ARMY TM 9-2320-365-20-2
AIR FORCE T.O. 36A12-1B-1095-2-2

TECHNICAL MANUAL
MAINTENANCE INSTRUCTIONS
UNIT MAINTENANCE
M1078 SERIES, 2 1/2-TON, 4 X 4,
LIGHT MEDIUM TACTICAL VEHICLES (LMTV)
VOLUME NO. 2 OF 5

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

HOW TO USE THIS MANUAL PAGE iv

ELECTRICAL SYSTEM TROUBLESHOOTING (CONT) PAGE 2-1087

TRANSMISSION SYSTEM TROUBLESHOOTING PAGE 2-1359

BRAKE SYSTEM TROUBLESHOOTING PAGE 2-1607

AIR SYSTEM TROUBLESHOOTING PAGE 2-1713

CENTRAL TIRE INFLATION SYSTEM (CTIS) TROUBLESHOOTING PAGE 2-1767

AXLE TROUBLESHOOTING PAGE 2-1895

STEERING TROUBLESHOOTING PAGE 2-1903

11K SELF-RECOVERY WINCH (SRW) SYSTEM TROUBLESHOOTING PAGE 2-1945

ENGINE MAINTENANCE PAGE 3-1

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

HEADQUARTERS, DEPARTMENTS OF THE ARMY AND THE AIR FORCE

JUNE1998

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.

WARNING

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

WARNING SUMMARY (CONT)

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure to comply may result in 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 degrees F (38 degrees C) and for Type II is 130 degrees F (50 degrees 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

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING SUMMARY (CONT)

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING SUMMARY (CONT)

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 to personnel.

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

Diesel fuel is flammable. Arctic heater components and fuel lines may contain small amounts of fuel. If fuel is spilled, clean up immediately. Failure to comply may result in serious injury or death to personnel.

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

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

WARNING

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

WARNING

Remove all loose equipment from van body. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Van body weighs approximately 3,360 lbs (1525 kgs) empty. Attach a suitable lifting device prior to removal. Failure to comply may result in serious injury or death to personnel.

WARNING

Guide ropes must be attached at opposite corners of van body to aid in controlling van body during removal. Failure to comply may result in serious injury or death to personnel.

WARNING

Center of gravity will change depending on equipment installed in van body. Attach and adjust lifting device so that van body lifts level. Failure to comply may result in serious injury or death to personnel or damage to equipment.

WARNING

Pod frame weighs approximately 80 lbs (36 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Do not install pod frame on van body for 72 hours after installing blind rivet nuts and spacers. Failure to comply may result in injury to personnel and/or damage to equipment.

WARNING

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

WARNING SUMMARY (CONT)

WARNING

RH door assembly weighs approximately 85 lbs (39 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

LH door assembly weighs approximately 85 lbs (39 kgs). Attach a suitable lifting device prior to removal. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

Wear appropriate eye protection when handling fluorescent lamps. Failure to comply may result in injury to personnel.

WARNING

- **Heavy objects/loads, such as tool boxes and heavy parts, must always be carried on the floor with the weight distributed as equally as possible between left and right sides of M1079 van. Failure to comply decreases the stability of the M1079 van and will increase the likelihood of a rollover.**
- **Heavy cabinets must always be mounted as low as possible with the weight distributed as equally as possible between left and right sides of M1079 van. Remember to consider the weight of the items that will be stored in the cabinets. Failure to comply decreases the stability of the M1079 van and will increase the likelihood of a rollover.**
- **Always keep in mind, when placing items inside the M1079 van, that heavier items must always be positioned as low as possible and the weight distributed as equally as possible between left and right sides of M1079 van. Failure to comply decreases the stability of the M1079 van and will increase the likelihood of a rollover.**

WARNING

Diesel fuel is flammable. Arctic heater components and fuel hoses may contain small amounts of fuel. If fuel is spilled, clean it up immediately. Failure to comply may result in serious injury or death to personnel.

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

- **Do not open coolant fill cap if temperature reads above 110°F (43°C). Steam or hot coolant is under pressure. Failure to comply may result in injury to personnel.**
- **Pressure in reservoir tank must be released before removing cap. Failure to comply may result in injury to personnel.**

WARNING

Heater weighs approximately 120 lbs (54 kgs). Use the aid of an assistant when lifting. Failure to comply may result in injury to personnel.

WARNING

200 amp alternator weighs approximately 70 lbs (32 kgs). The aid of an assistant is required to install 200 amp alternator. 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 LMHC boom assembly. Failure to comply may result in injury to personnel.

WARNING SUMMARY (CONT)

WARNING

Light Material Handling Crane (LMHC) boom 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

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

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

WARNING

Air conditioner weighs approximately 300 lbs (136 kg). Attach a suitable lifting device prior to installation. Failure to comply may result in injury to personnel.

WARNING

Ensure cargo bed is free of equipment and debris, and is not warped or damaged in any way. 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.

CHANGE NO. 1

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

Washington, D.C., 1 July 2003

TECHNICAL MANUAL
MAINTENANCE INSTRUCTIONS
UNIT MAINTENANCE
M1078 SERIES, 2 1/2-TON, 4x4,
LIGHT MEDIUM TACTICAL VEHICLE
(LMTV)

VOLUME NO. 2 OF 5

TM 9-2320-365-20-2, 17 June 1998, is changed as follows:

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

Remove Pages	Insert Pages
i and j	i and j
none	A and C/(D Blank)
i thru iv	i thru iv
none	v and vi
none	2-1086.1/(2-1086.2 Blank)
2-1087 and 2-1088	2-1087 and 2-1088
2-1103 thru 2-1108	2-1103 thru 2-1108
2-1175 thru 2-1222	2-1175 thru 2-1222
2-1229 thru 2-1244	2-1229 thru 2-1244
2-1359 and 2-1360	2-1359 and 2-1360
2-1363 thru 2-1462	2-1363 thru 2-1462
none	2-1462.1 and 2-1462.2
2-1463 thru 2-1482	2-1463 thru 2-1482
none	2-1482.1 thru 2-1482.42
2-1483 thru 2-1486	2-1483 thru 2-1486
none	2-1486.1 thru 2-1486.4
2-1487 thru 2-1568	2-1487 thru 2-1568
none	2-1568.1 and 2-1568.2
2-1569 thru 2-1595/ (2-1596 Blank)	2-1569 thru 2-1596
none	2-1596.1 thru 2-1596.29/ (2-1596.30 Blank)
2-1597 thru 2-1601/ (2-1602 Blank)	2-1597 thru 2-1601/ (2-1602 Blank)
2-1603 and 2-1604	2-1603 and 2-1604
2-1607 and 2-1608	2-1607 and 2-1608
2-1643 thru 2-1664	2-1643 thru 2-1664
2-1665 and 2-1666	2-1665/(2-1666 Blank)
2-1667 and 2-1668	none
2-1669 and 2-1670	(2-1669 Blank)/2-1670
2-1671 thru 2-1694	2-1671 thru 2-1694
2-1695 and 2-1696	2-1695/(2-1696 Blank)
2-1697 and 2-1698	(2-1697 Blank)/2-1698
2-1699 and 2-1700	2-1699 and 2-1700
2-1711/(2-1712 Blank)	2-1711 and 2-1712
none	2-1712.1/(2-1712.2 Blank)
2-1713 thru 2-1730	2-1713 thru 2-1730
2-1737 thru 2-1742	2-1737 thru 2-1742
none	2-1742.1 thru 2-1742.30
2-1743 thru 2-1748	2-1743 thru 2-1748
2-1753 and 2-1754	2-1753 and 2-1754
2-1761 and 2-1762	2-1761 and 2-1762
2-1767 thru 2-1770	2-1767 thru 2-1770
2-1821 thru 2-1830	2-1821 thru 2-1830
2-1831 and 2-1832	2-1831/(2-1832 Blank)
2-1833 thru 2-1852	none
2-1853 and 2-1854	(2-1853 Blank)/2-1854
2-1855 and 2-1856	2-1855 and 2-1856
2-1861 thru 2-1868	2-1861 thru 2-1868
2-1869 and 2-1870	2-1869/(2-1870 Blank)
2-1871 and 2-1872	(2-1871 Blank)/2-1872
2-1873 and 2-1874	2-1873 and 2-1874
2-1895 thru 2-1901/(2-1902 Blank)	2-1895 thru 2-1901/(2-1902 Blank)
2-1903 and 2-1904	2-1903 and 2-1904
2-1925 and 2-1926	2-1925 and 2-1926
2-1945 and 2-1946	2-1945 and 2-1946
2-1953 and 2-1954	2-1953 and 2-1954
2-1959 thru 2-1968	2-1959 thru 2-1968
none	2-1968.1 thru 2-1968.18
2-1969 and 2-1970	2-1969 and 2-1970
none	2-1970.1 thru 2-1970.14
2-1971 thru 2-1974	2-1971 thru 2-1974
none	2-1974.1 thru 2-1974.22
2-1975/(2-1976 Blank)	2-1975/(2-1976 Blank)
2-1977 and 2-1978	2-1977/(2-1978 Blank)

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

Remove Pages	Insert Pages	Remove Pages	Insert Pages
2-1979 thru 2-2076	none		
2-2077 and 2-2078	(2-2077 Blank)/2-2078		
2-2115 and 2-2116	2-2115 and 2-2116		
none	2-2116.1/(2-2116.2 Blank)		
none	2-2116.3 thru 2-2116.9/(2-2116.10 Blank)		
none	2-2116.11 and 2-2116.12		
2-2117 and 2-2118	2-2117 and 2-2118		
none	2-2118.1/(2-2118.2 Blank)		
none	2-2118.3 thru 2-2118.7/(2-2118.8 Blank)		
none	2-2118.9 and 2-2118.10		
2-2119/(2-2120 Blank)	2-2119/(2-2120 Blank)		
2-2121 and 2-2122	2-2121 and 2-2122		
none	2-2132.1/(2-2132.2 Blank)		
2-2133 and 2-2134	2-2133 and 2-2134		
3-1 and 3-2	3-1 and 3-2		
3-15 thru 3-18	3-15 and 3-18		
A-1 thru A-4	A-1 thru A-4		
B-13 thru B-20	B-13 thru B-19/(B-20 Blank)		
C-3 and C-4	C-3 and C-4		
D-1 thru D-5/(D-6 Blank)	D-1 thru D-6		
E3 and E4	E3 and E4		
none	E-21 and E-22		
G-1 thru G-10	G-1 thru G-10		
none	G-11/(G-12 Blank)		
H-1 thru H-8	H-1 thru H-8		
H-17 thru H-21/ (H-22 Blank)	H-17 thru H-21/ (H-22 Blank)		
none	K-1 thru K-4		
INDEX-1 thru INDEX-12	INDEX-1 thru INDEX-12		
FO-1 PF-1/(FP-2 Blank) thru FP-19/(FP-20 Blank)	FO-1 FP-1/(FP-2 Blank) thru FP-19/(FP-20 Blank)		
FO-1 FP-23/(FP-24 Blank)	FO-1 FP-23/(FP-24 Blank)		
FO-1 FP-27/(FP-28 Blank) thru FP-61/(FP-62 Blank)	FO-1 FP-27/(FP-28 Blank) thru FP-61/(FP-62 Blank)		
FO-1 FP-65/(FP-66 Blank) and FP-67/(FP-68 Blank)	FO-1 FP-65/(FP-66 Blank) and FP-67/(FP-68 Blank)		
DA FORM 2028-2 Sample	DA FORM 2028-2 Sample		
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
Acting Chief of Staff

Official:



JOEL B. HUDSON
Administrative Assistant to the
Secretary of the Army
0110103

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PAGES Insert latest changed pages. Destroy superseded pages.

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

Dates of issue for original and changed pages are:

Original ..... 0 ..... 17 June 1998
Change ..... 1 ..... 1 July 2003

THE TOTAL NUMBER OF PAGES IN THIS PUBLICATION IS 1376, CONSISTING OF THE FOLLOWING:

Page No.	*Change No.
Cover	1
Blank	0
a thru h	0
i	1
j	0
A thru C Added	1
D Blank Added	1
i	1
ii	0
iii and iv	1
v and vi Added	1
2-1086.1 Added	1
2-1086.2 Blank Added	1
2-1087	1
2-1088 thru 2-1103	0
2-1104 thru 2-1107	1
2-1108 and 2-1175	0
2-1176 thru 2-1221	1
2-1222 thru 2-1229	0
2-1230 thru 2-1243	1
2-1244 thru 2-1357	0
2-1358 Blank	0
2-1359 and 2-1360	1
2-1361 Blank	0
2-1362 and 2-1363	0
2-1364 thru 2-1462	1
2-1462.1 and 2-1462.2 Added	1
2-1463 thru 2-1482	1
2-1482.1 thru 2-1482.42 Added	1
2-1483	1
2-1484 and 2-1485	0
2-1486	1
2-1486.1 thru 2-1486.4 Added	1
2-1487 thru 2-1568	1
2-1568.1 and 1568.2 Added	1
2-1569 thru 2-1593	1
2-1594	0
2-1595 and 2-1596	1
2-1596.1 thru 2-1596.29 Added	1
2-1596.30 Blank Added	1
2-1597 thru 2-1601	1
2-1602 Blank	0
2-1603	1
2-1604 thru 2-1605	0
2-1606 Blank	0
2-1607	1
2-1608 thru 2-1643	0
2-1644 thru 2-1665	1
2-1666 Blank	1
2-1667 and 2-1668 Deleted	1
2-1669 Blank	1
2-1670 thru 2-1695	1
2-1696 Blank	1
2-1697 Blank	1
2-1698 and 2-1699	1
2-1700 thru 2-1711	0
2-1712	1
2-1712.1 Added	1
2-1712.2 Blank Added	1
2-1713 thru 2-1729	1
2-1730 thru 2-1737	0
2-1738 thru 2-1742	1
2-1742.1 thru 2-1742.30 Added	1
2-1743 thru 2-1747	1
2-1748 thru 2-1751	0
2-1752 Blank	0
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2-1754 thru 2-1759	0
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2-1761	1
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2-1766 Blank	0
2-1767 thru 2-1769	1
2-1770 thru 2-1821	0
2-1822 thru 2-1831	1
2-1832 Blank	1
2-1833 thru 2-1852 Deleted	1
2-1853 Blank	1
2-1854 and 2-1855	1
2-1856 thru 2-1861	0
2-1862 thru 2-1869	1
2-1870 Blank	1
2-1871 Blank	1
2-1872 and 2-1873	1
2-1874 thru 2-1893	0
2-1894 Blank	0
2-1895 thru 2-1901	1
2-1902 Blank	0
2-1903	1
2-1904 thru 2-1923	0
2-1924 Blank	0
2-1925	1
2-1926 thru 2-1943	0
2-1944 Blank	0
2-1945	1
2-1946 thru 2-1951	0
2-1952 Blank	0
2-1953	1
2-1954 thru 2-1957	0
2-1958 Blank	0
2-1959 thru 2-1968	1
2-1968.1 thru 2-1968.18 Added	1
2-1969 and 2-1970	1
2-1970.1 thru 2-1970.14	1
2-1971 thru 2-1974	1
2-1974.1 thru 2-1974.22 Added	1
2-1975	1
2-1976 Blank	0
2-1977	1
2-1978 Blank	1
2-1979 thru 2-2076 Deleted	1
2-2077 Blank	1

* Zero in this column indicates an original page.

LIST OF EFFECTIVE PAGES

Insert latest changed pages. Destroy superseded pages.

Page No.	*Change No.	Page No.	*Change No.	Page No.	*Change No.
2-2078	1	G-12 Blank Added	1	FO-1 FP-34 Blank	0
2-2079 thru 2-2113	0	H-1	0	FO-1 FP-35	1
2-2114 Blank	0	H-2 and H-3	1	FO-1 FP-36 Blank	0
2-2115 and 2-2116	1	H-4	0	FO-1 FP-37	1
2-2116.1 Added	1	H-5	1	FO-1 FP-38 Blank	0
2-2116.2 Blank Added	1	H-6 and H-7	0	FO-1 FP-39	1
2-2116.3 thru 2-2116.9 Added	1	H-8	1	FO-1 FP-40 Blank	0
2-2116.10 Blank Added	1	H-9 thru H-17	0	FO-1 FP-41	1
2-2116.11 and 2-2116.12 Added	1	H-18 and H-19	1	FO-1 FP-42 Blank	0
2-2117 and 2-2118	1	H-20	0	FO-1 FP-43	1
2-2118.1 Added	1	H-21	1	FO-1 FP-44 Blank	0
2-2118.2 Blank Added	1	H-22 Blank	0	FO-1 FP-45	1
2-2118.3 thru 2-2118.7 Added	1	J-1	0	FO-1 FP-46 Blank	0
2-2118.8 Blank Added	1	J-2 Blank	0	FO-1 FP-47	1
2-2118.9 and 2-2118.10 Added	1	K-1 thru K-4 Added	1	FO-1 FP-48 Blank	0
2-2119	1	INDEX-1 thru INDEX-12	1	FO-1 FP-49	1
2-2120 Blank	0	Glossary-1 and Glossary-2	0	FO-1 FP-50 Blank	0
2-2121	1	FO-1 FP-1	1	FO-1 FP-51	1
2-2122 thru 2-2125	0	FO-1 FP-2 Blank	0	FO-1 FP-52 Blank	0
2-2126 Blank	0	FO-1 FP-3	1	FO-1 FP-53	1
2-2127 thru 2-2132	0	FO-1 FP-4 Blank	0	FO-1 FP-54 Blank	0
2-2132.1 Added	1	FO-1 FP-5	1	FO-1 FP-55	1
2-2132.2 Blank Added	1	FO-1 FP-6 Blank	0	FO-1 FP-56 Blank	0
2-2133	1	FO-1 FP-7	1	FO-1 FP-57	1
2-2134 thru 2-2136	0	FO-1 FP-8 Blank	0	FO-1 FP-58 Blank	0
3-1	1	FO-1 FP-9	1	FO-1 FP-59	1
3-2 thru 3-14	0	FO-1 FP-10 Blank	0	FO-1 FP-60 Blank	0
3-15 thru 3-17	1	FO-1 FP-11	1	FO-1 FP-61	1
3-18 thru 3-21	0	FO-1 FP-12 Blank	0	FO-1 FP-62 Blank	0
3-22 Blank	0	FO-1 FP-13	1	FO-1 FP-63	0
A-1	0	FO-1 FP-14 Blank	0	FO-1 FP-64 Blank	0
A-2 and A-3	1	FO-1 FP-15	1	FO-1 FP-65	1
A-4	0	FO-1 FP-16 Blank	0	FO-1 FP-66 Blank	0
B-1 thru B-13	0	FO-1 FP-17	1	FO-1 FP-67	1
B-14 thru B-19	1	FO-1 FP-18 Blank	0	FO-1 FP-68 Blank	0
B-20 Blank	1	FO-1 FP-19	1	FO-2 FP-1	0
C-1 and C-2	0	FO-1 FP-20 Blank	0	FO-2 FP-2 Blank	0
C-3 and C-4	1	FO-1 FP-21	0	FO-2 FP-3	0
D-1 thru D-6	1	FO-1 FP-22 Blank	0	FO-2 FP-4 Blank	0
E-1 and E-2	0	FO-1 FP-23	1	FO-2 FP-5	0
E-3 and E-4	1	FO-1 FP-24 Blank	0	FO-2 FP-6 Blank	0
E-5 thru E-20	0	FO-1 FP-25	0	FO-2 FP-7	0
E-21 and E-22 Added	1	FO-1 FP-26 Blank	0	FO-2 FP-8 Blank	0
F-1 thru F-8	0	FO-1 FP-27	1	FO-3 FP-1	0
G-1 thru G-10	1	FO-1 FP-28 Blank	0	FO-3 FP-2 Blank	0
G-11 Added	1	FO-1 FP-29	1	FO-3 FP-3	0
		FO-1 FP-30 Blank	0	FO-3 FP-4 Blank	0
		FO-1 FP-31	1	FO-3 FP-5	0
		FO-1 FP-32 Blank	0	FO-3 FP-6 Blank	0
		FO-1 FP-33	1	FO-4 FP-1	0

* Zero in this column indicates an original page.

LIST OF EFFECTIVE PAGES

Insert latest changed pages. Destroy superseded pages.

Page No.	*Change No.	Page No.	*Change No.	Page No.	*Change No.
FO-4 FP-2 Blank	0				
FO-4 FP-3	0				
FO-4 FP-4 Blank	0				
FO-5 FP-1	0				
FO-5 FP-2 Blank	0				
FO-5 FP-3	0				
FO-5 FP-4 Blank	0				
FO-5 FP-5	0				
FO-5 FP-6 Blank	0				

* Zero in this column indicates an original page.

TECHNICAL MANUAL
NO. 9-2320-365-20-2

TECHNICAL ORDER
NO. 36A12-1B-1095-2-2

HEADQUARTERS
DEPARTMENTS OF THE ARMY
AND THE AIR FORCE

Washington, D.C., 17 June 1998

Unit Maintenance Manual
M1078 SERIES, 2 1/2-TON, 4 x 4, LIGHT MEDIUM TACTICAL VEHICLES (LMTV)
VOLUME NO. 2 OF 5

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

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

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

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TABLE OF CONTENTS

Page

HOW TO USE THIS MANUAL iii

ELECTRICAL SYSTEM TROUBLESHOOTING (CONT) 2-1087

TRANSMISSION SYSTEM TROUBLESHOOTING 2-1359

TABLE OF CONTENTS (CONT)

Page

PROPELLER SHAFT TROUBLESHOOTING 2-1597

POWER TAKE OFF (PTO) TROUBLESHOOTING 2-1603

BRAKE SYSTEM TROUBLESHOOTING 2-1607

AIR SYSTEM TROUBLESHOOTING 2-1713

WHEEL TROUBLESHOOTING 2-1753

HYDRAULIC SYSTEM TROUBLESHOOTING 2-1761

CENTRAL TIRE INFLATION SYSTEM (CTIS) TROUBLESHOOTING 2-1767

AXLE TROUBLESHOOTING 2-1895

STEERING TROUBLESHOOTING 2-1903

SUSPENSION SYSTEM TROUBLESHOOTING 2-1925

11K SELF-RECOVERY WINCH (SRW) SYSTEM TROUBLESHOOTING 2-1945

STEERING HYDRAULIC SYSTEM TROUBLESHOOTING 2-1953

AIR TRANSPORT TROUBLESHOOTING 2-1959

SPECIAL PURPOSE KIT TROUBLESHOOTING 2-1977

CAB TILT AND SPARE TIRE RETAINER ASSEMBLY TROUBLESHOOTING 2-2115

FRAME TROUBLESHOOTING 2-2121

CHAPTER 3 ENGINE MAINTENANCE 3-1

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

APPENDIXES
A. REFERENCES A-1
B. MAINTENANCE ALLOCATION CHART B-1
C. TOOLS IDENTIFICATION LIST C-1
D. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST D-1

E. ILLUSTRATED LIST OF MANUFACTURED ITEMS E-1
F. TORQUE LIMITS F-1
G. MANDATORY REPLACEMENT PARTS G-1
H. LUBRICATION ORDER H-1
J. ADDITIONAL AUTHORIZATION LIST (AAL) J-1
K. TRANSMISSION/TRANSMISSION CONTROLS ADAPTABILTY CHART K-1

SUBJECT INDEX Index-1
GLOSSARY Glossary-1

LIST OF ILLUSTRATIONS

Figure No.	Figure Title	Page
E-1.	Brake Adjusting Tool Support	E-4
E-2.	Brake Plunger Seal Driver	E-5
E-3.	Cab Support Tool Strut and Cab Rest	E-6
E-4.	Cab Support Tool Seat	E-7
E-5.	Cab Support Tool Seat Layout	E-8
E-6.	Cab Support Tool Assembly	E-9
E-7.	Headlight Adjustment Screen	E-10
E-8.	Lanyard Assembly	E-17
E-9.	CTIS Seal Driver	E-19
E-10.	Wheel Hub Grease Seal Driver	E-20
E-11.	Purge Valve Tool	E-22

LIST OF TABLES

Table No.	Table Title	Page
2-13.	Van Body Clearance/Marker Light Location and Connector Number	2-1107
2-14.	M1079 Blackout Light Locations and Connector Numbers	2-1225
2-15.	M1079 Emergency Light Locations and Connector Numbers	2-1233
2-16.	Transmission System Fault Index	2-1359
2-17.	Transmission Sump Oil Temperature Sensor Resistance Readings	2-1395
2-18.	WTEC II Cab Transmission Harness Transmission Solenoid Test Points	2-1401
2-19.	Connector P119 Transmission Solenoid Resistance Test Points	2-1403
2-20.	Transmission Solenoid Resistance Readings	2-1403
2-21.	Main Code 43 Sub Code 21 and 26 High Side Test Points	2-1405
2-22.	Main Code 43 Sub Code 21 and 26 Low Side Test Points	2-1407
2-23.	Transmission Solenoid F and G Resistance Test Points	2-1409
2-24.	Sub Code Range	2-1417
2-25.	WTEC II Cab Transmission Harness Continuity Check	2-1441
2-26.	Off-Going Clutch Pressure Tap	2-1447
2-27.	Clutch Pressure Tap	2-1451
2-28.	Off-Going Clutch Pressure Tap	2-1455
2-29.	Clutch Pressure Tap	2-1461
2-30.	Clutch Pressure Tap	2-1467
2-31.	Clutch Pressure Tap	2-1473
2-32.	Transmission Sump Oil Temperature Sensor Resistance Readings	2-1515
2-33.	WTEC III Cab Transmission Harness Transmission Solenoid Test Points	2-1523

LIST OF TABLES (CONT)

Table No.	Table Title	Page
2-34.	Connector P119 Transmission Solenoid Resistance Test Points	2-1525
2-35.	Transmission Solenoid Resistance Readings	2-1525
2-36.	Sub Code Range	2-1533
2-37.	WTEC III Cab Transmission Harness Continuity Check	2-1547
2-38.	Off-Going Clutch Pressure Tap	2-1553
2-39.	Clutch Pressure Tap	2-1557
2-40.	Off-Going Clutch Pressure Tap	2-1561
2-41.	Clutch Pressure Tap	2-1567
2-42.	Clutch Pressure Tap	2-1573
2-43.	Clutch Pressure Tap	2-1579
2-44.	Propeller Shaft Fault Index	2-1597
2-45.	PTO Fault Index	2-1603
2-46.	Brake System Fault Index	2-1607
2-47.	Air System Fault Index	2-1713
2-48.	Wheel Fault Index	2-1753
2-49.	Hydraulic System Fault Index	2-1761
2-50.	Central Tire Inflation System (CTIS) Fault Index	2-1767
2-51.	Axle Fault Index	2-1895
2-52.	Steering Fault Index	2-1903
2-53.	Suspension System Fault Index	2-1925
2-54.	11K Self-Recovery Winch (SRW) System Fault Index	2-1945
2-55.	Steering Hydraulic System Fault Index	2-1953
2-56.	Air Transport Components Fault Index	2-1959
2-57.	Special Purpose Kit Fault Index	2-1977
2-58.	Cab Tilt and Spare Tire Retainer Fault Index	2-2115
2-59.	Frame Fault Index	2-2121
E-1.	Pneumatic Tube Lengths	E-13
E-2.	Non-Metallic Electrical Cable Conduit Lengths	E-15
F-1.	Dry Torque Limits for SAE and ANSI Screws and Free Spinning Nuts	F-2
F-2.	Dry Torque Limits for SAE and ANSI Prevailing Torque Nuts	F-4
F-3.	Dry Torque Limits for Metric Screws and Free Spinning Nuts	F-5
F-4.	Dry Torque Limits for Metric Prevailing Torque Nuts	F-6
F-5.	Wet Torque Limits for SAE and ANSI Screws and Free Spinning Nuts	F-7

HOW TO USE THIS MANUAL

OVERVIEW

This technical manual (TM) is provided to help you maintain the LMTV 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.
- **CHAPTER 3, ENGINE MAINTENANCE.**

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

- **UNSCHEDULED MAINTENANCE.** Unscheduled maintenance is located in chapters 3 through 22. 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.

CHAPTER 2
VEHICLE MAINTENANCE (CONT)

Section IV. TROUBLESHOOTING (CONT)
2-16. ELECTRICAL SYSTEM TROUBLESHOOTING (CONT) 2-1087
2-17. TRANSMISSION SYSTEM TROUBLESHOOTING 2-1359
2-18. PROPELLER SHAFT TROUBLESHOOTING 2-1597
2-19. POWER TAKE OFF (PTO) TROUBLESHOOTING 2-1603
2-20. BRAKE SYSTEM TROUBLESHOOTING 2-1607
2-21. AIR SYSTEM TROUBLESHOOTING 2-1713
2-22. WHEEL TROUBLESHOOTING 2-1753
2-23. HYDRAULIC SYSTEM TROUBLESHOOTING 2-1761
2-24. CENTRAL TIRE INFLATION SYSTEM (CTIS) TROUBLESHOOTING 2-1767
2-25. AXLE TROUBLESHOOTING 2-1895
2-26. STEERING TROUBLESHOOTING 2-1903
2-27. SUSPENSION SYSTEM TROUBLESHOOTING 2-1925
2-28. 11K SELF-RECOVERY WINCH (SRW) SYSTEM TROUBLESHOOTING 2-1945
2-29. STEERING HYDRAULIC SYSTEM TROUBLESHOOTING 2-1953
2-30. AIR TRANSPORT TROUBLESHOOTING 2-1959
2-31. SPECIAL PURPOSE KIT TROUBLESHOOTING 2-1977
2-32. CAB TILT AND SPARE TIRE RETAINER ASSEMBLY TROUBLESHOOTING 2-2115
2-33. FRAME TROUBLESHOOTING 2-2121

Section V. MAINTENANCE PROCEDURES 2-2127
2-34. MAINTENANCE INTRODUCTION 2-2127
2-35. GROUND HANDLING 2-2127
2-36. GENERAL REMOVAL INSTRUCTIONS 2-2127
2-37. GENERAL DISASSEMBLY INSTRUCTIONS 2-2128
2-38. GENERAL CLEANING INSTRUCTIONS 2-2129
2-39. GENERAL INSPECTION INSTRUCTIONS 2-2132
2-40. GENERAL REPAIR INSTRUCTIONS 2-2132
2-41. GENERAL ASSEMBLY INSTRUCTIONS 2-2133
2-42. GENERAL INSTALLATION INSTRUCTIONS 2-2134
2-43. PREPARATION FOR STORAGE OR SHIPMENT INTRODUCTION 2-2134
2-44. PREPARATION FOR STORAGE OR SHIPMENT 2-2135
2-45. STORAGE MAINTENANCE PROCEDURES 2-2135

2-16. ELECTRICAL SYSTEM TROUBLESHOOTING (CONT)

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

Fault No.	Description	Page
e99.	M1079 Fan Does Not Operate	2-1088
e100.	All M1079 Van Body Marker Lights Do Not Operate	2-1100
e101.	M1079 Van Body Clearance Marker Light Does Not Illuminate	2-1104
e102.	All M1079 Fluorescent Lights Do Not Operate	2-1108
e103.	M1079 Lighting Fixture(s) DS80 and/or DS81 Do Not Operate	2-1118
e104.	M1079 Lighting Fixture(s) DS82 and/or DS83 Do Not Operate	2-1134
e105.	M1079 110 VAC Outlet J233 Does Not Operate	2-1152
e106.	M1079 110 VAC Outlet J234 Does Not Operate	2-1160
e107.	M1079 110 VAC Outlet J235 Does Not Operate	2-1168
e108.	M1079 110 VAC Outlet J232 Does Not Operate in Normal Mode	2-1176
e109.	M1079 110 VAC Outlet J232 and J233 Do Not Operate in Blackout Override Mode	2-1190
e110.	M1079 110 VAC Outlet J231 Does Not Operate	2-1194
e111.	M1079 110 VAC Outlet J230 Does Not Operate	2-1208
e112.	M1079 Blackout Light(s) Does Not Operate	2-1222
e113.	M1079 Emergency Light(s) Does Not Operate	2-1230
e114.	M1079 Field Phone 1 and/or 2 Binding Post Does Not Operate	2-1244
e115.	M1079 Air Conditioner Does Not Operate	2-1264
e116.	M1079 Heater Does Not Operate	2-1276
e117.	M1079 24 VDC Binding Post(s) Does Not Operate	2-1296
e118.	M1079 Van Door Open Light Does Not Illuminate and Audible Alarm Does Not Operate	2-1324
e119.	M1079 110 VAC Power Does Not Operate	2-1338
e120.	M1079 Fluorescent Lights Do Not Operate in Blackout Override Mode	2-1352

e99. M1079 FAN DOES NOT OPERATE

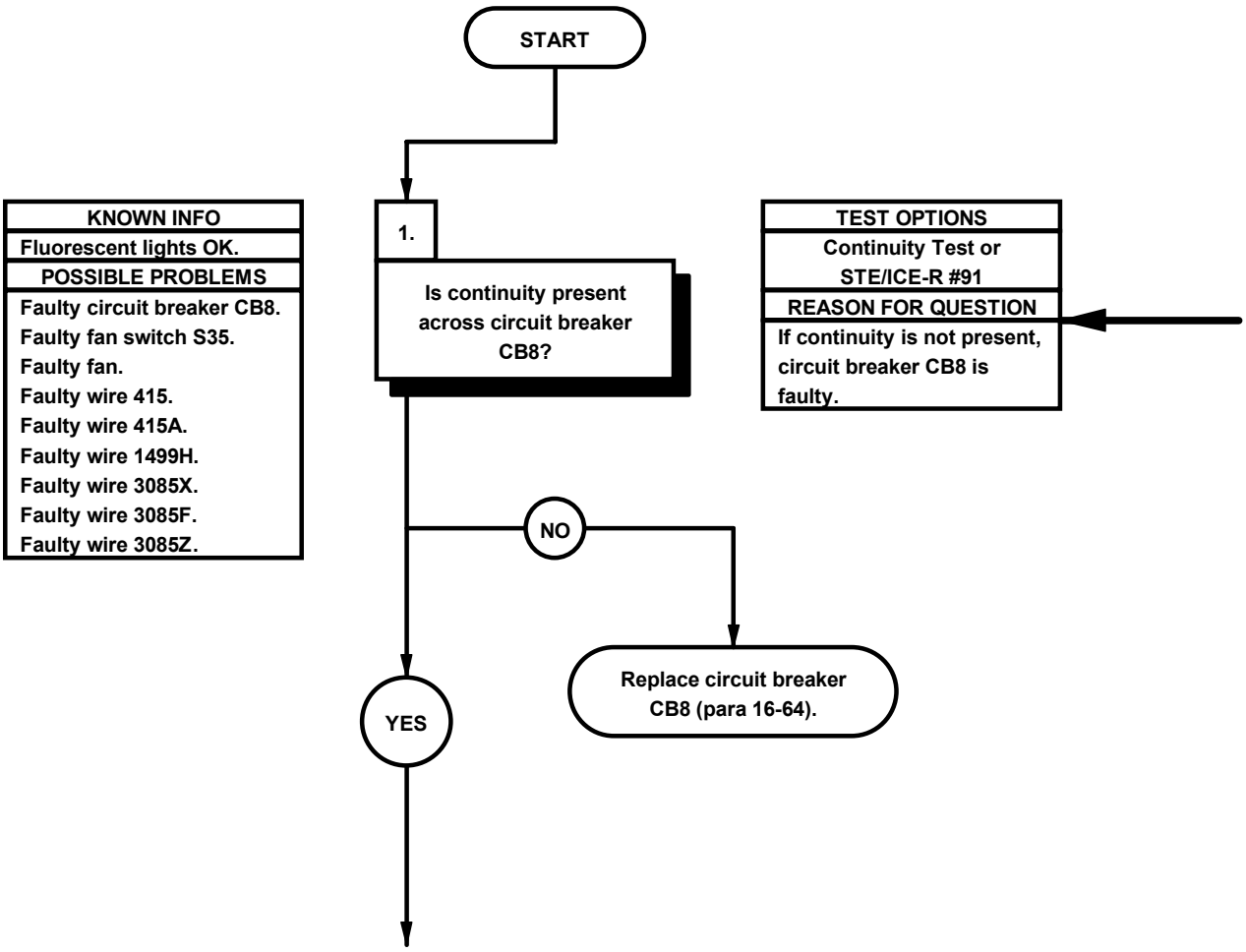
INITIAL SETUP

Equipment Condition
Engine shut down (TM 9-2320-365-10).
AC power disconnected (TM 9-2320-365-10).

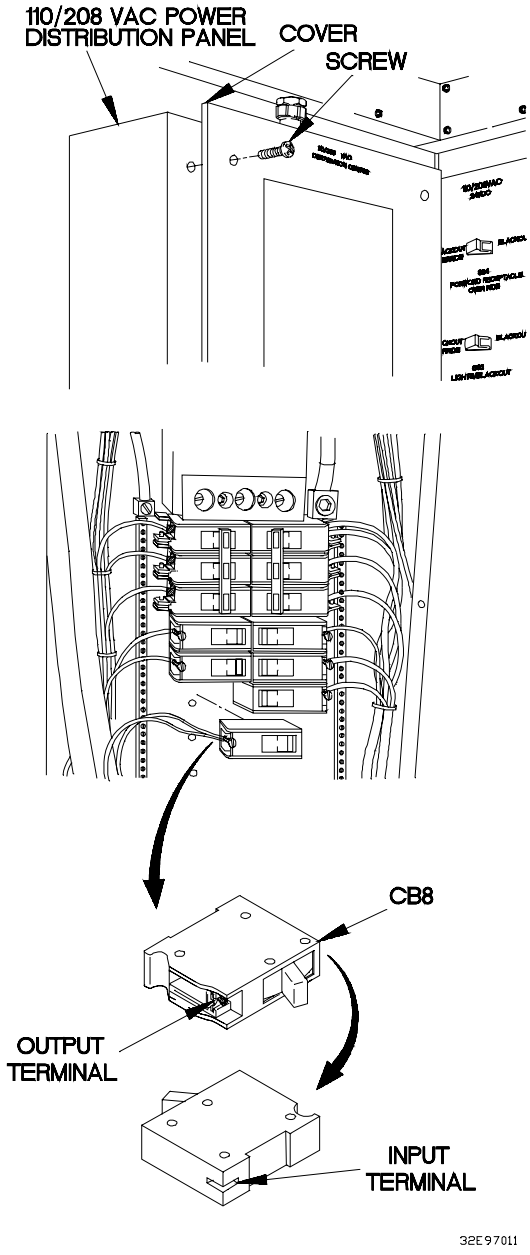
Personnel Required
(2)

References
TM 9-4910-571-12&P

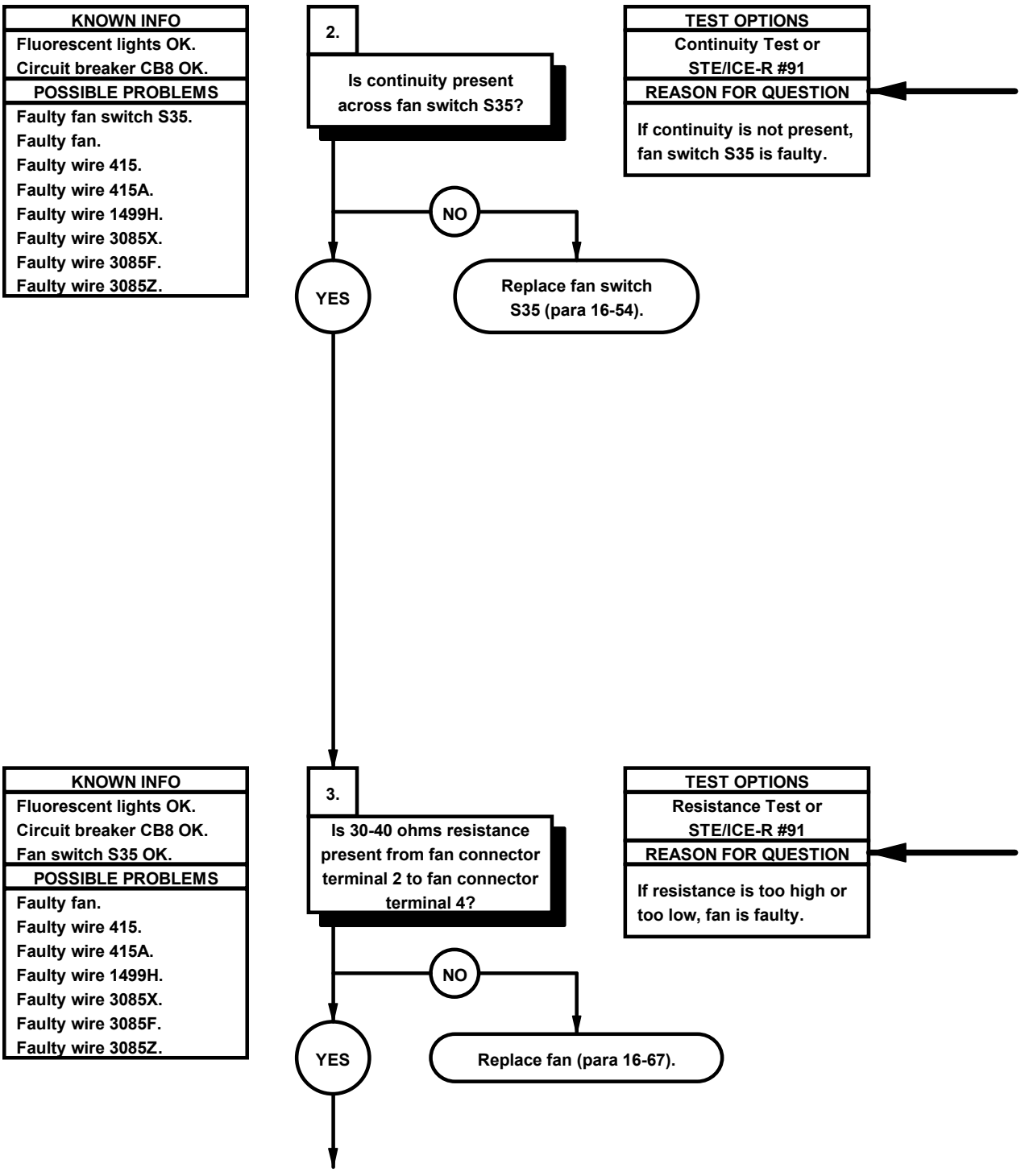
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Multimeter, Digital (Item 22, Appendix C)



CONTINUITY TEST
(1) Remove six screws and 110/208 VAC POWER DISTRIBUTION PANEL cover from power distribution panel.
(2) Remove circuit breaker CB8 from power distribution panel.
(3) Position circuit breaker CB8 to ON.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to output terminal of circuit breaker CB8.
(6) Connect negative (-) probe of multimeter to input terminal of circuit breaker CB8 and note reading on multimeter.
(7) If continuity is not present, replace circuit breaker CB8 (para 16-64).
(8) Install circuit breaker CB8 in power distribution panel.

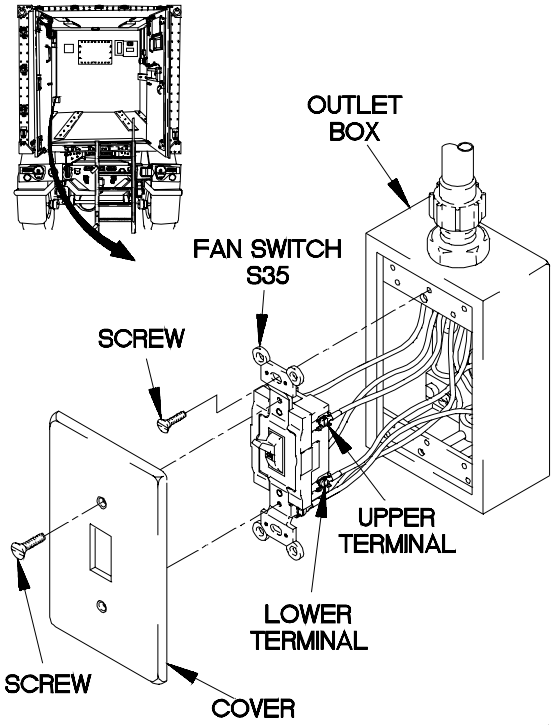


e99. M1079 FAN DOES NOT OPERATE (CONT)



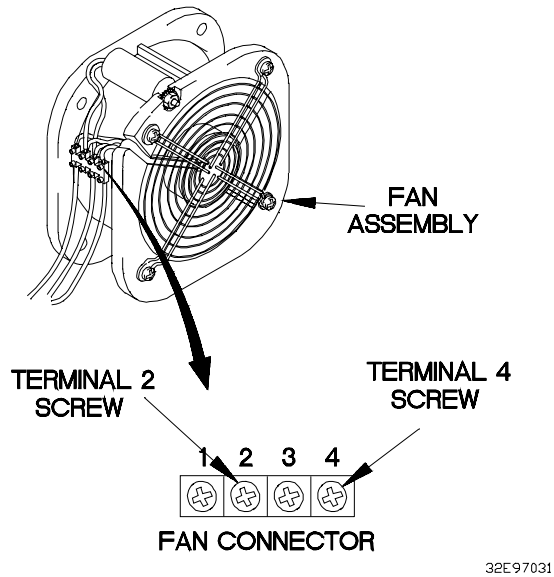
CONTINUITY TEST

(1) Remove two screws and cover from outlet box.
(2) Remove two screws and fan switch S35 from outlet box.
(3) Position fan switch S35 to ON.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to lower terminal of fan switch S35.
(6) Connect negative (-) probe of multimeter to upper terminal of fan switch S35 and note reading on multimeter.
(7) If continuity is not present, replace fan switch S35 (para 16-54).

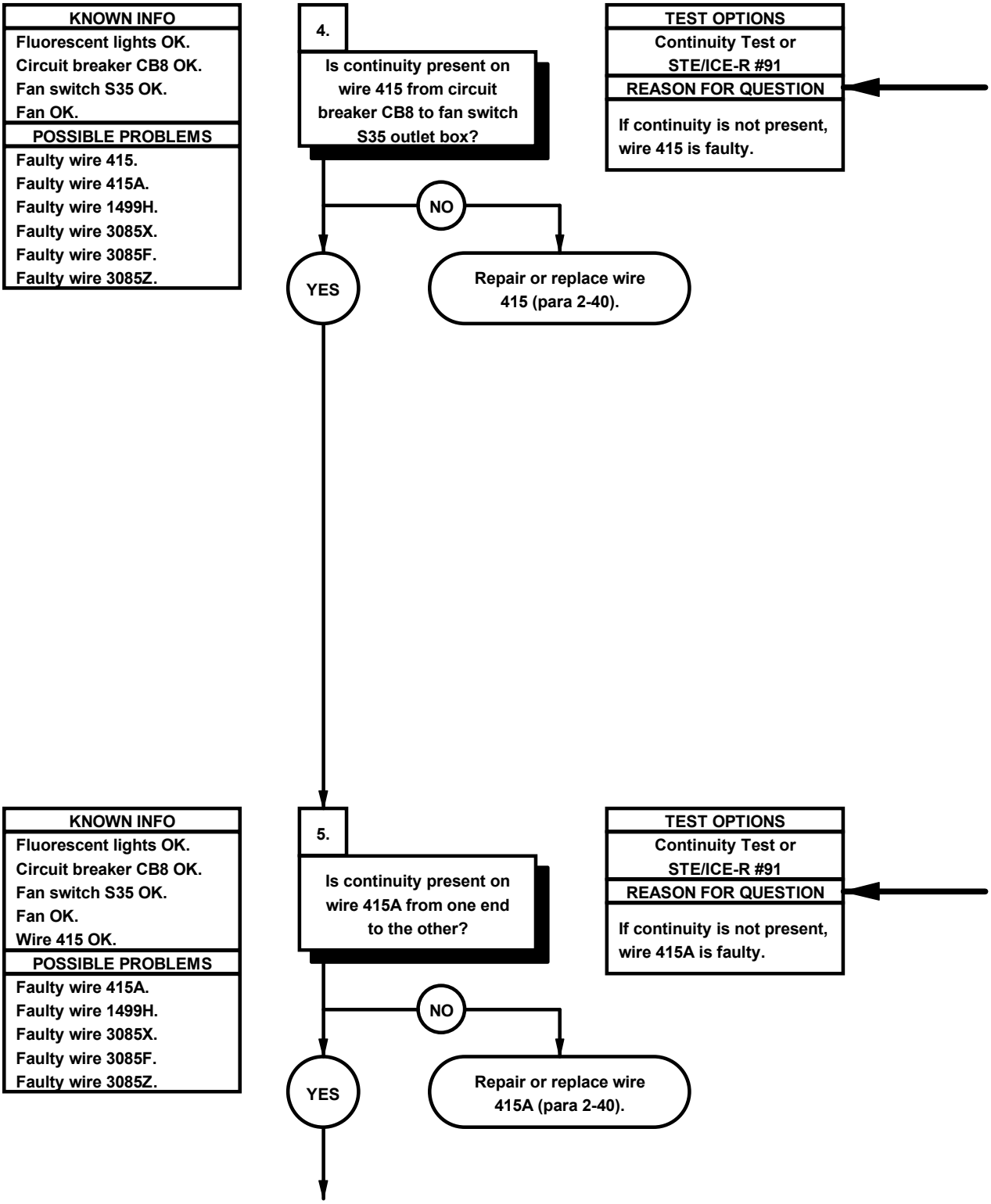


RESISTANCE TEST

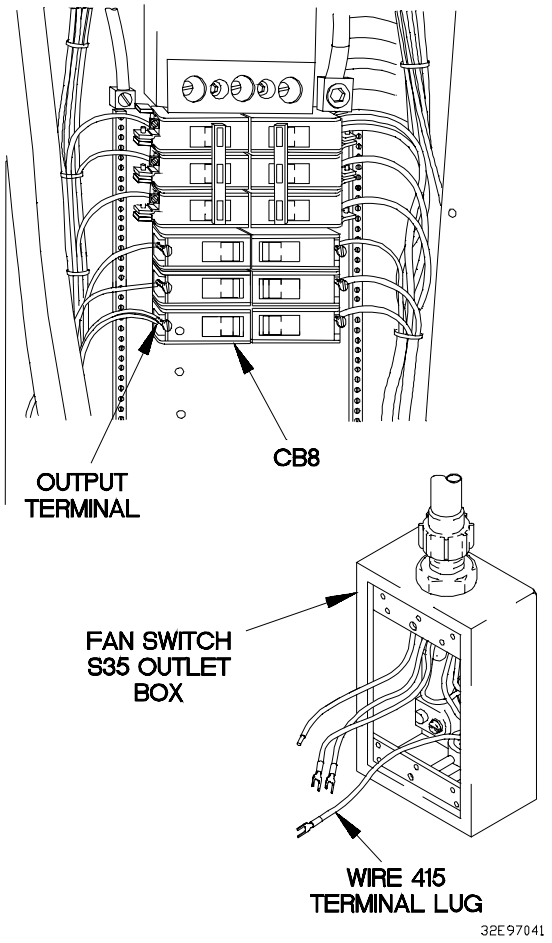
(1) Remove fan assembly (para 16-67).
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to fan connector terminal 4 screw.
(4) Connect negative (-) probe of multimeter to fan connector terminal 2 screw and note reading on multimeter.
(5) If 30-40 ohms resistance is not present, replace fan (para 16-67).



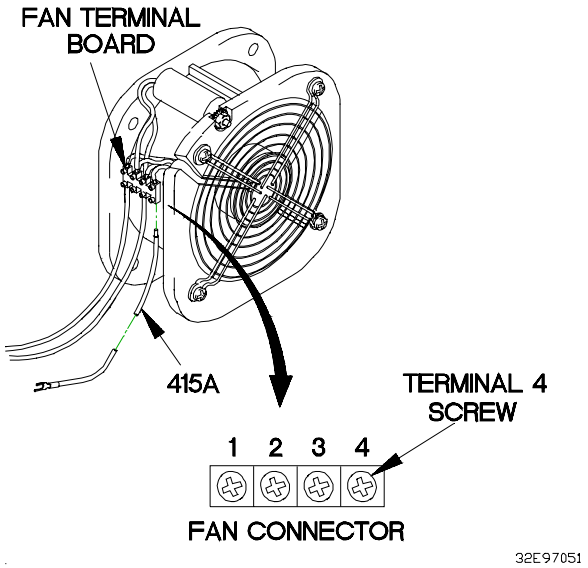
e99. M1079 FAN DOES NOT OPERATE (CONT)



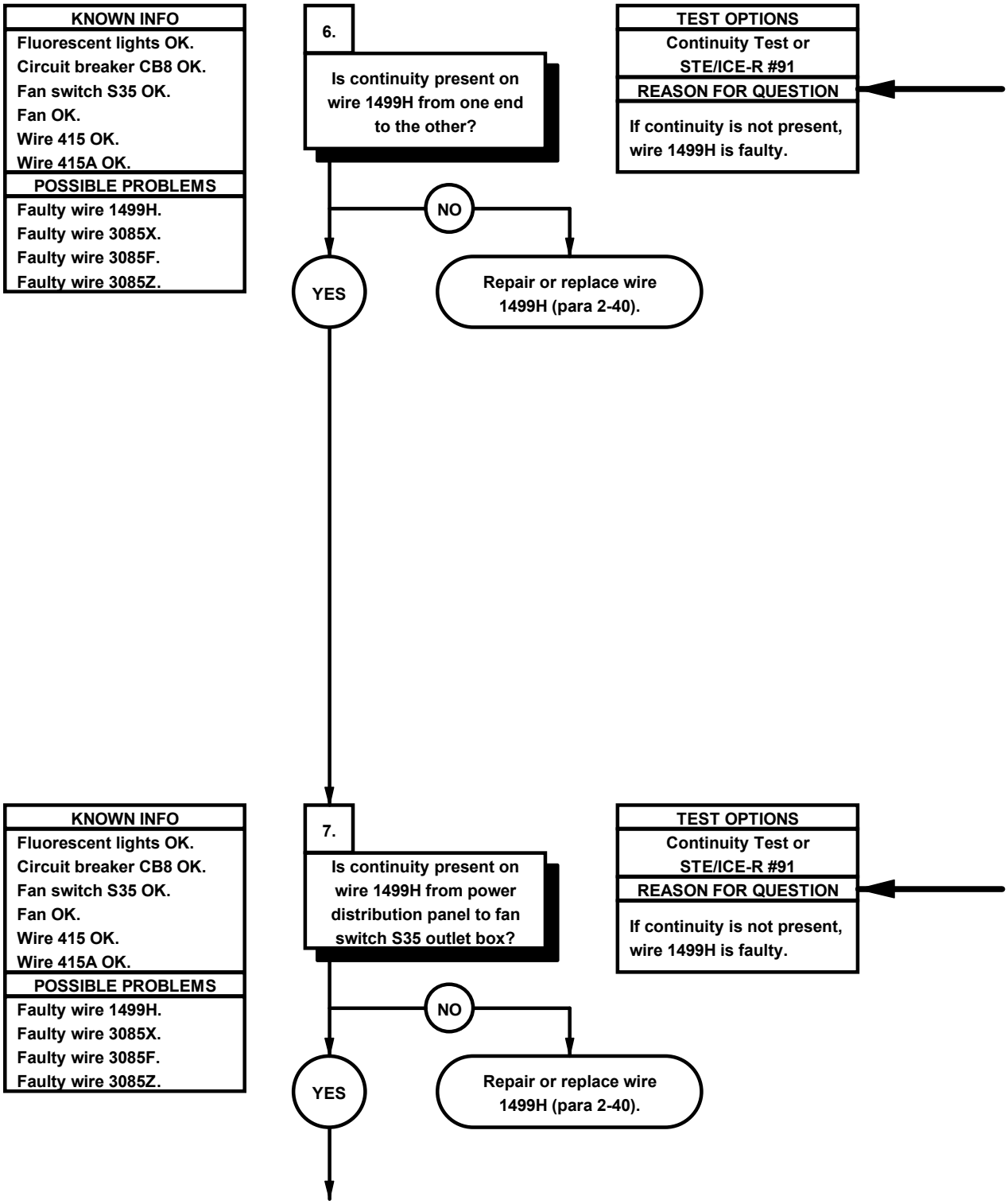
CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to output terminal of circuit breaker CB8.
(3) Connect negative (-) probe of multimeter to wire 415 terminal lug in fan switch S35 outlet box and note reading on multimeter.
(4) If continuity is not present, repair or replace 415 (para 2-40).



CONTINUITY TEST
(1) Loosen terminal 4 screw on fan terminal board.
(2) Remove wire 415A from fan terminal board.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to wire 415A terminal lug.
(5) Connect negative (-) probe of multimeter to other end of wire 415A and note reading on multimeter.
(6) If continuity is not present, repair or replace wire 415A (para 2-40).
(7) Position wire 415A in fan terminal board.
(8) Tighten terminal 4 screw on fan terminal board.

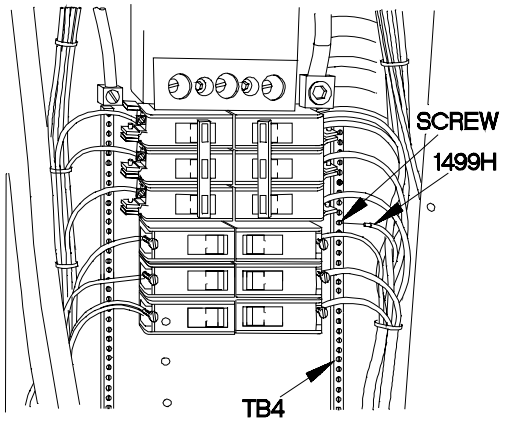


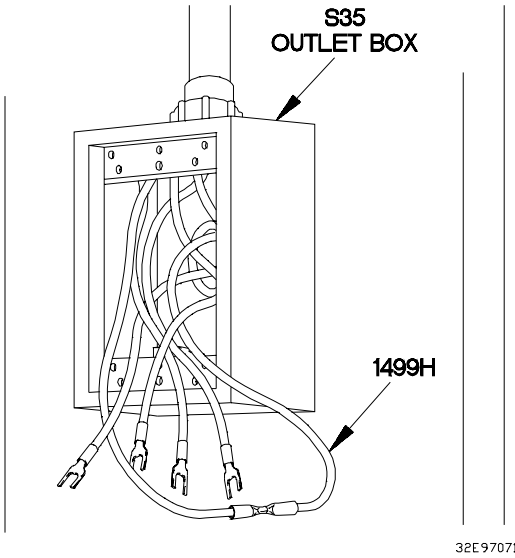
e99. M1079 FAN DOES NOT OPERATE (CONT)



CONTINUITY TEST

(1) Loosen screw on fan terminal board.
(2) Remove wire 1499H from fan terminal board.
(3) Set multimeter to ohms.
(4) Connect positive (+) multimeter to wire 1499H.
(5) Connect negative (-) probe of multimeter to wire 1499H and note reading on multimeter.
(6) If continuity is not present, repair or replace wire 1499H (para 2-40).
(7) Position wire 1499H in fan terminal board.
(8) Tighten screw on fan terminal board.

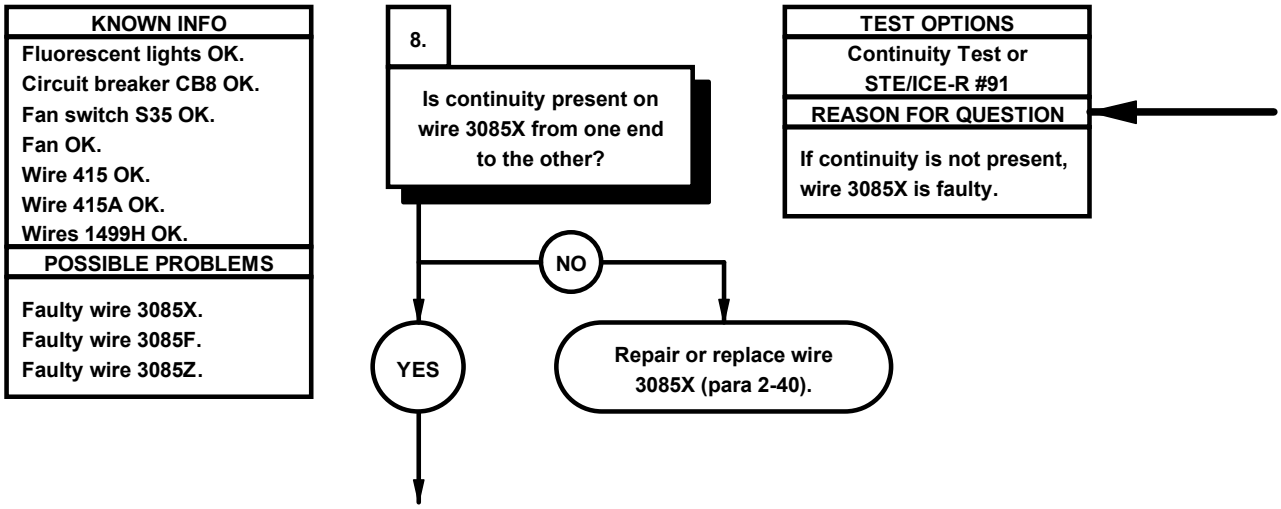




CONTINUITY TEST

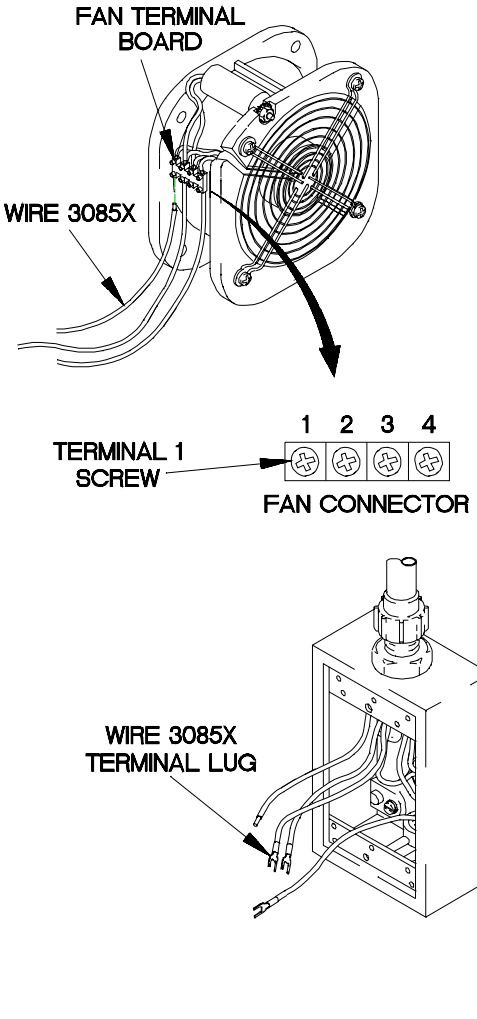
(1) Loosen screw in terminal board TB4.
(2) Remove wire 1499H from terminal board TB4.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to wire 1499H in power distribution panel.
(5) Connect negative (-) probe of multimeter to wire 1499H in fan switch S35 outlet box and note reading on multimeter.
(6) If continuity is not present, repair or replace wire 1499H (para 2-40).
(7) Position wire 1499H in terminal board TB4.
(8) Tighten screw in terminal board TB4.

e99. M1079 FAN DOES NOT OPERATE (CONT)



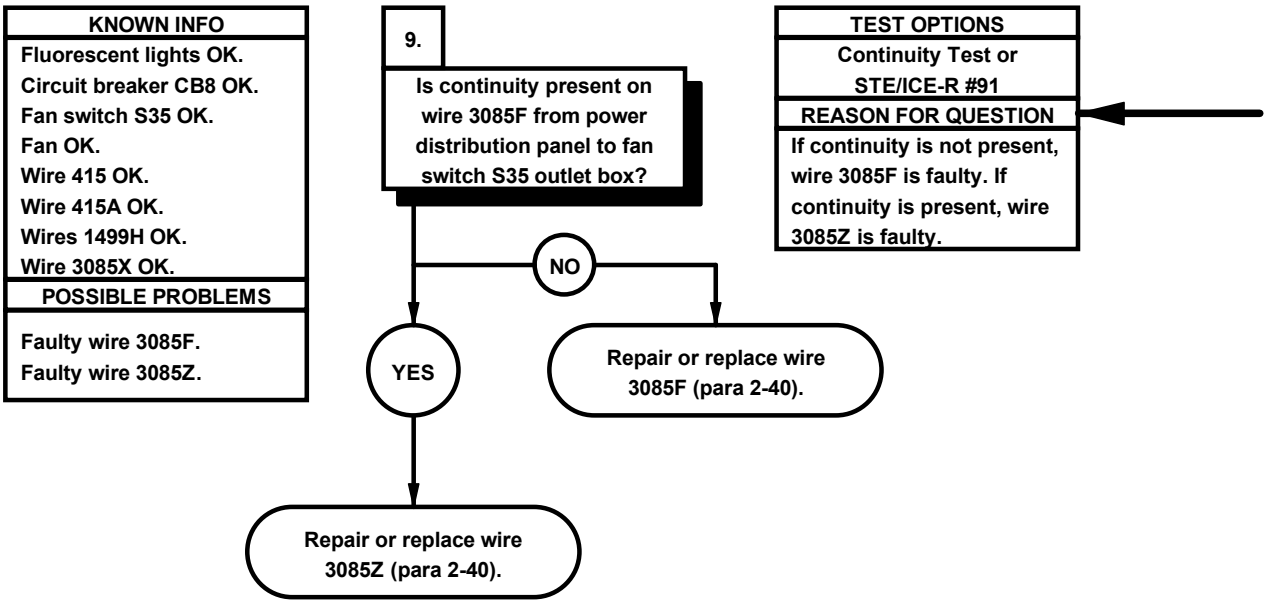
CONTINUITY TEST

(1) Loosen terminal 1 screw on fan terminal board.
(2) Remove wire 3085X from fan terminal board.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to wire 3085X terminal lug.
(5) Connect negative (-) probe of multimeter to other end of wire 3085X and note reading on multimeter.
(6) If continuity is not present, repair or replace wire 3085X.
(7) Position wire 3085X in fan terminal board.
(8) Tighten terminal 1 screw on fan terminal board.



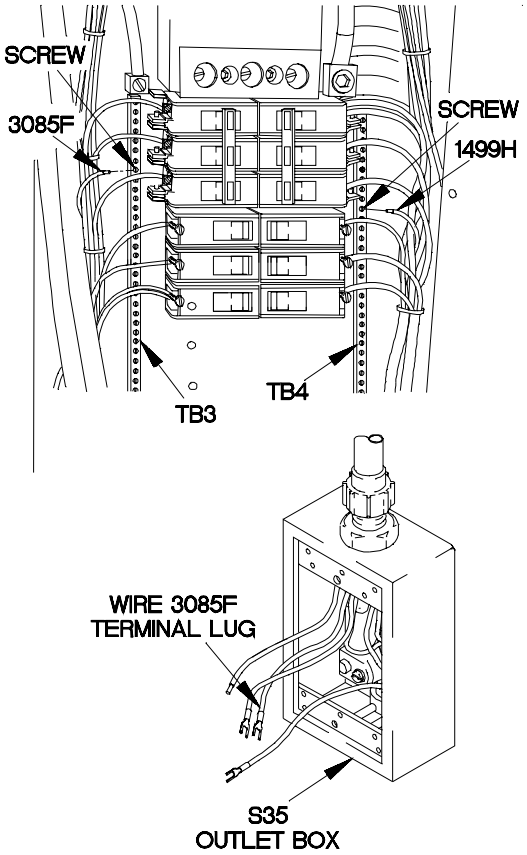
32E97081

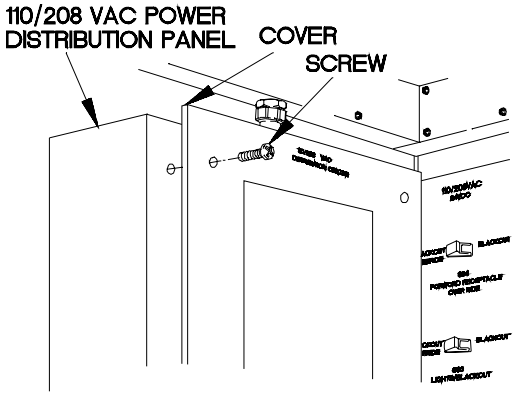
e99. M1079 FAN DOES NOT OPERATE (CONT)



CONTINUITY TEST

(1) Loosen screw in terminal board TB3.
(2) Remove wire 3085F from terminal board TB3.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to wire 3085F in power distribution panel.
(5) Connect negative (-) probe of multimeter to wire 3085F terminal lug in fan switch S35 outlet box and note reading on multimeter.
(6) If continuity is not present, repair or replace wire 3085F (para 2-40).
(7) If continuity is present, repair or replace wire 3085Z (para 2-40).
(8) Position wire 3085F in terminal board TB3.
(9) Tighten screw in terminal board TB3.
(10) Position wire 1499H in terminal board TB4.
(11) Tighten screw in terminal board TB4.
(12) Install 110/208 VAC POWER DISTRIBUTION PANEL cover on power distribution panel with six screws.
(13) Install fan assembly (para 16-67).





e100. ALL M1079 VAN BODY CLEARANCE AND MARKER LIGHTS DO NOT OPERATE

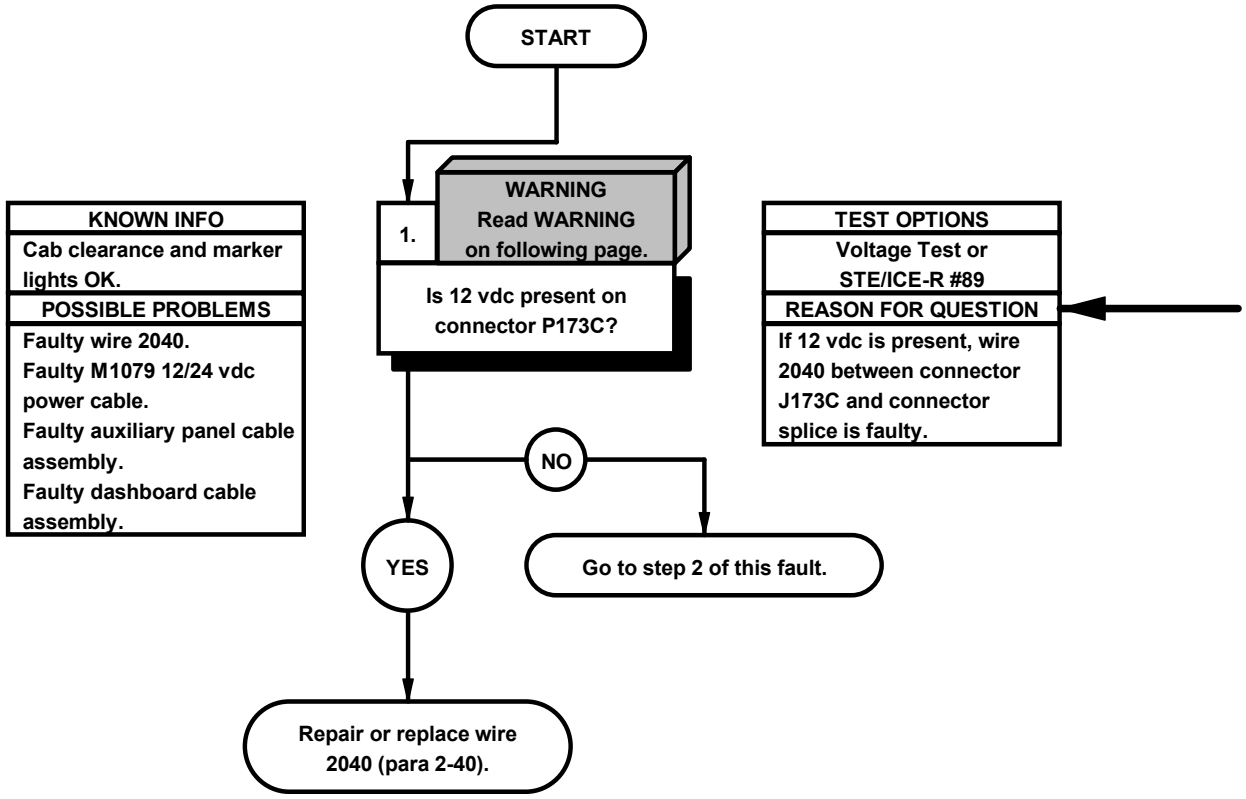
INITIAL SETUP

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

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

References
TM 9-4910-571-12&P

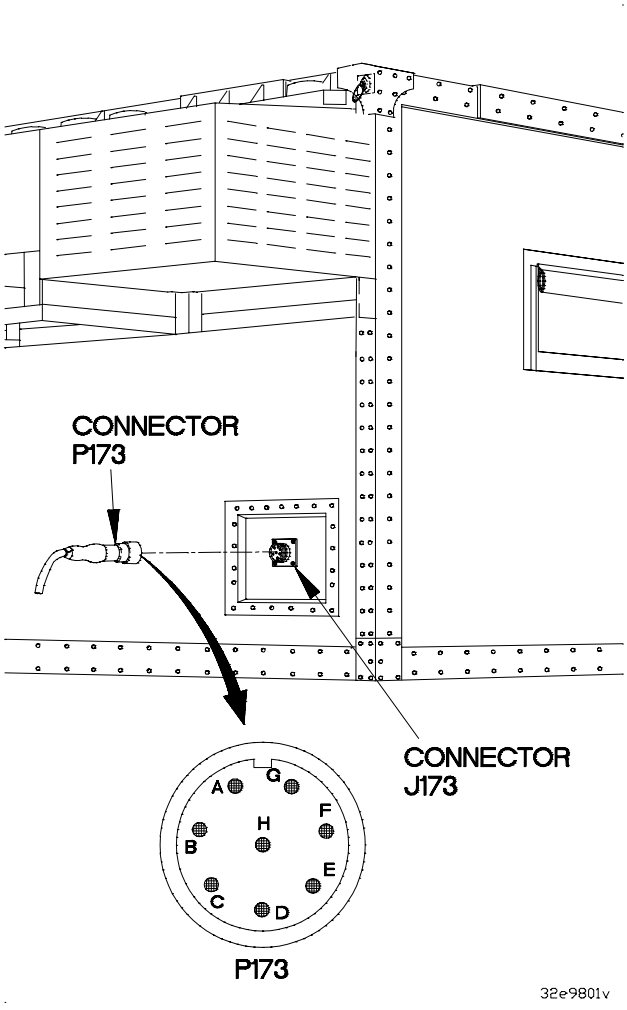


WARNING

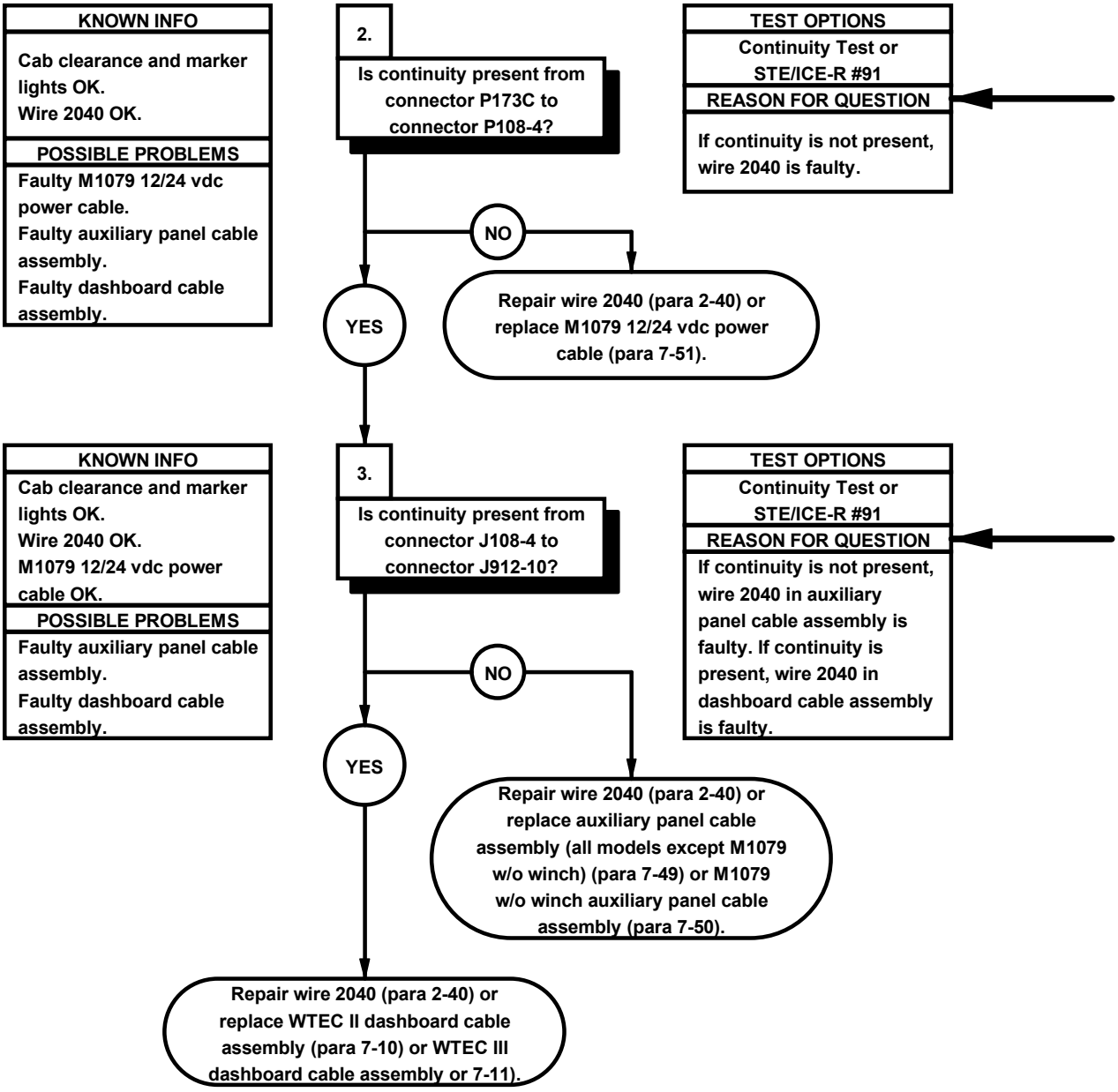
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Disconnect connector P173 from connector J173.
(2) Set multimeter to volts dc.
(3) Connect positive (+) probe of multimeter to connector P173C.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
(6) If 12 vdc is not present, repair or replace wire 2040 between connector J173 and connector splice (para 2-40).
(7) Position main light switch to OFF (TM 9-2320-365-10).



e100. ALL M1079 VAN BODY CLEARANCE AND MARKER LIGHTS DO NOT OPERATE (CONT)

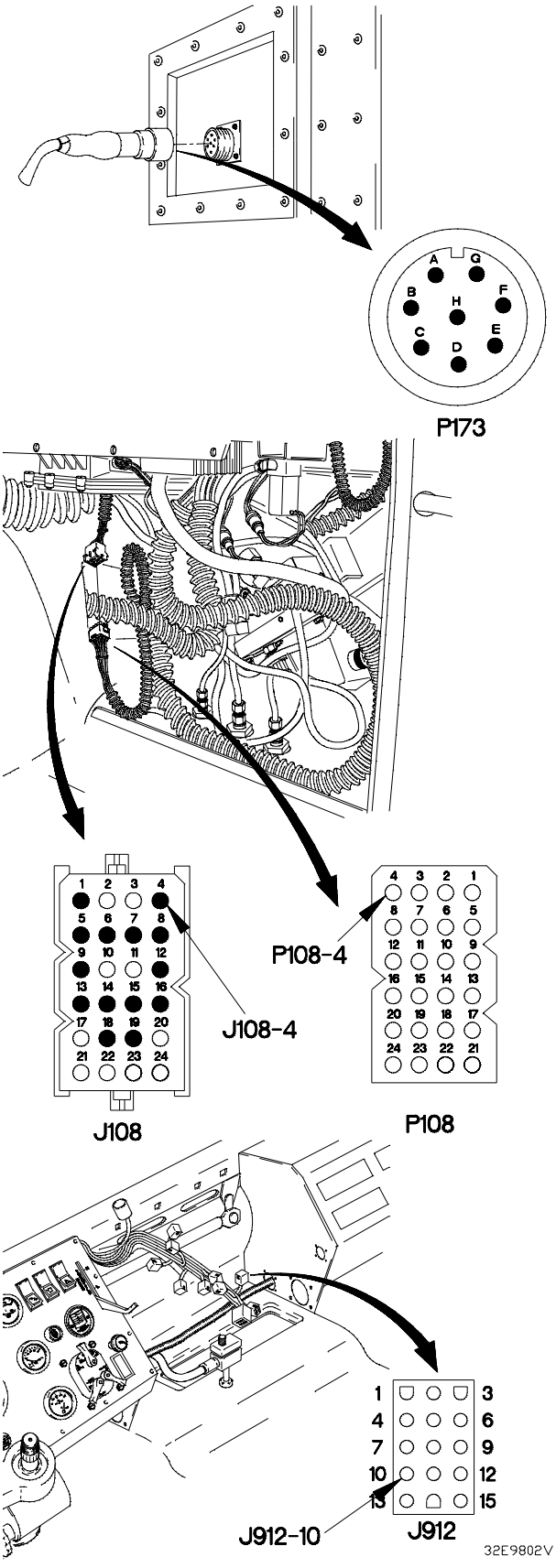


CONTINUITY TEST

(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 P173C.
(5) Connect negative (-) probe of multimeter to connector P108-4 and note reading on multimeter.
(6) If continuity is not present, repair wire 2040 (para 2-40) or replace M1079 12/24 vdc power cable (para 7-51).
(7) Connect connector P173 to connector J173.

CONTINUITY TEST

(1) Remove personnel heater (para 18-9).
(2) Disconnect connector J912 from connector P912.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector J108-4.
(5) Connect negative (-) probe of multimeter to connector J912-10 and note reading on multimeter.
(6) If continuity is not present, repair wire 2040 (para 2-40) or replace auxilliary panel cable assembly (all models except M1079 w/o winch) (para 7-49) or M1079 w/o winch auxiliary panel cable assembly (para 7-50).
(7) If continuity is present, repair wire 2040 (para 2-40) 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) Connect connector P108 to connector J108.
(10) Install personnel heater (para 18-9).



e101. M1079 VAN BODY CLEARANCE/MARKER LIGHT DOES NOT ILLUMINATE

INITIAL SETUP

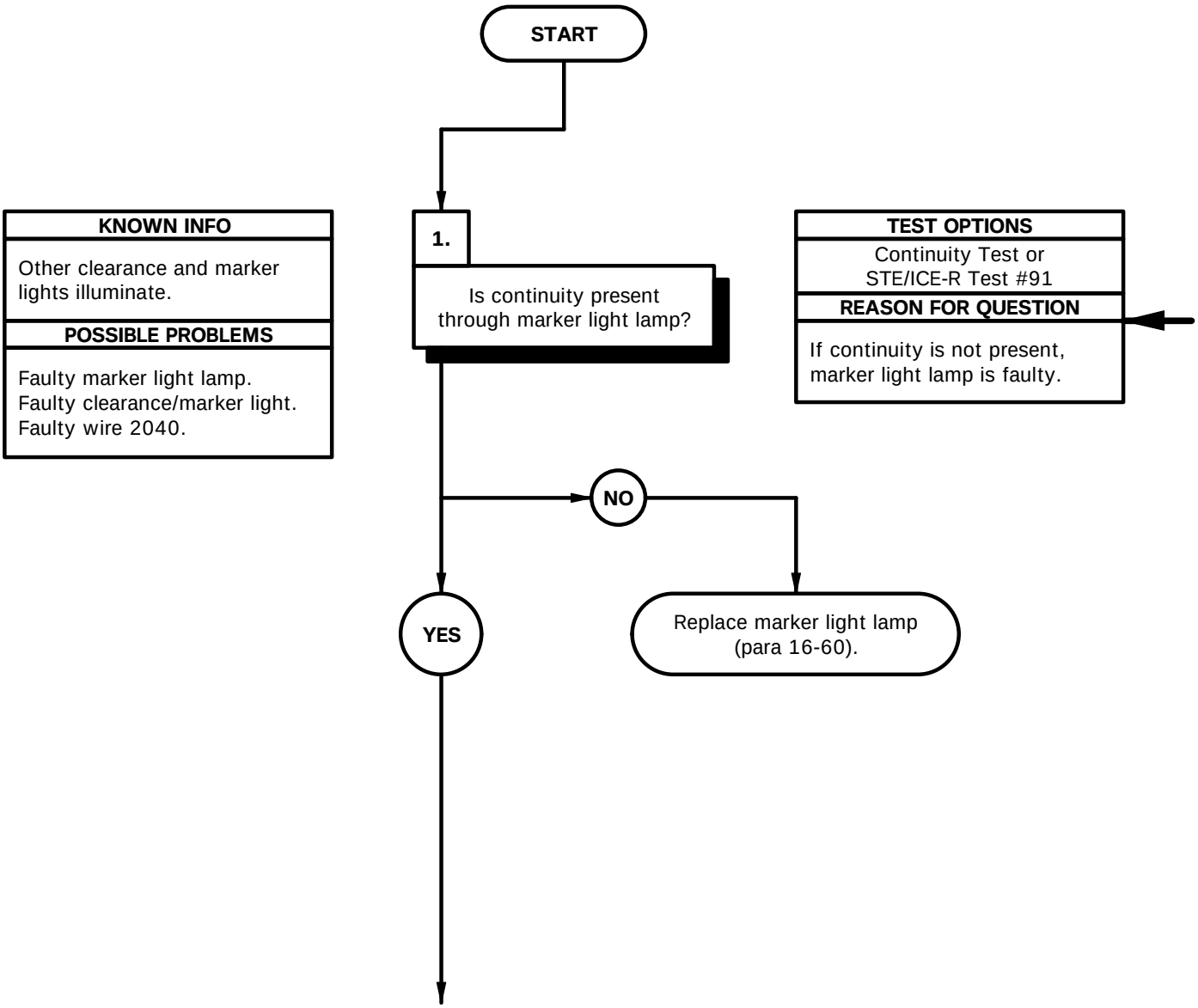
Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

Materials/Parts
Lockwasher (4) (Item 77, Appendix G)
Gasket (2) (Item 28, Appendix G)

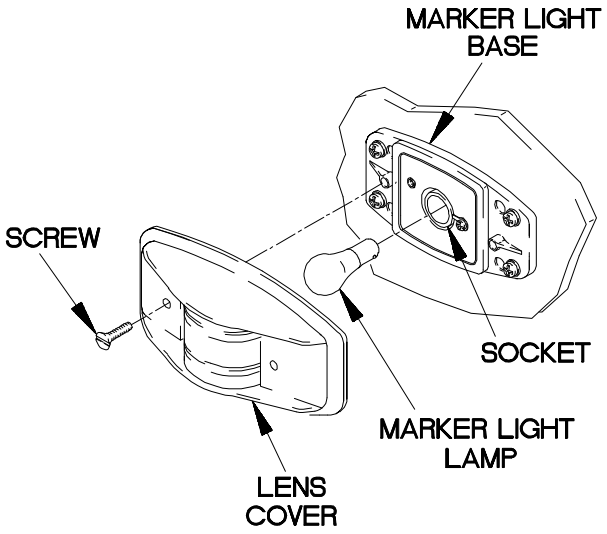
Personnel Required
(2)

References
TM 9-4910-571-12&P

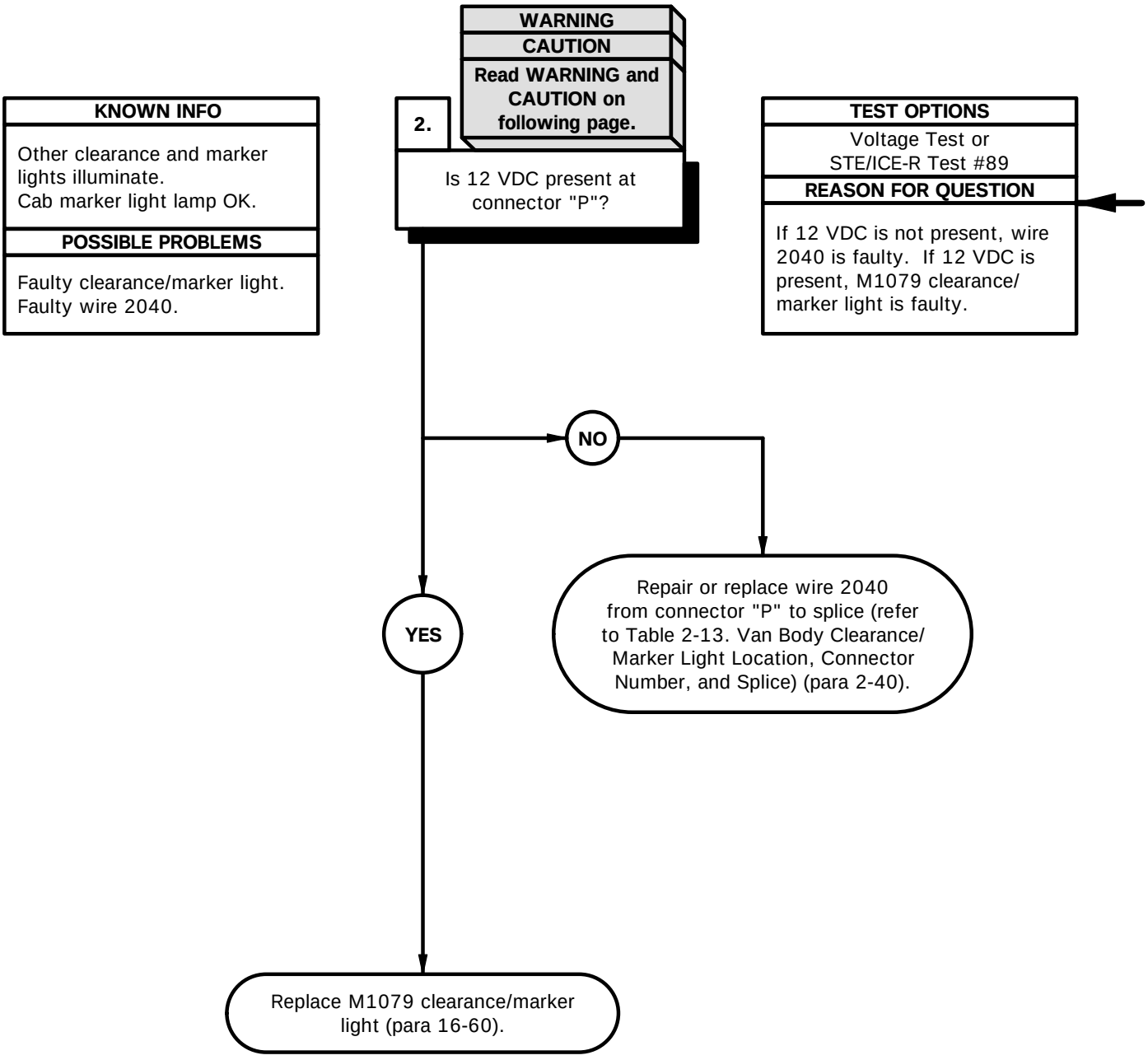


CONTINUITY TEST

(1) Remove two screws and lens cover from marker light base.
(2) Remove marker light lamp from socket.
(3) Set multimeter to ohms.
(4) Check continuity through marker light lamp and note reading on multimeter.
(5) If continuity is not present, replace marker light lamp (para 16-60).
(6) Install marker light lamp in socket.



e101. M1079 VAN BODY CLEARANCE/MARKER LIGHT 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) Remove four screws, lockwashers, and marker light base from van body. Discard lockwashers.
(2) Disconnect connector "P" from connector 489.
(3) Remove gasket from marker light base. Discard gasket.
(4) Set multimeter to volts DC.
(5) Connect positive (+) probe of multimeter to connector "P" (refer to Table 2-13. Van Body Clearance/Marker Light Location, Connector Number, and Splice).
(6) Connect negative (-) probe of multimeter to ground.
(7) Position main light switch to SER DRIVE (TM 9-2320-365-10) and note reading on multimeter.
(8) If 12 VDC is not present, repair or replace wire 2040 from connector "P" to splice (refer to Table 2-13. Van Body Clearance/ Marker Light Location, Connector Number, and Splice) (para 2-40).
(9) If 12 VDC is present, replace M1079 clearance/marker light (para 16-60).
(10) Position main light switch to OFF (TM 9-2320-365-10).
(11) Install gasket on marker light base.
(12) Connect connector "P" (refer to Table 2-13. Van Body Clearance/Marker Light Location, Connector Number, and Splice) to connector 489.

VOLTAGE TEST (Cont)

(13) Install marker light base on van body with four lockwashers and screws.
(14) Install lens cover on marker light base with two screws.

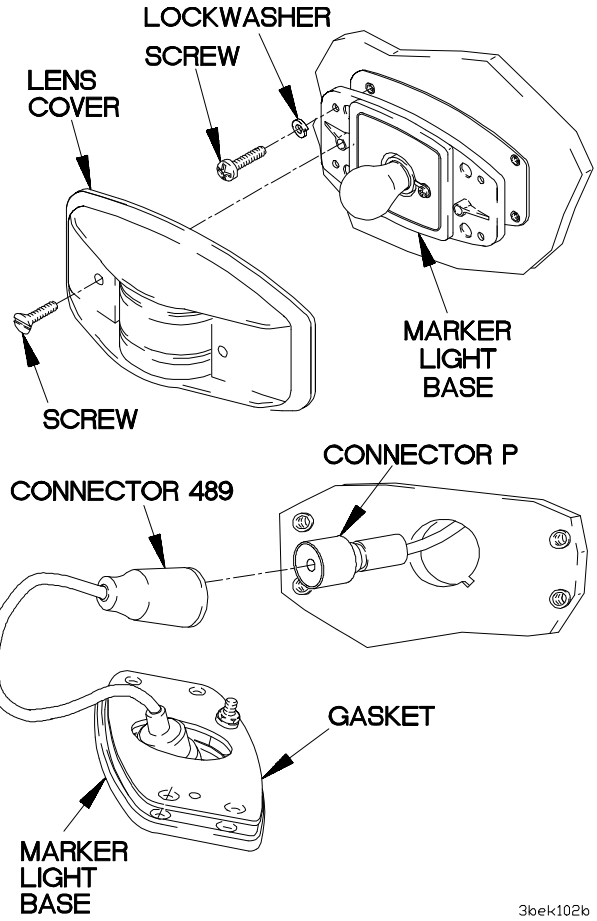


Table 2-13. Van Body Clearance/Marker Light Location, Connector Number, and Splice

Location	Connector Number	Splice
Left Front	P150	E504
Left Front Center	P151	E504
Front Center	P152	E504
Right Front Center	P153	E504
Right Front	P154	E504
Left Side Rear	P155	E505
Left Rear	P156	E505
Left Rear Center	P157	E506
Rear Center	P158	E506
Right Rear Center	P159	E505
Right Rear	P160	E505
Right Side Rear	P161	E506

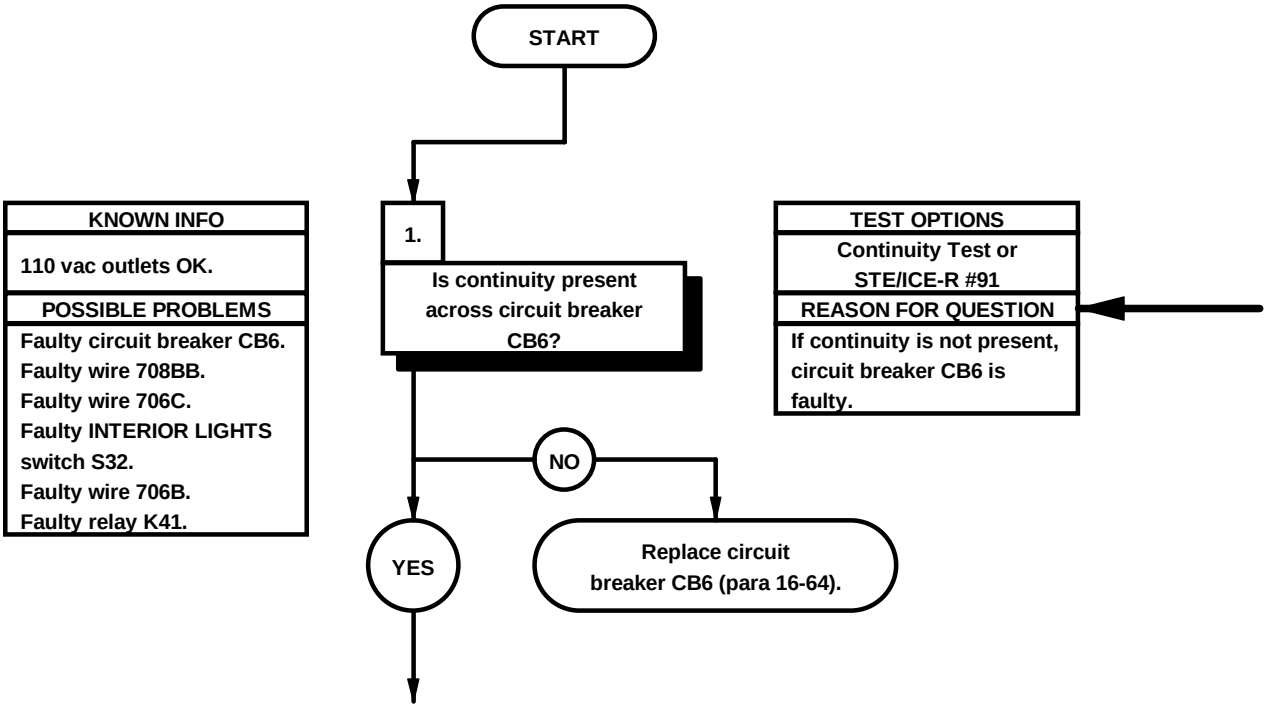
e102. ALL M1079 FLUORESCENT LIGHTS DO NOT OPERATE

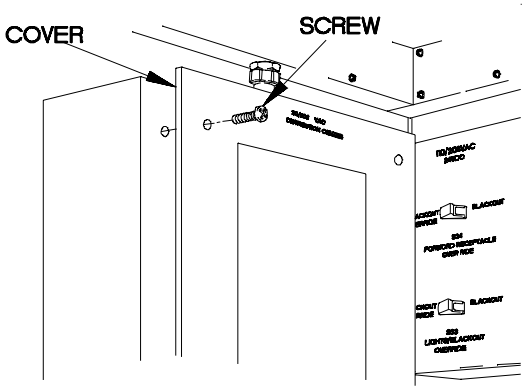
INITIAL SETUP

Equipment Condition
- Engine shut down (TM 9-2320-365-10).
- AC power disconnected (TM 9-2320-365-10).

Tools and Special Tools
- Tool Kit, Genl Mech (Item 44, Appendix C)
- STE/ICE-R (Item 39, Appendix C)
- Multimeter, Digital (Item 22, Appendix C)

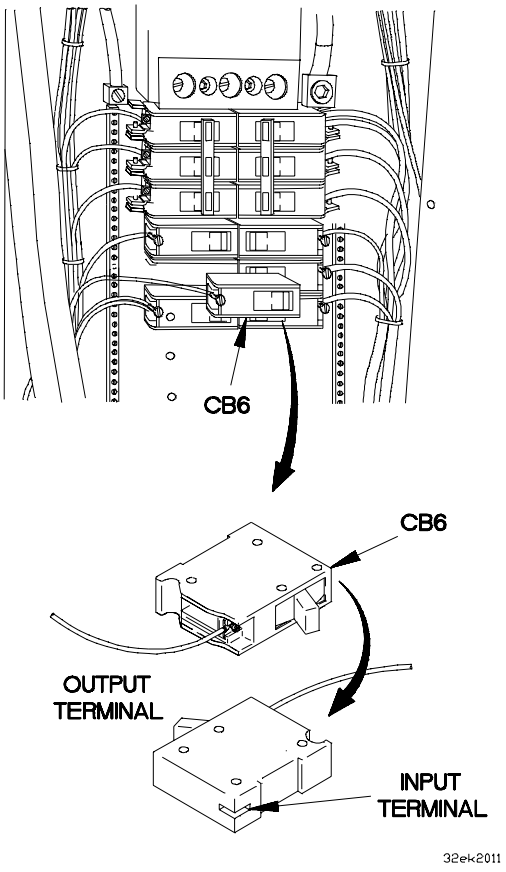
References
- TM 9-4910-571-12&P



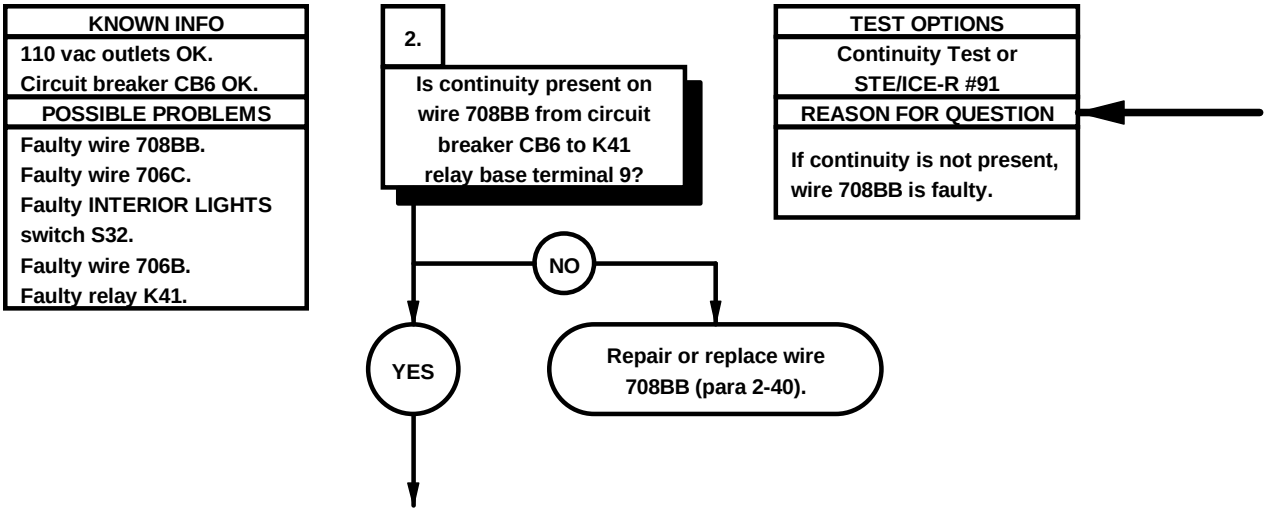


CONTINUITY TEST

(1) Remove six screws and cover from 110/208 VAC POWER DISTRIBUTION PANEL.
(2) Remove circuit breaker CB6 from 110/208 VAC POWER DISTRIBUTION PANEL.
(3) Position circuit breaker CB6 to ON.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to output terminal of circuit breaker CB6.
(6) Connect negative (-) probe of multimeter to input terminal of circuit breaker CB6 and note reading on multimeter.
(7) If continuity is not present, replace circuit breaker CB6 (para 16-64).
(8) Install circuit breaker CB6 on 110/208 VAC POWER DISTRIBUTION PANEL.

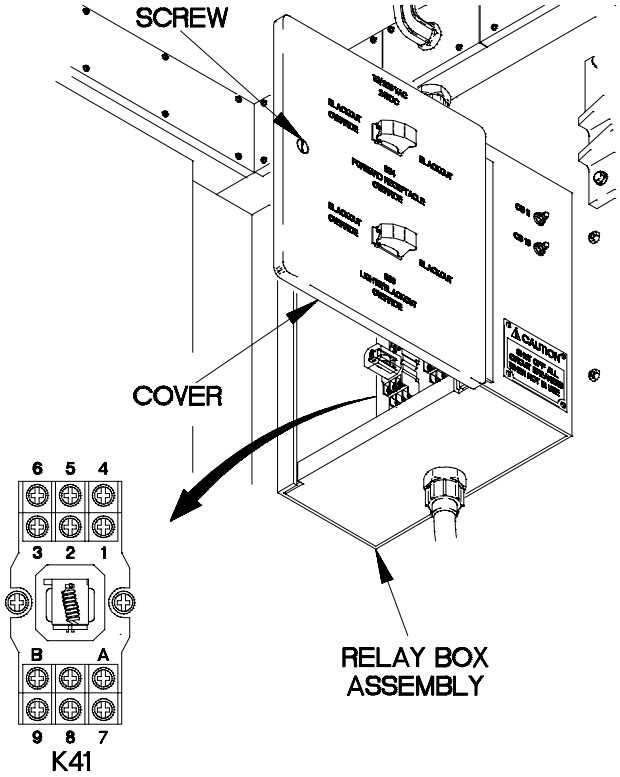


e102. ALL M1079 FLOURESCENT LIGHTS DO NOT OPERATE (CONT)

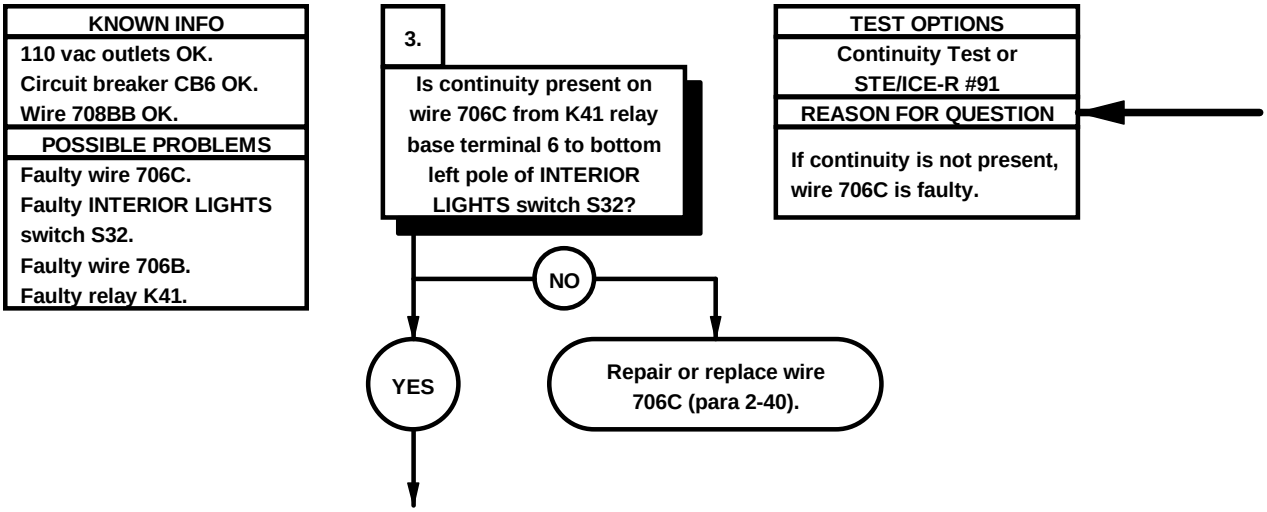


CONTINUITY TEST

(1) Loosen screw in cover.
(2) Open cover on relay box assembly.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to output terminal of circuit breaker CB6.
(5) Connect negative (-) probe of multimeter to K41 relay base terminal 9 and note reading on multimeter.
(6) If continuity is not present, repair or replace wire 708BB (para 2-40).
(7) Install cover on 110/208 VAC POWER DISTRIBUTION PANEL with six screws.

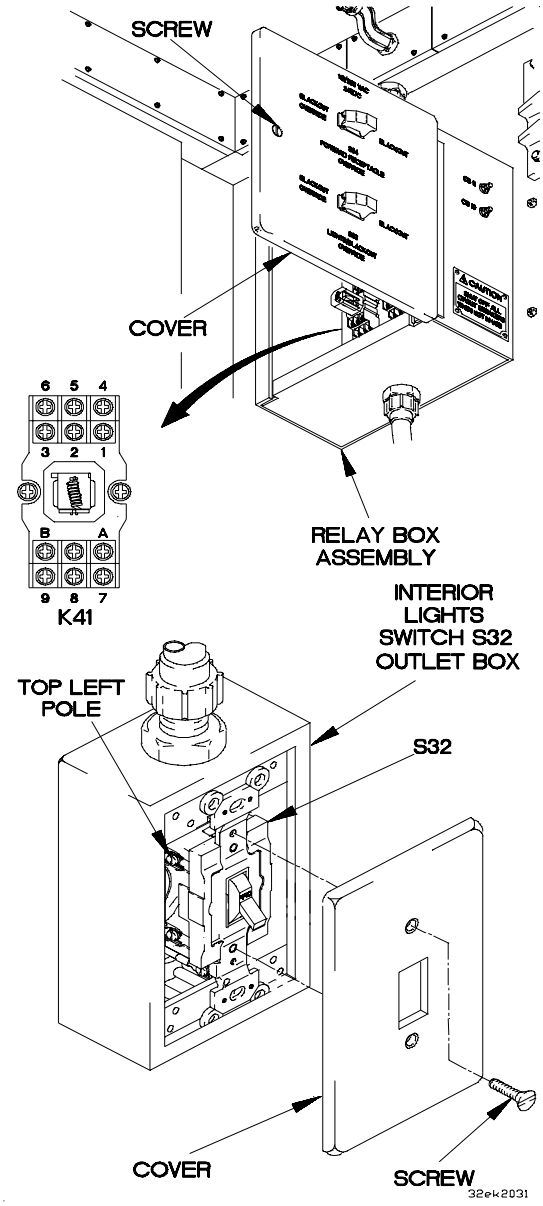


e102. ALL M1079 FLOURESCENT LIGHTS DO NOT OPERATE (CONT)

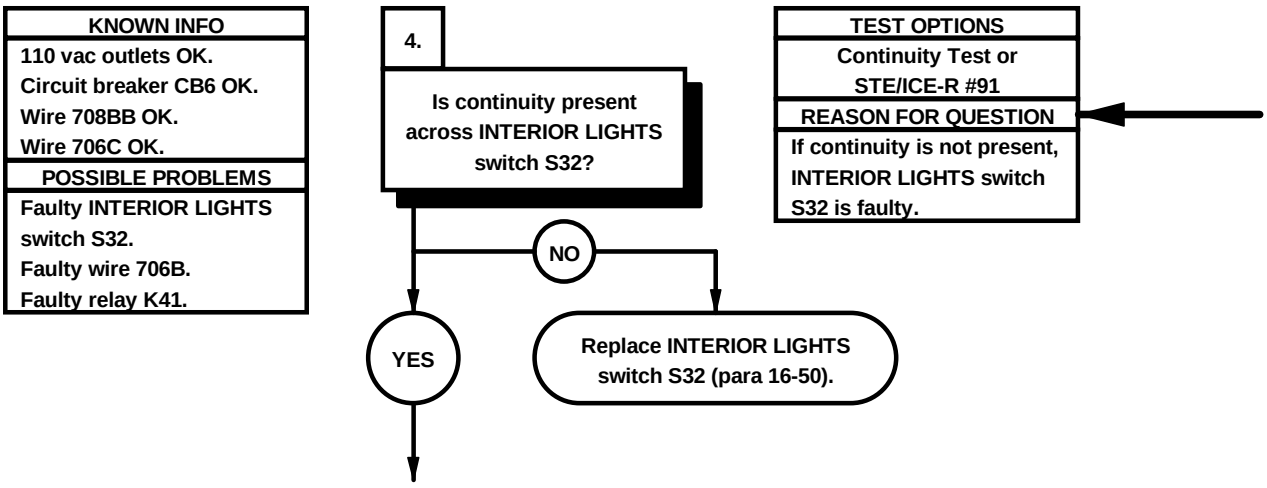


CONTINUITY TEST

(1) Remove two screws and cover from INTERIOR LIGHTS switch S32 outlet box.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to K41 relay base terminal 6.
(4) Connect negative (-) probe of multimeter to top left pole of INTERIOR LIGHTS switch S32 and note reading on multimeter.
(5) If continuity is not present, repair or replace wire 706C (para 2-40).
(6) Close cover on relay box assembly.
(7) Tighten screw in cover.

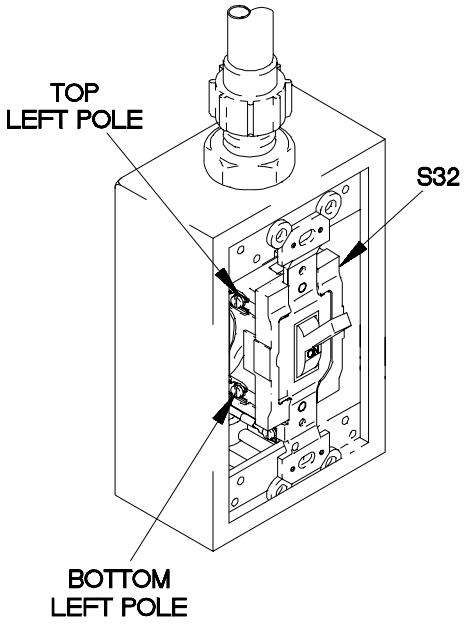


e102. ALL M1079 FLOURESCENT LIGHTS DO NOT OPERATE (CONT)



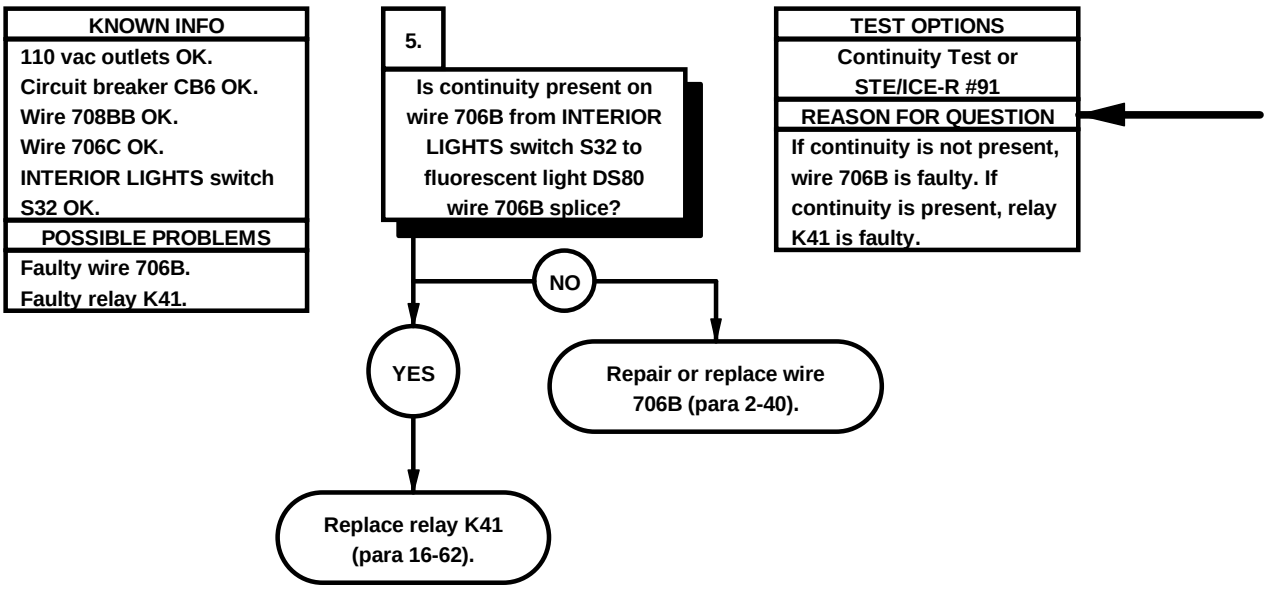
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to bottom left pole of INTERIOR LIGHTS switch S32.
(3) Connect negative (-) probe of multimeter to top left pole of INTERIOR LIGHTS switch S32.
(4) Position INTERIOR LIGHTS switch S32 to ON and note reading on multimeter.
(5) If continuity is not present, replace INTERIOR LIGHTS switch S32 (para 16-50).
(6) Position INTERIOR LIGHTS switch S32 to OFF.



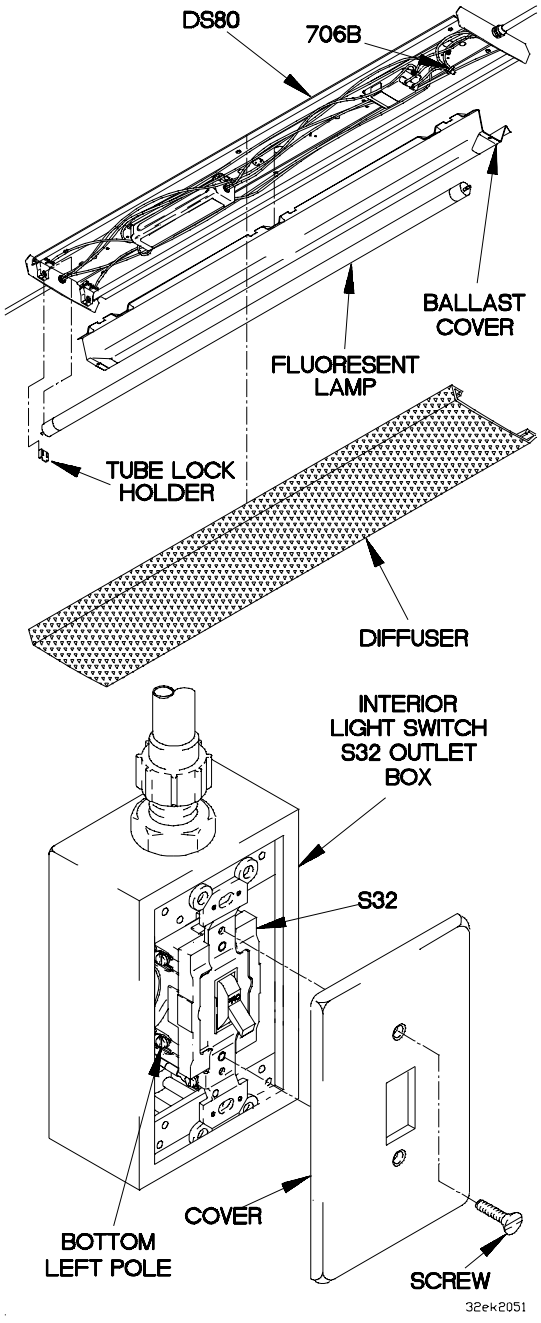
32E10041

e102. ALL M1079 FLOURESCENT LIGHTS DO NOT OPERATE (CONT)



CONTINUITY TEST

(1) Remove diffuser from light fixture DS80.
(2) Remove tube lock holder from each end of two fluorescent lamps.
(3) Remove two fluorescent lamps from light fixture DS80.
(4) Remove ballast cover from light fixture DS80.
(5) Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter to bottom left pole of INTERIOR LIGHTS switch S32.
(7) Connect negative (-) probe of multimeter to fluorescent light DS80 wire 706B splice and note reading on multimeter.
(8) If continuity is not present, repair or replace wire 706B (para 2-40).
(9) If continuity is present, replace relay K41 (para 16-62).
(10) Install ballast cover on light fixture DS80.
(11) Install two fluorescent lights in light fixture DS80.
(12) Install tube lock holder at each end of two fluorescent lamps.
(13) Install diffuser on light fixture DS80.
(14) Install cover on INTERIOR LIGHTS switch S32 box with two screws.



e103. M1079 LIGHTING FIXTURE(S) DS80 AND/OR DS81 DO NOT OPERATE

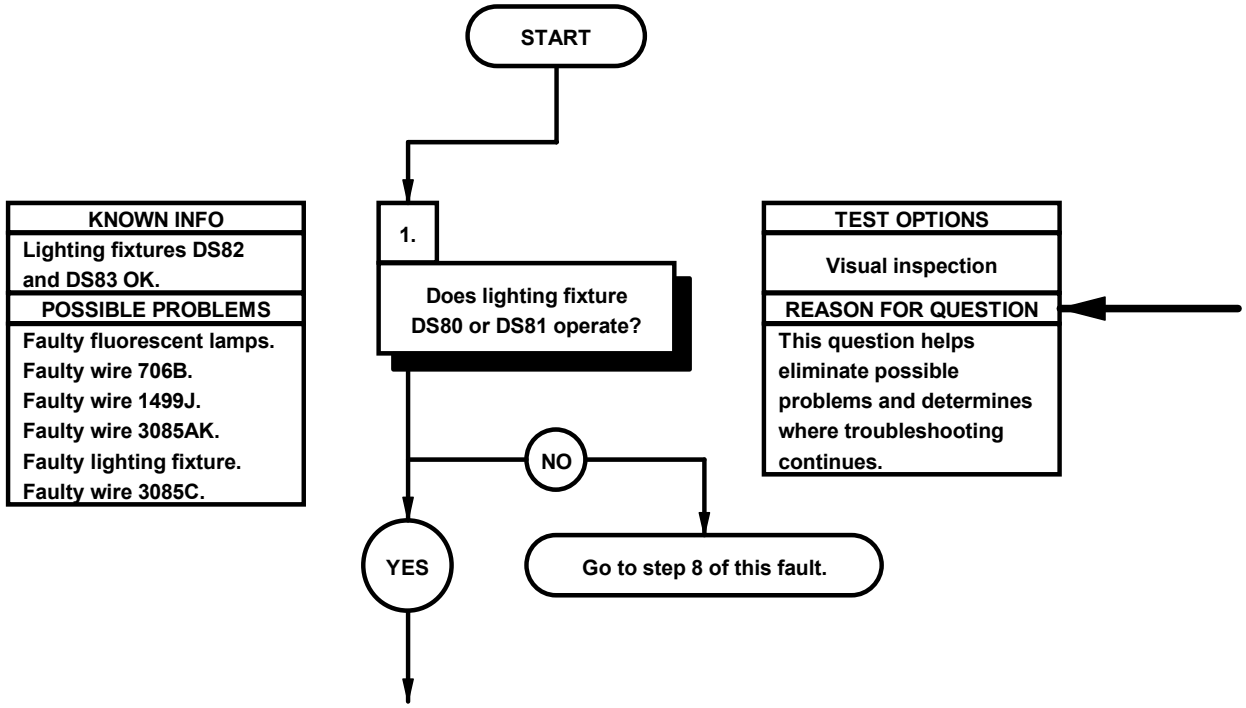
INITIAL SETUP

Equipment Condition
- Engine shut down (TM 9-2320-365-10).
- AC power connected (TM 9-2320-365-10).

Personnel Required
- (2)

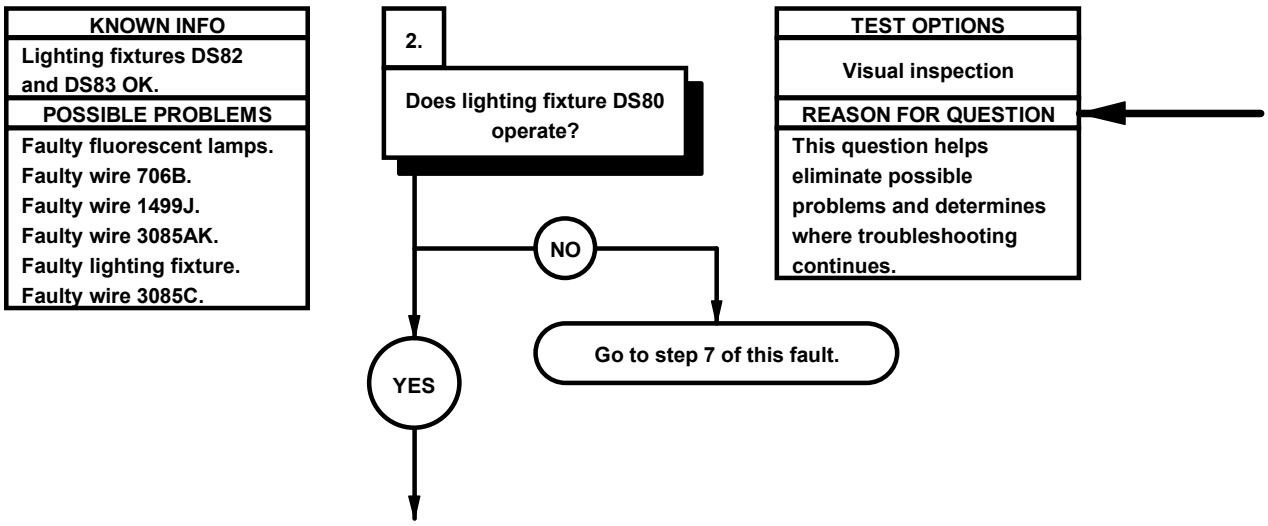
Tools and Special Tools
- Tool Kit, Genl Mech (Item 44, Appendix C)
- STE/ICE-R (Item 39, Appendix C)
- Multimeter, Digital (Item 22, Appendix C)

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



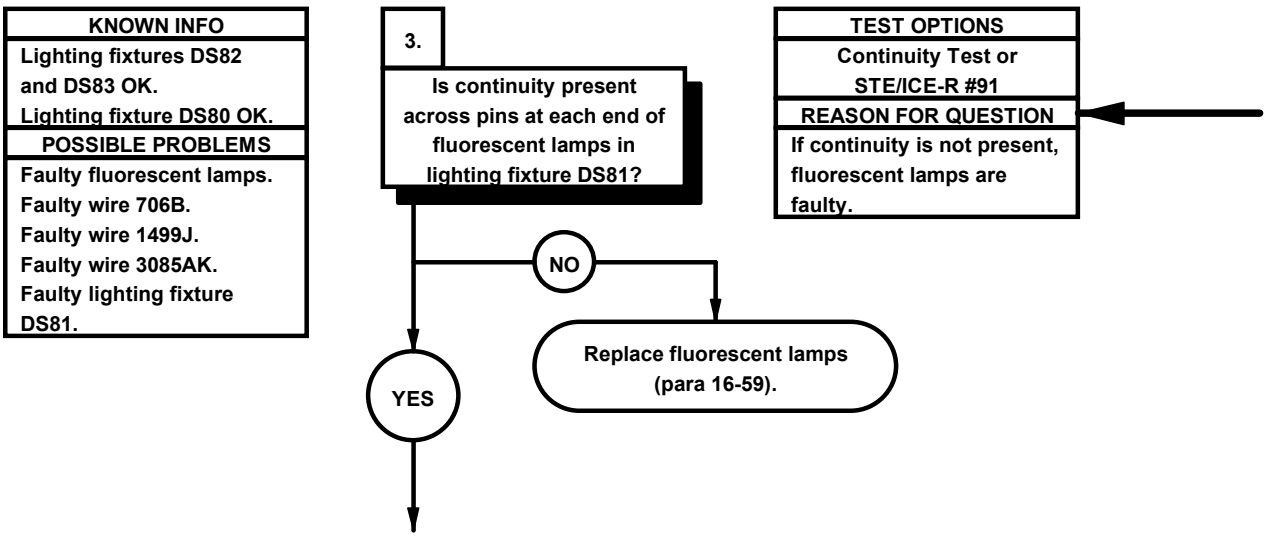
(1) Turn on interior lights (TM 9-2320-365-10).
(2) Check to see if lighting fixture DS80 or DS81 operates.
(3) If lighting fixtures DS80 and DS81 do not operate, go to step 8 of this fault.
(4) Turn off interior lights (TM 9-2320-365-10).

e103. M1079 LIGHTING FIXTURE(S) DS80 AND/OR DS81 DO NOT OPERATE (CONT)



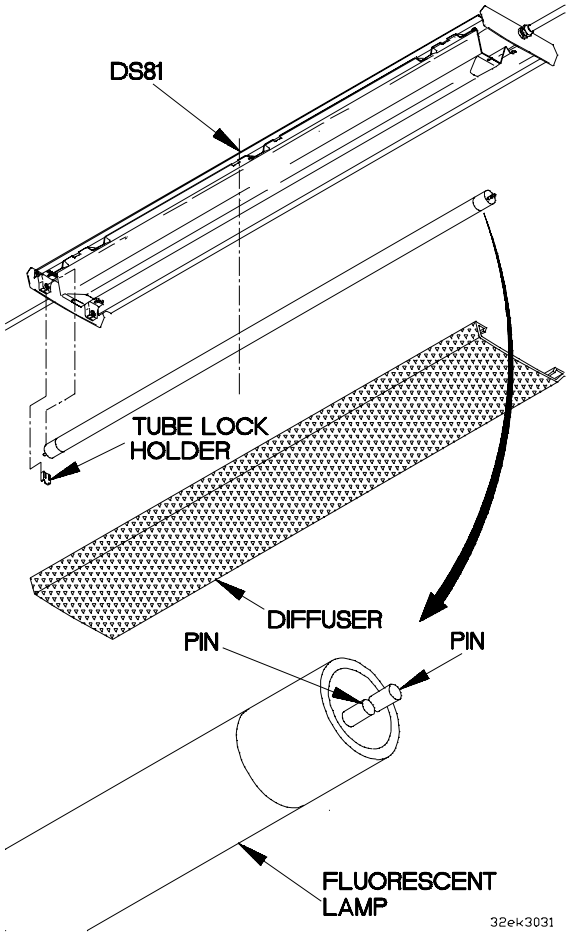
(1) Turn on interior lights (TM 9-2320-365-10).
(2) Check to see if lighting fixture DS80 operates.
(3) If lighting fixture DS80 does not operate, go to step 7 of this fault.
(4) Turn off interior lights (TM 9-2320-365-10).

e103. M1079 LIGHTING FIXTURE(S) DS80 AND/OR DS81 DO NOT OPERATE (CONT)

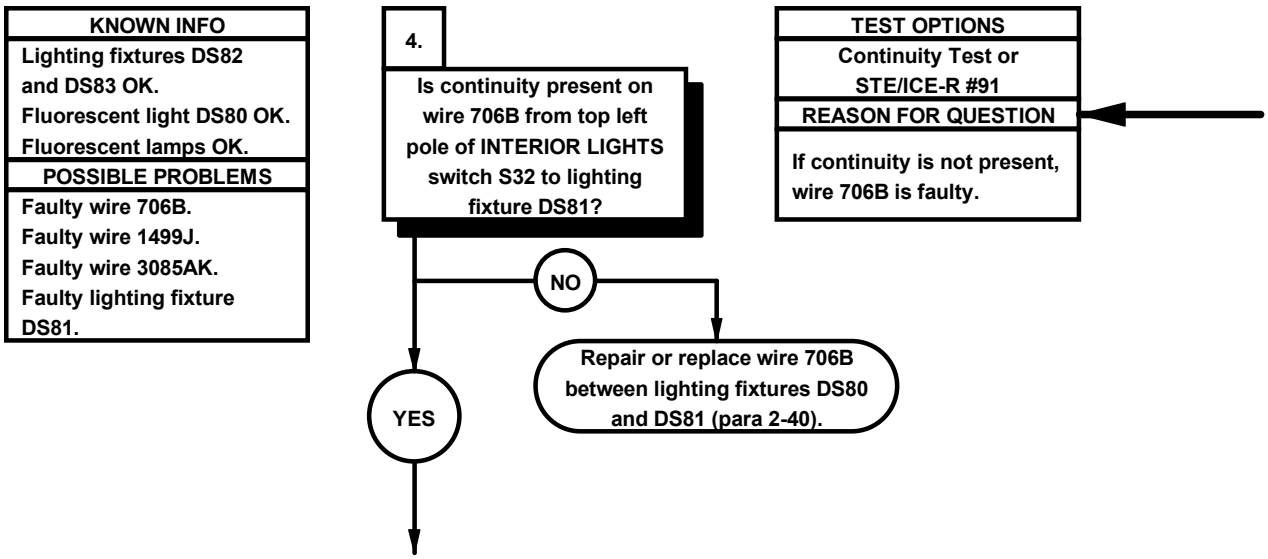


CONTINUITY TEST

(1) Remove diffuser from lighting fixture DS81.
(2) Remove tube lock holder from each end of two fluorescent lamps.
(3) Remove two fluorescent lamps from lighting fixture DS81.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to one pin on end of fluorescent lamp.
(6) Connect negative (-) probe of multimeter to other pin on same end of fluorescent lamp and note reading on multimeter.
(7) Perform steps (5) and (6) on opposite end of fluorescent lamp.
(8) If continuity is not present at either end of fluorescent lamp, replace fluorescent lamp (para 16-59).
(9) Perform steps (5) through (8) on second fluorescent lamp.

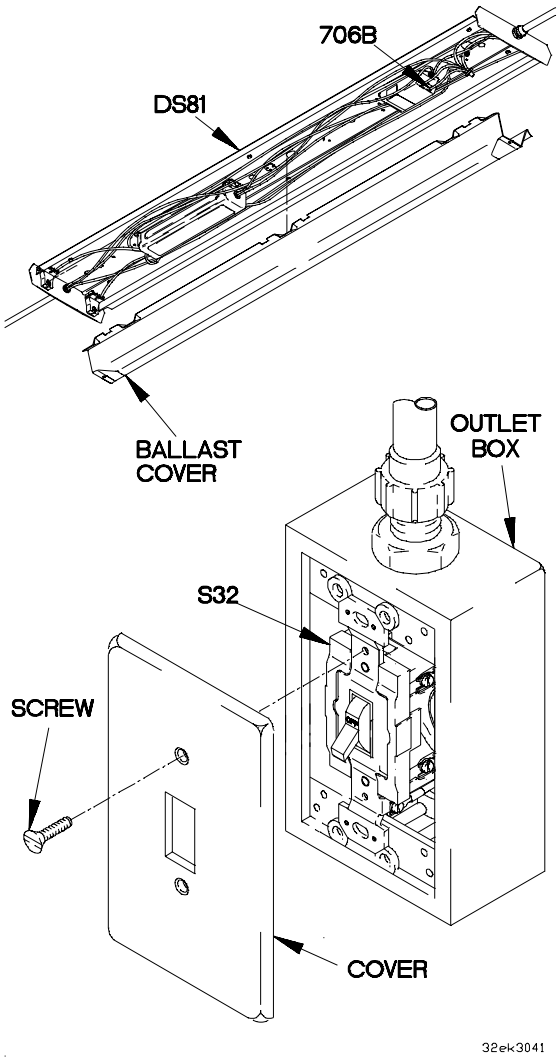


e103. M1079 LIGHTING FIXTURE(S) DS80 AND/OR DS81 DO NOT OPERATE (CONT)

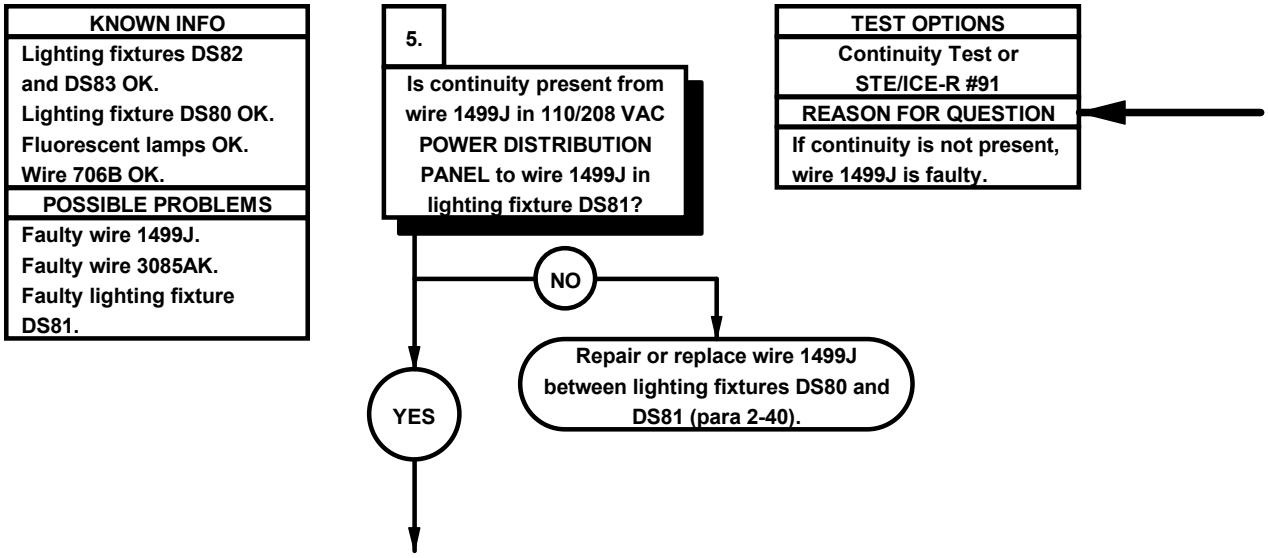


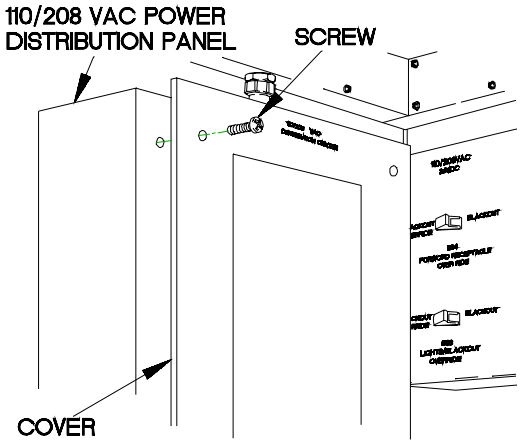
CONTINUITY TEST

(1) Open door on 110/208 VAC POWER DISTRIBUTION PANEL (TM 9-2320-365-10).
(2) Position circuit breaker CB1 to OFF (TM 9-2320-365-10).
(3) Remove two screws and cover from outlet box.
(4) Remove ballast cover from lighting fixture DS81.
(5) Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter to top left pole of INTERIOR LIGHTS switch S32.
(7) Connect negative (-) probe of multimeter to wire 706B in lighting fixture DS81 and note reading on multimeter.
(8) If continuity is not present, repair or replace wire 706B between lighting fixtures DS80 and DS81 (para 2-40).
(9) Install cover on outlet box with two screws.
(10) Close door on 110/208 VAC POWER DISTRIBUTION PANEL (TM 9-2320-365-10).



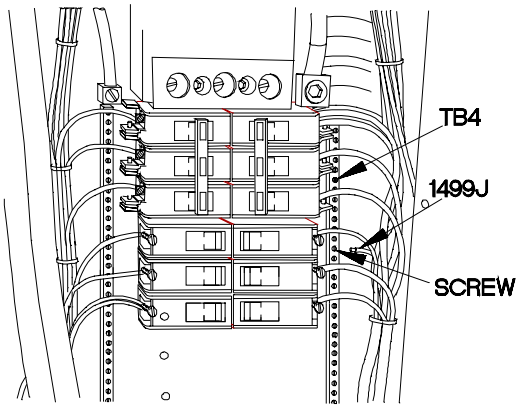
e103. M1079 LIGHTING FIXTURE(S) DS80 AND/OR DS81 DO NOT OPERATE (CONT)

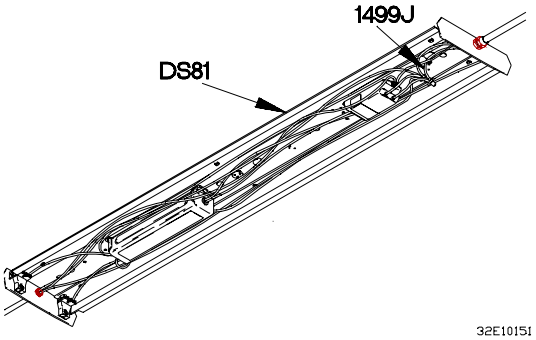




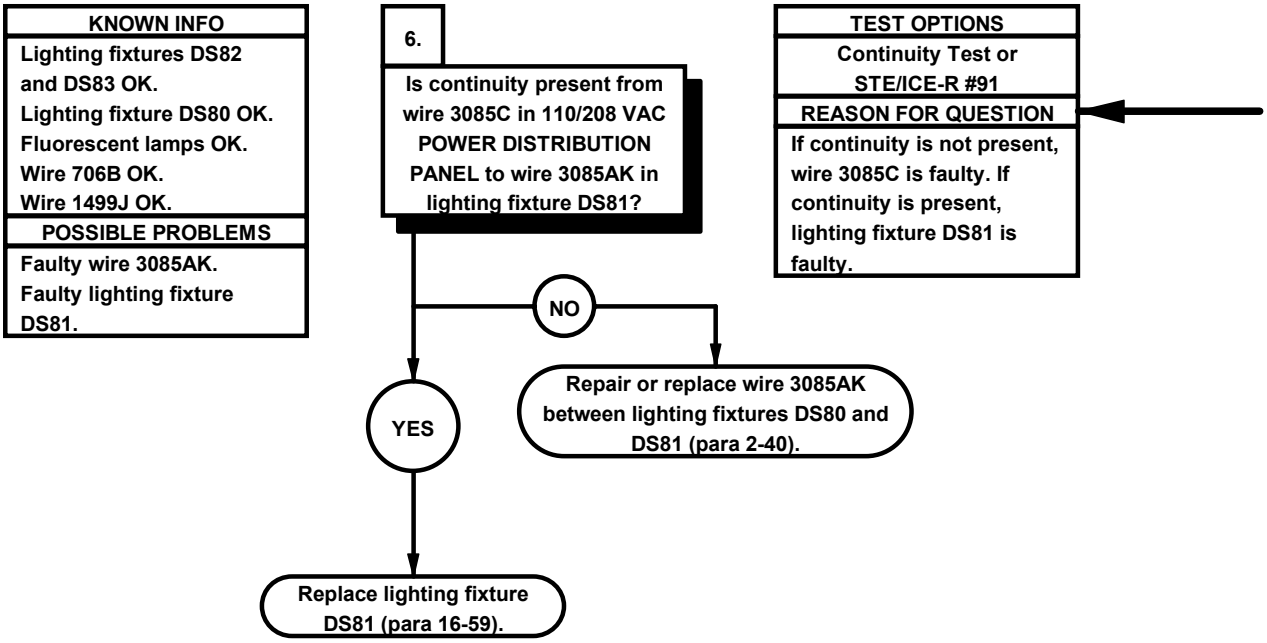
CONTINUITY TEST

(1) Remove six screws and cover from 110/208 VAC POWER DISTRIBUTION PANEL.
(2) Loosen screw in terminal board TB4.
(3) Remove wire 1499J from terminal board TB4.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to wire 1499J in 110/208 VAC POWER DISTRIBUTION PANEL.
(6) Connect negative (-) probe of multimeter to wire 1499J in lighting fixture DS81 and note reading on multimeter.
(7) If continuity is not present, repair or replace wire 1499J between lighting fixtures DS80 and DS81 (para 2-40).
(8) Install wire 1499J on terminal board TB4.
(9) Tighten screw in terminal board TB4.



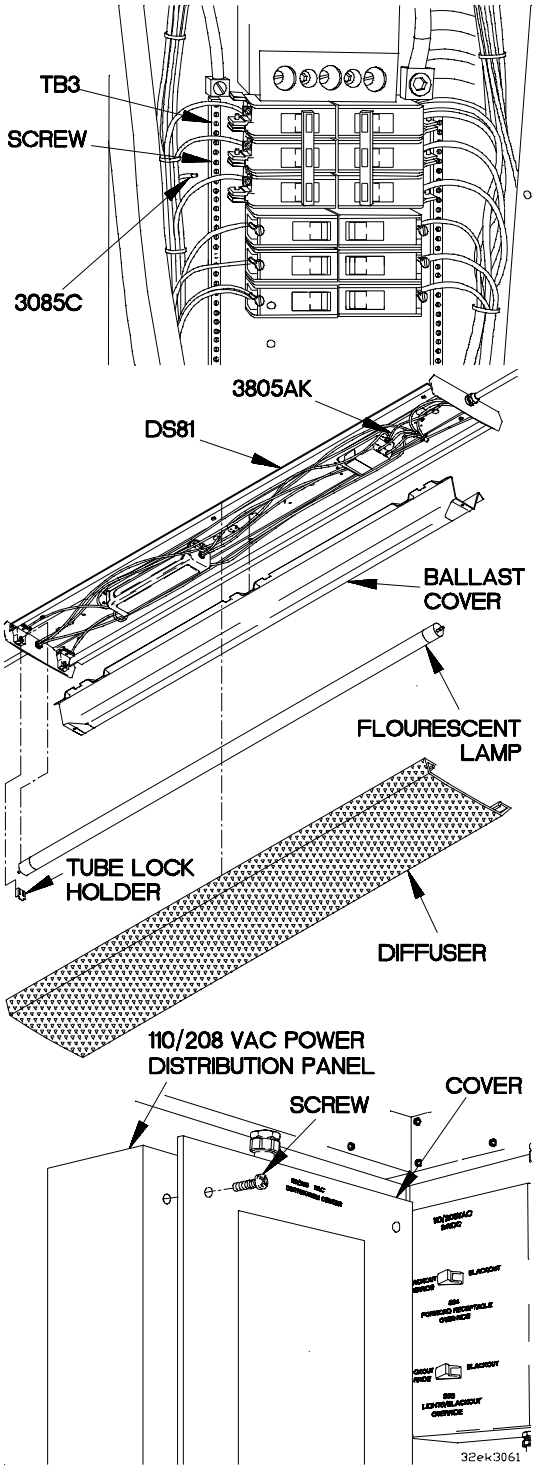


e103. M1079 LIGHTING FIXTURE(S) DS80 AND/OR DS81 DO NOT OPERATE (CONT)

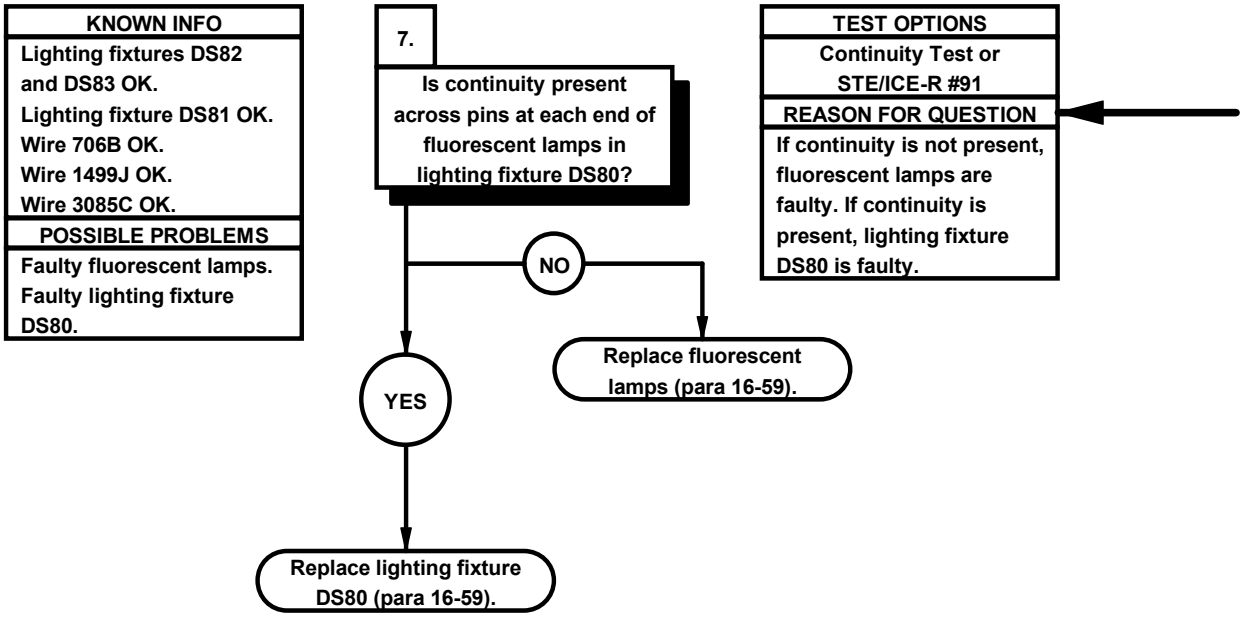


CONTINUITY TEST

(1) Loosen screw in terminal board TB3.
(2) Remove wire 3085C from terminal board TB3.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to wire 3085C.
(5) Connect negative (-) probe of multimeter to wire 3085AK and note reading on multimeter.
(6) If continuity is not present, repair or replace wire 3085AK between lighting fixtures DS80 and DS81 (para 2-40).
(7) If continuity is present, replace lighting fixture DS81 (para 16-59).
(8) Install ballast cover on lighting fixture DS81.
(9) Install two fluorescent lamps in lighting fixture DS81.
(10) Install tube lock holder at each end of two fluorescent lamps.
(11) Install diffuser on lighting fixture DS81.
(12) Install wire 3085C on terminal board TB3.
(13) Tighten screw in terminal board TB3.
(14) Install cover on 110/208 VAC POWER DISTRIBUTION PANEL with six screws.

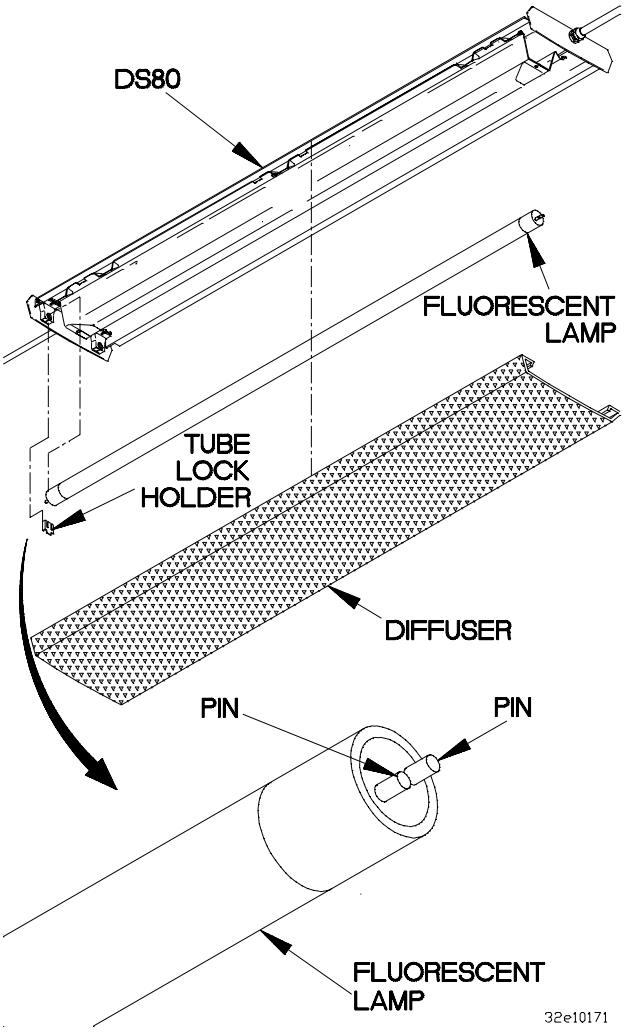


e103. M1079 LIGHTING FIXTURE(S) DS80 AND/OR DS81 DO NOT OPERATE (CONT)

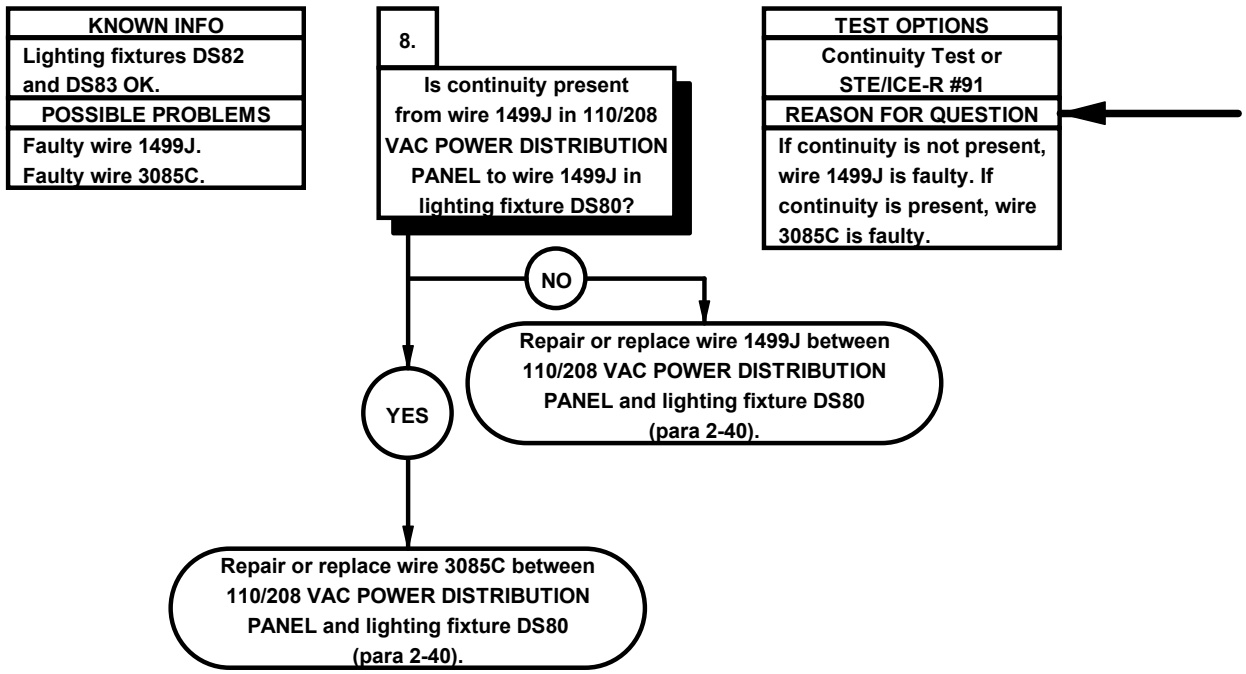


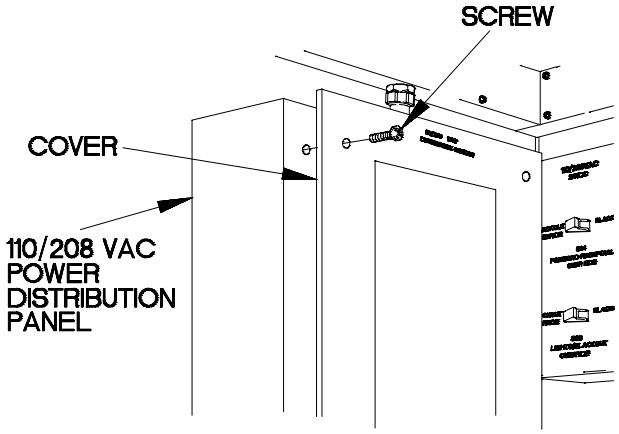
CONTINUITY TEST

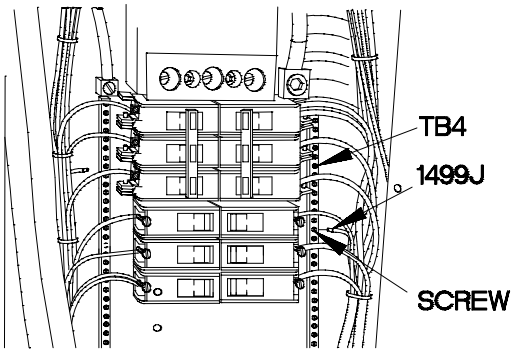
(1) Remove diffuser from lighting fixture DS80.
(2) Remove tube lock holder from each end of two fluorescent lamps.
(3) Remove two fluorescent lamps from lighting fixture DS80.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to one pin on end of fluorescent lamp.
(6) Connect negative (-) probe of multimeter to other pin on same end of fluorescent lamp and note reading on multimeter.
(7) Perform steps (5) and (6) on opposite end of fluorescent lamp.
(8) If continuity is not present at either end of fluorescent lamp, replace fluorescent lamp (para 16-59).
(9) Perform steps (5) through (8) on second fluorescent lamp.
(10) If continuity is present at both ends of two fluorescent lamps, replace lighting fixture DS80 (para 16-59).
(11) Install two fluorescent lamps in lighting fixture DS80.
(12) Install tube lock holder at each end of two fluorescent lamps.
(13) Install diffuser on lighting fixture DS80.



e103. M1079 LIGHTING FIXTURE(S) DS80 AND/OR DS81 DO NOT OPERATE (CONT)

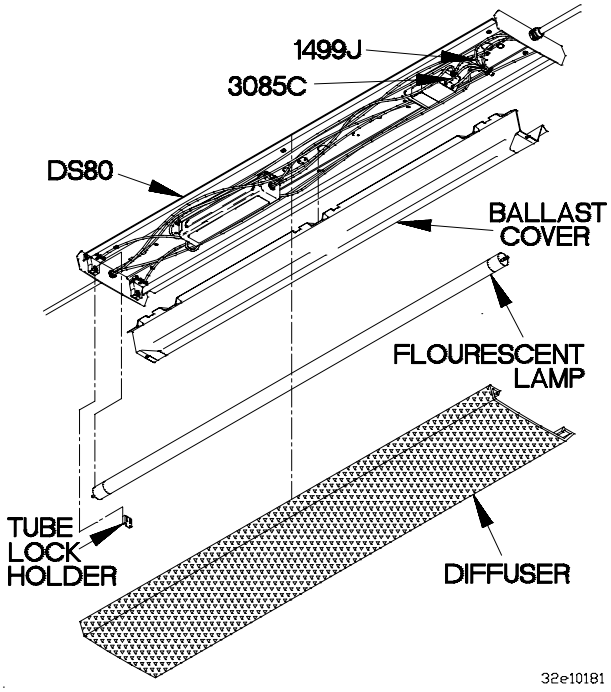






CONTINUITY TEST

(1) Open door on 110/208 VAC POWER DISTRIBUTION PANEL (TM 9-2320-365-10).
(2) Position circuit breaker CB1 to OFF (TM 9-2320-365-10).
(3) Remove six screws and cover from 110/208 VAC POWER DISTRIBUTION PANEL.
(4) Loosen screw in terminal board TB4.
(5) Remove wire 1499J from terminal board TB4.
(6) Remove diffuser from lighting fixture DS80.
(7) Remove tube lock holder from each end of two fluorescent lamps.
(8) Remove two fluorescent lamps from lighting fixture DS80.
(9) Remove ballast cover from lighting fixture DS80.
(10) Set multimeter to ohms.
(11) Connect positive (+) probe of multimeter to wire 1499J in 110/208 VAC POWER DISTRIBUTION PANEL.
(12) Connect negative (-) probe of multimeter to wire 1499J in lighting fixture DS80 and note reading on multimeter.
(13) If continuity is not present, repair or replace wire 1499J (para 2-40).
(14) If continuity is present, repair or replace wire 3085C (para 2-40).
(15) Install ballast cover on lighting fixture DS80.
(16) Install two fluorescent lamps in lighting fixture DS80.
(17) Install tube lock holder at each end of two fluorescent lamps.
(18) Install diffuser on lighting fixture DS80.
(19) Install wire 1499J on terminal board TB4.
(20) Tighten screw in terminal board TB4.
(21) Install cover on 110/208 VAC POWER DISTRIBUTION PANEL with six screws.
(22) Close door on 110/208 VAC POWER DISTRIBUTION PANEL.



e104. M1079 LIGHTING FIXTURE(S) DS82 AND/OR DS83 DO NOT OPERATE

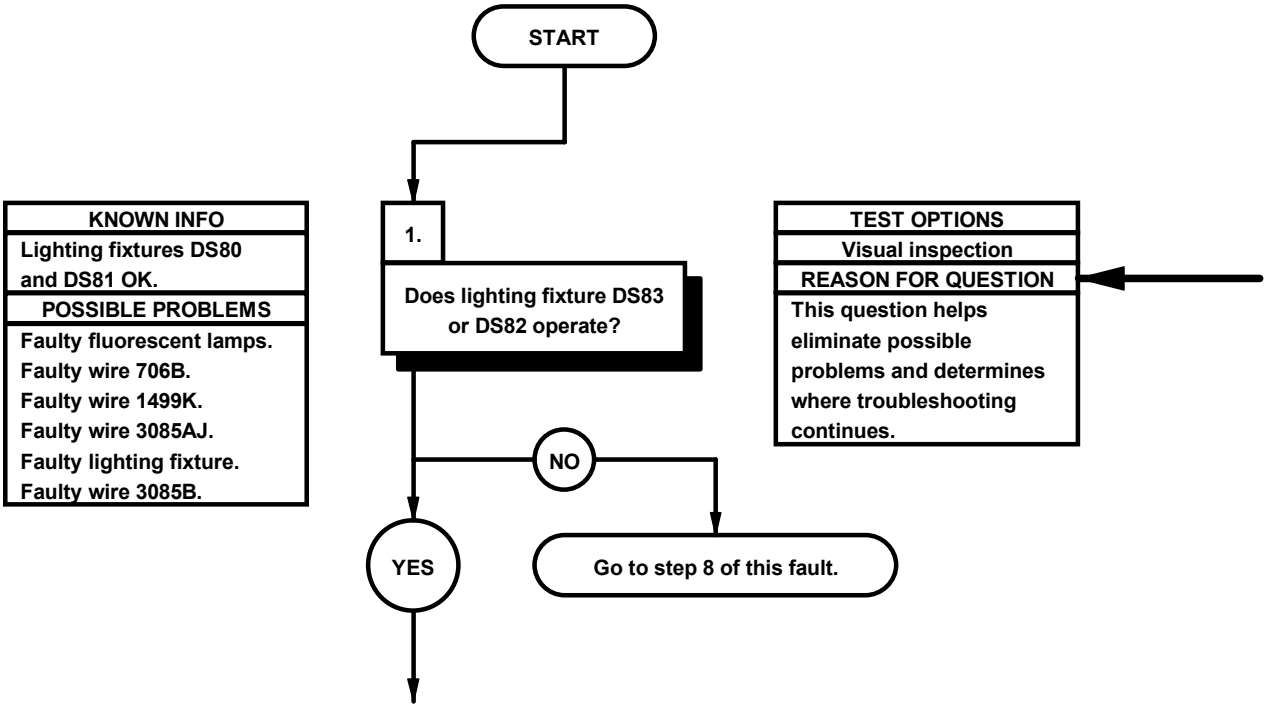
INITIAL SETUP

Equipment Condition
Engine shut down (TM 9-2320-365-10).
AC power connected (TM 9-2320-365-10).

Personnel Required
(2)

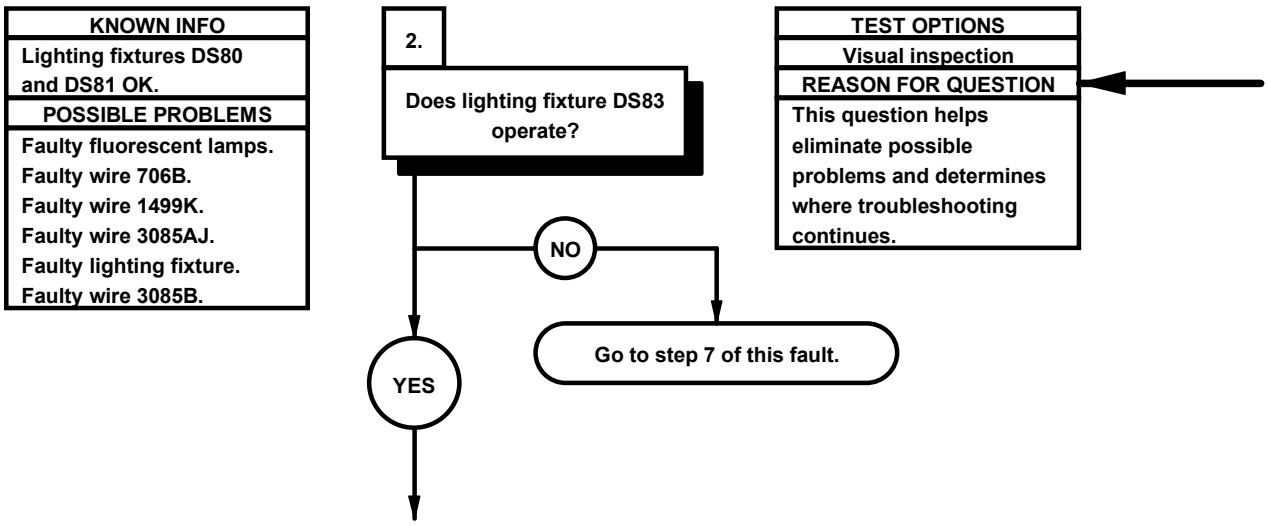
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

References
TM 9-4910-571-12&P



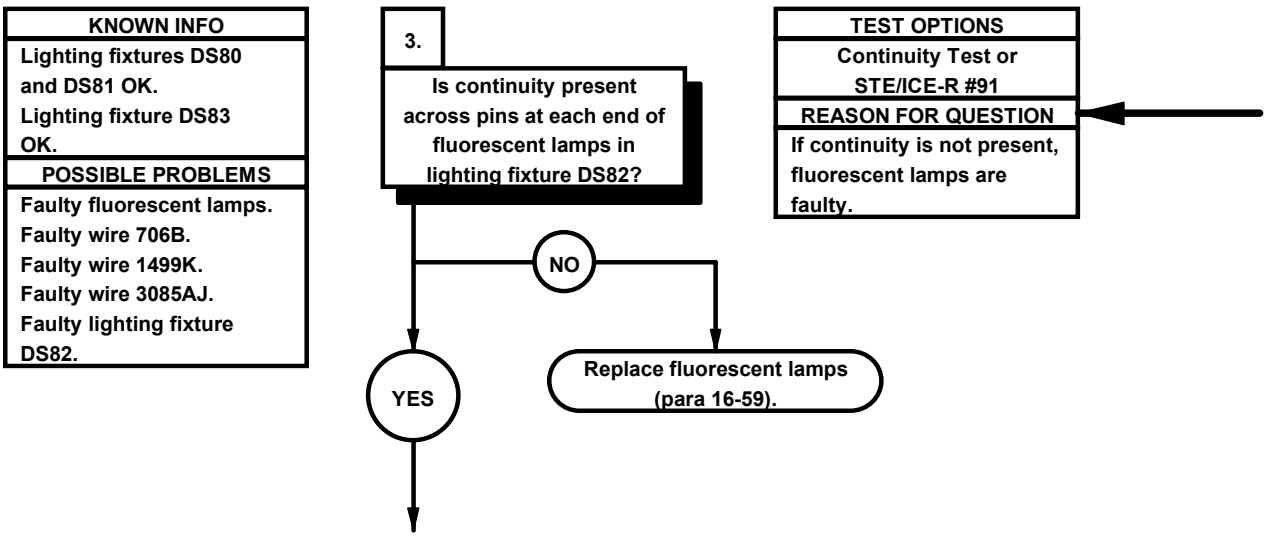
(1) Turn on interior lights (TM 9-2320-365-10).
(2) Check to see if lighting fixture DS82 or DS83 operates.
(3) If lighting fixtures DS82 and DS83 do not operate, go to step 8 of this fault.
(4) Turn off interior lights (TM 9-2320-365-10).

e104. M1079 LIGHTING FIXTURE(S) DS82 AND/OR DS83 DO NOT OPERATE (CONT)



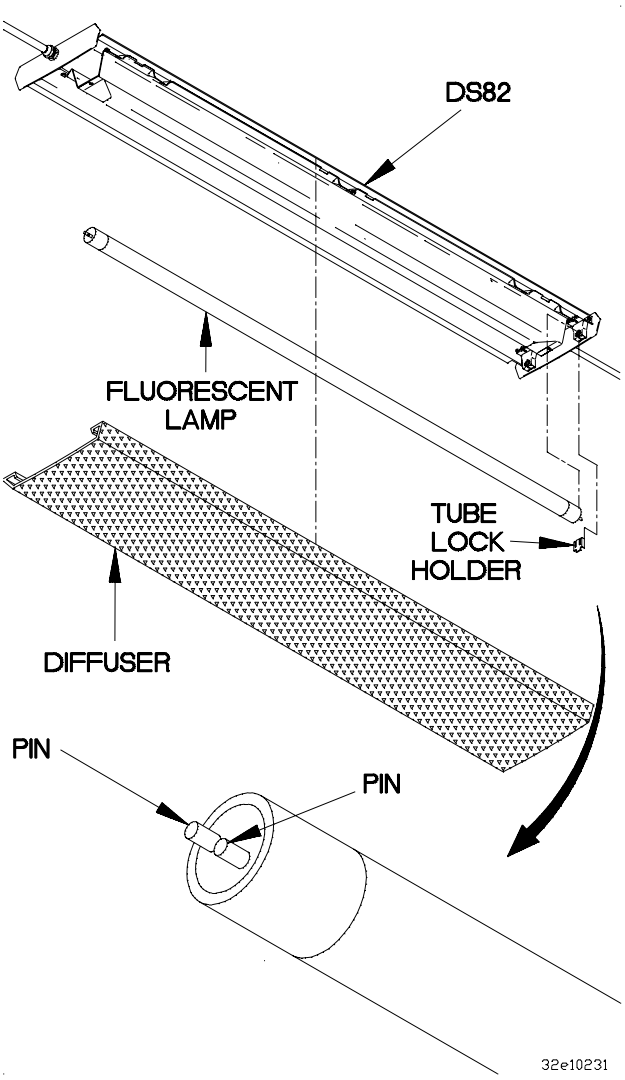
(1) Turn on interior lights (TM 9-2320-365-10).
(2) Check to see if lighting fixture DS83 operates.
(3) If lighting fixture DS83 does not operate, go to step 7 of this fault.
(4) Turn off interior lights (TM 9-2320-365-10).

e104. M1079 LIGHTING FIXTURE(S) DS82 AND/OR DS83 DO NOT OPERATE (CONT)

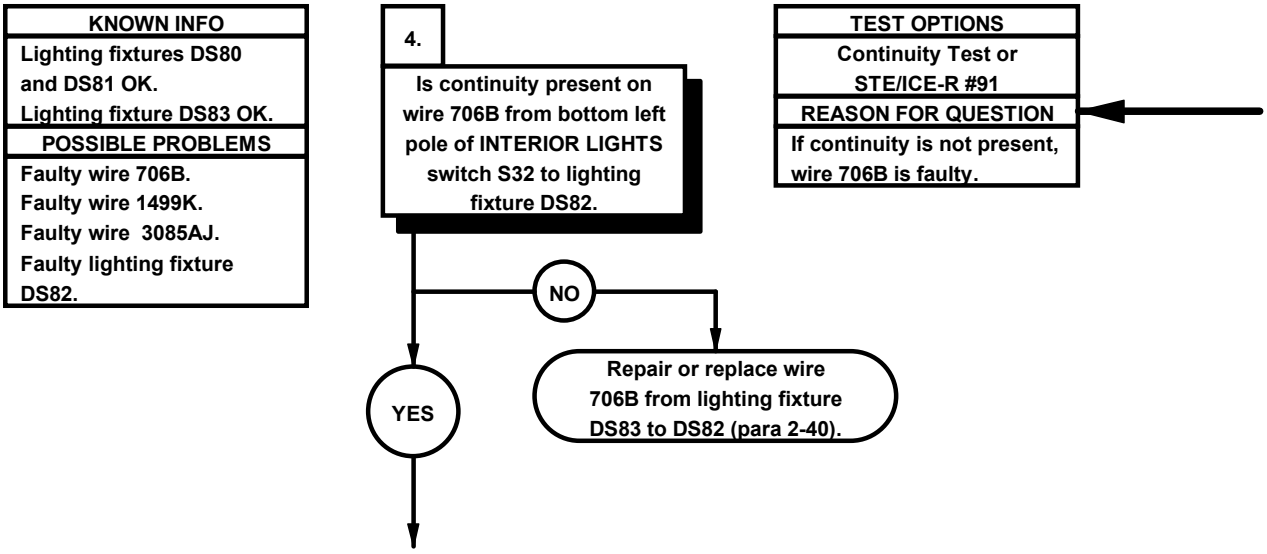


CONTINUITY TEST

(1) Remove diffuser from lighting fixture DS82.
(2) Remove tube lock holder from each end of two fluorescent lamps.
(3) Remove two fluorescent lamps from lighting fixture DS82.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to one pin on end of fluorescent lamp.
(6) Connect negative (-) probe of multimeter to other pin on same end of fluorescent lamp and note reading on multimeter.
(7) Perform steps (5) and (6) on opposite end of fluorescent lamp.
(8) If continuity is not present at either end of fluorescent lamp, replace fluorescent lamp (para 16-59).
(9) Perform steps (5) through (8) on second fluorescent lamp.

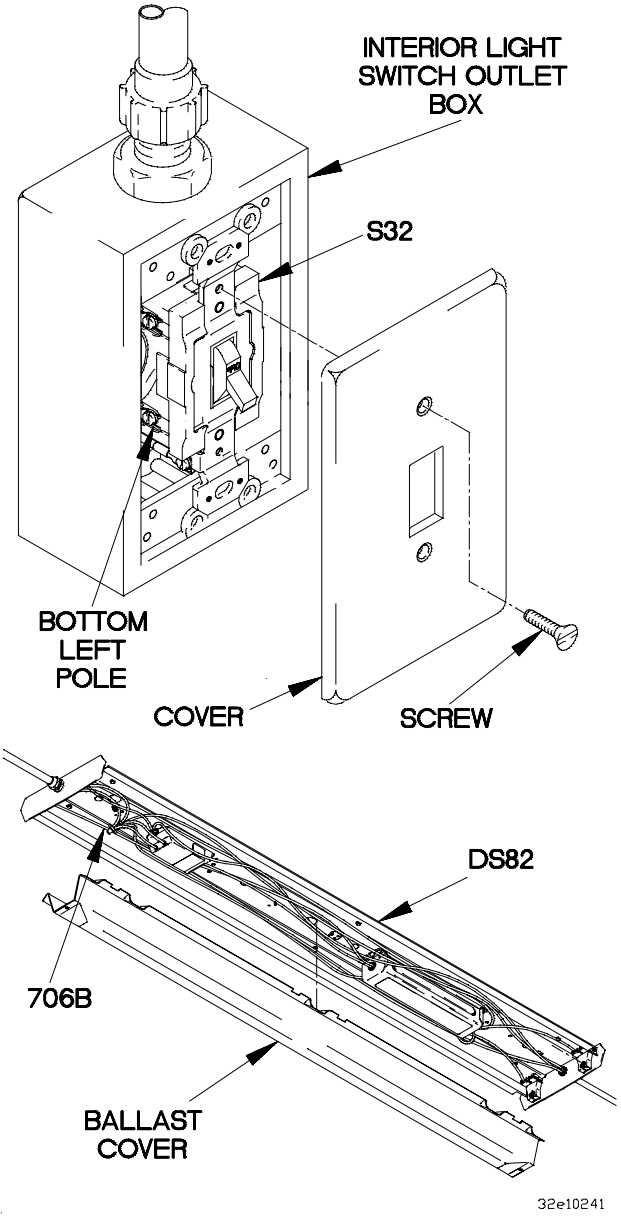


e104. M1079 LIGHTING FIXTURE(S) DS82 AND/OR DS83 DO NOT OPERATE (CONT)

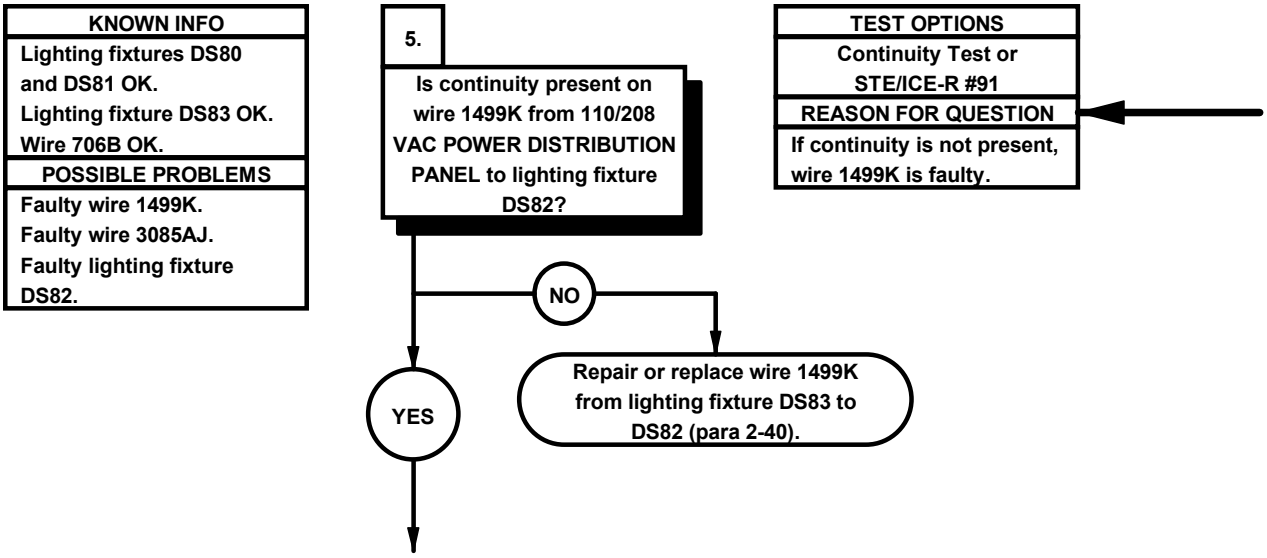


CONTINUITY TEST

(1) Open door on 110/208 VAC POWER DISTRIBUTION PANEL (TM 9-2320-365-10).
(2) Position circuit breaker CB1 to OFF (TM 9-2320-365-10).
(3) Remove two screws and cover from INTERIOR LIGHTS switch outlet box.
(4) Remove ballast cover from lighting fixture DS82.
(5) Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter to bottom left pole of switch S32.
(7) Connect negative (-) probe of multimeter to wire 706B in lighting fixture DS82 and note reading on multimeter.
(8) If continuity is not present, repair or replace wire 706B from lighting fixture DS83 to DS82 (para 2-40).
(9) Install cover on INTERIOR LIGHTS switch outlet box with two screws.
(10) Close door on 110/208 VAC POWER DISTRIBUTION PANEL (TM 9-2320-365-10).

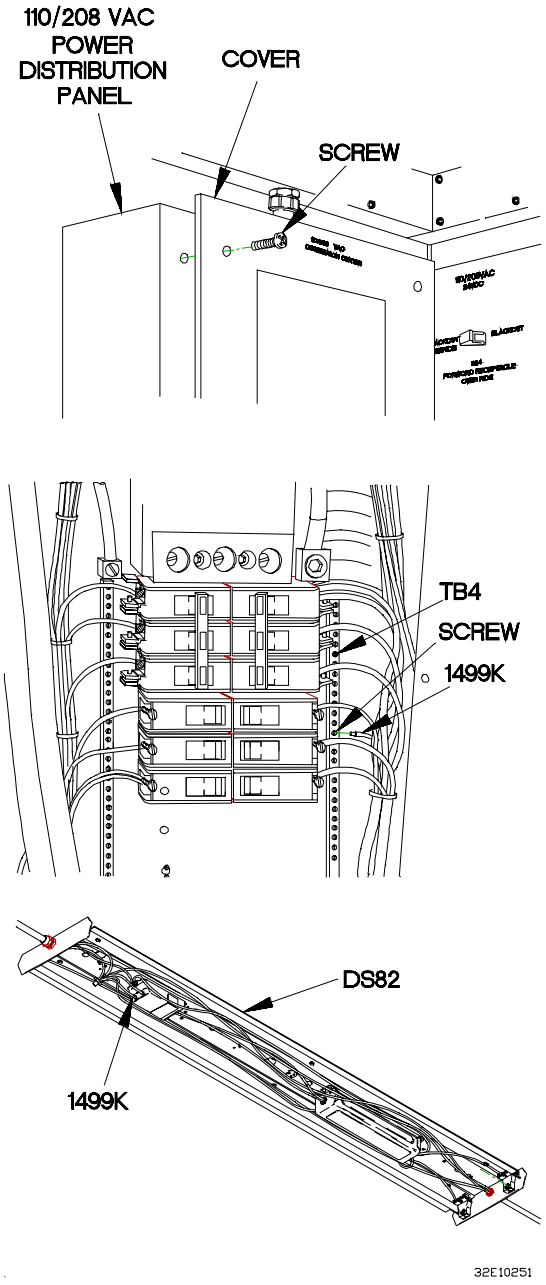


e104. M1079 LIGHTING FIXTURE(S) DS82 AND/OR DS83 DO NOT OPERATE (CONT)

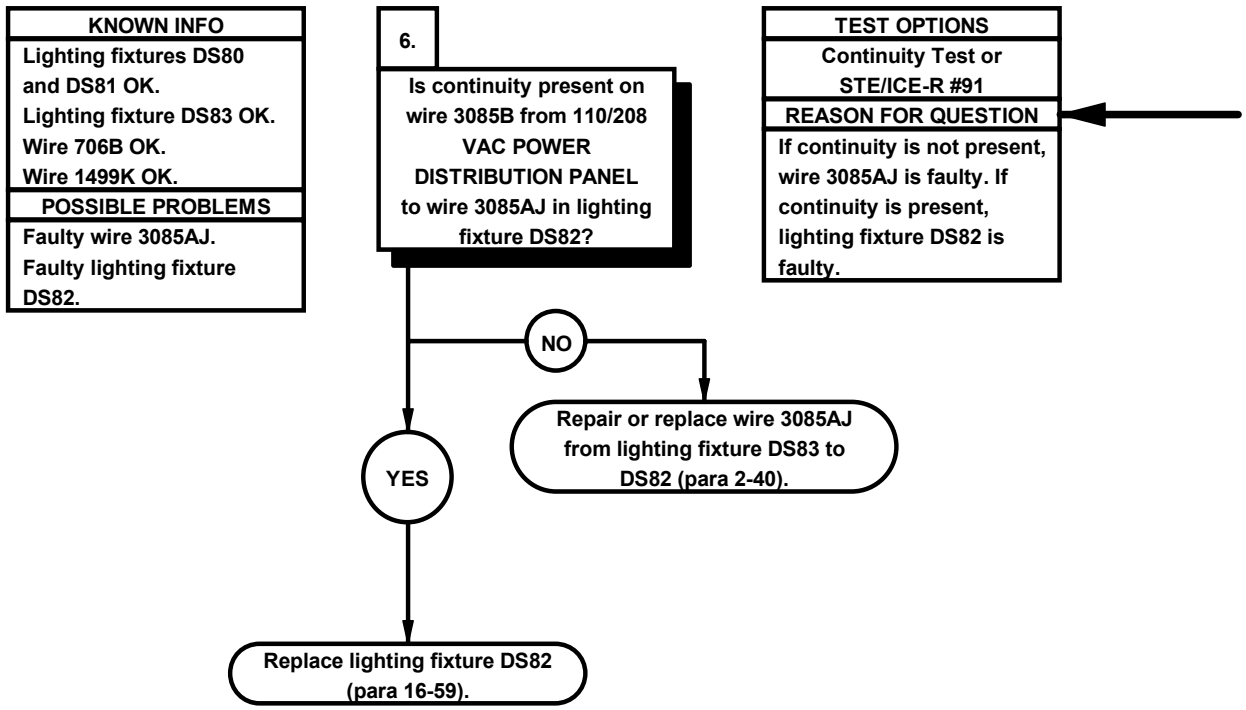


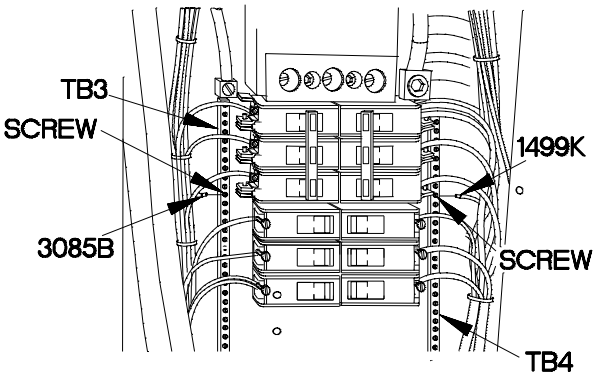
CONTINUITY TEST

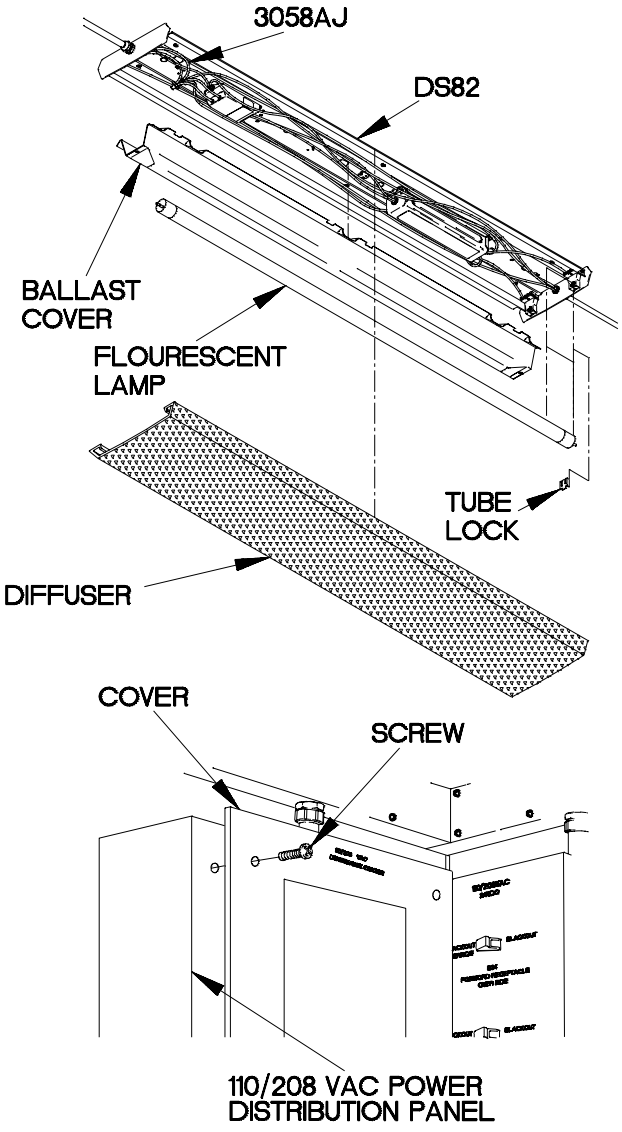
(1) Disconnect AC power (TM 9-2320-365-10).
(2) Remove six screws and cover from 110/208 VAC POWER DISTRIBUTION PANEL.
(3) Loosen screw in terminal board TB4.
(4) Remove wire 1499K from terminal board TB4.
(5) Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter to wire 1499K in 110/208 VAC POWER DISTRIBUTION PANEL.
(7) Connect negative (-) probe of multimeter to wire 1499K in lighting fixture DS82 and note reading on multimeter.
(8) If continuity is not present, repair or replace wire 1499K from lighting fixture DS83 to DS82 (para 2-40).



e104. M1079 LIGHTING FIXTURE(S) DS82 AND/OR DS83 DO NOT OPERATE (CONT)





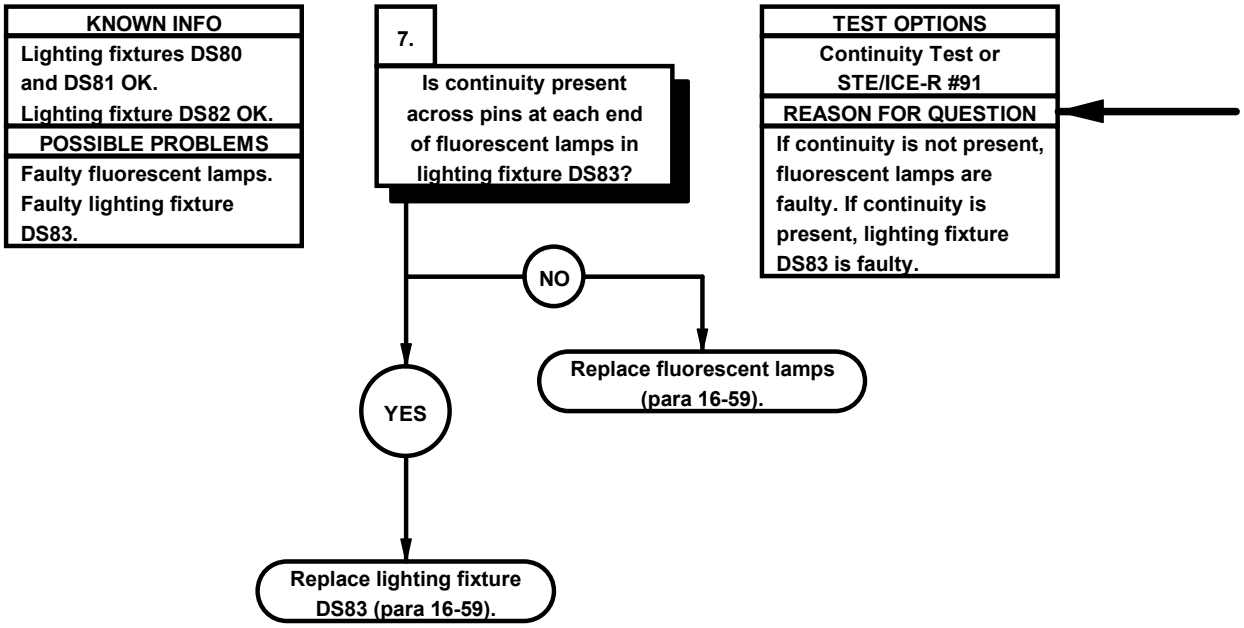


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CONTINUITY TEST

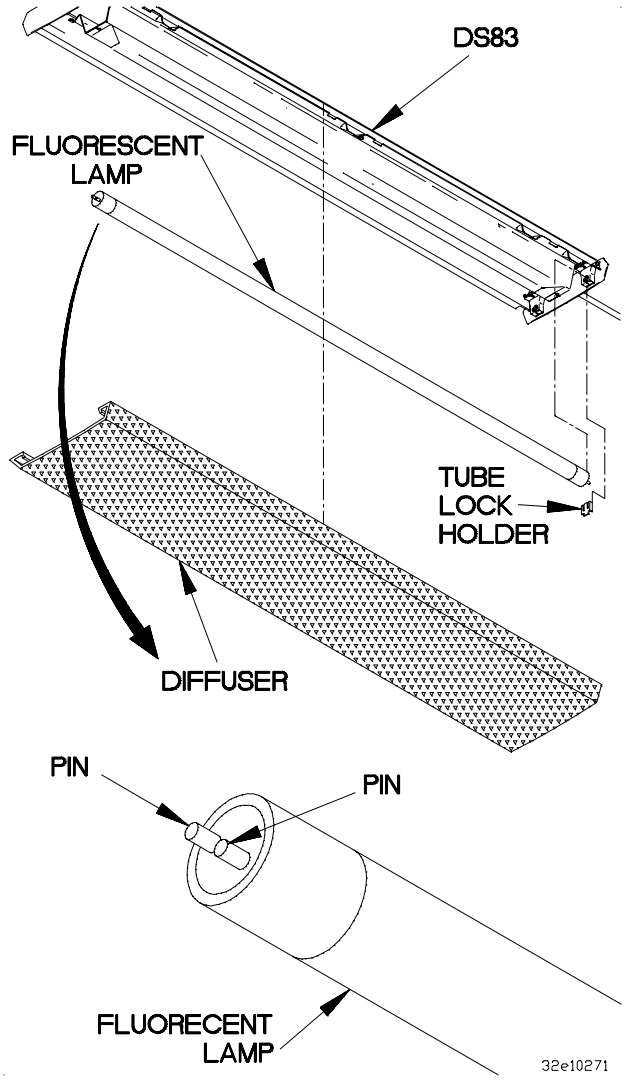
(1) Loosen screw in terminal board TB3.
(2) Remove wire 3085B from terminal board TB3.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to wire 3085B.
(5) Connect negative (-) probe of multimeter to wire 3085AJ and note reading on multimeter.
(6) If continuity is not present, repair or replace wire 3085AJ from lighting fixture DS83 to DS82 (para 2-40).
(7) If continuity is present, replace lighting fixture DS82 (para 16-59).
(8) Install ballast cover on lighting fixture DS82.
(9) Install two fluorescent lamps in lighting fixture DS82.
(10) Install tube lock holder at each end of two fluorescent lamps.
(11) Install diffuser on lighting fixture DS82.
(12) Install wire 3085B on terminal board TB3.
(13) Tighten screw in terminal board TB3.
(14) Install wire 1499K on terminal board TB4.
(15) Tighten screw in terminal board TB4.
(16) Install cover on 110/208 VAC POWER DISTRIBUTION PANEL with six screws.
(17) Open door on 110/208 VAC POWER DISTRIBUTION PANEL (TM 9-2320-365-10).
(18) Position circuit breaker CB1 to ON (TM 9-2320-365-10).
(19) Close door on 110/208 VAC POWER DISTRIBUTION PANEL (TM 9-2320-365-10).

e104. M1079 LIGHTING FIXTURE(S) DS82 AND/OR DS83 DO NOT OPERATE (CONT)

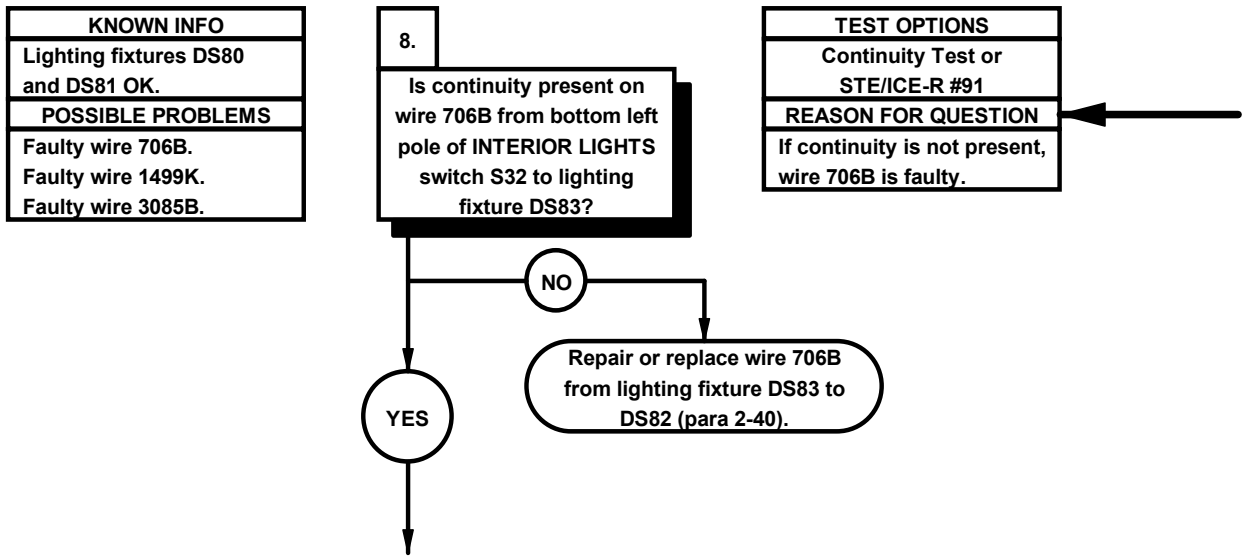


CONTINUITY TEST

(1) Remove diffuser from lighting fixture DS83.
(2) Remove tube lock holder from each end of two fluorescent lamps.
(3) Remove two fluorescent lamps from lighting fixture DS83.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to one pin on end of fluorescent lamp.
(6) Connect negative (-) probe of multimeter to other pin on same end of fluorescent lamp and note reading on multimeter.
(7) Perform steps (5) and (6) on opposite end of fluorescent lamp.
(8) If continuity is not present at either end of fluorescent lamp, replace fluorescent lamp (para 16-59).
(9) Perform steps (5) through (8) on second fluorescent lamp.
(10) If continuity is present at both ends of two fluorescent lamps, replace lighting fixture DS83 (para 16-59).
(11) Install two fluorescent lamps in lighting fixture DS83.
(12) Install tube lock holder at each end of two fluorescent lamps.
(13) Install diffuser on lighting fixture DS83.

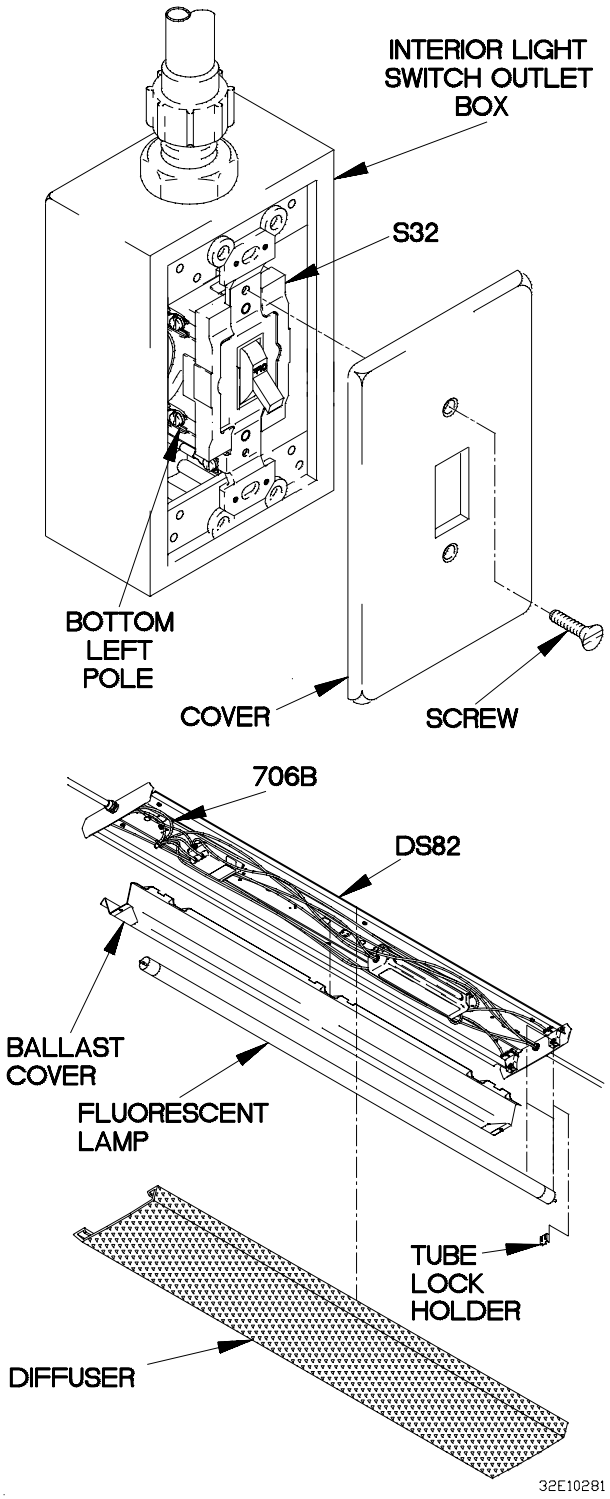


e104. M1079 LIGHTING FIXTURE(S) DS82 AND/OR DS83 DO NOT OPERATE (CONT)

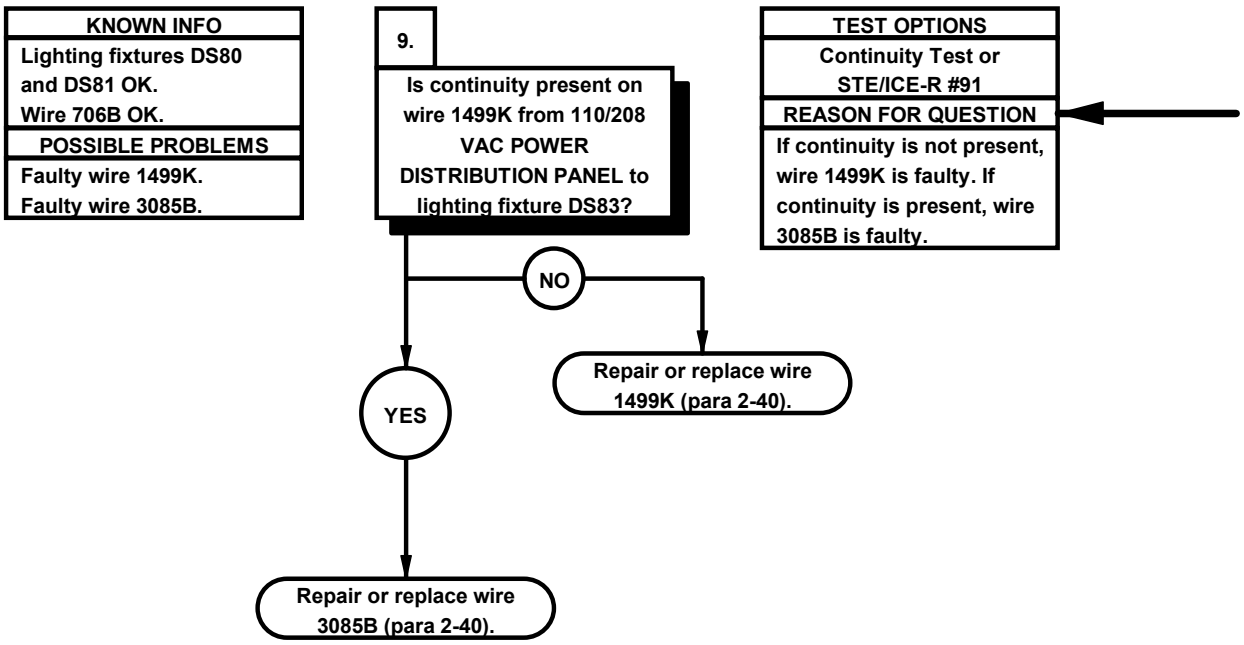


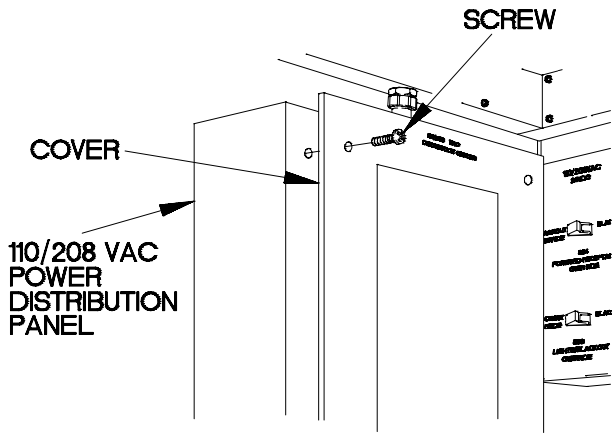
CONTINUITY TEST

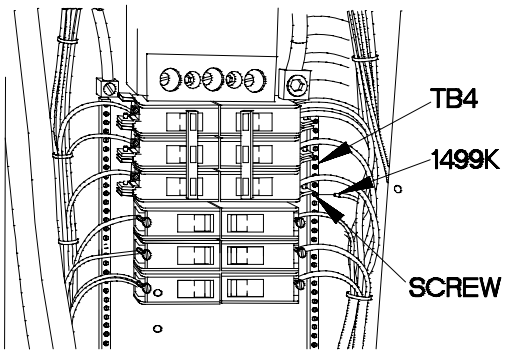
(1) Open door on 110/208 VAC POWER DISTRIBUTION PANEL (TM 9-2320-365-10).
(2) Position circuit breaker CB1 to OFF (TM 9-2320-365-10).
(3) Remove two screws and cover from INTERIOR LIGHTS switch outlet box.
(4) Remove diffuser from lighting fixture DS83.
(5) Remove tube lock holder from each end of two fluorescent lamps.
(6) Remove two fluorescent lamps from lighting fixture DS83.
(7) Remove ballast cover from lighting fixture DS83.
(8) Set multimeter to ohms.
(9) Connect positive (+) probe of multimeter to bottom left pole of INTERIOR LIGHTS switch S32.
(10) Connect negative (-) probe of multimeter to wire 706B in lighting fixture DS83 and note reading on multimeter.
(11) If continuity is not present, repair or replace wire 706B from lighting fixture DS83 to DS82 (para 2-40).
(12) Install cover on INTERIOR LIGHTS switch outlet box S32 with two screws.



e104. M1079 LIGHTING FIXTURE(S) DS82 AND/OR DS83 DO NOT OPERATE (CONT)

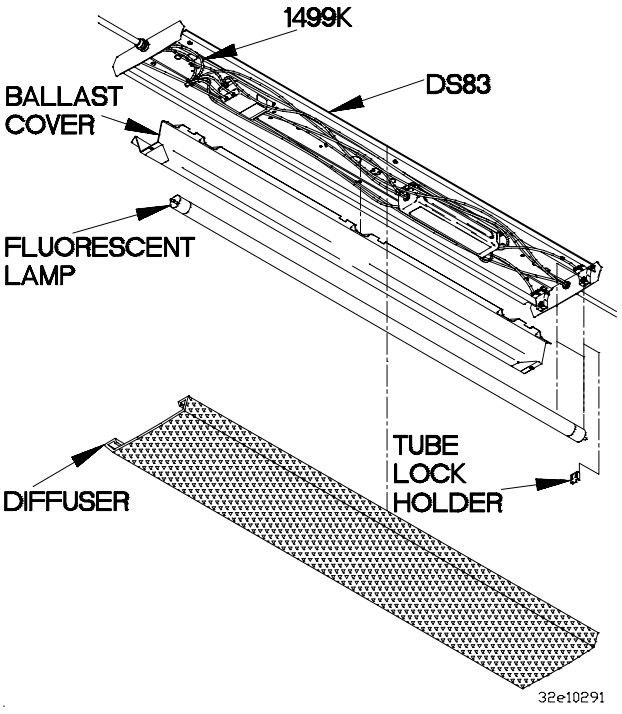






CONTINUITY TEST

(1) Disconnect AC power (TM 9-2320-365-10).
(2) Remove six screws and cover from 110/208 VAC POWER DISTRIBUTION PANEL.
(3) Loosen screw in terminal board TB4.
(4) Remove wire 1499K from terminal board TB4.
(5) Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter to wire 1499K in 110/208 VAC POWER DISTRIBUTION PANEL.
(7) Connect negative (-) probe of multimeter to wire 1499K in lighting fixture DS83 and note reading on multimeter.
(8) If continuity is not present, repair or replace wire 1499K (para 2-40).
(9) If continuity is present, repair or replace wire 3085B (para 2-40).
(9) Install ballast cover on lighting fixture DS83.
(10) Install two fluorescent lamps in lighting fixture DS83.
(11) Install tube lock holder at each end of two fluorescent lamps.
(12) Install diffuser on lighting fixture DS83.
(13) Install wire 1499K on terminal board TB4.
(14) Tighten screw in terminal board TB4.
(15) Install cover on 110/208 VAC POWER DISTRIBUTION PANEL with six screws.
(16) Position circuit breaker CB1 to ON (TM 9-2320-365-10).
(17) Close door on 110/208 VAC POWER DISTRIBUTION PANEL (TM 9-2320-365-10).
(18) Connect AC power (TM 9-2320-365-10).



e105. M1079 110 VAC OUTLET J233 DOES NOT OPERATE

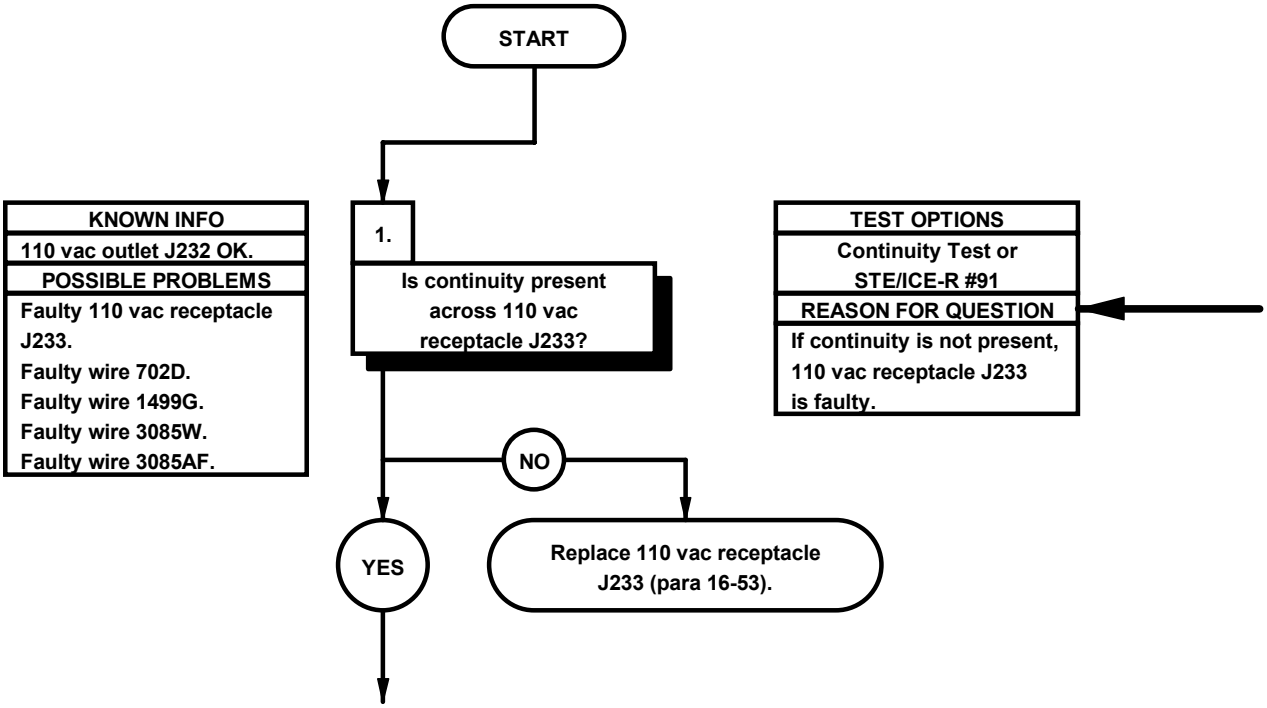
INITIAL SETUP

Equipment Condition
Engine shut down (TM 9-2320-365-10).
AC power disconnected (TM 9-2320-365-10).

Personnel Required
(2)

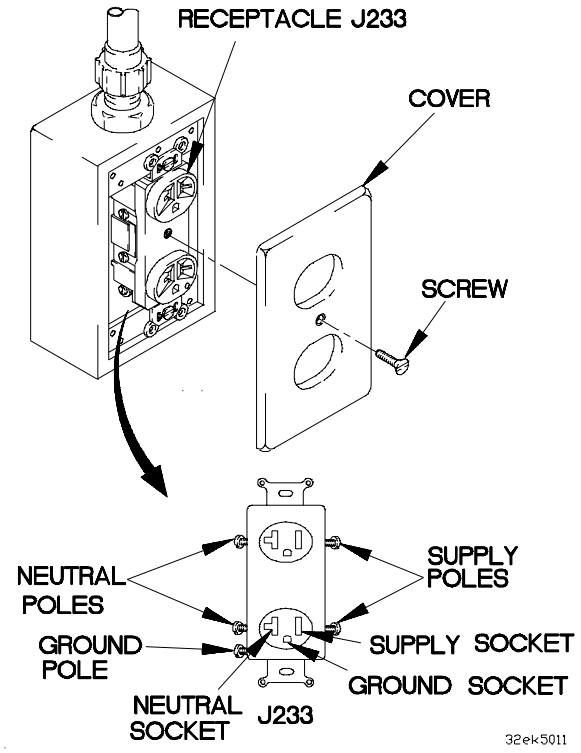
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

References
TM 9-4910-571-12&P

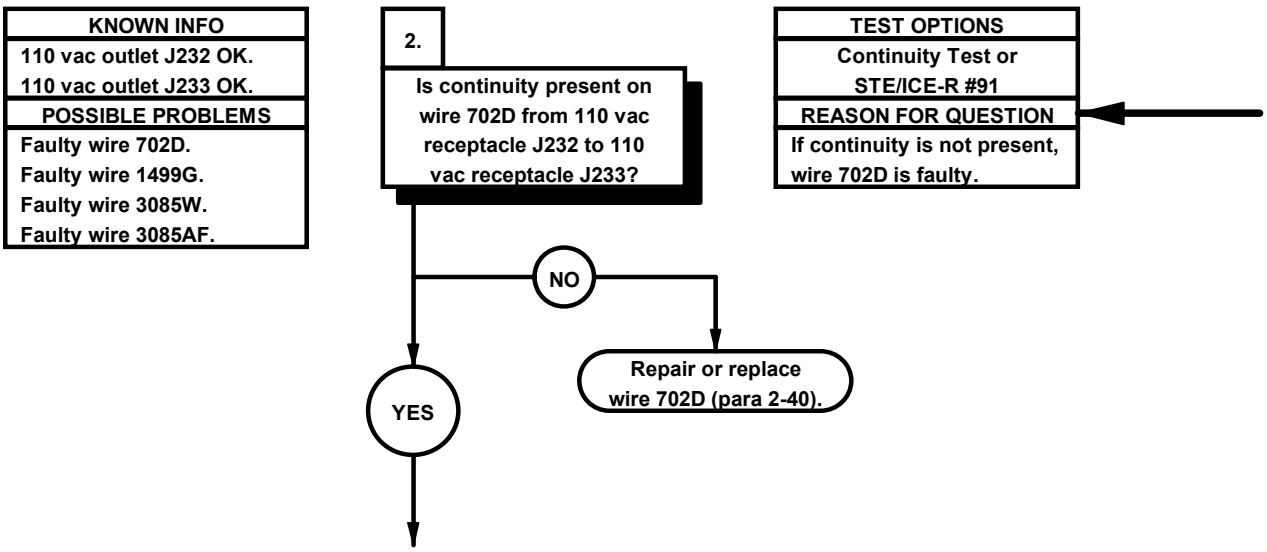


CONTINUITY TEST

(1) Remove screw and cover from 110 vac outlet J233.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to supply pole of 110 vac receptacle J233.
(4) Connect negative (-) probe of multimeter to supply socket of 110 vac receptacle J233 and note reading on multimeter.
(5) Connect positive (+) probe of multimeter to neutral pole of 110 vac receptacle J233.
(6) Connect negative (-) probe of multimeter to neutral socket of 110 vac receptacle J233 and note reading on multimeter.
(7) Connect positive (+) probe of multimeter to ground pole of 110 vac receptacle J233.
(8) Connect negative (-) probe of multimeter to ground socket of 110 vac receptacle J233 and note reading on multimeter.
(9) If continuity is not present in steps (4), (6), and (8), replace 110 vac receptacle J233 (para 16-53).

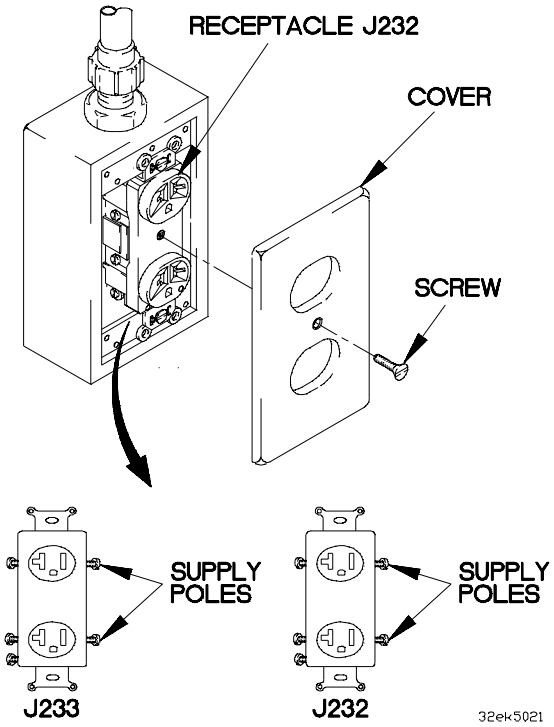


e105. M1079 110 VAC OULET J233 DOES NOT OPERATE (CONT)

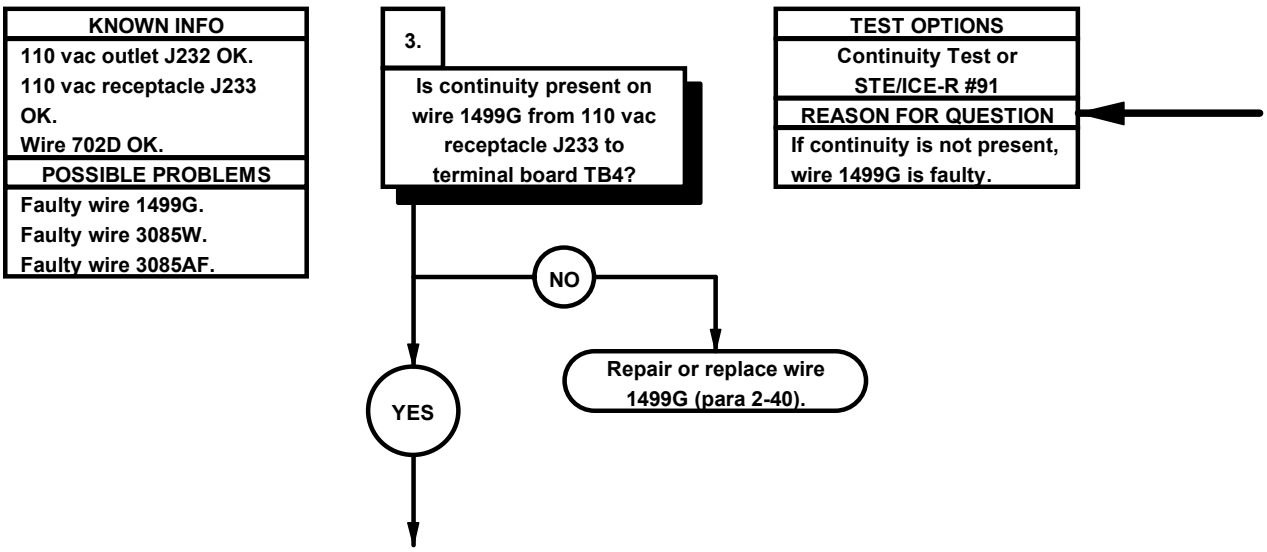


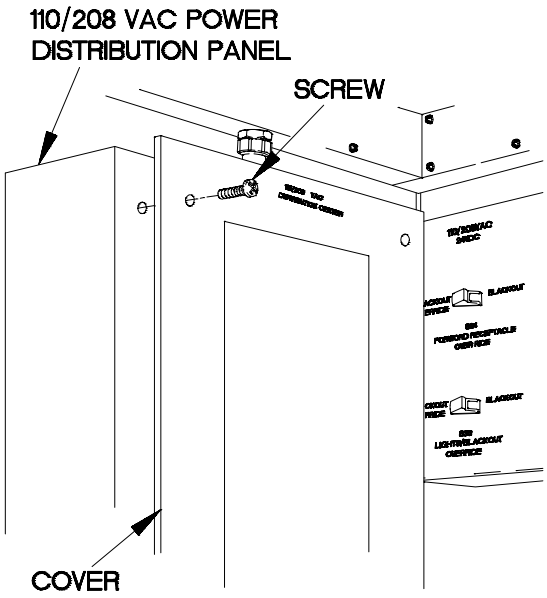
CONTINUITY TEST

(1) Remove screw and cover from 110 vac outlet J232.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to supply pole of 110 vac receptacle J232.
(4) Connect negative (-) probe of multimeter to supply pole of 110 vac receptacle J233 and note reading on multimeter.
(5) If continuity is not present, repair or replace wire 702D (para 2-40).
(6) Install cover on 110 vac outlet J232 with screw.



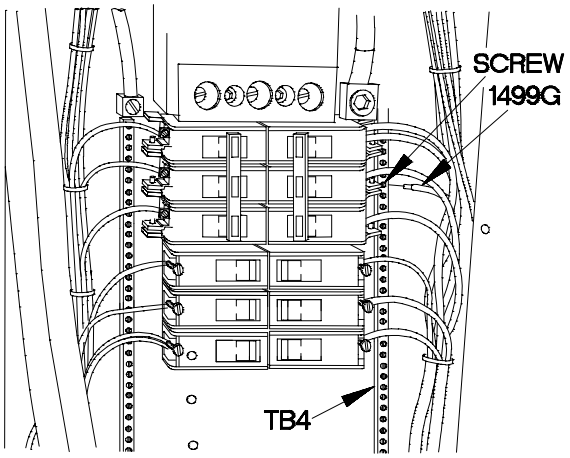
e105. M1079 110 VAC OULET J233 DOES NOT OPERATE (CONT)

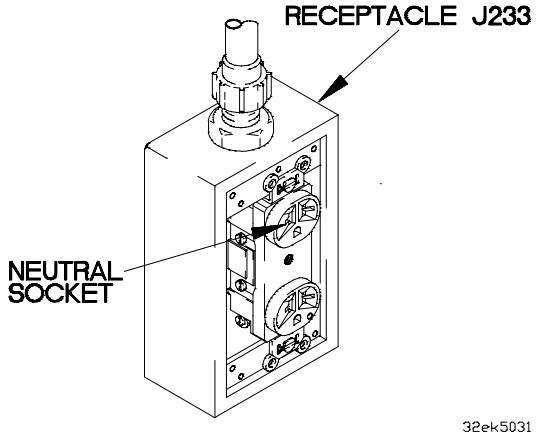




CONTINUITY TEST

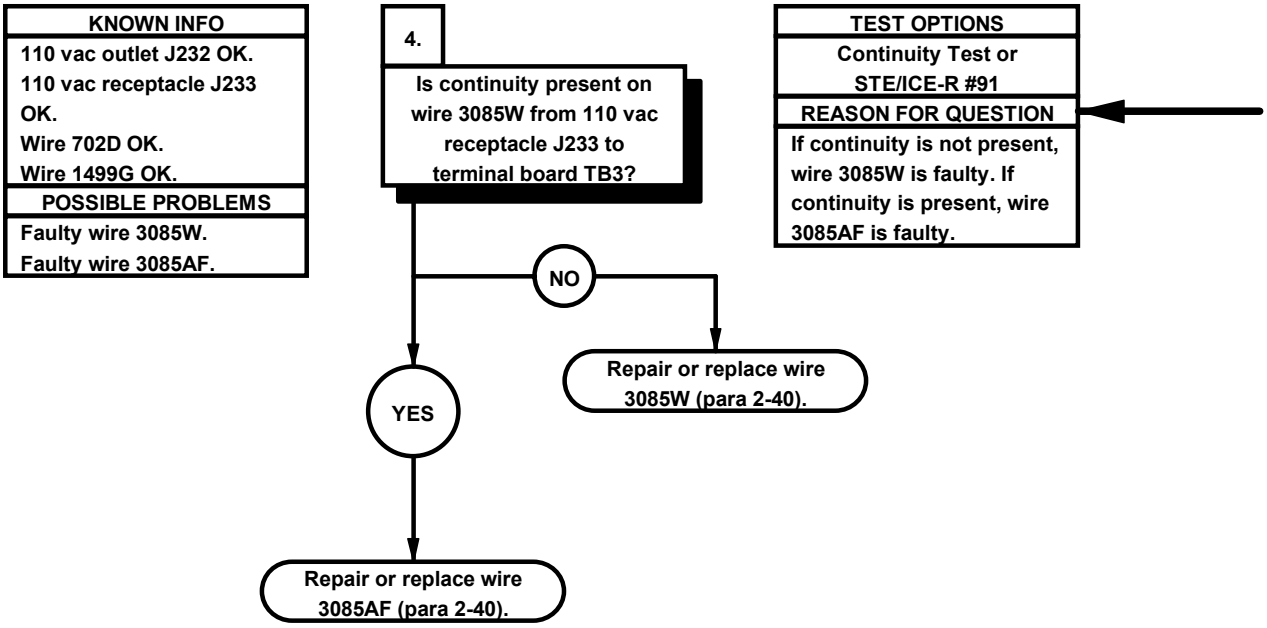
(1) Remove six screws and cover from 110/208 VAC POWER DISTRIBUTION PANEL.
(2) Loosen screw in terminal board TB4.
(3) Remove wire 1499G from terminal board TB4.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to wire 1499G.
(6) Connect negative (-) probe of multimeter to neutral socket of 110 vac receptacle J233 and note reading on multimeter.
(7) If continuity is not present, repair or replace wire 1499G (para 2-40).

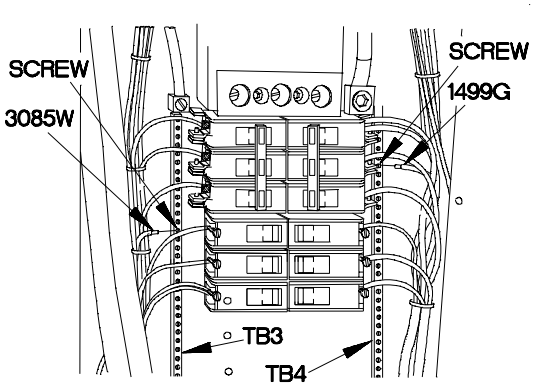


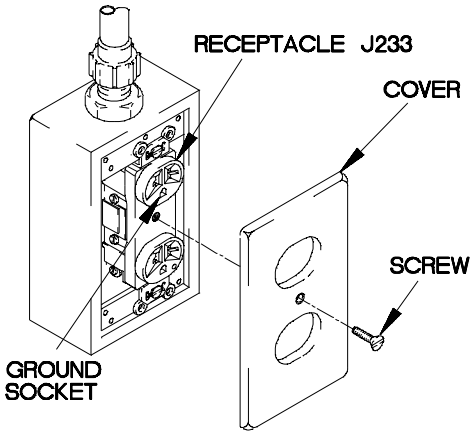


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e105. M1079 110 VAC OULET J233 DOES NOT OPERATE (CONT)

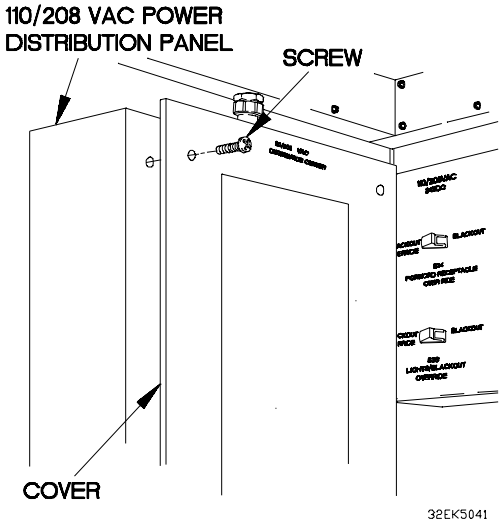






CONTINUITY TEST

(1) Loosen screw in terminal board TB3.
(2) Remove wire 3085W from terminal board TB3.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to wire 3085W.
(5) Connect negative (-) probe of multimeter to ground socket of 110 vac receptacle J233 and note multimeter.
(6) If continuity is not present, repair or replace wire 3085W (para 2-40).
(7) If continuity is present, repair or replace wire 3085AF (para 2-40).
(8) Install wire 3085W on terminal board TB3.
(9) Tighten screw in terminal board TB3.
(10) Install wire 1499G on terminal board TB4.
(11) Tighten screw in terminal board TB4.
(12) Install cover on 110/208 VAC POWER DISTRIBUTION PANEL with six screws.
(13) Install cover on 110 vac outlet J233 with screw.



e106. M1079 110 VAC OUTLET J234 DOES NOT OPERATE

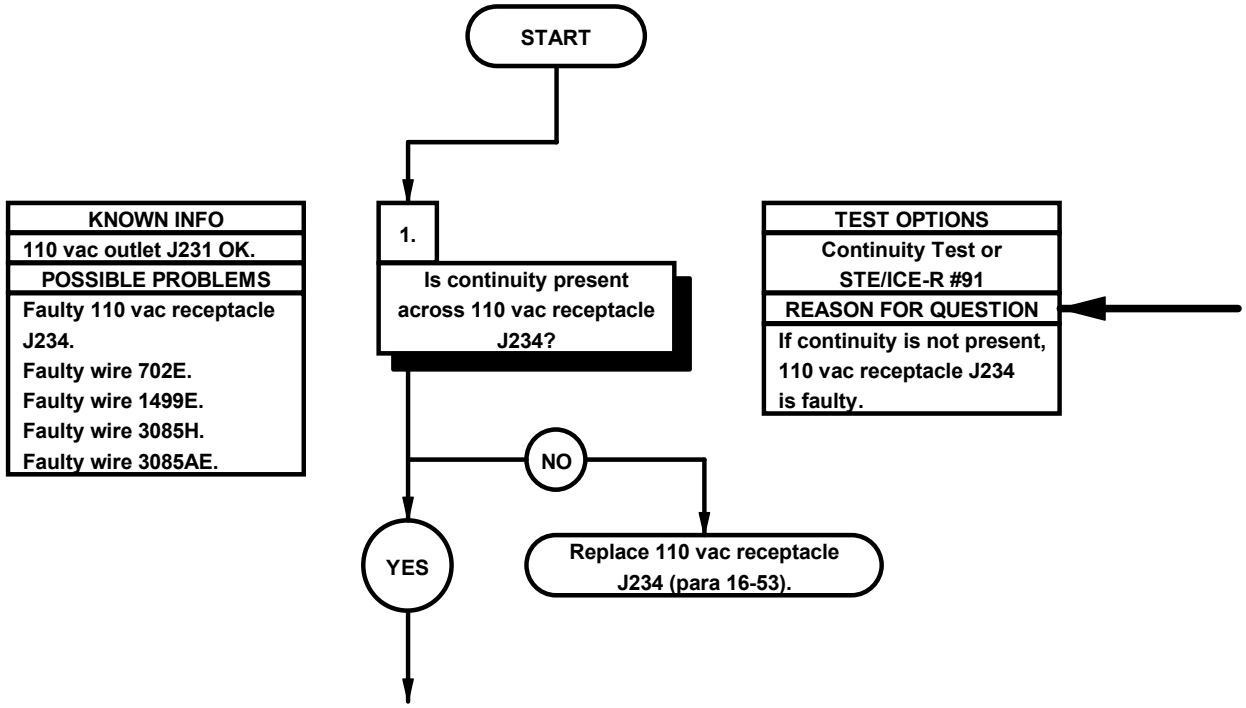
INITIAL SETUP

Equipment Condition
- Engine shut down (TM 9-2320-365-10).
- AC power disconnected (TM 9-2320-365-10).

Personnel Required
- (2)

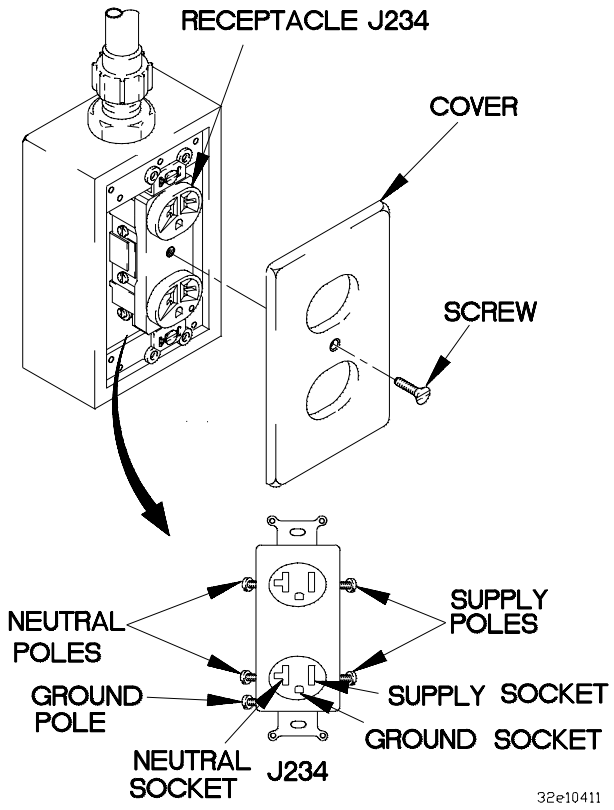
Tools and Special Tools
- Tool Kit, Genl Mech (Item 44, Appendix C)
- STE/ICE-R (Item 39, Appendix C)
- Multimeter, Digital (Item 22, Appendix C)

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

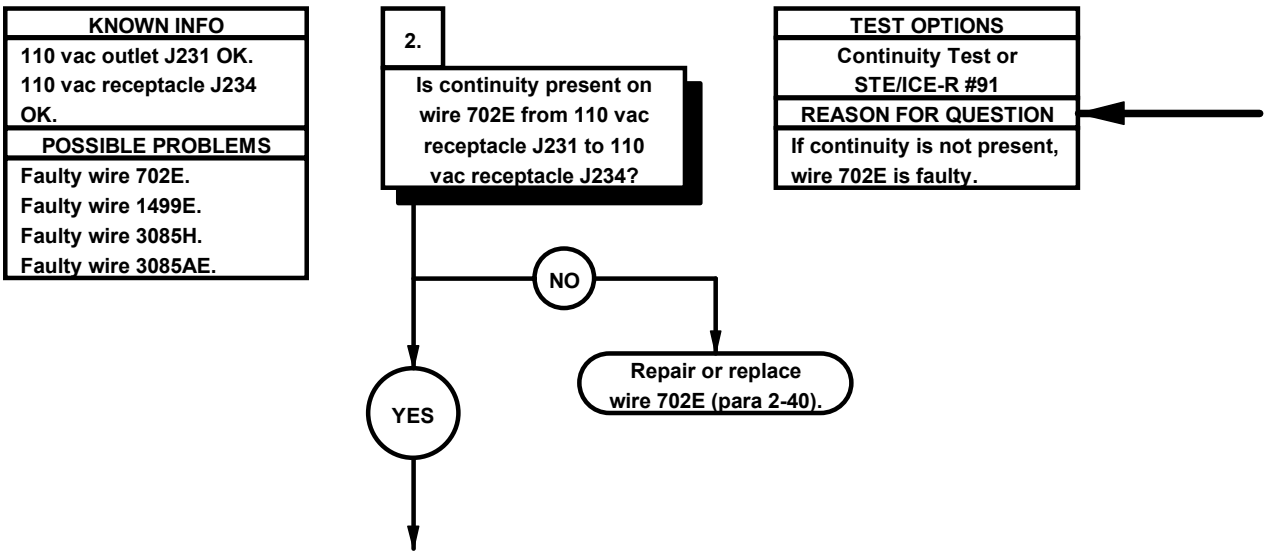


CONTINUITY TEST

(1) Remove screw and cover from 110 vac outlet J234.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to supply pole of 110 vac receptacle J234.
(4) Connect negative (-) probe of multimeter to supply socket of 110 vac receptacle J234 and note reading on multimeter.
(5) Connect positive (+) probe of multimeter to neutral pole of 110 vac receptacle J234.
(6) Connect negative (-) probe of multimeter to neutral socket of 110 vac receptacle J234 and note reading on multimeter.
(7) Connect positive (+) probe of multimeter to ground pole of 110 vac receptacle J234.
(8) Connect negative (-) probe of multimeter to ground socket of 110 vac receptacle J234 and note reading on multimeter.
(9) If continuity is not present in steps (4), (6), and (8), replace 110 vac receptacle J234 (para 16-53).

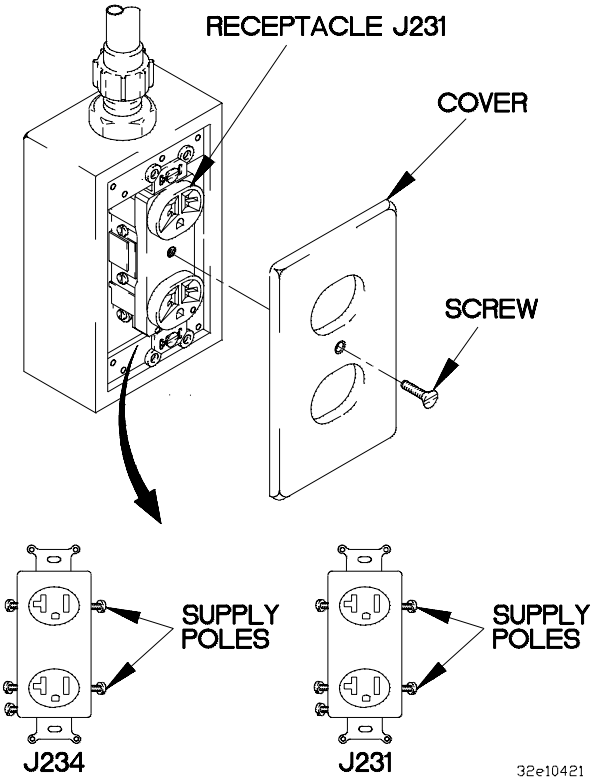


e106. M1079 110 VAC OULET J234 DOES NOT OPERATE (CONT)

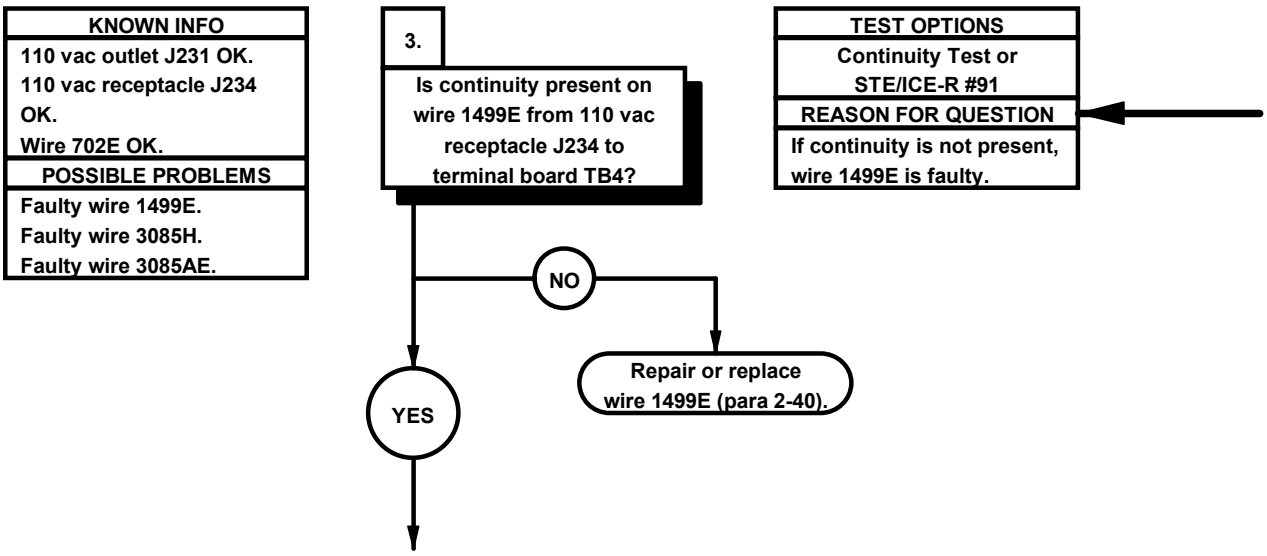


CONTINUITY TEST

(1) Remove screw and cover from 110 vac outlet J231.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to supply pole of 110 vac receptacle J231.
(4) Connect negative (-) probe of multimeter to supply pole of 110 vac receptacle J234 and note reading on multimeter.
(5) If continuity is not present, repair or replace wire 702E (para 2-40).
(6) Install cover on 110 vac outlet J231 with screw.

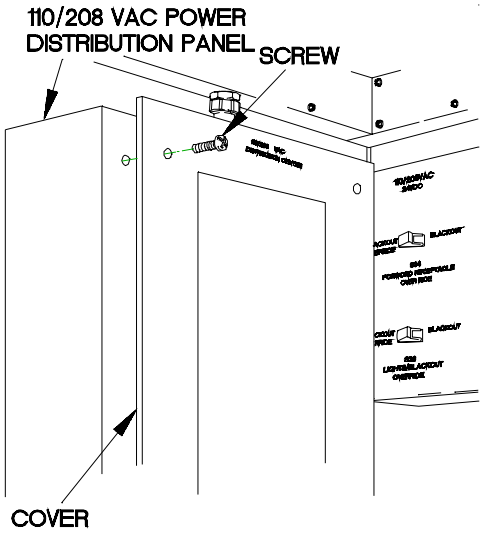


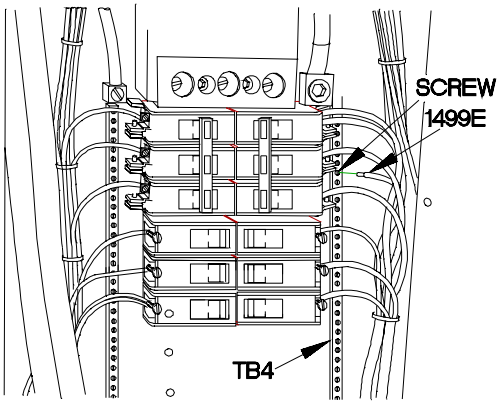
e106. M1079 110 VAC OULET J234 DOES NOT OPERATE (CONT)

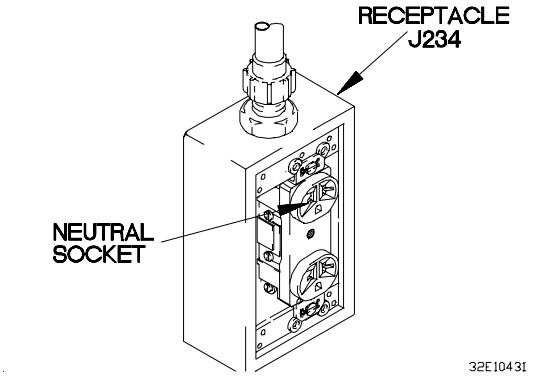


CONTINUITY TEST

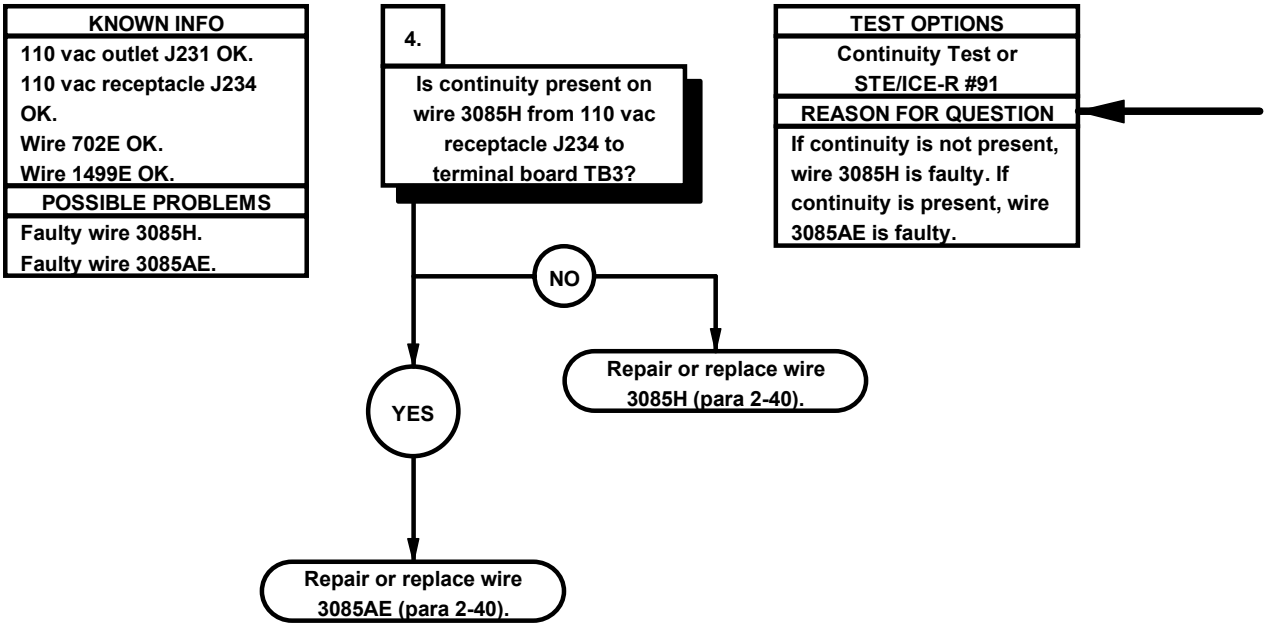
(1) Remove six screws and cover from 110/208 VAC POWER DISTRIBUTION PANEL.
(2) Loosen screw in terminal board TB4.
(3) Remove wire 1499E from terminal board TB4.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to wire 1499E.
(6) Connect negative (-) probe of multimeter to neutral socket of 110 vac receptacle J234 and note reading on multimeter.
(7) If continuity is not present, repair or replace wire 1499E (para 2-40).

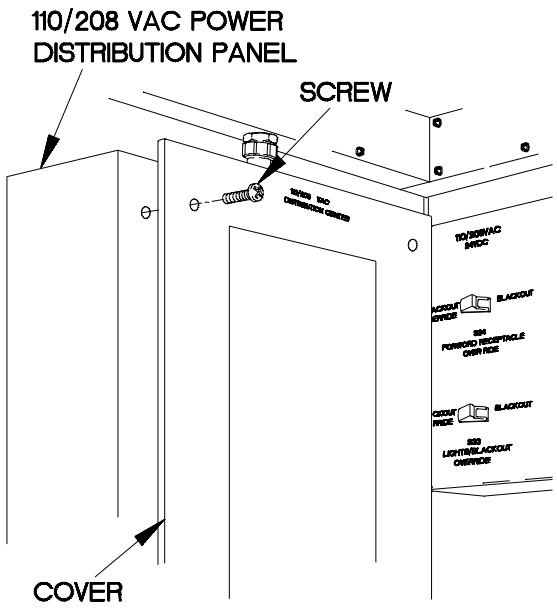






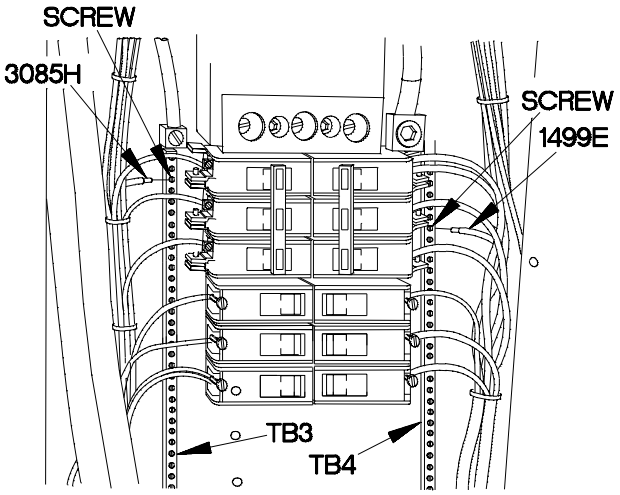
e106. M1079 110 VAC OULET J234 DOES NOT OPERATE (CONT)

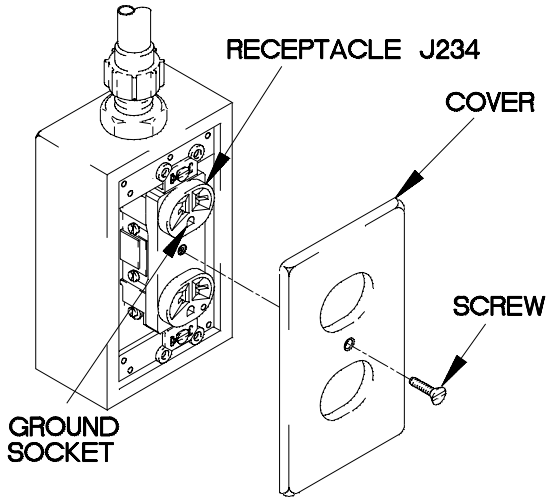




CONTINUITY TEST

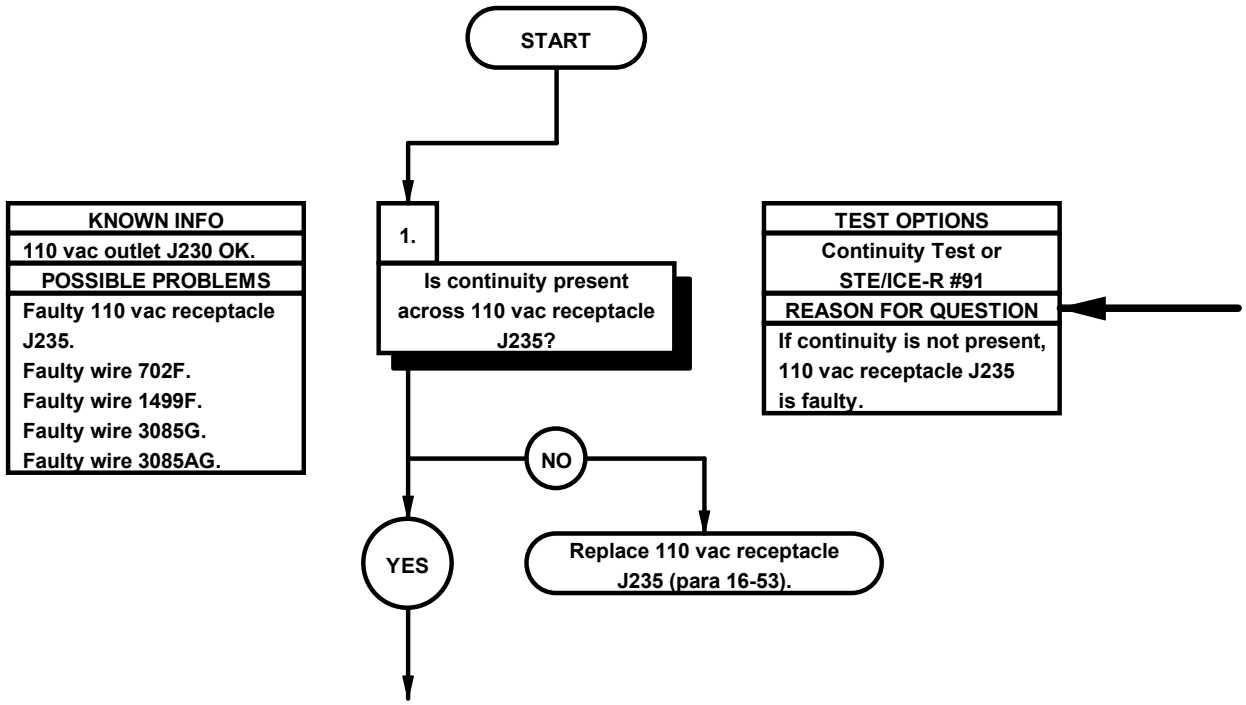
(1) Loosen screw in terminal board TB3.
(2) Remove wire 3085H from terminal board TB3.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to wire 3085H.
(5) Connect negative (-) probe of multimeter to ground socket of 110 vac receptacle J234 and note multimeter.
(6) If continuity is not present, repair or replace wire 3085H (para 2-40).
(7) If continuity is present, repair or replace wire 3085AE (para 2-40).
(8) Install wire 3085H on terminal board TB3.
(9) Tighten screw in terminal board TB3.
(10) Install wire 1499E on terminal board TB4.
(11) Tighten screw in terminal board TB4.
(12) Install cover on 110/208 VAC POWER DISTRIBUTION PANEL with six screws.
(13) Install cover on 110 vac outlet J234 with screw.





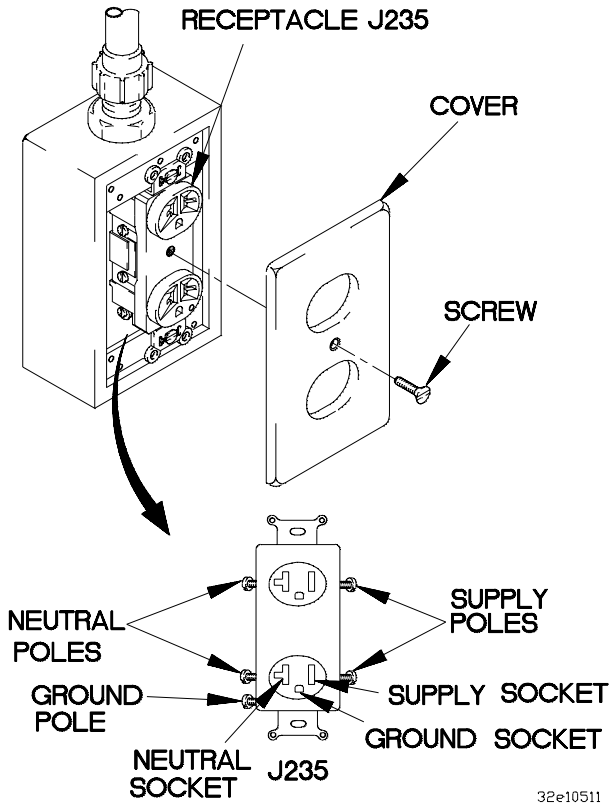
32e10441

e107. M1079 110 VAC OUTLET J235 DOES NOT OPERATE	
INITIAL SETUP	
Equipment Condition Engine shut down (TM 9-2320-365-10). AC power disconnected (TM 9-2320-365-10). **Personnel Required** (2)	**Tools and Special Tools** Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C) **References** TM 9-4910-571-12&P

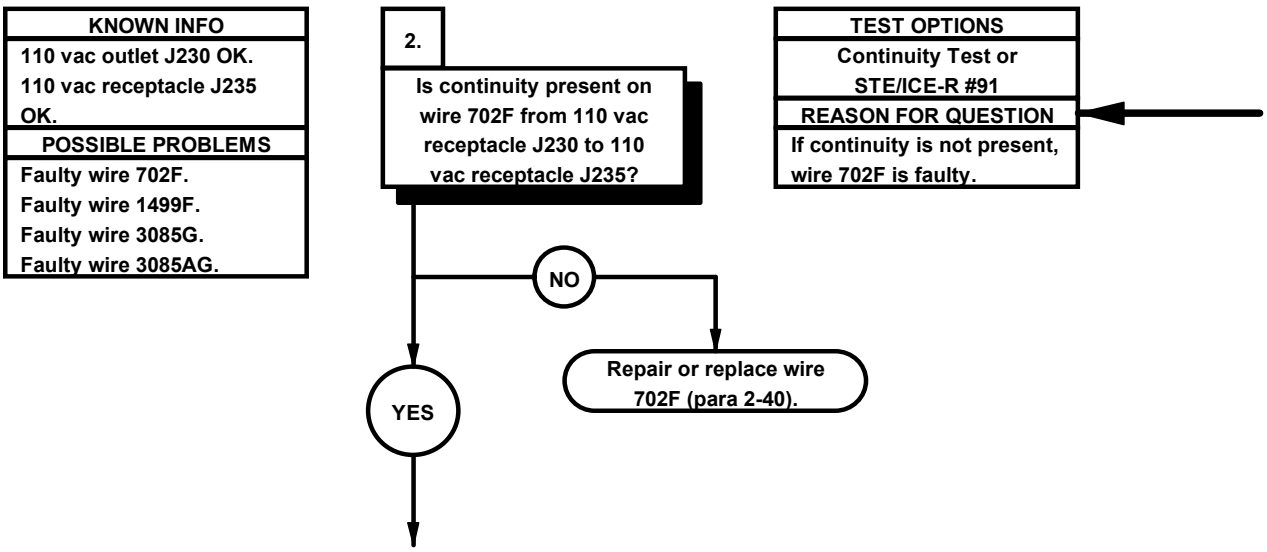


CONTINUITY TEST

(1) Remove screw and cover from 110 vac outlet J235.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to supply pole of 110 vac receptacle J235.
(4) Connect negative (-) probe of multimeter to supply socket of 110 vac receptacle J235 and note reading on multimeter.
(5) Connect positive (+) probe of multimeter to neutral pole of 110 vac receptacle J235.
(6) Connect negative (-) probe of multimeter to neutral socket of 110 vac receptacle J235 and note reading on multimeter.
(7) Connect positive (+) probe of multimeter to ground pole of 110 vac receptacle J235.
(8) Connect negative (-) probe of multimeter to ground socket of 110 vac receptacle J235 and note reading on multimeter.
(9) If continuity is not present in steps (4), (6), and (8), replace 110 vac receptacle J235 (para 16-53).

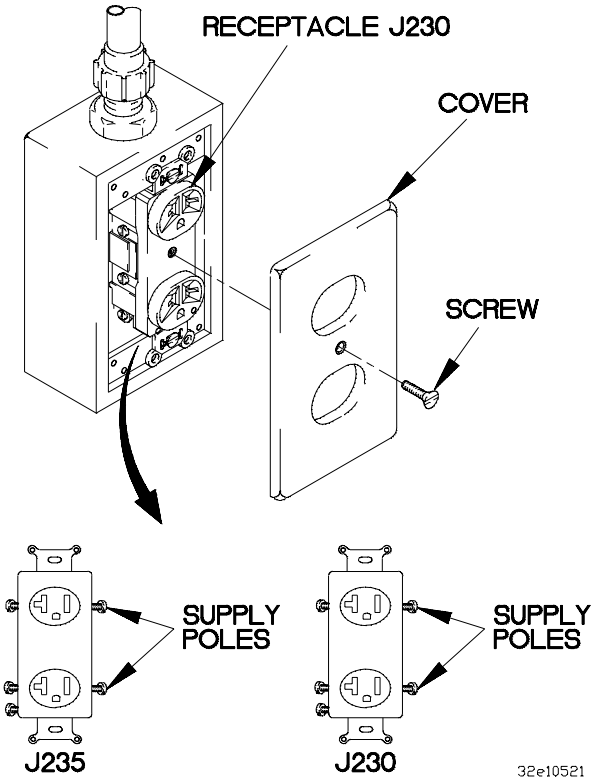


e107. M1079 110 VAC OULET J235 DOES NOT OPERATE (CONT)

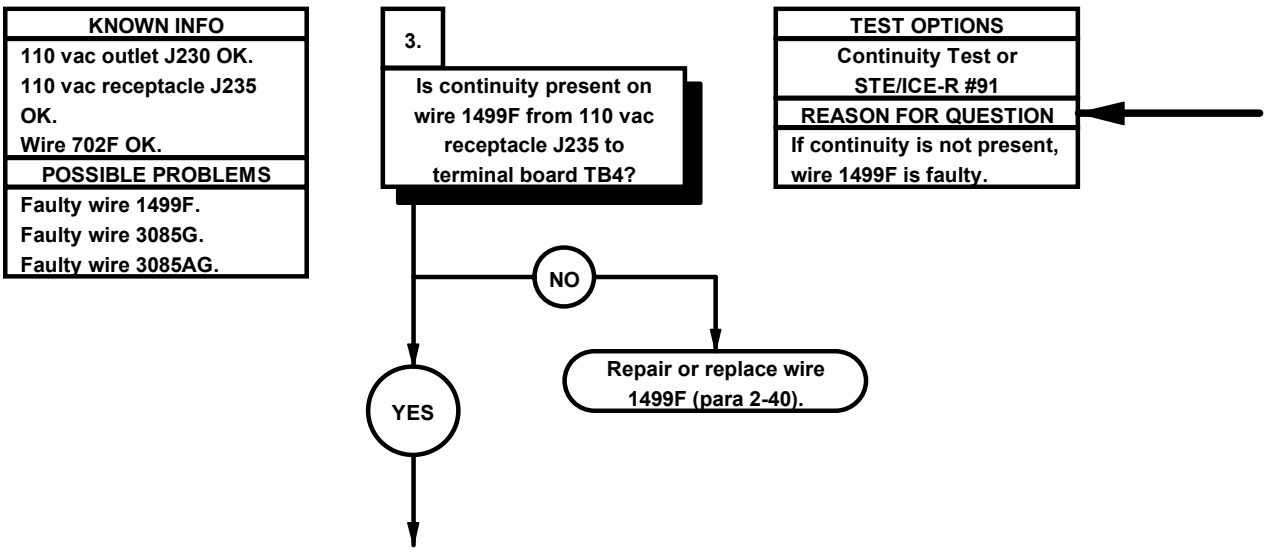


CONTINUITY TEST

(1) Remove screw and cover from 110 vac outlet J230.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to supply pole of 110 vac receptacle J230.
(4) Connect negative (-) probe of multimeter to supply pole of 110 vac receptacle J235 and note reading on multimeter.
(5) If continuity is not present, repair or replace wire 702F (para 2-40).
(6) Install cover on 110 vac outlet J230 with screw.

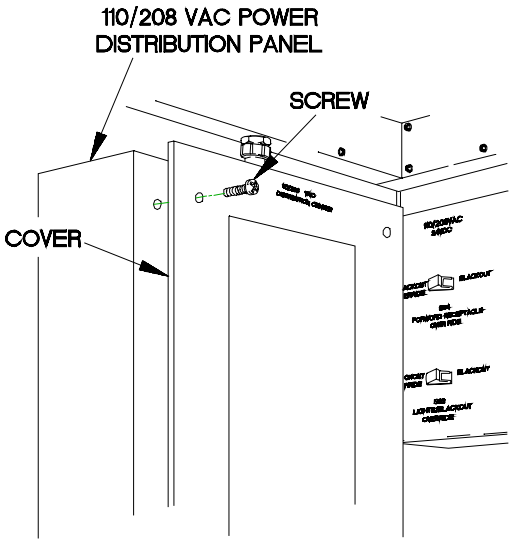


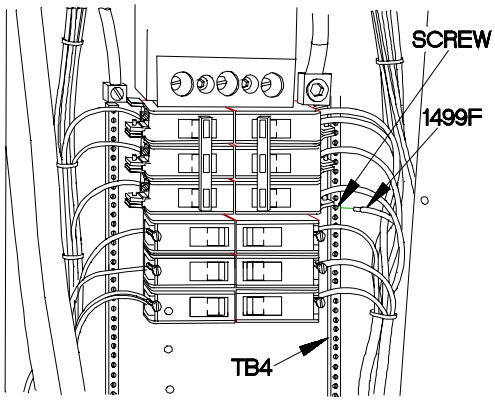
e107. M1079 110 VAC OULET J235 DOES NOT OPERATE (CONT)

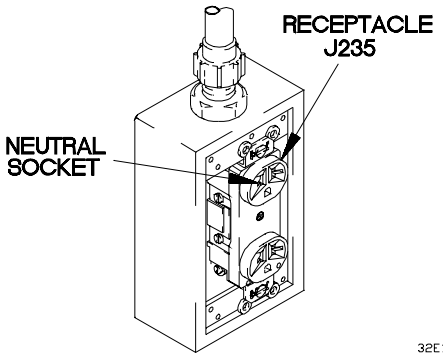


CONTINUITY TEST

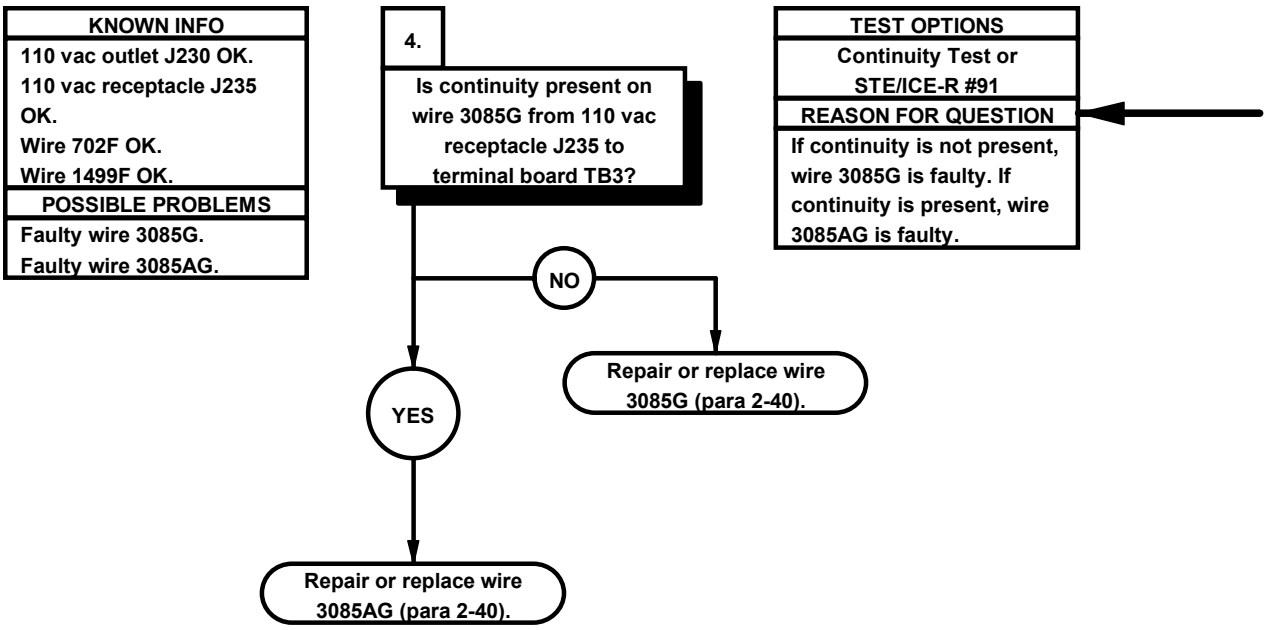
(1) Remove six screws and cover from 110/208 VAC POWER DISTRIBUTION PANEL.
(2) Loosen screw in terminal board TB4.
(3) Remove wire 1499F from terminal board TB4.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to wire 1499F.
(6) Connect negative (-) probe of multimeter to neutral socket of 110 vac receptacle J235 and note reading on multimeter.
(7) If continuity is not present, repair or replace wire 1499F (para 2-40).

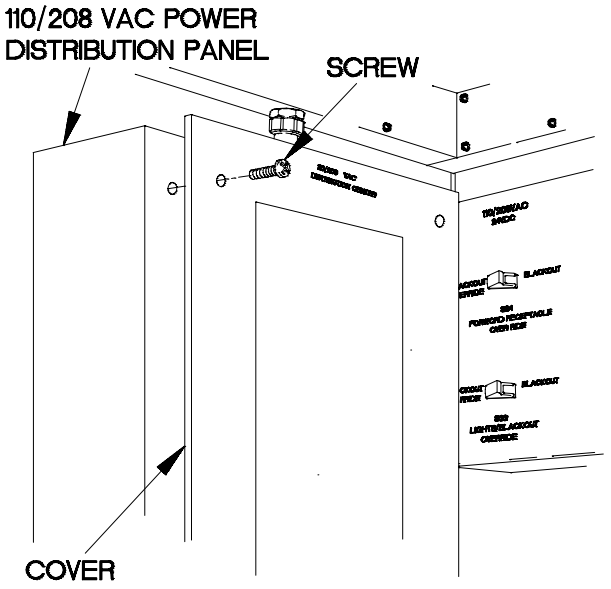


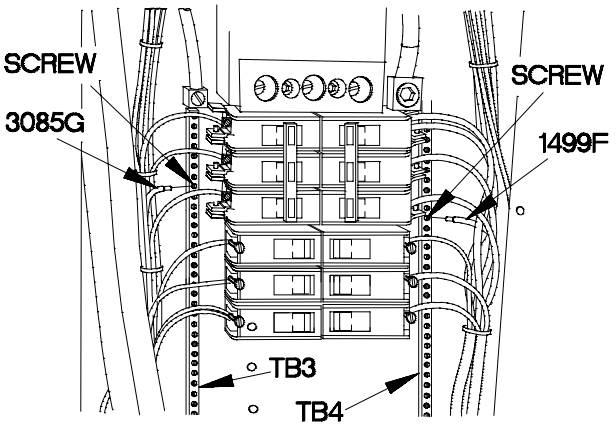




e107. M1079 110 VAC OULET J235 DOES NOT OPERATE (CONT)

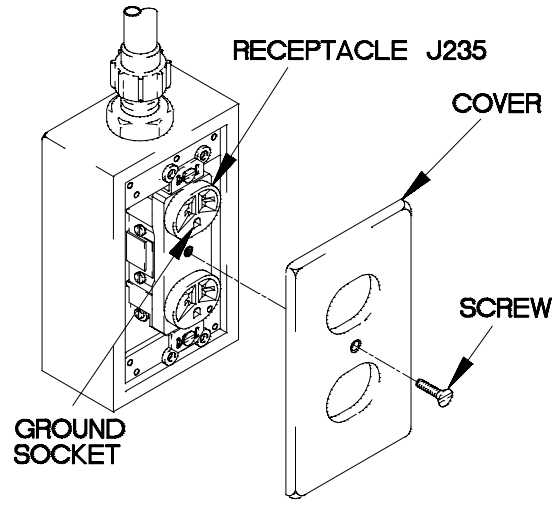






CONTINUITY TEST

(1) Loosen screw in terminal board TB3.
(2) Remove wire 3085G from terminal board TB3.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to wire 3085G.
(5) Connect negative (-) probe of multimeter to ground socket of 110 vac receptacle J235 and note multimeter.
(6) If continuity is not present, repair or replace wire 3085G (para 2-40).
(7) If continuity is present, repair or replace wire 3085AG (para 2-40).
(8) Position wire 3085G on terminal board TB3.
(9) Tighten screw in terminal board TB3.
(10) Position wire 1499F on terminal board TB4.
(11) Tighten screw in terminal board TB4.
(12) Install cover on 110/208 VAC POWER DISTRIBUTION PANEL with six screws.
(13) Install cover on 110 vac outlet J235 with screw.



32ek5041

e108. M1079 110 VDC OUTLET J232 DOES NOT OPERATE IN NORMAL MODE

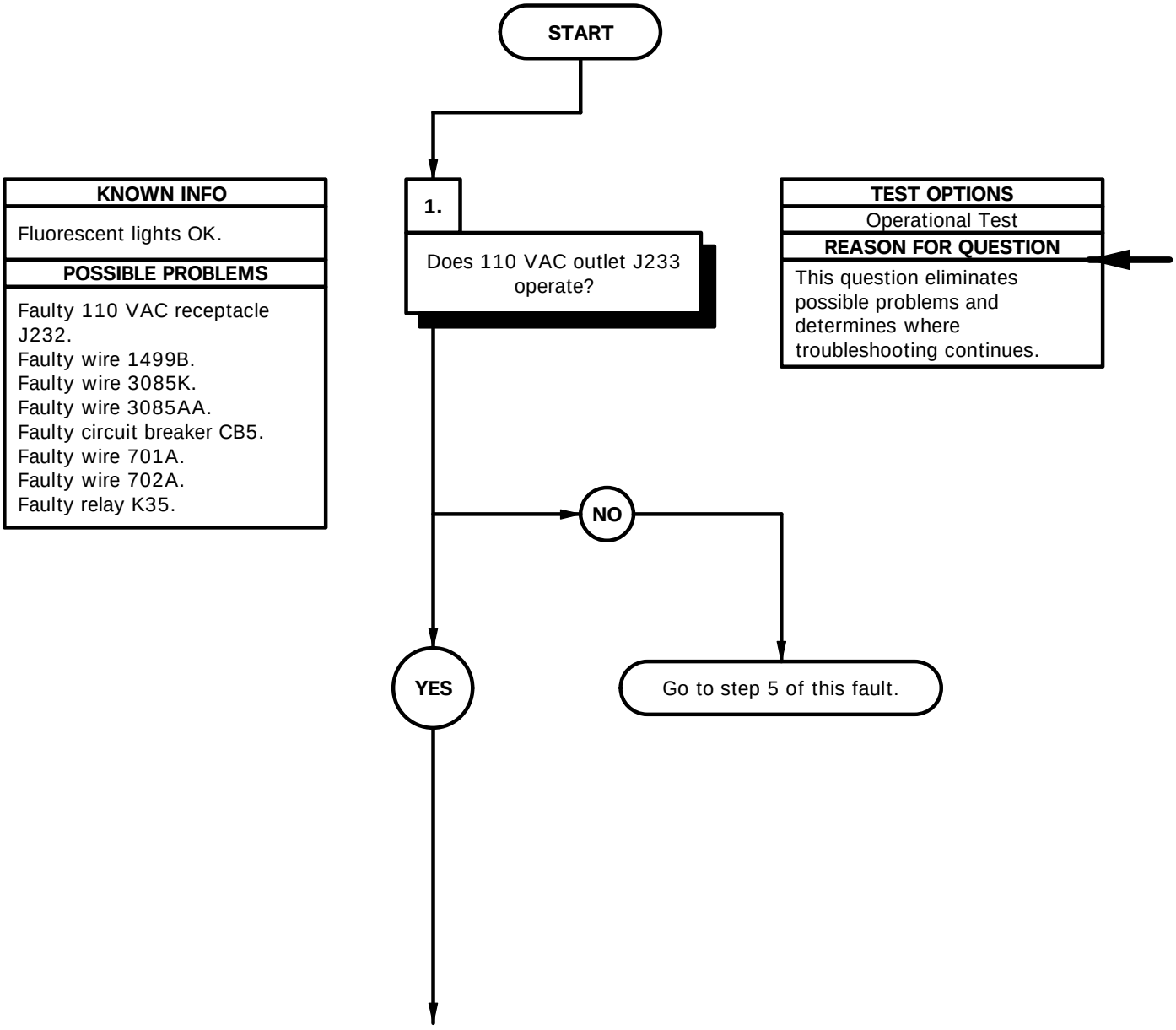
INITIAL SETUP

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

Personnel Required
(2)

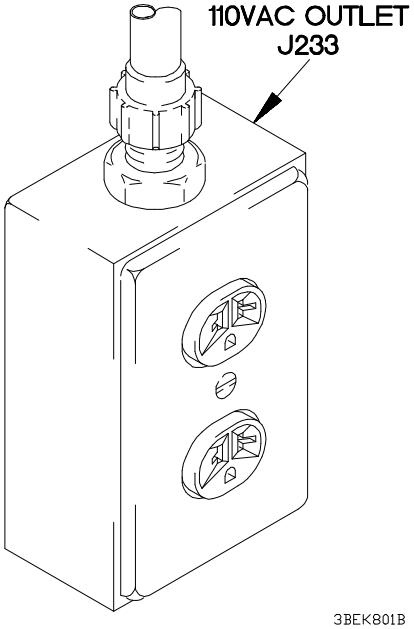
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

References
TM 9-4910-571-12&P



OPERATIONAL TEST

(1) Connect any 110 VAC appliance to 110 VAC outlet J233 and check for operation.
(2) If 110 VAC outlet J233 does not operate, go to step 5 of this fault.
(3) Disconnect 110 VAC appliance from 110 VAC outlet J233.



e108. M1079 110 VAC OUTLET J232 DOES NOT OPERATE IN NORMAL MODE (CONT)

KNOWN INFO

Fluorescent lights OK.
110 VAC outlet J233 OK.

POSSIBLE PROBLEMS

Faulty 110 VAC receptacle J232.
Faulty wire 1499B.
Faulty wire 3085K.
Faulty wire 3085AA.

2.

Is continuity present across 110 VAC receptacle J232?

TEST OPTIONS

Continuity Test or
STE/ICE-R Test #91

REASON FOR QUESTION

If continuity is not present, 110 VAC receptacle J232 is faulty.

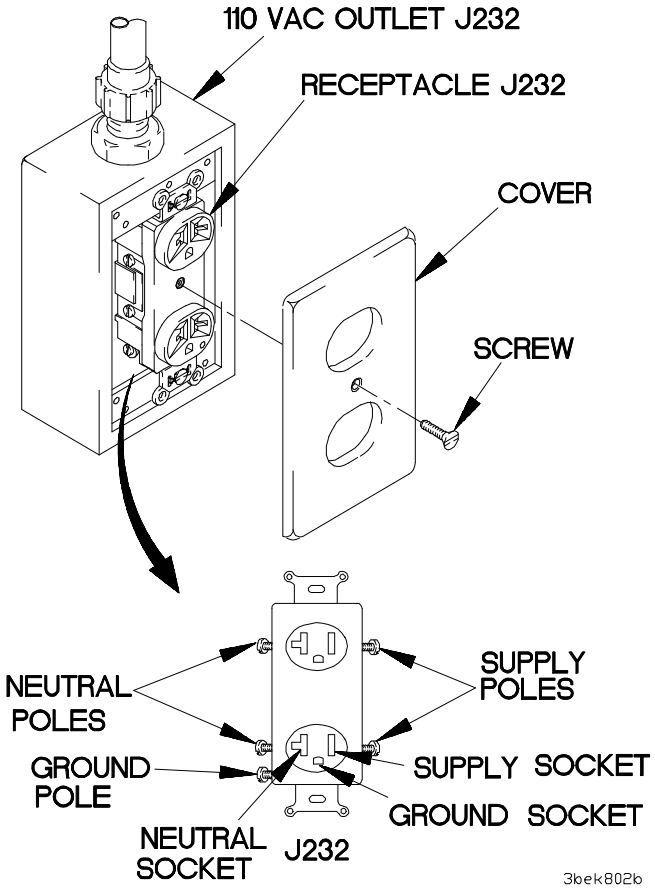
NO

YES

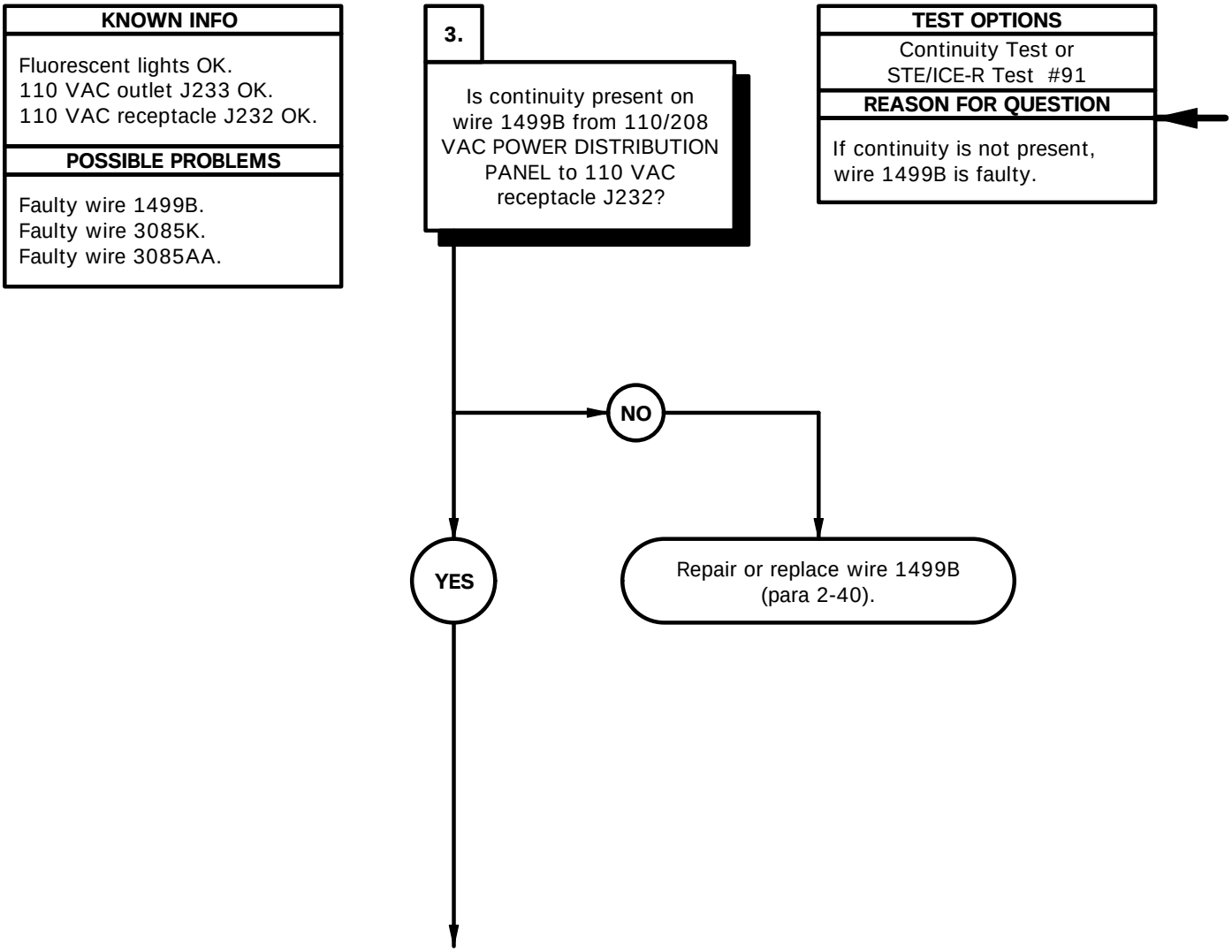
Replace 110 VAC receptacle J232 (para 16-53).

CONTINUITY TEST

(1) Open door on 110/208 VAC POWER DISTRIBUTION PANEL (TM 9-2320-365-10).
(2) Position circuit breaker CB1 to OFF (TM 9-2320-365-10).
(3) Remove screw and cover from 110 VAC outlet J232.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to supply pole of 110 VAC receptacle J232.
(6) Connect negative (-) probe of multimeter to supply socket of 110 VAC receptacle J232 and note reading on multimeter.
(7) Connect positive (+) probe of multimeter to neutral pole of 110 VAC receptacle J232.
(8) Connect negative (-) probe of multimeter to neutral socket of 110 VAC receptacle J232 and note reading on multimeter.
(9) Connect positive (+) probe of multimeter to ground pole of 110 VAC receptacle J232.
(10) Connect negative (-) probe of multimeter to ground socket of 110 VAC receptacle J232 and note reading on multimeter.
(11) If continuity is not present in steps (6), (8), and (10), replace 110 VAC receptacle J232 (para 16-53).

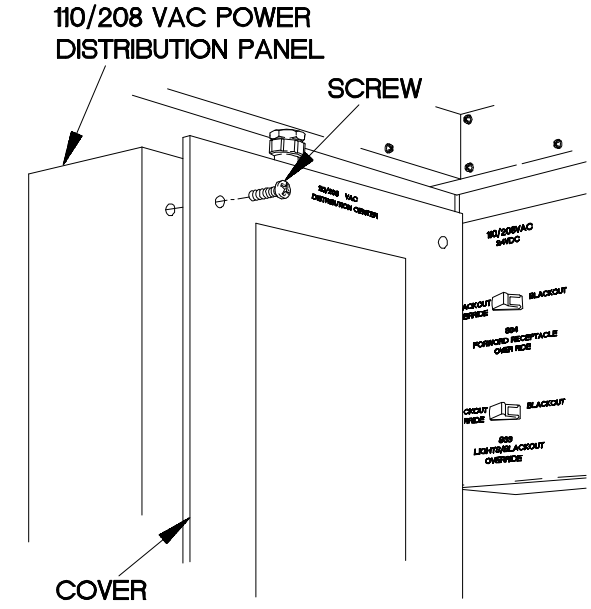


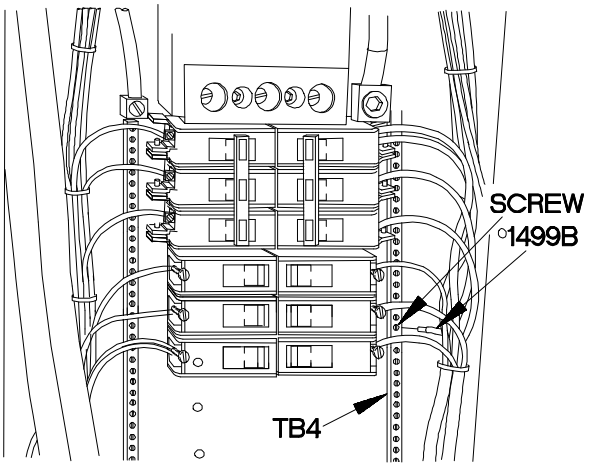
e108. M1079 110 VAC OUTLET J232 DOES NOT OPERATE IN NORMAL MODE (CONT)

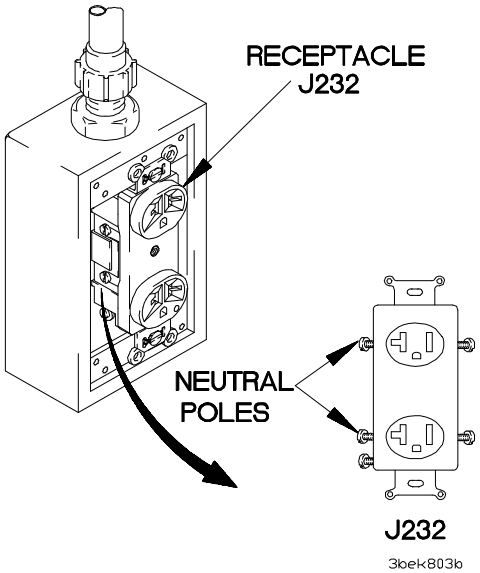


CONTINUITY TEST

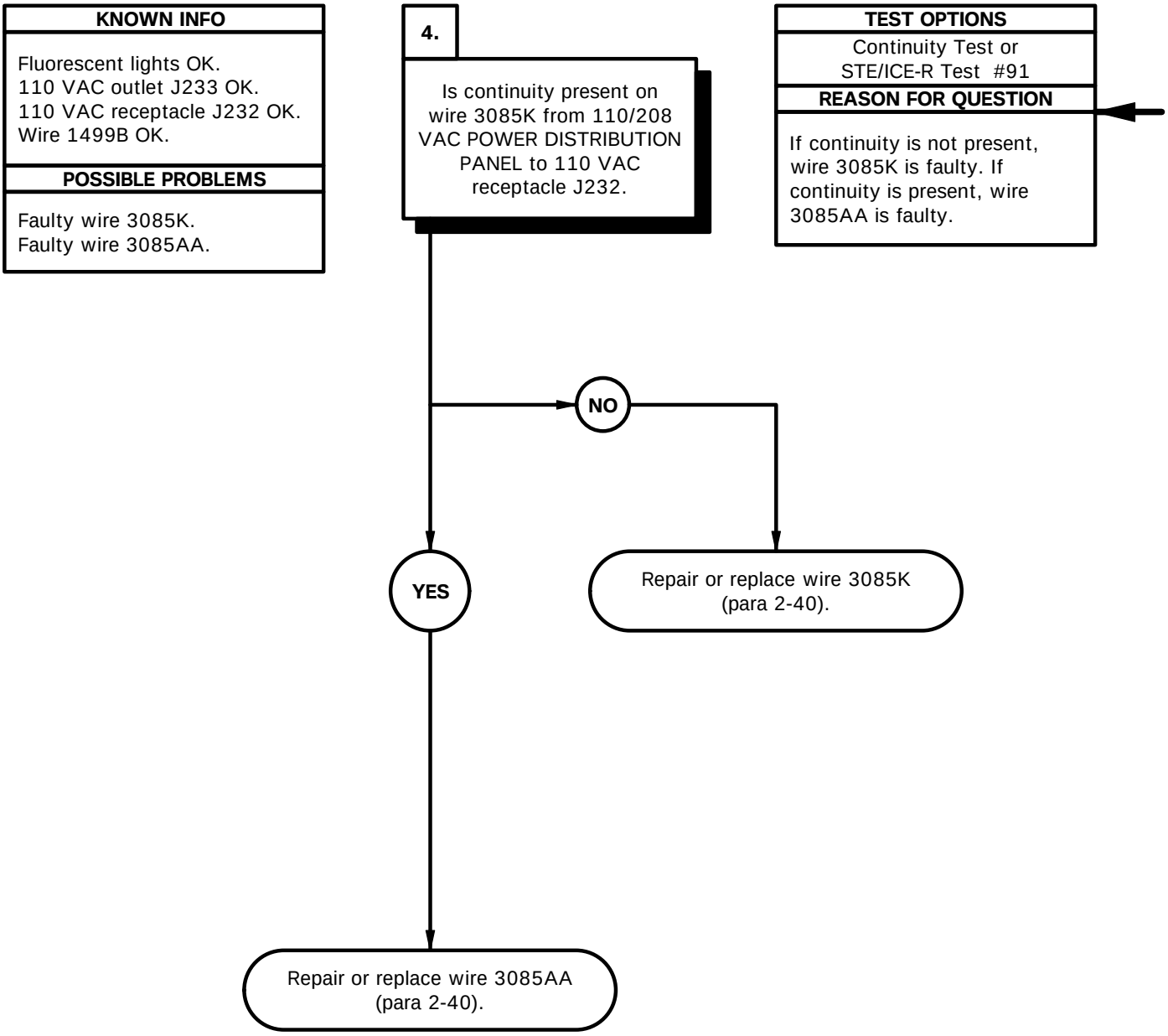
(1) Disconnect AC power (TM 9-2320-365-10).
(2) Remove six screws and cover from 110/208 VAC POWER DISTRIBUTION PANEL.
(3) Loosen screw in terminal board TB4.
(4) Remove wire 1499B from terminal board TB4.
(5) Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter to wire 1499B.
(7) Connect negative (-) probe of multimeter to neutral pole of 110 VAC receptacle J232 and note reading on multimeter.
(8) If continuity is not present, repair or replace wire 1499B (para 2-40).





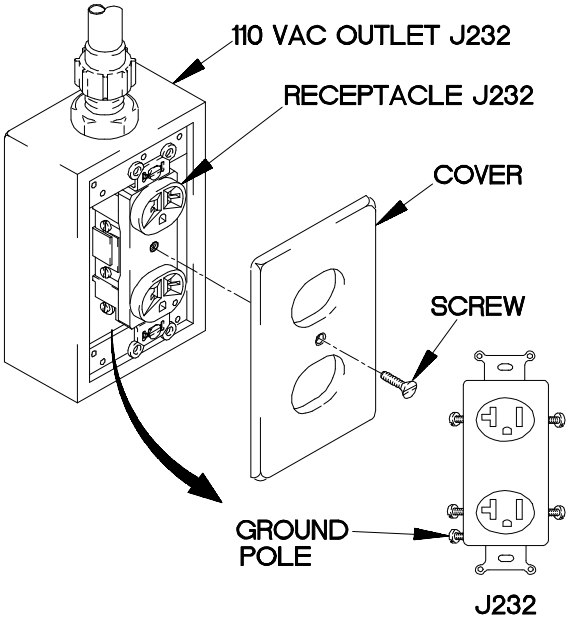


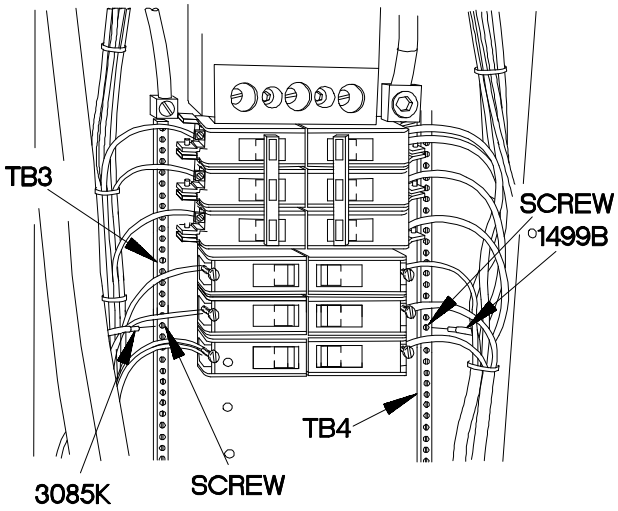
e108. M1079 110 VAC OUTLET J232 DOES NOT OPERATE IN NORMAL MODE (CONT)

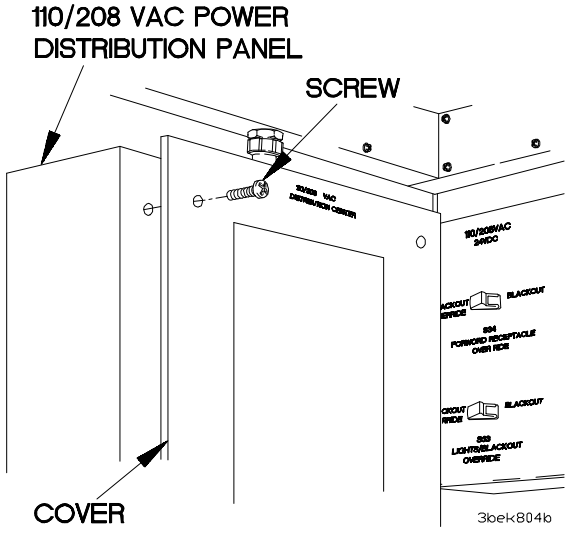


CONTINUITY TEST

(1) Loosen screw in terminal board TB3.
(2) Remove wire 3085K from terminal board TB3.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to wire 3085K.
(5) Connect negative (-) probe of multimeter to ground pole of 110 VAC receptacle J232 and note reading on multimeter.
(6) If continuity is not present, repair or replace wire 3085K (para 2-40).
(7) If continuity is present, repair or replace wire 3085AA (para 2-40).
(8) Position wire 3085K on terminal board TB3.
(9) Tighten screw in terminal board TB3.
(10) Position wire 1499B on terminal board TB4.
(11) Tighten screw in terminal board TB4.
(12) Install cover on 110/208 VAC POWER DISTRIBUTION PANEL with six screws.
(13) Install cover on 110 VAC outlet J232 with screw.
(14) Connect AC power (TM 9-2320-365-10).
(15) Position circuit breaker CB1 to ON (TM 9-2320-365-10).







e108. M1079 110 VAC OUTLET J232 DOES NOT OPERATE IN NORMAL MODE (CONT)

KNOWN INFO

Fluorescent lights OK.

POSSIBLE PROBLEMS

Faulty circuit breaker CB5.
Faulty wire 701A.
Faulty wire 702A.
Faulty relay K35.

5. Is continuity present across circuit breaker CB5?

TEST OPTIONS

Continuity Test or
STE/ICE-R Test #91

REASON FOR QUESTION

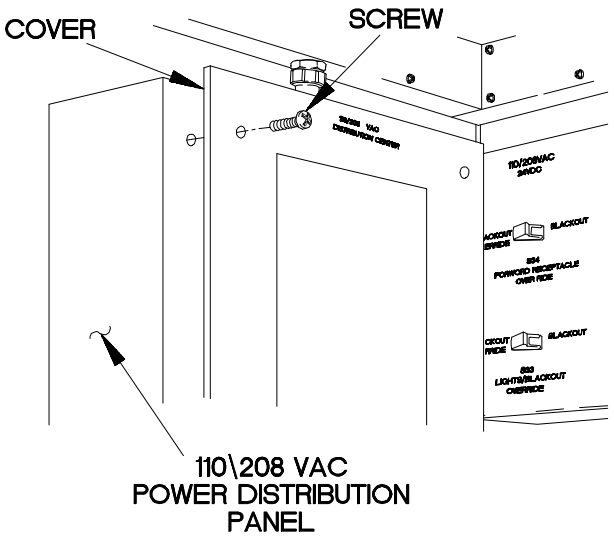
If continuity is not present, circuit breaker CB5 is faulty.

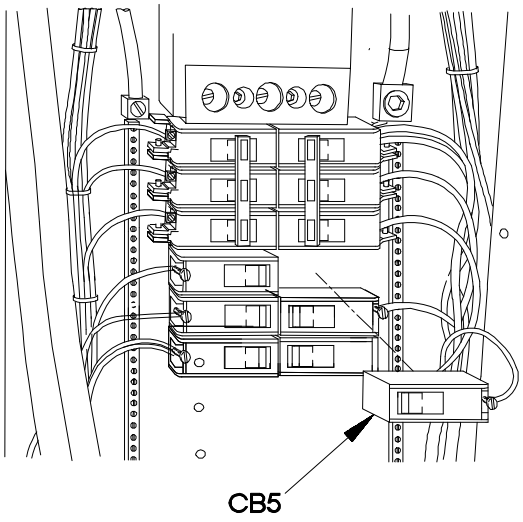
NO → Replace circuit breaker CB5 (para 16-64).

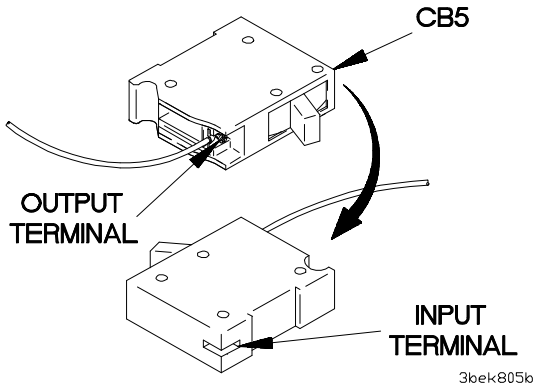
YES

CONTINUITY TEST

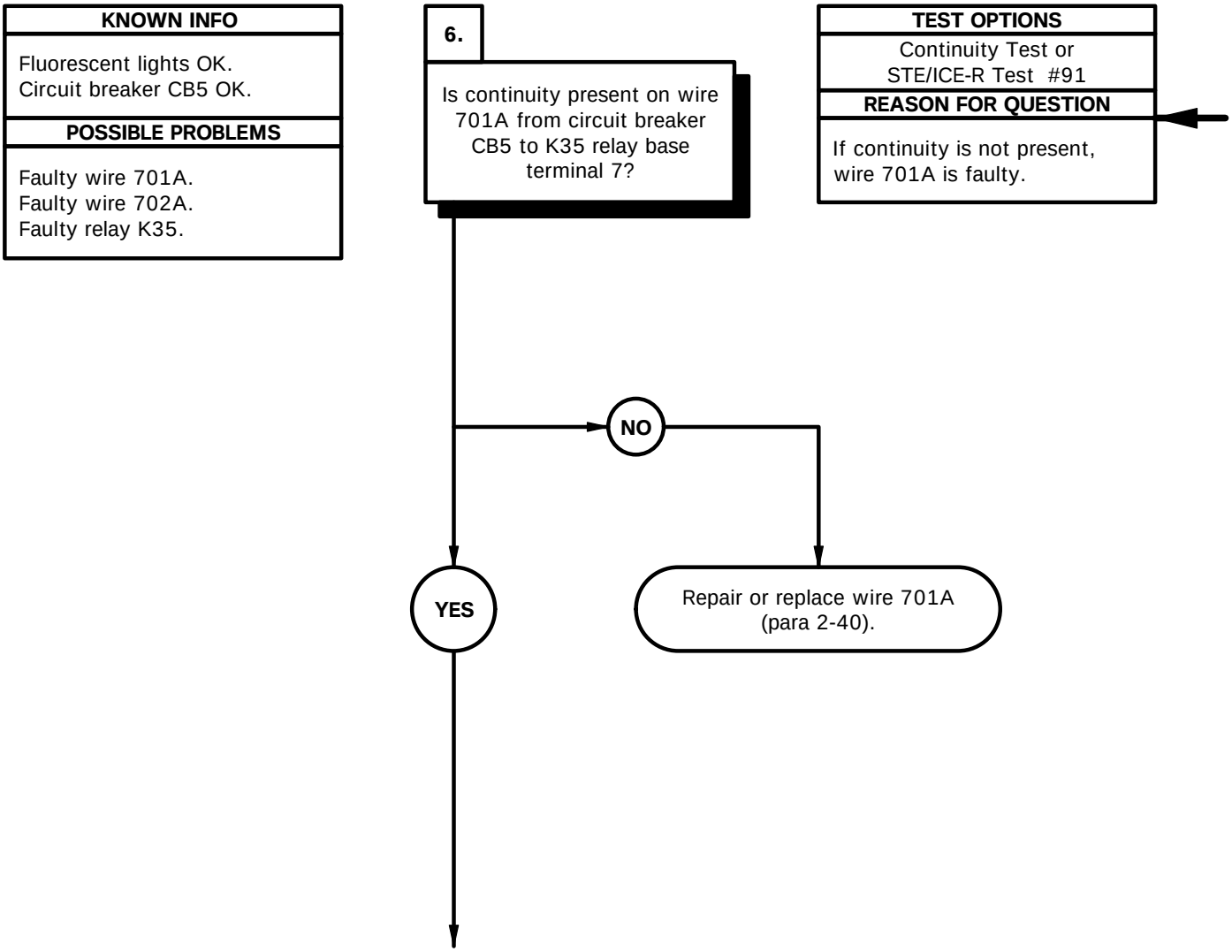
(1) Disconnect AC power (TM 9-2320-365-10).
(2) Remove six screws and cover from 110/208 VAC POWER DISTRIBUTION PANEL.
(3) Remove circuit breaker CB5 from 110/208 VAC POWER DISTRIBUTION PANEL.
(4) Position circuit breaker CB5 to ON (TM 9-2320-365-10).
(5) Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter to output terminal of circuit breaker CB5.
(7) Connect negative (-) probe of multimeter to input terminal of circuit breaker CB5 and note reading on multimeter.
(8) If continuity is not present, replace circuit breaker CB5 (para 16-64).
(9) Install circuit breaker CB5 on 110/208 VAC POWER DISTRIBUTION PANEL.





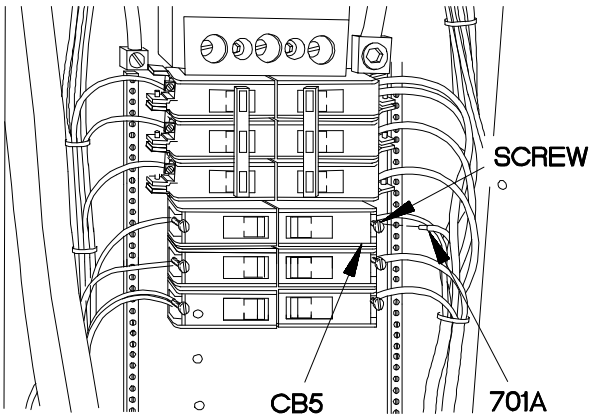


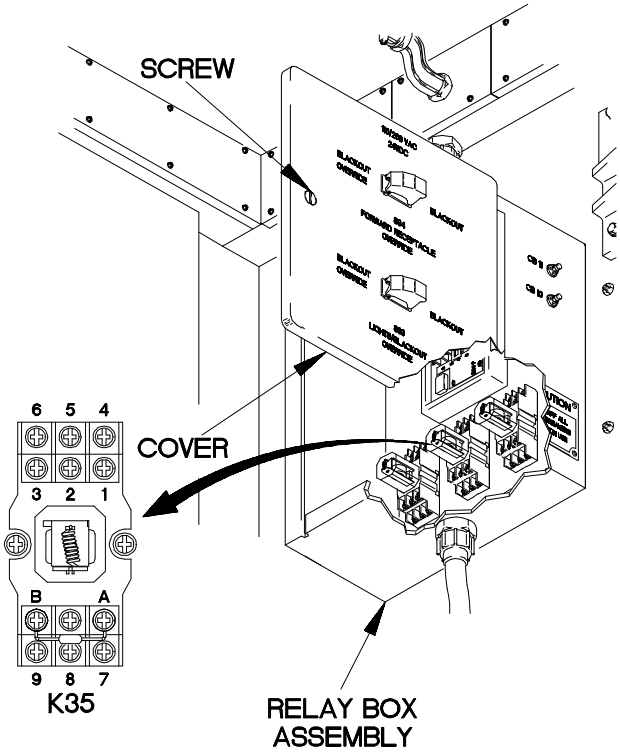
e108. M1079 110 VAC OUTLET J232 DOES NOT OPERATE IN NORMAL MODE (CONT)

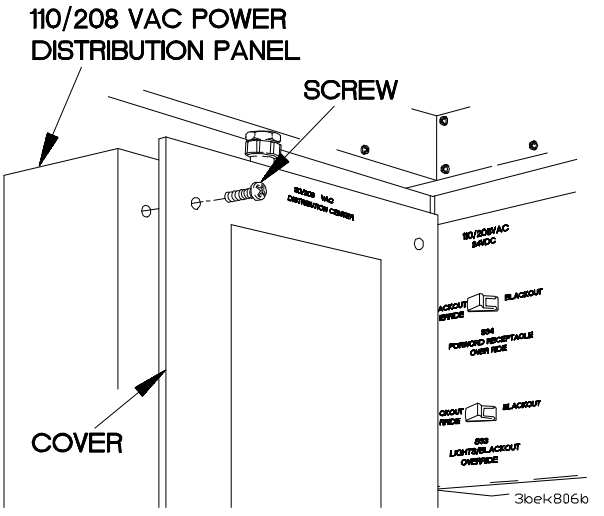


CONTINUITY TEST

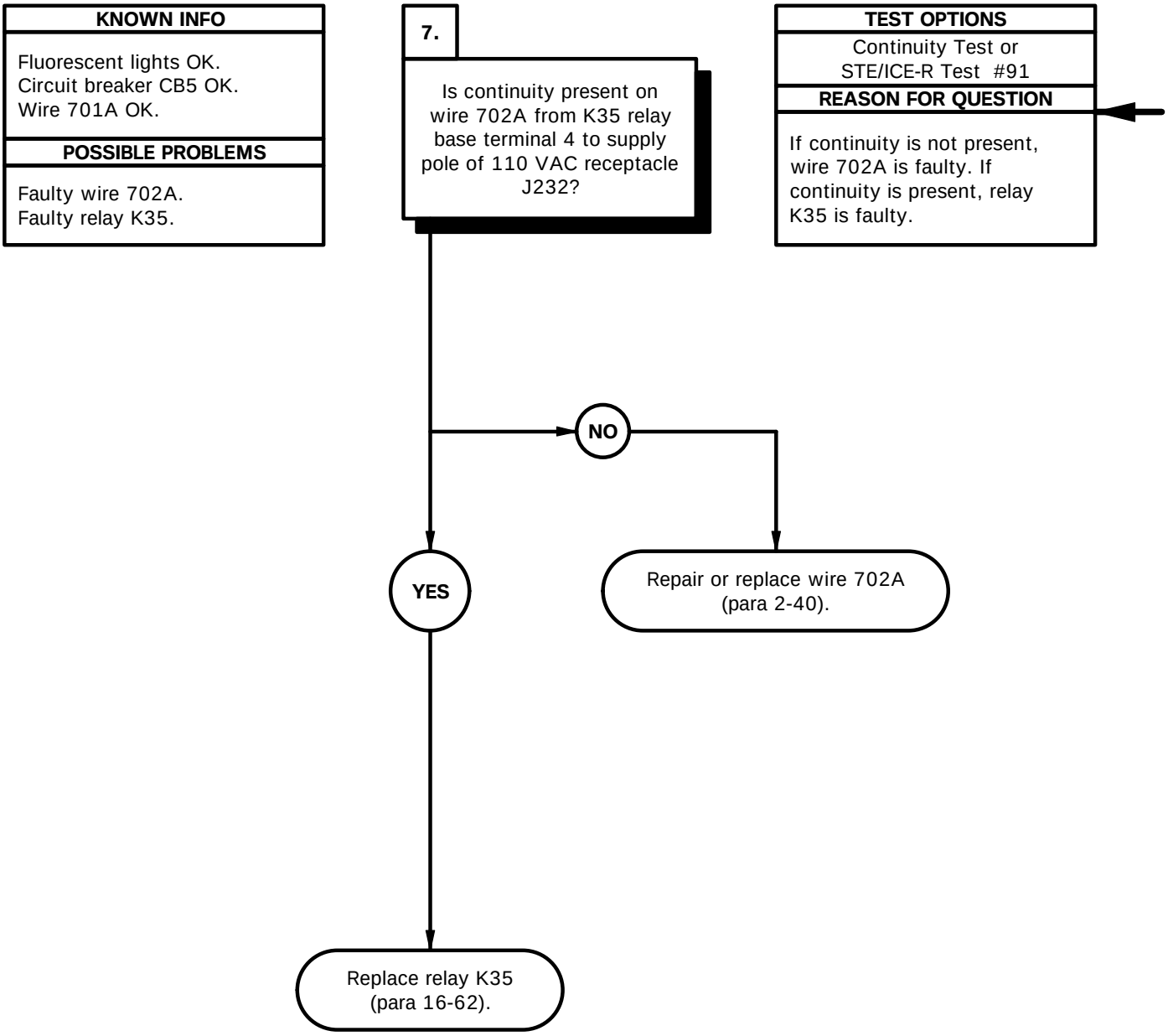
(1) Loosen screw in circuit breaker CB5.
(2) Remove wire 701A from circuit breaker CB5.
(3) Loosen screw in cover.
(4) Open cover on relay box assembly.
(5) Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter to wire 701A.
(7) Connect negative (-) probe of multimeter to K35 relay base terminal 7 and note reading on multimeter.
(8) If continuity is not present, repair or replace wire 701A (para 2-40).
(9) Position wire 701A in circuit breaker CB5.
(10) Tighten screw in circuit breaker CB5.
(11) Install cover on 110/208 VAC POWER DISTRIBUTION PANEL with six screws.





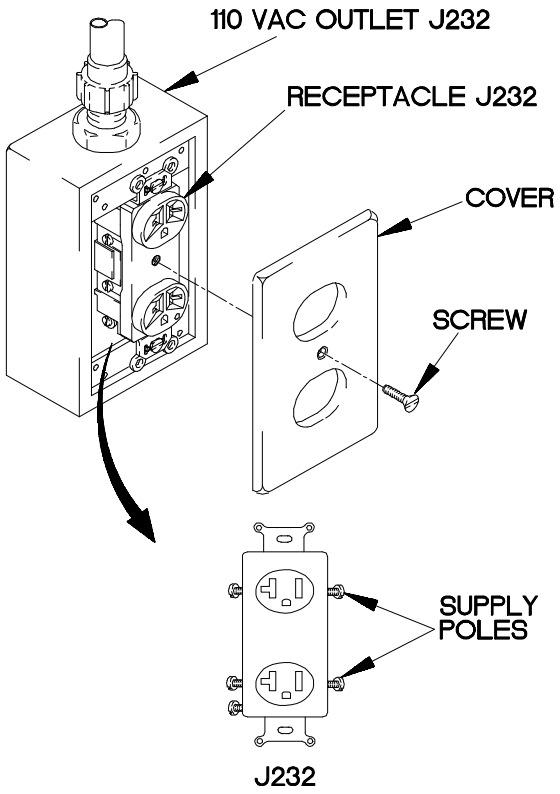


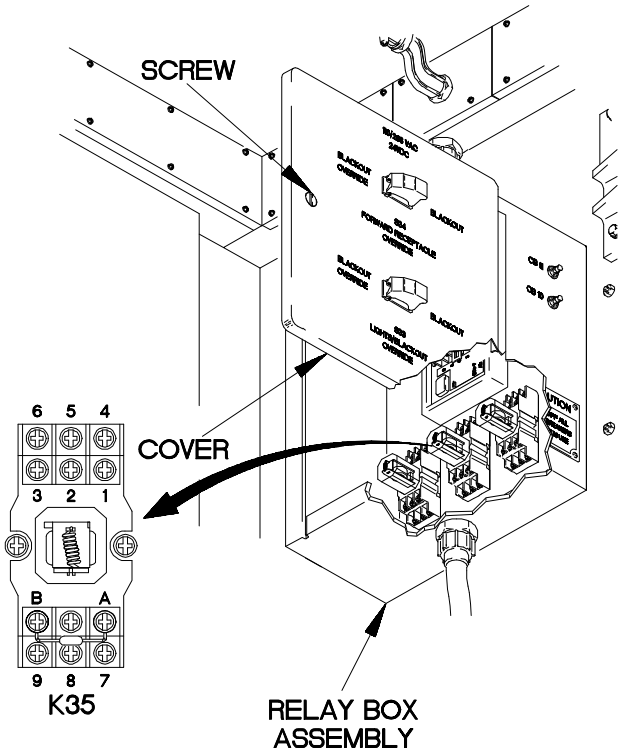
e108. M1079 110 VAC OUTLET J232 DOES NOT OPERATE IN NORMAL MODE (CONT)



CONTINUITY TEST

(1) Remove screw and cover from 110 VAC outlet J232.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to K35 relay base terminal 4.
(4) Connect negative (-) probe of multimeter to supply pole of 110 VAC receptacle J232 and note reading on multimeter.
(5) If continuity is not present, repair or replace wire 702A (para 2-40).
(6) If continuity is present, replace relay K35 (para 16-62).
(7) Install cover on 110 VAC outlet J232 with screw.
(8) Close cover on relay box assembly.
(9) Tighten screw in cover.
(10) Connect AC power (TM 9-2320-365-10).





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e109. M1079 110 VAC OUTLETS J232 AND J233 DO NOT OPERATE IN BLACKOUT OVERRIDE MODE

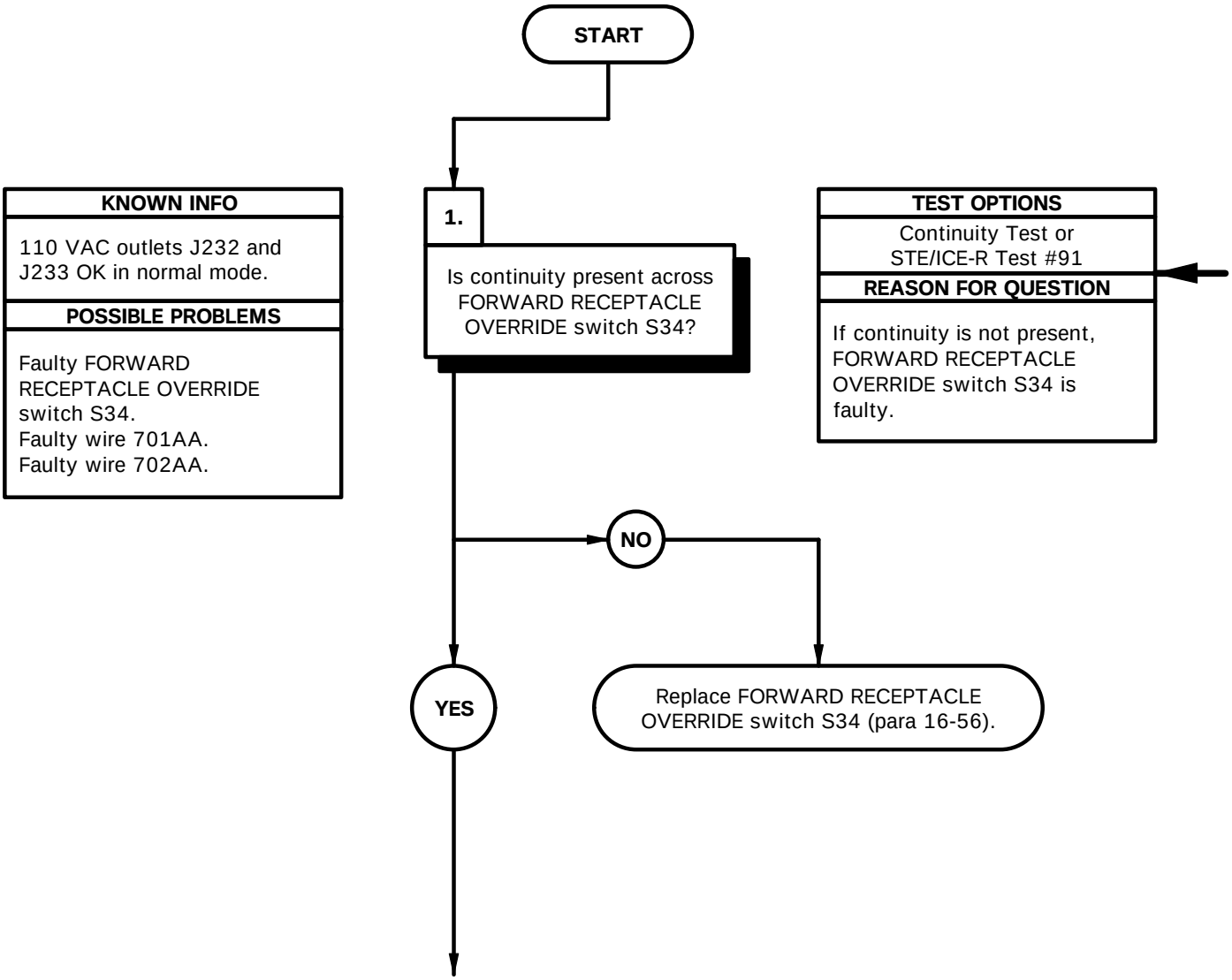
INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

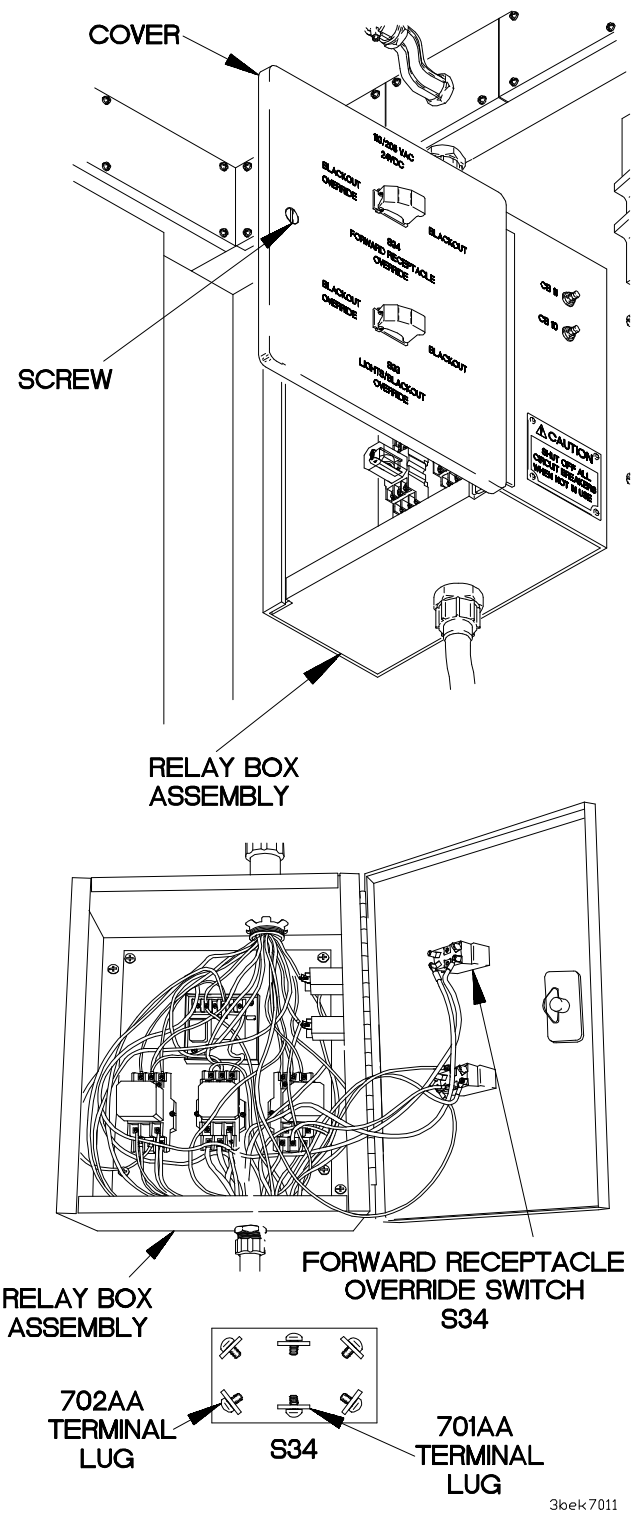
Personnel Required
(2)

References
TM 9-4910-571-12&P

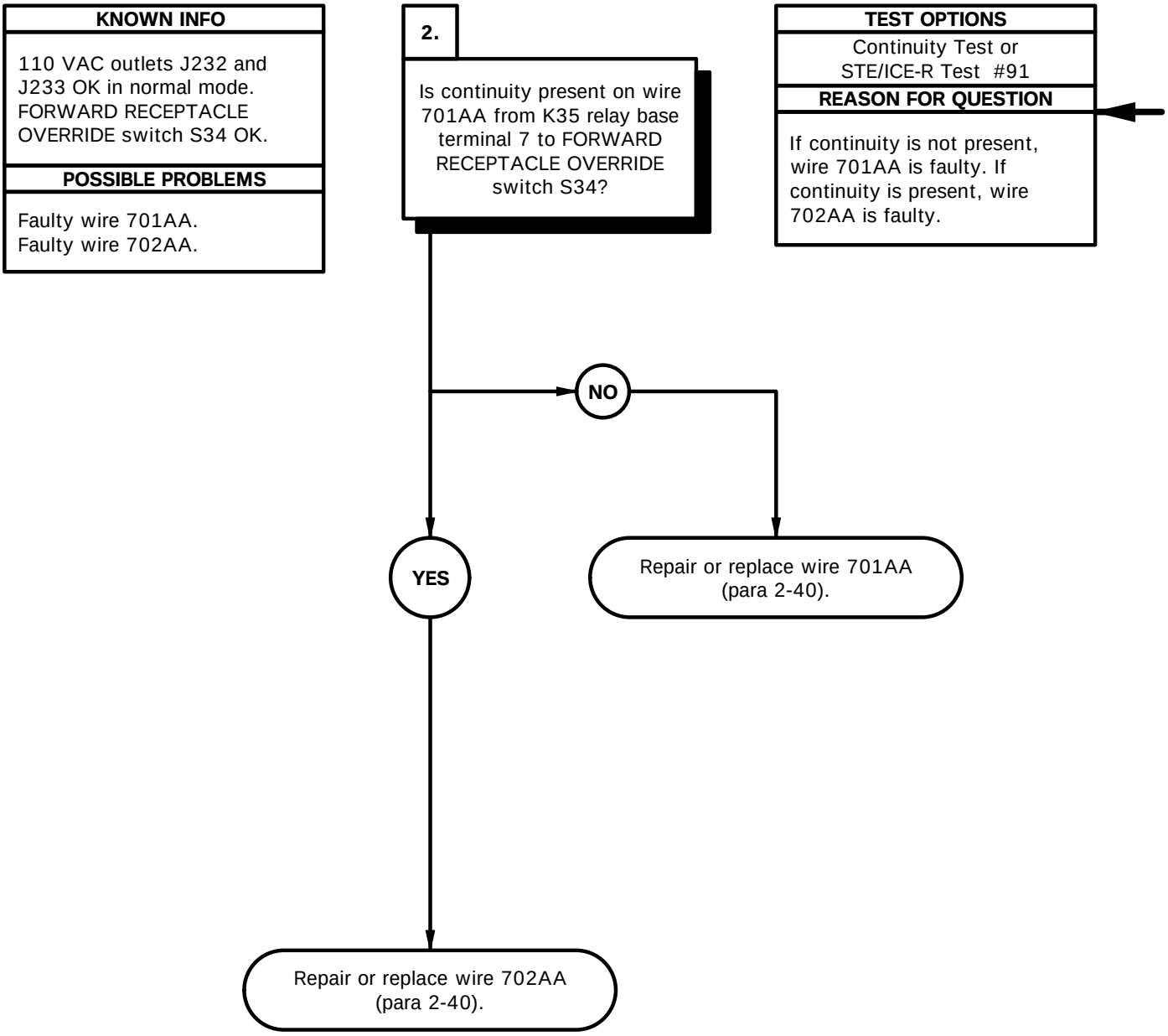


CONTINUITY TEST

(1) Loosen screw in cover.
(2) Open cover on relay box assembly.
(3) Position FORWARD RECEPTACLE OVERRIDE switch S34 to BLACKOUT OVERRIDE.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to wire 702AA terminal lug on FORWARD RECEPTACLE OVERRIDE switch S34.
(6) Connect negative (-) probe of multimeter to wire 701AA terminal lug on FORWARD RECEPTACLE OVERRIDE switch S34 and note reading on multimeter.
(7) If continuity is not present, replace FORWARD RECEPTACLE OVERRIDE switch S34 (para 16-56).

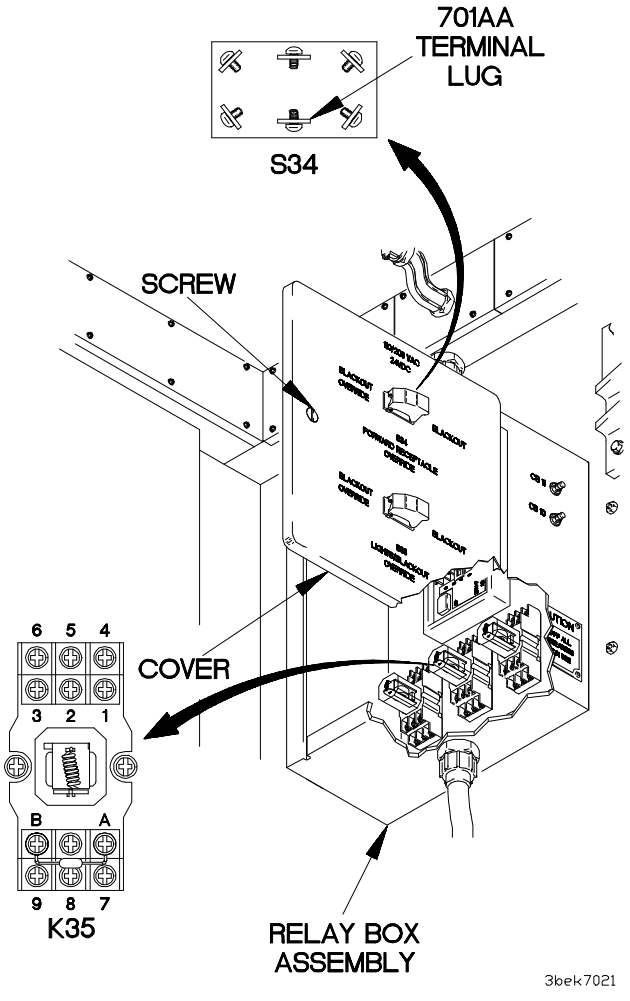


e109. M1079 110 VAC OUTLETS J232 AND J233 DO NOT OPERATE IN BLACKOUT OVERRIDE MODE (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to K35 relay base terminal 7.
(3) Connect negative (-) probe of multimeter to wire 701AA terminal lug on FORWARD RECEPTACLE OVERRIDE switch S34 and note reading on multimeter.
(4) If continuity is not present, repair or replace wire 701AA (para 2-40).
(5) If continuity is present, repair or replace wire 702AA (para 2-40).
(6) Position FORWARD RECEPTACLE OVERRIDE switch S34 to BLACKOUT (TM 9-2320-365-10).
(7) Close cover on relay box assembly.
(8) Tighten screw in cover.



e110. M1079 110 VAC OUTLET J231 DOES NOT OPERATE

INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

Personnel Required
(2)

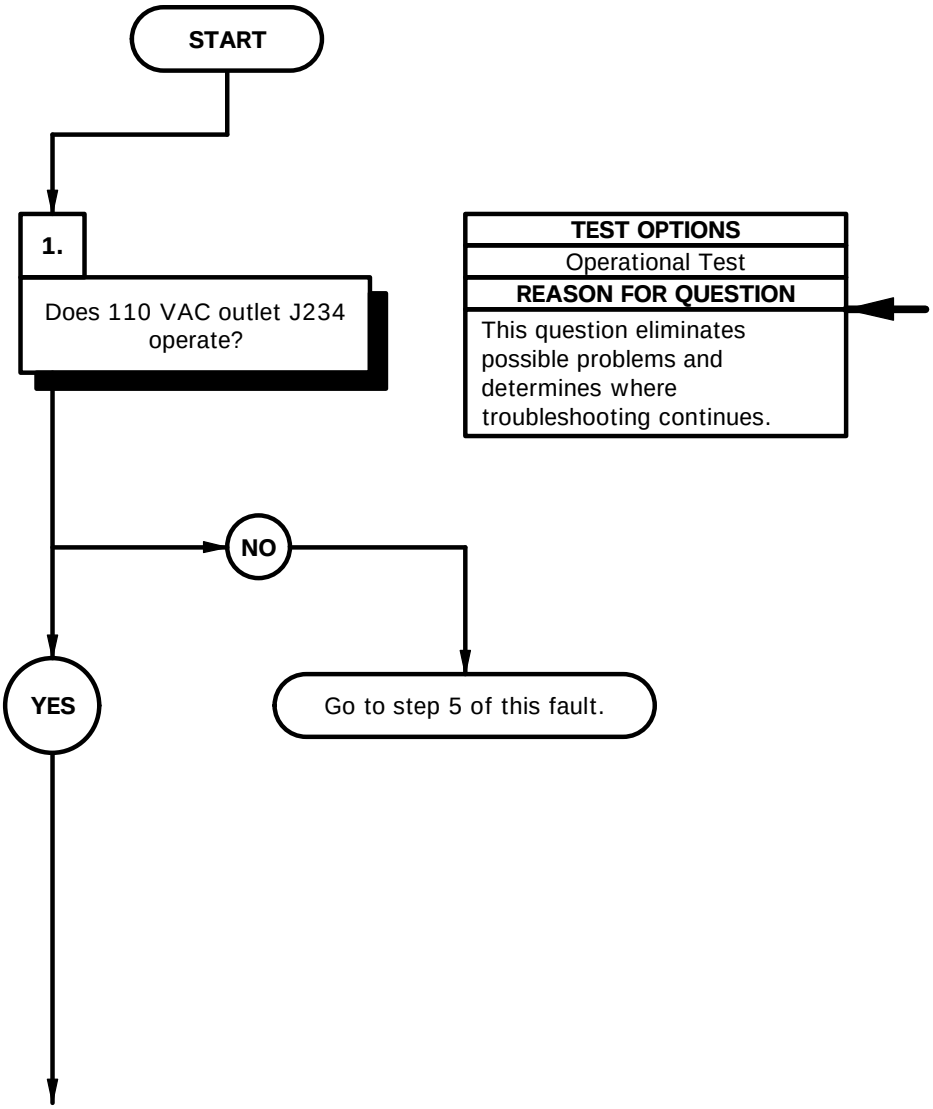
References
TM 9-4910-571-12&P

KNOWN INFO

110 VAC outlets J230, J232, J233, and J235 OK.

POSSIBLE PROBLEMS

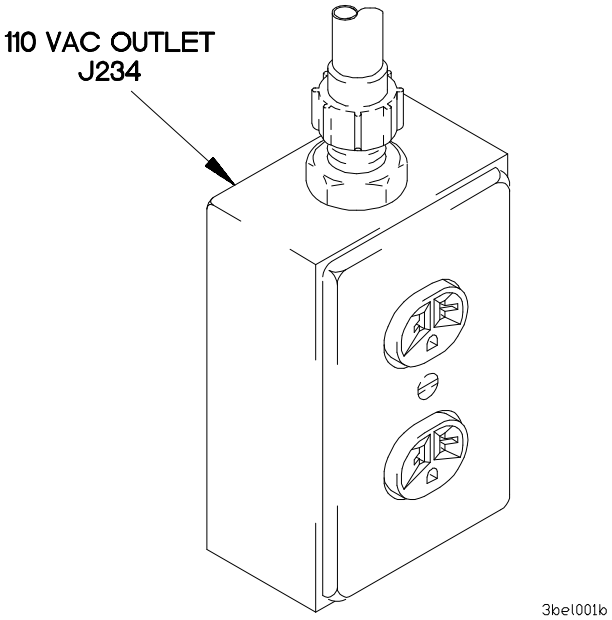
Faulty circuit breaker CB7.
Faulty wire 701B.
Faulty wire 702B.
Faulty relay K35.
Faulty 110 VAC receptacle J231.
Faulty wire 1499C.
Faulty wire 3085M.
Faulty wire 3085AB.



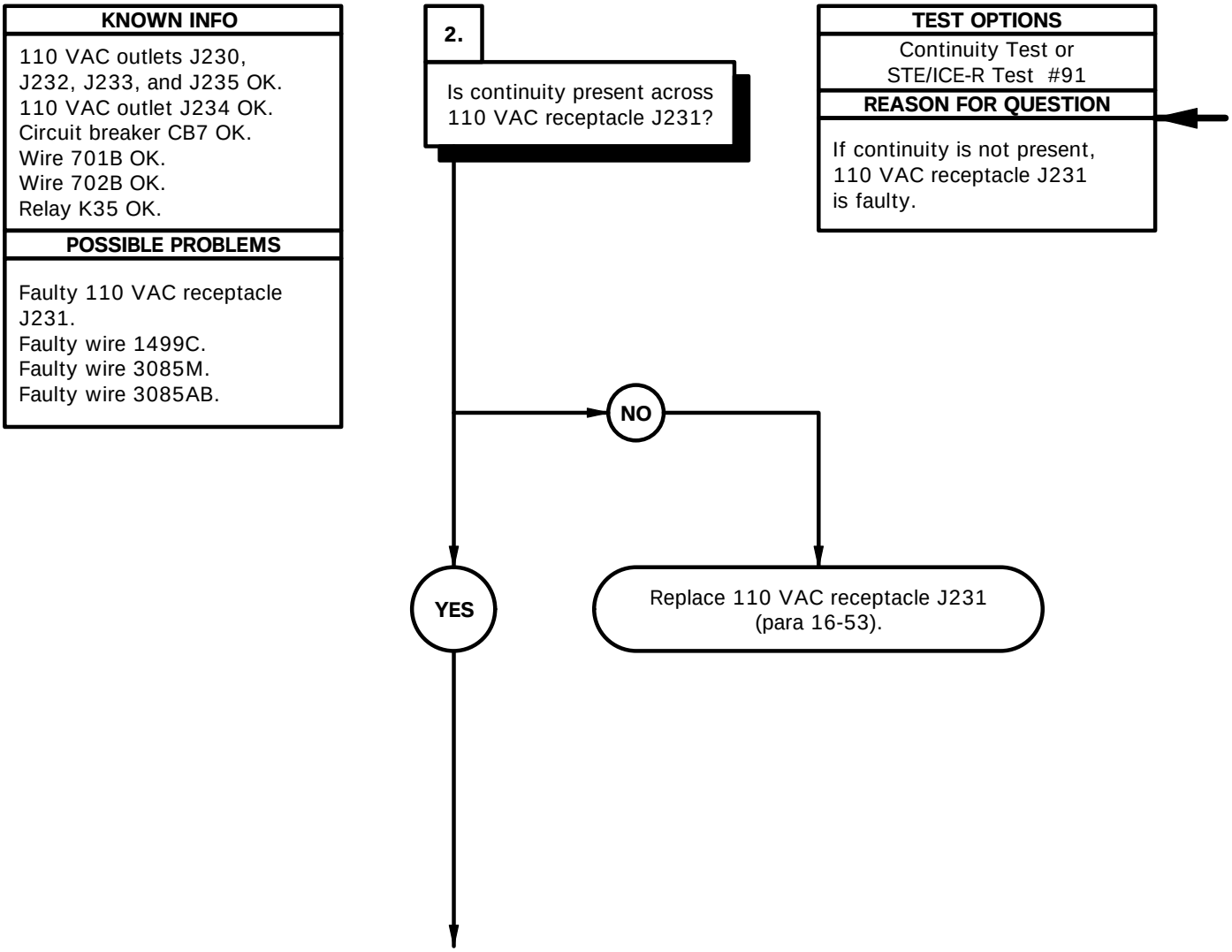
TEST OPTIONS
Operational Test

REASON FOR QUESTION
This question eliminates possible problems and determines where troubleshooting continues.

OPERATIONAL TEST
(1) Open door on 110/208 VAC POWER DISTRIBUTION PANEL (TM 9-2320-365-10). (2) Position circuit breaker CB7 to ON (TM 9-2320-365-10). (3) Plug any 110 vac appliance in 110 VAC receptacle J234. (4) Check to see if 110 VAC appliance operates. (5) If 110 VAC appliance does not operate, go to step 5 of this fault.

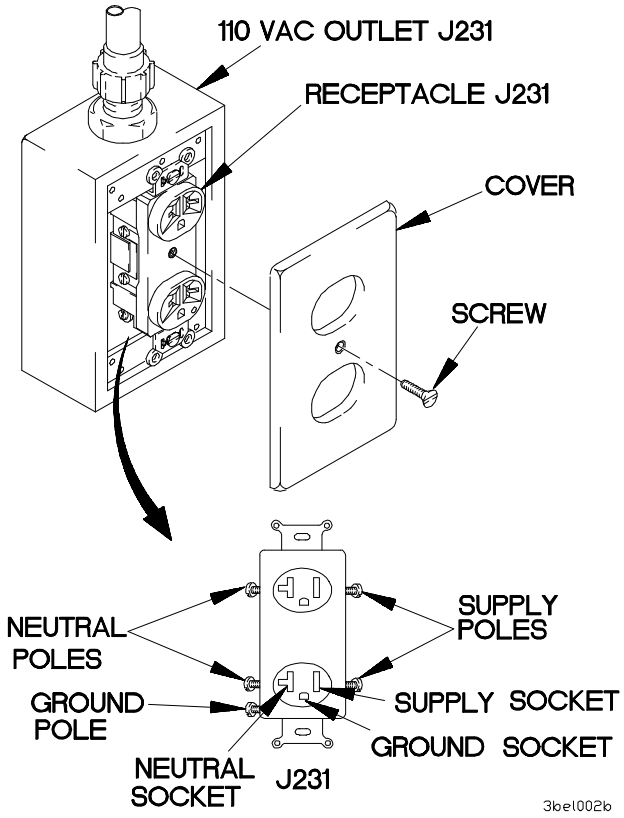


e110. M1079 110 VAC OUTLET J231 DOES NOT OPERATE (CONT)



CONTINUITY TEST

(1) Disconnect AC power (TM 9-2320-365-10).
(2) Remove screw and cover from 110 VAC outlet J231.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to supply pole of 110 VAC receptacle J231.
(5) Connect negative (-) probe of multimeter to supply socket of 110 VAC receptacle J231 and note reading on multimeter.
(6) Connect positive (+) probe of multimeter to neutral pole of 110 VAC receptacle J231.
(7) Connect negative (-) probe of multimeter to neutral socket of 110 VAC receptacle J231 and note reading on multimeter.
(8) Connect positive (+) probe of multimeter to ground pole of 110 VAC receptacle J231.
(9) Connect negative (-) probe of multimeter to ground socket of 110 VAC receptacle J231 and note reading on multimeter.
(10) If continuity is not present in steps (5), (7), and (9), replace 110 VAC receptacle J231 (para 16-53).



e110. M1079 110 VAC OUTLET J231 DOES NOT OPERATE (CONT)

KNOWN INFO

110 VAC outlets J230, J232, J233, and J235 OK.
110 VAC outlet J234 OK.
Circuit breaker CB7 OK.
Wire 701B OK.
Wire 702B OK.
Relay K35 OK.
110 VAC receptacle J231 OK.

POSSIBLE PROBLEMS

Faulty wire 1499C.
Faulty wire 3085M.
Faulty wire 3085AB.

3. Is continuity present on wire 1499C from 110 VAC receptacle J231 to terminal board TB4?

TEST OPTIONS

Continuity Test or
STE/ICE-R Test #91

REASON FOR QUESTION

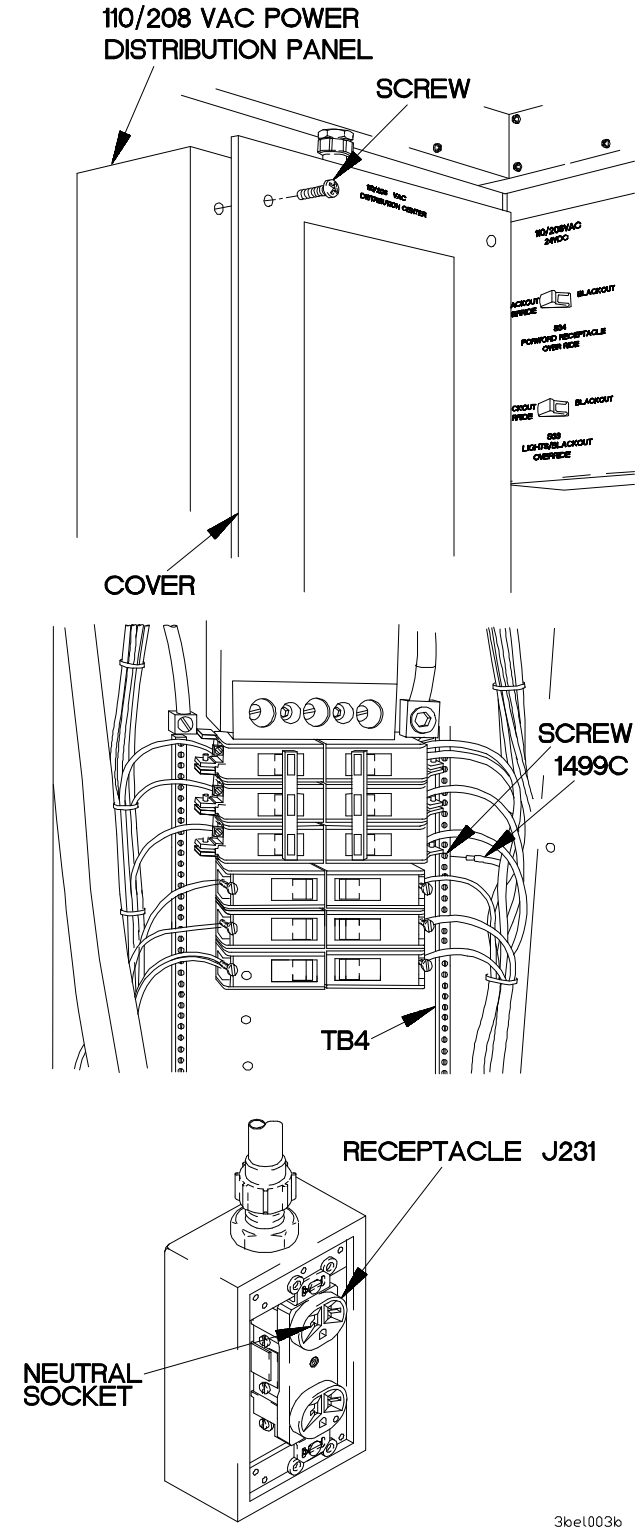
If continuity is not present, wire 1499C is faulty.

NO → Repair or replace wire 1499C (para 2-40).

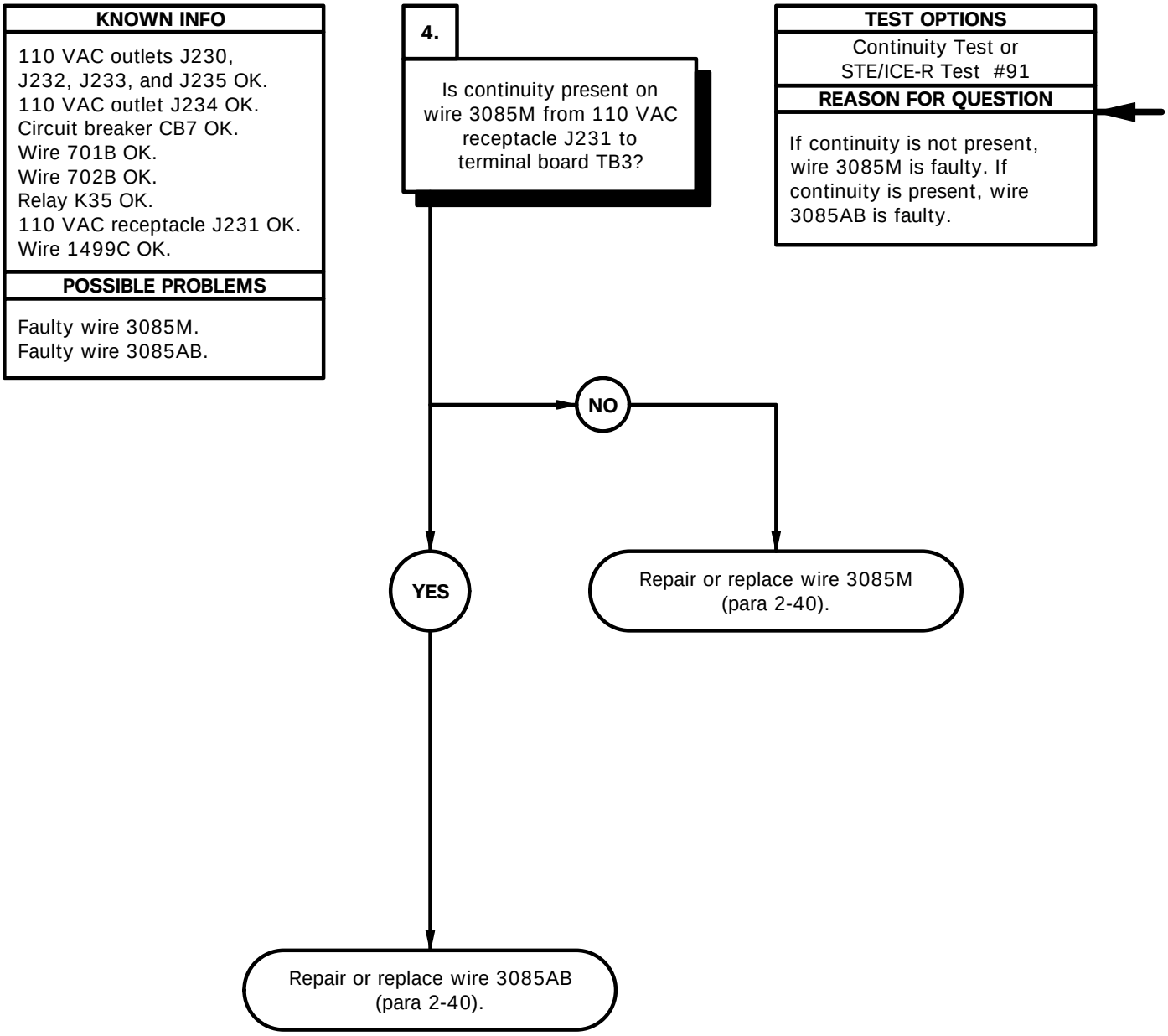
YES

CONTINUITY TEST

(1) Remove six screws and cover from 110/208 VAC POWER DISTRIBUTION PANEL.
(2) Loosen screw in terminal board TB4.
(3) Remove wire 1499C from terminal board TB4.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to wire 1499C.
(6) Connect negative (-) probe of multimeter to neutral socket of 110 VAC receptacle J231 and note reading on multimeter.
(7) If continuity is not present, repair or replace wire 1499C (para 2-40).

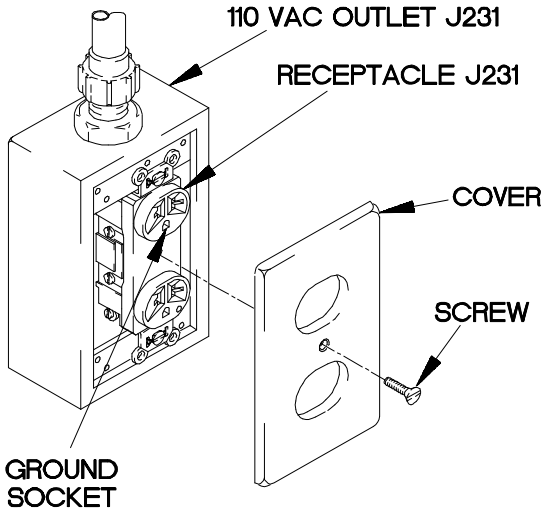


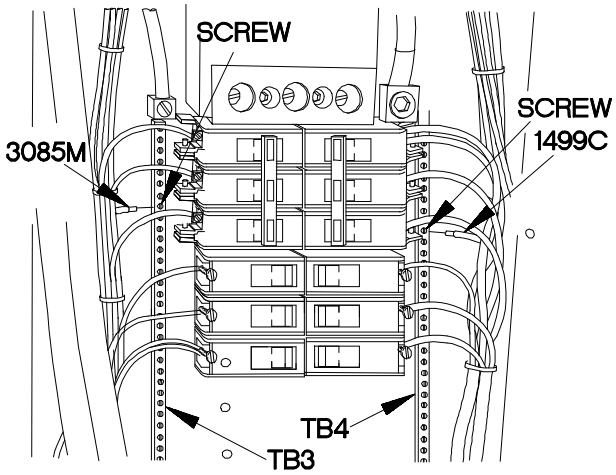
e110. M1079 110 VAC OUTLET J231 DOES NOT OPERATE (CONT)

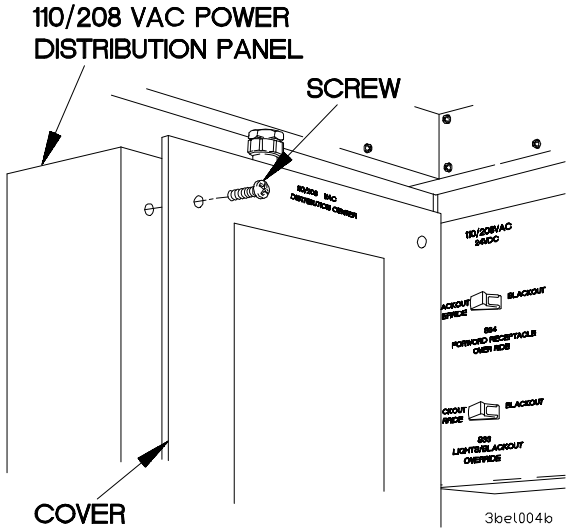


CONTINUITY TEST

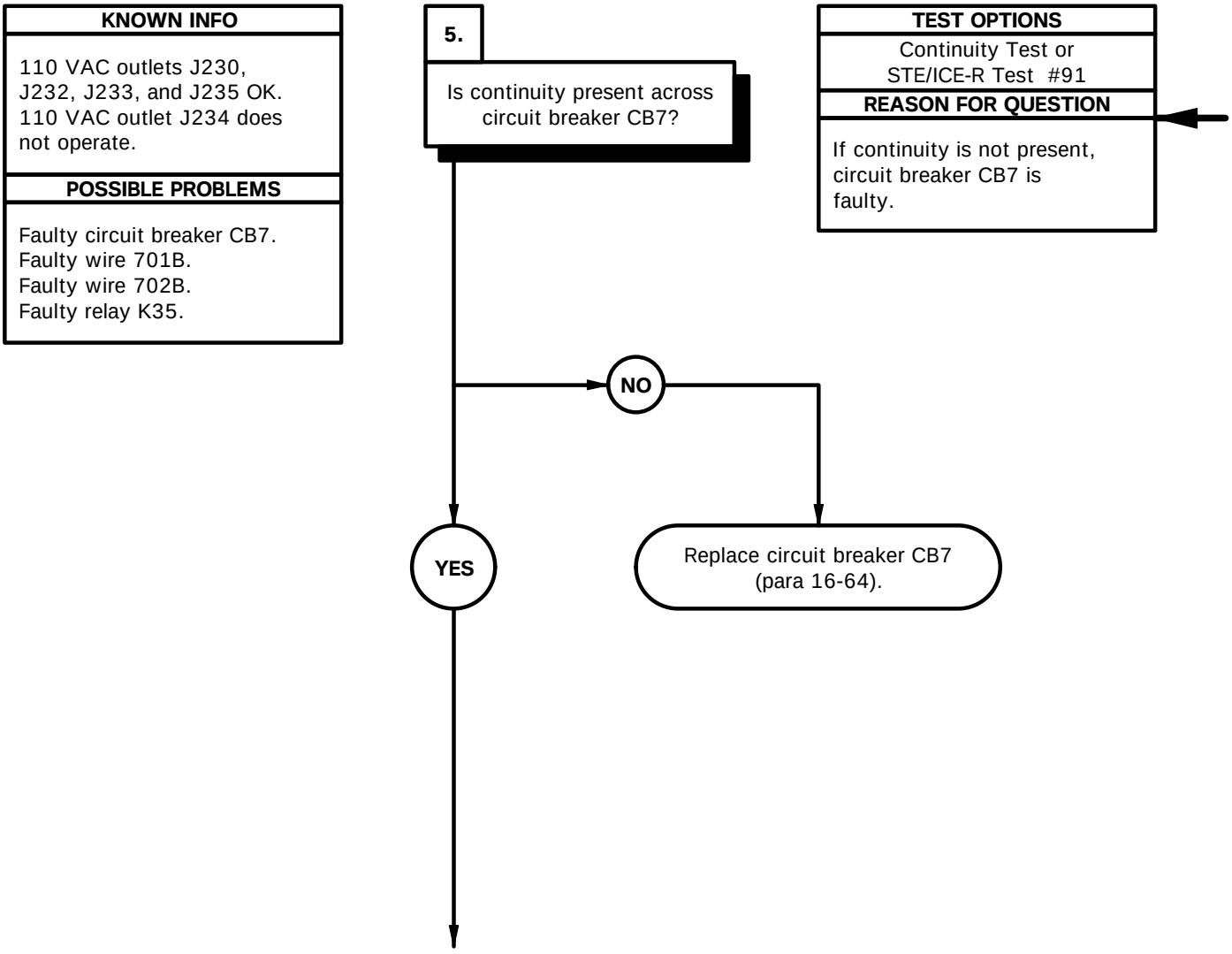
(1) Loosen screw in terminal board TB3.
(2) Remove wire 3085M from terminal board TB3.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to wire 3085M.
(5) Connect negative (-) probe of multimeter to ground socket of 110 VAC receptacle J231 and note reading on multimeter.
(6) If continuity is not present, repair or replace wire 3085M (para 2-40).
(7) If continuity is present, repair or replace wire 3085AB (para 2-40).
(8) Position wire 3085M on terminal board TB3.
(9) Tighten screw in terminal board TB3.
(10) Position wire 1499C on terminal board TB4.
(11) Tighten screw in terminal board TB4.
(12) Install cover on 110/208 VAC POWER DISTRIBUTION PANEL with six screws.
(13) Install cover on 110 VAC outlet J231 with screw.





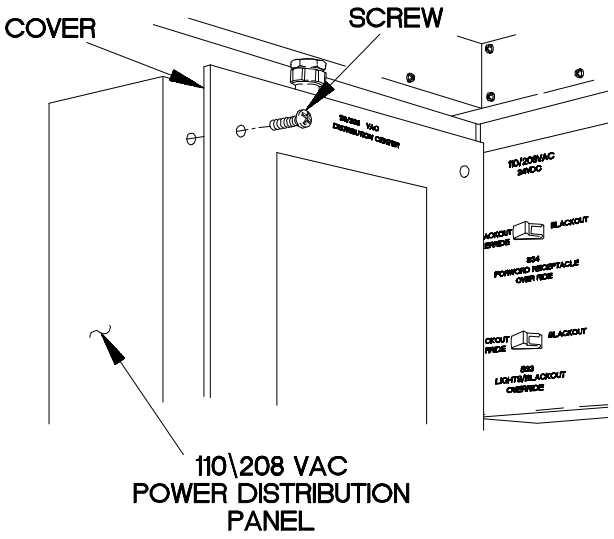


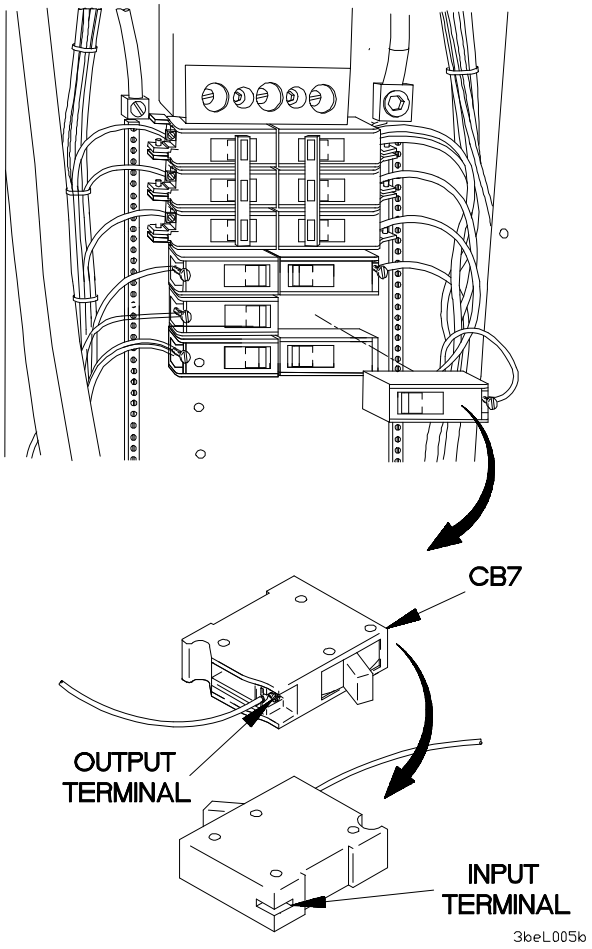
e110. M1079 110 VAC OUTLET J231 DOES NOT OPERATE (CONT)



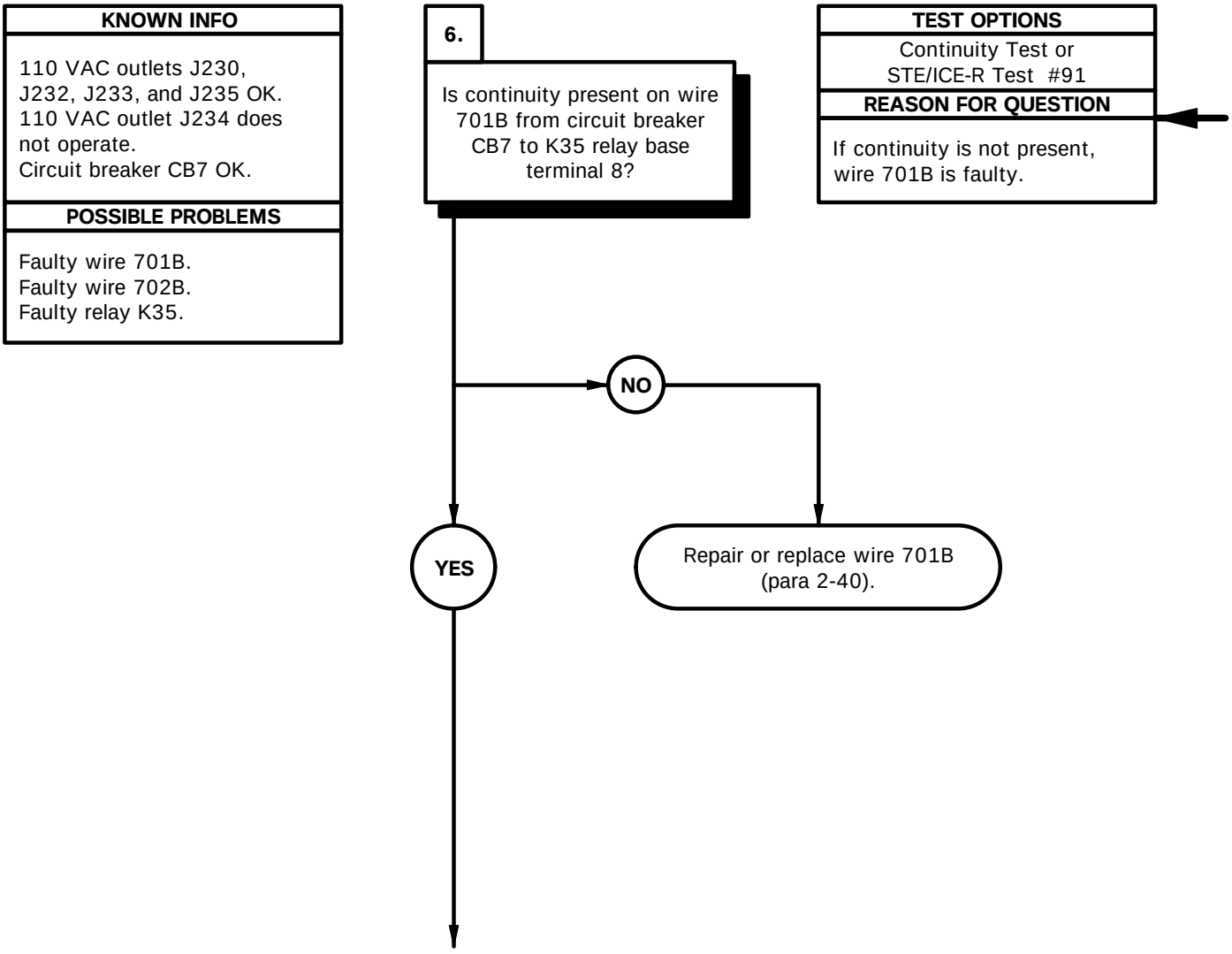
CONTINUITY TEST

(1) Disconnect AC power (TM 9-2320-365-10).
(2) Remove six screws and cover from 110/208 VAC POWER DISTRIBUTION PANEL.
(3) Remove circuit breaker CB7 from 110/208 VAC POWER DISTRIBUTION PANEL.
(4) Position circuit breaker CB7 to ON (TM 9-2320-365-10).
(5) Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter to output terminal of circuit breaker CB7.
(7) Connect negative (-) probe of multimeter to input terminal of circuit breaker CB7 and note reading on multimeter.
(8) If continuity is not present, replace circuit breaker CB7 (para 16-64).
(9) Install circuit breaker CB7 on 110/208 VAC POWER DISTRIBUTION PANEL.



