inking Pad, Rubber Stamp (88001) 0603A	ea
28	O	5970-01-100-4464	Insulating Compound, Electrical (08800) RTV-102WHITE	tu
28.1	O	5970-01-378-3018	Insulation Sleeving, Electrical (06090) ATUM-1/4-0-4FT	lg
29	O	5970-00-838-5951	Insulation Sleeving, Electrical (06090) CRN3-16BLACK	ft
29.1	O	5970-01-161-6796	Insulation Sleeving, Electrical (06090) M23053/4-302-0	ft
29.2	O	5970-00-767-0524	Insulation Sleeving, Electrical (81349) (MIL-1-23053/5 4 in.	ea

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
30	O	1650-00-166-4834	Lockwire (90166) 68A32	ea
31	O	9150-01-360-1905	Lubricant, Solid Film (81349) (MIL-L-46147) 16 oz can	cn
31.1	O		Modification Kit, Junction Box 6-576-100041 (12361)	ea
32	O	4730-00-019-0608	Nipple, Pipe (81996) A2303-12-52PC102	ea
33	O	4730-00-825-7304	Nipple, Tube (96906) MS51501B4	ea
34	O	5310-00-059-4265	Nut, Plain, Hex (89346) 98881R1	ea
34.1	C		Oil, Commercial Burner Fuel, Grade FO-1 (ASTM D396)	
34.2	C		Oil, Commercial Burner Fuel, Grade FO-2 (ASTM D396)	
35	C		Oil, Fuel, Diesel, DF-A Arctic (81348) (VV-F-800)	
		9140-00-286-5282	5 gl can	cn
		9140-00-286-5283	Bulk	gl
		9140-00-286-5284	55 gl drum, 16 gauge	dr
		9140-00-286-5285	55 gl drum, 18 gauge	dr
36	C		Oil, Fuel, Diesel, DF-1, Winter (81348) (VV-F-800)	
		9140-00-286-5286	Bulk	gl
		9140-00-286-5287	5 gl can	cn
		9140-00-286-5288	55 gl drum, 16 gauge	dr
		9140-00-286-5289	55 gl drum, 18 gauge	dr
37	C		Oil, Fuel, Diesel, DF-2, Regular (81348) (VV-F-800)	
		9140-00-286-5294	Bulk	gl
		9140-00-286-5295	Can	cn
		9140-00-286-5296	55 gl drum, 16 gauge	dr
		9140-00-286-5297	55 gl drum, 18 gauge	dr
38	C		Oil, Lubricating, Arctic (81349) (MIL-L-46167)	
		9150-00-402-2372	5 gl can	cn
		9150-00-491-7197	55 gl drum	dr
39	C		Oil, Lubricating, Gear, GO 75W (81349) (MIL-L-2105)	
		9150-01-035-5390	1 qt can	cn
		9150-01-035-5391	5 gl can	cn
40	C		Oil, Lubricating, Gear, 80W-90 (81349) (MIL-L-2105)	
		9150-01-035-5392	1 qt can	qt
		9150-01-035-5393	5 gl can	cn
		9150-01-035-5394	55 gl drum, 16 gauge	dr

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
41	O		Oil, Lubricating, Gear, 85W-140 (81349) (MIL-L-2105)	
		9150-01-048-4591	1 qt can	qt
		9150-01-035-5395	5 gl can	cn
		9150-01-035-5396	55 gl drum	dr
42	C		Oil, Lubricating, OE/HDO 10 (81349) (MIL-L-2104)	
		9150-00-183-7807	Bulk	gl
		9150-00-186-6668	5 gl can	cn
		9150-00-191-2772	55 gl drum	dr
43	C	9150-00-189-6727	Oil, Lubricating, OE/HDO 10W (81349) (MIL-L-2104) 1 qt can	cn
44	C		Oil, Lubricating, OE/HDO 15W-40 (81349) (MIL-L-2104)	
		9150-01-152-4117	1 qt can	cn
		9150-01-152-4118	5 gl can	cn
		9150-01-152-4119	55 gl drum	dr
45	C		Oil, Lubricating, OE/HDO 30 (SAE 30) (81349) (MIL-L-2104)	
		9150-00-183-7808	Bulk	gl
		9150-00-186-6681	1 qt can	cn
		9150-00-188-9858	5 gl can	cn
		9150-00-189-6729	55 gl drum, 18 gauge	dr
46	C		Oil, Lubricating, OE/HDO 40 (81349) (MIL-L-2104)	
		9150-00-405-2987	Bulk	gl
		9150-00-189-6730	1 qt can	cn
		9150-00-188-9862	5 gl can	cn
47	O	5350-00-067-7639	Paper, Abrasive (28124) 02347 pg contains 100 sheets	pg
48	O	8010-01-146-2650	Polyurethane Coating (81349) (MIL-C-46168)	kt
49	O	8030-00-181-8372	Primer, Sealing Compound (05972) 747-56	cn
50	C	7920-00-205-1711	Rag, Wiping (64067) 7920-00-205-1711 50 lb bale	be
51		DELETED		
52	O	4020-00-106-9342	Rope, Nylon (81349) (MIL-R-24050)	ro
53	O	7520-00-634-2442	Rubber Stamp Set, Fixed Type (02663) W-5-3/8-AZ SET	ea
53.1	O	5305-01-299-4602	Screw, Cap, Hex Hd (64678) 000933 006058	ea
53.2	O	5305-01-454-5938	Screw, Cap, Hex Hd (19207) 12419954-093	ea
53.3	O	5305-00-021-3740	Screw, Cap, Hex Hd (97942) 645A560H43	ea

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
54	O	5305-01-296-0019	Screw, Cap, Socket Head (06888) SHCM75275 50 ct box	bx
54.1	O	8030-01-157-0988	Sealing Compound (83574) PR-1422 A-1/2 6 oz	ca
54.2	O	8030-01-371-8405	Sealing Compound (83574) PR-1422 B-1/2 6 oz	ca
55	O	8030-00-111-2762	Sealing Compound (05972) 290-31	bt
55.1	O	8030-01-255-4144	Sealant (19207) 12297953	tb
55.2	O	8030-00-956-2397	Sealing Compound 104	ea
55.3	O	8030-00-728-9665	Sealant (62377) 80017	pt
56	O	8030-00-133-3164	Sealing Compound (05972) 571-31	bt
57	O	8030-00-148-9833	Sealing Compound (05972) 271-21	bx
58	O	8030-00-204-9149	Sealing Compound (05972) 592-41	tu
59	O	8030-00-656-1426	Sealing Compound (81349) (MIL-S-45180)	pt
60	O	8030-01-025-1692	Sealing Compound (05972) 242-41 (MIL-S-46163)	bt
61	O	8030-01-088-8140	Sealing Compound (52571) 9001512-0011	bt
62	O	8030-01-155-3238	Sealing Compound (11083) 6V6640	ml
63	C	7930-00-634-3935	Soap, Laundry (81348) P-S-1792	lb
64	O	3439-00-006-7764	Solder, Tin Alloy (81348) SN63WRAP3 1 lb spool	sl
65	C		Solvent, Dry Cleaning SD (P-D-680)	
		6850-00-281-1985	1 gl can	cn
		6850-00-664-5685	1 qt can	cn
65.1	O		Strap, Tiedown, Electrical Components (06383) PLP2S	ea
65.2	O	9320-01-244-0046	Tape, Adhesive, Rubber (18876) MIS-41157-08 180 ft	ro
66	O	8030-00-889-3534	Tape, Antiseizing (81349) (MIL-T-27730)	ea
67	O	5640-00-103-2254	Tape, Duct (39428) 1791K70	ea
68	O	5970-00-644-3167	Tape, Insulation, Electrical (80063) TL83	ro
68.1	O	4730-00-138-8050	Tee, Pipe (81343) 8-8-8 140424C	ea
69	O	5975-01-379-4997	Ties, Cable, Plastic (06383) PLT 35-C-O	hd
69.1	C		Turbine Fuel, Aviation, Kerosene Type (MIL-T-83133), Grade JP-8	
69.2	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

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
69.3	C		Turbine Fuel, (MIL-F-5624), Grade JP-4 (NATO Code No. F40)	
		9130-00-273-2380	Drum, 16 gage	dr
69.4	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
70	O	8010-00-180-6343	Varnish, Oil (23667) 515320	pt
71	O		Wire, Electrical (80009) 175-0825-00	
		6145-01-148-2263	50 ft	ft
72	O		Wire, Nonelectrical (96906) MS20995C47	
		9505-00-555-8648	5 lb spool	sl

APPENDIX E
ILLUSTRATED LIST OF MANUFACTURED ITEMS

Section I. INTRODUCTION

E-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

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Cab Support Tool		E-4
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M1089 30K Winch Test Adapter		E-7
M1089 Solenoid Test Adapter		E-8
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12414690-002	Pneumatic Tube	E-12
12414690-003	Pneumatic Tube	E-12
12414690-004	Pneumatic Tube	E-12
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12414690-006	Pneumatic Tube	E-12
12414690-007	Pneumatic Tube	E-12
12414690-008	Pneumatic Tube	E-12
12414690-009	Pneumatic Tube	E-12
12414690-010	Pneumatic Tube	E-12
12414690-101	Pneumatic Tube	E-12
12414690-102	Pneumatic Tube	E-12
12414690-103	Pneumatic Tube	E-12
12414690-104	Pneumatic Tube	E-12
12414690-105	Pneumatic Tube	E-12
12414690-106	Pneumatic Tube	E-12
12414690-107	Pneumatic Tube	E-12
12414690-108	Pneumatic Tube	E-12
12414690-109	Pneumatic Tube	E-12
12414690-112	Pneumatic Tube	E-12
12414690-113	Pneumatic Tube	E-12
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12414690-120	Pneumatic Tube	E-12
12414690-125	Pneumatic Tube	E-12
12414690-128	Pneumatic Tube	E-12
12414690-129	Pneumatic Tube	E-12
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Section II. MANUFACTURED ITEMS INDEX (CONT)

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12414690-132	Pneumatic Tube	E-12
12414690-133	Pneumatic Tube	E-12
12414690-134	Pneumatic Tube	E-12
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12414690-136	Pneumatic Tube	E-12
12414690-137	Pneumatic Tube	E-12
12414690-138	Pneumatic Tube	E-12
12414690-139	Pneumatic Tube	E-12
12414690-140	Pneumatic Tube	E-12
12414690-141	Pneumatic Tube	E-12
12414690-142	Pneumatic Tube	E-12
12414690-143	Pneumatic Tube	E-12
12414690-144	Pneumatic Tube	E-12
12414690-145	Pneumatic Tube	E-12
12414690-146	Pneumatic Tube	E-12
12414690-147	Pneumatic Tube	E-12
12414690-148	Pneumatic Tube	E-12
12414690-149	Pneumatic Tube	E-12
12414690-150	Pneumatic Tube	E-12
12414690-151	Pneumatic Tube	E-12
12414690-152	Pneumatic Tube	E-12
12414690-153	Pneumatic Tube	E-12
12414690-154	Pneumatic Tube	E-12
12414690-155	Pneumatic Tube	E-12
12414690-156	Pneumatic Tube	E-12
12414690-157	Pneumatic Tube	E-12
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12414690-159	Pneumatic Tube	E-12
12414690-160	Pneumatic Tube	E-12
12414690-161	Pneumatic Tube	E-12
12414690-162	Pneumatic Tube	E-12
12414690-163	Pneumatic Tube	E-12
12414690-164	Pneumatic Tube	E-12
12414690-165	Pneumatic Tube	E-12
12414690-166	Pneumatic Tube	E-12
12414690-167	Pneumatic Tube	E-12
12414690-168	Pneumatic Tube	E-12
12414690-169	Pneumatic Tube	E-12
12414690-201	Pneumatic Tube	E-12
12414690-202	Pneumatic Tube	E-12
12414690-203	Pneumatic Tube	E-12
12414690-205	Pneumatic Tube	E-12
12414690-206	Pneumatic Tube	E-12
12414690-207	Pneumatic Tube	E-12
12414690-208	Pneumatic Tube	E-12
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12414690-212	Pneumatic Tube	E-12
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ITEM NAME/PART NUMBER	ITEM DESCRIPTION	PARA NO.
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12414690-218	Pneumatic Tube	E-12
12414690-219	Pneumatic Tube	E-12
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12414690-221	Pneumatic Tube	E-12
12414690-222	Pneumatic Tube	E-12
12414690-223	Pneumatic Tube	E-12
12414690-224	Pneumatic Tube	E-12
12414690-225	Pneumatic Tube	E-12
12414690-228	Pneumatic Tube	E-12
12414690-229	Pneumatic Tube	E-12
12414690-230	Pneumatic Tube	E-12
12414690-231	Pneumatic Tube	E-12
12414690-232	Pneumatic Tube	E-12
12414690-233	Pneumatic Tube	E-12
12414690-234	Pneumatic Tube	E-12
12414690-235	Pneumatic Tube	E-12
12414690-236	Pneumatic Tube	E-12
12414690-237	Pneumatic Tube	E-12
12414690-238	Pneumatic Tube	E-12
12414690-239	Pneumatic Tube	E-12
12414690-240	Pneumatic Tube	E-12
12414690-241	Pneumatic Tube	E-12
12414690-242	Pneumatic Tube	E-12
12414690-243	Pneumatic Tube	E-12
12414690-244	Pneumatic Tube	E-12
12414690-245	Pneumatic Tube	E-12
12414690-246	Pneumatic Tube	E-12
12414690-247	Pneumatic Tube	E-12
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12414690-302	Pneumatic Tube	E-12
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12416381P10	Non-Metallic Electrical Cable Conduit	E-13
12416381P11	Non-Metallic Electrical Cable Conduit	E-13
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12416381P13	Non-Metallic Electrical Cable Conduit	E-13
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12416381P15	Non-Metallic Electrical Cable Conduit	E-13
12416381P16	Non-Metallic Electrical Cable Conduit	E-13
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Section II. MANUFACTURED ITEMS INDEX (CONT)

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12416381P34	Non-Metallic Electrical Cable Conduit	E-13
12416381P35	Non-Metallic Electrical Cable Conduit	E-13
12416381P36	Non-Metallic Electrical Cable Conduit	E-13
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12416381P8	Non-Metallic Electrical Cable Conduit	E-13
12416381P9	Non-Metallic Electrical Cable Conduit	E-13
12418037	Steering Gear Return Hose	E-14
12418460-001	Transmission Oil Cooler Hose	E-14
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12418763	Lanyard Assembly	E-15
12420196	Lanyard Assembly	E-15
12420197-001	Non-Metallic Vent Air Hose	E-16
12420197-002	Non-Metallic Vent Air Hose	E-16
12420197-003	Non-Metallic Vent Air Hose	E-16
12420197-004	Non-Metallic Vent Air Hose	E-16
12420197-005	Non-Metallic Vent Air Hose	E-16
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12420198-001	Non-Metallic Vent Air Hose	E-16
12420198-002	Non-Metallic Vent Air Hose	E-16
12420308-457	Personnel Heater Air Duct Hose	E-17
12420308-760	Personnel Heater Air Duct Hose	E-17
12420489	Block Seal	E-18
3256-H-1048	CTIS Seal Driver	E-19
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Purge Valve Tool		E-22
M1089 30K Winch Air Hoses		E-23
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Section III. MANUFACTURED ITEMS

E-2. 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 E-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. (152.4 mm) x 0.134 in. (3.4 cm)	2

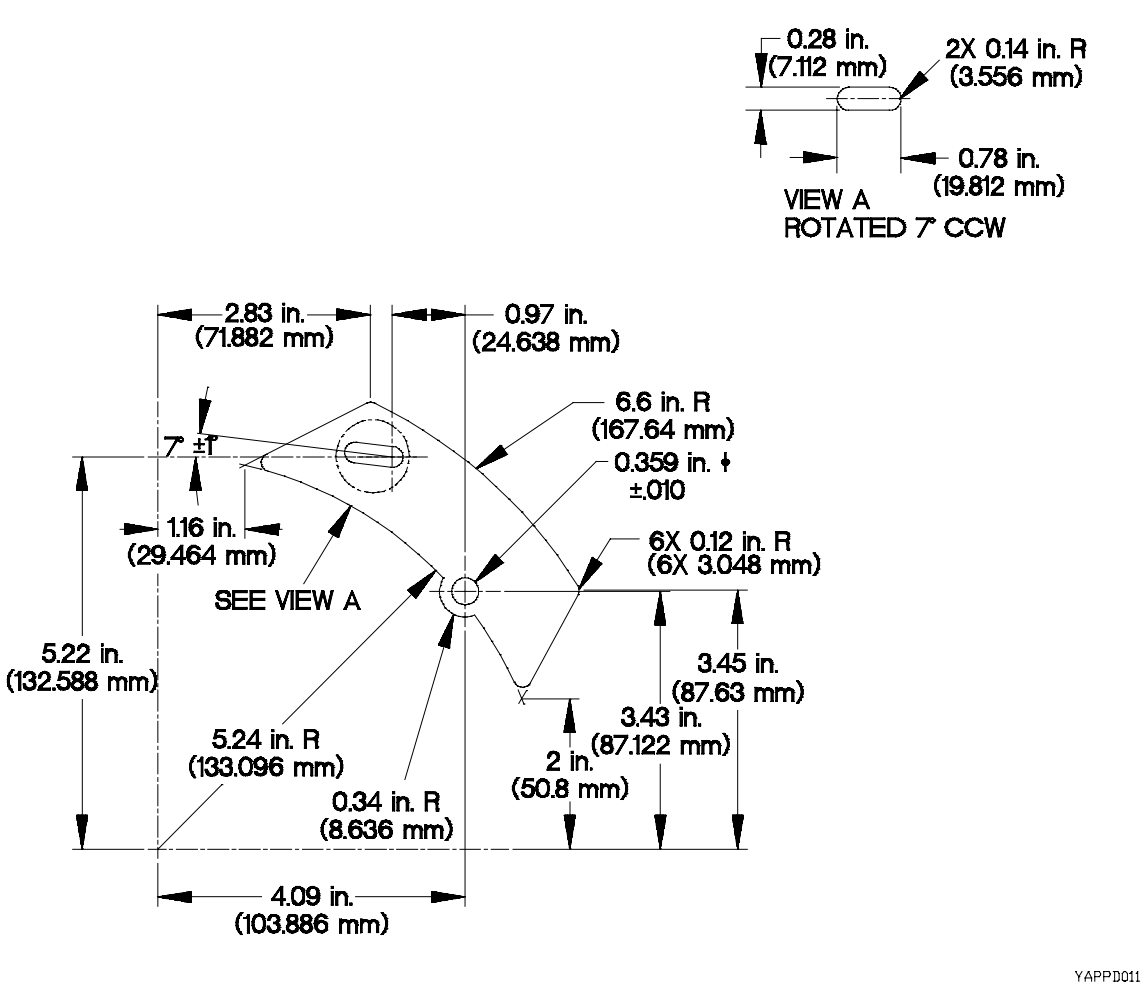


Figure E-1. Brake Adjusting Tool Support

a. All dimensions are in inches (millimeters).
b. Cut steel sheet as shown by dimensions on **Figure E-1. Brake Adjusting Tool Support**.
c. De-burr and remove sharp edges.

E-3. BRAKE PLUNGER SEAL DRIVER

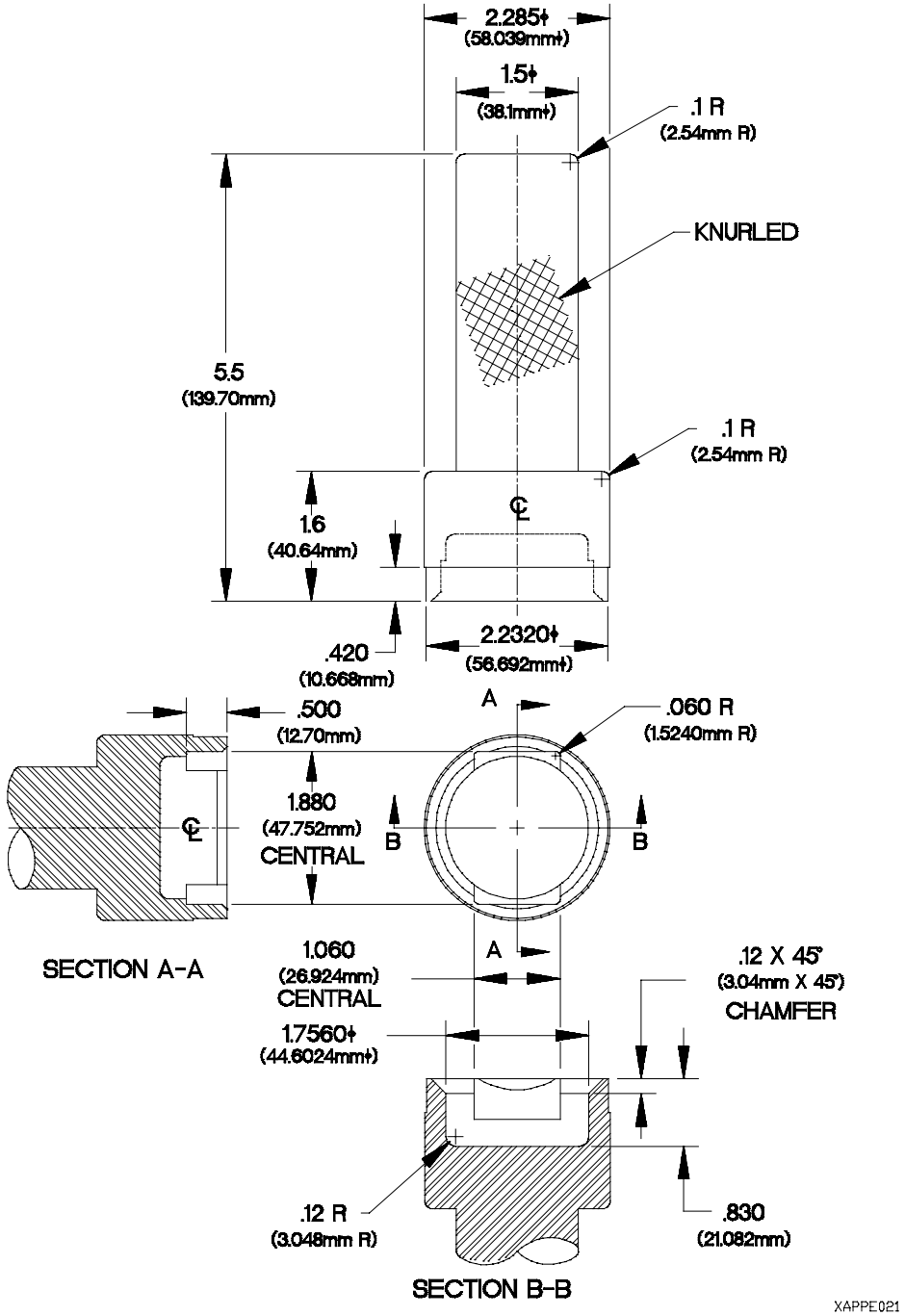


Figure E-2. Brake Plunger Seal Driver

a. All dimensions are in inches (millimeters).
b. Manufacture from round steel stock.
c. De-burr and remove sharp edges.

E-4. CAB SUPPORT TOOL

Make the cab support tool from .38 inch (.96 cm) flat steel stock and angle iron stock according to the following instructions. Refer to the parts list and **Figure E-3. Cab Support Tool Strut and Cab Rest** for details.

Item	Part Number	Material Description	Size	Qty
1	N/A	Steel, Flat Bar	4.0 in. (10.2 cm) X 33.38 in. X (84.8 cm) X 0.38 in. (0.96 cm)	1
2	N/A	Steel, Flat Bar	4.0 in. (10.2 cm) X 12.0 in. (30.5 cm) X 0.38 in. (0.96 cm)	1
3	N/A	Angle Iron	2.0 in. (5.1 cm) X 2.0 in. (5.1 cm) X 3.5 in. (8.9 cm)	2
4	H.S.105VW-1	Insulgrip, CSA 105 C		

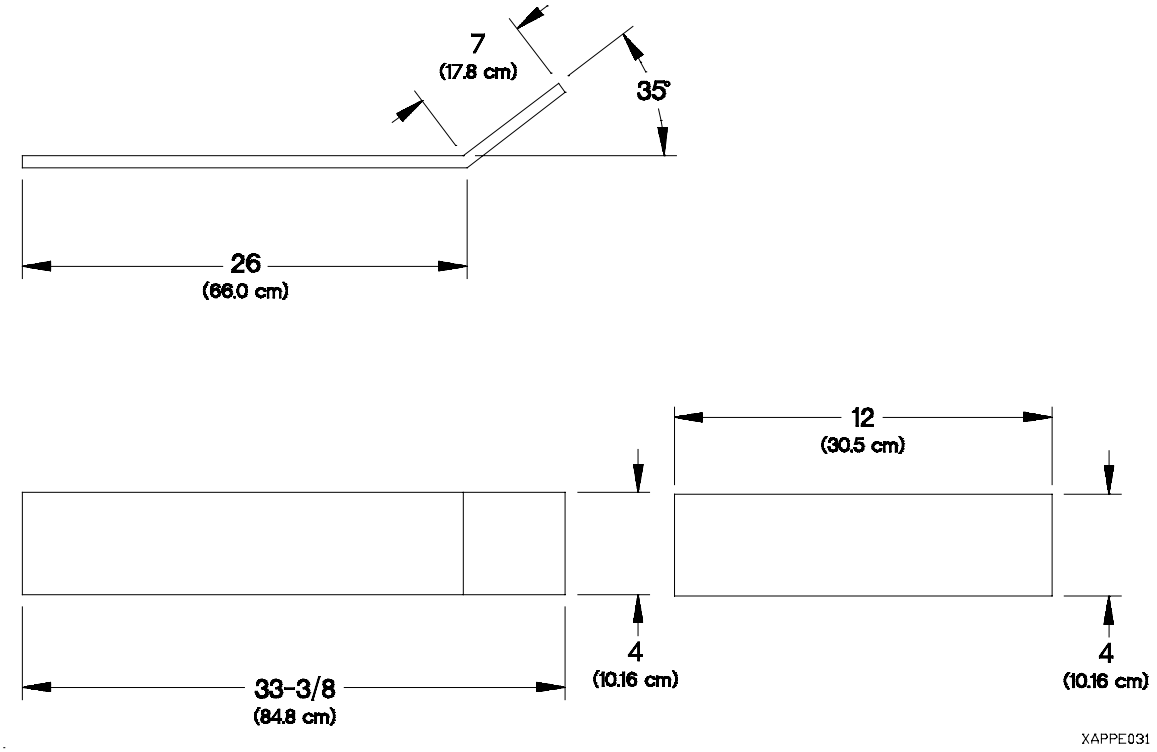


Figure E-3. Cab Support Tool Strut and Cab Rest

a. All dimensions are in inches (centimeters).
b. Cut cab support tool strut (1) from steel flat bar and bend to shape as shown in **Figure E-3. 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.

E-4. CAB SUPPORT TOOL (CONT)

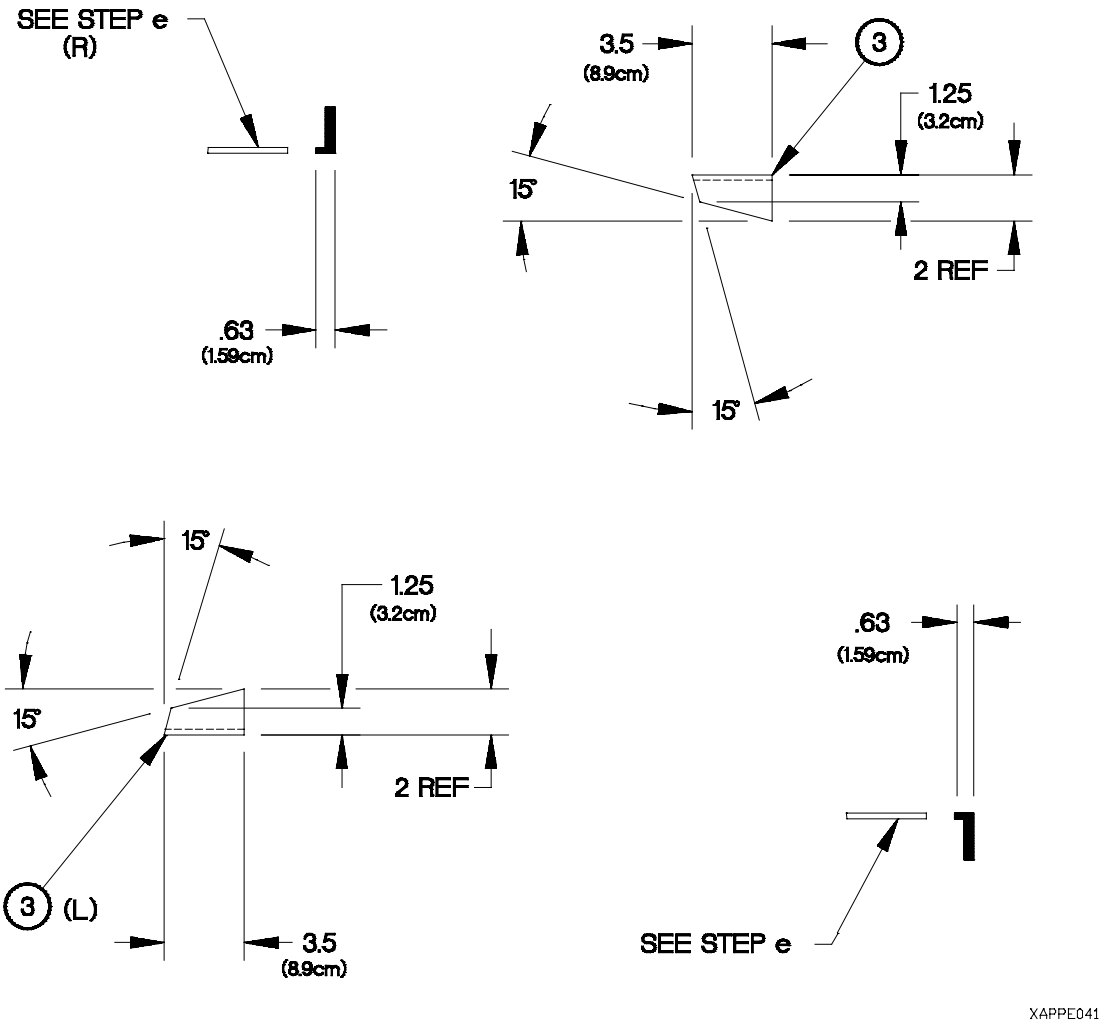


Figure E-4. Cab Support Tool Seat

e. Remove flange side of cab support tool seats (3) as shown in **Figure E-4. Cab Support Tool Seat**.
f. Cut cab support tool seats (3) L and (3) R according to dimensions and left\right orientation shown on **Figure E-4. Cab Support Tool Seat**.
g. De-burr and remove sharp edges.

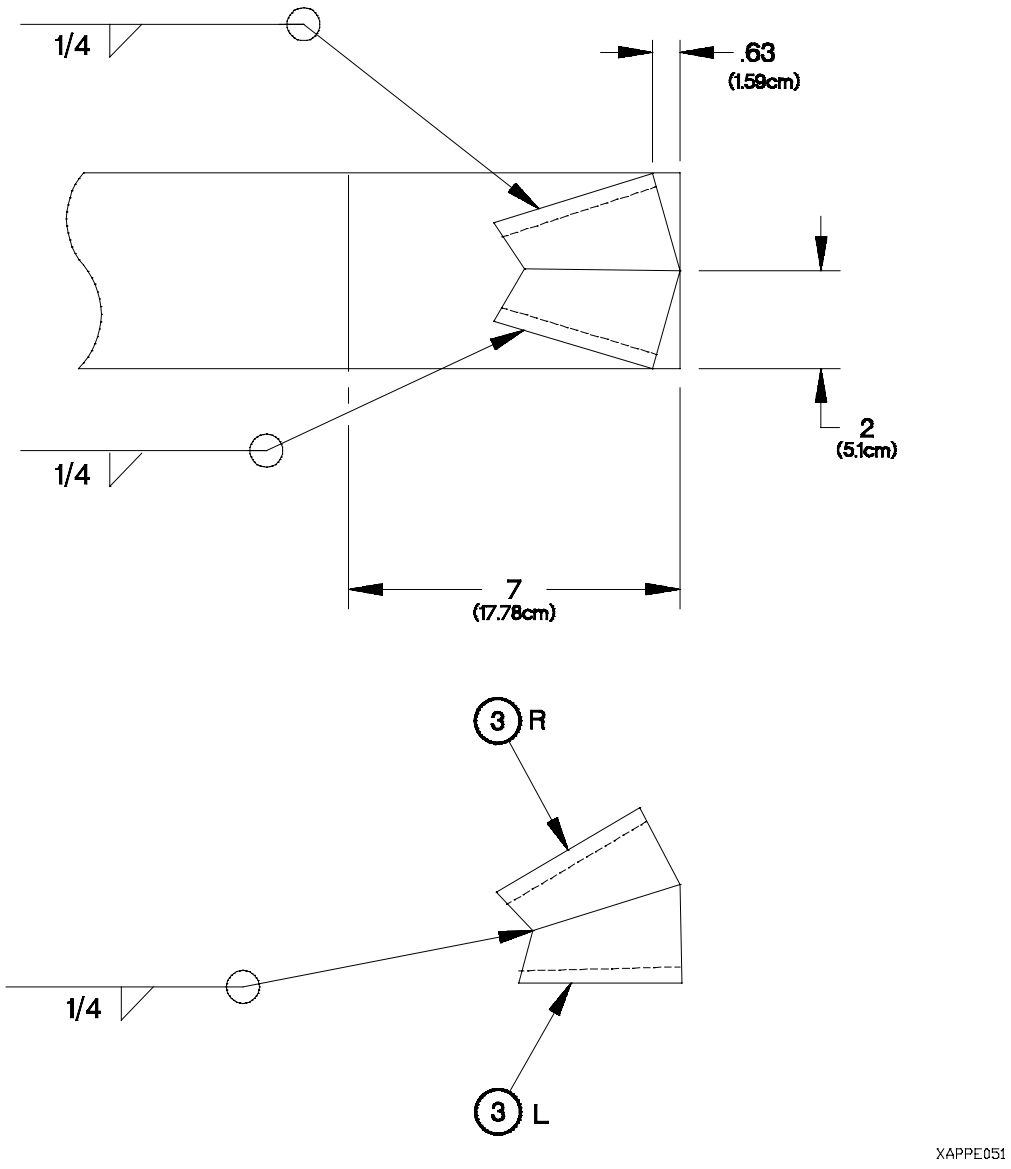


Figure E-5. Cab Support Tool Seat Layout

h. Position and clamp cab support tool seats (3) L and (3) R together as shown by dimensions on **Figure E-5. Cab Support Tool Seat Layout**.
i. Weld cab support tool seat (3) L to cab support tool seat (3) R as identified on assembly table and **Figure E-5. 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 on **Figure E-5. Cab Support Tool Seat Layout**.
k. Weld items clamped in step (f) as shown in **Figure E-5. Cab Support Tool Seat Layout**.
l. De-burr and remove sharp edges.

E-4. CAB SUPPORT TOOL (CONT)

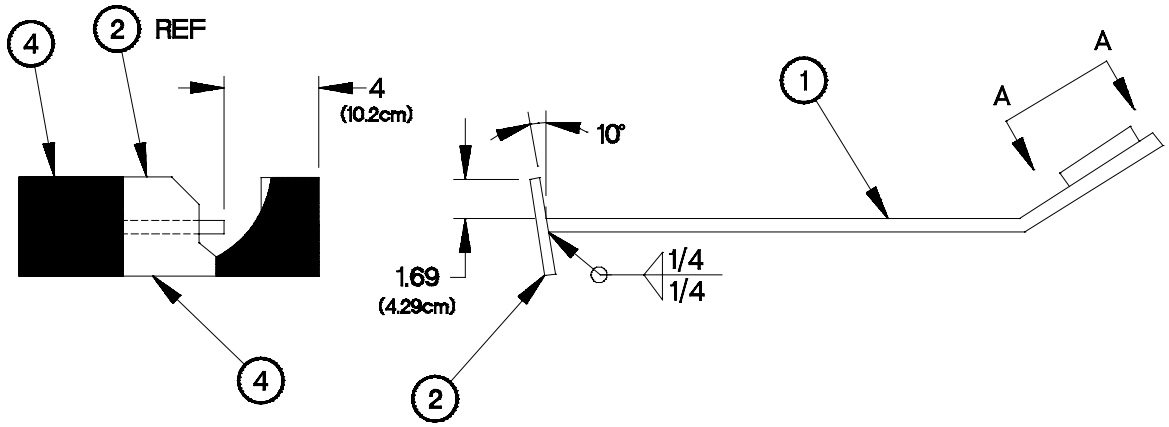


Figure E-6. Cab Support Tool Assembly

m. Position and clamp cab support tool strut (1) to cab support tool cab rest (2) as shown by dimensions on **Figure E-6. 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.

E-5. DUMP BODY LIFTING BRACKET

Make the dump body lifting bracket assembly from the front, rear, top, guide, and mount plates according to the following instructions. Refer to the parts list tables and accompanying figures for details.

Item	Part Number	Name/Description	Qty
1	N/A	Rear Plate	1
2	N/A	Top Plate	1
3	N/A	Front Plate	1
4	N/A	Guide Brace	1
5	N/A	Plate, Mounting	1

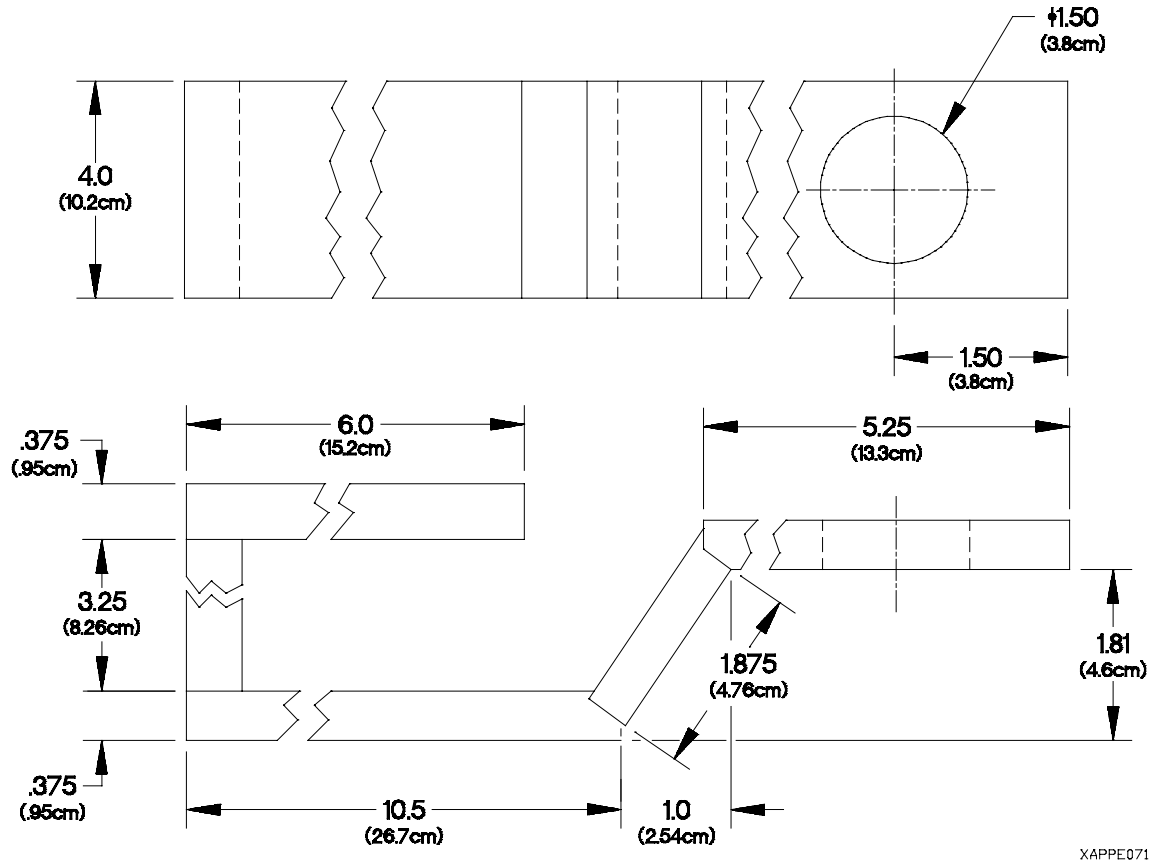


Figure E-7. Dump Body Lifting Bracket

a. All dimensions are in inches (centimeters).
b. Position and clamp pieces (1 through 5) together as shown by dimensions on **Figure E-7. Dump Body Lifting Bracket**.
c. Weld pieces together as shown in **Figure E-7. Dump Body Lifting Bracket**.
d. Coat all surfaces with Plastisol.

E-5. DUMP BODY LIFTING BRACKET (CONT)

Item	Part Number	Material Description	Size	Qty
1	N/A	Plate, steel, ASTM A-36	6.0 in. (15.2 cm) X 4.0 in. (10.2 cm) X 0.375 in. (0.95 cm)	1
2	N/A	Plate, steel, ASTM A-36	3.25 in. (8.26 cm) X 4.0 in. (10.2 cm) X 0.375 in. (0.95 cm)	1
4	N/A	Plate, steel, ASTM A-36	1.875 in. (10.2 cm) X 4.0 in. (10.2 cm) X 0.375 in. (0.95 cm)	1

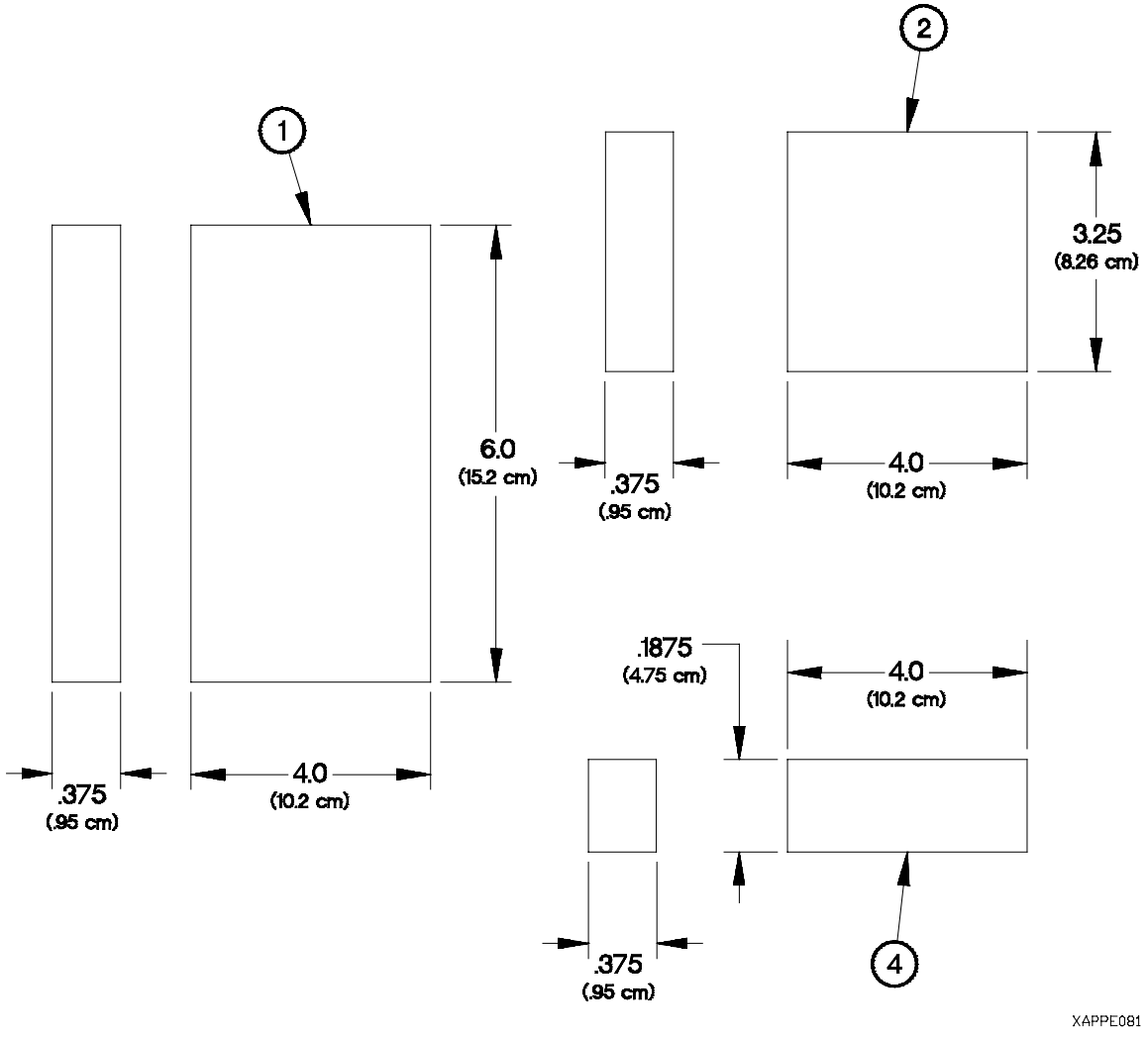


Figure E-8. Rear, Top, and Guide Plate

a. All dimensions are in inches (centimeters).
b. Fabricate (1),(2), and (4) from ASTM A-36 steel plate as shown on **Figure E-8. Rear, Top, and Guide Plate**.
c. De-burr and remove sharp edges.

Item	Part Number	Material Description	Size	Qty
3	N/A	Plate steel, ASTM A36	10.5 in. (26.7 cm) X 4.0 in. (10.2 cm) X 0.375 in. (0.95 cm)	1
5	N/A	Plate steel, ASTM A36	5.25 in. (13.3 cm) X 4.0 in. (10.2 cm) X 0.375 in. (0.95 cm)	1

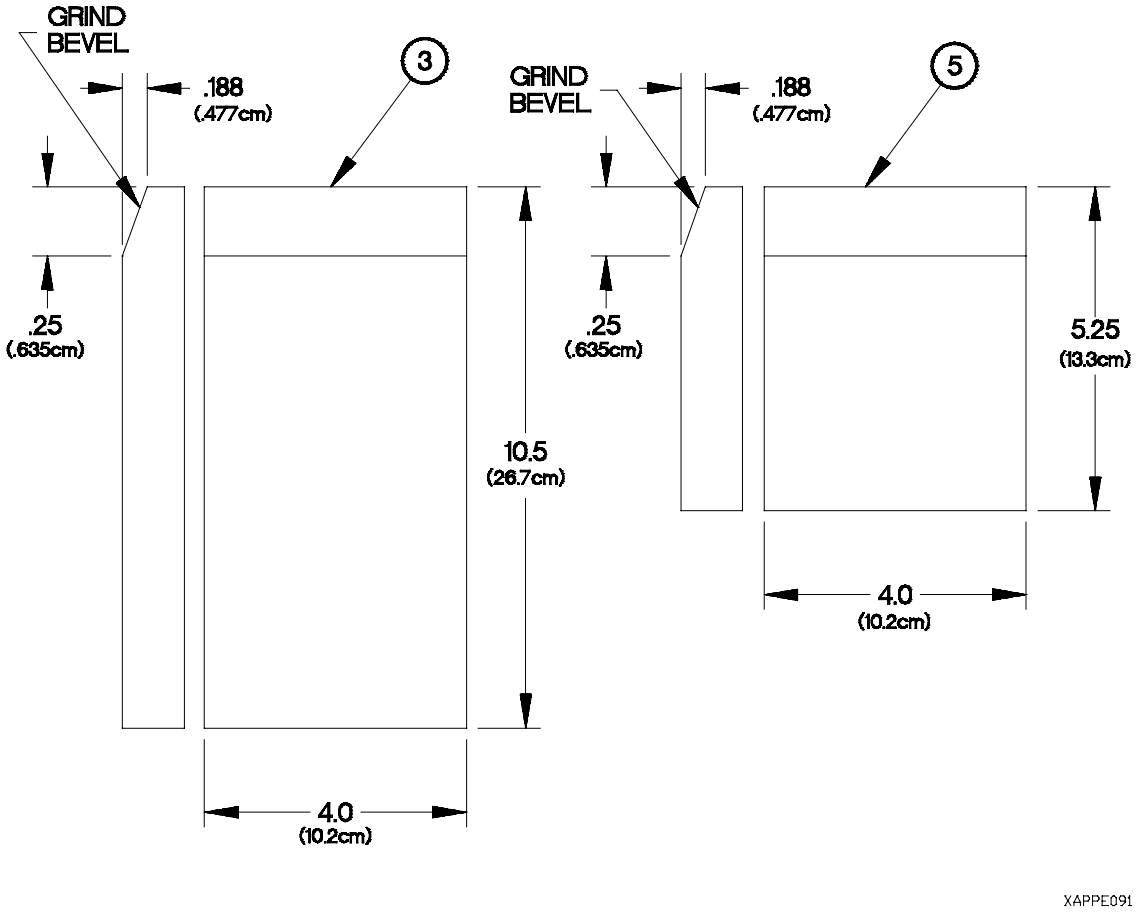


Figure E-9. Front and Mounting Plate

a. All dimensions are in inches (centimeters).
b. Fabricate (3) and (5) from ASTM A-36 steel plate.
c. Drill 1-1/2 inch (3.84 cm) diameter hoe in (5) as shown on **Figure E-9. Front and Mounting Plate**.
d. Grind bevel edge of each plate for weld surface as shown on **Figure E-9. Front and Mounting Plate**.
e. De-burr and remove sharp edges.

E-6. HEADLIGHT ADJUSTMENT SCREEN

The headlight adjustment screen may be drawn on any vertical surface at least 50 in. (127 cm) high and 100 in. (254 cm) wide.

a. Draw two vertical lines (1) 50 in. (127 cm) high and 90.6 in. (230 cm) apart (centered on headlight adjustment screen).

b. Locate two points 40 in. (101.6 cm) from floor and 13 in. (33 cm) toward the center from each vertical line (1).

c. Draw vertical line (2) about 3-5 in. (8-13 cm) centered on each of the two points.

d. Draw horizontal line (3) about 3-5 in. (8-13 cm) centered on each of the two points.

e. Measure out 4 in. (10 cm) along each vertical line (2) and horizontal line (3) from each of the two points to make 8 in. (20 cm) squares (4).

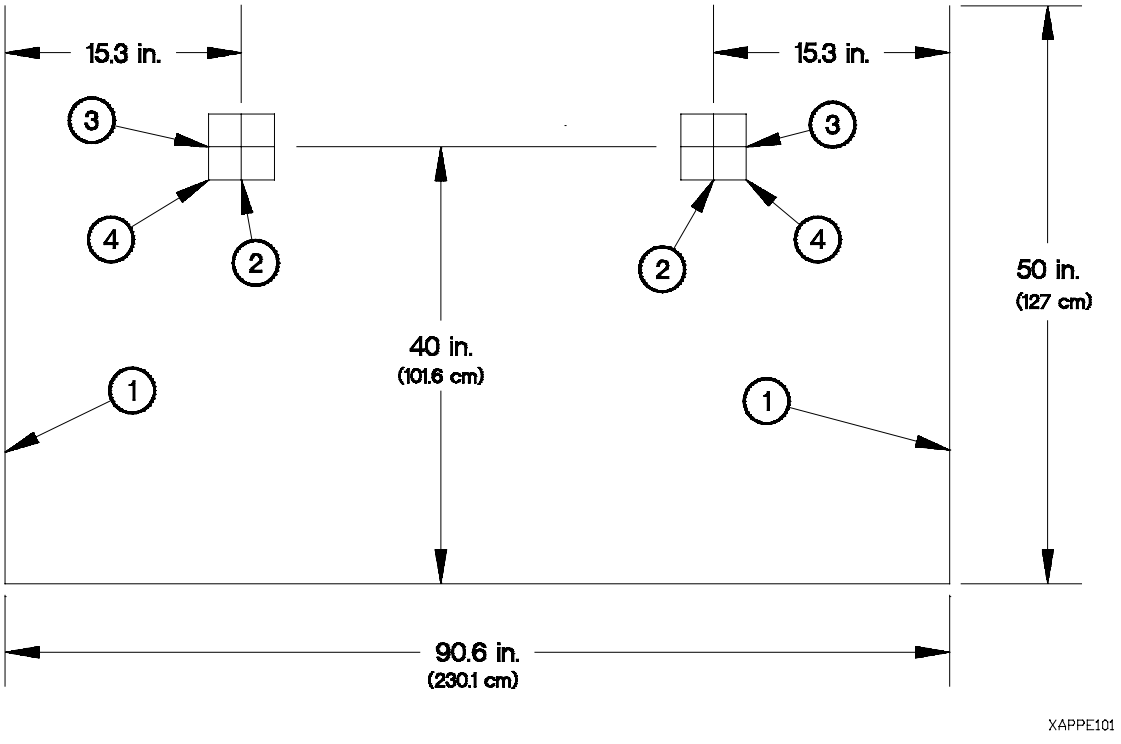


Figure E-10. Headlight Adjustment Screen

E-7. M1089 30K WINCH TEST ADAPTER

Assemble the M1089 30K winch test adapter according to the following steps. Refer to the following parts list and **Figure E-11. M1089 30K Winch Test Adapter** for details.

Part Number	Material Description	National Stock Number	Qty
4-4-4 100401BA	Tee, Tube	4730-01-095-3430	1
4-6 100102BA	Adapter, Straight, Pipe to Tube	4730-01-096-9398	1
207P-4	Coupling, Pipe	4730-00-881-1161	1
NB-4-035	Tubing, Nonmetallic	4720-01-071-4042	4 in.
MIL-T-27730	Tape, Antiseizing	8030-00-889-3534	1 roll

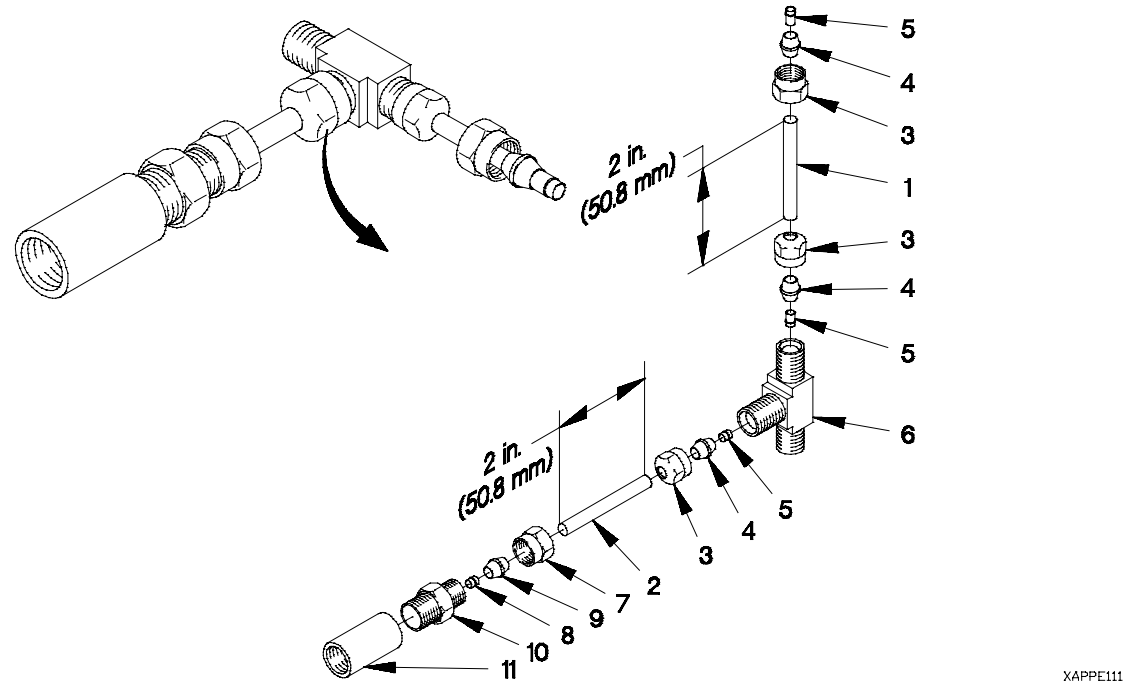


Figure E-11. M1089 30K Winch Test Adapter

a. All dimensions are in inches (millimeters).
b. Cut two pieces of nonmetallic tubing (1 and 2) to 2.0 in. (50.8 mm) long.
c. Remove three nuts (3), sleeves (4), and ferrules (5) from tube tee (6).
d. Install two nuts (3), sleeves (4), and ferrules (5) on nonmetallic tubing (1).
e. Install nonmetallic tubing (1) on tube tee (6).
f. Remove nut (7), sleeve (8), and ferrule (9) from straight adapter (10).
g. Install two nuts (3 and 7), sleeves (4 and 8), and ferrules (5 and 9) on nonmetallic tubing (2).
h. Install nonmetallic tubing (2) on tube tee (6).
i. Install nut (9) on straight adapter (10).
j. Apply one wrap of antiseizing tape to threads of straight adapter (10).
k. Install pipe coupling (11) on straight adapter (10).

E-8. M1089 SOLENOID TEST ADAPTER

Assemble the M1089 solenoid test adapter according to the following steps. Refer to the following parts list and **Figure E-12. M1089 Solenoid Test Adapter** for details.

Part Number	Material Description	National Stock Number	Qty
2-2-2 080401CA	Tee, Tube	4730-01-214-6990	1
2-2 080202CA	Elbow, Pipe to Tube	4730-00-845-5345	1
4-2 130140B	Bushing, Pipe	4730-00-828-0171	1
NB-2-031	Tubing, Nonmetallic	4720-01-287-4499	24 in.

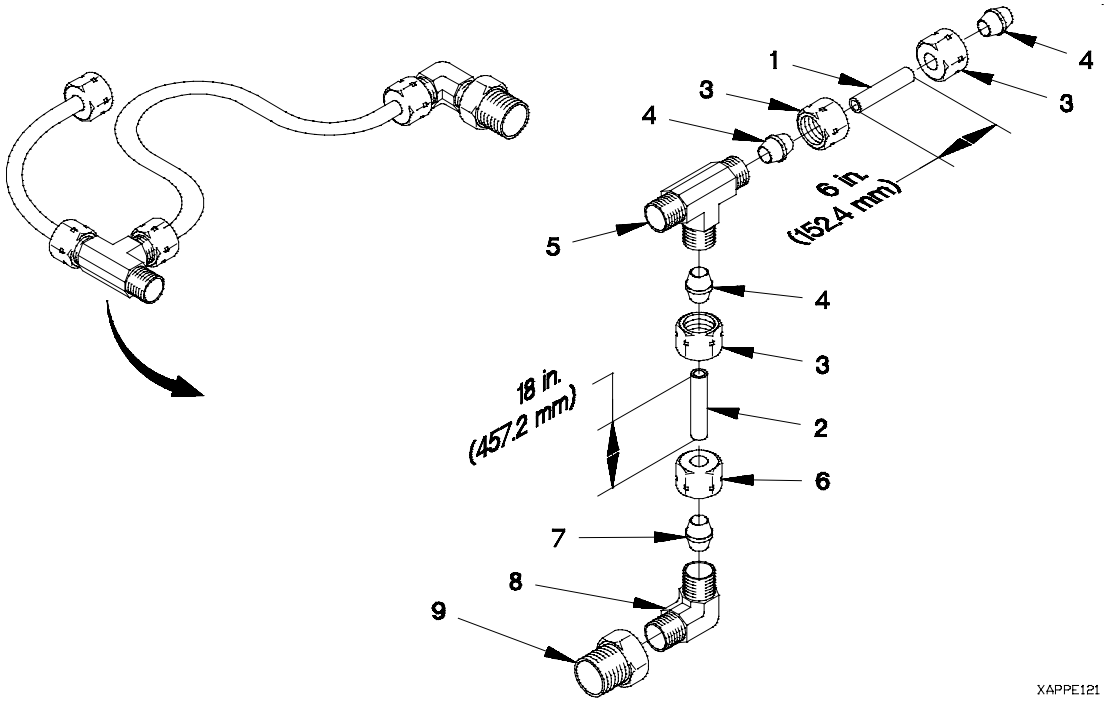


Figure E-12. M1089 Solenoid Test Adapter

a. All dimensions are in inches (millimeters).
b. Cut one piece of nonmetallic tubing (1) to 6.0 in. (152.4 mm) long.
c. Cut one piece of nonmetallic tubing (2) to 18.0 in. (457.2 mm) long.
c. Remove three nuts (3) and ferrule sleeves (4) from tube tee (5).
d. Install two nuts (3) and ferrule sleeves (4) on nonmetallic tubing (1).
e. Install nonmetallic tubing (1) on tube tee (5).
f. Remove nut (6) and ferrule sleeve (7) from pipe to tube elbow (8).
g. Install two nuts (3 and 6) and ferrule sleeves (4 and 7) on nonmetallic tubing (2).
h. Install nonmetallic tubing (2) on tube tee (5).
i. Install nut (6) on pipe to tube elbow (8).
j. Install pipe bushing (9) on pipe to tube elbow (8).

E-9. RELAY TEST WIRE

Fabricate the relay test wire according to the following steps. Refer to the following parts list for materials.

Material Description	National Stock Number	Cut Length
Wire, Electrical (MIL-W-16878)	6145-00-330-3318	6 in. (152 mm)

a. Dimensions are in inches (millimeters).
b. Cut a length of wire six inches (152 mm) long.
c. Remove approximately 3/4 in. (19 mm) of electrical insulation from each end of wire.

E-10. TRANSMISSION AUXILIARY OIL COOLER RUBBER SEAL

Fabricate the transmission auxiliary oil cooler rubber seals in accordance with the following parts list.

Part Number	Description	National Stock Number	Cut Length	
			inches	mm
MIL-R-6130	Tape, Adhesive, Rubber	9320-00-501-7537	24.7	627

E-11. 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	Description
QQ-T-570	9510-00-866-1037	Bar, Metal

a. Dimensions are in inches (millimeters)
b. Cut metal bar to 9.0 inches (228.6 mm) long.
c. De-burr and remove sharp edges from ends of metal bar.

E-12. PNEUMATIC TUBES FABRICATION

Cut pneumatic tubes from bulk tubing stock listed in **Table E-1. Pneumatic Tube Lengths**. Use a fine-toothed hacksaw or suitable cutting device and cut tubing to required length.