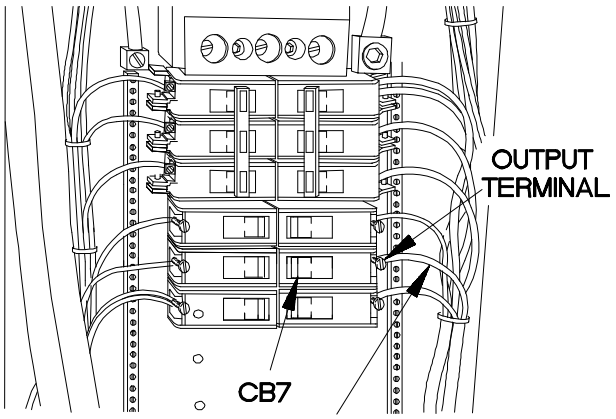


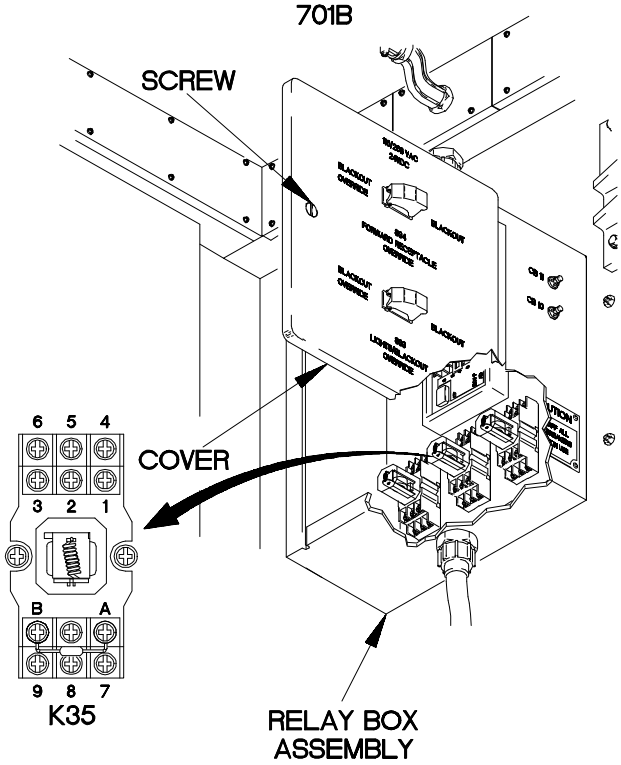
e110. M1079 110 VAC OUTLET J231 DOES NOT OPERATE (CONT)

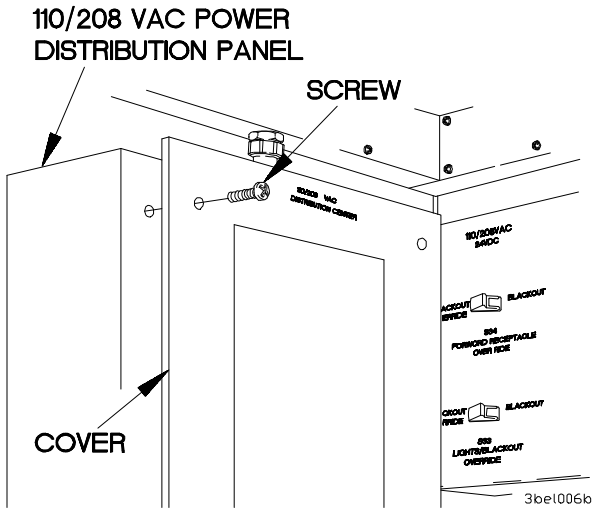


CONTINUITY TEST

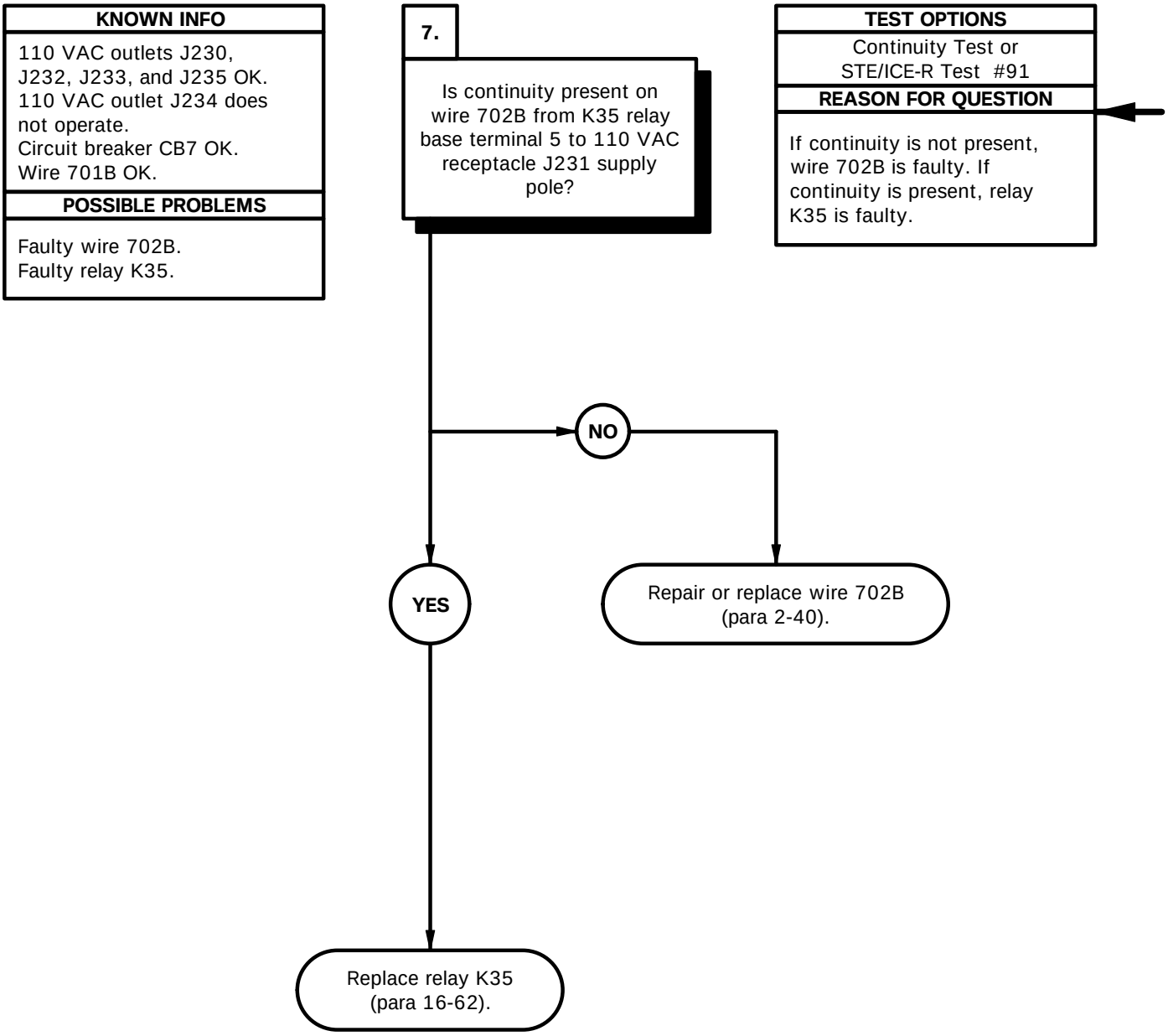
(1) Loosen screw in cover.
(2) Open cover on relay box assembly.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to K35 relay base terminal 8.
(5) Connect negative (-) probe of multimeter to output terminal on circuit breaker CB7 and note reading on multimeter.
(6) If continuity is not present, repair or replace wire 701B (para 2-40).
(7) Install cover on 110/208 VAC POWER DISTRIBUTION PANEL with six screws.





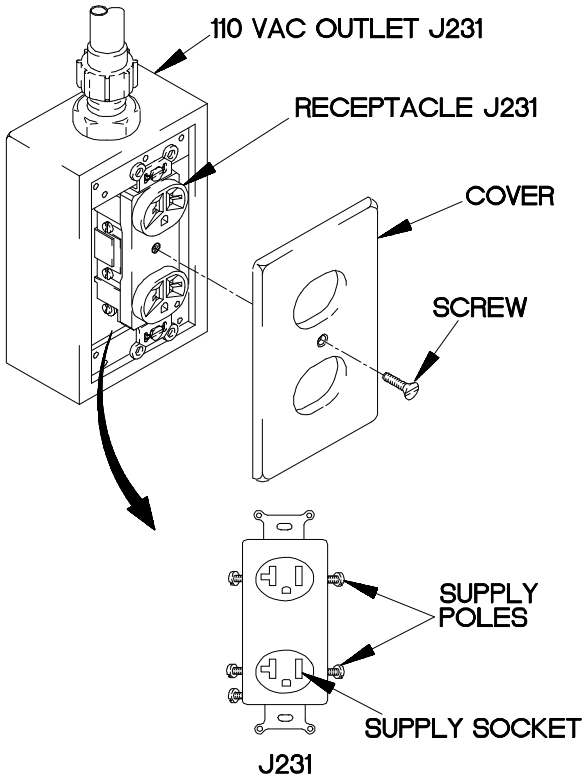


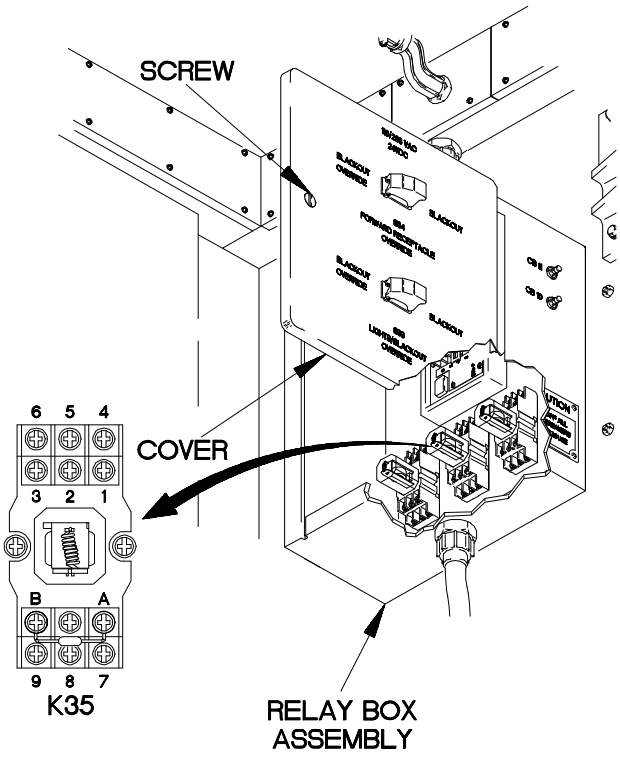
e110. M1079 110 VAC OUTLET J231 DOES NOT OPERATE (CONT)



CONTINUITY TEST

(1) Remove screw and cover from 110 VAC outlet J231.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to K35 relay base terminal 5.
(4) Connect negative (-) probe of multimeter to supply pole on 110 VAC receptacle J231 and note reading on multimeter.
(5) If continuity is not present, repair or replace wire 702B (para 2-40).
(6) If continuity is present, replace relay K35 (para 16-62).
(7) Install cover on 110 VAC outlet J231 with screw.
(8) Close cover on relay box assembly.
(9) Tighten screw in cover.





e111. M1079 110 VAC OUTLET J230 DOES NOT OPERATE

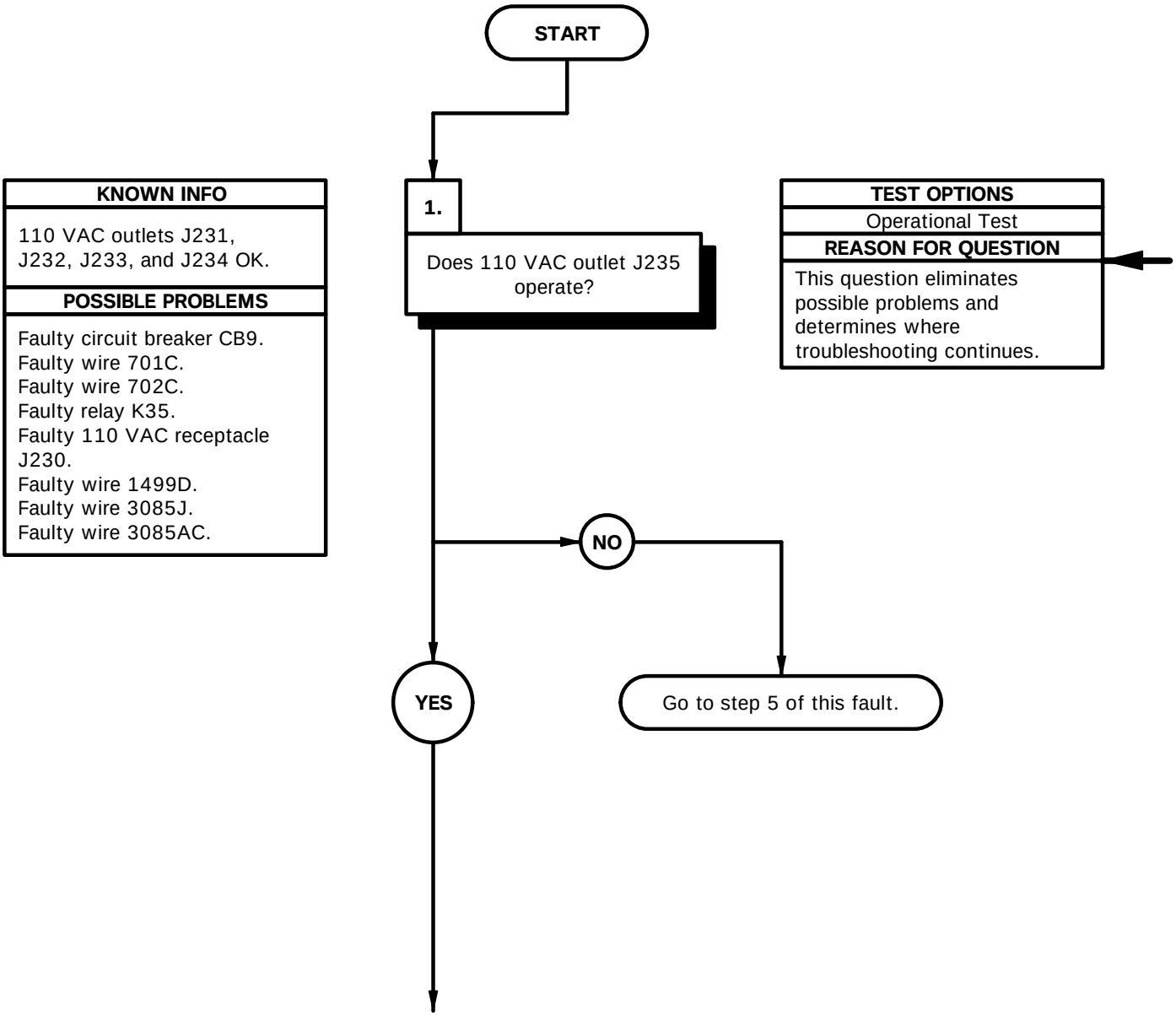
INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

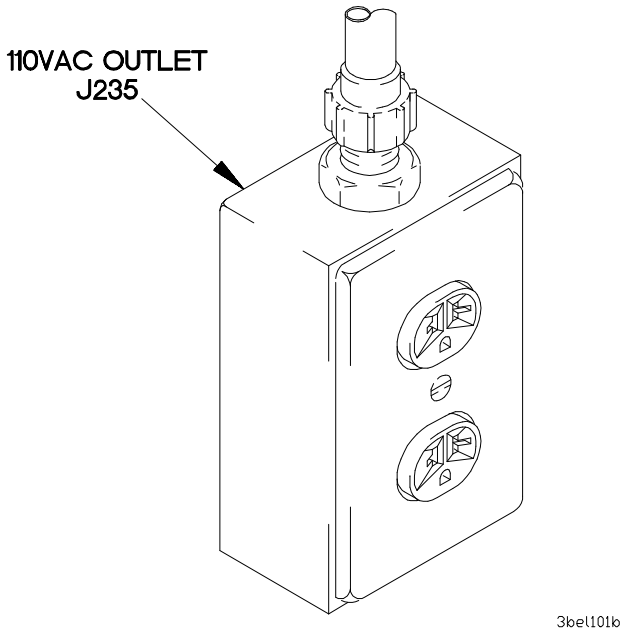
Personnel Required
(2)

References
TM 9-4910-571-12&P

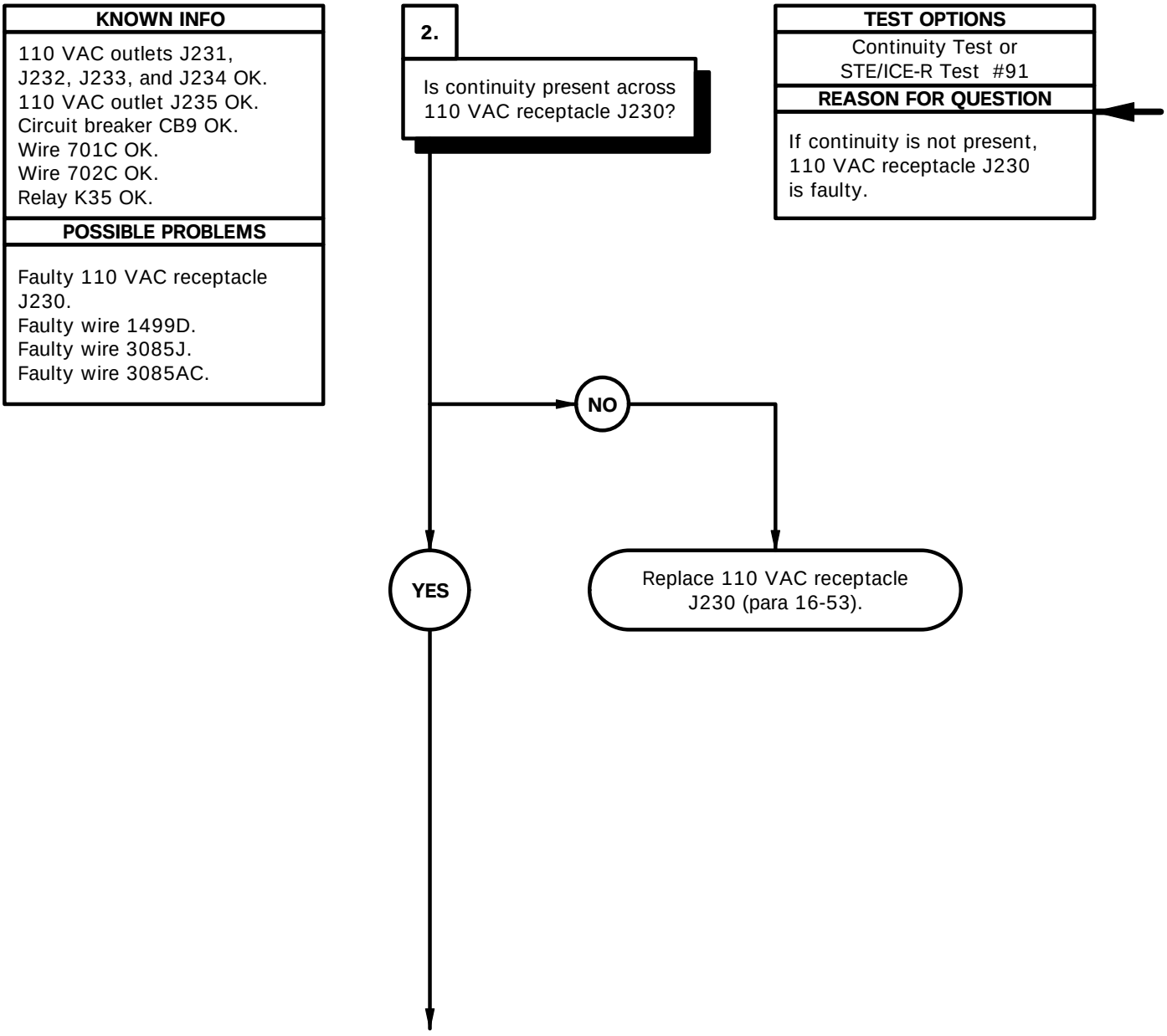


OPERATIONAL TEST

(1) Open door on 110/208 VAC POWER DISTRIBUTION PANEL (TM 9-2320-365-10).
(2) Position circuit breaker CB9 to ON (TM 9-2320-365-10).
(3) Plug any 110 VAC appliance in 110 VAC receptacle J235.
(4) Check to see if 110 VAC appliance operates.
(5) If 110 VAC appliance does not operate, go to step 5 of this fault.

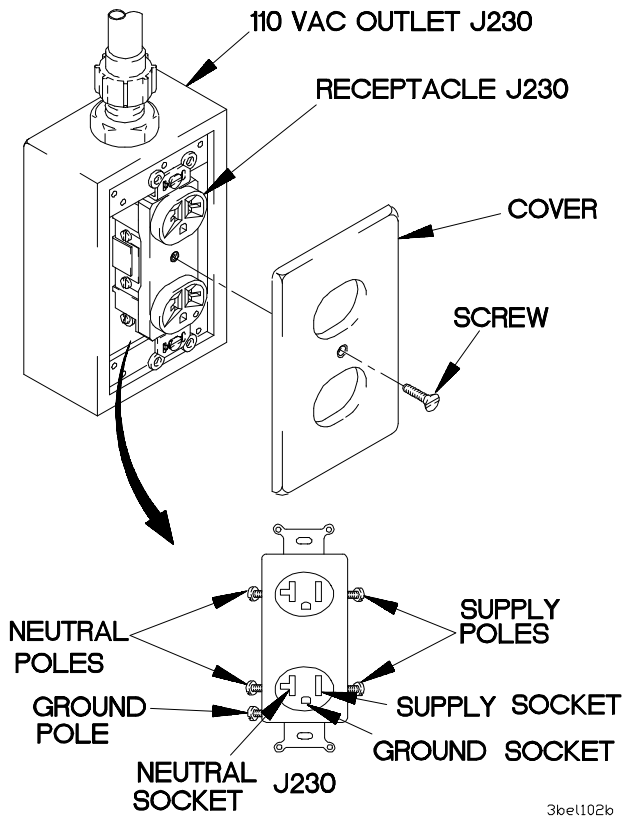


e111. M1079 110 VAC OUTLET J230 DOES NOT OPERATE (CONT)

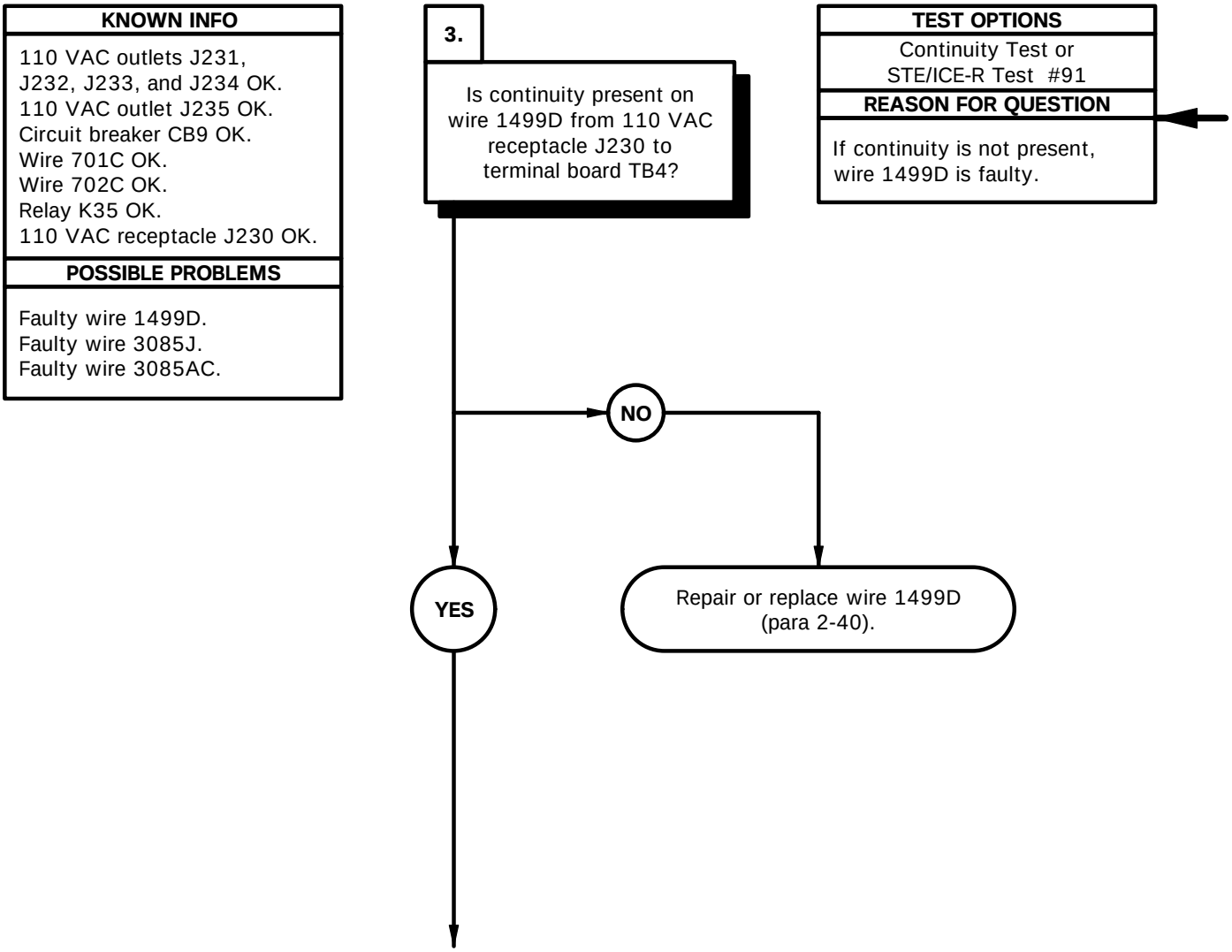


CONTINUITY TEST

(1) Disconnect AC power (TM 9-2320-365-10).
(2) Remove screw and cover from 110 VAC outlet J230.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to supply pole of 110 VAC receptacle J230.
(5) Connect negative (-) probe of multimeter to supply socket of 110 VAC receptacle J230 and note reading on multimeter.
(6) Connect positive (+) probe of multimeter to neutral pole of 110 VAC receptacle J230.
(7) Connect negative (-) probe of multimeter to neutral socket of 110 VAC receptacle J230 and note reading on multimeter.
(8) Connect positive (+) probe of multimeter to ground pole of 110 VAC receptacle J230.
(9) Connect negative (-) probe of multimeter to ground socket of 110 VAC receptacle J230 and note reading on multimeter.
(10) If continuity is not present in steps (5), (7), and (9), replace 110 VAC receptacle J230 (para 16-53).

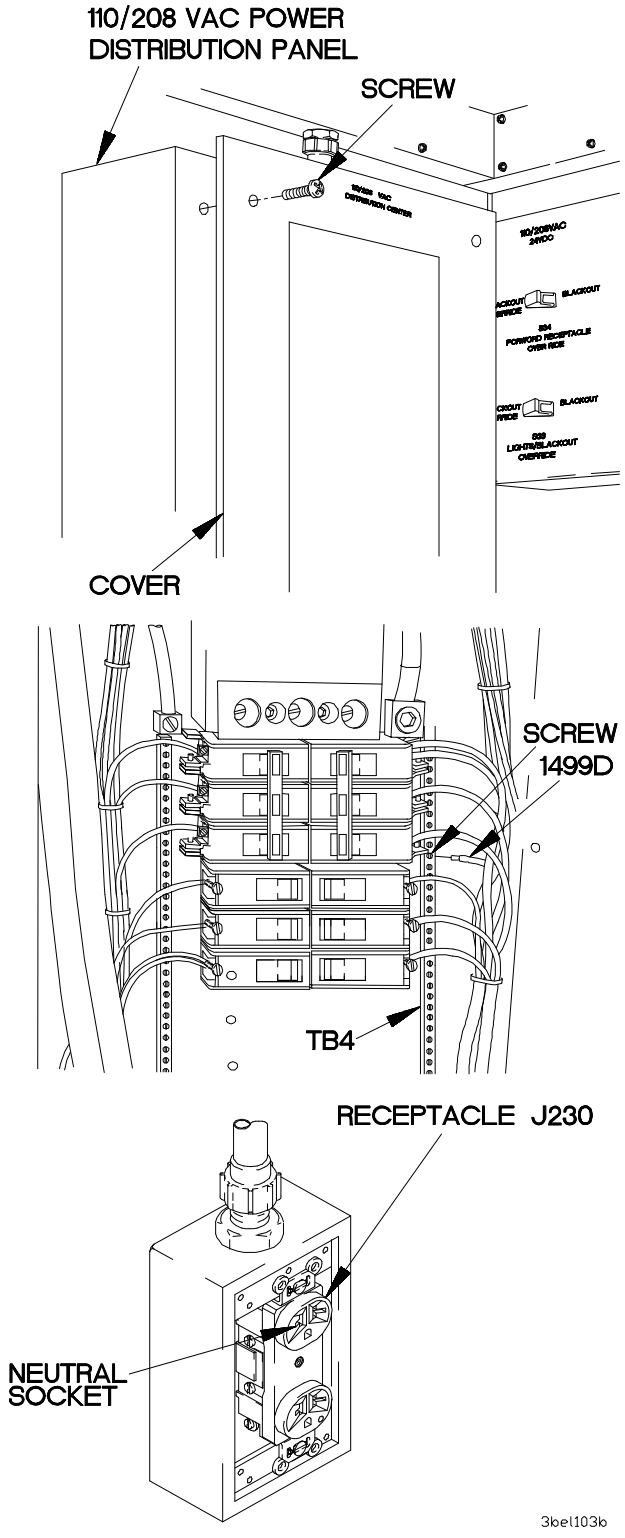


e111. M1079 110 VAC OUTLET J230 DOES NOT OPERATE (CONT)

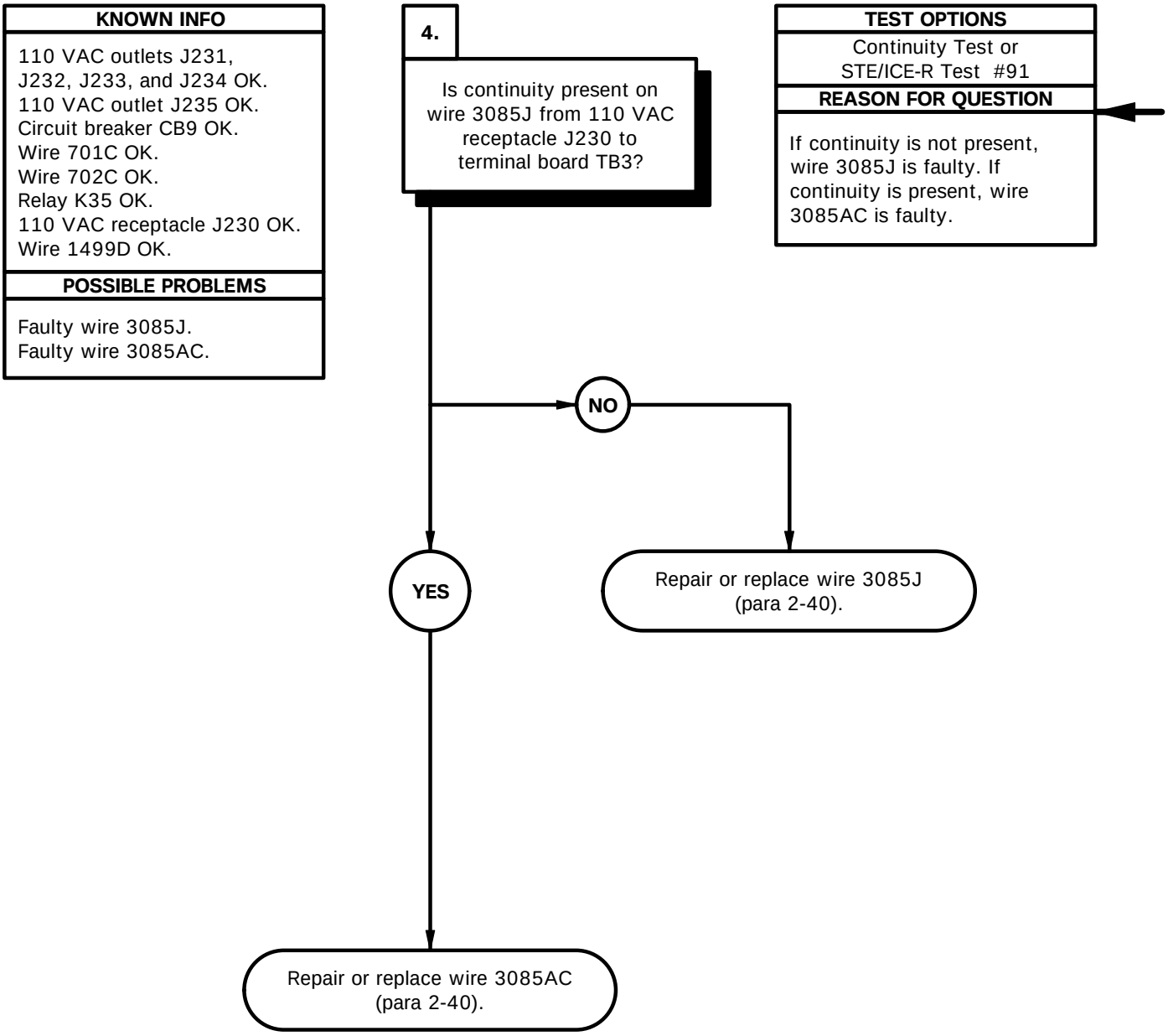


CONTINUITY TEST

(1) Remove six screws and cover from 110/208 VAC POWER DISTRIBUTION PANEL.
(2) Loosen screw in terminal board TB4.
(3) Remove wire 1499D from terminal board TB4.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to wire 1499D.
(6) Connect negative (-) probe of multimeter to neutral socket of 110 VAC receptacle J230 and note reading on multimeter.
(7) If continuity is not present, repair or replace wire 1499D (para 2-40).

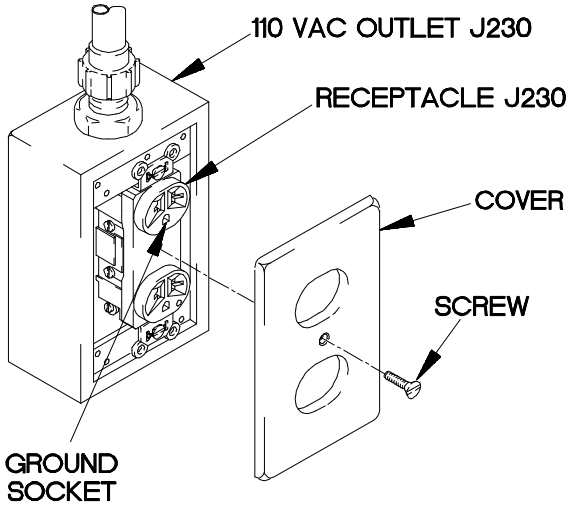


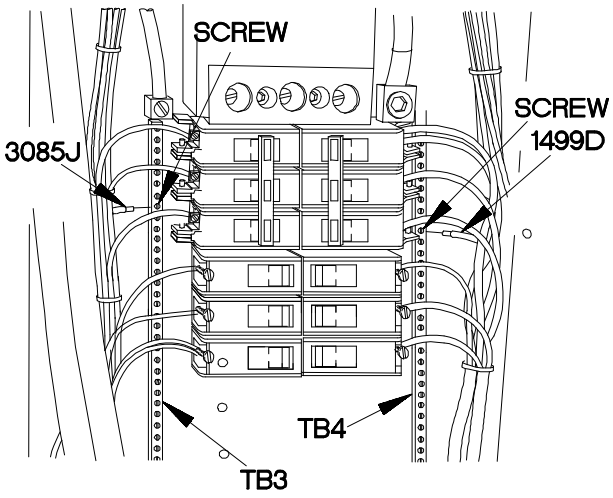
e111. M1079 110 VAC OUTLET J230 DOES NOT OPERATE (CONT)

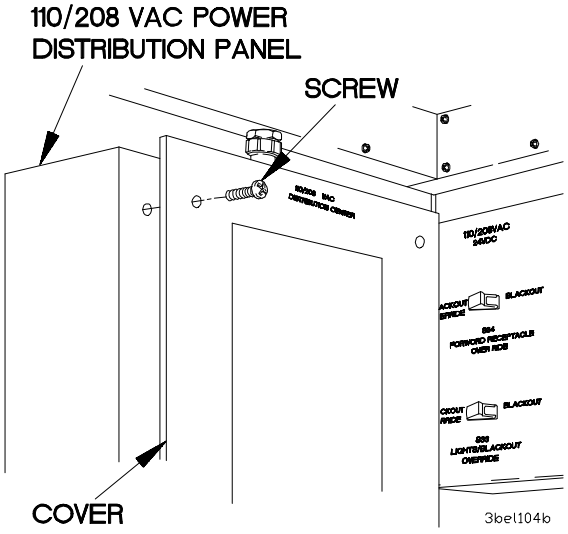


CONTINUITY TEST

(1) Loosen screw in terminal board TB3.
(2) Remove wire 3085J from terminal board TB3.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to wire 3085J.
(5) Connect negative (-) probe of multimeter to ground socket of 110 VAC receptacle J230 and note reading on multimeter.
(6) If continuity is not present, repair or replace wire 3085J (para 2-40).
(7) If continuity is present, repair or replace wire 3085AC (para 2-40).
(8) Position wire 3085J on terminal board TB3.
(9) Tighten screw in terminal board TB3.
(10) Position wire 1499D on terminal board TB4.
(11) Tighten screw in terminal board TB4.
(12) Install cover on 110/208 VAC POWER DISTRIBUTION PANEL with six screws.
(13) Install cover on 110 VAC outlet J230 with screw.







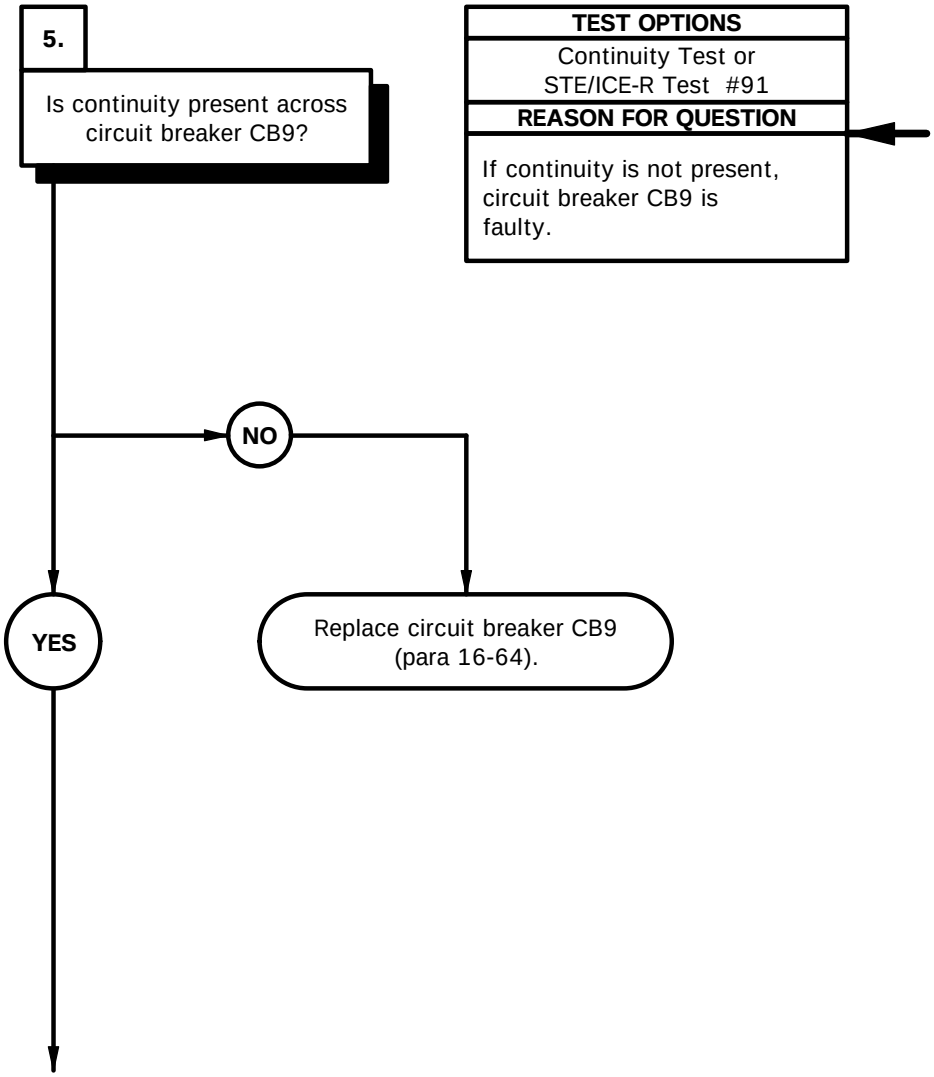
e111. M1079 110 VAC OUTLET J230 DOES NOT OPERATE (CONT)

KNOWN INFO

110 VAC outlets J231, J232, J233, and J234 OK. 110 VAC outlet J235 does not operate.

POSSIBLE PROBLEMS

Faulty circuit breaker CB9.
Faulty wire 701C.
Faulty wire 702C.
Faulty relay K35.



TEST OPTIONS

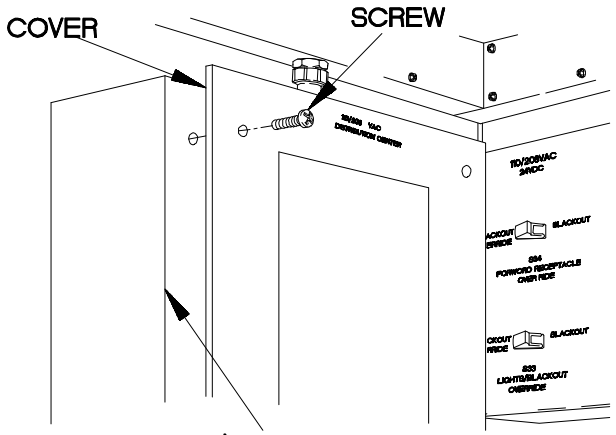
Continuity Test or STE/ICE-R Test #91

REASON FOR QUESTION

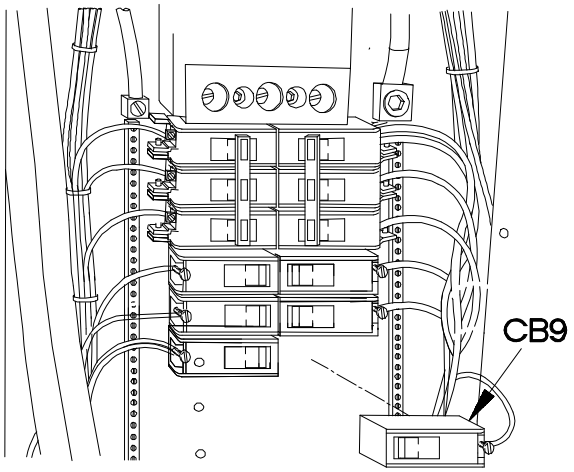
If continuity is not present, circuit breaker CB9 is faulty.

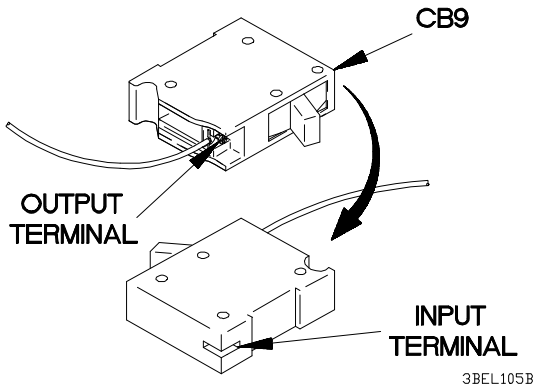
CONTINUITY TEST

(1) Disconnect AC power (TM 9-2320-365-10).
(2) Remove six screws and cover from 110/208 VAC POWER DISTRIBUTION PANEL.
(3) Remove circuit breaker CB9 from 110/208 VAC POWER DISTRIBUTION PANEL.
(4) Position circuit breaker CB9 to ON (TM 9-2320-365-10).
(5) Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter to output terminal of circuit breaker CB9.
(7) Connect negative (-) probe of multimeter to input terminal of circuit breaker CB9 and note reading on multimeter.
(8) If continuity is not present, replace circuit breaker CB9 (para 16-64).
(9) Install circuit breaker CB9 on 110/208 VAC POWER DISTRIBUTION PANEL.

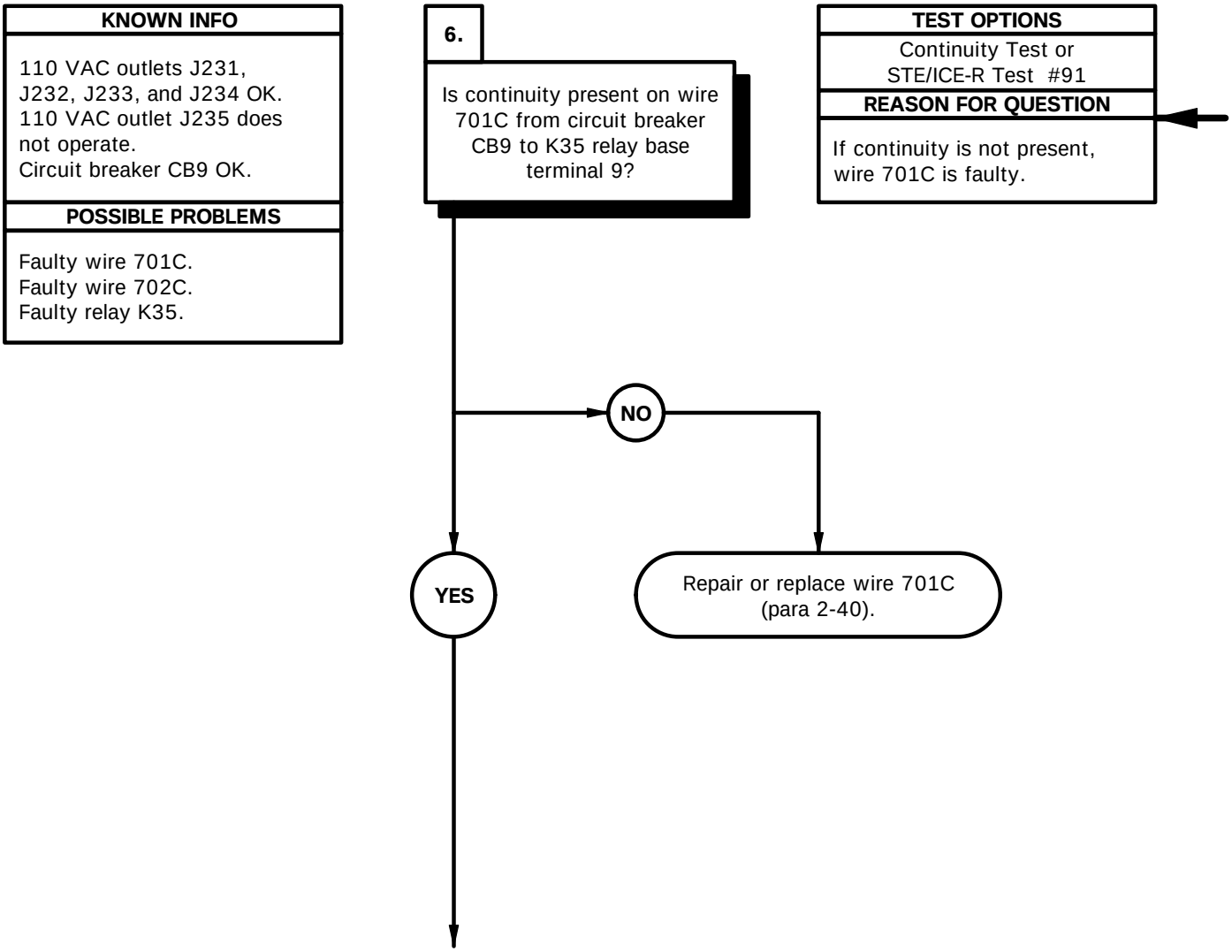


110\208 VAC POWER DISTRIBUTION PANEL



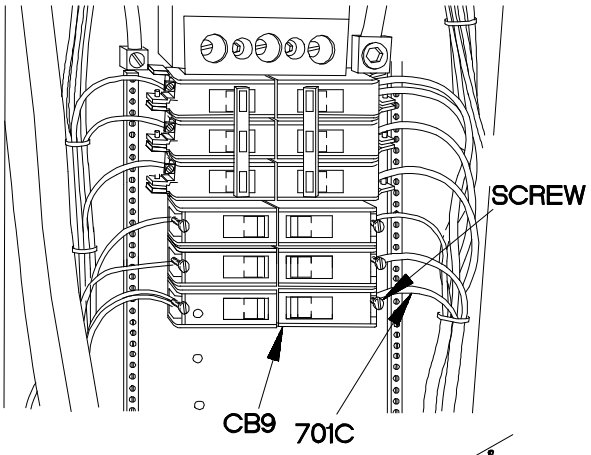


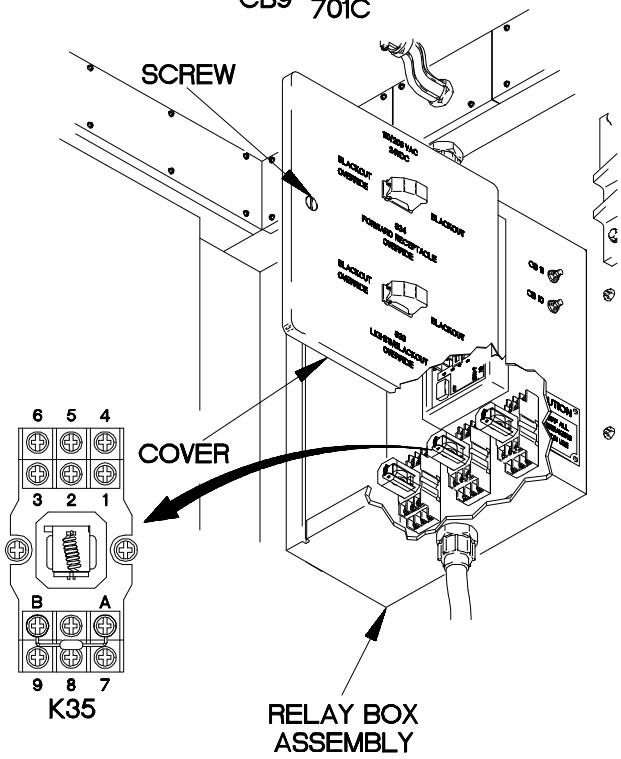
e111. M1079 110 VAC OUTLET J230 DOES NOT OPERATE (CONT)

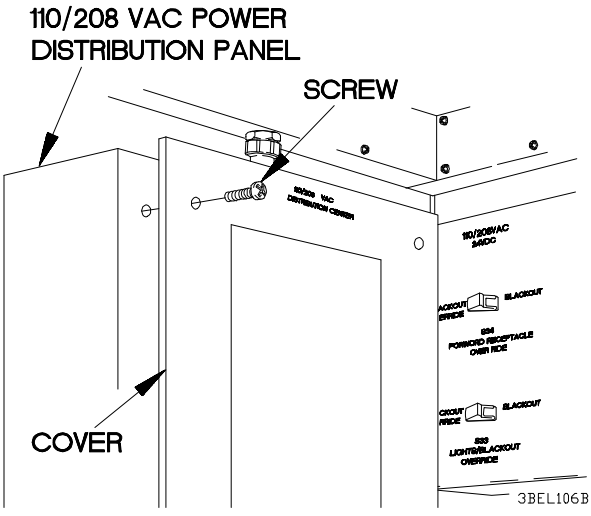


CONTINUITY TEST

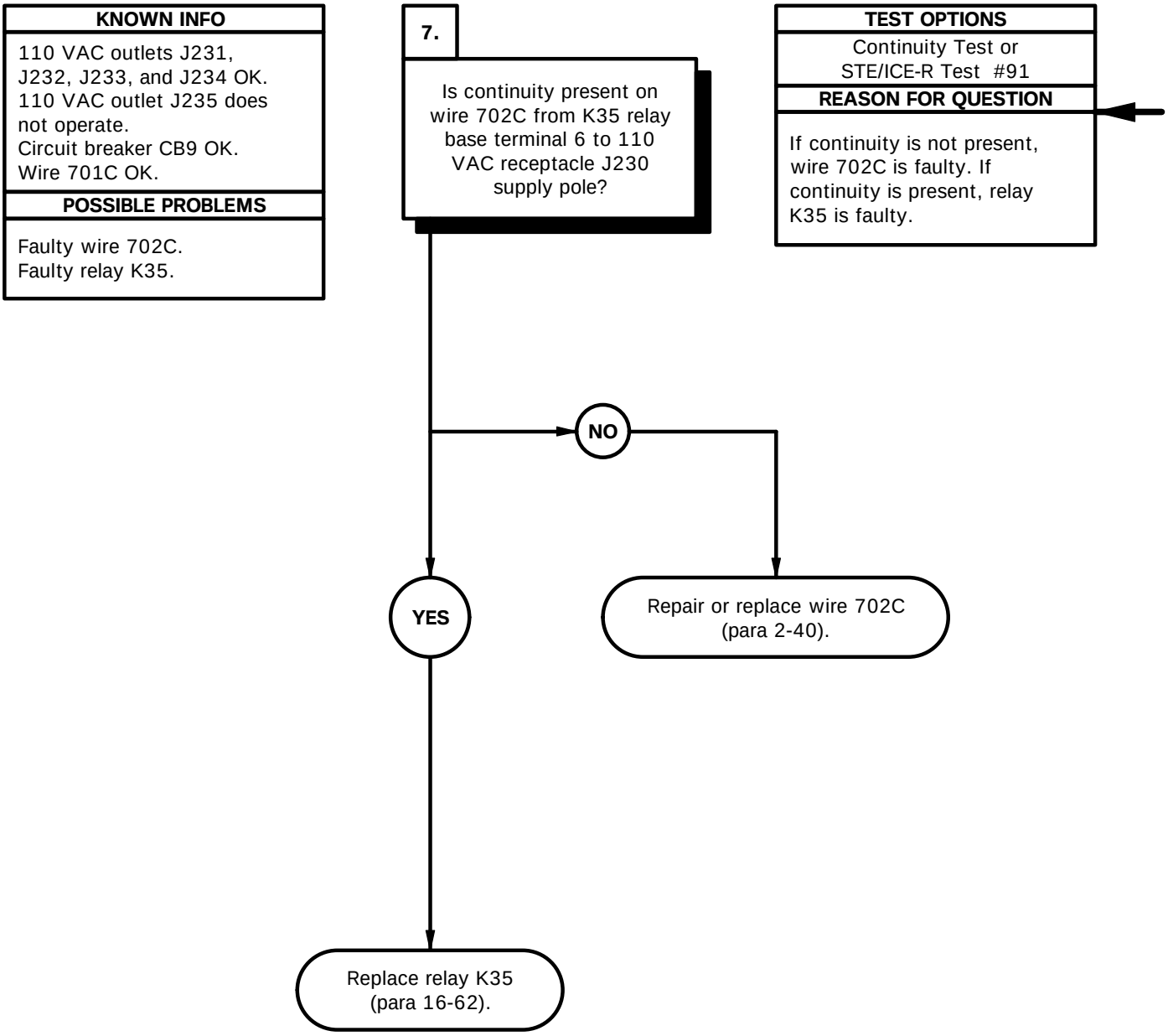
(1) Loosen screw in cover.
(2) Open cover on relay box assembly.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to K35 relay base terminal 9.
(5) Connect negative (-) probe of multimeter to output terminal on circuit breaker CB9 and note reading on multimeter.
(6) If continuity is not present, repair or replace wire 701C (para 2-40).
(7) Install cover on 110/208 VAC POWER DISTRIBUTION PANEL with six screws.





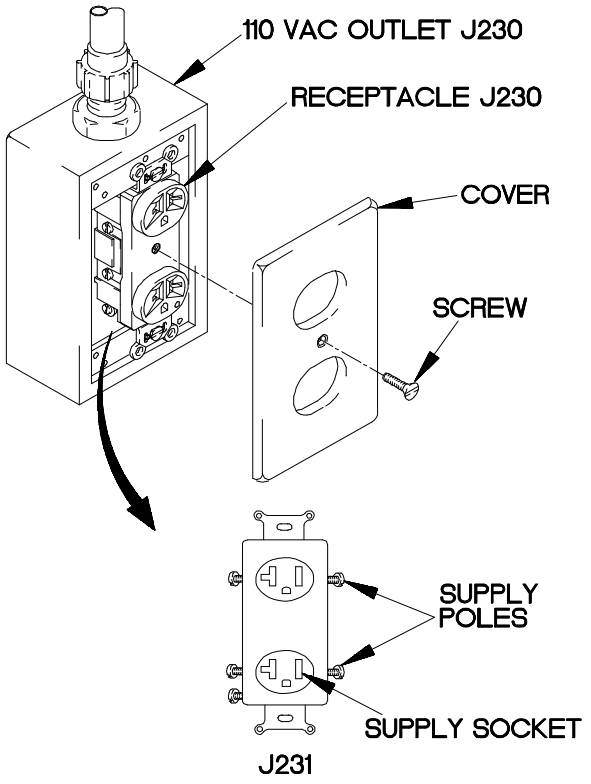


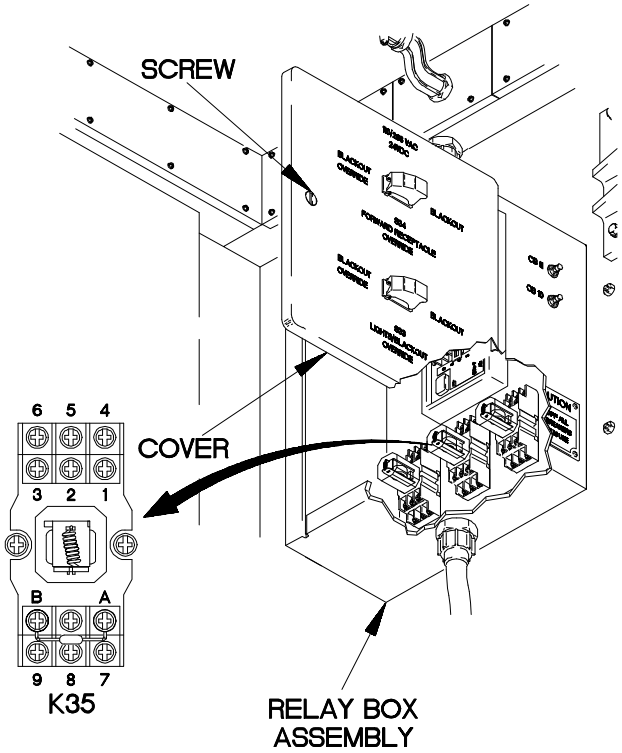
e111. M1079 110 VAC OUTLET J230 DOES NOT OPERATE (CONT)



CONTINUITY TEST

(1) Remove screw and cover from 110 VAC outlet J230.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to K35 relay base terminal 6.
(4) Connect negative (-) probe of multimeter to supply pole on 110 VAC receptacle J230 and note reading on multimeter.
(5) If continuity is not present, repair or replace wire 702C (para 2-40).
(6) If continuity is present, replace relay K35 (para 16-62).
(7) Install cover on 110 VAC outlet J230 with screw.
(8) Close cover on relay box assembly.
(9) Tighten screw in cover.





3bel107b

e112. M1079 BLACKOUT LIGHT(S) DOES NOT OPERATE

INITIAL SETUP

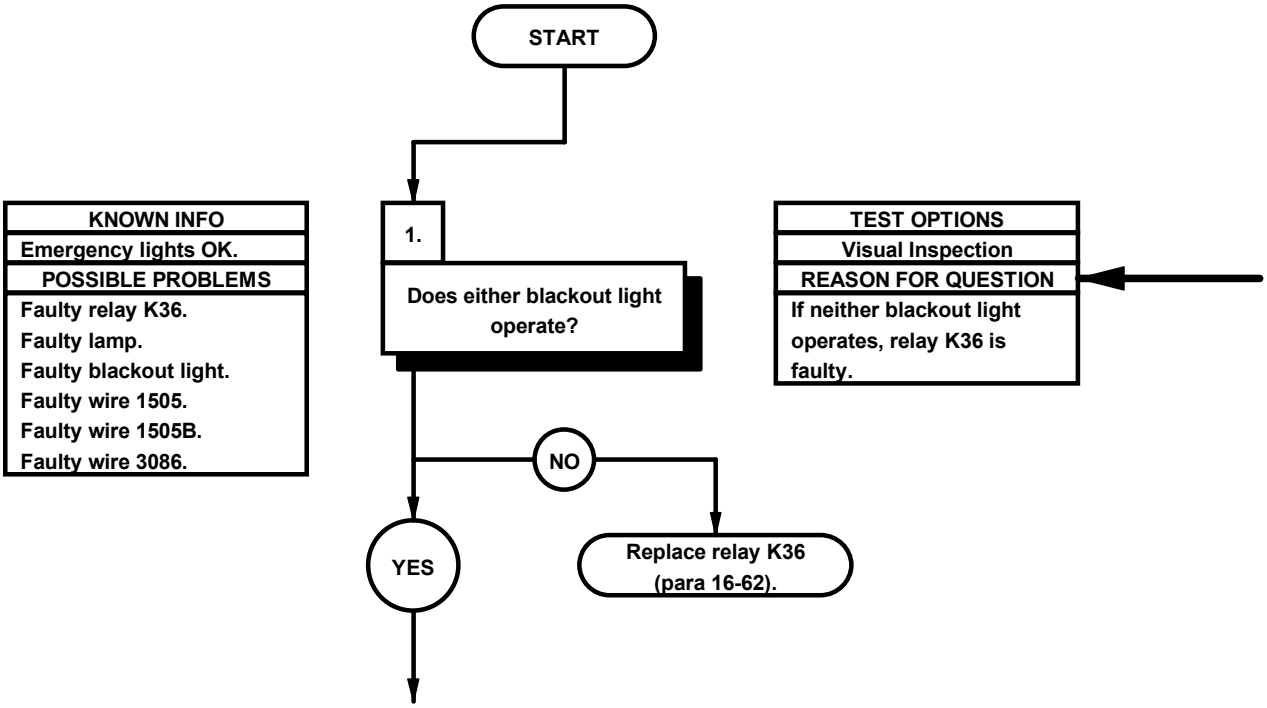
Equipment Condition
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

Materials/Parts
Lockwasher (12) (Item 81, Appendix G)

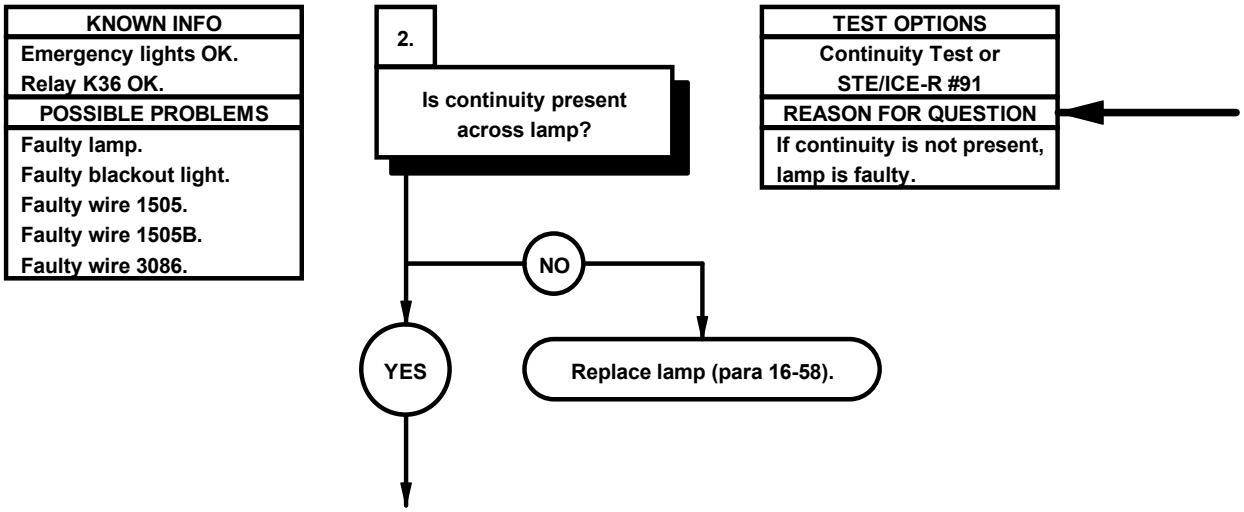
Personnel Required
(2)

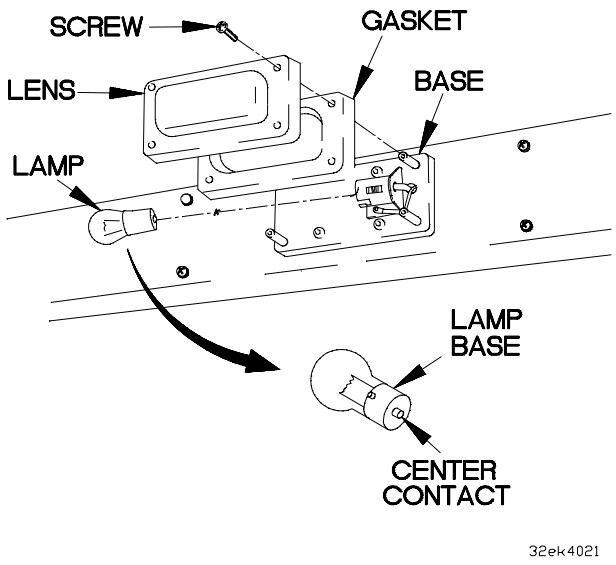
References
TM 9-4910-571-12&P



(1) Push in circuit breaker CB11 (TM 9-2320-365-10).
(2) Push in circuit breaker CB10 (TM 9-2320-365-10).
(3) Position INTERIOR LIGHTS switch S32 to ON (TM 9-2320-365-10).
(4) Position LIGHTS/BLACKOUT OVERRIDE switch S33 to BLACKOUT (TM 9-2320-365-10).
(5) Open any blackout shield or RH door (TM 9-2320-365-10).
(6) Check to see if either blackout light operates.
(7) If neither blackout light operates, replace relay K36 (para 16-62).
(8) Position INTERIOR LIGHTS switch S32 to OFF (TM 9-2320-365-10).
(9) Pull out circuit breaker CB10 (TM 9-2320-365-10).
(10) Pull out circuit breaker CB11 (TM 9-2320-365-10).

e112. M1079 BLACKOUT LIGHT(S) DOES NOT OPERATE (CONT)





CONTINUITY TEST

NOTE

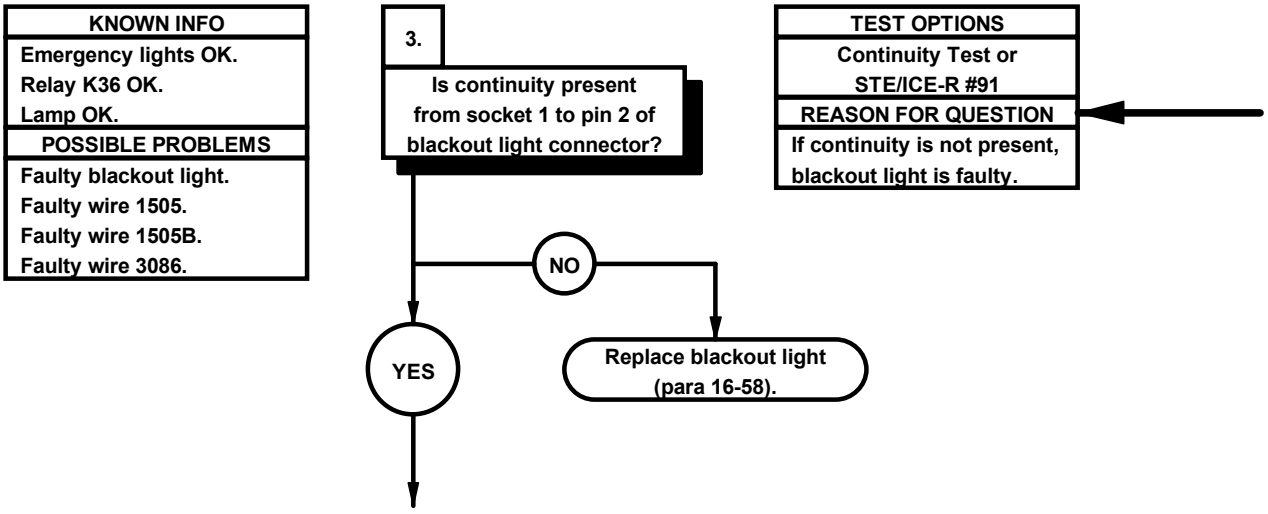
Both blackout light lamps are tested the same way. Refer to Table 2-14. M1079 Blackout Light Locations and Connector Numbers for details. Blackout light DS75 shown.

(1) Remove four screws and lens from base.
(2) Remove gasket from base.
(3) Remove lamp from base.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to center contact of lamp base.
(6) Connect negative (-) probe of multimeter to lamp base and note reading on multimeter.
(7) If continuity is not present, replace lamp (para 16-58).
(8) Install lamp in base.
(9) Install gasket on base.
(10) Install lens on base with four screws.

Table 2-14. M1079 Blackout Light Locations and Connector Numbers

LOCATION	NUMBER	CONNECTORS
RH side	DS75	J162, P162
LH side	DS76	J164, P164

e112. M1079 BLACKOUT LIGHT(S) DOES NOT OPERATE (CONT)



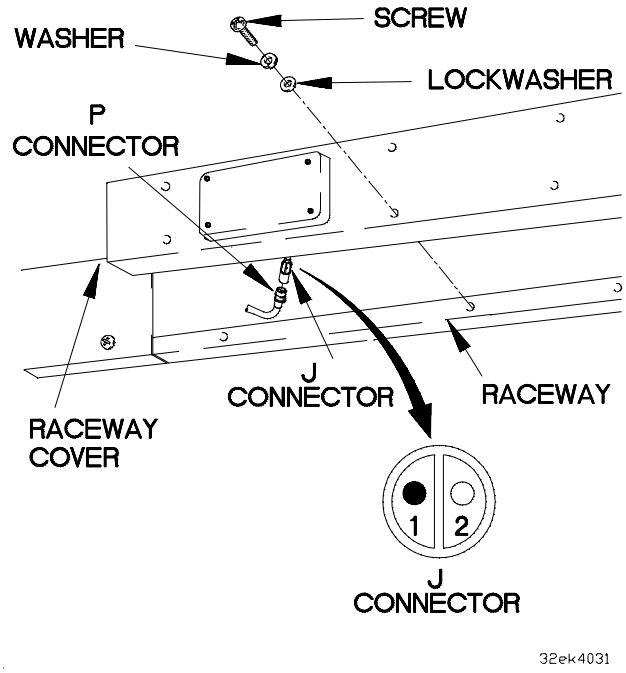
CONTINUITY TEST

(1) Remove 12 screws, lockwashers, and washers from raceway cover. Discard lockwashers.
(2) Remove raceway cover from raceway.

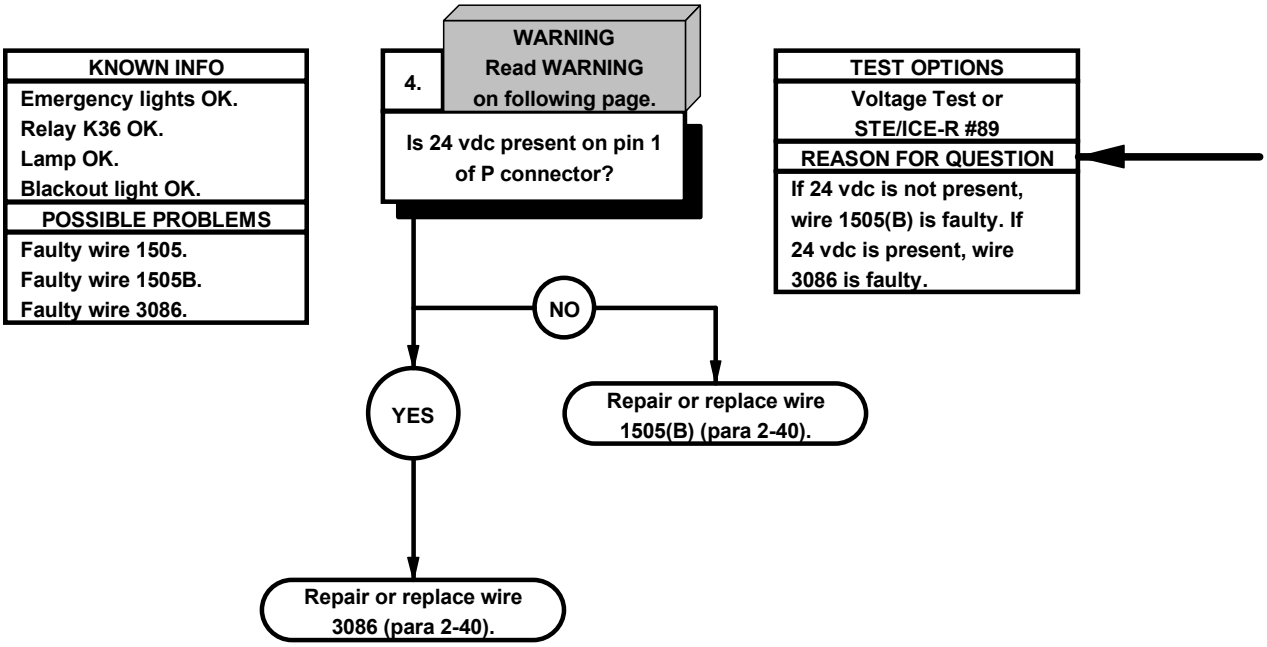
NOTE

Both blackout lights are tested the same way. Refer to Table 2-14. M1079 Blackout Light Locations and Connector Numbers for details. Blackout Light DS75 shown.

(3) Disconnect J connector from P connector.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to socket 1 of J connector.
(6) Connect negative (-) probe of multimeter to pin 2 of J connector and note reading on multimeter.
(7) If continuity is not present, replace blackout light (para 16-58).



e112. M1079 BLACKOUT LIGHT(S) DOES NOT OPERATE (CONT)

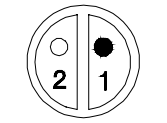


WARNING

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) Push in circuit breaker CB11 (TM 9-2320-365-10).
(2) Push in circuit breaker CB10 (TM 9-2320-365-10).
(3) Position INTERIOR LIGHTS switch S32 to ON (TM 9-2320-365-10).
(4) Set multimeter to volts dc.
(5) Connect positive (+) probe of multimeter to pin 1 of P connector. Refer to Table 2-14. M1079 Blackout Light Locations and Connector Numbers.
(6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(7) If 24 vdc is not present, repair or replace wire 1505(B) (para 2-40).
(8) If 24 vdc is present, repair or replace wire 3086 (para 2-40).
(9) Position INTERIOR LIGHTS switch S32 to OFF (TM 9-2320-365-10).
(10) Pull out circuit breaker CB10 (TM 9-2320-365-10).
(11) Pull out circuit breaker CB11 (TM 9-2320-365-10).
(12) Install blackout light (para 16-58).



P
CONNECTOR

32EK4041

e113. M1079 EMERGENCY LIGHTS(S) DO NOT ILLUMINATE

INITIAL SETUP

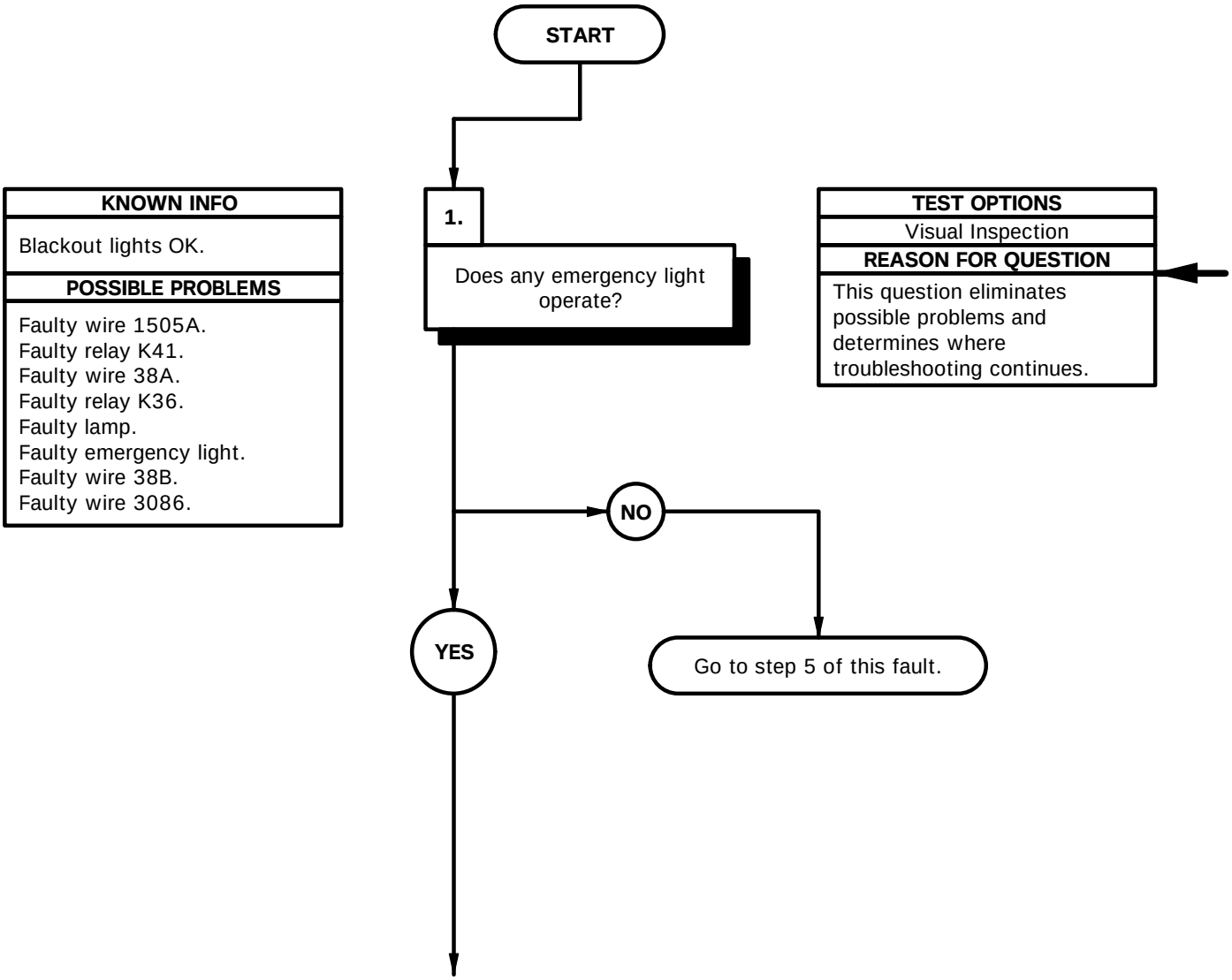
Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

Materials/Parts
Lockwasher (12) (emergency lights DS78, DS79, and DS97) (Item 81, Appendix G)
Lockwasher (16) (emergency light DS96) (Item 81, Appendix G)

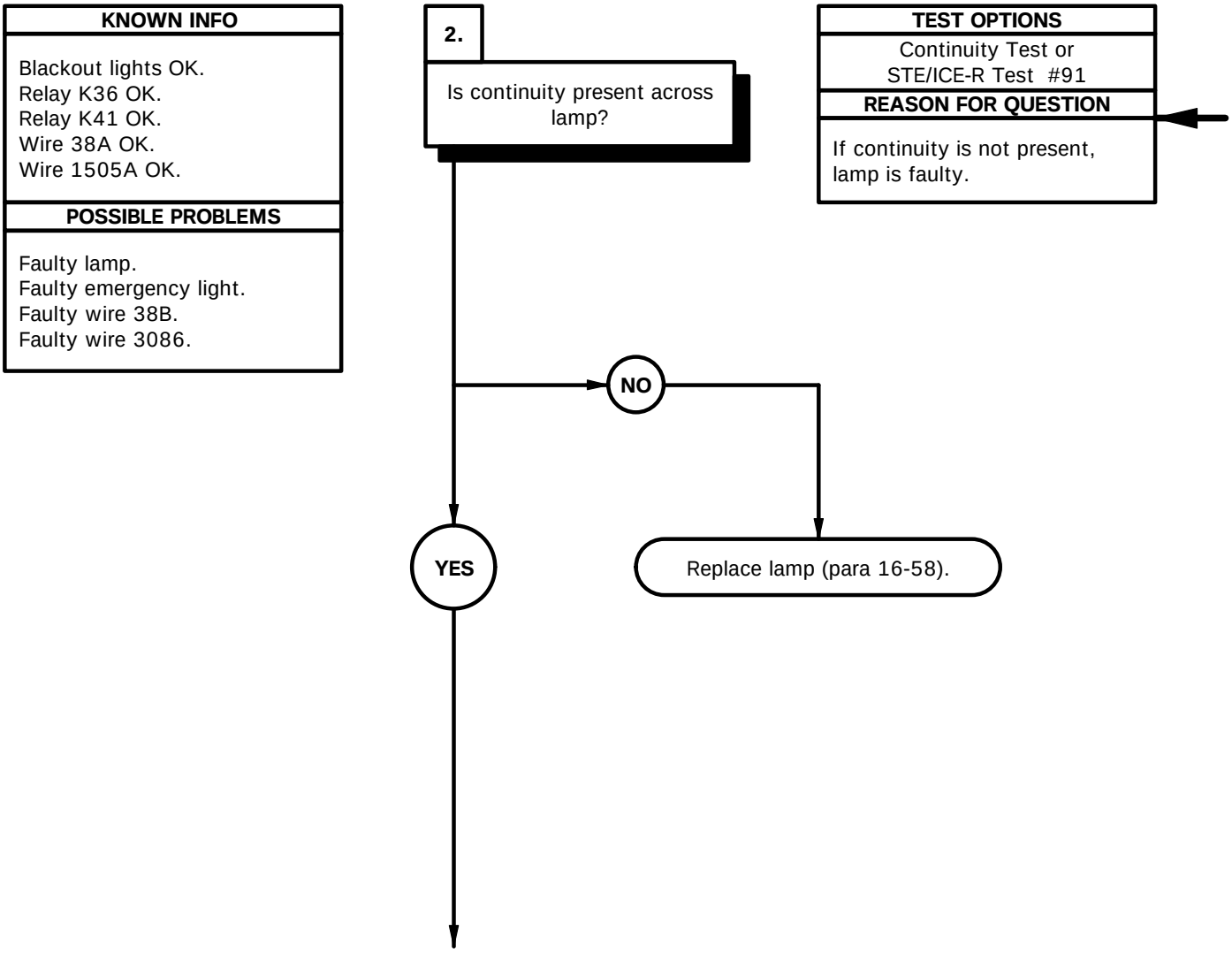
Personnel Required
(2)

References
TM 9-4910-571-12&P



(1) Disconnect AC power (TM 9-2320-365-10).
(2) Push in circuit breaker CB11 (TM 9-2320-365-10).
(3) Push in circuit breaker CB10 (TM 9-2320-365-10).
(4) Position INTERIOR LIGHTS switch S32 to ON (TM 9-2320-365-10).
(5) Position LIGHTS/BLACKOUT OVERRIDE switch S33 to BLACKOUT OVERRIDE (TM 9-2320-365-10).
(6) Check to see if any emergency light illuminates.
(7) If all emergency lights do not illuminate, go to step 5 of this fault.
(8) Position LIGHTS/BLACKOUT OVERRIDE switch S33 to BLACKOUT (TM 9-2320-365-10).
(9) Position INTERIOR LIGHTS switch S32 to OFF (TM 9-2320-365-10).
(10) Pull out circuit breaker CB10 (TM 9-2320-365-10).
(11) Pull out circuit breaker CB11 (TM 9-2320-365-10).

e113. M1079 EMERGENCY LIGHT(S) DOES NOT ILLUMINATE (CONT)



NOTE

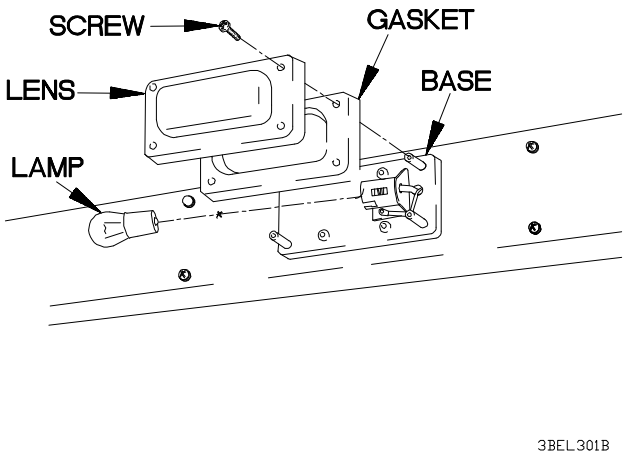
All emergency light lamps are tested the same way. Refer to Table 2-15. M1079 Emergency Light Locations and Connector Numbers for details. Emergency light DS78 shown.

CONTINUITY TEST

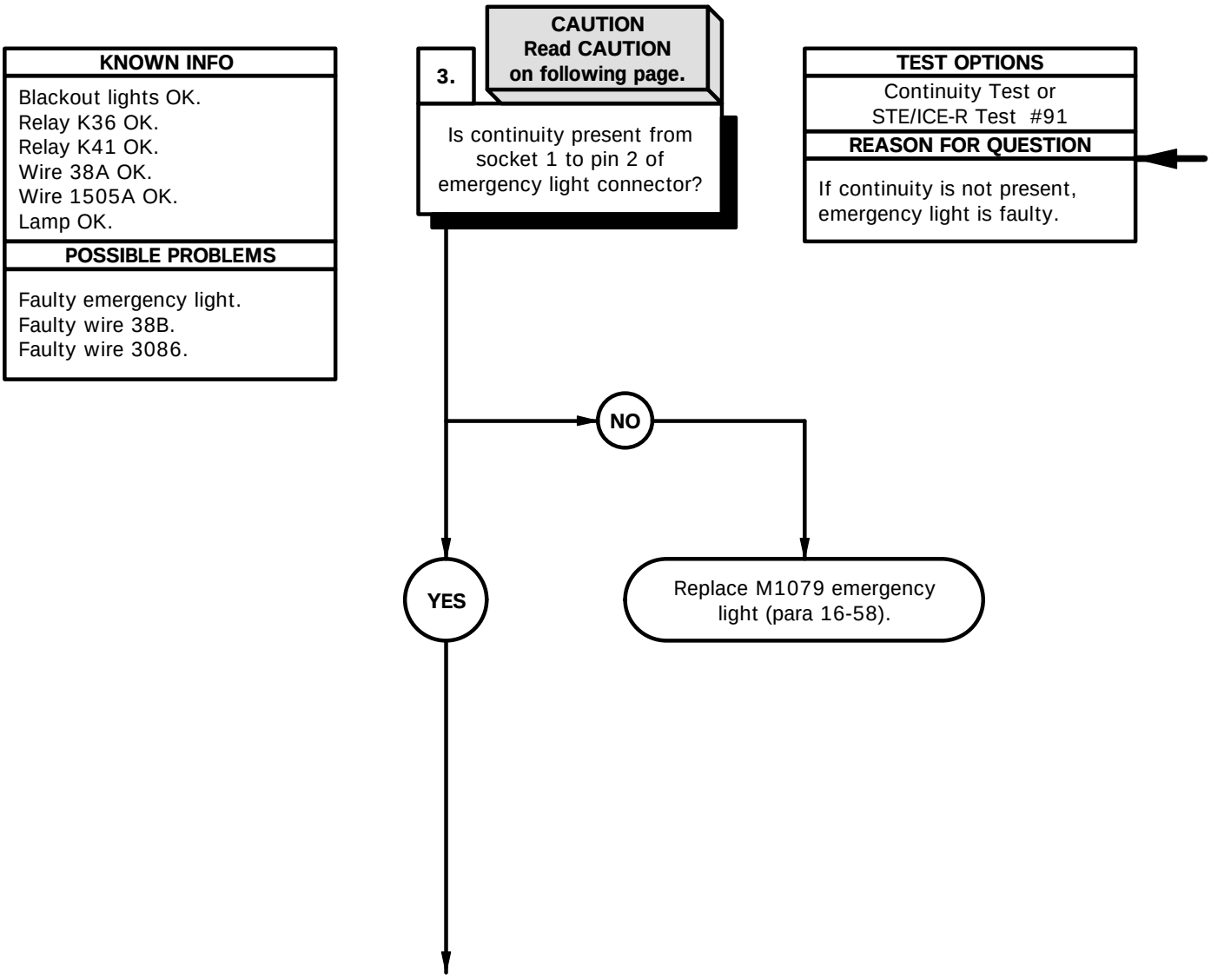
(1) Remove four screws and lens from base.
(2) Remove gasket from base.
(3) Remove lamp from base.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to center contact of lamp.
(6) Connect negative (-) probe of multimeter to lamp base and note reading on multimeter.
(7) If continuity is not present, replace lamp (16-58).
(8) Install lamp in base.

Table 2-15. M1079 Emergency Light Locations and Connector Numbers

Location	Number	Connector
RH Side	DS78	J163,P163
LH Side	DS79	J165, P165
Front	DS96	J166, P166
Rear	DS97	J167, P167



e113. M1079 EMERGENCY LIGHT(S) 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

All emergency lights are tested the same way. Refer to Table 2-15. M1079 Emergency Light Locations and Connector Numbers for details. Emergency light DS78 shown.

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

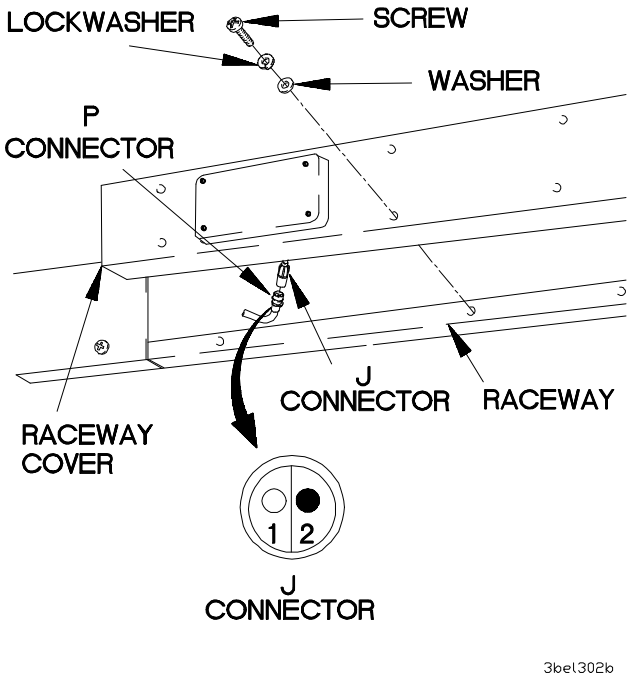
CONTINUITY TEST

(1) Remove 12 screws, lockwashers, and washers from raceway cover. Discard lockwashers.

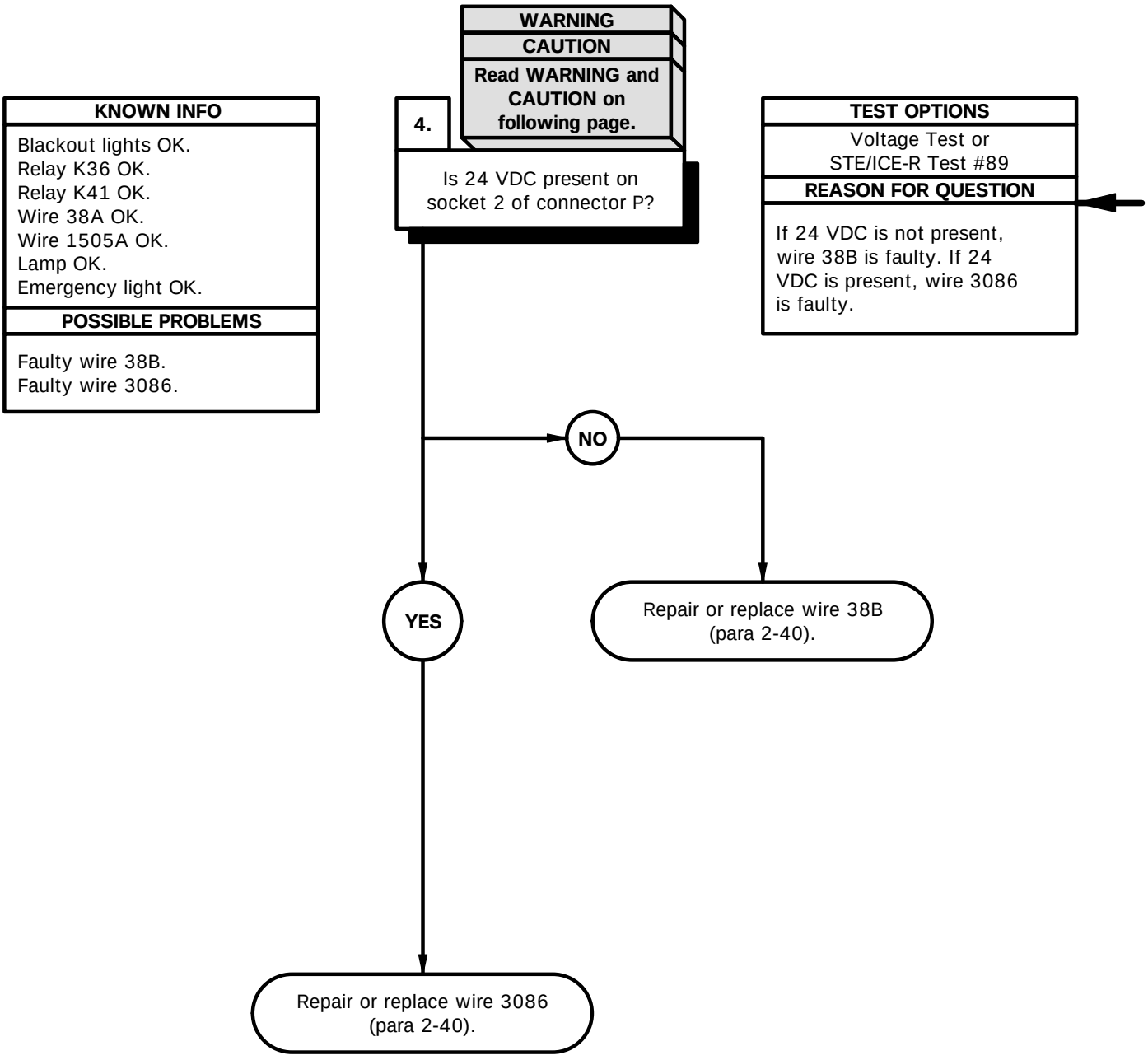
NOTE

Perform step (2) on front raceway cover.

(2) Remove two screws, lockwashers, and washers from each end of raceway cover. Discard lockwashers.
(3) Remove raceway cover from raceway.
(4) Disconnect J connector from P connector.
(5) Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter to socket 1 of J connector.
(7) Connect negative (-) probe of multimeter to pin 2 of J connector and note reading on multimeter.
(8) If continuity is not present, replace M1079 emergency light (para 16-58).



e113. M1079 EMERGENCY LIGHT(S) 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

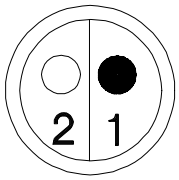
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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) Push in circuit breaker CB11 (TM 9-2320-365-10).
(2) Push in circuit breaker CB10 (TM 9-2320-365-10).
(3) Position INTERIOR LIGHTS switch S32 to ON (TM 9-2320-365-10).
(4) Position LIGHTS/BLACKOUT OVERRIDE switch S33 to BLACKOUT OVERRIDE (TM 9-2320-365-10).
(5) Set multimeter to volts DC.
(6) Connect positive (+) probe of multimeter to socket 2 of P connector. Refer to Table 2-15. M1079 Emergency Light Locations and Connector Numbers.
(7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(8) If 24 VDC is not present, repair or replace wire 38B (para 2-40).
(9) If 24 VDC is present, repair or replace wire 3086 (para 2-40).
(10) Position LIGHTS/BLACKOUT OVERRIDE switch S33 to BLACKOUT (TM 9-2320-365-10).
(11) Position INTERIOR LIGHTS switch to OFF (TM 9-2320-365-10).
(12) Pull out circuit breaker CB10 (TM 9-2320-365-10).
(13) Pull out circuit breaker CB11 (TM 9-2320-365-10).
(14) Install M1079 emergency light (para 16-58).



P
CONNECTOR

3BEL303B

e113. M1079 EMERGENCY LIGHT(S) DOES NOT ILLUMINATE (CONT)

KNOWN INFO

Blackout lights OK.
All emergency lights do not operate.

POSSIBLE PROBLEMS

Faulty wire 1505A.
Faulty relay K41.
Faulty wire 38A.
Faulty relay K36.

5. Is continuity present on wire 1505A from K36 relay base terminal 8 to K41 relay base terminal 8?

TEST OPTIONS

Continuity Test or
STE/ICE-R Test #91

REASON FOR QUESTION

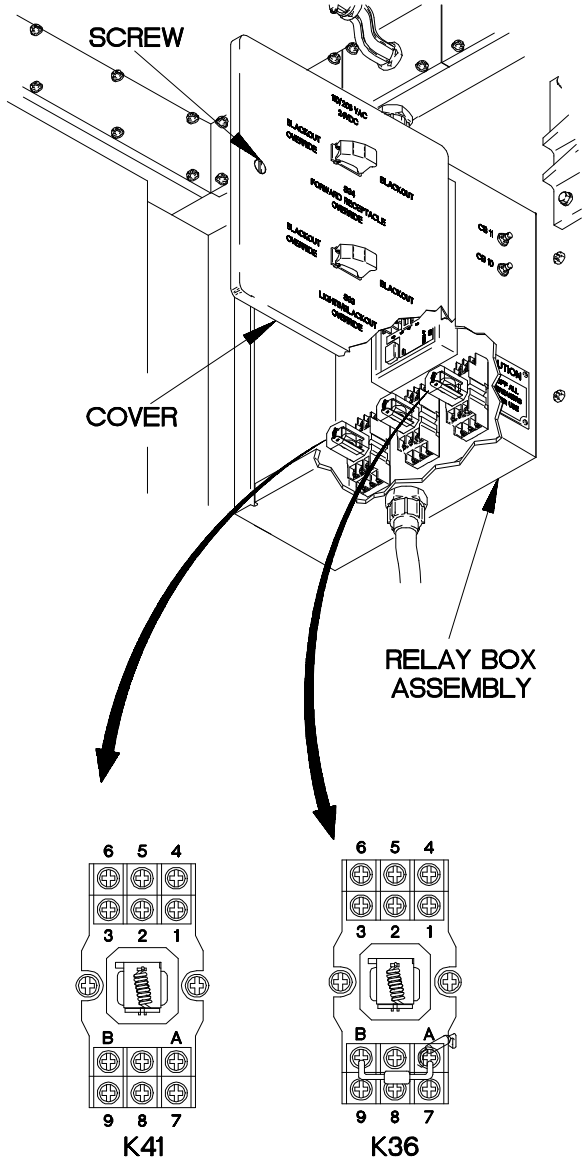
If continuity is not present, wire 1505A is faulty.

NO → Repair or replace wire 1505A (para 2-40).

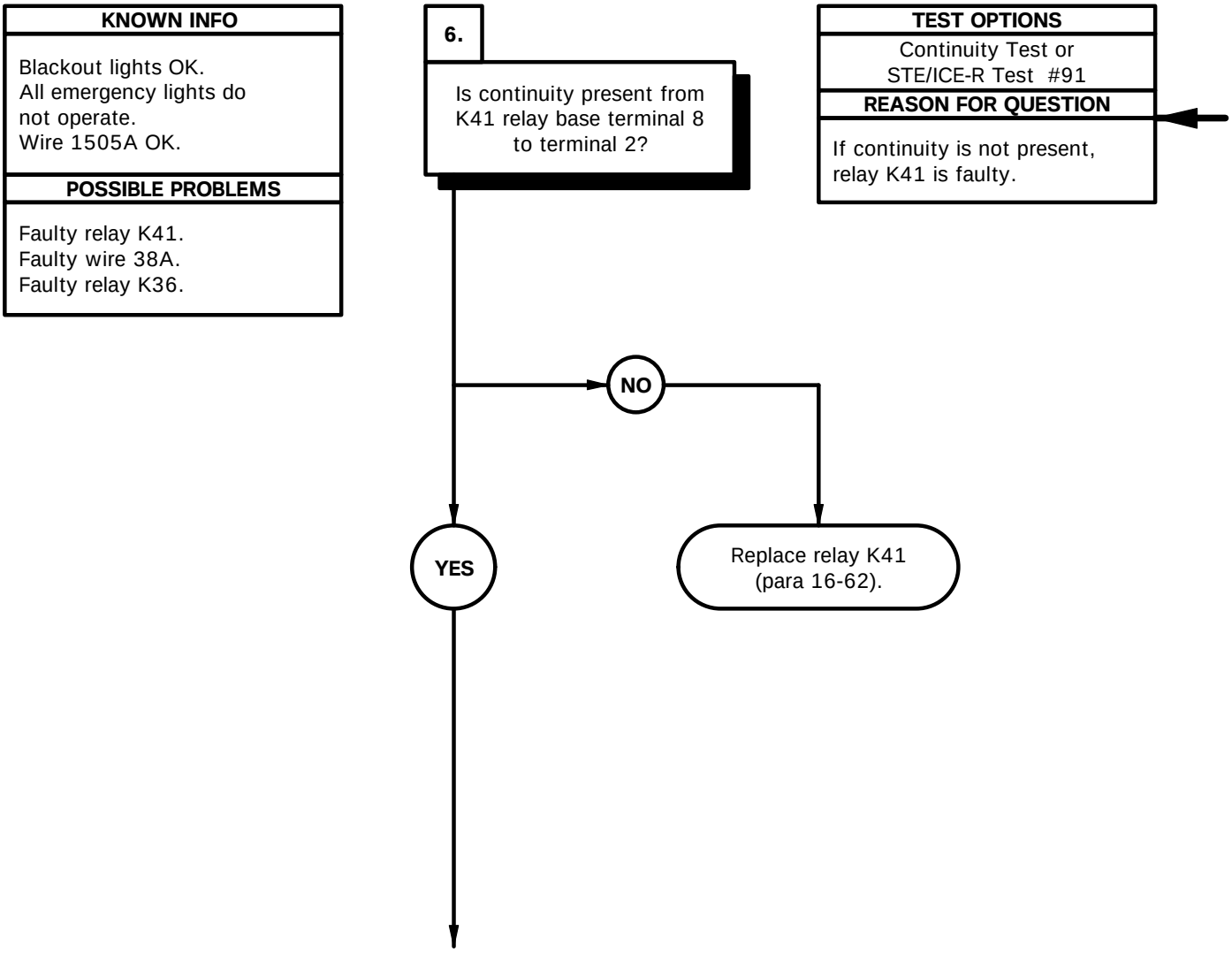
YES

CONTINUITY TEST

(1) Loosen screw in cover.
(2) Open cover on relay box assembly.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to K36 relay base terminal 8.
(5) Connect negative (-) probe of multimeter to K41 relay base terminal 8 and note reading on multimeter.
(6) If continuity is not present, repair or replace wire 1505A (para 2-40).

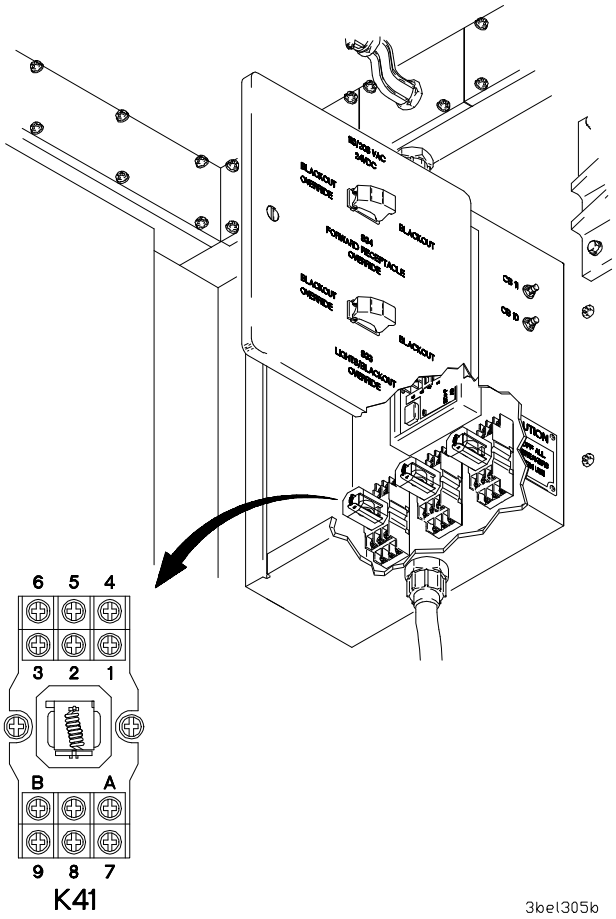


e113. M1079 EMERGENCY LIGHT(S) DOES NOT ILLUMINATE (CONT)

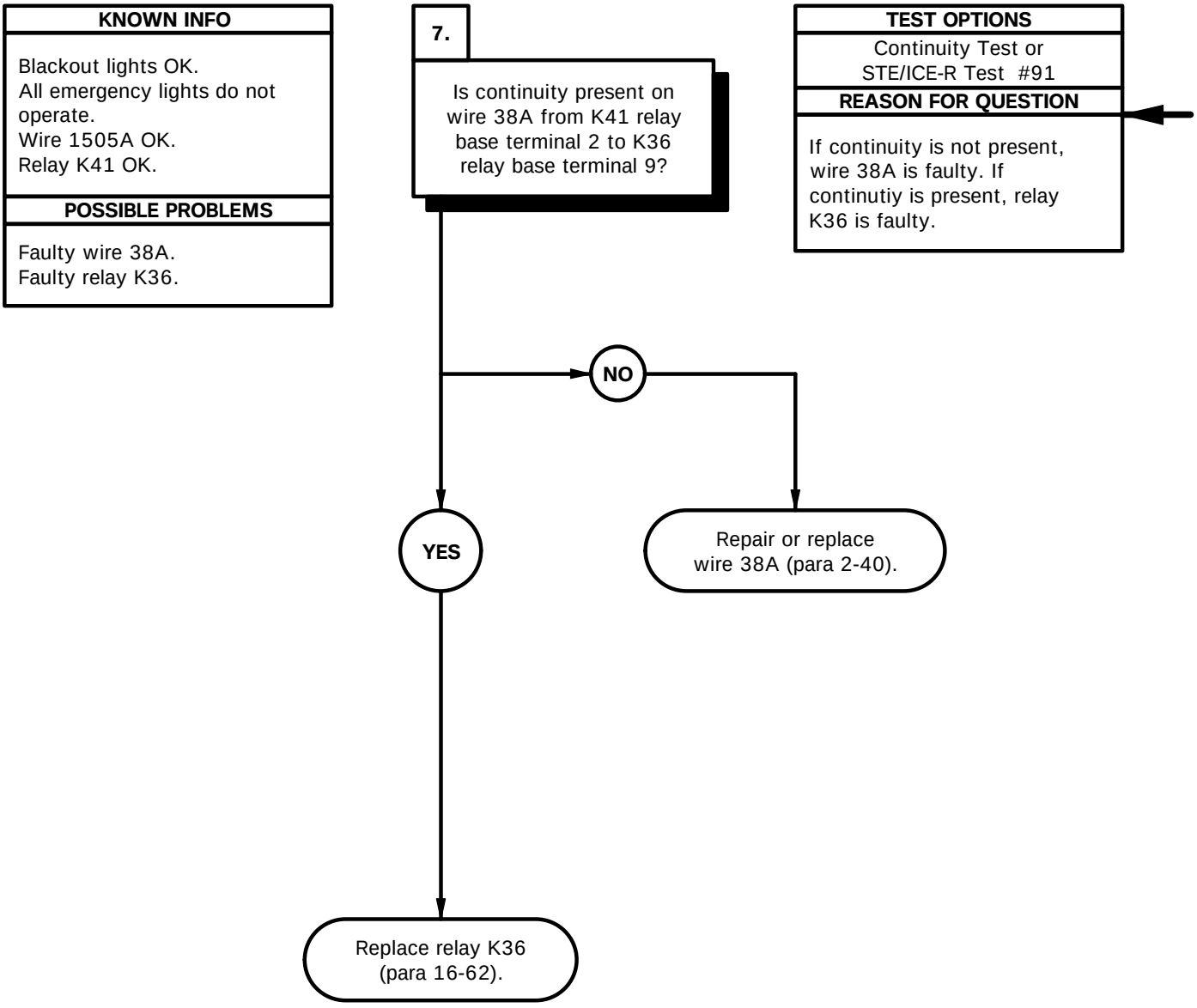


CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to K4 relay base terminal 8.
(3) Connect negative (-) probe of multimeter to K41 relay base terminal 2 and note reading on multimeter.
(4) If continuity is not present, replace relay K41 (para 16-62).

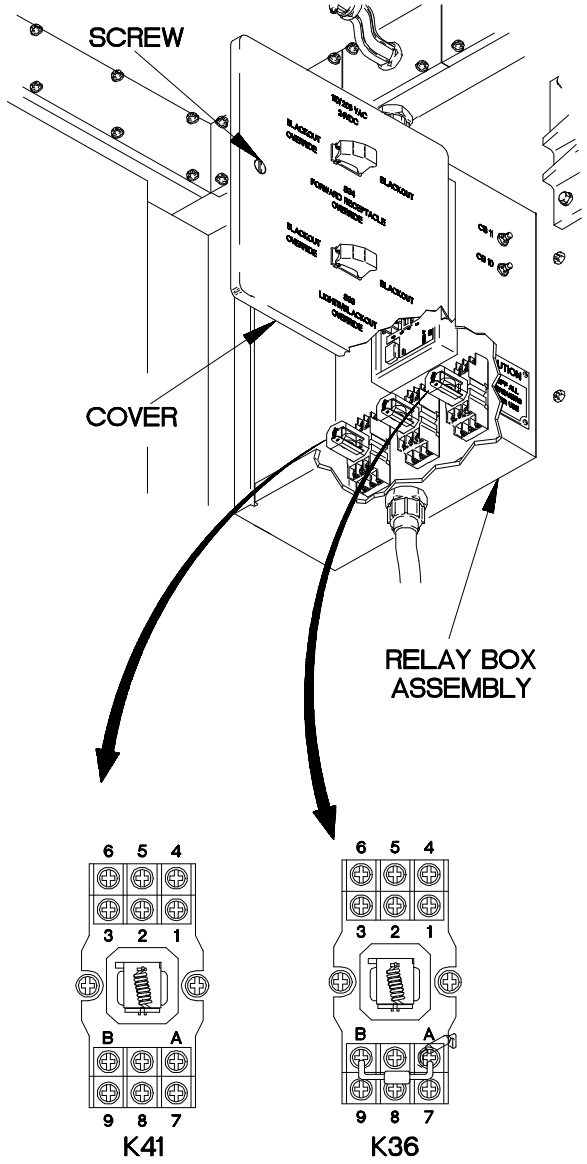


e113. M1079 EMERGENCY LIGHT(S) DOES NOT ILLUMINATE (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to K4 relay base terminal 2.
(3) Connect negative (-) probe of multimeter to K36 relay base terminal 9 and note reading on multimeter.
(4) If continuity is not present, repair or replace wire 38A (para 2-40).
(5) If continuity is present, replace relay K36 (para 16-62).
(6) Close cover on relay box assembly.
(7) Tighten screw in cover.



e114. M1079 PHONE 1 AND/OR 2 BINDING POST DOES NOT OPERATE

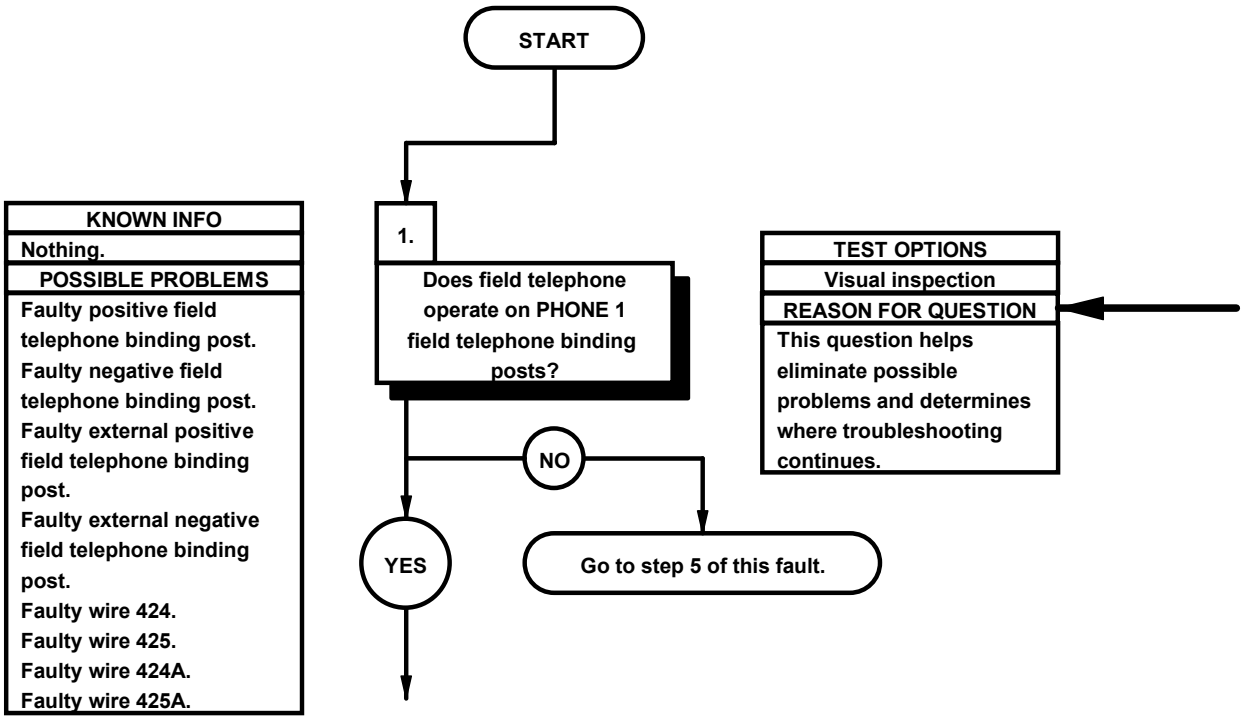
INITIAL SETUP

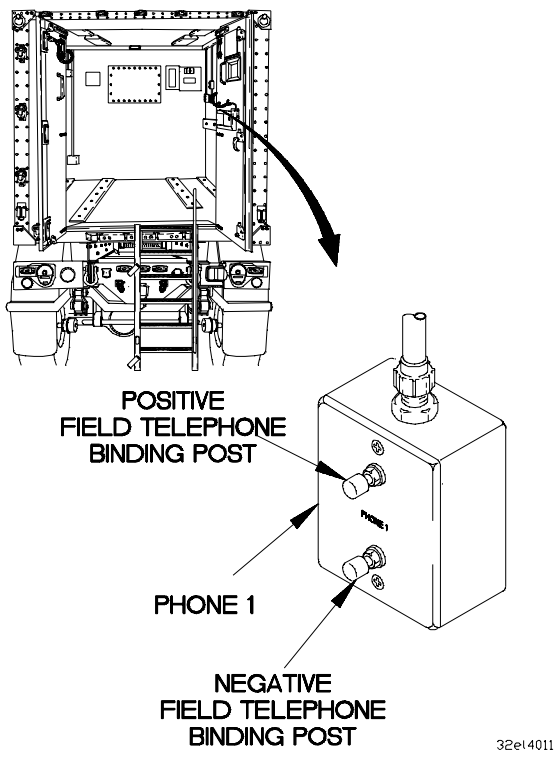
Equipment Condition
Engine shut down (TM 9-2320-365-10).

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

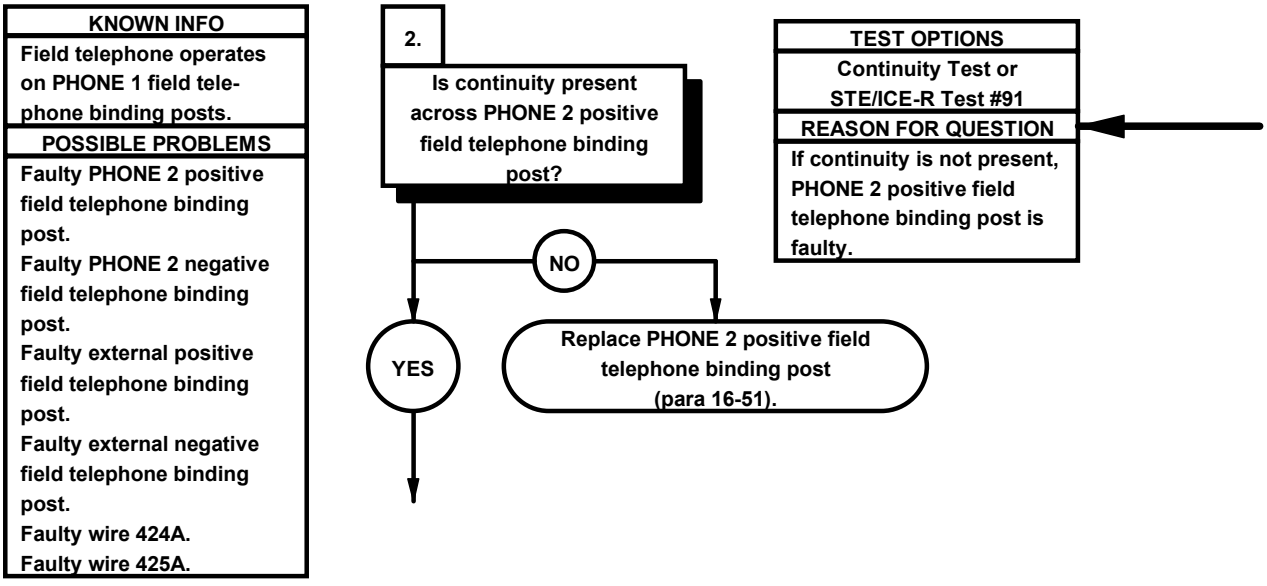
References
TM 9-4910-571-12&P





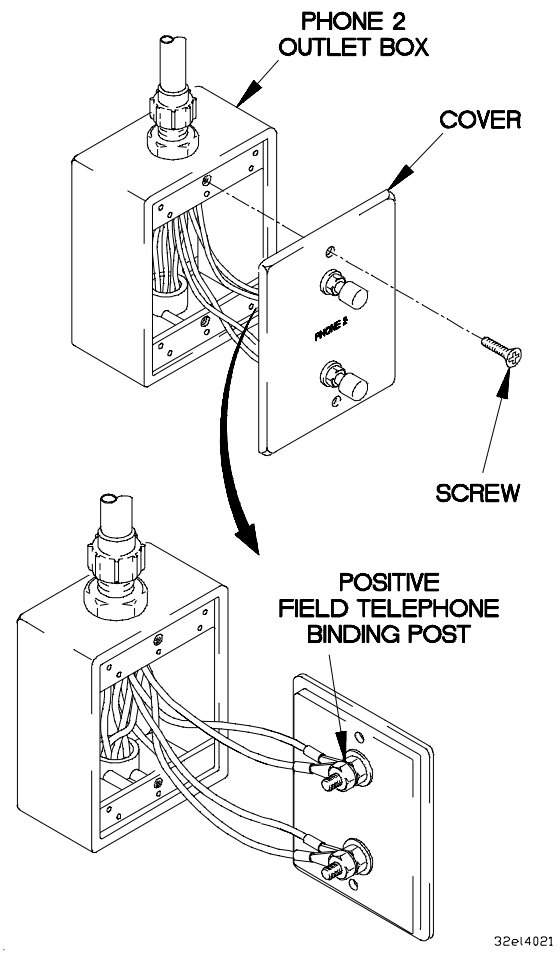
(1) Install field telephone on PHONE 1 field telephone binding posts.
(2) Operate field telephone.
(3) If field telephone does not operate, go to step 5 of this fault.
(4) Remove field telephone from PHONE 1 field telephone binding posts.

e114. M1079 PHONE 1 AND/OR 2 BINDING POST DOES NOT OPERATE (CONT)

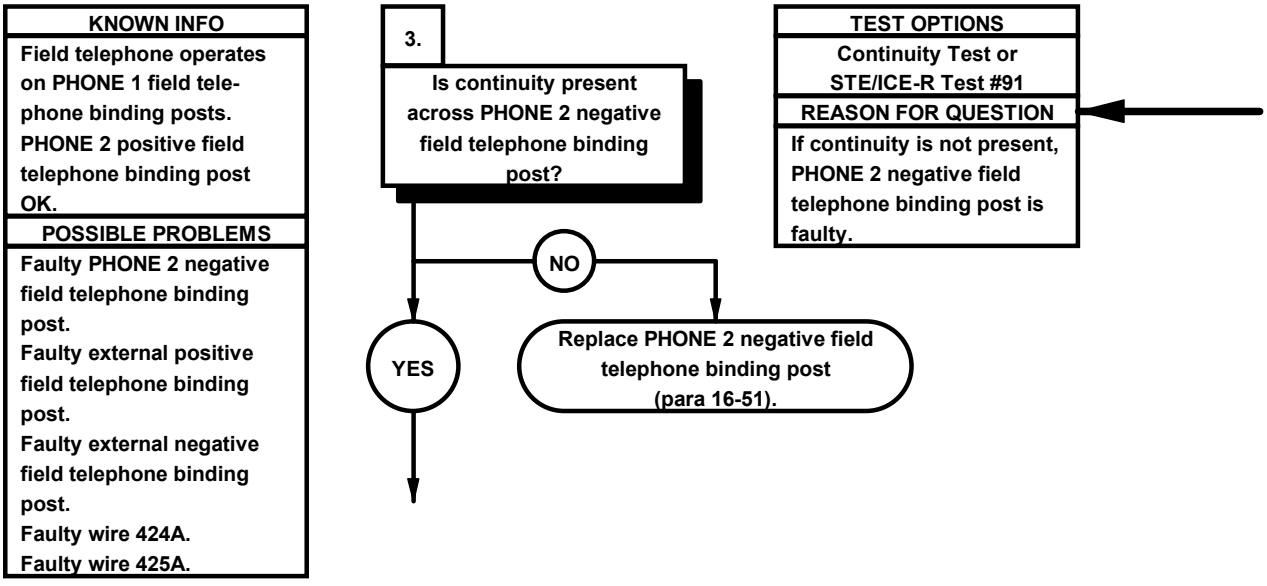


CONTINUITY TEST

(1) Remove two screws and cover from PHONE 2 outlet box.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to one side of PHONE 2 positive field telephone binding post.
(4) Connect negative (-) probe of multimeter to other side of PHONE 2 positive field telephone binding post and note reading on multimeter.
(5) If continuity is not present, replace PHONE 2 positive field telephone binding post (para 16-51).

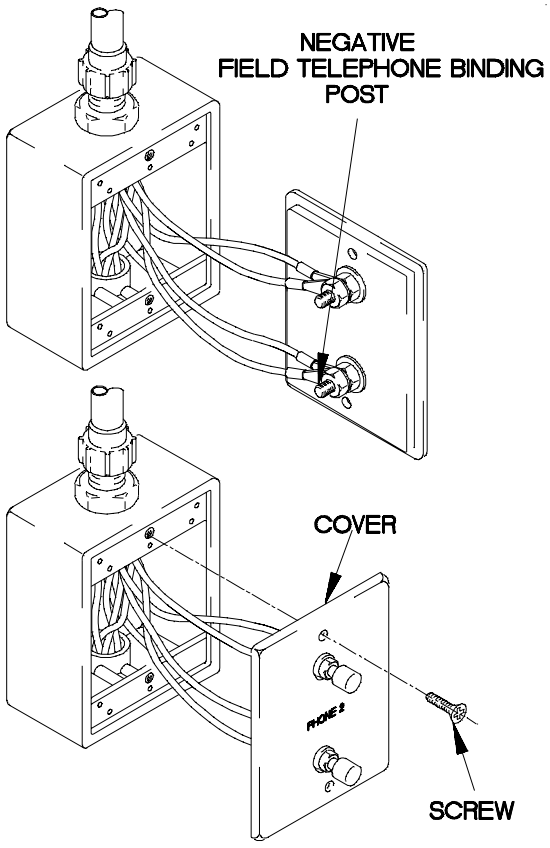


e114. M1079 PHONE 1 AND/OR 2 BINDING POST DOES NOT OPERATE (CONT)

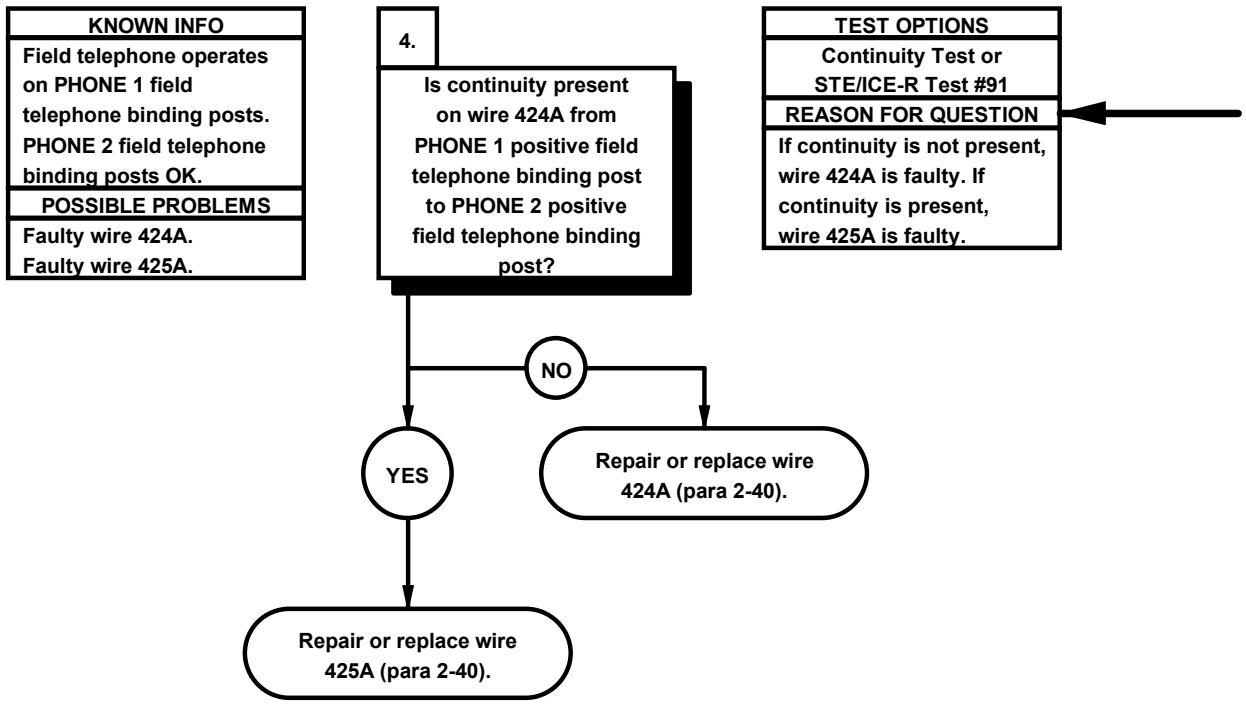


CONTINUITY TEST

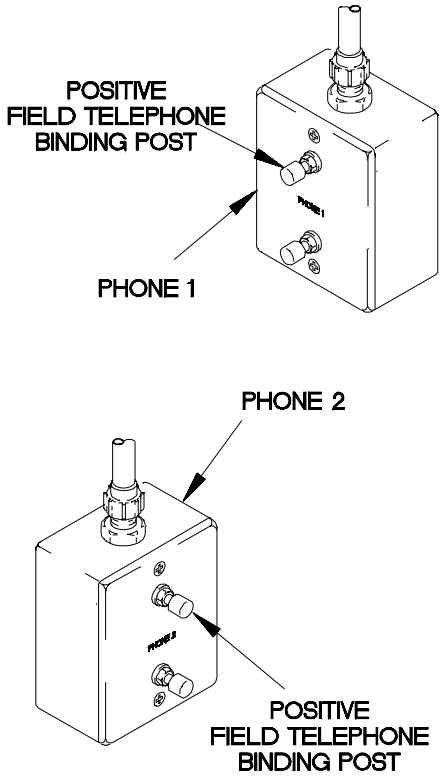
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to one side of PHONE 2 negative field telephone binding post.
(3) Connect negative (-) probe of multimeter to other side of PHONE 2 negative field telephone binding post and note reading on multimeter.
(4) If continuity is not present, replace PHONE 2 negative field telephone binding post (para 16-51).
(5) Install cover on PHONE 2 outlet box with two screws.



e114. M1079 PHONE 1 AND/OR 2 BINDING POST DOES NOT OPERATE (CONT)

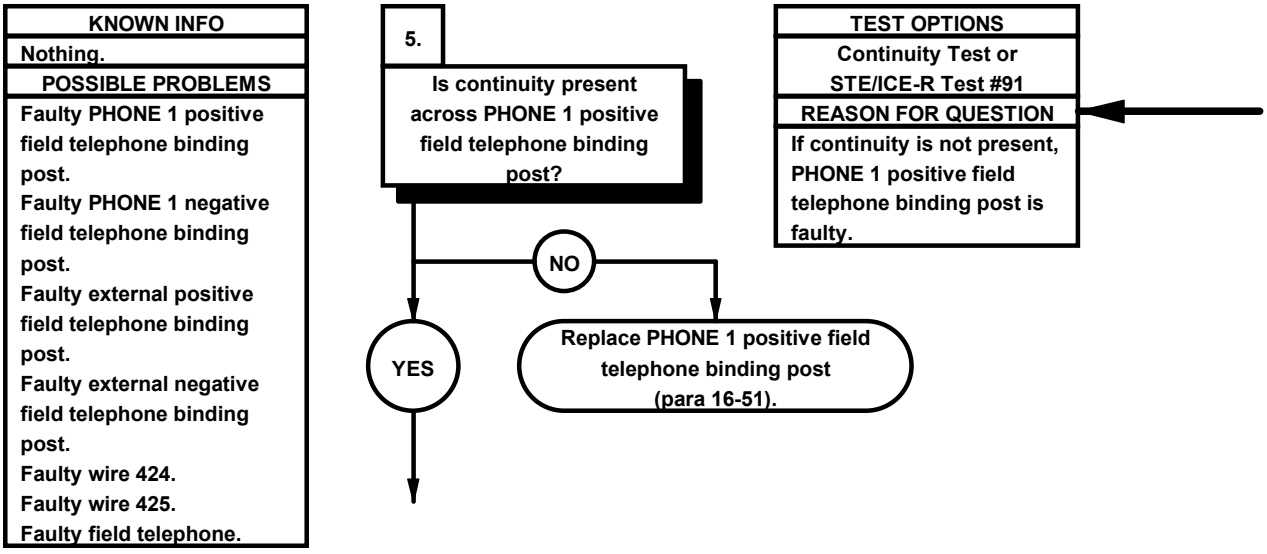


CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to PHONE 1 positive field telephone binding post.
(3) Connect negative (-) probe of multimeter to PHONE 2 positive field telephone binding post and note reading on multimeter.
(4) If continuity is not present, repair or replace wire 424A (para 2-40).
(5) If continuity is present, repair or replace wire 425A (para 2-40).

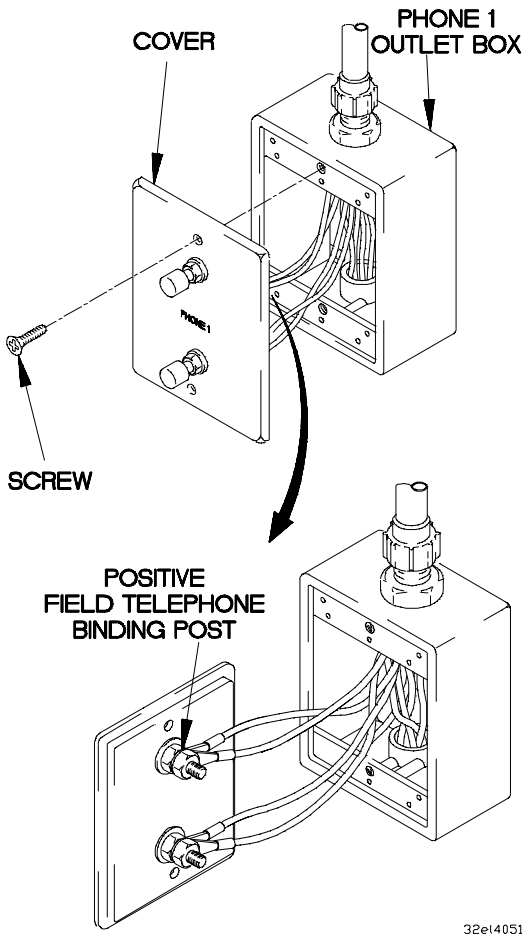


32EK2041

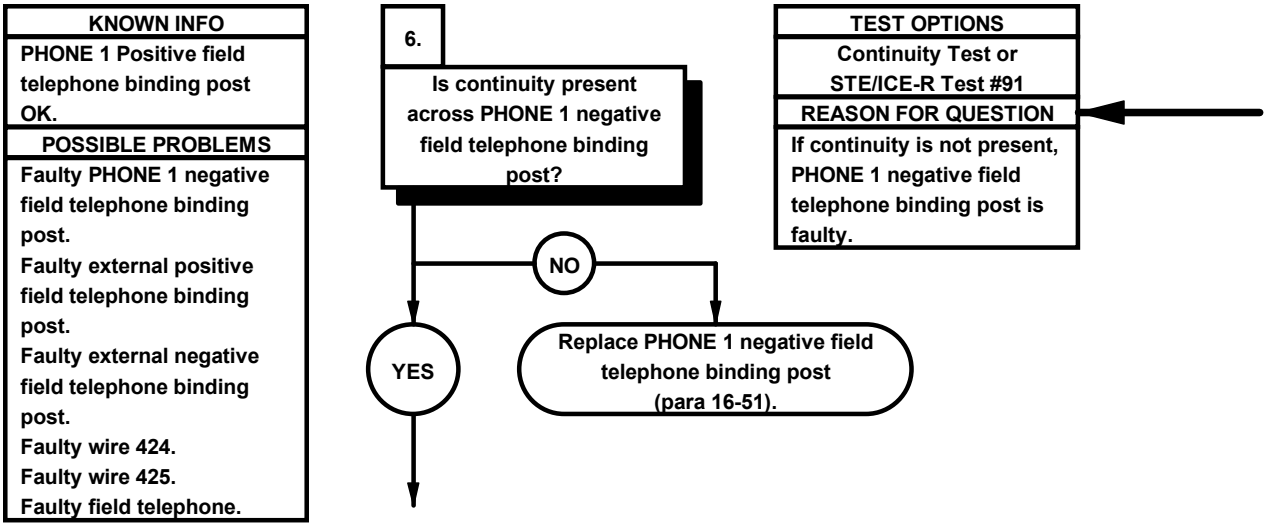
e114. M1079 PHONE 1 AND/OR 2 BINDING POST DOES NOT OPERATE (CONT)



CONTINUITY TEST
(1) Remove two screws and cover from PHONE 1 outlet box.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to one side of PHONE 1 positive field telephone binding post.
(4) Connect negative (-) probe of multimeter to other side of PHONE 1 positive field telephone binding post and note reading on multimeter.
(5) If continuity is not present, replace PHONE 1 positive field telephone binding post (para 16-51).

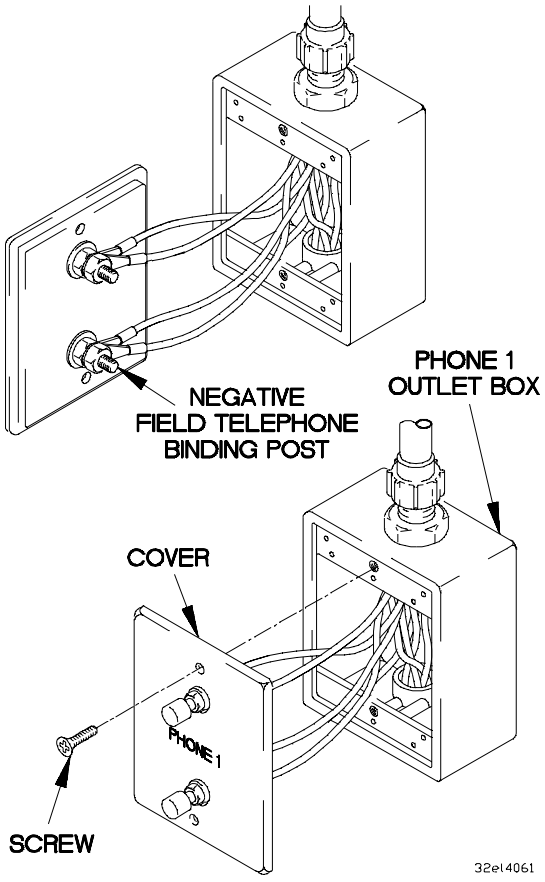


e114. M1079 PHONE 1 AND/OR 2 BINDING POST DOES NOT OPERATE (CONT)

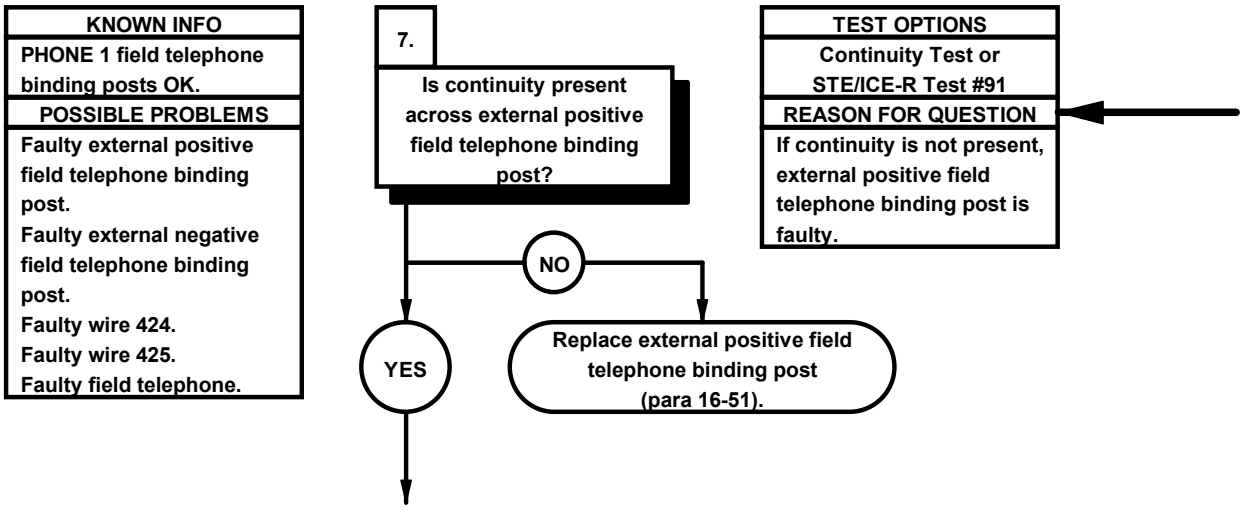


CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to one side of PHONE 1 negative field telephone binding post.
(3) Connect negative (-) probe of multimeter to other side of PHONE 1 negative field telephone binding post and note reading on multimeter.
(4) If continuity is not present, replace PHONE 1 negative field telephone binding post (para 16-51).
(5) Install cover on PHONE 1 outlet box with two screws.



e114. M1079 PHONE 1 AND/OR 2 BINDING POST DOES NOT OPERATE (CONT)



CONTINUITY TEST

NOTE

Perform step (1) on van body serial numbers 001 through 190.

(1) Remove 28 screws, lockwashers, washers, and cover from 110/208 vac power entry panel. Discard lockwashers.

NOTE

Perform step (2) on van bodies serial number 191 and higher.

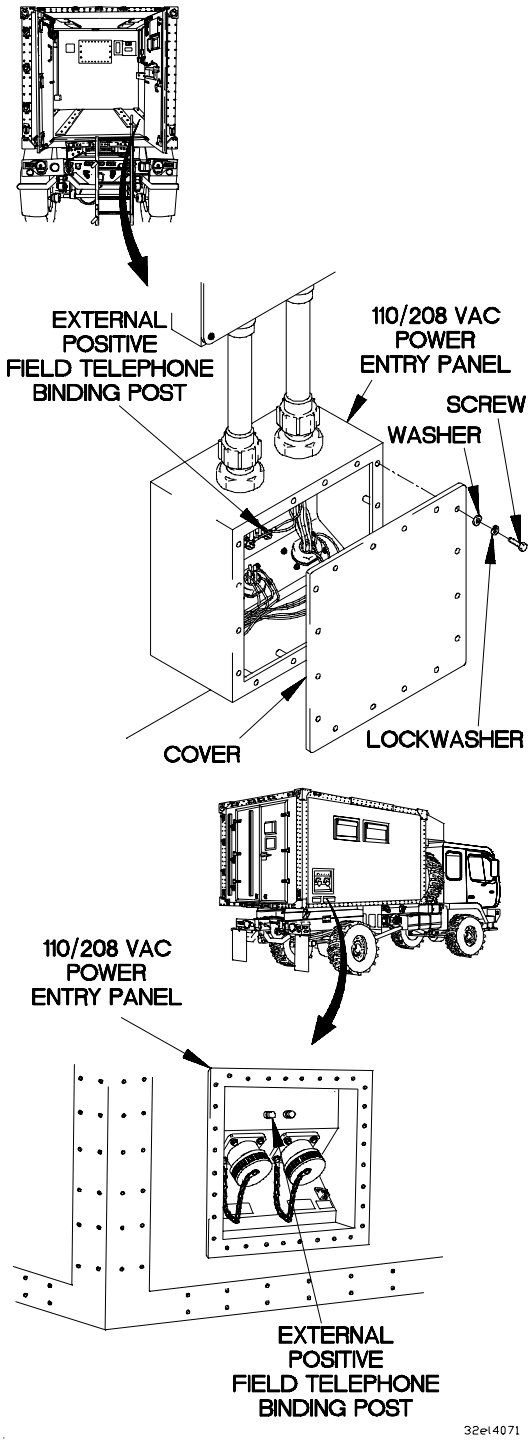
(2) Remove 16 screws, lockwashers, washers, and cover from 110/208 vac power entry panel. Discard lockwashers.

(3) Set multimeter to ohms.

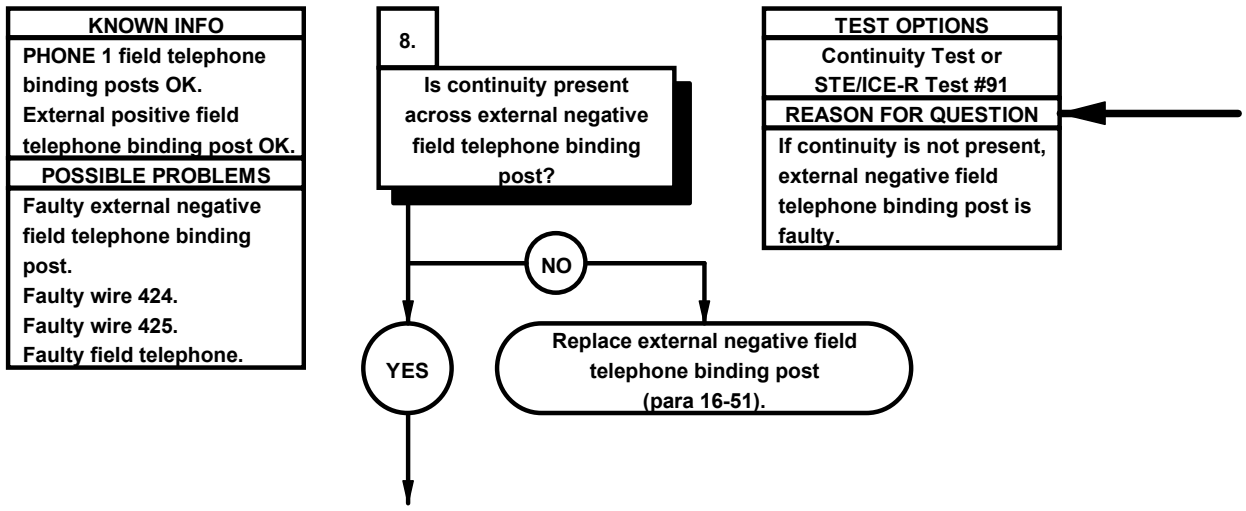
(4) Connect positive (+) probe of multimeter to one end of external positive field telephone binding post.

(5) Connect negative (-) probe of multimeter to other end of external positive field telephone binding post and note reading on multimeter.

(6) If continuity is not present, replace external positive field telephone binding post (para 16-51).



e114. M1079 PHONE 1 AND/OR 2 BINDING POST DOES NOT OPERATE (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.

(2) Connect positive (+) probe of multimeter to one end of external negative field telephone binding post.

(3) Connect negative (-) probe of multimeter to other end of external negative field telephone binding post and note reading on multimeter.

(4) If continuity is not present, replace external negative field telephone binding post (para 16-51).

NOTE

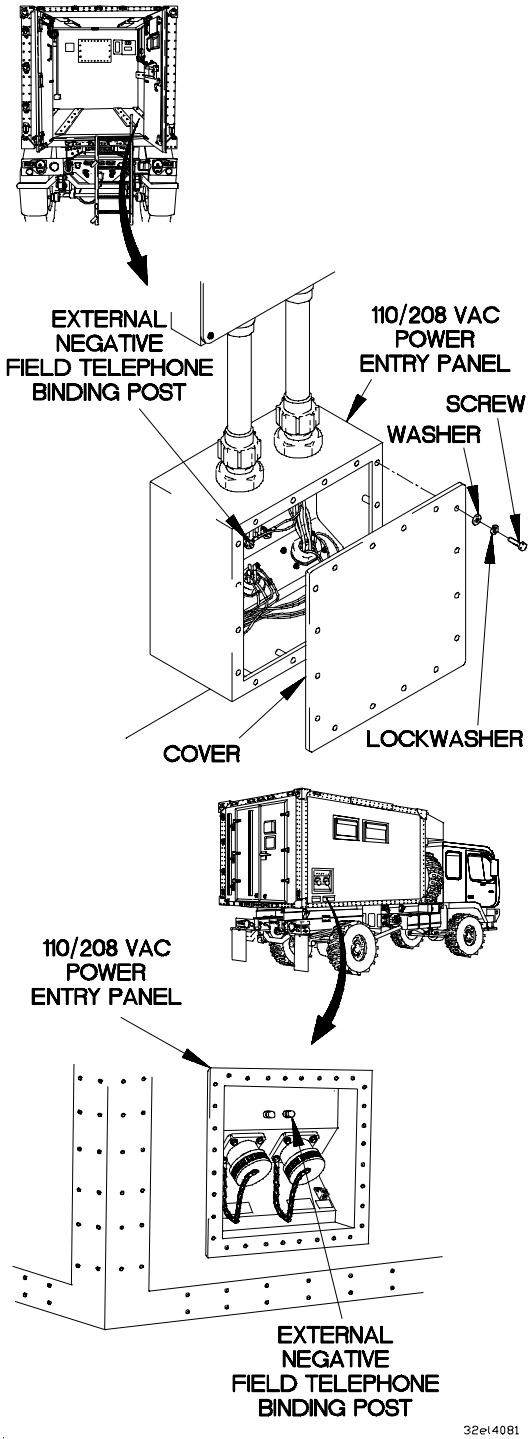
Perform step (5) on van bodies serial number 191 and higher.

(5) Install cover on 110/208 vac power entry panel with 16 washers, lockwashers, and screws.

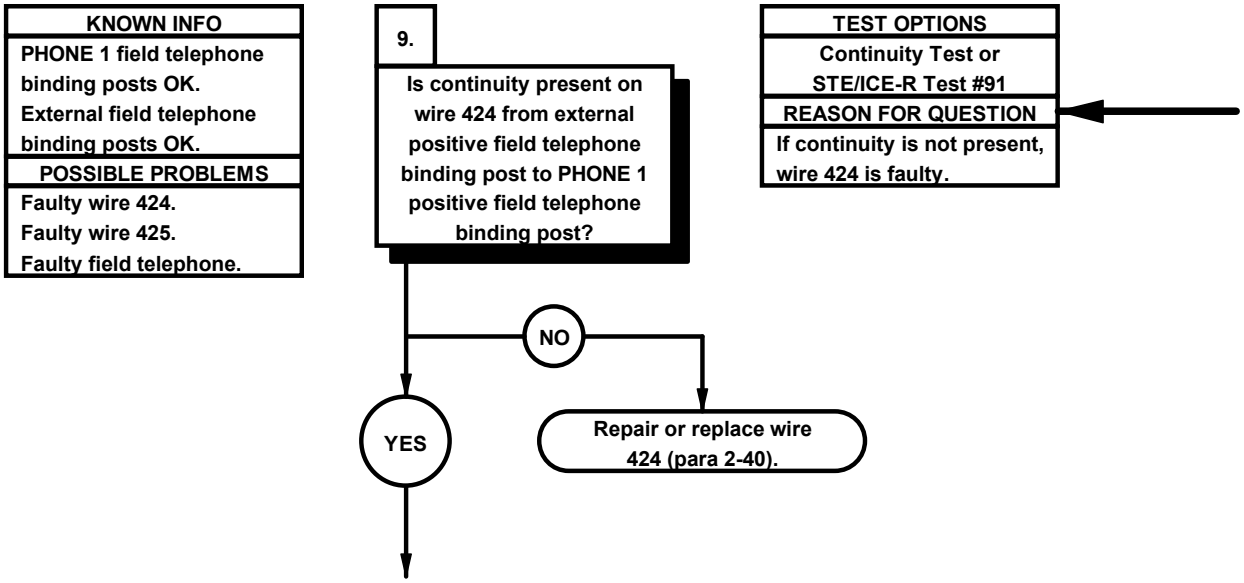
NOTE

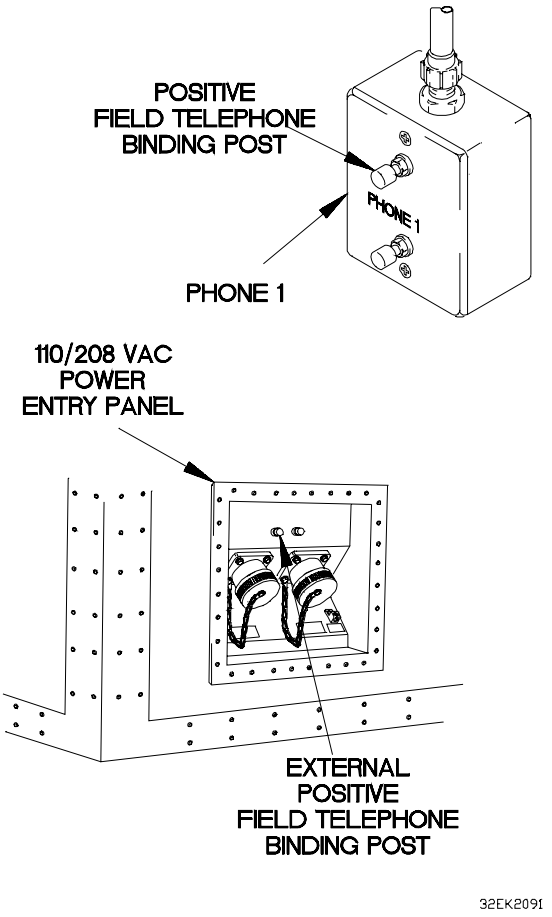
Perform step (6) on van body serial numbers 001 through 190.

(6) Install cover on 110/208 vac power entry panel with 28 washers, lockwashers, and screws.



e114. M1079 PHONE 1 AND/OR 2 BINDING POST DOES NOT OPERATE (CONT)

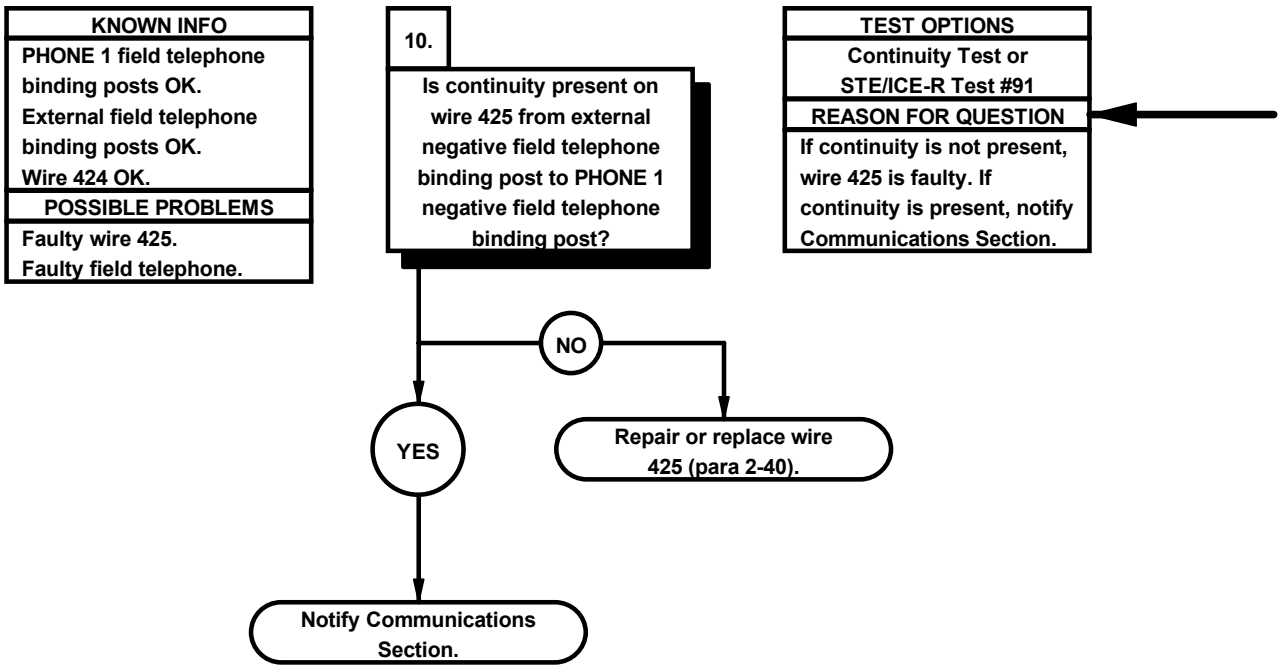




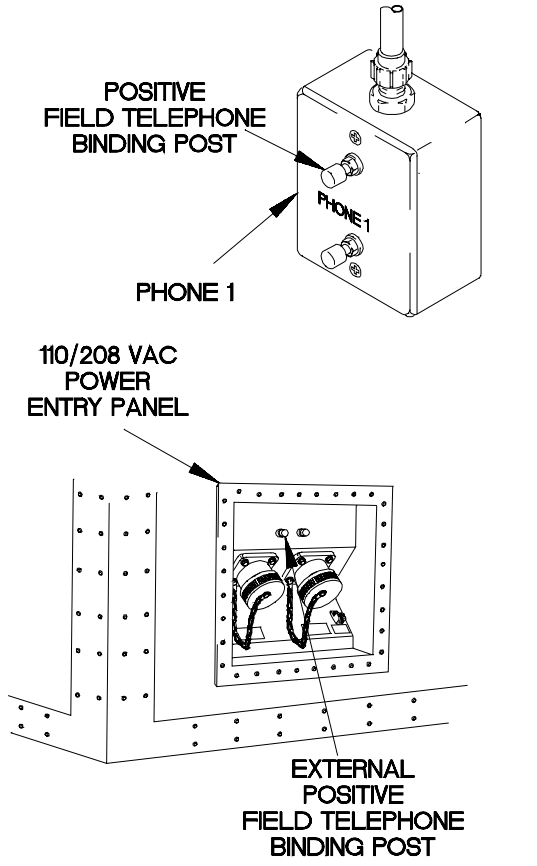
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to PHONE 1 positive field telephone binding post.
(3) Connect negative (-) probe of multimeter to external positive field telephone binding post and note reading on multimeter.
(4) If continuity is not present, repair or replace wire 424 (para 2-40).

e114. M1079 PHONE 1 AND/OR 2 BINDING POST DOES NOT OPERATE (CONT)



CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to PHONE 1 negative field telephone binding post.
(3) Connect negative (-) probe of multimeter to external negative field telephone binding post and note reading on multimeter.
(4) If continuity is not present, repair or replace wire 425 (para 2-40).
(5) If continuity is present, notify communications section.



e115. M1079 AIR CONDITIONER DOES NOT OPERATE

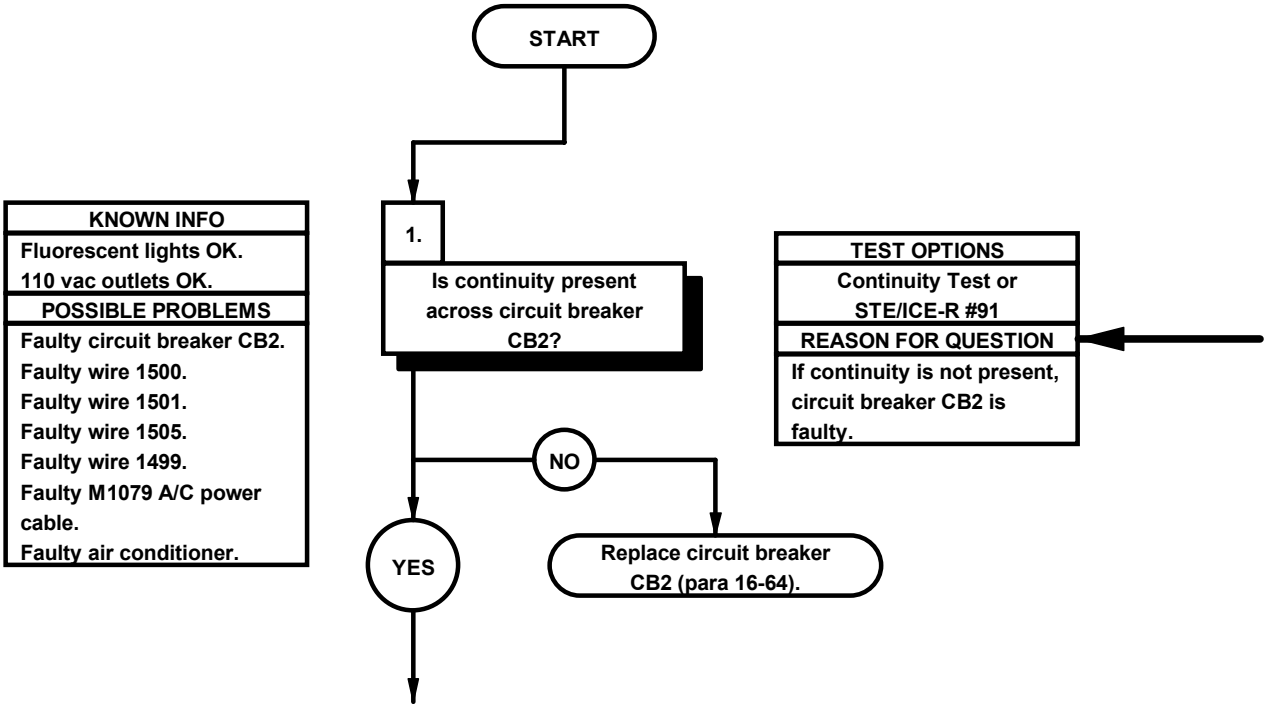
INITIAL SETUP

Equipment Condition
- Engine shut down (TM 9-2320-365-10).
- AC power disconnected (TM 9-2320-365-10).

Personnel Required
- (2)

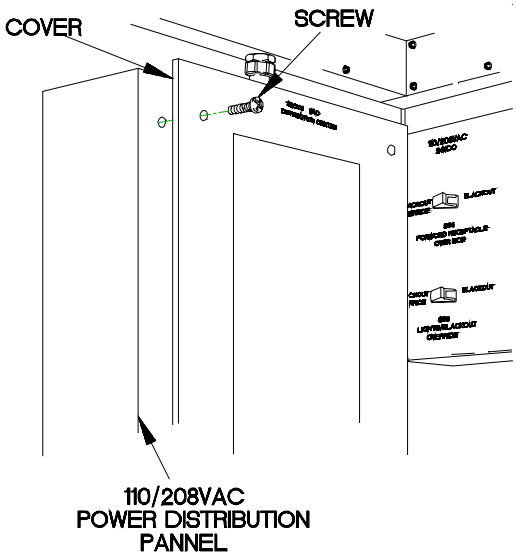
Tools and Special Tools
- Tool Kit, Genl Mech (Item 44, Appendix C)
- STE/ICE-R (Item 39, Appendix C)
- Multimeter, Digital (Item 22, Appendix C)

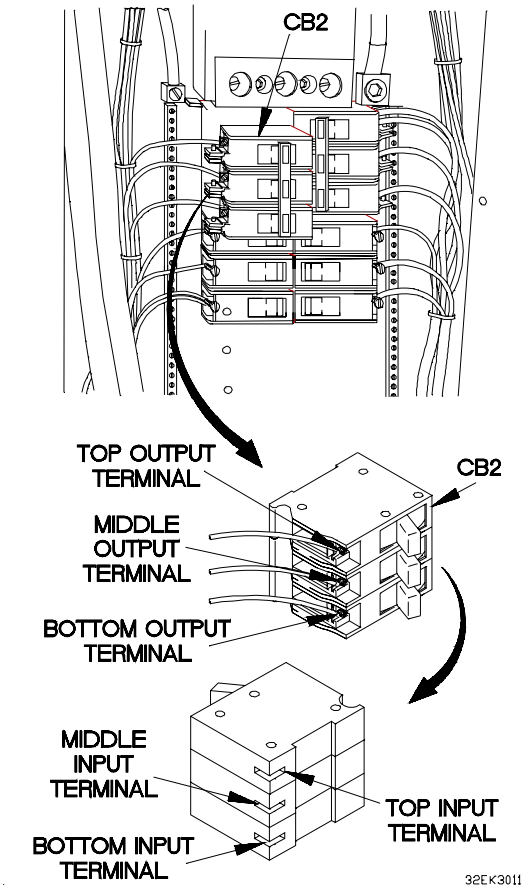
References
- TM 9-4910-571-12&P
- TM 5-4120-384-14



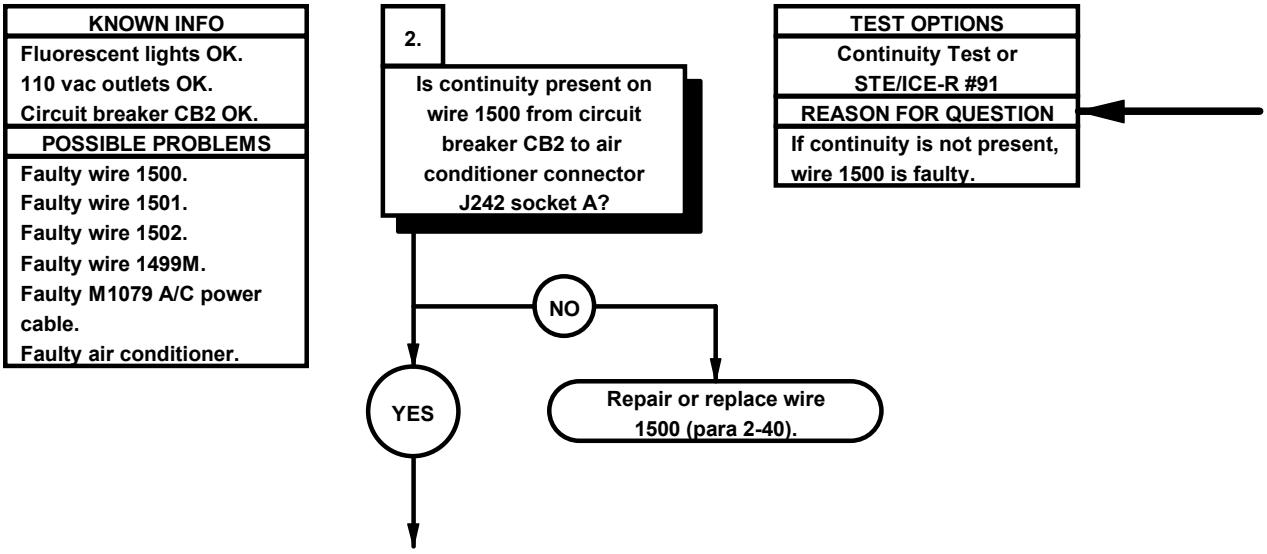
CONTINUITY TEST

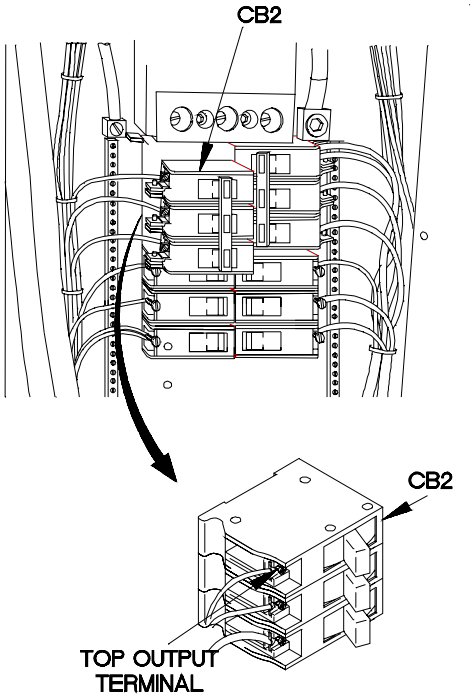
(1) Remove six screws and cover from 110/208 VAC POWER DISTRIBUTION PANEL.
(2) Remove circuit breaker CB2 from 110/208 VAC POWER DISTRIBUTION PANEL.
(3) Position circuit breaker CB2 to ON (TM 9-2320-365-10).
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to top output terminal on circuit breaker CB2.
(6) Connect negative (-) probe of multimeter to top input terminal on circuit breaker CB2 and note reading on multimeter.
(7) Connect positive (+) probe of multimeter to middle output terminal on circuit breaker CB2.
(8) Connect negative (-) probe of multimeter to middle input terminal on circuit breaker CB2 and note reading on multimeter.
(9) Connect positive (+) probe of multimeter to bottom output terminal on circuit breaker CB2.
(10) Connect negative (-) probe of multimeter to bottom input terminal on circuit breaker CB2 and note reading on multimeter.
(11) If continuity is not present in steps (6), (8), and (10), replace circuit breaker CB2 (para 16-64).
(12) Install circuit breaker CB2 on 110/208 VAC POWER DISTRIBUTION PANEL.





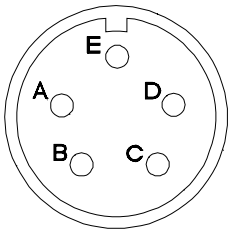
e115. M1079 AIR CONDITIONER DOES NOT OPERATE (CONT)

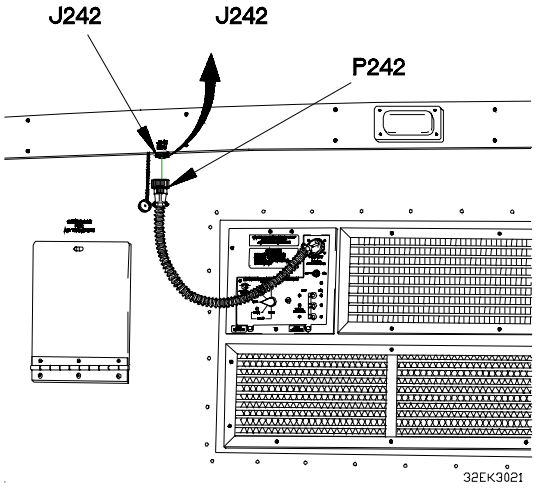




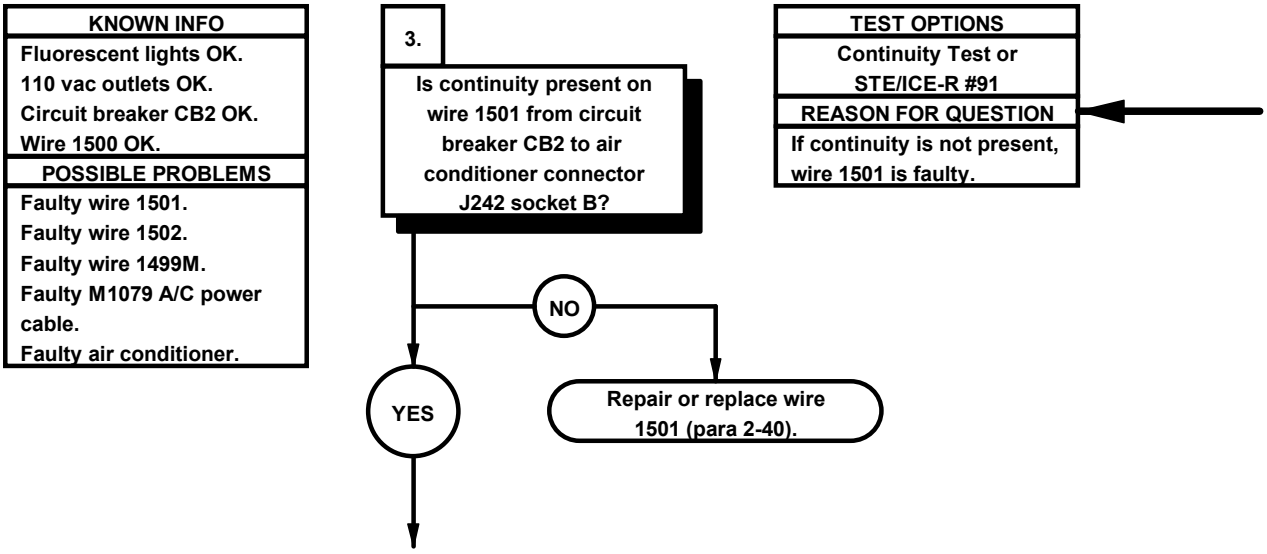
CONTINUITY TEST

(1) Disconnect connector P242 from air conditioner connector J242.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to top output terminal on circuit breaker CB2.
(4) Connect negative (-) probe of multimeter to air conditioner connector J242 socket A and note reading on multimeter.
(5) If continuity is not present, repair or replace wire 1500 (para 2-40).

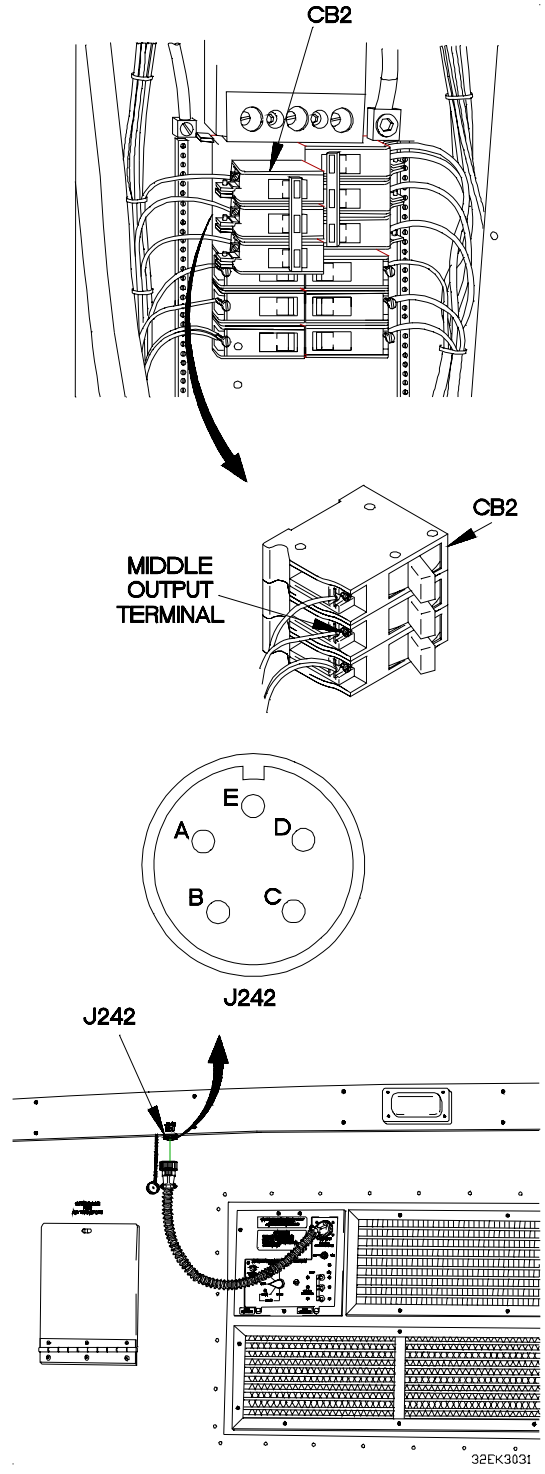




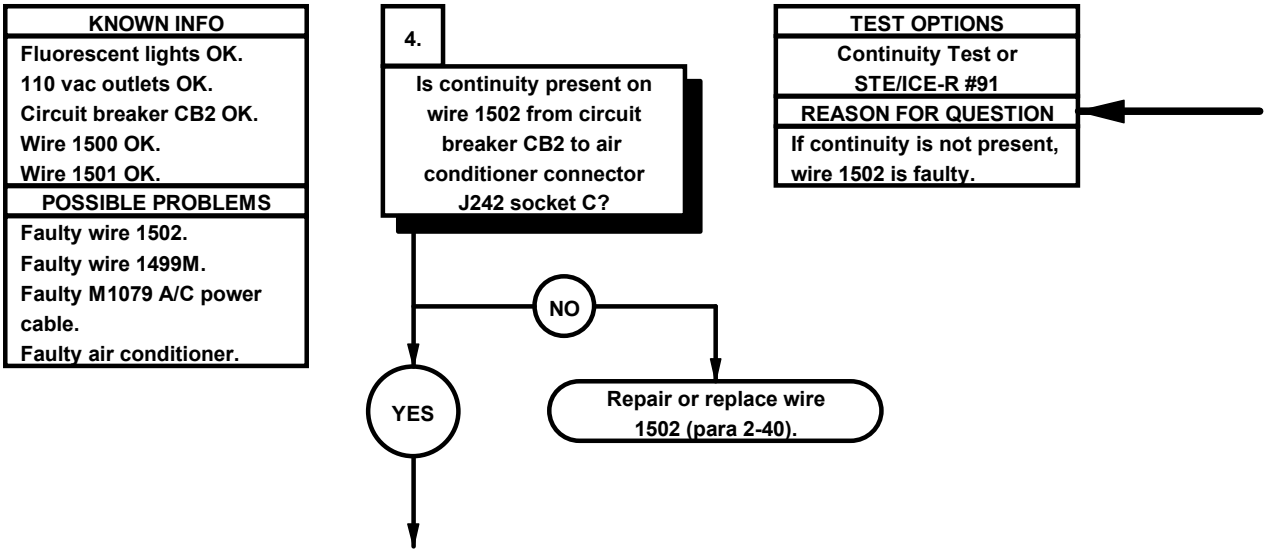
e115. M1079 AIR CONDITIONER DOES NOT OPERATE (CONT)

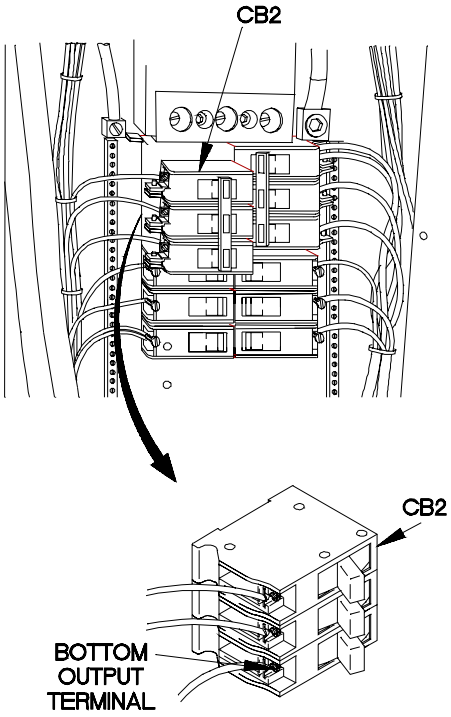


CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to middle output terminal on circuit breaker CB2.
(3) Connect negative (-) probe of multimeter to air conditioner connector J242 socket B and note reading on multimeter.
(4) If continuity is not present, repair or replace wire 1501 (para 2-40).



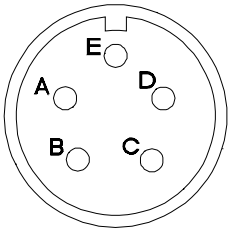
e115. M1079 AIR CONDITIONER DOES NOT OPERATE (CONT)

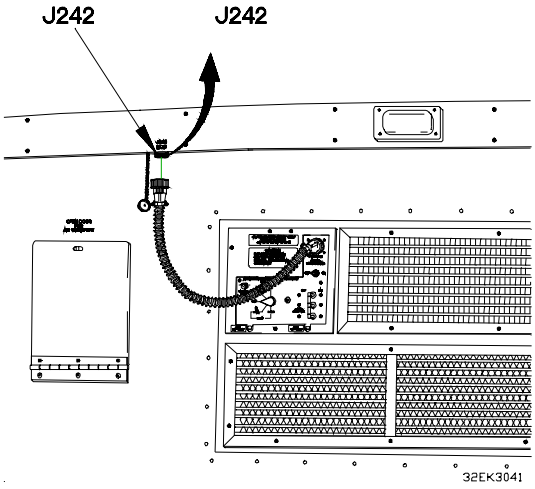




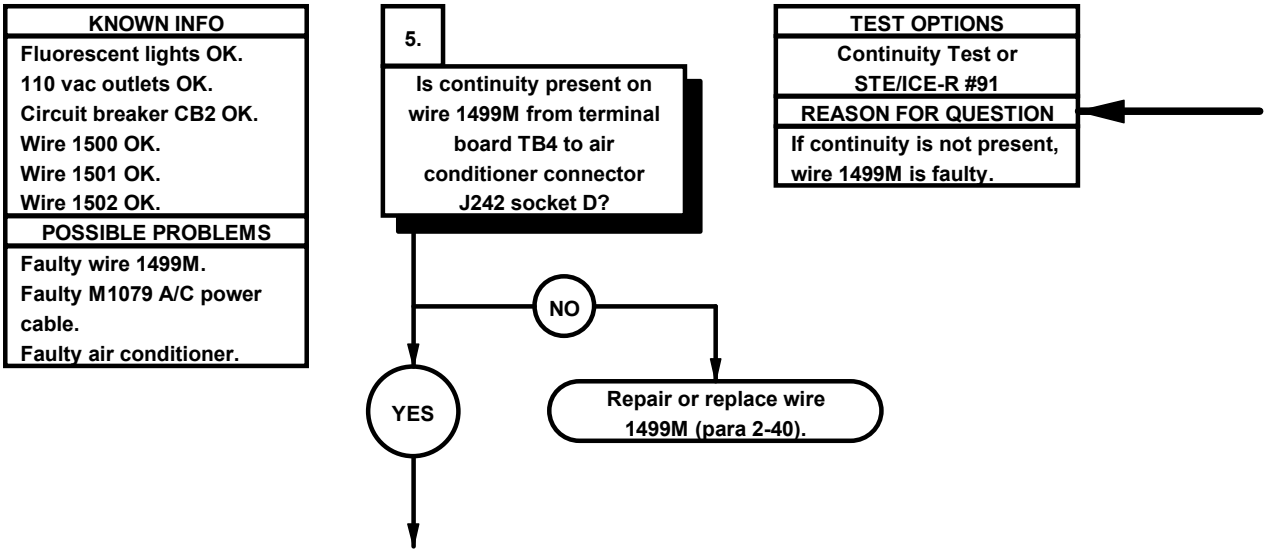
CONTINUITY TEST

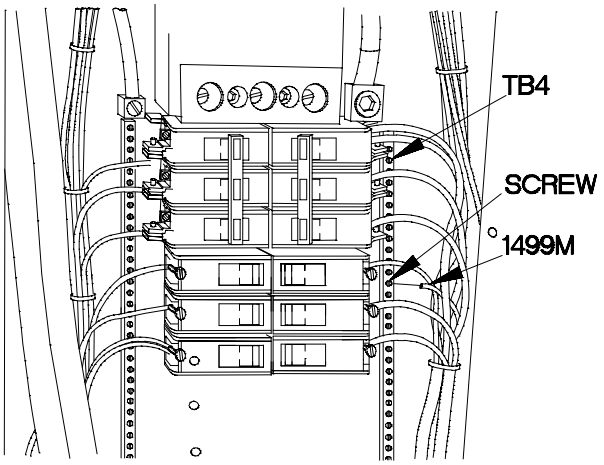
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to bottom output terminal on circuit breaker CB2.
(3) Connect negative (-) probe of multimeter to air conditioner connector J242 socket C and note reading on multimeter.
(4) If continuity is not present, repair or replace wire 1502 (para 2-40).





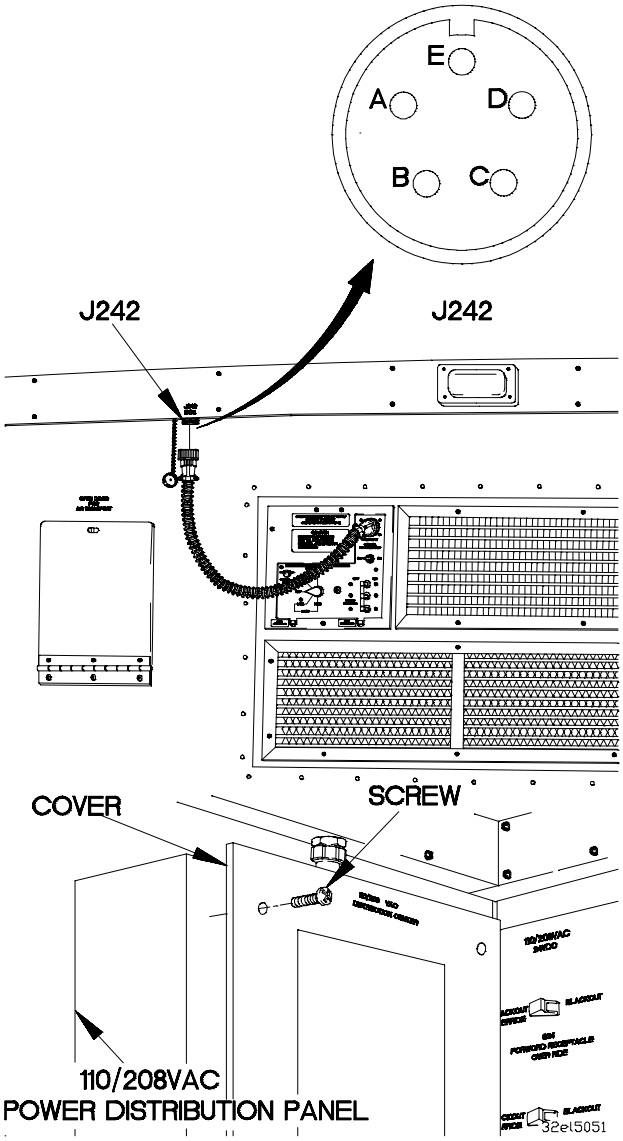
e115. M1079 AIR CONDITIONER DOES NOT OPERATE (CONT)



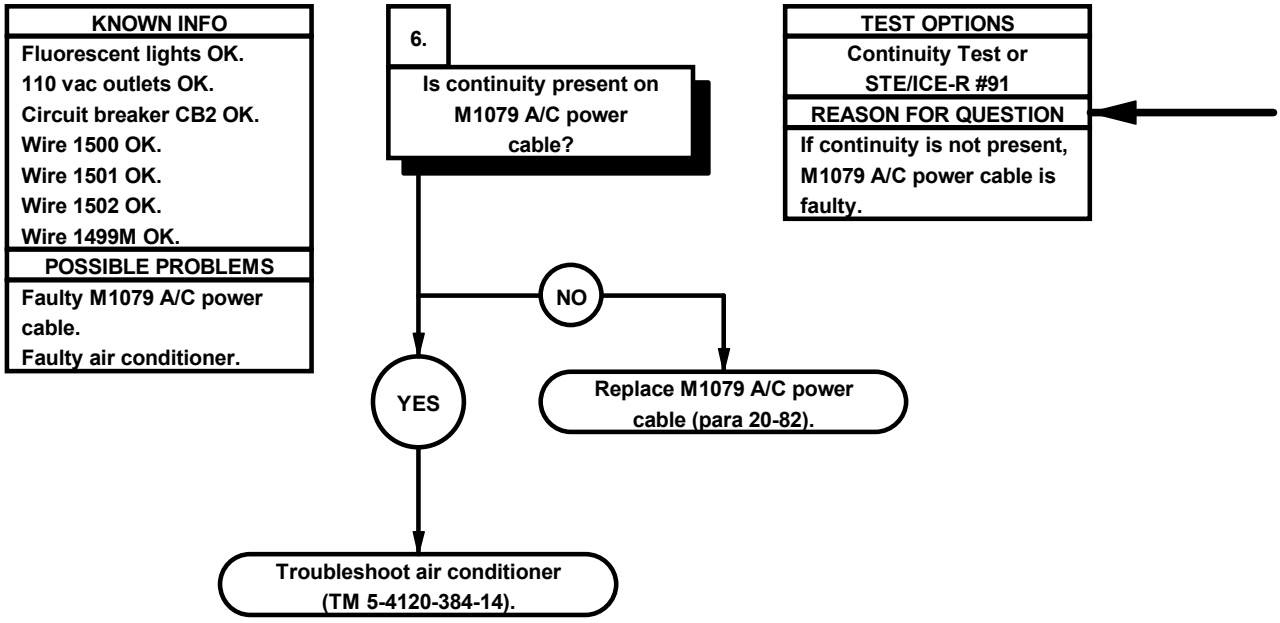


CONTINUITY TEST

(1) Loosen screw in terminal board TB4.
(2) Remove wire 1499M from terminal board TB4.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to wire 1499M.
(5) Connect negative (-) probe of multimeter to air conditioner connector J242 socket D and note reading on multimeter.
(6) If continuity is not present, repair or replace wire 1499M (para 2-40).
(7) Install wire 1499M on terminal board TB4.
(8) Tighten screw in terminal board TB4.
(9) Install cover on 110/208 VAC POWER DISTRIBUTION PANEL with six screws.

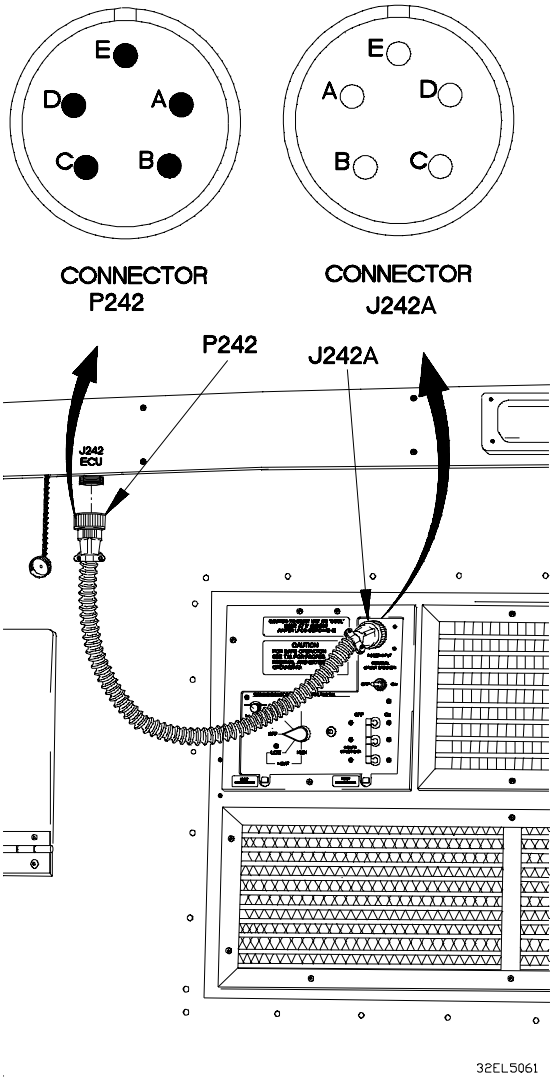


e115. M1079 AIR CONDITIONER DOES NOT OPERATE (CONT)



CONTINUITY TEST

(1) Disconnect connector J242A from air conditioner POWER INPUT connector.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector P242 socket A.
(4) Connect negative (-) probe of multimeter to connector J242A pin A and note reading on multimeter.
(5) Connect positive (+) probe of multimeter to connector P242 socket B.
(6) Connect negative (-) probe of multimeter to connector J242A pin B and note reading on multimeter.
(7) Connect positive (+) probe of multimeter to connector P242 socket C.
(8) Connect negative (-) probe of multimeter to connector J242A pin C and note reading on multimeter.
(9) Connect positive (+) probe of multimeter to connector P242 socket D.
(10) Connect negative (-) probe of multimeter to connector J242A pin D and note reading on multimeter.
(11) If continuity is not present in steps (4), (6), (8), and (10), replace M1079 A/C power cable (para 20-82).
(12) If continuity is present, troubleshoot air conditioner (TM 5-4120-384-14).
(13) Connect connector J242A to air conditioner POWER INPUT connector.
(14) Connect connector P242 to air conditioner connector J242.



e116. M1079 HEATER DOES NOT OPERATE

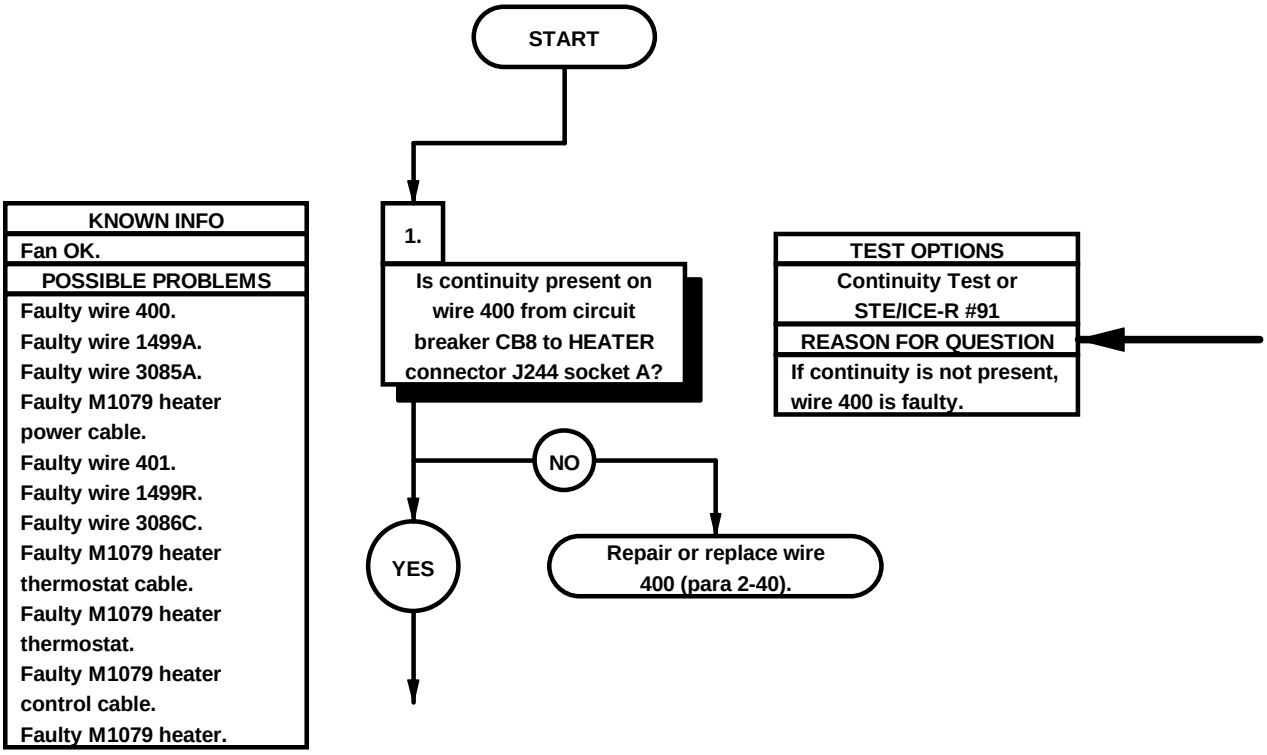
INITIAL SETUP

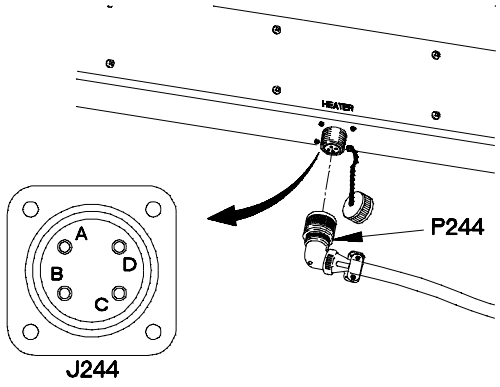
Equipment Condition
- Engine shut down (TM 9-2320-365-10).
- AC power disconnected (TM 9-2320-365-10).

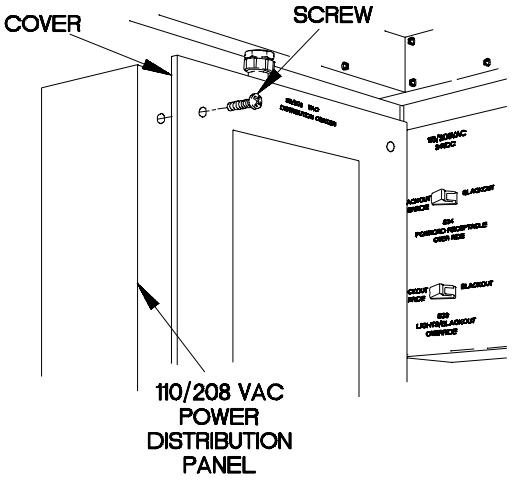
Personnel Required
- (2)

Tools and Special Tools
- Tool Kit, Genl Mech (Item 44, Appendix C)
- STE/ICE-R (Item 39, Appendix C)
- Multimeter, Digital (Item 22, Appendix C)

References
- TM 9-4910-571-12&P
- TM 5-4520-253-13

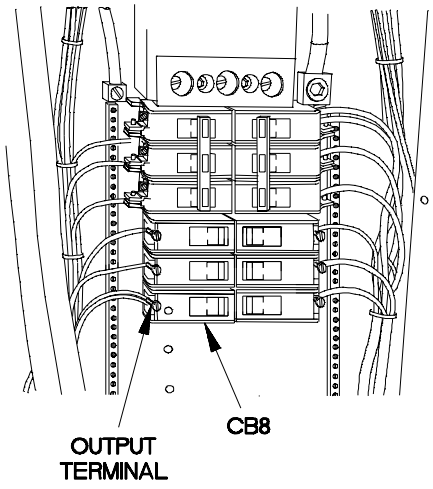






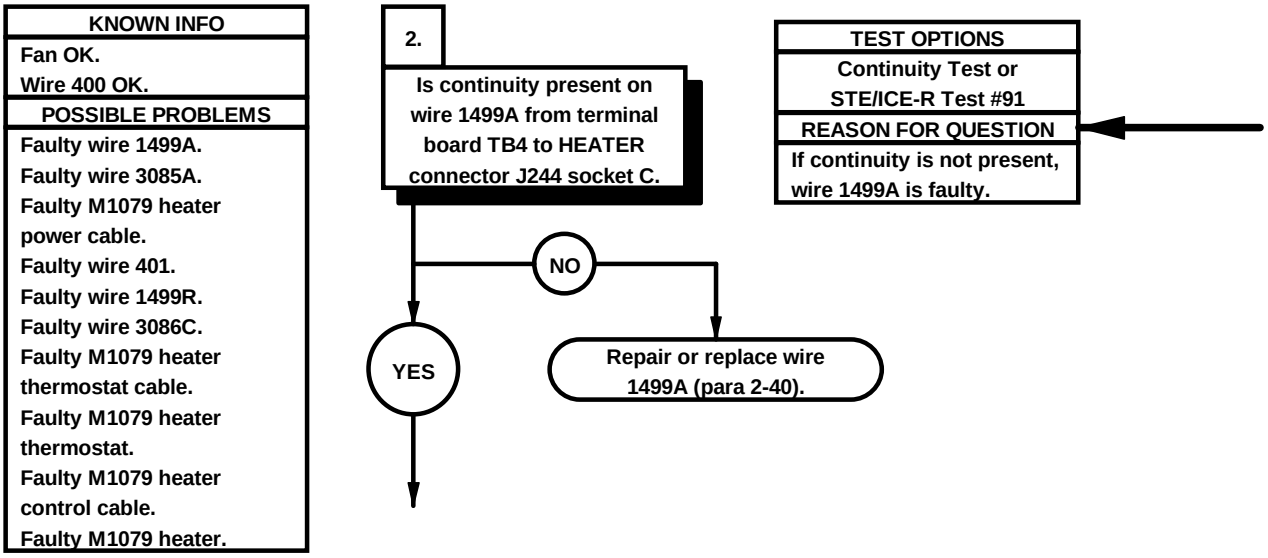
CONTINUITY TEST

(1) Disconnect connector P244 from HEATER connector J244.
(2) Remove six screws and cover from 110/208 VAC POWER DISTRIBUTION PANEL.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to output terminal on circuit breaker CB8.
(5) Connect negative (-) probe of multimeter to HEATER connector J244 socket A and note reading on multimeter.
(6) If continuity is not present, repair or replace wire 400 (para 2-40).

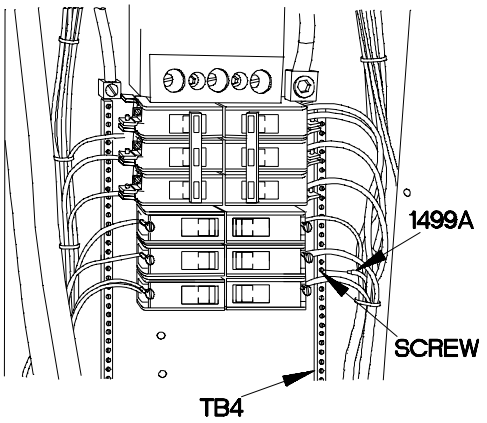


32e11401

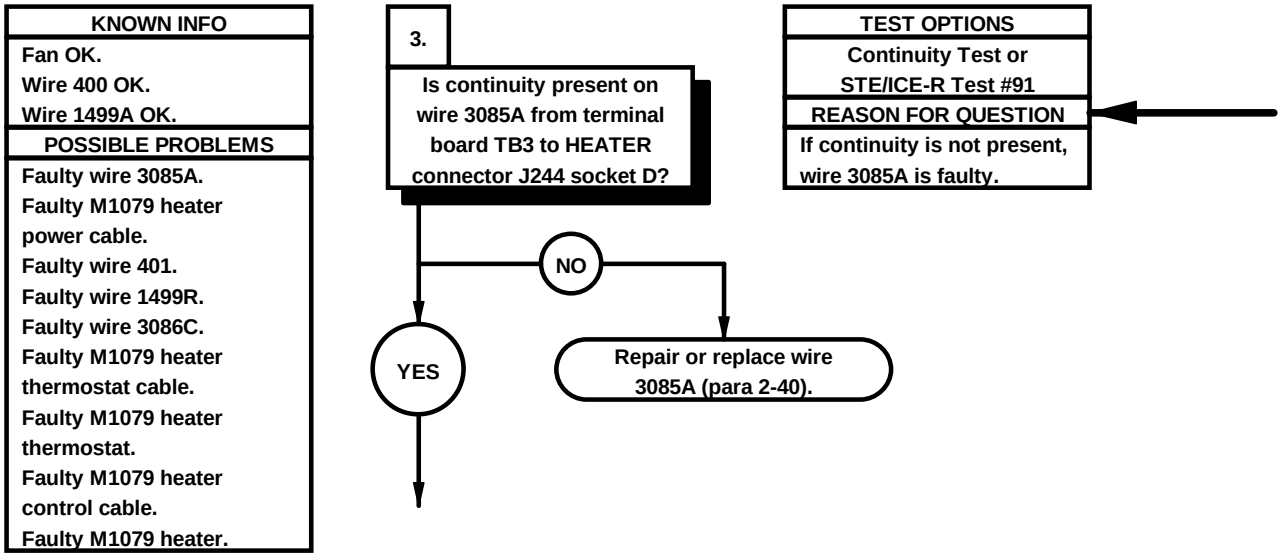
e116. M1079 HEATER DOES NOT OPERATE (CONT)

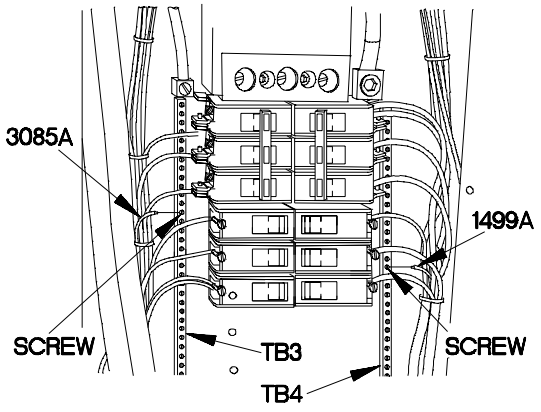


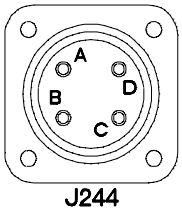
CONTINUITY TEST
(1) Loosen screw in terminal board TB4.
(2) Remove wire 1499A from terminal board TB4.
(3) Set multimeter to ohms.
(4) Connect positve (+) probe of multimeter to wire 1499A.
(5) Connect negative (-) probe of multimeter to HEATER connector J244 socket C and note reading on multimeter.
(6) If continuity is not present, repair or replace wire 1499A (para 2-40).



e116. M1079 HEATER DOES NOT OPERATE (CONT)

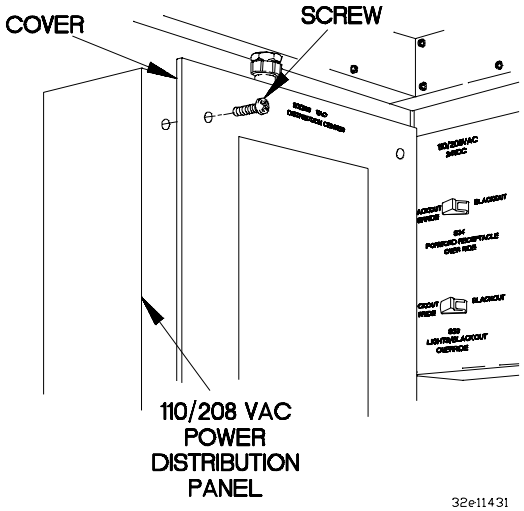




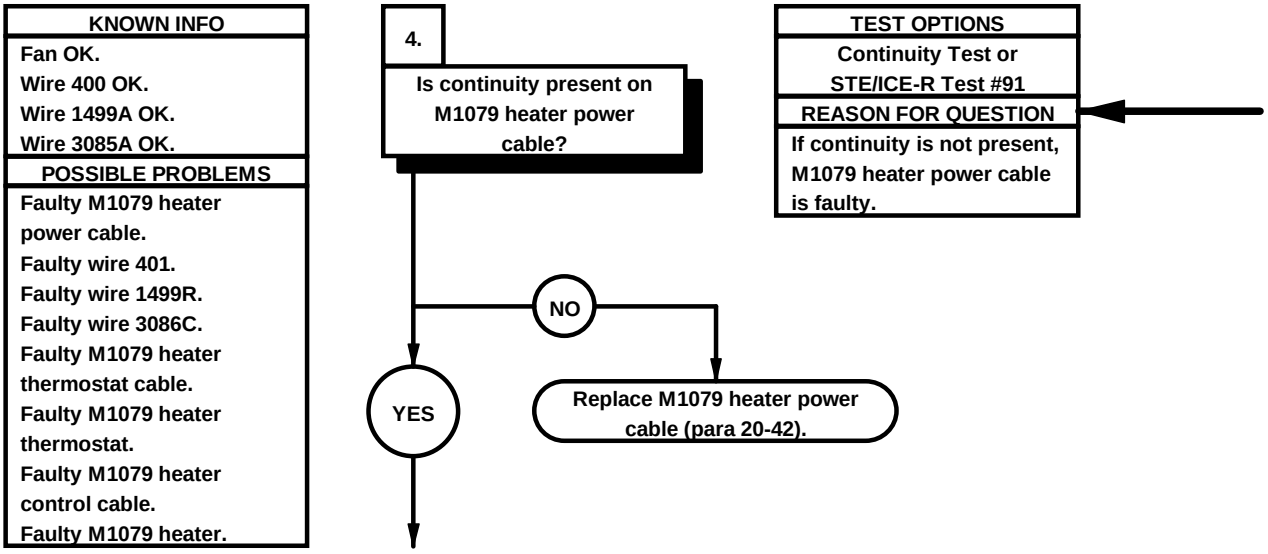


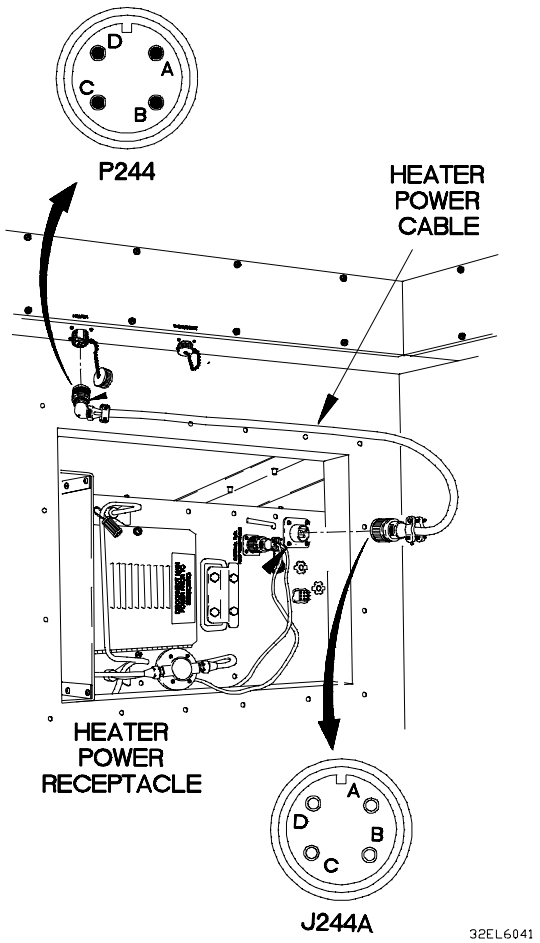
CONTINUITY TEST

(1) Loosen screw in terminal board TB3.
(2) Remove wire 3085A from terminal board TB3.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to wire 3085A.
(5) Connect negative (-) probe of multimeter to HEATER connector J244 socket D and note reading on multimeter.
(6) If continuity is not present, repair or replace wire 3085A (para 2-40).
(7) Install wire 3085A on terminal board TB3.
(8) Tighten screw in terminal board TB3.
(9) Install wire 1499A on terminal board TB4.
(10) Tighten screw in terminal board TB4.
(11) Install cover on 110/208 VAC POWER DISTRIBUTION PANEL with six screws.



e116. M1079 HEATER DOES NOT OPERATE (CONT)

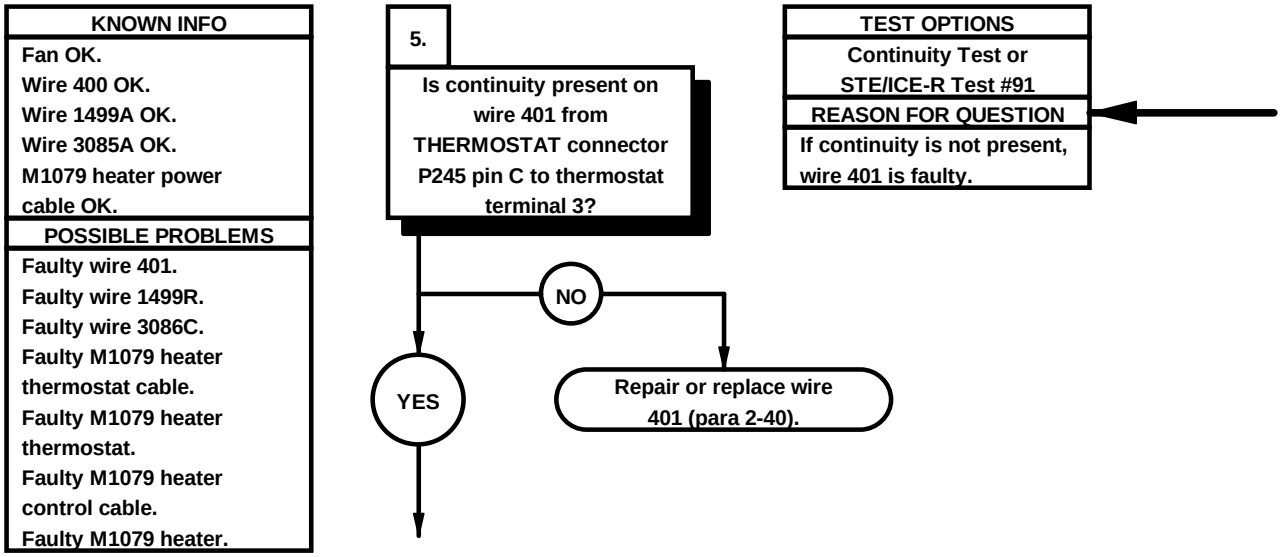




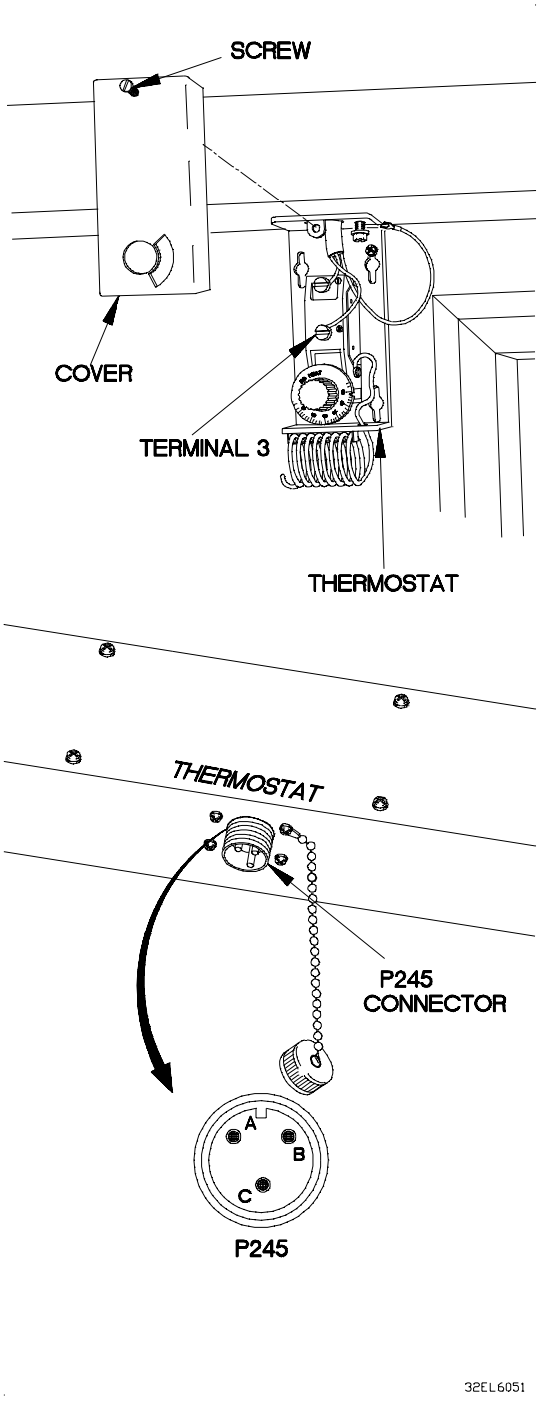
CONTINUITY TEST

(1) Remove heater deflector/duct and hood (para 20-50).
(2) Disconnect connector J244A from heater POWER RECEPTACLE connector.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector P244 pin A.
(5) Connect negative (-) probe of multimeter to connector J244A socket A and note reading on multimeter.
(6) Connect positive (+) probe of multimeter to connector P244 pin C.
(7) Connect negative (-) probe of multimeter to connector J244A socket C and note reading on multimeter.
(8) Connect positive (+) probe of multimeter to connector P244 pin D.
(9) Connect negative (-) probe of multimeter to connector J244A socket D and note reading on multimeter.
(10) If continuity is not present in step 5, 7, or 9, replace M1079 heater power cable (para 20-50).
(11) Connect connector J244A to heater POWER RECEPTACLE connector.

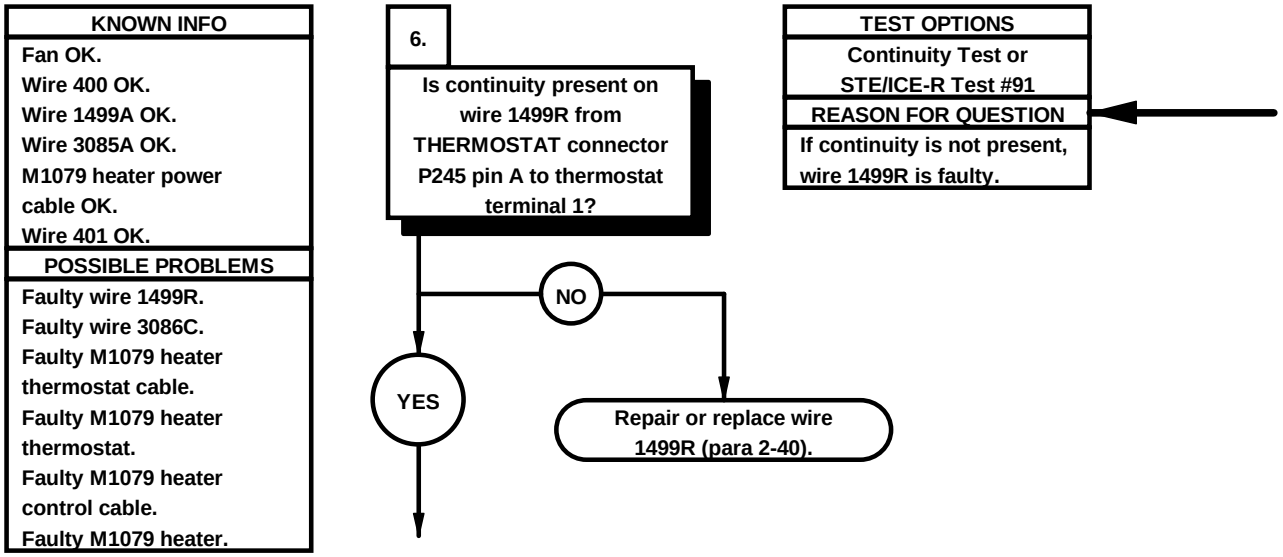
e116. M1079 HEATER DOES NOT OPERATE (CONT)



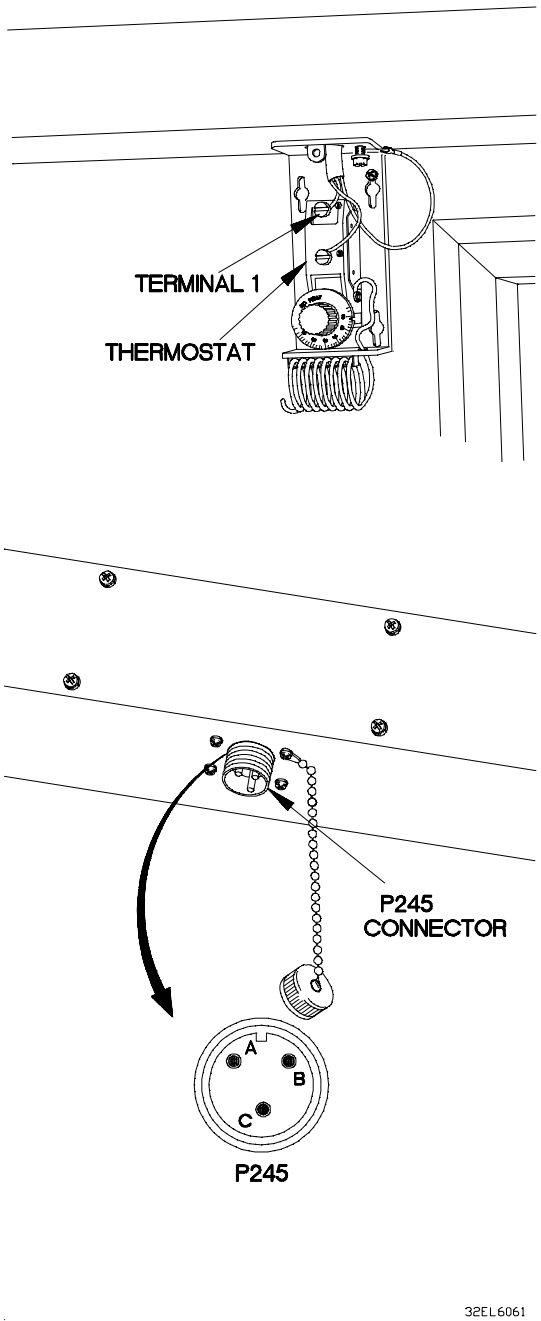
CONTINUITY TEST
(1) Loosen screw in thermostat cover.
(2) Remove thermostat cover from thermostat.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to thermostat terminal 3.
(5) Connect negative (-) probe of multimeter to THERMOSTAT connector P245 pin C and note reading on multimeter.
(6) If continuity is not present, repair or replace wire 401 (para 2-40).



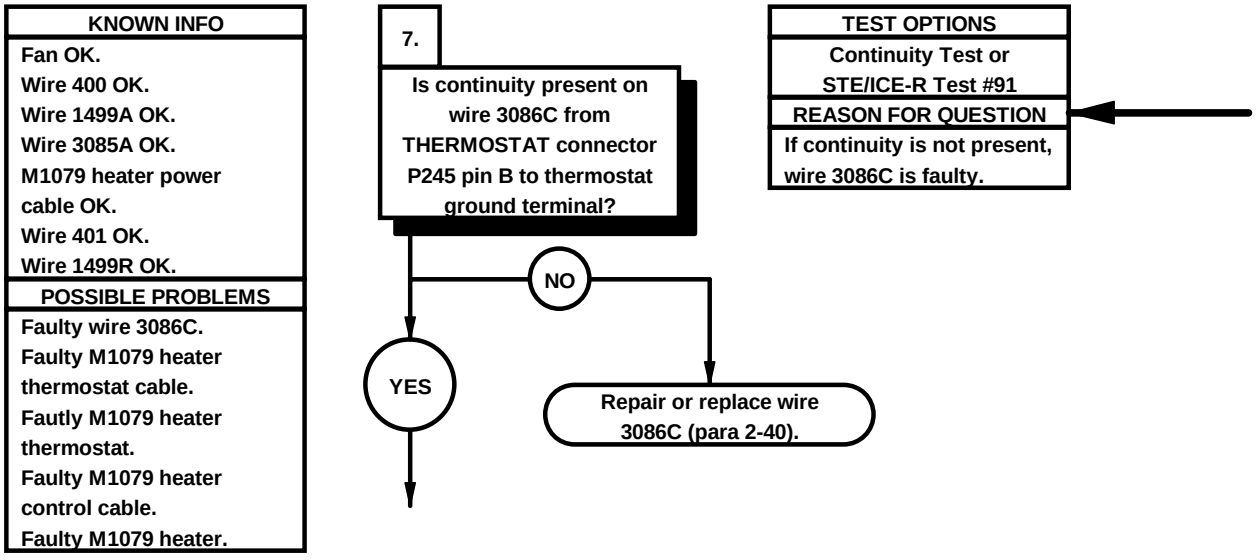
e116. M1079 HEATER DOES NOT OPERATE (CONT)



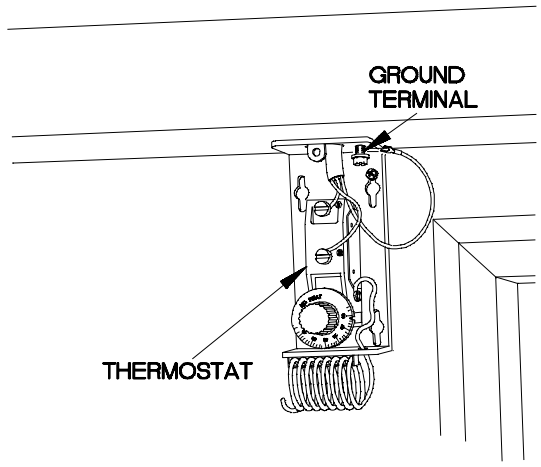
CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to thermostat terminal 1.
(3) Connect negative (-) probe of multimeter to THERMOSTAT connector P245 pin A and note reading on multimeter.
(4) If continuity is not present, repair or replace wire 1499R (para 2-40).

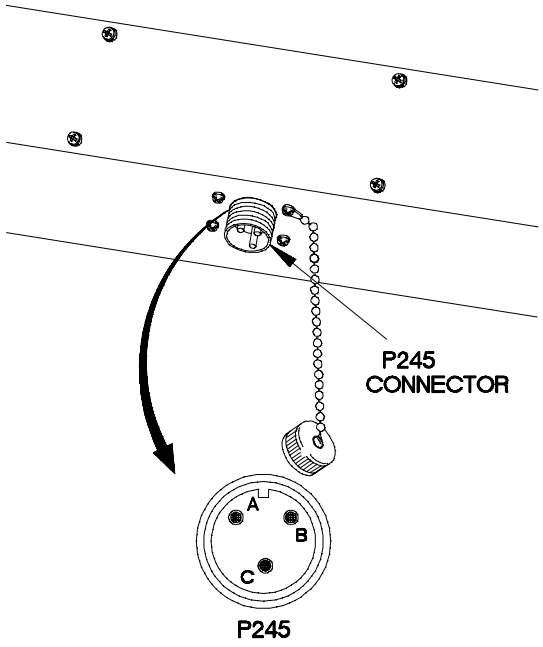


e116. M1079 HEATER DOES NOT OPERATE (CONT)



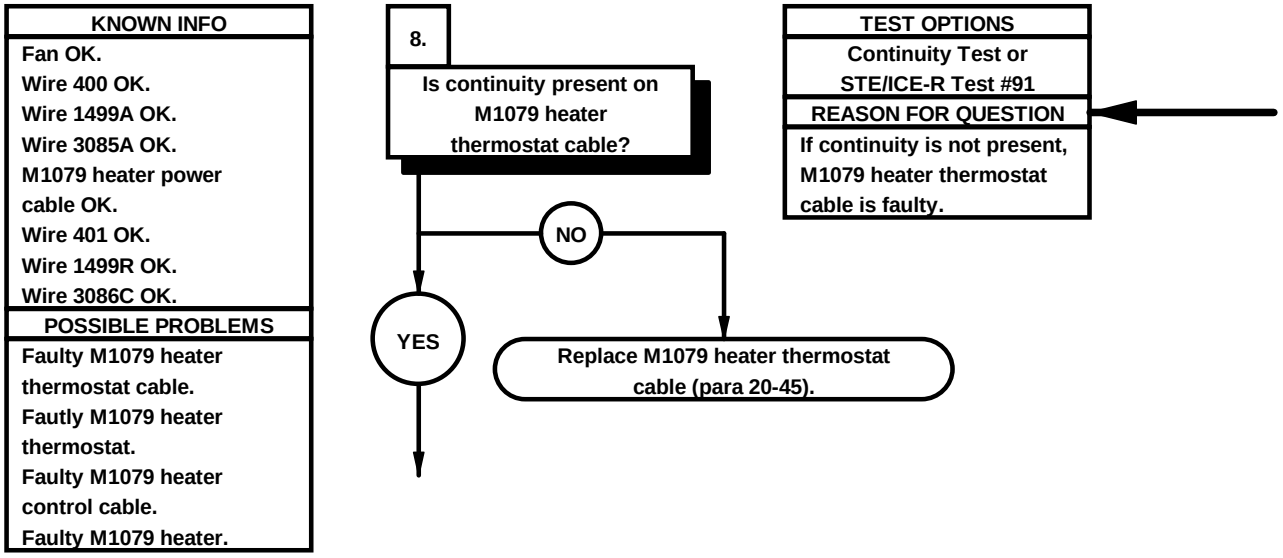
CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to thermostat ground terminal.
(3) Connect negative (-) probe of multimeter to THERMOSTAT connector P245 pin B and note reading on multimeter.
(4) If continuity is not present, repair or replace wire 3086C (para 2-40).





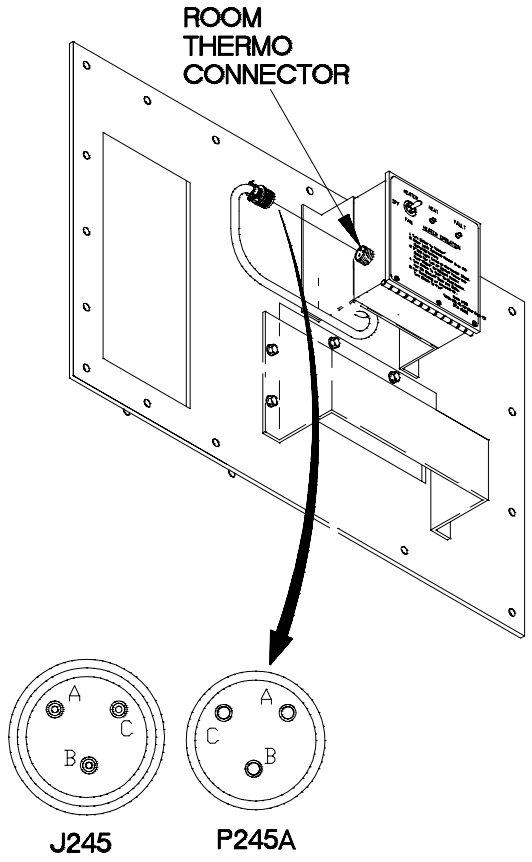
32EL6071

e116. M1079 HEATER DOES NOT OPERATE (CONT)

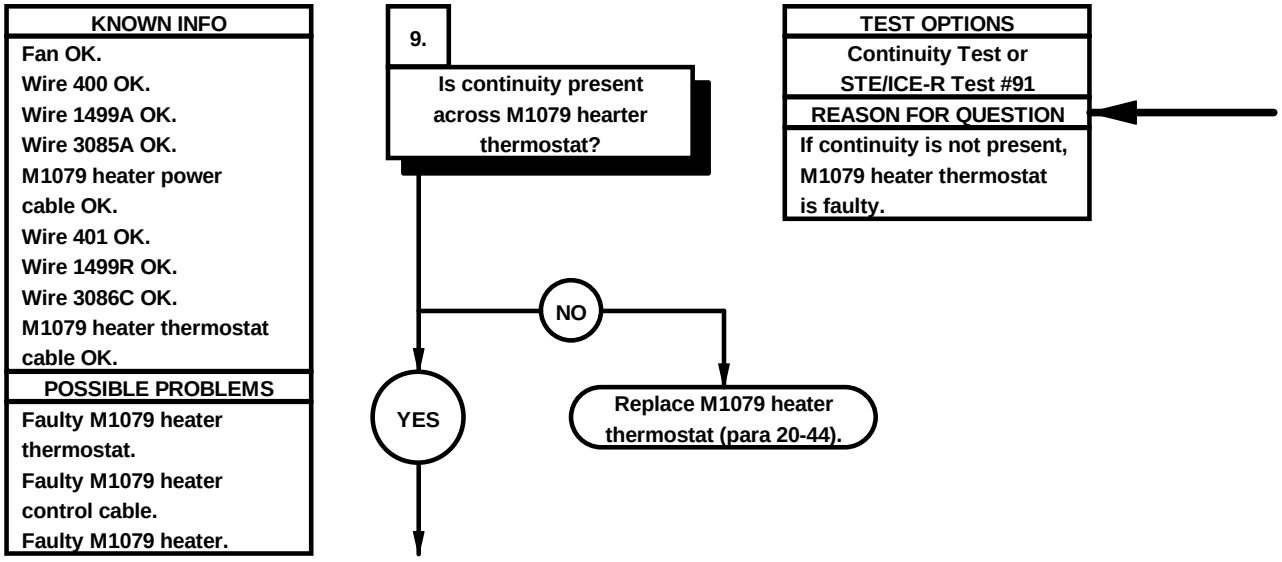


CONTINUITY TEST

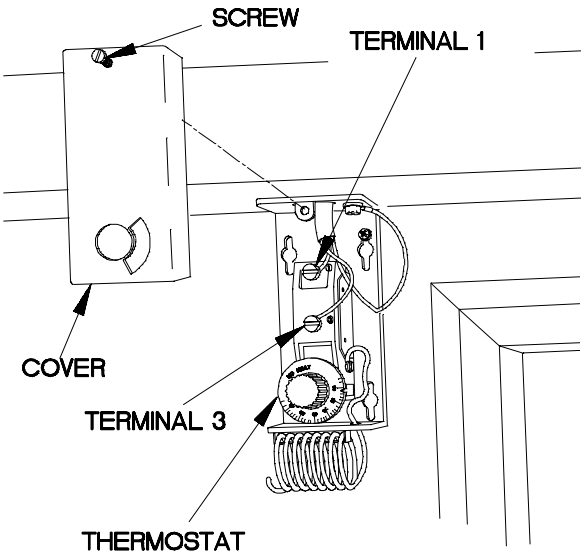
(1) Disconnect connector P245A from ROOM THERMO connector.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector P245A pin A.
(4) Connect negative (-) probe of multimeter to connector J245 socket A and note reading on multimeter.
(5) Connect positive (+) probe of multimeter to connector P245A pin B.
(6) Connect negative (-) probe of multimeter to connector J245 socket B and note reading on multimeter.
(7) Connect positive (+) probe of multimeter to connector P245A pin C.
(8) Connect negative (-) probe of multimeter to connector J245 socket C and note reading on multimeter.
(9) If continuity is not present in step 4, 6, or 8, replace M1079 heater thermostat cable (para 20-45).
(10) Connect connector P245A to ROOM THERMO connector.



e116. M1079 HEATER DOES NOT OPERATE (CONT)

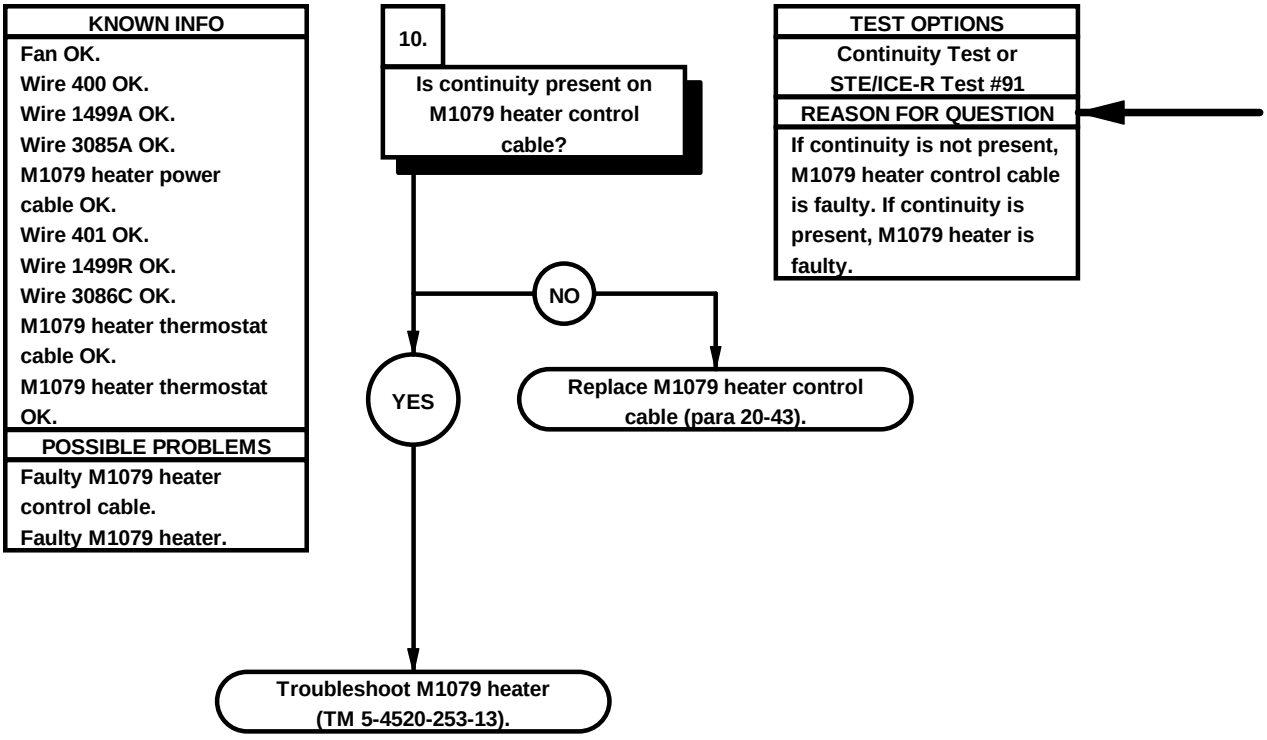


CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Set M1079 heater thermostat to highest setting (TM 9-2320-365-10).
(3) Connect positive (+) probe of multimeter to thermostat terminal 3.
(4) Connect negative (-) probe of multimeter to thermostat terminal 1 and note reading on multimeter.
(5) If continuity is not present, replace M1079 heater thermostat (para 20-44).
(6) Install thermostat cover on thermostat.
(7) Tighten screw in thermostat cover.



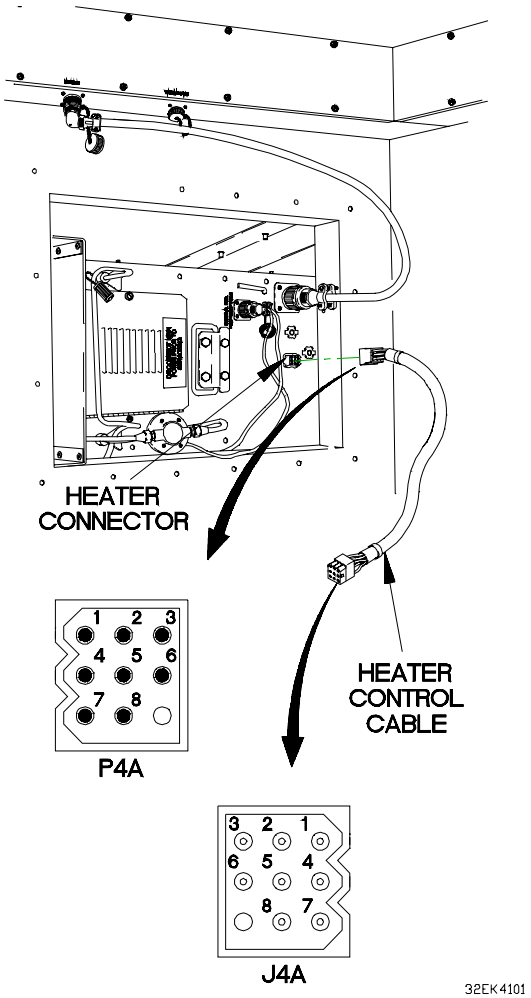
32EL6091

e116. M1079 HEATER DOES NOT OPERATE (CONT)

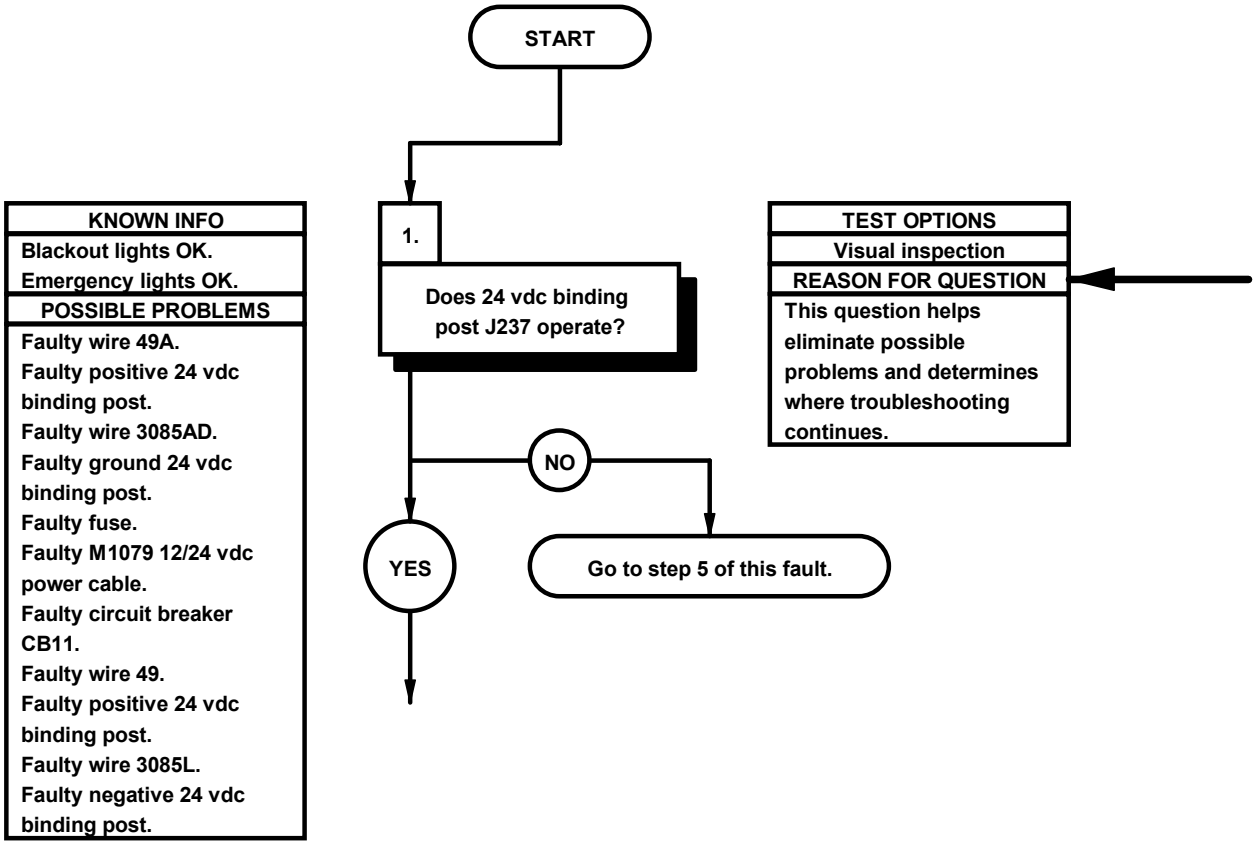


CONTINUITY TEST

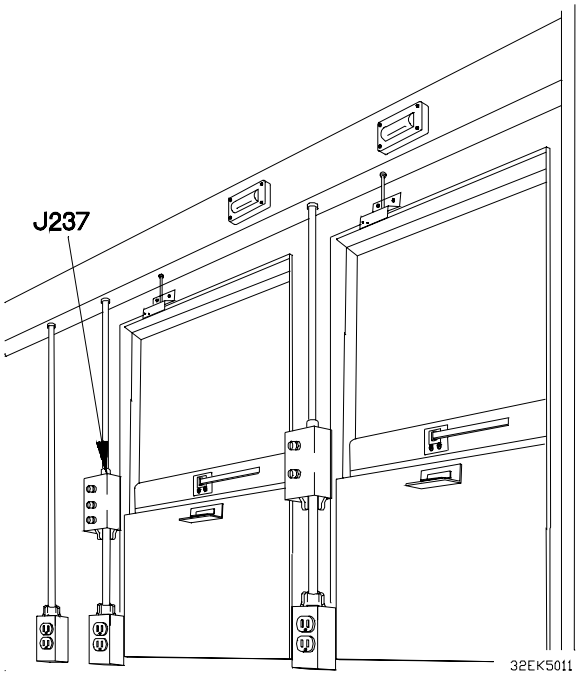
(1) Disconnect connector P4A from heater connector.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector P4A pin 1.
(4) Connect negative (-) probe of multimeter to connector J4A socket 1 and note reading on multimeter.
(5) Connect positive (+) probe of multimeter to connector P4A pin 2.
(6) Connect negative (-) probe of multimeter to connector J4A socket 2 and note reading on multimeter.
(7) Connect positive (+) probe of multimeter to connector P4A pin 3.
(8) Connect negative (-) probe of multimeter to connector J4A socket 3 and note reading on multimeter.
(9) Connect positive (+) probe of multimeter to connector P4A pin 4.
(10) Connect negative (-) probe of multimeter to connector J4A socket 4 and note reading on multimeter.
(11) Connect positive (+) probe of multimeter to connector P4A pin 5.
(12) Connect negative (-) probe of multimeter to connector J4A socket 5 and note reading on multimeter.
(13) Connect positive (+) probe of multimeter to connector P4A pin 6.
(14) Connect negative (-) probe of multimeter to connector J4A socket 6 and note reading on mutimeter.
(15) Connect positive (+) probe of multimeter to connector P4A pin 7.
(16) Connect negative (-) probe of multimeter to connector J4A socket 7 and note reading on multimeter.
(17) Connect positive (+) probe of multimeter to connector P4A pin 8.
(18) Connect negative (-) probe of multimeter to connector J4A socket 8 and note reading on multimeter.
(19) If continuity is not present in step 4, 6, 8, 10, 12, 14, 16, or 18, replace M1079 heater control cable (para 20-53).
(20) If continuity is present, troubleshoot M1079 heater (TM 5-4520-253-13).
(21) Connect connector P127 to heater connector.
(22) Install M1079 heater deflector/duct (para 20-50).



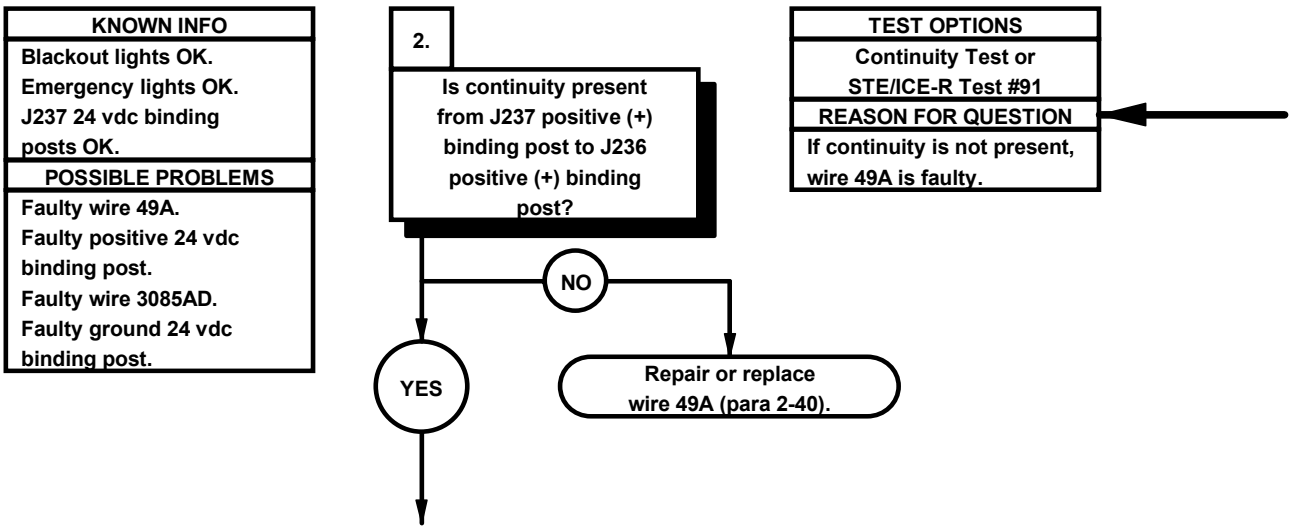
e117. M1079 24 VDC BINDING POST(S) DOES NOT OPERATE	
INITIAL SETUP	
Equipment Condition Engine shut down (TM 9-2320-365-10). AC power disconnected (TM 9-2320-365-10). Personnel Required (2)	Tools and Special Tools Tool Kit, Genl Mech (Item 44, Appendix C) STE/ICE-R (Item 39, Appendix C) Multimeter, Digital (Item 22, Appendix C) References TM 9-4910-571-12&P



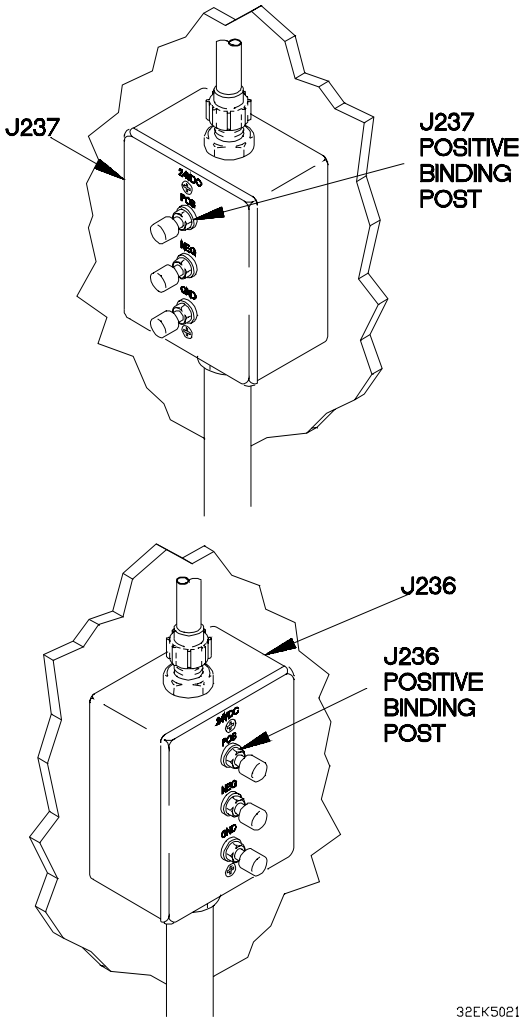
(1) Install a known good 24 vdc appliance to J237 binding posts.
(2) Operate 24 vdc appliance.
(3) If 24 vdc appliance does not operate, go to step 5 of this fault.
(4) Remove 24 vdc appliance from J237 binding posts.



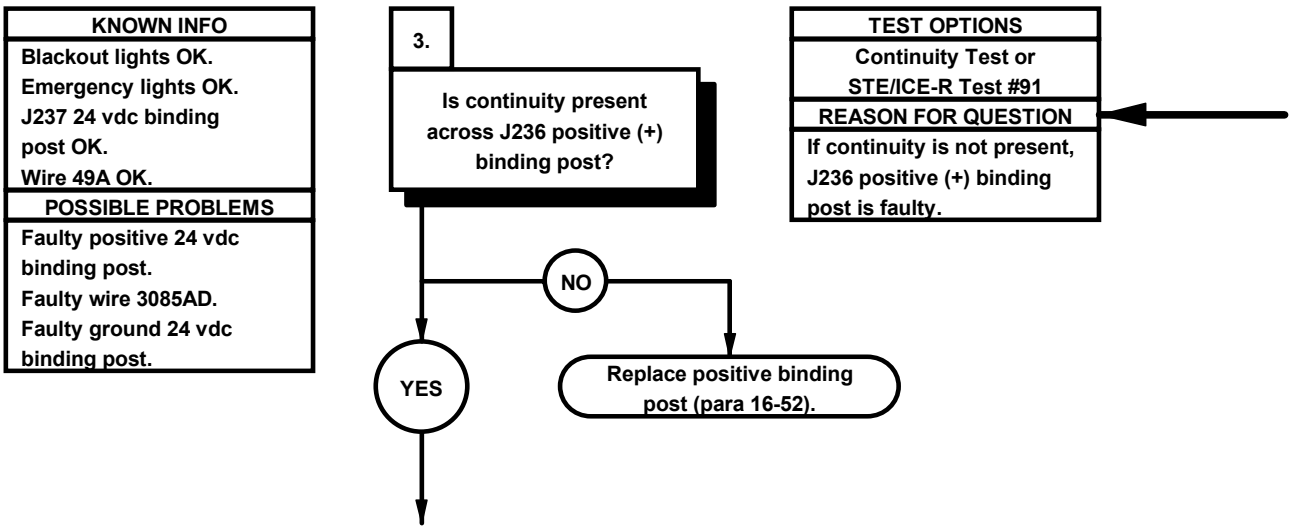
e117. M1079 24 VDC BINDING POST(S) DOES NOT OPERATE (CONT)



CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to J237 positive (+) binding post.
(3) Connect negative (-) probe of multimeter to J236 positive (+) binding post and note reading on multimeter.
(4) If continuity is not present, repair or replace wire 49A (para 2-40).

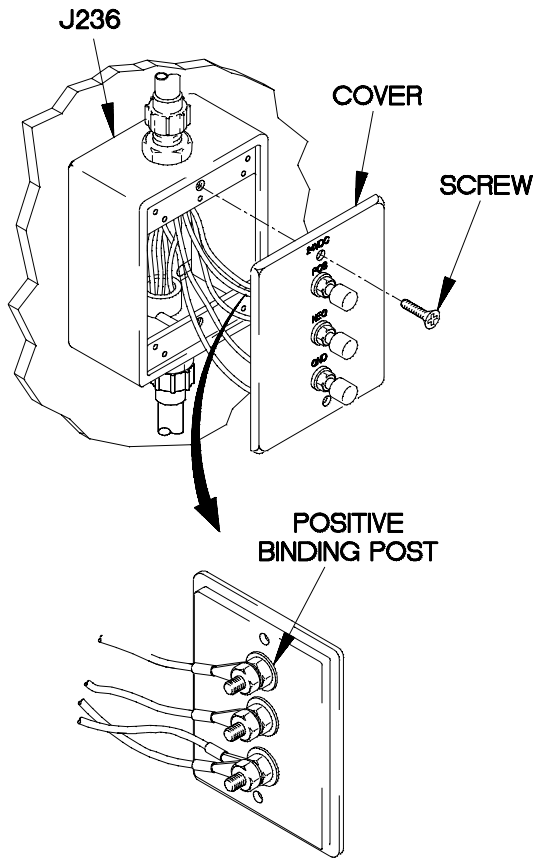


e117. M1079 24 VDC BINDING POST(S) DOES NOT OPERATE (CONT)

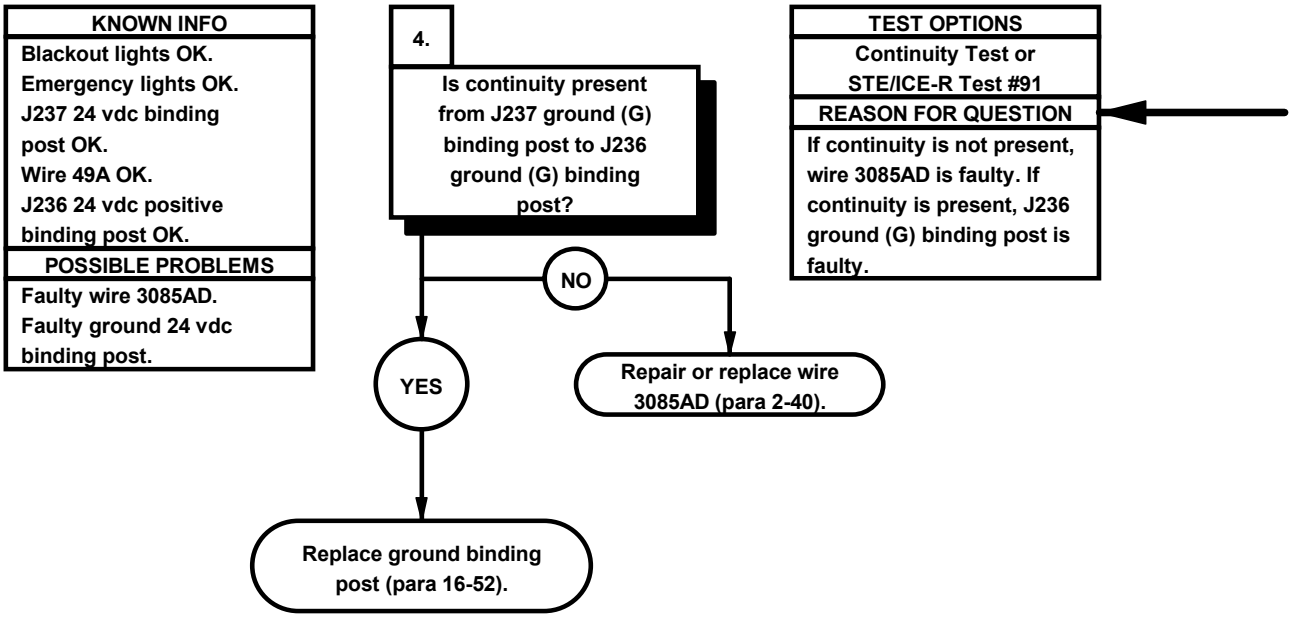


CONTINUITY TEST

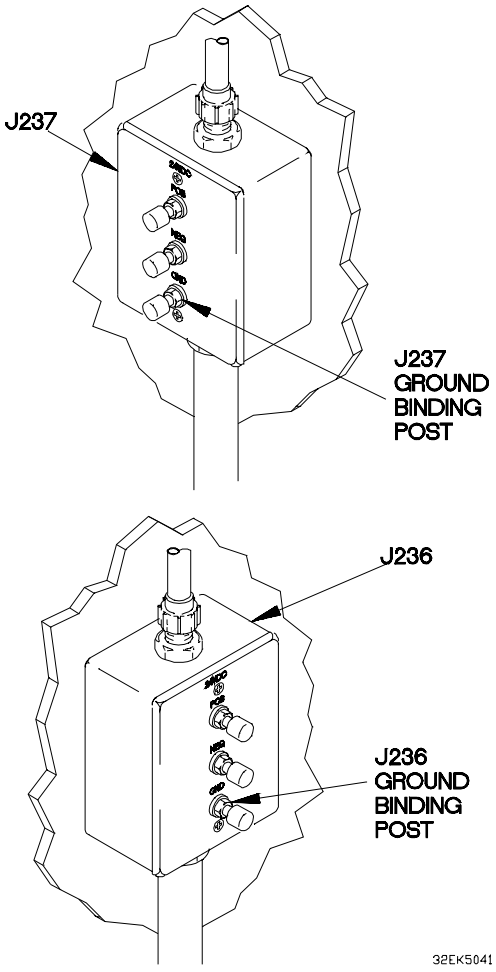
(1) Disconnect M1079 12/24 vdc power cable from van body (TM 9-2320-365-10).
(2) Remove two screws and cover from J236 24 vdc outlet box.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to inside of J236 positive (+) binding post.
(5) Connect negative (-) probe of multimeter to front side of J236 positive (+) binding post and note reading on multimeter.
(6) If continuity is not present, replace J236 24 vdc positive binding post (para 16-52).
(7) Install cover on J236 24 vdc outlet box with two screws.



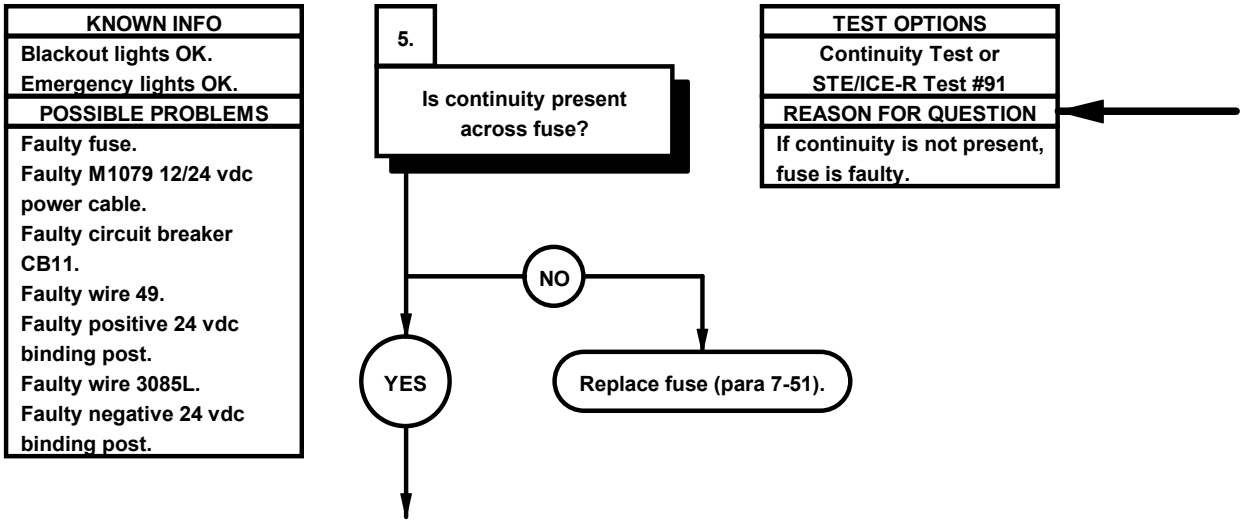
e117. M1079 24 VDC BINDING POST(S) DOES NOT OPERATE (CONT)

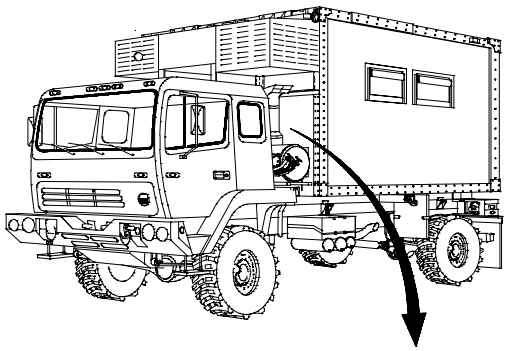


CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to J237 ground (G) binding post.
(3) Connect negative (-) probe of multimeter to J236 ground (G) binding post and note reading on multimeter.
(4) If continuity is not present, repair or replace wire 3085AD (para 2-40).
(5) If continuity is present, replace J236 24 vdc ground binding post (para 16-52).



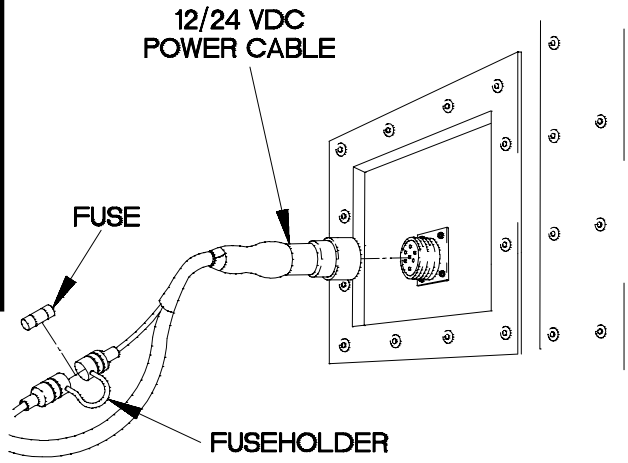
e117. M1079 24 VDC BINDING POST(S) DOES NOT OPERATE (CONT)





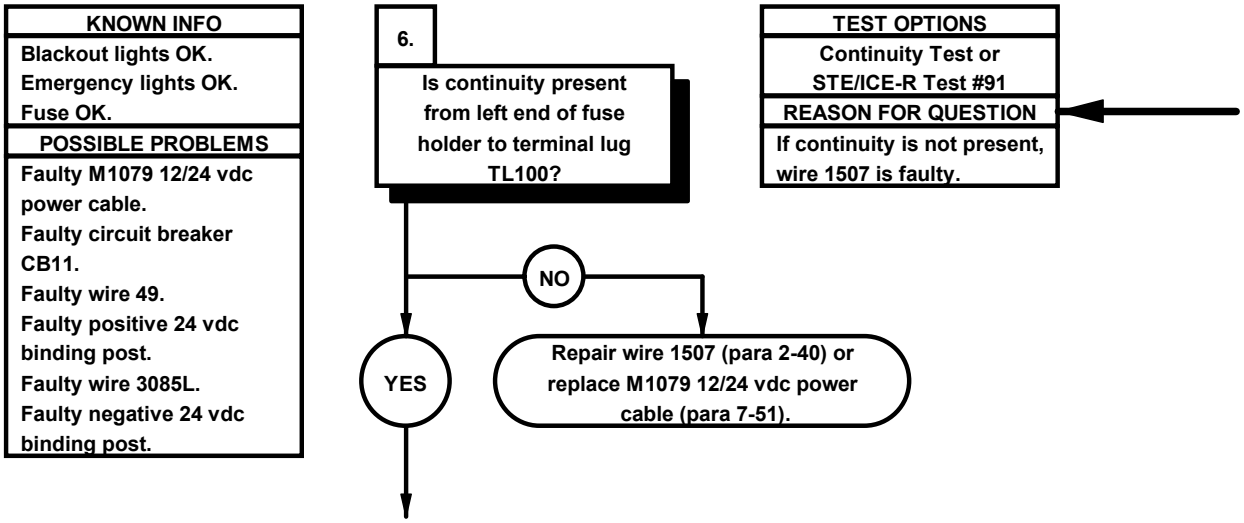
CONTINUITY TEST

(1) Disconnect M1079 12/24 vdc power cable from van body (TM 9-2320-365-10).
(2) Open fuse holder on M1079 12/24 vdc power cable.
(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 fuse (para 7-51).



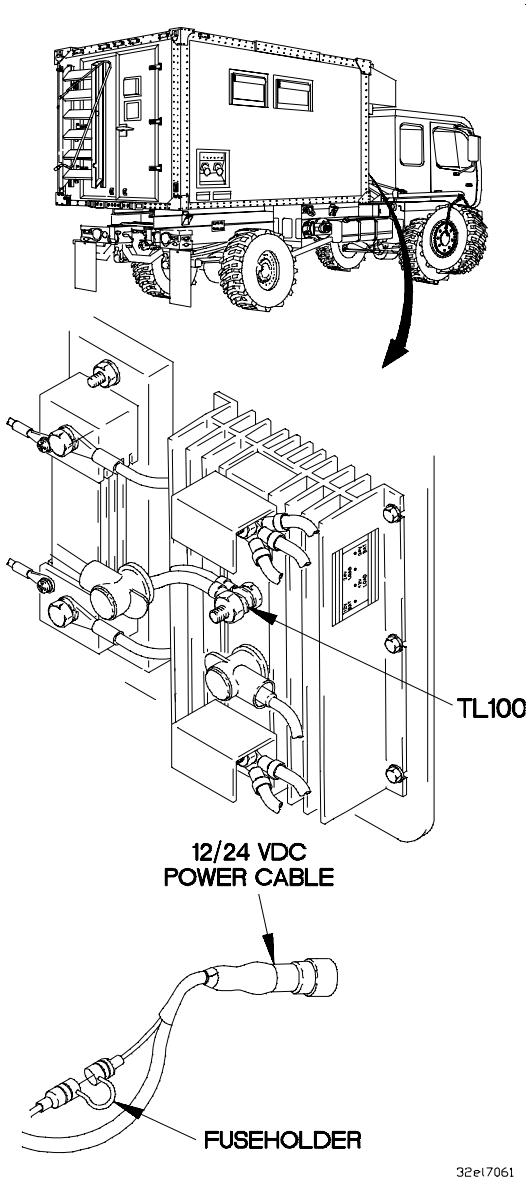
32el7051

e117. M1079 24 VDC BINDING POST(S) DOES NOT OPERATE (CONT)

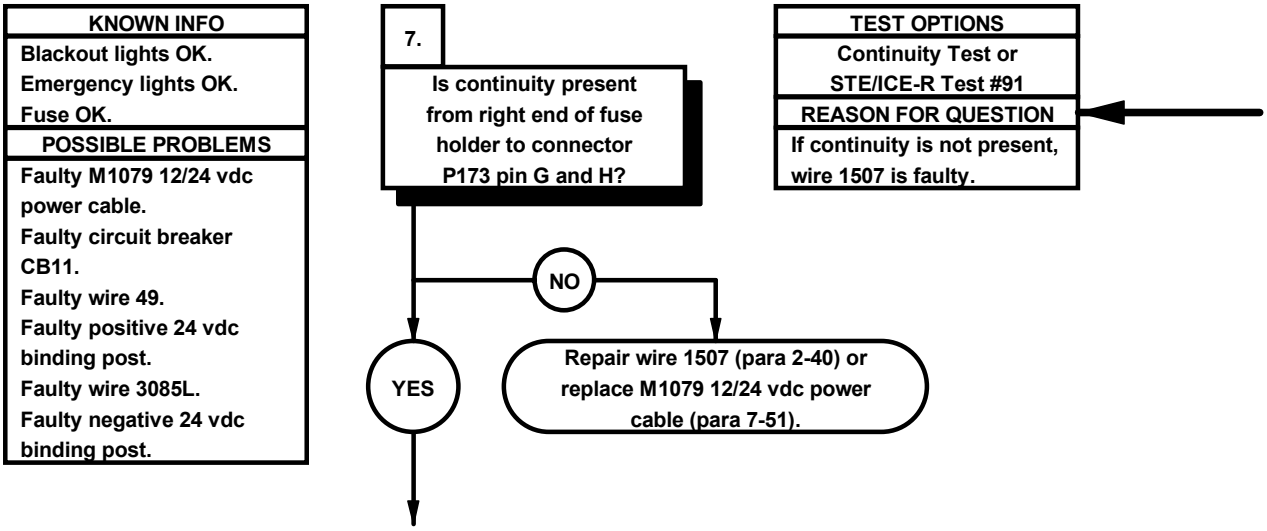


CONTINUITY TEST

(1) Lower spare tire (TM 9-2320-365-10).
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to left end of fuse holder.
(4) Connect negative (-) probe of multimeter to terminal lug TL100 and note reading on multimeter.
(5) If continuity is not present, repair wire 1507 (para 2-40) or replace M1079 12/24 vdc power cable (para 7-51).
(6) Raise spare tire (TM 9-2320-365-10).

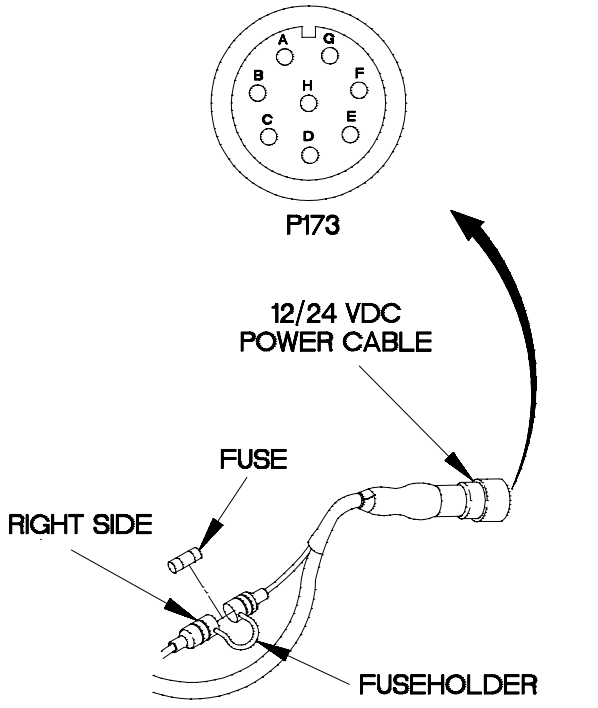


e117. M1079 24 VDC BINDING POST(S) DOES NOT OPERATE (CONT)



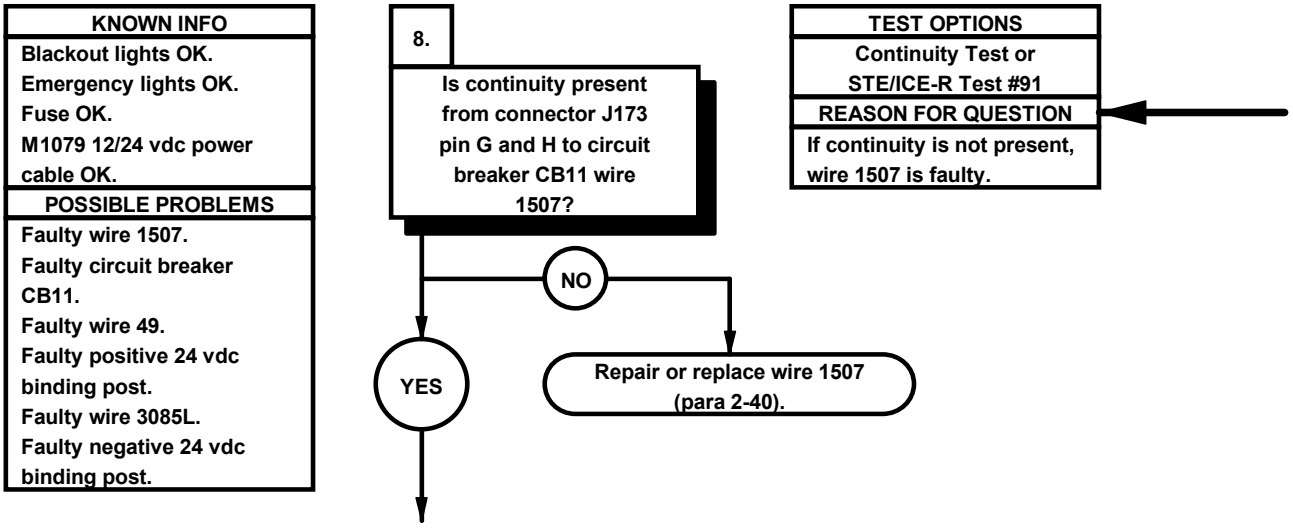
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to right end of fuse holder.
(3) Connect negative (-) probe of multimeter to connector P173-G and note reading on multimeter.
(4) Connect negative (-) probe of multimeter to connector P173-H and note reading on multimeter.
(5) If continuity is not present at connector P173-G and/or P173-H, repair wire 1507 (para 2-40) or replace M1079 12/24 vdc power cable (para 7-51).
(6) Install fuse in fuse holder on M1079 12/24 vdc power cable.
(7) Close fuse holder.

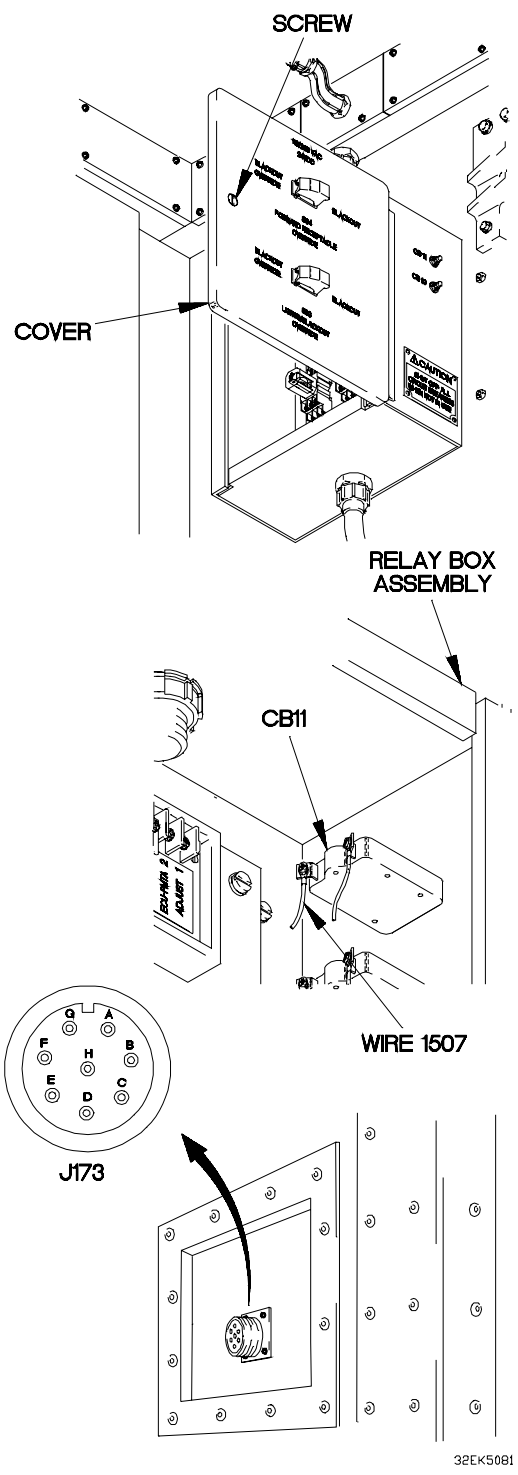


32el7071

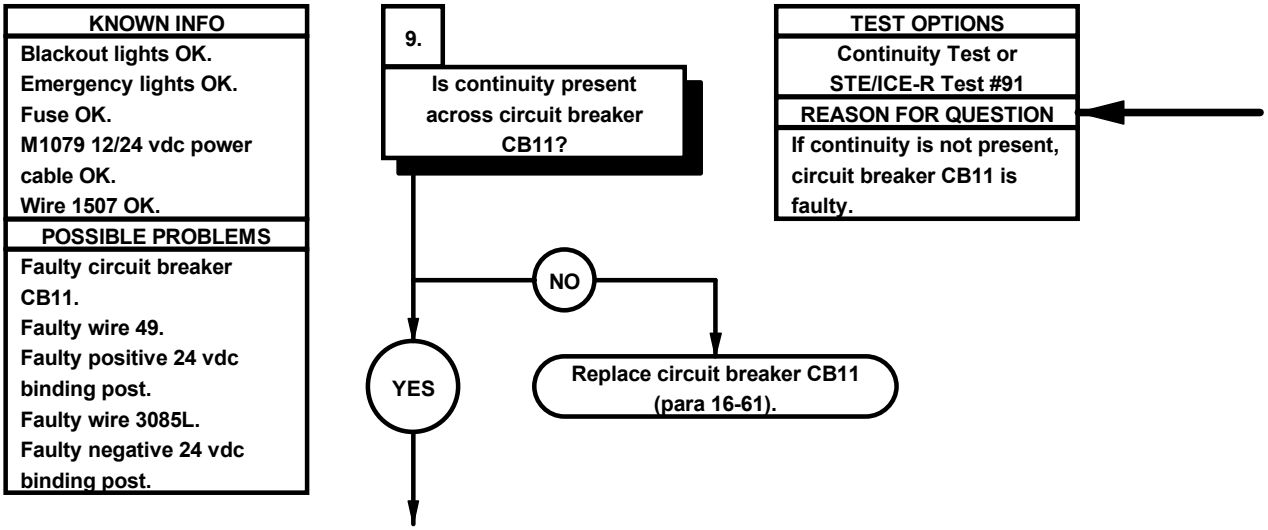
e117. M1079 24 VDC BINDING POST(S) DOES NOT OPERATE (CONT)



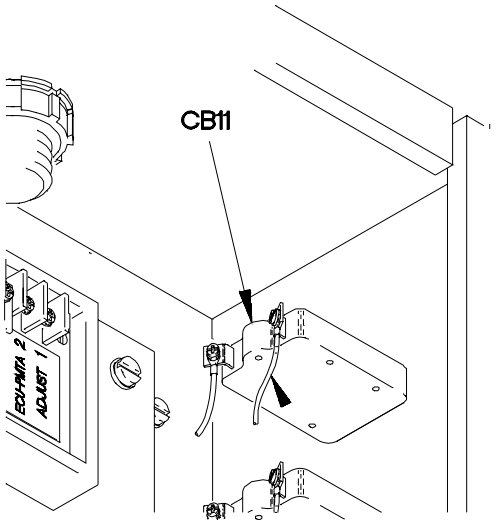
CONTINUITY TEST
(1) Loosen screw in cover.
(2) Open cover on relay box assembly.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector J173-G.
(5) Connect negative (-) probe of multimeter to circuit breaker CB11 wire 1507 and note reading on multimeter.
(6) Connect positive (+) probe of multimeter to connector J173-H and note reading on multimeter.
(5) If continuity is not present at connector J173-G and/or J173-H, repair wire 1507 (para 2-40).



e117. M1079 24 VDC BINDING POST(S) DOES NOT OPERATE (CONT)

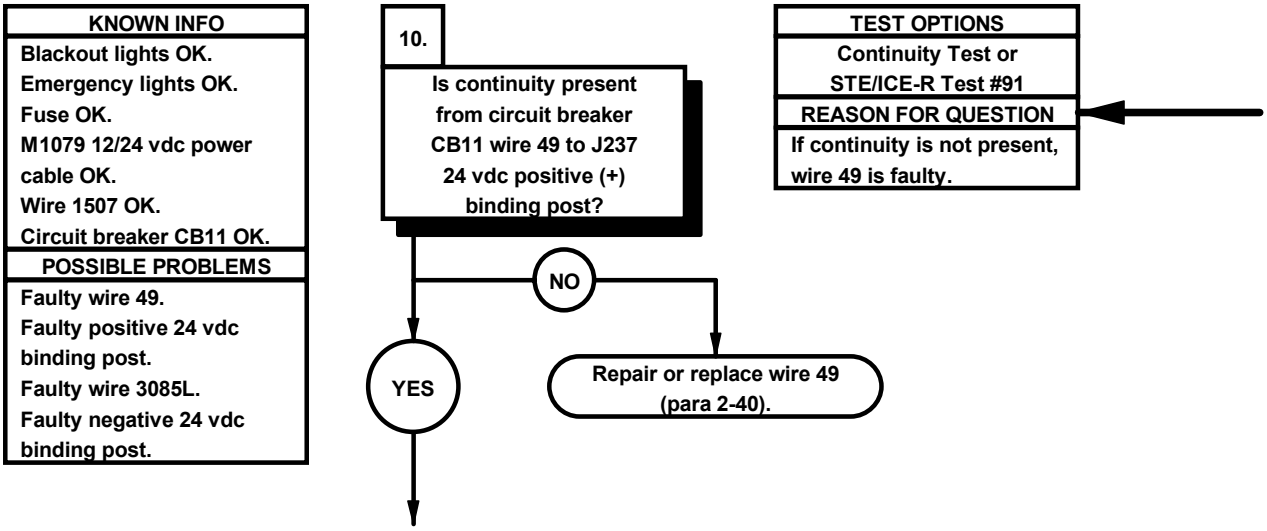


CONTINUITY TEST
(1) Push in circuit breaker CB11.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to one end of circuit breaker CB11.
(4) Connect negative (-) probe of multimeter to other end of circuit breaker CB11 and note reading on multimeter.
(5) If continuity is not present, replace circuit breaker CB11 (para 16-61).

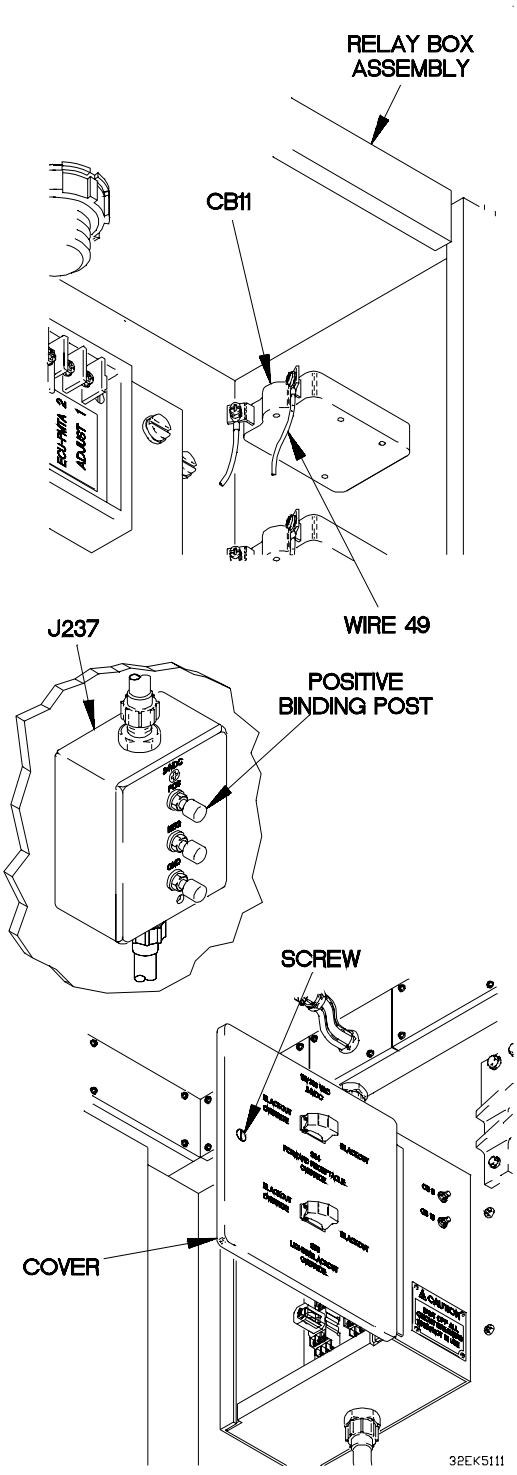


32EK5091

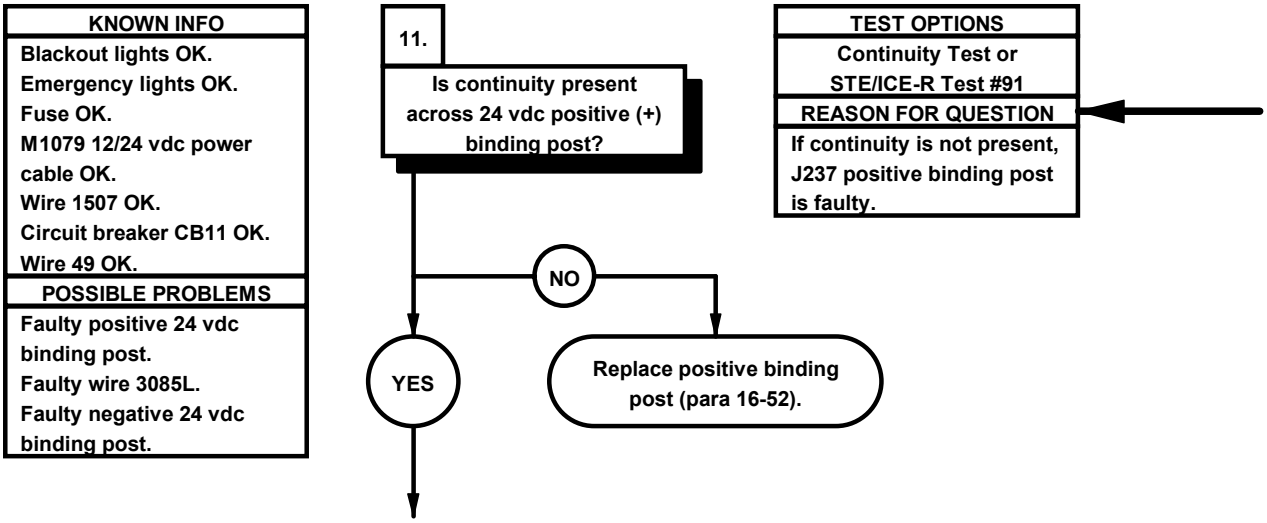
e117. M1079 24 VDC BINDING POST(S) DOES NOT OPERATE (CONT)



CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to circuit breaker CB11 wire 49.
(3) Connect negative (-) probe of multimeter to J237 24 vdc positive (+) binding post and note reading on multimeter.
(4) If continuity is not present, repair or replace wire 49 (para 2-40).
(5) Close cover on relay box assembly.
(6) Tighten screw in cover.

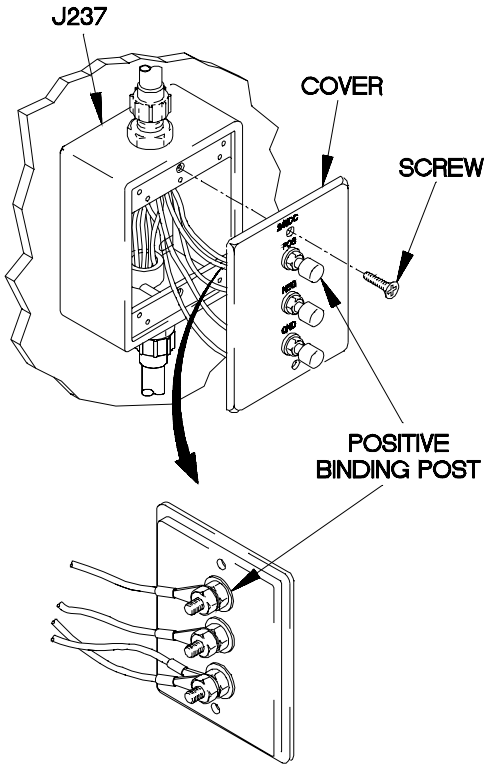


e117. M1079 24 VDC BINDING POST(S) DOES NOT OPERATE (CONT)



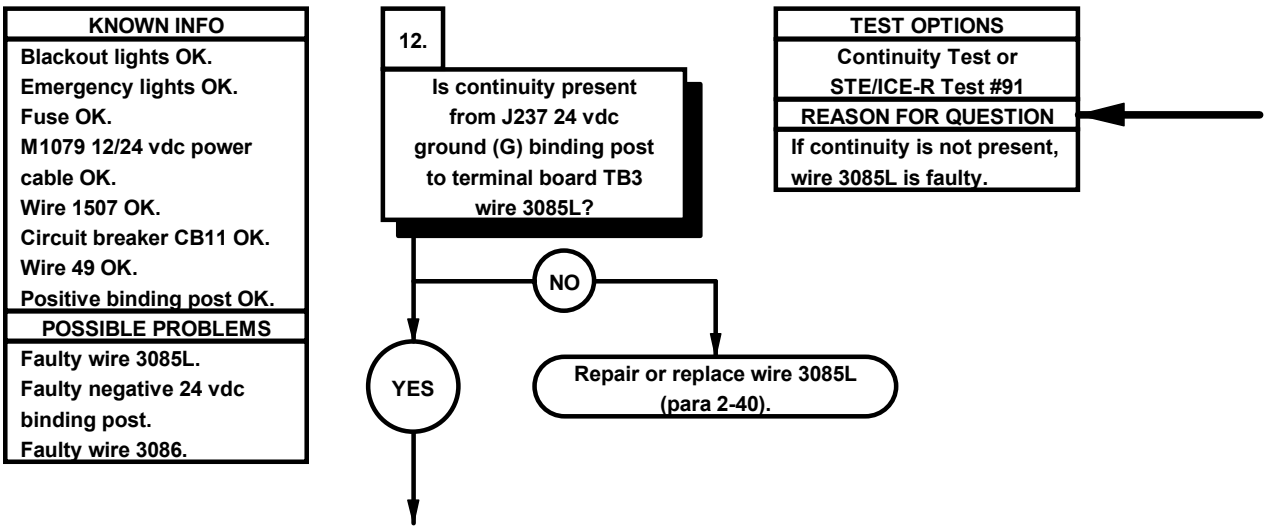
CONTINUITY TEST

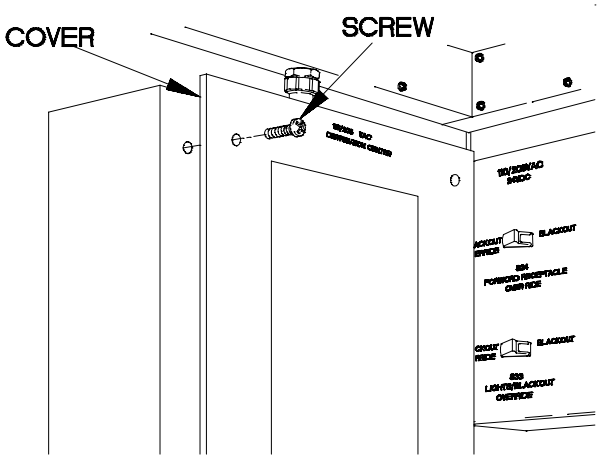
(1) Remove two screws and cover from J237 24 vdc outlet box.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to one side of J237 positive (+) binding post.
(4) Connect negative (-) probe of multimeter to other side of J237 positive (+) binding post and note reading on multimeter.
(5) If continuity is not present, replace J237 24 vdc positive binding post (para 16-52).

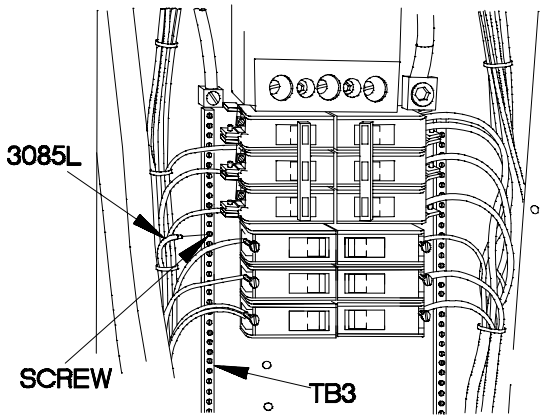


32EK5121

e117. M1079 24 VDC BINDING POST(S) DOES NOT OPERATE (CONT)

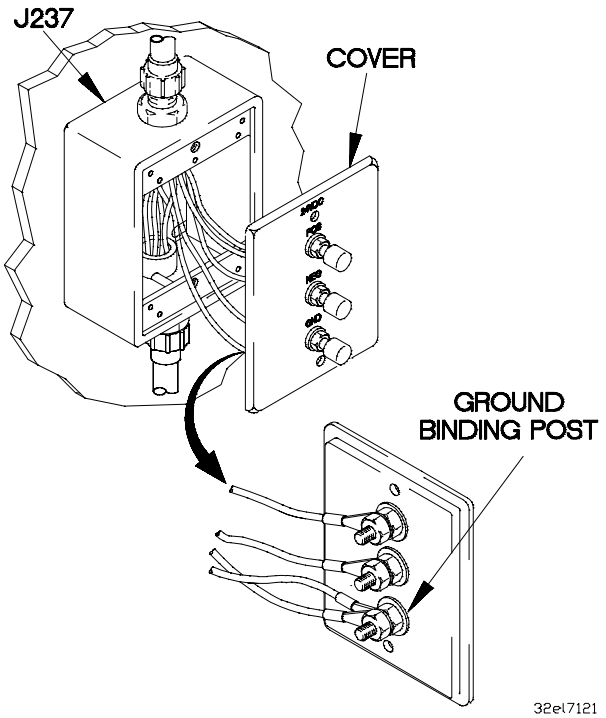




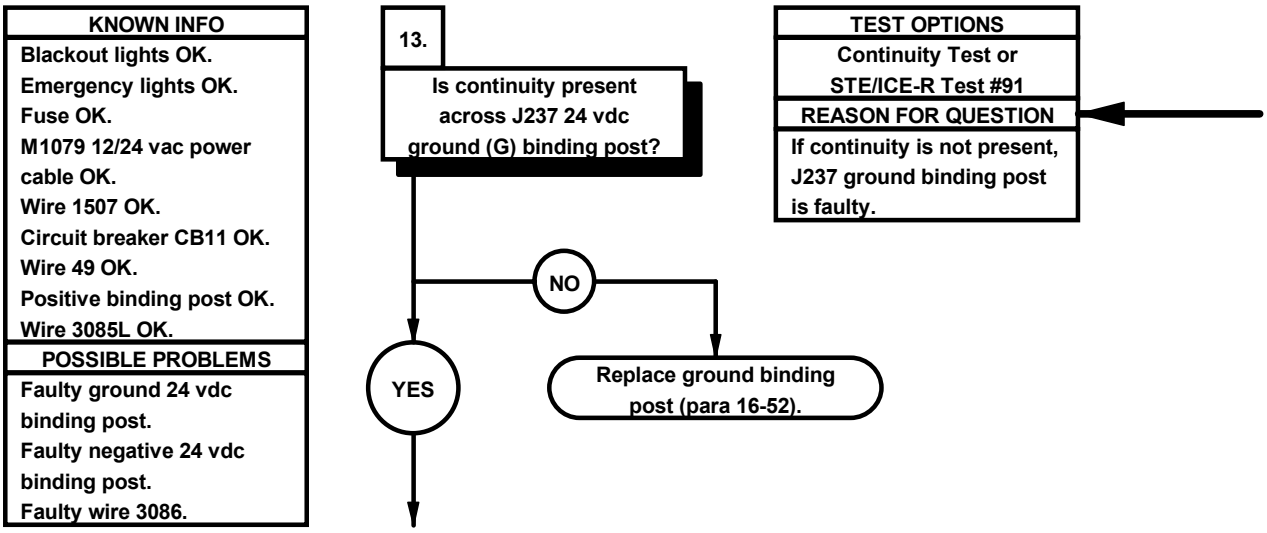


CONTINUITY TEST

(1) Remove six screws and cover from 110/208 VAC POWER DISTRIBUTION PANEL.
(2) Loosen screw in terminal board TB3.
(3) Remove wire 3085L from terminal board TB3.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to J237 24 vdc ground (G) binding post.
(6) Connect negative (-) probe of multimeter to terminal board TB3 wire 3085L and note reading on multimeter.
(7) If continuity is not present, repair or replace wire 3085L (para 2-40).
(8) Position wire 3085L in terminal board TB3.
(9) Tighten screw in terminal board TB3.
(10) Install cover on 110/208 VAC POWER DISTRIBUTION PANEL with six screws.

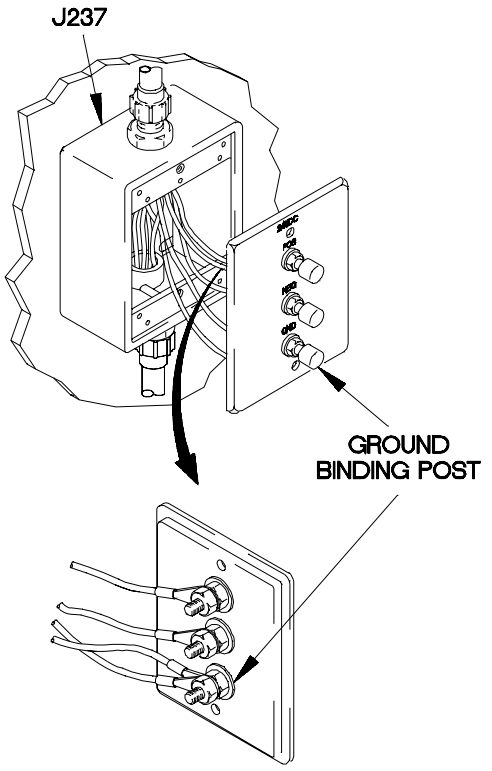


e117. M1079 24 VDC BINDING POST(S) DOES NOT OPERATE (CONT)



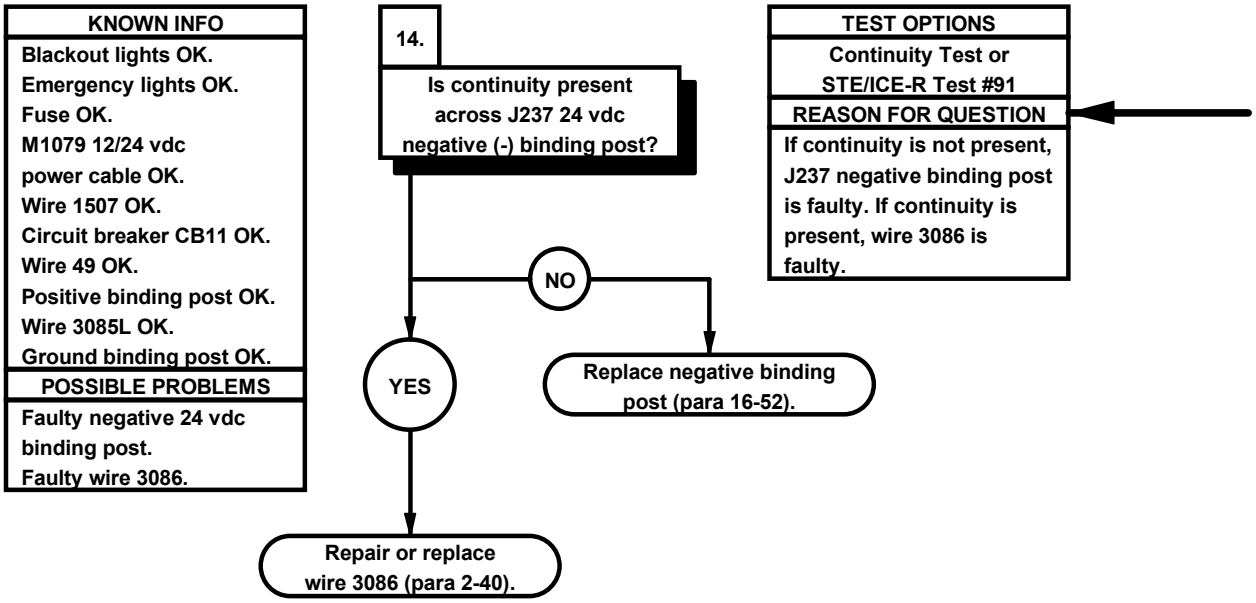
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to inside of J237 ground (G) binding post.
(3) Connect negative (-) probe of multimeter to front side of J237 ground (G) binding post and note reading on multimeter.
(4) If continuity is not present, replace J237 24 vdc ground binding post (para 16-52).



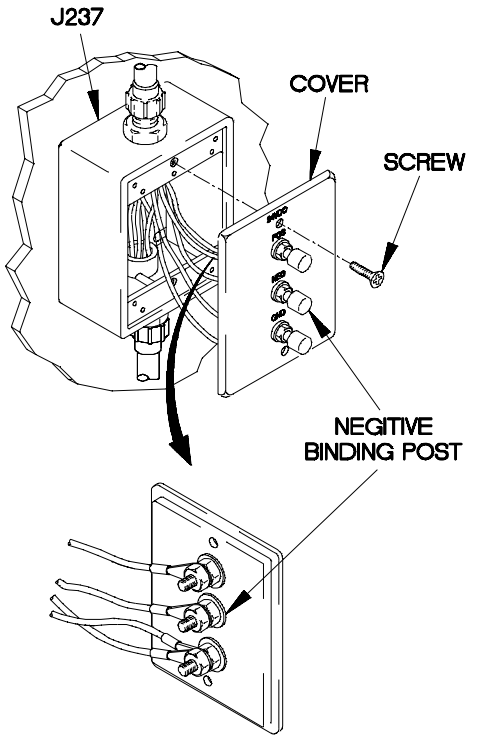
32EK5141

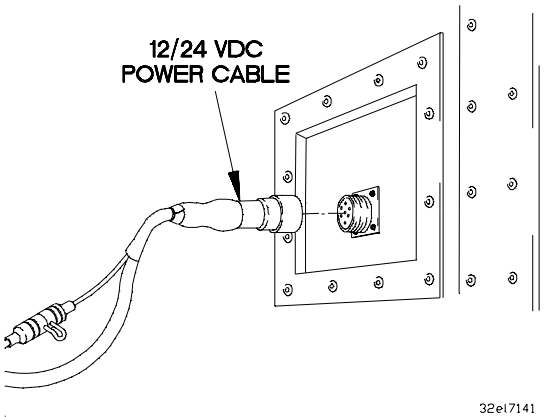
e117. M1079 24 VDC BINDING POST(S) DOES NOT OPERATE (CONT)



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to inside of J237 negative (-) binding post.
(3) Connect negative (-) probe of multimeter to front side of J237 negative (-) binding post and note reading on multimeter.
(4) If continuity is not present, replace J237 24 vdc negative binding post (para 16-52).
(5) If continuity is present, repair or replace wire 3086 (para 2-40).
(6) Install cover on J237 24 vdc outlet box with two screws.
(7) Connect M1079 12/24 vdc power cable to van body (TM 9-2320-365-10).





32el7141

e118. M1079 VAN DOOR OPEN INDICATOR DOES NOT OPERATE

INITIAL SETUP

Equipment Condition
Engine shut down (TM 9-2320-365-10).
AC power disconnected (TM 9-2320-365-10).

Personnel Required
(2)

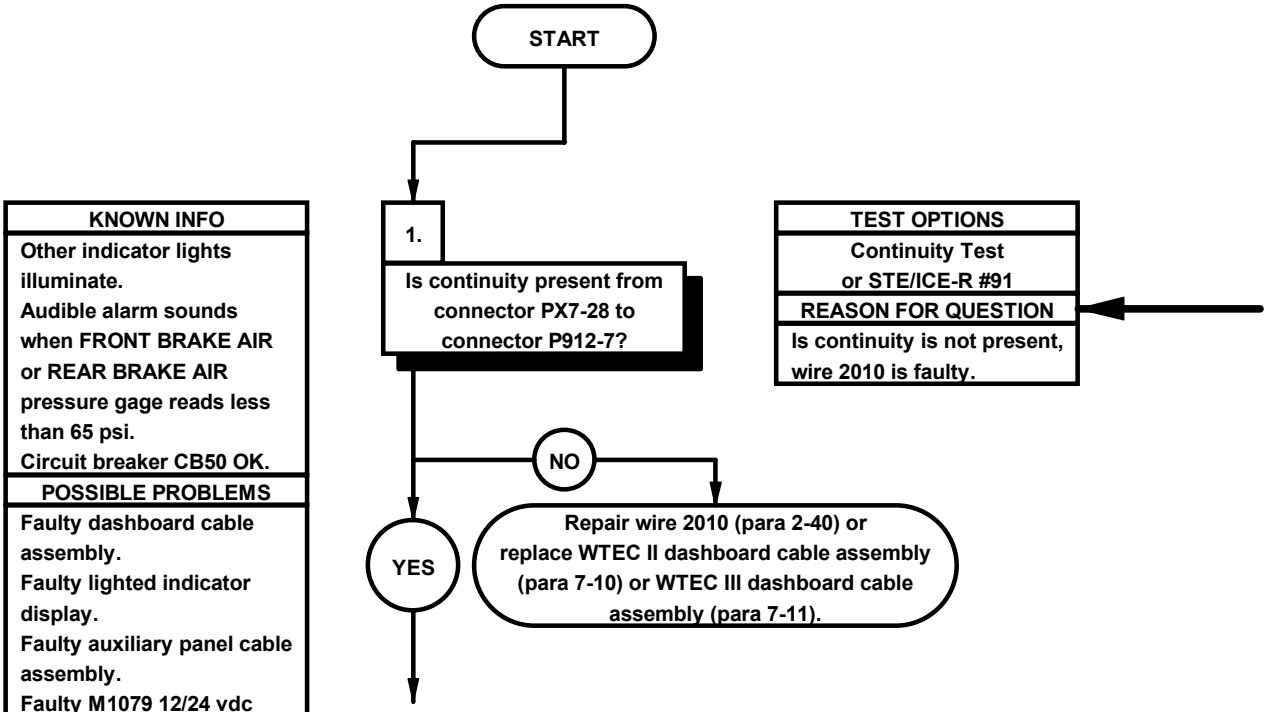
Materials/Parts
Wire, Elect, 50 ft (Item 77, Appendix D)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)

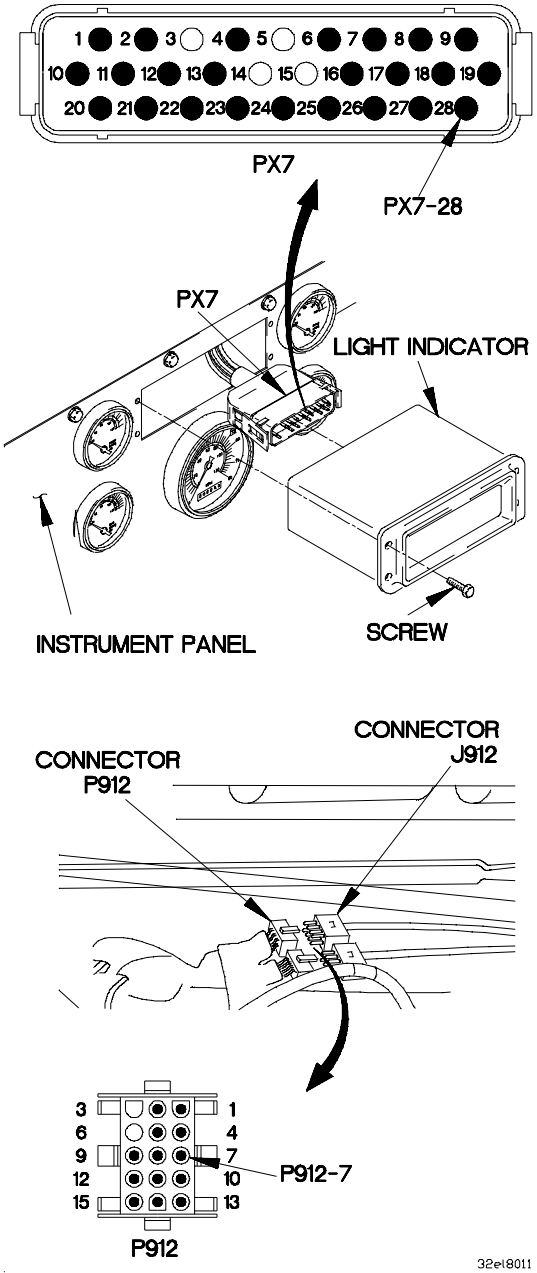
References
TM 9-4910-571-12&P

KNOWN INFO
Other indicator lights illuminate.
Audible alarm sounds when FRONT BRAKE AIR or REAR BRAKE AIR pressure gage reads less than 65 psi.
Circuit breaker CB50 OK.

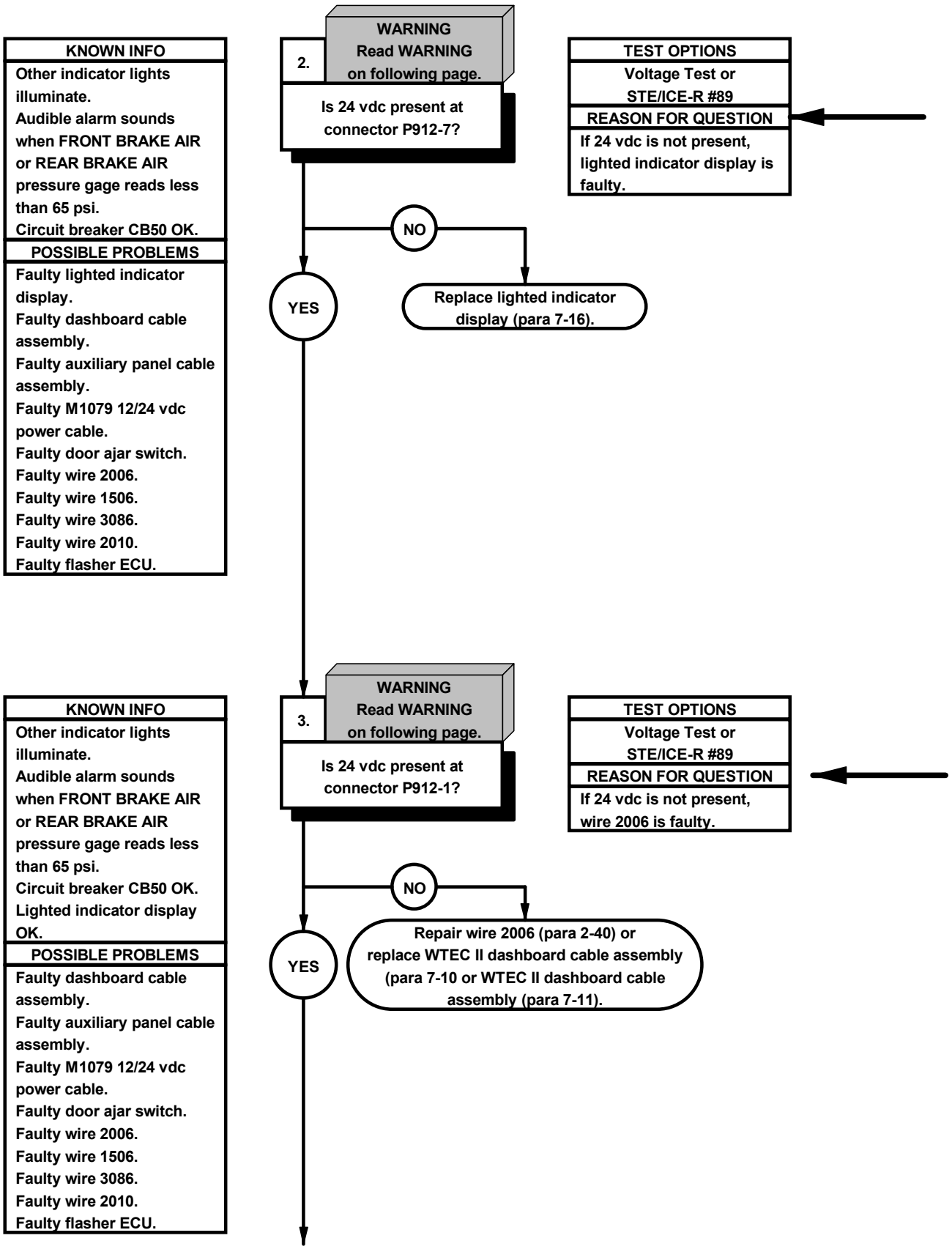
POSSIBLE PROBLEMS
Faulty dashboard cable assembly.
Faulty lighted indicator display.
Faulty auxiliary panel cable assembly.
Faulty M1079 12/24 vdc power cable.
Faulty door ajar switch.
Faulty wire 2006.
Faulty wire 1506.
Faulty wire 3086.
Faulty wire 2010.
Faulty flasher ECU.



CONTINUITY TEST
(1) Open van body RH door (TM 9-2320-365-10).
(2) Remove four screws from lighted indicator display.
(3) Remove lighted indicator display from instrument panel assembly.
(4) Disconnect connector PX7 from lighted indicator display.
(5) Remove personnel heater for access (para 18-9).
(6) Disconnect connector P912 from connector J912.
(7) Set multimeter to ohms.
(8) Connect positive (+) probe of multimeter to connector PX7-28.
(9) Connect negative (-) probe of multimeter to connector P912-7 and note reading on multimeter.
(10) If continuity is not present, repair wire 2010 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(11) Connect connector PX7 to lighted indicator display.
(12) Position lighted indicator display in instrument panel assembly with four screws.
(13) Tighten four screws to 6-10 lb-in. (1 N·m).



e118. M1079 VAN DOOR OPEN INDICATOR DOES NOT OPERATE (CONT)

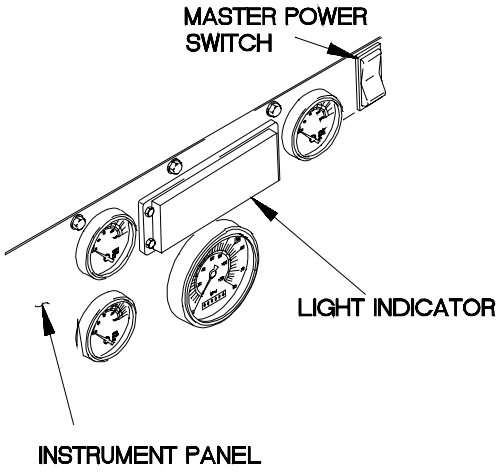


WARNING

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 P912-7.
(3) Connect negative (-) probe of multimeter to ground.
(4) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
(5) If 24 vdc is not present, replace lighted indicator display (para 7-16).
(6) Position master power switch to off (TM 9-2320-365-10).

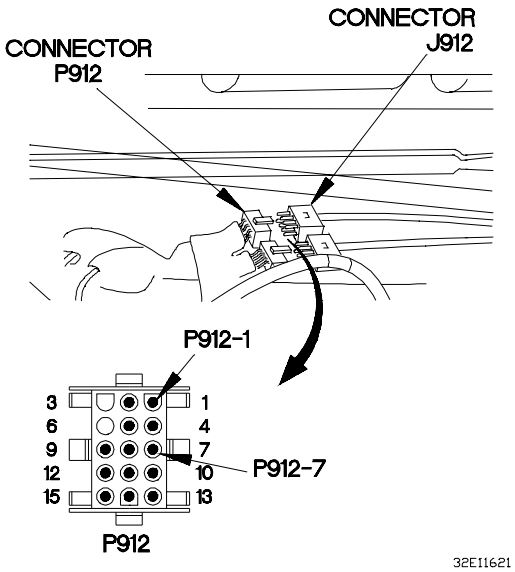


WARNING

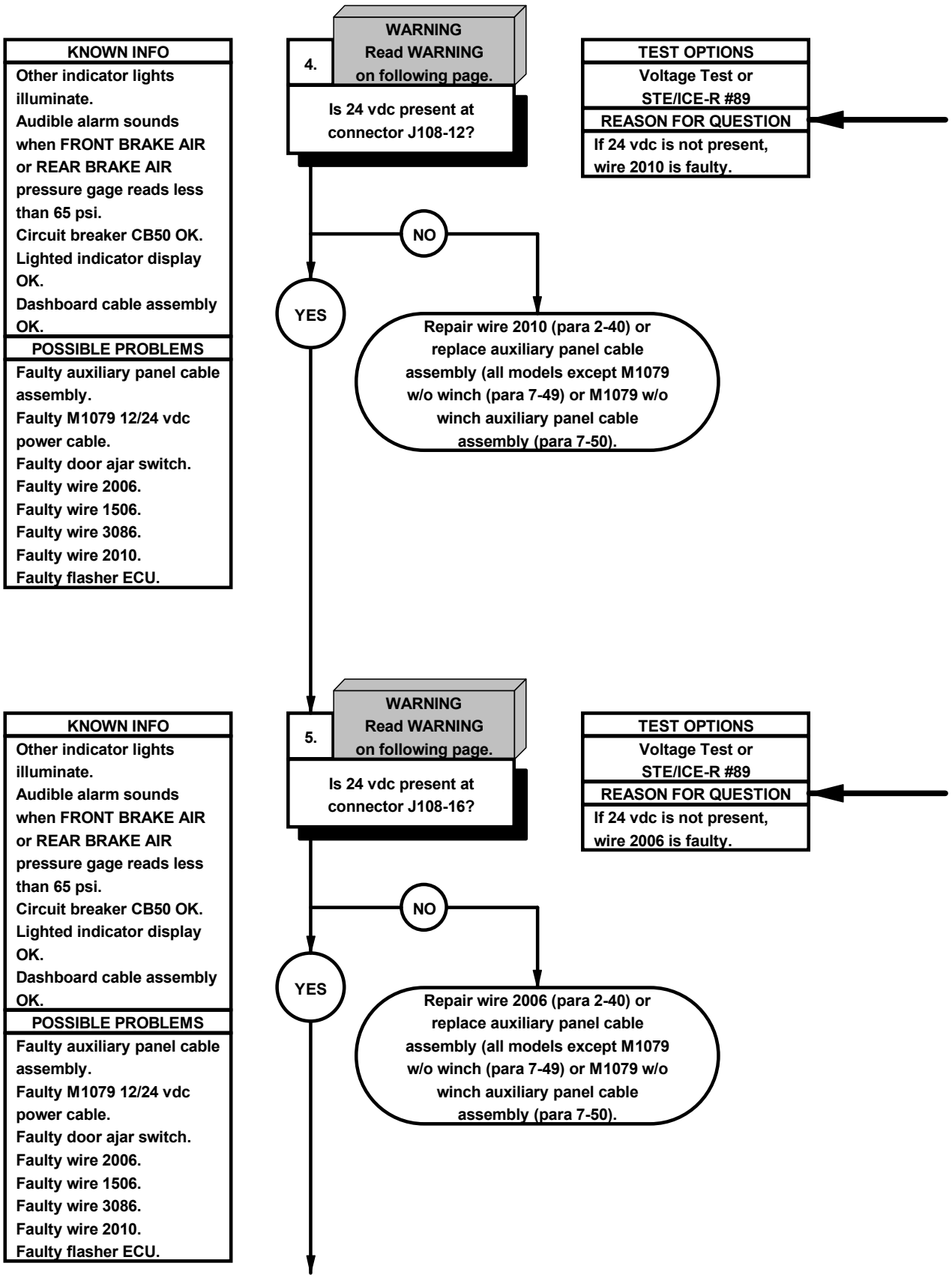
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Set multimeter to volts dc.
(2) Connect positive (+) probe of multimeter to connector P912-1.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If 24 vdc is not present, repair wire 2006 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10 or WTEC III dashboard cable assembly (para 7-11).
(5) Connect connector P912 to connector J912.
(6) Install personnel heater (para 18-9).



e118. M1079 VAN DOOR OPEN INDICATOR 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

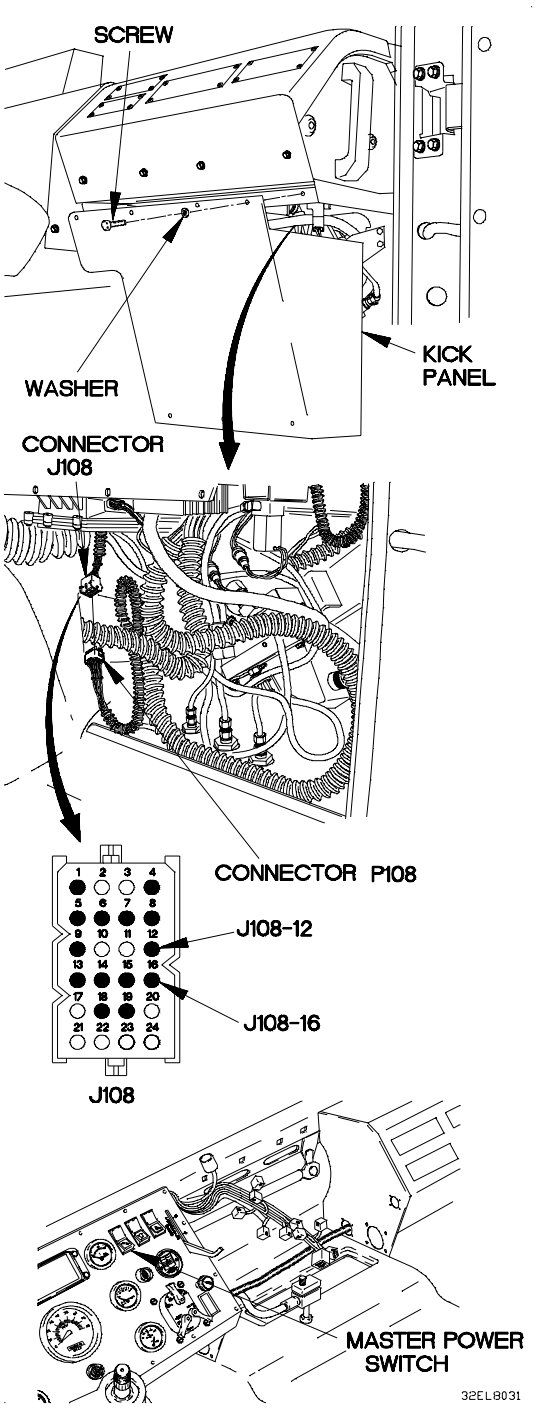
(1) Remove kick panel (para 16-3).
(2) Disconnect connector P108 from connector J108.
(3) Set multimeter to volts dc.
(4) Connect positive (+) probe of multimeter to connector J108-12.
(5) Connect negative (-) probe of multimeter to ground.
(6) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
(7) If 24 vdc is not present, repair wire 2010 (para 2-40) or replace auxiliary panel cable assembly (all models except M1079 w/o winch) (para 7-49) or M1079 w/o winch auxiliary panel cable assembly (par 7-50).
(8) Position master power switch to off (TM 9-2320-365-10).

WARNING

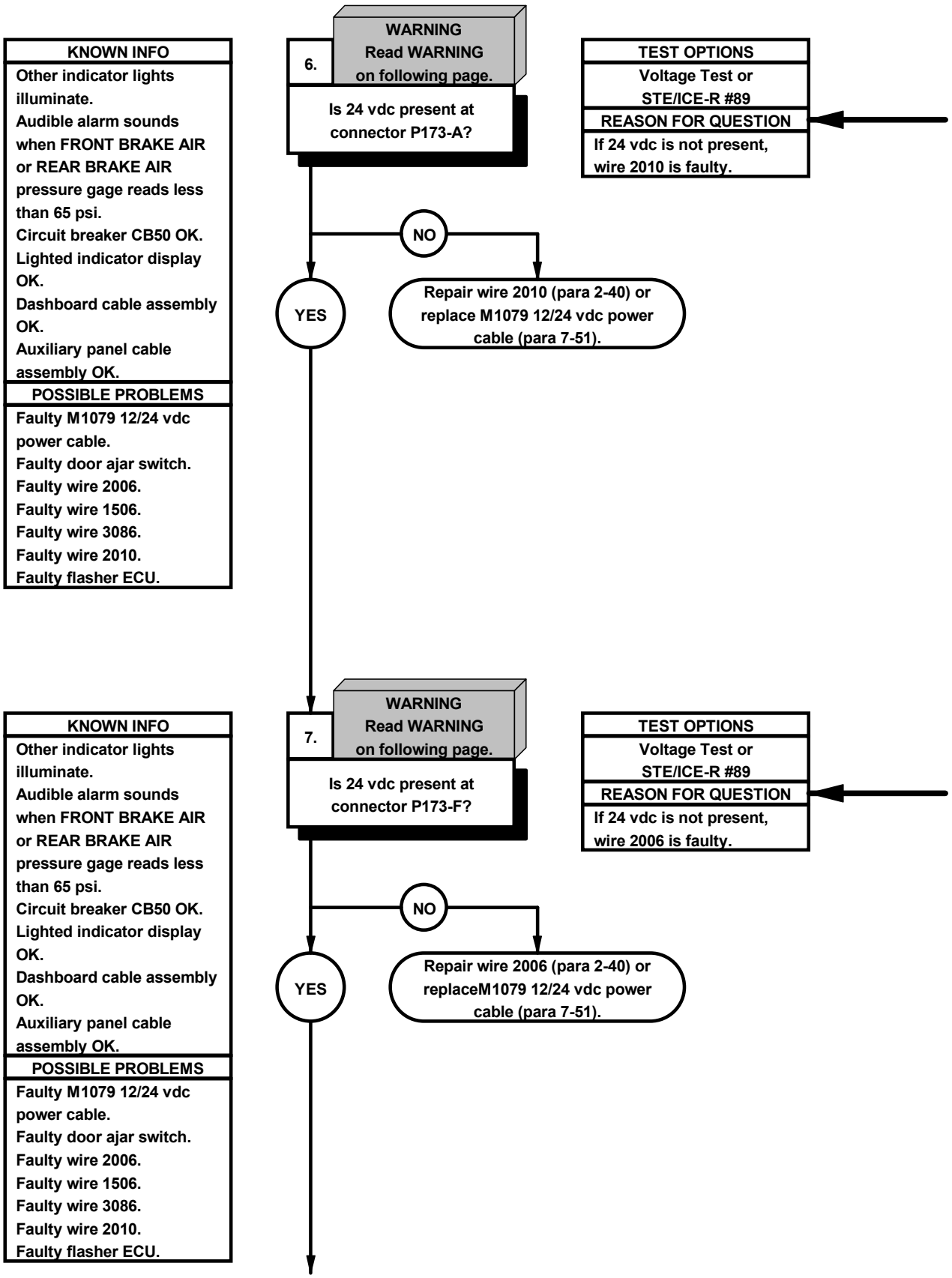
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Set multimeter to volts dc.
(2) Connect positive (+) probe of multimeter to connector J108-16.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If 24 vdc is not present, repair wire 2006 (para 2-40) or replace auxiliary panel cable assembly (all models except M1079 w/o winch) (para 7-49) or M1079 w/o/ winch auxiliary panel cable assembly (para 7-50).
(5) Connect connector P108 to connector J108.
(6) Install kick panel (para 16-3).



e118. M1079 VAN DOOR OPEN INDICATOR DOES NOT OPERATE (CONT)

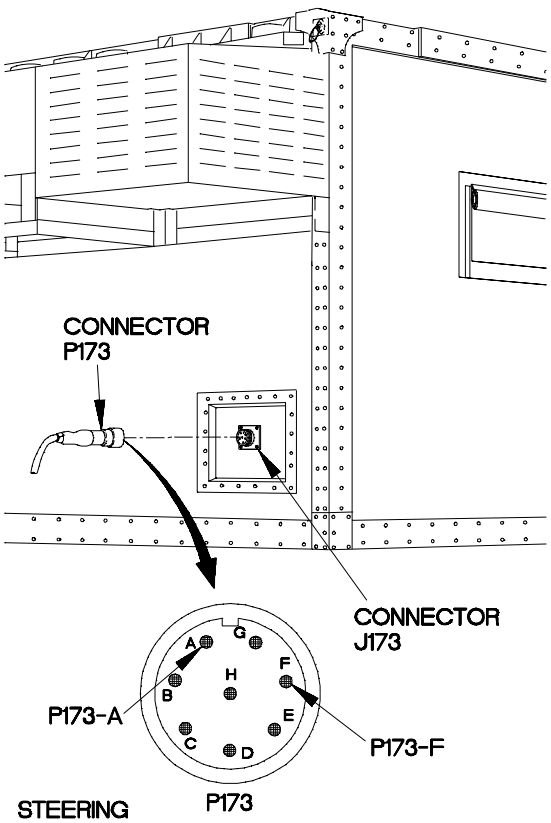


WARNING

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 P173 from connector J173.
(2) Set multimeter to volts dc.
(3) Connect positive (+) probe of multimeter to connector P173-A.
(4) Connect negative (-) probe of multimeter to ground.
(5) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
(6) If 24 vdc is not present, repair wire 2010 (para 2-40) or replace M1079 12/24 vdc power cable (para 7-51).
(7) Position master power switch to off (TM 9-2320-365-10).

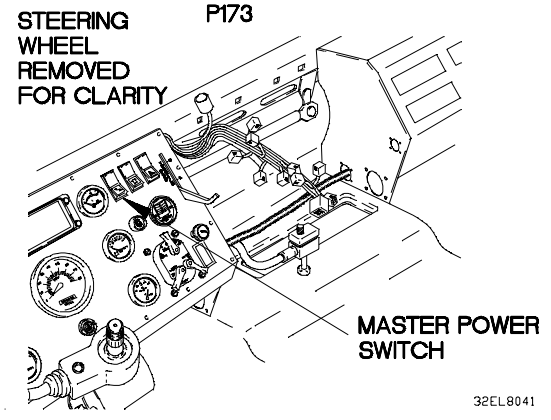


WARNING

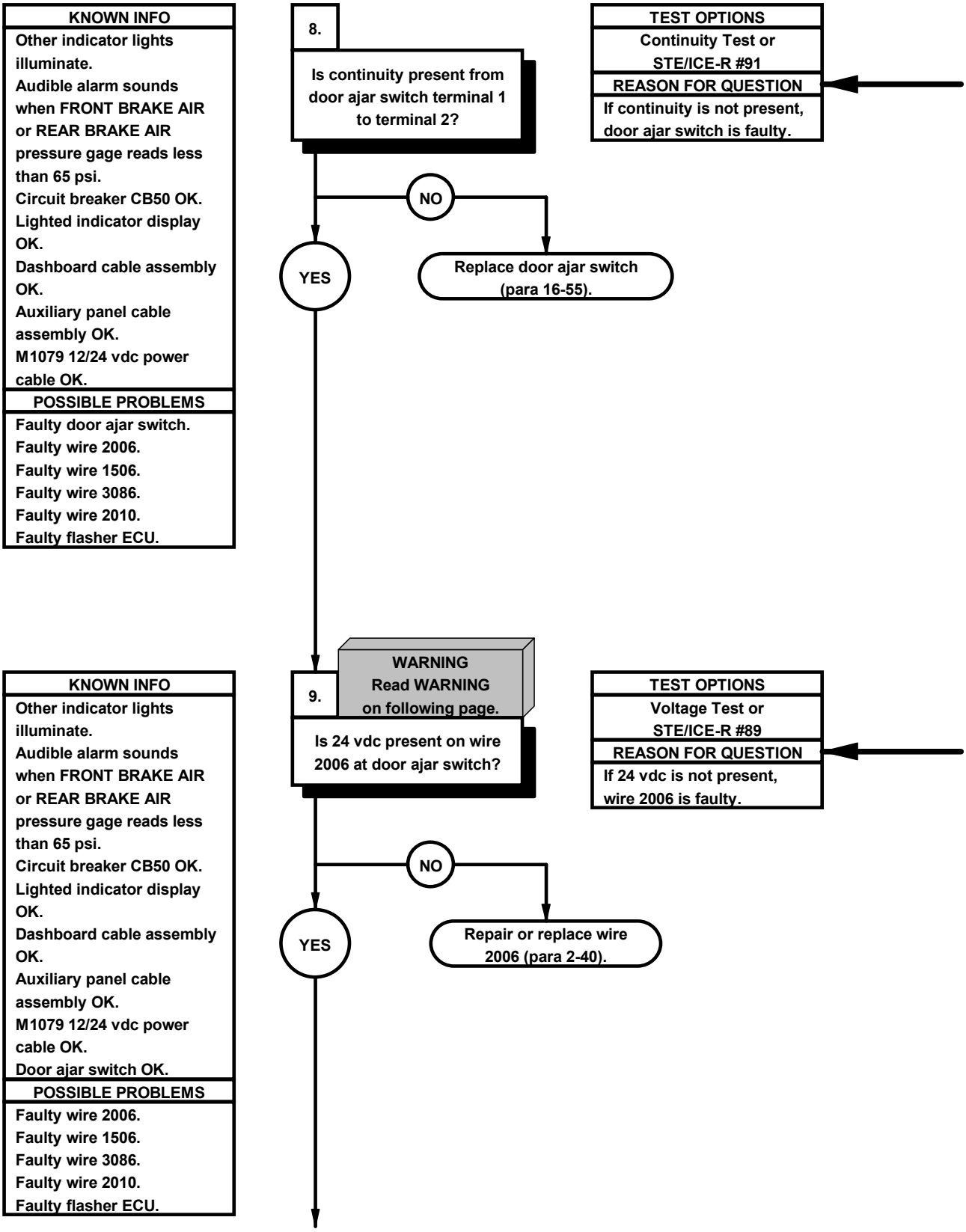
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Set multimeter to volts dc.
(2) Connect positive (+) probe of multimeter to connector P173-F.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If 24 vdc is not present, repair wire 2006 (para 2-40) or replace M1079 12/24 vdc power cable (para 7-51).

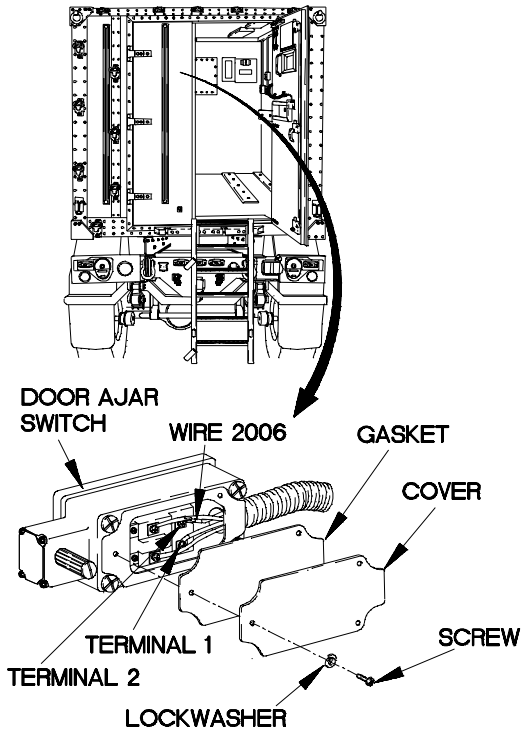


e118. M1079 VAN DOOR OPEN INDICATOR DOES NOT OPERATE (CONT)



CONTINUITY TEST

(1) Remove three screws, lockwashers, cover, and gasket from door ajar switch.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to door ajar switch terminal 1.
(4) Connect negative (-) probe of multimeter to door ajar switch terminal 2 and note reading on multimeter.
(5) If continuity is not present, replace door ajar switch (para 16-55).

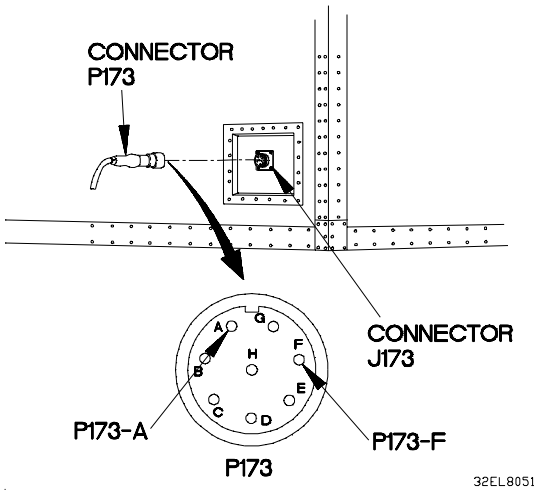


WARNING

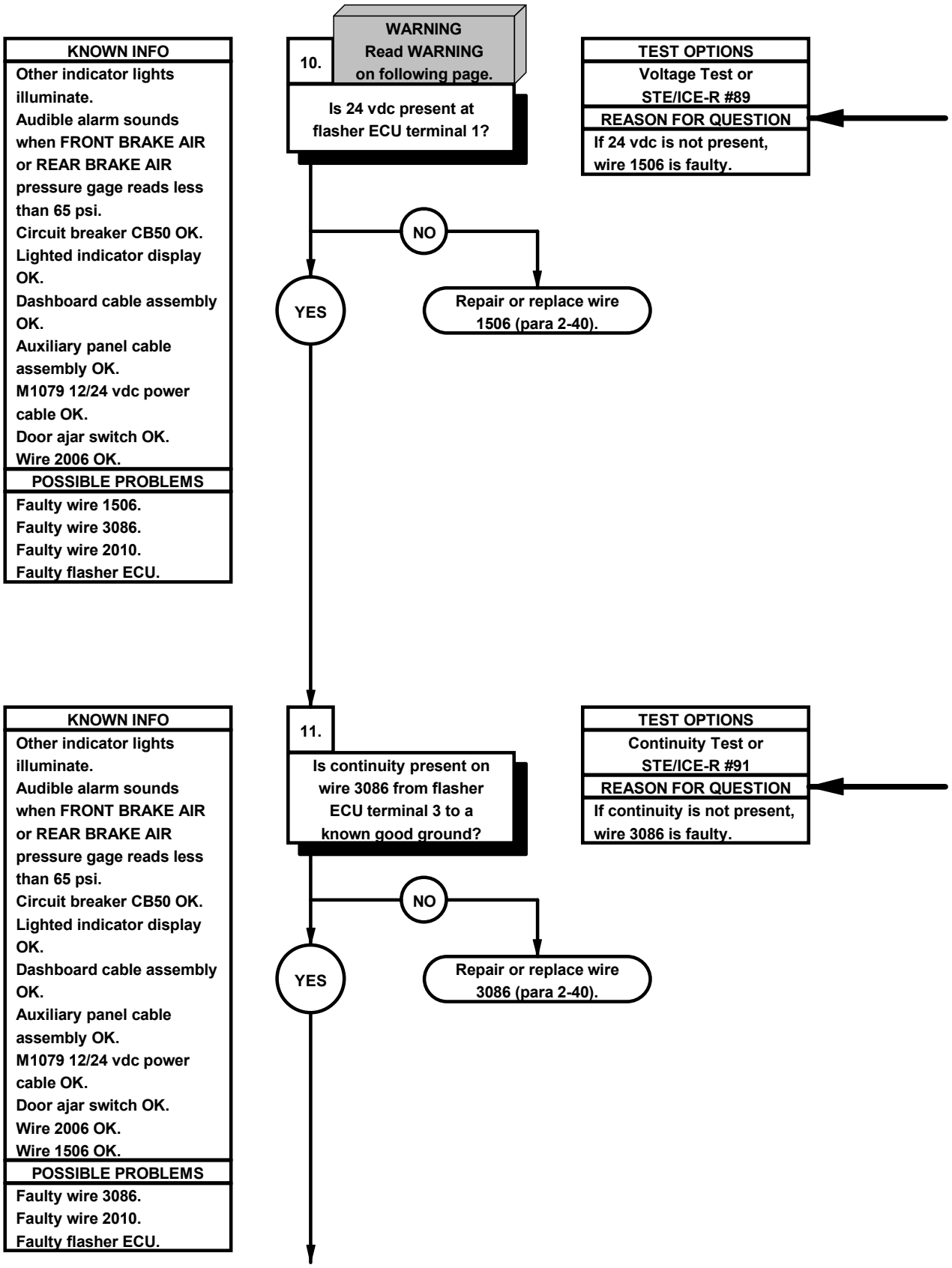
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Loosen screw 2 in door ajar switch.
(2) Remove wire 2006 from door ajar switch terminal 2.
(3) Connect connector P173 to connector J173.
(4) Set multimeter to volts dc.
(5) Connect positive (+) probe of multimeter to wire 2006.
(6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(7) If 24 vdc is not present, repair or replace wire 2006 (para 2-40).
(8) Disconnect connector P173 from connector J173.
(9) Install wire 2006 on door ajar switch terminal 2.
(10) Tighten screw 2 in door ajar switch.
(11) Install gasket and cover on door ajar switch with three lockwashers and screws.
(12) Connect connector P173 to connector J173.



e118. M1079 VAN DOOR OPEN INDICATOR DOES NOT OPERATE (CONT)



WARNING

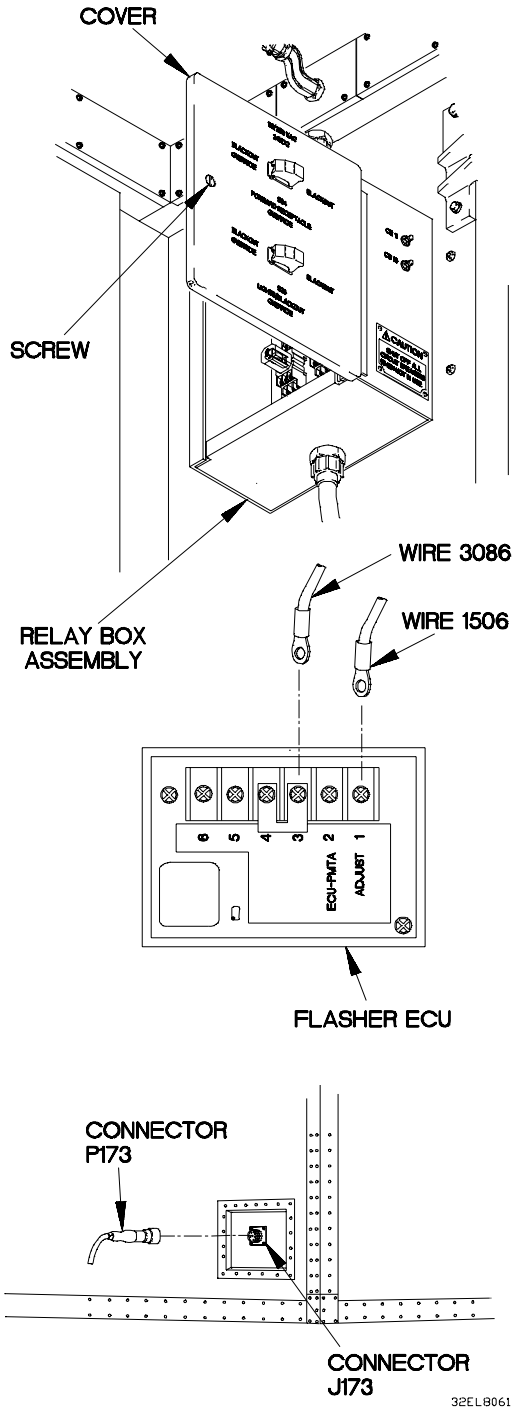
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

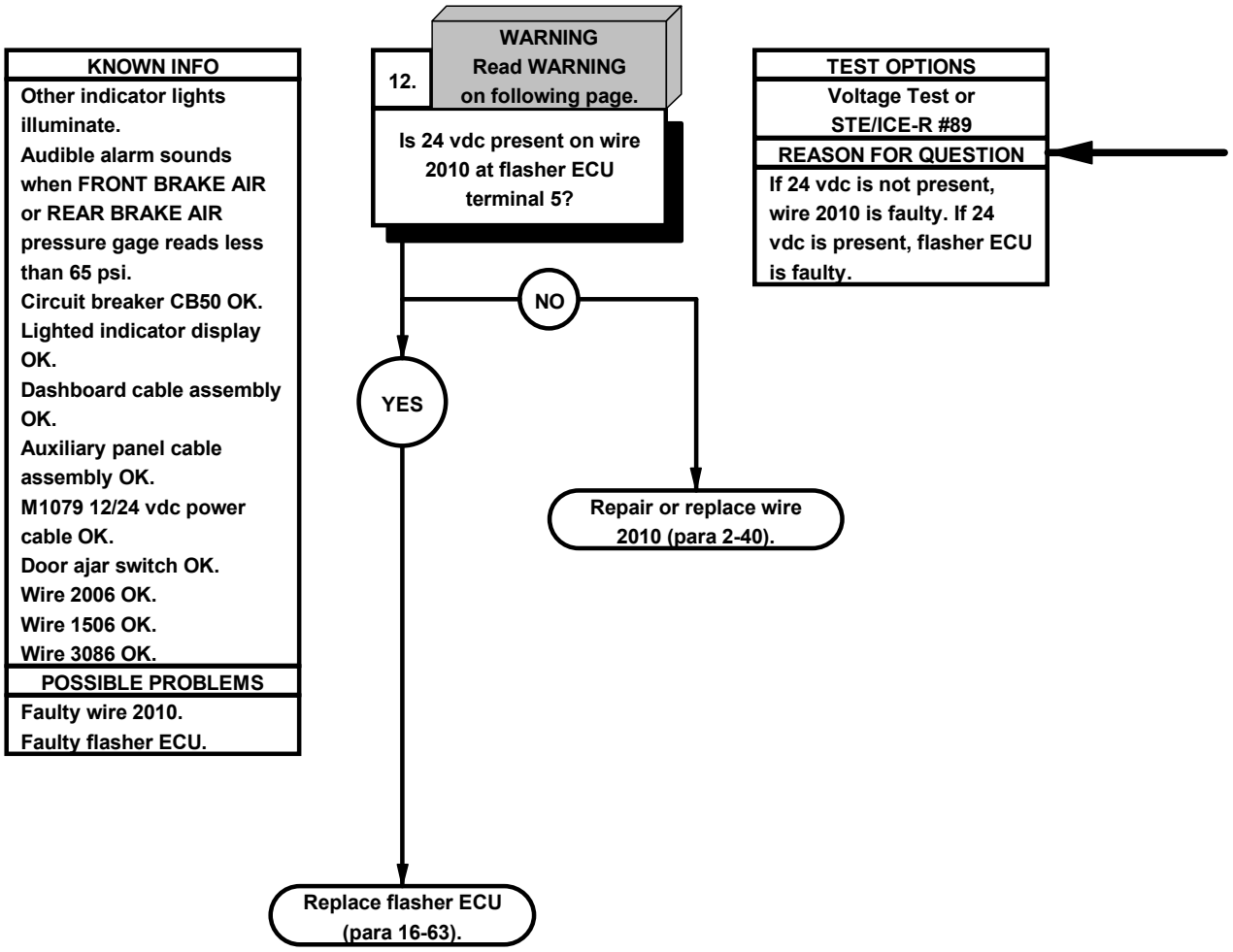
(1) Loosen screw in cover.
(2) Open cover on relay box assembly.
(3) Set multimeter to volts dc.
(4) Connect positive (+) probe of multimeter to flasher ECU terminal 1.
(5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(6) If 24 vdc is not present, repair or replace wire 1506 (para 2-40).

VOLTAGE TEST

(1) Disconnect connector P173 from connector J173.
(2) Loosen screw 3 in flasher ECU.
(3) Remove wire 3086 from flasher ECU terminal 3.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to wire 3086.
(6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(7) If continuity is not present, repair or replace wire 3086 (para 2-40).
(8) Install wire 3086 on flasher ECU terminal 3.
(9) Tighten screw 3 in flasher ECU.



e118. M1079 VAN DOOR OPEN INDICATOR DOES NOT OPERATE (CONT)

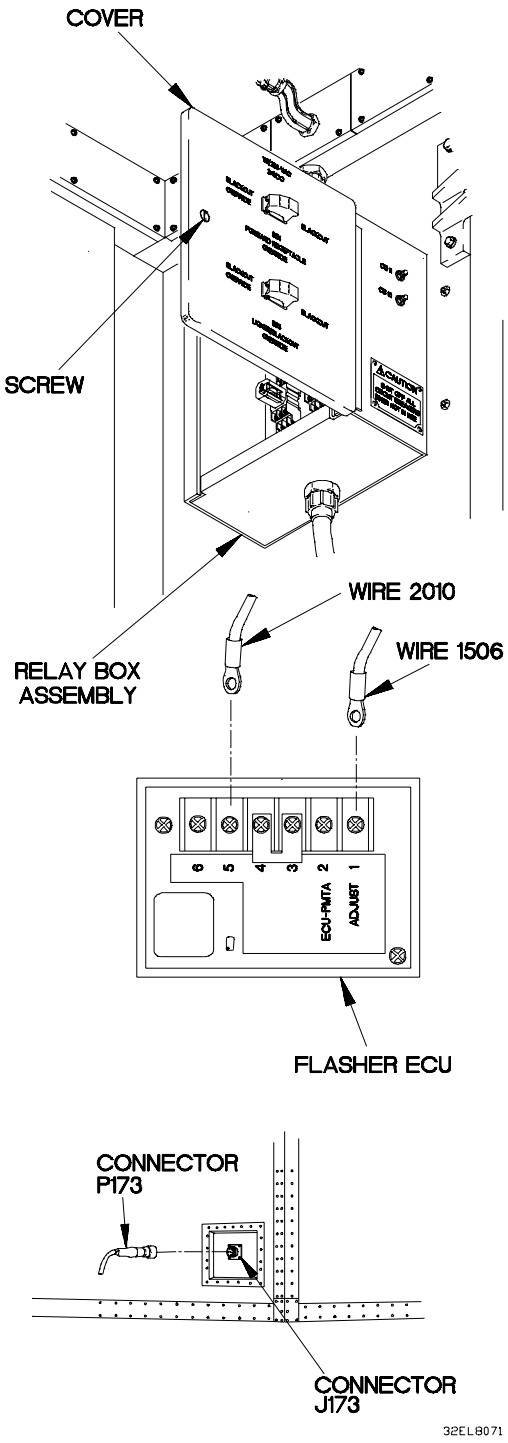


WARNING

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 1 in flasher ECU.
(2) Remove wire 1506 from flasher ECU terminal 1.
(3) Loosen screw 5 in flasher ECU.
(4) Remove wire 2010 from flasher ECU terminal 5.
(5) Connect connector P173 to connector J173.
(6) Position master power switch to on (TM 9-2320-365-10).
(7) Set multimeter to volts dc.
(8) Connect positive (+) probe of multimeter to wire 2010.
(9) Connect negative (-) probe of multimeter to flasher ECU terminal 3 and note reading on multimeter.
(10) If 24 vdc is not present, repair or replace wire 2010 (para 2-40).
(11) If 24 vdc is present, replace flasher ECU (para 16-63).
(12) Position master power switch to off (TM 9-2320-365-10).
(13) Disconnect connector P173 from connector J173.
(14) Install wire 2010 on flasher ECU terminal 5.
(15) Tighten screw 5 in flasher ECU.
(16) Install wire 1506 on flasher ECU terminal 1.
(17) Tighten screw 1 in flasher ECU.
(18) Close cover on relay box assembly.
(19) Tighten screw in cover.
(20) Connect connector P173 to connector J173.
(21) Close van body RH door (TM 9-2320-365-10).



e119. M1079 110 VAC POWER DOES NOT OPERATE

INITIAL SETUP

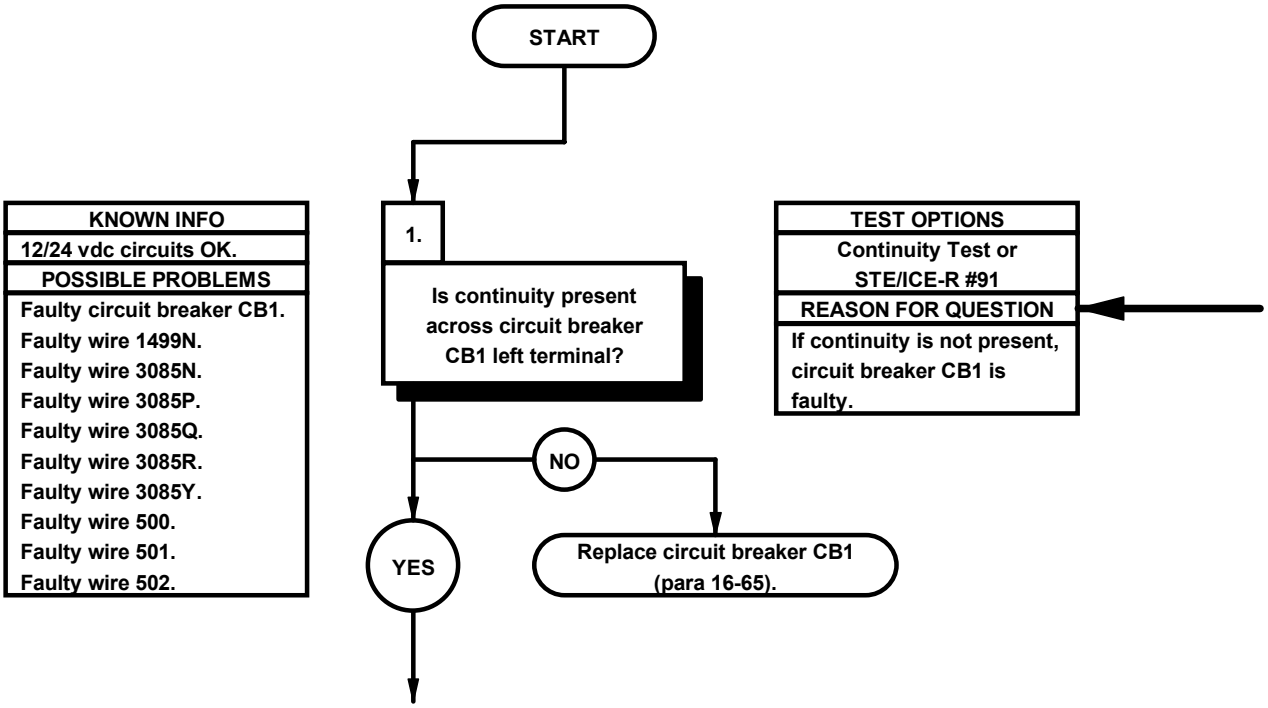
Equipment Condition
Engine shut down (TM 9-2320-365-10).
AC power disconnected (TM 9-2320-365-10).

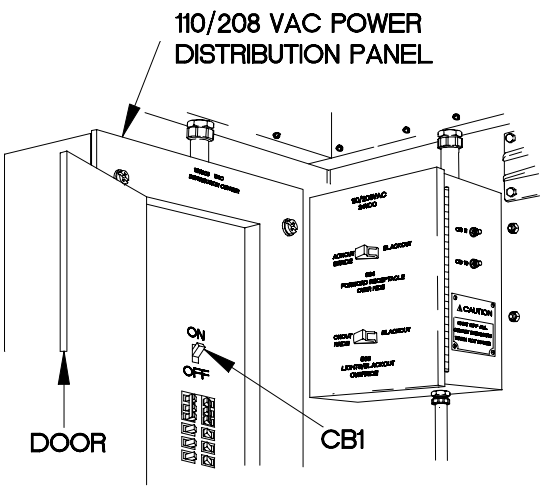
Materials/Parts
Wire, Electrical, 50 ft (Item 77, Appendix C)

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

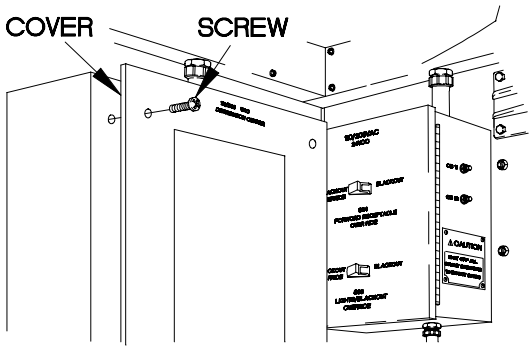
References
TM 9-4910-571-12&P

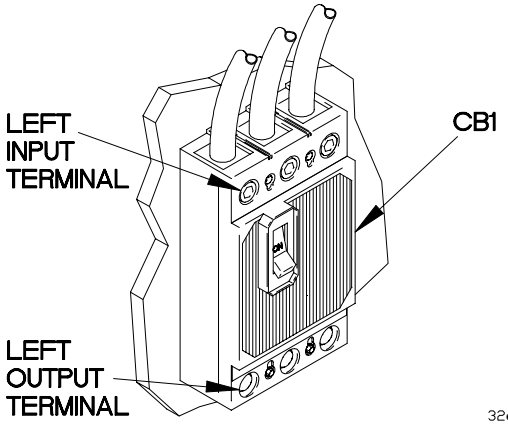




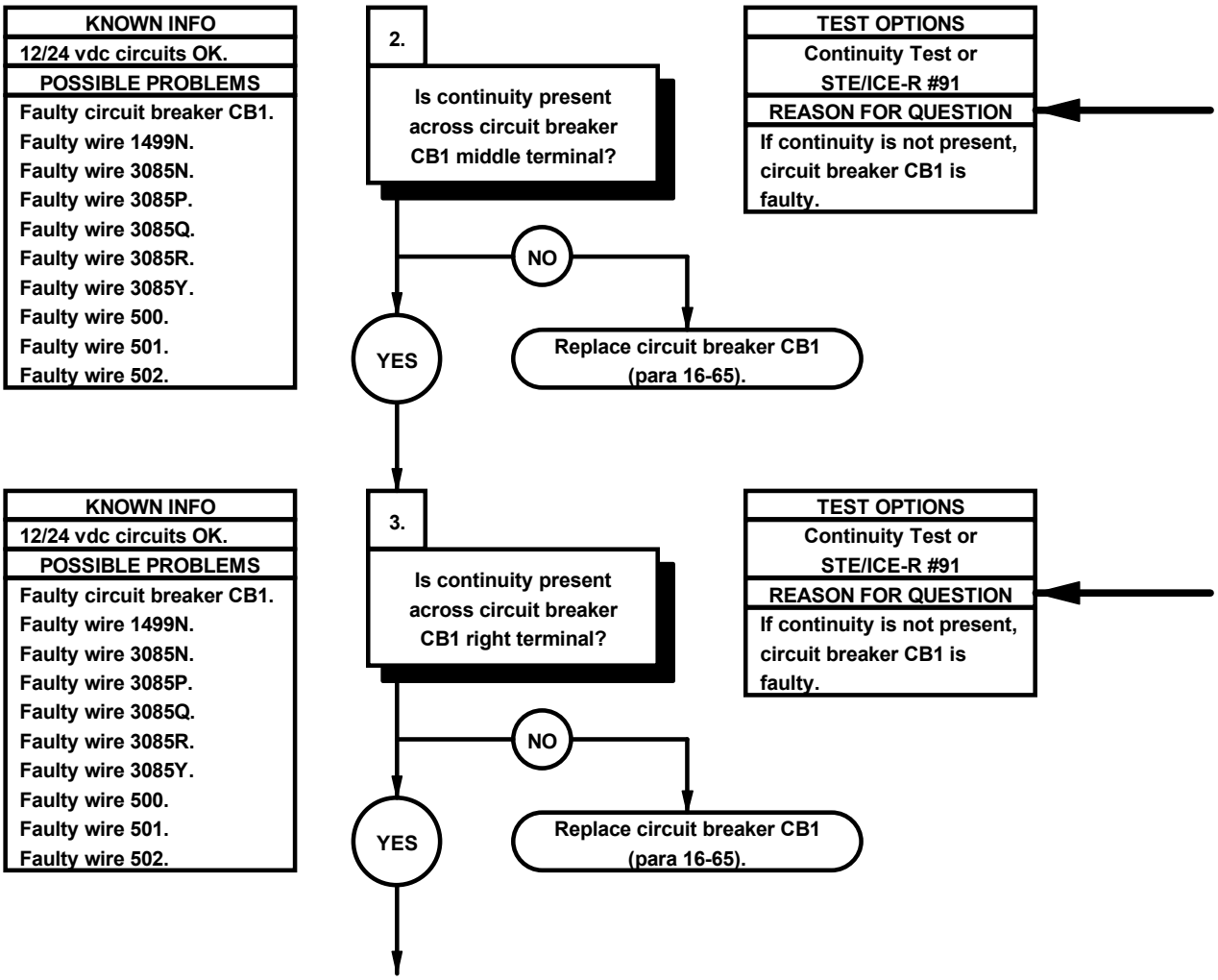
CONTINUITY TEST

(1) Position circuit breaker CB1 to OFF.
(2) Remove six screws and cover from 110/208 VAC POWER DISTRIBUTION PANEL.
(3) Position circuit breaker CB1 to ON.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to left output terminal of circuit breaker CB1.
(6) Connect negative (-) probe of multimeter to left input terminal of circuit breaker CB1 and note reading on multimeter.
(7) If continuity is not present, replace circuit breaker CB1 (para 16-65).



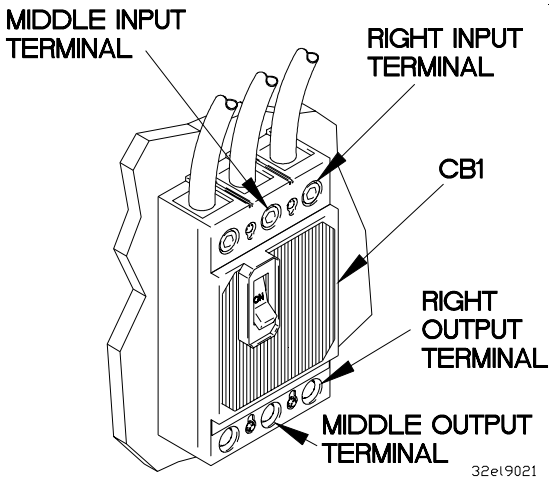


e119. M1079 110 VAC POWER DOES NOT OPERATE (CONT)

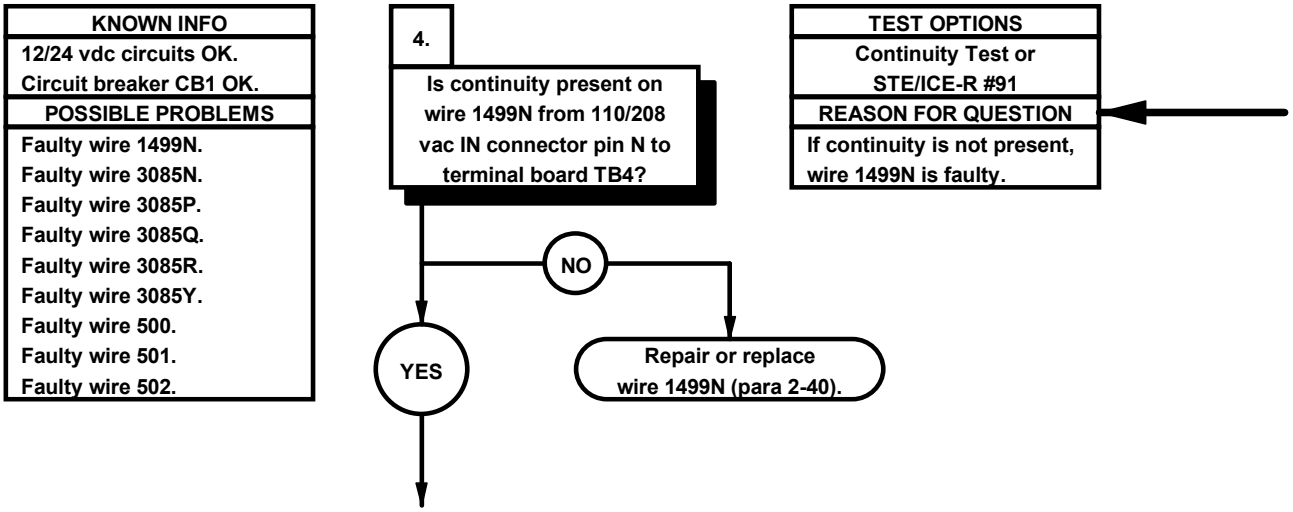


CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to middle output terminal of circuit breaker CB1.
(3) Connect negative (-) probe of multimeter to middle input terminal of circuit breaker CB1 and note reading on multimeter.
(4) If continuity is not present, replace circuit breaker CB1 (para 16-65).

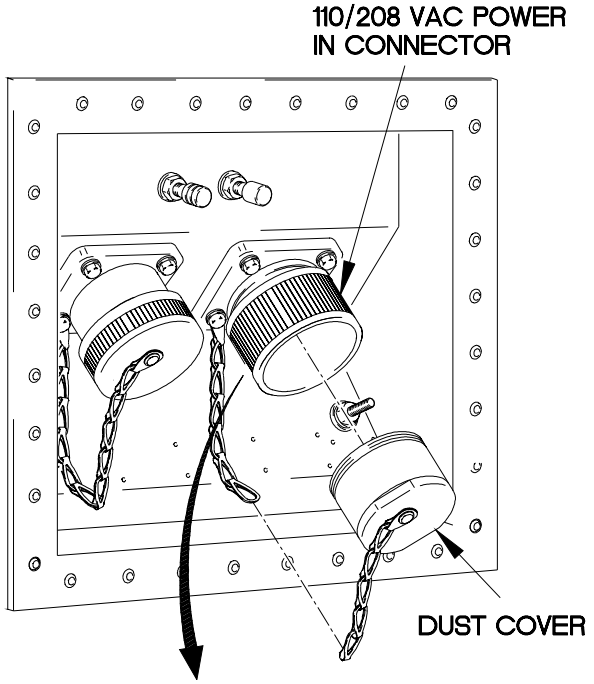
CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to right output terminal of circuit breaker CB1.
(3) Connect negative (-) probe of multimeter to right input terminal of circuit breaker CB1 and note reading on multimeter.
(4) If continuity is not present, replace circuit breaker CB1 (para 16-65).

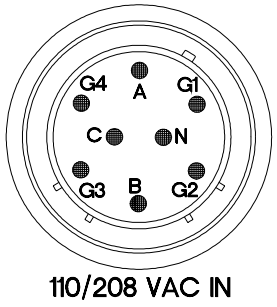


e119. M1079 110 VAC POWER DOES NOT OPERATE (CONT)

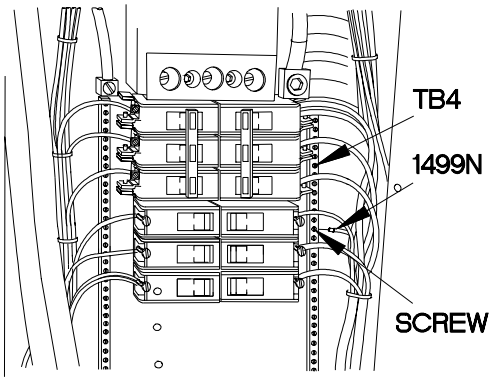


CONTINUITY TEST
(1) Remove dust cover on 110/208 VAC power IN connector.
(2) Loosen screw in terminal board TB4.
(3) Remove wire 1499N from terminal board TB4.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to 110/208 vac IN connector pin N.
(6) Connect negative (-) probe of multimeter to terminal board TB4 wire 1499N and note reading on multimeter.
(7) If continuity is not present, repair or replace wire 1499N (para 2-40).
(8) Position wire 1499N in terminal board TB4.
(9) Tighten screw in terminal board TB4.



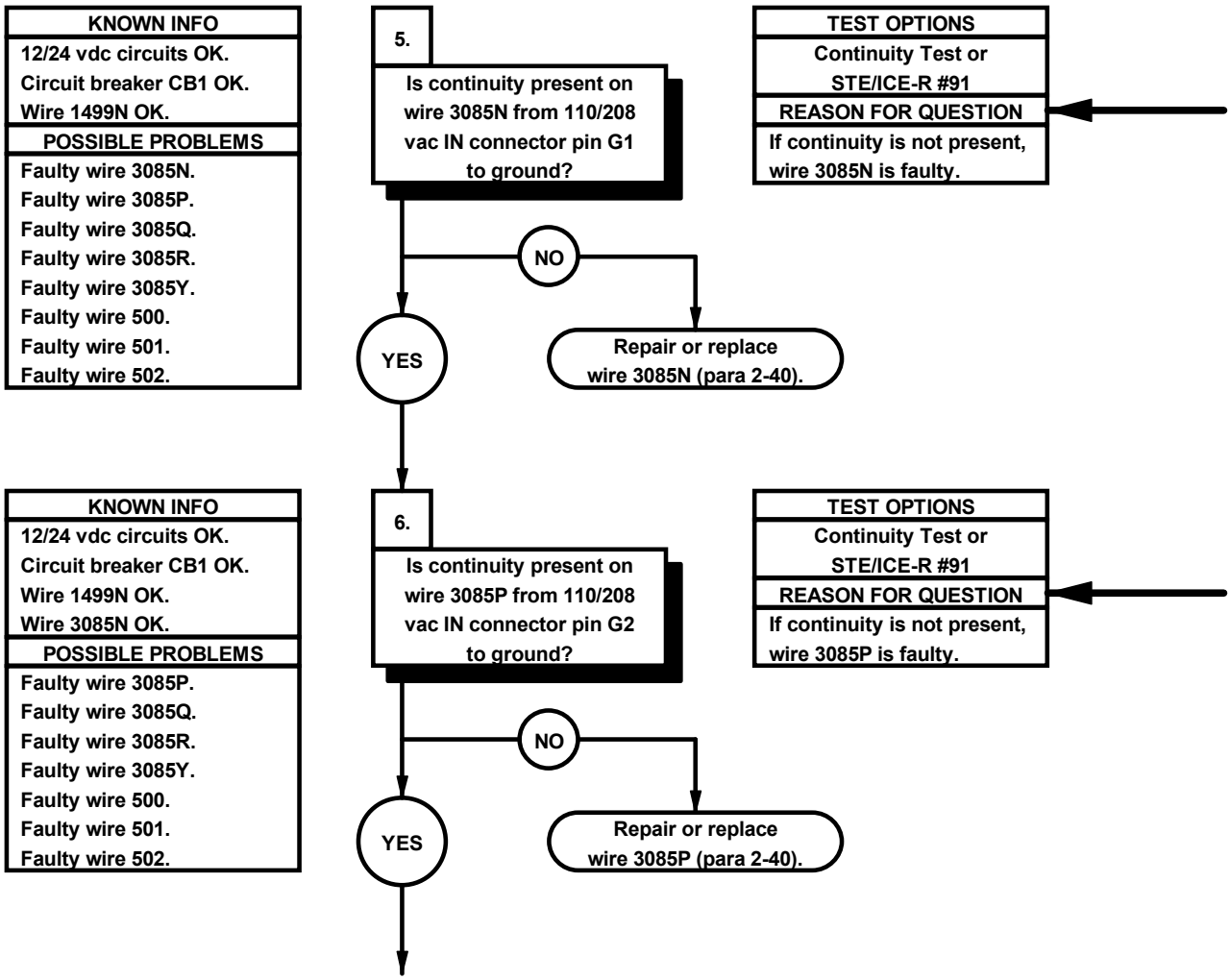


110/208 VAC IN



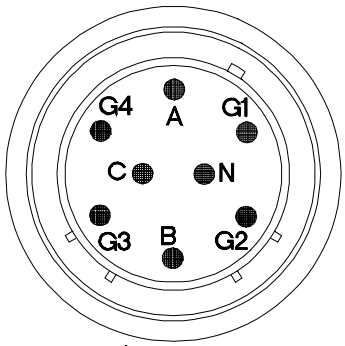
32el9031

e119. M1079 110 VAC POWER DOES NOT OPERATE (CONT)



CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to 110/208 vac IN connector pin G1.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair or replace wire 3085N (para 2-40).

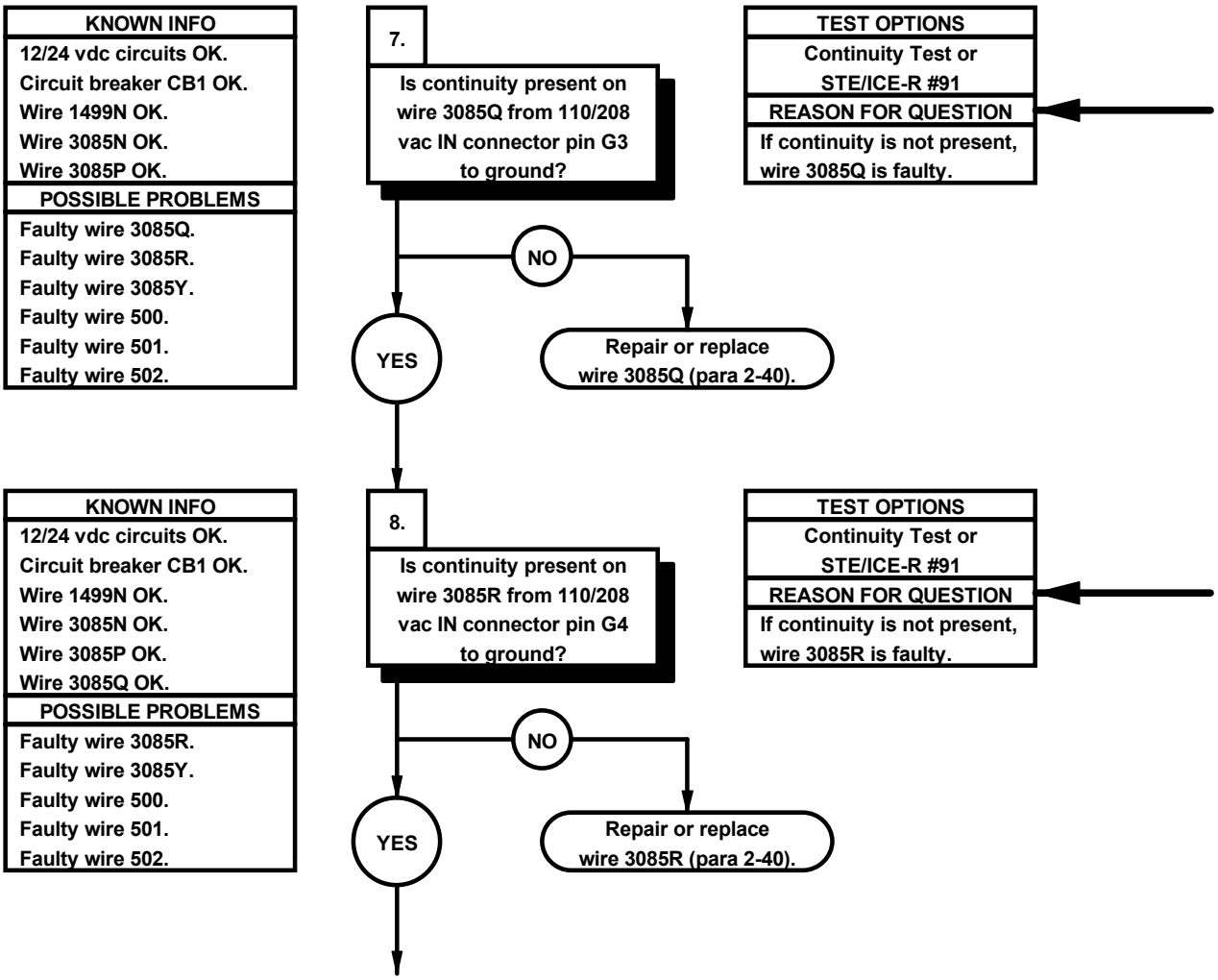
CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to 110/208 vac IN connector pin G2.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair or replace wire 3085P (para 2-40).



110/208 VAC IN

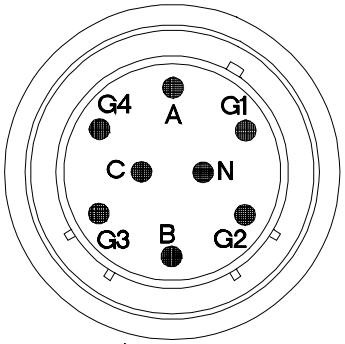
32E11704

e119. M1079 110 VAC POWER DOES NOT OPERATE (CONT)



CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to 110/208 vac IN connector pin G3.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair or replace wire 3085Q (para 2-40).

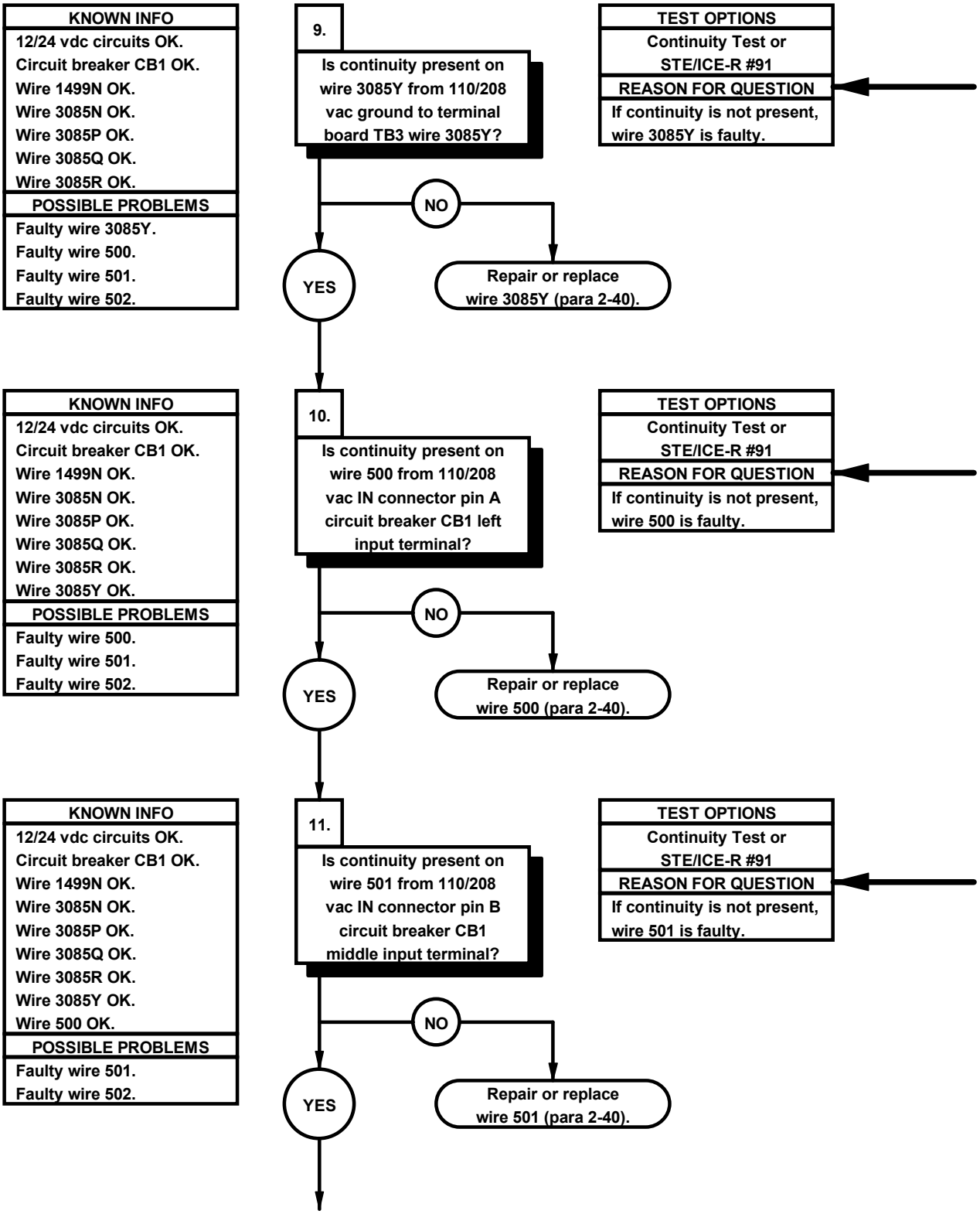
CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to 110/208 vac IN connector pin G4.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair or replace wire 3085R (para 2-40).



110/208 VAC IN

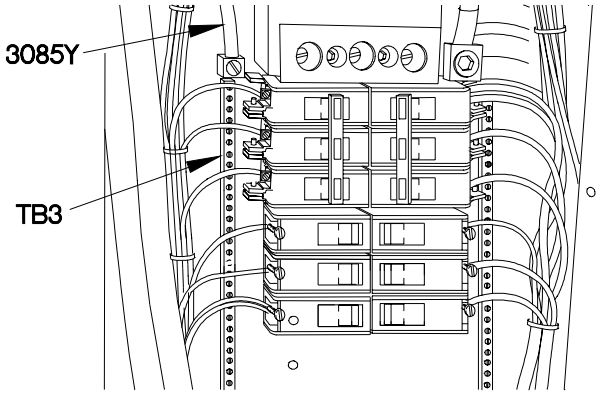
32E11705

e119. M1079 110 VAC POWER DOES NOT OPERATE (CONT)



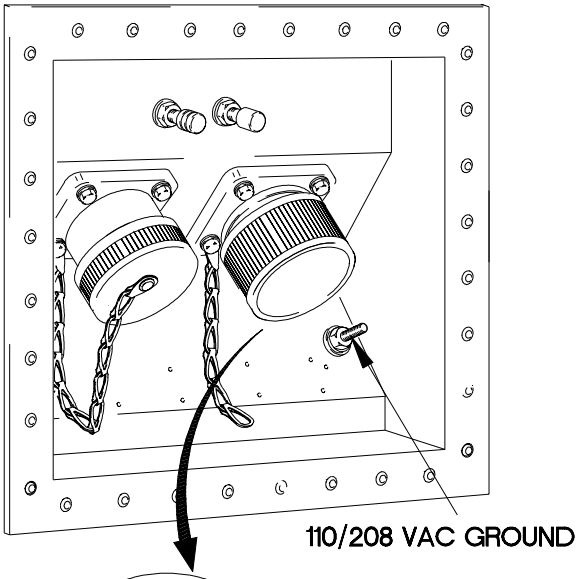
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to 110/208 vac ground.
(3) Connect negative (-) probe of multimeter to terminal board TB3 wire 3085Y and note reading on multimeter.
(4) If continuity is not present, repair or replace wire 3085Y (para 2-40).



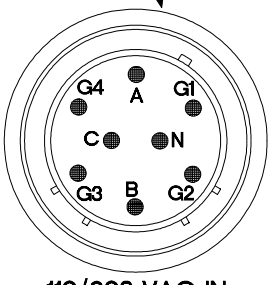
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to 110/208 vac IN connector pin A.
(3) Connect negative (-) probe of multimeter to circuit breaker CB1 left input terminal and note reading on multimeter.
(4) If continuity is not present, repair or replace wire 500 (para 2-40).

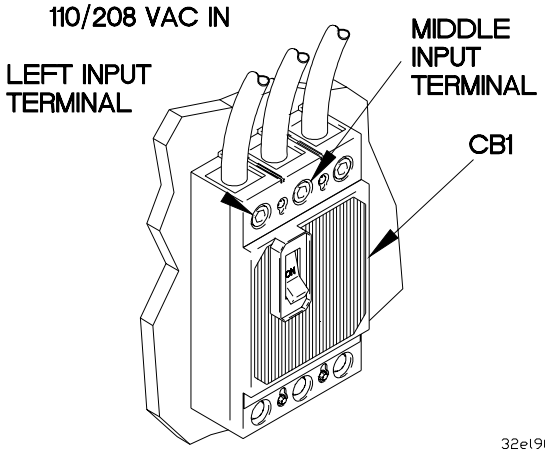


CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to 110/208 vac IN connector pin B.
(3) Connect negative (-) probe of multimeter to circuit breaker CB1 middle input terminal and note reading on multimeter.
(4) If continuity is not present, repair or replace wire 501 (para 2-40).

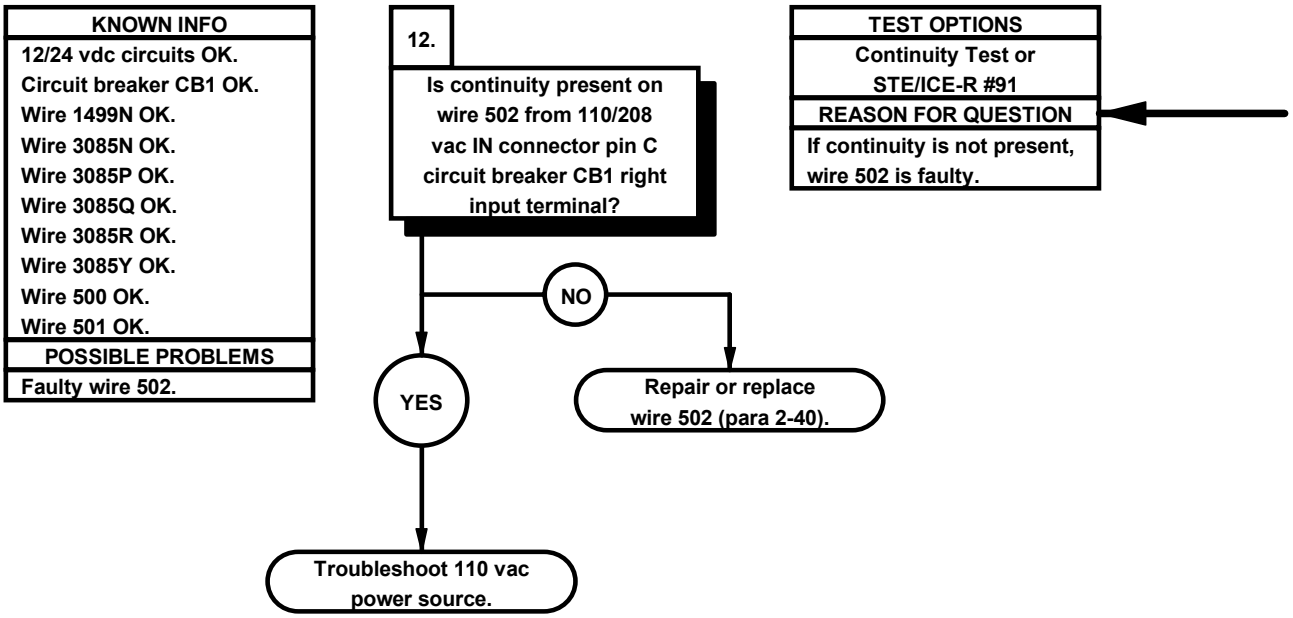


110/208 VAC IN



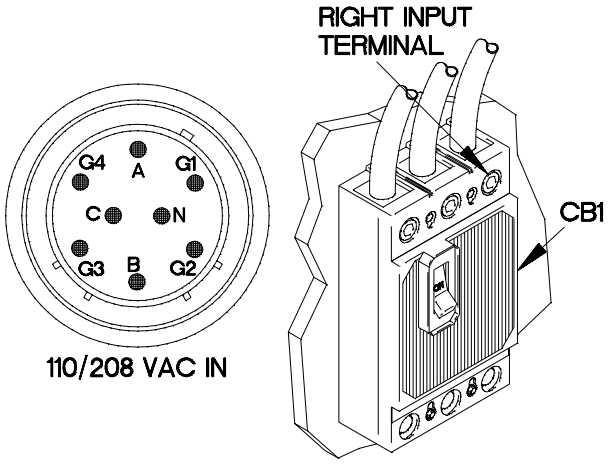
32el9061

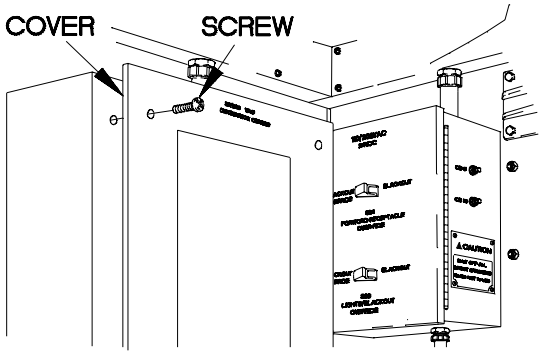
e119. M1079 110 VAC POWER DOES NOT OPERATE (CONT)

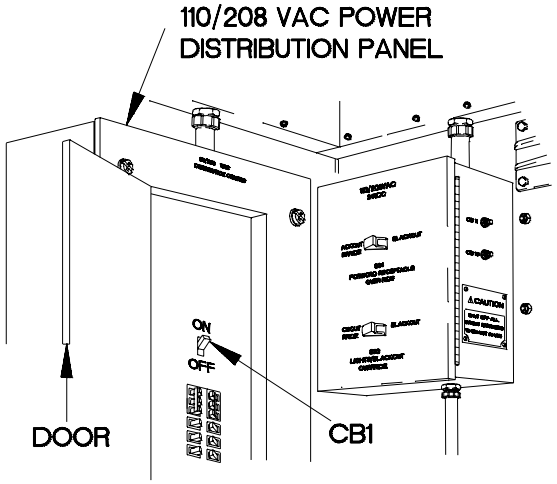


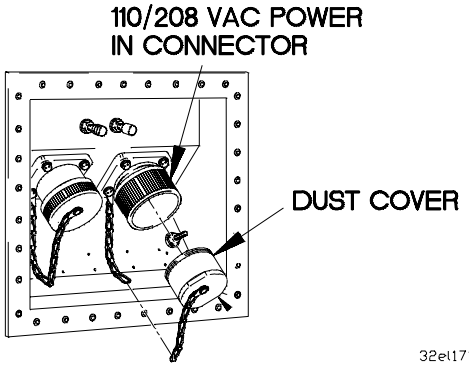
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to 110/208 vac IN connector pin C.
(3) Connect negative (-) probe of multimeter to circuit breaker CB1 right input terminal and note reading on multimeter.
(4) If continuity is not present, repair or replace wire 502 (para 2-40).
(5) If continuity is present, troubleshoot 110 vac power source.
(6) Position circuit breaker CB1 to OFF.
(7) Install cover on 110/208 VAC POWER DISTRIBUTION PANEL with six screws.
(8) Install dust cover on 110/208 VAC power IN connector.
(9) Position circuit breaker CB1 to ON.









32el1711

e120. M1079 FLUORESCENT LIGHTS DO NOT OPERATE IN BLACKOUT OVERRIDE MODE

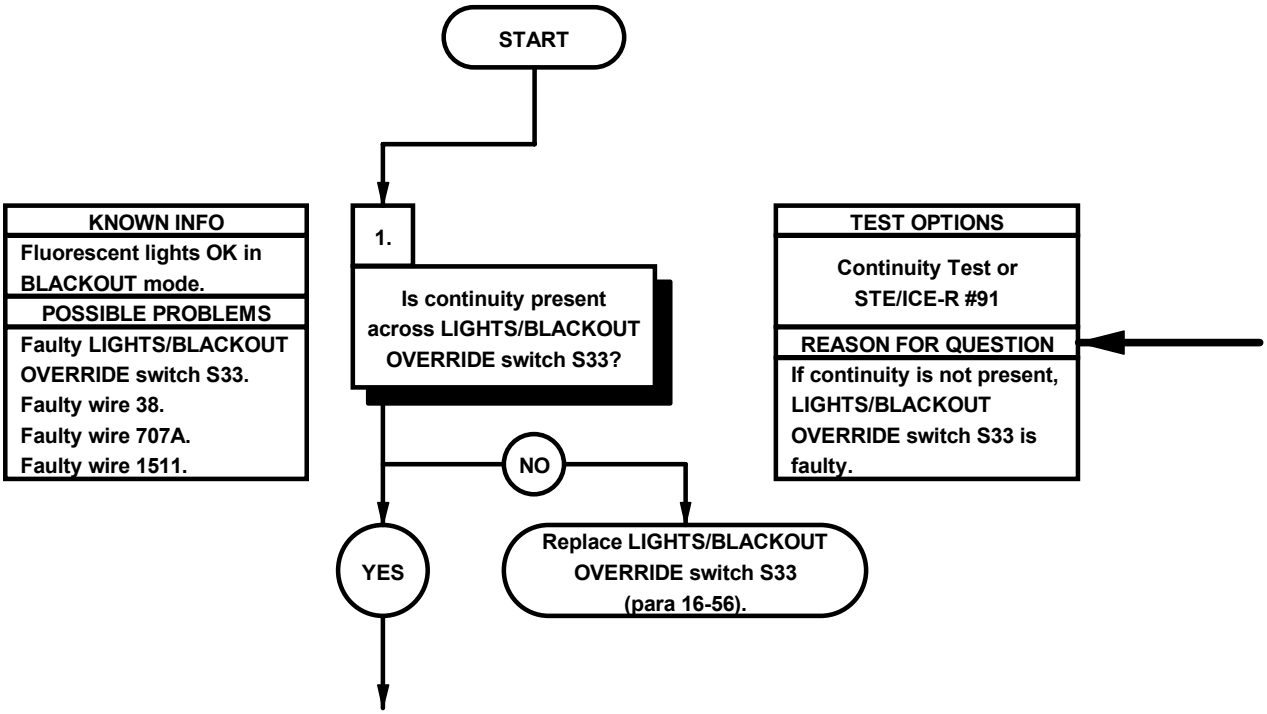
INITIAL SETUP

Equipment Condition
Engine shut down (TM 9-2320-365-10).
AC power disconnected (TM 9-2320-365-10).

Personnel Required
(2)

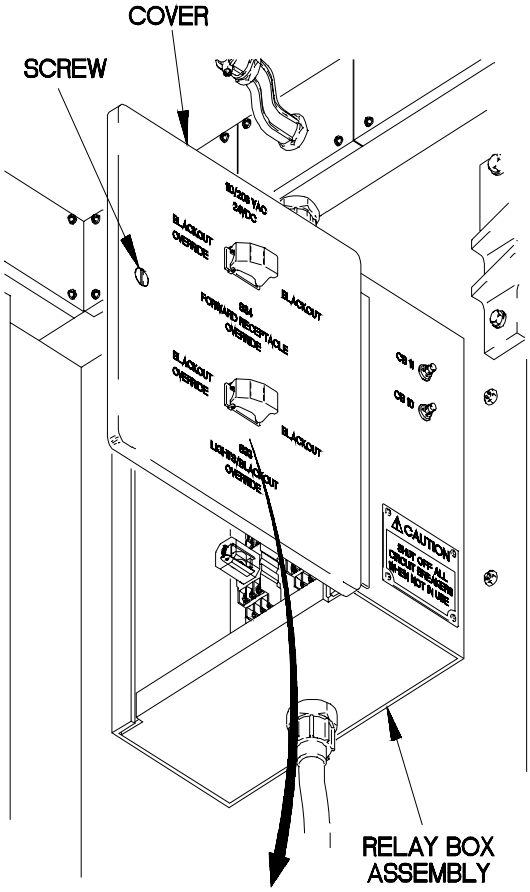
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

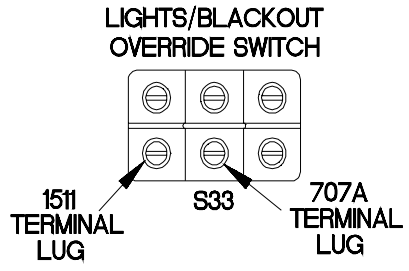
References
TM 9-4910-571-12&P



CONTINUITY TEST

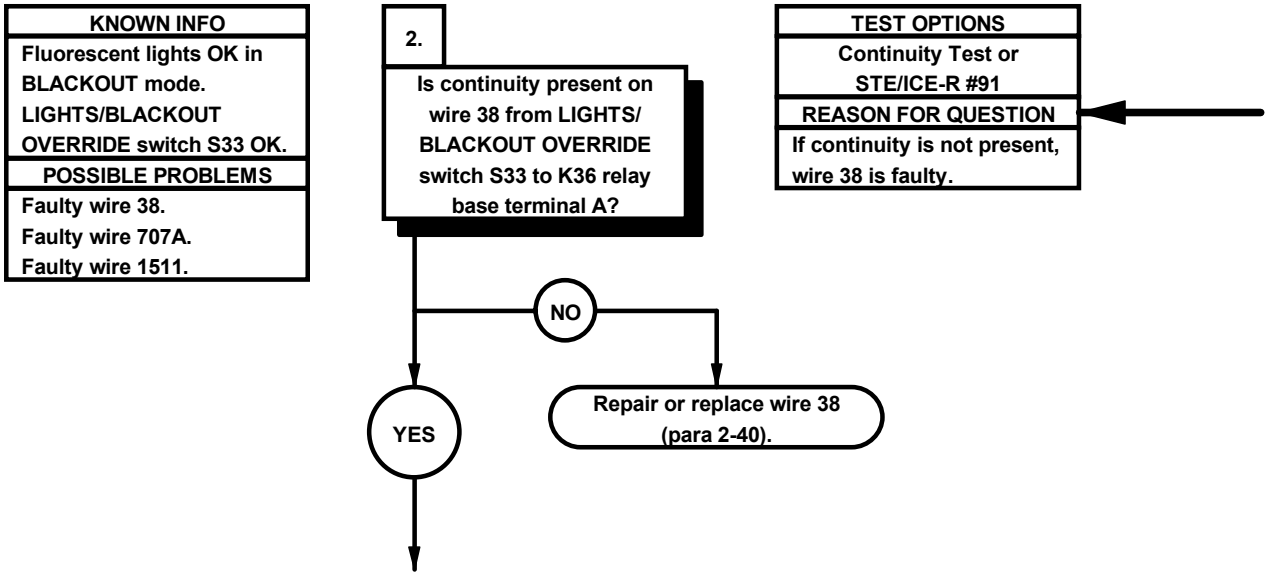
(1) Pull out circuit breaker CB10 (TM 9-2320-365-10).
(2) Loosen screw in cover.
(3) Open cover on relay box assembly.
(4) Set multimeter to ohms.
(5) Position LIGHTS/BLACKOUT OVERRIDE switch S33 to BLACKOUT OVERRIDE (TM 9-2320-365-10).
(6) Connect positive (+) probe of multimeter to wire 707A terminal lug on LIGHTS/BLACKOUT OVERRIDE switch S33.
(7) Connect negative (-) probe of multimeter to wire 1511 terminal lug on LIGHTS/BLACKOUT OVERRIDE switch S33 and note reading on multimeter.
(8) If continuity is not present, replace LIGHTS/BLACKOUT OVERRIDE switch S33 (para 16-56).





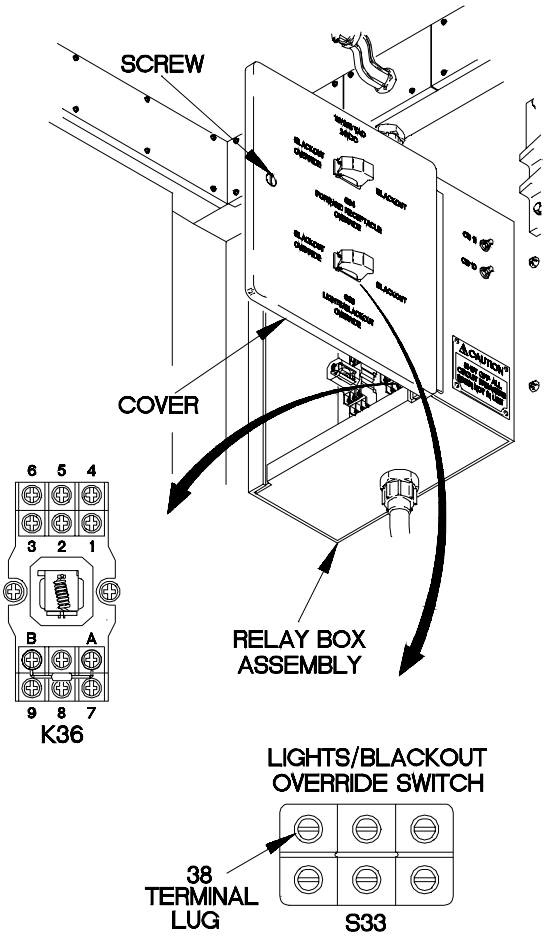
32EK1211

e120. M1079 FLUORESCENT LIGHTS DO NOT OPERATE IN BLACKOUT OVERRIDE MODE (CONT)



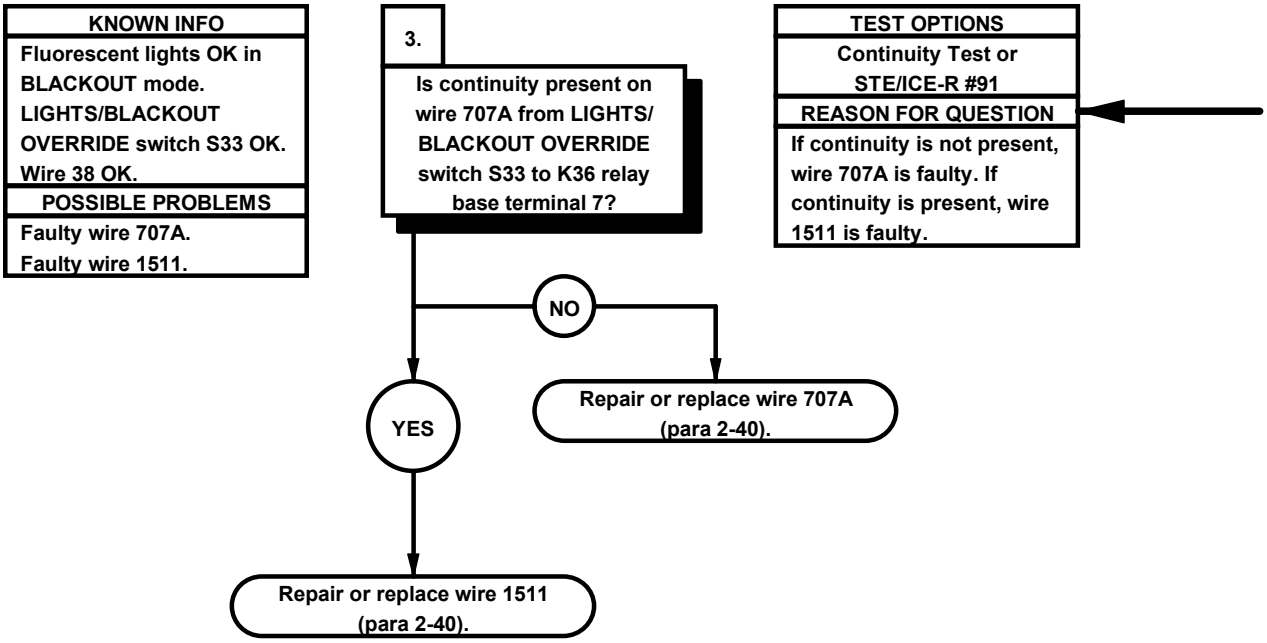
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to wire 38 terminal lug on LIGHTS/BLACKOUT OVERRIDE switch S33.
(3) Connect negative (-) probe of multimeter to K36 relay base terminal A and note reading on multimeter.
(4) If continuity is not present, repair or replace wire 38 (para 2-40).



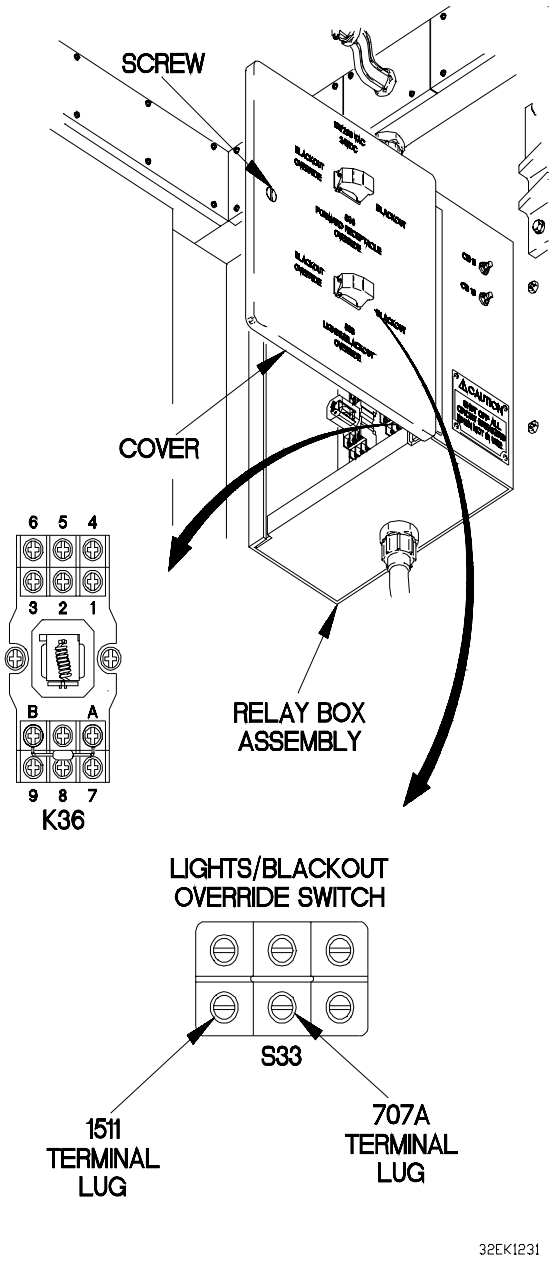
32EK1221

e120. M1079 FLUORESCENT LIGHTS DO NOT OPERATE IN BLACKOUT OVERRIDE MODE



CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to wire 707A terminal lug on LIGHTS/BLACKOUT OVERRIDE switch S33.
(3) Connect negative (-) probe of multimeter to K36 relay base terminal 7 and note reading on multimeter.
(4) If continuity is not present, repair or replace wire 707A (para 2-40).
(5) If continuity is present, repair or replace wire 1511 (para 2-40).
(6) Position LIGHTS/BLACKOUT OVERRIDE switch S33 to BLACKOUT (TM 9-2320-365-10).
(7) Close cover on relay box assembly.
(8) Tighten screw in cover.



2-17. TRANSMISSION SYSTEM TROUBLESHOOTING

This paragraph covers Transmission System Troubleshooting. The Transmission System Fault Index, Table 2-16, lists faults for the transmission system of the vehicle.

Table 2-16. 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	2-1362
f2.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 14	2-1364
f3.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 15	2-1372
f4.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 16	2-1378
f5.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 24 and/or 33 and Any Sub Code	2-1384
f6.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 32 and Any Sub Code	2-1396
f7.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45, and/or 69 and Any Sub Code	2-1400
f8.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 43 and Any Sub Code	2-1404
f9.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 52 and Any Sub Code	2-1410
f10.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 57 and Any Sub Code	2-1416
f11.	Transmission Unusually Noisy When Operating	2-1420
f12.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 21 and Any Sub Code	2-1430
f13.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 51 Sub Code 10, 12, 21, 43, 45, or 65	2-1444
f14.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 25 and Any Sub Code	2-1448
f15.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 53 and Any Sub Code	2-1452
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	2-1456
f17.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 55 and Any Sub Code	2-1462
f18.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 56 and Any Sub Code	2-1468
f19.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 13 and Any Sub Code	2-1474
f19A.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 23 and Any Sub Code	2-1482.2
f19B.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Does Not Illuminate	2-1482.16
f20.	Metal Particles Found During Transmission Oil Change	2-1484
f21.	Transmission Does Not Shift or Is Slow To Shift When Cold	2-1486

2-17. TRANSMISSION SYSTEM TROUBLESHOOTING (CONT)

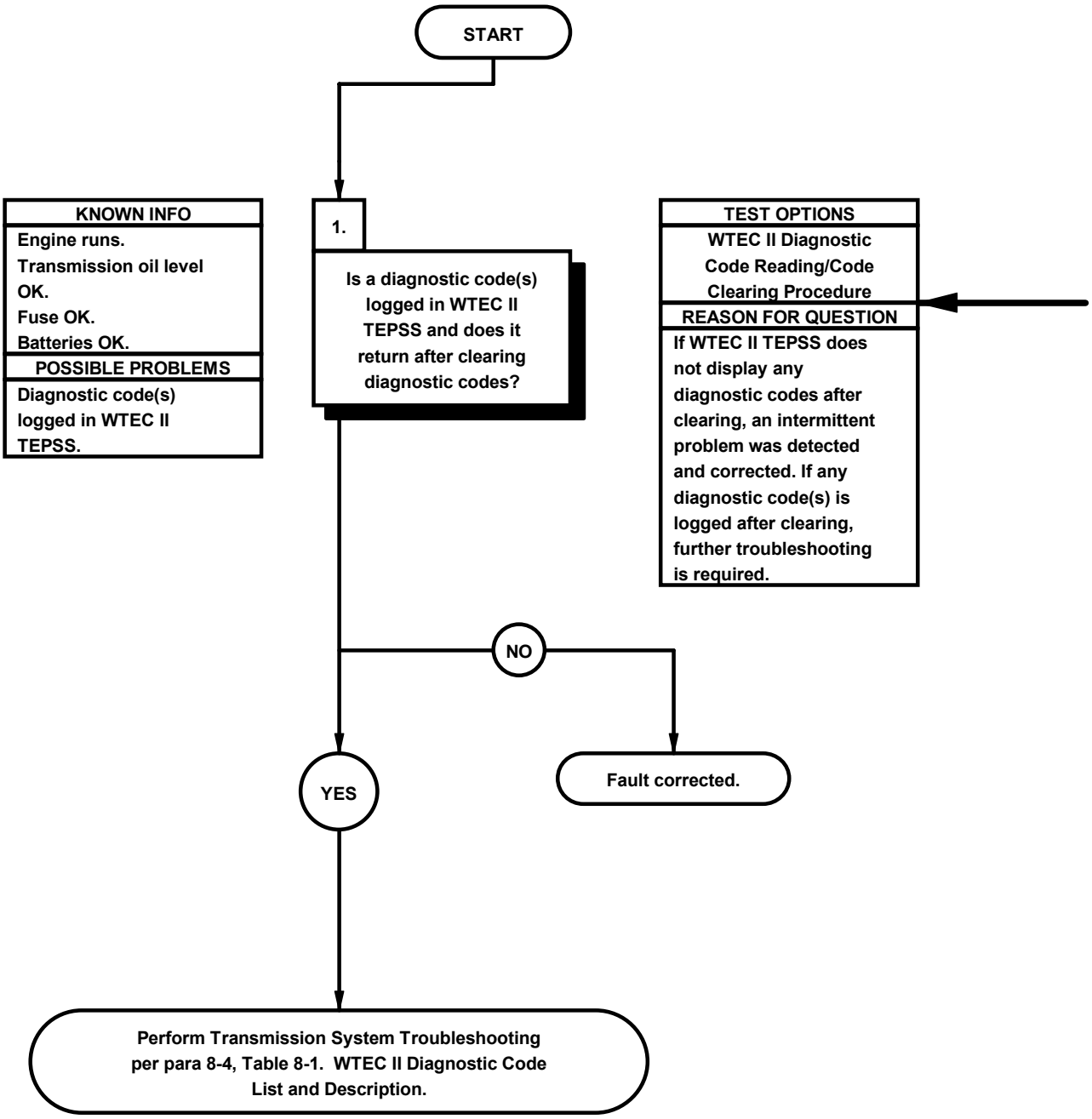
Table 2-16. Transmission System Fault Index (Cont)

Fault No.	Description	Page
f22.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays main code 22 Sub Code 14	2-1488
f23.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 15	2-1494
f24.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 16	2-1498
f25.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 24 and/or 33 and Any Sub Code	2-1504
f26.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 32 and Any Sub Code	2-1516
f27.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, 45, 46, and/or 69 and Any Sub Code	2-1522
f28.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 52 and Any Sub Code	2-1526
f29.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 57 and Any Sub Code	2-1532
f30.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 21 and Any Sub Code	2-1536
f31.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 51 and Any Sub Code	2-1550
f32.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 25 and Any Sub Code	2-1554
f33.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 53 and Any Sub Code	2-1558
f34.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 54 and Any Sub Code	2-1562
f35.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 55 and Any Sub Code	2-1568
f36.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 56 and Any Sub Code	2-1574
f37.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 13 and Any Sub Code	2-1580
f38.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Indicator Displays "--" and/or Transmission Does Not Shift Gears	2-1594
f39.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 23 and Any Sub Code	2-1596
f40.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Does Not Illuminate	2-1596.12

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 9-2320-365-10).



(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

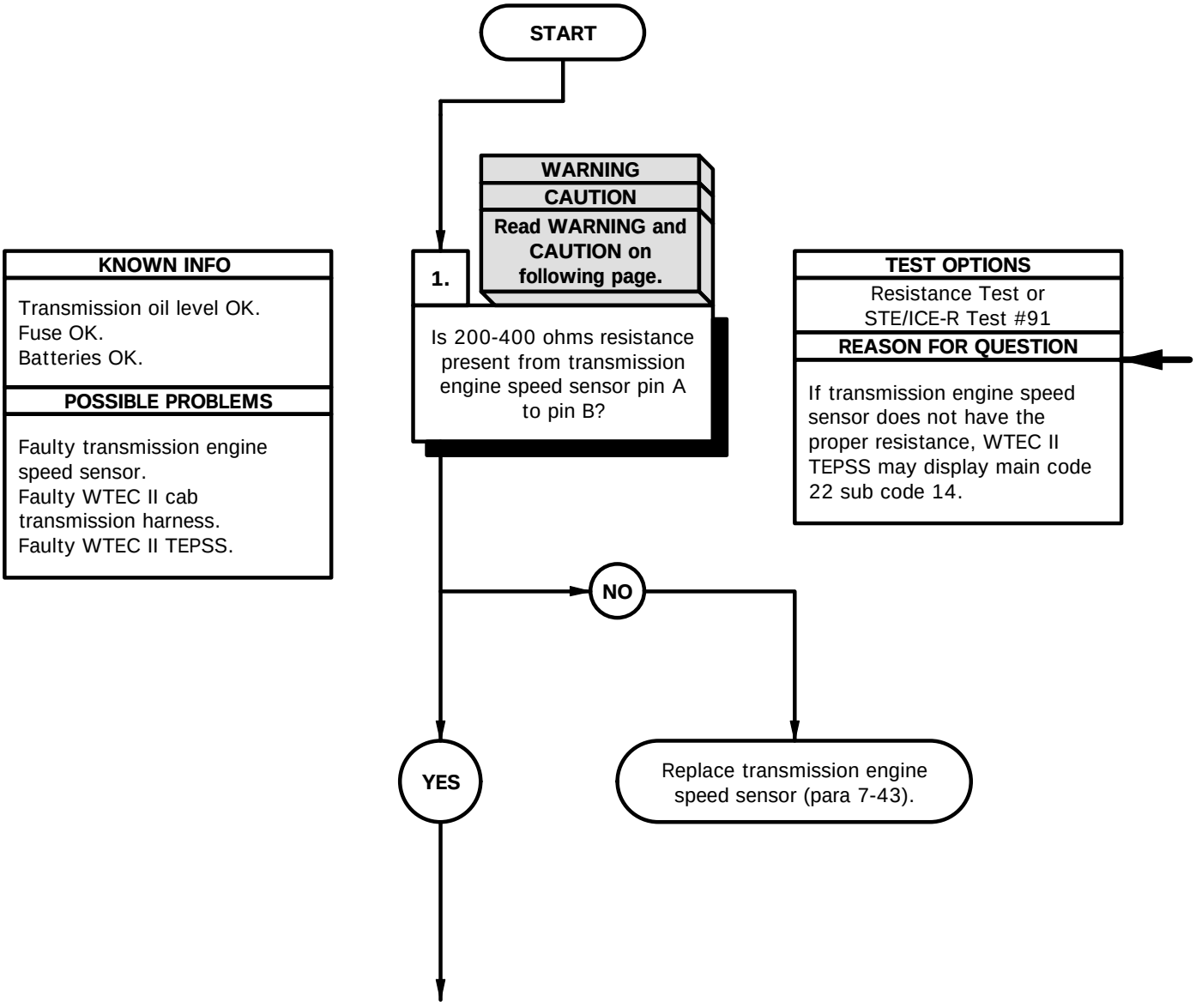
INITIAL SETUP

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

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

Tools and Special Tools (Cont)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Wrench Set, Socket (Item 49, Appendix C)
STE/ICE-R (Item 39, 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

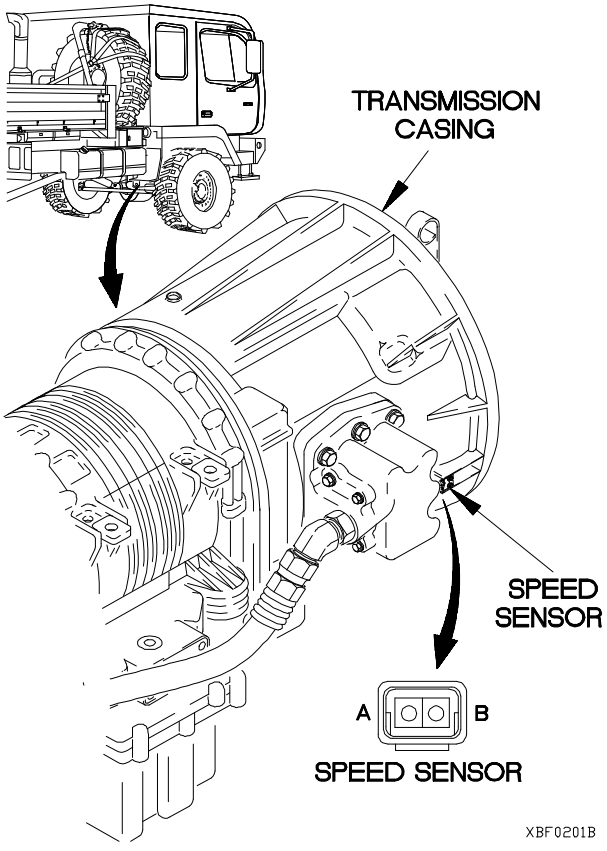
(1) Disconnect transmission engine speed sensor connector from transmission engine speed sensor.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to terminal A of transmission engine speed sensor.
(4) Connect negative (-) probe of multimeter to terminal B of transmission engine speed sensor and note reading on multimeter.

NOTE

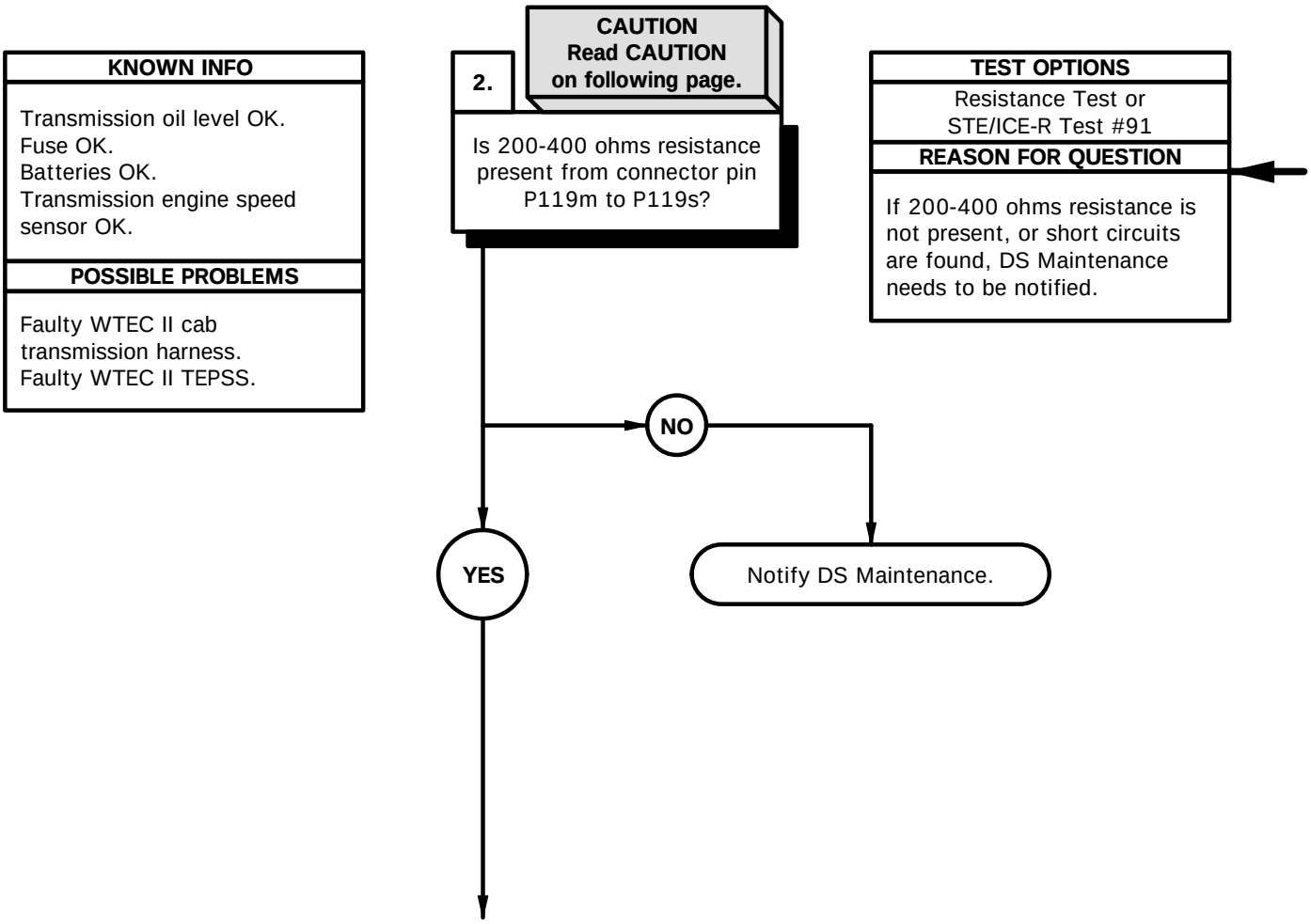
A good transmission engine speed sensor will return a reading of 200-400 ohms resistance as follows:

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 7-43).
(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

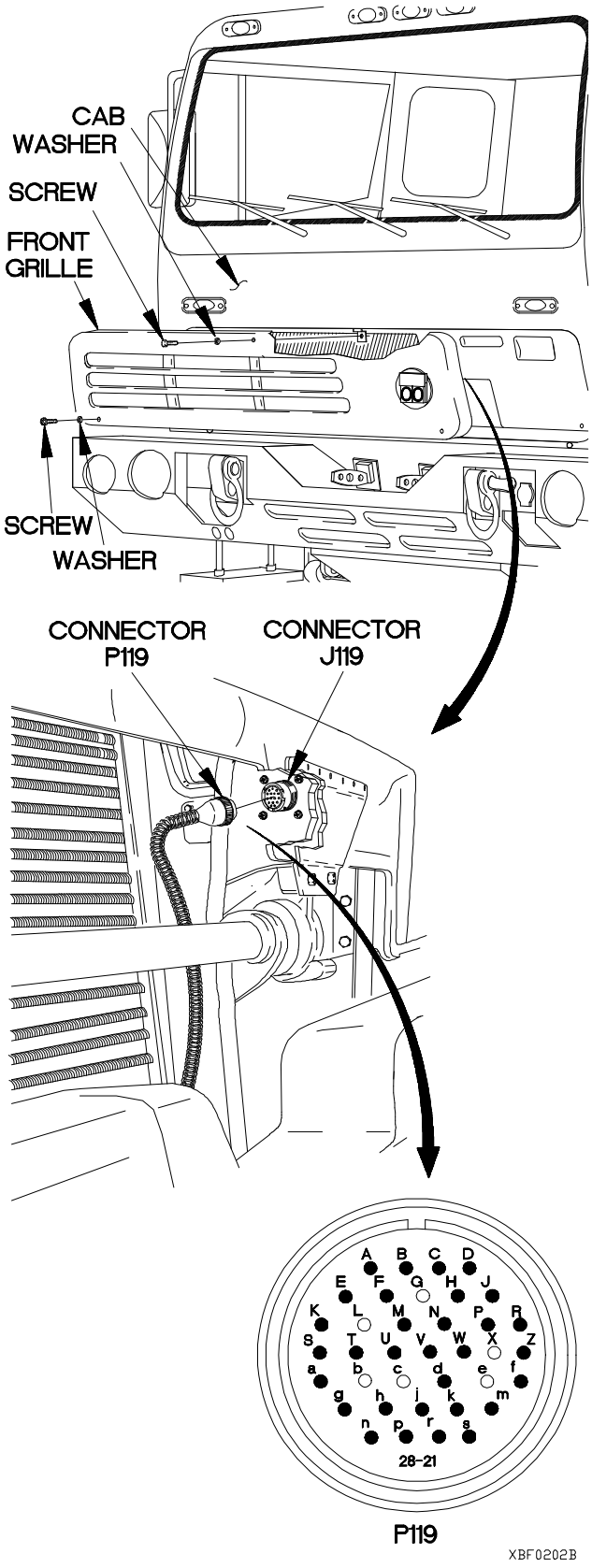
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

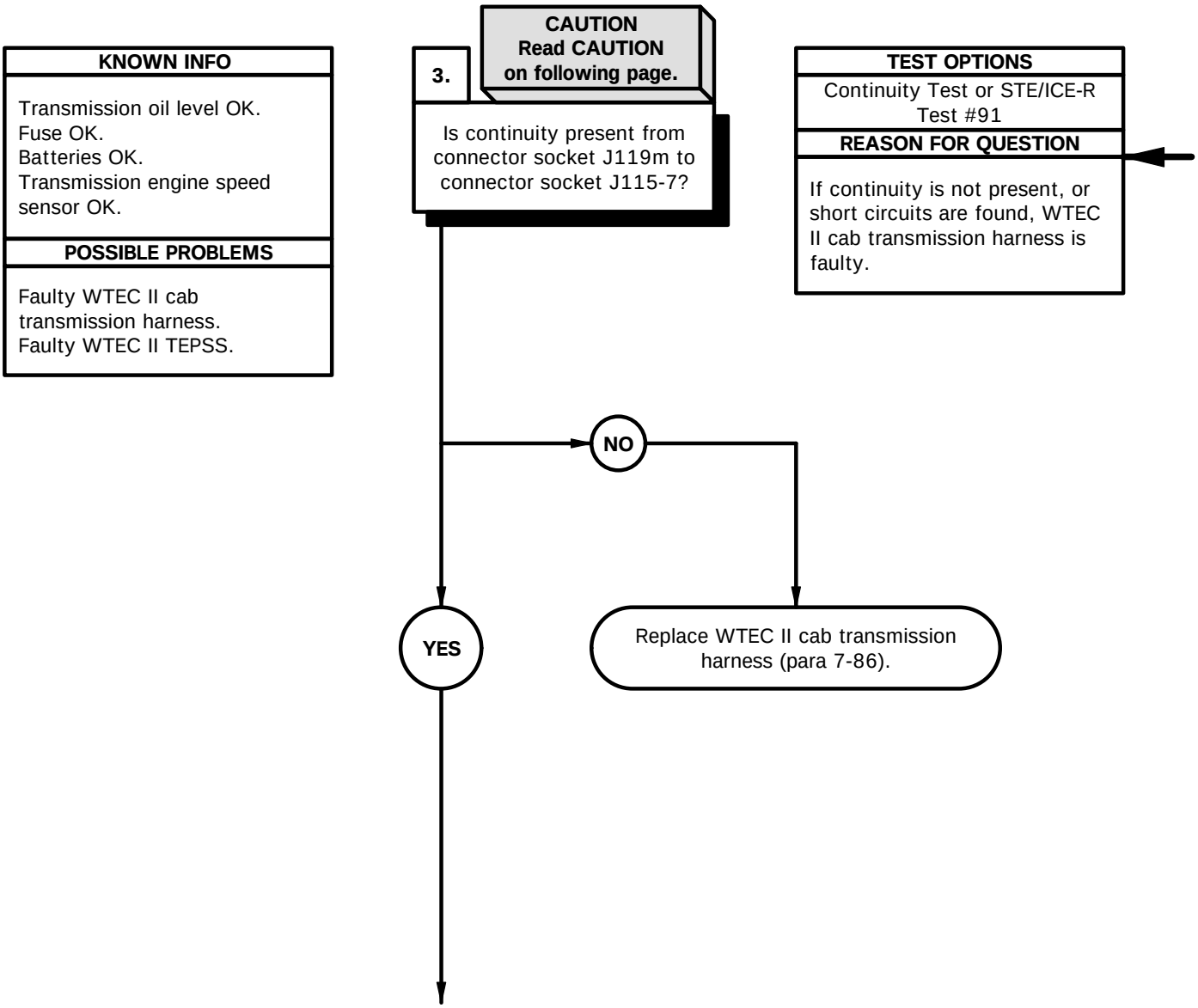
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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 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

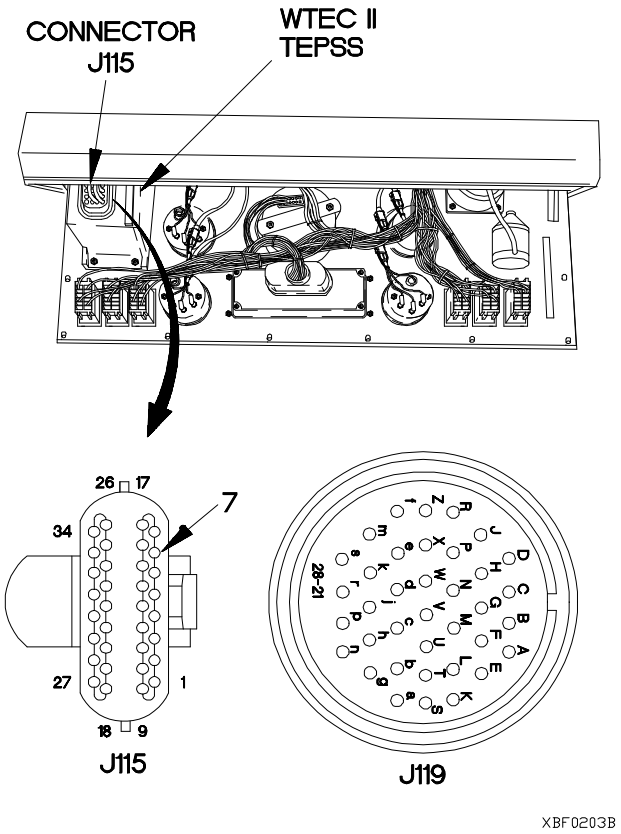
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

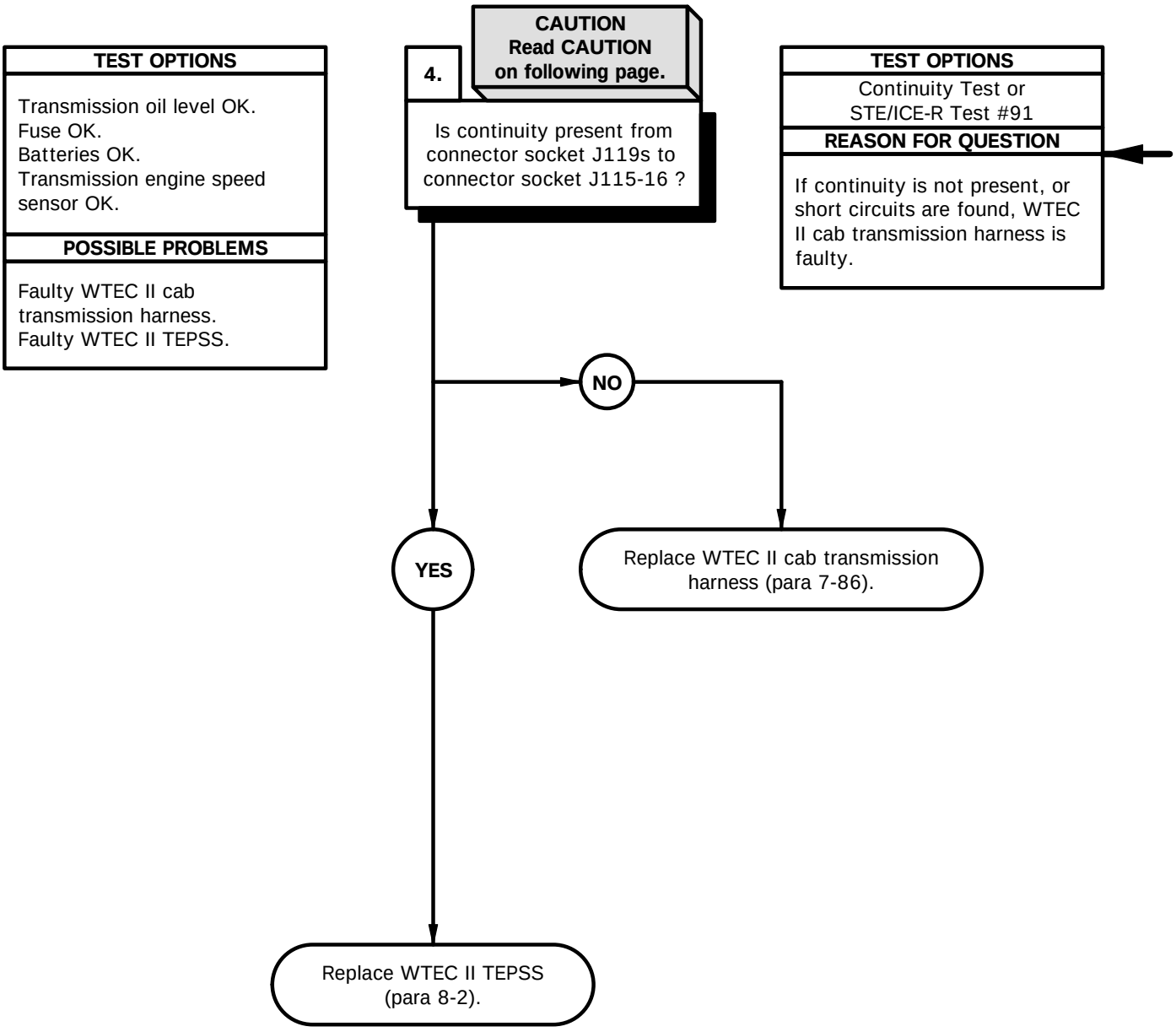
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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 7-86).



f2. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 14 (CONT)



CAUTION

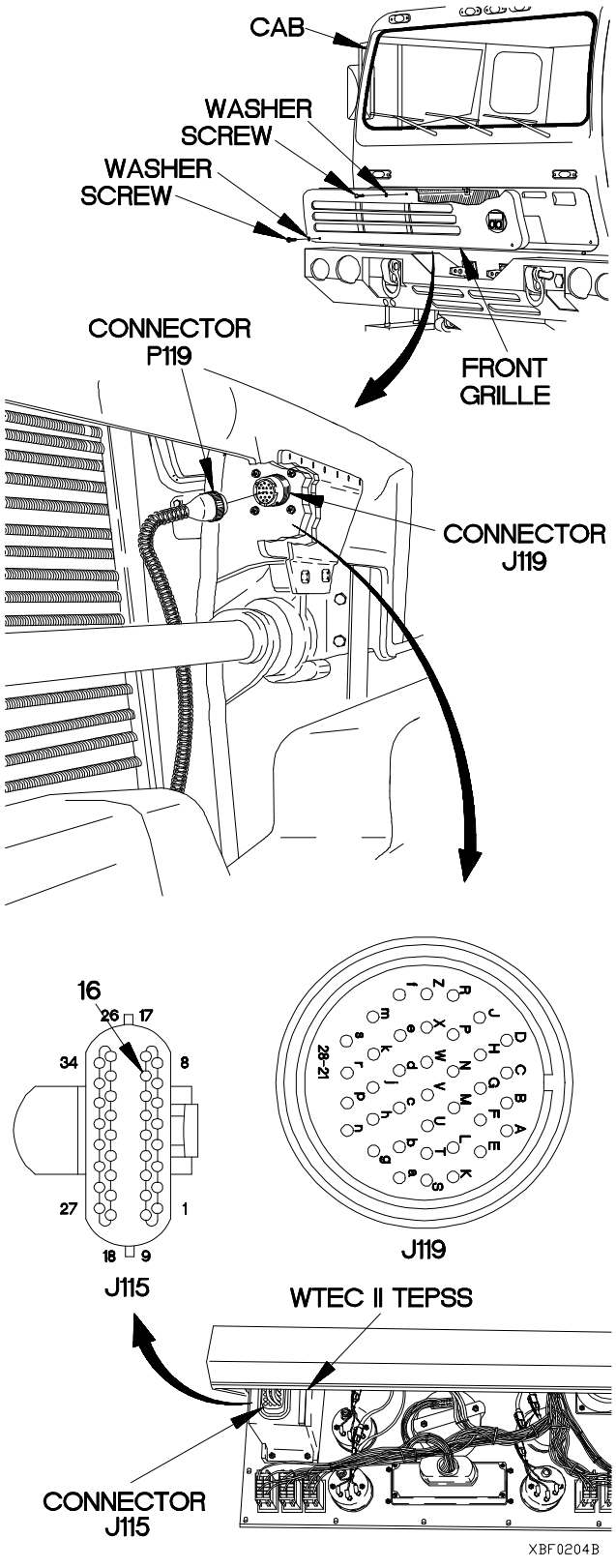
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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 7-86).
(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

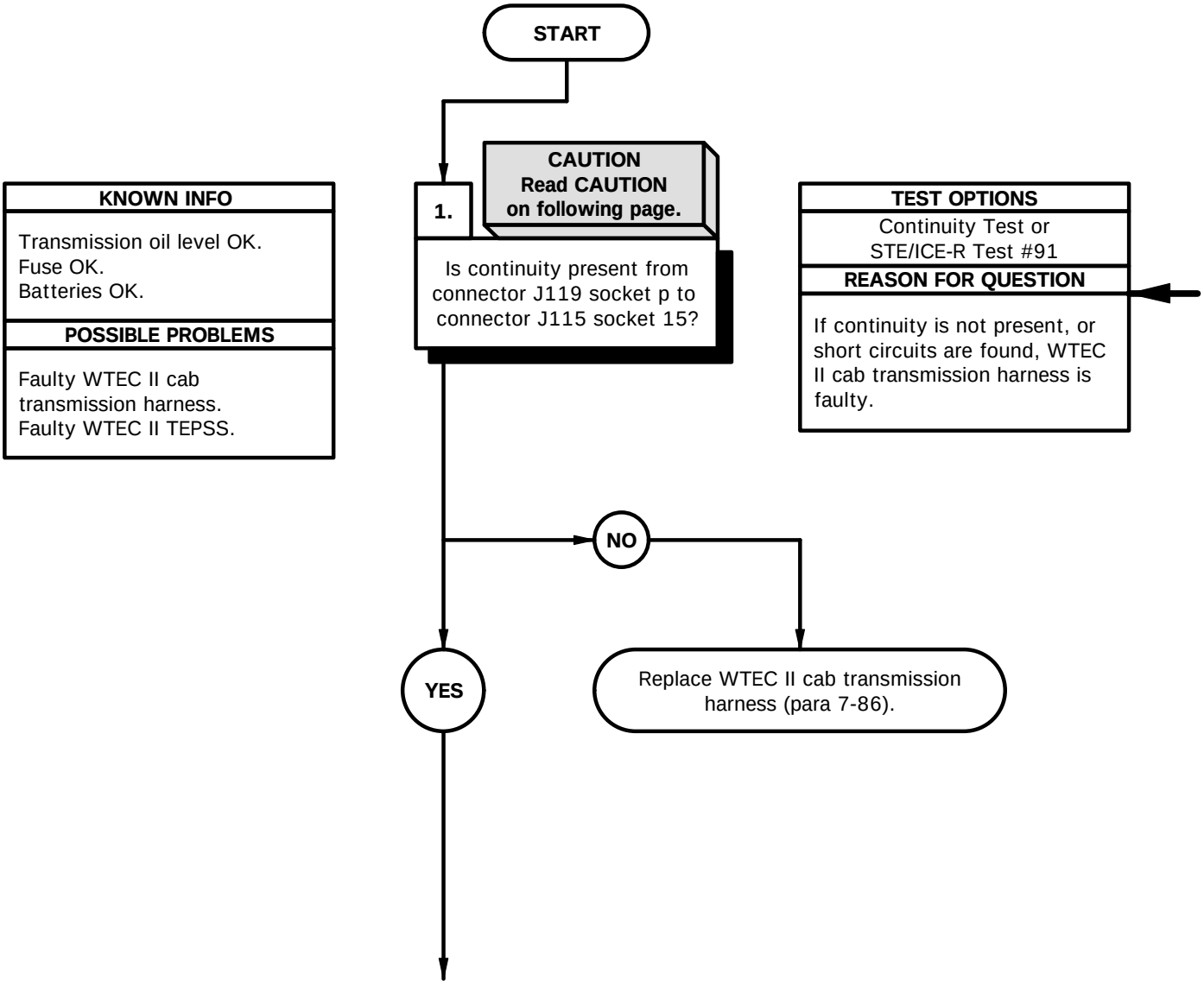
INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

Tools and Special Tools (Cont)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Wrench Set, Socket (Item 49 Appendix C)
STE/ICE-R (Item 39, 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.

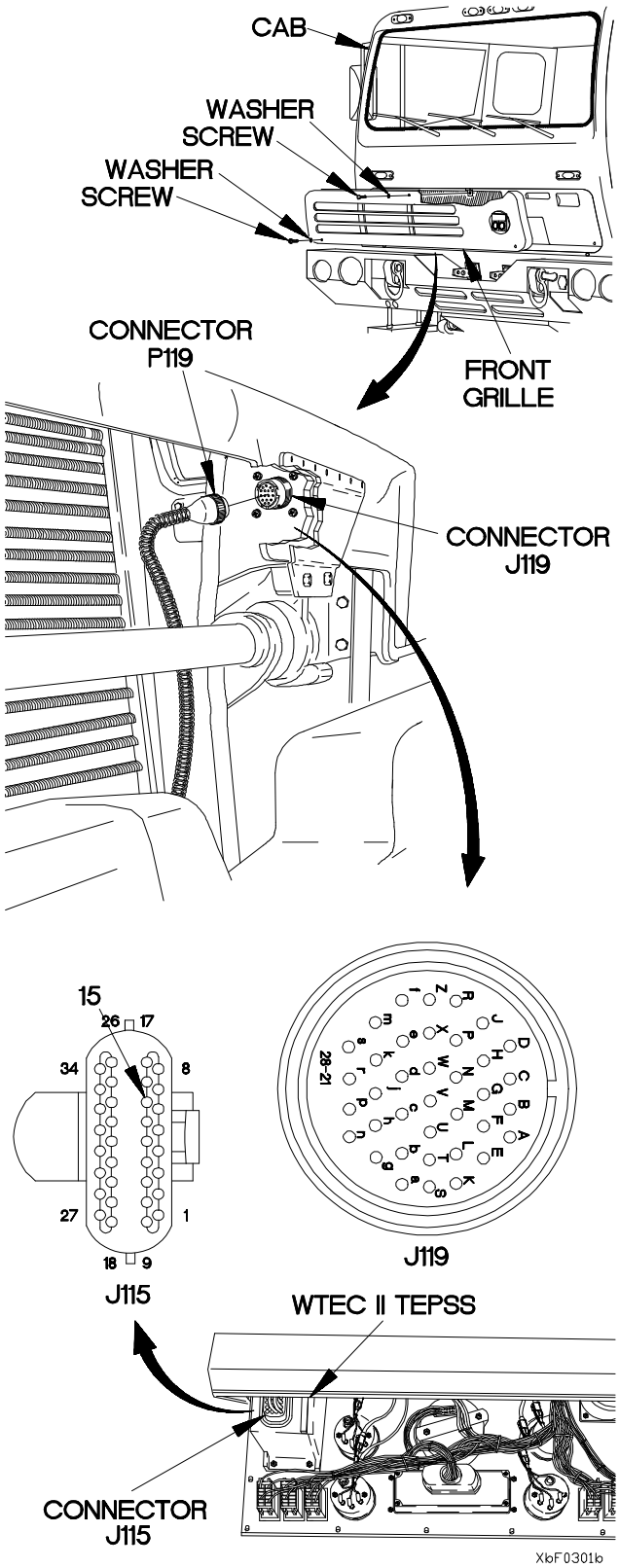
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

NOTE

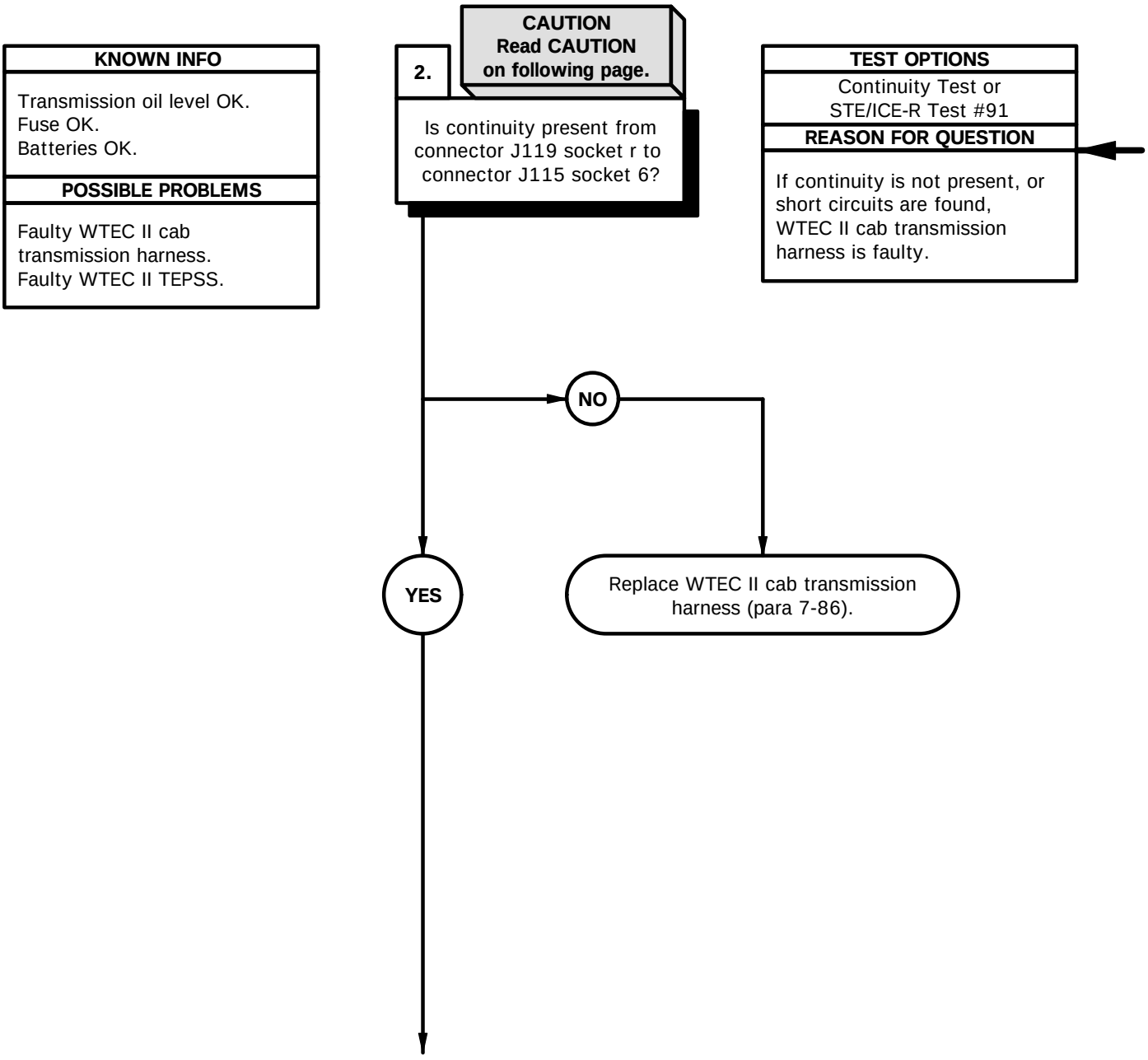
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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 7-86).



f3. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 15 (CONT)



CAUTION

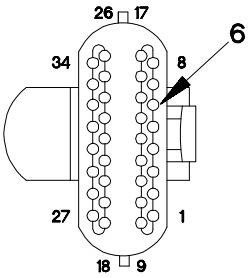
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

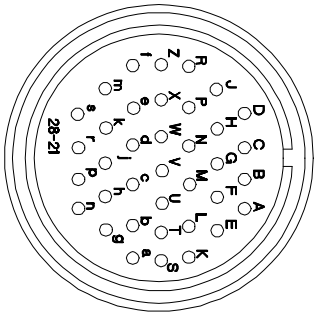
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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 7-86).



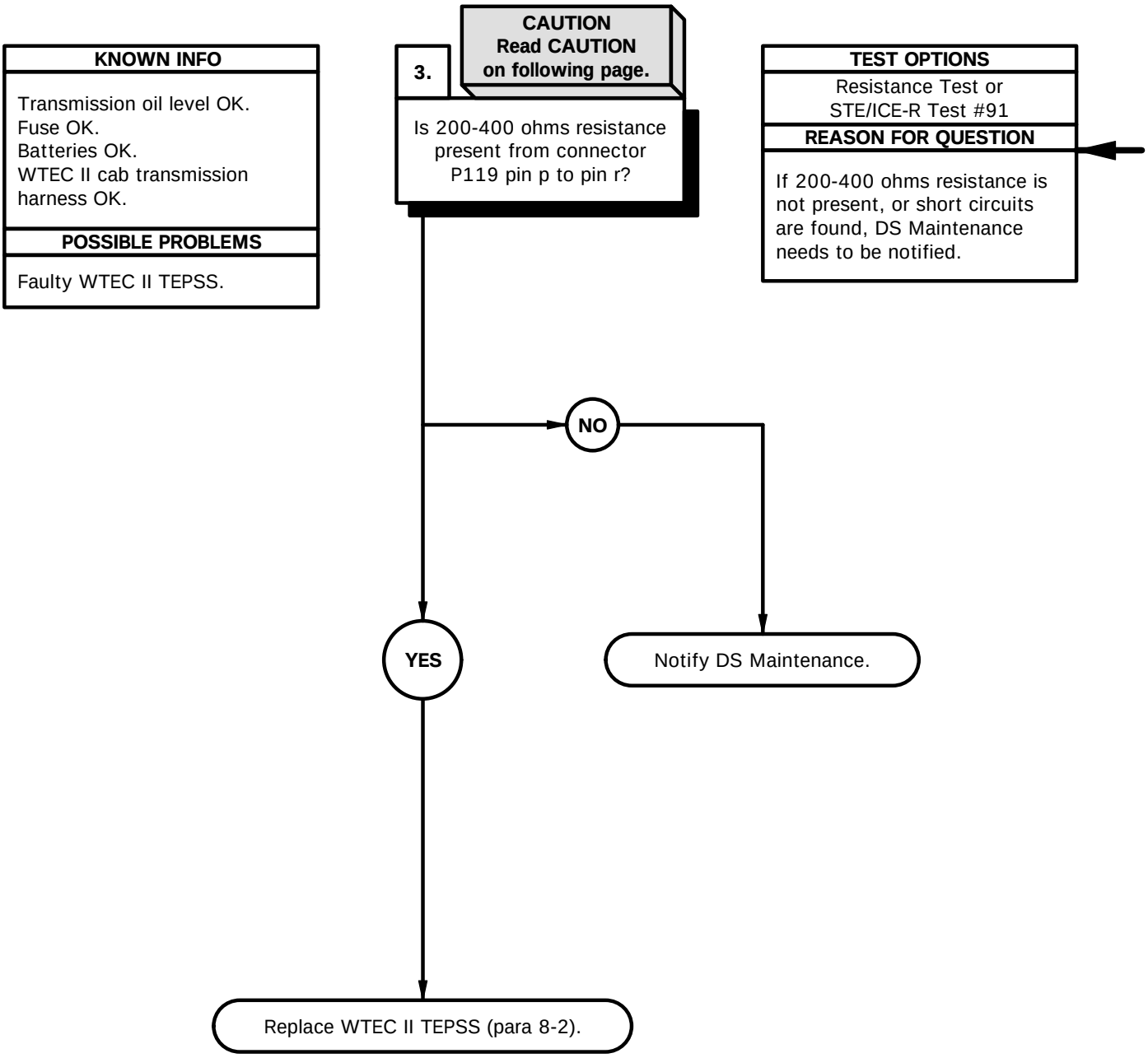
J115



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

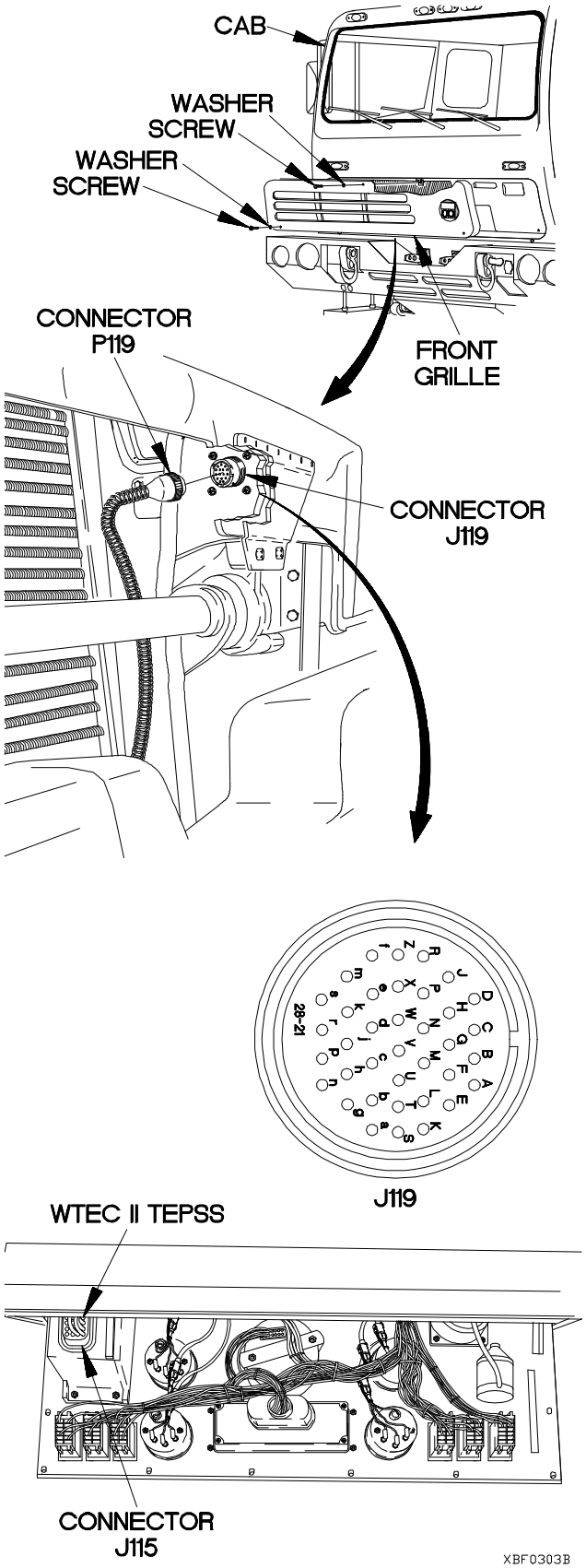
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P119 pin p.
(3) Connect negative (-) probe of multimeter to connector P119 pin r and note reading on multimeter.

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

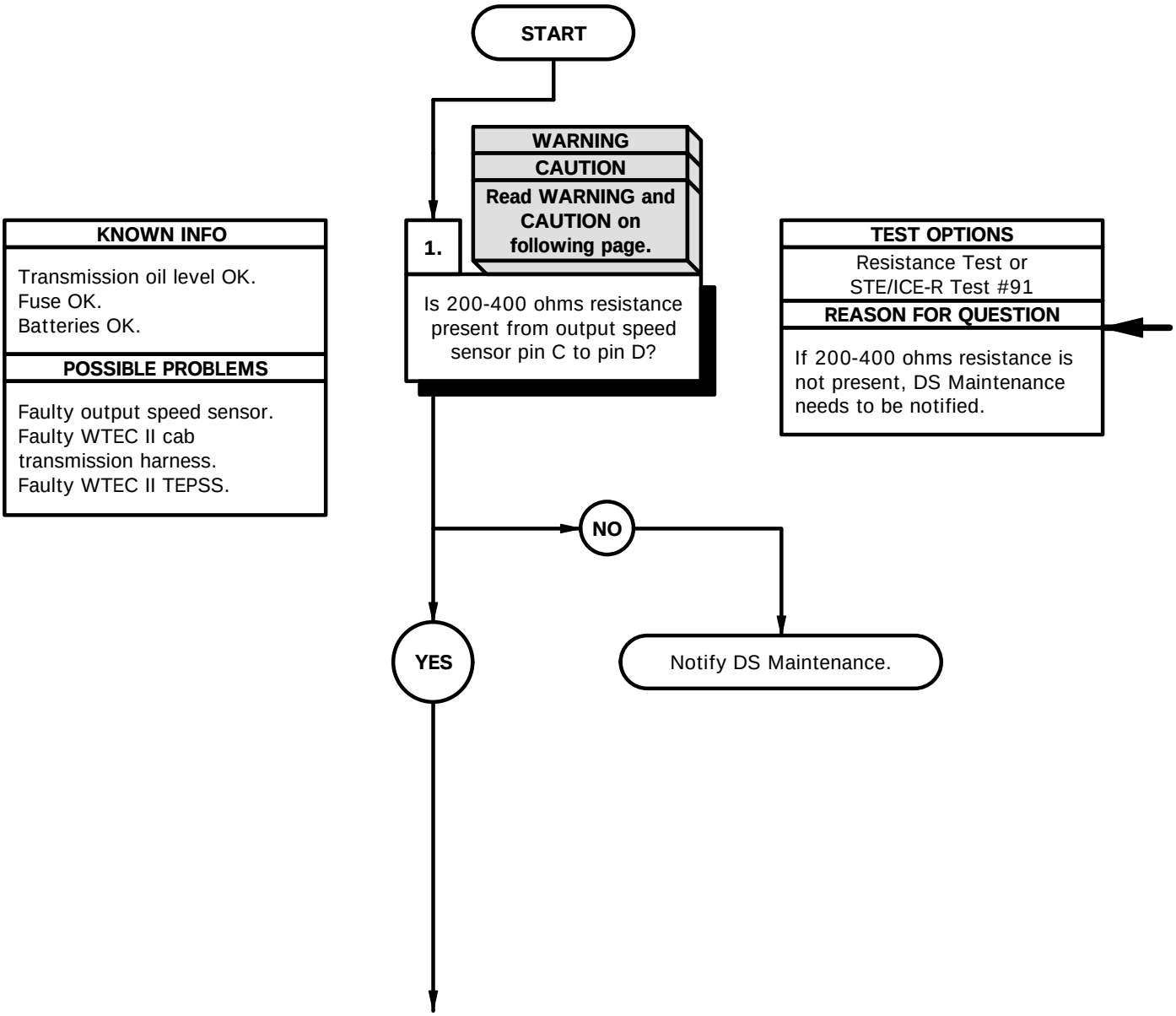
INITIAL SETUP

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

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)

Tools and Special Tools
Multimeter, Digital (Item 22, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)
STE/ICE-R (Item 39, 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

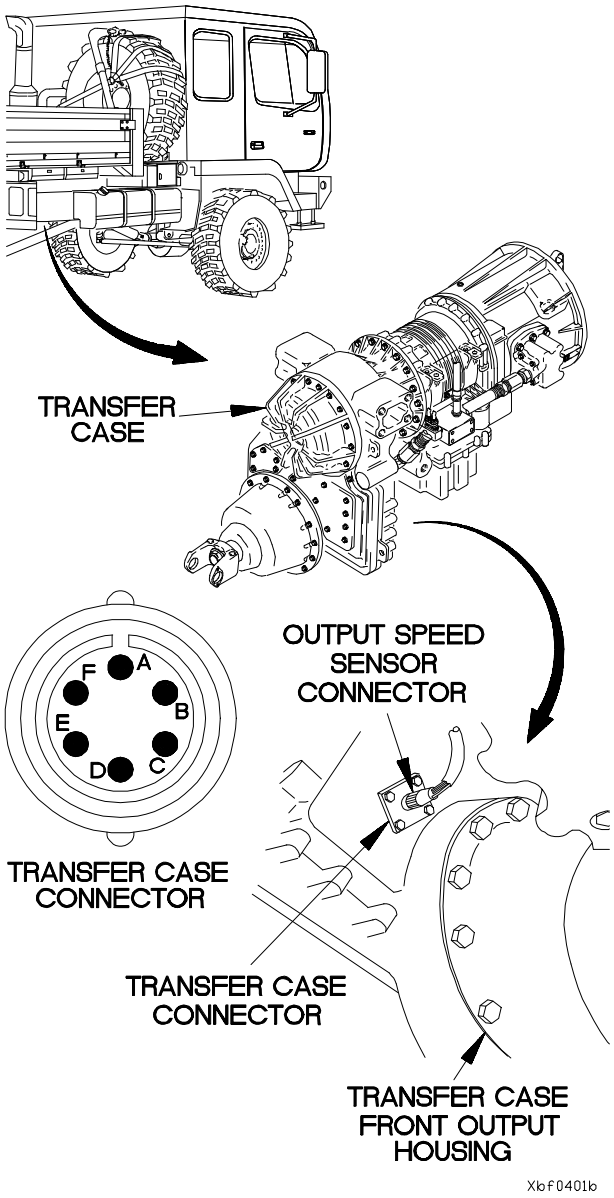
(1) Disconnect output speed sensor connector from transfer case connector.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to pin C of transfer case connector.

NOTE

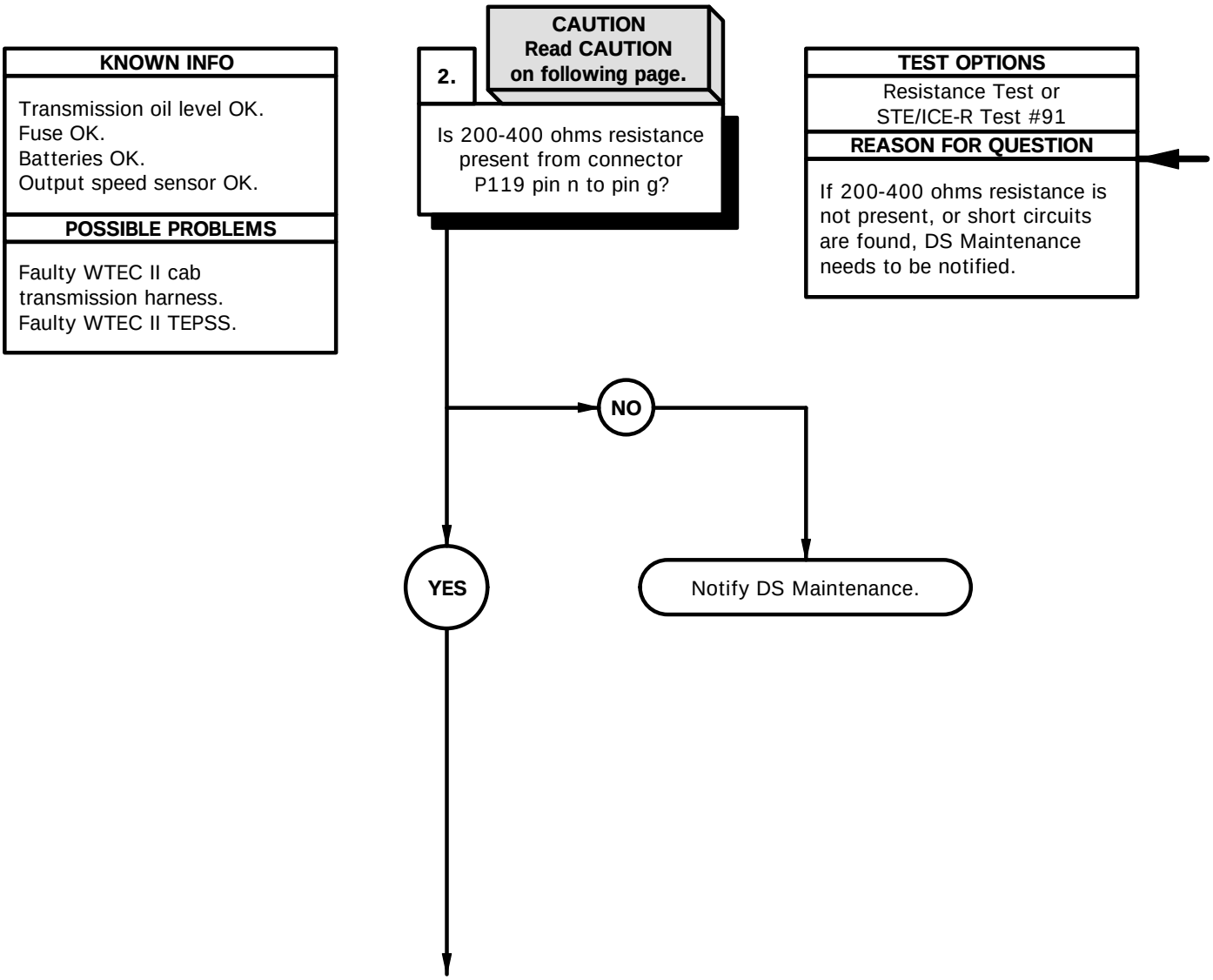
A good output speed sensor will return a reading of 200-400 ohms resistance as follows:

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 200-400 ohms resistance is not present, 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)



CAUTION

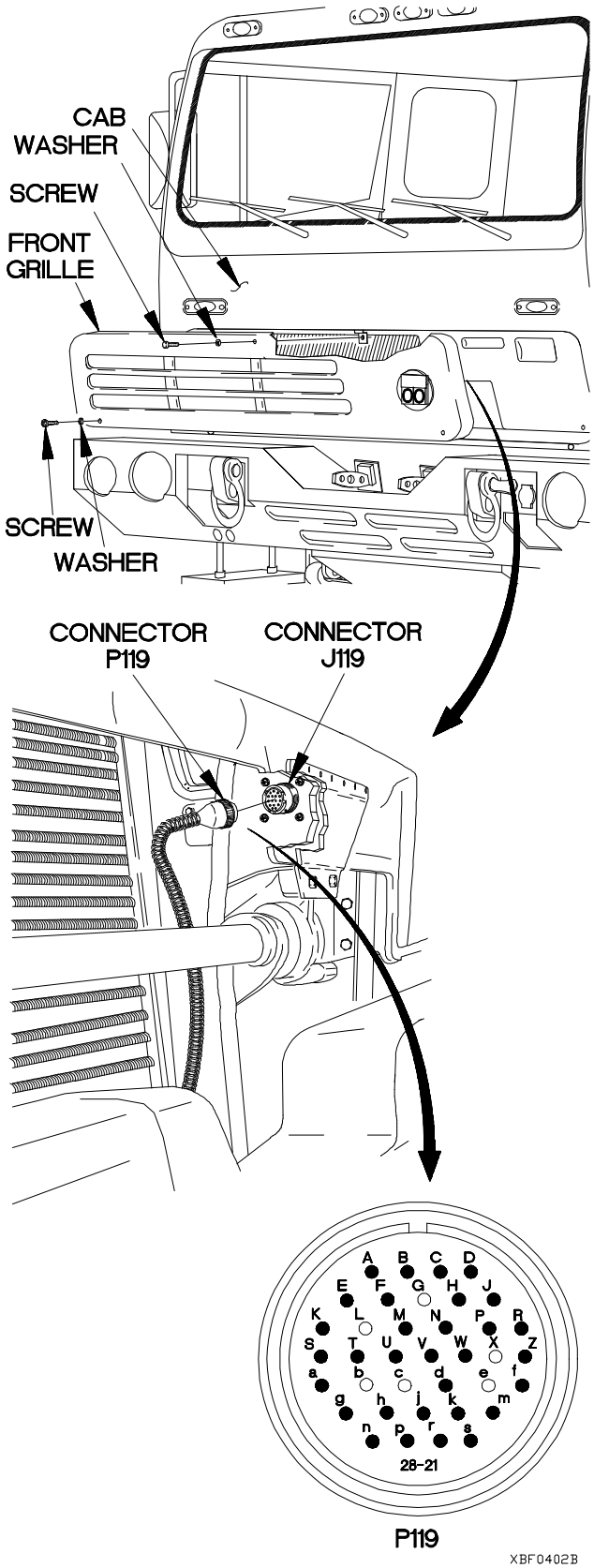
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

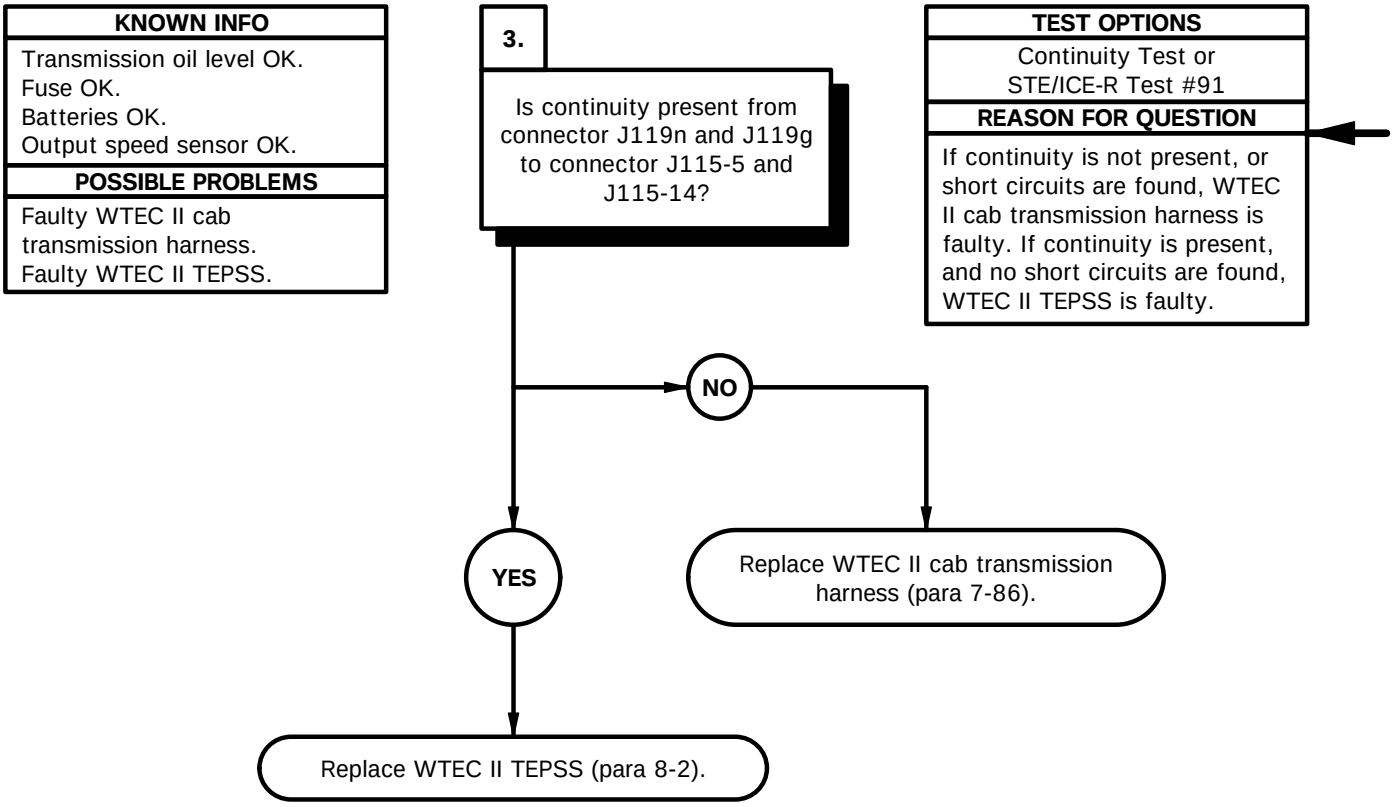
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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) Set multimeter to ohms.
(6) Connect positive (+) probe of multimeter to connector P119 pin n.
(7) Connect negative (-) probe of multimeter to connector P119 pin g 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 P119 pin g.
(11) Connect negative (-) probe of multimeter to all other pins in connector P119 (except pin n), 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.

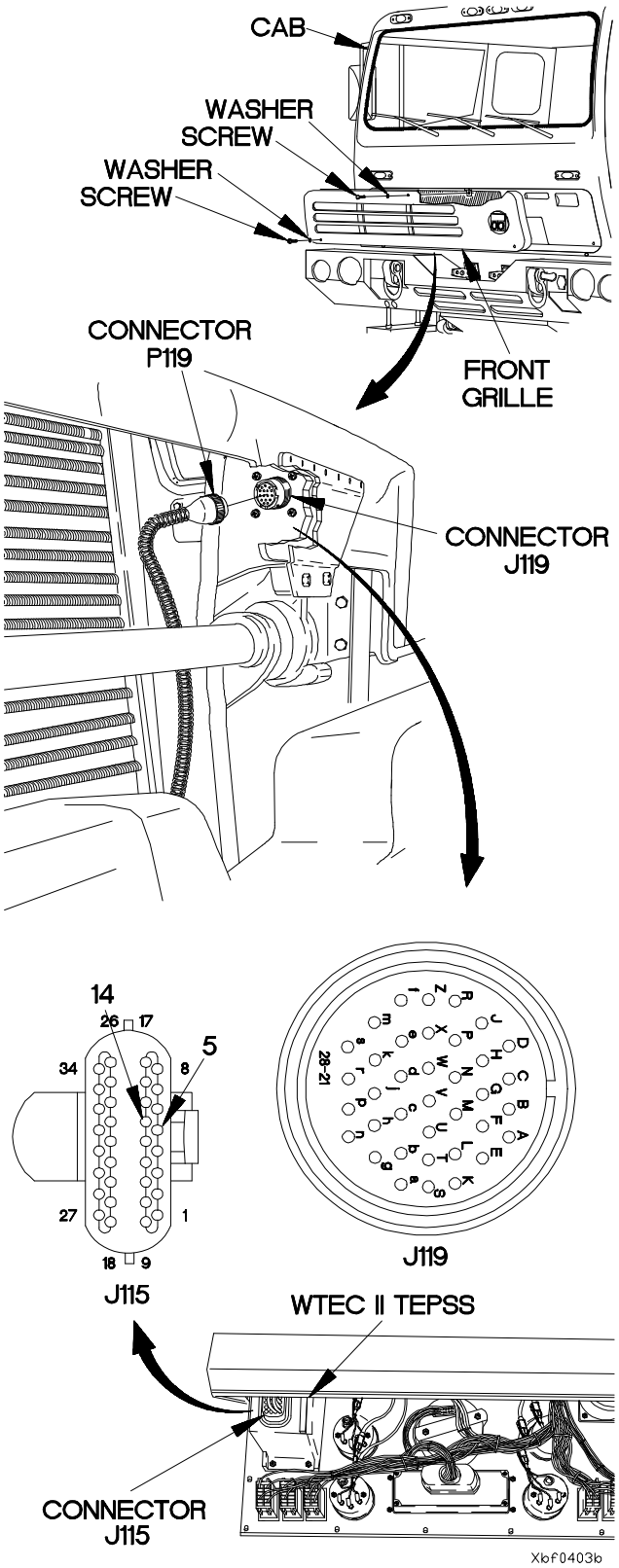


f4. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 16 (CONT)



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 7-86).
(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

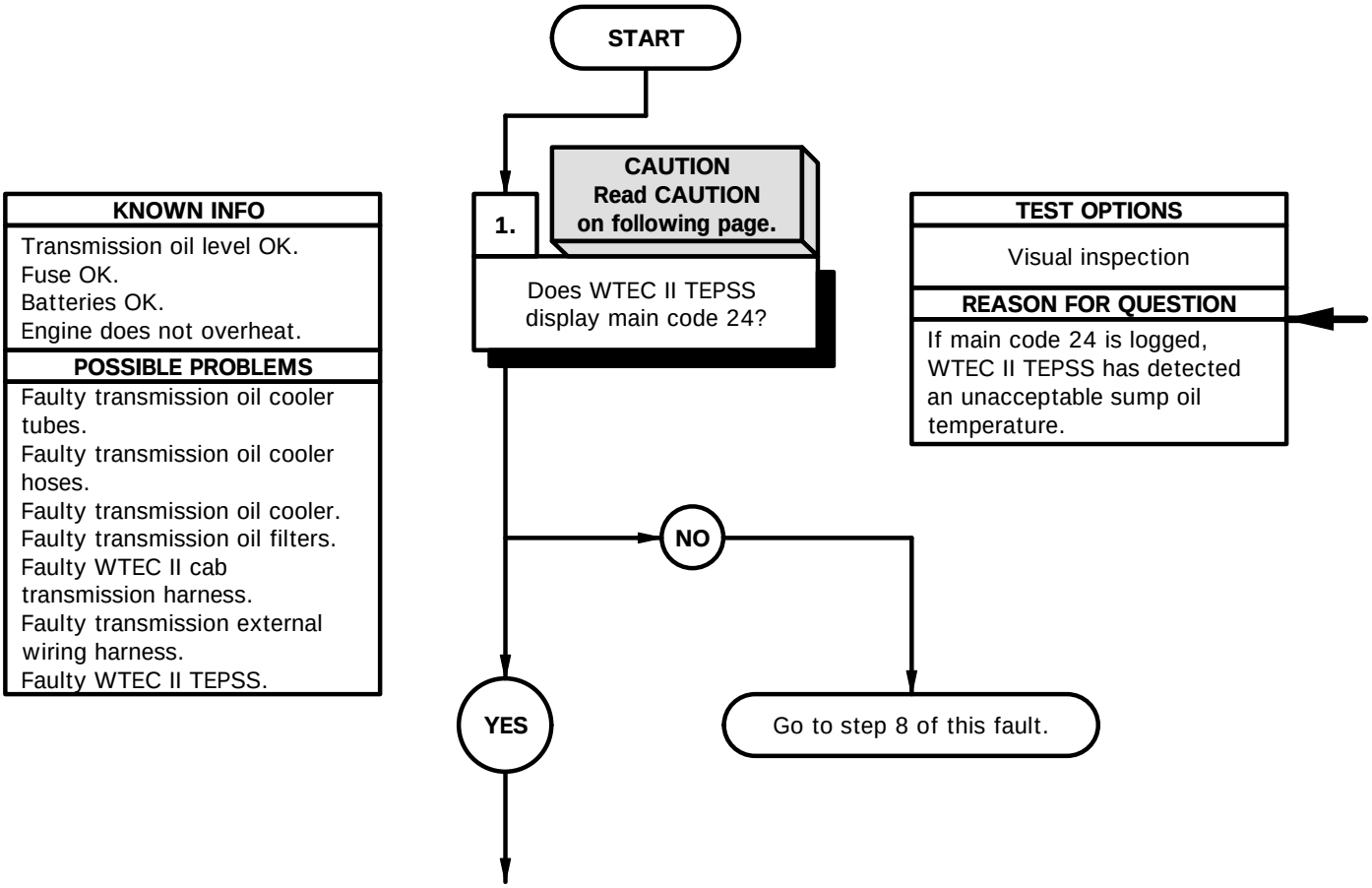
INITIAL SETUP

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

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

Tools and Special Tools
Pan, Drain (Item 24, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Wrench Set, Socket (Item 49, Appendix C)
STE/ICE-R (Item 39, Appendix C)

References
TM 9-4910-571-12&P

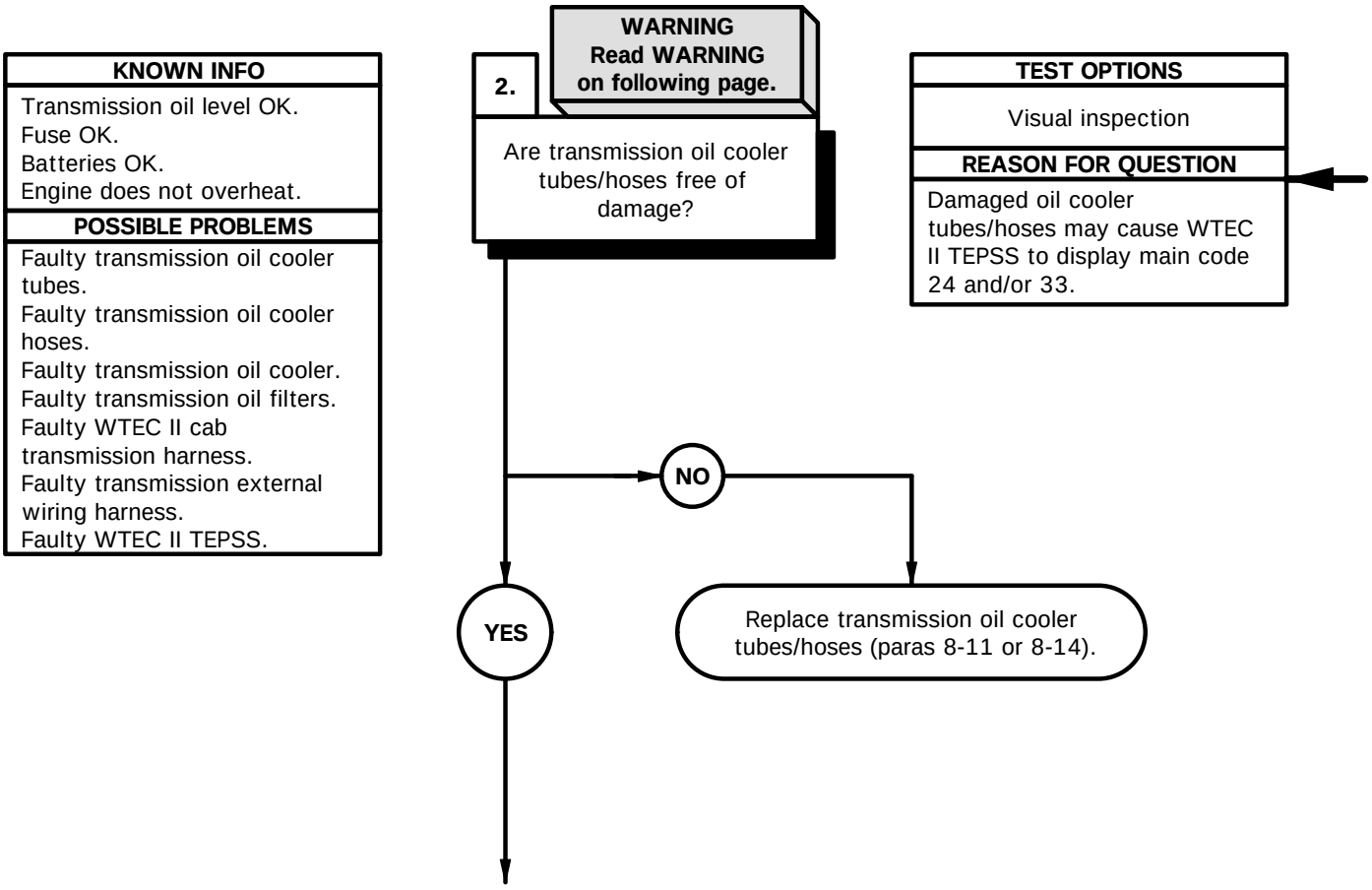


CAUTION

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.

(1) Position master power switch to on (TM 9-2320-365-10).
(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 (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 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 9-2320-365-10).

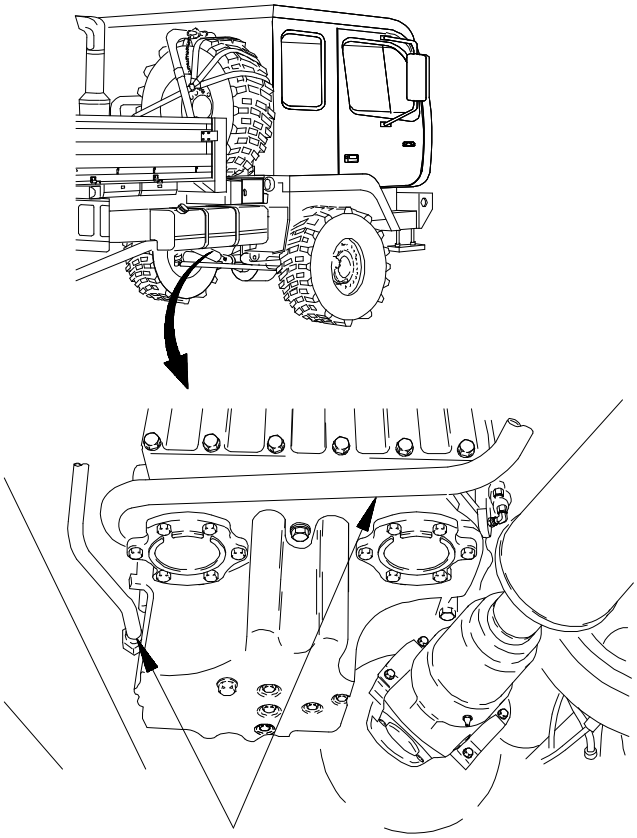
f5. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 AND/OR 33 AND ANY SUB CODE (CONT)



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.

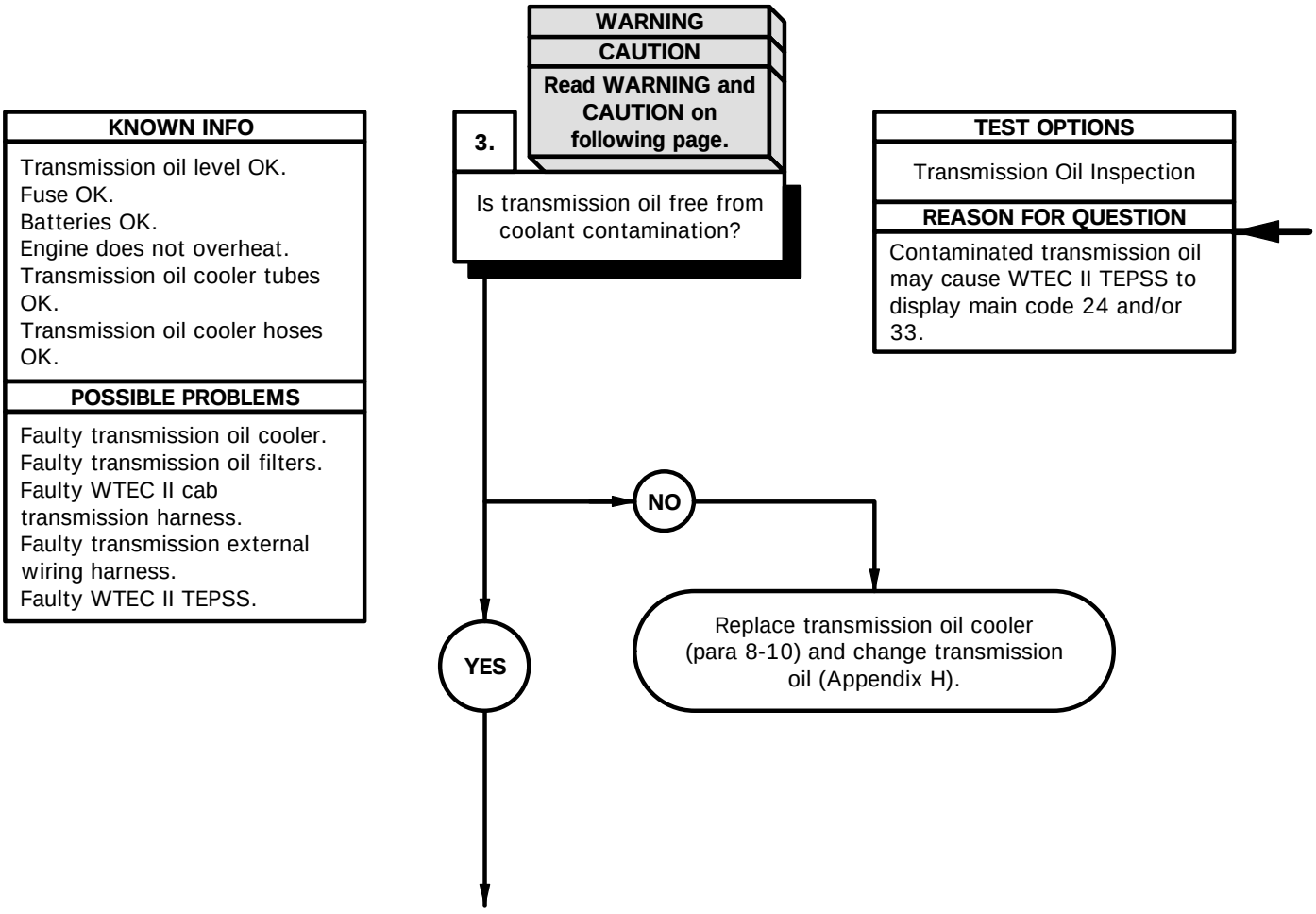
(1) Check transmission oil cooler tubes/hoses for damage and restrictions.
(2) If damage or restriction are present, replace transmission oil cooler tubes/hose (paras 8-11 or 8-14).



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

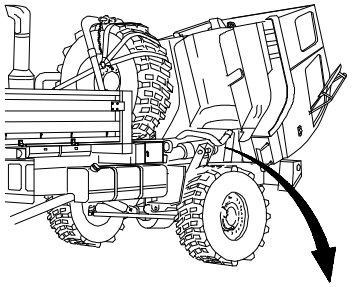
Transmission oil must be changed whenever there is evidence of oil breakdown or contamination. Oil breakdown or contamination may be caused from overheating transmission and/or oil cooler internal failure and is indicated by discoloration, strong odor, or oil analysis.

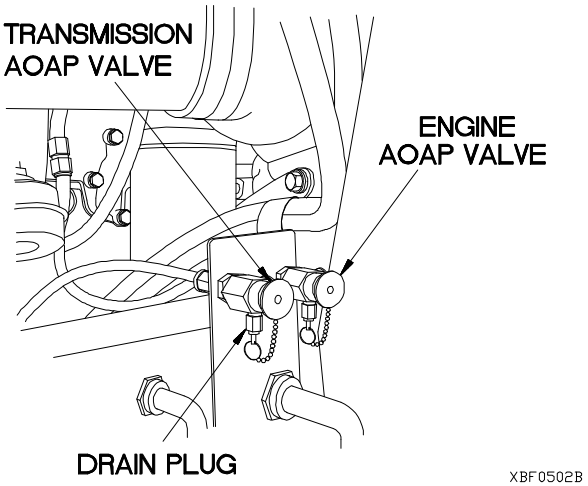
TRANSMISSION OIL INSPECTION

Note

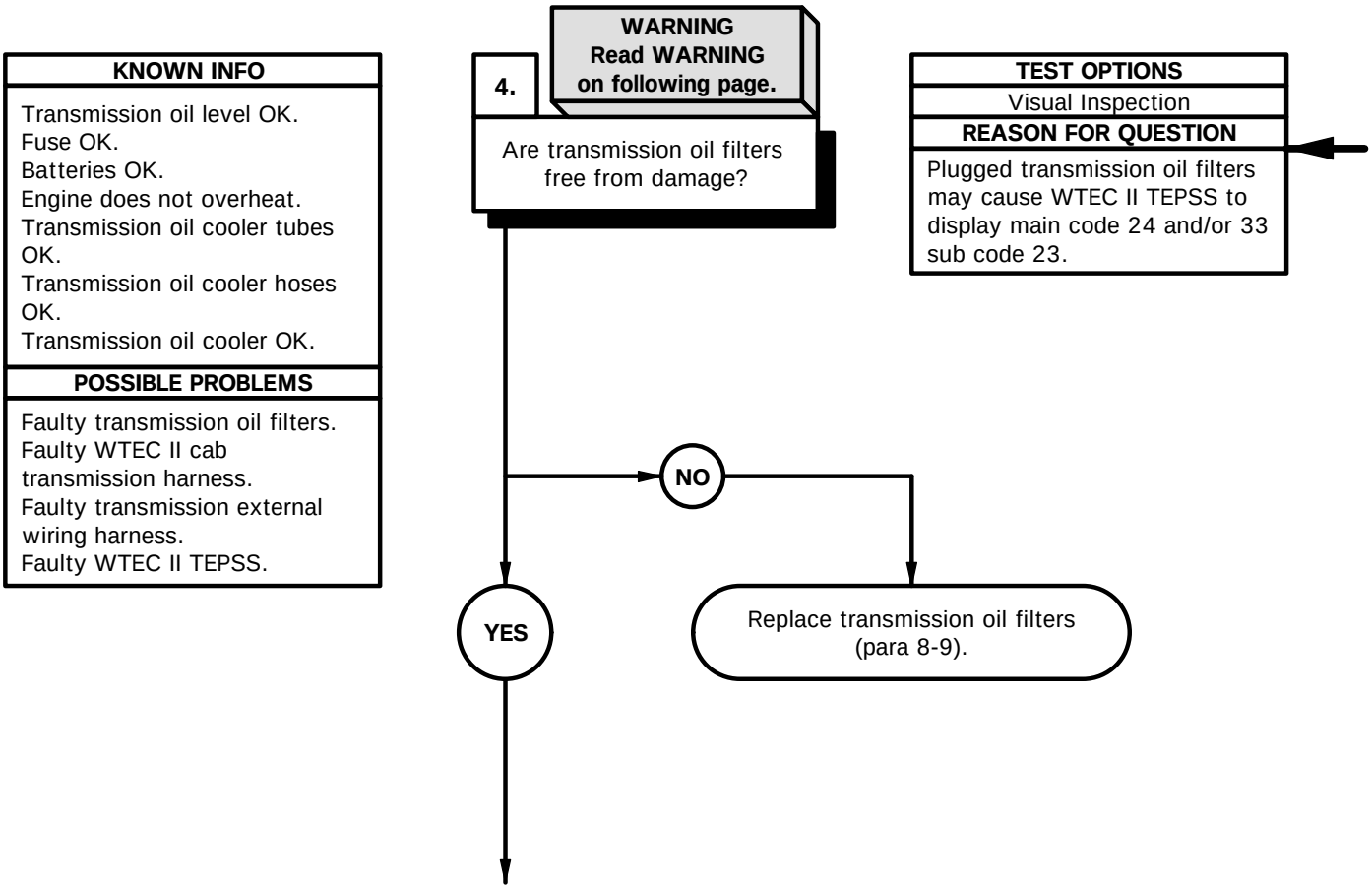
Transmission fluid capacity is 42.3 qt (40 L).

(1) Start engine (TM 9-2320-365-10).
(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 9-2320-365-10).
(10) Add oil to transmission (Appendix H).





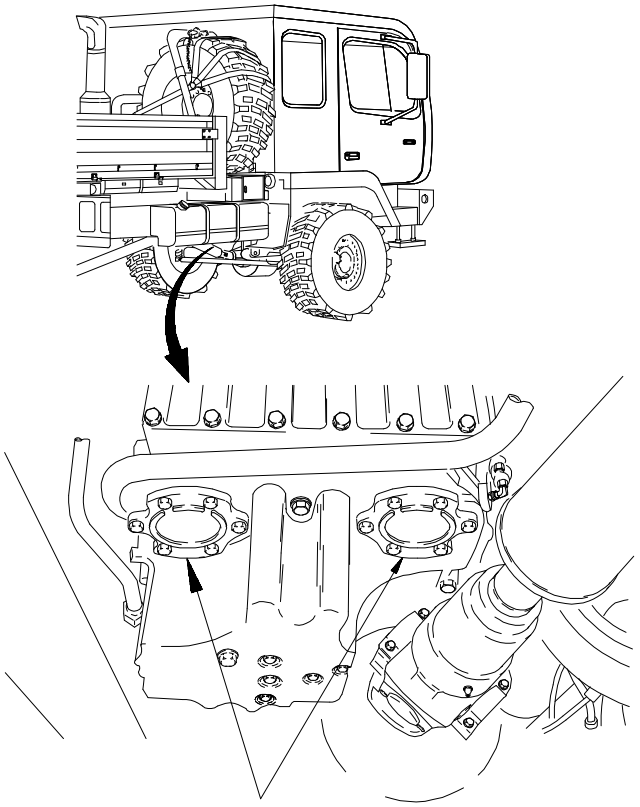
f5. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 AND/OR 33 AND ANY SUB CODE (CONT)



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.

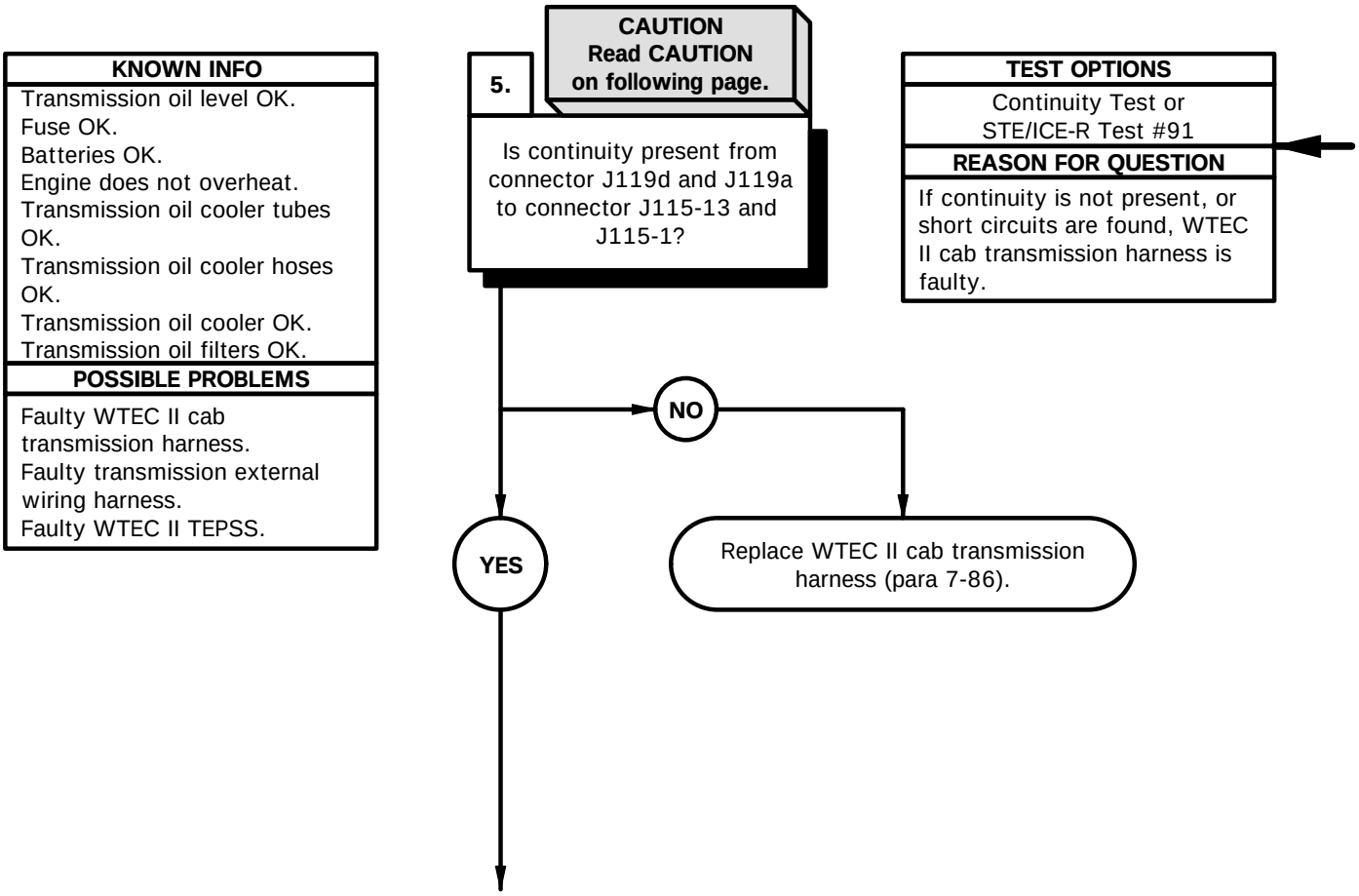
Check transmission oil filters for damage (para 8-9).



TRANSMISSION OIL FILTERS

Xbf0503b

f5. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 AND/OR 33 AND ANY SUB CODE (CONT)



CAUTION

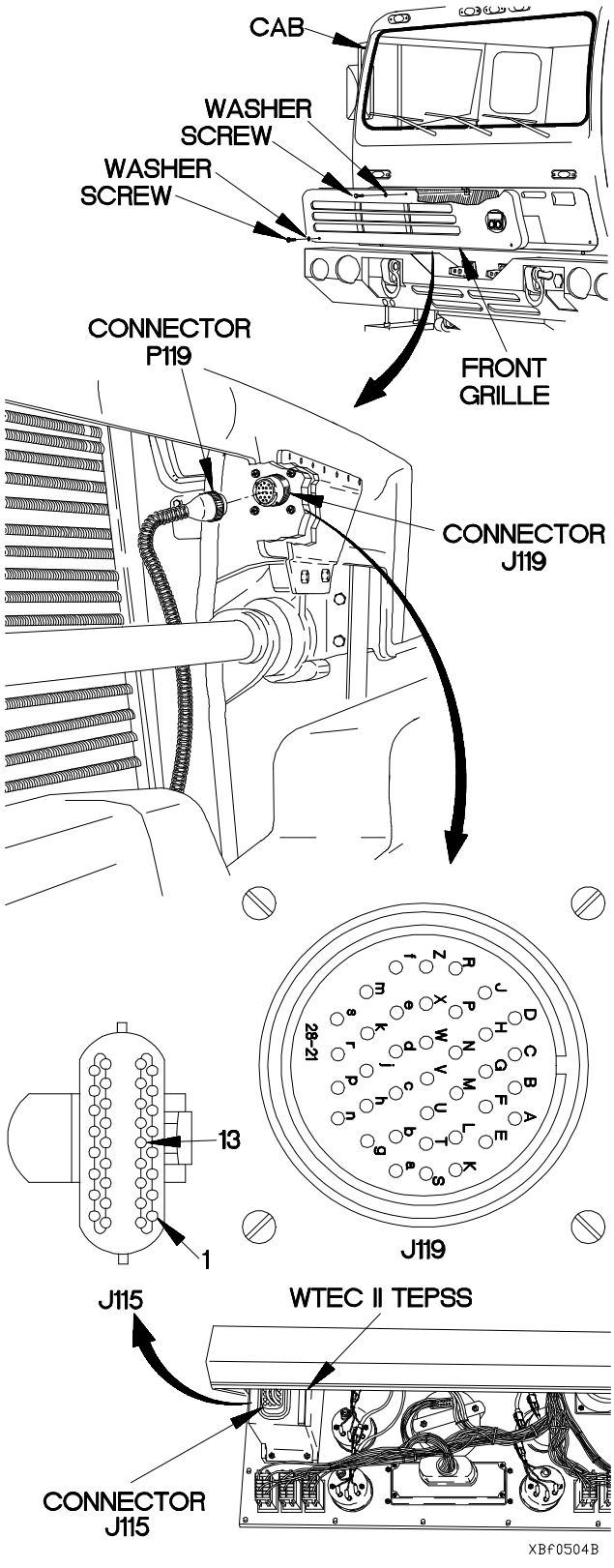
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

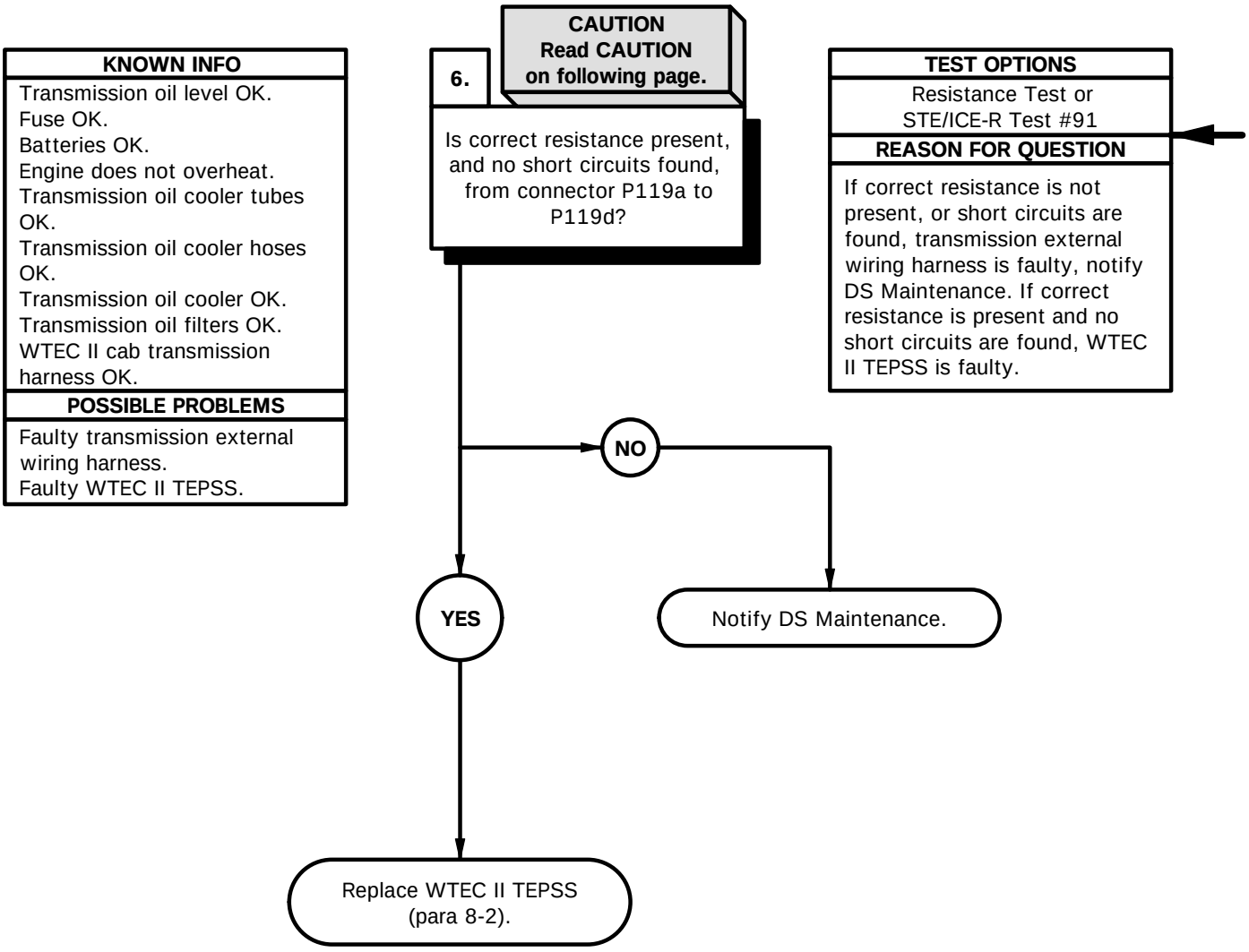
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back or not capable of making good contact.

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 7-86).
(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 or not 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 2-17. 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).

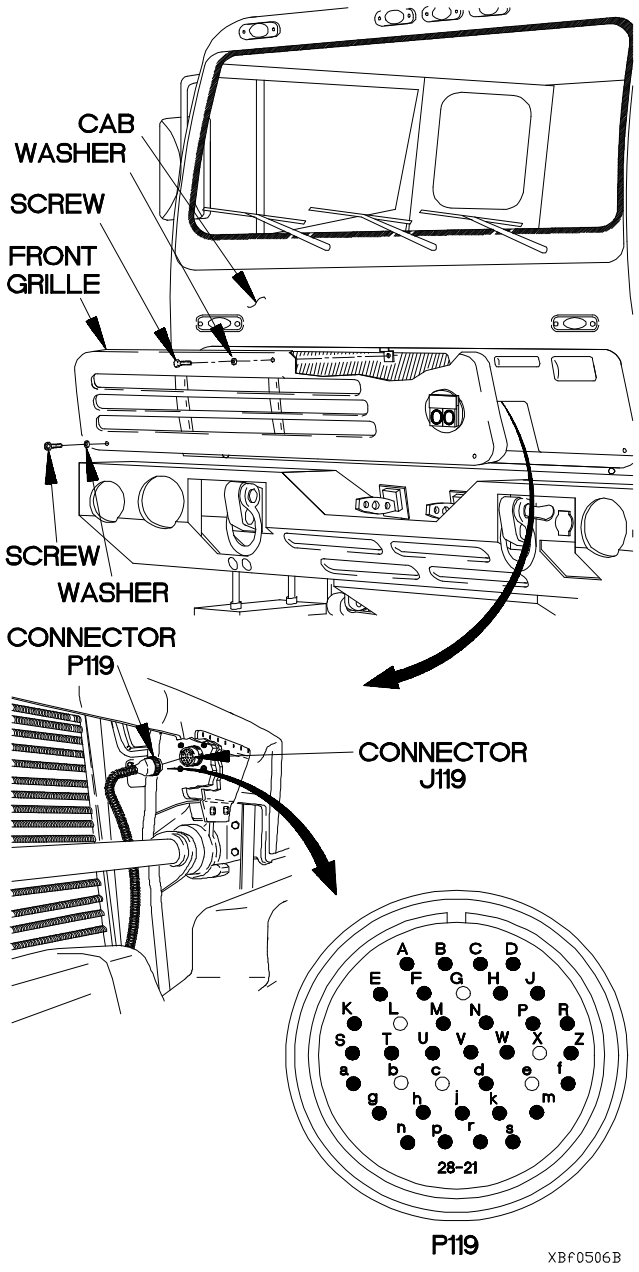


Table 2-17. Transmission Sump Oil Temperature Sensor Resistance Readings

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 SUB CODE

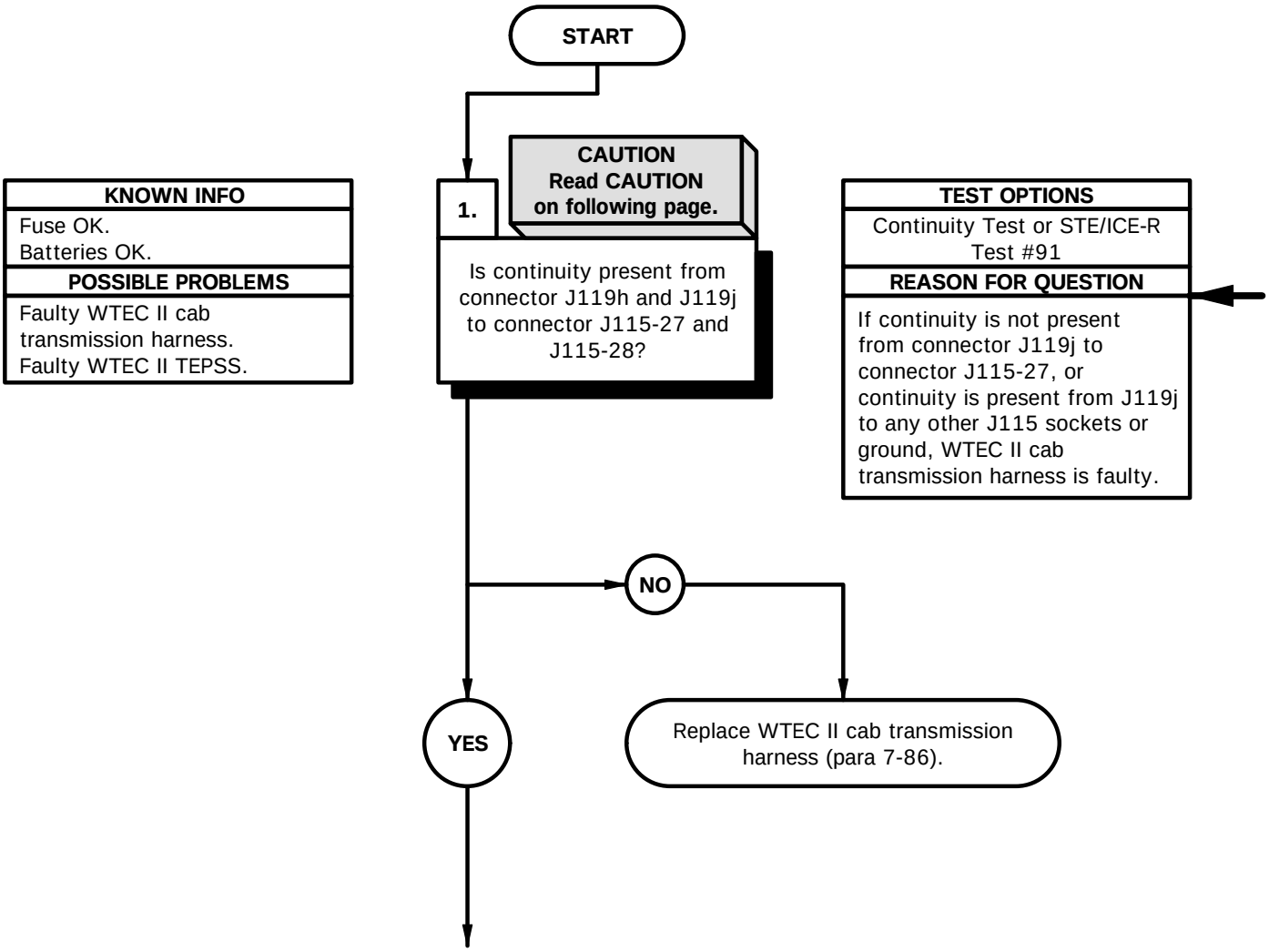
INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

Tools and Special Tools (Cont)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Wrench Set, Socket (Item 49, Appendix C)
STE/ICE-R (Item 39, 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.

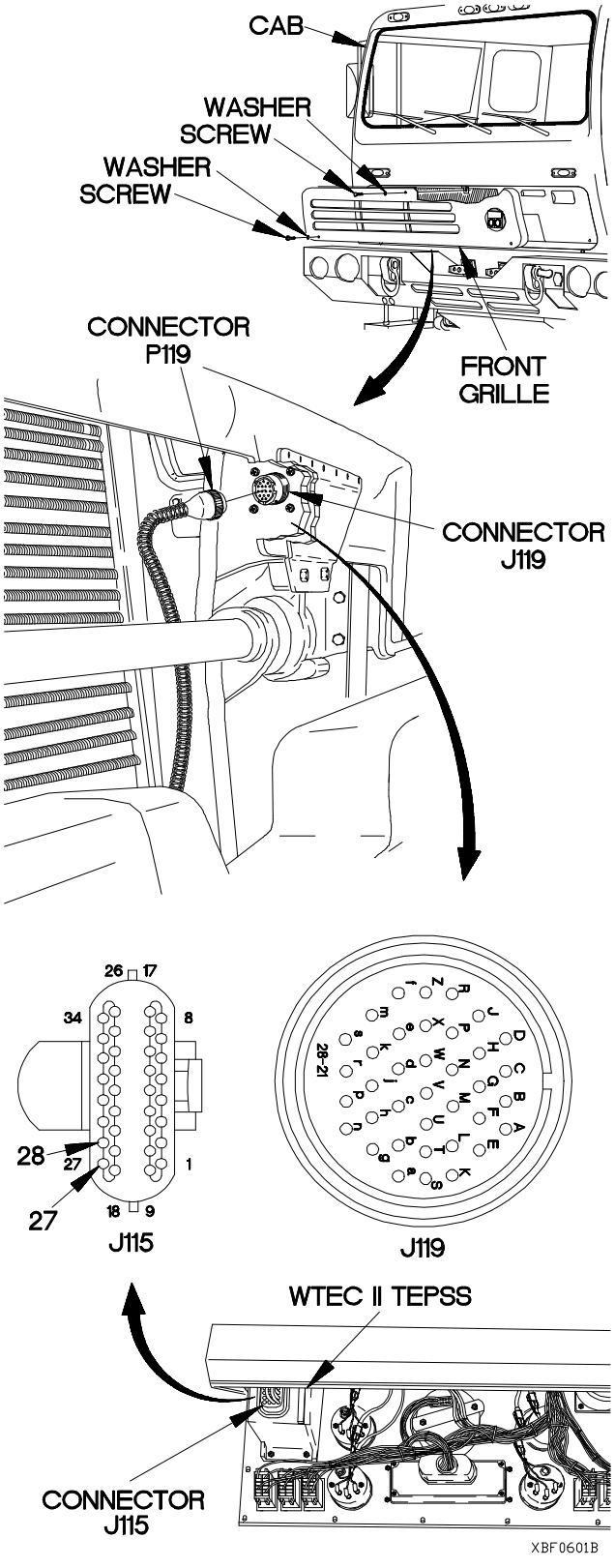
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

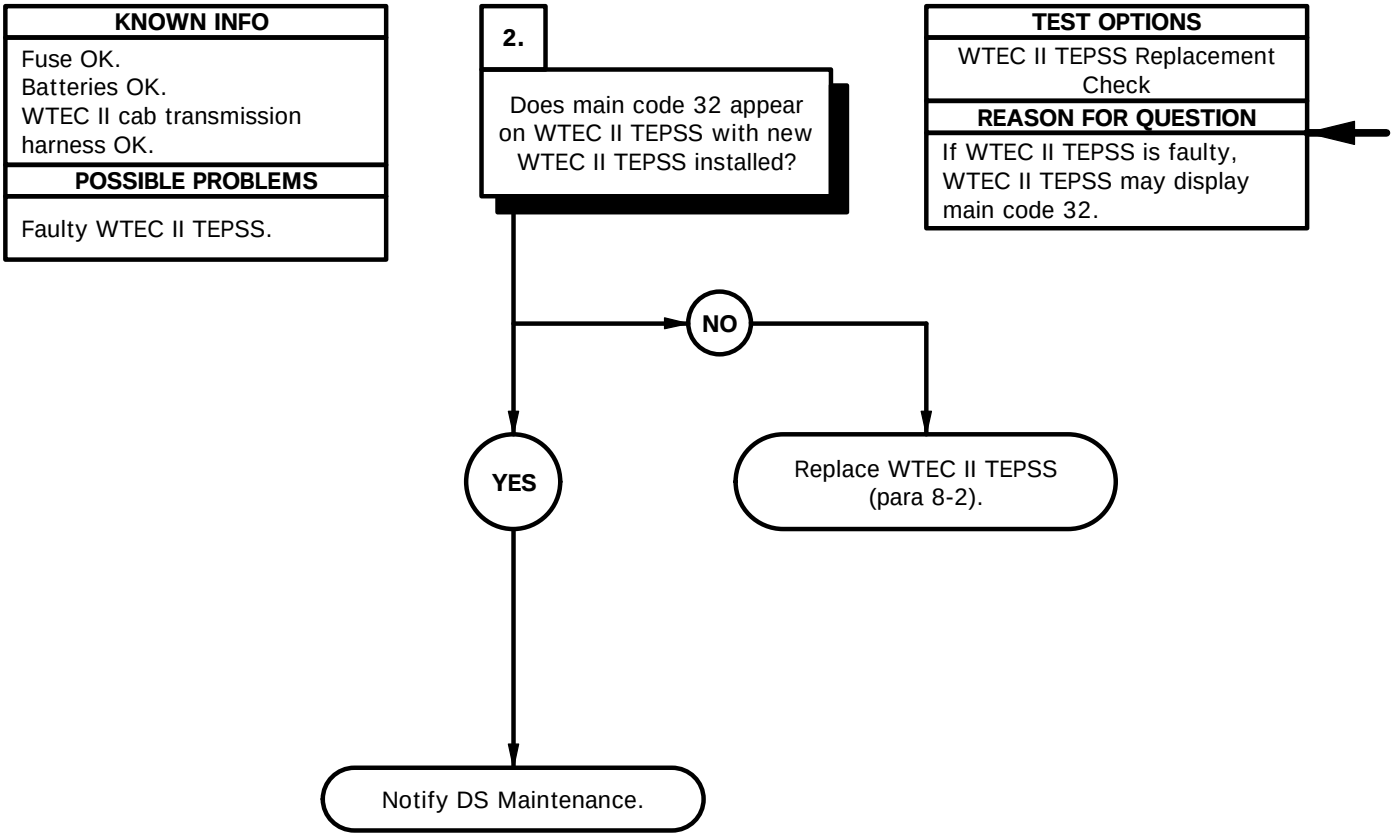
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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 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 7-86).
(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).

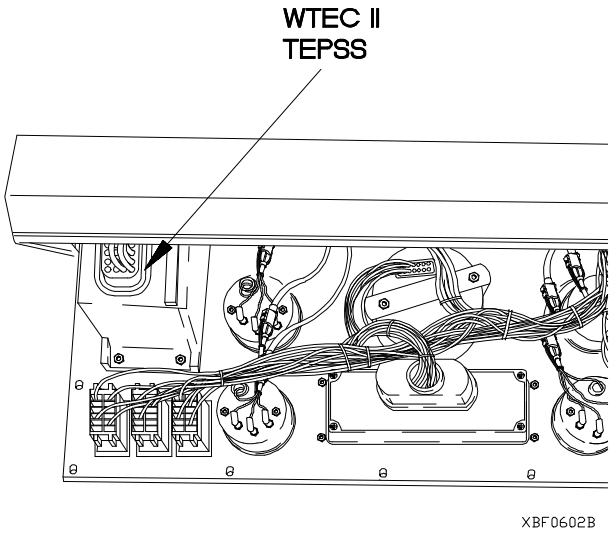


f6. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (CONT)



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 9-2320-365-10).
(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 9-2320-365-10).
(9) Clear diagnostic codes (para 8-4).



f7. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, 45, AND/OR 69 AND ANY SUB CODE

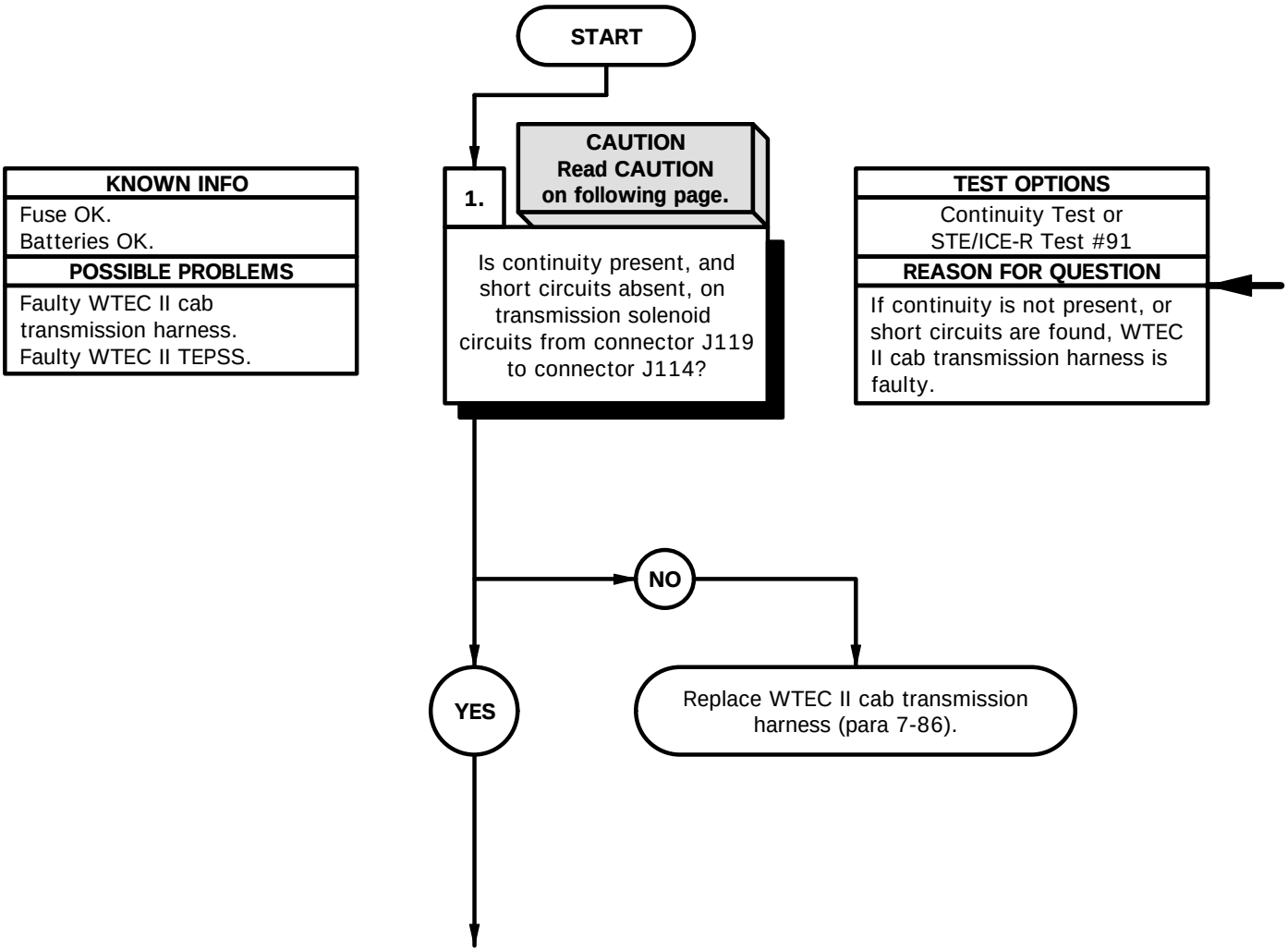
INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)

Tools and Special Tools
STE/ICE-R (Item 39, 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 2-18. 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 2-18. 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 2-18. 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 7-86).
(14) Connect connector J114 to WTEC II TEPSS.
(15) Install instrument panel assembly (para 7-15).

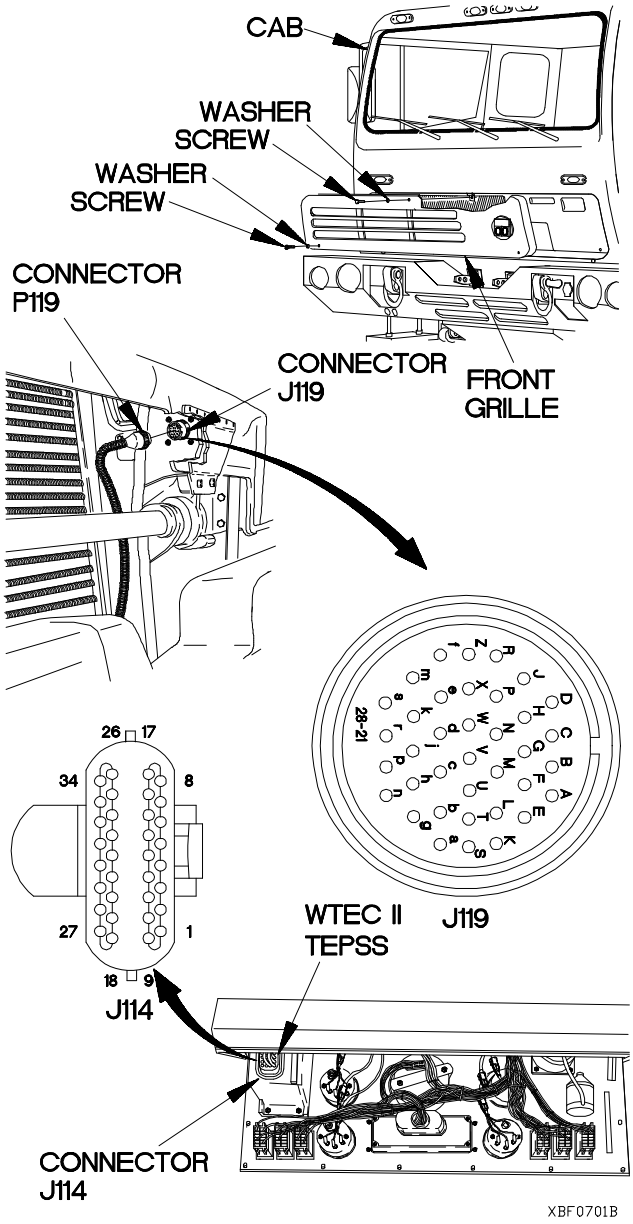
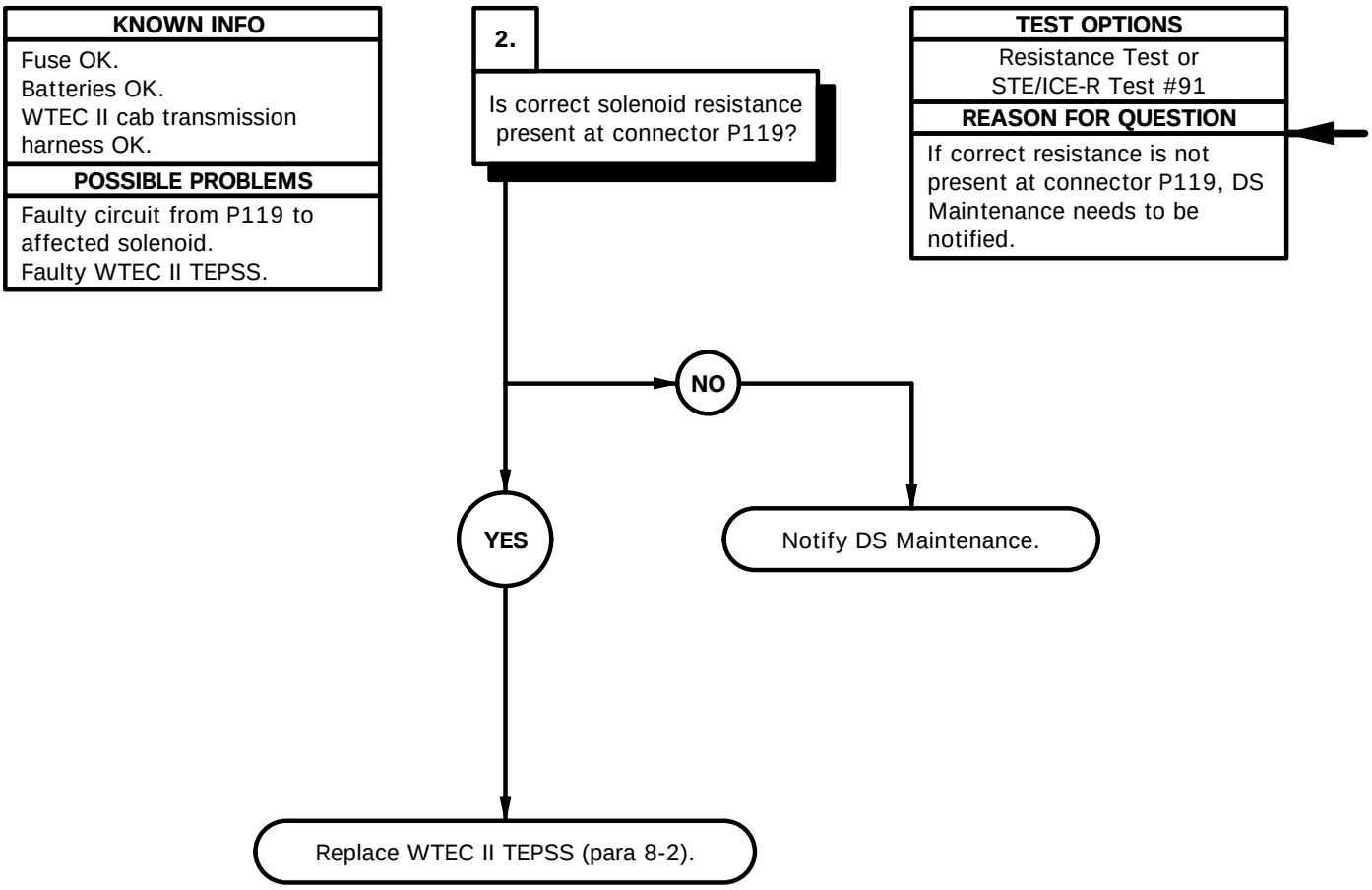


Table 2-18. WTEC II Cab Transmission Harness Transmission Solenoid Test Points

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, 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 2-19. 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 2-19. Connector P119 Transmission Solenoid Resistance Test Points for appropriate sub code(s) and connector P119 pin(s).

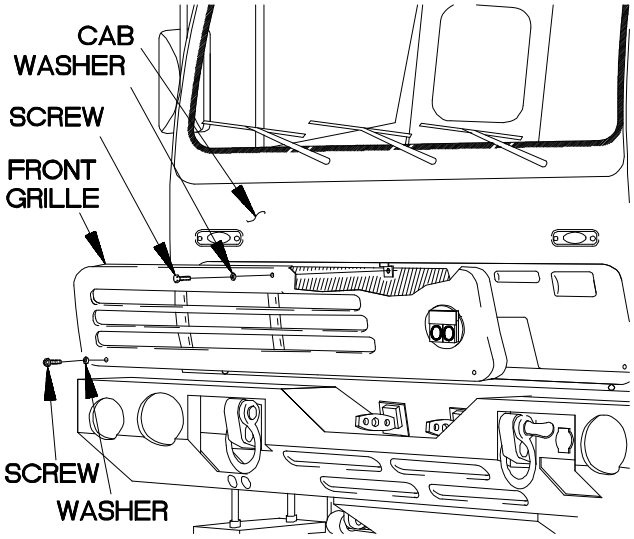
NOTE

Transmission solenoid resistance is affected by temperature. Refer to Table 2-20. 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 2-19. 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



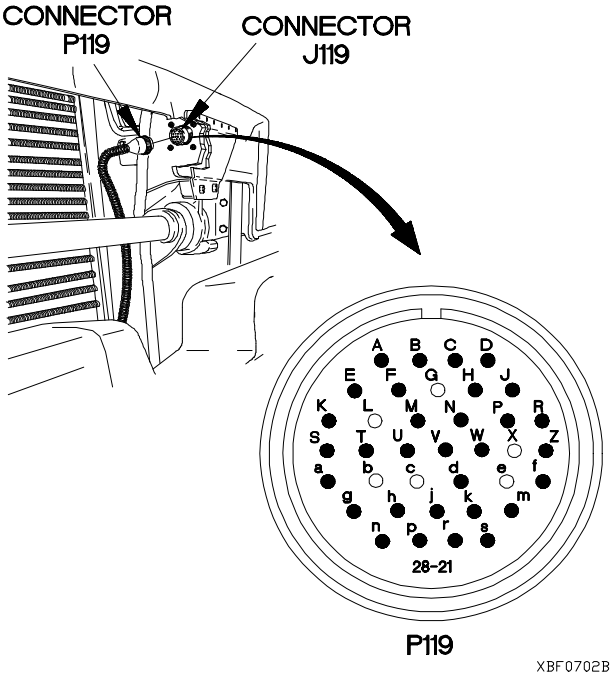


Table 2-20. Transmission Solenoid Resistance Readings

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

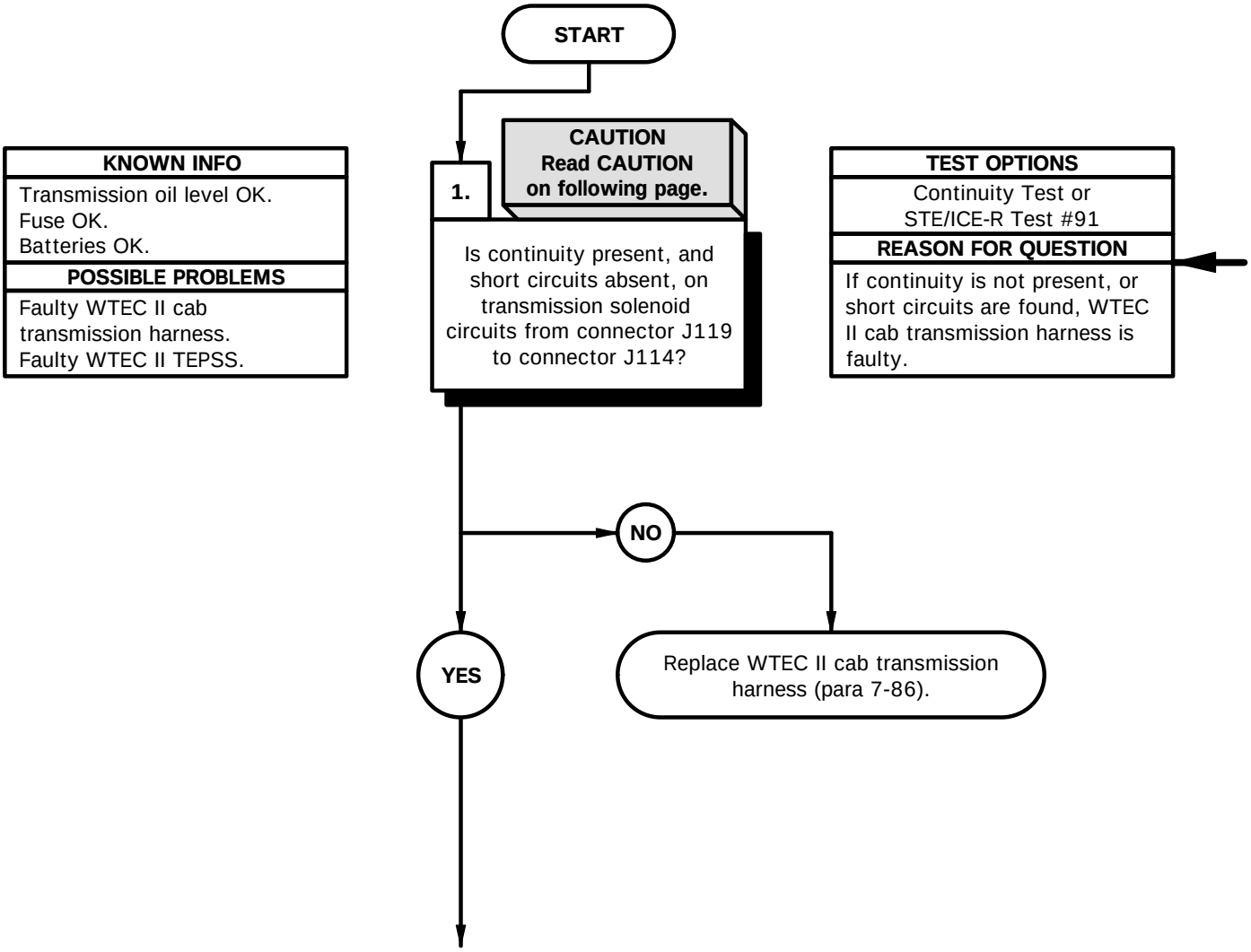
INITIAL SETUP

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

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

Tools and Special Tools (Cont)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Wrench Set, Socket (Item 49, Appendix C)
STE/ICE-R (Item 39, 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 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 2-21. 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 2-21. 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 7-86).

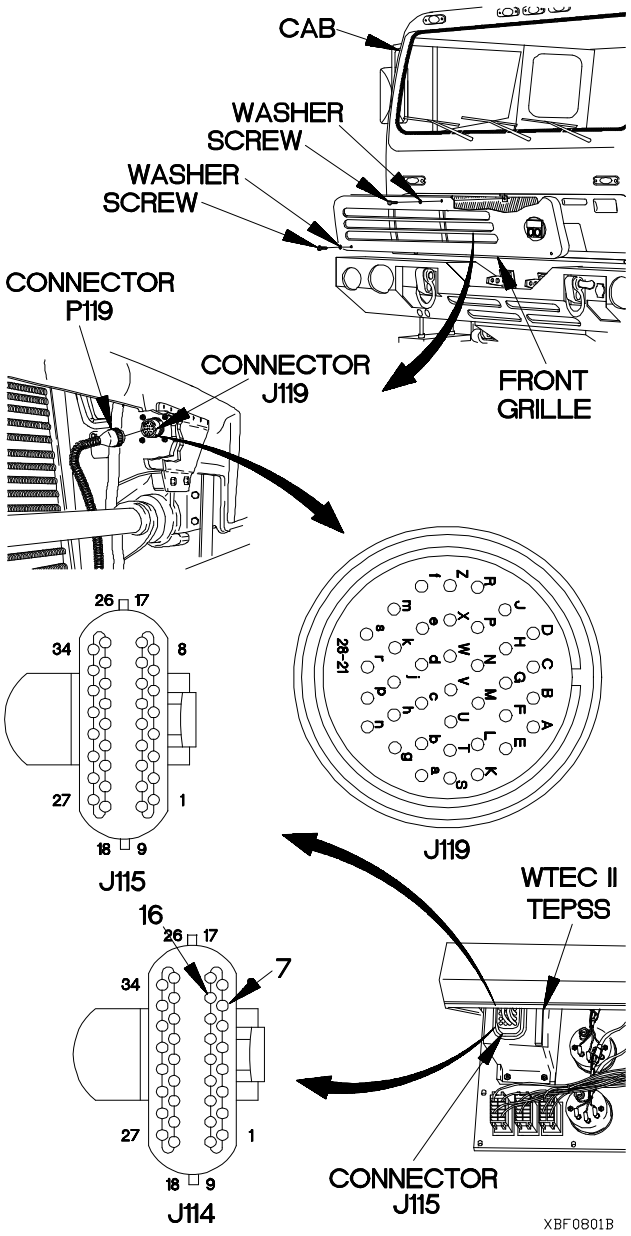
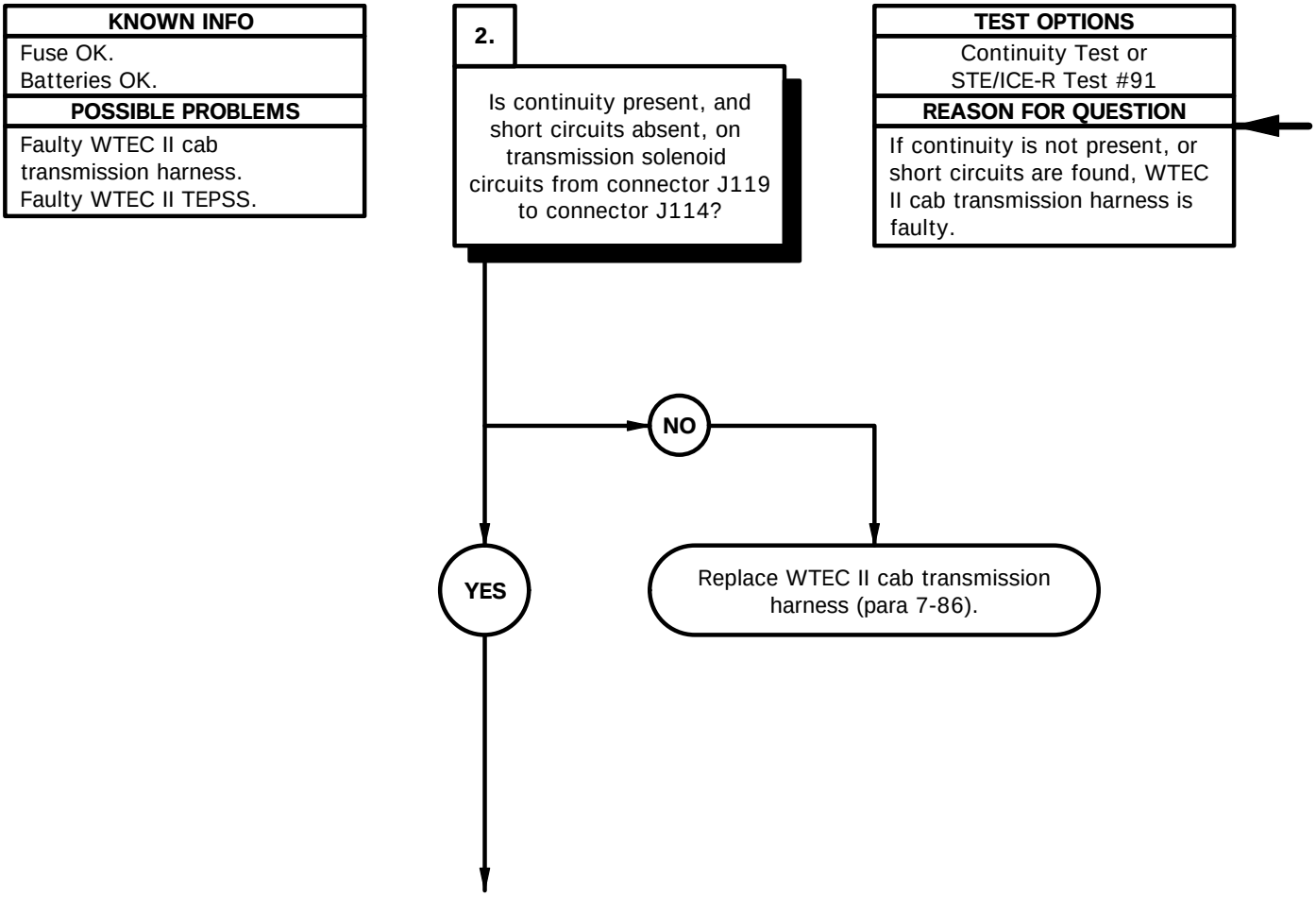


Table 2-21. Main Code 43 Sub Code 21 and 26 High Side Test Points

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)

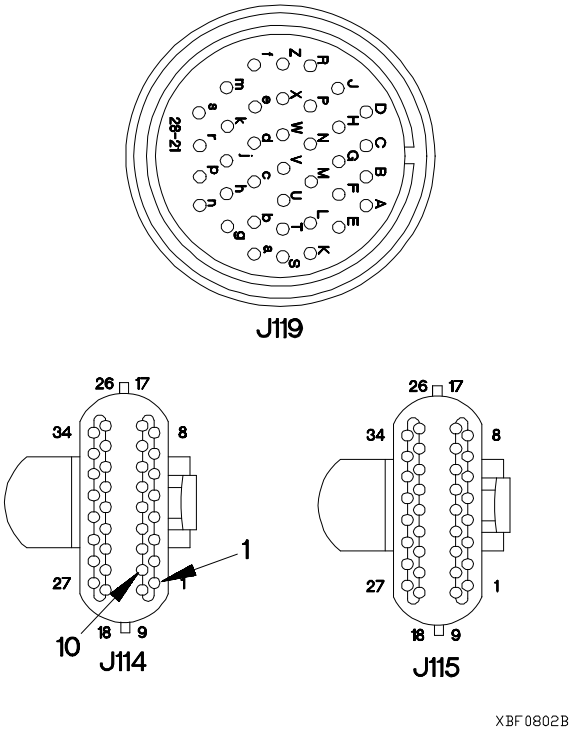


CONTINUITY TEST

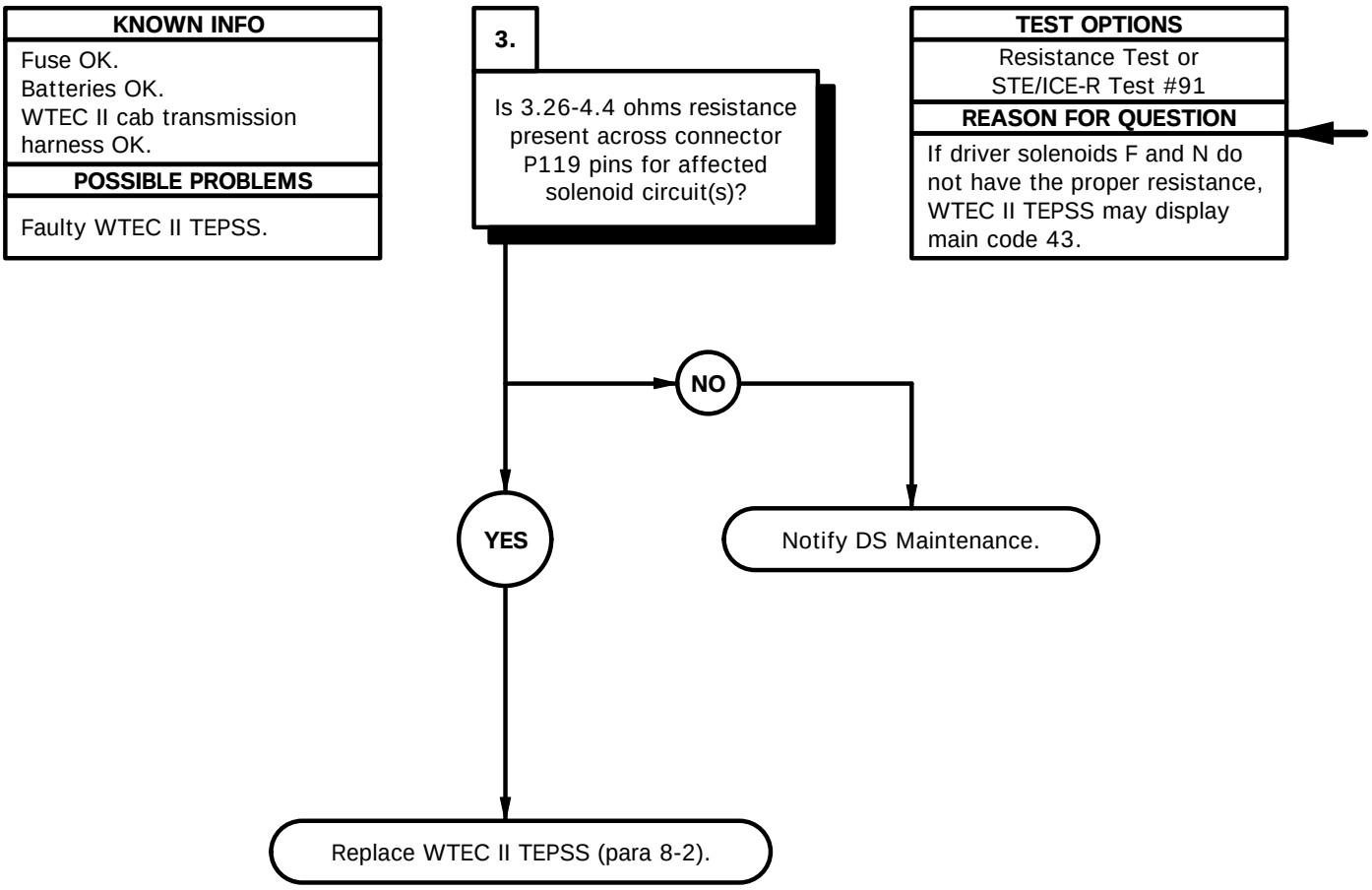
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector J119. Refer to Table 2-22. Main Code 43 Sub Code 21 and 26 Low Side Test Points.
(3) Connect negative (-) probe of multimeter to connector J114 and note reading on multimeter. Refer to Table 2-22. Main Code 43 Sub Code 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 7-86).

Table 2-22. 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)

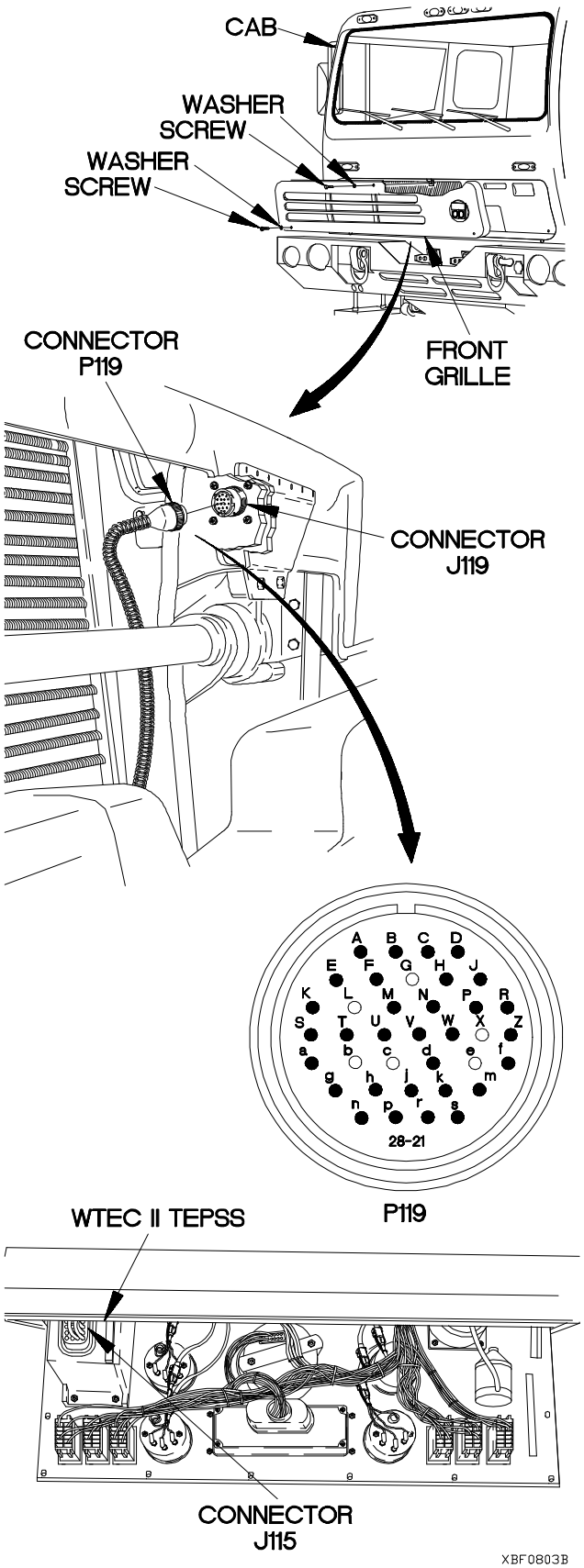


RESISTANCE TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P119. Refer to Table 2-23. 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 2-23. 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, replace WTEC II cab transmission harness (para 7-86).
(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 2-23. Transmission Solenoid F and G Resistance Test Points

Sub Code	Affected Solenoid	Connector P119 High	Connector P119 Low
21	F	K	H
26	N	F	A



f9. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE

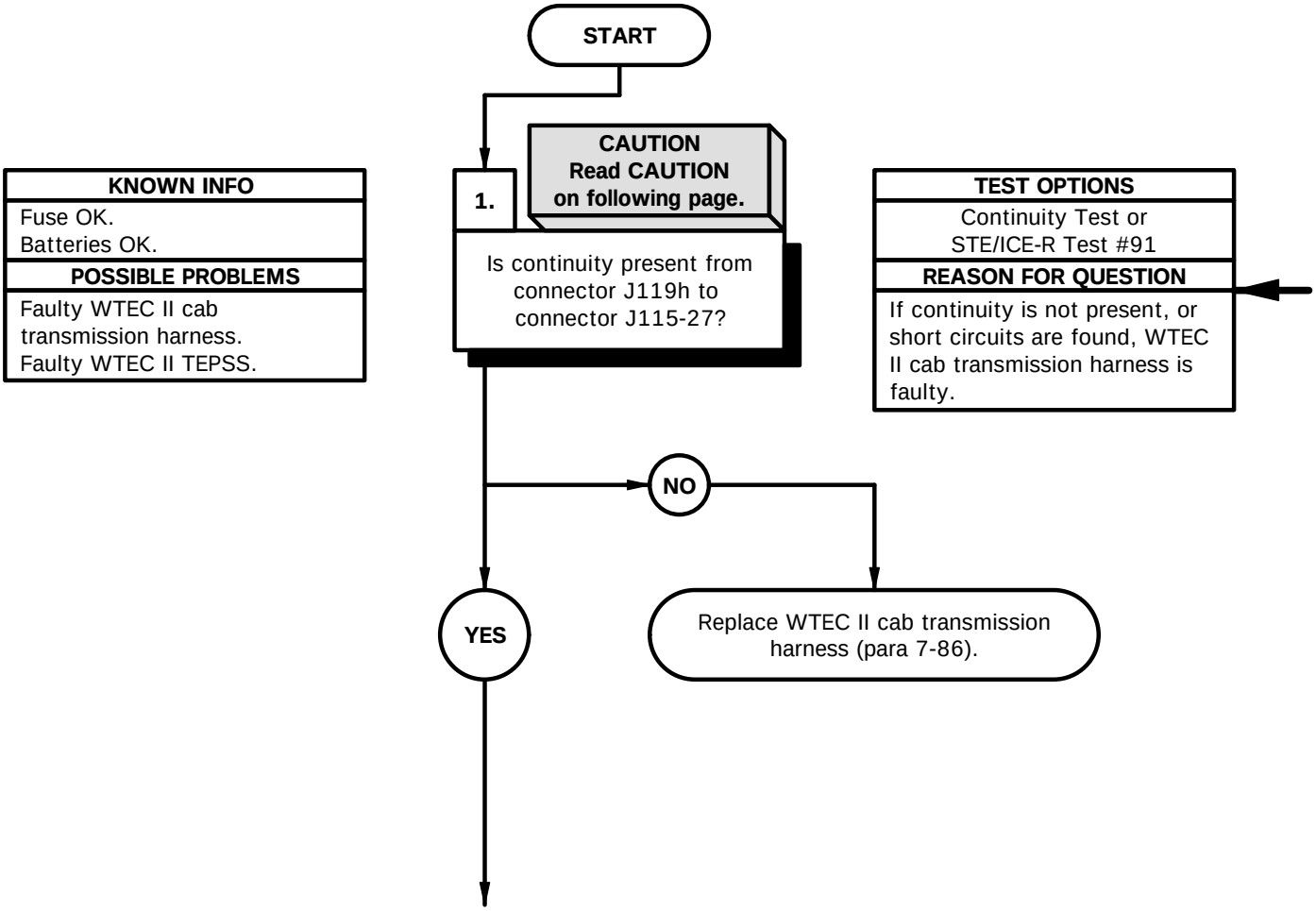
INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

Tools and Special Tools (Cont)
Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)
STE/ICE-R (Item 39, 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.

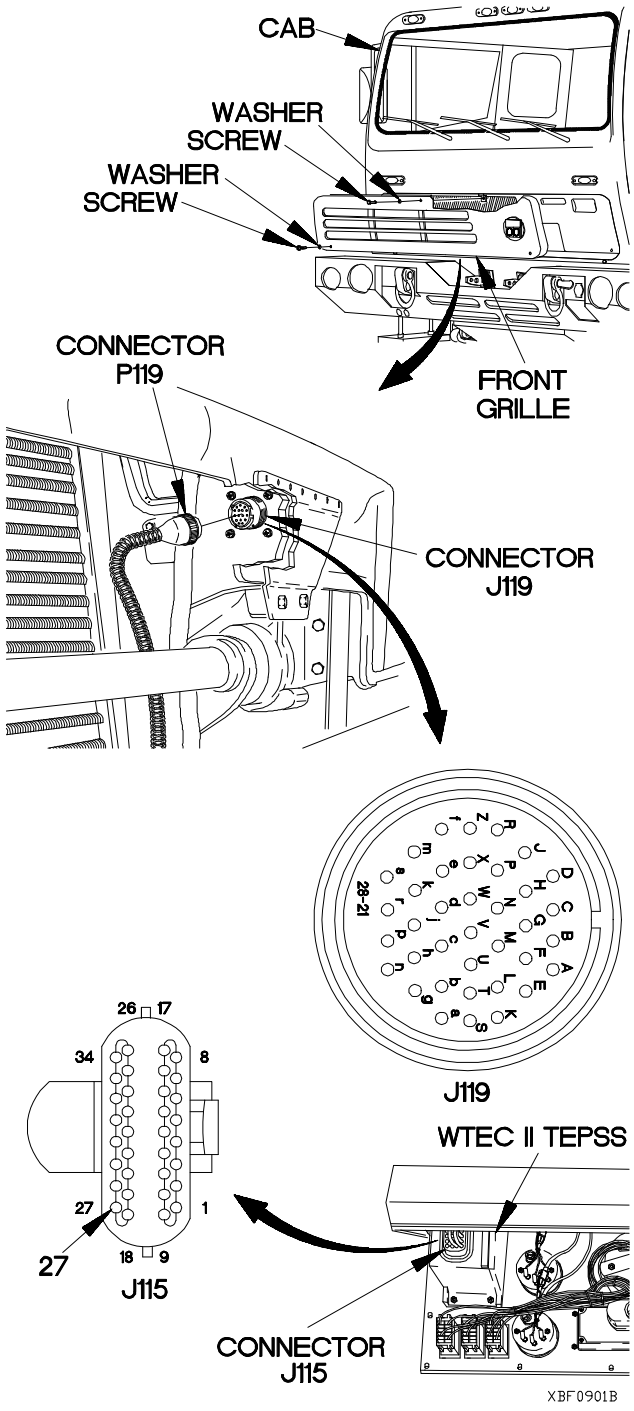
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

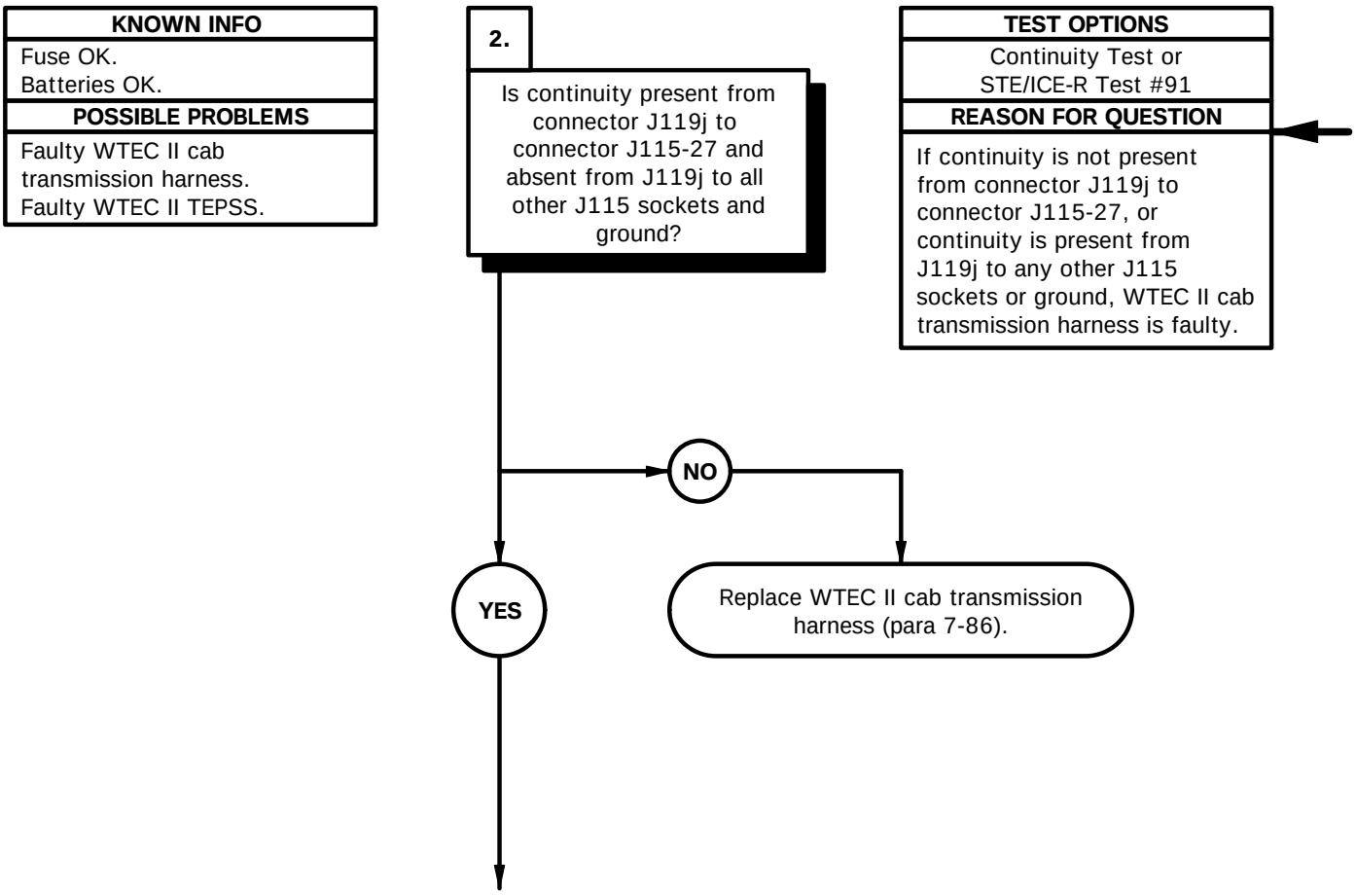
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille 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 7-86).

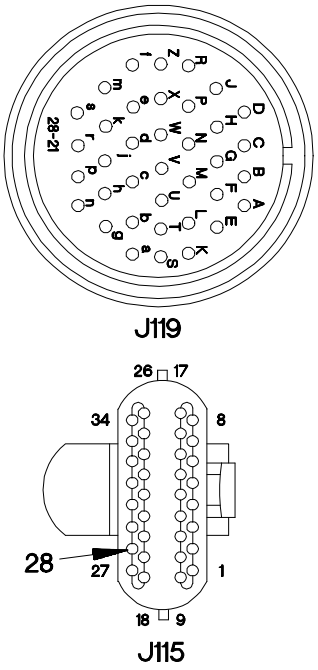


f9. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (CONT)

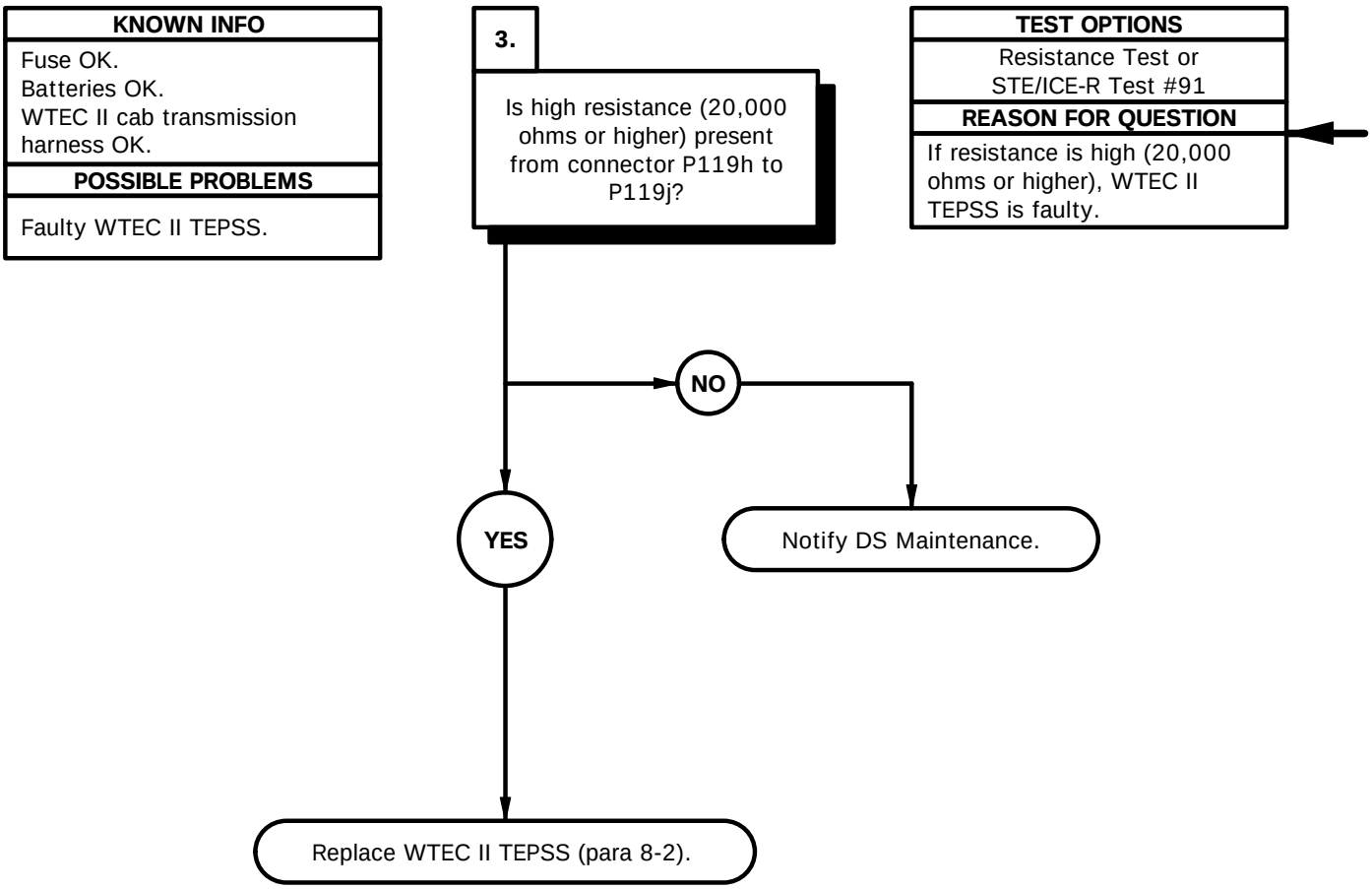


CONTINUITY TEST

(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 7-86).

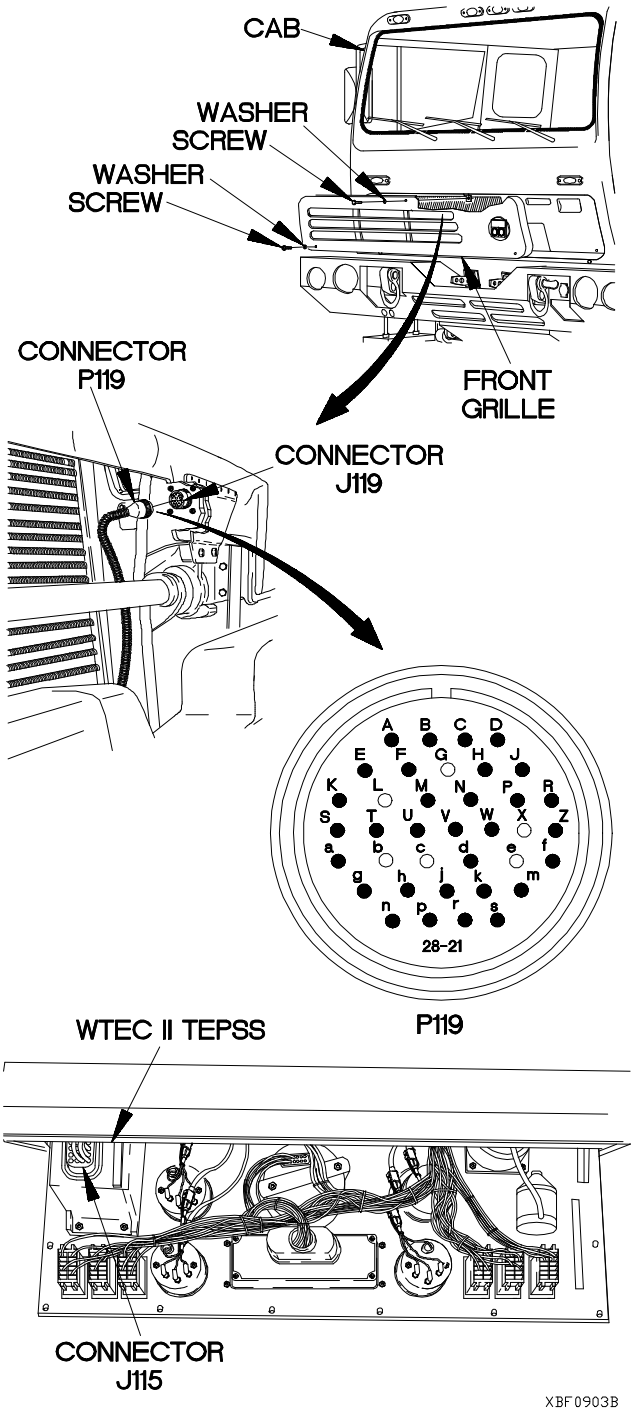


f9. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (CONT)



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

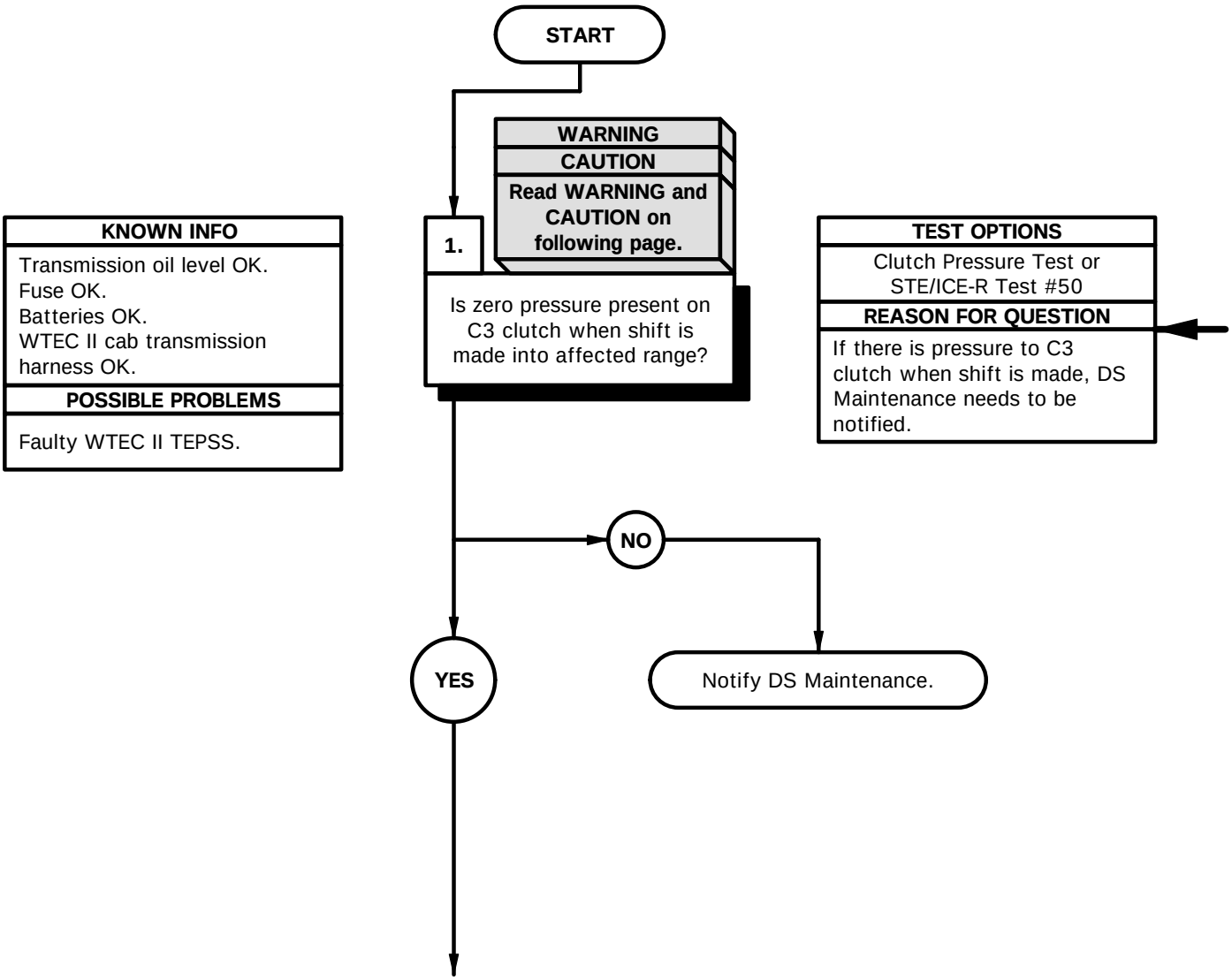
Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Pan, Drain (Item 24, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Wrench Set, Socket (Item 49 Appendix C)

Materials/Parts
Packing, Preformed (Item 199, Appendix G)
Adapter, Staight, Pipe to Tube (Item 1,2, Appendix D)
Adapter, Straight, Tube to Boss (Item 1.3, Appendix D)
Hose Assembly, Nonmetallic (Item 25.1, Appendix D)

Reference
TM 9-491-571-12&P

Personnel Required
(2)



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 rear 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 9-2320-365-10) 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, notify DS Maintenance.
(9) Shut down engine (TM 9-2320-365-10).
(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 rear propeller shafts (para 9-2).

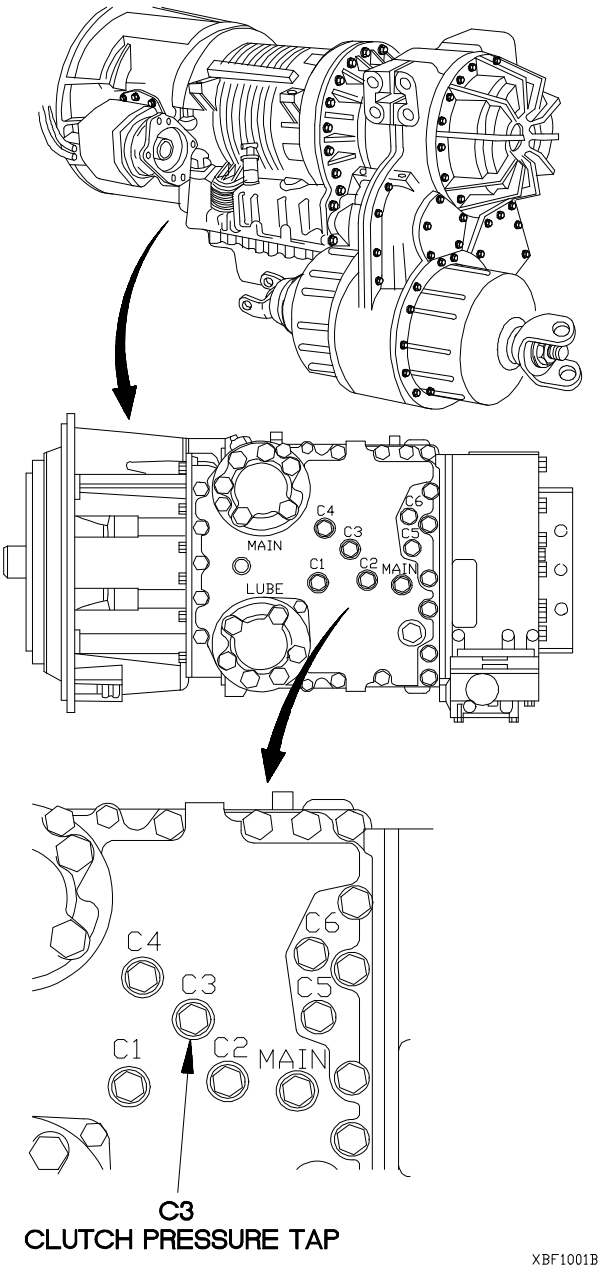
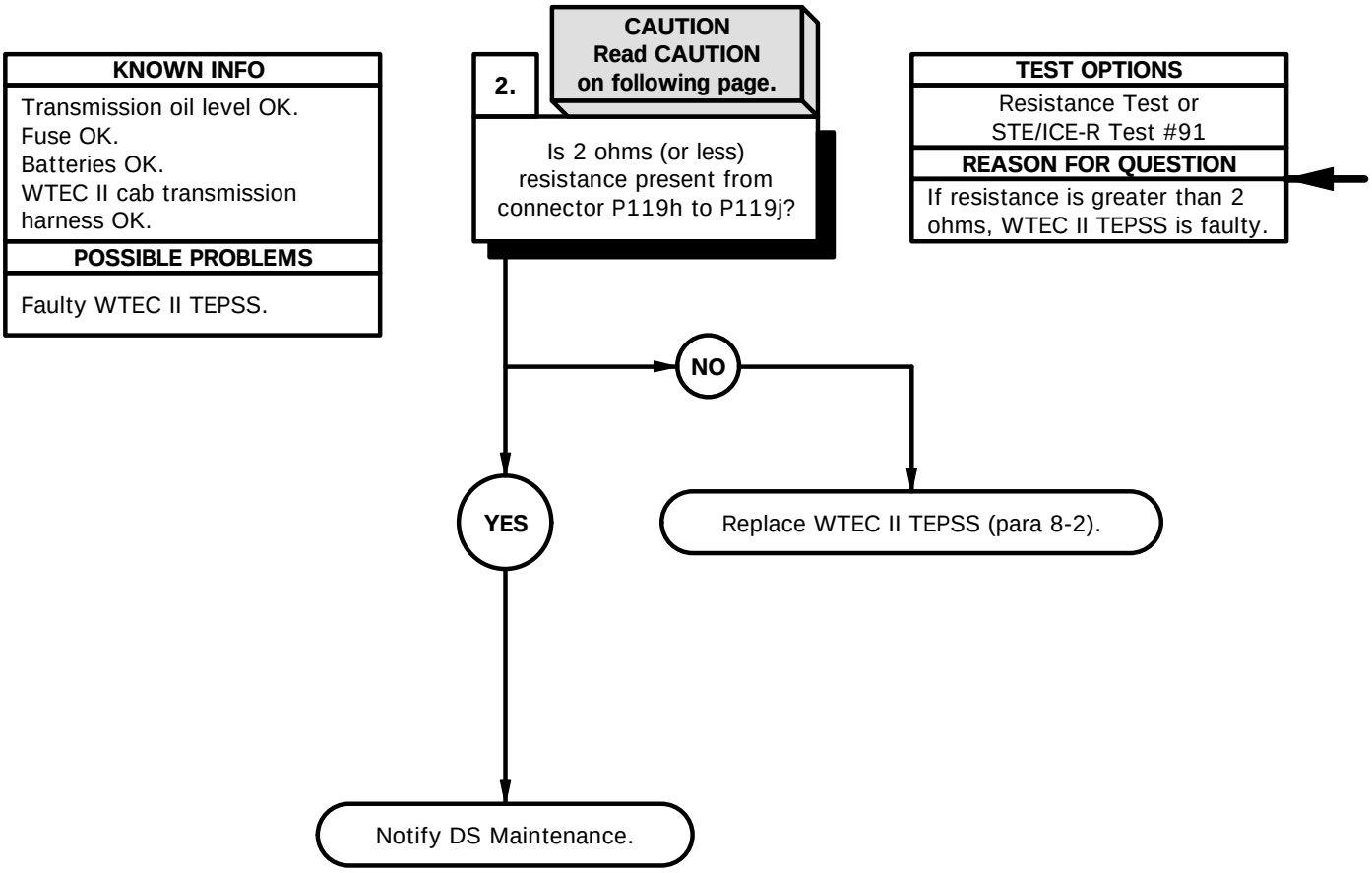


Table 2-24. Sub Code Range

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 (CONT)



CAUTION

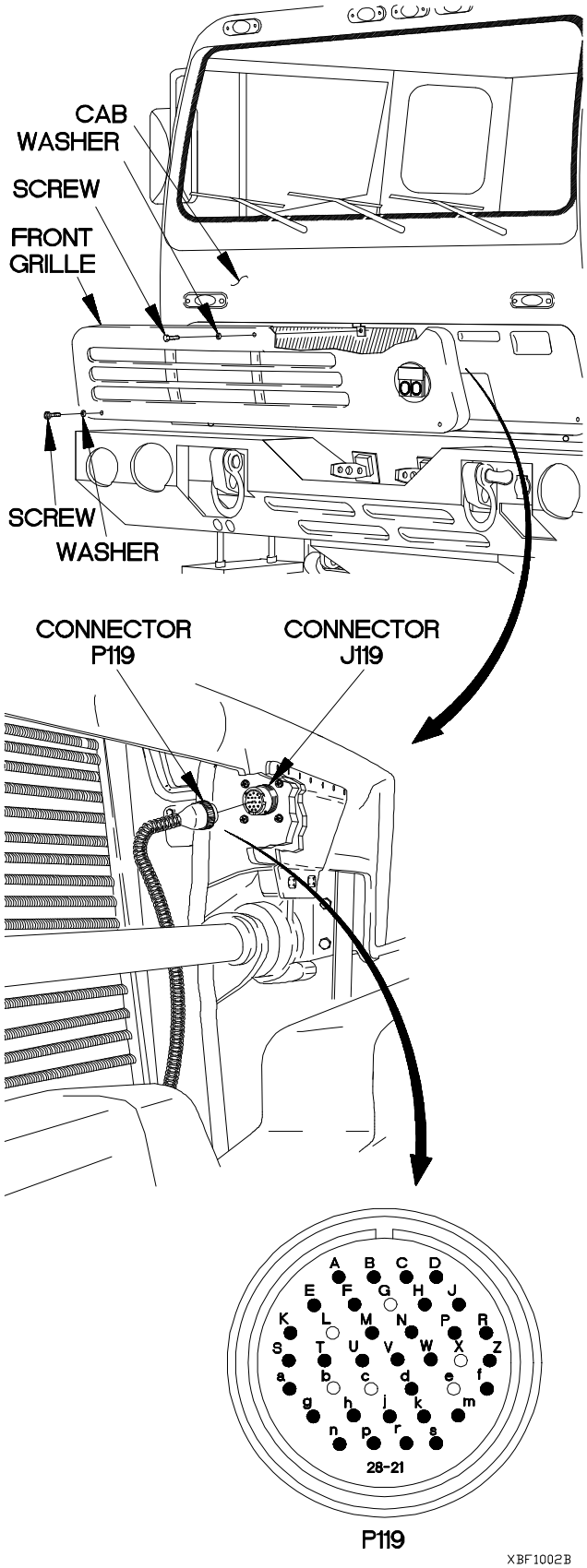
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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 P119h.
(7) Connect negative (-) probe of multimeter to connector 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 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

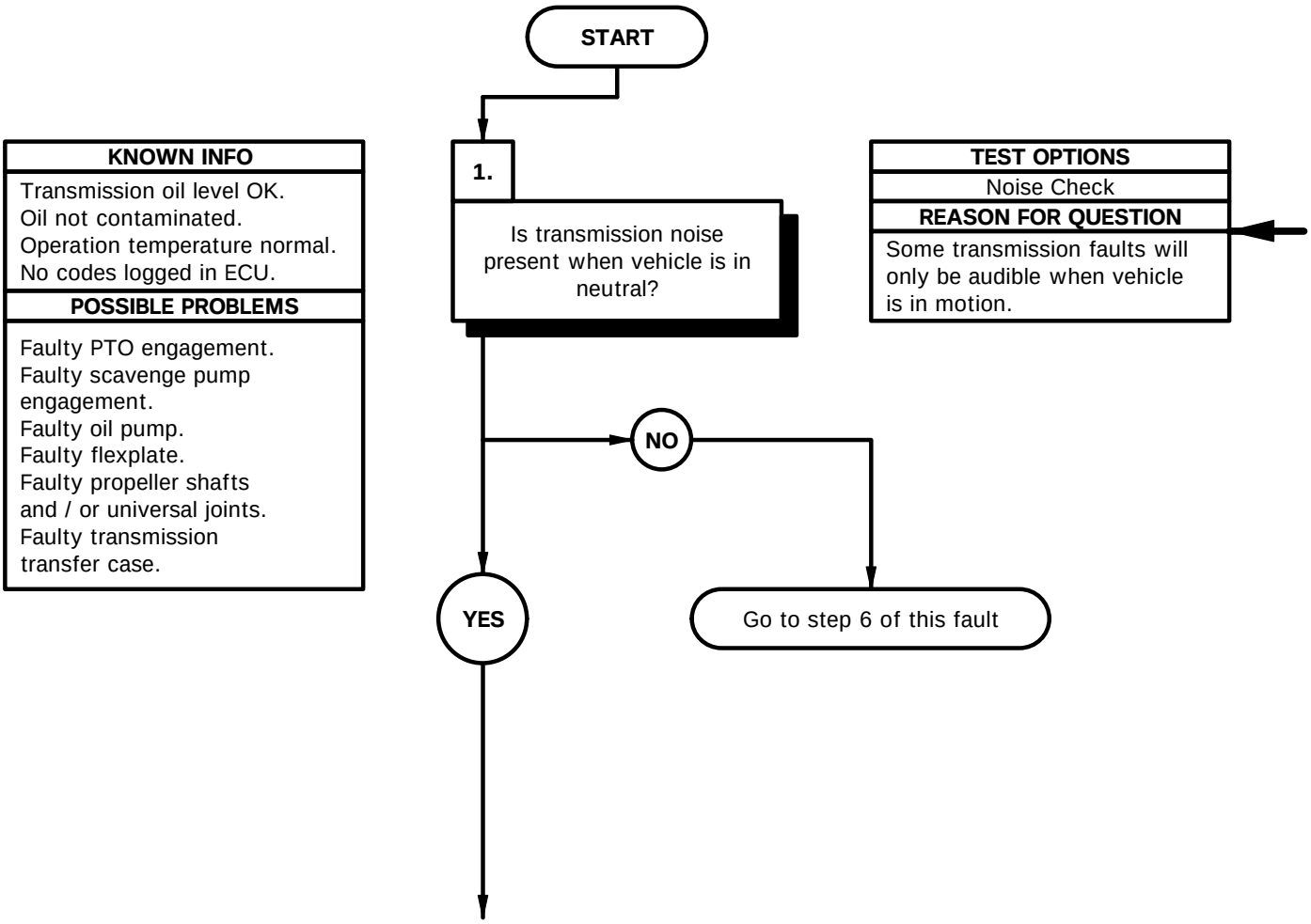
Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Wrench Set, Socket (Item 49, Appendix C)
Wrench, Torque, 0-175 lb ft (Item 57, Appendix C)

Tools and Special Tools
STE/ICE-R (Item 39, 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 25.1, 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

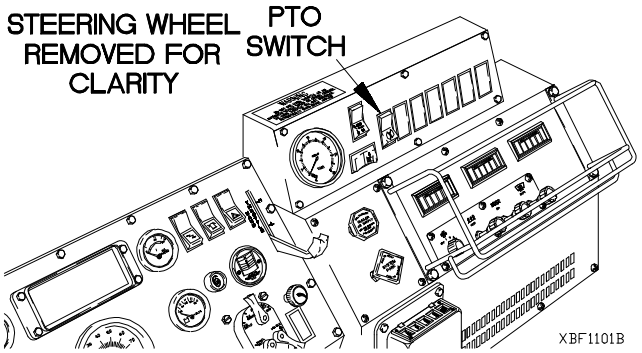
Worn transmission gear teeth and / or scavenge pump gear will cause a noisy transmission.

NO → Notify DS Maintenance.

YES

NOISE CHECK

(1) Engage PTO (TM 9-2320-365-10).
(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 9-2320-365-10).
(5) Shut down engine (TM 9-2320-365-10).



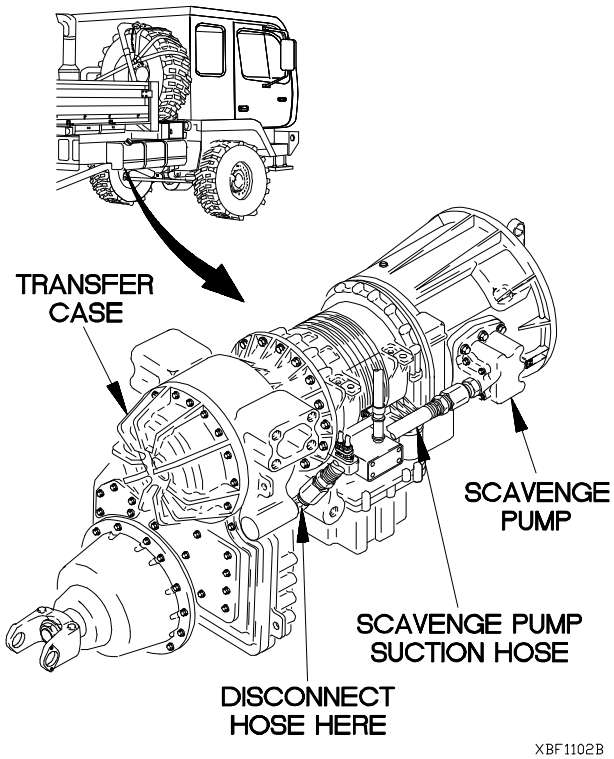
(1) Place drain pan under transfer case.
(2) Disconnect scavenge pump suction hose at transfer case.
(3) Start engine (TM 9-2320-365-10).
(4) If oil drips or runs from fitting on transfer case, scavenge is not picking up oil from transmission transfer case causing it to overflow.
(5) Perform scavenge pump suction test.
(6) Shut down engine (TM 9-2320-365-10).

CAUTION

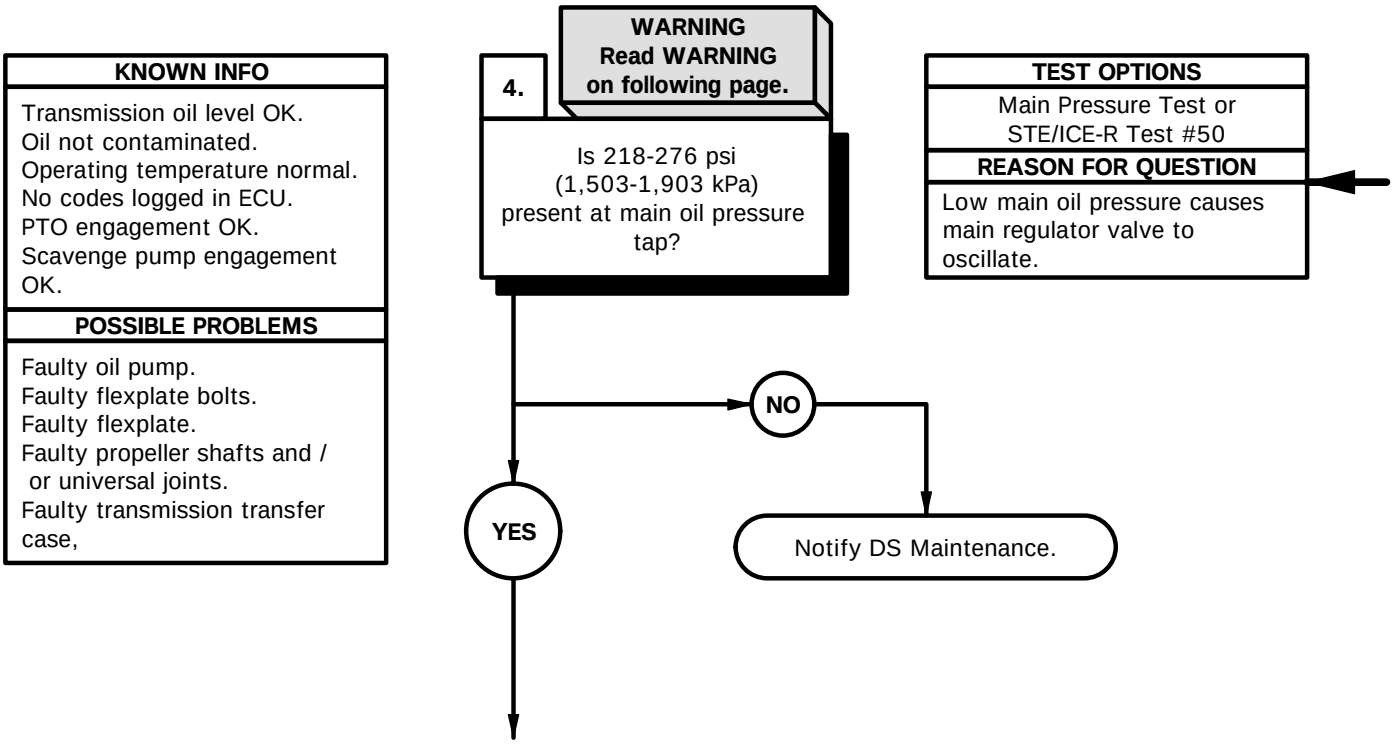
Be sure to shut down engine immediately after test has been completed. Failure to comply may result in damage to transmission.

SCAVENGE PUMP SUCTION TEST

(1) Place end of hose in cup containing approximately one pint of oil.
(2) Start engine (TM 9-2320-365-10).
(3) Select neutral at pushbutton shift selector (TM 9-2320-365-10) and check if oil is immediately sucked into hose by scavenge pump.
(4) Shut down engine (TM 9-2320-365-10).
(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)

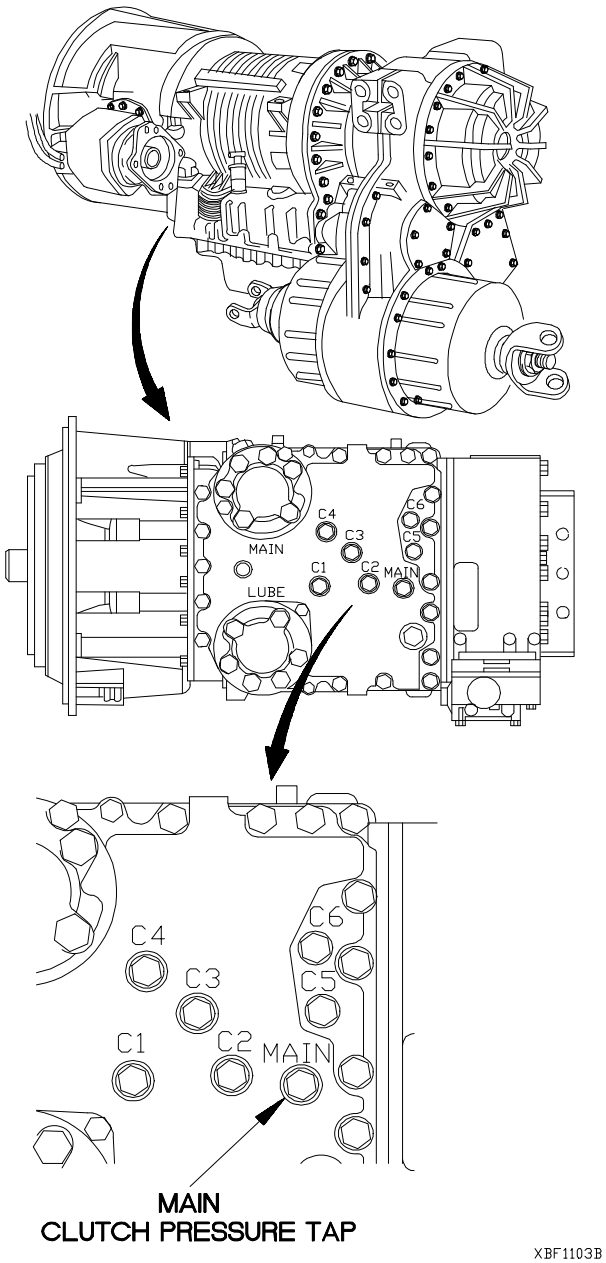


WARNING

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

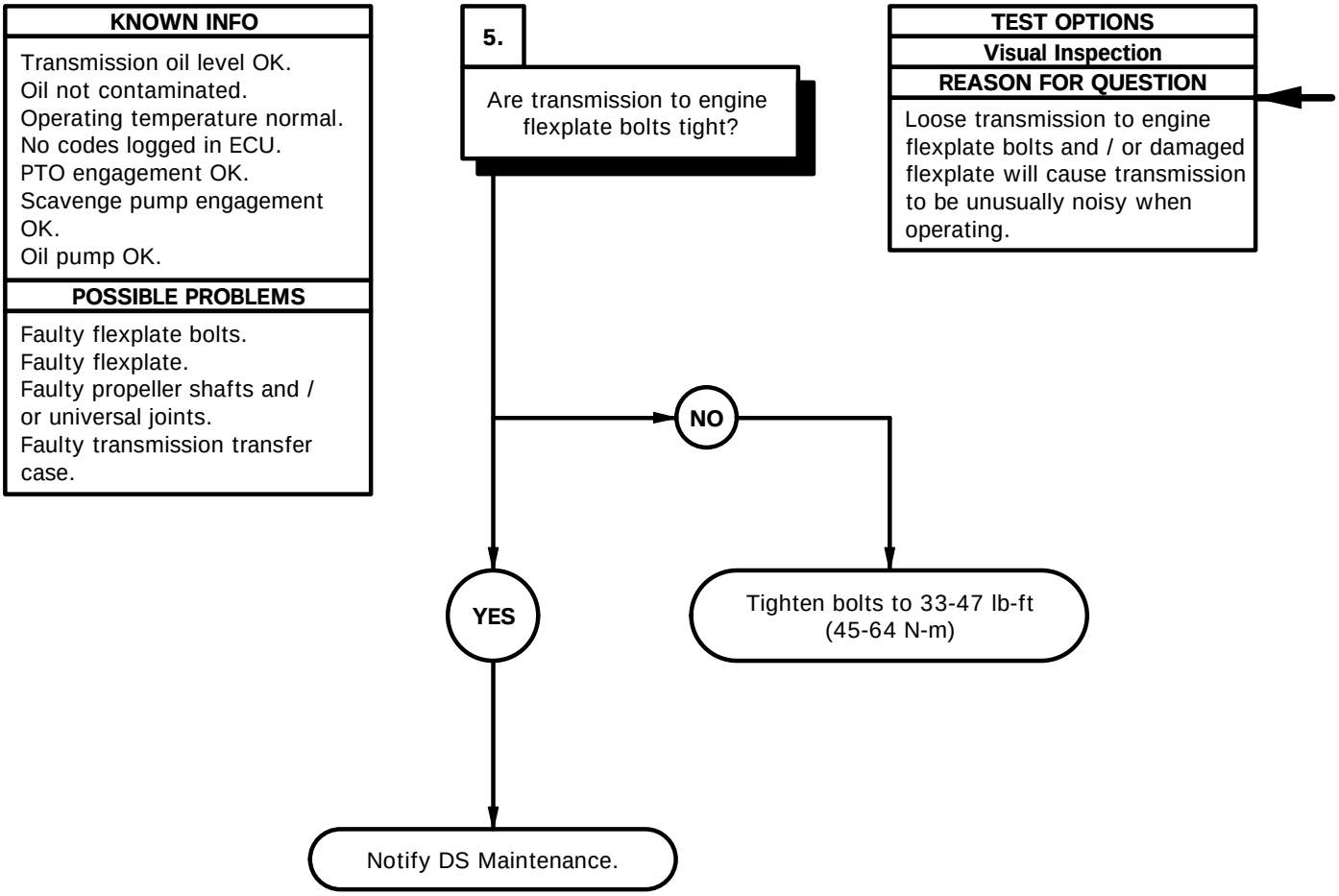
(1) Position drain pan under pressure tap.
(2) Remove main pressure tap plug and preformed packing from control valve module. Discard preformed packing.
(3) Connect tube to boss adapter, hose, and pipe to tube adapter to main pressure tap.
(4) Perform STE/ICE-R Test # 50 (TM 9-4910-571-12&P).
(5) Start engine (TM 9-2320-365-10) 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 9-2320-365-10).
(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.



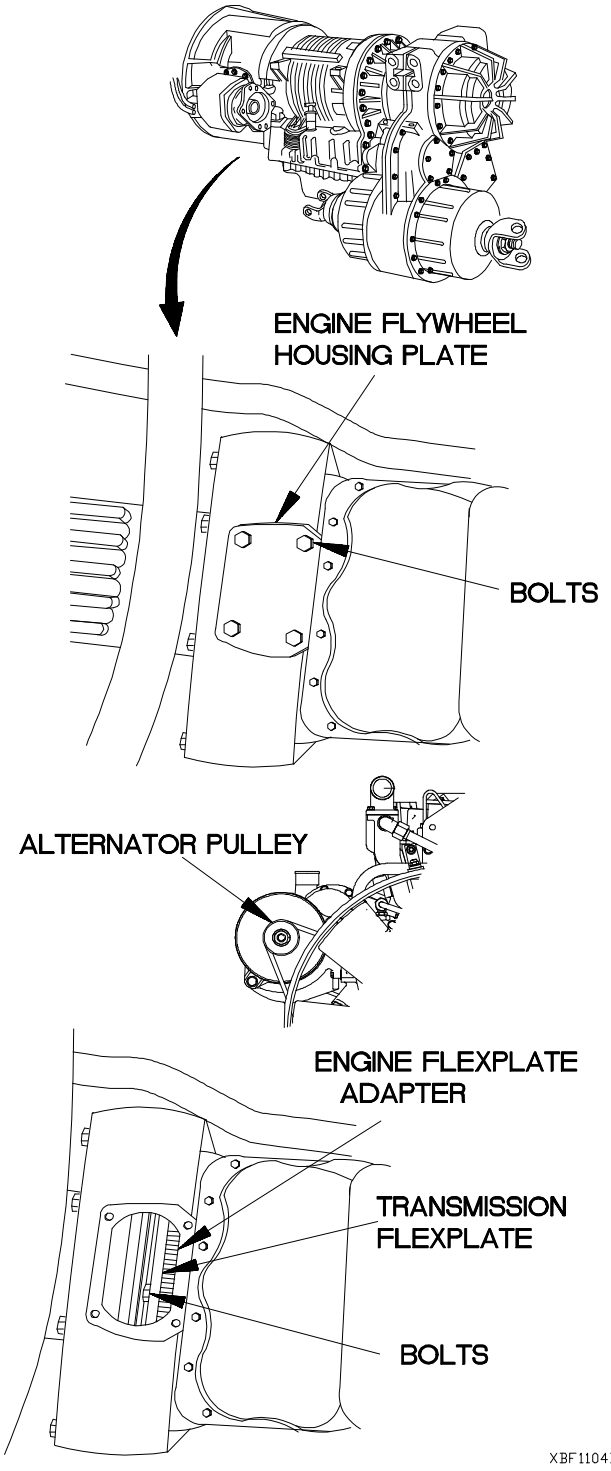
MAIN
CLUTCH PRESSURE TAP

XBF1103B

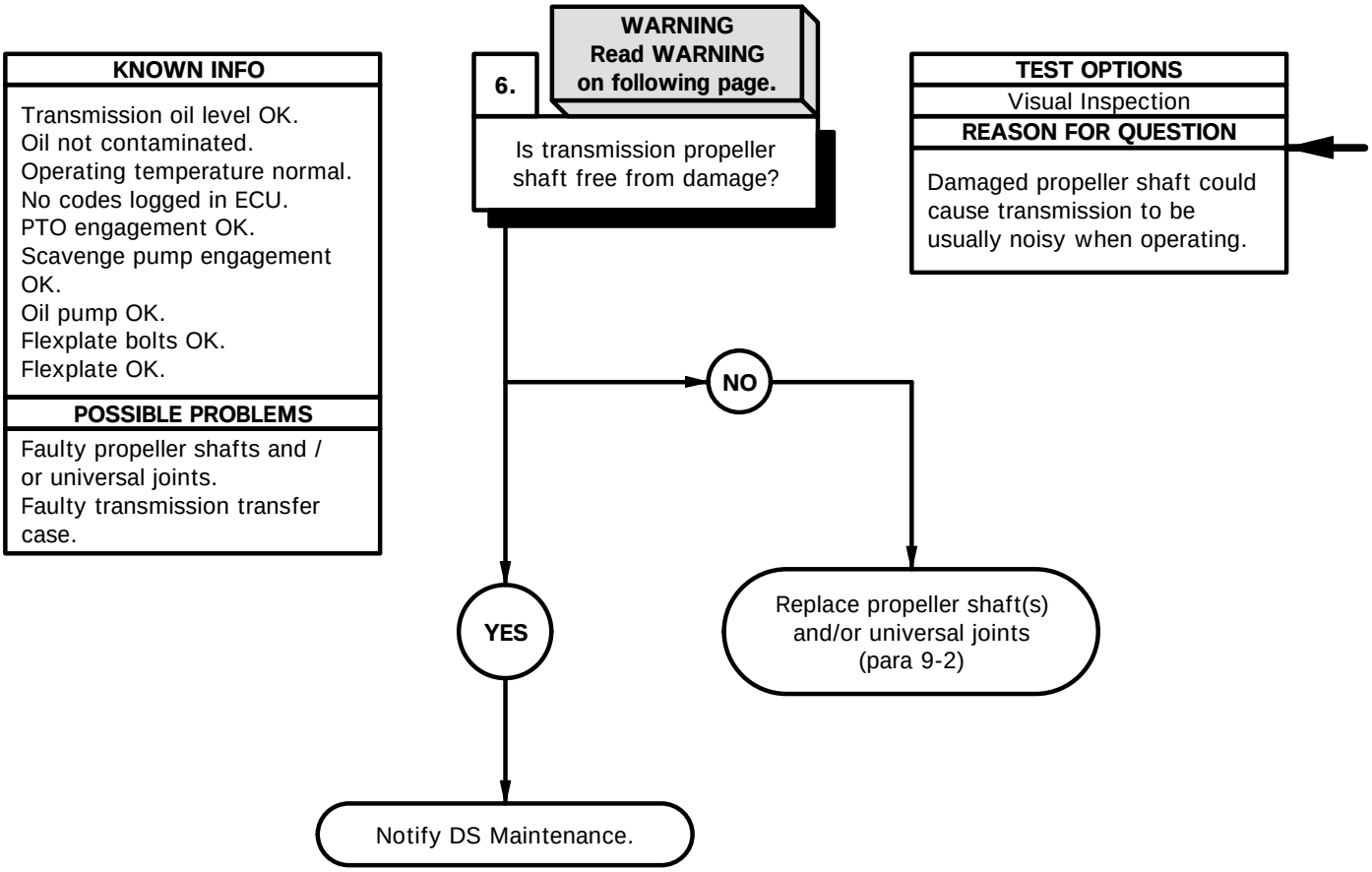
f11. TRANSMISSION UNUSUALLY NOISY WHEN OPERATING (CONT)



(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 flexplace 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.



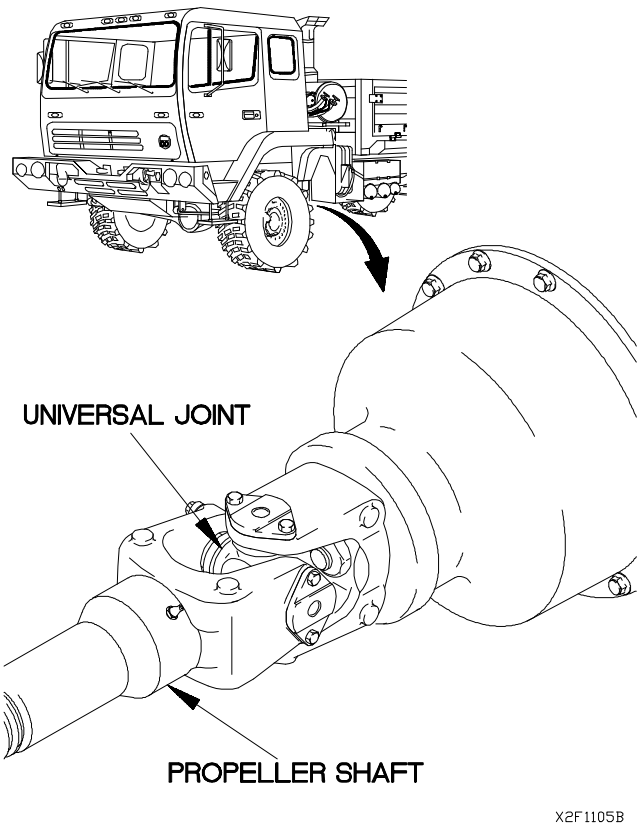
f11. TRANSMISSION UNUSUALLY NOISY WHEN OPERATING (CONT)



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

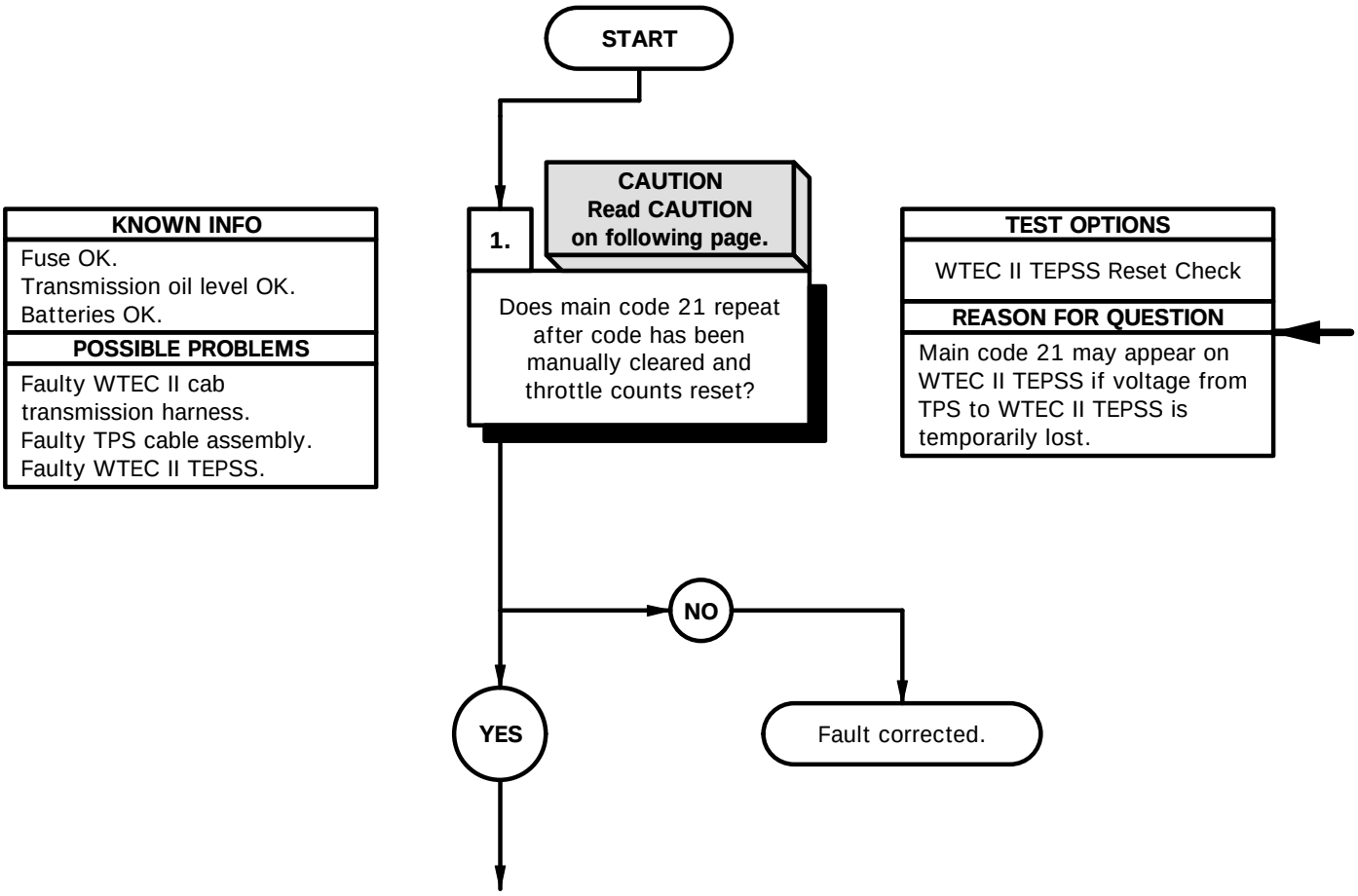
INITIAL SETUP

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.

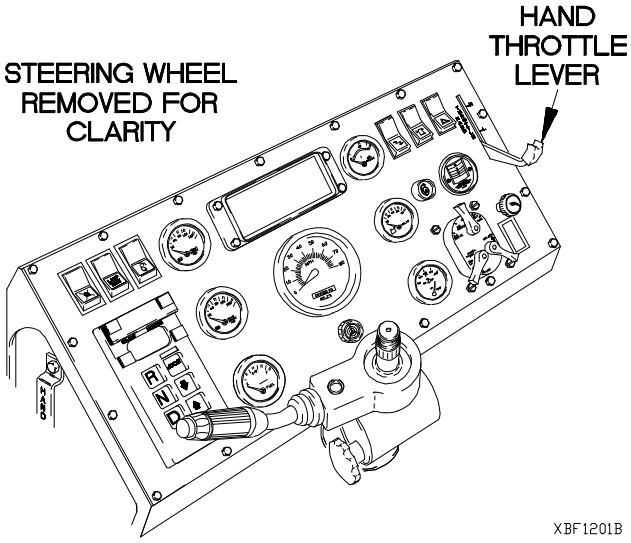
NOTE

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).



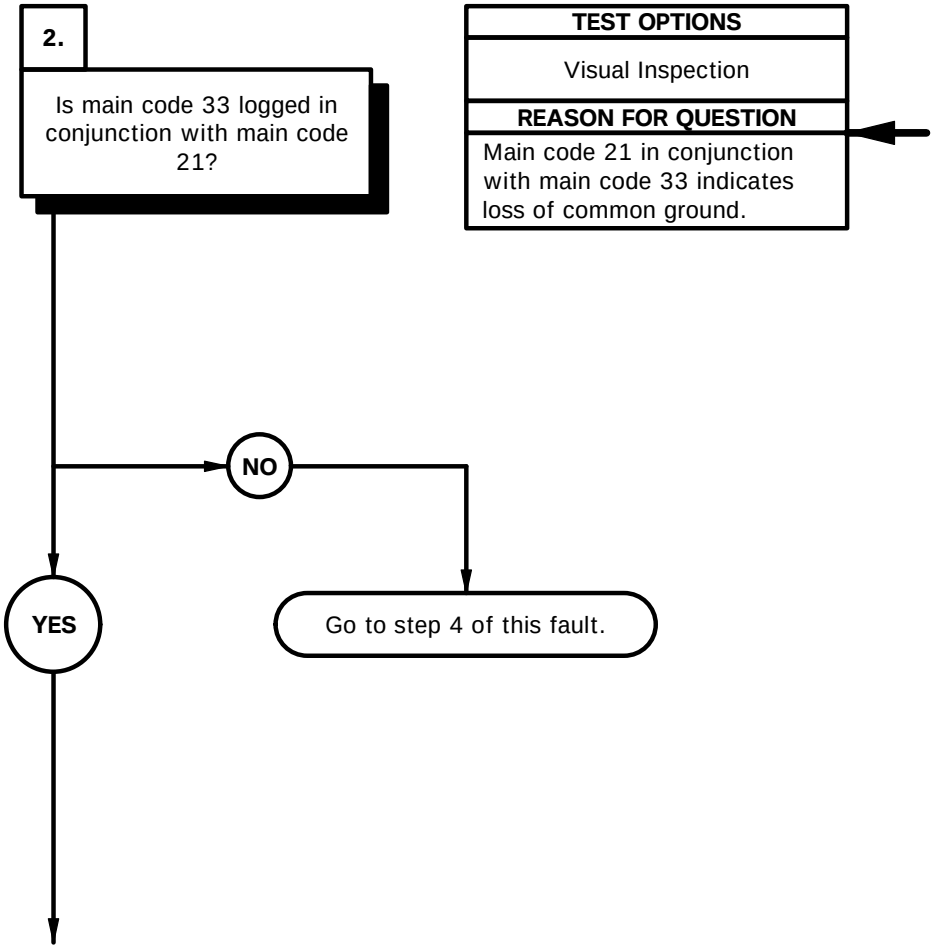
f12. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 21 AND ANY SUB CODE (CONT)

KNOWN INFO

Fuse OK.
Transmission oil level OK.
Batteries OK.

POSSIBLE PROBLEMS

Faulty WTEC II cab transmission harness.
Faulty WTEC II TEPSS.
Faulty TPS cable assembly.



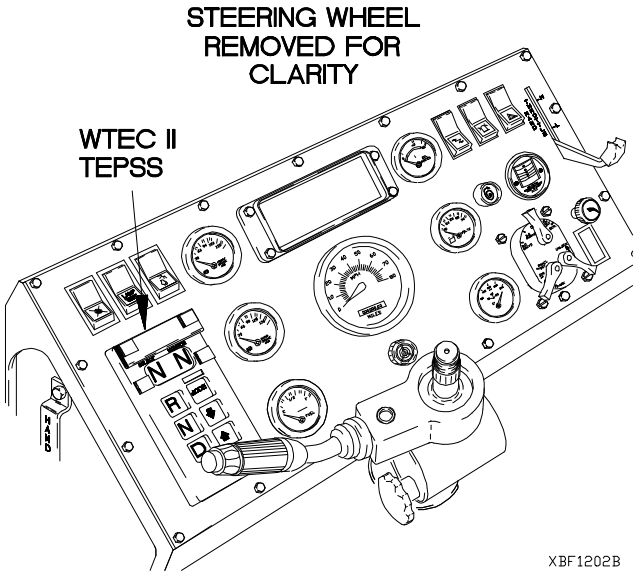
TEST OPTIONS

Visual Inspection

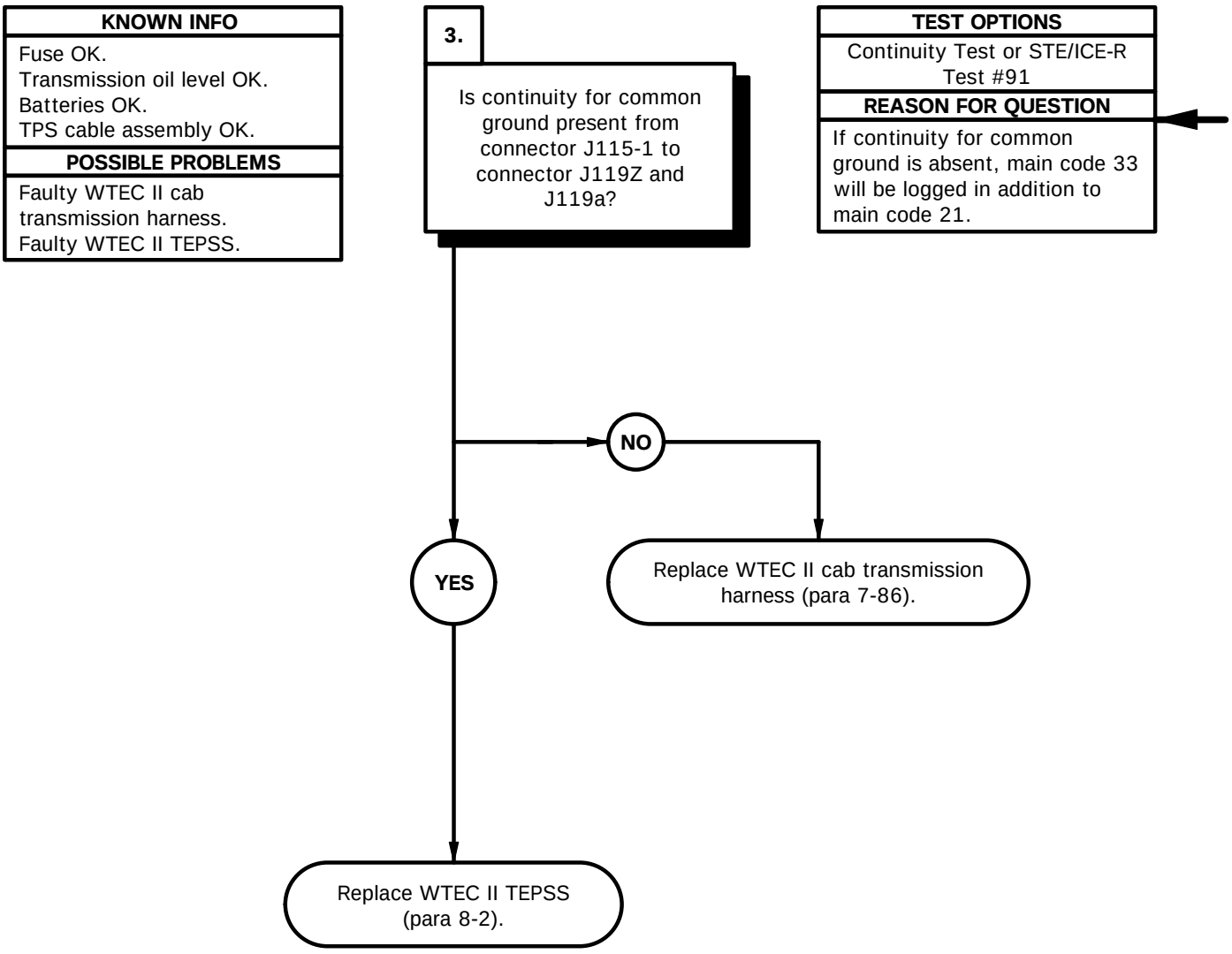
REASON FOR QUESTION

Main code 21 in conjunction with main code 33 indicates loss of common ground.

(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).

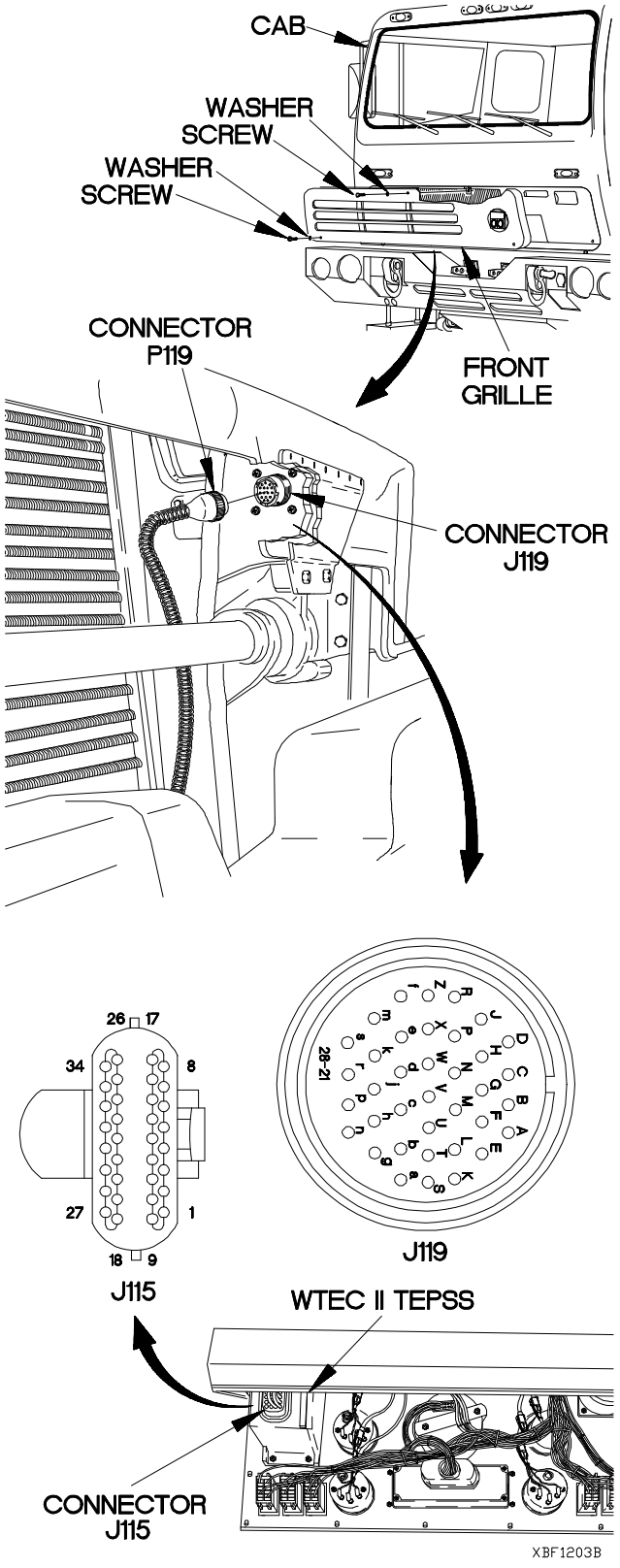


f12. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 21 AND ANY SUB CODE (CONT)

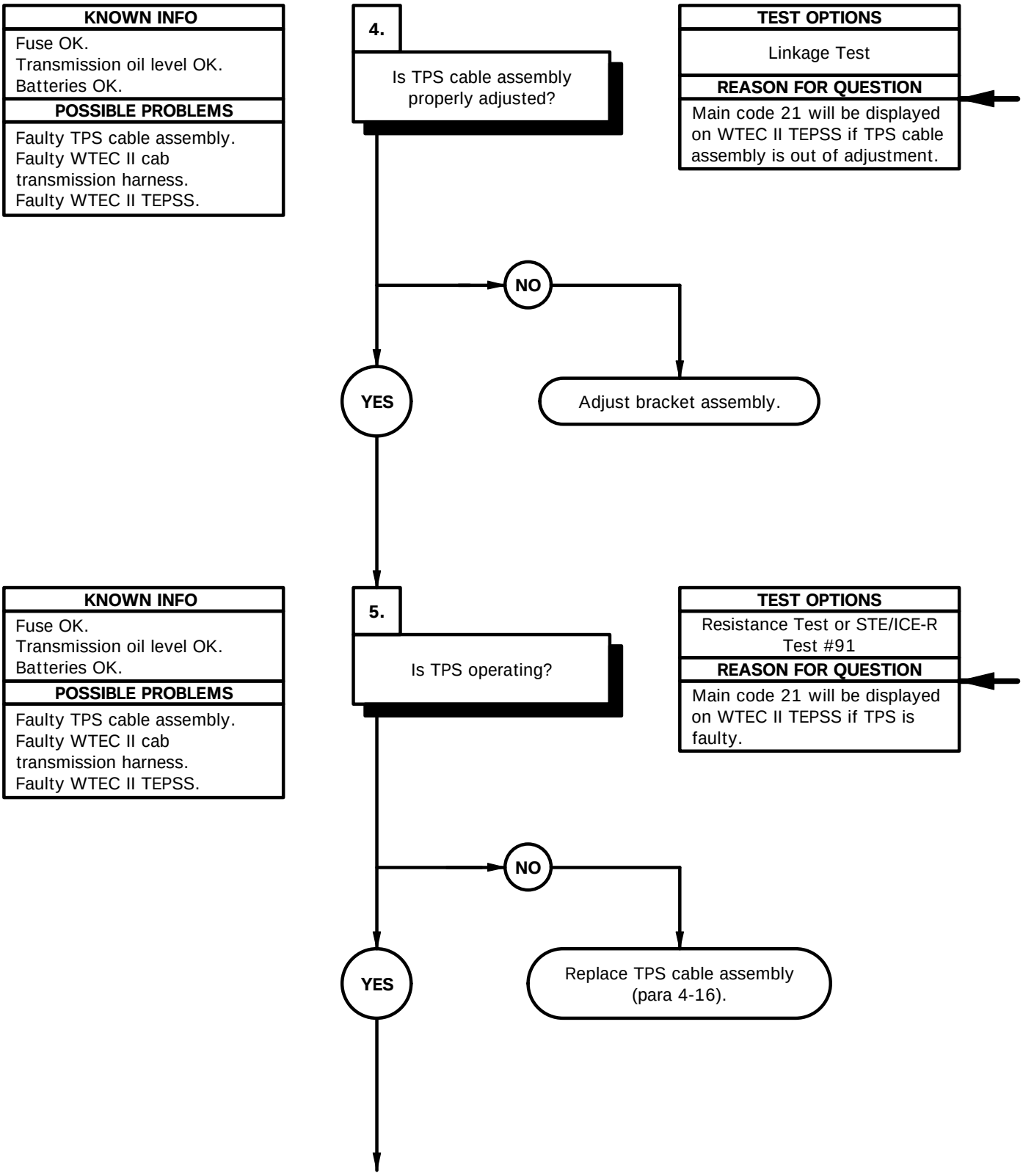


CONTINUITY TEST

(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 7-86).
(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)

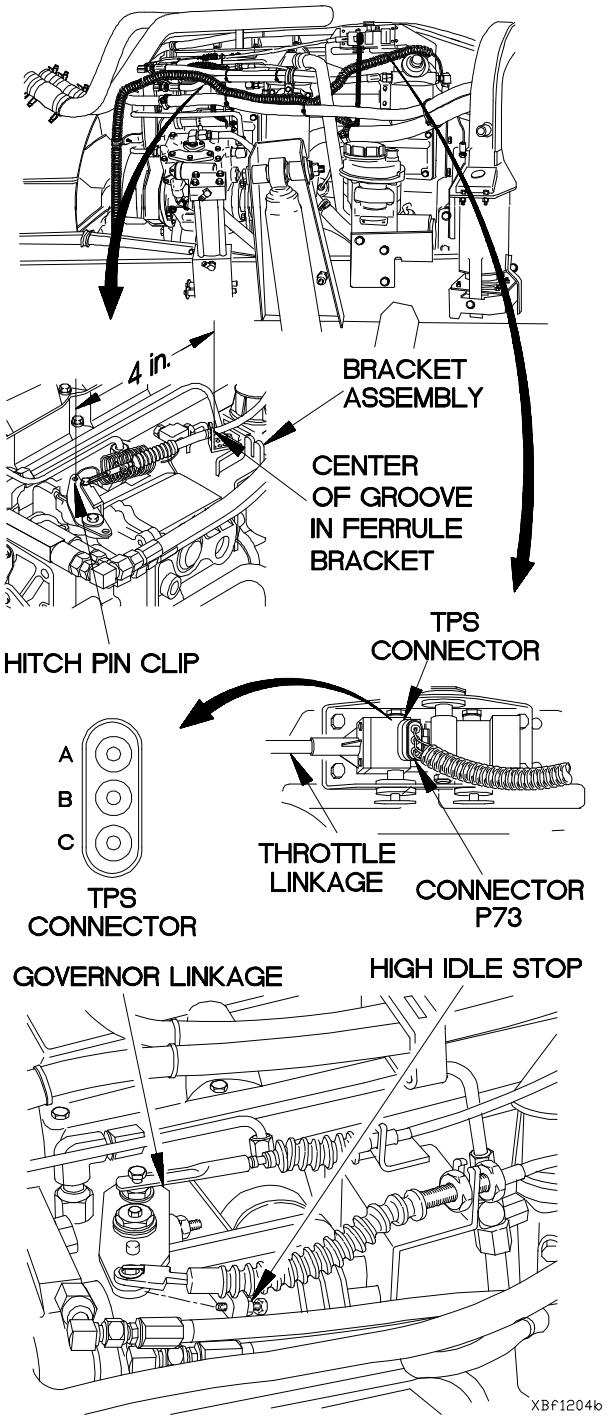


LINKAGE TEST

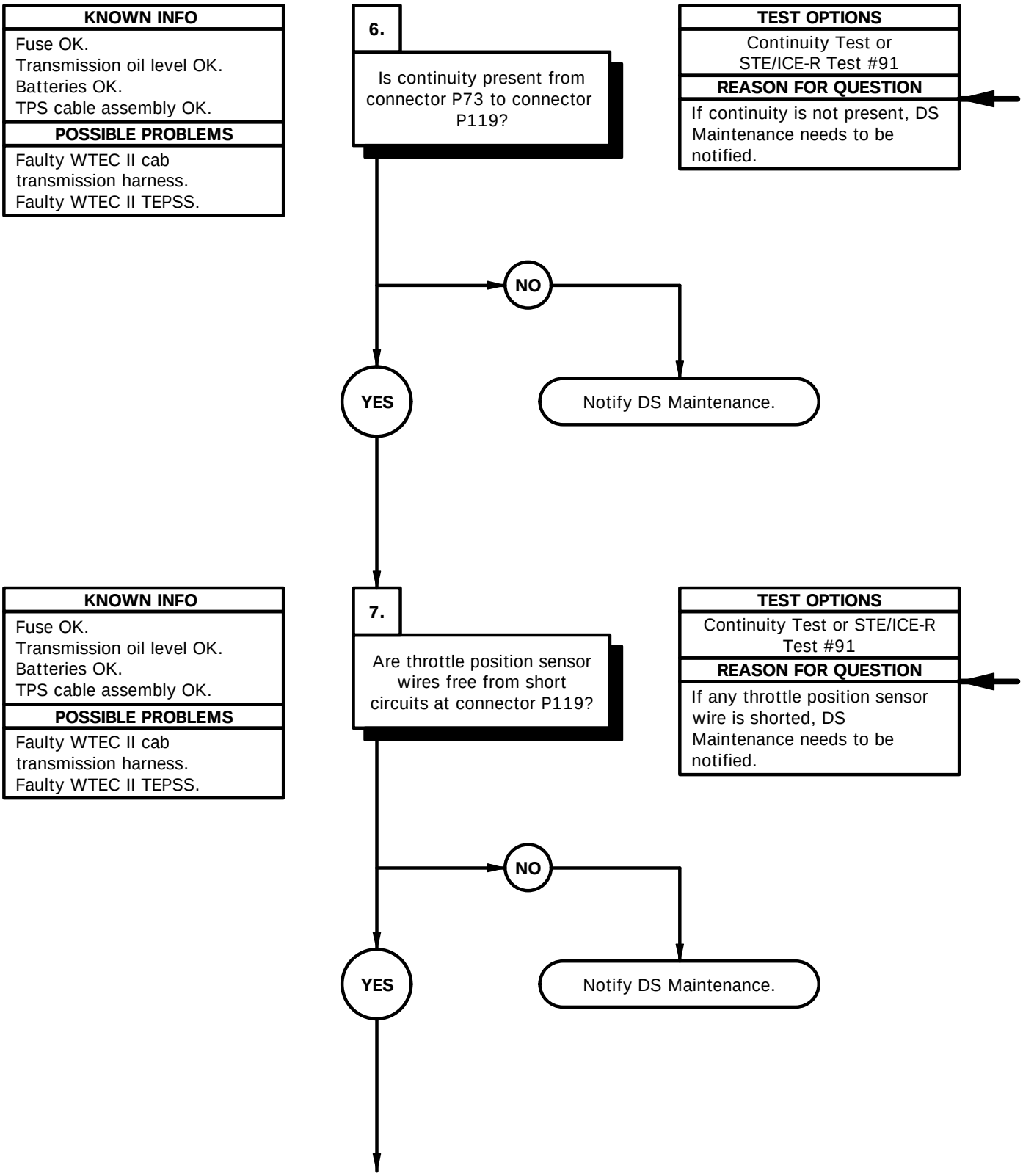
(1) Raise cab (TM 9-2320-365-10).
(2) Verify distance between hitch pin clip on end of sensor rod and center of cable groove in ferrule is 4 in. (10 cm).
(3) If distance is not 4 in. (10 cm), adjust bracket assembly to obtain correct measurement.

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)

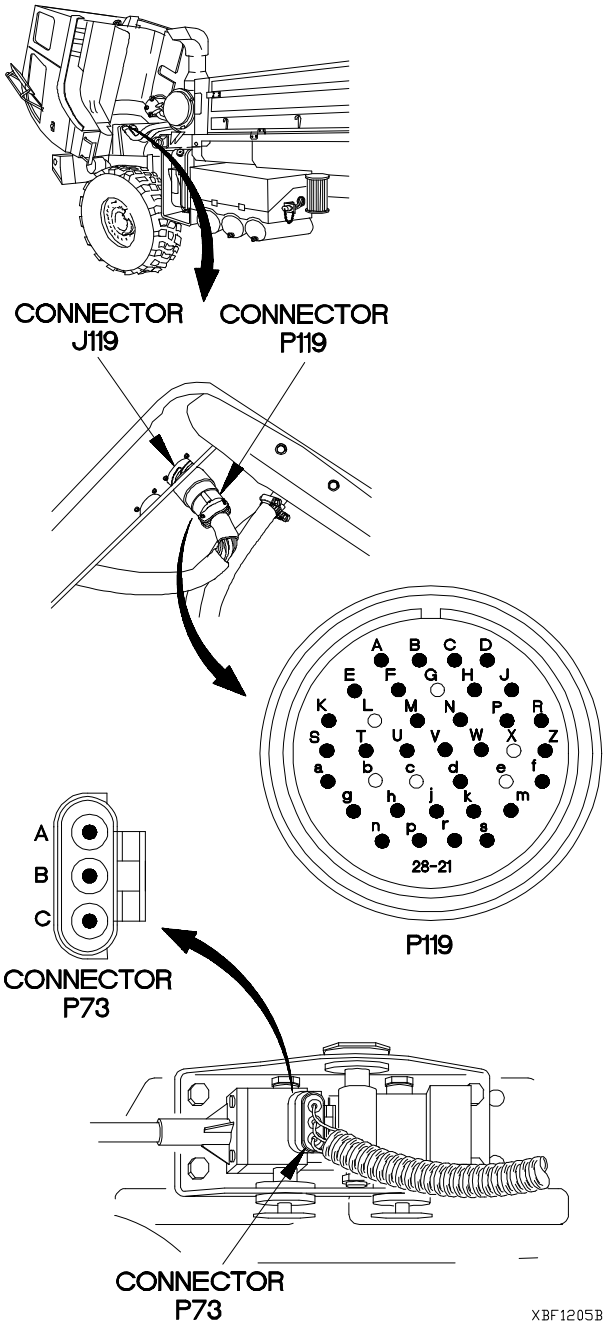


CONTINUITY TEST

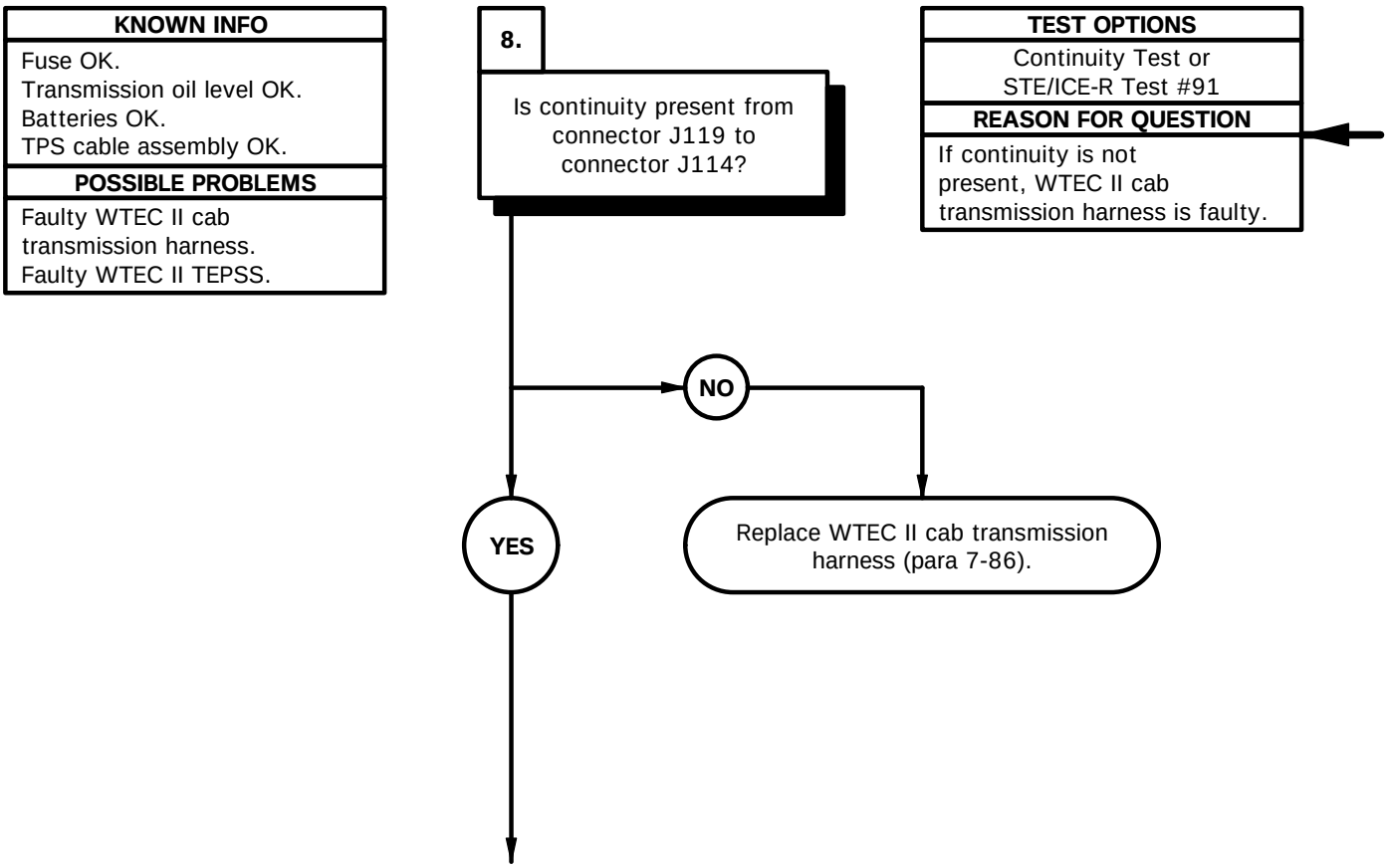
(1) Disconnect connector P119 from connector J119.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector P119R.
(4) Connect negative (-) probe of multimeter to connector P73 pin C and note reading on multimeter.
(5) Connect positive (+) probe of multimeter to connector 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)

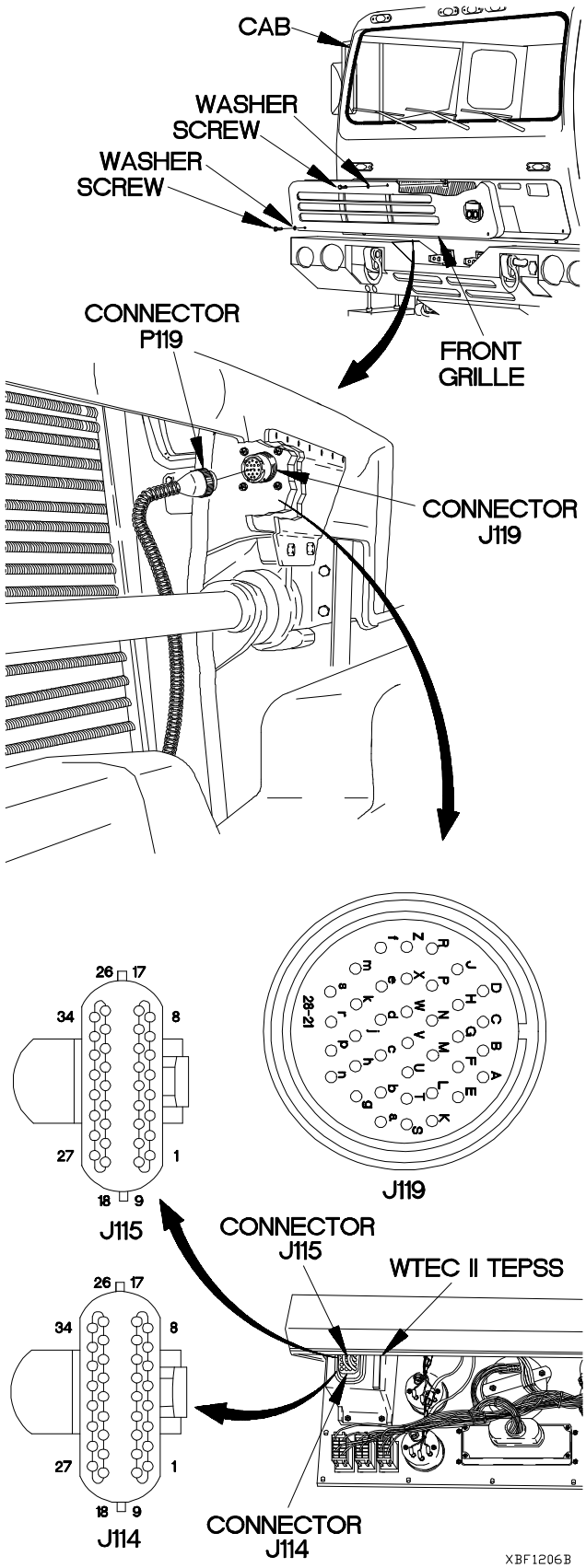


CONTINUITY TEST

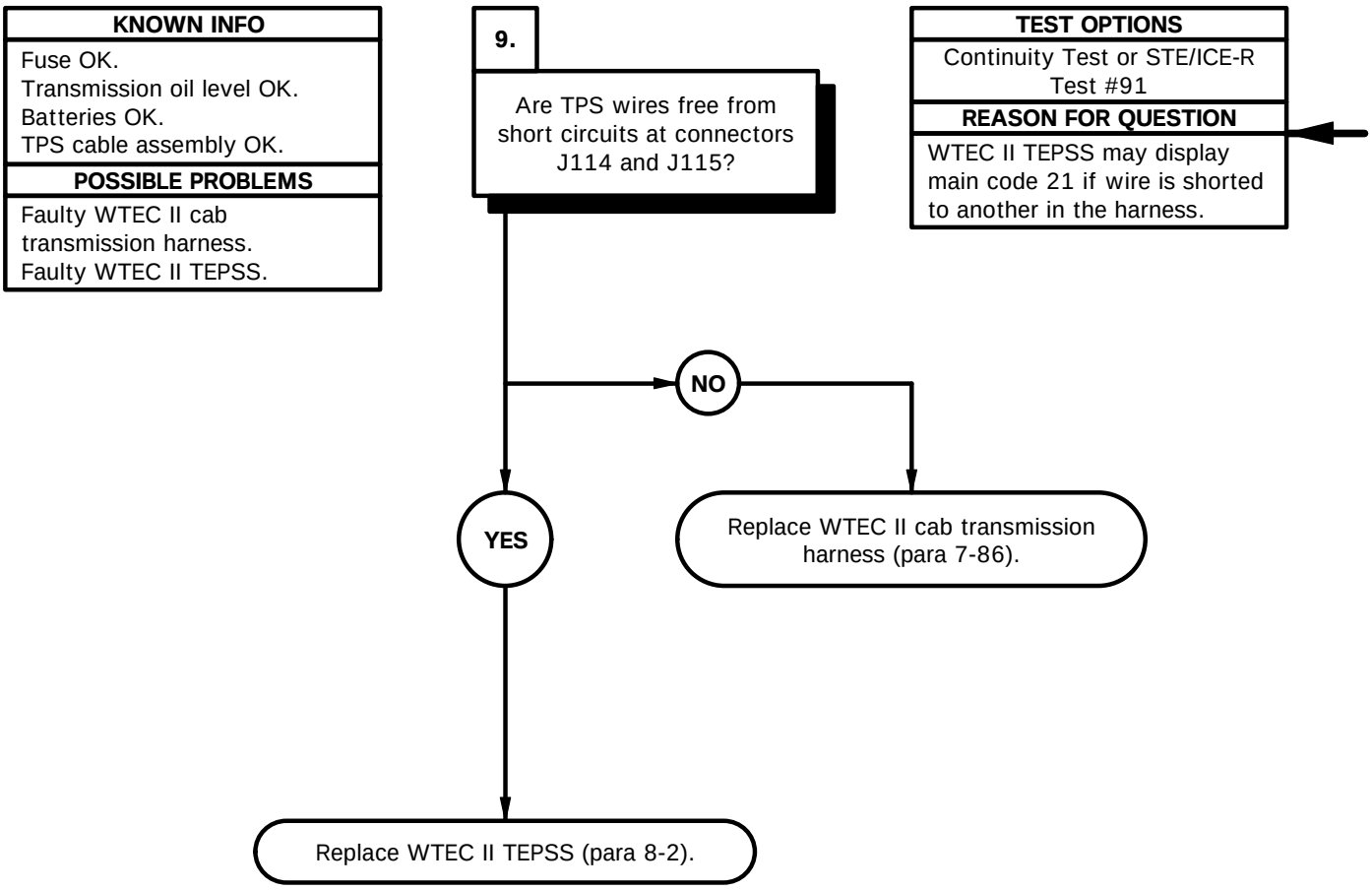
(1) Lower cab (TM 9-2320-365-10).
(2) Remove two screws and washers from front grille.
(3) Remove screw and washer from front grille.
(4) Remove front grille from cab.
(5) Remove instrument panel assembly for access (para 7-15).
(6) Disconnect connector J114 (bottom connector) at WTEC II TEPSS.
(7) Set multimeter to ohms.
(8) For each line of Table 2-25. 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 2-25. WTEC II Cab Transmission Harness Continuity Check, replace WTEC II cab transmission harness (para 7-86).
(10) Remove jumper wire from connector J119.

Table 2-25. 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

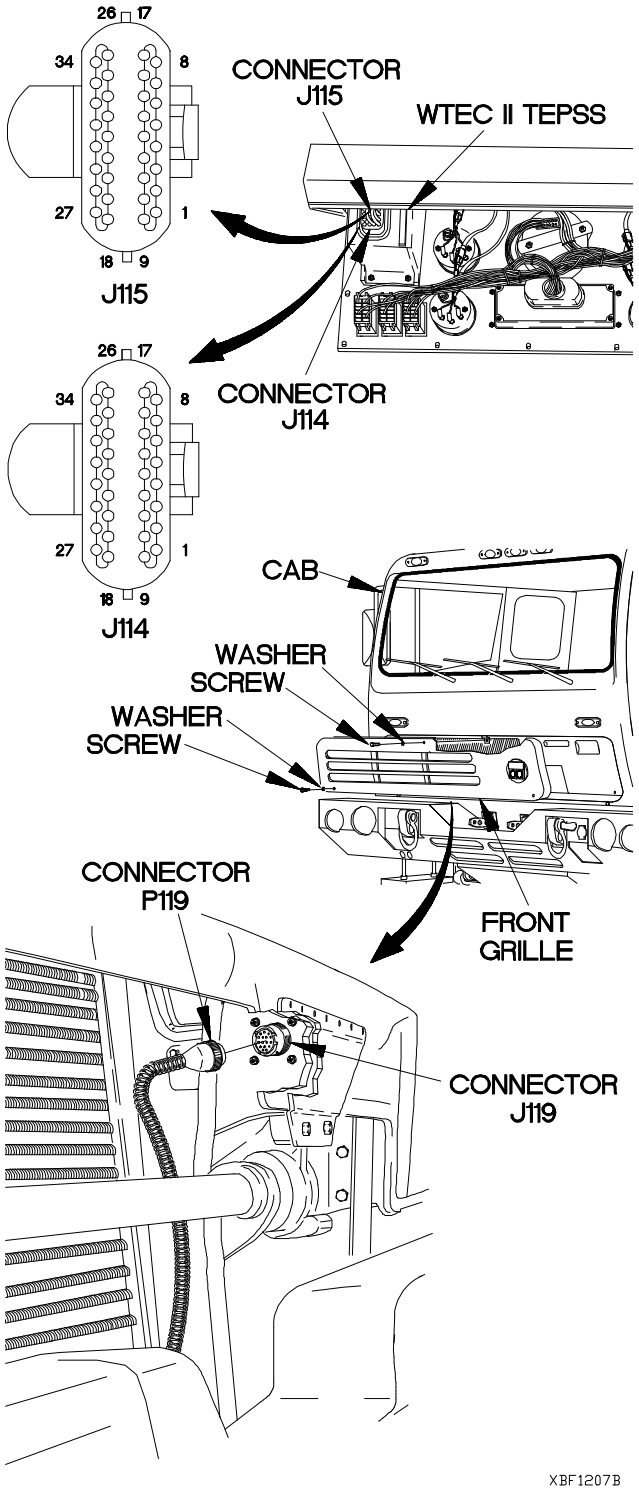


f12. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 21 AND ANY SUB CODE (CONT)



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 7-86).
(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

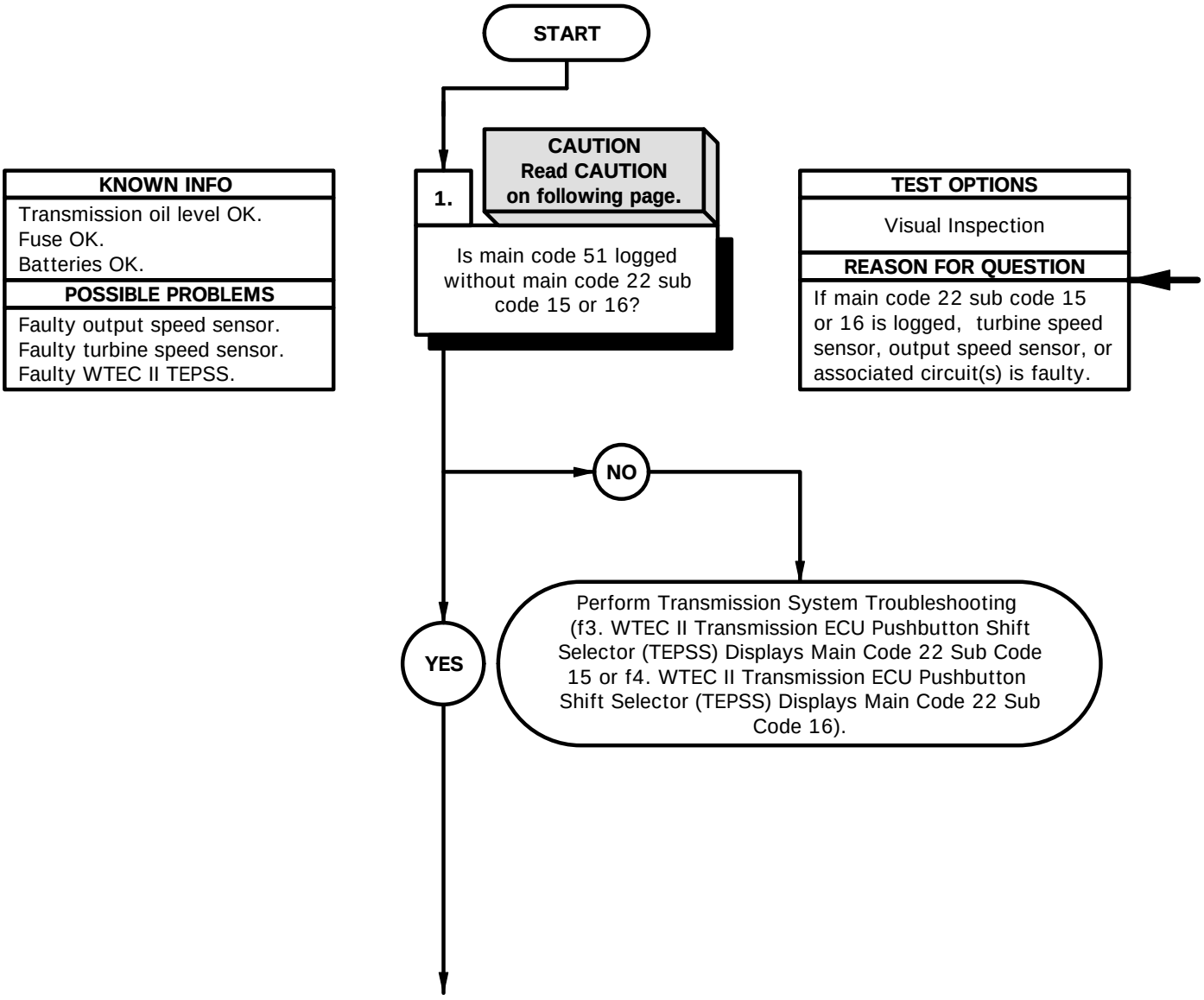
Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Pan, Drain (Item 24, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Wrench Set, Socket (Item 49, 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 25.1, Appendix D)

Personnel Required
(2)

Reference
TM 9-4910-571-12&P

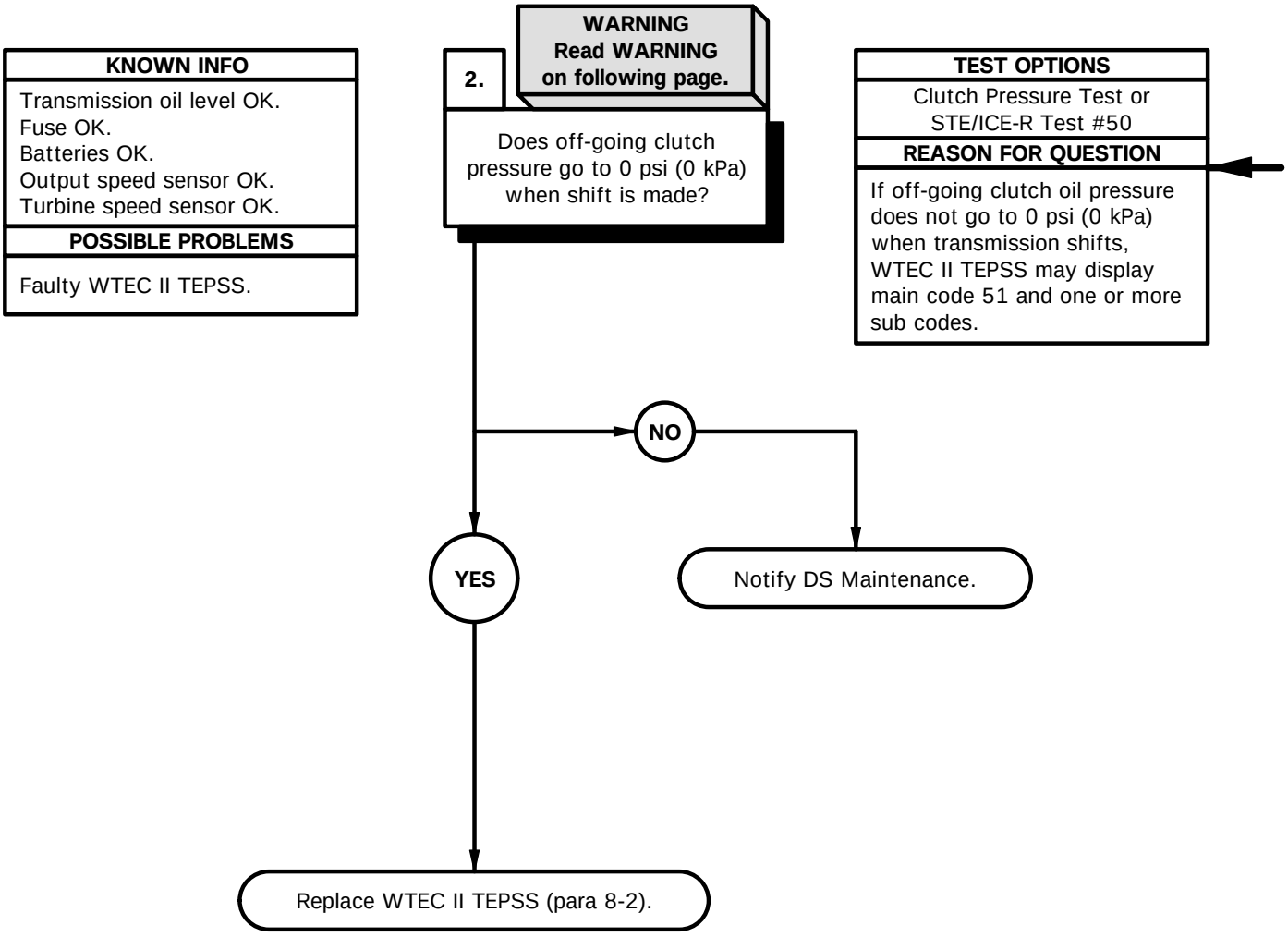


CAUTION

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).

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 rear 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 2-26. Off-Going Clutch Pressure Tap. Discard preformed packing.
(4) Connect tube to boss adapter, hose, and pipe to tube adapter to clutch presure tap.
(5) Perform STE/ICE-R Test #50 (TM 9-4910-571-12&P).
(6) Start engine (TM 9-2320-365-10) 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 9-2320-365-10).
(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 rear propeller shaft (para 9-2).
(15) Clear diagnostic codes (para 8-4).

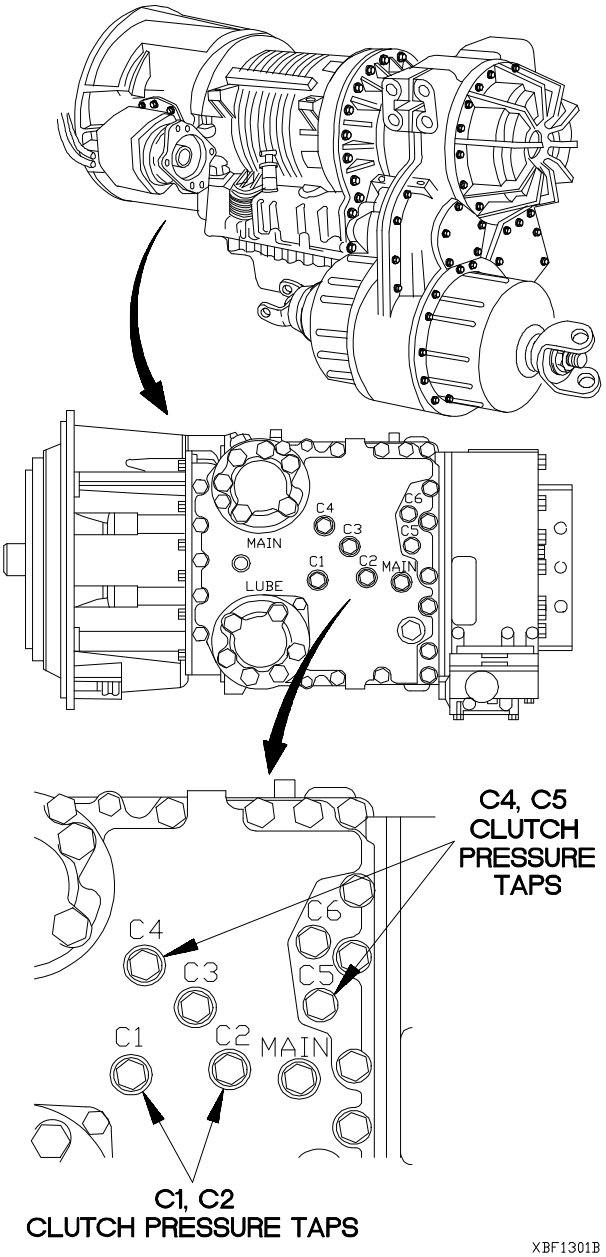


Table 2-26. Off-Going Clutch Pressure Tap

Sub Code	Sub Code Meaning	Off-Going Cluth	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

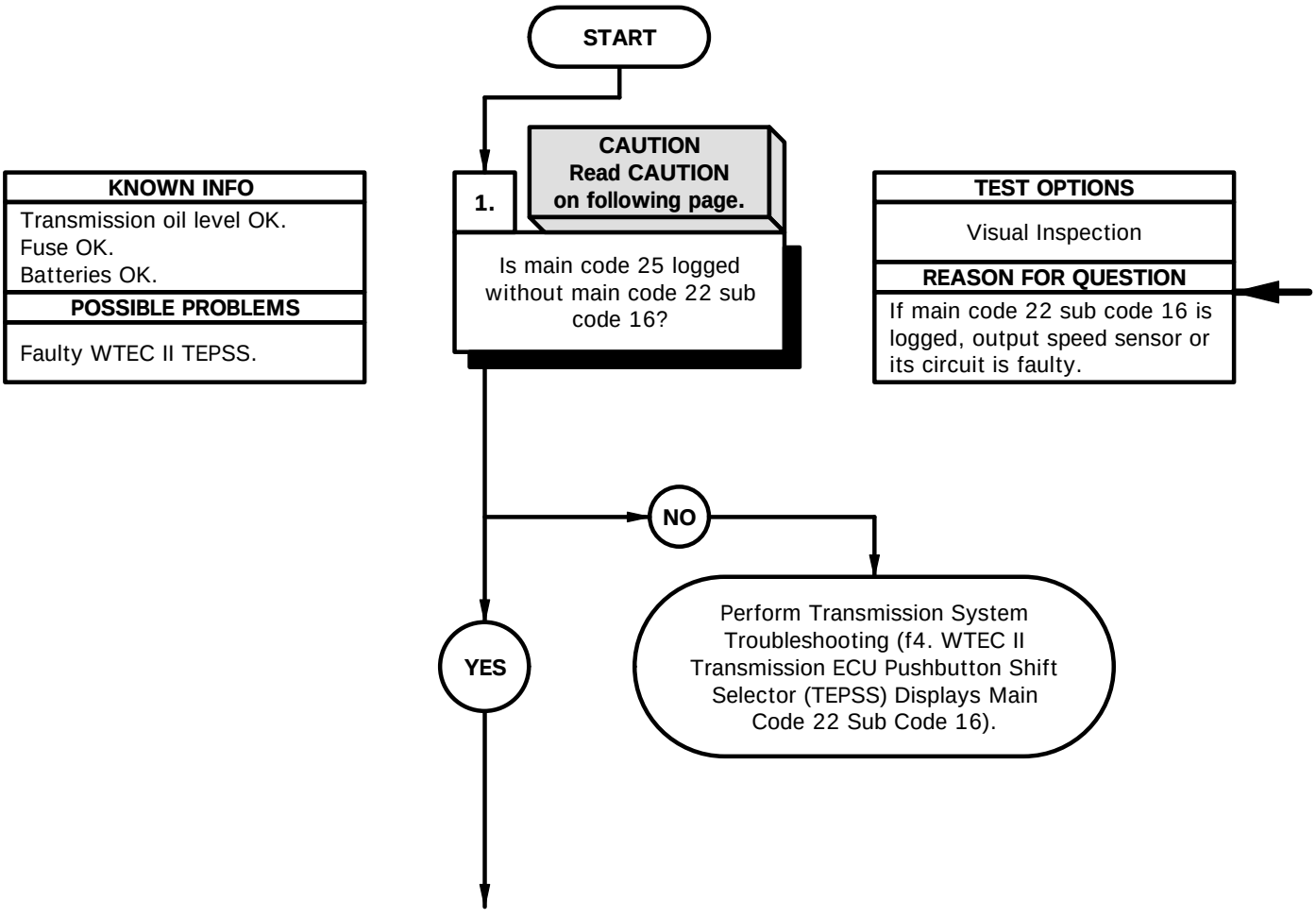
Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Pan, Drain (Item 24, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Wrench Set, Socket (Item 49, Appendix C)

Materials/Parts
Packing, Preformed (Item 199, Appendix G)
Adapter, Straight, Pipe to Tube (Item 1.2, Appandix D)
Adapter, Straight, Tube to Boss (Item 1.3, Appendix D)
Hose Assembly, Nonmetallic (Item 25.1, Appendix D)

Personnel Required
(2)

Reference
TM 9-4910-571-12&P

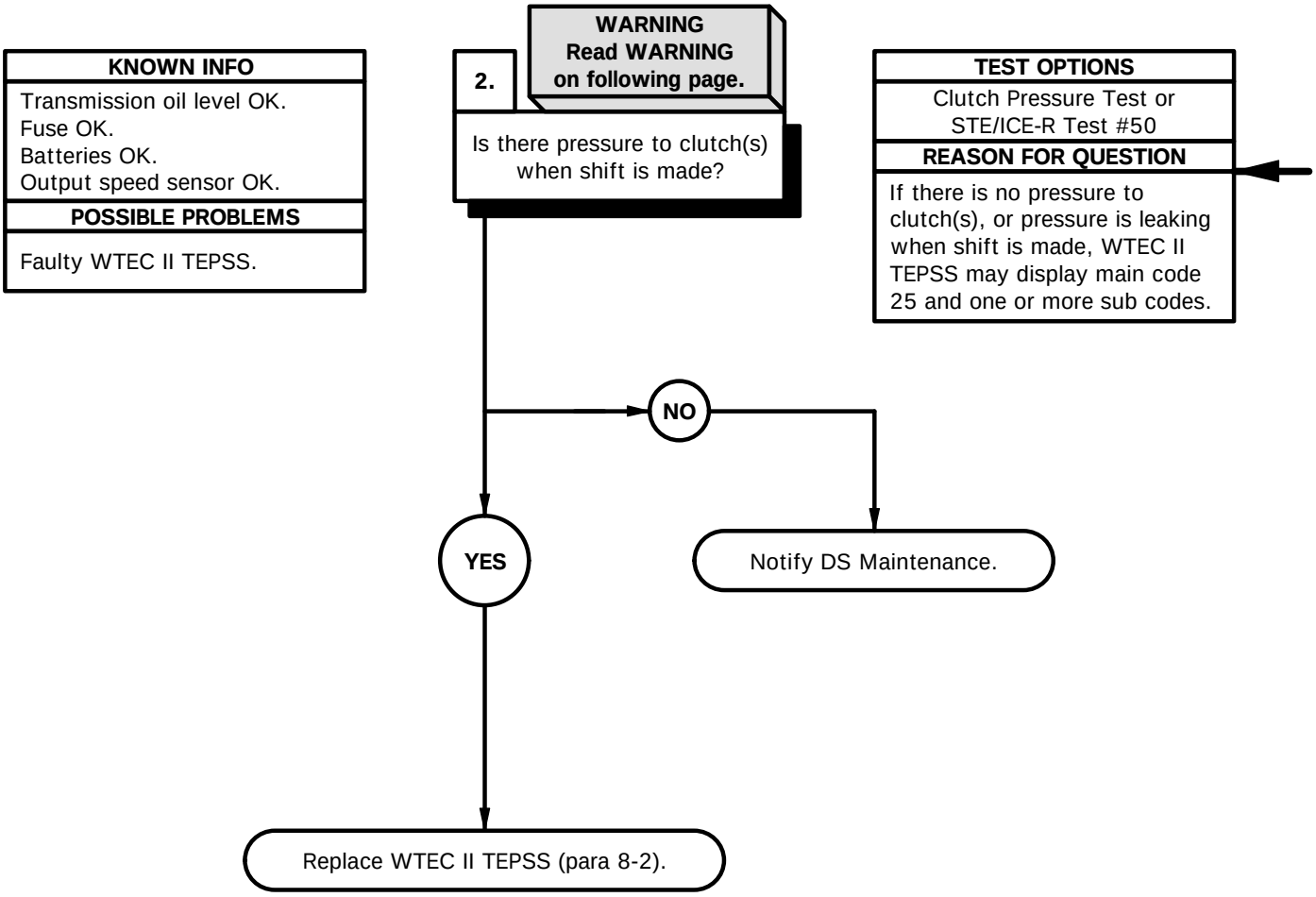


CAUTION

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 rear 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 2-27. 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 9-2320-365-10).
(7) With brake applied, make shift indicated by sub code. Refer to Table 2-27. Clutch Pressure Tap.
(8) Accelerate engine until WTEC II TEPSS displays desired range. Refer to Table 2-27. 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 9-2320-365-10).
(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 rear 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).

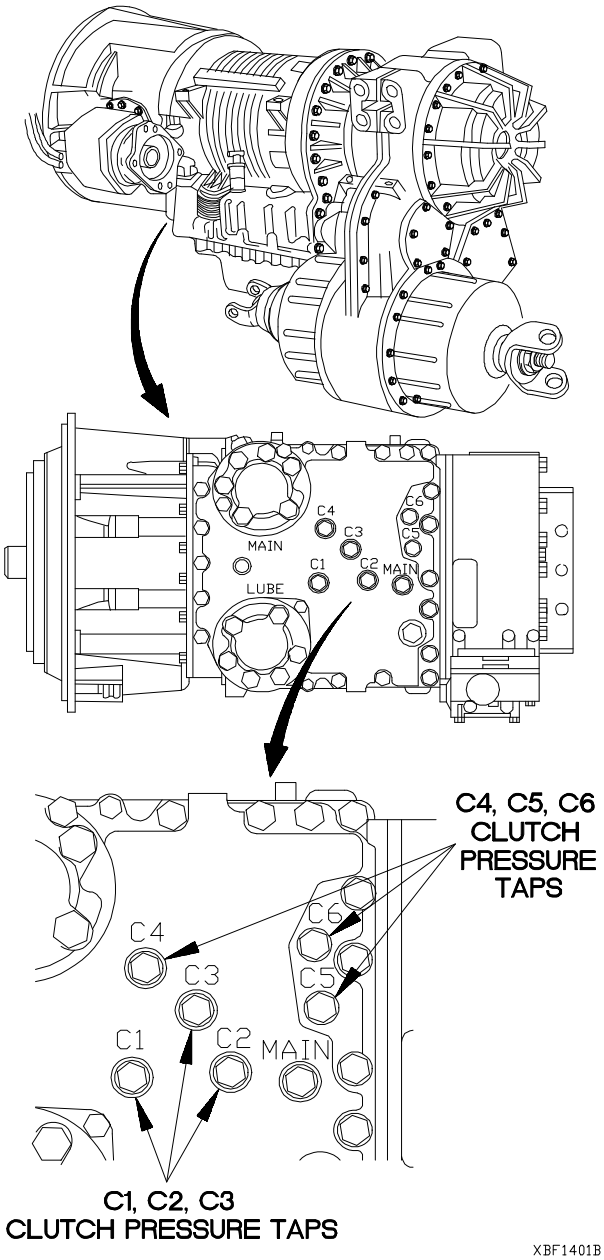


Table 2-27. Clutch Pressure Tap

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)

f15. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 53 AND ANY SUB CODE

INITIAL SETUP

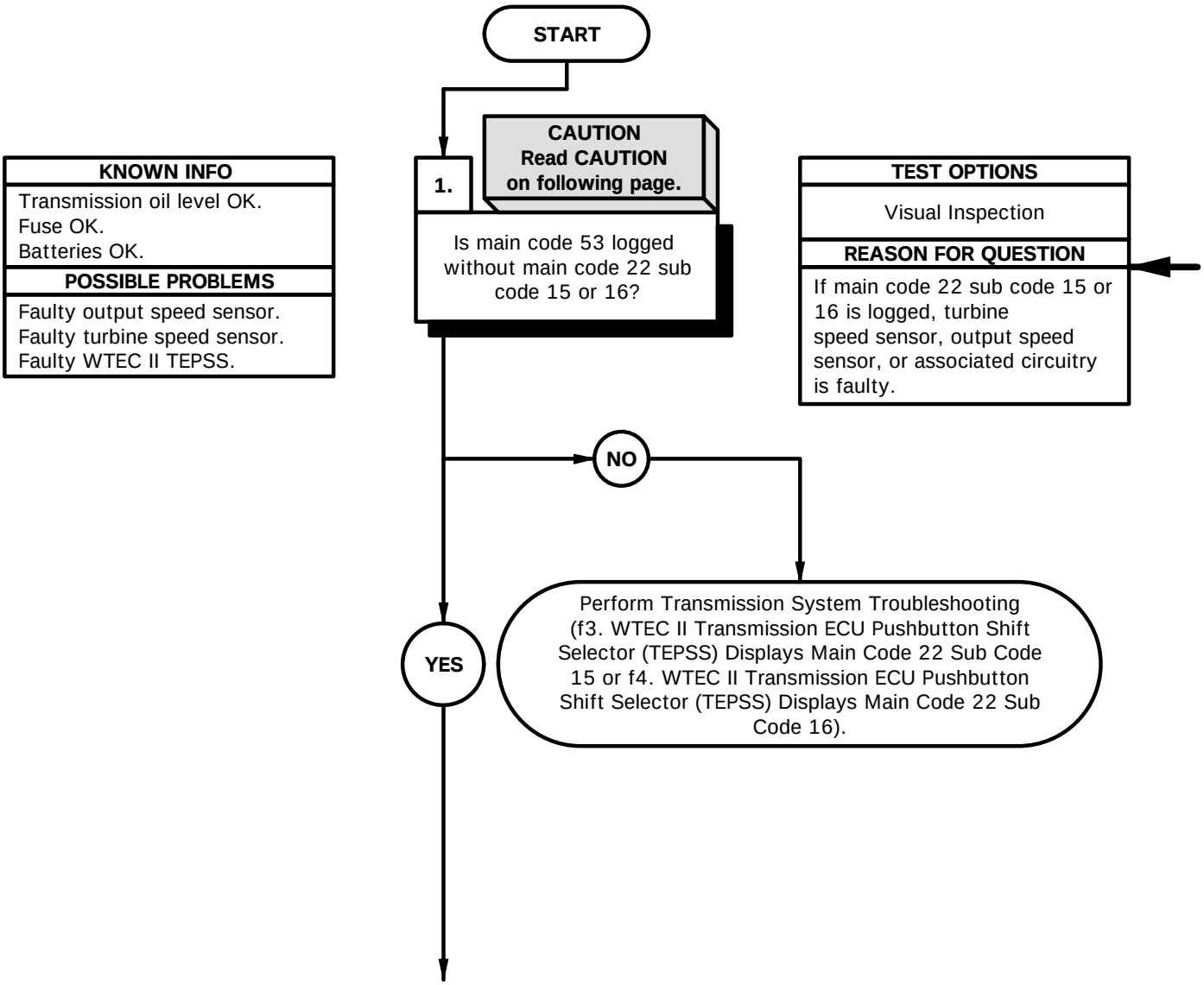
Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Pan, Drain (Item 24, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Wrench Set, Socket (item 49, 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 25.1, Appendix D)

Personnel Required
(2)

Reference
TM 9-4910-571-12&P

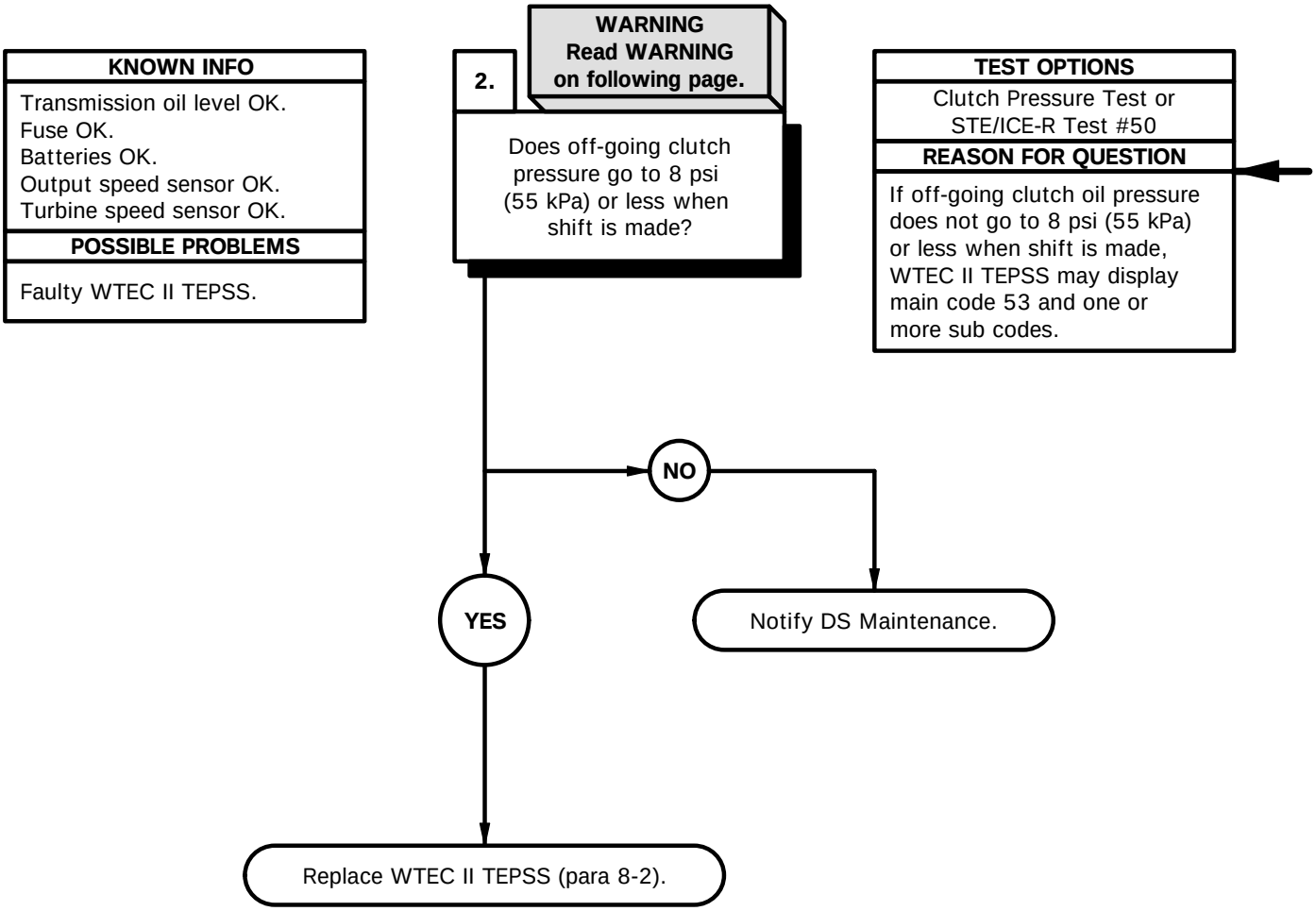


CAUTION

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)

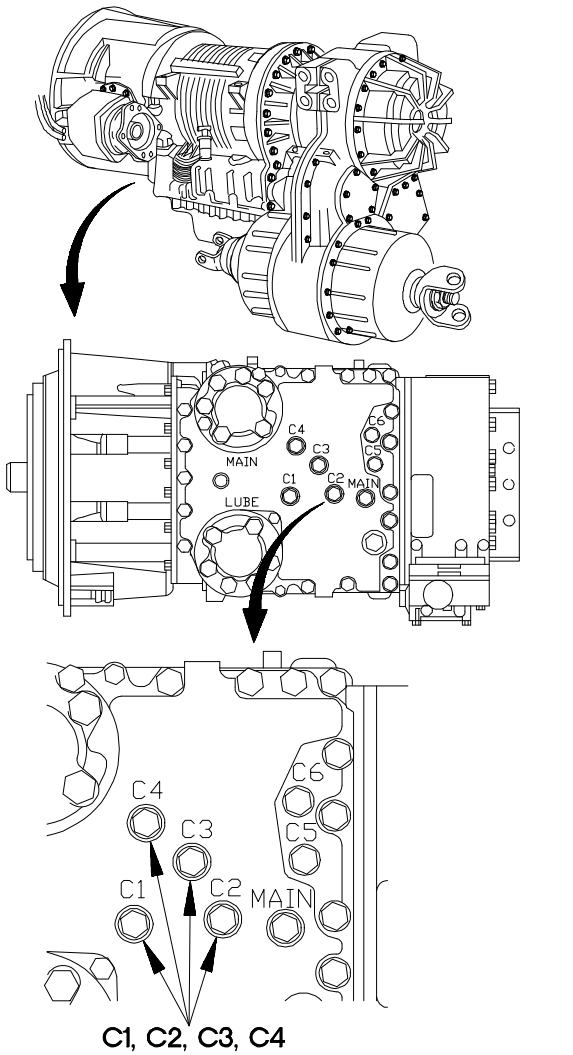


WARNING

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 rear 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 9-2320-365-10) 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 9-2320-365-10).
(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 rear propeller shafts (para 9-2).
(16) Clear diagnostic codes (para 8-4).



C1, C2, C3, C4
CLUTCH PRESSURE TAPS

XBF1501B

Table 2-28. Off-Going Clutch Pressure Tap

Sub Code	Sub Code Meaning	Off-Going Clutch(s)
08	L-N1	C3
18	1-N1	C1
28	2-N1	C1 & C4
29	2-N2	C1
38	3-N1	C1 & C3
39	3-N3	C1
48	4-N1	C1 & C2
49	4-N3	C1 & C2
58	5-N1	C2 & C3
59	5-N3	C2
68	6-N1	C2 & C4
69	6-N4	C2
78	R-N1	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

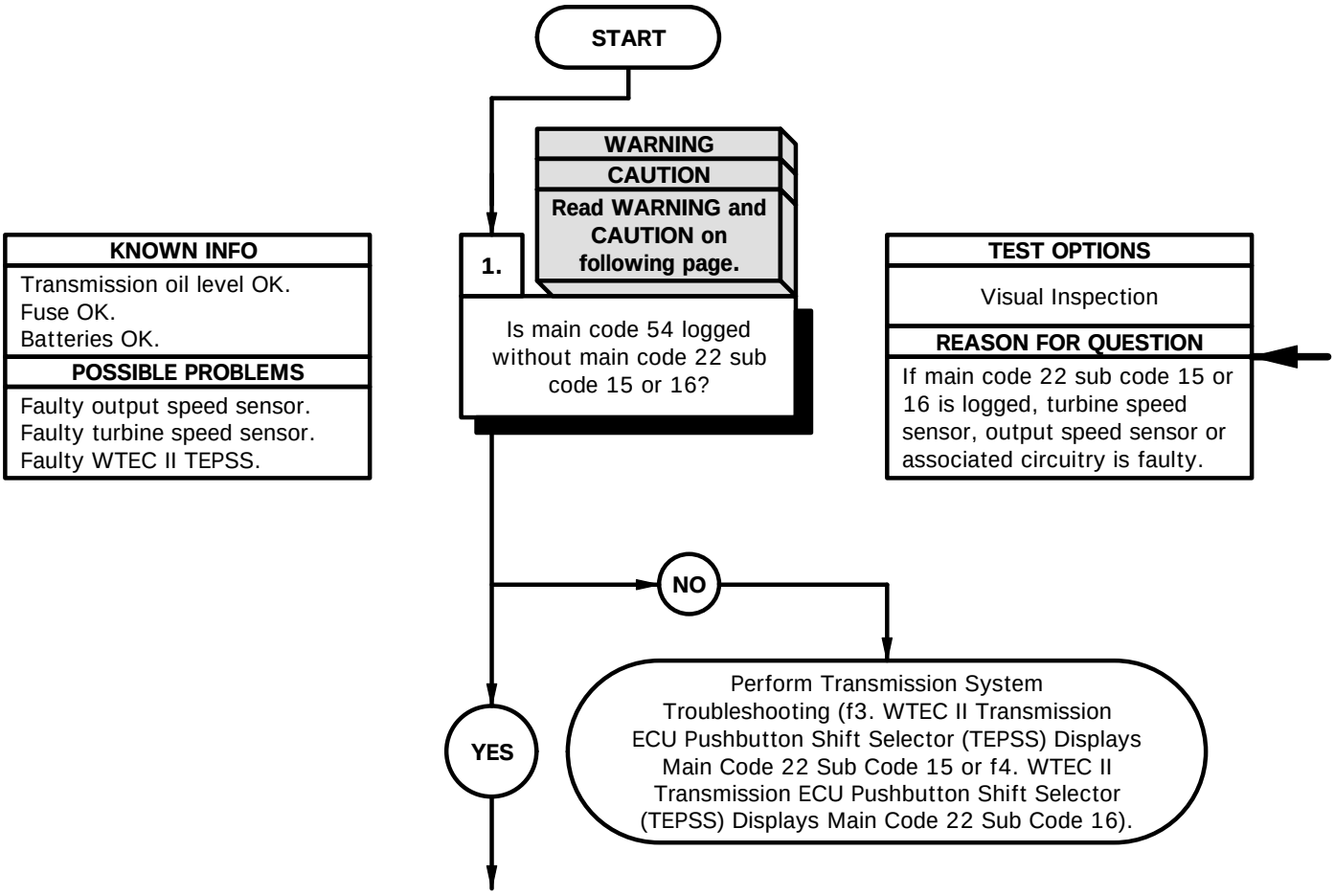
Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Pan, Drain (Item 24, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Wrench Set, Socket (Item 49, 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 25.1, Appendix D)

Personnel Required
(2)

Reference
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.

(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).

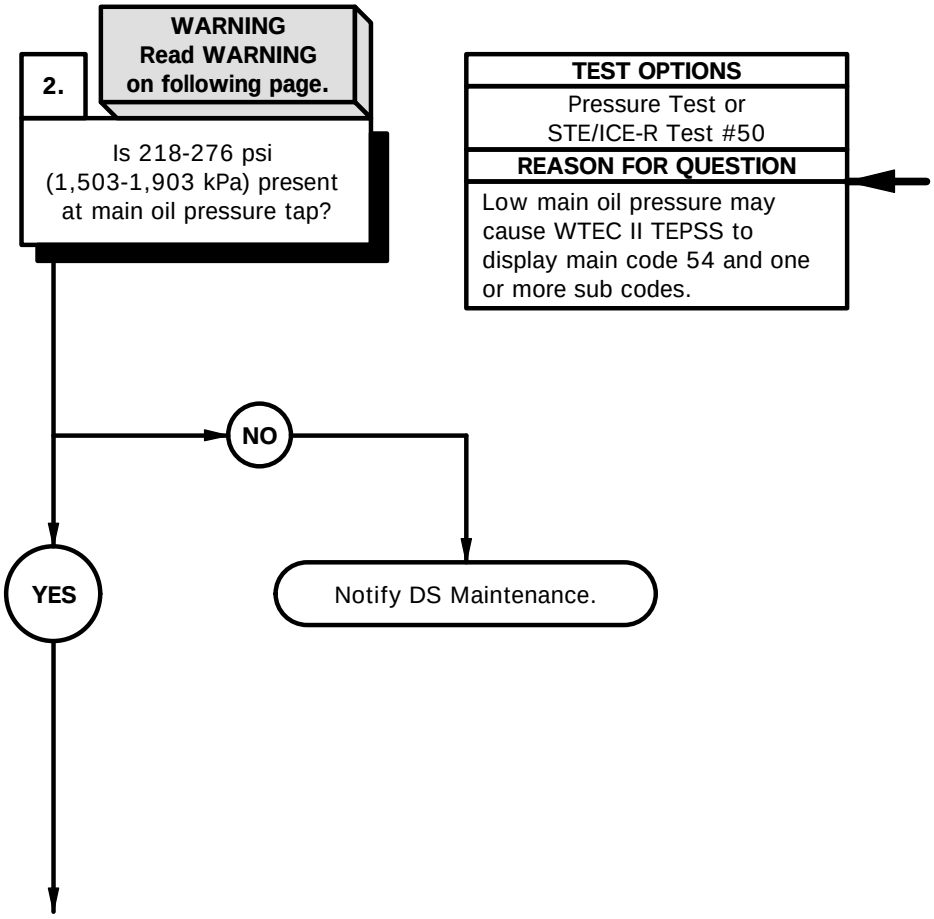
f16. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 54 SUB CODE 01, 07, 10, 12, 17, 21, 23, 27, 32, 34, 43, 45, 54, 56, 65, 70, 71, 72, 80, 81, 82, 83, 85, 86, 92, 93, 95, 96, or 97 (CONT)

KNOWN INFO

Transmission oil level OK.
Fuse OK.
Batteries OK.
Output speed sensor OK.
Turbine speed sensor OK.

POSSIBLE PROBLEMS

Faulty WTEC II TEPSS.



TEST OPTIONS

Pressure Test or
STE/ICE-R Test #50

REASON FOR QUESTION

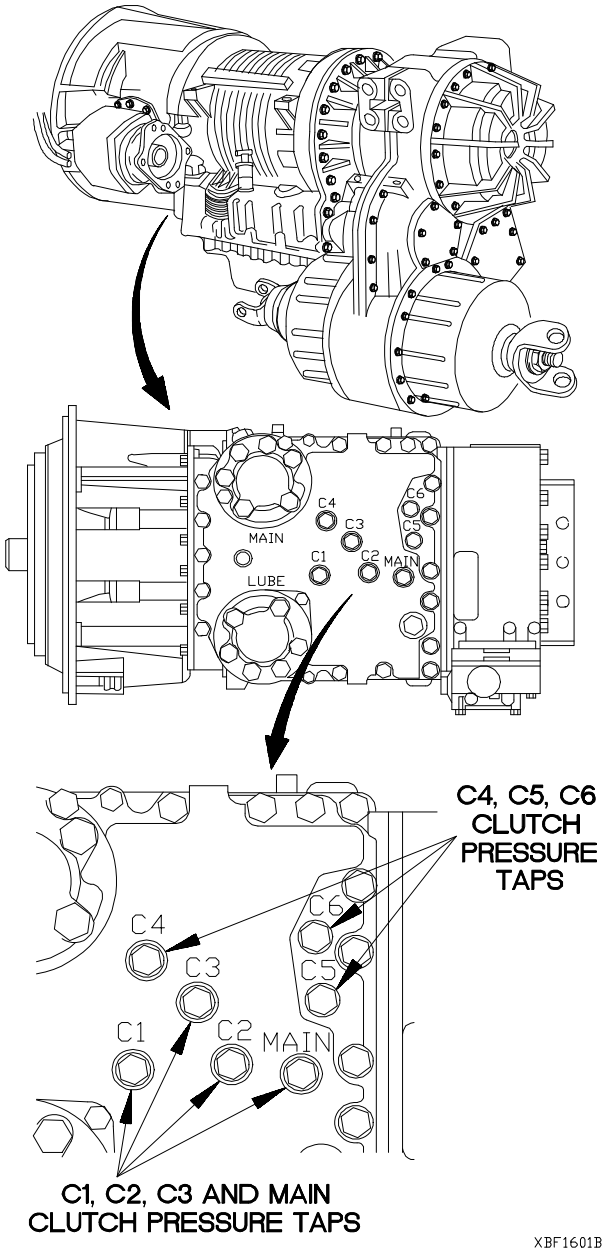
Low main oil pressure may cause WTEC II TEPSS to display main code 54 and one or more sub codes.

WARNING

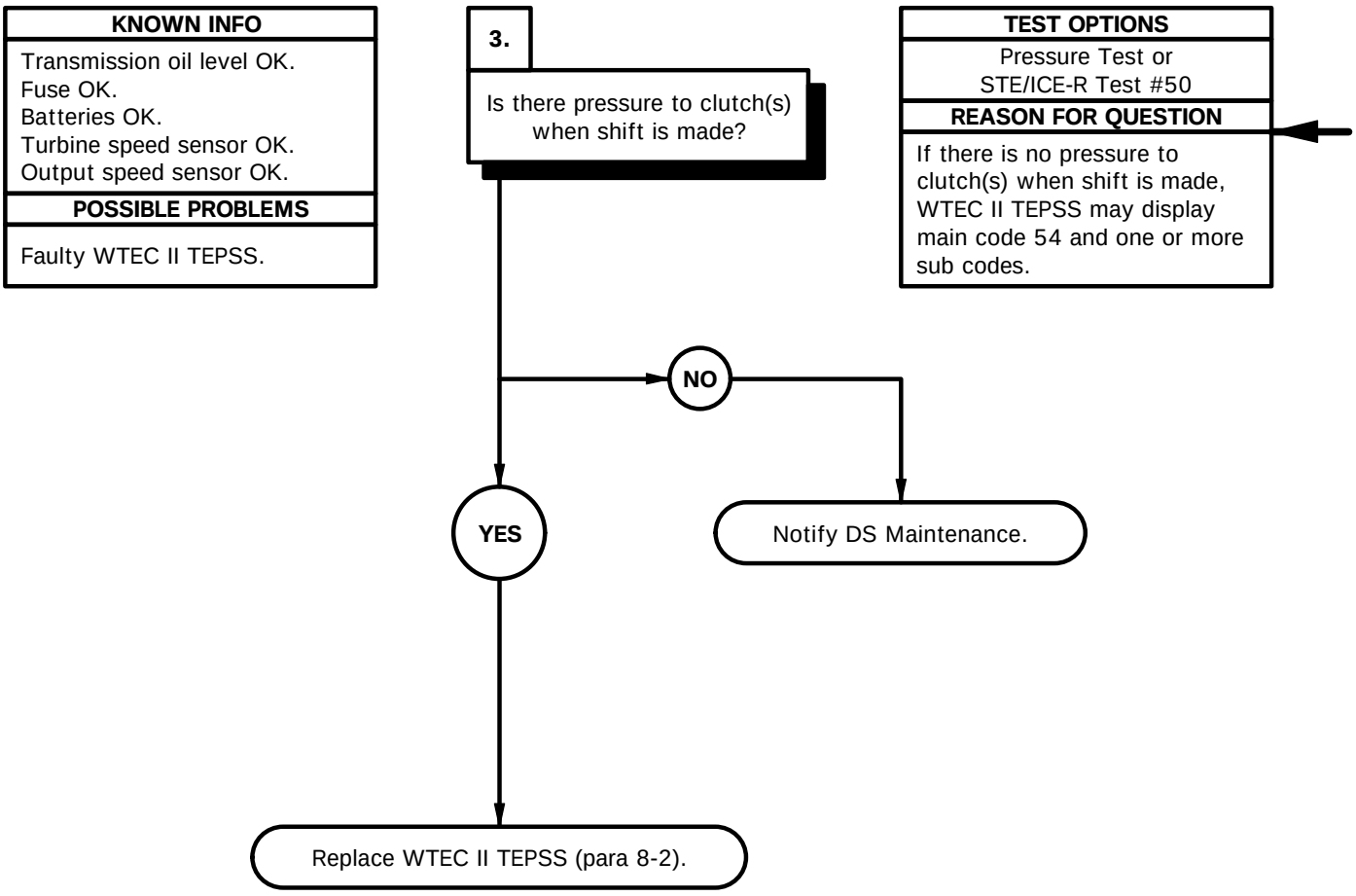
Wear approved eye protection when performing transmission pressure checks. If oil contacts eyes, seek medical attention immediately. Failure to comply may result in injury to personnel.

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 9-2320-365-10) 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 9-2320-365-10).
(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 rear 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.
(4) Connect tube to boss adapter, hose, and pipe to tube adapter to clutch pressure tap.
(5) Start engine (TM 9-2320-365-10).
(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 2-29. Clutch Pressure Tap.
(8) Accelerate engine until WTEC II TEPSS displays denied range. Refer to Table 2-29. 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. If all clutches indicate proper pressure, replace WTEC II TEPSS (para 8-2).
(13) Shut down engine (TM 9-2320-365-10).
(14) Remove pipe to tube adapter, hose, and tube to boss adapter from clutch pressure tap.
(15) Position preformed packing and pressure tap plug in control valve module.
(16) Tighten pressure tap plug to 84-120 lb-in. (9-14 N·m).
(17) Remove drain pan under pressure tap.
(18) Install front and rear propeller shafts (para 9-2).
(19) Clear diagnostic codes (para 8-4).

Table 2-29. Clutch Pressure Tap

Sub Code	Sub Code Meaning	Pressure at Clutch(s)	Pressure Readings at Taps
01	L-R Upshift	C1 & C5	187-305 psi (1280-2100 kPa)
07	L-1 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

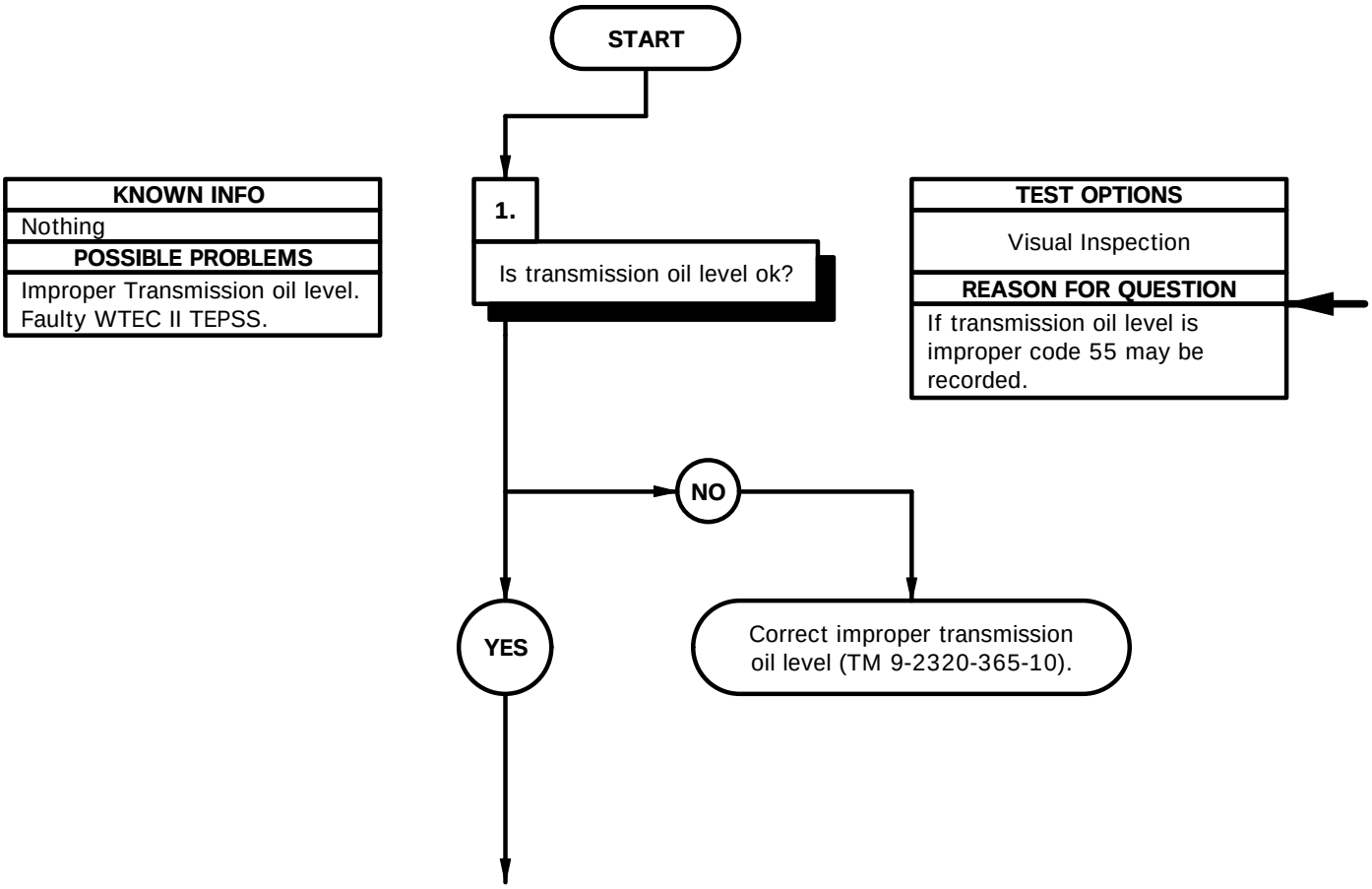
Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Pan, Drain (Item 24, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Wrench Set, Socket (Item 49 Appendix C)

Materials/Parts
Packing, Preformed (Item 199, Appendix G)
Adapter, Straight, Tube to Boss (Item 1.3, Appendix D)
Hose Assembly, Nonmetallic (Item 25.1, Appendix D)
Adapter, Straight, Pipe to Tube (Item 1.2, Appendix D)

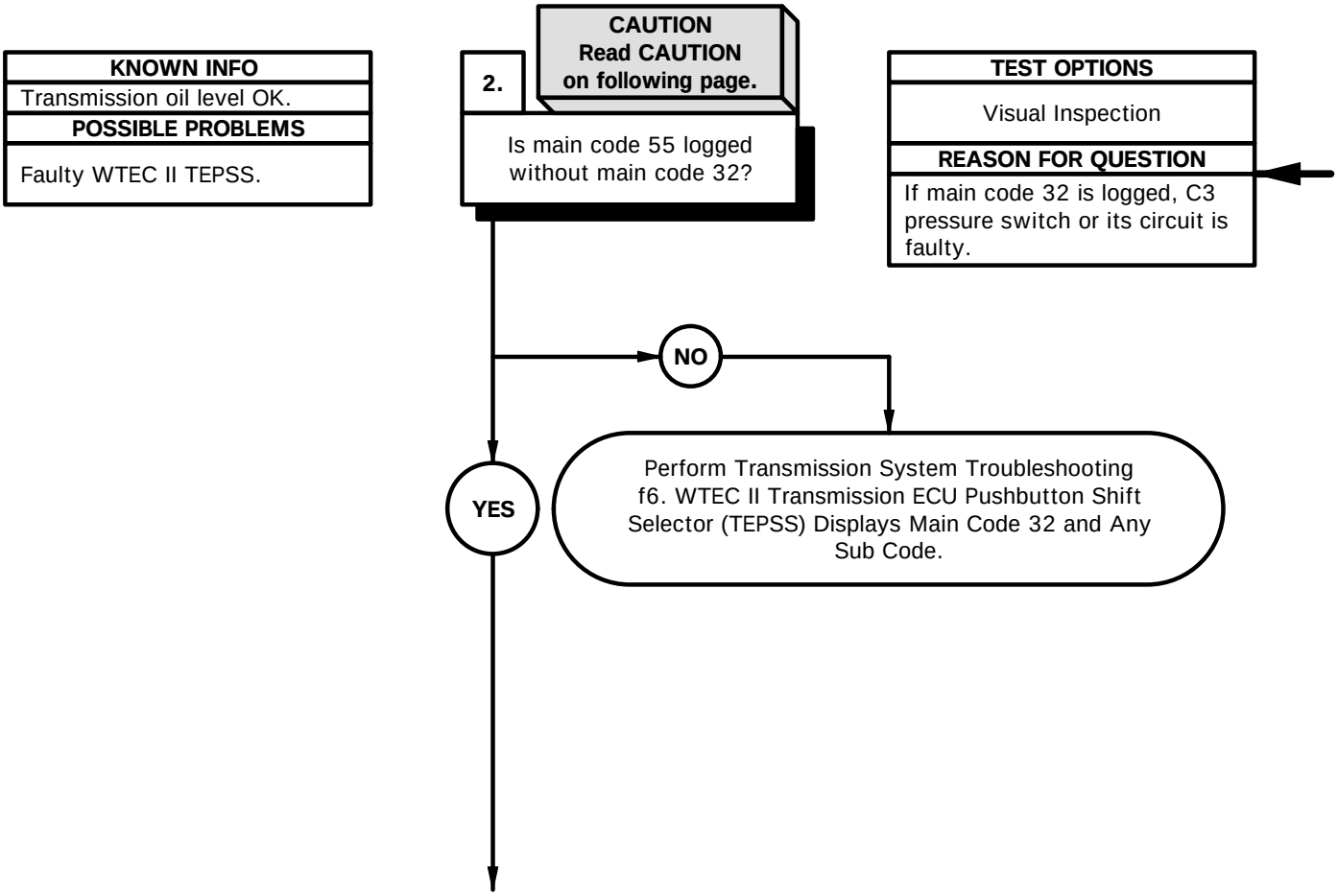
Reference
TM 9-4910-571-12&P

Personnel Required
(2)



(1) Check transmission oil level (TM 9-2320-365-10).
(2) If transmission oil level is improper, correct as required (TM 9-2320-365-10).

f17. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 55 AND ANY SUB CODE (CONT)



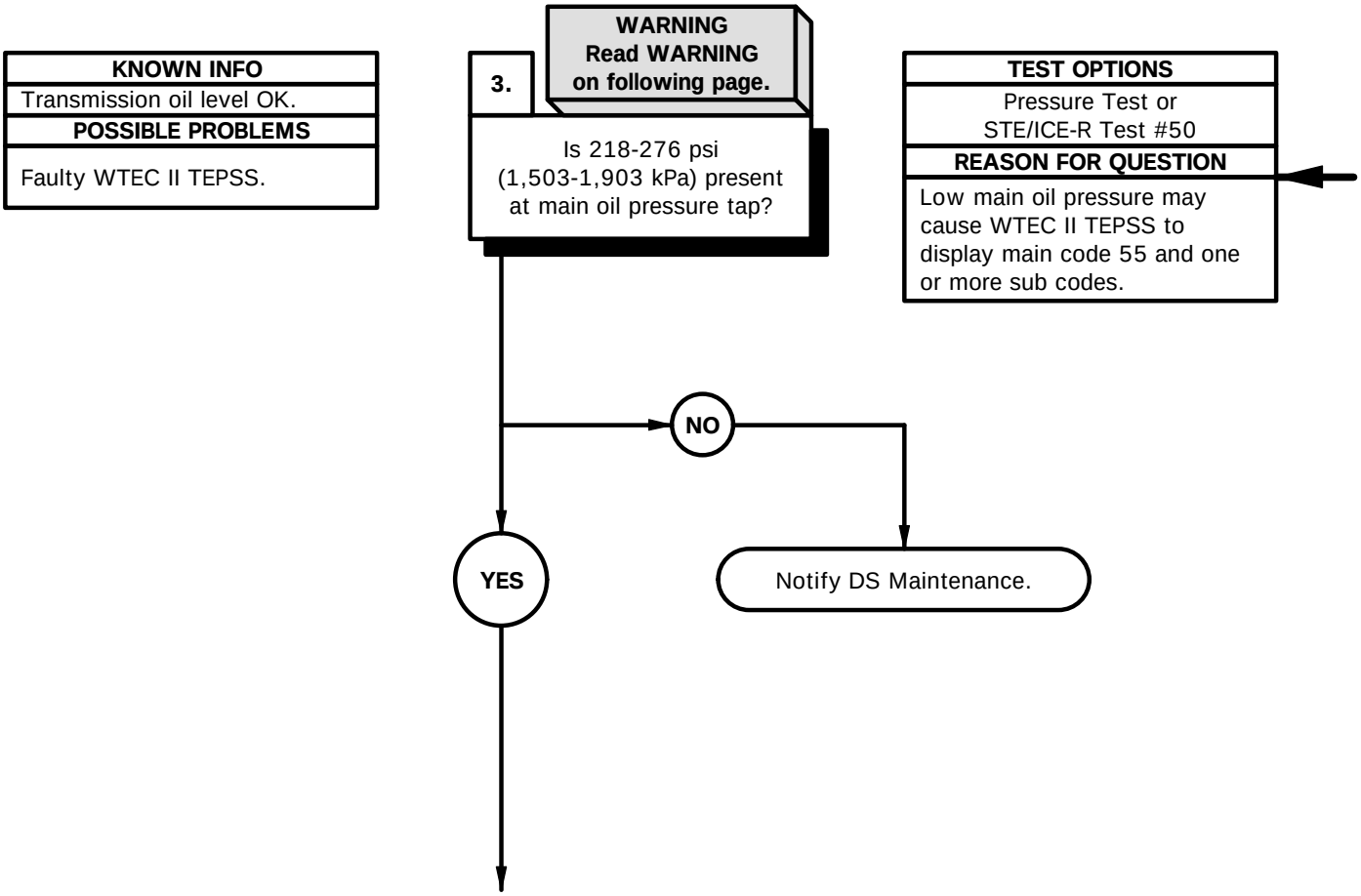
CAUTION

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 faulty 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)

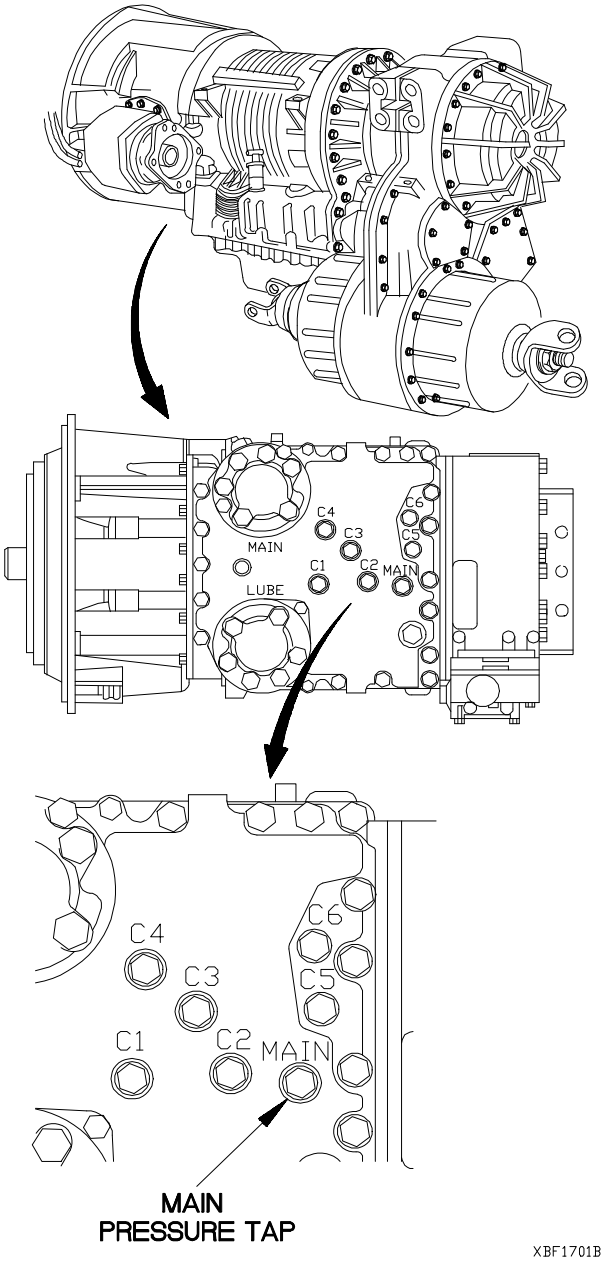


WARNING

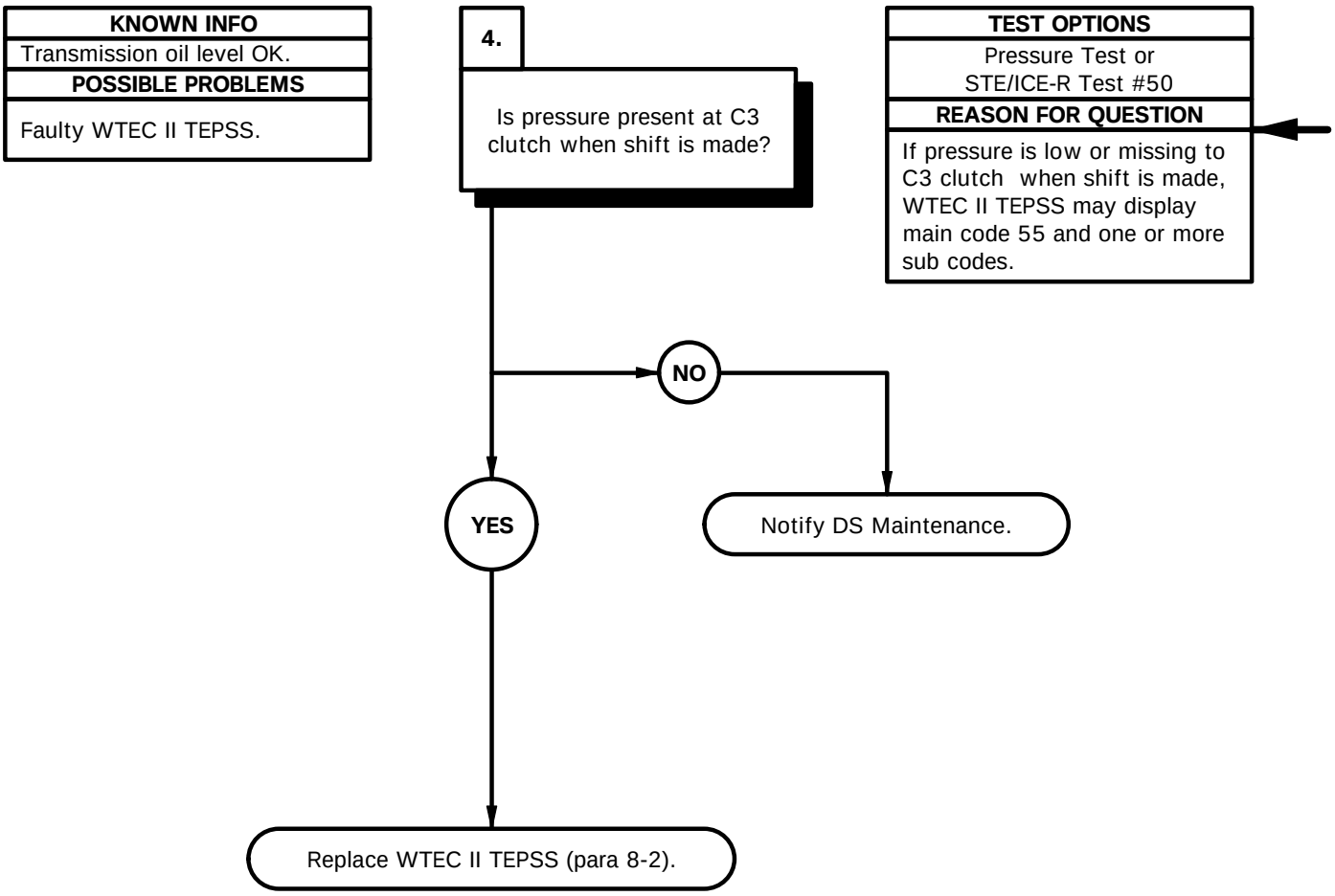
Wear approved eye protection when performing transmission pressure checks. If oil contacts eyes, seek medical attention immediately. Failure to comply may result in injury to personnel.