Table E-1. Pneumatic Tube Lengths

Tube Part Number	Bulk Tubing Part Number	Cut Length	
		inches	cm
12414690-001	NT-100-4 (79470)	18.1	46.0
12414690-002	NT-100-4 (79470)	16.0	40.6
12414690-003	NT-100-4 (79470)	15.0	38.1
12414690-004	NT-100-4 (79470)	74.8	190.0
12414690-005	NT-100-4 (79470)	69.7	177.0

E-12. PNEUMATIC TUBES FABRICATION (CONT)

Table E-1. Pneumatic Tube Lengths (Cont)

Tube Part Number	Bulk Tubing Part Number	Cut Length	
		inches	cm
12414690-006	NT-100-4 (79470)	239.0	607.0
12414690-007	NT-100-4 (79470)	254.8	647.0
12414690-008	NT-100-4 (79470)	286.3	727.0
12414690-009	NT-100-4 (79470)	294.1	747.0
12414690-010	NT-100-4 (79470)	180.0	457.2
12414690-101	J844TYBSIZE 3/8 (81343)	18.0	45.7
12414690-102	J844TYBSIZE 3/8 (81343)	35.4	90.0
12414690-103	J844TYBSIZE 3/8 (81343)	20.9	53.0
12414690-104	J844TYBSIZE 3/8 (81343)	13.8	35.0
12414690-105	J844TYBSIZE 3/8 (81343)	11.8	30.0
12414690-106	J844TYBSIZE 3/8 (81343)	20.5	52.0
12414690-107	J844TYBSIZE 3/8 (81343)	39.0	99.0
12414690-108	J844TYBSIZE 3/8 (81343)	15.4	39.0
12414690-109	J844TYBSIZE 3/8 (81343)	23.0	58.4
12414690-112	J844TYBSIZE 3/8 (81343)	80.0	198.0
12414690-113	J844TYBSIZE 3/8 (81343)	11.4	29.0
12414690-115	J844TYBSIZE 3/8 (81343)	82.8	210.2
12414690-118	J844TYBSIZE 3/8 (81343)	11.8	30.0
12414690-120	J844TYBSIZE 3/8 (81343)	11.9	30.2
12414690-125	J844TYBSIZE 3/8 (81343)	10.8	27.3
12414690-128	J844TYBSIZE 3/8 (81343)	180.1	457.5
12414690-129	J844TYBSIZE 3/8 (81343)	39.3	99.7
12414690-130	J844TYBSIZE 3/8 (81343)	164.4	417.5
12414690-131	J844TYBSIZE 3/8 (81343)	180.1	457.5
12414690-132	J844TYBSIZE 3/8 (81343)	219.5	557.5
12414690-133	J844TYBSIZE 3/8 (81343)		
12414690-134	J844TYBSIZE 3/8 (81343)	277.4	704.5
12414690-135	J844TYBSIZE 3/8 (81343)	325.0	825.5
12414690-136	J844TYBSIZE 3/8 (81343)	332.5	844.6
12414690-137	J844TYBSIZE 3/8 (81343)	51.0	129.5
12414690-138	J844TYBSIZE 3/8 (81343)	67.0	170.2
12414690-139	J844TYBSIZE 3/8 (81343)	98.5	250.2
12414690-140	J844TYBSIZE 3/8 (81343)	106.0	269.2
12414690-141	J844TYBSIZE 3/8 (81343)	52.5	133.4
12414690-142	J844TYBSIZE 3/8 (81343)	68.5	174.0
12414690-143	J844TYBSIZE 3/8 (81343)	100.0	254.0
12414690-144	J844TYBSIZE 3/8 (81343)	107.5	273.0

Table E-1. Pneumatic Tube Lengths (Cont)

Tube Part Number	Bulk Tubing Part Number	Cut Length	
		inches	cm
12414690-145	J844TYBSIZE 3/8 (81343)		
12414690-146	J844TYBSIZE 3/8 (81343)	267.3	679.0
12414690-147	J844TYBSIZE 3/8 (81343)	283.1	719.0
12414690-148	J844TYBSIZE 3/8 (81343)	314.6	799.0
12414690-149	J844TYBSIZE 3/8 (81343)	322.4	819.0
12414690-150	J844TYBSIZE 3/8 (81343)	296.1	752.0
12414690-151	J844TYBSIZE 3/8 (81343)	343.5	872.5
12414690-152	J844TYBSIZE 3/8 (81343)	36.0	91.5
12414690-153	J844TYBSIZE 3/8 (81343)	32.0	81.3
12414690-154	J844TYBSIZE 3/8 (81343)	48.0	122.0
12414690-155	J844TYBSIZE 3/8 (81343)	79.5	202.0
12414690-156	J844TYBSIZE 3/8 (81343)	87.0	221.0
12414690-157	J844TYBSIZE 3/8 (81343)	59.5	151.1
12414690-158	J844TYBSIZE 3/8 (81343)	66.5	169.0
12414690-159	J844TYBSIZE 3/8 (81343)	98.0	249.0
12414690-160	J844TYBSIZE 3/8 (81343)	105.5	268.0
12414690-161	J844TYBSIZE 3/8 (81343)	48.0	122.0
12414690-162	J844TYBSIZE 3/8 (81343)	36.0	91.5
12414690-163	J844TYBSIZE 3/8 (81343)	161.5	410.2
12414690-164	J844TYBSIZE 3/8 (81343)	120.0	304.8
12414690-165	J844TYBSIZE 3/8 (81343)	78.0	198.1
12414690-166	J844TYBSIZE 3/8 (81343)	108.0	274.3
12414690-167	J844TYBSIZE 3/8 (81343)	168.0	426.7
12414690-168	J844TYBSIZE 3/8 (81343)	108.0	274.3
12414690-169	J844TYBSIZE 3/8 (81343)	72.0	182.9
12414690-201	C608-100BLK (13174)	14.8	37.5
12414690-202	C608-100BLK (13174)	14.1	35.7
12414690-203	C608-100BLK (13174)	6.5	16.5
12414690-205	C608-100BLK (13174)	14.5	36.8
12414690-206	C608-100BLK (13174)	14.8	37.7
12414690-207	C608-100BLK (13174)	15.6	39.5
12414690-208	C608-100BLK (13174)	6.7	17.0
12414690-209	C608-100BLK (13174)	19.5	49.5
12414690-210	C608-100BLK (13174)	15.5	39.3
12414690-211	C608-100BLK (13174)	8.0	20.3
12414690-212	C608-100BLK (13174)	17.0	43.0
12414690-215	C608-100BLK (13174)	163.0	414.0
12414690-216	C608-100BLK (13174)	160.0	406.4
12414690-217	C608-100BLK (13174)	62.6	159.0

E-12. PNEUMATIC TUBES FABRICATION (CONT)

Table E-1. Pneumatic Tube Lengths (Cont)

Tube Part Number	Bulk Tubing Part Number	Cut Length	
		inches	cm
12414690-218	C608-100BLK (13174)	119.8	304.2
12414690-219	C608-100BLK (13174)	69.0	175.3
12414690-220	C608-100BLK (13174)	45.5	115.6
12414690-221	C608-100BLK (13174)	12.6	32.0
12414690-222	C608-100BLK (13174)	5.5	14.0
12414690-223	C608-100BLK (13174)	14.6	37.1
12414690-224	C608-100BLK (13174)	170.0	431.8
12414690-225	C608-100BLK (13174)	174.0	442.0
12414690-228	C608-100BLK (13174)	3.5	8.9
12414690-229	C608-100BLK (13174)	62.2	158.1
12414690-230	C608-100BLK (13174)	14.6	37.0
12414690-231	C608-100BLK (13174)	60.5	153.7
12414690-232	C608-100BLK (13174)	126.4	321.0
12414690-233	C608-100BLK (13174)	142.1	361.0
12414690-234	C608-100BLK (13174)		
12414690-235	C608-100BLK (13174)		
12414690-236	C608-100BLK (13174)	131.9	335.0
12414690-237	C608-100BLK (13174)	147.6	375.0
12414690-238	C608-100BLK (13174)	179.5	456.0
12414690-239	C608-100BLK (13174)	187.0	475.0
12414690-240	C608-100BLK (13174)	111.5	283.2
12414690-241	C608-100BLK (13174)	127.5	324.0
12414690-242	C608-100BLK (13174)	159.0	404.0
12414690-243	C608-100BLK (13174)	166.5	423.0
12414690-244	C608-100BLK (13174)	41.0	104.2
12414690-245	C608-100BLK (13174)	57.0	144.8
12414690-246	C608-100BLK (13174)	88.6	225.0
12414690-247	C608-100BLK (13174)	96.0	244.0
12414690-248	C608-100BLK (13174)	48.0	122.0
12414690-249	C608-100BLK (13174)	54.0	137.2
12414690-301	PFT-10B-BLK-100 (61424)	19.0	48.3
12414690-302	PFT-10B-BLK-100 (61424)	56.0	142.2
12414690-303	PFT-10B-BLK-100 (61424)	118.1	300.0

E-13. NON-METALLIC ELECTRICAL CABLE CONDUIT FABRICATION

Make conduit to cover electrical cables described on 1241638 from bulk tube stock listed in **Table E-2. Non-Metallic Electrical Cable Conduit Lengths**. Use a fine-toothed hacksaw or suitable cutting device and cut hose/tube to required length.

Table E-2. Non-Metallic Electrical Cable Conduit Lengths

Tube Part Number	Bulk Tube Part Number	Cut Length	
		inch	cm
12416381P1	49008	8.9	22.6
12416381P10	49008	17.8	45.2
12416381P11	49008	29.9	75.9
12416381P12	49008	33.0	83.8
12416381P13	49008	13.9	35.3
12416381P14	49008	4.0	10.2
12416381P15	49008	17.4	44.2
12416381P16	49008	3.2	8.1
12416381P17	49008	4.5	11.4
12416381P2	49008	16.2	41.1
12416381P20	27413	32.8	83.3
12416381P21	27413	9.2	23.4
12416381P22	27413	8.0	20.3
12416381P23	27413	23.3	59.2
12416381P26	49008	2.5	6.4
12416381P3	27413	7.3	18.5
12416381P30	49007	17.0	43.2
12416381P32	49005	1.7	4.3
12416381P34	49005	20.7	52.6
12416381P35	49005	21.8	55.4
12416381P36	49005	5.5	14.0
12416381P37	49005	8.0	20.3
12416381P38	49008	3.7	9.4
12416381P4	49008	12.0	30.5
12416381P5	49008	26.0	66.0
12416381P6	49008	7.7	19.6
12416381P7	49008	26.7	67.8
12416381P8	49008	5.2	13.2
12416381P9	49008	16.8	42.7

E-14. STEERING GEAR RETURN HOSE AND TRANSMISSION OIL COOLER HOSES FABRICATION

Cut the following hoses from bulk hose using a fine-toothed hacksaw or suitable cutting device.

Hose Part Number	Bulk Hose Part Number	Cut Length	
		inches	cm
12418037	A110 (30327)	75.5	191.7
12418460-001	MS521302B110360 (96906)	17.5	44.4
12418460-002	MS521301A206R (96906)	16.0	40.6

E-15. 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 E-14. 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	.06 in. (16 cm) X .37 in. (9.5 mm) X 1.25 in. (32 mm)	1

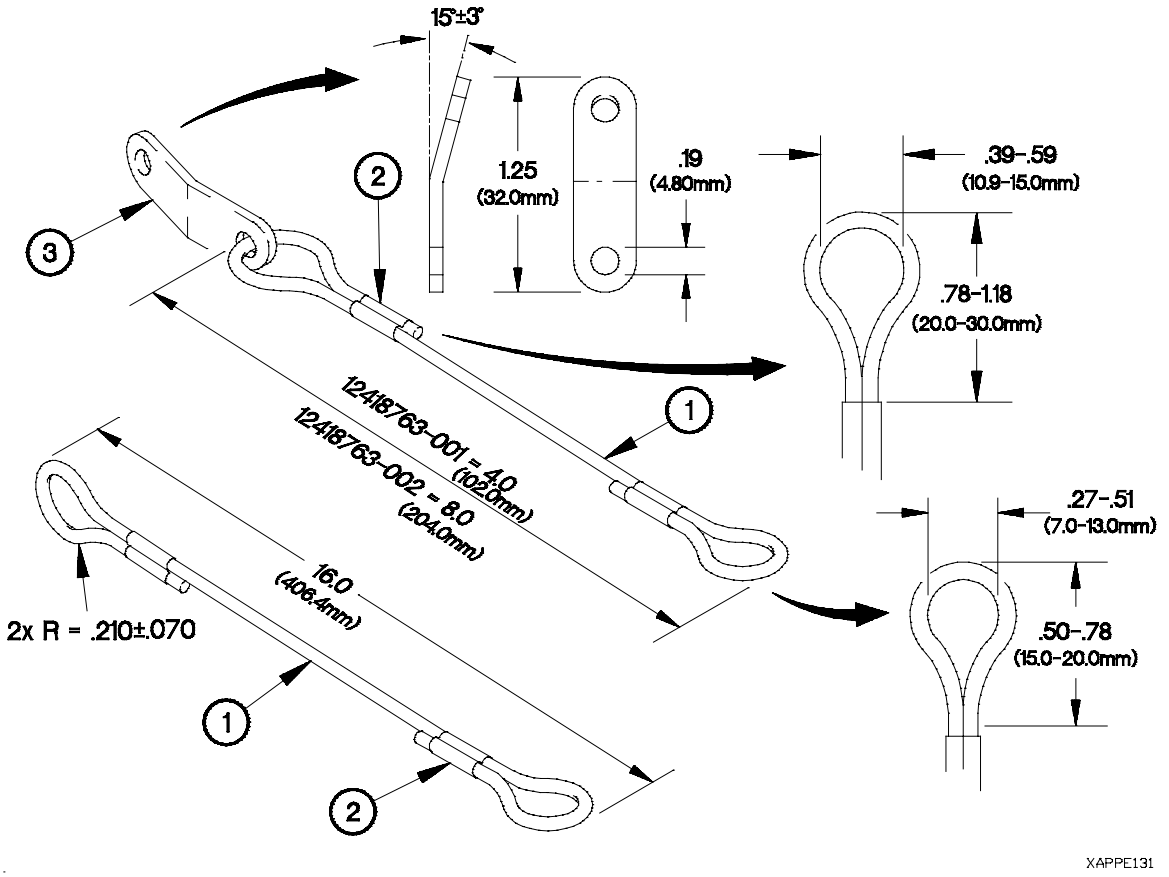


Figure E-14. Lanyard Assembly

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 on **Figure E-14. Lanyard Assembly**.
d. De-burr and remove sharp edges.
e. Bend tab as shown on **Figure E-14. 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 E-14. Lanyard Assembly**.
g. Crimp two sleeves over cable ends.

E-16. NON-METALLIC VENT AIR HOSES FABRICATION

Cut the following vent air hoses from bulk hose using a fine-toothed hacksaw or suitable cutting device.

Hose Part Number	Bulk Hose Part Number	Cut Length	
		inches	cm
12420197-001	483666 (02280)	180.0	457.2
12420197-002	483666 (02280)	120.0	304.8
12420197-003	483666 (02280)	96.0	243.8
12420197-004	483666 (02280)	36.0	91.4
12420197-005	483666 (02280)	156.0	396.2
12420197-006	483666 (02280)	72.0	182.9
12420198-001	881-16 (98441)	120.0	304.8
12420198-002	11657469	36.0	91.4

E-17. PERSONNEL HEATER AIR DUCT HOSE FABRICATION

Cut the following hoses from bulk hose using a fine-toothed hacksaw or suitable cutting device.

Hose Part Number	Bulk Hose Part Number	Cut Length	
		inches	cm
12420308-457	8711054 (19207)	18.3	46.4
12420308-760	8711054 (19207)	30.4	77.2

E-18. 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.

E-19. CTIS SEAL DRIVER 3256-H-1048

Used on Front, Intermediate, and Rear Axle CTIS Seals.

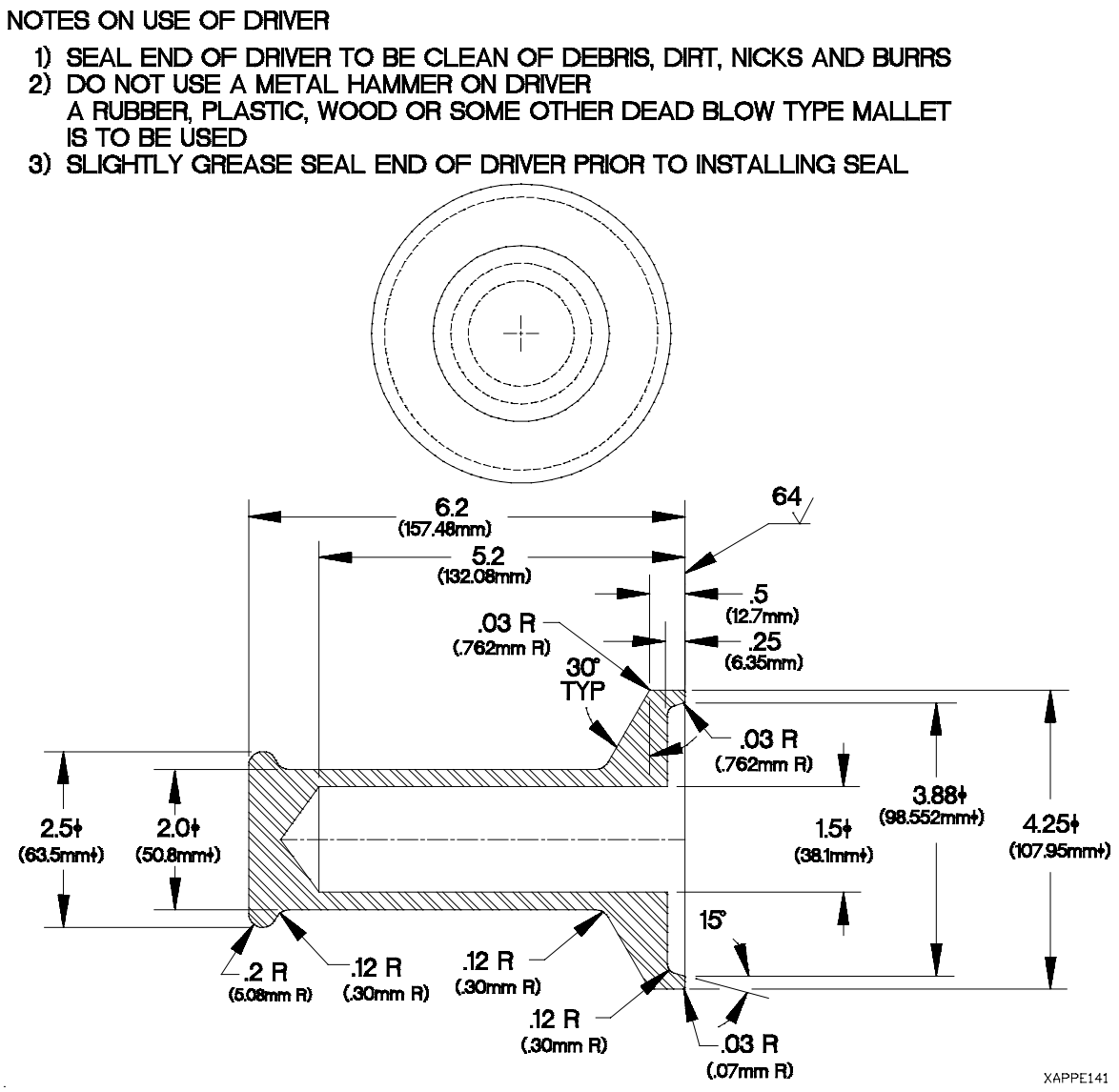


Figure E-15. CTIS Seal Driver

a. All dimensions are in inches (millimeters).
b. Manufacture from round steel stock.
c. De-burr and remove sharp edges.

E-20. 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

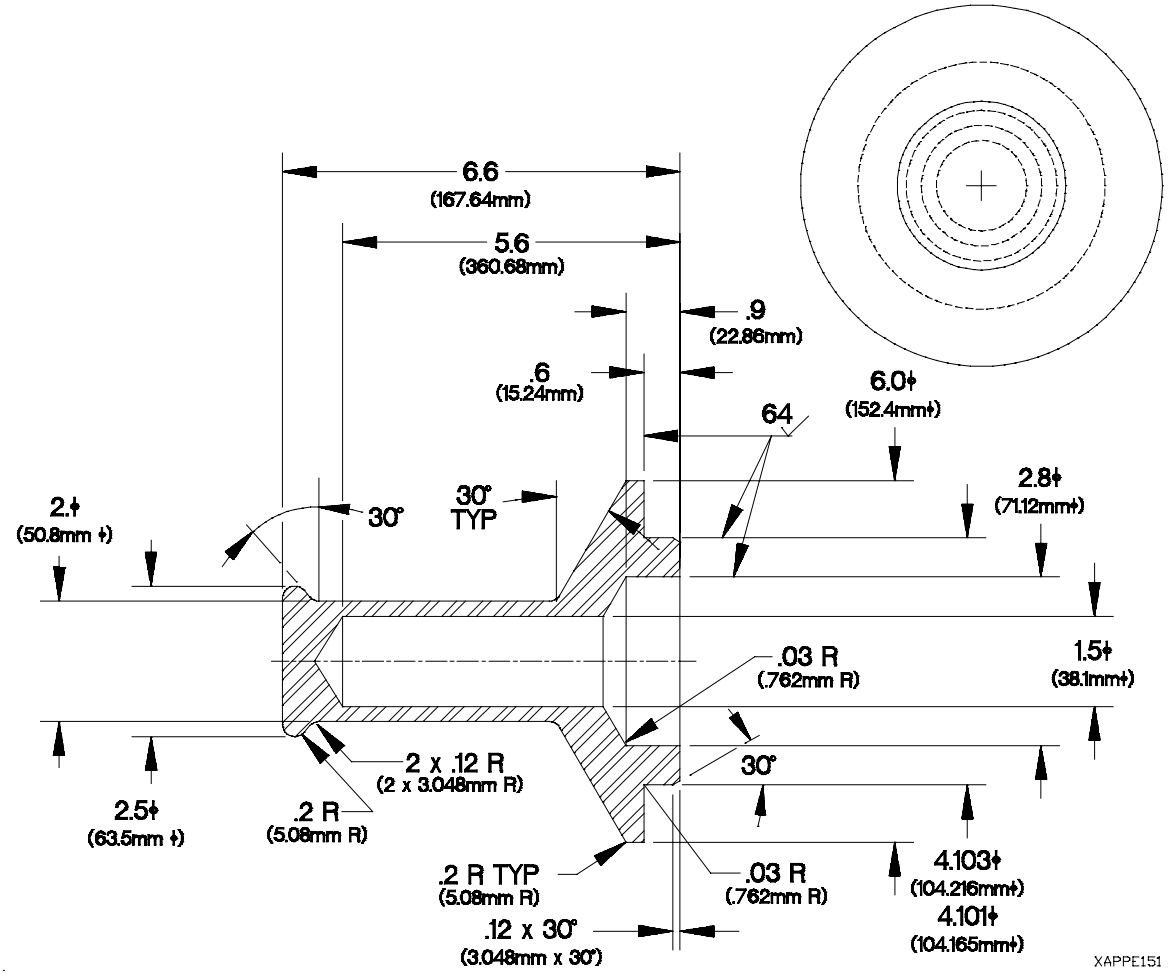


Figure E-16. Wheel Hub Grease Seal Driver

a. All dimensions are in inches (millimeters).
b. Manufacture from round steel stock.
c. De-burr and remove sharp edges.

E-21. 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.

E-22. PURGE VALVE TOOL

Fabricate Purge Valve Tool according to the following instructions. Refer to Figure E-17. 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

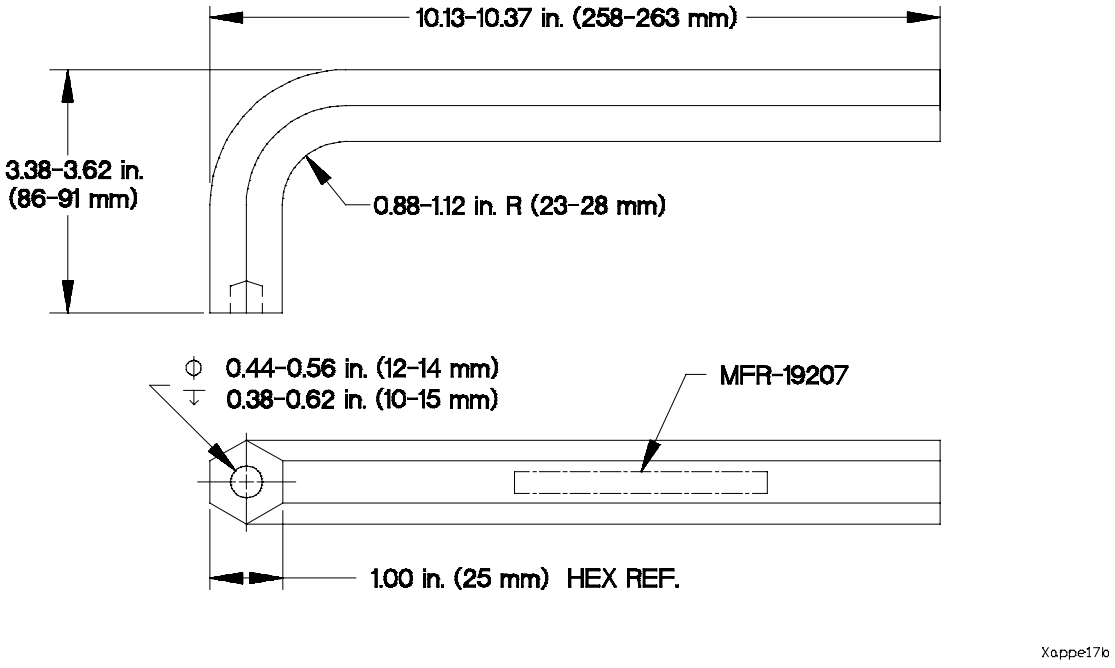


Figure E-17. Purge Valve Tool

a. All dimensions are in inches (cm).
b. Cut steel bar (1) and bend to shape as shown in Figure E-17.
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.

E-23. M1089 30K WINCH AIR HOSES

Cut air hoses and convoluted tubing from bulk hose stock listed in Table E-3. M1089 30K Winch Air Hose Lengths and Fittings. Use a fine-toothed hacksaw or suitable cutting device and cut air hoses and convoluted tubing to required length.

Table E-3. M1089 30K Air Hose Lengths and Fittings

Hose Name	Bulk Hose P/N	Hose Cut Length		Bulk Convoluted Tubing P/N	Convoluted Tubing Cut Length		Fittings P/N	Fittings Qty.
		in.	mm		in.	mm		
Air Supply	NB-4-035	96.0	2438	12420924-001	94.0	2388	4-100110B 4-100115B 63NTA-4	2 2 2
Manifold Supply	NB-4-035	40.0	1016	12420924-001	38.0	965	4-100110B 4-100115B 63NTA-4	2 2 2
LH freespool	NB-4-035	66.0	1676	12420924-001	64.0	1626	4-100110B 4-100115B 63NTA-4	2 2 2
RH freespool	NB-4-035	48.0	1219	12420924-001	46.0	1168	4-100110B 4-100115B 63NTA-4	2 2 2
LH regulator input	NB-4-035	12.0	305	N/A	N/A	N/A	4-100110B 4-100115B 63NTA-4	2 2 2
RH regulator input	NB-4-035	12.0	305	N/A	N/A	N/A	4-100110B 4-100115B 63NTA-4	2 2 2
LH check valve return	NB-4-035	3.0	76	N/A	N/A	N/A	4-100110B 4-100115B 63NTA-4	2 2 2
RH check valve return	NB-4-035	3.0	76	N/A	N/A	N/A	4-100110B 4-100115B 63NTA-4	2 2 2
Front LH tension supply	NB-4-035	48.0	1219	12420924-001	46.0	1168	4-100110B 4-100115B 63NTA-4	2 2 2
Front RH tension supply	NB-4-035	66.0	1676	12420924-001	64.0	1626	4-100110B 4-100115B 63NTA-4	2 2 2

Table E-3. M1089 30K Air Hose Lengths and Fittings (Cont)

Hose Name	Bulk Hose P/N	Hose Cut Length		Bulk Convoluted Tubing P/N	Convoluted Tubing Cut Length		Fittings P/N	Fittings Qty.
		in.	mm		in.	mm		
RH 30K winch supply	NB-2-016	40.0	1016	N/A	N/A	N/A	2-2 100102BA 2-2 100202BA	1 1
RH 30K winch return	NB-2-016	40.0	1016	N/A	N/A	N/A	2-2 100102BA	2
Underlift fold supply	NB-2-016	40.0	1016	N/A	N/A	N/A	2-2 100102BA	1
Underlift fold return	NB-2-016	40.0	1016	N/A	N/A	N/A	2-2 100102BA 2-2 100202BA	1 1
Underlift supply	NB-2-016	40.0	1016	N/A	N/A	N/A	2-2 100102BA	2
Underlift return	NB-2-016	40.0	1016	N/A	N/A	N/A	2-2 100102BA 2-2 100202BA	1 1
Stinger supply	NB-2-016	40.0	1016	N/A	N/A	N/A	2-2 100102BA	2
Stinger Return	NB-2-016	40.0	1016	N/A	N/A	N/A	2-2 100102BA 2-2 100202BA	1 1
LH 30K Winch supply	NB-2-016	40.0	1016	N/A	N/A	N/A	2-2 100102BA 2-2 100202BA	1 1
LH 30K winch return	NB-2-016	40.0	1016	N/A	N/A	N/A	2-2 100102BA	2

E-24. M1089 30K WINCH PNEUMATIC TEST ADAPTER

Assembly the M1089 30K winch pneumatic test adapter to the following steps. Refer to the following parts list and **Figure E-18. M1089 30K Winch Pneumatic Test Adapter** for details.

Part Number	Material Description	National Stock Number	Qty.
NB-4-035	Tubing, Nonmetallic	4720-01-071-4042	14 in. (355.6 mm)
MIL-T-27730	Tape, antiseizing	8030-00-889-3534	1 roll
207P-4	Coupling, Pipe	4730-00-881-1161	1
4-6 100102 BA	Adapter, Straight, Pipe to Tube	4730-01-096-9398	1
4-4 100101 BA	Nipple, Tube	4730-01-091-4012	1

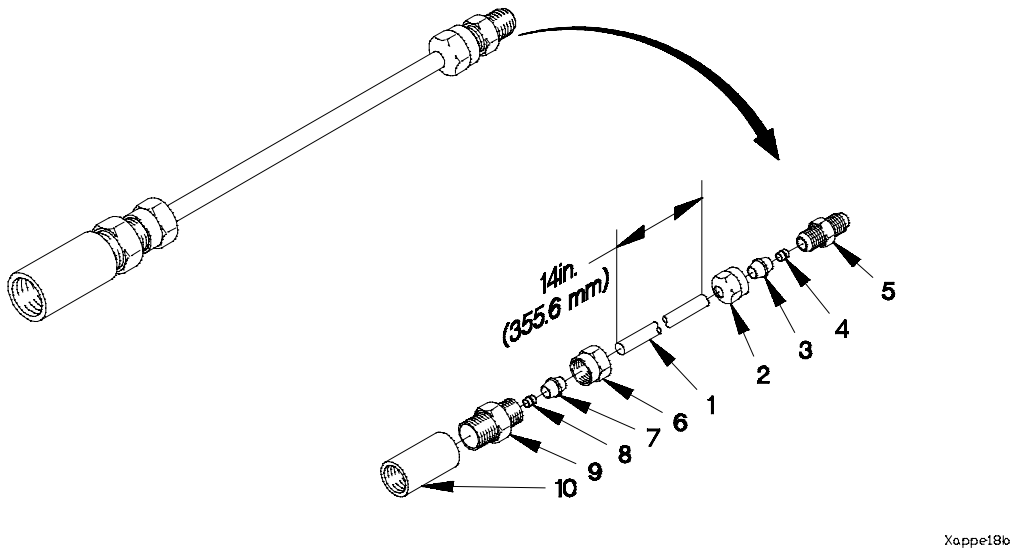


Figure E-18. M1089 30K Winch Pneumatic Test Adapter

a. All dimensions are in inches (millimeter).
b. Cut piece of nonmetallic tubing (1) to 14.0 in. (355.6 mm).
c. Remove two nuts (2), ferrules (3), and sleeves (4) from tube nipple (5).
d. Install nut (2), ferrule (3), and sleeve (4) on nonmetallic tubing (1).
e. Install nonmetallic tubing (1) on tube nipple (5).
f. Remove nut (6), ferrule (7), and sleeve (8) from straight adapter (9).
g. Install nut (6), ferrule (7), and sleeve (8) on nonmetallic tubing (1).
h. Install nonmetallic tubing (1) on straight adapter (9).
i. Apply on wrap of antiseizing tape to threads of straight adapter (9).
j. Install pipe coupling (10) on straight adapter (9).
k. Retain nut (2), ferrule (3), and sleeve (4) for future use.

APPENDIX F
TORQUE LIMITS

F-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.

F-2. TORQUE LIMITS

Refer to **Table F-1. Torque Limits for SAE and ANSI Fasteners** for torque limits on standard (SAE and ANSI) screws and free spinning nuts. Refer to **Table F-2. Torque Limits for SAE and ANSI Prevailing Torque Nuts** for torque limits on standard (SAE and ANSI) self-locking nuts. Refer to **Table F-3. Torque Limits for Metric Screws and Free Spinning Nuts** for torque limits on metric screws and free spinning nuts. Refer to **Table F-4. Torque Limits for Metric Prevailing Torque Nuts** for torque limits on metric self-locking nuts.

F-3. USE OF TORQUE TABLES

(1) Measure the diameter of the screw to be installed.

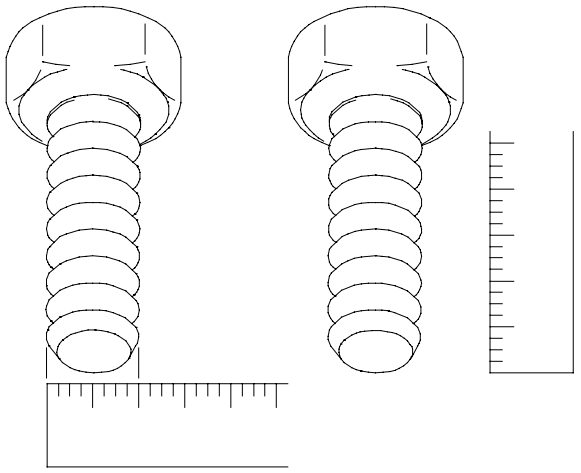
(2) Count the number of threads per inch.

(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.



XAPPF01A

APPENDIX F
TORQUE LIMITS

Table F-1. Dry Torque Limits for SAE and ANSI Screws and Free Spinning Nuts

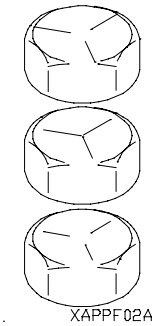
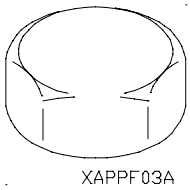
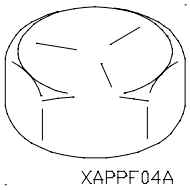
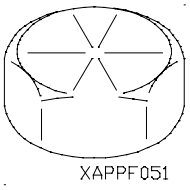
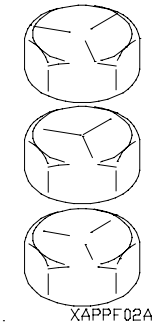
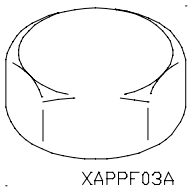
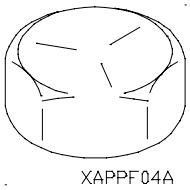
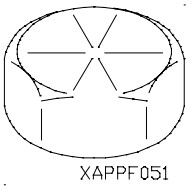
 XAPPF02A **NOTE Manufacturer's marks may vary. These are all SAE Grade 5.**		Material Grade Markings					
		 XAPPF03A **SAE Grade 2**		 XAPPF04A **SAE Grade 5**		 XAPPF051 **SAE Grade 8**	
Diameter	**Threads per inch**	**Torque**					
inch		**lb-ft**	**N·m**	**lb-ft**	**N·m**	**lb-ft**	**N·m**
1/4	20	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 F-1. Dry Torque Limits for SAE and ANSI Screws and Free Spinning Nuts (Cont)

 XAPPF02A Manufacturer's marks may vary. These are all SAE Grade 5		Material Grade Markings					
		 XAPPF03A SAE Grade 2		 XAPPF04A SAE Grade 5		 XAPPF051 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 F
TORQUE LIMITS

Table F-2. Dry Torque Limits for SAE and ANSI Prevailing Torque Nuts

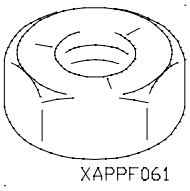
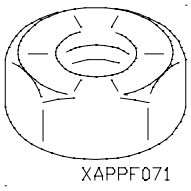
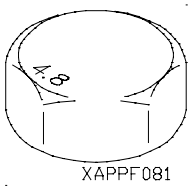
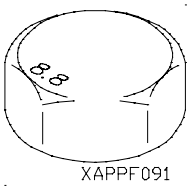
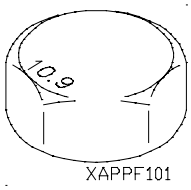
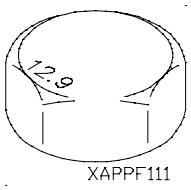
		Material Grade Markings			
		 XAPPF061		 XAPPF071	
		SAE Grade 5		SAE Grade 8	
Hole Diameter	Threads per inch	Torque			
inch		lb-ft	N·m	lb-ft	N·m
1/4	20	10-12	14-16	15-17	20-24
1/4	28	12-14	16-18	14-18	21-25
5/16	18	20-24	27-33	26-32	36-44
5/16	24	22-26	30-36	29-35	40-48
3/8	16	35-41	47-55	48-58	65-77
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 F-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 F
TORQUE LIMITS

Table F-4. Dry Torque Limits for Metric Prevailing Torque Nuts

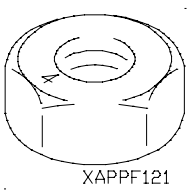
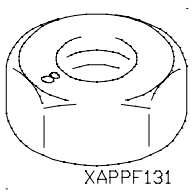
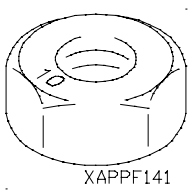
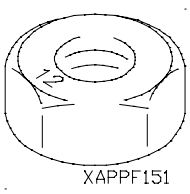
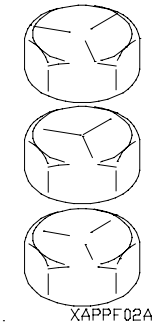
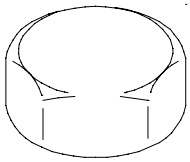
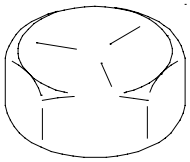
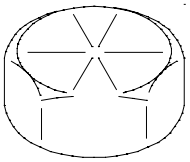
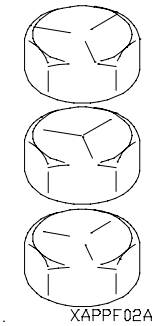
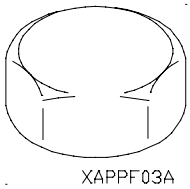
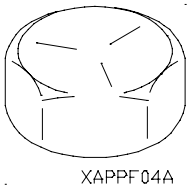
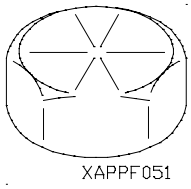
		Material Grade Markings							
		 Metric Grade 4.8		 Metric Grade 8.8		 Metric Grade 10.9		 Metric Grade 12.9	
Diameter	Thread Pitch	Torque							
mm		lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m
6	1	5-6	7-8	7-9	10-12	10-12	14-17	11-14	15-19
8	1.25	12-14	16-18	18-22	24-30	24-30	32-40	27-33	36-46
8	1	12-14	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 F-5. Wet Torque Limits for SAE and ANSI Screws and Free Spinning Nuts

 XAPPF02A **NOTE Manufacturer's marks may vary. These are all SAE Grade 5.**		Material Grade Markings					
		 XAPPF03A **SAE Grade 2**		 XAPPF04A **SAE Grade 5**		 XAPPF051 **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 F
TORQUE LIMITS

Table F-5. Wet Torque Limits for SAE and ANSI Screws and Free Spinning Nuts (Cont)

 XAPPF02A **Manufacturer's marks may vary. These are all SAE Grade 5**		**Material Grade Markings**					
		 XAPPF03A **SAE Grade 2**		 XAPPF04A **SAE Grade 5**		 XAPPF051 **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 G
MANDATORY REPLACEMENT PARTS

Section I. INTRODUCTION

G-1. SCOPE

This appendix lists mandatory replacement parts you will need to maintain the MTV vehicle.

G-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	BLADE, WINDSHIELD WIPER	105.384	2540-01-364-1621
2	BOLT, MACHINE	12414307-065	5306-01-382-5054
3	BOOT KIT, EXHAUST	DQ6025	4730-01-417-3197
4	BUMPER, NONMETALLIC	1011-05	5340-01-342-1110
5	BUMPER, RUBBER	12419182	5340-01-410-8397
6	BUSHING, SLEEVE	7-199-002668	3120-01-367-6894
7	CHANNEL, RUBBER	ZZR765/2-001A7	9390-01-420-4560
8	CLAMP	12421183-005	4730-01-447-4312
9	CLAMP	12411183-006	4730-01-447-4313
9.1	CLAMP, WIRE ROPE, SADDLED	MS51868-56	4030-00-042-7882
10	COVER, FLUID FILTER	12412628	2590-01-414-1243
11	DECAL	12340917	7690-01-256-4909
12	FASTENER TAPE	MIL-F-21840	8315-00-006-9855
13	FASTENER TAPE	50-534718-19	8315-00-935-6762
14	FILTER ASSEMBLY	75223-11	2940-01-417-9333

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
15	FILTER ELEMENT	1048011	2940-01-385-8931
16	FILTER ELEMENT, FLUID	K05-0104	2910-01-377-3128
17	FILTER ELEMENT, FLUID	R22146	2910-01-360-6366
17.1	FILTER ELEMENT, FLUID	ST117073098-000	2910-01-467-4594
18	FILTER ELEMENT, FLUID	29507750	2940-01-361-2405
19	FILTER ELEMENT, FLUID	599791	4460-01-284-2344
20	FILTER ELEMENT, FLUID	931558	2940-01-363-4377
21	FILTER ELEMENT, INTAKE AIR CLEANER	P52-7750	2940-01-361-2407
22	FILTER, FUEL	7E9763	2910-01-363-3089
23	FILTER, OIL	1R0739	2940-00-029-0388
24	GASKET	F337576M6	
25	GASKET	M28840/24HA	5935-01-421-9754
26	GASKET	QS-1181	5330-01-058-3788
27	GASKET	10-36675-18	5330-00-298-0190
27.1	GASKET	11446	5330-00-247-4174
28	GASKET	119-2940	5330-01-424-7905
29	GASKET	12412394	5330-01-371-6199
29.1	GASKET	12421155	5330-01-295-0115
29.2	GASKET	12421469	5330-01-453-2980
29.3	GASKET	3N4087	5330-01-061-8003
30	GASKET	350700	5330-01-295-3053
31	GASKET	350903	5330-00-576-4626
32	GASKET	352200	5330-01-421-6105
33	GASKET	352302	5330-01-421-6107
34	GASKET	353400	5330-01-421-6102
35	GASKET	353806	5330-01-421-6103
36	GASKET	353810	5330-01-450-6666
37	GASKET	355148	5330-01-423-0596
38	GASKET	355175	5330-01-423-0623
39	GASKET	3K3257	5330-01-305-6550
40	GASKET	4P1624	5330-01-360-5934

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
41	GASKET	4W0549	5330-01-347-3207
42	GASKET	9Y8103	5330-01-360-5931
43	GASKET and PREFORMED PACKING KIT	P4-4	5330-00-122-0624
43.1	GASKET and PREFORMED PACKING SET	9X8318	5330-01-360-9098
44	GASKET, FUEL FILTER	7C1159	5330-01-360-5941
45	NOT USED		
46	GASKET, THERMOSTAT	2W7212	5330-01-347-3206
47	GROMMET, NONMETALLIC	MS21266-3N	5325-00-926-1394
48	GROMMET, NONMETALLIC	MS35489-109	5325-00-290-0074
49	GROMMET, NONMETALLIC	MS35489-6	5325-00-263-6632
50	GROMMET, NONMETALLIC	12412334-2	9320-01-456-1672
51	GROMMET, NONMETALLIC	12417598	5325-01-375-1299
52	GROMMET, NONMETALLIC	12421402	5325-01-440-2178
53	GROMMET, NONMETALLIC	4082-37634-01	5325-01-194-3076
54	GROMMET, NONMETALLIC	50S12-1-1AA	5325-01-145-0105
55	GROMMET, NONMETALLIC	8741442	5325-00-088-6147
55.1	HEAD, FLUID FILTER	7632-002-144	2940-01-387-4397
56	INDICATOR, SIGHT, LIQUID	SLT-1214	6680-01-356-8162
57	INSERT, NYLON	12SWS2520	5310-01-439-8881
58	INSERT, NYLON	12SWS2542	5310-01-439-8883
59	INSERT, NYLON	12421463-003	5310-01-453-2087
60	INSULATOR, TANK	A1394J	5970-01-385-7317
61	INSULATOR, TANK	A1394K	5970-01-385-7262
62	NOT USED		
63	KIT, FILTER	29526899	5330-01-453-0770
64	KIT, FILTER	29503829	
65	LAMP, INCANDESCENT	CM7-7373	6240-00-270-6824
66	LAMP, INCANDESCENT	CM7376	6240-00-499-6278
67	LATCH, BAIL HEAD	68-20-101-10	2540-01-232-2470
68	LOCKNUT	0770-023-003	5310-01-423-3725
69	LOCKWASHER	ABCH207-LW-1/2	
70	LOCKWASHER	ABCH207-LW-3/8	

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
71	LOCKWASHER	D70336/1-20	5310-01-110-7933
72	LOCKWASHER	D70336/3-50	5310-01-439-2542
73	LOCKWASHER	D70336/3-52	5310-01-439-2543
73.1	LOCKWASHER	ERNA245	5310-00-584-5272
74	LOCKWASHER	MS35333-136	5310-01-078-9699
75	LOCKWASHER	MS35333-78	5310-00-261-7156
76	LOCKWASHER	MS35335-30	5310-00-209-0788
77	LOCKWASHER	MS35335-31	5310-00-596-7693
78	LOCKWASHER	MS35335-33	5310-00-209-0786
79	LOCKWASHER	MS35335-36	5310-00-550-3503
80	LOCKWASHER	MS35335-37	5310-00-209-5116
81	LOCKWASHER	MS35335-38	5310-00-616-6354
82	LOCKWASHER	MS35335-58	5310-00-209-1366
83	LOCKWASHER	MS35335-61	5310-00-527-3634
84	LOCKWASHER	MS35335-62	5310-00-184-9562
85	LOCKWASHER	MS35337-25	5310-00-012-1637
86	LOCKWASHER	MS35338-100	5310-00-261-8278
87	LOCKWASHER	MS35338-103	5310-00-184-8971
88	LOCKWASHER	MS35338-137	5310-00-933-8119
89	LOCKWASHER	MS35338-138	5310-00-933-8120
90	LOCKWASHER	MS35338-141	5310-00-984-7042
90.1	LOCKWASHER	MS35338-147	5310-00-926-5871
91	LOCKWASHER	MS35338-41	5310-00-045-4007
92	LOCKWASHER	MS35338-42	5310-00-045-3299
93	LOCKWASHER	MS35338-43	5310-00-045-3296
94	LOCKWASHER	MS35338-44	5310-00-582-5965
95	LOCKWASHER	MS35338-45	5310-00-407-9566
96	LOCKWASHER	MS35338-46	5310-01-334-4710
97	LOCKWASHER	MS35338-47	5310-00-209-0965
98	LOCKWASHER	MS35338-51	5310-00-584-7888
99	LOCKWASHER	MS35338-58	5310-00-702-6286
100	LOCKWASHER	MS51414-1	5310-01-235-2057

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
101	LOCKWASHER	MS51414-2	5310-01-310-1098
102	LOCKWASHER	MS51414-4	5310-01-251-9276
103	LOCKWASHER	N9015	5310-01-046-0186
104	LOCKWASHER	N9459	5310-01-348-8393
105	LOCKWASHER	N9461	5310-01-348-8392
105.1	LOCKWASHER	XP1113	5310-01-460-5991
105.2	LOCKWASHER	10241	5310-01-416-3010
105.3	LOCKWASHER	10030	
106	LOCKWASHER	114021	5310-01-081-0798
107	LOCKWASHER	1229-S-513-C	5310-01-062-3384
108	LOCKWASHER	12412477-14	
109	LOCKWASHER	12412601-02	5310-01-387-1152
110	LOCKWASHER	12414570-005	5310-01-452-9420
111	LOCKWASHER	12414570-011	5310-01-374-3292
112	LOCKWASHER	12414570-013	5310-01-374-4515
113	LOCKWASHER	12414570-015	5310-01-388-2043
113.1	LOCKWASHER	12414570-019	5310-01-470-2362
114	LOCKWASHER	12414570-021	5310-01-374-4516
115	NOT USED		
116	NOT USED		
117	NOT USED		
118	LOCKWASHER	1729B262	5310-00-964-7811
119	NOT USED		
120	MOUNT, RESILIENT	12413126	5340-01-439-3765
121	MOUNT, RESILIENT	12418476	5340-01-377-0693
122	NUT, CLIP	MS90724-24	5310-01-074-5041
123	NUT, CONDUIT	BL75	5975-00-642-7261
124	NUT, CONDUIT	141	5975-00-152-1075
125	NUT, CONDUIT	143	5975-00-714-8031
126	NUT, PLAIN, BLIND RIVET	ALS7-632-80	5325-01-465-0001
127	NUT, PLAIN, HEX	MS35649-282	5310-00-934-9757
127.1	NUT, PLAIN, ROUND	1727N40	5310-00-123-2572
128	NUT, SELF-LOCKING	DIN-934STM6	5310-01-342-2739

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
129	NUT, SELF-LOCKING	MS20500-524	5310-00-208-4023
130	NUT, SELF-LOCKING	MS21042-04	5310-00-811-6419
130.1	NUT, SELF-LOCKING	MS21045L5	5310-00-857-5559
131	NUT, SELF-LOCKING	MS21083N08	5310-00-941-6019
132	NUT, SELF-LOCKING	MS21083N6	5310-00-926-1852
133	NUT, SELF-LOCKING	MS51922-1	5310-00-088-1251
134	NUT, SELF-LOCKING	MS51922-17	5310-00-087-4652
135	NUT, SELF-LOCKING	MS51922-2	5310-00-929-1807
136	NUT, SELF-LOCKING	MS51922-33	5310-00-225-6993
137	NUT, SELF-LOCKING	MS51922-49	5310-00-269-4040
138	NUT, SELF-LOCKING	MS51922-5	5310-00-959-7600
139	NUT, SELF-LOCKING	MS51922-57	5310-00-067-6356
140	NUT, SELF-LOCKING	MS51922-65	5310-00-225-6992
141	NUT, SELF-LOCKING	MS51922-9	5310-00-984-3806
142	NUT, SELF-LOCKING	N9406	5310-01-362-6171
143	NUT, SELF-LOCKING	N9410	5310-01-348-8398
143.1	NUT, SELF-LOCKING	N9453	5310-01-348-8314
144	NUT, SELF-LOCKING	N9467	5310-01-350-4257
144.1	NUT, SELF-LOCKING	N9556	5310-01-423-0880
145	NUT, SELF-LOCKING	12301125	5310-01-210-0199
146	NUT, SELF-LOCKING	12412476-09	5310-01-445-6346
146.1	NUT, SELF-LOCKING	12411174-008	
147	NUT, SELF-LOCKING	12412476-11	5310-01-407-7178
148	NUT, SELF-LOCKING	12412476-12	
149	NUT, SELF-LOCKING	12412478-04	5310-01-381-9901
150	NUT, SELF-LOCKING	12414308-002	5310-01-381-9819
151	NUT, SELF-LOCKING	12414308-003	5310-01-377-1549
152	NUT, SELF-LOCKING	12414308-004	5310-01-369-5703
153	NUT, SELF-LOCKING	12414308-007	5310-01-369-6073
154	NUT, SELF-LOCKING	12414308-017	5310-01-381-9830
155	NUT, SELF-LOCKING	12414308-018	5310-01-369-3337
156	NUT, SELF-LOCKING	12414308-019	5310-01-369-9522

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
157	NUT, SELF-LOCKING	12414308-020	5310-01-381-9849
158	NUT, SELF-LOCKING	12414308-021	5310-01-369-3338
159	NUT, SELF-LOCKING	12414308-022	5310-01-417-1262
160	NUT, SELF-LOCKING	12414308-023	5310-01-369-6705
161	NUT, SELF-LOCKING	12414308-025	5310-01-369-6706
162	NUT, SELF-LOCKING	12414308-027	5310-01-369-3339
163	NUT, SELF-LOCKING	12414308-078	
164	NUT, SELF-LOCKING	12414315-002	5310-01-374-1381
165	NUT, SELF-LOCKING	12414315-003	5310-01-374-1382
166	NUT, SELF-LOCKING	12414315-005	5310-01-372-3023
167	NUT, SELF-LOCKING	12414315-006	5310-01-369-3332
168	NUT, SELF-LOCKING	12414315-009	5310-01-365-7236
169	NUT, SELF-LOCKING	12414315-015	5310-01-462-0580
170	NUT, SELF-LOCKING	12414315-017	5310-01-368-8065
171	NUT, SELF-LOCKING	12414420-004	5310-01-370-0010
172	NUT, SELF-LOCKING	12419003	5310-01-376-0773
173	NUT, SELF-LOCKING	29514660	
174	NUT, SELF-LOCKING	7-660-081600	5310-01-390-8487
175	NUT, SELF-LOCKING	7-660-082504	5310-01-354-8734
176	NUT, SELF-LOCKING	7794625	5310-00-579-1031
177	NUT, SELF-LOCKING	7951286	5310-00-789-0398
178	PACKING, PREFORMED	A82777	5330-00-579-6495
178.1	PACKING, PREFORMED	F4001-16	5331-01-466-0354
179	PACKING, PREFORMED	J515-16-3	5331-01-465-3634
180	PACKING, PREFORMED	5999807	5331-01-456-9156
181	PACKING, PREFORMED	MS28775-011	5330-00-582-2133
181.1	PACKING, PREFORMED	MS28775-910	5331-00-448-6753
182	PACKING, PREFORMED	MS28778-10	5330-00-285-9842
183	PACKING, PREFORMED	MS28778-12	5330-00-251-8839
184	PACKING, PREFORMED	MS28778-16	5330-00-804-5694
185	PACKING, PREFORMED	MS28778-20	5330-00-816-3546

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
186	PACKING, PREFORMED	MS28778-4	5330-00-805-2966
187	PACKING, PREFORMED	MS28778-6	5330-00-804-5695
188	PACKING, PREFORMED	MS9955-113	5330-01-374-2325
189	PACKING, PREFORMED	M25988/1-246	5330-01-189-6351
189.1	PACKING, PREFORMED	M83461/1-442	5330-01-183-0987
190	PACKING, PREFORMED	OR420A	5330-01-389-6028
191	PACKING, PREFORMED	11639519-1	5330-00-463-0200
191.1	PACKING, PREFORMED	12422548-004	5331-01-059-1141
192	PACKING, PREFORMED	1509	5330-00-172-1919
192.1	PACKING, PREFORMED	195045	5331-00-618-5361
192.2	PACKING, PREFORMED	19755	5331-01-415-9632
192.3	PACKING, PREFORMED	198336	5331-00-584-1840
193	PACKING, PREFORMED	2-012N507-90	5330-01-092-5502
194	PACKING, PREFORMED	2-018N507-90	5330-01-092-5503
195	PACKING, PREFORMED	2M4453	5330-00-074-3768
196	PACKING, PREFORMED	22617-16	5330-01-168-0885
197	PACKING, PREFORMED	23043446	5330-01-424-6629
197.1	PACKING, PREFORMED	250192	5331-01-417-5105
197.2	PACKING, PREFORMED	251216	5330-01-417-5107
198	PACKING, PREFORMED	29500969	5330-01-360-7852
199	PACKING, PREFORMED	29503383	5330-01-360-6017
200	PACKING, PREFORMED	3-906N552-90	5330-01-104-1093
201	PACKING, PREFORMED	3-908N552-90	5330-00-929-8171
202	PACKING, PREFORMED	3D2824	5330-00-944-8281
203	PACKING, PREFORMED	3J1907	5330-01-333-6444
204	PACKING, PREFORMED	3J7354	5330-00-952-8008
205	PACKING, PREFORMED	3K0360	5330-00-948-6482
206	PACKING, PREFORMED	4J5477	5330-00-855-8059
207	PACKING, PREFORMED	4L9564	5330-00-828-8639
207.1	PACKING, PREFORMED	420828	5340-01-417-3788
208	PACKING, PREFORMED	5-X-1155	5330-01-392-1637
209	PACKING, PREFORMED	5F7054	5330-00-339-6224

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
210	PACKING, PREFORMED	5P7813	5330-01-335-0042
211	PACKING, PREFORMED	6V8397	5330-00-579-6495
212	PACKING, PREFORMED	673268	
213	PACKING, PREFORMED	673269	5330-01-395-1252
214	PACKING, PREFORMED	7F8267	5330-00-291-7353
215	PACKING, PREFORMED	7320658	5330-00-297-7106
216	PACKING, PREFORMED	9604792-001	5330-01-429-3089
217	PAD, CUSHIONING	12413120	2590-01-474-8307
218	PARTS KIT, DEHYDRATOR	RN-60-A	4440-01-337-7324
219	PARTS KIT, HYDRAULIC PUMP	P1-12RP	4320-00-125-3208
220	PARTS KIT, SEAL REPLACEMENT	SK10-2	5330-01-350-4474
221	PARTS KIT, SEAL REPLACEMENT	SK10-3	5330-01-350-4472
222	PARTS KIT, SEAL REPLACEMENT	SK10-4	5330-01-343-2745
222.1	PARTS KIT, SEAL REPLACEMENT, MECHANICAL	SKD1VW	5330-01-309-2603
223	PIN, COTTER	K-2412-Z	5315-01-179-9882
224	PIN, COTTER	MS24665-151	5315-00-815-1405
225	PIN, COTTER	MS24665-298	5315-00-234-1861
226	PIN, COTTER	MS24665-385	5315-00-187-9382
227	PIN, COTTER	MS24665-394	5315-00-234-1628
228	PIN, COTTER	MS24665-423	5315-00-013-7228
229	PIN, COTTER	MS24665-455	5315-00-187-9392
230	PIN, COTTER	MS24665-457	5315-00-187-9393
231	PIN, COTTER	MS24665-459	5315-00-187-9394
232	PIN, COTTER	MS24665-494	
233	PIN, COTTER	MS24665-498	5315-00-849-9854
234	PIN, COTTER	MS24665-628	5315-00-846-0126
235	PIN, COTTER	MS24665-654	5315-00-187-9413
236	PIN, COTTER	MS24665-69	5315-00-828-8190
236.1	PIN, COTTER	XB-781-1	5315-01-369-1346
237	NOT USED		
238	PIN, SPRING	MS16562-142	5315-00-058-6115

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
239	PIN, SPRING	MS16562-146	5315-00-853-3814
240	PLASTIC STRIP	352700	5330-01-396-2109
241	RECEPTACLE	50R4-1-1AA	5325-01-049-2049
241.1	REPAIR KIT, GOVERNOR	RN32W	
241.2	RETAINER, PACKING	11863-012	5330-01-417-7795
241.3	RETAINER, PACKING	202624	5330-01-417-7794
242	RETAINER	A-1205-D-2344	5330-01-360-5253
243	RIVET, BLIND	AD66H	5320-01-008-8204
243.1	RIVET, BLIND	MS20601AD5W3	5320-00-582-3299
243.2	RIVET, BLIND	MS20601B4W2	5320-00-616-5274
244	RIVET, BLIND	MS20604B3W2	5320-00-721-9075
245	RIVET, BLIND	M24243/1-B302	5320-00-999-0397
246	RIVET, BLIND	M24243/1-B610	5320-00-454-5156
247	RIVET, BLIND	M24243/1-D404	5320-00-865-8994
248	RIVET, BLIND	M24243/1-D502	5320-00-850-3248
249	RIVET, BLIND	M24243/1-D504	5320-01-020-9756
250	RIVET, BLIND	M24243/1-D506	5320-00-850-3225
251	RIVET, BLIND	M24243/1-D604	5320-00-850-3233
252	RIVET, BLIND	M24243/1-D608	5320-00-850-3246
253	RIVET, BLIND	M24243/1-D610	5320-01-030-3218
254	RIVET, BLIND	M24243/1-F402	5320-00-129-9706
254.1	RIVET, BLIND	M24243/1F608	5320-01-392-0699
254.2	RIVET, BLIND	M24243/1F610	
255	RIVET, BLIND	M24243/6-A503H	5320-00-490-2238
256	RIVET, BLIND	NAS1398C5A4	5320-00-321-2521
257	RIVET, BLIND	SD64BSLF	5320-01-397-3347
258	RIVET, BLIND	206057	5320-01-411-0081
259	RIVET, COMPRESSION	12418469	5320-01-376-0699
260	RUBBER STRIP	12412581	9320-01-399-4888
260.1	SCREW, CAP	CSH5-24-39	5305-01-479-7857
261	SCREW, CAP	12414475-131	5303-01-363-0703

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
262	SCREW, CAP	6V-2315	5306-01-433-4753
263	SCREW, SELF-LOCKING	MS16998-61L	5305-01-211-3097
264	SEAL	VC08G1R0B	5330-01-389-6109
265	SEAL	355150	5330-01-423-0689
266	SEAL ASSEMBLY, CTIS	A1205-Q-2435	5330-01-360-7753
267	SEAL ASSEMBLY, HUB	A1205-R-2254	5330-01-360-5252
268	SEAL RING, METAL	29505809	5330-01-360-5329
269	SEAL, NONMETALLIC	CC3350	5330-01-431-7575
270	SEAL, NONMETALLIC	12417725	5330-01-375-2908
270.1	SEAL, NONMETALLIC	077032935	5330-01-387-2167
271	SEAL, NONMETALLIC	673999	5310-01-454-5553
271.1	SEAL, PLAIN	N72143	5330-01-453-4462
271.2	SEAL, SHAFT	SE-RUR25-2	5330-01-135-3376
272	SEAL, URETHANE FOAM	12420420-001	5680-01-453-8912
273	SEAL, URETHANE FOAM	12420420-002	5680-01-453-8485
274	SEAL, URETHANE FOAM	12420420-003	5680-01-453-8486
274.1	SEMICONDUCTOR DEVICE, DIODE	JANTX1N3957	5961-00-181-0661
274.2	SPIDER, UNIVERSAL JOINT, VEHICULAR	R279X	
274.3	SPLICE, CONDUCTOR	M7928/5-4	5940-01-079-1375
274.4	SPLICE, CONDUCTOR	M83519/1-2	5940-01-136-2540
274.5	SPLICE, CONDUCTOR	M83519/1-3	5940-01-135-7077
274.6	SPLICE, CONDUCTOR	M83519/1-5	5940-01-135-7079
274.7	SPLICE, CONDUCTOR	12420927-001	5940-01-456-1319
275	SPLICE, CONDUCTOR	23035	5940-01-210-9261
276	SPLICE, CONDUCTOR	23075	3830-01-210-9260
276.1	SPACER	12422545	5365-01-490-6790
277	TERMINAL, LUG	MS20659-163	5940-00-113-3145
278	TERMINAL, LUG	MS20659-164	5940-00-113-3148
278.1	TERMINAL, LUG	12420344	5940-01-082-3321
279	TERMINAL, LUG	MS25036-122	5940-00-113-8190
279.1	WASHER, FLAT	12414473-010	5310-01-374-6990
280	WASHER, FLAT	12417948-004	5365-01-436-8308

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
280.1	WASHER, FLAT	251391	5310-01-417-1041
280.2	WASHER, FLAT	990 3861	5310-01-155-1911
281	WASHER, FLAT RUBBER	900.032	5330-01-378-7541
282	WASHER, KEY	TW107	5310-01-014-5136
283	WASHER, NYLON	MS51859-16	5310-01-381-9990
284	WASHER, NYLON	12421464-001	
285	WASHER, NYLON	12421464-002	5310-01-445-6828
286	WASHER, SPRING	D63474/1-30	5310-01-413-8475
287	WASHER, SPRING	110 7289	5310-01-246-1387
288	WASHER, SPRING	12414559-021	5310-01-374-4517
289	WASHER, SPRING	12414560-009	5310-01-333-5517
290	WASHER, SPRING	12414560-011	5310-01-421-9556
291	WASHER, SPRING	12414560-017	5310-01-395-0820
292	WASHER, SPRING	12414560-018	5310-01-381-3281
293	WASHER, SPRING	12414560-019	5310-01-369-6074
294	WASHER, SPRING	12417503	5310-01-406-6326
295	WASHER, SPRING	12418220	5310-01-372-3495
296	WASHER, SPRING	128BSTM4	5310-01-333-5517
297	WASHER, SPRING	12414560-009	5310-01-333-5517

APPENDIX H
LUBRICATION ORDER AND SERVICES

SECTION I. INTRODUCTION

H-1. GENERAL

The information contained in this appendix provides the lubrication/services requirements for the MTV vehicle.

a. Adherence. Intervals (on-condition or hardtime) and the related man-hour times are based on normal operation. The man-hour time specified is the time needed to do all the services prescribed for a particular interval. On-condition (OC) oil sample intervals will be applied unless changed by the Army Oil Analysis Program (AOAP) laboratory. Change the hardtime interval if the lubricants are contaminated or if operating the equipment under adverse operating conditions, including longer-than-usual operating hours. The calendar interval may be extended during periods of low activity. If extended, adequate preservation precautions must be taken. Hardtime intervals will be applied in the event AOAP laboratory support is not available. Hardtime intervals must be applied during the warranty period.

Intervals shown in this lubrication order and services are based on mileage/calendar, and in some cases mileage alone. An example of a mileage/calendar interval is: **Q**, which means every 3,000 miles (4,827 km) or quarterly (every three months). The lubrication is to be performed at whichever interval occurs first for the vehicle. An example of a mileage alone interval is: **6K**, which stands for every 6,000 miles (9,654 km). The lubrication/services is to be performed at the mileage indicated regardless of the calendar interval.

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 breath 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 138 F (50 C). Failure to comply may result in serious injury or death to personnel.**

- **If personnel become dizzy while using 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 medical attention. Failure to comply may result in injury to personnel.**

b. Cleaning fittings before lubricating. Clean parts with dry cleaning solvent (SD P-D-680) (Item 65, Appendix D) or equivalent. Dry before lubricating. Dashed arrows indicate lubrication on both sides of the equipment.

c. Lubricating after fording. If fording occurs, lubricate all fittings below fording depth and check submerged gearboxes for presence of water.

d. Lubricating after high-pressure washing. After a thorough washing, lubricate all grease fittings and oil can points outside and underneath vehicle.

e. Level of Maintenance. The lowest level of maintenance authorized to lubricate a point is Operator/Unit Maintenance (O). Operator/crew (C) may lubricate points authorized for Unit Maintenance (O) when authorized by Unit Maintenance (O).

f. Localized views. A reference to the appropriate localized view is given after most lubrication entries. Localized views begin on page H-13.