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) Start engine (TM 9-2320-365-10) and run at idle.
(5) Perform STE/ICE-R Test #50 (TM 9-4910-571-12&P).
(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 9-2320-365-10).
(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)

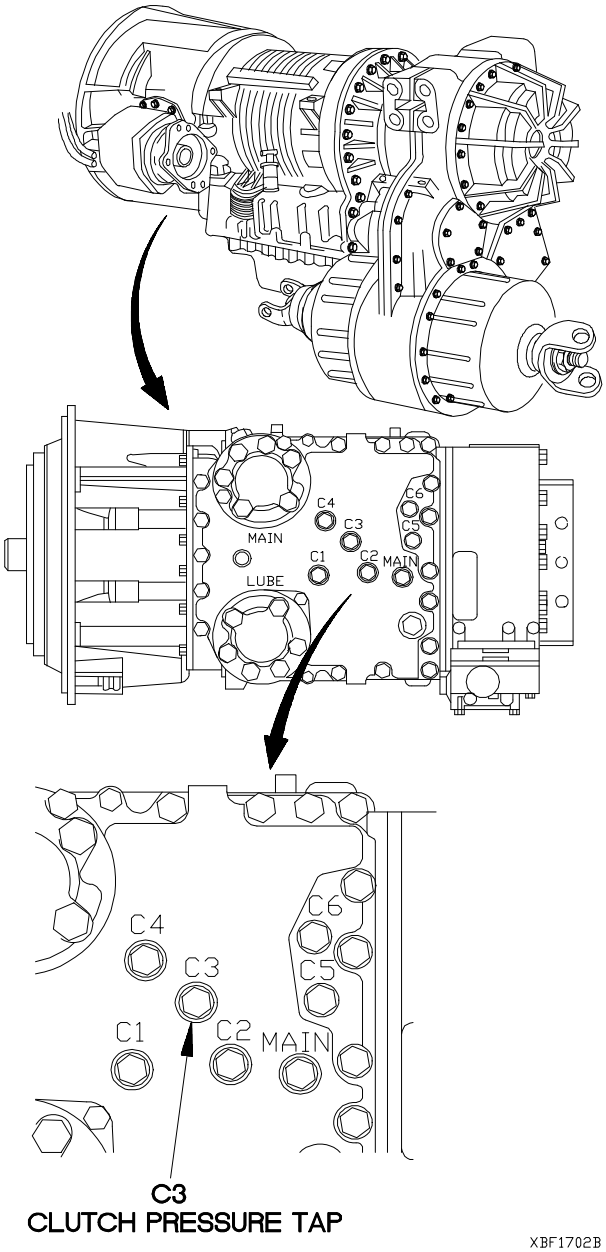


PRESSURE TEST

(1) Remove front and rear 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 9-2320-365-10) 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 2-30. Clutch Pressure Tap.
(8) Shut down engine (TM 9-2320-365-10).
(9) If 215-276 psi (1,480-1,900 kPa) pressure is not obtained for affected code, notify DS Maintenance.
(10) If 215-276 psi (1,480- 1,900 kPa) 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 rear propeller shafts (para 9-2).
(16) Clear diagnostic codes (para 8-4).

Table 2-30. Clutch Pressures

Sub Code	Sub Code Meaning	Pressure Readings C3 Tap
17	1-R	215-276 psi (1,480-1,900 kPa)
27	2-R	215-276 psi (1,480-1,900 kPa)
80	N1-L	215-276 psi (1,480-1,900 kPa)
87	N1-R	215-276 psi (1,480-1,900 kPa)
97	2-R	215-276 psi (1,480-1,900 kPa)



f18. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 56 AND ANY SUB CODE

INITIAL SETUP

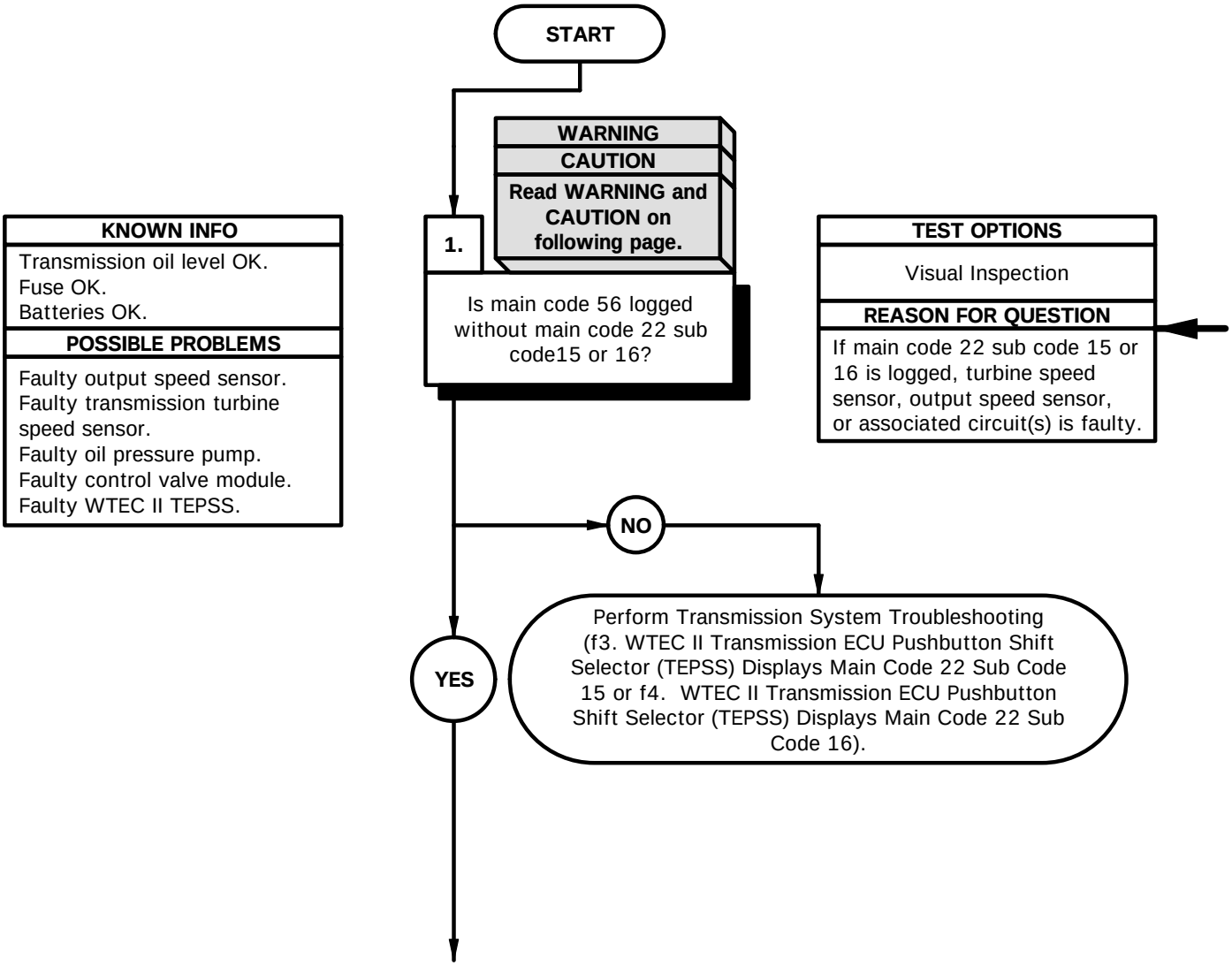
Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Pan, Drain (Item 24, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Wrench Set, Socket (Item 49, 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 25.1, Appendix D)

Personnel Required
(2)

Reference
TM 9-4910-571-12&P



WARNING

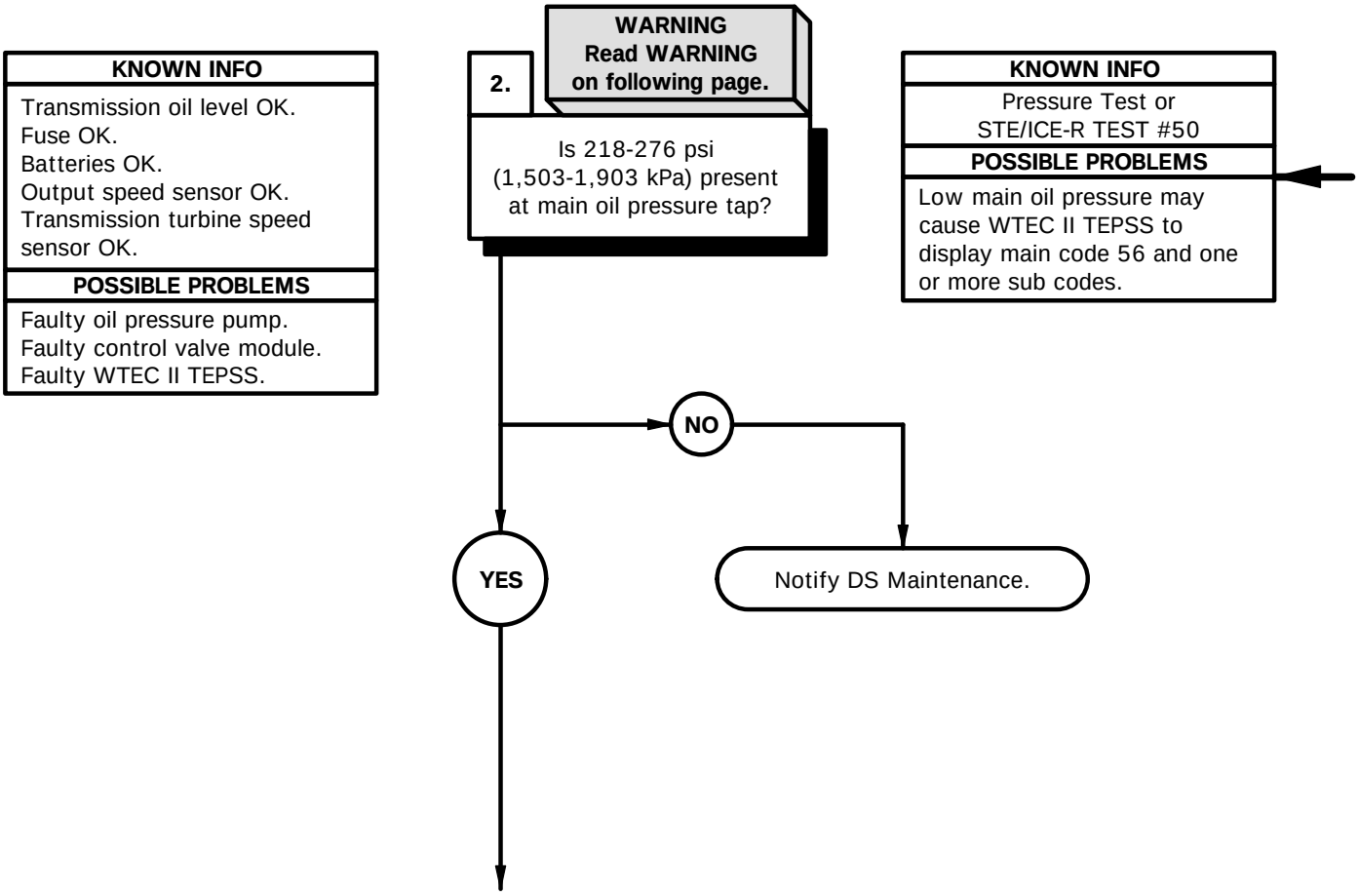
Wear approved eye protection when performing transmission pressure checks. If oil contacts eyes, seek medical attention immediately. Failure to comply may result in injury to personnel.

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.

(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)

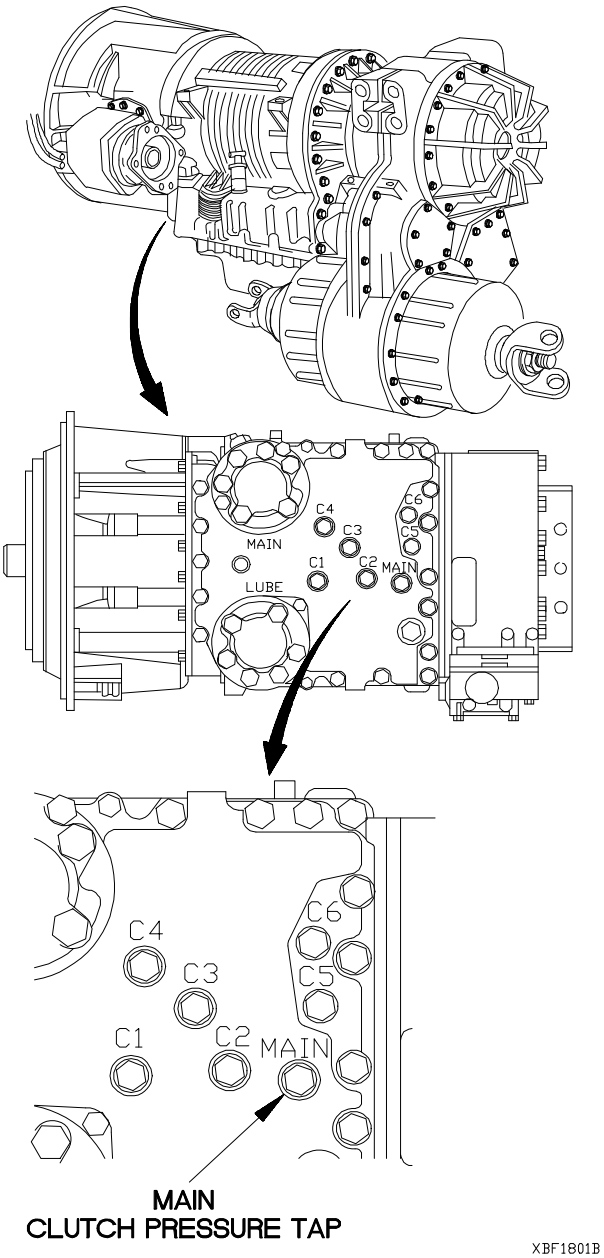


WARNING

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

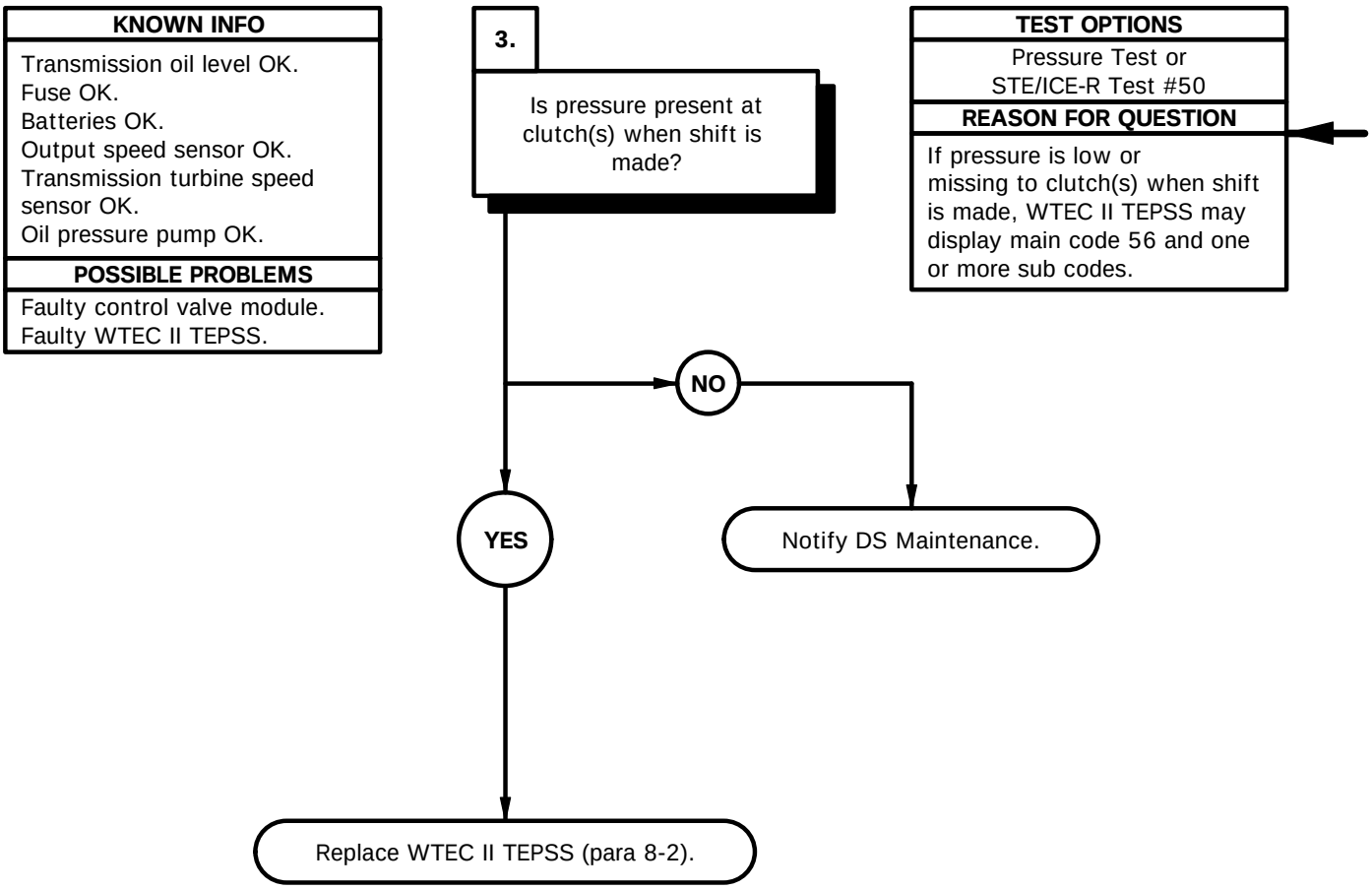
(1) Position drain pan under pressure tap.
(2) Remove main pressure tap plug and preformed packing from control valve module.
(3) Connect tube to boss adapter, hose, and pipe to tube adapter to main pressure tap.
(4) Perform STE/ICE-R test #50 (TM 9-4910-571-12&P).
(5) Start engine (TM 9-2320-365-10) 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 9-2320-365-10).
(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

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f18. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 56 AND ANY SUB CODE (CONT)



PRESSURE TEST

(1) Remove front and rear 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) Perform STE/ICE-R test #50 (TM 9-4910-571-12&P).
(6) Start engine (TM 9-2320-365-10).
(7) Make shift indicated by sub code. Refer to Table 2-31. Clutch Pressure Tap.
(8) Accelerate engine until WTEC II TEPSS displays desired 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 transmission into neutral (TM 9-2320-365-10).
(12) Shut down engine (TM 9-2320-365-10).
(13) If one or more of clutches failed to indicate proper pressure, notify DS Maintenance. If all clutches indicate proper pressure, replace WTEC II TEPSS (para 8-2).
(14) Remove pipe to tube adapter, hose, and tube to boss adapter from clutch pressure tap.
(15) Position preformed packing and pressure tap plug in control valve module.
(16) Tighten pressure tap plug to 84-120 lb-in. (9-14 N·m).
(17) Remove drain pan under pressure tap.
(18) Install front and rear propeller shafts (para 9-2).
(19) Clear diagnostic codes (para 8-4).

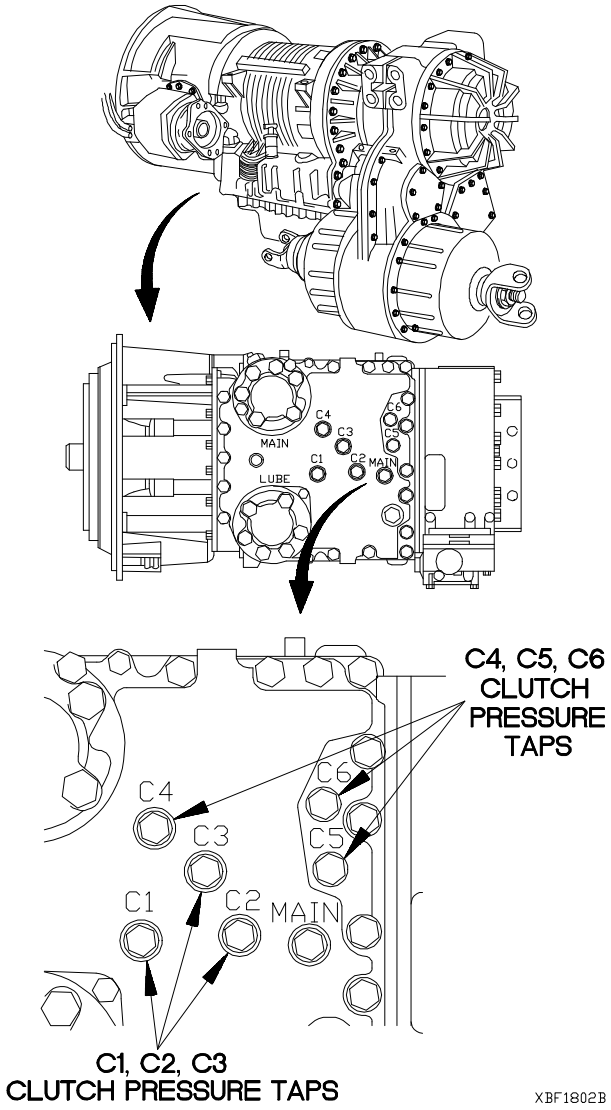


Table 2-31. Clutch Pressure Tap

Sub Code	Sub Code Meaning	Pressure at Clutch(s)	Pressure Readings at Taps
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

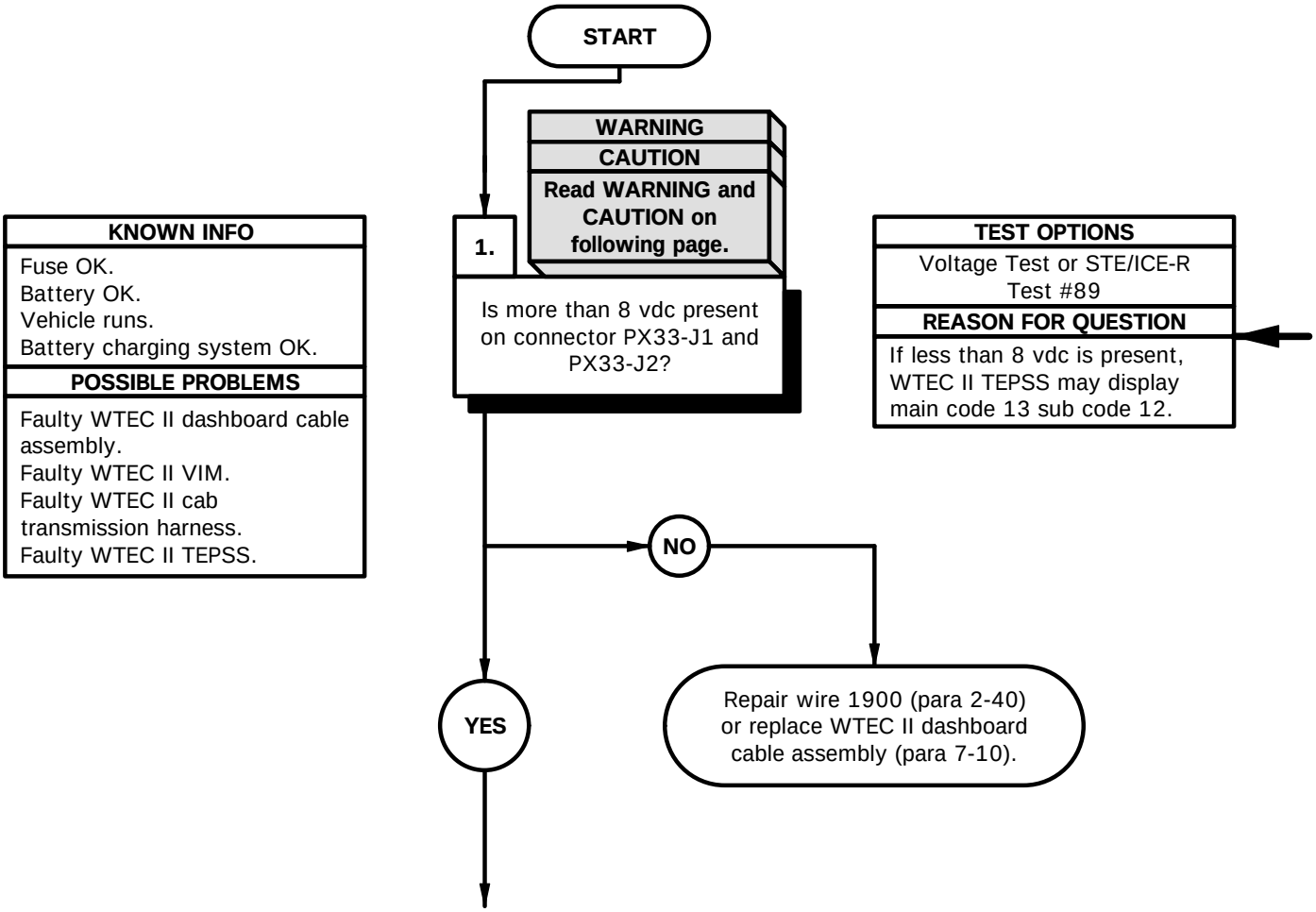
Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
STE/ICE-R (Item 39, Appendix C)

Tools and Special Tools (Cont)
Wrench Set, Socket (Item 49, Appendix C)

References
TM 9-4910-571-12&P

Personnel Required
(2)



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.

CAUTION

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

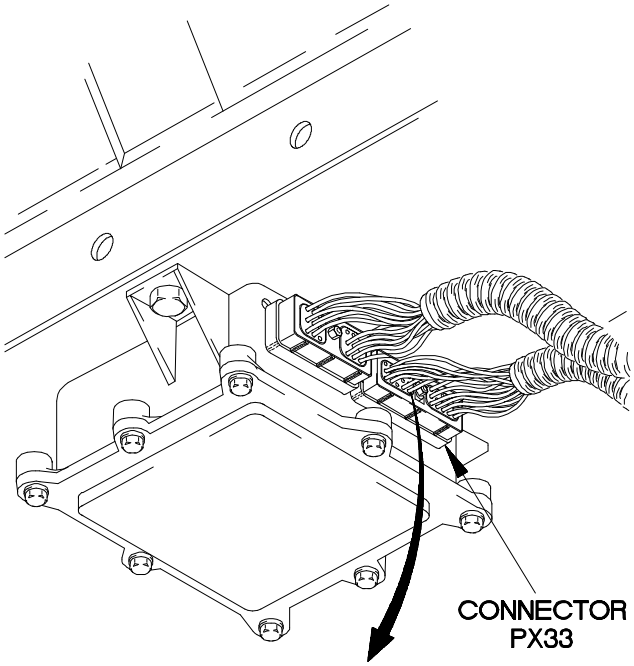
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

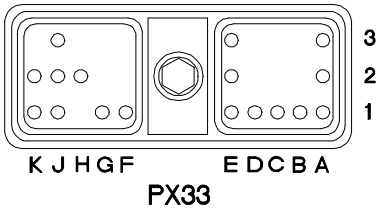
NOTE

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

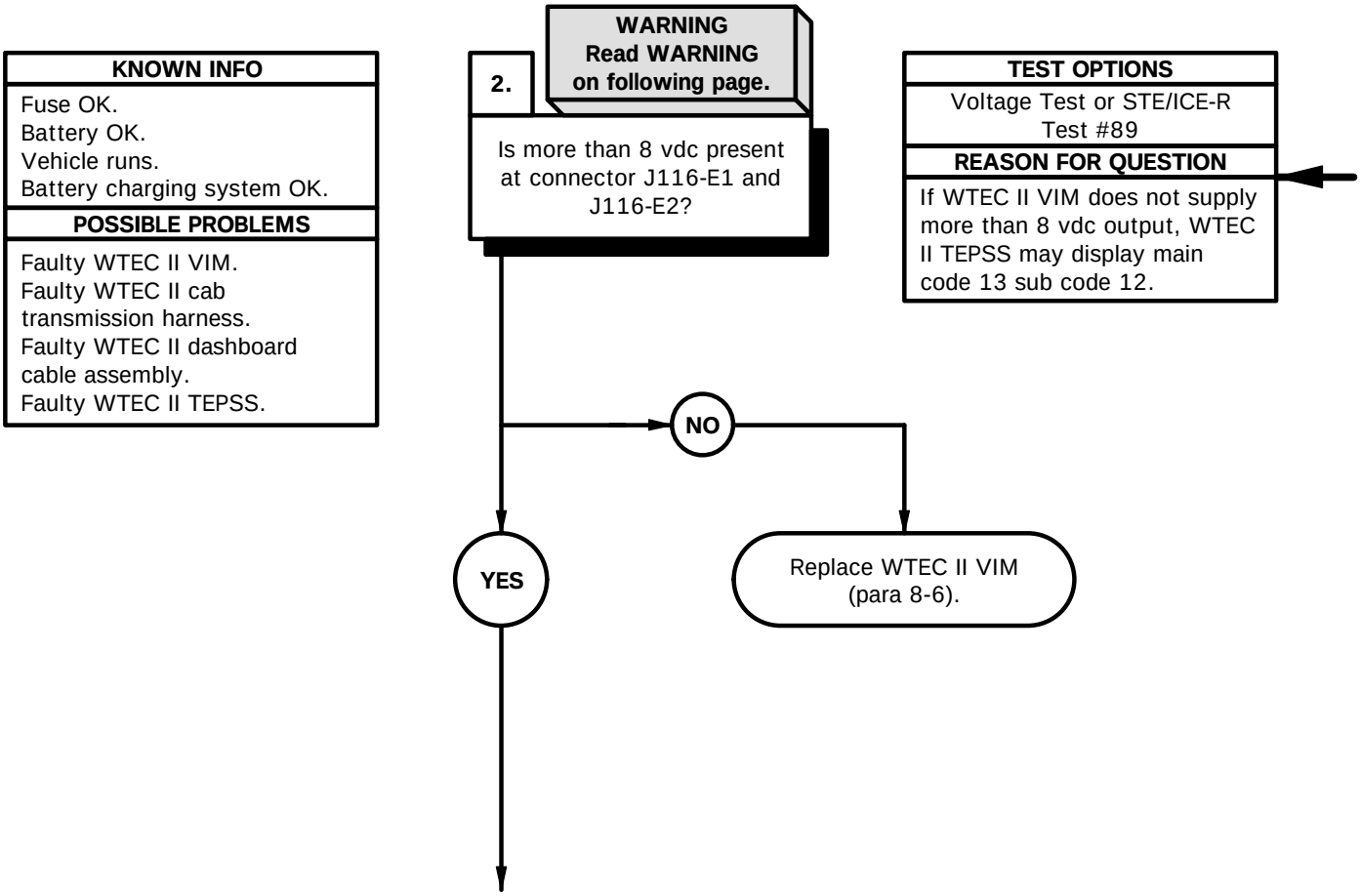
(1) Remove kick panel (para 16-3).
(2) Set multimeter to volts dc.
(3) Start engine (TM 9-2320-365-10).
(4) Connect positive (+) probe of multimeter to connector PX33-J1.
(5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(6) Connect positive (+) probe of multimeter 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 2-40) or replace WTEC II dashboard cable assembly (para 7-10).
(9) Shut down engine (TM 9-2320-365-10).





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f19. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 13 AND ANY SUB CODE (CONT)

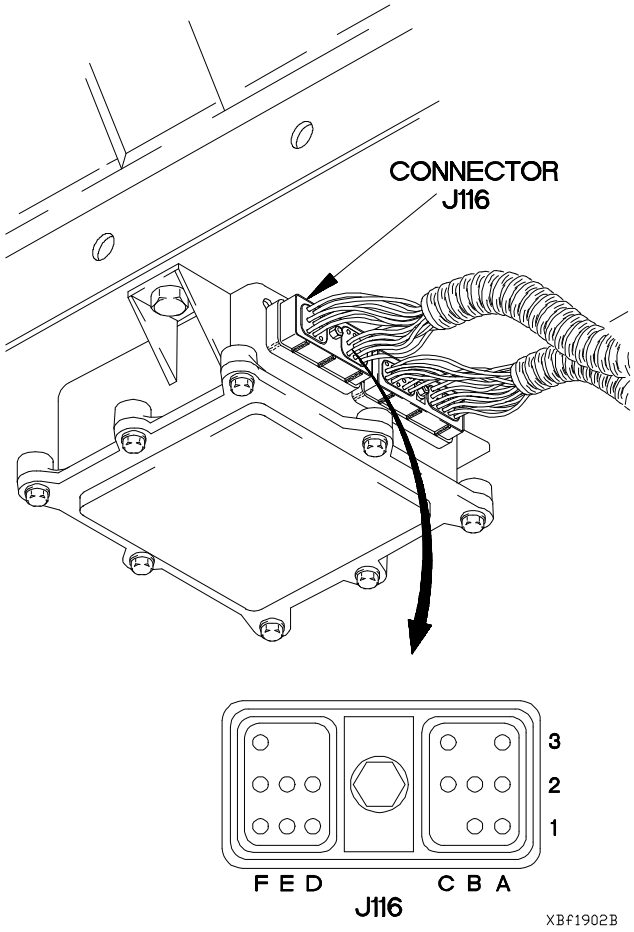


WARNING

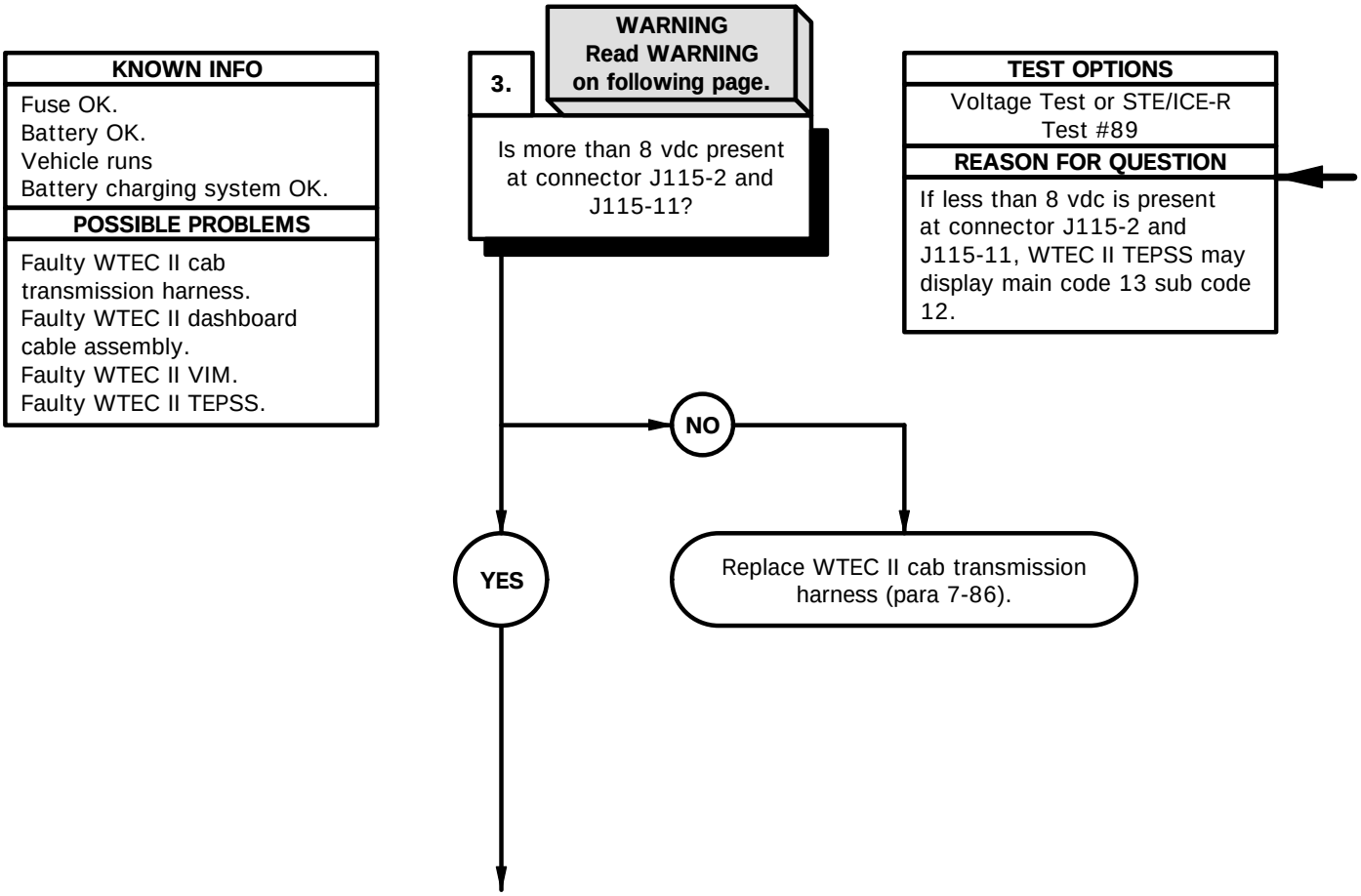
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Start engine (TM 9-2320-365-10).
(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 9-2320-365-10).



f19. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 13 AND ANY SUB CODE (CONT)

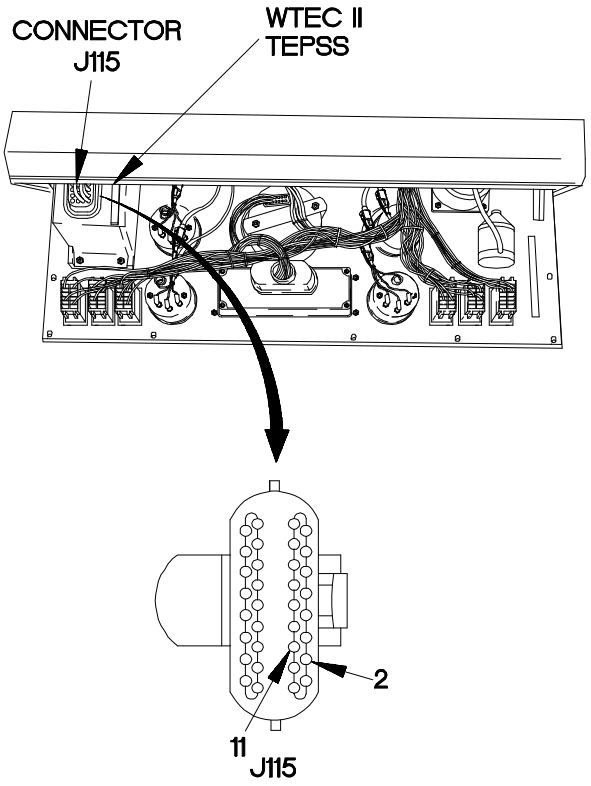


WARNING

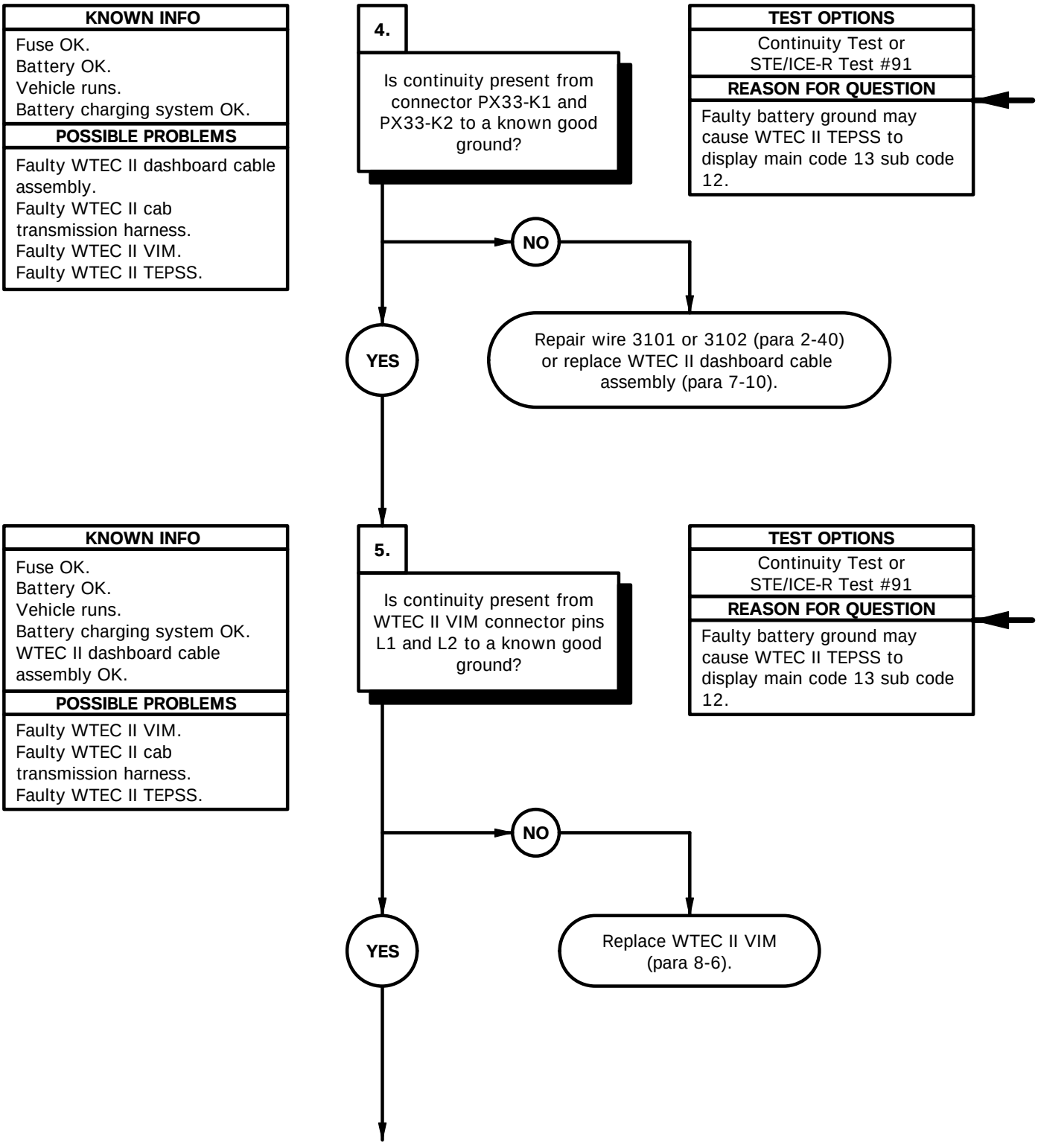
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuits and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Remove instrument panel assembly for access (para 7-15).
(2) Start engine (TM 9-2320-365-10).
(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 7-86).
(10) Shut down engine (TM 9-2320-365-10).



f19. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 13 AND ANY SUB CODE (CONT)

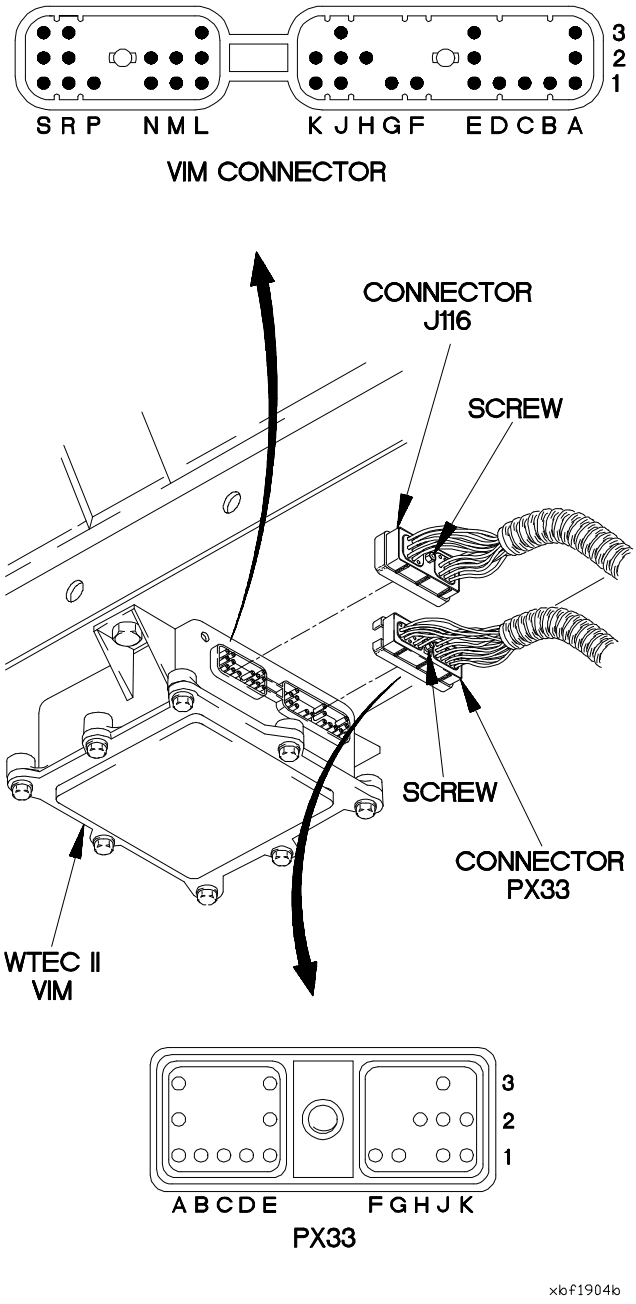


CONTINUITY TEST

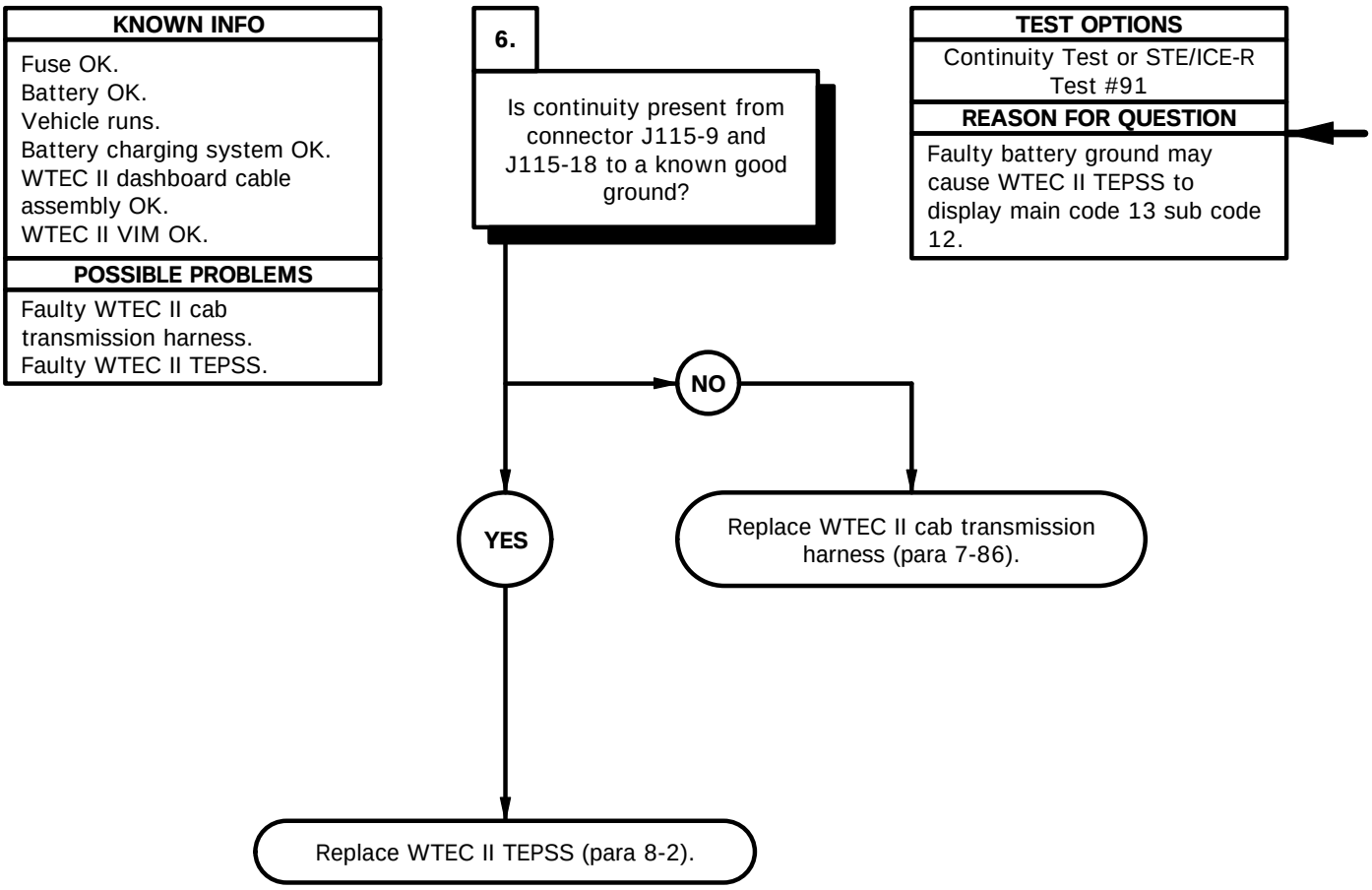
(1) Loosen screw in connector PX33.
(2) Disconnect connector PX33 from WTEC II VIM.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector PX33-K1.
(5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(6) Connect positive (+) probe of multimeter 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 2-40) or replace WTEC II dashboard cable assembly (para 7-10).
(9) If continuity is not present on connector PX33-K2, repair wire 3102 (para 2-40) 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).

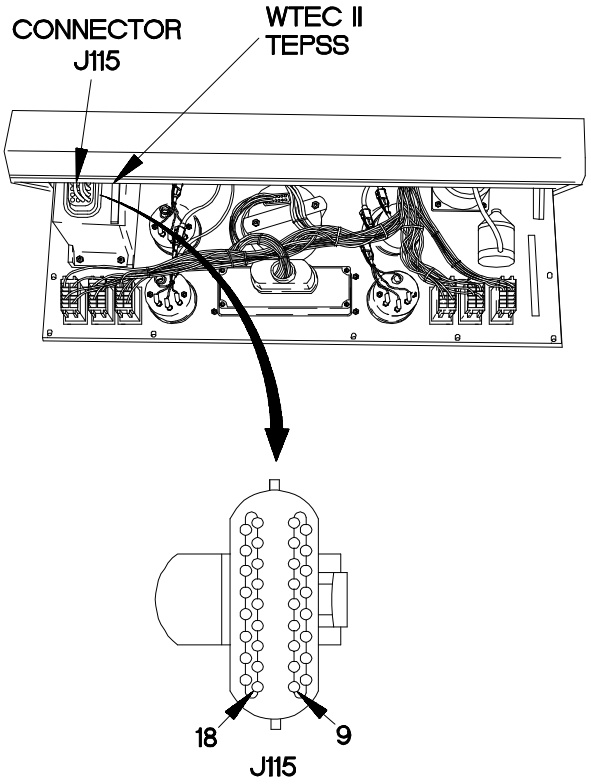


f19. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 13 AND ANY SUB CODE (CONT)



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 7-86).
(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).



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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 9-2320-365-10).

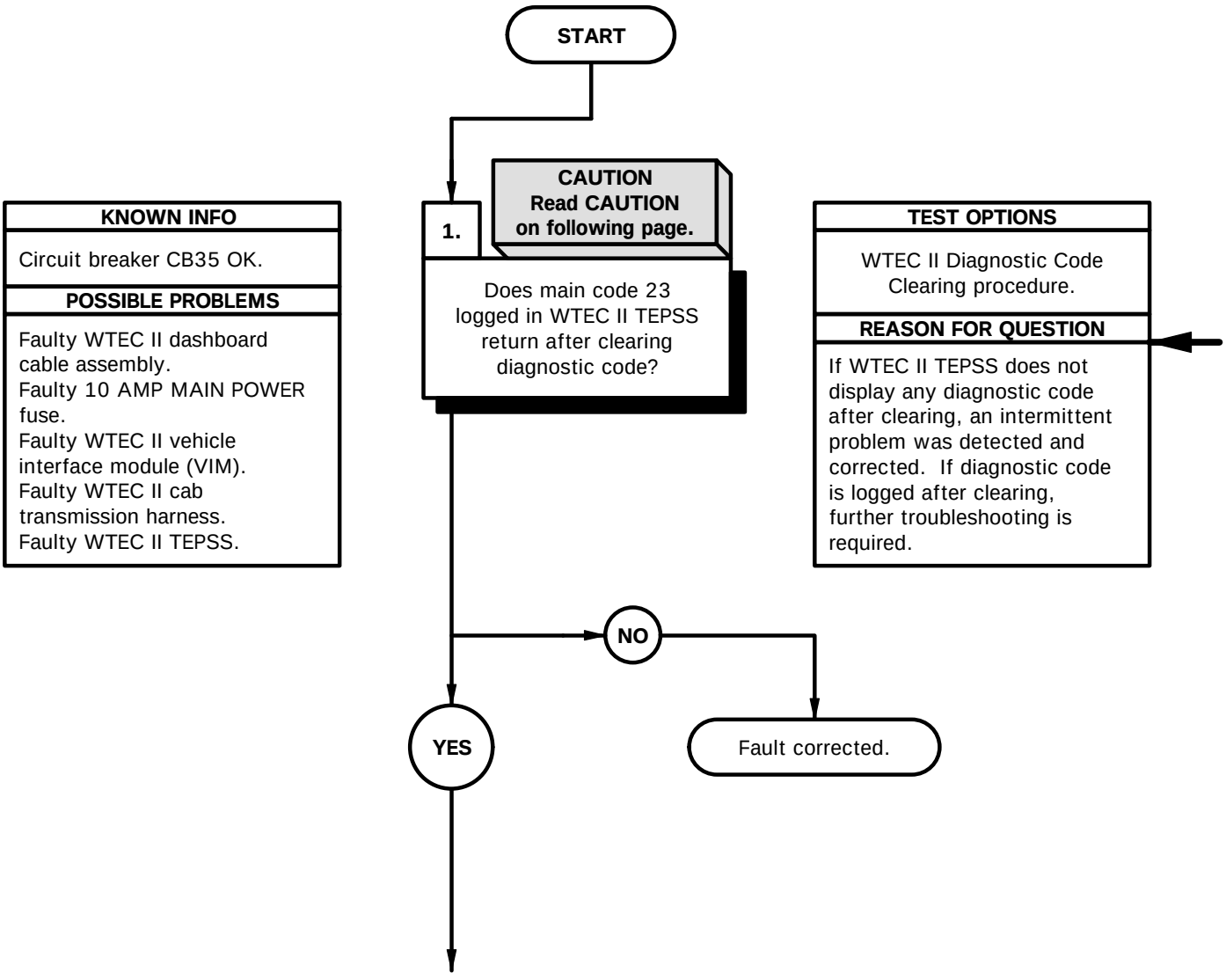
Personnel Required
(2)

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)

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.

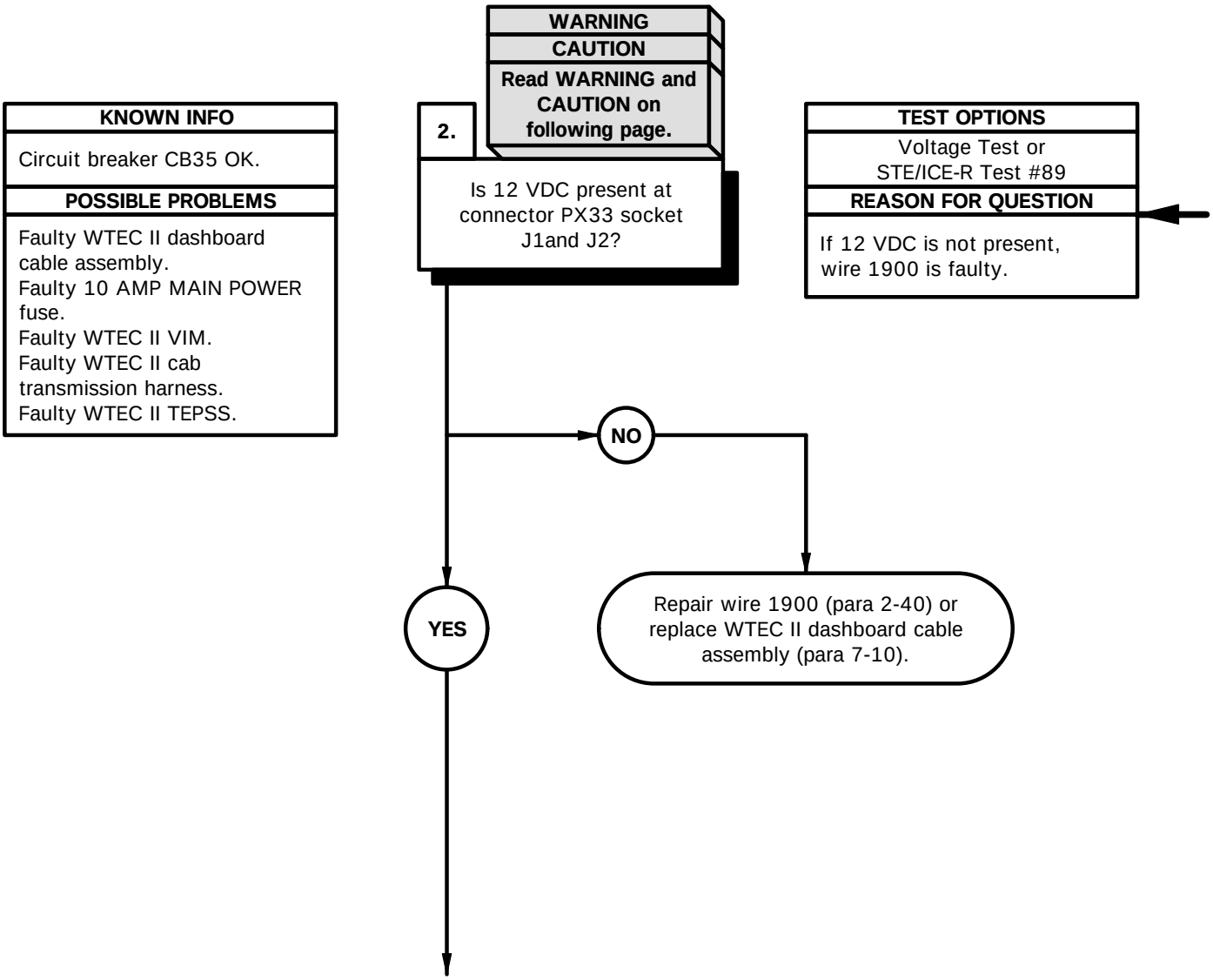


CAUTION

Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic 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

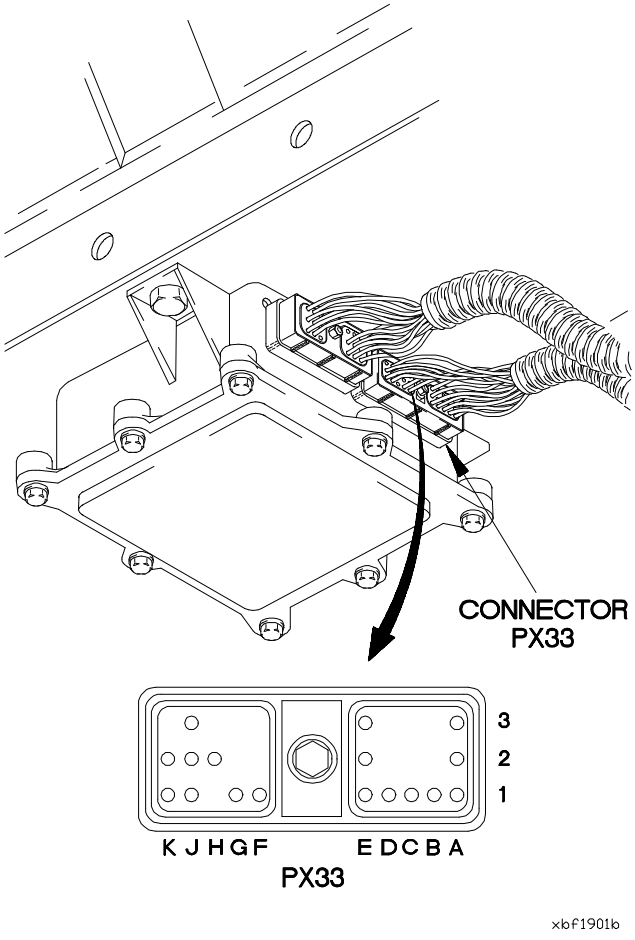
Use care when testing electrical connectors not to bend connector pins or damage connector sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

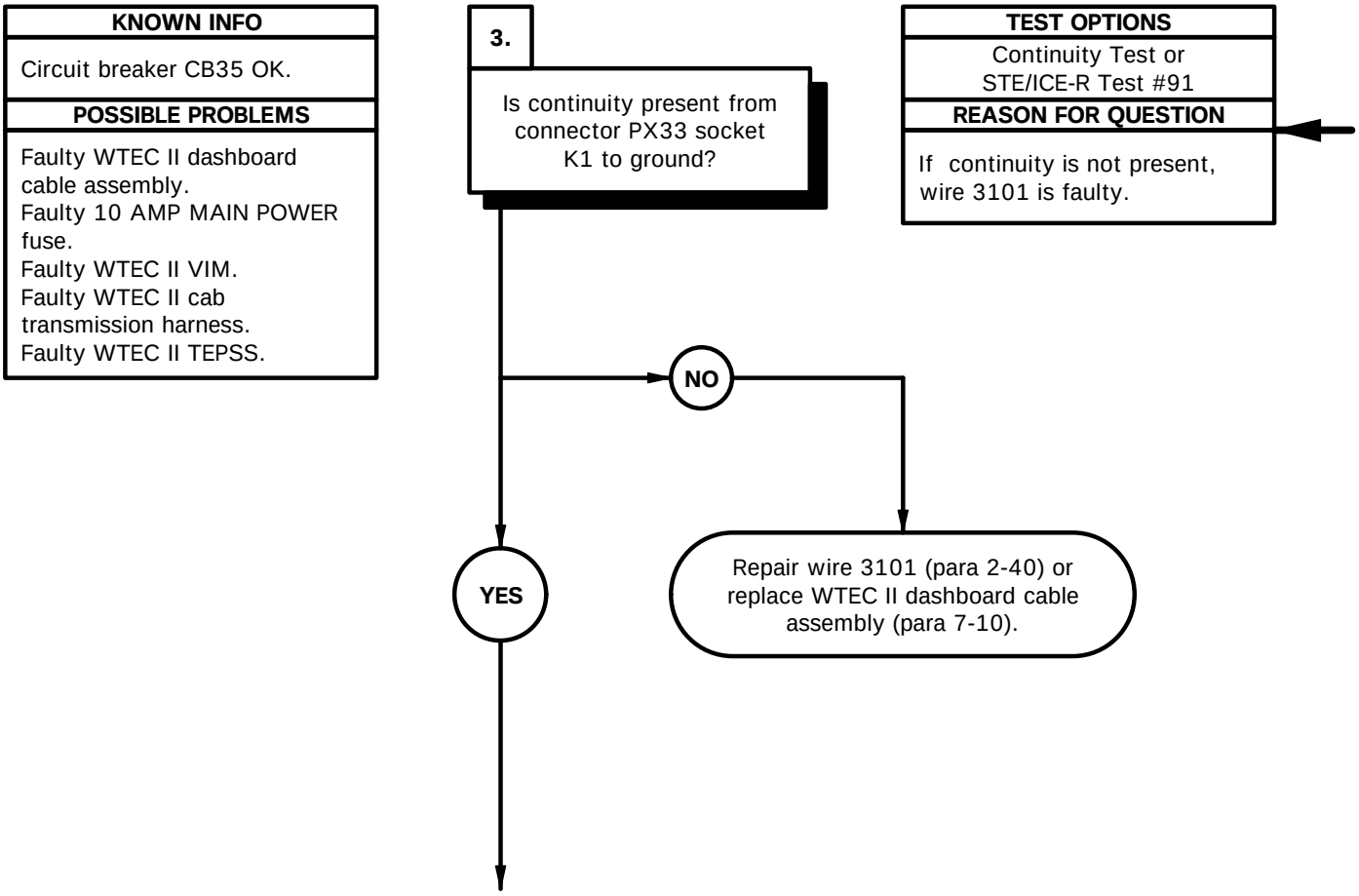
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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 2-40) or replace WTEC II dashboard cable assembly (para 7-10).

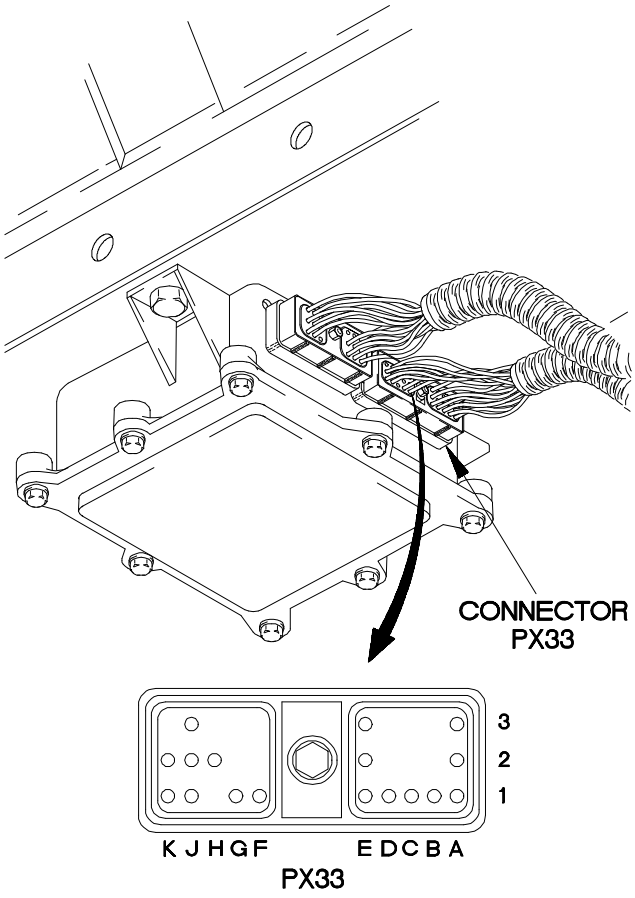


f19A. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 23 AND ANY SUB CODE (CONT)

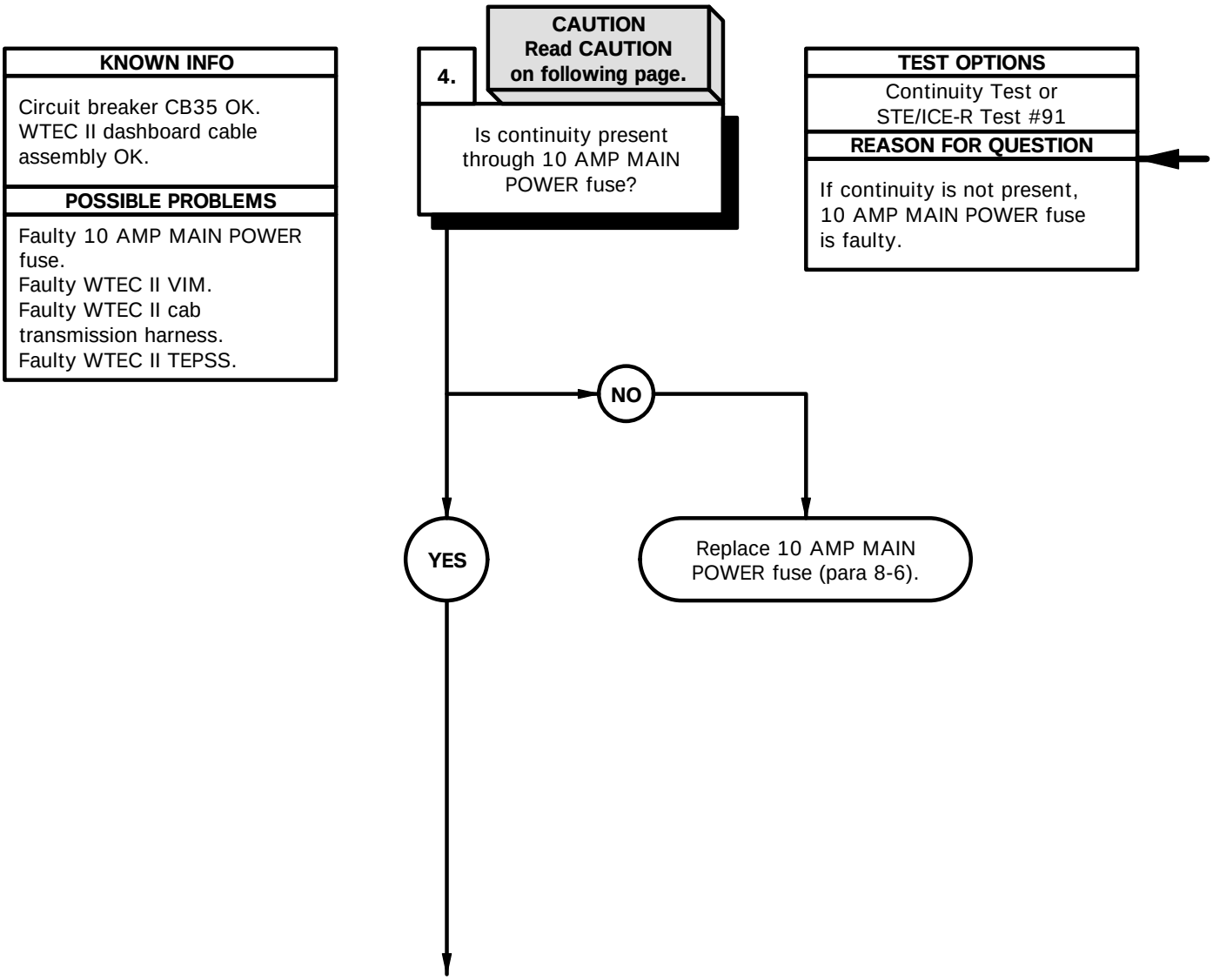


CONTINUITY TEST

(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 2-40) 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

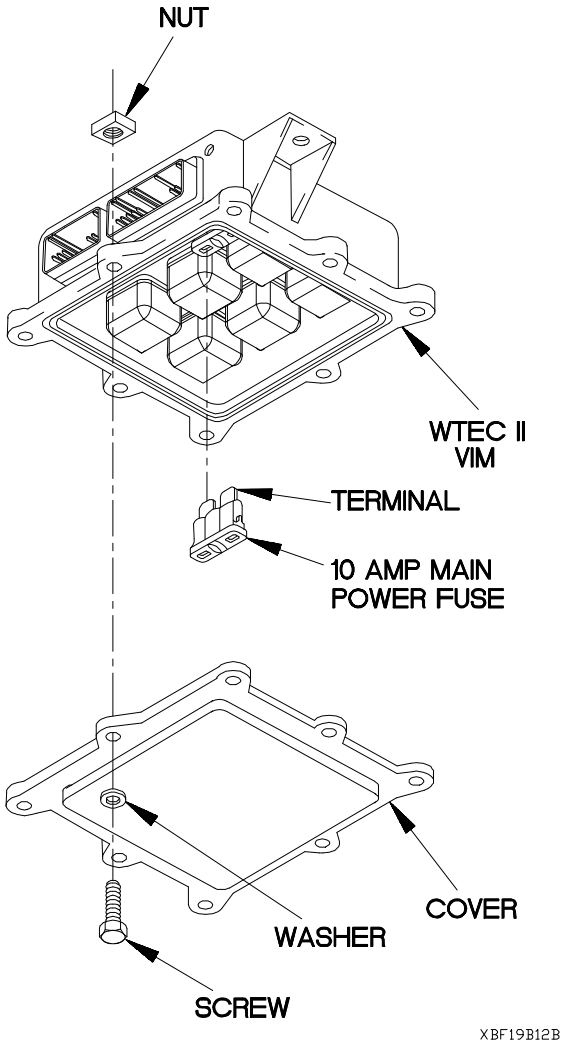
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

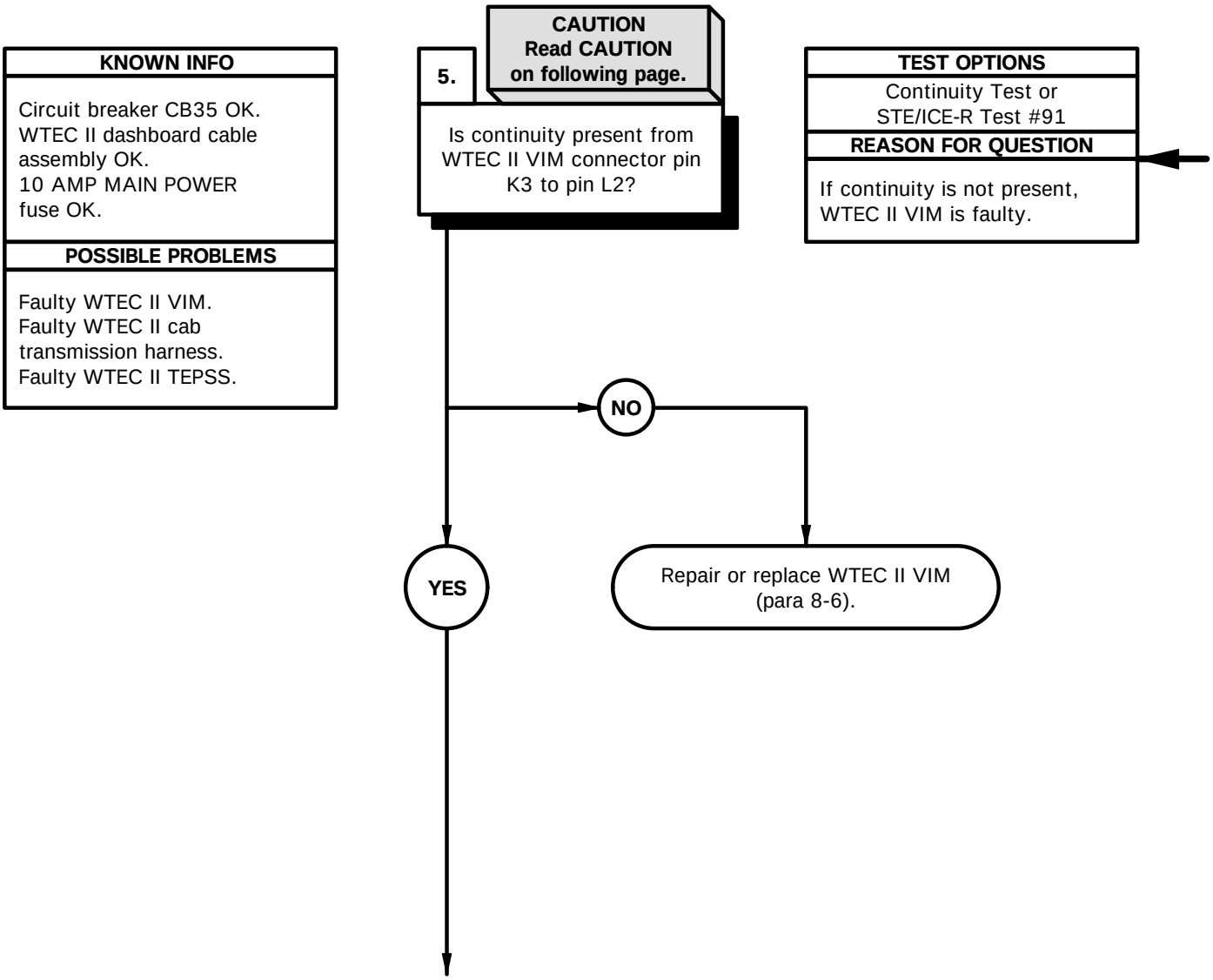
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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

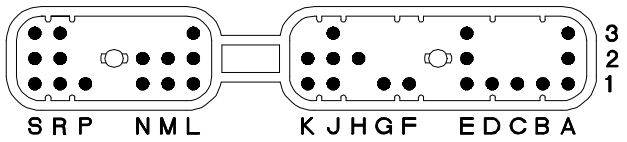
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

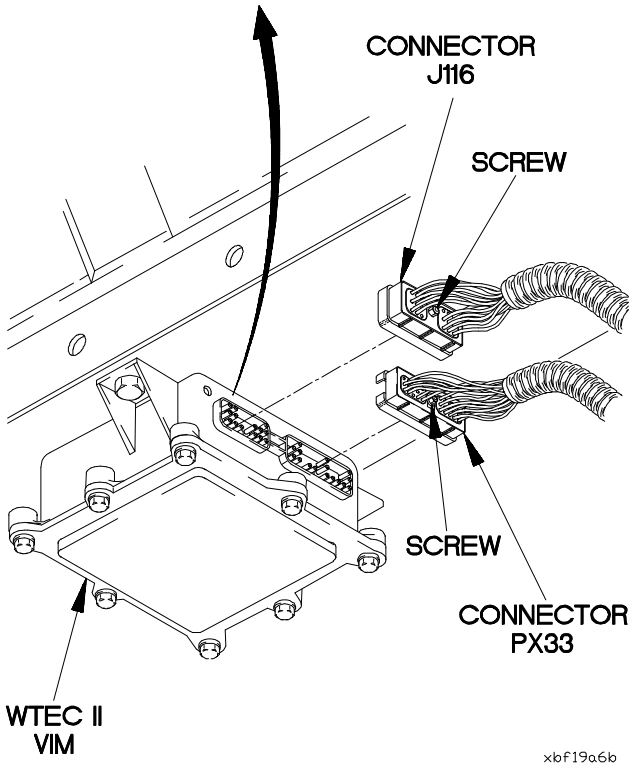
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

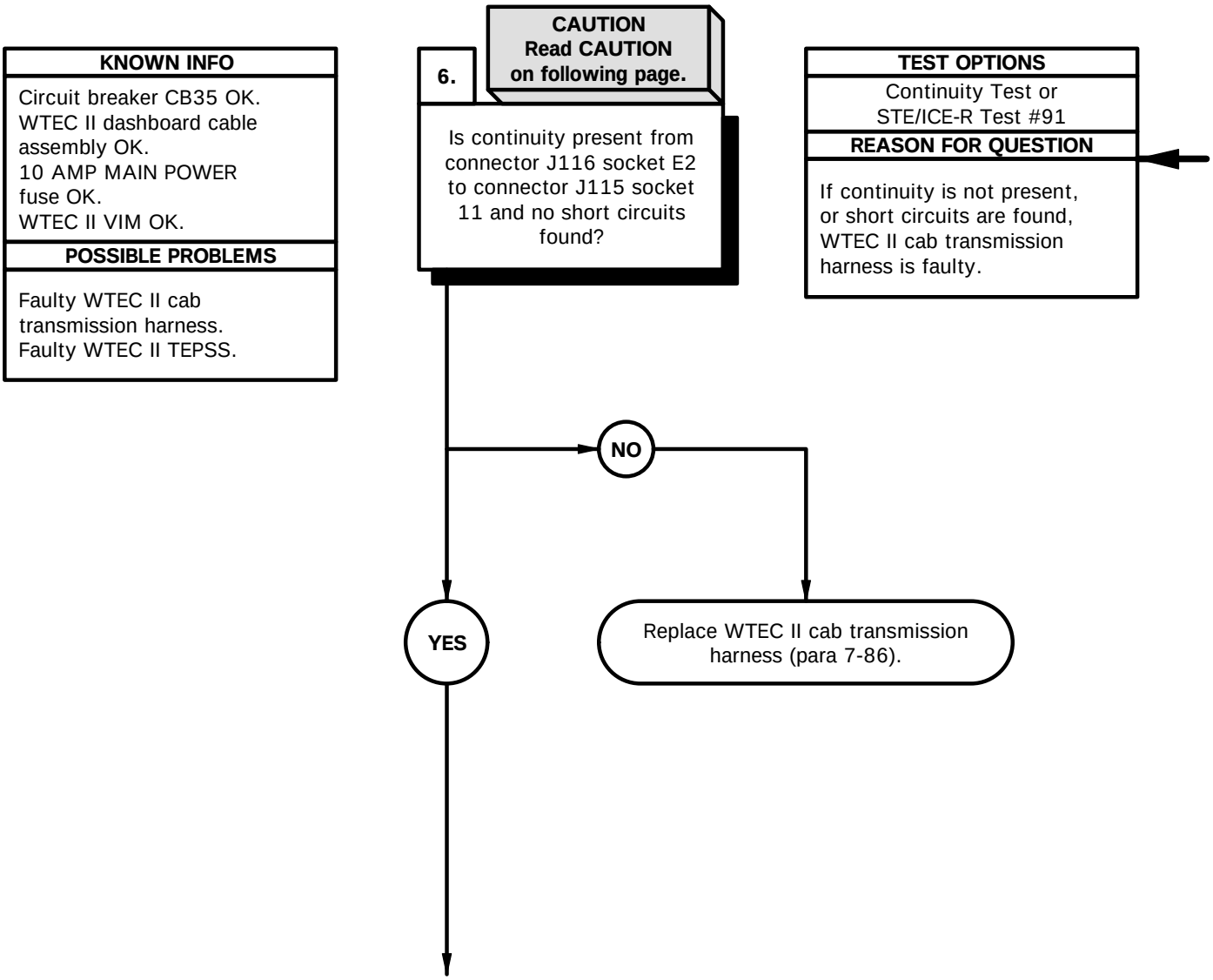
(1) Loosen screw in connector J116.
(2) Disconnect connector J116 from WTEC II VIM.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to WTEC II VIM connector pin K3.
(5) Connect negative (-) probe of multimeter to WTEC II VIM connector pin L2 and note reading on multimeter.
(6) 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

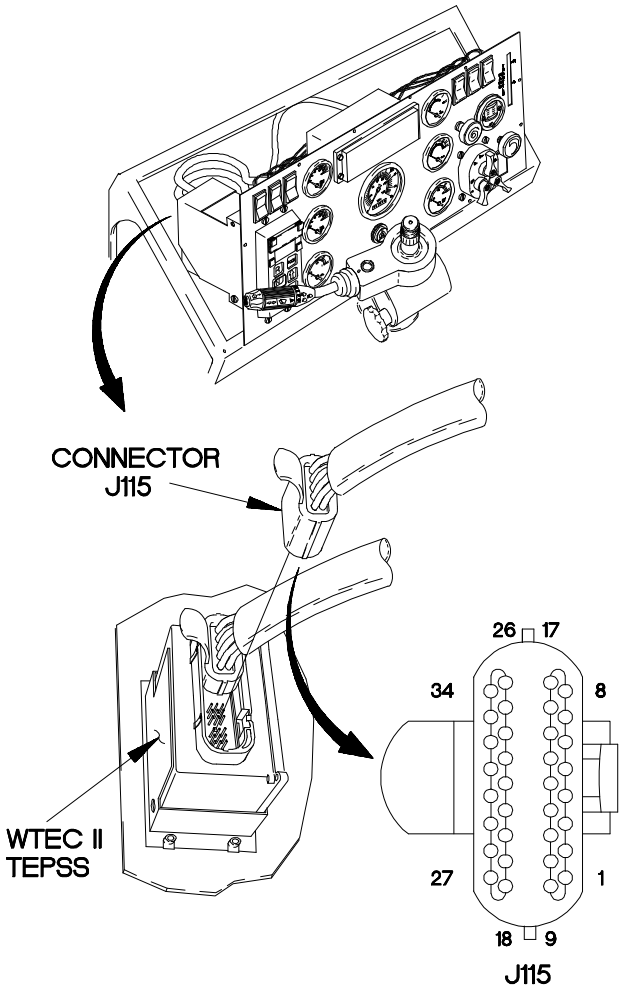
Use care when testing electrical connectors not to bend connector pins or damage connector sockets with multimeter probes. Failure to comply may result in damage to equipment.

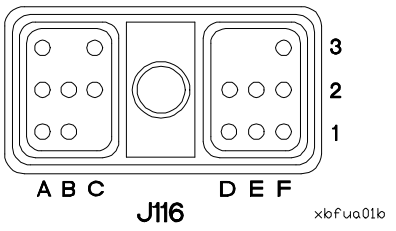
NOTE

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

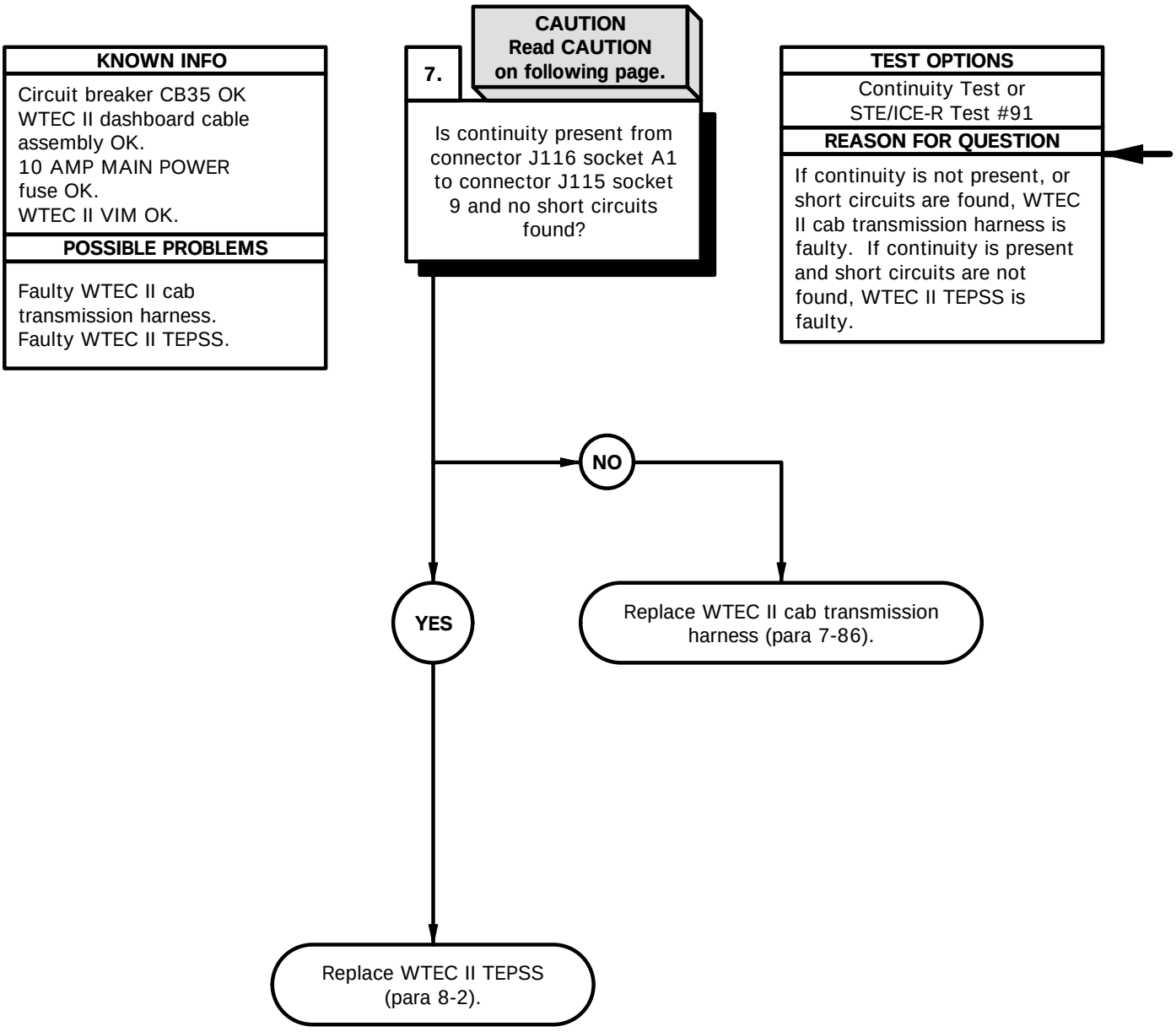
CONTINUITY TEST

(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 7-86).





f19A. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 23 AND ANY SUB CODE (CONT)



CAUTION

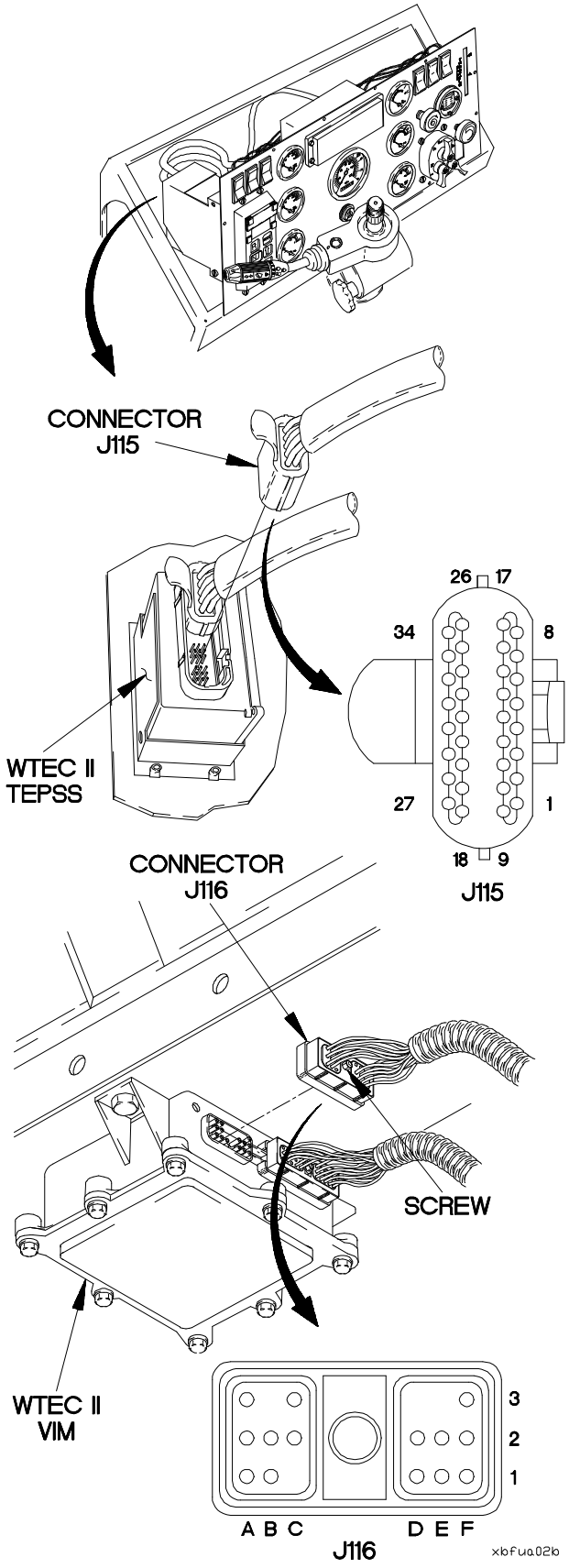
Use care when testing electrical connectors not to bend connector pins or damage connector sockets with multimeter probes. Failure to comply may result in damage to equipment.

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 7-86).
(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 9-2320-365-10).
Kick panel removed (para 16-3).

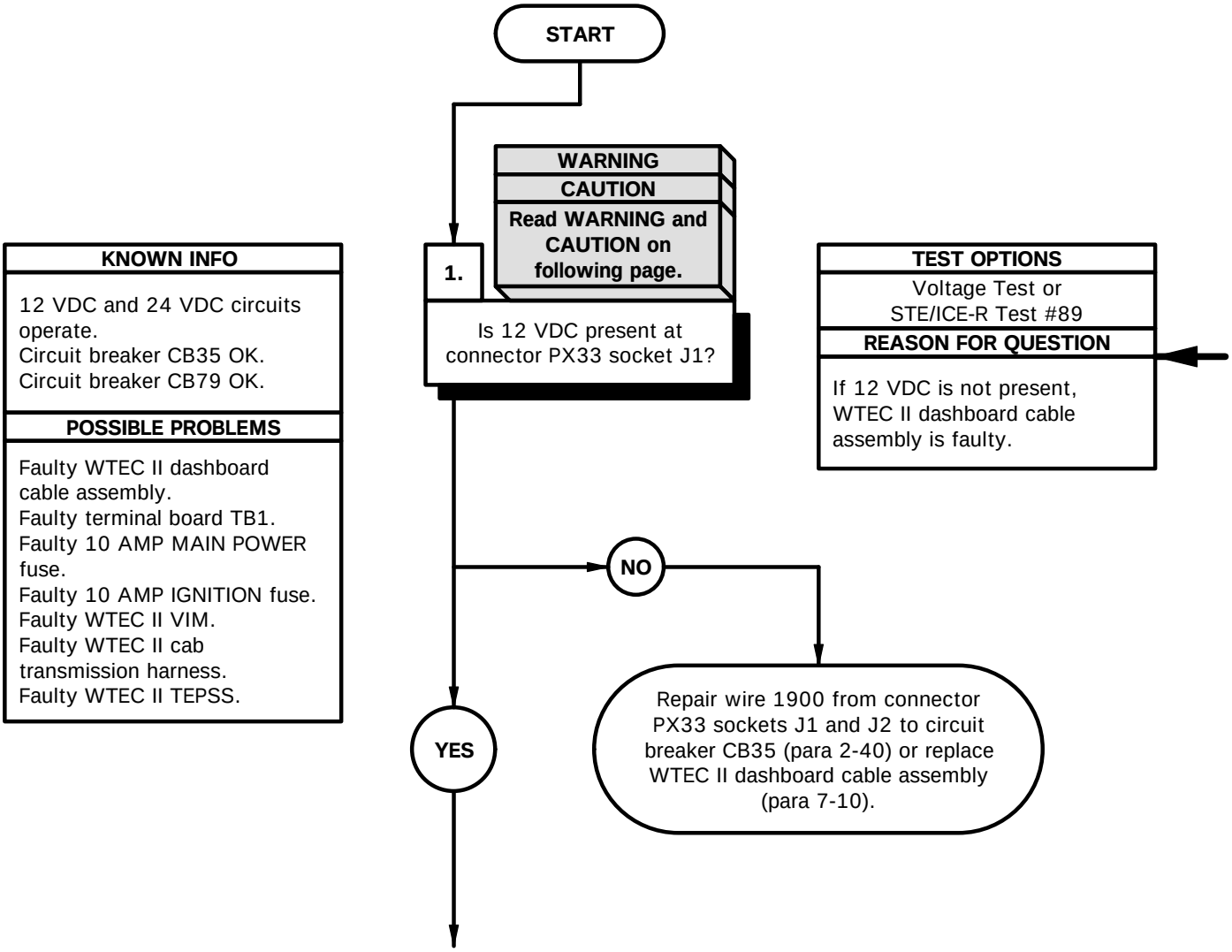
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

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.



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

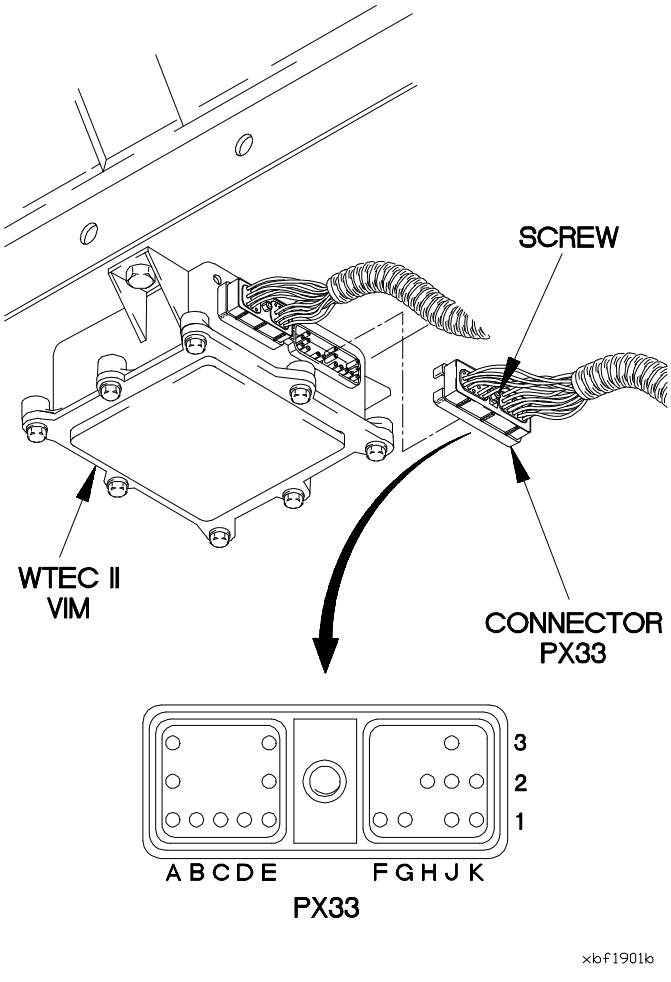
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

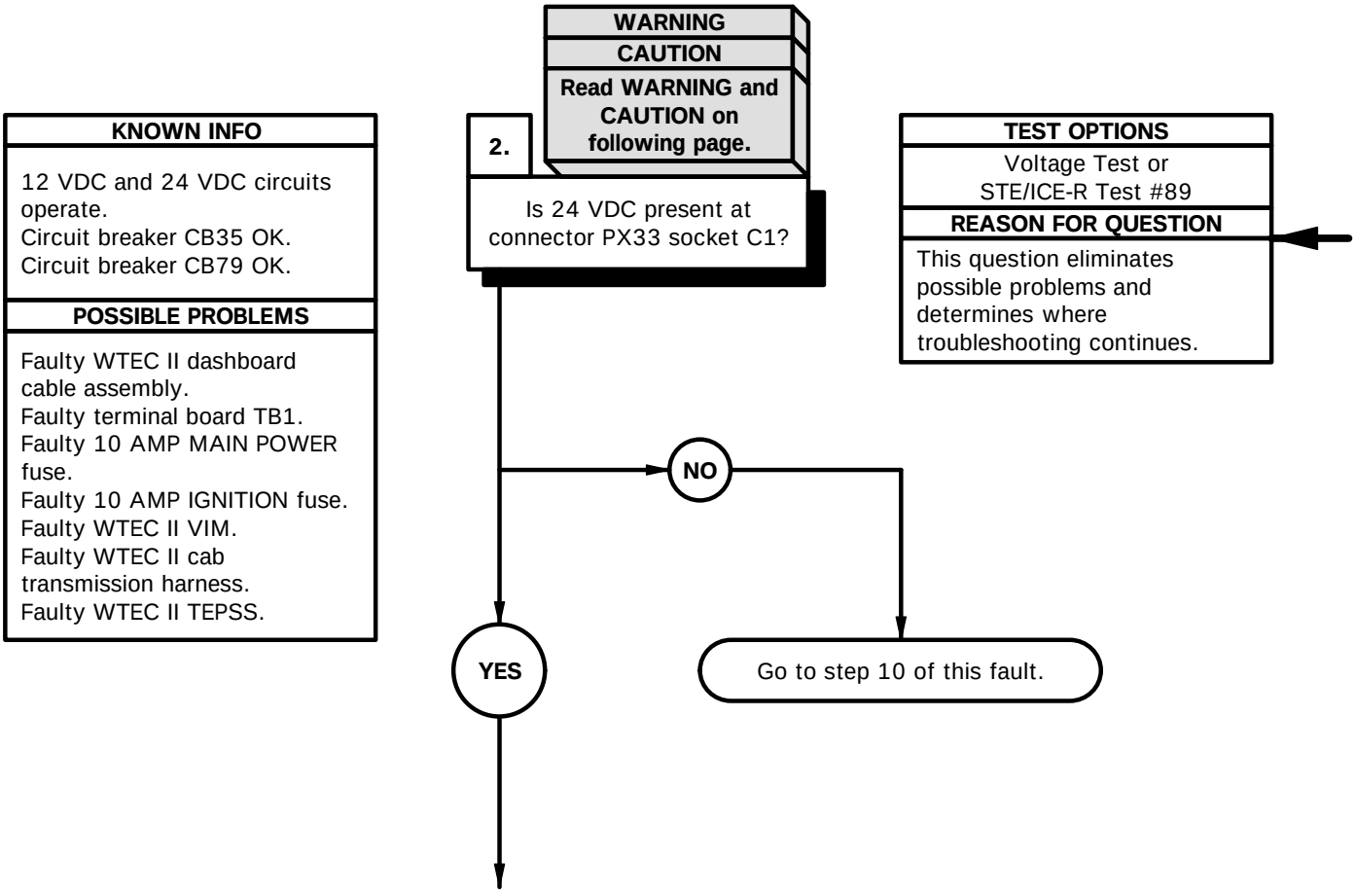
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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 9-2320-365-10) and note reading on multimeter.
(7) Position master power switch to off (TM 9-2320-365-10).
(8) If 12 VDC is not present, repair wire 1900 from connector PX33 sockets J1 and J2 to circuit breaker CB35 (para 2-40) 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

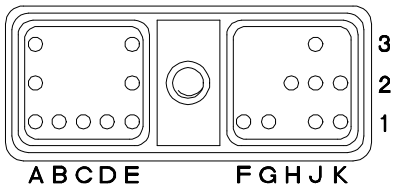
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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

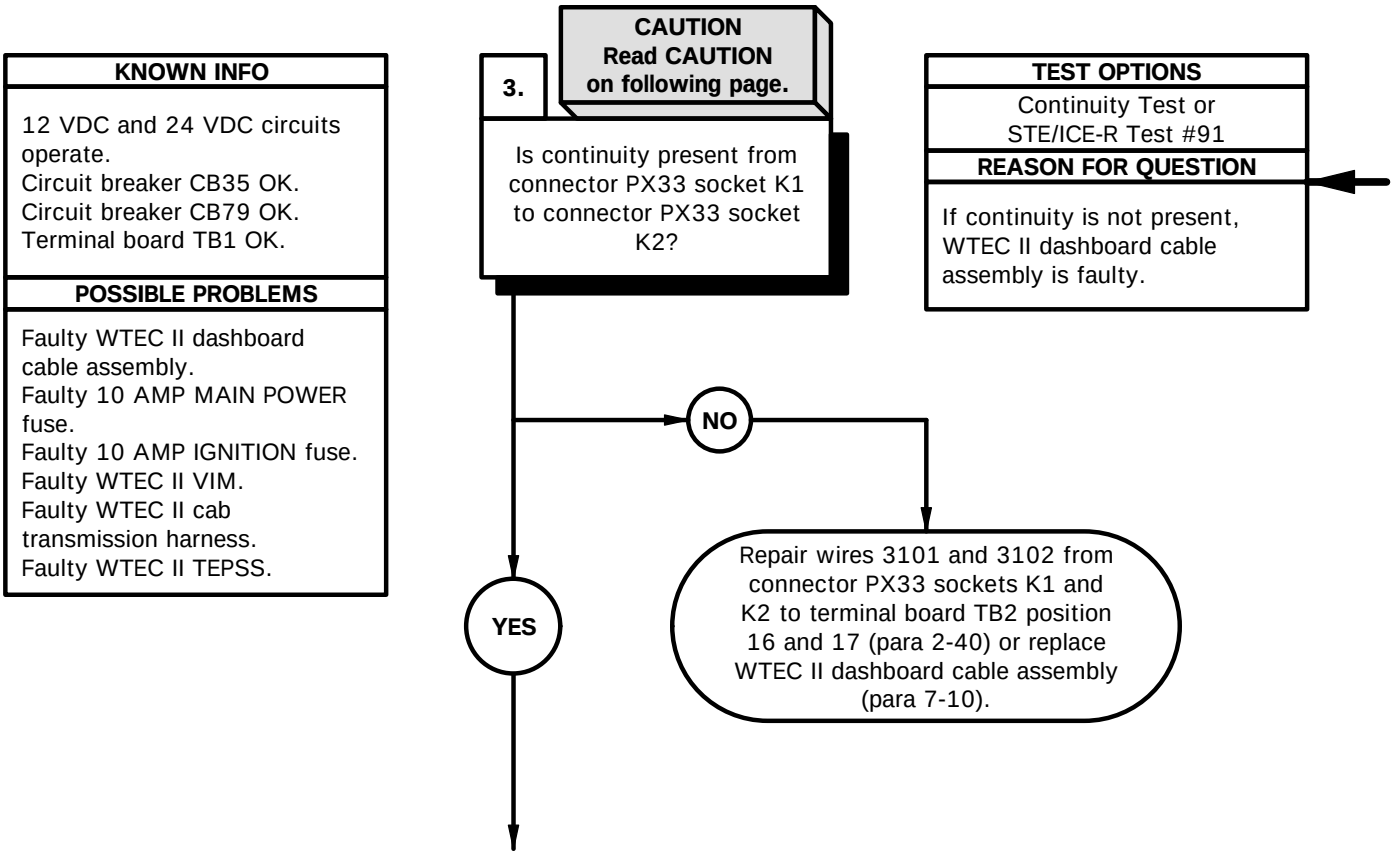
(1) Set multimeter to volts DC.
(2) Connect positive (+) probe of multimeter to connector PX33 socket C1.
(3) Connect negative (-) probe of multimeter to ground.
(4) Position master power switch to on (TM 9-2320-365-10) and note reading on multimeter.
(5) Position master power switch to off (TM 9-2320-365-10).
(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

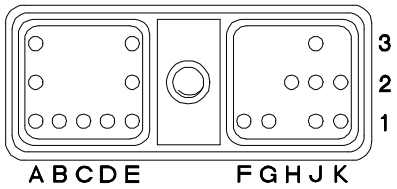
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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

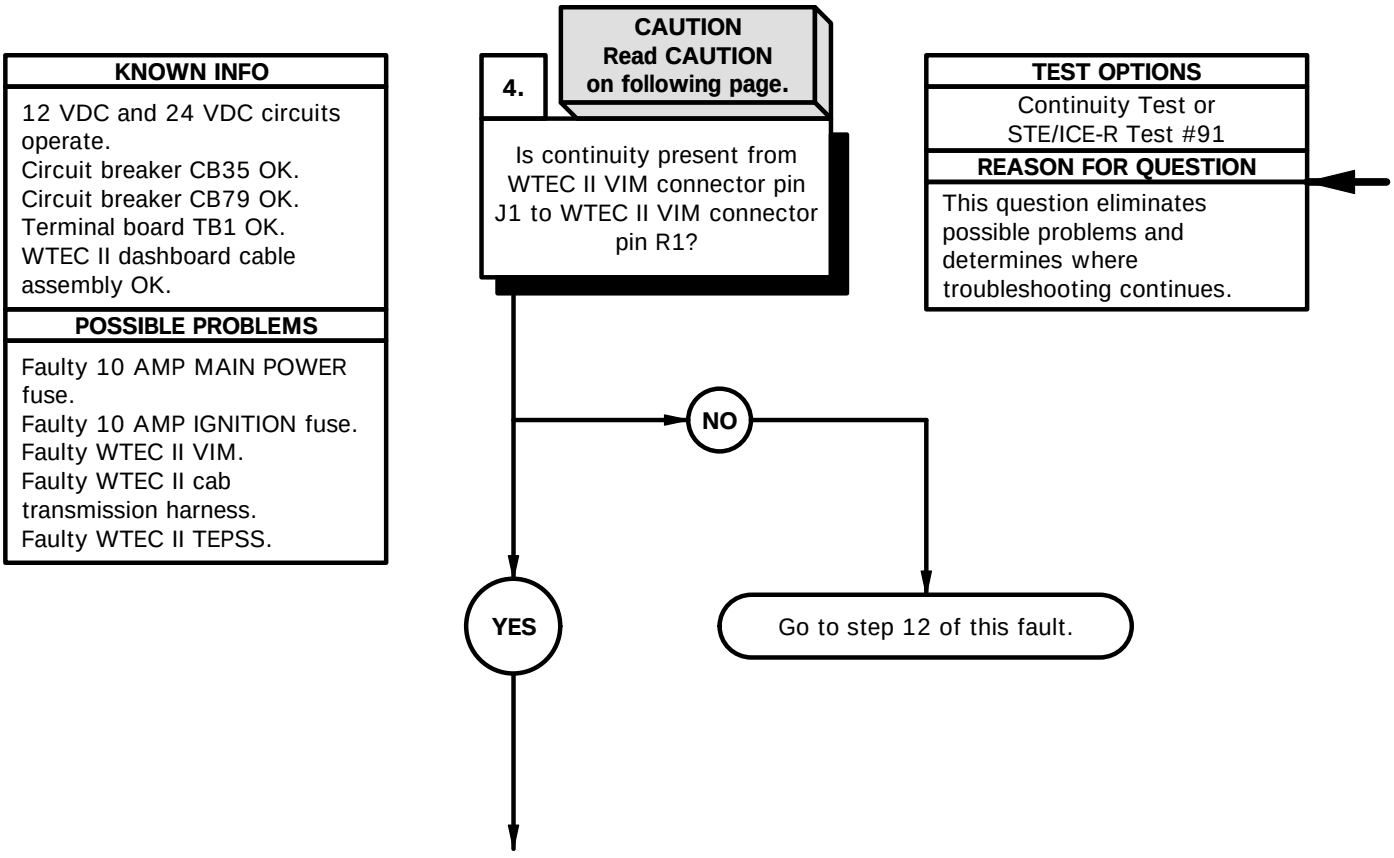
(1) Disconnect batteries (para 7-48).
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector PX33 socket K1.
(4) Connect negative (-) probe of multimeter to connector PX33 socket K2 and note reading on multimeter.
(5) If continuity is not present, Repair wires 3101 and 3102 from connector PX33 sockets K1 and K2 to terminal board TB2 position 16 and 17 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10).



PX33

XBF19B03B

f19B. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DOES NOT ILLUMINATE (CONT)



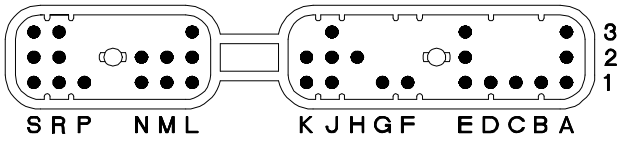
CAUTION

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.

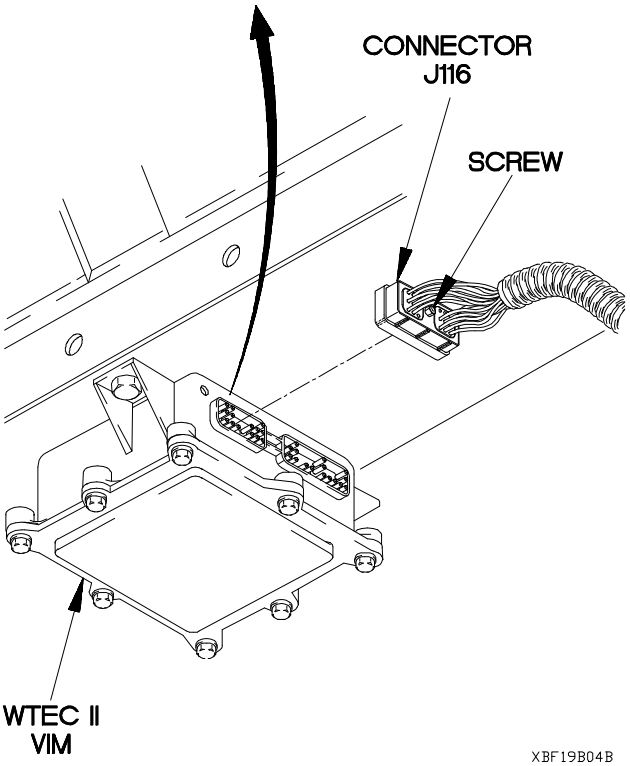
NOTE

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

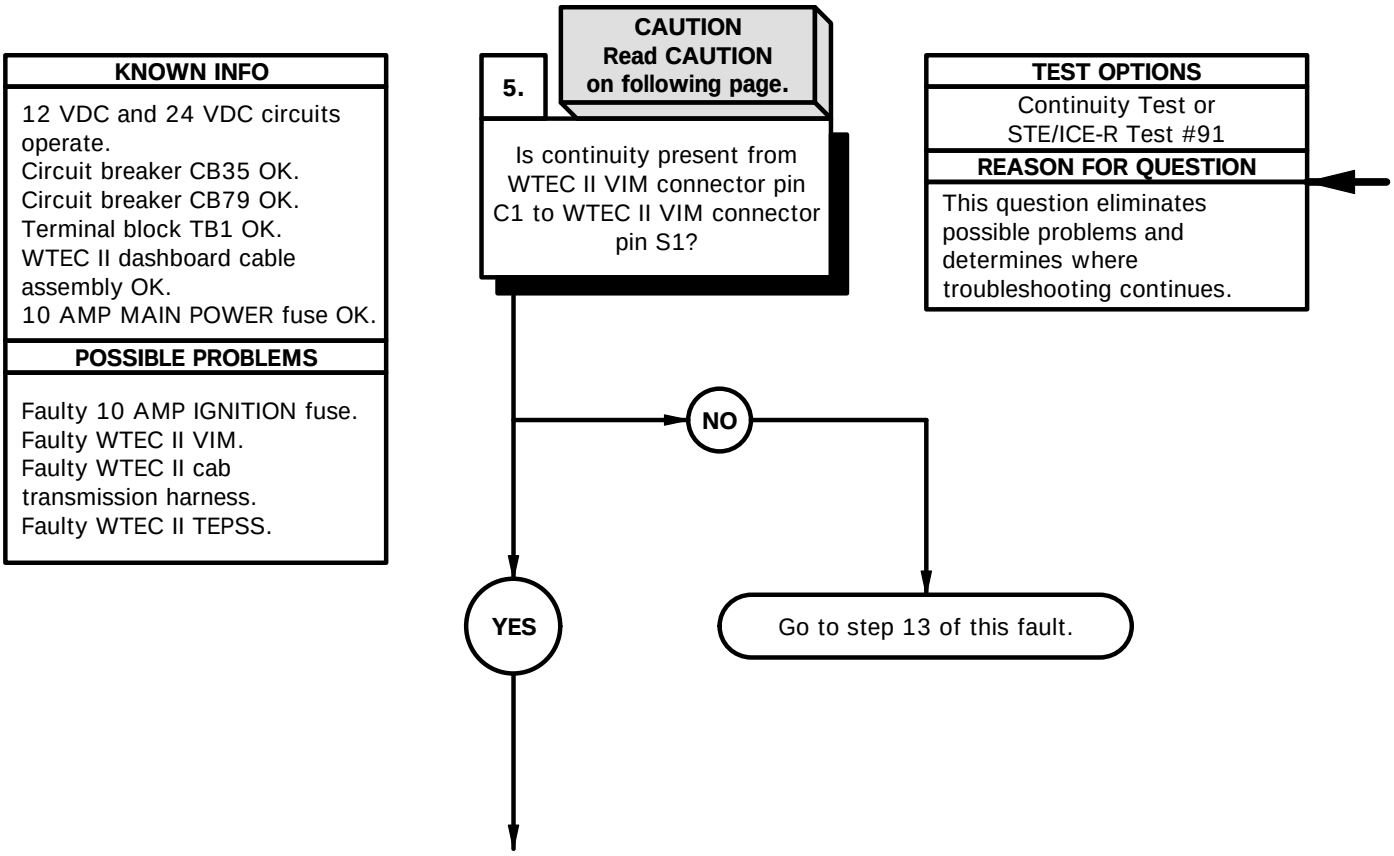
CONTINUITY TEST
(1) Loosen screw in connector P116.
(2) Disconnect connector P116 from WTEC II VIM.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to WTEC II connector pin J1.
(5) Connect negative (-) probe of multimeter to WTEC II connector pin R1 and note reading on multimeter.
(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

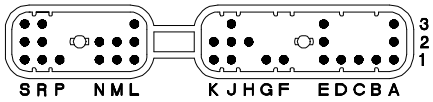
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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

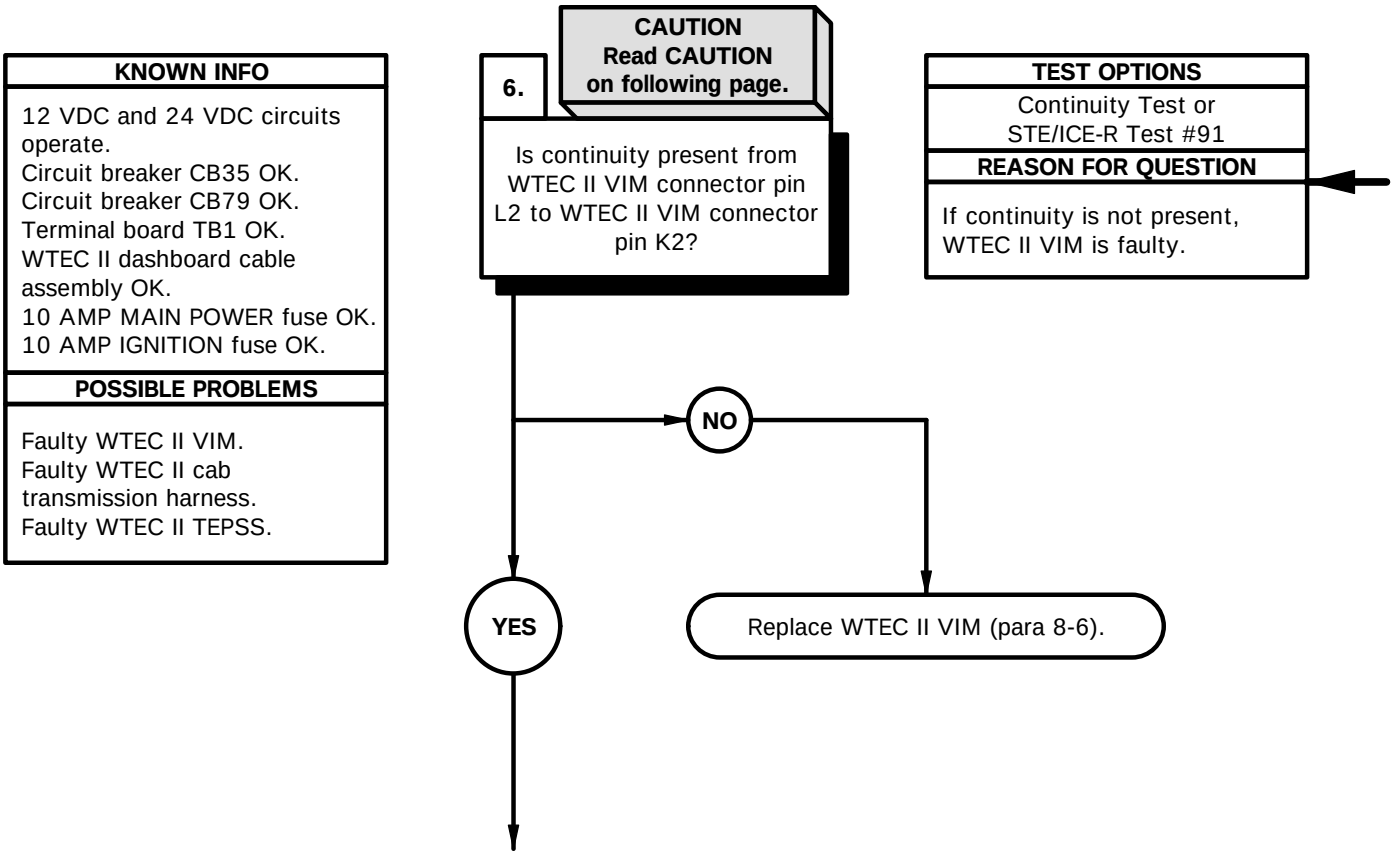
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to WTEC II connector pin C1.
(3) Connect negative (-) probe of multimeter to WTEC II connector pin S1 and note reading on multimeter.
(4) If continuity is not present, go to step 13 of this fault.

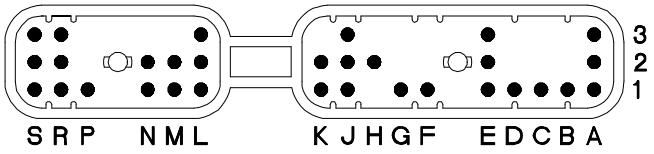


VIM CONNECTOR PINS

XBF19B05B

f19B. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DOES NOT ILLUMINATE (CONT)





VIM CONNECTOR

CAUTION

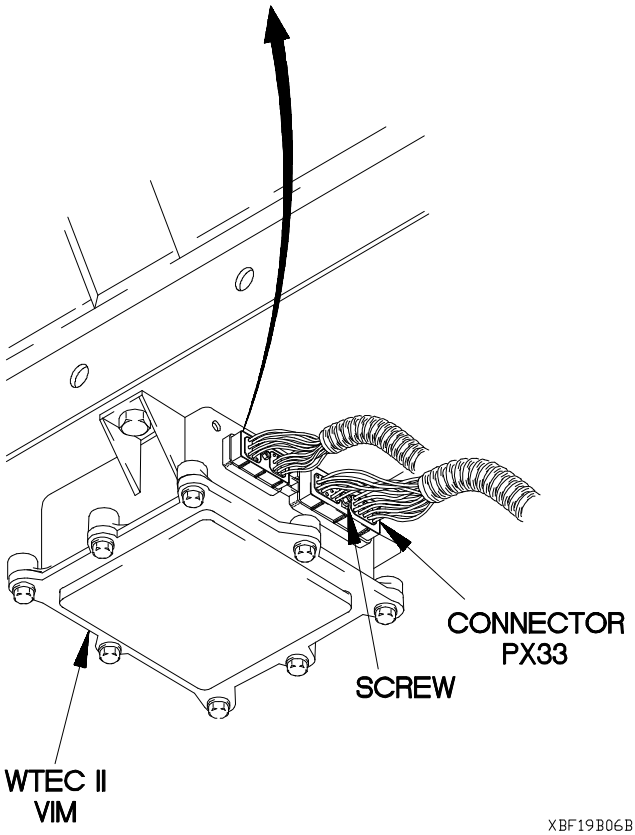
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

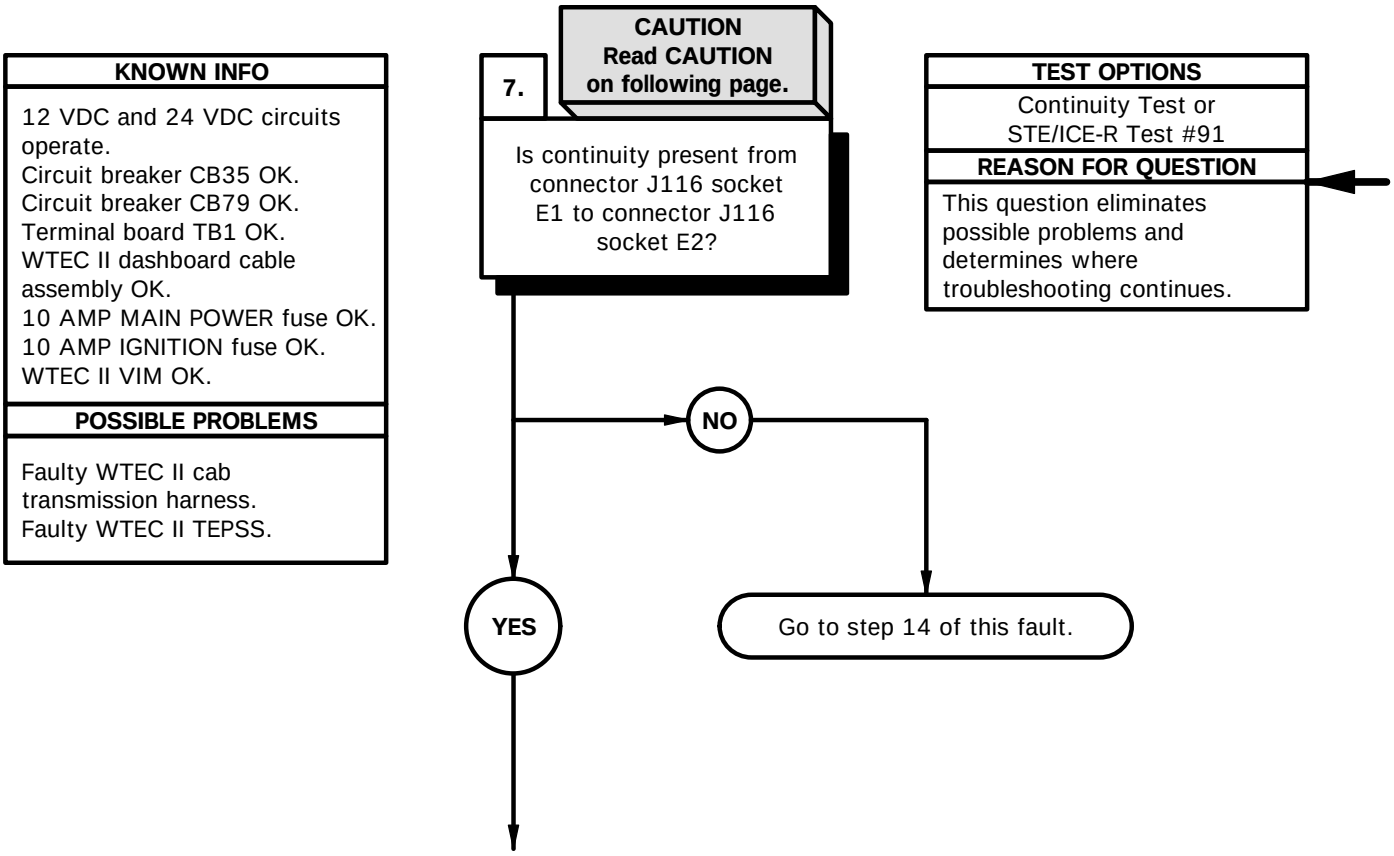
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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.



f19B. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DOES NOT ILLUMINATE (CONT)



CAUTION

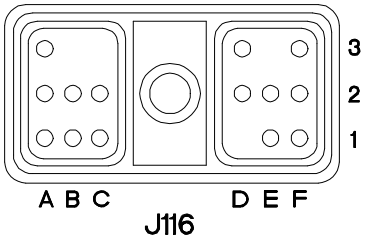
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

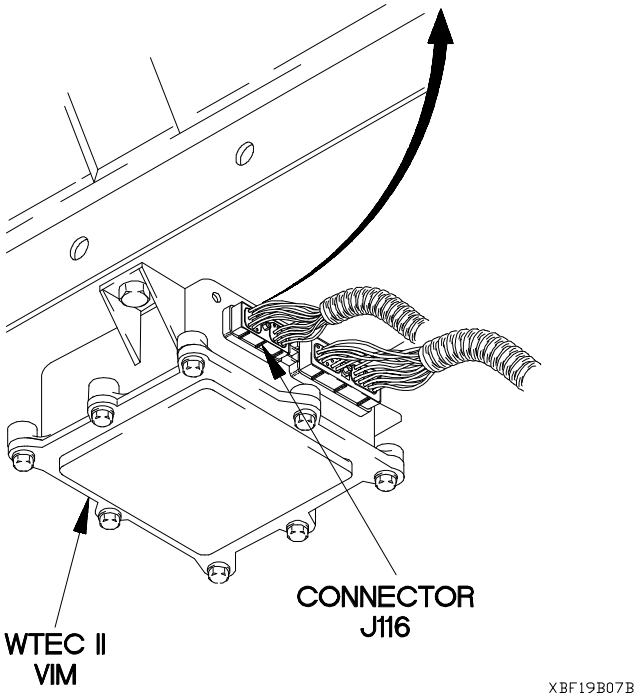
NOTE

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

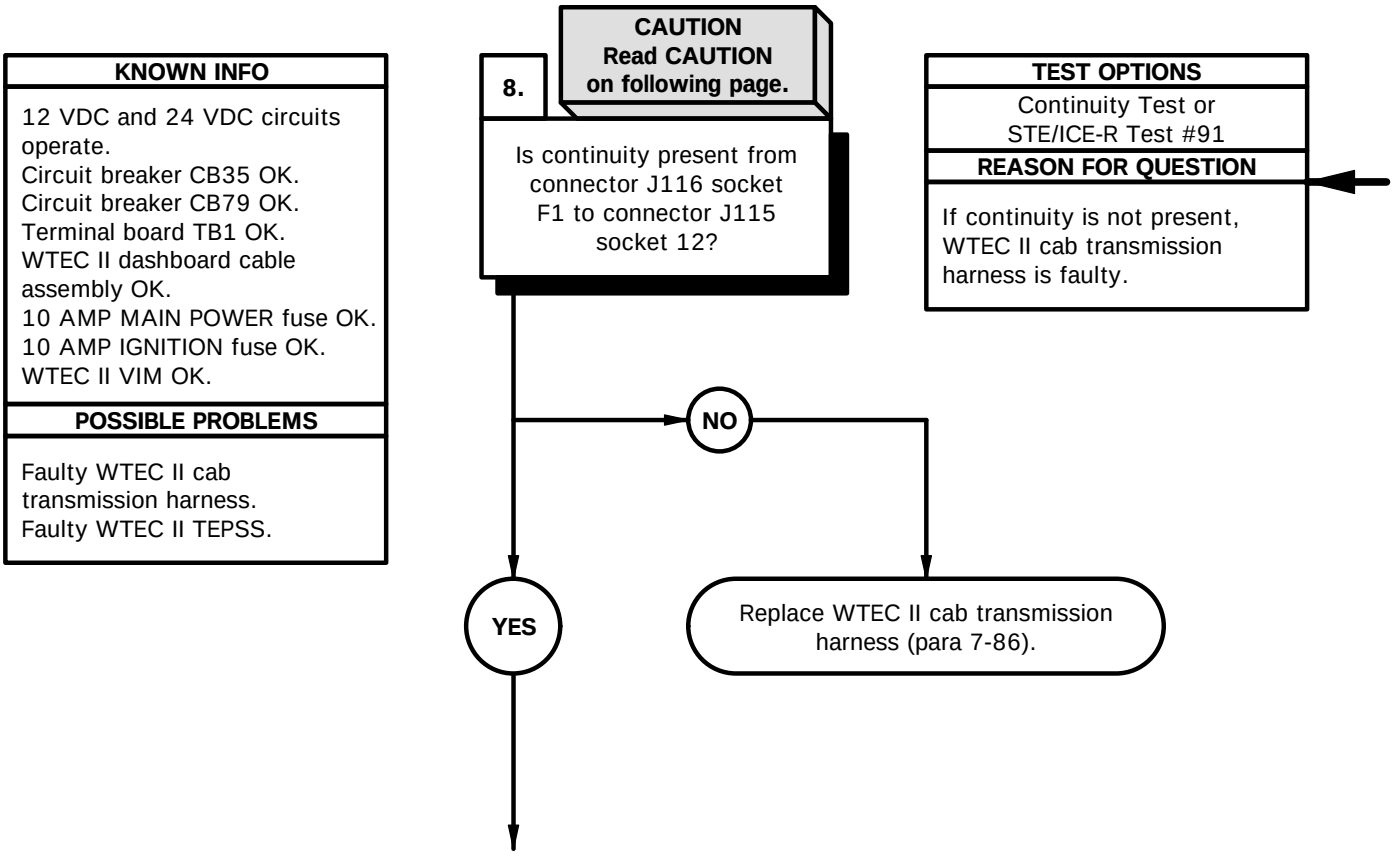
CONTINUITY TEST

(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

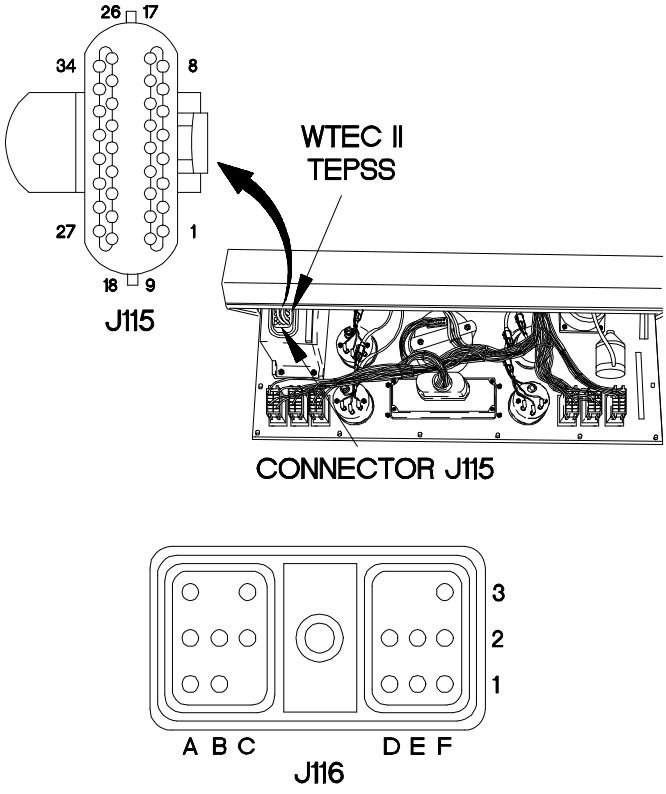
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

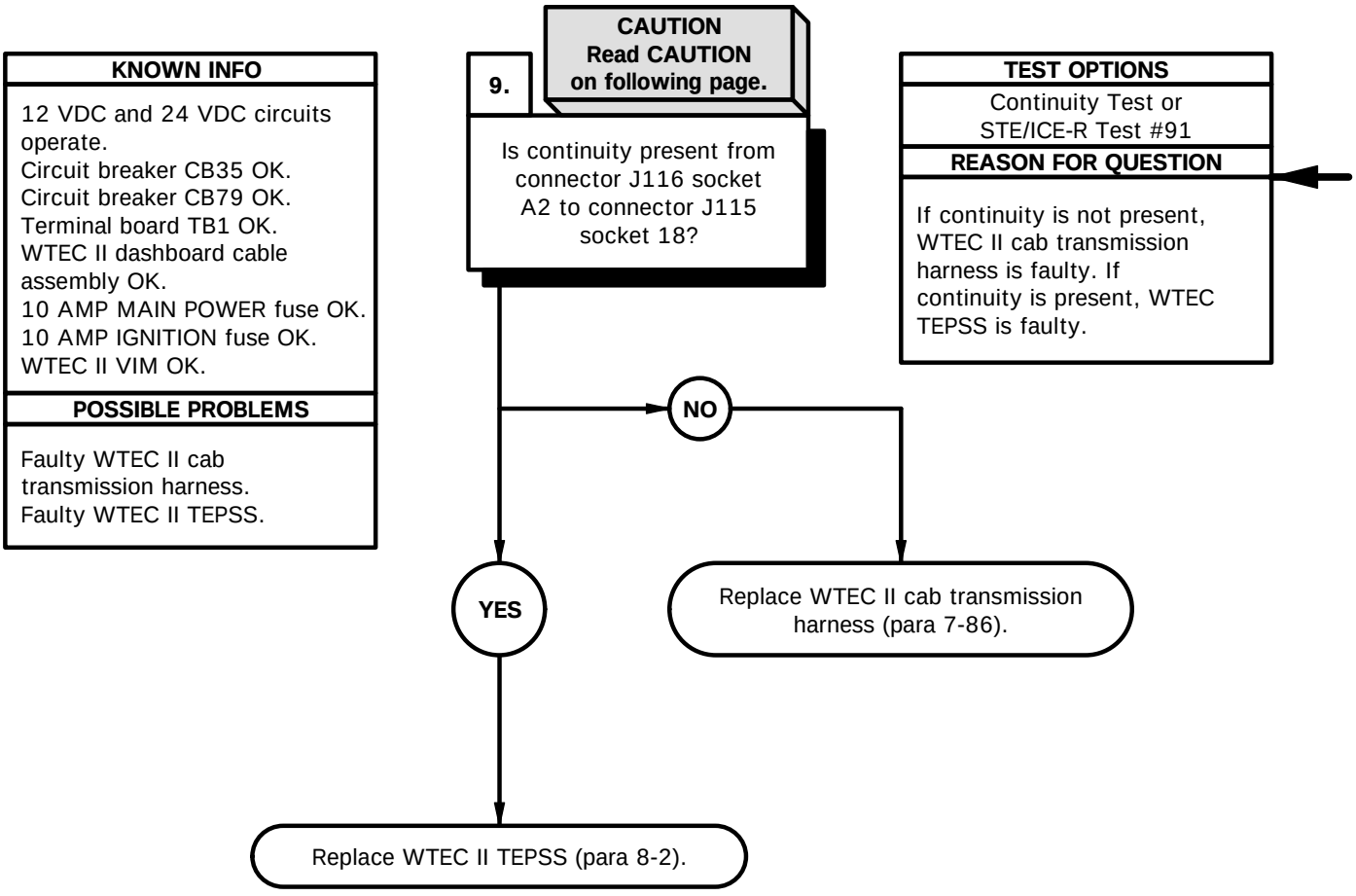
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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 7-86).



f19B. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DOES NOT ILLUMINATE (CONT)



CAUTION

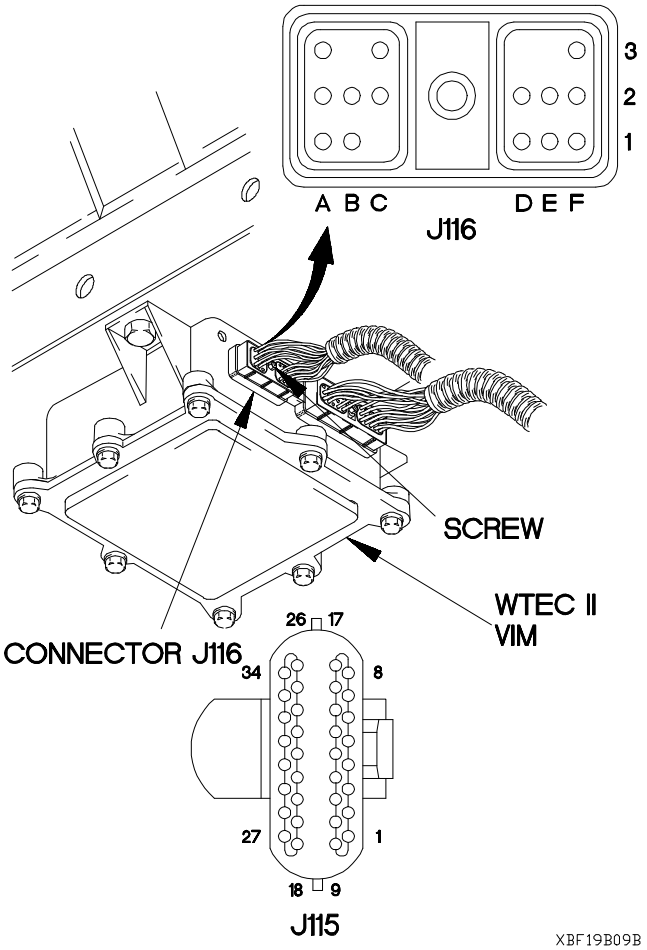
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

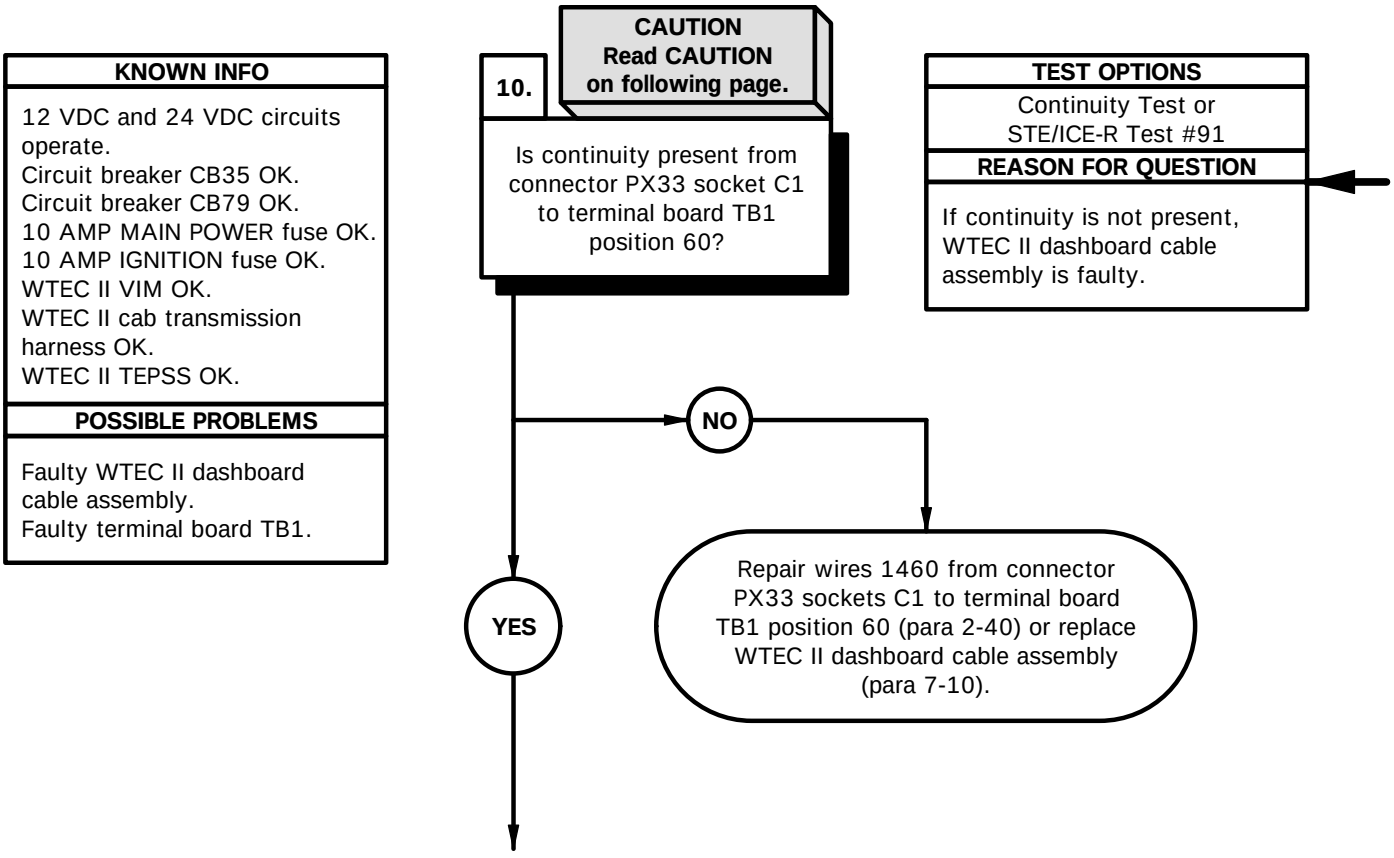
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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 7-86).
(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 P116.
(8) Install kick panel (para 16-3).



f19B. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DOES NOT ILLUMINATE (CONT)



CAUTION

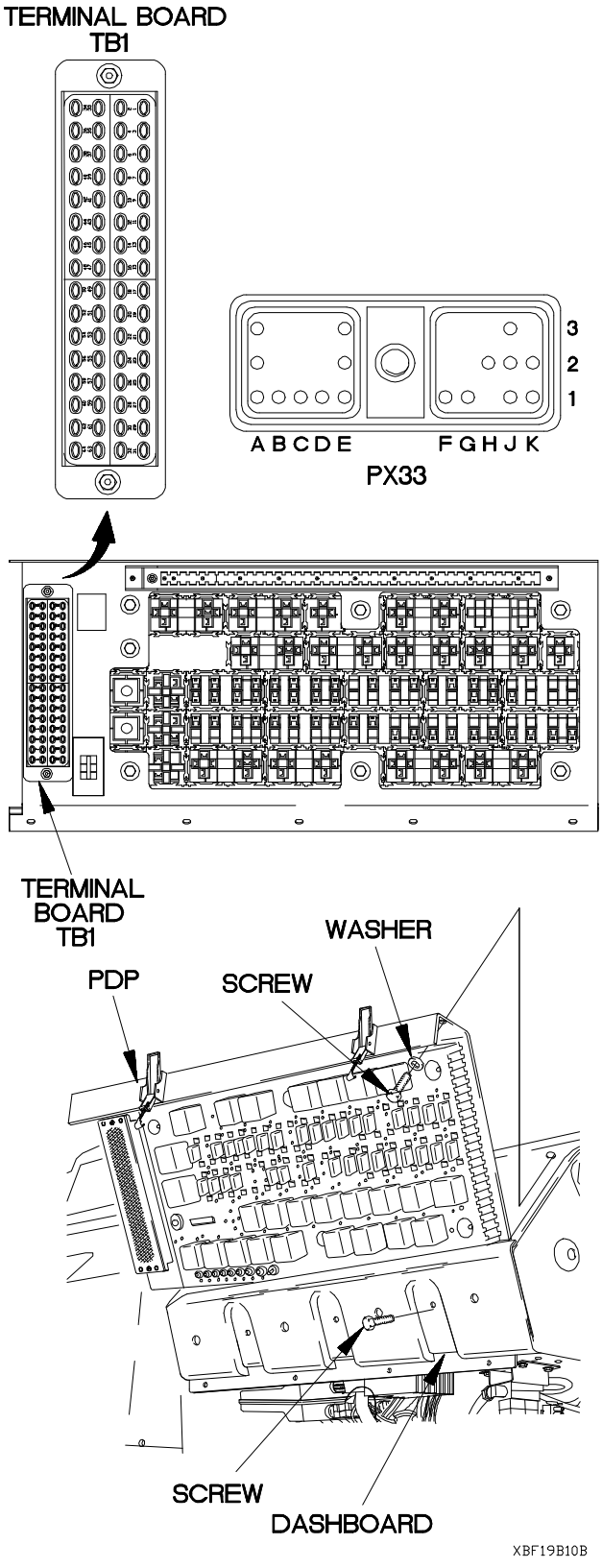
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

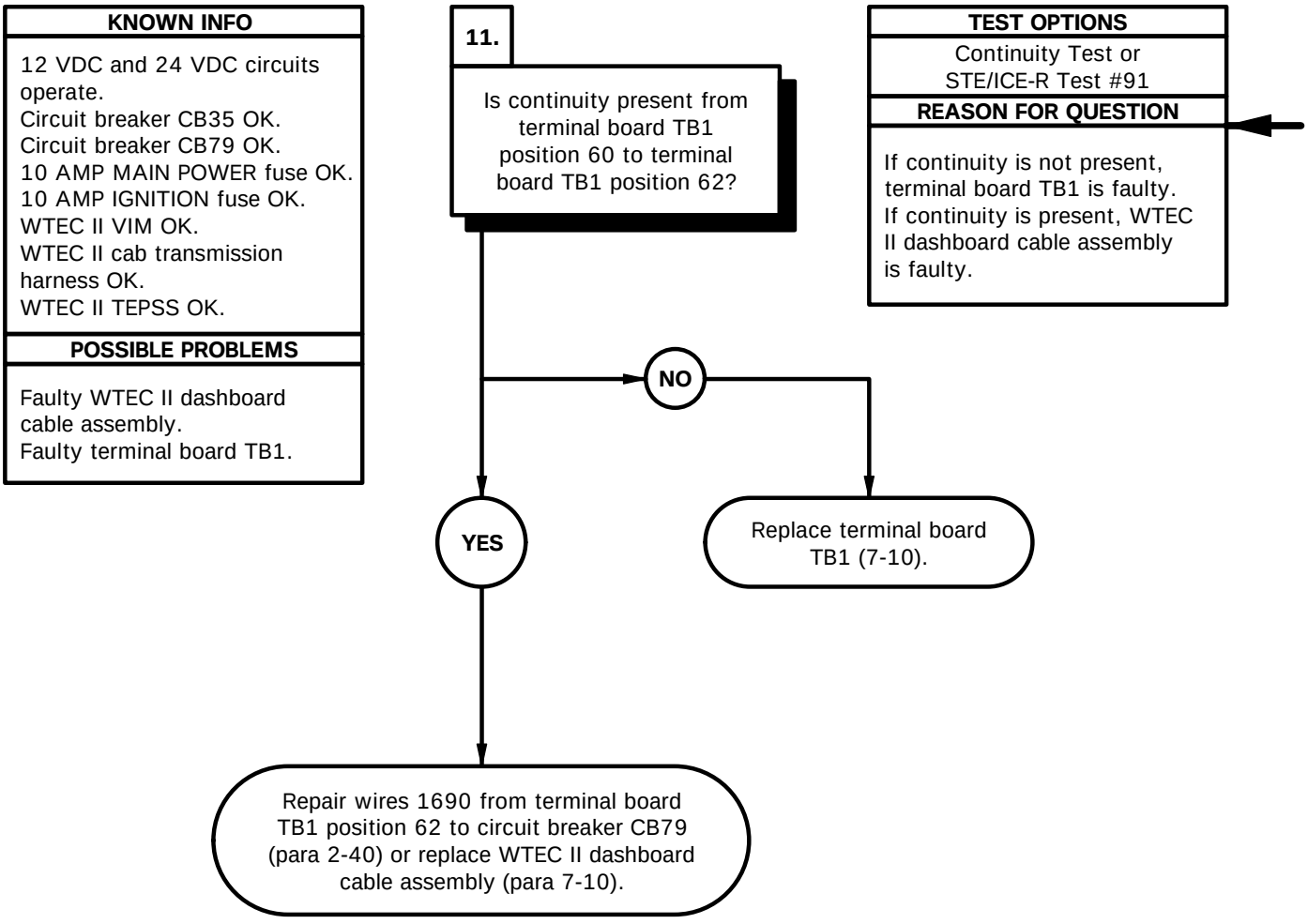
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Disconnect batteries (para 7-48).
(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 2-40) 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).

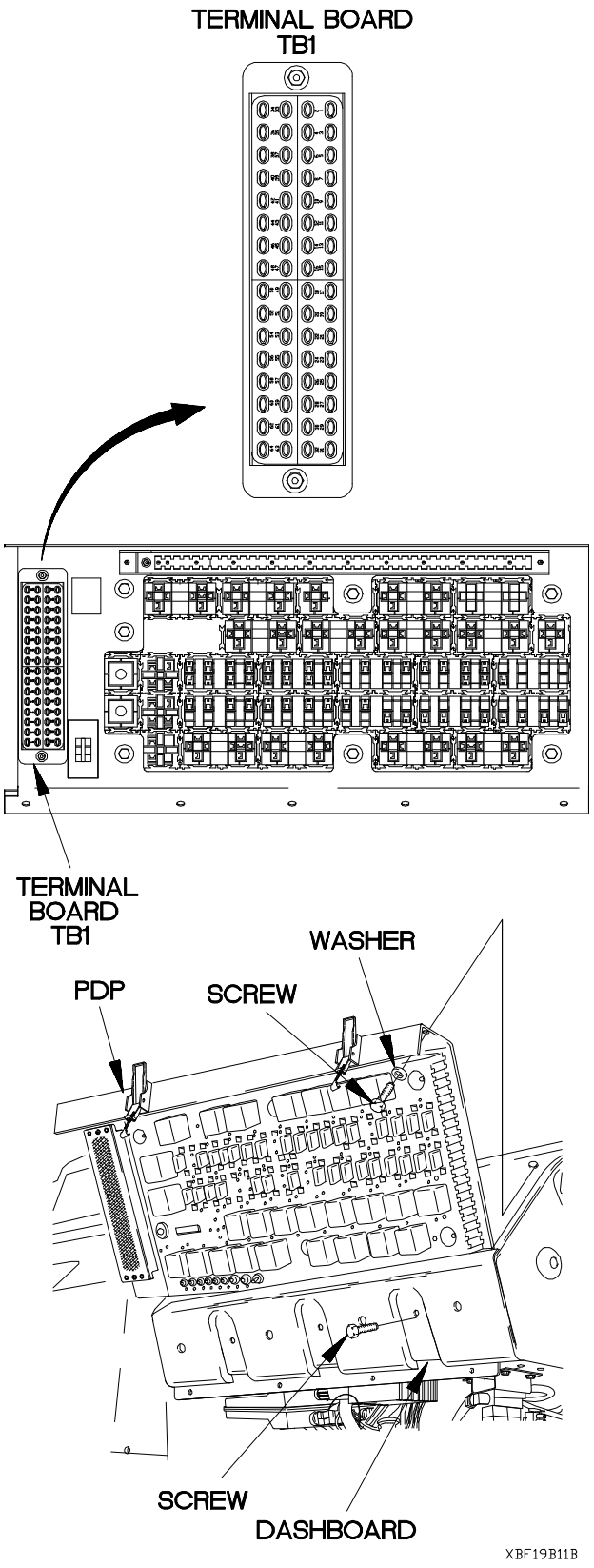


f19B. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DOES NOT ILLUMINATE (CONT)

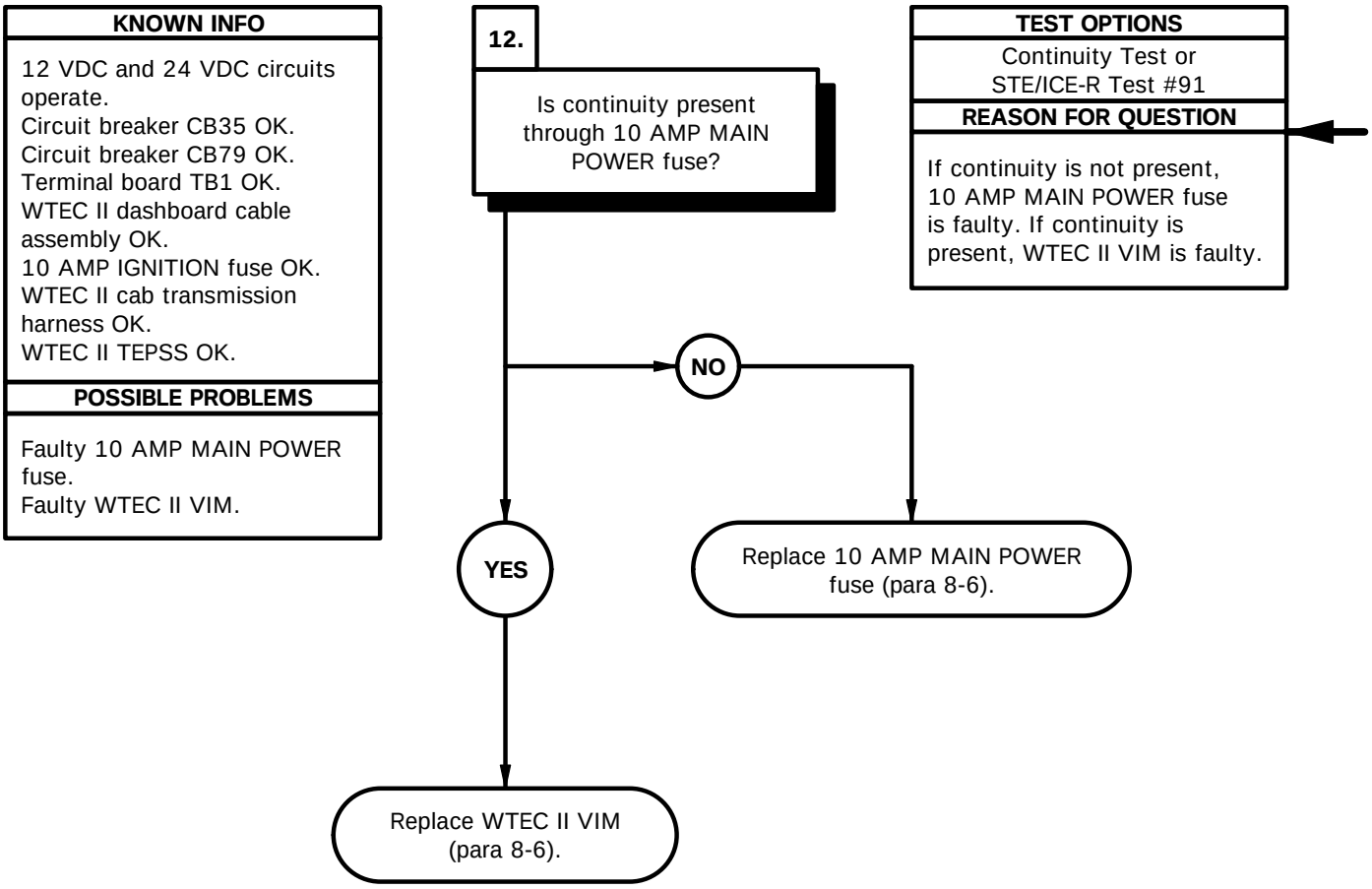


CONTINUITY TEST

(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 2-40) 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 7-48).

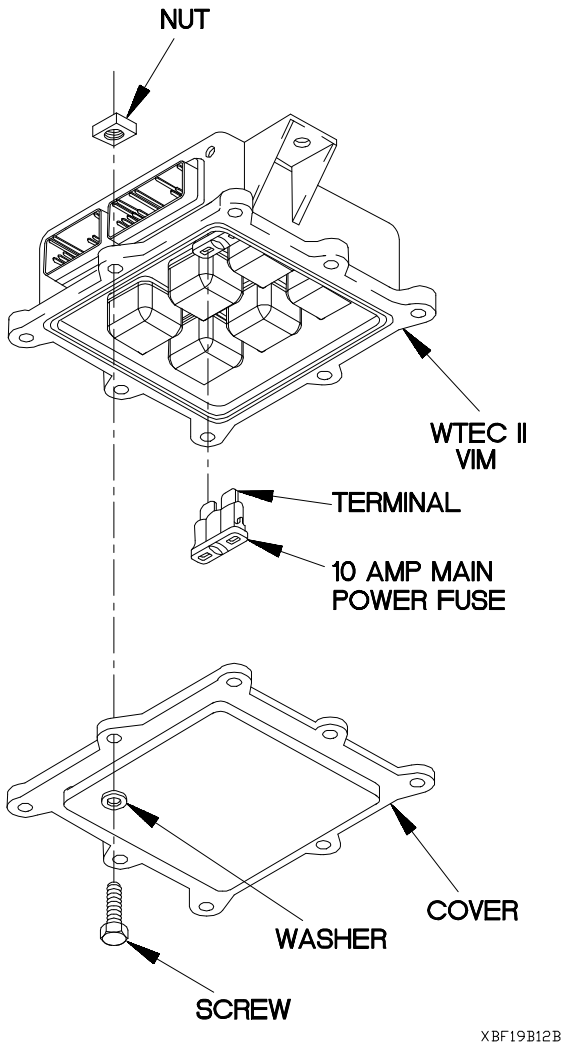


f19B. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DOES NOT ILLUMINATE (CONT)

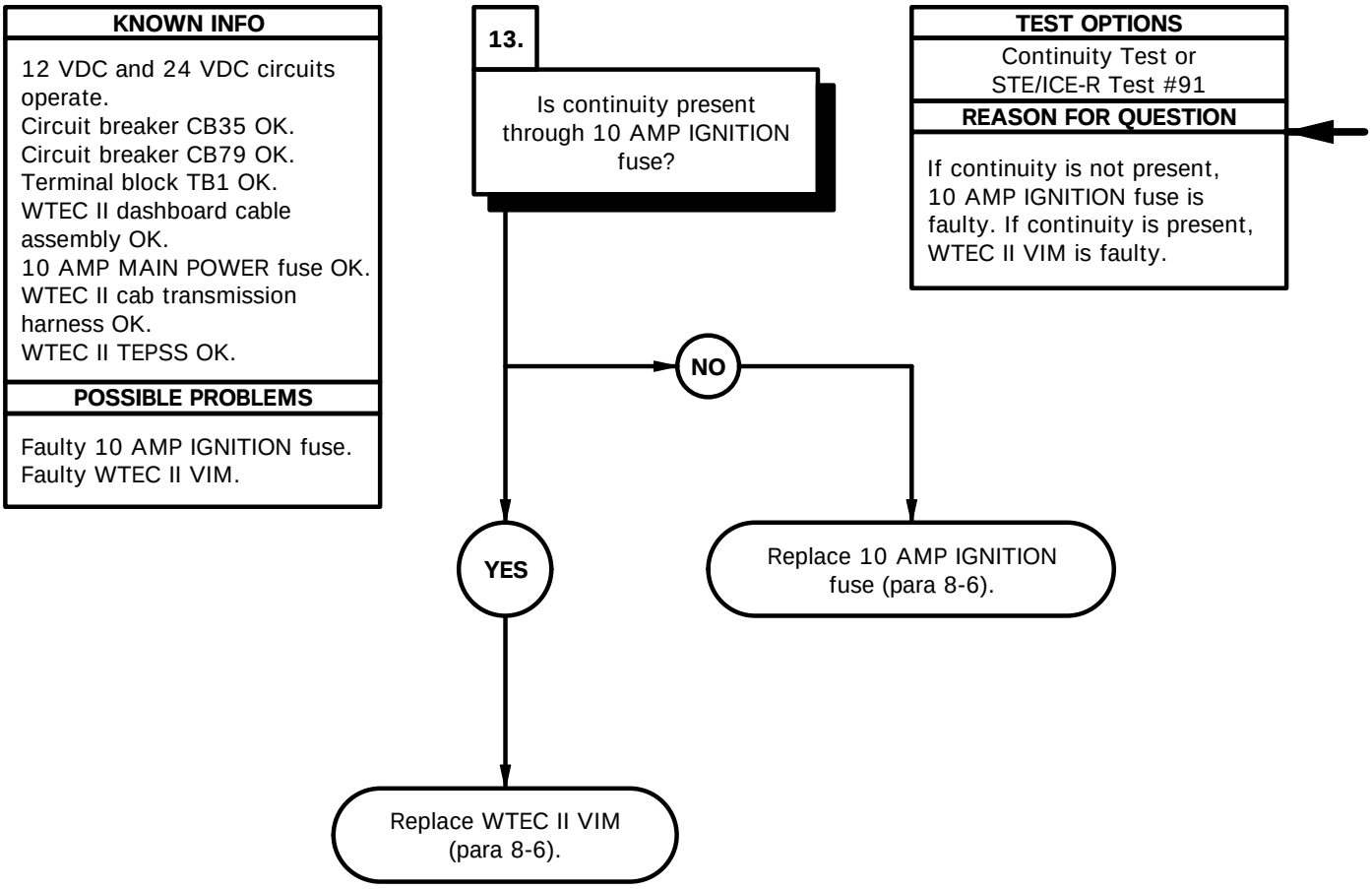


CONTINUITY TEST

(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).

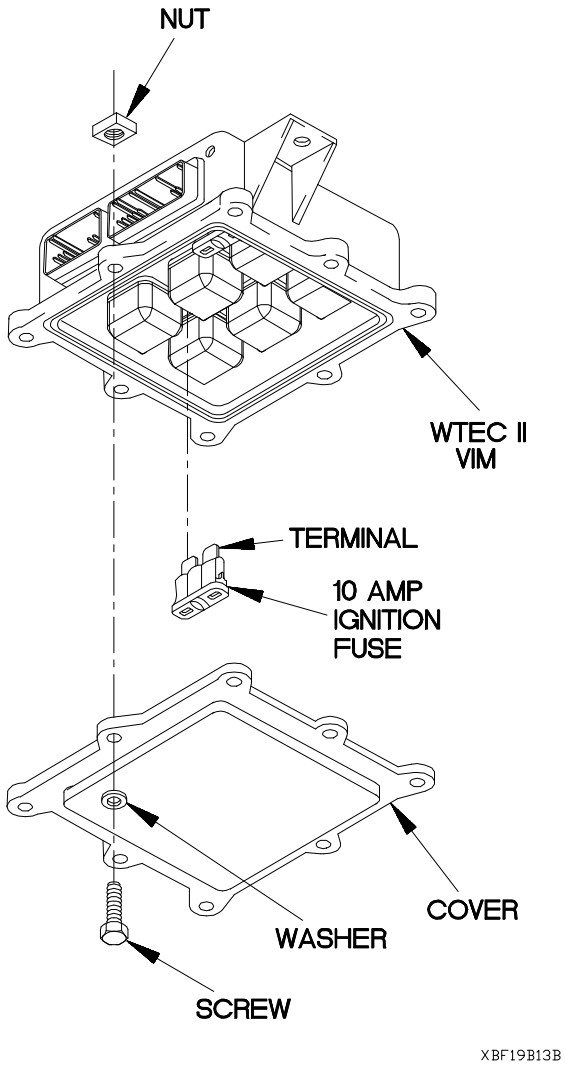


f19B. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DOES NOT ILLUMINATE (CONT)

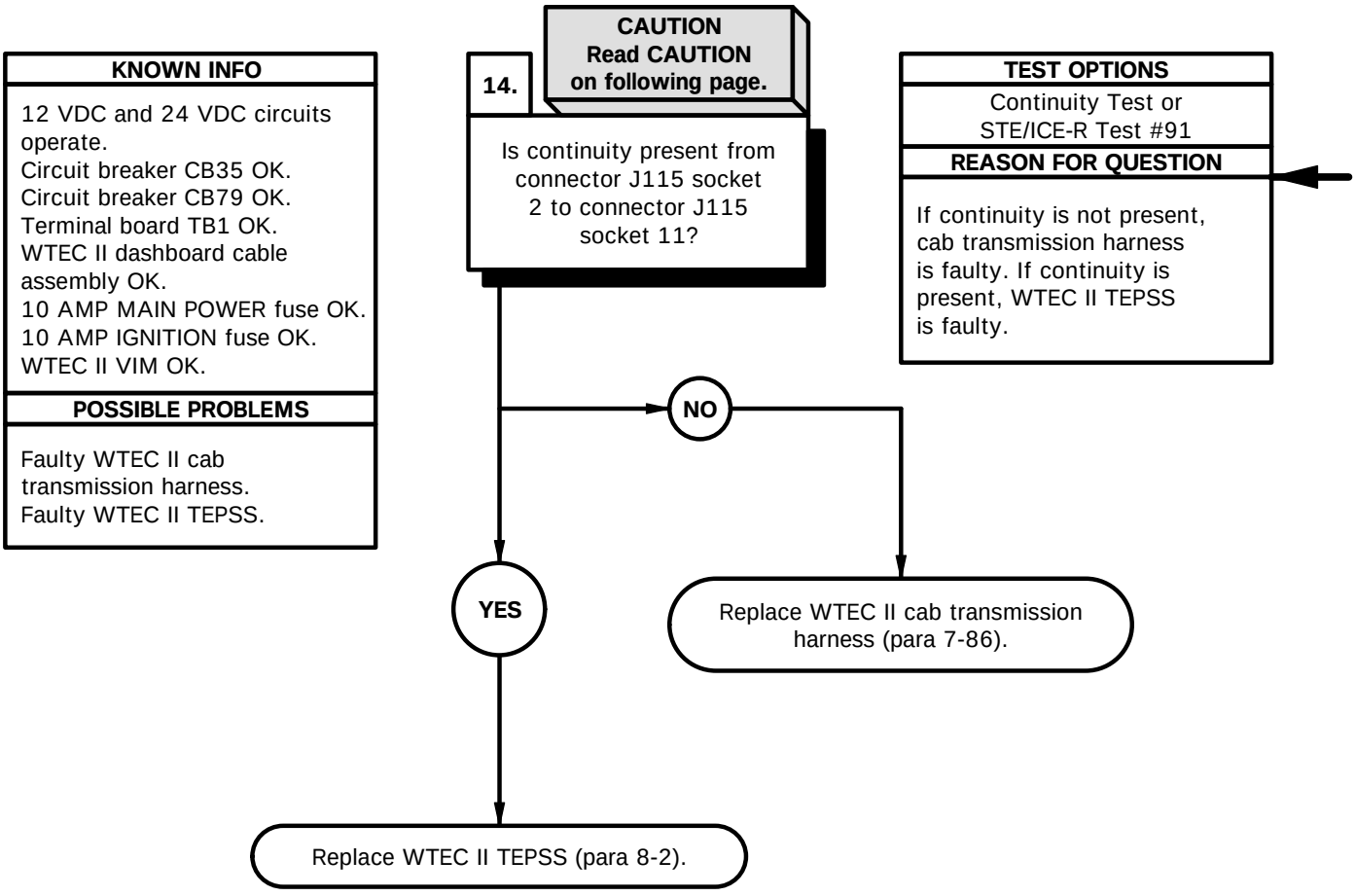


CONTINUITY TEST

(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

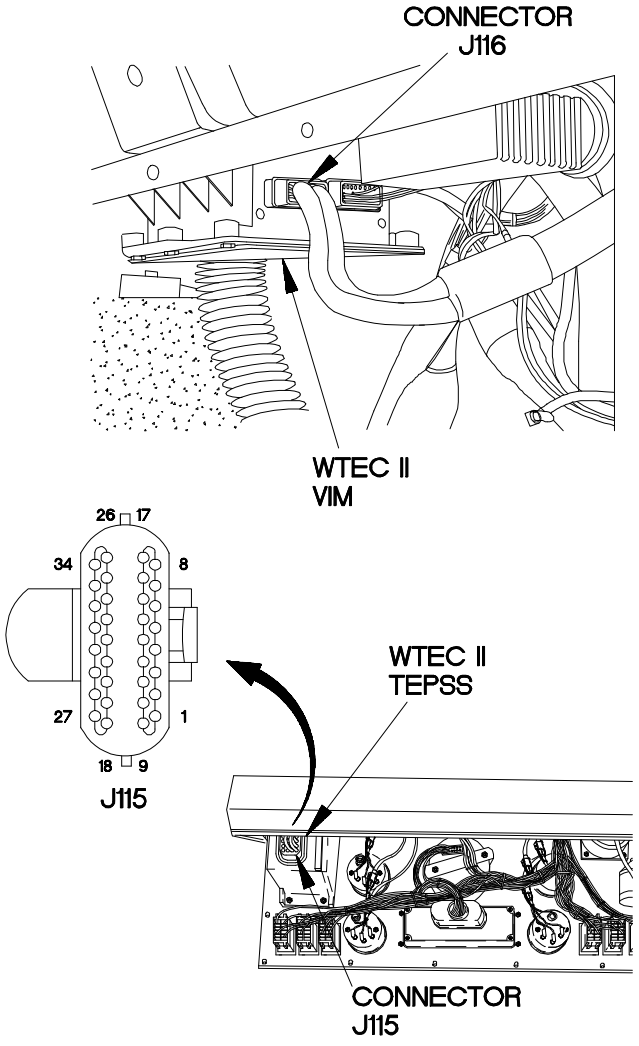
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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 P116 to WTEC II VIM.
(2) Tighten screw in connector P116.
(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 P115 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 7-86).
(9) If continuity is present, replace WTEC II TEPSS (para 8-2).
(10) Install kick panel (para 16-3).
(11) Connect batteries (para 7-48).

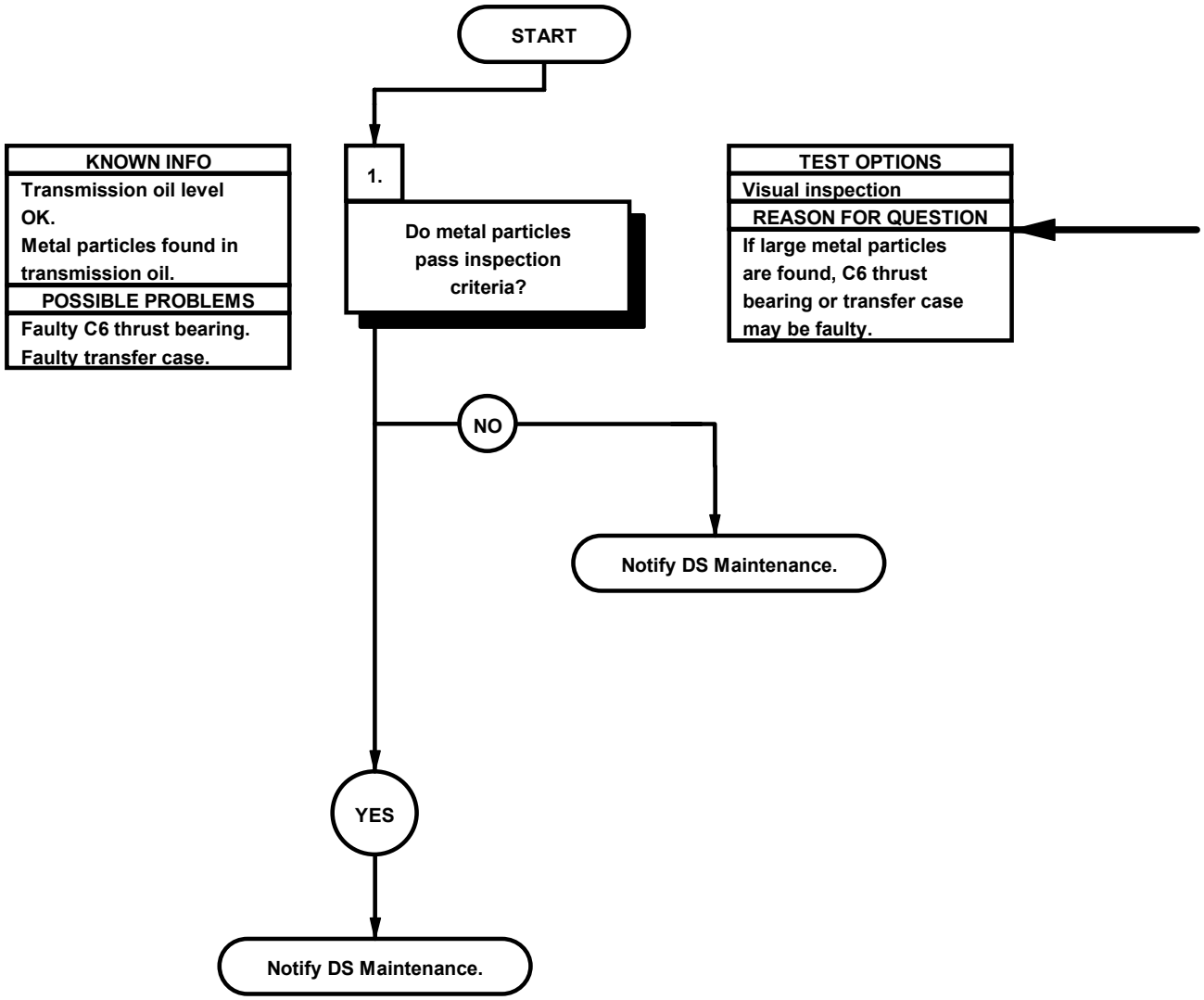


f20. METAL PARTICLES FOUND DURING TRANSMISSION OIL CHANGE

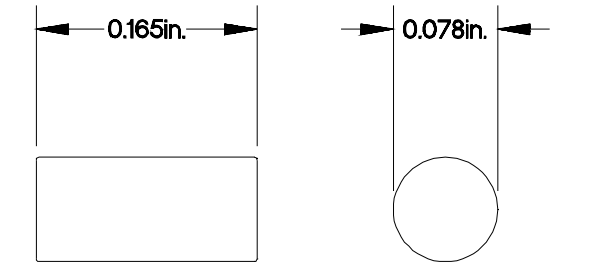
INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, 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.



METAL PARTICLES

X2F2001A

f21. TRANSMISSION DOES NOT SHIFT OR IS SLOW TO SHIFT WHEN COLD

INITIAL SETUP

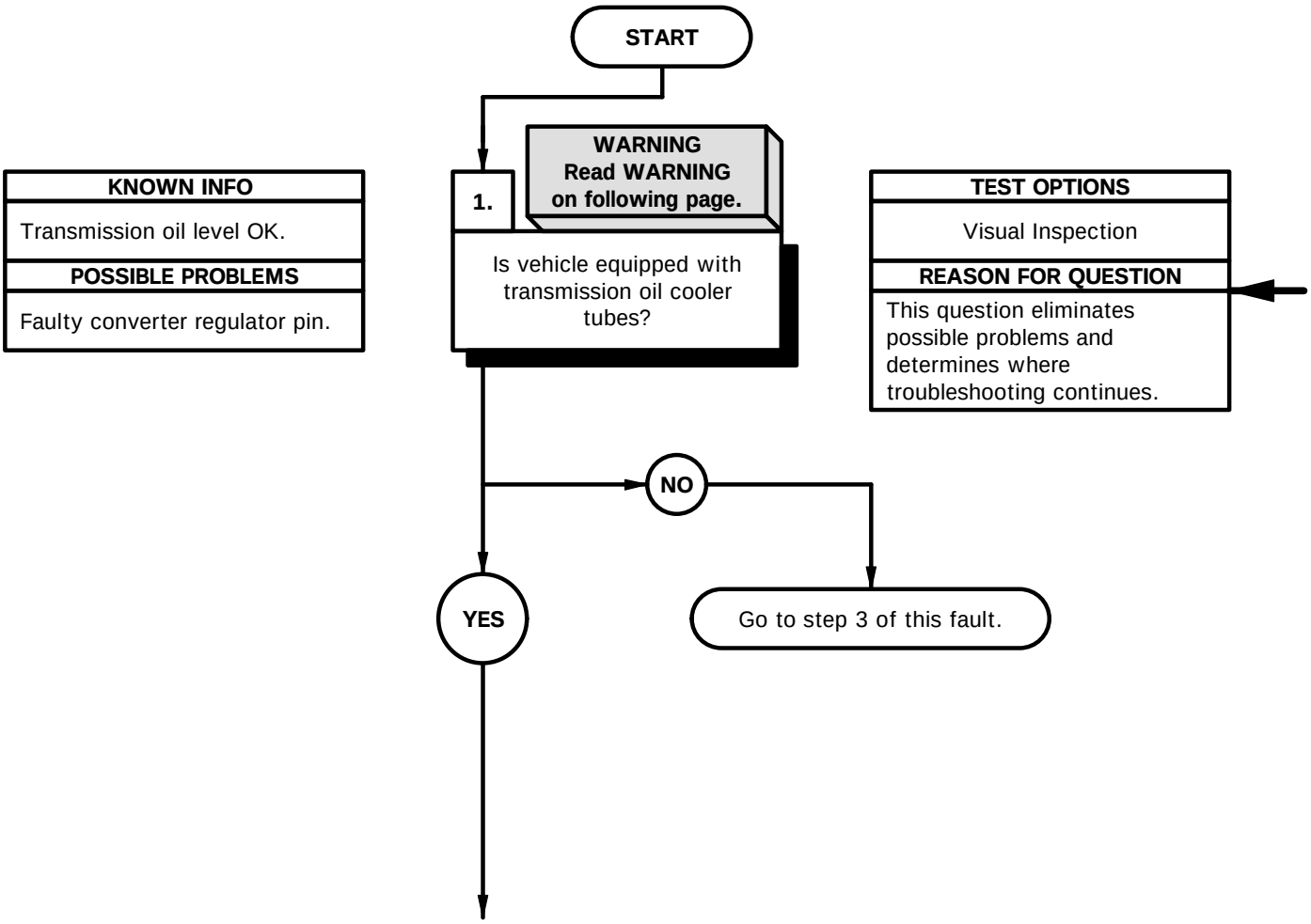
Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Personnel Required
(2)

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

Tools and Special Tools
Tool Kit, Genl, Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Goggles, Industrial (Item 15, Appendix C)

Materials/Parts
Adapter, Pipe to Tube (Item 1, Appendix D)
Packing, Preformed (Item 177, Appendix G)

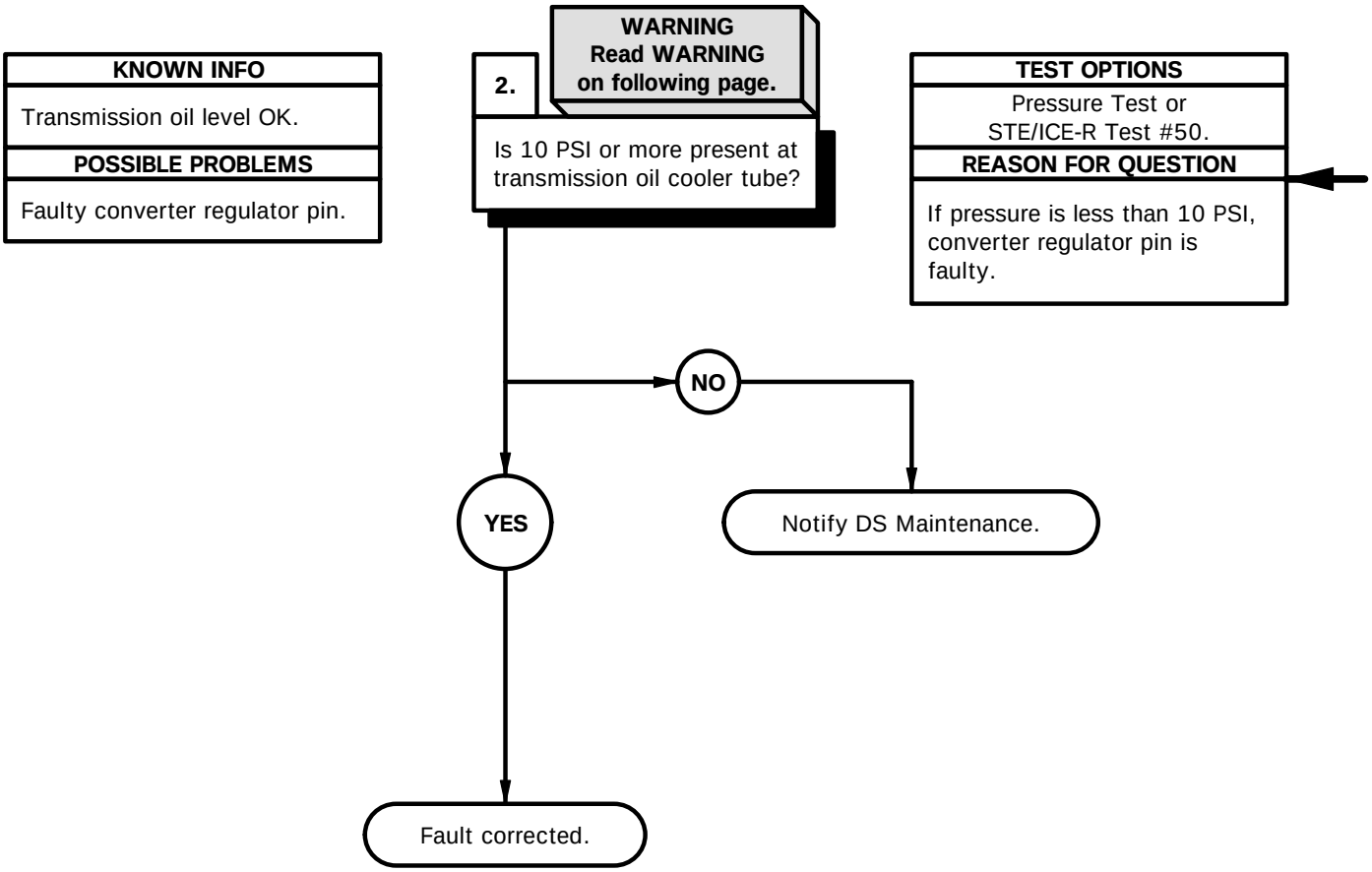


WARNING

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.

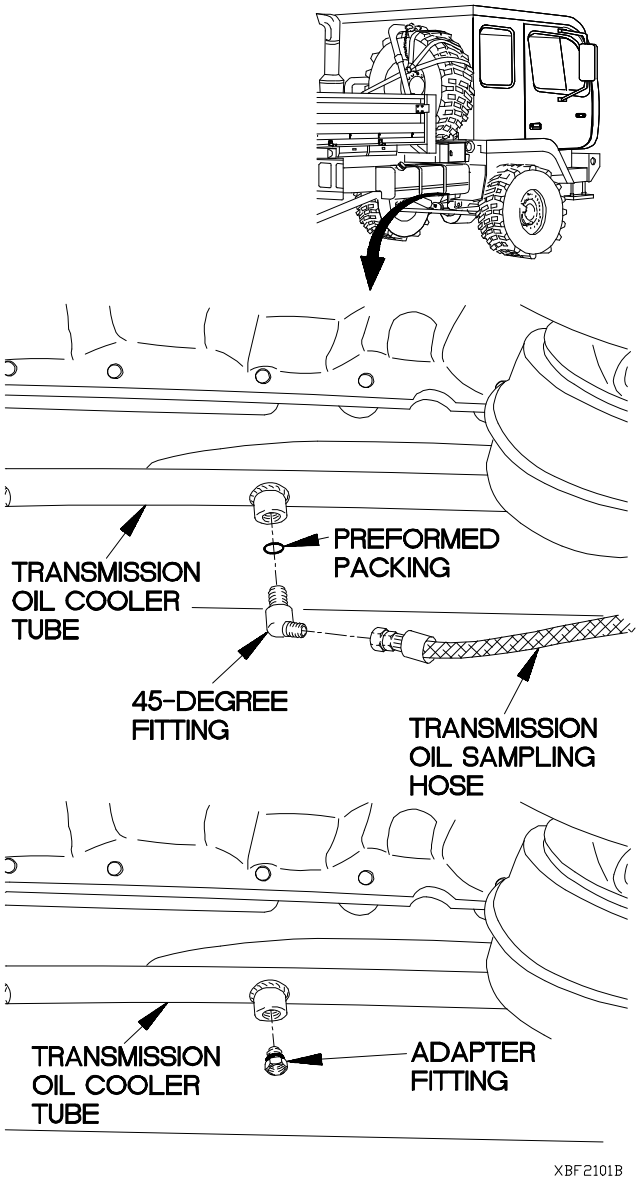
PRESSURE TEST

(1) Place drain pan under transmission oil cooler tube.
(2) Disconnect transmission oil sampling hose from 45 degree fitting.

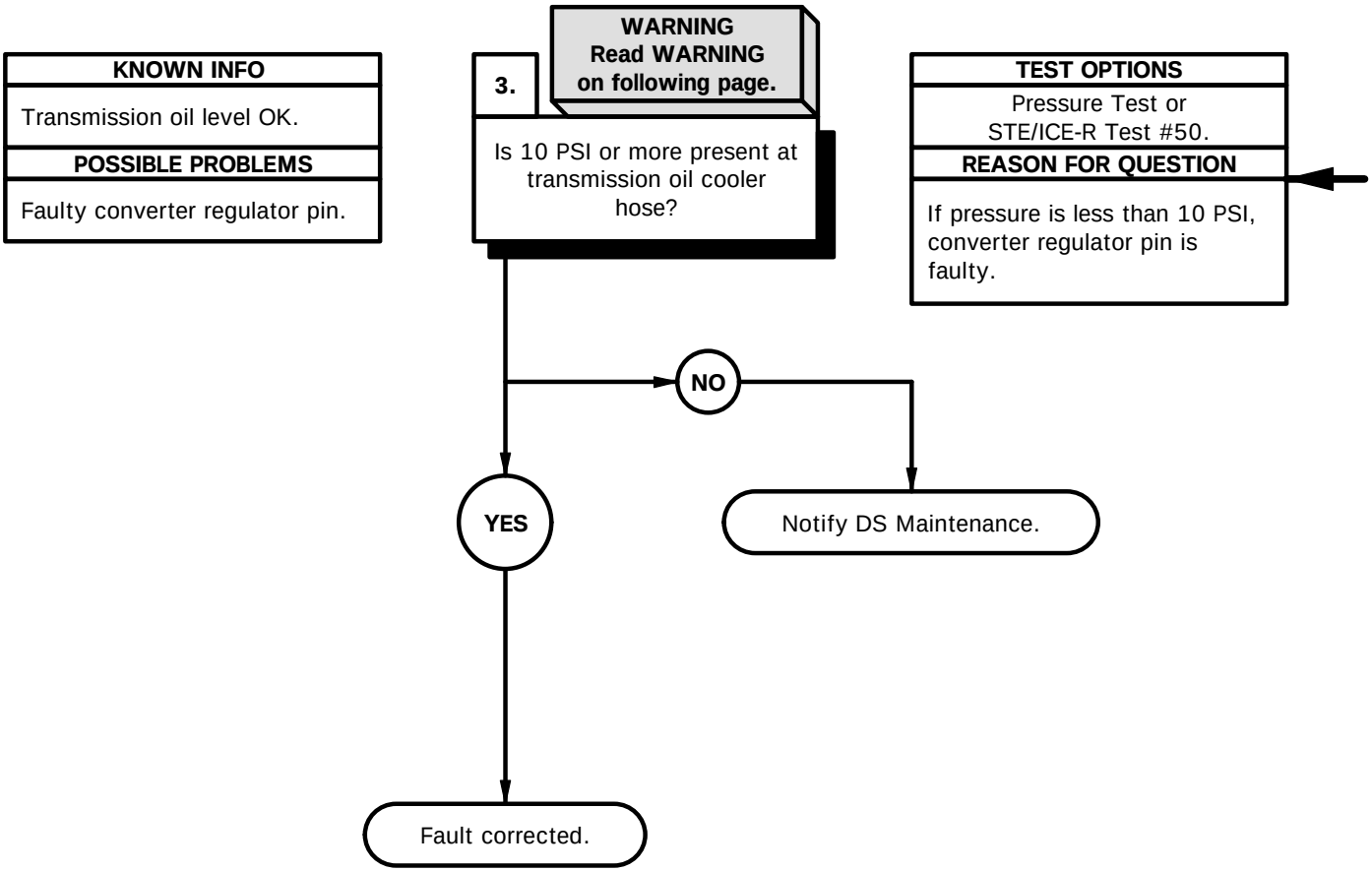
NOTE

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 9-2320-365-10).
(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 9-2320-365-10).
(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

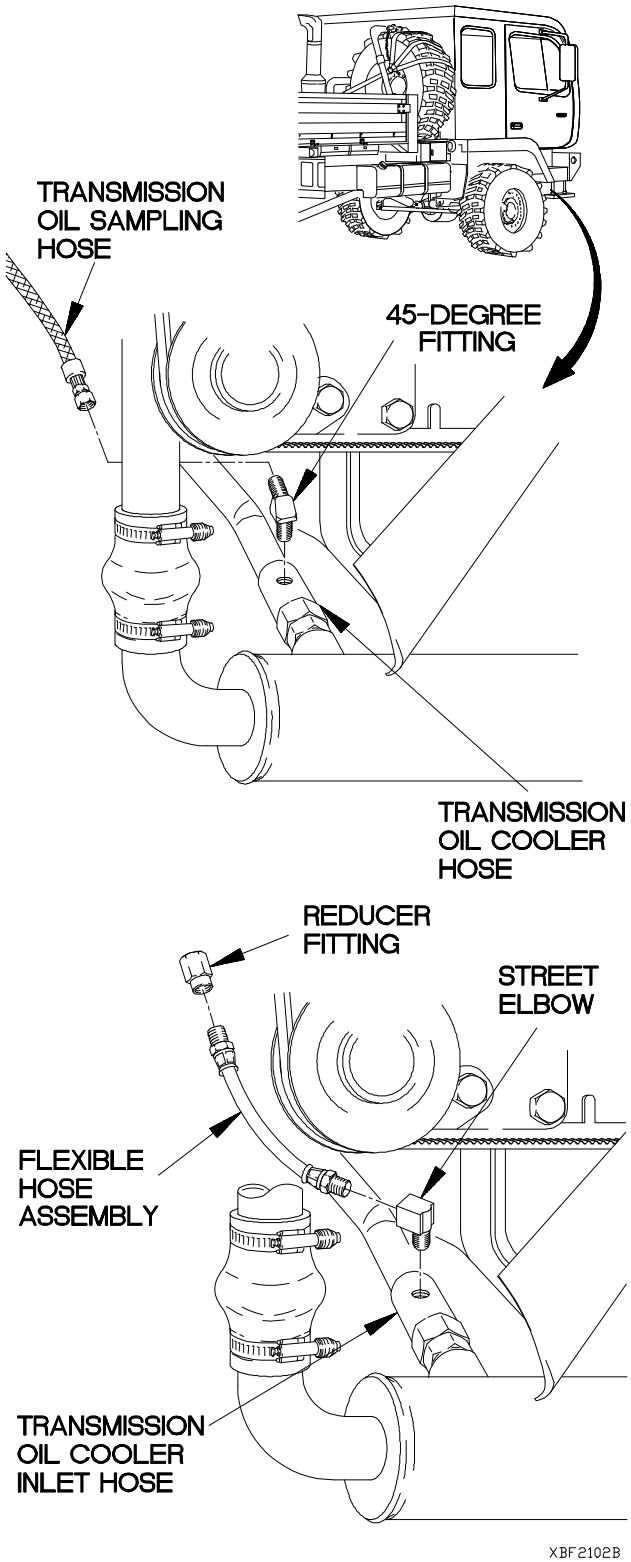
Prolonged contact with lubricating oil (MIL-L-2104) may cause a skin rash. Skin and clothing that come in contact with lubricating oil should be thoroughly washed immediately. Saturated clothing should be removed immediately. Areas in which lubricating oil is used should be well ventilated to keep fumes 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 9-2320-365-10).
(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 9-2320-365-10).
(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

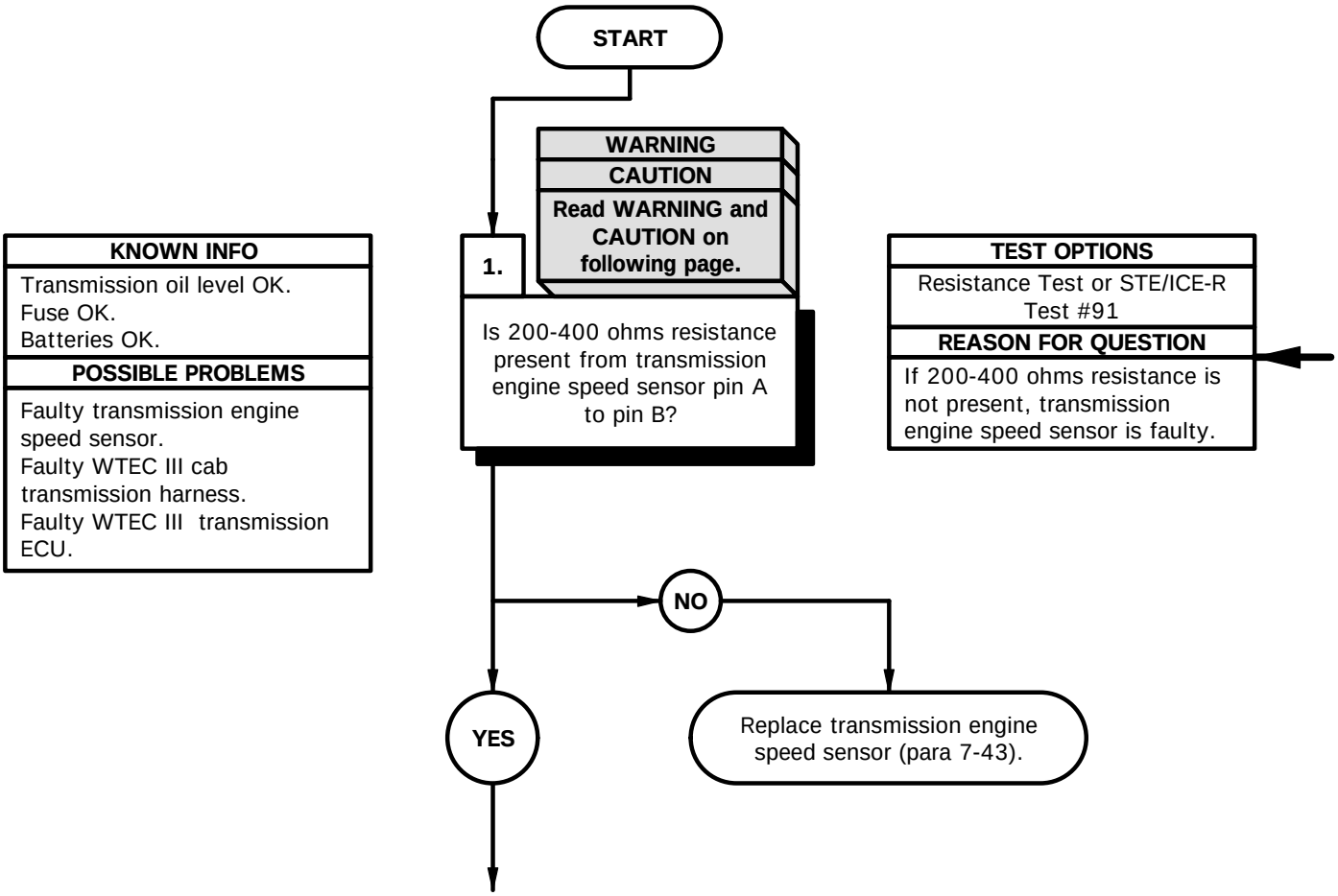
INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 81, Appendix B)

Tools and Special Tools
STE/ICE-R (Item 39, 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

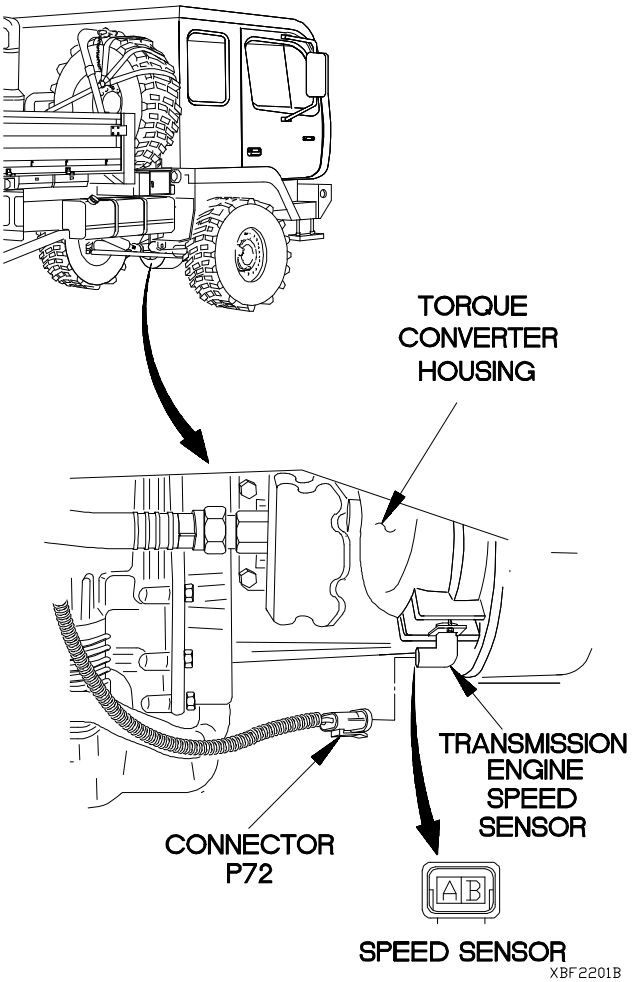
(1) Disconnect connector P72 from transmission engine speed sensor.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to pin A of transmission engine speed sensor.

NOTE

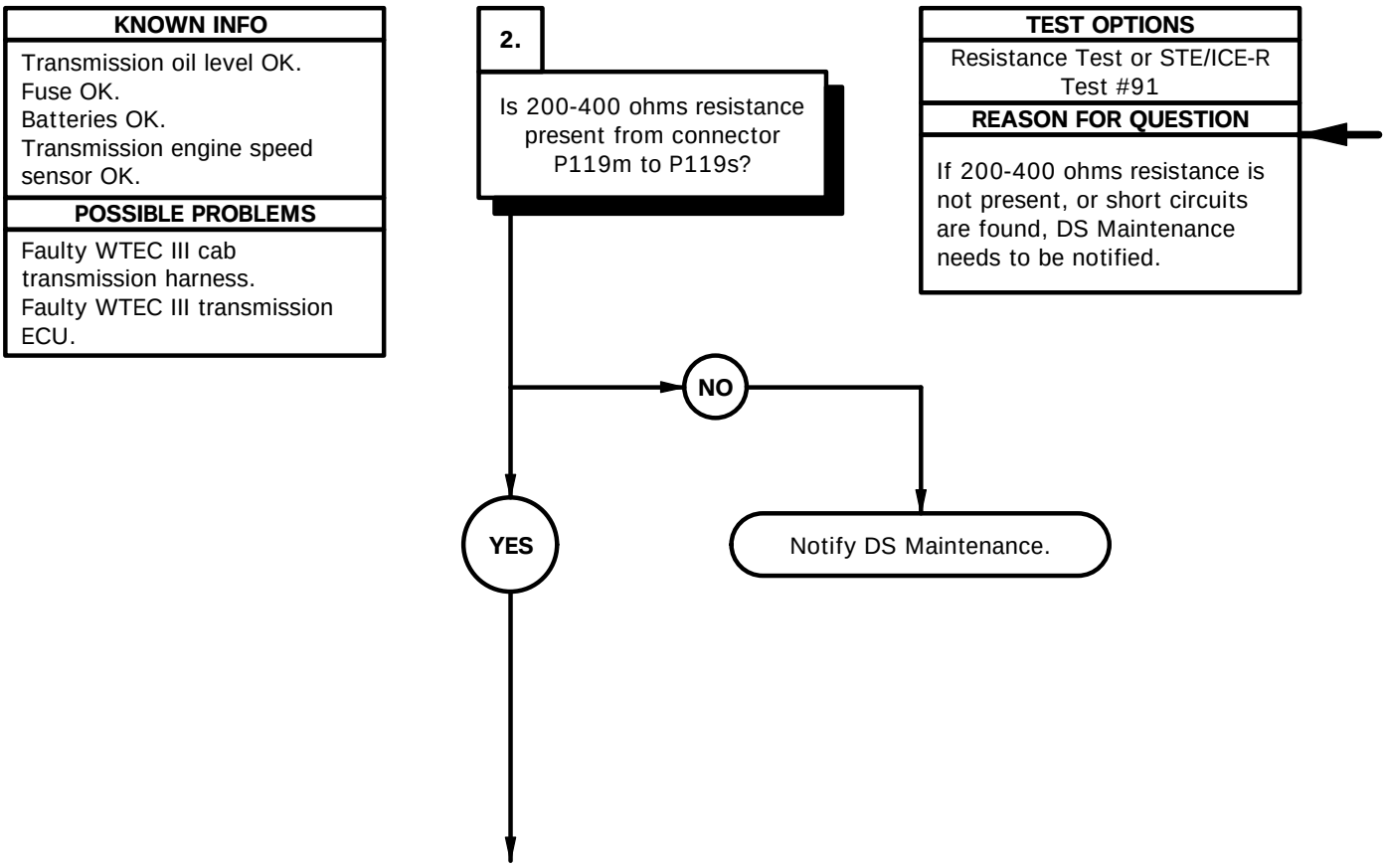
A good transmission engine speed sensor will return a reading of 200-400 ohms resistance as follows:

a. 200 ohms at - 40° F (- 40° C)
b. 300 ohms at 68° F (20° C)
c. 400 ohms 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 7-43).
(6) Connect connector P72 to transmission engine speed sensor.

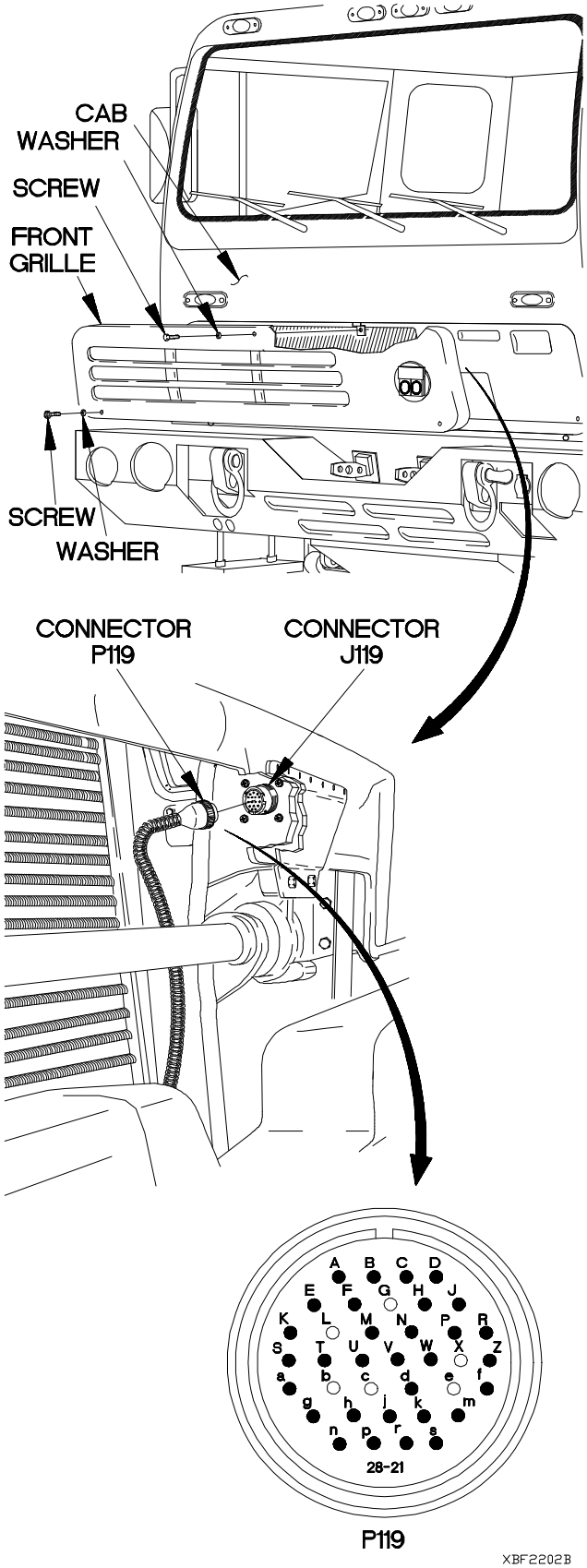


f22. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 14 (CONT)

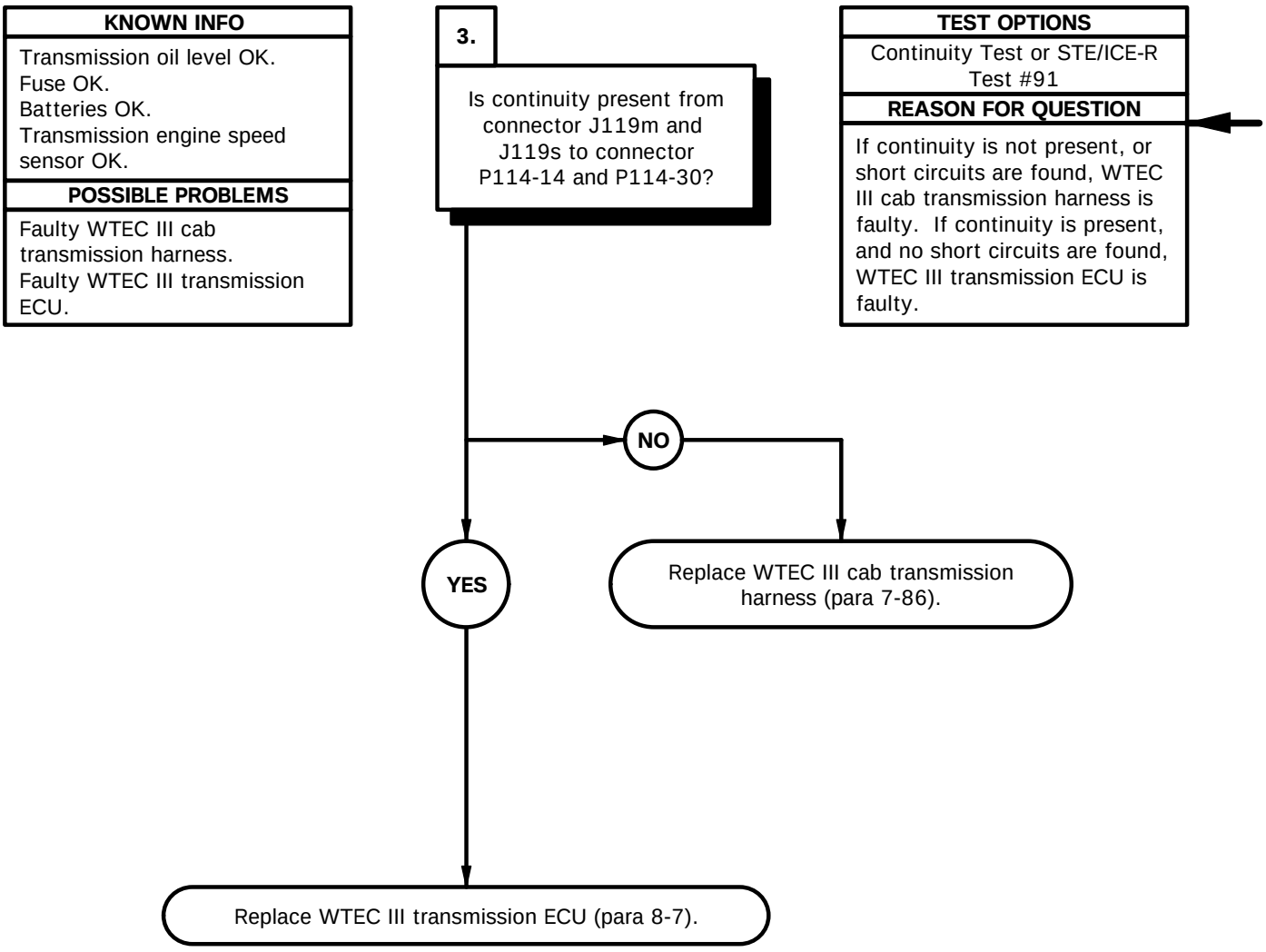


RESISTANCE TEST

(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 continuity is not present at 200-400 ohms resistance in step 7, or continuity is present in step 8, 9, 11, or 12, notify DS Maintenance.

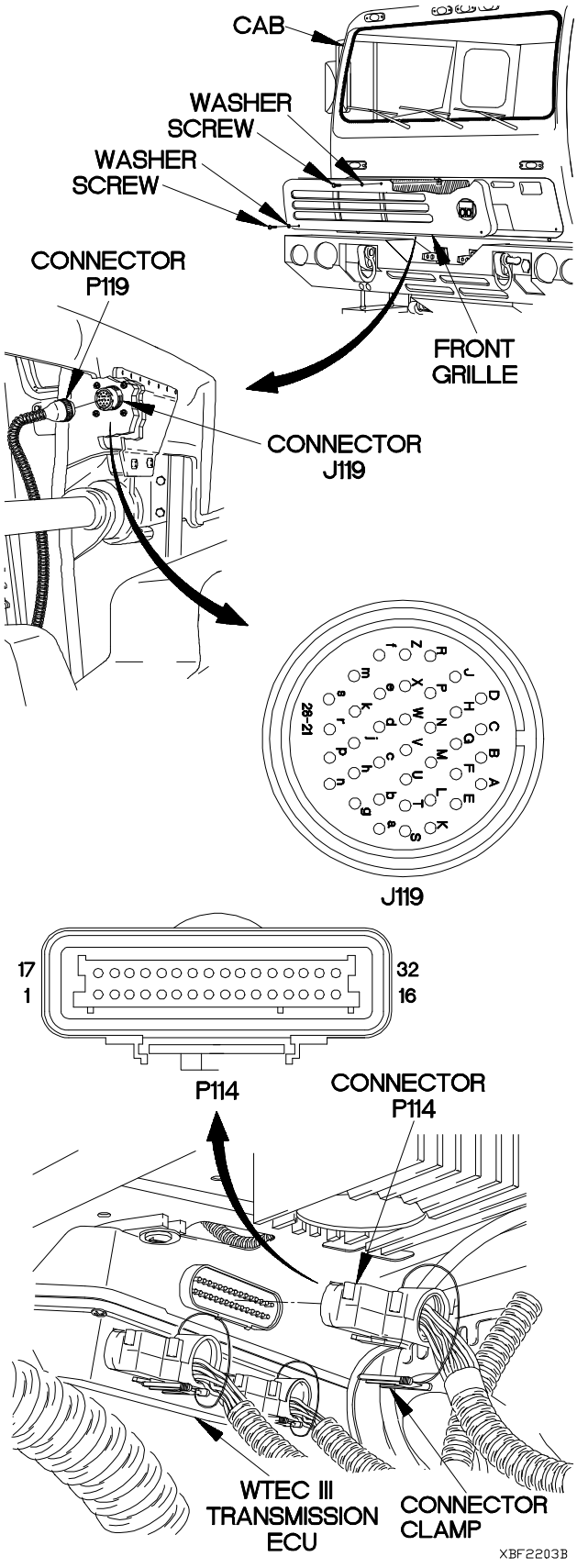


f22. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 14 (CONT)



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 8-7). 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 7-86).
(14) Remove jumper wire from connector J119s and J119m.
(15) Connect connector P119 to connector J119.
(16) Position front grille on cab with washer and screw.
(17) Position two washers and screws in front grille.
(18) Tighten screw to 48-60 lb-in. (5-7 N·m).
(19) Tighten two screws to 24 lb-in. (3 N·m).
(20) Connect connector P114 to WTEC III transmission ECU.
(21) Connect connector clamp to connector P114.
(22) Install kick panel (para 16-3).
(23) Clear diagnostic codes (para 8-5).



f23. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 15

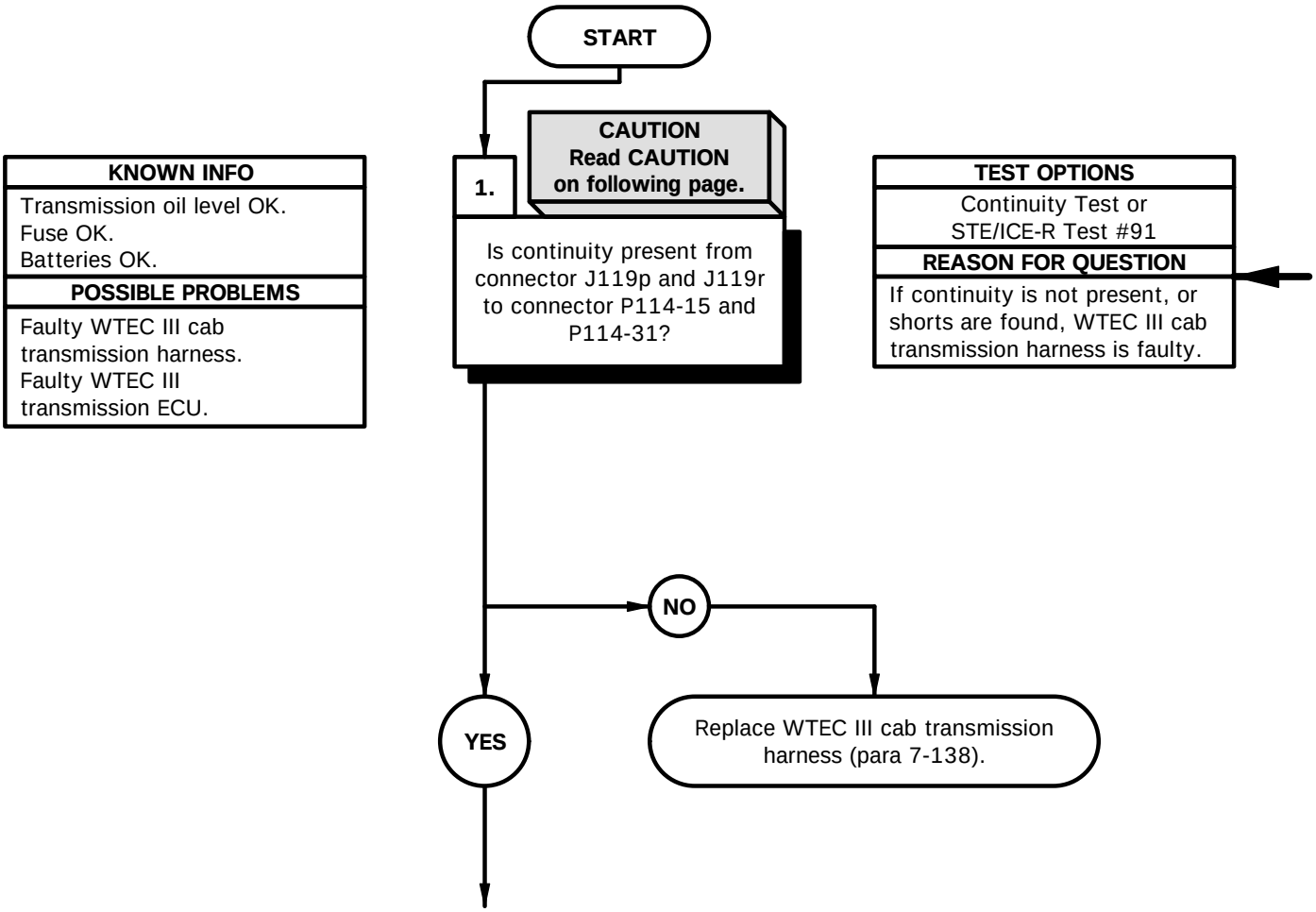
INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)

Tools and Special Tools (Cont)
STE/ICE-R (Item 39, 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

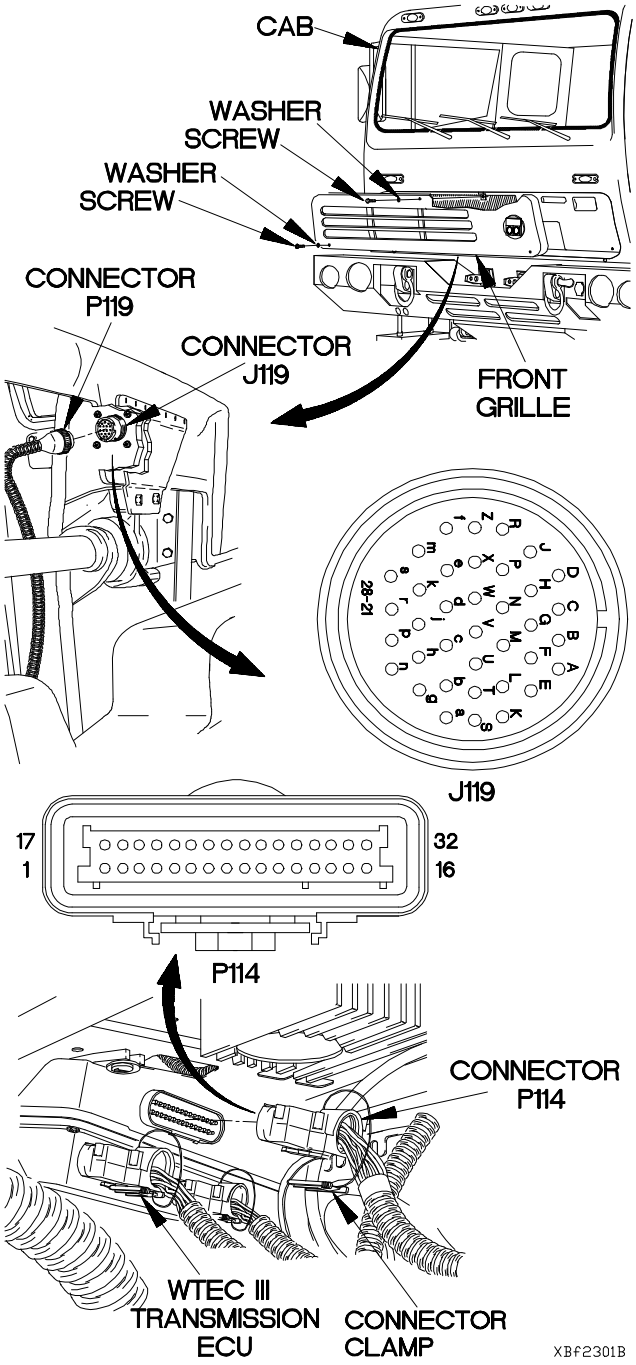
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

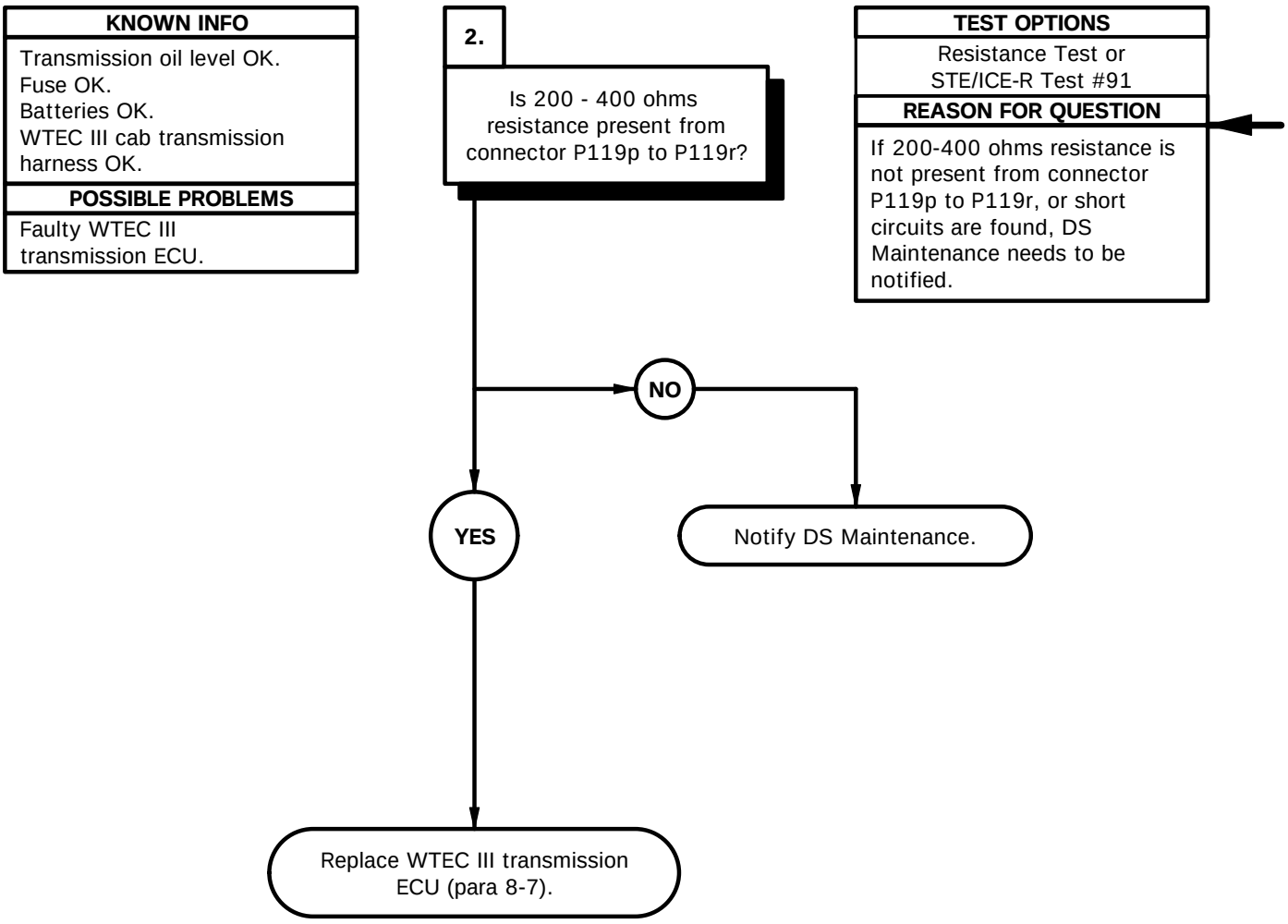
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Remove kick panel (para 16-3).
(6) Disconnect connector clamp from connector P114.
(7) Disconnect connector P114 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

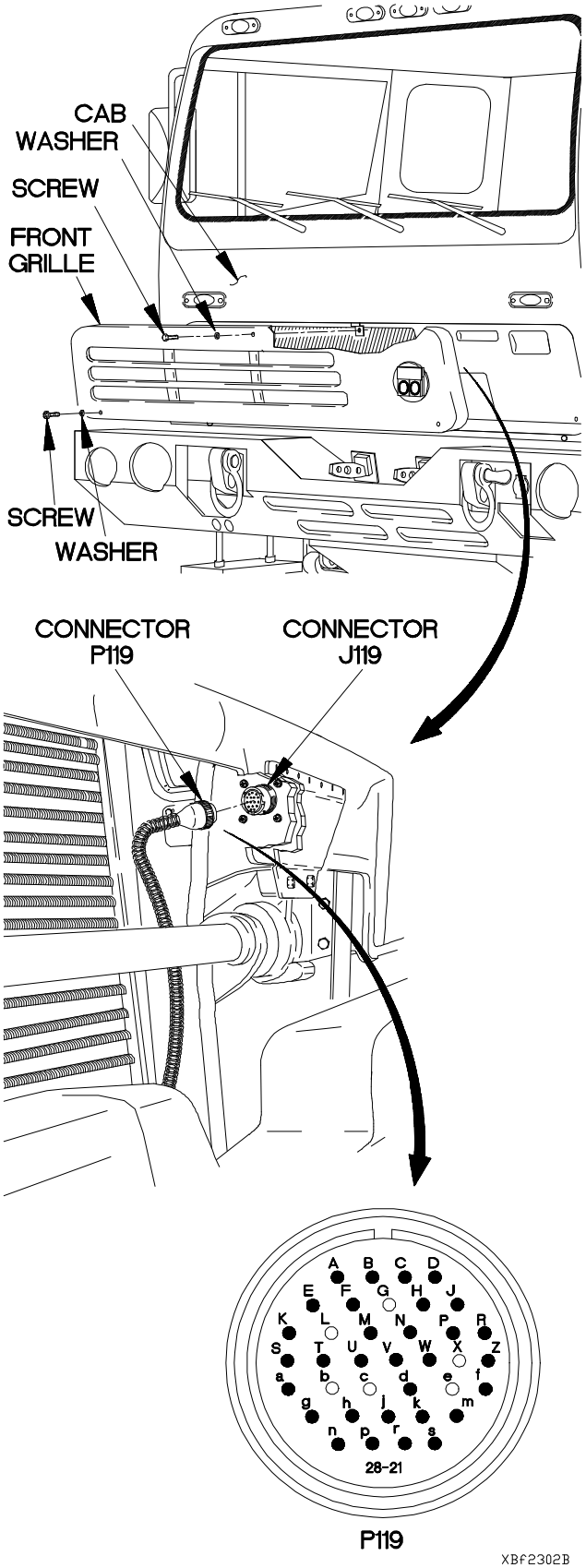
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P119p.
(3) Connect negative (-) probe of multimeter to connector P119r and note reading on multimeter.

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

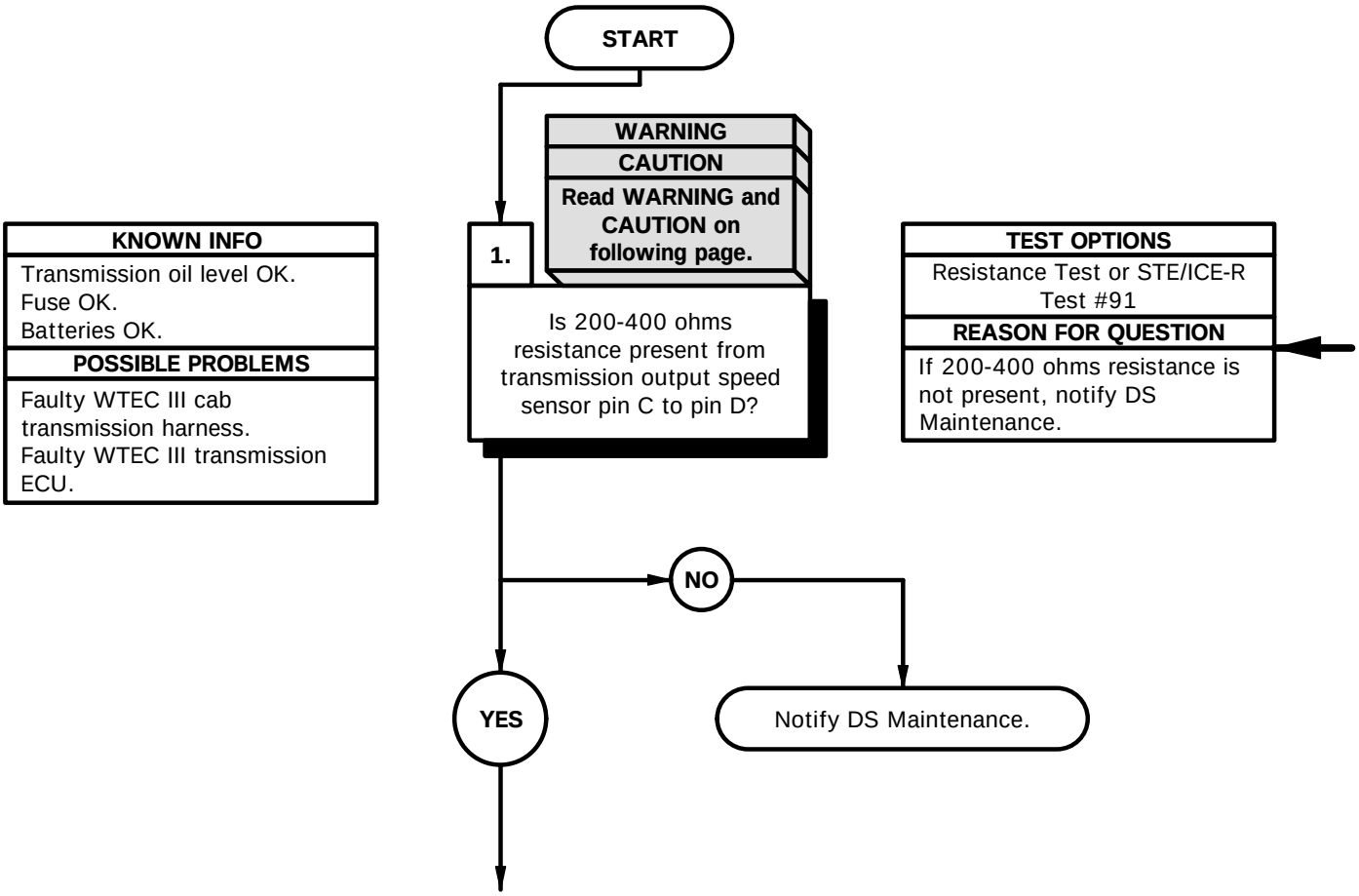
INITIAL SETUP

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

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

Tools and Special Tools (Cont)
Wrench, Torque, 0-75 lb-in. (Item 81, Appendix B)
STE/ICE-R (Item 39, 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

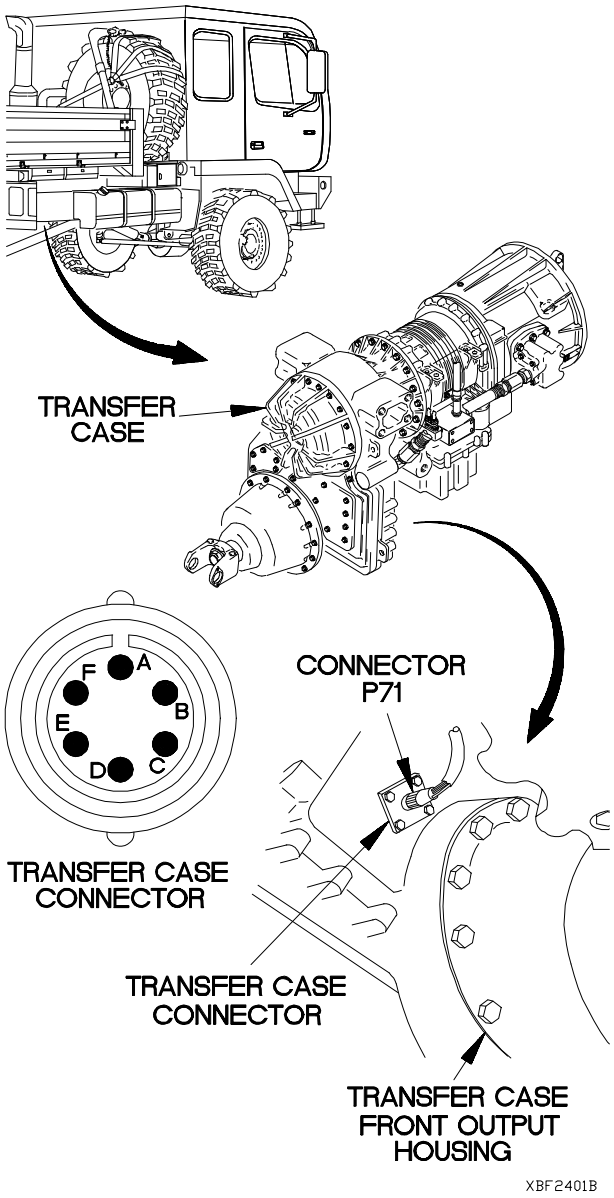
(1) Disconnect output speed sensor connector from transfer case connector.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to pin C of transfer case connector.

NOTE

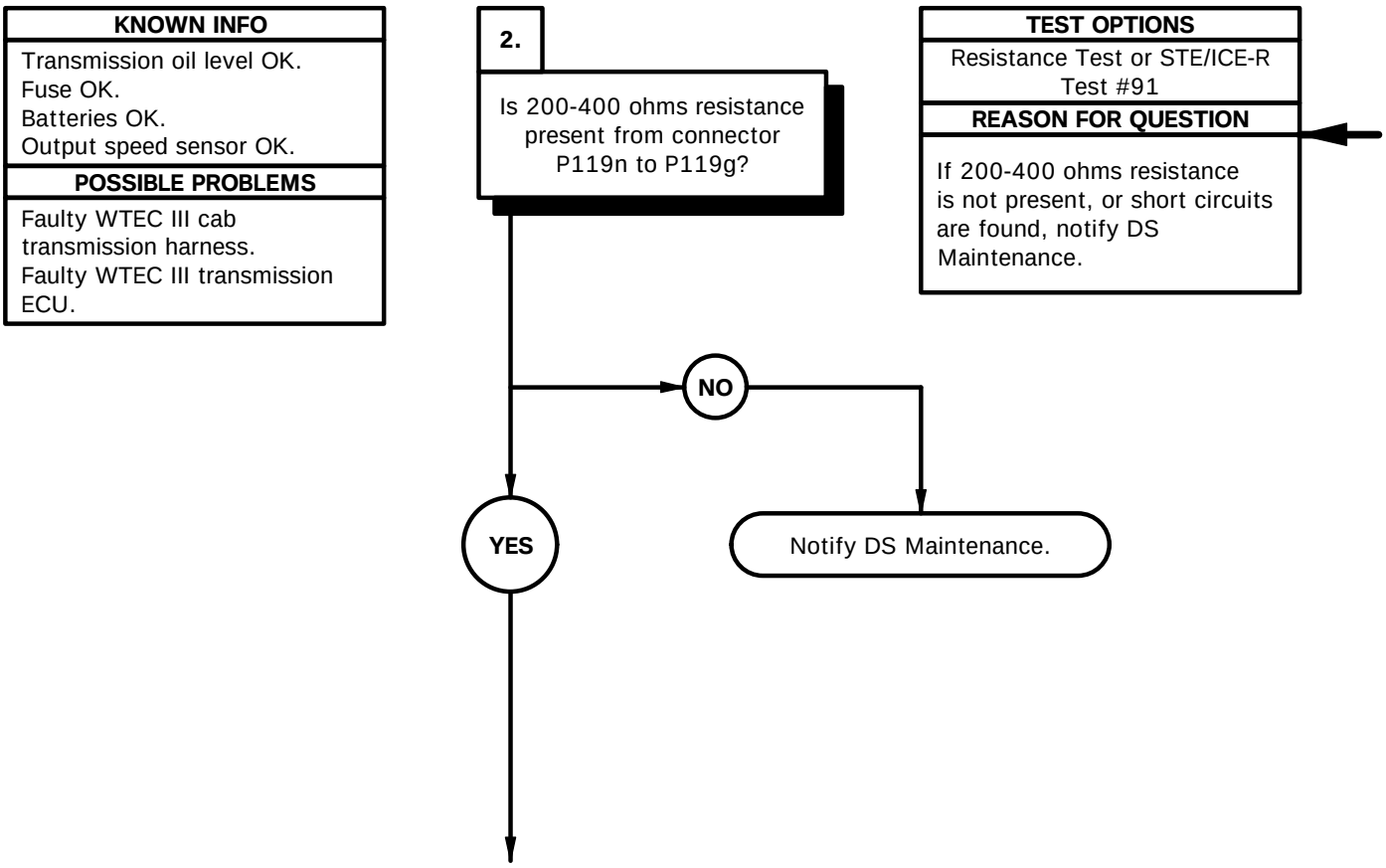
A good output speed sensor will return a reading of 200-400 ohms resistance as follows:

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.

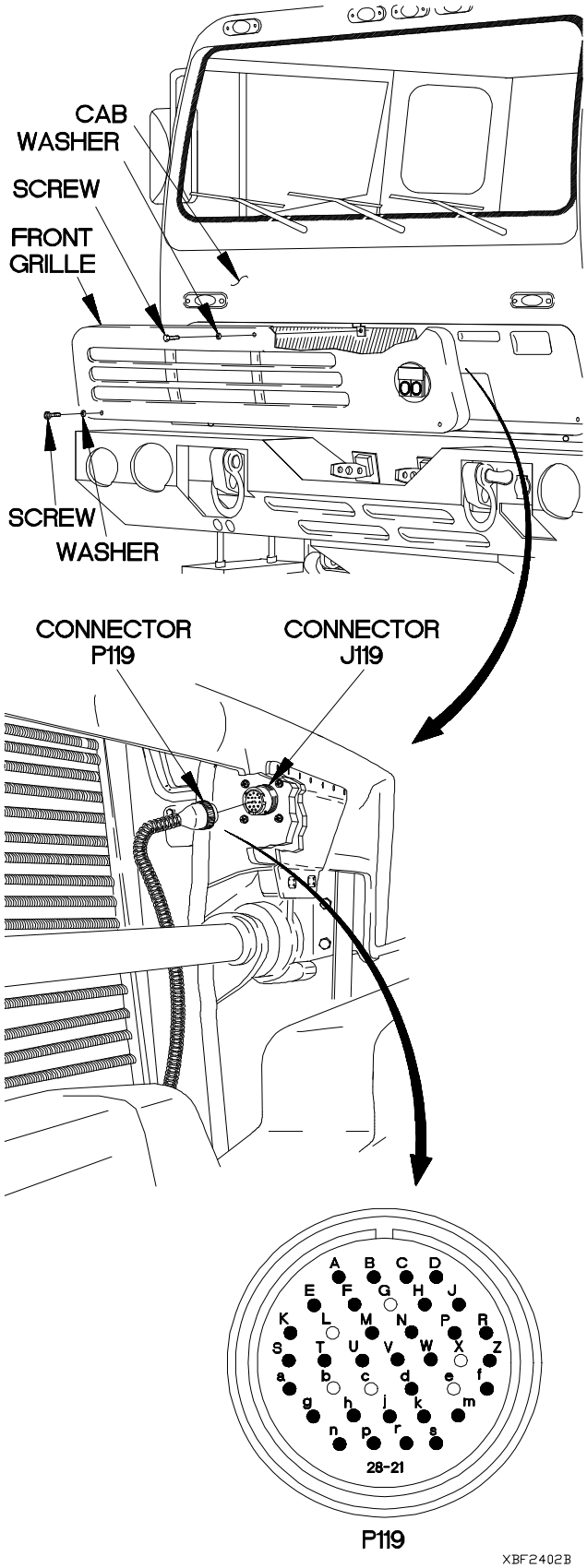


f24. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 16 (CONT)

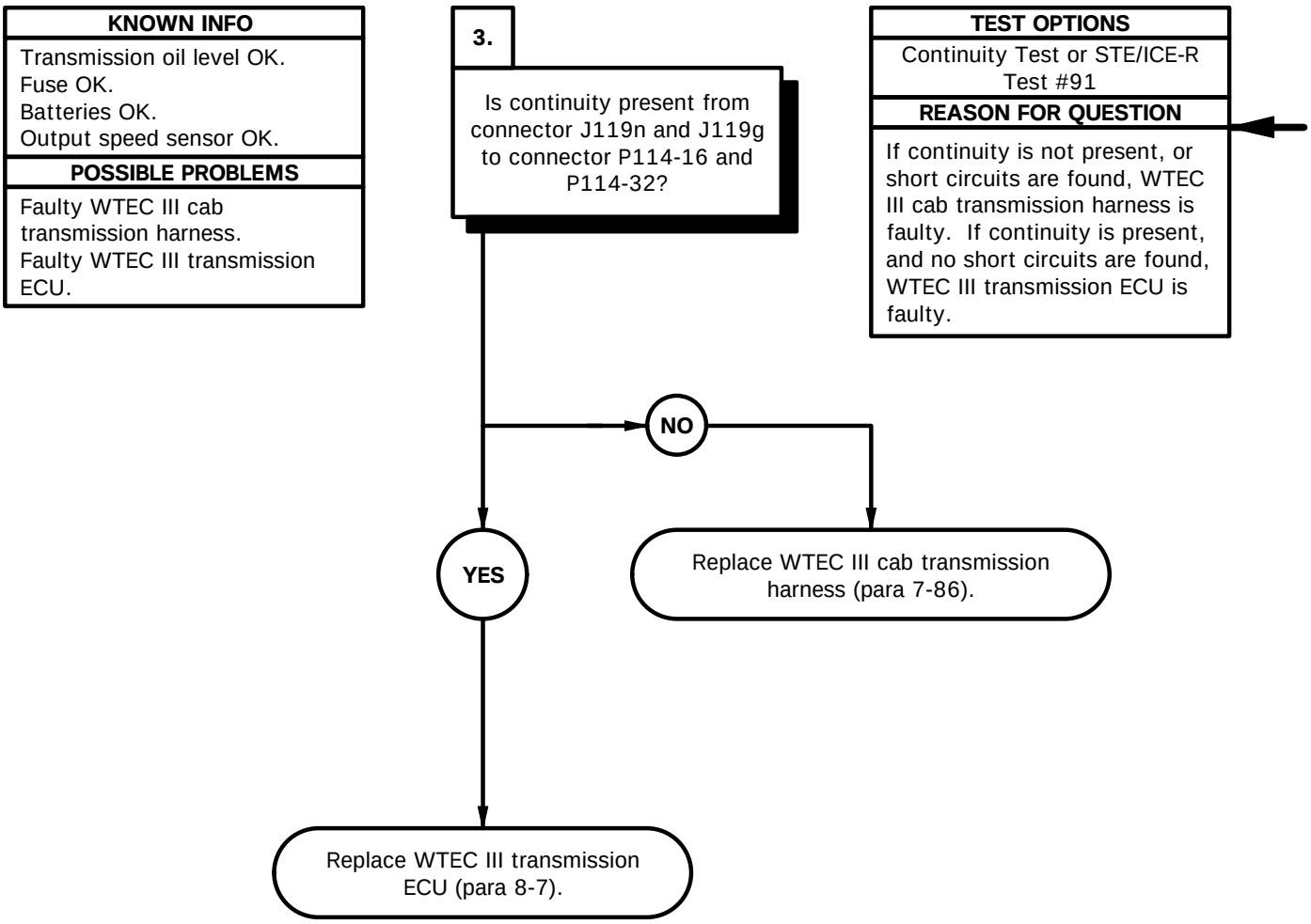


RESISTANCE TEST

(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 on 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.

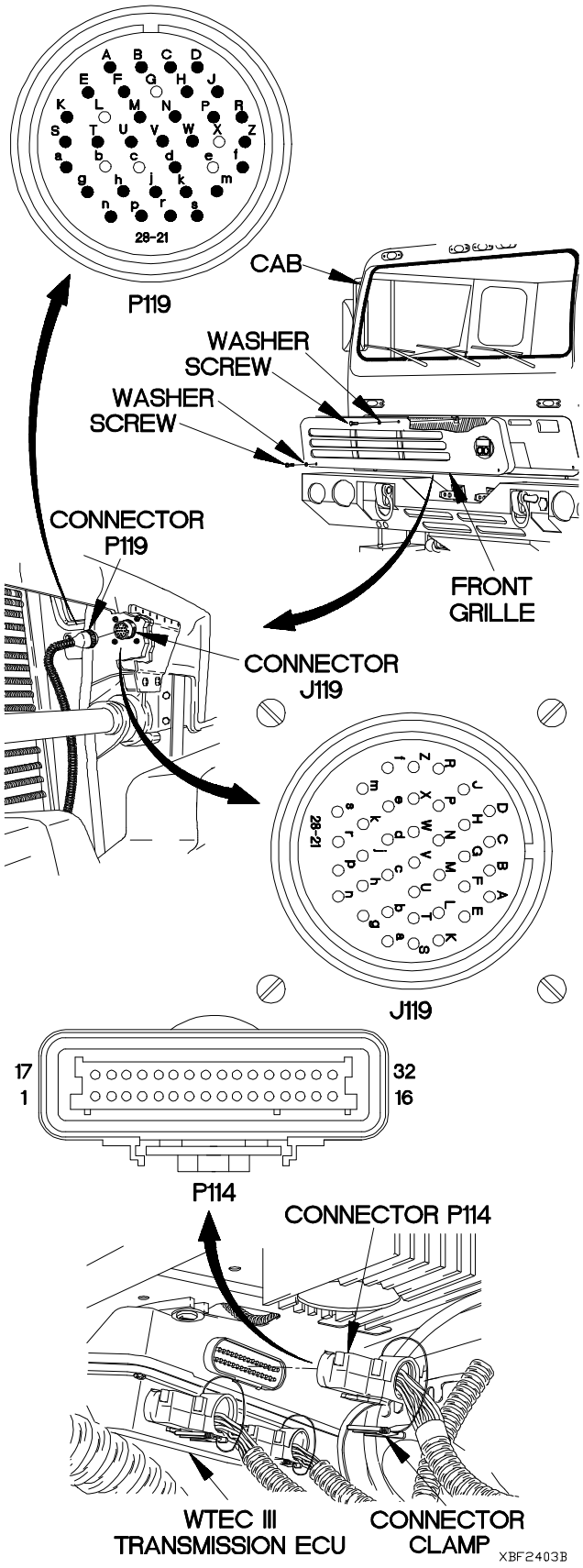


f24. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 16 (CONT)



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 7-86).
(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

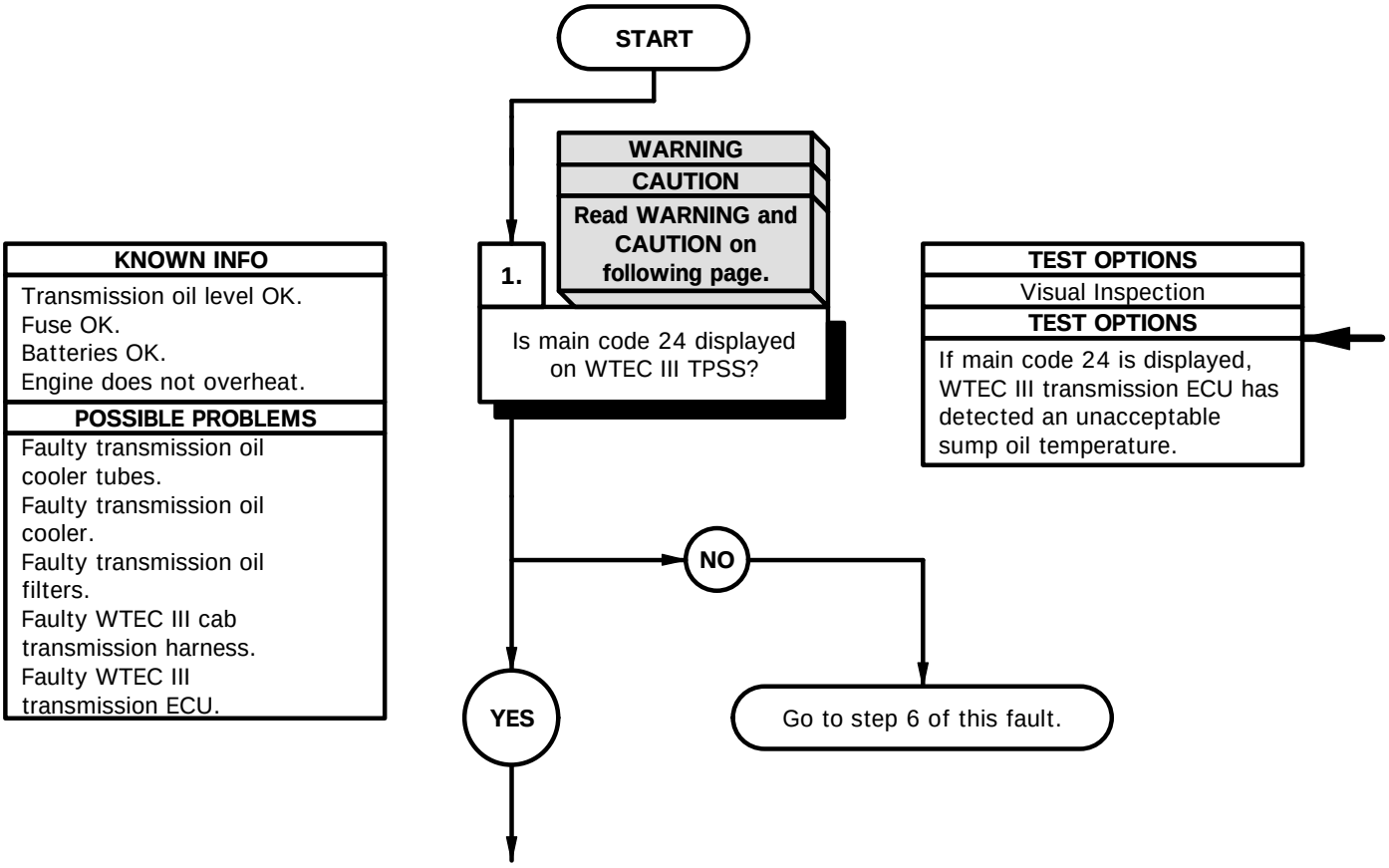
INITIAL SETUP

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

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Pan, Drain (Item 24, Appendix C)

Tools and Special Tools (Cont)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Wrench Set, Socket (Item 48, Appendix C)
STE/ICE-R (Item 39, Appendix C)

References
TM 9-4910-571-12&P



WARNING

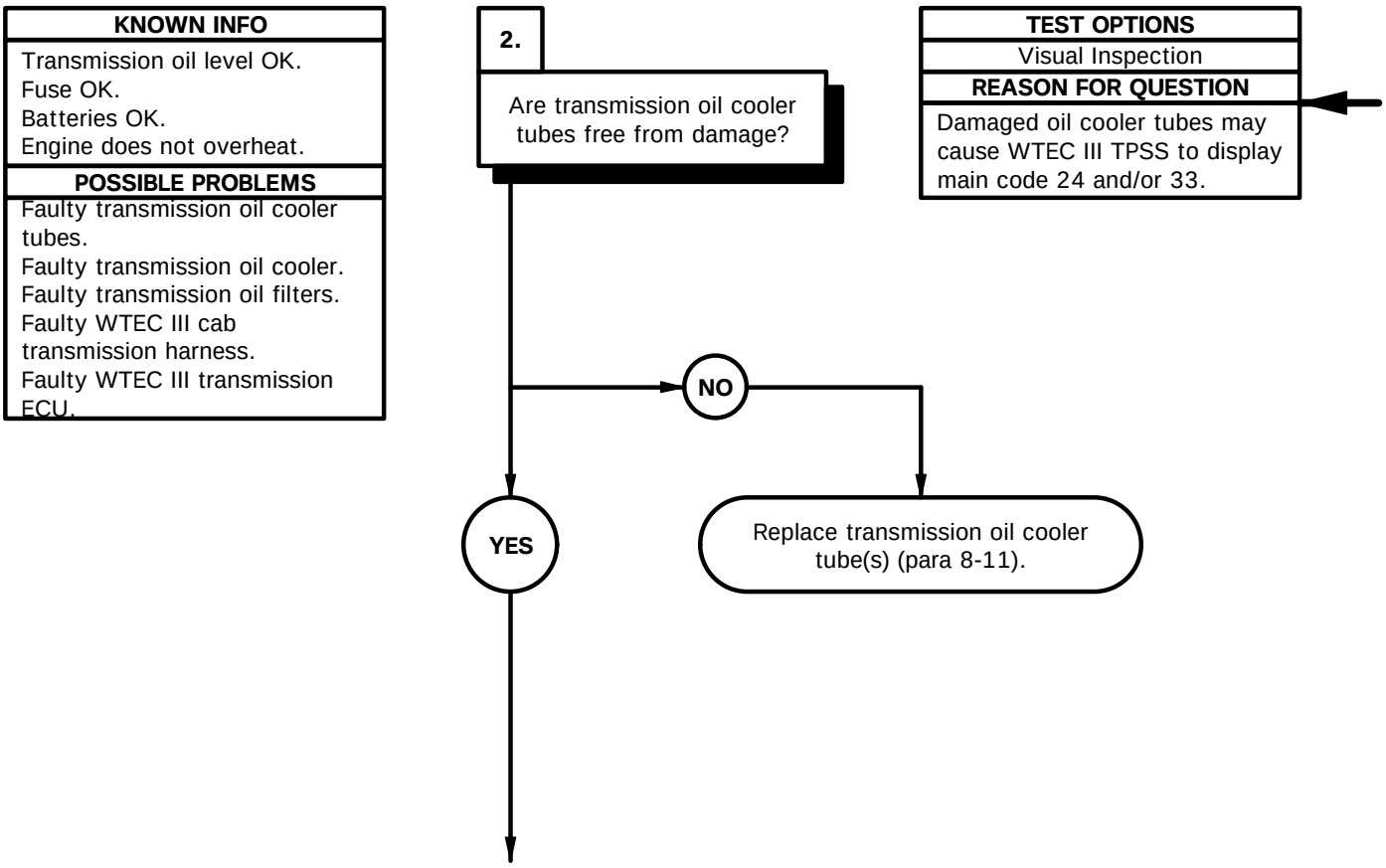
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

CAUTION

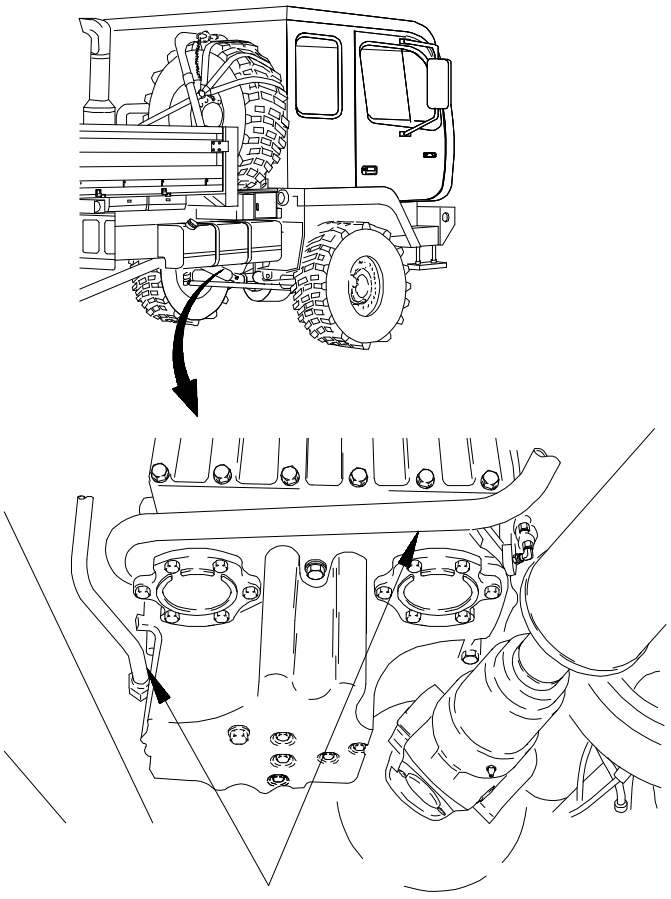
Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

(1) Position master power switch to on (TM 9-2320-365-10).
(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 9-2320-365-10).

f25. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 AND/OR 33 AND ANY SUB CODE (CONT)



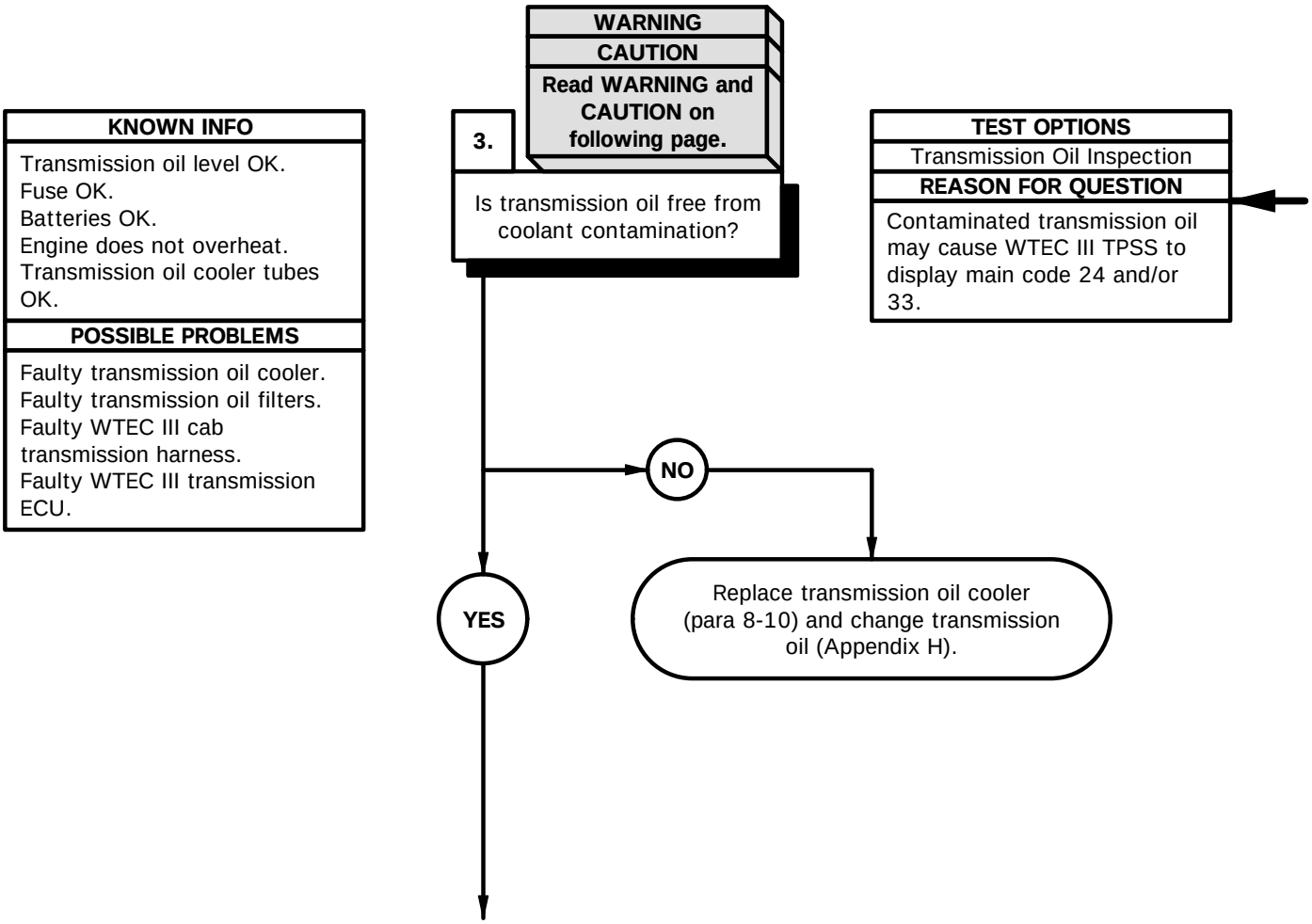
(1) Check transmission oil cooler tubes for damage and restrictions.
(2) If damage or restrictions are found, replace transmission oil cooler tube(s) (para 8-11).



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)



WARNING

Do not drain transmission oil when transmission is hot. Failure to comply may cause severe injury to personnel.

CAUTION

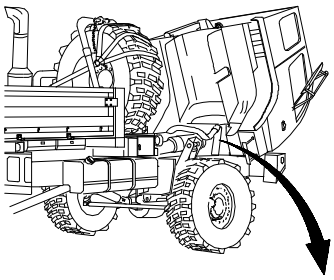
Transmission oil must be changed whenever there is evidence of oil breakdown or contamination. Oil breakdown or contamination may be caused from overheating transmission and/or oil cooler internal failure and is indicated by discoloration, strong odor, or oil analysis.

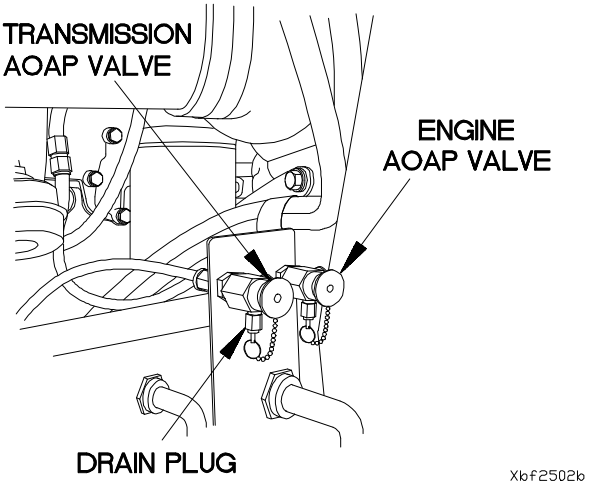
TRANSMISSION OIL INSPECTION

NOTE

Transmission fluid capacity is 42.3 qt (40 L).

(1) Start engine (TM 9-2320-365-10).
(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).





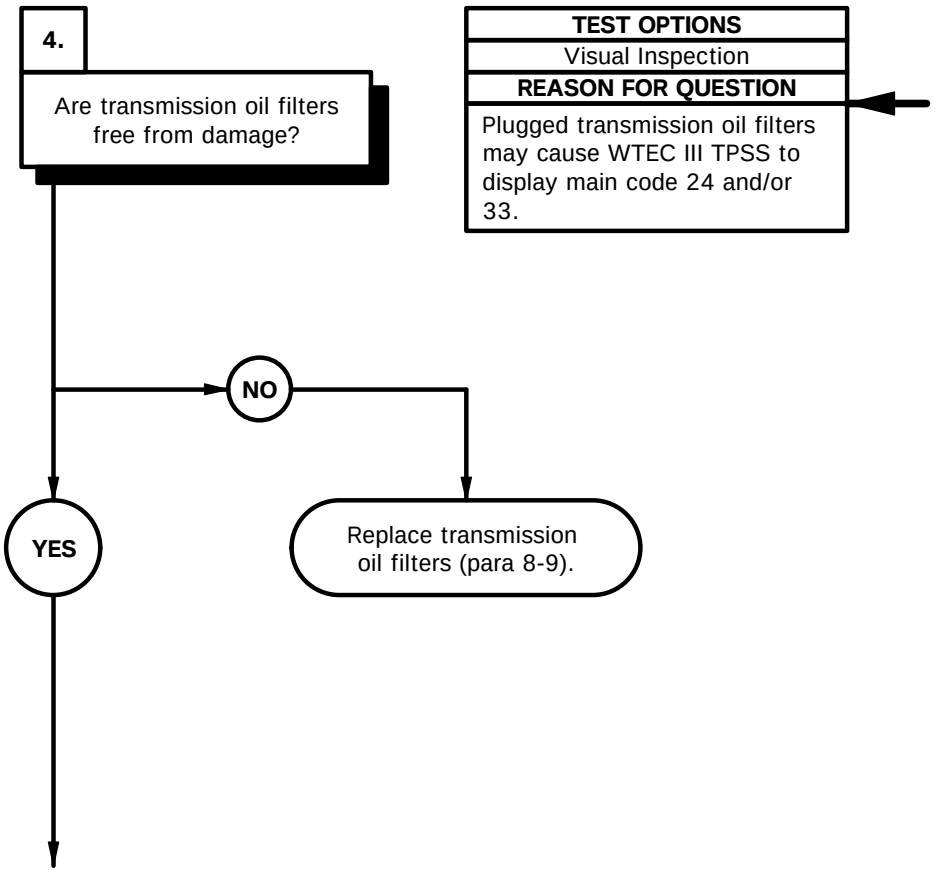
f25. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 AND/OR 33 AND ANY SUB CODE (CONT)

KNOWN INFO

Transmission oil level OK.
Fuse OK.
Batteries OK.
Engine does not overheat.
Transmission oil cooler tubes OK.
Transmission oil cooler OK.

POSSIBLE PROBLEMS

Faulty transmission oil filters.
Faulty WTEC III cab transmission harness.
Faulty WTEC III transmission ECU.



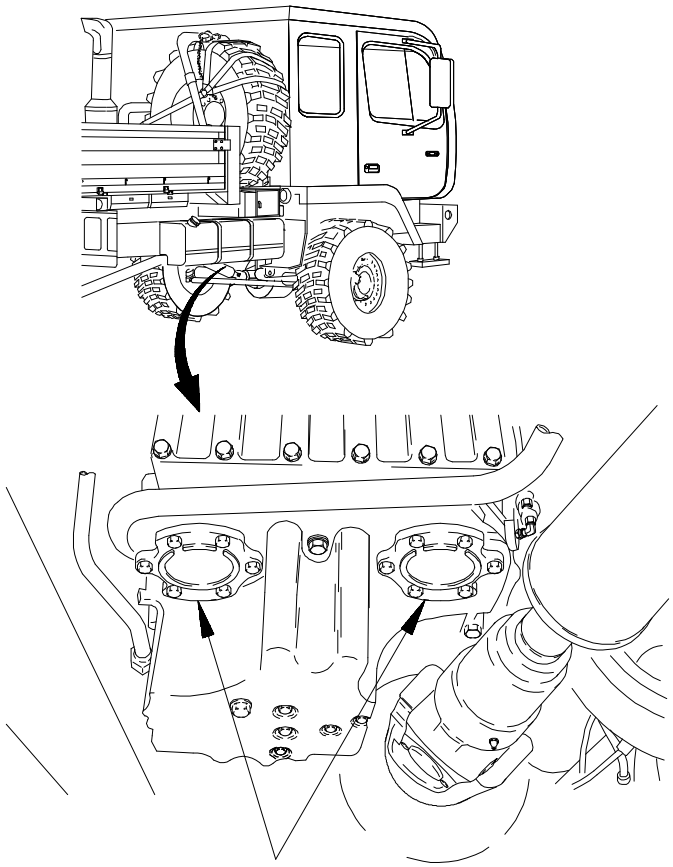
TEST OPTIONS

Visual Inspection

REASON FOR QUESTION

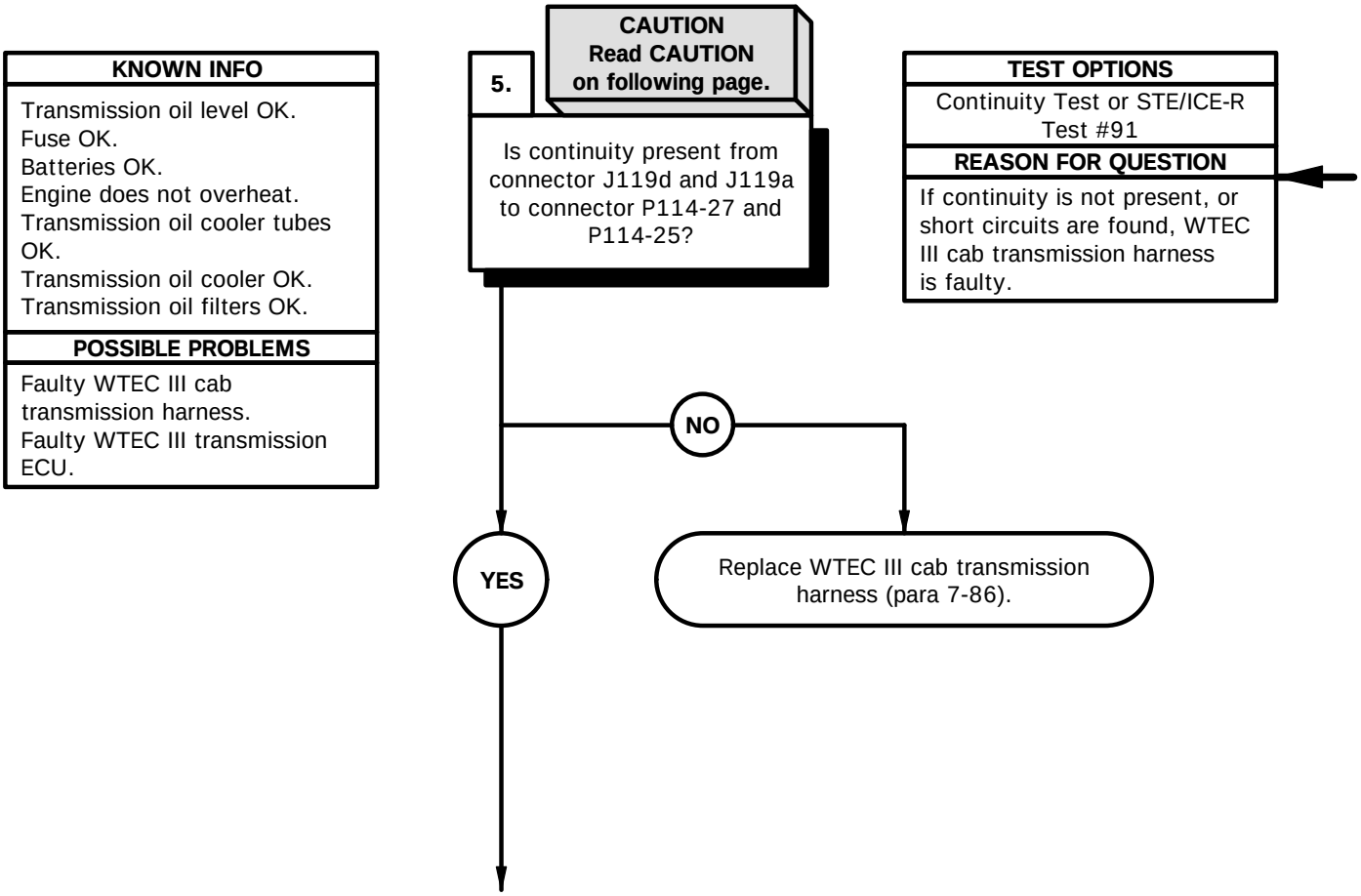
Plugged transmission oil filters may cause WTEC III TPSS to display main code 24 and/or 33.

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)



CAUTION

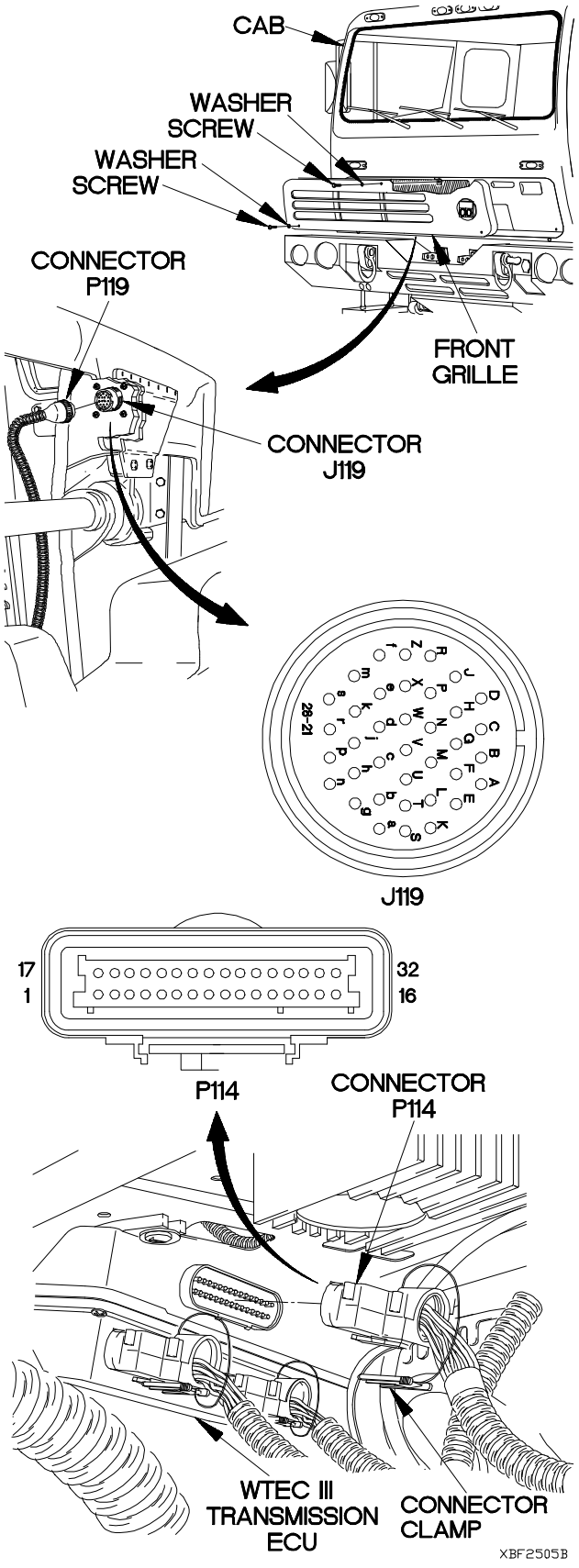
Use care when testing electrical connectors not to bend connector pins or damage connector sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

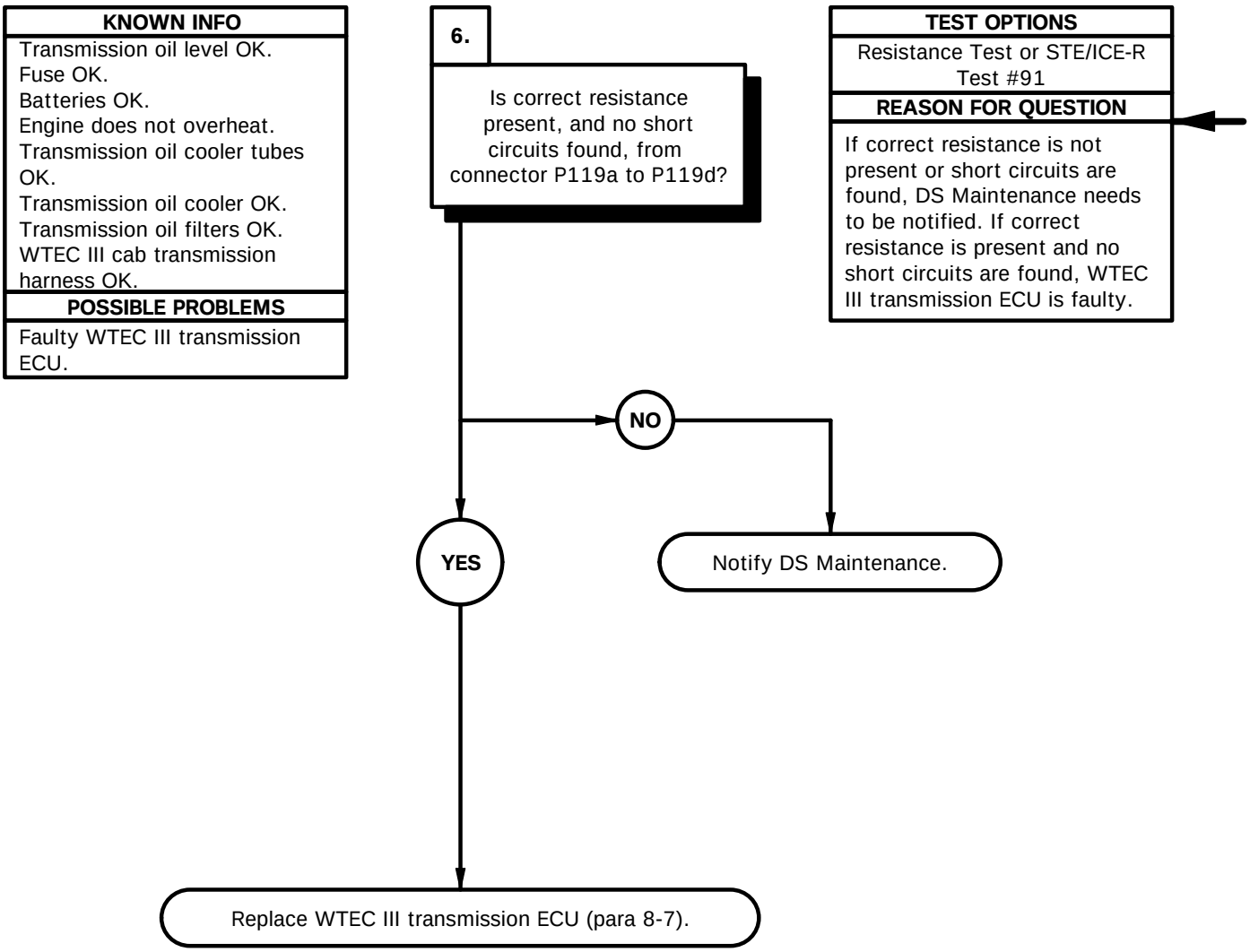
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Remove 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 7-86).
(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)



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.

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 2-32. 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).

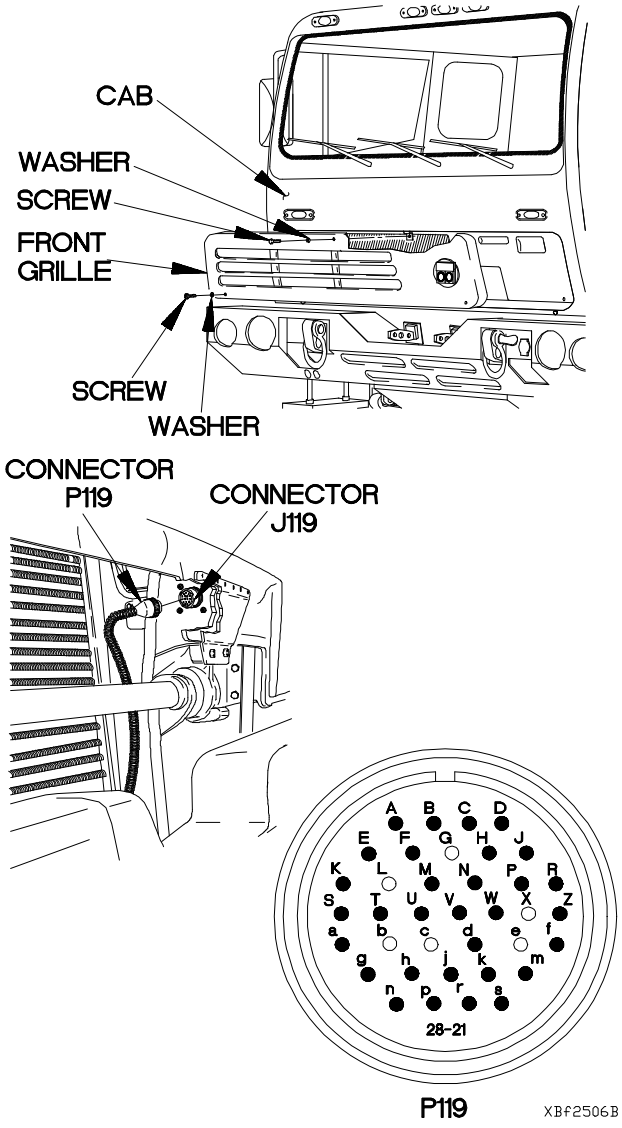


Table 2-32. Transmission Sump Oil Temperature Sensor Resistance Readings

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

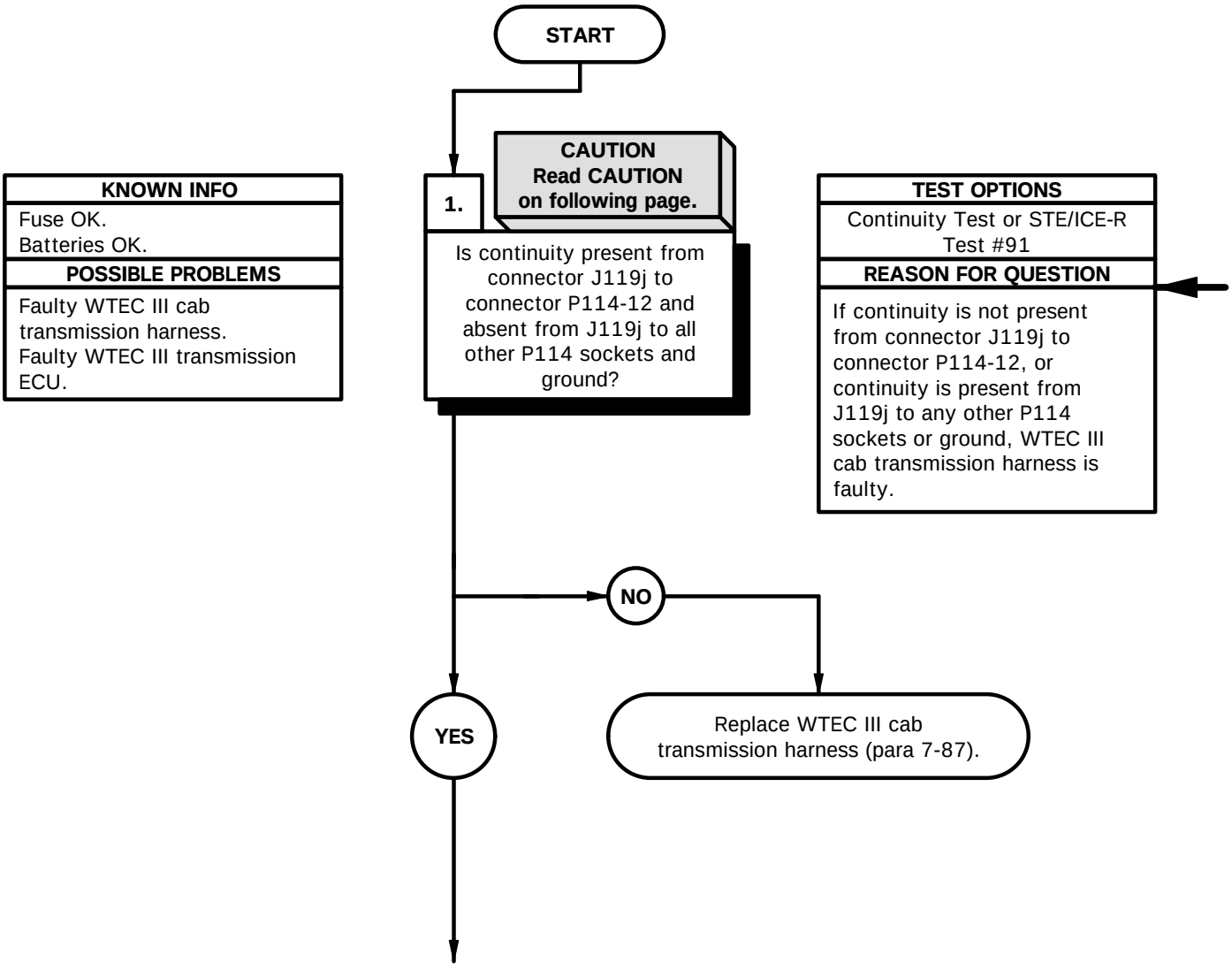
INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)

Tools and Special Tools
Wrench Set, Socket (Item 49, Appendix C)
STE/ICE-R (Item 39, 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.

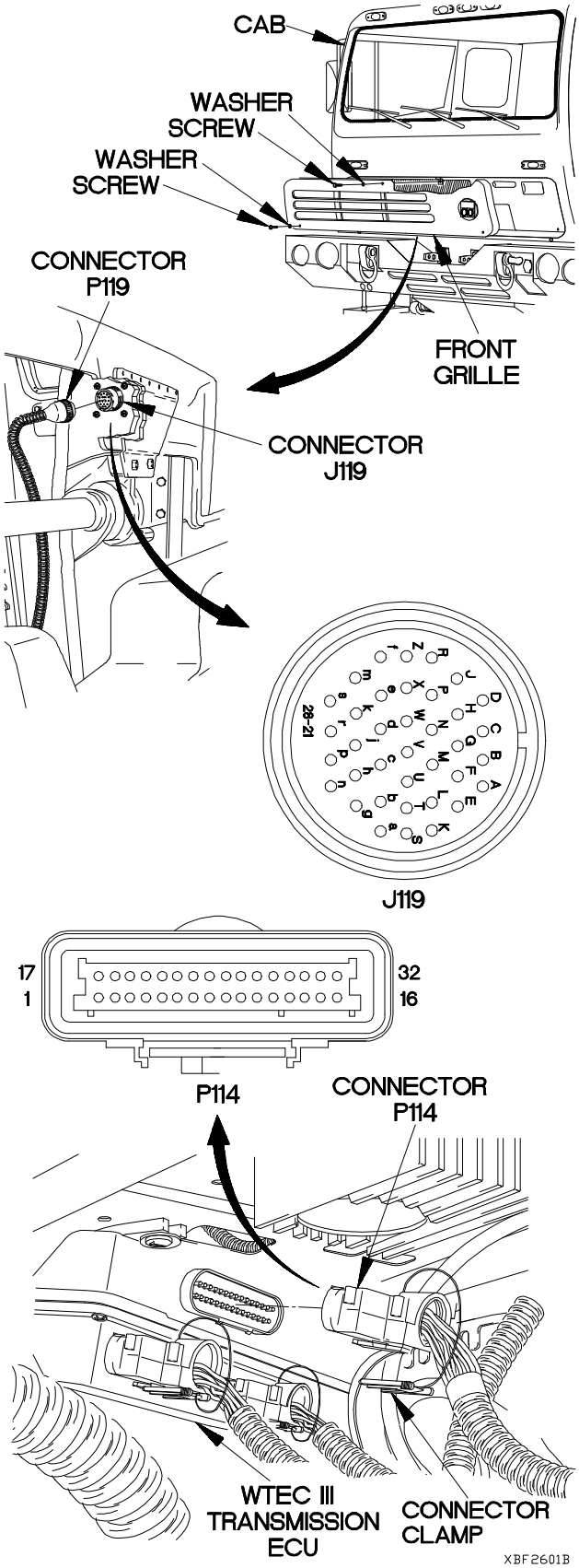
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

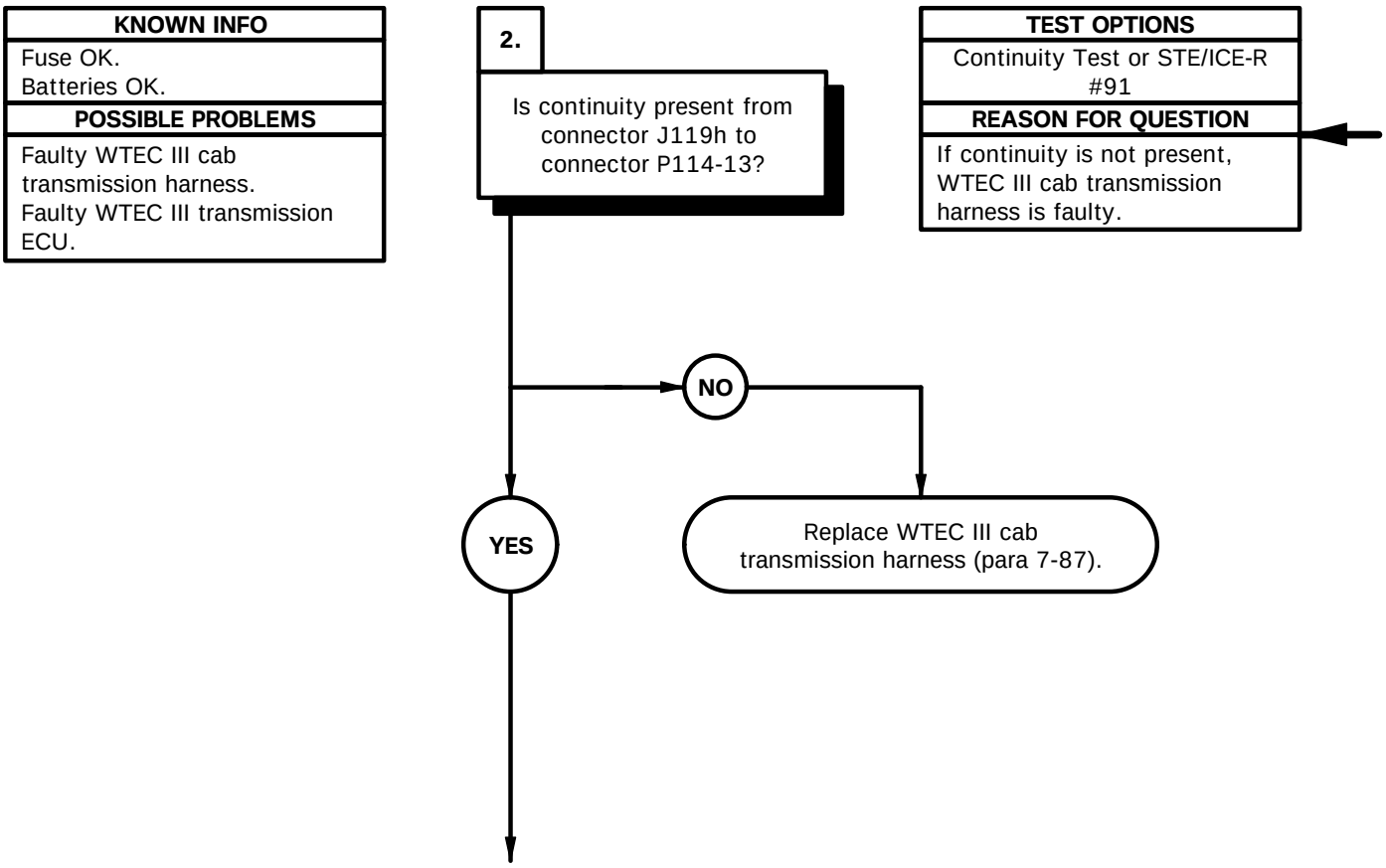
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

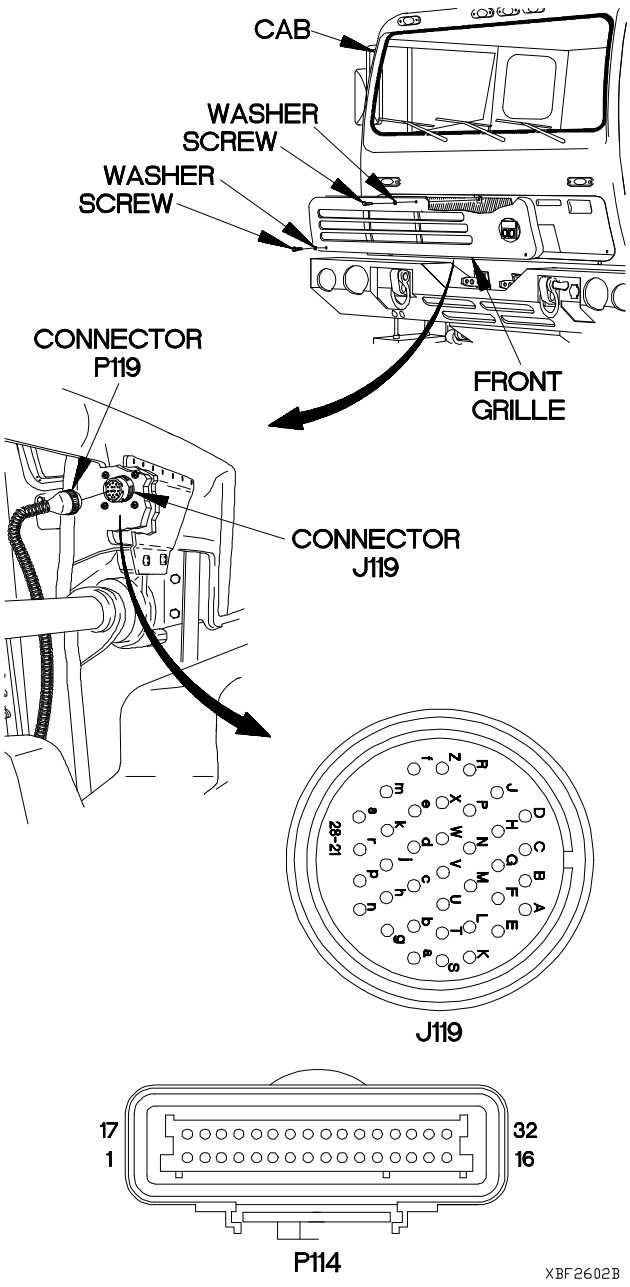
(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Disconnect connector P119 from connector J119.
(5) Remove kick panel (para 16-3).
(6) Disconnect connector clamp from connector P114.
(7) Disconnect connector P114 from WTEC III transmission ECU.
(8) 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 7-87).



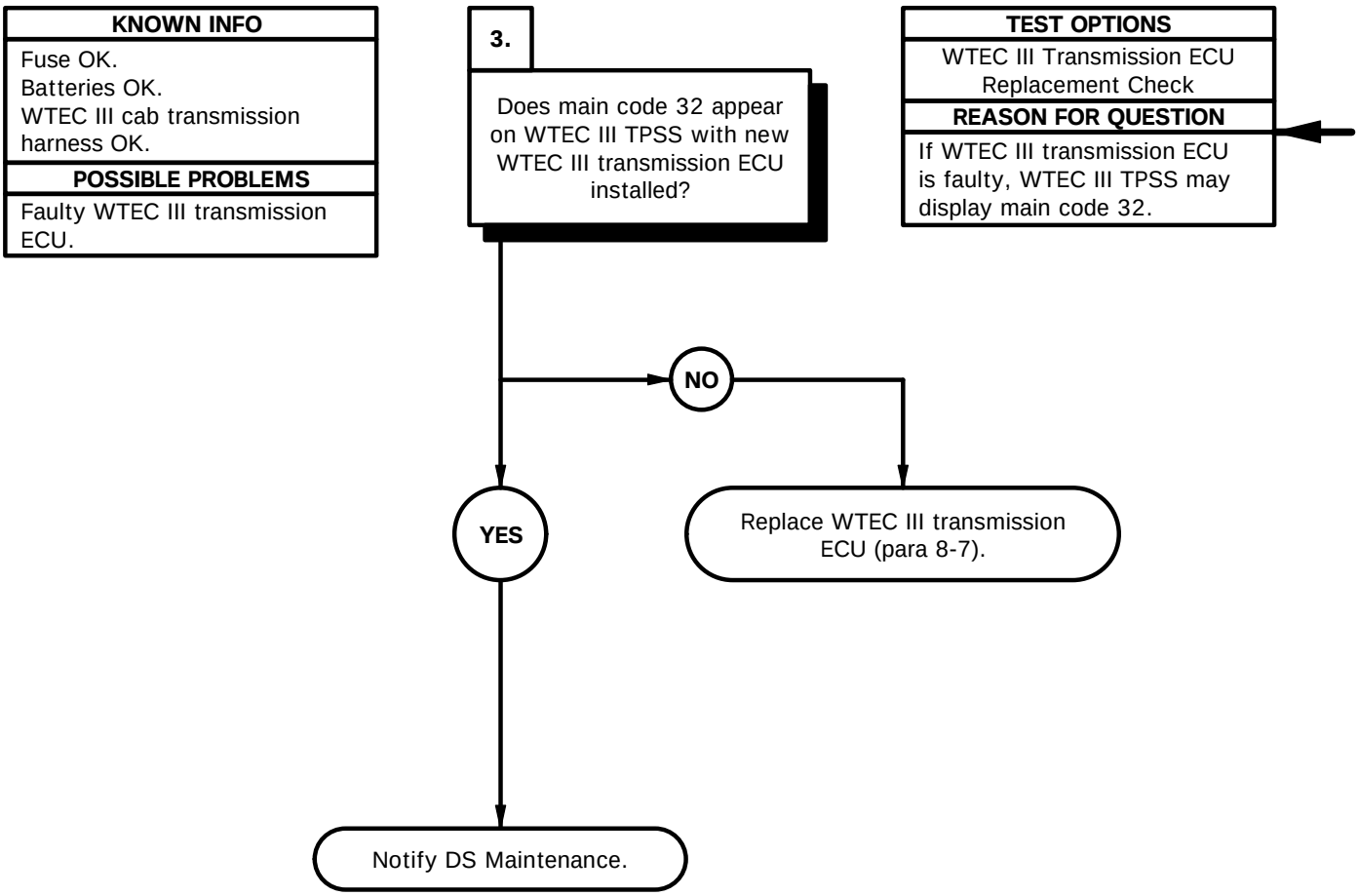
f26. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (CONT)



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 7-87). (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 9-2320-365-10).
(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 9-2320-365-10).
(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, AND/OR 69 AND ANY SUB CODE

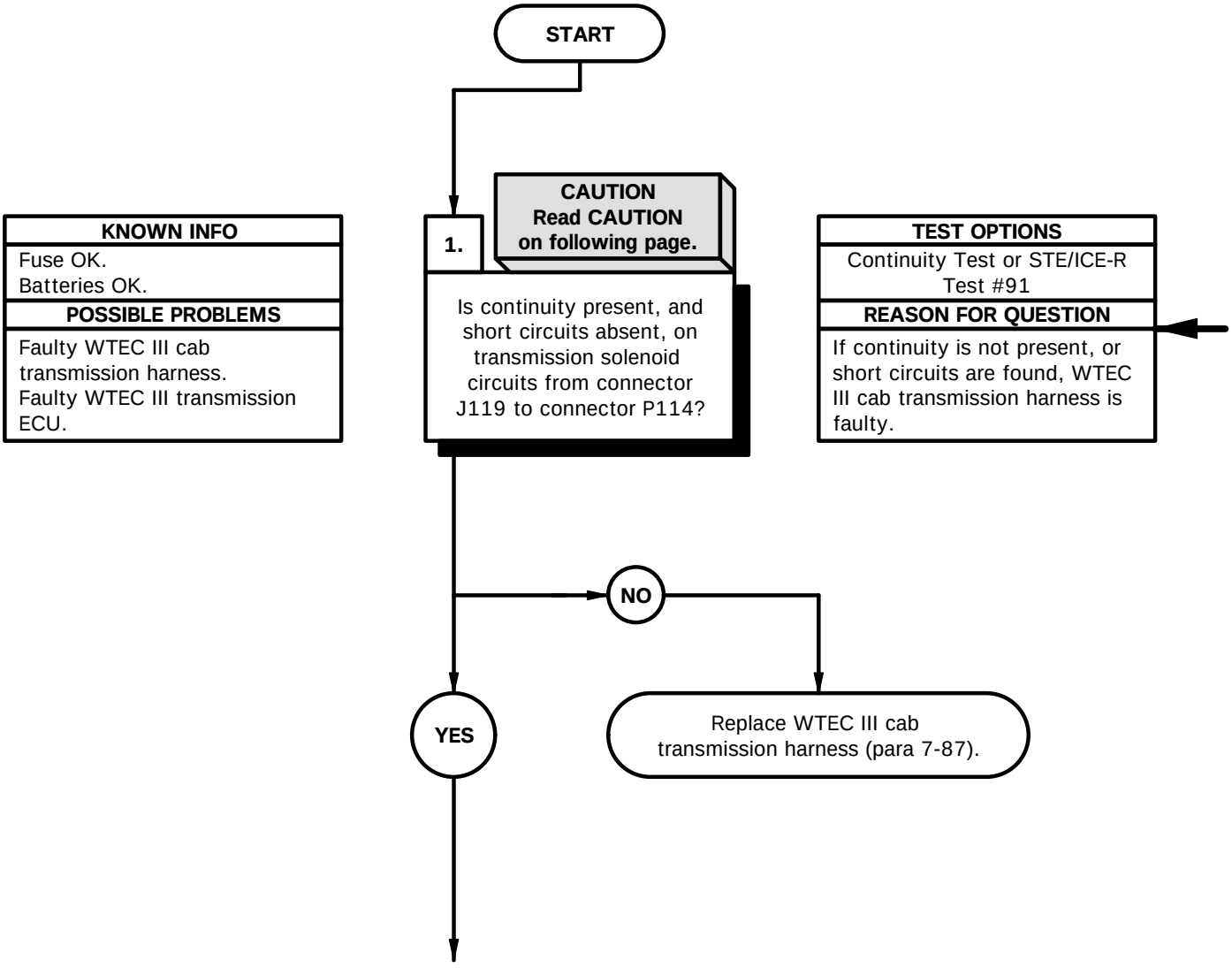
INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

Tools and Special Tools (Cont)
Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)
STE/ICE-R (Item 39, 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 2-33. 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 2-33. 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 2-33. 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 7-87).
(15) Remove jumper wire from connector J119.
(16) Connect connector P119 to connector J119.

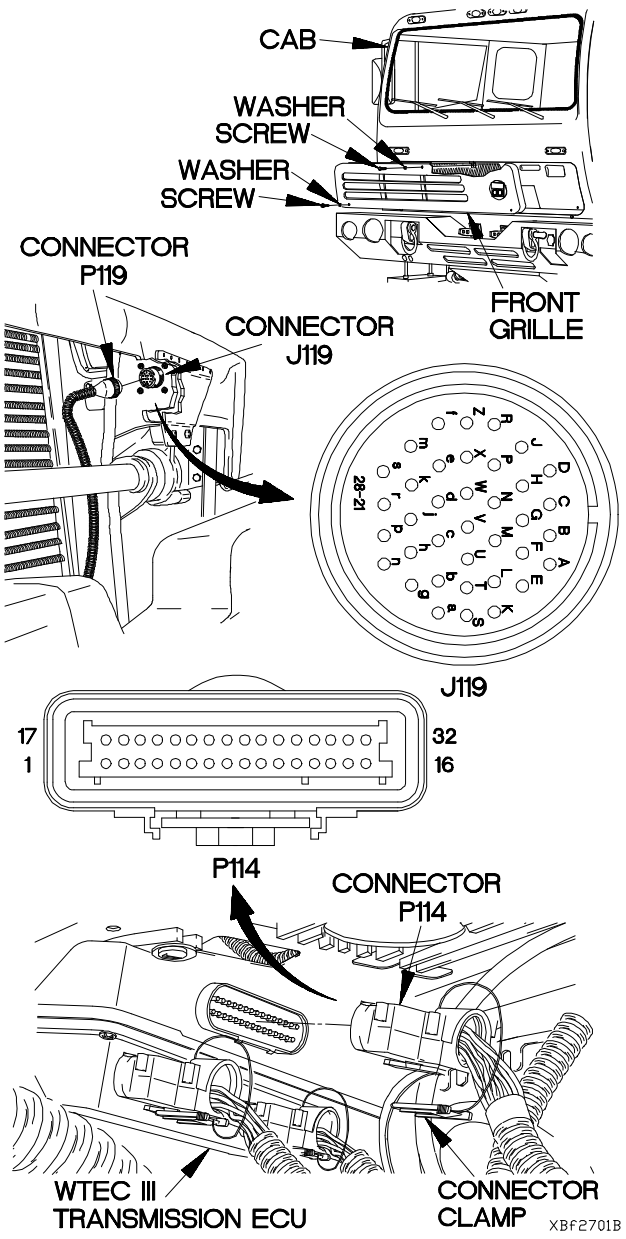
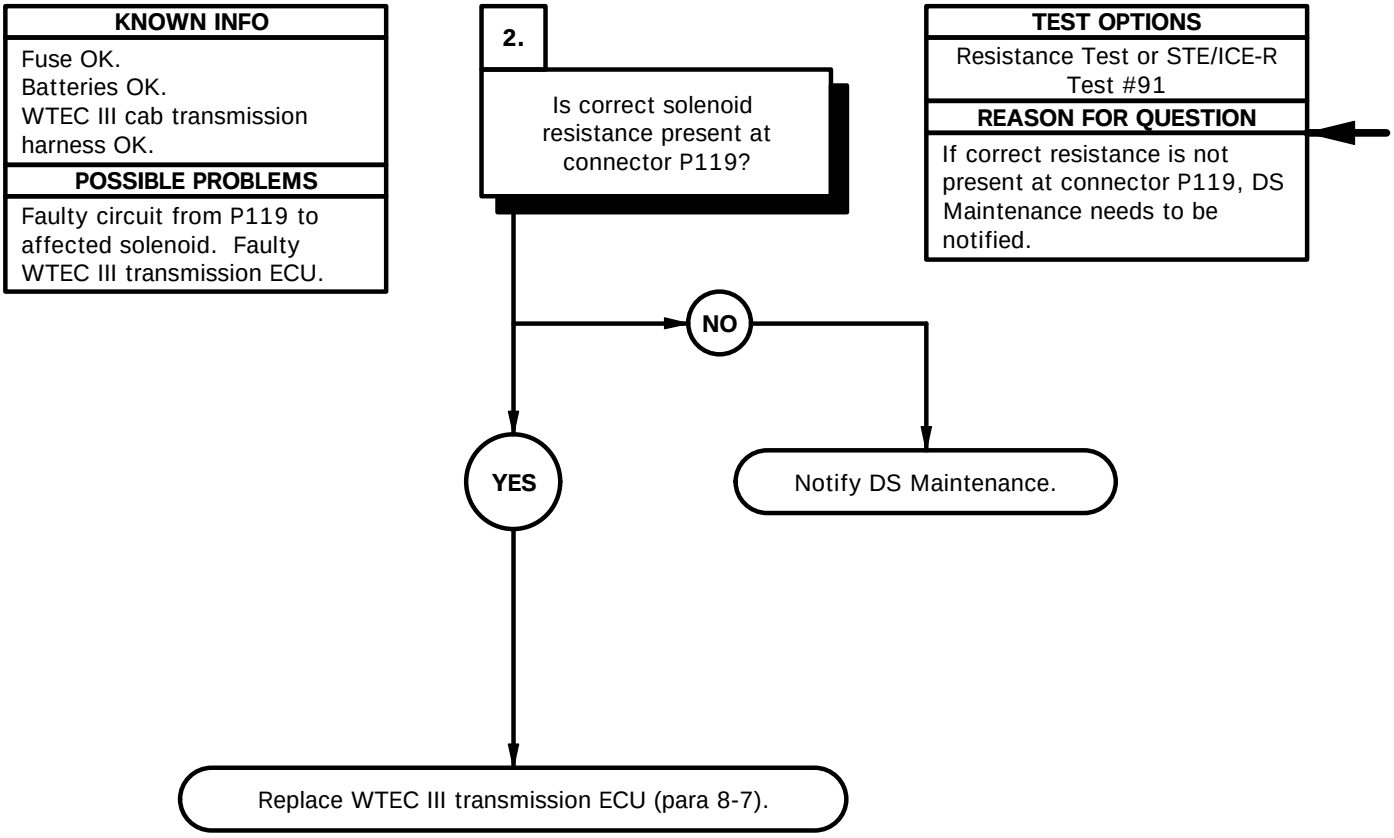


Table 2-33. WTEC III Cab Transmission Harness Transmission Solenoid Test Points

Sub Code	Jumper Across	Connector P114	
		Positive (+) Probe	Negative (-) Probe
12	J119M to J119B	P114-1	P114-4
13	J119T to 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

f27. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, 45, 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 2-34. 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 2-34. 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 2-35. 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).

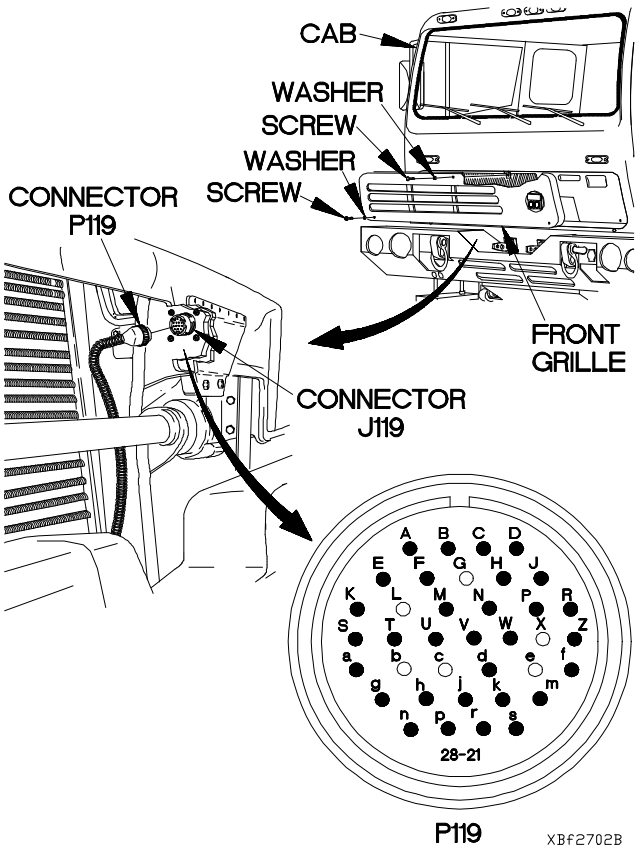


Table 2-34. Connector P119 Transmission Solenoid Resistance Test Points

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 2-35. 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

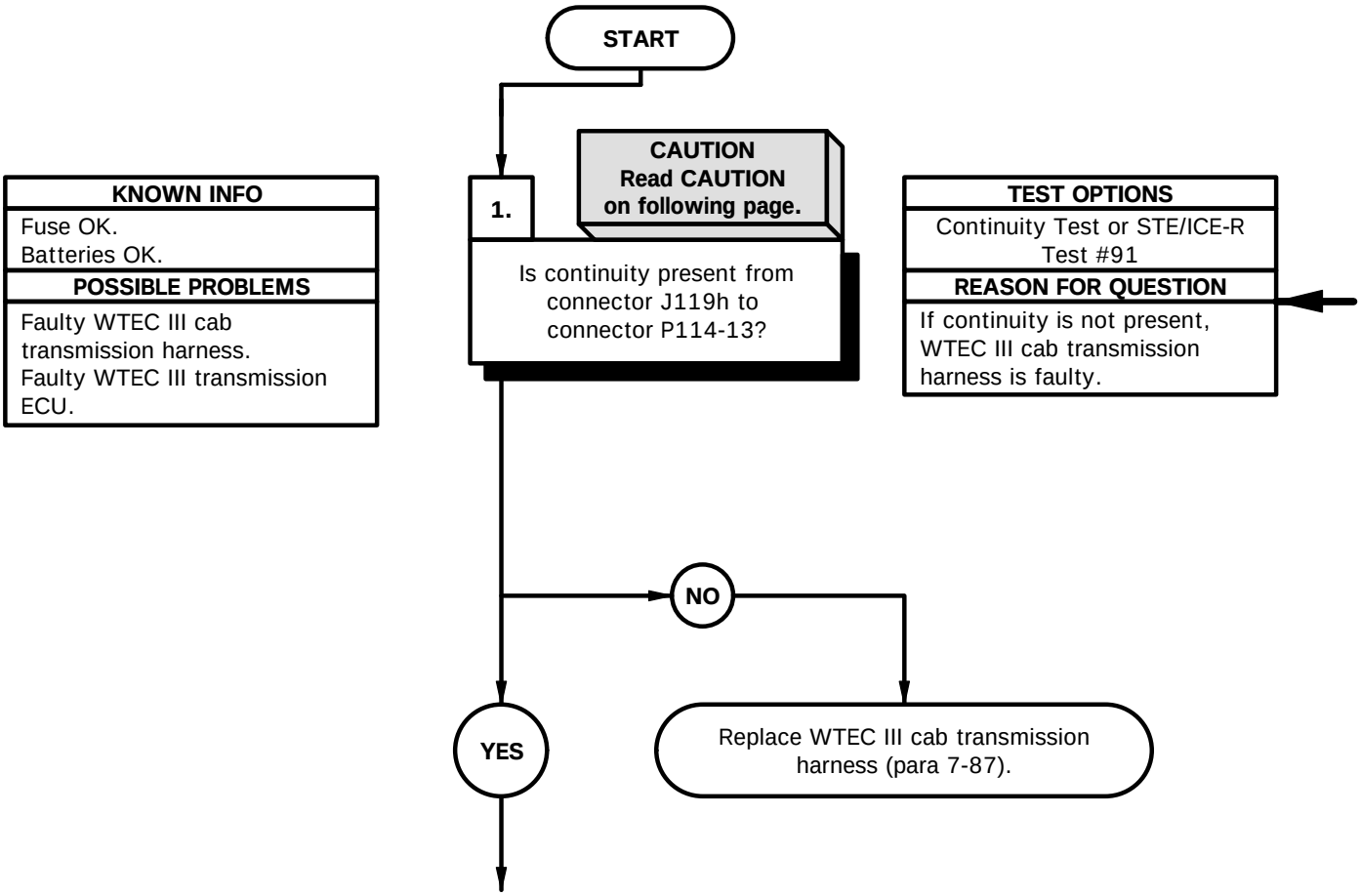
INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

Tools and Special Tools (Cont)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Wrench Set, Socket (Item 49, Appendix C)
STE/ICE-R (Item 39, 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.

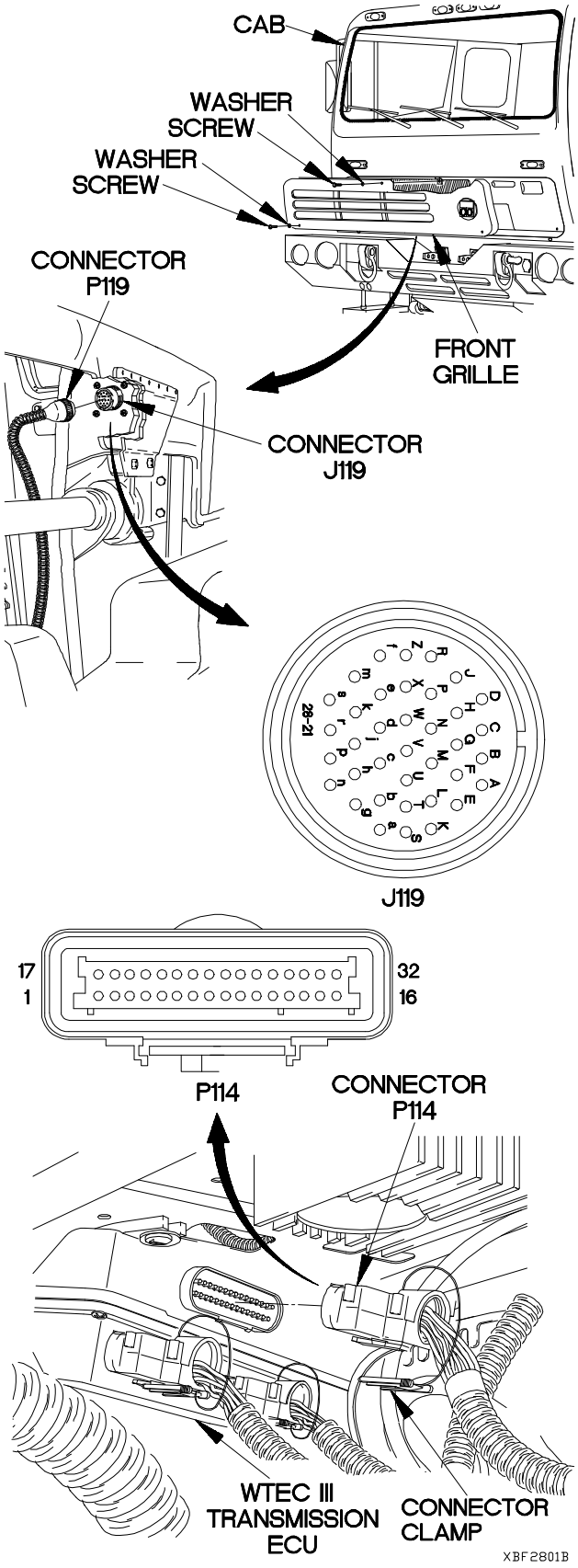
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

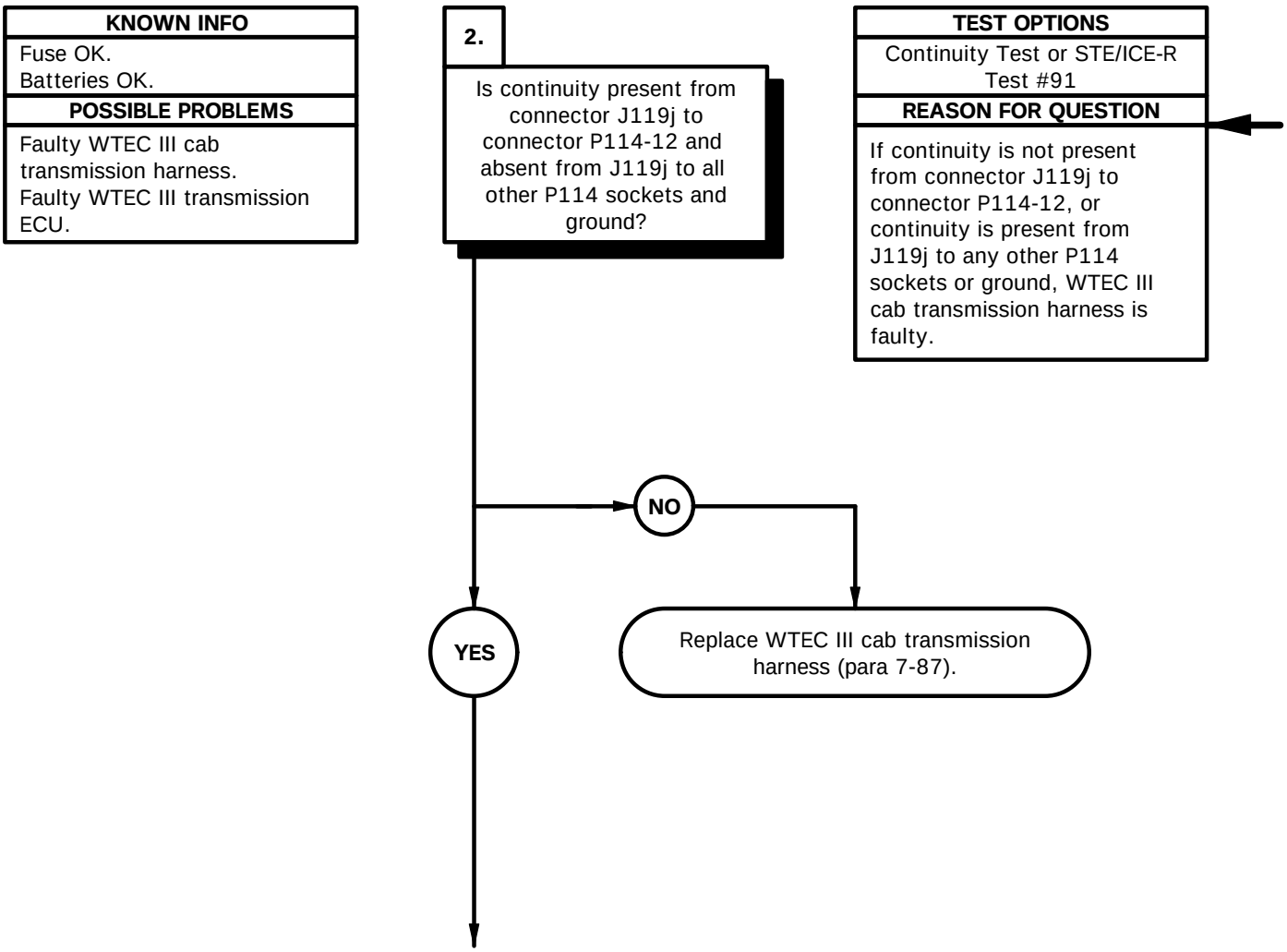
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille 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 7-87).

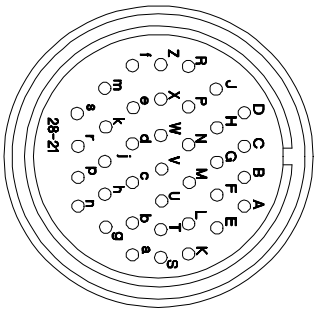


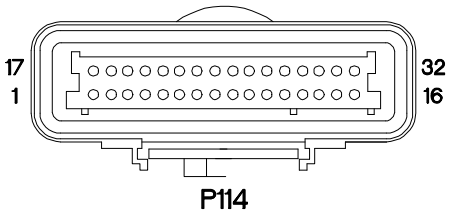
f28. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE (CONT)



CONTINUITY TEST

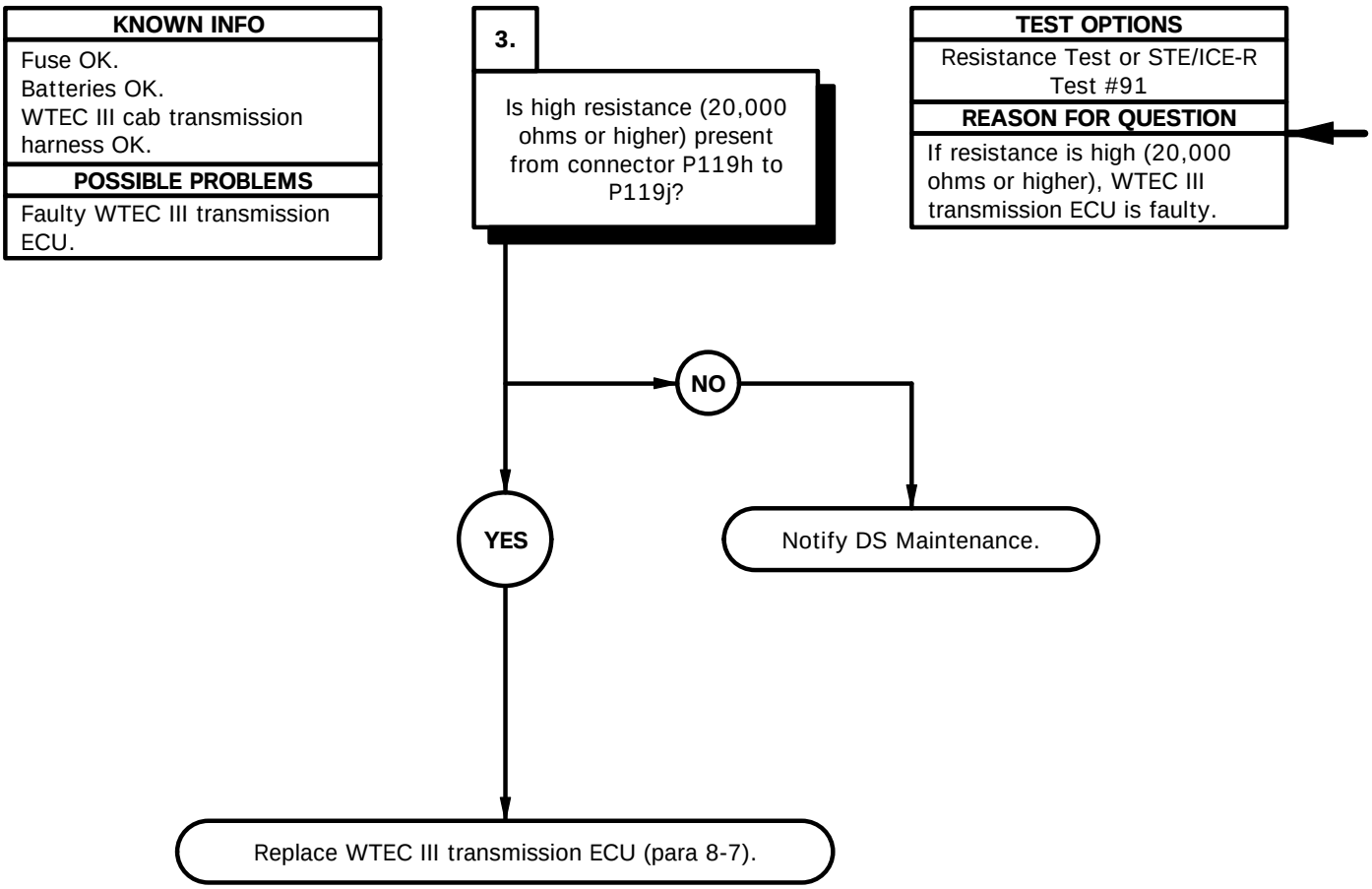
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector J119j.
(3) Connect negative (-) probe of multimeter to connector P114-12 and note reading on multimeter.
(4) Connect negative (-) probe of multimeter to all other sockets in connector P114, one at a time, and note reading 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 7-87).





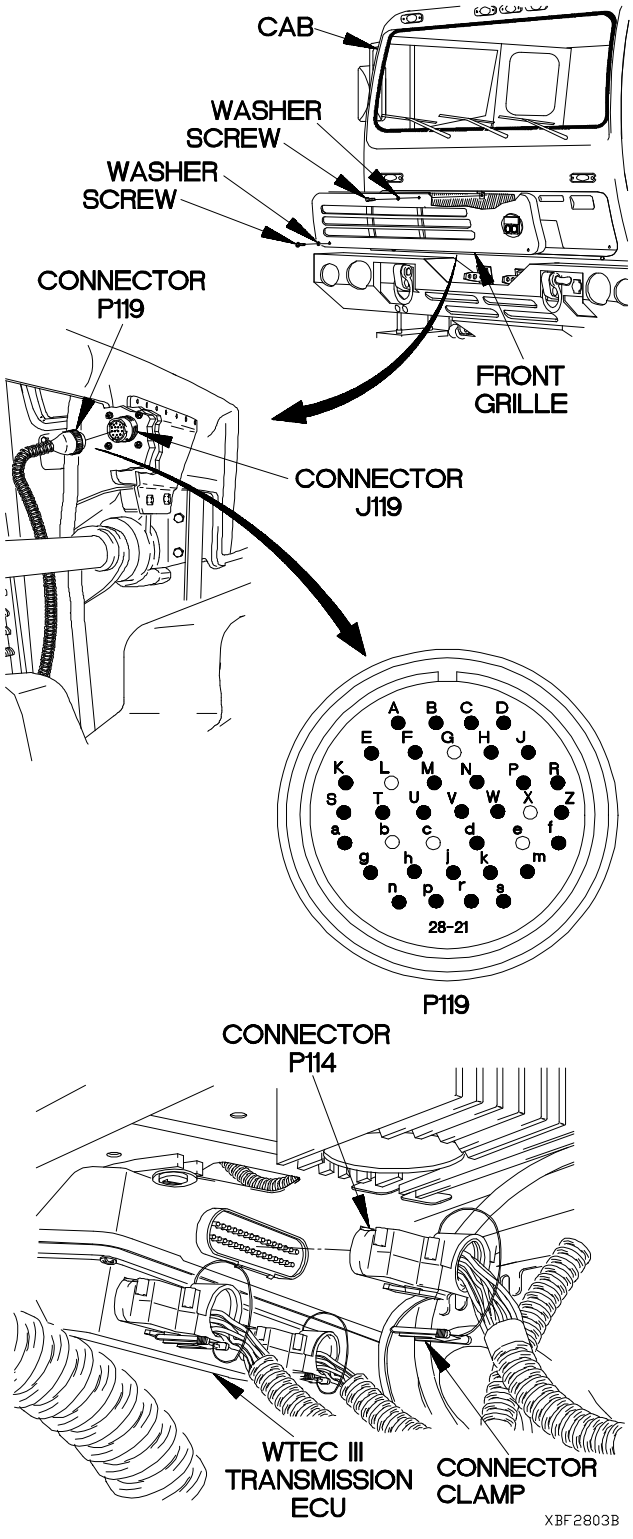
XBF2802B

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 7-18).
(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

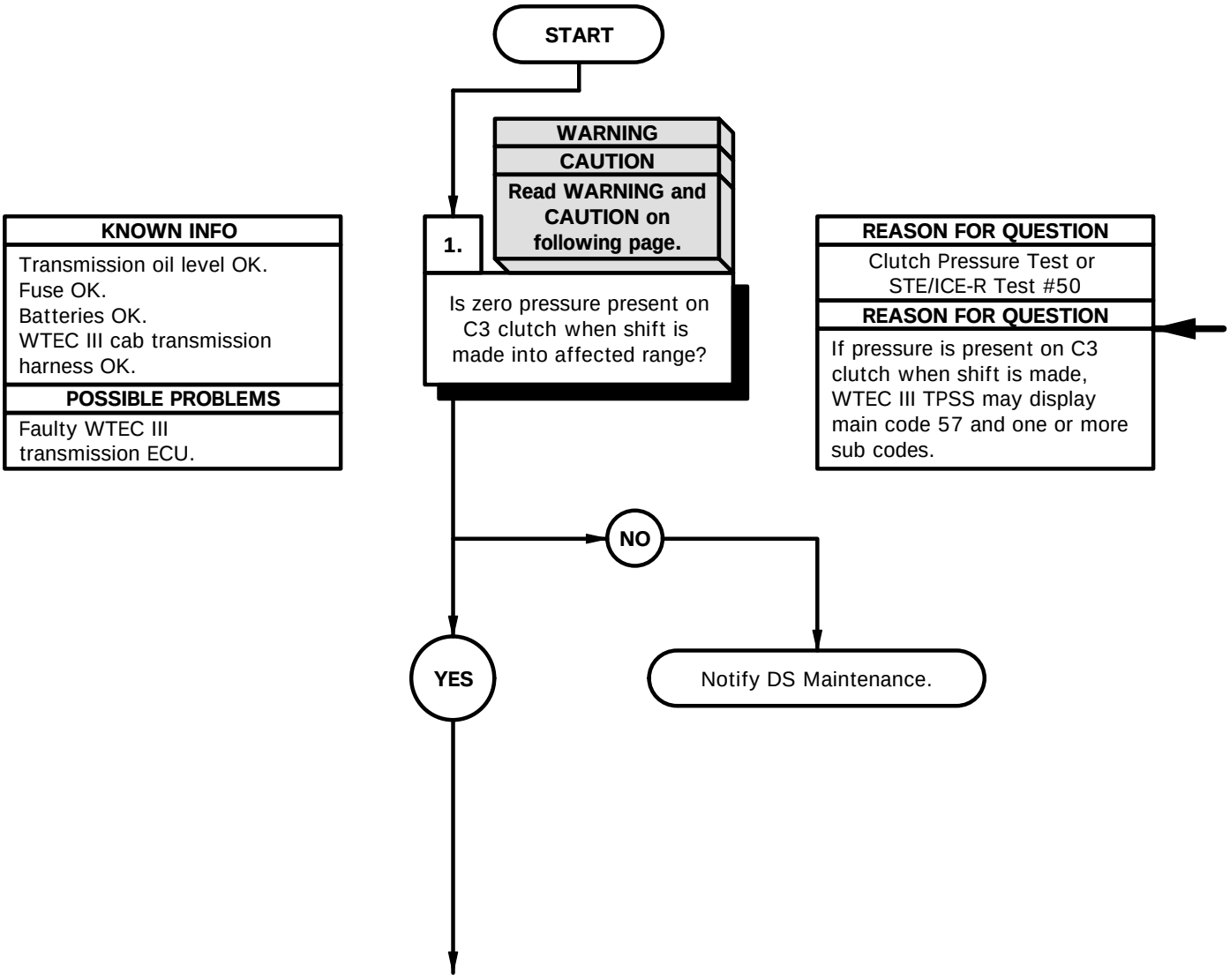
Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Pan, Drain (Item 24, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)

Tools and Special Tools (Cont)
Wrench Set, Socket (Item 49, 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 25.1, Appendix D)

Reference
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

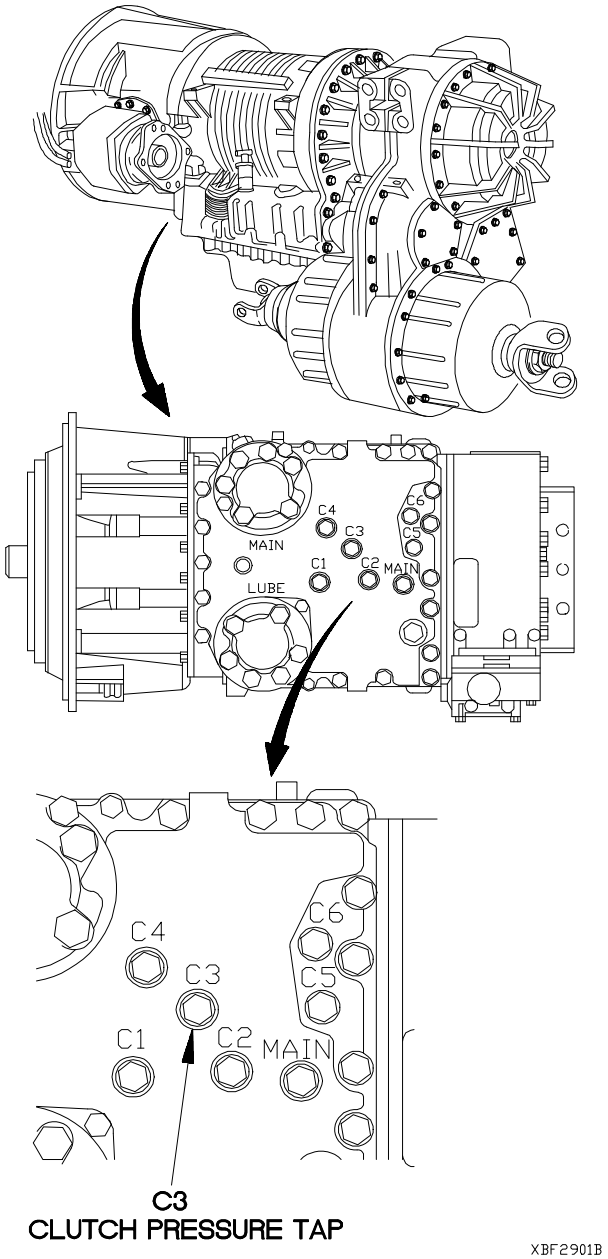
Loose or dirty connectors may cause intermittent loss of power to transmission ECU and diagnostic codes to be logged. Ensure that all connectors are clean and tight before performing troubleshooting. Failure to comply may result in incorrect test results.

CLUTCH PRESSURE TEST

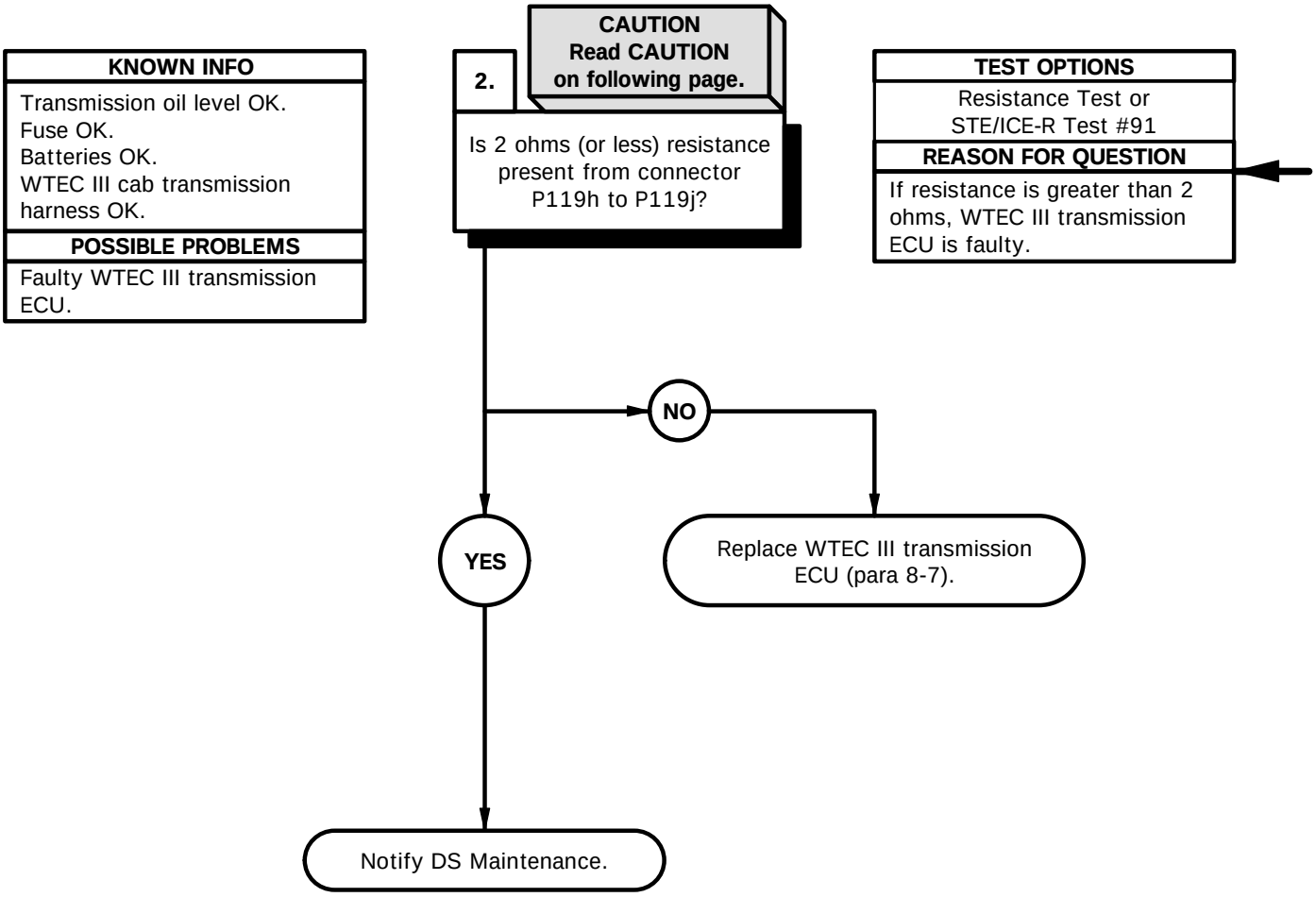
(1) Remove front and rear propeller shafts (para 9-2).
(2) Position drain pan under C3 pressure tap plug.
(3) Remove C3 pressure tap plug and preformed packing from control valve module. Discard preformed packing.
(4) Connect tube to boss adapter, hose, and pipe to tube adapter to C3 pressure tap.
(5) Perform STE/ICE-R Test # 50 (TM 9-4910-571-12&P).
(6) Start engine (TM 9-2320-365-10) 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 2-36. 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 9-2320-365-10).
(10) Remove pipe to tube adapter, hose, and tube to boss adapter from C3 pressure tap.
(11) Position preformed packing and C3 pressure tap plus 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 rear propeller shafts (para 9-2).

Table 2-36. 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

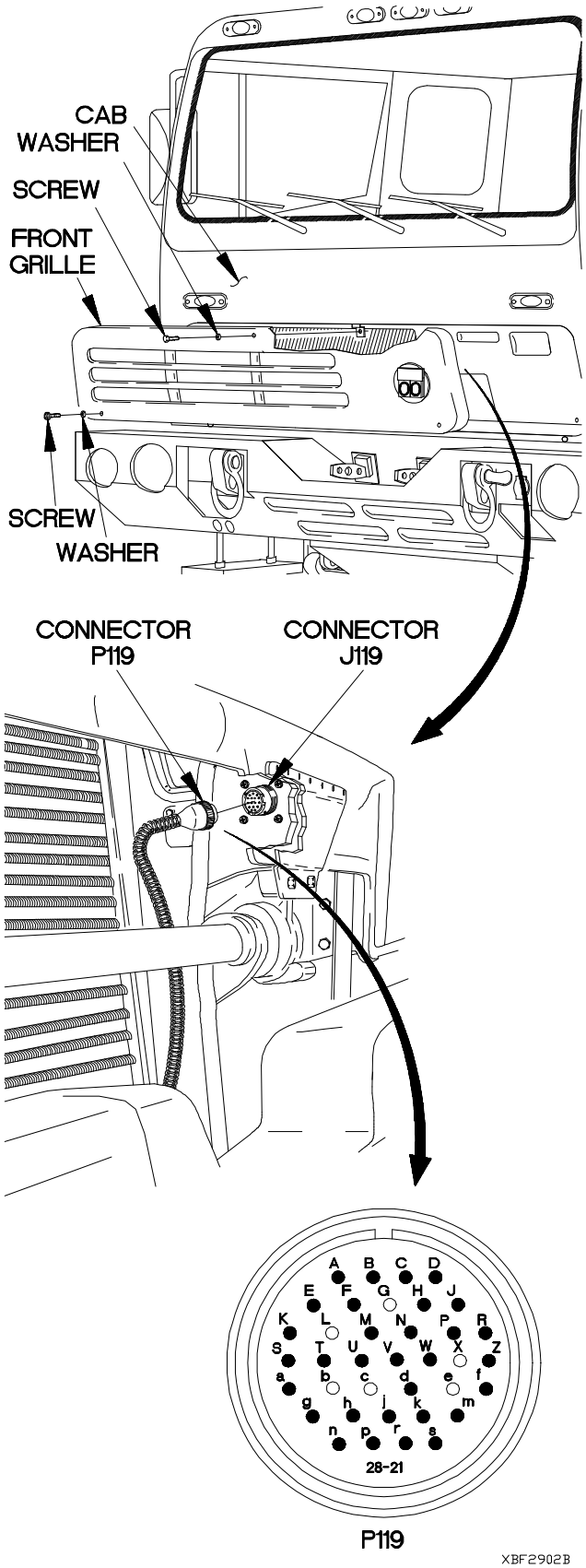
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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

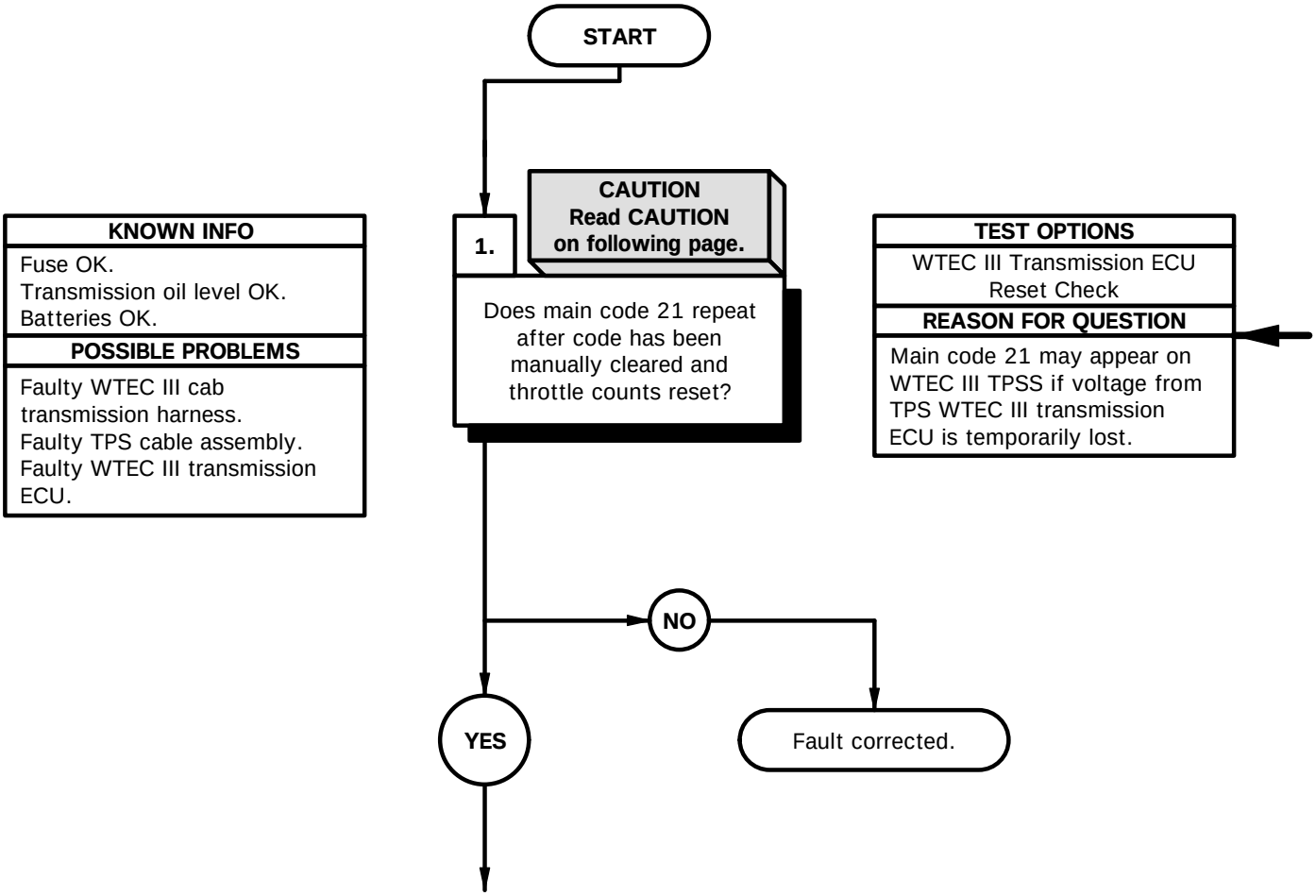
INITIAL SETUP

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

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

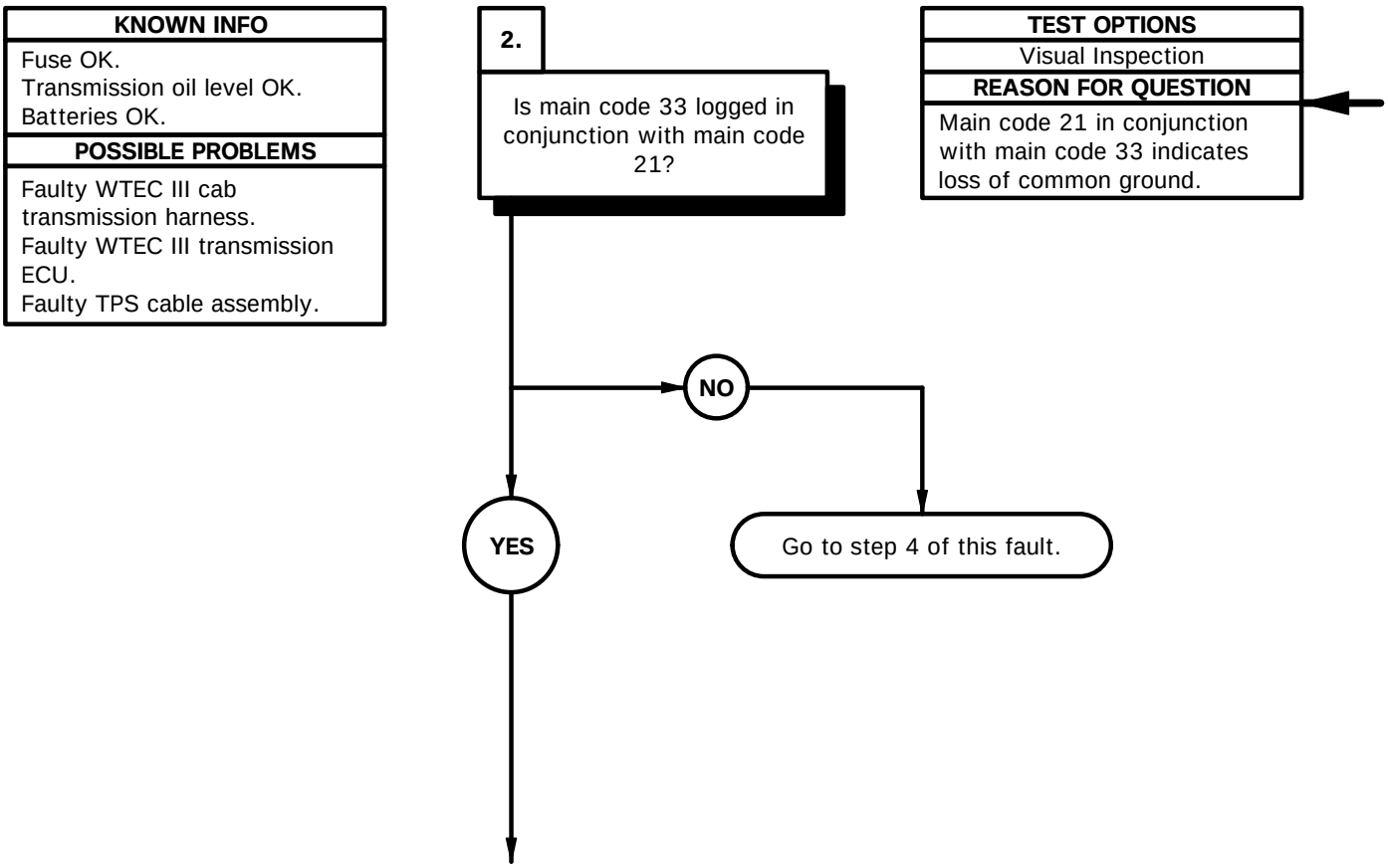
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

Main display code 21 needs to be cleared manually from WTEC 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

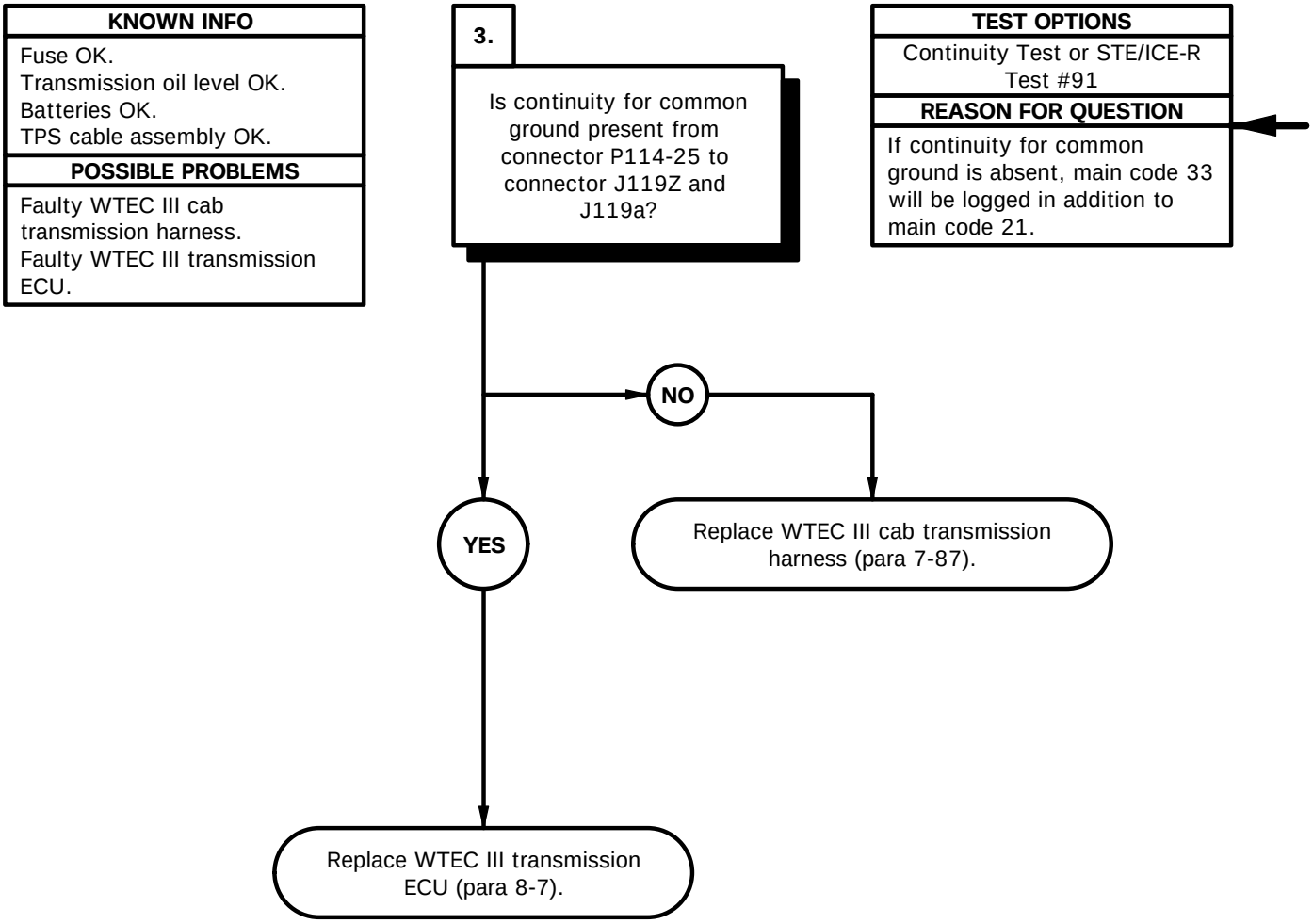
(1) Cycle master power switch to on (TM 9-2320-365-10), then to off five times to clear existing throttle count settings.
(2) Position master power switch to on (TM 9-2320-365-10).
(3) Depress accelerator pedal from idle position to full throttle position (TM 9-2320-365-10) to set new 0% and 100% throttle count values in WTEC 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 9-2320-365-10).

f30. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 21 AND ANY SUB CODE (CONT)



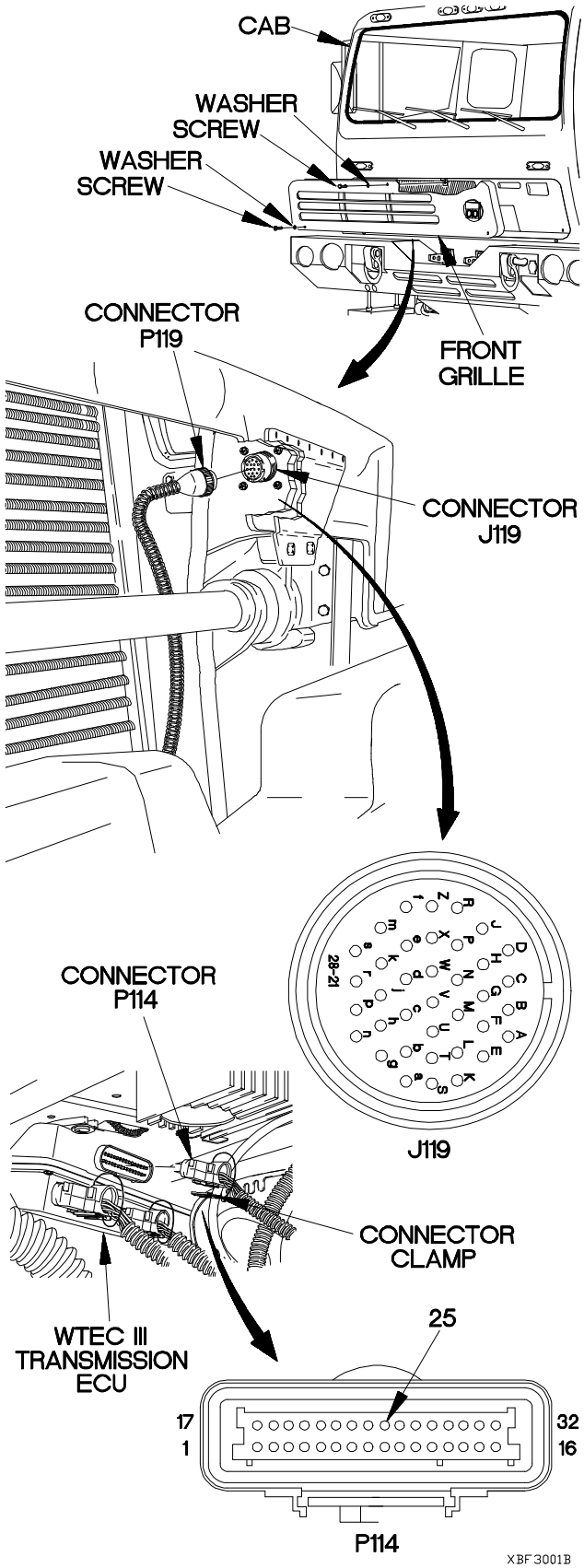
(1) Position master power switch to on (TM 9-2320-365-10).
(2) Press MODE button on WTEC III TPSS to bring up second code (if any) (para 8-5).
(3) If main code 33 displays on WTEC III TPSS, common ground may have been lost. If main code 21 is the only code displayed, TPS may be faulty. Go to step 4 of this fault.
(4) Position master power switch to off (TM 9-2320-365-10).

f30. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 21 AND ANY SUB CODE (CONT)

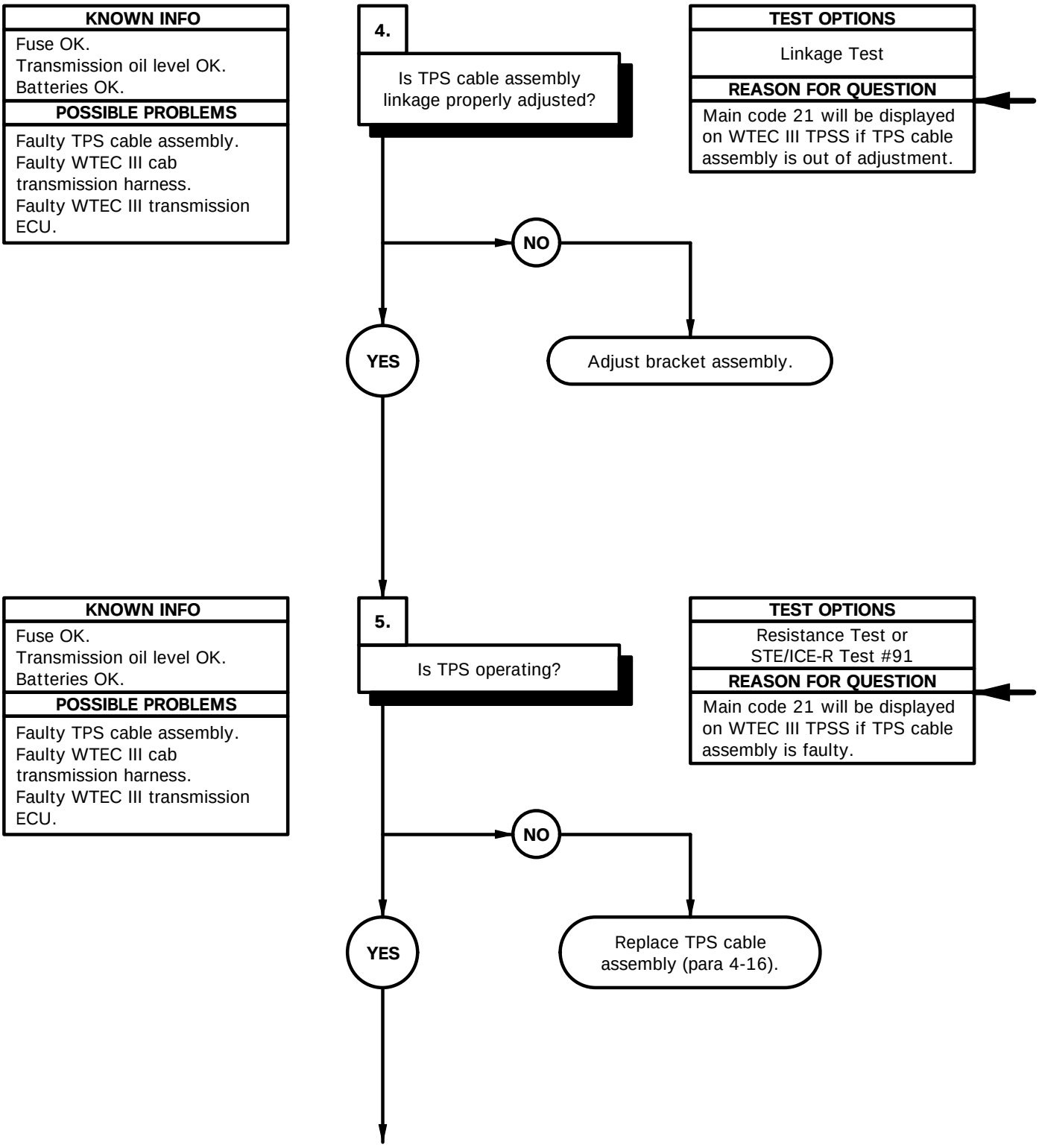


CONTINUITY TEST

(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 7-87).
(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)

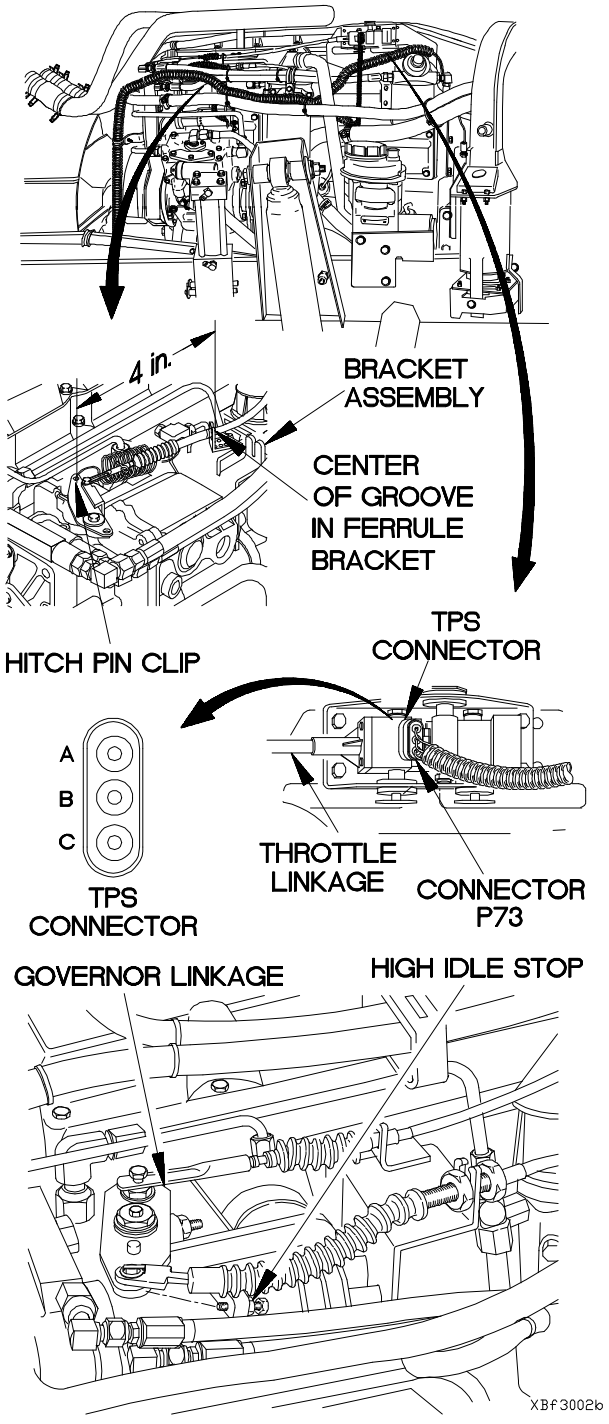


LINKAGE TEST

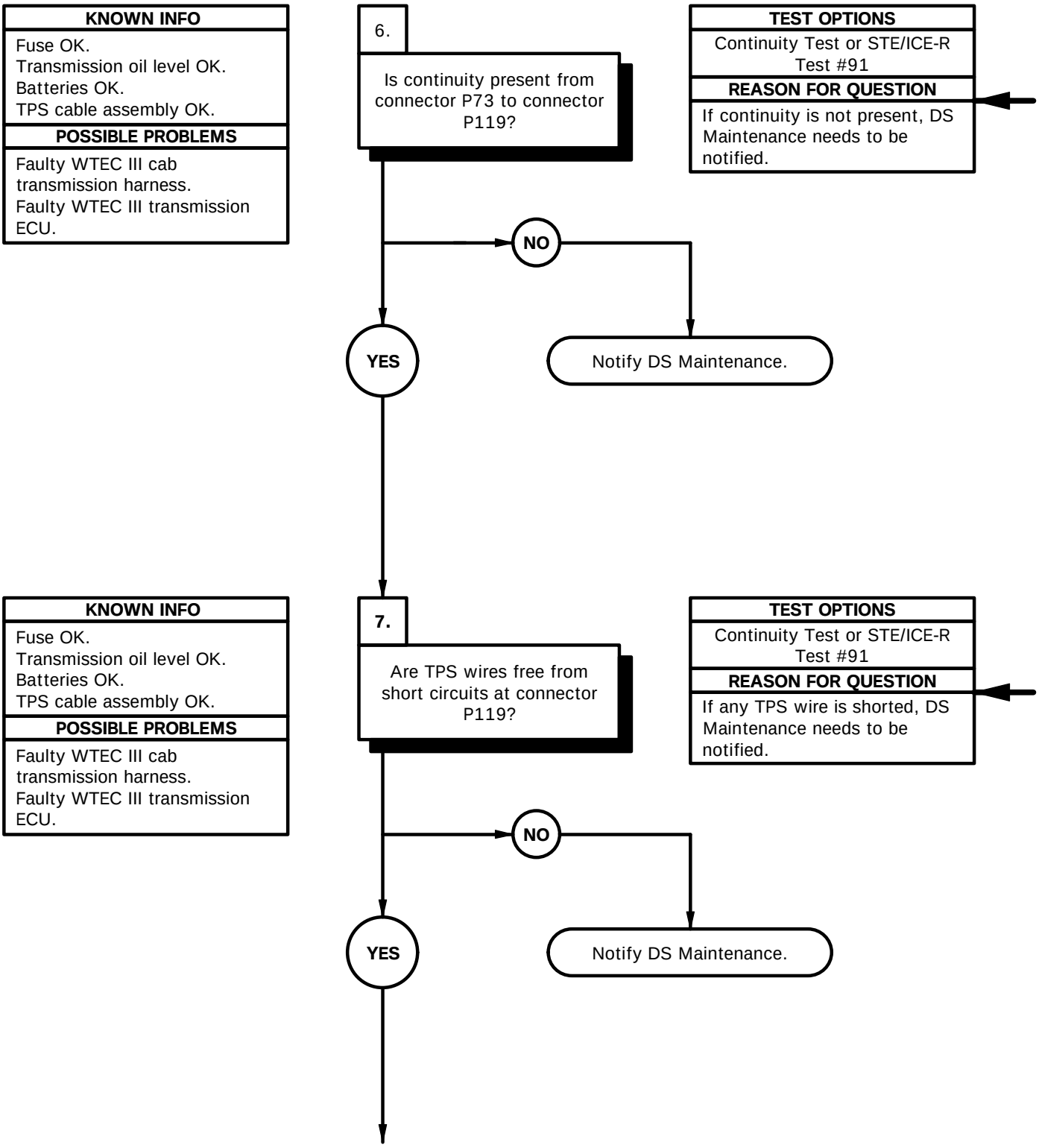
(1) Raise cab (TM 9-2320-365-10).
(2) Verify distance between hitch pin clip on end of sensor rod and center of cable groove in ferrule is 4 in. (10 cm).
(3) If distance is not 4 in. (10 cm), adjust bracket assembly to obtain correct measurement.