H-1. GENERAL (CONT)

g. Interval Symbols. The lubrications/services interval symbols will be used as applicable:

Q-quarterly/3,000 mi (4,827 km) (whichever occurs first)
S-semiannually/6,000 mi (9,654 km) (whichever occurs first)
A-annually/12,000 mi (19,308 km) (whichever occurs first)
B-biennially/24,000 mi (38,616 km) (whichever occurs first)
3K-every 3,000 mi (4,827 km) (no calendar interval)
6K-every 6,000 mi (9,654 km) (no calendar interval)
12K-every 12,000 mi (19,308 km) (no calendar interval)
24K-every 24,000 mi (38,616 km) (no calendar interval)

H-2. OIL FILTERS

Oil filters shall be serviced/changed as applicable, when:

a. They are known to be contaminated, or clogged;

b. Service is recommended by AOAP laboratory analysis; or

c. At prescribed hardtime intervals while vehicle is under warranty, or if AOAP is not available/used as required.

H-3. AOAP SAMPLING INTERVAL

WARNING

- **Engine oil is hot and under pressure. The oil sampling valve releases oil proportionally to the amount of pressure applied to valve. Activate oil sampling valve by pressing in slowly to prevent injury to personnel. Failure to comply may result in injury to personnel.**
- **Wear safety goggles when taking oil sample. Oil is under pressure and could cause injury to personnel. Failure to comply may result in injury to personnel.**

Units participating in AOAP will sample engine oil every 3,000 miles (4,827 km) or 6 months, whichever occurs first and change engine oil as directed by AOAP. Units participating in AOAP will sample transmission oil every 6,000 miles (9,654 km) or 12 months, whichever occurs first and change transmission oil as directed by AOAP. Units participating in AOAP will sample hydraulic system oil initially after 6 weeks or 10 hours of operation, whichever occurs first. After initial oil change samples should be taken every 12 months or 50 hours of operation, whichever occurs first and change hydraulic oil as directed by AOAP.

H-4. WARRANTY HARDTIME STATEMENT

"For equipment under manufacturer's warranty, hardtime oil service intervals shall be followed. Intervals shall be shortened if lubricants are known to be contaminated or if operation is under adverse conditions (such as longer than usual operating hours, extended idling periods, extreme dust)."

SECTION II. LUBRICATION/SERVICES CHART

H-5. LUBRICATION/SERVICES KEY

LUBRICANTS	
Specification	**Type**
MIL-L-2104 (OE/HDO)	Lubricating Oil, Internal Combustion Engine, Combat/Tactical Service
MIL-L-46167 (OEA)	Lubricating Oil, Internal Combustion Engine, Arctic
MIL-L-2105 (GO)	Lubricating Oil, Gear, Multipurpose
MIL-G-10924 (GAA)	Grease, Automotive and Artillery
MIL-G-18458 (GW)	Grease, Wire-Rope and Exposed Gear
MIL-H-5606 (OHA)	Hydraulic Fluid, Petroleum Base, Aircraft, Missile, and Ordnance

DESCRIPTION	CAPACITY	EXPECTED TEMPERATURES		
		Above +40 F (Above +4 C)	+40 F to -15 F (+4 C to -26 C)	-15 F to -50 F (-26 C to -46 C)
Engine crankcase	25 qt (24 L)	OE/HDO-15/40	OE/HDO-15/40	OEA
Transmission (total system) (all models except M1088 and M1089)	49.3 qt (46.7 L)	OE/HDO-15/40	OE/HDO-10	OEA
Transmission (at oil change) (all models except M1088 and M1089)	36.8 qt (34.7 L)	OE/HDO-15/40	OE/HDO-10	OEA
Transmission (total system) (M1088 and M1089)	58.6 qt (55.4 L)	OE/HDO-15/40	OE/HDO-10	OEA
Transmission (at oil change) (M1088 and M1089)	31.8 qt (30.0 L)	OE/HDO-15/40	OE/HDO-10	OEA
Transmission (after overhaul)	39.0 qt (37.0 L)	OE/HDO-15/40	OE/HDO-10	OEA
Steering system	5 qt (4.8 L)	OE/HDO-10	OE/HDO-10	OEA
Hydraulic reservoir (except M1089)	27 gal (102.2 L)	OE/HDO-10	OE/HDO-10	OEA
Hydraulic tank (M1089)	74 gal (280 L)	OE/HDO-10	OE/HDO-10	OEA
Front axle differential (maximum capacity)	9.5 qt (9 L)	GO-80/90	GO-80/90	SAE 75W90 OR GO-75
Intermediate axle differential (maximum capacity)	14.7 qt (13.9 L)	GO-80/90	GO-80/90	SAE 75W90 OR GO-75
Rear axle differential (maximum capacity)	12.15 qt (11.5 L)	GO-80/90	GO-80/90	SAE 75W90 OR GO-75
Front axle planetary hubs	11-13 oz (0.33-0.38 L)	GO-80/90	GO-80/90	SAE 75W90 OR GO-75

H-5. LUBRICATION/SERVICES KEY (CONT)

DESCRIPTION	CAPACITY	EXPECTED TEMPERATURES		
		Above +40 F (Above +4 C)	+40 F to -15 F (+4 C to -26 C)	-15 F to -50 F (-26 C to -46 C)
Rear axle bogie	0.5 qt (0.5 L)	GO-85/140	GO-85/140	GO-85/140
15K Self-Recovery Winch (SRW)	As Required	GO-85/140	GO-80/90	GO-75
30K winches	As Required	GO-85/140	GO-80/90	GO-75
Propeller shaft universal and slip joints	As Required	GAA	GAA	GAA
Tie rod ends	As Required	GAA	GAA	GAA
Towing pintle assembly	As Required	GAA	GAA	GAA
Fifth wheel	As Required	GAA	GAA	GAA
Spring bolts and spring shackles	As Required	GAA	GAA	GAA
Front axle shaft U-joints and steering knuckles	As Required	GAA	GAA	GAA
Front axle inner wheel bearing	As Required	GAA	GAA	GAA
Intermediate axle inner wheel bearing	As Required	GAA	GAA	GAA
Rear axle inner wheel bearing	As Required	GAA	GAA	GAA
Front lifting beam	As Required	GAA	GAA	GAA
15K Self-Recovery Winch (SRW) cable	As Required	GW	GW	GW
30K winch cables	As Required	GW	GW	GW
Air/hydraulic power unit	3 pt (1.4 L)	OHA	OHA	OHA
Backup hydraulic pump	19 oz (562 ml)	OHA	OHA	OHA

COOLANT	
Specification	**Type**
A-A-52624A	Antifreeze, Multi-Engine Type
MIL-A-11755	Antifreeze, Arctic-Type

DESCRIPTION	CAPACITY	EXPECTED TEMPERATURES		
		Above +40 F (Above +4 C)	+40 F to -15 F (+4 C to -26 C)	-15 F to -50 F (-26 C to -46 C)
Cooling system (engine only)	14 qt (13 L)	A-A-52624A	A-A-52624A	
Cooling system (total system)	50.3 qt (47.6 L)	A-A-52624A	A-A-52624A	N/A
Cooling system (total system) (M1088, M1089)	52.8 qt (49.9 L)	A-A-52624A	A-A-52624A	N/A
Cooling system, Arctic (total system)	64.8 qt (61.3 L)	N/A	N/A	MIL-A-11755
Cooling system, Arctic (total system) (M1088, M1089)	76.5 qt (72.4 L)	N/A	N/A	MIL-A-11755

CLEANING AGENT	
Specification	**Type**
P-D-680	Dry Cleaning Solvent, SD-II
O-C-1901	Cleaning Compound, Windshield

DESCRIPTION	CAPACITY	EXPECTED TEMPERATURES		
		Above +15 F (Above -9 C)	+15 F to -15 F (-9 C to -26 C)	-15 F to -50 F (-26 C to -46 C)
All metal parts as required	N/A	SD-II (all temperatures)		
Windshield washer reservoir	7.5 qt (7.1 L)	2/3 water to 1/3 O-C-1901	1/2 water to 1/2 O-C-1901	1/3 water to 2/3 O-C-1901

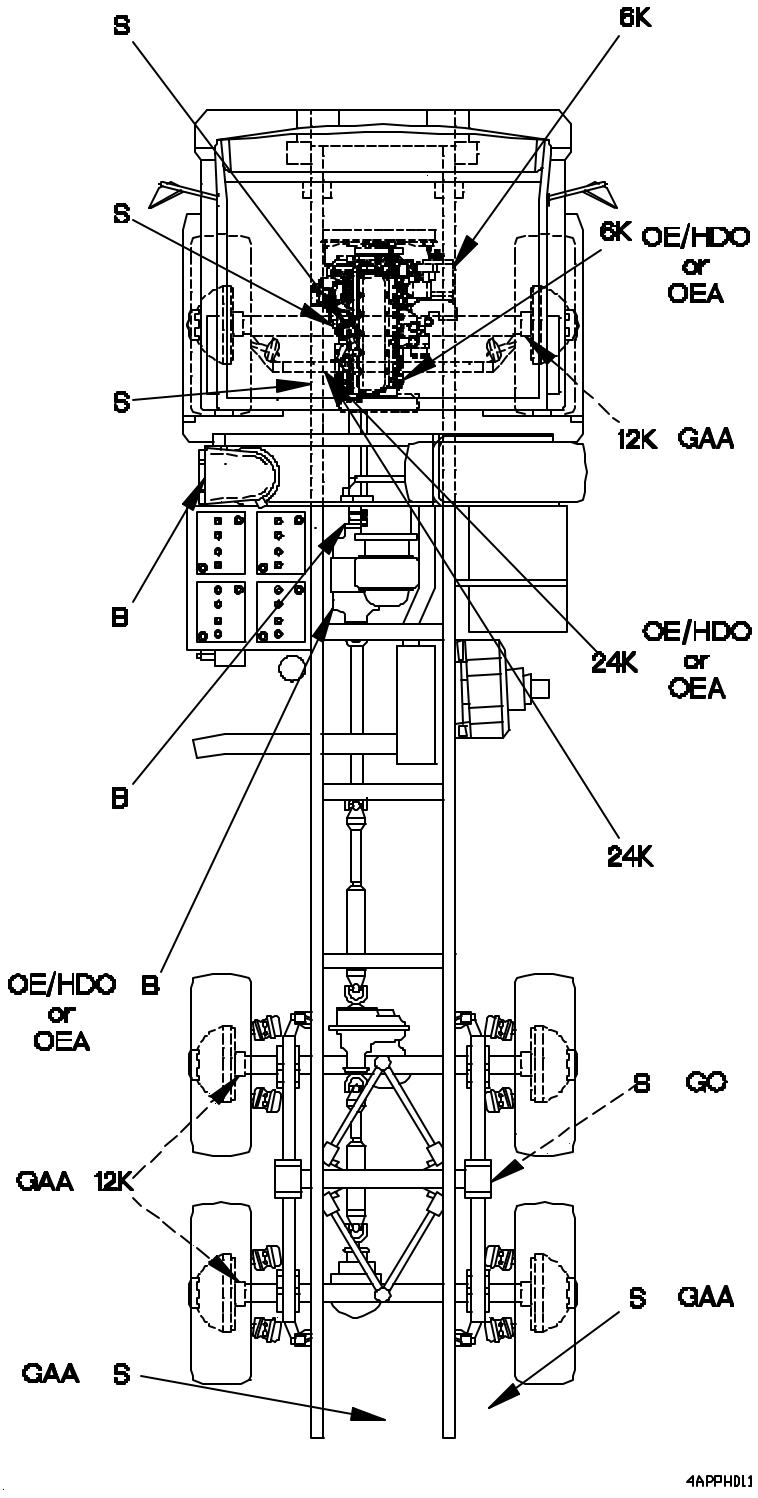
For arctic operation refer to FM 9-207.

H-6. LUBRICATION/SERVICES INTERVALS

Intervals		Total Man-Hours
Quarterly (Q)	Lubrication performed once every three months or 3,000 mi. (4,827 km).*	2.0
Semi-annually (S)	Lubrication performed once every six months or 6,000 mi. (9,654 km).*	6.0
Annually (A)	Lubrication performed once every year or every 12,000 mi. (19,308 km).*	1.5
Biennially (B)	Lubrication performed once every two years or every 24,000 mi. (38,616 km).*	3.5
3K	Lubrication performed once every 3,000 mi. (4,827 km).**	1.0
6K	Lubrication performed once every 6,000 mi. (9,654 km).**	1.0
12K	Lubrication performed once every 12,000 mi. (19,308 km).**	6.5
24K	Lubrication performed once every 24,000 mi. (38,616 km).**	0.5

* Whichever occurs first.
** No calendar interval.

H-7. LOCATOR VIEWS



CHASSIS

NOTE: Dashed arrows indicate lubrication on both sides of vehicle.

LUBRICANT INTERVAL

Spring Shackle
Fill (O)
(See note 18 and view I)

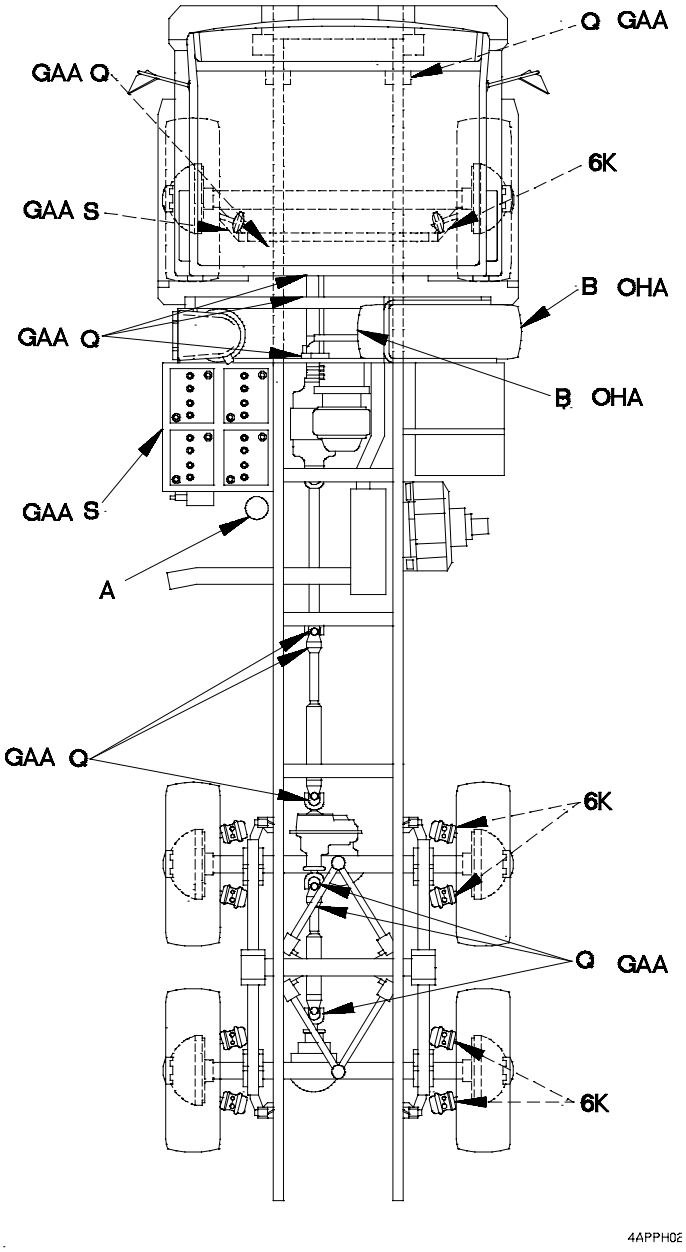
Tie Rod Ends
Fill (O)
(See note 13 and view N)

Universal and Slip Joints
Fill (O)
(See note 9 and view P)

Battery Posts (O)
(See note 19 and view Q)

Air Dryer (O)
(See note 37 and view BB)

Universal and Slip Joints
Fill (O)
(See note 9 and view P)



INTERVAL LUBRICANT

Spring Bolt
Fill (O)
(See note 18 and view H)

Brake Wedge and Air Chamber (O)
(See note 21 and view L)

Backup Hydraulic Pump Drain and Fill (O)
(See note 10 and view R)

Air/Hydraulic Power Unit Drain and Fill (O)
(See note 10 and view S)

Brake Wedge and Air Chamber (O)
(See note 21 and view M)

Universal Joint and Slip Joints
Fill (O)
(See note 9 and view P)

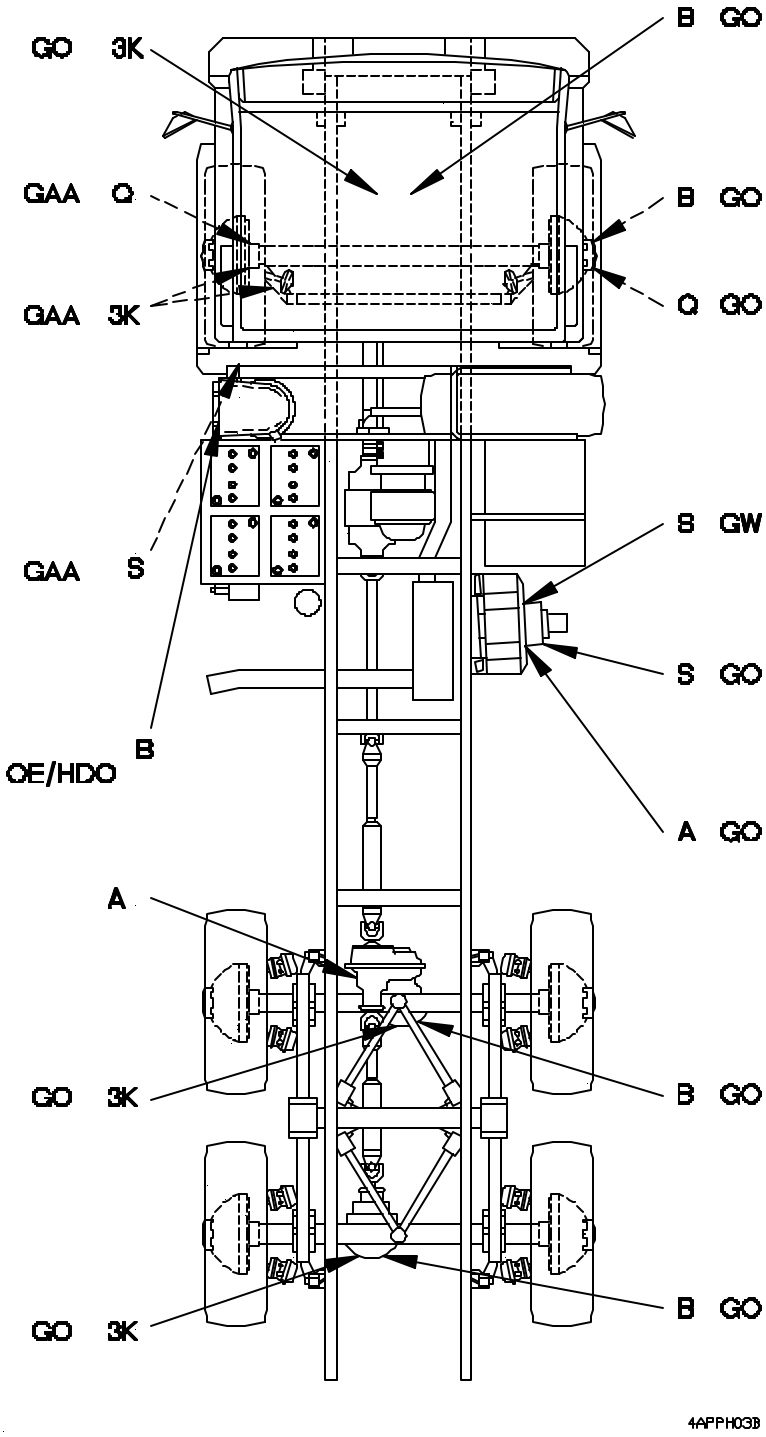
Brake Wedge and Air Chamber (O)
(See note 21 and view M)

CHASSIS

NOTE: Dashed arrows indicate lubrication on both sides of vehicle.

H-7. LOCATOR VIEWS (CONT)

LUBRICANT INTERVAL **INTERVAL LUBRICANT**



Front Axle
Check and Fill (O)
(See note 11 and view T)

Axle Shaft U-Joints
Fill (O)
(See note 20 and view U)

Steering Knuckles
Fill (O)
(See note 20 and view U)

Front Lifting Beam
Clean and Grease (O)
(See note 36 and view AI)

Hydraulic Reservoir and Filter
Drain and Fill (O)
(See note 8 and view X)

Intermediate Axle Screen and Plug Oil Filter Assembly
Clean (O)
(See note 31 and view AH)

Intermediate Axle
Check and Fill (O)
(See note 11 and view T)

Rear Axle
Check and Fill (O)
(See note 11 and view T)

Front Axle
Drain and Fill (O)
(See note 11 and view T)

Wheel End Planetary Hubs
Drain and Fill (O)
(See note 12 and view V)

Wheel End Planetary Hubs
Check and Fill (O)
(See note 12 and view V)

15K Self-Recovery Winch (SRW) Cable
Fill (O)
(See note 14 and view W)

15K Self-Recovery Winch (SRW)
Check and Fill (O)
(See note 15 and view Y)

15K Self-Recovery Winch (SRW)
Drain and Fill (O)
(See note 15 and view Y)

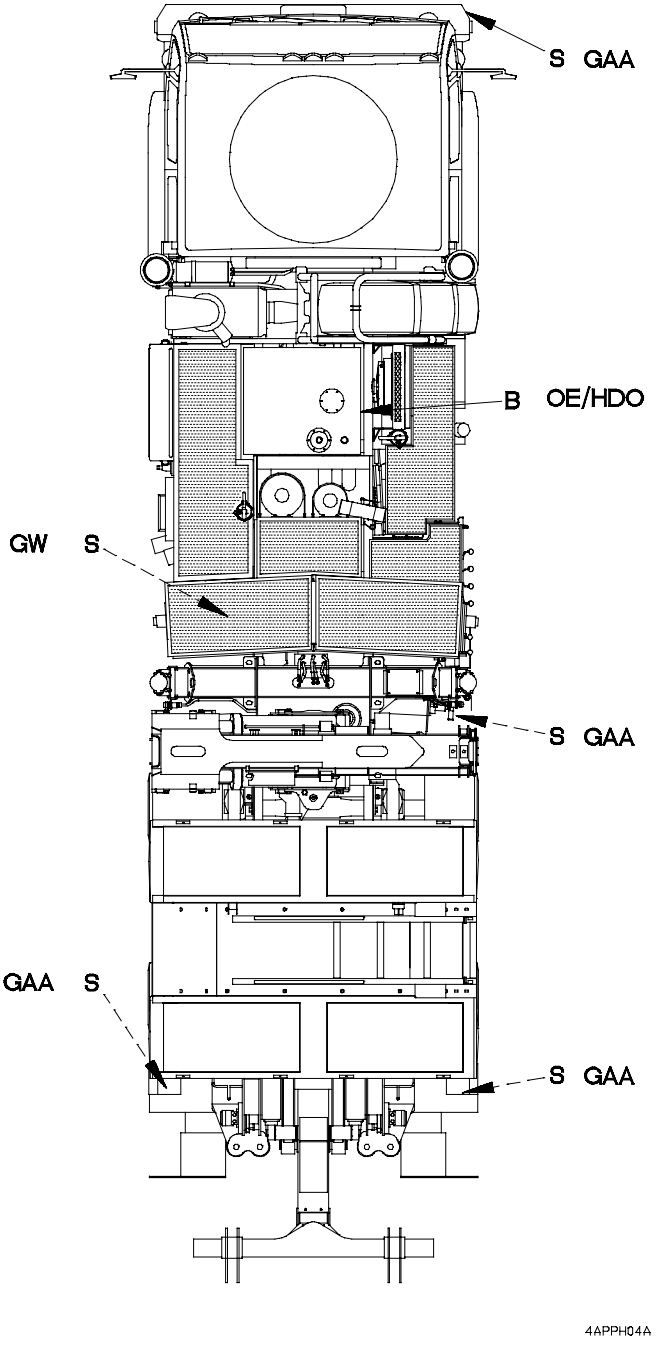
Intermediate Axle
Drain and Fill (O)
(See note 11 and view T)

Rear Axle
Drain and Fill (O)
(See note 11 and view T)

CHASSIS

NOTE: Dashed arrows indicate lubrication on both sides of vehicle.

LUBRICANT	INTERVAL

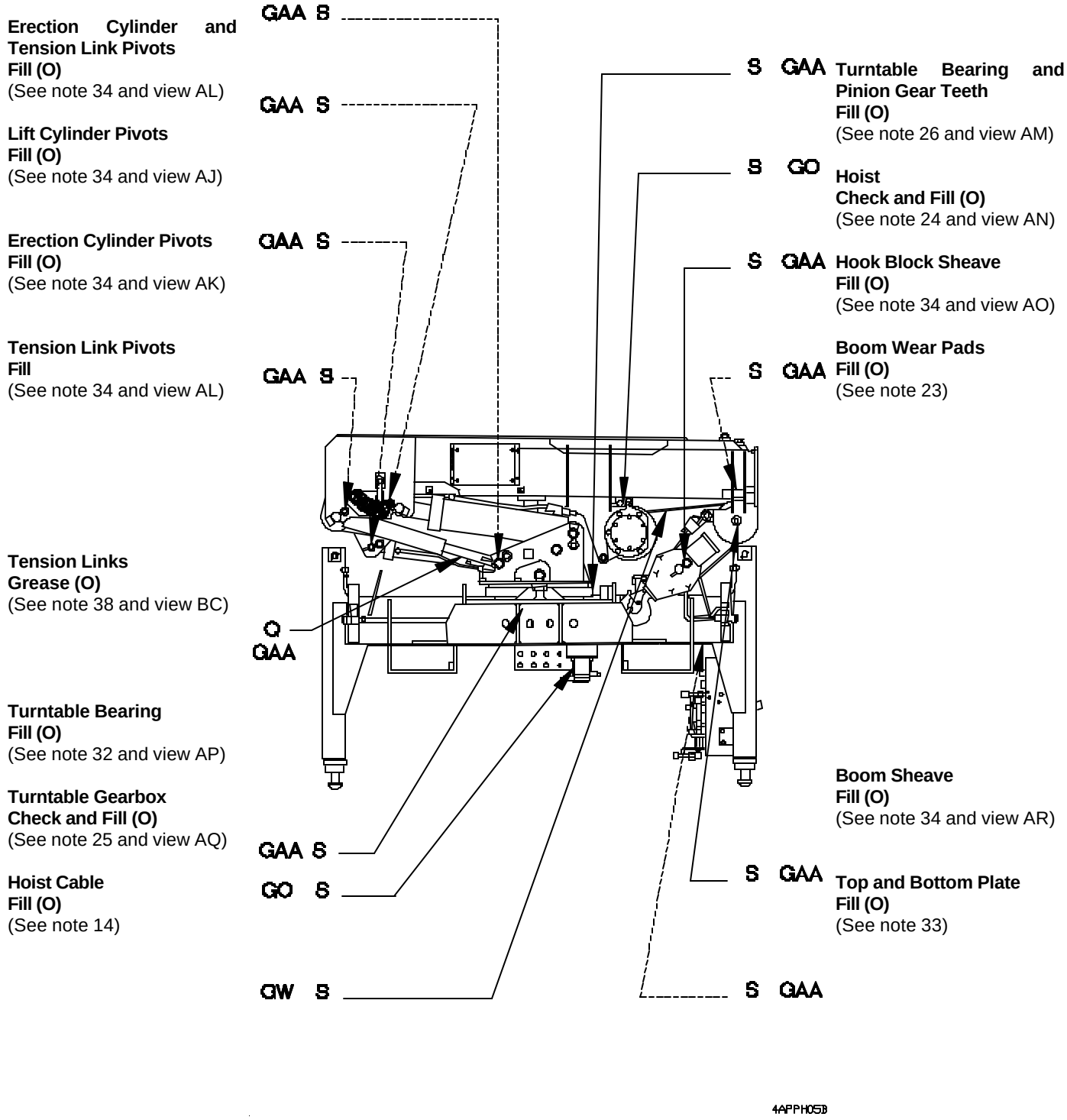


LUBRICANT	INTERVAL
	15K Self-Recovery Winch (SRW) Cable Front Roller Fairlead **Fill (O)** (See note 29 and views Z and AA)
	Hydraulic Tank and Filter Drain and Fill (O) (See note 22 and view AD)
30K Winch Cable **Fill (O)** (See note 14 and view AB)	
	30K Winch Cable Guide Rollers **Fill (O)** (See note 30 and view AB)
Pay-Out Assembly Lower Tension Sheave **Fill (O)** (See note 30 and view BA)	
	30K Winch Cable Guide Rollers **Fill (O)** (See note 30 and view AC)

M1089

NOTE: Dashed arrows indicate lubrication on both sides of vehicle.

H-7. LOCATOR VIEWS (CONT)

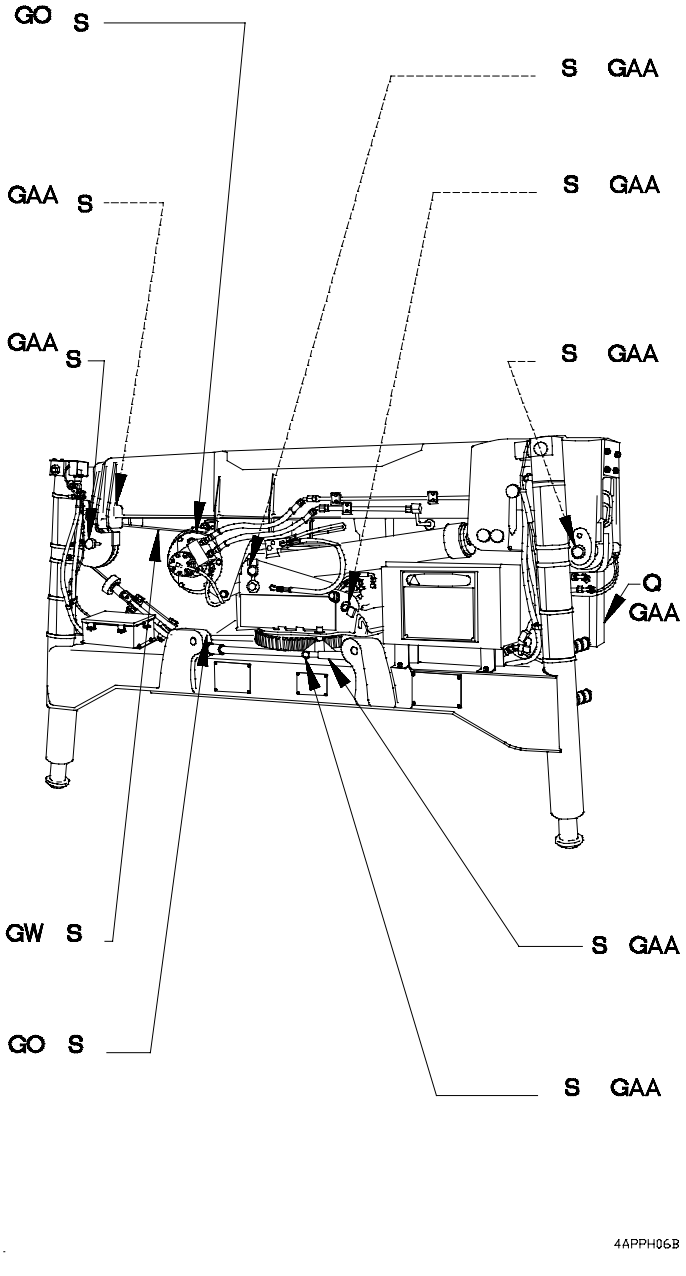


M1089 MATERIAL HANDLING CRANE (MHC)

NOTE: Dashed arrows indicate lubrication on both sides of vehicle.

LUBRICANT	INTERVAL
Hoist	GO S
Check and Fill (O)	
(See note 24 and view AS)	
Boom Wear Pads	GAA S
Fill (O)	
(See note 23)	
Boom Sheave	GAA S
Fill (O)	
(See note 34 and view AT)	
Hoist Cable	GW S
Fill (O)	
(See note 14)	
Turntable Gearbox	GO S
Check and Fill (O)	
(See note 25 and view AU)	

LUBRICANT	INTERVAL
Lift Cylinder Pivots	S GAA
Fill (O)	
(See note 34 and view AV)	
Erection Cylinder and Tension Link Pivots	S GAA
Fill (O)	
(See note 34 and view AW)	
Erection Cylinder and Tension Link Pivots	S GAA
Fill (O)	
(See note 34 and view AX)	
Tension Link	O GAA
Grease (O)	
(See note 38 and view BC)	
Turntable Bearing and Pinion Gear Teeth	S GAA
Fill (O)	
(See note 26 and view AY)	
Turntable Bearing	S GAA
Fill (O)	
(See note 32 and view AZ)	

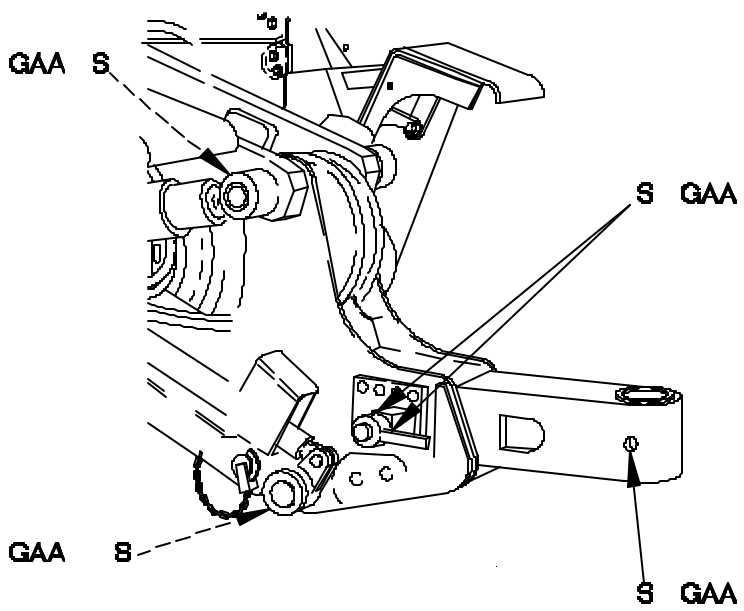


M1084/M1086 MATERIAL HANDLING CRANE (MHC)

NOTE: Dashed arrows indicate lubrication on both sides of vehicle.

H-7. LOCATOR VIEWS (CONT)

LUBRICANT INTERVAL **INTERVAL LUBRICANT**



Camlock Assembly
Fill (O)
(See note 35)

Left and Right Lift Cylinder Pivots
Fill (O)
(See note 35)

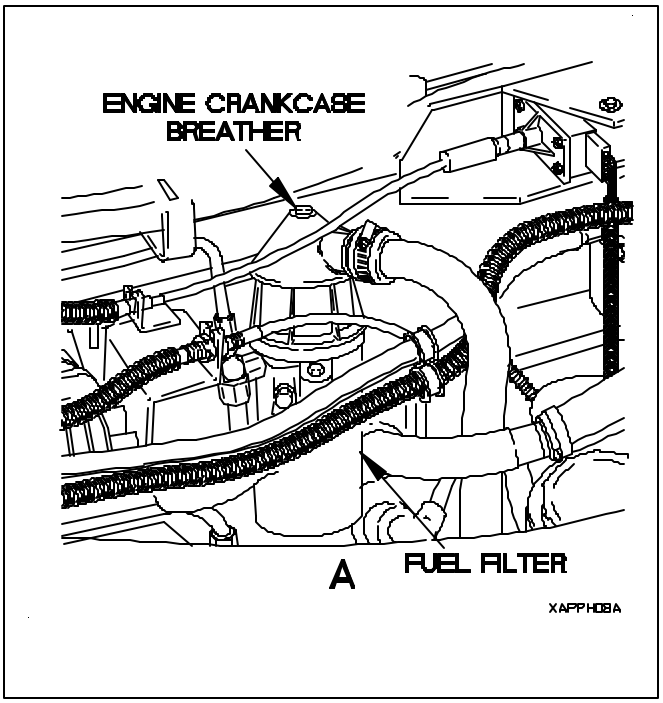
Crossbar Bushing
Fill (O)
(See note 35)

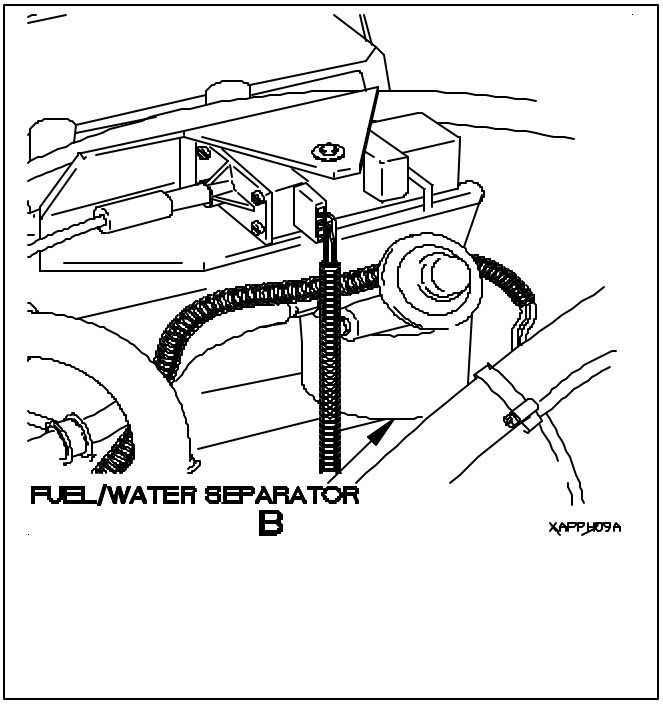
Left and Right Lower Arm Pivots
Fill (O)
(See note 35)

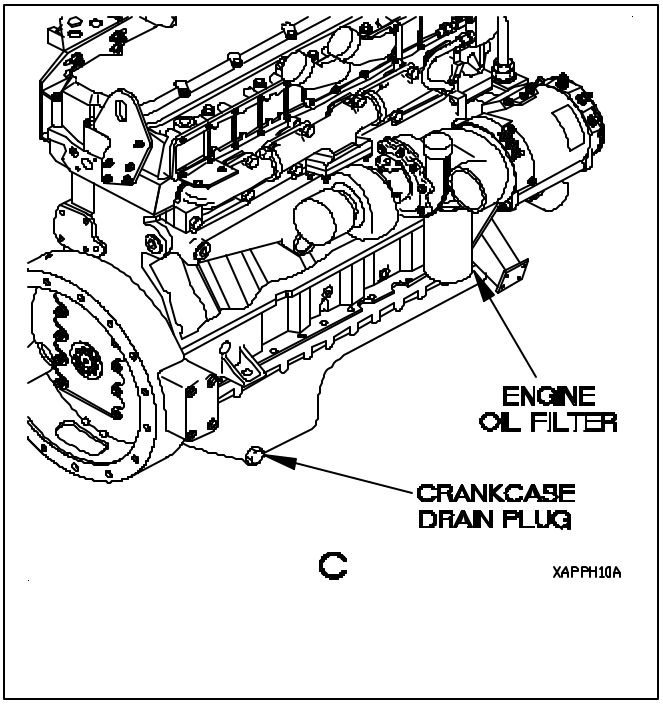
M1089 UNDERLIFT ASSEMBLY

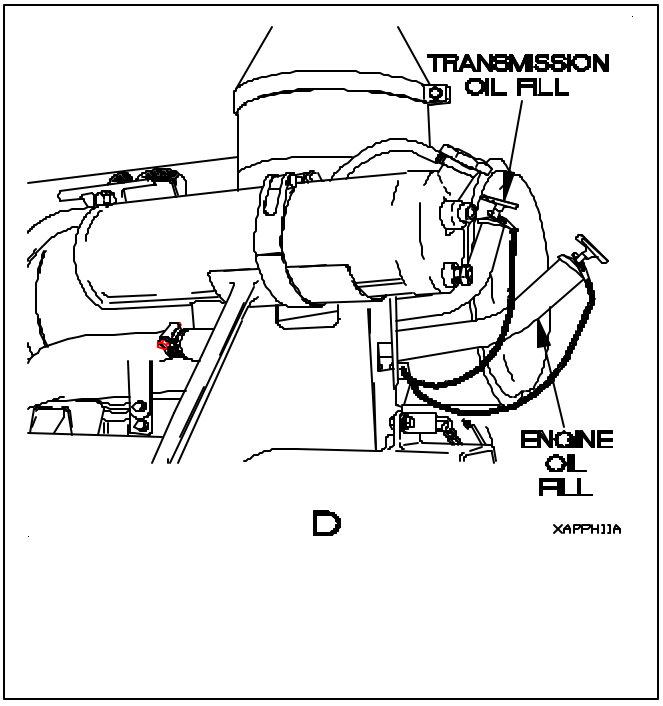
NOTE: Dashed arrows indicate lubrication on both sides of vehicle

H-8. LOCAL VIEWS

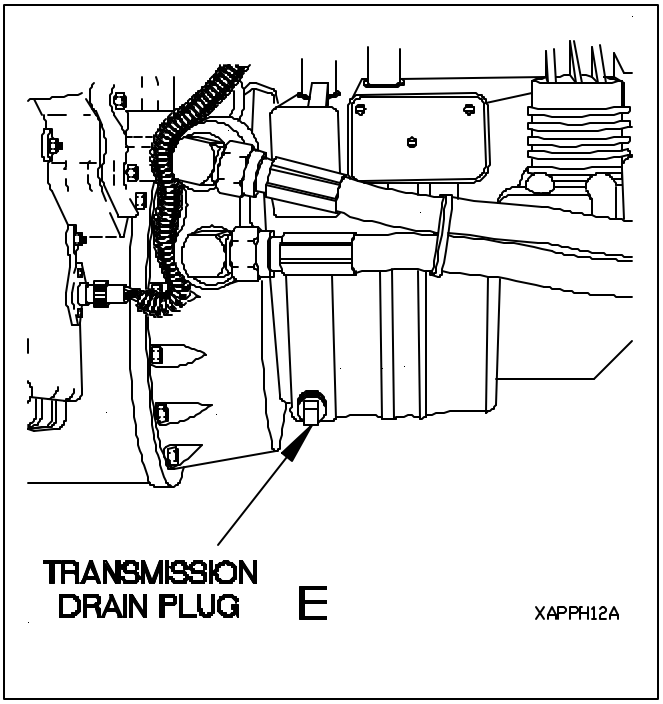


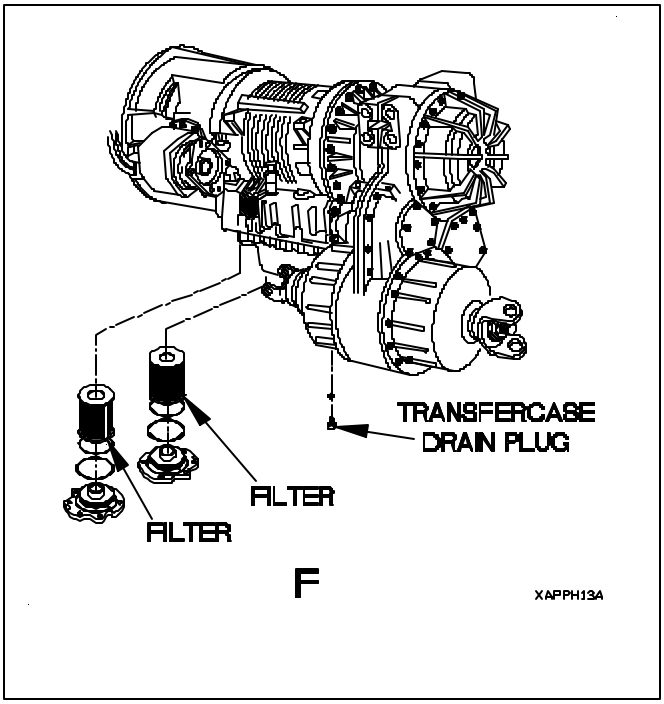


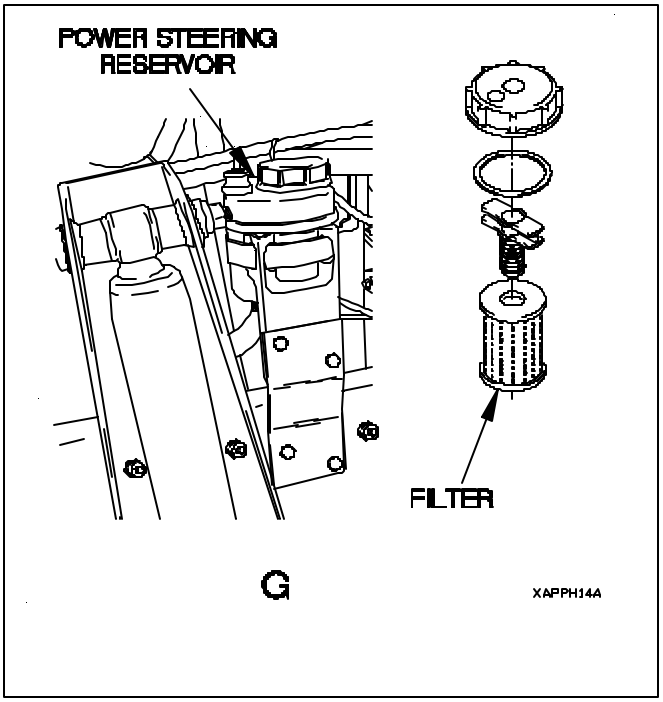


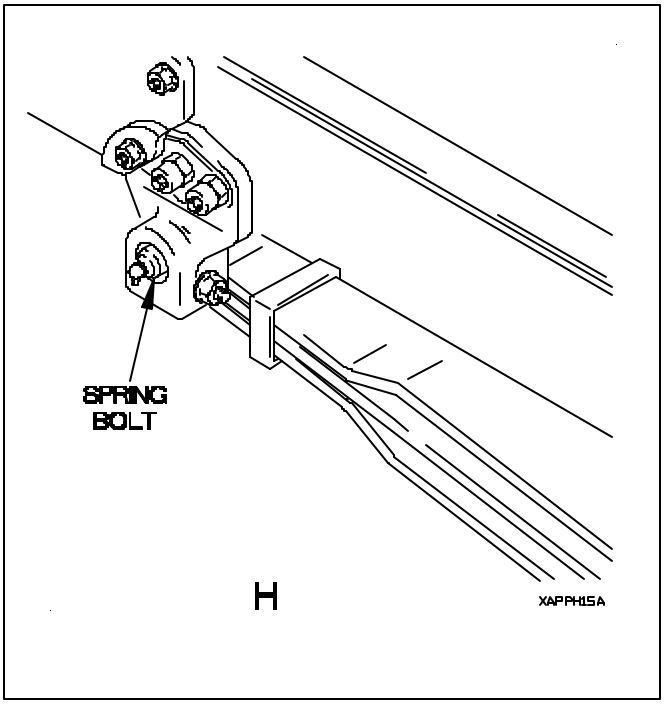


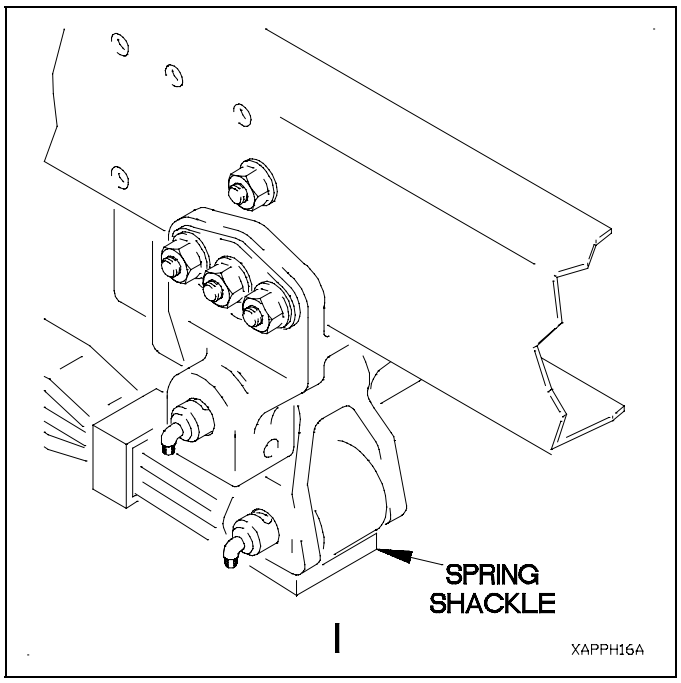
H-8. LOCAL VIEWS (CONT)



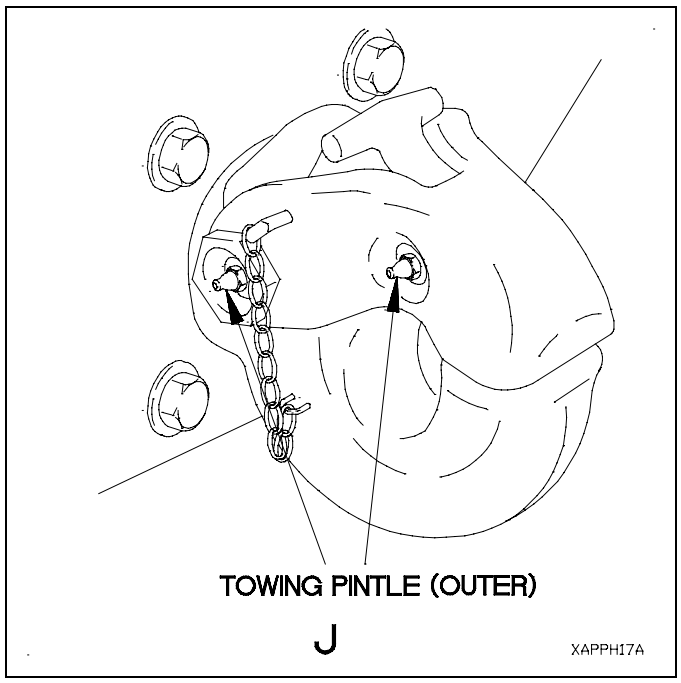




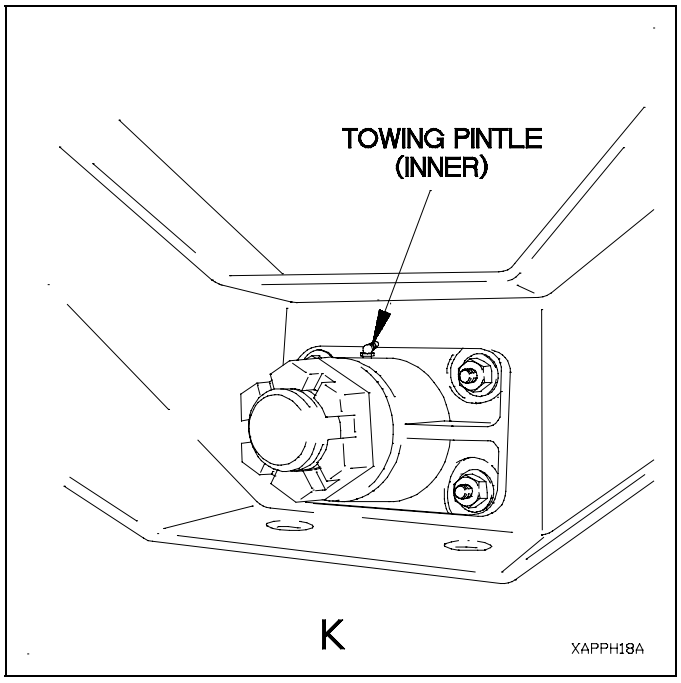



SPRING
SHACKLE
XAPPH16A

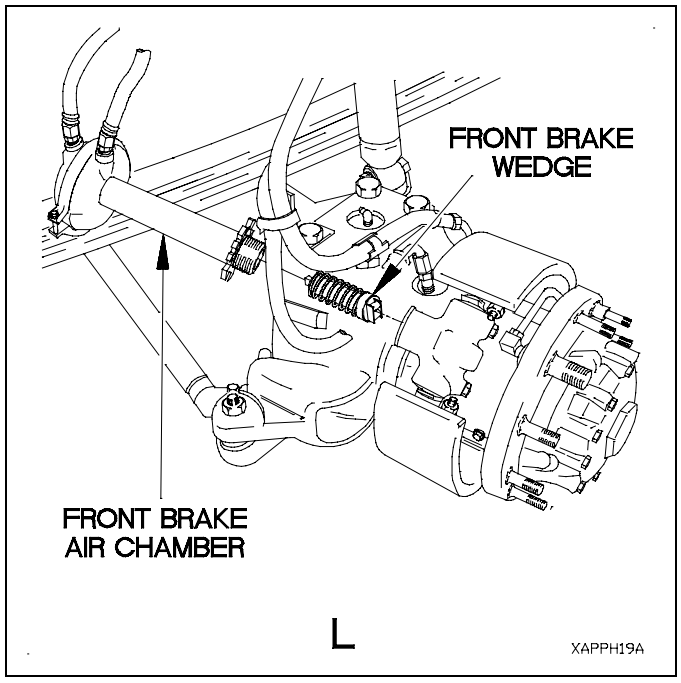
I


TOWING PINTLE (OUTER)
XAPPH17A

J

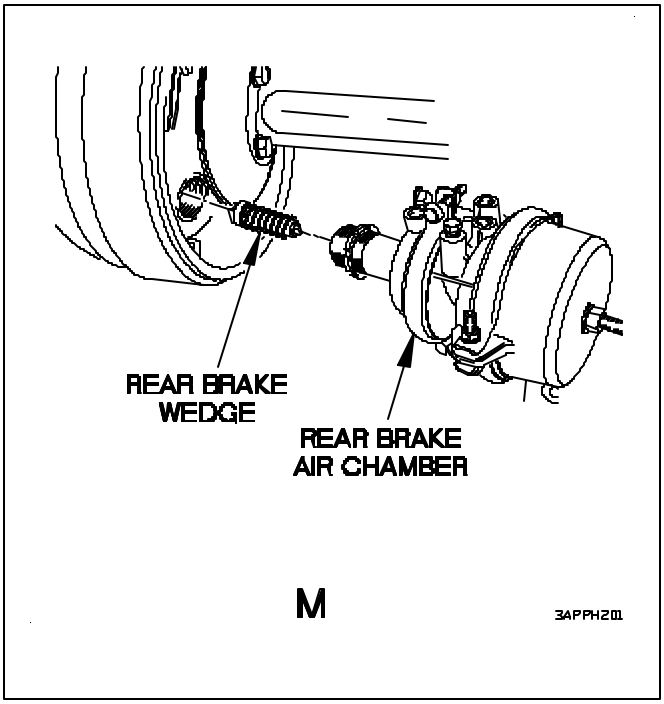

TOWING PINTLE
(INNER)
XAPPH18A

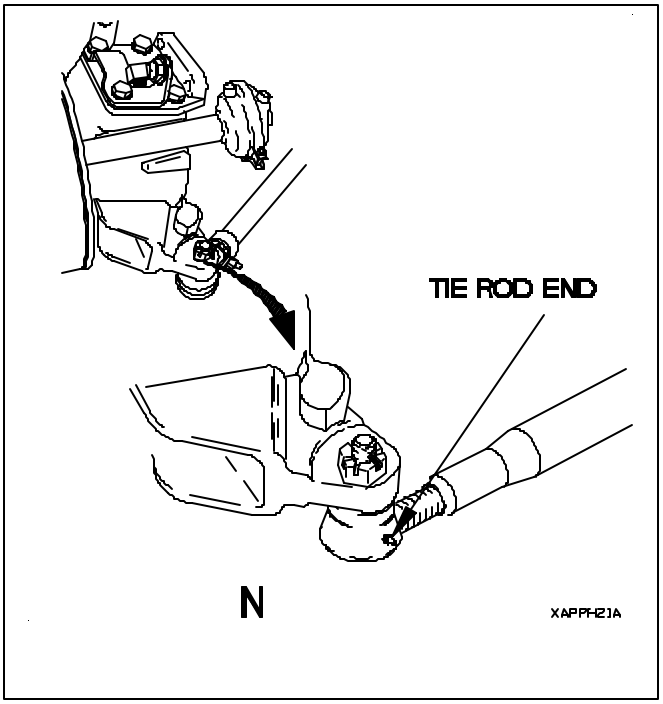
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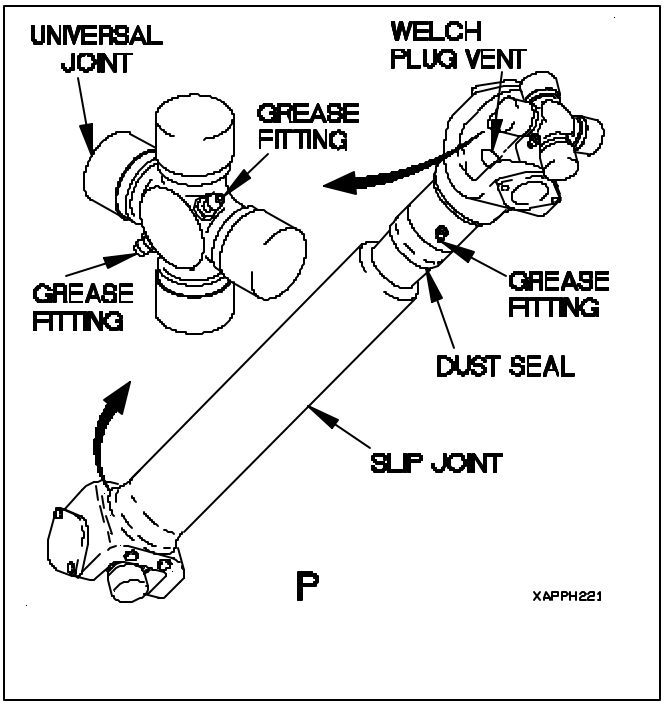

FRONT BRAKE
WEDGE
FRONT BRAKE
AIR CHAMBER
XAPPH19A

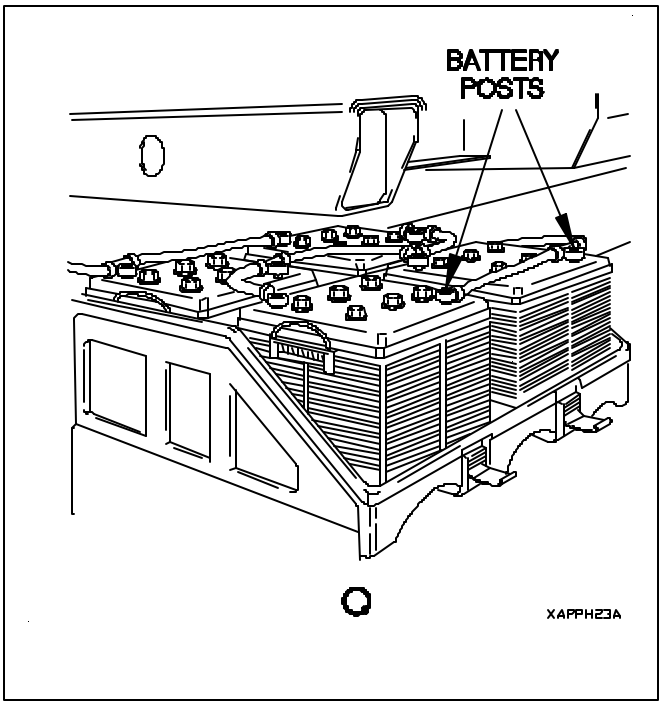
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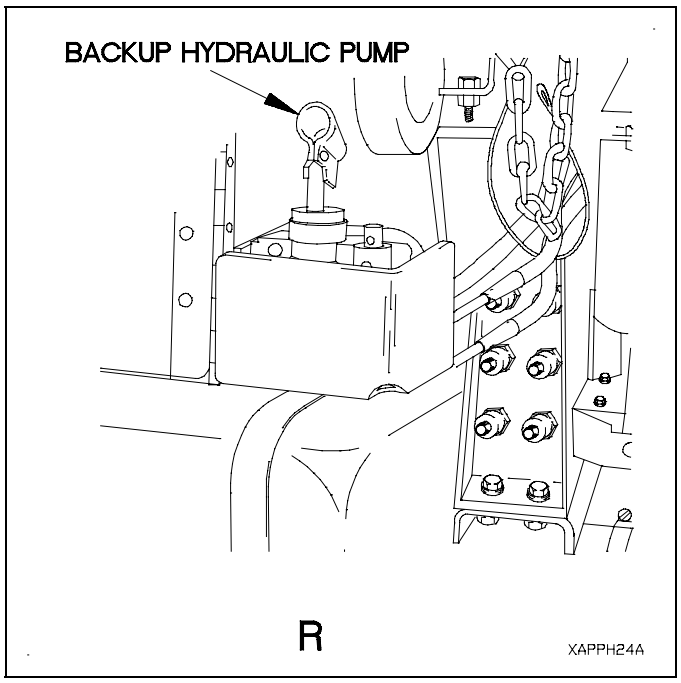
H-8. LOCAL VIEWS (CONT)

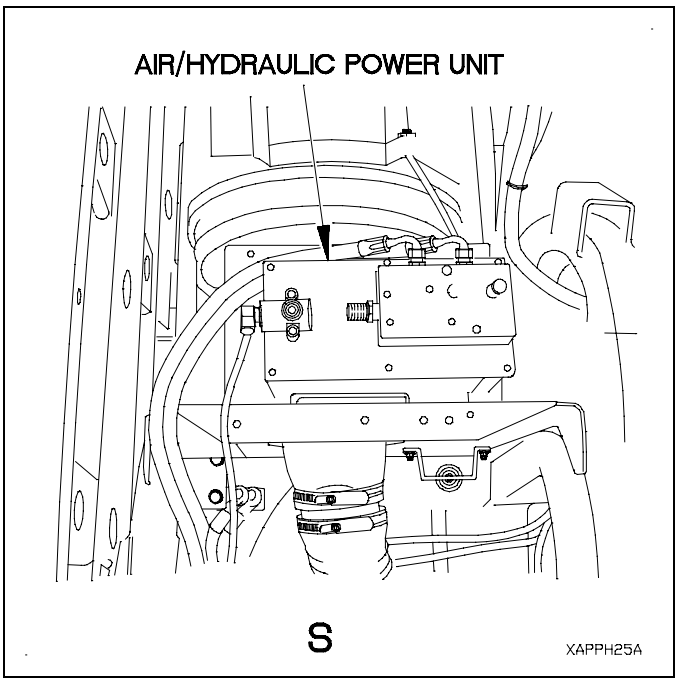


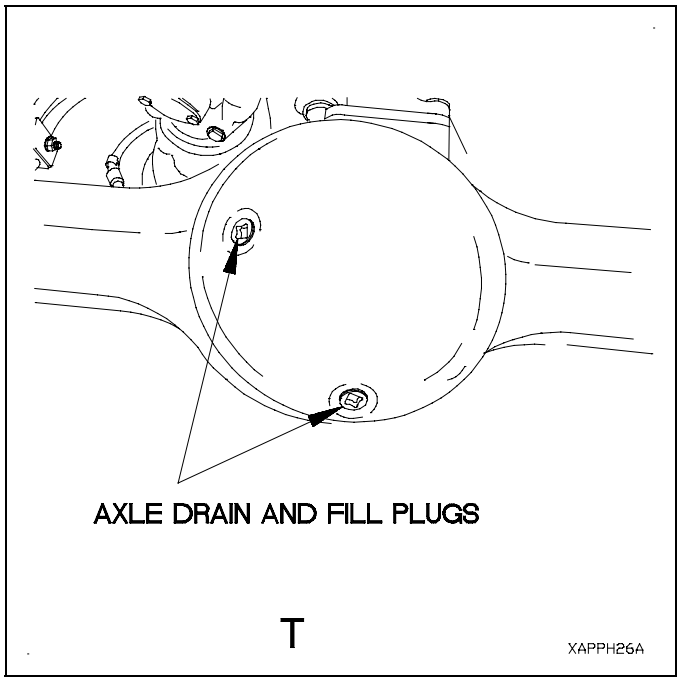


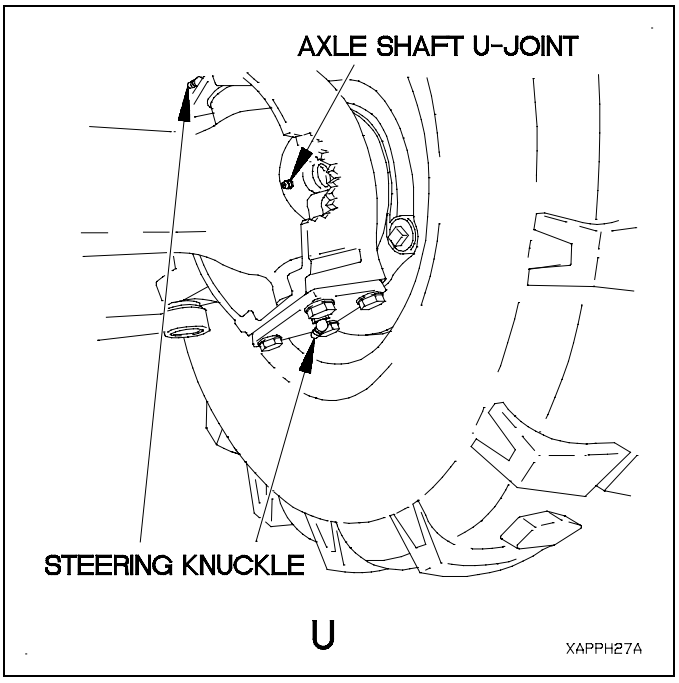




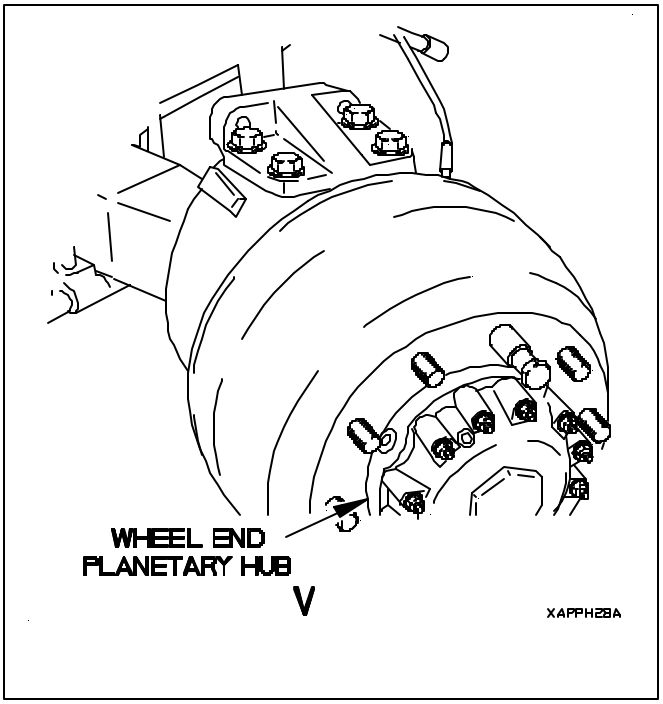

BACKUP HYDRAULIC PUMP
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XAPPH24A