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)

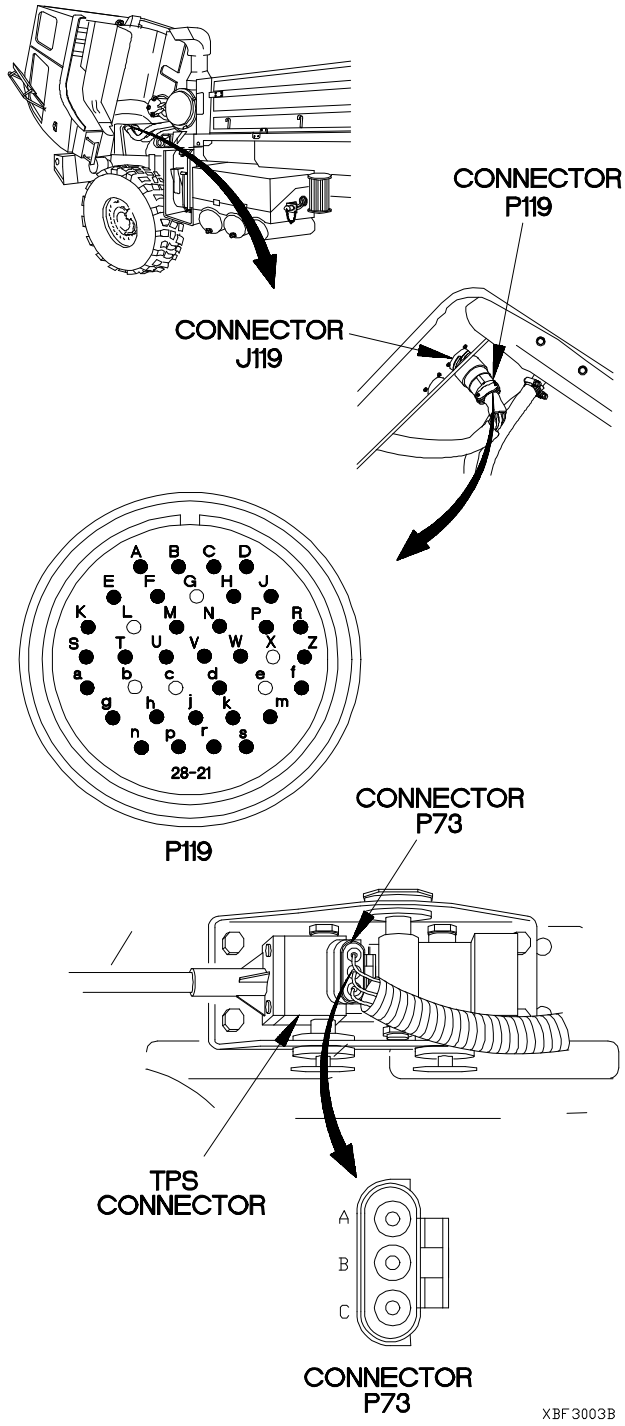


CONTINUITY TEST

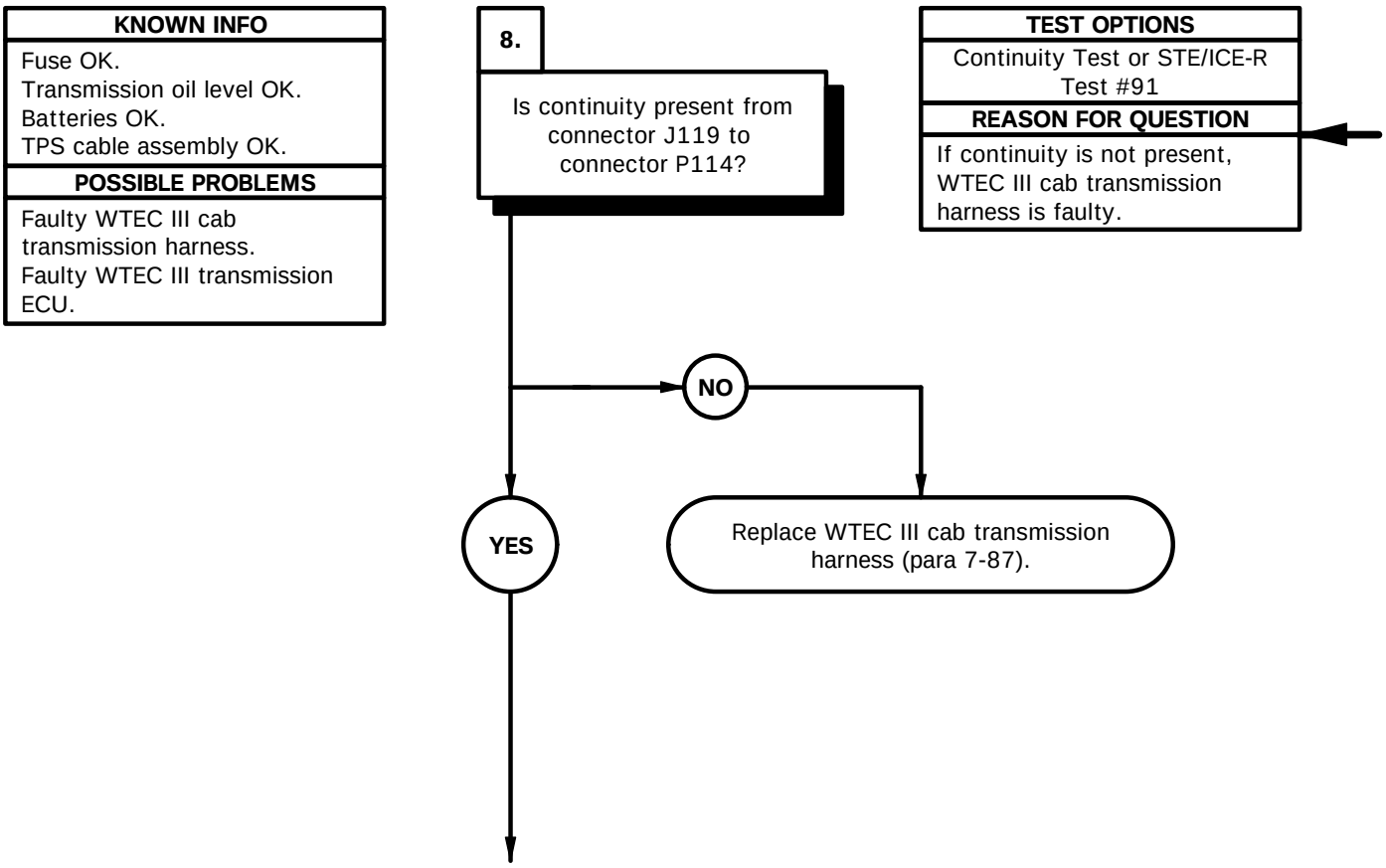
(1) Disconnect connector P119 from connector J119.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector P119R.
(4) Connect negative (-) probe of multimeter to connector P73 pin C and note reading on multimeter.
(5) Connect positive (+) probe of multimeter to connector 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)

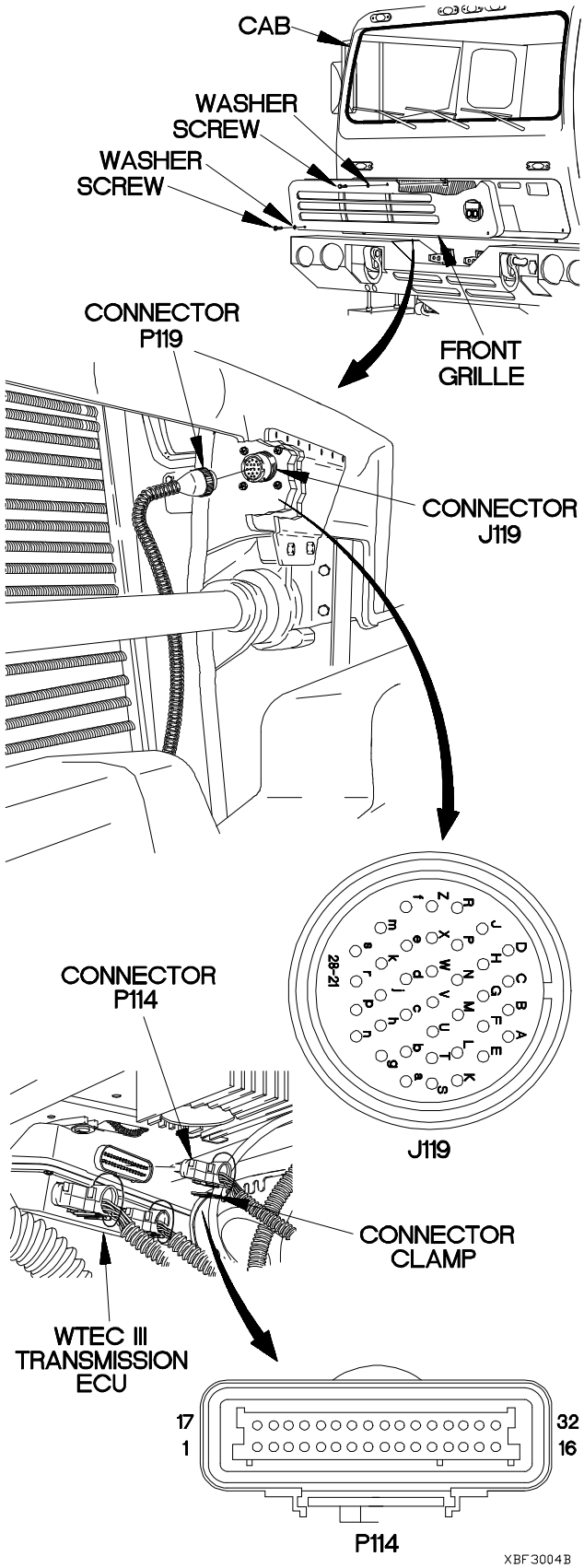


CONTINUITY TEST

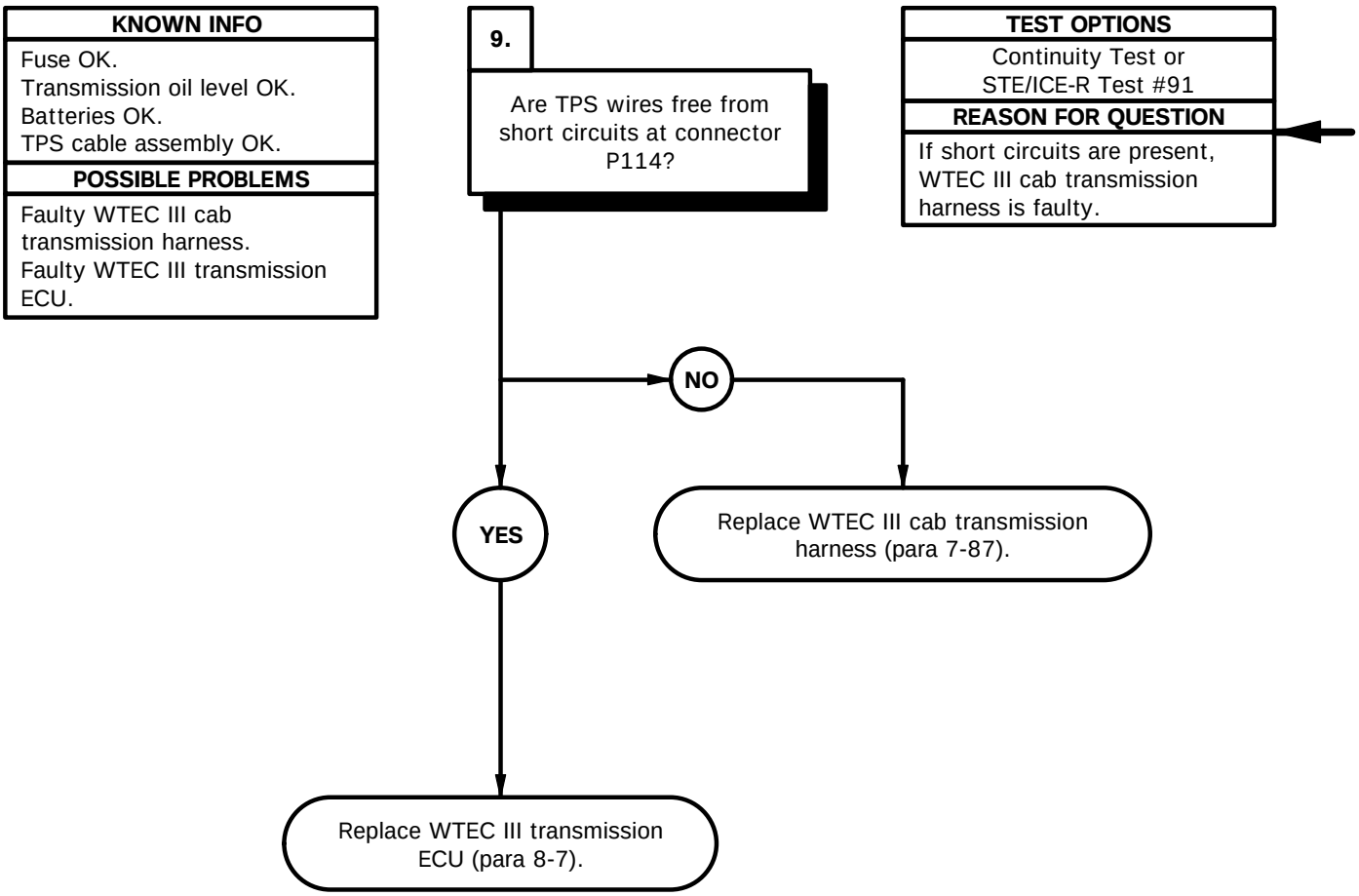
(1) Lower cab (TM 9-2320-365-10).
(2) Remove two screws and washers from front grille.
(3) Remove screw and washer from front grille.
(4) Remove front grille from cab.
(5) Remove kick panel (para 16-3).
(6) Disconnect connector clamp from connector P114.
(7) Disconnect connector P114 from WTEC III transmission ECU.
(8) Set multimeter to ohms.
(9) For each line of Table 2-37. 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 2-37. Cab Transmission Harness Continuity Check, replace WTEC III cab transmission harness (para 7-87).
(11) Remove jumper wire from connector J119.

Table 2-37. 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

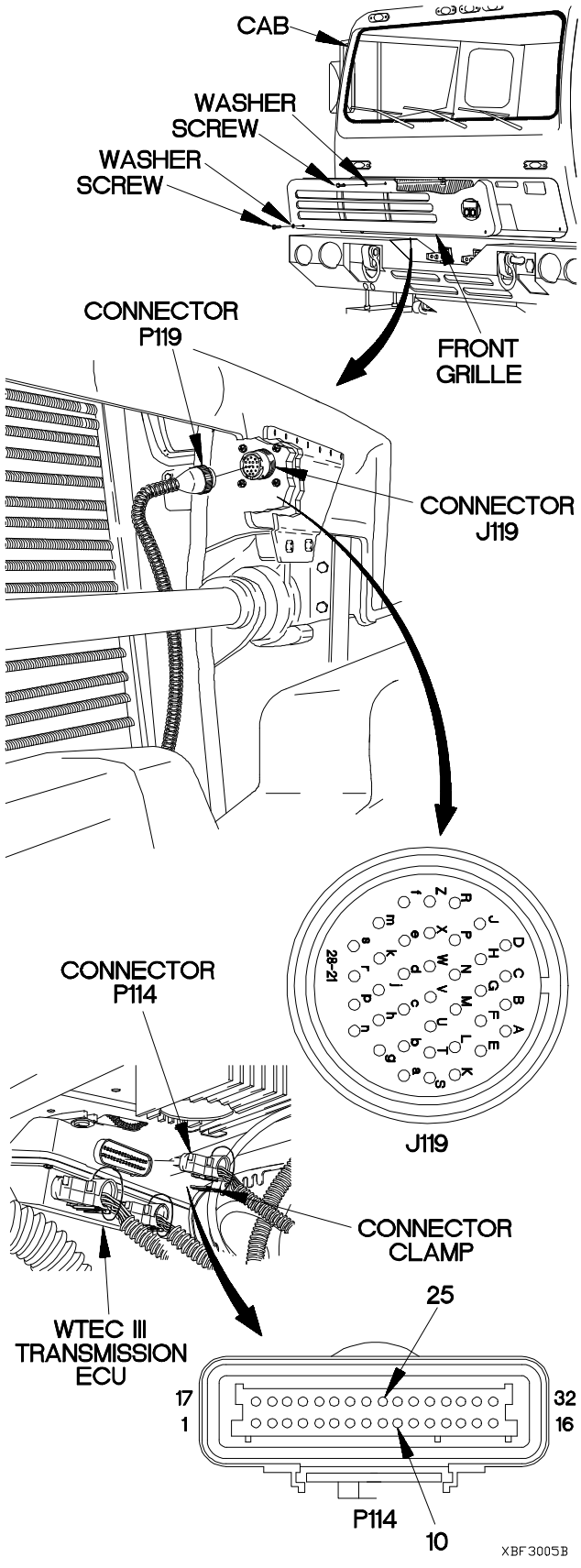


f30. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 21 AND ANY SUB CODE (CONT)



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 7-87).
(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

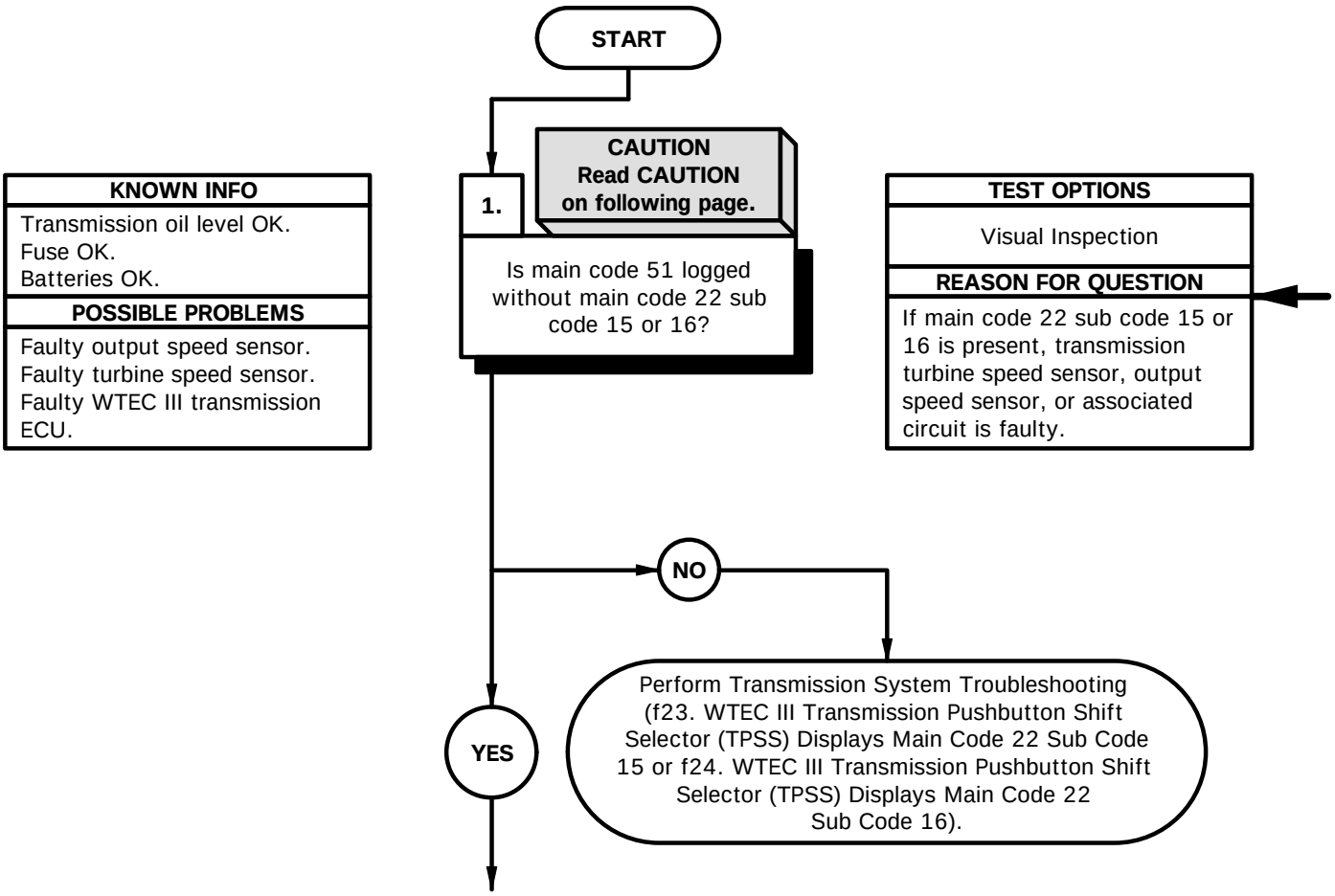
Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Pan, Drain (Item 24, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Wrench Set, Socket (Item 49, 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 25.1, Appendix D)

Personnel Required
(2)

Reference
TM 9-4910-571-12&P

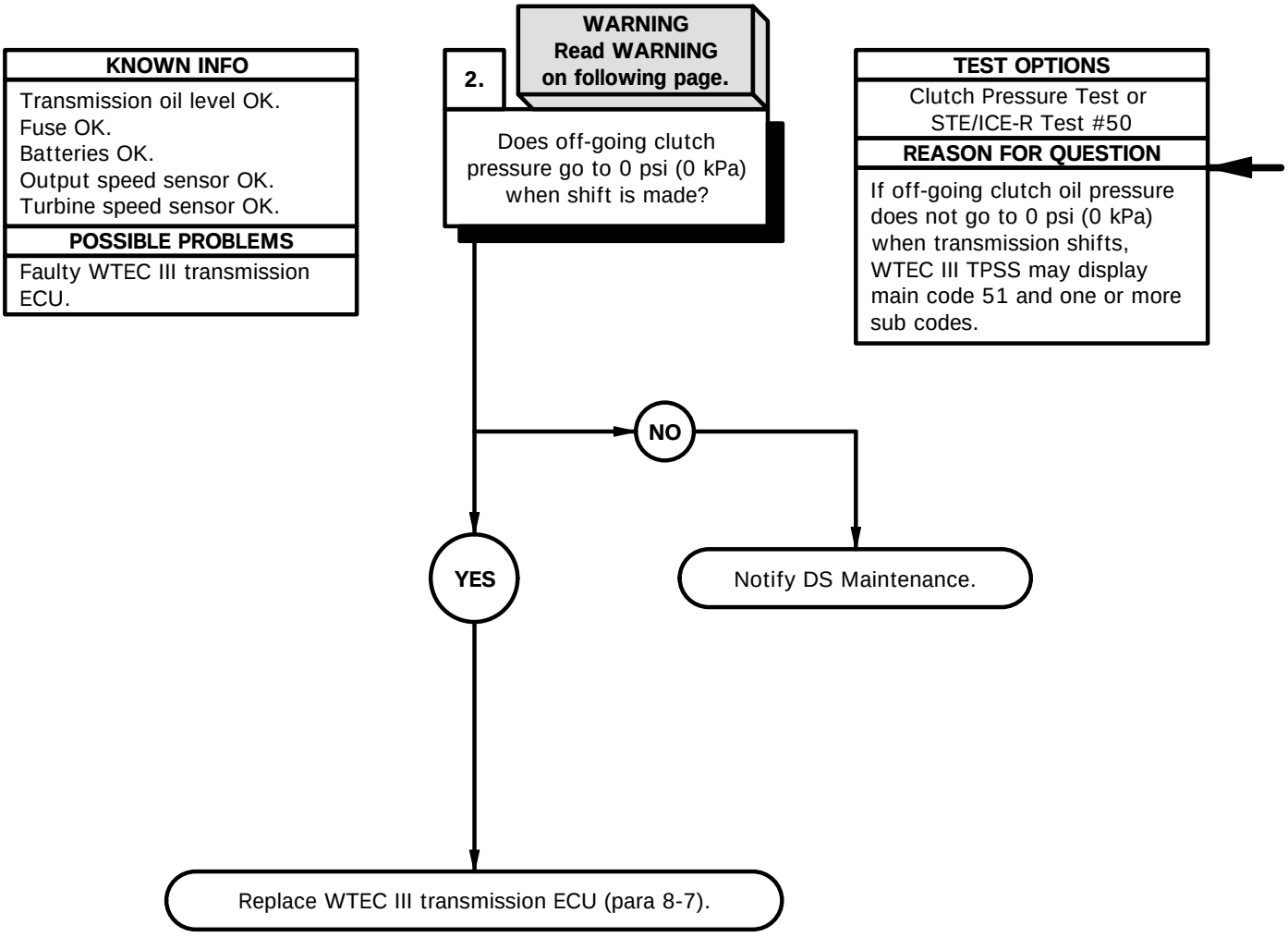


CAUTION

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 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 rear 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 2-38. 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 9-2320-365-10) 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. 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 9-2320-365-10).
(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 rear propeller shaft (para 9-2).
(15) Clear diagnostic codes (para 8-5).

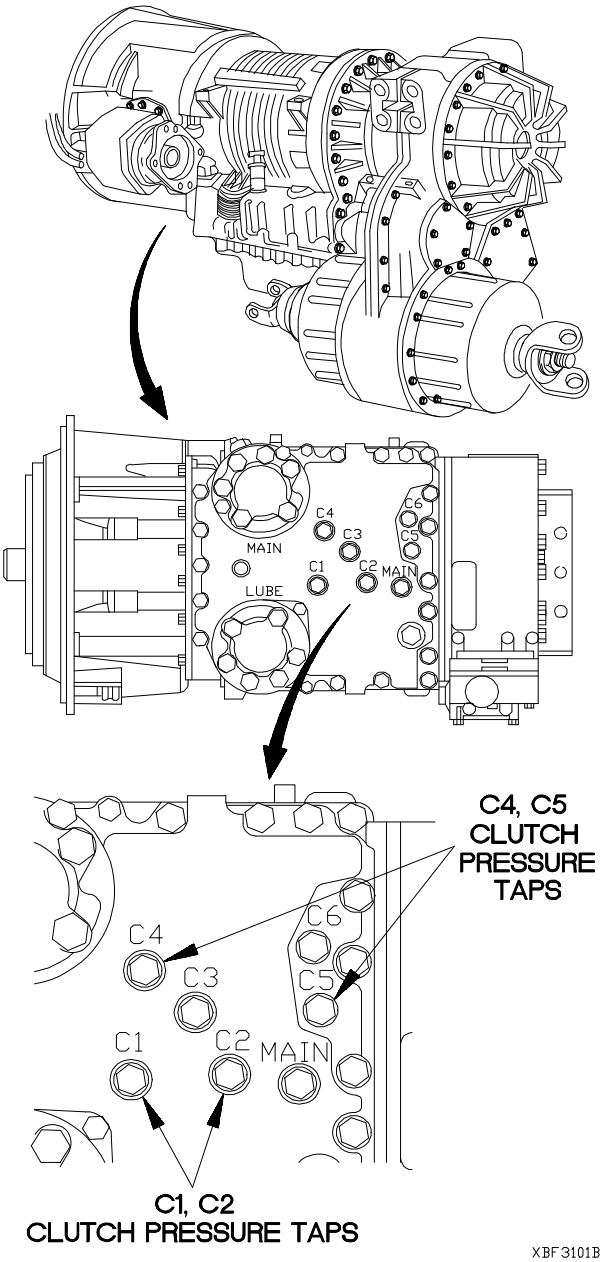


Table 2-38. Off-Going Clutch Pressure Tap

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

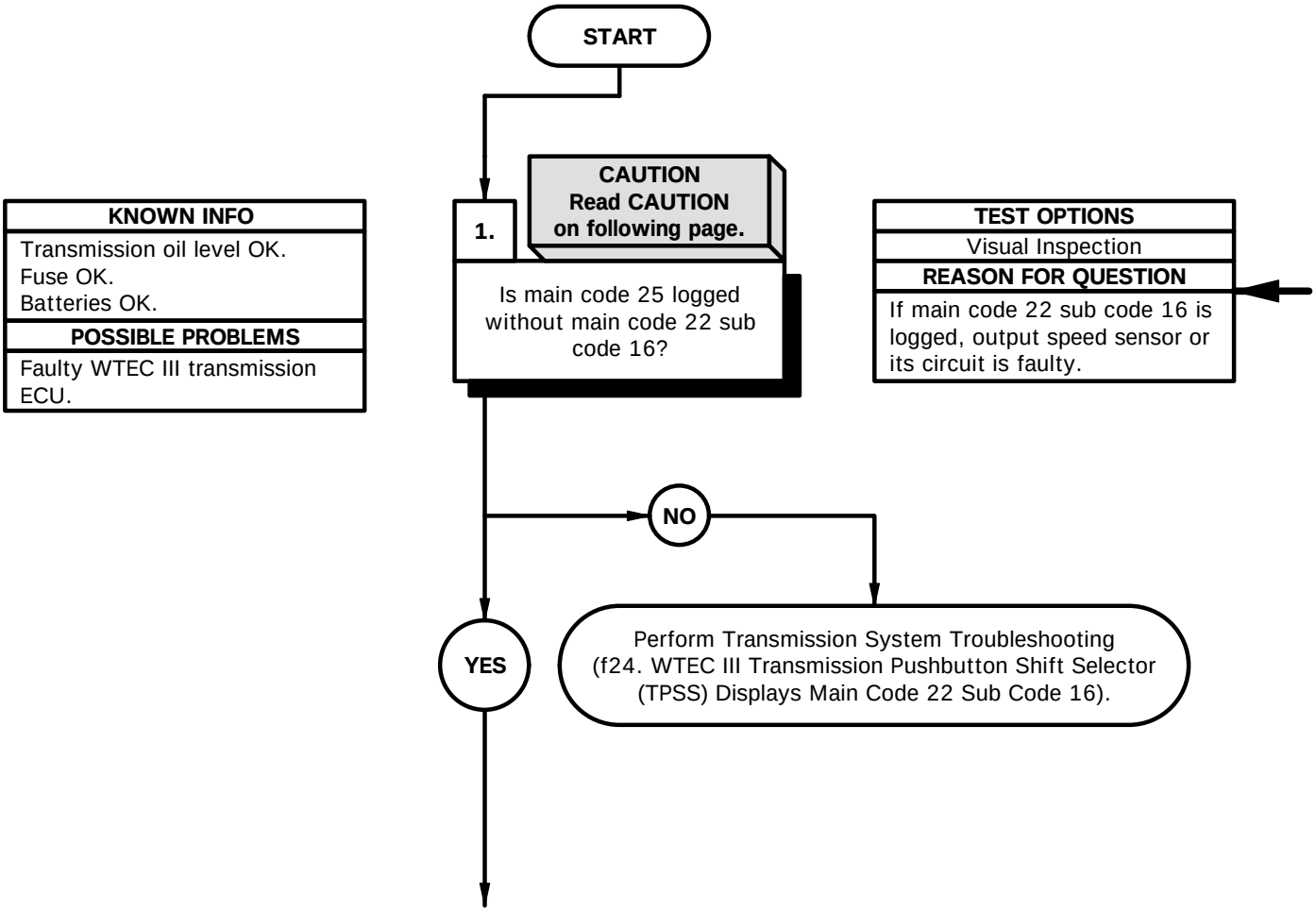
Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Pan, Drain (Item 24, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Wrench Set, Socket (Item 49, 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 25.1, Appendix D)

Personnel Required
(2)

Reference
TM 9-4910-571-12&P

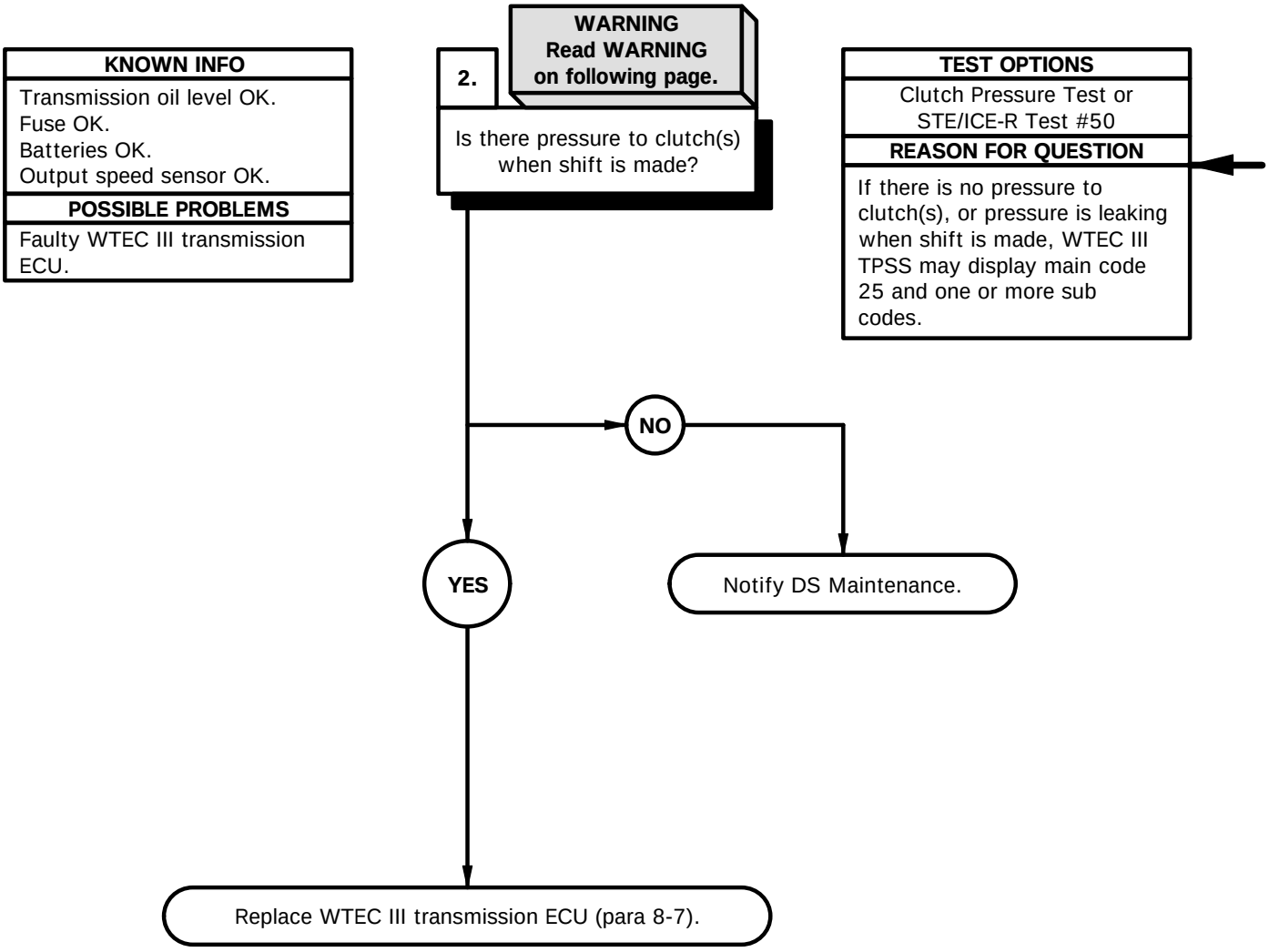


CAUTION

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 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 rear 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 2-39. 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 9-2320-365-10).
(7) With brake applied, make shift indicated by sub code. Refer to Table 2-39. Clutch Pressure Tap.
(8) Accelerate engine until WTEC III TPSS displays desired range. Refer to Table 2-39. 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 9-2320-365-10).
(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 under pressure tap.
(17) Install front and rear 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).

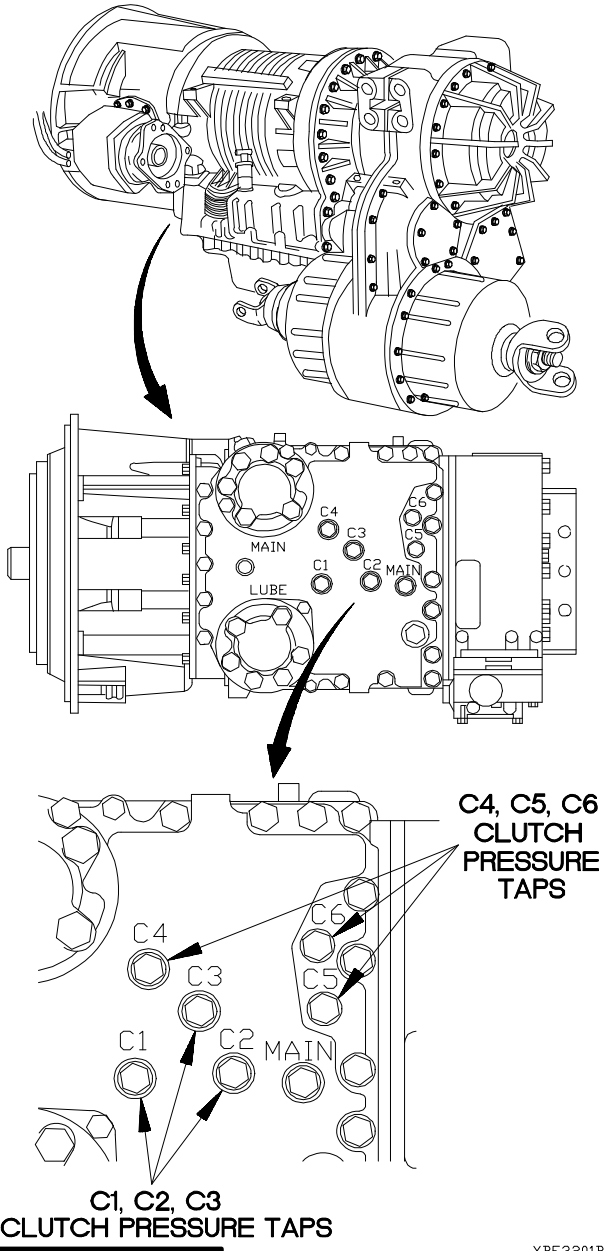


Table 2-39. Clutch Pressure Tap

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

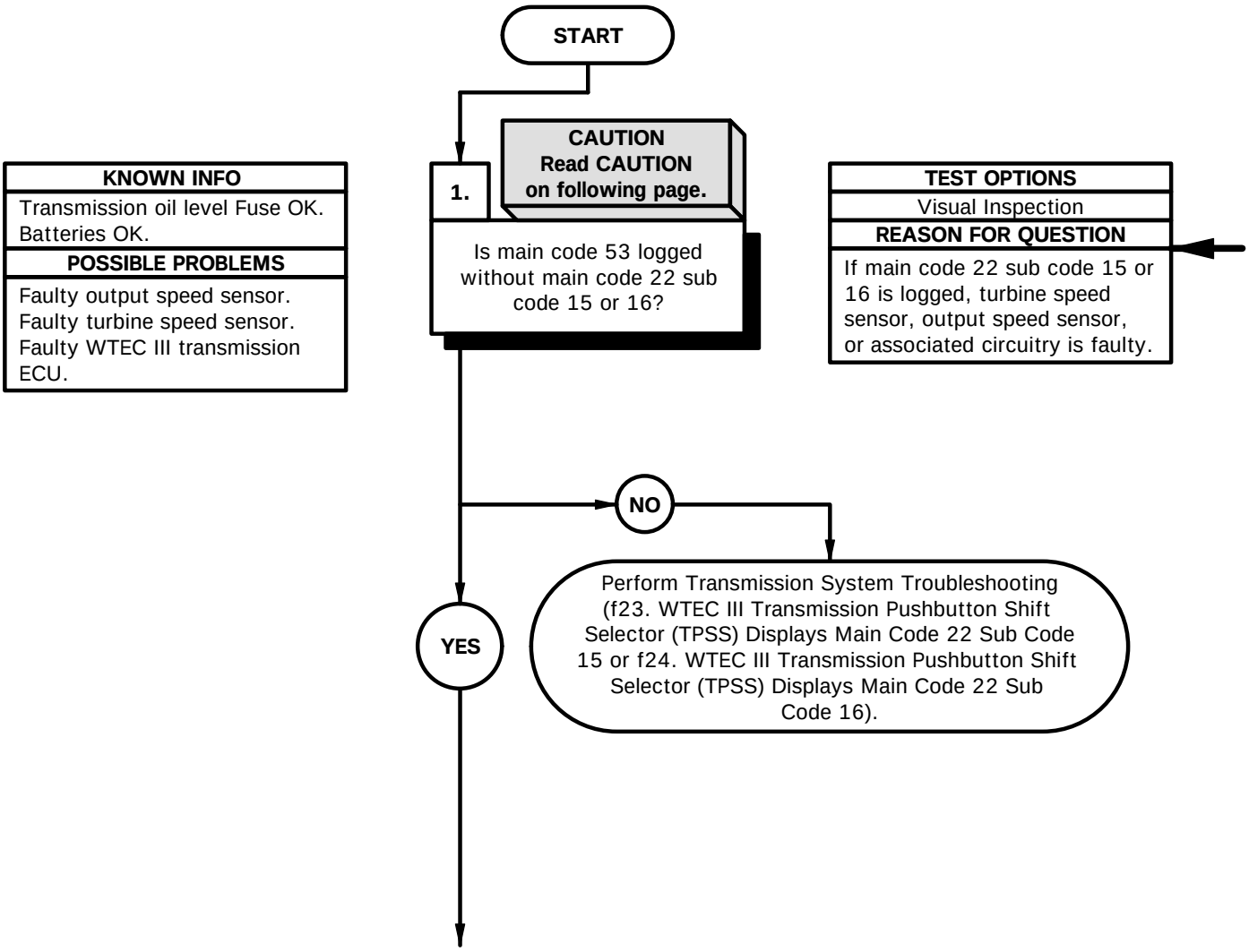
Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Pan, Drain (Item 24, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Wrench Set, Socket (Item 49, Appendix C0

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 25.1, Appendix D)

Personnel Required
(2)

Reference
TM 9-4910-571-12&P

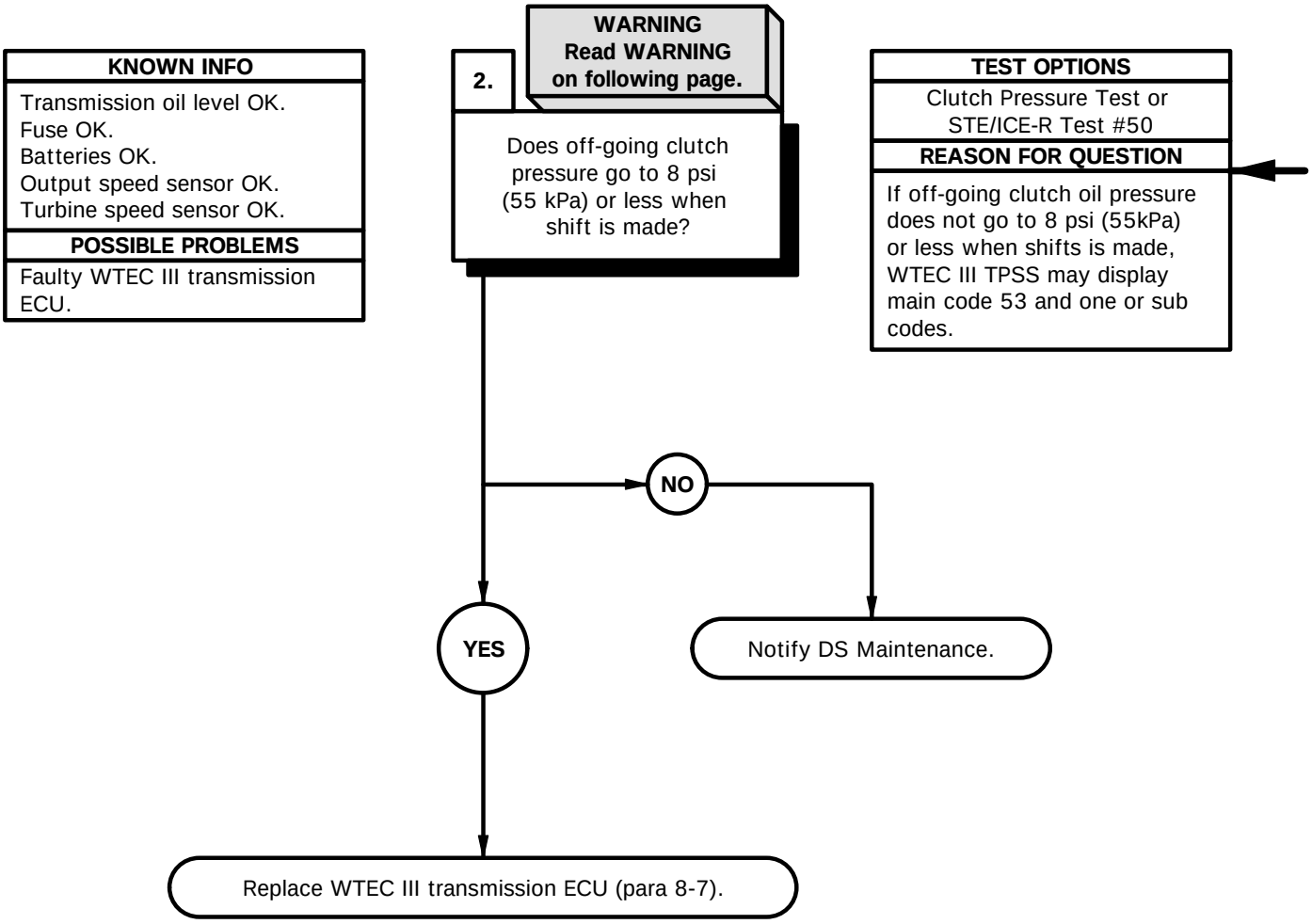


CAUTION

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 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)

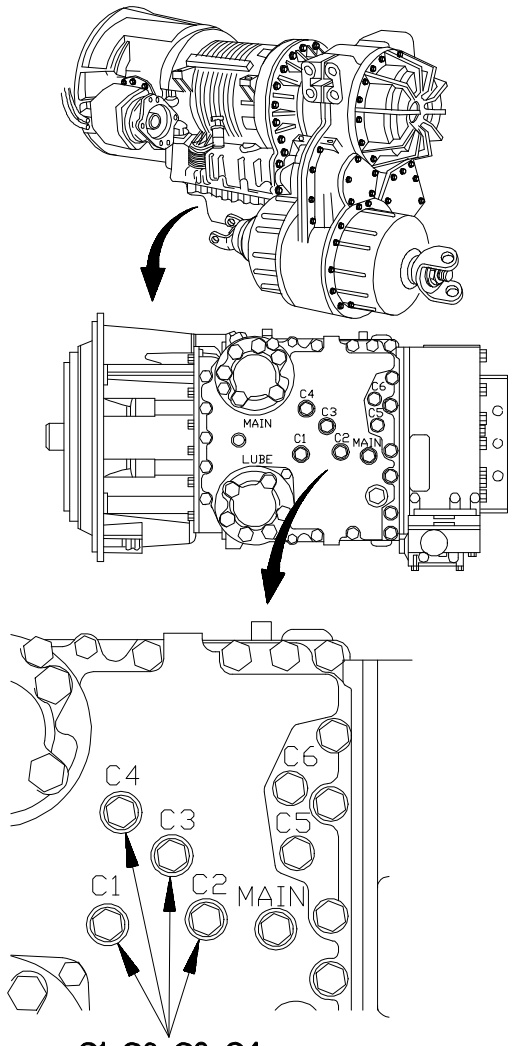


WARNING

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 rear 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 9-2320-365-10) 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 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 9-2320-365-10).
(11) Remove pipe to tube adapter, hose, and tube to boss adapter from 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 rear propeller shafts (para 9-2).
(16) Clear diagnostic codes (para 8-5).



C1, C2, C3, C4
CLUTCH PRESSURE TAPS

Xlof3301b

Table 2-40. 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	C3
78	R-N1 Shift	C2
99	N3-N2 or N2-N3 Shift	C2 & C4

f34. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 54 AND ANY SUB CODE

INITIAL SETUP

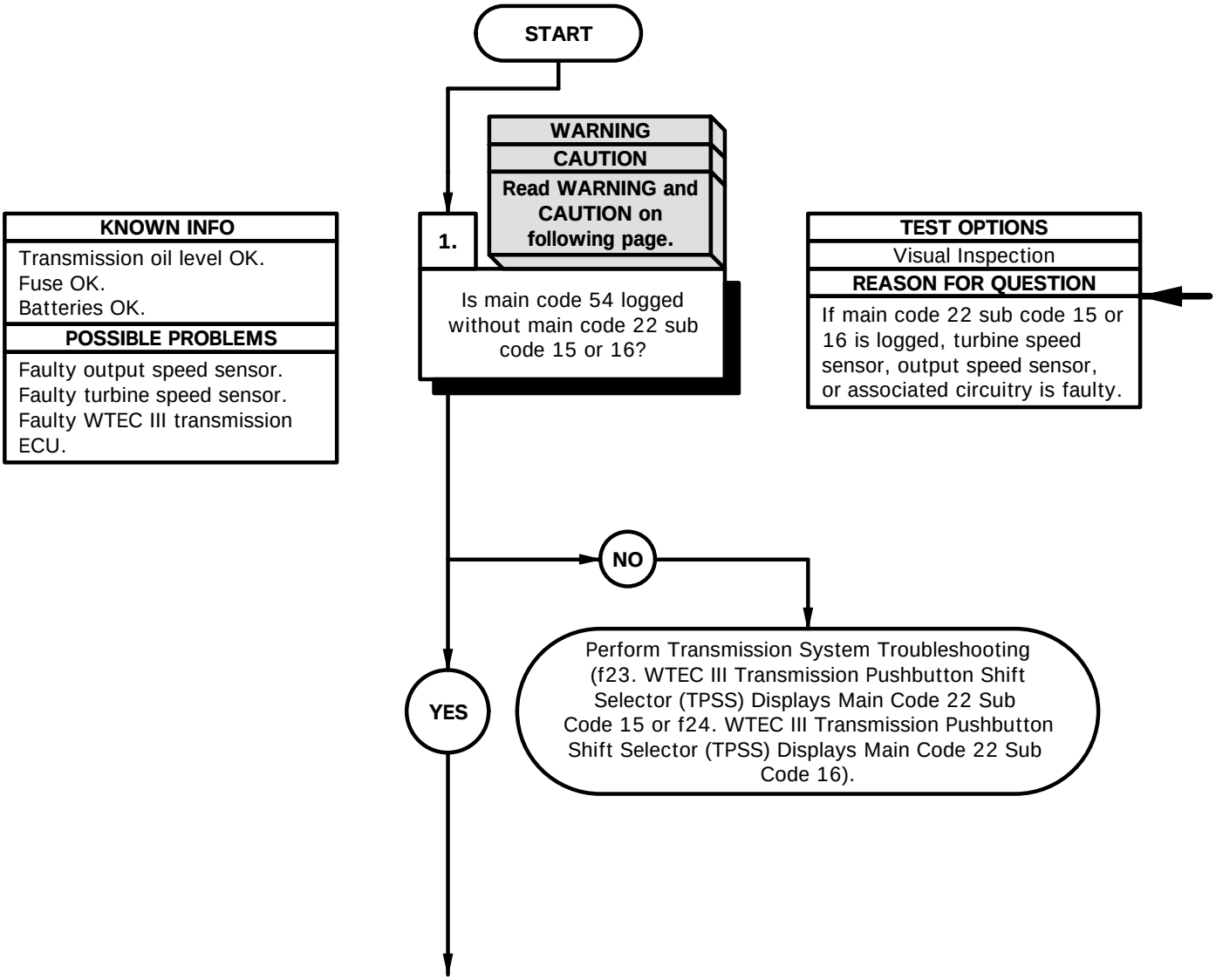
Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Pan, Drain (Item 24, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Wrench Set, Socket (Item 49, 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 25.1, Appendix D)

Personnel Required
(2)

Reference
TM 9-4910-571-12&P



WARNING

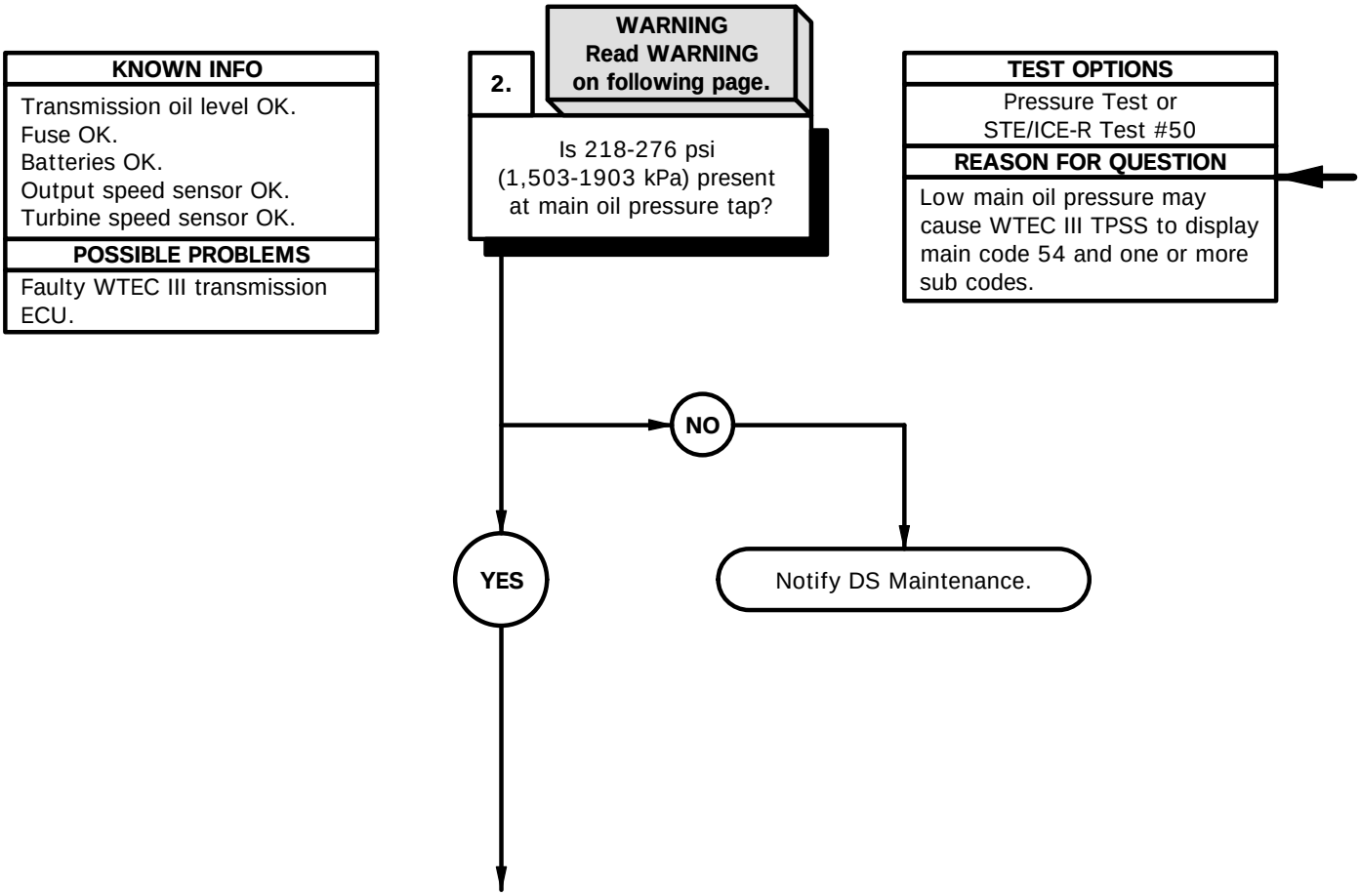
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

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.

(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)

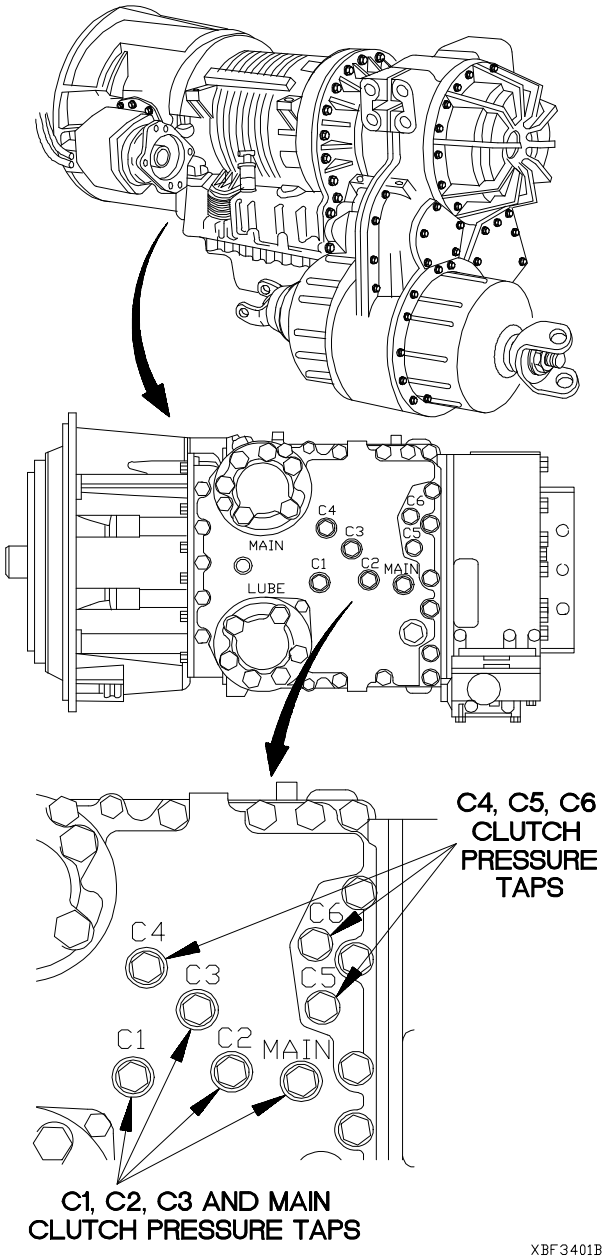


WARNING

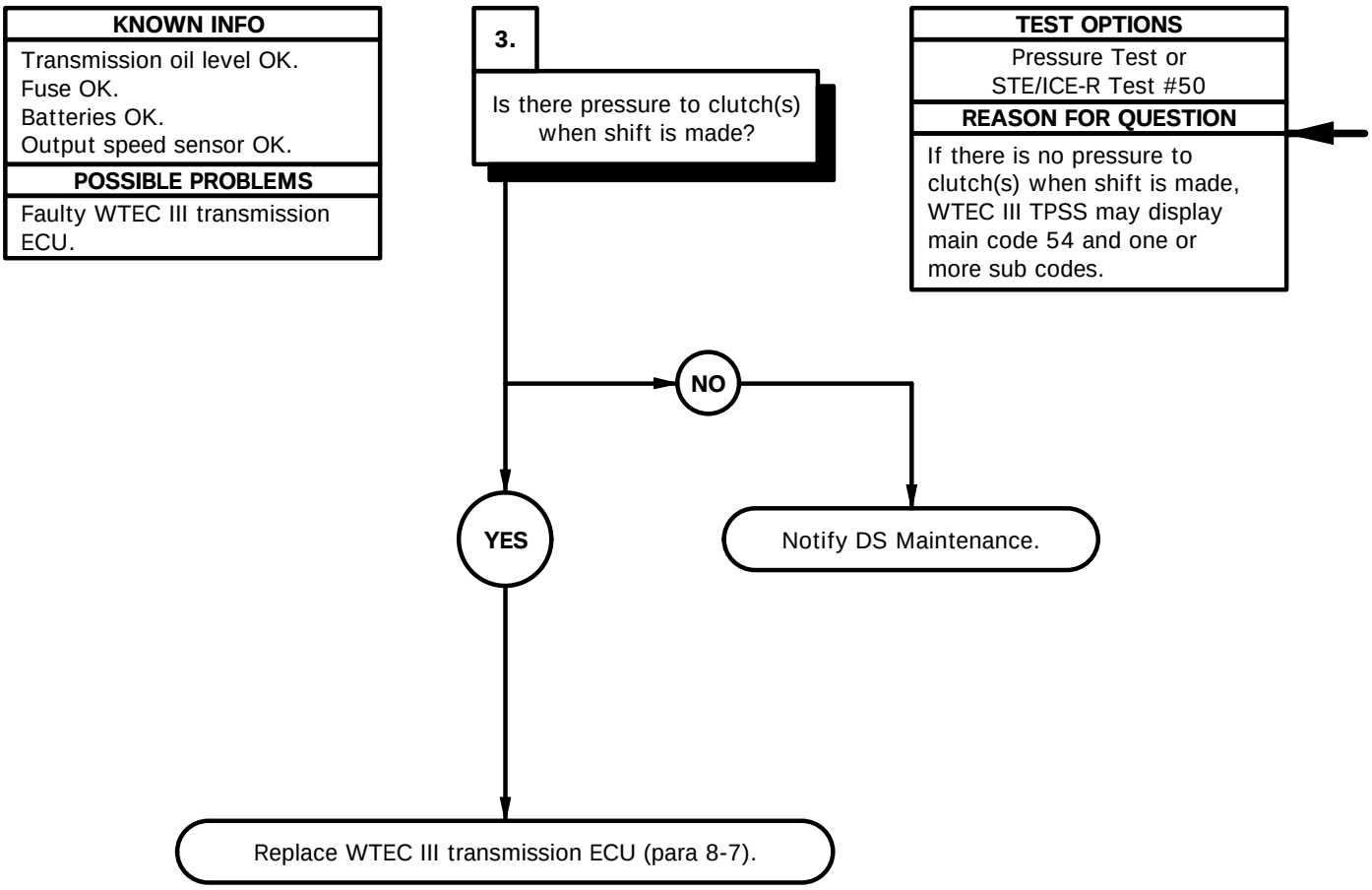
Wear approved eye protection when performing transmission pressure checks. If oil contacts eyes, seek medical attention immediately. Failure to comply may result in injury to personnel.

PRESSURE TEST

(1) Place drain pan under transmission 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 9-2320-365-10) 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 9-2320-365-10).
(8) If main oil pressure is low, notify DS Maintenance.
(9) Remove pipe to tube adapter, hose, and tube to boss 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)



PRESSURE TEST

(1) Remove front and rear 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.
(4) Connect tube to boss adapter, hose, and pipe to tube adapter to clutch pressure tap.
(5) Start engine (TM 9-2320-365-10).
(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 2-41. Clutch Pressure Tap.
(8) Accelerate engine until WTEC III TPSS displays denied range. Refer to Table 2-41. 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 9-2320-365-10).
(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 transmission front and rear output propeller shafts (para 9-2).
(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
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)

f35. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 55 AND ANY SUB CODE

INITIAL SETUP

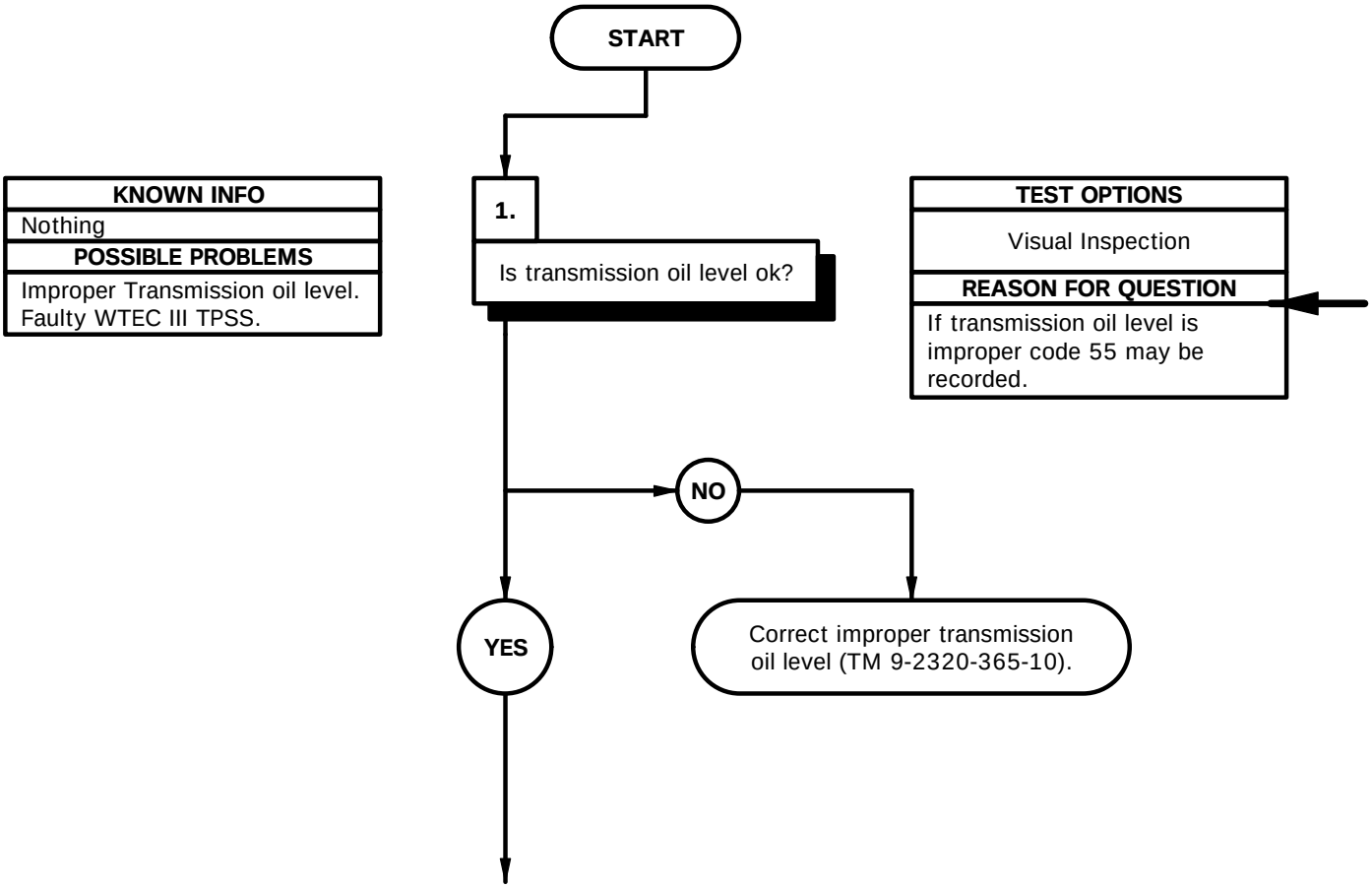
Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Pan, Drain (Item 24, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Wrench Set, Socket (Item 49, Appendix C)

Materials/Parts
Packing, Preformed (Item 199, Appendix G)
Adapter, Straight, Tube to Boss (Item 1.3, Appendix D)
Hose Assembly, Nonmetallic (Item 25.1, Appendix D)
Adapter, Straight, Pipe to Tube (Item 1.2, Appendix D)

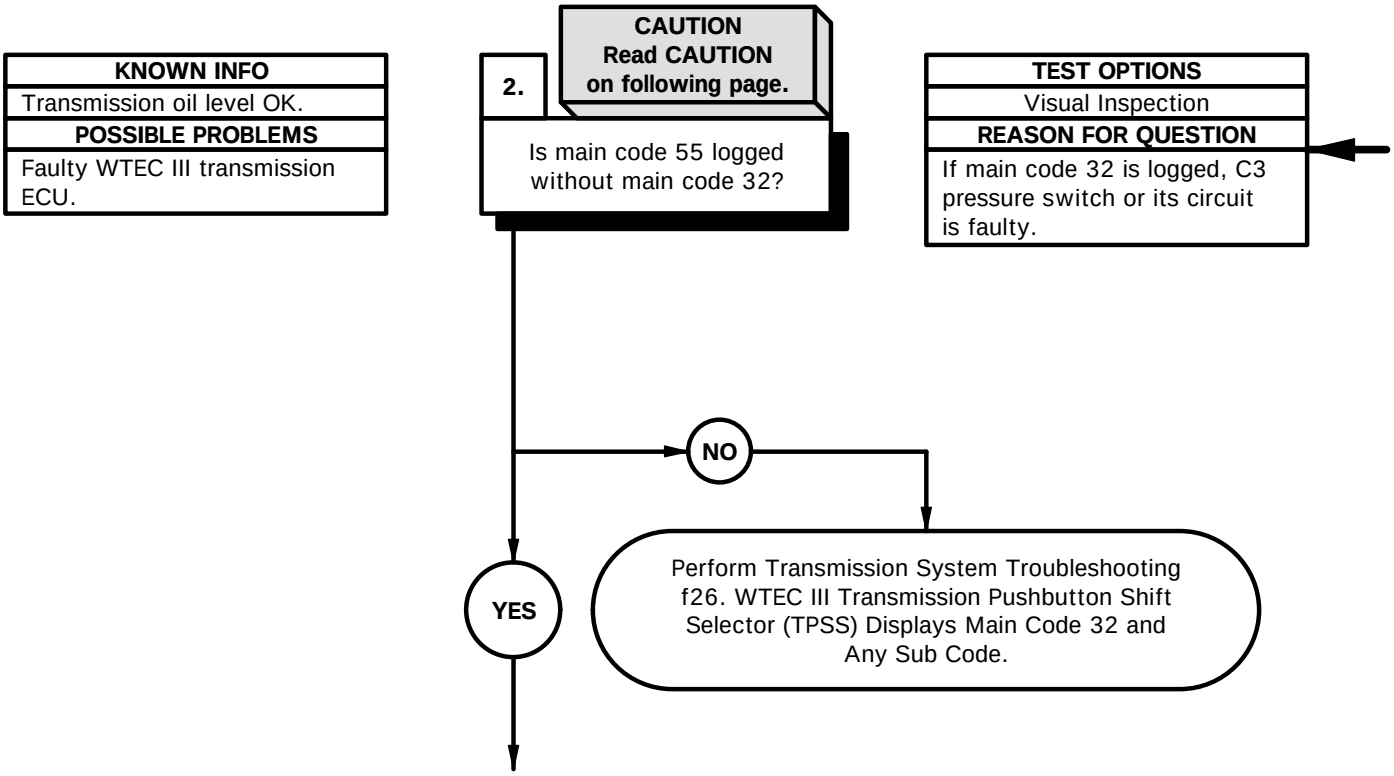
Personnel Required
(2)

Reference
TM 9-4910-571-12&P



(1) Check transmission oil level (TM 9-2320-365-10).
(2) If transmission oil level is improper, correct as required (TM 9-2320-365-10).

f35. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 55 AND ANY SUB CODE (CONT)

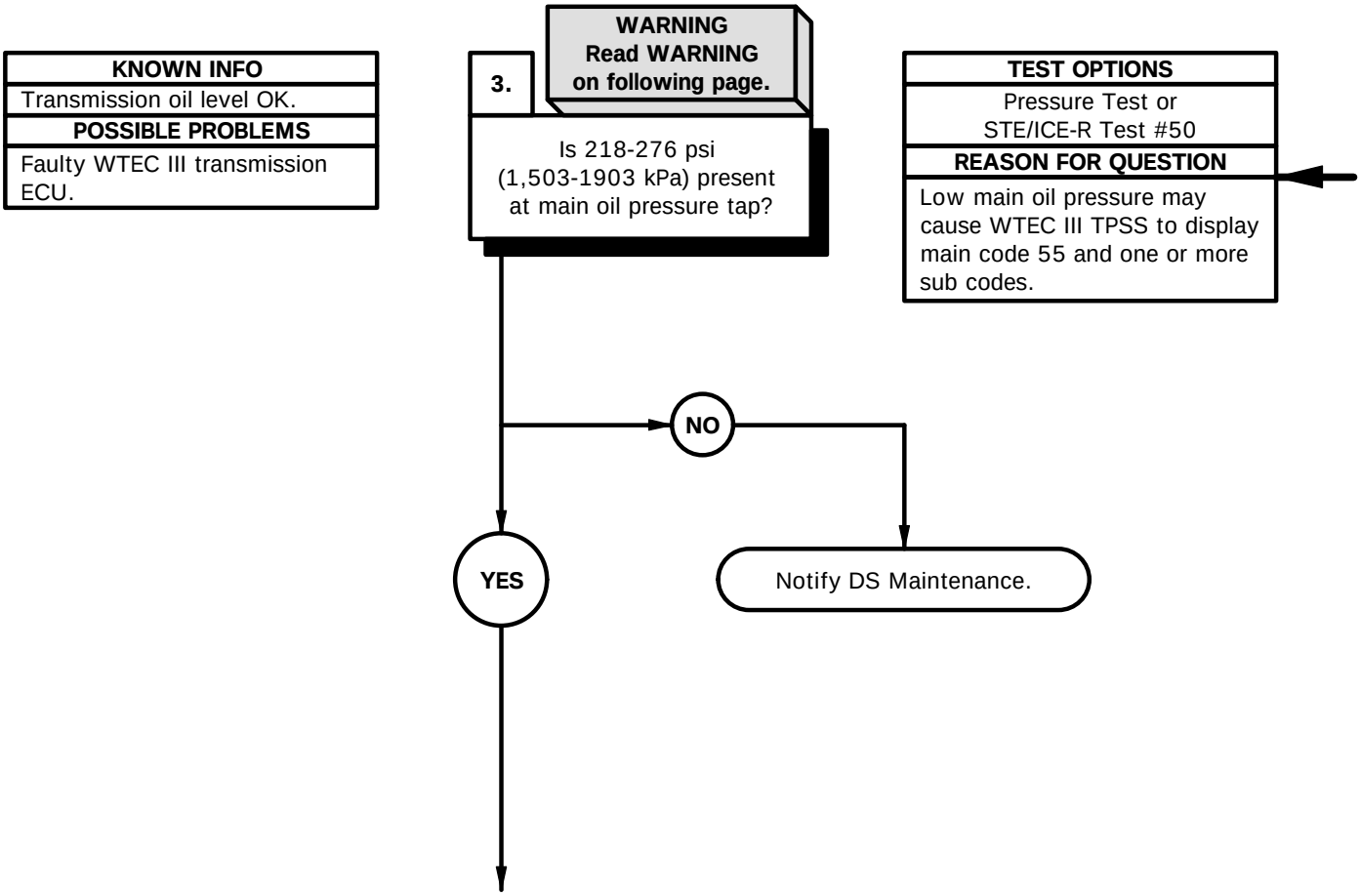


CAUTION

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)

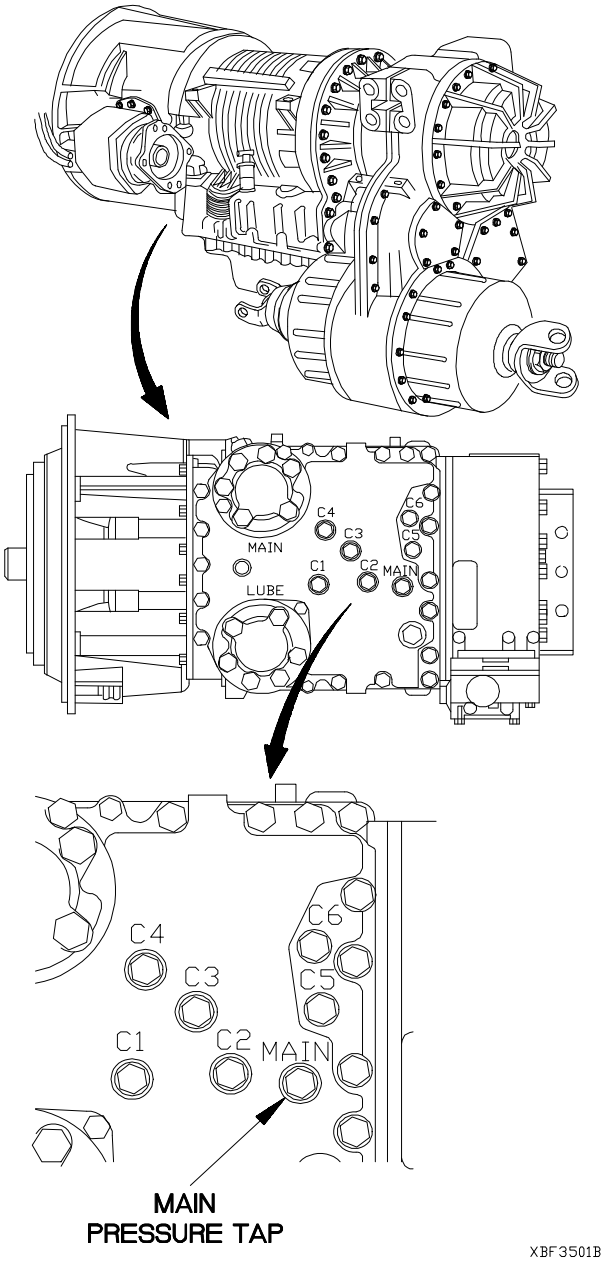


WARNING

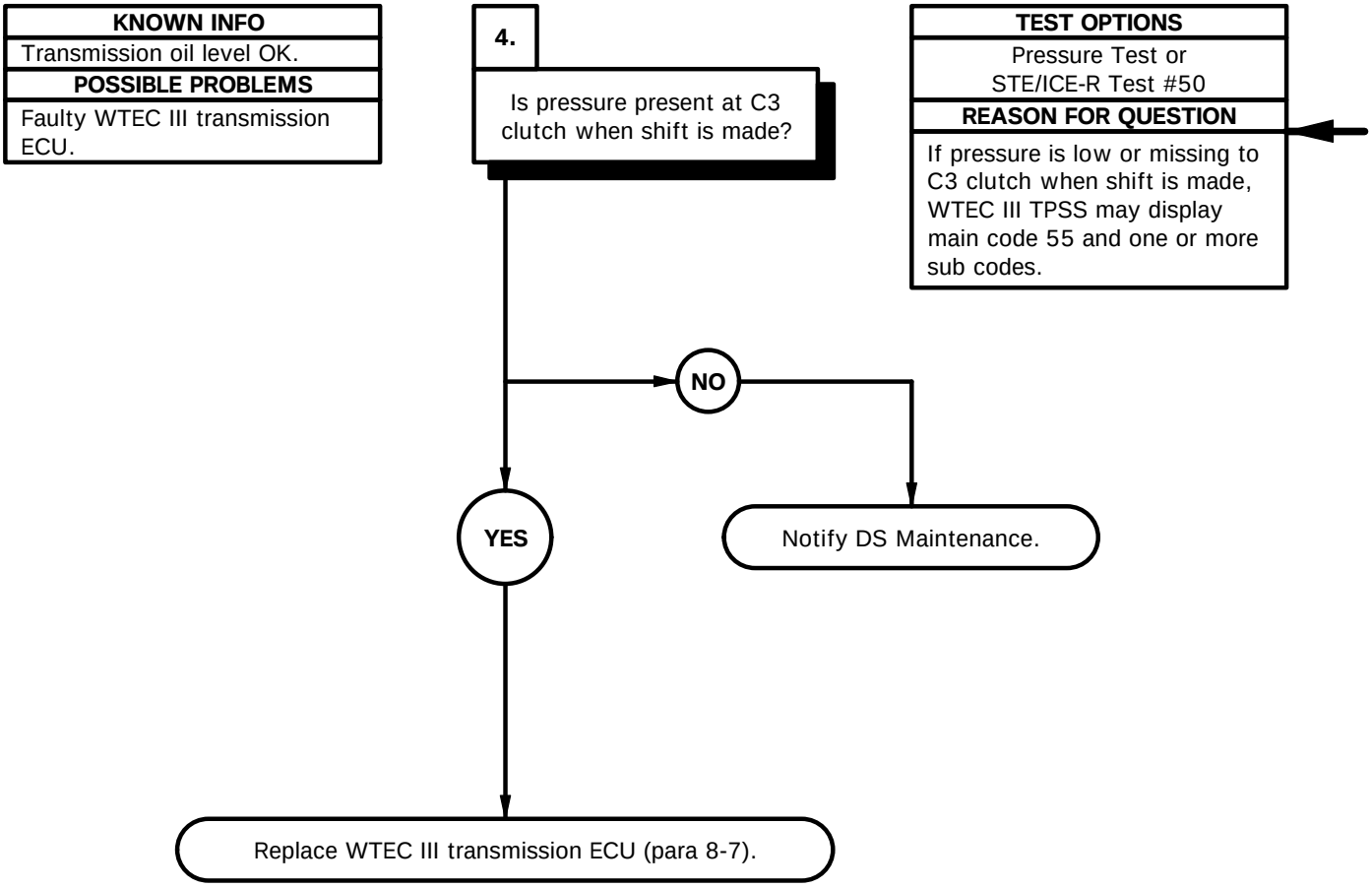
Wear approved eye protection when performing transmission pressure checks. If oil contacts eyes, seek medical attention immediately. Failure to comply may result in injury to personnel.

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 9-2320-365-10) 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 9-2320-365-10).
(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)

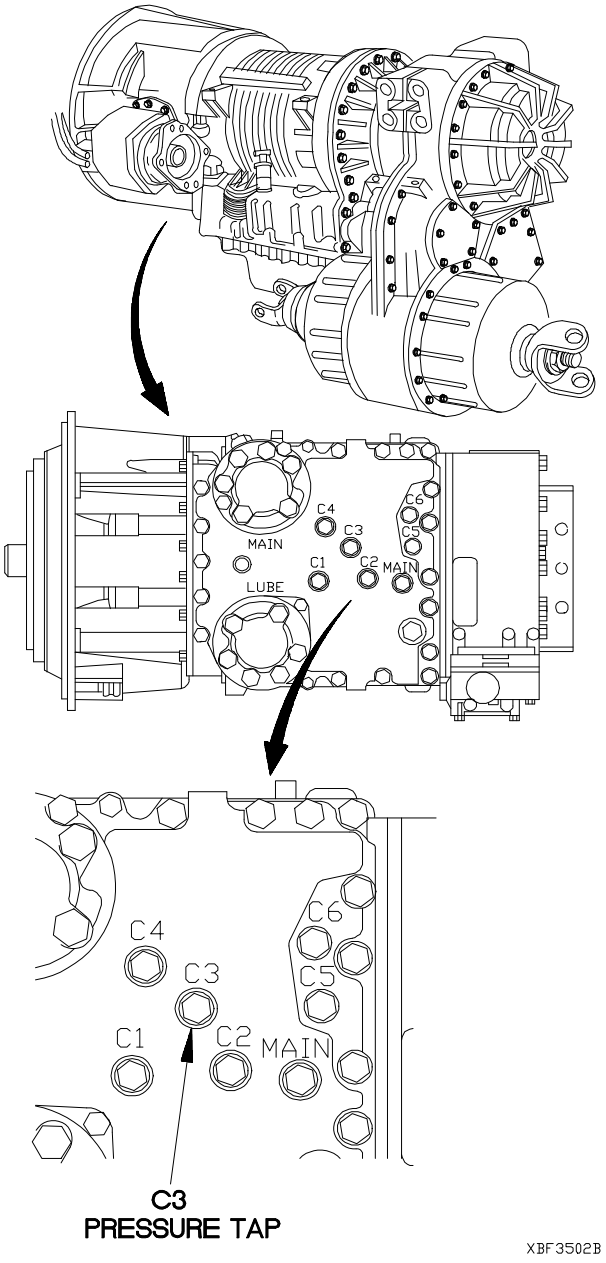


PRESSURE TEST

(1) Remove front and rear 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 9-2320-365-10) 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 9-2320-365-10).
(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 rear propeller shafts (para 9-2).
(16) Clear diagnostic codes (para 8-5).

Table 2-42. 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

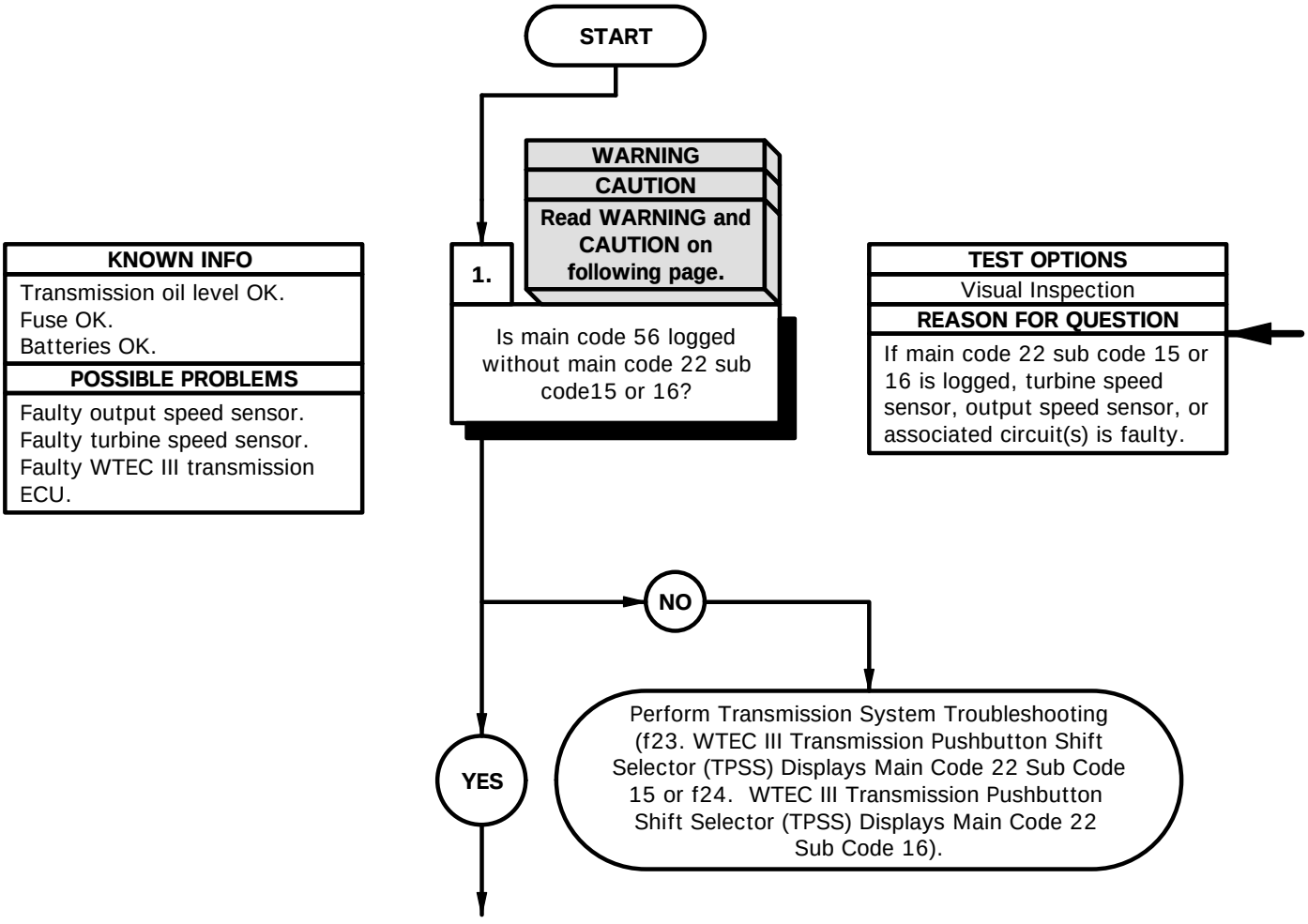
Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Pan, Drain (Item 24, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Wrench Set, Socket (Item 49, 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 25.1, Appendix D)

Personnel Required
(2)

Reference
TM 9-4910-571-12&P



WARNING

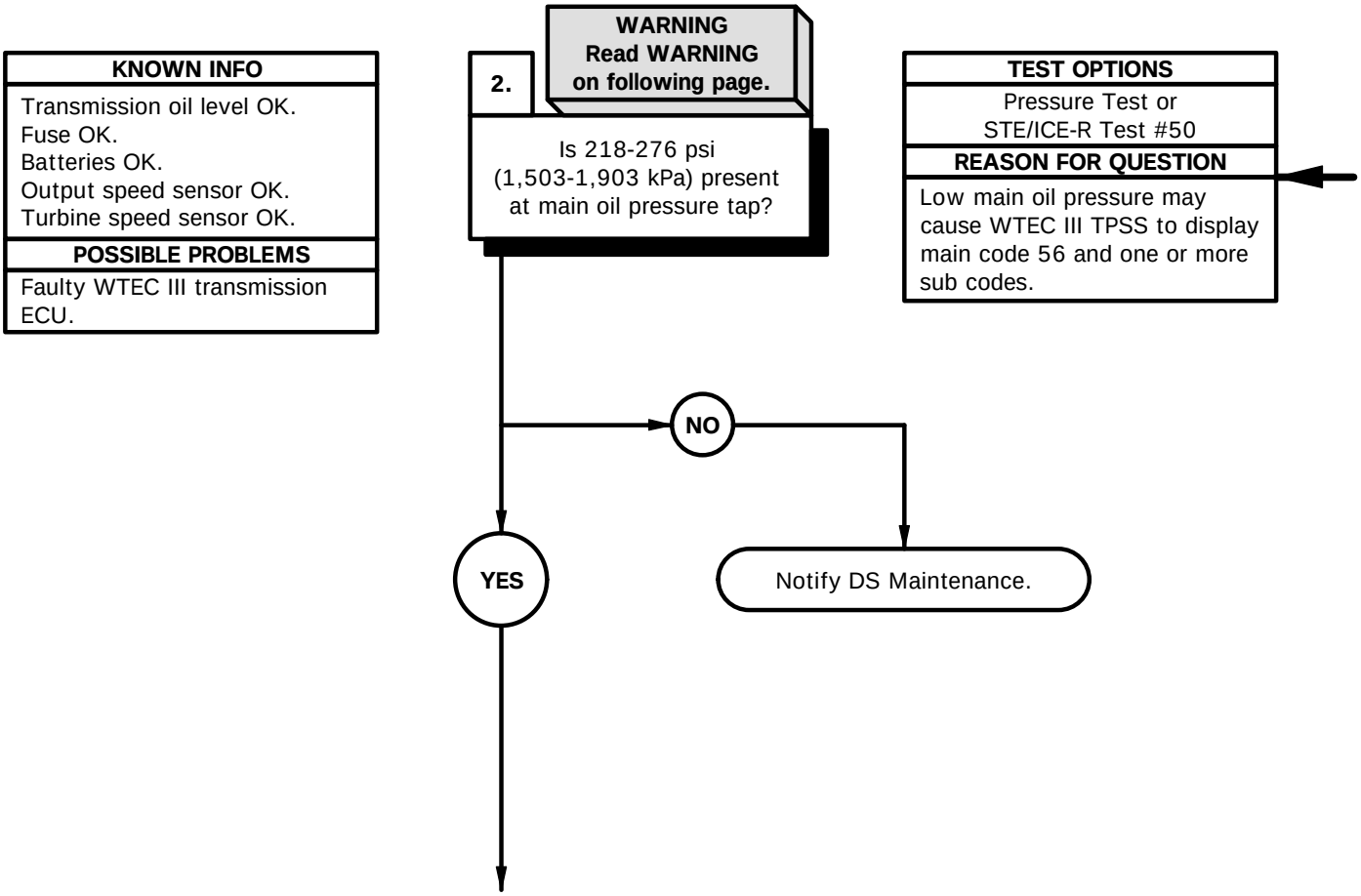
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

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.

(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)

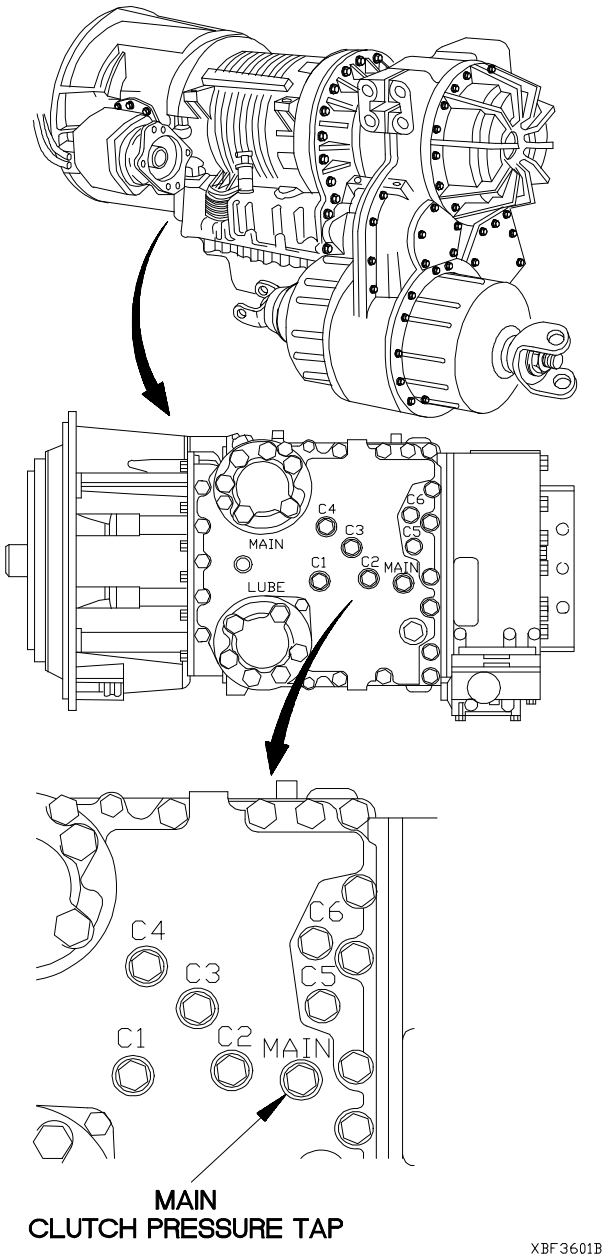


WARNING

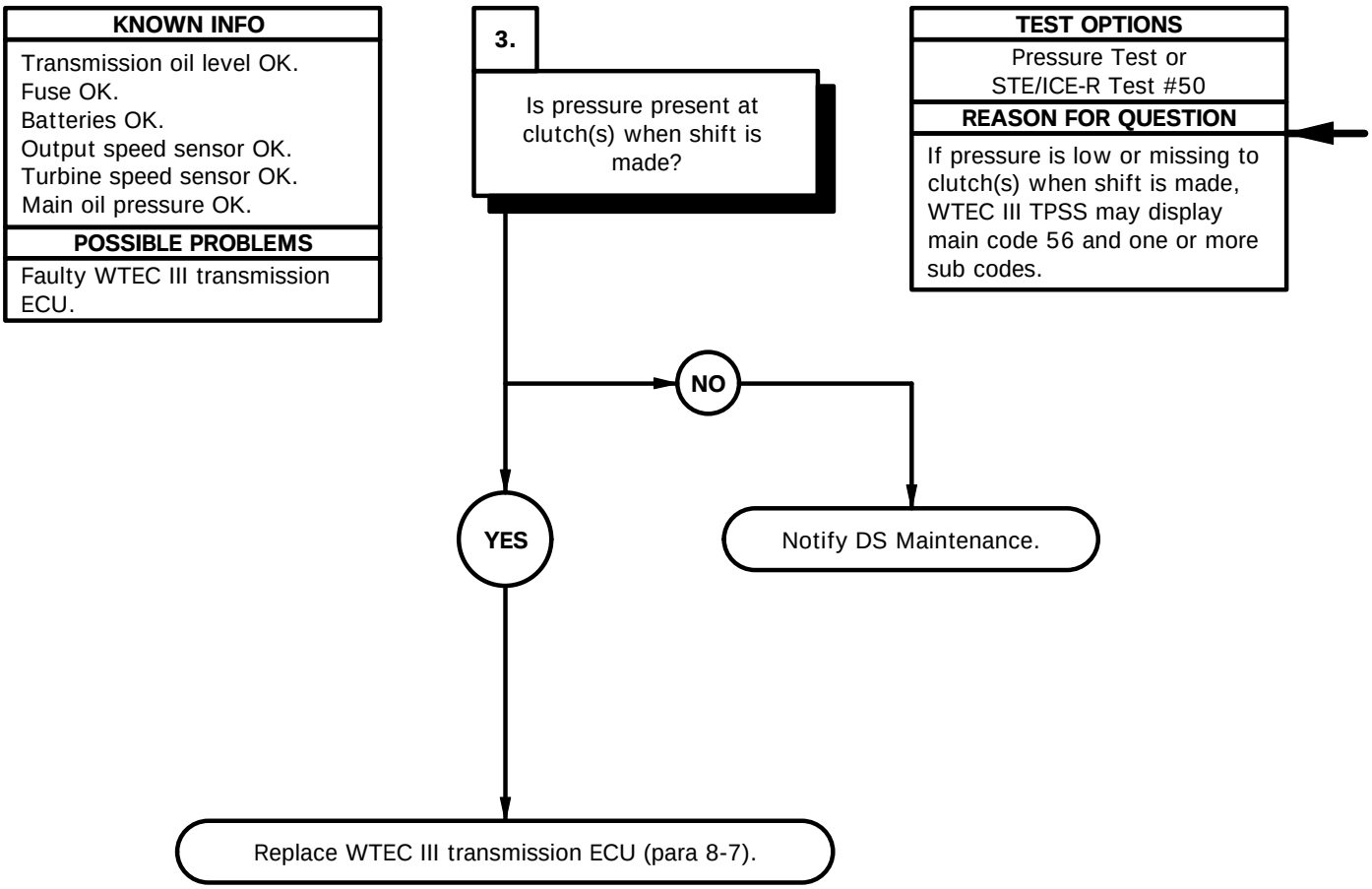
Wear approved eye protection when performing transmission pressure checks. If oil contacts eyes, seek medical attention immediately. Failure to comply may result in injury to personnel.

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 on main pressure tap.
(4) Perform STE/ICE-R test #50 (TM 9-4910-571-12&P).
(5) Start engine (TM 9-2320-365-10) 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 9-2320-365-10).
(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 rear 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) Perform STE/ICE-R test #50 (TM 9-4910-571-12&P).
(6) Start engine (TM 9-2320-365-10).
(7) Make shift indicated by sub code. Refer to Table 2-43. Clutch Pressure Tap.
(8) Accelerate engine until WTEC III TPSS displays desired 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 transmission into neutral (TM 9-2320-365-10).
(12) Shut down engine (TM 9-2320-365-10).
(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 rear propeller shafts (para 9-2).
(20) Clear diagnostic codes (para 8-5).

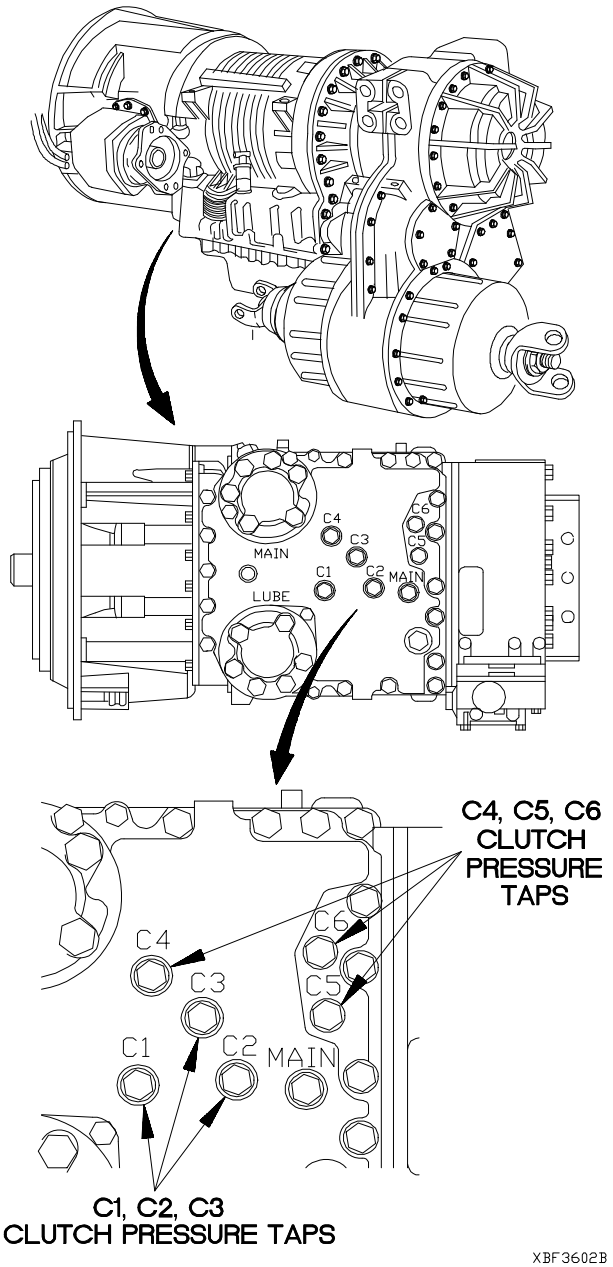


Table 2-43. Clutch Pressure Tap

Sub Code	Sub Code Meaning	Pressure at Clutch(s)	Pressure Readings at Taps
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

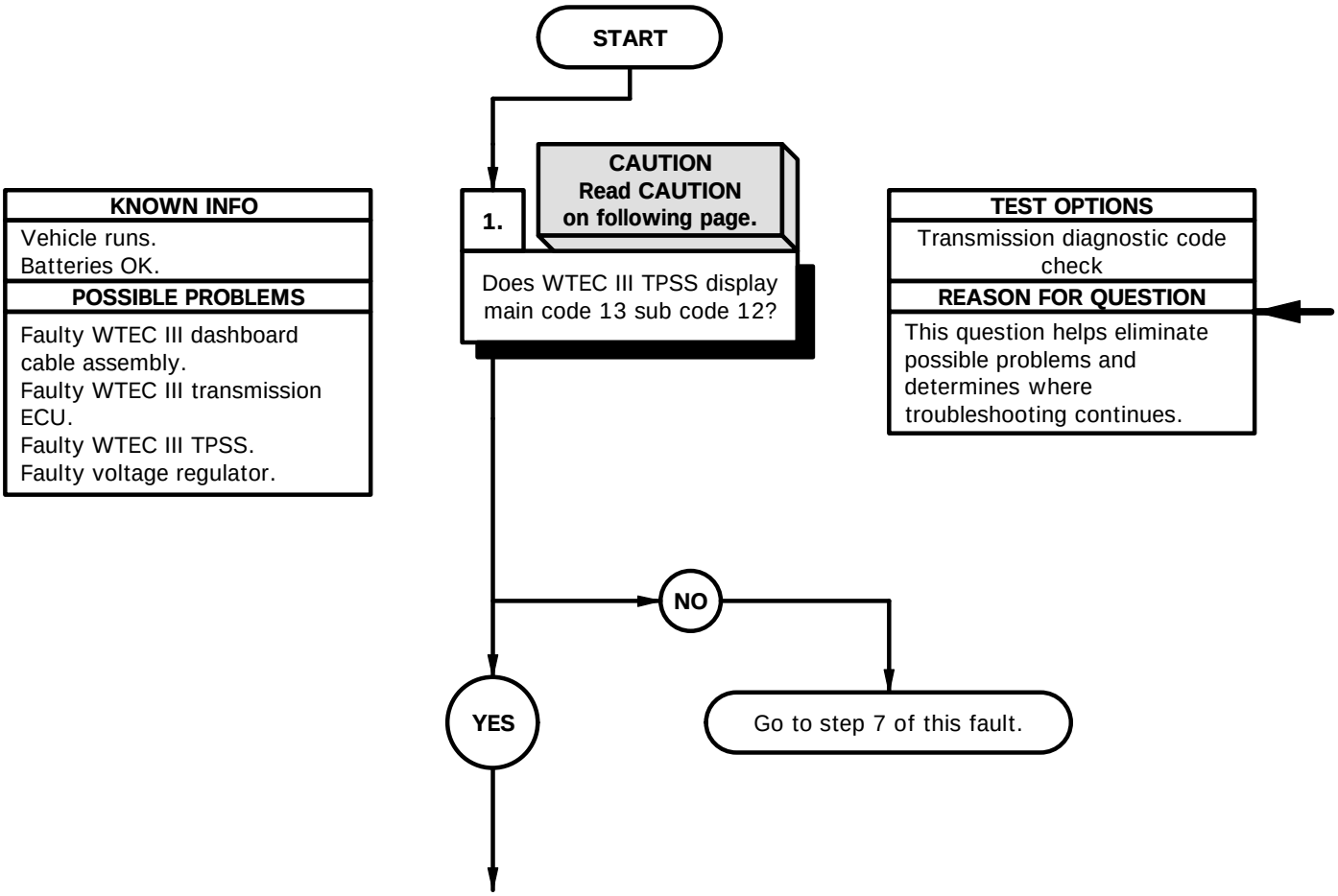
INITIAL SETUP

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

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.

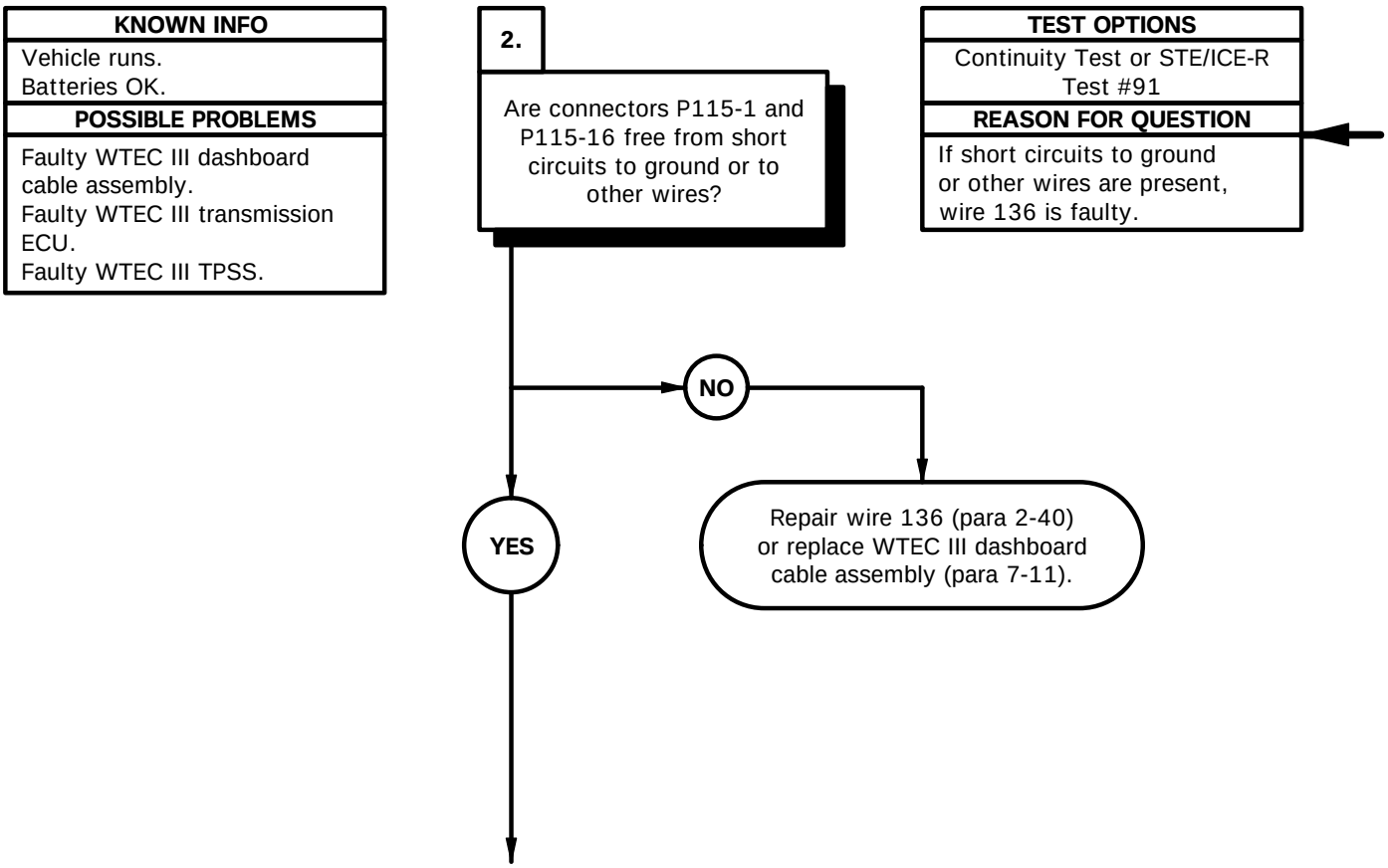
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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.

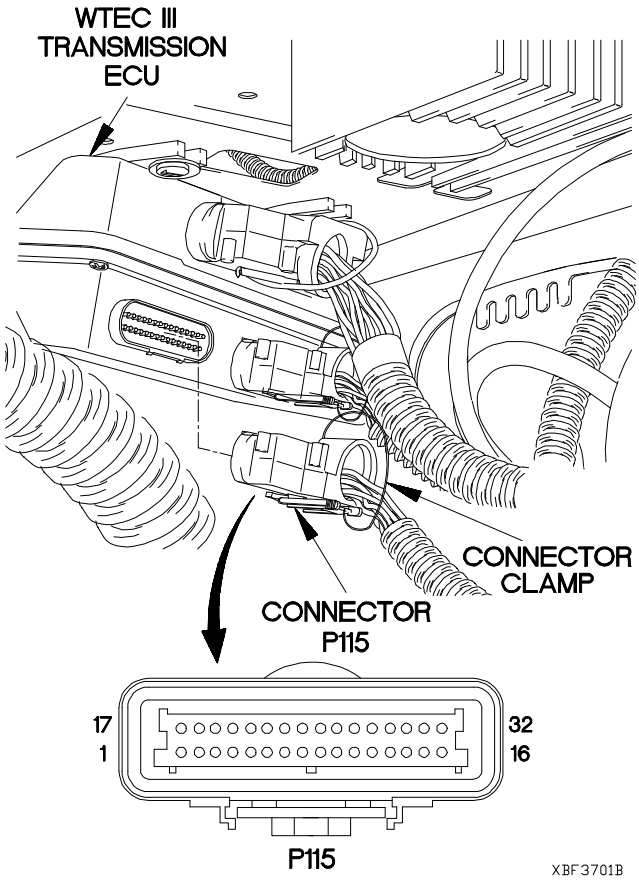
(1) Check to see if main code 13 sub code 12 is active in WTEC III TPSS (para 8-5).
(2) If main code 13 sub code 12 is not active in WTEC III TPSS, go to step 7 of this fault.

f37. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 13 AND ANY SUB CODE (CONT)

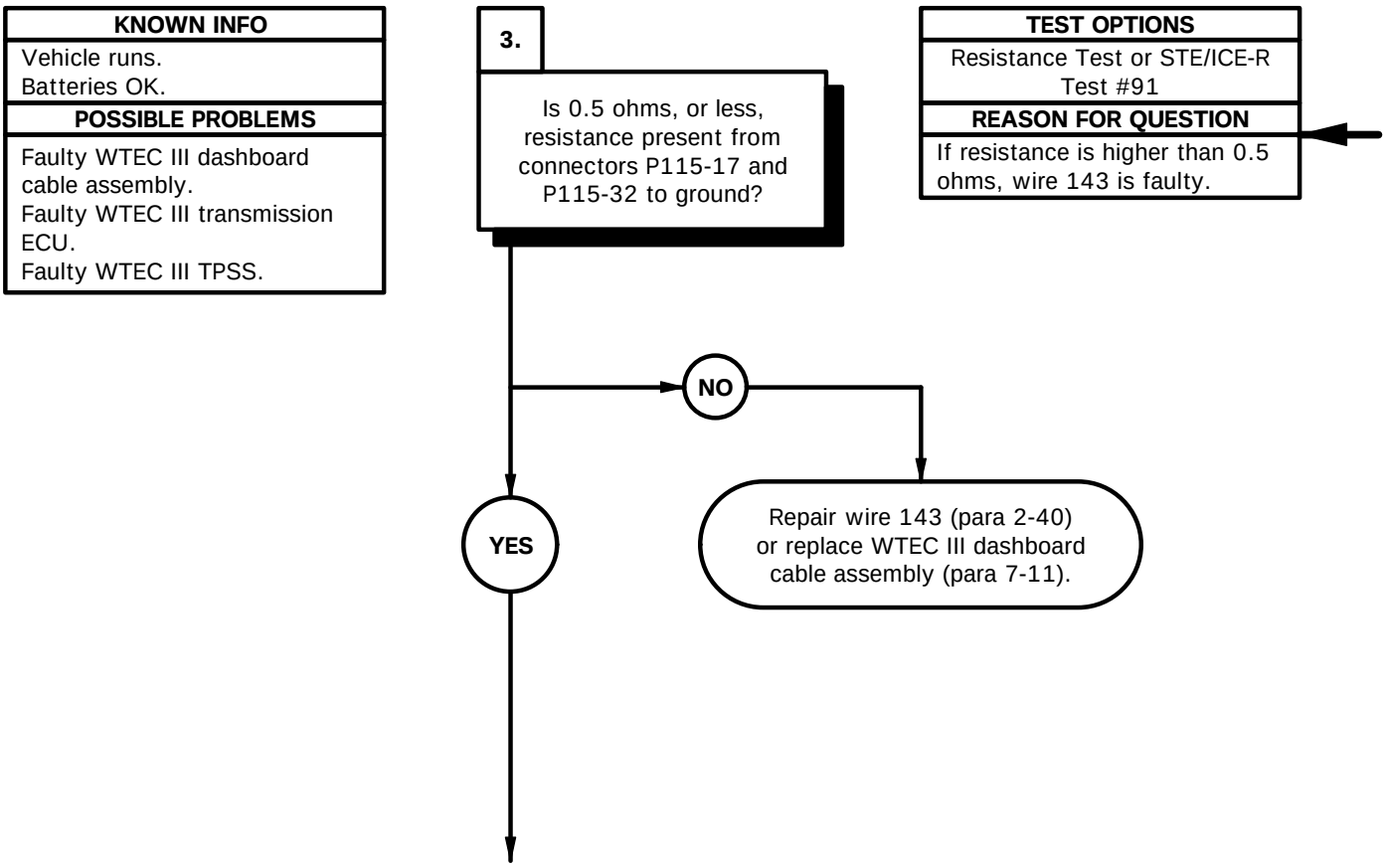


CONTINUITY TEST

(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 2-40) or replace WTEC III dashboard cable assembly (para 7-11).

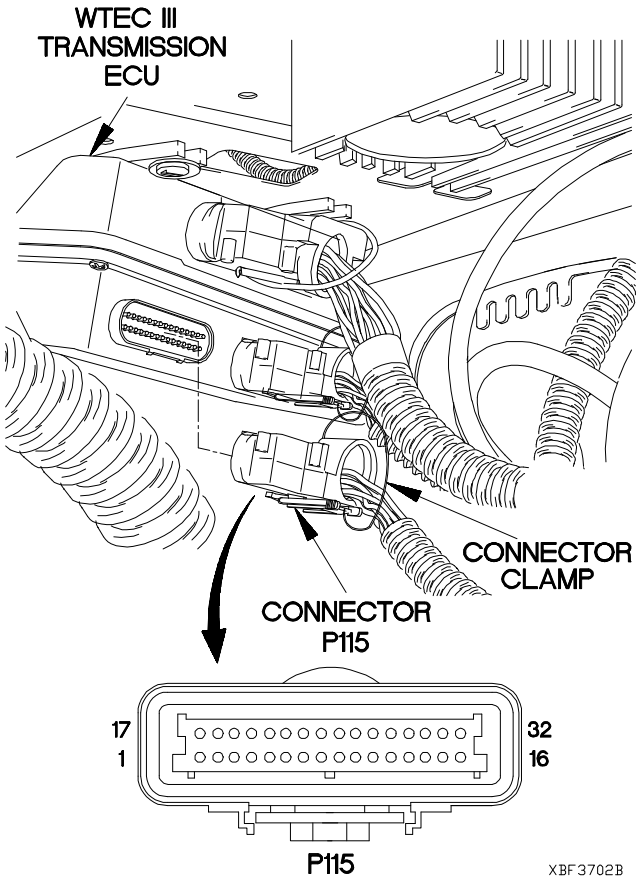


f37. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 13 AND ANY SUB CODE (CONT)

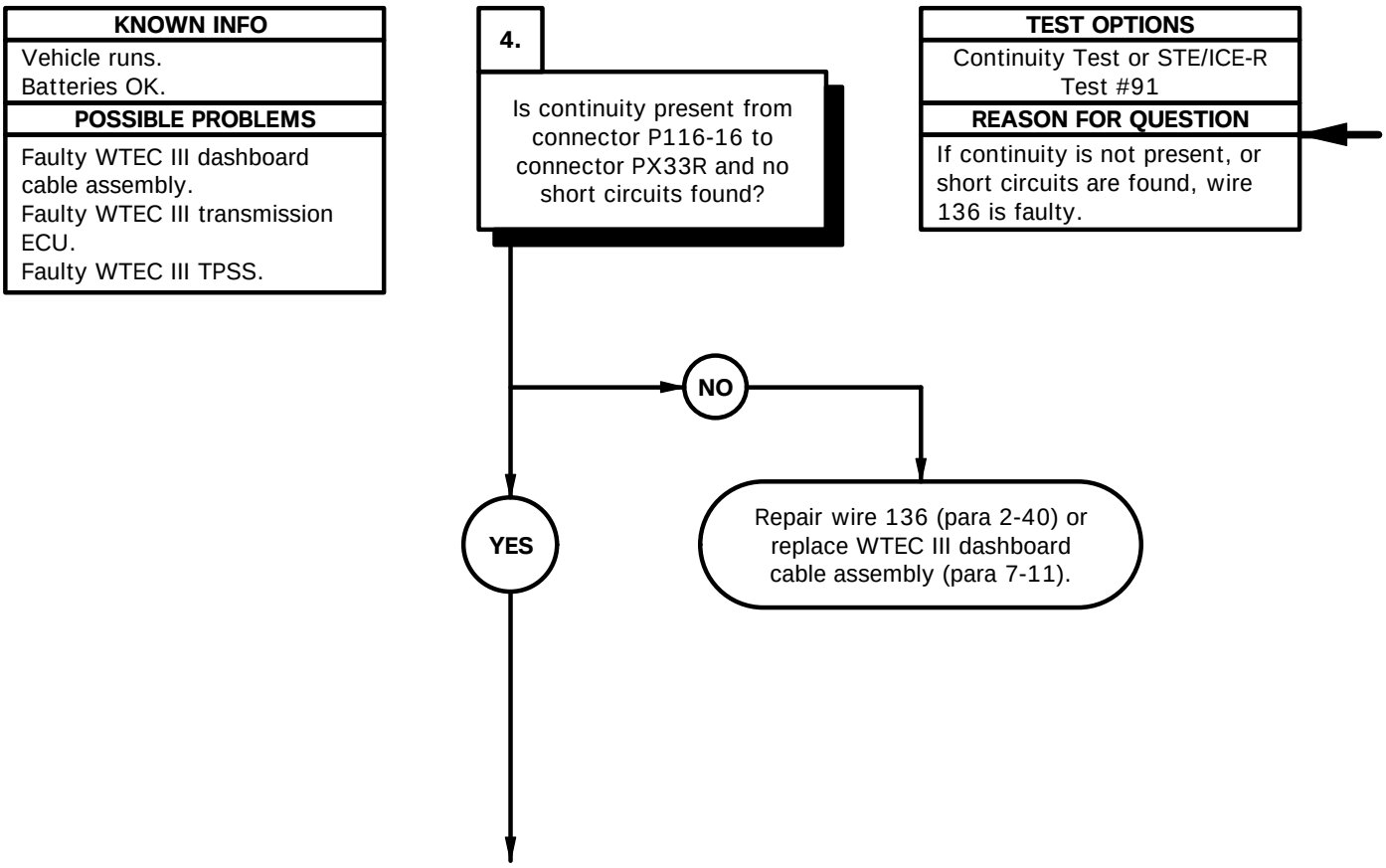


RESISTANCE TEST

(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 2-40) 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.

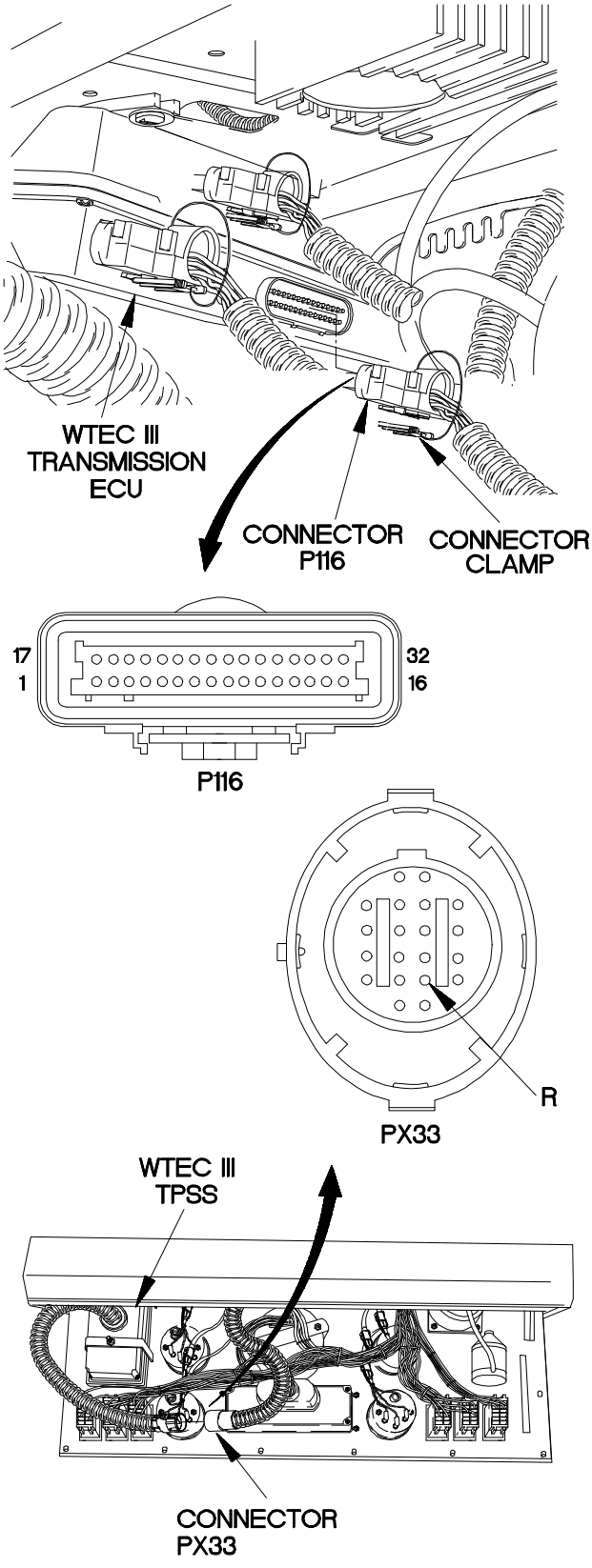


f37. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 13 AND ANY SUB CODE (CONT)

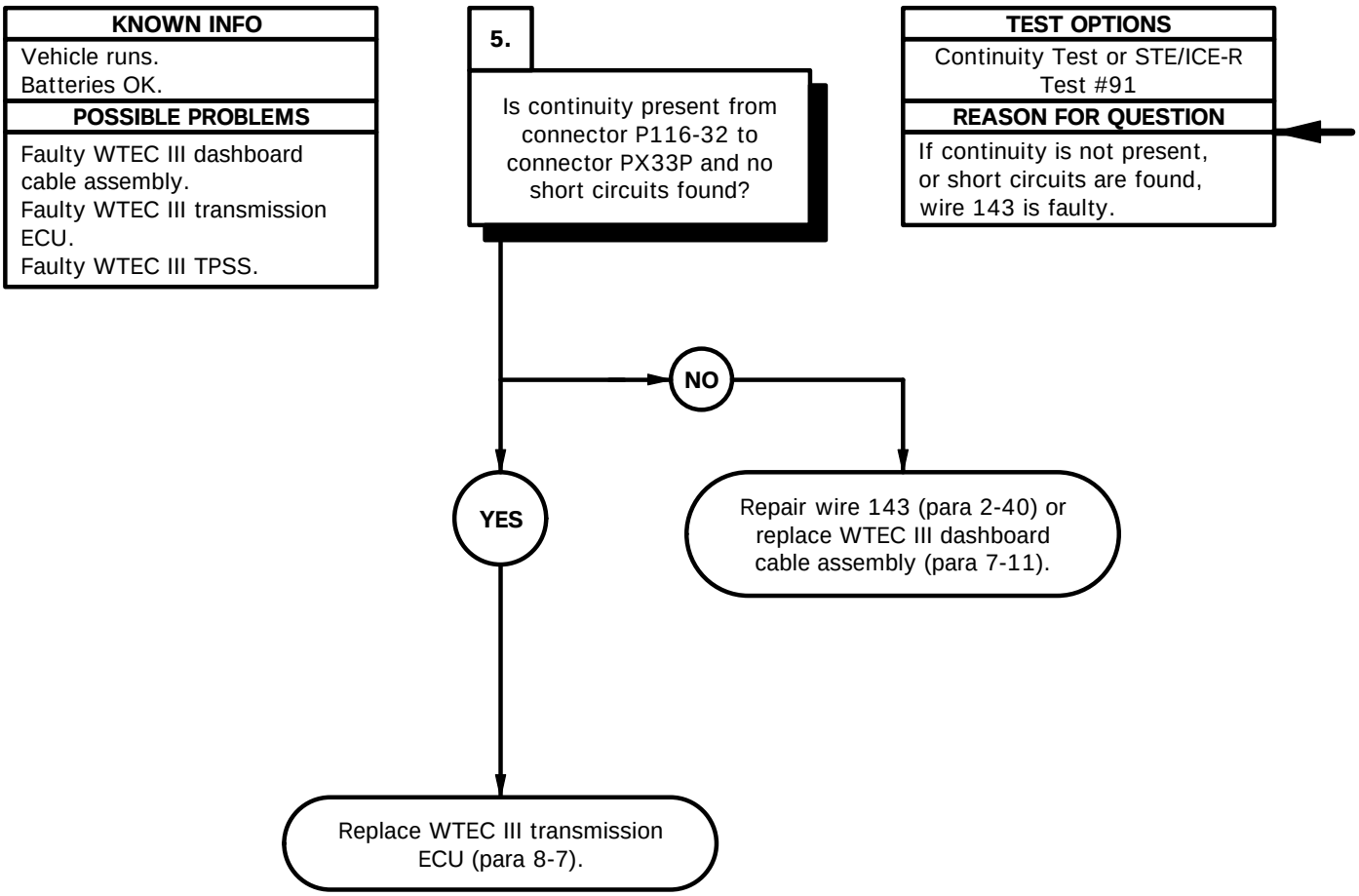


CONTINUITY TEST

(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 2-40) or replace WTEC III dashboard cable assembly (para 7-11).

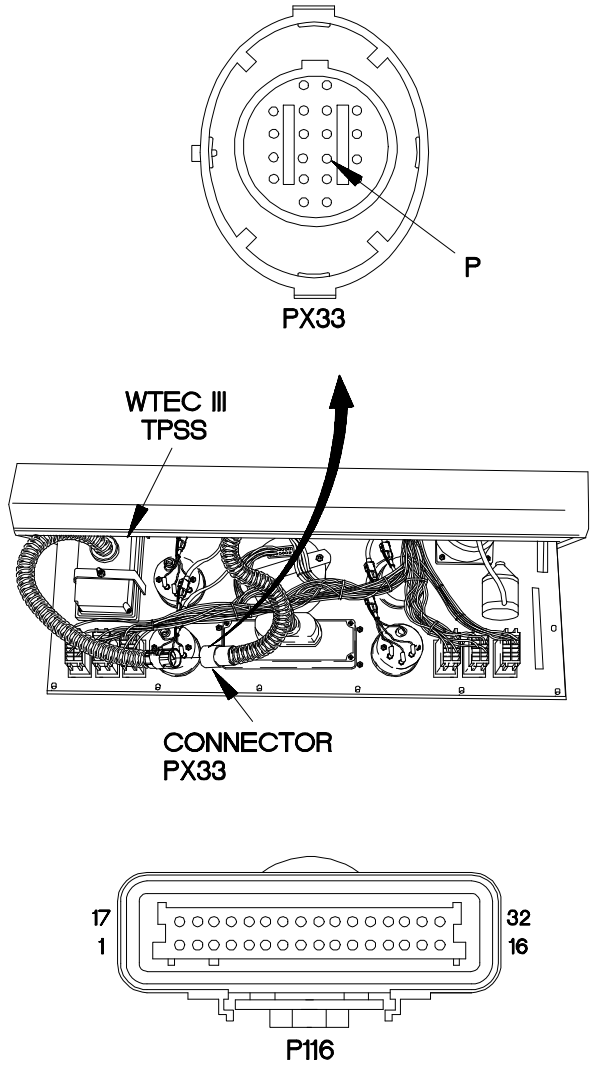


f37. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 13 AND ANY SUB CODE (CONT)



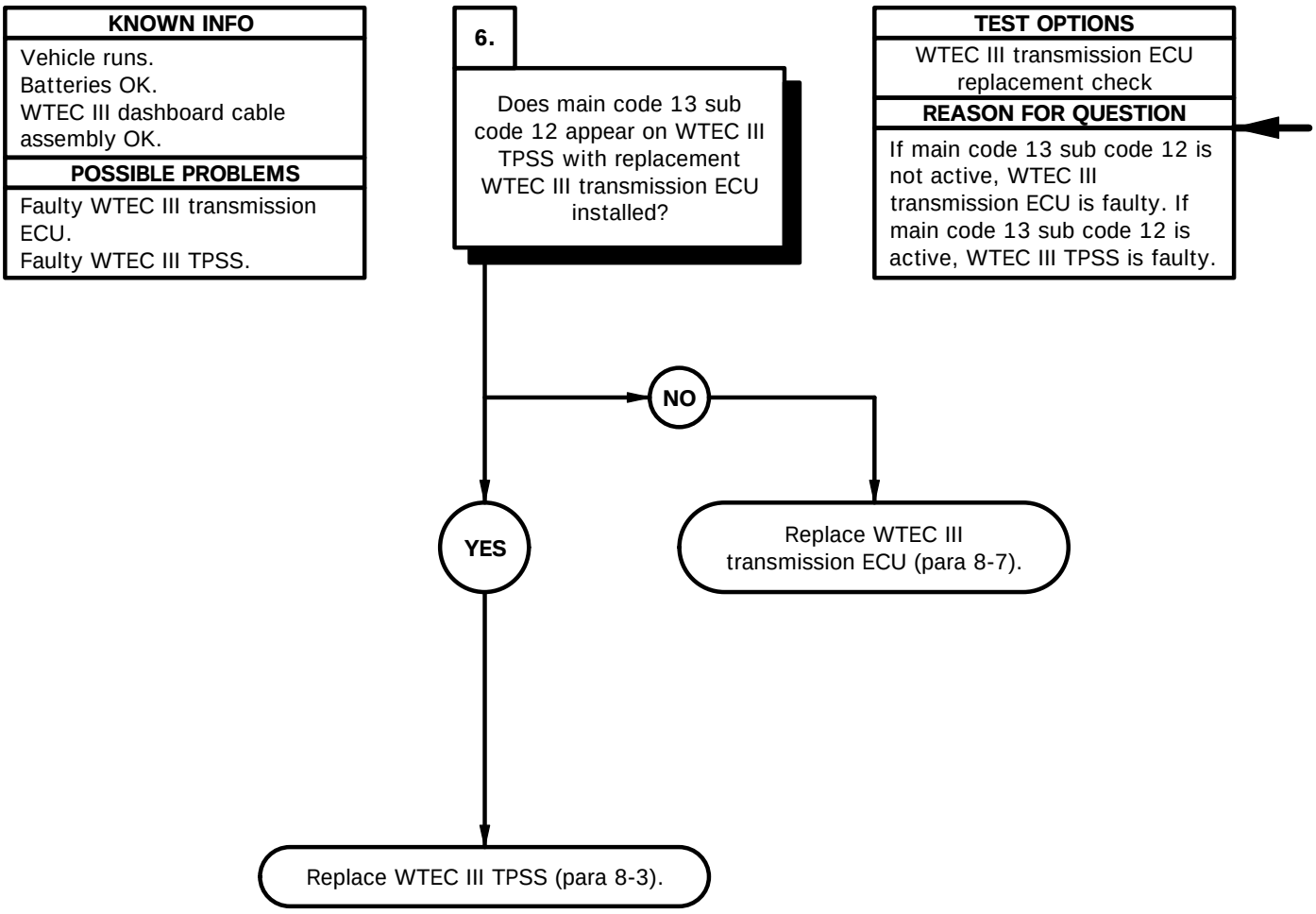
CONTINUITY TEST

(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 2-40) 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).



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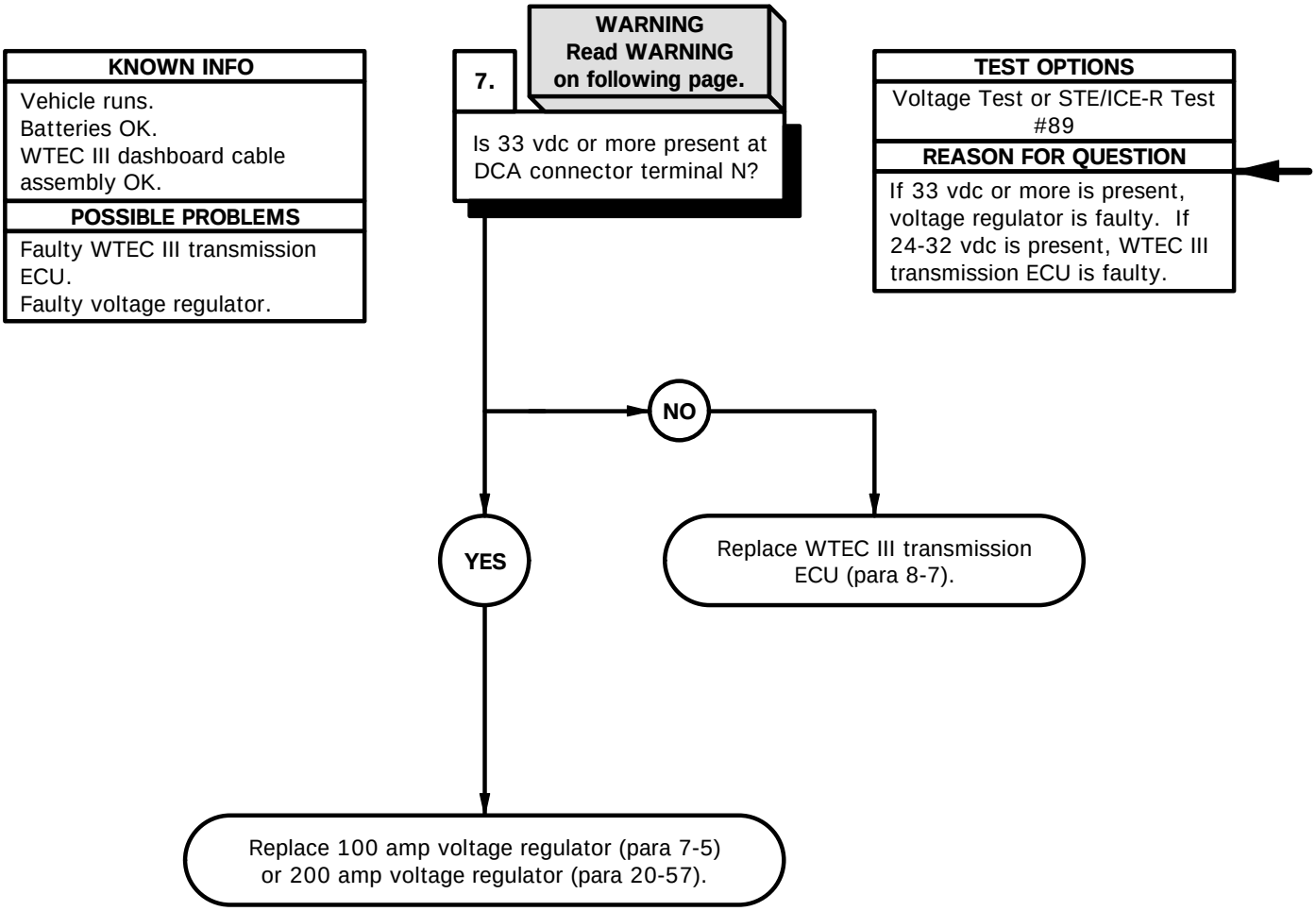
f37. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 13 AND ANY SUB CODE (CONT)



WTEC III TRANSMISSION ECU REPLACEMENT CHECK

(1) Install replacement WTEC III transmission ECU (para 8-7).
(2) Start engine (TM 9-2320-365-10).
(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 9-2320-365-10).
(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)

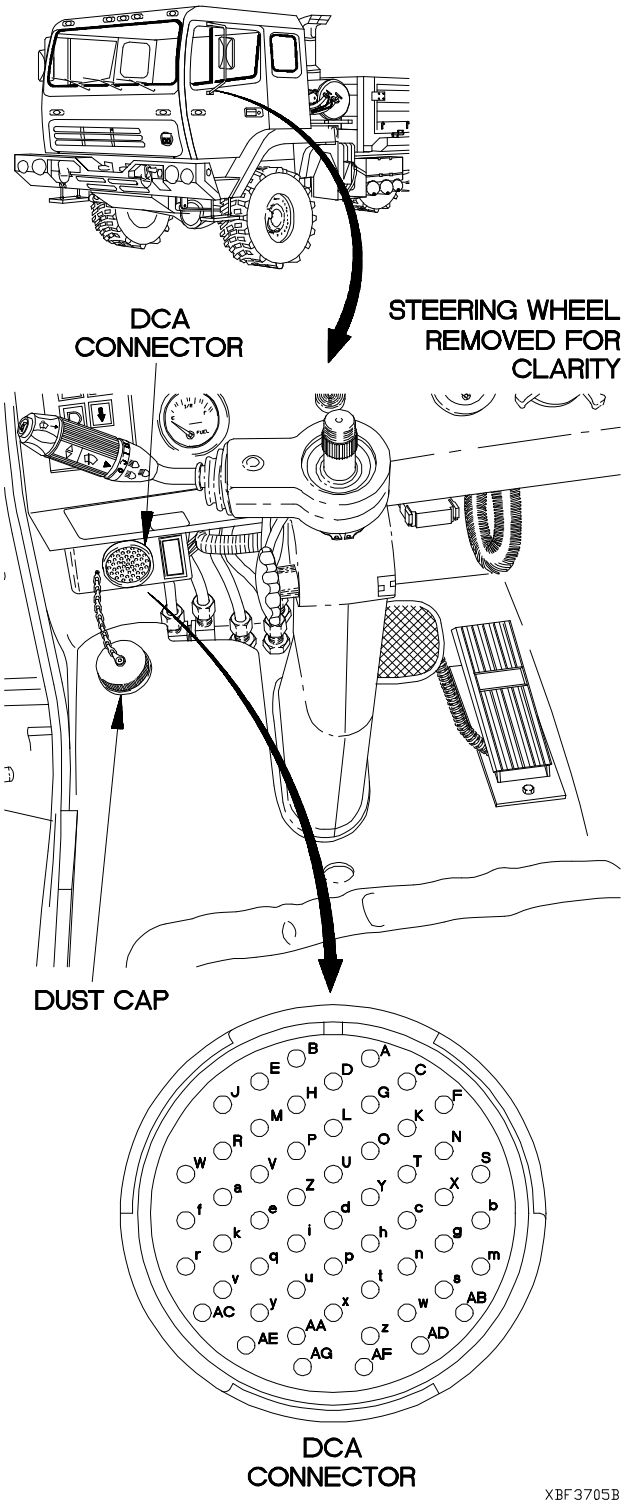


WARNING

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

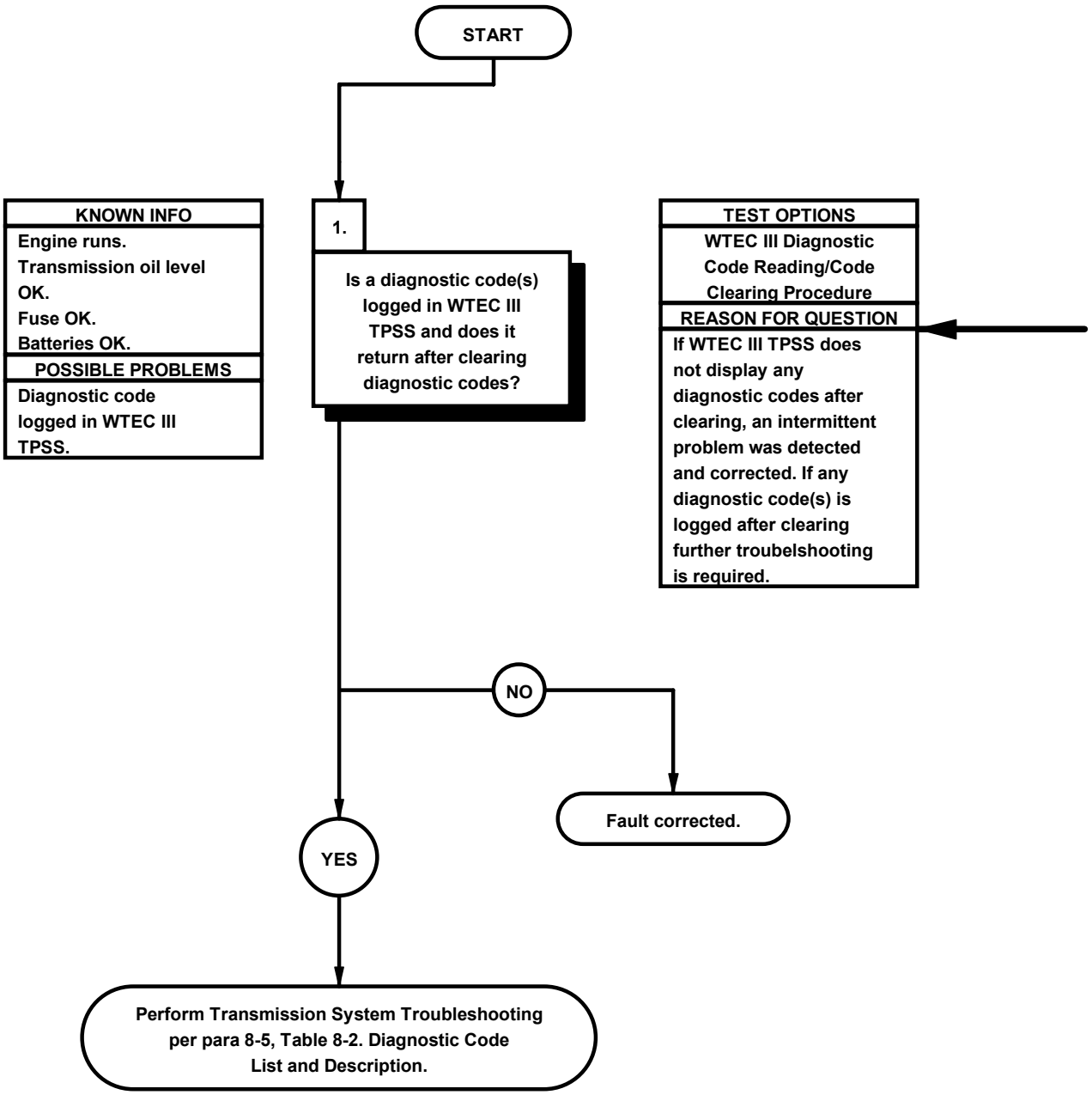
(1) Start engine (TM 9-2320-365-10).
(2) Remove dust cap from DCA connector.
(3) Set multimeter to volts dc.
(4) Connect positive (+) probe of multimeter to DCA connector terminal N.
(5) Connect negative (-) probe of multimeter to DCA connector terminal P and note reading on multimeter.
(6) If 33 vdc or more is present, replace 100 amp voltage regulator (para 7-5) or 200 amp voltage regulator (para 20-57).
(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 9-2320-365-10).



f38. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) LED DISPLAYS "- -" AND/OR TRANSMISSION DOES NOT SHIFT GEARS

INITIAL SETUP

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



(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 9-2320-365-10).

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)
Wrench Set, Socket (Item 49, Appendix C)

Tools and Special Tools (Cont)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)

Personnel Required
(2)

References
TM 9-4910-571-12&P

NOTE

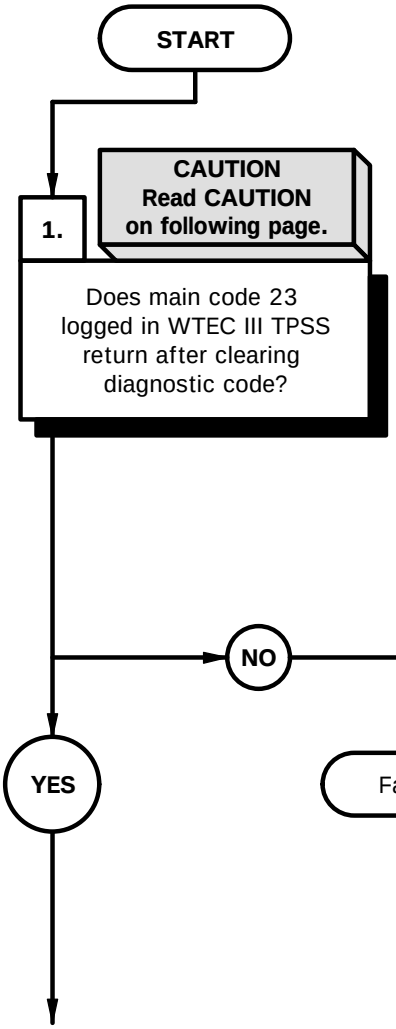
Perform electrical system troubleshooting e1. Circuit Breaker Does Not Operate on circuit breakers C43 and CB79 prior to begining this task.

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

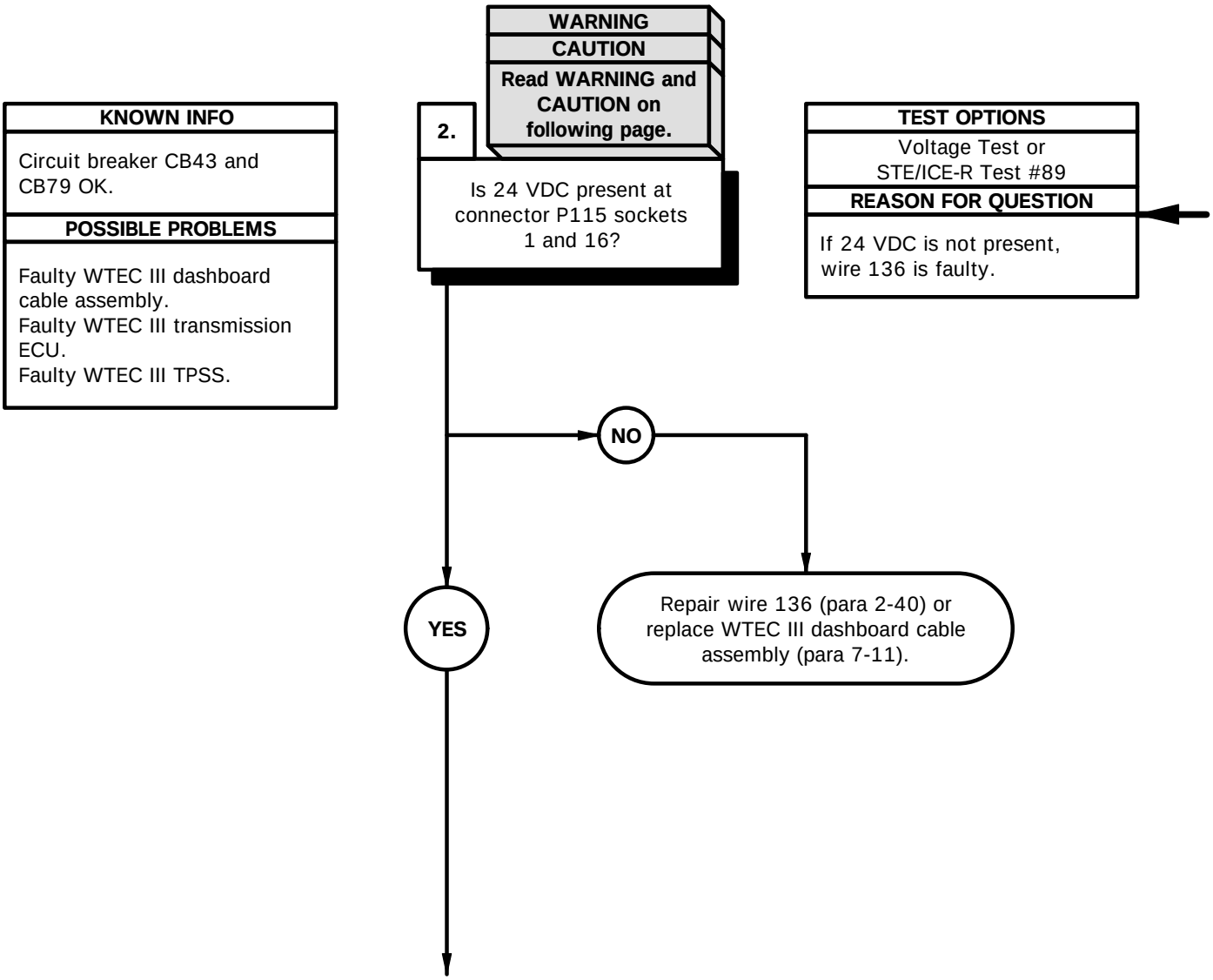
If WTEC III TPSS does not display any diagnostic code after clearing, an intermittent problem was detected and corrected. If diagnostic code is logged after clearing, further troubleshooting is required.

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

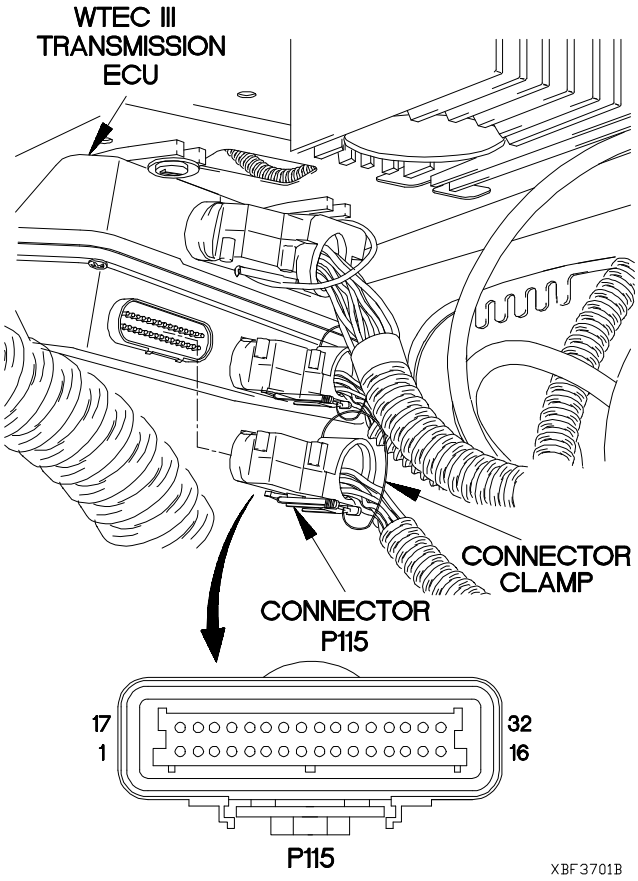
Use care when testing electrical connectors not to bend connector pins or damage connector sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

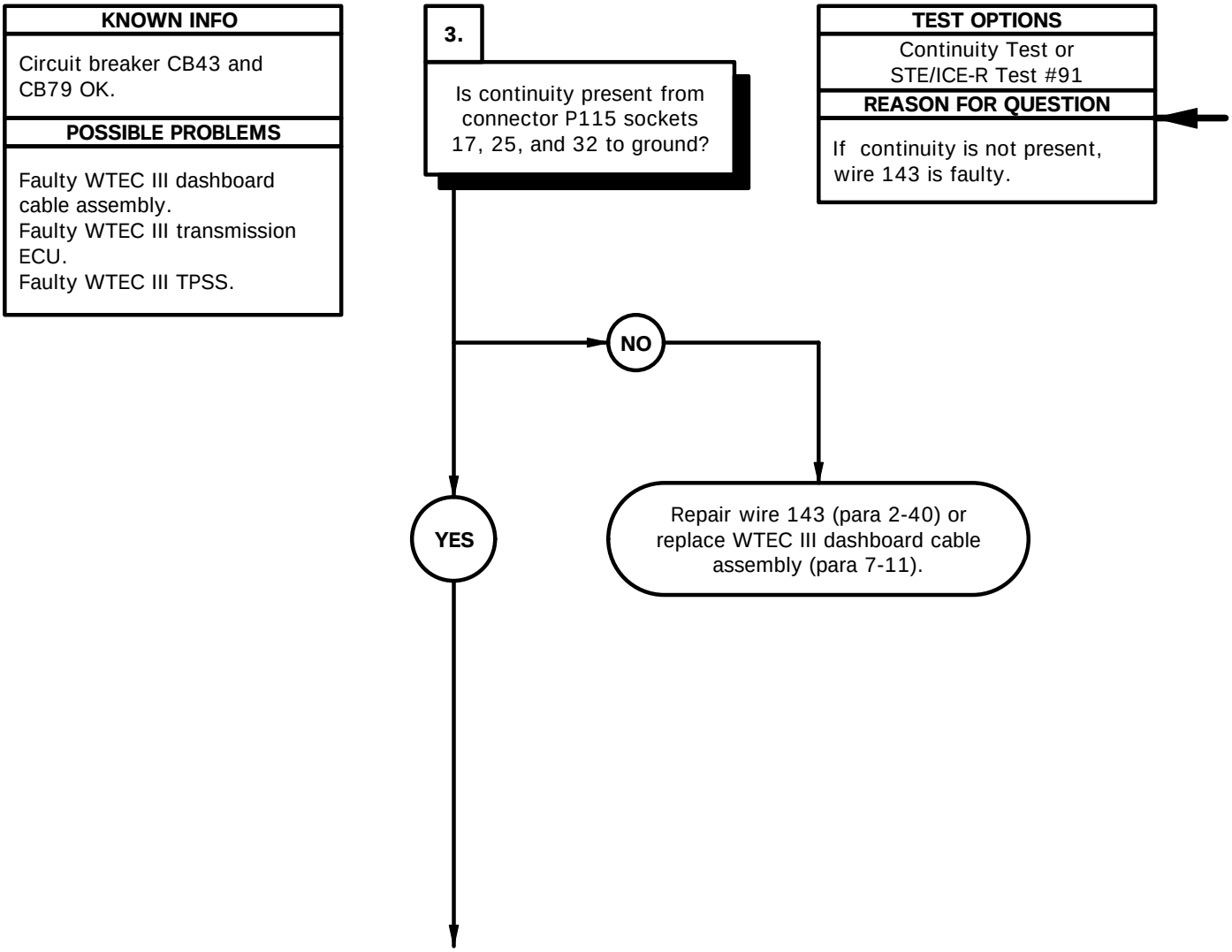
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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 2-40) or replace WTEC III dashboard cable assembly (para 7-11).

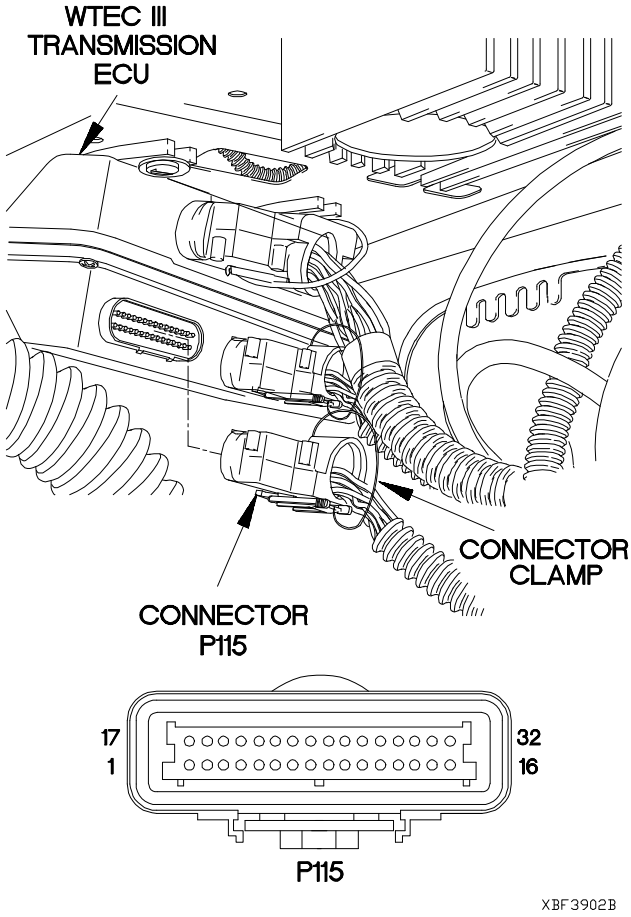


f39. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 23 AND ANY SUB CODE (CONT)

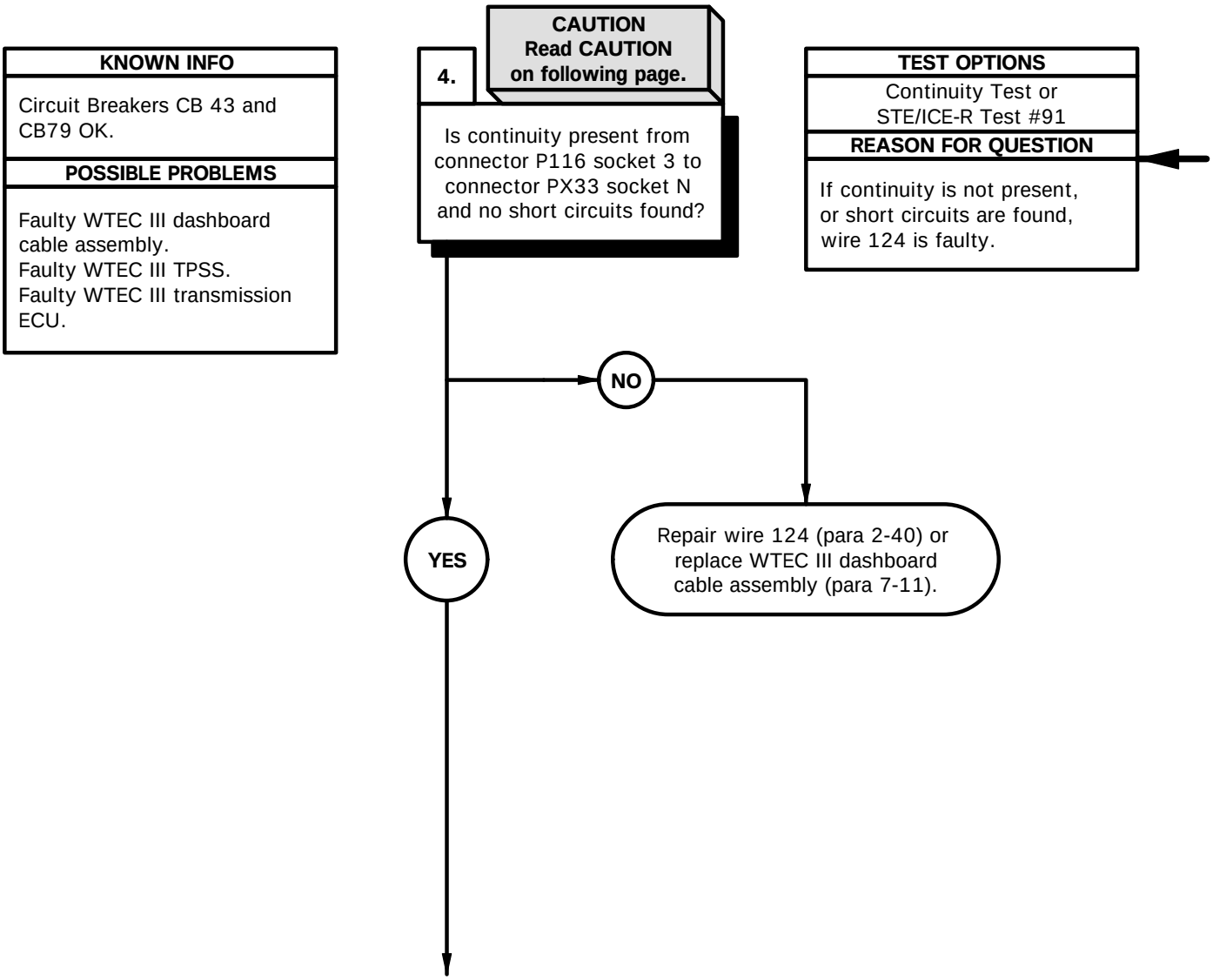


CONTINUITY TEST

(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 2-40) 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 2-40) 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 2-40) 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

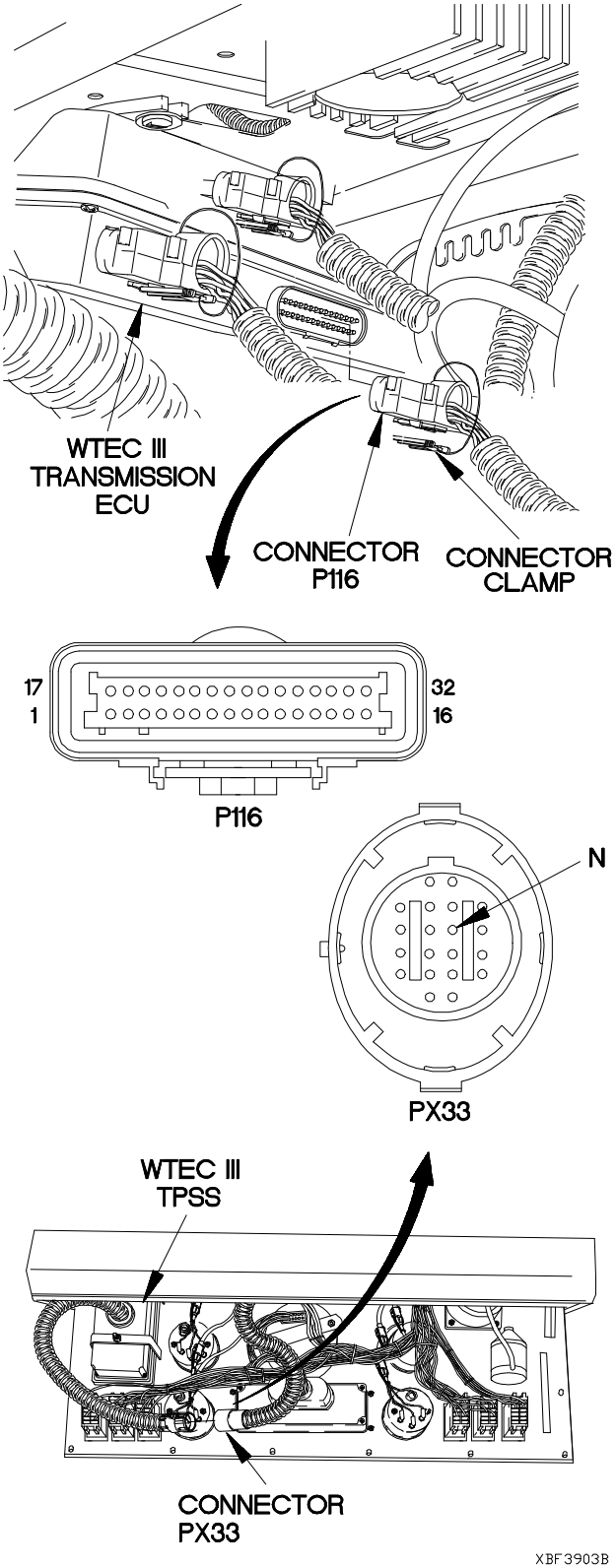
Use care when testing electrical connectors not to bend connector pins or damage connector sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

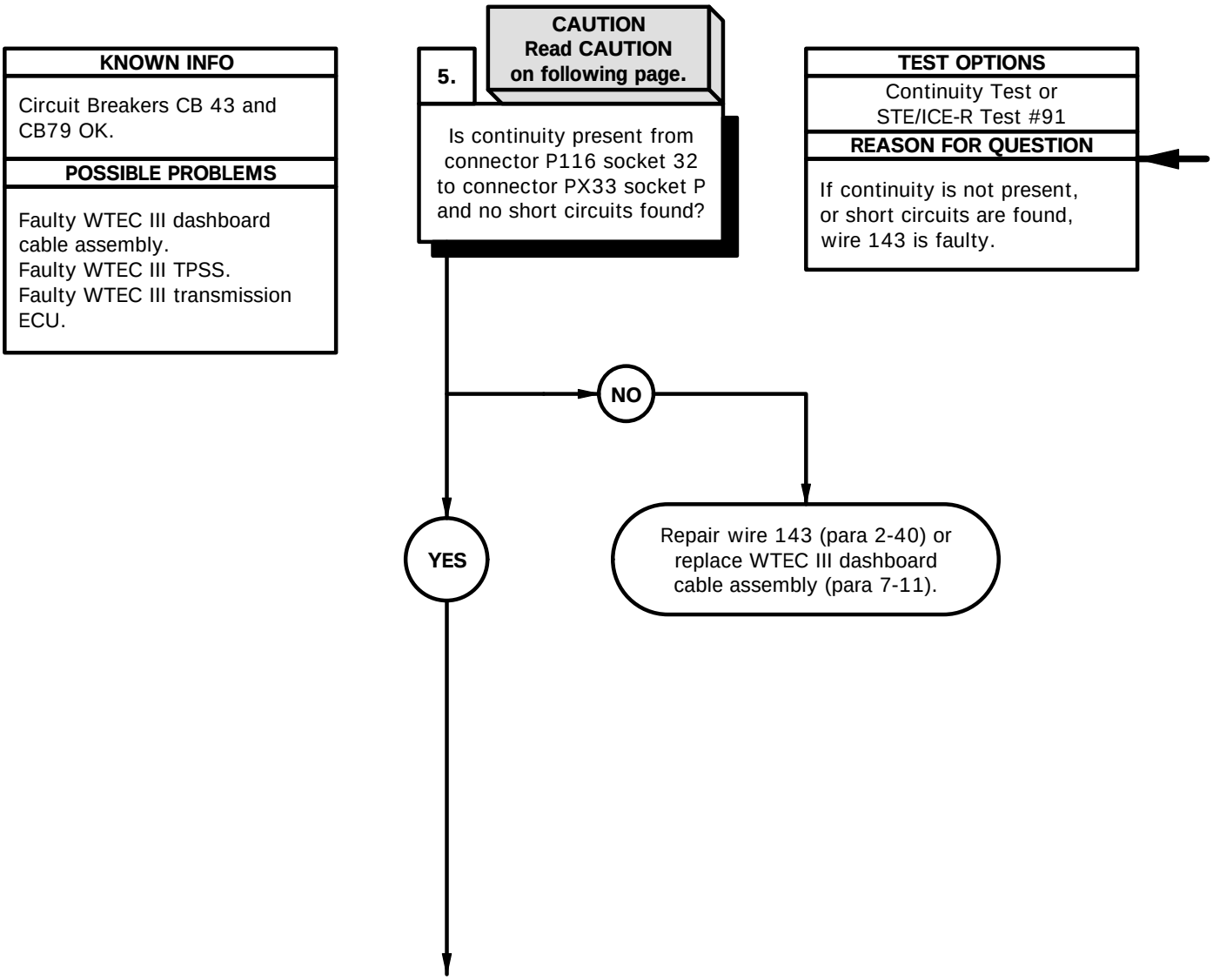
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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 mutimeter.
(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 2-40) 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

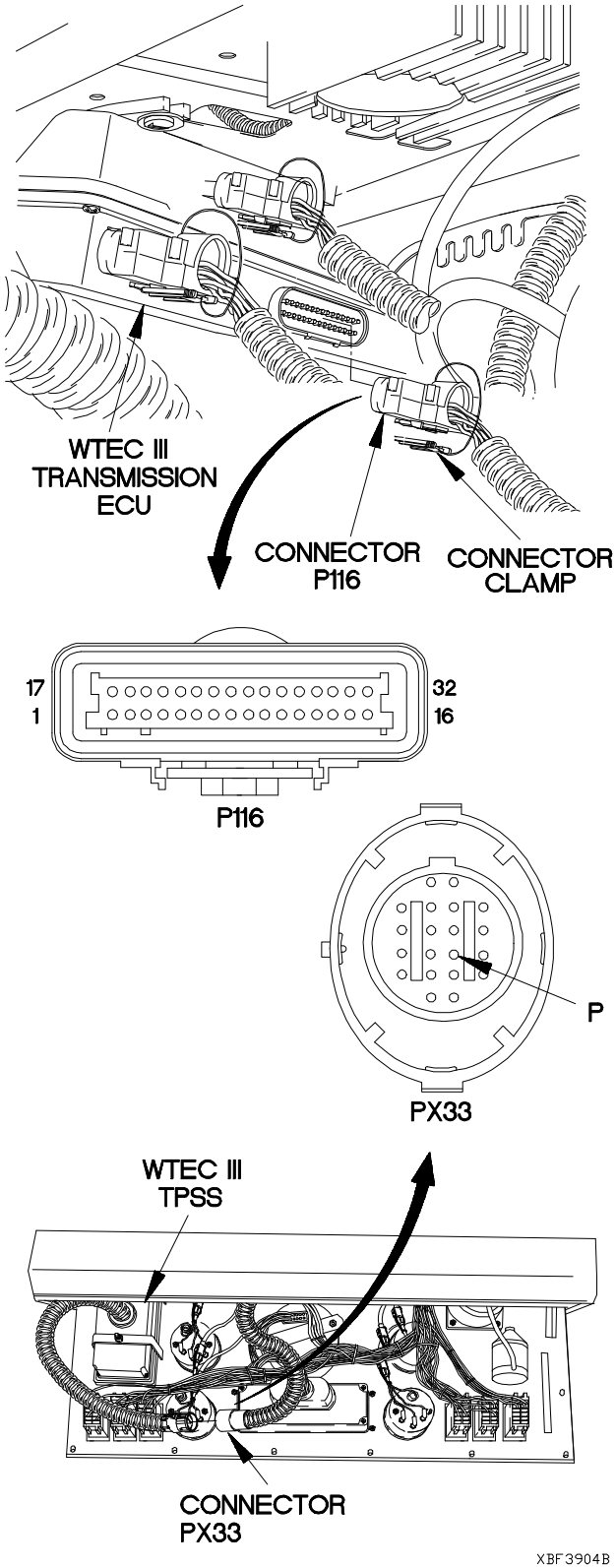
Use care when testing electrical connectors not to bend connector pins or damage connector sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

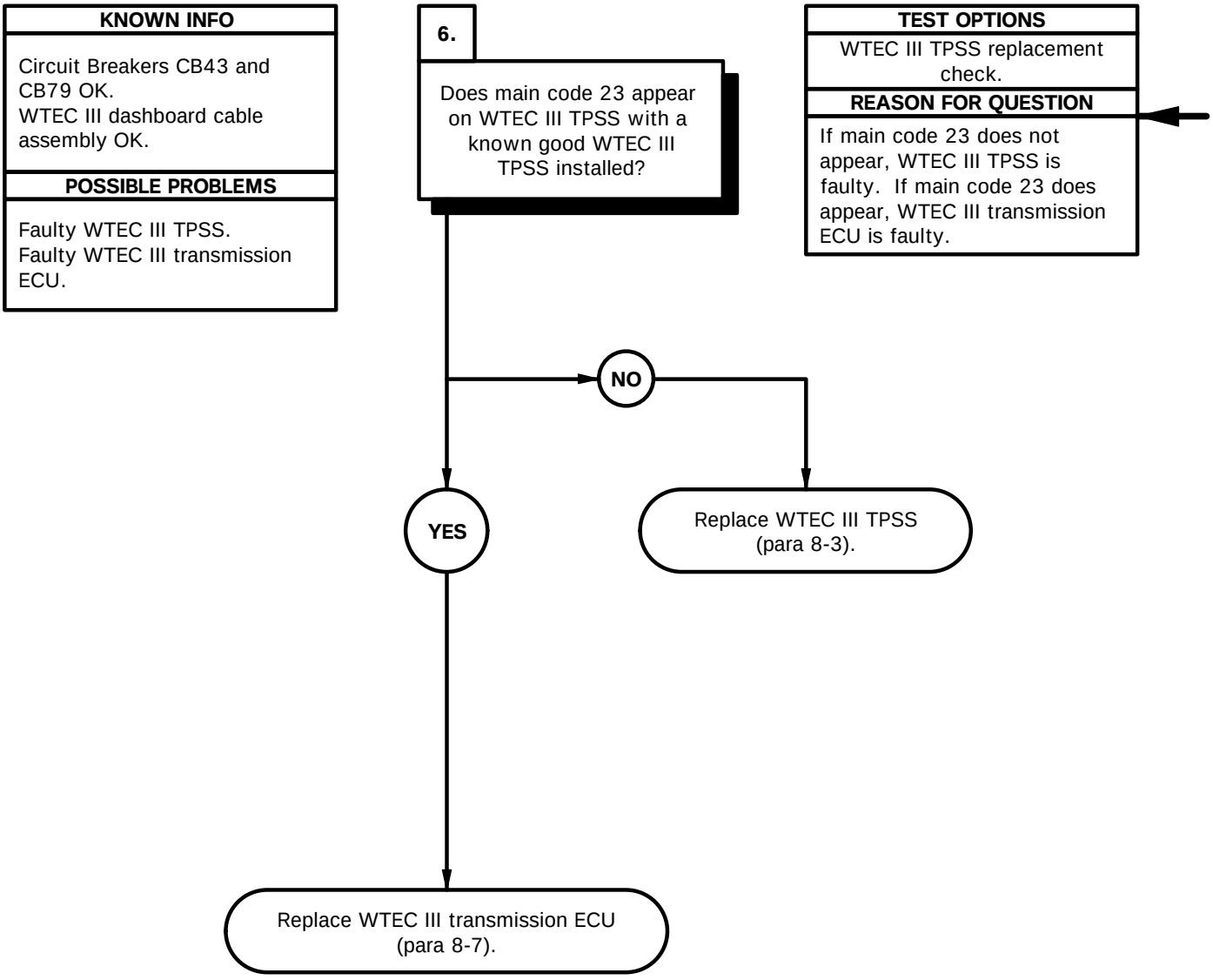
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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 mutimeter.
(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 2-40) 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.

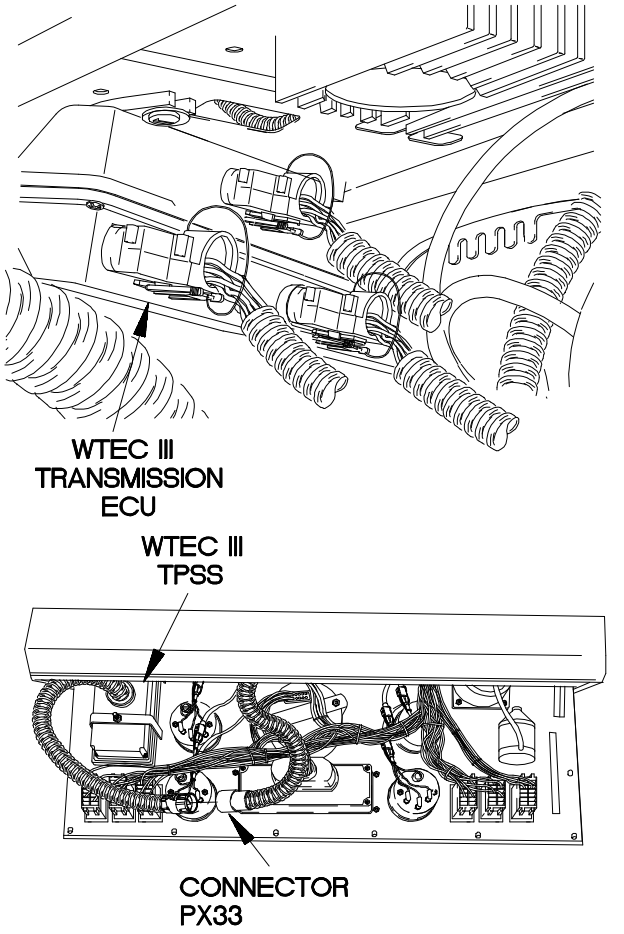


f39. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 23 AND ANY SUB CODE (CONT)



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 connnector 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 9-2320-365-10).
Kick panel removed (para 16-3).

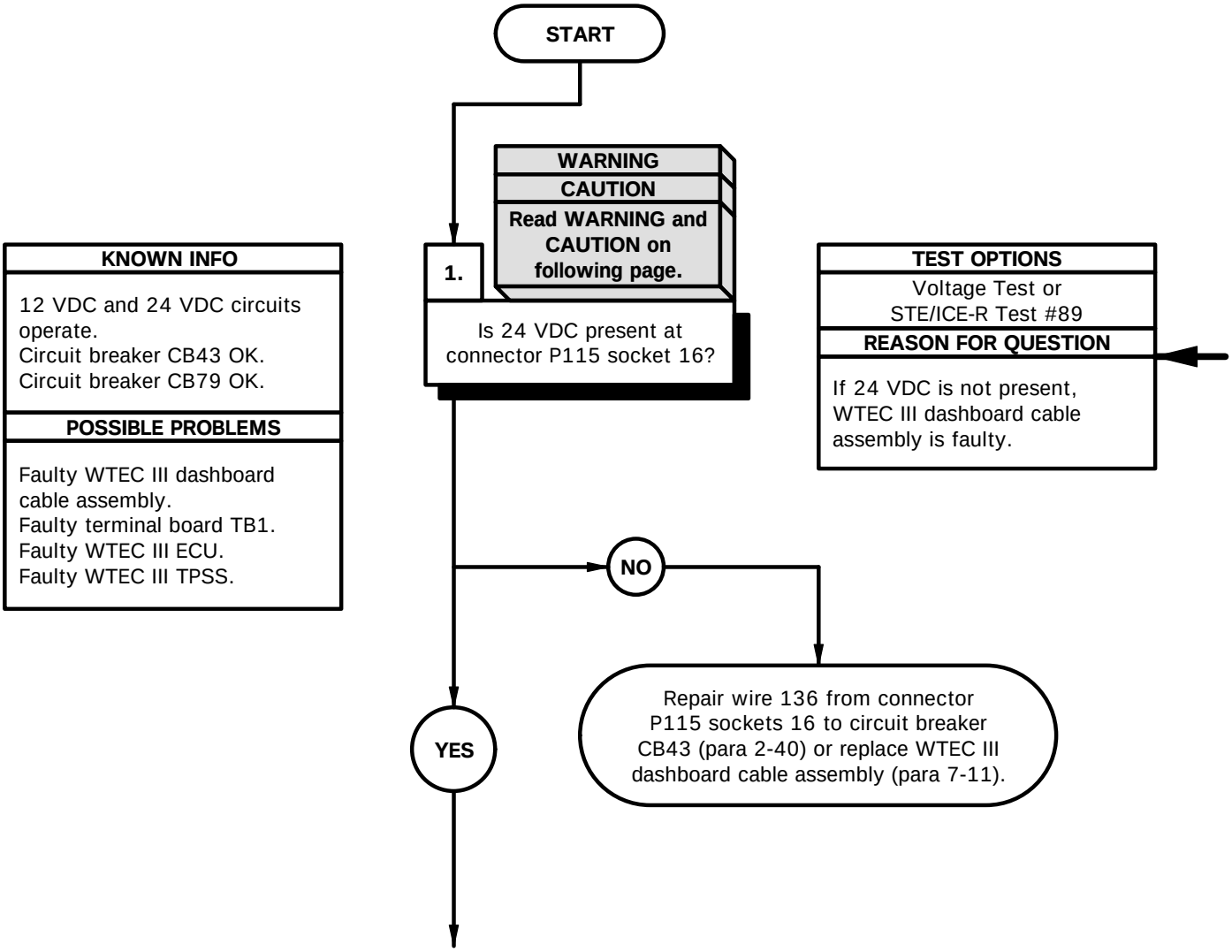
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

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.



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

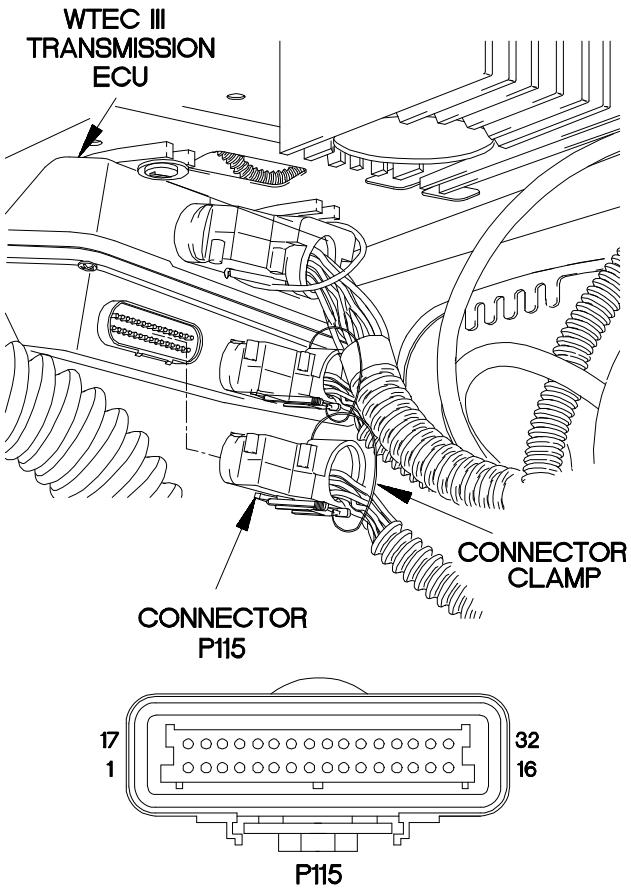
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

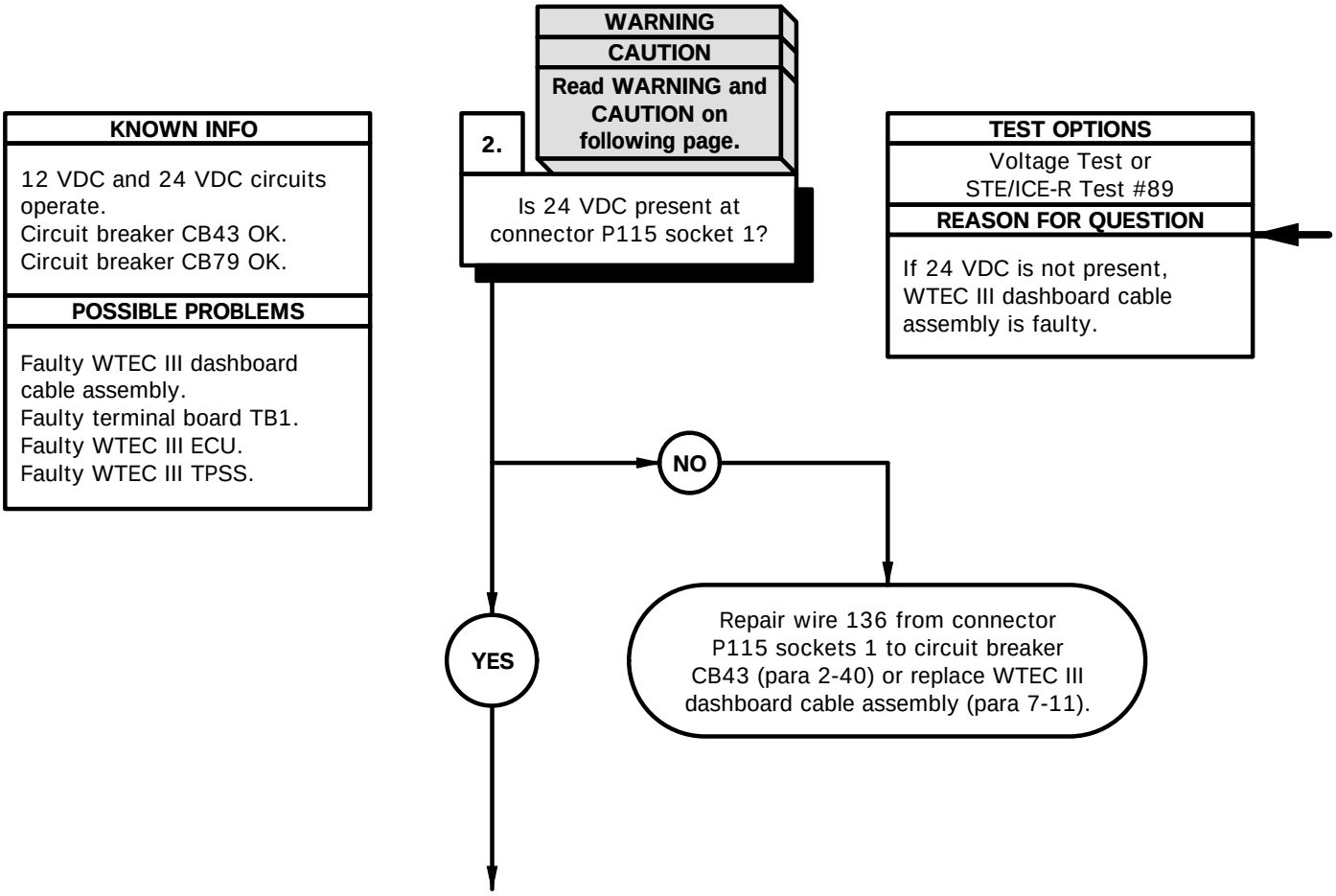
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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 and note reading on multimeter.
(6) If 24 VDC is not present, repair wire 136 from connector P115 sockets 16 to circuit breaker CB43 (para 2-40) 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

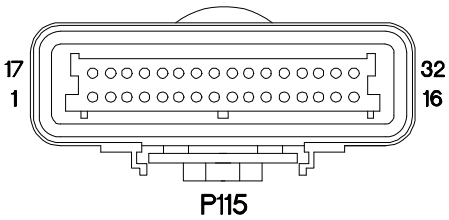
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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.

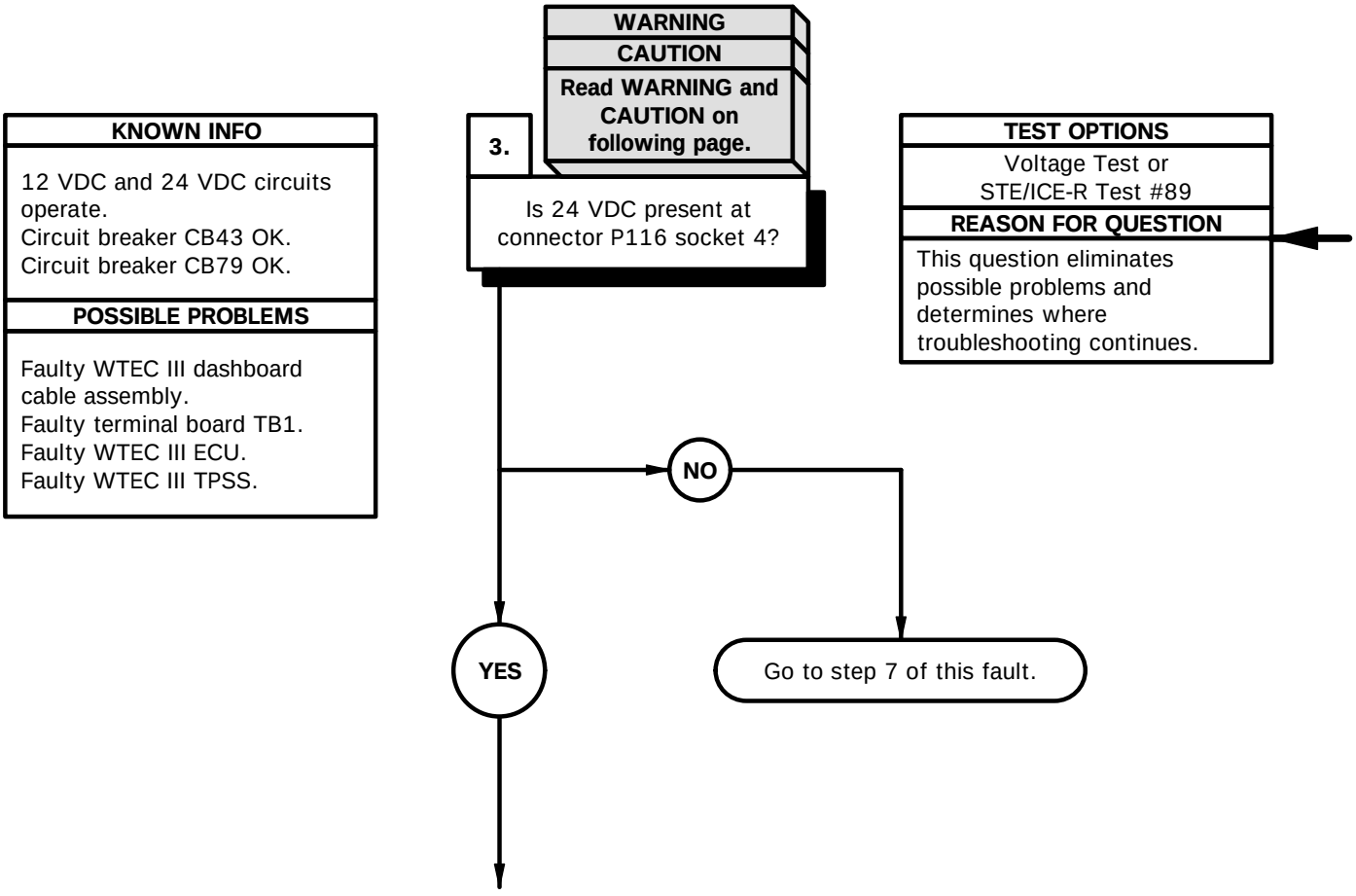
VOLTAGE TEST

(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 2-40) 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

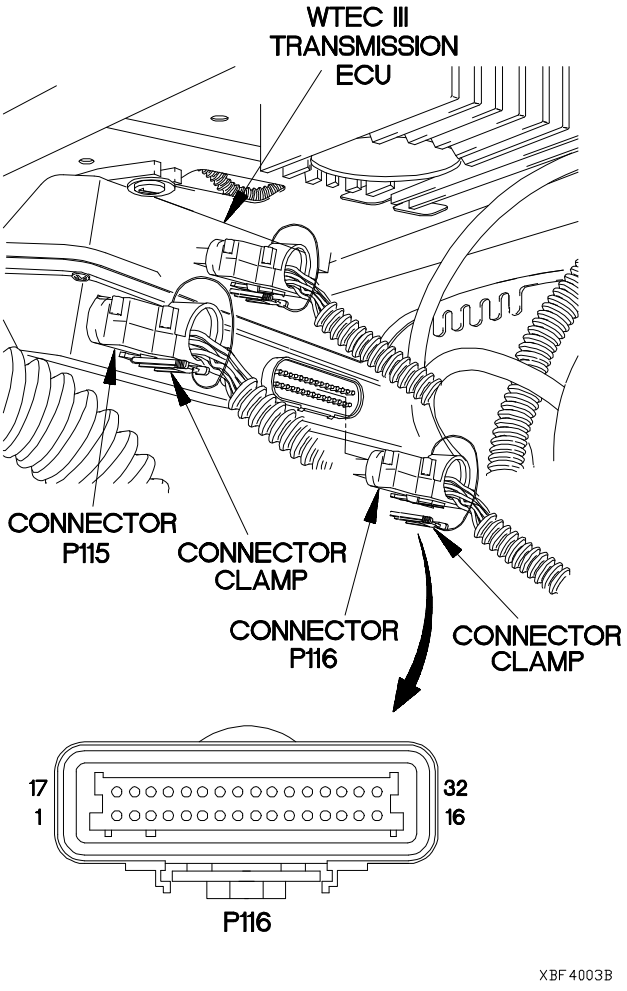
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

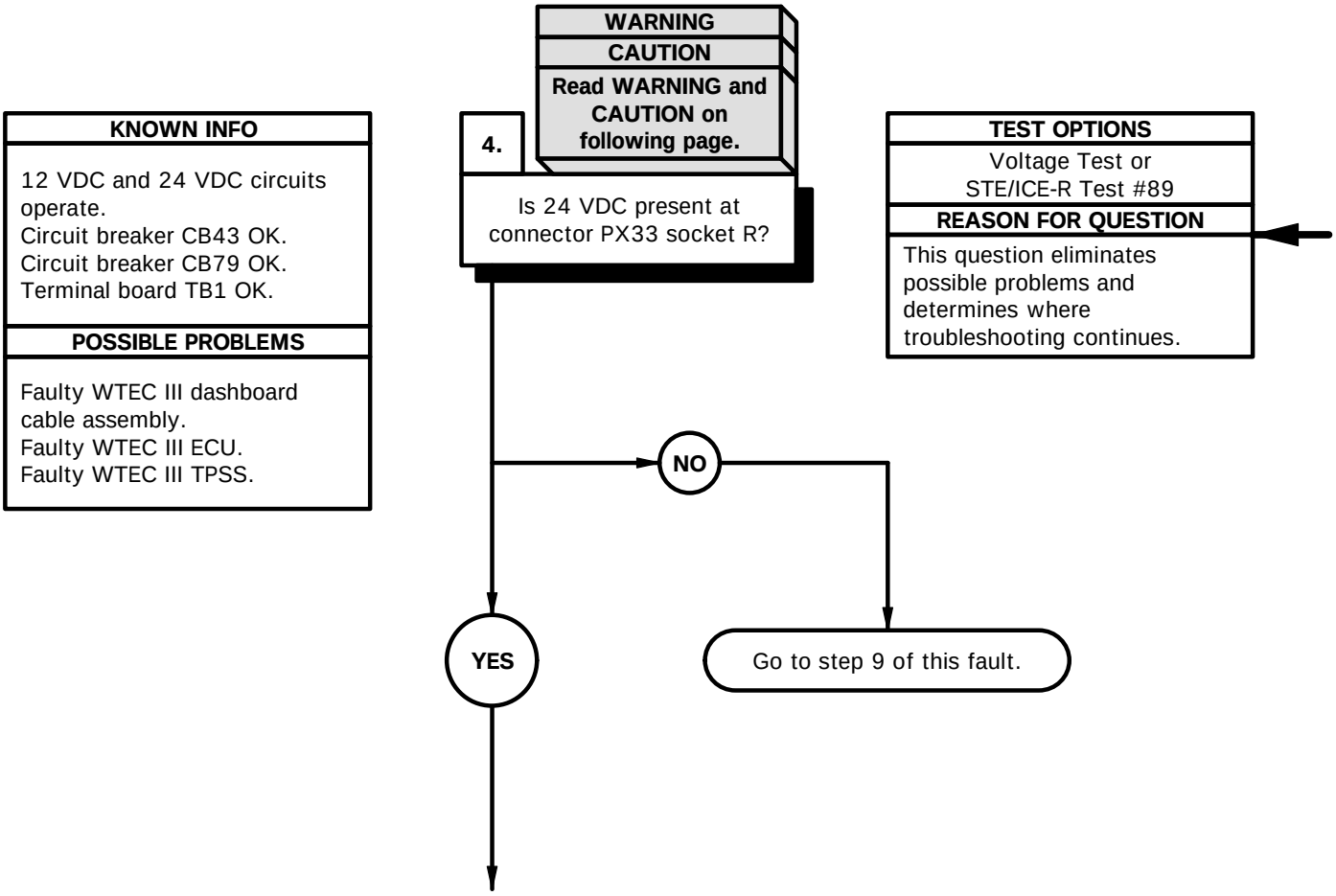
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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 9-2320-365-10) and note reading on multimeter.
(9) Position master power switch to off (TM 9-2320-365-10).
(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

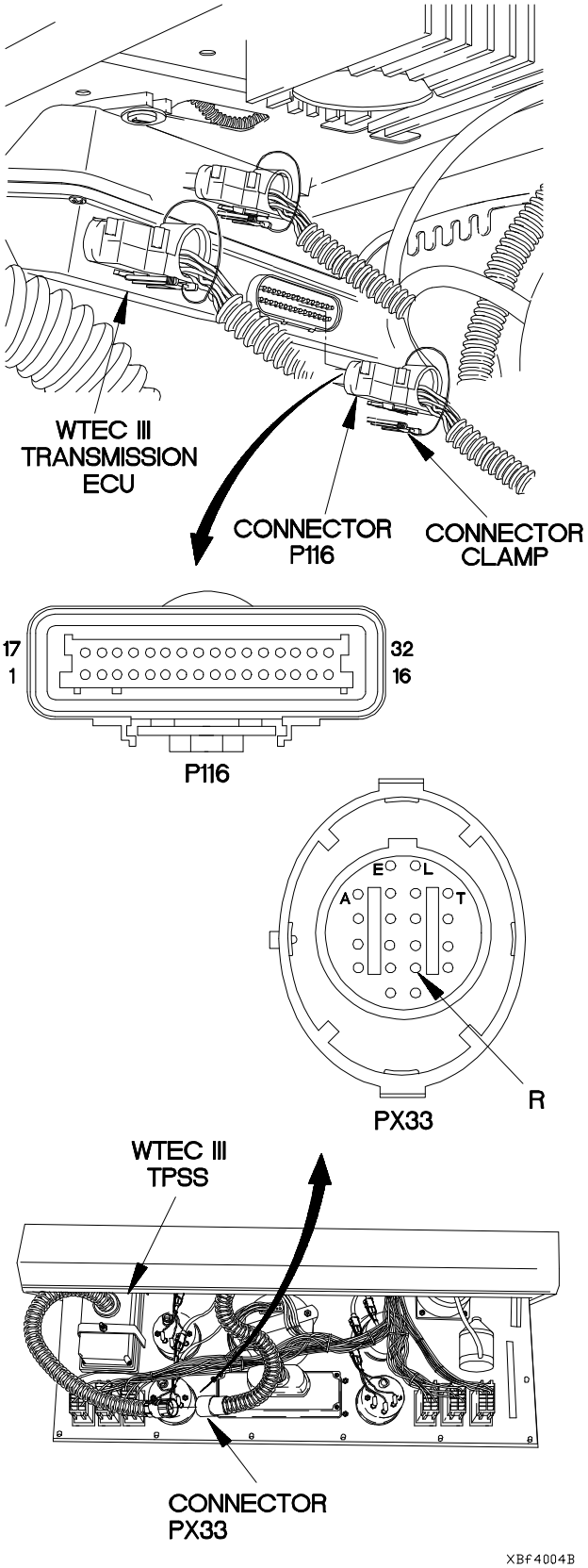
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

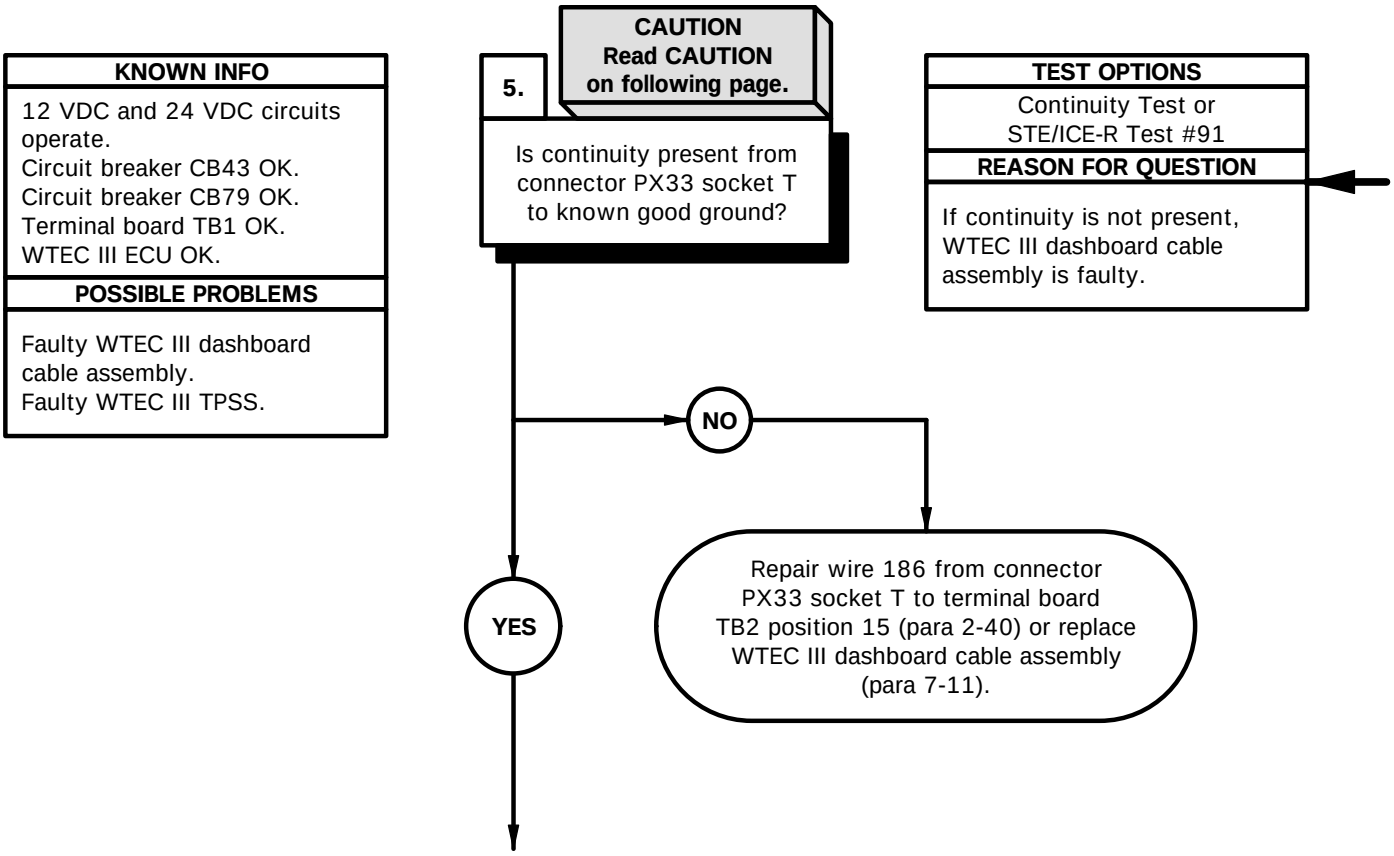
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

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 9-2320-365-10) and note reading on multimeter.
(9) Position master power switch to off (TM 9-2320-365-10).
(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

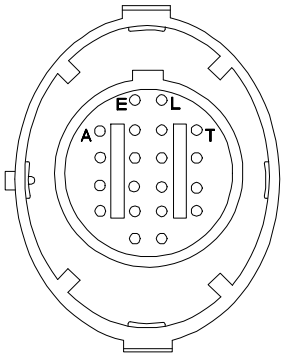
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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

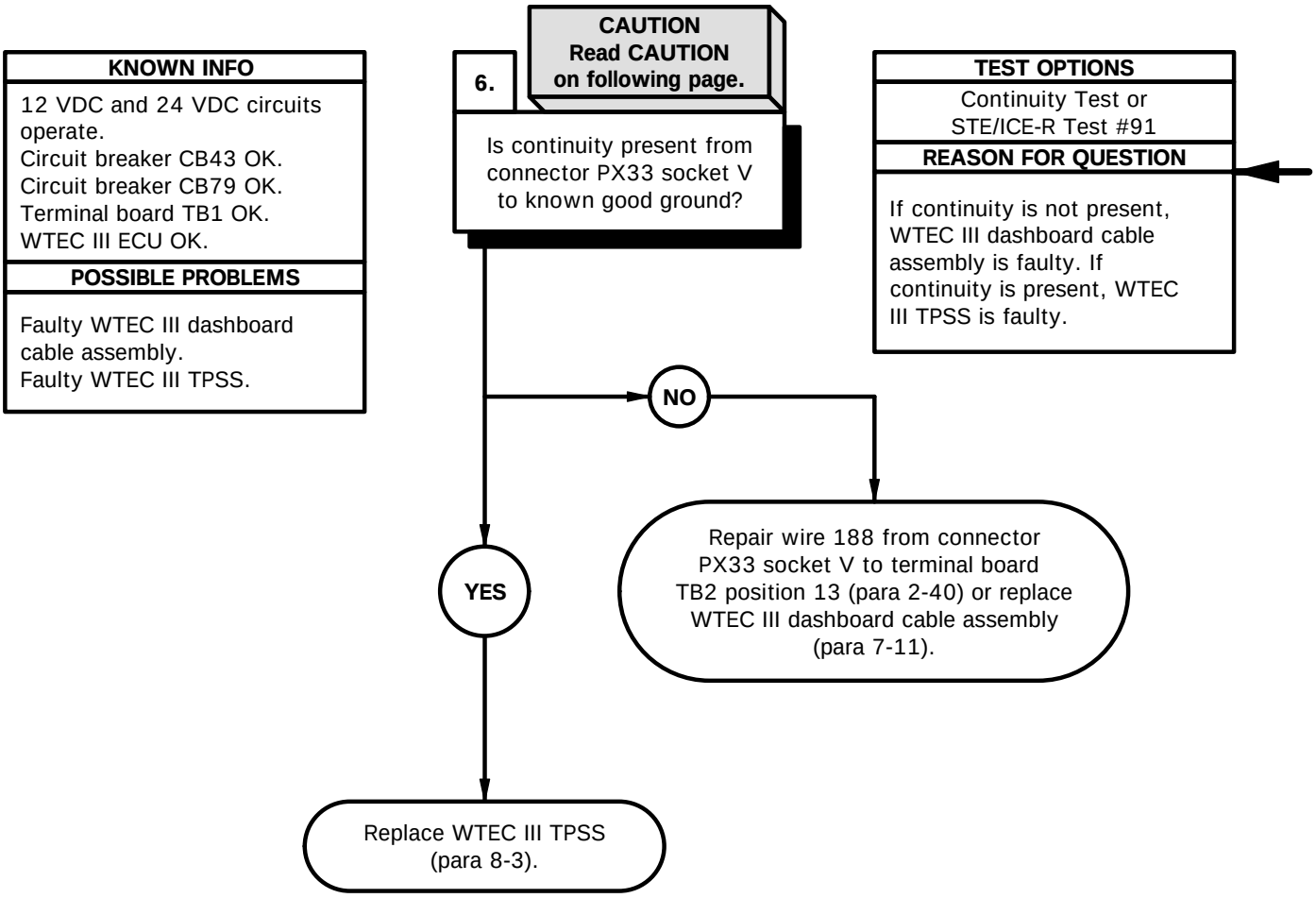
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector PX33 socket T.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, Repair wire 186 from connector PX33 socket T to terminal board TB2 position 15 (para 2-40) 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

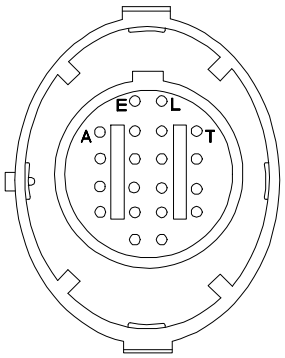
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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

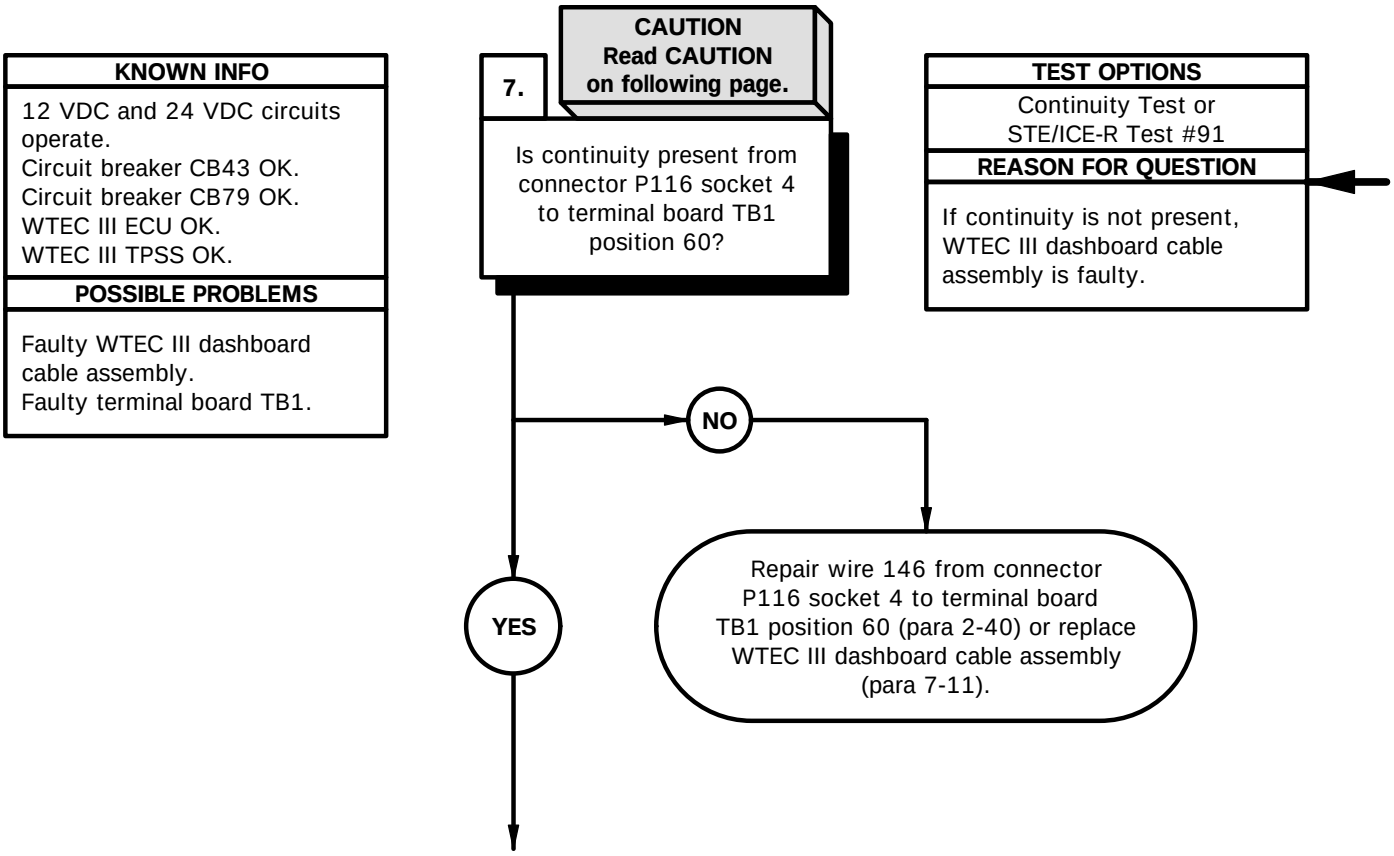
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector PX33 socket V.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, Repair wire 188 from connector PX33 socket V to terminal board TB2 position 13 (para 2-40) 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

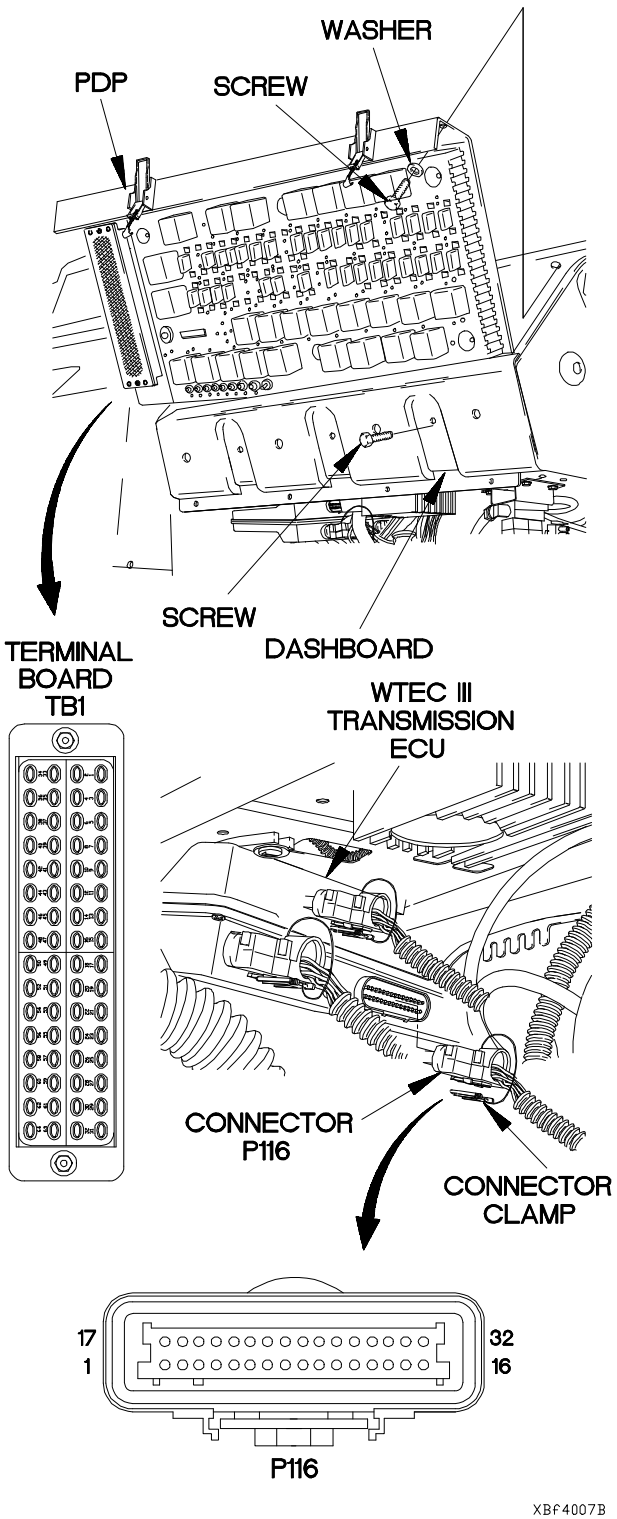
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

NOTE

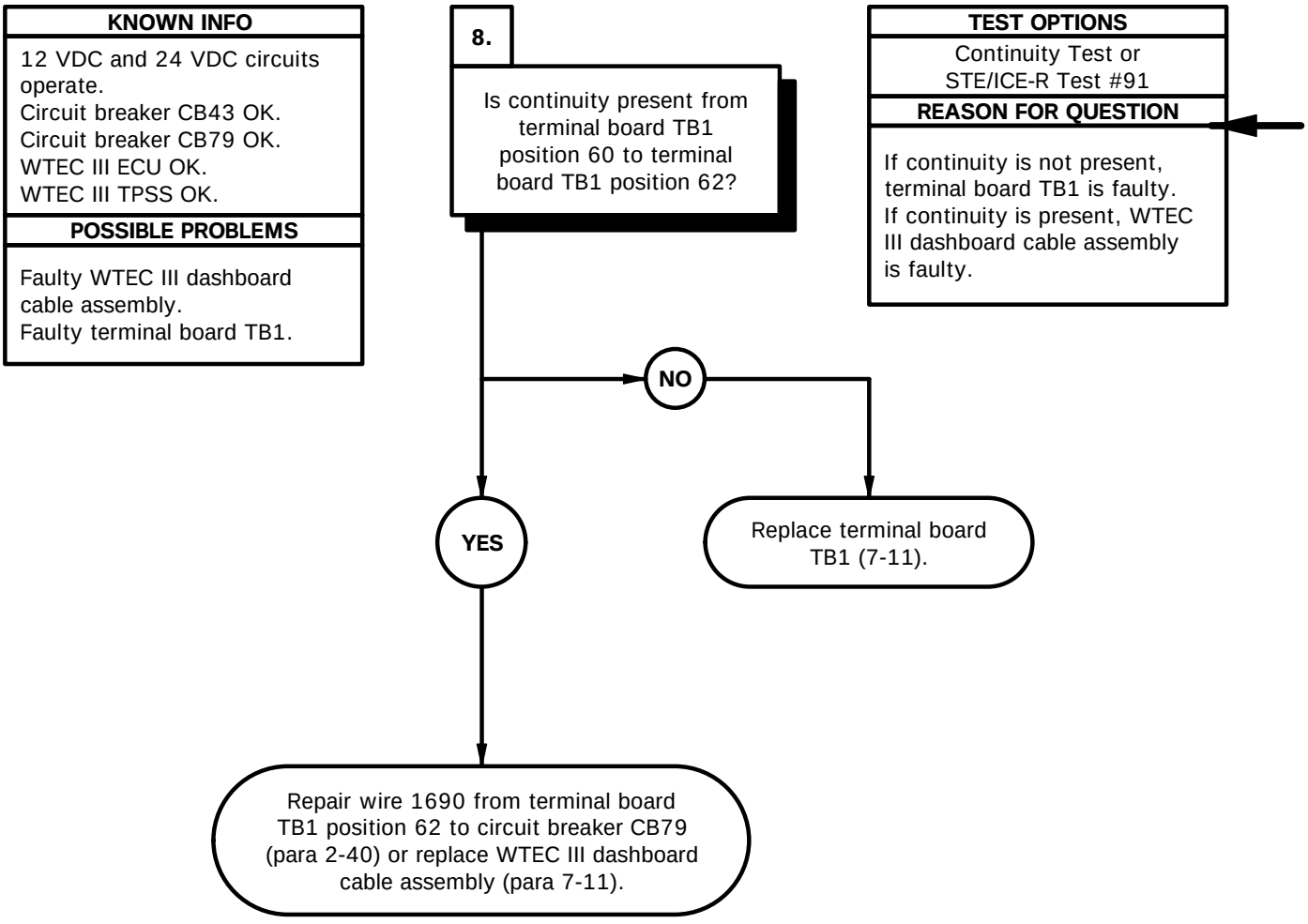
Inspect connector pins/sockets for damage, corrosion, and serviceability. Check that connector pins are not pushed back and are capable of making good contact.

CONTINUITY TEST

(1) Disconnect batteries (para 7-48).
(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 2-40) 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).

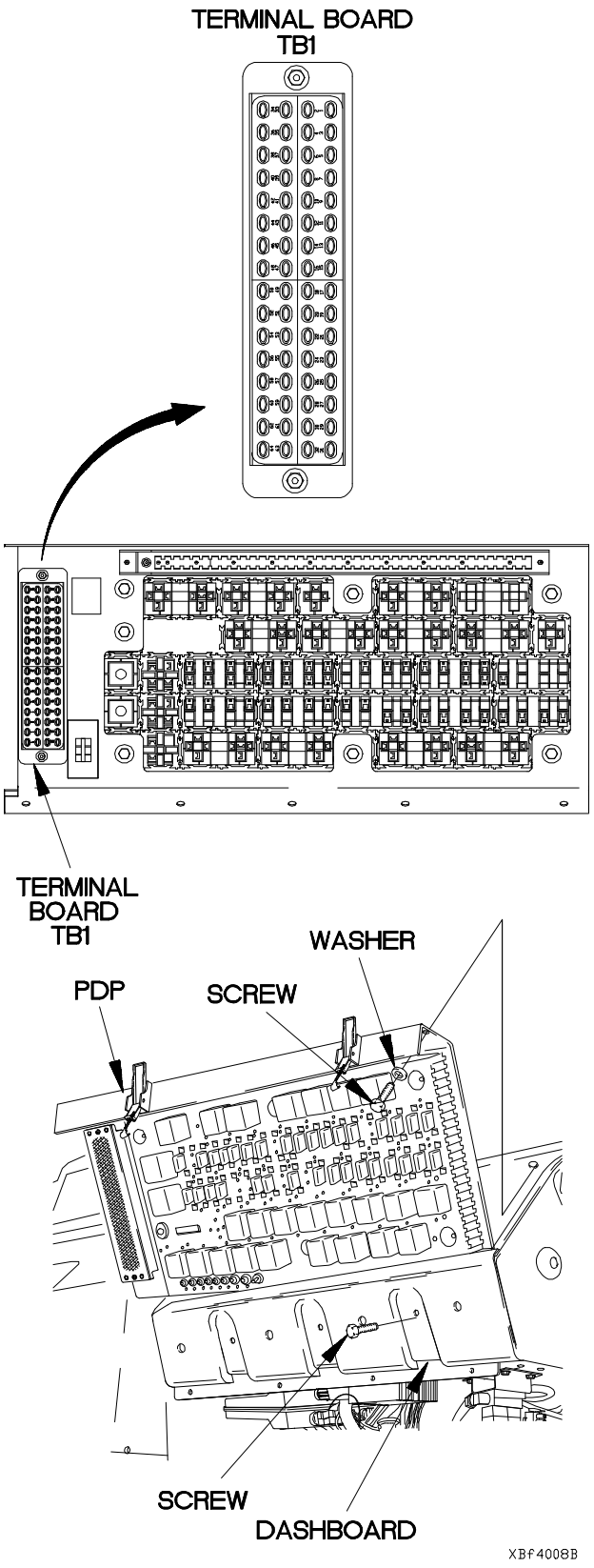


f40. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DOES NOT ILLUMINATE (CONT)

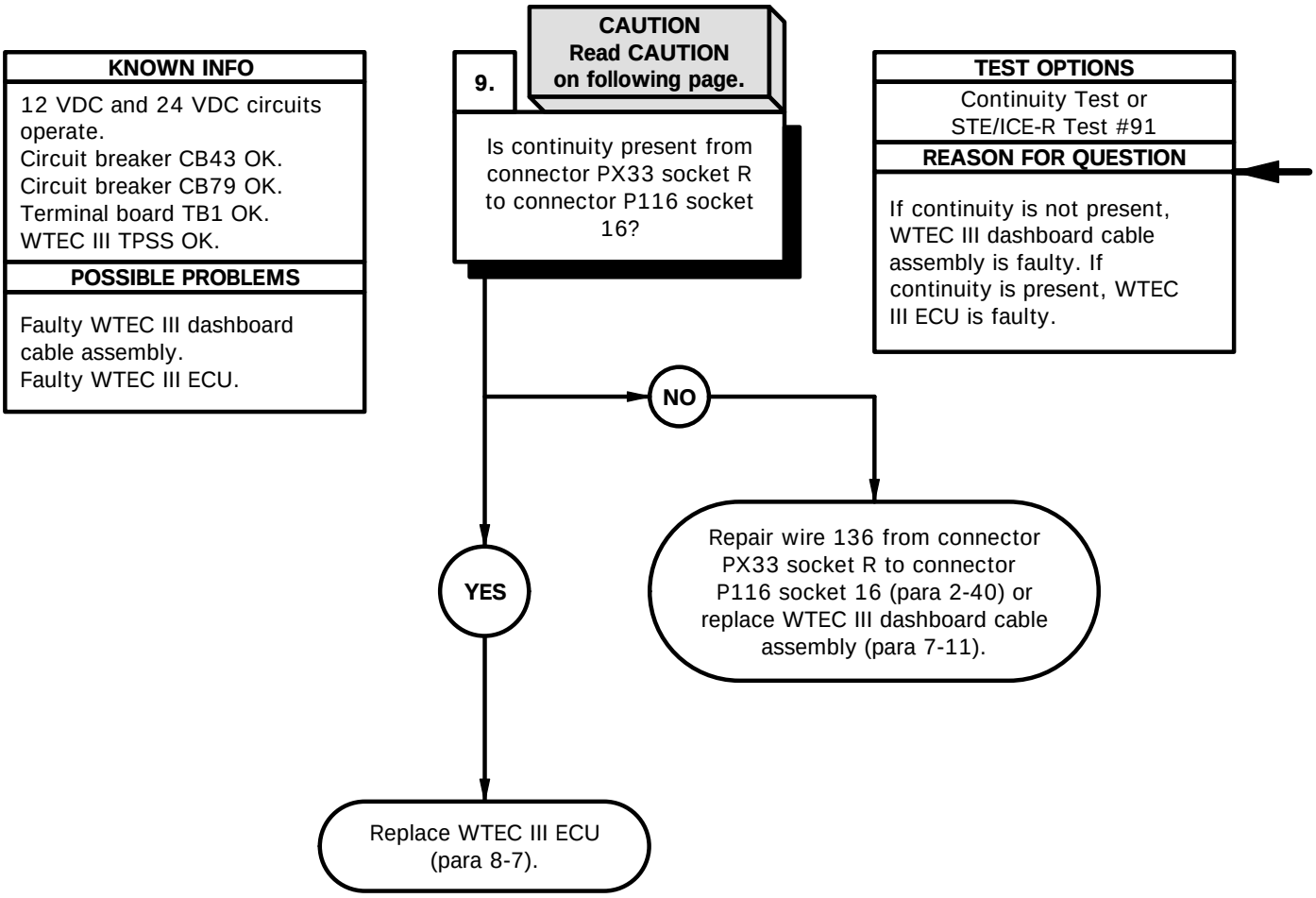


CONTINUITY TEST

(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 2-40) 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 7-48).



f40. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DOES NOT ILLUMINATE (CONT)



CAUTION

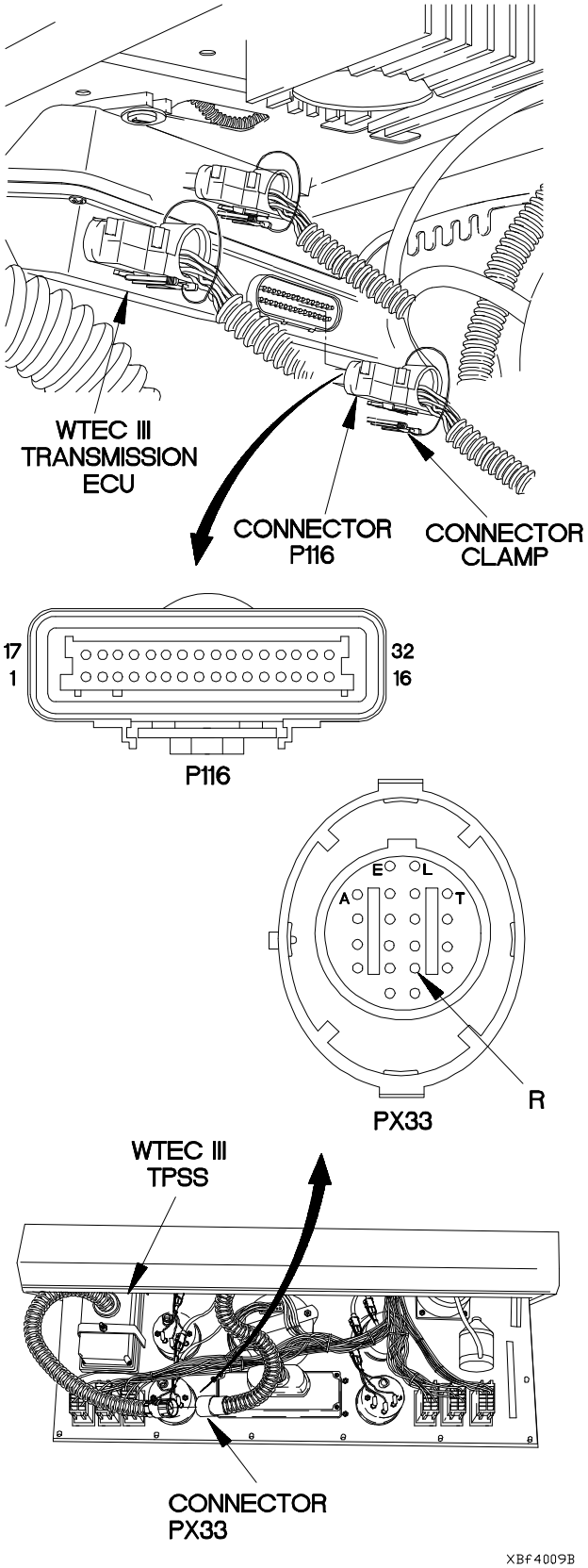
Use care when testing electrical connectors. Do not damage connector pins or sockets with multimeter probes. Failure to comply may result in damage to equipment.

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 2-40) 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 2-44, lists faults for the propeller shafts of the vehicle.

Table 2-44. Propeller Shaft Fault Index

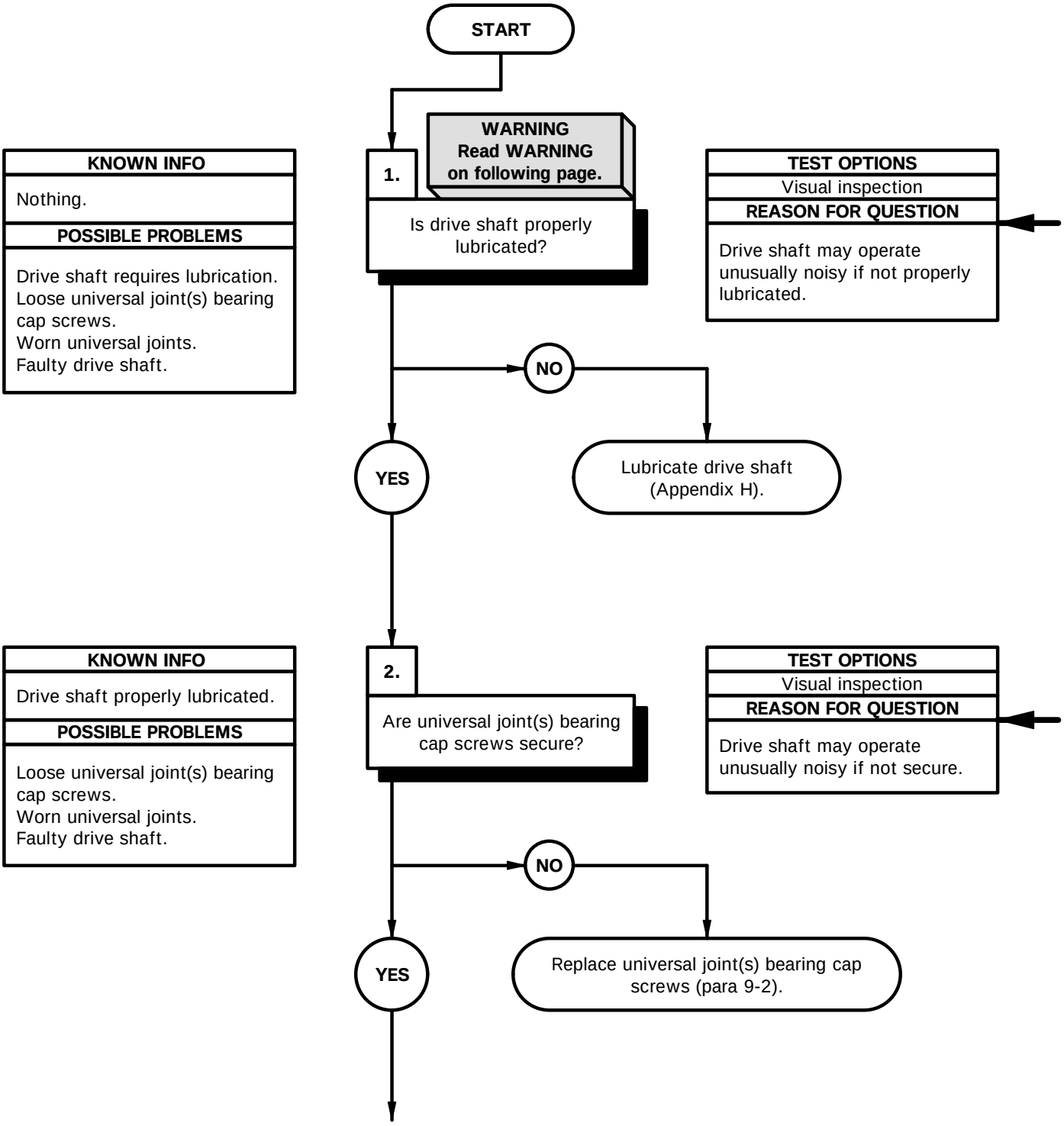
Fault No.	Description	Page
g1.	Drive Shaft or Universal Joint Unusually Noisy When Operating	2-1598

g1. DRIVE SHAFT OR UNIVERSAL JOINT UNUSUALLY NOISY WHEN OPERATING

INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Goggles, Industrial (Item 15, Appendix C)

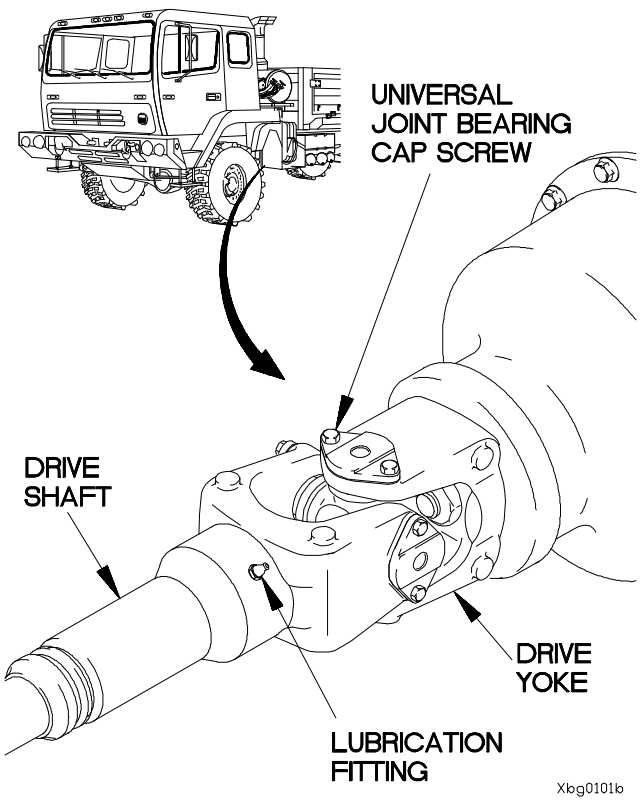


WARNING

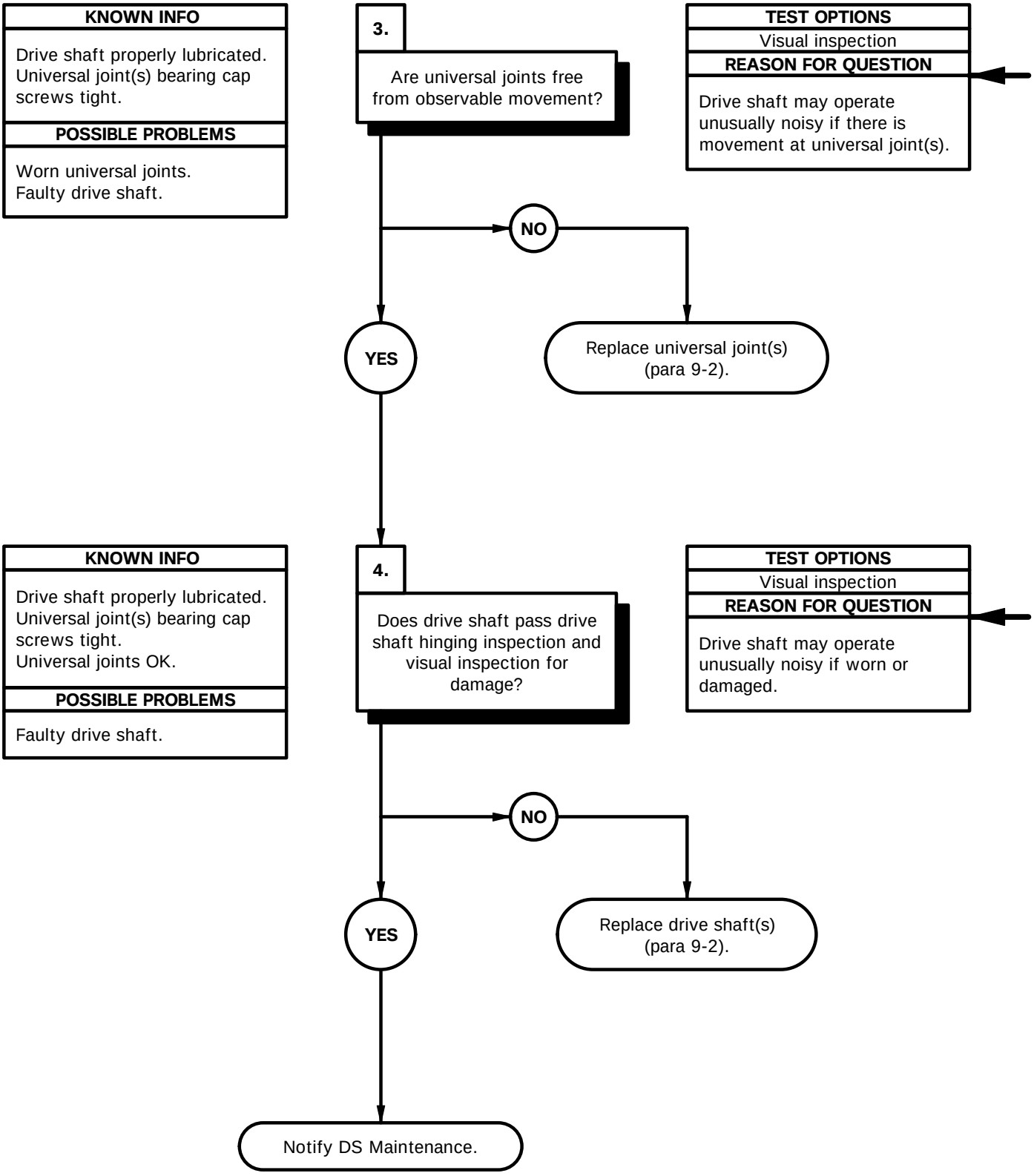
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Lubricate drive shaft lubrication fittings (Appendix H).

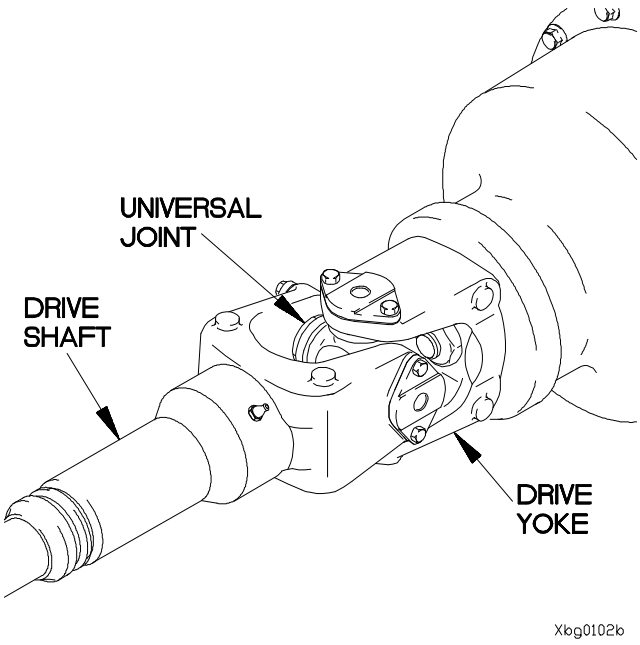
(1) Visually inspect universal joint(s) bearing cap screws for tightness.
(2) Replace any screw(s) that appears to be loose (para 9-2).



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(s) (para 9-2).



(1) Perform drive shaft hinging inspection (para 9-3).
(2) Visually inspect drive shaft for damaged slip yoke, bent/dented tubing, or missing balance weights.
(3) If drive shaft does not pass hinging inspection or visual inspection, replace drive shaft (para 9-2).

2-19. POWER TAKE OFF (PTO) TROUBLESHOOTING

This paragraph covers Power Take Off (PTO) Troubleshooting. The PTO Fault Index, Table 2-45, lists faults for the PTO of the vehicle.

Table 2-45. PTO Fault Index

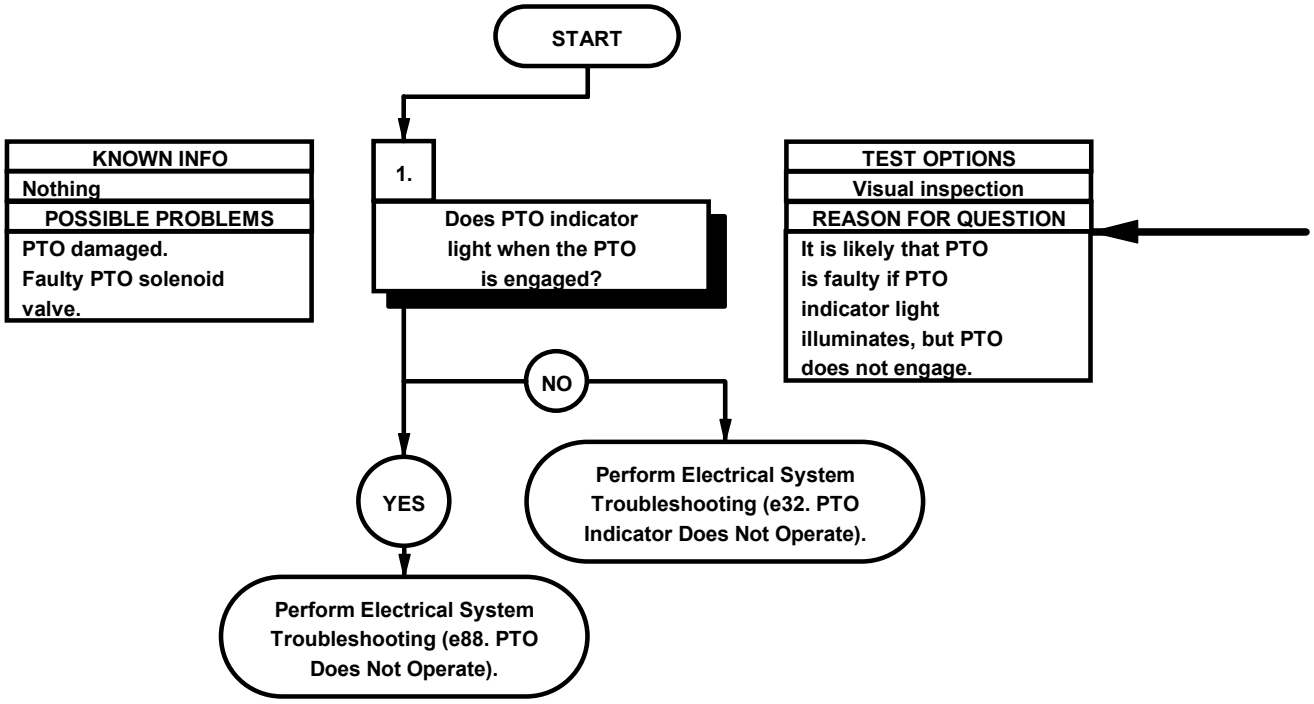
Fault No.	Description	Page
h1.	PTO Does Not Engage	2-1604

h1. PTO DOES NOT ENGAGE

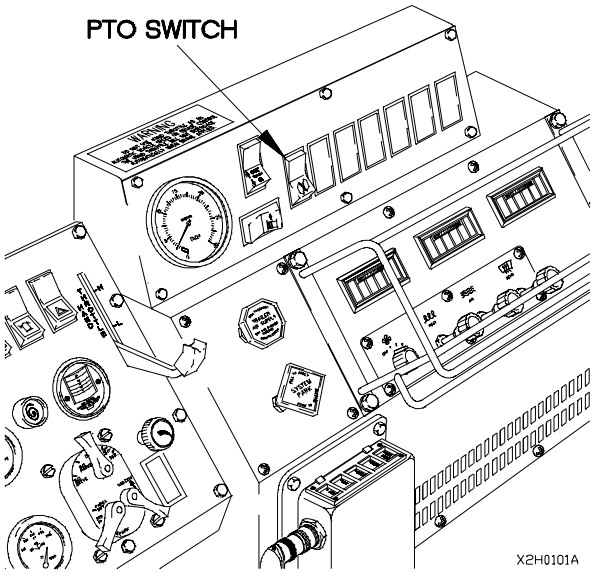
INITIAL SETUP

Equipment Conditions
- Engine running (TM 9-2320-365-10).
- Parking brake on (TM 9-2320-365-10).
- Wheels chocked (TM 9-2320-365-10).

Tools and Special Tools
- Tool Kit, Genl Mech (Item 44, Appendix C)



(1) Engage PTO (TM 9-2320-365-10).
(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 (e88. PTO Does Not Operate).
(5) Disengage PTO (TM 9-2320-365-10).
(6) Shut down engine (TM 9-2320-365-10).



2-20. BRAKE SYSTEM TROUBLESHOOTING

This paragraph covers Brake System Troubleshooting. The Brake System Fault Index, Table 2-46, lists faults for the Brake System of the vehicle.

Table 2-46. Brake System Fault Index

Fault No.	Description	Page
i1.	Excessive Braking Distance	2-1608
i2.	Rear Brakes Do Not Apply	2-1620
i3.	Parking Brake Does Not Release	2-1644
i4.	Front Brakes Overheat and/or Do Not Release	2-1670
i5.	Vehicle Brakes Unevenly, Brakes Pull To One Side or Grab	2-1676
i6.	Front Brakes Do Not Apply	2-1690
i7.	Rear Brakes Overheat	2-1700
i8.	Parking Brake Does Not Apply	2-1708
i9.	Brake System Loses Air When Service Brakes Are Applied	2-1712

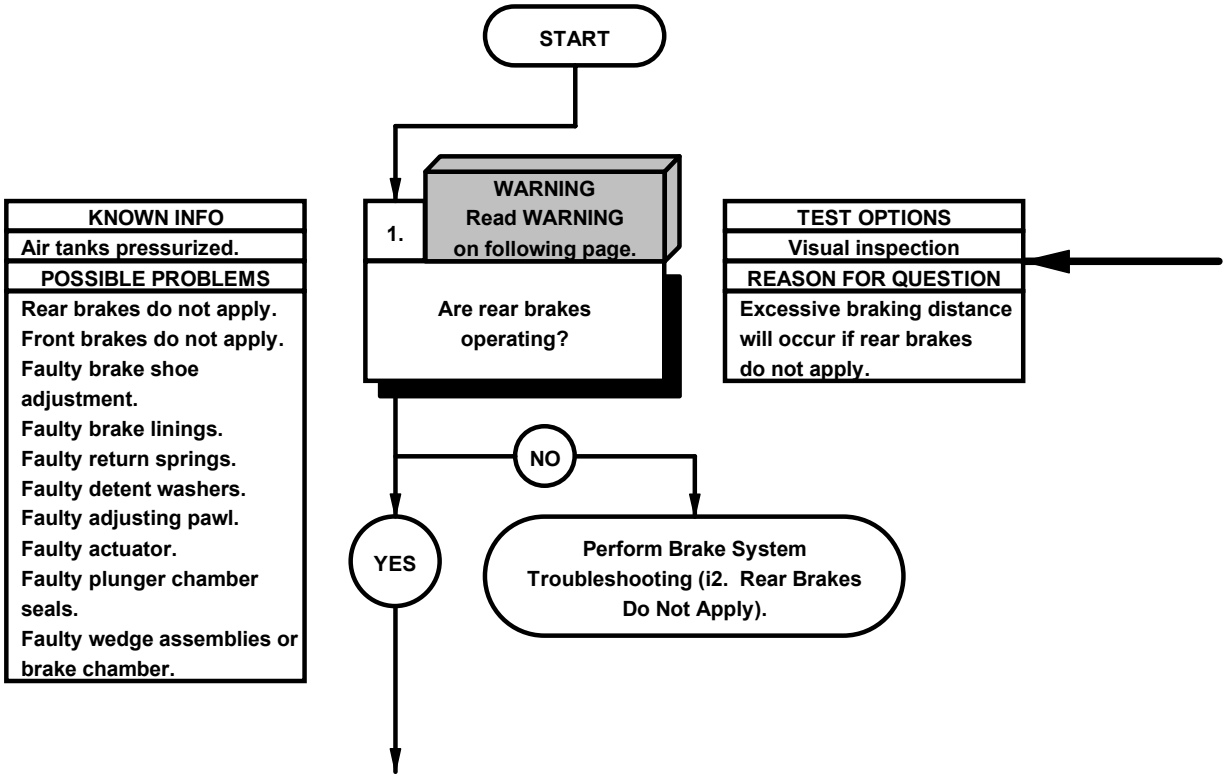
i1. EXCESSIVE BRAKING DISTANCE

INITIAL SETUP

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

Personnel Required
(2)

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Jack, Hydraulic, Hand (Item 21, Appendix C)
Trestle, Motor Vehicle Maintenance (2) (Item 45, Appendix C)
Tool, Spring Removal (Item 83, Appendix B)

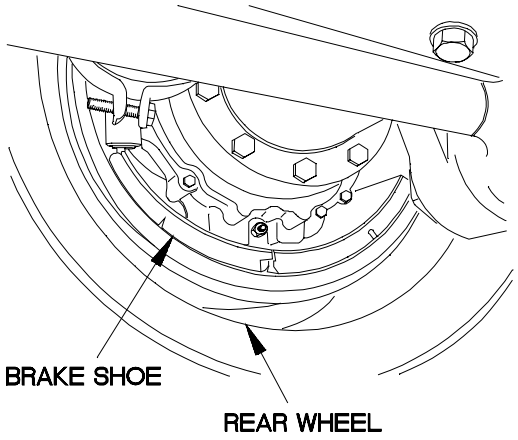


WARNING

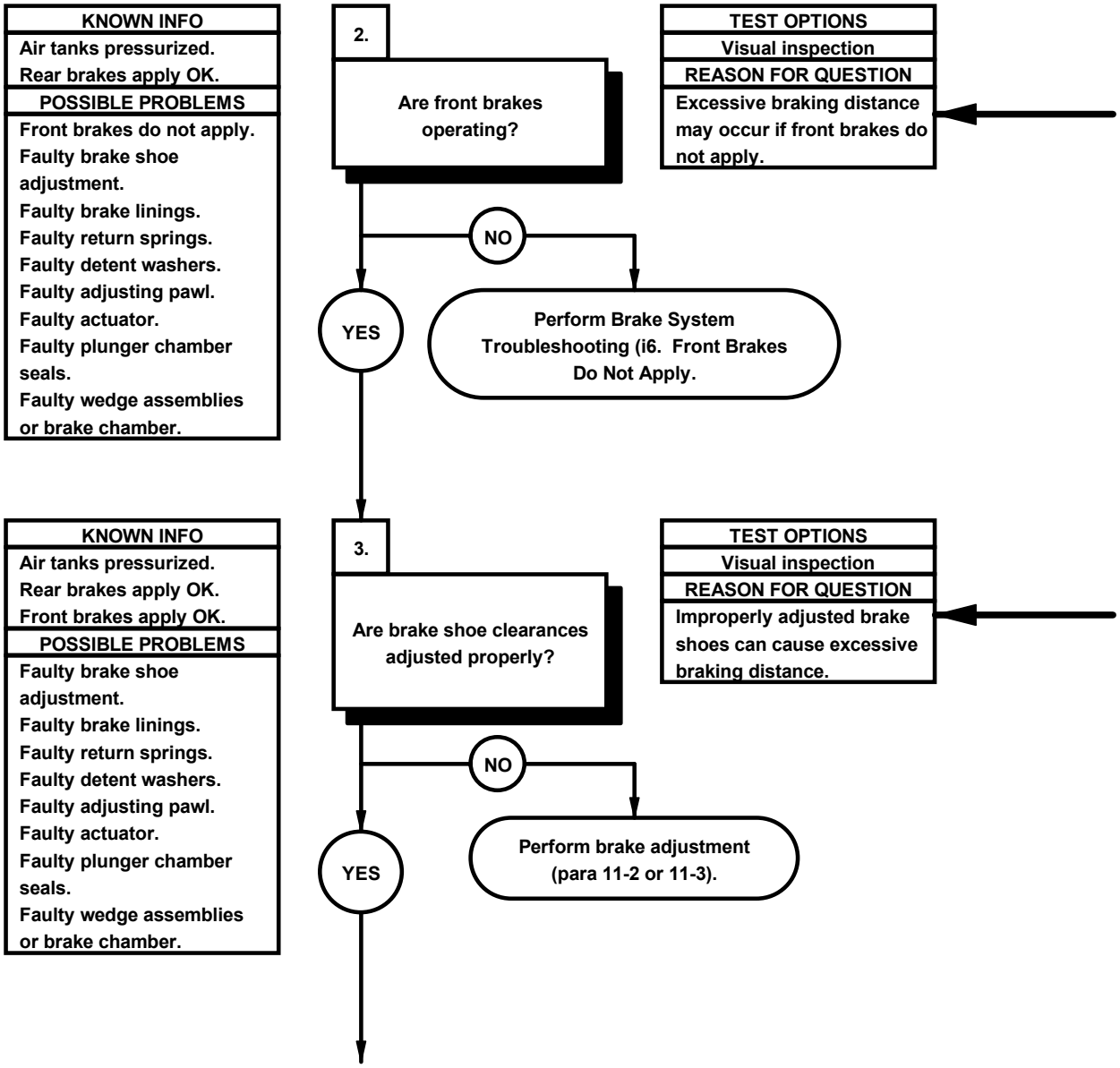
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

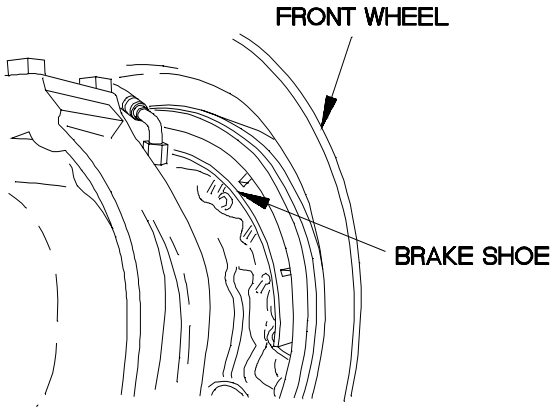
(1) Apply brakes and observe operation of brake shoes at all rear wheels.

(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).

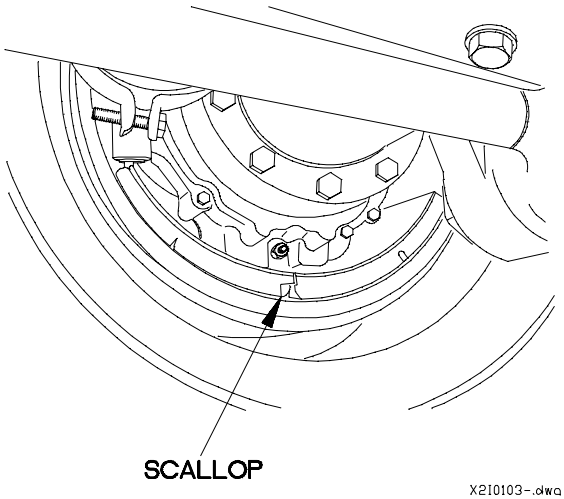
(1) Jack up axle with affected brakes and support with trestles.
(2) Make periodic brake applications to position floating shoes.

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.

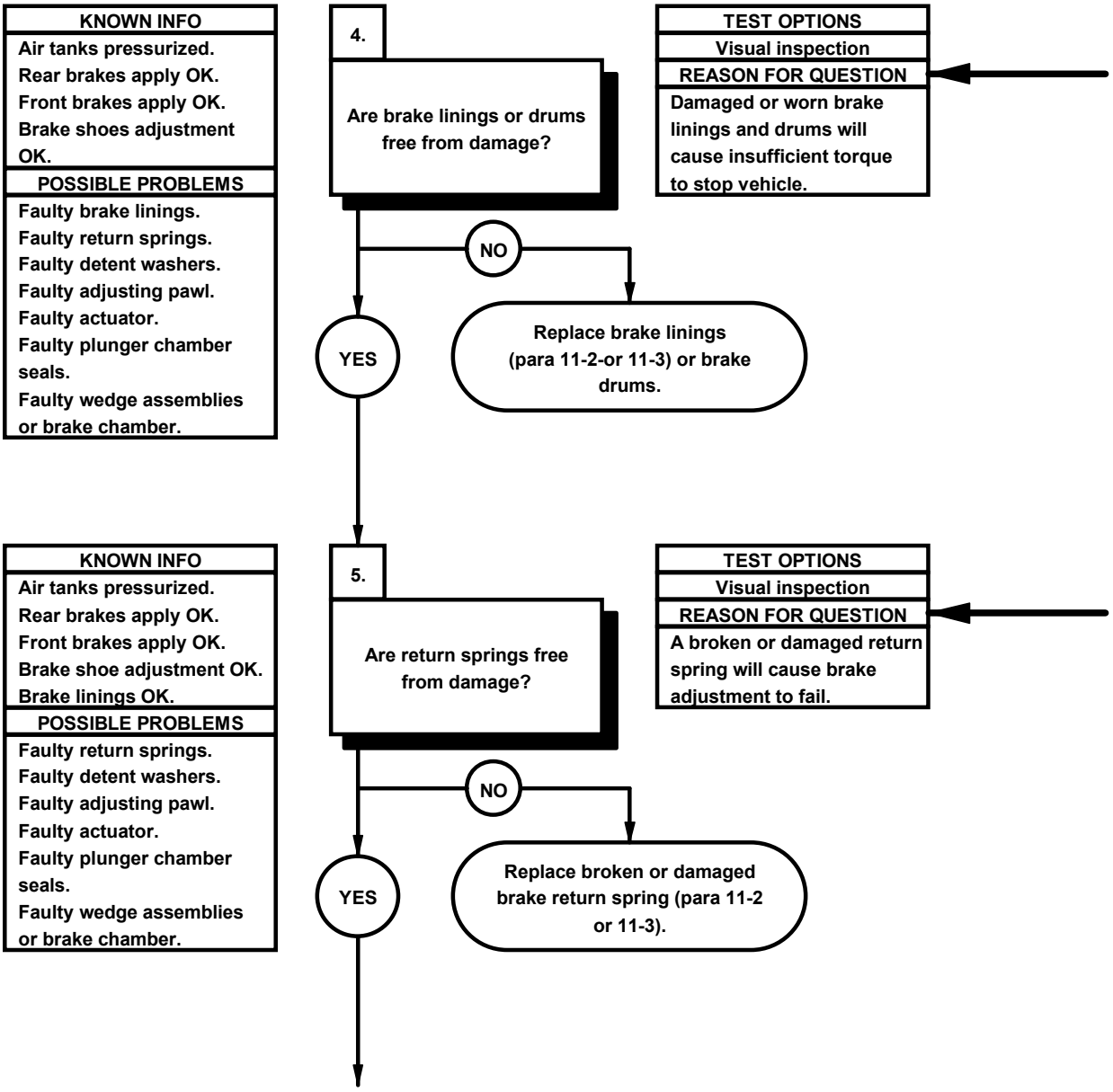
(3) Measure shoe clearance checking along centerline of shoe at scallop. Rotate wheel during check.
(4) If clearance is not between .020" and .040", adjust brakes (para 11-2 or 11-3).

X210102-

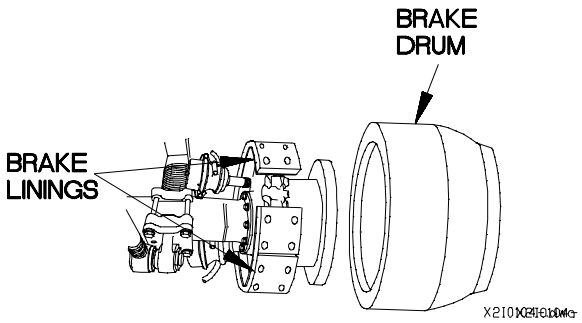


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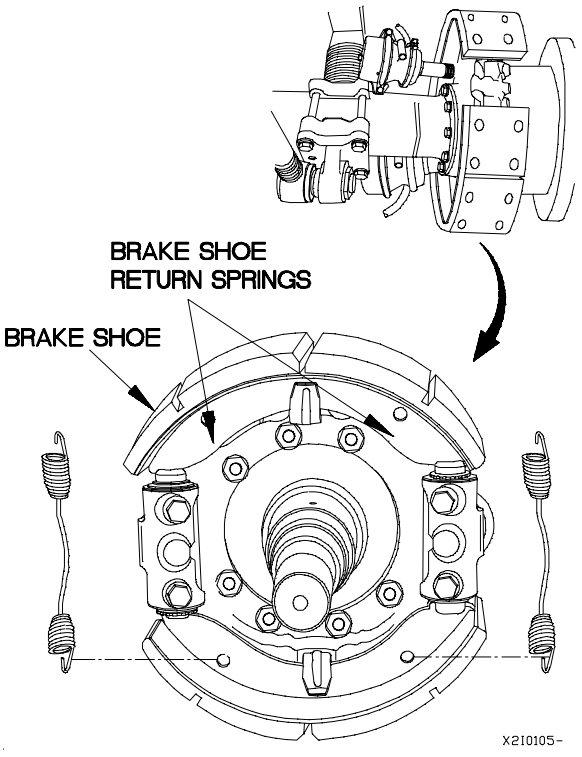
i1. EXCESSIVE BRAKING DISTANCE (CONT)



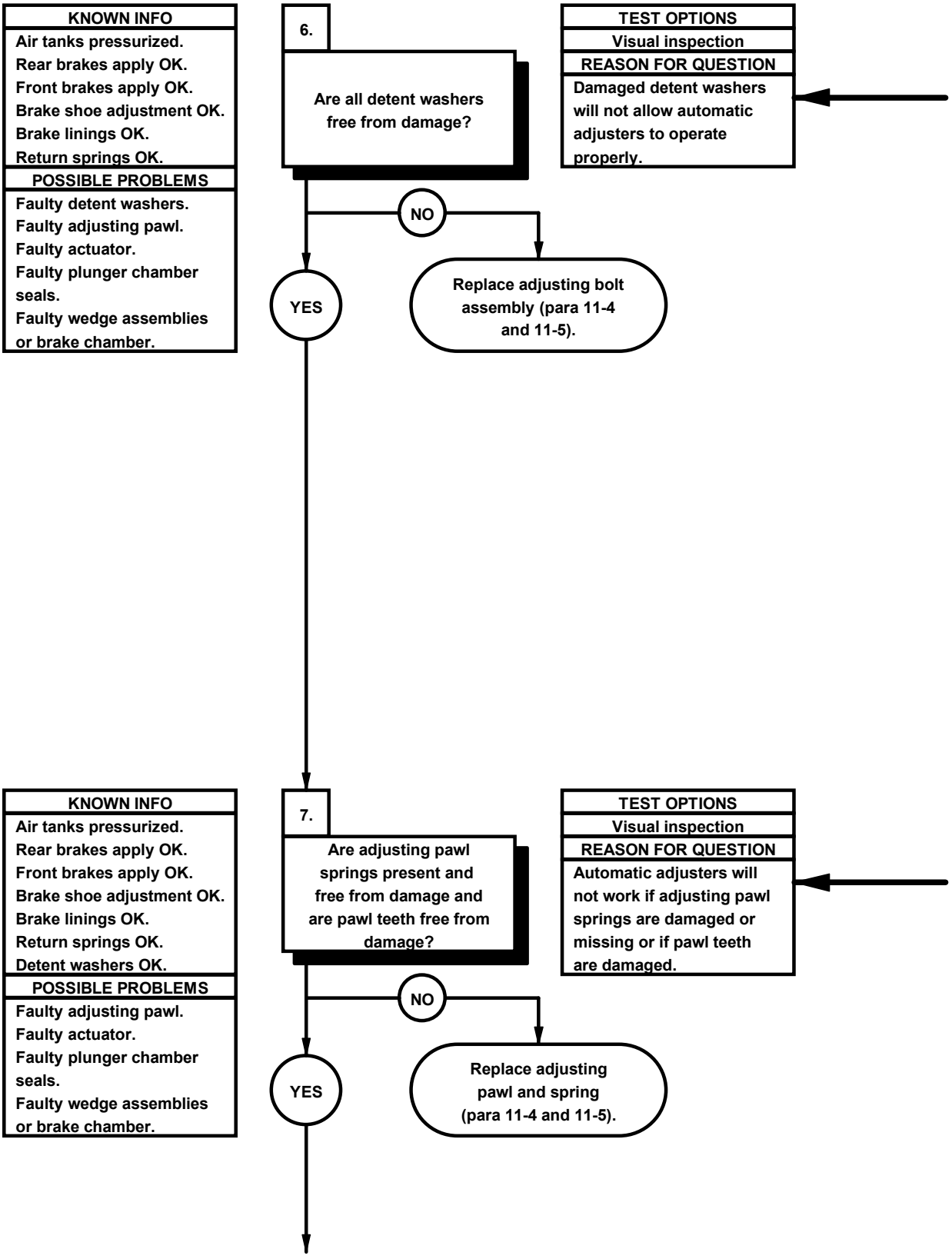
(1) Remove lugnuts and lift off wheel.
(2) Slide brake drum off axle.
(3) Inspect brake linings for worn, glazed, damaged condition, or contamination (para 11-2).
(4) Inspect brake drum for, out of round, scoring, pitting, heat cracks, and blue scorch marks.



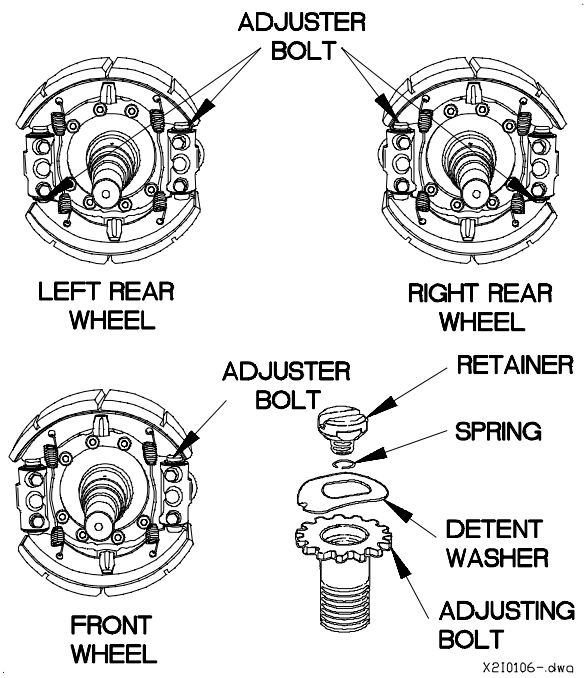
(1) Detach each return spring from brake shoe.
(2) Examine return spring for stretching, bluing, damage or breakage.
(3) If return spring(s) is damaged, replace broken or damaged return spring (s) (para 11-2 or 11-3).



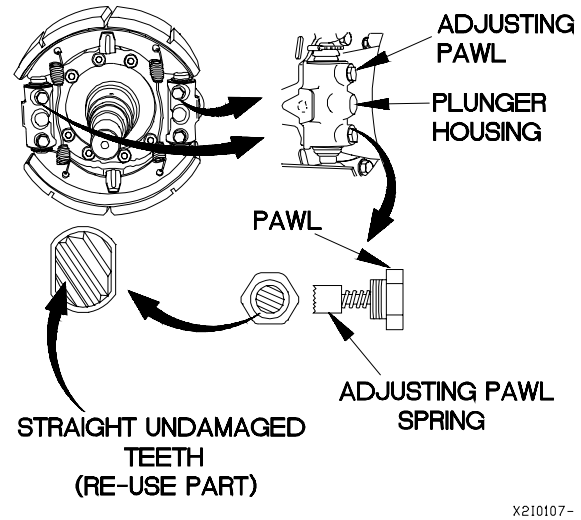
i1. EXCESSIVE BRAKING DISTANCE (CONT)



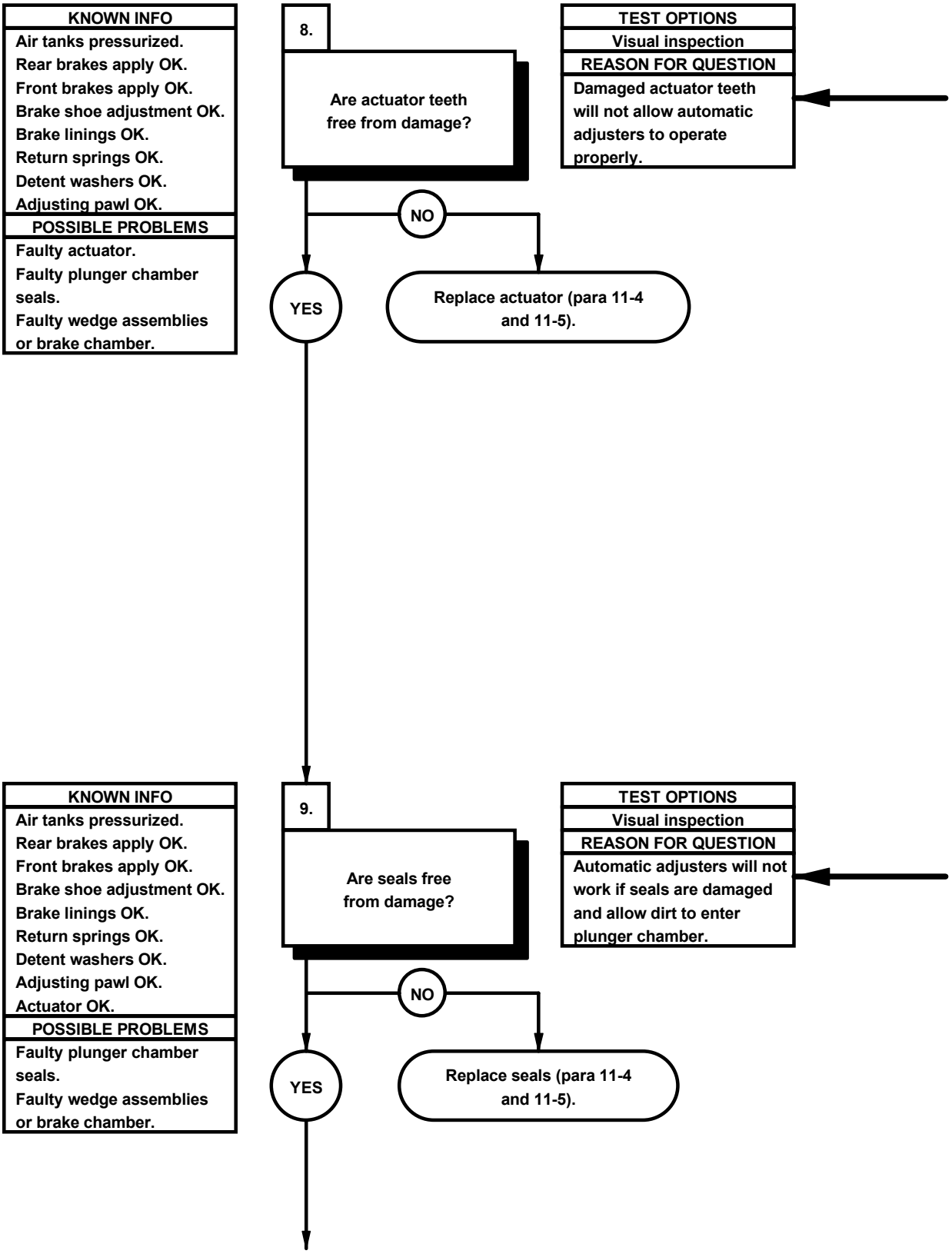
(1) Remove brake shoes from clips on wheel hub.
(2) Screw adjuster bolt out of plunger housing.
(3) Check if detent washer is damaged or broken.
(4) If detent washer is damaged, replace adjusting bolt assembly (para 11-4 or 11-5).



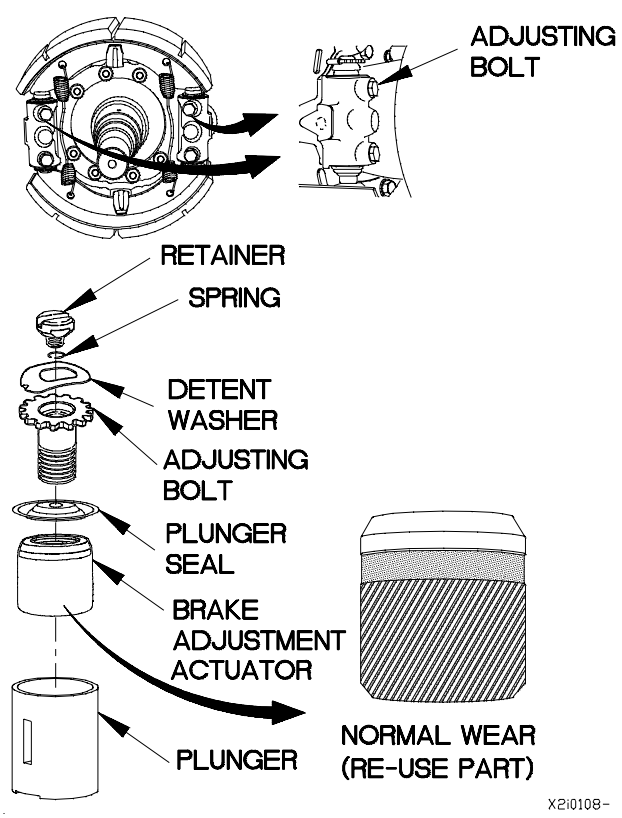
(1) Unscrew adjusting pawl from plunger housing.
(2) Check adjusting pawl springs for damage. Ensure that springs are not missing or broken.
(3) Check adjusting pawl teeth for damage and abrasion.



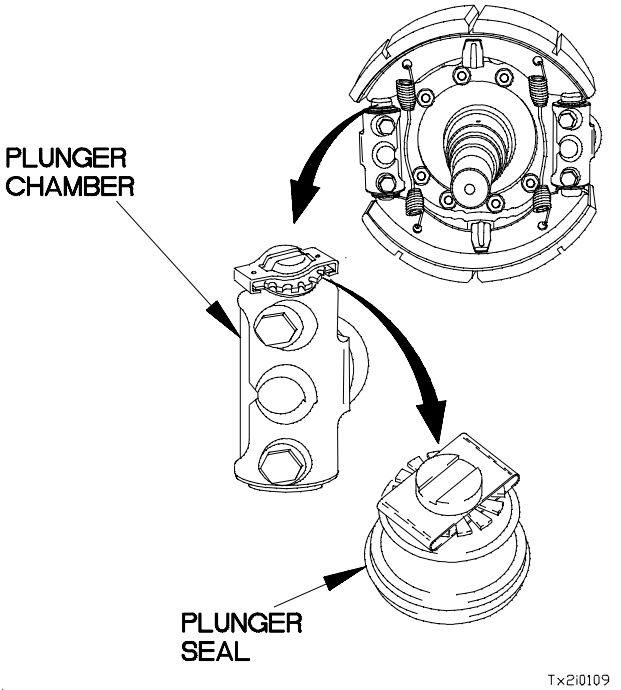
i1. EXCESSIVE BRAKING DISTANCE (CONT)



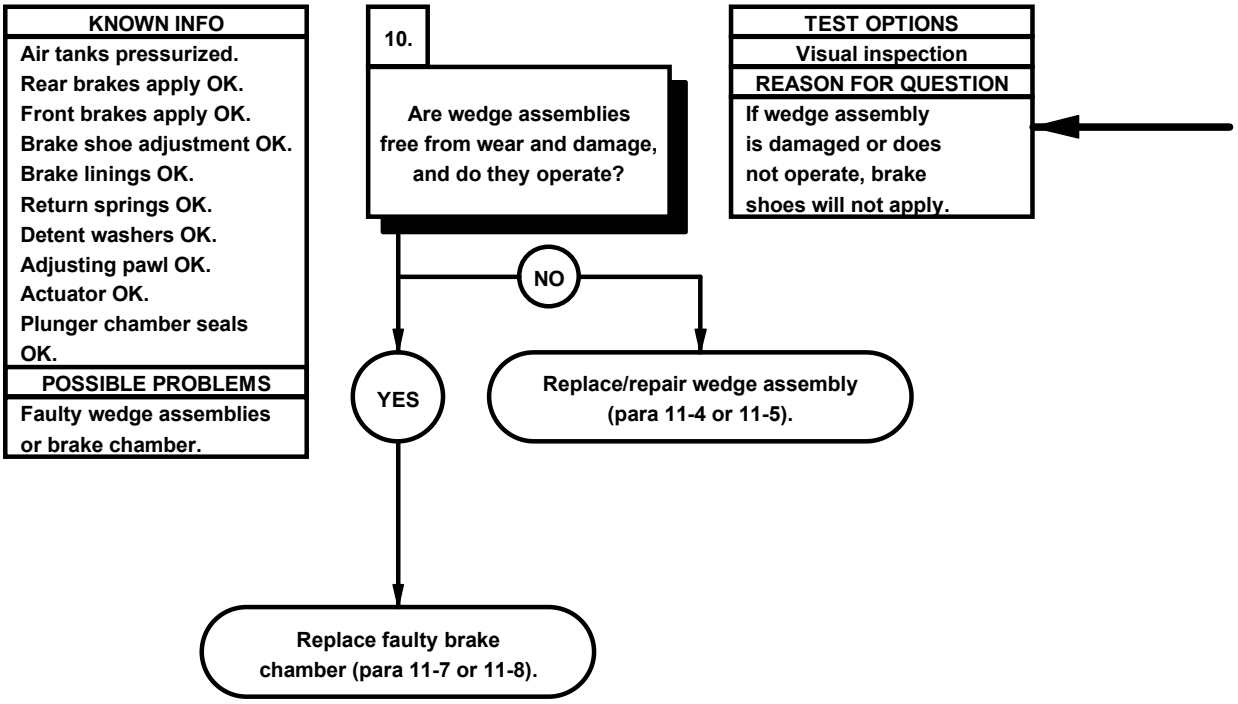
(1) Lift actuator from plunger housing.
(2) Check actuator teeth for damage.



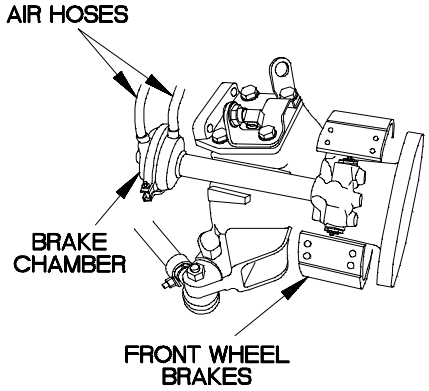
(1) Check that seal elements are not damaged or broken.
(2) A damaged seal may permit dirt to enter plunger chamber and interfere with adjustment.

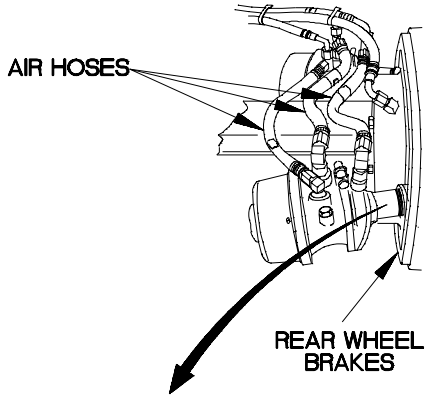


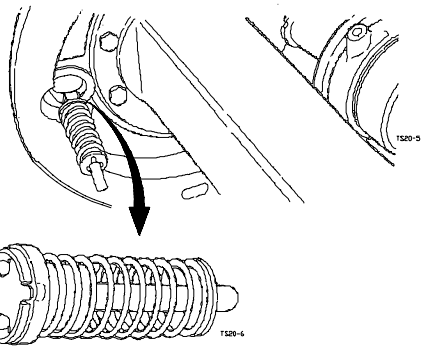
i1. EXCESSIVE BRAKING DISTANCE (CONT)

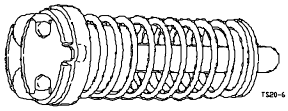


(1) Disconnect and tag air hoses to brake chambers at wheel.
(2) Cage spring brakes on rear wheels (para 11-6).
(3) Unscrew brake chamber(s) from hub.
(4) Remove wedge assembly from wheel.
(5) Inspect wedge spring for damage.
(6) Inspect rollers for flattening or damage.
(7) Manually check operation 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.









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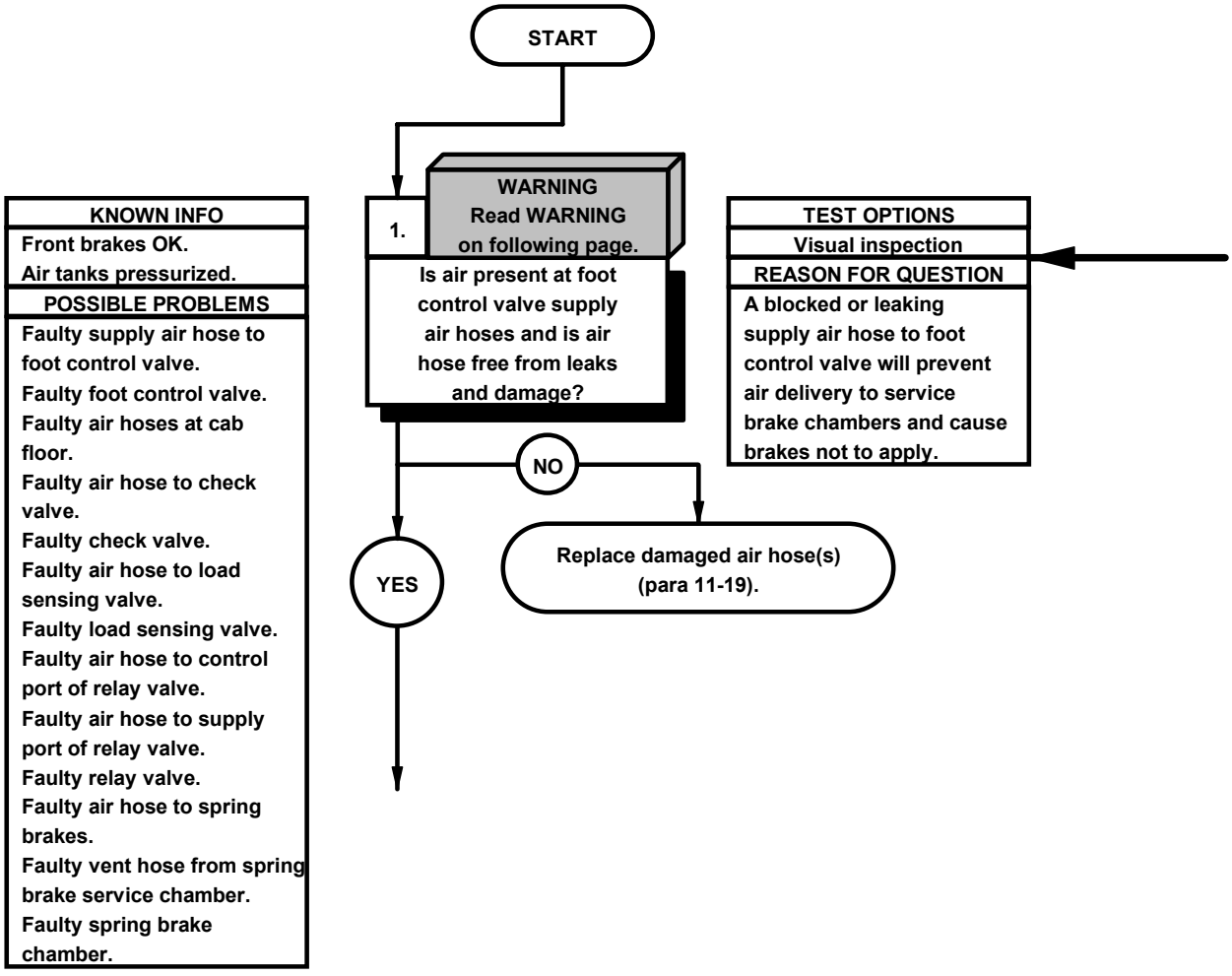
i2. REAR BRAKES DO NOT APPLY

INITIAL SETUP

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

Personnel Required
(2)

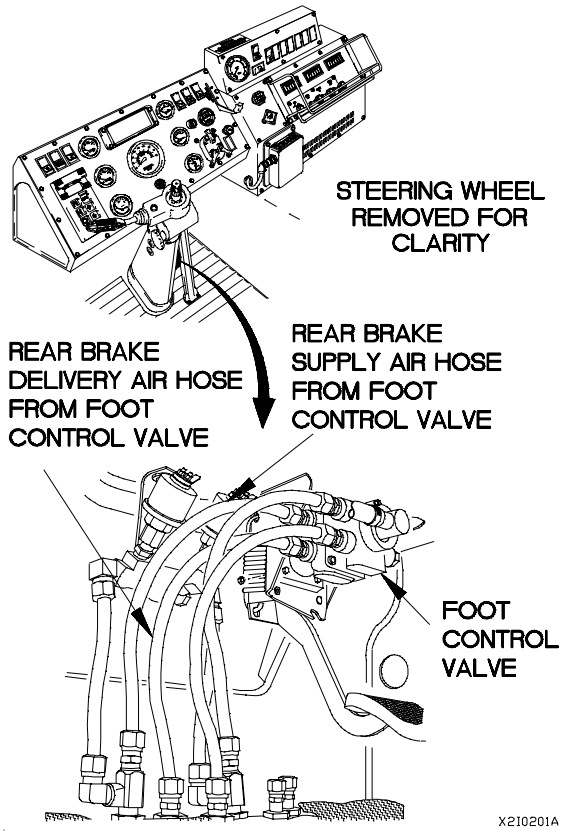
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Goggles, Industrial (Item 15, Appendix C)



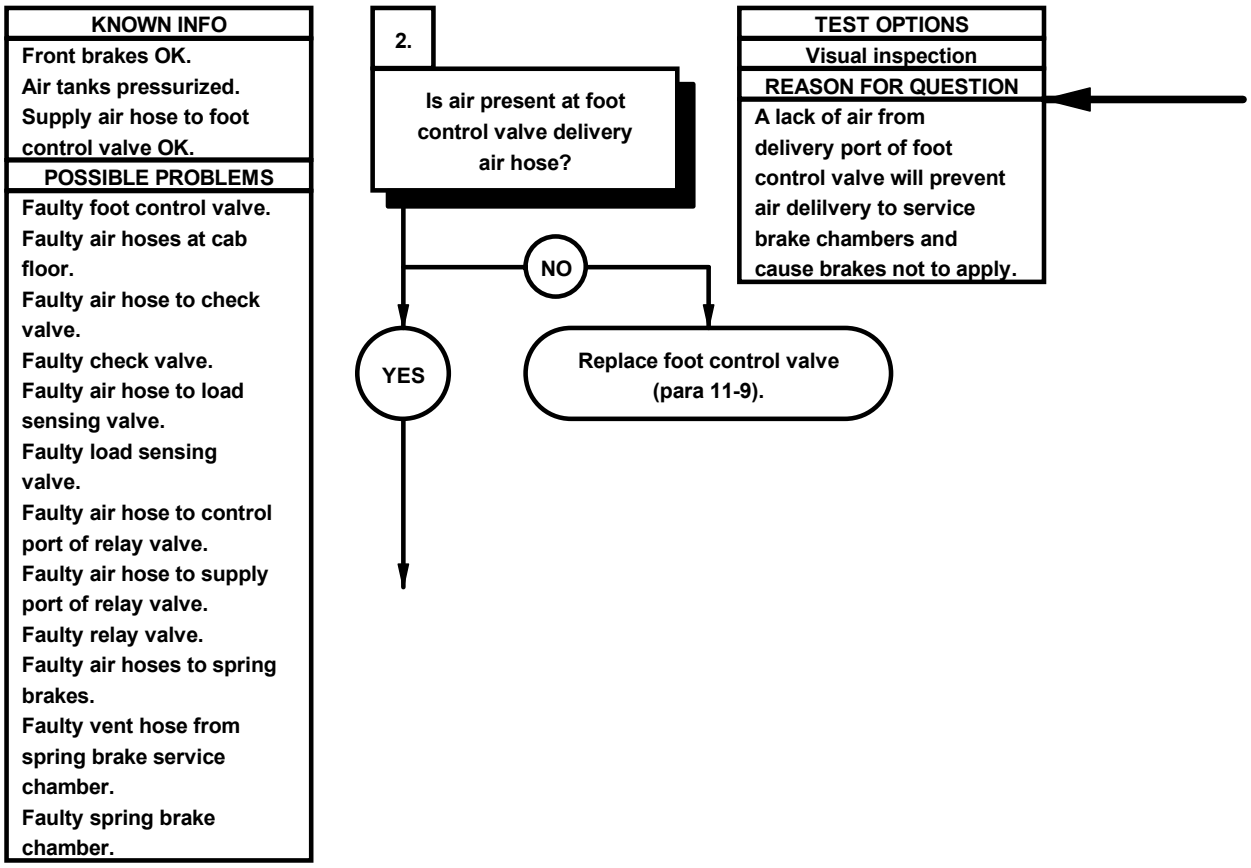
WARNING

- **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.**

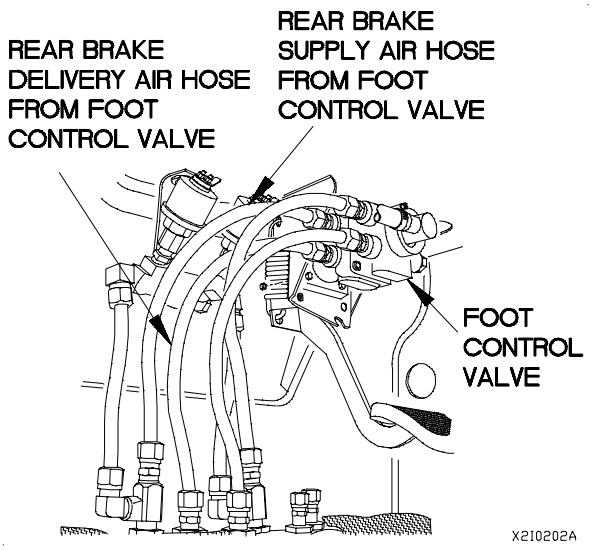
(1) Loosen supply air hose at foot control valve.
(2) Check for presence of air. If no air is present, replace air hose (para 11-19).
(3) Tighten supply air hose to foot control valve.



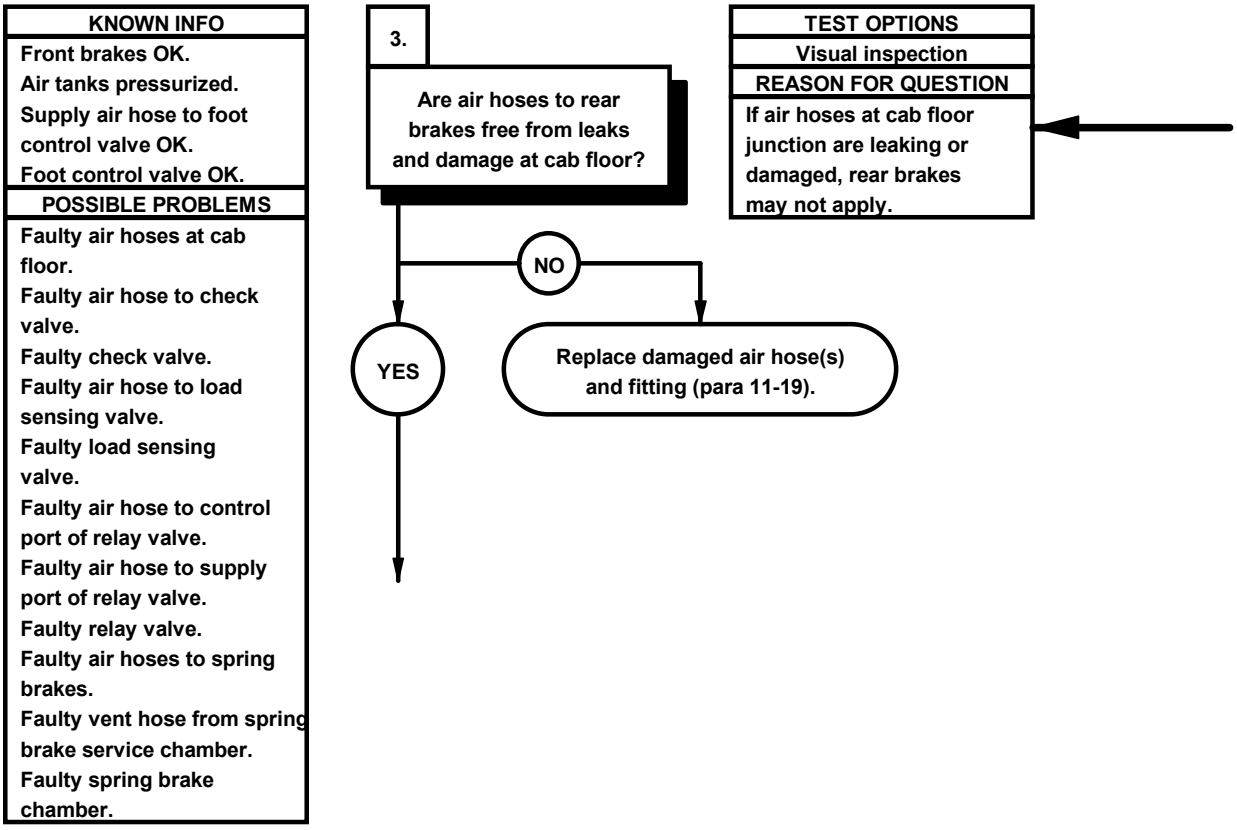
i2. REAR BRAKES DO NOT APPLY (CONT)



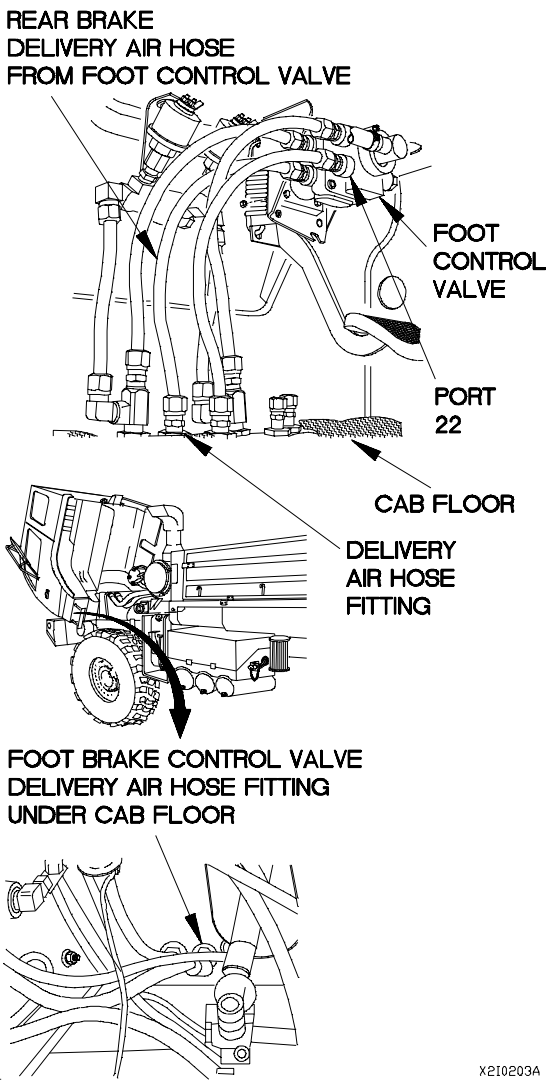
(1) Loosen delivery air hose at foot control valve.
(2) Apply brake and check for presence of air.
(3) If no air is present, replace foot control valve (para 11-9).
(3) Tighten delivery air hose on foot control valve.



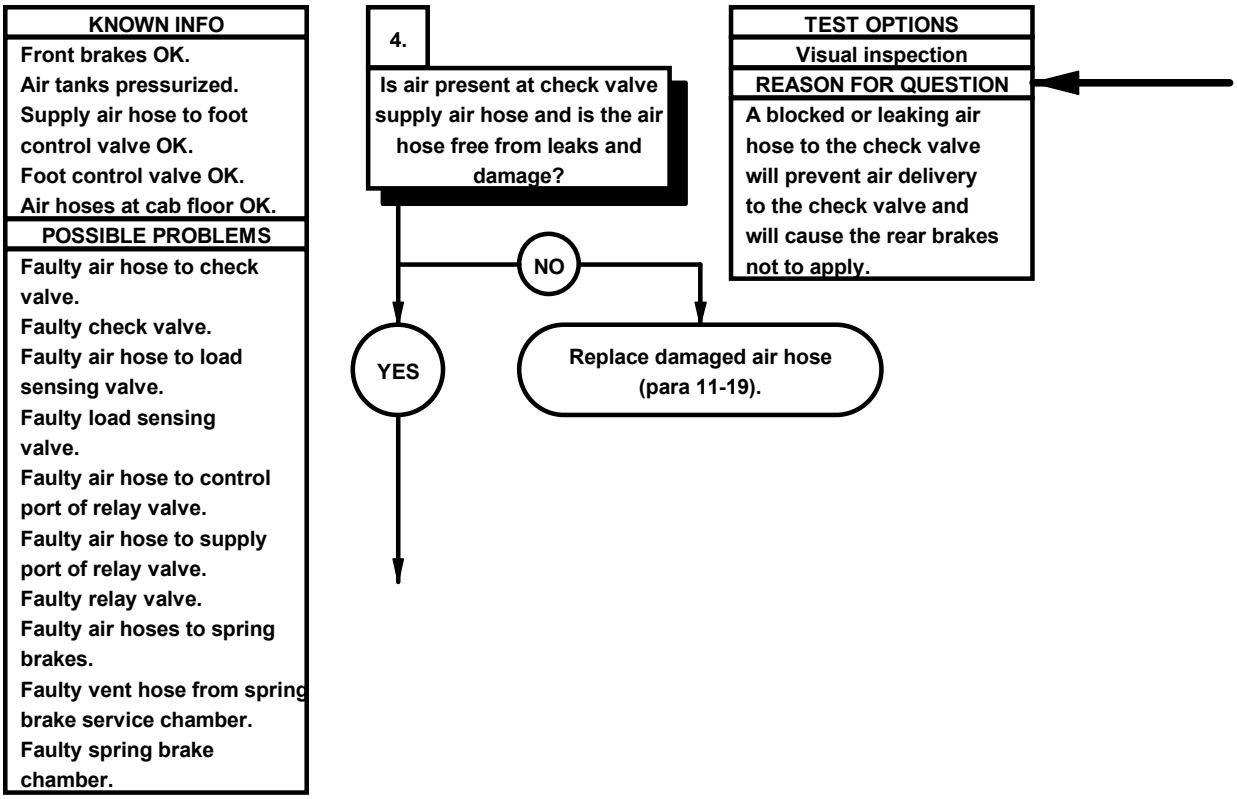
i2. REAR BRAKES DO NOT APPLY (CONT)



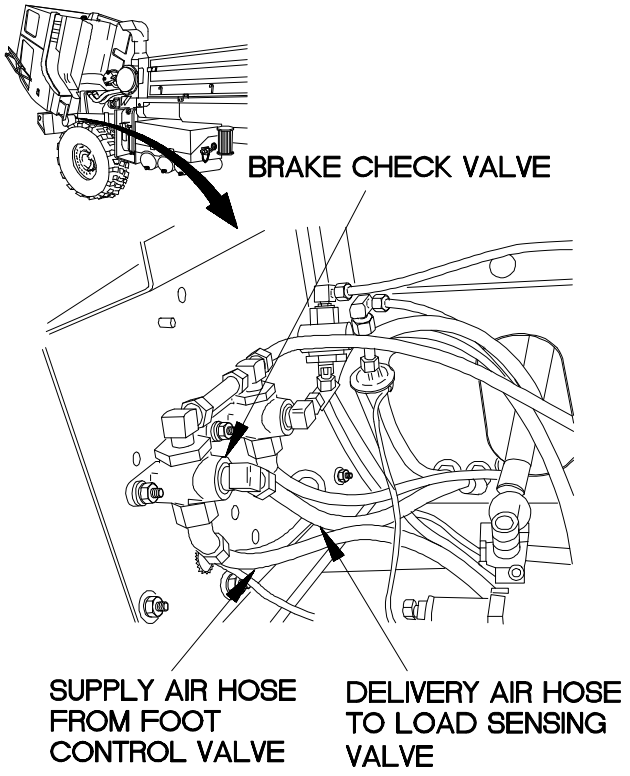
(1) Loosen delivery air hose at cab floor.
(2) Apply brakes.
(3) Check for presence of air from air hose when brake is applied.
(4) If no air is present, replace air hose (para 11-19).
(5) Tighten air hose at cab floor.
(6) Raise cab (TM 9-2320-365-10).
(7) Loosen delivery air hose under cab floor.
(8) 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 11-19).
(11) Tighten air hose and fitting.



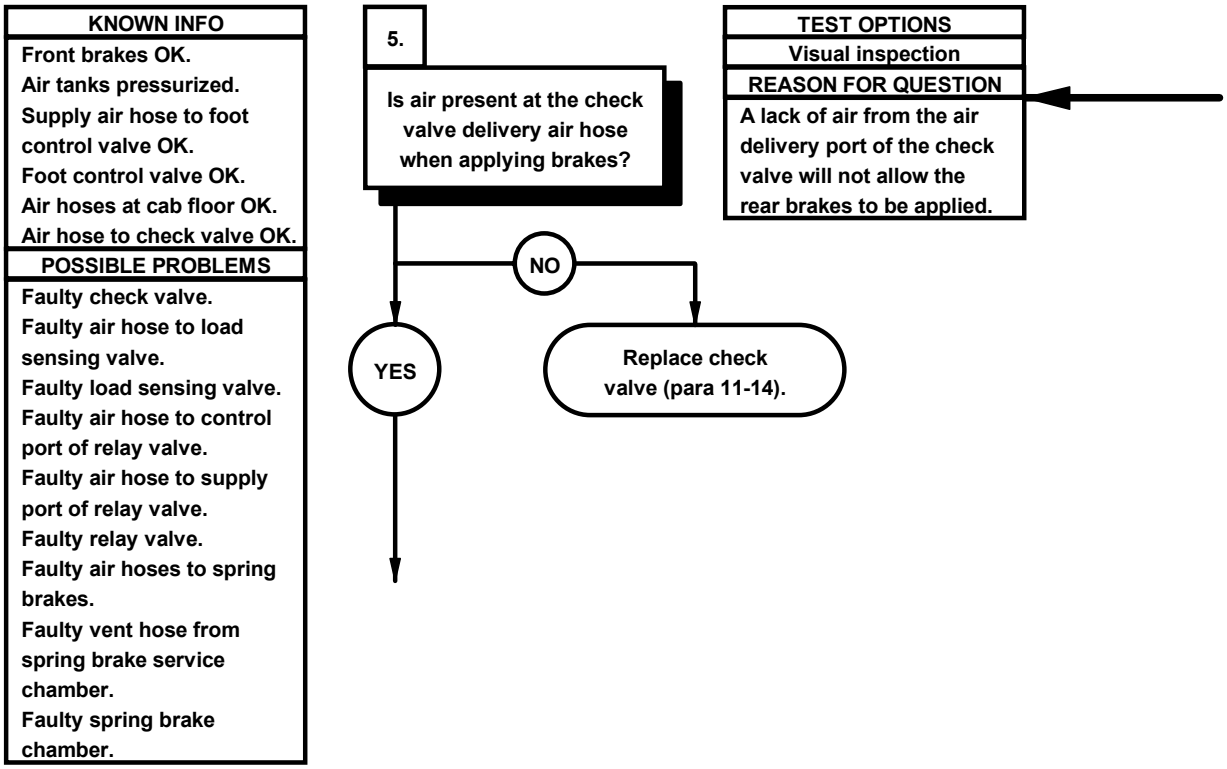
i2. REAR BRAKES DO NOT APPLY (CONT)



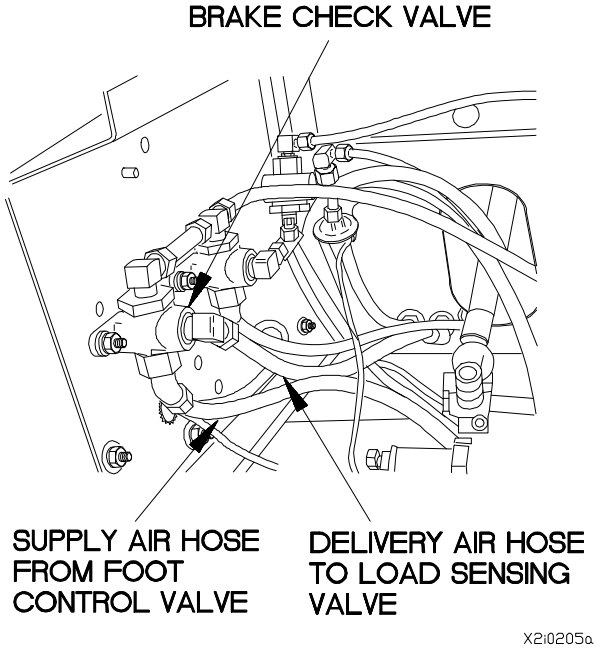
(1) Loosen supply air hose at check valve.
(2) Apply brakes.
(3) Check for presence of air at air hose when brake is applied.
(4) If no air is present, replace air hose (para 11-19).
(5) Tighten air hose at supply port of check valve.



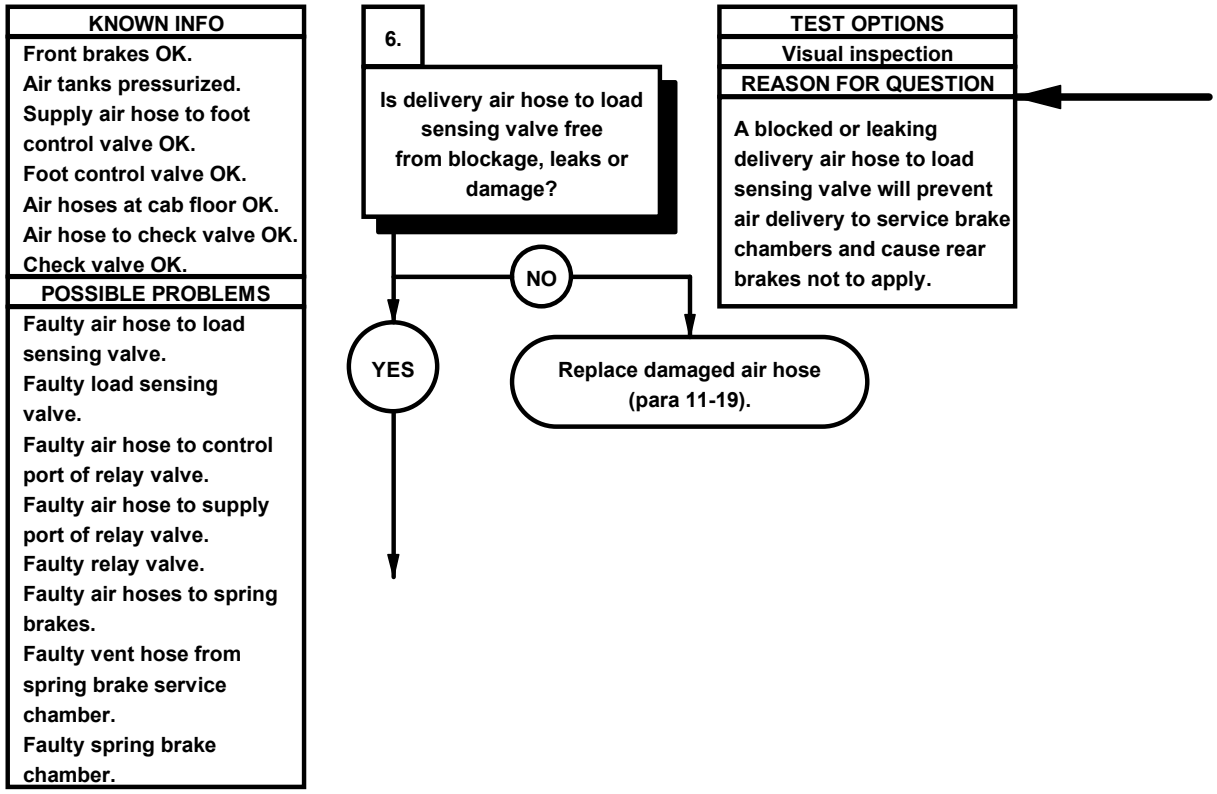
i2. REAR BRAKES DO NOT APPLY (CONT)



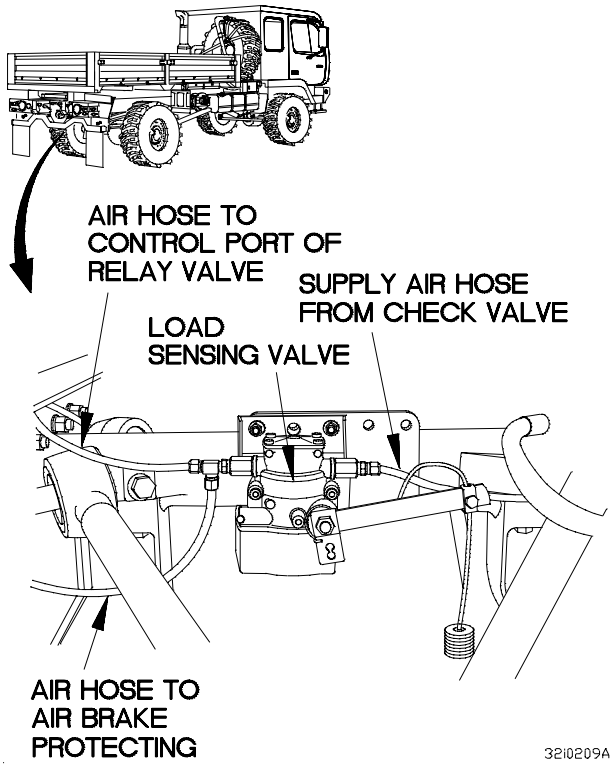
(1) Loosen delivery air hose on check valve.
(2) Apply brakes.
(3) Check for presence of air from air hose when brake is applied.
(4) If no air is present, replace check valve (para 11-14).
(5) Tighten delivery air hose on check valve.



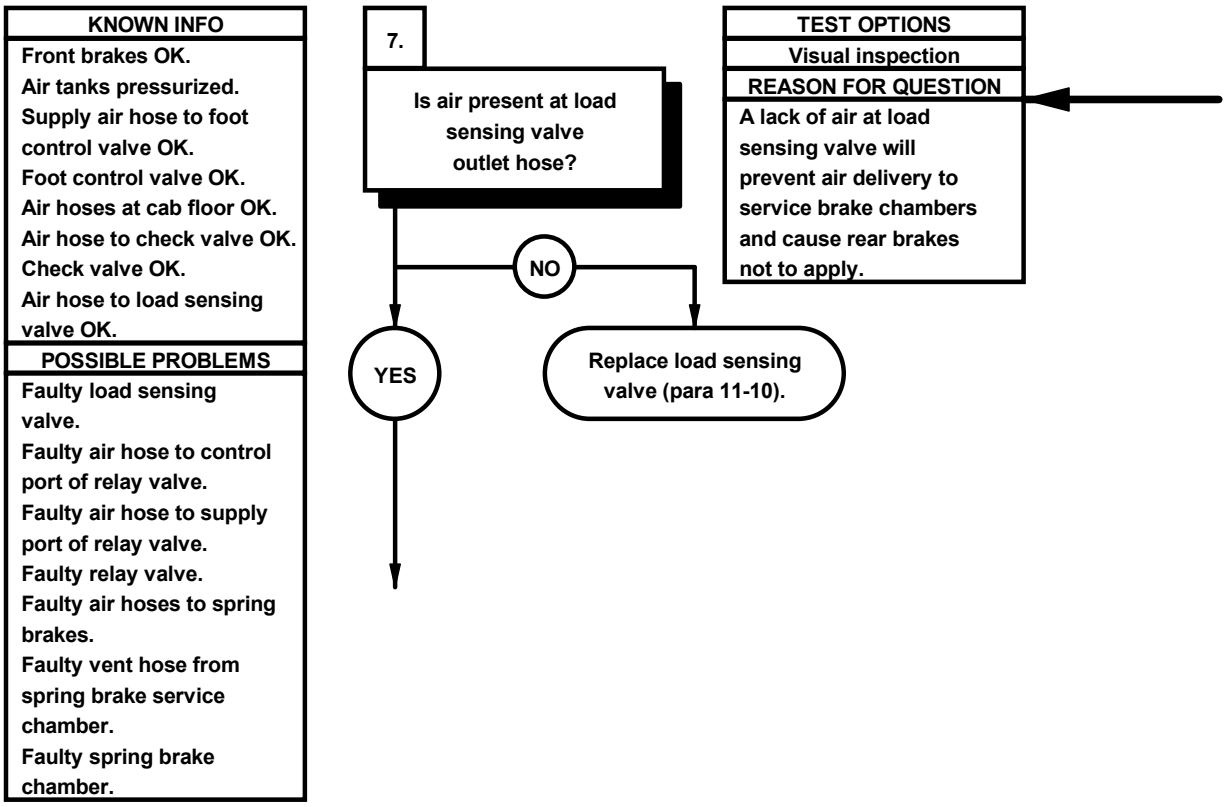
i2. REAR BRAKES DO NOT APPLY (CONT)



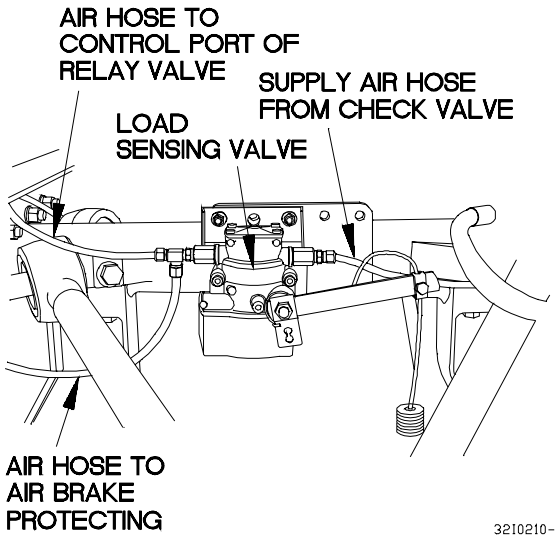
(1) Loosen delivery air hose at load sensing valve.
(2) Apply brakes.
(3) Check for presence of air.
(4) If no air is present, replace air hose (para 11-19).
(5) Tighten delivery air hose on load sensing valve.



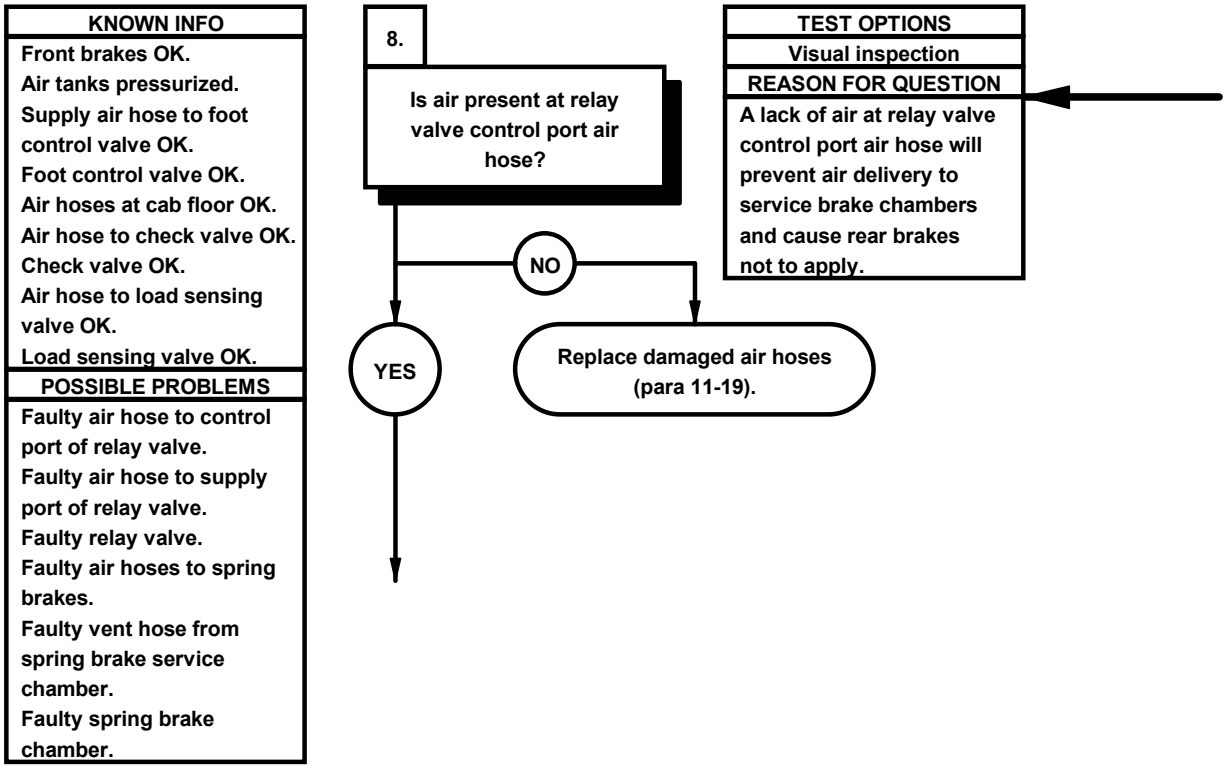
i2. REAR BRAKES DO NOT APPLY (CONT)



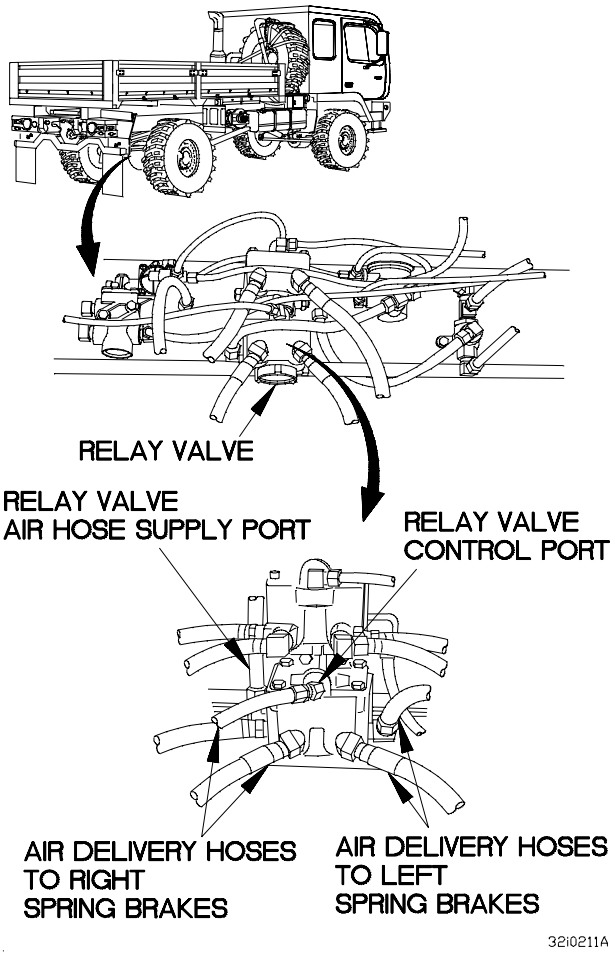
(1) Loosen outlet air hose at load sensing valve.
(2) Apply brakes.
(3) Check for presence of air.
(4) If no air is present, replace load sensing valve (para 11-10).
(5) Tighten outlet air hose on load sensing valve.



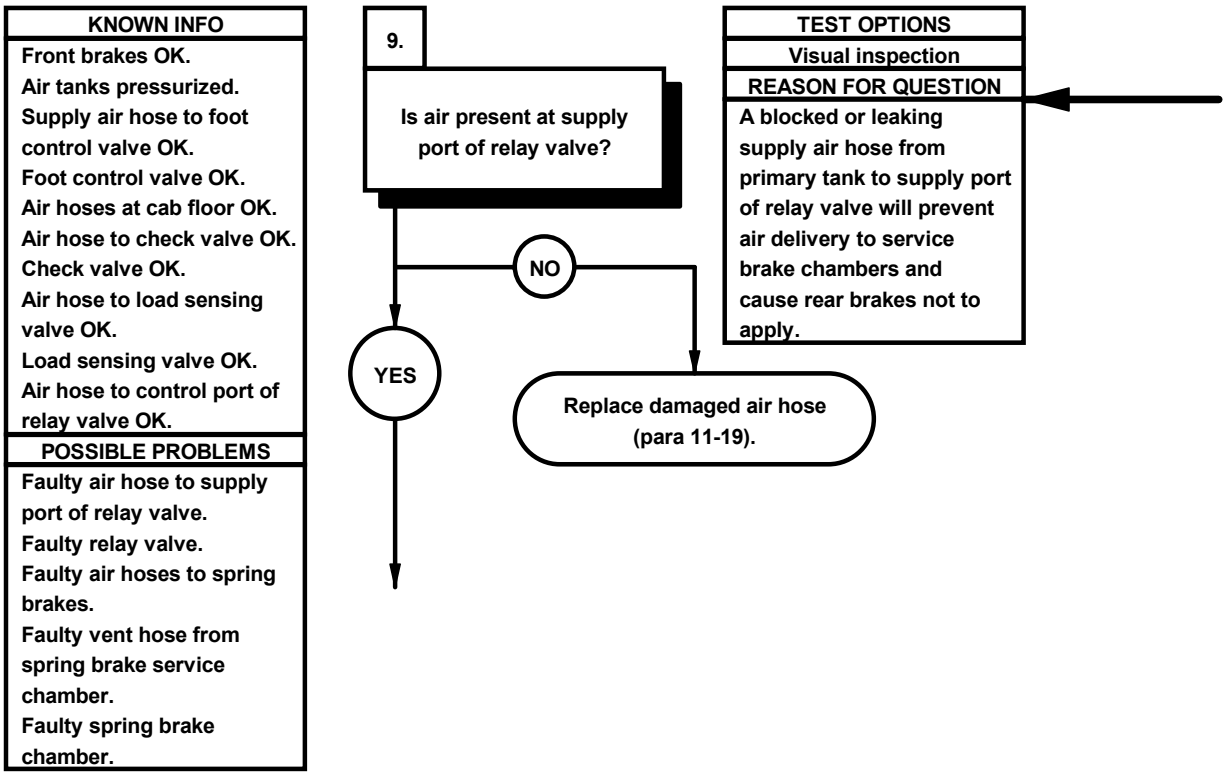
i2. REAR BRAKES DO NOT APPLY (CONT)



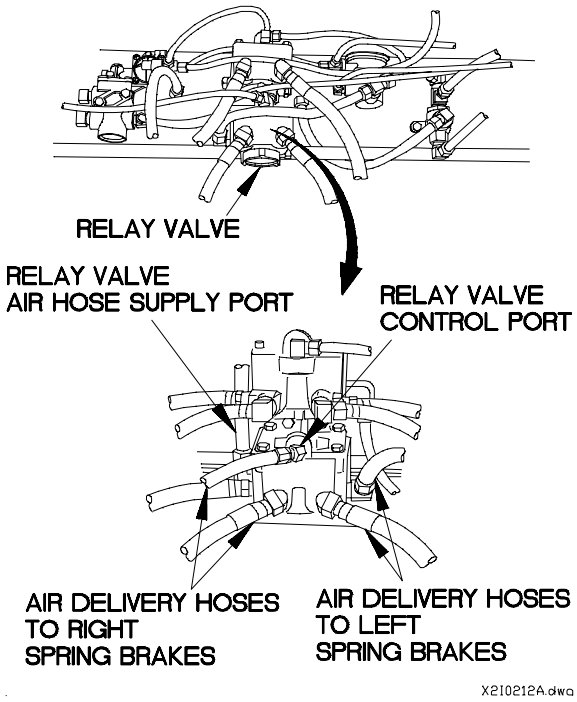
(1) Loosen control port air hoses at relay valve.
(2) Apply brakes.
(3) Check for presence of air.
(4) If no air is present, replace air hose(s) (para 11-19).
(5) Tighten inlet air hoses on relay valve.



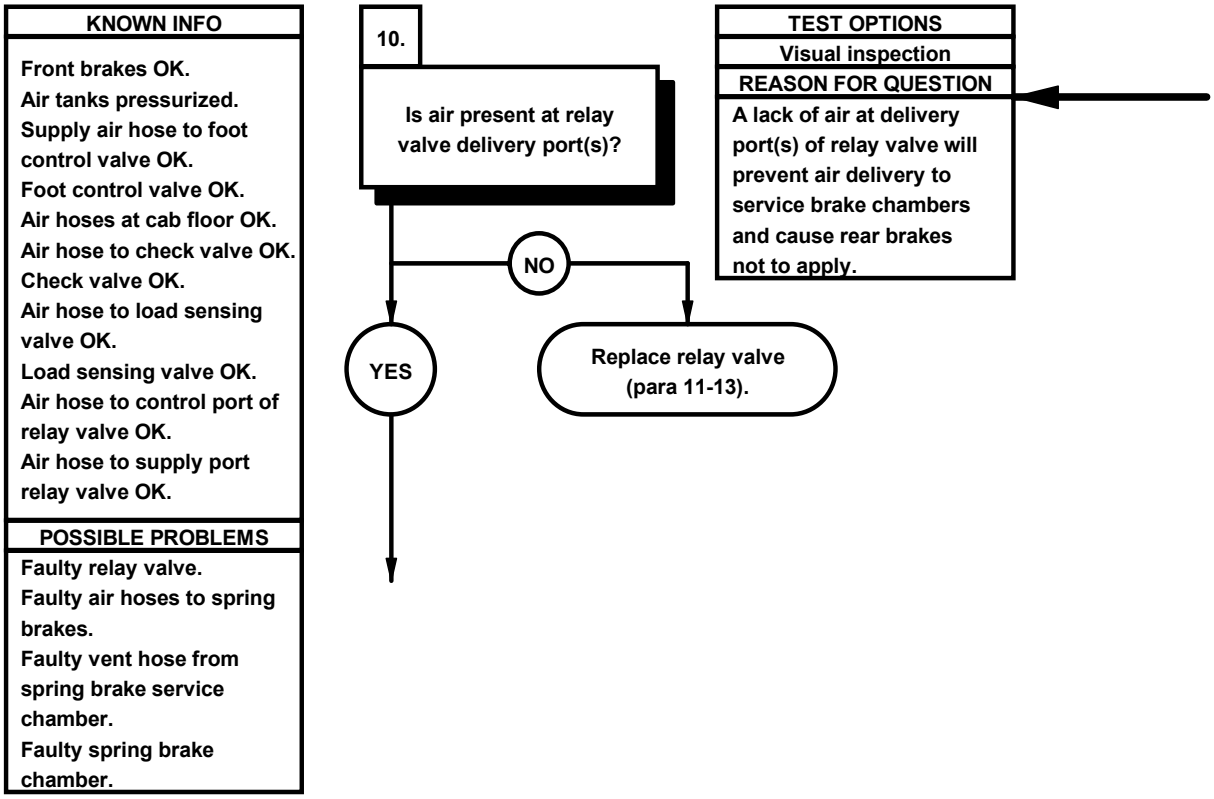
i2. REAR BRAKES DO NOT APPLY (CONT)



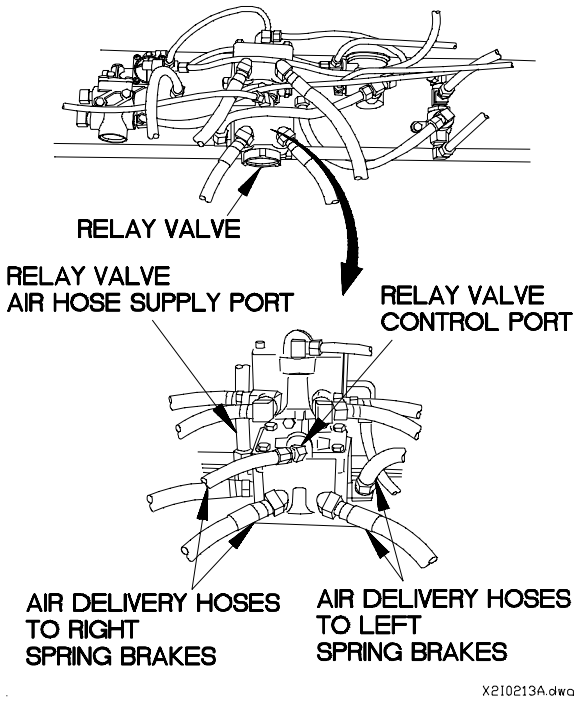
(1) Loosen supply air hose at supply port of relay valve.
(2) Apply brakes.
(3) Check for presence of air.
(4) If no air is present, replace air hose (para 11-19).
(5) Tighten supply air hose to relay valve.



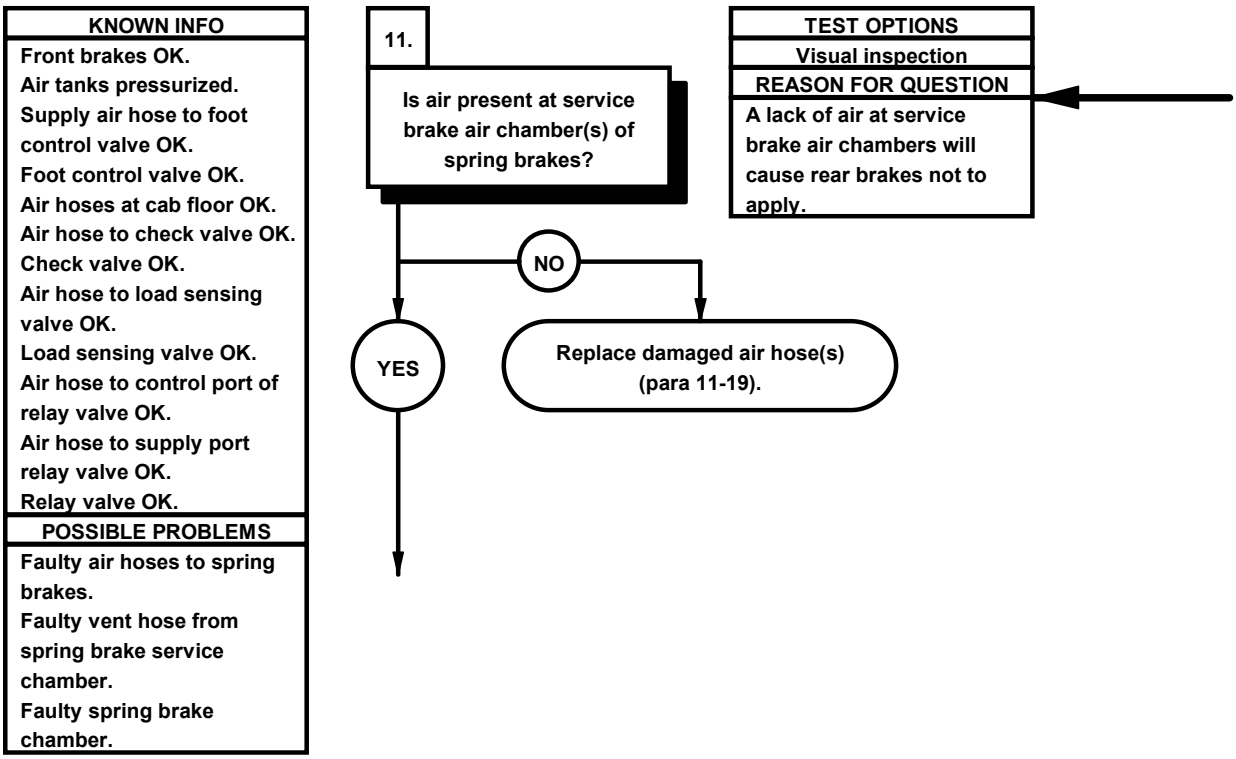
i2. REAR BRAKES DO NOT APPLY (CONT)



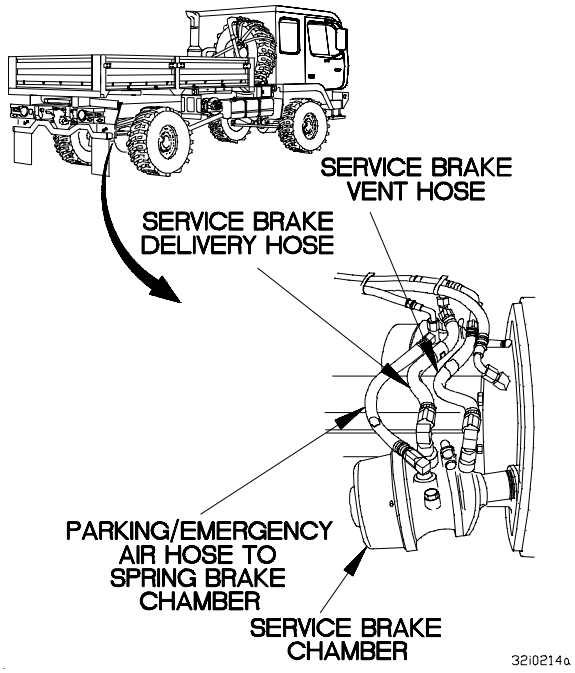
(1) Loosen delivery air hose(s) at relay valve.
(2) Apply brakes.
(3) Check for presence of air.
(4) If no air is present, replace relay valve (para 11-13).
(5) Tighten delivery air hose(s) to relay valve.



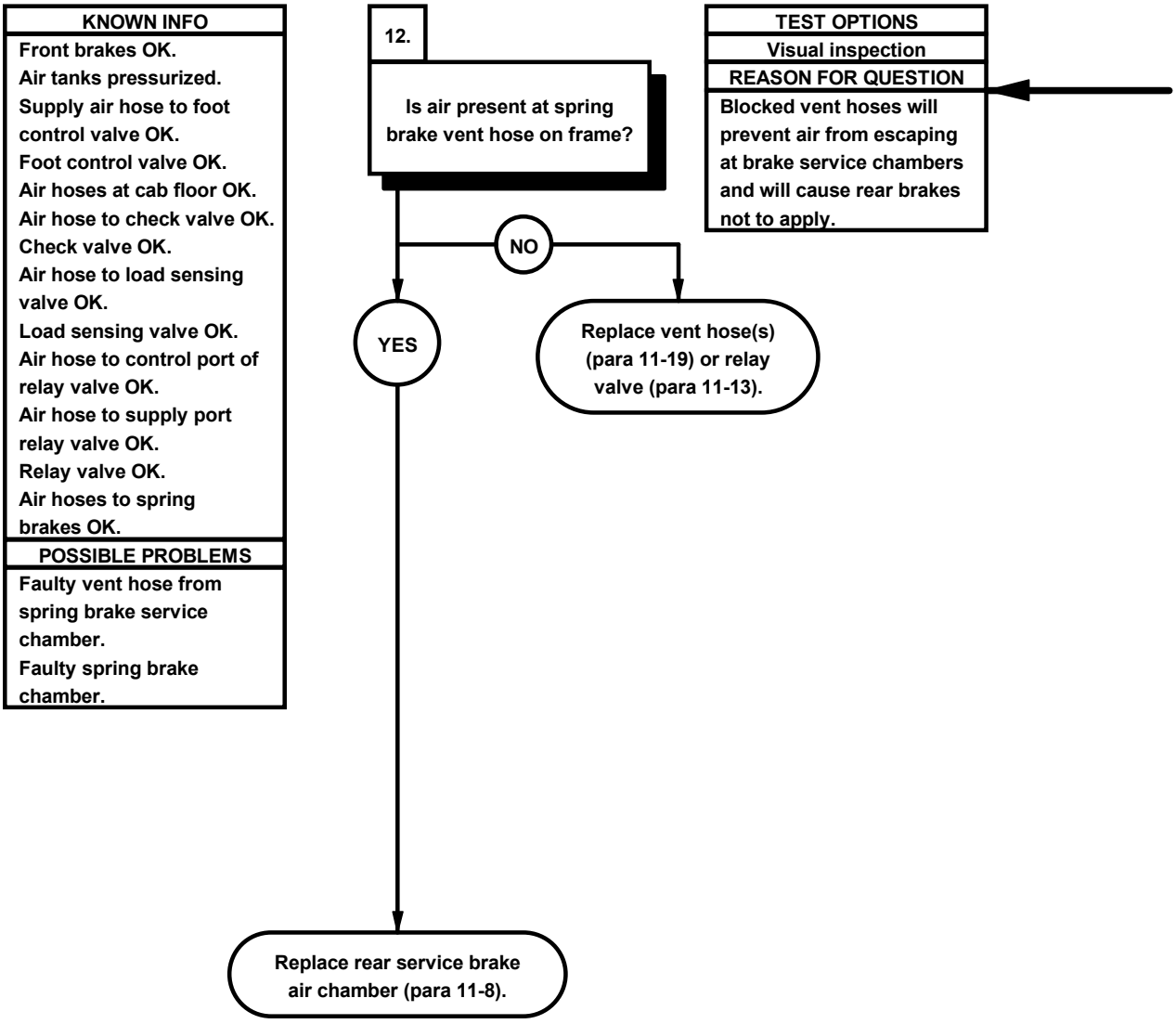
i2. REAR BRAKES DO NOT APPLY (CONT)



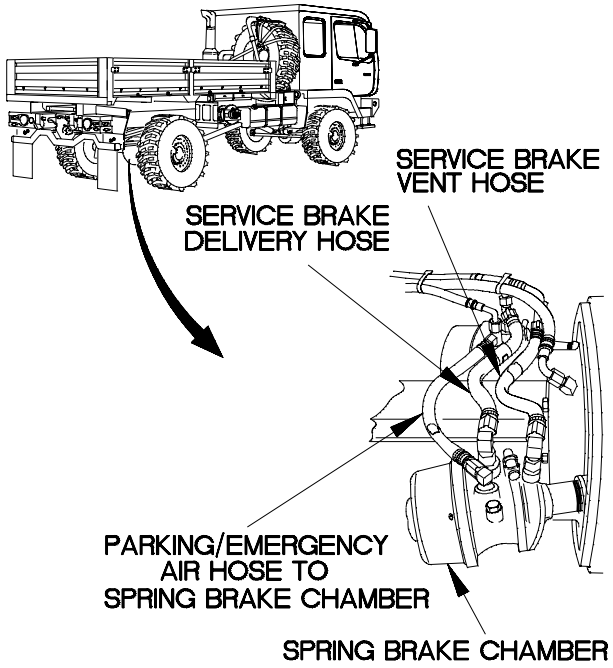
(1) Loosen service brake air hose at spring brake chamber.
(2) Apply brakes.
(3) Check for presence of air.
(4) If no air is present, replace air hose (para 11-19).
(5) Tighten service brake air hose on spring brake chamber.

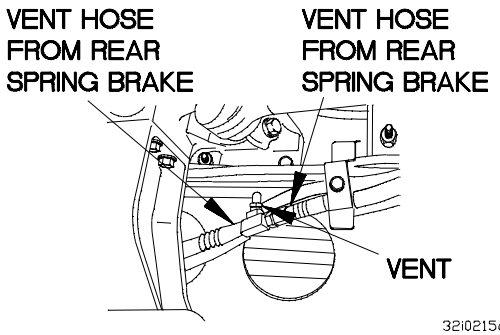


i2. REAR BRAKES DO NOT APPLY (CONT)



(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 11-19) or relay valve (para 11-13).
(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 9-2320-365-10).



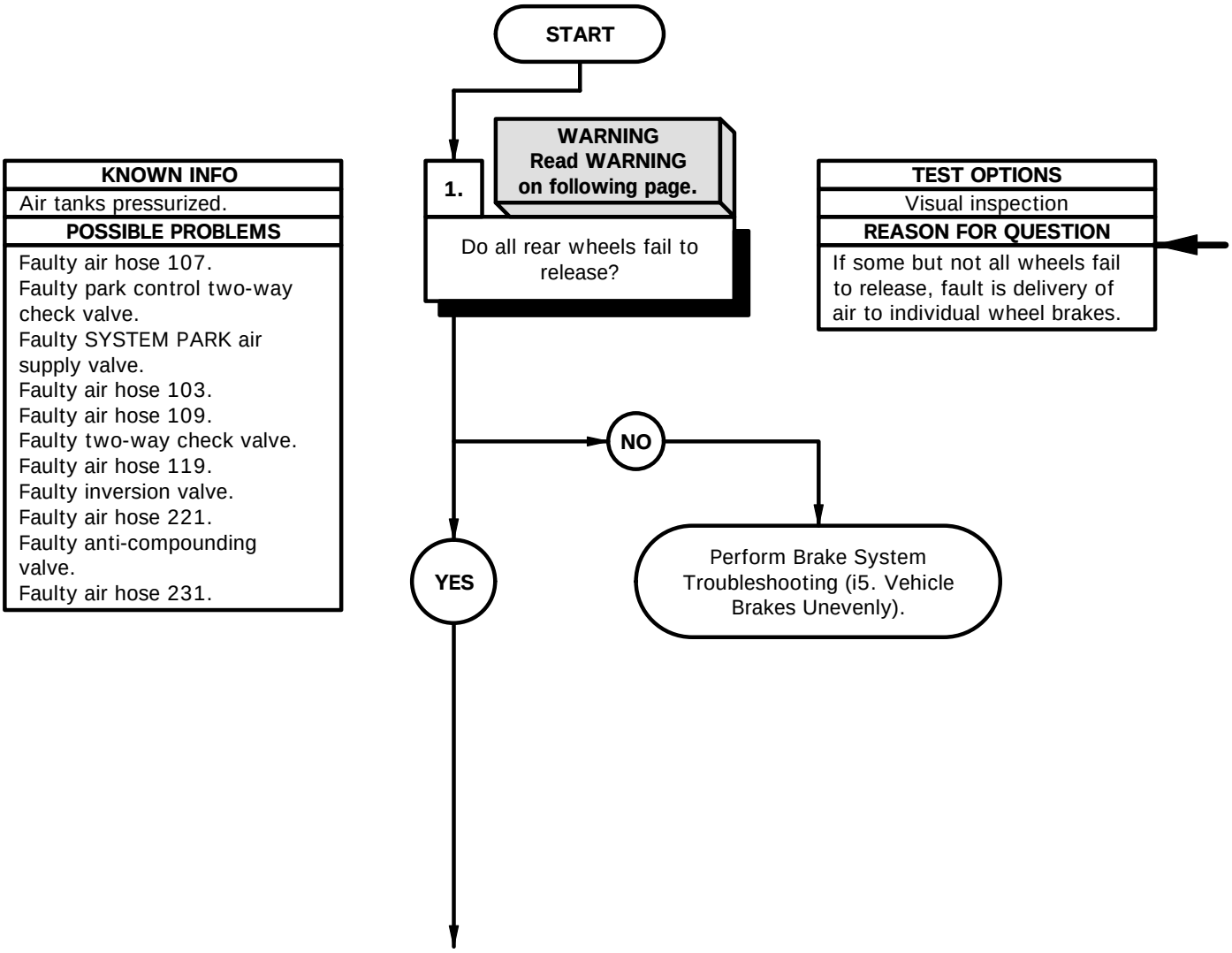


i3. PARKING BRAKE DOES NOT RELEASE

INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Goggles, Industrial (Item 15, Appendix C)

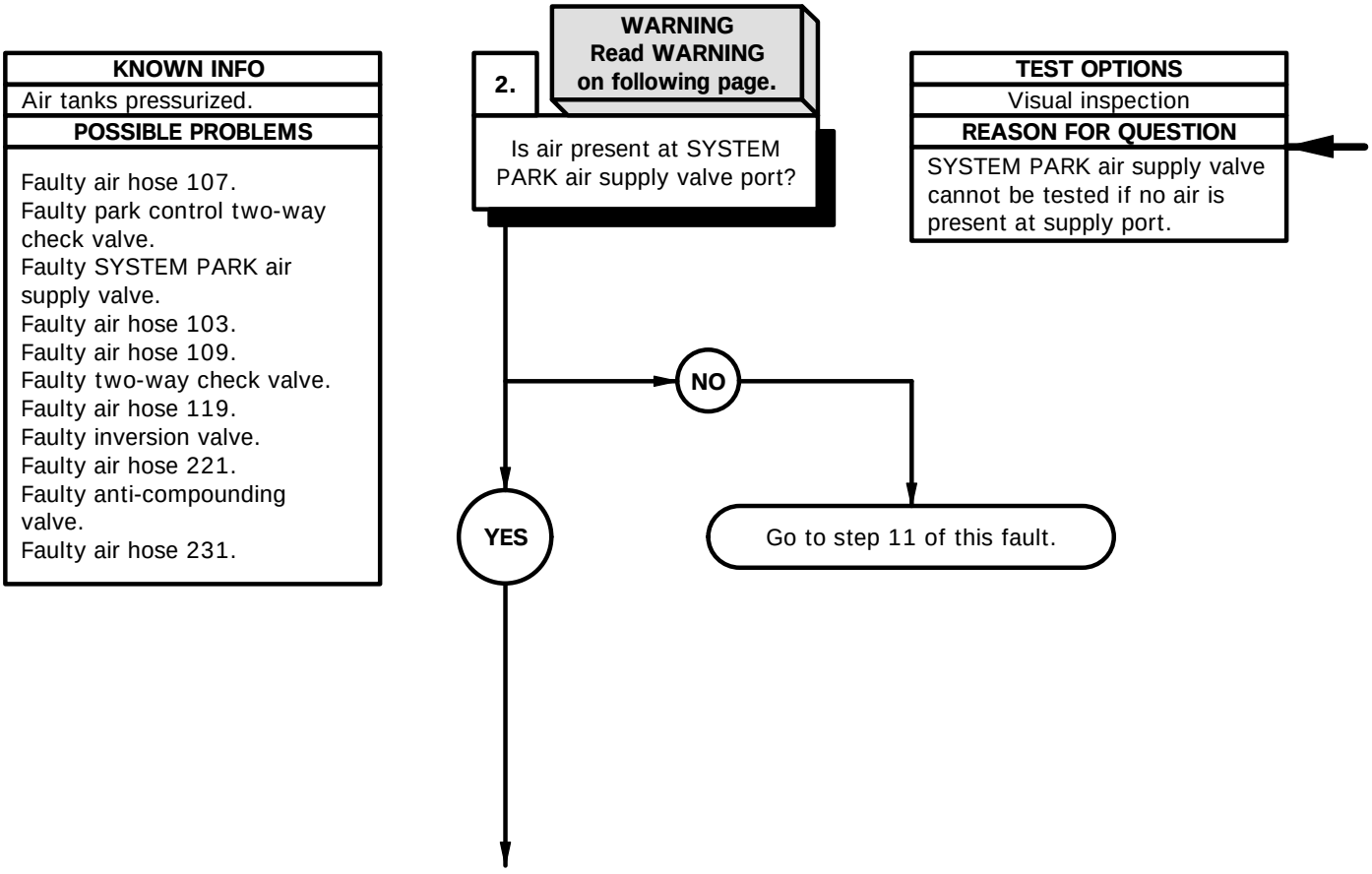


WARNING

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 9-2320-365-10).
(2) Release SYSTEM PARK control (TM 9-2320-365-10).
(3) Check if vehicle moves.
(4) If vehicle moves, locate locked wheel(s) and troubleshoot individual wheel(s).
(5) Shut down engine (TM 9-2320-365-10).

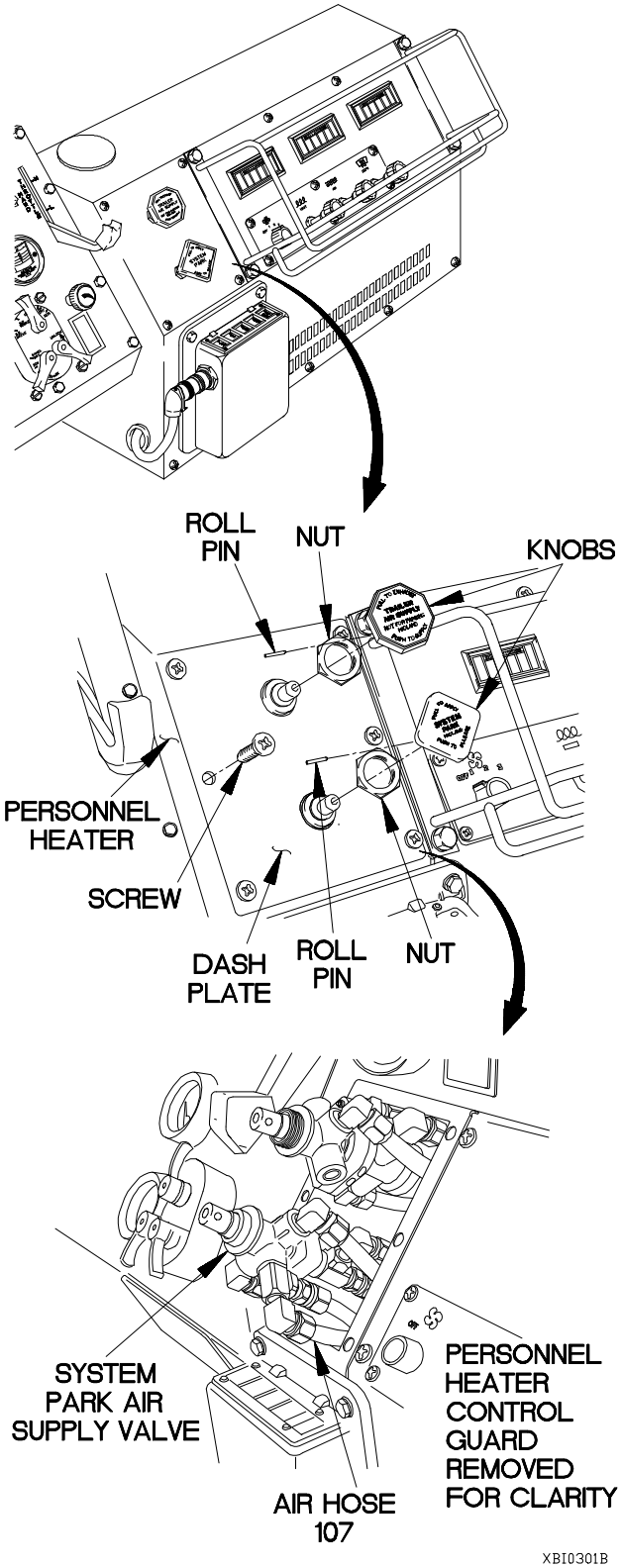
i3. PARKING BRAKE DOES NOT RELEASE (CONT)



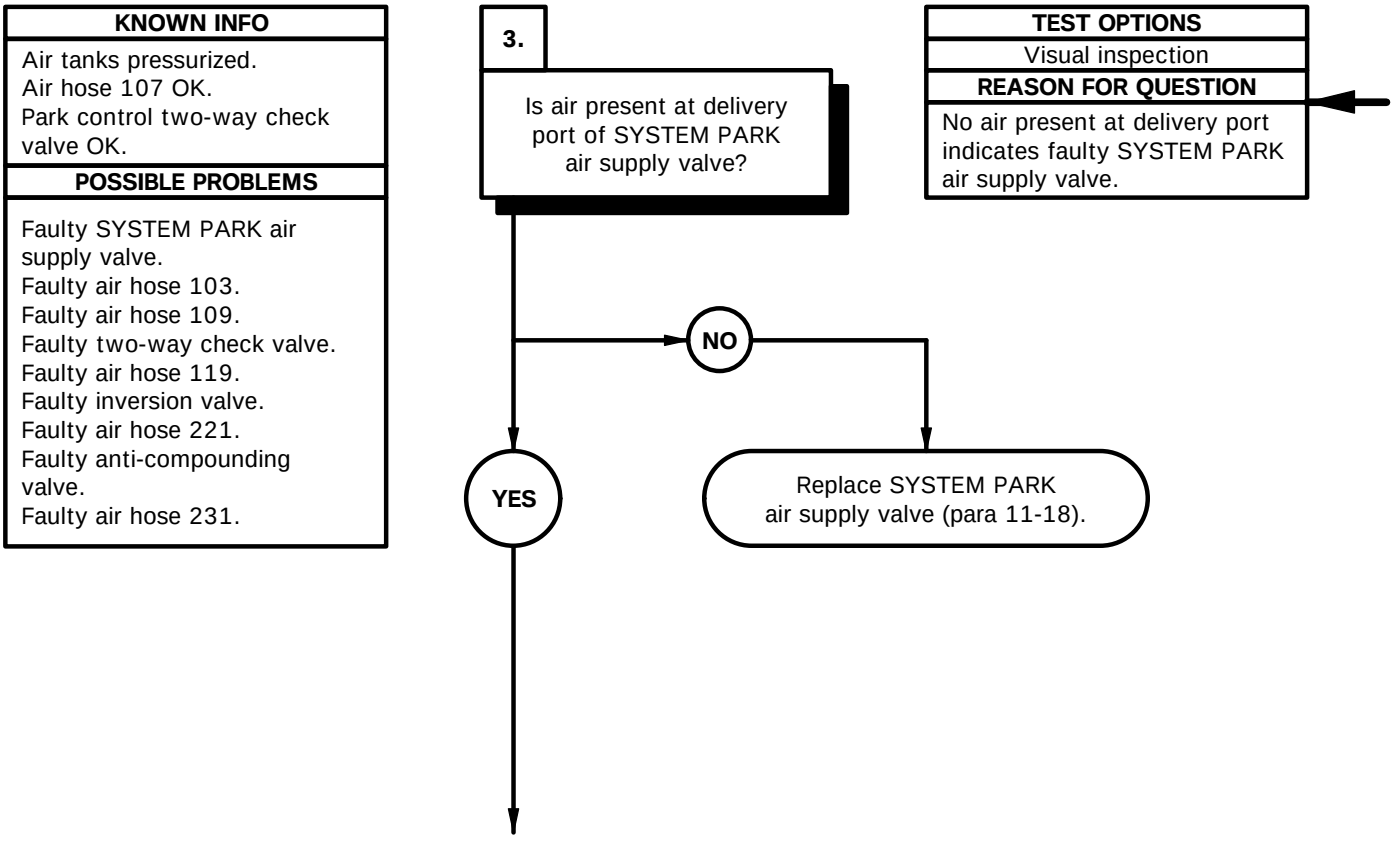
WARNING

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

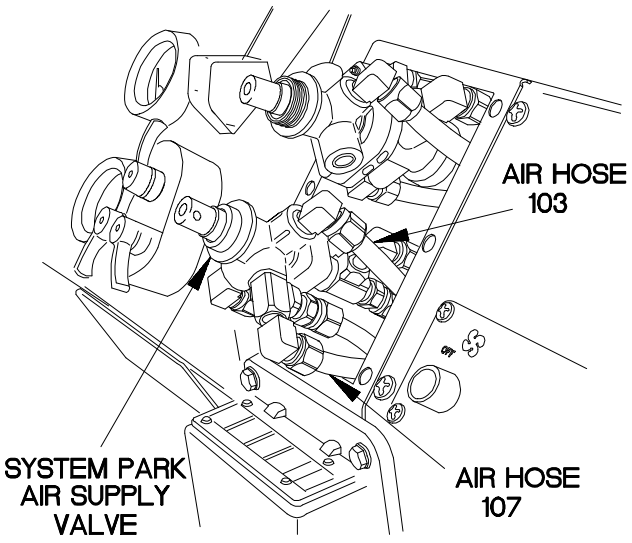
(1) Remove roll pins from knobs of SYSTEM PARK and TRAILER AIR SUPPLY valves.
(2) Remove SYSTEM PARK and TRAILER AIR SUPPLY valve knobs.
(3) Unscrew nuts at base of knob stem on each valve.
(4) Remove six screws from dash plate.
(5) Remove dash plate from personnel heater.
(6) Pull out SYSTEM PARK air 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.



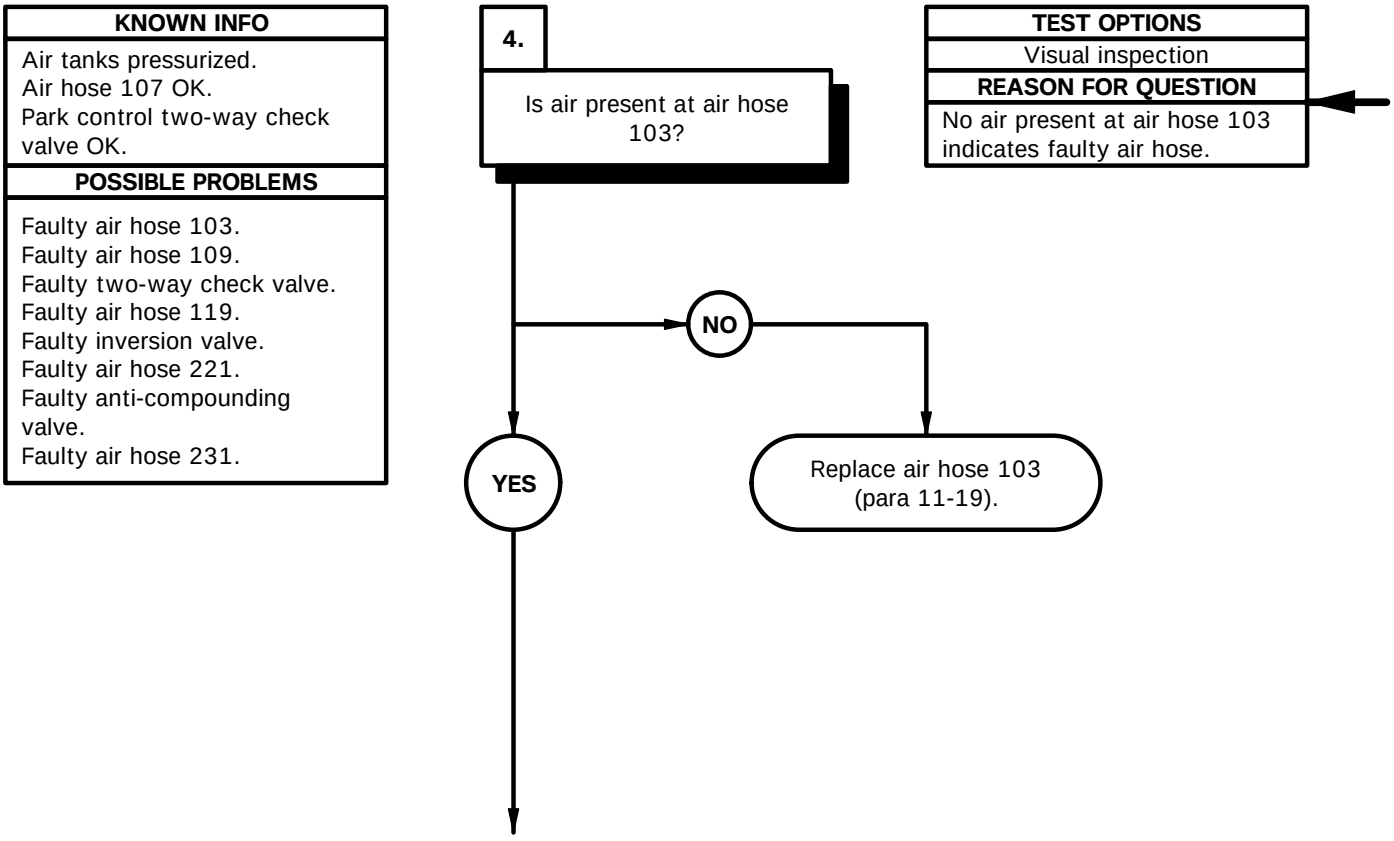
i3. PARKING BRAKE DOES NOT RELEASE (CONT)



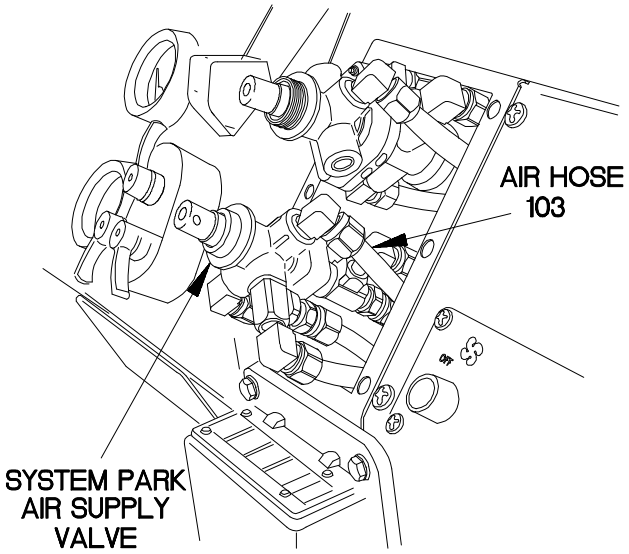
(1) Tighten air hose 107 at SYSTEM PARK air supply valve supply port.
(2) Loosen air hose 103 at SYSTEM PARK air supply valve delivery port.
(3) Check for presence of air from SYSTEM PARK air supply valve.
(4) If no air is present, replace SYSTEM PARK air supply valve (para 11-18).



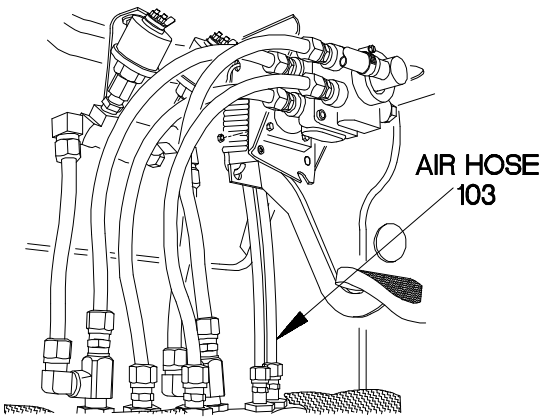
i3. PARKING BRAKE DOES NOT RELEASE (CONT)



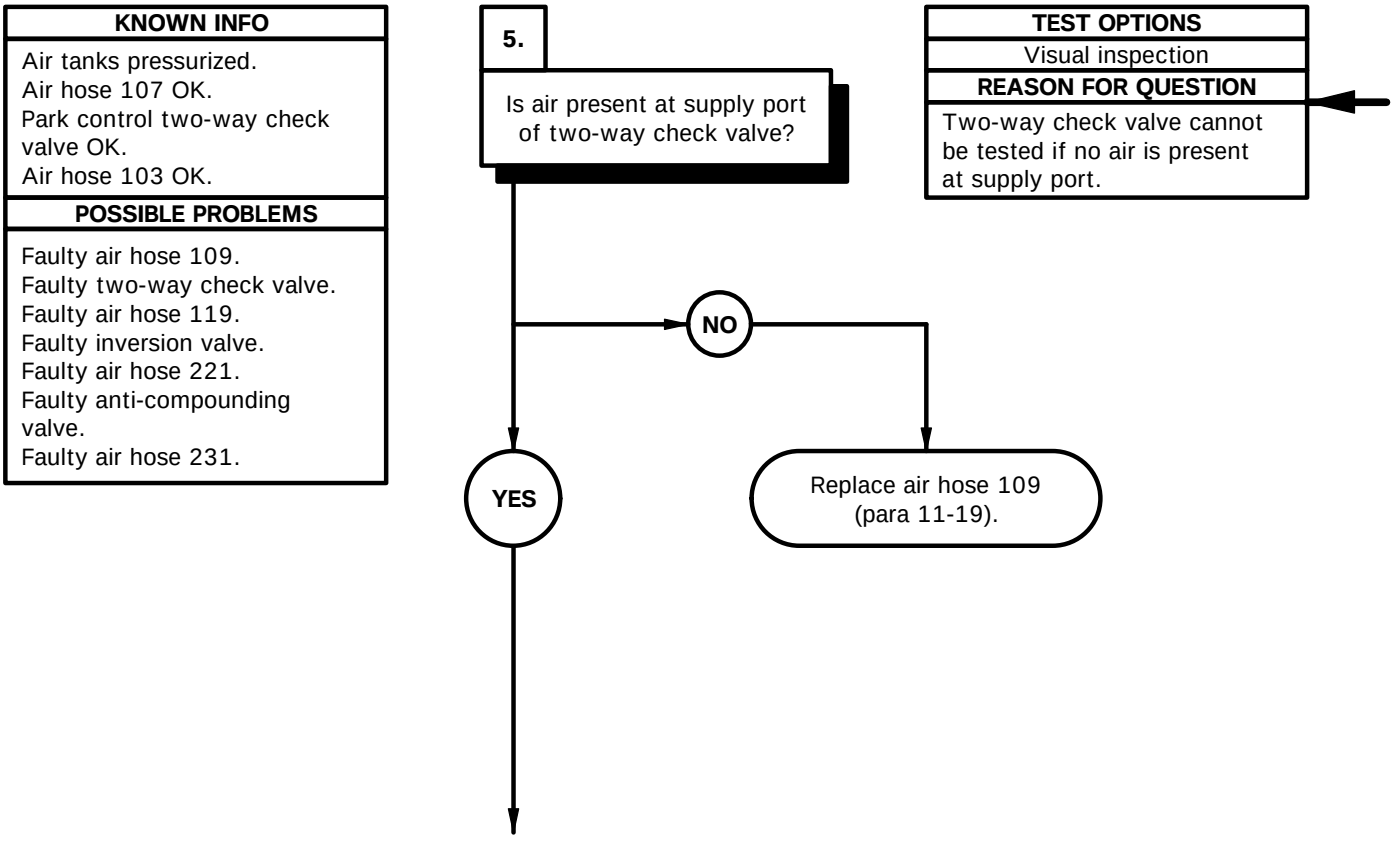
(1) Tighten air hose 103 at SYSTEM PARK air supply valve delivery port.
(2) Loosen air hose 103 at cab floor fitting.
(3) Check for presence of air from air hose 103.
(4) If no air is present, replace air hose 103 (para 11-19).



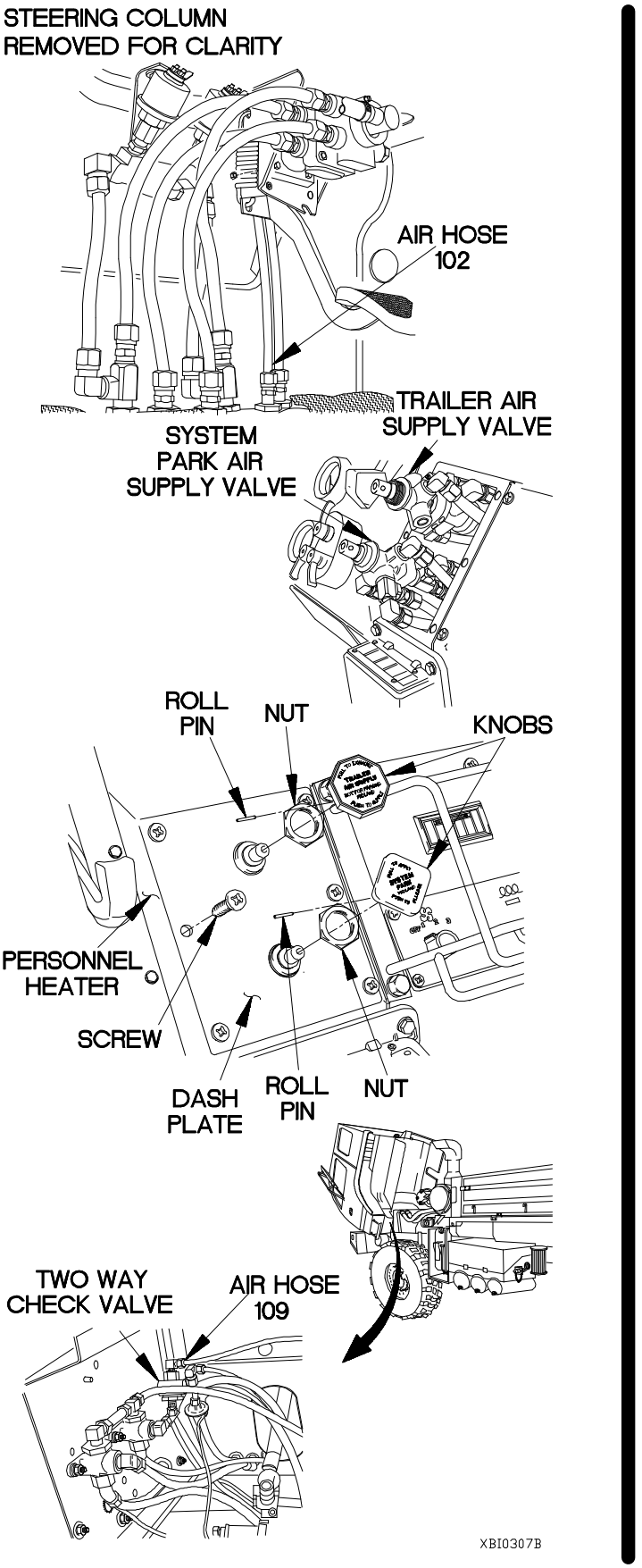
STEERING COLUMN
REMOVED FOR CLARITY



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 9-2320-365-10).
(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 11-19).



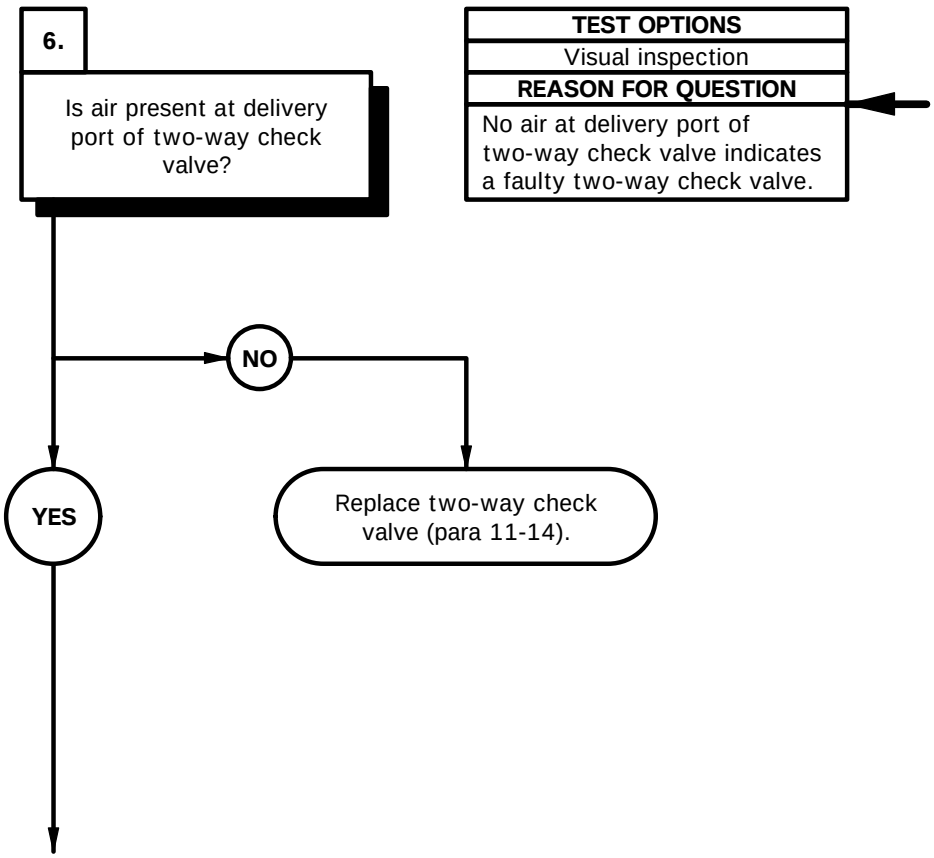
i3. PARKING BRAKE DOES NOT RELEASE (CONT)

KNOWN INFO

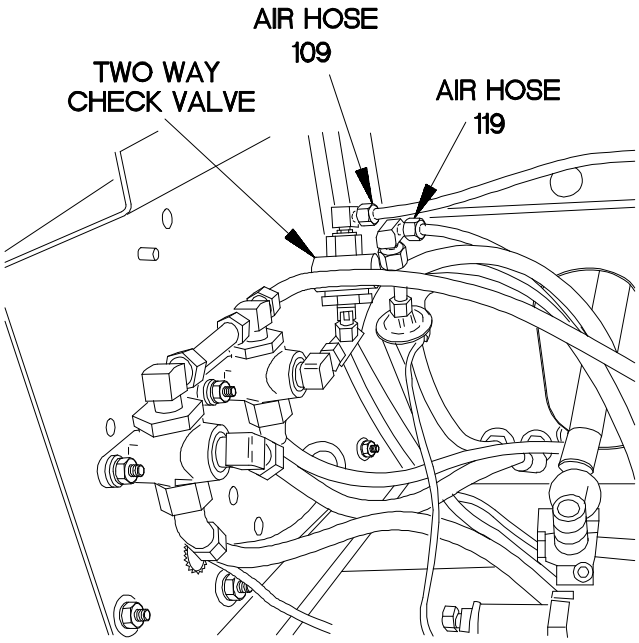
Air tanks pressurized.
Air hose 107 OK.
Park control two-way check valve OK.
Air hose 103 OK.
Air hose 109 OK.

POSSIBLE PROBLEMS

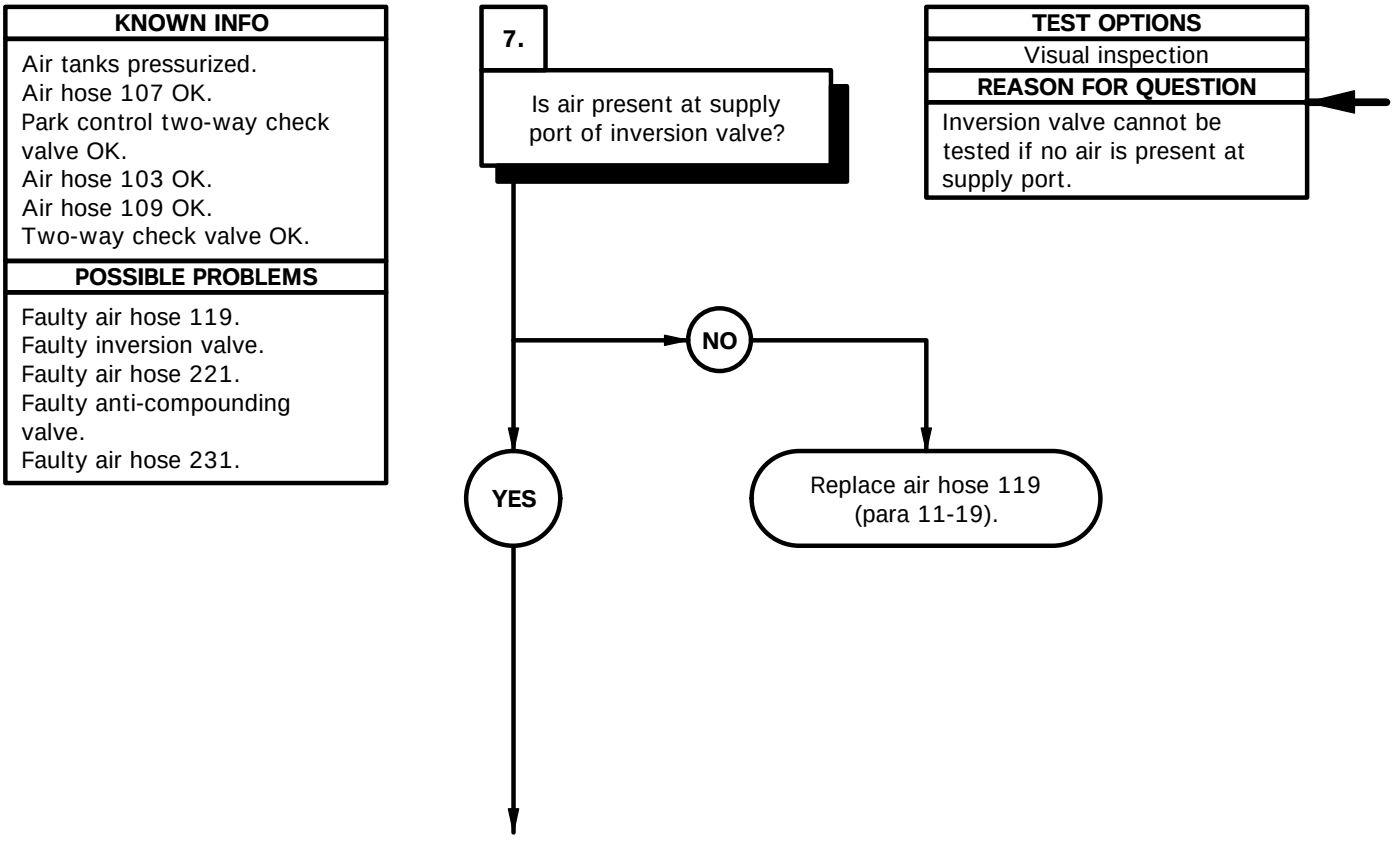
Faulty two-way check valve.
Faulty air hose 119.
Faulty inversion valve.
Faulty air hose 221.
Faulty anti-compounding valve.
Faulty air hose 231.



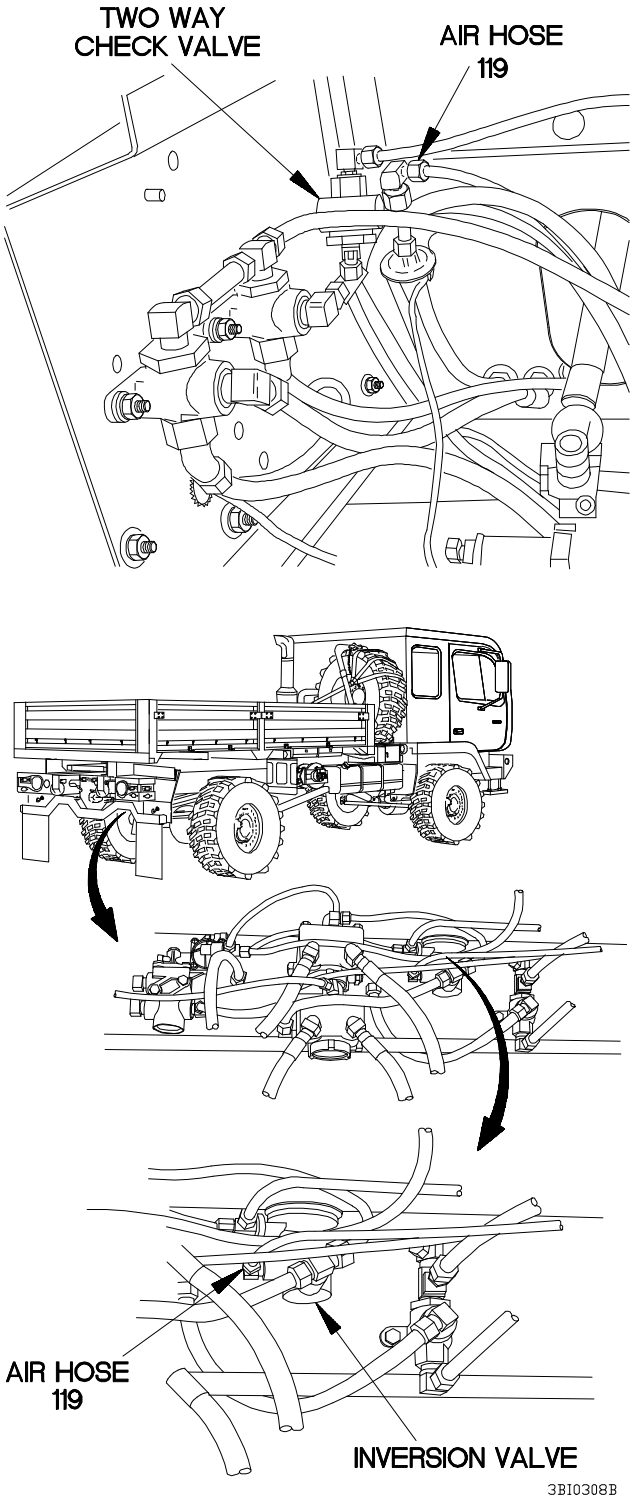
(1) Tighten air hose 109 at two-way check valve supply port.
(2) Loosen air hose 119 at delivery port of two-way check valve.
(3) Release SYSTEM PARK (TM 9-2320-365-10) and check for presence of air at air hose 119.
(4) If no air is present, replace two-way check valve (para 11-14).



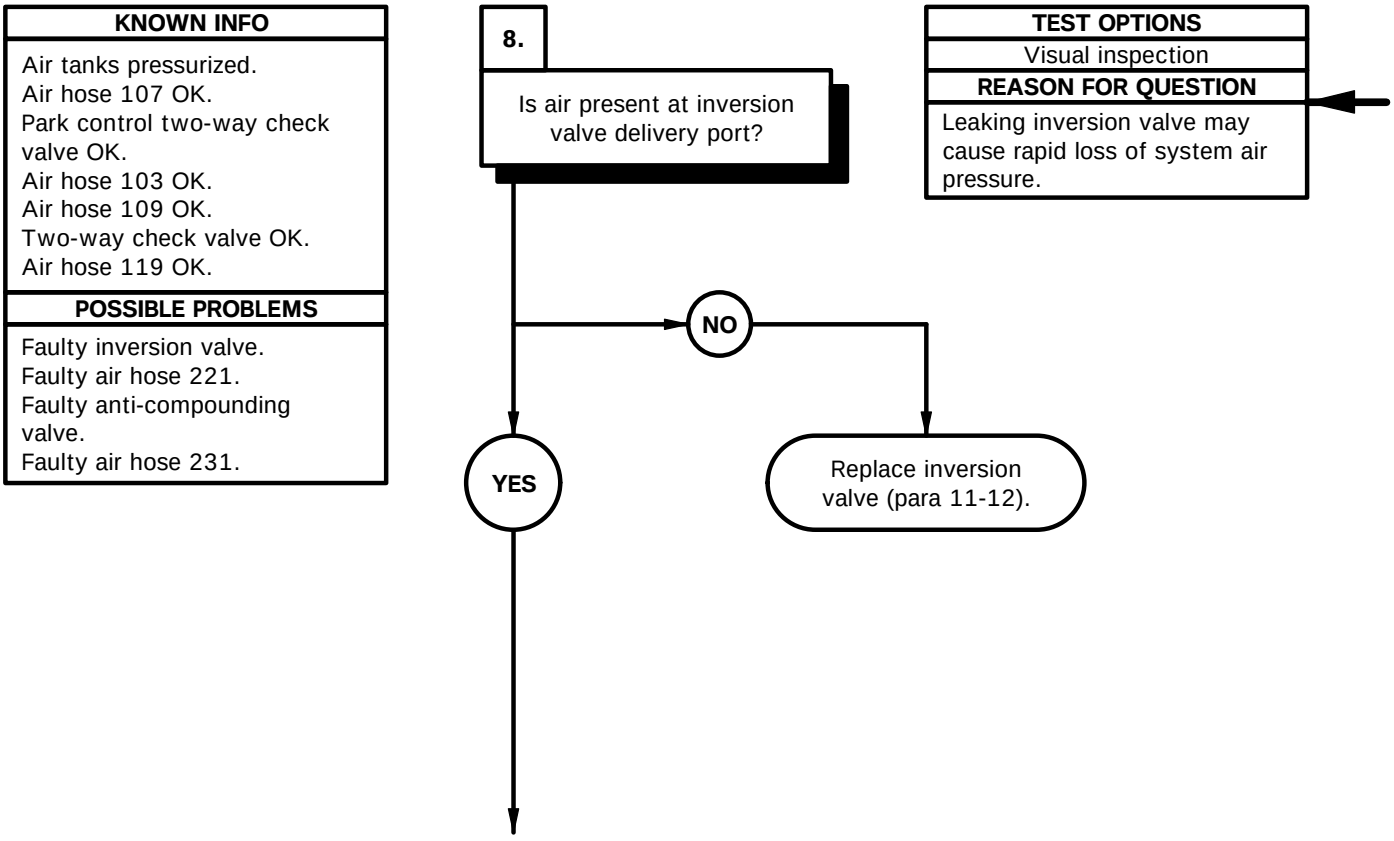
i3. PARKING BRAKE DOES NOT RELEASE (CONT)



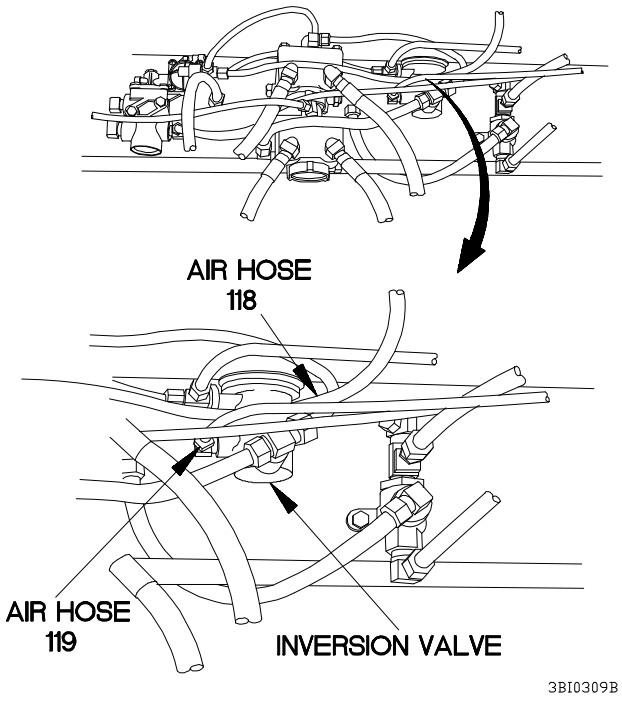
(1) Tighten air hose 119 at two-way check valve delivery port.
(2) Lower cab (TM 9-2320-365-10).
(3) Loosen air hose 119 at inversion valve supply port.
(4) Check for presence of air at air hose 119.
(5) If no air is present, replace air hose 119 (para 11-19).



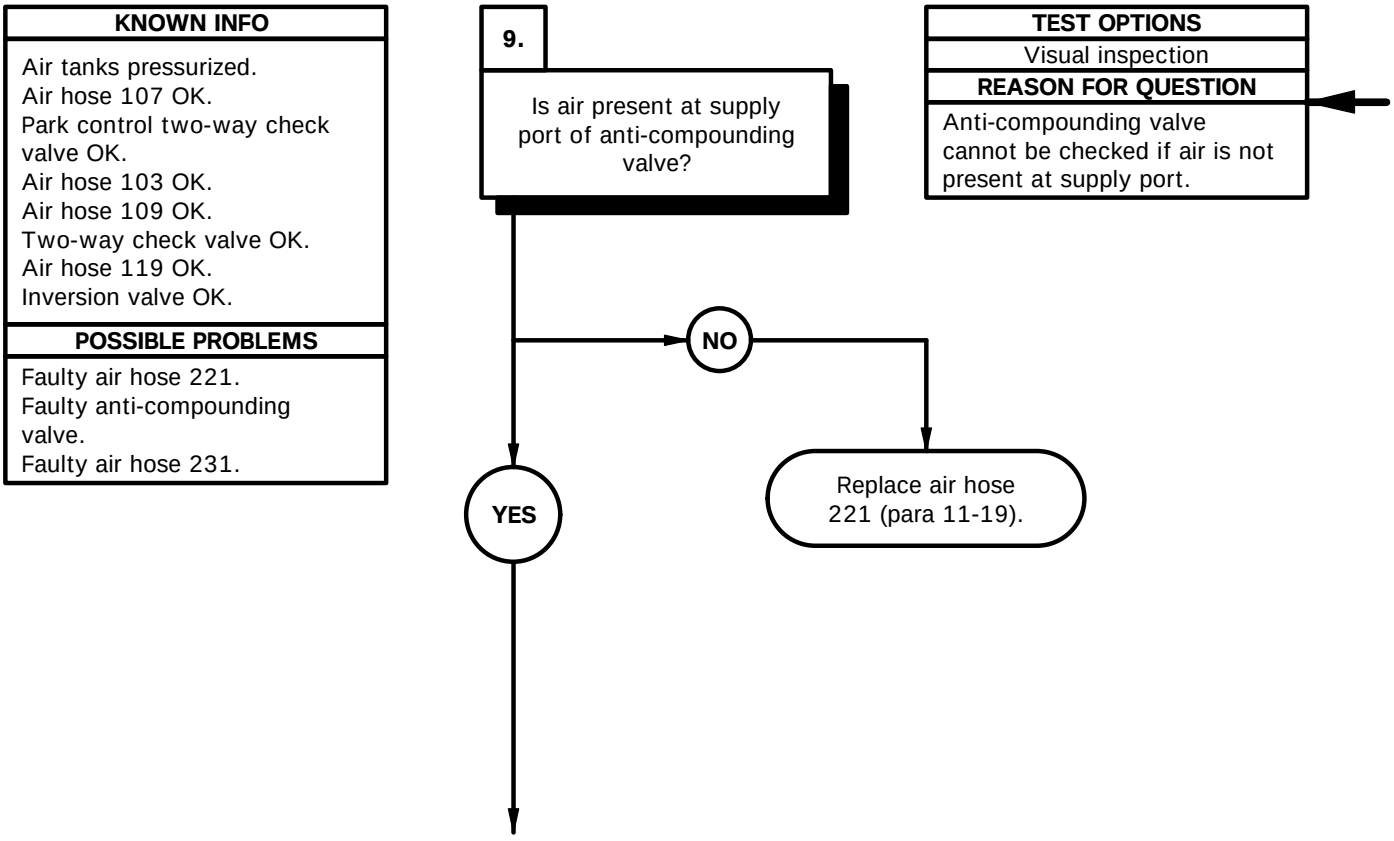
i3. PARKING BRAKE DOES NOT RELEASE (CONT)



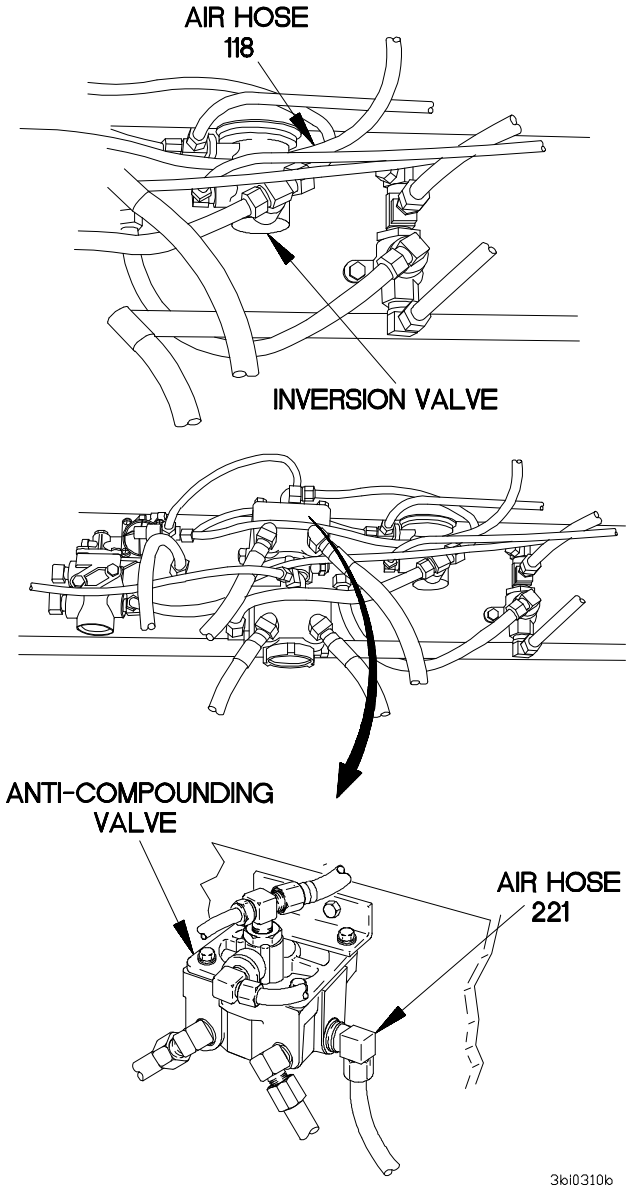
(1) Tighten air hose 119 at inversion valve supply port.
(2) Loosen air hose 118 at inversion valve delivery port.
(3) Check for presence of air at air hose 118.
(4) If no air is present, replace inversion valve (para 11-12).



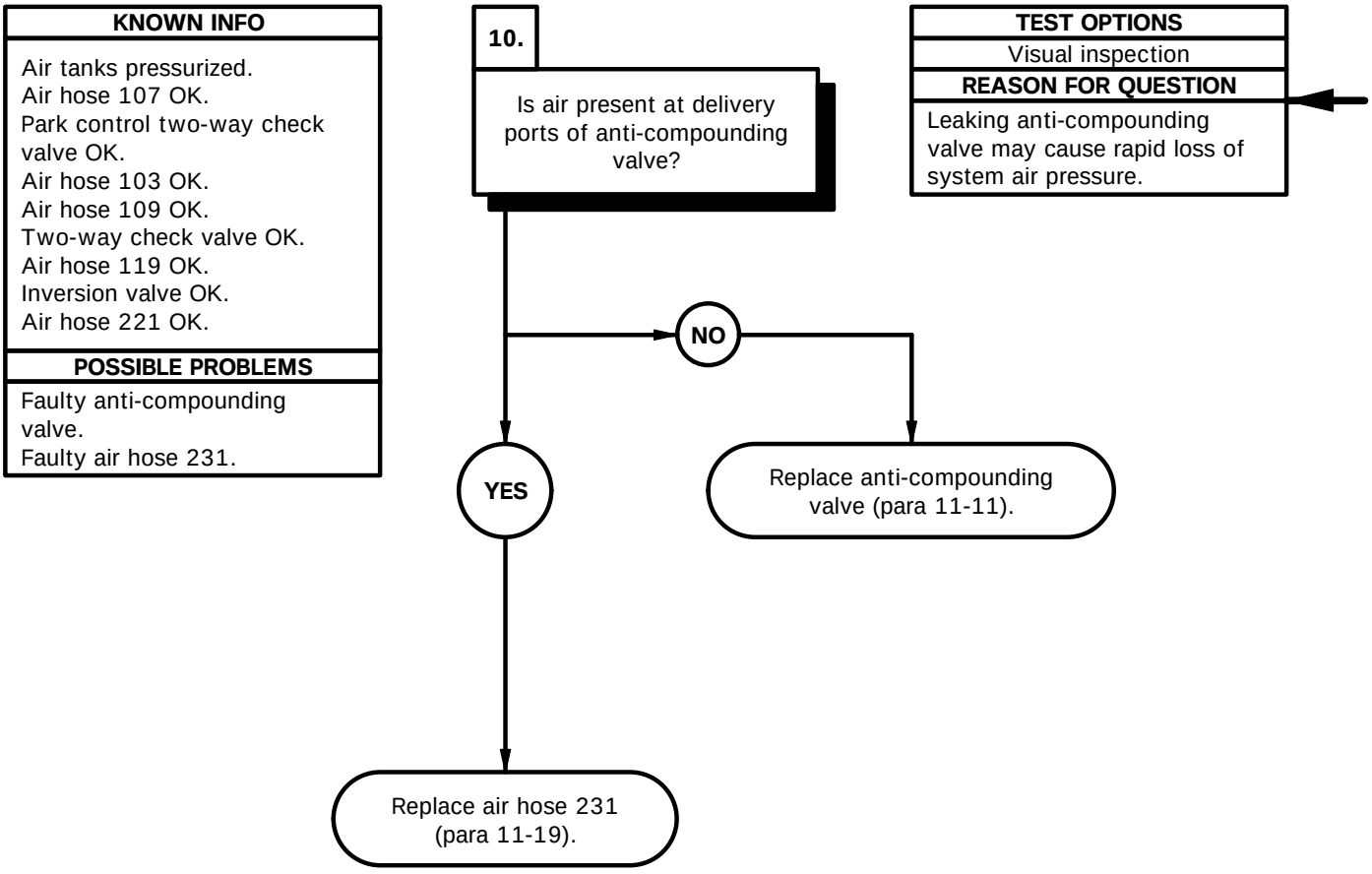
i3. PARKING BRAKE DOES NOT RELEASE (CONT)



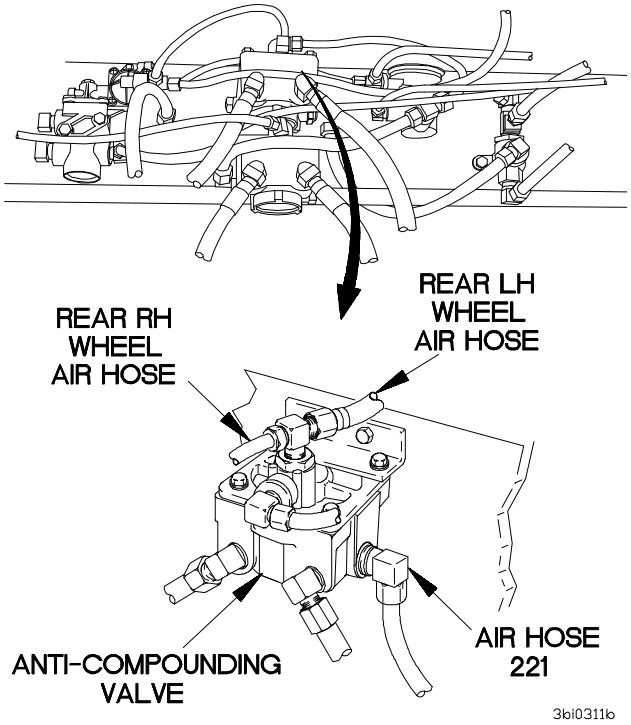
(1) Tighten air hose 118 at inversion valve delivery port.
(2) Loosen air hose 221 at supply port of anti-compounding valve.
(3) Check for presence of air at air hose 221.
(4) If no air is present, replace air hose 221 (para 11-19).



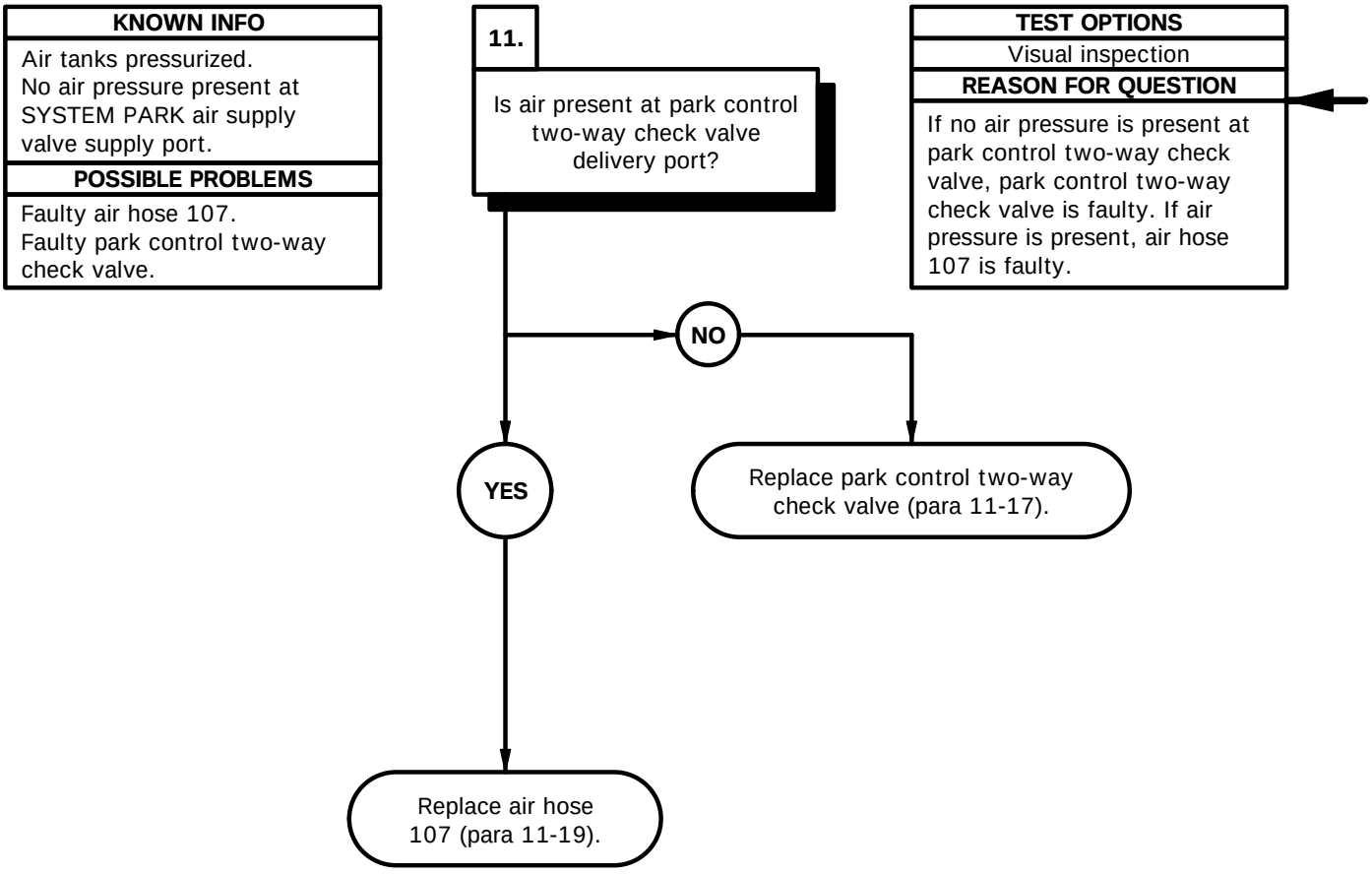
i3. PARKING BRAKE DOES NOT RELEASE (CONT)



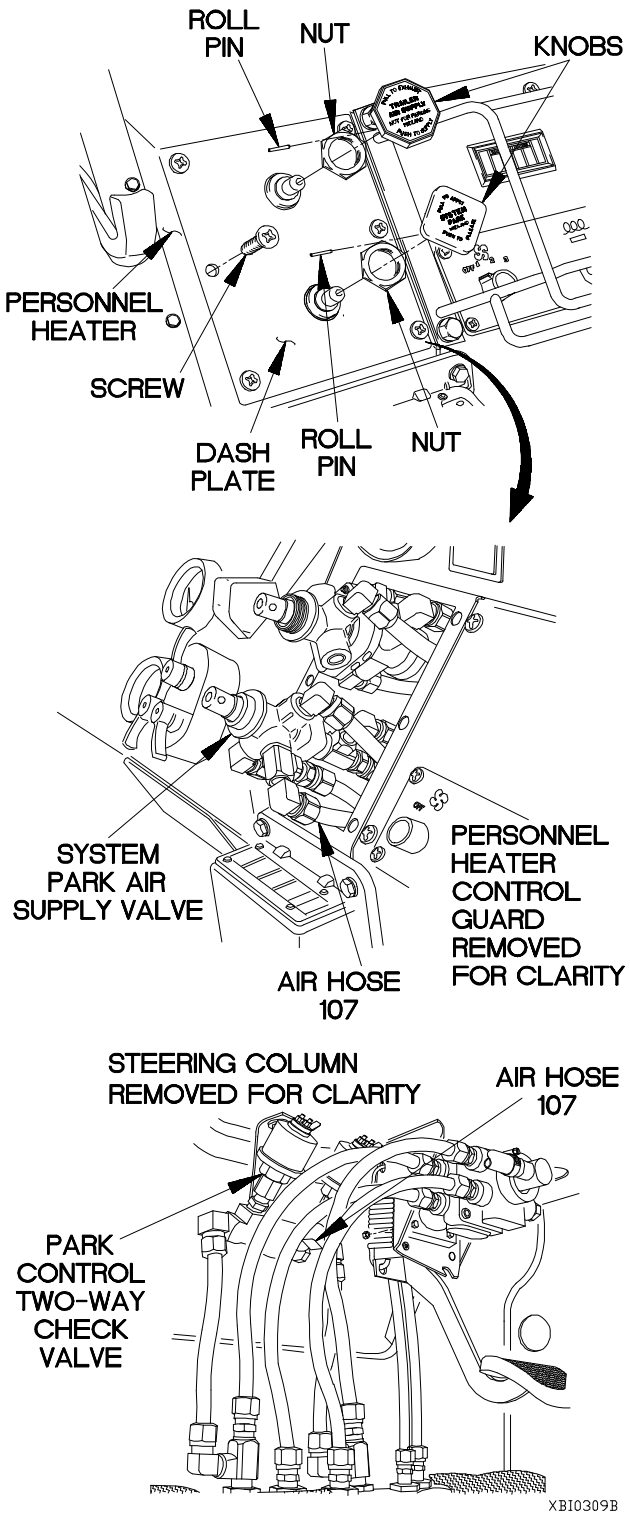
(1) Tighten air hose 221 at anti-compounding valve supply port.
(2) Loosen air delivery hoses at delivery ports of anti-compounding valve.
(3) Check for presence of air at anti-compounding valve air hoses.
(4) If no air is present, replace anti-compounding valve (para 11-11).
(5) If air is present, replace air hose 231 (para 11-19).
(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 11-17).
(9) If air is present, replace air hose (para 11-19).
(10) Tighten air hose 107 at park control two-way check valve.



All data on pages 2-1666 thru 2-1669, including pages 2-1667 and 2-1668, deleted.

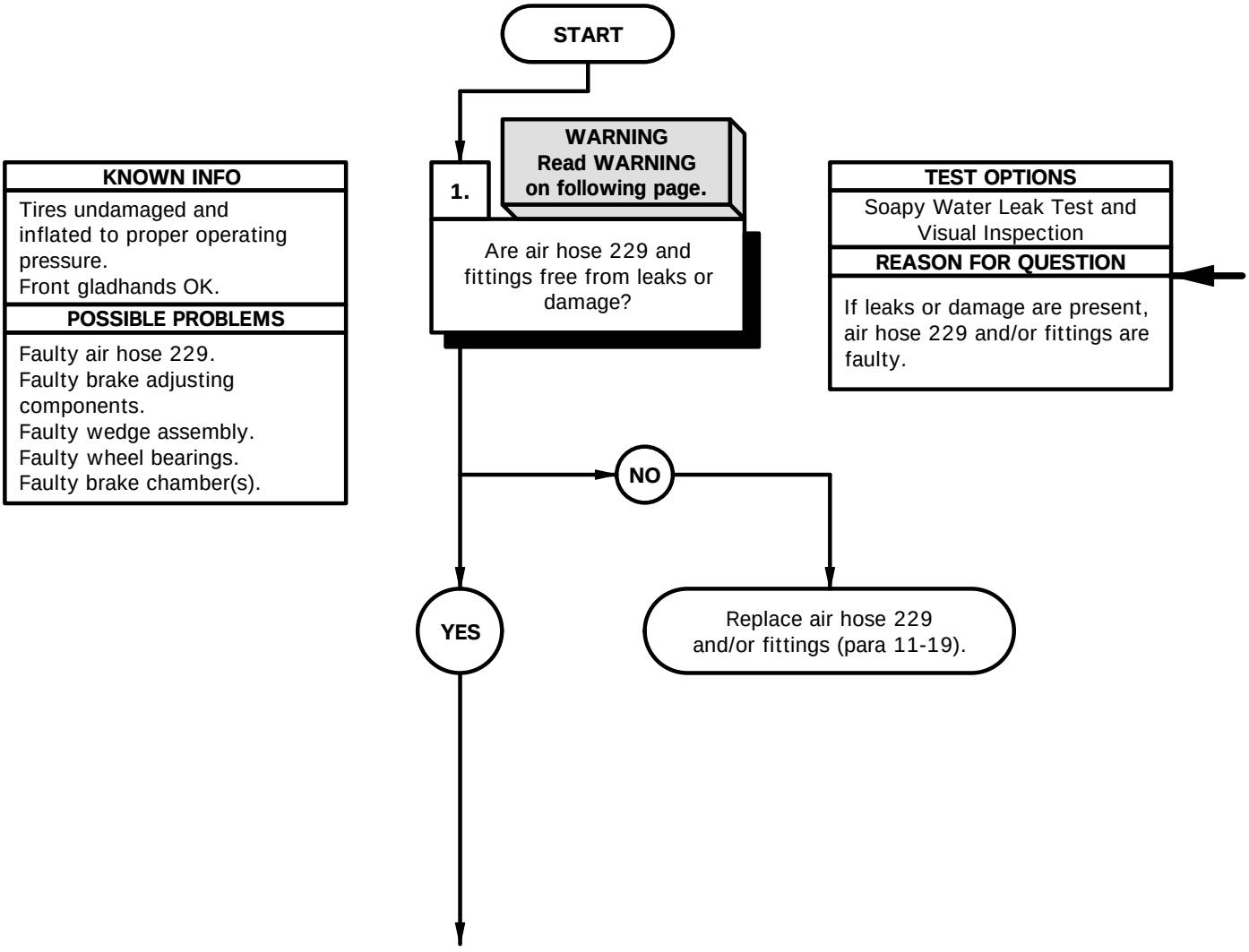
i4. FRONT BRAKES OVERHEAT AND/OR DO NOT RELEASE

INITIAL SETUP

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

Personnel
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Trestle, Motor Vehicle Maintenance (2)
(Item 45, Appendix C)
Adjusting Tool, Brake Shoe (Item 2, Appendix C)



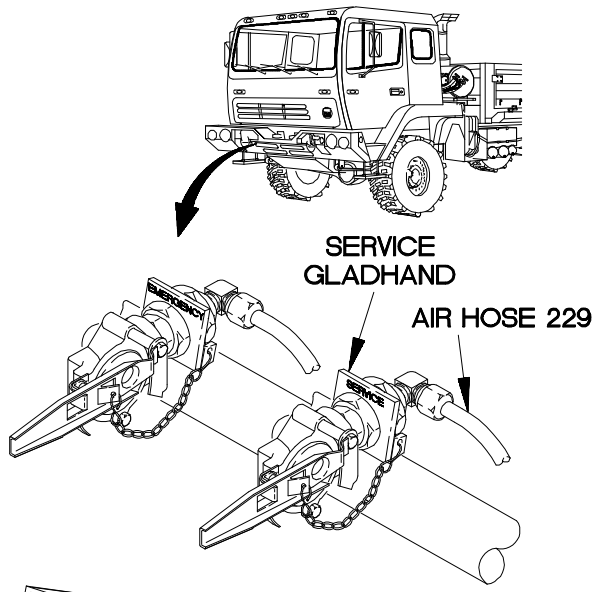
WARNING

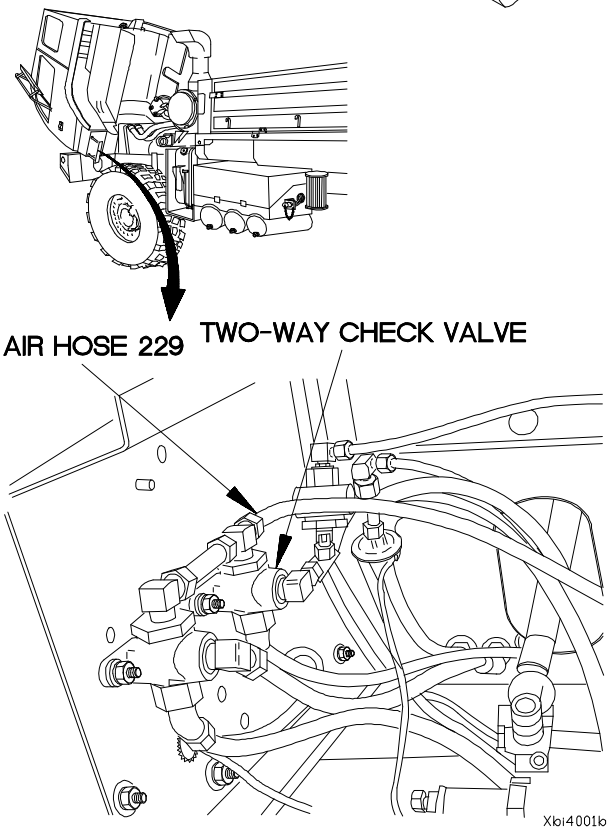
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

SOAPY WATER LEAK TEST

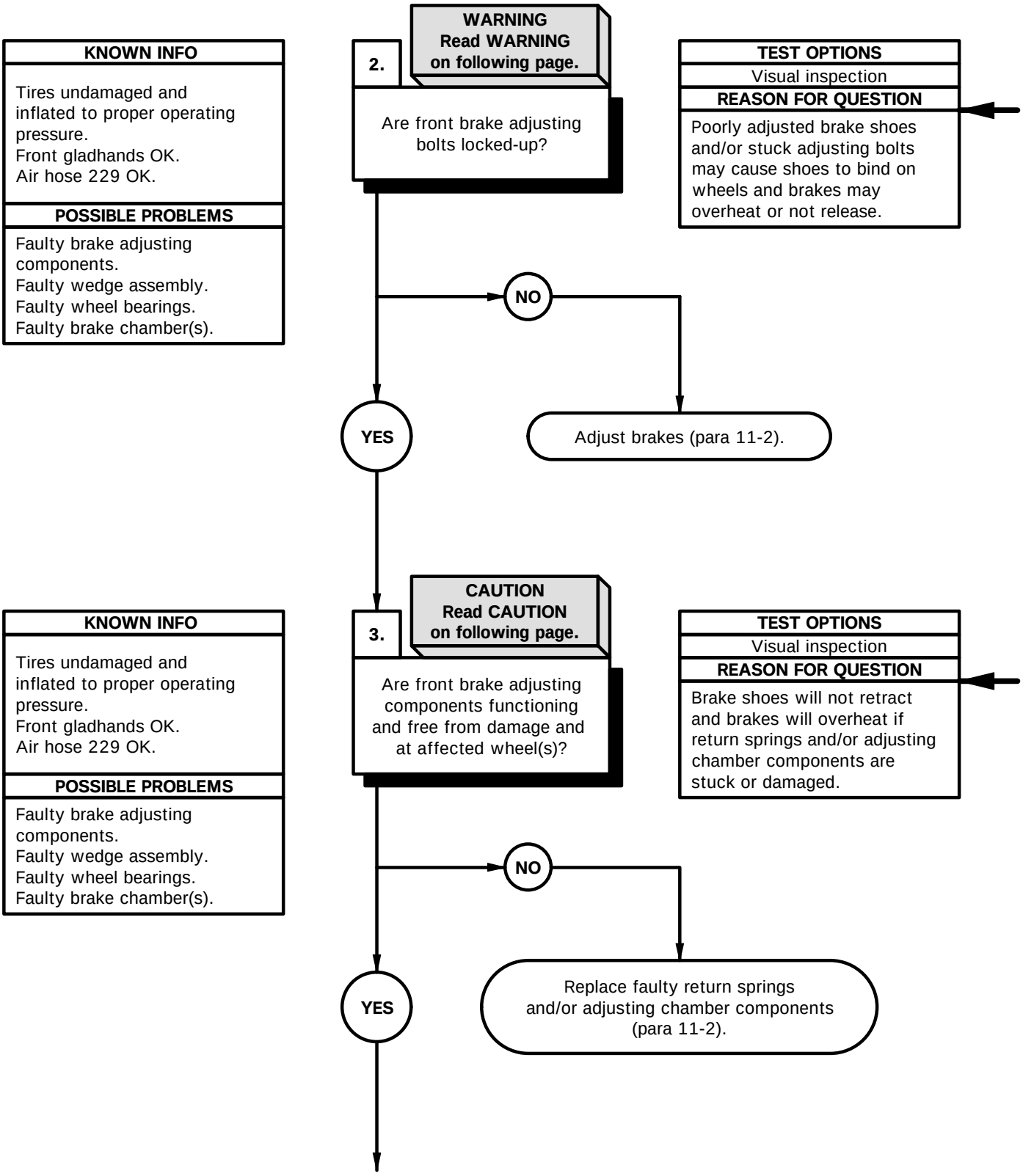
(1) Apply soapy water solution to air hose 229 and fittings.
(2) Check air hose 229 and fittings for bubbles, indicating leaks.

(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 11-19).





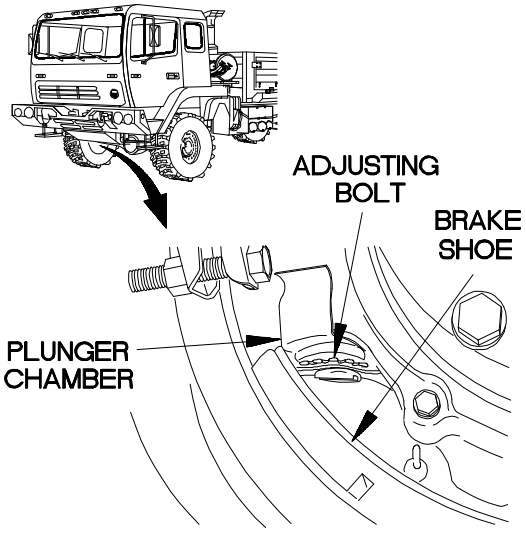
i4. FRONT BRAKES OVERHEAT AND/OR DO NOT RELEASE (CONT)



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).

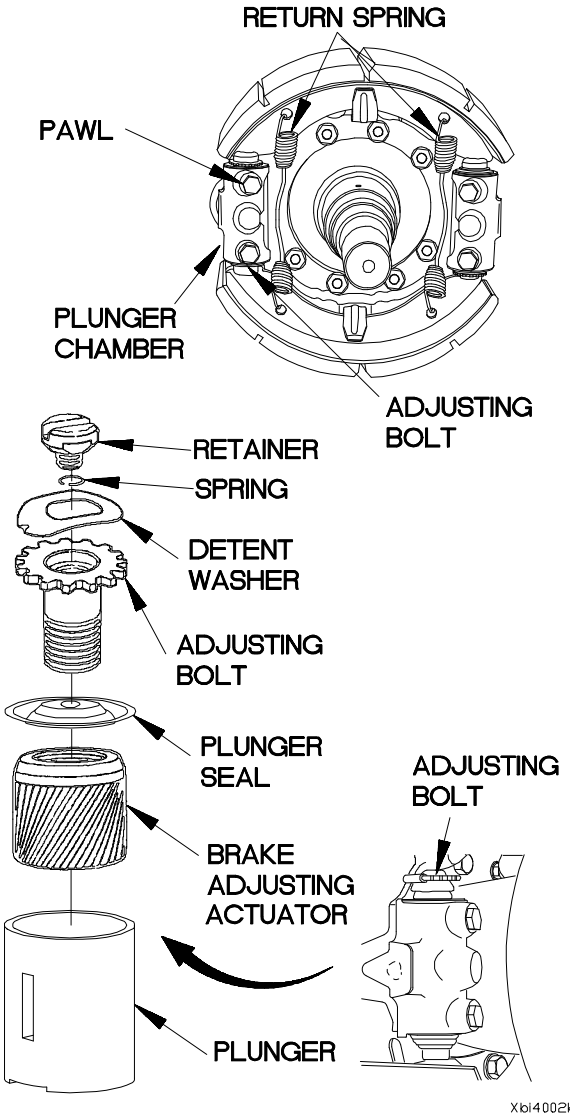


(1) Remove wheel(s) with affected brakes and disassemble brake components (para 11-2).
(2) Inspect return springs for stretching, bluing, damage, or breakage.
(3) If spring(s) is damaged, replace spring(s) (para 11-2).
(4) Check adjusting pawl spring for damage.
(5) Ensure adjusting pawl spring is not missing or broken.
(6) Check adjusting pawl teeth for damage and abrasion.
(7) Ensure seal elements are not damaged or broken.

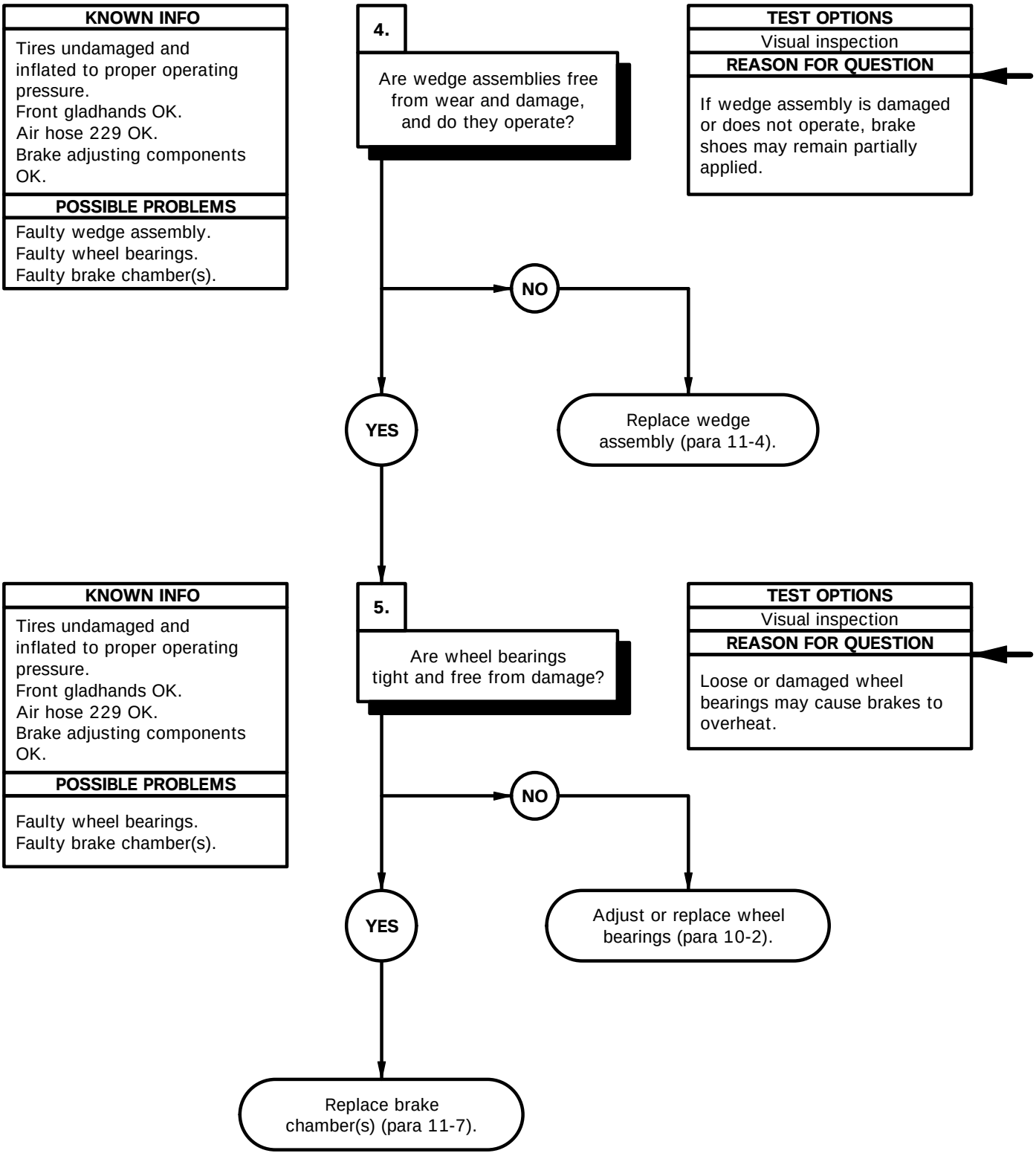
CAUTION

Ensure seal is free from damage. Failure to comply may result in dirt entering plunger chamber and interfering with adjustment.

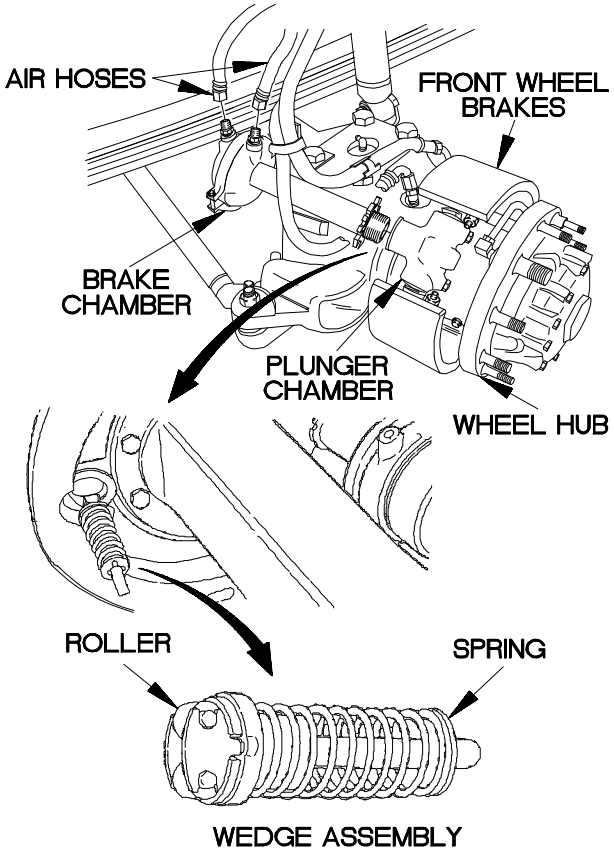
(8) Check actuator teeth for damage.
(9) Check plunger for freedom of movement inside plunger housing.



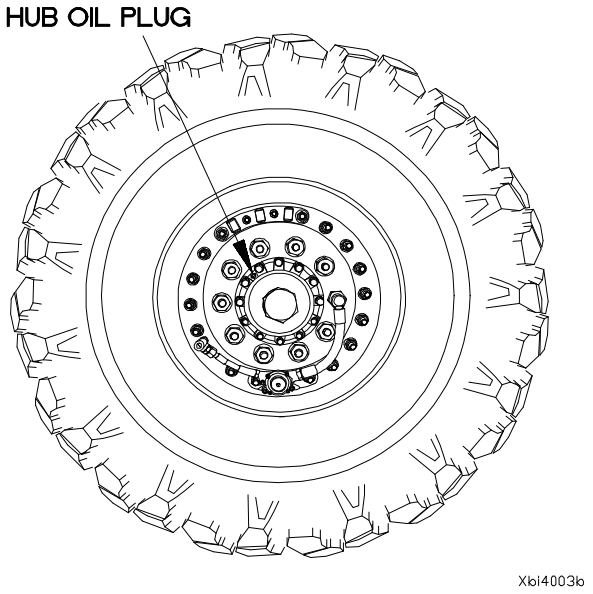
i4. FRONT BRAKES OVERHEAT AND/OR DO NOT RELEASE (CONT)



(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 9-2320-365-10).
(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.



i5. VEHICLE BRAKES UNEVENLY, BRAKES PULL TO ONE SIDE OR GRAB

INITIAL SETUP

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

Personnel Required
(2)

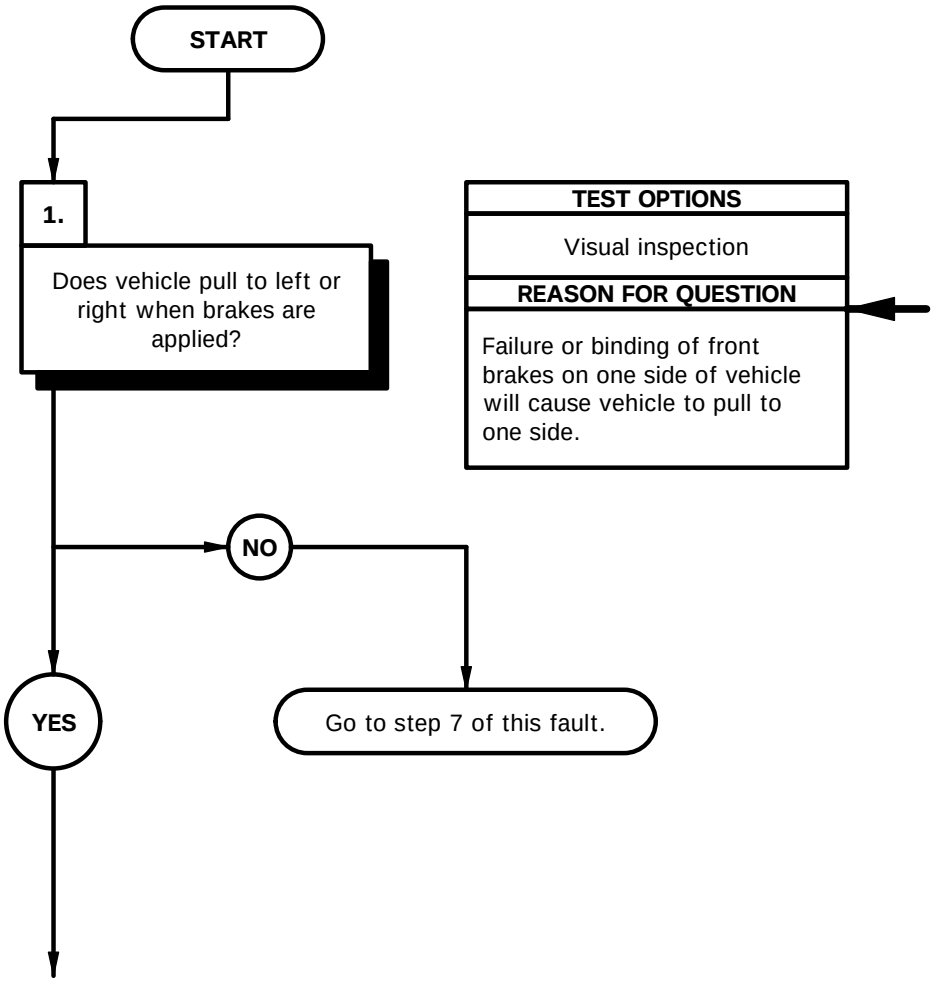
Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Trestle, Motor Vehicle Maintenance (2) (Item 45, Appendix C)

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

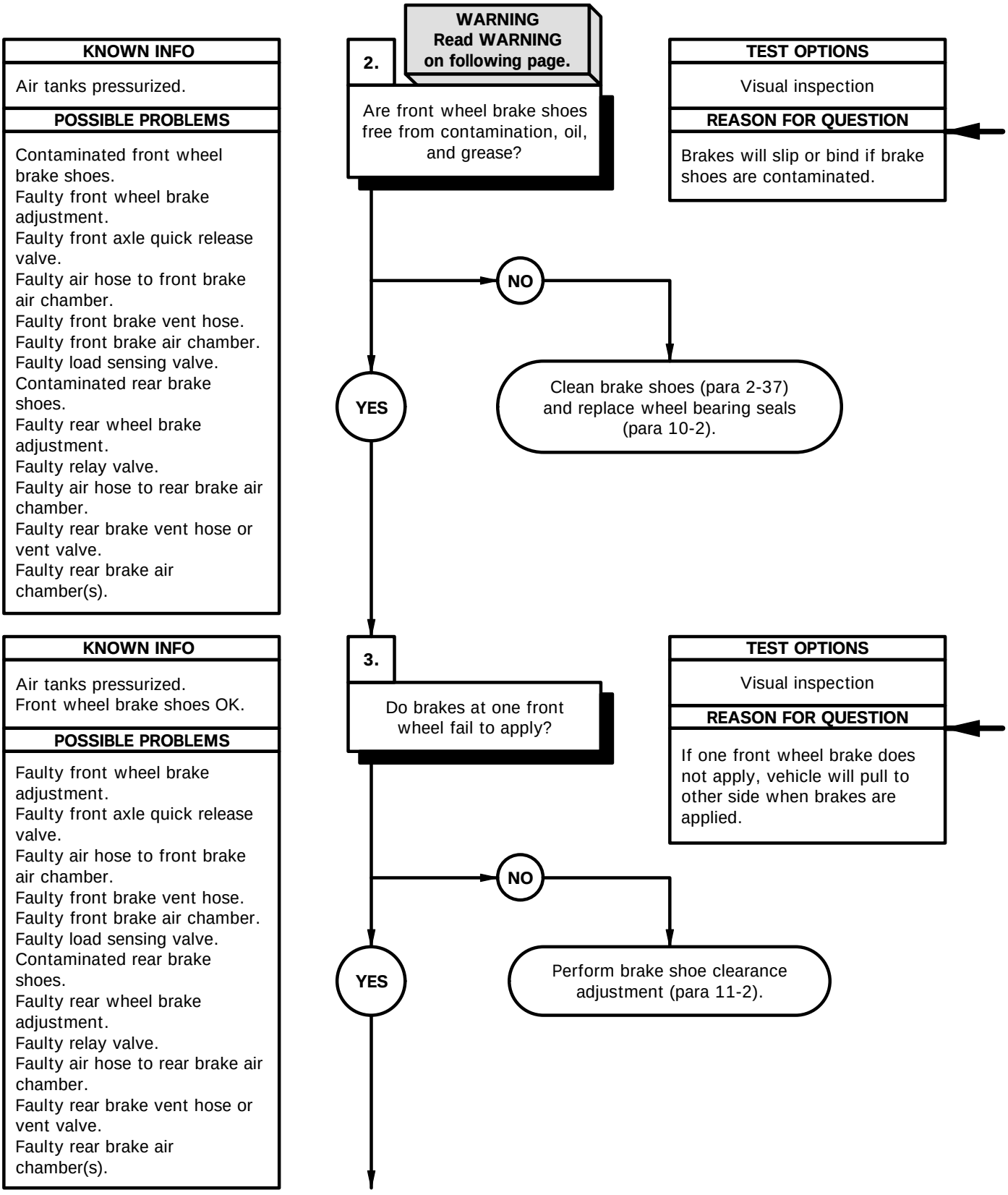
Visual inspection

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 9-2320-365-10).
(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 9-2320-365-10).
(5) If vehicle pulls to one side when brakes are applied, front brakes are faulty.
(6) If both rear wheels lock up before front wheels, load sensing valve may need adjustment or is faulty.
(7) If individual rear wheel locks up or drags, individual rear wheel brakes may need adjustment or are faulty.

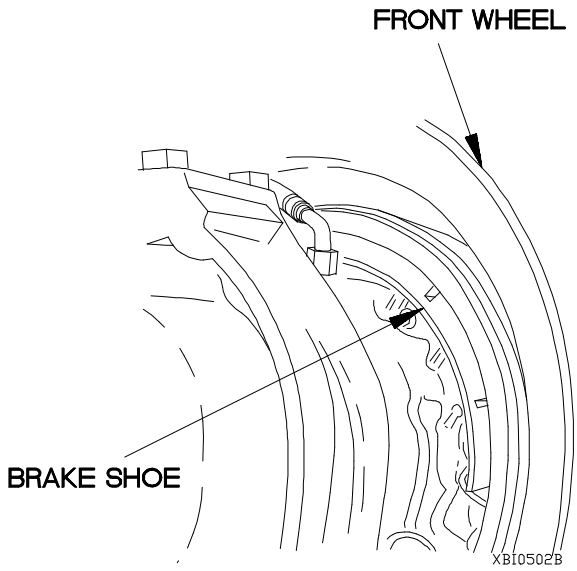
i5. VEHICLE BRAKES UNEVENLY, BRAKES PULL TO ONE SIDE OR GRAB (CONT)



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) 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 11-15).

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

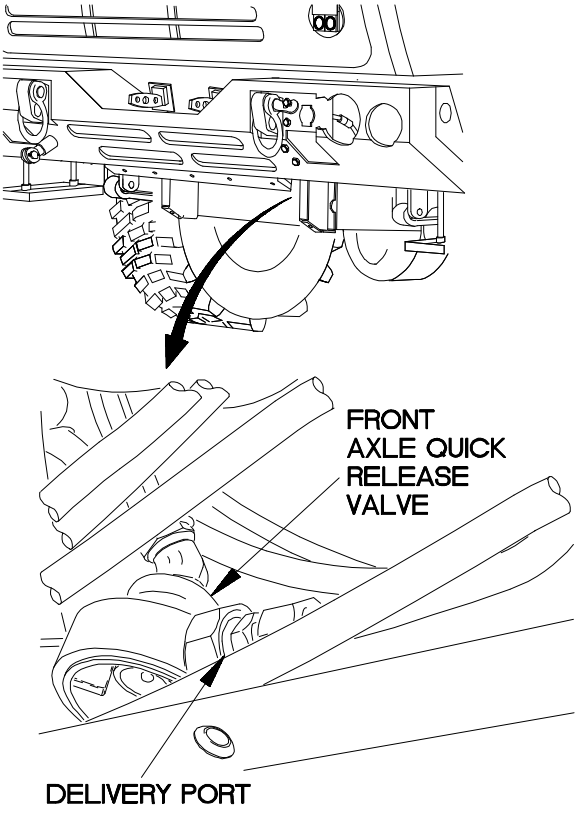
REASON FOR QUESTION

If air hose to front brake(s) is damaged or blocked, brakes will not operate on affected side of vehicle.

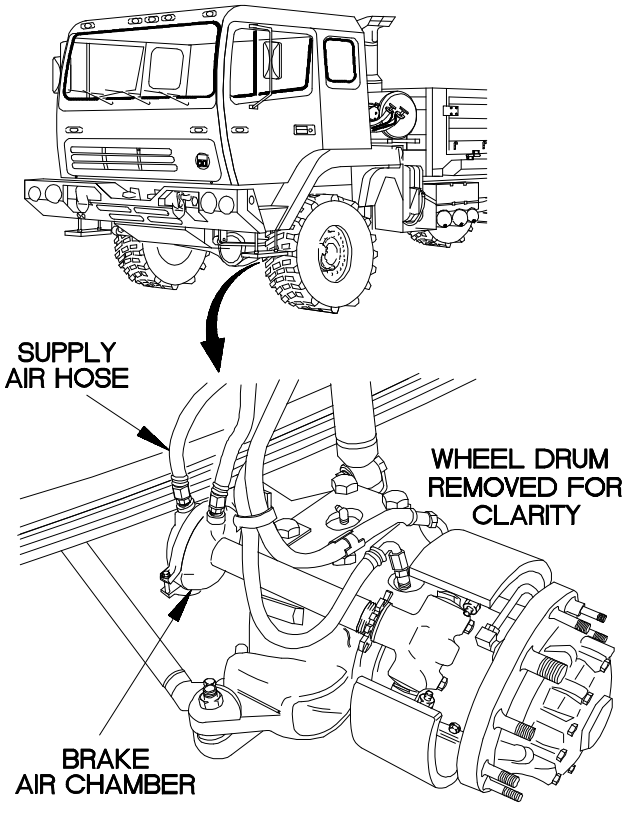
NO → Replace damaged air hose(s) (para 11-19).

YES

(1) Remove gravel deflector extension and gravel deflector (para 14-7).
(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 11-15).
(6) Tighten delivery air hose on front axle quick release valve.
(7) Install gravel deflector and gravel deflector extension (para 14-7).



(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 11-19).
(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 11-19).

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

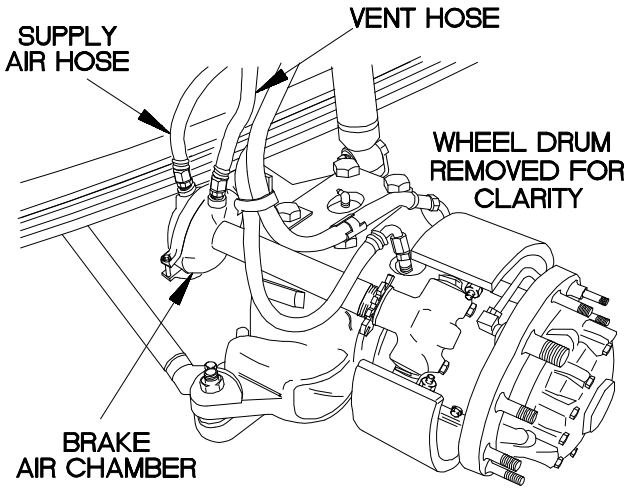
REASON FOR QUESTION

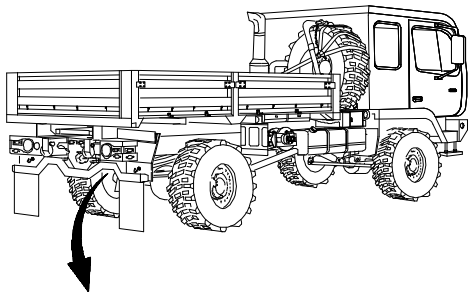
If rear brakes lock up or grab before front brakes on unloaded vehicle, load sensing valve needs adjustment or is faulty.

NO → Adjust or replace load sensing valve (para 11-10).

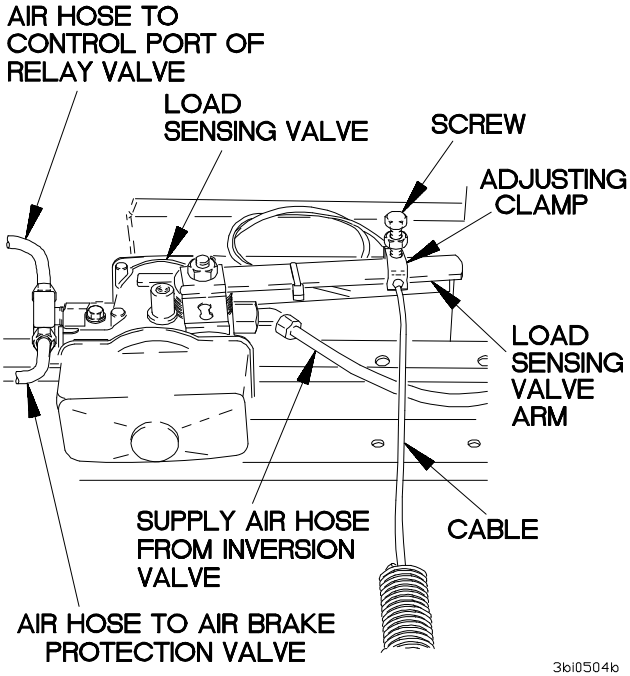
YES →

(1) Disconnect vent hose from front brake air chamber.
(2) Blow compressed air through vent hose.
(3) Check for air escaping at vent.
(4) Connect vent hose to 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 2-37) 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

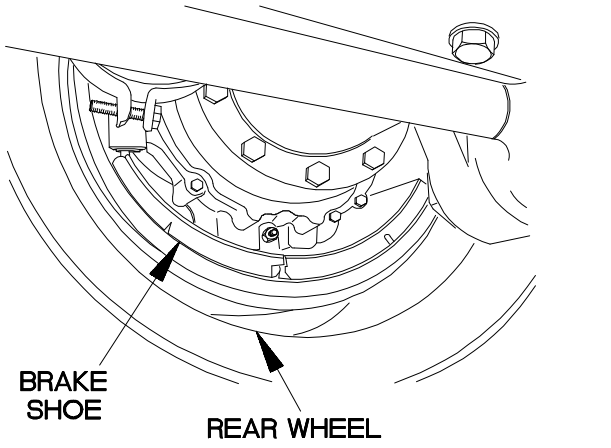
REASON FOR QUESTION

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 rear axle 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 rear axle off maintenance trestles.
(5) Remove maintenance trestles and lower wheels to ground.



(1) Chock wheels.
(2) Release parking brake (TM 9-2320-365-10).
(3) Apply brakes and observe operation of brake shoes at rear wheels.
(4) If brake shoes fail to apply on one side, brake air delivery system or brake air chamber is faulty on that side.
(5) If both 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 11-13).

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

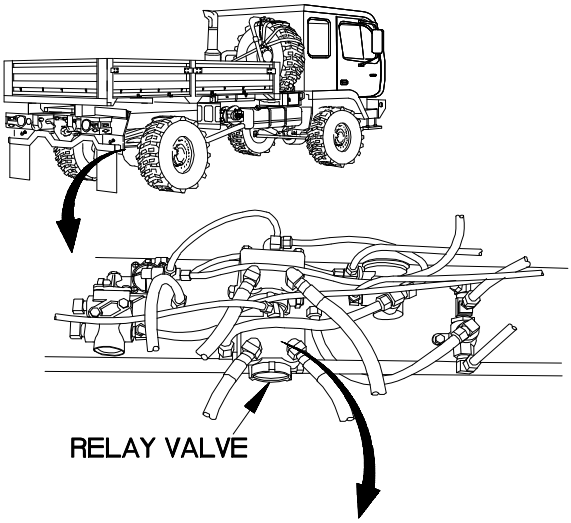
REASON FOR QUESTION

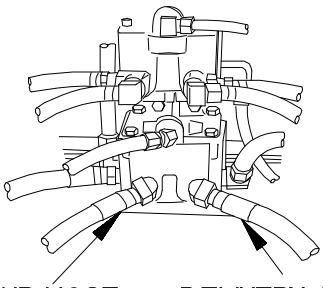
If air hose(s) to affected brake(s) is damaged or blocked, brakes will not operate at affected wheel(s).

NO → Replace damaged air hose(s) (para 11-19).

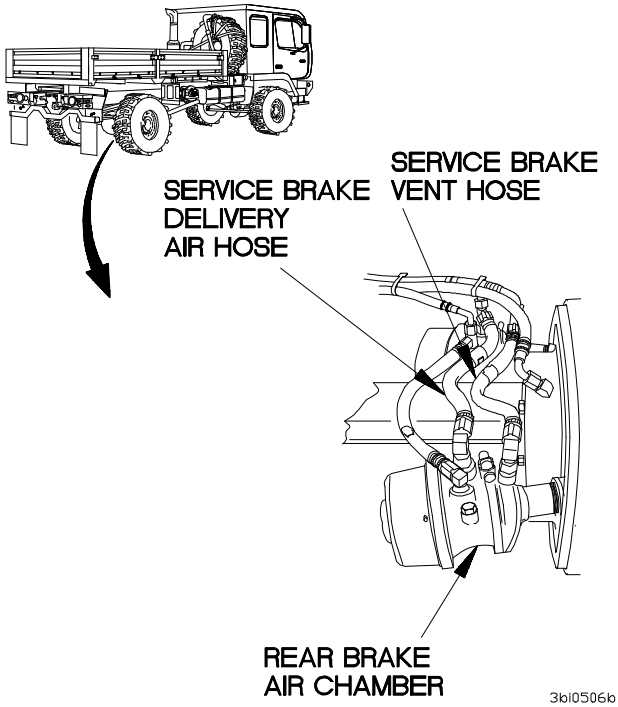
YES

(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 11-13).
(5) Tighten delivery air hoses on relay valve delivery ports.

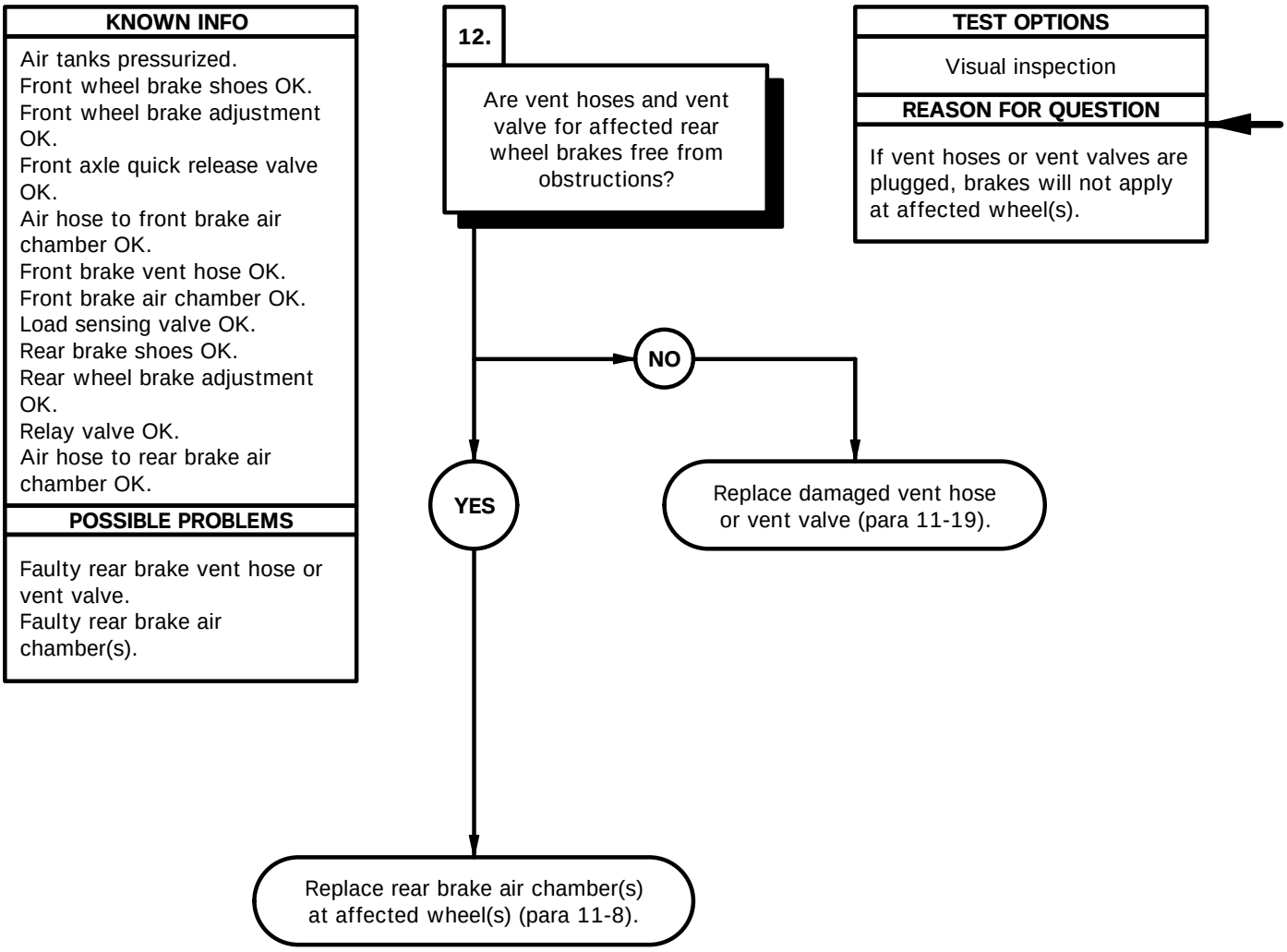




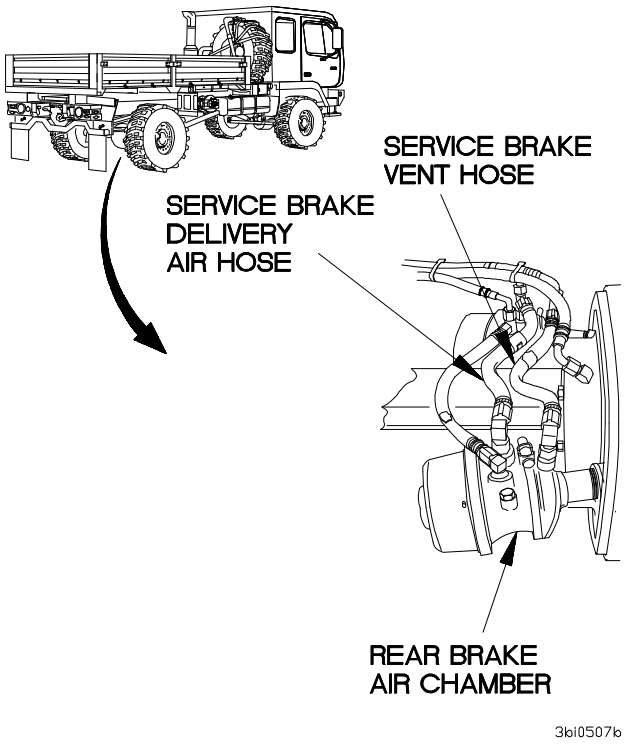
(1) Loosen service brake air hose on rear brake air chamber.
(2) Apply brakes.
(3) Listen for escaping air when brakes are applied.
(4) If escaping air cannot be heard, replace air hose (para 11-19).
(5) Tighten service brake air hose on rear brake air chamber.
(6) Apply parking brake (TM 9-2320-365-10).



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 9-2320-365-10).



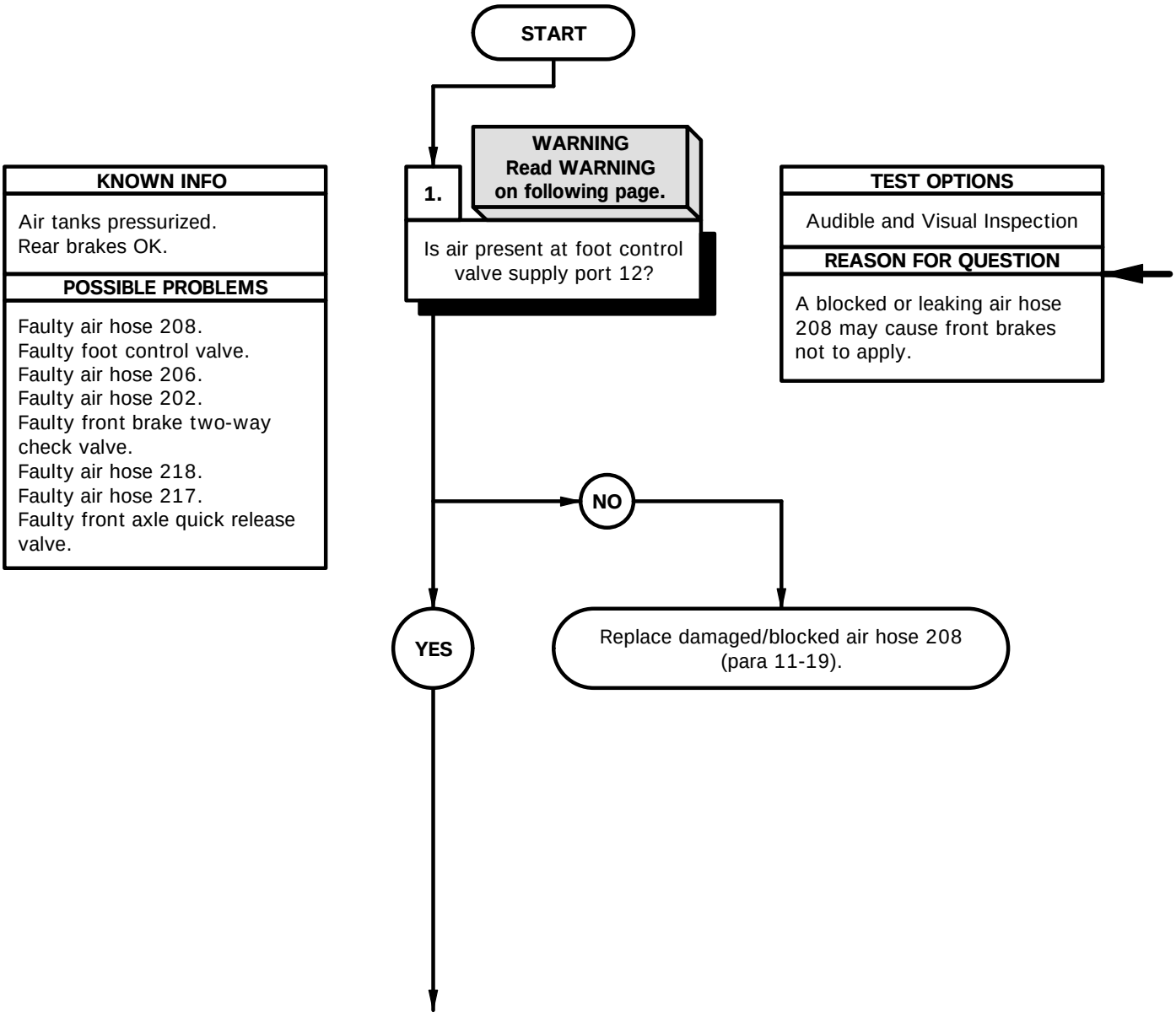
i6. FRONT BRAKES DO NOT APPLY

INITIAL SETUP

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

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Goggles, Industrial (Item 15, Appendix C)



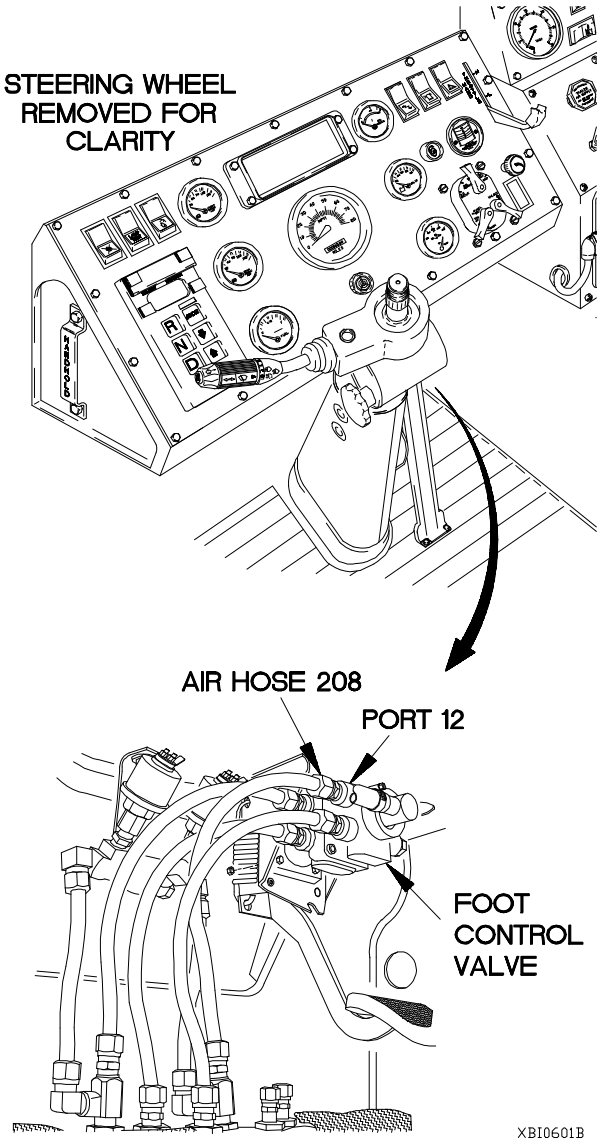
WARNING

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

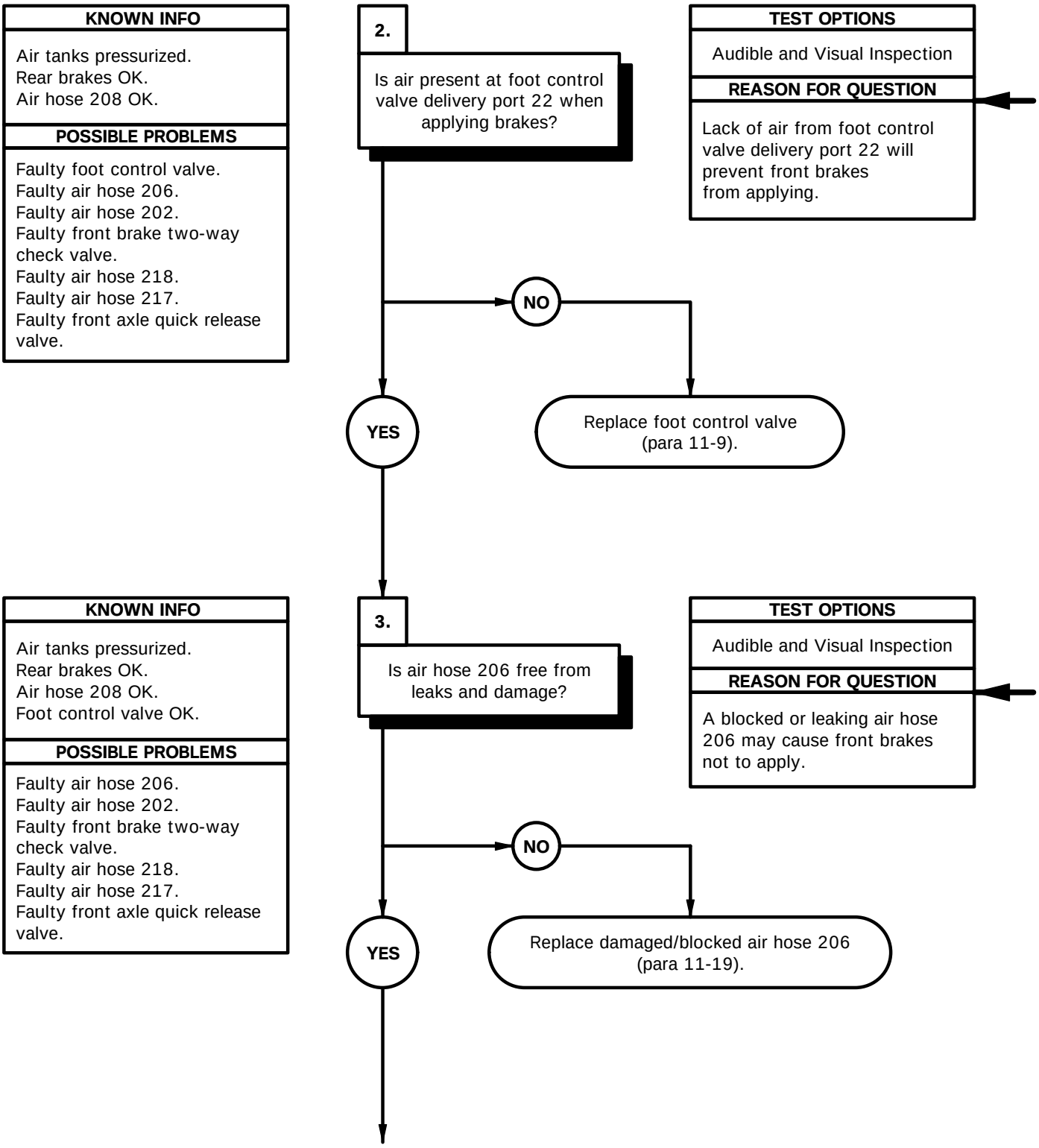
NOTE

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.

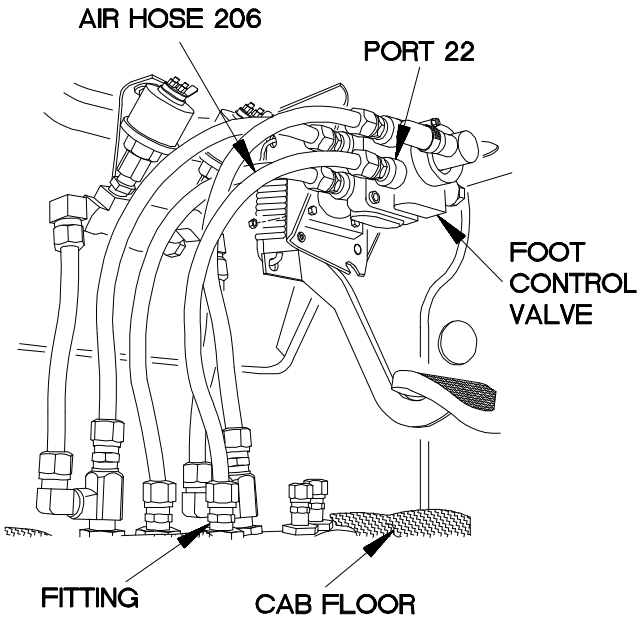
(1) Loosen air hose 208 at foot control valve supply port 12 and listen for presence of escaping air.
(2) If escaping air cannot be heard, replace air hose 208 (para 11-19).
(3) Tighten air hose 208 on foot control valve supply port 12.



i6. FRONT BRAKES DO NOT APPLY (CONT)

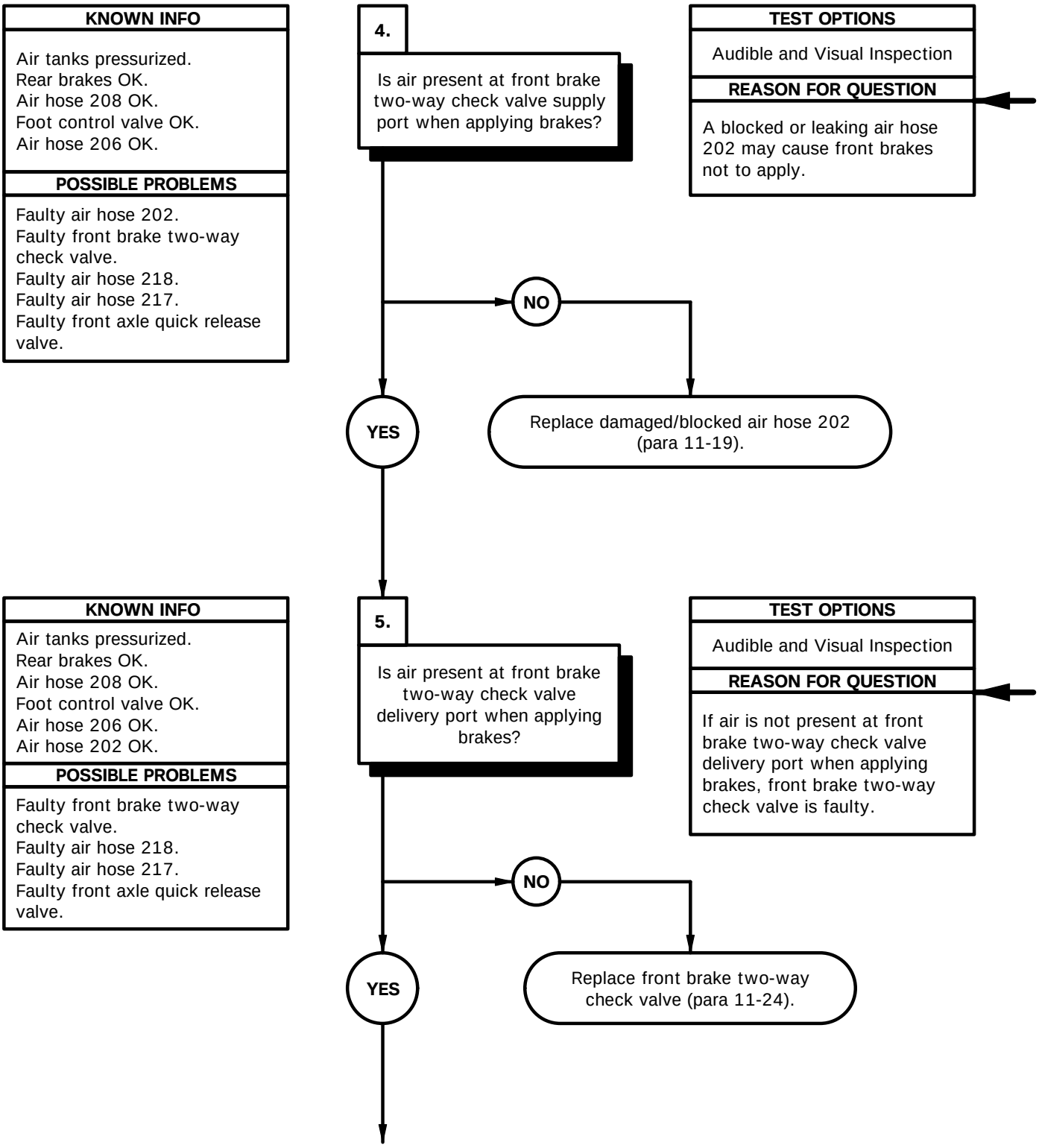


(1) Loosen air hose 206 on foot control valve delivery port 22.
(2) Apply foot brake.
(3) Listen for escaping air from air hose 206 when brakes are applied.
(4) If escaping air cannot be heard when brakes are applied, replace foot control valve (para 11-9).
(5) Tighten air hose 206 on foot control valve delivery port 22.



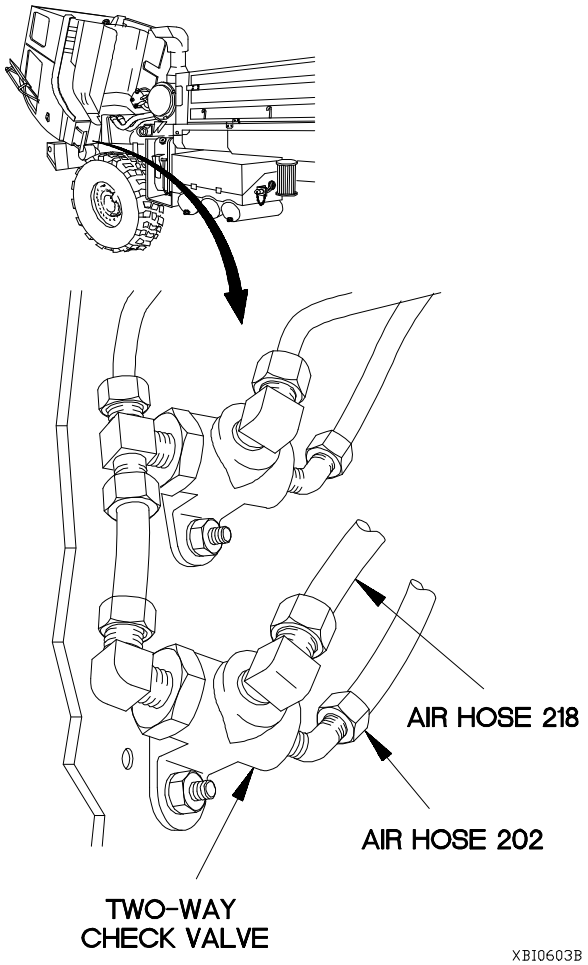
(1) Loosen air hose 206 at fitting on cab floor.
(2) Apply foot brake.
(3) Listen for air escaping from air hose 206 when brakes are applied.
(4) If escaping air cannot be heard when brakes are applied, replace air hose 206 (para 11-19).
(5) Tighten air hose 206 at fitting on cab floor.

i6. FRONT BRAKES DO NOT APPLY (CONT)

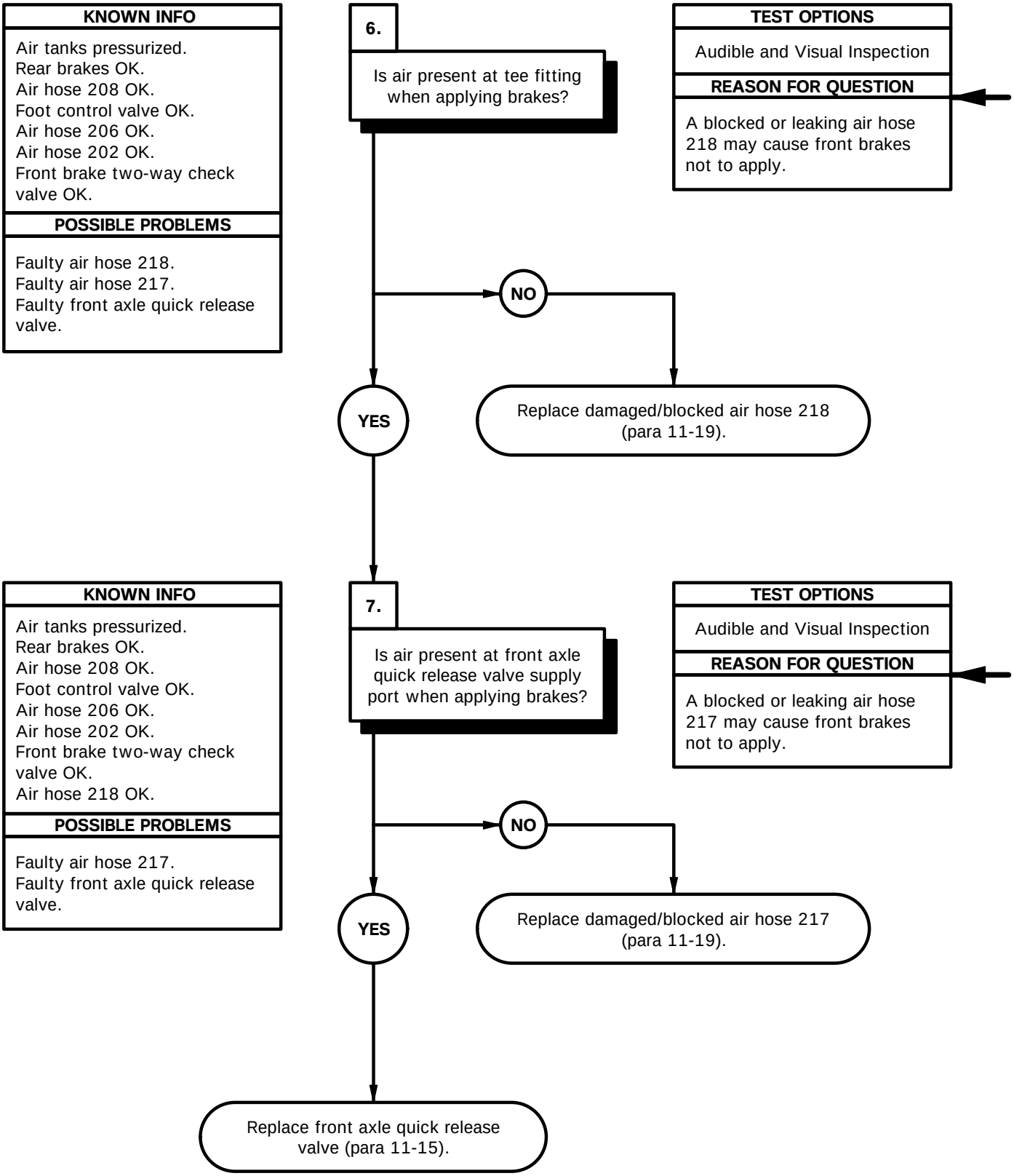


(1) Loosen air hose 202 on front brake two-way check valve supply port.
(2) Apply foot brake.
(3) Listen for escaping air from air hose 202 when brakes are applied.
(4) If escaping air cannot be heard when brakes are applied, replace air hose 202 (para 11-19).
(5) Tighten air hose 202 on front brake 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 11-24).
(5) Tighten air hose 218 on front brake two-way check valve delivery port.

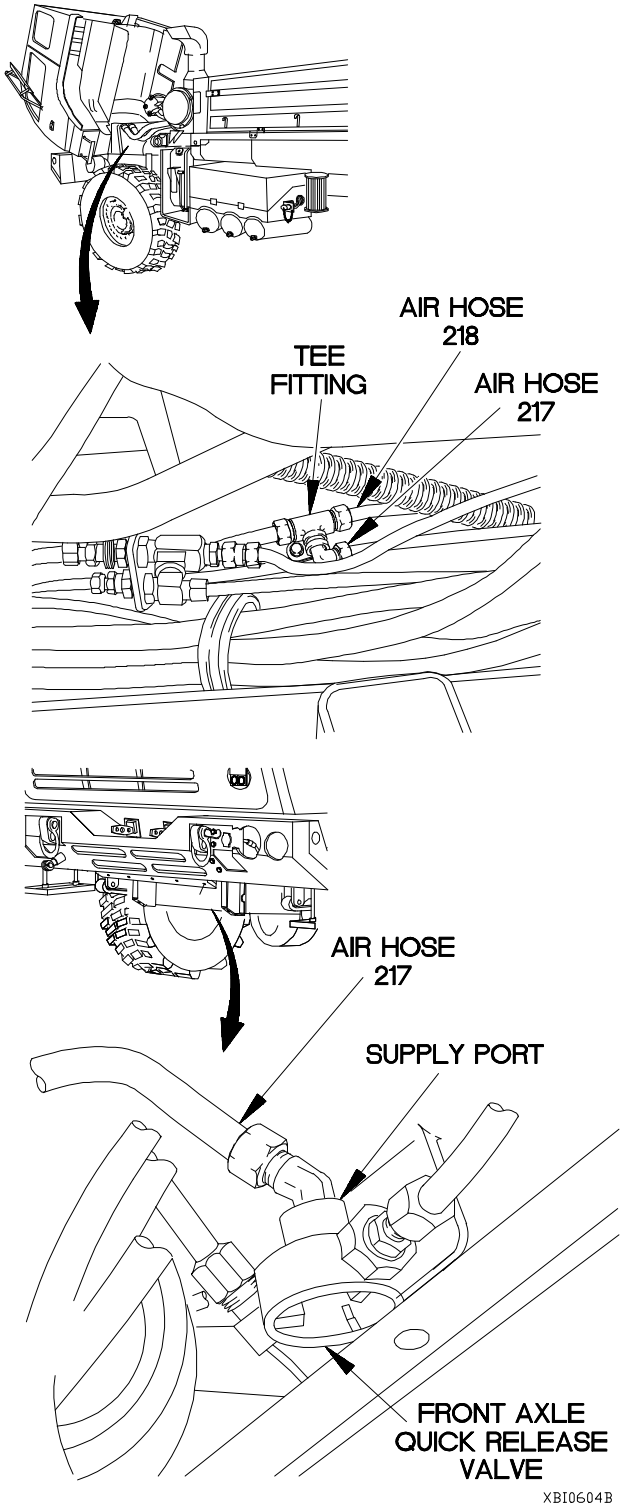


i6. FRONT BRAKES DO NOT APPLY (CONT)



(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 11-19).
(5) Tighten air hose 218 on tee fitting.

(1) Remove gravel deflector extension and gravel deflector (para 14-7).
(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 11-19).
(6) If air can be heard escaping when brakes are applied, replace front axle quick release valve (para 11-15).
(7) Tighten air hose 217 on front axle quick release valve supply port.
(8) Install gravel deflector and gravel deflector extension (para 14-7).



i7. REAR BRAKES OVERHEAT

INITIAL SETUP

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

Personnel Required
(2)

Tools and Special Tools
Goggles, Industrial (Item 14, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Trestle, Motor Vehicle Maintenance (2) (Item 45, Appendix C)
Adjusting Tool, Brake Shoe (Item 2, Appendix C)

KNOWN INFO

Tires undamaged and inflated to operating pressure.

POSSIBLE PROBLEMS

Faulty spring brake chamber(s).
Faulty brake adjusting components.
Faulty wedge assembly.
Faulty wheel bearings.

WARNING
Read WARNING on following page.

1. Do both spring brakes release on affected rear wheels?

TEST OPTIONS

Visual Inspection

REASON FOR QUESTION

A failed spring brake will cause brakes to apply and overheat affected wheel.

NO → Tighten or replace air hose (para 11-19). Replace spring brake chamber(s) (para 11-8).

YES

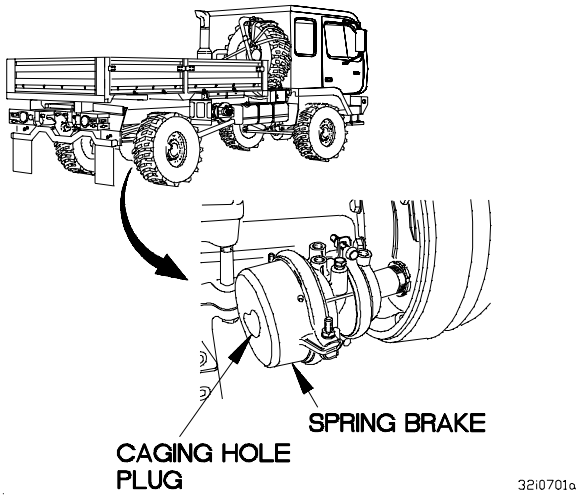
WARNING

- **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.**

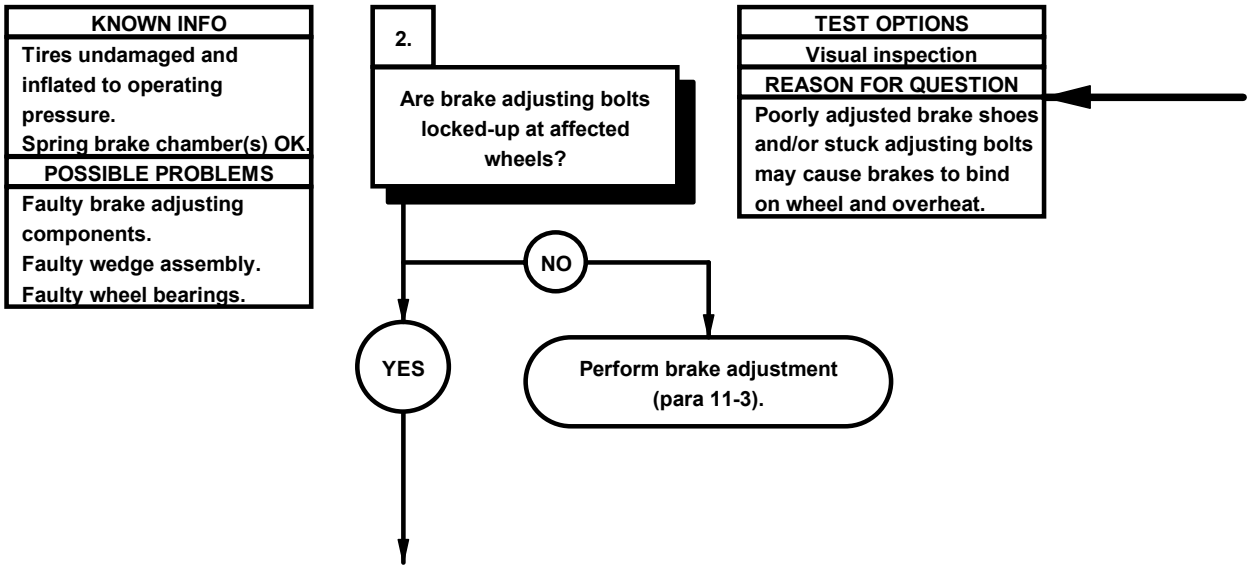
NOTE

If wheel drums are too hot for hand touch after road test of vehicle, brakes are overheated.

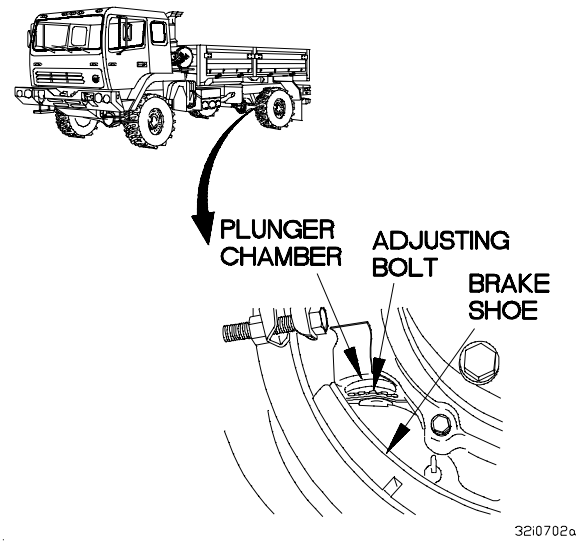
(1) Release parking brake (TM 9-2320-365-10).
(2) Check for presence of air at air hose to spring brake chamber. If air is present at spring brake chamber, replace fittings or air hose (para 11-19).
(3) Remove cover plug from caging hole at back of spring brake chamber (TM 9-2320-365-10).
(4) With flashlight 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 9-2320-365-10).
(6) Apply parking brake (TM 9-2320-365-10).



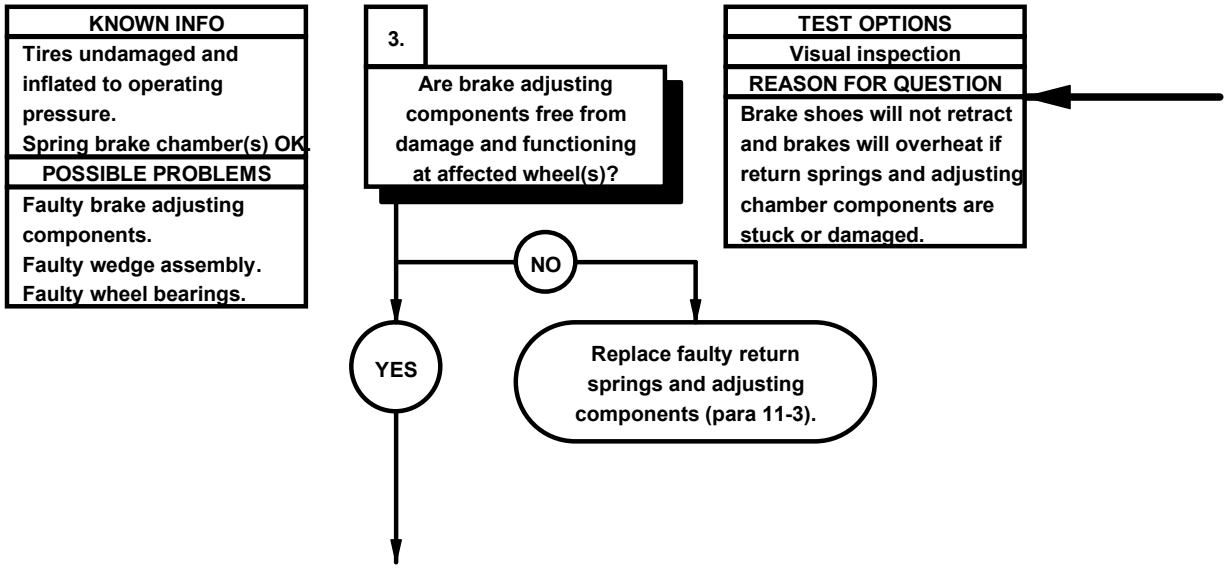
i7. REAR BRAKES OVERHEAT (CONT)



(1) Jack up axle with overheated brakes, and support with trestle stands.
(2) Release parking brake (TM 9-2320-365-10).
(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)

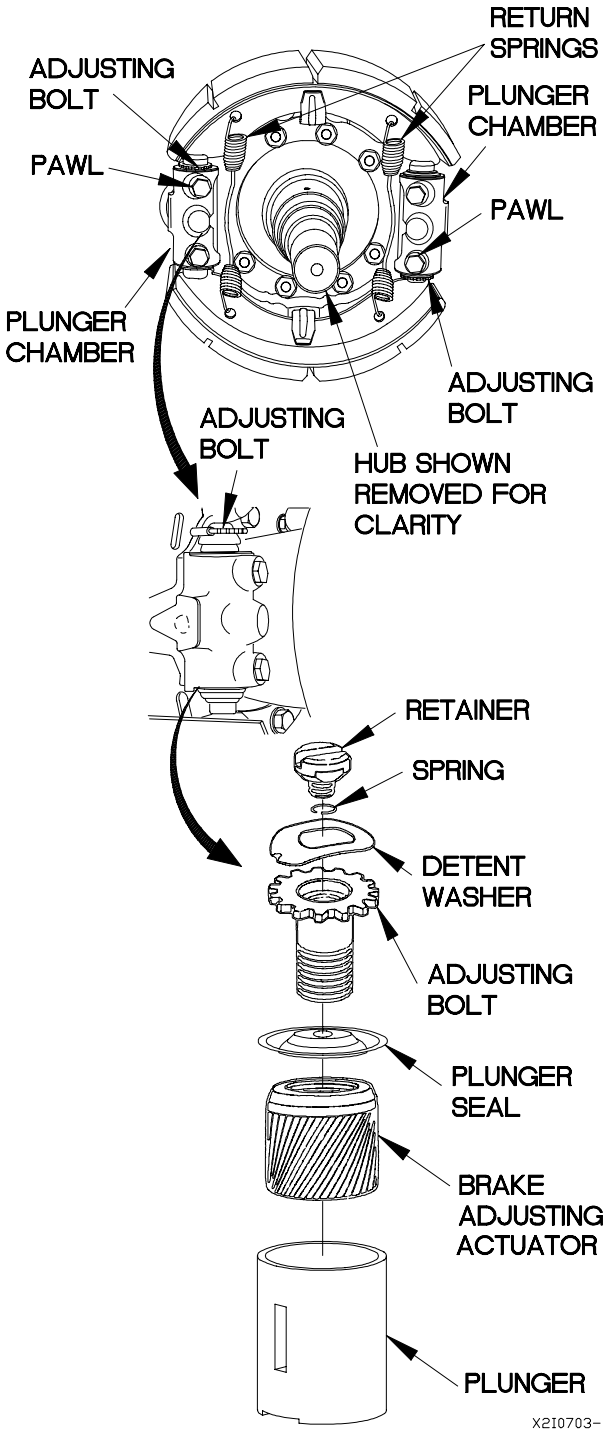


(1) Remove wheel(s) with affected brakes (TM 9-2320-365-10).
(2) Disassemble brakes (para 11-3).
(3) Inspect spring for stretching, bluing, damage, or breakage. If spring(s) is damaged, brake shoes will not retract from wheel.
(4) Check adjusting pawl spring for damage. Ensure springs are not missing or broken.
(5) Check adjusting pawl teeth for damage and abrasion.

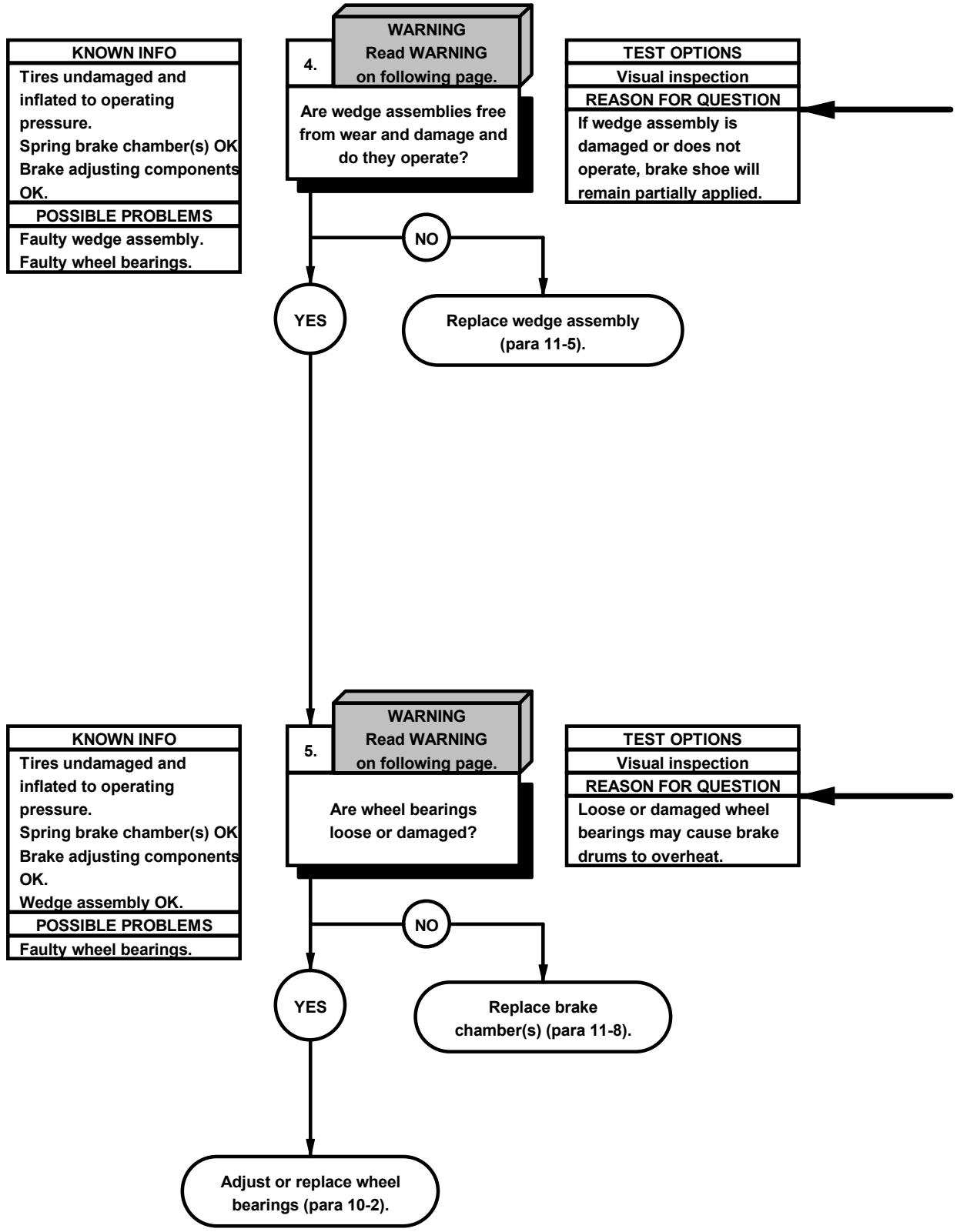
NOTE

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.



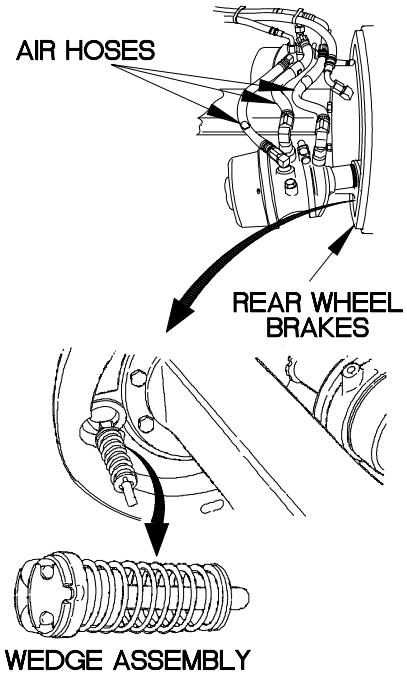
i7. REAR BRAKES OVERHEAT (CONT)



WARNING

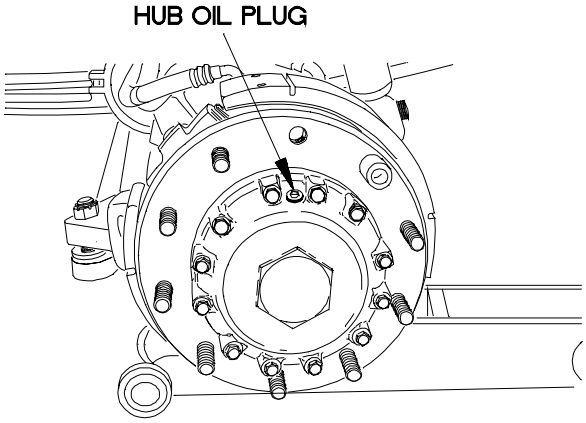
Spring brake chambers are very powerful. Cage spring brakes before removing chambers. Failure to comply may result in injury to personnel.

(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).



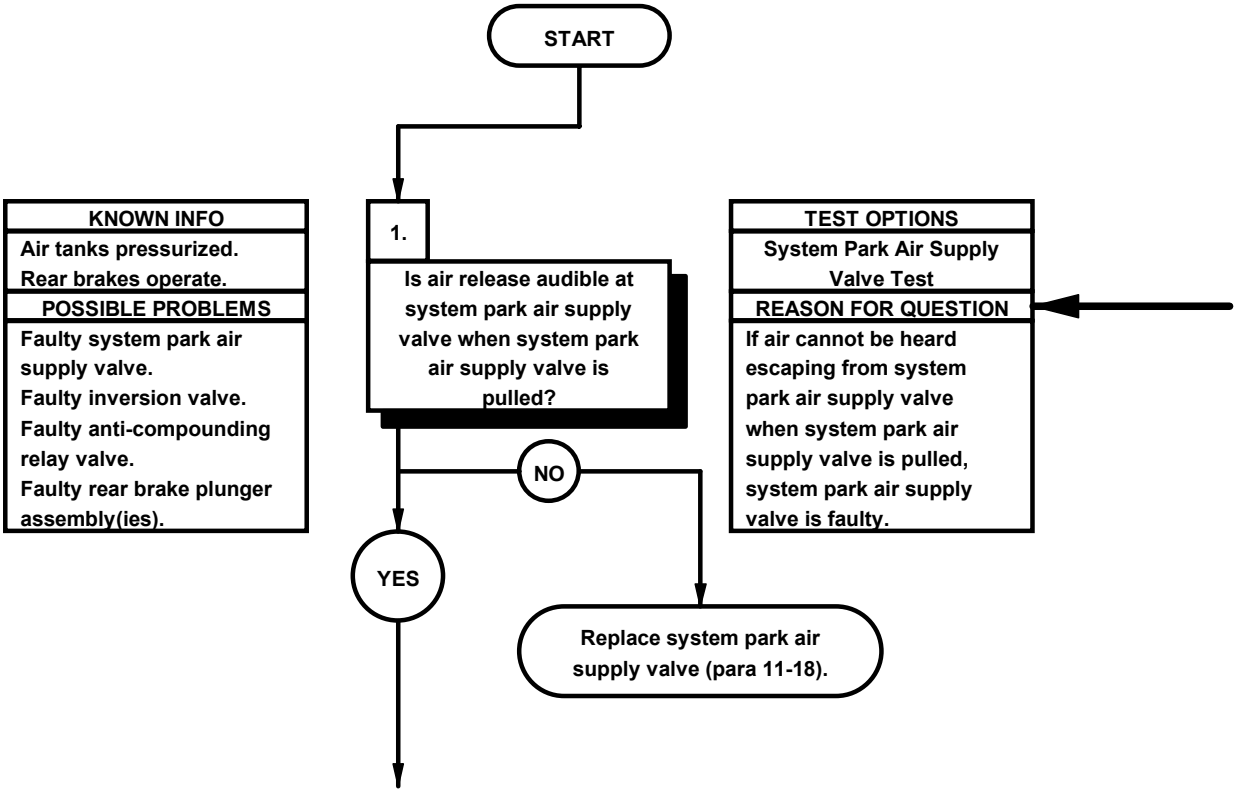
X2I0704A

(1) Install wheels (TM 9-2320-365-10).
(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 9-2320-365-10).
(7) Remove trestle stands and lower wheels to ground.

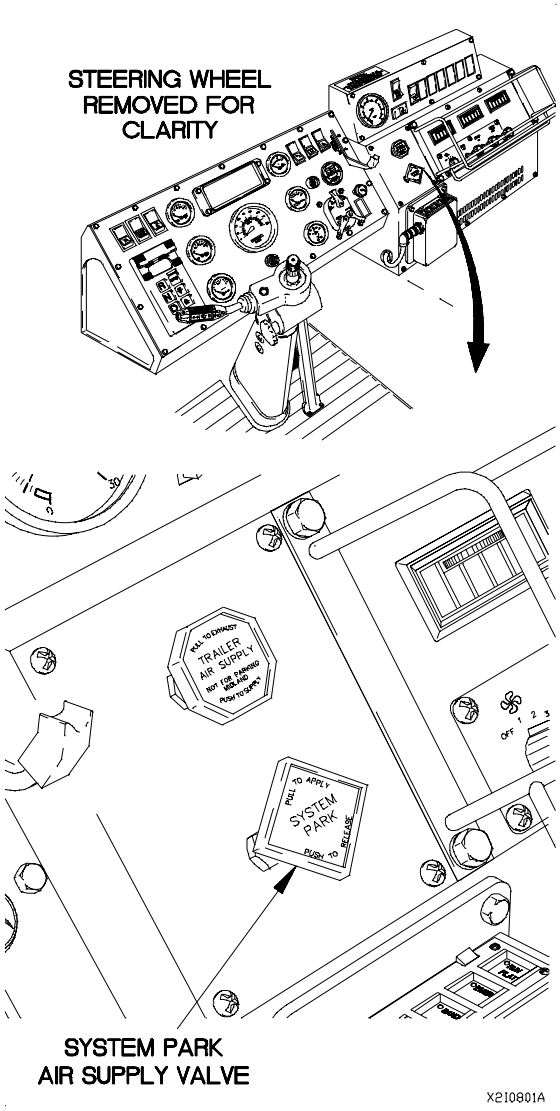


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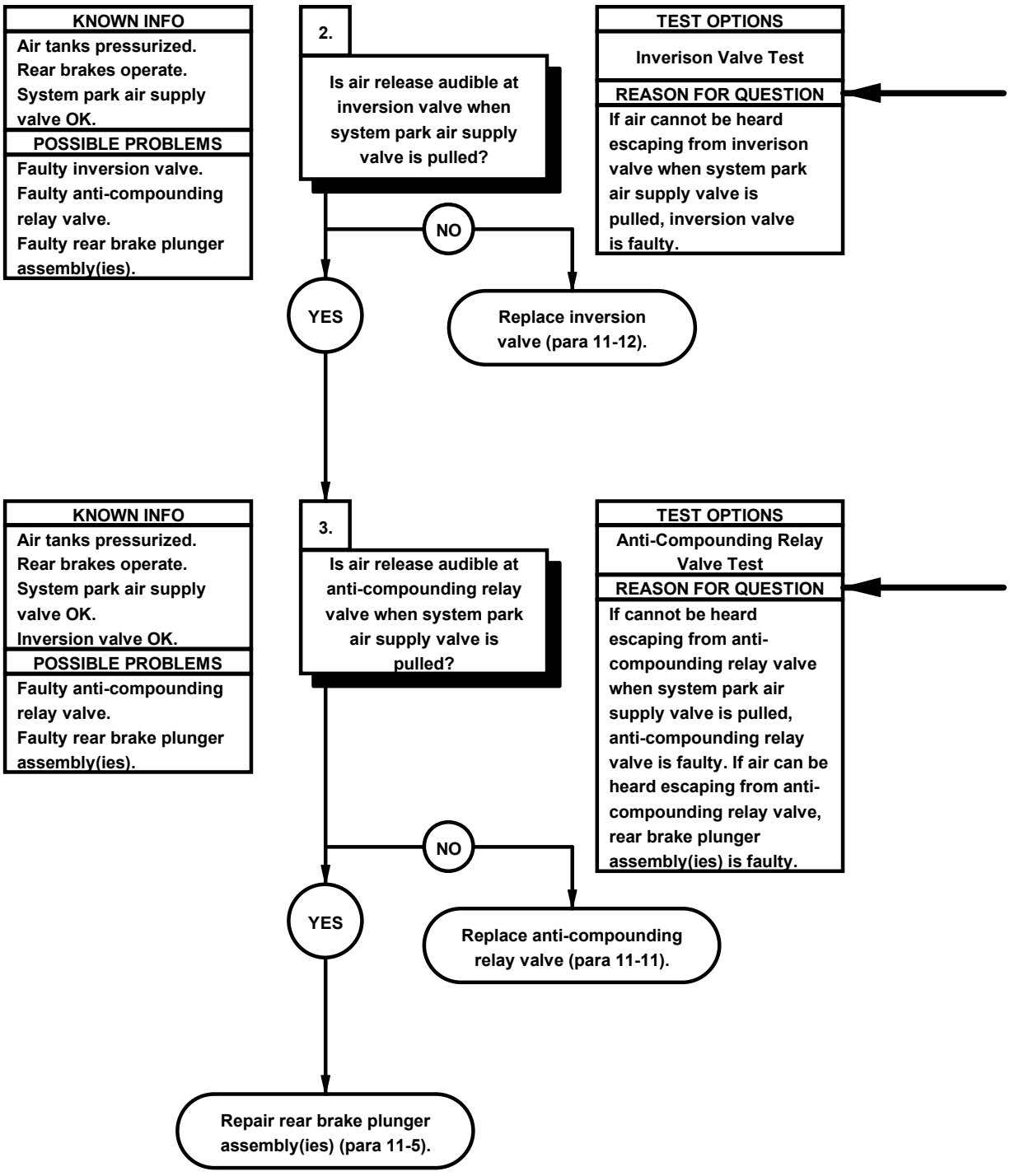
i8. PARKING BRAKE DOES NOT APPLY	
INITIAL SETUP	
Equipment Conditions Air tanks pressurized (TM 9-2320-365-10). Engine shut down (TM 9-2320-365-10).	**Tools and Special Tools** Tool Kit, Genl Mech (Item 44, Appendix C) Goggles, Industrial (Item 15, Appendix C)
Personnel Required (2)	



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 11-18).



i8. PARKING BRAKE DOES NOT APPLY (CONT)

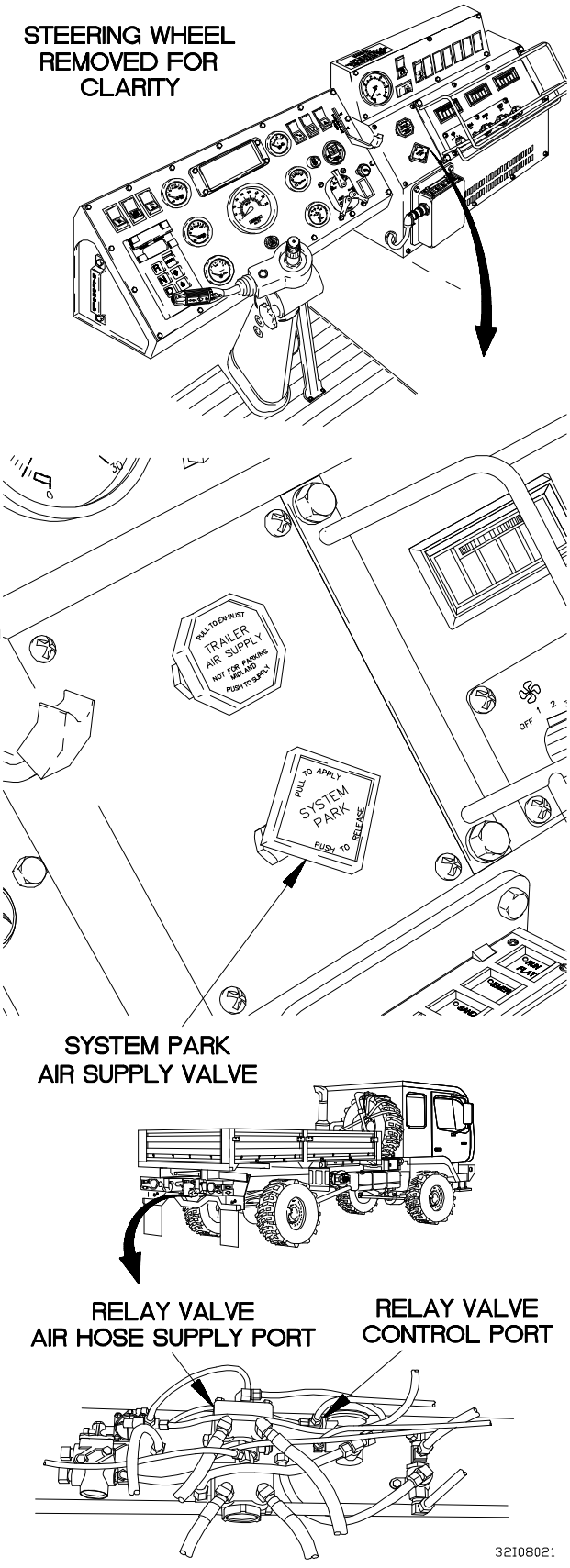


INVERSION VALVE TEST

(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 inversion valve, replace inversion valve (para 11-12).

ANTI-COMPONDING RELAY 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 anti-compounding relay valve, replace anti-compounding relay valve (para 11-11).
(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.

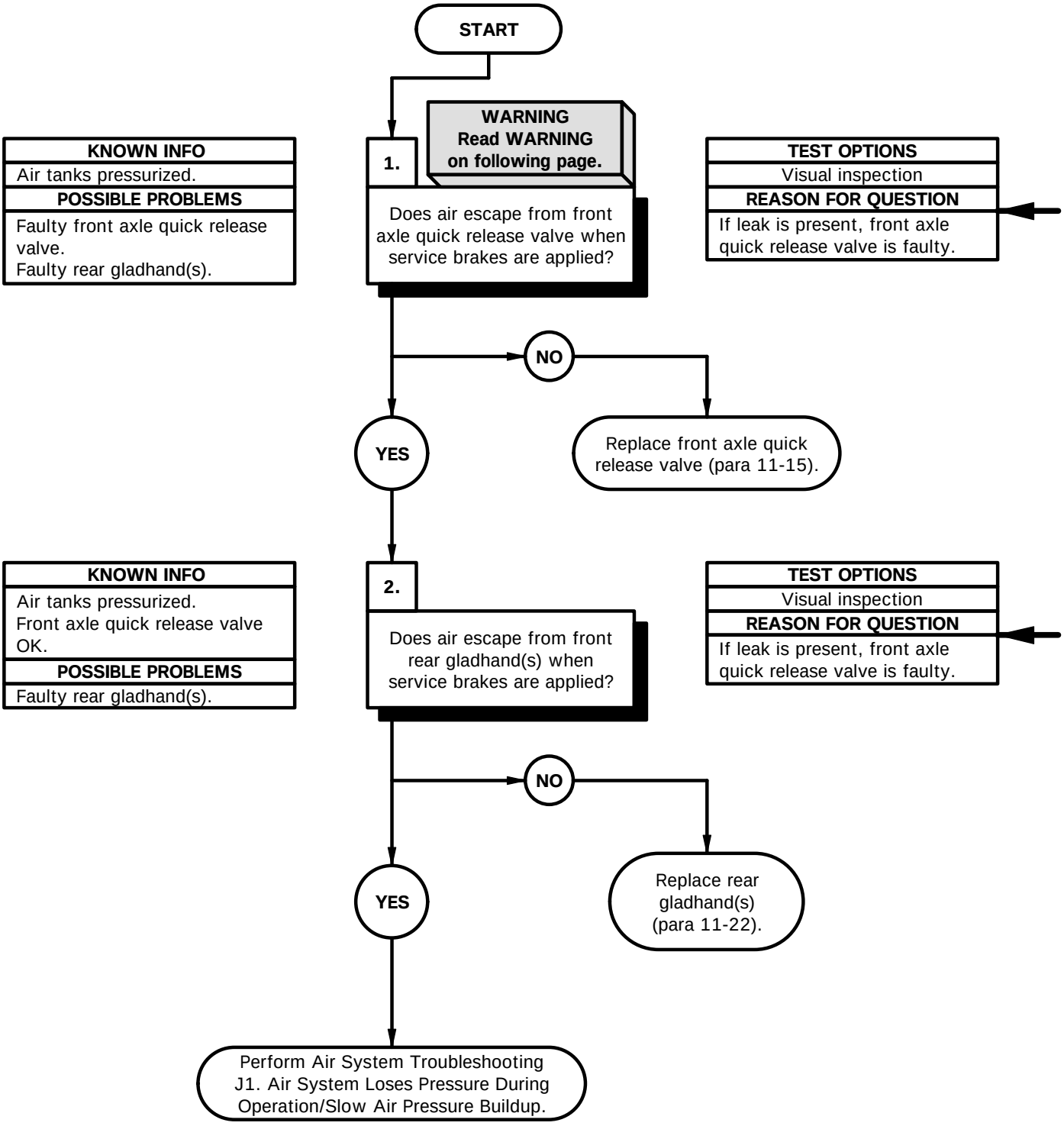


i9. BRAKE SYSTEM LOSES AIR WHEN SERVICE BRAKES ARE APPLIED

INITIAL SETUP

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

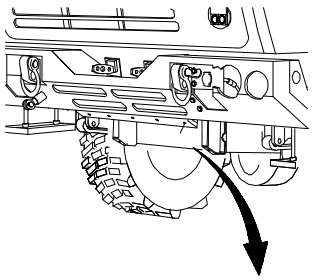
Tools and Special Tools
Tool Kit, Genl Mech (Item 44 Appendix C)
Goggles, Industrial (Item 15, Appendix C)

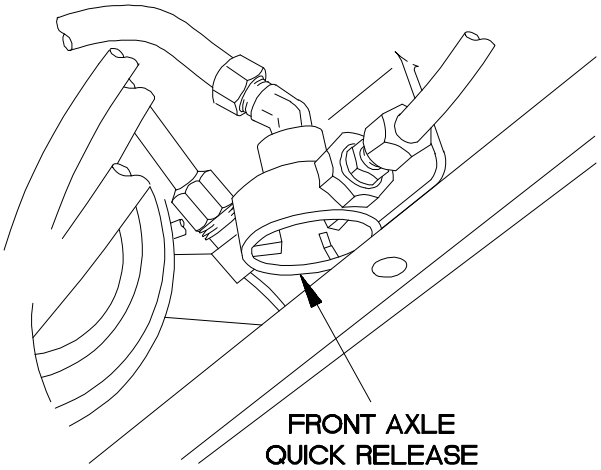


WARNING

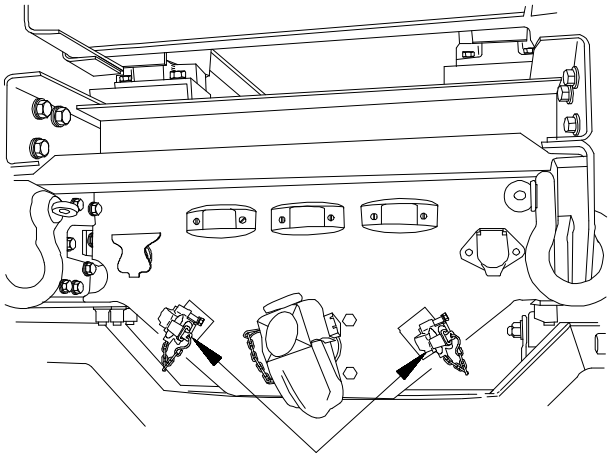
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

(1) Have assistant apply service brakes (TM 9-2320-365-10).
(2) Listen for air escaping from front axle quick release valve.
(3) If air leak is present, replace front axle quick release valve (para 11-15).





(1) Have assistant apply service brakes (TM 9-2320-365-10).
(2) Listen for air escaping from rear gladhand(s).
(3) If air leak is present, replace rear gladhand(s) (para 11-15).
(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 2-47, lists faults for the Air System of the vehicle.

Table 2-47. Air System Fault Index

Fault No.	Description	Page
j1.	Air System Loses Pressure During Operation/Slow, No, or Incorrect Air Pressure Buildup	2-1714
j2.	Large quantity of moisture Expelled From Air Reservoirs	2-1730
j3.	Air Dryer Purges Contstantly	2-1734
j4.	No Air Pressure Present at Rear Gladhand(s)	2-1738
j5.	Air System Pressure Builds Up More Than 120 Psi (827 kPa) (Compressor Fails to Unload)	2-1744
j6.	Noisy Air Compressor Operation	2-1748

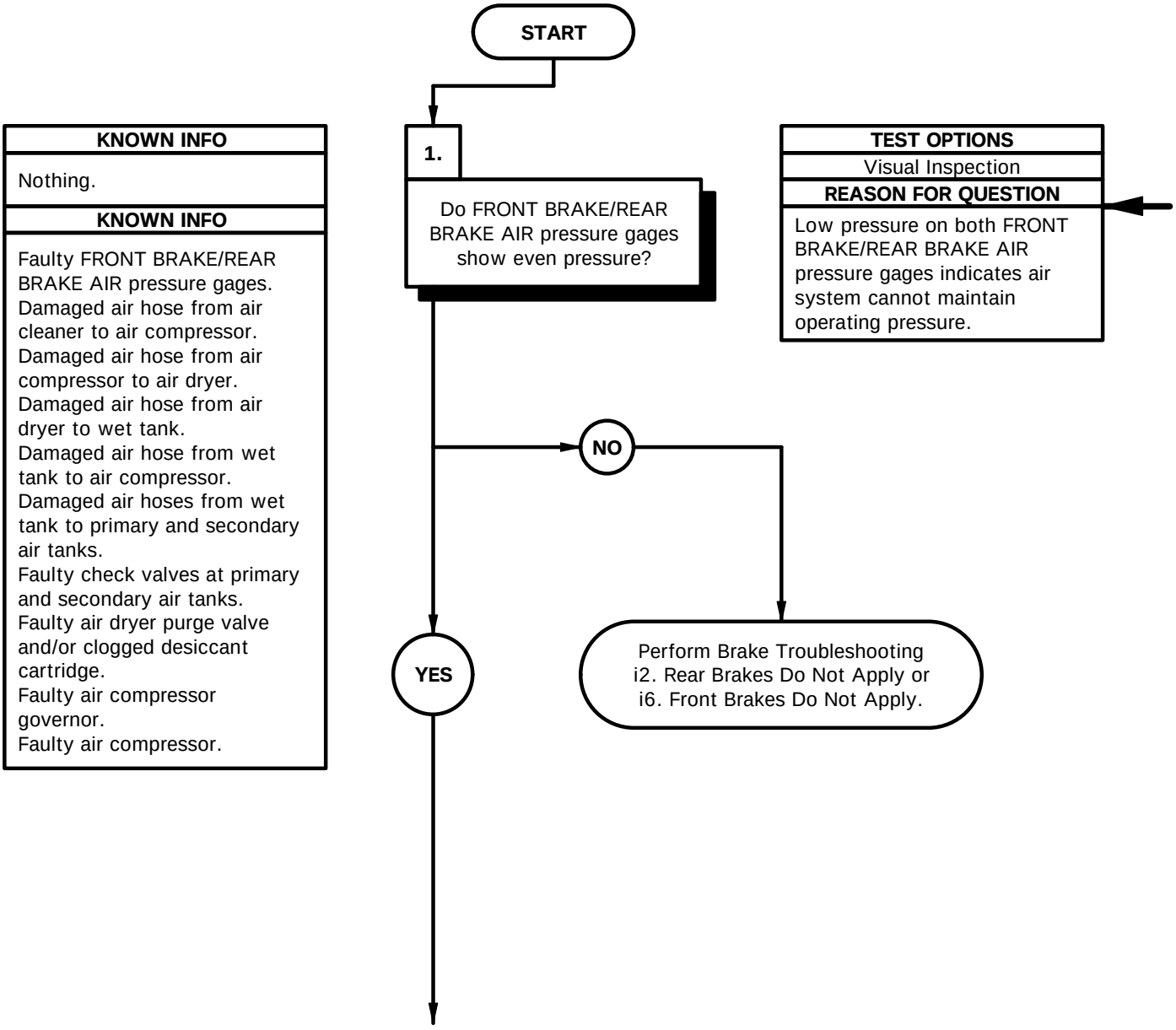
j1. AIR SYSTEM LOSES PRESSURE DURING OPERATION/SLOW, NO, OR INCORRECT AIR PRESSURE BUILDUP

INITIAL SETUP

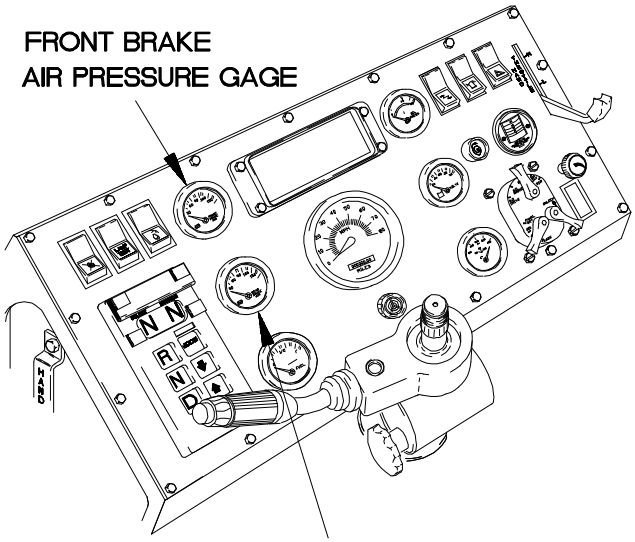
Equipment Conditions
Engine running (TM 9-2320-365-10).
Parking brake on (TM 9-2320-365-10).
Wheels chocked (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Pan, Wash (Item 25, Appendix C)

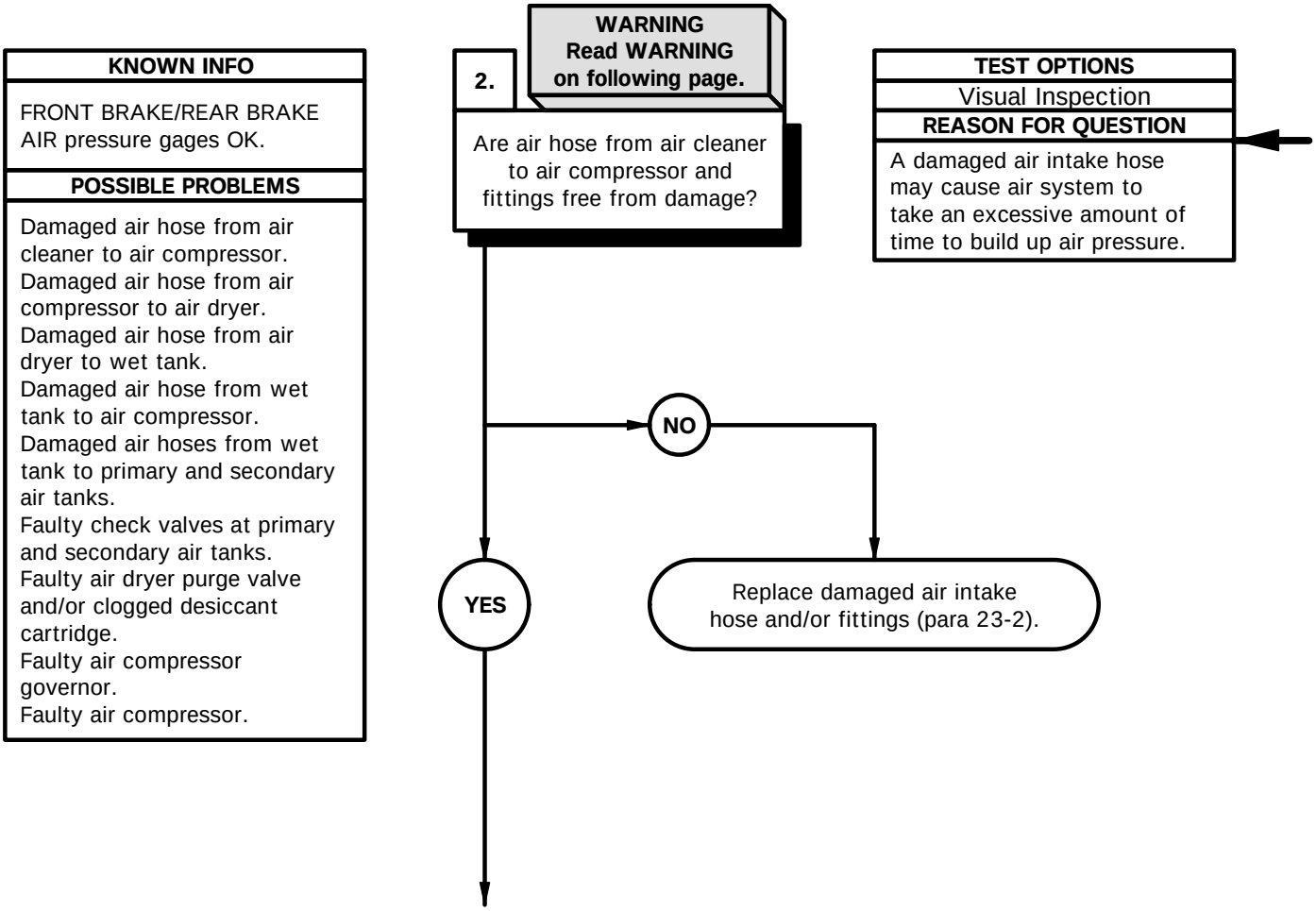
Materials/Parts
Soap, Laundry (Item 69, Appendix D).



(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.



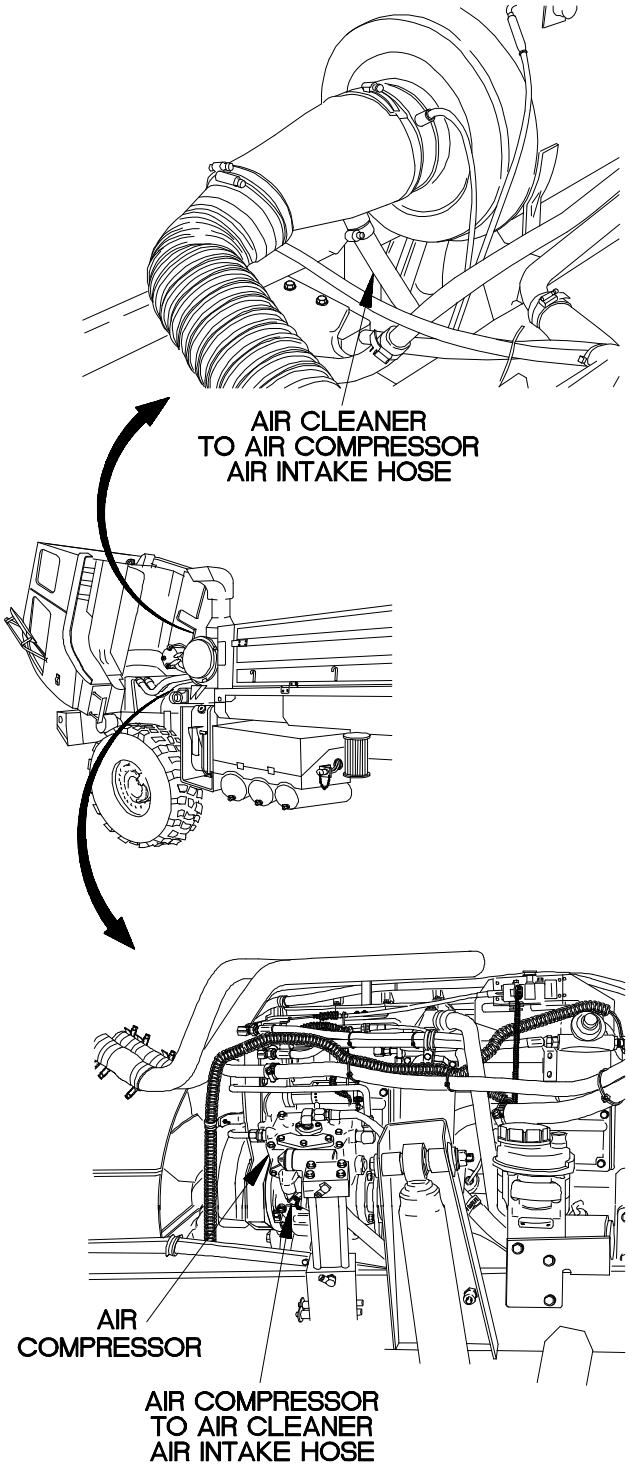
j1. AIR SYSTEM LOSES PRESSURE DURING OPERATION/SLOW, NO, OR INCORRECT AIR PRESSURE BUILDUP (CONT)



WARNING

Wear apprpriate 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 9-2320-365-10).
(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).



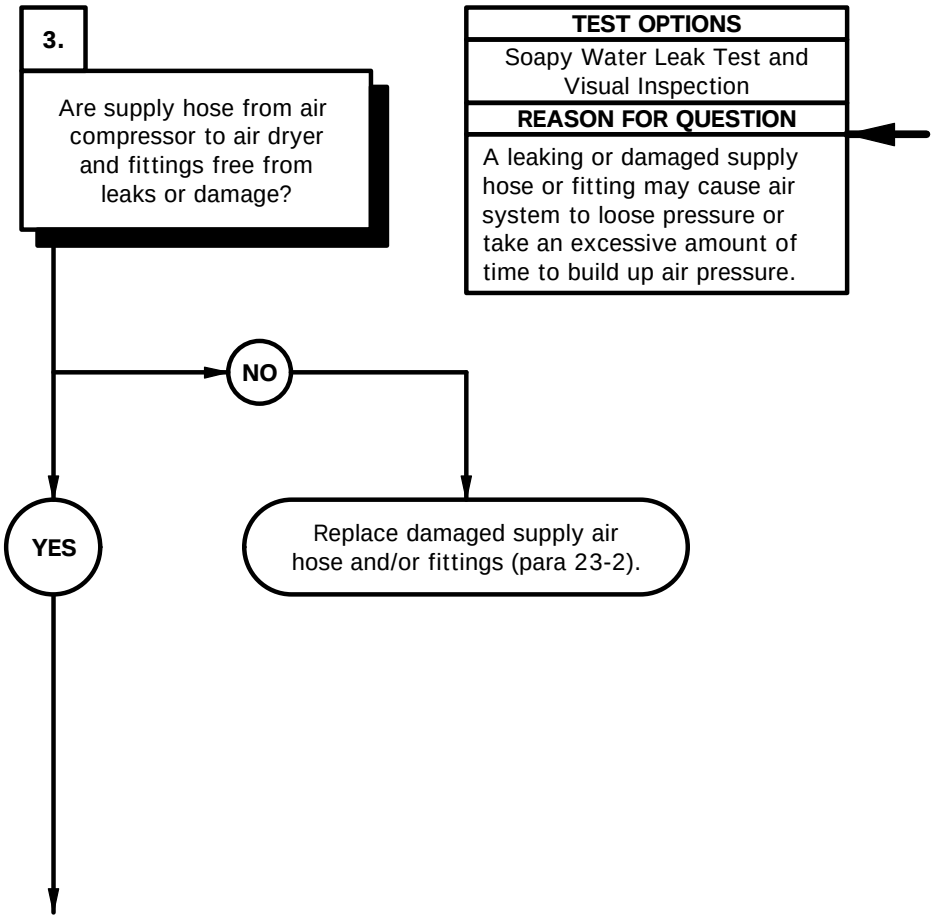
j1. AIR SYSTEM LOSES PRESSURE DURING OPERATION/SLOW, NO, OR INCORRECT AIR PRESSURE BUILDUP (CONT)

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

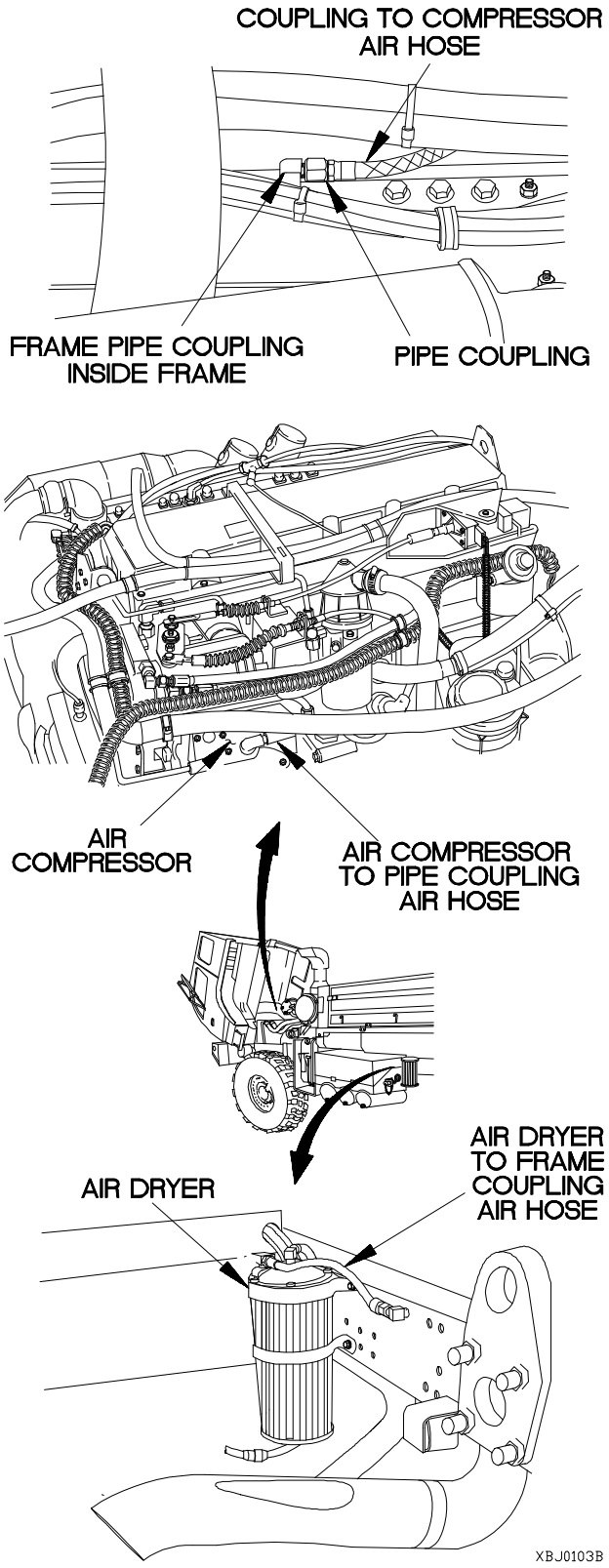
Soapy Water Leak Test and Visual Inspection

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.

4. Are air hose from air dryer to wet tank and fittings free from leaks or damage?

TEST OPTIONS

Soapy Water Leak Test and Visual Inspection

REASON FOR QUESTION

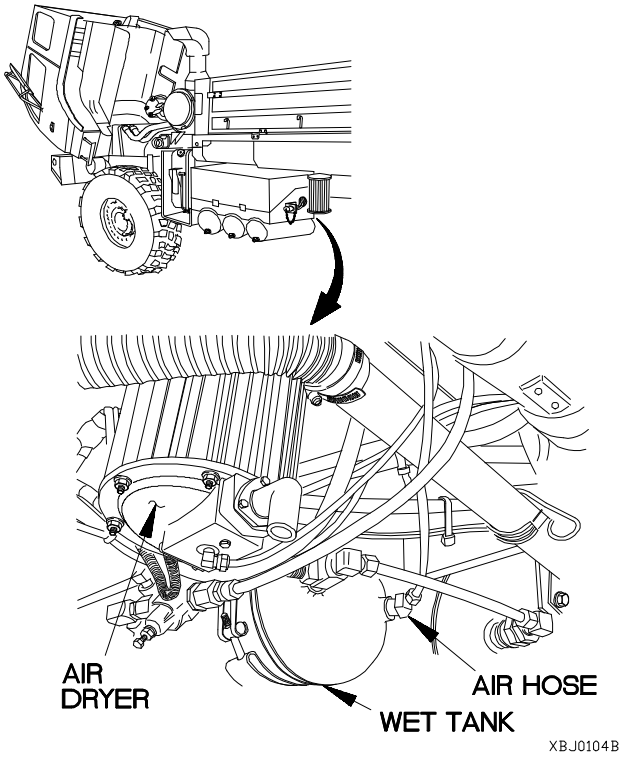
A leaking or damaged hose or fitting may cause air system to loose pressure or take an excessive amount of time to build up air pressure.

NO → Replace damaged air hose and/or fittings (para 23-2).

YES

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).



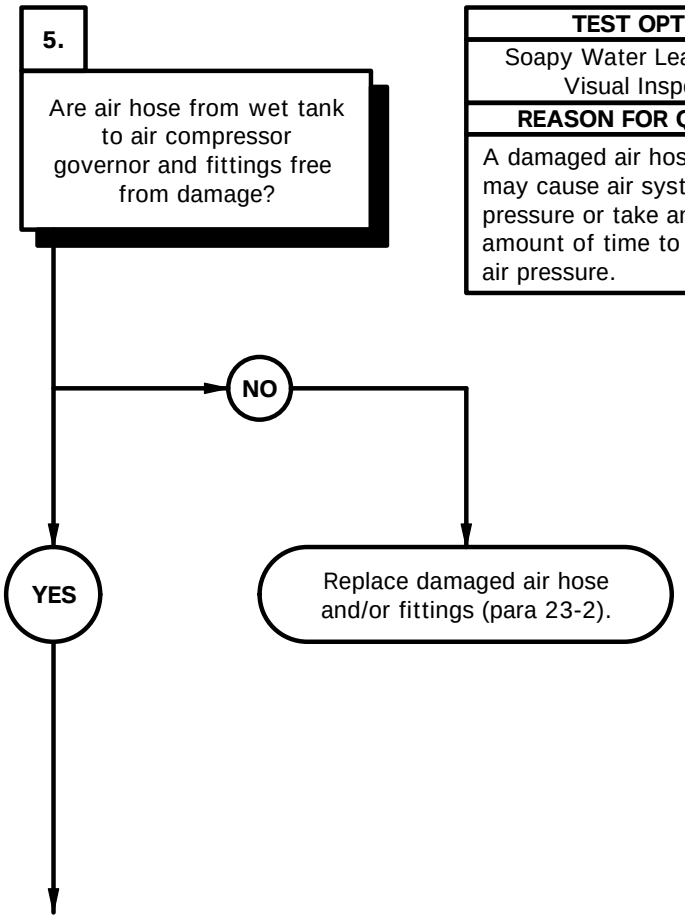
j1. AIR SYSTEM LOSES PRESSURE DURING OPERATION/SLOW, NO, OR INCORRECT AIR PRESSURE BUILDUP (CONT)

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

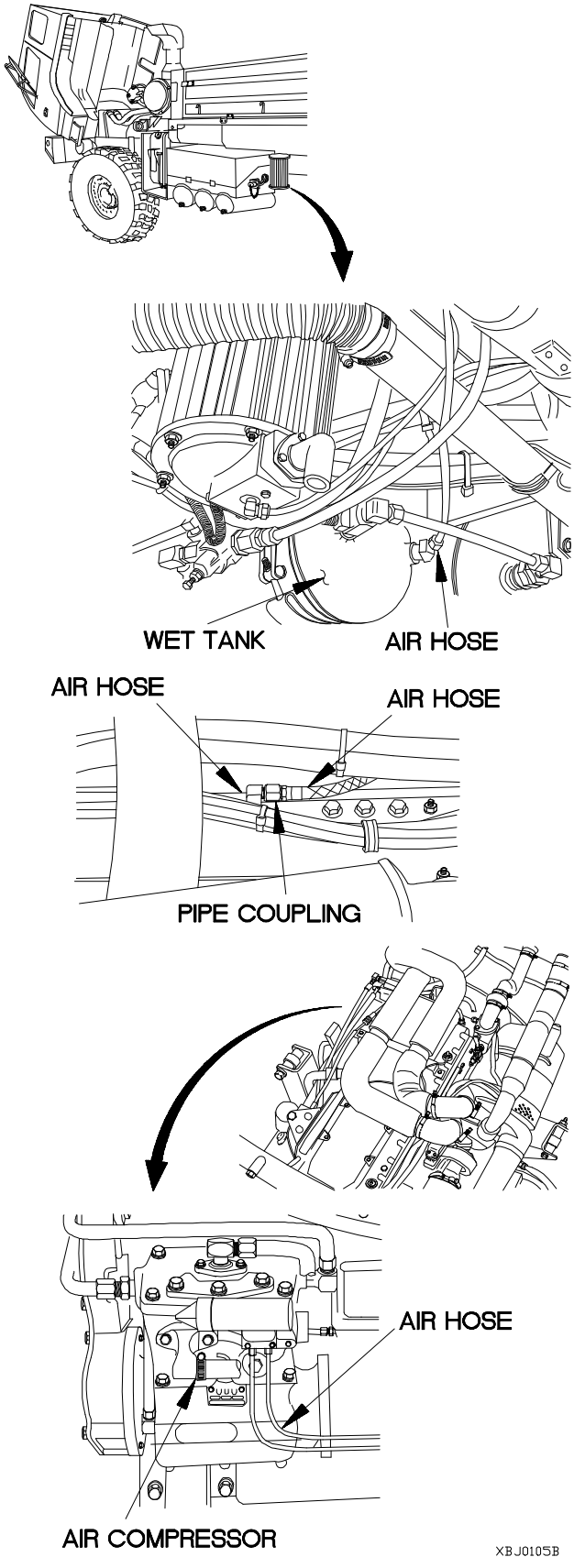
REASON FOR QUESTION

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 9-2320-365-10).



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.

POSSIBLE PROBLEMS

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.

6.

Are air hoses from wet tank to primary and secondary air tanks, check valves, and fittings free from damage?

NO

Replace damaged air hose and/or fittings (para 23-2).

YES

TEST OPTIONS

Soapy Water Leak Test and Visual Inspection

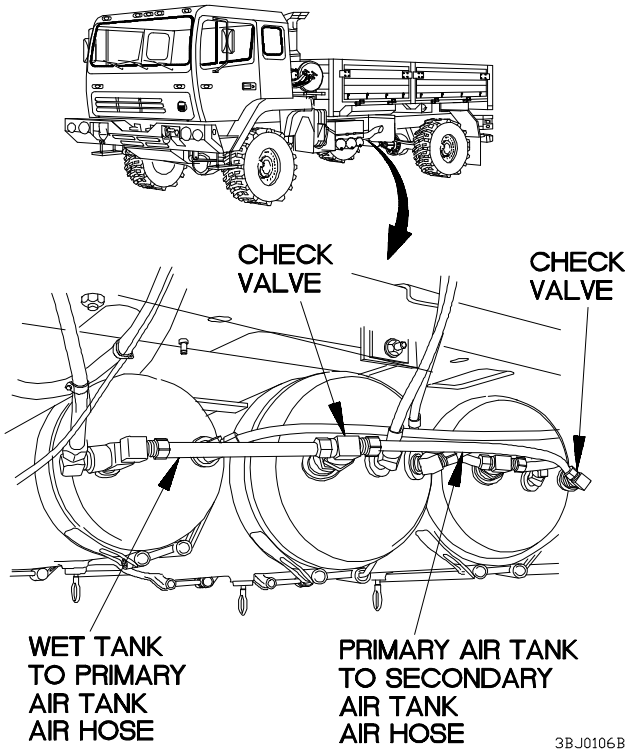
REASON FOR QUESTION

A leaking or 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 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).



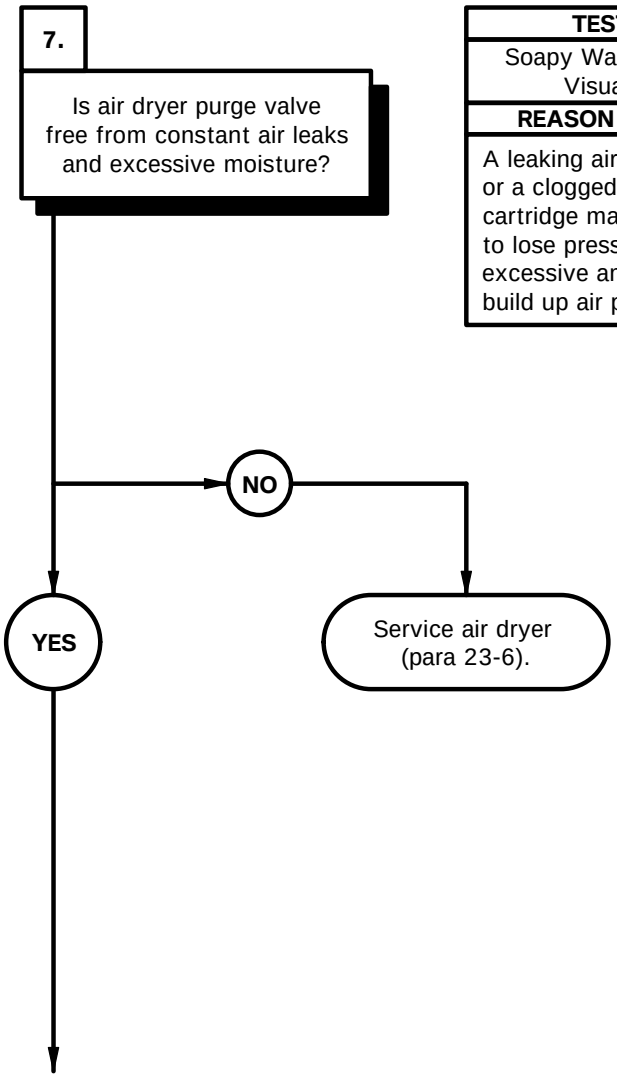
j1. AIR SYSTEM LOSES PRESSURE DURING OPERATION/SLOW, NO, OR INCORRECT AIR PRESSURE BUILDUP (CONT)

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 Inspection

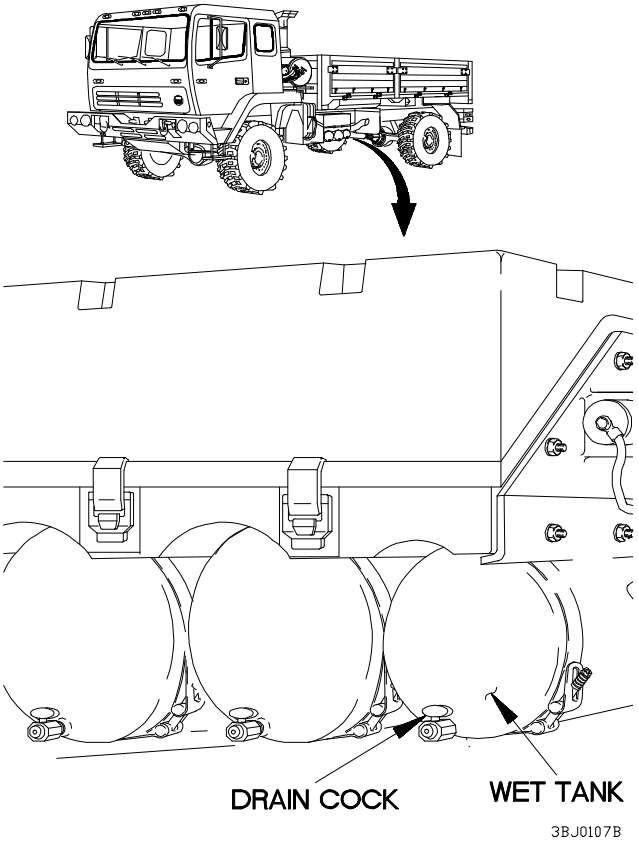
REASON FOR QUESTION

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 (para 23-6).
(3) Close wet tank drain cock.



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.
Purge valve and desiccant cartridge OK.

POSSIBLE PROBLEMS

Faulty air compressor governor.
Faulty air compressor.

8.

Do both FRONT BRAKE/ REAR BRAKE AIR pressure gages read 120 psi?

TEST OPTIONS

Visual Inspection

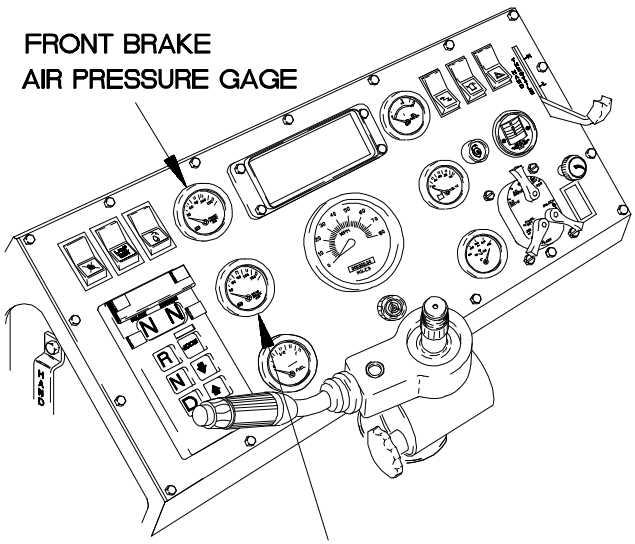
REASON FOR QUESTION

With no leaks in supply system, 120 psi cannot be maintained if air compressor governor is out of adjustment or faulty.

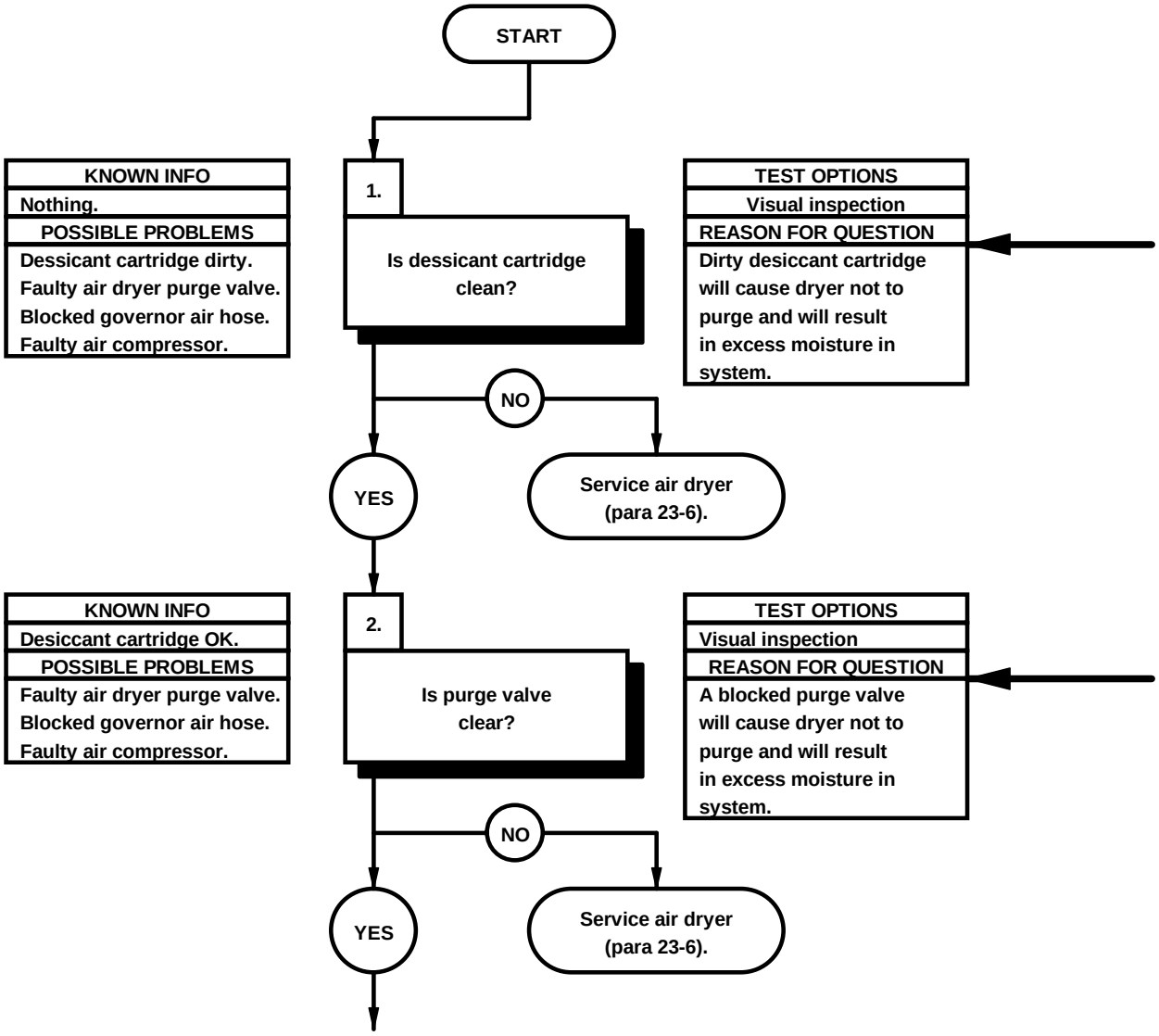
NO → Adjust or replace air compressor governor (para 11-29)

YES → Notify DS Maintenance to replace air compressor.

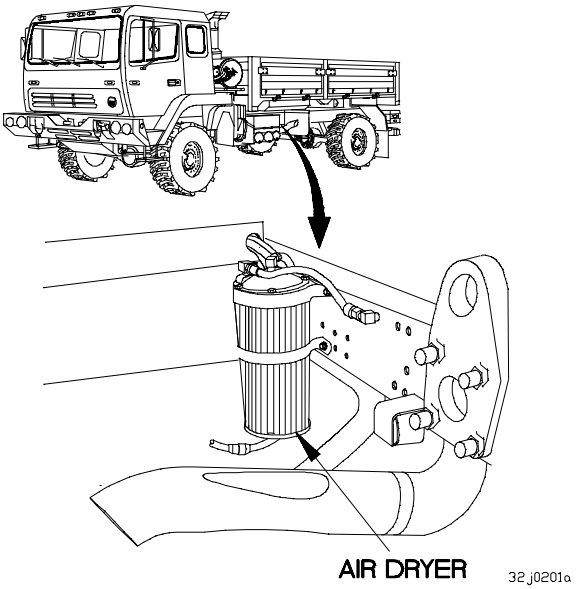
(1) Allow pneumatic system to build pressure and observe FRONT BRAKE/REAR BRAKE AIR pressure gages without applying brakes or operating air system.
(2) Check to see if air pressure stabilizes at 120 psi.
(3) If air pressure remains below 120 psi, adjust or replace air compressor governor (para 11-29).
(4) If air pressure continues to remain below 120 psi, notify DS Maintenance to replace air compressor.
(5) Shut down engine (TM 9-2320-365-10).



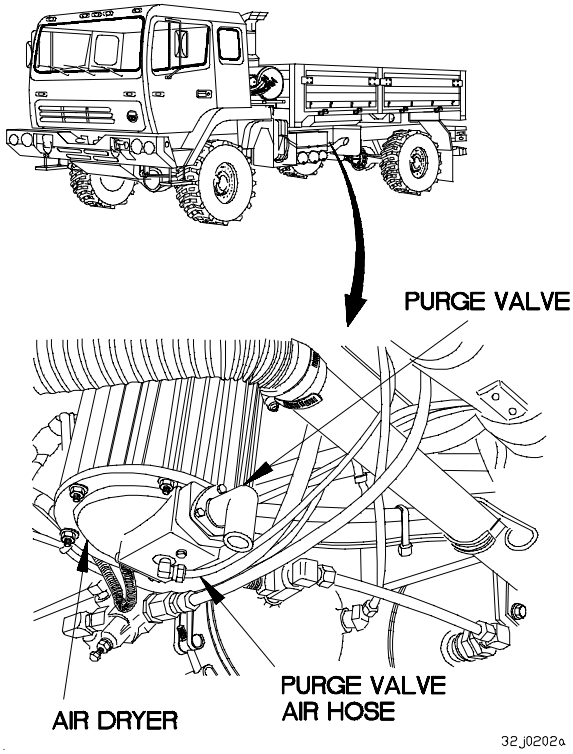
j2. LARGE QUANTITY OF MOISTURE EXPELLED FROM AIR RESERVOIRS	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-365-10).	**Tools and Special Tools** Tool Kit, Genl Mech (Item 44, Appendix C) Goggles, Industrial (Item 15, Appendix C)



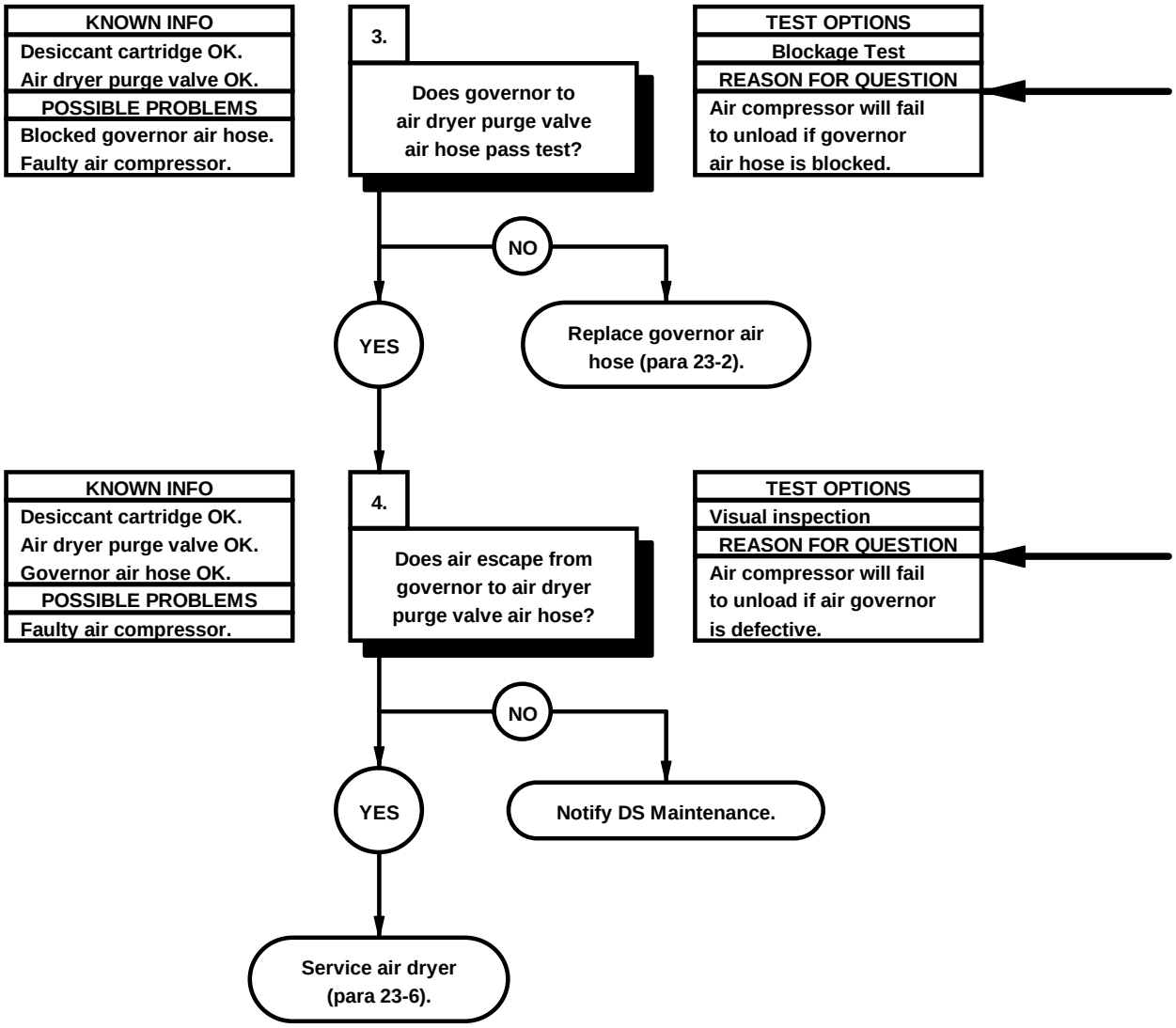
(1) Remove desiccant cartridge from air dryer (para 23-6).
(2) Inspect the desiccant cartridge for cleanliness.



(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.

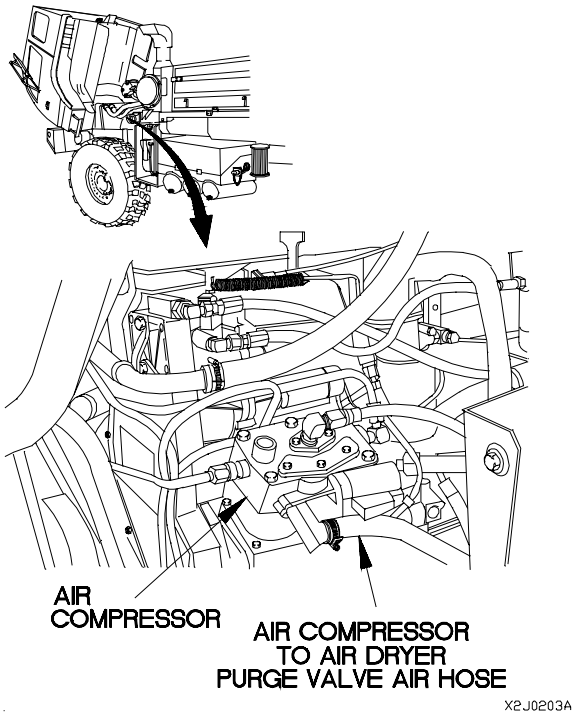


j2. LARGE QUANTITY OF MOISTURE EXPELLED FROM AIR RESERVOIRS (CONT)

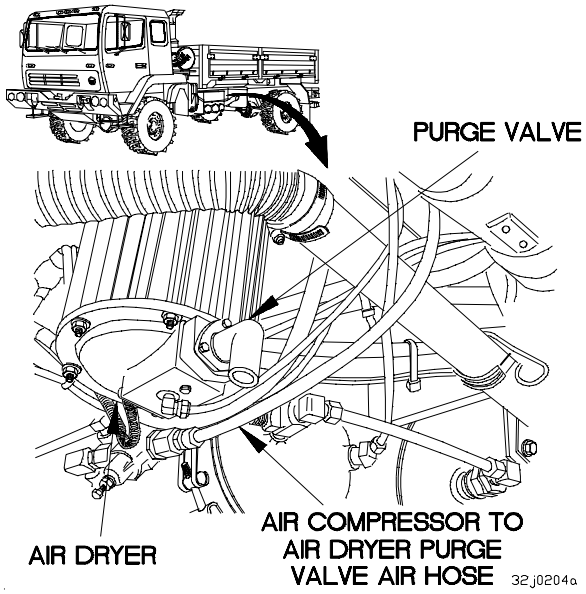


BLOCKAGE TEST

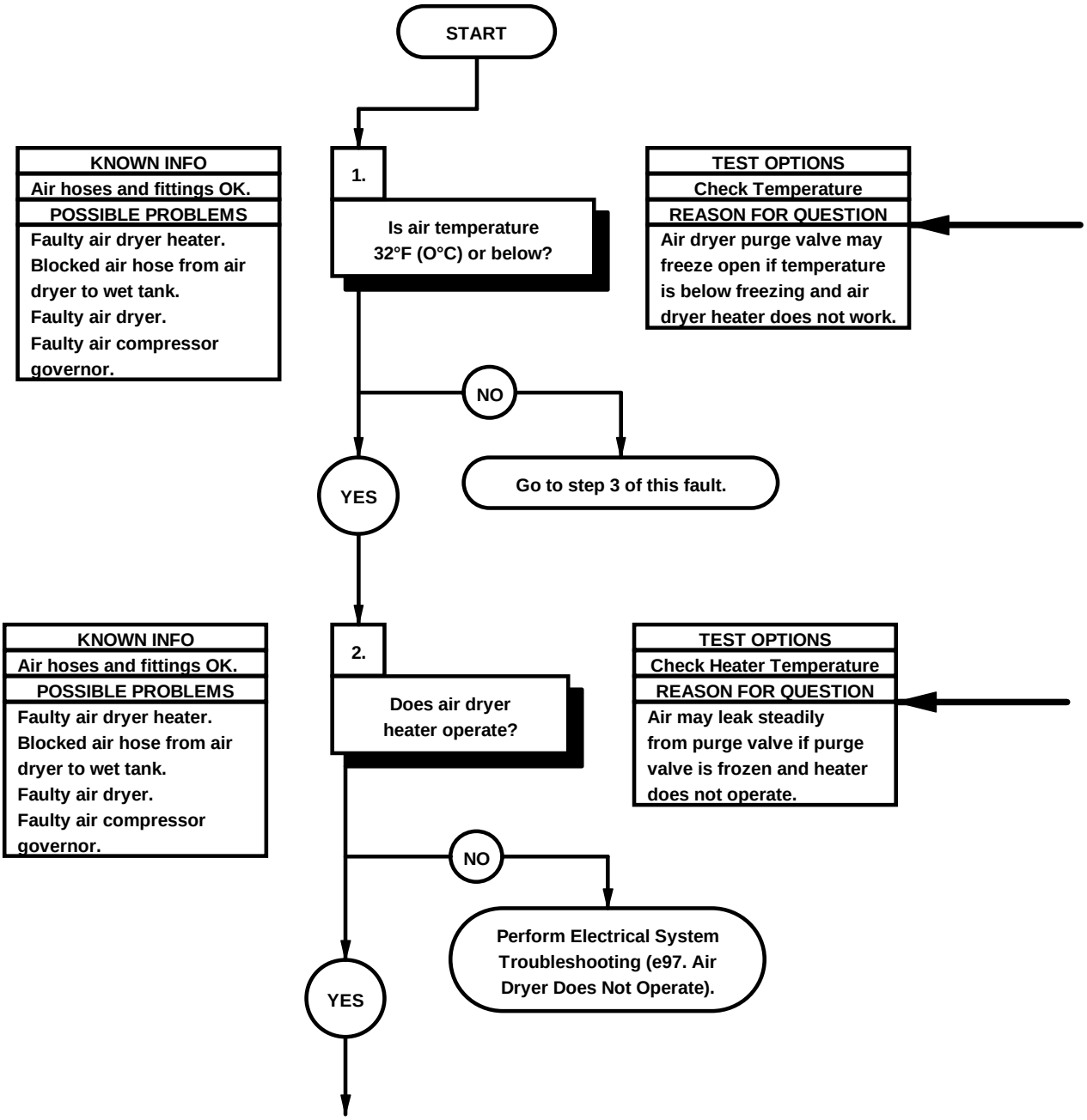
(1) Disconnect governor to air dryer air hose at governor and at purge valve.
(2) Blow through one end of air hose. If no air escapes from other end of air hose, air hose is blocked.
(3) Connect governor to air dryer air hose to governor and purge valve.



(1) Disconnect governor air hose at air dryer purge valve.
(2) Start engine (TM 9-2320-365-10).
(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 9-2320-365-10).
(5) Connect air compressor to air dryer air hose to air dryer.
(6) Install desiccant cartridge in air dryer (para 23-6).



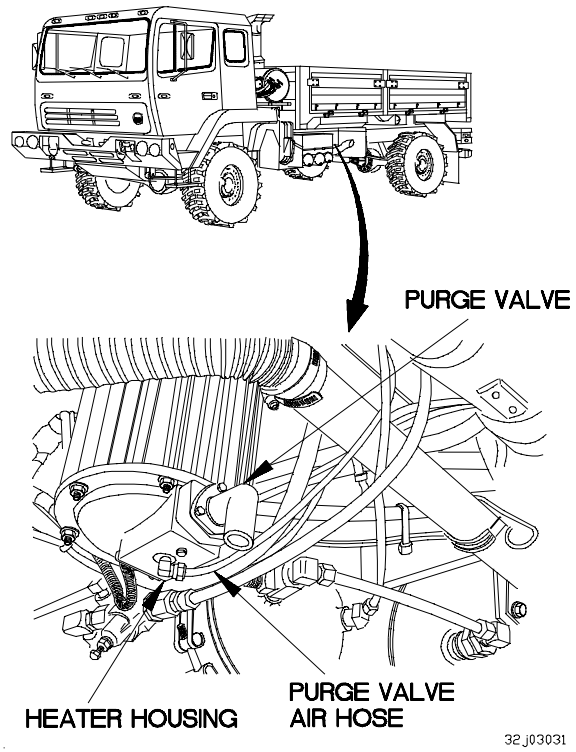
j3. AIR DRYER CONTINUALLY PURGES	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-365-10).	Tools and Special Tools Tool Kit, Genl Mech (Item 44, Appendix C) Goggles, Industrial (Item 15, Appendix C)



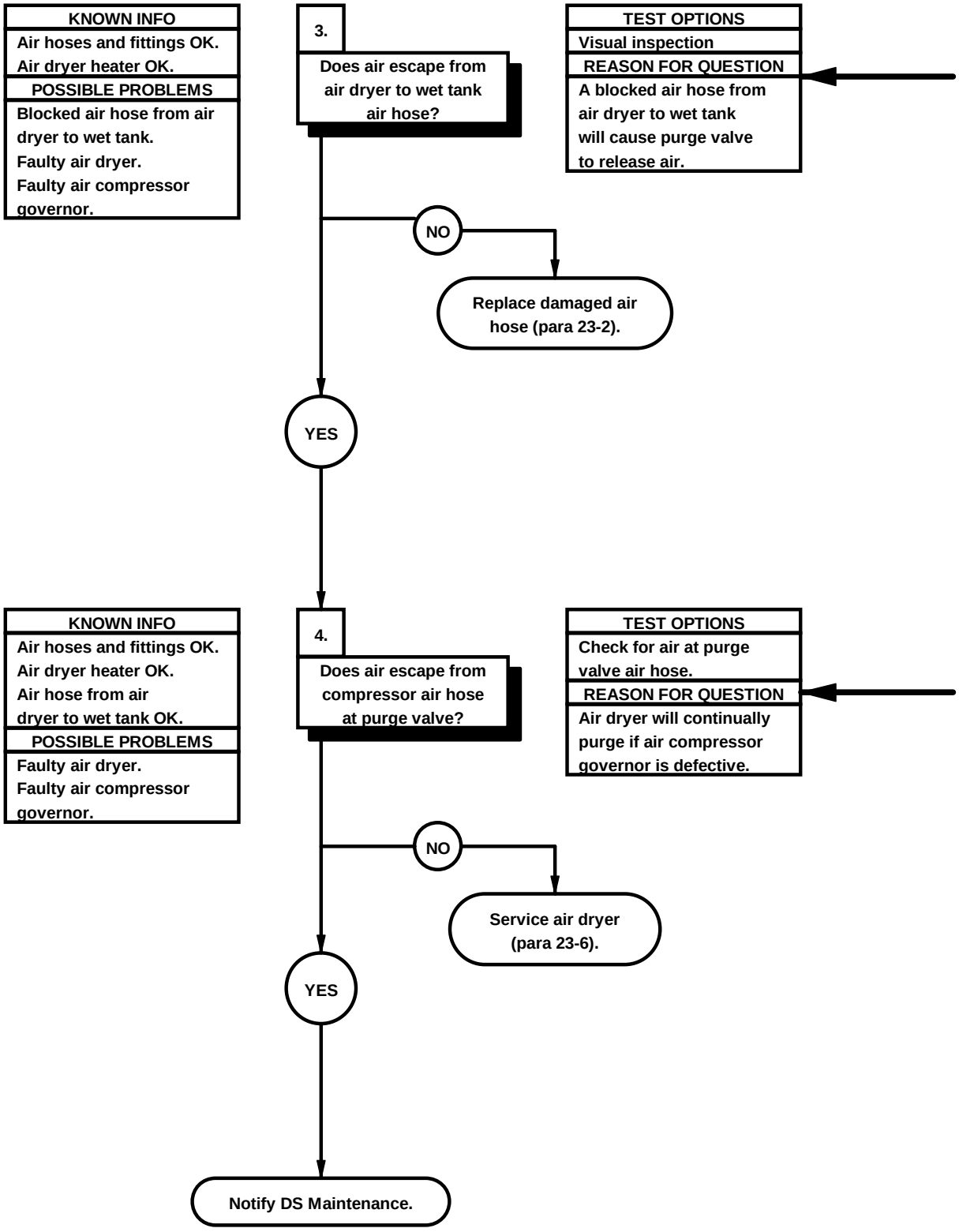
NOTE

- **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.**

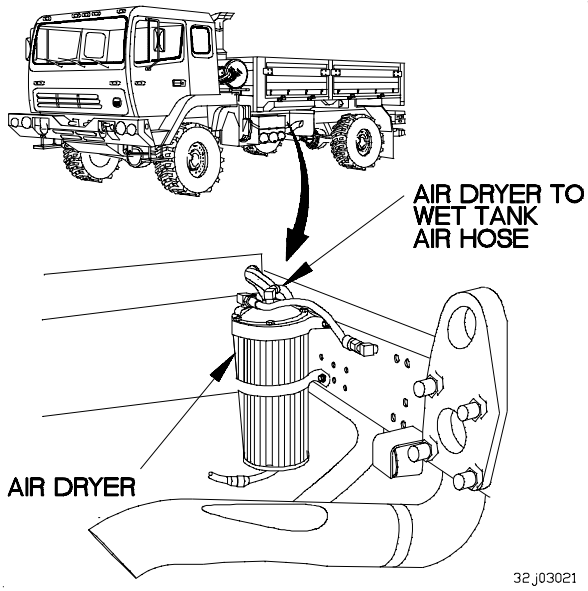
(1) Start engine (TM 9-2320-365-10).
(2) Bring engine to operating temperature.
(3) Check bottom (heater) housing on air dryer.
(4) If housing is not warm, heater is not receiving power or is faulty.
(5) Shut down engine (TM 9-2320-365-10).



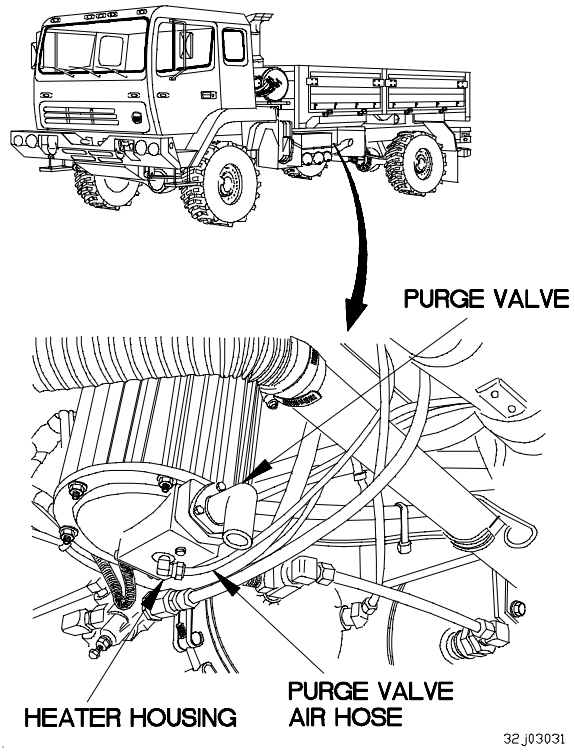
j3. AIR DRYER CONTINUALLY PURGES (CONT)



(1) Disconnect air hose on wet tank coming from air dryer.
(2) Start engine (TM 9-2320-365-10).
(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 23-6).
(5) Shut down engine (TM 9-2320-365-10).



(1) Disconnect air hose from purge valve on air dryer.
(2) Start engine (TM 9-2320-365-10).
(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 9-2320-365-10).
(6) Connect air hose to purge valve on air dryer.

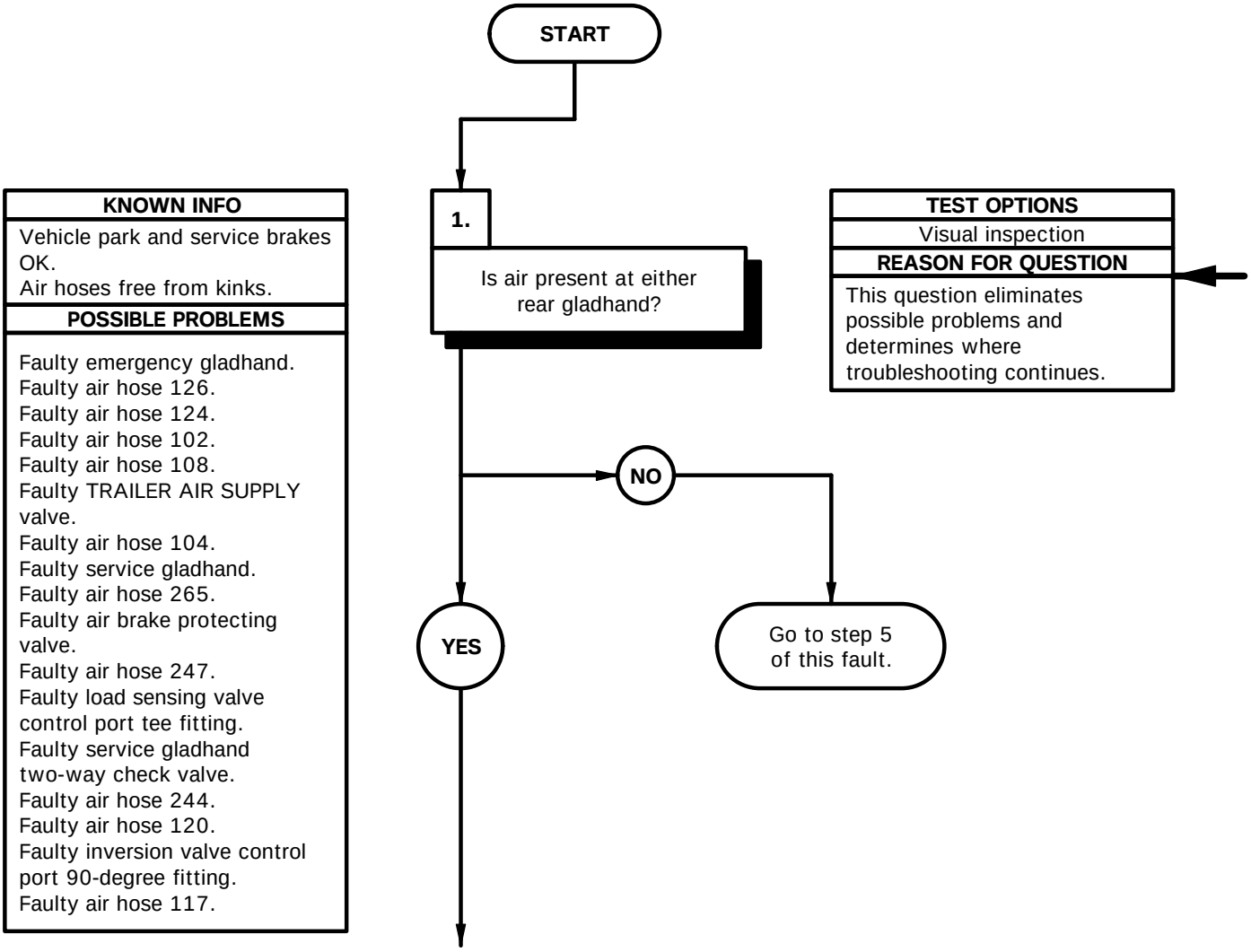


j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S)

INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, 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 126.
Faulty air hose 124.
Faulty air hose 102.
Faulty air hose 108.
Faulty TRAILER AIR SUPPLY valve.
Faulty air hose 104.
Faulty service gladhand.
Faulty air hose 265.
Faulty air brake protecting valve.
Faulty air hose 247.
Faulty load sensing valve control port tee fitting.
Faulty service gladhand two-way check valve.
Faulty air hose 244.
Faulty air hose 120.
Faulty inversion valve control port 90-degree fitting.
Faulty air hose 117.

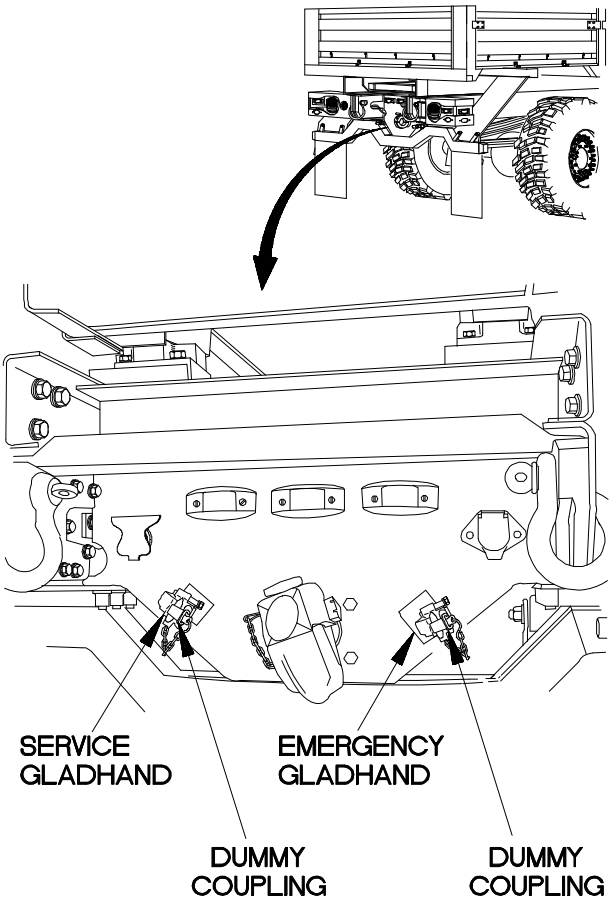
TEST OPTIONS

Visual inspection

REASON FOR QUESTION

This question eliminates possible problems and determines where troubleshooting continues.

(1) Disconnect dummy coupling from emergency gladhand.
(2) Start engine (TM 9-2320-365-10).
(3) Push in TRAILER AIR SUPPLY control (TM 9-2320-365-10).
(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 9-2320-365-10).
(8) Check for presence of air at service gladhand.
(9) Shut down engine (TM 9-2320-365-10).
(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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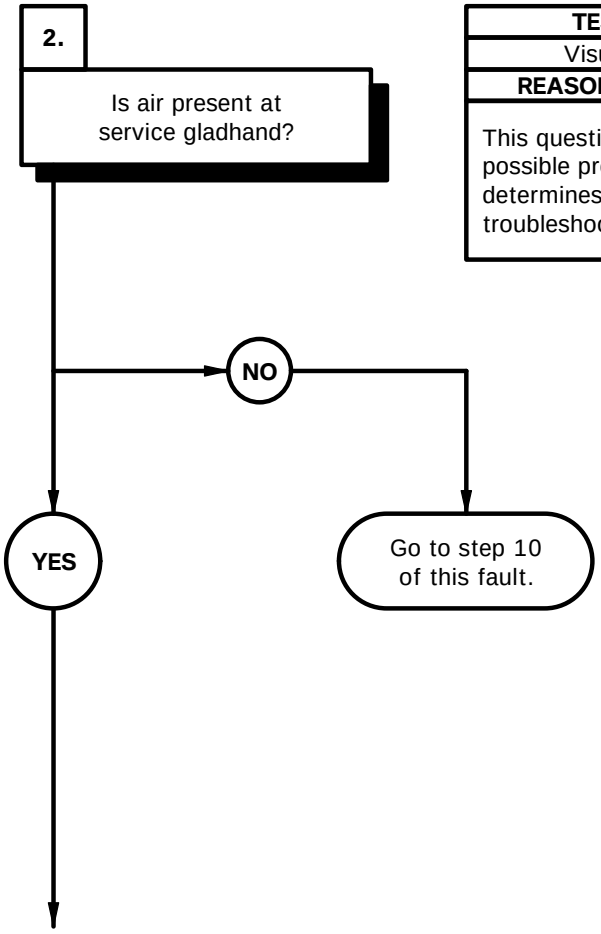
j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (CONT)

KNOWN INFO

Vehicle park and service brakes OK.
Air hoses free from kinks.
Air hose 124 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 126.
Faulty service gladhand.
Faulty air hose 265.
Faulty air brake protecting valve.
Faulty air hose 247.
Faulty load sensing valve control port tee fitting.
Faulty service gladhand two-way check valve.
Faulty air hose 244.
Faulty air hose 120.
Faulty inversion valve control port 90-degree fitting.
Faulty air hose 117.



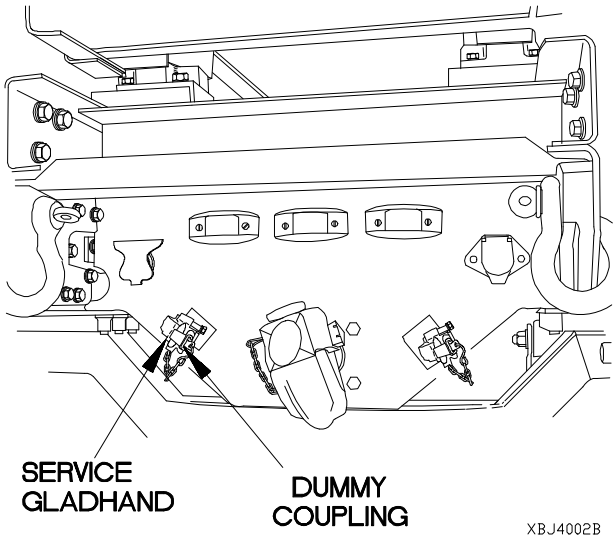
TEST OPTIONS

Visual inspection

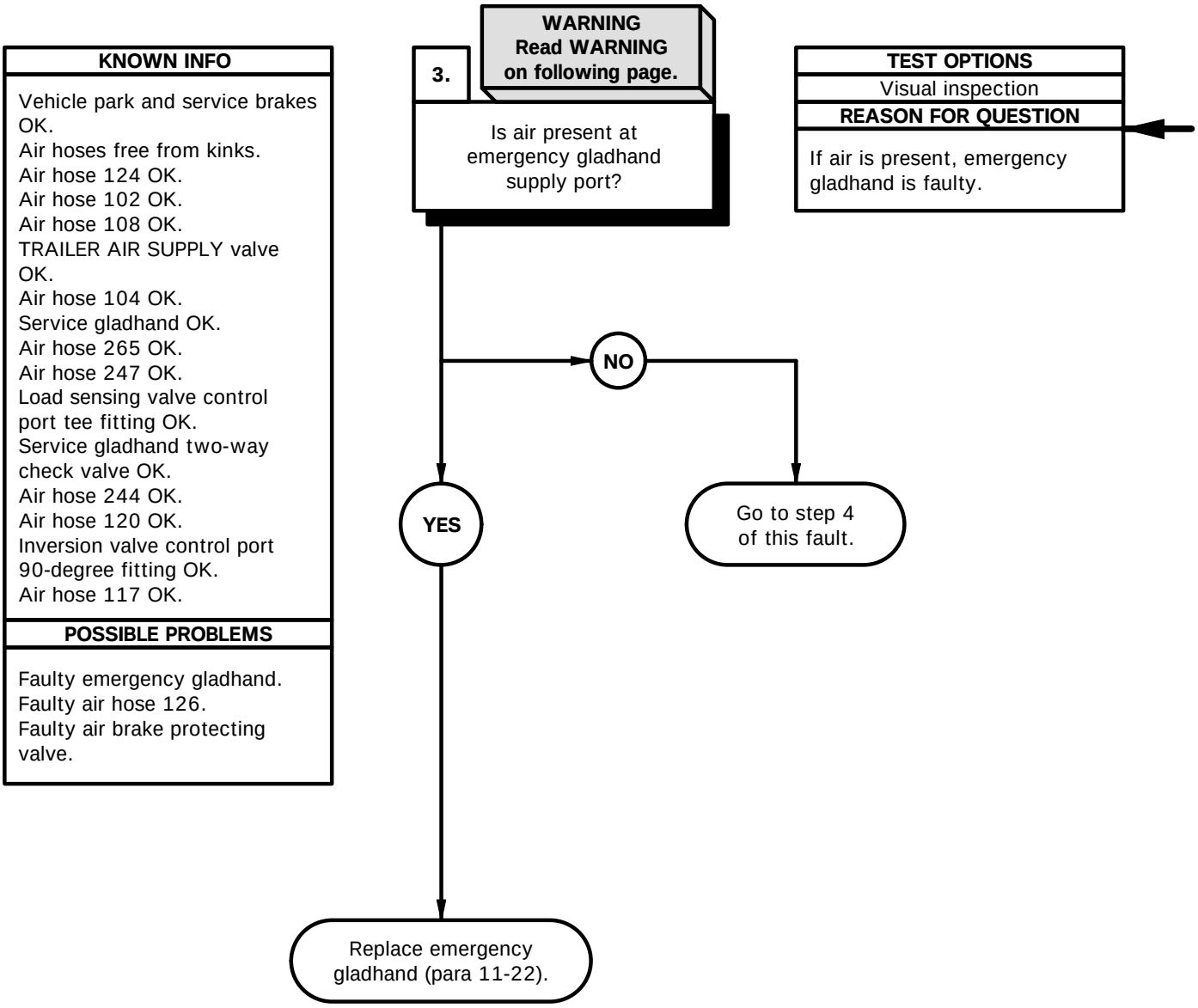
REASON FOR QUESTION

This question eliminates possible problems and determines where troubleshooting continues.

(1) Disconnect dummy coupling from service gladhand.
(2) Start engine (TM 9-2320-365-10).
(3) Push in TRAILER AIR SUPPLY control (TM 9-2320-365-10).
(4) Apply service brakes (TM 9-2320-365-10).
(5) Check for presence of air at service gladhand.
(6) Shut down engine (TM 9-2320-365-10).
(7) Connect dummy coupling to service gladhand.
(8) If air is not present, go to step 10 of this fault.



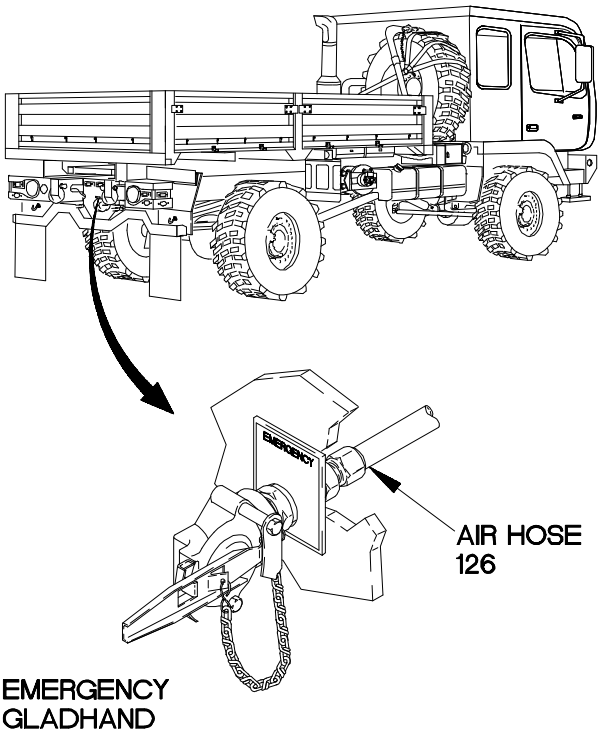
j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (CONT)



WARNING

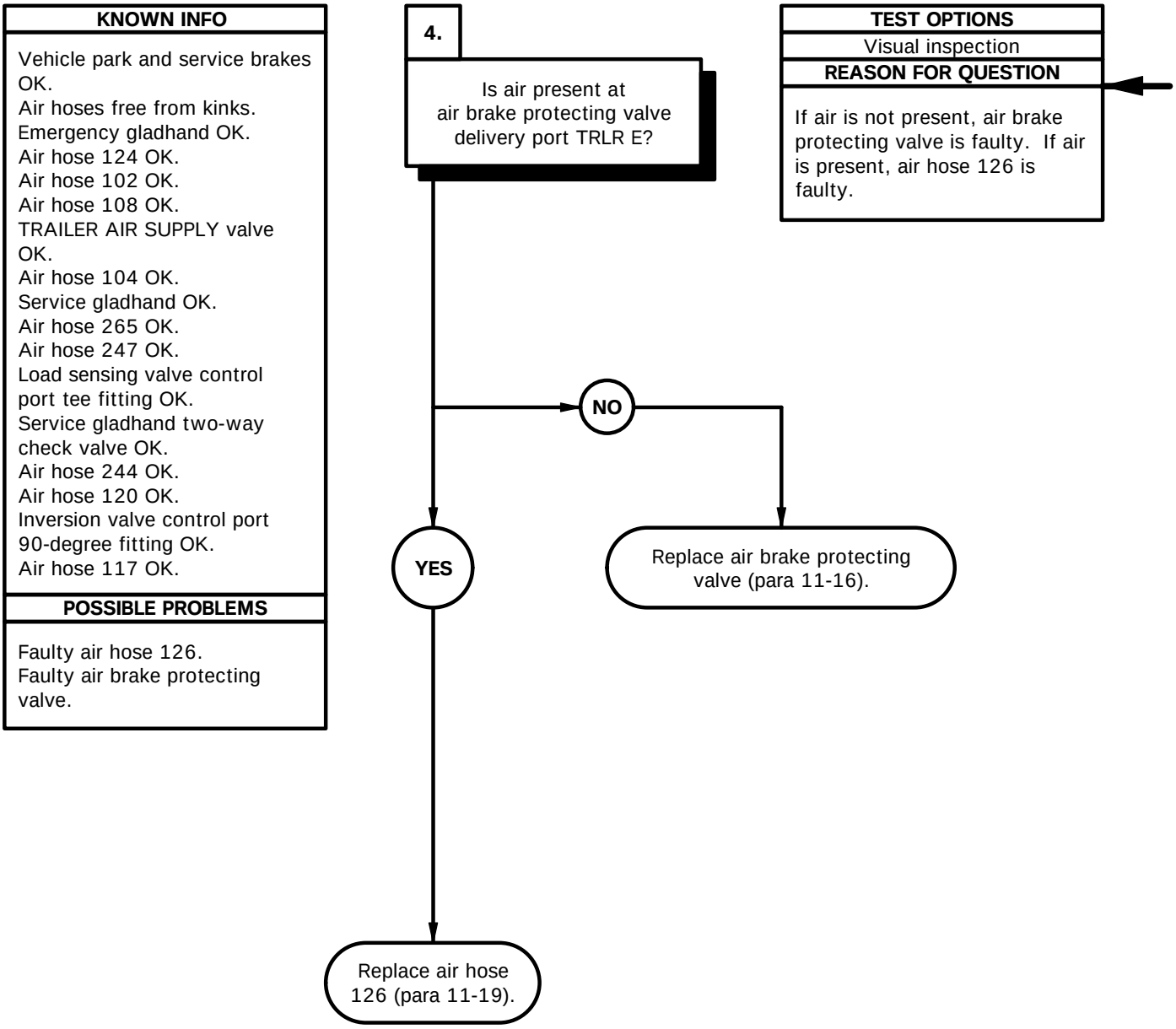
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

(1) Loosen air hose 126 at emergency gladhand.
(2) Start engine (TM 9-2320-365-10).
(3) Push in TRAILER AIR SUPPLY control (TM 9-2320-365-10).
(4) Check for presence of air at air hose 126.
(5) Shut down engine (TM 9-2320-365-10).
(6) If air is not present, go to step 4 of this fault.
(7) If air is present, replace emergency gladhand (para 11-22).
(8) Tighten air hose 126 at emergency gladhand.

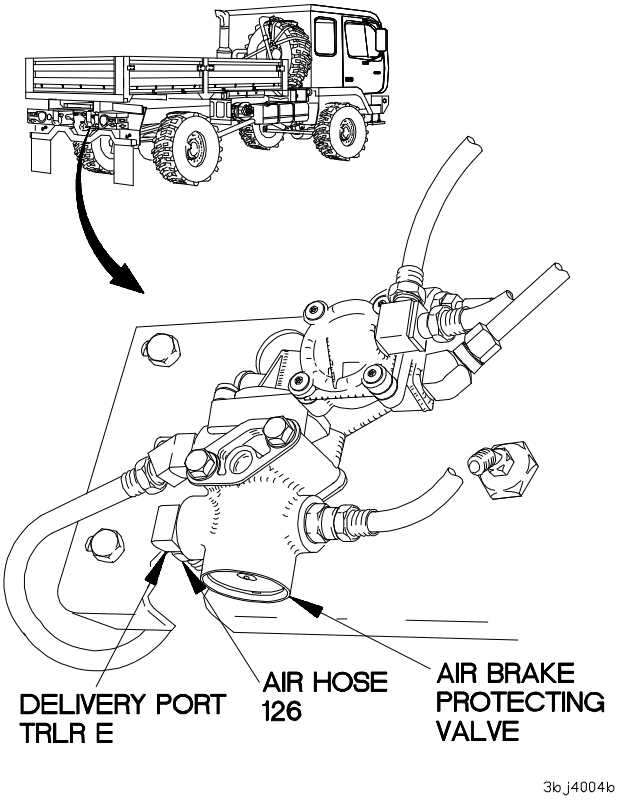


3BJ4003B

j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (CONT)



(1) Loosen air hose 126 at air brake protecting valve delivery port TRLR E.
(2) Start engine (TM 9-2320-365-10).
(3) Push in TRAILER AIR SUPPLY control (TM 9-2320-365-10).
(4) Check for presence of air at air brake protecting valve delivery port TRLR E.
(5) Shut down engine (TM 9-2320-365-10).
(6) If air is not present, replace air brake protecting valve (para 11-16).
(7) If air is present, replace air hose 126 (para 11-19).
(8) Tighten air hose 126 at air brake protecting valve delivery port TRLR E.



j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (CONT)

KNOWN INFO

Vehicle park and service brakes OK.
Air hoses free from kinks.
Emergency gladhand OK.
Air hose 126 OK.
Service gladhand OK.
Air hose 265 OK.
Air hose 247 OK.
Load sensing valve control port tee fitting OK.
Service gladhand two-way check valve OK.
Air hose 244 OK.
Air hose 120 OK.
Inversion valve control port 90-degree fitting OK.
Air hose 117 OK.

POSSIBLE PROBLEMS

Faulty air hose 124.
Faulty air hose 102.
Faulty air hose 108.
Faulty TRAILER AIR SUPPLY valve.
Faulty air hose 104.
Faulty air brake protecting valve.

5. Is air present at air brake protecting valve control port TRA E?

TEST OPTIONS

Visual inspection

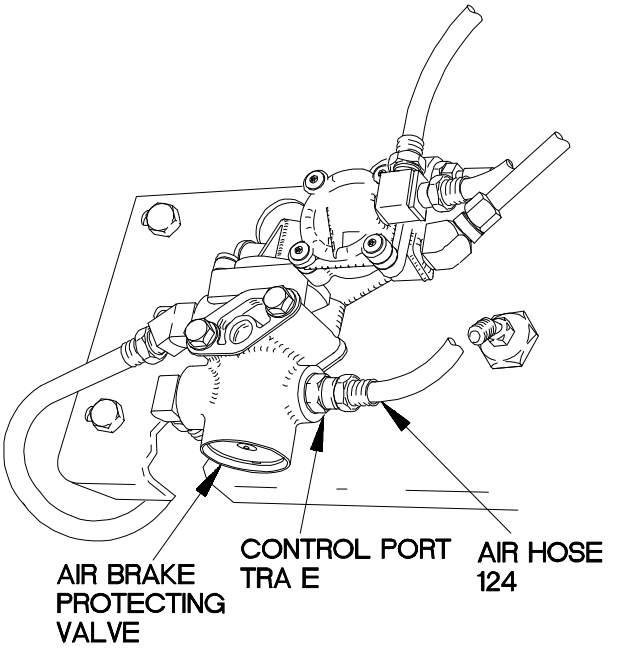
REASON FOR QUESTION

If air is present, air brake protecting valve is faulty.

NO → Go to step 6 of this fault.

YES → Replace air brake protecting valve (para 11-16).

(1) Loosen air hose 124 at air brake protecting valve control port TRA E.
(2) Start engine (TM 9-2320-365-10).
(3) Push in TRAILER AIR SUPPLY control (TM 9-2320-365-10).
(4) Check for presence of air at air hose 124.
(5) Shut down engine (TM 9-2320-365-10).
(6) If air is not present, go to step 6 of this fault.
(7) If air is present, replace air brake protecting valve (para 11-16).
(8) Tighten air hose 124 at air brake protecting valve control port TRA E.



3bJ4005b

j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (CONT)

KNOWN INFO

Vehicle park and service brakes OK.
Air hoses free from kinks.
Emergency gladhand OK.
Air hose 126 OK.
Service gladhand OK.
Air hose 265 OK.
Air brake protecting valve OK.
Air hose 247 OK.
Load sensing valve control port tee fitting OK.
Service gladhand two-way check valve OK.
Air hose 244 OK.
Air hose 120 OK.
Inversion valve control port 90-degree fitting OK.
Air hose 117 OK.

POSSIBLE PROBLEMS

Faulty air hose 124.
Faulty air hose 102.
Faulty air hose 108.
Faulty TRAILER AIR SUPPLY valve.
Faulty air hose 104.

6. Is air present at cab floor fitting?

TEST OPTIONS

Visual inspection

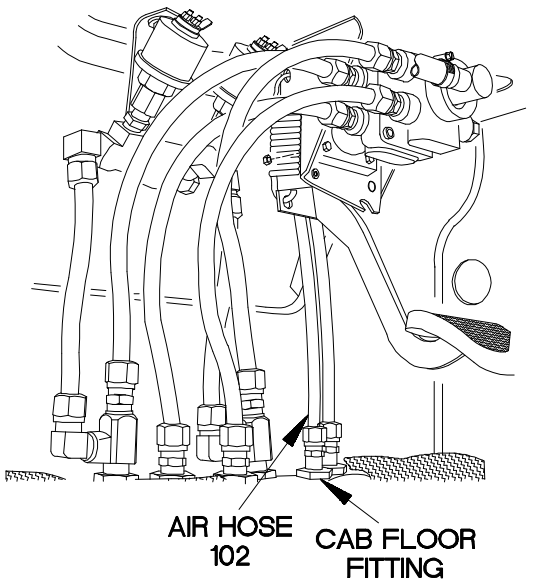
REASON FOR QUESTION

If air is present, air hose 124 is faulty.

NO → Go to step 7 of this fault.

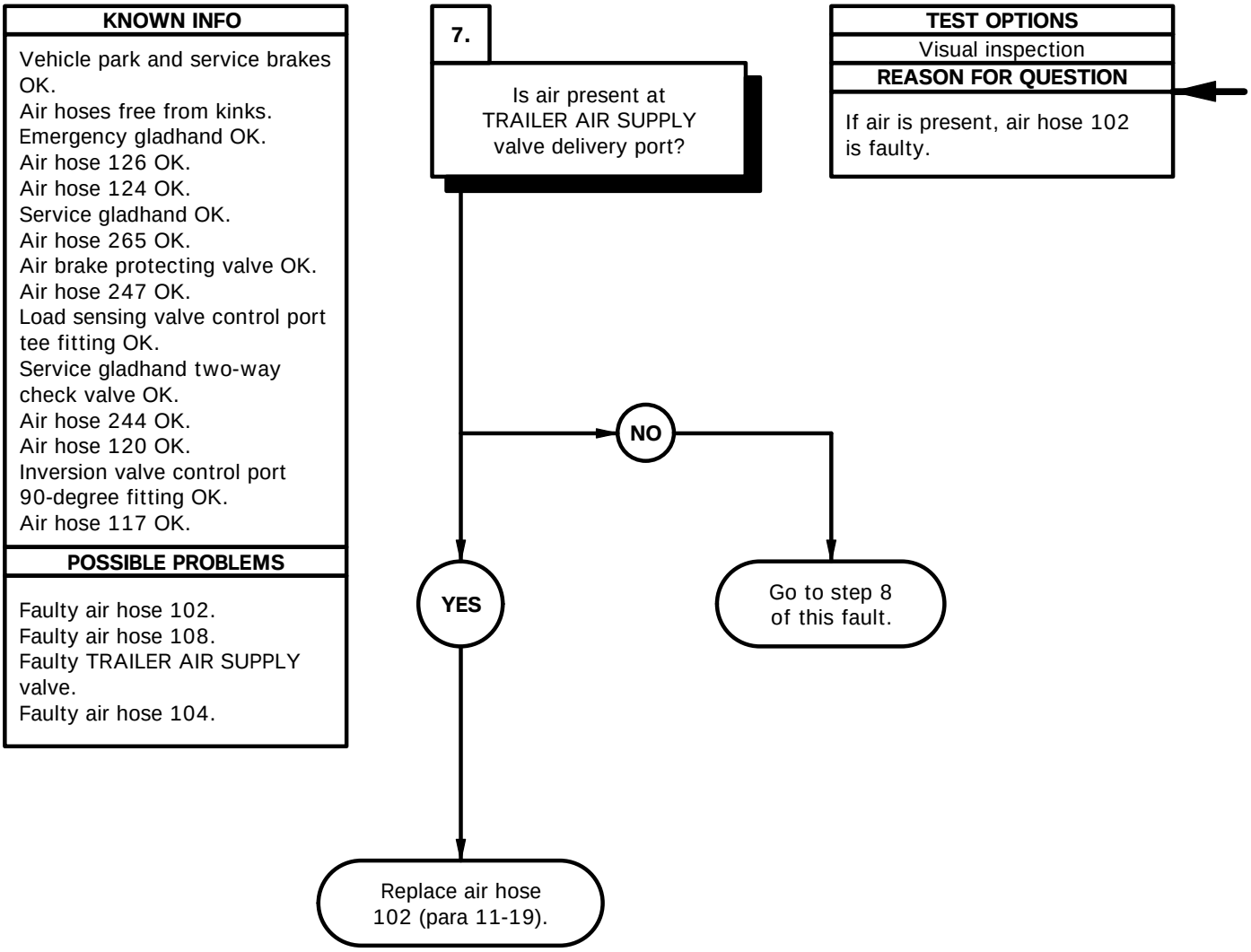
YES → Replace air hose 124 (para 11-19).

(1) Loosen air hose 102 at cab floor fitting.
(2) Start engine (TM 9-2320-365-10).
(3) Push in TRAILER AIR SUPPLY control (TM 9-2320-365-10).
(4) Check for presence of air at air hose 102.
(5) Shut down engine (TM 9-2320-365-10).
(6) If air is not present, go to step 7 of this fault.
(7) If air is present, replace air hose 124 (para 11-19).
(8) Tighten air hose 102 at cab floor fitting.

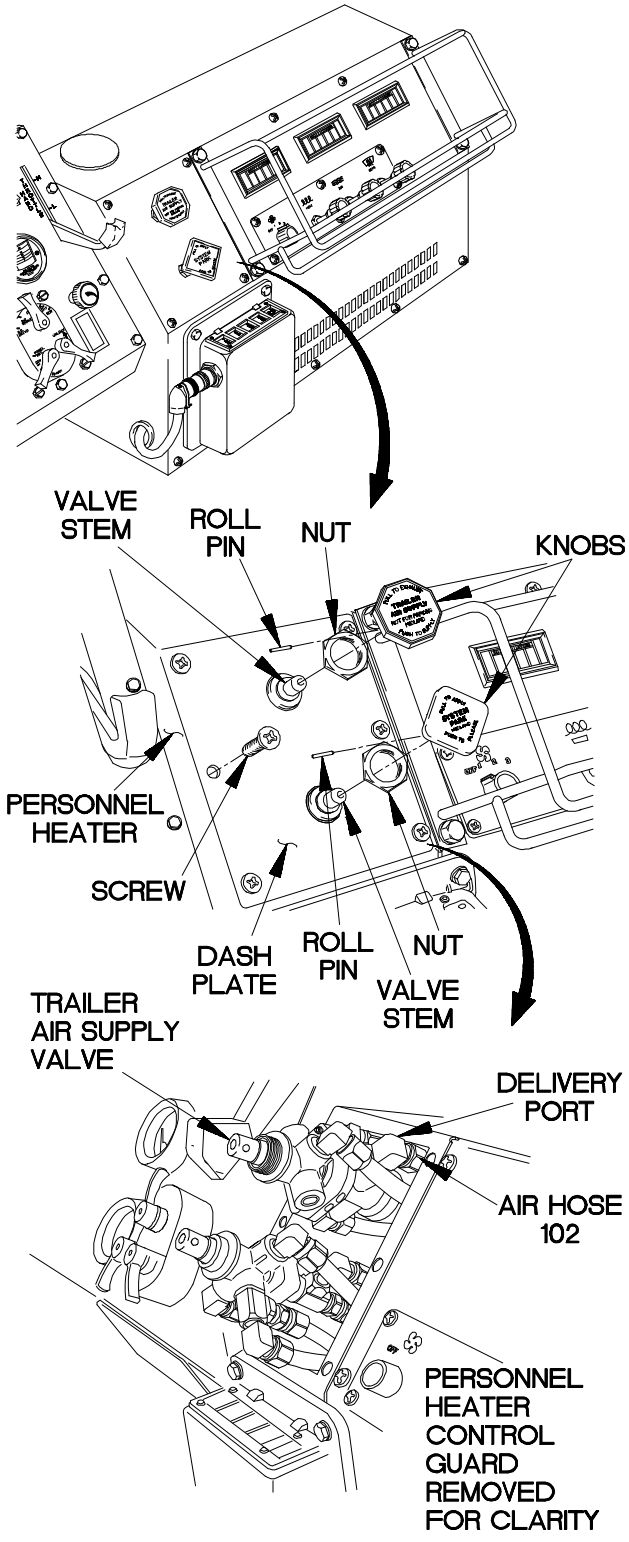


XBJ4006B

j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (CONT)



(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 9-2320-365-10).
(8) Push in SYSTEM PARK control (TM 9-2320-365-10).
(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 11-19).
(13) Shut down engine (TM 9-2320-365-10).
(14) Tighten air hose 102 at TRAILER AIR SUPPLY valve delivery port.



Xlo j4007lo

j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (CONT)

KNOWN INFO

Vehicle park and service brakes OK.
Air hoses free from kinks.
Emergency gladhand OK.
Air hose 126 OK.
Air hose 124 OK.
Air hose 102 OK.
Service gladhand OK.
Air hose 265 OK.
Air brake protecting valve OK.
Air hose 247 OK.
Load sensing valve control port tee fitting OK.
Service gladhand two-way check valve OK.
Air hose 244 OK.
Air hose 120 OK.
Inversion valve control port 90-degree fitting OK.
Air hose 117 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

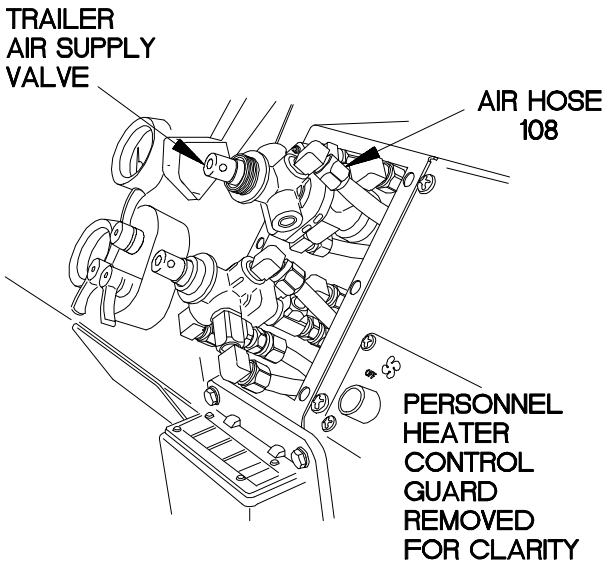
If air is not present, air hose 108 is faulty.

NO

Replace air hose 108 (para 11-19).

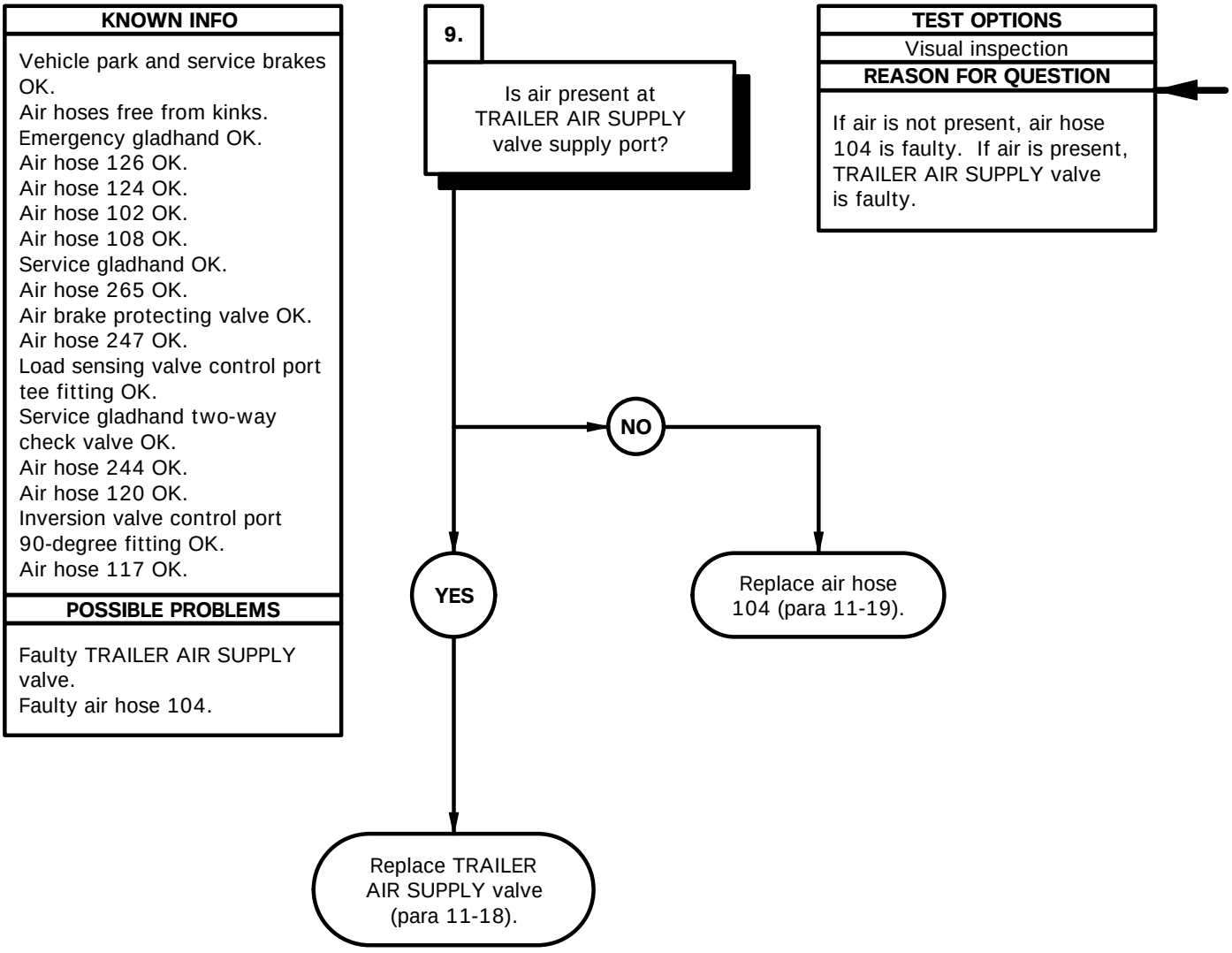
YES

(1) Loosen air hose 108 at TRAILER AIR SUPPLY valve control port.
(2) Start engine (TM (9-2320-365-10).
(3) Push in SYSTEM PARK control (TM 9-2320-365-10).
(4) Check for presence of air at air hose 108.
(5) If air is not present, replace air hose 108 (para 11-19).
(6) Shut down engine (TM 9-2320-365-10).
(7) Tighten air hose 108 at TRAILER AIR SUPPLY valve control port.

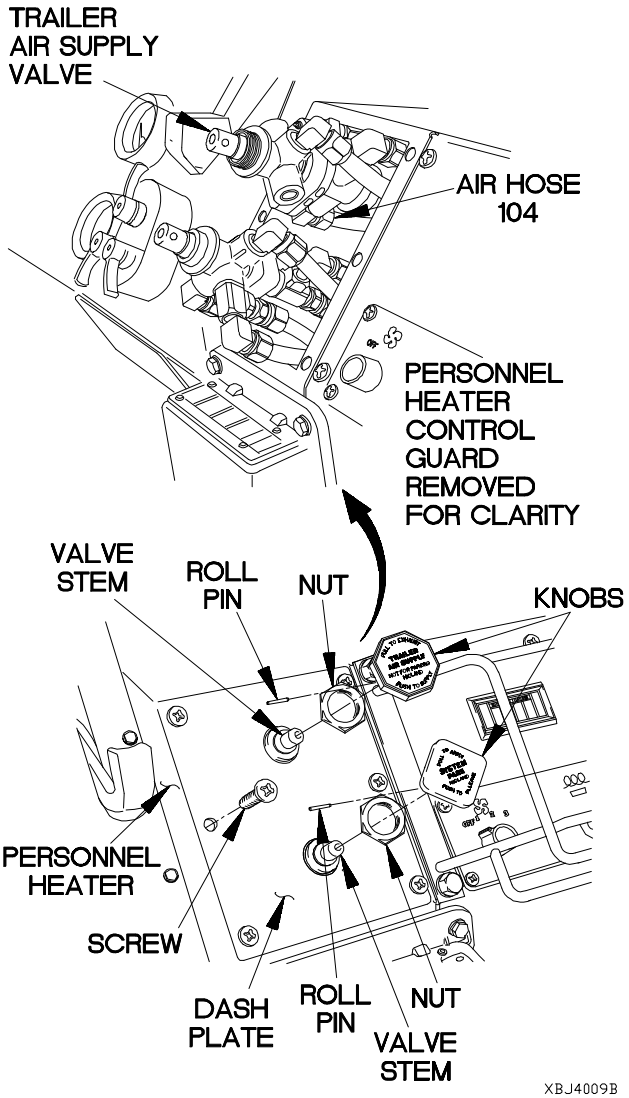


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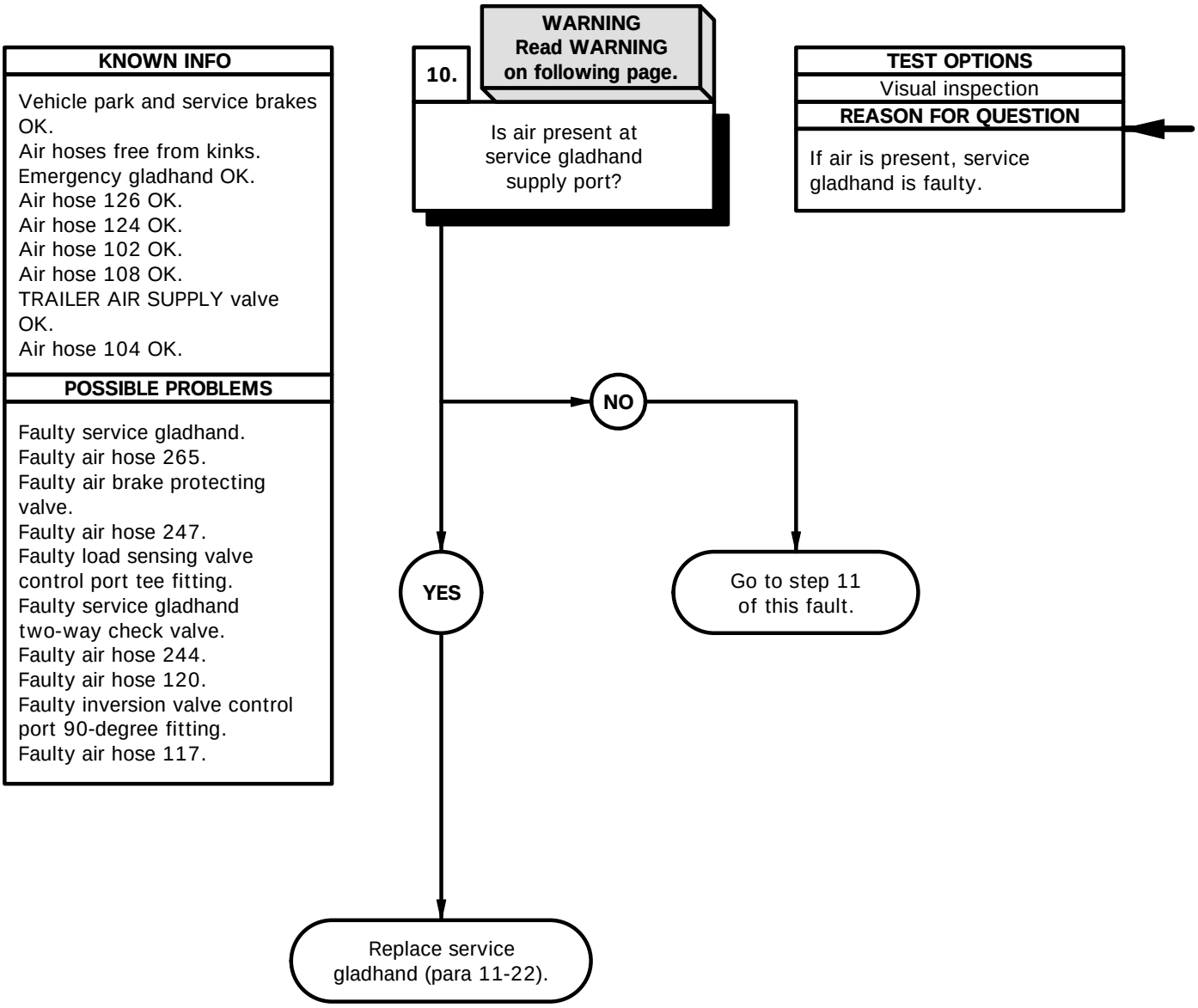
j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (CONT)



(1) Loosen air hose 104 at TRAILER AIR SUPPLY valve supply port.
(2) Start engine (TM 9-2320-365-10).
(3) Push in SYSTEM PARK control (TM 9-2320-365-10).
(4) Check for presence of air at air hose 104.
(5) If air is not present, replace air hose 104 (para 11-19).
(6) If air is present, replace TRAILER AIR SUPPLY valve (para 11-18).
(7) Shut down engine (TM 9-2320-365-10).
(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 on valve stems with roll pins.



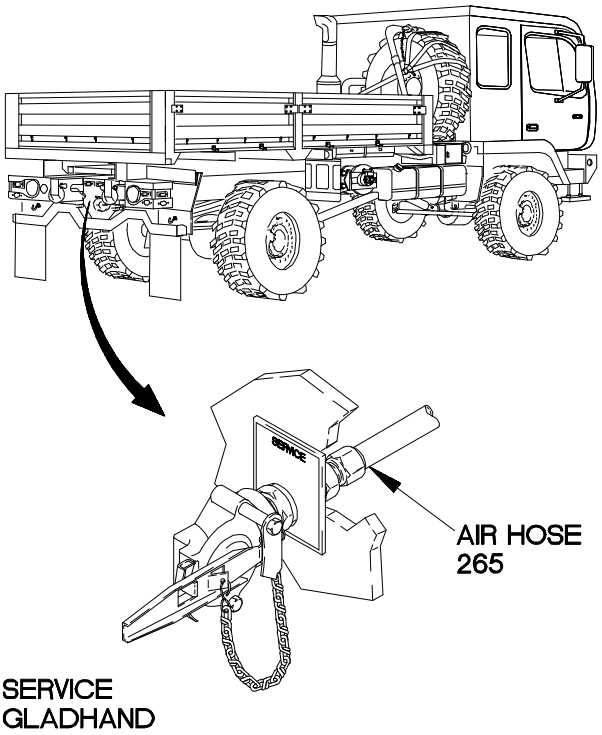
j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (CONT)



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 265 at service gladhand.
(2) Start engine (TM 9-2320-365-10).
(3) Push in TRAILER AIR SUPPLY control (TM 9-2320-365-10).
(4) Apply service brakes (TM 9-2320-365-10).
(5) Check for presence of air at air hose 265.
(6) Shut down engine (TM 9-2320-365-10).
(7) If air is not present, go to step 11 of this fault.
(8) If air is present, replace service gladhand (para 11-22).
(9) Tighten air hose 265 at service gladhand.



3lbj4010b

j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (CONT)

KNOWN INFO

Vehicle park and service brakes OK.
Air hoses free from kinks.
Emergency gladhand OK.
Air hose 126 OK.
Service gladhand OK.
Air hose 124 OK.
Air hose 102 OK.
Air hose 108 OK.
TRAILER AIR SUPPLY valve OK.
Air hose 104 OK.

POSSIBLE PROBLEMS

Faulty air hose 265.
Faulty air brake protecting valve.
Faulty air hose 247.
Faulty load sensing valve control port tee fitting.
Faulty service gladhand two-way check valve.
Faulty air hose 244.
Faulty air hose 120.
Faulty inversion valve control port 90-degree fitting.
Faulty air hose 117.

11.

Is air present at air brake protecting valve delivery port TRLR S?

TEST OPTIONS

Visual inspection

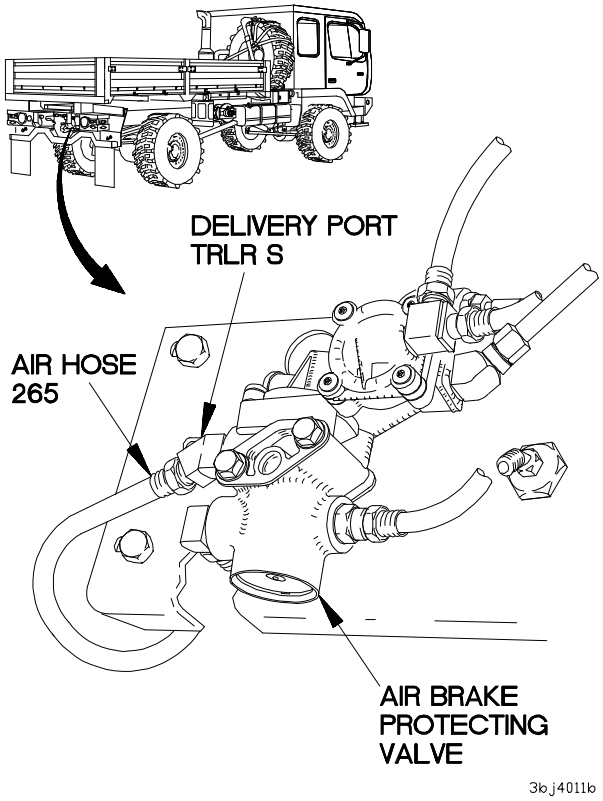
REASON FOR QUESTION

If air is present, air hose 265 is faulty.

NO → Go to step 12 of this fault.

YES → Replace air hose 265 (para 11-19).

(1) Loosen air hose 265 at air brake protecting valve delivery port TRLR S.
(2) Start engine (TM 9-2320-365-10).
(3) Push in TRAILER AIR SUPPLY control (TM 9-2320-365-10).
(4) Apply service brakes (TM 9-2320-365-10).
(5) Check for presence of air at air brake protecting valve delivery port TRLR S.
(6) Shut down engine (TM 9-2320-365-10).
(7) If air is not present, go to step 12 of this fault.
(8) If air is present, replace air hose 265 (para 11-19).
(9) Tighten air hose 265 at air brake protecting valve delivery port TRLR S.



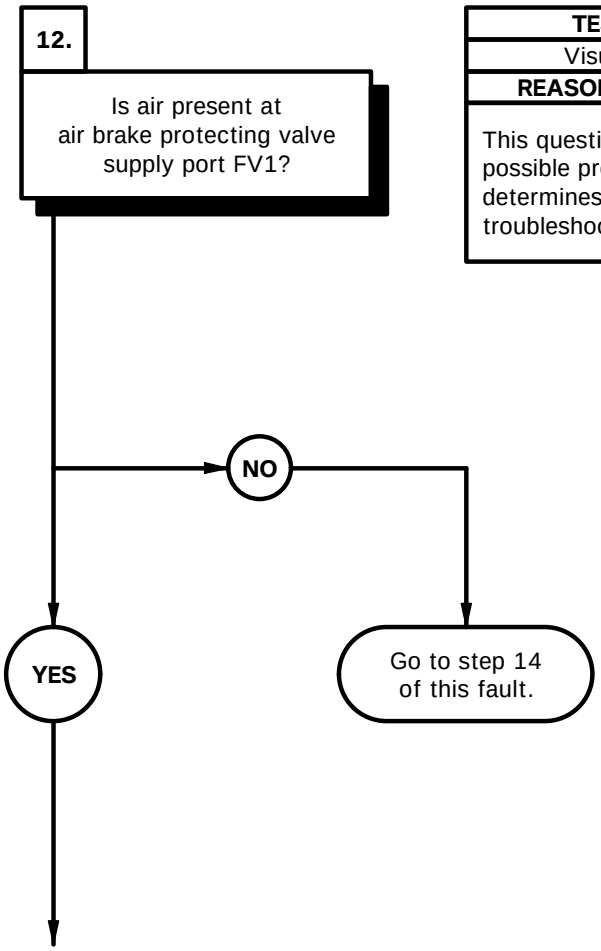
j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (CONT)

KNOWN INFO

Vehicle park and service brakes OK.
Air hoses free from kinks.
Emergency gladhand OK.
Air hose 126 OK.
Service gladhand OK.
Air hose 124 OK.
Air hose 102 OK.
Air hose 108 OK.
TRAILER AIR SUPPLY valve OK.
Air hose 104 OK.
Air hose 265 OK.

POSSIBLE PROBLEMS

Faulty air brake protecting valve.
Faulty air hose 247.
Faulty load sensing valve control port tee fitting.
Faulty service gladhand two-way check valve.
Faulty air hose 244.
Faulty air hose 120.
Faulty inversion valve control port 90-degree fitting.
Faulty air hose 117.



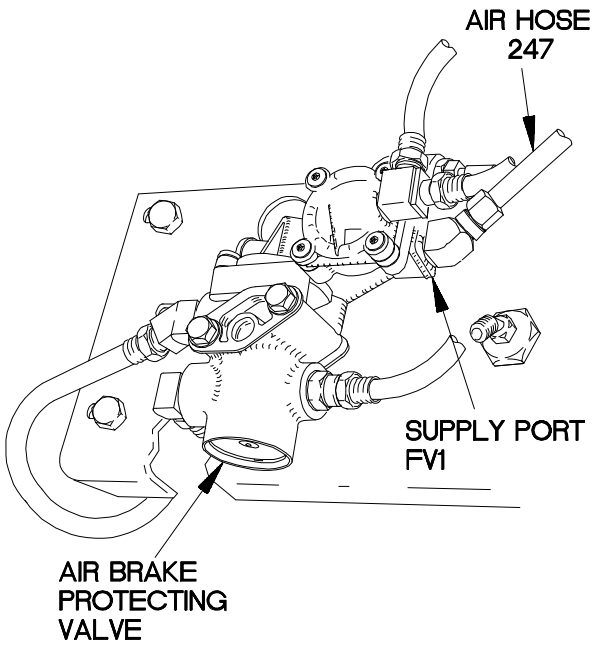
TEST OPTIONS

Visual inspection

REASON FOR QUESTION

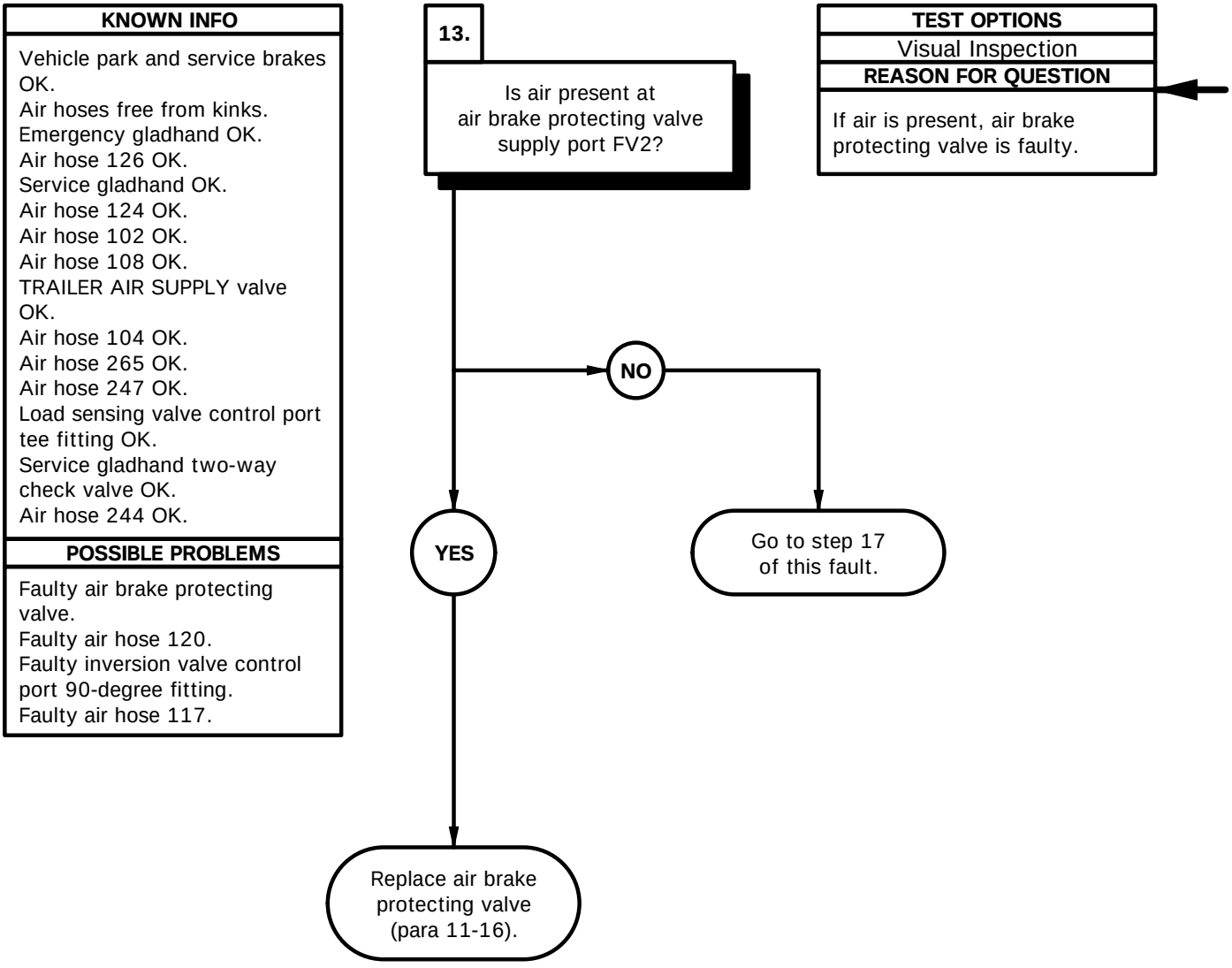
This question eliminates possible problems and determines where troubleshooting continues.

(1) Loosen air hose 247 at air brake protecting valve supply port FV1.
(2) Start engine (TM 9-2320-365-10).
(3) Apply service brakes (TM 9-2320-365-10).
(4) Check for presence of air at air hose 247.
(5) Shut down engine (TM 9-2320-365-10).
(6) If air is not present, go to step 14 of this fault.
(7) Tighten air hose 247 at air brake protecting valve supply port FV1.

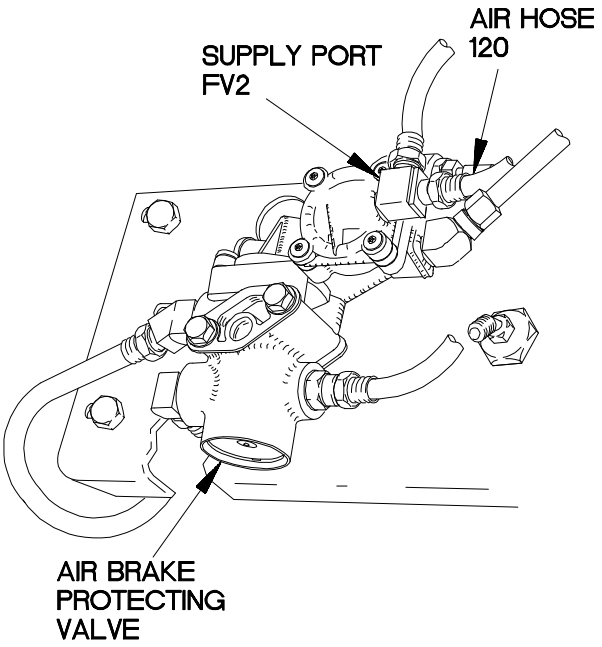


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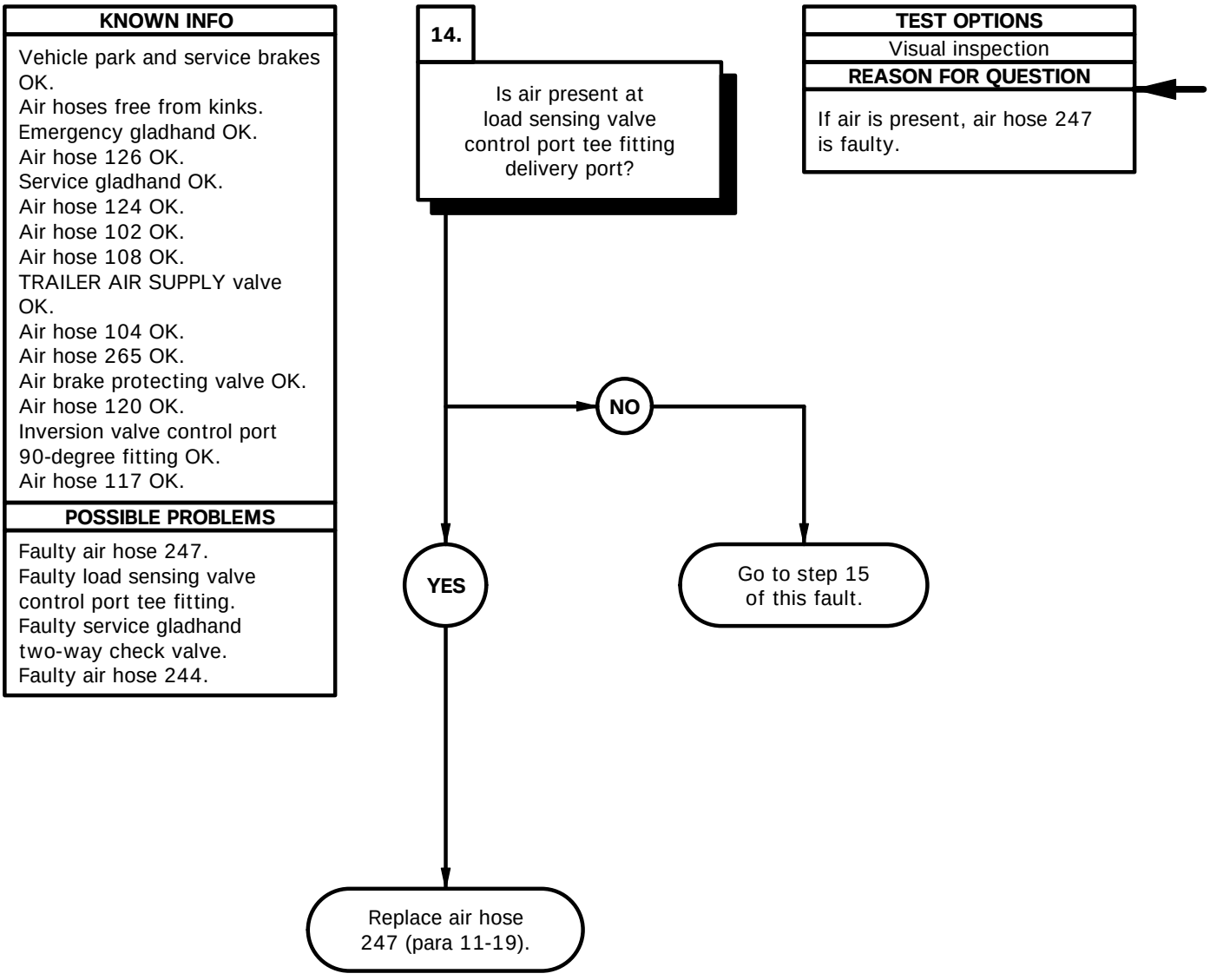
j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (CONT)



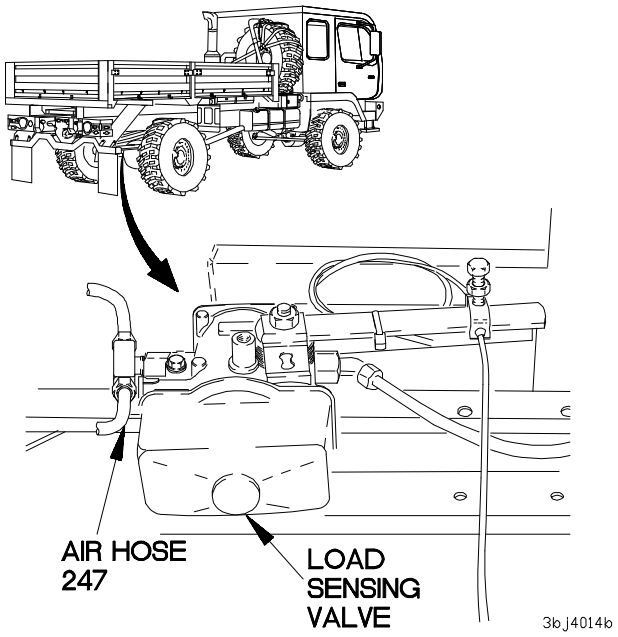
(1) Loosen air hose 120 at air brake protecting valve supply port FV2.
(2) Start engine (TM 9-2320-365-10).
(3) Apply service brakes (TM 9-2320-365-10).
(4) Check for presence of air at air hose 120.
(5) Shut down engine (TM 9-2320-365-10).
(6) If air is not present, go to step 17 of this fault.
(7) If air is present, replace air brake protecting valve (para 11-16).
(8) Tighten air hose 120 at air brake protecting valve supply port FV2.



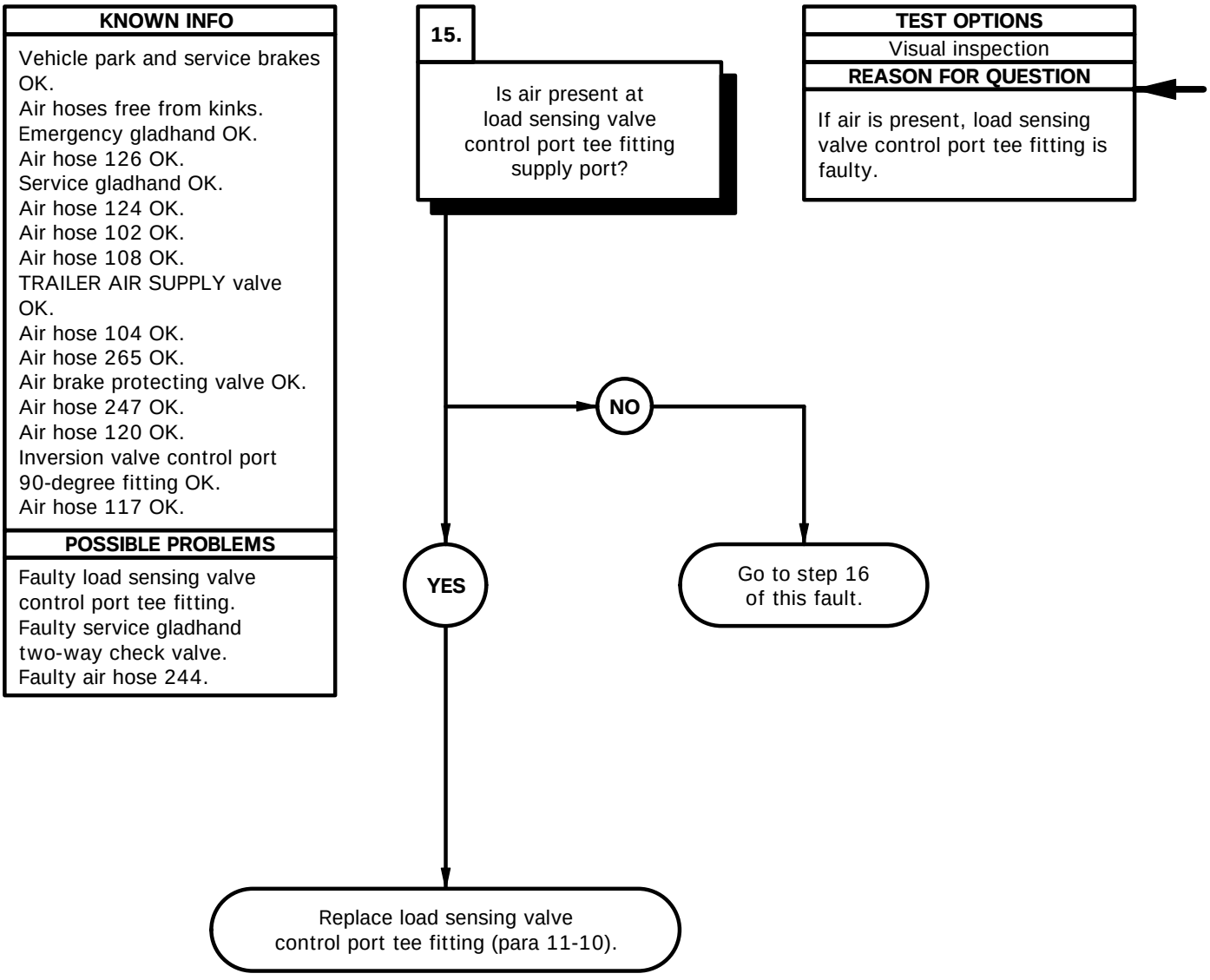
j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (CONT)



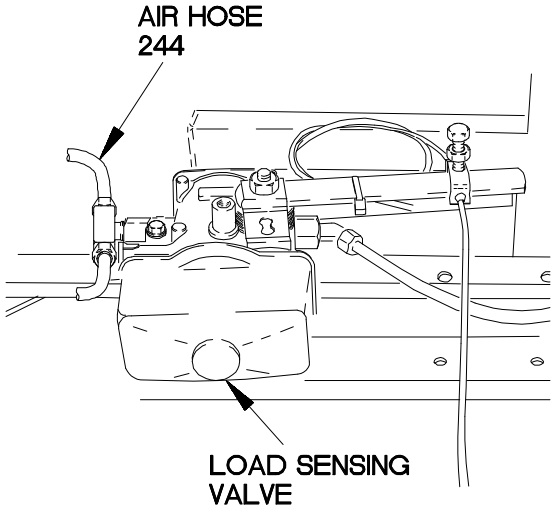
(1) Loosen air hose 247 at load sensing valve control port tee fitting delivery port.
(2) Start engine (TM 9-2320-365-10).
(3) Apply service brakes (TM 9-2320-365-10).
(4) Check for presence of air at load sensing valve control port tee fitting delivery port.
(5) Shut down engine (TM 9-2320-365-10).
(6) If air is not present, go to step 15 of this fault.
(7) If air is present, replace air hose 247 (para 11-19).
(8) Tighten air hose 247 at load sensing valve control port tee fitting delivery port.



j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (CONT)

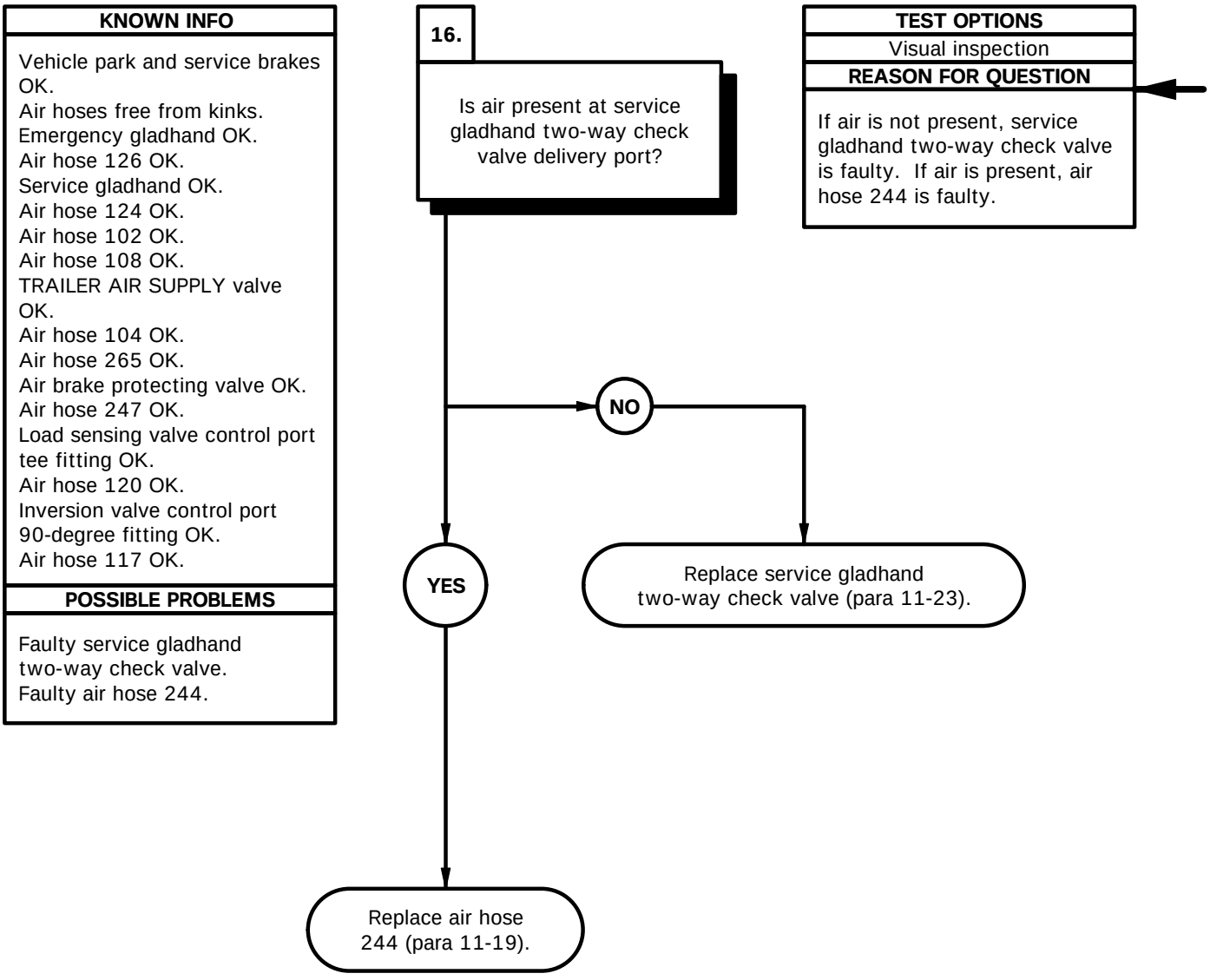


(1) Loosen air hose 244 at load sensing valve control port tee fitting supply port.
(2) Start engine (TM 9-2320-365-10).
(3) Apply service brakes (TM 9-2320-365-10).
(4) Check for presence of air at air hose 244.
(5) Shut down engine (TM 9-2320-365-10).
(6) If air is not present, go to step 16 of this fault.
(7) If air is present, replace load sensing valve control port tee fitting (para 11-10).
(8) Tighten air hose 244 at load sensing valve control port tee fitting supply port.

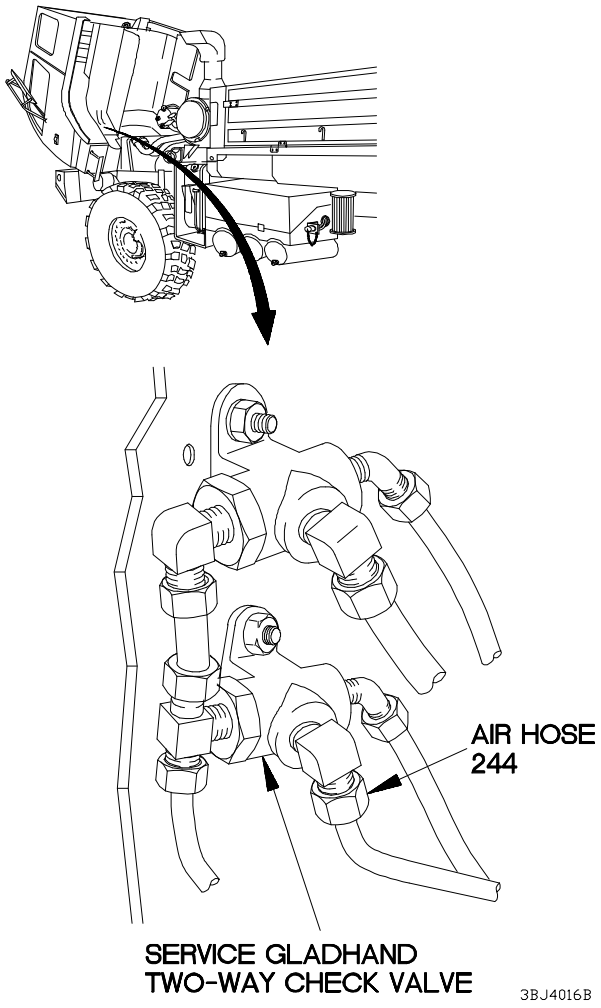


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j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (CONT)



(1) Raise cab (TM 9-2320-365-10).
(2) Loosen air hose 244 at service gladhand two-way check valve delivery port.
(3) Start engine (TM 9-2320-365-10).
(4) Apply service brakes (TM 9-2320-365-10).
(5) Check for presence of air at service gladhand two-way check valve delivery port.
(6) Shut down engine (TM 9-2320-365-10).
(7) If air is not present, replace service gladhand two-way check valve (para 11-23).
(8) If air is present, replace air hose 244 (para 11-19).
(9) Tighten air hose 244 at service gladhand two-way check valve delivery port.
(10) Lower cab (TM 9-2320-365-10).



j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (CONT)

KNOWN INFO

Vehicle park and service brakes OK.
Air hoses free from kinks.
Emergency gladhand OK.
Air hose 126 OK.
Service gladhand OK.
Air hose 124 OK.
Air hose 102 OK.
Air hose 108 OK.
TRAILER AIR SUPPLY valve OK.
Air hose 104 OK.
Air hose 265 OK.
Air hose 247 OK.
Load sensing valve control port tee fitting OK.
Service gladhand two-way check valve OK.
Air hose 244 OK.
Air brake protecting valve OK.

POSSIBLE PROBLEMS

Faulty air hose 120.
Faulty inversion valve control port 90-degree fitting.
Faulty air hose 117.

17. Is air present at inversion valve control port 90-degree fitting delivery port?

TEST OPTIONS

Visual Inspection

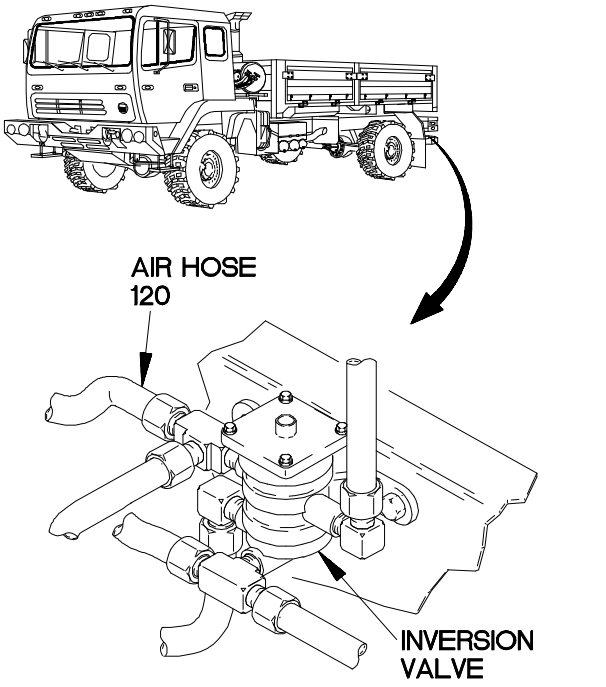
REASON FOR QUESTION

If air is present, air hose 120 is faulty.

NO → Go to step 18 of this fault.

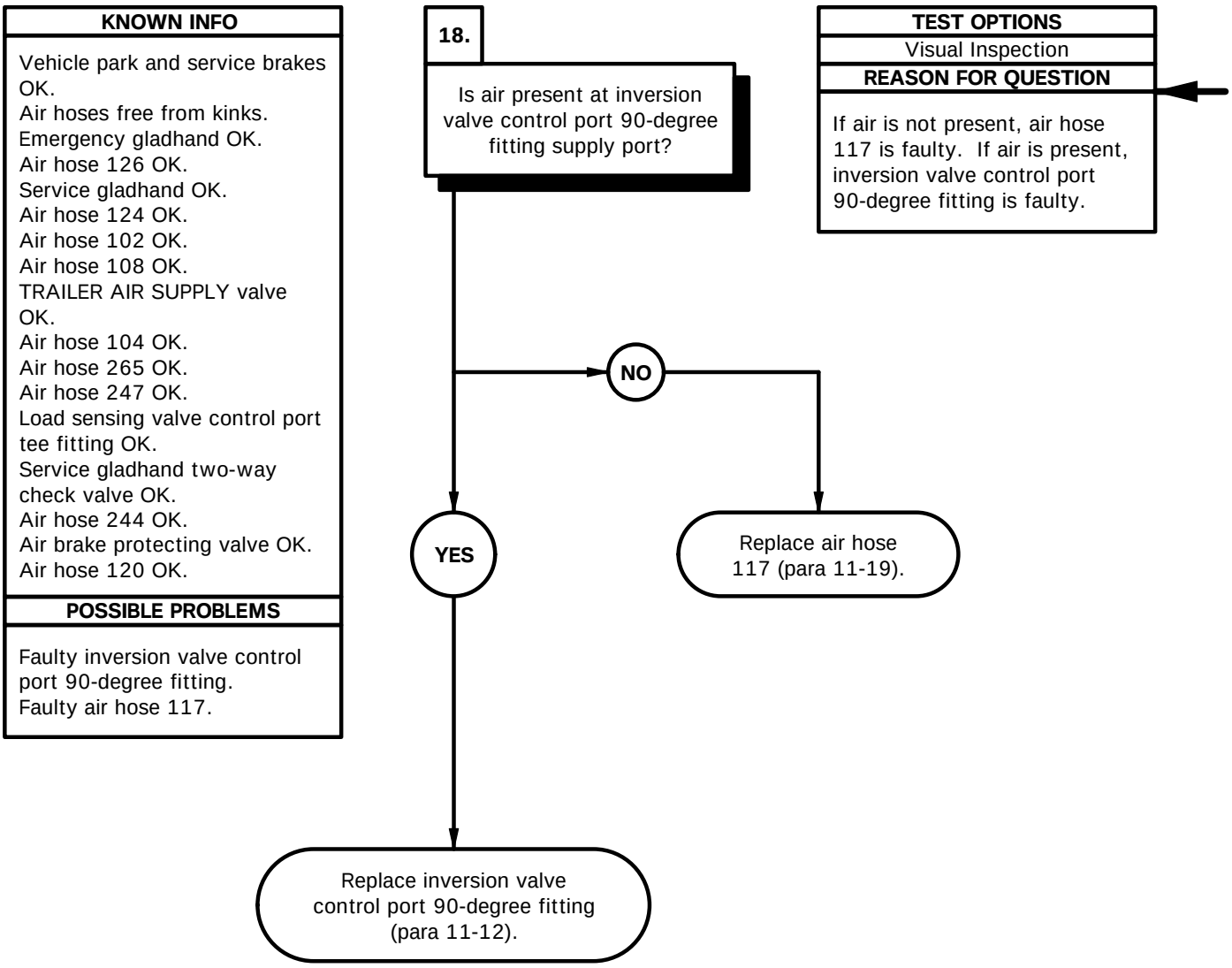
YES → Replace air hose 120 (para 11-19).

(1) Loosen air hose 120 at inversion valve control port 90-degree fitting delivery port.
(2) Start engine (TM 9-2320-365-10).
(3) Apply service brakes (TM 9-2320-365-10).
(4) Check for presence of air at inversion valve control port 90-degree fitting delivery port.
(5) Shut down engine (TM 9-2320-365-10).
(6) If air is not present, go to step 18 of this fault.
(7) If air is present, replace air hose 120 (para 11-19).
(8) Tighten air hose 120 at inversion valve control port 90-degree fitting delivery port.

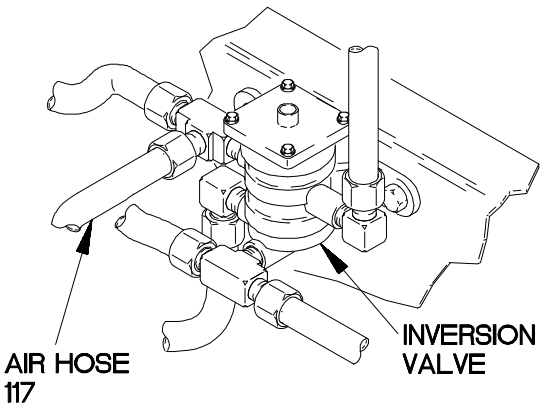


3BJ4017B

j4. NO AIR PRESSURE PRESENT AT REAR GLADHAND(S) (CONT)



(1) Loosen air hose 117 at inversion valve control port 90-degree fitting supply port.
(2) Start engine (TM 9-2320-365-10).
(3) Apply service brakes (TM 9-2320-365-10).
(4) Check for presence of air at air hose 117.
(5) Shut down engine (TM 9-2320-365-10).
(6) If air is not present, replace air hose 117 (para 11-19).
(7) If air is present, replace inversion valve control port 90-degree fitting (para 11-12).
(8) Tighten air hose 117 at inversion valve control port 90-degree fitting supply port.



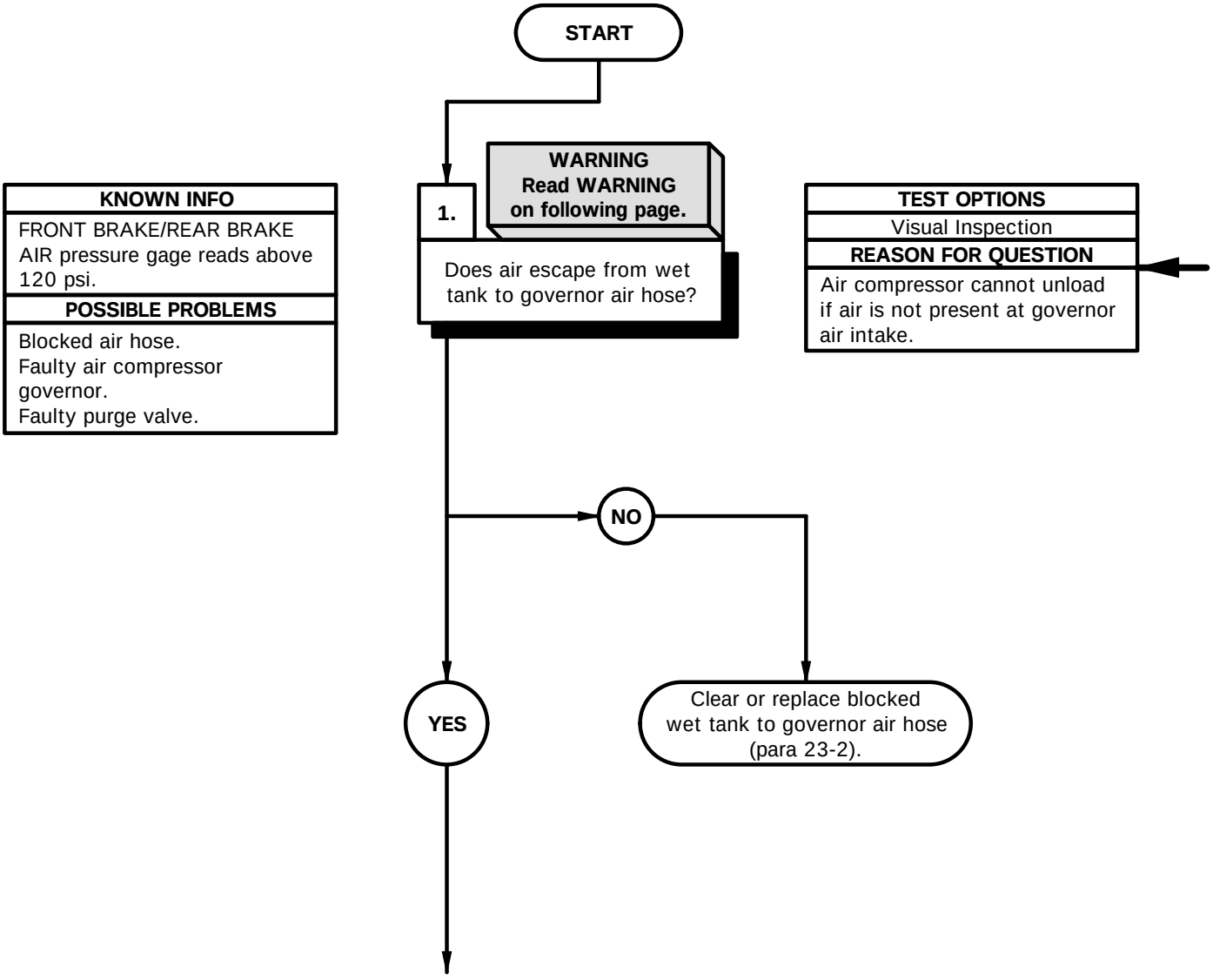
3bj4018b

j5. AIR SYSTEM PRESSURE BUILDS UP MORE THAN 120 PSI (827 KPA) (COMPRESSOR FAILS TO UNLOAD)

INITIAL SETUP

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

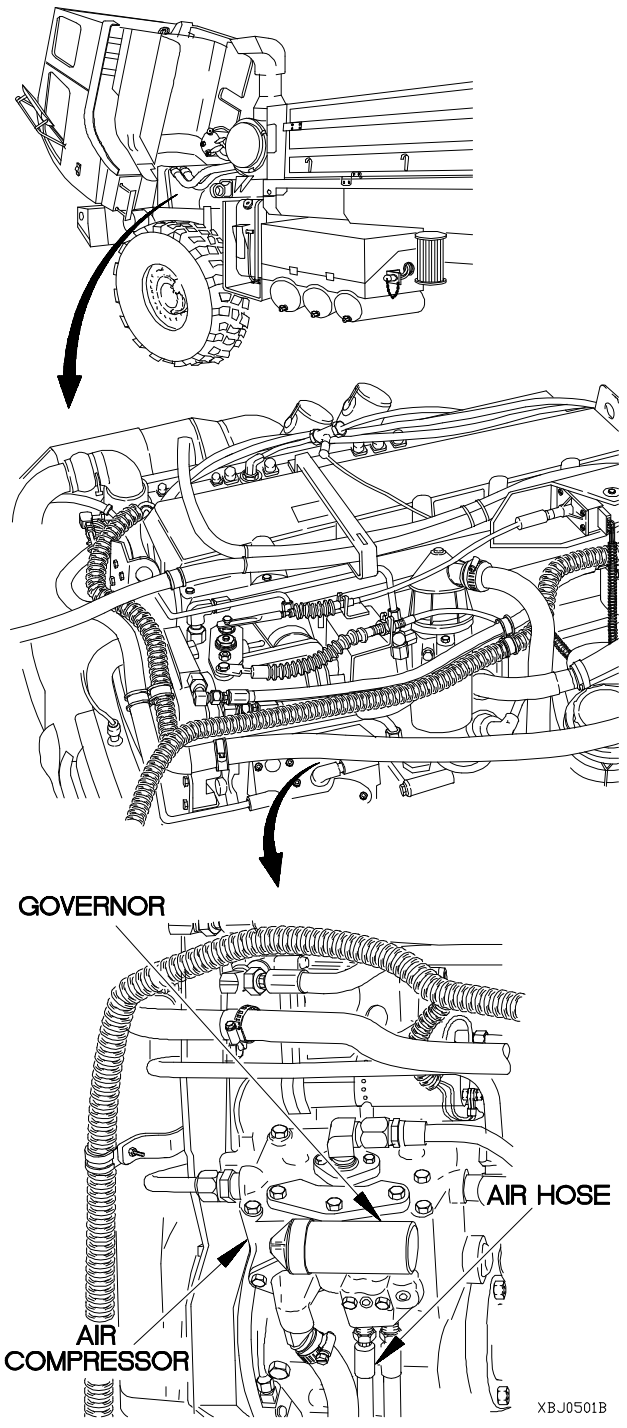
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Goggles, Industrial (Item 15, Appendix C)



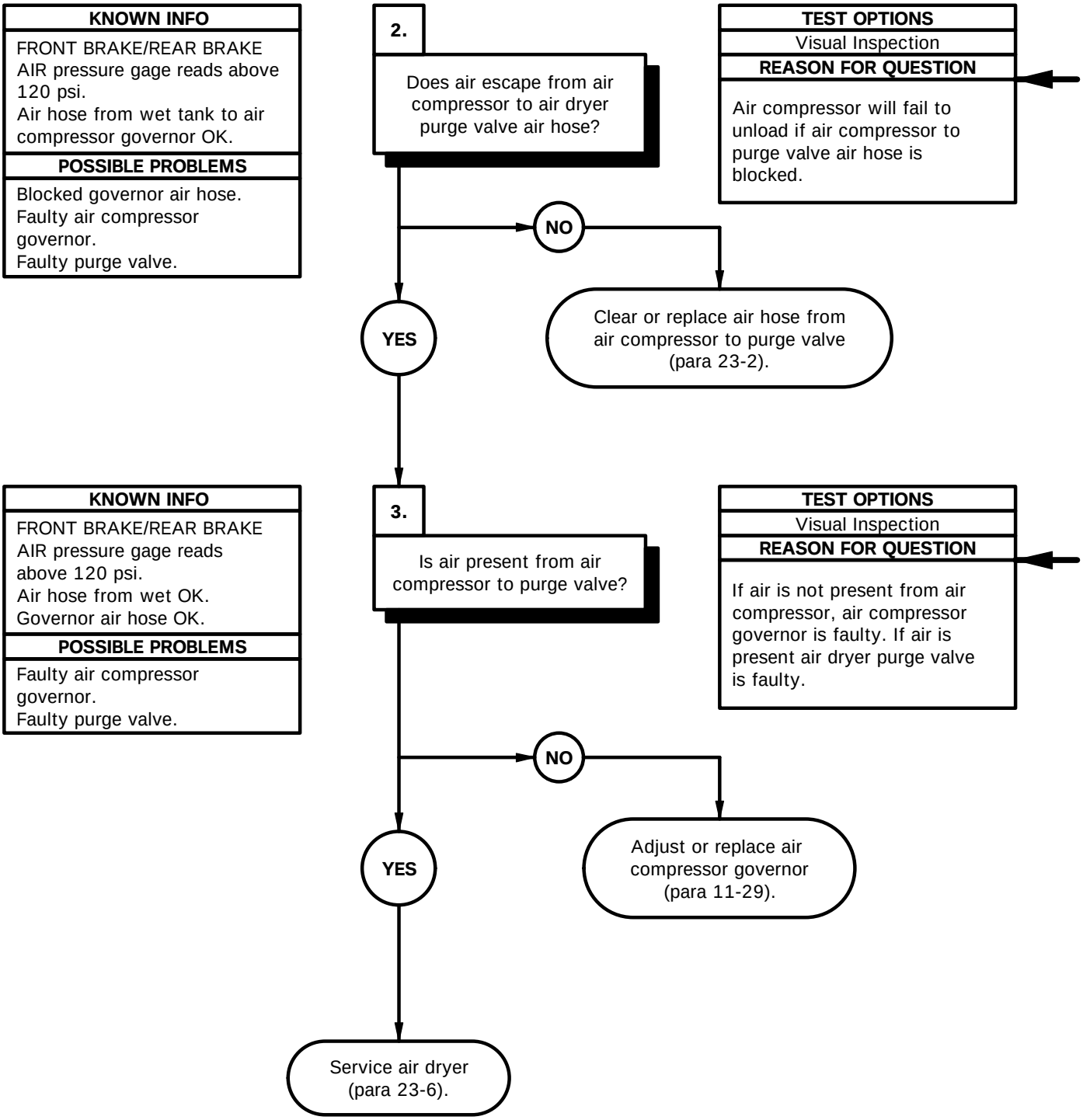
WARNING

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 9-2320-365-10).
(2) Disconnect (wet tank to governor) air hose from air compressor governor.
(3) Lower cab (TM 9-2320-365-10).
(4) Start engine (TM 9-2320-365-10).
(5) Raise cab (TM 9-2320-365-10).
(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 9-2320-365-10).
(9) Shut down engine (TM 9-2320-365-10).
(10) Raise cab (TM 9-2320-365-10).
(11) Connect (wet tank to governor) air hose to air compressor governor.

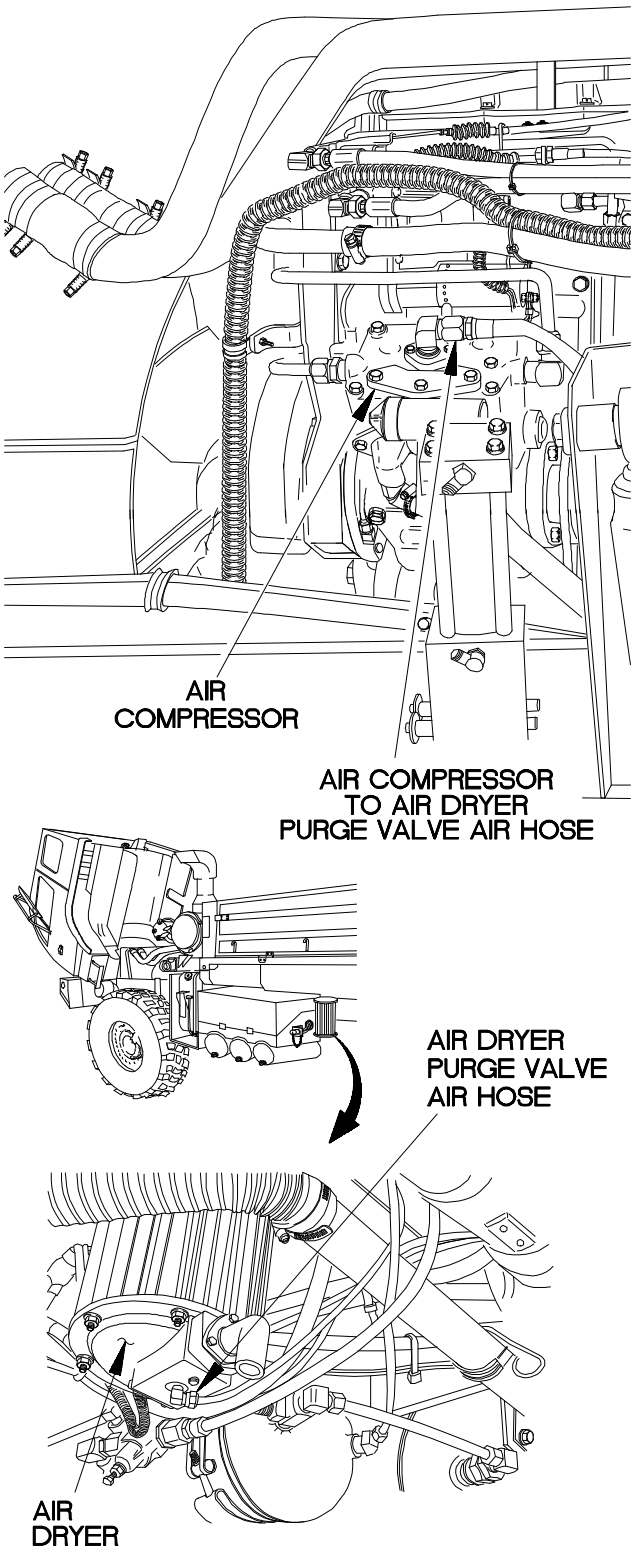


j5. AIR SYSTEM PRESSURE BUILDS UP MORE THAN 120 PSI (827 KPA) (COMPRESSOR FAILS TO UNLOAD) (CONT)



(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 9-2320-365-10).

(1) Start engine (TM 9-2320-365-10).
(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 11-29).
(4) If air escapes from air hose, service air dryer for faulty purge valve (para 23-6).
(5) Shut down engine (TM 9-2320-365-10).
(6) Connect (air compressor to purge valve) air hose to air dryer purge valve.

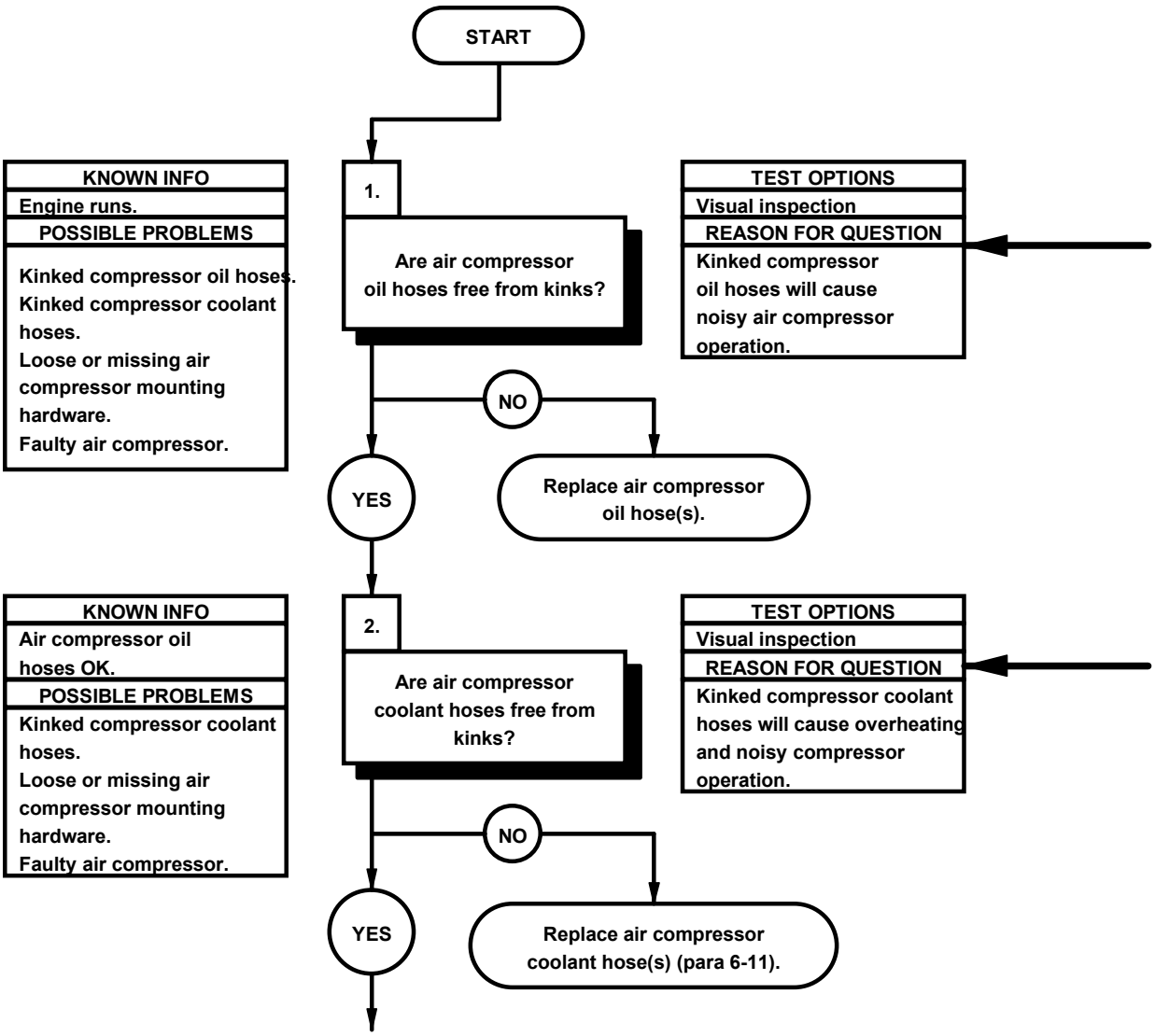


j6. NOISY AIR COMPRESSOR OPERATION

INITIAL SETUP

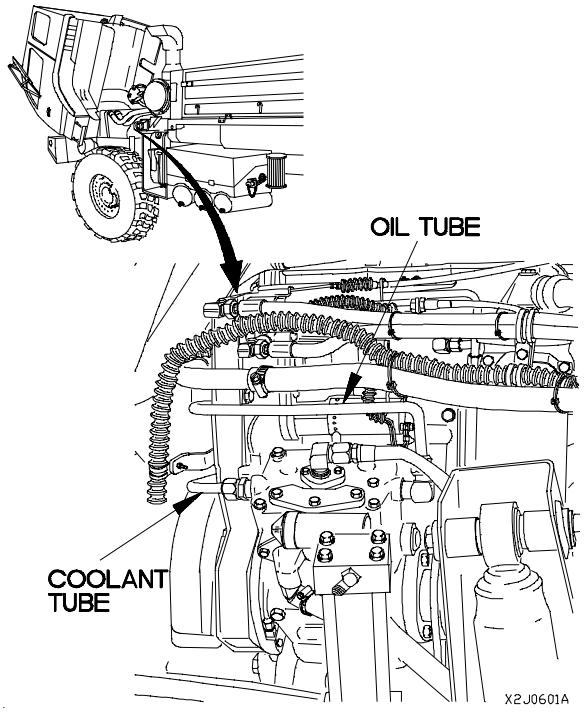
Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

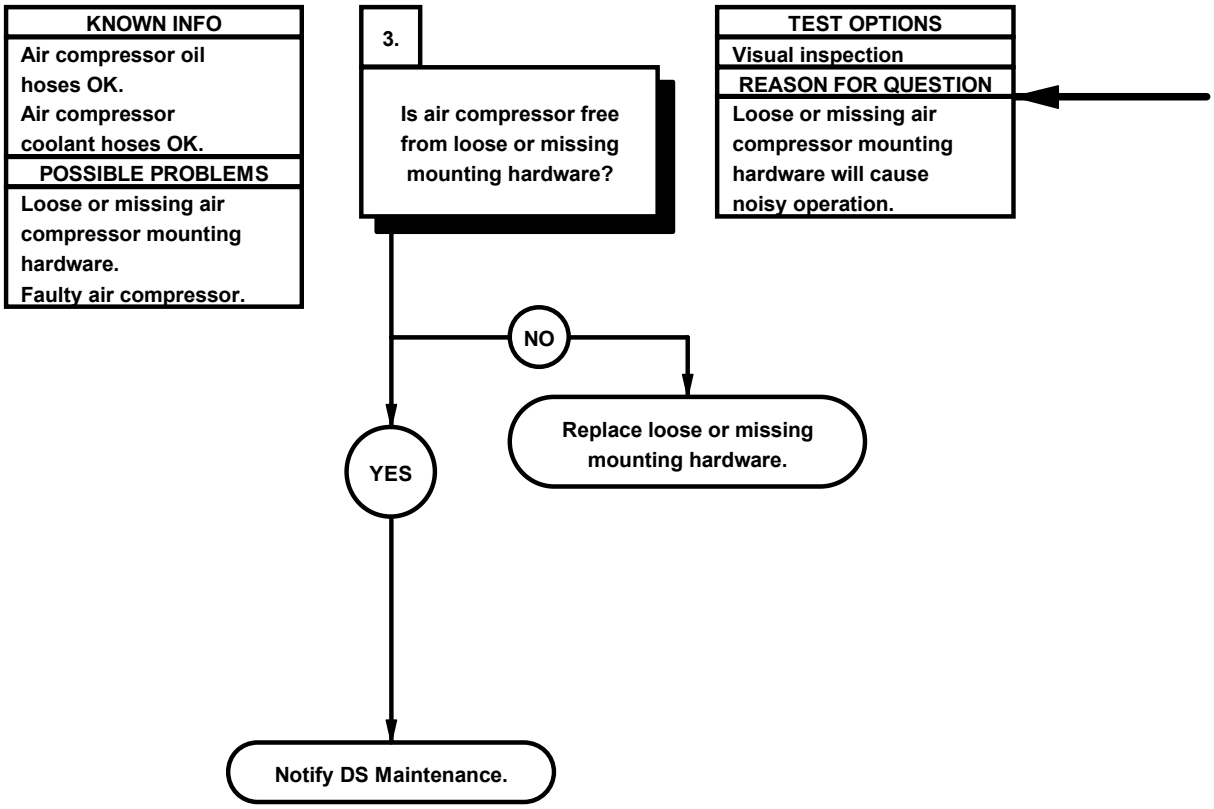


(1) Raise cab (TM 9-2320-365-10).
(2) Check air compressor oil hoses for kinks.

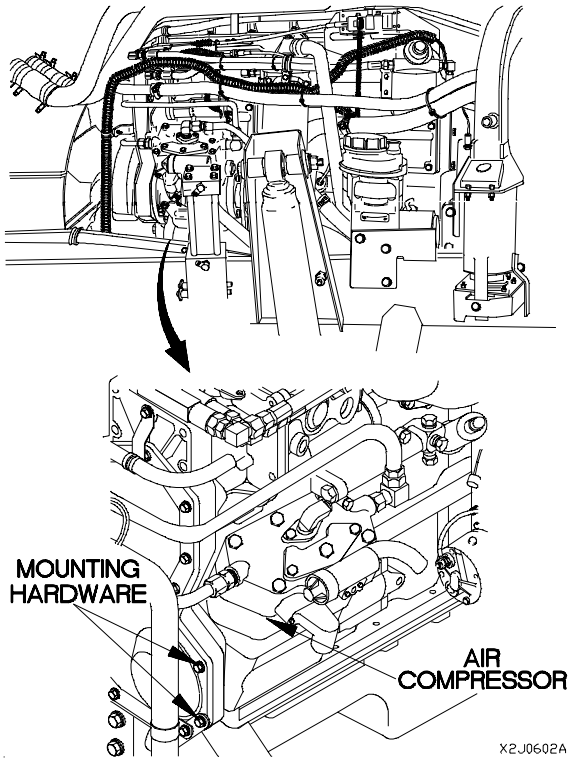
Check air compressor coolant hoses.



j6. NOISY AIR COMPRESSOR OPERATION (CONT)



(1) Check air compressor for loose or missing mounting hardware.
(2) Lower cab (TM 9-2320-365-10).



2-22. WHEEL TROUBLESHOOTING

This paragraph covers Wheel Troubleshooting. The Wheel Fault Index, Table 2-48, lists faults for the Wheel of the vehicle.

Table 2-48. Wheel Fault Index

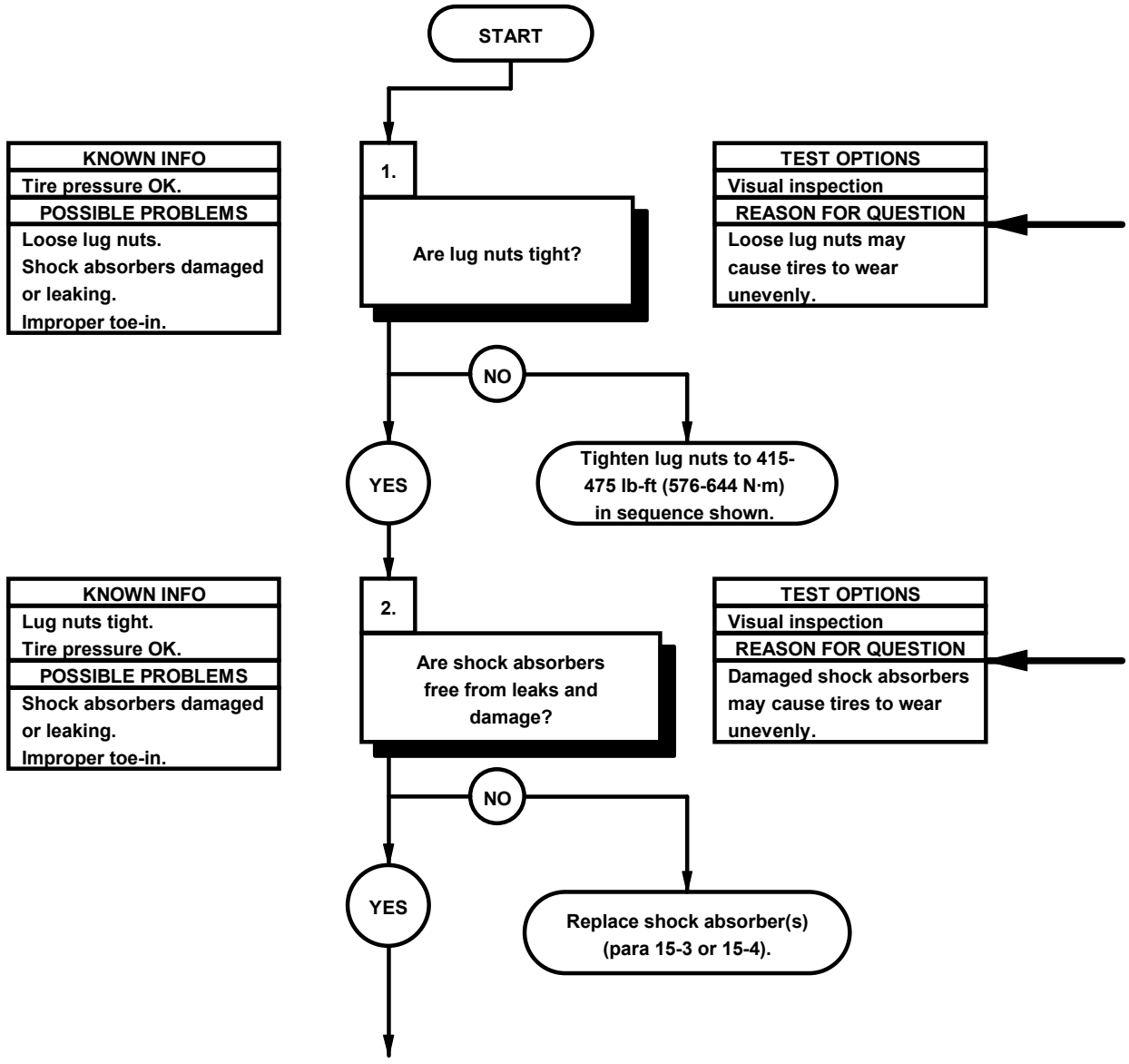
Fault No.	Description	Page
k1.	Tires Wear Unevenly or Excessively	2-1754
k2.	Wheel Wobbles or Shimmies	2-1758

k1. TIRES WEAR UNEVENLY OR EXCESSIVELY

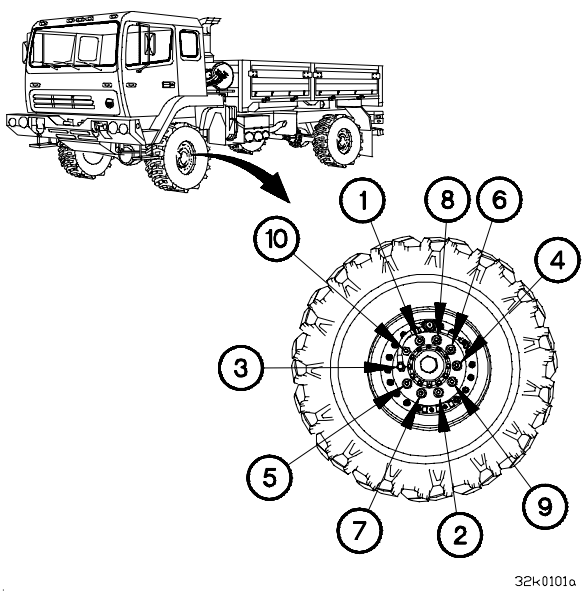
INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Multiplier, Torque Wrench (Item 23, Appendix C)
Wrench, Torque, 0-600 lb-ft (Item 59, Appendix C)

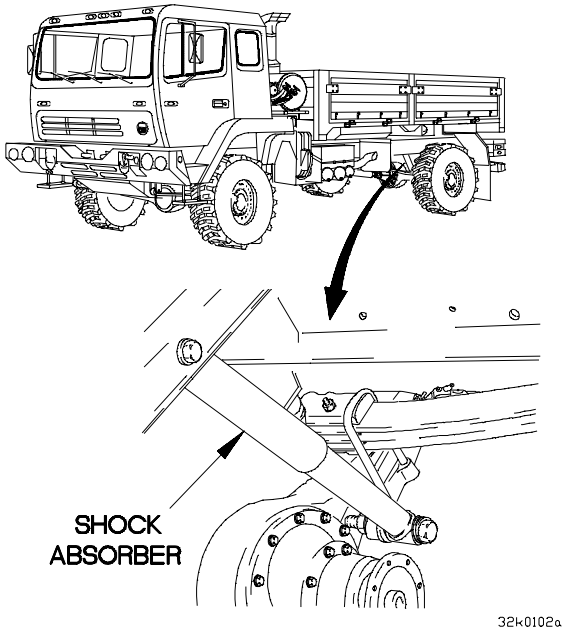


Inspect tires for excessive wear and for spacing between lug nuts and wheels. Tires that are worn unevenly may indicate that lug nuts need tightening.



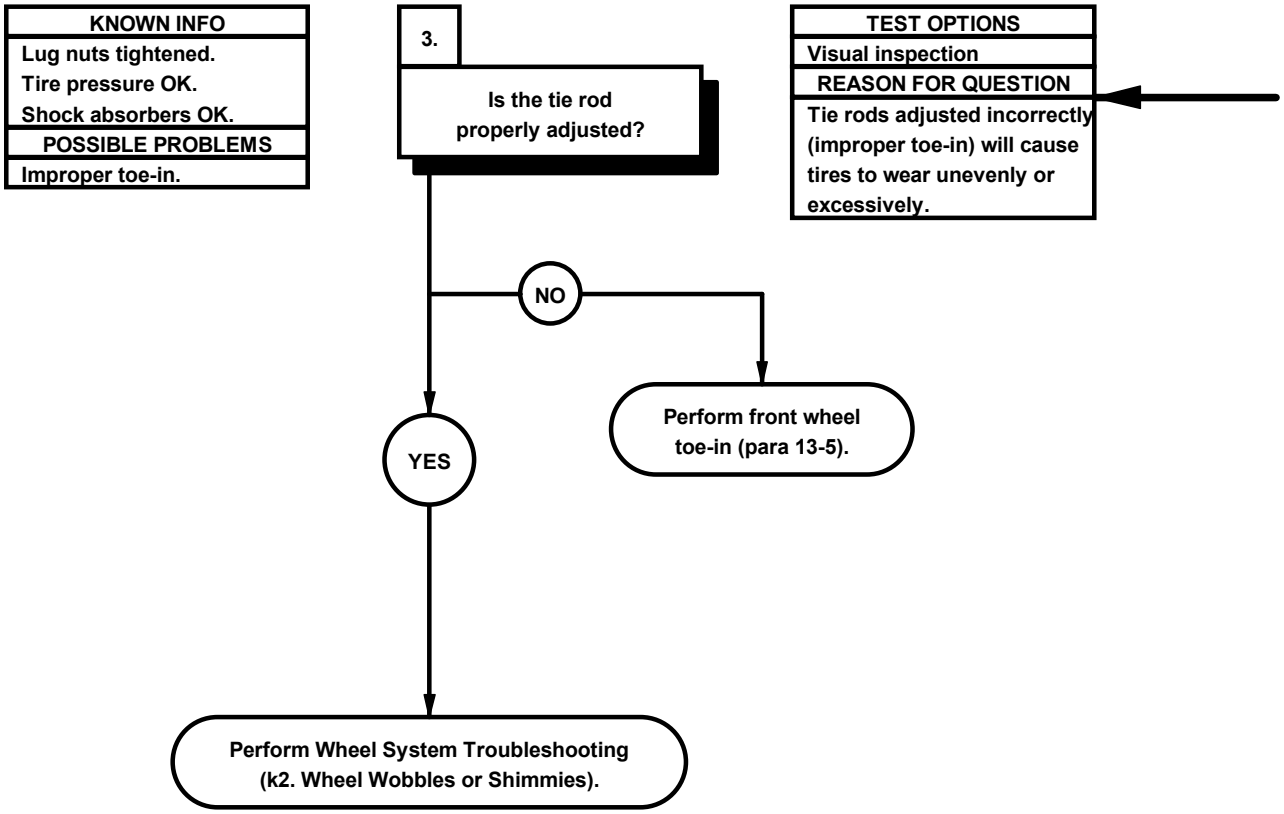
32k0101a

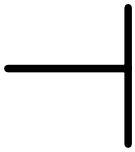
Inspect tires for excessive wear. Tires that have flat spots may indicate a defective shock absorber. Inspect shock absorbers for leaks or damage.



32k0102a

k1. TIRES WEAR UNEVENLY OR EXCESSIVELY (CONT)





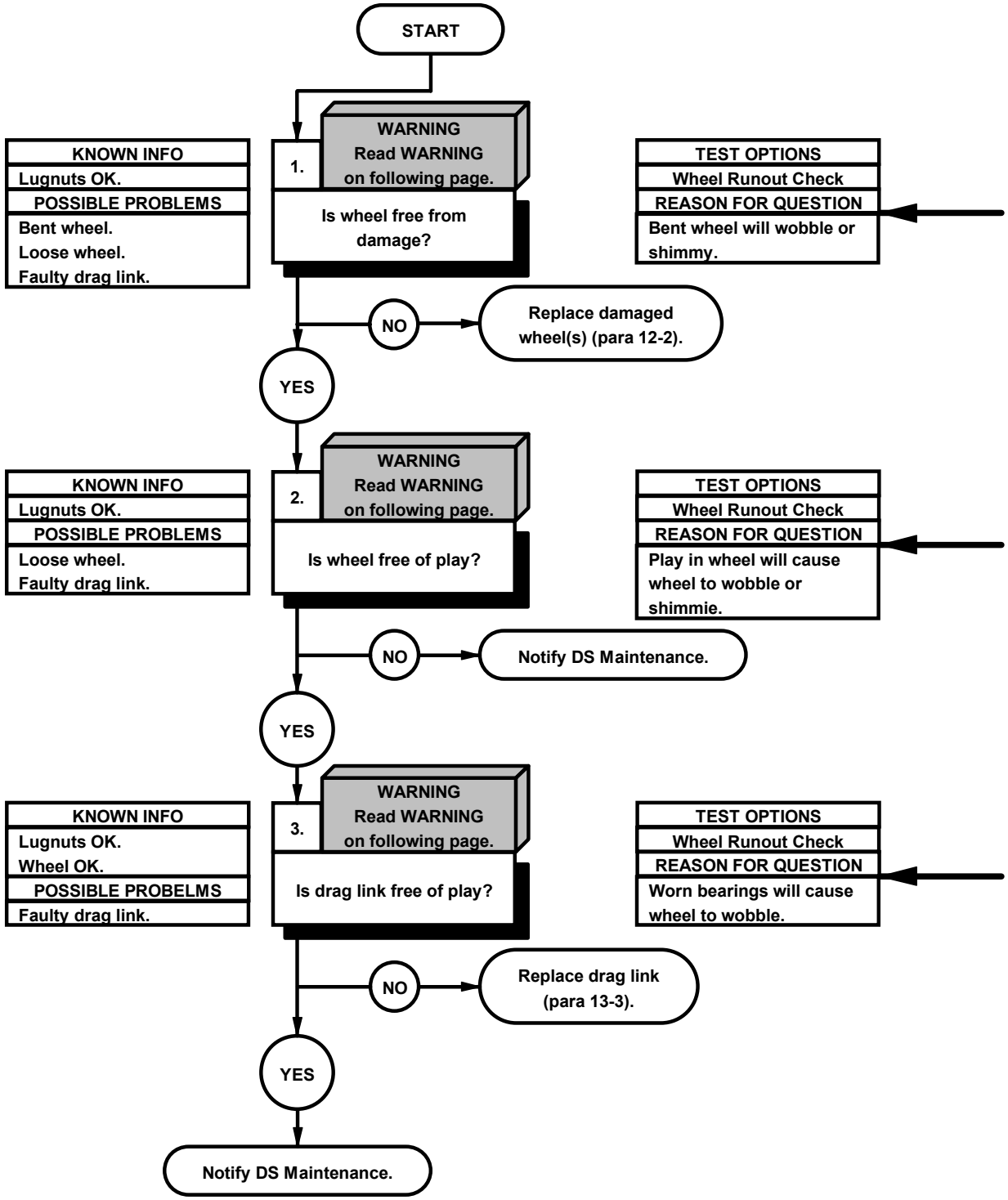
Check front wheel toe-in (para 13-5).

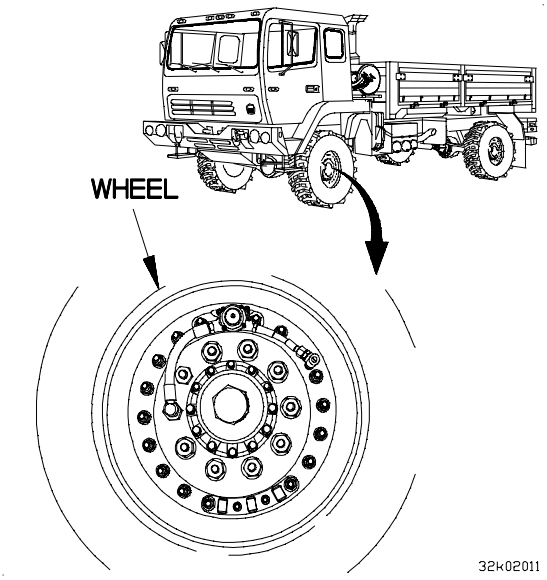
k2. WHEEL WOBBLES OR SHIMMIES

INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Trestle, Motor Vehicle Maintenance (Item 45, Appendix C)



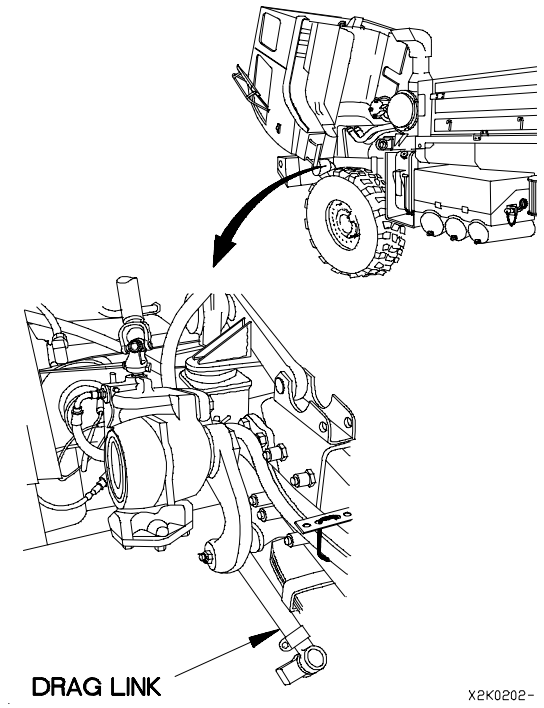


WHEEL RUNOUT CHECK

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 9-2320-365-10) 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 9-2320-365-10).



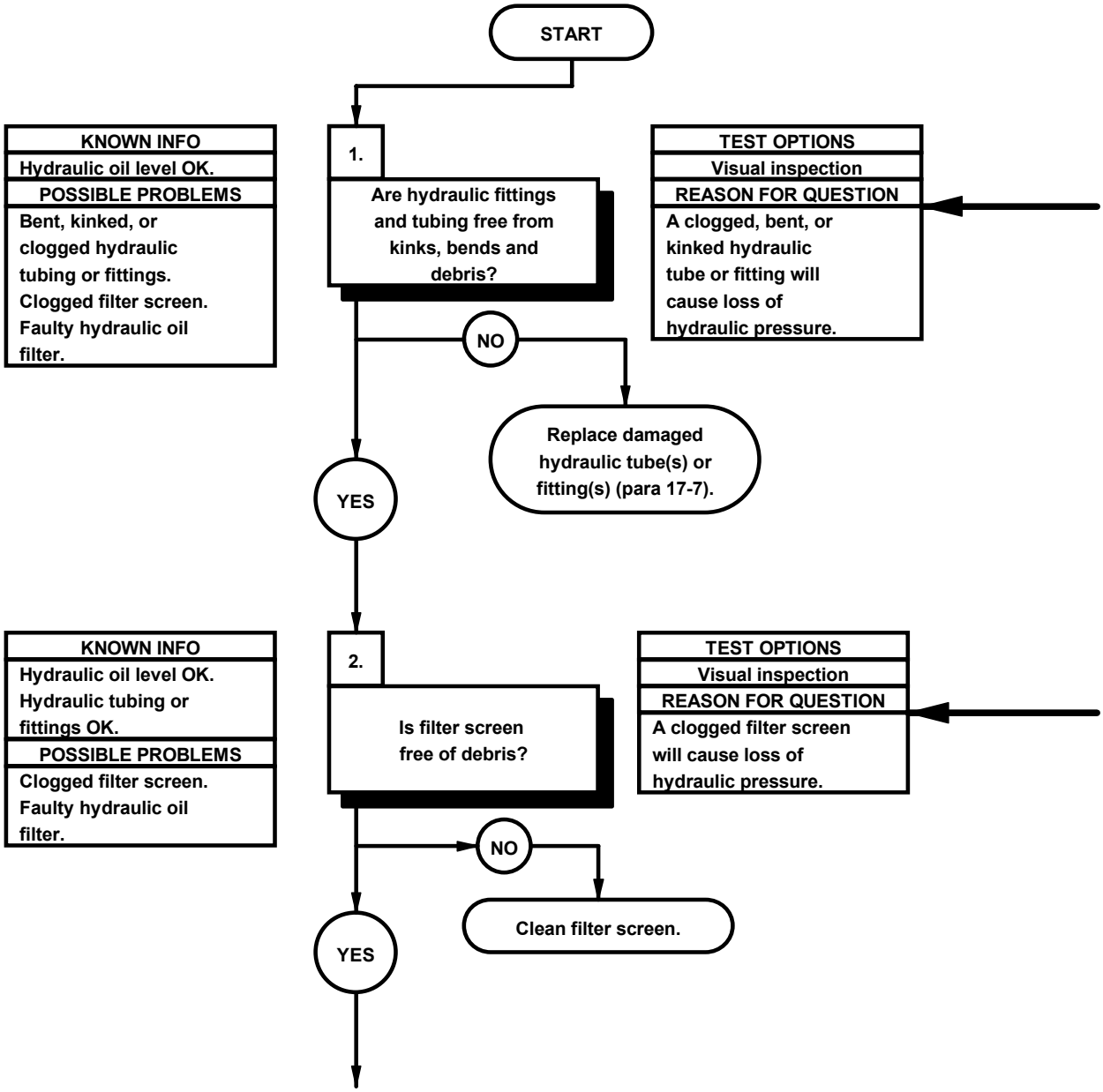
2-23. HYDRAULIC SYSTEM TROUBLESHOOTING

This paragraph covers Hydraulic System Troubleshooting. The Hydraulic System Fault Index, Table 2-49, lists faults for the Hydraulic System of the vehicle.