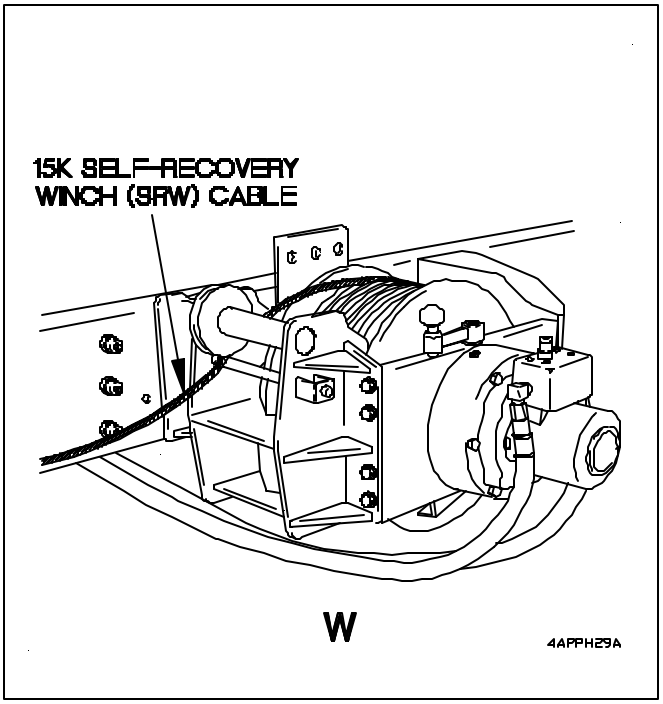

AIR/HYDRAULIC POWER UNIT
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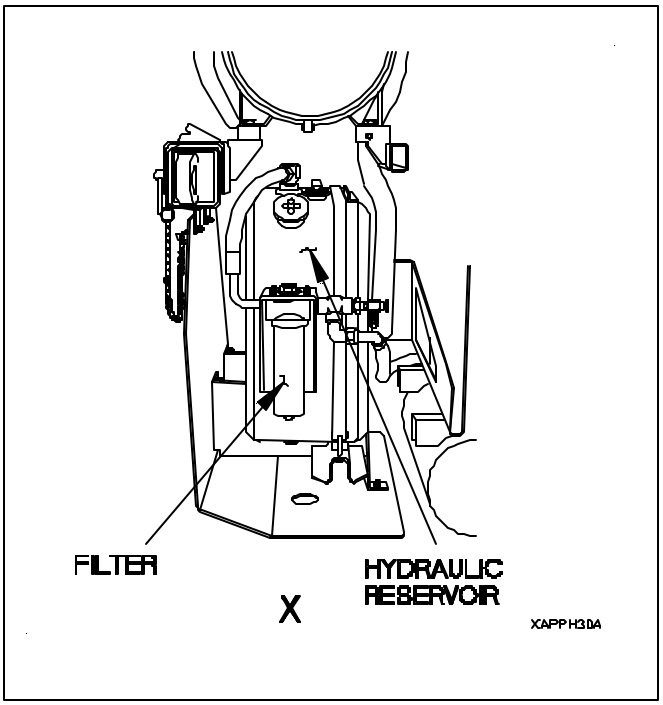

AXLE DRAIN AND FILL PLUGS
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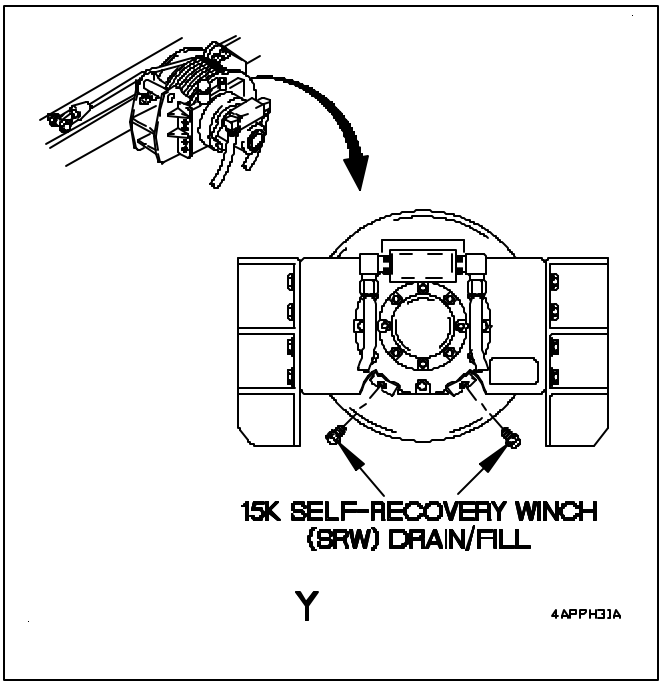

AXLE SHAFT U-JOINT
STEERING KNUCKLE
U
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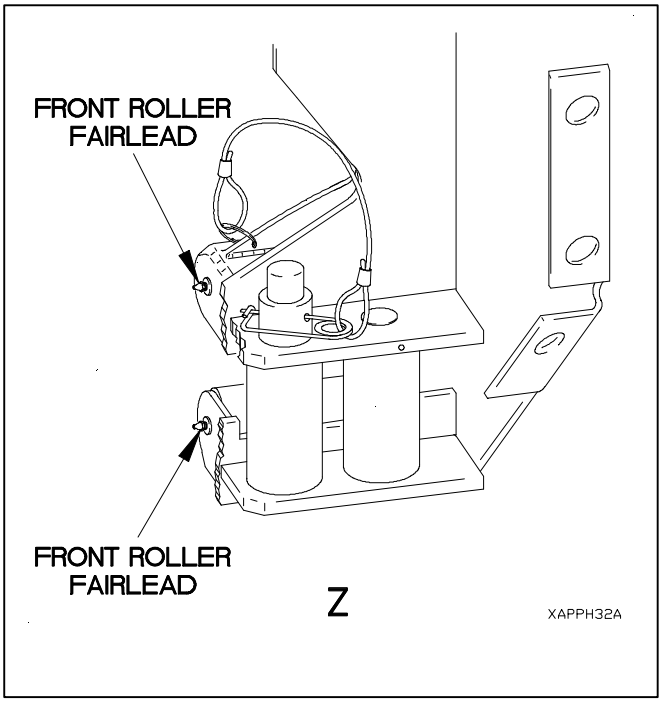
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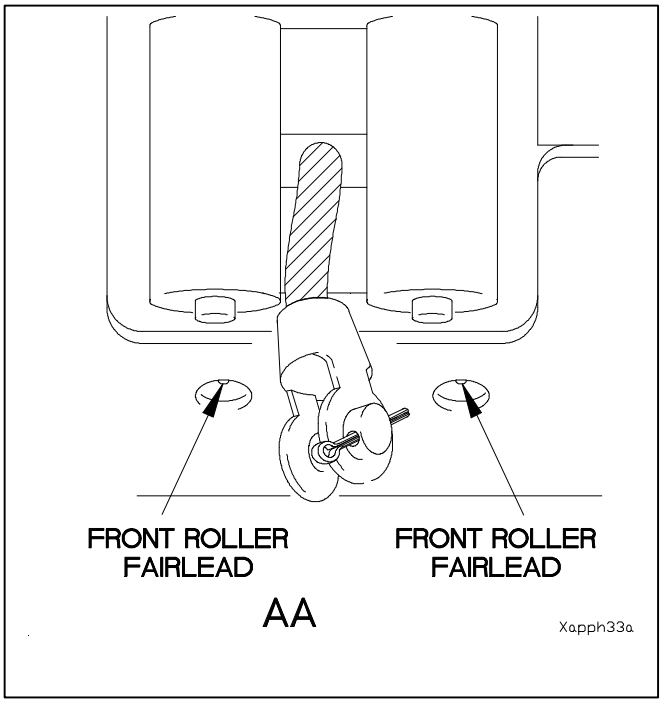


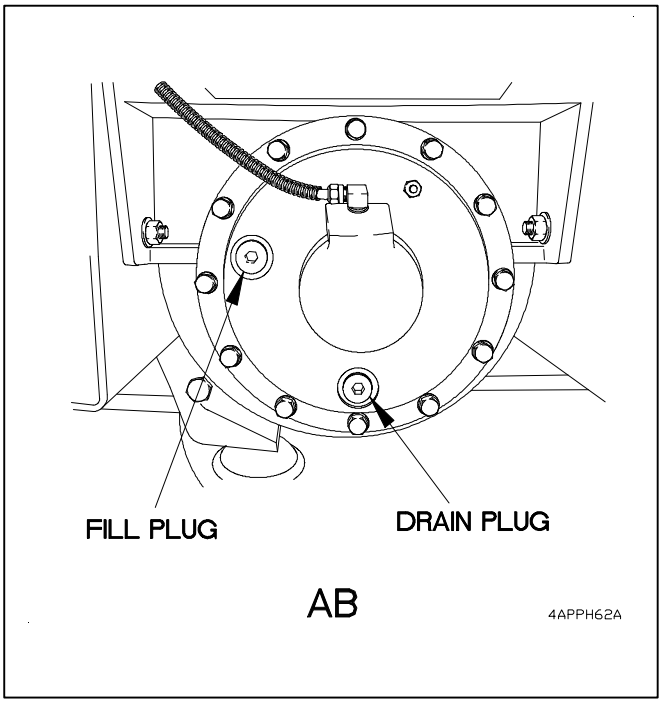


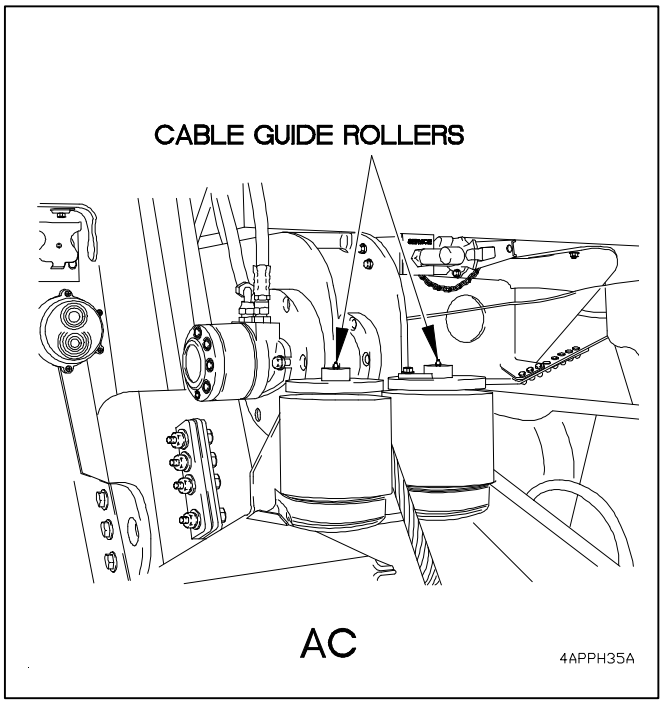




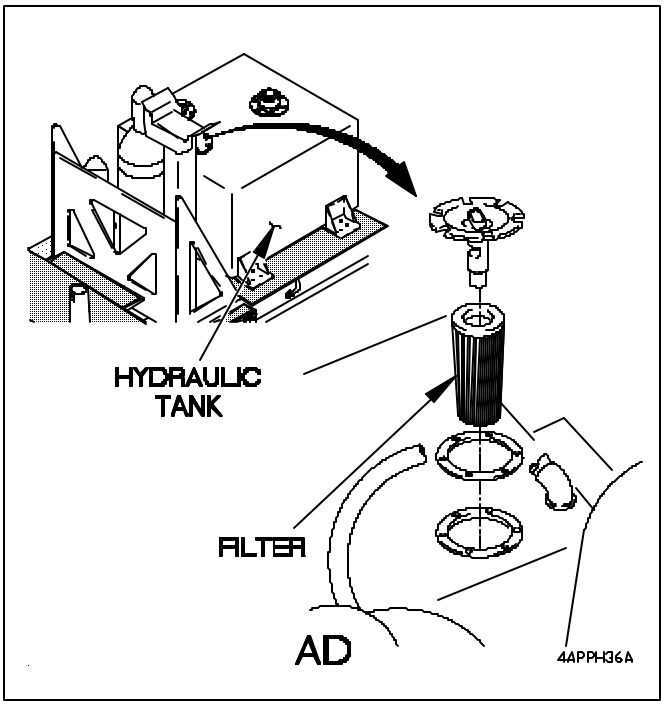

FRONT ROLLER FAIRLEAD
FRONT ROLLER FAIRLEAD
Z
XAPPH32A

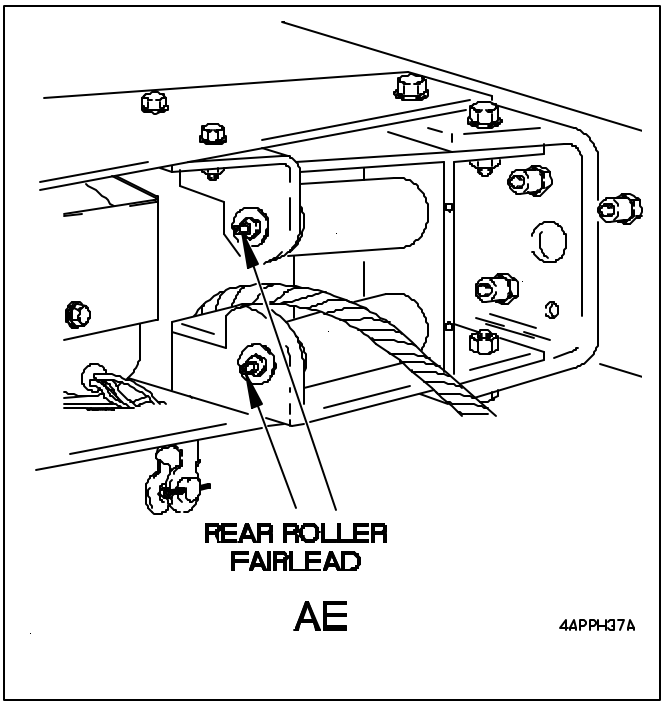

FRONT ROLLER FAIRLEAD
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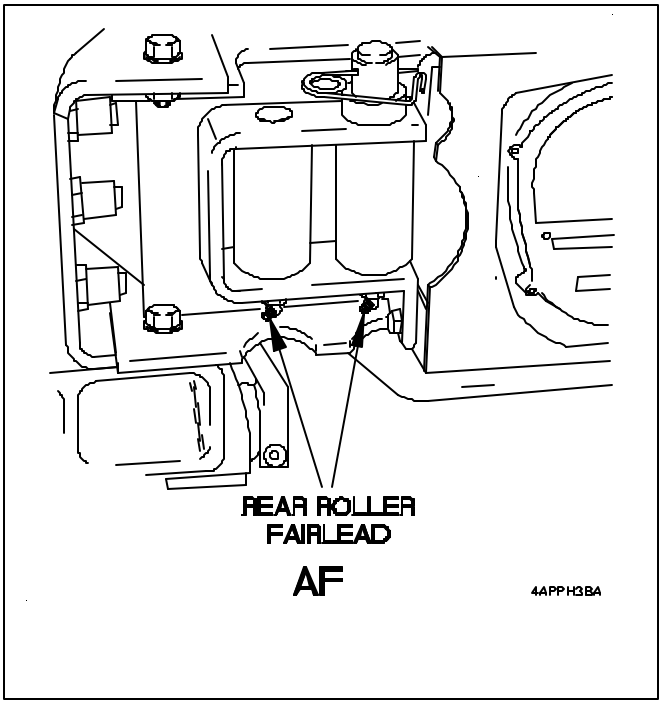

FILL PLUG
DRAIN PLUG
AB
4APPH62A

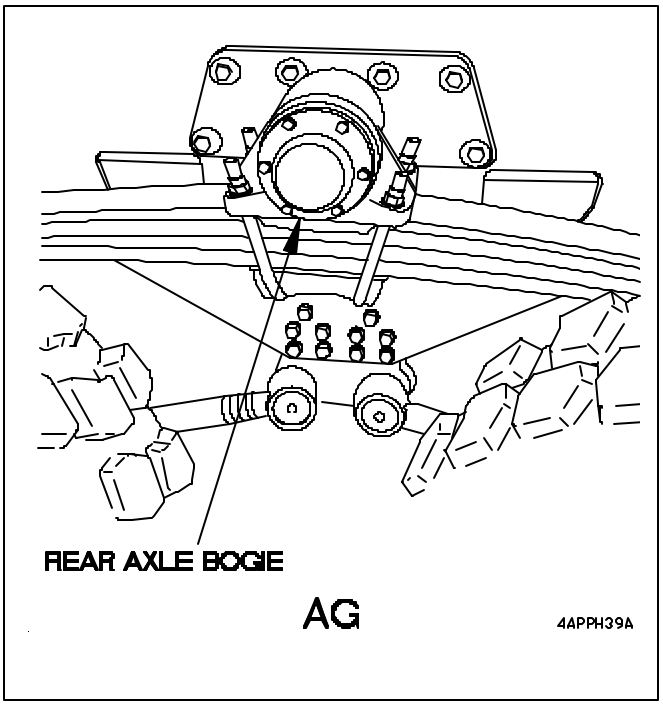

CABLE GUIDE ROLLERS
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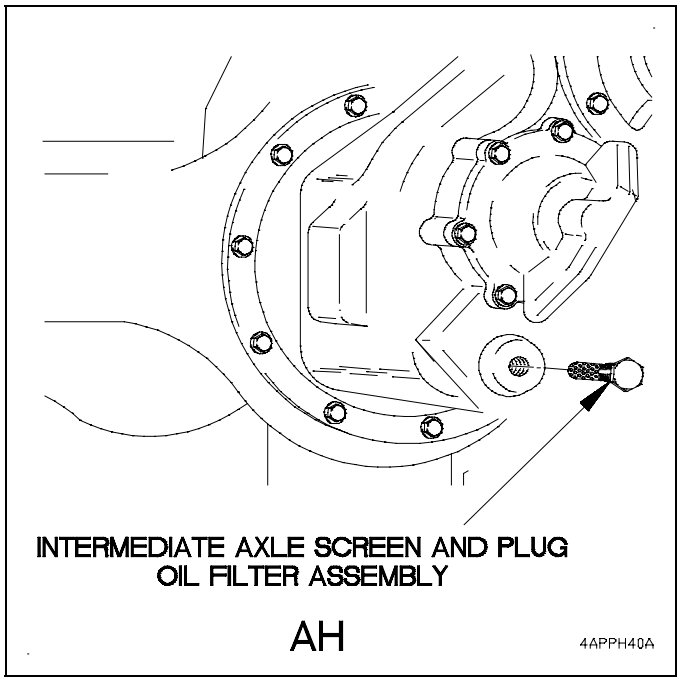
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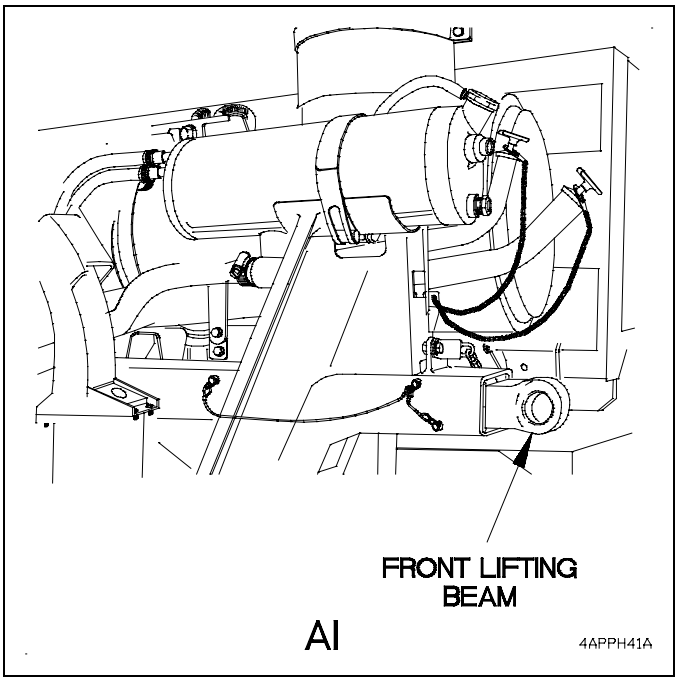




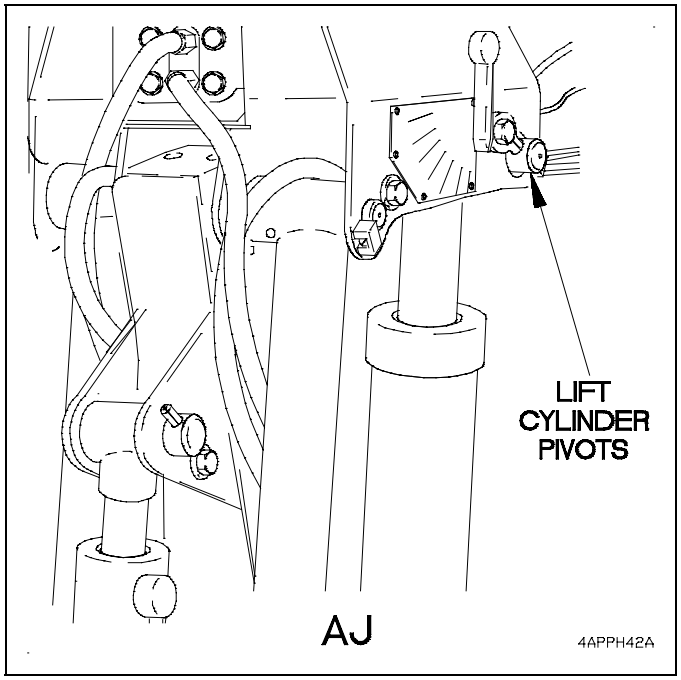




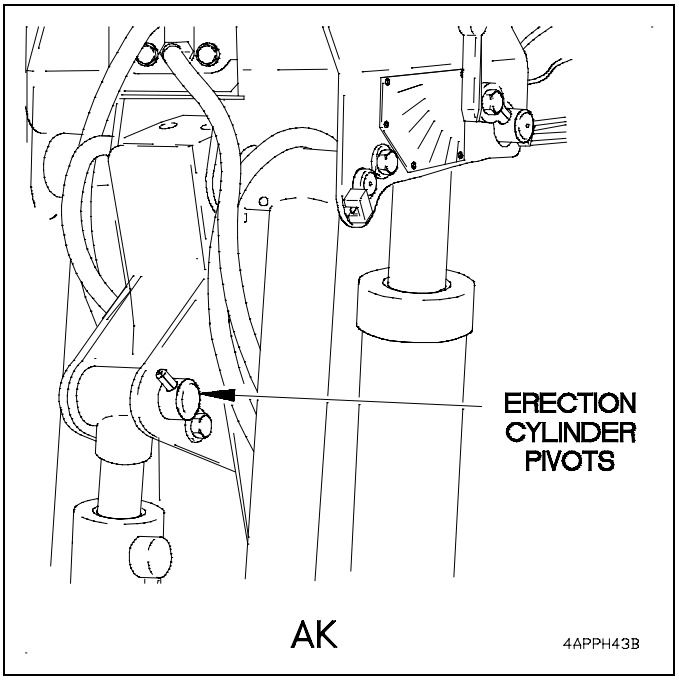
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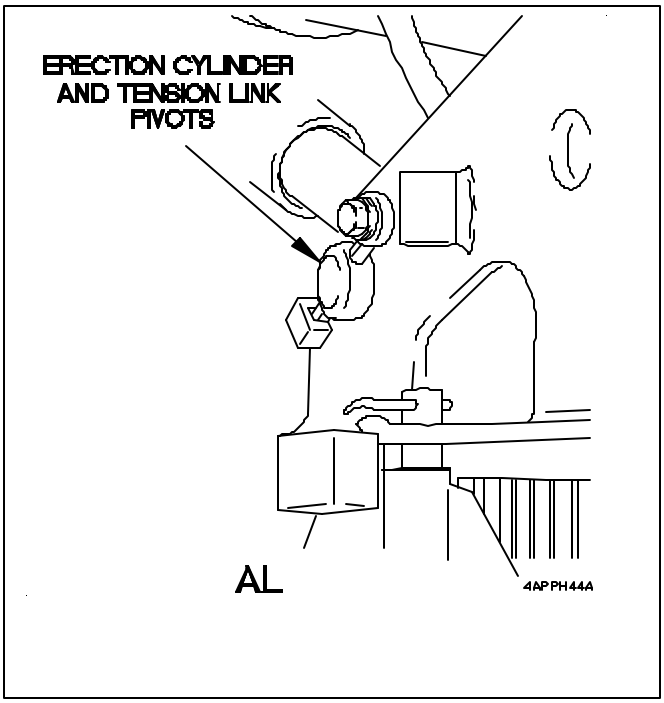


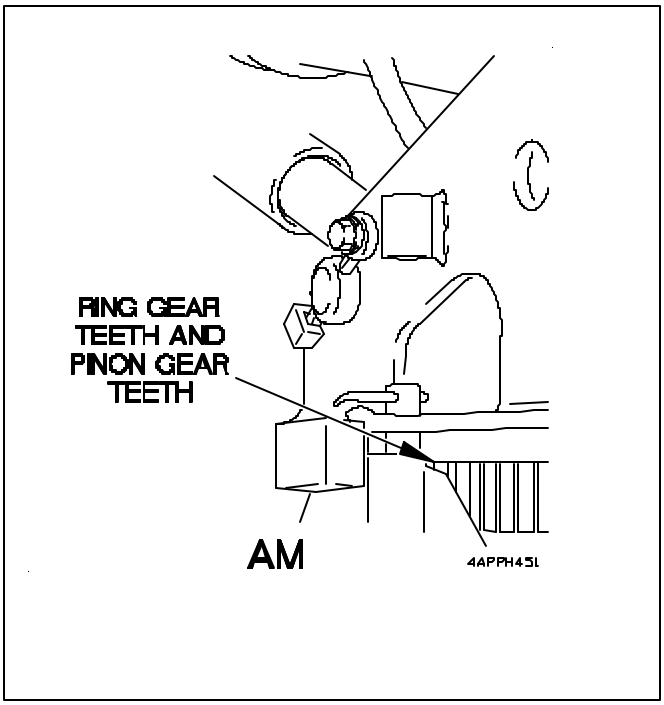
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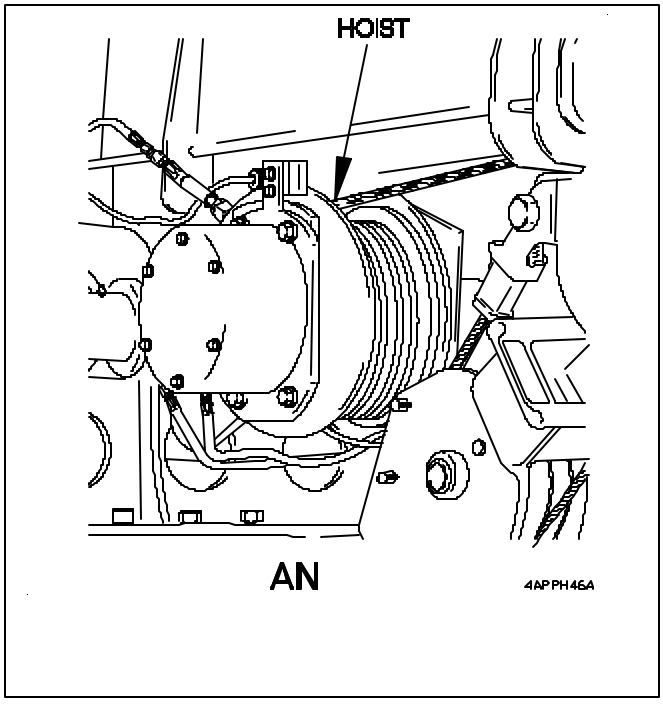


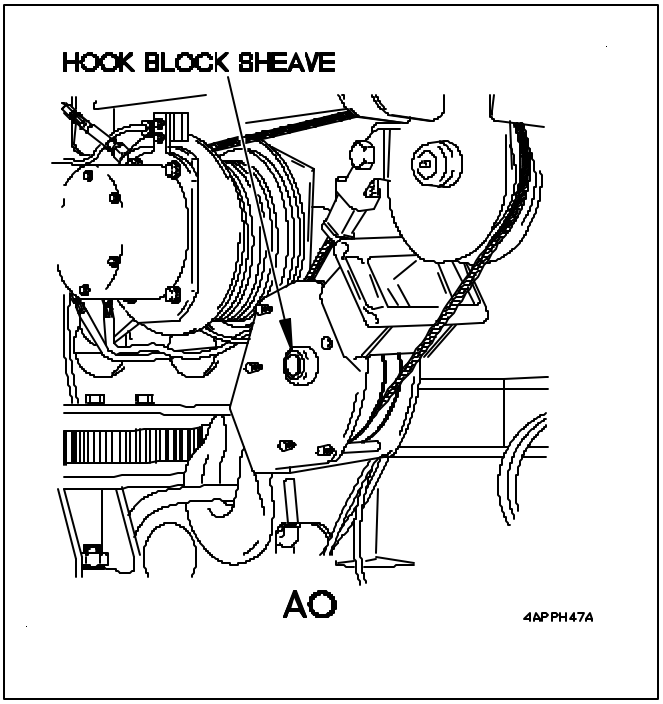
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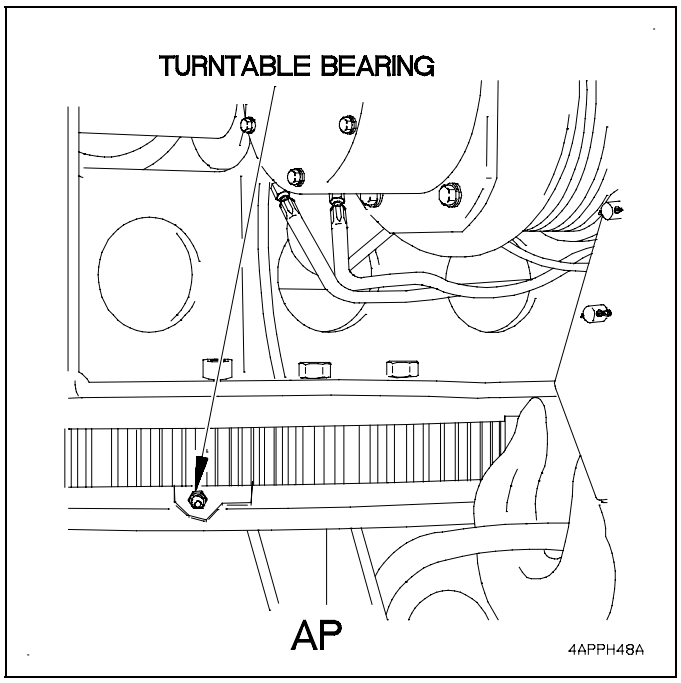
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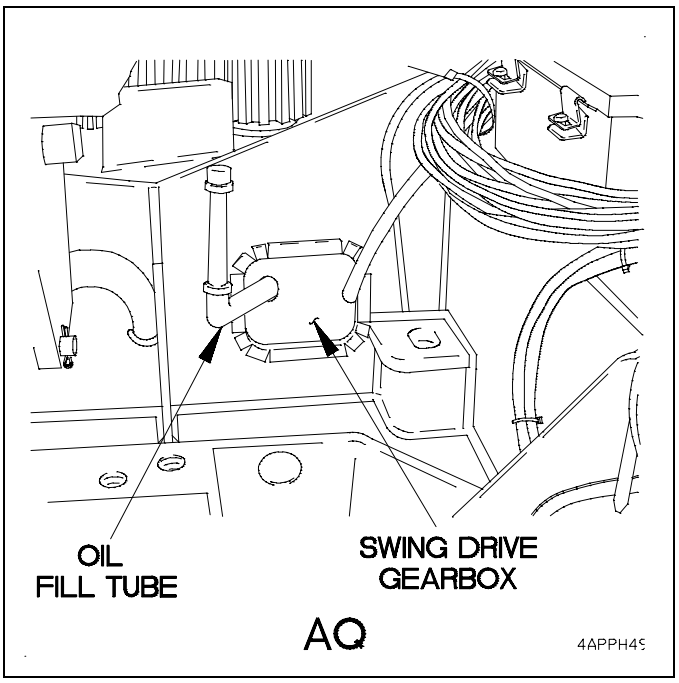


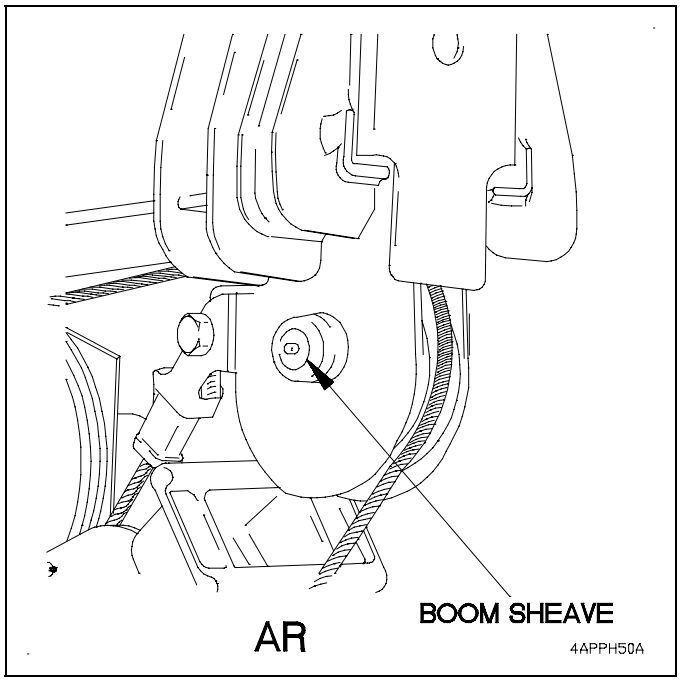


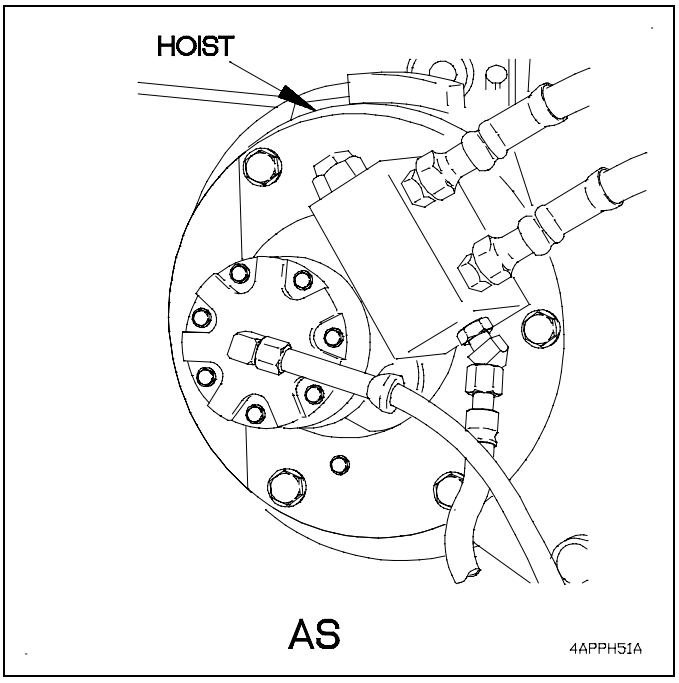




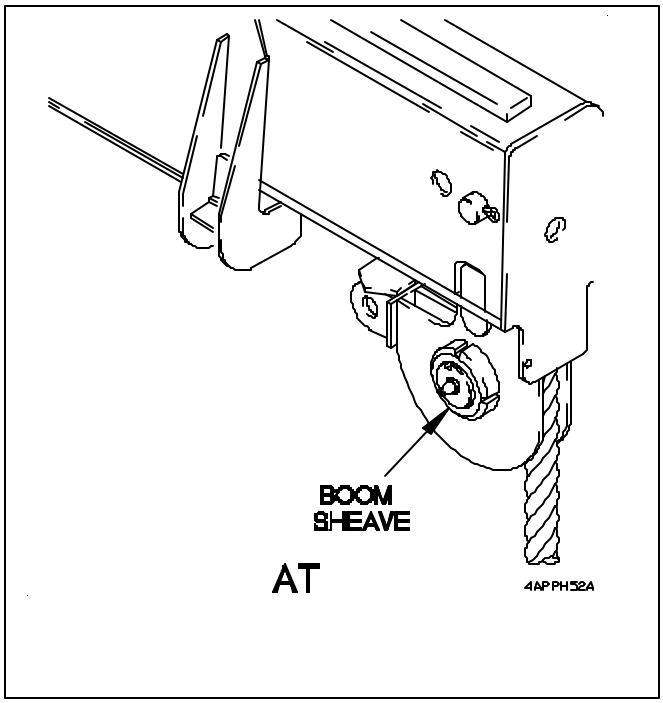

TURNTABLE BEARING
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4APPH48A

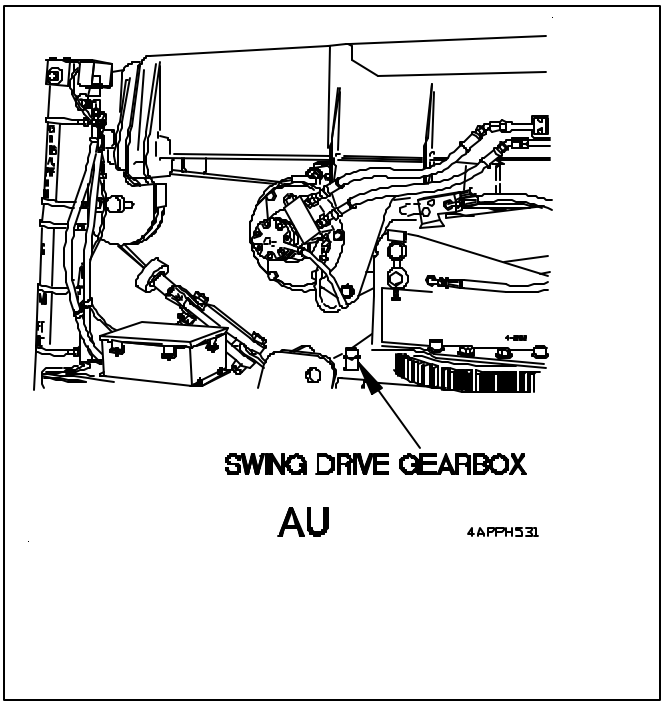

OIL
FILL TUBE
SWING DRIVE
GEARBOX
AQ
4APPH49

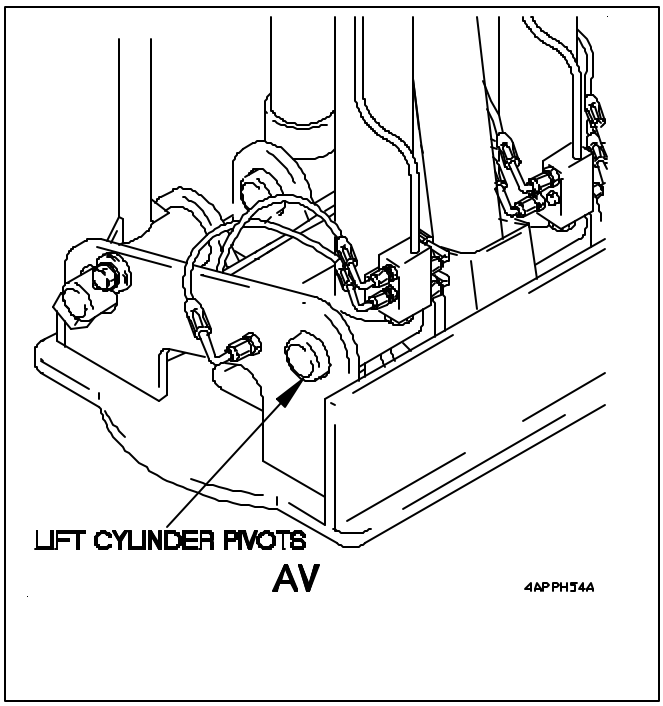

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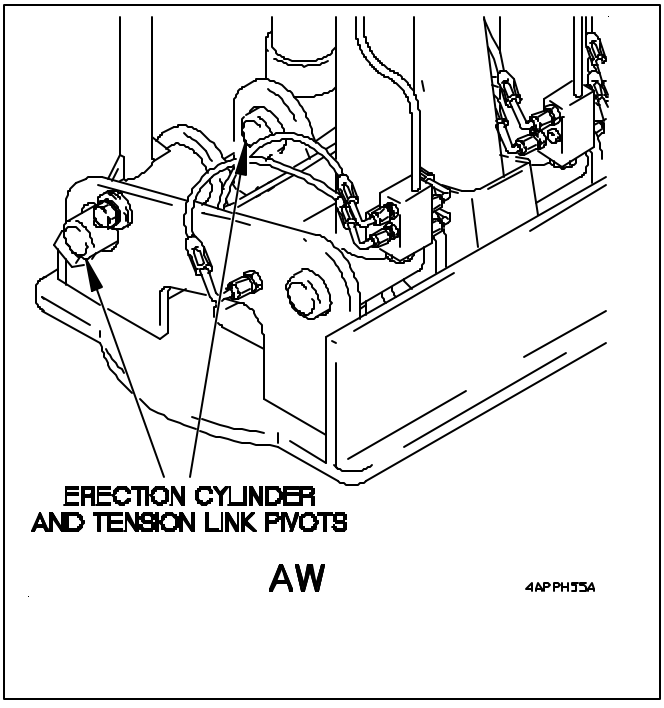

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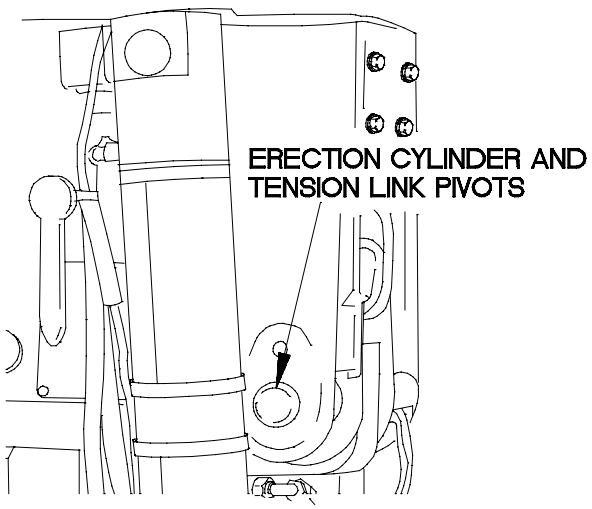
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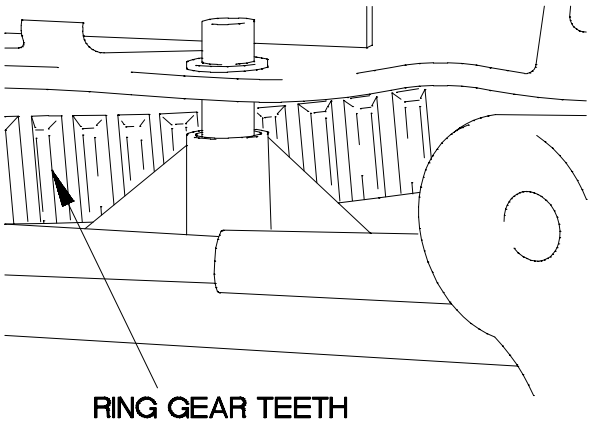




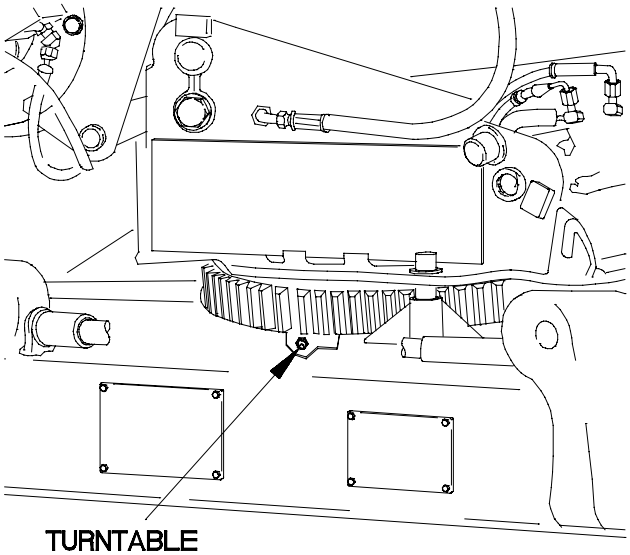




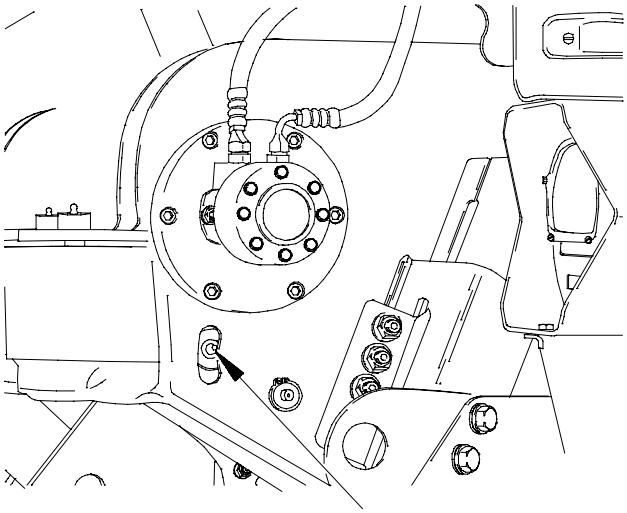
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AY 4APPH57

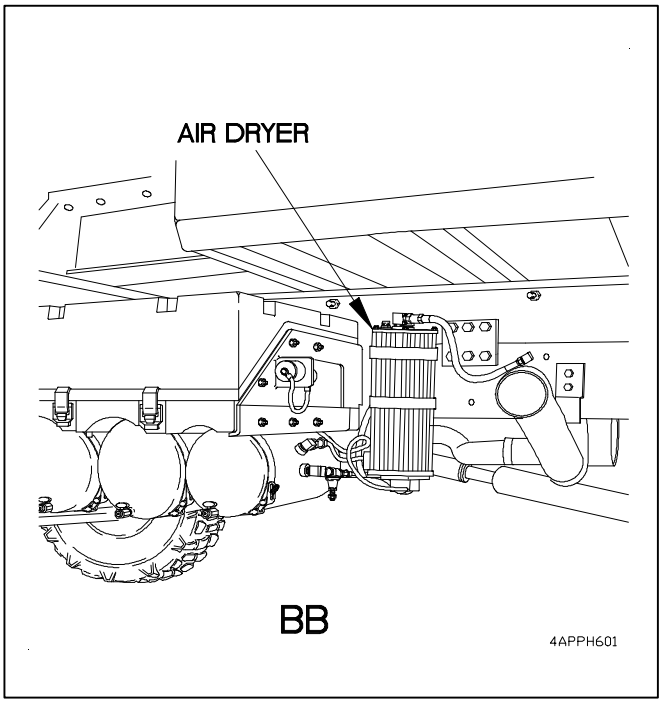


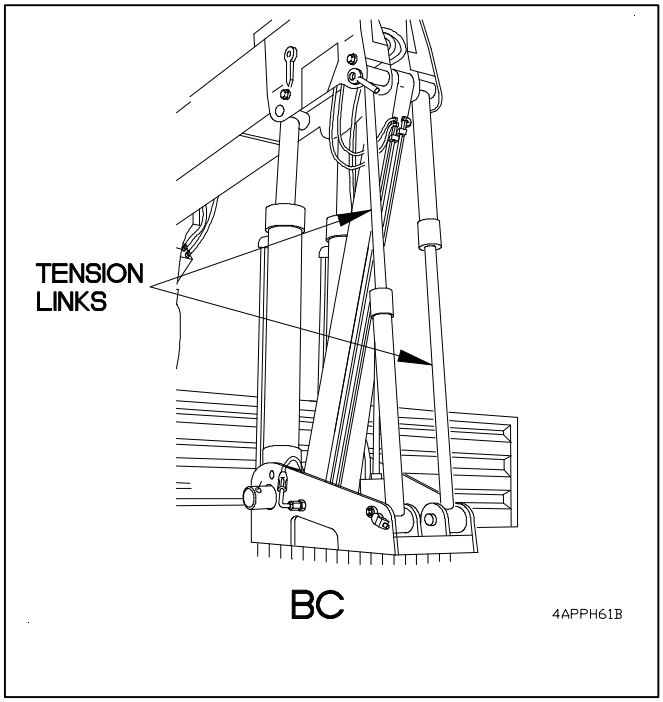
AZ 4APPH58A



BA 4APPH59A

H-8. LOCAL VIEWS (CONT)





H-9. LUBRICATION/SERVICES NOTES

1. ENGINE CRANKCASE. Check engine oil level daily. Change engine oil at initial 5,000 miles (8,045 km). During the remainder of the 12,000 mile (19,308 km)/18 month warranty period. Units participating in AOAP will sample engine oil every 3,000 miles (4,827 km) or 6 months, whichever occurs first and change oil as directed by AOAP. Units not participating in AOAP, will change engine oil every 6,000 miles (9,654 km) or every six months, whichever occurs first. After expiration of engine warranty period, Units participating in AOAP will perform engine oil change as directed by AOAP. Units not participating in AOAP will change engine oil every 6,000 miles (9,654 km) or every six months, whichever occurs first, or when operating in dusty areas or under severe operating conditions, change the oil every 3,000 miles (4,827 km) or every three months, whichever occurs first. Drain engine oil when engine is warm. Refill engine crankcase with OE/HDO specified for the ambient temperature. Engine oil is full when level is within crosshatch marks on the dipstick. Do not overfill.

2. ENGINE OIL FILTER. Filter is replaced each time the crankcase is drained. If water or metal particles are detected during oil filter replacement, notify Direct Support Maintenance personnel before refilling crankcase (para 3-4).

3. TRANSMISSION. Check transmission oil level daily. Change transmission oil at initial 5,000 miles (8,045 km). During the remainder of the 24 month/unlimited mileage warranty. Units participating in AOAP will sample transmission oil every 6,000 miles (9,654 km) or 12 months, whichever occurs first and change oil as directed by AOAP. Units not participating in AOAP will perform transmission oil change every 24,000 miles (38,616 km) or once every two years, whichever occurs first. Drain transmission oil when engine is warm. Refill with OE/HDO specified for ambient temperature. Add oil until the proper level is reached (TM 9-2320-366-10-1). Do not overfill. Replace oil filters each time transmission oil is changed (para 8-9).

4. POWER STEERING. Check power steering oil level weekly. Change the oil every 24,000 miles (38,616 km). Disconnect upper and lower hoses from steering gear and drain oil. Refill power steering pump reservoir with OE/HDO specified for the ambient temperature. Reservoir is full when oil is between the two marks on the dipstick. Do not overfill. Remove dipstick, wipe clean and install dipstick fully into reservoir. Remove dipstick and read oil level. Replace oil filter each time power steering oil is changed (para 13-8).

5. FUEL/WATER SEPARATOR. Replace filter element every 6,000 miles (9,654 km) or once every six months, whichever occurs first (para 4-13).

6. FUEL FILTER. The fuel particle filter is replaced when a new fuel/water separator filter element is installed. The normal replacement interval is every 6,000 miles (9,654 km) or once every six months, whichever occurs first (para 4-14).

7. ENGINE COOLANT. Check engine coolant level daily. Change the coolant and flush the cooling system every 24,000 miles (38,616 km) or once every two years, whichever occurs first. Fill radiator overflow tank with an Ethylene Glycol/water mixture as specified in 0-A-548D. Service the cooling system before the specified interval if:

- Coolant is heavily contaminated.
- Engine overheats.
- Oil cooler has failed allowing oil and coolant to mix.

8. HYDRAULIC RESERVOIR AND FILTER (All Models Except M1089). Check oil level weekly and make sure oil level gage reads **F (full)**. Units participating in AOAP will sample oil annually and change oil and filter as directed by AOAP. Units not participating in AOAP will change oil and filter every two years. Drain oil and refill hydraulic reservoir with OE/HDO specified for ambient operating temperature. Fill hydraulic reservoir until oil level gage reads **F (full).** Do not overfill. Replace oil filter each time oil is changed (para 19-13).

9. DRIVE SHAFT UNIVERSAL and SLIP YOKE.
Lubricate drive shafts with GAA every 3,000 miles (4,827 km) or once every three months, whichever occurs first, using a low pressure lubrication gun. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first. Perform drive shaft hinging inspection every time drive shafts are serviced (para 9-3).

- UNIVERSAL JOINT:
  A. Apply grease to both grease fittings until new grease purges from all four bearing caps.
  B. If grease does not purge from all four bearing caps, perform the following steps:
  (1) Loosen two screws on bearing cap that does not purge, approximately 1/4 in.
  (2) Apply grease to grease fitting for bearing cap that does not purge until bearing cap purges.
  (3) Remove and discard the two screws loosened in step (1).
  (4) Position two replacement screws in bearing cap and tighten down evenly.
  (5) Tighten two screws to 26-35 lb-ft (35-47 N m).

- SLIP JOINT:
  A. Apply grease until grease appears at the vent in the welch plug.
  B. Place your finger over the welch plug vent and add grease until grease purges from the dust seal.
  C. If grease does not purge from the dust seal, inspect drive shaft slip yoke (para 9-2).

10. AIR/HYDRAULIC POWER UNIT and BACKUP HYDRAULIC PUMP. Change OHA oil every 24,000 miles (38,616 km) or once every two years, whichever occurs first. To service air/hydraulic power unit and backup hydraulic pump refer to vehicle para 19-8, Air Transportability Hydraulic System Service.

11. ALL AXLE DIFFERENTIALS. Check oil level in differentials every 3,000 miles (4,827 km). Check oil level with vehicle parked on level surface and axle differential at ambient temperature, allowing at least one hour to cool down after vehicle operation. If oil is checked when axle differential is hot, it is normal for oil to spill out of the port due to expansion from the heat. Oil level is considered full if it is within one inch of the bottom of the fill port. If oil spills from the fill port when the axle differential is cool, it is overfull. Allow oil to drain until no more drains out. If the oil level is more than one inch below the bottom of the fill port, refill axle differential with GO specified for the ambient temperature until level with bottom of fill port. Change the oil every 24,000 miles (38,616 km) or once every two years, whichever occurs first. Drain oil when hot after operation.

H-9. LUBRICATION/SERVICES NOTES (CONT)

12. FRONT AXLE WHEEL END PLANETARY HUBS. There are two lube intervals for the front axle wheel end planetary hubs.

a. Check and fill front axle wheel end planetary hubs every 3,000 miles (4,827 km) or once every three months, whichever occurs first, as follows:

(1) Position vehicle on a level surface. Allow 15 minutes for vehicle to cool before checking oil levels.
(2) Position fill port at 4 o'clock position. If oil flows from fill port when plug is loosened, let oil drain to correct level. If oil level is below fill port, fill hub with GO specified for the ambient temperature until oil is level with fill port.

b. Drain and fill front axle wheel end planetary hubs every 24,000 miles (38,616 km) or once every two years, whichever occurs first, following the repacking of the inner wheel bearings, or whenever wheel end assemblies are taken apart for other maintenance as follows:

(1) Position vehicle on a level surface.
(2) Position fill port at the 6 o'clock (down) position.
(3) Drain hub oil (allow a minimum of 15 minutes for oil to drain down from vent tubes).
(4) Refill hubs with 11-13 ounces of GO specified for the ambient temperature.

13. TIE ROD ENDS. Lubricate tie rod ends with GAA every 6,000 miles (9,654 km) or once every six months, whichever occurs first, using a low pressure lubrication gun, until new grease is seen purging from the boot area. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

14. WINCH CABLES:

CAUTION

Do not use dry cleaning solvent to clean winch cables. Use of dry cleaning solvent will remove lubricant from inner strands of winch cables. Failure to comply may result in damage to equipment.

a. After winch operation:

Refer to FM 5-125.

b. Care of wire rope:

Refer to FM 5-125.

c. Inspection of wire rope:

Refer to FM 5-125.

d. Every six months:

(1) Unwind entire length of winch cable (TM 9-2320-366-10-1).
(2) Soak and clean winch cable with new OE/HDO 30.
(3) Wipe off excess OE/HDO 30.
(4) Coat winch cable with GW.
(5) Rewind winch cable (TM 9-2320-366-10-1).

15. 15K SRW. Check 15K SRW gear oil level every 6,000 miles (9,654 km) or once every six months, whichever occurs first. Refill 15K SRW with GO specified for ambient temperature. Change oil every 12,000 miles (19,308 km) or once every year, whichever occurs first. Use procedure (a) to check and fill oil level; use procedure (b) to change oil.

a. Check and fill oil level as follows:

(1) Shift the freespool mechanism to the disengage position so the drum can be freely rotated.
(2) Rotate the drum to where either plug is near the top of the 15K SRW. Remove the plug.
(3) Rotate the drum 90 degrees in the direction that allows the other plug to be near the top of the 15K SRW. Remove the plug.

NOTE

Oil level is full if a small amount of oil runs out of lower plug.

(4) Add oil until a small amount of oil runs out of lower plug hole.
(5) Apply adhesive (Item 3, Appendix D) to plug and position plug in top hole.
(6) Rotate drum until open hole is at top.
(7) Apply adhesive (Item 3, Appendix D) to plug and position plug in top hole.
(8) Tighten plugs to 13-15 lb-ft (18-20 N·m).

b. Change oil as follows:

(1) Shift the freespool mechanism to the disengage position so the drum can be freely rotated.
(2) Rotate the drum to where either plug is near the top of the 15K SRW. Remove the plug.
(3) Rotate the drum 90 degrees in the direction that allows the other plug to be near the top of the 15K SRW. Remove the plug.
(4) Position drain pan (Item 39, Appendix C) under 15K SRW.
(5) Rotate the drum until either hole is straight down to the bottom of the 15K SRW. Allow the oil to drain completely.
(6) Rotate the drum until either hole is at top.

NOTE

Oil level is full if a small amount of oil runs out of lower plug.

(7) Add oil until a small amount of oil runs out of lower plug hole.
(8) Apply adhesive (Item 3, Appendix D) to plug and position plug in top hole.
(9) Rotate drum until open hole is at top.
(10) Apply adhesive (Item 3, Appendix D) to plug and position plug in top hole.
(11) Tighten plugs to 13-15 lb-ft (18-20 N·m).

16. TOWING PINTLE. Lubricate towing pintle with GAA every 6,000 miles (9,654 km) or once every six months, whichever occurs first, using a low pressure lubrication gun until new grease is seen purging.

H-9. LUBRICATION/SERVICES NOTES (CONT)

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 breath 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 138 F (50 C). Failure to comply may result in serious injury or death to personnel.**

- **If personnel become dizzy while using 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 medical attention. Failure to comply may result in injury to personnel.**

17. ENGINE CRANKCASE BREATHER. Remove crankcase breather and clean with Dry Cleaning Solvent (SD P-D-680) (Item 65, Appendix D) or equivalent, and replace o-ring seal every 6,000 miles (9,654 km) or once every six months, whichever occurs first (para 3-5).

18. FRONT AXLE SPRING BOLT and SPRING SHACKLE. Lubricate front axle spring bolt and spring shackle with GAA every 3,000 miles (4,827 km) or once every three months, whichever occurs first, using a low pressure lubrication gun until grease appears between pins and bushings at both ends of spring bolt and spring shackle. If pins do not accept grease, notify Direct Support to remove pins. Clean and inspect pins and bushings, replace if necessary. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

19. BATTERY POSTS. Service batteries in accordance with TM 9-6140-200-14, every 6,000 miles (9,654 km) or once every six months, whichever occurs first.

20. FRONT AXLE SHAFT UNIVERSAL JOINTS and STEERING KNUCKLES. Lubricate universal joints every 3,000 miles (4,827 km) or once every three months, whichever occurs first. Lubricate steering knuckles with GAA every 6,000 miles (9,654 km) or once every six months, whichever occurs first, using a low pressure lubrication gun. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

21. BRAKE WEDGE and AIR CHAMBER: BRAKE SPIDER, SELF-ADJUSTER MECHANISM, AND WEDGE ASSEMBLY. Clean and lubricate (with GAA) areas of spider and hardware that contact the brake shoes. Disassemble, clean and lubricate the self-adjuster mechanism. Clean and lubricate the wedge head, rollers and ramps in the plungers. Clean and lubricate every 6,000 miles (9,654 km). If operating conditions are severe or abnormal, service at 3,000 miles (4,827 km) or once every three months, whichever occurs first, or when any of the following occur: Refer to para 11-4 and 11-5

- Seals are replaced
- Plungers are removed
- Brakes are relined
- Grease becomes contaminated or hardened

22. HYDRAULIC TANK (M1089). Check oil level weekly and make sure oil level indicates FULL. Units participating in AOAP will sample oil annually and change oil and filter as directed by AOAP. Units not participating in AOAP will change oil and filter every two years. Drain oil and refill hydraulic tank with OE/HDO specified for ambient operating temperature. Fill hydraulic tank until oil level is at the FULL mark on the sight glass. Do not overfill. Replace hydraulic oil filter (para 19-20) when oil is changed. Check oil level with Material Handling Crane (MHC) in the stowed position.

23. BOOM WEAR PADS (M1084/M1086/M1089). Lubricate every 6,000 miles (9,654 km) or once every six months, whichever occurs first. Coat boom wear pads with GAA while boom is extended, for the lower wear pads, boom must be retracted and access cover removed at rear of base boom to grease the upper wear pads. Extend boom in and out while applying grease. This method assures full lubrication for entire length of boom. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

24. HOIST ASSEMBLY DRUM (M1084/M1086/M1089). Check hoist assembly drum oil level every 6,000 miles (9,654 km) or every six months, whichever occurs first. Check oil level in hoist assembly drum using two pipe plugs (90 degrees apart) on the drum housing. Operate hoist assembly drum so that one pipe plug is positioned at top of drum (fill point) and the other is accessible and level with ground (check level point). Oil level is full if a small quantity of oil runs from check level opening. If oil level is low, add oil at fill opening. to drain, operate drum so that one pipe plug is bottom of drum. Remove plug to drain. Drain and refill with GO specified for the ambient temperature, if oil becomes contaminated.

25. SWING DRIVE GEARBOX (M1084/M1086/M1089). Check swing drive gearbox oil level every 6,000 miles (9,654 km) or once every six months, whichever occurs first. Oil level is checked by removing pipe plug located on side of gear reducer. Oil level is full if a small quantity of oil runs out of opening. Add oil at fill point if necessary. Notify Direct Support to drain and refill with GO specified for the ambient temperature, if oil becomes contaminated.

26. RING GEAR TEETH and PINION GEAR TEETH (M1084/M1086/M1089). Lubricate every 6,000 miles (9,654 km), after washing, or once every six months, whichever occurs first. Apply a light coat of GAA to ring gear teeth and pinion gear teeth. Operate MHC (TM 9-2320-366-10) to rotate turntable. This will allow grease to be applied to all gear teeth. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

27. FRONT, INTERMEDIATE, and REAR AXLE INNER WHEEL BEARINGS. Repack inner wheel bearings with GAA every 12,000 miles (19,308 km), when semiannual PMCS inspection of service brakes reveals oil leak from inner hub, or whenever wheel end assemblies are taken apart for other maintenance (para 10-2).

28. REAR AXLE BOGIE. Change oil every 6,000 miles (9,654 km) or once every six months, whichever occurs first. Remove six screws and rear axle bogie cover from one side at a time. Raise axle on opposite side of vehicle to allow oil to drain out. Lower axle and repeat on other side of vehicle. Apply thin bead of silicone adhesive sealant 593 to seating surface of housing. Position cover (with fill plug at the 1 o'clock position) and six screws on housing. Tighten six screws to 24 lb-ft (32 N m). Remove plug from cover and plug from top of rear axle bogie housing. Refill rear axle bogie with GO specified for the ambient temperature, until level with port on housing cover. Install plugs in cover and housing.