Table 2-49. Hydraulic System Fault Index

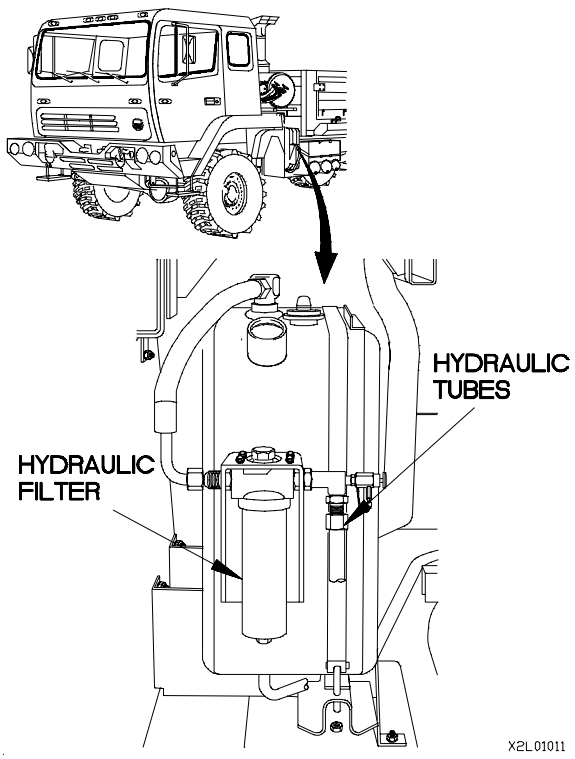
Fault No.	Description	Page
l1.	Loss of Hydraulic Pressure (Single Stage Pump)	2-1762

I1. LOSS OF HYDRAULIC PRESSURE (SINGLE STAGE PUMP)	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-365-10).	Tools and Special Tools Tool Kit, Genl Mech (Item 44, Appendix C)

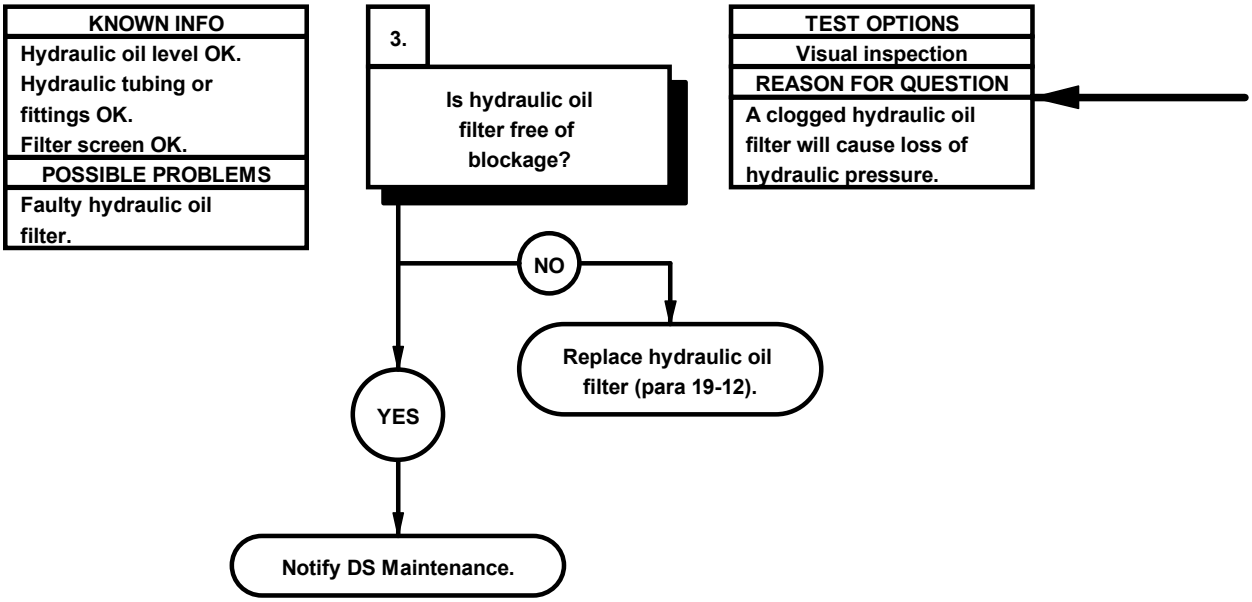


Check hydraulic tubes and fittings for kinks, bends, and debris.

Check filter screen for debris.



I1. LOSS OF HYDRAULIC PRESSURE (SINGLE STAGE PUMP) (CONT)



(1) Remove hydraulic oil filter (para 19-12).
(2) Check hydraulic oil filter for blockage.
(3) Install hydraulic oil filter (para 19-12).

2-24. CENTRAL TIRE INFLATION SYSTEM (CTIS) TROUBLESHOOTING

This paragraph covers Central Tire Inflation System (CTIS) Troubleshooting. The Central Tire Inflation System (CTIS) Fault Index, Table 2-50, lists faults for the CTIS System of the vehicle.

Table 2-50. Central Tire Inflation System (CTIS) Fault Index

Fault No.	Description	Page
m1.	Two Steady Mode Lights Illuminate on Central Tire Inflation System (CTIS) ECU	2-1768
m2.	Four CTIS ECU Indicator Lights Flashing	2-1798
m3.	Five CTIS ECU Indicator Lights Flashing	2-1822
m4.	CTIS Repeatedly Resumes Cycling 30 Seconds After Indicator Lights Stop Flashing	2-1856
m5.	Central Tire Inflation System (CTIS) ECU Indicates No Fault Code But System Fails To Inflate or Deflate	2-1862
m6.	No Overspeed Warning Light and/or Overspeed Pressure Change	2-1874

m1. TWO STEADY MODE LIGHTS ILLUMINATE ON CENTRAL TIRE INFLATION SYSTEM (CTIS) ECU

INITIAL SETUP

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

Materials/Parts
Soap, Laundry (Item 69, Appendix D)

Personnel Required
(2)

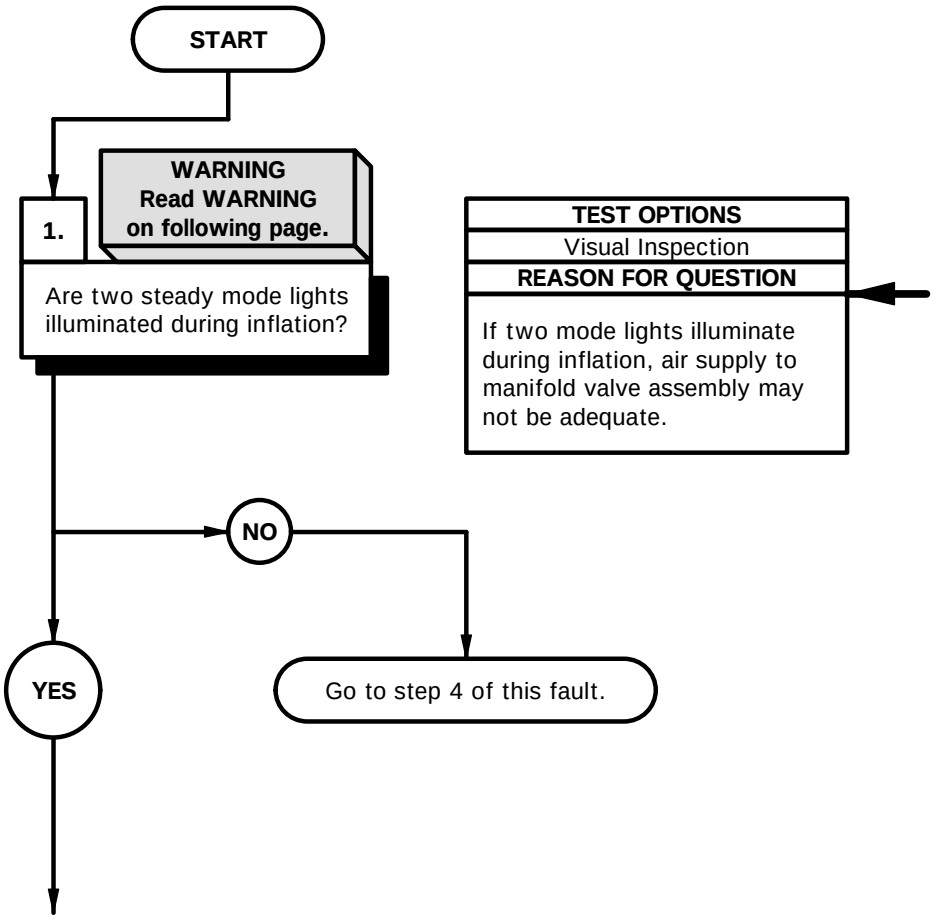
Tools and Special Tools
Materials/Parts
Tool Kit, Genl Mech (Item 44, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Trestle, Motor Vehicle Maintenance (2) (Item 45, Appendix C)
Pan, Wash (Item 25, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)

KNOWN INFO

Nothing

POSSIBLE PROBLEMS

Faulty air hose from wet tank to manifold valve assembly.
Faulty air compressor or governor adjustment.
Faulty wheel valve venting.
Faulty manifold valve assembly relief valve.
Faulty manifold valve assembly.
Faulty quick release valve(s).
Faulty rear axle quick release valve fittings.
Faulty front quick release valve fittings.
Faulty front tee fittings.
Faulty manifold valve assembly delivery port fittings.
Faulty cab floor supply hose fittings.
Faulty supply hoses from quick release valve(s) to wheel valve(s).
Faulty wheel valve filters.
Faulty electrical connections at CTIS ECU and manifold valve assembly.
Faulty CTIS ECU.



WARNING

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

NOTE

Two steady mode lights are an indication that the CTIS has disconnected operation because of particular inflation or deflation sequence has taken longer than limits allow (40 minutes for inflate; 20 minutes for deflate).

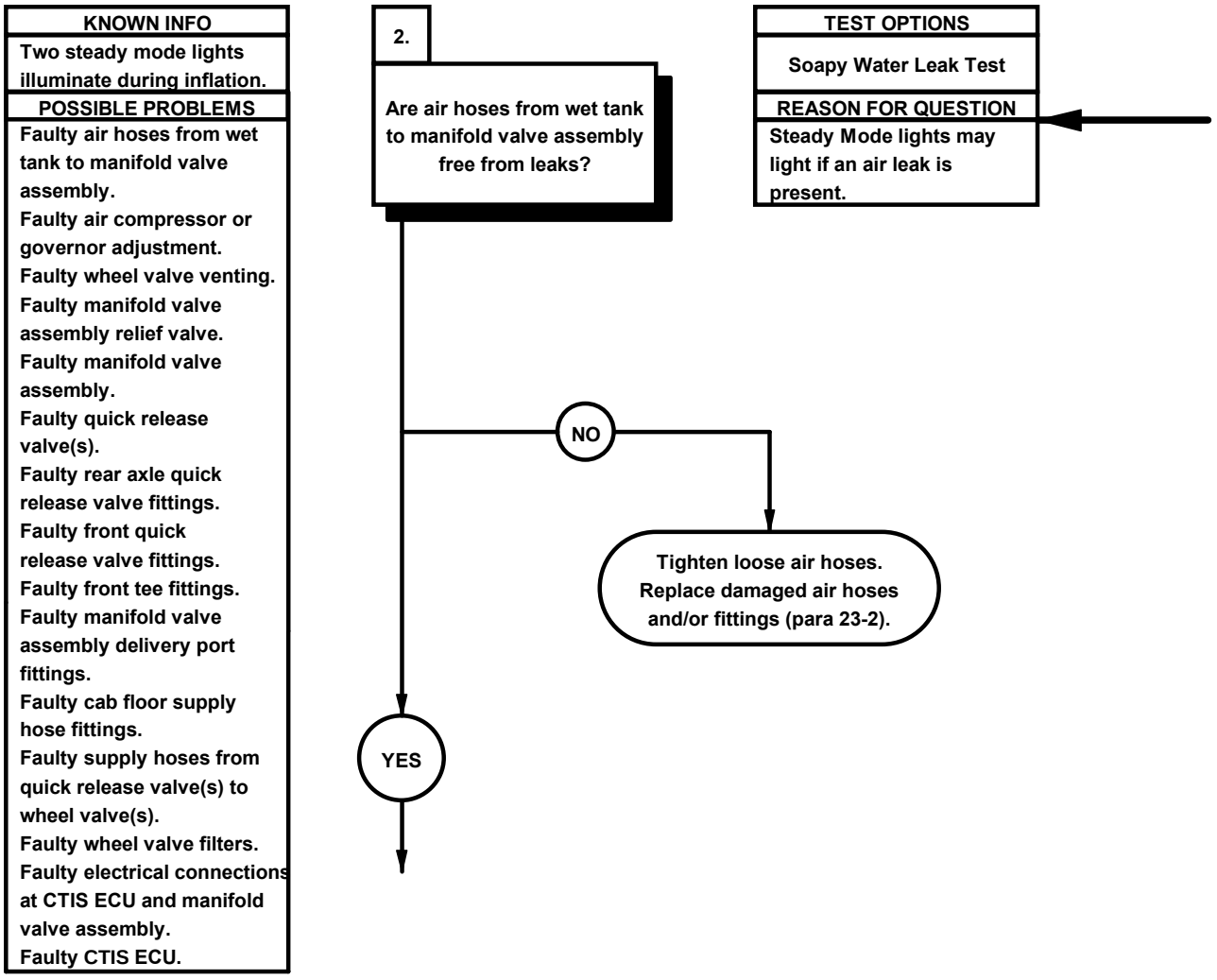
Two steady mode lights indicates that system shut off with air pressure between modes.

The CTIS may still operate including modes that are illuminated by manually pressing the desired mode.

To perform deflate or inflate checks throughout this task, it will be necessary to perform the opposite function first from time to time so that a desired mode selection is available.

(1) Start engine (TM 9-2320-365-10).
(2) Select an inflation mode on CTIS ECU (TM 9-2320-365-10) and determine if two light mode is displayed.
(3) Select RUN FLAT mode or shut down engine and restart engine (TM 9-2320-365-10) again to reset ECU.
(4) Select a deflation mode on CTIS ECU (TM 9-2320-365-10) and determine if two light mode is displayed.
(5) Shut down engine (TM 9-2320-265-10).
(6) If two steady light mode lights do not illuminate during inflation, go to step 4 of this fault.

m1. TWO STEADY MODE LIGHTS ILLUMINATE ON CTIS ECU (CONT)

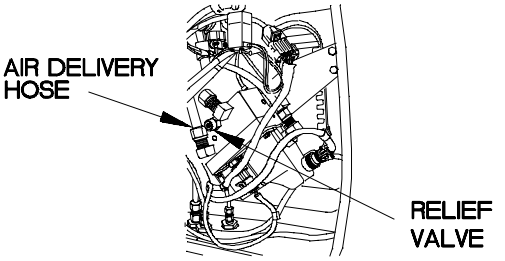


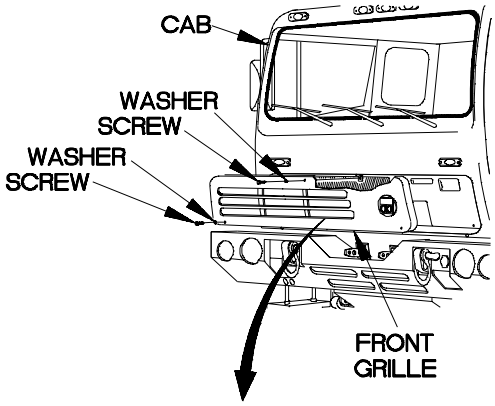
NOTE

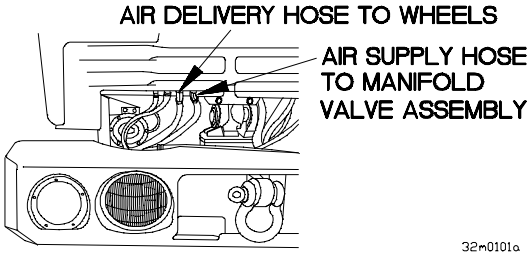
- **Two steady mode lights are an indication that the CTIS has discontinued operation because a particular inflate or deflate sequence has taken longer than limits allow (40 minutes for inflate; 20 minutes for deflate).**
- **Two steady mode lights indicate that CTIS is shut off with air pressure between modes.**
- **The CTIS may still operate including modes that are lit, by manually pressing the desired mode.**
- **To perform deflate or inflate checks throughout this task, it may be necessary to perform the opposite function first so that a desired mode selection is available.**

SOAPY WATER LEAK TEST

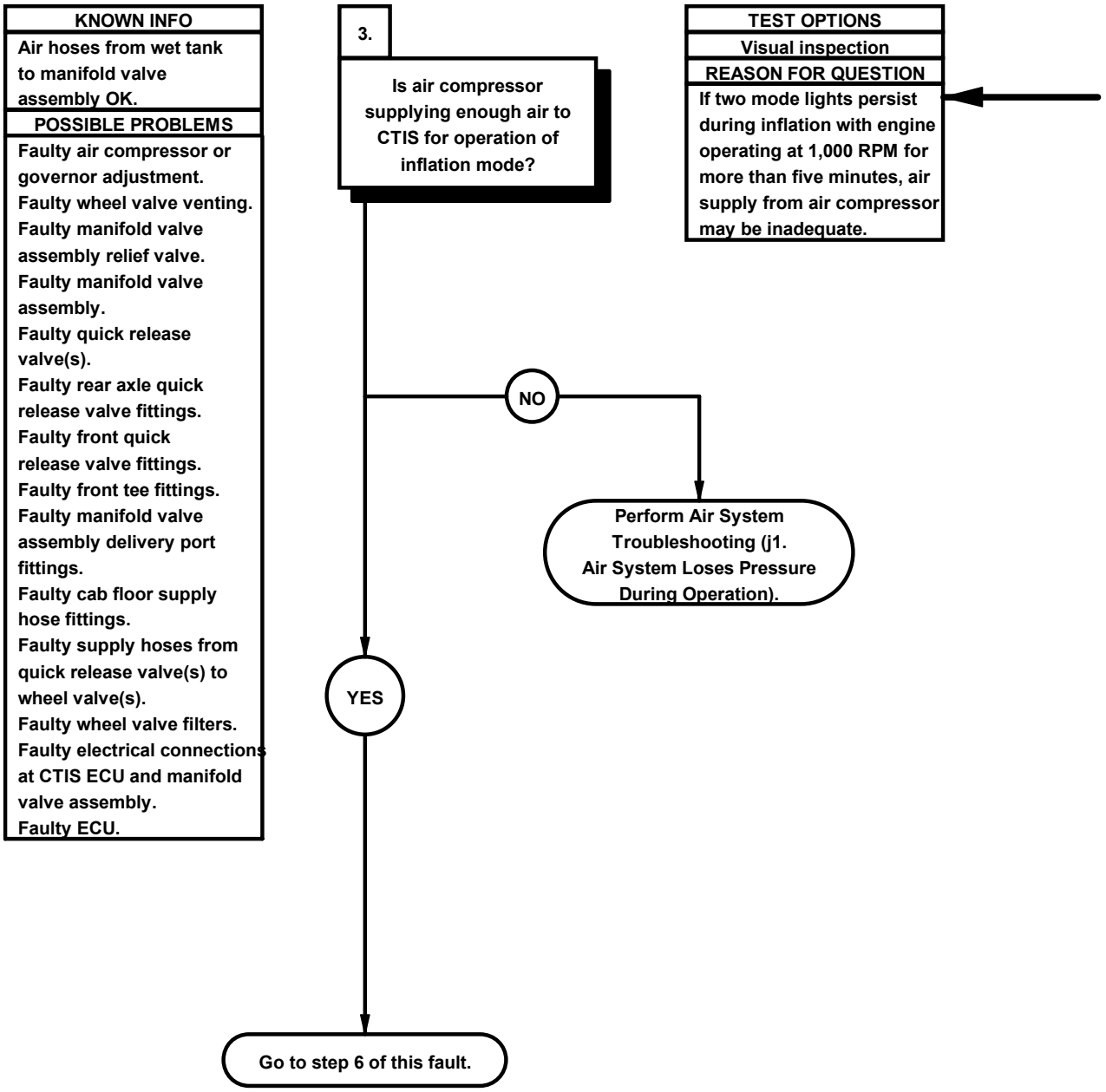
(1) Remove kick panel (para 16-3).
(2) Apply soapy water solution to supply air hose fitting at manifold valve assembly.
(3) Check for air escaping at manifold valve assembly, indicated by air bubbles.
(4) Remove two screws and washers from front grille.
(5) Remove screw and washer from front grille.
(6) Remove front grille from cab.
(7) Apply soapy water solution to supply air hose from wet tank at cab floor.
(8) Check for air escaping at cab floor fittings, indicated by air bubbles.



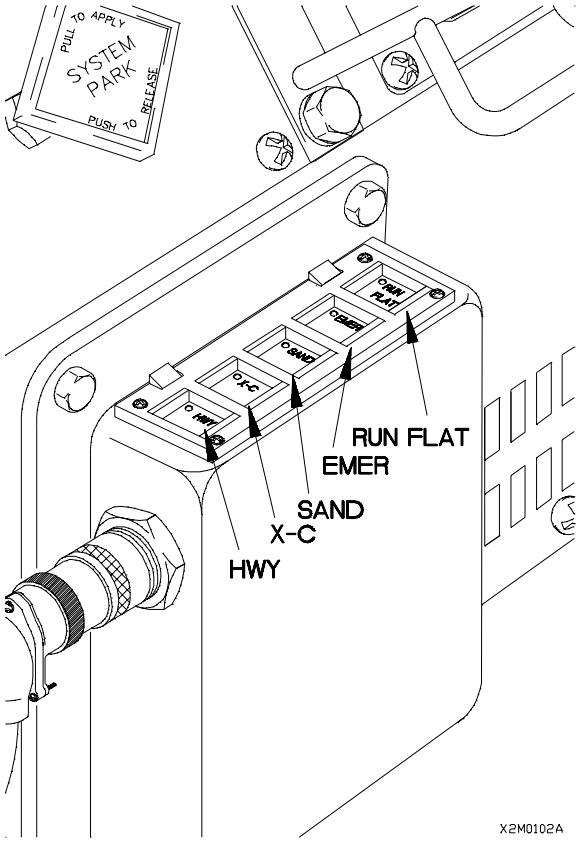




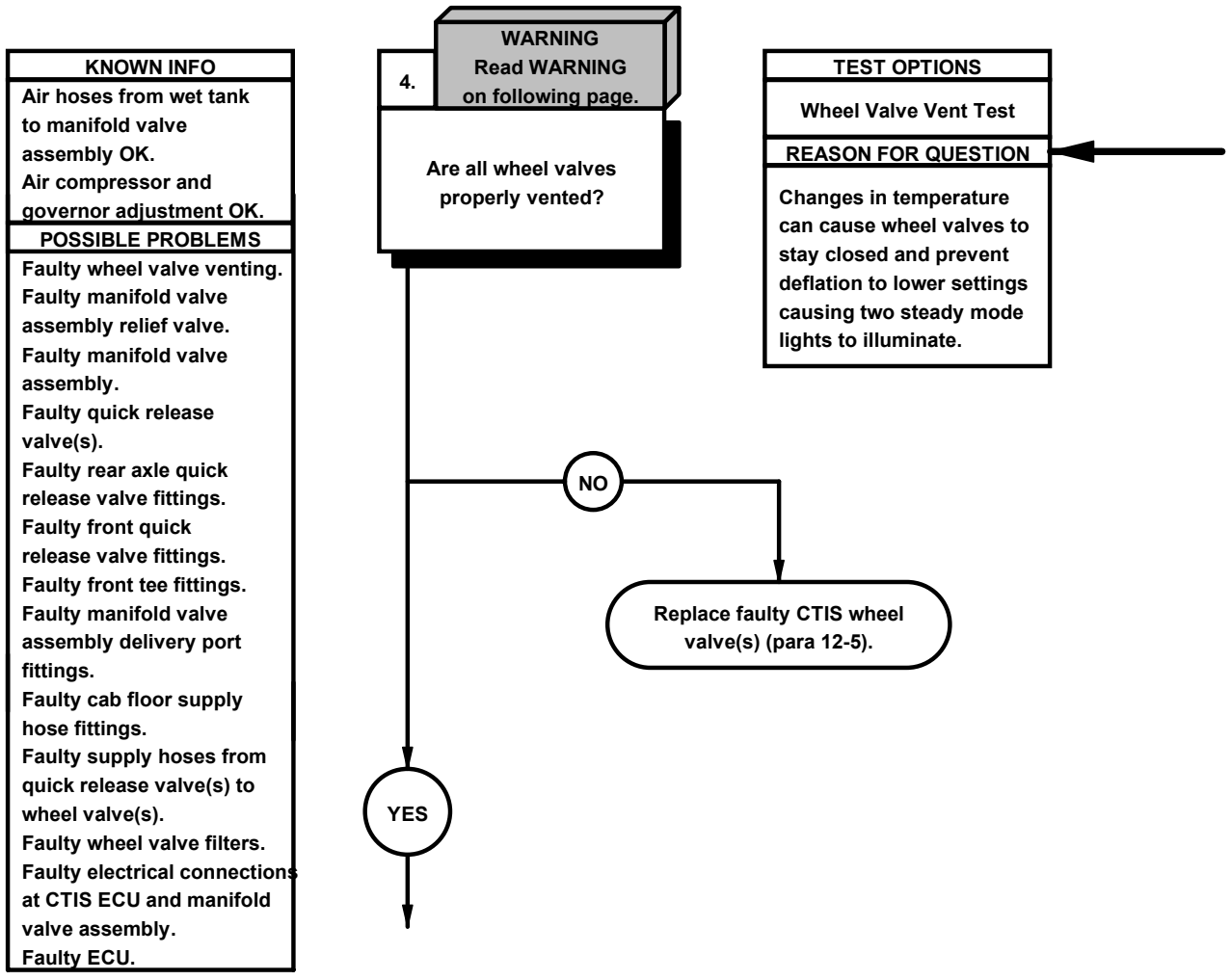
m1. TWO STEADY MODE LIGHTS ILLUMINATE ON CTIS ECU (CONT)



(1) Start engine (TM 9-2320-365-10) and operate at 1,000 RPM for five minutes.
(2) Select an inflation mode at CTIS ECU and check if two steady mode light returns.
(3) Apply and release brakes once or twice and check if pressure gages are slow to reach 120 psi.
(4) If two steady mode lights remain illuminated and brake air pressure gages are slow to reach 120 psi, Perform Air System Troubleshooting (j1. Air System Loses Pressure During Operation).
(5) Shut down engine (TM 9-2320-365-10).



m1. TWO STEADY MODE LIGHTS ILLUMINATE ON CTIS ECU (CONT)



WARNING

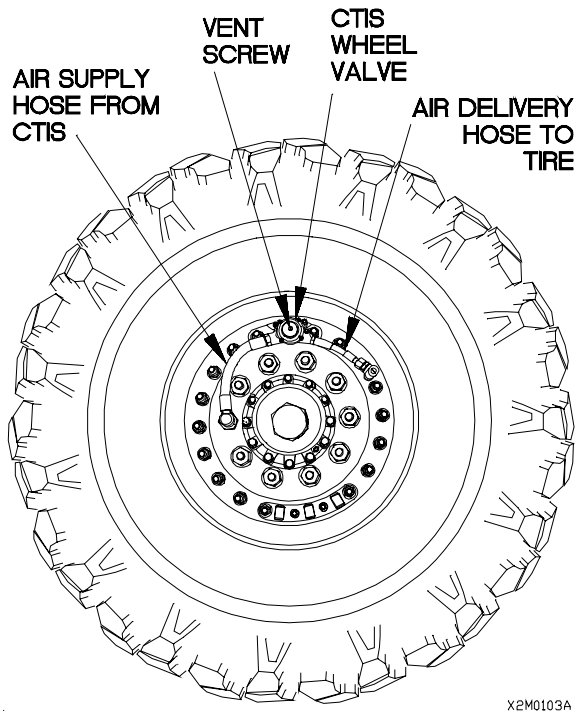
Do not loosen screw on wheel valve while CTIS is in use. Failure to comply may result in injury to personnel.

NOTE

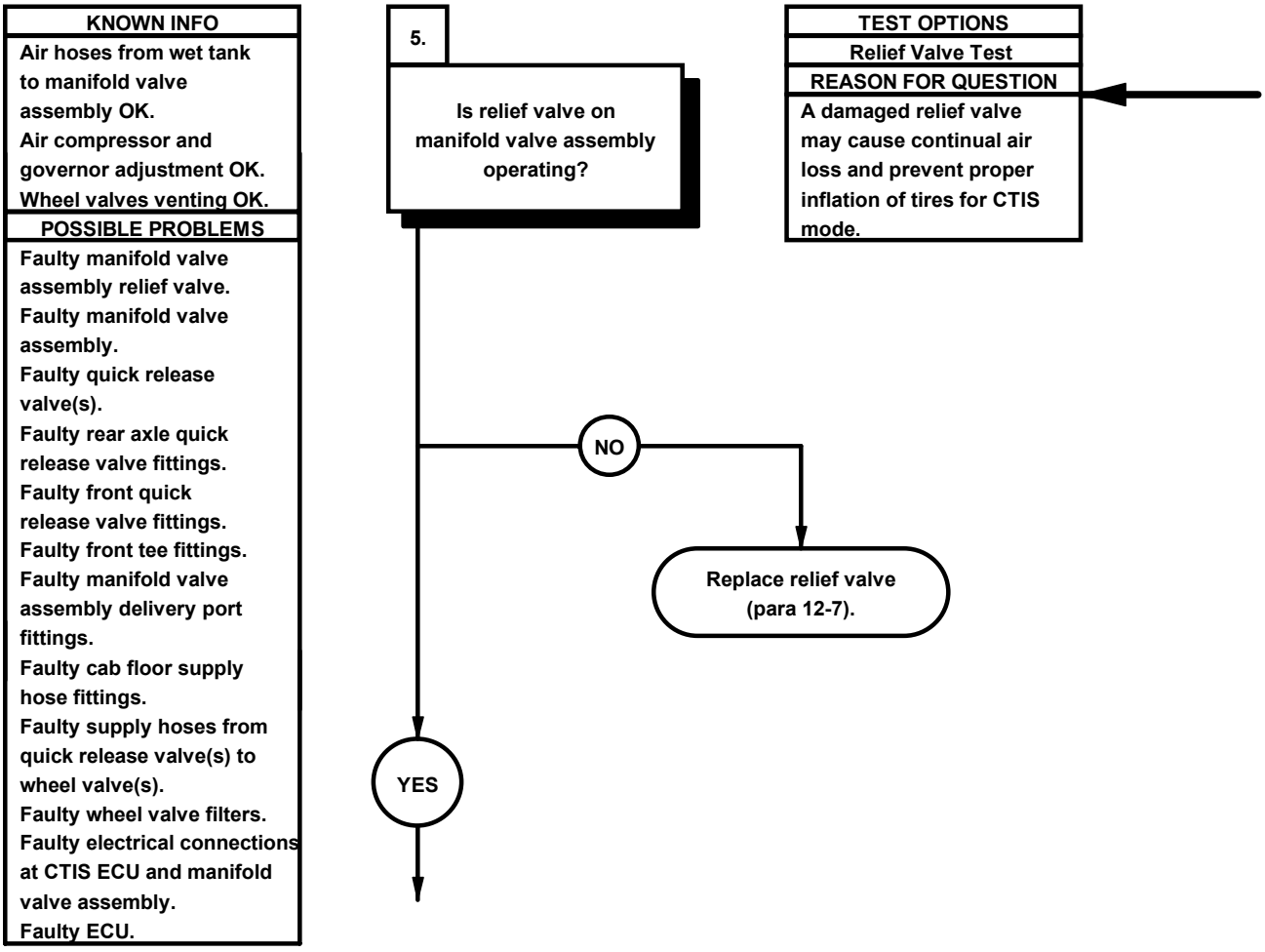
At high temperatures, air pressure increases in cap chamber of wheel valve, adding to spring pressure so that valve cannot open to allow tire deflation to lower settings.

WHEEL VALVE VENT TEST

(1) Release air from all CTIS wheel valves by backing off vent screws approximately three turns.
(2) If CTIS wheel valve fails to release air, replace CTIS wheel valve (para 12-5).
(3) Tighten vent screws. Do not overtighten.

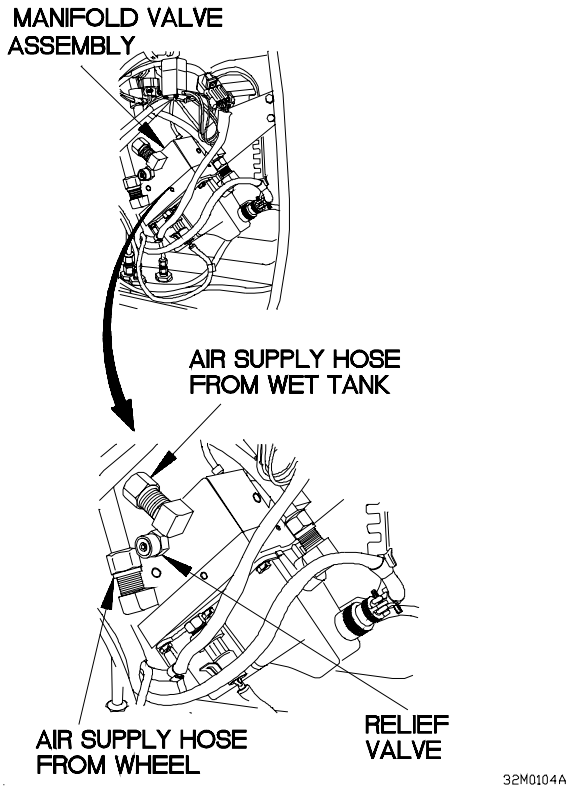


m1. TWO STEADY MODE LIGHTS ILLUMINATE ON CTIS ECU (CONT)



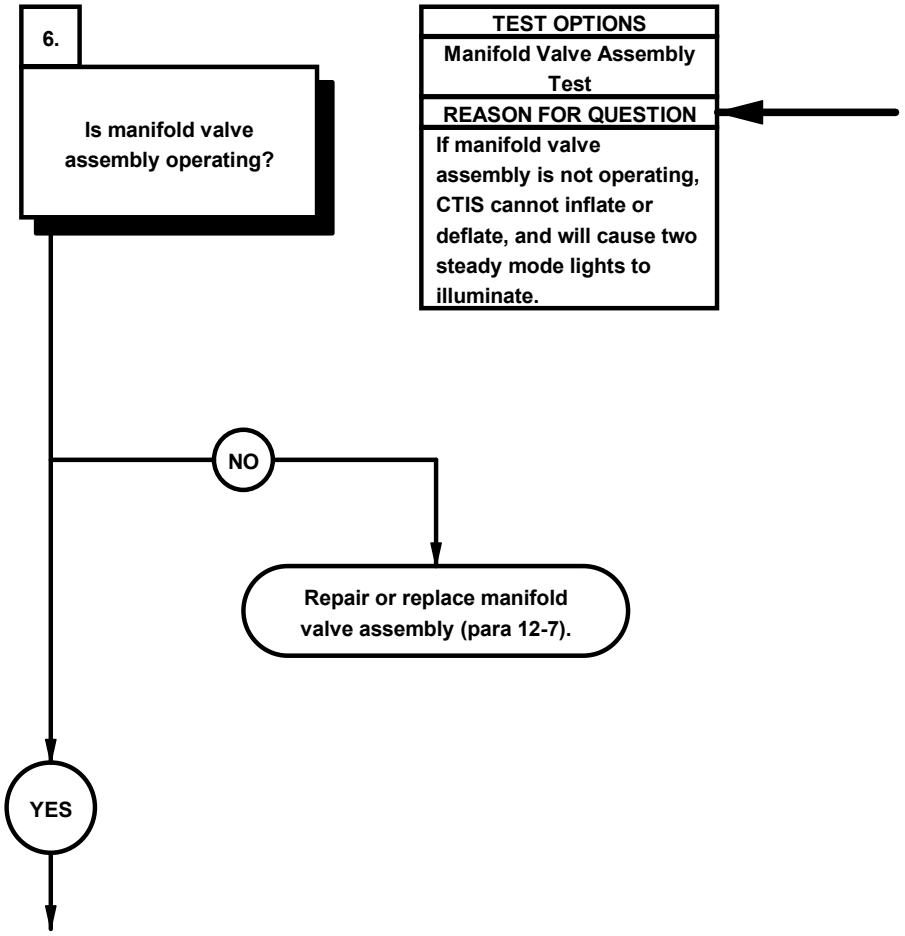
RELIEF VALVE TEST

(1) Remove kick panel (para 16-3).
(2) Check if relief valve poppet on manifold valve assembly is missing.
(3) Position master power switch to on (TM 9-2320-365-10).
(4) Select a mode that is lower on CTIS ECU (TM 9-2320-365-10).
(5) Check if air escapes continuously from relief valve during deflation sequence.
(6) If air escapes continuously, replace relief valve (para 12-7).
(7) Position master power switch to off (TM 9-2320-365-10).



m1. TWO STEADY MODE LIGHTS ILLUMINATE ON CTIS ECU (CONT)

KNOWN INFO
Air hoses from wet tank to manifold valve assembly OK. Air compressor and governor adjustment OK. Wheel valves venting OK. Manifold valve assembly relief valve OK.
POSSIBLE PROBLEMS
Faulty manifold valve assembly. Faulty quick release valve(s). Faulty rear axle quick release valve fittings. Faulty front quick release valve fittings. Faulty front tee fittings. Faulty manifold valve assembly delivery port fittings. Faulty cab floor supply hose fittings. Faulty supply hoses from quick release valve(s) to wheel valve(s). Faulty wheel valve filters. Faulty electrical connections at CTIS ECU and manifold valve assembly. Faulty ECU.



TEST OPTIONS
Manifold Valve Assembly Test
REASON FOR QUESTION
If manifold valve assembly is not operating, CTIS cannot inflate or deflate, and will cause two steady mode lights to illuminate.

NOTE

When checking manifold valve assembly, ensure air pressure in air tanks is 120 psi. Manifold valve assembly cannot be checked if air supply is not available to it.

MANIFOLD VALVE ASSEMBLY TEST

(1) Position master power switch to on (TM 9-2320-365-10).

(2) If two mode lights illuminate during deflation:

(a) Select a mode that is lower on CTIS ECU (TM 9-2320-365-10).

(b) Check if manifold valve assembly clicks when no air is escaping from relief valve.

(c) If manifold valve assembly clicks and no air escapes at relief valve, replace manifold valve assembly (para 12-7).

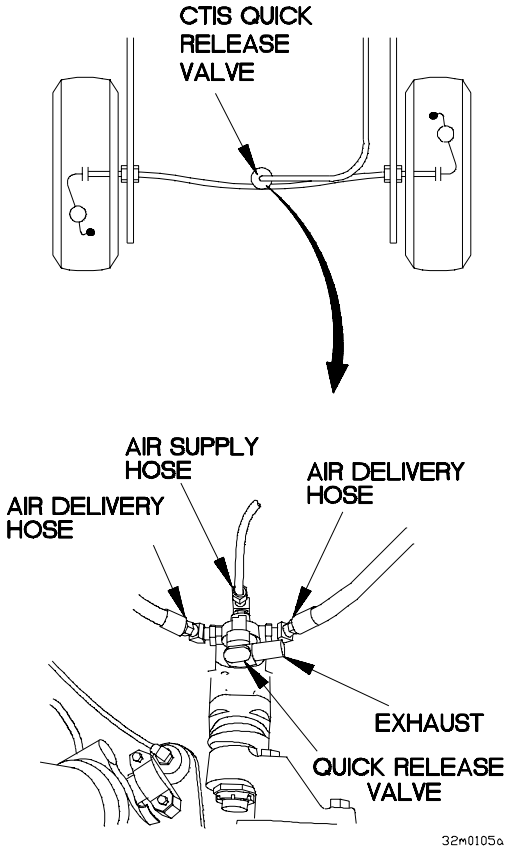
(3) If two mode lights illuminate during inflation:

(a) Select a mode that is higher on CTIS ECU (TM 9-2320-365-10).

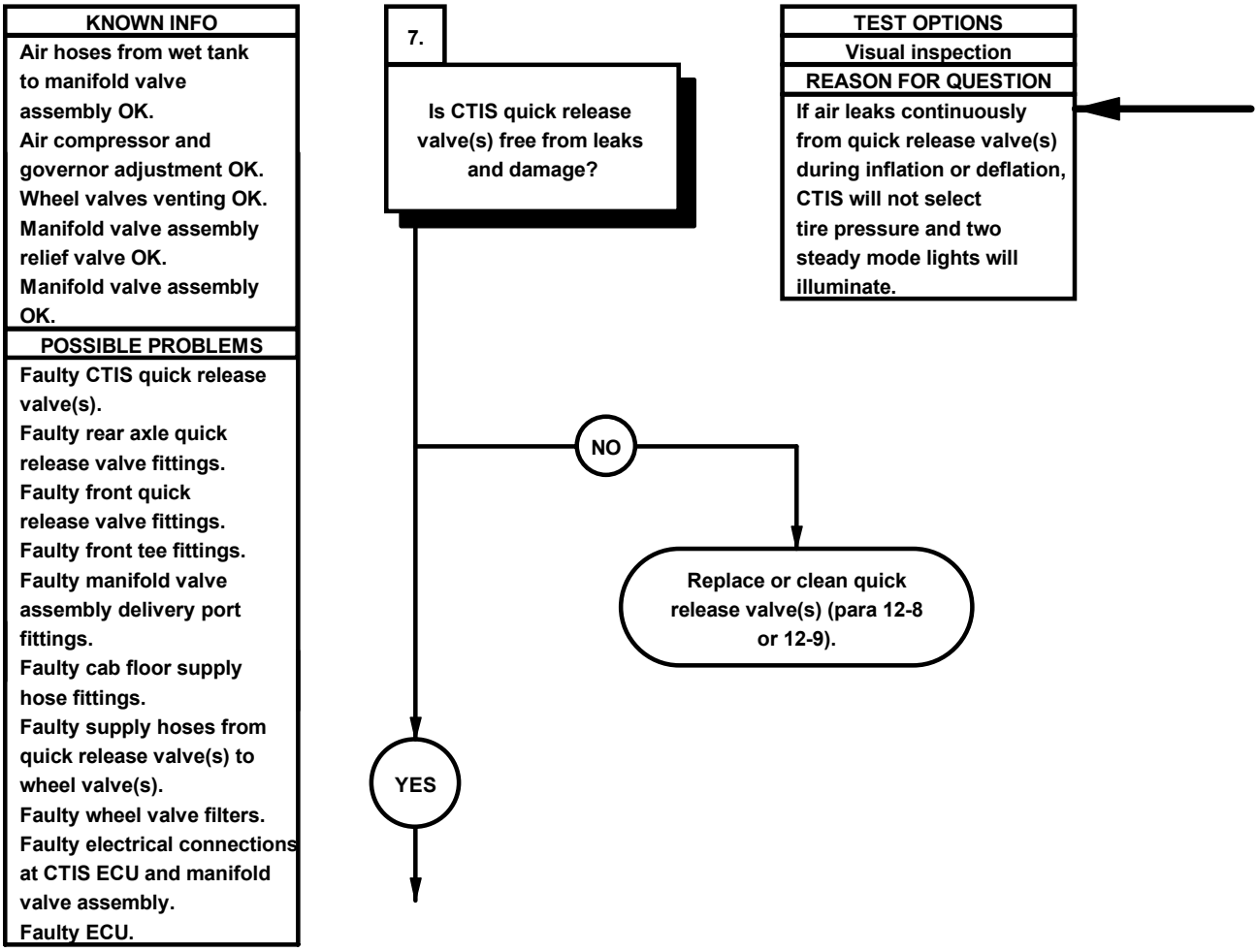
(b) Disconnect air hose at delivery port of manifold valve assembly.

(c) Check if manifold valve assembly clicks and no air escapes at delivery port.

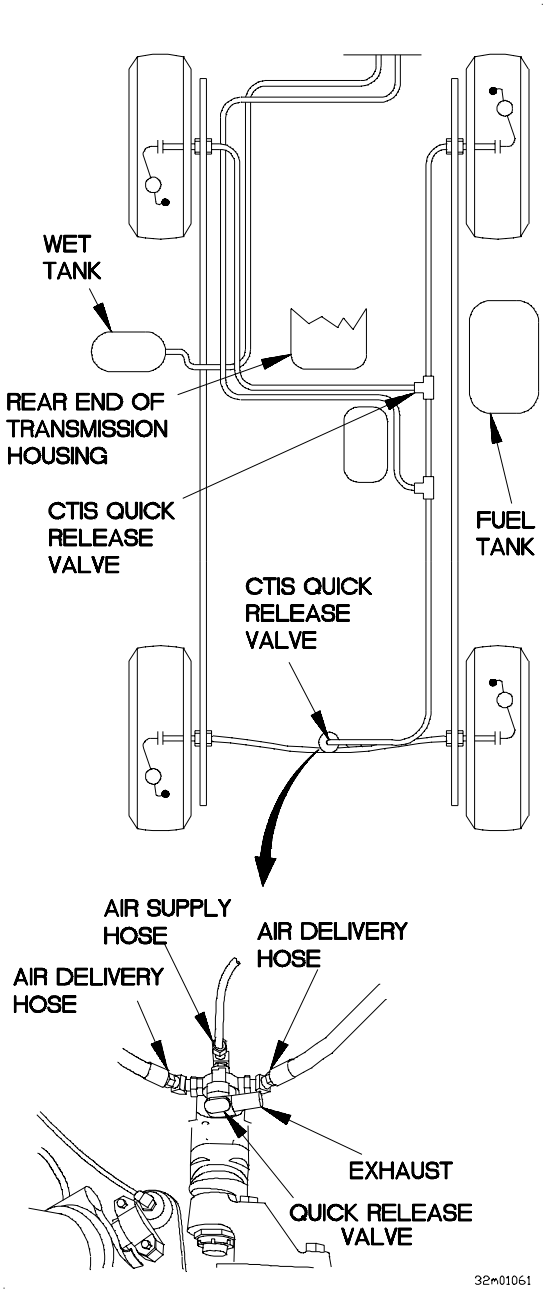
(d) If no air escapes at delivery port during inflation mode, replace manifold valve assembly (para 12-7).



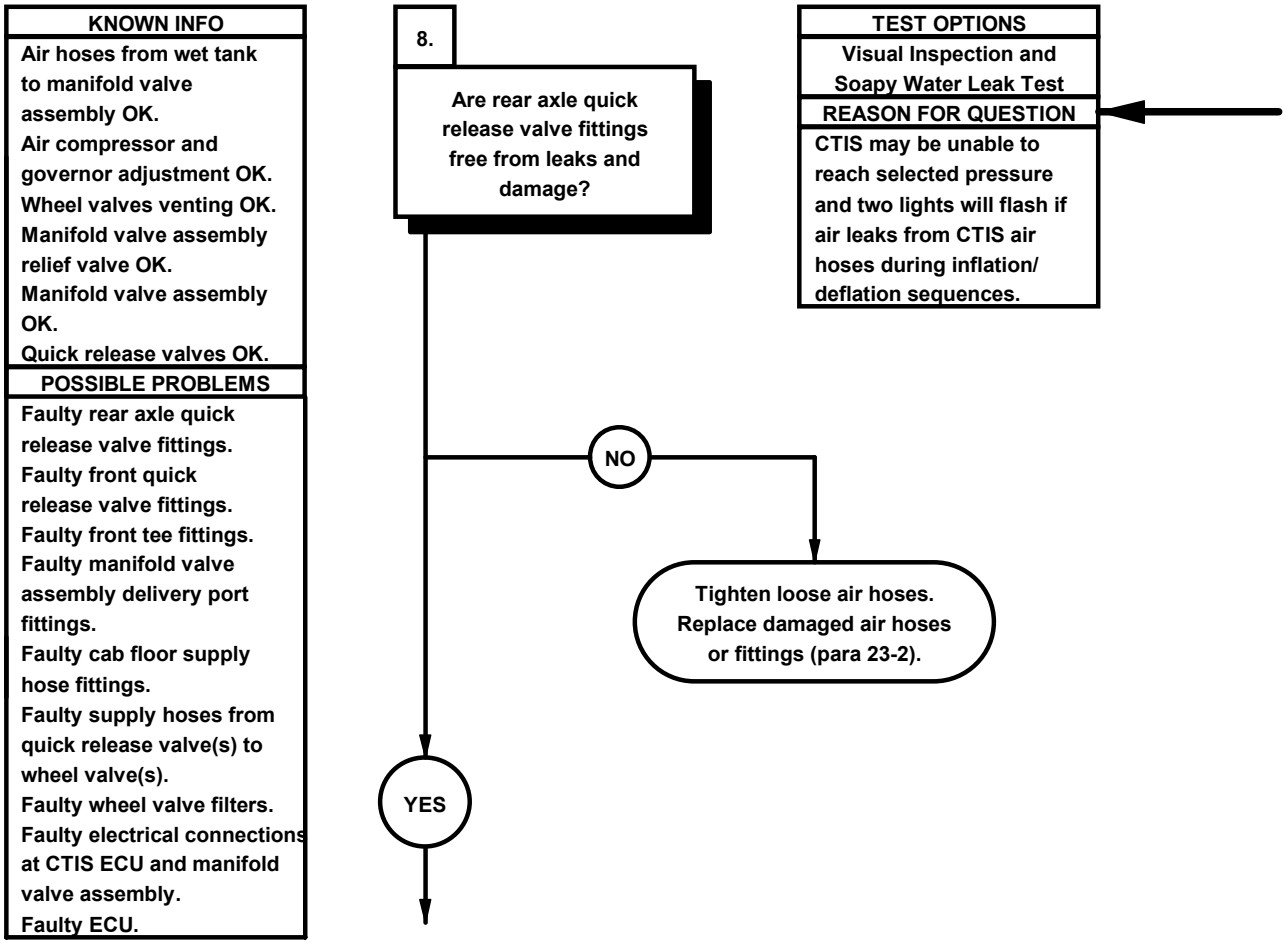
m1. TWO STEADY MODE LIGHTS ILLUMINATE ON CTIS ECU (CONT)



(1) Position CTIS ECU in a mode that is higher.
(2) Check for air escaping continuously from exhaust port of quick release valve(s).
(3) If air escapes continuously from quick release valve(s) during inflation, quick release valve diaphram is damaged, replace quick release valve(s) or clean quick release valve(s) (para 12-8 or 12-9).
(5) If foreign object is lodged in quick release valve(s), replace quick release valve(s) (para 12-8 or 12-9).

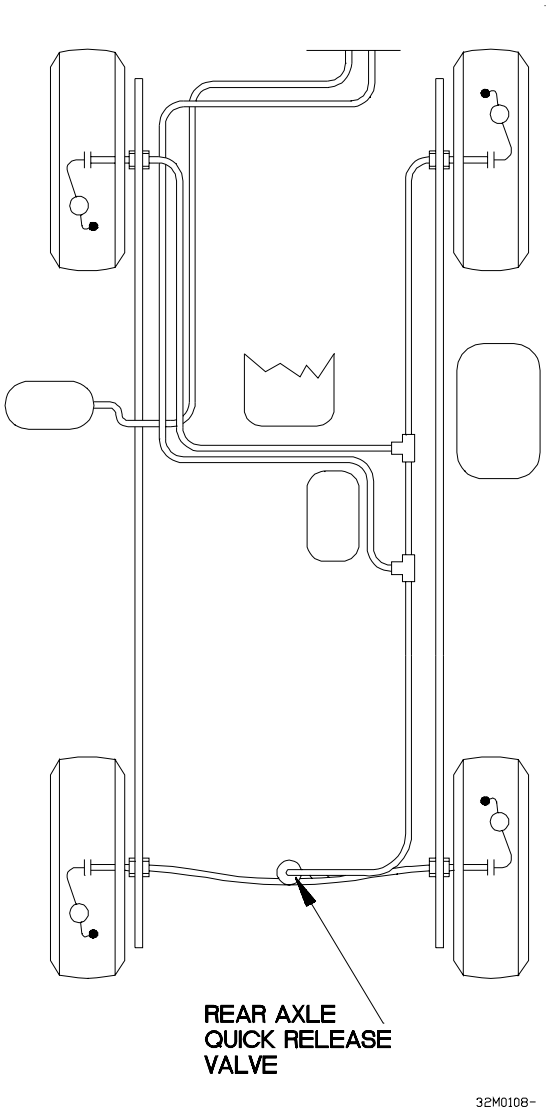


m1. TWO STEADY MODE LIGHTS ILLUMINATE ON CTIS ECU (CONT)

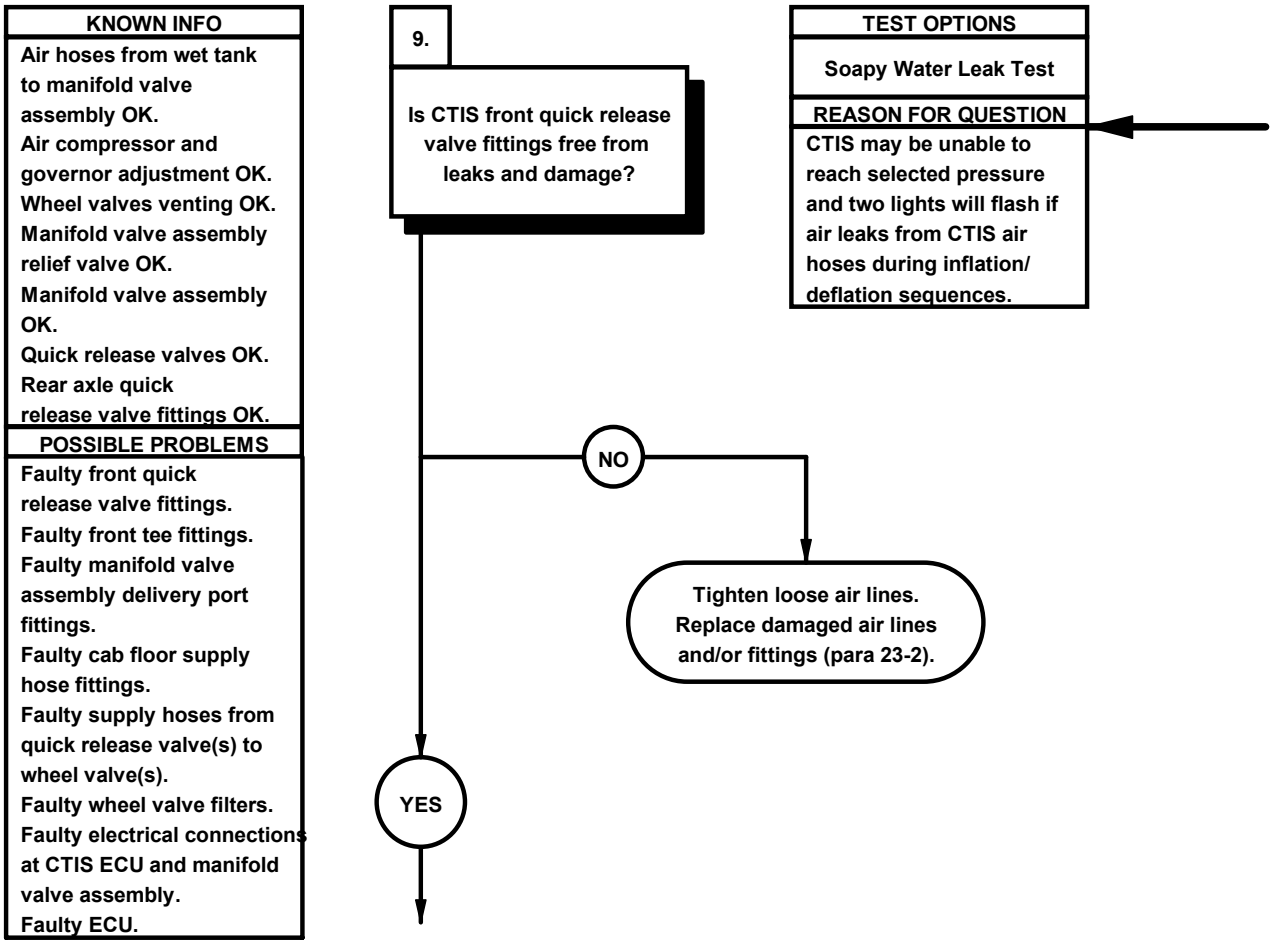


(1) Select an inflation mode at CTIS ECU (TM 9-2320-365-10).
(2) If obvious air escape is heard. Tighten loose air hoses or replace damaged air hoses and/or fittings (para 23-2).
(3) If no obvious air escape is heard, proceed to Soapy Water Leak Test.

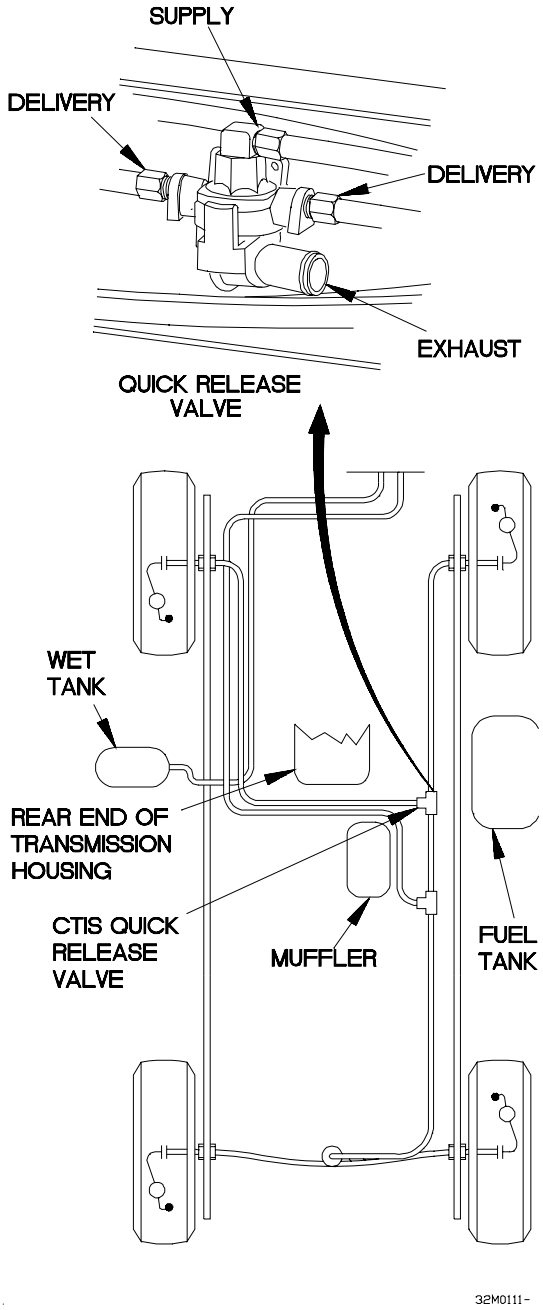
SOAPY WATER LEAK TEST
(1) Apply soapy water solution to quick release valve fittings at rear axle.
(2) Check for air bubbles indicating leaks.



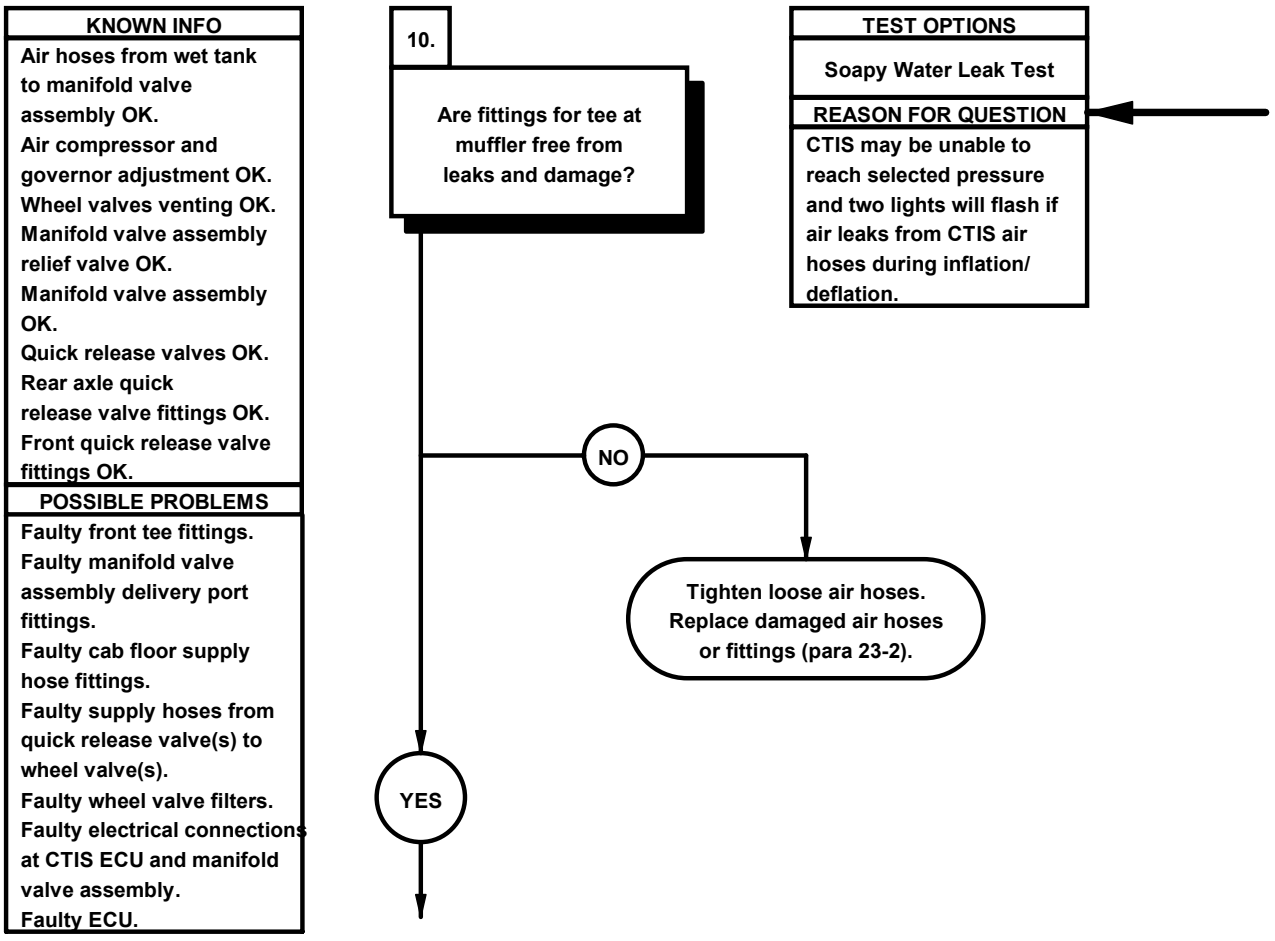
m1. TWO STEADY MODE LIGHTS ILLUMINATE ON CTIS ECU (CONT)



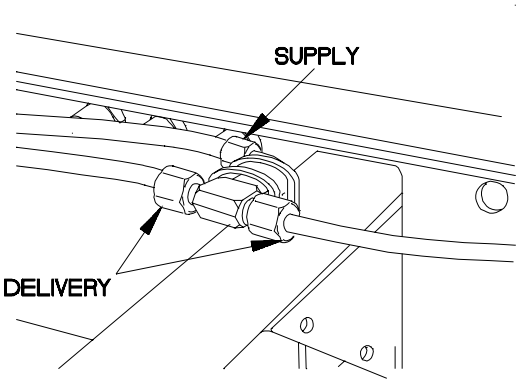
SOAPY WATER LEAK TEST
(1) Apply soapy water solution to front quick release valve fittings.
(2) Check for air bubbles indicating leaks.

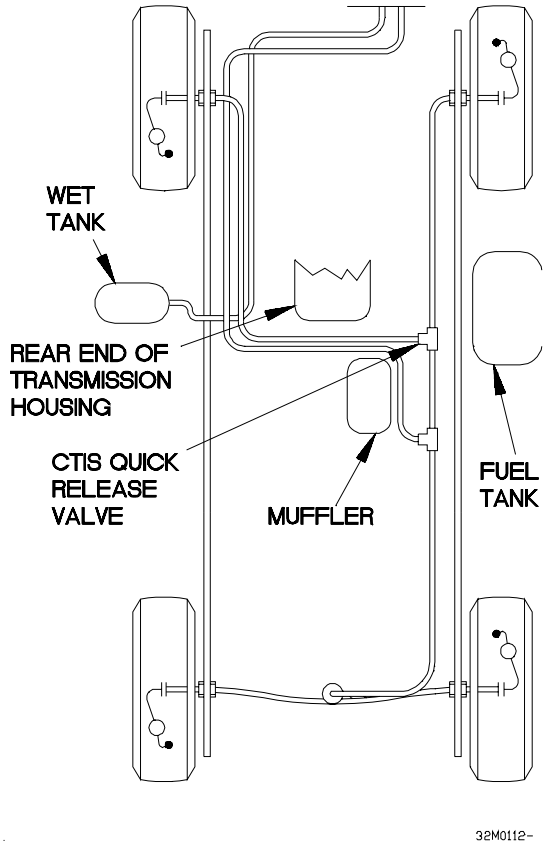


m1. TWO STEADY MODE LIGHTS ILLUMINATE ON CTIS ECU (CONT)

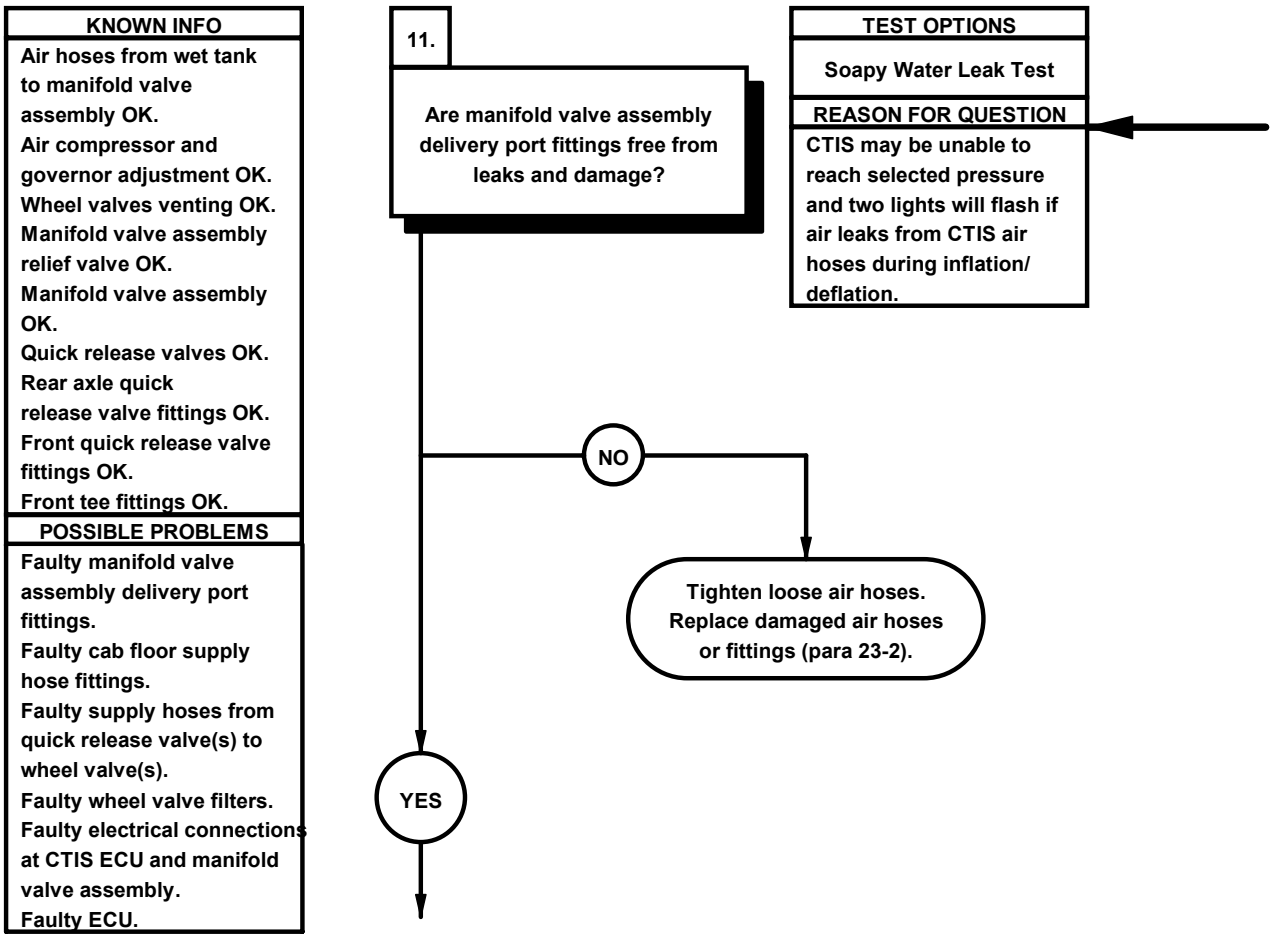


SOAPY WATER LEAK TEST
(1) Apply soapy water solution to fittings at tee above muffler.
(2) Check for air bubbles indicating leaks.

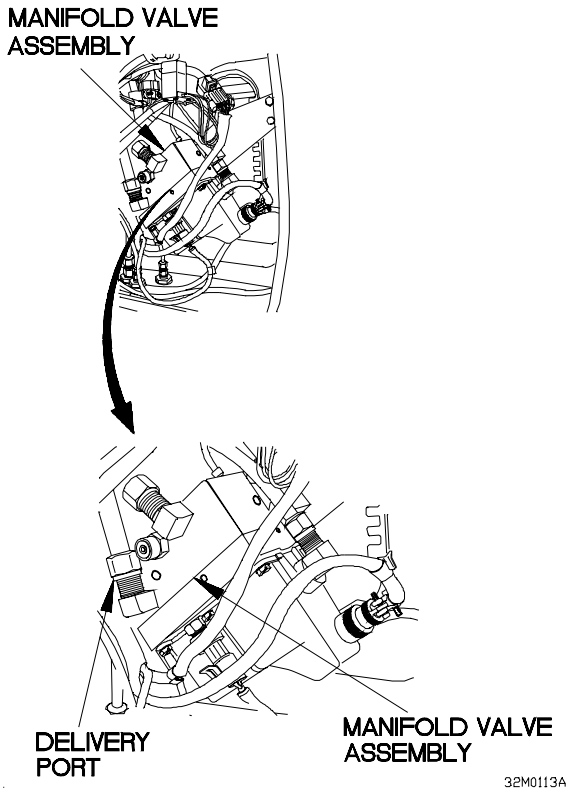




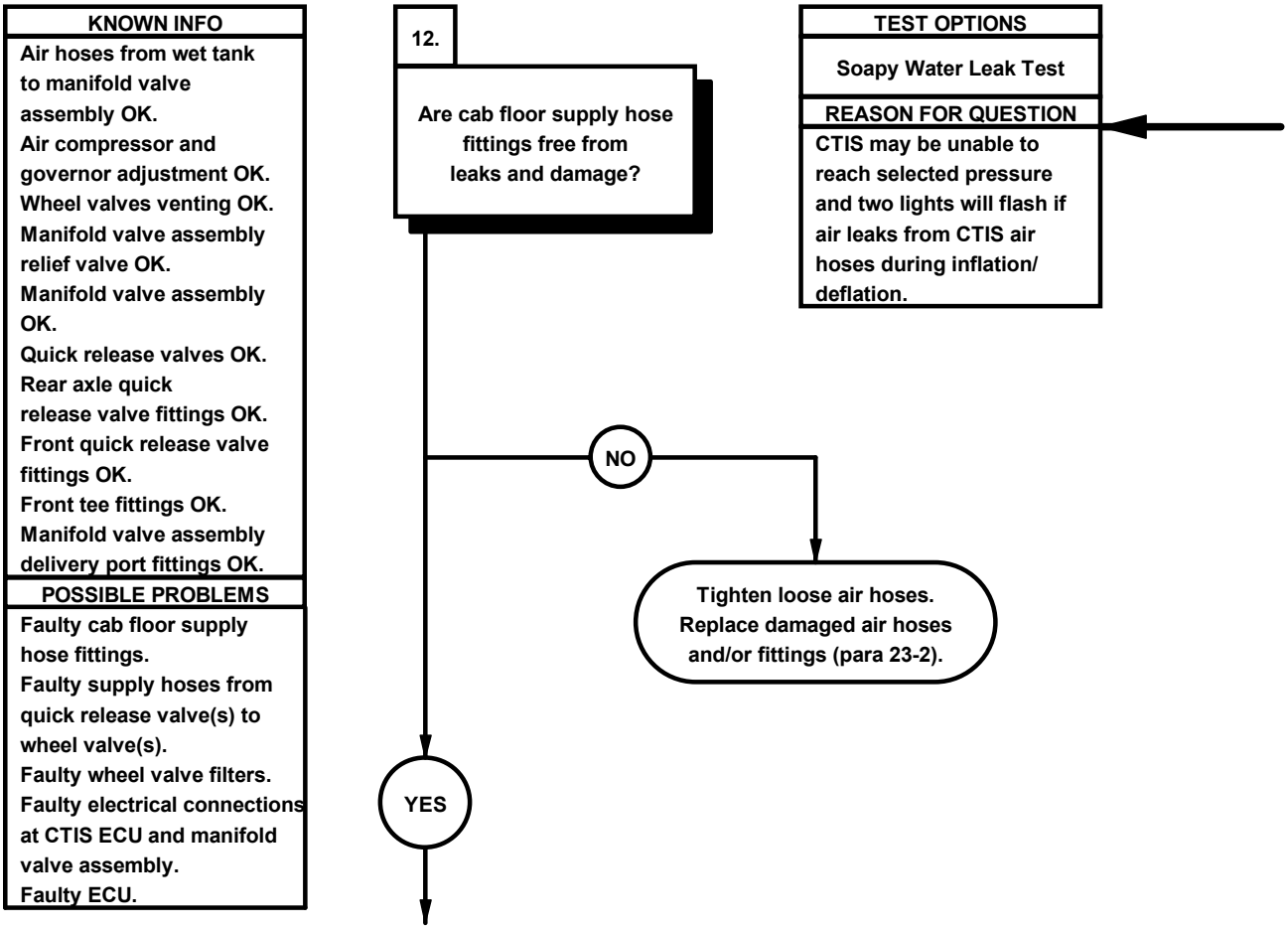
m1. TWO STEADY MODE LIGHTS ILLUMINATE ON CTIS ECU (CONT)



SOAPY WATER LEAK TEST
(1) Apply soapy water solution to manifold valve assembly delivery port fittings.
(2) Check for air bubbles indicating leaks.

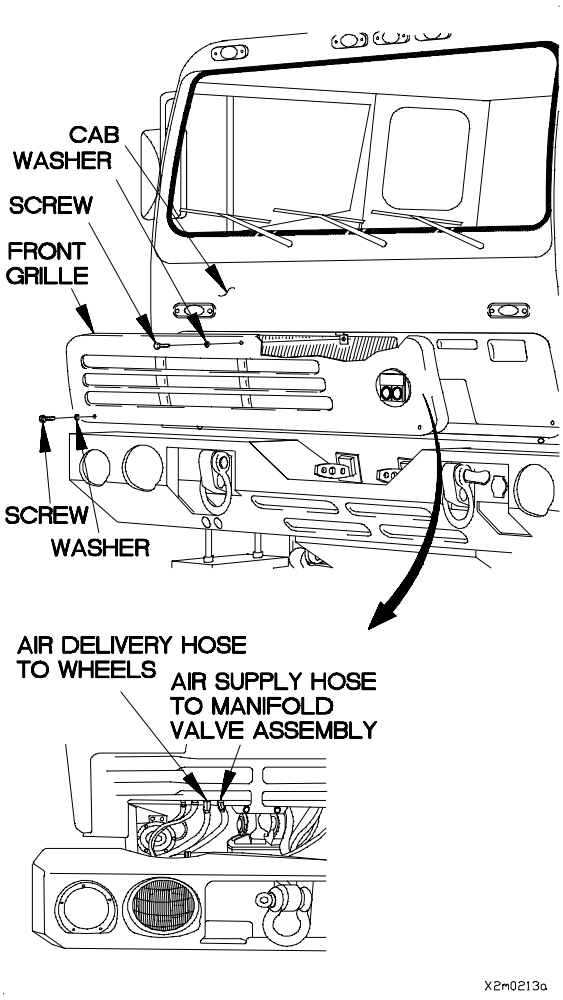


m1. TWO STEADY MODE LIGHTS ILLUMINATE ON CTIS ECU (CONT)

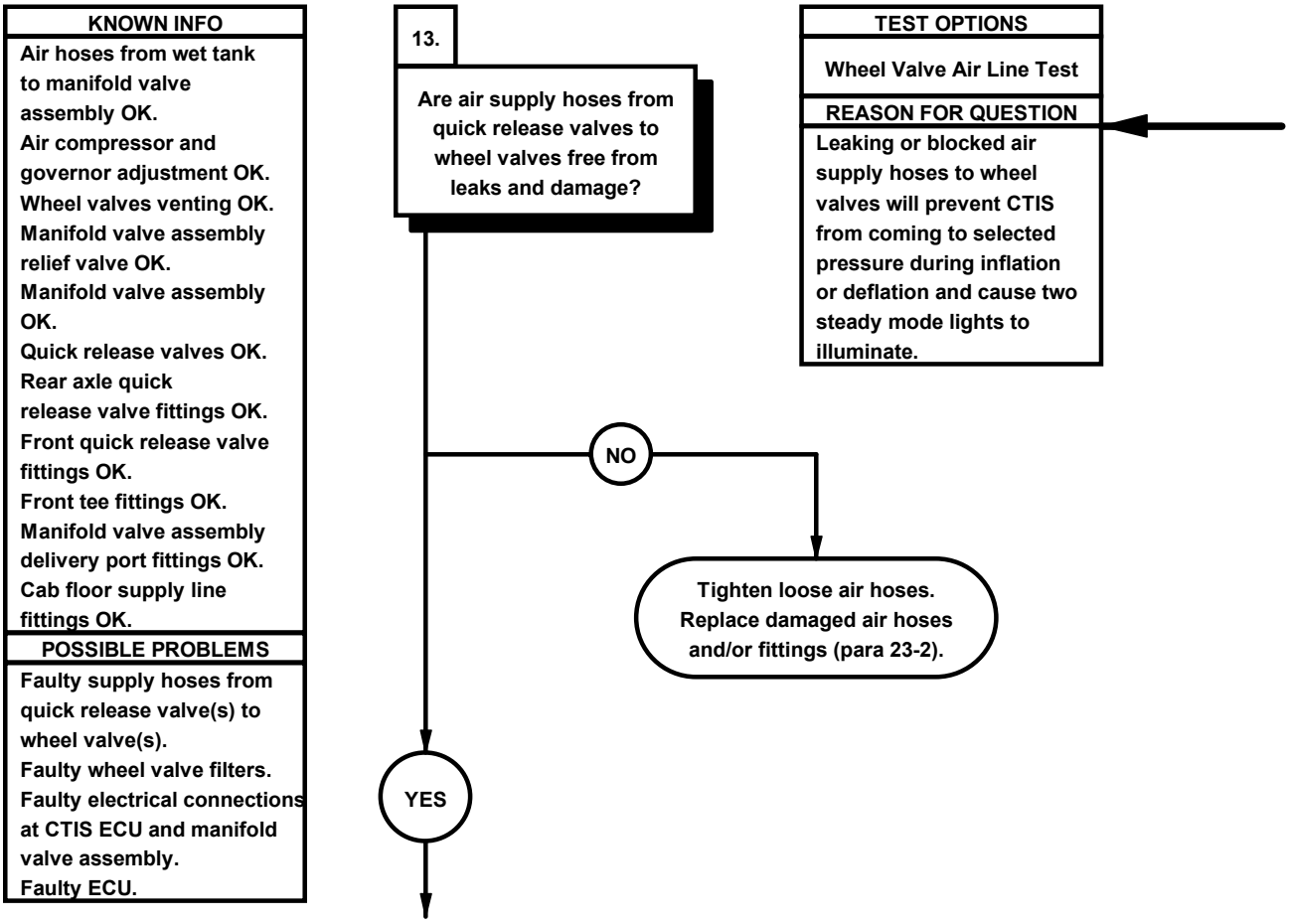


SOAPY WATER LEAK TEST

(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille from cab.
(4) Apply soapy water solution to cab floor supply hose fittings.
(5) Check for air bubbles indicating leaks.
(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).

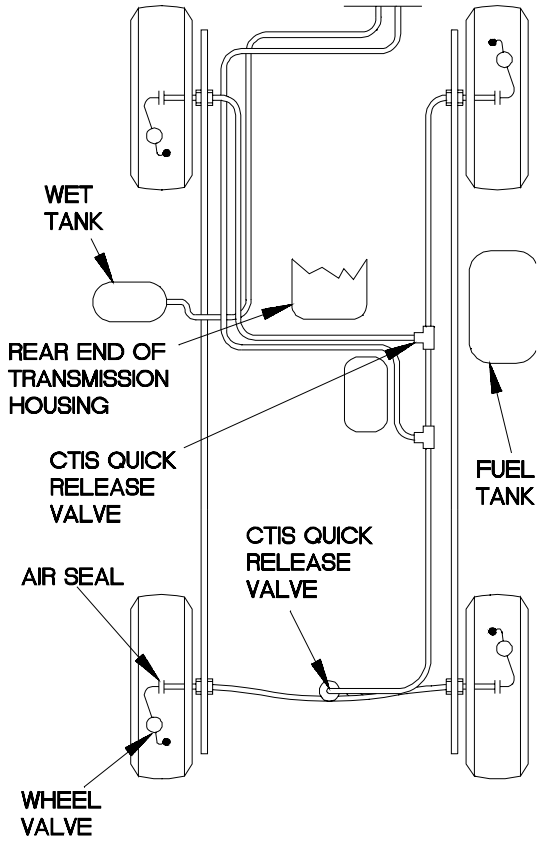


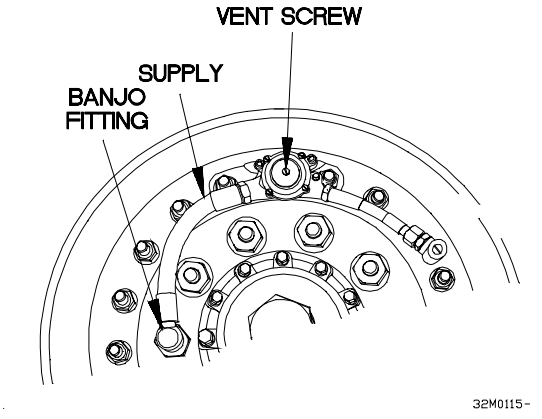
m1. TWO STEADY MODE LIGHTS ILLUMINATE ON CTIS ECU (CONT)



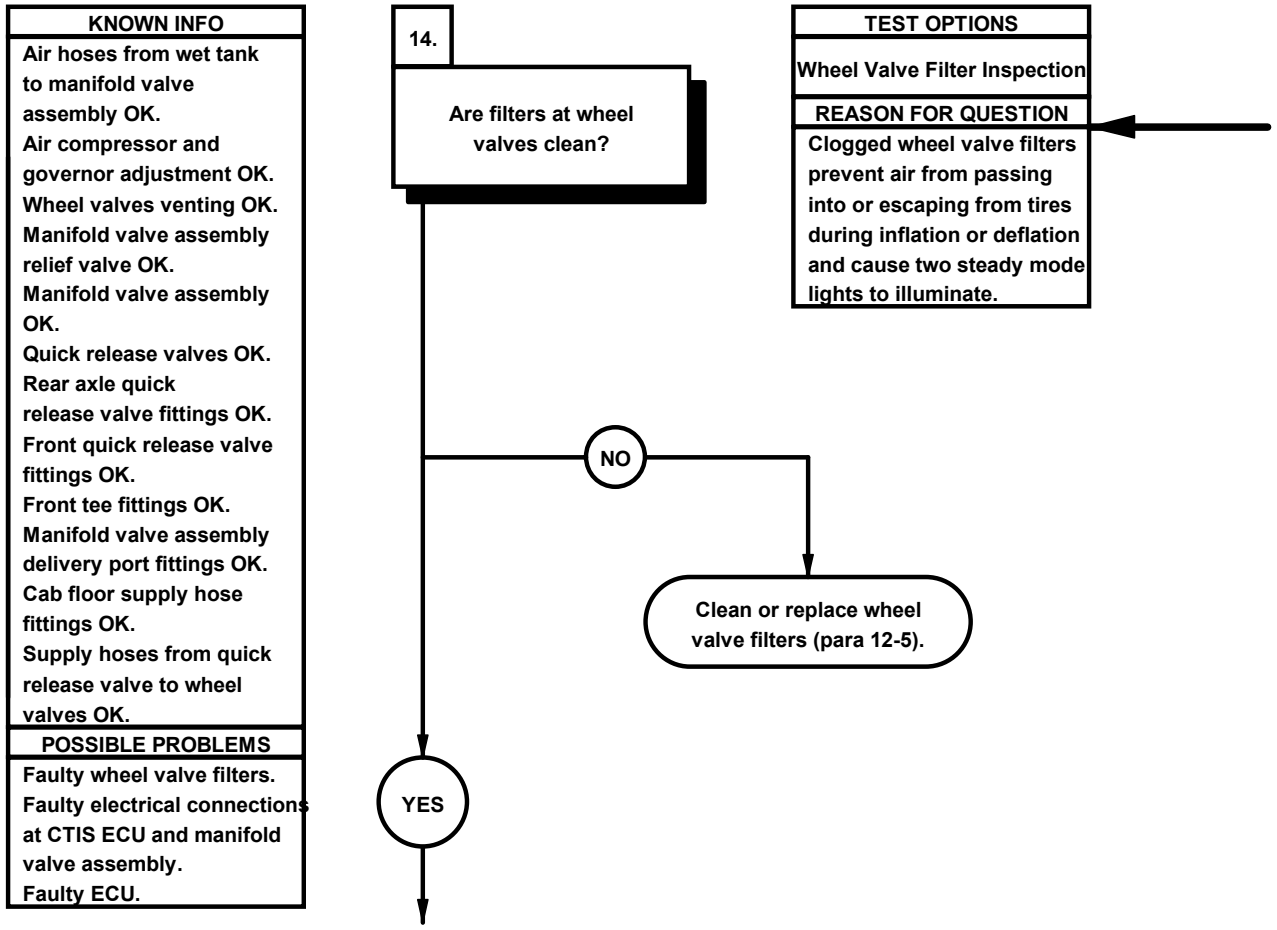
WHEEL VALVE AIR LINE TEST

(1) Check tire pressures after a deflation or inflation sequence. If one or more tires are at a different pressure than the rest, air hose to affected wheel(s) may be faulty.
(2) Disconnect supply air hose at banjo fitting on affected wheel(s).
(3) Select an inflation sequence at CTIS ECU (TM 9-2320-365-10).
(4) Check if air escapes at wheel during inflation.
(5) If air does not escape, locate leak or blockage by tracing hose between quick release valve and affected wheel(s) (refer to pneumatic schematic).



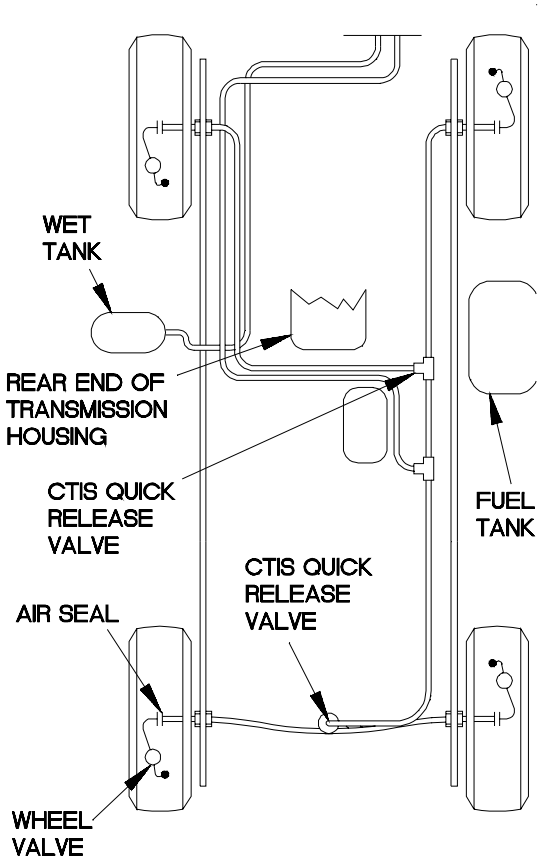


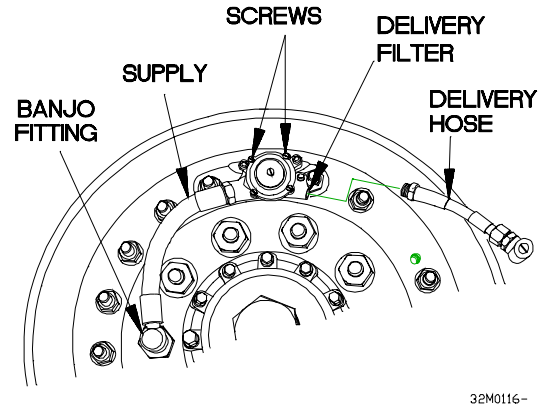
m1. TWO STEADY MODE LIGHTS ILLUMINATE ON CTIS ECU (CONT)



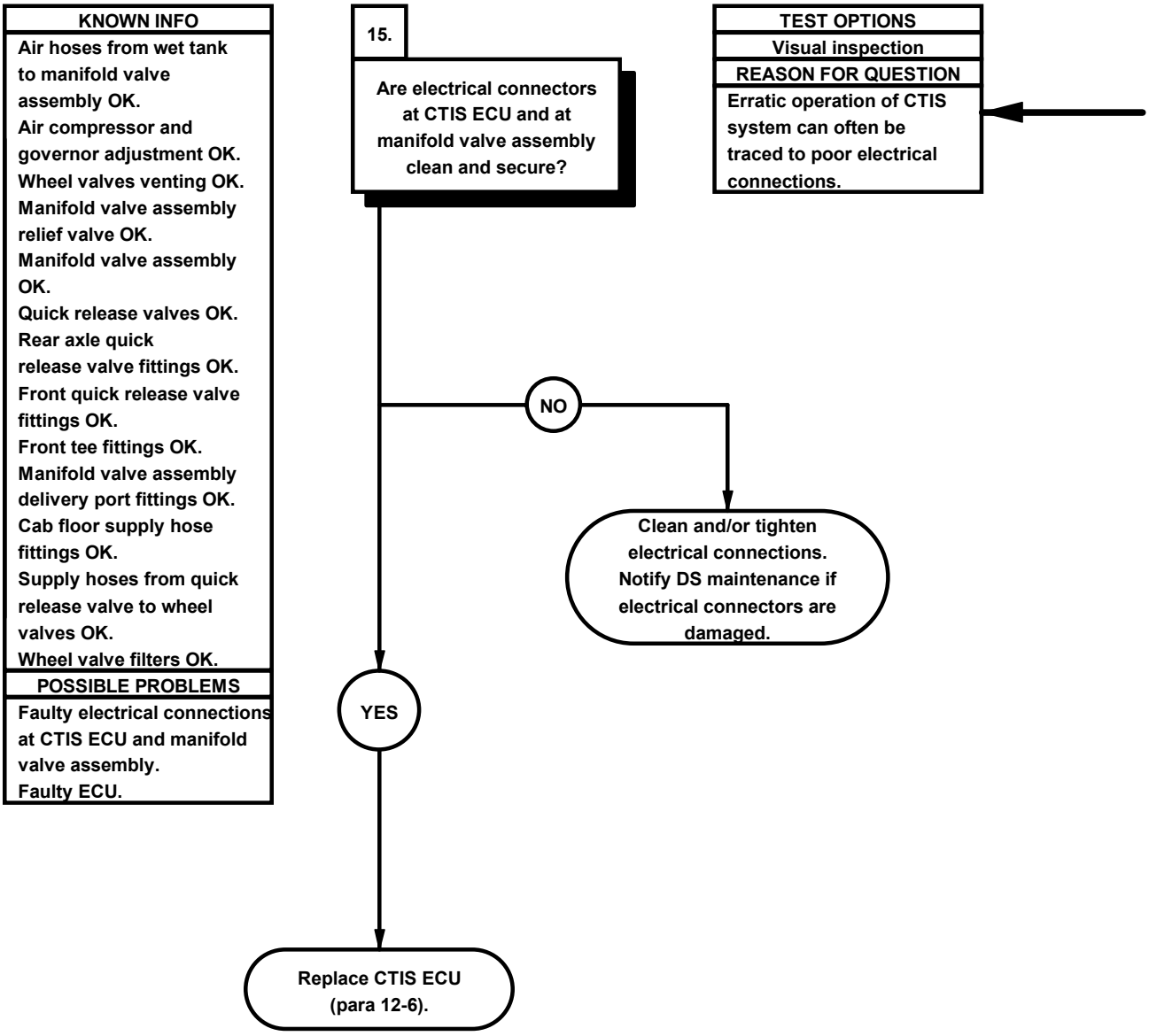
WHEEL VALVE FILTER INSPECTION

(1) Jack up axle at affected wheel and support with trestles.
(2) Remove two screws from wheel valve.
(3) Remove wheel valve and unscrew from delivery hose.
(4) Unscrew wheel valve filter from wheel valve.
(5) Check if filter is clean and free from obstruction.
(6) If filter is plugged with dirt, clean or replace wheel valve filters (para 12-5).
(7) Install wheel valve on delivery hose.
(8) Install wheel valve with two screws.
(9) Install supply air line on banjo fitting.

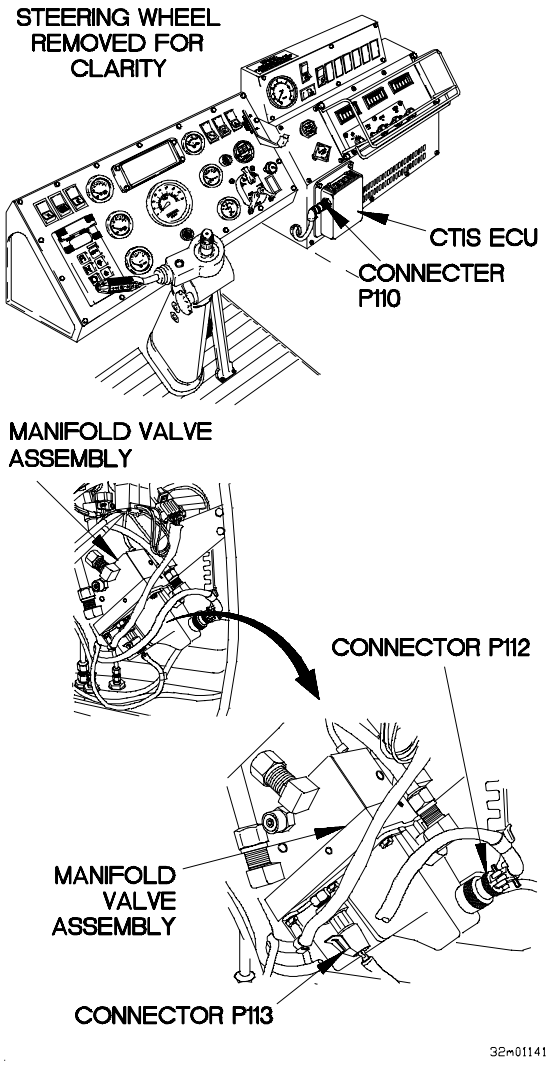




m1. TWO STEADY MODE LIGHTS ILLUMINATE ON CTIS ECU (CONT)



(1) Disconnect connectors P110 at CTIS ECU, P112 at manifold valve assembly solenoid, and P113 at manifold valve assembly pressure transducer.
(2) Check if connectors are clean and pins are undamaged.
(3) Connect and tighten connectors P113, P112, and P110.
(4) Install kick panel (para 16-3).



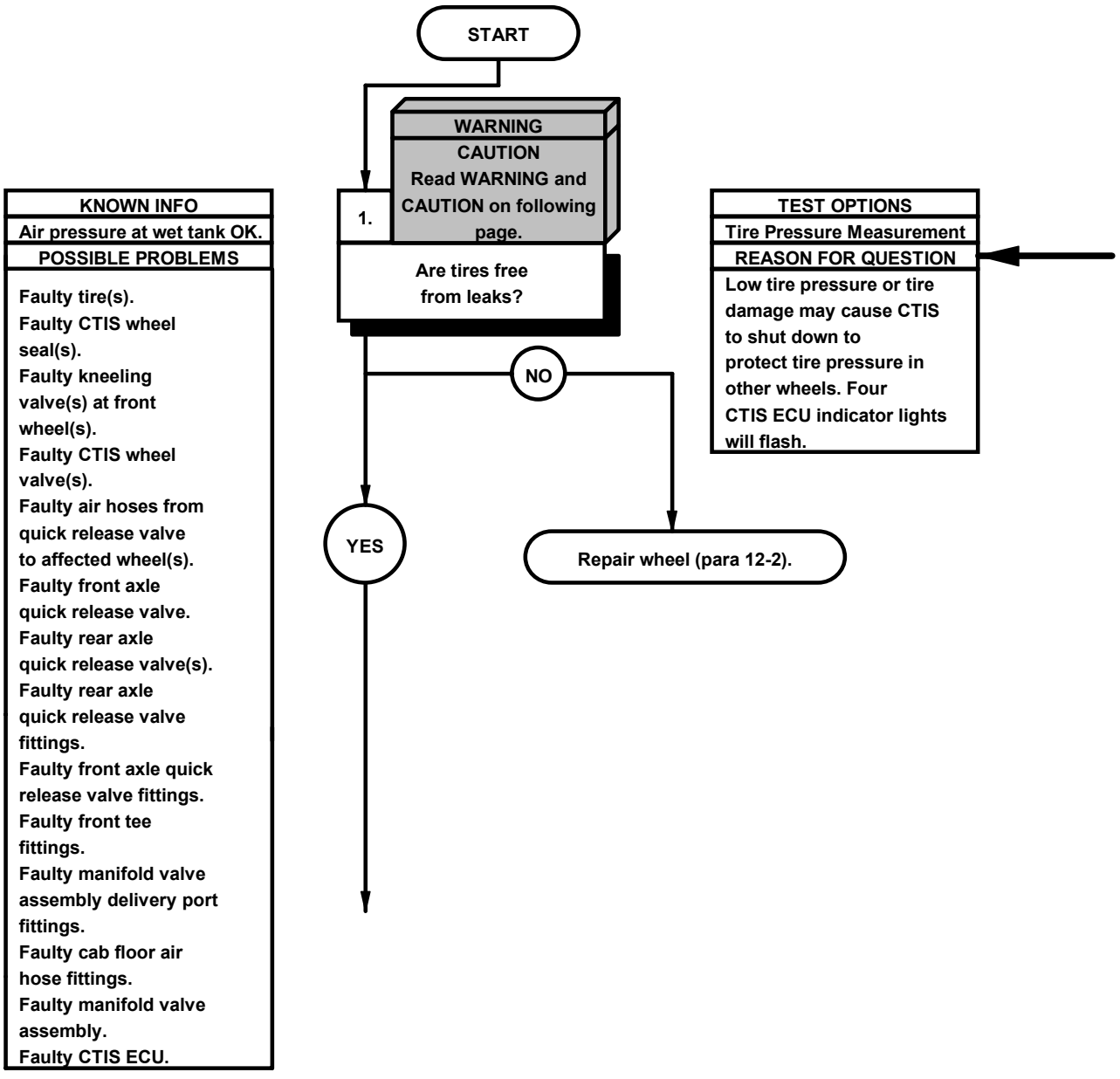
m2. FOUR CTIS ECU INDICATOR LIGHTS FLASHING

INITIAL SETUP

Equipment Conditions
- Engine running (TM 9-2320-365-10).
- Parking brake on (TM 9-2320-365-10).
- Wheels chocked (TM 9-2320-365-10).

Materials/Parts
- Soap, Laundry (Item 69, Appendix D)

Tools and Special Tools
- Tool Kit, Genl Mech (Item 44, Appendix C)
- Goggles, Industrial (Item 15, Appendix C)
- Gage, Tire Pressure (Item 11, Appendix C)
- Pan, Wash (Item 25, Appendix C)
- Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)



WARNING

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

CAUTION

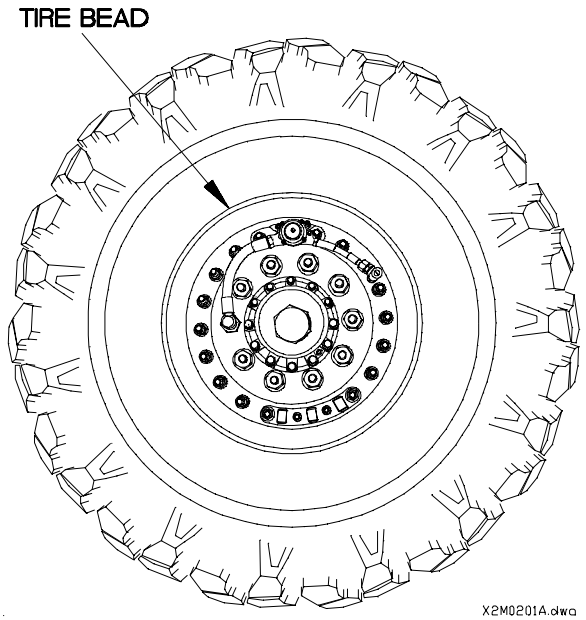
When RUN FLAT has been selected to perform a troubleshooting step, be sure to press RUN FLAT again when step is completed to terminate CTIS operation and prevent excessive air loss.

NOTE

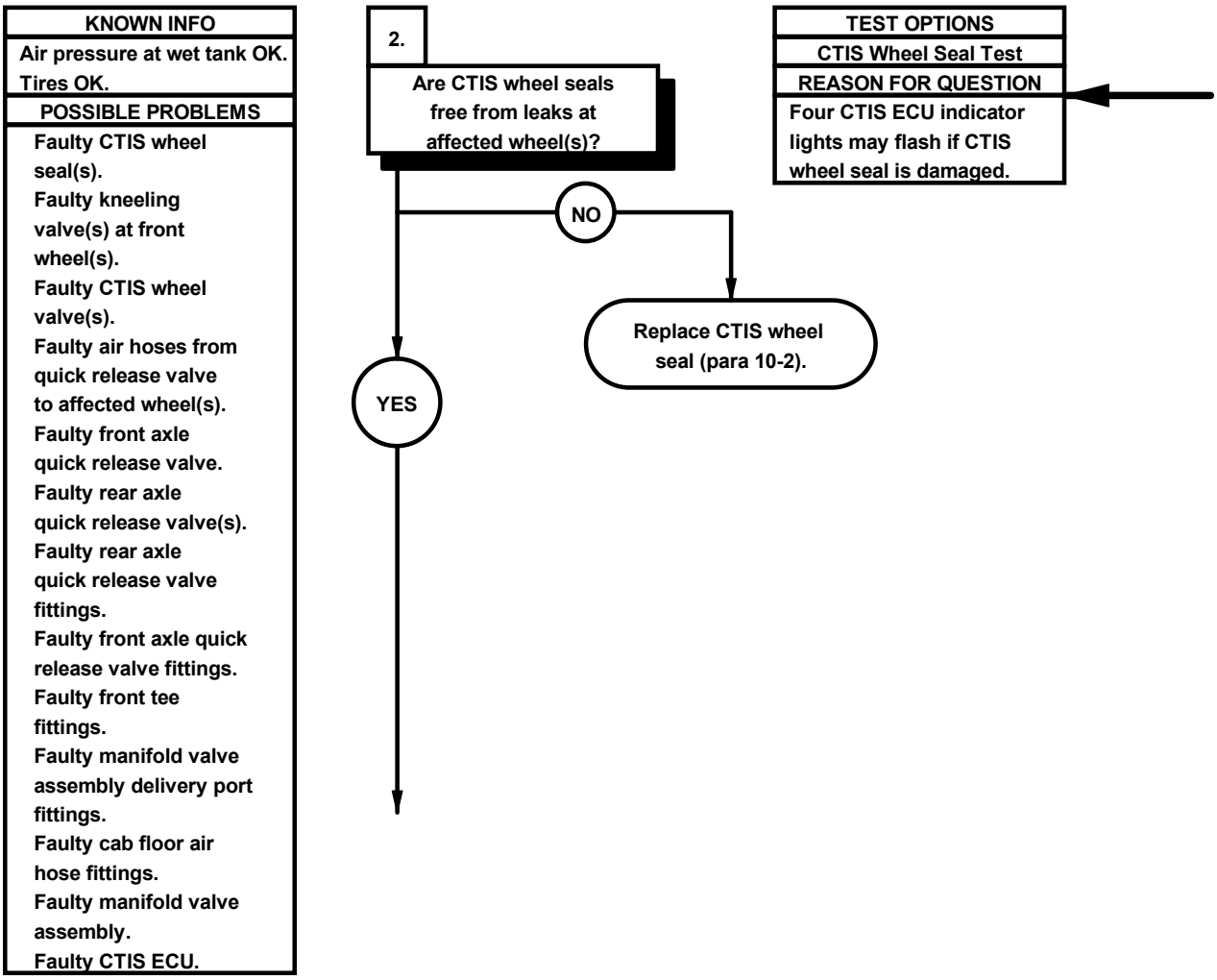
Four mode lights flashing indicate CTIS has shut off due to uneven tire pressure (one tire 50 percent less than other pressures will do it), tire damage, or major leak. Operator can continue CTIS operation by pressing RUN FLAT on CTIS ECU. When RUN FLAT has been selected CTIS ECU checks pressures at 15 second intervals.

TIRE PRESSURE MEASUREMENT

(1) Measure and record the tire pressure of each tire (TM 9-2320-365-10).
(2) If any tire pressure is lower than the rest, visually inspect tire for damage.
(3) Apply soapy water solution to tire bead.
(4) Observe tire for bubbles indicating leaks.

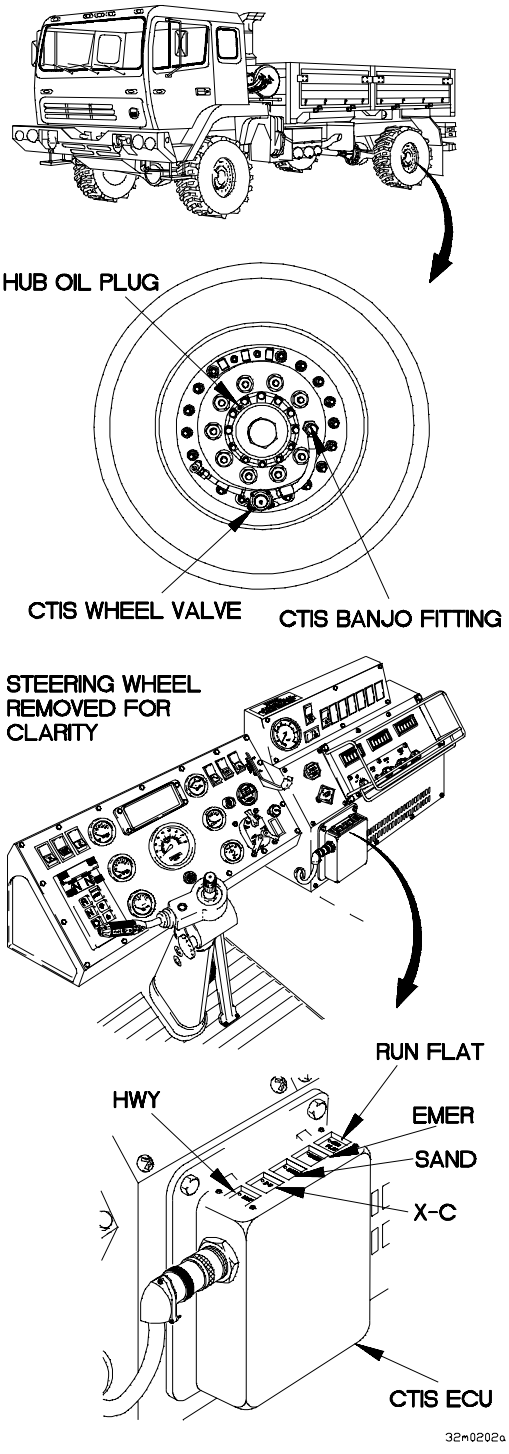


m2. FOUR CTIS ECU INDICATOR LIGHTS FLASHING (CONT)

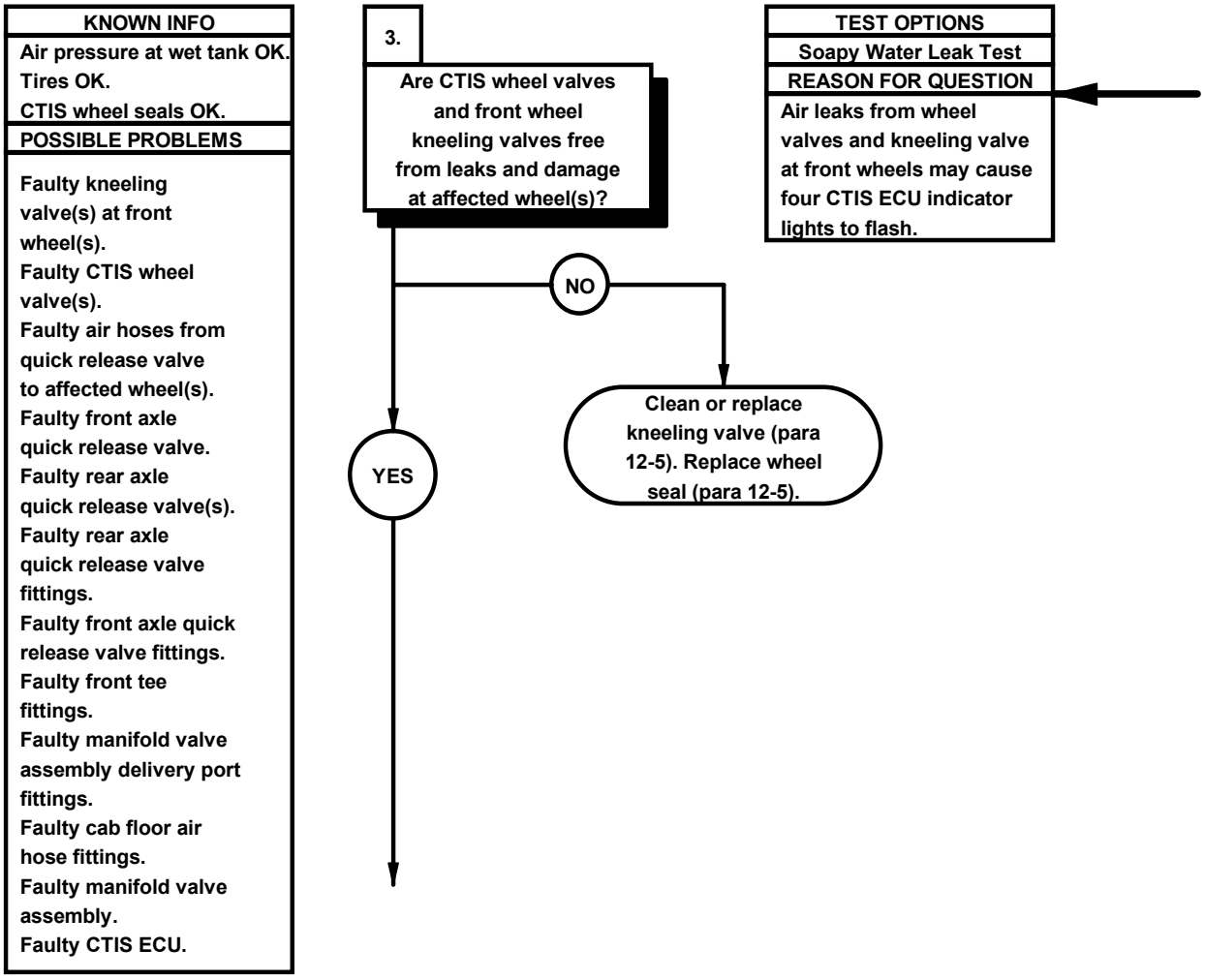


CTIS WHEEL SEAL TEST

(1) Check axle hubs for presence of oil leaks that indicate a damaged CTIS wheel seal.
(2) Ensure wheel is at rest with hub plug at top of hub.
(3) Remove hub oil plug.
(4) Select RUN FLAT at CTIS ECU (TM 9-2320-365-10).
(5) Determine if air is escaping from hub. If air escapes,replace CTIS wheel seal (para 10-3).
(6) Install hub oil plug on wheel hub.

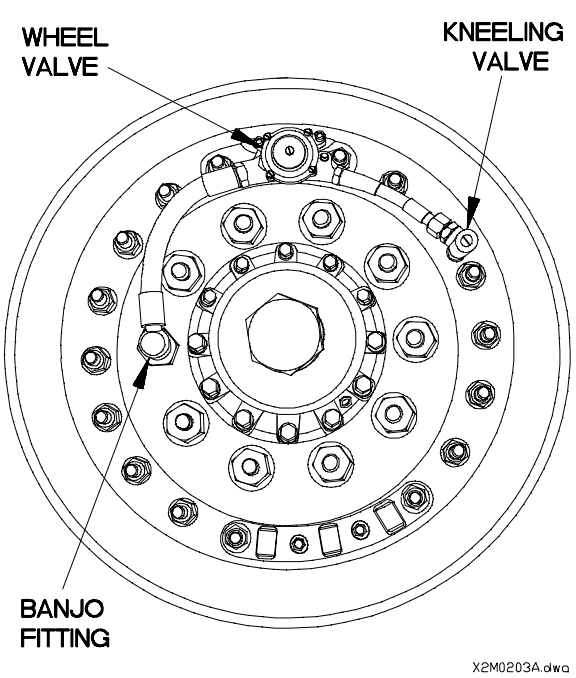


m2. FOUR CTIS ECU INDICATOR LIGHTS FLASHING (CONT)

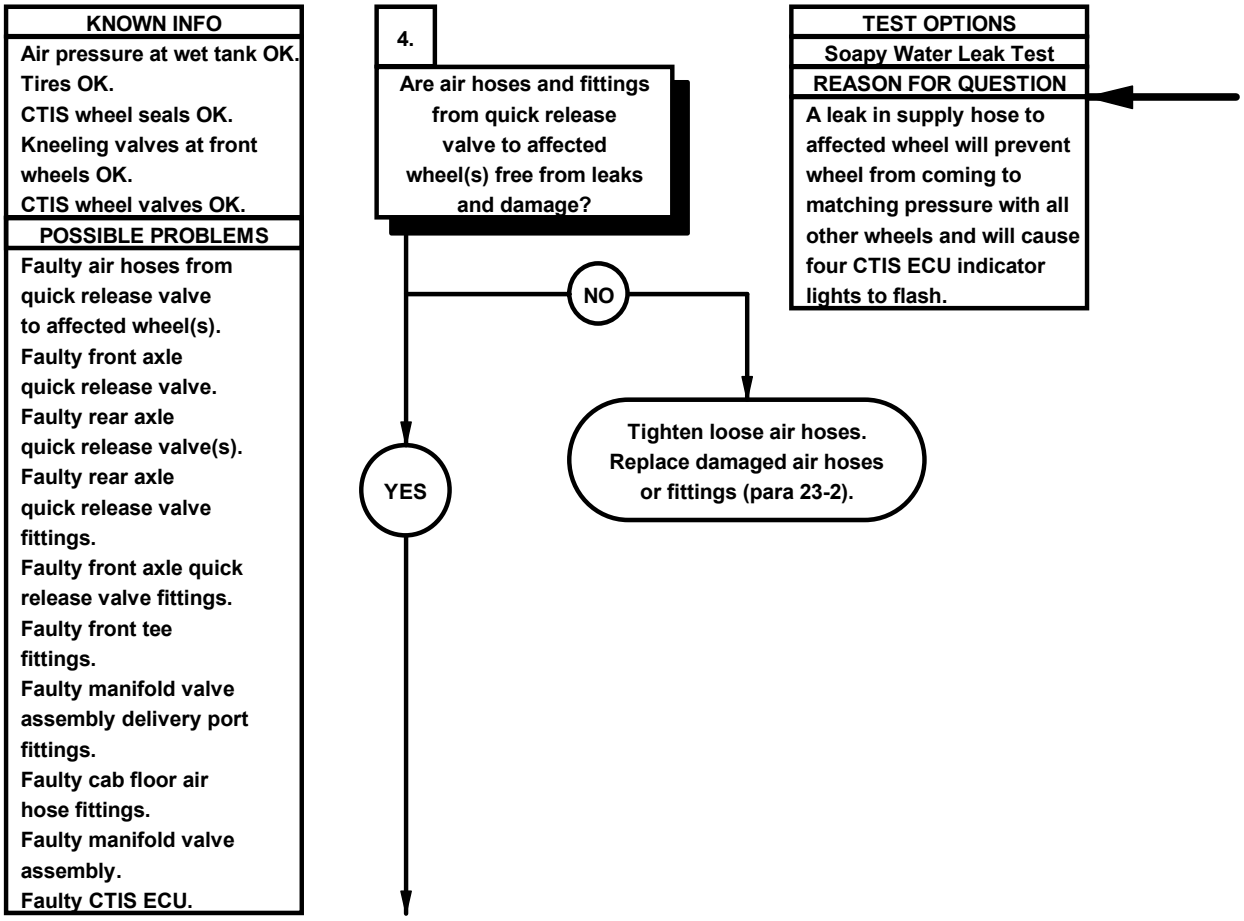


SOAPY WATER LEAK TEST

(1) If front wheel is leaking, ensure kneeling valve is tight and secure in valve seat.
(2) Apply soapy water to kneeling valve and check for leaks.
(3) Apply soapy water solution to fittings on either side of wheel valve and observe fittings for bubbles indicating leaks.
(4) With wheel valve still connected to tire, disconnect wheel valve air supply hose from hub at banjo fitting.
(5) Place open end of air supply hose in container of water. Look for bubbles. Persistent bubbles from air supply hose indicate leaking wheel valve.
(6) Connect air supply hose to hub at banjo fitting.



m2. FOUR CTIS ECU INDICATOR LIGHTS FLASHING (CONT)



SOAPY WATER LEAK TEST

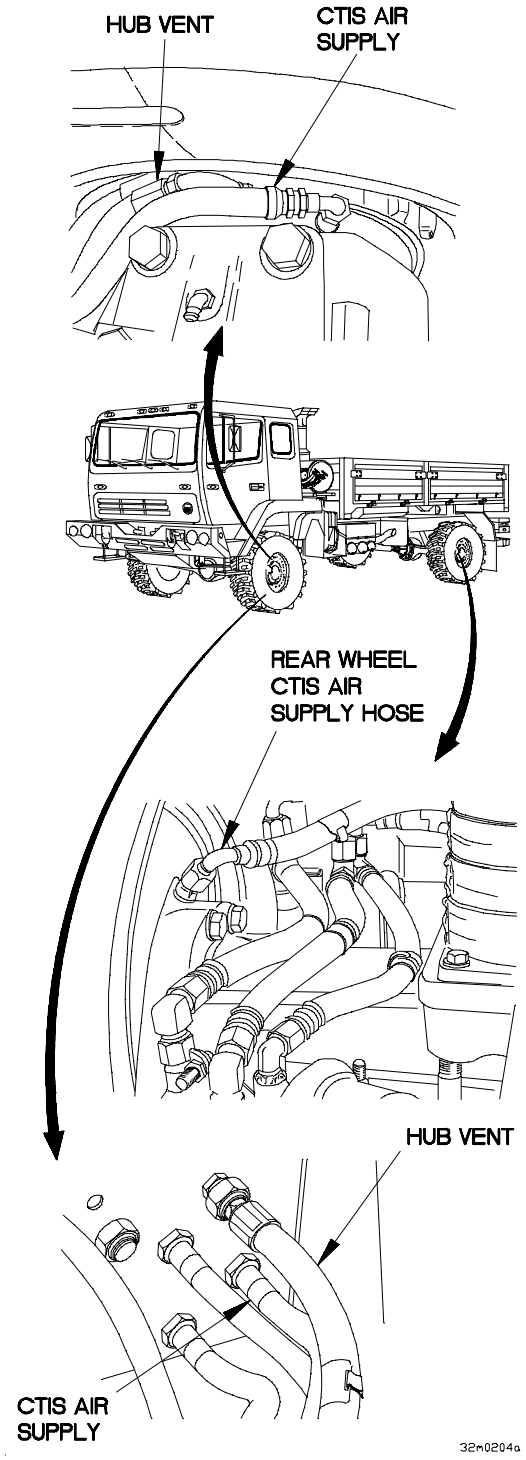
(1) If affected wheel is on intermediate axle:
   (a) Apply soapy water solution to air supply fittings at affected wheel(s).
   (b) Select RUN FLAT at CTIS ECU (TM 9-2320-365-10).
   (c) Check for bubbles indicating leaks at fittings.
   (d) Inspect air hose from wheel to quick release valve for leaks and damage.

(2) If affected wheel is on front axle:
   (a) Apply soapy water solution to air supply fittings at affected wheel(s) and at frame adapter.

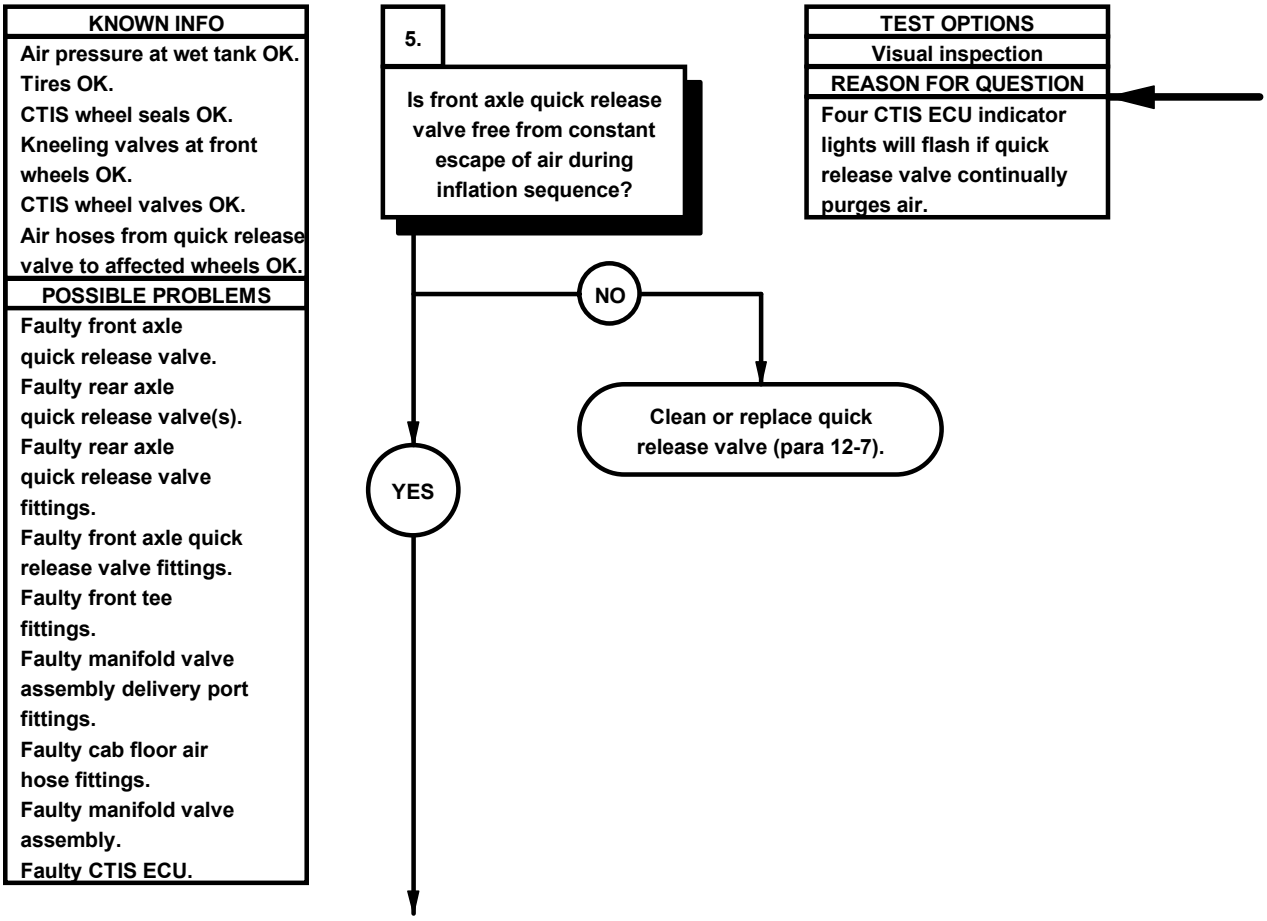
NOTE

CTIS air supply is front fitting on left front wheel; back fitting on right front wheel.

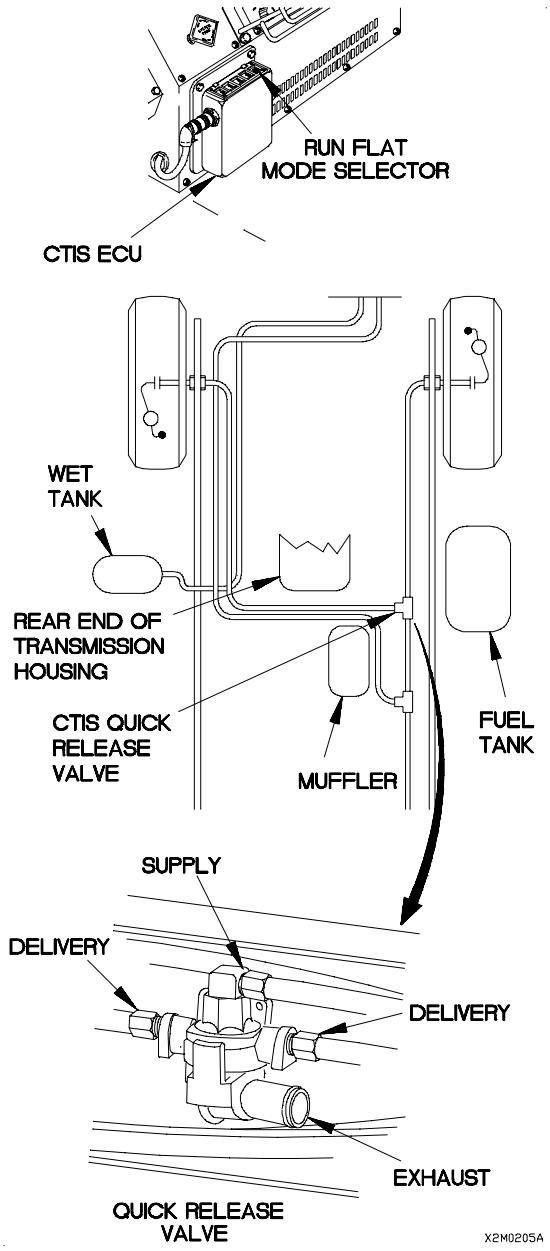
   (b) Select RUN FLAT at CTIS ECU (TM 9-2320-365-10).
   (c) Check for bubbles indicating leaks at fittings.
   (d) Inspect air hose from frame adapter to quick release valve for leaks and damage.



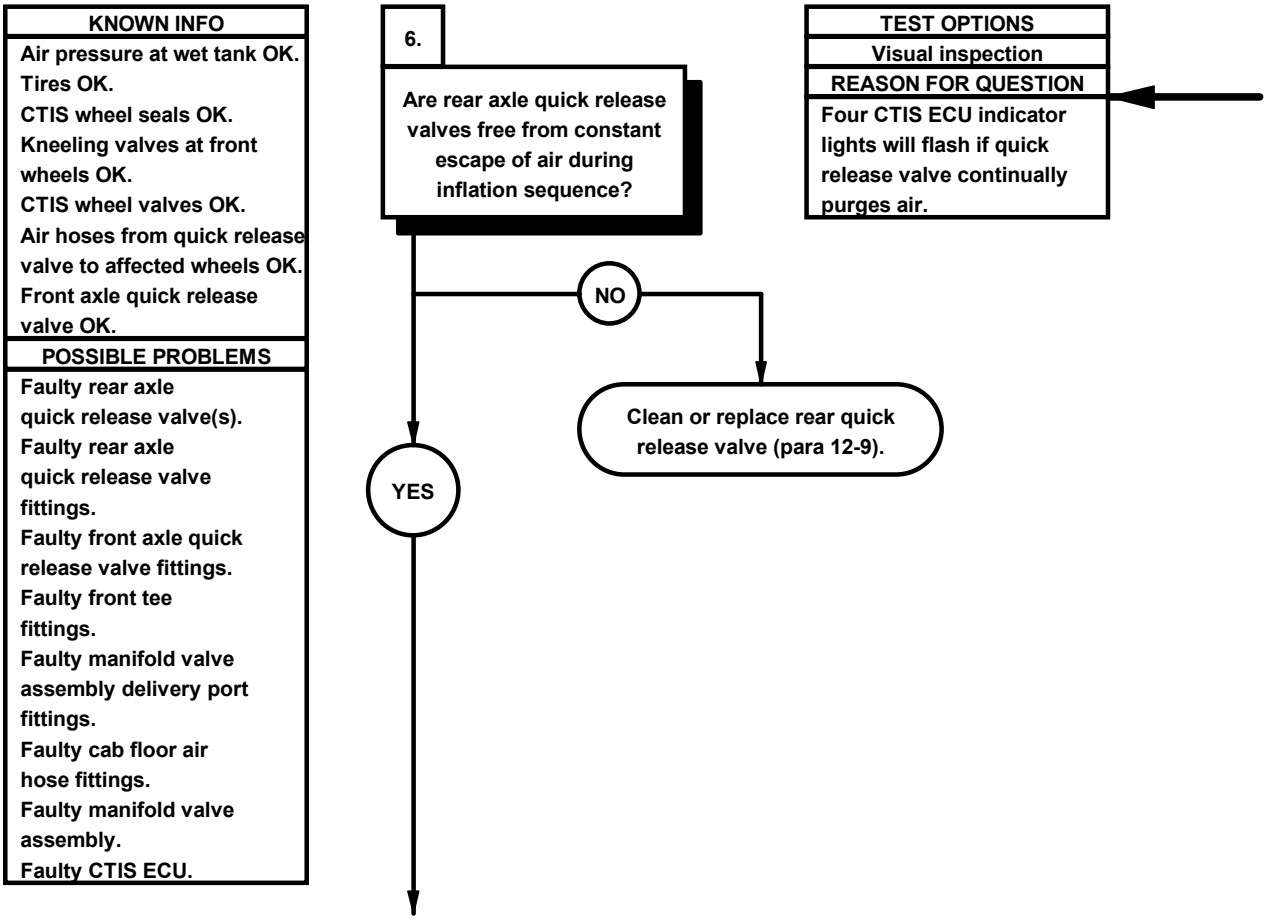
m2. FOUR CTIS ECU INDICATOR LIGHTS FLASHING (CONT)



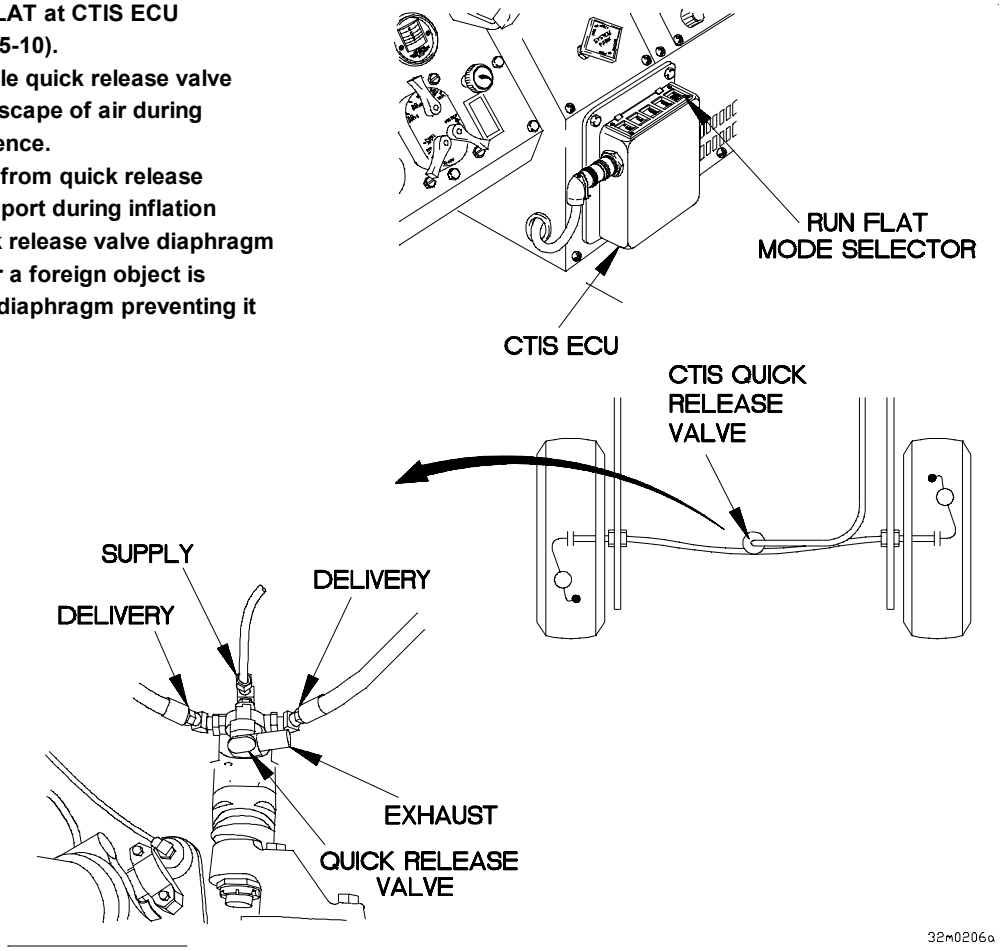
(1) Select RUN FLAT at CTIS ECU (TM 9-2320-365-10).
(2) Check front axle quick release valve for constant escape of air during inflation sequence.
(3) If air escapes from quick release valve exhaust port during inflation attempt, quick release valve diaphragm is damaged or a foreign object is lodged under diaphragm preventing it from closing.



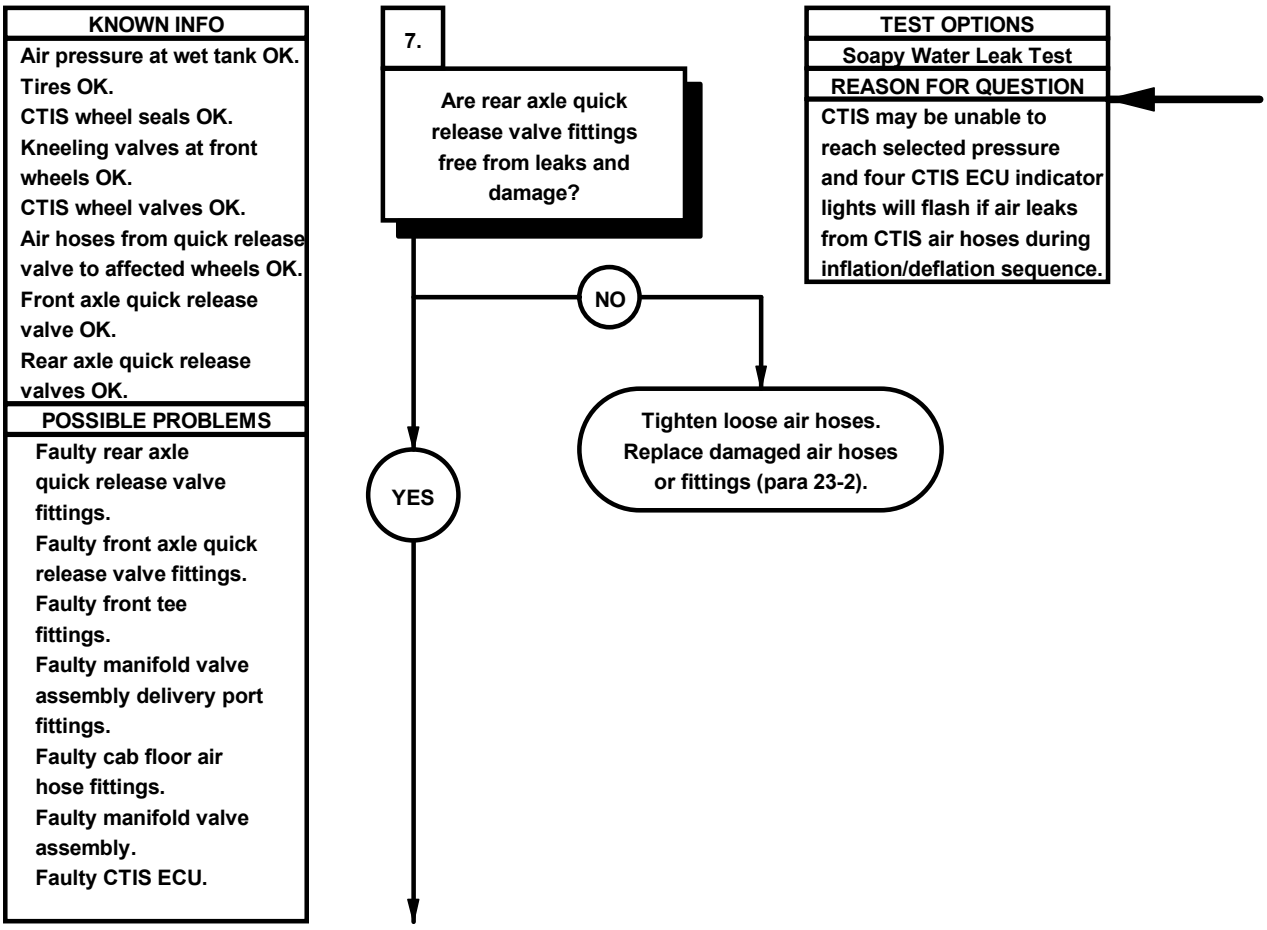
m2. FOUR CTIS ECU INDICATOR LIGHTS FLASHING (CONT)



(1) Select RUN FLAT at CTIS ECU (TM 9-2320-365-10).
(2) Check rear axle quick release valve for constant escape of air during inflation sequence.
(3) If air escapes from quick release valve exhaust port during inflation attempt, quick release valve diaphragm is damaged or a foreign object is lodged under diaphragm preventing it from closing.



m2. FOUR CTIS ECU INDICATOR LIGHTS FLASHING (CONT)



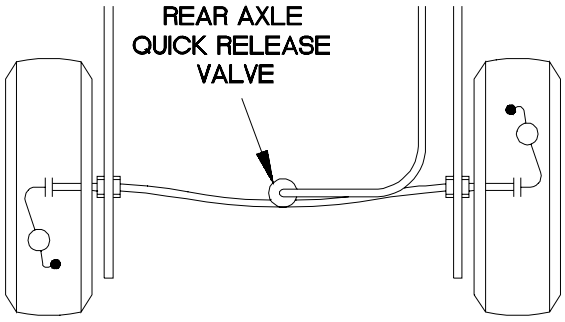
SOAPY WATER LEAK TEST

(1) Select RUN FLAT at CTIS ECU (TM 9-2320-365-10) and listen for obvious air escape in CTIS system.

(2) If obvious air escape is heard, perform repair at damaged area. If no obvious air escape is heard, proceed to quick release valve leak check.

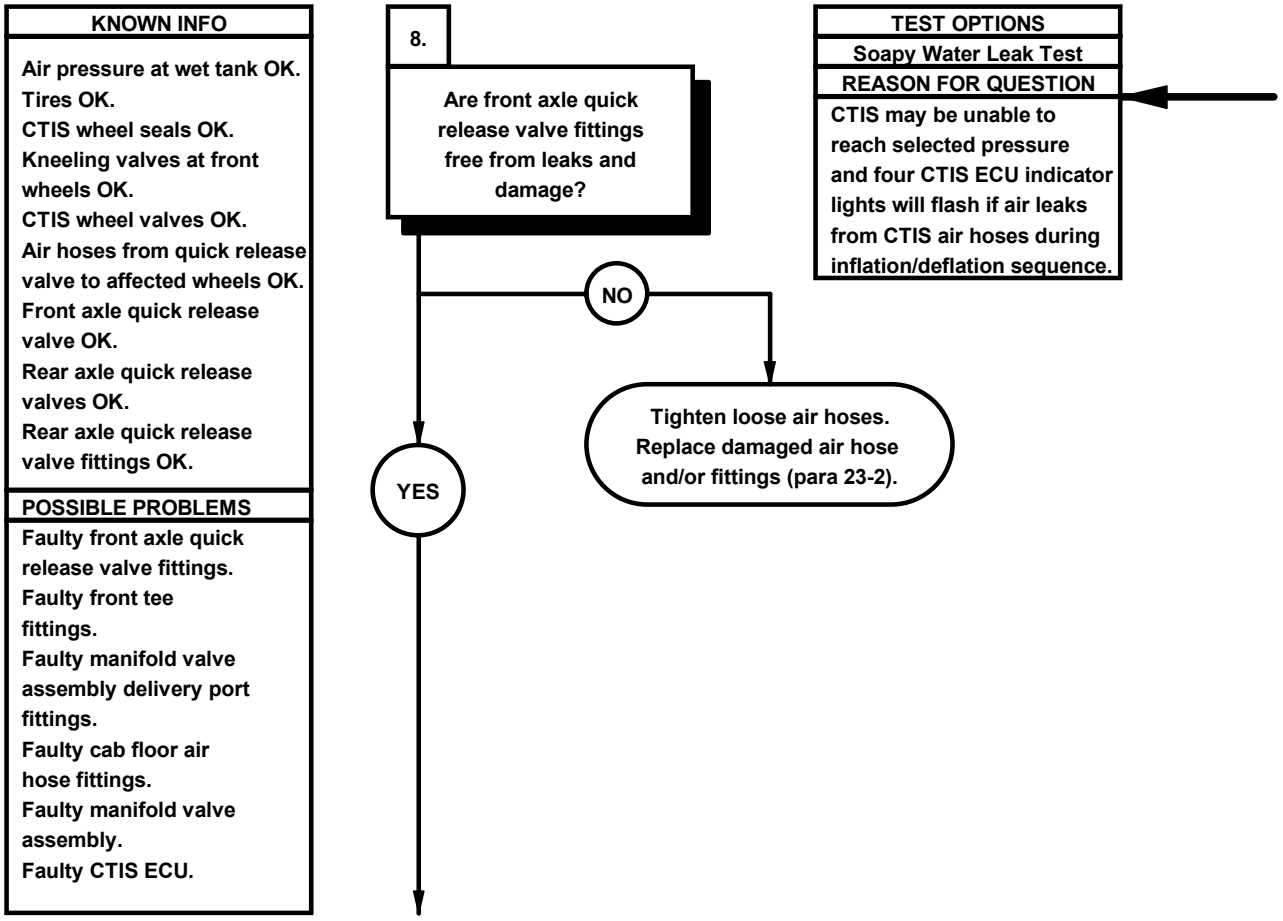
(3) Apply soapy water solution to quick release valve fittings at rear axle.

(4) Check for bubbles indicating leaks.

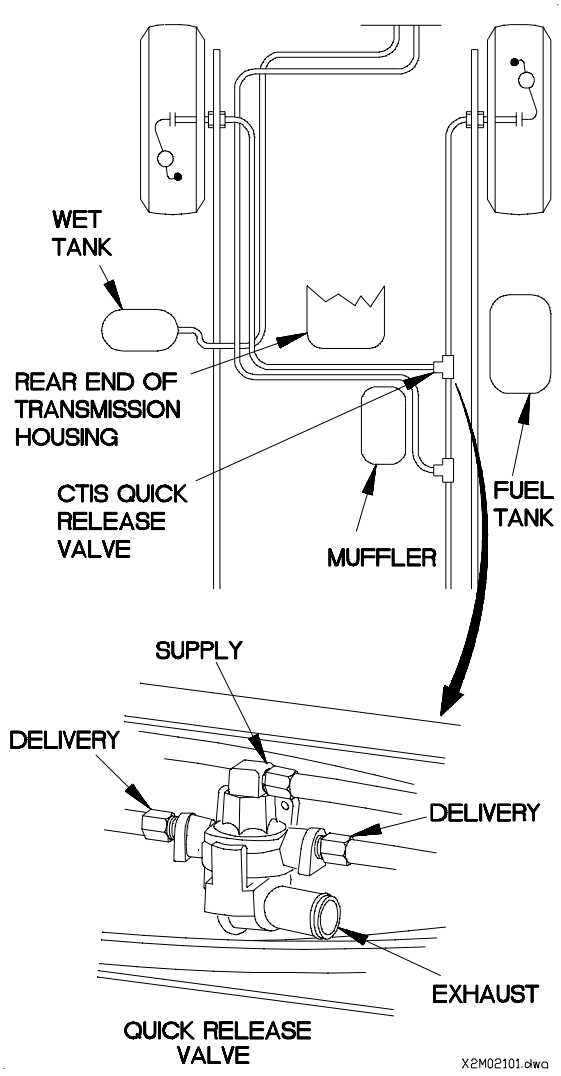


32M0207-

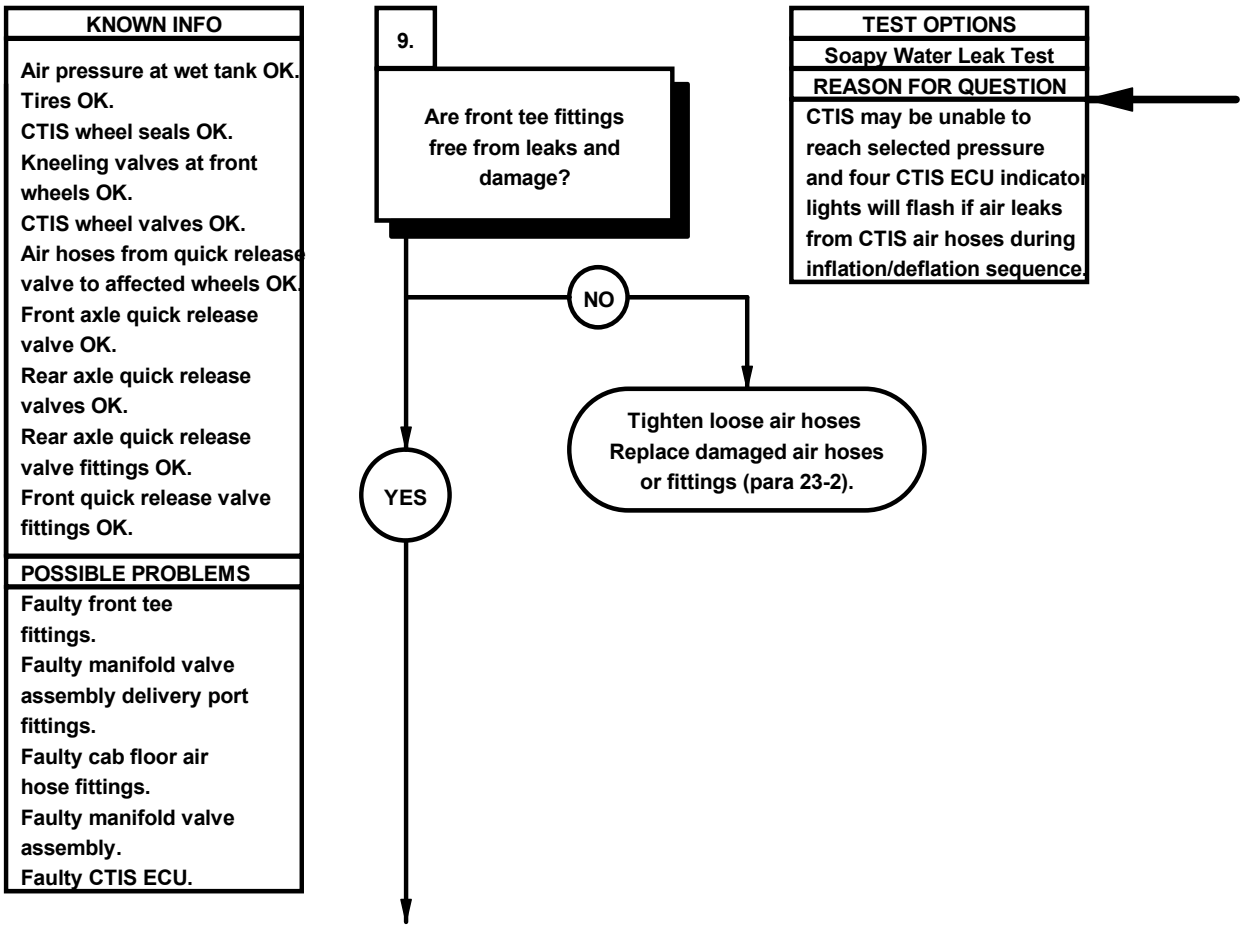
m2. FOUR CTIS ECU INDICATOR LIGHTS FLASHING (CONT)



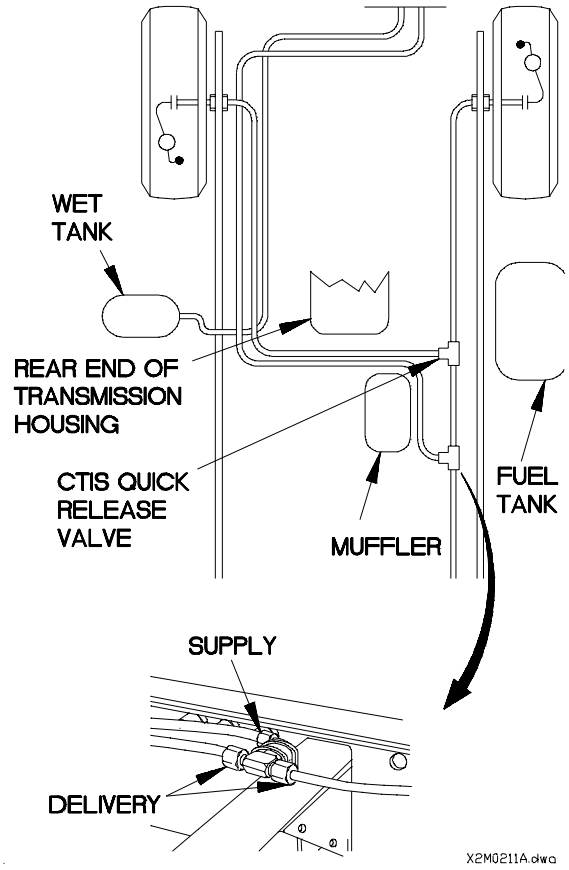
SOAPY WATER LEAK TEST
(1) Apply soapy water solution to front quick release valve fittings.
(2) Select RUN FLAT at CTIS ECU (TM 9-2320-365-10).
(3) Check for bubbles indicating leaks.



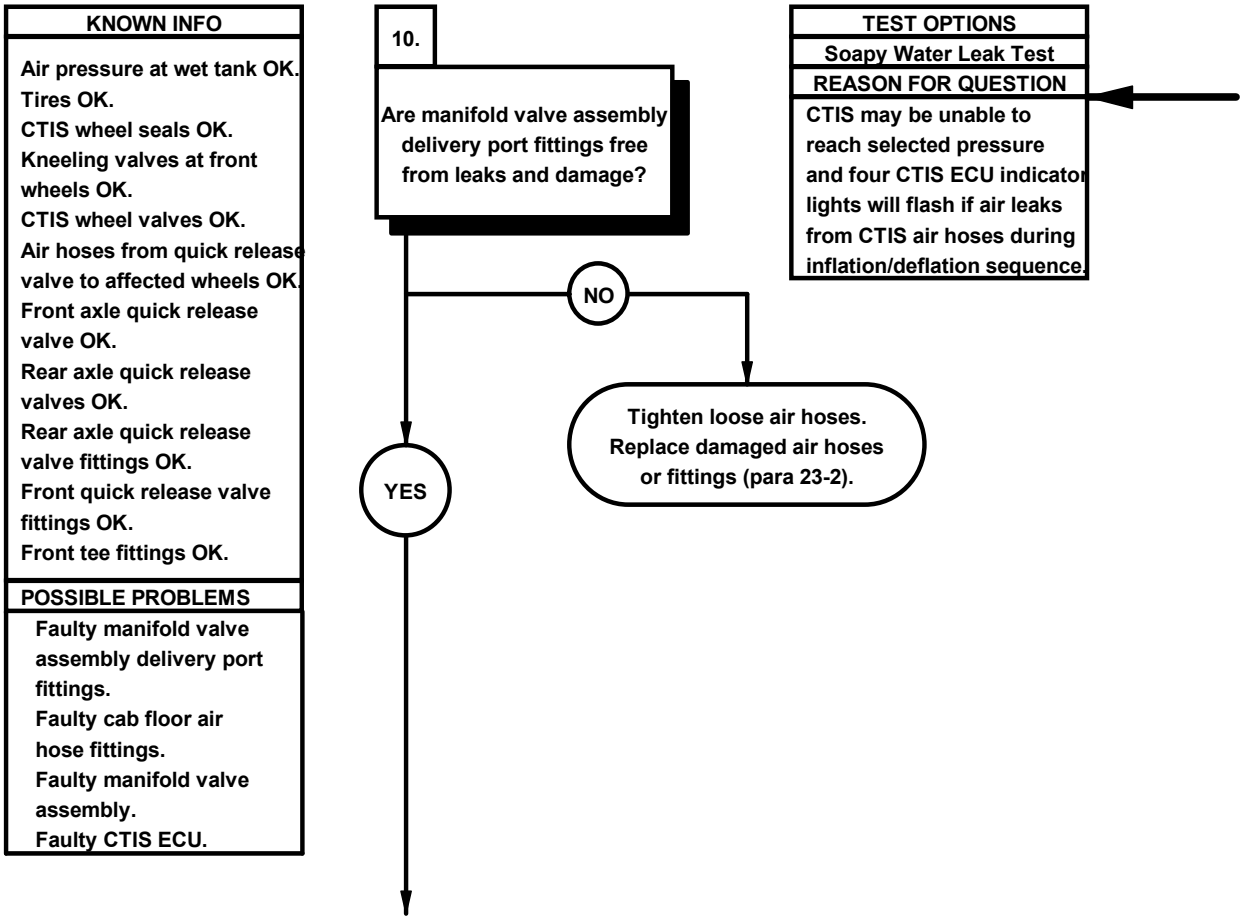
m2. FOUR CTIS ECU INDICATOR LIGHTS FLASHING (CONT)



SOAPY WATER LEAK TEST
(1) Apply soapy water solution to tee fittings at muffler.
(2) Select RUN FLAT at CTIS ECU (TM 9-2320-365-10).
(3) Check for bubbles indicating leaks.

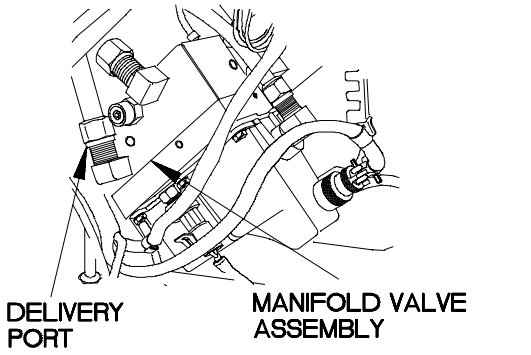


m2. FOUR CTIS ECU INDICATOR LIGHTS FLASHING (CONT)



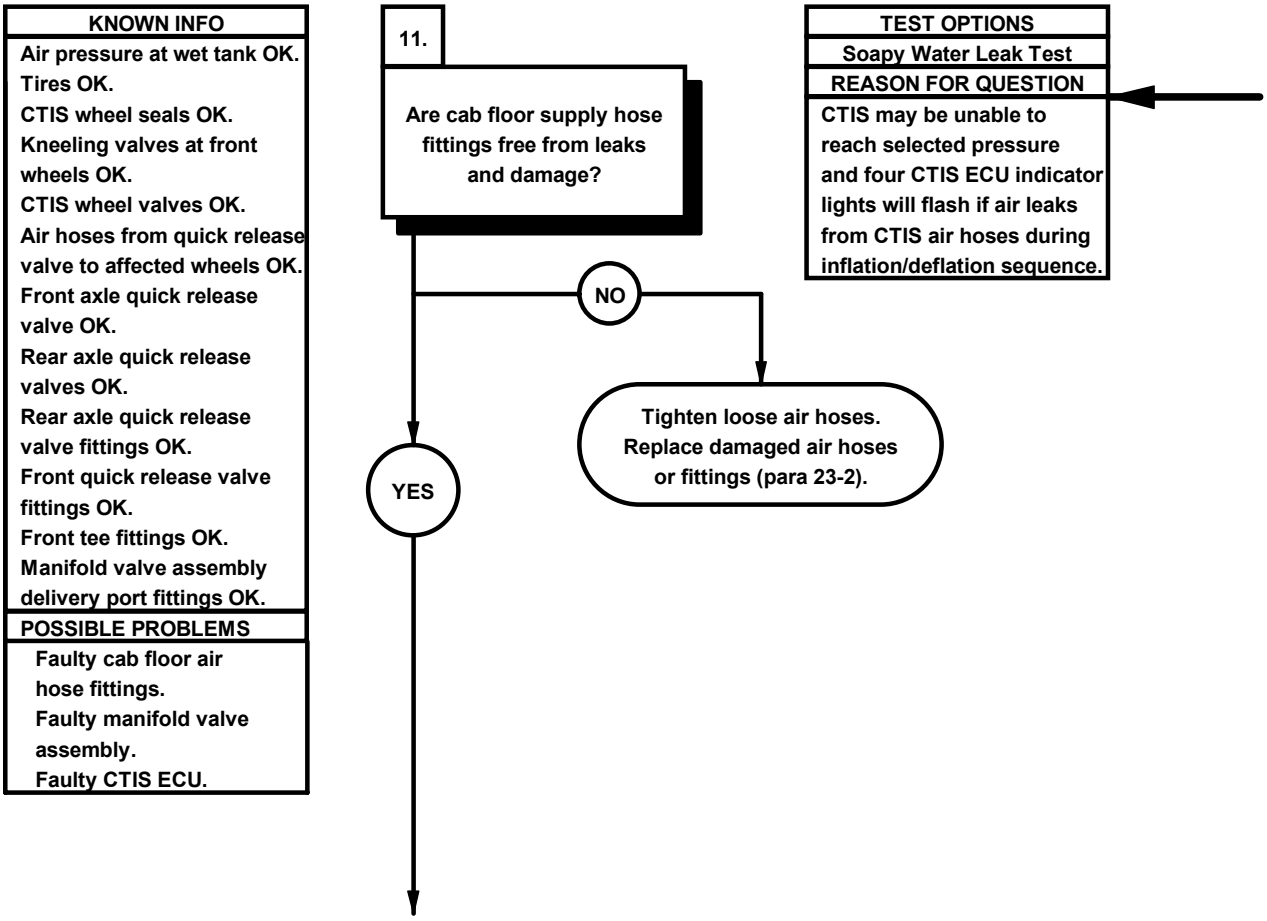
SOAPY WATER LEAK TEST

(1) Remove kick panel (para 16-3).
(2) Apply soapy water solution to manifold valve assembly delivery port fittings.
(3) Select RUN FLAT at CTIS ECU (TM 9-2320-365-10).
(4) Check for bubbles indicating leaks.



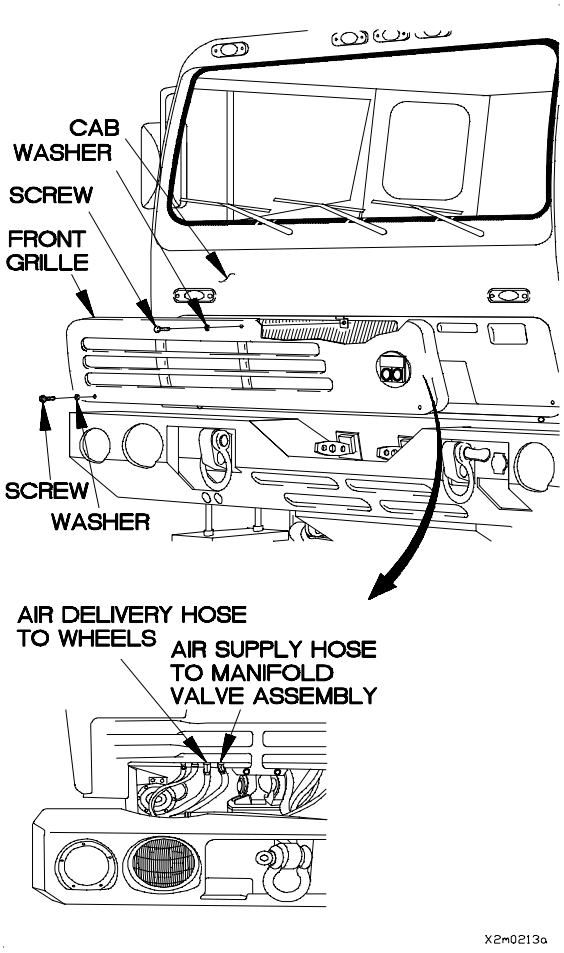
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m2. FOUR CTIS ECU INDICATOR LIGHTS FLASHING (CONT)

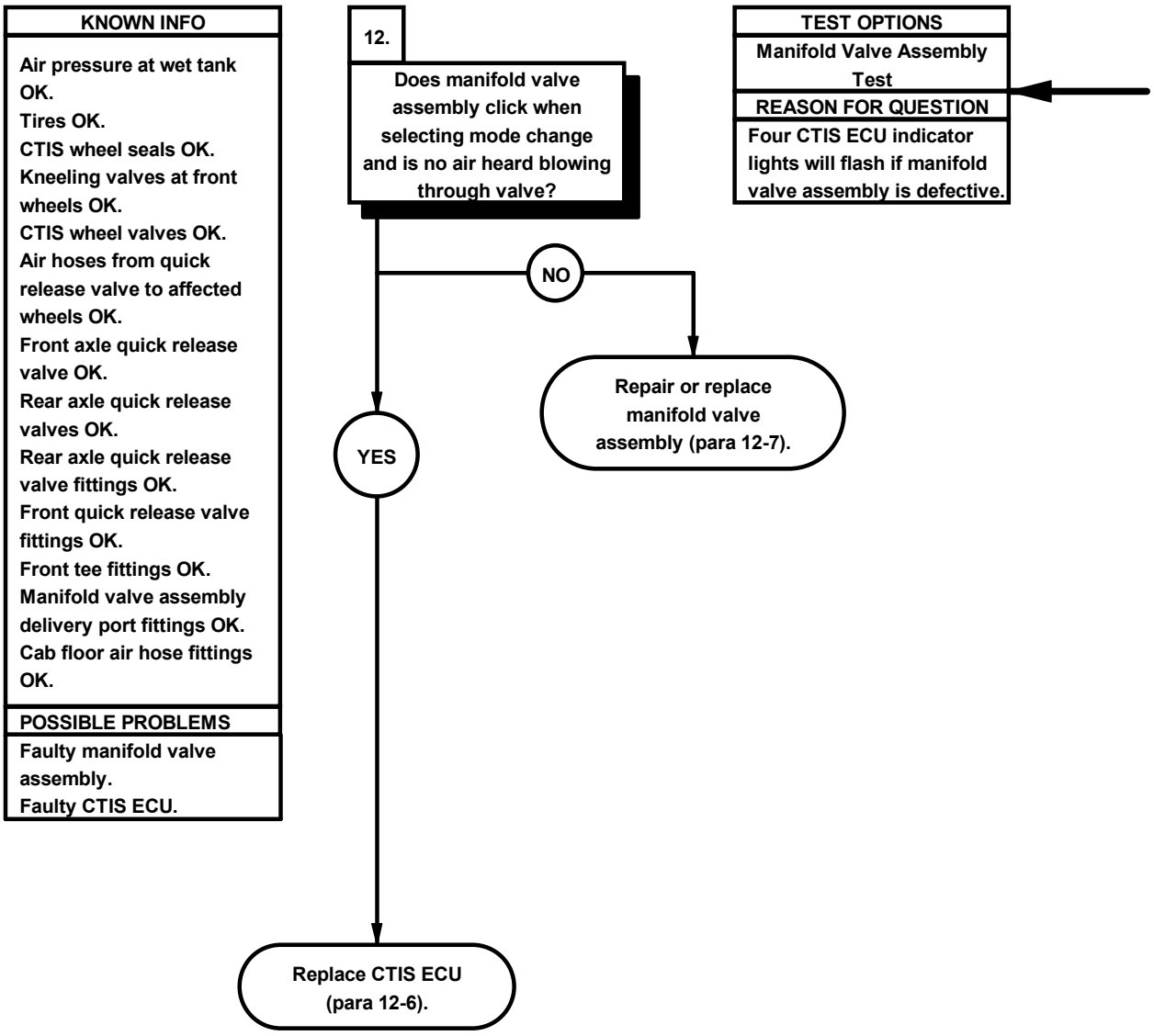


SOAPY WATER LEAK TEST

(1) Remove two screws and washers from front grille.
(2) Remove screw and washer from front grille.
(3) Remove front grille.
(4) Apply soapy water solution to cab floor supply hose fittings.
(5) Select RUN FLAT at CTIS ECU (TM 9-2320-365-10).
(6) Check for bubbles indicating leaks.
(7) Position front grille on cab with washer and screw.
(8) Position two washers and screws in front grille.
(9) Tighten screw to 48-60 lb-in. (5-7 N·m).
(10) Tighten two screws to 24 lb-in. (3 N·m).

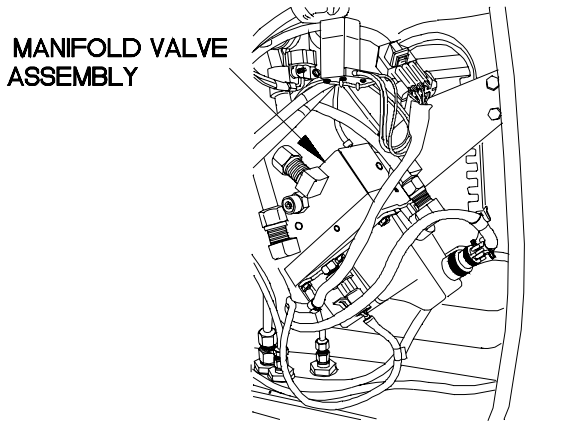


m2. FOUR CTIS ECU INDICATOR LIGHTS FLASHING (CONT)



MANIFOLD VALVE ASSEMBLY TEST

(1) Select RUN FLAT at CTIS ECU (TM 9-2320-365-10).
(2) Check manifold valve assembly by listening for clicking when selecting mode change. If no clicking is heard or if air blows through manifold valve assembly, replace manifold valve assembly (para 12-7).
(3) If manifold valve is ok, replace CTIS ECU (para 12-6).
(4) Install kick panel (para 16-3).



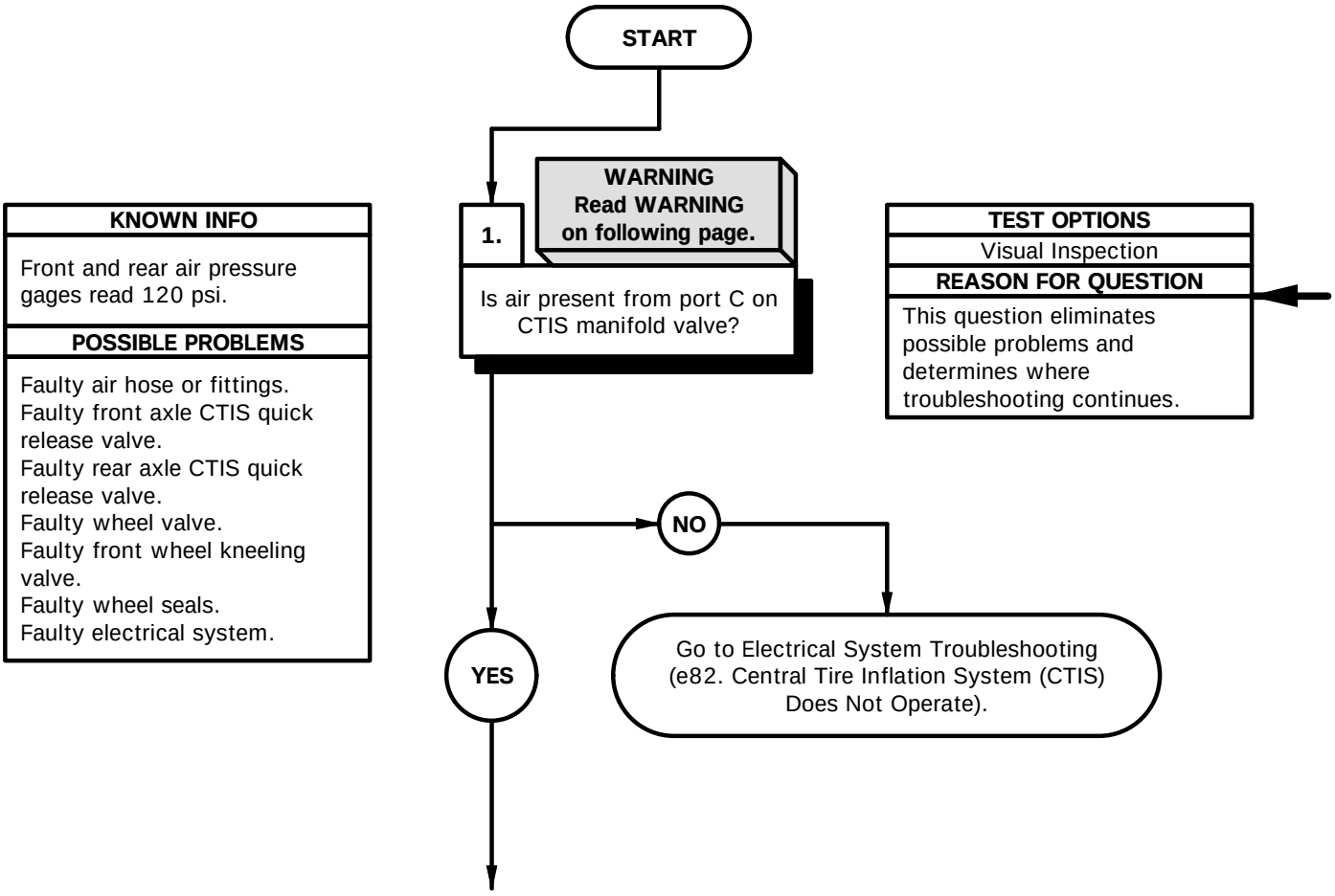
32M0214A

m3. FIVE CENTRAL TIRE INFLATION SYSTEM (CTIS) ECU INDICATOR LIGHTS FLASHING

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10)
Kick panel removed (para 16-3).

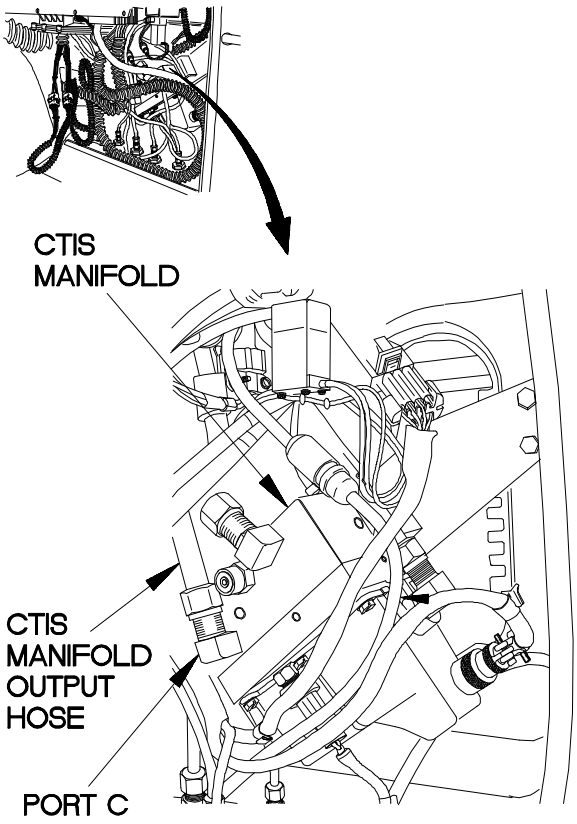
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Goggles, Industrial (Item 15, Appendix C)



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.

(1) Disconnect CTIS manifold output hose from CTIS manifold valve port C.
(2) Select CTIS inflation mode (TM 9-2320-365-10).
(3) Start engine (TM 9-2320-365-10).
(4) Wait for CTIS to cycle and check for quick bursts of air to expel from CTIS manifold valve port C.
(5) Check for five CTIS ECU indicator lights flashing.
(6) If air does not expel from CTIS manifold valve or CTIS ECU does not have five flashing indicator lights, go to Electrical System Troubleshooting (e82. Central Tire Inflation System (CTIS) Does Not Operate).
(7) Shut down engine (TM 9-2320-365-10).
(8) Connect CTIS manifold output hose to CTIS manifold valve port C.
(9) Install kick panel (para 16-3).



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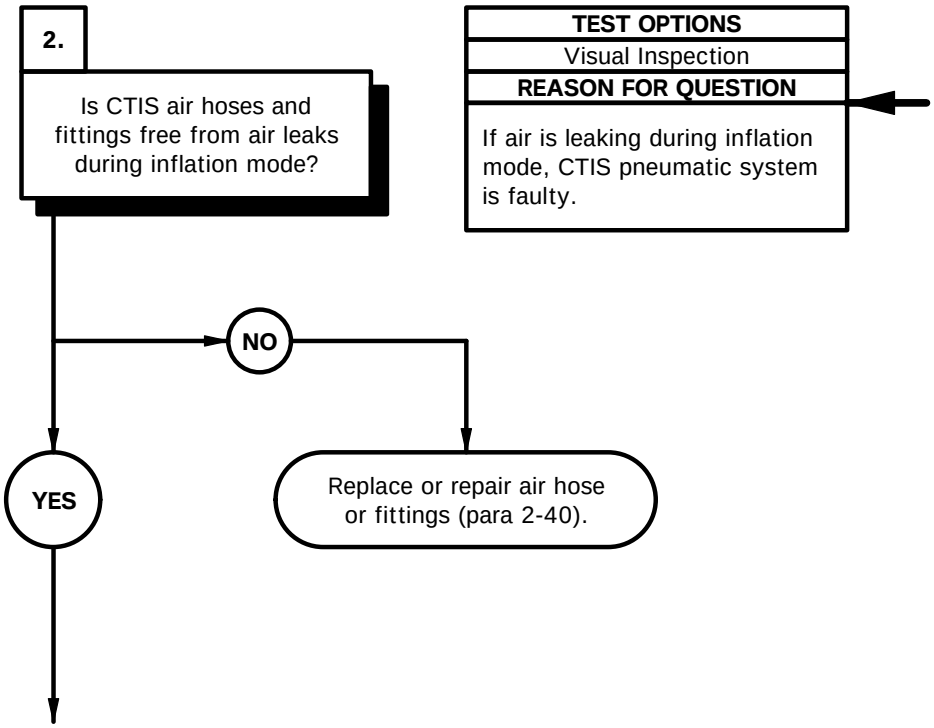
m3. FIVE CENTRAL TIRE INFLATION SYSTEM (CTIS) ECU INDICATOR LIGHTS FLASHING (CONT)

KNOWN INFO

Front and rear air pressure gages read 120 psi.

POSSIBLE PROBLEMS

Faulty air hose or fittings.
Faulty front axle CTIS quick release valve.
Faulty rear axle CTIS quick release valve.
Faulty wheel valve.
Faulty front wheel kneeling valve.
Faulty wheel seals.
Faulty electrical system.

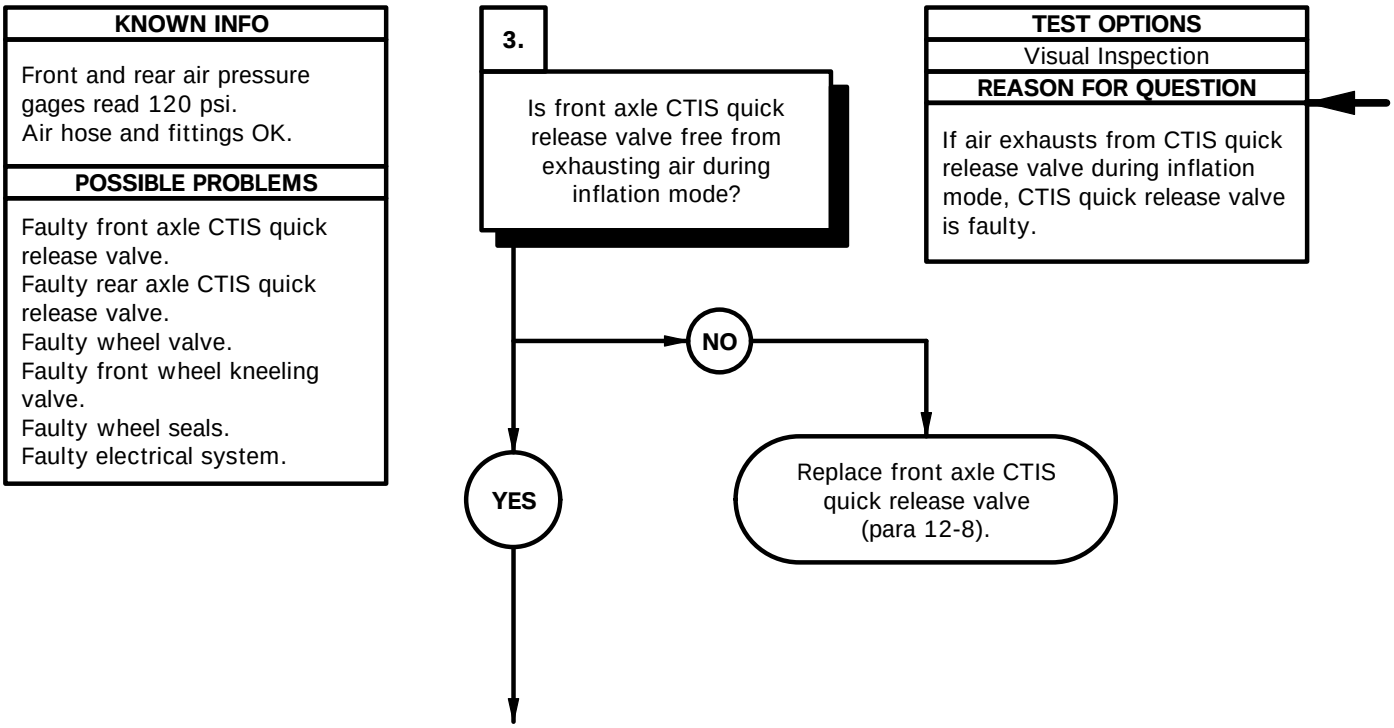


NOTE

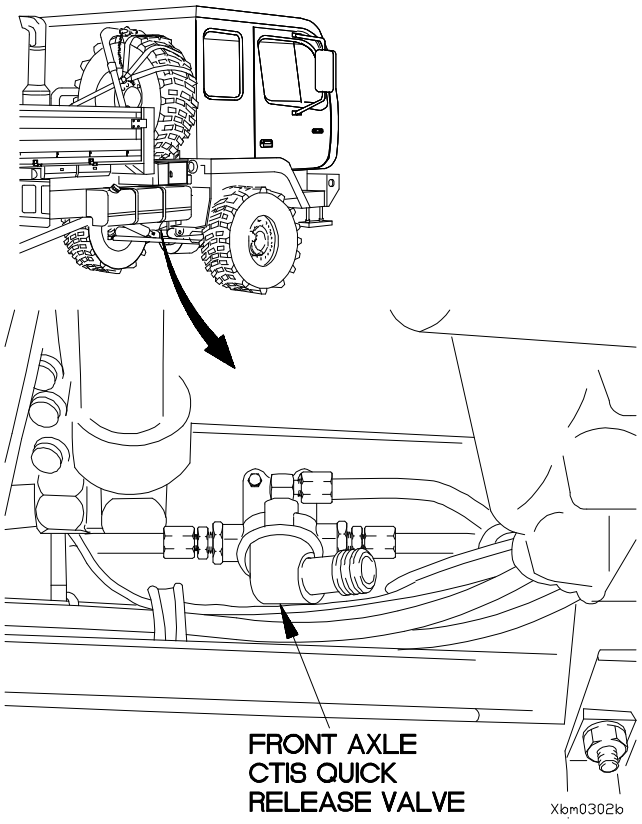
Five flashing indicator lights indicate a defect in CTIS critical component(s) causing system to shut off. Override cannot be applied but system can be activated by turning vehicle off and then on again.

(1) Start engine (TM 9-2320-365-10).
(2) Set CTIS ECU to RUN FLAT mode (TM 9-2320-365-10).
(3) Check CTIS air hoses and fittings for leaks (Table 23-2 Central Tire Inflation System (CTIS) Air Hose Locations).
(4) If any leaks are found, repair or replace CTIS air hose and/or fittings (para 2-40).
(5) Shut down engine (TM 9-2320-365-10).

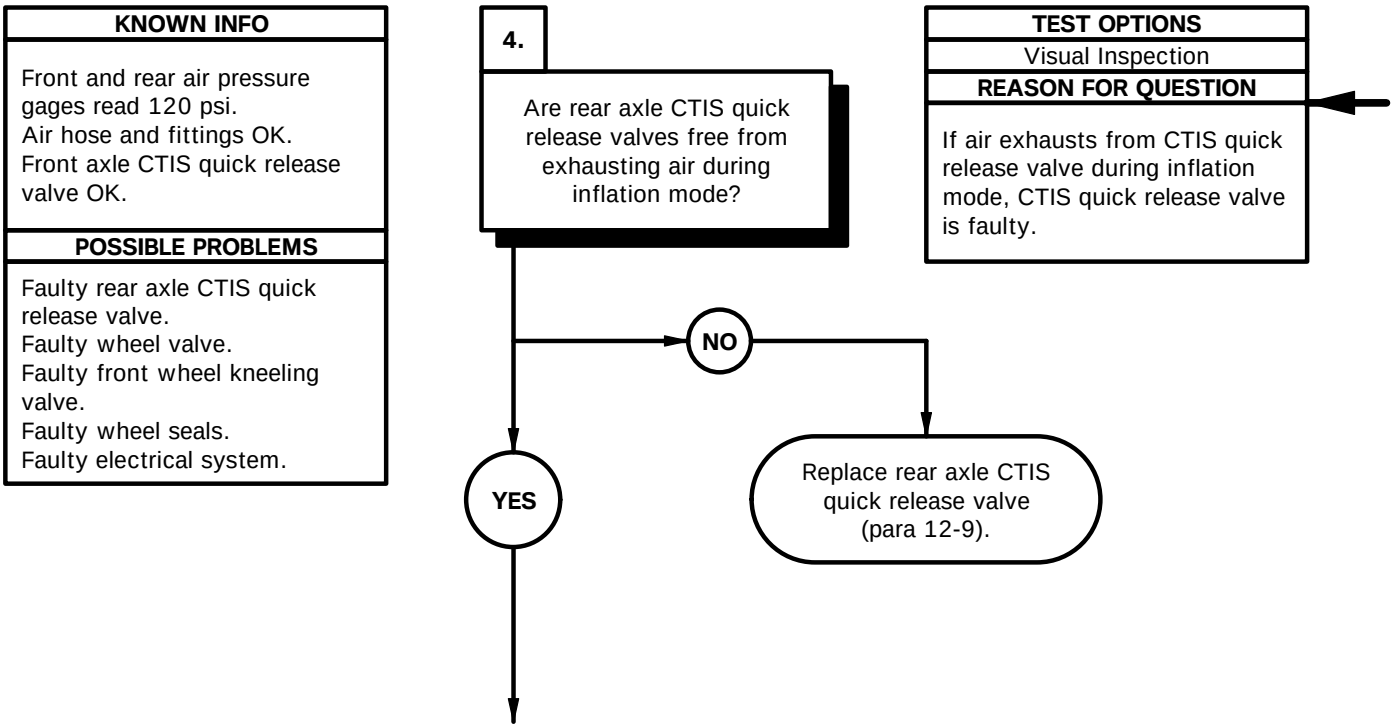
m3. FIVE CENTRAL TIRE INFLATION SYSTEM (CTIS) ECU INDICATOR LIGHTS FLASHING (CONT)



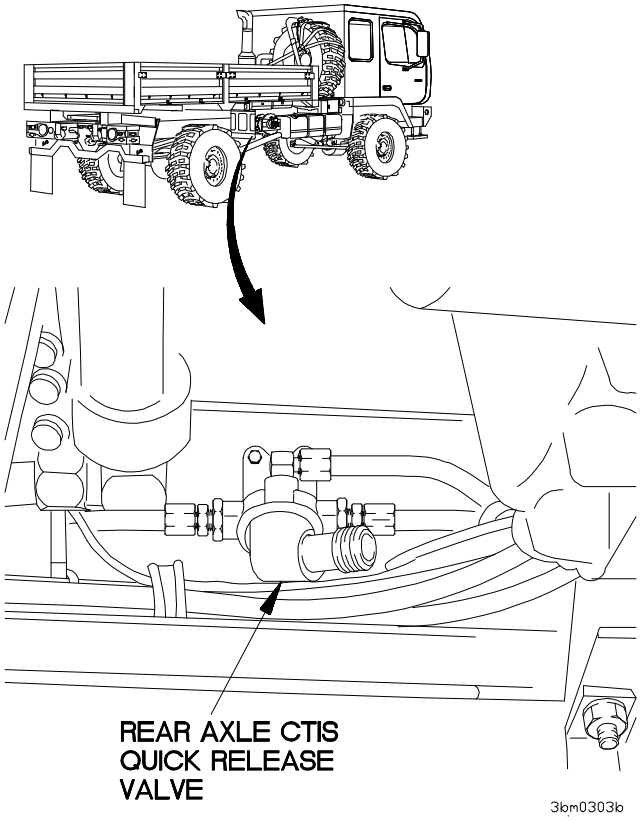
(1) Start engine (TM 9-2320-365-10).
(2) Select CTIS inflation mode (TM 9-2320-365-10).
(3) Check for air escaping from front axle CTIS quick release valve during inflation mode.
(4) If air is escaping from front axle CTIS quick release valve during inflation mode, replace front axle CTIS quick release valve (para 12-8).
(5) Shut down engine (TM 9-2320-365-10).



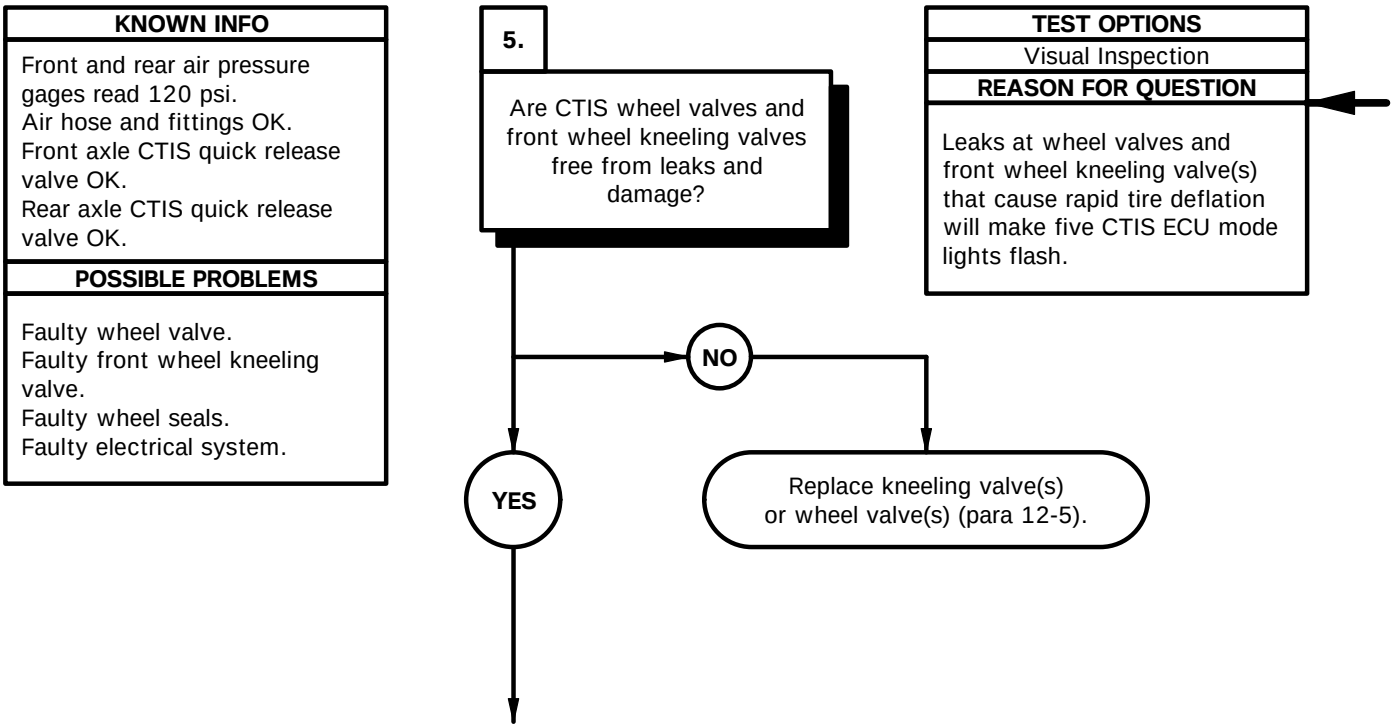
m3. FIVE CENTRAL TIRE INFLATION SYSTEM (CTIS) ECU INDICATOR LIGHTS FLASHING (CONT)



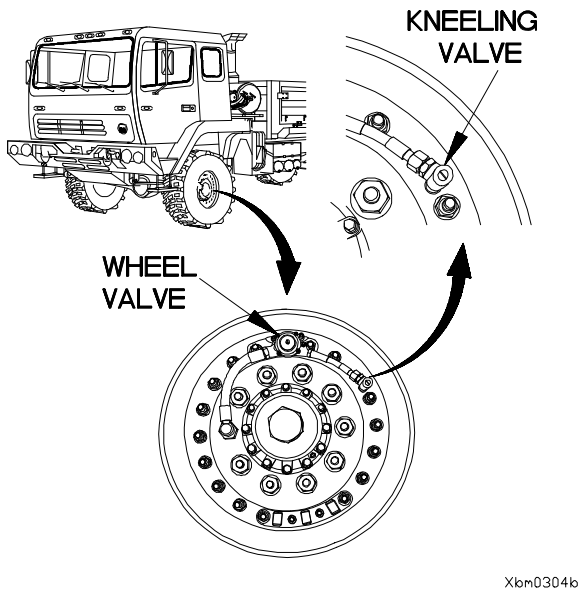
(1) Start engine (TM 9-2320-365-10).
(2) Select CTIS inflation mode (TM 9-2320-365-10).
(3) Check for air escaping from rear axle CTIS quick release valves during inflation mode.
(4) If air is escaping from rear axle CTIS quick release valves during inflation mode, replace rear axle CTIS quick release valve (para 12-9).
(5) Shut down engine (TM 9-2320-365-10).



m3. FIVE CENTRAL TIRE INFLATION SYSTEM (CTIS) ECU INDICATOR LIGHTS FLASHING (CONT)

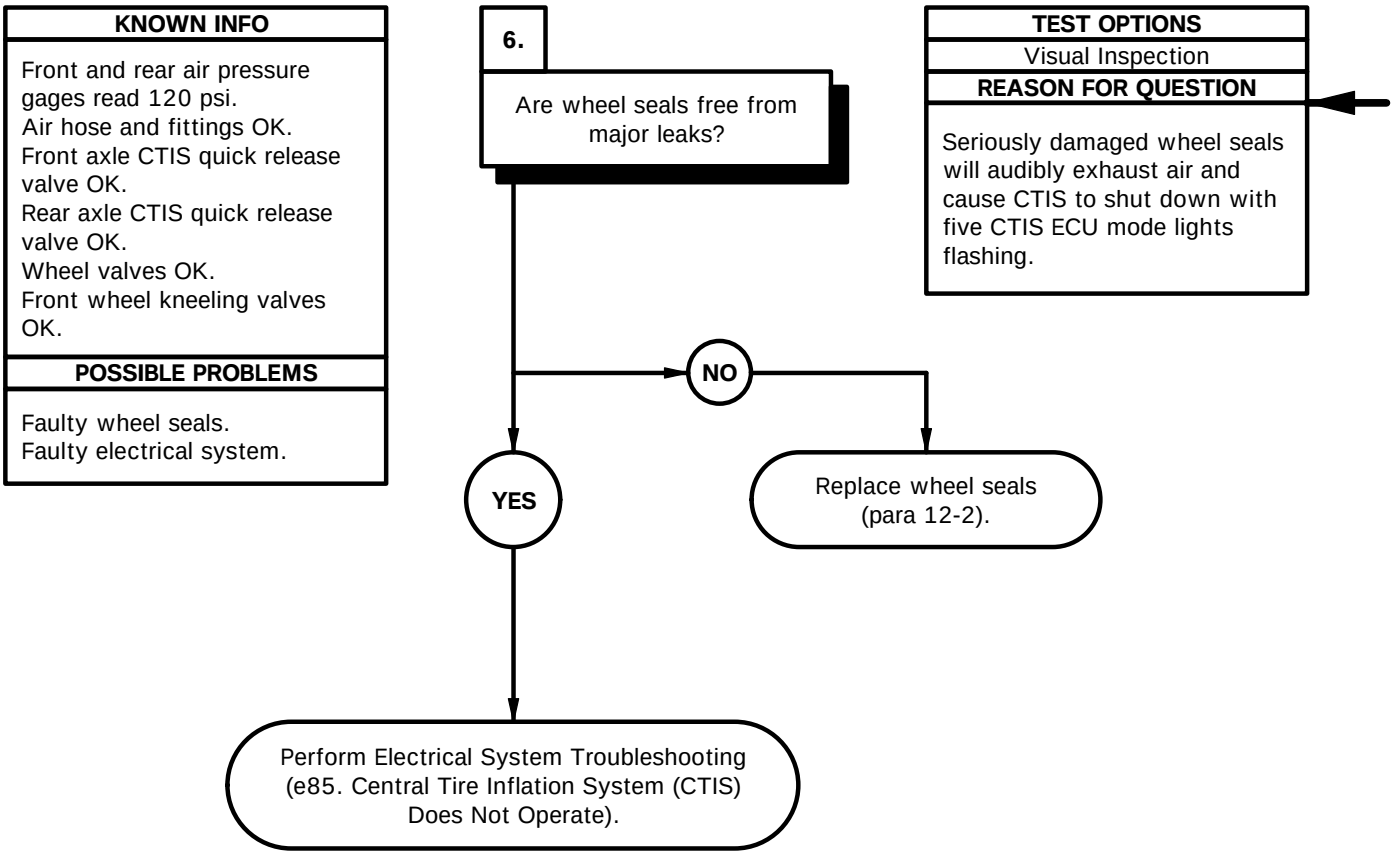


(1) Start engine (TM 9-2320-365-10).
(2) Select CTIS inflation mode (TM 9-2320-365-10).
(3) Listen for audible escape of air at kneeling valve (front wheels only) and CTIS wheel valves on each wheel.
(4) If audible escape of air is present, replace wheel kneeling valve(s) or wheel valve(s) (para 12-5).
(5) Shut down engine (TM 9-2320-365-10).

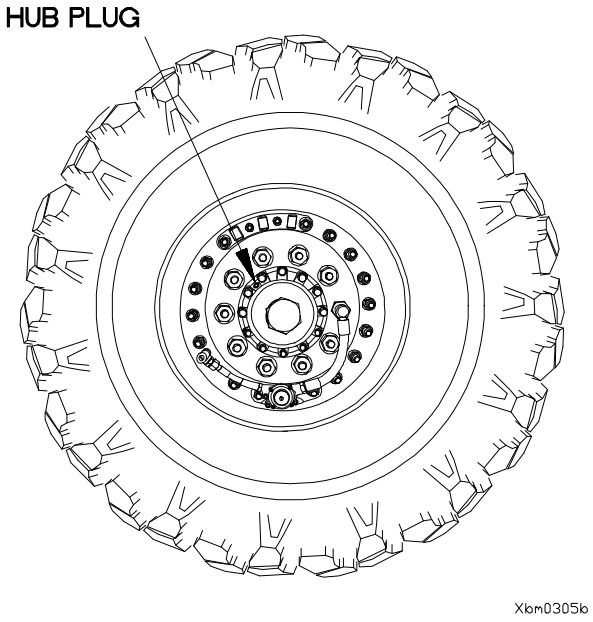


All data on pages 2-1832 thru 2-1853, including pages 2-1833 thru 2-1852, deleted.

m3. FIVE CENTRAL TIRE INFLATION SYSTEM (CTIS) ECU INDICATOR LIGHTS FLASHING (CONT)



(1) Move vehicle until hub plug on wheel is in 12 o'clock position.
(2) Remove wheel hub plug.
(3) Start engine (TM 9-2320-365-10).
(4) Select CTIS inflation mode (TM 9-2320-365-10).
(5) Listen at wheel hub for audible escape of air.
(6) If audible escape of air is present, replace wheel seal (para 12-2).
(7) Install wheel hub plug.
(8) Perform steps 1 thru 5 on remaining wheels.
(9) If no air is audibly present from wheel hub, perform Electrical System Troubleshooting (e82. Central Tire Inflation System (CTIS) Does Not Operate).
(10) Shut down engine (TM 9-2320-365-10).



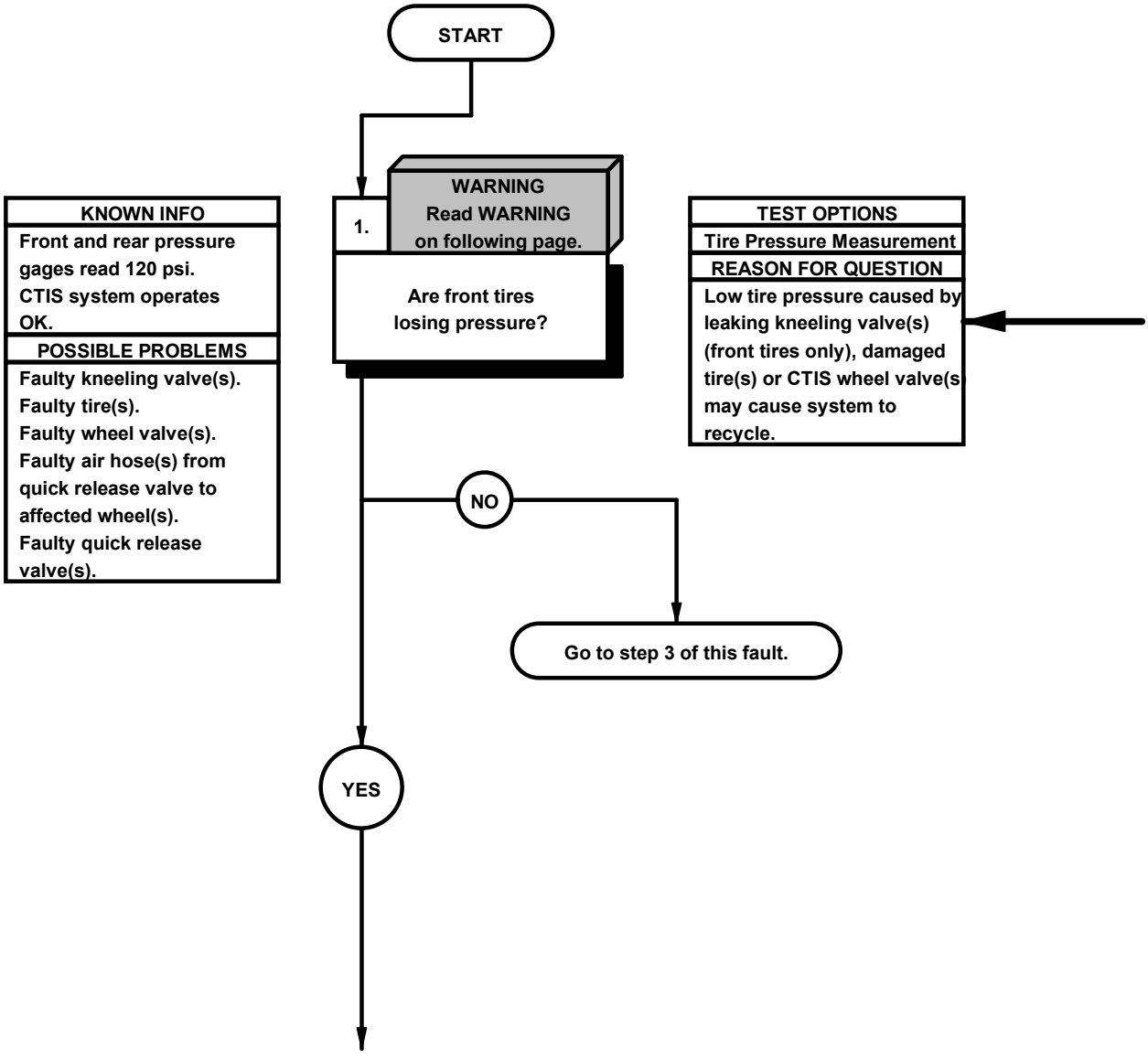
m4. CTIS REPEATEDLY RESUMES CYCLING 30 SECONDS AFTER INDICATOR LIGHTS STOP FLASHING

INITIAL SETUP

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

Materials/Parts
Soap, Laundry (Item 69, Appendix D)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Gage, Tire Pressure (Item 11, Appendix C)
Pan, Wash (Item 25, Appendix C)



WARNING

Wear appropriate eye protection when working under vehicle and around CTIS system due to the possibility of falling and/or blown debris. Failure to comply may result in injury to personnel.

NOTE

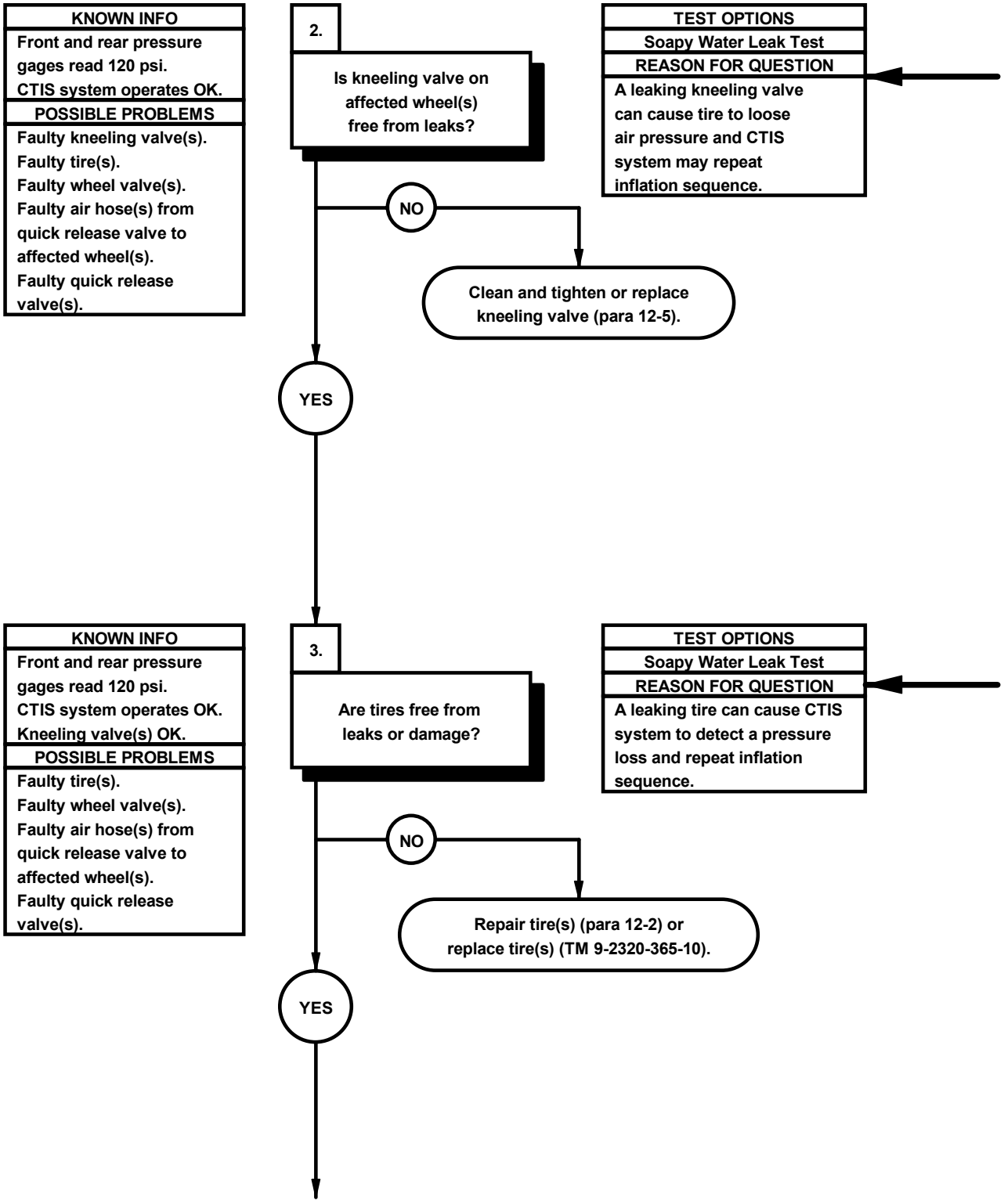
CTIS ECU checks tire pressure 30 seconds after completing a pressure change sequence. If tire pressures are the same, system reverts to checking pressure every 15 minutes. If tires are losing pressure, ECU inflates tires and checks pressure again in 30 seconds. If CTIS has to repeat this process more than 10 times, ECU will display four flashing lights.

(1) Measure and record the tire pressure of each tire (TM 9-2320-365-10).

(2) If front tire(s) have lower pressure than the rest, kneeling valve, tire or CTIS wheel valve is faulty.

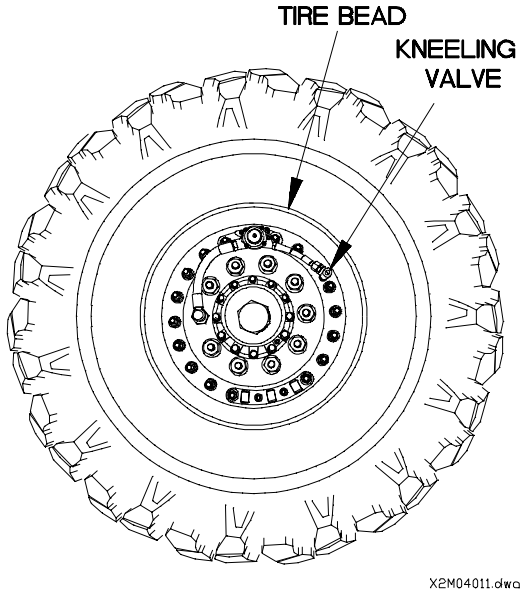
(3) If rear tire(s) have lower pressure than the rest, tire or CTIS wheel valve is faulty.

m4. CTIS REPEATEDLY RESUMES CYCLING 30 SECONDS AFTER INDICATOR LIGHTS STOP FLASHING (CONT)



SOAPY WATER LEAK TEST

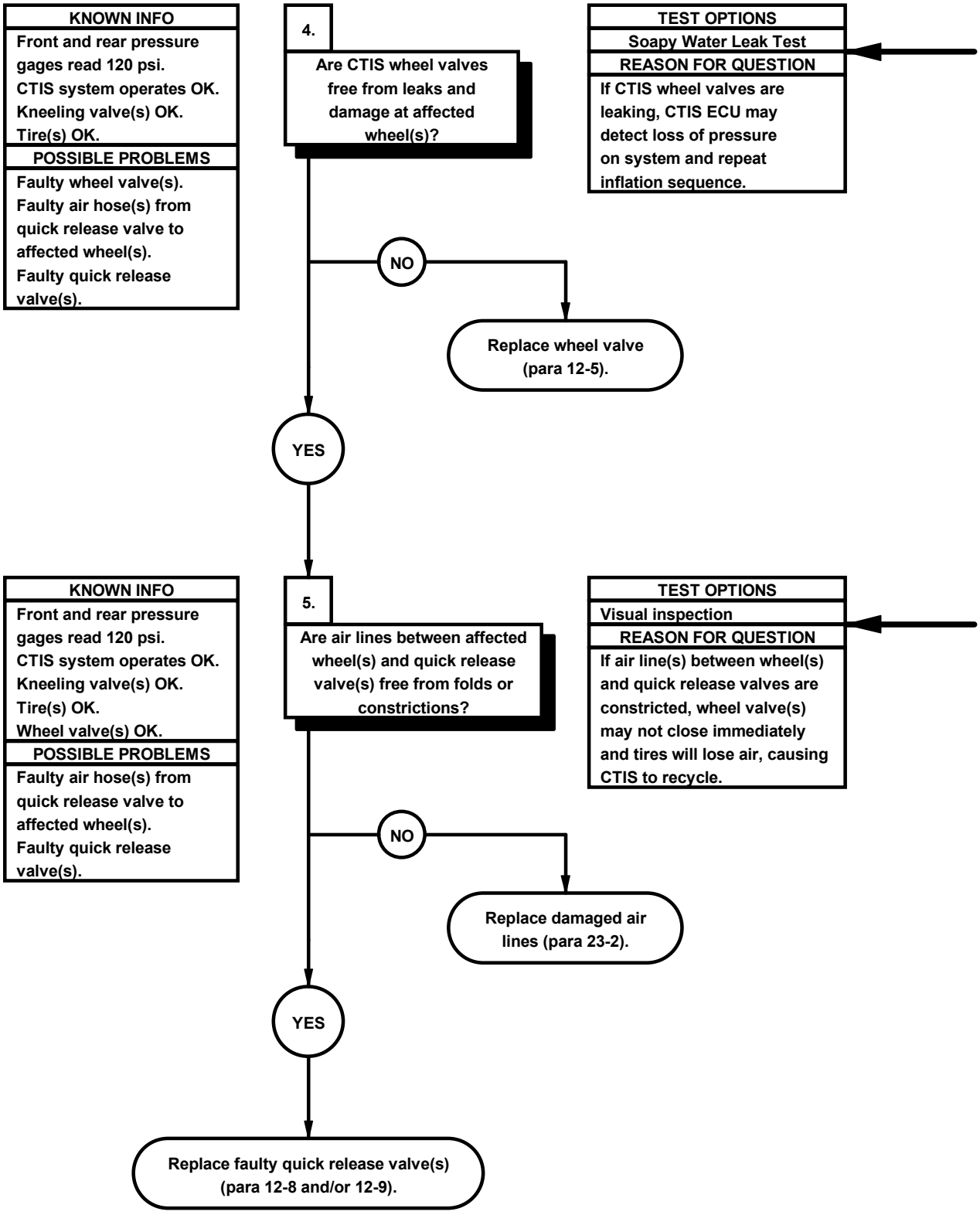
(1) Check kneeling valve is tight and secure in valve seat.
(2) Apply soapy water to valve and check for leaks.



SOAPY WATER LEAK TEST

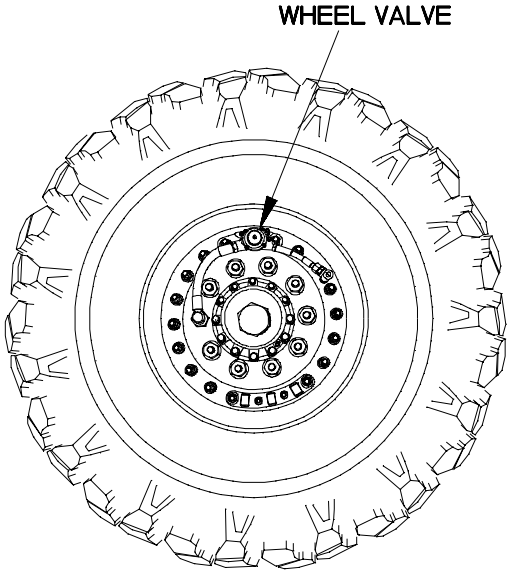
(1) Visually inspect tire for damage.
(2) Apply soapy water solution to tire bead.
(3) Observe tire for bubbles indicating leaks.

m4. CTIS REPEATEDLY RESUMES CYCLING 30 SECONDS AFTER INDICATOR LIGHTS STOP FLASHING (CONT)



SOAPY WATER LEAK TEST

(1) Apply soapy water solution to CTIS fittings on outside of wheel.
(2) Observe fittings for bubbles indicating leaks.
(3) With wheel valve still connected to tire, disconnect wheel valve air supply line from hub at banjo bolt.
(4) Place open end of air supply line in container of water. Look for air bubbles.
(5) Persistent bubbles from air line indicate faulty wheel valve.
(6) Connect wheel valve to hub at banjo bolt.

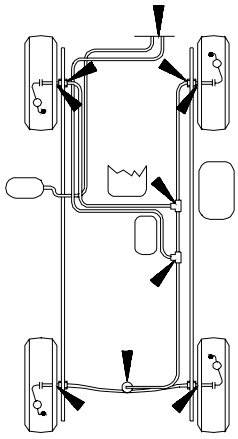


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NOTE

If air line from quick release valve to affected wheel is partially obstructed, air line to wheel cannot escape back to quick release valve immediately after tire is pressurized causing wheel valve to remain partially open and tire to lose pressure. System will cycle again when low pressure is checked after 30 seconds.

(1) Check air supply line(s) from quick release valve(s) to affected wheel(s) for constrictions. See illustration for fitting and quick release valve locations.
(2) If air supply line is not constricted, quick release valve for affected wheel is faulty.



AIR HOSE FITTINGS WHEELS TO QUICK RELEASE VALVES

32M0405-

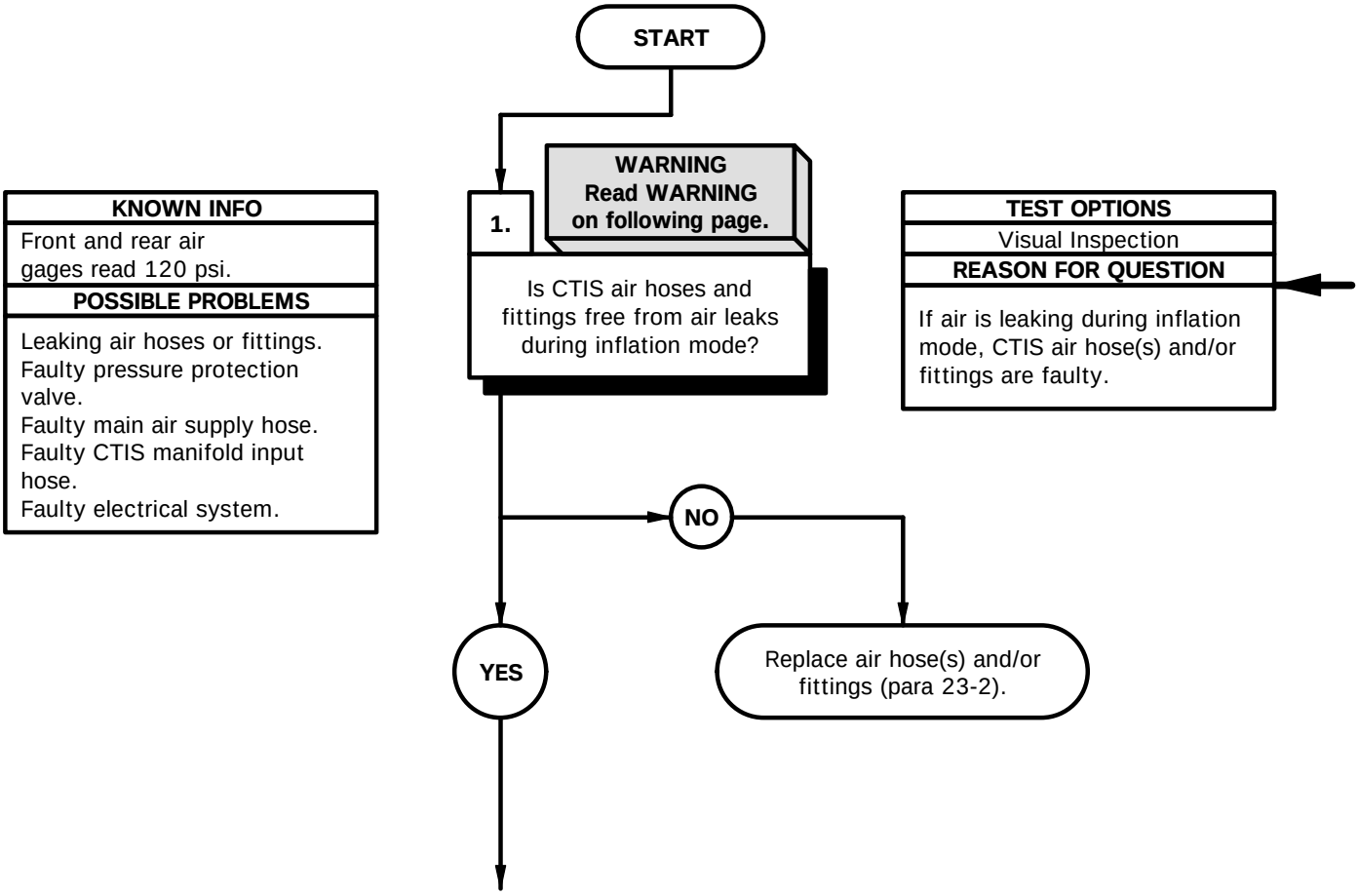
m5. CENTRAL TIRE INFLATION SYSTEM (CTIS) ECU INDICATES NO FAULT CODE BUT SYSTEM FAILS TO INFLATE OR DEFLATE

INITIAL SETUP

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

Materials/Parts
Soap, Laundry (Item 69, Appendix D)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Pan, Wash (Item 25, Appendix C)
Goggles, Industrial (Item 15, Appendix C)

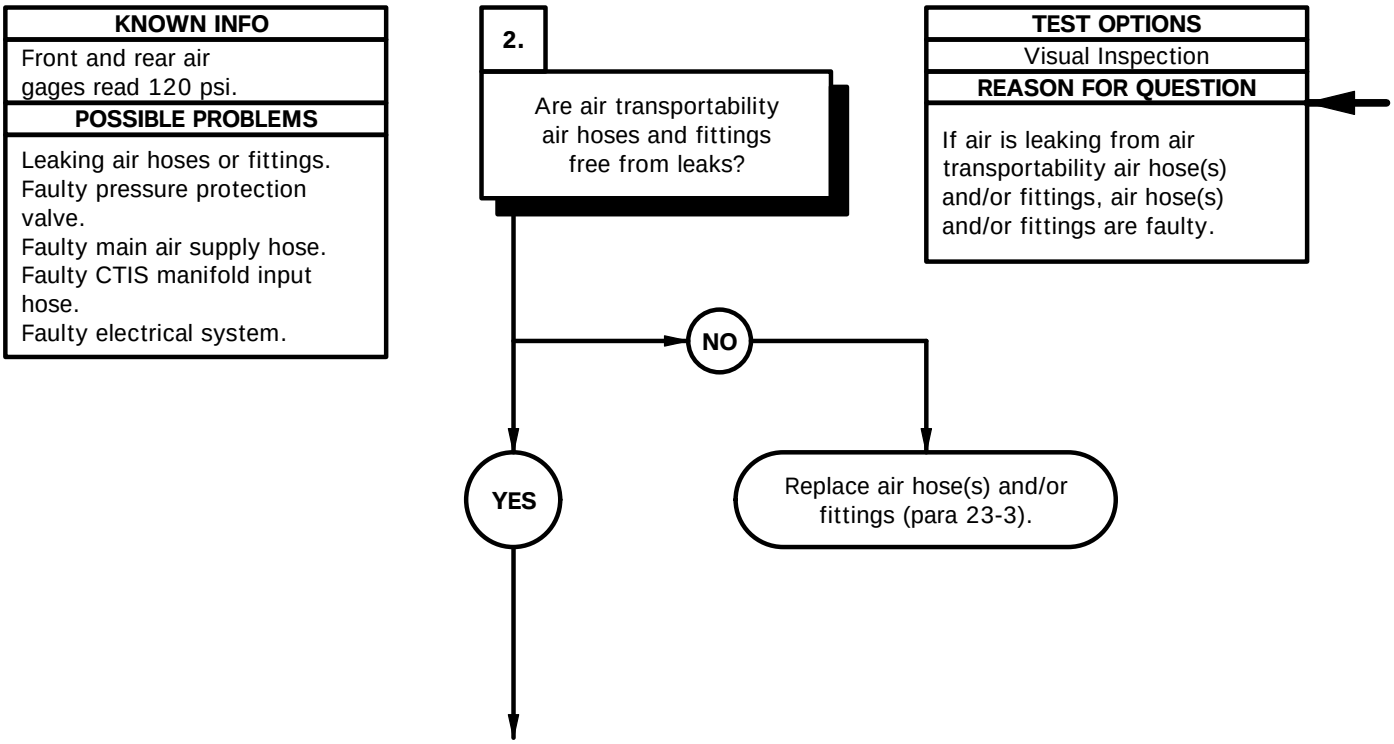


WARNING

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

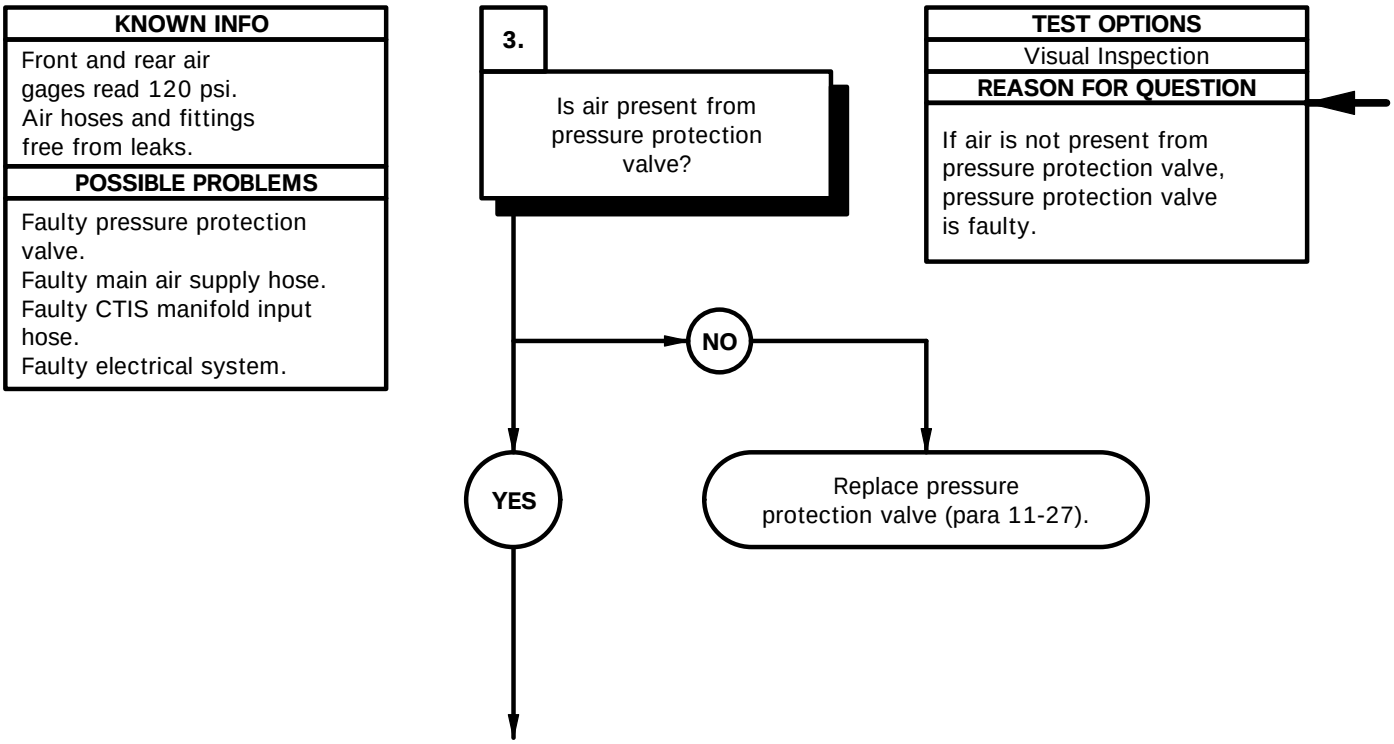
(1) Start engine (TM 9-2320-365-10).
(2) Set CTIS ECU to RUN FLAT mode (TM 9-2320-365-10).
(3) Apply soapy water solution to CTIS air hoses and fittings (Table 23-2 Central Tire Inflation System (CTIS) Air Hose Locations).
(4) Check for soap bubbles indicating leaks.
(5) If any leaks are found, replace CTIS air hose and/or fittings (para 23-2).
(6) Shut down engine (TM 9-2320-365-10).

m5. CENTRAL TIRE INFLATION SYSTEM (CTIS) ECU INDICATES NO FAULT CODE BUT SYSTEM FAILS TO INFLATE OR DEFLATE (CONT)

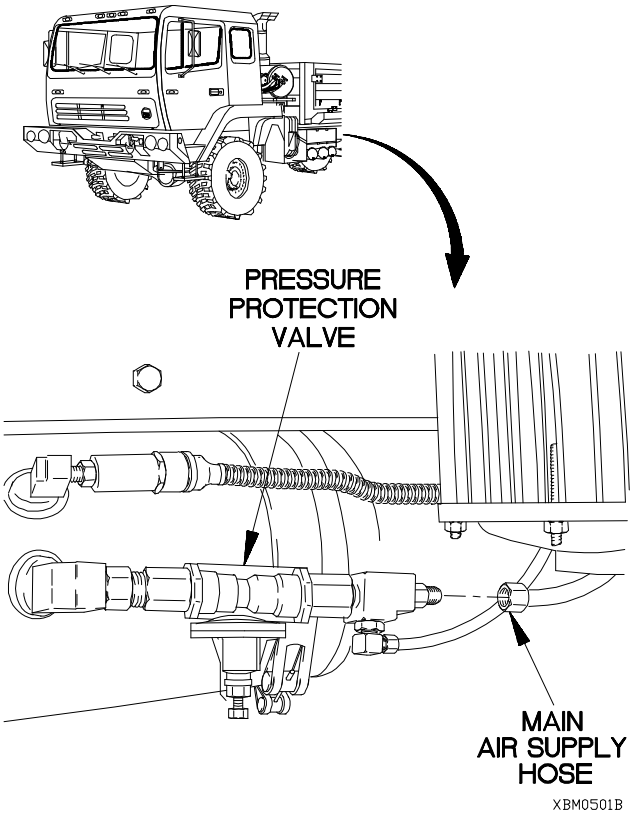


(1) Start engine (TM 9-2320-365-10).
(2) Apply soapy water solution to air transportability air hoses and fittings (Table 23-3. Air Transportability Air Hose Locations).
(3) Check for soap bubbles indicating leaks.
(4) If any leaks are found, replace air transportability air hose and/or fittings (para 23-3).
(5) Shut down engine (TM 9-2320-365-10).

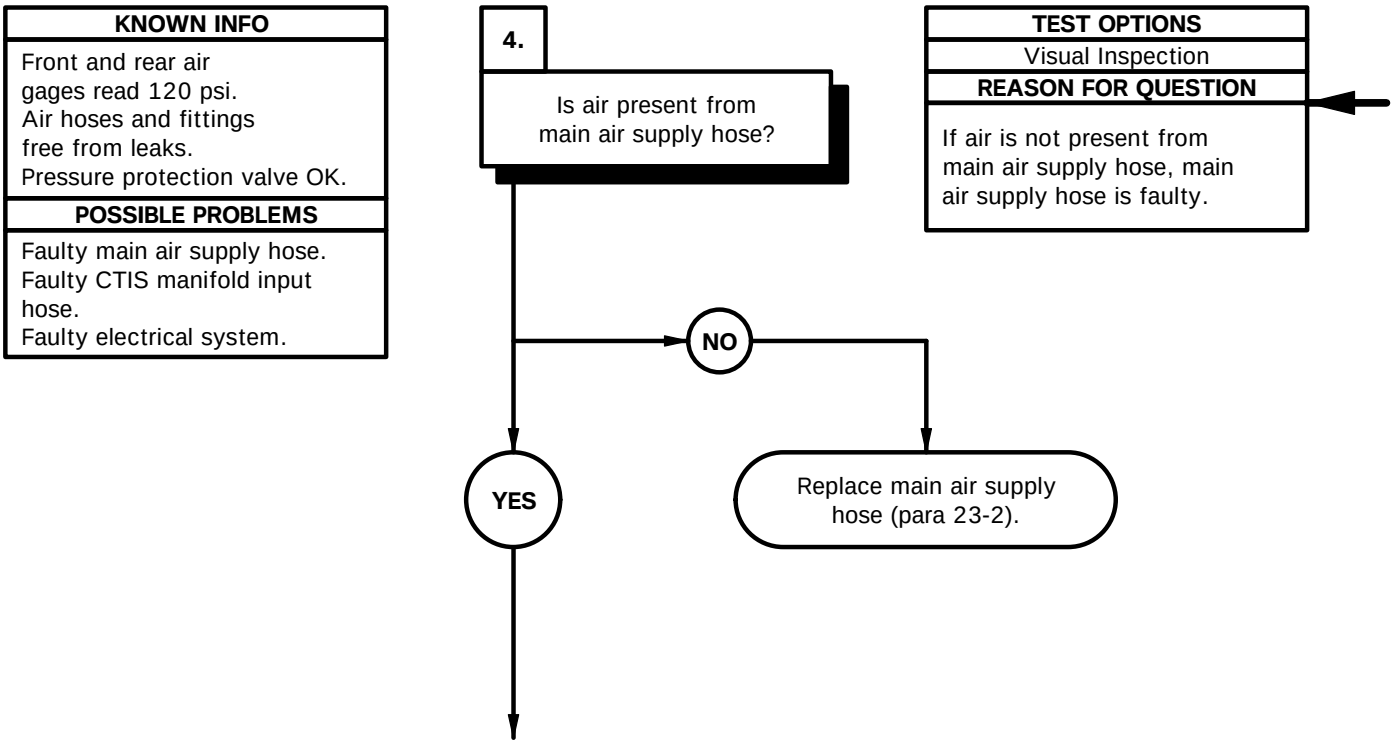
m5. CENTRAL TIRE INFLATION SYSTEM (CTIS) ECU INDICATES NO FAULT CODE BUT SYSTEM FAILS TO INFLATE OR DEFLATE (CONT)



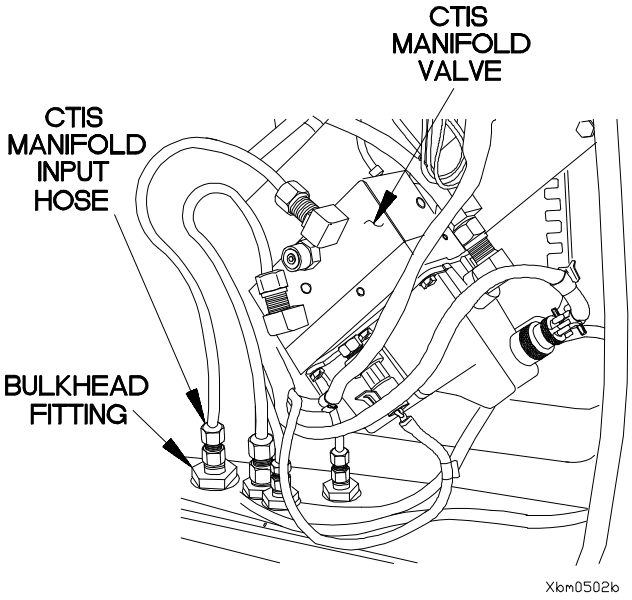
(1) Disconnect main air supply hose from pressure protection valve.
(2) Start engine (TM 9-2320-365-10).
(3) If air is not present from pressure protection valve, replace pressure protection valve (para 11-27).
(4) Shut down engine (TM 9-2320-365-10).
(5) Connect main air supply hose to pressure protection valve.



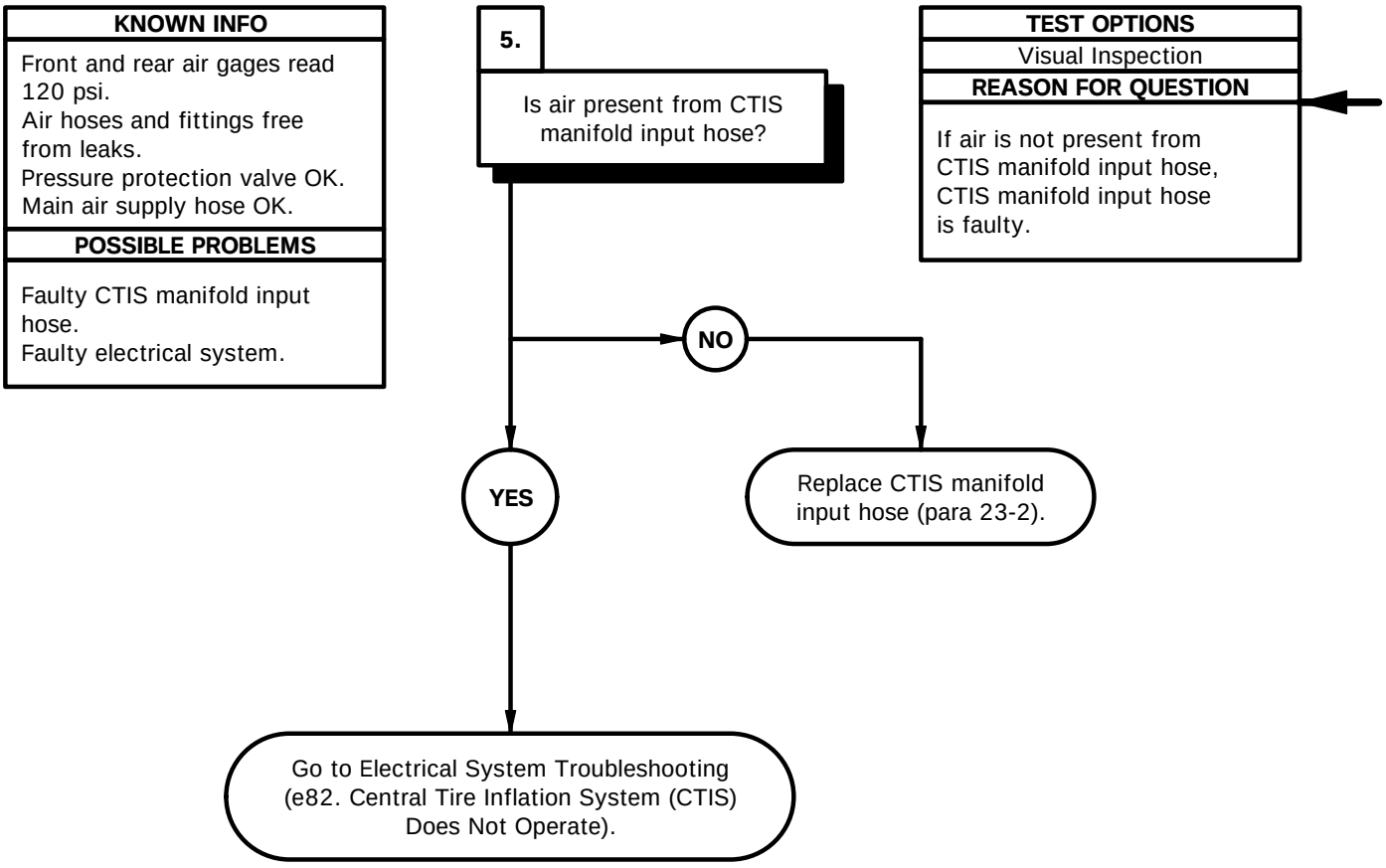
m5. CENTRAL TIRE INFLATION SYSTEM (CTIS) ECU INDICATES NO FAULT CODE BUT SYSTEM FAILS TO INFLATE OR DEFLATE (CONT)



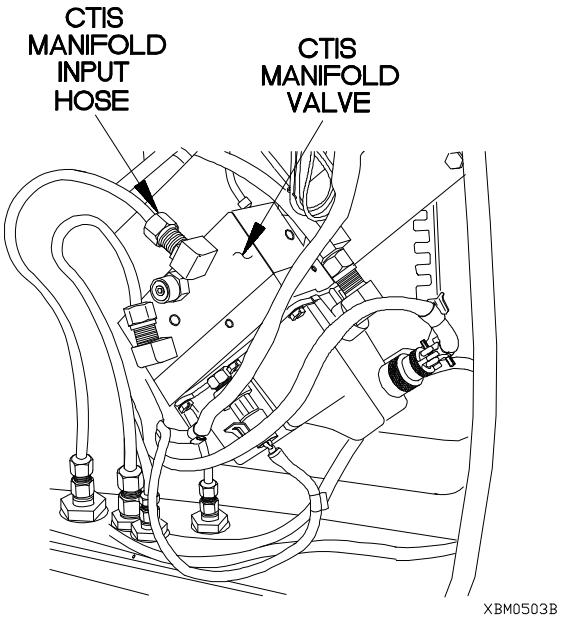
(1) Remove kick panel (para 16-3).
(2) Disconnect CTIS manifold input hose from cab bulkhead fitting.
(3) Start engine (TM 9-2320-365-10).
(4) If air is not present from cab bulkhead fitting, replace main air supply hose (para 23-2).
(5) Shut down engine (TM 9-2320-365-10).
(6) Connect CTIS manifold input hose to cab bulkhead fitting.



m5. CENTRAL TIRE INFLATION SYSTEM (CTIS) ECU INDICATES NO FAULT CODE BUT SYSTEM FAILS TO INFLATE OR DEFLATE (CONT)



(1) Disconnect CTIS manifold input hose from CTIS manifold valve.
(2) Start engine (TM 9-2320-365-10).
(3) If air is not present from CTIS manifold input hose, replace CTIS manifold input hose (para 23-2).
(4) If air is present from CTIS manifold input hose go to Electrical Troubleshooting (e82. Central Tire Inflation System (CTIS) Does Not Operate).
(5) Shut down engine (TM 9-2320-365-10).
(6) Connect CTIS manifold input hose to CTIS manifold valve.
(7) Install kick panel (para 16-3).



m6. CTIS OVERSPEED WARNING LIGHT DOES NOT ILLUMINATE AND/OR OVERSPEED PRESSURE CHANGE

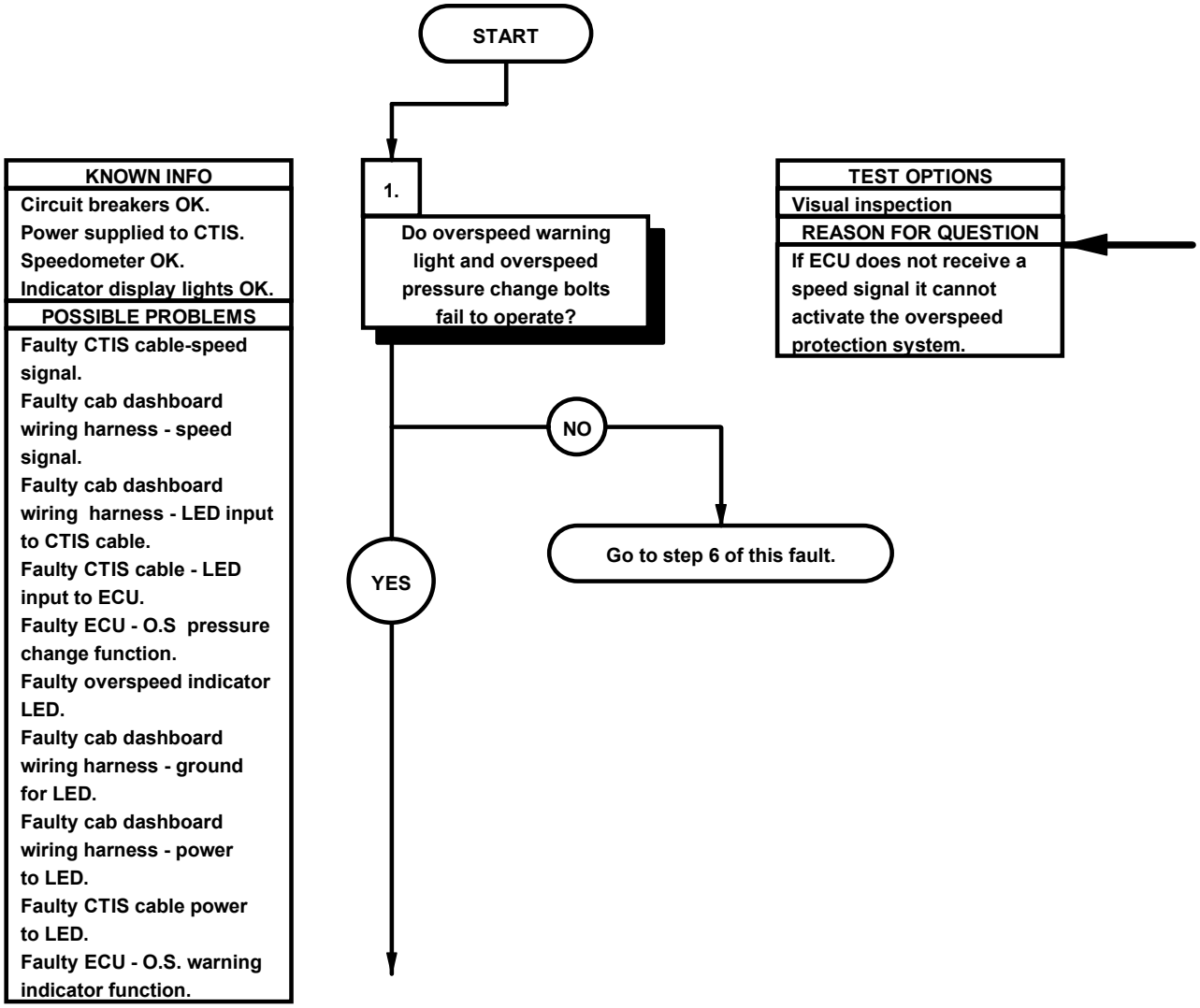
INITIAL SETUP

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

Personnel Required
(2)

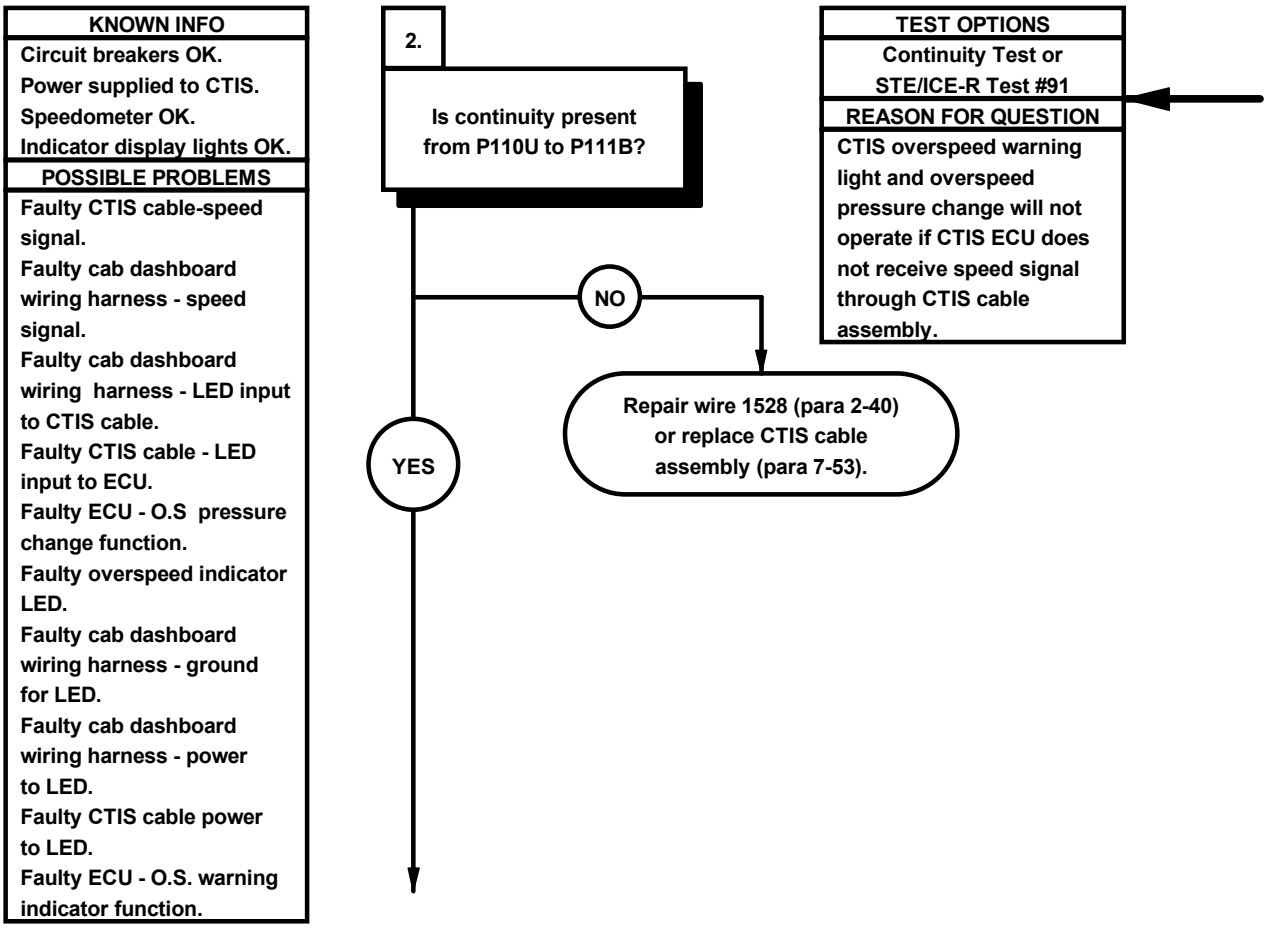
References
TM 9-4910-571-12&P

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Wrench, Torque, 0-75 lb-in. (Item 86, Appendix B)
STE/ICE-R (Item 39, Appendix C)

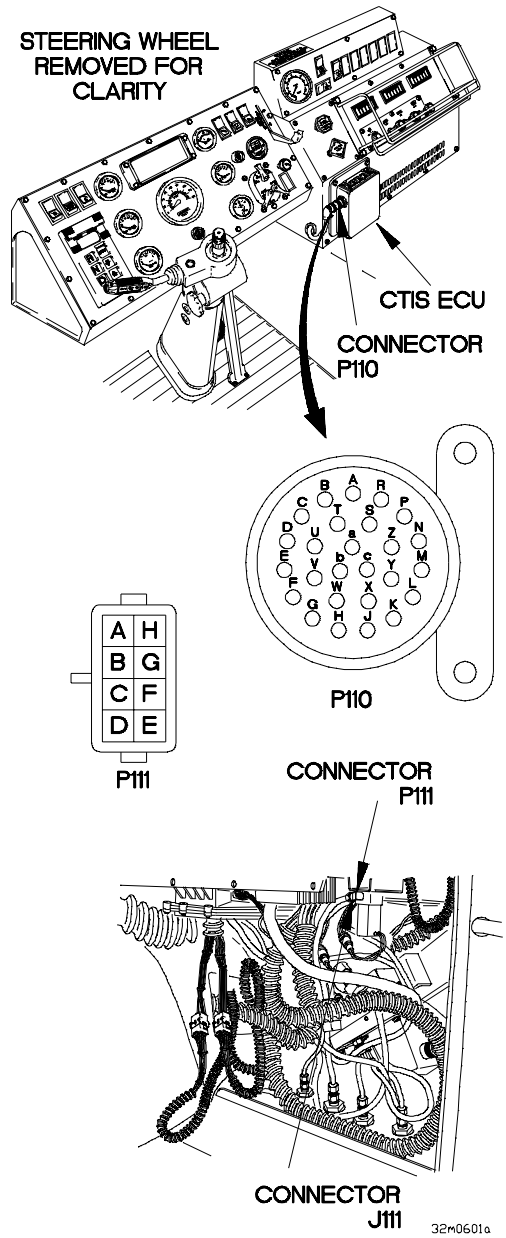


(1) Select X-C mode at CTIS ECU (TM 9-2320-365-10).
(2) Turn on headlights (TM 9-2320-365-10).
(3) Perform road test.
(4) Increase speed to 40 mph.
(5) Check if overspeed warning light flashes.
(6) After about one minute, check if overspeed pressure change is activated to raise tire pressure to HWY mode.
(7) If both functions fail to activate, speed signal to ECU is faulty or ECU may be faulty.
(8) Shut down engine (TM 9-2320-365-10).

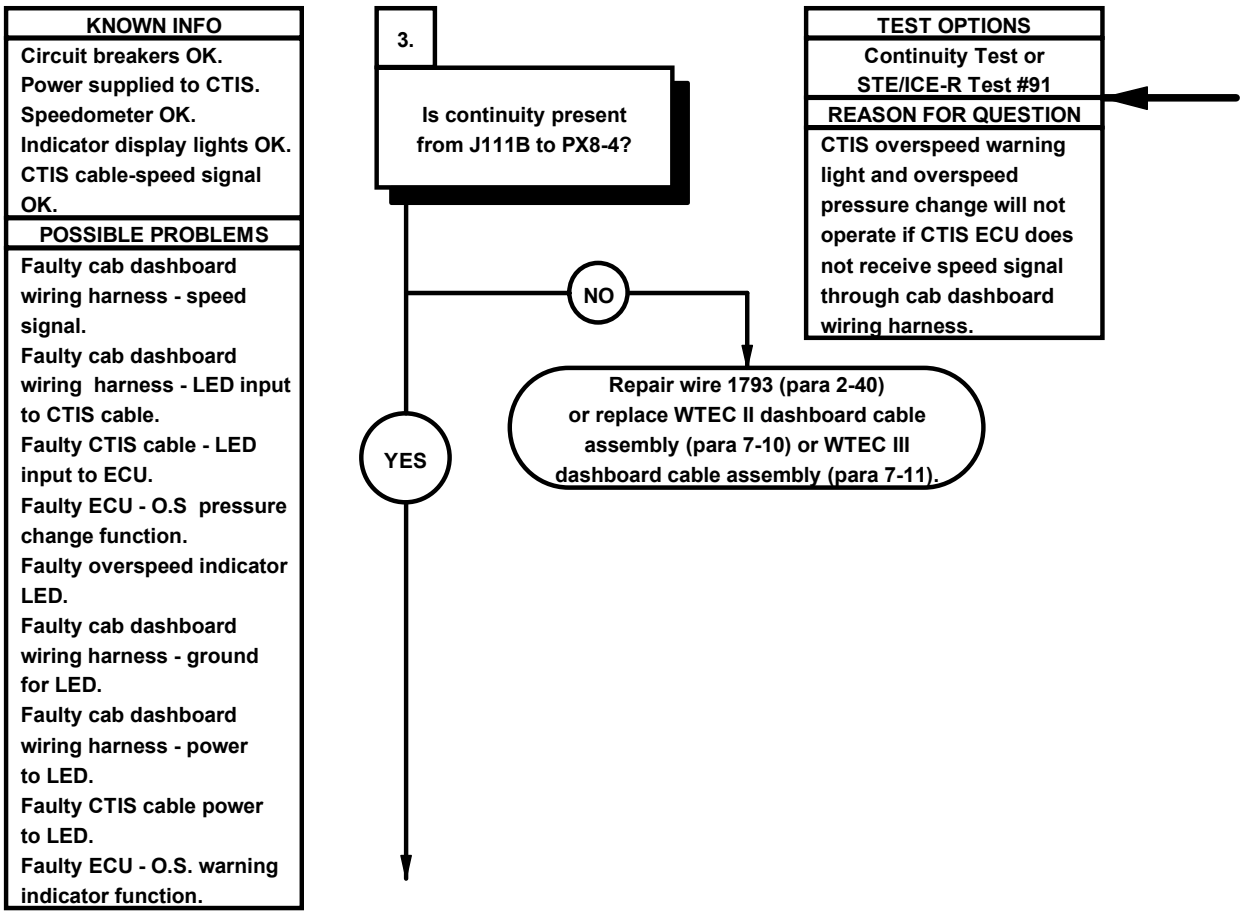
m6. CTIS OVERSPEED WARNING LIGHT DOES NOT ILLUMINATE AND/OR OVERSPEED PRESSURE CHANGE (CONT)



CONTINUITY TEST
(1) Remove kick panel (para 16-3).
(2) Disconnect connector P110 from CTIS ECU.
(3) Disconnect connector P111 from connector J111.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to connector P110U.
(6) Connect negative (-) probe of multimeter to connector P111B and note reading on multimeter.
(7) If continuity is not present, repair wire 1528 (para 2-40) or replace CTIS cable assembly (para 7-53).

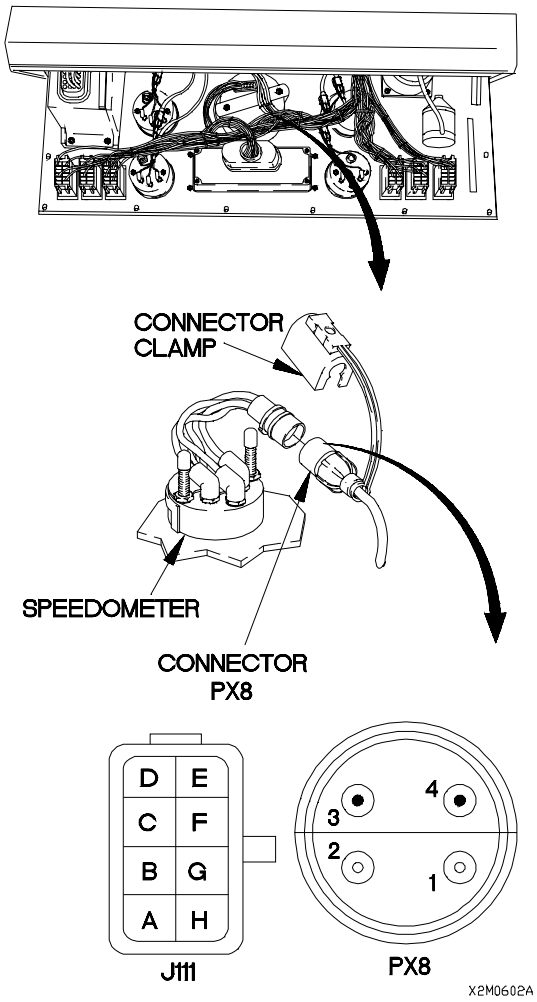


m6. CTIS OVERSPEED WARNING LIGHT DOES NOT ILLUMINATE AND/OR OVERSPEED PRESSURE CHANGE (CONT)



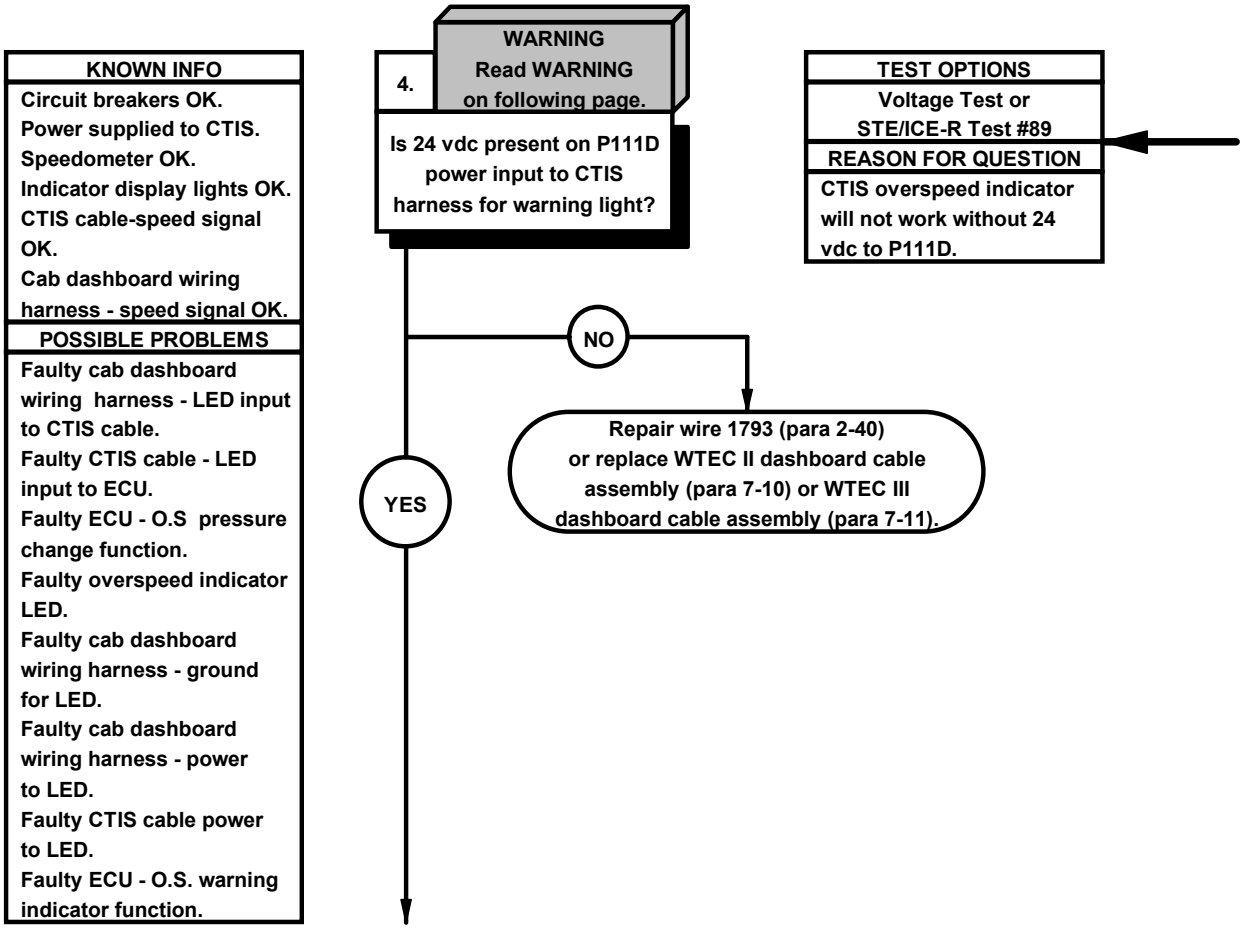
CONTINUITY TEST

(1) Remove instrument panel assembly for access (para 7-15).
(2) Disconnect connector clamp from speedometer connector.
(3) Disconnect connector PX8 from speedometer.
(4) Set multimeter to ohms position.
(5) Connect positive (+) probe of multimeter to connector J111B.
(6) Connect negative (-) probe of multimeter to connector PX8-4 and note reading on multimeter.
(7) If continuity is not present, repair wire 1793 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(8) Connect connector PX8 to speedometer.
(9) Connect connector clamp to speedometer connector.
(10) Install instrument panel assembly (para 7-15).



X2M0602A

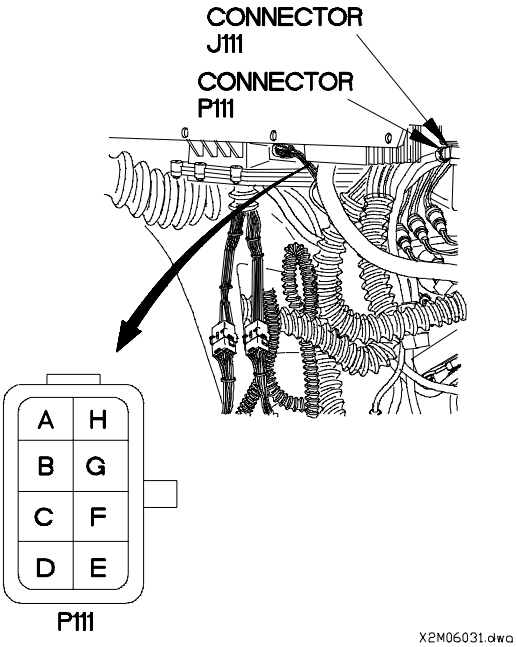
m6. CTIS OVERSPEED WARNING LIGHT DOES NOT ILLUMINATE AND/OR OVERSPEED PRESSURE CHANGE (CONT)



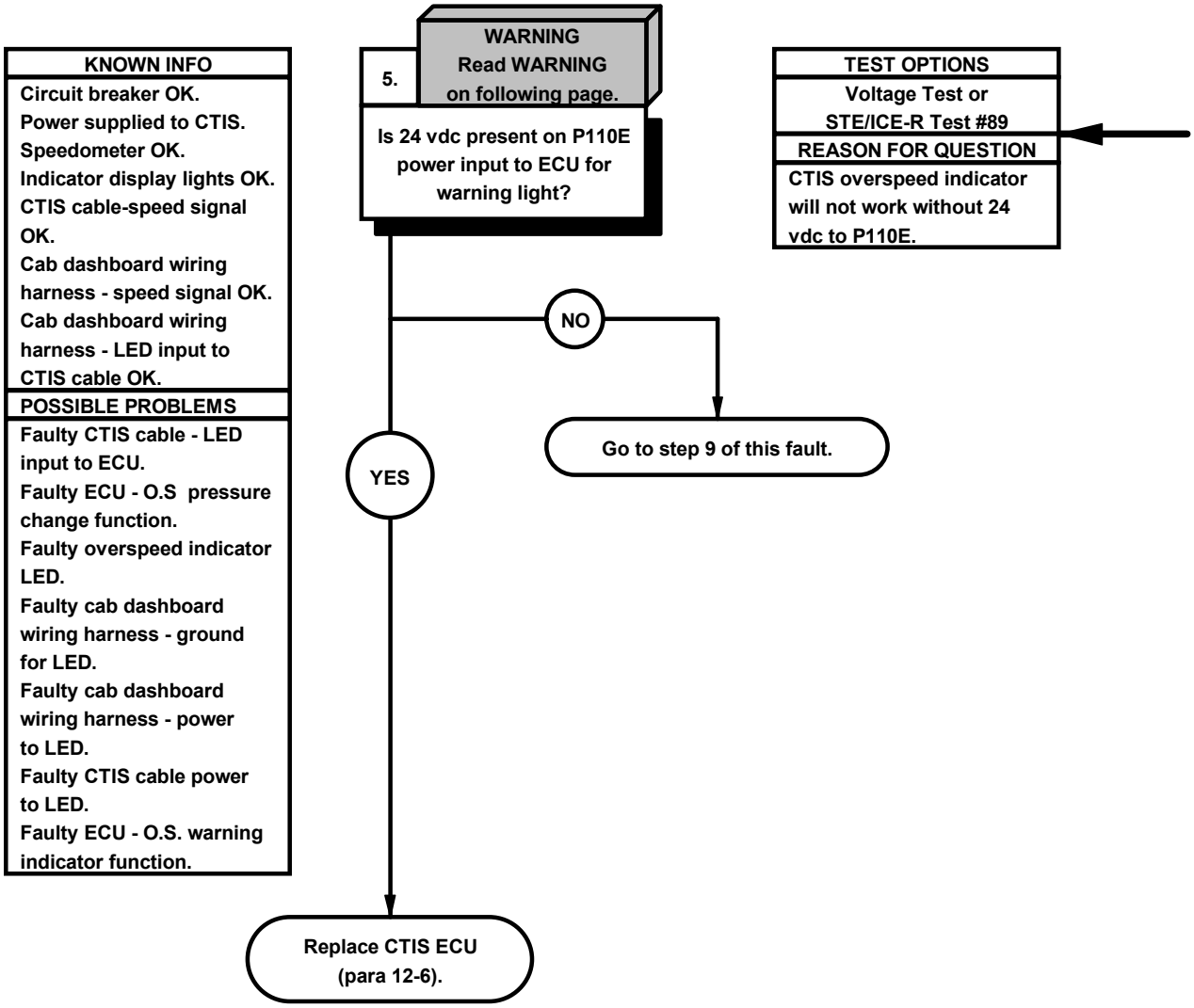
WARNING

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) Position master power switch to on (TM 9-2320-365-10).
(2) Connect positive (+) probe of multimeter to connector P111D.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If 24 vdc is not present, repair wire 1793 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(5) Position master power switch to off (TM 9-2320-365-10).
(6) Connect connector P111 to connector J111.



m6. CTIS OVERSPEED WARNING LIGHT DOES NOT ILLUMINATE AND/OR OVERSPEED PRESSURE CHANGE (CONT)

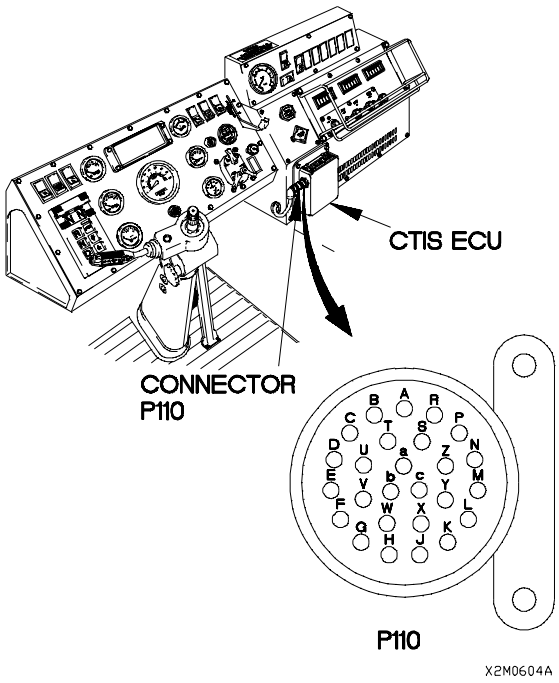


WARNING

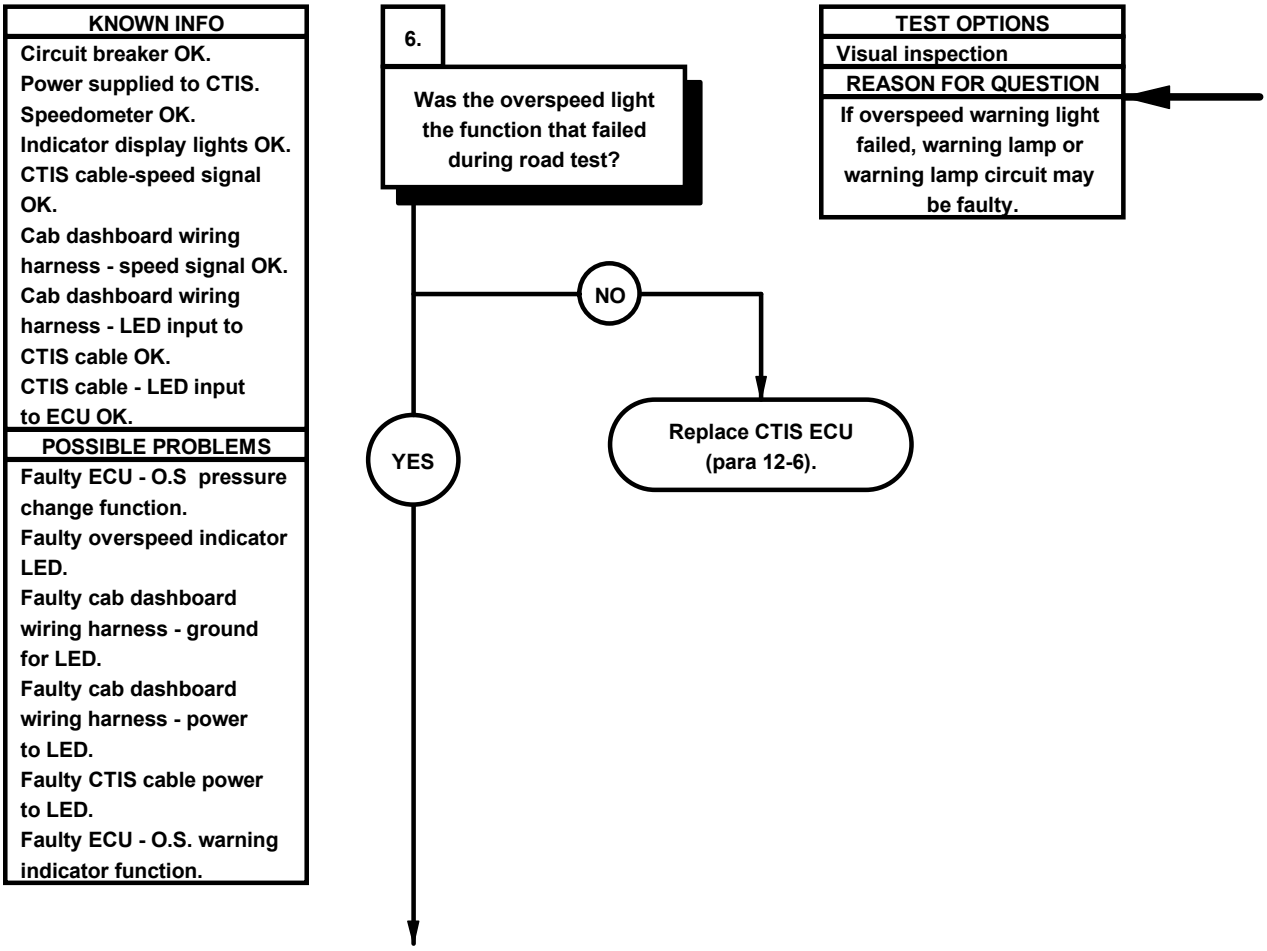
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

(1) Position master power switch to on (TM 9-2320-365-10).
(2) Connect positive (+) probe of multimeter to connector P110E.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If 24 vdc is not present, CTIS wiring harness is faulty.
(5) If 24 vdc is present, replace CTIS ECU (para 12-6).
(6) Position master power switch to off (TM 9-2320-365-10).
(7) Connect connector P110 to CTIS ECU.

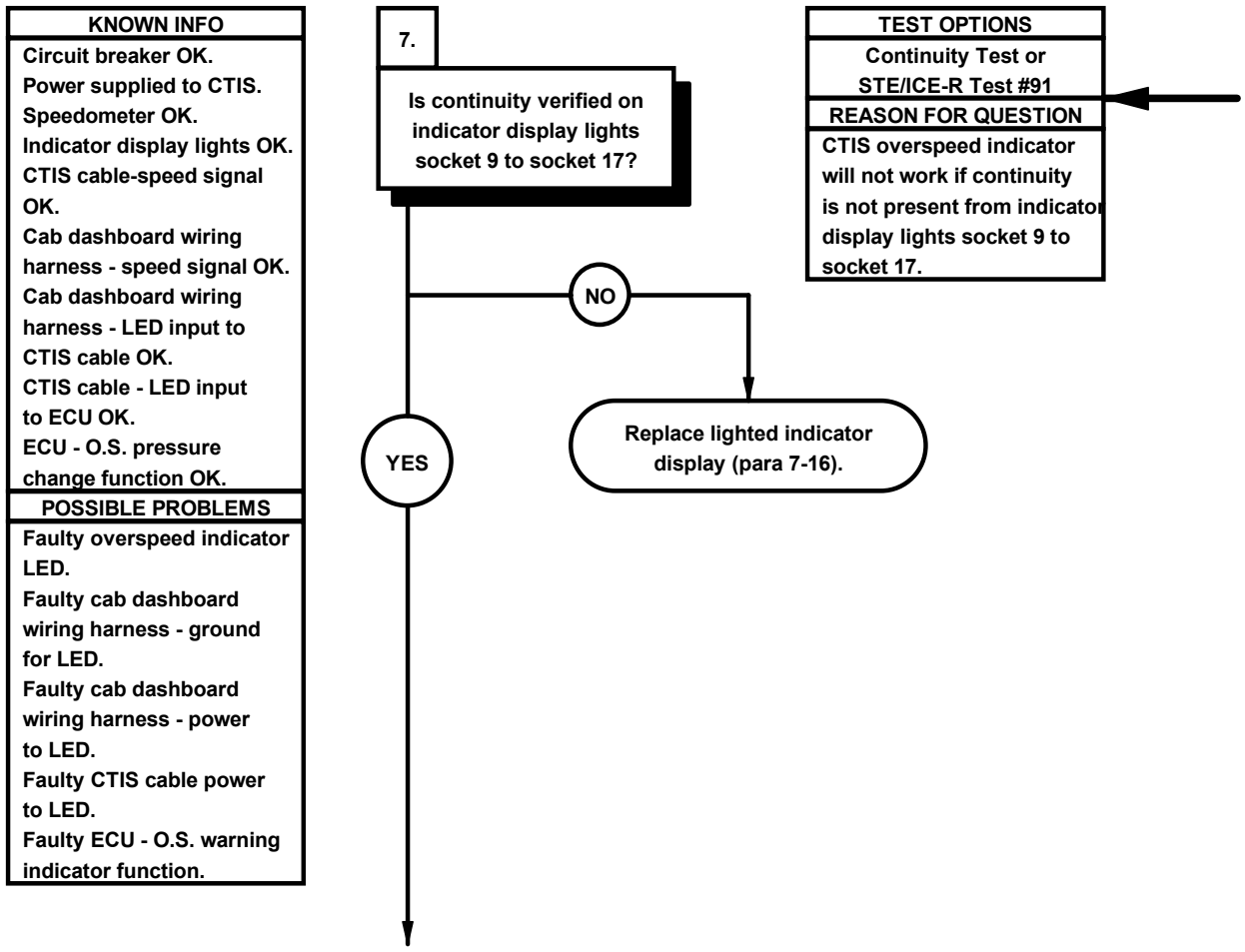


m6. CTIS OVERSPEED WARNING LIGHT DOES NOT ILLUMINATE AND/OR OVERSPEED PRESSURE CHANGE (CONT)

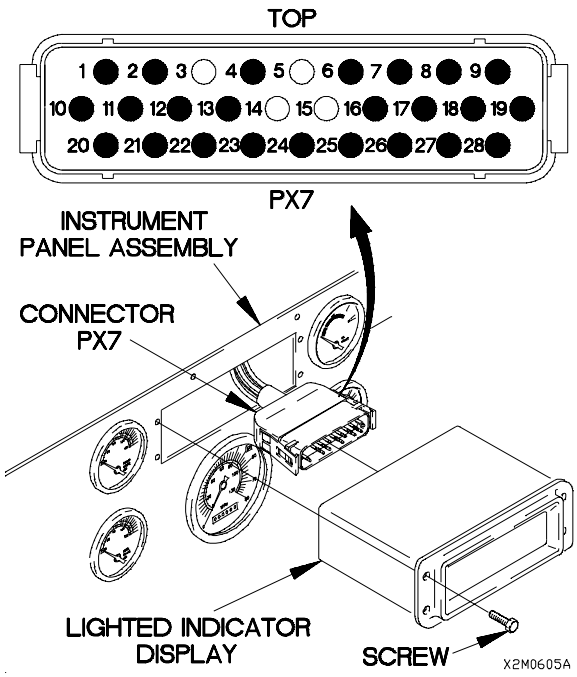


(1) If overspeed warning light failed on road test while overspeed pressure change occurred;
   (a) Warning lamp may be faulty.
   (b) Wiring from CTIS ECU to lamp or lamp to ground may be faulty.
   (c) CTIS ECU may be faulty.
(2) If overspeed warning light flashed on road test while overspeed pressure change did not occur, CTIS ECU has received a good speed signal but has not translated the signal into an overspeed inflation. CTIS ECU is faulty.

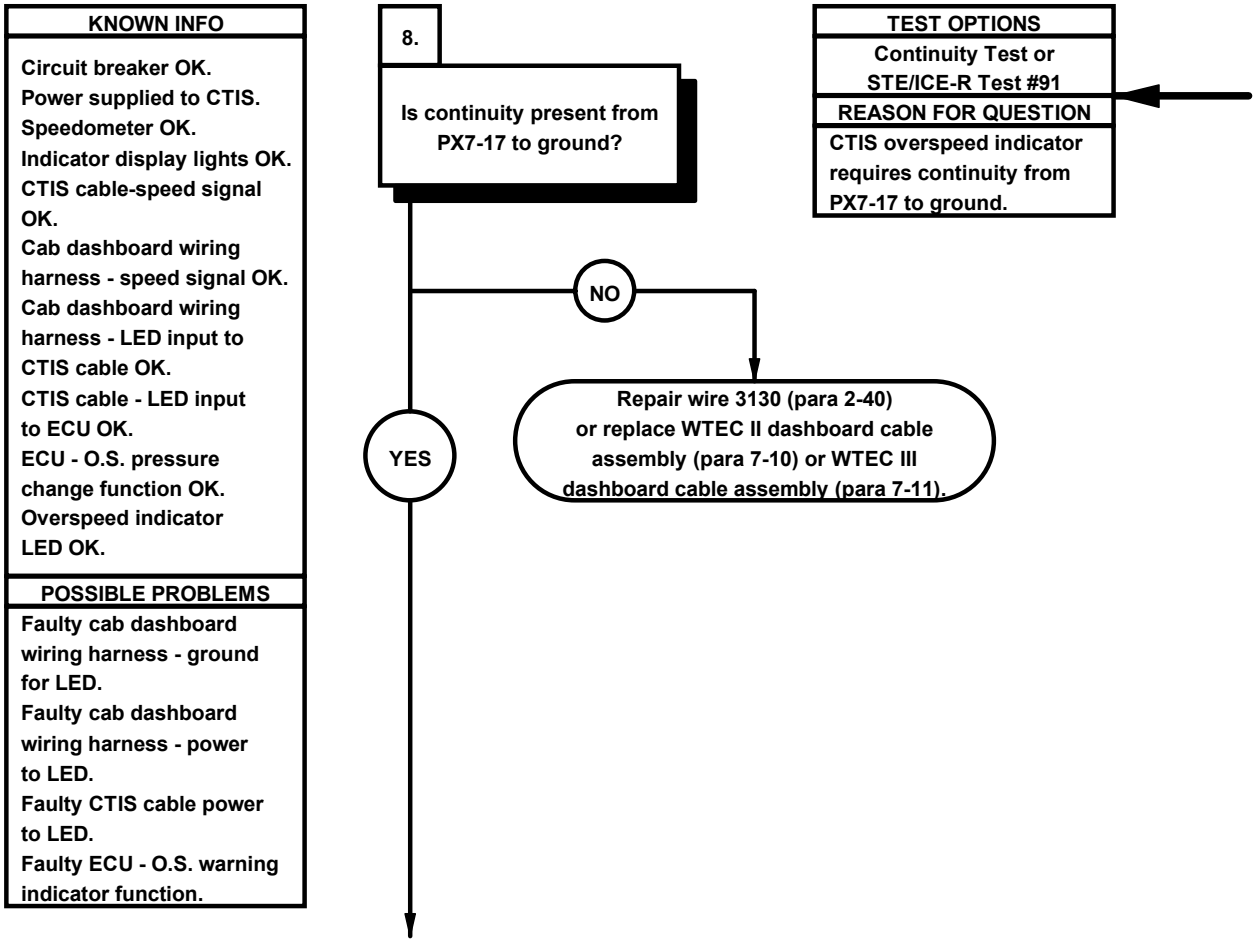
m6. CTIS OVERSPEED WARNING LIGHT DOES NOT ILLUMINATE AND/OR OVERSPEED PRESSURE CHANGE (CONT)



CONTINUITY TEST
(1) Remove four screws from lighted indicator display.
(2) Remove lighted indicator display from instrument panel assembly.
(3) Disconnect connector PX7 from lighted indicator display.
(4) Set multimeter to ohms.
(5) Connect positive (+) probe of multimeter to lighted indicator display terminal 17.
(6) Connect negative (-) probe of multimeter to lighted indicator terminal 9 and note reading on multimeter.
(7) If continuity is not present, replace lighted indicator display (para 7-16).

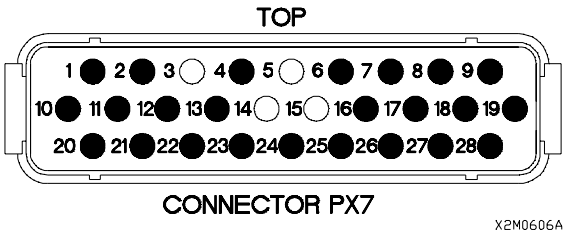


m6. CTIS OVERSPEED WARNING LIGHT DOES NOT ILLUMINATE AND/OR OVERSPEED PRESSURE CHANGE (CONT)

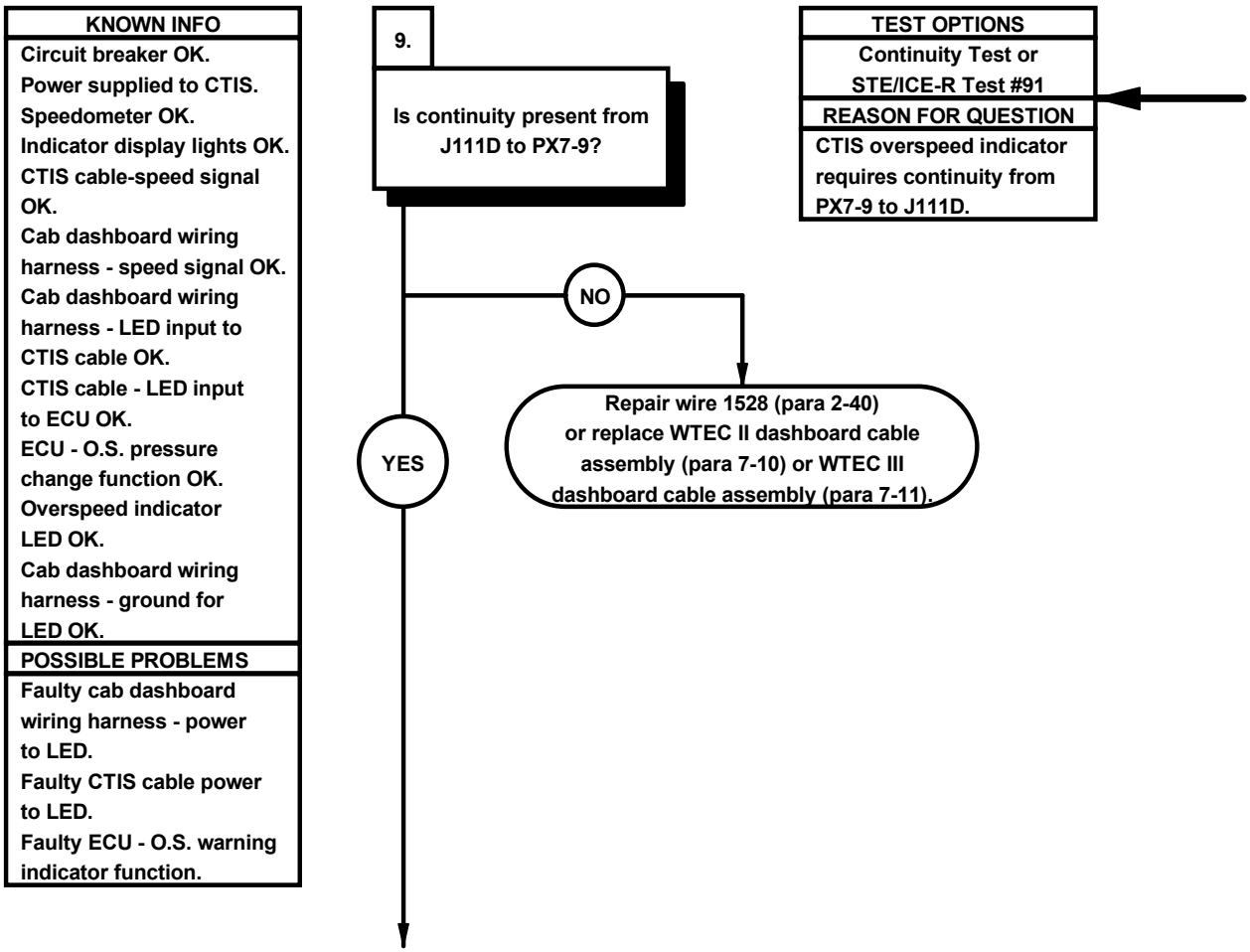


CONTINUITY TEST

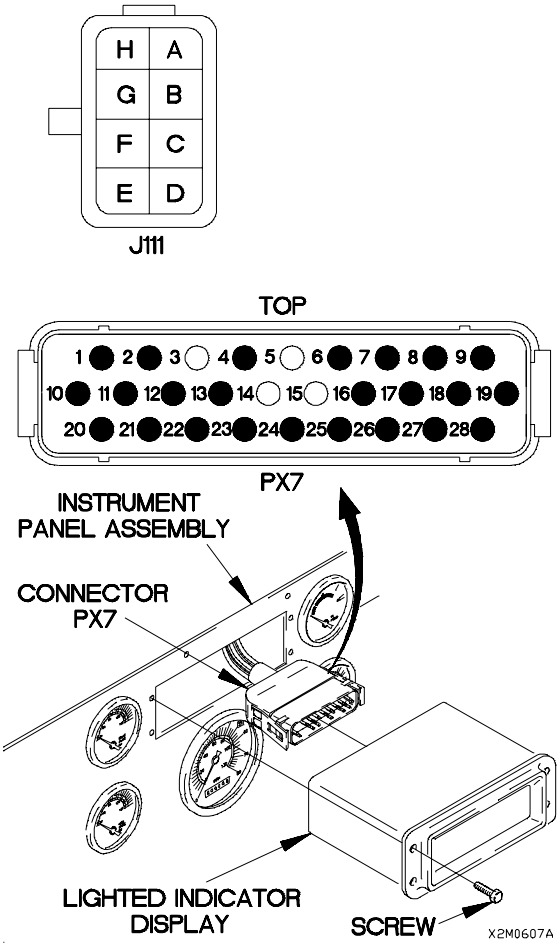
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector PX7-17.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair wire 3130 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).



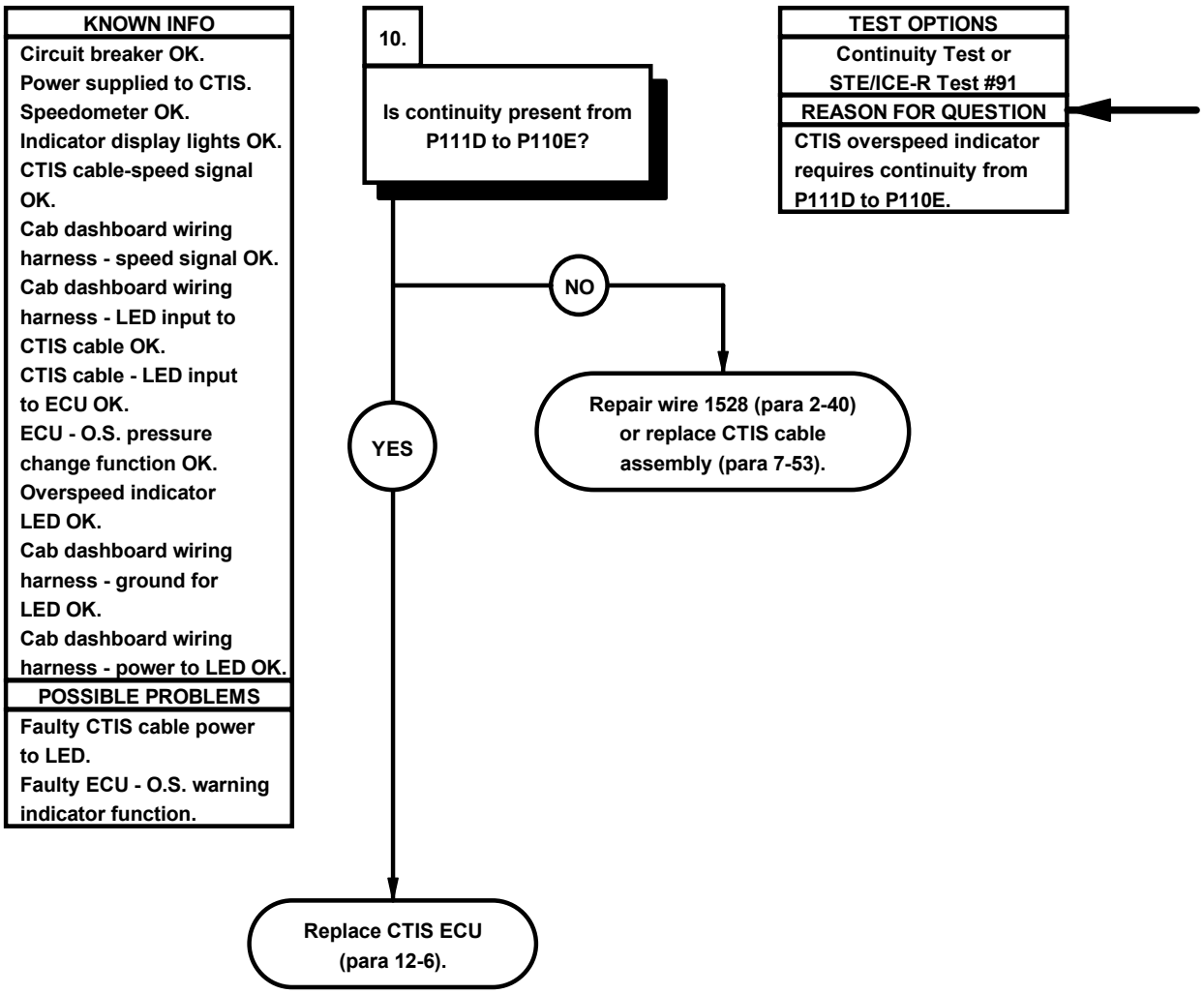
m6. CTIS OVERSPEED WARNING LIGHT DOES NOT ILLUMINATE AND/OR OVERSPEED PRESSURE CHANGE (CONT)



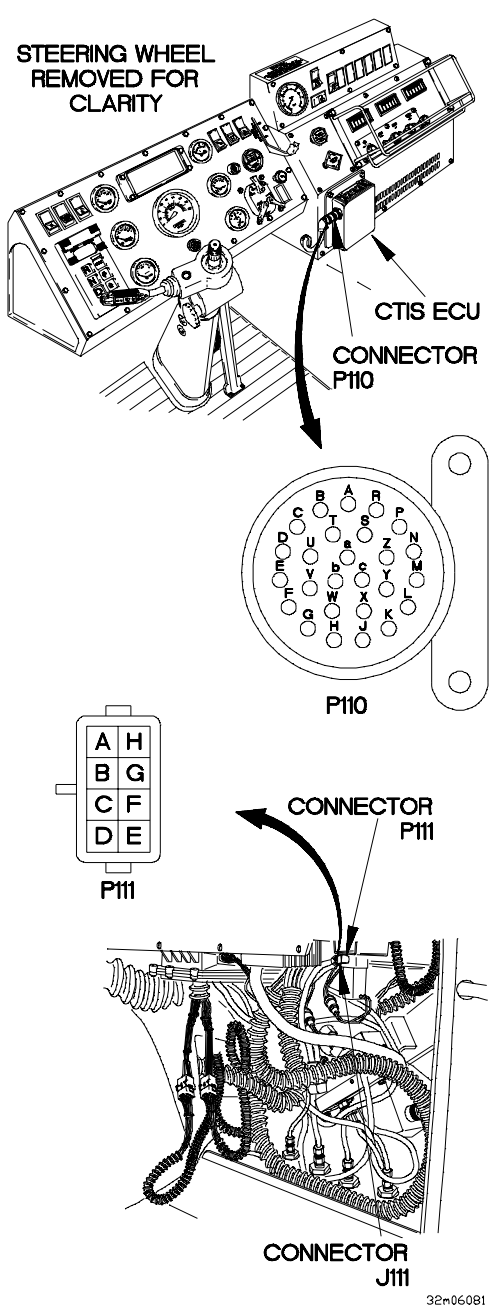
CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector PX7-9.
(3) Connect negative (-) probe of multimeter to connector J111D and note reading on multimeter.
(4) If continuity is not present, repair wire 1528 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
(5) Connect lighted indicator display to connector PX7.
(6) Position lighted indicator display in instrument panel assembly with four screws.
(7) Tighten four screws to 6-10 lb-in. (1 N·m).



m6. CTIS OVERSPEED WARNING LIGHT DOES NOT ILLUMINATE AND/OR OVERSPEED PRESSURE CHANGE (CONT)



CONTINUITY TEST
(1) Disconnect connector P110 from CTIS ECU.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector P111D.
(4) Connect negative (-) probe of multimeter to connector P110E and note reading on multimeter.
(5) If continuity is not present, repair wire 1528 (para 2-40) or replace CTIS cable assembly (para 7-53).
(6) If continuity is present, replace CTIS ECU (para 12-6).
(7) Connect connector P110 to CTIS ECU.
(8) Connect connector P111 to connector J111.
(9) Install kick panel (para 16-3).



2-25. AXLE TROUBLESHOOTING

This paragraph covers Axle Troubleshooting. The Axle Fault Index, Table 2-51, lists faults for the axles of the vehicle.

Table 2-51. Axle Fault Index

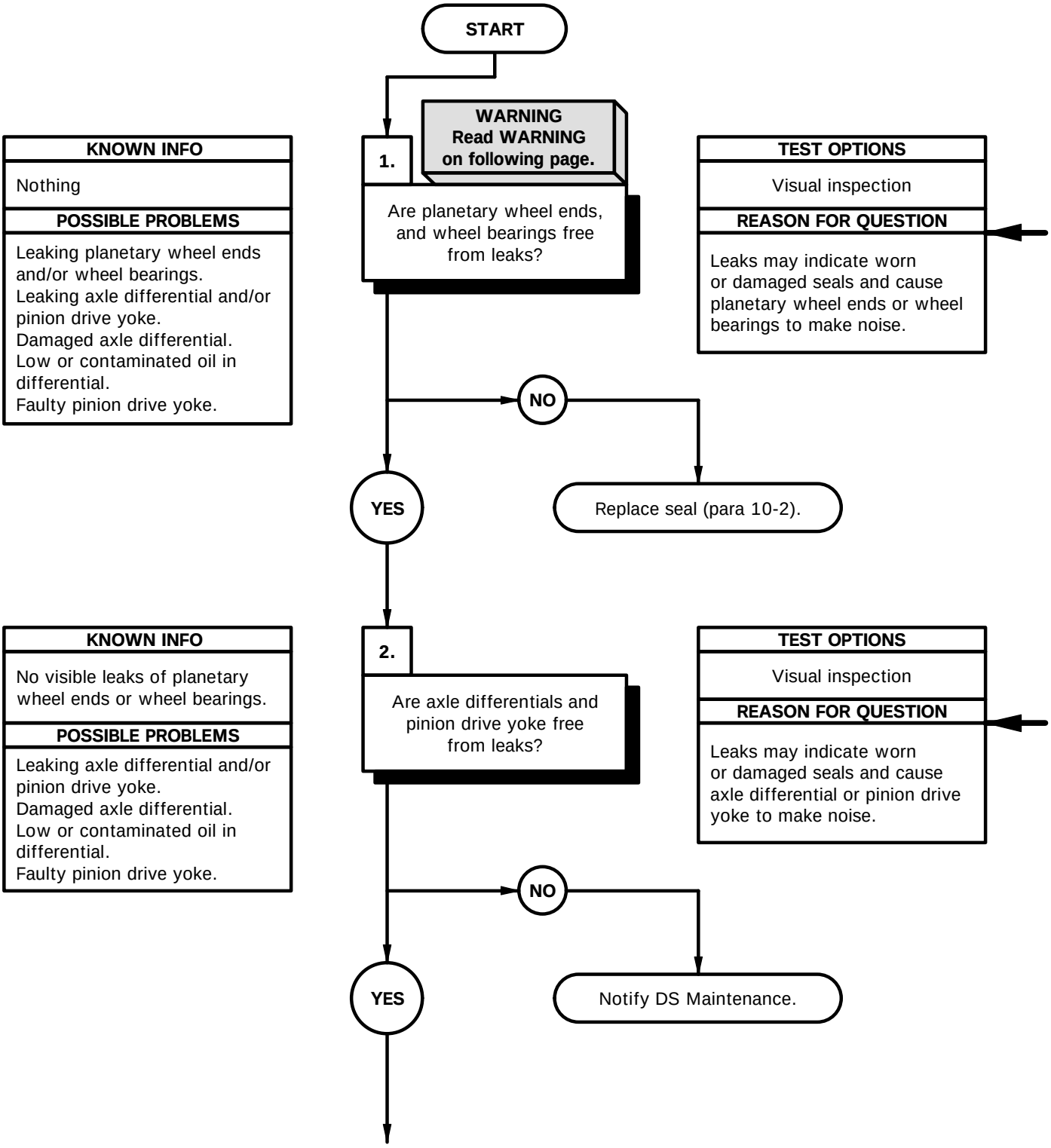
Fault No.	Description	Page
n1.	Axle Differential(s) Noisy	2-1896

n1. AXLE DIFFERENTIAL(S) NOISY

INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

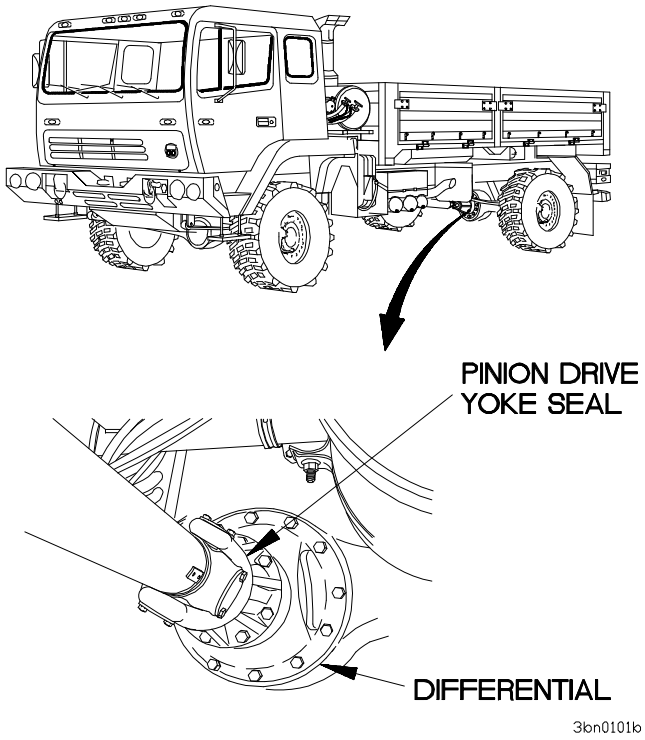


WARNING

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) Check planetary wheel ends for leaks (para 10-2).
(2) Check wheel bearings for leaks (para 10-2).
(3) If leaks are found replace seal(s) (para 10-2).

(1) Check differential and pinion drive yoke seal for leaks.
(2) If leaks are found, notify DS maintenance.



n1. AXLE DIFFERENTIAL(S) NOISY (CONT)

KNOWN INFO

No visible leaks of planetary wheel ends or wheel bearings.
No visible leaks of axle differential or pinion drive yoke.

POSSIBLE PROBLEMS

Damaged axle differential.
Low or contaminated oil in axle differential.
Faulty pinion drive yoke.

3. Are the axle differentials free from damage?

TEST OPTIONS

Visual inspection

REASON FOR QUESTION

Axle differential(s) may be unusually noisy when operating if damaged.

NO → Perform Propeller Shaft Troubleshooting (g1. Drive Shaft or Universal Joint Unusually Noisy When Operating

YES

KNOWN INFO

No visible leaks of planetary wheel ends or wheel bearings.
No visible leaks of axle differential or pinion drive yoke.
Axle differential(s) free from damage.

POSSIBLE PROBLEMS

Low or contaminated oil in axle differential.
Faulty pinion drive yoke.

4. Is the axle differential oil at proper level and free of contamination?

TEST OPTIONS

Visual inspection

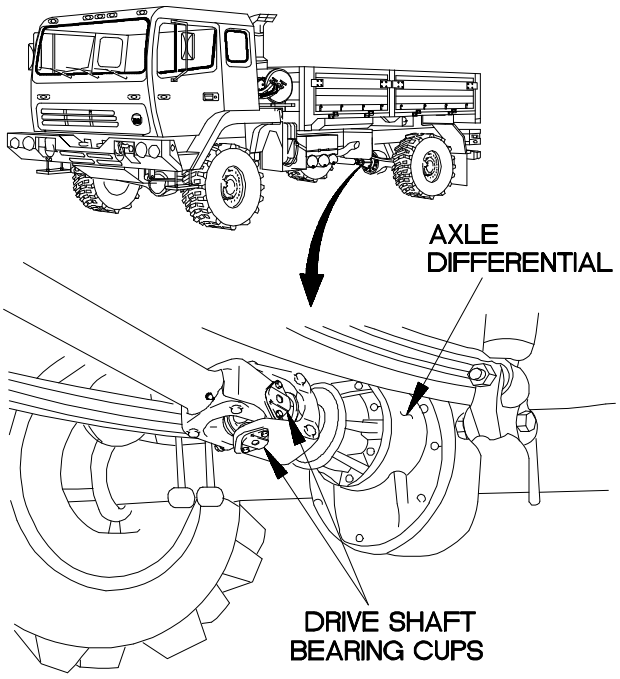
REASON FOR QUESTION

Low oil level will cause axle differential(s) to make unusual noises and lead to damage.

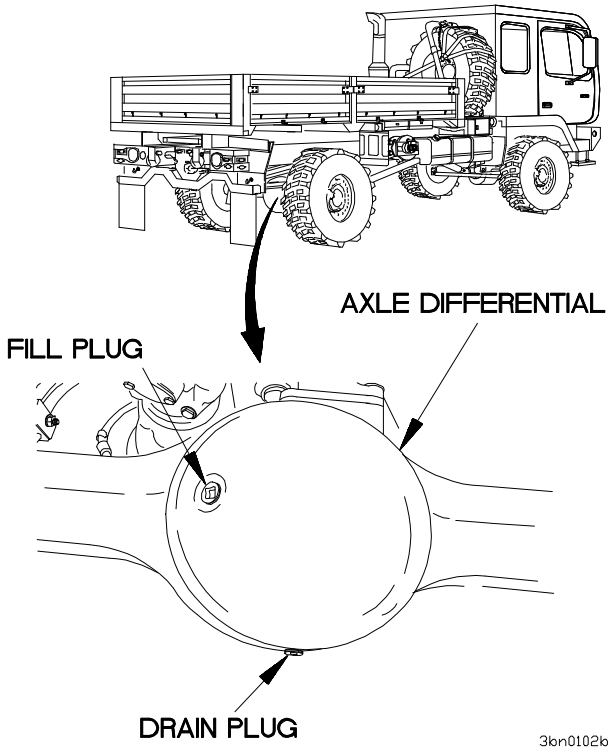
NO → Add/change oil (Appendix H).

YES

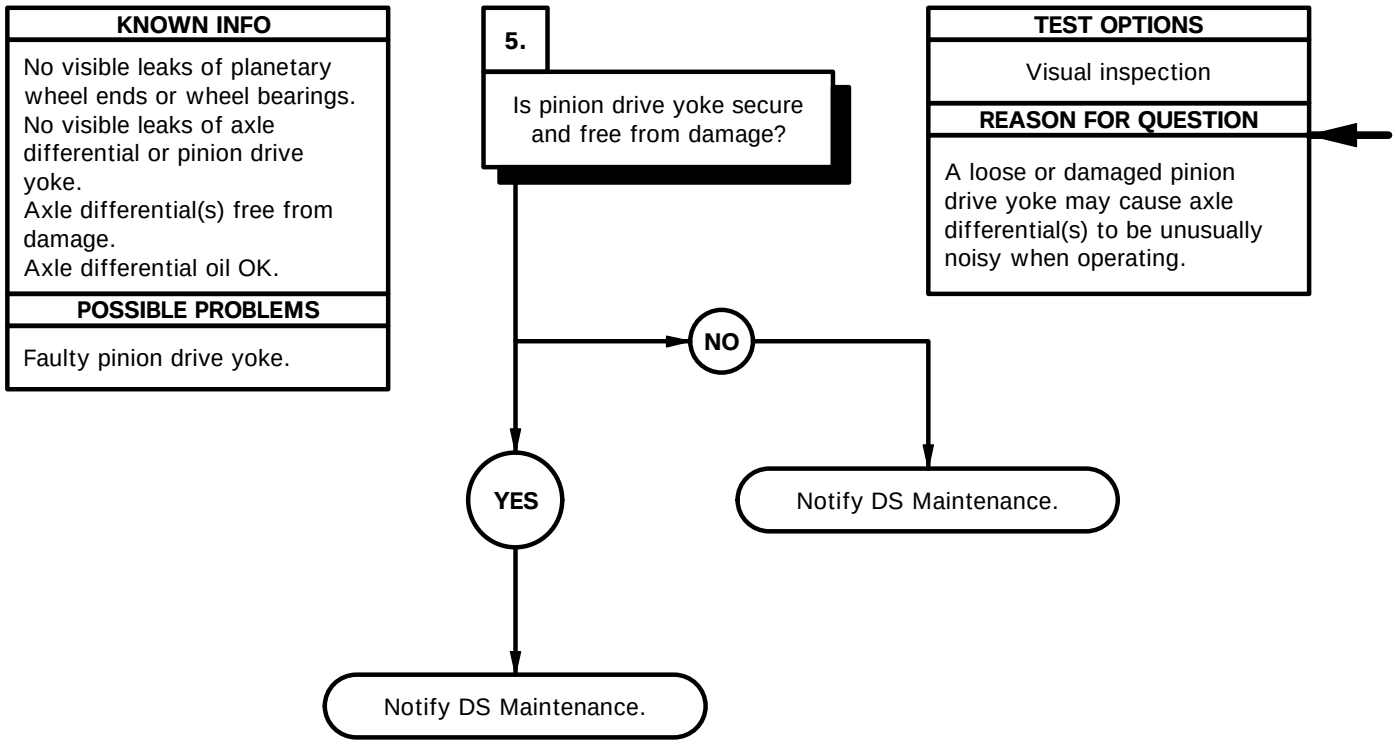
(1) Check axle differential for loose, missing, or damaged hardware.
(2) If axle differential is damaged, Notify DS Maintenance.
(3) Check drive shaft and bearing caps for looseness.
(4) If drive shaft is loose, perform Propeller Shaft Troubleshooting (g1. Drive Shaft or Universal Joint Unusually Noisy When Operating).



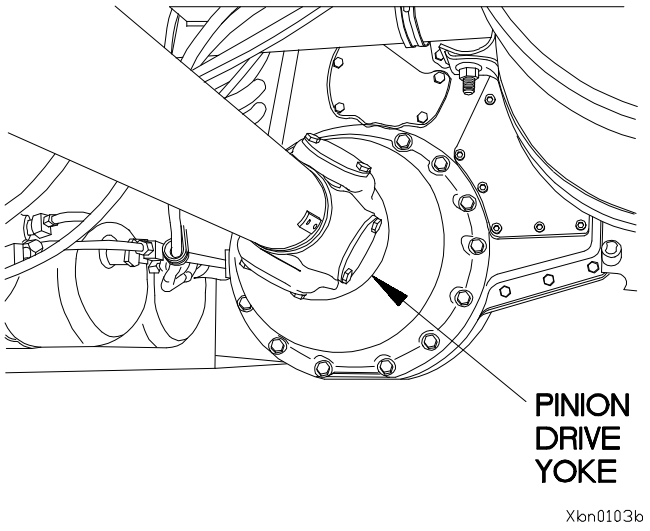
(1) Check oil level according to (Appendix H).
(2) Remove axle differential fill plug.
(3) Insert finger into axle differential to check oil level.
(4) Remove axle differential drain plug.
(5) Allow differential oil to drain into pan.
(6) Check oil for contamination. If metal chips are present, notify DS Maintenance.
(7) Install axle differential drain plug.
(8) Fill axle differential with oil (Appendix H).
(9) Install axle differential fill plug.



n1. AXLE DIFFERENTIAL(S) NOISY (CONT)



(1) Check pinion drive yoke for looseness by attempting to rotate pinion drive yoke in both directions and listening for unusual backlash noise.
(2) If pinion drive yoke is damaged, notify DS Maintenance.
(3) If pinion drive yoke is not damaged, notify DS Maintenance.



2-26. STEERING TROUBLESHOOTING

This paragraph covers Steering Troubleshooting. The Steering Fault Index, Table 2-52, lists faults for the steering of the vehicle.

Table 2-52. Steering Fault Index

Fault No.	Description	Page
p1.	Hard To Steer	2-1904
p2.	Wanders, Pulls To One Side, or Shimmies	2-1910
p3.	Excessive Play When Turning Steering Wheel	2-1916
p4.	No Response When Turning Steering Wheel	2-1920

p1. HARD TO STEER

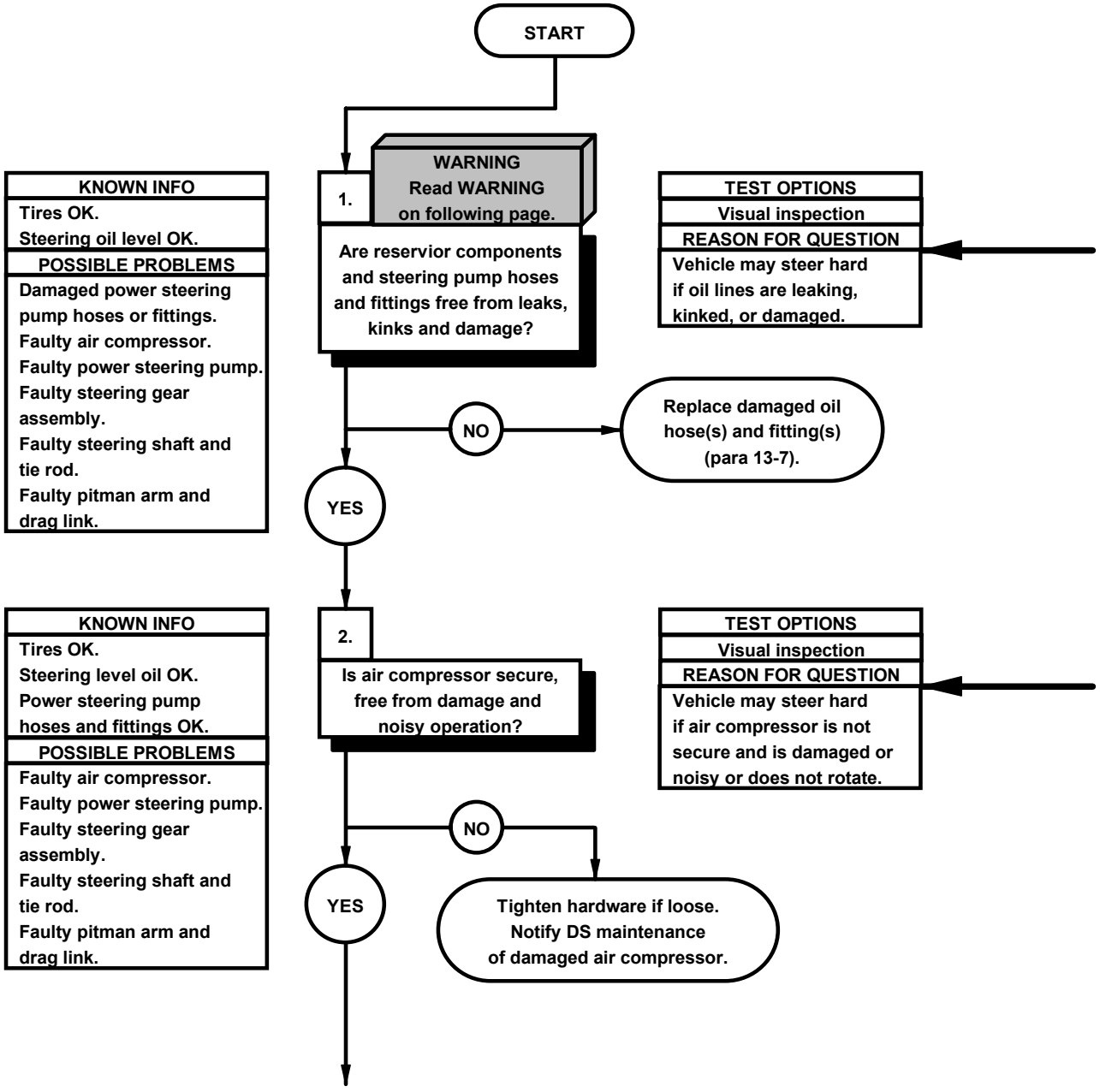
INITIAL SETUP

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

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

Materials/Parts
Locknut (Item 60, Appendix G)



WARNING

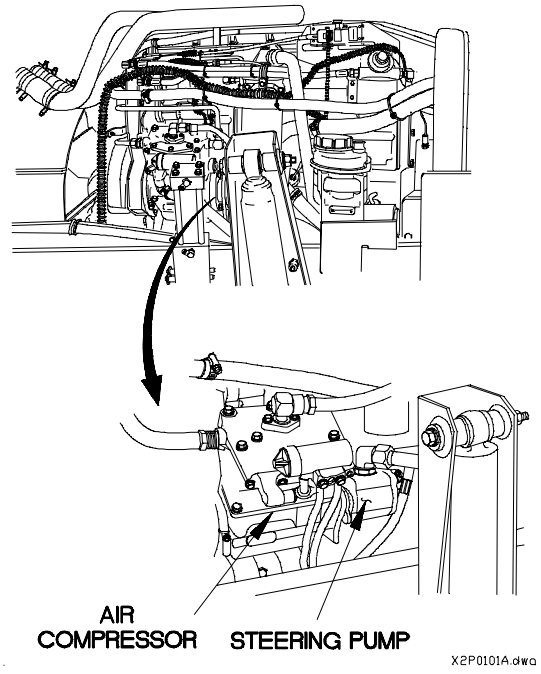
- **Engine compartment and its components may be hot to the touch. Extreme care should be taken when checking for leaks in the engine compartment. Failure to comply may result in burns or injury to personnel.**
- **Engine compartment includes a partially covered fan blade. Extreme care should be taken when working in the engine compartment. Failure to comply may cause injury to personnel.**

NOTE

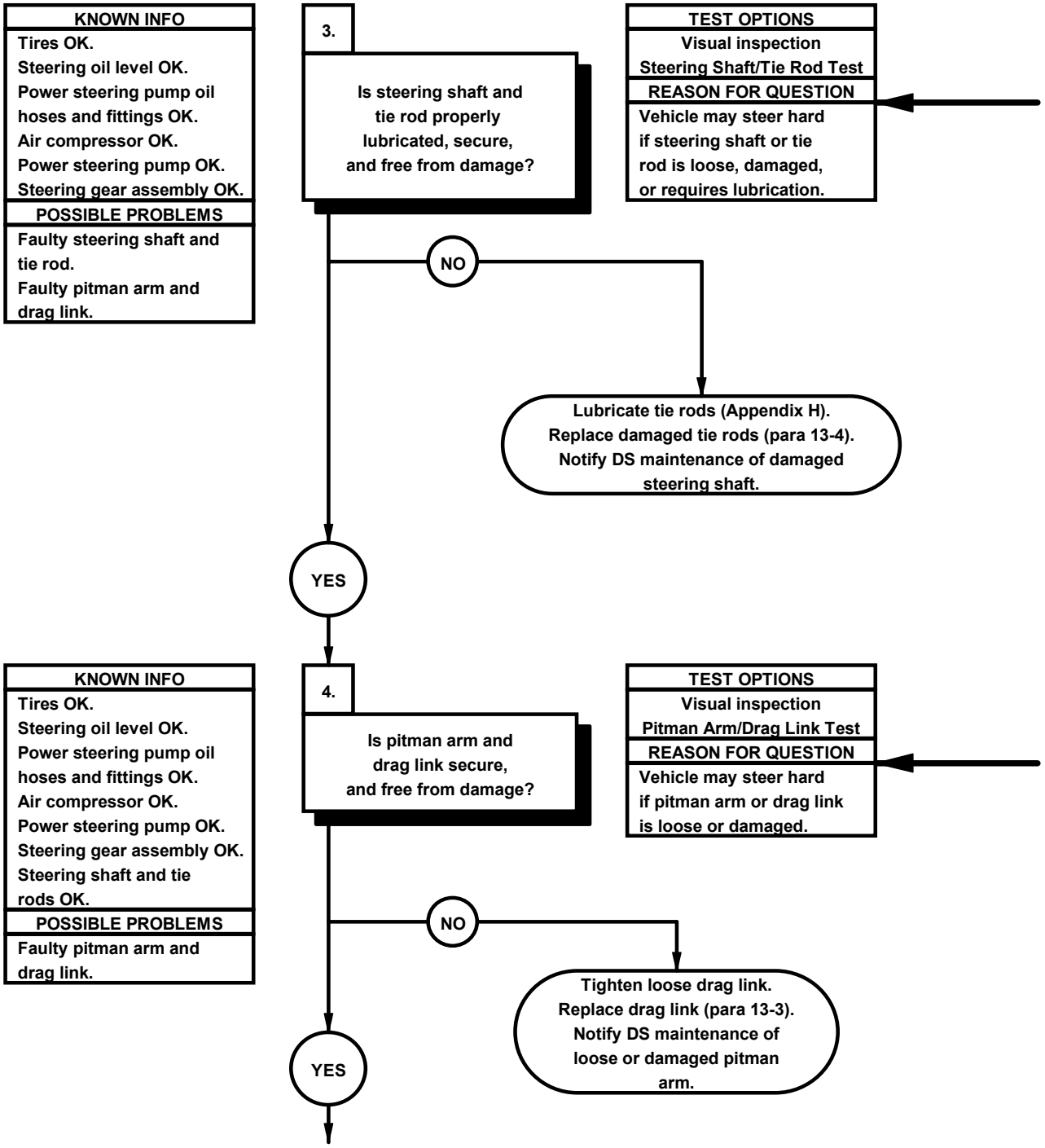
Refer to steering hydraulic hose schematic for steering hose locations.

Check reservoir components and steering hoses and fittings for leakage, kinks and damage.

Check air compressor for loose or missing mounting hardware, damage and noisy operation and rotation.



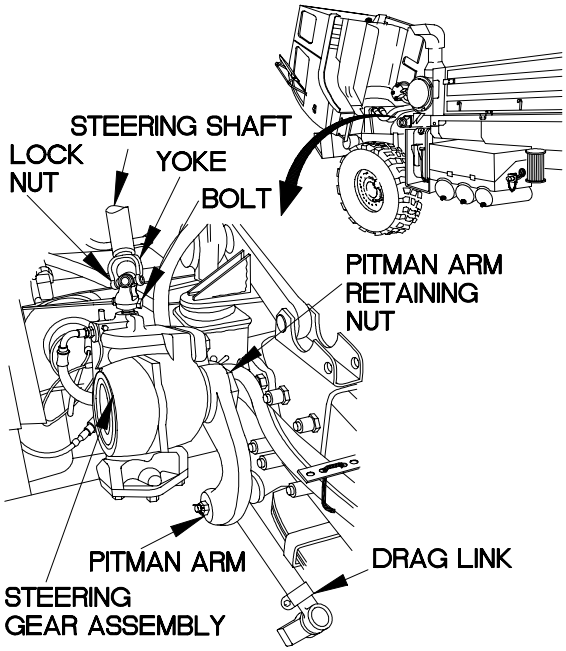
p1. HARD TO STEER (CONT)



Check steering shaft and tie rod for damage, and loose or missing mounting hardware. Refer to Appendix H to lubricate tie rods.

STEERING SHAFT/TIE ROD TEST

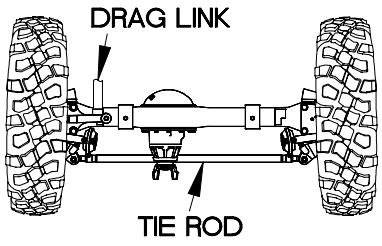
(1) Grasp steering shaft to ensure there is no up and down play.
(2) Grasp tie rod to ensure there is no up and down or left and right play.



Check pitman arm and drag link for damage, and loose or missing mounting hardware.

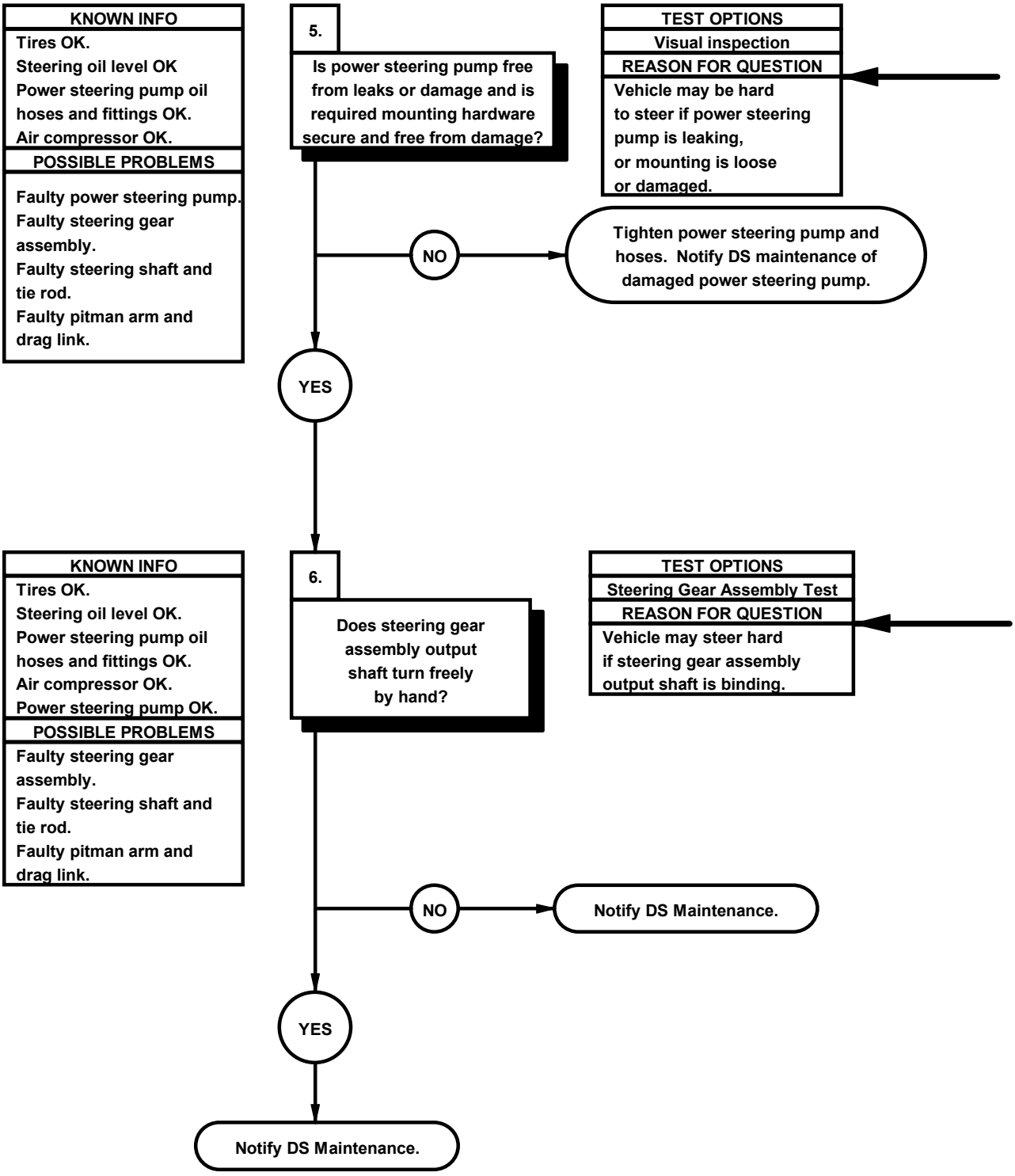
PITMAN ARM/DRAG LINK TEST

(1) Check nut securing pitman arm to steering gear assembly. Ensure there is no play.
(2) Grasp drag link and ensure there is no play left and right or up and down.
(3) Check for loose bolts, nuts, and clamps on drag link.

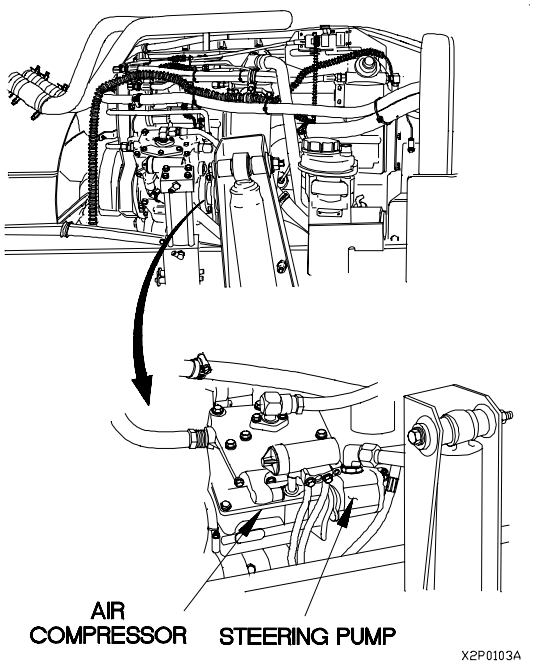


X2p0104-

p1. HARD TO STEER (CONT)



(1) Check power steering pump for leaks, and for loose, missing, or damaged mounting hardware.
(2) Lower cab (TM 9-2320-365-10).
(3) Shut down engine (TM 9-2320-365-10).
(4) Raise cab (TM 9-2320-365-10).

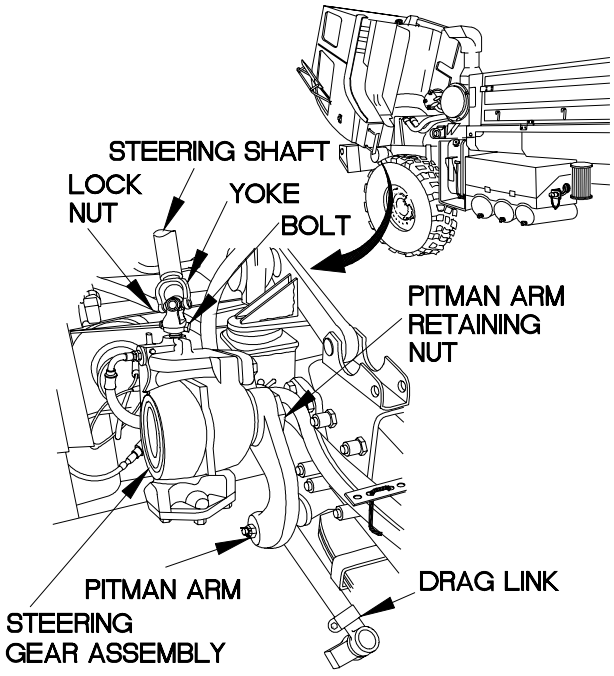


NOTE

An alignment mark shall be marked on yoke and steering gear assembly to ensure ease during installation.

STEERING GEAR TEST

(1) Remove bolt and self-locking nut from lower yoke of steering gear arm. Discard self-locking nut.
(2) Remove yoke from top steering gear assembly shaft.
(3) Remove drag link (para 13-3).
(4) Turn top steering gear assembly shaft to check for binding and proper output. Notify DS maintenance if steering gear assembly fails to turn smoothly or if it binds when top shaft is turned.
(5) Install drag link (para 13-3).
(6) Position yoke onto top steering gear assembly shaft.
(7) Install bolt and self-locking nut into yoke to secure yoke to top steering gear assembly shaft.

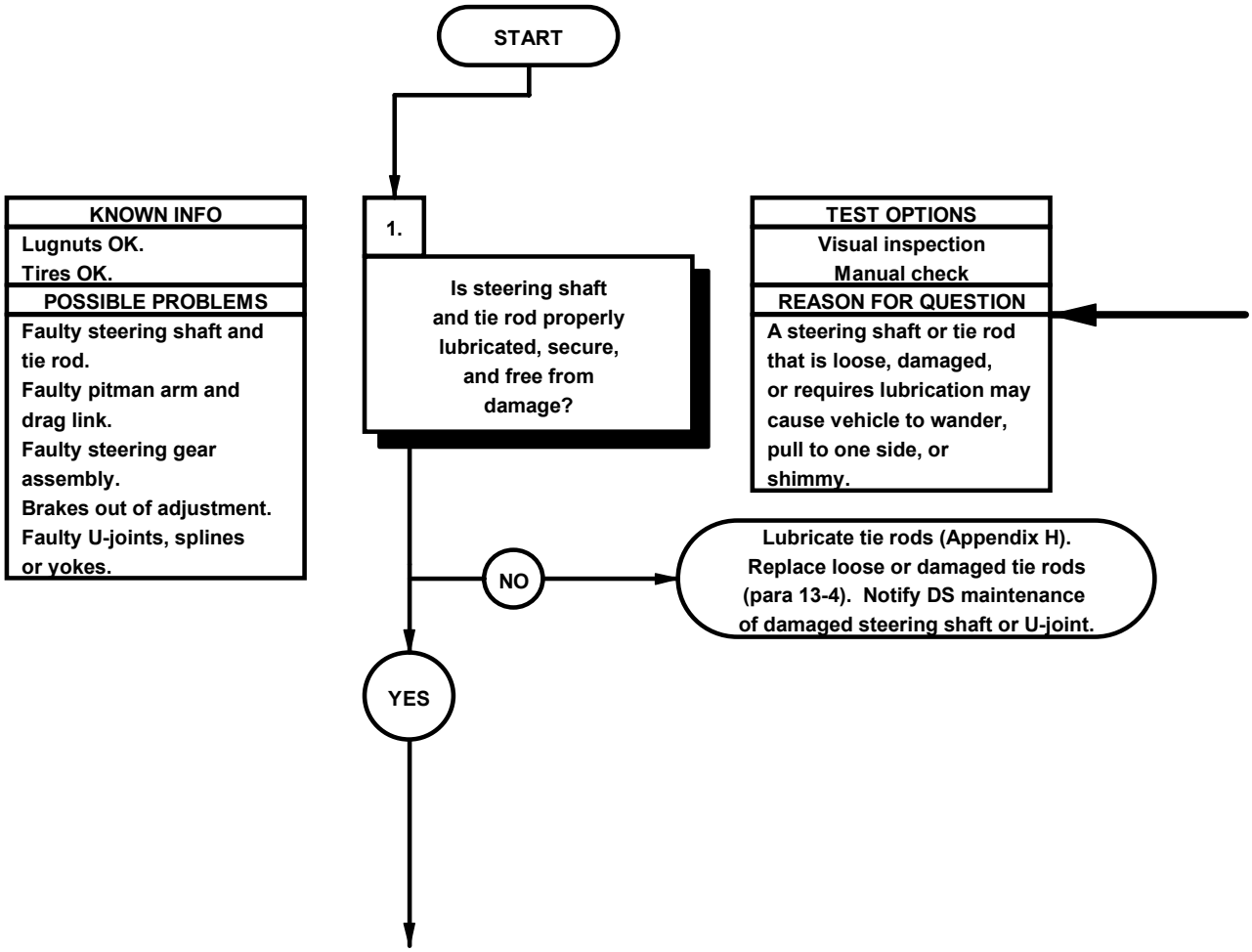


p2. WANDERS, PULLS TO ONE SIDE, OR SHIMMIES

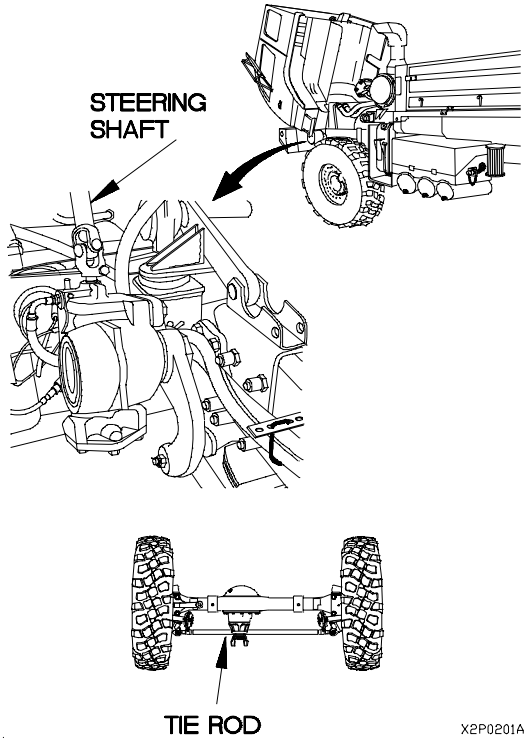
INITIAL SETUP

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

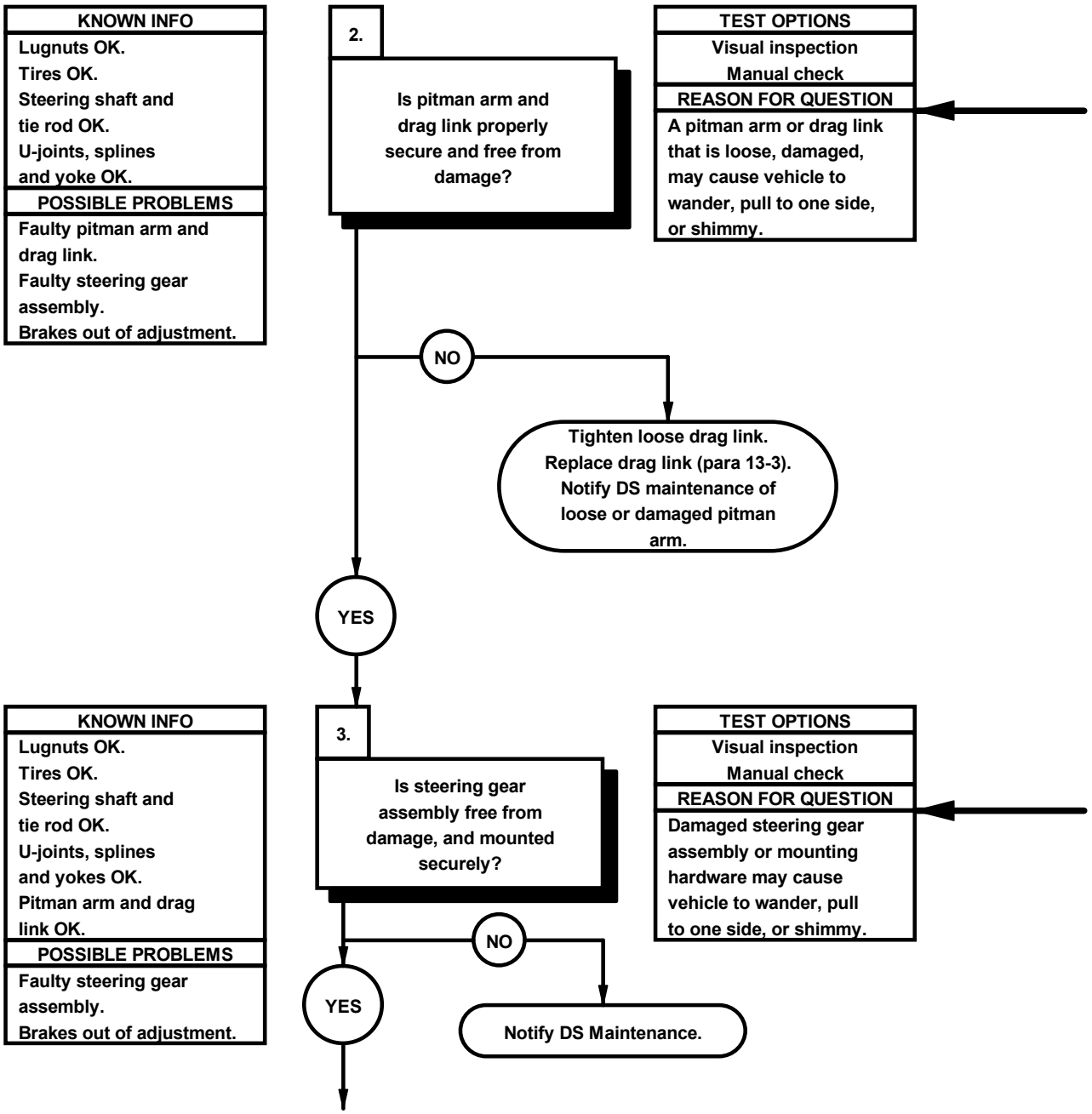
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)



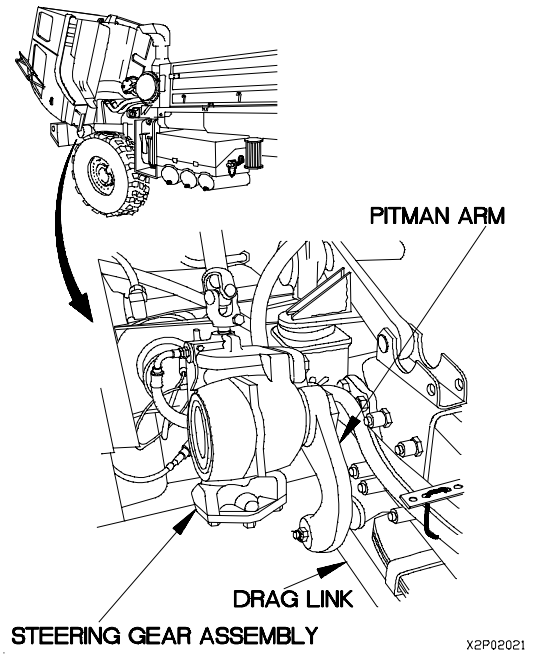
(1) Raise cab (TM 9-2320-365-10).
(2) Check steering shaft and tie rods for damage, and loose or missing mounting hardware. Refer to Appendix H to lubricate tie rods.
(3) Grasp the steering gear shaft and ensure there is no up and down play.
(4) Grasp the tie rod and ensure there is no up and down or sideways play.



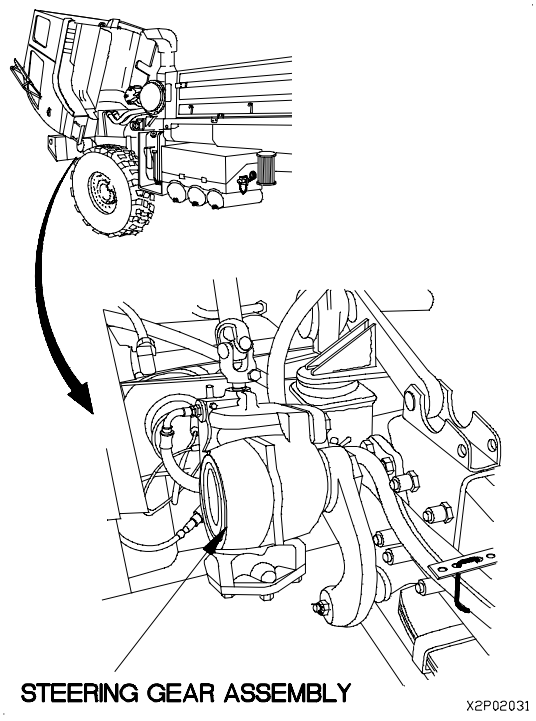
p2. WANDERS, PULLS TO ONE SIDE, OR SHIMMIES (CONT)



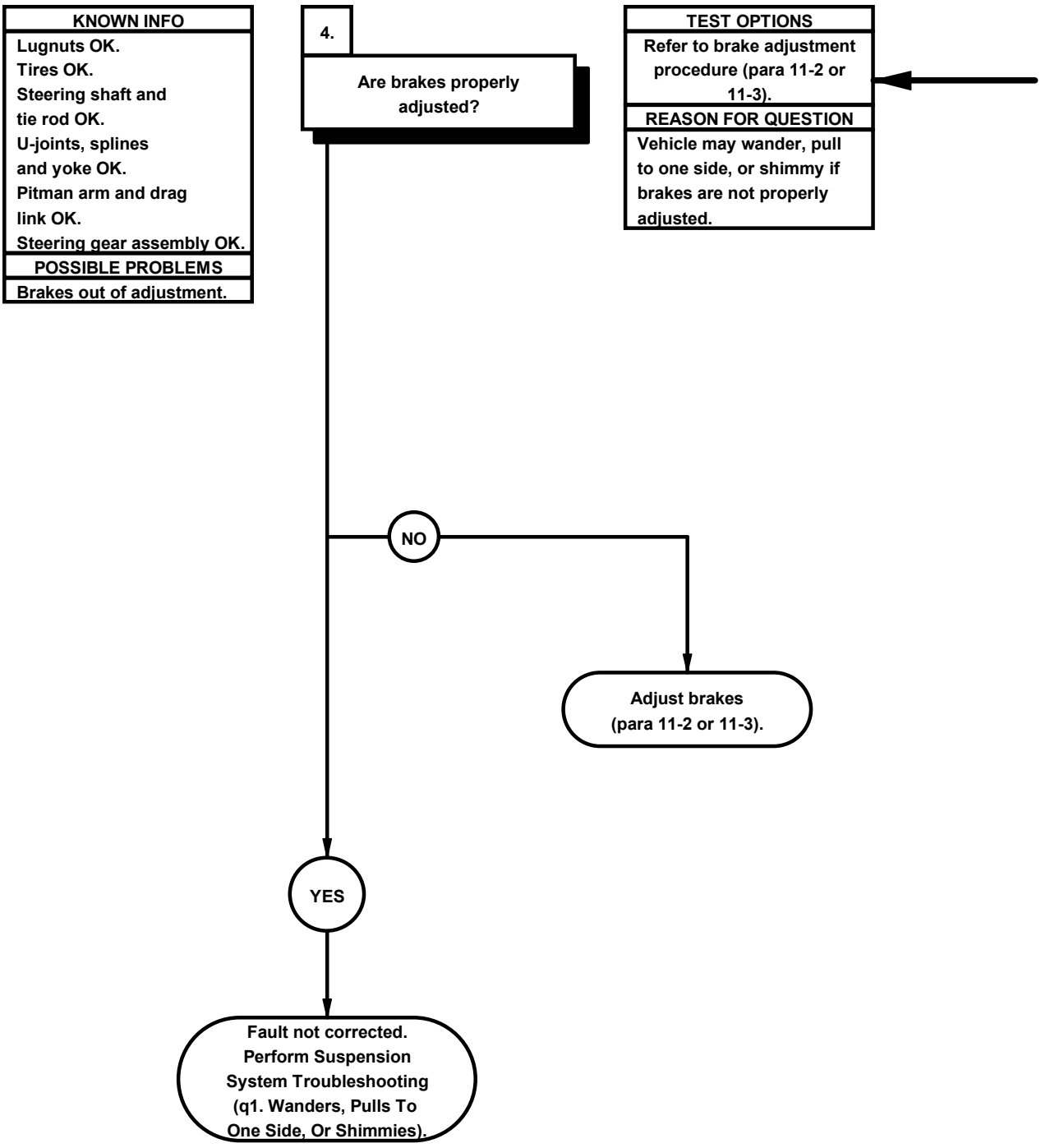
(1) Check pitman arm and drag link for damage, and loose or missing mounting hardware.
(2) Grasp pitman arm and ensure it and drag link are free of play.

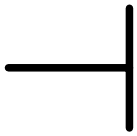


(1) Check steering gear assembly for damage, and loose or missing mounting hardware.
(2) Lower cab (TM 9-2320-365-10).



p2. WANDERS, PULLS TO ONE SIDE, OR SHIMMIES (CONT)





Refer to para 11-2 or 11-3 to adjust brakes.

p3. EXCESSIVE PLAY WHEN TURNING STEERING WHEEL

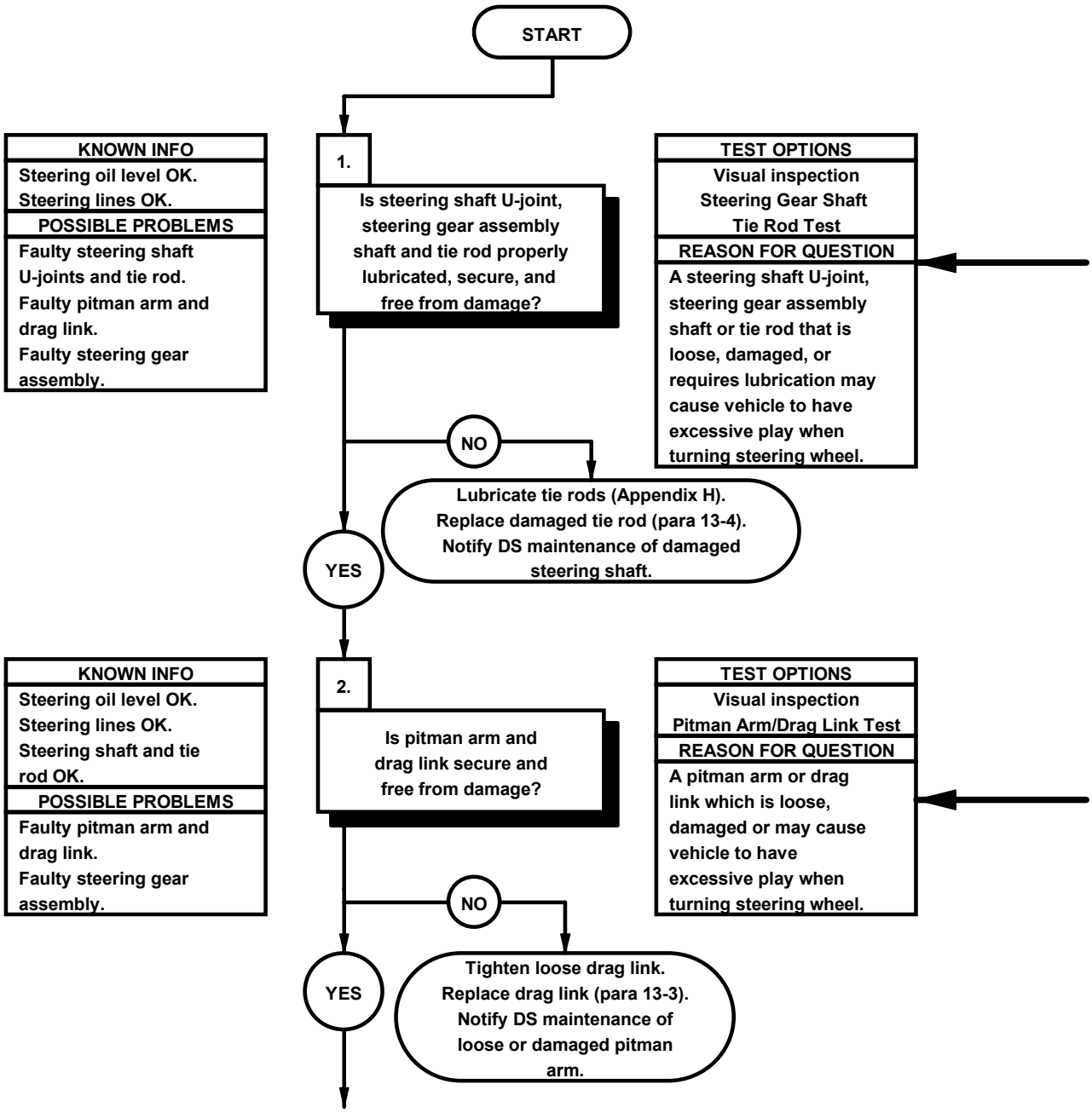
INITIAL SETUP

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

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

Materials/Parts
Locknut (Item 60, Appendix G)

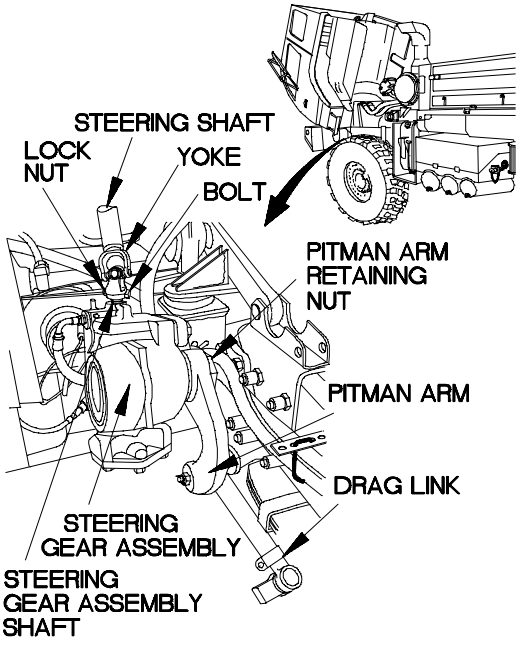


Check steering shaft U-joint, steering gear assembly shafts, and tie rod for damage and loose or missing mounting hardware. Refer to Appendix H to lubricate tie rods.

NOTE

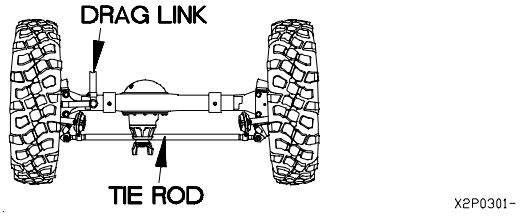
An aligment mark shall be used on yoke and steering gear assembly to ensure ease during installation.

STEERING GEAR SHAFT TIE ROD TEST
(1) Grasp steering shaft and ensure there is no up and down play.
(2) Remove self-locking nut and bolt securing yoke of top steering shaft to steering gear assembly shaft. Discard self-locking nut.
(3) Remove yoke from top steering gear assembly shaft.
(4) Ensure spline shaft of steering gear assembly and yoke of steering shaft are not damaged.
(5) Grasp tie rod and ensure there is no up and down or left or right play.

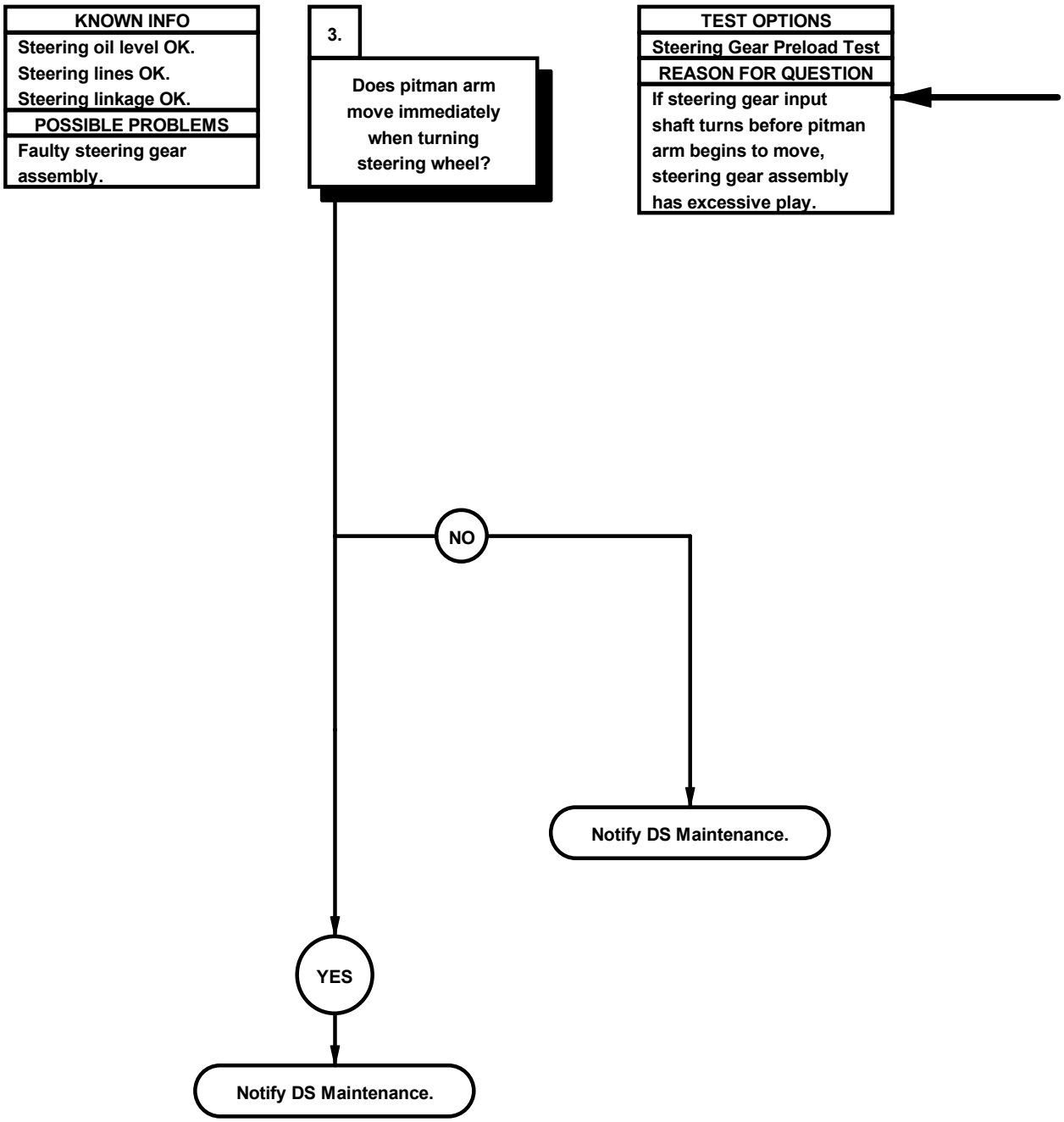


Check pitman arm and drag link for damage and loose or missing mounting hardware.

PITMAN ARM/DRAG LINK TEST
(1) Check nut securing pitman arm to steering gear assembly. Ensure there is no play.
(2) Grasp drag link and ensure there is no play left or right and up or down.
(3) Check for loose bolts, nuts, and clamps on drag link.

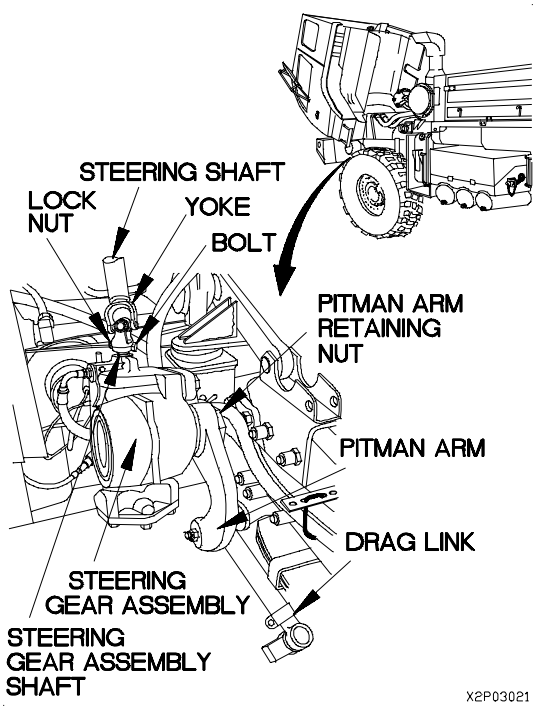


p3. EXCESSIVE PLAY WHEN TURNING STEERING WHEEL (CONT)



STEERING GEAR PRELOAD TEST

(1) Remove drag link (para 13-3).
(2) Pull pitman arm back and forth to check for binding and proper output. If pitman arm fails to turn smoothly or if it binds and top shaft does not turn immediately, steering gear assembly is damaged.
(3) Install drag link (para 13-3).
(4) Position yoke onto top steering gear assembly shaft.
(5) Install bolt and self-locking nut onto yoke to secure yoke to top steering gear assembly shaft.
(6) Lower cab (TM 9-2320-365-10).