29. 15K SELF-RECOVERY WINCH (SRW) CABLE ROLLER FAIRLEADS. Lubricate with GAA every 6,000 miles (9,654 km) or once every six months, whichever occurs first, using a low pressure lubrication gun. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

30. 30K WINCH CABLE GUIDE ROLLERS and PAY-OUT LOWER TENSION SHEAVE. Lubricate with GAA every 6,000 miles (9,654 km) or once every six months, whichever occurs first, using a low pressure lubrication gun. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

H-9. LUBRICATION/SERVICES NOTES (CONT)

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 breath 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 138 F (50 C). Failure to comply may result in serious injury or death to personnel.**

- **If personnel become dizzy while using 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 medical attention. Failure to comply may result in injury to personnel.**

31. SCREEN and PLUG OIL FILTER ASSEMBLY (intermediate axle only). Clean the area around the screen and plug oil filter assembly. Remove the screen and plug oil filter assembly. Clean with Dry Cleaning Solvent (Item 65, Appendix D) or equivalent, every 12,000 miles (19,308 km) or once every year, whichever occurs first. Clean filter each time the differential is drained. If screen is crushed or bent, replace with a new one. Clean the screen cavity in the carrier of all debris and particles. If excessive amount of metal particles are detected during oil filter servicing, notify Direct Support Maintenance personnel before refilling differential.

32. TURNTABLE BEARING (M1084/M1086/M1089). Lubricate with GAA every 6,000 miles (9,654 km), after washing, or once every six months, whichever occurs first. Use a low pressure lubrication gun. Apply lubrication to grease fitting inside turntable bearing. Operate MHC (TM 9-2320-366-10) to rotate turntable bearing through full range of travel between applications of grease. This method assures full lubrication of the turntable bearing. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

33. TOP and BOTTOM PLATES (M1089). Lubricate every 6,000 miles (9,654 km) or once every six months, whichever occurs first. Coat top and bottom plates with GAA. Extending outriggers in and out while applying grease assures full lubrication for the entire length of top and bottom plates. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

34. CRANE GREASE FITTINGS (M1084/M1086/M1089). Lubricate with GAA every 6,000 miles (9,654), after washing, or once every six months, whichever occurs first. Use a low pressure lubrication gun. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

35. UNDERLIFT ASSEMBLY GREASE FITTINGS. Lubricate with GAA every 6,000 miles (9,654), after washing, or once every six months, whichever occurs first. Use a low pressure lubrication gun. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

36. FRONT LIFTING BEAM. Remove left and right lifting beams and clean with Dry Cleaning Solvent (Item 65, Appendix D) or equivalent, every 6,000 miles (9,654 km) or once every six months, whichever occurs first. Apply a light coat of GAA to lifting beams. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

37. AIR DRYER. Service air dryer (para 23-11) every 12,000 miles (19,308 km) or annually, whichever occurs first.

38. TENSION LINKS. Lubricate tension link(s) every three months with GAA.

39. FRONT LEAF SPRING AND REAR BOGIE AXLE. At initial 1000 miles (1609 km) of vehicle operation, tighten U-bolts to 390-510 lb-ft (529-692 N•m).

APPENDIX J
ADDITIONAL AUTHORIZATION LIST (AAL)

Section I. INTRODUCTION

J-1. SCOPE

This appendix lists additional items you are authorized for the support of the MTV.

J-2. GENERAL

This list identifies items that do not have to accompany the MTV 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).

J-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	10,000 PSI Transducer: (19207) 12258956	EA	1

APPENDIX K
TRANSMISSION/TRANSMISSION CONTROLS ADAPTABILITY CHART

Section I. INTRODUCTION

K-1. INTRODUCTION

This appendix lists the various transmission controls and configuration modifications that may be required to permit the transmission to function correctly. This appendix will guide the mechanic through the hardware selection process by identifying compatibility issues between the transmission controls (WTEC II/WTEC III) and the numerous revisions of the Allison MD3070PT transmission (PRE-ID w/ 24-pin connector, PRE-ID w/ 31-pin connector, TID 1, TID 2, and TID 3). Refer to Figure 1. After replacing any component of the transmission controls or the transmission assembly, perform calibration procedures in TM 9-2320-366-20-4 paragraph 8-2 or 8-3.

K-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.

K-3. HOW TO USE THIS CHART

a. Determine which controls and transmission are installed in the vehicle.

b. Determine which component requires replacement.

c. Read across the row to column (3) to determine the required modification.

Section II.

TRANSMISSION/TRANSMISSION CONTROLS ADAPTABILITY CHART

(1) Installed Controls or Controls Being Installed	(2) Installed Transmission or Transmission Being Installed	(3) Required Modification (Refer to Section III)
WTEC II (with 24-pin connector)	PRE-ID w/ 24-pin connector (transmission serial number prior to 6510032369)	No modification required.
WTEC II (with 24-pin connector)	PRE-ID w/ 31-pin connector (transmission serial number 6510032369 to 6510090785)	Install 31-pin connector.
WTEC II (with 24-pin connector)	TID 1 (transmission serial number 6510090786 to 6510142171)	Install 31-pin connector.
WTEC II (with 24-pin connector)	TID 2 (transmission serial number 6510142172 to 6510262116)	Install 31-pin connector and replace transmission internal wiring harness.

TRANSMISSION/TRANSMISSION CONTROLS ADAPTABILITY CHART (CONT)

(1) Installed Controls or Controls Being Installed	(2) Installed Transmission or Transmission Being Installed	(3) Required Modification (Refer to Section III)
WTEC II (with 24-pin connector)	TID 3 (transmission serial number 6510262117 and subsequent)	Install 31-pin connector, replace transmission internal wiring harness, and reprogram WTEC II TEPSS. [1]
WTEC II (with 31-pin connector)	PRE-ID w/ 24-pin connector (transmission serial number prior to 6510032369)	Install adapter cable assembly.
WTEC II (with 31-pin connector)	PRE-ID w/ 31-pin connector (transmission serial number 6510032369 to 6510090785)	No modification required.
WTEC II (with 31-pin connector)	TID 1 (transmission serial number 6510090786 to 6510142171)	No modification required.
WTEC II (with 31-pin connector)	TID 2 (transmission serial number 6510142172 to 6510262116)	Replace transmission internal wiring harness.
WTEC II (with 31-pin connector)	TID 3 (transmission serial number 6510262117 and subsequent)	Replace transmission internal wiring harness and reprogram WTEC II TEPSS. [1]
WTEC III (with ECU manufactured prior to October 1999) [2]	PRE-ID w/ 24-pin connector (transmission serial number prior to 6510032369)	Install adapter cable assembly and ID harness.
WTEC III (with ECU manufactured prior to October 1999) [2]	PRE-ID w/ 31-pin connector (transmission serial number 6510032369 to 6510090785)	Install ID harness.
WTEC III (with ECU manufactured prior to October 1999) [2]	TID 1 (transmission serial number 6510090786 to 6510142171)	No modification required.
WTEC III (with ECU manufactured prior to October 1999) [2]	TID 2 (transmission serial number 6510142172 to 6510262116)	No modification required.
WTEC III (with ECU manufactured prior to October 1999) [2]	TID 3 (transmission serial number 6510262117 and subsequent)	Reprogram WTEC III ECU [1] or install new WTEC III ECU (P/N 12421787-002).
WTEC III (with ECU manufactured after October 1999) [3]	PRE-ID w/ 24-pin connector (transmission serial number prior to 6510032369)	Install adapter cable assembly and ID harness.
WTEC III (with ECU manufactured after October 1999) [3]	PRE-ID w/ 31-pin connector (transmission serial number 6510032369 to 6510090785)	Install ID harness.
WTEC III (with ECU manufactured after October 1999) [3]	TID 1 (transmission serial number 6510090786 to 6510142171)	No modification required.

[1] Reprogramming can only be accomplished by an authorized Allison Transmission distributor. You must provide the transmission serial number of the transmission being installed to ensure correct reprogramming. If at a later time, an earlier version transmission is installed in a WTEC II equipped vehicle, WTEC II TEPSS will require reprogramming again.
[2] Vehicle serial number 012477 and lower. Refer to Figure 1.
[3] Vehicle serial number 012478 and higher. Refer to Figure 1.

(1) Installed Controls or Controls Being Installed	(2) Installed Transmission or Transmission Being Installed	(3) Required Modification (Refer to Section III)
WTEC III (with ECU manufactured after October 1999) [3]	TID 2 (transmission serial number 6510142172 to 6510262116)	No modification required.
WTEC III (with ECU manufactured after October 1999) [3]	TID 3 (transmission serial number 6510262117 and subsequent)	No modification required.

Section III.

MODIFICATION PARTS IDENTIFICATION

Identification	Part Number/NSN	Description
31-pin connector	300130 5935-21-921-1813	Converts a transmission external wiring harness from a 24-pin ("D" type) connector to a 31-pin (round type) connector.
Transmission internal wiring harness	29529474 6150-01-481-8088	Converts a TID 2 transmission to a TID 1 configuration to allow WTEC II controls to communicate with the transmission.
Gasket	29503283 5330-01-360-9035	Required when replacing transmission internal wiring harness.
ID harness	200100 6150-21-921-1191	Allows WTEC III controls to communicate with a PRE-ID transmission.
Adapter cable assembly	29519210 6150-01-420-5987	Adapts a PRE-ID transmission with 24-pin ("D" type) connector to a transmission external wiring harness with a 31-pin (round) connector.

MODIFICATION PARTS IDENTIFICATION (CONT)

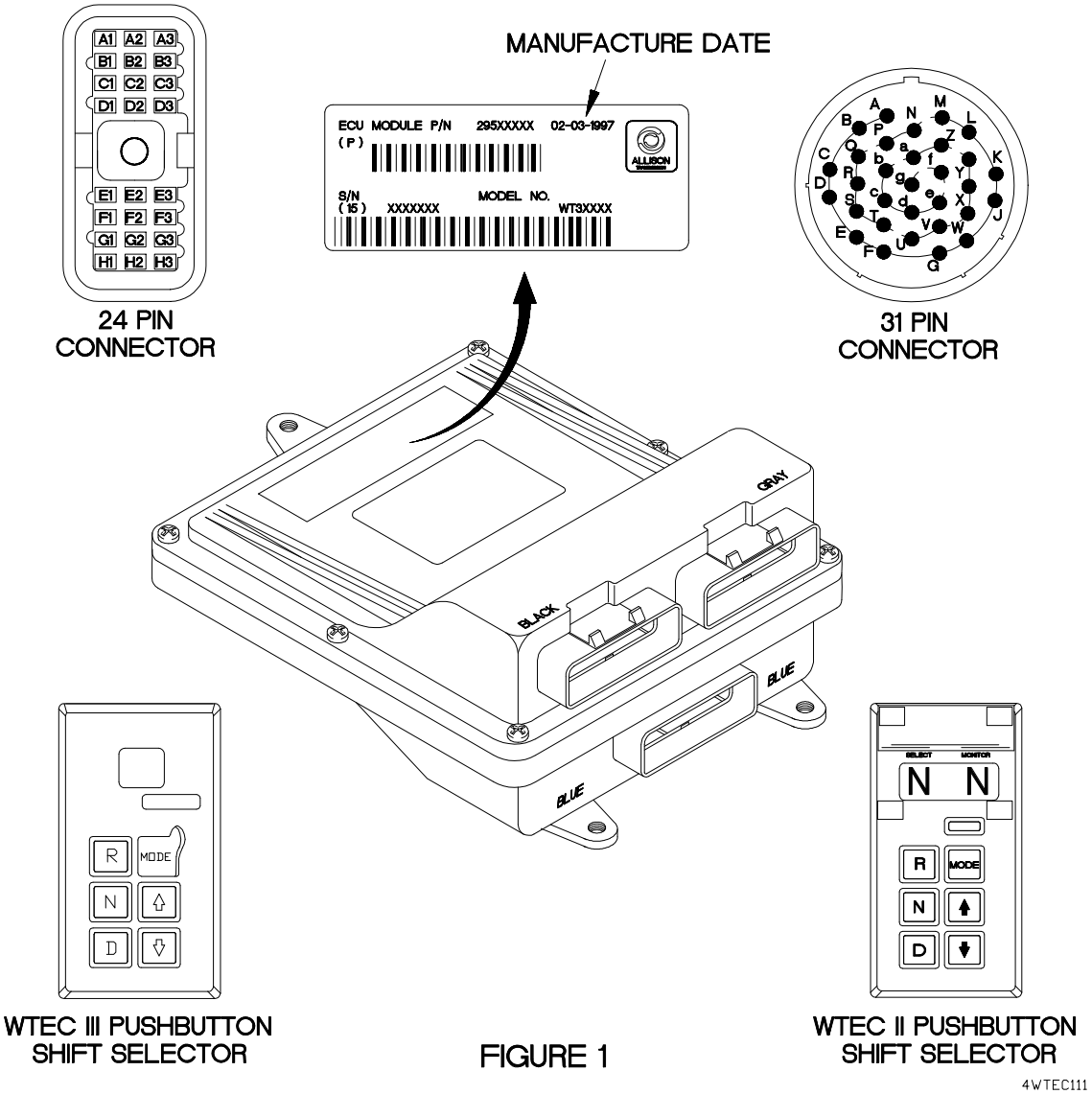


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All Wrecker Functions Do Not Operate From Wrecker Remote Control 2-16
One Wrecker Function Does Not Operate From Wrecker Remote Control 2-16
Main Winch LH or RH Speed Switch Does Not Operate From Wrecker Control Panel 2-16

GLOSSARY
ABBREVIATIONS

ANSI	American National Standards Institute
CCW	Counterclockwise
CTIS	Central Tire Inflation System
CW	Clockwise
ECU	Electronic Control Unit
EMI	Electromagnetic Interference
LED	Light Emitting Diode
LH	Left Hand
LMHC	Light Material Handling Crane
MAC	Maintenance Allocation Chart
MHC	Material Handling Crane
NATO	North Atlantic Treaty Organization
NBC	Nuclear, Biological, or Chemical
NO/NC	Normally Open/Normally Closed
O/R	Outrigger
PDP	Power Distribution Panel
PMCS	Preventive Maintenance Checks and Services
PTO	Power Takeoff
RH	Right Hand
SAE	Society of Automotive Engineers
SRW	Self-Recovery Winch
STE/ICE-R	Simplified Test Equipment/Internal Combustion Engine-Reprogrammable
TEPSS	Transmission ECU Pushbutton Shift Selector
TM	Technical Manual
TPS	Thottle Position Sensor

GLOSSARY
ABBREVIATIONS (CONT)

TPSS . . . . . Transmission Pushbutton Shift Selector

VDC . . . . . Volts Direct Current

VIM . . . . . Vehicle Interface Module

WTEC II . . . . . World Transmission Electronic Controls (version 2)

WTEC III . . . . . World Transmission Electronic Controls (version 3)

By Order of the Secretary of the Army:

DENNIS J. REIMER
General, United States Army
Chief of Staff

Official:

JOEL B. HUDSON
Administrative Assistant *to the*
Secretary of the Army
05189

DISTRIBUTION: To be distributed in accordance with the initial distribution number (IDN) 380940, requirements for TM 9-2320-366-20-2.

*U.S. GOVERNMENT PRINTING OFFICE:1998-746-025/80064

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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

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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
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SAMPLE

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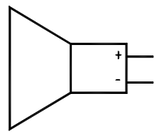
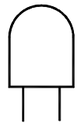
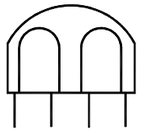
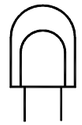
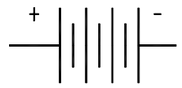
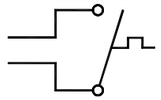
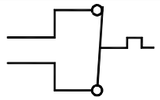
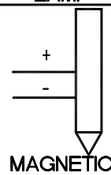
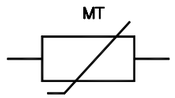
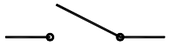
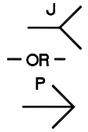
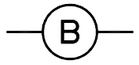
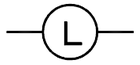
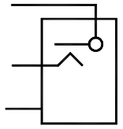
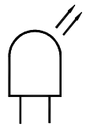
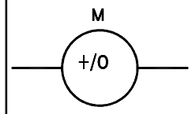
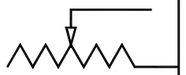
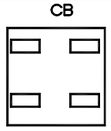
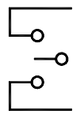
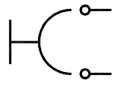
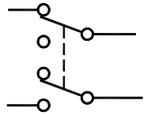
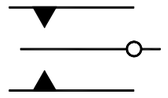
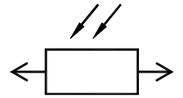
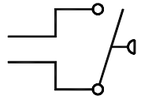
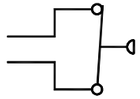
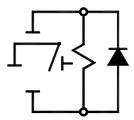
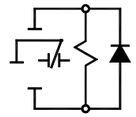
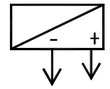
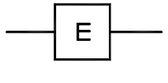
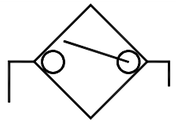
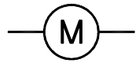
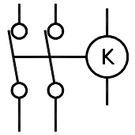
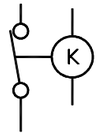
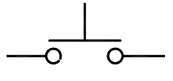
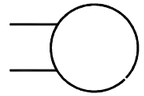
 HORN	 BLACKOUT LAMP	 LAMP	 DUALBEAM LAMP	 GROUND	 POWER LAMP	 OPEN CONTACT	 BATTERY
 TEMPERATURE SWITCH OPEN	 TEMPERATURE SWITCH CLOSED	 MAGNETIC PICKUP	 SENSOR	 NORMALLY OPEN	 NORMALLY CLOSED	 CONNECTOR	 RECEPTACLE
 MOTOR	 SOLENOID	 LEVEL SENSOR	 FILTER	 LED	 METER OR GAGE	 CLOSED CONTACT	 DIMMER MODULE
 CIRCUIT BREAKER	 TWO WAY SWITCH	 BRIDGE RECTIFIER	 POWER SWITCH BREAKER	 DPDT SWITCH	 DPST SWITCH	 PHOTOCELL	 FUSE
 PRESSURE SWITCH OPEN	 PRESSURE SWITCH CLOSED	 NORMALLY OPEN	 NORMALLY CLOSED	 ALTERNATOR	 RESISTOR	 TERMINAL LUG	 ELECTRONIC IGNITION UNIT
 DIODE	 SPLICE	 SENSING SWITCH	 MOTOR	 GROUND RELAY	 RELAY	 PUSHBUTTON	 CIRCULATING PUMP

FIGURE FO-1 ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 1 OF 40

SIZE B | ILL. NO. 6WD01IL1B | FP-1/ (FP-2 BLANK)

CONNECTORS			
NUMBER	ZONE	SH	DESCRIPTION
CABLE A	G315	35	OVERLOAD SHUTDOWN SYSTEM
CABLE A	D317	36	WRECKER MATERIAL HANDLING CRANE
CABLE A	F324	36	OVERLOAD SHUTDOWN SYSTEM
CABLE A	D340	38	WRECKER CONTROLS
CABLE B	A307	35	CARGO MATERIAL HANDLING CRANE
CABLE C	G308	35	CARGO MATERIAL HANDLING CRANE
CABLE F	B308	36	INTERNAL REMOTE CONNECTOR
CABLE G	F299	35	CARGO MATERIAL HANDLING CRANE
CABLE G	A324	36	INTERNAL REMOTE CONTROL CONNECTOR
CABLE H	F304	35	CRANE CONTROL PANEL
CABLE H	E313	36	CRANE CONTROL PANEL
CABLE I	G313	35	CRANE CONTROL PANEL
CABLE I	F322	36	CRANE CONTROL PANEL
CABLE J	G313	35	CRANE CONTROL PANEL
CABLE J	F322	36	CRANE CONTROL PANEL
CABLE K	G304	35	CRANE CONTROL PANEL
CABLE K	F322	36	CRANE CONTROL PANEL
CABLE L	D304	35	CRANE CONTROL PANEL
CABLE L	C322	36	CRANE CONTROL PANEL
CABLE M	D313	35	CRANE CONTROL PANEL
CABLE M	C322	36	CRANE CONTROL PANEL
CABLE N	D313	35	CRANE CONTROL PANEL
CABLE N	D322	36	CRANE CONTROL PANEL
CABLE O	C313	35	CRANE CONTROL PANEL
CABLE O	G322	36	CRANE CONTROL PANEL
CABLE P	C313	35	CRANE CONTROL PANEL
CABLE P	C322	36	CRANE CONTROL PANEL
CABLE Q	E313	35	CRANE CONTROL PANEL
CABLE Q	E322	36	CRANE CONTROL PANEL
CABLE R	E313	35	CRANE CONTROL PANEL
CABLE R	D322	36	CRANE CONTROL PANEL
CABLE S	F313	35	CRANE CONTROL PANEL
CABLE S	E322	36	CRANE CONTROL PANEL
CABLE T	F313	35	CRANE CONTROL PANEL
CABLE T	E322	36	CRANE CONTROL PANEL
CABLE U	A314	35	CRANE REMOTE CONNECTOR
CABLE V	E313	35	CRANE CONTROL PANEL
CONN F	C335	38	WRECKER REMOTE
CONN G	C340	38	WRECKER REMOTE
J2	A194	22	EMI FILTER
J3	D241	27	AIRDROP ONLY
J4	E340	38	WRECKER CONTROLS
J5	A47	6	VEHICLE HORN
J6	A47	6	VEHICLE HORN
J7	A197	22	WTEC II TRANSMISSION PUSHBUTTON SHIFT SELECTOR DIMMER MODULE
J8	B47	6	BLACKOUT MARKER RIGHT FRONT
J9	C47	6	FRONT RIGHT TURN SIGNAL
J10	B47	6	PARKING LIGHT FRONT RIGHT
J12	D47	6	RIGHT HEADLIGHT
J13	C47	6	RIGHT HEADLIGHT
J14	C47	6	RIGHT HEADLIGHT
J17	H47	6	BLACKOUT DRIVE LIGHT
J18	D47	6	LEFT HEADLIGHT
J19	E47	6	LEFT HEADLIGHT
J19	C186	21	CAB - DASH - LEFT - UNDERDASH
J20	D47	6	LEFT HEADLIGHT
J22	G47	6	PARKING LIGHT FRONT LEFT
J23	F47	6	FRONT LEFT TURN SIGNAL
J24	H47	6	BLACKOUT MARKER LEFT FRONT
J25	G94	11	WINDSHIELD WASHER ROTARY PUMP (B3)
J27	A52	6	CHASSIS - FRONT
J31	E65	8	ENGINE
J31X	F184	21	CAB - DASH - LEFT - UNDERDASH
J39	G70	8	ENGINE
J43	G51	6	CHASSIS - FRONT
J43X	F51	6	CHASSIS - FRONT
J43X	G184	21	CAB - DASH - LEFT - UNDERDASH
J44	B238	27	ROTARY WARNING LIGHT CONNECTOR
J45	C238	27	ROTARY WARNING LIGHT CONNECTOR
J50	E94	11	CAB MARKER LIGHT FRONT UPPER LEFT
J51	D51	6	CHASSIS - FRONT
J52	E47	6	CHASSIS - FRONT BUMPER

CONNECTORS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
J52	B239	27	CHASSIS - FRONT
J53	F236	27	AIRDROP ONLY
J55	C94	11	CAB MARKER LIGHT FRONT UPPER RIGHT
J57	D94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT
J59	C94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT
J60	D94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE
J62	E97	11	ROTARY WARNING LIGHT CONNECTOR
J65	E195	22	ROTARY WARNING LIGHT CONNECTOR
J78	F194	22	CAB RADIO CONNECTOR
J80	A299	34	AIR DRYER CONNECTOR
J80	D87	10	AIR DRYER (EXCEPT DUMP)
J93	B59	7	CHASSIS - SPARE TIRE
J95	E47	6	12V INTERVEHICULAR
J95	B242	27	ENGINE
J99	E196	22	CHEMICAL ALARM CONNECTOR
J106	F59	7	CHEMICAL DETECTOR RECEPTACLE
J108	B258	29	CAB - DASH - CENTER - OPTIONS PANEL
J111	E131	15	CTIS ELECTRONIC CONTROL UNIT
J113	G195	22	CTIS PRESSURE TRANSDUCER
J114	B173	20	CAB - DASH - LEFT - TRANSMISSION HARNESS - WTEC II
J114	C353	40	WTEC III CAB TRANSMISSION HARNESS (TIDI) CONNECTOR
J114	C357	40	WTEC III CAB TRANSMISSION HARNESS (TID2) CONNECTOR
J115	C163	19	CAB - DASH - LEFT - WTEC III TRANSMISSION HARNESS
J115	C346	39	WTEC III TRANSMISSION ECU CONNECTOR
J116	C168	19	CAB - DASH - LEFT - WTEC III TRANSMISSION HARNESS
J116	E346	39	WTEC III TRANSMISSION ECU CONNECTOR
J117	F170	19	CAB - DASH - LEFT - WTEC III TRANSMISSION HARNESS
J117	B343	39	WTEC III DIAGNOSTIC CONNECTOR
J118	D170	19	CAB - DASH - LEFT - WTEC III TRANSMISSION HARNESS
J119	B178	20	CAB - DASH - LEFT - TRANSMISSION HARNESS
J119	C355	40	WTEC III CAB TRANSMISSION HARNESS (TIDI)
J119	C359	40	WTEC III CAB TRANSMISSION HARNESS (TID2)
J129	F94	11	CAB MARKER LIGHT FRONT LOWER LEFT
J130	F94	11	CAB MARKER LIGHT LEFT DOOR
J130	F238	27	12 PIN CONNECTOR
J131	B94	11	CAB MARKER LIGHT RIGHT DOOR
J132	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT
J172	A300	34	DUMP BODY CONNECTOR
J209	F265	30	ALL MTV W/O PTO
J209	G265	30	DUMP, CARGO LWB, CARGO W/MHC, CARGO LWB W/MHC
J209A	G267	30	TRACTOR W/O WINCH
J209A	C266	30	PTO EQUIPPED
J209B	F267	30	TRANSMISSION AUXILIARY OIL COOLER FAN
J209B	D266	30	PTO EQUIPPED
J210	F258	29	CAB - DASH - CENTER - OPTIONS PANEL
J215	E266	30	PTO EQUIPPED
J912	B133	15	CAB - DASH - CENTER - HEATER/CTIS ECU
J912	D245	28	CAB - DASH - CENTER - OPTIONS PANEL
J912	G264	30	ALL MTV W/O PTO
J912	F265	30	TRACTOR W/O WINCH
J913	B131	15	CAB - DASH - CENTER - HEATER/CTIS ECU
J921	G70	8	TROOP TRANSPORT ALARM
L4	E268	30	WINCH IN SOLENOID
L5	D268	30	WINCH OUT SOLENOID
L7	B301	34	TAILGATE RELEASE CONNECTOR
L8	B301	34	DUMP BED UP CONNECTOR
L9	A301	34	DUMP BED DOWN CONNECTOR
P2	A194	22	EMI FILTER
P3	D240	27	AIRDROP ONLY
P5	A47	6	VEHICLE HORN
P6	A47	6	VEHICLE HORN

CONNECTORS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
P8	B47	6	BLACKOUT MARKER RIGHT FRONT
P9	C47	6	FRONT RIGHT TURN SIGNAL
P10	B47	6	PARKING LIGHT FRONT RIGHT
P12	D47	6	RIGHT HEADLIGHT
P13	C47	6	RIGHT HEADLIGHT
P14	C47	6	RIGHT HEADLIGHT
P17	H47	6	BLACKOUT DRIVE LIGHT
P18	D47	6	LEFT HEADLIGHT
P18	A186	21	CAB - DASH - LEFT - UNDERDASH
P19	E47	6	LEFT HEADLIGHT
P20	D47	6	LEFT HEADLIGHT
P22	G47	6	PARKING LIGHT FRONT LEFT
P23	F47	6	FRONT LEFT TURN SIGNAL
P24	H47	6	BLACKOUT MARKER LEFT FRONT
P25	G94	11	WINDSHIELD WASHER ROTARY PUMP (B3)
P25	B300	34	DUMP BED SWITCH CONNECTOR
P27	A52	6	CHASSIS - FRONT
P31	E65	8	ENGINE
P31X	D65	8	ENGINE
P32	F68	8	ENGINE OIL PRESSURE SENSOR
P33	H68	8	FUEL/WATER SEPARATOR
P34	E68	8	OIL PRESSURE WARNING LIGHT SWITCH
P36	A66	8	WATER COOLER TEMPERATURE
P37	C66	8	WATER TEMPERATURE SWITCH
P38	F70	8	ENGINE SPEED MAGNETIC PICKUP
P39	G70	8	ENGINE
P41	B66	8	WATER TEMPERATURE SENSOR
P42	F66	8	ETHER SENSOR SWITCH
P43	G51	6	CHASSIS - FRONT
P43X	F51	6	CHASSIS - FRONT
P50	E94	11	CAB MARKER LIGHT FRONT UPPER LEFT
P50	F242	27	LH FRONT TOP CAB MARKER LIGHT
P51	D199	23	CAB - DASH - RIGHT - POWER DISTRIBUTION PANEL
P51	D208	24	REAR LIGHTS TRACTOR
P51	D217	25	LONG WHEEL BASE
P51	D226	26	CAB - DASH - RIGHT - POWER DISTRIBUTION PANEL
P52F	E47	6	CHASSIS - FRONT
P52M	G208	24	REAR LIGHTS TRACTOR
P52R	E205	23	WRECKER REAR LIGHTS
P52R	G214	24	REAR LIGHTS TRACTOR
P52R	E223	25	LONG WHEEL BASE
P52R	E232	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
P53M	F208	24	REAR LIGHTS TRACTOR
P53R	D205	23	WRECKER REAR LIGHTS
P53R	F214	24	REAR LIGHTS TRACTOR
P53R	D223	25	LONG WHEEL BASE
P53R	D232	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
P54	D206	23	LEFT REAR MARKER
P54	F215	24	LEFT REAR MARKER
P54	D224	25	LEFT REAR MARKER
P54	D233	26	LEFT REAR MARKER
P55	C94	11	CAB MARKER LIGHT FRONT UPPER RIGHT
P55	D242	27	RH FRONT TOP CAB MARKER LIGHT
P56	D206	23	MIDDLE REAR MARKER
P56	E224	25	MIDDLE REAR MARKER
P56	F215	24	MIDDLE REAR MARKER
P56	E233	26	MIDDLE REAR MARKER
P57	D94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT
P57	F242	27	LH FRONT TOP CAB CLEARANCE LIGHT
P58	E206	23	RIGHT REAR MARKER
P58	E215	24	RIGHT REAR MARKER
P58	E224	25	RIGHT REAR MARKER
P58	E233	26	RIGHT REAR MARKER
P59	C94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT
P59	D242	27	RH FRONT TOP CAB CLEARANCE LIGHT
P60	D94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE

CONNECTORS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
P60	E242	27	MIDDLE FRONT TOP CLEARANCE LIGHT
P61	E215	24	RH COMPOSITE LIGHT
P61	F206	23	RH COMPOSITE LIGHT
P61	F224	25	RH COMPOSITE LIGHT
P61	F233	26	RH COMPOSITE LIGHT
P62	D215	24	RH COMPOSITE LIGHT
P62	F206	23	RH COMPOSITE LIGHT
P62	F224	25	RH COMPOSITE LIGHT
P62	F233	26	RH COMPOSITE LIGHT
P62A	B236	27	ROTARY WARNING LIGHT CONNECTOR
P63	F224	25	RH COMPOSITE LIGHT
P63	G206	23	RH COMPOSITE LIGHT
P63	D215	24	RH COMPOSITE LIGHT
P63	G233	26	RH COMPOSITE LIGHT
P64	F206	23	RH COMPOSITE LIGHT
P64	F224	25	RH COMPOSITE LIGHT
P64	D215	24	RH COMPOSITE LIGHT
P64	F233	26	RH COMPOSITE LIGHT
P65	E195	22	ROTARY WARNING LIGHT CONNECTOR
P67	A83	10	PRE-BLOCK SEVEN WITH PIGTAIL TRANSMISSION EXTERNAL WIRING HARNESS TO TRANSMISSION CONNECTOR
P67	B78	9	TIDI, TID2, AND TID3 TRANSMISSION EXTERNAL WIRING HARNESS TO TRANSMISSION CONNECTOR
P69	D68	8	ENGINE
P71	E75	9	PRE-BLOCK SEVEN TRANSMISSION OUTPUT SPEED SENSOR CONNECTOR
P71	E79	9	TIDI, TID2, AND TID3 TRANSMISSION OUTPUT SPEED SENSOR CONNECTOR
P71	E83	10	PRE-BLOCK SEVEN WITH PIGTAIL TRANSMISSION OUTPUT SPEED SENSOR CONNECTOR
P72	E83	10	PRE-BLOCK SEVEN W/PIGTAIL TRANSMISSION ENGINE SPEED SENSOR CONNECTOR
P72	F75	9	PRE-BLOCK SEVEN TRANSMISSION ENGINE SPEED SENSOR CONNECTOR
P72	F79	9	TIDI, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR CONNECTOR
P73	F75	9	PRE-BLOCK SEVEN TRANSMISSION THROTTLE POSITION SENSOR CONNECTOR
P73	F79	9	TIDI, TID2, AND TID3 TRANSMISSION THROTTLE POSITION SENSOR CONNECTOR
P73	F83	10	PRE-BLOCK SEVEN WITH PIGTAIL TRANSMISSION THROTTLE POSITION SENSOR CONNECTOR
P74	A215	24	LH COMPOSITE LIGHT
P74	B206	23	LH COMPOSITE LIGHT
P74	B224	25	LH COMPOSITE LIGHT
P74	B233	26	LH COMPOSITE LIGHT
P76	B206	23	LH COMPOSITE LIGHT
P76	B215	24	LH COMPOSITE LIGHT
P76	B224	25	LH COMPOSITE LIGHT
P76	B233	26	LH COMPOSITE LIGHT
P77	C206	23	LH COMPOSITE LIGHT
P77	B215	24	LH COMPOSITE LIGHT
P77	C224	25	LH COMPOSITE LIGHT
P77	C233	26	LH COMPOSITE LIGHT
P78	B206	23	LH COMPOSITE LIGHT
P78	B215	24	LH COMPOSITE LIGHT
P78	B224	25	LH COMPOSITE LIGHT
P78	B234	26	LH COMPOSITE LIGHT
P80	G60	7	CHASSIS - REAR
P80	A298	34	AIR DRYER CONNECTOR (DUMP)
P80B	A298	34	AIR DRYER CONNECTOR (DUMP)
P80B	A299	34	AIR DRYER CONNECTOR (DUMP)
P81	C56	7	CHASSIS - FRONT
P81	D71	8	STARTER THERMO SWITCH
P82	B60	7	FUEL TANK LEVEL SENSOR
P83	B181	21	CAB - DASH - LEFT - UNDERDASH
P84	F60	7	CHASSIS - REAR
P85	A206	23	LH SIDE MARKER LIGHT
P85	A224	25	LH SIDE MARKER LIGHT

CONNECTORS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
P85	A233	26	LH SIDE MARKER LIGHT
P86	A206	23	LH REAR MARKER LIGHT
P86	A215	24	LH REAR MARKER LIGHT
P86	A224	25	LH REAR MARKER LIGHT
P86	A233	26	LH REAR MARKER LIGHT
P87	C206	23	BACKUP LIGHT
P87	B215	24	BACKUP LIGHT
P87	C224	25	BACKUP LIGHT
P87	C233	26	BACKUP LIGHT
P88	G206	23	RH SIDE MARKER LIGHT
P88	H224	25	RH SIDE MARKER LIGHT
P88	H233	26	RH SIDE MARKER LIGHT
P89	G206	23	RH REAR MARKER LIGHT
P89	C215	24	RH REAR MARKER LIGHT
P89	G224	25	RH REAR MARKER LIGHT
P89	G233	26	RH REAR MARKER LIGHT
P107	B199	23	WRECKER REAR LIGHTS
P108	B258	29	CAB - DASH - CENTER - OPTIONS PANEL
P108	F199	23	WRECKER REAR LIGHTS
P110	E128	15	CTIS ELECTRONIC CONTROL UNIT
P111	E131	15	CTIS ELECTRONIC CONTROL UNIT
P112	G132	15	CAB - DASH - CENTER - HEATER/CTIS ECU
P113	F132	15	CTIS ELECTRONIC CONTROL UNIT
P114	C350	39	WTEC III CAB TRANSMISSION HARNESS (TID2)
P115	C346	39	WTEC III CAB - DASH - RIGHT - KICK PANEL
P116	E346	39	WTEC III CAB - DASH - RIGHT - KICK PANEL
P116	C194	22	CAB - DASH - RIGHT - UNDERDASH WTEC II
P118	D170	19	CAB - DASH - LEFT - TRANSMISSION HARNESS
P119	B178	20	CAB - DASH - LEFT - TRANSMISSION HARNESS
P119	D73	9	PRE-BLOCK SEVEN TRANSMISSION CONNECTOR
P119	D78	9	TIDI, TID2, AND TID3 TRANSMISSION CONNECTOR
P119	D82	10	PRE-BLOCK SEVEN WITH PIGTAIL TRANSMISSION CONNECTOR
P125	G93	11	WINDSHIELD WASHER ROTARY PUMP (B3)
P129	F94	11	CAB MARKER LIGHT FRONT LOWER LEFT
P130	F94	11	CAB MARKER LIGHT LEFT DOOR
P131	A94	11	CAB MARKER LIGHT RIGHT DOOR
P132	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT
P133	A199	23	LH WORKLIGHTS
P133	B209	24	LH WORKLIGHTS
P133A	B199	23	LH WORKLIGHTS
P133A	B209	24	LH WORKLIGHTS
P134	G199	23	RH WORKLIGHTS
P134	C209	24	RH WORKLIGHTS
P134A	F199	23	RH WORKLIGHTS
P134A	B209	24	RH WORKLIGHTS
P135	D260	29	CAB - DASH - CENTER - OPTIONS PANEL
P136	C260	29	CAB - DASH - CENTER - OPTIONS PANEL
P171	F308	35	CARGO MATERIAL HANDLING CRANE
P172	A300	34	DUMP BODY CONNECTOR
P201	G70	8	ENGINE
P209A	F268	30	TRANSMISSION AUXILIARY OIL COOLER FAN
P209B	G264	30	DUMP, CARGO LWB, CARGO W/MHC, CARGO LWB W/MHC
P209B	G268	30	TRANSMISSION AUXILIARY OIL COOLER FAN
P210	F258	29	CAB - DASH - CENTER - OPTIONS PANEL
P210	C263	30	PTO EQUIPPED
P215	E266	30	PTO EQUIPPED
P216	E265	30	PTO EQUIPPED
P216	A304	34	PTO PRESSURE SWITCH CONNECTOR
P217	C265	30	PTO EQUIPPED
P217	B304	34	PTO SOLENOID CONNECTOR
P901	A245	28	CAB - DASH - CENTER - OPTIONS PANEL
P902	C250	28	CAB - DASH - CENTER - OPTIONS PANEL
P902A	D250	28	CAB - DASH - CENTER - OPTIONS PANEL
P903	C248	28	CAB - DASH - CENTER - OPTIONS PANEL
P903A	D248	28	CAB - DASH - CENTER - OPTIONS PANEL
P904	C247	28	CAB - DASH - CENTER - OPTIONS PANEL
P904A	D247	28	CAB - DASH - CENTER - OPTIONS PANEL
P905	A247	28	CAB - DASH - CENTER - OPTIONS PANEL

FIGURE FO-1 ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 2 OF 40

SIZE B | ILL. NO. 6WD01L2B | FP-3/ (FP-4 BLANK)

CONNECTORS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
P905A	B247	28	CAB - DASH - CENTER - OPTIONS PANEL
P906	A248	28	CAB - DASH - CENTER - OPTIONS PANEL
P906A	B248	28	CAB - DASH - CENTER - OPTIONS PANEL
P908	A251	28	CAB - DASH - CENTER - OPTIONS PANEL
P908A	B251	28	CAB - DASH - CENTER - OPTIONS PANEL
P909	A256	29	CAB - DASH - CENTER - OPTIONS PANEL
P909A	B256	29	CAB - DASH - CENTER - OPTIONS PANEL
P910	B251	28	CAB - DASH - CENTER - OPTIONS PANEL
P910A	D251	28	CAB - DASH - CENTER - OPTIONS PANEL
P911	B256	29	CAB - DASH - CENTER - OPTIONS PANEL
P911A	D256	29	CAB - DASH - CENTER - OPTIONS PANEL
P912	B133	15	CAB - DASH - CENTER - HEATER/CTIS - ECU
P912A	F134	15	CAB - DASH - CENTER - HEATER/CTIS - ECU
P913	B131	15	CAB - DASH - CENTER - HEATER/CTIS - ECU
P913	F245	28	CAB - DASH - CENTER - OPTIONS PANEL
P914	A250	28	CAB - DASH - CENTER - OPTIONS PANEL
P914A	B250	28	CAB - DASH - CENTER - OPTIONS PANEL
P921	G70	8	TROOP TRANSPORT ALARM
P94	A199	23	LH INTERMEDIATE MARKER
P94	A217	25	LH INTERMEDIATE MARKER
P95	G199	23	RH INTERMEDIATE MARKER
P95	G217	25	RH INTERMEDIATE MARKER
P99	F195	22	CHEMICAL ALARM CONNECTOR
PX1	A101	12	ENGINE FAN OFF SWITCH
PX10	D116	13	CAB - DASH - LEFT - INSTRUMENT PANEL
PX11	G116	13	CAB - DASH - LEFT - INSTRUMENT PANEL
PX12	C121	14	ROTATING WARNING LIGHT SWITCH
PX12A	E121	14	CAB - DASH - LEFT - INSTRUMENT PANEL
PX13	F101	12	ETHER STARTER SWITCH
PX13A	G101	12	CAB - DASH - LEFT - INSTRUMENT PANEL
PX14	F121	14	FULL HAZARD WARNING SWITCH
PX14A	H121	14	CAB - DASH - LEFT - INSTRUMENT PANEL
PX15	C124	14	MAIN LIGHT SWITCH
PX17	A121	14	IGNITION SWITCH
PX17A	C112	14	CAB - DASH - LEFT - INSTRUMENT PANEL
PX1A	B101	12	CAB - DASH - LEFT - INSTRUMENT PANEL
PX2	D101	12	LAMP TEST SWITCH
PX20	C197	22	TURN SIGNAL FLASHER
PX21	A143	16	WIPER DELAY MODULE
PX22	A193	22	EMI FILTER
PX24	G124	14	INSTRUMENT PANEL LIGHTS DIMMER MODULE
PX25	C128	15	CAB - DASH - CENTER - HEATER/CTIS - ECU
PX26	B188	21	CAB - DASH - LEFT - UNDERDASH
PX2A	E101	12	CAB - DASH - LEFT - INSTRUMENT PANEL
PX33	B191	22	CAB - DASH - RIGHT - UNDERDASH
PX33	G346	39	WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR
PX34	E197	22	FRONT AIR PRESSURE METER
PX4	F106	12	FAN SOLENOID
PX5	B106	12	REAR AIR PRESSURE METER
PX50	D197	22	INTER-AXLE DIFFERENTIAL SOLENOID
PX6	B116	13	CAB - DASH - LEFT - INSTRUMENT PANEL
PX7	A113	13	CAB - DASH - LEFT - INSTRUMENT PANEL
PX8	G111	13	CAB - DASH - LEFT - INSTRUMENT PANEL
PX9	D106	12	FUEL LEVEL METER

LIGHTS			
NUMBER	ZONE	SH	DESCRIPTION
DS1	D105	12	CAB - DASH - LEFT - INSTRUMENT PANEL
DS2	G115	12	CAB - DASH - LEFT - INSTRUMENT PANEL
DS3	F105	12	CAB - DASH - LEFT - INSTRUMENT PANEL
DS4	B105	12	CAB - DASH - LEFT - INSTRUMENT PANEL
DS5	B115	13	CAB - DASH - LEFT - INSTRUMENT PANEL
DS6	G110	13	CAB - DASH - LEFT - INSTRUMENT PANEL
DS7	D115	13	CAB - DASH - LEFT - INSTRUMENT PANEL
DS8	C100	12	CAB - DASH - LEFT - INSTRUMENT PANEL
DS9	B110	13	DUMP BODY UP
DS10	E120	14	CAB - DASH - LEFT - INSTRUMENT PANEL
DS11	G100	12	CAB - DASH - LEFT - INSTRUMENT PANEL
DS12	H120	14	CAB - DASH - LEFT - INSTRUMENT PANEL
DS13	C120	14	CAB - DASH - LEFT - INSTRUMENT PANEL
DS14	B110	13	LEFT TURN SIGNAL
DS15	B110	13	RIGHT TURN SIGNAL

LIGHTS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
DS16	E110	13	HIGH BEAM
DS17	D128	15	HEATER CONTROL PANEL ILLUMINATION
DS18	A244	28	CAB - DASH - CENTER - OPTIONS PANEL
DS19	E110	13	RADIATOR FAN OFF
DS21	C110	13	EMERGENCY BRAKE
DS22	D110	13	PARKING BRAKE
DS23	C110	13	PTO ON
DS24	D110	13	OIL PRESSURE
DS25	C110	13	WATER TEMPERATURE
DS27	C110	13	REAR BRAKE AIR
DS28	E110	13	FRONT AIR BRAKE
DS29	D110	13	ENGINE OIL LEVEL
DS30	F110	13	MASTER STOP
DS31	D249	28	CAB - DASH - CENTER - OPTIONS PANEL
DS32	B110	13	CHEMICAL DETECT
DS34	C110	13	CTIS OVERSPEED
DS35	C207	23	WRECKER BLACKOUT STOP LEFT REAR
DS35	B216	24	TRACTOR BLACKOUT STOP LEFT REAR
DS35	C225	25	LONG WHEEL BASE BLACKOUT STOP LEFT REAR
DS35	C234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE BLACKOUT STOP LEFT REAR
DS36	G207	23	WRECKER BLACKOUT STOP RIGHT REAR
DS36	D216	24	TRACTOR BLACKOUT STOP RIGHT REAR
DS36	G225	25	LONG WHEEL BASE BLACKOUT STOP RIGHT REAR
DS36	G234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE BLACKOUT STOP RIGHT REAR
DS37	B207	23	WRECKER REAR LEFT COMPOSITE
DS37	A216	24	TRACTOR REAR LEFT COMPOSITE
DS37	B225	25	LONG WHEEL BASE REAR LEFT COMPOSITE
DS37	B234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE REAR LEFT COMPOSITE
DS38	F207	23	WRECKER REAR RIGHT COMPOSITE
DS38	E216	24	TRACTOR REAR RIGHT COMPOSITE
DS38	F225	25	LONG WHEEL BASE REAR RIGHT COMPOSITE
DS38	F234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE REAR RIGHT COMPOSITE
DS39	F46	6	FRONT LEFT TURN SIGNAL
DS41	D110	13	TRANSMISSION OIL TEMPERATURE
DS42	C47	6	FRONT RIGHT TURN SIGNAL
DS43	D248	28	CAB - DASH - CENTER - OPTIONS PANEL
DS44	D46	6	RIGHT HEADLIGHT
DS45	D207	23	WRECKER BACKUP LIGHT
DS45	C216	24	TRACTOR BACKUP LIGHT
DS45	C225	25	LONG WHEEL BASE BACKUP LIGHT
DS45	C234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE BACKUP LIGHT
DS46	D246	28	CAB - DASH - CENTER - OPTIONS PANEL
DS47	G46	6	PARKING LIGHT FRONT LEFT
DS48	B47	6	PARKING LIGHT FRONT RIGHT
DS49	G46	6	BLACKOUT MARKER LEFT FRONT
DS50	B47	6	BLACKOUT MARKER RIGHT FRONT
DS51	B207	23	WRECKER BLACKOUT MARKER LEFT REAR
DS51	B216	24	TRACTOR BLACKOUT MARKER LEFT REAR
DS51	B225	25	LONG WHEEL BASE BLACKOUT MARKER LEFT REAR
DS51	C234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND WRECKER BLACKOUT MARKER LEFT REAR
DS52	F207	23	WRECKER BLACKOUT MARKER RIGHT REAR
DS52	D216	24	TRACTOR BLACKOUT MARKER RIGHT REAR
DS52	F225	25	LONG WHEEL BASE BLACKOUT MARKER RIGHT REAR
DS52	F234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE BLACKOUT MARKER RIGHT REAR
DS53	H46	6	BLACKOUT DRIVE LIGHT
DS54	D93	11	CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT
DS54	F242	27	LH FRONT TOP CAB CLEARANCE LIGHT
DS52	F234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE BLACKOUT MARKER RIGHT REAR

LIGHTS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
DS53	H46	6	BLACKOUT DRIVE LIGHT
DS54	D93	11	CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT
DS54	F242	27	LH FRONT TOP CAB CLEARANCE LIGHT
DS55	D93	11	CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE
DS55	E242	27	MIDDLE FRONT TOP CLEARANCE LIGHT
DS56	C93	11	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT
DS56	D242	27	RH FRONT TOP CAB CLEARANCE LIGHT
DS57	C93	11	CAB MARKER LIGHT FRONT UPPER RIGHT
DS57	D242	27	RH FRONT TOP CAB MARKER LIGHT
DS58	E93	11	CAB MARKER LIGHT FRONT UPPER LEFT
DS58	F242	27	LH FRONT TOP CAB MARKER LIGHT
DS59	B93	11	CAB MARKER LIGHT RIGHT DOOR
DS60	F93	11	CAB MARKER LIGHT FRONT LOWER LEFT
DS61	A93	11	CAB MARKER LIGHT RIGHT DOOR
DS62	F93	11	CAB MARKER LIGHT LEFT DOOR
DS63	B246	28	CAB - DASH - CENTER - OPTIONS PANEL
DS64	B248	28	CAB - DASH - CENTER - OPTIONS PANEL
DS65	A207	23	WRECKER LH SIDE MARKER LIGHT
DS65	A225	25	LONG WHEEL BASE LH SIDE MARKER LIGHT
DS65	A234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE LH SIDE MARKER LIGHT
DS66	A207	23	WRECKER LH REAR MARKER LIGHT
DS66	A216	24	TRACTOR LH REAR MARKER LIGHT
DS66	A225	25	LONG WHEEL BASE LH REAR MARKER LIGHT
DS66	A234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE LH REAR MARKER LIGHT
DS67	H207	23	WRECKER RH SIDE MARKER LIGHT
DS67	H225	25	LONG WHEEL BASE RH SIDE MARKER LIGHT
DS67	H234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE RH SIDE MARKER LIGHT
DS68	G207	23	WRECKER RH REAR MARKER LIGHT
DS68	C216	24	TRACTOR RH REAR MARKER LIGHT
DS68	G225	25	LONG WHEEL BASE RH REAR MARKER LIGHT
DS68	G234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE RH REAR MARKER LIGHT
DS69	D207	23	WRECKER LEFT REAR MARKER
DS69	G216	24	TRACTOR LEFT REAR MARKER
DS69	D225	25	LONG WHEEL BASE LEFT REAR MARKER
DS69	D234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE LEFT REAR MARKER
DS70	E207	23	WRECKER MIDDLE REAR MARKER
DS70	F216	24	TRACTOR MIDDLE REAR MARKER
DS70	E225	25	LONG WHEEL BASE MIDDLE REAR MARKER
DS70	E234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE MIDDLE REAR MARKER
DS71	E207	23	WRECKER RIGHT REAR MARKER
DS71	E216	24	TRACTOR RIGHT REAR MARKER
DS71	E225	25	LONG WHEEL BASE RIGHT REAR MARKER
DS71	E234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE RIGHT REAR MARKER
DS72	B207	23	WRECKER REAR LEFT COMPOSITE
DS72	B216	24	TRACTOR REAR LEFT COMPOSITE
DS72	B225	25	LONG WHEEL BASE REAR LEFT COMPOSITE
DS72	B234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE REAR LEFT COMPOSITE
DS73	F207	23	WRECKER REAR RIGHT COMPOSITE
DS73	E216	24	TRACTOR REAR RIGHT COMPOSITE
DS73	F225	25	LONG WHEEL BASE REAR RIGHT COMPOSITE
DS73	F234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE REAR RIGHT COMPOSITE
DS74	D46	6	LEFT HEADLIGHT
DS96	B251	28	CAB - DASH - CENTER - OPTIONS PANEL
DS97	B255	29	CAB - DASH - CENTER - OPTIONS PANEL
DS98	D251	28	CAB - DASH - CENTER - OPTIONS PANEL
DS99	D255	29	CAB - DASH - CENTER - OPTIONS PANEL
DS100	B249	28	CAB - DASH - CENTER - OPTIONS PANEL
DS101	D128	15	HEATER CONTROL PANEL ILLUMINATION
DS108	E100	12	CAB - DASH - LEFT - INSTRUMENT PANEL

CIRCUIT BREAKERS			
NUMBER	ZONE	SH	DESCRIPTION
CB20	C149	17	CAB RADIO
CB21	C158	18	WTEC II VIM STE/ICE

CIRCUIT BREAKERS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
CB22	C158	18	FAN/ETHER
CB23	C156	18	HEATER BLOWER
CB30	C148	17	CHEMICAL ALARM
CB35	D158	18	WTEC II VIM POWER
CB36	C156	18	HORN POWER
CB37	C160	18	WINDSHIELD WIPER/WASHER
CB38	D156	18	ROTATING BEACON
CB39	C155	18	TRAILER BLACKOUT STOP
CB40	C159	18	CTIS COOLER
CB41	C151	17	TRAILER REAR LIGHTS POWER
CB42	C151	17	BLACKOUT MARKER LIGHTS POWER
CB43	C152	17	REAR COMPOSITE LIGHTS / WTEC III ECU
CB44	C152	17	REAR COMPOSITE LIGHTS
CB45	C148	17	FUEL PREHEAT
CB48	C149	17	ARCTIC CAB/ENGINE KILL
CB49	C160	18	PTO POWER
CB50	C155	18	SWINGFIRE PUMP POWER
CB53	D149	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB54	D151	17	BLACKOUT HEADLIGHT
CB61	D162	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB62	D162	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB63	D160	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB64	D160	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB65	D149	17	PARKING LIGHTS
CB66	D152	17	BLACKOUT MARKER POWER
CB67	D148	17	MARKER LIGHTS
CB68	C161	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB70	D155	18	IGNITION/MAIN LIGHT SWITCH
CB71	D158	18	HAZARD/FLASHER WORKLIGHTS
CB72	D148	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB73	D159	18	BACK-UP LIGHT POWER
CB74	D159	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB76	D152	17	BLACKOUT STOP RELAY POWER
CB77	C161	18	ENGINE INSTR POWER
CB78	D156	18	HEADLIGHTS
CB79	C159	18	WTEC II VIM POWER / WTEC III REVERSE WARNING RELAY
CB80	D151	17	TAILLIGHTS

TERMINAL LUGS			
NUMBER	ZONE	SH	DESCRIPTION
TL1	B63	7	POLARITY PROTECTION
TL1	E69	8	ALTERNATOR
TL1	F62	7	200 AMP
TL2	D62	7	200 AMP
TL2	B62	7	POLARITY PROTECTION
TL2	D69	8	ALTERNATOR
TL3	C94	11	CAB MARKER LIGHT FRONT UPPER RIGHT
TL3	D242	27	RH FRONT TOP CAB MARKER LIGHT
TL4	C94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT
TL4	D242	27	RH FRONT TOP CAB CLEARANCE LIGHT
TL5	D69	8	ALTERNATOR
TL6	D69	8	ALTERNATOR
TL9	D56	7	24V AUXILIARY STARTER SOLENOID
TL8	D94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE
TL8	E242	27	MIDDLE FRONT TOP CLEARANCE LIGHT
TL10	C61	7	CHASSIS - REAR (REF E1)
TL12	C58	7	BATTERIES
TL12	C71	8	STARTER/STARTER SOLENOID
TL14	E97	11	ROTARY WARNING LIGHT CONNECTOR
TL15	A206	23	WRECKER REAR LIGHTS
TL15	A224	25	LONG WHEEL BASE
TL15	A233	26	LH SIDE MARKER LIGHT
TL16	B206	23	WRECKER REAR LIGHTS
TL16	G215	24	REAR LIGHTS TRACTOR
TL16	B224	25	LONG WHEEL BASE
TL16	A233	26	LH REAR MARKER LIGHT

TERMINAL LUGS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
TL17	C233	26	BACKUP LIGHT
TL17	C206	23	WRECKER REAR LIGHTS
TL17	C215	24	REAR LIGHTS TRACTOR
TL17	C224	25	LONG WHEEL BASE
TL18	C206	23	WRECKER REAR LIGHTS
TL18	H215	24	REAR LIGHTS TRACTOR
TL18	C224	25	LONG WHEEL BASE REAR LIGHTS
TL18	C233	26	LONG WHEEL BASE
TL19	H206	23	WRECKER REAR LIGHTS
TL19	H224	25	LONG WHEEL BASE
TL19	H233	26	RH SIDE MARKER LIGHT
TL20	G233	26	RH REAR MARKER LIGHT
TL20	C215	24	TRACTOR REAR LIGHTS
TL20	G224	25	LONG WHEELBASE REAR LIGHTS
TL20	G206	23	WRECKER REAR LIGHTS
TL21	G206	23	WRECKER REAR LIGHTS
TL21	D215	24	REAR LIGHTS TRACTOR
TL21	G224	25	LONG WHEEL BASE
TL21	G233	26	RH COMPOSITE LIGHT
TL22	D94	11	CAB MARKER LIGHTS
TL22	E242	27	LH FRONT TOP CAB CLEARANCE LIGHT
TL23	D56	7	24V AUXILIARY STARTER SOLENOID
TL24	D56	7	24V AUXILIARY STARTER SOLENOID
TL25	C56	7	CHASSIS - FRONT
TL25	C71	8	STARTER/STARTER SOLENOID
TL26	B56	7	CHASSIS - FRONT
TL26	C71	8	STARTER/STARTER SOLENOID
TL27	E94	11	CAB MARKER LIGHTS
TL27	F242	27	LH FRONT TOP CAB MARKER LIGHT
TL28	G66	8	FUEL SOLENOID
TL29	H66	8	FUEL SOLENOID
TL30	D206	23	WRECKER REAR LIGHTS
TL30	E215	24	REAR LIGHTS TRACTOR
TL30	D224	25	LONG WHEEL BASE
TL30	D233	26	LEFT REAR MARKER
TL31	E206	23	WRECKER REAR LIGHTS
TL31	F215	24	REAR LIGHTS TRACTOR
TL31	E224	25	LONG WHEEL BASE
TL31	E233	26	MIDDLE REAR MARKER
TL32	E206	23	WRECKER REAR LIGHTS
TL32	G215	24	REAR LIGHTS TRACTOR
TL32	E224	25	LONG WHEEL BASE
TL32	E233	26	RIGHT REAR MARKER
TL320	E268	30	PTO EQUIPPED
TL320	C277	31	ARCTIC KIT W/PTO EQUIPPED
TL33	E56	7	24V AUXILIARY STARTER SOLENOID
TL35	D70	8	ALTERNATOR
TL36	B62	7	POLARITY PROTECTION
TL36	F63	7	200 AMP
TL37	F63	7	200 AMP
TL37	B63	7	POLARITY PROTECTION
TL38	D59	7	SHUNT
TL39	C61	7	CHASSIS - REAR (REF E1)
TL41	B62	7	POLARITY PROTECTION
TL42	B62	7	POLARITY PROTECTION
TL44	B62	7	POLARITY PROTECTION
TL44	E63	7	200 AMP
TL45	D59	7	SHUNT
TL46	D58	7	SHUNT
TL46	D71	8	STARTER/STARTER SOLENOID
TL47	F63	7	200 AMP
TL47	C63	7	POLARITY PROTECTION
TL48	E61	7	CHASSIS - REAR (REF E2)
TL49A	D61	7	CHASSIS - REAR (REF E1)
TL49A	F61	7	NATO SLAVE RECEPTACLE
TL50	G130	15	CHASSIS GROUND
TL50A	F61	7	NATO SLAVE RECEPTACLE
TL51	E59	7	SHUNT
TL52	E59	7	SHUNT

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 3 OF 40

SIZE B | ILL NO. 6WD01L3B | FP-5/ (FP-6 BLANK)

TERMINAL LUGS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
TL53	B56	7	CHASSIS - FRONT
TL53	B71	8	STARTER/STARTER SOLENOID
TL54	C200	23	WRECKER REAR LIGHTS
TL55	B56	7	CHASSIS - FRONT
TL55	C71	8	STARTER/STARTER SOLENOID
TL56	F145	17	X3 GROUND
TL57	F145	17	CAB GROUND
TL58	D69	8	ALTERNATOR
TL59	C70	8	ALTERNATOR
TL60	C62	7	POLARITY PROTECTION
TL60	D69	8	ALTERNATOR
TL61	C62	7	POLARITY PROTECTION
TL61	E69	8	ALTERNATOR
TL61	F62	7	200 AMP
TL62	C56	7	CHASSIS - FRONT
TL63	C56	7	CHASSIS - FRONT
TL63	B71	8	STARTER/STARTER SOLENOID
TL66	H70	8	ENGINE (REF P201)
TL67	F307	35	CARGO MATERIAL HANDLING CRANE
TL68	D260	29	CAB - DASH - CENTER - OPTIONS PANEL
TL69	E260	29	CAB - DASH - CENTER - OPTIONS PANEL
TL70	B47	6	FRONT RH COMPOSITE LIGHT
TL71	A94	11	CAB MARKER LIGHT RIGHT DOOR
TL72	H47	6	BLACKOUT DRIVE LIGHT
TL73	B95	11	CAB MARKER LIGHTS
TL74	D95	11	CAB MARKER LIGHTS
TL74	E240	27	AIRDROP ONLY
TL75	F96	11	CAB MARKER LIGHTS
TL76	D265	30	PTO EQUIPPED
TL77	B299	34	DUMP BODY
TL78	B298	34	DUMP BODY
TL77	B299	34	DUMP BODY
TL78	B298	34	DUMP BODY
TL79	F47	6	FRONT LH COMPOSITE LIGHT
TL80	E63	7	200 AMP
TL80	C62	7	POLARITY PROTECTION
TL81	C48	6	CHASSIS - GROUND
TL82	F47	6	CHASSIS - GROUND
TL83	B61	7	FUEL TANK LEVEL SENSOR
TL84	B58	7	CHASSIS - SPARE TIRE (REF J93)
TL85	G61	7	CHASSIS - REAR
TL86	C95	11	CAB MARKER LIGHTS
TL86	D240	27	AIRDROP ONLY
TL87	F95	11	CAB MARKER LIGHTS
TL88	A199	23	WRECKER REAR LIGHTS
TL88	A217	25	LONG WHEEL BASE
TL89	G199	23	WRECKER REAR LIGHTS
TL89	G217	25	LONG WHEEL BASE
TL90	H199	23	WRECKER REAR LIGHTS
TL90	H217	25	LONG WHEEL BASE
TL92	H200	23	WRECKER REAR LIGHTS
TL92	C215	24	REAR LIGHTS TRACTOR
TL92	G224	25	LONG WHEEL BASE
TL92	F231	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
TL93	H199	23	WRECKER REAR LIGHTS
TL93	G215	24	REAR LIGHTS TRACTOR
TL93	G230	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
TL93M	G208	24	REAR LIGHTS TRACTOR
TL94	G94	11	WINDSHIELD WASHER ROTARY PUMP (B3)
TL97	B97	11	CHEMICAL ALARM CONNECTOR
TL98	B97	11	CHEMICAL ALARM CONNECTOR
TL99	D61	7	CHASSIS - REAR (REF E2)
TL101	G264	30	ALL MTV W/O PTO
TL101	G267	30	TRACTOR W/O WINCH
TL109	C209	24	REAR LIGHTS TRACTOR
TL110	D70	8	ALTERNATOR
TL111	D266	30	PTO EQUIPPED
TL123	E47	6	CHASSIS - FRONT (REF J19)
TL126	E135	15	CHASSIS - GROUND
TL130	F94	11	CAB MARKER LIGHTS
TL131	A94	11	CAB MARKER LIGHTS

TERMINAL LUGS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
TL133	F94	11	CAB MARKER LIGHTS
TL134	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT
TL150	F186	21	SENSOR/FRONT AIR PRESSURE TRANSMITTER
TL151	G186	21	SENSOR/REAR AIR PRESSURE TRANSMITTER
TL152	C188	21	STOPLIGHT SWITCH
TL501	G197	22	CAB - DASH - RIGHT - UNDERDASH
TL502	G197	22	CAB - DASH - RIGHT - UNDERDASH
TL153	C188	21	STOPLIGHT SWITCH
TL154	D188	21	STOPLIGHT SWITCH
TL155	D188	21	STOPLIGHT SWITCH
TL156	F186	21	SWITCH/FRONT AIR PRESSURE TRANSMITTER
TL157	G186	21	SWITCH/REAR AIR PRESSURE TRANSMITTER
TL158	E146	17	START INHIBIT PUSHBUTTON
TL159	E145	17	START INHIBIT PUSHBUTTON
TL162	B123	14	STARTER PUSHBUTTON
TL163	B123	14	STARTER PUSHBUTTON
TL164	G71	8	ENGINE (REF J921)
TL165	G71	8	ENGINE (REF J921)
TL166	F62	7	200 AMP
TL167	E62	7	200 AMP
TL168	D63	7	200 AMP
TL169	D62	7	200 AMP
TL171	F62	7	200 AMP
TL172	F62	7	200 AMP
TL173	E63	7	200 AMP
TL174	D62	7	200 AMP
TL190	D344	39	WTEC III PRESSURE SWITCH GROUND
TL201	E134	15	PARKING BRAKE SWITCH
TL202	E133	15	PARKING BRAKE SWITCH

SWITCHES			
NUMBER	ZONE	SH	DESCRIPTION
S3	A186	21	COLUMN SWITCH
S3	C186	21	COLUMN SWITCH
S4	D123	14	MAIN LIGHT SWITCH
S5/1	B120	14	IGNITION SWITCH
S5/11	A100	12	ENGINE FAN OFF SWITCH
S5/14	C249	28	WINCH ON OFF
S5/15	B248	28	WINCH IN-OUT
S5/16	F100	12	ETHER STARTER SWITCH
S5/2	D100	12	LAMP TEST SWITCH
S5/2	D120	14	ROTATING WARNING LIGHT SWITCH
S5/22	G120	14	FULL HAZARD WARNING SWITCH
S5/25	A255	29	SWINGFIRE PUMP SWITCH
S5/37	C255	29	DUMP UP DOWN SWITCH
S5/5	A247	28	WORKLIGHTS ON/OFF SWITCH
S5/6	B246	28	PTO ON/OFF SWITCH
S5/8	A249	28	BLACKOUT OVERRIDE SWITCH
S5/9	A250	28	FUEL PRE-HEAT SWITCH
S6	A123	14	STARTER PUSHBUTTON
S7	F146	17	START INHIBIT PUSHBUTTON
S10A	C188	21	STOPLIGHT SWITCH
S10B	D188	21	STOPLIGHT SWITCH
S18	D305	34	PTO PRESSURE SWITCH
S20	E186	21	SWITCH/FRONT AIR PRESSURE TRANSMITTER
S23	F61	7	AIR PRESSURE SWITCH FOR CTIS
S24	E134	15	PARKING BRAKE SWITCH
S25	B299	34	DUMP BED POSITION SWITCH
S26	C66	8	WATER TEMPERATURE SENSOR
S27	E68	8	OIL PRESSURE WARNING LIGHT SWITCH
S29	G186	21	SWITCH/REAR AIR PRESSURE TRANSMITTER
S31	A252	28	ARCTIC TROOP HEATER SWITCH
S36	C251	28	TAILGATE RELEASE SWITCH
S40	F67	8	ETHER SENSOR SWITCH
S45	G71	8	TROOP ALARM SWITCH
S56	A66	8	WATER TEMPERATURE SWITCH

GAGES			
NUMBER	ZONE	SH	DESCRIPTION
M2	D115	13	VOLTMETER
M3	B115	13	ENGINE OIL PRESSURE METER
M4	F105	12	FRONT AIR PRESSURE METER
M5	B105	12	REAR AIR PRESSURE METER

GAGES (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
M6	G116	13	WATER TEMPERATURE METER
M7	D105	12	FUEL LEVEL METER
M8	G111	13	SPEEDOMETER
M9	A246	28	TACHOMETER

RELAYS			
NUMBER	ZONE	SH	DESCRIPTION
K1	F158	18	STARTER RELAY
K2	B152	17	CONTROL PANEL RELAY
K6	F153	17	STOPLIGHT RELAY
K7	G162	18	HEADLIGHT RELAY
K8	G160	18	HEADLIGHT LO/HI-BEAM RELAY
K9	A151	17	HAZARD FLASHER BO OVERIDE
K10	F159	18	STARTER RELAY
K11	F155	18	ALTERNATOR EXCITATION RELAY
K12	B148	17	WORKLIGHT RELAY
K13	B158	18	ROTATING BEACON BO OVRD RELAY
K15	B149	17	AUXILIARY COOLER RELAY
K19	B159	18	START INHIBIT RELAY
K20	H147	17	MARKER LIGHTS RELAY
K24	B160	18	CRANKING LOCKOUT RELAY
K25	B346	39	WTEC III REVERSE WARNING RELAY
K26	B344	39	WTEC III NEUTRAL START RELAY
K27	H152	17	BO STOP RELAY
K28	H151	17	TRAILER REAR LIGHTS RELAY
K29	F151	17	BO MARKER RELAY / WTEC III BLACKOUT DRIVE RELAY
K30	H156	18	REAR LEFT COMPOSITE LAMP RELAY
K31	H158	18	REAR RIGHT COMPOSITE LAMP RELAY
K32	B156	18	HORN RELAY
K37	B348	39	WTEC III PTO ENABLE OUTPUT RELAY
K52	H148	17	CTIS OVERSPEED INDICATION RELAY
K53	H149	17	RADIO POWER RELAY

RESISTORS			
NUMBER	ZONE	SH	DESCRIPTION
R1	D88	10	AIR DRYER
R2	E181	21	CAB - DASH - LEFT - UNDERDASH
R4	D184	21	CAB - DASH - LEFT - UNDERDASH
R5	C184	21	CAB - DASH - LEFT - UNDERDASH
R6	F181	21	CAB - DASH - LEFT - UNDERDASH

SOLENOIDS			
NUMBER	ZONE	SH	DESCRIPTION
KS	D56	7	24V AUXILIARY STARTER SOLENOID
L1	E198	22	FAN SOLENOID
L1	H337	38	RIGHT WINCH OUT
L2	H76	8	FUEL SOLENOID
L2	H337	38	RIGHT WINCH IN
L3	B305	34	PTO SOLENOID
L4	E269	30	WINCH IN SOLENOID
L5	D269	30	WINCH OUT SOLENOID
L5	H340	38	LEFT WINCH IN
L6	D198	22	INTER-AXLE DIFFERENTIAL SOLENOID
L6	H339	38	LEFT WINCH OUT
L7	B302	34	TAILGATE RELEASE SOLENOID
L8	B302	34	DUMP BED UP SOLENOID
L9	A302	34	DUMP BED SOLENOID
L11	H338	38	UNDERLIFT DOWN
L13	H339	38	STINGER OUT
L14	H338	38	UNDERLIFT UP
L15	B60	7	CHASSIS - SPARE TIRE
L15	H337	38	UNDERLIFT FOLD DOWN
L16	H339	38	STINGER IN
L18	H338	38	UNDERLIFT FOLD UP

HORNS AND ALARMS			
NUMBER	ZONE	SH	DESCRIPTION
LS1	A46	6	VEHICLE HORN
LS2	H110	13	AUDIBLE ALARM

MOTORS			
NUMBER	ZONE	SH	DESCRIPTION
B2	A192	22	WINDSHIELD WIPER MOTOR
B4	C127	15	FAN MOTOR
B6	F268	30	TRANSMISSION AUXILIARY OIL COOLER FAN
B6A	G268	30	TRANSMISSION AUXILIARY OIL COOLER FAN

BATTERIES			
NUMBER	ZONE	SH	DESCRIPTION
BT1	C61	7	BATTERY
BT2	D61	7	BATTERY
BT3	D61	7	BATTERY
BT4	E61	7	BATTERY

MISCELLANEOUS			
NUMBER	ZONE	SH	DESCRIPTION
10A	C192	22	WTEC II VEHICLE INTERFACE MODULE
10A	E192	22	WTEC II VEHICLE INTERFACE MODULE
A2	F127	15	CTIS ELECTRONIC CONTROL UNIT
A3	G123	14	INSTRUMENT PANEL LIGHTS DIMMER MODULE
A5	A143	16	WIPER DELAY MODULE
A7	B188	21	FREQUENCY DIVIDER
A18	A112	13	LIGHTED INDICATOR DISPLAY
A20	H68	8	FUEL/WATER SEPARATOR
B1	C72	8	STARTER/STARTER SOLENOID
B10	E76	9	WTEC II TRANSFER CASE (SERIAL # 6510032369)
B10	E81	9	WTEC II TRANSFER CASE (SERIAL # 651032369 AND HIGHER)
B10	E75	9	WTEC II TRANSMISSION (SERIAL # 6510032369)
B10	E79	9	WTEC II TRANSMISSION (SERIAL # 6510032369 AND HIGHER)
B10	E85	10	TRANSFER CASE PRIOR (SERIAL # 6510032369 WITH ADAPTER CABLE ASSEMBLY)
B10	E83	10	TRANSMISSION PRIOR TO (SERIAL # 6510032369 WITH ADAPTER CABLE ASSEMBLY)
B3	G92	11	WINDSHIELD WASHER ROTARY PUMP
BJ1	A184	21	JUNCTION BOX
D1A	C147	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D1B	C147	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D2A	D147	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D2B	D147	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D3A	B147	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D3B	A147	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D7	B307	35	DIODE ASSEMBLY
D7	B318	36	DIODE ASSEMBLY
D8	C307	35	DIODE ASSEMBLY
D8	A318	36	DIODE ASSEMBLY
E1	C61	7	BATTERY
E1	D61	7	BATTERY
E1	D61	7	BATTERY
E1	E61	7	BATTERY
E2	C4	6	CHASSIS - FRONT BUMPER (REF J27)
E2	C52	7	BATTERY
E2	D52	7	BATTERY
E2	E52	7	BATTERY
E2	E52	7	BATTERY
E3	H157	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
E4	H159	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
E5	B160	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
E14	E221	25	LONG WHEEL BASE
E14	E230	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E15	E224	25	LONG WHEEL BASE
E15	E233	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E16	A224	25	LONG WHEEL BASE
E16	A233	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E17	G222	25	LONG WHEEL BASE

MISCELLANEOUS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
E17	G222	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E18	G212	25	LONG WHEEL BASE
E18	G221	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E19	F212	25	LONG WHEEL BASE
E19	F221	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E20	E213	25	LONG WHEEL BASE
E20	E221	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E21	D213	25	LONG WHEEL BASE
E21	D222	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E22	B86	11	CAB MARKER LIGHTS
E27	F213	24	REAR LIGHTS TRACTOR
E28	G215	24	REAR LIGHTS TRACTOR
E29	E209	24	REAR LIGHTS TRACTOR
E30	D214	24	REAR LIGHTS TRACTOR
E31	D213	24	REAR LIGHTS TRACTOR
E32	G212	24	REAR LIGHTS TRACTOR
E33	C209	24	REAR LIGHTS TRACTOR
E34	B210	24	REAR LIGHTS TRACTOR
E35	F209	24	REAR LIGHTS TRACTOR
E36	E210	24	REAR LIGHTS TRACTOR
E37	E211	24	REAR LIGHTS TRACTOR
E38	F209	24	REAR LIGHTS TRACTOR
E39	E210	24	REAR LIGHTS TRACTOR
E40	F210	24	REAR LIGHTS TRACTOR
E41	D211	24	REAR LIGHTS TRACTOR
E42	D210	24	REAR LIGHTS TRACTOR
E43	D210	24	REAR LIGHTS TRACTOR
E44	H213	24	REAR LIGHTS TRACTOR
E45	G209	24	REAR LIGHTS TRACTOR
E46	G203	23	WRECKER REAR LIGHTS
E47	F203	23	WRECKER REAR LIGHTS
E48	E204	23	WRECKER REAR LIGHTS
E49	D203	23	WRECKER REAR LIGHTS
E50	E206	23	WRECKER REAR LIGHTS
E51	A206	23	WRECKER REAR LIGHTS
E52	G204	23	WRECKER REAR LIGHTS
E53	D200	23	WRECKER REAR LIGHTS
E54	B200	23	WRECKER REAR LIGHTS
E55	F200	23	WRECKER REAR LIGHTS
E56	E211	24	REAR LIGHTS TRACTOR
E57	E203	23	WRECKER REAR LIGHTS
E58	D204	23	WRECKER REAR LIGHTS
E59	G204	23	WRECKER REAR LIGHTS
E64	D221	25	LONG WHEEL BASE
E65	B50	6	CHASSIS - FRONT
E66	C50	6	CHASSIS - FRONT
E66	D354	40	WTEC III CAB TRANSMISSION HARNESS (TID1)
E66	D358	40	WTEC III CAB TRANSMISSION HARNESS (TID2)
E67	D47	6	CHASSIS - FRONT
E68	D49	6	CHASSIS - FRONT
E69	D260	29	CAB - DASH - CENTER - OPTIONS PANEL
E70	C265	30	PTO EQUIPPED
E70	F266	30	TRACTOR W/O WINCH
E71	F182	21	CAB - DASH - LEFT - UNDERDASH
E72	G222	25	LONG WHEEL BASE
E74	G266	30	TRACTOR W/O WINCH
E78	A290	34	DUMP BODY
E79	B227	27	ROTARY WARNING LIGHT CONNECTOR
E80	C227	27	ROTARY WARNING LIGHT CONNECTOR
E81	B228	27	ROTARY WARNING LIGHT CONNECTOR
E82	C228	27	ROTARY WARNING LIGHT CONNECTOR
E83	B228	27	ROTARY WARNING LIGHT CONNECTOR
E84	B228	27	ROTARY WARNING LIGHT CONNECTOR
E88	B106	13	CAB - DASH - LEFT - INSTRUMENT PANEL

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 4 OF 40

SIZE B | ILL. NO. 6WD01L4B | FP-7/ (FP-8 BLANK)

MISCELLANEOUS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
E89	C115	13	CAB - DASH - LEFT - INSTRUMENT PANEL
E90	E354	40	WTEC III CAB TRANSMISSION HARNESS (TID1)
E90	E358	40	WTEC III CAB TRANSMISSION HARNESS (TID2)
E91	C354	40	WTEC III CAB TRANSMISSION HARNESS (TID1)
E91	C358	40	WTEC III CAB TRANSMISSION HARNESS (TID2)
FL	E183	22	WTEC II VEHICLE INTERFACE MODULE
FL1	G85	11	EMI FILTER
FL2	A184	22	EMI FILTER
FL3	C118	15	FAN MOTOR
G1	D70	8	ALTERNATOR
MPU1	F61	8	ENGINE SPEED MAGNETIC PICKUP
MT3	G69	8	ENGINE OIL PRESSURE SENSOR
MT4	E177	21	SENSOR/FRONT AIR PRESSURE TRANSMITTER
MT5	G186	21	SENSOR/REAR AIR PRESSURE TRANSMITTER
MT6	B66	8	WATER COOLER TEMPERATURE
MT7	B61	7	FUEL TANK LEVEL SENSOR
NS	E192	22	WTEC II VEHICLE INTERFACE MODULE
NS	F192	22	WTEC II VEHICLE INTERFACE MODULE
R11	D59	7	SHUNT
TB	C309	35	CARGO MATERIAL HANDLING CRANE
TB	F309	35	CARGO MATERIAL HANDLING CRANE
TB	D319	36	WRECKER MATERIAL HANDLING CRANE
TB	E247	38	WRECKER CONTROLS
TB1	C137	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PANEL
TB2	F139	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PANEL
X1	C146	17	24 VDC
X11	F61	7	NATO SLAVE RECEPTACLE
X2	D146	17	24 VDC
X3	F146	17	GROUND

TRANSMISSION			
NUMBER	ZONE	SH	DESCRIPTION
A10	B192	22	WTEC II VEHICLE INTERFACE MODULE
A11	C347	39	WTEC III TRANSMISSION ECU
A12	G347	39	WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR
A13	A75	9	PRE-BLOCK SEVEN TRANSMISSIONS
A13	A78	9	TID1, TID2 AND TID3 TRANSMISSIONS
A13	A82	10	PRE-BLOCK SEVEN WITH PIGTAIL TRANSMISSIONS
B10	E76	9	PRE-BLOCK SEVEN TRANSMISSION OUTPUT SPEED SENSOR
B10	E85	10	PRE-BLOCK SEVEN TRANSMISSION WITH PIGTAIL OUTPUT SPEED SENSOR
B10	E80	9	TID1, TID2, AND TID3 TRANSMISSION OUTPUT SPEED SENSOR
MT9	F76	9	PRE-BLOCK SEVEN TRANSMISSION ENGINE SPEED SENSOR
MT9	F85	10	PRE-BLOCK SEVEN WITH PIGTAIL TRANSMISSION ENGINE SPEED SENSOR
MT9	F80	9	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR
MT11	G76	9	PRE-BLOCK SEVEN TRANSMISSION THROTTLE POSITION SENSOR
MT11	F85	10	PRE-BLOCK SEVEN WITH PIGTAIL TRANSMISSION THROTTLE POSITION SENSOR
MT11	F80	9	TID1, TID2, AND TID3 TRANSMISSION THROTTLE POSITION SENSOR
REV	C192	22	WTEC II VEHICLE INTERFACE MODULE
RW	D192	22	WTEC II VEHICLE INTERFACE MODULE
S02	F192	22	WTEC II VEHICLE INTERFACE MODULE
S03	F192	22	WTEC II VEHICLE INTERFACE MODULE
SF01	D192	22	WTEC II VEHICLE INTERFACE MODULE
SF01	D192	22	WTEC II VEHICLE INTERFACE MODULE
SF02	C192	22	WTEC II VEHICLE INTERFACE MODULE
SF02	D192	22	WTEC II VEHICLE INTERFACE MODULE
SF3	F192	22	WTEC II VEHICLE INTERFACE MODULE
SF04	C192	22	WTEC II VEHICLE INTERFACE MODULE
SF4	D192	22	WTEC II VEHICLE INTERFACE MODULE

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 5 OF 40

SIZE B | ILL. NO. 6WD01IL5B | FP-9/ (FP-10 BLANK)

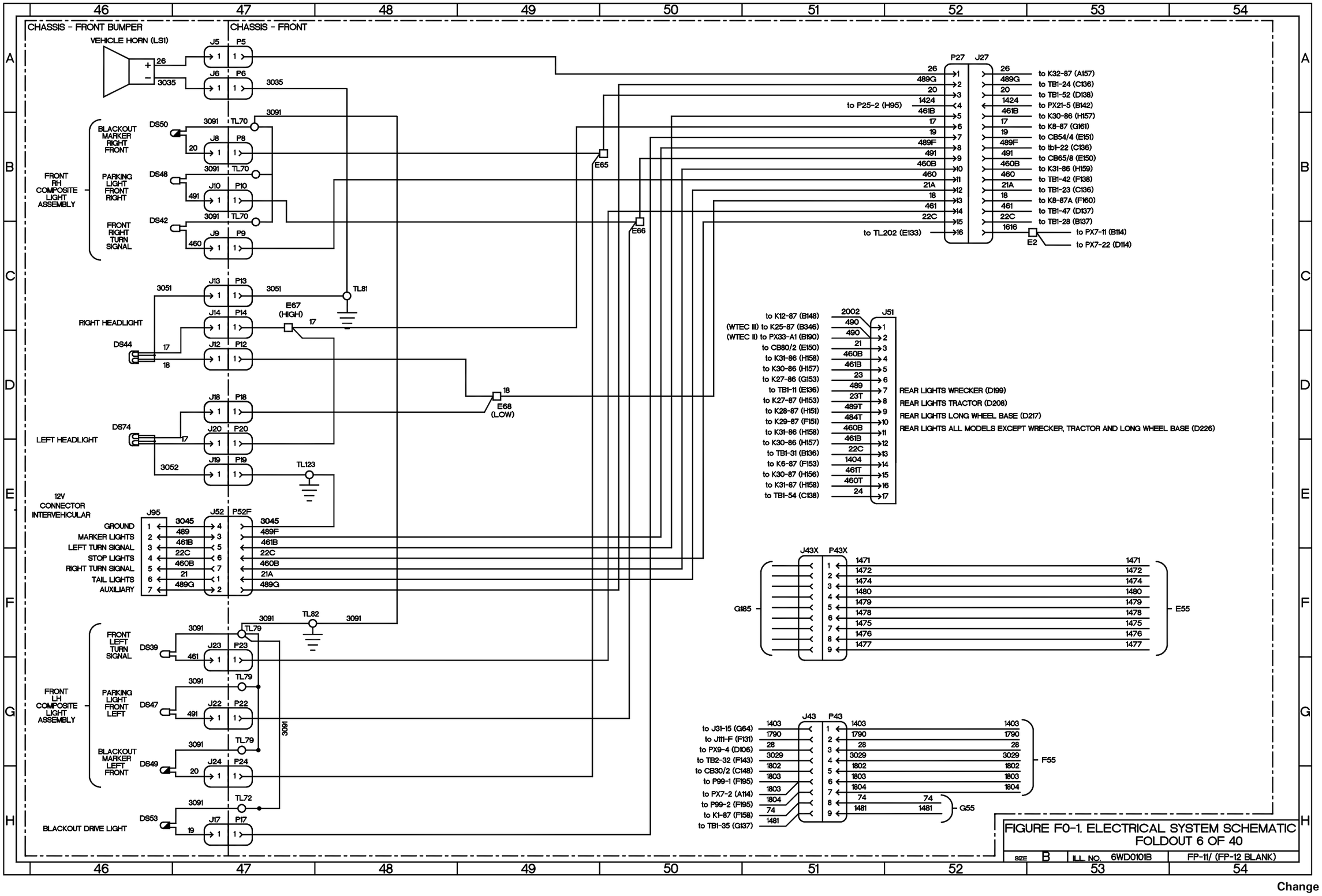


FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 6 OF 40

SIZE	ILL. NO.	
B	6WD0101B	FP-11/ (FP-12 BLANK)

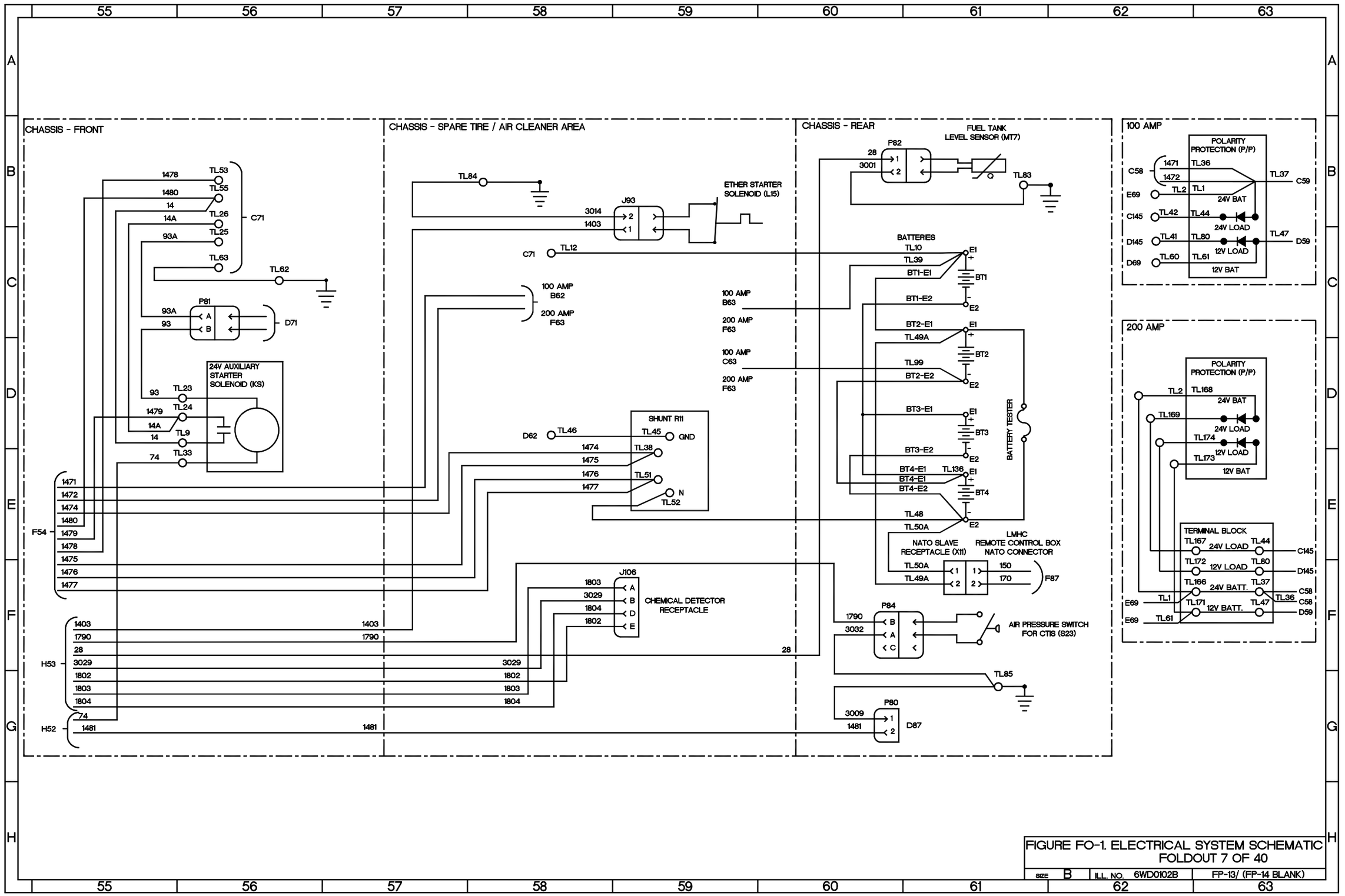


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 7 OF 40

SIZE	ILL. NO.	
B	6WD0102B	FP-13/ (FP-14 BLANK)

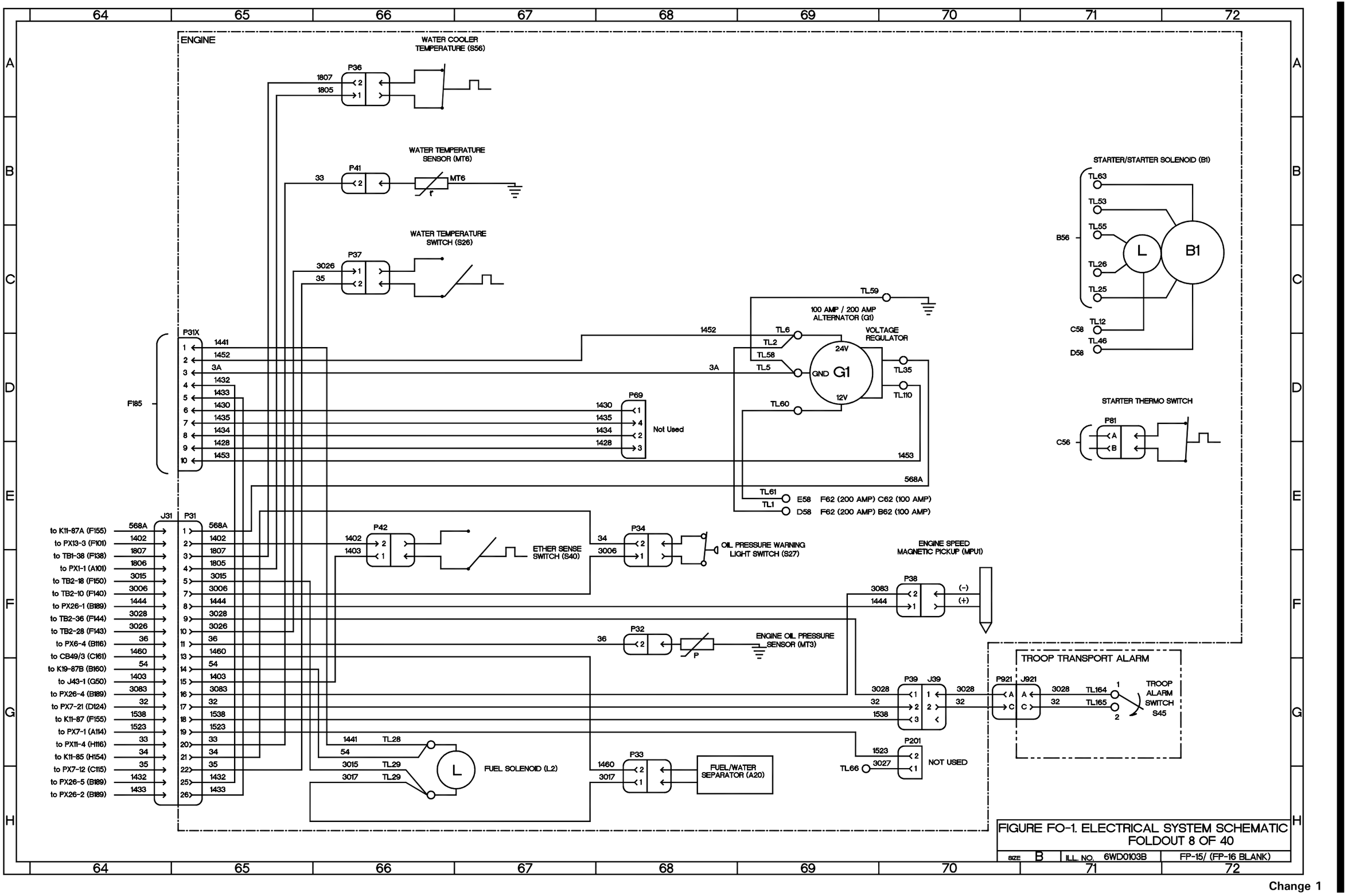


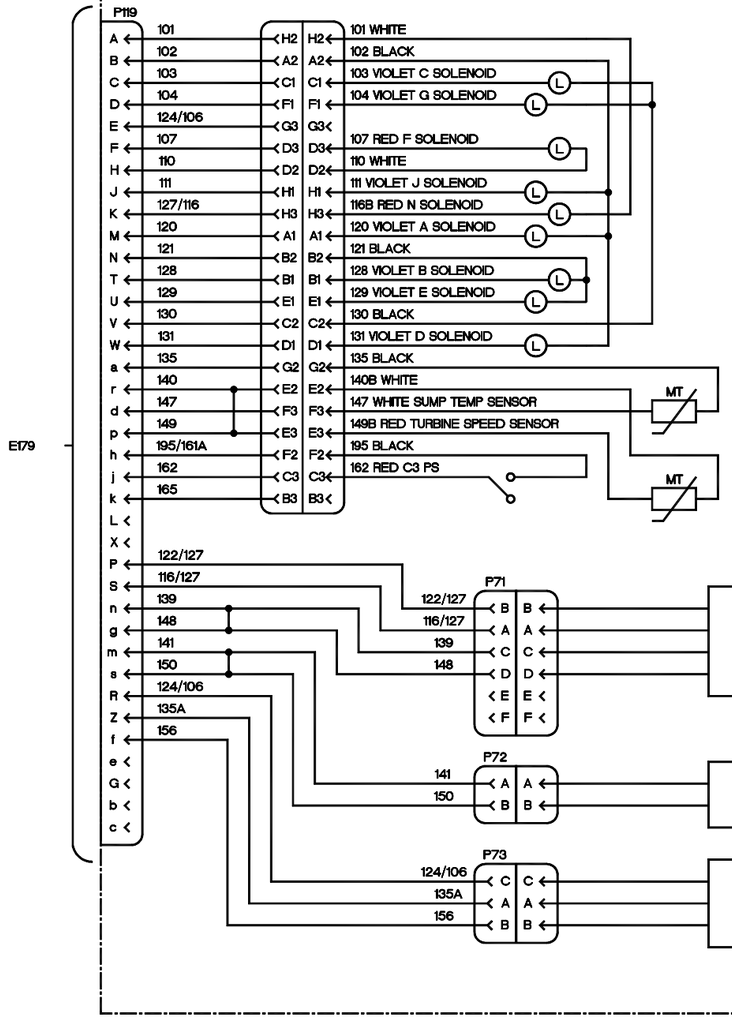
FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 8 OF 40

SIZE B | ILL. NO. 6WD0103B | FP-15/ (FP-16 BLANK)

PRIOR TO SERIAL NUMBER 6510032369

PRE-BLOCK SEVEN TRANSMISSION

EXTERNAL WIRING HARNESS TO TRANSMISSION CONNECTOR



SERIAL NUMBER 6510032369 AND HIGHER

TID1, TID2, AND TID3 TRANSMISSIONS

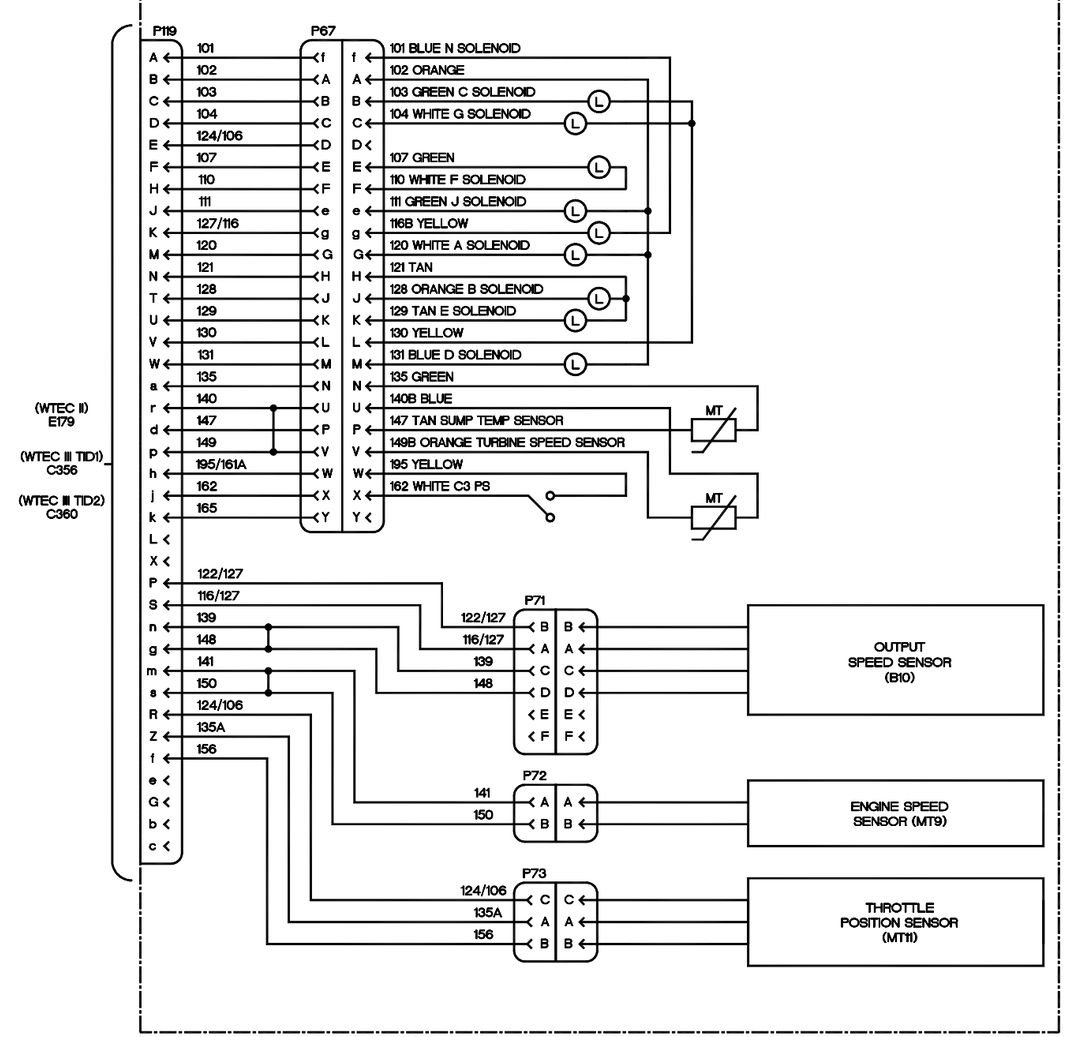
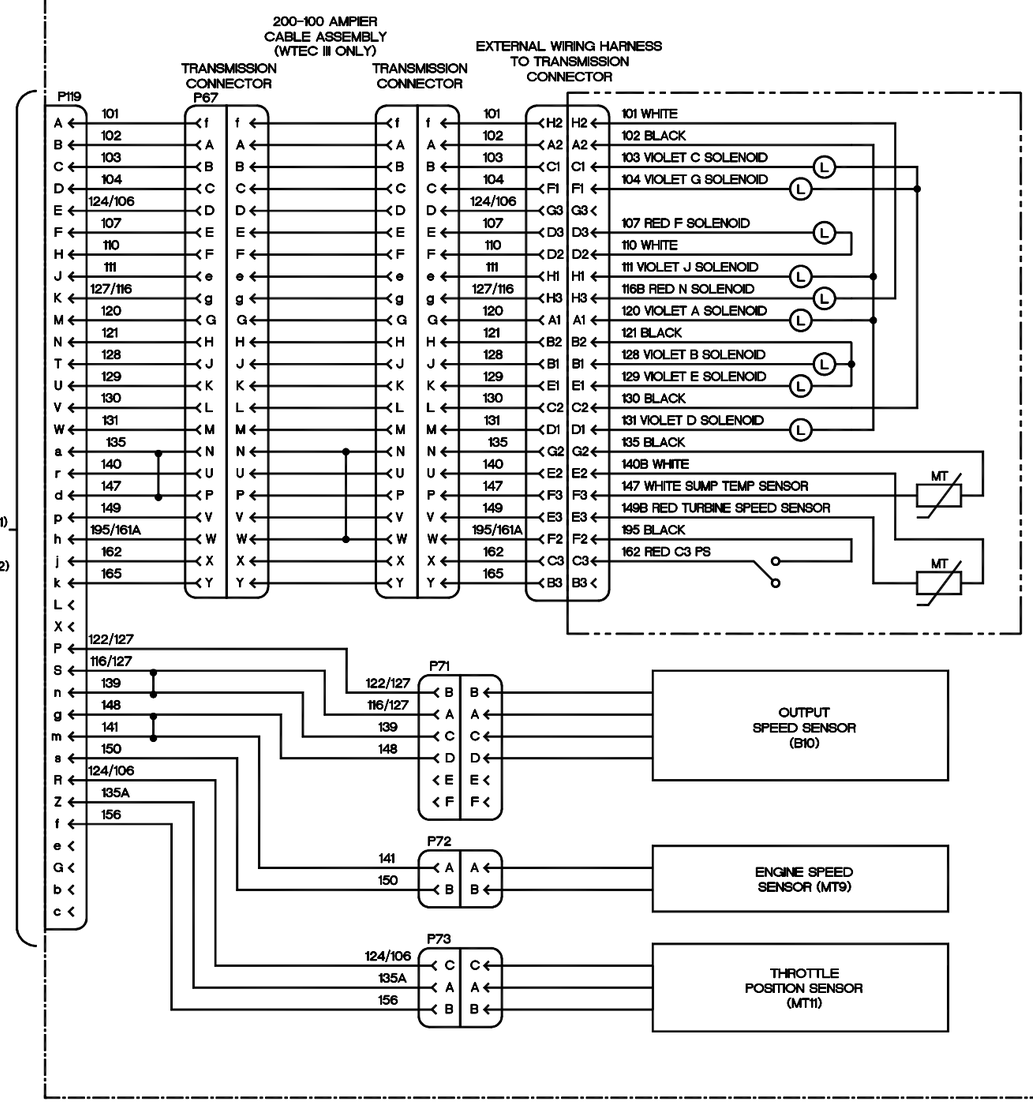


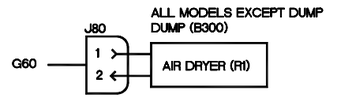
FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 9 OF 40

SIZE	ILL. NO.	
B	6WD0104B	FP-17/ (FP-18 BLANK)

PRIOR TO SERIAL NUMBER 6510032369 WITH ADAPTER CABLE ASSEMBLY

PRE-BLOCK SEVEN WITH PIGTAIL TRANSMISSION





LIGHT MATERIAL HANDLING CRANE (LMHC)

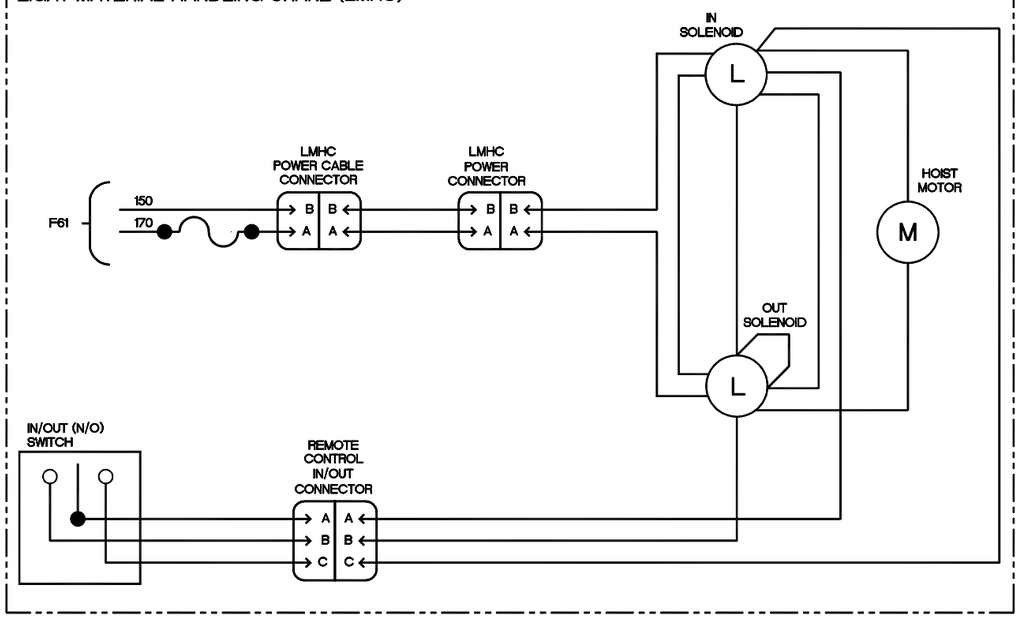


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 10 OF 40

SIZE	ILL. NO.	
B	6WD0105B	FP-19/ (FP-20 BLANK)

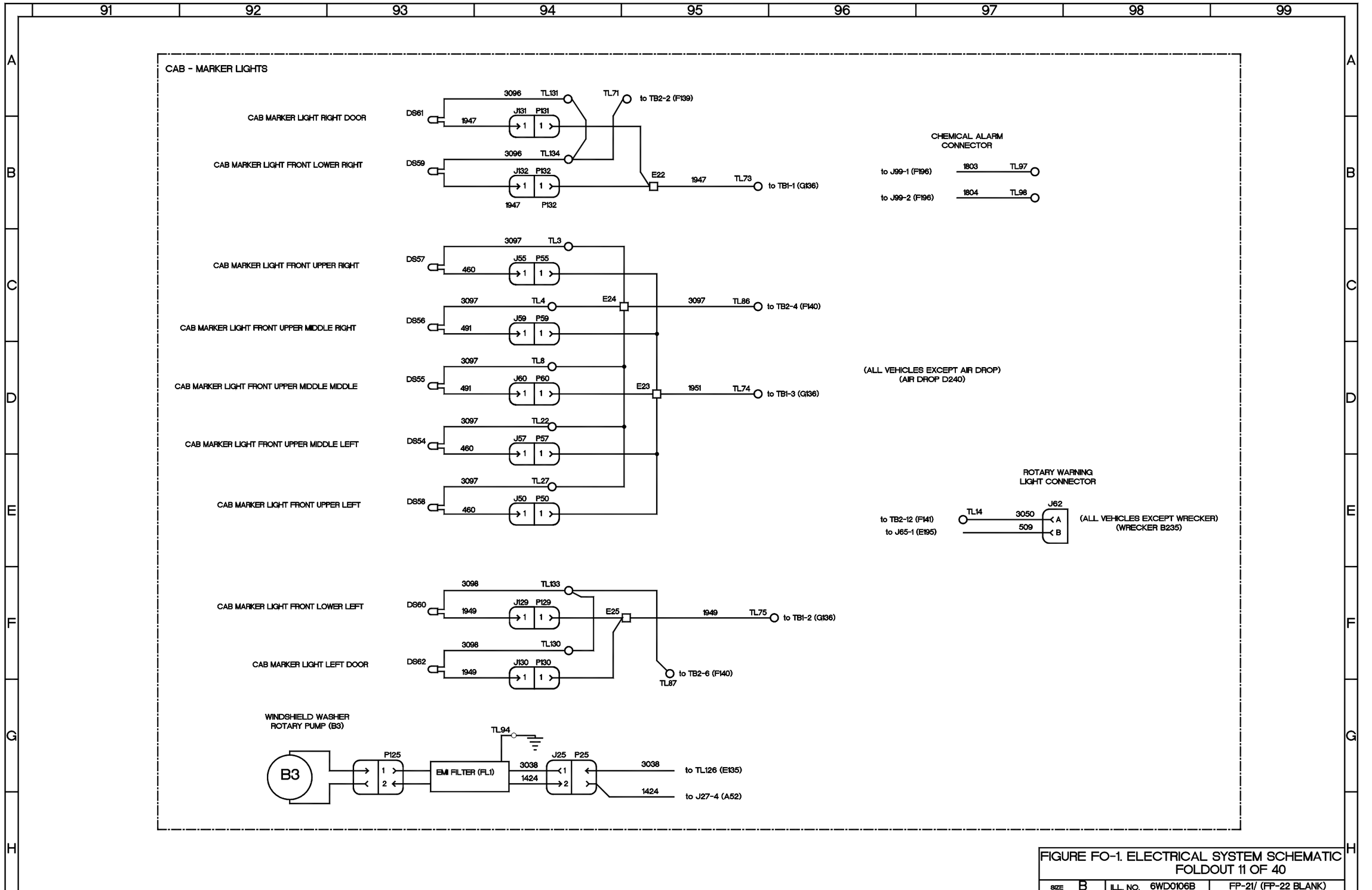


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 11 OF 40

SIZE	ILL. NO.	
B	6WD0106B	FP-21/ (FP-22 BLANK)

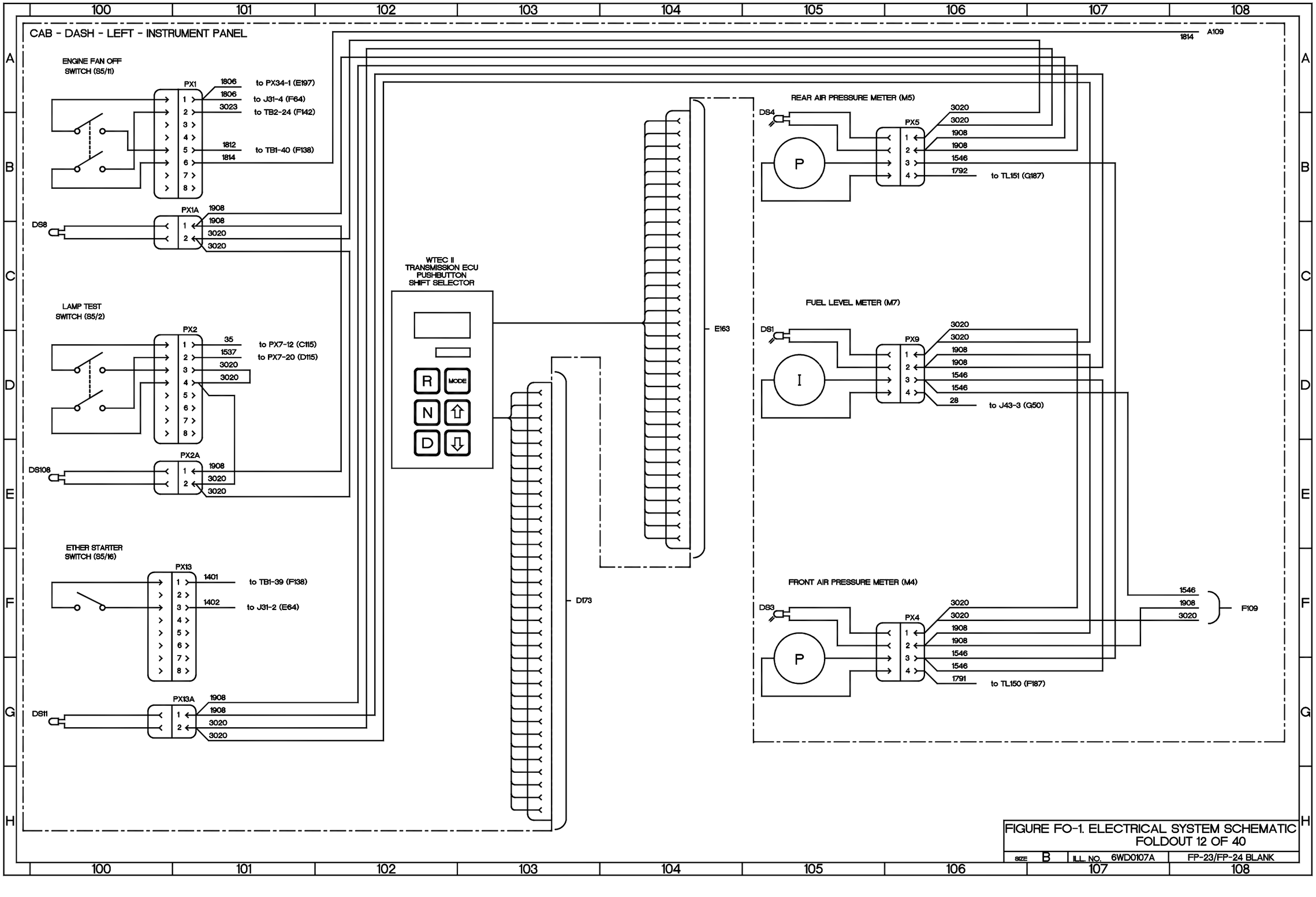


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 12 OF 40

SIZE	ILL. NO.	
B	6WD0107A	FP-23/FP-24 BLANK

CAB - DASH - LEFT - INSTRUMENT PANEL

A108 1814

LIGHTED INDICATOR DISPLAY (A18)

PX7

CHEM DETECT	DS32	1	1523 to J31-19 (G64)
RIGHT TURN SIGNAL	DS15	2	1803
LEFT TURN SIGNAL	DS14	3	to J43-6 (H51)
DUMP BODY UP	DS9	4	1580 to TB1-41 (E138)
CTIS OVRSPD	DS34	5	
PTO ON	DS23	6	1570 to TB1-47 (F138)
EMER BRAKE	DS21	7	3021 to TB2-25 (G142)
WATER TEMPERATURE	DS25	8	2034 to P912-9 (C133)
REAR BRAKE AIR	DS27	9	1528 to J111-D (F131)
TRANS OIL TEMP	DS41	10	2021 to J913-13 (C130)
ENGINE OIL LEVEL	DS29	11	1616 to J27-16 (C52)
PARK BRAKE	DS22	12	35
OIL PRESSURE	DS24	13	1525 to TL157 (H187)
HIGH BEAM	DS16	14	
FRONT AIR BRAKE	DS28	15	
RADIATOR FAN OFF	DS19	16	1532
MASTER STOP	DS30	17	3030 to TB2-33 (F143)
		18	
		19	1536
		20	1537
		21	
		22	1616 to J27-16 (C52)
		23	34A to D3B-4 (A147)
		24	1681 to K8-87 (F160)
		25	1530 to TL156 (F187)
		26	1814
		27	1658 to TB1-61 (B138)
		28	2010 to P912-7 (B133)

ENGINE OIL PRESSURE METER (M3)

DS5 — OP

PX6

1	3020	
2	3020	
3	1908	
4	1908	B118
	1546	
	1546	
	36	to J31-11 (F64)

E88 35 to PX2-1 (D101)
35 to J31-22 (H64)

E89 1537 to PX2-2 (D101)
1537 to J118-1 (D171) (WTEC II)
105 to P115-19 (D344) (WTEC III)

VOLTMETER (M2)

DS7 — V

PX10

1	3020	
2	3020	
3	1908	
4	1908	D118
	1546	
	1546	E118
	3004	to TB2-9 (G140)

F108 1546, 1908, 3020

3020, 3020, 1908, 1908, 1546, 1546 — F118

SPEEDOMETER (M8)

DS6 — KM

PX8

1	3020	
2	3020	
3	1908	
4	1908	
	1546	
	1546	
	1793	to PX33-H2 (E190) (WTEC II)
	1793	to J111-B (F131) (WTEC II)
	157	to P116-30 (F345) (WTEC III)
	157	to J111-B (F131) (WTEC III)

AUDIBLE ALARM (LS2)

32 TL178 to J31-17 (G64)
1536 TL160
1532 TL161

WATER TEMPERATURE METER (M6)

DS2 — t°

PX11

1	3020	
2	3020	
3	1908	
4	1908	G118
	1546	
	1546	
	33	to J31-20 (G64)

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 13 OF 40

SIZE B | ILL. NO. 6WD0108B | FP-25/ (FP-26 BLANK)

CAB - DASH - LEFT - INSTRUMENT PANEL

IGNITION SWITCH (S5/1)

PX17

B117: 3020, 3020, 1908, 1908, 1546, 1546

1548 to K2-86 (A152)

1586 to CB70/4 (E155)

DS13 — PX17A: 1908, 1908, 3020, 3020

STARTER PUSHBUTTON (S6)

TL163 — TL162 — 1405 to K24-87 (A161); 3007 to TB2-11 (G140)

ROTATING WARNING LIGHT SWITCH (S5/2)

PX12

D117: 3020, 3020, 1908, 1908, 1546

E117: 1546

1559 to K13-86 (A158)

1575

1575 to K20-86 (G147)

DS10 — PX12A: 1908, 1908, 3020, 3020

MAIN LIGHT SWITCH (S4)

PX15

1542

22 to D1A-2 (C147)

19 to CB54/3 (D151)

1572 to CB66/1 (D152)

1586 to CB70/4 (D155)

1575

1577 to CB74/5 (D159)

1404 to K6-87 (F152)

491 to CB65/7 (D150)

16 to P18-3 (B187)

23 to K27-86 (G152)

F117: 3020, 1908

FULL HAZARD WARNING SWITCH (S5/22)

PX14

1565 to K9-87 (B151)

1566 to J19-5 (D186)

1566 to K10-87A (F159)

1567 to PX20-B (C197)

1568 to J19-12 (E186)

1568 to PX20-A (C197)

1514 to CB74/6 (E159)

G117: 3020, 3020, 1908, 1908, 1546

DS12 — PX14A: 1908, 1908, 3020, 3020

1908 to J913-11 (C130)

3020 to J913-10 (C130)

INSTRUMENT PANEL LIGHTS DIMMER MODULE (A3)

PX24

1908, 1908, 1542

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 14 OF 40

SIZE B | ILL. NO. 6WD0109A | FP-27/FP-28 BLANK

CAB - DASH - CENTER - HEATER / CTIS ECU

PERSONNEL HEATER

FAN MOTOR
B4
FL3
3 HIGH
2 MED
1 LOW
OFF

PX25
1 1601 to CB23/7 (C166)
2 1908
3 3003
4 3003 to TB2-8 (F149)

DS17
DS101
HEATER CONTROL PANEL ILLUMINATION

J913 P913
1 1673 to K12-86 (A148)
2 1674 to CB72/2 (D148)
3 1672 to D2B-3 (D147)
4 1670 to CB45/4 (C148)
5 1925 to CB49/3 (C161)
6 1954 to J118-9 (E171)
7 161 (WTEC II) to PX33-A3 (C190)
8 153 (WTEC II) to P115-12 (C344)
9 1546 to PX10-3 (E116)
10 3020 to TB2-31 (G143)
11 1908 to PX14A-2 (H121)
12 1550 to PX26-1 (B188)
13 2021 to PX7-10 (B114)
14 2019 (WTEC III) to K37-87 (B348)
15 1904 (WTEC III) to K37-30 (A348)
1673 1674 1672 1670 1925 1954 161 (WTEC II) to J118-13 (E171) 161/1952 (WTEC III) to P115-31 (D344) 153 (WTEC II) to J118-8 (D171) 1546 to TB1-61 (B138) 3020 to PX14A-1 (H121) 2019 (WTEC II) to PX33-E2 (D190) 1904 (WTEC II) to PX33-E3 (D190) 1904 (WTEC III) to K37-87A (A348)
G244

P912 J912
2006 to CB50/2 (C154)
2069 to CB48/8 (C150)
2004 to K12-87 (B148)
1328 to CB63/1 (D160)
2010 to PX7-28 (D114)
2033 to CB53/6 (E149)
2034 to PX7-8 (B114)
2040 to TB1-20 (D136)
2041 to TB1-50 (D138)
1650 to X1 (C145)
1653 to X1 (C145)
2037 to K19-87 (B159)
1811 to K15-87A (A149)
2006 2006 2069 2069 2012 2004 1328 2010 2033 2033 2034 2040 2041 1650 1653 2037 1811
E244

PARKING BRAKE SWITCH
C51 TL202 1616 S24 3024 TL201 TL126
3038 to P25-1 (Q95)

CTIS ELECTRONIC CONTROL UNIT (A2)

P110
H 01
F 02
Z 01 01 (ALL VEHICLES EXCEPT M1089 AND M1088)
M
U 03
S 04
E 05
T 06
P 07
b 08
c 09
j 10
R 11
B 12
C 13

P111 J111
01 E 1911 to CB40/7 (C159)
02 A 3031 to TB2-35 (G144)
03 B 1793 to PX8-4 (G112) (WTEC II)
04 G 157 to PX8-4 (G112) (WTEC III)
05 D 1911 to K52-87A (G148)
06 F 1528 to PX7-9 (B114)
1790 to J43-2 (G51)

P113
B
C
A

P112
D
F
E
A
B
G195

TL50
CHASSIS GROUND

P912A
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
M1088 W/O PTO (F265)
M1083/M1085/M1092/M1093/M1096 W/O PTO (F264)
to K15-87A (A150) 1811A

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 15 OF 40

SIZE	ILL. NO.	
B	6WD0110B	FP-29/ (FP-30 BLANK)

CAB - DASH - RIGHT - POWER DISTRIBUTION PANEL

PX21

to P18-9 (B187) 1599
to CB37/1 (C161) 1569
to J2-4 (B194) 1916
to TB2-37 (G144) 3034
to P18-8 (B187) 1424
to J27-4 (A52) 1424
to P18-7 (B187) 1597

WIPER DELAY MODULE (A5)

22C J51-13 (E51)
1940 K10-87 (F159)
1940 K10-86 (F159)
22 D1A-1 (C147)
22C J27-15 (C52)
1912 CB67-4 (D148)
21A J27-12 (B52)
489G J27-2 (A52)
489F J27-8 (B52)
2040 P912-10 (C133)
489 J51-7 (D51)
1426 J7-1 (A197)
1955 K28-86 (H151)
1951 TL74 (D95)
1947 TL73 (B95)
1949 TL75 (F95)

1930 K11-86 (F155)
1929 CB77/5 (C161)
1658 K11-30 (F155)
1546 J913-9 (C131)
1658 PX7-27 (D114)
1690 CB79/5 (C159) (WTEC II)
1462 K19-30 (A159)
1460 PX33-C1 (C190) (WTEC III)
146 K25-86 (B246) (WTEC III)
1463 TL159 (E145)
146 J117-C (C343) (WTEC III)
1572 CB66/2 (E152)
1408 K29-86 (F151)
24 J51-17 (F51)
1329 K52-86 (H148)
20 J27-3 (A52)
2041 P912-11 (C133)
461 J27-14 (B52)
1570 PX7-6 (B114)
1581 J19-1 (C186)
1524 J19-4 (D187)
1580 PX7-4 (B114)
460 J27-11 (B52)
1401 PX13-1 (F101)
1812 PX1-5 (B101)
1935 CB22/3 (C158)
1807 J31-3 (F64)
1481 J43-9 (H51)
1692 CB21/1 (C158)
1692 PX26-3 (B188)
(WTEC II) 1692 PX33-E1 (D190)
(WTEC III) 1692 K34-30 (B347)
1692 PX33-F1 (D190) (WTEC II)
1692 K26-30 (B344) (WTEC III)

TB1

3101 K37-85 (B348) (WTEC III)
3054 K20-85 (H147)
3036 K32-85 (A156)
3047 K30-85 (H156)
3039 K9-85 (A151)
3099 J7-3 (B197)
3046 K10-85 (F160)
3016 K19-85 (A159)
3053 K8-85 (F161)
3002 K7-85 (F162)
3041 K2-85 (A152)
3042 TL502 (G196)
3043 TL153 (C189)
3048 K31-85 (G158)
3049 PX20-C (C198)
3012 K15-85 (A150)
3011 PX34-2 (E198)

1603 TB2-1 — F145

1603 X3

TB2

3096 TL71 (A94)
3097 TL86 (C95)
3098 TL87 (F95)
3003 PX25-3 (C129)
3006 J31-7 (F64)
3050 TL14 (E97)
3008 PX50-1 (D197)
3101 PX33-K1 (F190) (WTEC II)
143 P115-32 (D344) (WTEC III)
3015 J31-5 (F64)
3040 K29-85 (F151)
3056 K28-85 (G151)
3023 PX1-2 (B101)
3083 PX26-6 (B188)
3026 J31-10 (F64)
3067 K12-85 (A148)
3029 J43-4 (H52)
3044 K27-85 (A152)
3028 J31-9 (F64)
3045 K52-85 (H148)
3004 PX10-4 (E117)
3007 TL163 (B124)
(WTEC II) 188 PX33-V (H346)
(WTEC III) 188 PX33-7 (H346)
(WTEC II) 3102 PX33-K2 (F190)
(WTEC III) 3102 K26-85 (B344)
3018 J78-2 (F194)
3019 J78-4 (F194)
3021 PX7-7 (B114)
(WTEC III) 143 P115-17 (D344)
(WTEC III) 143 J117-E (C343)
2120 J913-10 (C130)
3030 PX7-17 (C114)
3031 J111-A (F131)
3034 PX21-4 (A142)
3037 J2-3 (A194)

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 16 OF 40

SIZE	ILL. NO.	
B	6WD0111B	FP-31/ (FP-32 BLANK)

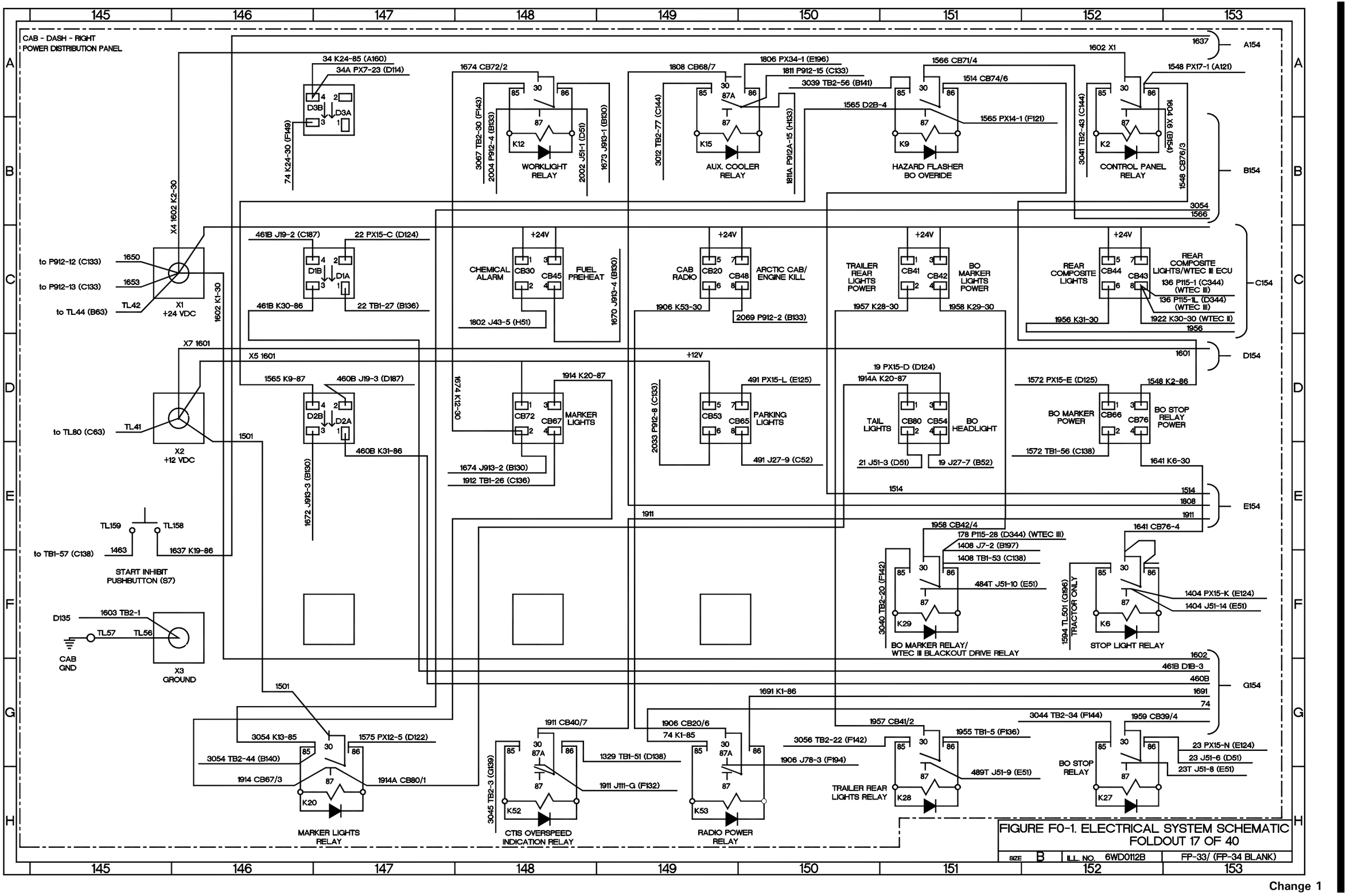


FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 17 OF 40

SIZE B | ILL. NO. 6WD0112B | FP-33/ (FP-34 BLANK)

CAB - DASH - RIGHT
POWER DISTRIBUTION PANEL

A153 1637
B152 1604 X6
B153
3054
1566
C153
D153 1601
E153 1514 1808 1911
F153 1602 461B D1B-3 460B 1691 74 1959

1637 TL158
26 CB36/5 — 25 P18-12 (C187) — 26 J27-1 (A52) — 3036 TB2-46 (C140) — K32 HORN RELAY
509 CB38/8 — 3054 K20-85 — K13 ROTATING BEACON BO OVRD RELAY — 509 P65-1 (E195) — 1559 PX12-1 (D122)
1462 TB1-59 (B138) — 3016 TB2-62 (C142) — K19 START INHIBIT RELAY — 2037 P912-14 (C133) — 54 J31-14 (C64)
1658 K11-30 — 74 D3B-3 (B146) — 74 K1-85 — 34 K11-85 — 34 D3B-4 (B145) — K24 CRANKING LOCKOUT RELAY — 1405 TL162 (B124)

+24V — SWING FIRE PUMP POWER — CB50 CB39 — TRAILER BO STOP LIGHTS — 2006 P912-1 (B133) — 1959 K27-30
26 K32-30 — 1601 PX25-1 (C129) — HORN POWER — CB36 CB23 — HEATER BLOWER
1692 TB1-36 (G138) — WTEC II VIM STE/ICE — CB21 CB22 — FAN/ETHER — 1935 TB1-37 (F138)
1690 TB1-62 (B138) — 1911 J11-E (E132) — 1911 K52-30 — WTEC II VIM POWER — CB79 CB40 — CTIS COOLER
E5 — 1569 J2-2 (A194) — 1569 P18-4 (B186) — 1569 PX21-2 (A143)
1925 J913-5 (B131) — 1460 J31-13 (F64) — WINDSHIELD WIPER/WASHER — CB37 CB49 — PTO POWER
1929 TB1-64 (B138) — 1808 K15-30 — ENGINE INSTR POWER — CB77 CB68

+12V — IGNITION/MAIN LIGHT SWITCH — CB70 — 1586 PX15-F (D124) — 1586 PX17-5 (B121)
HEAD LIGHTS — CB78 CB38 — ROTATING BEACON — 509 K13-30
VIM POWER — CB35 CB71 — HAZARD/FLASHER WORKLIGHTS — 1566 K9-30 — 1900 PX33-J1 (E191) — 1900 PX33-J2 (E191)
1577 PX15-J (C125) — CB74 CB73 — BACK-UP LIGHT POWER — 1514 PX14-7 (G122) — 1813 PX33-B1 (C190) (WTEC II) — 1903 K25-30 (B346) (WTEC III)
1328 P912-5 (B133) — CB63 CB64 — CB61 CB62
1514 K9-86
1416 K7-30
1416
1911

34 K24-85 — 1658 K24-86 — 1658 TB1-64 (B138) — 1930 TB1-63 (B138) — 568A J31-1 (E64) — 1538 J31-18 (G64) — 34 J31-21 (G64) — K11 ALTERNATOR EXCITATION RELAY
1691 K26-87 (B344) (WTEC III) — 1602 X1 — 1691 PX33-G1 (E190) (WTEC II) — 1691 K53-86 — 74 K24-30 — 74 K53-85 — 74 J43-8 (H51) — K1 STARTER RELAY
1594 J19-6 (D187) — 1940 TB1-30 (B137) — 3046 TB2-60 (B142) — K10 STOP/HAZARD FLASHER RELAY — 1940 TB1-29 (B136) — 1566 PX14-2 (G122)
18 J27-13 (B52) — 3053 TB2-70 (B143) — 1417 K7-87 — 16A P18-2 (B187) — K8 HEADLIGHT LO/HI-BEAM RELAY — 17 J27-6 (B52) — 1681 PX7-24 (D114)
3002 TB2-74 (B143) — 1416 CB78/6 — 16 P18-3 (B187) — 1417 K8-30 — K7 HEADLIGHT RELAY

1922 CB43/8 — 3047 TB2-50 (C140) — 461T J51-15 (E51) — K30 REAR LEFT COMPOSITE LAMP RELAY
B99 — E3 — 461B J51-12 (E51) — 461B J27-5 (B51) — 461B J51-5 (E51) — 461B D1B-3
1956 CB44/6 — 3048 TB2-53 (C142) — K31 REAR RIGHT COMPOSITE LAMP RELAY — 460T J51-16 (E51)
E4 — 460B D2A-1 — 460B J51-4 (D51) — 460B J51-11 (E51) — 460B J27-10 (B51)

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 18 OF 40

SIZE B | ILL. NO. 6WD0113B | FP-35/ (FP-36 BLANK)

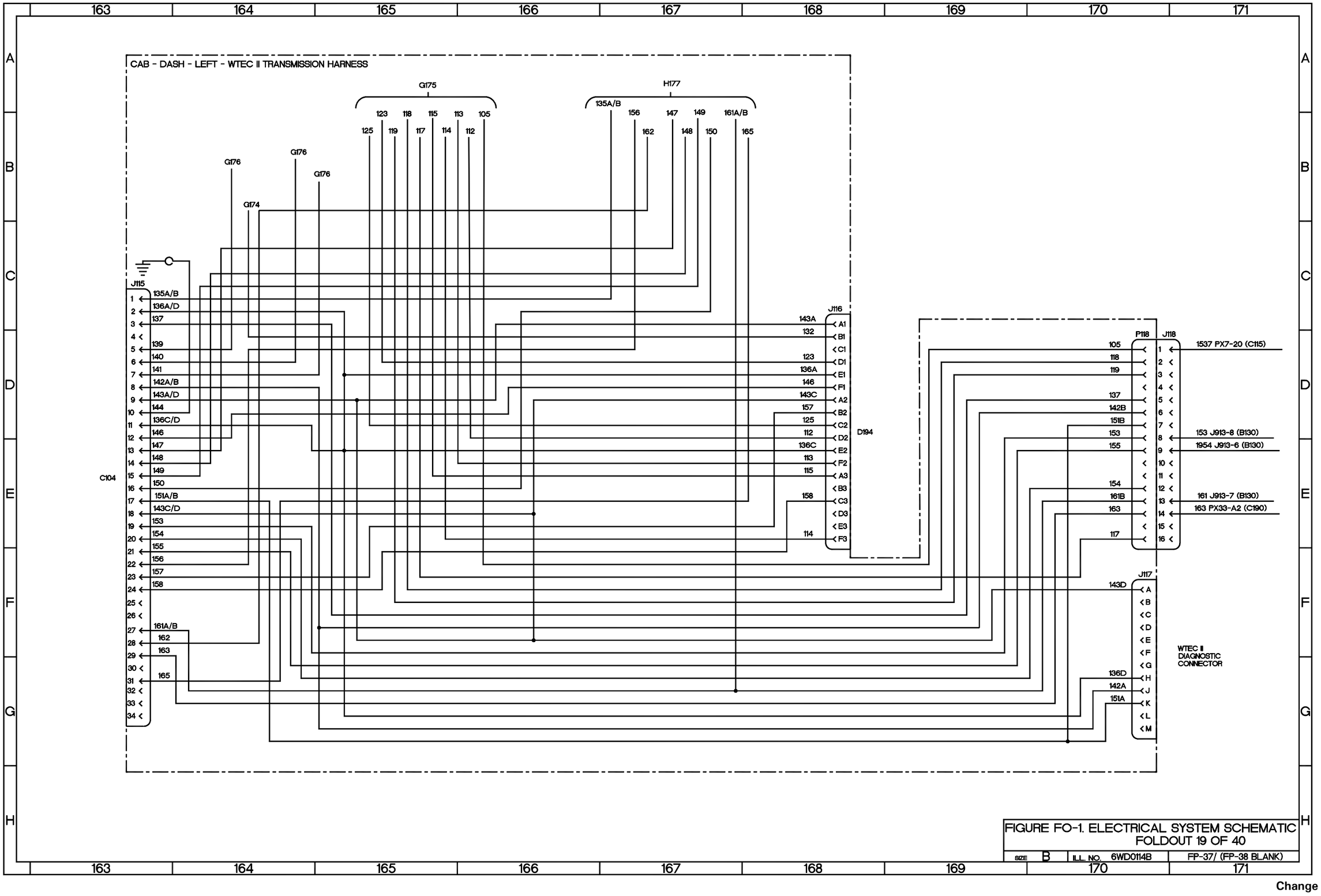


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 19 OF 40

SIZE	ILL. NO.	
B	6WD0114B	FP-37/ (FP-38 BLANK)

CAB-DASH-LEFT-WTECII TRANSMISSION HARNESS

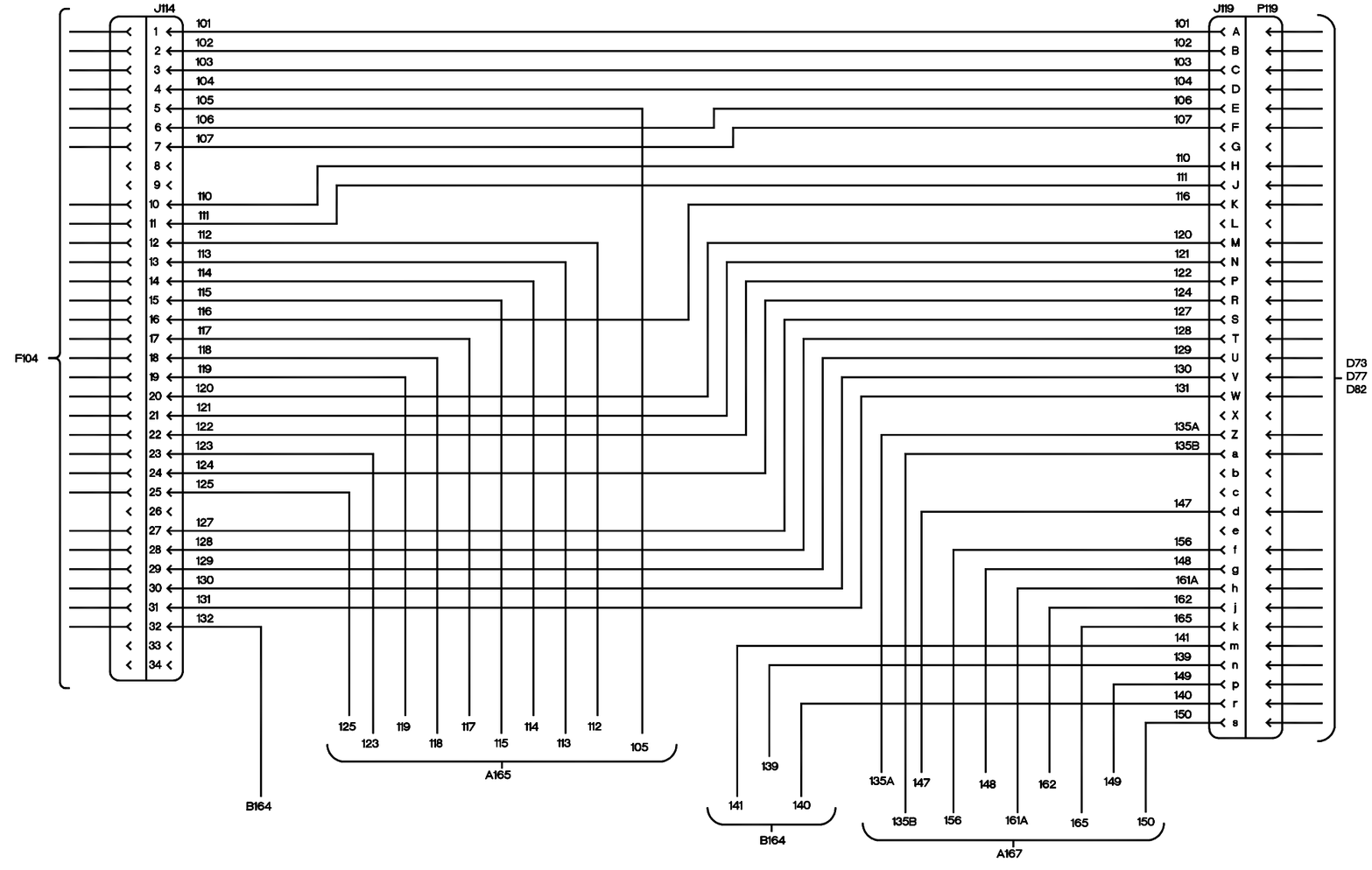


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 20 OF 40

SIZE	ILL. NO.	
B	6WD0115B	FP-39/ (FP-40 BLANK)

CAB - DASH - LEFT - UNDERDASH

JUNCTION BOX (BJ1)

P83

STE / ICE RECEPTACLE

f 1610 — 1610
AB 1437 — 1430
AD 1431
AE 1446
z 1427 — 1437
x 1423 — 1431
p 1438 — 1446
m 1436 — 1427
AA 1612 — 1423
g 1439 — 1438
k 1421 — 1436
n 1425 — 1612
w 1447 — 1434
y 1429 — 1439
AC 1441 — 1421
R 1452 — 1425
N 3A — 1447
P 1432 — 1429
d 1433
c 1435
v 1428
u 1453
O 1471
E 1472
V 1474
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

R5
R4

BLUE
BROWN
GREEN
RED
YELLOW
BLACK
WHITE

J31X

1441 — 1
1452 — 2
3A — 3
1432 — 4
1433 — 5
1430 — 6
1435 — 7
1434 — 8
1428 — 9
1453 — 10

D64

J43X

1471 — 1
1472 — 2
1474 — 3
1480 — 4
1479 — 5
1478 — 6
1475 — 7
1476 — 8
1477 — 9

F50

COLUMN SWITCH (S3)

P18

1 — 16A — to K8-86 (F160)
2 — 16 — to K7-86 (F162)
3 — 16 — to PX15-M (E125)
4 — 1569 — to CB37/1 (B161)
5 — 1527 — to J2-5 (B195)
6 — 1590 — to J2-1 (A195)
7 — 1597 — to PX21-6 (B142)
8 — 1424 — to PX21-5 (B142)
9 — 1599 — to PX21-1 (A142)
10
11
12 — 25 — to K32-86 (B156)

HORN PUSHBUTTON SWITCH

COLUMN SWITCH (S3)

J19

1 — 1581 — to TB1-46 (E138)
2 — 461B — to D1B-4 (C146)
3 — 460B — to D2A-2 (D147)
4 — 1524 — to TB1-43 (E137)
5 — 1566 — to PX14-2 (G122)
6 — 1594 — to K10-30 (F159)
7
8
9
10
11
12 — 1568 — to PX14-6 (G122)

FREQUENCY DIVIDER (A7)

INPUT (+)
OUTPUT (+)
+24V POWER
INPUT (-)
OUTPUT (-)
GROUND

PX26

1 — 1550 — to J913-12 (C130)
2 — 1444 — to J31-8 (F64)
3 — 1433 — to J31-26 (H64)
4 — 1692 — to TB1-36 (G138)
5 — 3083 — to J31-16 (G64)
6 — 1432 — to J31-25 (G64)
3083 — to TB2-26 (F142)

STOP LIGHT SWITCH (S10A)

TL152 — TL153 — 3043 — 3043 — to TB2/47 (C140)
1594 — 1594 — to TL501 (G197) (TRACTOR ONLY)

STOP LIGHT SWITCH (S10B)

TL154 — TL155 — 3043
1594

FRONT AIR PRESSURE TRANSMITTER

SENSOR (MT4) / SWITCH (S20)

TL150 — 1791 — to PX4-4 (G106)
P
TL156 — 1530 — to PX7-25 (D114)

REAR AIR PRESSURE TRANSMITTER

SENSOR (MT5) / SWITCH (S29)

TL151 — 1792 — to PX5-4 (B106)
P
TL157 — 1525 — to PX7-13 (C114)

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 21 OF 40

SIZE B | ILL. NO. 6WD0116B | FP-41/ (FP-42 BLANK)

CAB - DASH - RIGHT - UNDERDASH

WINDSHIELD WIPER MOTOR (B2)

PX22

B2

EMI FILTER (FL2)

P2 J2

1590 to P18-6 (B187)
1569 to CB37/1 (B160)
3037 to TB2-39 (G144)
1916 to PX21-3 (A142)
1527 to P18-5 (B187)

TRANSMISSION DIMMER MODULE

J7

1426 to TB1-9 (F139)
1408 to K29-86 (F150)
3099 to TB2-58 (B144)
158

WTEC II VEHICLE INTERFACE MODULE (A10)

PX33

to J51-2 (D51)
to J118-14 (E171)
to J913-7 (B130)
to CB73/8 (E159)
to TB1-60 (B138)
to TB1-33 (G137)
to J913-14 (D130)
to J913-15 (D130)
to TB1-34 (G138)
to K1-86 (F158)
to PX8-4 (G112)
to CB35/2 (E158)
to CB35/2 (E158)
to TB2-16 (F141)
to TB2-17 (G141)

REV
PTO ENABLE OUTPUT RELAY SF02
DIFFERENTIAL LOCK RELAY SF04
REVERSE WARNING RELAY RW
INDICATOR OUTPUT RELAY SF01
10A
SF01
SF4
SF02
NS
FL
10A
NEUTRAL START RELAY NS
NOT USED SF3
S02
S03

P116

D168

TURN SIGNAL FLASHER (A1)

OUTPUT
INPUT
GROUND

PX20

1568 to PX14-6 (G122)
1567 to PX14-5 (G122)
3049 to TB2-55 (C141)

INTER-AXLE DIFFERENTIAL SOLENOID (L6)

PX50

to TB2-14 (F141)
(WTEC III) 1692 K34-97A (B347)

ROTARY WARNING LIGHTS CONNECTION

P65 J65

to K13-87 (B158)
to J62-B (E97)

FAN SOLENOID (L1)

PX34

to K15-86 (A149)
to PX1-1 (A101)
to TB2-79 (C144)

CHEMICAL ALARM CONNECTION

P99 J99

to J43-6 (H51)
to J43-7 (H51)
to TL88 (B97)
to TL98 (B97)

CAB RADIO CONNECTION

J78

to TB2-21 (G142)
to K53-87A (H150)
to TB2-23 (G142)

J113

CTIS PRESSURE TRANSDUCER
CTIS PNEUMATIC CONTROLLER

G132

C180
to K6-85 (F152)
TL501 TL502
to TB2-45 (D140)

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 22 OF 40

SIZE B | ILL. NO. 6WD0117B | FP-43/ (FP-44 BLANK)

WRECKER REAR LIGHTS

LH INTERMEDIATE MAKER — P94 — 1 — 489 — TL88 — 3089

LH WORK LIGHTS — P133 (A 3063, B 2002); P133A (1 3064, 2 2002) — E54

E341 — P107 (a 3088, b 3087, d 2037, e 2033, f 2069, g 2006, z 2033) — TL54

CAB-DASH-RIGHT-POWER DISTRIBUTION PANEL

D52 — P51 (1 2002, 2 490, 3 21, 4 460B, 5 461B, 6 23, 7 489, 8 23T, 9 489T, 10 484T, 11 460B, 12 461B, 13 22C, 14 1404, 15 461T, 16 460T, 17 24) — E53

B258 — P108 (9 2033, 13 2037, 14 2033, 15 2069, 16 2006)

RH WORK LIGHTS — P134A (1 3062, 2 2002) — E55; P134 (A 3061, B 2002)

RH INTERMEDIATE MARKER — P95 (1 489) — TL89 3089 — T90 3089

TL93 3094; TL92 3094 3094

E49

E57

E48

E58 — P53R (1 3094, 2 489T, 3 3094, 4 1404, 5 460T, 6 23T, 7 484T, 8 461T, 9 484T, 10 484T) — F236

P52R (1 21, 2, 3 489, 4 3045, 5 461B, 6 22C, 7 460B) — B239

E47

E46

E59

E52

E51

E50

P85 — 489 — DS65 — LH SIDE MARKER LIGHT — 3094 — TL15

P86 — 489 — DS66 — LH REAR MARKER LIGHT — 3094 — TL16

P74 — 461B — DS37 — LH TURN AND STOPLIGHT

P78 — 21 — DS72 — LH TAILLIGHT

P76 — 24 — DS51 — BLACKOUT MARKER LH REAR

P77 — 23 — DS35 — BLACKOUT STOP LH REAR

LH REAR COMPOSITE LIGHT

3094 3094 TL86 — TL18 — DS45

P87 — 490 — DS45 — BACKUP LIGHT — 3094 — TL17

P54 — 489 — DS69 — LEFT REAR MARKER — 3094 — TL30

P56 — 489 — DS70 — MIDDLE REAR MARKER — 3094 — TL31

P58 — 489 — DS71 — RIGHT REAR MARKER — 3094 — TL32

P61 — 460B — DS38 — RH TURN AND STOPLIGHT

P64 — 21 — DS73 — RH TAILLIGHT

P62 — 24 — DS52 — BLACKOUT MARKER RH REAR

P63 — 23 — DS36 — BLACKOUT STOP RH REAR

RH REAR COMPOSITE LIGHT

3095 3095 — TL21

P89 — 489 — DS68 — RH REAR MARKER LIGHT — 3095 — TL20

P88 — 489 — DS67 — RH SIDE MARKER LIGHT — 3095 — TL19

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 23 OF 40

SIZE B | ILL. NO. 6WD0118B | FP-45/ (FP-46 BLANK)

REAR LIGHTS TRACTOR

LH WORKLIGHTS
RH WORKLIGHTS
P133A
P133
P134A
P134
E33
E34
TL109
P51
D52
P53M
F236
TL93M
P52M
B239
E42
E36
E43
E41
E29
E37
E56
E39
E40
E38
E45
E35
E31
E30
E26
E27
E32
E44
P53R
P52R
P86
DS66 LH REAR MARKER LIGHT
P74
DS37 LH TURN AND STOPLIGHT
P78
DS72 LH TAILLIGHT
P76
DS51 LH BLACKOUT MARKER LIGHT
P77
DS35 LH BLACKOUT STOPLIGHT
P87
DS45 BACKUP LIGHT
LH REAR COMPOSITE LIGHT
TL17
TL20
TL92
P89
DS68 RH REAR MARKER LIGHT
TL21
P63
DS36 RH BLACKOUT STOPLIGHT
P62
DS52 RH BLACKOUT MARKER LIGHT
P64
DS73 RH TAILLIGHT
P61
DS38 RH TURN AND STOPLIGHT
RH REAR COMPOSITE LIGHT
P58
DS71 RIGHT REAR MARKER
TL30
P56
DS70 REAR MIDDLE MARKER
TL31
P54
DS69 LEFT REAR MARKER
TL32
E28
TL93
TL16
TL18

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 24 OF 40

SIZE B | ILL. NO. 6WD0119B | FP-47/ (FP-48 BLANK)

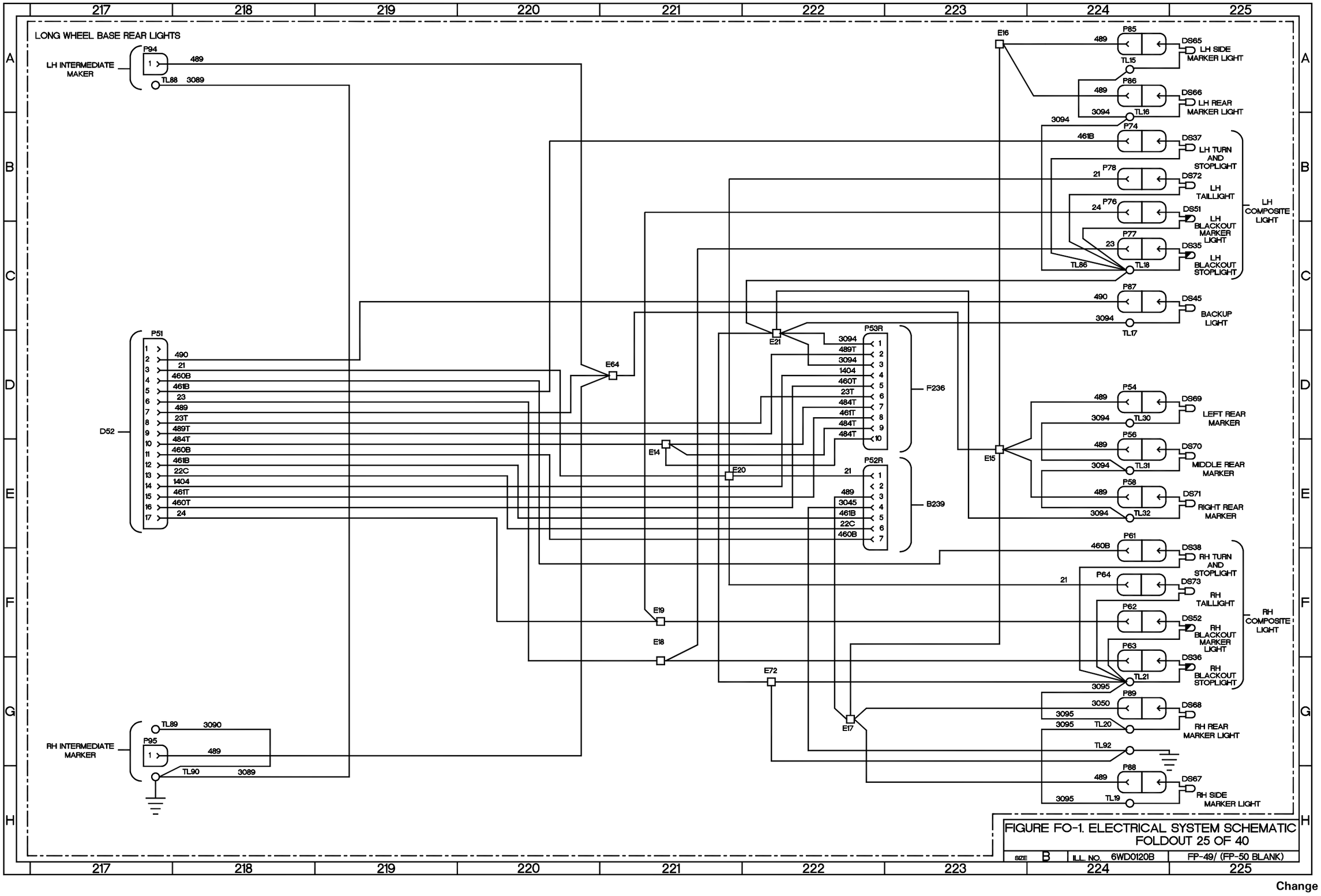


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 25 OF 40

SIZE B | ILL. NO. 6WD0120B | FP-49/ (FP-50 BLANK)

REAR LIGHTS ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE

CAB-DASH-RIGHT-POWER DISTRIBUTION PANEL

D52 — P51
1 490
2 21
3 460B
4 461B
5 23
6 489
7 23T
8 489T
9 484T
10 460B
11 461B
12 22C
13 1404
14 461T
15 460T
16 24
17

E21 — P53R
3094 1
489T 2
3094 3
1404 4
460T 5
23T 6
484T 7
461T 8
484T 9
484T 10
F236

E14 — P52R
21 1
489 2
3045 3
461B 4
22C 5
460B 6
7
B239

E20
E19
E18
E17
TL93
3045 TL92 3095

E16
P85 489 DS65 LH SIDE MARKER LIGHT — 3094 TL15
P86 489 DS66 LH REAR MARKER LIGHT — 3094 TL16
P74 461B DS37 LH TURN AND STOPLIGHT
P78 21 DS72 LH TAILLIGHT
P76 24 DS51 LH BLACKOUT MARKER LIGHT
P77 23 DS35 LH BLACKOUT STOPLIGHT — 3094 TL18 3094 TL86
LH COMPOSITE LIGHT
P87 490 DS45 BACKUP LIGHT — 3094 TL17

E15
P54 489 DS69 LEFT REAR MARKER — 3094 TL30
P56 489 DS70 MIDDLE REAR MARKER — 3094 TL31
P58 489 DS71 RIGHT REAR MARKER — 3094 TL32

P61 460B DS38 RH TURN AND STOPLIGHT
P64 21 DS73 RH TAILLIGHT
P62 24 DS52 RH BLACKOUT MARKER LIGHT
P63 23 DS36 RH BLACKOUT STOPLIGHT — 3095 3095 TL21
RH COMPOSITE LIGHT
P89 489 DS68 RH REAR MARKER LIGHT — 3095 3095 TL20
P88 489 DS67 RH SIDE MARKER LIGHT — 3095 TL19

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 26 OF 40

SIZE B | ILL. NO. 6WD0121B | FP-51/ (FP-52 BLANK)

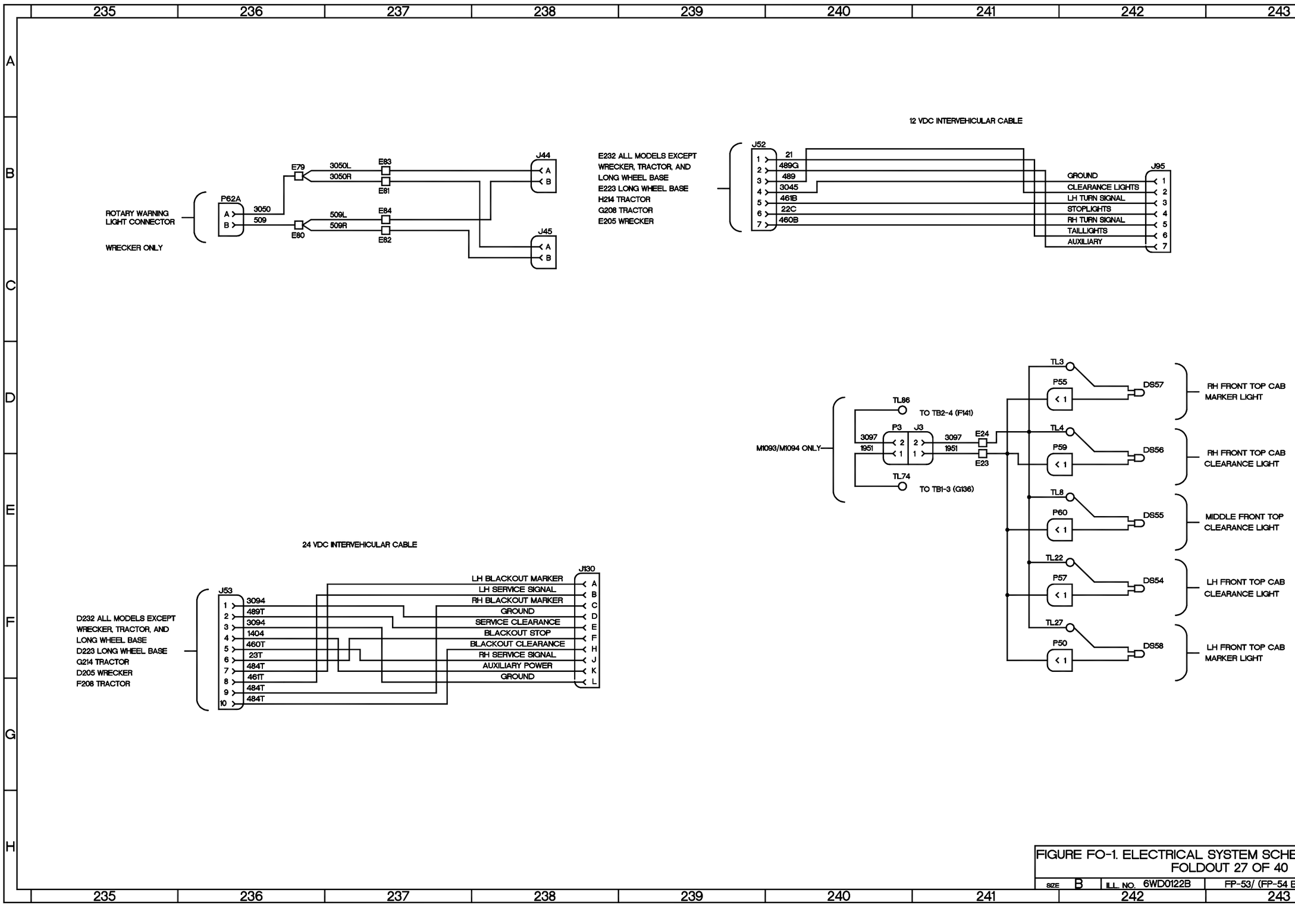
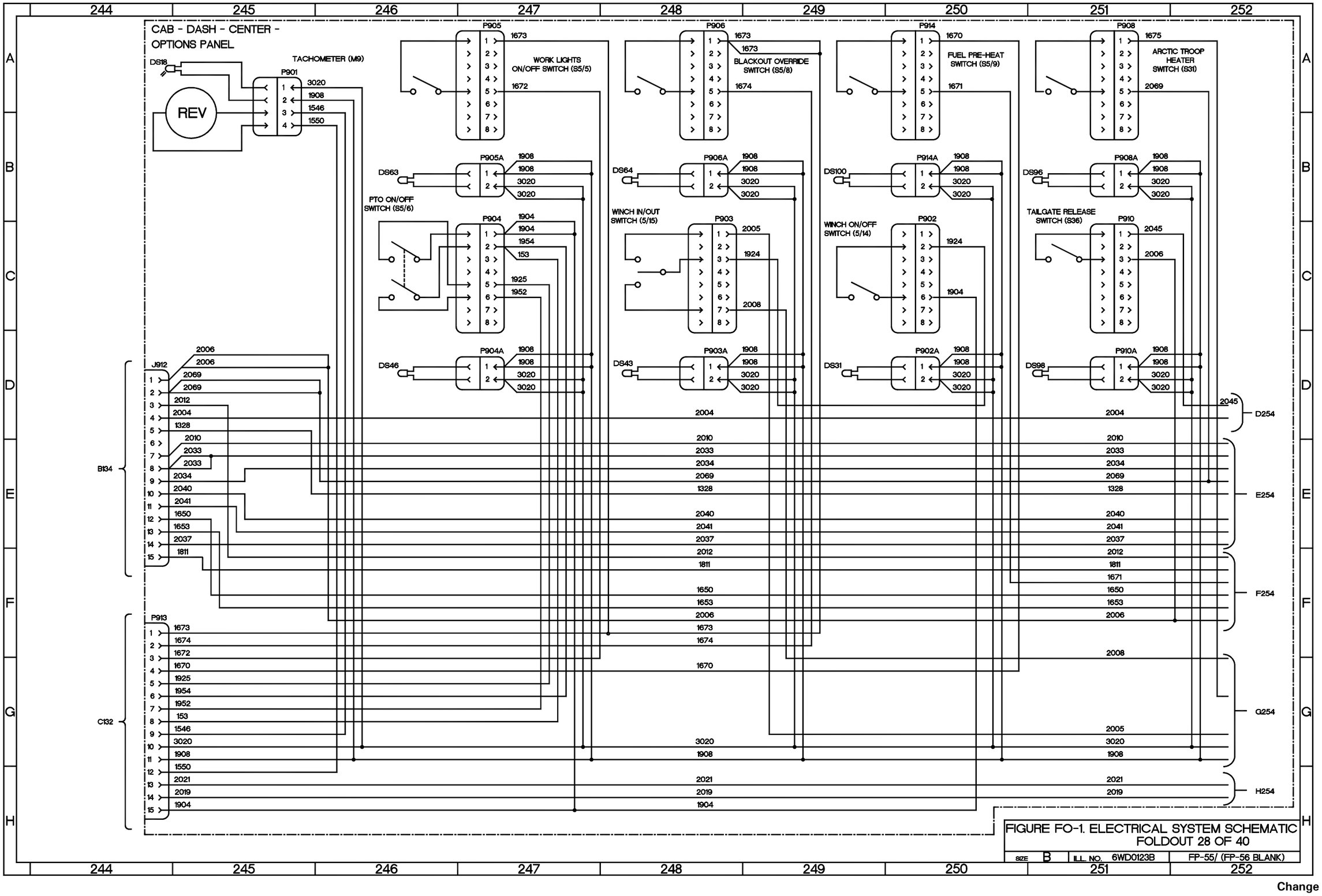


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 27 OF 40

SIZE	ILL. NO.	
B	6WD0122B	FP-53/ (FP-54 BLANK)


CAB - DASH - CENTER - OPTIONS PANEL
TACHOMETER (M9)
DS18
REV
P901
WORK LIGHTS ON/OFF SWITCH (S5/5)
BLACKOUT OVERRIDE SWITCH (S5/8)
FUEL PRE-HEAT SWITCH (S5/9)
ARCTIC TROOP HEATER SWITCH (S31)
PTO ON/OFF SWITCH (S5/6)
WINCH IN/OUT SWITCH (5/15)
WINCH ON/OFF SWITCH (5/14)
TAILGATE RELEASE SWITCH (S36)
DS63
DS64
DS100
DS96
DS46
DS43
DS31
DS98
J912
B134
C132
P913
D254
E254
F254
G254
H254
FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 28 OF 40
SIZE B
ILL. NO. 6WD0123B
FP-55/ (FP-56 BLANK)

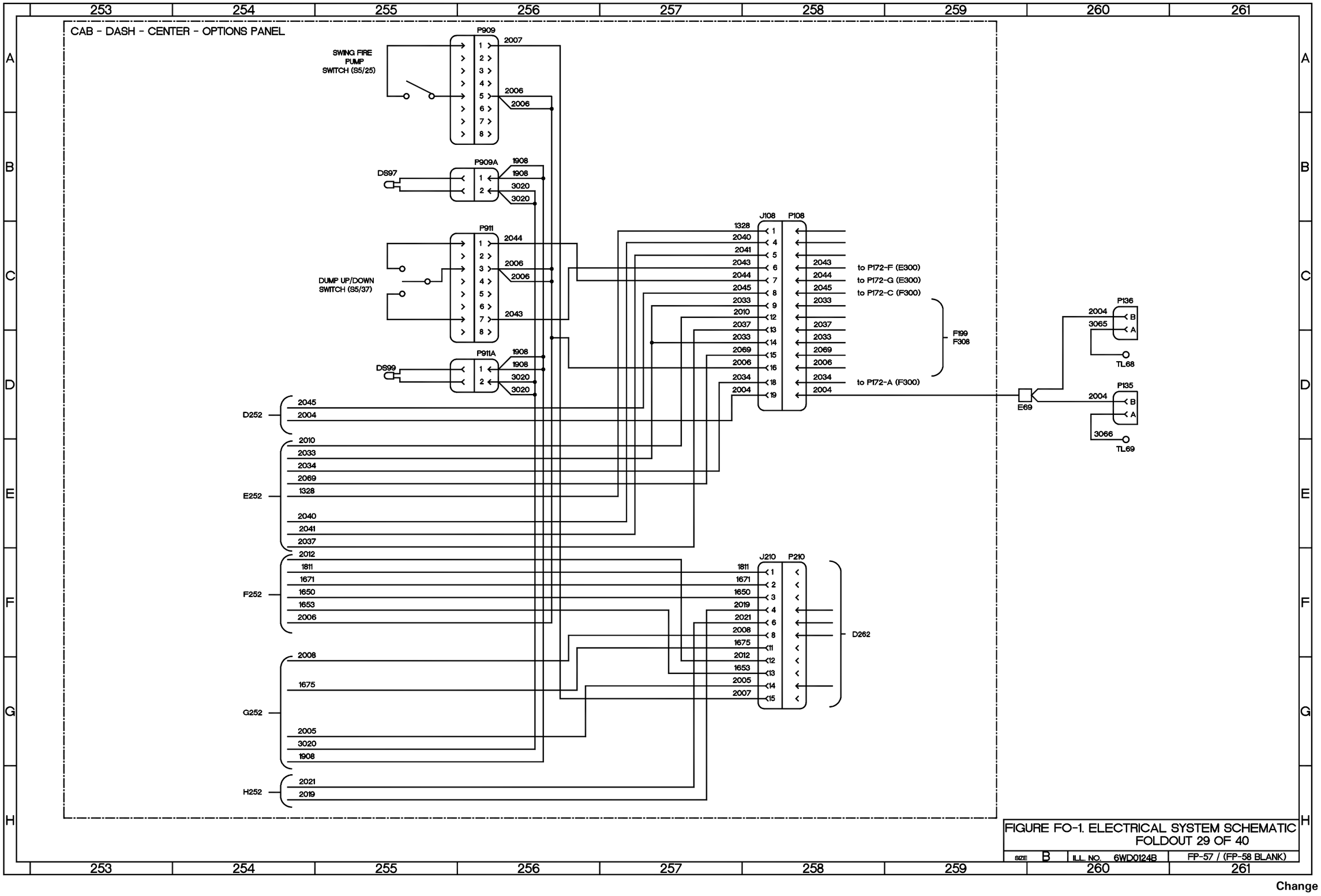


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 29 OF 40

SIZE	ILL. NO.	
B	6WD0124B	FP-57 / (FP-58 BLANK)

PTO EQUIPPED

P210 G258: 1 1811, 4 2019, 6 2021, 8 2008, 14 2005

E70

P217: 3068 A, 2019 B — E304

TL76

P216: 3025 A, 2021 B — D304

J209A: 1811 1, 3013 2 — F268

TL111: 3013

J209B: 1811 1, 3013 2 — M1084/M1085/M1086/M1090 G264; M1083/M1088/M1089/M1090/M1093/M1094 G268

WINCH OUT SOLENOID (L5)

L5: 3070 1, 2 — L5

TL320

WINCH IN SOLENOID (L4)

L4: 3069 1, 2 — L4

P215 J215: 2008 1, 2005 2 — 2008 2, 2005 1

J912 G134: 15 — 1811 — J209: 1811 1, 3013 2 — F268; 3013 — TL101

M1083/M1085/M1093 WITHOUT PTO

P209B G268: 1 2 — J209: 1811 1, 3013 2 — D266

M1084/M1086/M1090 M1083/M1085 WITH PTO

J912 G134: 15 — 1811 — E70 — J209B: 1811 1, 3013 2 — G268

E74 — TL101: 3013 — J209A: 1811 1, 3013 2 — F268

M1088 WITHOUT PTO

P209A C266 F265: 1 2 — B6 — TRANSMISSION AUXILIARY OIL COOLER FAN

P209B D266 G264: 1 2 — B6A — TRANSMISSION AUXILIARY OIL COOLER FAN

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 30 OF 40

SIZE	ILL. NO.	
B	6WD0125B	FP-59/ (FP-60 BLANK)

DELETED

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 31 OF 40

SIZE B | ILL. NO. 6WD0126B | FP-61/ (FP-62 BLANK)

DELETED

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 32 OF 40

SIZE	ILL. NO.	
B	6WD0127B	FP-63/ (FP-64 BLANK)

289 290 291 292 293 294 295 296 297

A B C D E F G H

DELETED

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 33 OF 40

SIZE B | ILL. NO. 6WD0128B | FP-65/ (FP-66 BLANK)

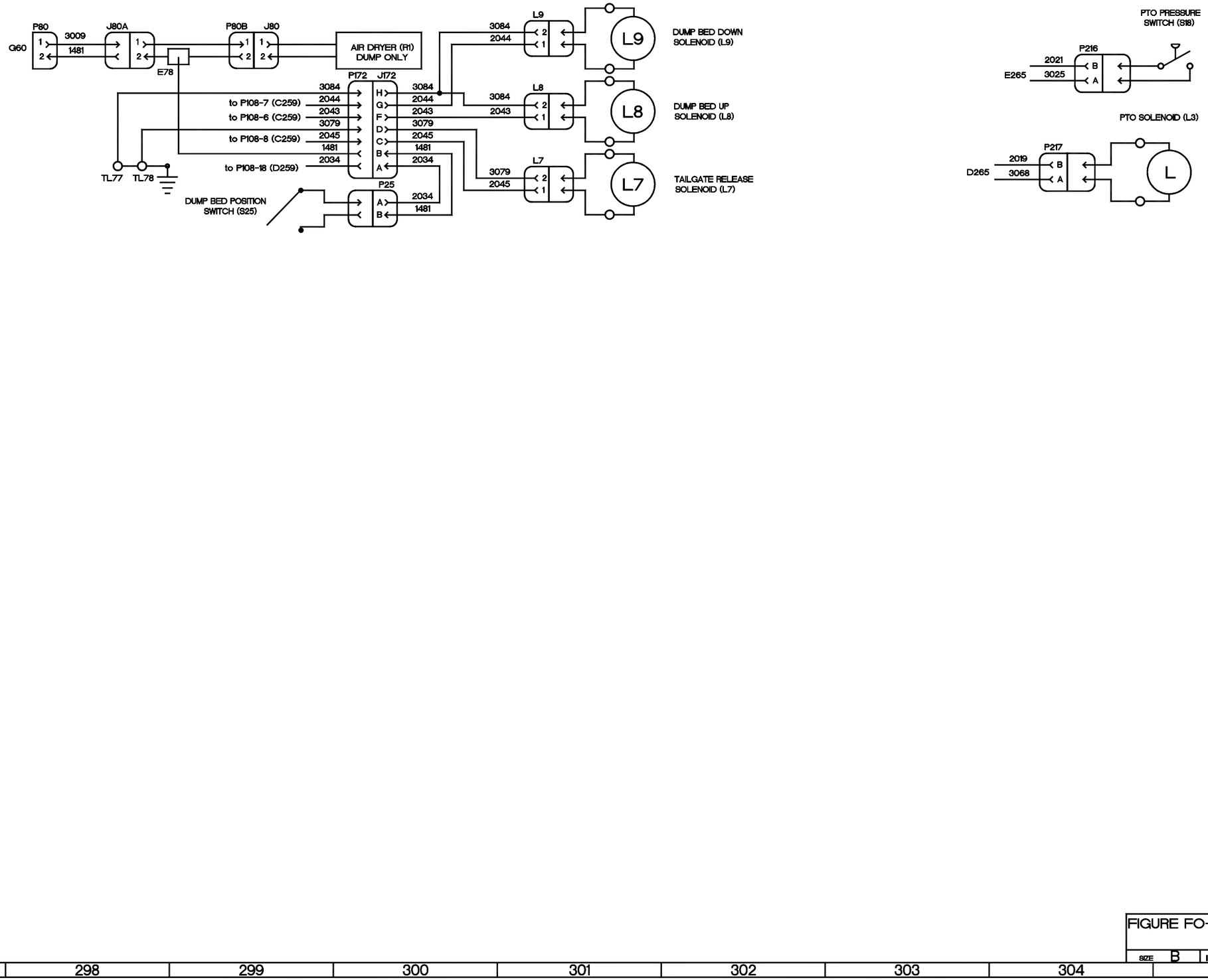


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 34 OF 40

SIZE	ILL. NO.	
B	6WD0129B	FP-67/ (FP-68 BLANK)

CARGO MATERIAL HANDLING CRANE

PROXIMITY SENSOR
CABLE B
WHT
BLK
RED
JUNCTION BOX
BLK
10A
WHT
POWER SWITCH/BREAKER
DIODE ASSEMBLY
D7
D8
CONTROL LOCKOUT RELAY
RED
GRN
3 BLK
WHT
BLU
HYDRAULIC SYSTEM SHUTDOWN RELAY
TB
RED
GRY
VIO
GROUNDING STRIP
WHT
BLK
TAN
YEL
PNK
BRN
ORG
RED/GRN
P171
CABLE G
WHITE
GREEN
BLACK
RED
3077
2069
2033
3078
to P108-15 (C259)
to P108-9 (C259)
TL67
PROXIMITY SENSOR
CABLE C
SHIELD
RED
WHT
BLK
CRANE REMOTE CONNECTOR
CABLE U
RED
GRN
YEL
WHT
BLU
BLK
ORG
VIO
RED/GRN
GRY
TAN
BRN
PNK
CRANE CONTROL PANEL
CABLE 0
SYSTEM SHUTDOWN
CABLE P
BOOM UP L/O
CABLE N
CONTROL L/O
CABLE L
TELESCOPE OUT L/O
CABLE M
CABLE V
BOOM DOWN L/O
CABLE R
HOIST UP L/O
HOIST DOWN
CABLE Q
HOIST UP
CABLE T
BOOM DOWN
CABLE S
BOOM UP
CABLE H
TELESCOPE IN
CABLE I
TELESCOPE OUT
CABLE K
SWING CW
CABLE J
SWING CCW
OVERLOAD SHUTDOWN SYSTEM
HOIST
EXC
TENSION LOAD CELL
OUT
HOIST LAYER SENSING SWITCH
OVERLOAD SHUTDOWN BOX
CABLE A

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 35 OF 40

SIZE B | ILL. NO. 6WD0130A | FP-69/FP-70 BLANK

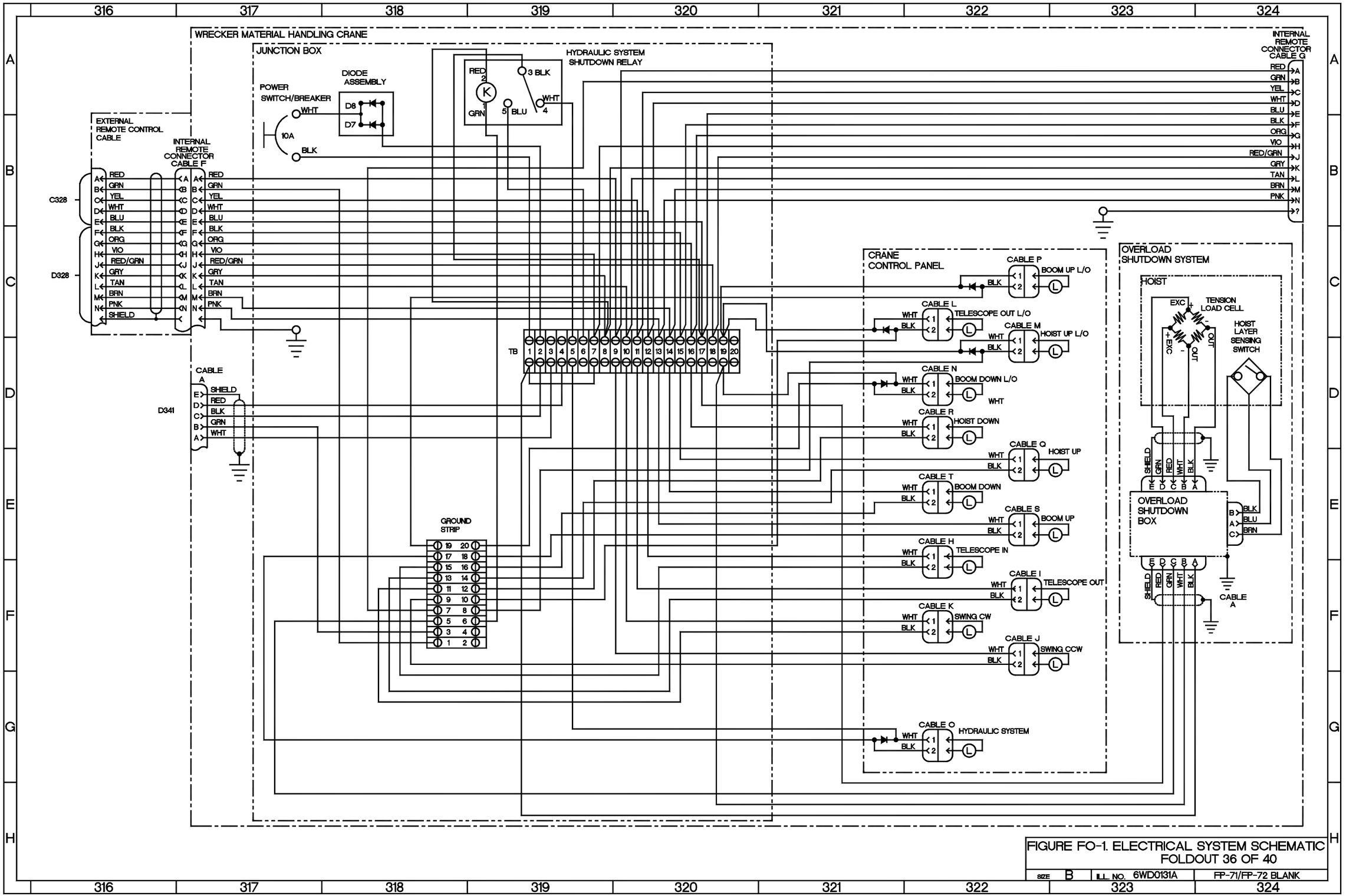


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 36 OF 40

SIZE	ILL. NO.	
B	6WD0131A	FP-71/FP-72 BLANK

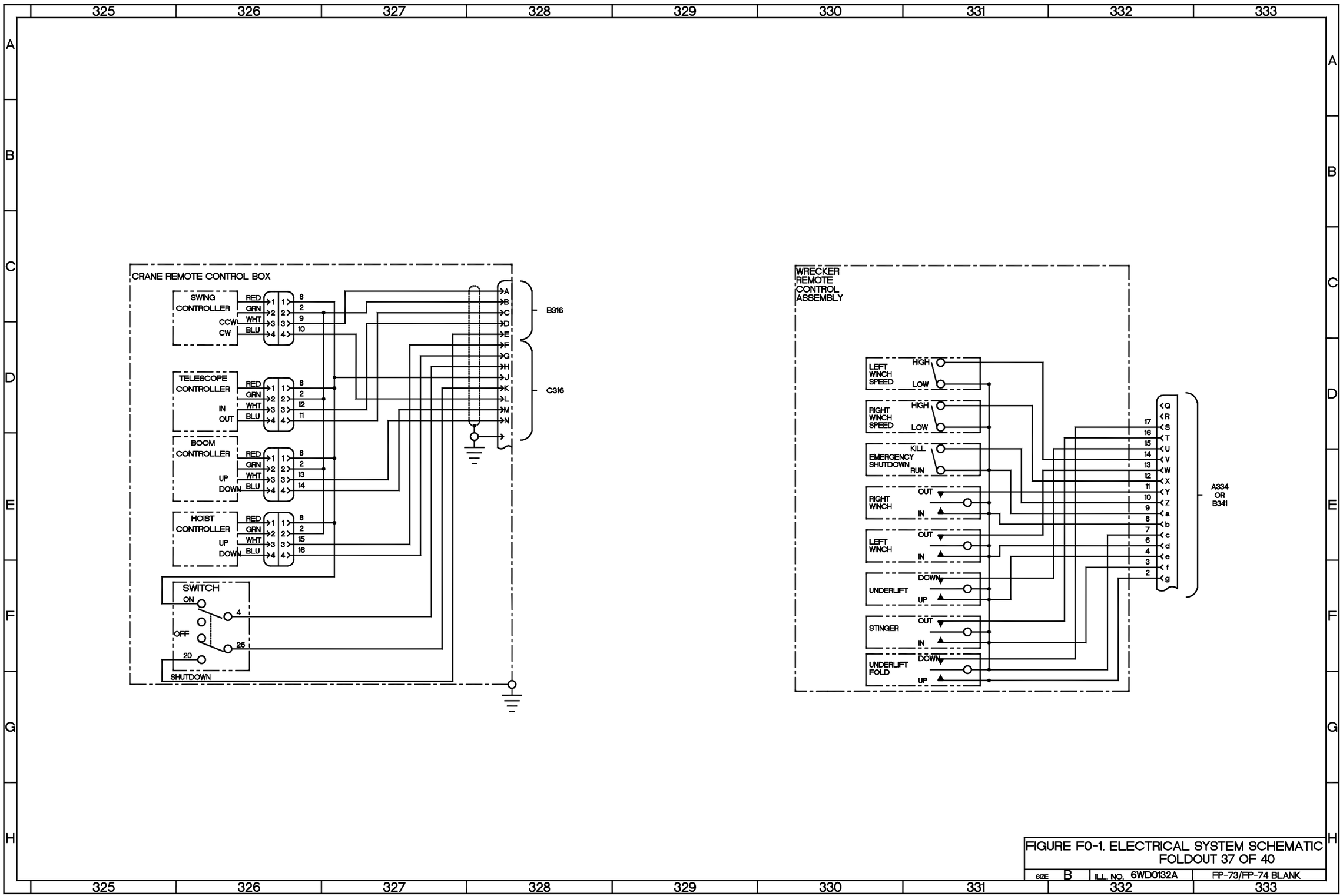


FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 37 OF 40

SIZE	ILL. NO.	
B	6WD0132A	FP-73/FP-74 BLANK

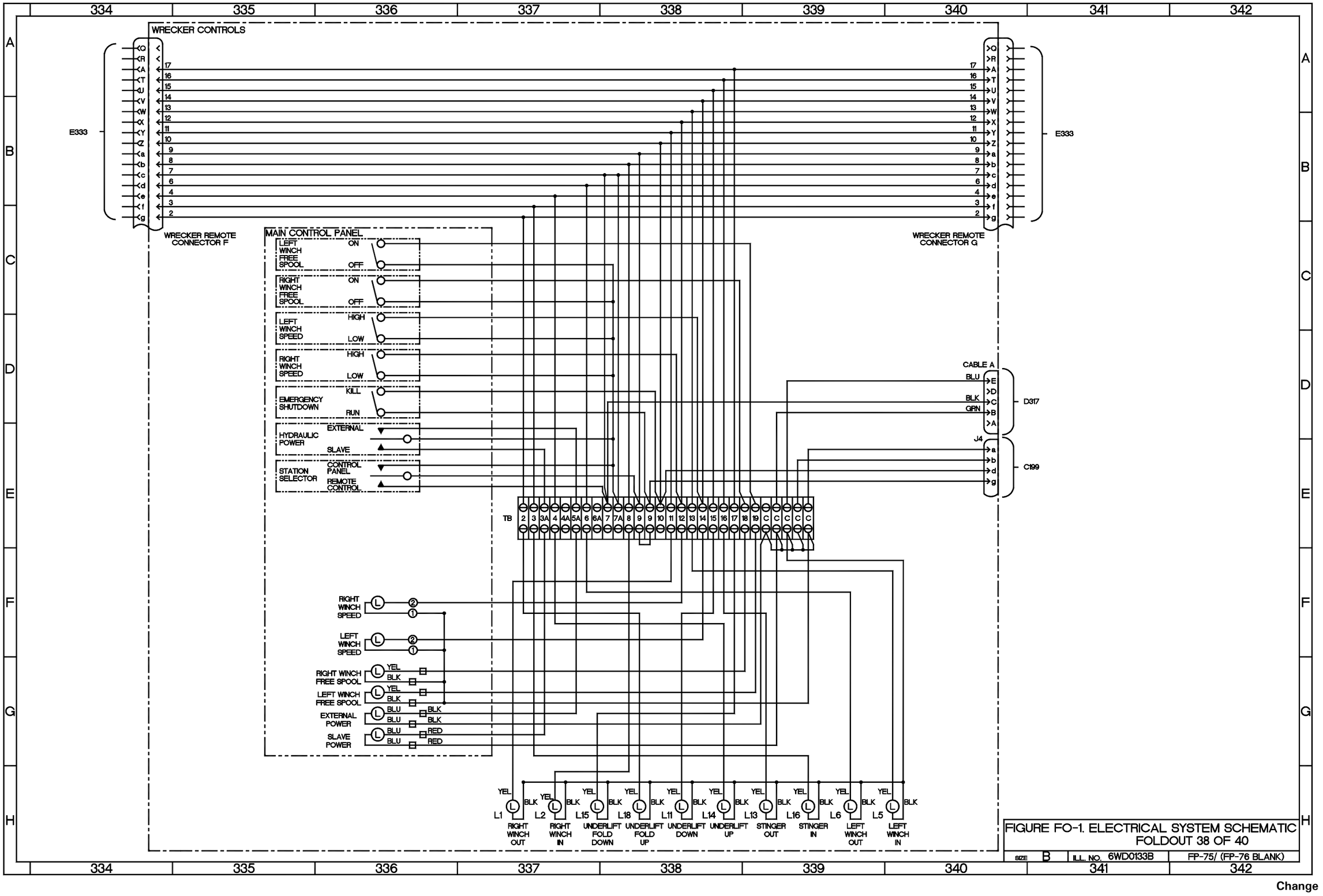


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 38 OF 40

SIZE	ILL. NO.	
B	6WD0133B	FP-75/ (FP-76 BLANK)

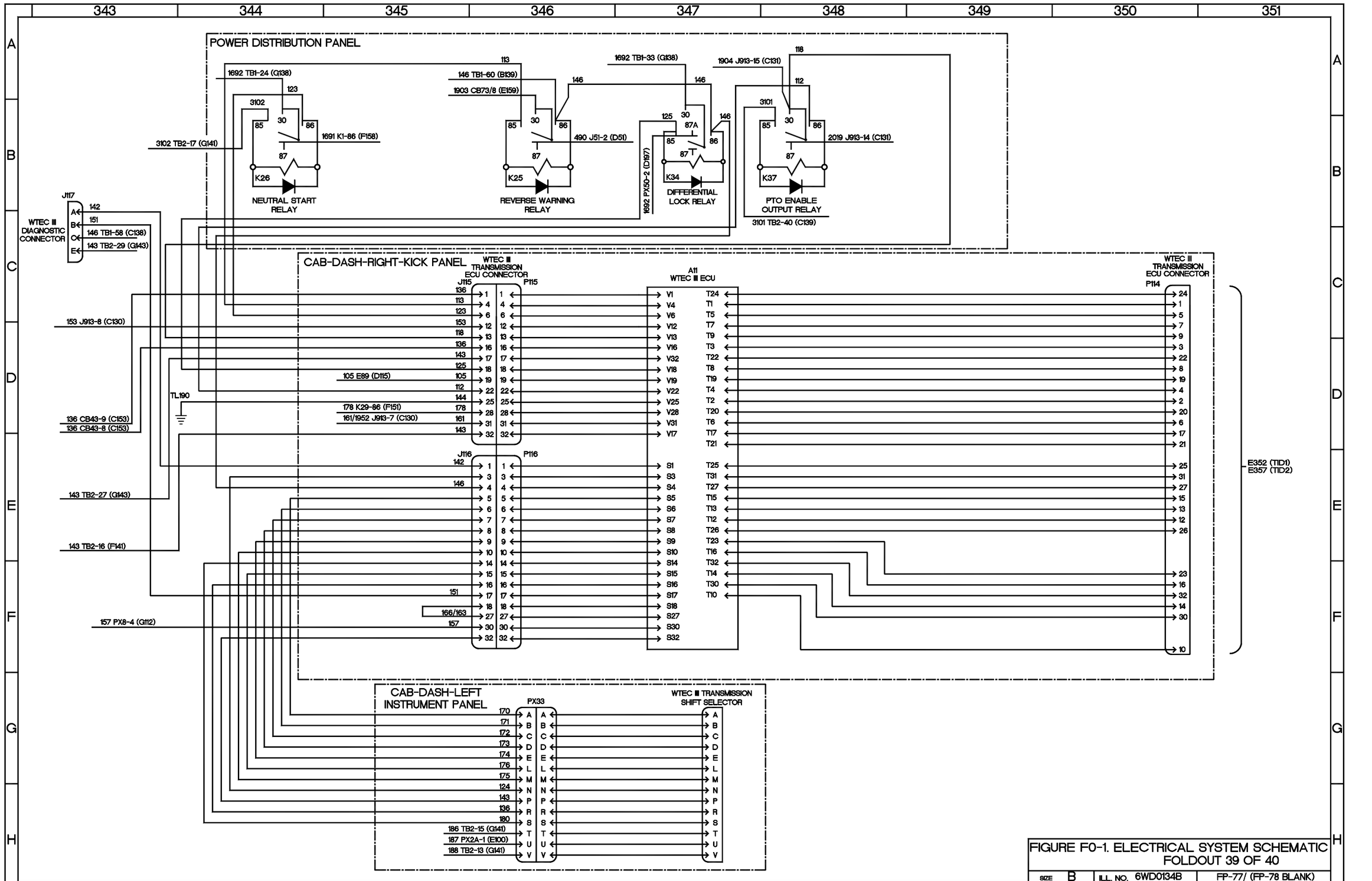
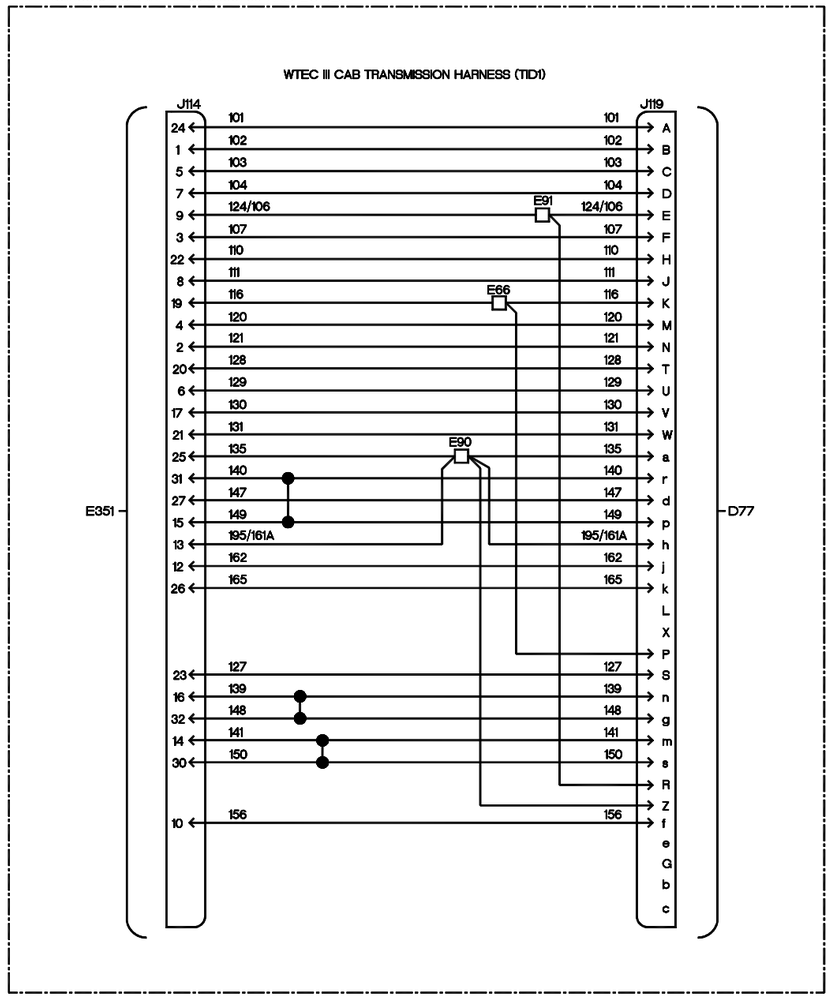


FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 39 OF 40

SIZE	ILL. NO.	
B	6WD0134B	FP-77/ (FP-78 BLANK)

TRANSMISSION SERIAL #: 6510090785 AND LOWER



TRANSMISSION SERIAL #: 6510090786 AND HIGHER

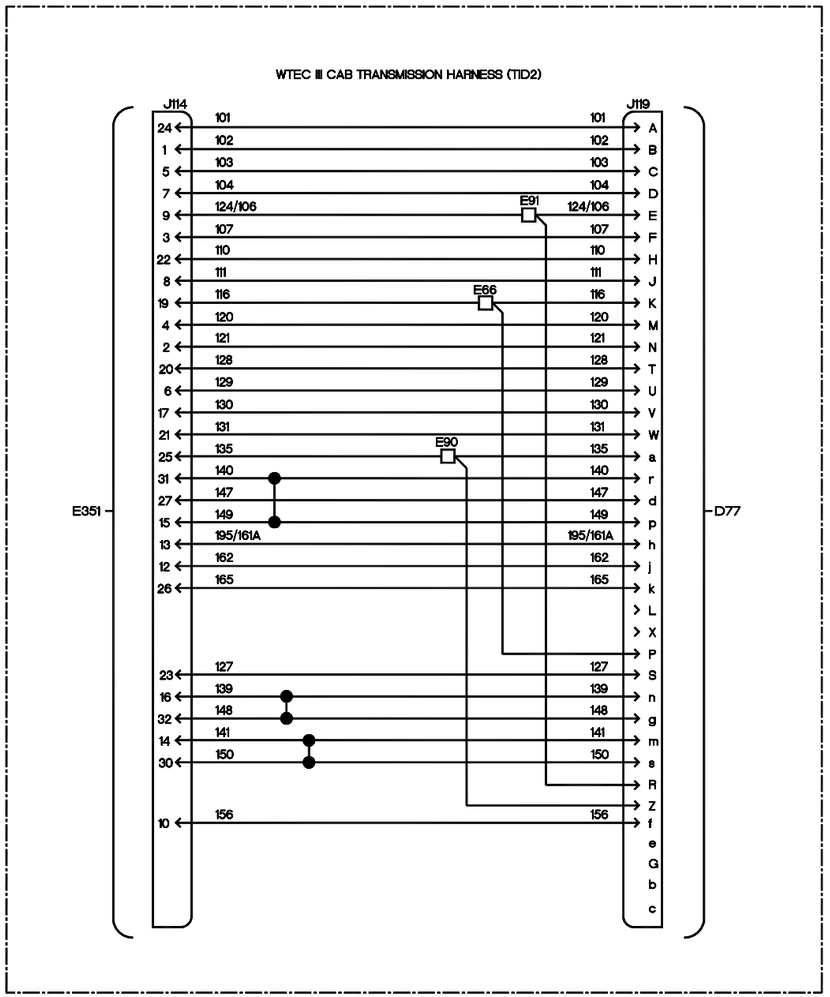


FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 40 OF 40

SIZE B | ILL NO. 6WD0135B | FP-79/ (FP-80 BLANK)

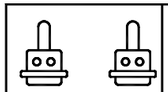
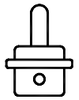
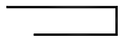
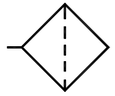
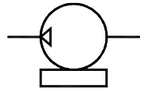
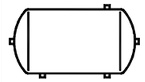
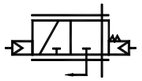
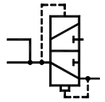
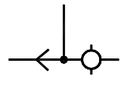
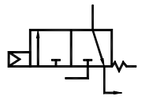
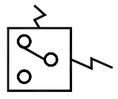
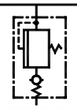
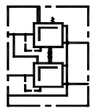
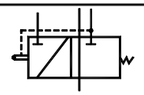
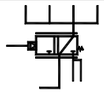
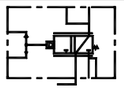
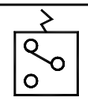
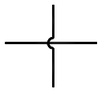
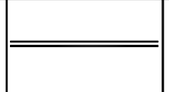
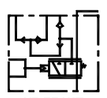
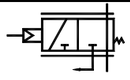
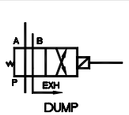
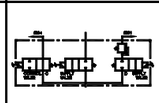
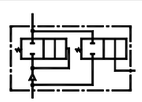
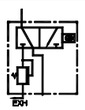
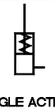
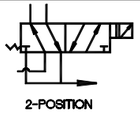
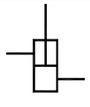
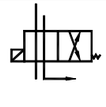
 REAR AXLE BRAKE CHAMBER	 FRONT AXLE BRAKE CHAMBER	 COUPLER AIR BRAKE	 AIR DRYER	 AIR CLEANER INTAKE	 AIR COMPRESSOR WITH GOVERNOR	 AIR TANK	 DASH GAUGE
 MANUAL VALVE	 ONE WAY CHECK VALVE	 FAN CLUTCH	 MODULATED CONTROL VALVE	 QUICK RELEASE VALVE	 TWO WAY CHECK VALVE	 3/2 WAY SOLENOID VALVE	 PRESSURE SWITCH
 PRESSURE RELIEF VALVE	 FOOT CONTROL VALVE	 PARK CONTROL VALVE (HAND OPERATED)	 TRAILER AIR SUPPLY VALVE (HAND OPERATED)	 LOAD SENSING VALVE (MECHANICALLY CONTROLLED)	 DIRECTIONAL RELAY VALVE	 CONTROL VALVE WITH TWO WAY CHECK VALVE	 STOPLIGHT SWITCH
 CONNECTION	SUPPLY AIR HOSE	 NO CONNECTION	 DELIVERY AIR HOSE	PARK/EMERGENCY AIR HOSE	 AIR BRAKE PROTECTING VALVE	 INTERMEDIATE DIFFERENTIAL	 AIR BRAKE PRESSURE TRANSMITTER
 BOOSTER VALVE	 AIR/HYDRAULIC INVERSION VALVE	 DELIVERY AIR HOSE NO CONNECTION	 DUMP TAILGATE SOLENOID	 BLEED VALVE	 TAILGATE CYLINDER	 CTIS MANIFOLD VALVE	 WHEEL VALVE
 KNEELING VALVE	 TIRE	 (SINGLE ACTING) CYLINDER RETURN SPRING	 2-POSITION SPRING OFFSET SOLENOID VALVE	 (DOUBLE ACTING) CYLINDER	 MANIFOLD VALVE	 2-POSITION SOLENOID VALVE	

FIGURE F0-2 PNEUMATIC SYSTEM SCHEMATIC
FOLDOUT 1 OF 4

SIZE	ILL. NO.	
B	6PD01AL1	FP-1/FP-2 BLANK

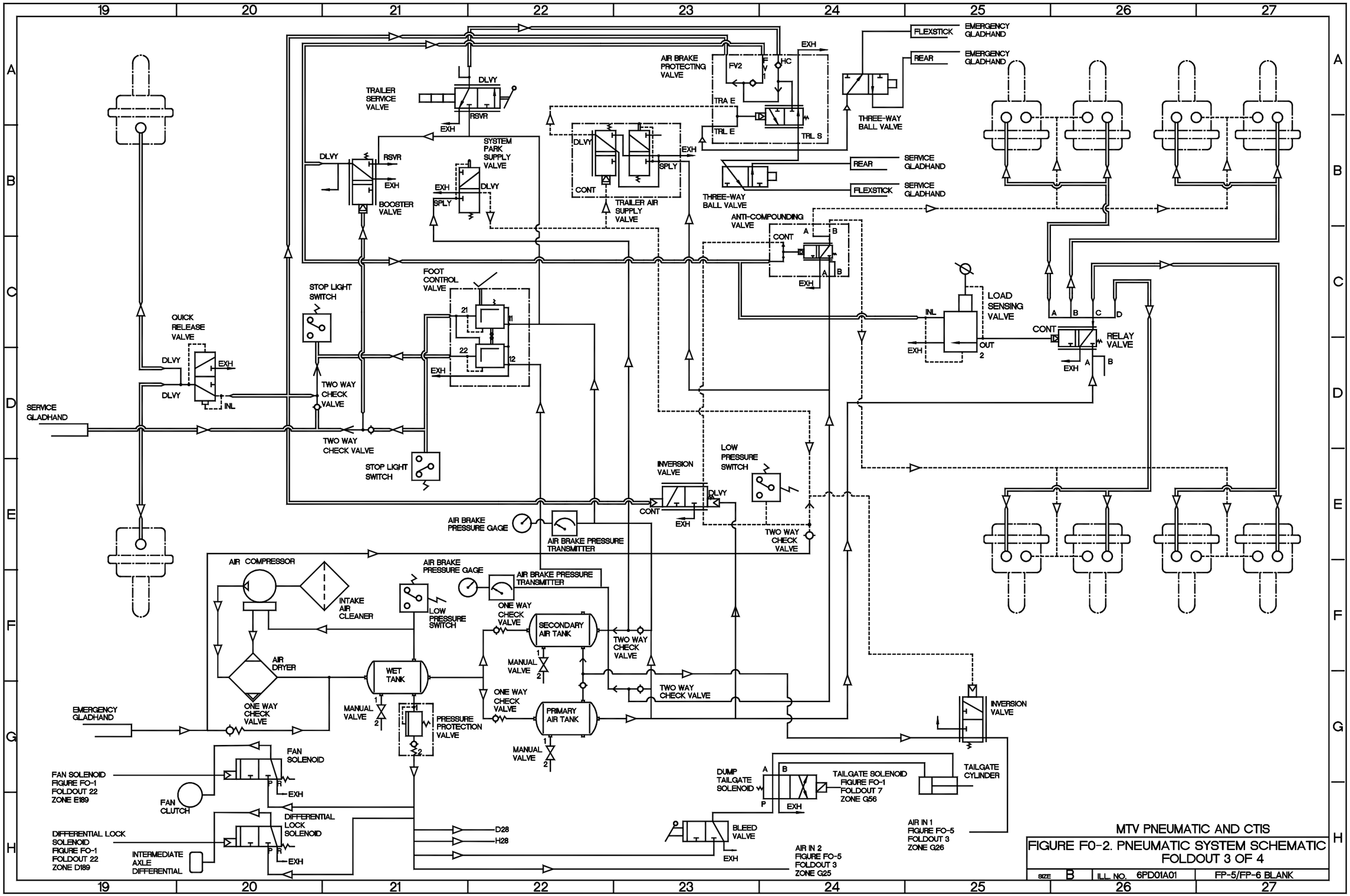
SH	ZONE	DESCRIPTION
3	E22	AIR BRAKE PRESSURE TRANSMITTER
3	F21	AIR BRAKE PRESSURE TRANSMITTER
3	A23	AIR BRAKE PROTECTING VALVE
3	F20	AIR COMPRESSOR
3	F20	AIR DRYER
3	B24	ANTI-COMPOUNDING VALVE
3	H23	BLEED VALVE
3	B21	BOOSTER VALVE
4	D30	CONTROL VALVE
4	C30	CTIS MANIFOLD VALVE
4	D31	DEFLATE VALVE
3	H20	DIFFERENTIAL LOCK SOLENOID
3	G24	DUMP TAILGATE SOLENOID
3	A25	EMERGENCY GLADHAND
3	A25	EMERGENCY GLADHAND
3	G19	EMERGENCY GLADHAND
3	H20	FAN CLUTCH
3	G20	FAN SOLENOID
3	C22	FOOT CONTROL VALVE
3	F20	INTAKE AIR CLEANER
3	H19	INTERMEDIATE AXLE DIFFERENTIAL
3	E23	INVERSION VALVE
3	G25	INVERSION VALVE
4	A28	KNEELING VALVE
4	C28	KNEELING VALVE
4	E28	LH MAIN WINCH FREESPOOL
4	E30	LH MAIN WINCH TENSIONER
4	G29	LH MAIN WINCH VALVE
3	C25	LOAD SENSING VALVE
3	E23	LOW PRESSURE SWITCH
3	F21	LOW PRESSURE SWITCH
4	F28	MANIFOLD
4	G29	MANIFOLD
3	F22	MANUAL VALVE
3	G21	MANUAL VALVE
3	G22	MANUAL VALVE
3	F22	ONE WAY CHECK VALVE
3	G20	ONE WAY CHECK VALVE
3	G22	ONE WAY CHECK VALVE
3	G21	PRESSURE PROTECTION VALVE
3	G22	PRIMARY AIR TANK
4	B30	QUICK RELEASE VALVE
4	B33	QUICK RELEASE VALVE
4	B36	QUICK RELEASE VALVE
3	C20	QUICK RELEASE VALVE
4	E30	REGULATOR
4	E31	REGULATOR

SH	ZONE	DESCRIPTION
4	F28	REGULATOR
3	D26	RELAY VALVE
4	E29	RH MAIN WINCH FREESPOOL
4	E30	RH MAIN WINCH TENSIONER
4	G33	RH MAIN WINCH VALVE
3	F22	SECONDARY AIR TANK
3	B24	SERVICE GLADHAND
3	B24	SERVICE GLADHAND
3	D19	SERVICE GLADHAND
4	G30	STINGER VALVE
3	C20	STOPLIGHT SWITCH
3	E21	STOPLIGHT SWITCH
4	D31	SUPPLY VALVE
3	B21	SYSTEM PARK SUPPLY VALVE
3	G25	TAILGATE CYLINDER
3	A24	THREE WAY BALL VALVE
3	B23	THREE WAY BALL VALVE
3	B22	TRAILER AIR SUPPLY VALVE
3	A21	TRAILER SERVICE VALVE
3	D21	TWO WAY CHECK VALVE
3	D21	TWO WAY CHECK VALVE
3	E24	TWO WAY CHECK VALVE
4	E30	TWO WAY CHECK VALVE
4	E30	TWO WAY CHECK VALVE
3	F23	TWO WAY CHECK VALVE
3	G23	TWO WAY CHECK VALVE
4	G32	UNDERLIFT FOLD VALVE
4	G31	UNDERLIFT VALVE
3	F21	WET TANK
4	C34	WHEEL VALVE
4	A28	WHEEL VALVE
4	A32	WHEEL VALVE
4	A34	WHEEL VALVE
4	C28	WHEEL VALVE
4	C32	WHEEL VALVE

MTV PNEUMATIC AND CTIS

FIGURE F0-2. PNEUMATIC SYSTEM SCHEMATIC FOLDOUT 2 OF 4

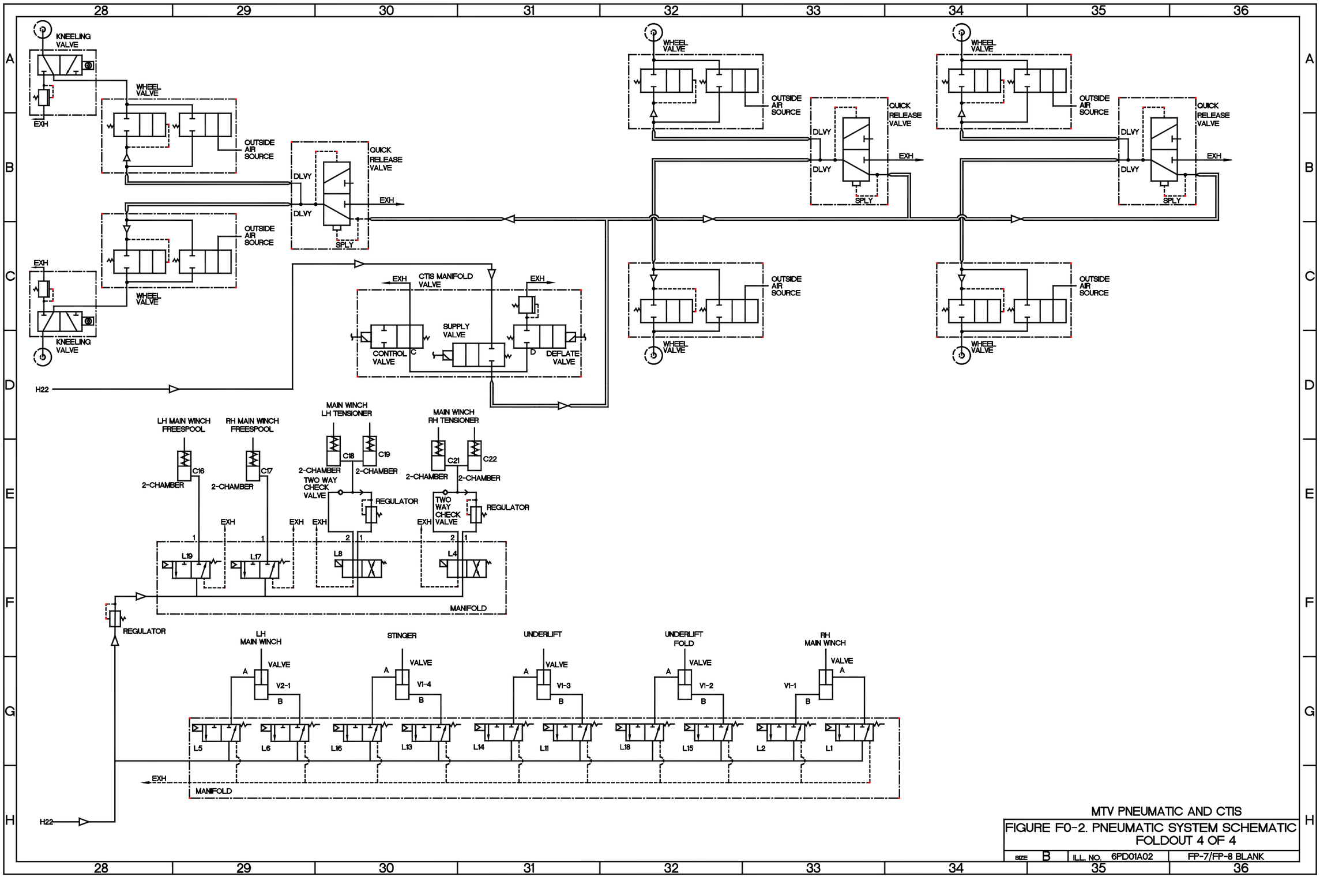
SIZE	ILL. NO.	
B	6PD01AL2	FP-3/FP-4 BLANK



MTV PNEUMATIC AND CTIS

FIGURE FO-2. PNEUMATIC SYSTEM SCHEMATIC FOLDOUT 3 OF 4

SIZE	ILL. NO.	
B	6PD01A01	FP-5/FP-6 BLANK



MTV PNEUMATIC AND CTIS

FIGURE F0-2. PNEUMATIC SYSTEM SCHEMATIC FOLDOUT 4 OF 4

SIZE	ILL. NO.	
B	6PD01A02	FP-7/FP-8 BLANK

CHECK VALVE	BYPASS VALVE	CHECK VALVE	AIR OR OIL FILTER	MOTOR	PUMP	PTO	HOIST CYLINDER
AIR LINE LUBRICATOR	CYLINDER	HYDRAULIC ACCUMULATOR	FLOW CONTROL VALVE	CLOSED 2 WAY VALVE	2 WAY SOLENOID VALVE	VALVE	SWING MOTOR
DIRECTIONAL CONTROL VALVE	PRESSURE CONTROL VALVE	CHECK VALVE	HOLDING VALVE	NORMALLY CLOSED 2 WAY VALVE	PRESSURE RELIEF VALVE	SWING DRIVE	RESERVOIR
VALVE	HYDRAULIC CYLINDER	MANUAL SHUT OFF	SUCTION LINE	CROSS OVER RELIEF VALVE	HAND PUMP	MOTOR CONTROL VALVE	

FIGURE FO-3. HYDRAULIC SYSTEM SCHEMATIC

FOLDOUT 1 OF 8

SIZE	ILL. NO.	
B	6HD01AL1	FP-1/FP-2 BLANK

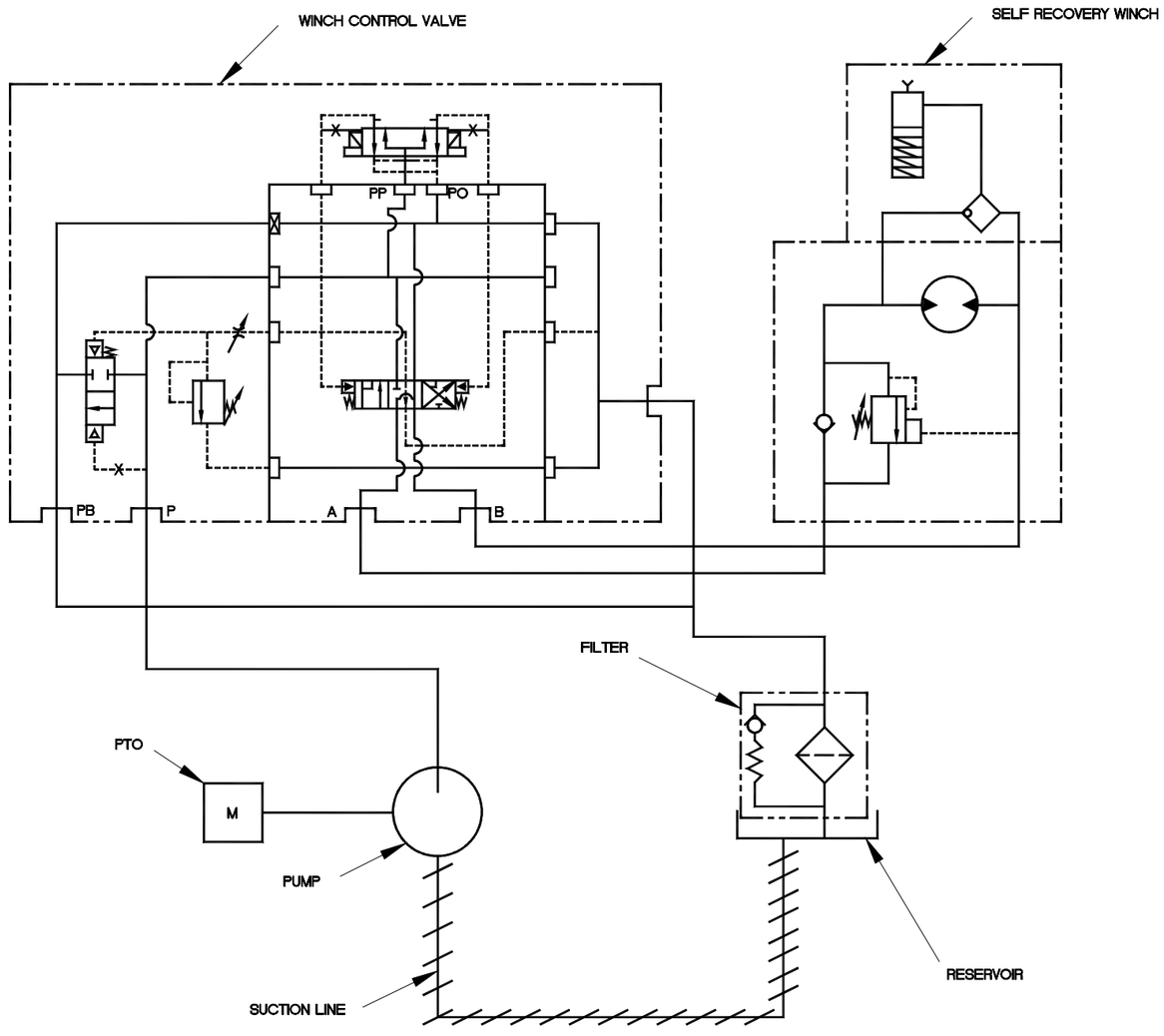
SH	ZONE	DESCRIPTION
6	D46	2 WAY SOLENOID VALVE
7	D60	2 WAY SOLENOID VALVE
7	D55	2 WAY SOLENOID VALVE, OPERATING PRESS
7	F60	3 BANK VALVE ASSEMBLY
7	C61	4 BANK VALVE ASSEMBLY
6	B52	BOOM
7	F55	BULKHEAD PLATE (SUBFRAME)
7	F57	CHECK VALVE
7	G62	CHECK VALVE
7	D55	CHECK VALVE
5	E37	CHECK VALVE CK1
5	E37	CHECK VALVE CK2
5	E37	CHECK VALVE CK3
5	E37	CHECK VALVE CK4
5	E37	CHECK VALVE CK5
5	E37	CHECK VALVE CK6
8	E65	CONTROL VALVE
5	B44	COUNTERBALANCE VALVE
6	B48	CROSS RELIEF VALVE
7	C57	CROSS RELIEF VALVE
8	E64	DUMP BODY HYDRAULIC HOIST
6	G48	ERECTION CYLINDER
5	E38	FC1 SLAVE POWER
5	E38	FC2 EXTERNAL POWER
3	F23	FILTER
4	D34	FILTER
8	E68	FILTER
5	B43	FLOW CONTROL VALVE
5	B45	FLOW CONTROL VALVE
5	B43	FOLD CYLINDER
7	C62	FULL FLOW
6	G54	GAUGE PORT
6	E47	HAND PUMP
7	E56	HAND PUMP
7	G57	HOIST
7	A62	HOIST
6	B53	HOIST
8	G65	HOIST CYLINDER
7	G58	HOIST MOTOR
6	G46	HOIST MOTOR
7	H57	HOIST MOTOR CONTROL VALVE
6	H46	HOIST MOTOR CONTROL VALVE
7	H59	HOLDING VALVE
7	G62	HOLDING VALVE
6	C47	HOLDING VALVE
6	H53	HOLDING VALVE
7	C55	HOLDING VALVE
7	G56	HOLDING VALVES
6	E48	HOLDING VALVES
6	G48	HOLDING VALVES
5	D41	HYDRAULIC MOTOR, PAY-OUT
5	E41	HYDRAULIC MOTOR, PAY-OUT
7	A60	HYDRAULIC ACCUMULATOR

SH	ZONE	DESCRIPTION
6	E54	HYDRAULIC ACCUMULATOR
7	H61	LEFT JACK CYLINDER
6	H49	LEFT JACK CYLINDER
5	G42	LEFT MAIN WINCH
7	A61	LIFT
6	E48	LIFT CYLINDERS
5	C37	LINEAR DIRECTIONAL CONTROL VALVE
5	B42	LOWER MAIN CONTROL VALVE ASSEMBLY
5	D37	M1089 MATERIAL HANDLING CRANE LOC.
6	B51	MANUAL OVERRIDE
7	G61	MAST ERECTION
7	H59	MAST ERECTION CYLINDER
4	C30	MATERIAL HANDLING EQUIPMENT
5	E38	MC1 SLAVE POWER
5	E38	MC2 EXTERNAL POWER
5	D40	MONO BLOCK VALVE ASSEMBLY
7	G58	MOTOR DRAIN
6	G46	MOTOR DRAIN
6	D54	N/C 2 WAY VALVE
6	H52	OUTRIGGER EXTENSION CYLINDER
7	A60	PRESSURE CHECK POINT
3	F21	PTO
4	E32	PTO
8	G68	PTO
3	F22	PUMP
4	E33	PUMP
8	F68	PUMP
5	F37	PUMP ASSEMBLY
5	D41	RELIEF VALVE
5	E41	RELIEF VALVE
5	F42	RELIEF VALVE ASSEMBLY
5	B42	RELIEF VALVE ASSY (RIGHT MAIN WINCH)
3	F24	RESERVOIR
4	F34	RESERVOIR
8	G69	RESERVOIR
5	G40	RETURN VALVE
5	B44	RH UNDERLIFT COUNTERBALANCE VALVE
7	G62	RIGHT JACK CYLINDER
6	H54	RIGHT JACK CYLINDER
5	B42	RIGHT MAIN WINCH
5	F40	SAMPLING VALVE
3	B24	SELF RECOVERY WINCH
5	G41	SELF RECOVERY WINCH
8	B71	SELF RECOVERY WINCH
5	G43	STIFFLEG CYLINDER LH
5	G45	STIFFLEG CYLINDER RH
5	B45	STINGER CYLINDER
7	F55	SUCTION LINE-HAND PUMP
3	G22	SUCTION LINE
4	F33	SUCTION LINE
5	F37	SUPPLY VALVE
7	A58	SWING
6	B50	SWING

SH	ZONE	DESCRIPTION
6	B48	SWING DRIVE
7	B57	SWING DRIVE
6	A48	SWING MOTOR
7	B57	SWING MOTOR
6	C46	TELESCOPE CYLINDER
7	A59	TELESCOPE
6	B51	TELESCOPE
7	B55	TELESCOPE CYLINDER
5	A44	TELESCOPIC LIFT CYLINDER, LH
5	A45	TELESCOPIC LIFT CYLINDER, RH
6	F49	UNLOADER VALVE
7	E56	UNLOADER VALVE
5	E42	UPPER MAIN CONTROL VALVE ASSEMBLY
5	E37	VALVE, SELECTOR
3	B21	WINCH CONTROL VALVE
8	B69	WINCH CONTROL VALVE

FIGURE FO-3 HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 2 OF 8

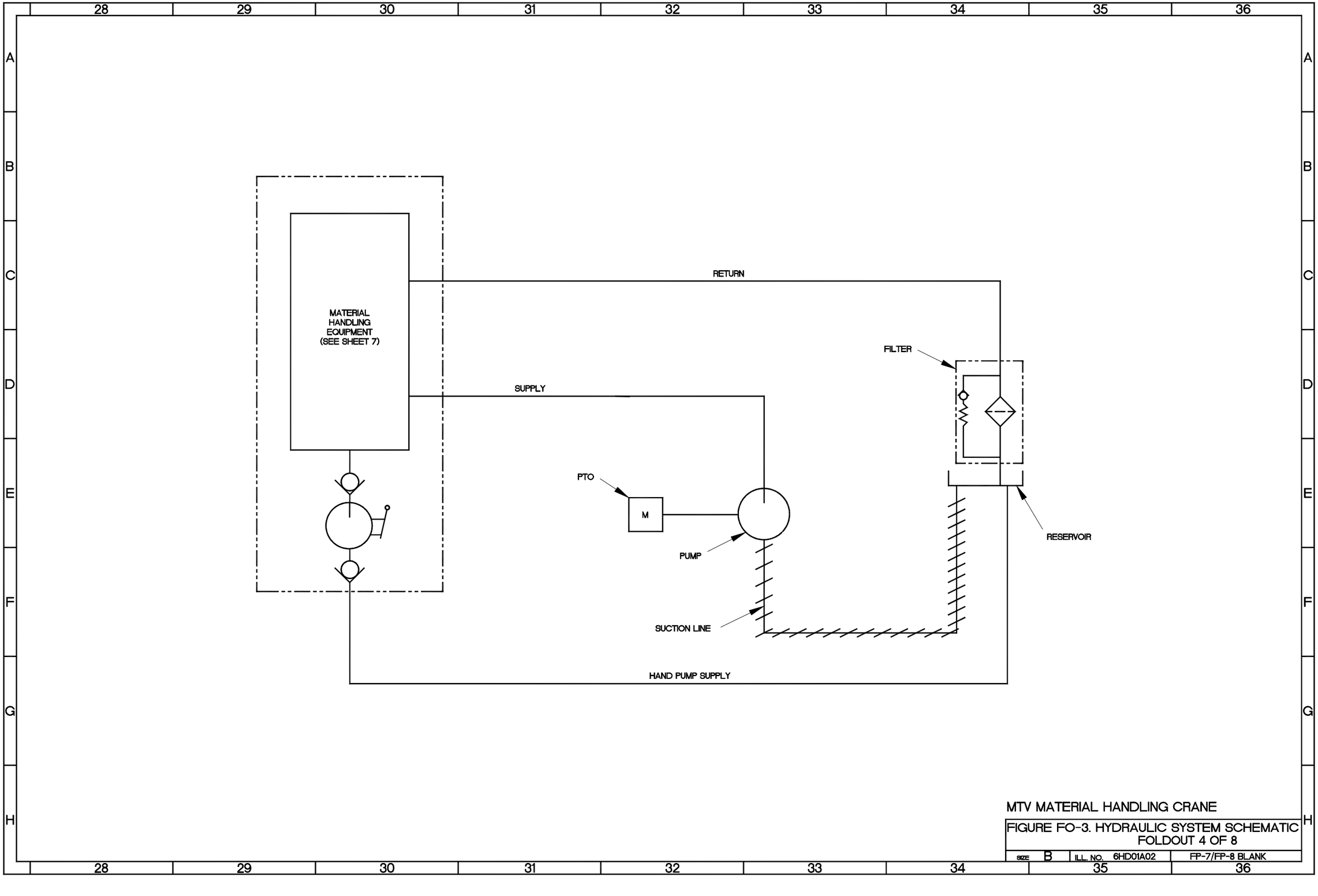
SIZE B | ILL. NO. 6HD01AL2 | FP-3/FP-4 BLANK



MTV TRUCK W/WINCH

FIGURE FO-3. HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 3 OF 8

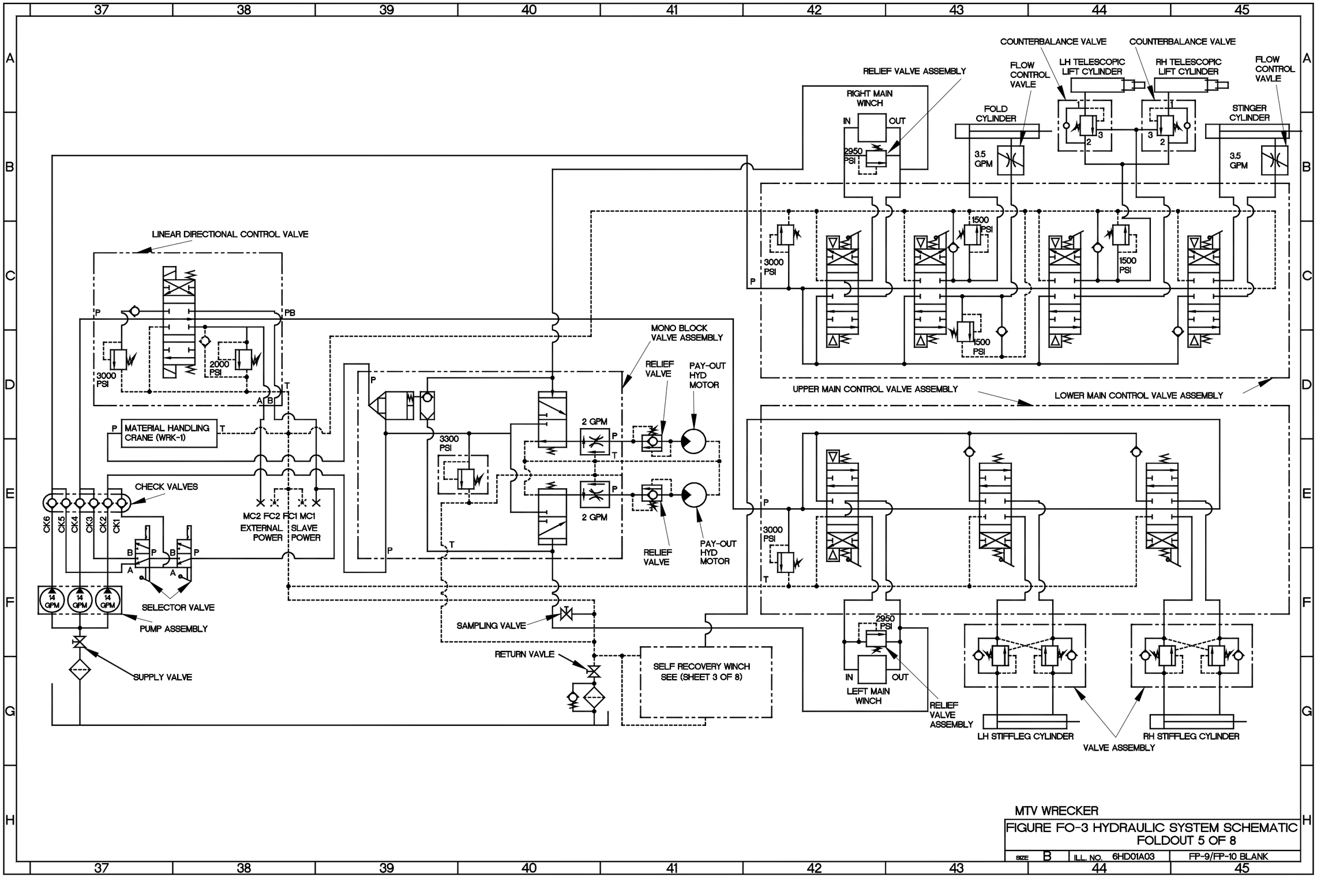
SIZE	ILL. NO.	
B	6HD01A01	FP-5/FP-6 BLANK



MTV MATERIAL HANDLING CRANE

FIGURE FO-3. HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 4 OF 8

SIZE	ILL. NO.	
B	6HD01A02	FP-7/FP-8 BLANK



MTV WRECKER

FIGURE FO-3 HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 5 OF 8

SIZE	ILL. NO.	
B	6HD01A03	FP-9/FP-10 BLANK

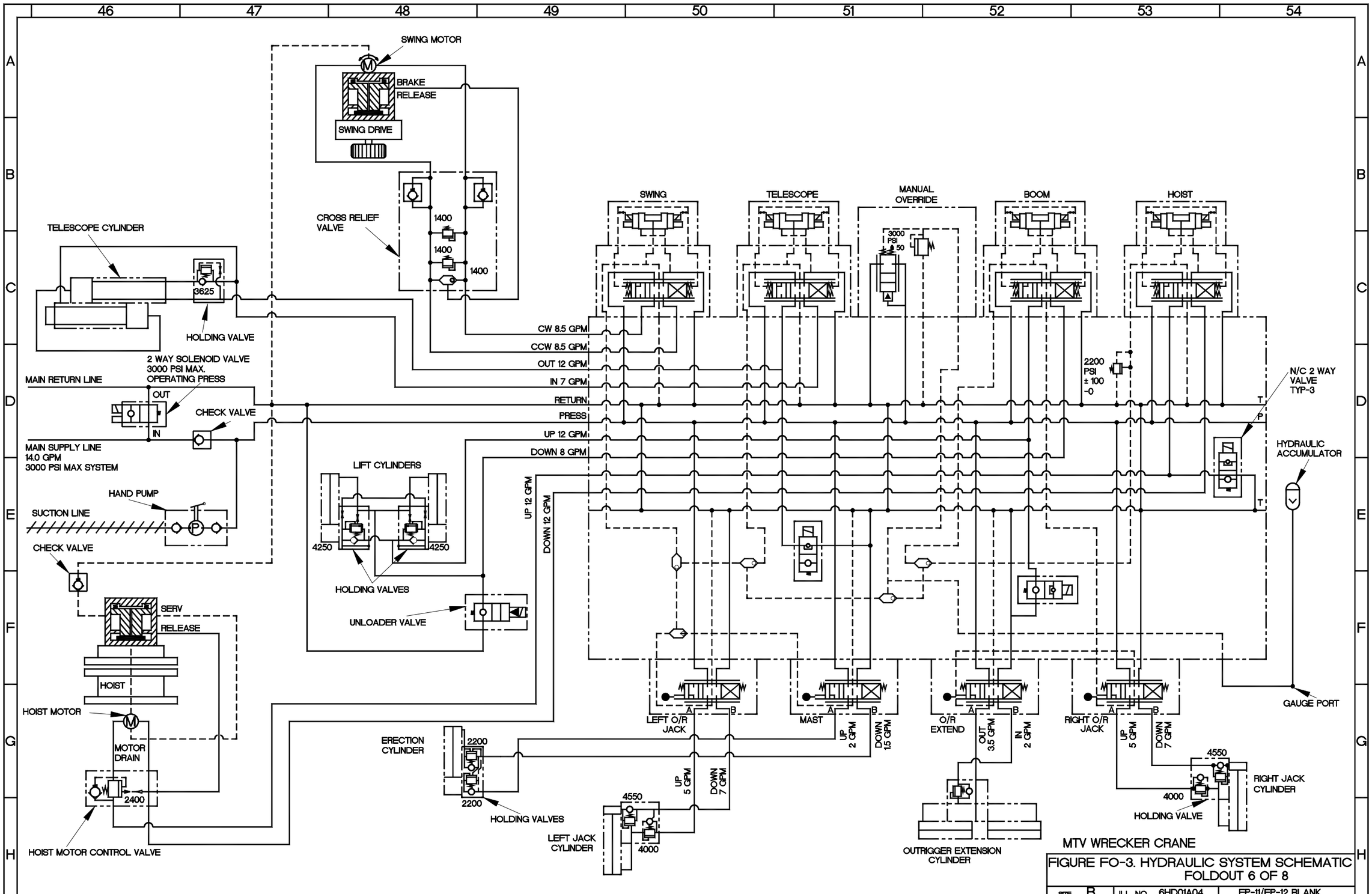
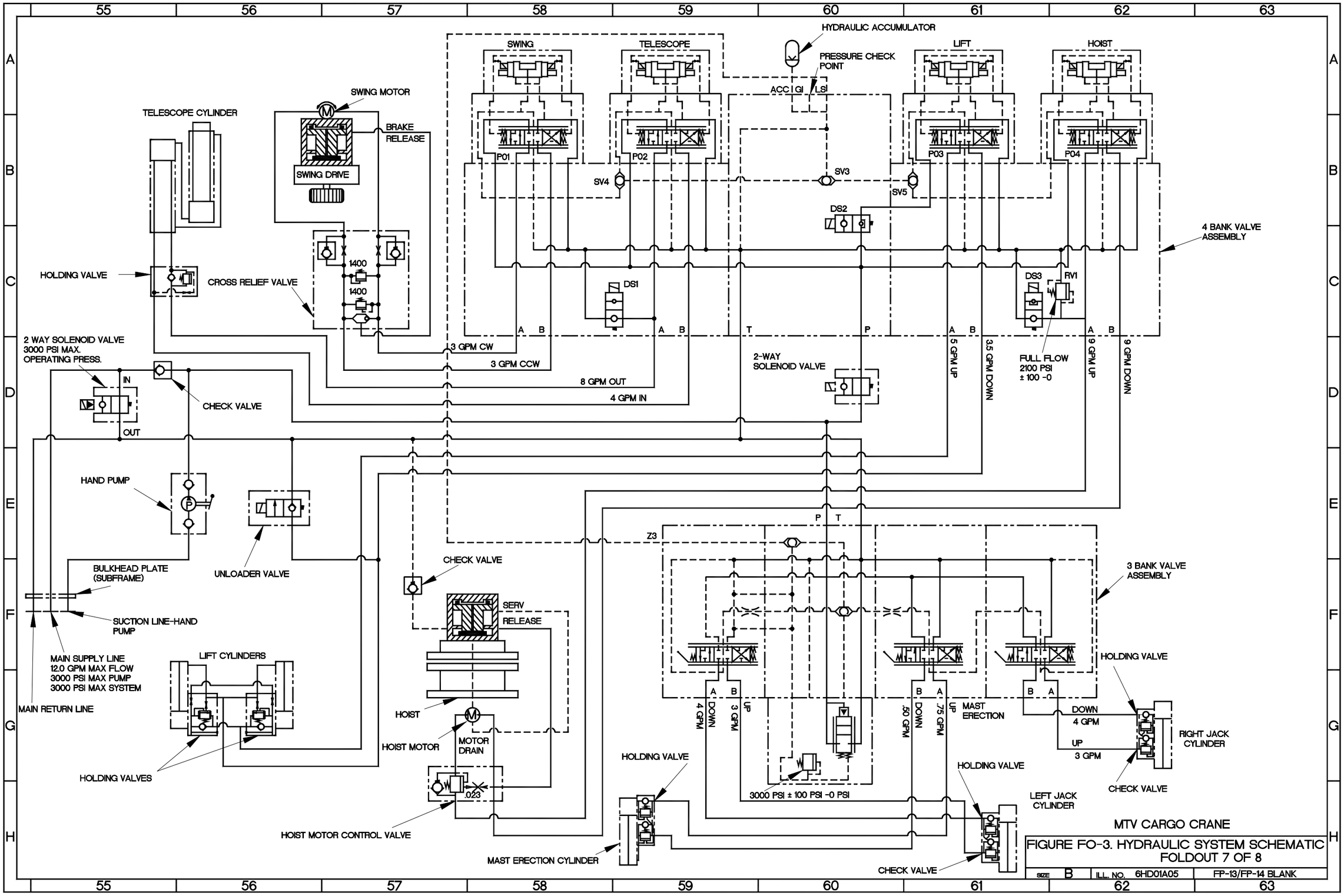


FIGURE FO-3. HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 6 OF 8

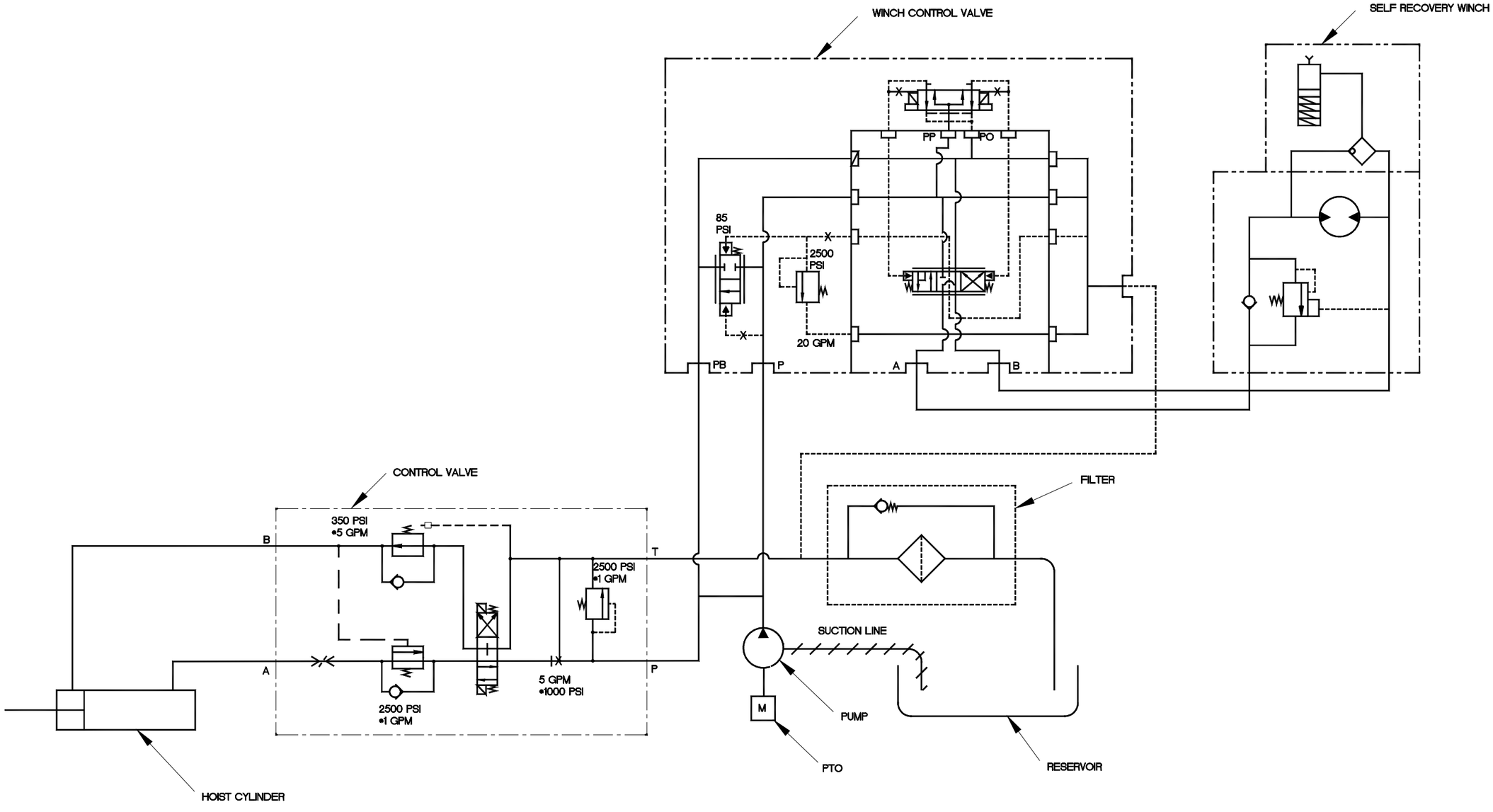
SIZE	ILL. NO.	
B	6HD01A04	FP-11/FP-12 BLANK



MTV CARGO CRANE

FIGURE FO-3. HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 7 OF 8

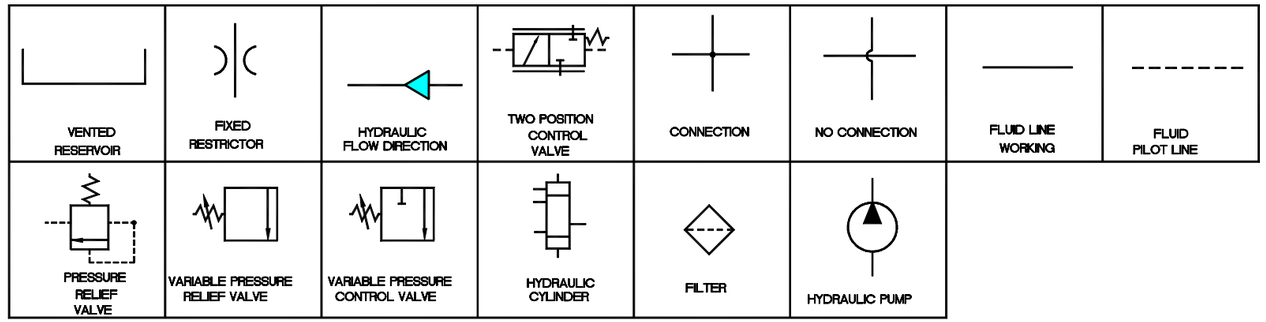
SIZE B | ILL. NO. 6HD01A05 | FP-13/FP-14 BLANK



MTV DUMP W/ WINCH
MTV DUMP W/O WINCH

FIGURE FO-3. HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 8 OF 8

SIZE	ILL. NO.	
B	6HD01A06	FP-15/FP-16 BLANK



SH	ZONE	DESCRIPTION
2	D11	FILTER
2	D14	FIXED RESTRICTOR
2	E17	HYDRAULIC CYLINDER
2	E13	HYDRAULIC PUMP
2	C13	PRESSURE RELIEF VALVE
2	D13	TWO POSITION CONTROL VALVE
2	E16	VARIABLE PRESSURE CONTROL VALVE
2	E16	VARIABLE PRESSURE RELIEF VALVE
2	C11	VENTED RESERVOIR

FIGURE FO-4 HYDRAULIC STEERING SYSTEM

FOLDOUT 1 OF 2

SIZE B | ILL. NO. YSD01AL1 | FP-1/FP-2 BLANK

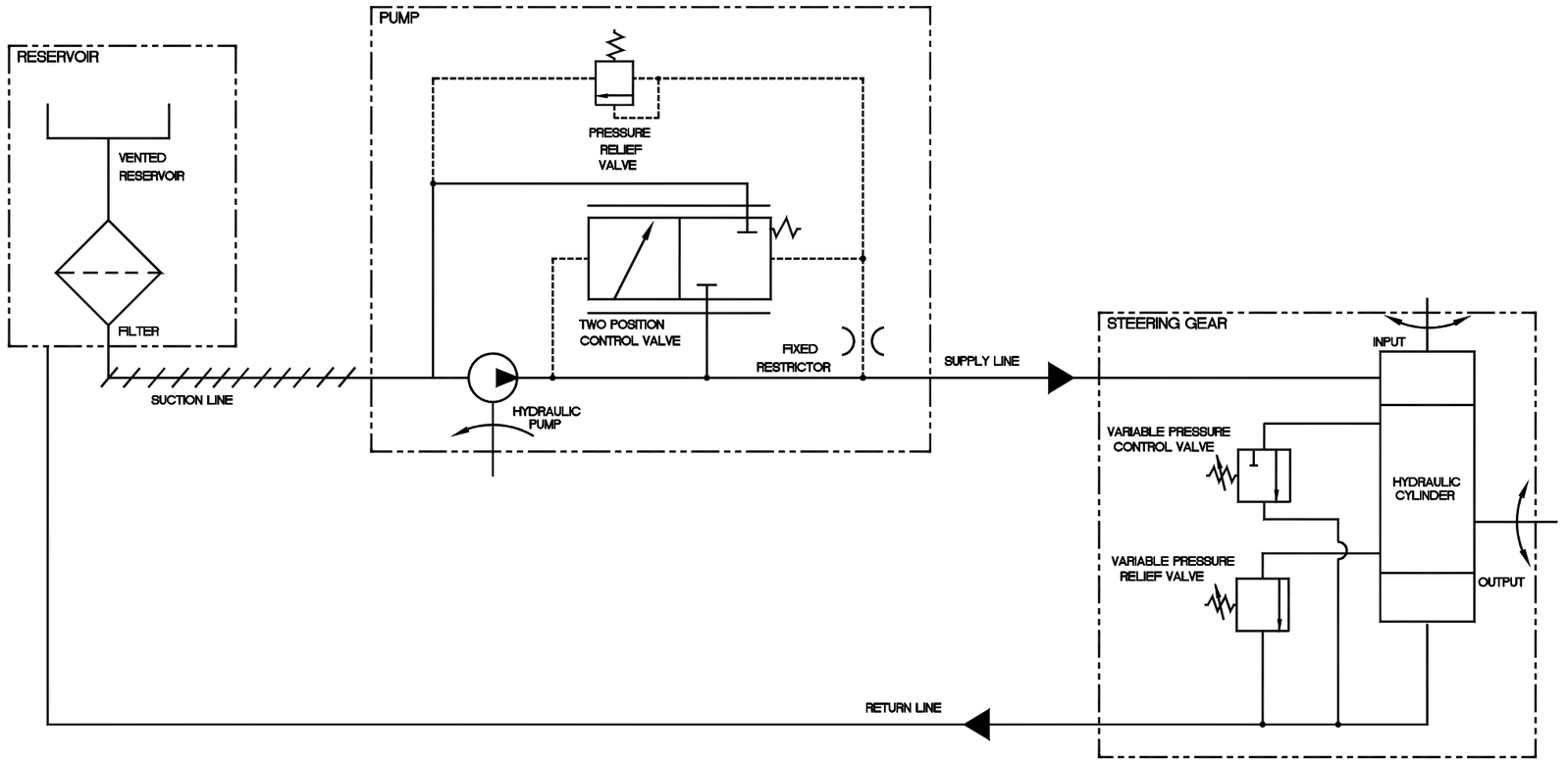


FIGURE FO-4 HYDRAULIC STEERING SYSTEM

FOLDOUT 2 OF 2

SIZE	ILL. NO.	
B	YSD01A01	FP-3/FP-4 BLANK

VENTED RESERVOIR	ABOVE FLUID LEVEL RESERVOIR	HYDRAULIC FLOW DIRECTION	PNEUMATIC FLOW DIRECTION	CONNECTION	NO CONNECTION	FLUID LINE WORKING	FLUID PILOT LINE
FIXED RESTRICTOR	CHECK VALVE	VARIABLE CONTROL CHECK VALVE	CHECK PILOT	PRESSURE RELIEF VALVE	FILTER	HAND PUMP	DETENT
TWO POSITION CAB SUSPENSION VALVE	MUFFLER	HYDRAULIC CYLINDER	CAB AIR SUSPENSION W/DAMPER	REAR CAB LATCH	TWO POSITION AIR PUMP VALVE	PRESSURE INTENSIFIER	HEIGHT CONTROL VALVE
TWO POSITION CAB TILT VALVE	TWO POSITION SUSPENSION VALVE	TWO POSITION SPARE TIRE VALVE	THREE POSITION SELECTION VALVE				

FIGURE F0-5 AIR TRANSPORTABILITY
HYDRAULIC/PNEUMATIC SYSTEM SCHEMATIC

FOLDOUT 1 OF 3

SIZE B | ILL. NO. YAD01AL1 | FP-1/FP-2 BLANK

SH	ZONE	DESCRIPTION
3	A25	CAB AIR SUSPENSION W/DAMPER
3	F21	CHECK PILOT
3	A22	CHECK VALVE
3	A23	CHECK VALVE
3	B22	CHECK VALVE
3	B23	CHECK VALVE
3	B25	CHECK VALVE
3	C20	CHECK VALVE
3	C21	CHECK VALVE
3	E19	CHECK VALVE
3	E24	CHECK VALVE
3	E25	CHECK VALVE
3	F19	CHECK VALVE
3	F21	CHECK VALVE
3	G21	CHECK VALVE
3	A22	FILTER
3	B22	FILTER
3	A24	FILTER
3	B24	FILTER
3	D19	FILTER
3	D20	FILTER
3	D21	FILTER
3	E19	FILTER
3	G19	FILTER
3	G21	FILTER
3	A22	FIXED RESTRICTOR
3	B22	FIXED RESTRICTOR
3	A23	FIXED RESTRICTOR
3	B23	FIXED RESTRICTOR
3	F19	HAND PUMP
3	B25	HEIGHT CONTROL VALVE
3	B22	HYDRAULIC CYLINDER
3	B23	HYDRAULIC CYLINDER
3	C21	HYDRAULIC CYLINDER
3	F20	MUFFLER
3	F21	PRESSURE INTENSIFIER
3	F19	PRESSURE RELIEF VALVE
3	A24	REAR CAB LATCH
3	E21	THREE POSITION SELECTION VALVE
3	D26	TWO POSITION AIR PUMP VALVE
3	D25	TWO POSITION CAB SUSPENSION VALVE
3	C24	TWO POSITION CAB TILT VALVE
3	C23	TWO POSITION SPARE TIRE VALVE
3	D21	TWO POSITION SUSPENSION VALVE
3	G22	VARIABLE CONTROL CHECK VALVE
3	G22	VENTED RESERVOIR

FIGURE F0-5 AIR TRANSPORTABILITY
HYDRAULIC/PNEUMATIC SYSTEM SCHEMATIC
FOLDOUT 2 OF 3

SIZE B | ILL NO. YAD01AL2 | FP-3/FP-4 BLANK

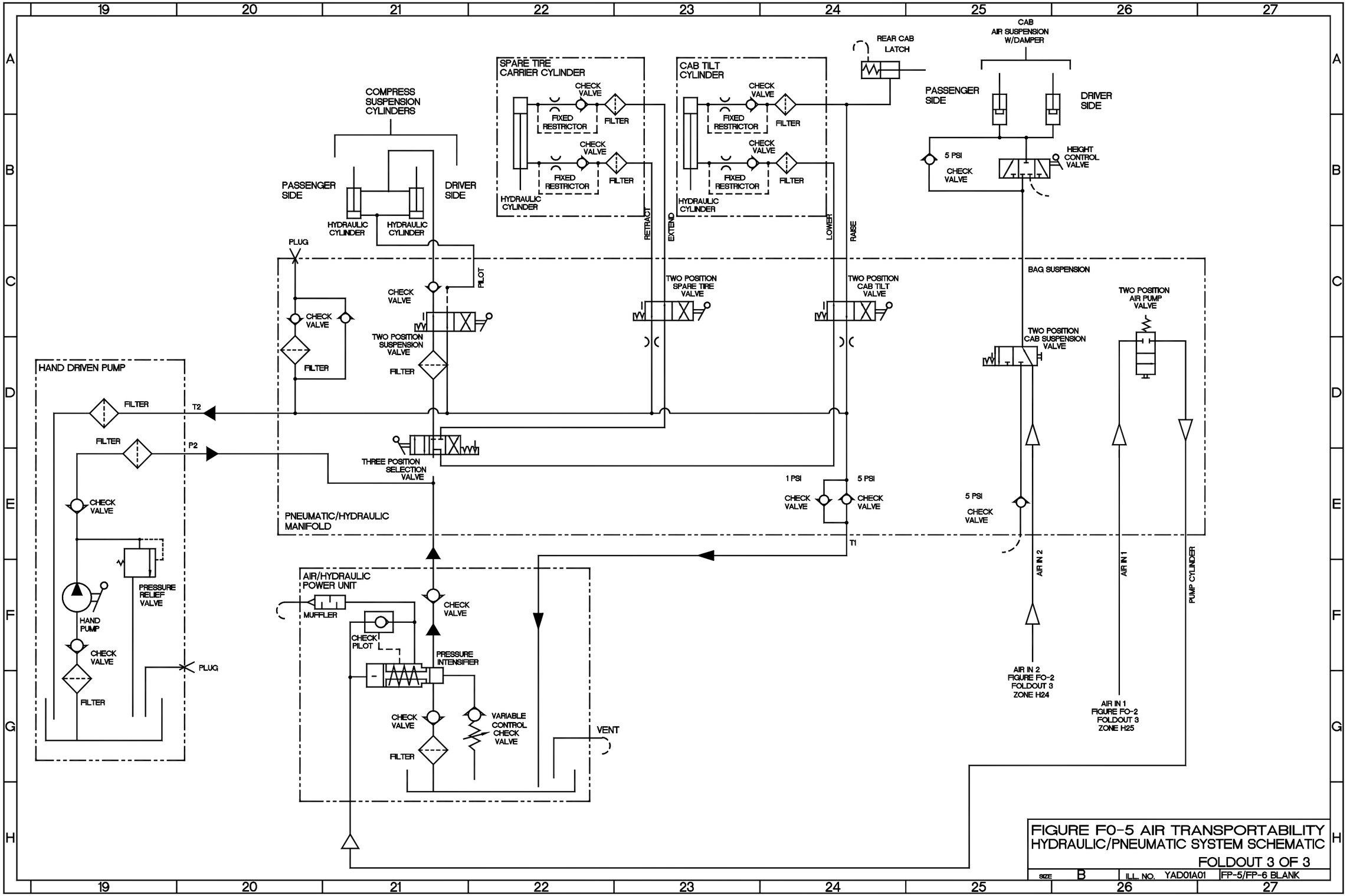


FIGURE FO-5 AIR TRANSPORTABILITY HYDRAULIC/PNEUMATIC SYSTEM SCHEMATIC
FOLDOUT 3 OF 3

SIZE B | ILL NO. YAD01A01 | FP-5/FP-6 BLANK

THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE
1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
1 Kilometer = 1000 Meters = 0.621 Miles

SQUARE MEASURE
1 Sq Centimeter = 100 Sq Millimeters = 0.155 Sq Inches
1 Sq Meter = 10,000 Sq Centimeters = 10.76 Sq Feet
1 Sq Kilometer = 1,000,000 Sq Meters = 0.386 Sq Miles

WEIGHTS
1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
1 Kilogram = 1000 Grams = 2.2 Lb
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

CUBIC MEASURE
1 Cu Centimeter = 1000 Cu Millimeters = 0.06 Cu Inches
1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

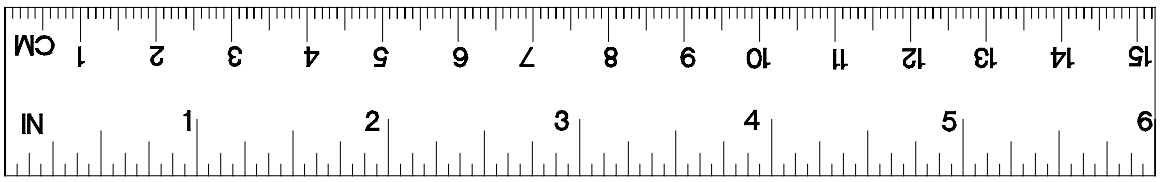
LIQUID MEASURE
1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

TEMPERATURE
5/9 (°F - 32) = °C
212° Fahrenheit is equivalent to 100° Celsius
90° Fahrenheit is equivalent to 32.2° Celsius
32° Fahrenheit is equivalent to 0° Celsius
9/5 C° + 32 = F°

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Inches	Millimeters	25.4
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.57
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.35
Pounds	Kilograms	0.454
Pounds (force)	Newtons	4.448
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds/Sq Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Millimeters	Inches	0.0394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Sq Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Sq Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Newtons	Pounds (force)	0.2248
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds per Sq Inch	0.145
Km per Liter	Miles per Gallon	2.354
Km per Hour	Miles per Hour	0.621



YMET001A

PIN: 074409-000