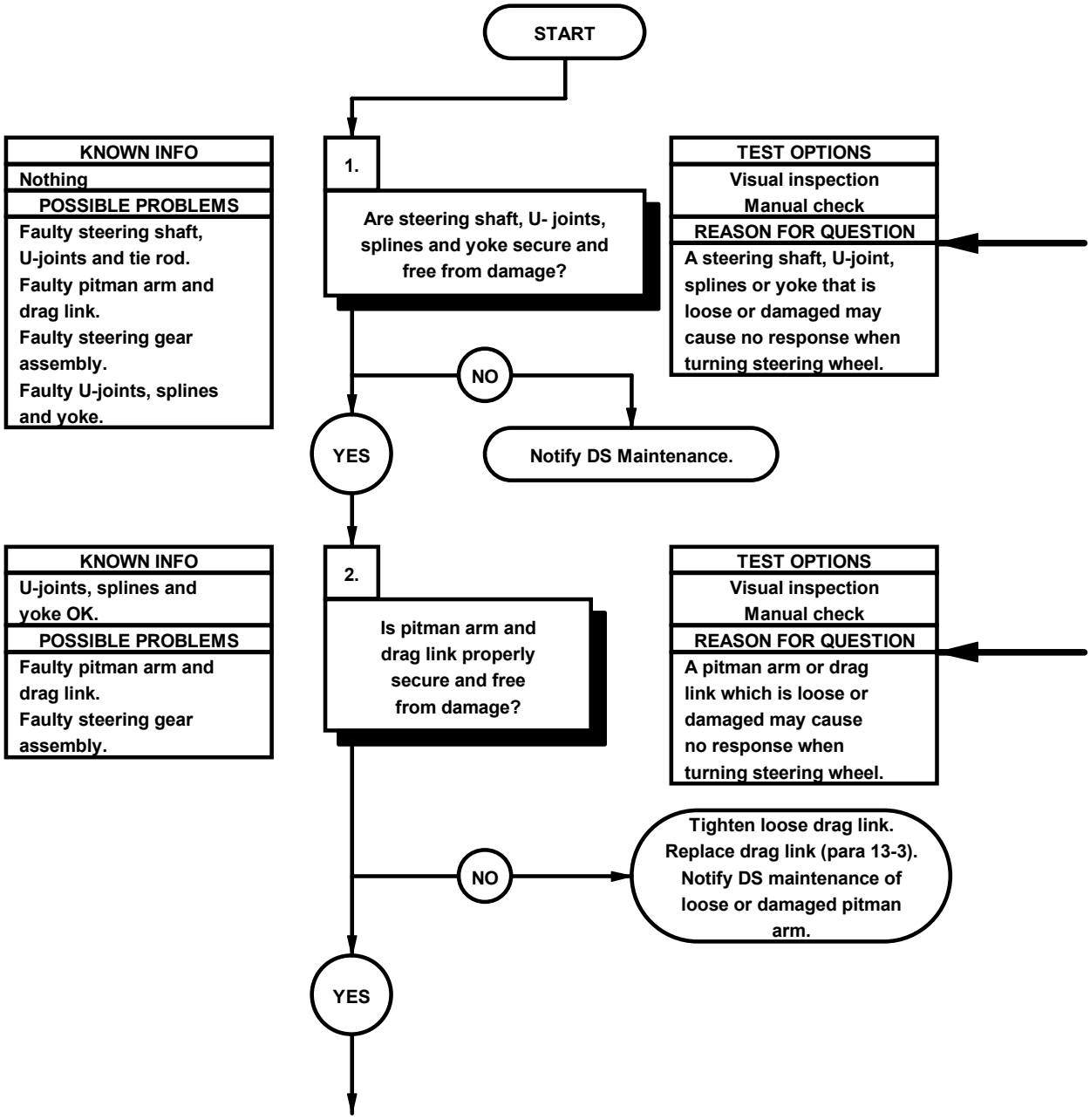
p4. NO RESPONSE WHEN TURNING STEERING WHEEL

INITIAL SETUP

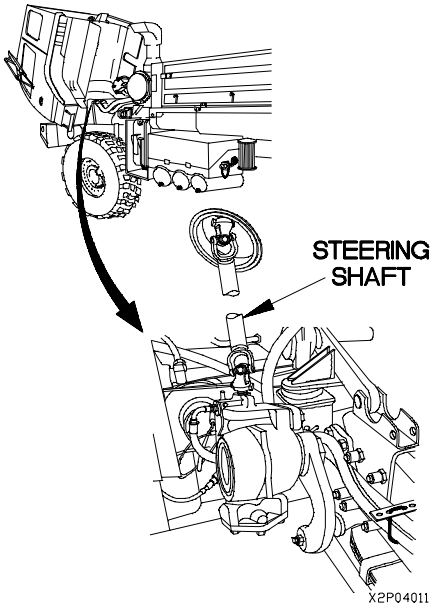
Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).

Tools and Special Tools
Tool Kit, Genl Mech (Item 43, Appendix C)

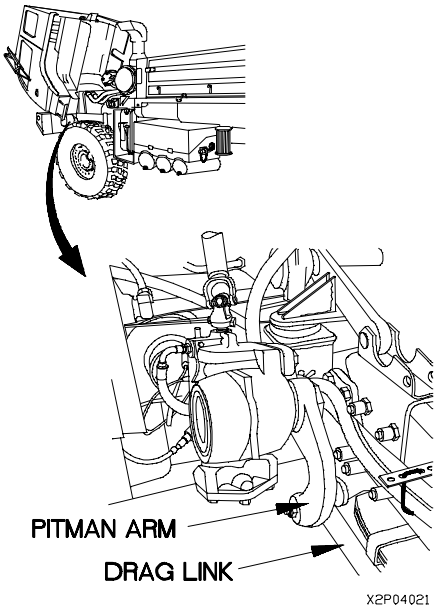
Materials/Parts
Locknut (Item 63, Appendix G)



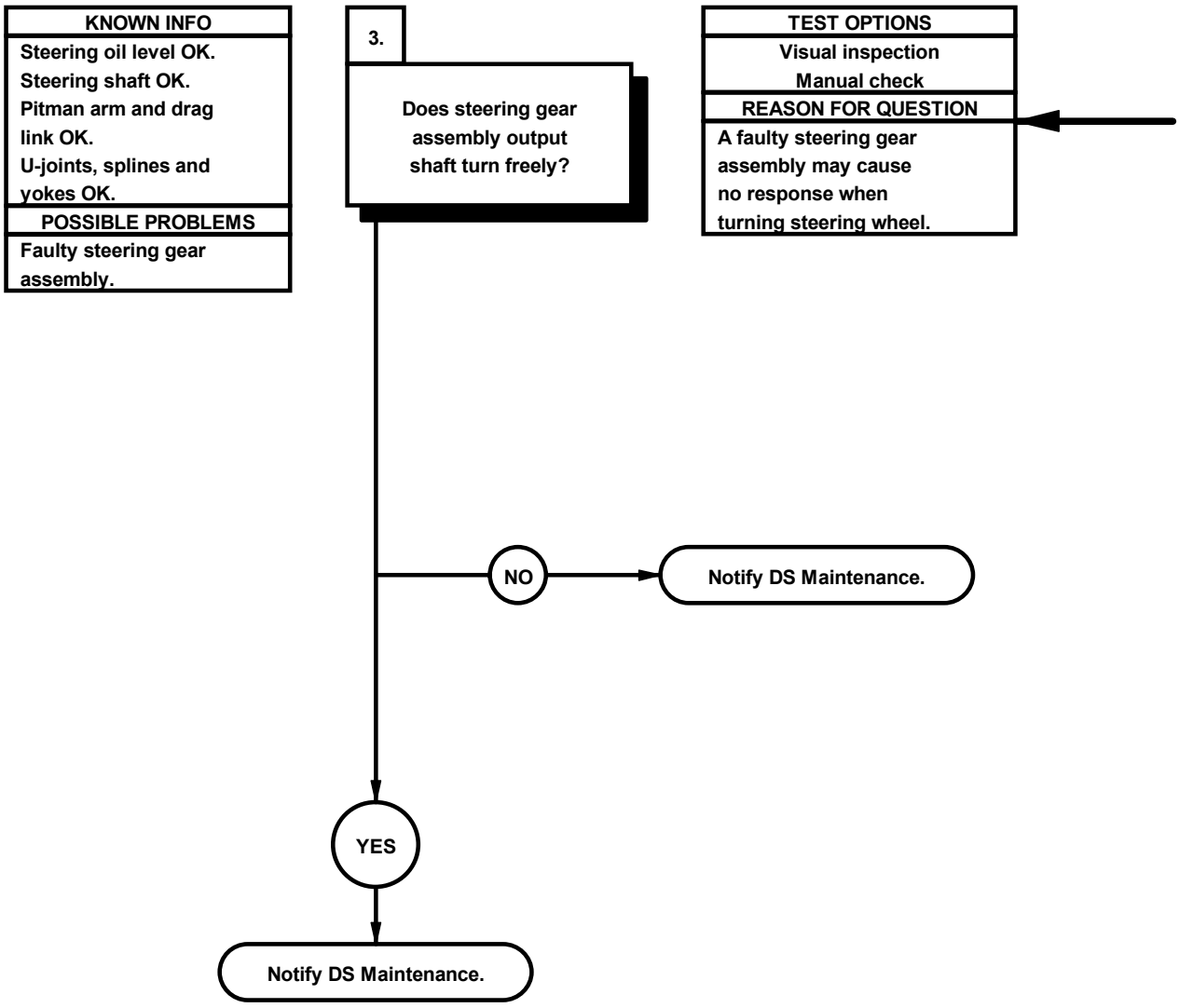
(1) Raise cab (TM 9-2320-365-10).
(2) Check steering shaft for looseness and damage.
(3) Grasp steering shaft and ensure it is free of play.
(4) Repeat step (3) while observing yoke, U-joint and locknuts.



(1) Check pitman arm and drag link for damage and loose or missing mounting hardware.
(2) Grasp pitman arm and ensure it and drag link are free of play.



p4. NO RESPONSE WHEN TURNING STEERING WHEEL (CONT)

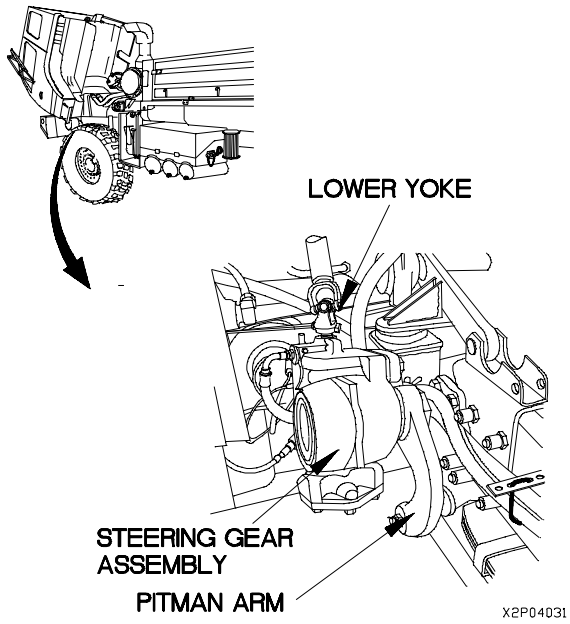


NOTE

An alignment mark shall be made on yoke and steering gear assembly shaft prior to disassembly to ensure proper alignment during installation.

STEERING GEAR TEST

(1) Remove bolt and locknut from lower yoke of steering gear arm. Discard locknut.
(2) Remove yoke from top steering gear assembly shaft.
(3) Remove drag link (para 13-3).
(4) Turn pitman arm to check for binding and proper output. Notify DS maintenance if steering gear assembly fails to turn smoothly or if it binds when top shaft is turned.
(5) Install drag link (para 13-3).
(6) Position yoke on to steering gear assembly.
(7) Install bolt and locknut into yoke to top steering gear assembly shaft.
(8) Lower cab (TM 9-2320-365-10).



2-27. SUSPENSION SYSTEM TROUBLESHOOTING

This paragraph covers Suspension System Troubleshooting. The Suspension System Fault Index, Table 2-53, lists faults for the suspension system of the vehicle.

Table 2-53. Suspension System Fault Index

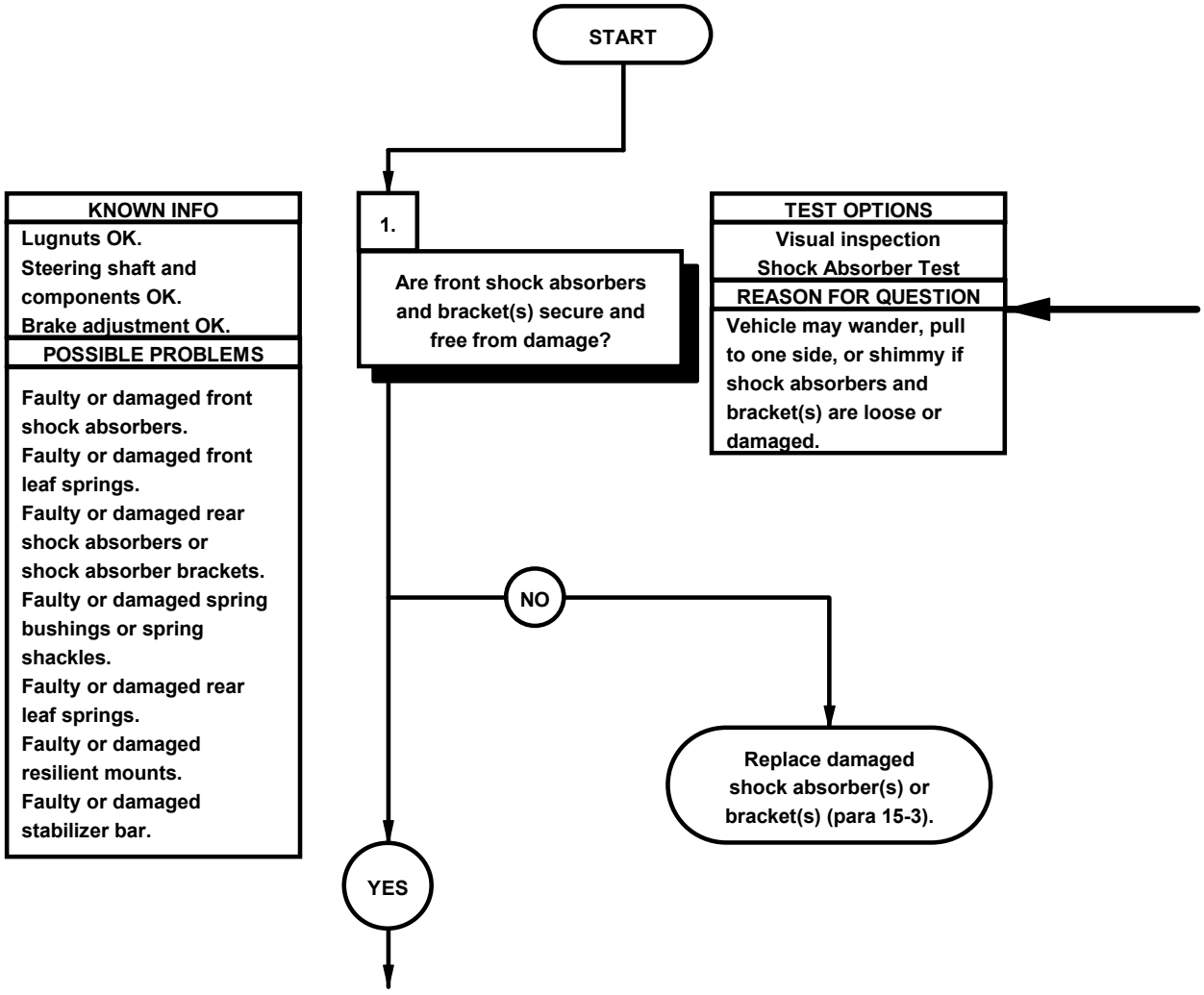
Fault No.	Description	Page
q1.	Wanders, Pulls To One Side, or Shimmies	2-1926
q2.	Leans To One Side or Rear of Vehicle Sags	2-1940

q1. WANDERS, PULLS TO ONE SIDE, OR SHIMMIES

INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Iron, Tire (Item 20, Appendix C)

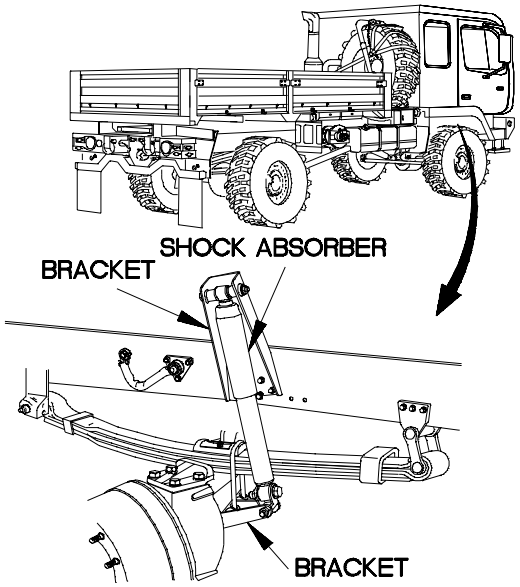


NOTE

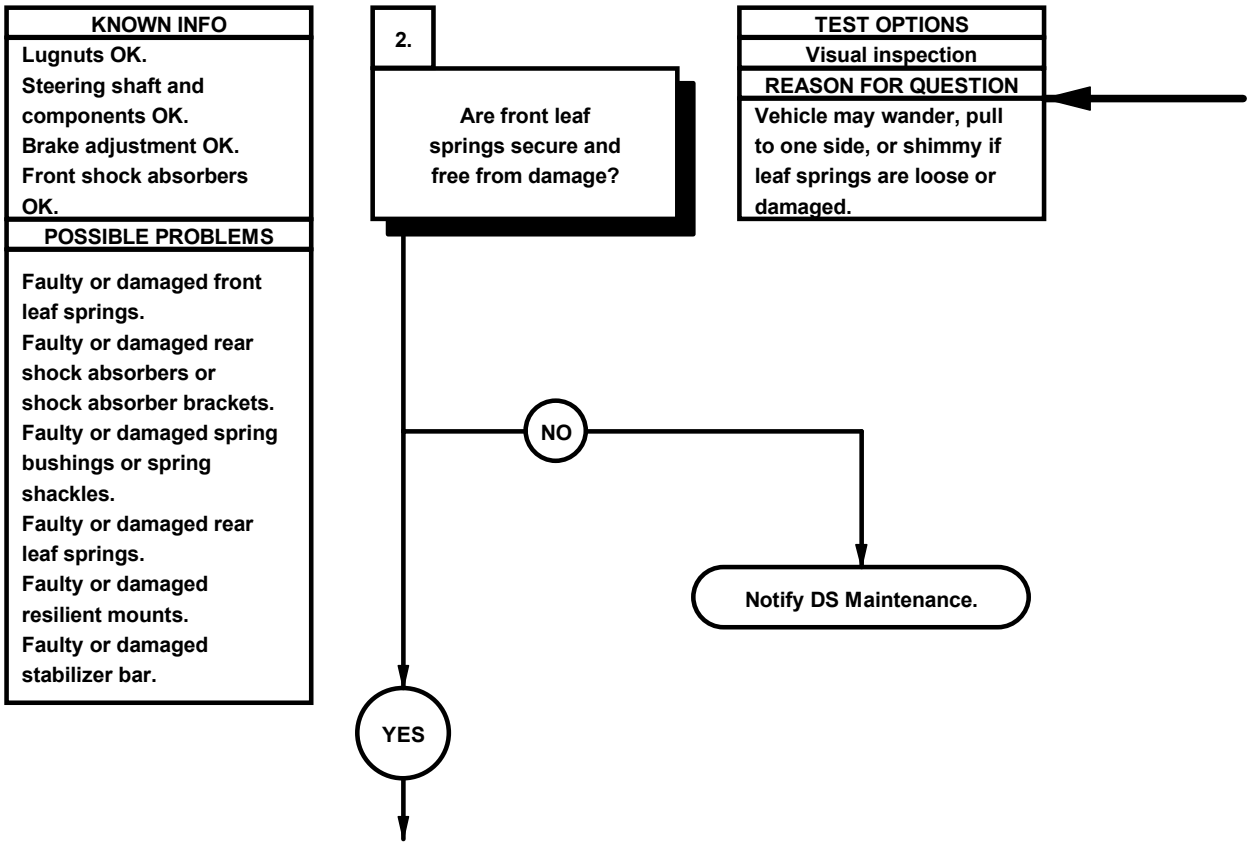
Perform Steering System Troubleshooting (p2, Wanders, Pulls To One Side, Or Shimmies) before starting the steps given below.

(1) Check shock absorbers for damage or leaks, and for missing mounting hardware.
(2) Check shock absorbers bushings for movement.
(3) Check shock absorber brackets for damage and for missing mounting hardware.

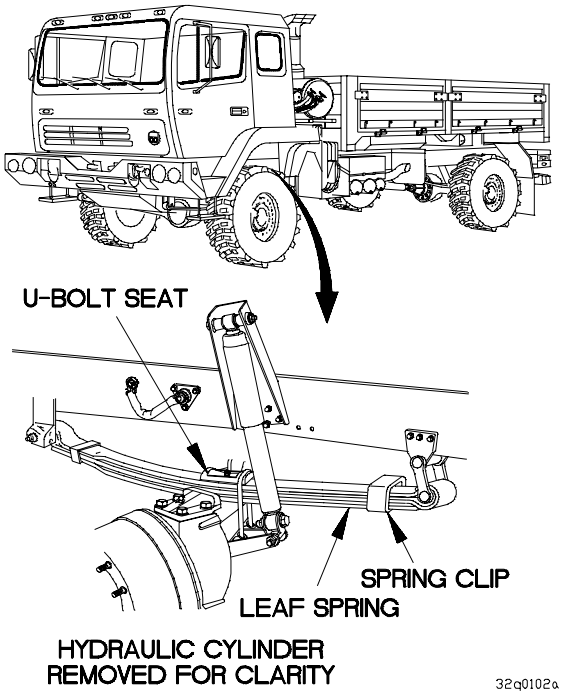
SHOCK ABSORBER TEST
(1) Grasp shock absorber and ensure there is no excessive play.
(2) Replace worn bushings.



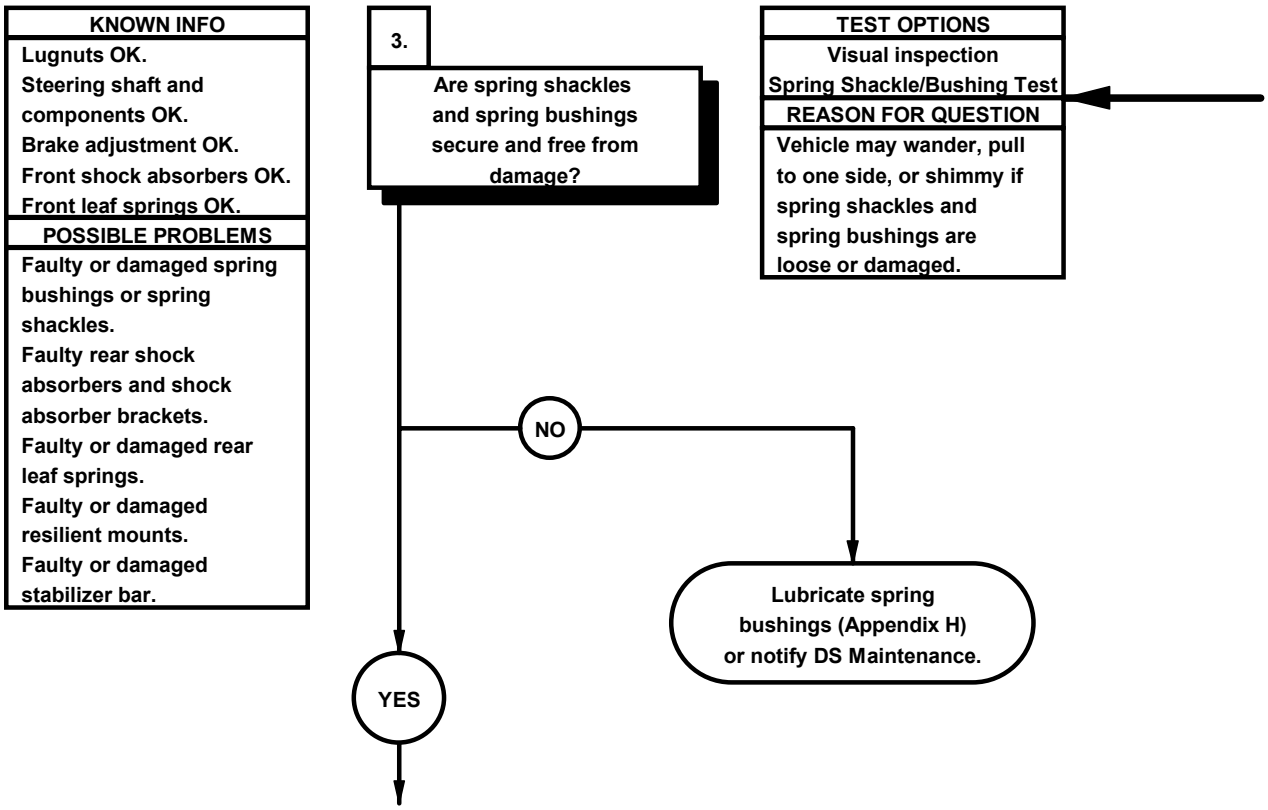
q1. WANDERS, PULLS TO ONE SIDE, OR SHIMMIES (CONT)



(1) Check leaf springs for cracked or broken leaves or missing spring clips and U-bolts.
(2) Check seats for looseness or damage.

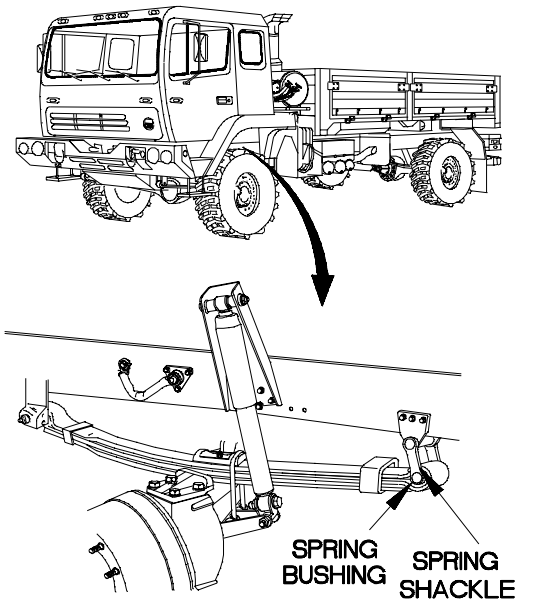


q1. WANDERS, PULLS TO ONE SIDE, OR SHIMMIES (CONT)



Check spring shackles and spring bushings for damage and for missing mounting hardware. Refer to Appendix H for lubrication of spring bushings.

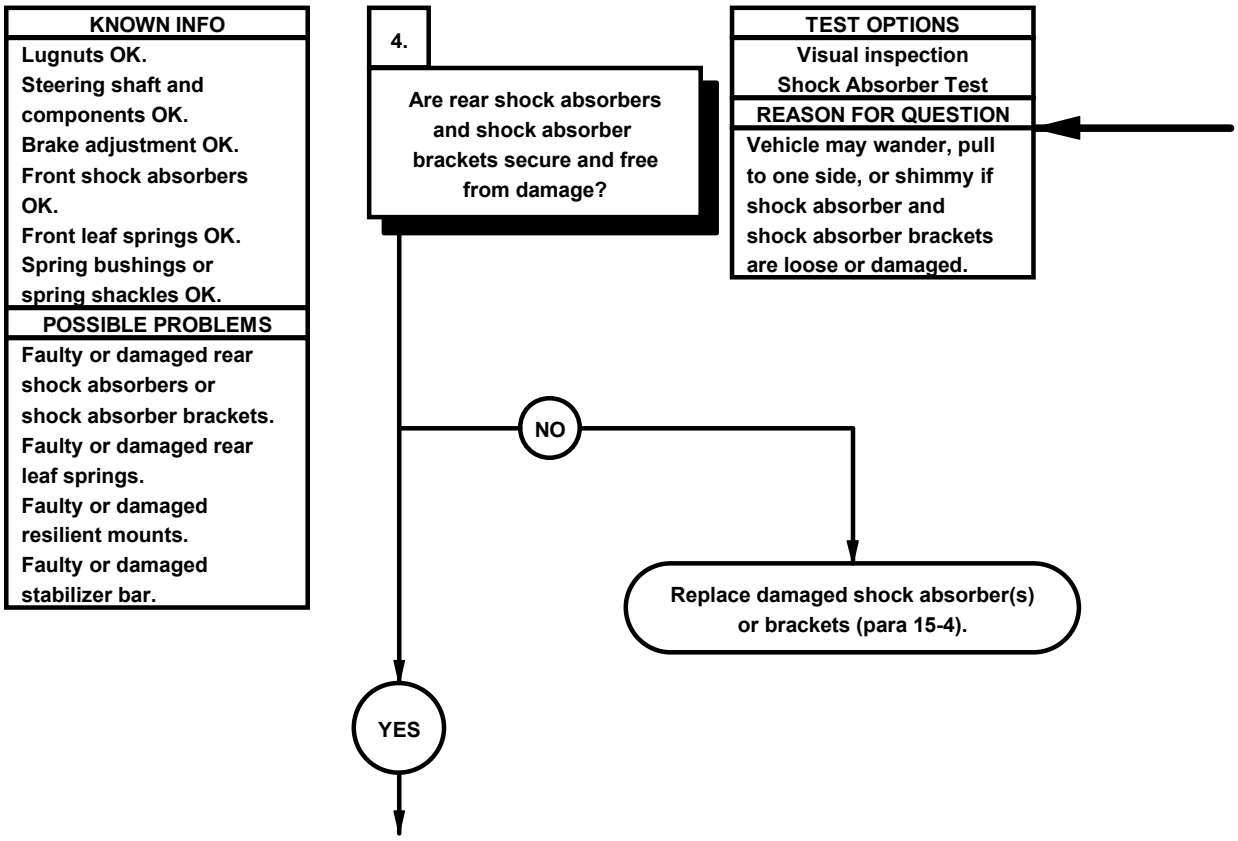
SPRING SHACKLE/BUSHING TEST
(1) Position tire iron between spring assembly and frame.
(2) Pry up and down and ensure there is no movement.
(3) Shackles or bushings are damaged if movement occurs.



HYDRAULIC CYLINDER REMOVED FOR CLARITY

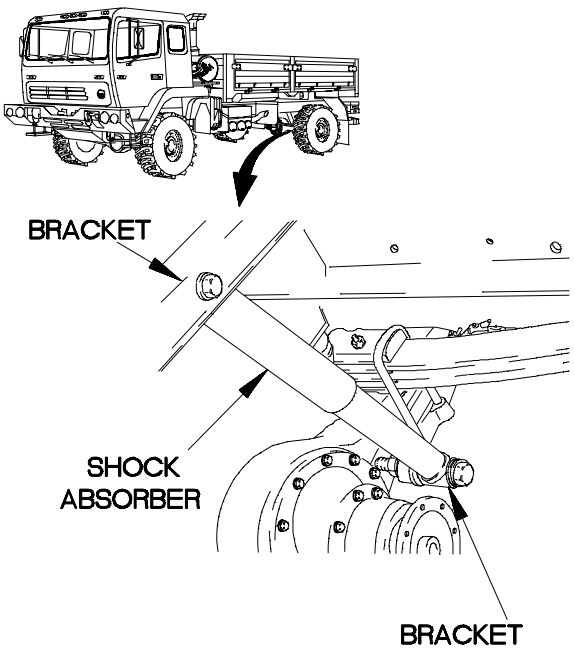
32q0103a

q1. WANDERS, PULLS TO ONE SIDE, OR SHIMMIES (CONT)



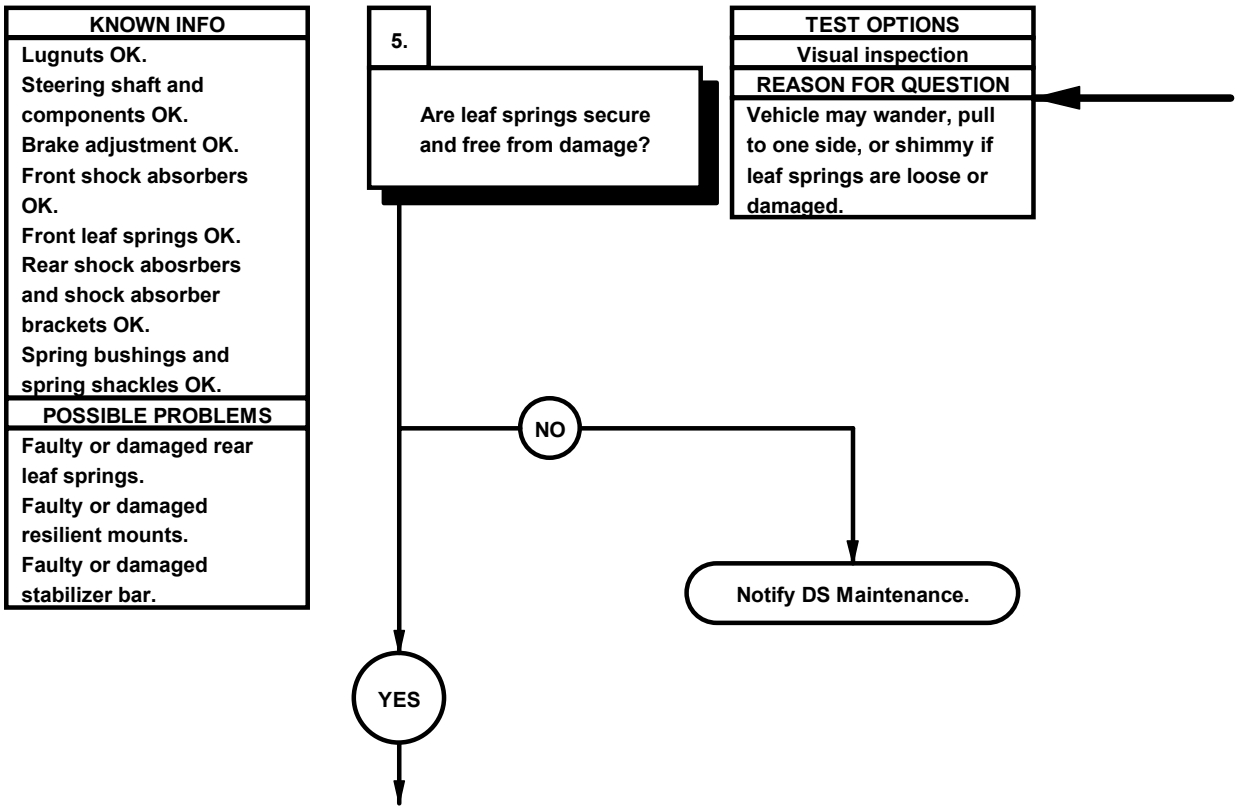
(1) Check shock absorbers for damage or leaks, and for missing mounting hardware.
(2) Check shock absorber brackets for damage and for missing mounting hardware.
(3) Check shock absorber bushings for movement.

SHOCK ABSORBER TEST
(1) Grasp shock absorber and ensure there is no excessive play.
(2) Replace worn bushings.

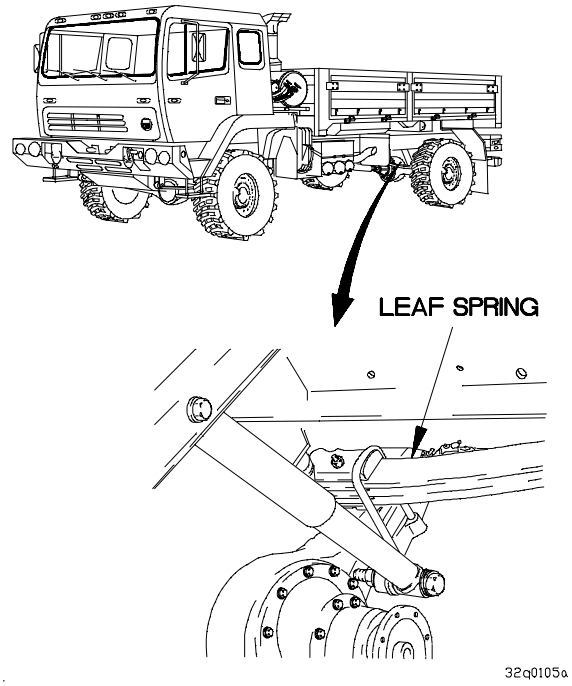


32q0104a

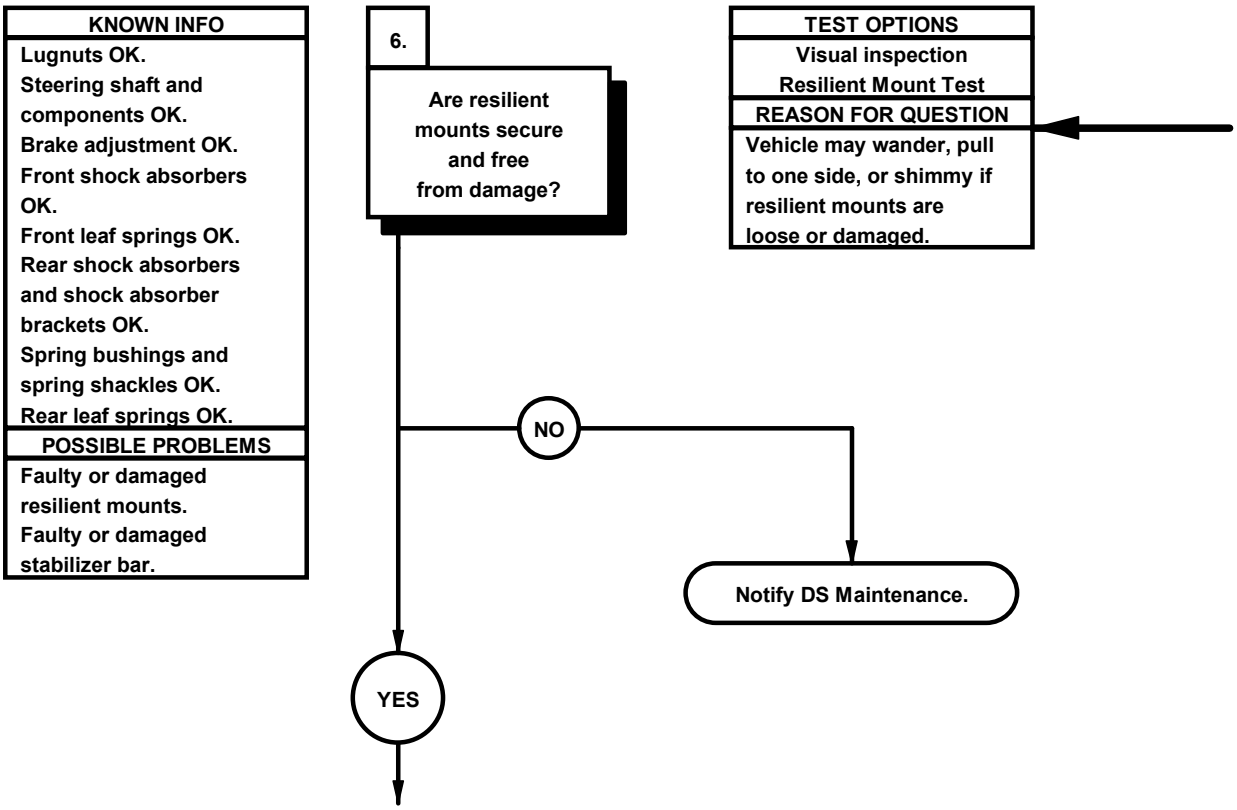
q1. WANDERS, PULLS TO ONE SIDE, OR SHIMMIES (CONT)



Check rear leaf springs for damage and for missing mounting hardware.

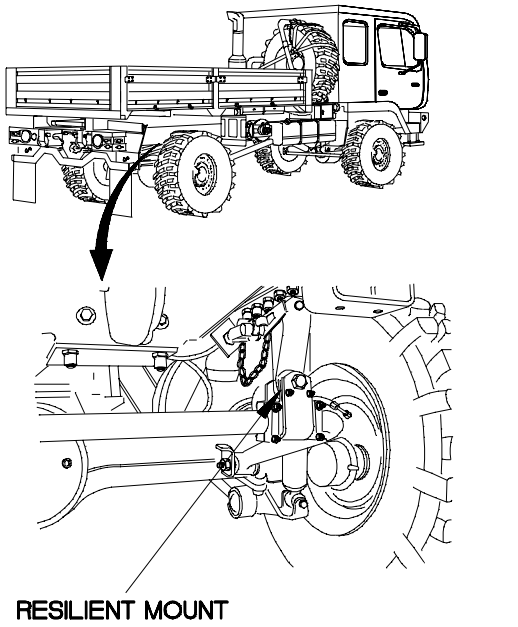


q1. WANDERS, PULLS TO ONE SIDE, OR SHIMMIES (CONT)



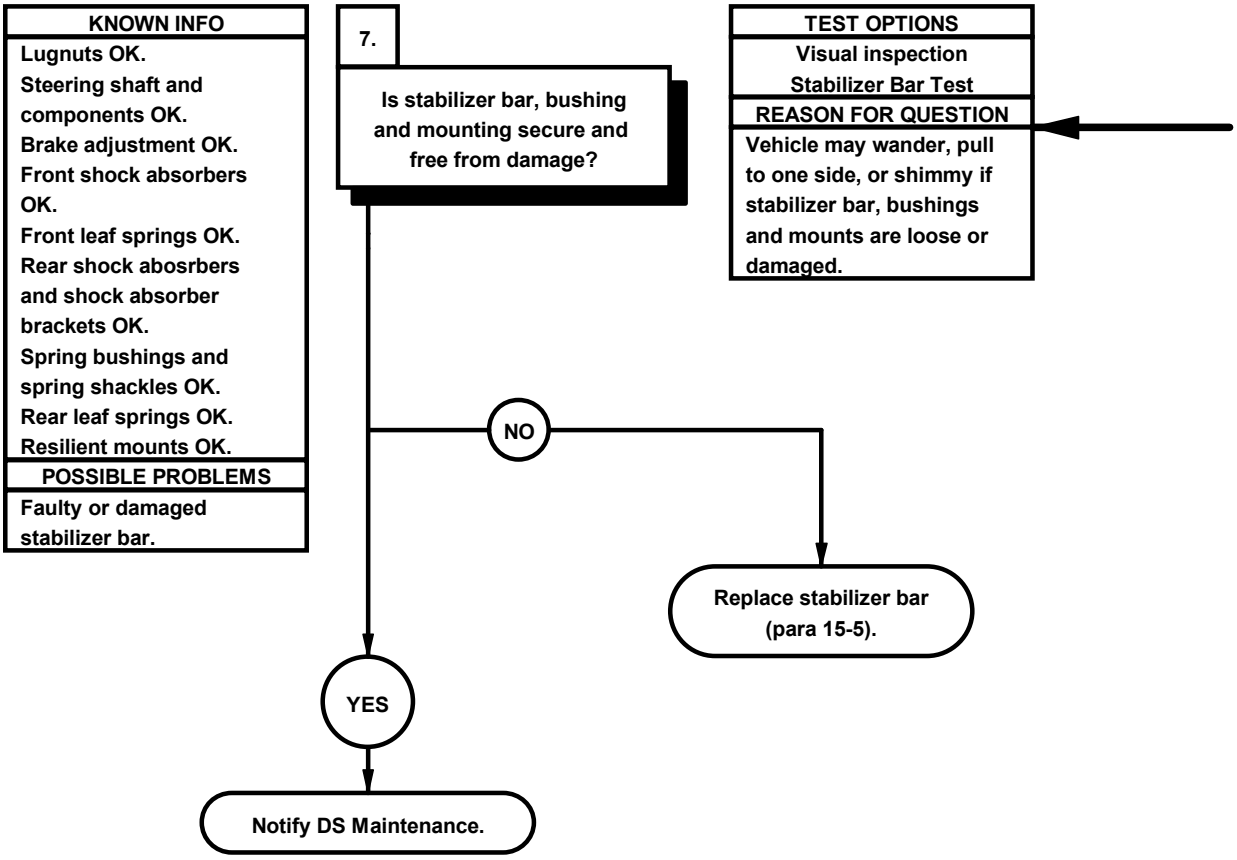
Check resilient mounts for damage and for missing mounting hardware.

RESILIENT MOUNT TEST
(1) Position tire iron between spring near resilient mount and tire.
(2) Pry up and down to ensure there is no movement.
(3) Resilient mount is damaged if movement occurs.



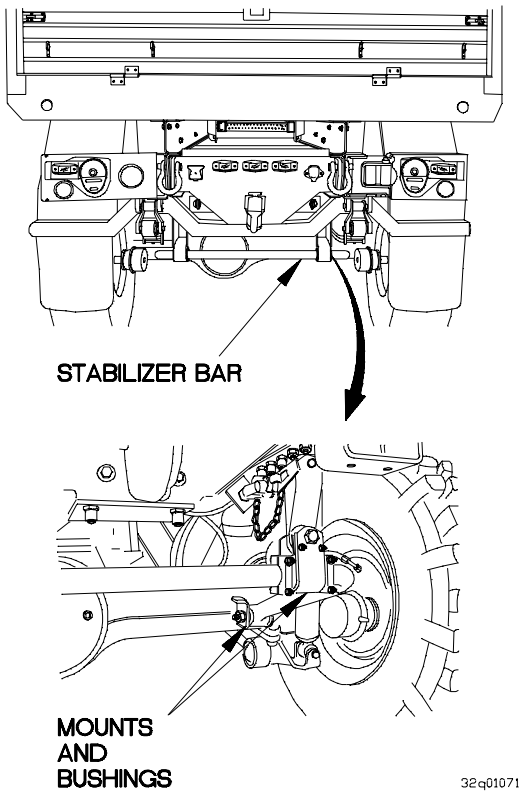
32q01061

q1. WANDERS, PULLS TO ONE SIDE, OR SHIMMIES (CONT)

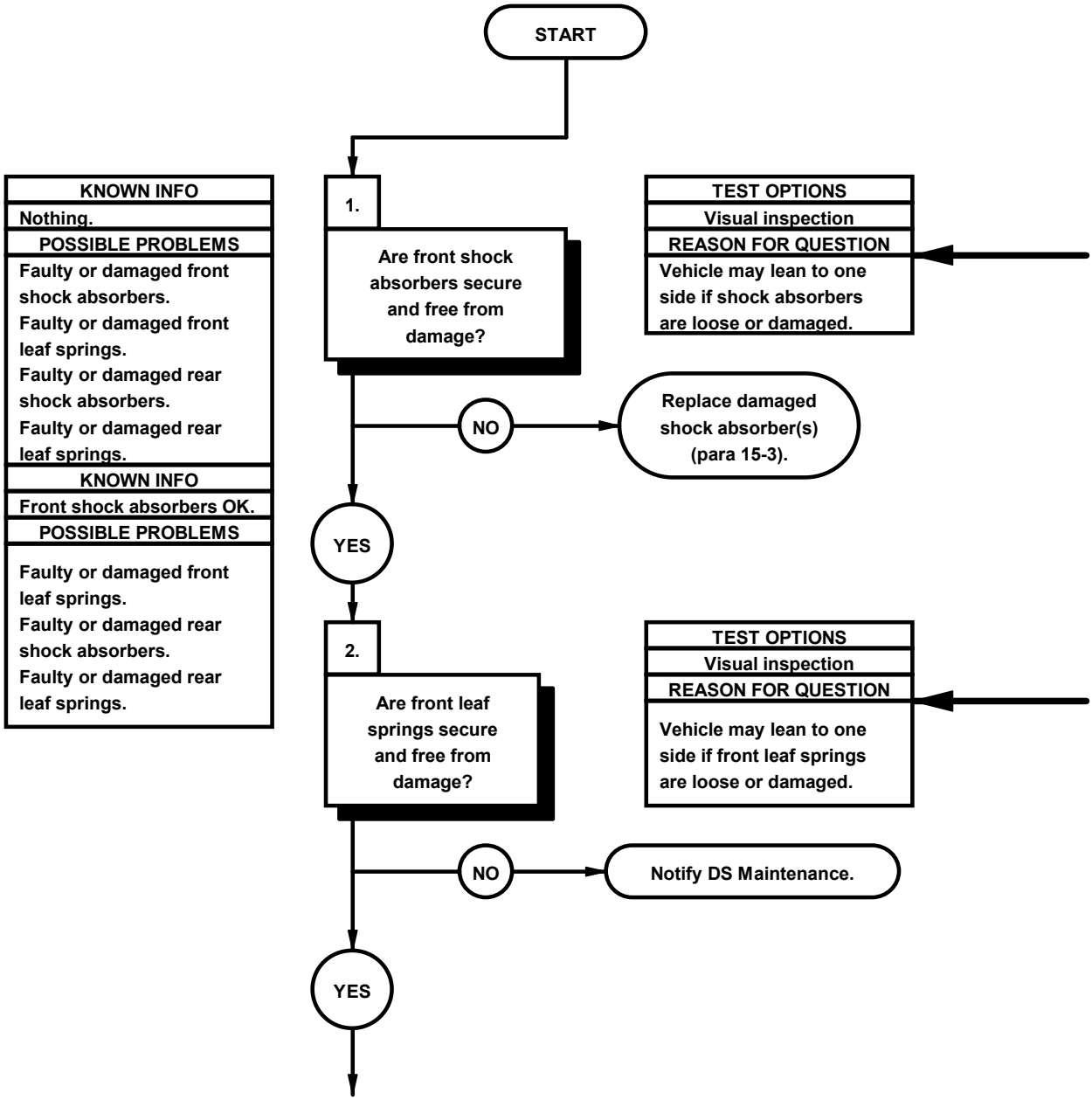


Check stabilizer bar, bushings and mounts for damage and for missing mounting hardware.

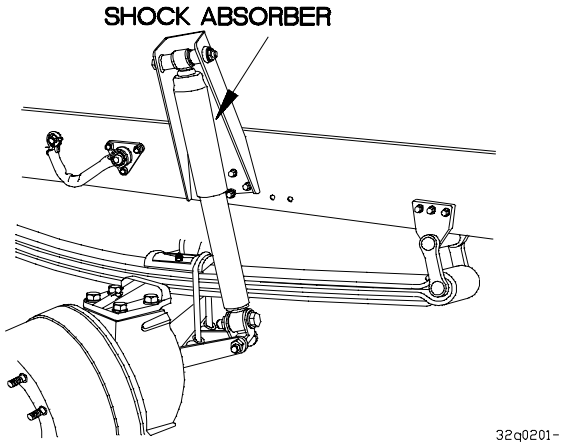
STABILIZER BAR TEST
(1) Position tire iron between bottom of pintle hook mount and top of stabilizer bar.
(2) Pry up to ensure there is no movement.
(3) Replace stabilizer bar or mounts if movement occurs or damaged.



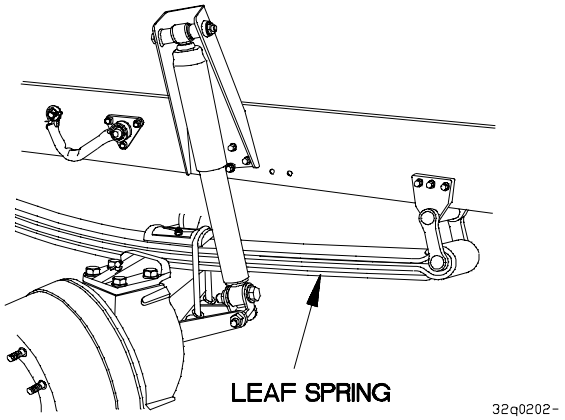
q2. LEANS TO ONE SIDE OR REAR OF VEHICLE SAGS	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-365-10).	**Tools and Special Tools** Tool Kit, Genl Mech (Item 44, Appendix C)



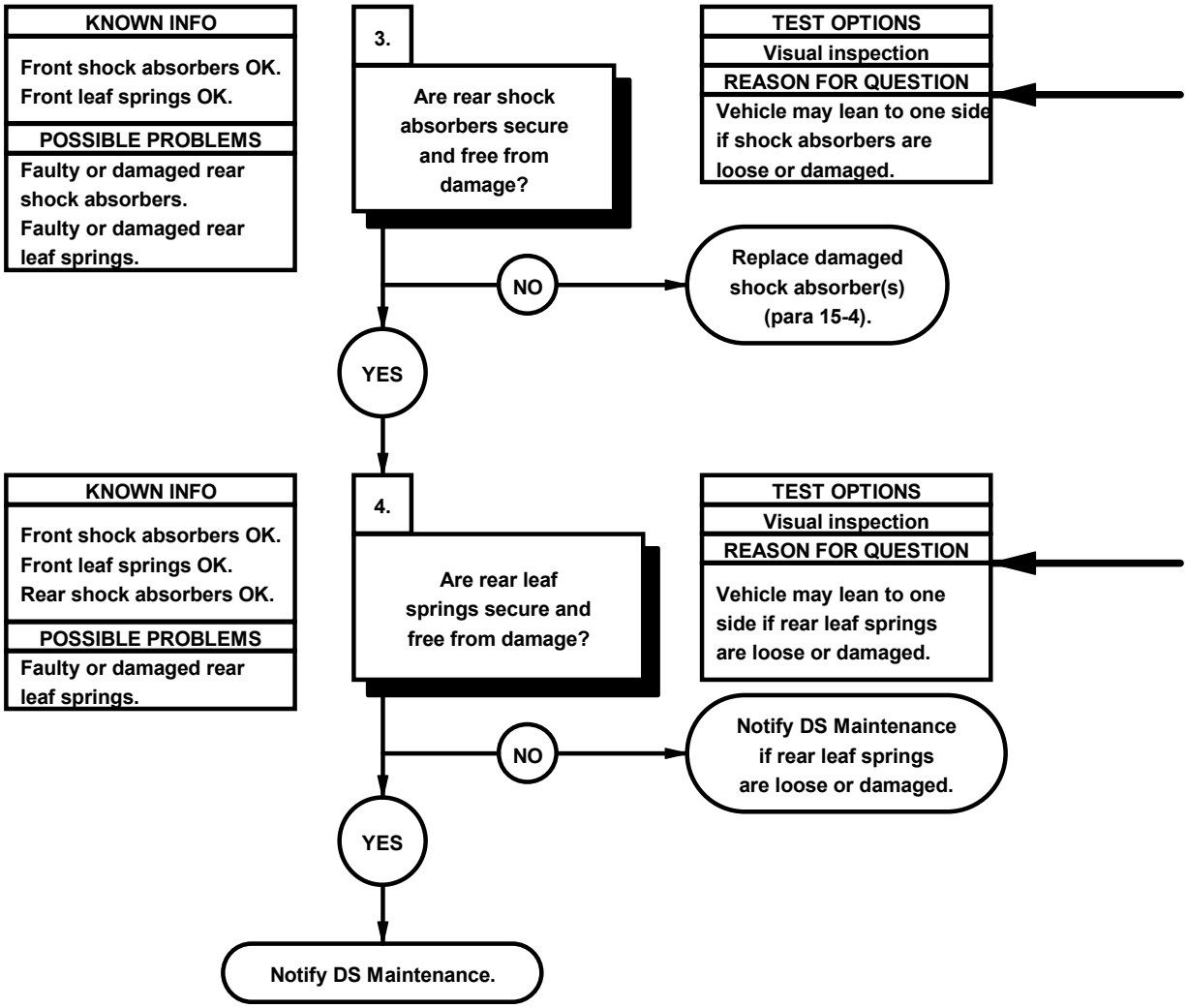
Check shock absorbers for damage or leaks, and for missing or cracked mounting hardware.



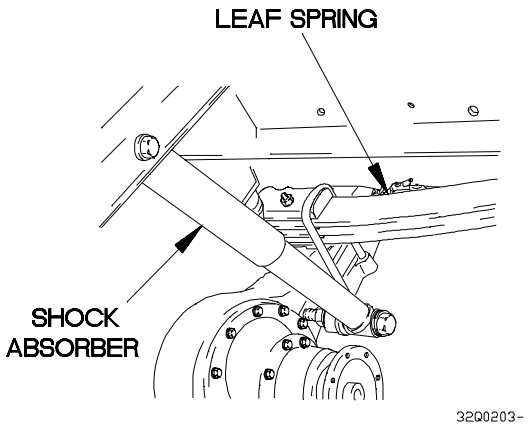
Check front leaf springs for damage and for loose or missing mounting hardware.



q2. LEANS TO ONE SIDE OR REAR OF VEHICLE SAGS (CONT)



Check shock absorbers for damage or leaks, and for missing or cracked mounting hardware.



Check rear leaf springs for damage or leaks, and for missing mounting hardware.

2-28. 11K SELF-RECOVERY WINCH (SRW) SYSTEM TROUBLESHOOTING

This paragraph covers 11K Self-Recovery Winch (SRW) System Troubleshooting. The 11K Self-Recovery Winch (SRW) System Fault Index, Table 2-54, lists faults for the 11K SRW system of the vehicle.

Table 2-54. 11K Self-Recovery Winch (SRW) System Fault Index

Fault No.	Description	Page
r1.	11K Self-Recovery Winch (SRW) Does Not Work	2-1946

r1. 11K SELF-RECOVERY WINCH DOES NOT WORK

INITIAL SETUP

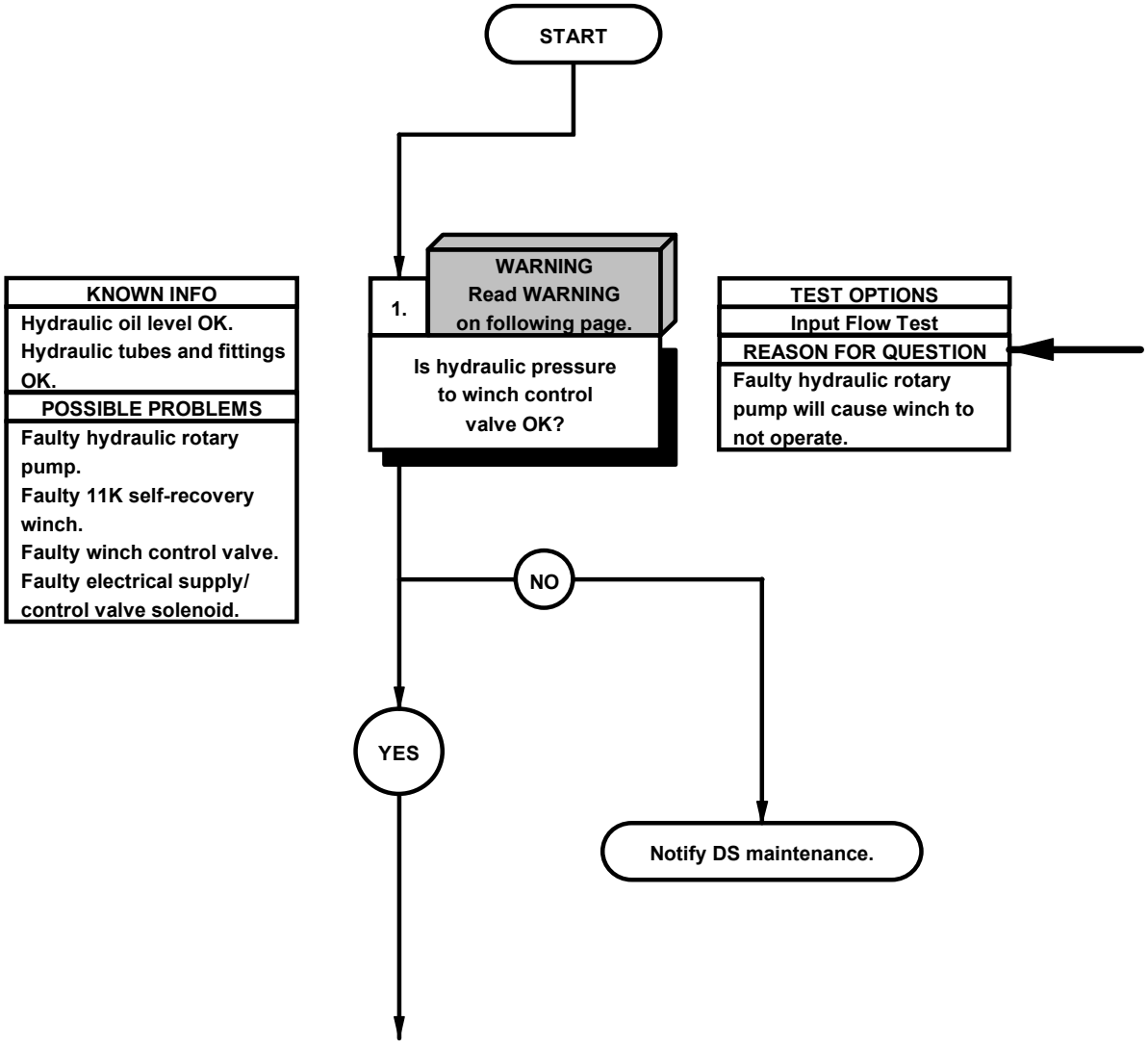
Equipment Conditions
Engine shut down (TM 9-2320-365-10).

Personnel Required
(2)

References
TM 9-4910-571-12&P

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Pan, Drain (Item 24, Appendix C)
Transducer, STE/ICE-R (Item 1, Appendix J)
Goggles, Industrial (Item 15, Appendix C)

Materials/Parts
Rag, Wiping (Item 51, Appendix D)

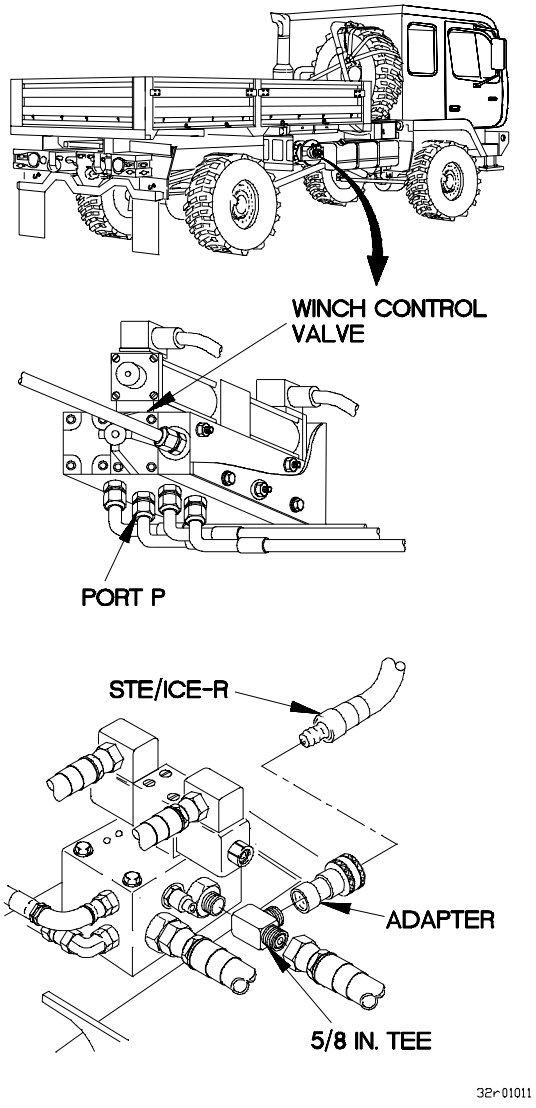


WARNING

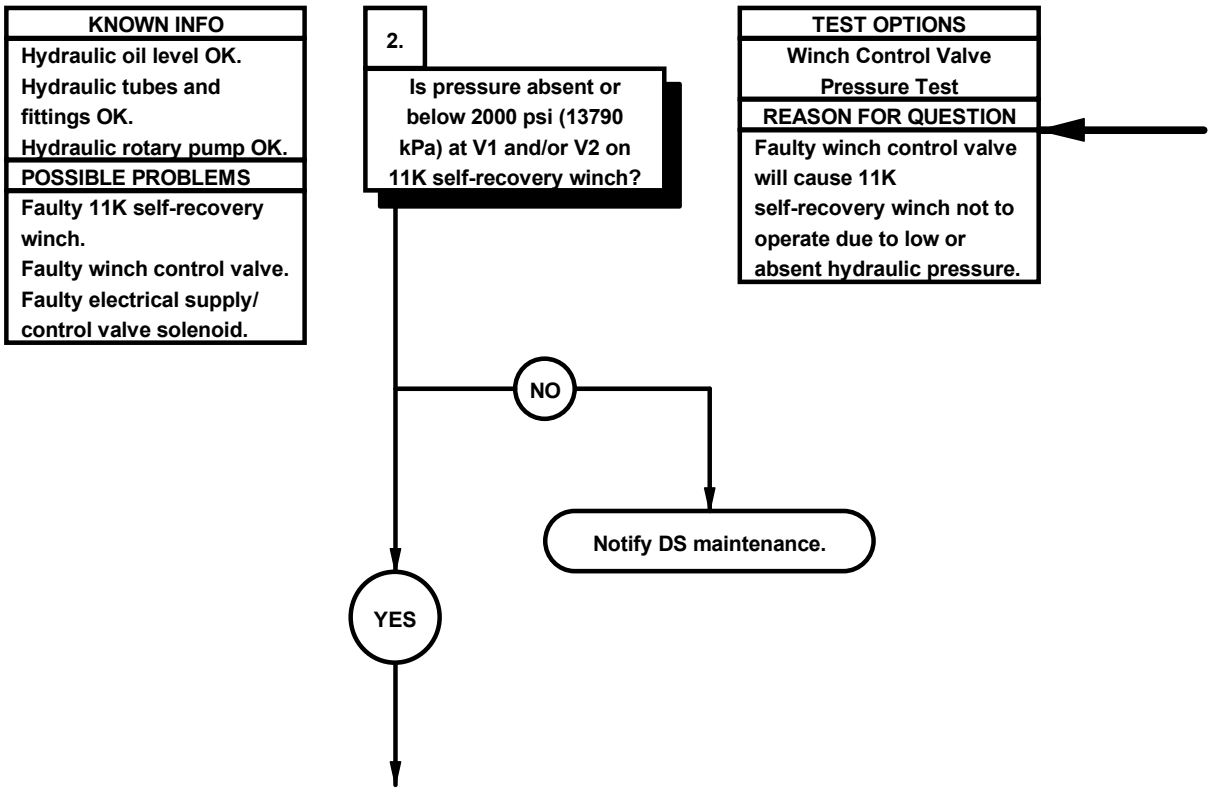
- **Drop hydraulic pressure to zero before disconnecting any hydraulic hoses, tubes or fittings. Failure to comply may result in injury to personnel.**
- **Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.**
- **Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.**

INPUT FLOW TEST

(1) Place drain pan under control valve.
(2) Disconnect hose from port P of winch control valve.
(3) Connect STE/ICE-R with 5/8 in. tee and adapter kit between hose fitting and port P.
(4) Start engine (TM 9-2320-365-10).
(5) Position PTO switch to on (TM 9-2320-365-10).
(6) Attach stall load to winch cable (TM 9-2320-365-10).
(7) Position WINCH POWER switch to on (TM 9-2320-365-10).
(8) Engage winch clutch (TM 9-2320-365-10).
(9) Toggle WINCH IN/OUT switch to IN (TM 9-2320-365-10) and perform STE/ICE-R test #51 (TM 9-4910-574-12&P) and note pressure reading.
(10) Check if pressure is 2000-2100 psi (13790-14480 kPa), if pressure is lower than 2000 psi (13790 kPa), notify DS Maintenance.
(11) Position WINCH POWER and PTO switches to off (TM 9-2320-365-10).
(12) Shut down engine (TM 9-2320-365-10).
(13) Disconnect STE/ICE-R, tee, and adapter kit.
(14) Connect hose fitting to port P.
(15) Remove drain pan.

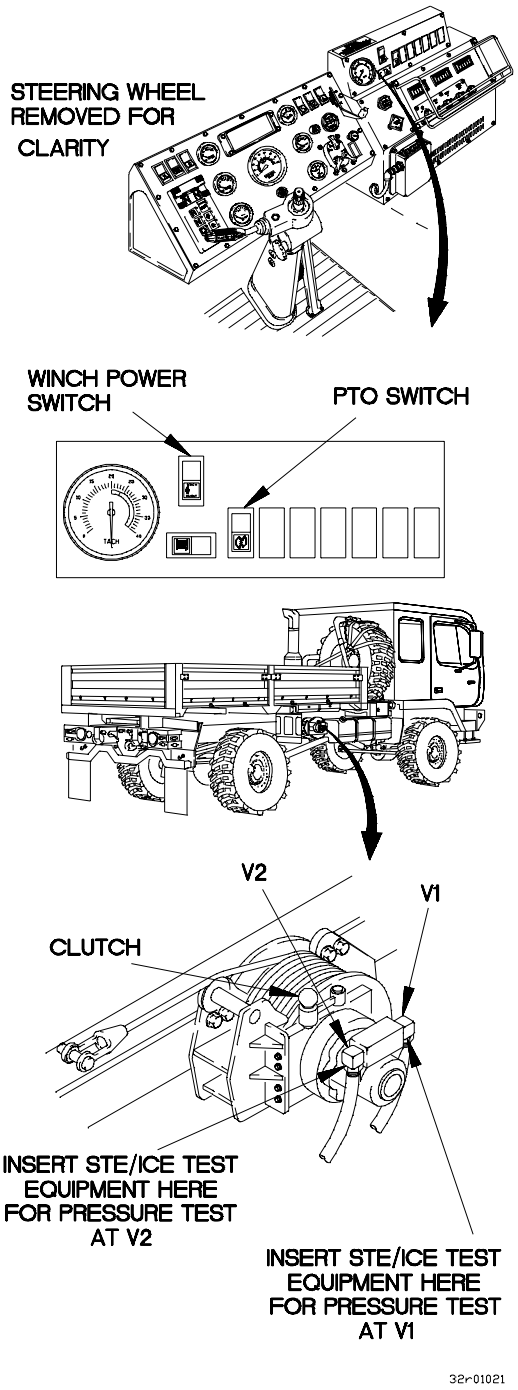


r1. 11K SELF-RECOVERY WINCH DOES NOT WORK (CONT)

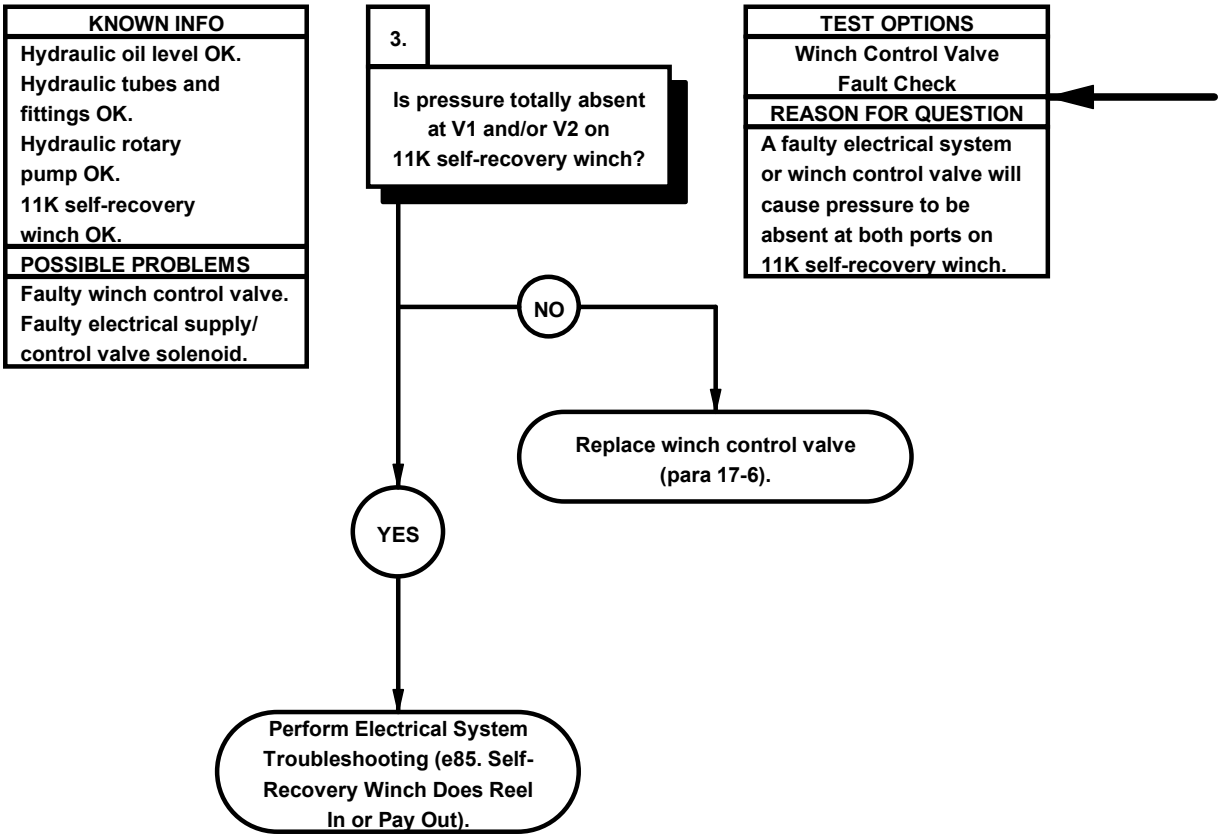


WINCH CONTROL VALVE PRESSURE TEST

(1) Disconnect hose from fitting below elbow at port V1 (on side of 11K self-recovery winch toward front of vehicle).
(2) Connect STE/ICE-R with tee between port V1 and hose.
(3) Start engine (TM 9-2320-365-10).
(4) Attach stall load to winch cable (TM 9-2320-365-10).
(5) Position PTO switch and WINCH POWER switch to ON (TM 9-2320-365-10).
(6) Engage winch clutch (TM 9-2320-365-10).
(7) Perform STE/ICE-R test #51 and toggle WINCH IN/OUT switch to IN position and hold (TM 9-4910-571-12&P).
(8) Check if pressure reading is between 2000-2100 psi (13790-14480 kPa) on STE/ICE-R.
(9) If pressure is less than 2000 psi (13790 kPa), notify DS Maintenance.
(10) Position WINCH POWER and PTO switches to off (TM 9-2320-365-10).
(11) Shut down engine (TM 9-2320-365-10).
(12) Disconnect STE/ICE-R and tee.
(13) Connect hose fitting to port V1.
(14) Disconnect hose (below elbow) from port V2.
(15) Connect STE/ICE-R with tee between hose and port V2.
(16) Start engine (TM 9-2320-365-10).
(17) Position PTO and WINCH POWER switches to on (TM 9-2320-365-10).
(18) Perform STE/ICE-R test #51 and toggle WINCH IN/OUT switch to OUT (TM 9-4910-571-12&P).
(19) Check if pressure reading is between 2000-2100 psi (13790-14480 kPa).
(20) If pressure is lower than 2000 psi, notify DS Maintenance.
(21) Release load and retrieve cable (TM 9-2320-365-10).
(22) Position WINCH POWER and PTO switches to off (TM 9-2320-365-10).
(23) Disengage winch clutch (TM 9-2320-365-10).
(24) Shut down engine (TM 9-2320-365-10).
(25) Disconnect STE/ICE-R and tee.
(26) Connect hose fitting to port V2.



r1. 11K SELF-RECOVERY WINCH DOES NOT WORK (CONT)



WINCH CONTROL VALVE FAULT CHECK
(1) If hydraulic pressure was absent in winch control valve pressure test (step 2.), perform Electrical System Troubleshooting (e85. 11K Self-Recovery Winch Does Not Reel In or Pay Out).
(2) If hydraulic pressure was low in winch control valve pressure test (step 2.), replace winch control valve (para 17-6).

2-29. STEERING HYDRAULIC SYSTEM TROUBLESHOOTING

This paragraph covers Steering Hydraulic System Troubleshooting. The Steering Hydraulic System Fault Index, Table 2-55, lists faults for the steering hydraulic system of the vehicle.

Table 2-55. Steering Hydraulic System Fault Index

Fault No.	Description	Page
s1.	Steering Hard or Does Not Work	2-1954

s1. STEERING HARD OR DOES NOT WORK

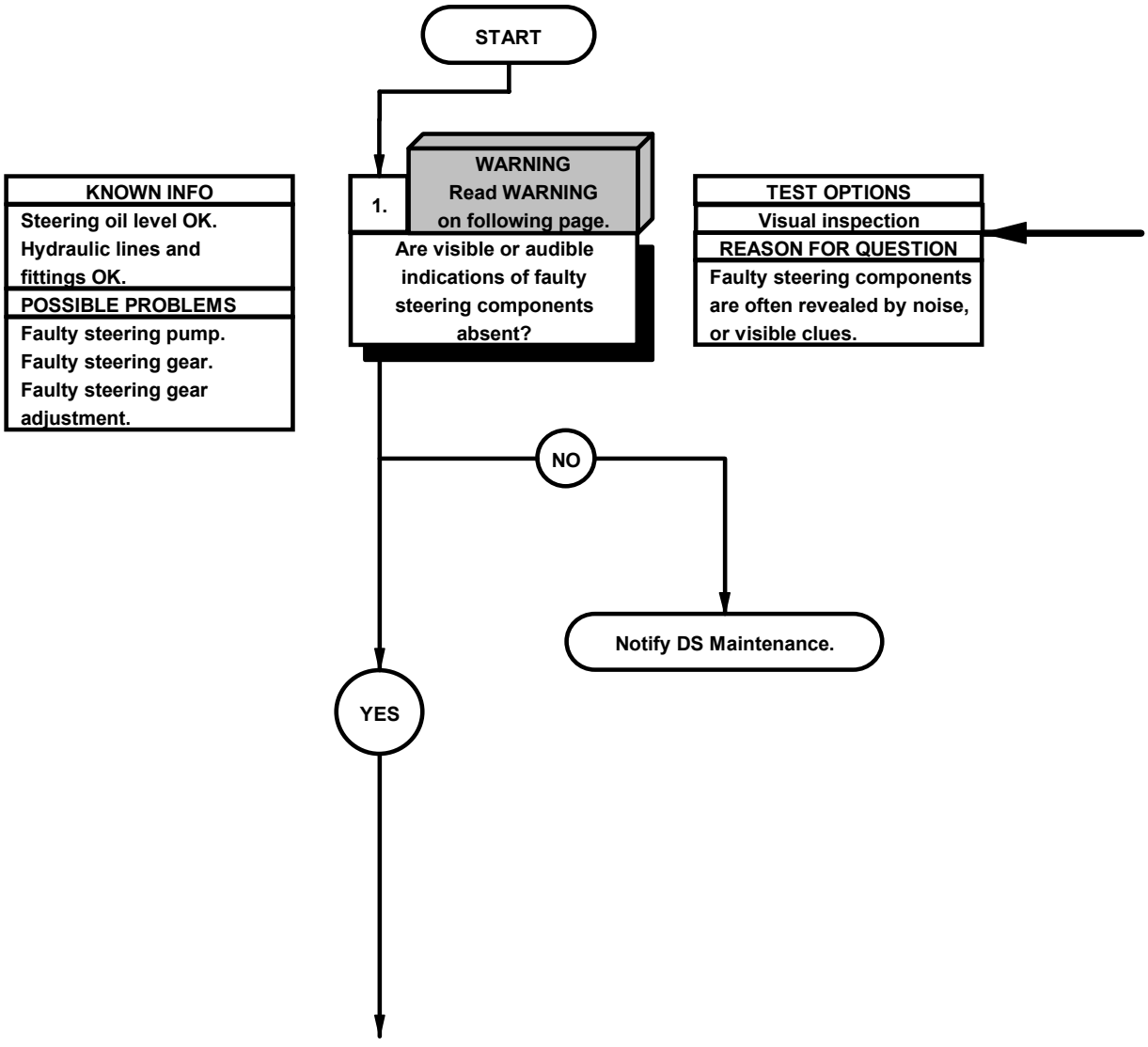
INITIAL SETUP

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

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Goggles, Industrial (Item 15, Appendix C)

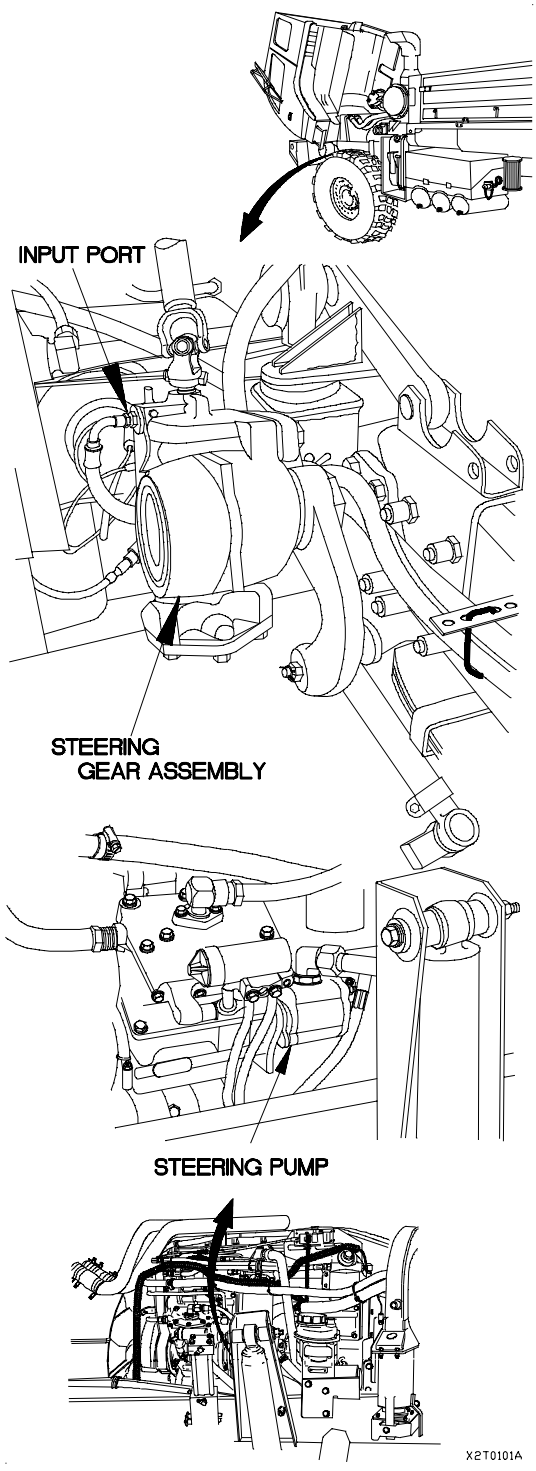
Materials/Parts
Rag, Wiping (Item 51, Appendix D)



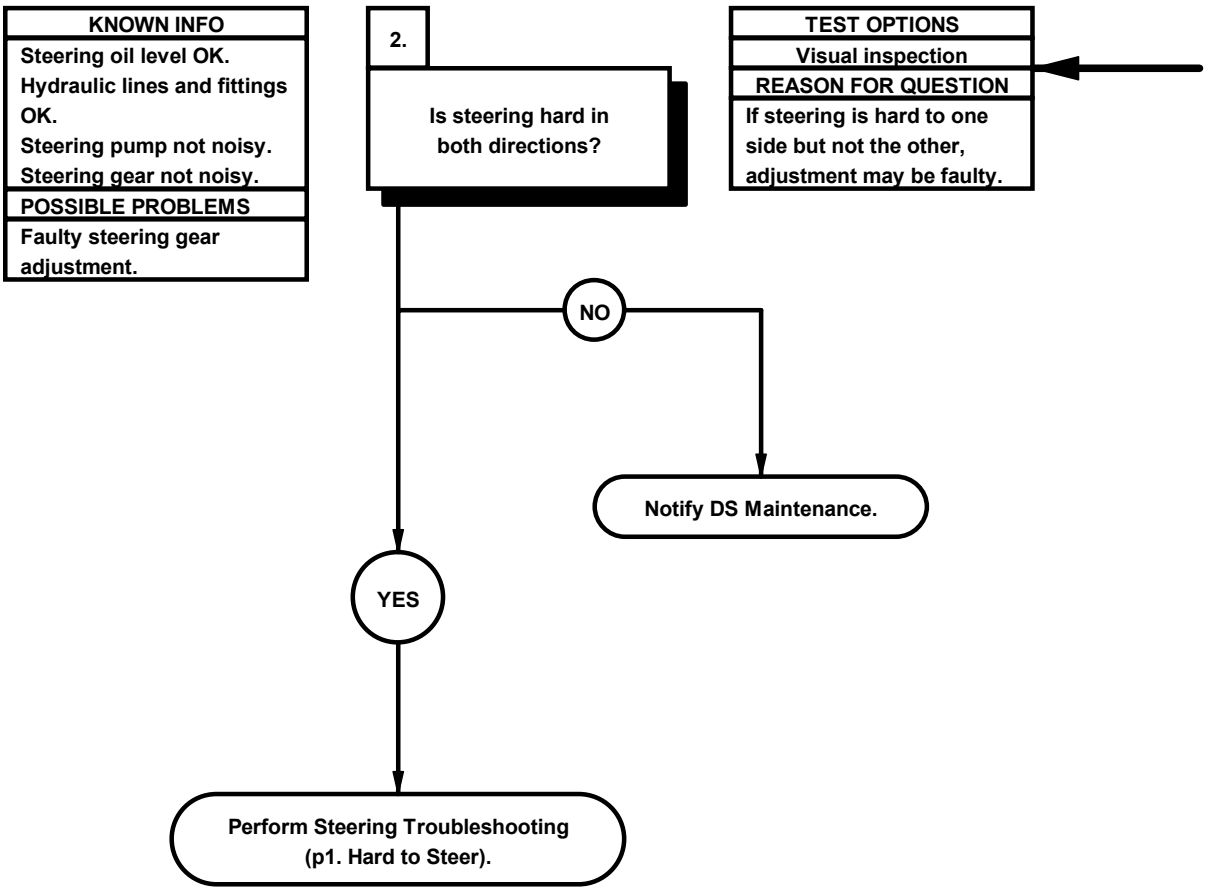
WARNING

- **Drop hydraulic pressure to zero before disconnecting any hydraulic line. Failure to comply may result in injury to personnel.**
- **Wear approved eye protection when performing pressure checks. Failure to comply may result in oil getting into eyes. If oil contacts eyes, seek medical attention immediately.**
- **Fuel and oil are slippery and can cause falls. Wipe up spilled fuel or oil with rags. Failure to comply may result in injury to personnel.**

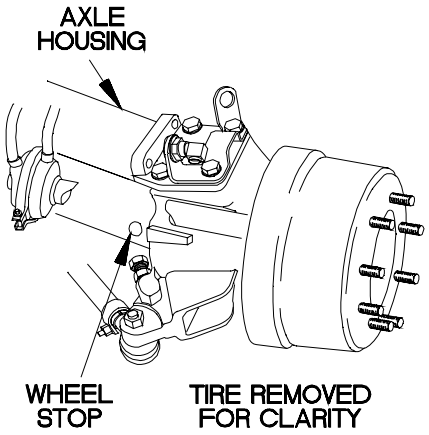
(1) Check steering oil level and fill as required (Appendix H).
(2) Start engine (TM 9-2320-365-10).
(3) Turn steering wheel from lock-to-lock.
(4) Listen for unusual sounds. Faulty steering pump or steering gear may be noisy.
(5) Shut down engine (TM 9-2320-365-10).



s1. STEERING HARD OR DOES NOT WORK (CONT)



(1) Raise cab (TM 9-2320-365-10).
(2) Inspect point on each end of front axle housing where wheel stop contacts axle. If this spot is gouged or peened or if steering is harder in one direction than the other, steering adjustment may be faulty.
(3) Lower cab (TM 9-2320-365-10).



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2-30. AIR TRANSPORT TROUBLESHOOTING

This paragraph covers Air Transport Troubleshooting. The Air Transport Fault Index, Table 2-56, lists faults for the air transport components of the vehicle.

Table 2-56. Air Transport Fault Index

Fault No.	Description	Page
t1.	Cab Tilt, Spare Tire Retainer, and Suspension Compression Do Not Operate	2-1960
t2.	Suspension Does Not Compress and/or Return To Normal	2-1970
t3.	Cab Leveling Air Springs Do Not Operate	2-1972

t1. CAB TILT, SPARE TIRE RETAINER, AND SUSPENSION COMPRESSION DO NOT OPERATE

INITIAL SETUP

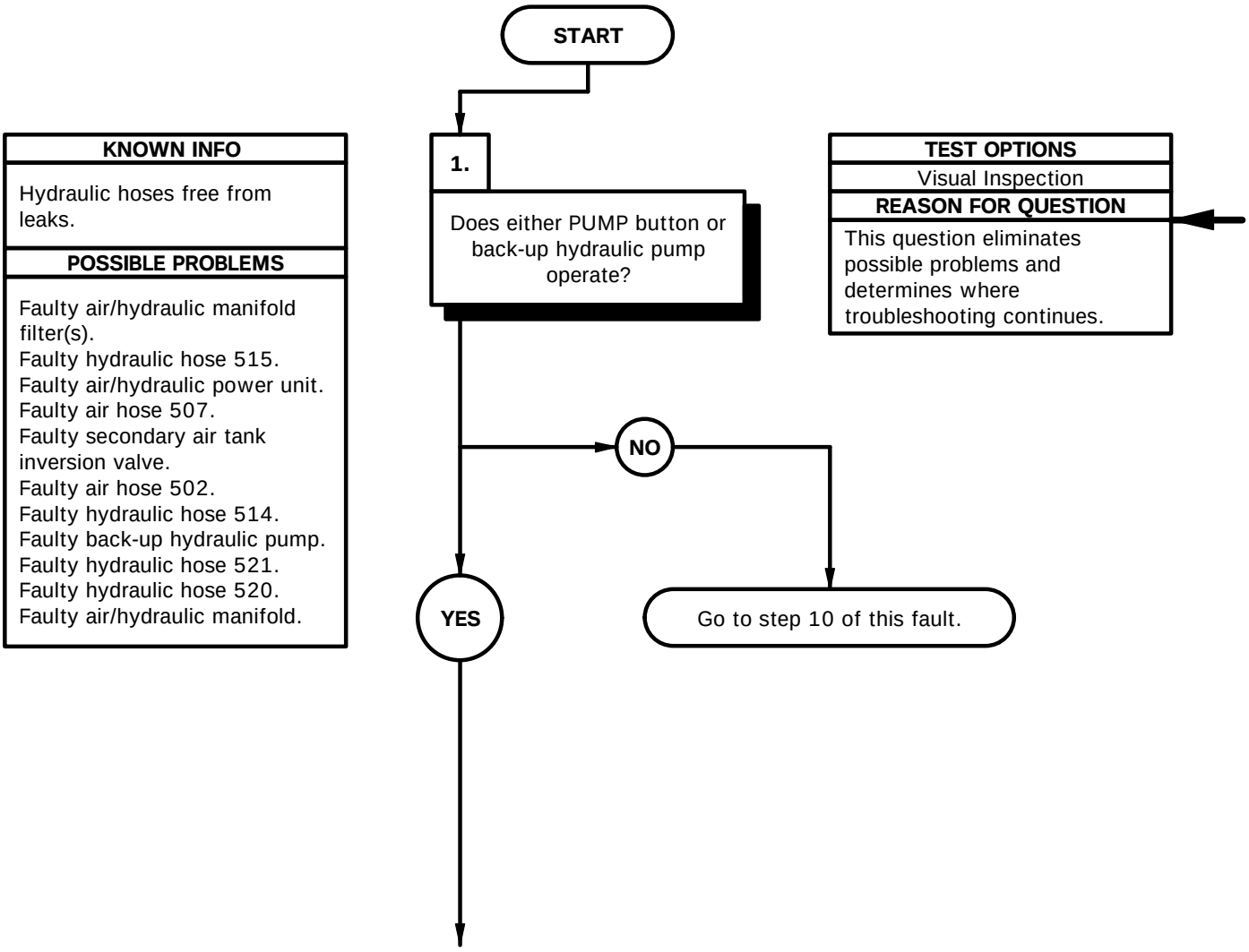
Equipment Condition
Engine shut down (TM 9-2320-365-10).

Personnel Required
(2)

Material/Parts
Filter Assembly (2) (Item 12, Appendix G)
Rag, Wiping (Item 51, Appendix D)

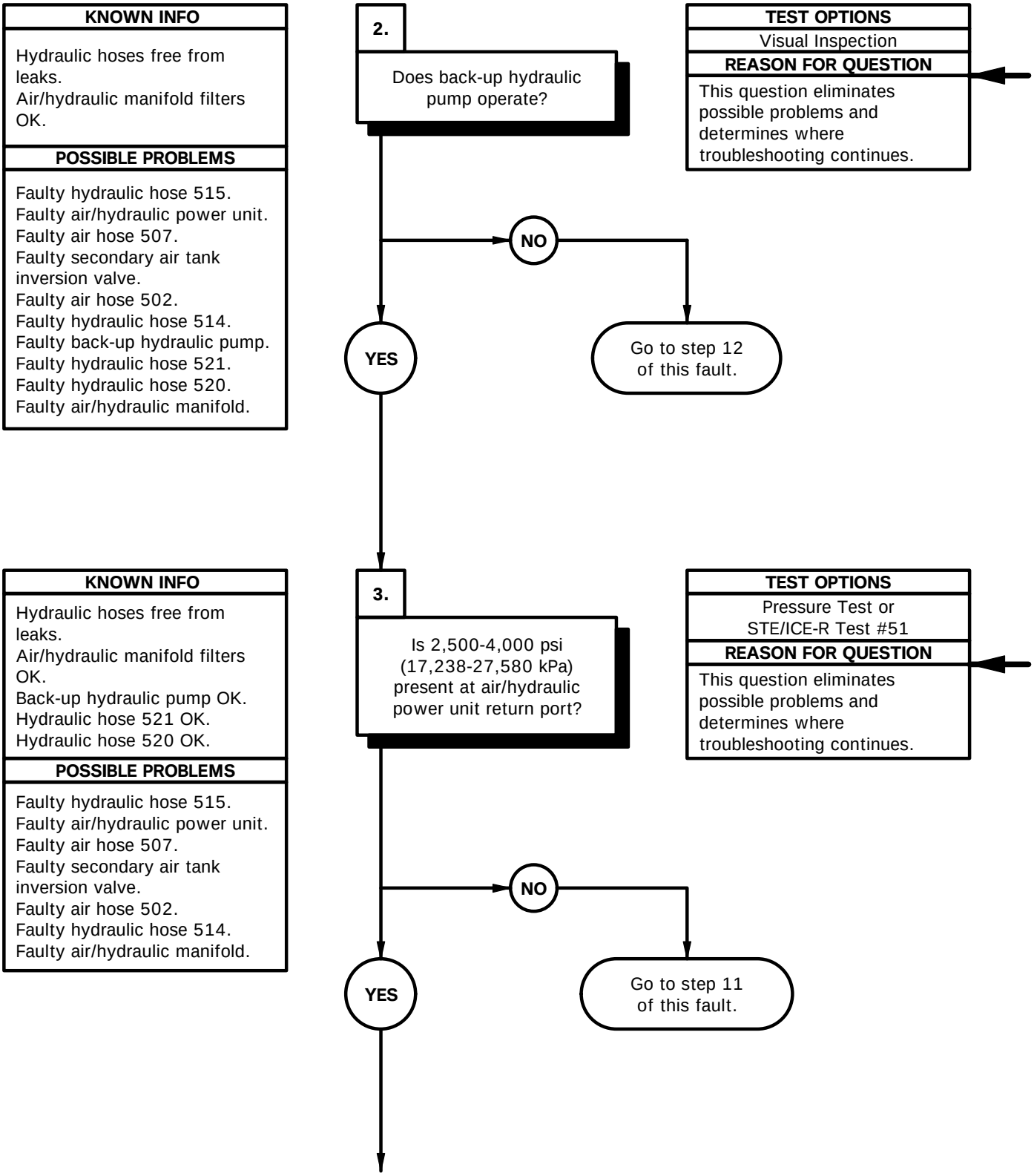
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Pan, Drain (Item 24, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Transducer, 10,000 PSI (Item 1, Appendix J)
Gloves, Rubber (Item 13, Appendix C)

References
TM 9-4910-571-12&P



(1) Attempt to raise cab using PUMP button (TM 9-2320-365-10).
(2) Attempt to raise cab using back-up hydraulic pump (TM 9-2320-365-10).
(3) If cab does not raise in both steps (1) and (2), go to step 10 of this fault.

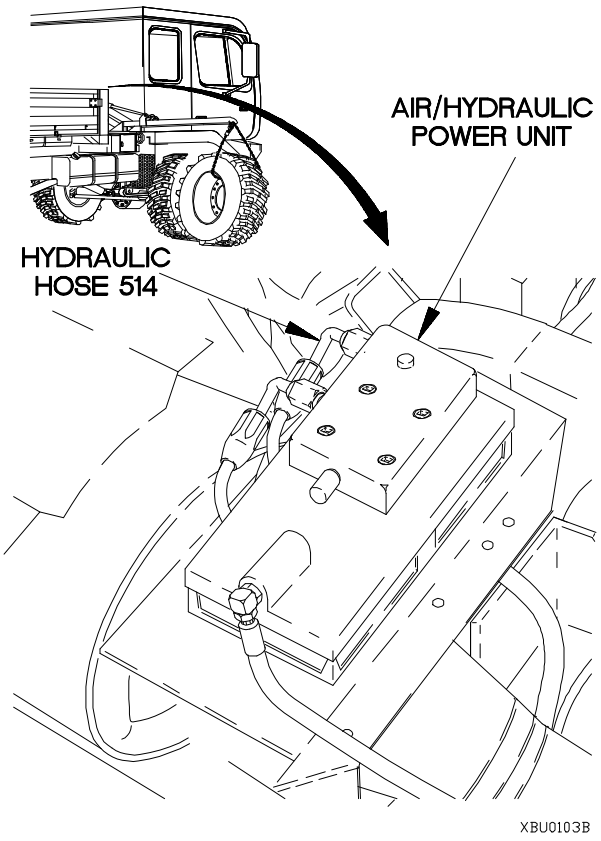
t1. CAB TILT, SPARE TIRE RETAINER, AND SUSPENSION COMPRESSION DO NOT OPERATE (CONT)



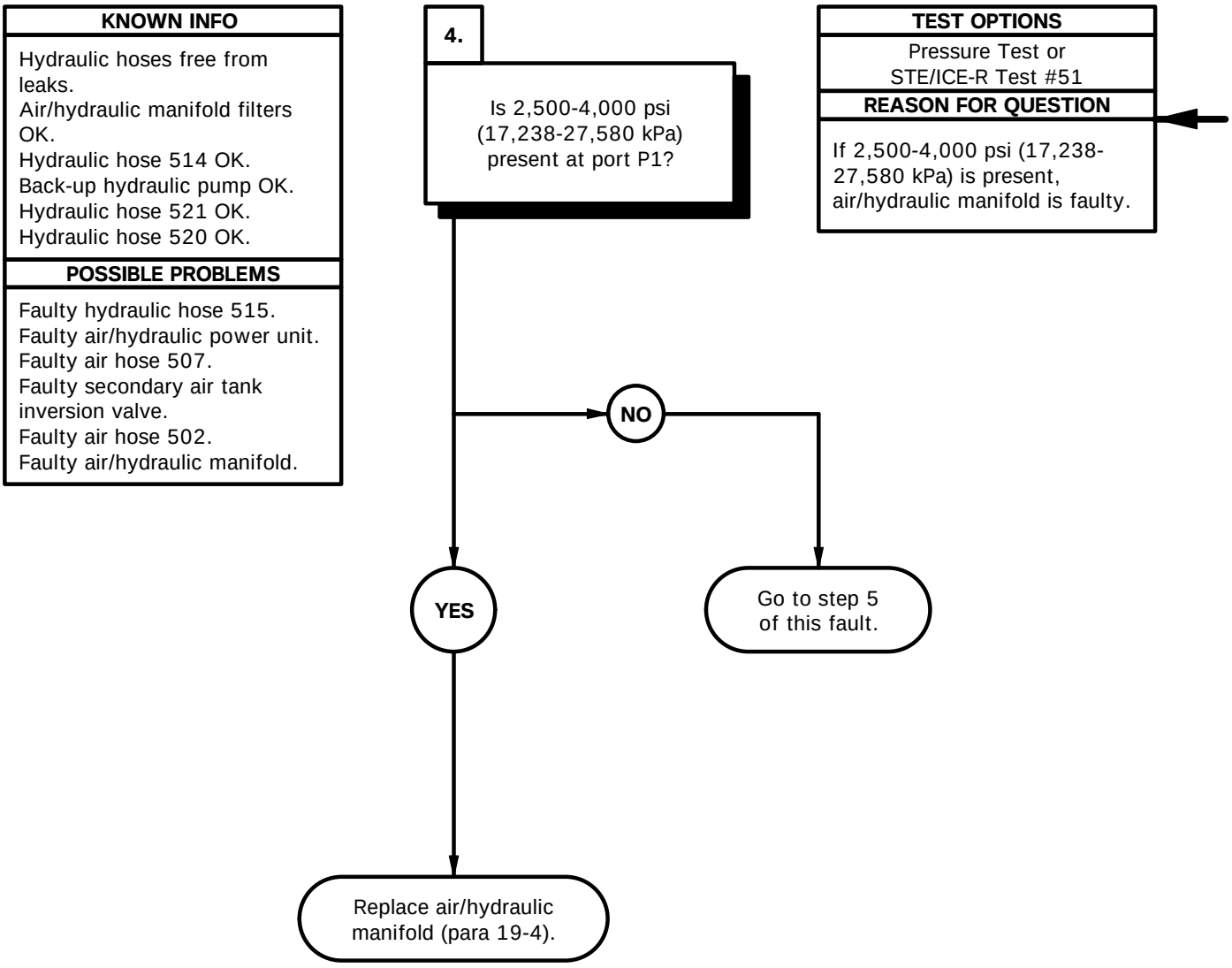
(1) Attempt to raise cab using back-up hydraulic pump (TM 9-2320-365-10).
(2) If cab does not raise, go to step 12 of this fault.
(3) Lower cab (TM 9-2320-365-10).

PRESSURE TEST

(1) Position drain pan under air/hydraulic power unit.
(2) Disconnect hydraulic hose 514 from air/hydraulic power unit return port.
(3) Connect STE/ICE-R between hydraulic hose 514 and return port.
(4) Start engine (TM 9-2320-365-10).
(5) Position SUSPENSION knob to LOWER (TM 9-2320-365-10).
(6) Position FUNCTION SELECT knob to SUSPENSION (TM 9-2320-365-10).
(7) Push and hold PUMP plunger button (TM 9-2320-365-10) and perform STE/ICE-R Test #51.
(8) If 2,500-4,000 psi (17,238-27,580 kPa) is not present, go to step 11 of this fault.
(9) Disconnect STE/ICE-R from hydraulic hose 514 and return port.
(10) Connect hydraulic hose 514 to return port.

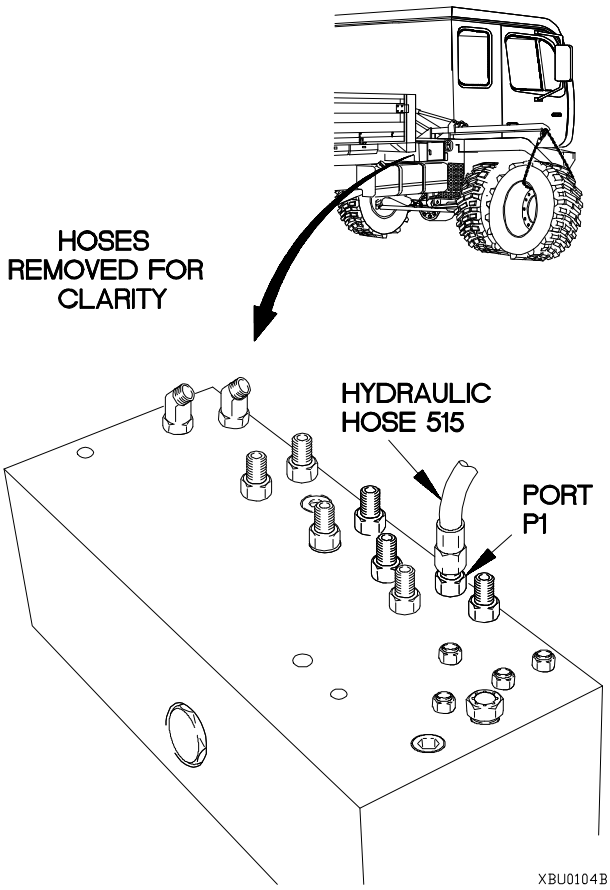


t1. CAB TILT, SPARE TIRE RETAINER, AND SUSPENSION COMPRESSION DO NOT OPERATE (CONT)

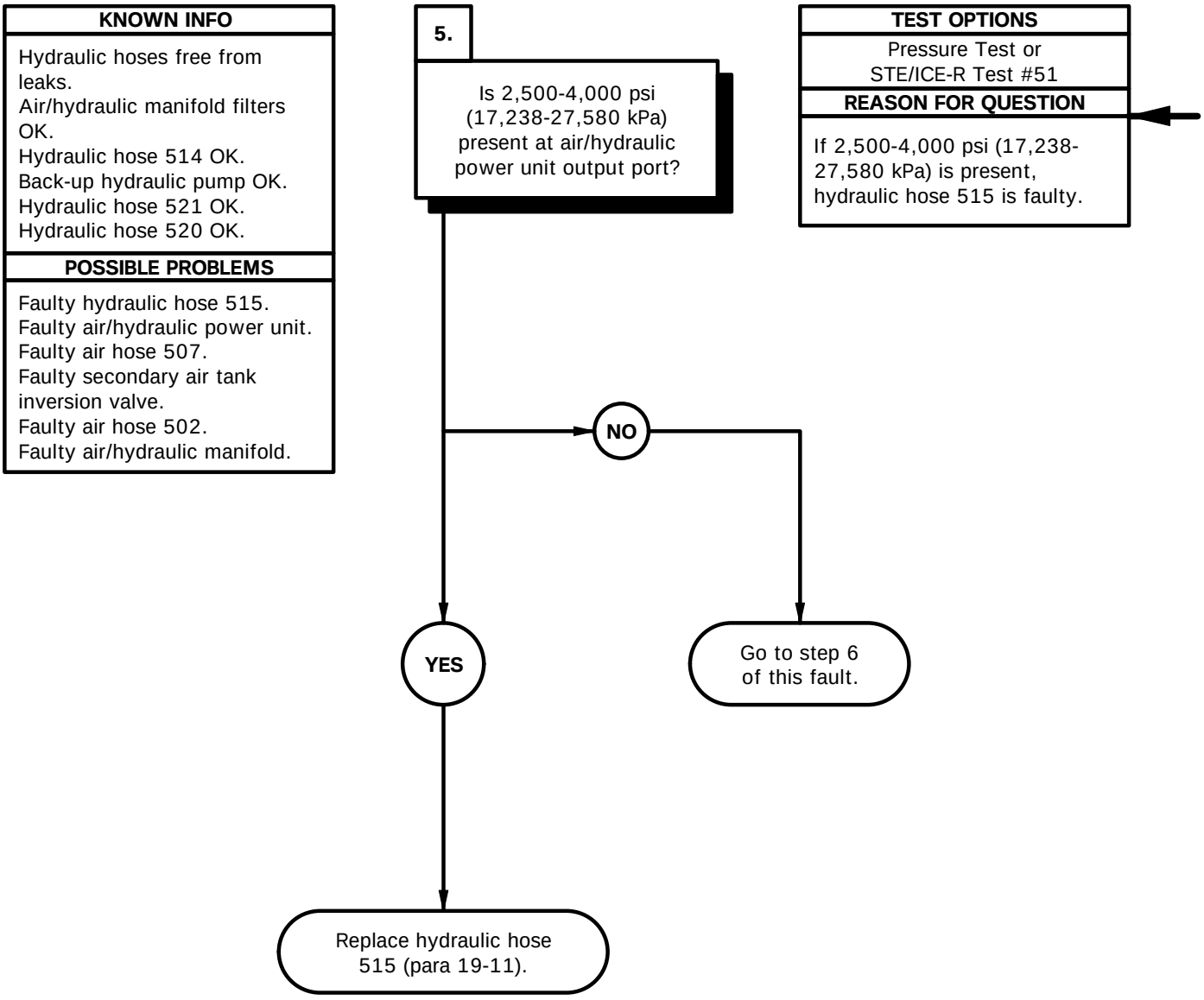


PRESSURE TEST

(1) Position drain pan under air/hydraulic manifold.
(2) Disconnect hydraulic hose 515 from port P1.
(3) Connect STE/ICE-R between hydraulic hose 515 and port P1.
(4) Start engine (TM 9-2320-365-10).
(5) Position SUSPENSION knob to LOWER (TM 9-2320-365-10).
(6) Position FUNCTION SELECT knob to SUSPENSION (TM 9-2320-365-10).
(7) Push and hold PUMP plunger button (TM 9-2320-365-10) and perform STE/ICE-R Test #51.
(8) If 2,500-4,000 psi (17,238-27,580 kPa) is not present, go to step 5 of this fault.
(9) If 2,500-4,000 psi (17,238-27,580 kPa) is present, replace air/hydraulic manifold (para 19-4).
(10) Disconnect STE/ICE-R from hydraulic hose 515 and port P1.
(11) Connect hydraulic hose 515 to port P1.

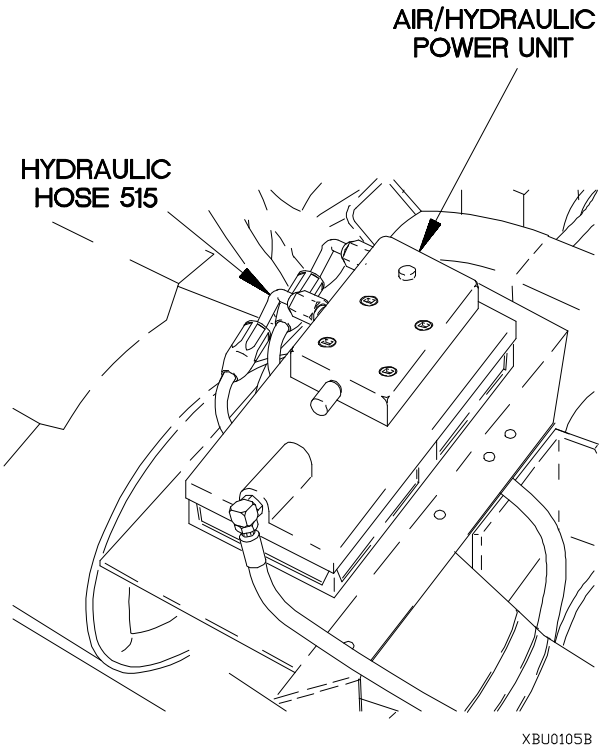


t1. CAB TILT, SPARE TIRE RETAINER, AND SUSPENSION COMPRESSION DO NOT OPERATE (CONT)

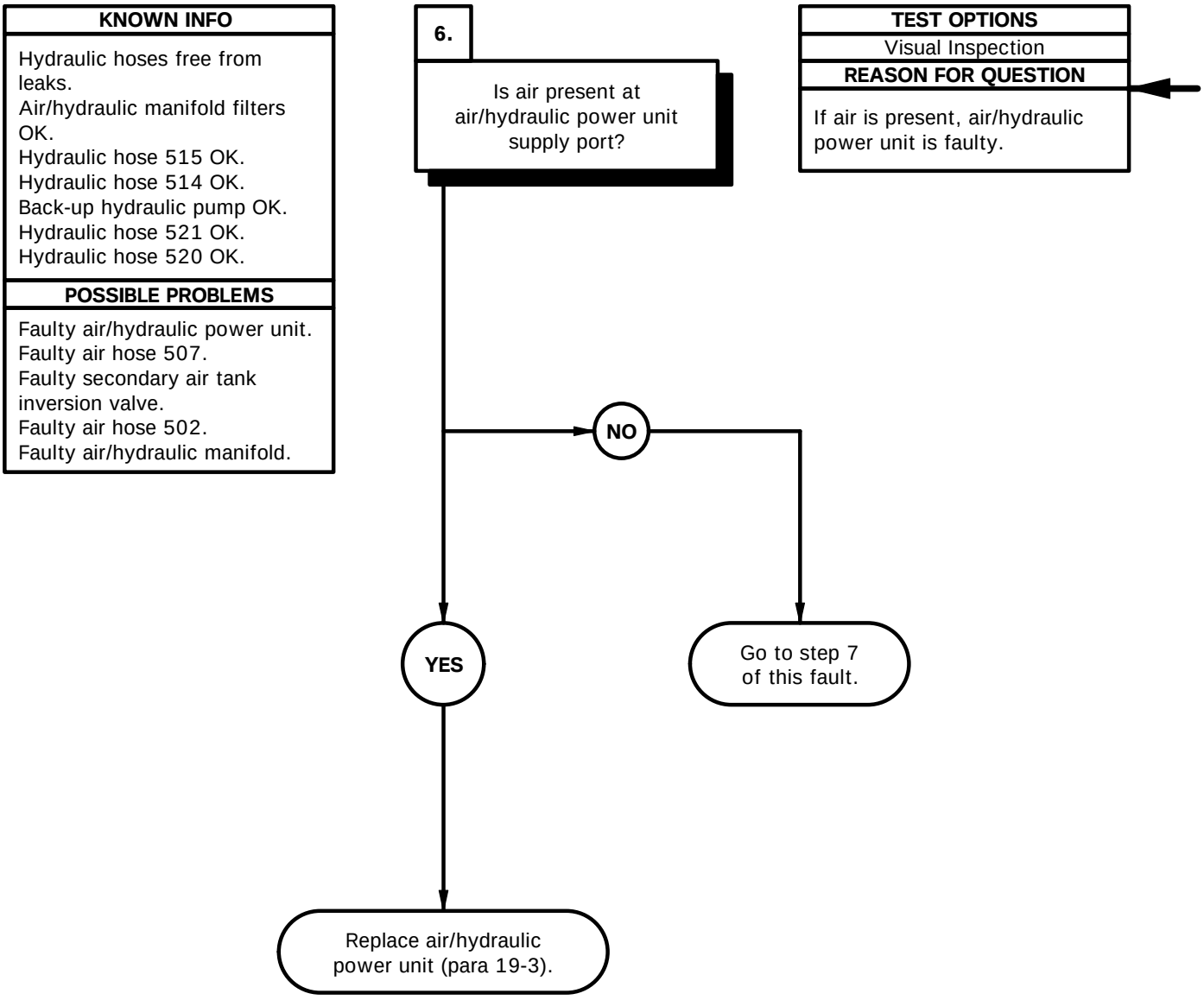


PRESSURE TEST

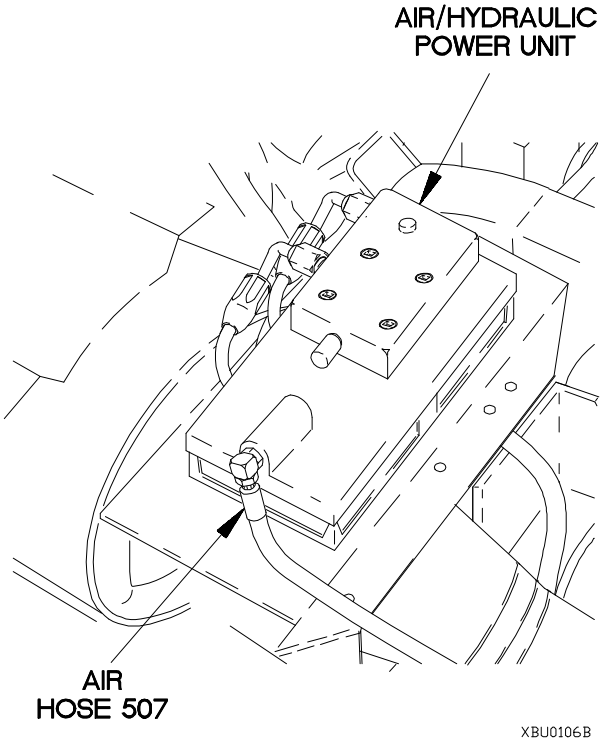
(1) Position drain pan under air/hydraulic power unit.
(2) Disconnect hydraulic hose 515 from output port.
(3) Connect STE/ICE-R between hydraulic hose 515 and output port.
(4) Start engine (TM 9-2320-365-10).
(5) Position SUSPENSION knob to LOWER (TM 9-2320-365-10).
(6) Position FUNCTION SELECT knob to SUSPENSION (TM 9-2320-365-10).
(7) Push and hold PUMP plunger button (TM 9-2320-365-10) and perform STE/ICE-R Test #51.
(8) If 2,500-4,000 psi (17,238-27,580 kPa) is not present, go to step 6 of this fault.
(9) If 2,500-4,000 psi (17,238-27,580 kPa) is present, replace hydraulic hose 515 (para 19-11).
(10) Disconnect STE/ICE-R from hydraulic hose 515 and output port.
(11) Connect hydraulic hose 515 to output port.



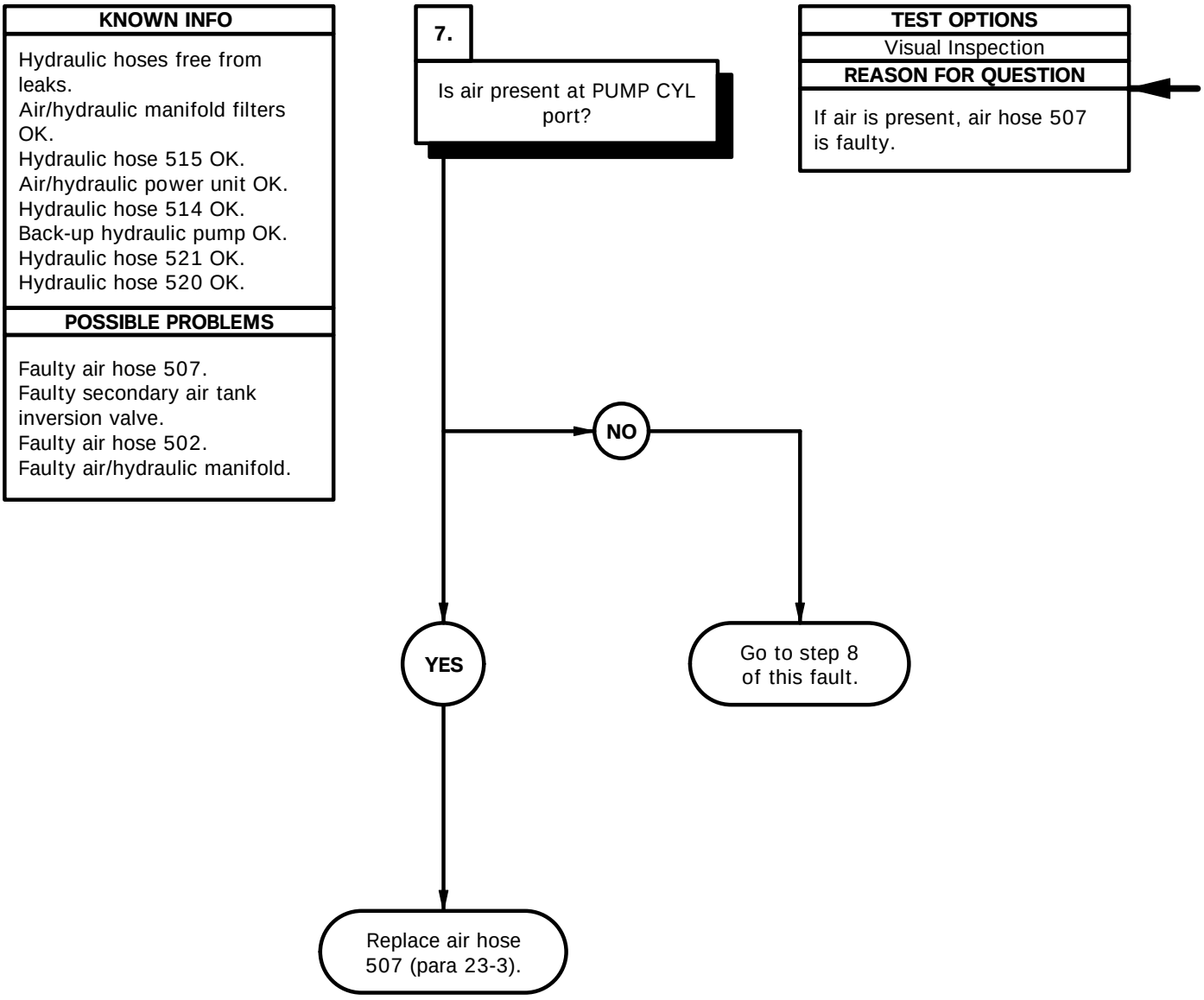
t1. CAB TILT, SPARE TIRE RETAINER, AND SUSPENSION COMPRESSION DO NOT OPERATE (CONT)



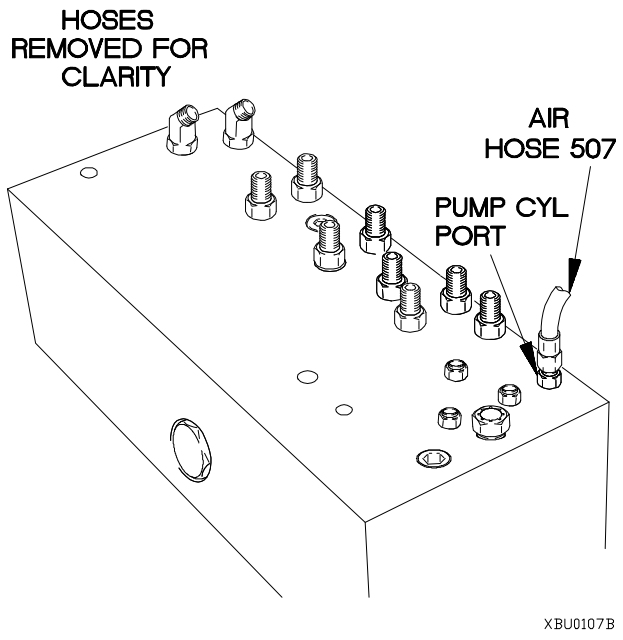
(1) Drain air tanks (TM 9-2320-365-10).
(2) Loosen air hose 507 at air/hydraulic power unit.
(3) Start engine and charge air tanks (TM 9-2320-365-10).
(4) Check for presence of air at air hose 507.
(5) If air is not present, go to step 7 of this fault.
(6) If air is present, replace air/hydraulic power unit (para 19-3).
(7) Drain air tanks (TM 9-2320-365-10).
(8) Tighten air hose 507 at air/hydraulic power unit.



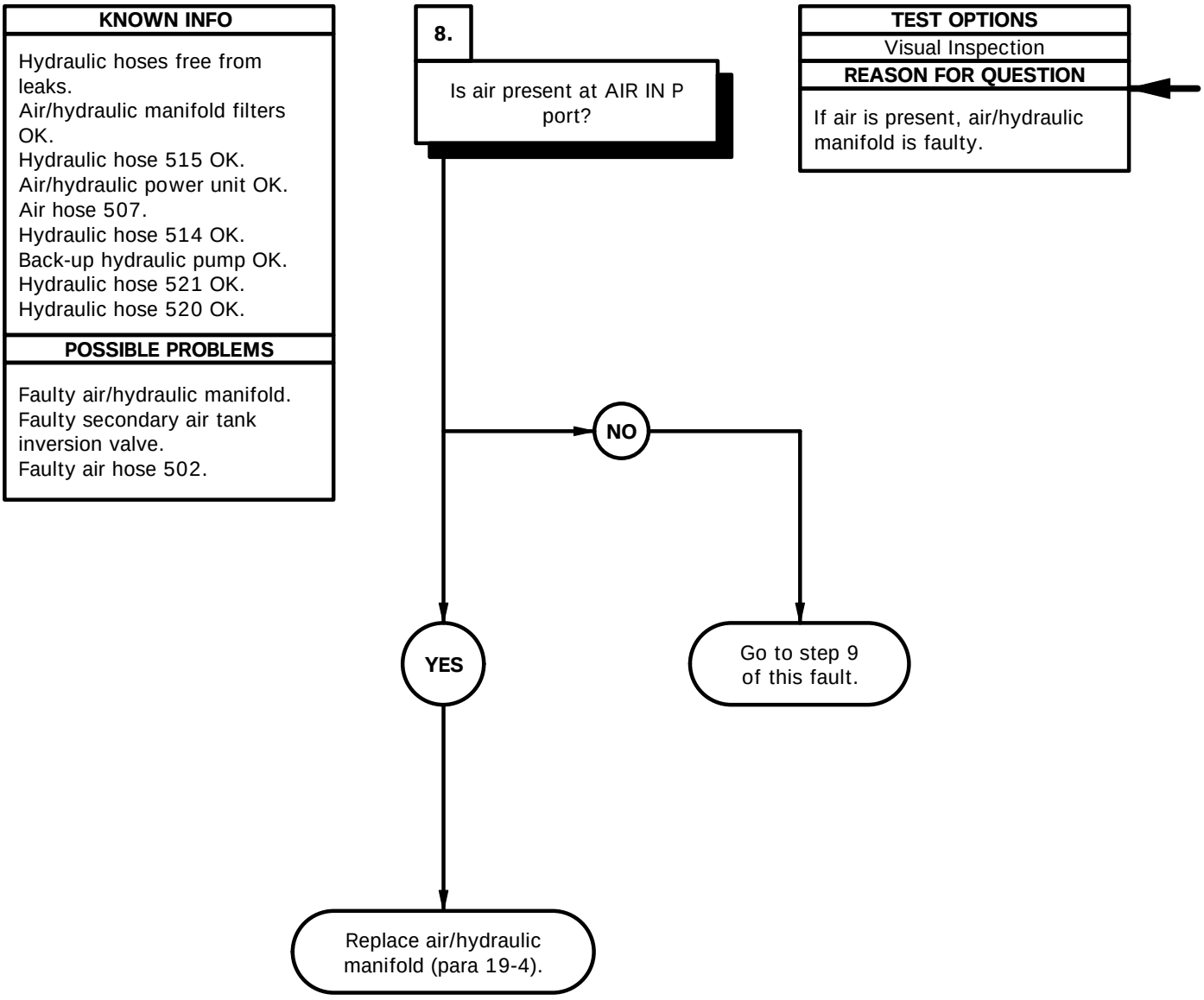
t1. CAB TILT, SPARE TIRE RETAINER, AND SUSPENSION COMPRESSION DO NOT OPERATE (CONT)



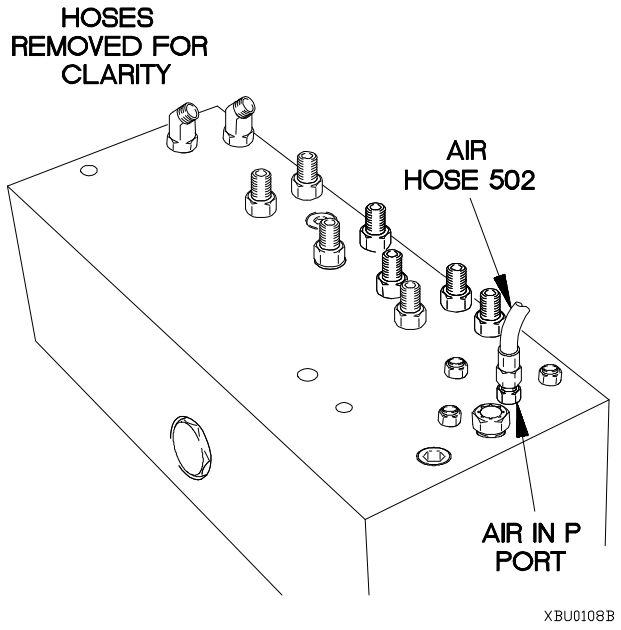
(1) Drain air tanks (TM 9-2320-365-10).
(2) Loosen air hose 507 at PUMP CYL port.
(3) Start engine and charge air tanks (TM 9-2320-365-10).
(4) Check for presence of air at PUMP CYL port.
(5) If air is not present, go to step 8 of this fault.
(6) If air is present, replace air hose 507 (para 23-3).
(7) Drain air tanks (TM 9-2320-365-10).
(8) Tighten air hose 507 at PUMP CYL port.



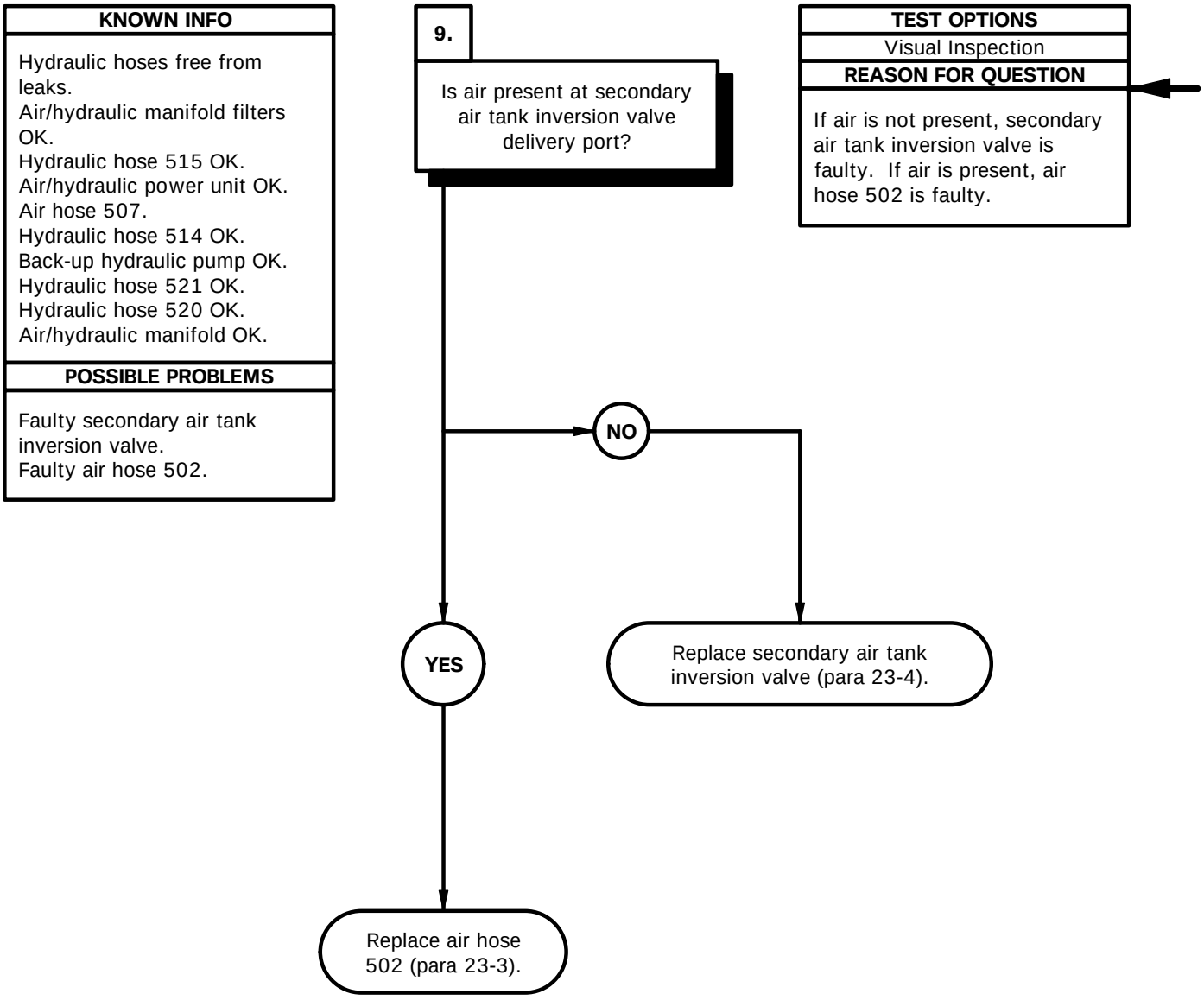
t1. CAB TILT, SPARE TIRE RETAINER, AND SUSPENSION COMPRESSION DO NOT OPERATE (CONT)



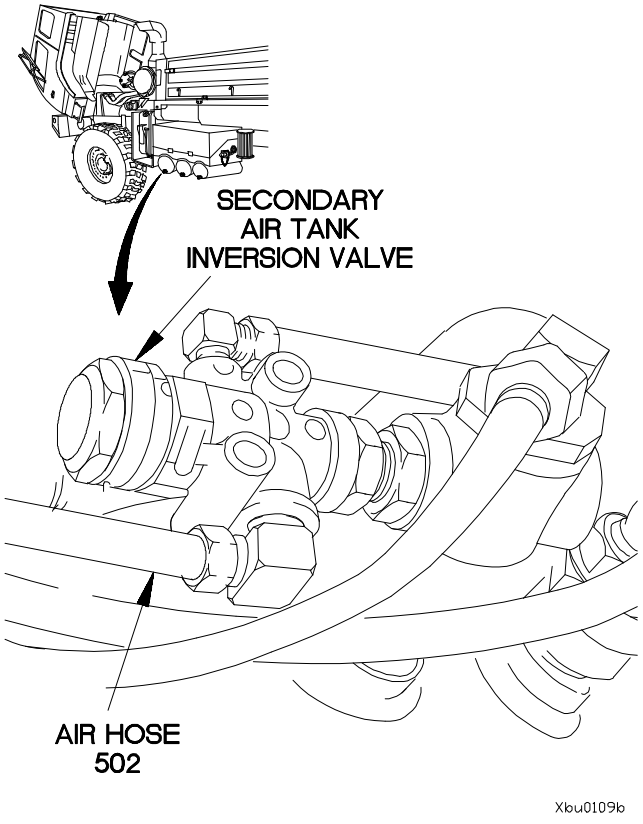
(1) Drain air tanks (TM 9-2320-365-10).
(2) Loosen air hose 502 at AIR IN P port.
(3) Start engine and charge air tanks (TM 9-2320-365-10).
(4) Check for presence of air at air hose 502.
(5) If air is not present, go to step 9 of this fault.
(6) If air is present, replace air/hydraulic manifold (para 19-4).
(7) Drain air tanks (TM 9-2320-365-10).
(8) Tighten air hose 502 at AIR IN P port.



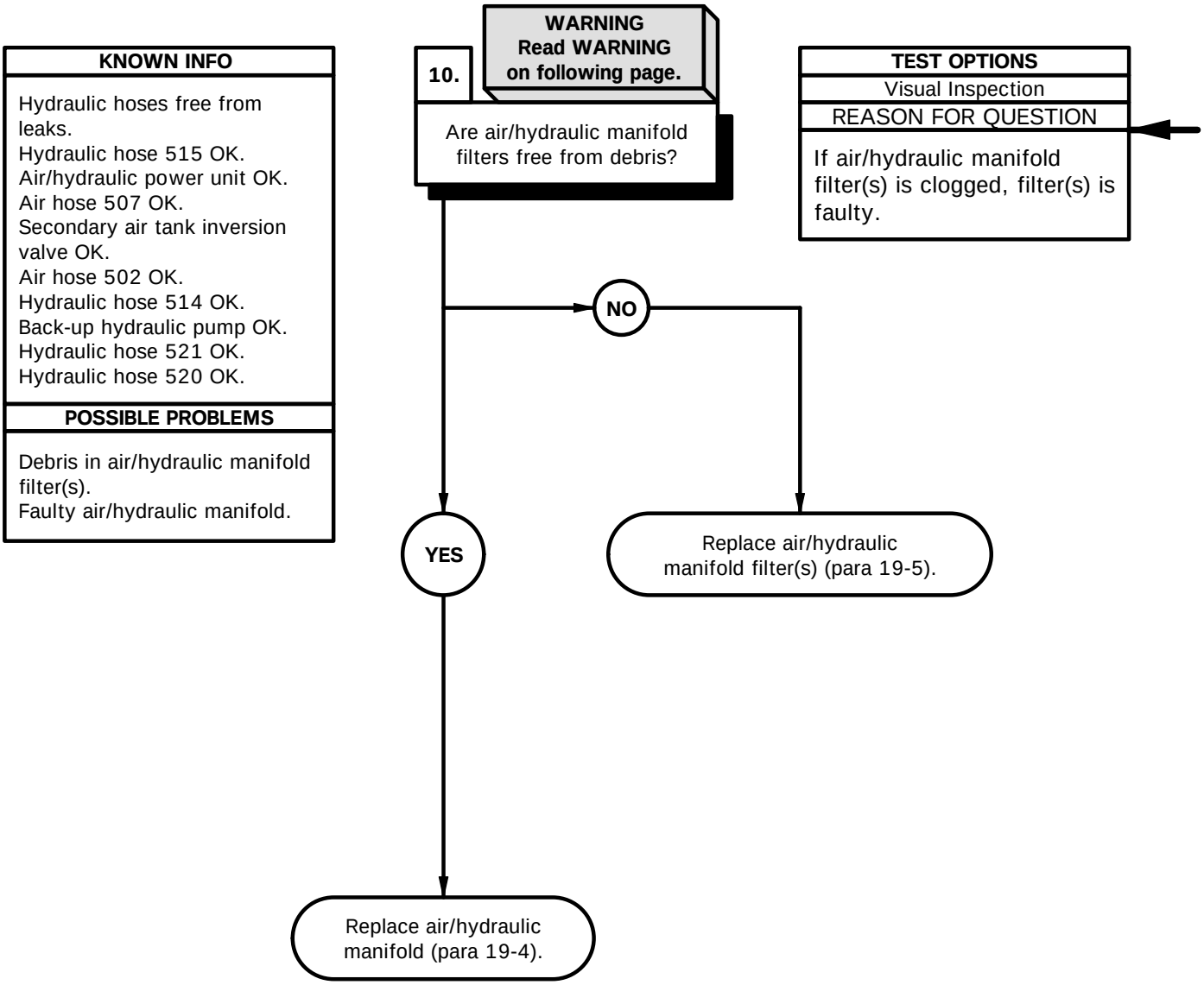
t1. CAB TILT, SPARE TIRE RETAINER, AND SUSPENSION COMPRESSION DO NOT OPERATE (CONT)



(1) Drain air tanks (TM 9-2320-365-10).
(2) Loosen air hose 502 at secondary air tank inversion valve delivery port.
(3) Start engine and charge air tanks (TM 9-2320-365-10).
(4) Check for presence of air at secondary air tank inversion valve delivery port.
(5) If air is not present, replace secondary air tank inversion valve (para 23-4).
(6) If air is present, replace air hose 502 (para 23-3).
(7) Drain air tanks (TM 9-2320-365-10).
(8) Tighten air hose 502 at secondary air tank inversion valve delivery port.



t1. CAB TILT, SPARE TIRE RETAINER, AND SUSPENSION COMPRESSION DO NOT OPERATE (CONT)



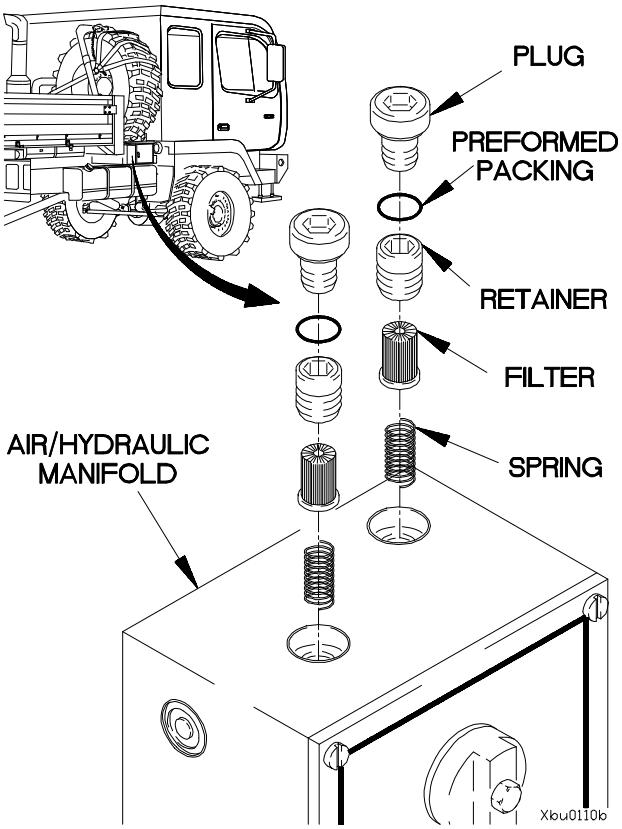
WARNING

Drop hydraulic pressure to zero before disconnecting any hydraulic hoses. Failure to comply may result in injury to personnel.

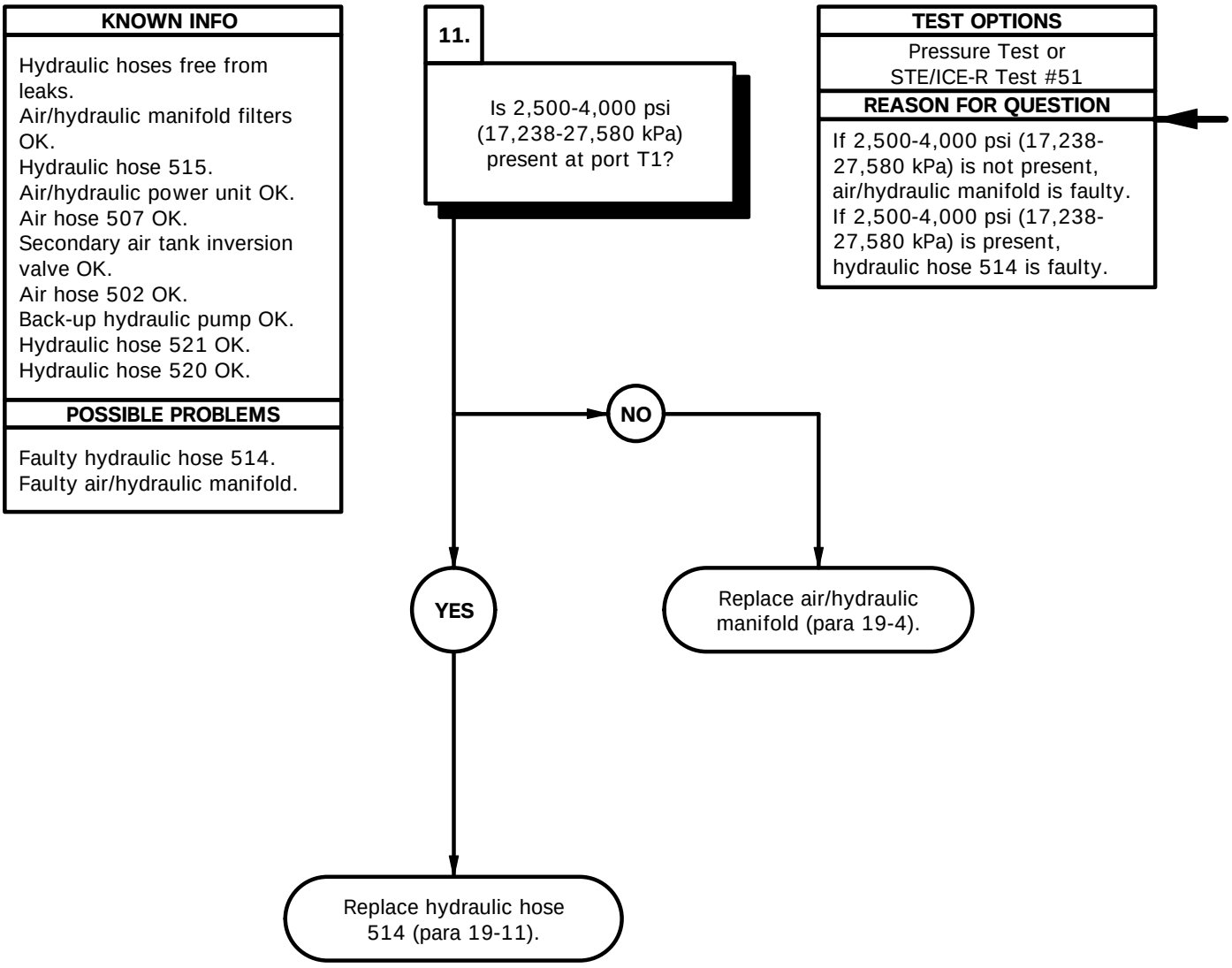
Hydraulic fluid (MIL-H-5606) is TOXIC. Wear protective goggles and gloves; use only in well ventilated area; avoid contact with skin, eyes, and clothes. Skin and clothing that come into contact with hydraulic fluid should be washed immediately. Saturated clothing should be removed immediately. Failure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

Compressed air used for cleaning purposes will not exceed 30 psi (270 kPa). Use only with effective chip guarding and personal protective equipment (goggles, shields, gloves, etc.). Failure to comply may result in injury to personnel.

(1) Remove two plugs from air/hydraulic manifold. Discard plugs.
(2) Remove two retainers, filters, and springs from air/hydraulic manifold. Discard retainers and springs.
(3) Inspect filters for debris or signs of damage.
(4) Discard filters.
(5) If filters are free from debris and damage, repair or replace air/hydraulic manifold (para 19-4).
(6) Position two springs and filters in hydraulic manifold with two retainers.
(7) Install two preformed packings on plugs.
(8) Install two plugs in air/hydraulic manifold.

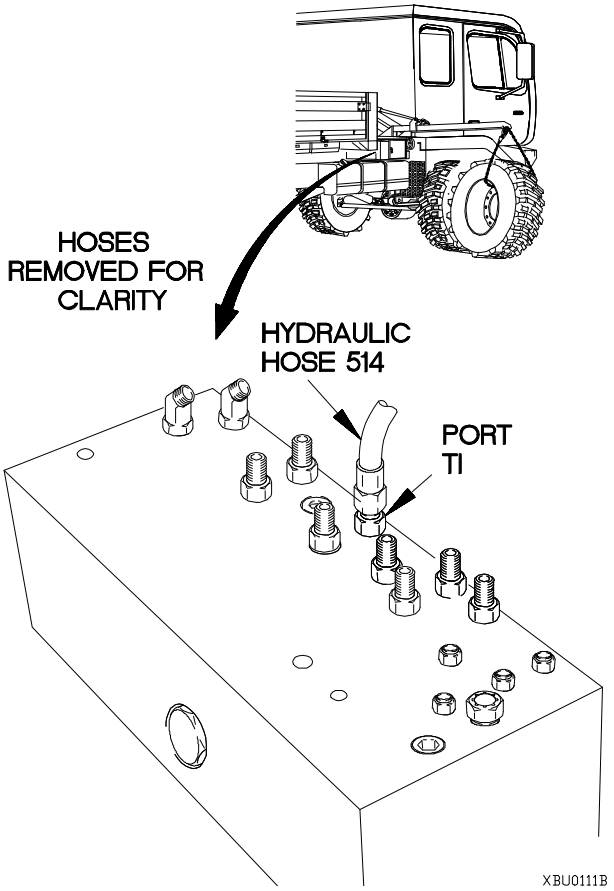


t1. CAB TILT, SPARE TIRE RETAINER, AND SUSPENSION COMPRESSION DO NOT OPERATE (CONT)

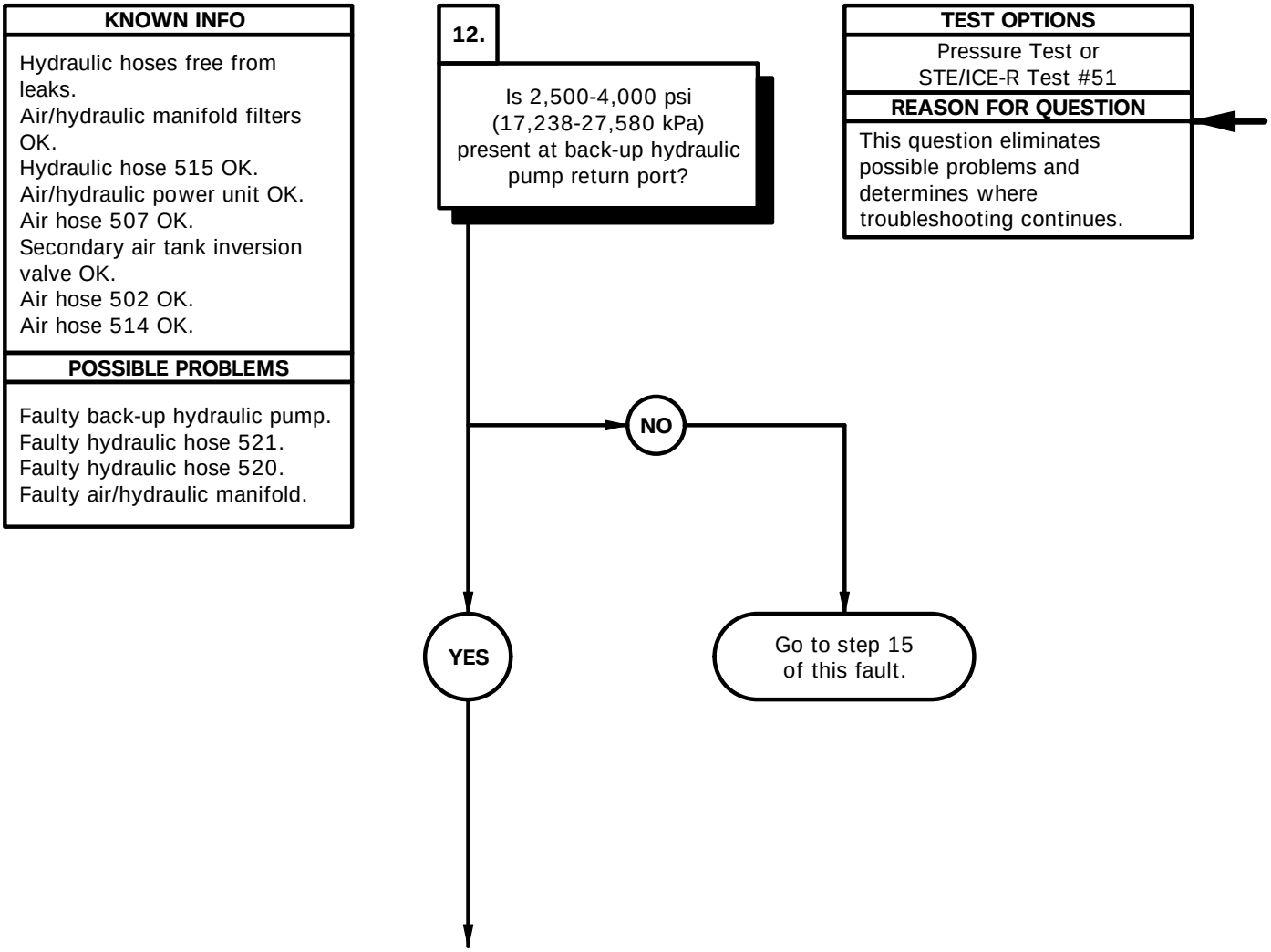


PRESSURE TEST

(1) Position drain pan under air/hydraulic manifold.
(2) Disconnect hydraulic hose 514 from port T1.
(3) Connect STE/ICE-R between hydraulic hose 514 and port T1.
(4) Start engine (TM 9-2320-365-10).
(5) Position SUSPENSION knob to LOWER (TM 9-2320-365-10).
(6) Position FUNCTION SELECT knob to SUSPENSION (TM 9-2320-365-10).
(7) Push and hold PUMP plunger button (TM 9-2320-365-10) and perform STE/ICE-R Test #51.
(8) If 2,500-4,000 psi (17,238-27,580 kPa) is not present, replace air/hydraulic manifold (para 19-4).
(9) If 2,500-4,000 psi (17,238-27,580 kPa) is present, replace hydraulic hose 514 (para 19-11).
(10) Disconnect STE/ICE-R from hydraulic hose 514 and port T1.
(11) Connect hydraulic hose 514 to port T1.

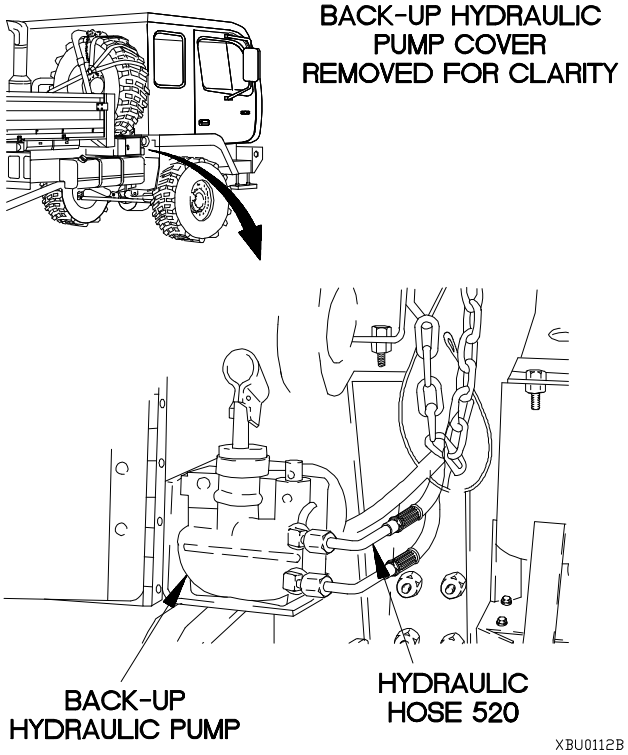


t1. CAB TILT, SPARE TIRE RETAINER, AND SUSPENSION COMPRESSION DO NOT OPERATE (CONT)

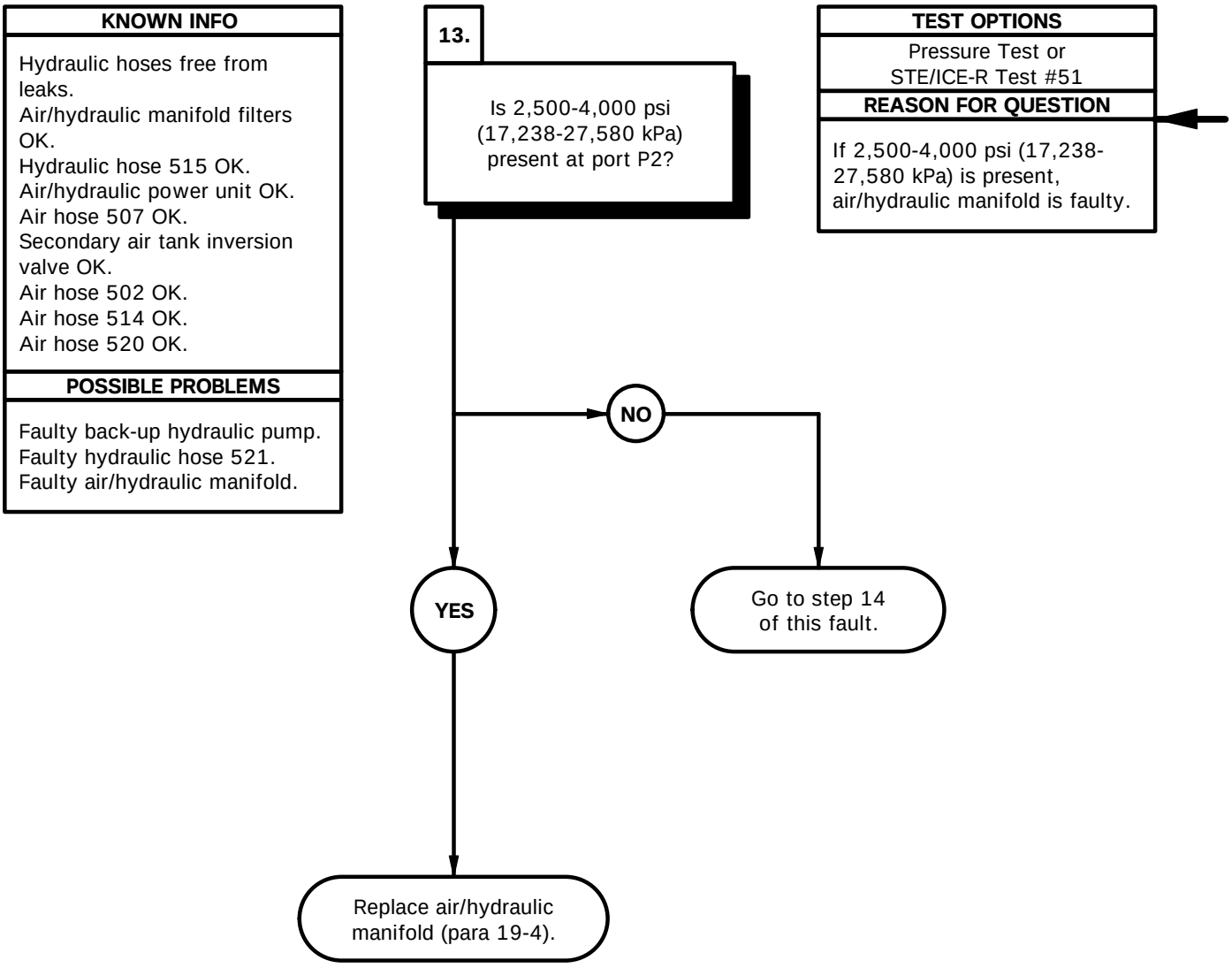


PRESSURE TEST

(1) Position drain pan under back-up hydraulic pump.
(2) Disconnect hydraulic hose 520 from back-up hydraulic pump return port.
(3) Connect STE/ICE-R between hydraulic hose 520 and return port.
(4) Start engine (TM 9-2320-365-10).
(5) Position SUSPENSION knob to LOWER (TM 9-2320-365-10).
(6) Position FUNCTION SELECT knob to SUSPENSION (TM 9-2320-365-10).
(7) Push and hold PUMP plunger button (TM 9-2320-365-10) and perform STE/ICE-R Test #51.
(8) If 2,500-4,000 psi (17,238-27,580 kPa) is not present, go to step 15 of this fault.
(9) Disconnect STE/ICE-R from hydraulic hose 520 and return port.
(10) Connect hydraulic hose 520 to return port.

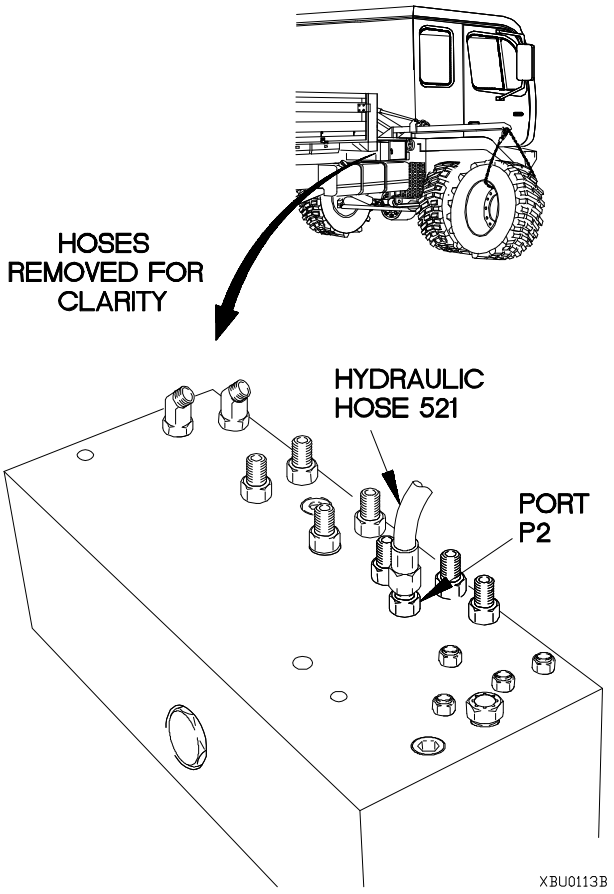


t1. CAB TILT, SPARE TIRE RETAINER, AND SUSPENSION COMPRESSION DO NOT OPERATE (CONT)

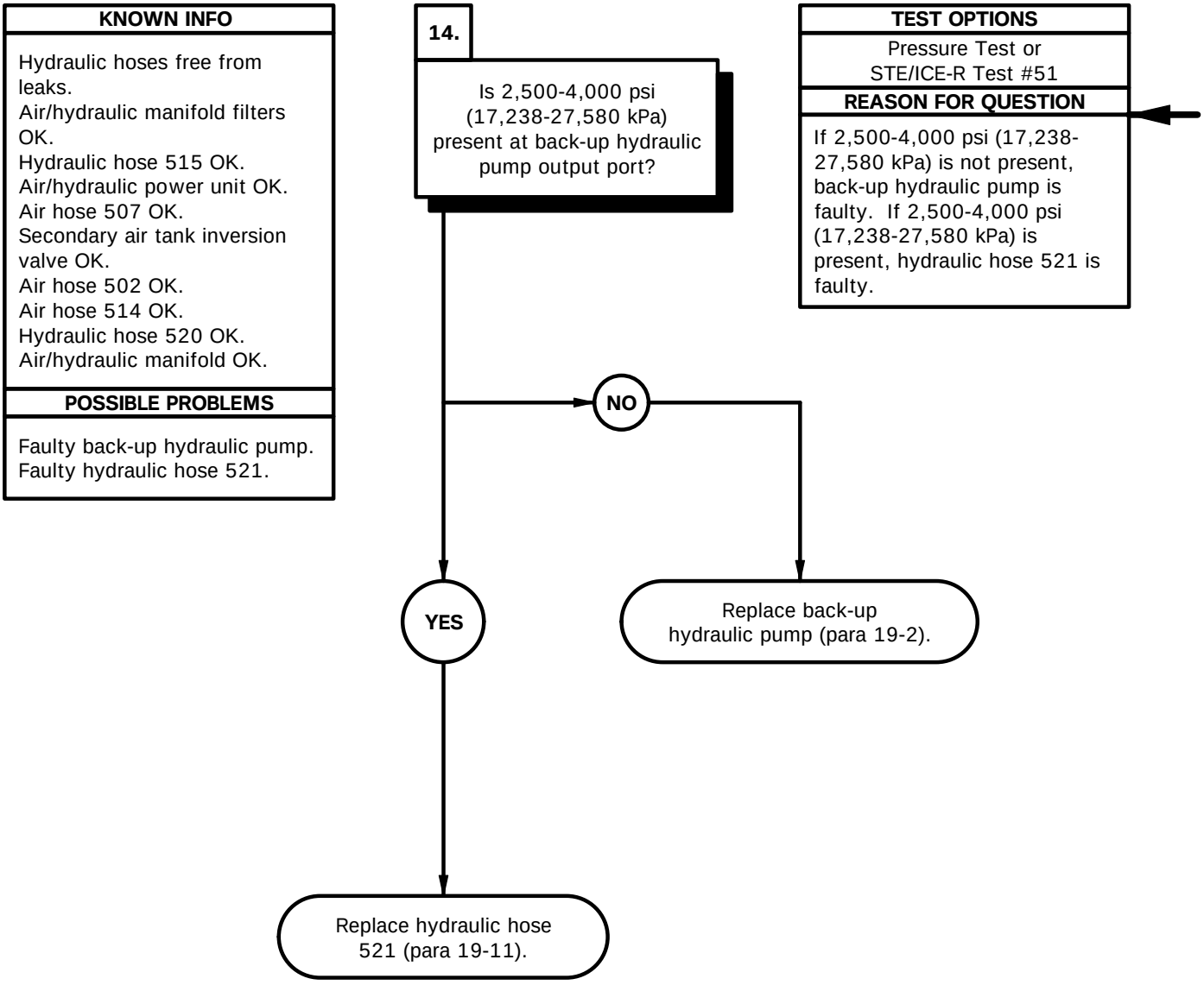


PRESSURE TEST

(1) Position drain pan under air/hydraulic manifold.
(2) Disconnect hydraulic hose 521 from port P2.
(3) Connect STE/ICE-R between hydraulic hose 521 and port P2.
(4) Position SUSPENSION knob to LOWER (TM 9-2320-365-10).
(5) Position FUNCTION SELECT knob to SUSPENSION (TM 9-2320-365-10).
(6) Operate back-up hydraulic pump (TM 9-2320-365-10) and perform STE/ICE-R Test #51.
(7) If 2,500-4,000 psi (17,238-27,580 kPa) is not present, go to step 14 of this fault.
(8) If 2,500-4,000 psi (17,238-27,580 kPa) is present, replace air/hydraulic manifold (para 19-4).
(9) Disconnect STE/ICE-R from hydraulic hose 521 and port P2.
(10) Connect hydraulic hose 521 to port P2.

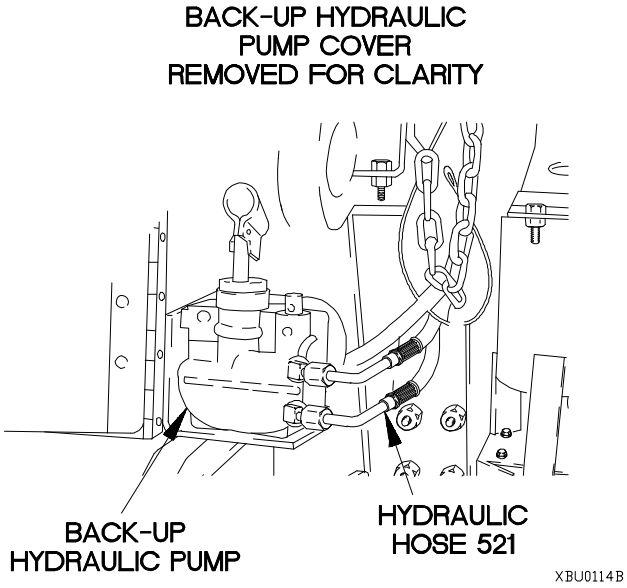


t1. CAB TILT, SPARE TIRE RETAINER, AND SUSPENSION COMPRESSION DO NOT OPERATE (CONT)

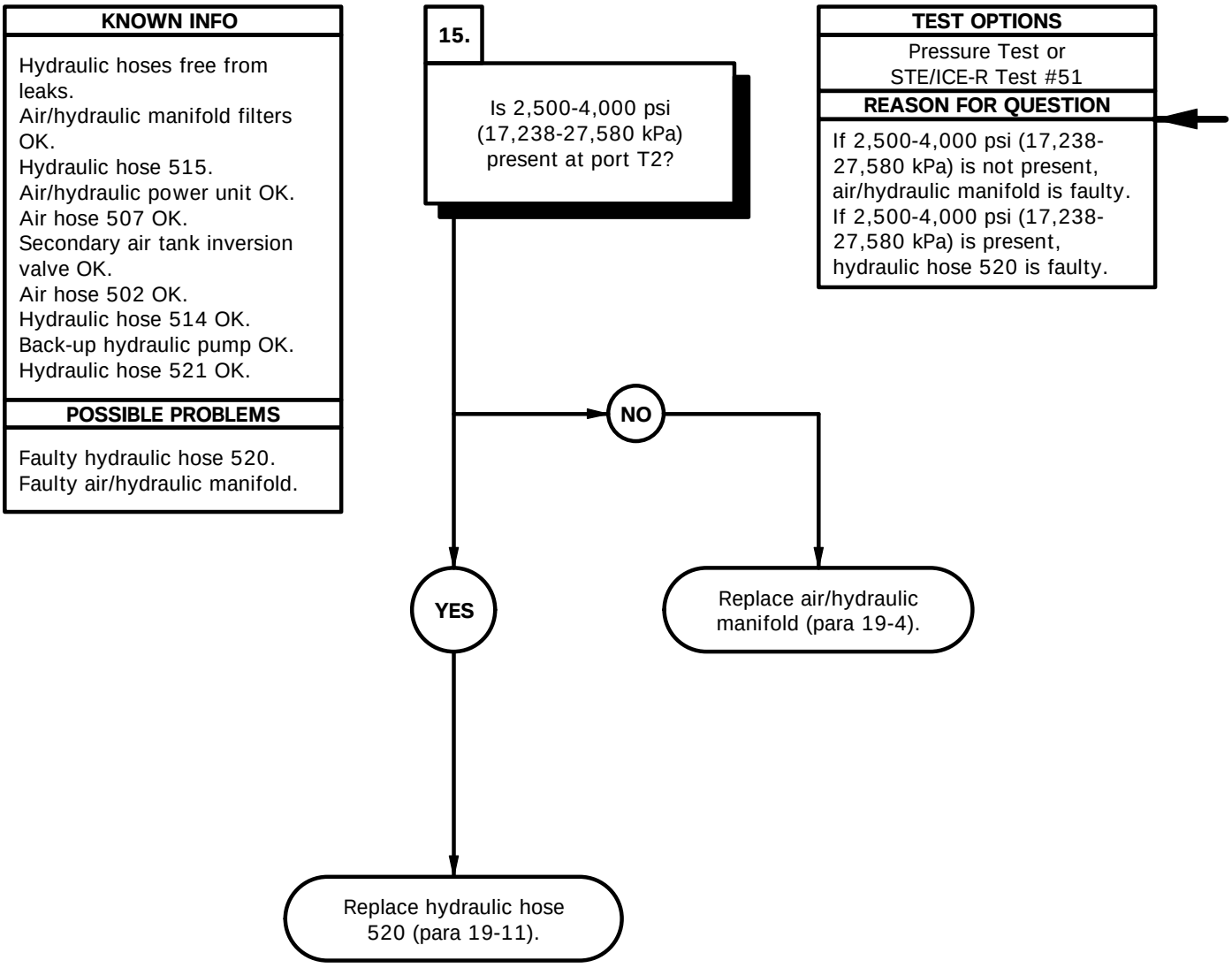


PRESSURE TEST

(1) Position drain pan under back-up hydraulic pump.
(2) Disconnect hydraulic hose 521 from back-up hydraulic pump output port.
(3) Connect STE/ICE-R between hydraulic hose 521 and output port.
(4) Position SUSPENSION knob to LOWER (TM 9-2320-365-10).
(5) Position FUNCTION SELECT knob to SUSPENSION (TM 9-2320-365-10).
(6) Operate back-up hydraulic pump (TM 9-2320-365-10) and perform STE/ICE-R Test #51.
(7) If 2,500-4,000 psi (17,238-27,580 kPa) is not present, replace back-up hydraulic pump (para 19-2).
(8) If 2,500-4,000 psi (17,238-27,580 kPa) is present, replace hydraulic hose 521 (para 19-11).
(9) Disconnect STE/ICE-R from hydraulic hose 521 and output port.
(10) Connect hydraulic hose 521 to output port.

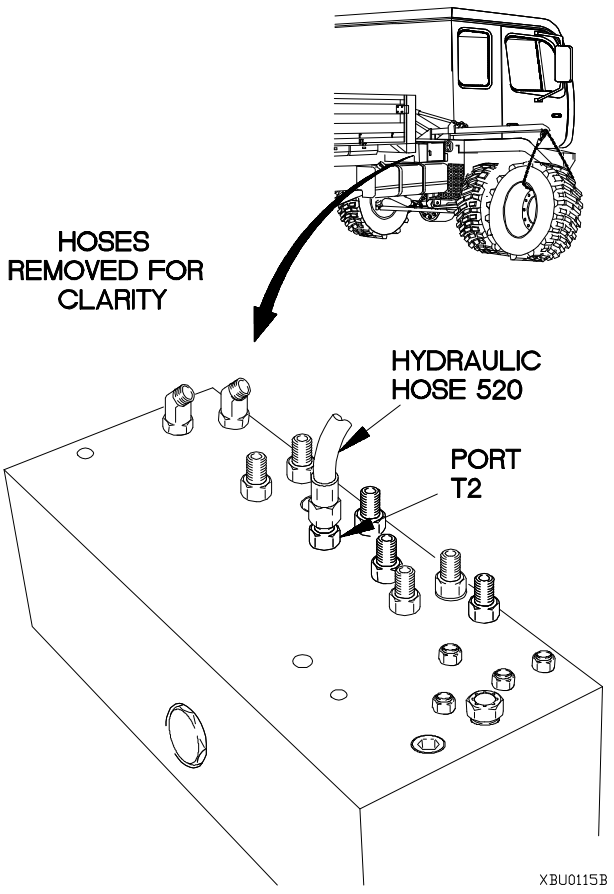


t1. CAB TILT, SPARE TIRE RETAINER, AND SUSPENSION COMPRESSION DO NOT OPERATE (CONT)



PRESSURE TEST

(1) Position drain pan under air/hydraulic manifold.
(2) Disconnect hydraulic hose 520 from port T2.
(3) Connect STE/ICE-R between hydraulic hose 520 and port T2.
(4) Start engine (TM 9-2320-365-10).
(5) Position SUSPENSION knob to LOWER (TM 9-2320-365-10).
(6) Position FUNCTION SELECT knob to SUSPENSION (TM 9-2320-365-10).
(7) Push and hold PUMP plunger button (TM 9-2320-365-10) and perform STE/ICE-R Test #51.
(8) If 2,500-4,000 psi (17,238-27,580 kPa) is not present, replace air/hydraulic manifold (para 19-4).
(9) If 2,500-4,000 psi (17,238-27,580 kPa) is present, replace hydraulic hose 520 (para 19-11).
(10) Disconnect STE/ICE-R from hydraulic hose 520 and port T2.
(11) Connect hydraulic hose 520 to port T2.



t2. SUSPENSION DOES NOT COMPRESS AND/OR RETURN TO NORMAL

INITIAL SETUP

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

Personnel Required
(2)

Material/Parts
Rag, Wiping (Item 51, Appendix D)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Pan, Drain (Item 24, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Transducer, 10,000 PSI (Item 1, Appendix J)
Gloves, Rubber (Item 13, Appendix C)

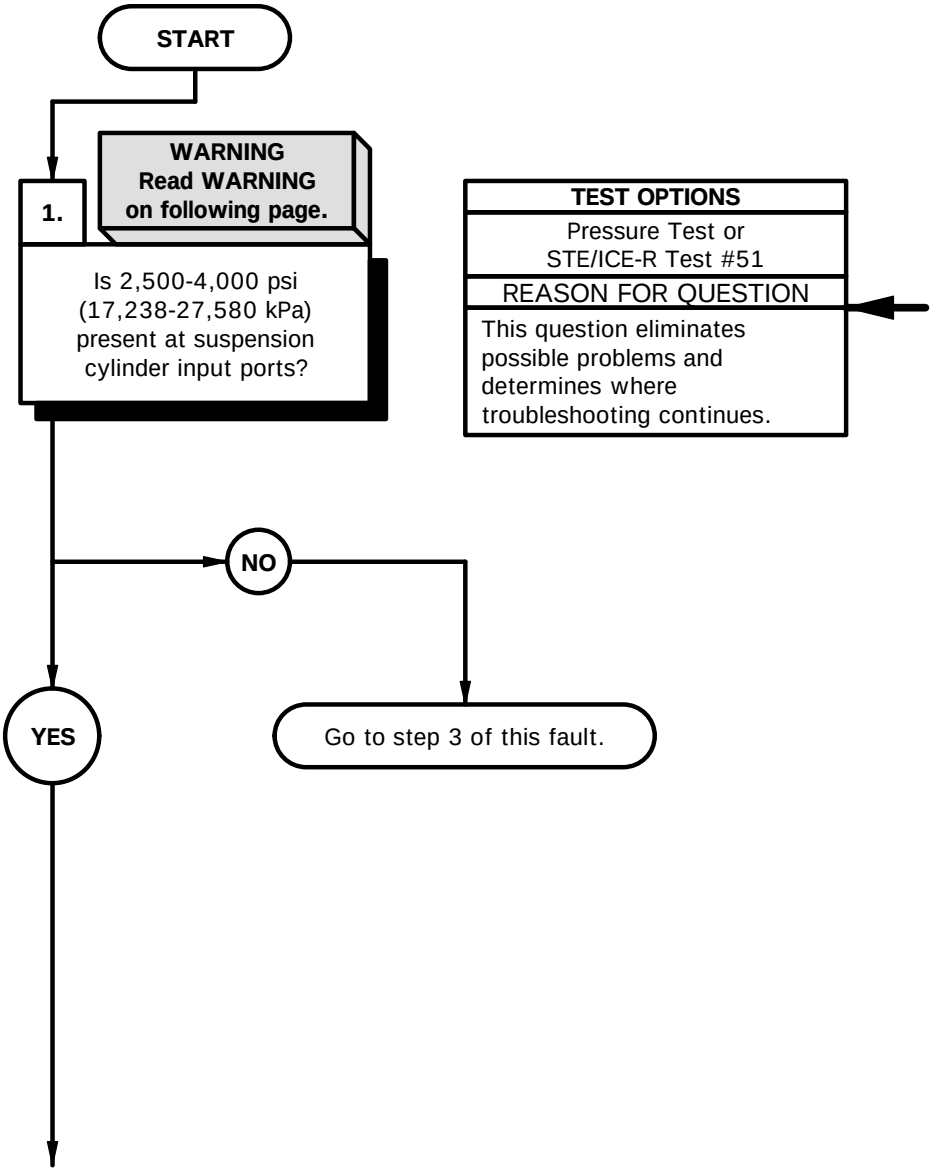
References
TM 9-4910-571-12&P

KNOWN INFO

Other hydraulic manifold functions OK.
Hydraulic hoses free from leaks.

POSSIBLE PROBLEMS

Faulty hydraulic hose(s) 508 and/or 510.
Faulty suspension compression tee fitting.
Faulty air/hydraulic manifold.
Faulty hydraulic hose 512.
Faulty hydraulic hose 513.
Faulty suspension release tee fitting.
Faulty suspension cylinder(s).
Faulty hydraulic hose(s) 509 and/or 511.



TEST OPTIONS

Pressure Test or
STE/ICE-R Test #51

REASON FOR QUESTION

This question eliminates possible problems and determines where troubleshooting continues.

WARNING

Drop hydraulic pressure to zero before disconnecting any hydraulic hoses. Failure to comply may result in injury to personnel.

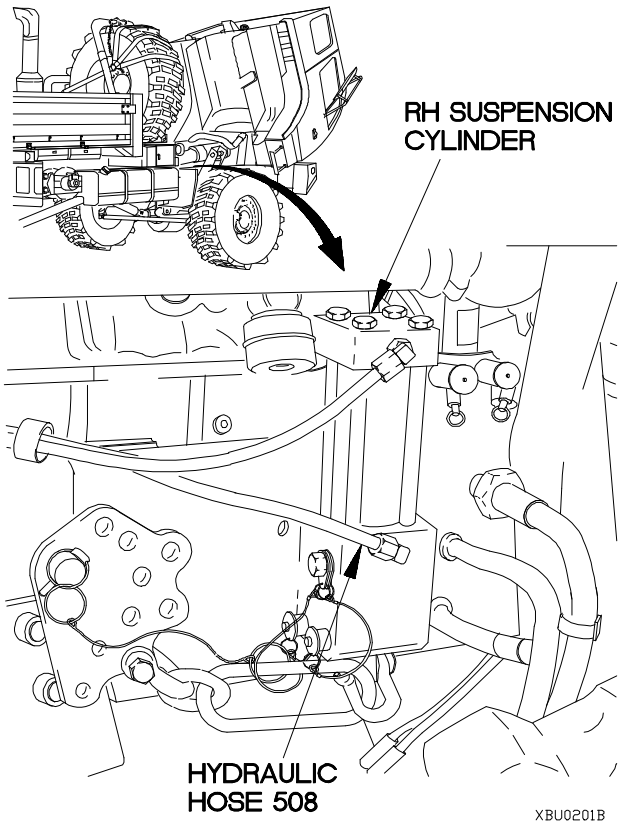
Hydraulic oil (MIL-H 5605) is TOXIC. Wear protective goggles and gloves. Use only in well ventilated area. Avoid contract with skin, eyes, and clothes. Skin and clothing that come into contact with hydraulic oil should be washed immediately. Failure to comply may result in injury to personnel.

NOTE

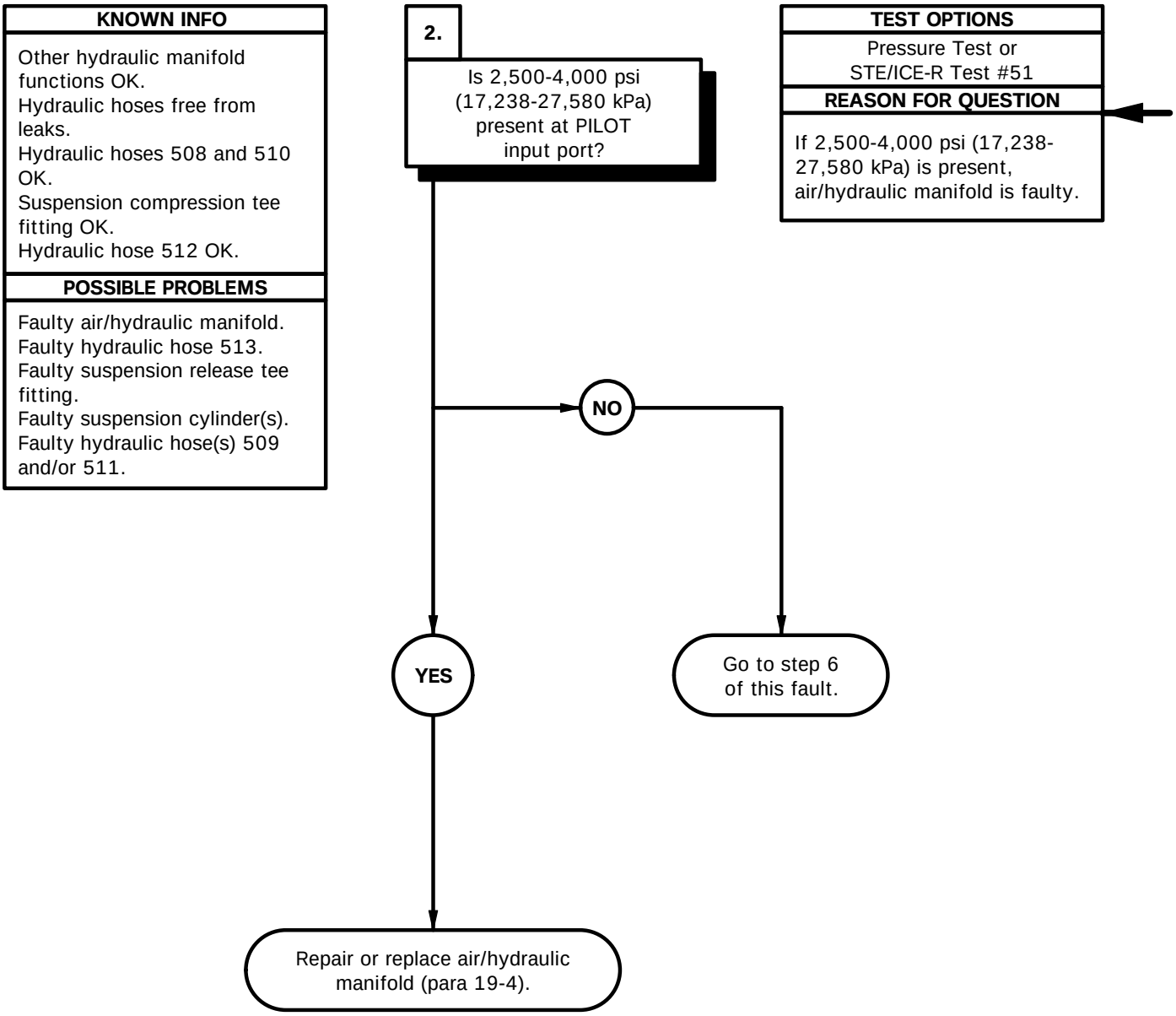
SYSTEM PARK control must be engaged (TM 9-2320-365-10) before operating SUSPENSION compression.

PRESSURE TEST

(1) Position drain pan under RH suspension cylinder.
(2) Disconnect hydraulic hose 508 from RH suspension cylinder input port.
(3) Connect STE/ICE-R between hydraulic hose 508 and RH suspension cylinder input port.
(4) Start engine (TM 9-2320-365-10).
(5) Position FUNCTION SELECT knob to SUSPENSION (TM 9-2320-365-10).
(6) Push and hold PUMP plunger button (TM 9-2320-365-10) and perform STE/ICE-R Test #51.
(7) Shut down engine (TM 9-2320-365-10).
(8) Disconnect STE/ICE-R from RH suspension cylinder input port and hydraulic hose 508.
(9) Connect hydraulic hose 508 to RH suspension cylinder input port.
(10) Repeat steps (1) through (9) on LH suspension cylinder and hydraulic hose 510.
(11) If 2,500-4,000 psi (17,238-27,580 kPa) is not present at either suspension cylinder, go to step 3 of this fault.

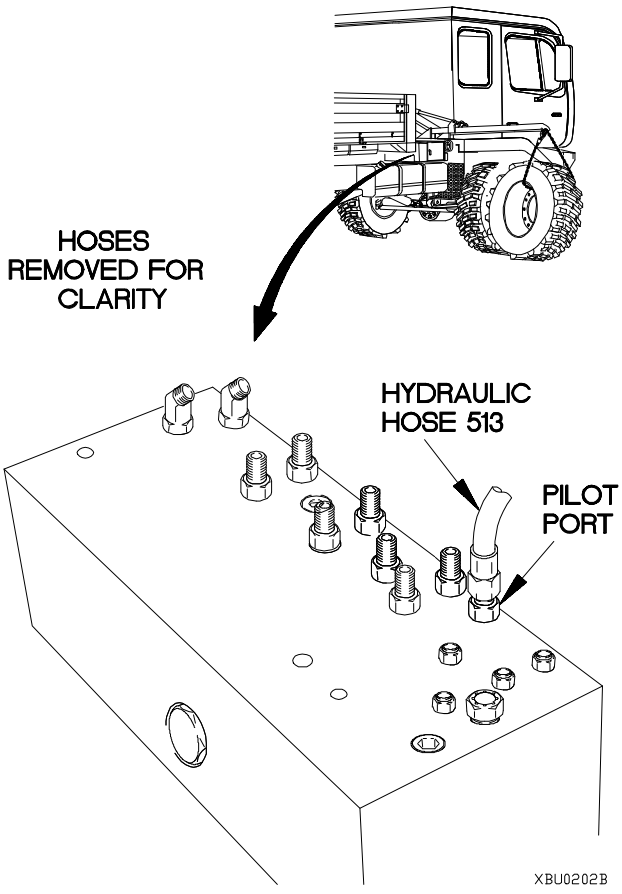


t2. SUSPENSION DOES NOT COMPRESS AND/OR RETURN TO NORMAL (CONT)

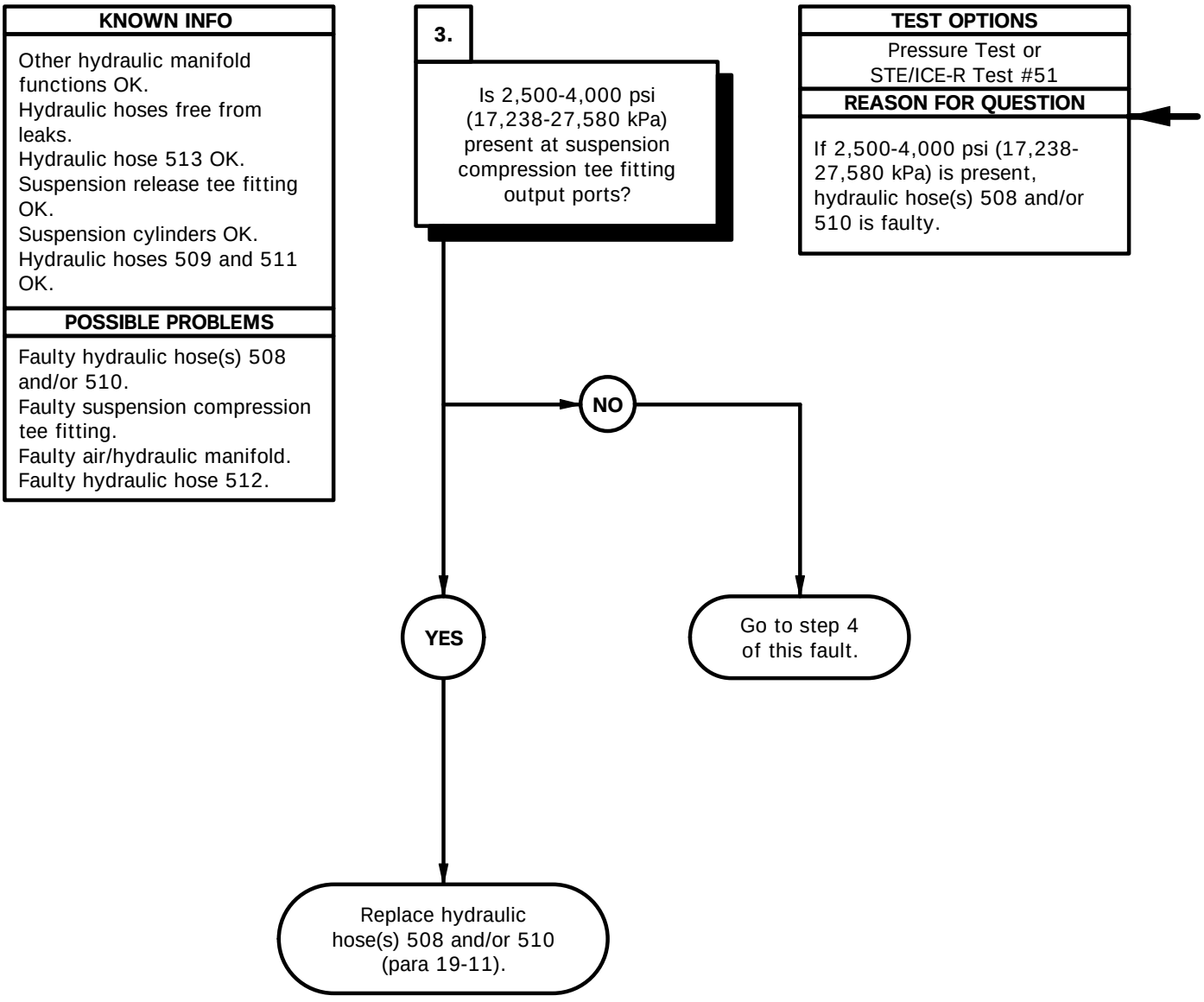


PRESSURE TEST

(1) Position drain pan under air/hydraulic manifold
(2) Disconnect hydraulic hose 513 from PILOT port.
(3) Connect STE/ICE-R between hydraulic hose 513 and PILOT port.
(4) Start engine (TM 9-2320-365-10).
(5) Position SUSPENSION knob to LOWER (TM 9-2320-365-10).
(6) Position FUNCTION SELECT knob to SUSPENSION (TM 9-2320-365-10).
(7) Push and hold PUMP plunger button (TM 9-2320-365-10) and perform STE/ICE-R Test #51.
(8) If 2,500-4,000 psi (17,238-27,580 kPa) is not present, go to step 6 of this fault.
(9) If 2,500-4,000 psi (17,238-27,580 kPa) is present, repair or replace air/hydraulic manifold (para 19-4).
(10) Disconnect STE/ICE-R from hydraulic hose 513 and PILOT port.
(11) Connect hydraulic hose 513 to PILOT port.

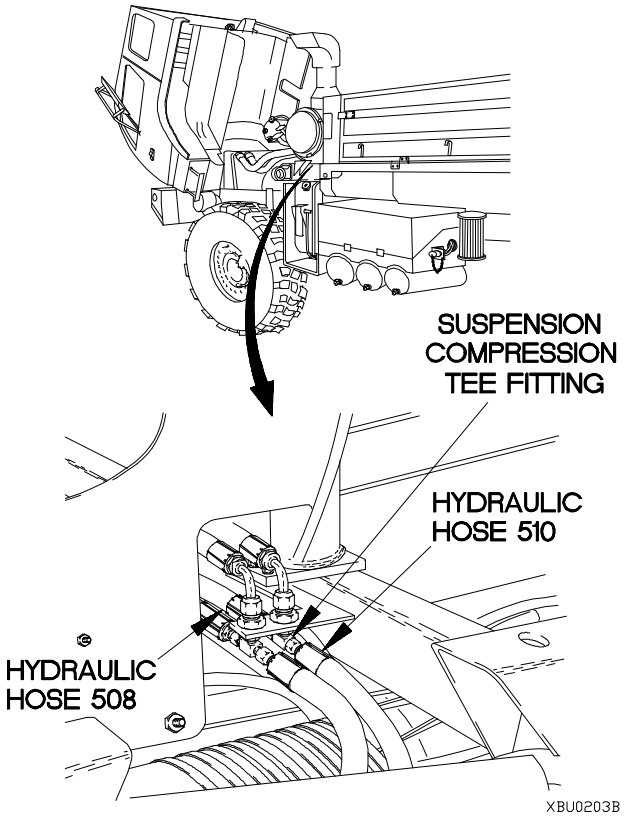


t2. SUSPENSION DOES NOT COMPRESS AND/OR RETURN TO NORMAL (CONT)

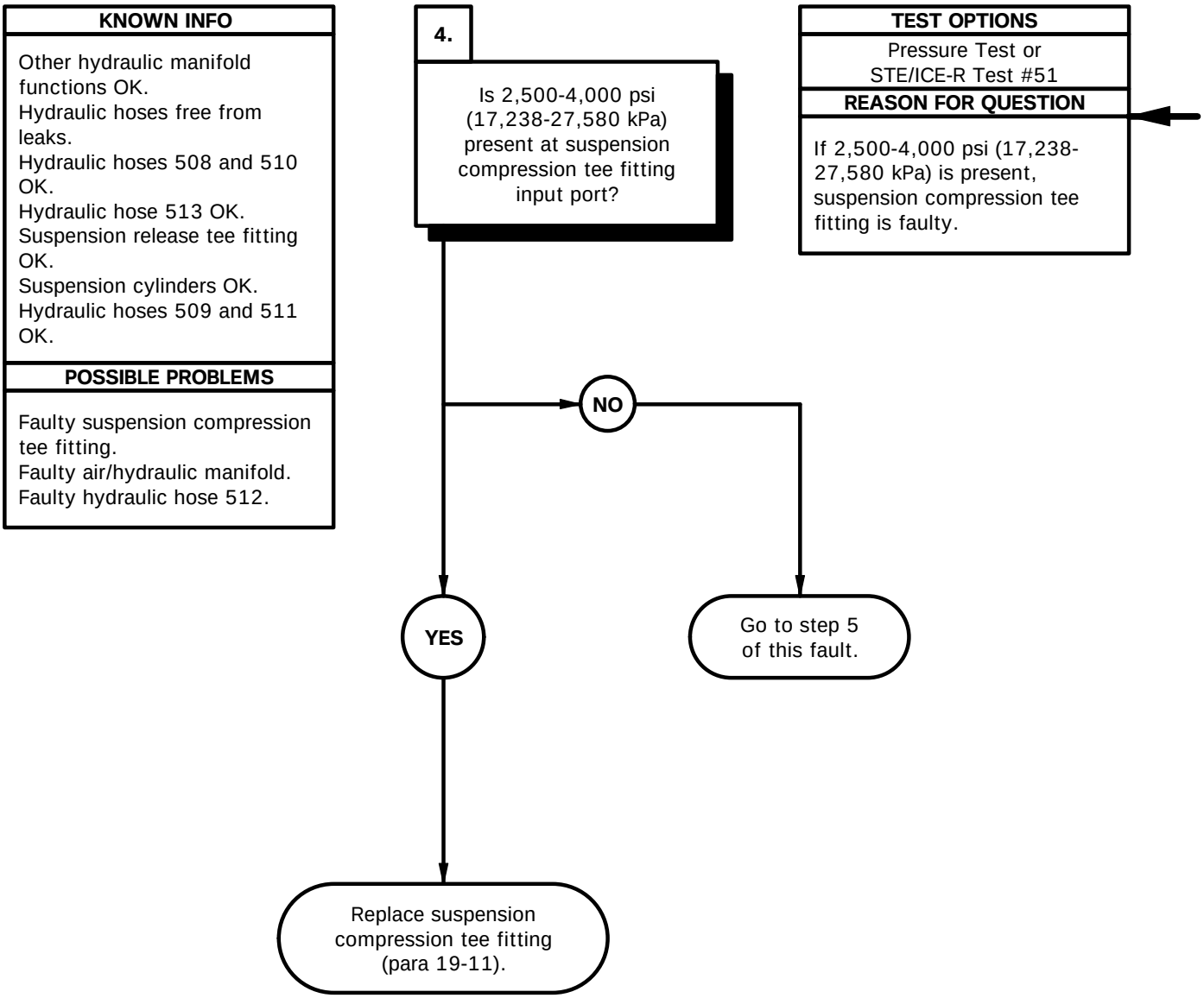


PRESSURE TEST

(1) Position drain pan under suspension compression tee fitting.
(2) Disconnect hydraulic hose 510 from suspension compression tee fitting LH output port.
(3) Connect STE/ICE-R between hydraulic hose 510 and suspension compression tee fitting LH output port.
(4) Start engine (TM 9-2320-365-10).
(5) Position SUSPENSION knob to RAISE (TM 9-2320-365-10).
(6) Position FUNCTION SELECT knob to SUSPENSION (TM 9-2320-365-10).
(7) Push and hold PUMP plunger button (TM 9-2320-365-10) and perform STE/ICE-R Test #51.
(8) If 2,500-4,000 psi (17,238-27,580 kPa) is not present, go to step 4 of this fault.
(9) If 2,500-4,000 psi (17,238-27,580 kPa) is present, replace hydraulic hose 510 (para 19-11).
(10) Disconnect STE/ICE-R from hydraulic hose 510 and suspension compression tee fitting LH output port.
(11) Connect hydraulic hose 510 to suspension compression tee fitting LH output port.
(12) Repeat steps (2) through (12) on hydraulic hose 508 and suspension compression tee fitting RH output port.

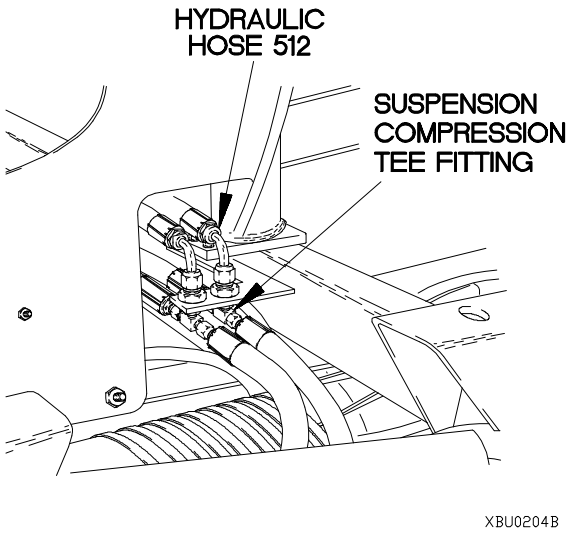


t2. SUSPENSION DOES NOT COMPRESS AND/OR RETURN TO NORMAL (CONT)

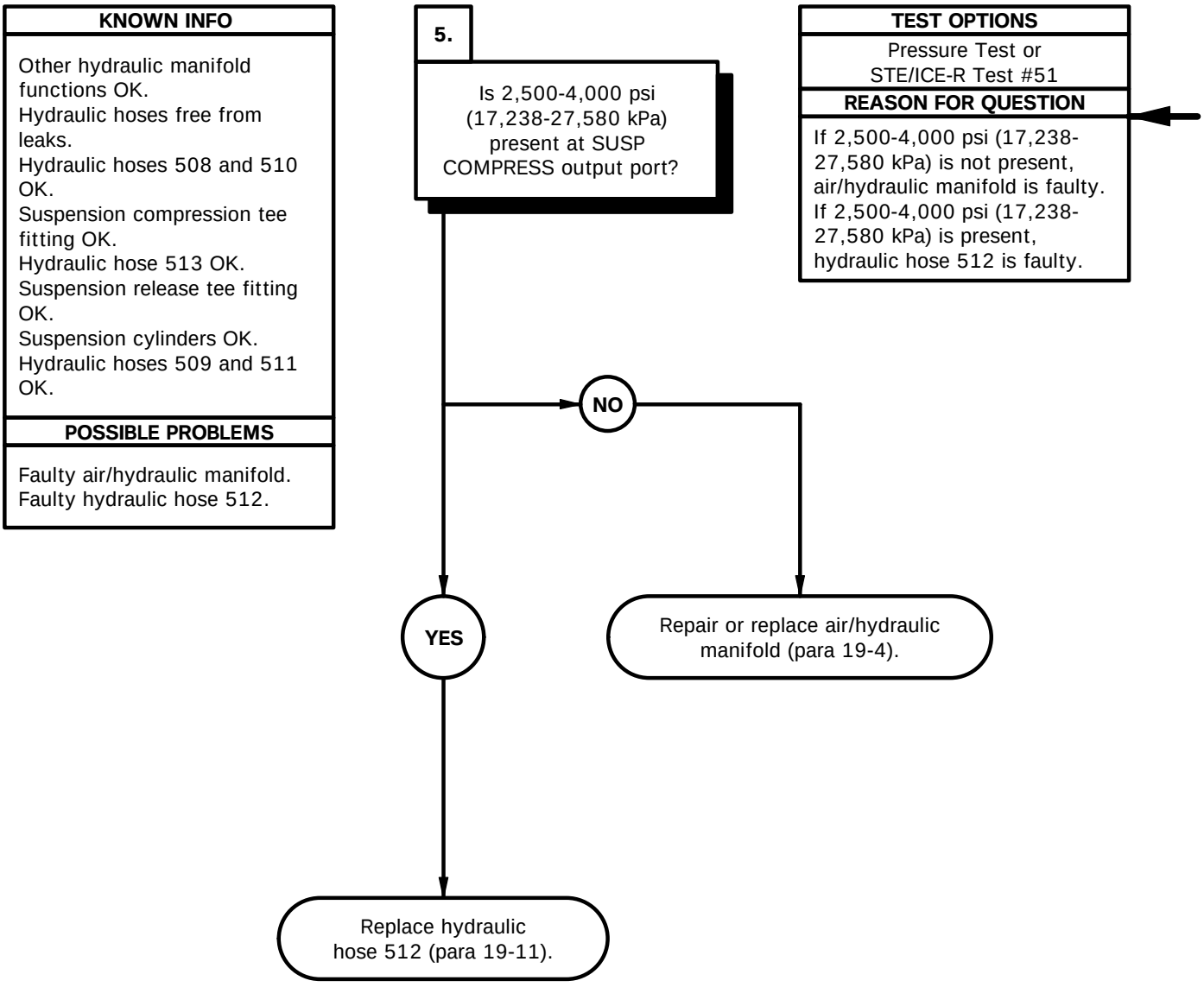


PRESSURE TEST

(1) Disconnect hydraulic hose 512 from suspension compression tee fitting input port.
(2) Connect STE/ICE-R between hydraulic hose 512 and suspension compression tee fitting input port.
(3) Start engine (TM 9-2320-365-10).
(4) Position SUSPENSION knob to RAISE (TM 9-2320-365-10).
(5) Position FUNCTION SELECT knob to SUSPENSION (TM 9-2320-365-10).
(6) Push and hold PUMP plunger button (TM 9-2320-365-10) and perform STE/ICE-R Test #51.
(7) If 2,500-4,000 psi (17,238-27,580 kPa) is not present, go to step 5 of this fault.
(8) If 2,500-4,000 psi (17,238-27,580 kPa) is present, replace suspension compression tee fitting (para 19-11).
(9) Disconnect STE/ICE-R from hydraulic hose 512 and suspension compression tee fitting input port.
(10) Connect hydraulic hose 512 to suspension compression tee fitting input port.

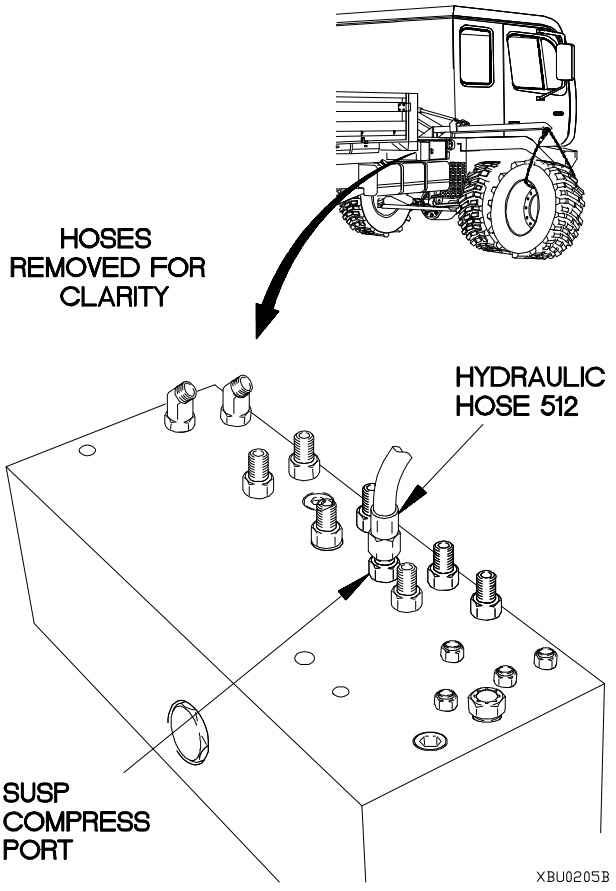


t2. SUSPENSION DOES NOT COMPRESS AND/OR RETURN TO NORMAL (CONT)

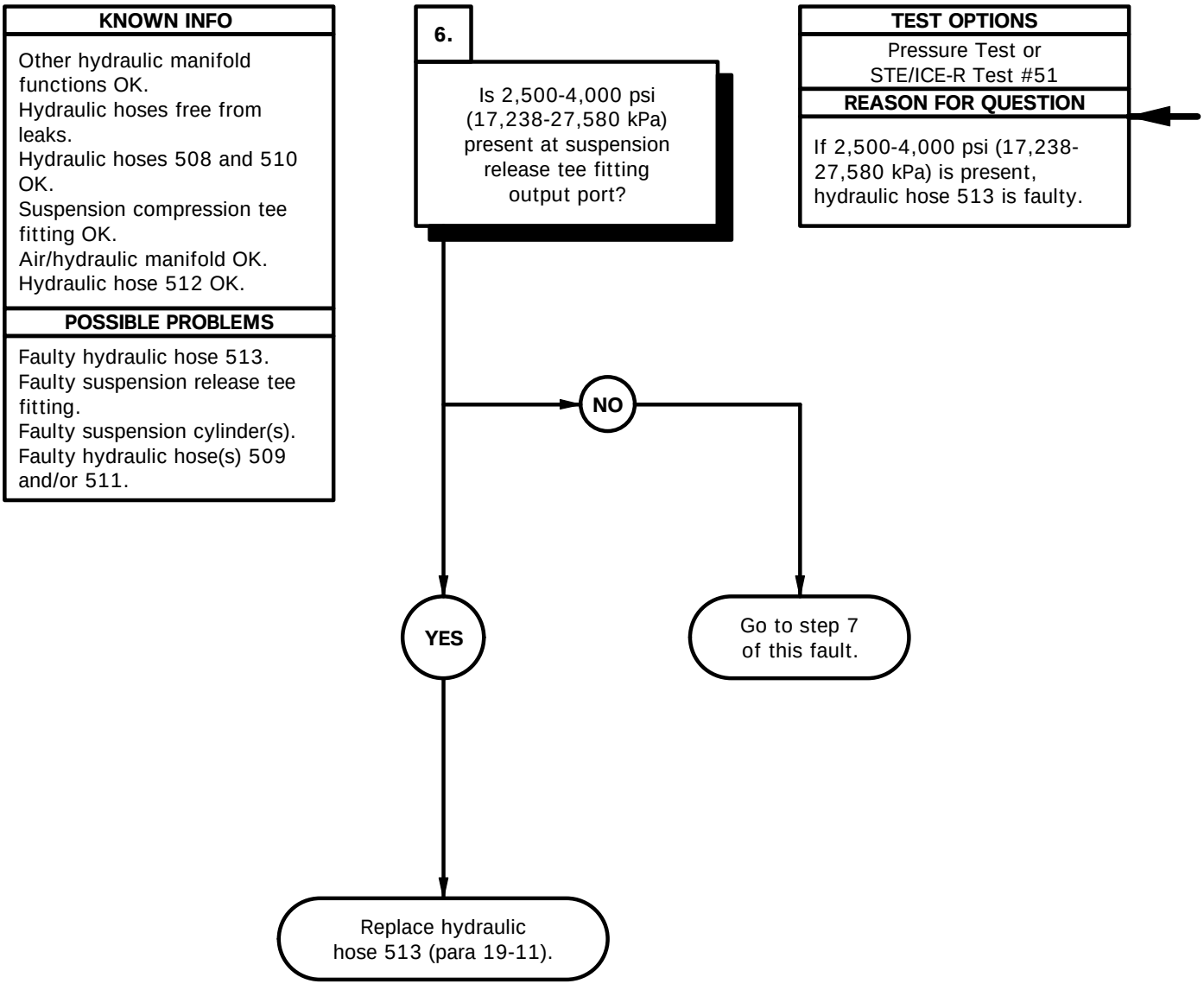


PRESSURE TEST

(1) Position drain pan under air/hydraulic manifold
(2) Disconnect hydraulic hose 512 from SUSP COMPRESS port.
(3) Connect STE/ICE-R between hydraulic hose 512 and SUSP COMPRESS port.
(4) Start engine (TM 9-2320-365-10).
(5) Position SUSPENSION knob to RAISE (TM 9-2320-365-10).
(6) Position FUNCTION SELECT knob to SUSPENSION (TM 9-2320-365-10).
(7) Push and hold PUMP plunger button (TM 9-2320-365-10) and perform STE/ICE-R Test #51.
(8) If 2,500-4,000 psi (17,238-27,580 kPa) is not present, repair or replace air/hydraulic manifold (para 19-4).
(9) If 2,500-4,000 psi (17,238-27,580 kPa) is present, replace hydraulic hose 512 (para 19-11).
(10) Disconnect STE/ICE-R from hydraulic hose 512 and SUSP COMPRESS port.
(11) Connect hydraulic hose 512 to SUSP COMPRESS port.

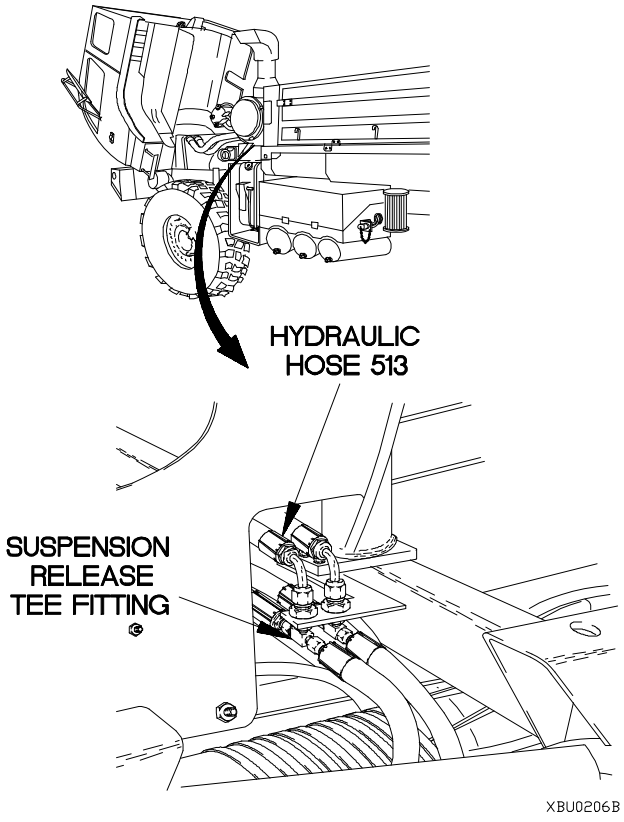


t2. SUSPENSION DOES NOT COMPRESS AND/OR RETURN TO NORMAL (CONT)

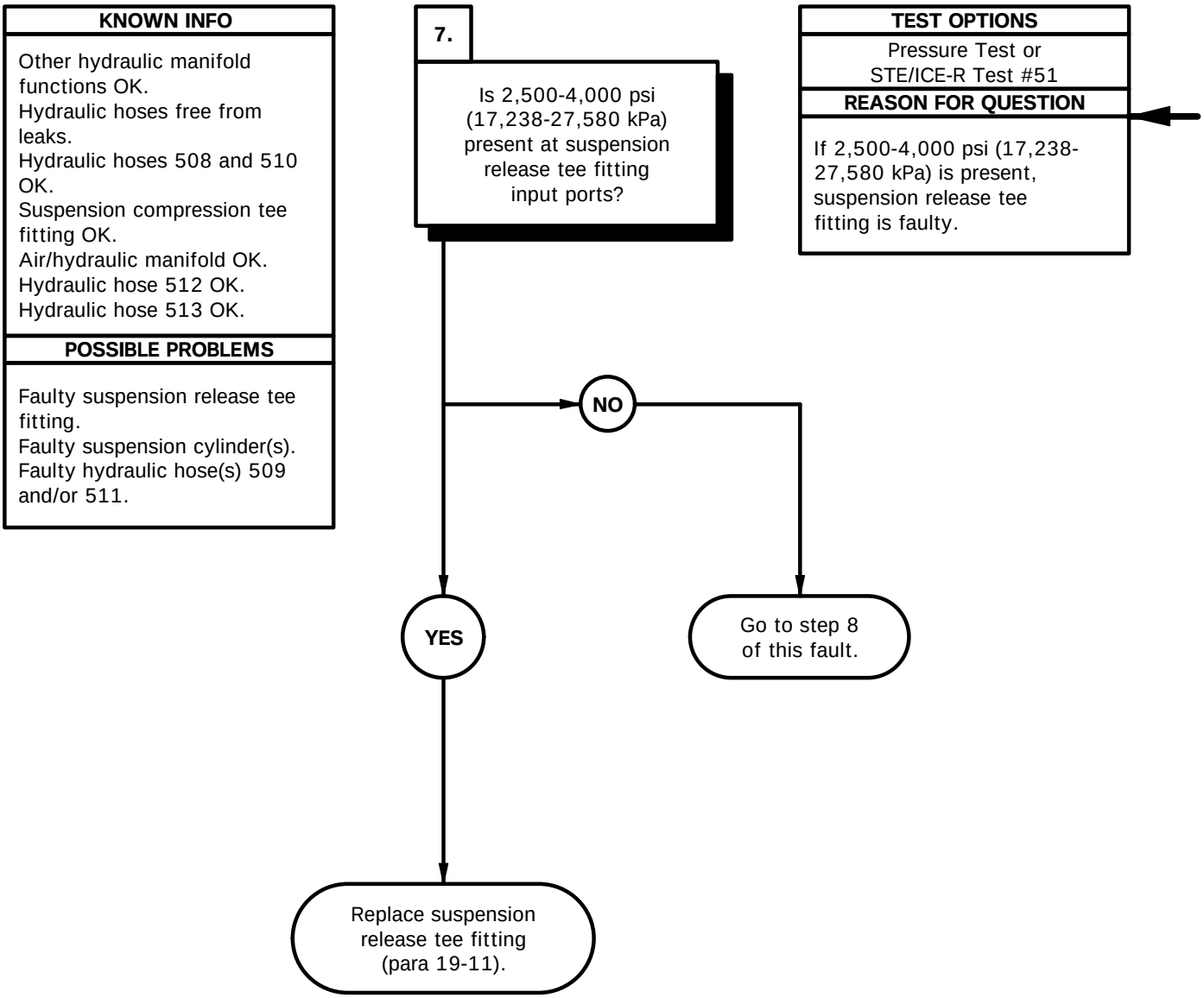


PRESSURE TEST

(1) Position drain pan under suspension release tee fitting.
(2) Disconnect hydraulic hose 513 from suspension release tee fitting output port.
(3) Connect STE/ICE-R between hydraulic hose 513 and suspension release tee fitting output port.
(4) Start engine (TM 9-2320-365-10).
(5) Position SUSPENSION knob to LOWER (TM 9-2320-365-10).
(6) Position FUNCTION SELECT knob to SUSPENSION (TM 9-2320-365-10).
(7) Push and hold PUMP plunger button (TM 9-2320-365-10) and perform STE/ICE-R Test #51.
(8) If 2,500-4,000 psi (17,238-27,580 kPa) is not present, go to step 7 of this fault.
(9) If 2,500-4,000 psi (17,238-27,580 kPa) is present, replace hydraulic hose 513 (para 19-11).
(10) Disconnect STE/ICE-R from hydraulic hose 513 and suspension release tee fitting output port.
(11) Connect hydraulic hose 513 to suspension release tee fitting output port.

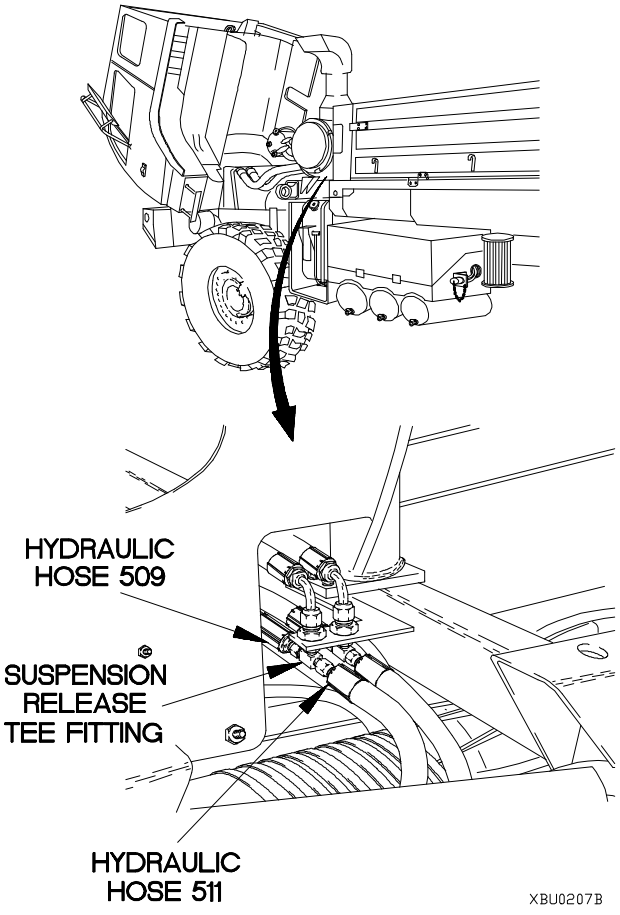


t2. SUSPENSION DOES NOT COMPRESS AND/OR RETURN TO NORMAL (CONT)

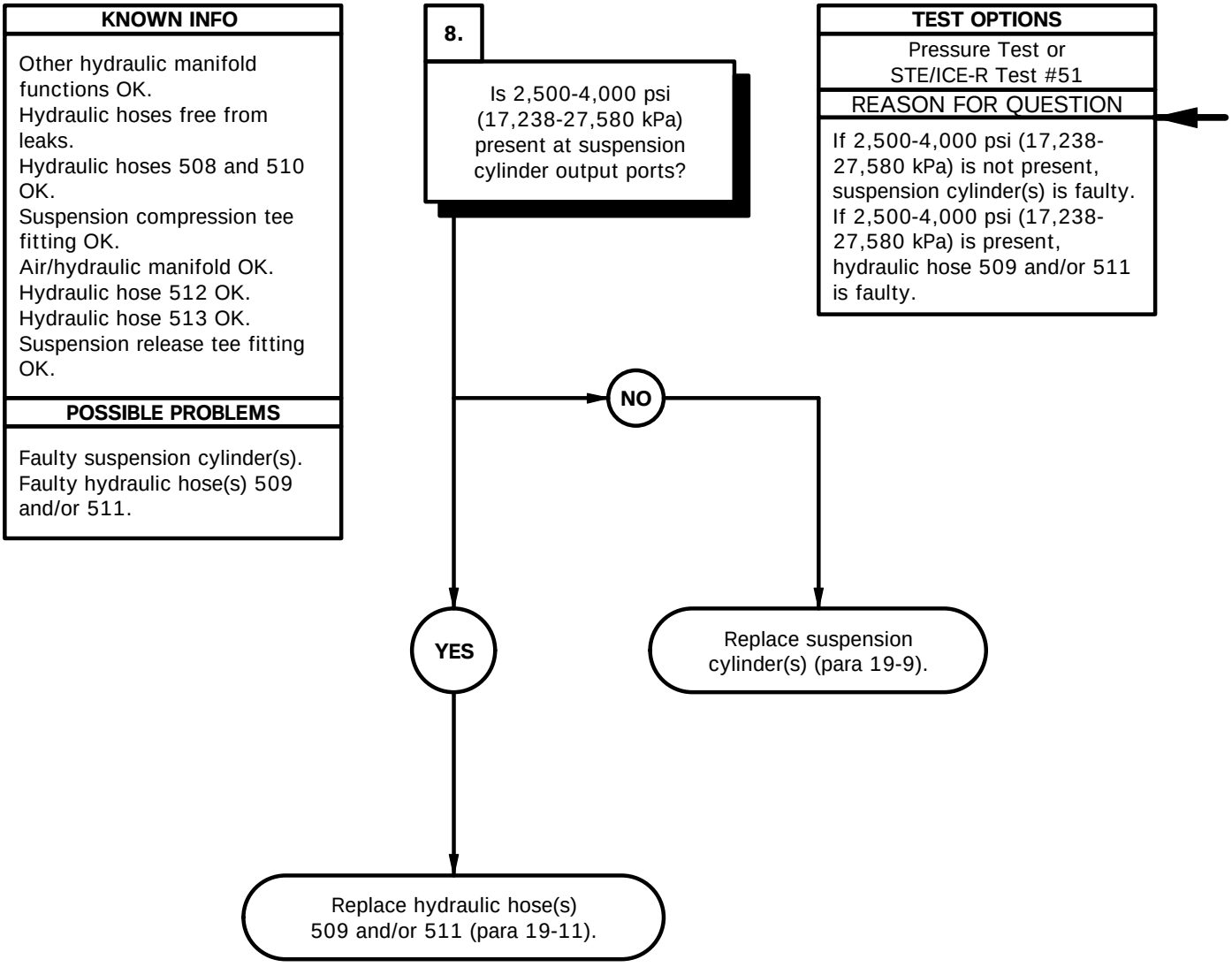


PRESSURE TEST

(1) Disconnect hydraulic hose 511 from suspension release tee fitting LH input port.
(2) Connect STE/ICE-R between hydraulic hose 511 and suspension release tee fitting LH input port.
(3) Start engine (TM 9-2320-365-10).
(4) Position SUSPENSION knob to LOWER (TM 9-2320-365-10).
(5) Position FUNCTION SELECT knob to SUSPENSION (TM 9-2320-365-10).
(6) Push and hold PUMP plunger button (TM 9-2320-365-10) and perform STE/ICE-R Test #51.
(7) If 2,500-4,000 psi (17,238-27,580 kPa) is not present, go to step 5 of this fault.
(8) If 2,500-4,000 psi (17,238-27,580 kPa) is present, replace hydraulic hose 511 (para 19-11).
(9) Disconnect STE/ICE-R from hydraulic hose 511 and suspension release tee fitting LH input port.
(10) Connect hydraulic hose 511 to suspension release tee fitting LH input port.
(11) Repeat steps (2) through (12) on hydraulic hose 509 and suspension release tee fitting RH input port.

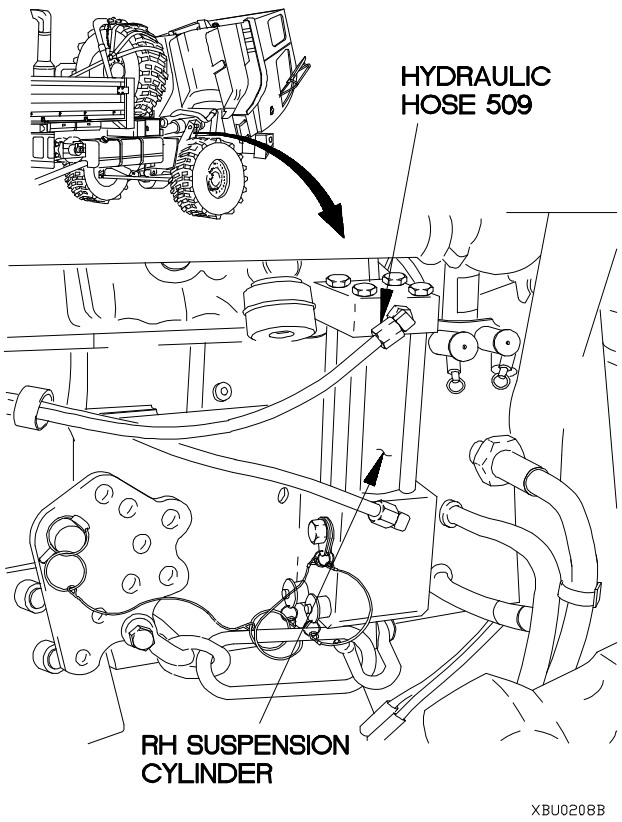


t2. SUSPENSION DOES NOT COMPRESS AND/OR RETURN TO NORMAL (CONT)



PRESSURE TEST

(1) Position drain pan under RH suspension cylinder.
(2) Disconnect hydraulic hose 509 from RH suspension cylinder output port.
(3) Connect STE/ICE-R between hydraulic hose 509 and RH suspension cylinder output port.
(4) Start engine (TM 9-2320-365-10).
(5) Position SUSPENSION knob to RAISE (TM 9-2320-365-10).
(6) Position FUNCTION SELECT knob to SUSPENSION (TM 9-2320-365-10).
(7) Push and hold PUMP plunger button (TM 9-2320-365-10) and perform STE/ICE-R Test #51.
(8) Shut down engine (TM 9-2320-365-10).
(9) Disconnect STE/ICE-R from RH suspension cylinder output port and hydraulic hose 509.
(10) Connect hydraulic hose 509 to RH suspension cylinder output port.
(11) Repeat steps (1) through (10) on LH suspension cylinder and hydraulic hose 511.
(12) If 2,500-4,000 psi (17,238-27,580 kPa) is not present, replace suspension cylinder(s) (para 19-9).
(13) If 2,500-4,000 psi (17,238-27,580 kPa) is present, replace hydraulic hose(s) 509 and/or 511.



t3. CAB LEVELING AIR SPRINGS DO NOT OPERATE

INITIAL SETUP

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

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Goggles, Industrial (Item 15, Appendix C)

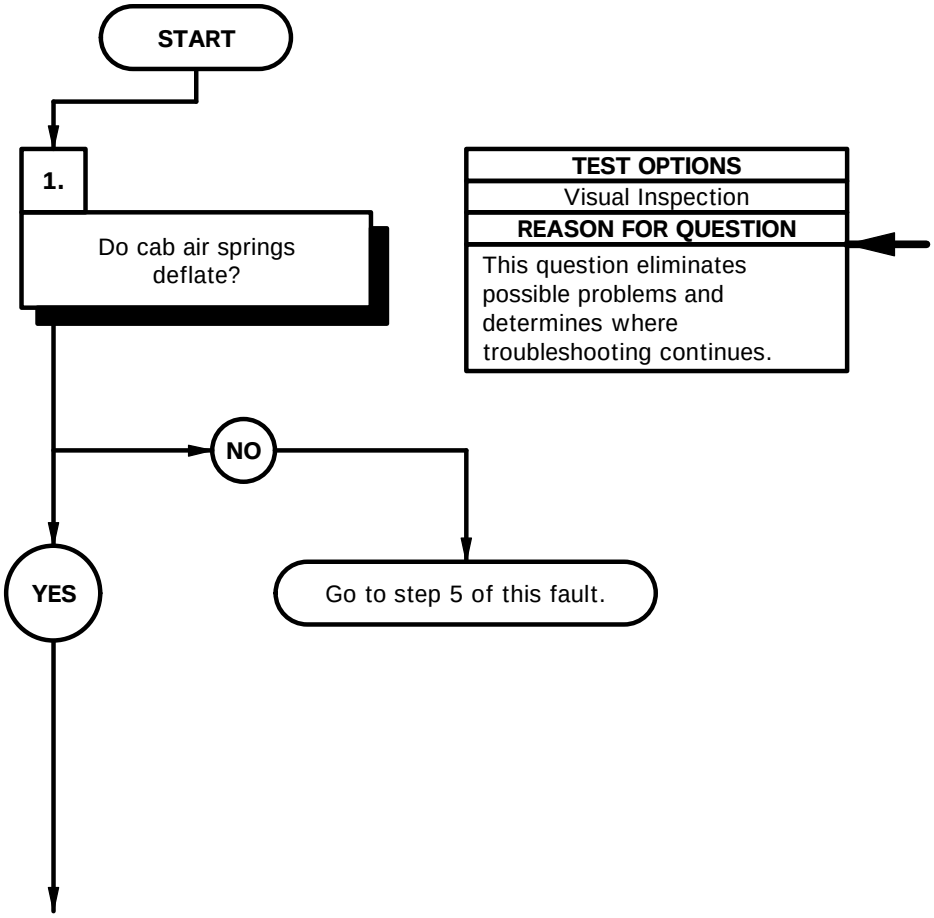
References
TM 9-4910-571-12&P

KNOWN INFO

CTIS operates.
Air hoses free from kinks and leaks.

POSSIBLE PROBLEMS

Faulty variable control check valve.
Faulty air hose 503.
Faulty air hose 522.
Faulty cab leveling valve tee fitting.
Faulty air hose 506.
Faulty air/hydraulic manifold.
Faulty pressure protection valve.
Faulty air hose 501.
Faulty cab leveling valve.
Faulty air spring cylinder(s).
Faulty air hose(s) 504 and/or 505.

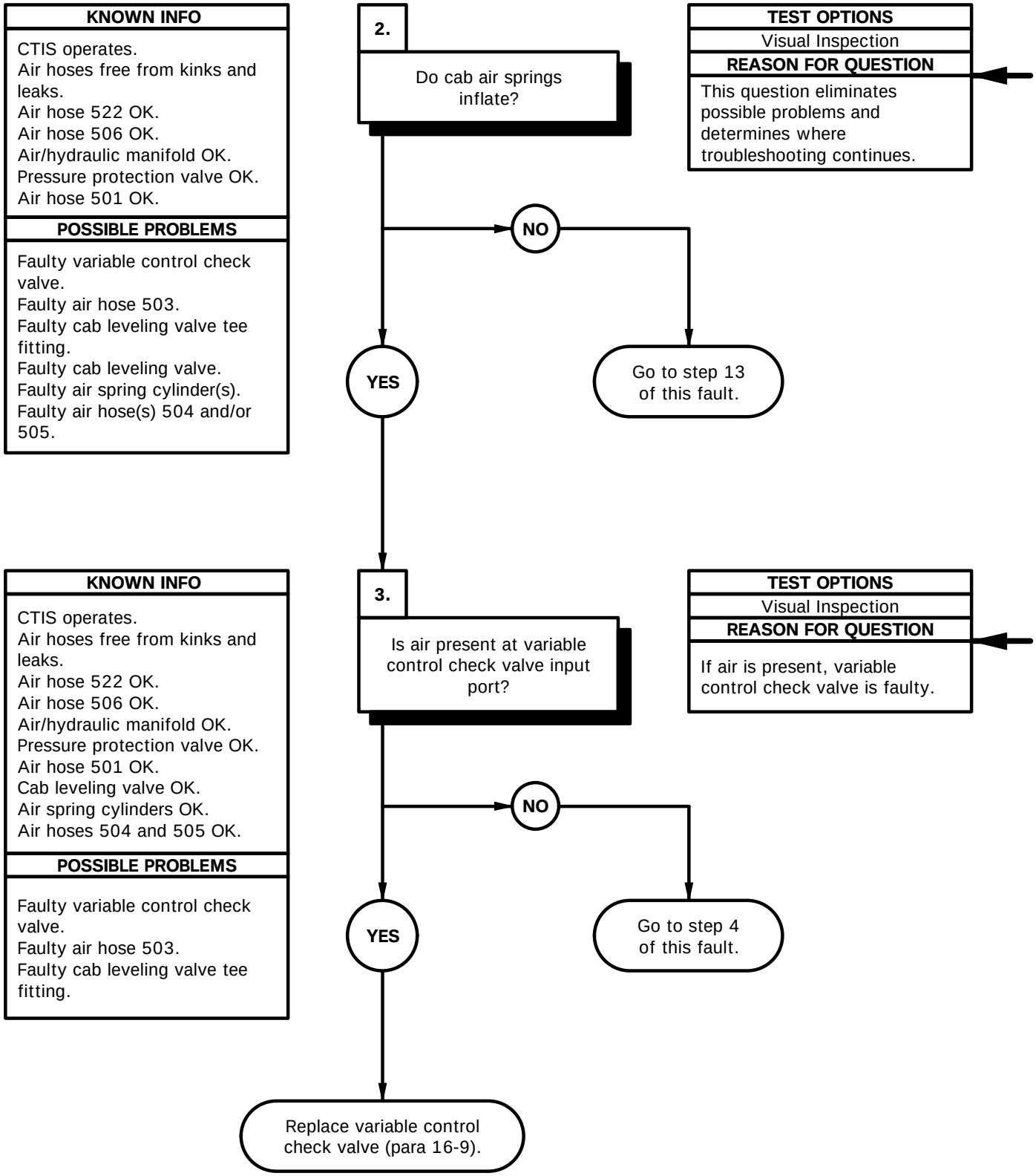


NOTE

SYSTEM PARK control must be engaged (TM 9-2320-365-10) before operating SUSPENSION compression.

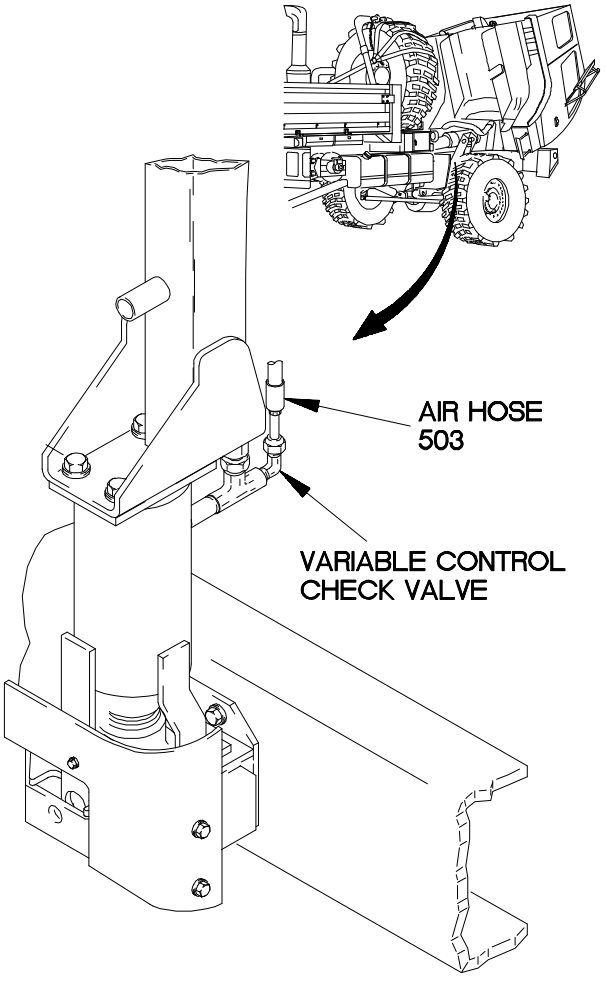
(1) Attempt to deflate cab air springs (TM 9-2320-365-10).
(2) If cab air springs do not deflate, go to step 5 of this fault.

t3. CAB LEVELING AIR SPRINGS DO NOT OPERATE (CONT)

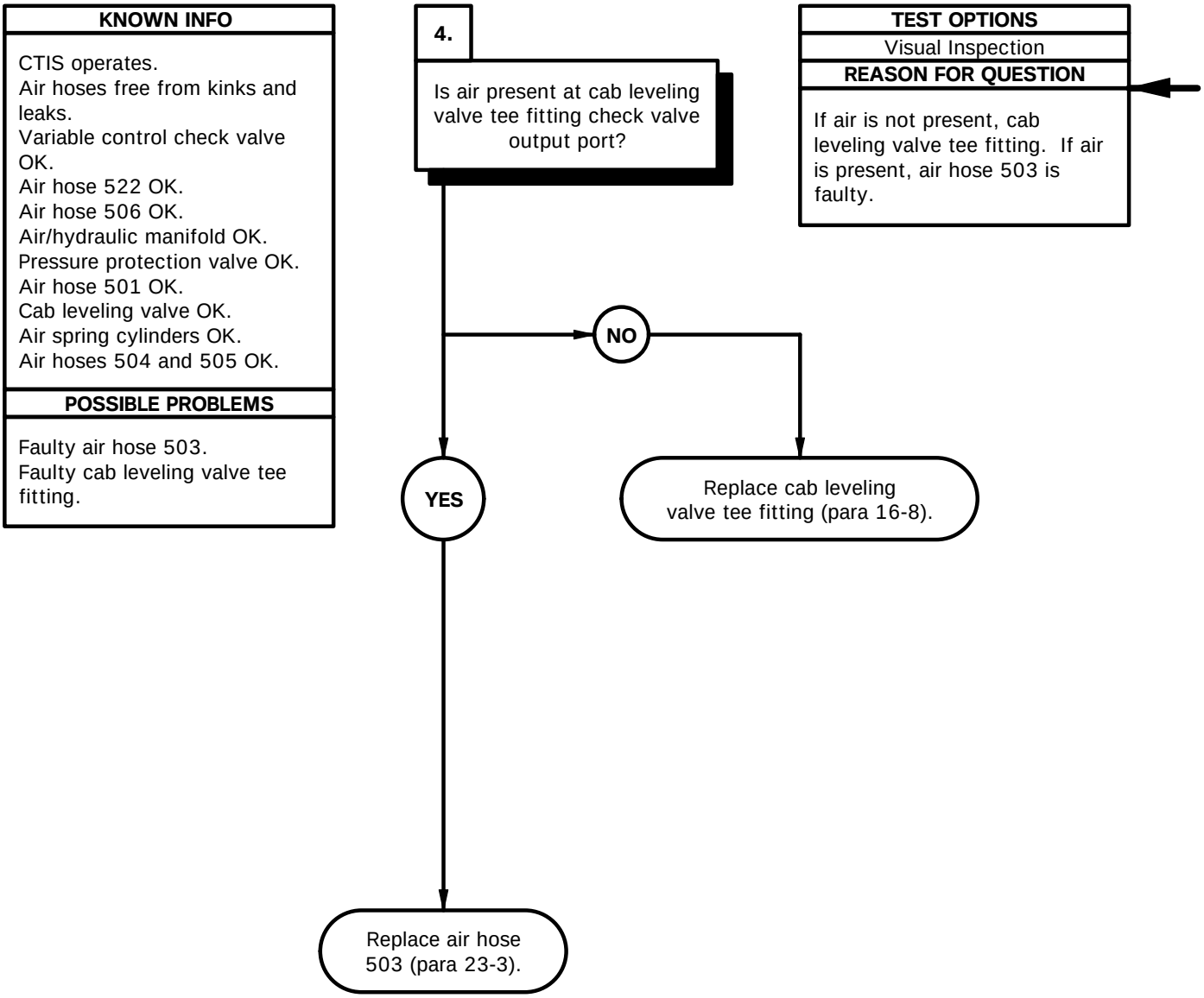


(1) Attempt to inflate cab air springs (TM 9-2320-365-10).
(2) If cab air springs do not inflate, go to step 13 of this fault.

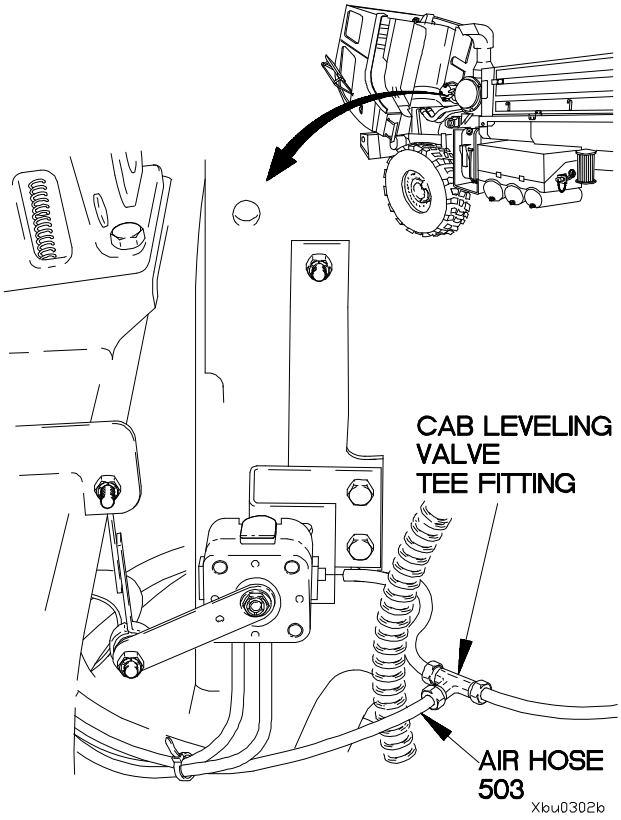
(1) Start engine and allow air tanks to pressurize (TM 9-2320-365-10).
(2) Shut down engine (TM 9-2320-365-10).
(3) Raise cab (TM 9-2320-365-10).
(4) Loosen air hose 503 at variable control check valve input port.
(5) Check for pressure of air at air hose 503.
(6) Tighten air hose 503 to variable control check valve.
(7) If air is not present, go to step 4 of this fault.
(8) If air is present, replace variable control check valve (para 16-9).



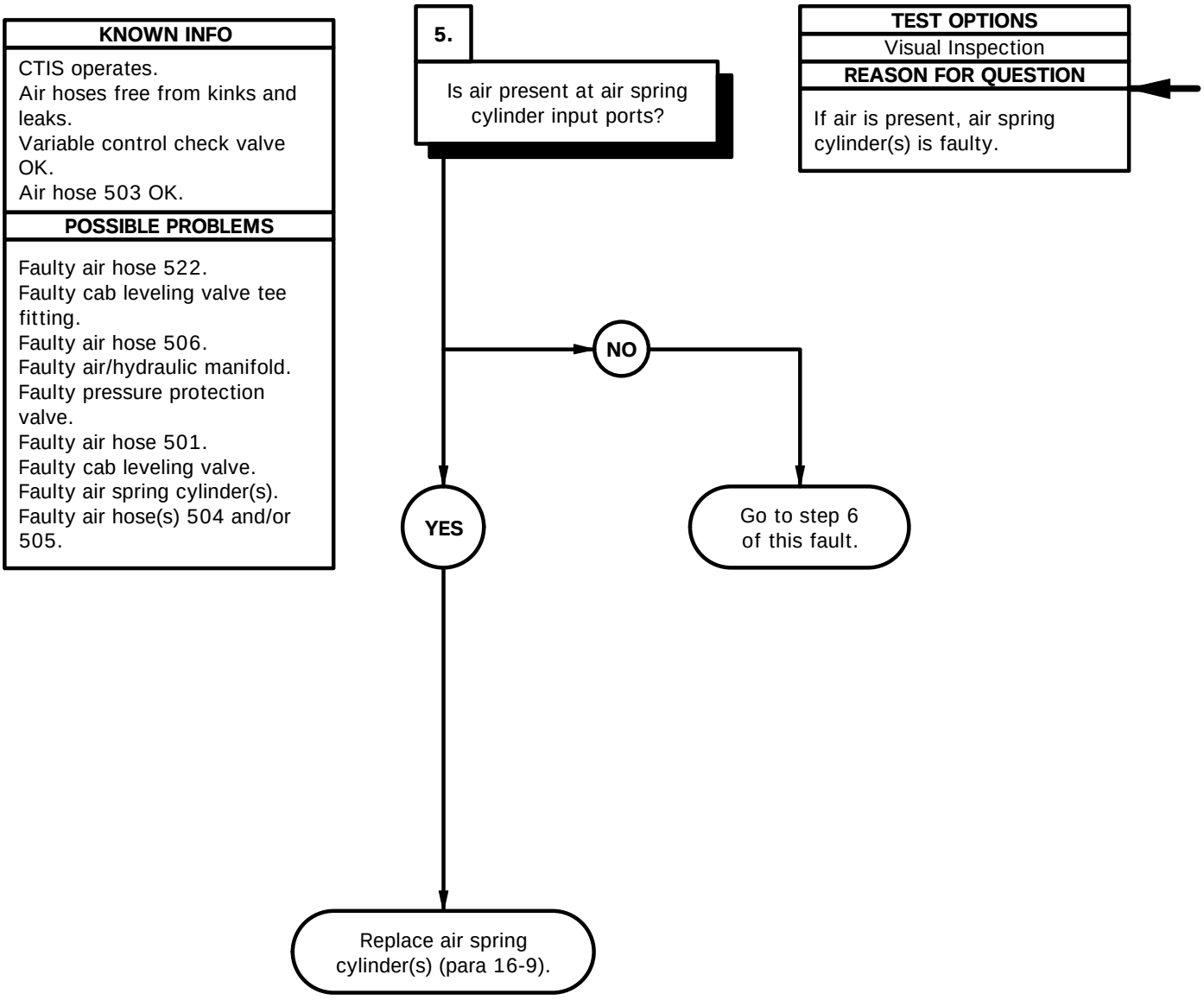
t3. CAB LEVELING AIR SPRINGS DO NOT OPERATE (CONT)



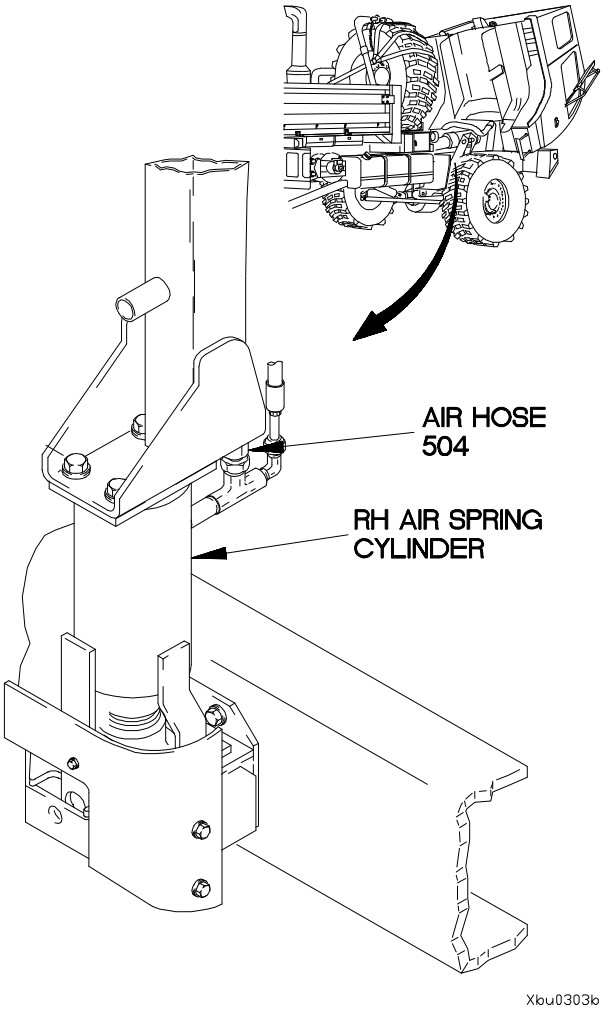
(1) Loosen air hose 503 at cab leveling valve tee fitting check valve output port.
(2) Check for pressure of air at cab leveling valve tee fitting check valve output port.
(3) Tighten air hose 503 at cab leveling valve tee fitting check valve output port.
(4) Lower cab (TM 9-2320-365-10).
(5) If air is not present, replace cab leveling valve tee fitting (para 16-8).
(6) If air is present, replace air hose 503 (para 23-3).



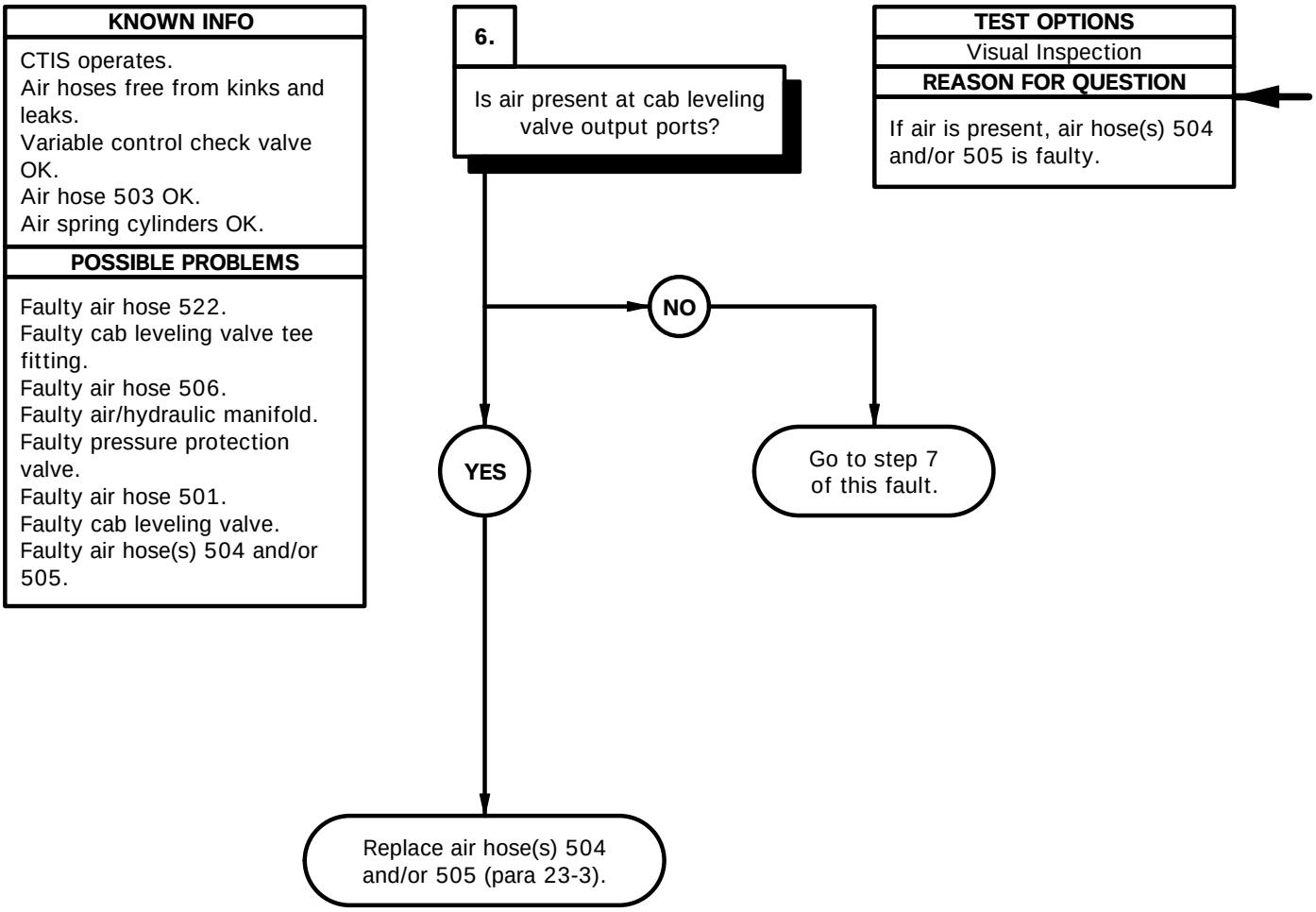
t3. CAB LEVELING AIR SPRINGS DO NOT OPERATE (CONT)



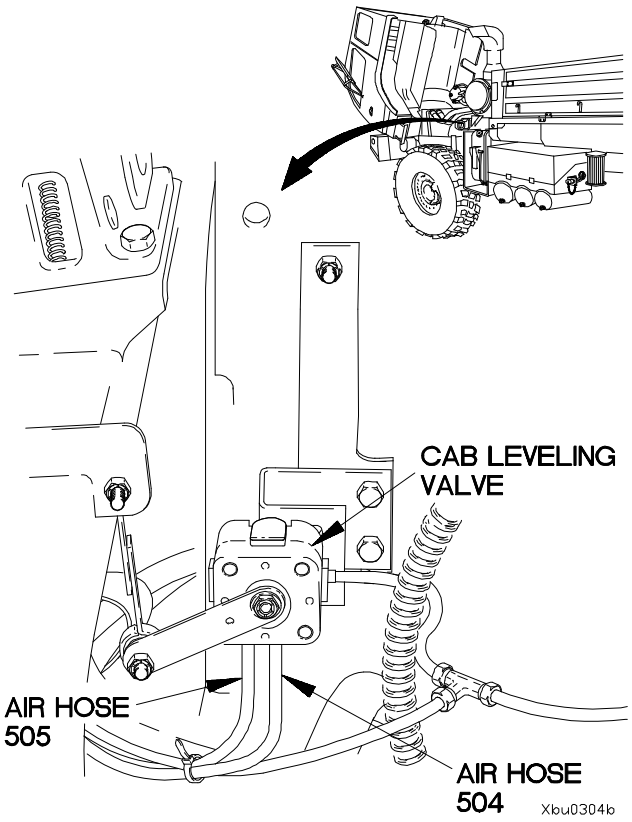
(1) Start engine and allow air tanks to pressurize (TM 9-2320-365-10).
(2) Shut down engine (TM 9-2320-365-10).
(3) Raise cab (TM 9-2320-365-10).
(4) Loosen air hose 504 at RH air spring cylinder.
(5) Turn CAB knob to the right and push in (TM 9-2320-365-10).
(6) Check for presence of air at air hose 504.
(7) Turn CAB knob to the left (TM 9-2320-365-10).
(8) Tighten air hose 504 at RH air spring cylinder.
(9) Repeat steps (4) through (8) on LH air spring cylinder and air hose 505.
(10) If air is not present, go to step 6 of this fault.
(11) If air is present, replace air spring cylinder(s) (para 16-9).



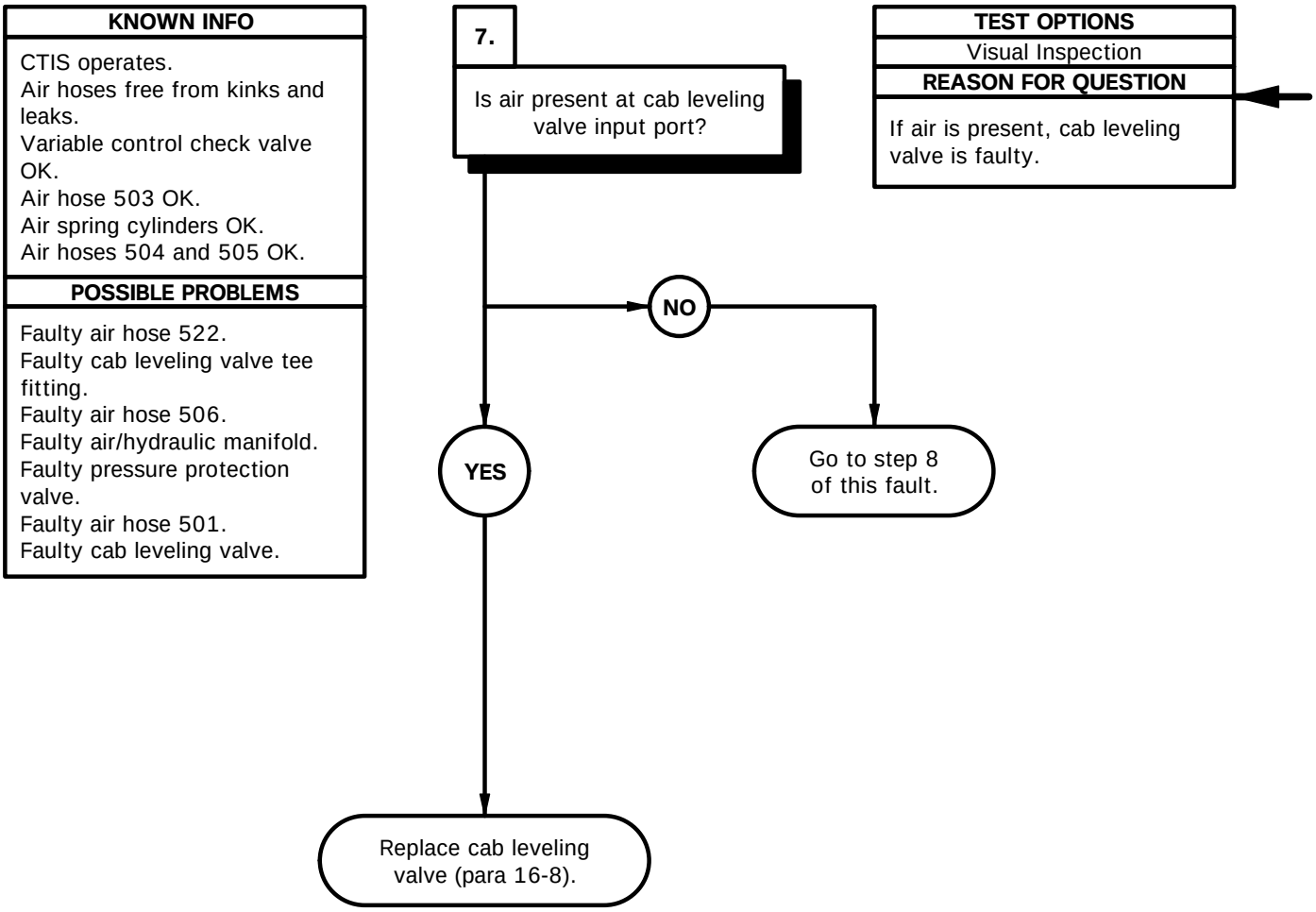
t3. CAB LEVELING AIR SPRINGS DO NOT OPERATE (CONT)



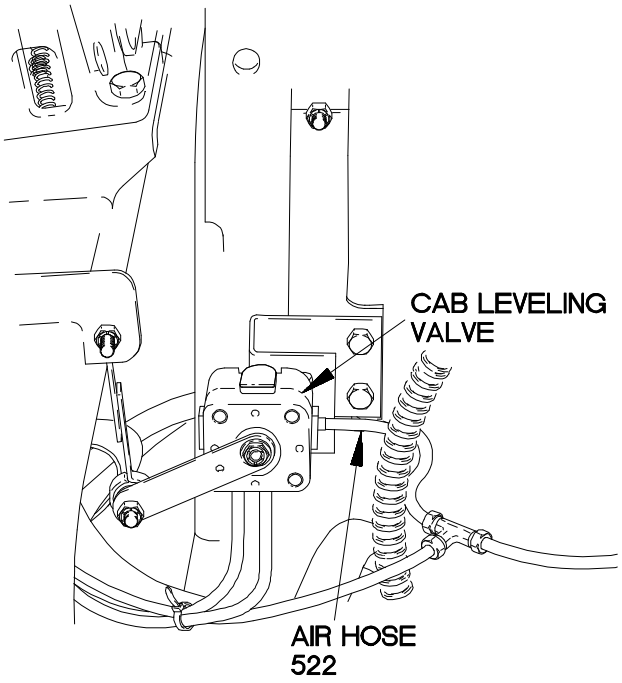
(1) Loosen air hoses 504 and 505 at cab leveling valve output ports.
(2) Turn CAB knob to the right and push in (TM 9-2320-365-10).
(3) Check for presence of air at cab leveling valve output ports.
(4) Turn CAB knob to the left (TM 9-2320-365-10).
(5) Tighten air hoses 504 and 505 at cab leveling valve output ports.
(6) If air is not present, go to step 7 of this fault.
(7) If air is present, replace air hose(s) 504 and/or 505 (para 23-3).



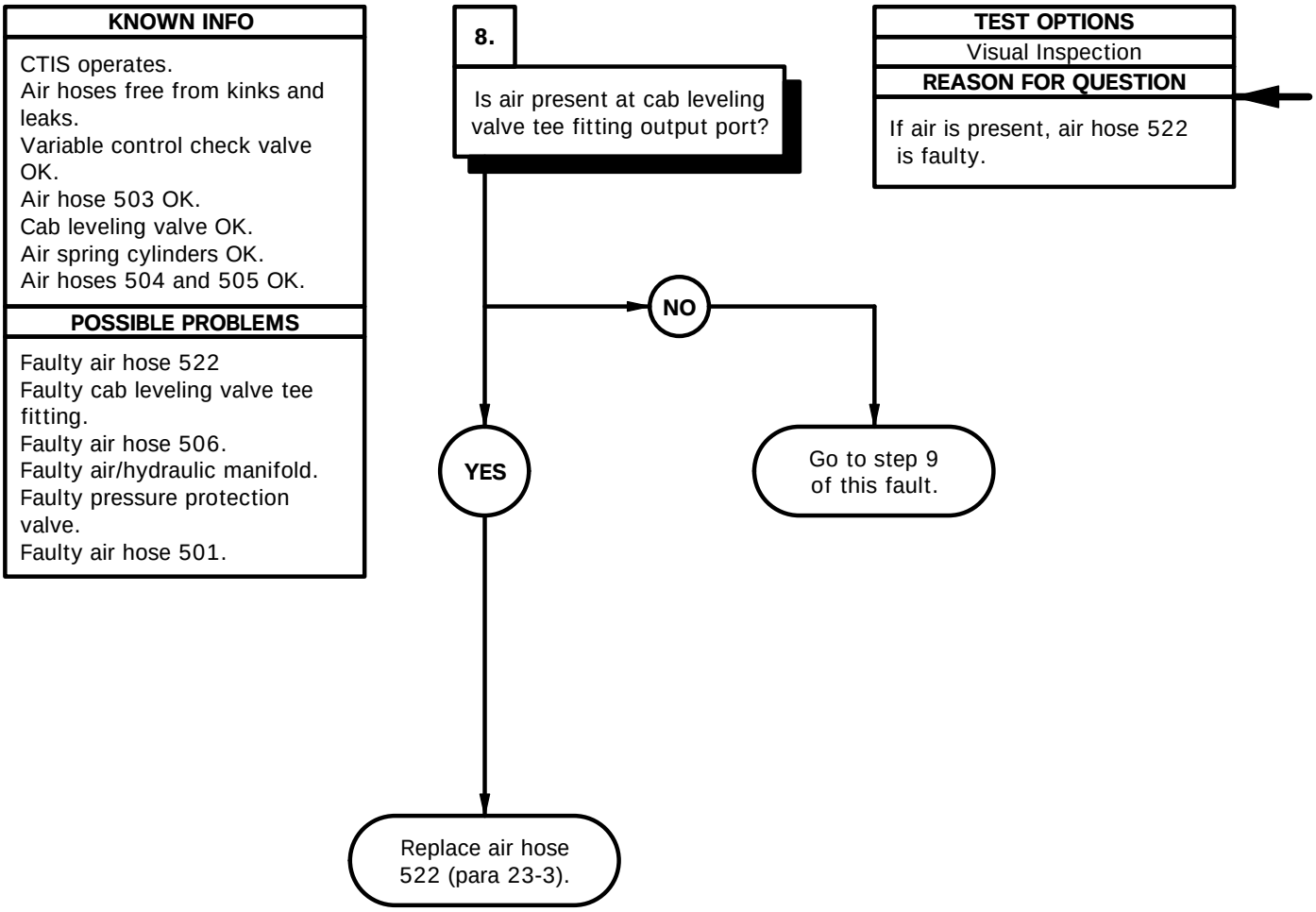
t3. CAB LEVELING AIR SPRINGS DO NOT OPERATE (CONT)



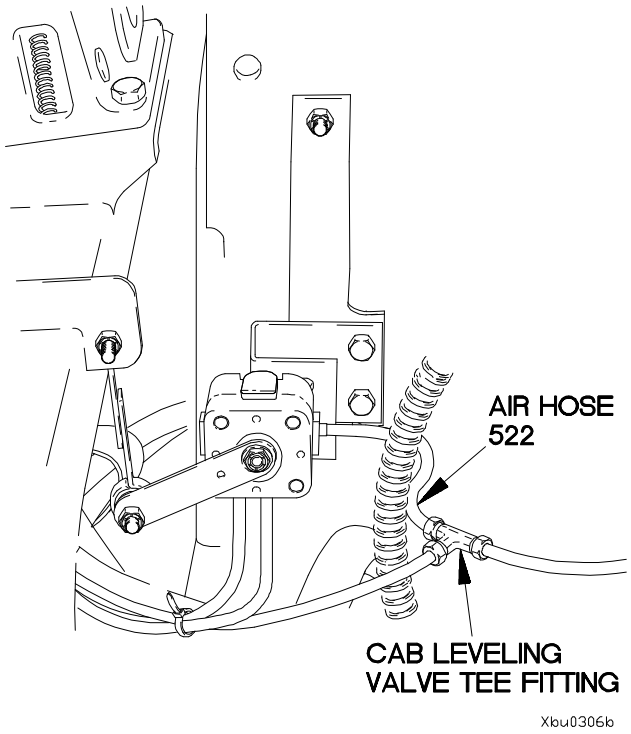
(1) Loosen air hose 522 at cab leveling valve input port.
(2) Turn CAB knob to the right and push in (TM 9-2320-365-10).
(3) Check for presence of air at air hose 522.
(4) Turn CAB knob to the left (TM 9-2320-365-10).
(5) Tighten air hose 522 at cab leveling valve input port.
(6) If air is not present, go to step 8 of this fault.
(7) If air is present, replace cab leveling valve (para 16-8).



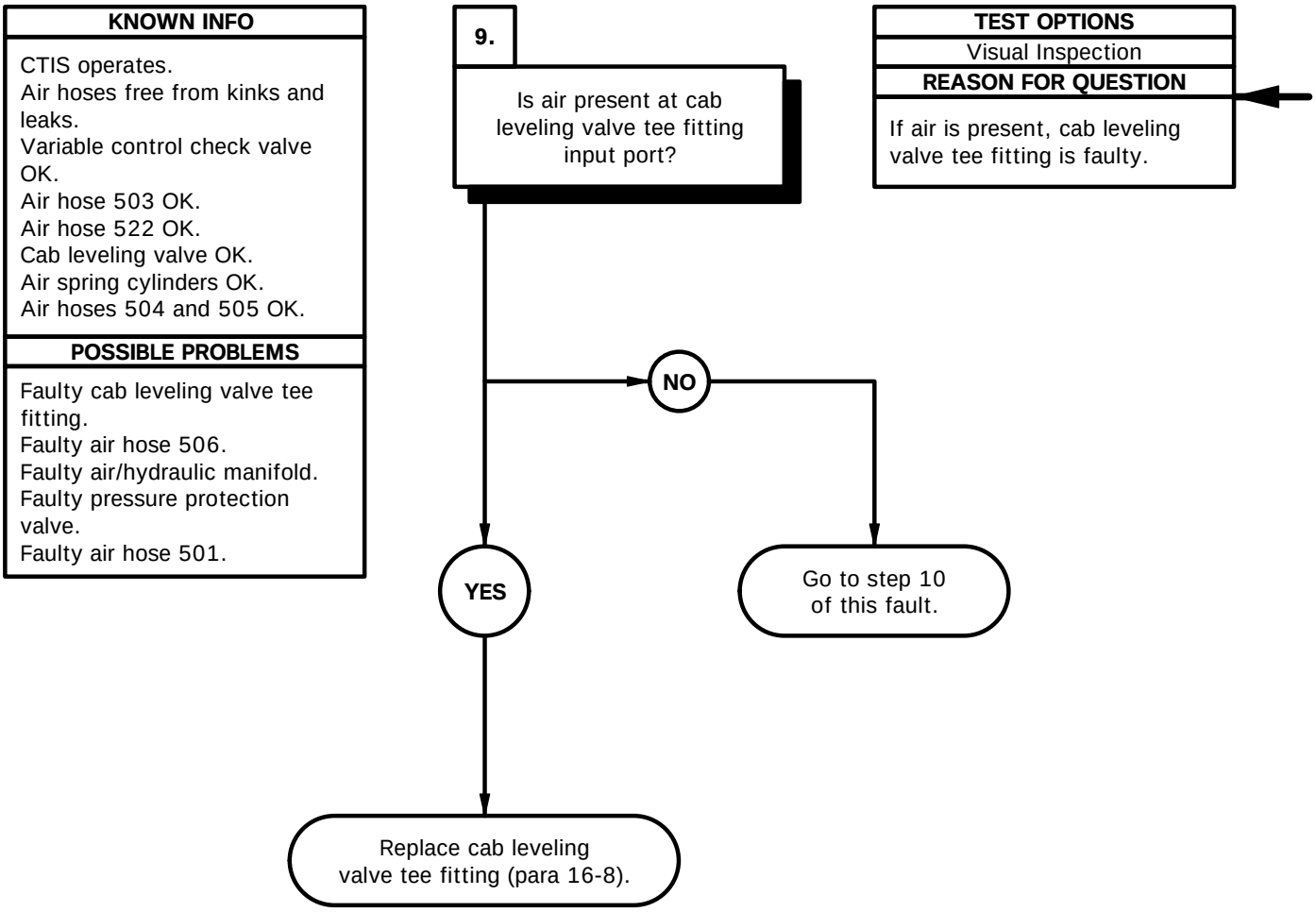
t3. CAB LEVELING AIR SPRINGS DO NOT OPERATE (CONT)



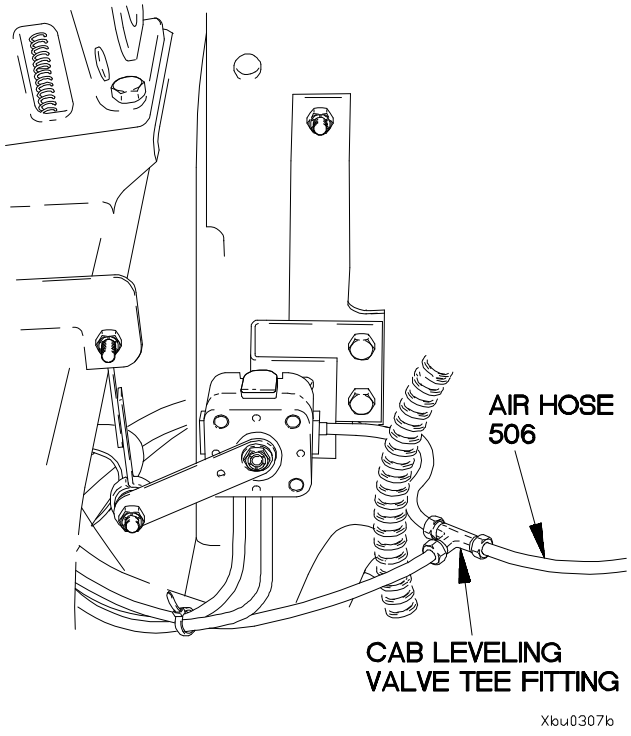
(1) Loosen air hose 522 at cab leveling valve tee fitting output port.
(2) Turn CAB knob to the right and push in (TM 9-2320-365-10).
(3) Check for presence of air at cab leveling valve tee fitting output port.
(4) Turn CAB knob to the left (TM 9-2320-365-10).
(5) Tighten air hose 522 at cab leveling valve tee fitting output port.
(6) If air is not present, go to step 9 of this fault.
(7) If air is present, replace cab leveling valve tee fitting (para 16-8).



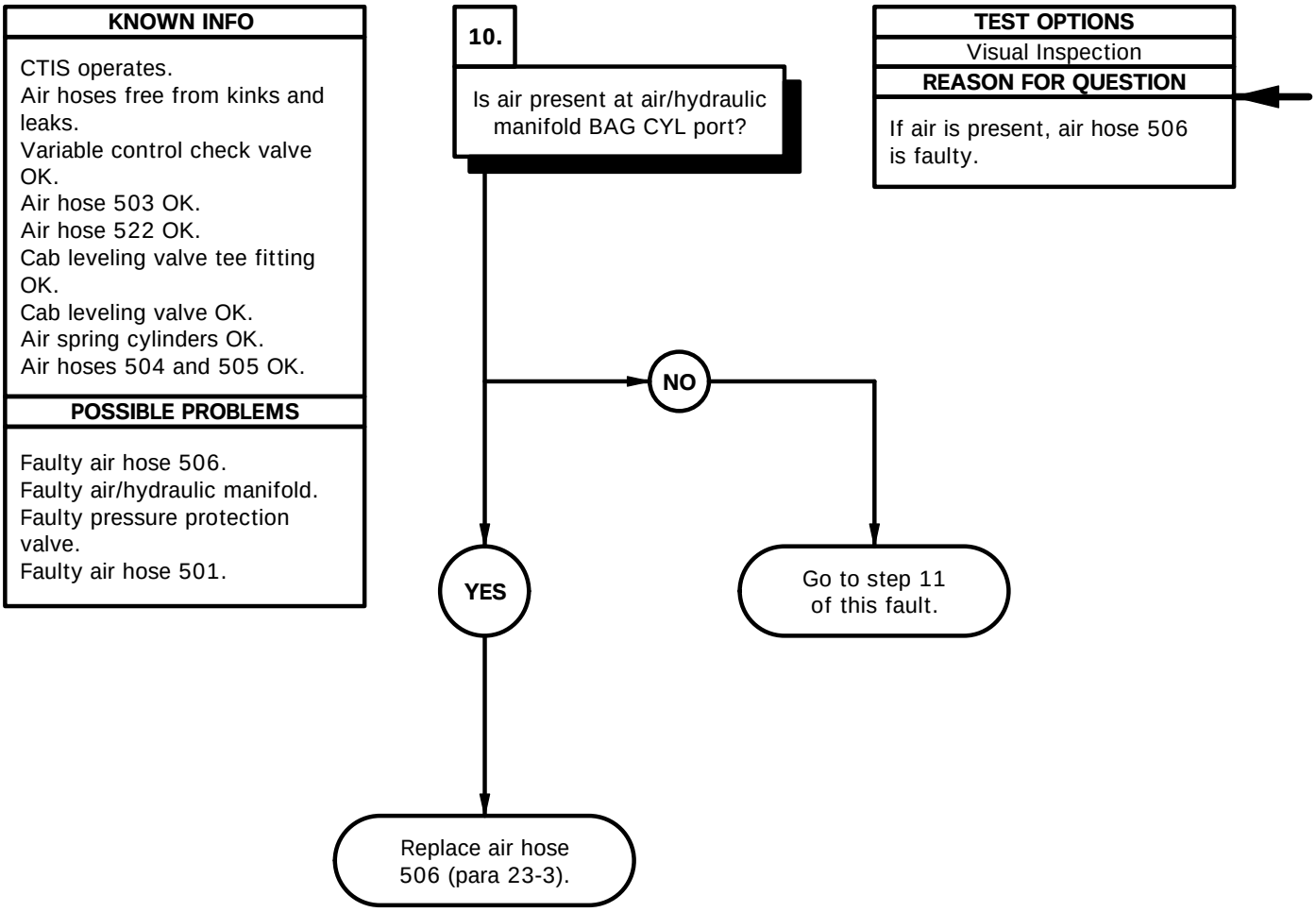
t3. CAB LEVELING AIR SPRINGS DO NOT OPERATE (CONT)



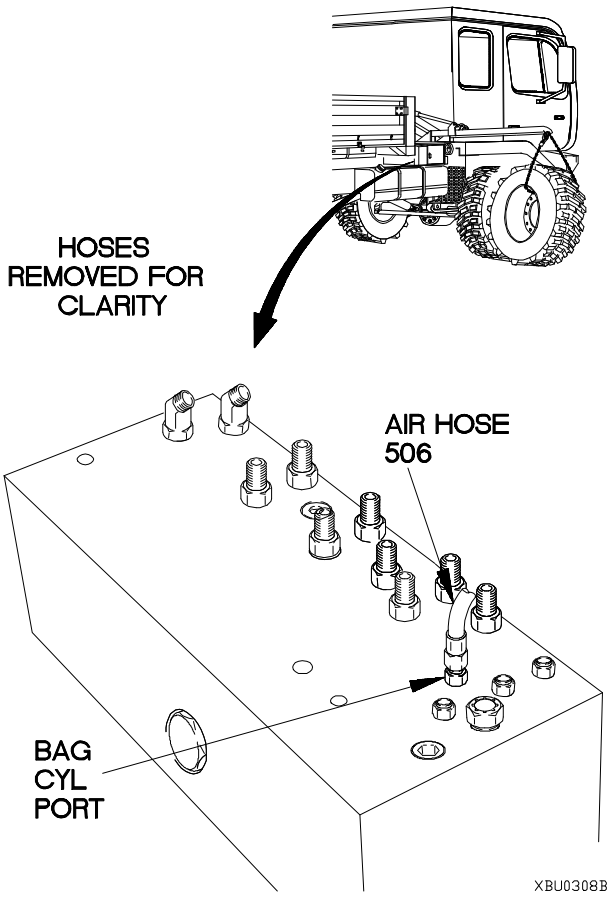
(1) Loosen air hose 506 at cab leveling valve tee fitting input port.
(2) Turn CAB knob to the right and push in (TM 9-2320-365-10).
(3) Check for presence of air at air hose 506.
(4) Turn CAB knob to the left (TM 9-2320-365-10).
(5) Tighten air hose 506 at cab leveling valve tee fitting input port.
(6) Lower cab (TM 9-2320-365-10).
(7) If air is not present, go to step 10 of this fault.
(8) If air is present, replace cab leveling valve tee fitting (para 16-8).



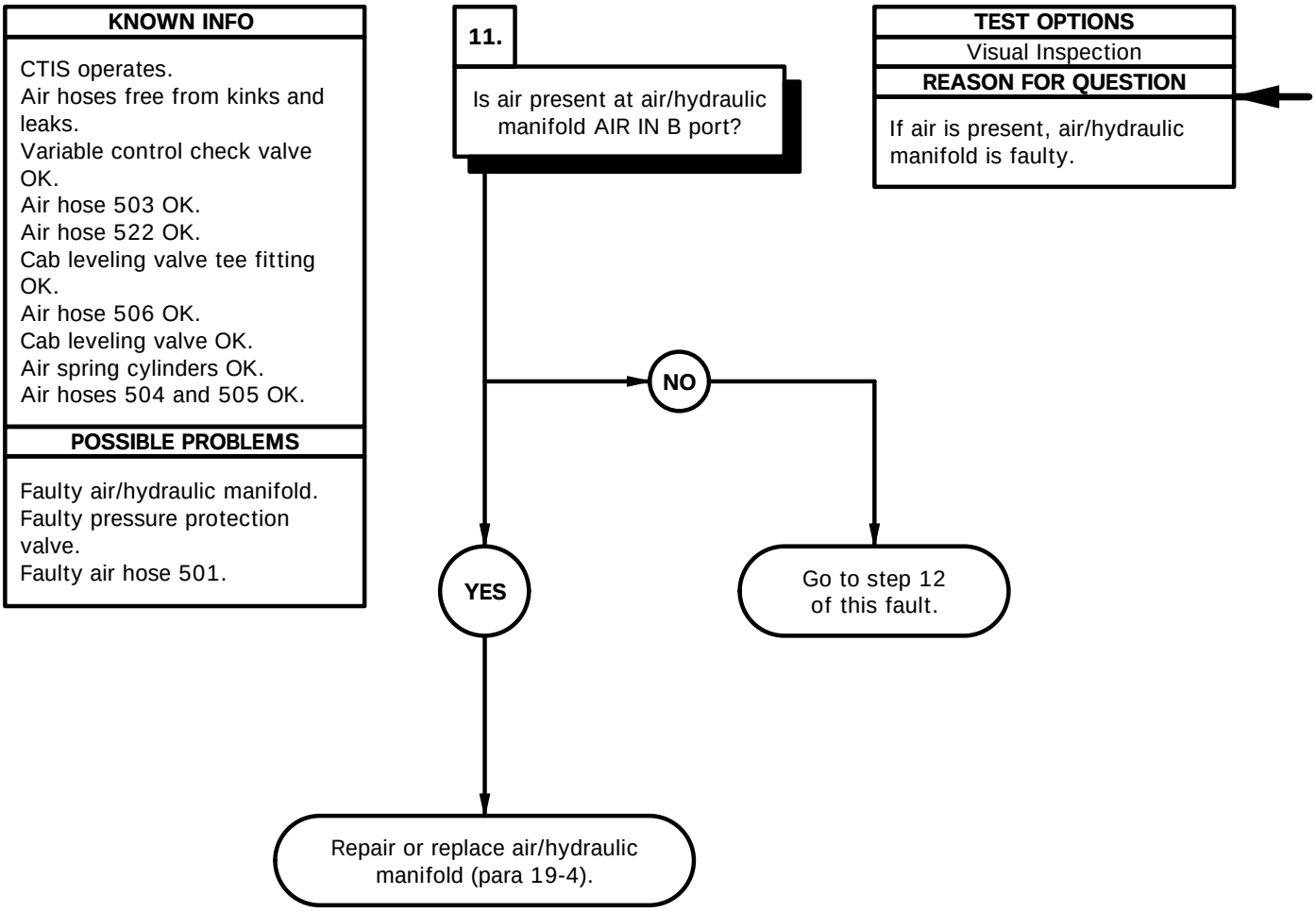
t3. CAB LEVELING AIR SPRINGS DO NOT OPERATE (CONT)



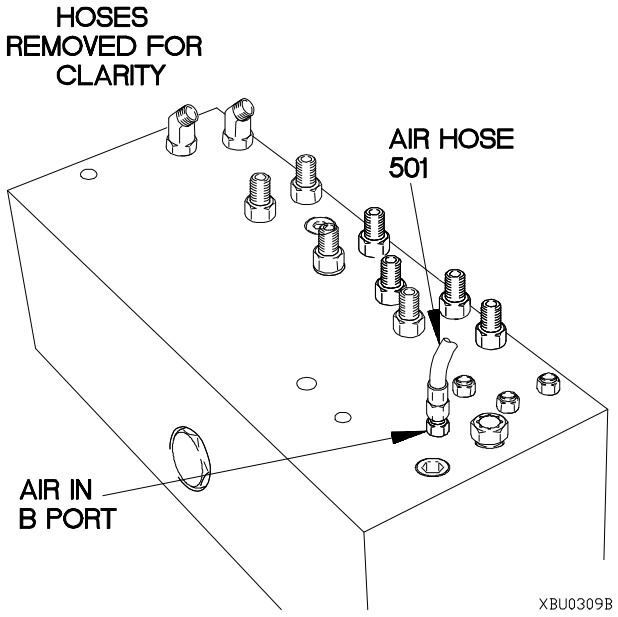
(1) Loosen air hose 506 at air/hydraulic manifold BAG CYL port.
(2) Turn CAB knob to the right and push in (TM 9-2320-365-10).
(3) Check for presence of air at air/hydraulic manifold BAG CYL port.
(4) Turn CAB knob to the left (TM 9-2320-365-10).
(5) Tighten air hose 506 at air/hydraulic manifold BAG CYL port.
(6) If air is not present, go to step 11 of this fault.
(7) If air is present, replace air hose 506 (para 23-3).



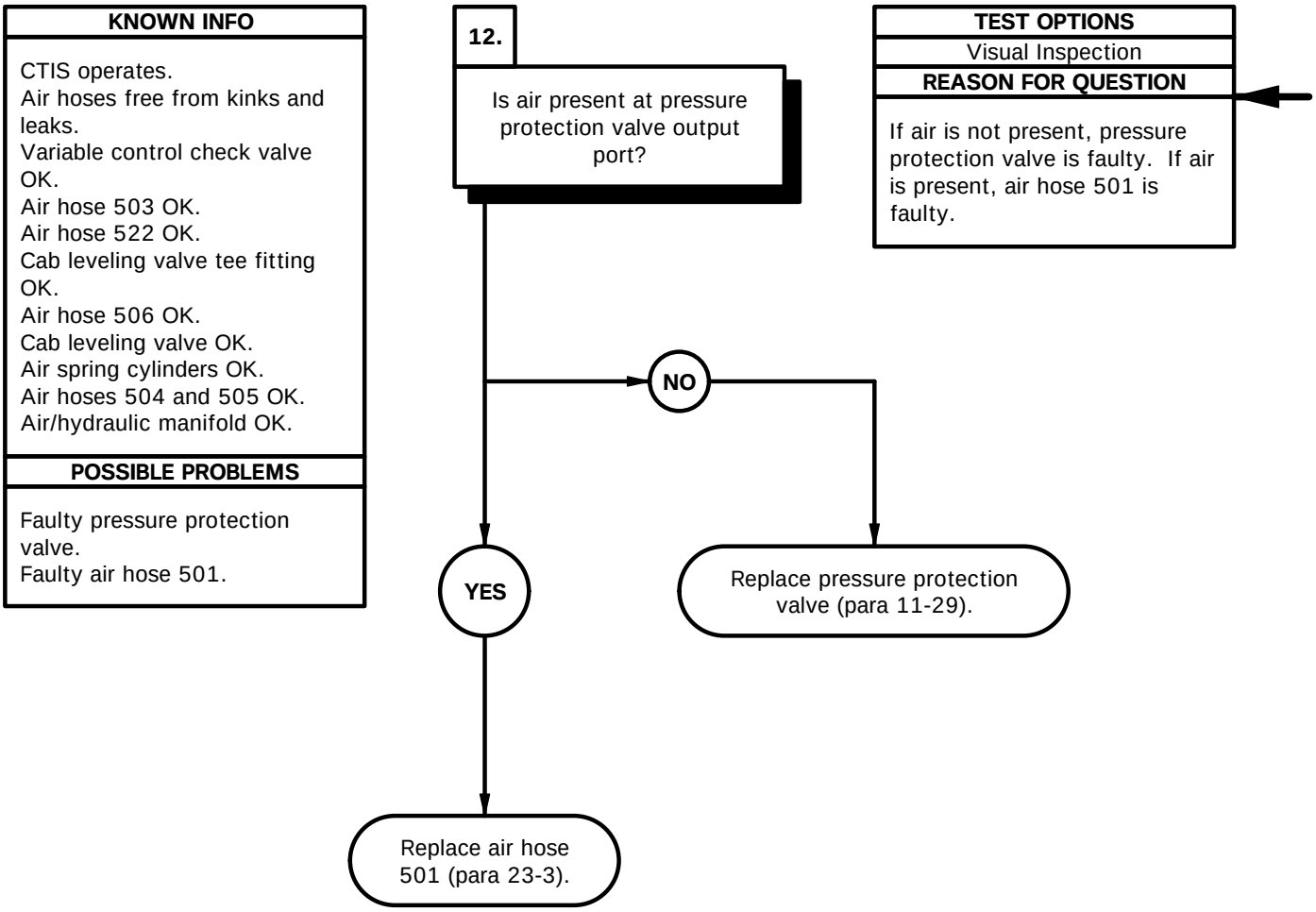
t3. CAB LEVELING AIR SPRINGS DO NOT OPERATE (CONT)



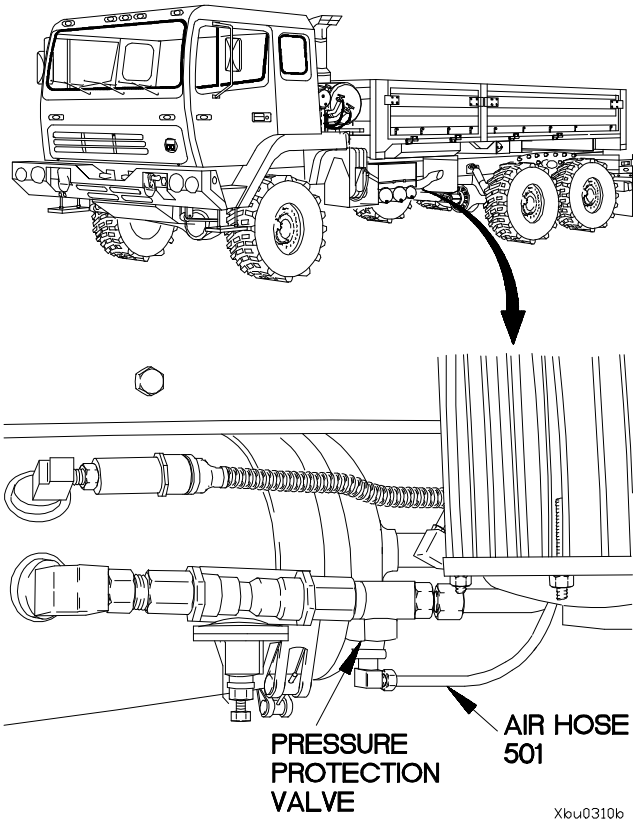
(1) Loosen air hose 501 at air/hydraulic manifold AIR IN B port.
(2) Check for presence of air at air hose 501.
(3) Tighten air hose 501 at air/hydraulic manifold AIR IN B port.
(4) If air is not present, go to step 12 of this fault.
(5) If air is present, repair or replace air/hydraulic manifold (para 19-4).



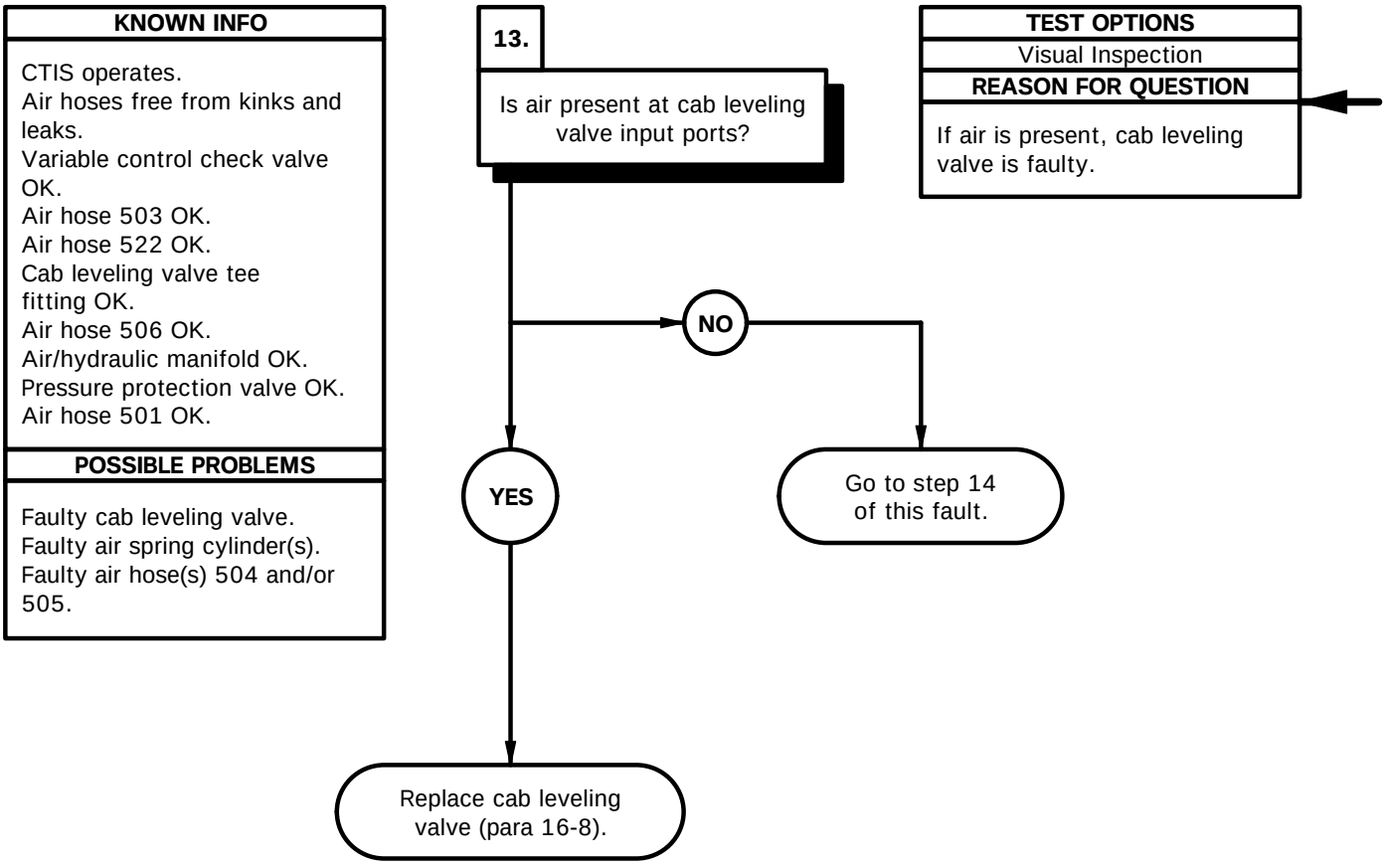
t3. CAB LEVELING AIR SPRINGS DO NOT OPERATE (CONT)



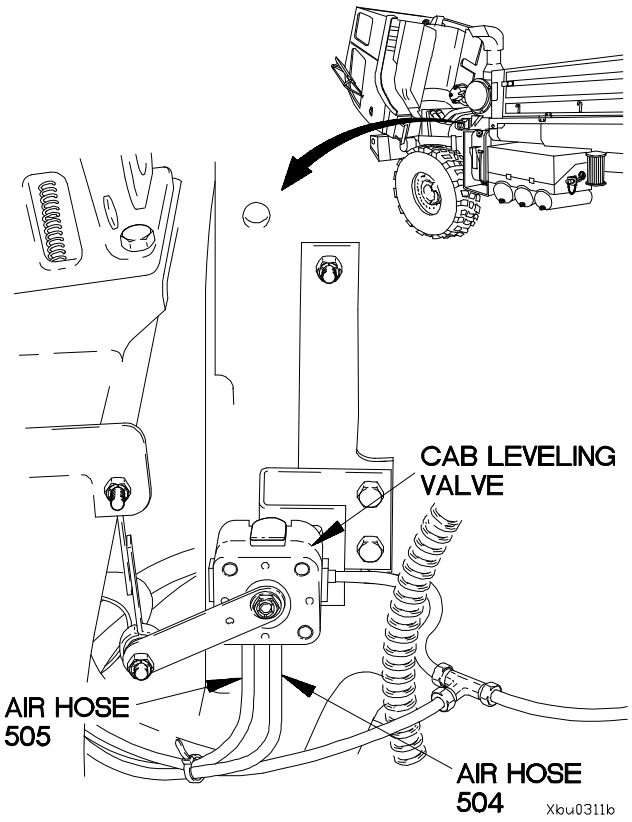
(1) Loosen air hose 501 at pressure protection valve output port.
(2) Check for presence of air at pressure protection valve output port.
(3) Tighten air hose 501 at pressure protection valve output port.
(4) If air is not present, replace pressure protection valve (para 11-29).
(5) If air is present, replace air hose 501 (para 23-3).



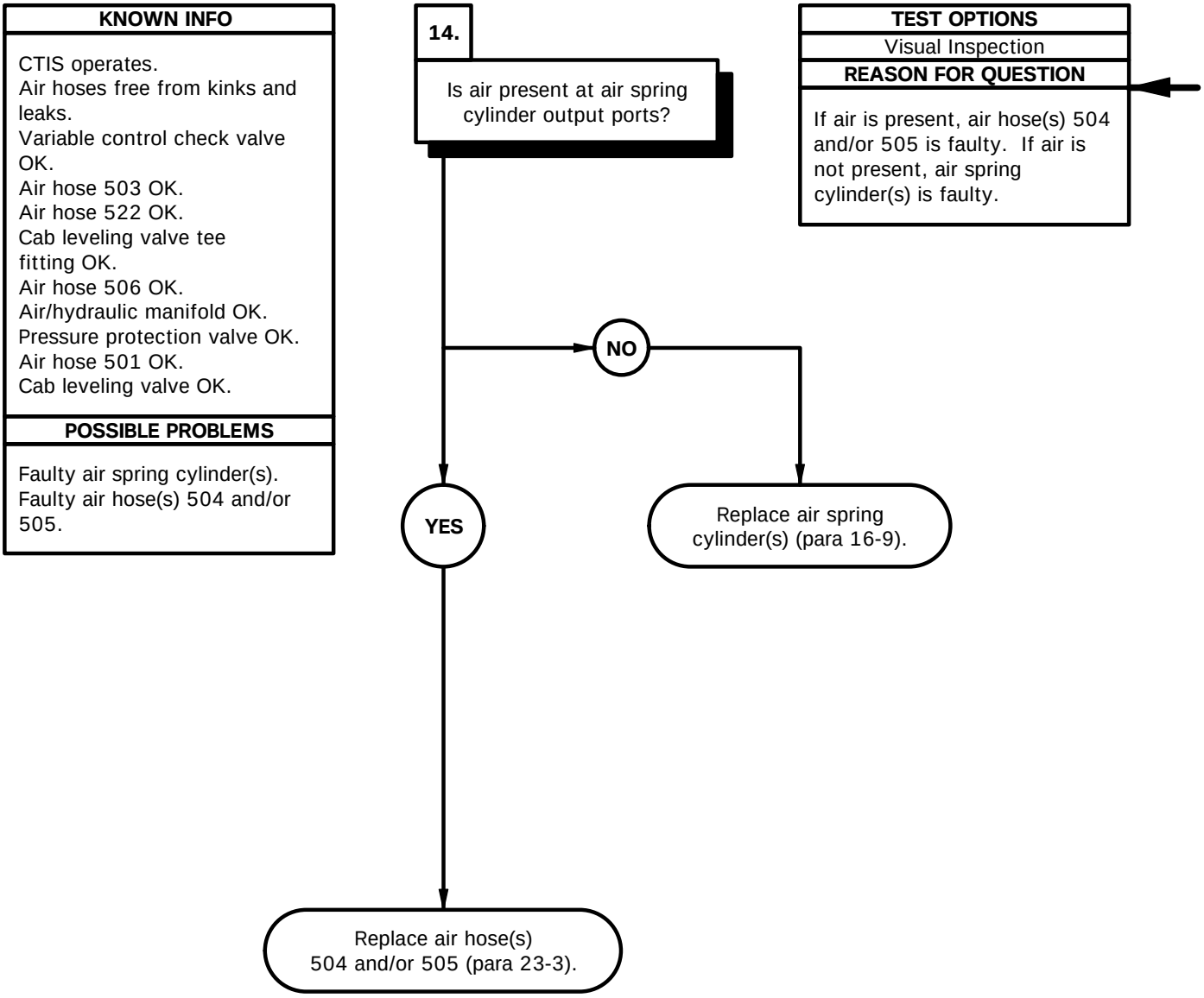
t3. CAB LEVELING AIR SPRINGS DO NOT OPERATE (CONT)



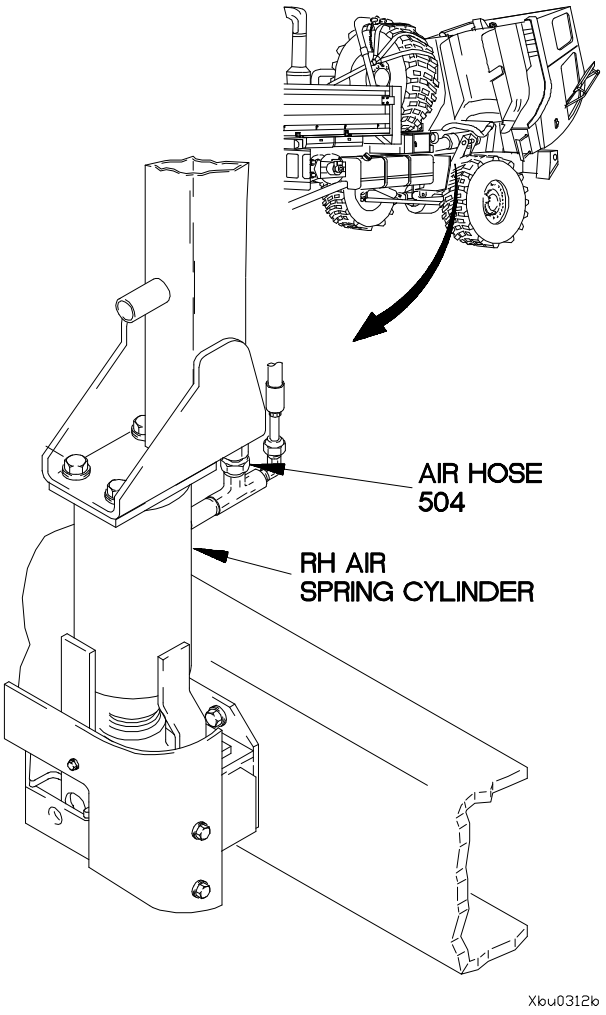
(1) Start engine and allow air tanks to pressurize (TM 9-2320-365-10).
(2) Shut down engine (TM 9-2320-365-10).
(3) Raise cab (TM 9-2320-365-10).
(4) Loosen air hoses 504 and 505 at cab leveling valve input ports.
(5) Turn CAB knob to the left (TM 9-2320-365-10).
(6) Check for presence of air at air hoses 504 and 505.
(7) Tighten air hoses 504 and 505 at cab leveling valve input ports.
(8) If air is not present, go to step 14 of this fault.
(9) If air is present, replace cab leveling valve (para 16-8).



t3. CAB LEVELING AIR SPRINGS DO NOT OPERATE (CONT)



(1) Loosen air hose 504 at RH air spring cylinder.
(2) Turn CAB knob to the right (TM 9-2320-365-10).
(3) Check for presence of air at RH air spring cylinder.
(4) Tighten air hose 504 at RH air spring cylinder.
(5) Repeat steps (1) through (4) on LH air spring cylinder and air hose 505.
(6) Lower cab (TM 9-2320-365-10).
(7) If air is not present, replace air spring cylinder(s) (para 16-9).
(8) If air is present, replace air hose(s) 504 and/or 505 (para 23-3).



2-31. SPECIAL PURPOSE KIT TROUBLESHOOTING

This paragraph covers Special Purpose Kit Troubleshooting. The Special Purpose Kit Fault Index, Table 2-57, lists faults for the special purpose kits of the vehicle.

Table 2-57. Special Purpose Kit Fault Index

Fault No.	Description	Page
u1.	Deleted	2-1978
u2.	Deleted	2-1980
u3.	Deleted	2-1986
u4.	Deleted	2-1996
u5.	Deleted	2-2002
u6.	Deleted	2-2004
u7.	Deleted	2-2010
u8.	Deleted	2-2016
u9.	Deleted	2-2020
u10.	Deleted	2-2030
u11.	Deleted	2-2032
u12.	Deleted	2-2038
u13.	Deleted	2-2050
u14.	Deleted	2-2060
u15.	Deleted	2-2062
u16.	Deleted	2-2068
u17.	Deleted	2-2074
u18.	Troop Transport Alarm Does Not Operate	2-2078
u19.	Light Material Handling Crane (LMHC) Does Not Operate	2-2088
u20.	Light Material Handling Crane (LMHC) Hoist IN Does Not Operate	2-2106
u21.	Light Material Handling Crane (LMHC) Hoist OUT Does Not Operate	2-2110

All data on pages 2-1978 thru 2-2077,
including pages 2-1979 thru 2-2076, deleted.

u18. TROOP TRANSPORT ALARM DOES NOT OPERATE

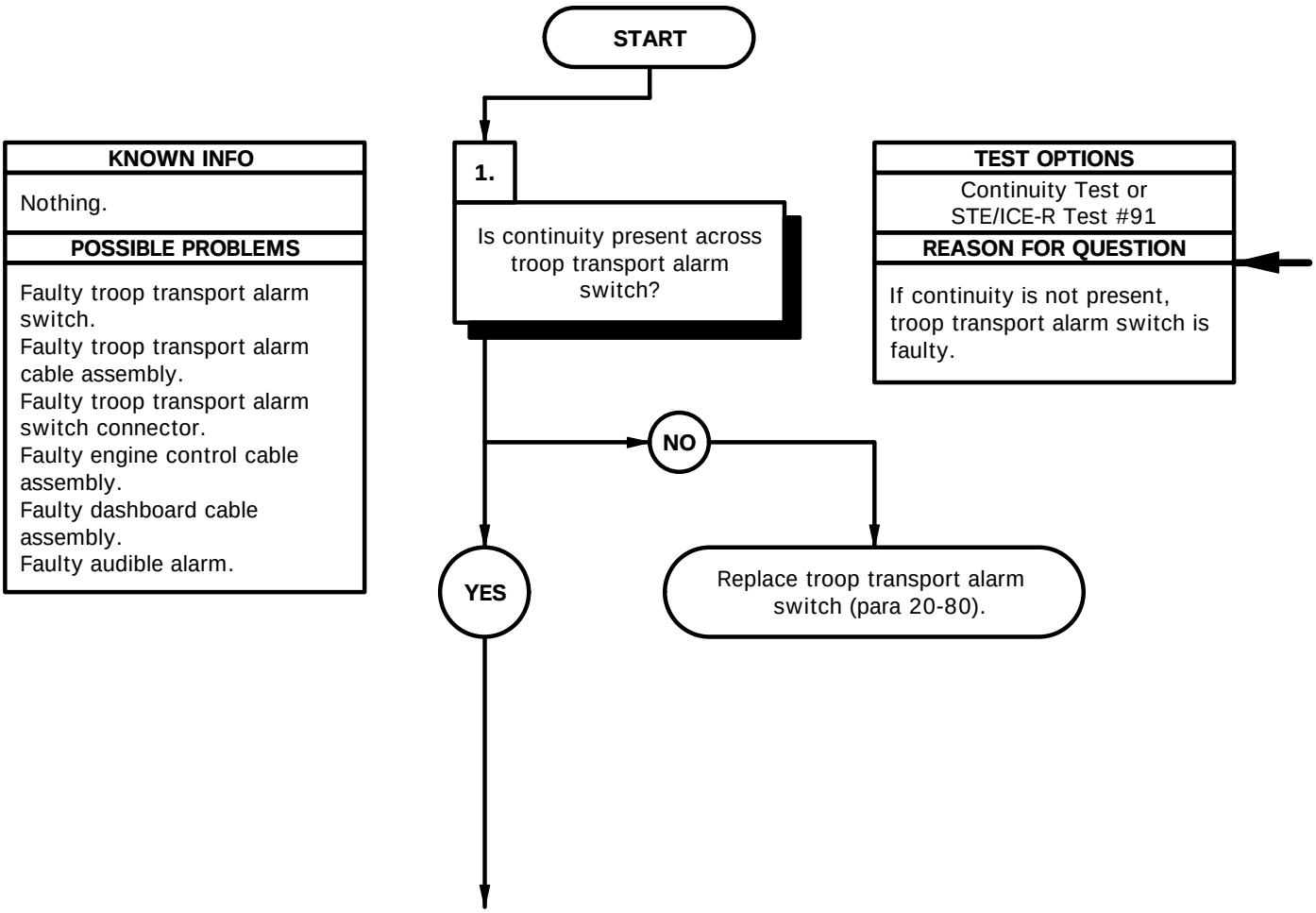
INITIAL SETUP

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

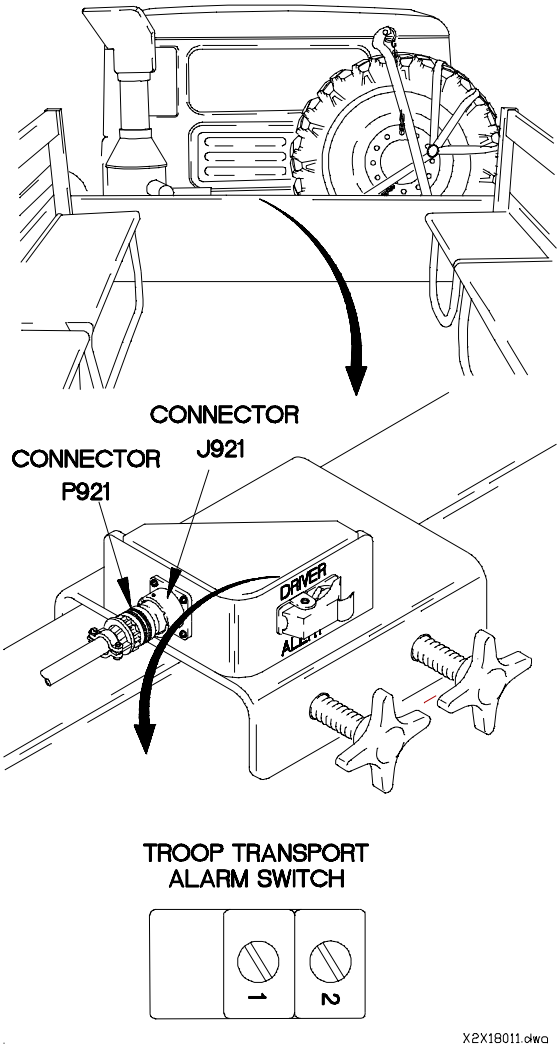
Personnel Required
(2)

References
TM 9-4910-571-12&P

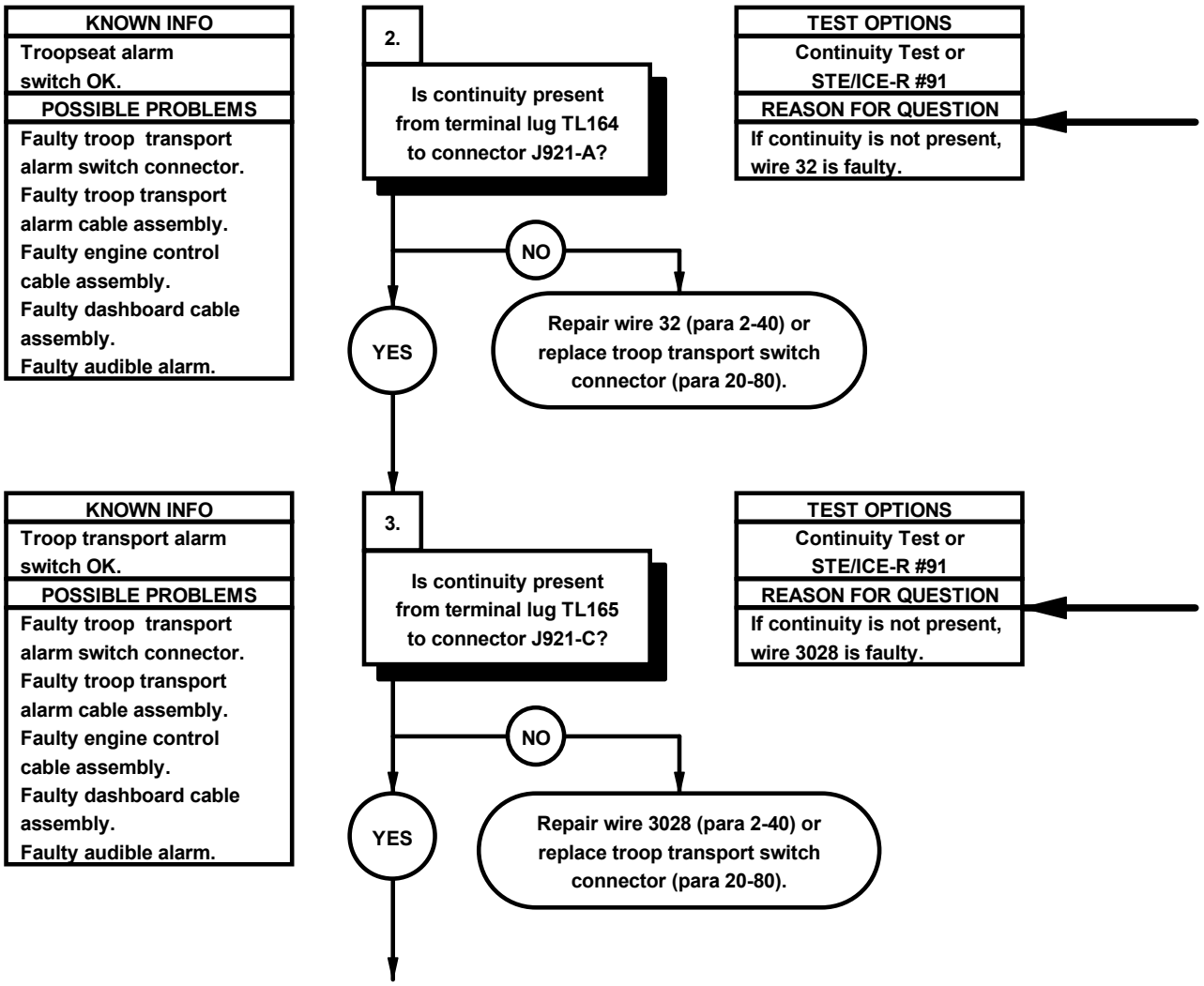
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Wire, Elect, 50 ft (Item 77, Appendix D)



CONTINUITY TEST
(1) Disconnect connector P921 from connector J921.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to pin 1 of troop transport alarm switch.
(4) Connect negative (-) probe of multimeter to pin 2 of troop transport alarm switch.
(5) Press troop transport alarm switch and note reading on multimeter.
(6) If continuity is not present, replace troop transport alarm switch (para 20-80).



u18. TROOP TRANSPORT ALARM DOES NOT OPERATE (CONT)

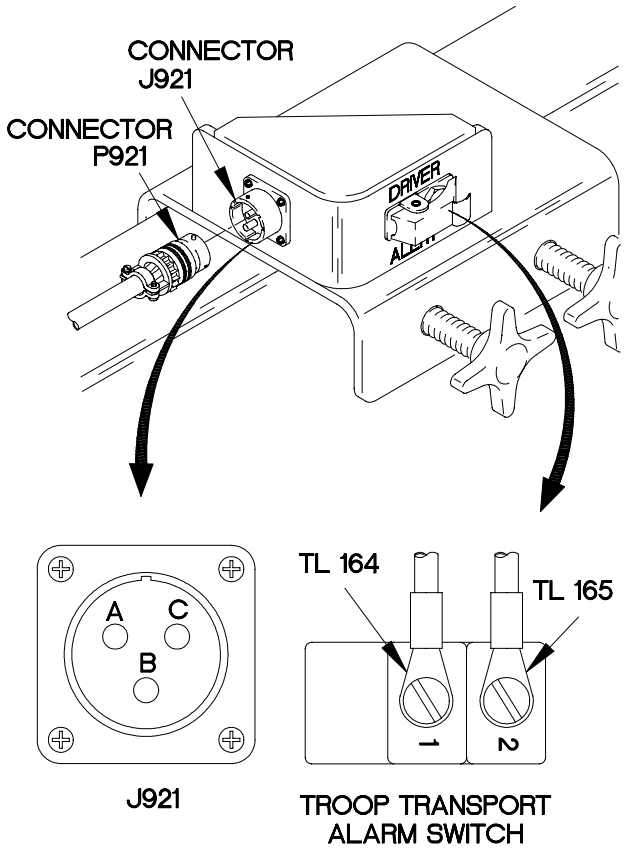


CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to terminal lug TL164.
(3) Connect negative (-) probe of multimeter to connector J921-A and note reading on multimeter.
(4) If continuity is not present, repair wire 32 (para 2-43) or replace troop transport alarm switch connector (para 20-80).

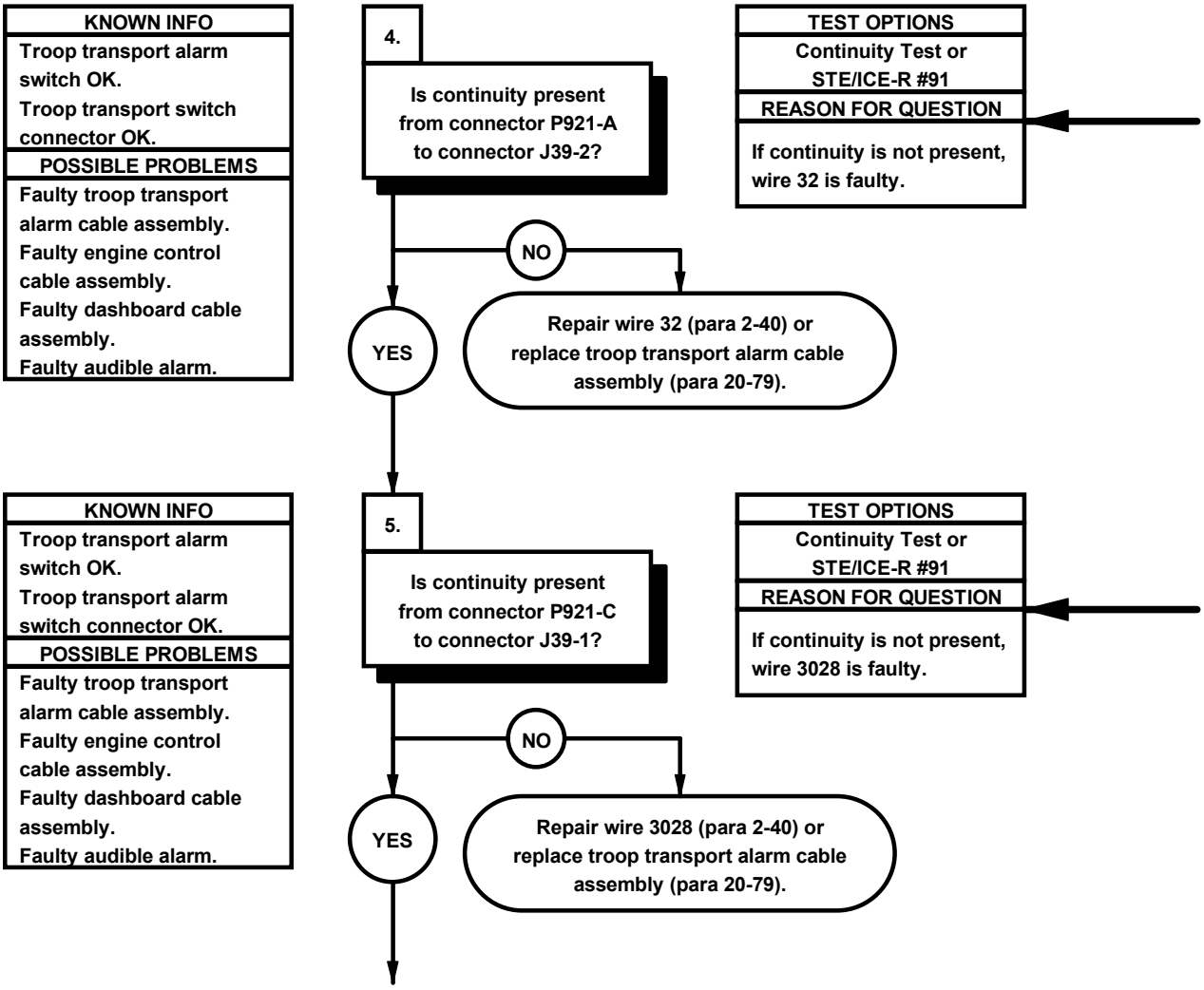
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to terminal lug TL165.
(3) Connect negative (-) probe of multimeter to connector J921-C and note reading on multimeter.
(4) If continuity is not present, repair wire 3028 (para 2-43) or replace troop transport alarm switch connector (para 20-80).



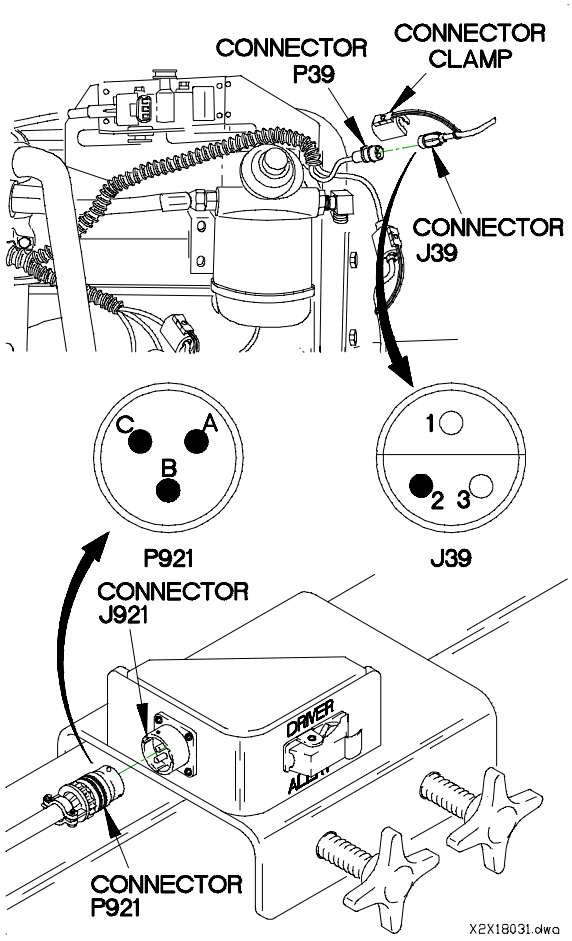
X2X18021

u18. TROOP TRANSPORT ALARM DOES NOT OPERATE (CONT)

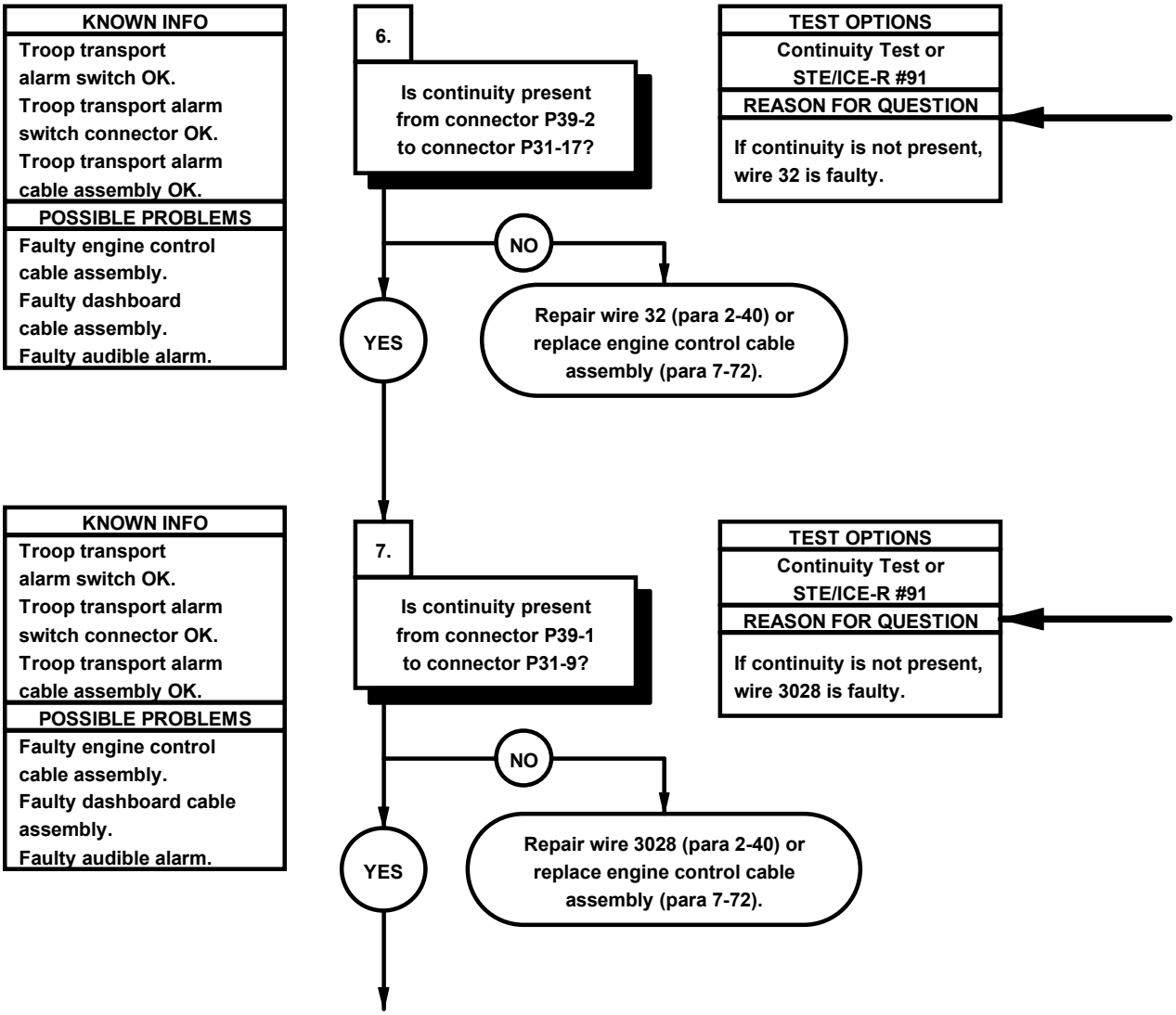


CONTINUITY TEST
(1) Set multimeter to ohms. (2) Disconnect connector clamp from connector J39. (3) Disconnect connector J39 from connector P39. (4) Connect positive (+) probe of multimeter to connector P921-A. (5) Connect negative (-) probe of multimeter to connector J39-2 and note reading on multimeter. (6) If continuity is not present, repair wire 32 (para 2-40) or replace troop transport alarm cable assembly (para 20-79).

CONTINUITY TEST
(1) Set multimeter to ohms. (2) Connect positive (+) probe of multimeter to connector P921-C. (3) Connect negative (-) probe of multimeter to connector J39-1 and note reading on multimeter. (4) If continuity is not present, repair wire 3028 (para 2-40) or replace troop transport alarm cable assembly (para 20-79). (5) Connect connector P921 to connector J921.

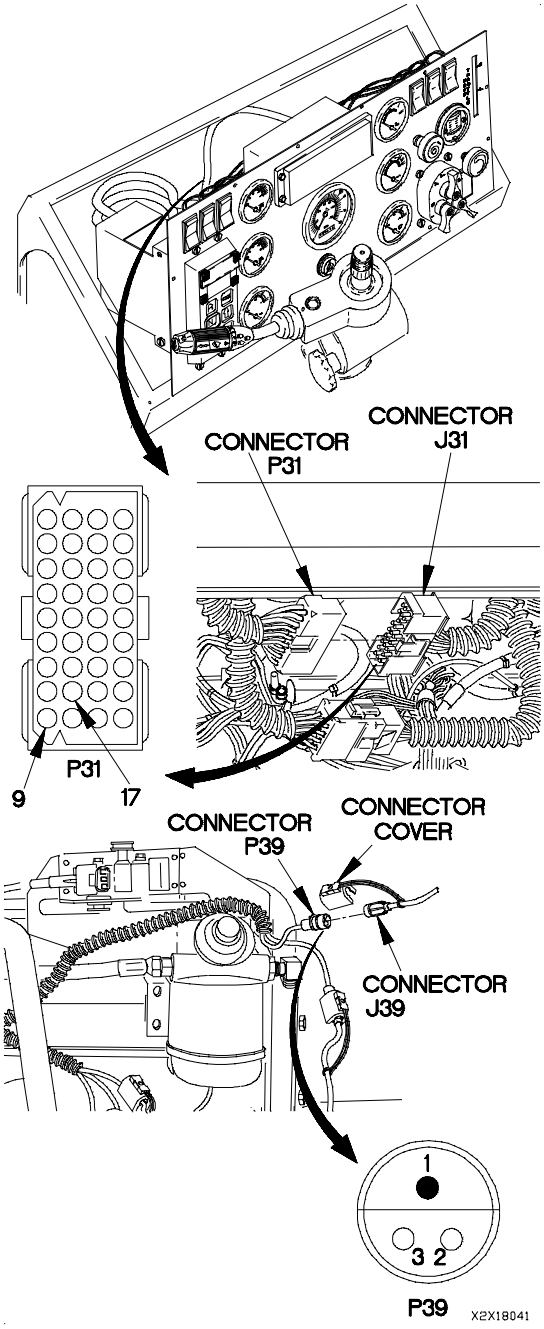


u18. TROOP TRANSPORT ALARM DOES NOT OPERATE (CONT)

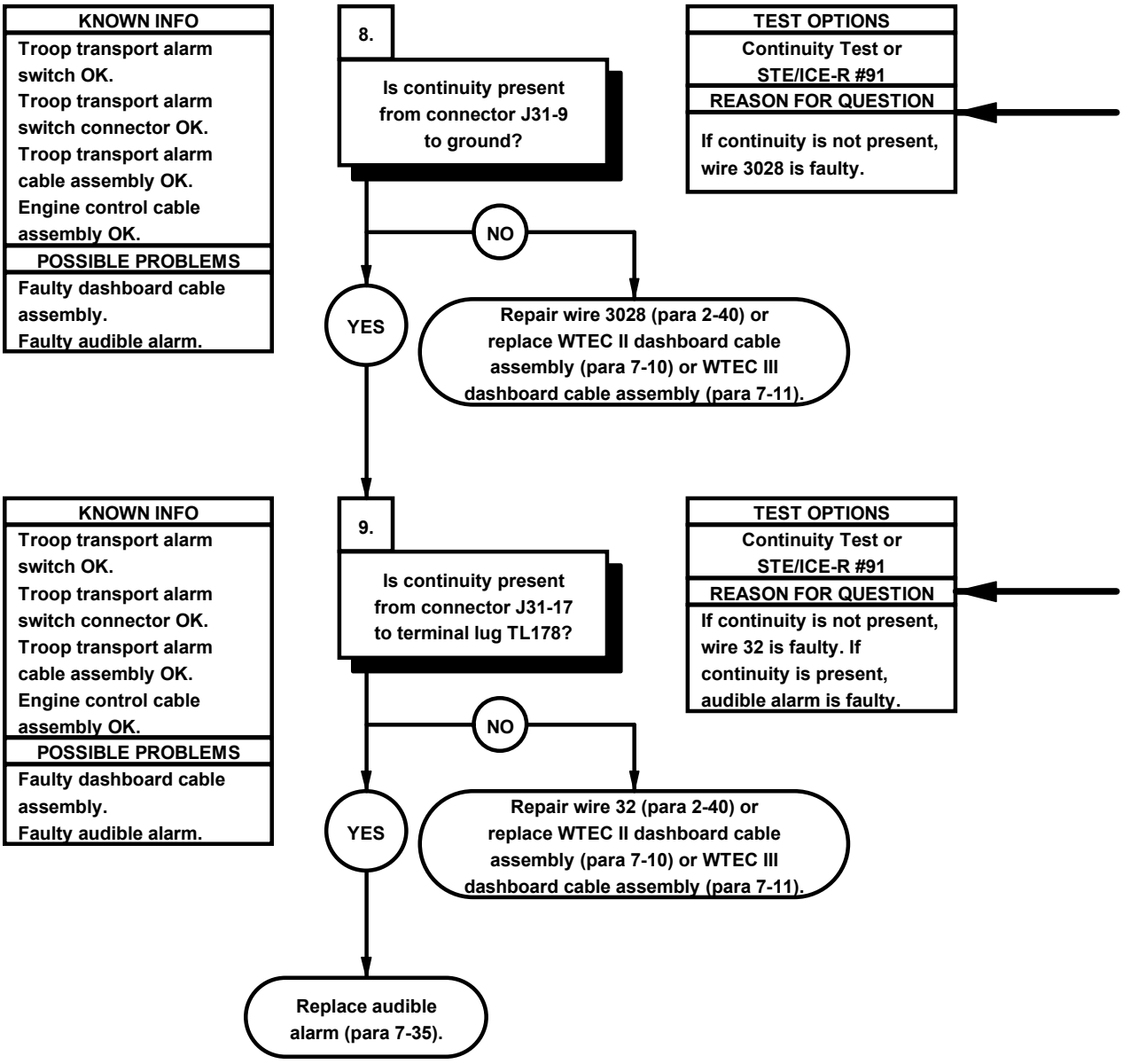


CONTINUITY TEST
(1) Lift instrument panel assembly outward to gain access (para 7-15).
(2) Disconnect connector P31 from connector J31.
(3) Set multimeter to ohms.
(4) Connect positive (+) probe of multimeter to connector P39-2.
(5) Connect negative (-) probe of multimeter to connector P31-17 and note reading on multimeter.
(6) If continuity is not present, repair wire 32 (para 2-40) or replace engine control cable assembly (para 7-72).

CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector P39-1.
(3) Connect negative (-) probe of multimeter to connector P31-9 and note reading on multimeter.
(4) If continuity is not present, repair wire 3028 (para 2-40) or replace engine control cable assembly (para 7-72).
(5) Connect connector P39 to connector J39.
(6) Connect connector clamp to connector J39.

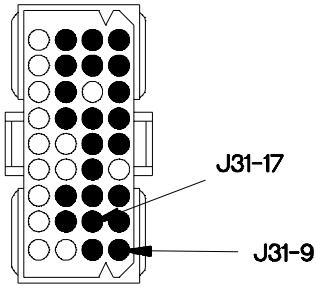


u18. TROOP TRANSPORT ALARM DOES NOT OPERATE (CONT)



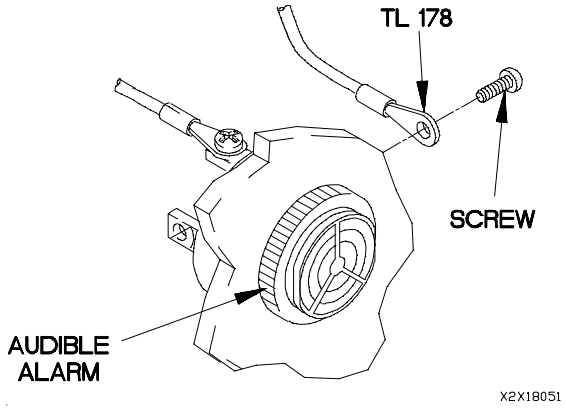
CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to connector J31-9.
(3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(4) If continuity is not present, repair wire 3028 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).



CONTINUITY TEST

(1) Remove screw and terminal lug TL178 from audible alarm.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to connector J31-17.
(4) Connect negative (-) probe of multimeter to terminal lug TL178 and note reading on multimeter.
(5) If continuity is not present, repair wire 32 (para 2-40) 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 audible alarm (para 7-35).
(7) Install terminal lug TL178 on audible alarm with screw.
(8) Connect connector P31 to connector J31.
(9) Install instrument panel assembly (para 7-15).



u19. LIGHT MATERIAL HANDLING CRANE (LMHC) DOES NOT OPERATE

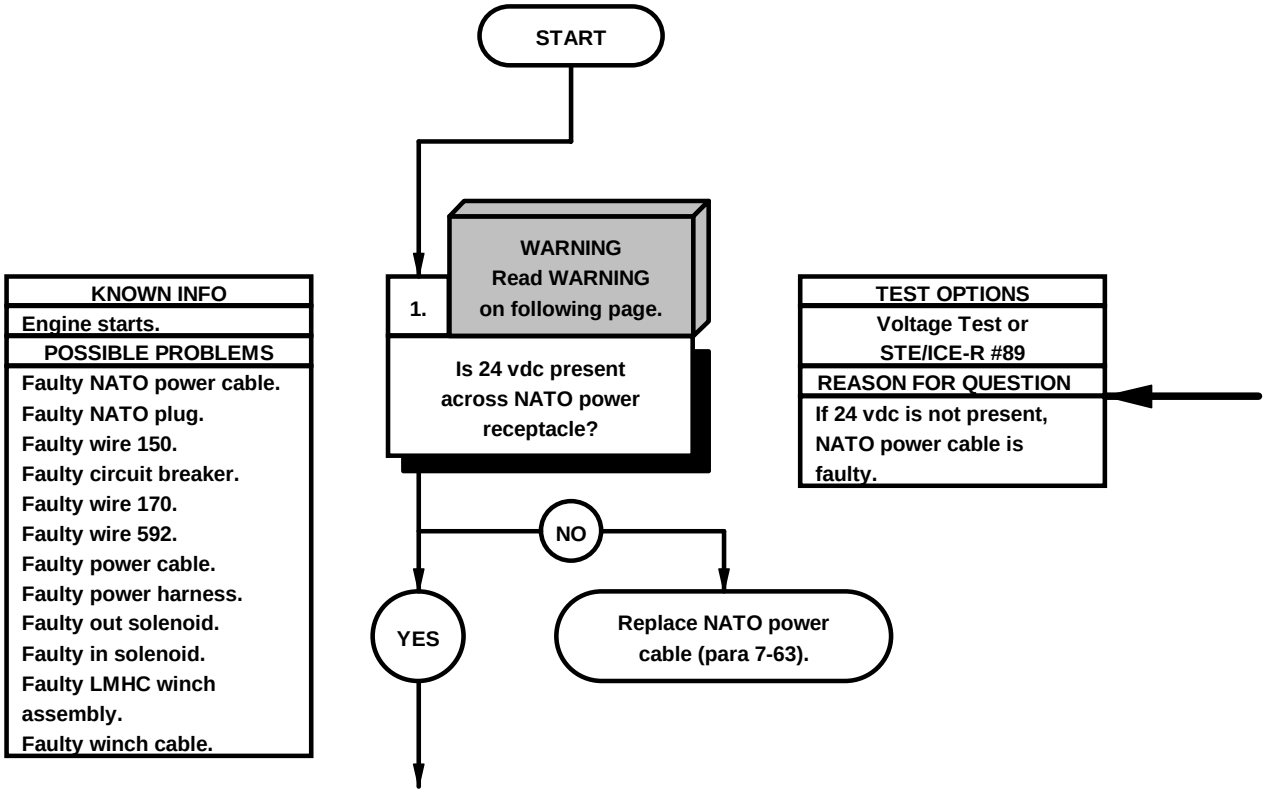
INITIAL SETUP

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

Personnel Required
(2)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

References
TM 9-4910-571-12&P

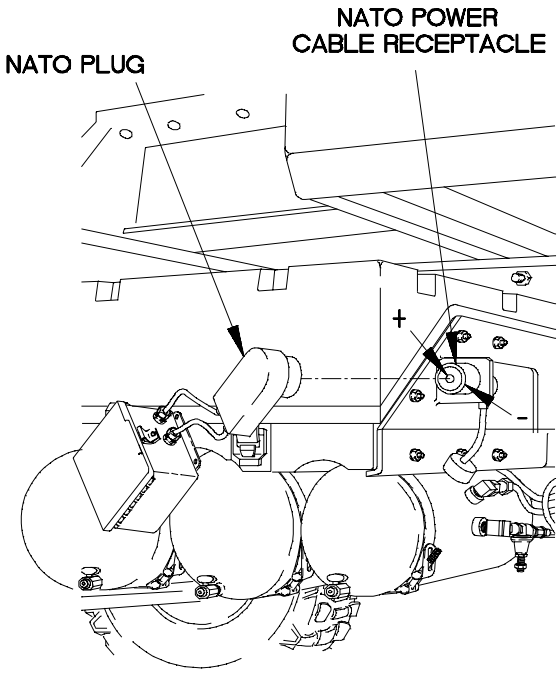


WARNING

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. Batteries can explode from a spark. Battery acid is harmful to skin and eyes. Always wear eye protection when working with batteries.

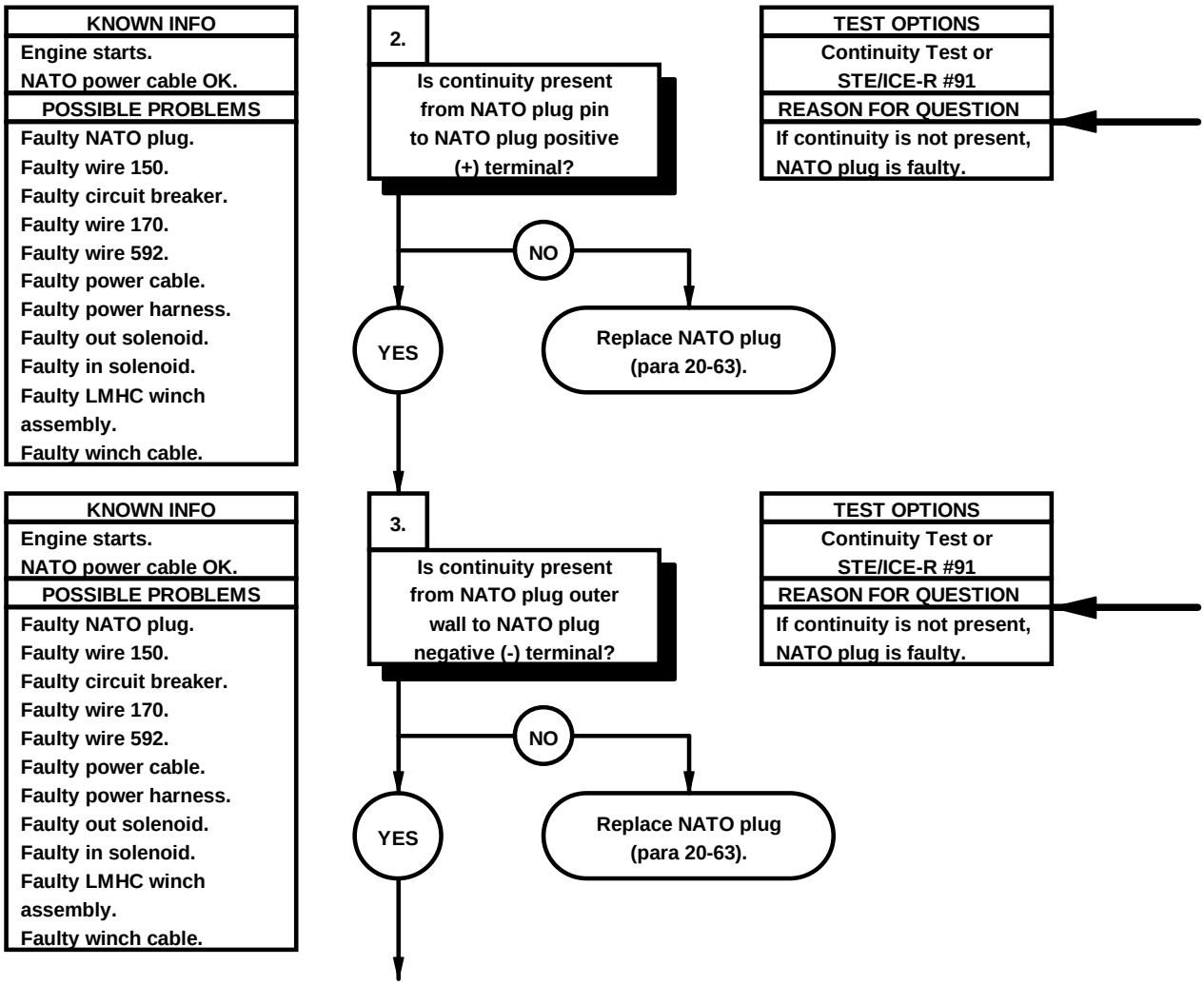
VOLTAGE TEST

(1) Disconnect NATO plug from NATO power cable receptacle.
(2) Set multimeter to volts dc.
(3) Connect positive (+) probe of multimeter to inside of NATO power cable receptacle.
(4) Connect negative (-) probe of multimeter to outside of NATO power cable receptacle and note reading on multimeter.
(5) If 24 vdc is not present, replace NATO power cable (para 7-63).



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u19. LIGHT MATERIAL HANDLING CRANE (LMHC) DOES NOT OPERATE (CONT)

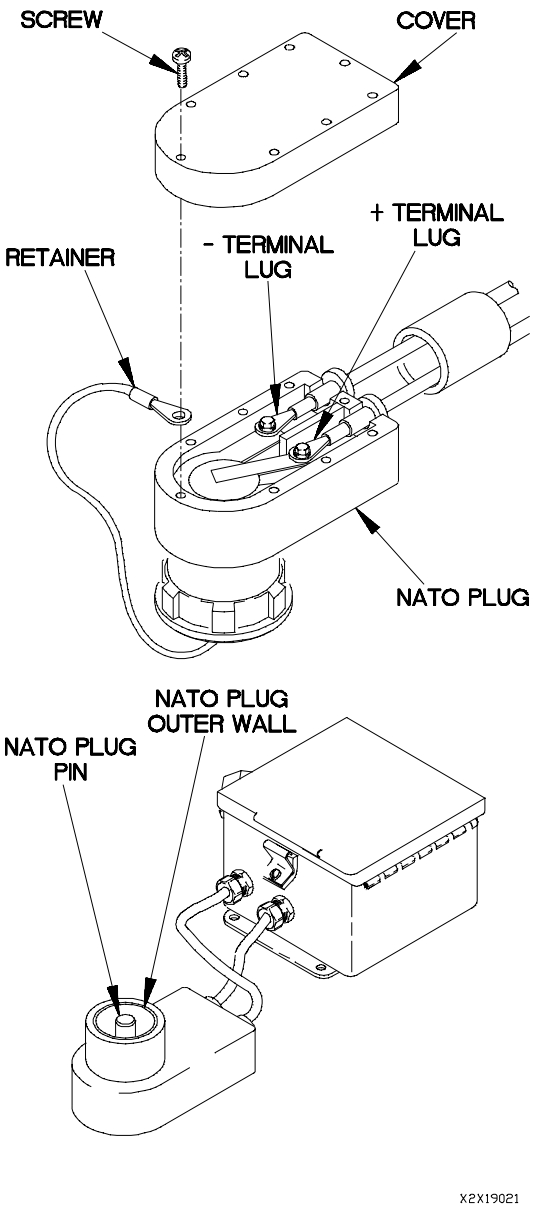


CONTINUITY TEST

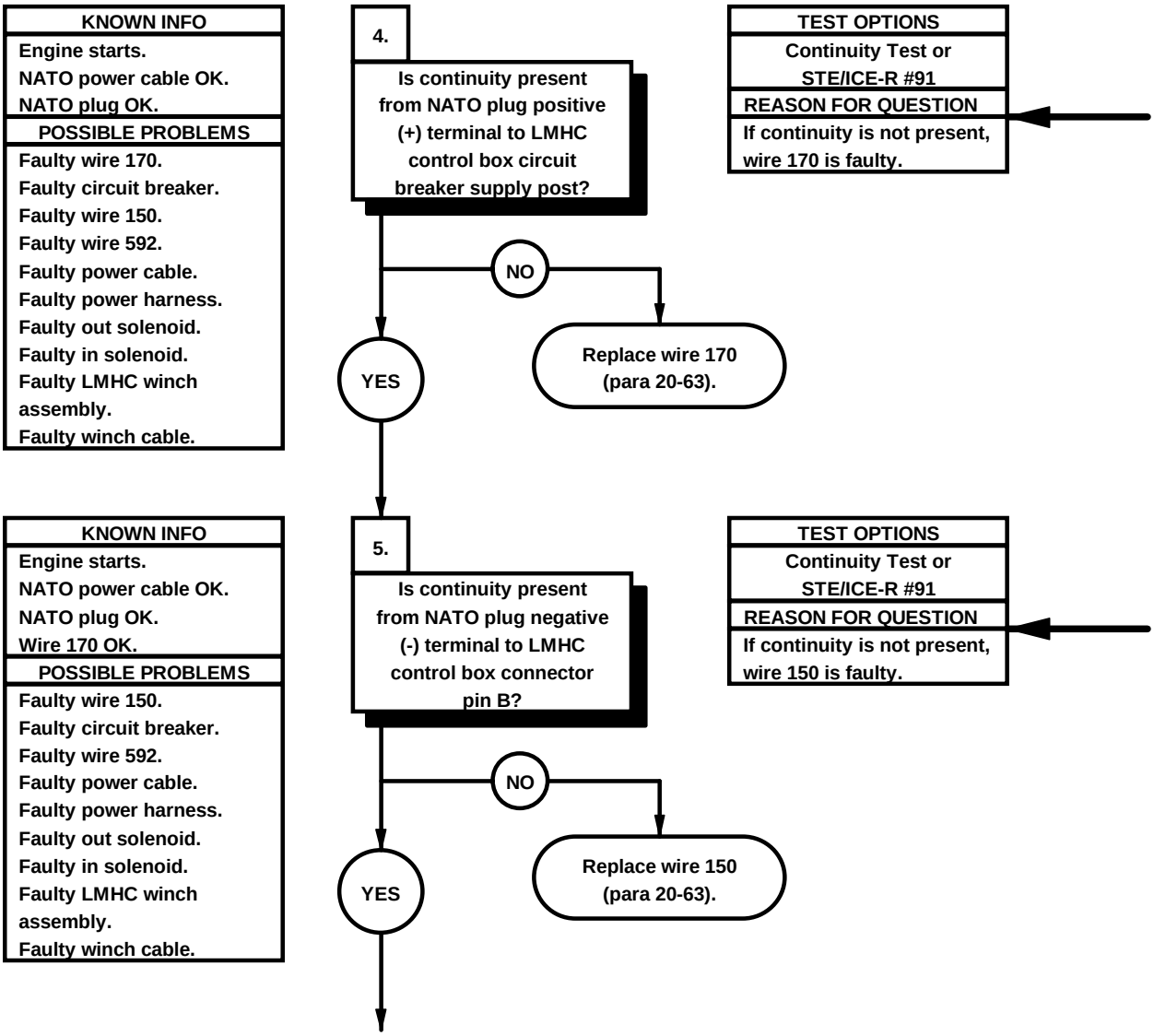
(1) Remove eight screws, cover, and retainer from NATO plug.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to NATO plug pin.
(4) Connect negative (-) probe of multimeter to NATO plug positive (+) terminal lug and note reading on multimeter.
(5) If continuity is not present, replace NATO plug (para 20-63).

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to NATO plug outer wall.
(3) Connect negative (-) probe of multimeter to NATO plug negative (-) terminal lug and note reading on multimeter.
(4) If continuity is not present, replace NATO plug (para 20-63).



u19. LIGHT MATERIAL HANDLING CRANE (LMHC) DOES NOT OPERATE (CONT)

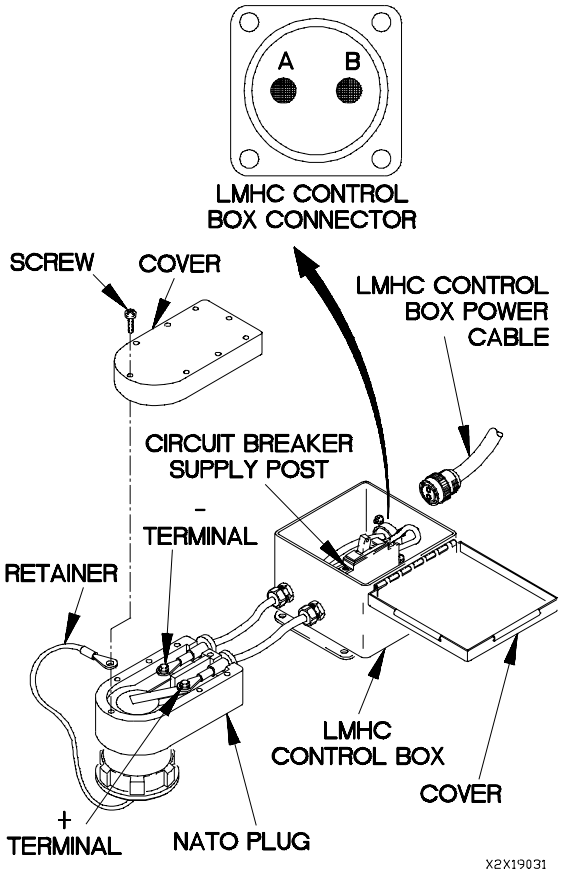


CONTINUITY TEST

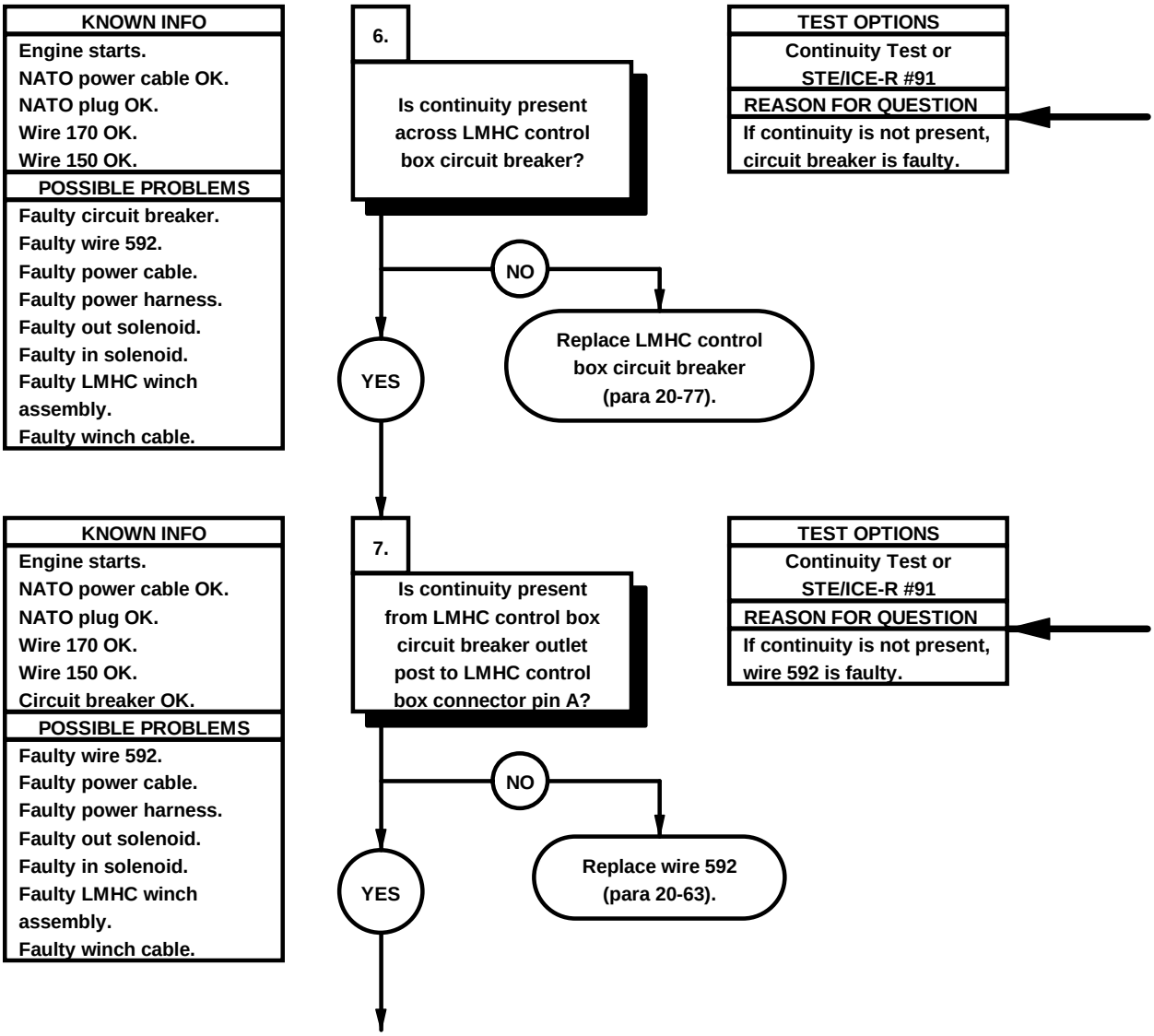
(1) Open cover on LMHC control box.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to NATO plug positive (+) terminal.
(4) Connect negative (-) probe of multimeter to LMHC control box circuit breaker supply post and note reading on multimeter.
(5) If continuity is not present, replace wire 170 (para 20-63).

CONTINUITY TEST

(1) Disconnect LMHC control box power cable from LMHC control box connector.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to NATO plug negative (-) terminal.
(4) Connect negative (-) probe of multimeter to LMHC control box connector pin B and note reading on multimeter.
(5) If continuity is not present, replace wire 150 (para 20-63).
(6) Install cover and retainer on NATO plug with eight screws.



u19. LIGHT MATERIAL HANDLING CRANE (LMHC) DOES NOT OPERATE (CONT)

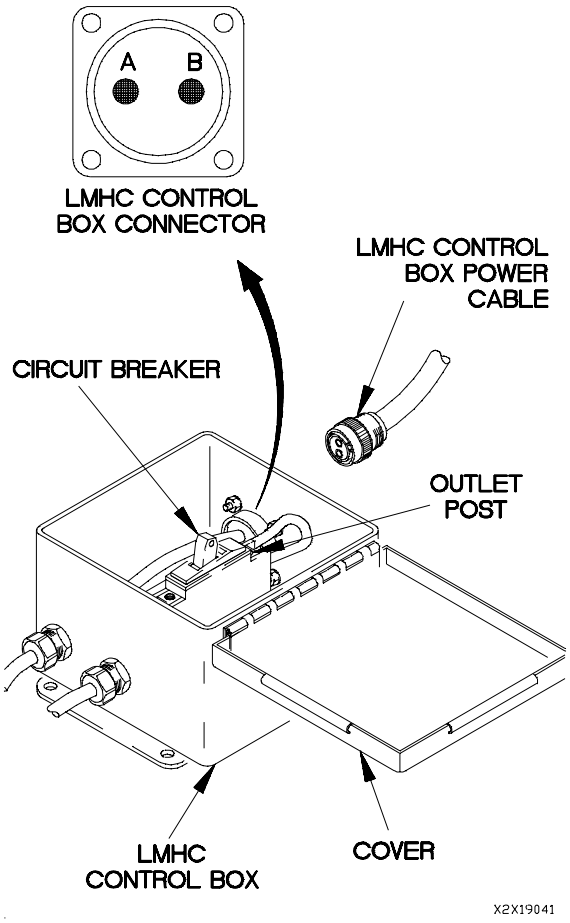


CONTINUITY TEST

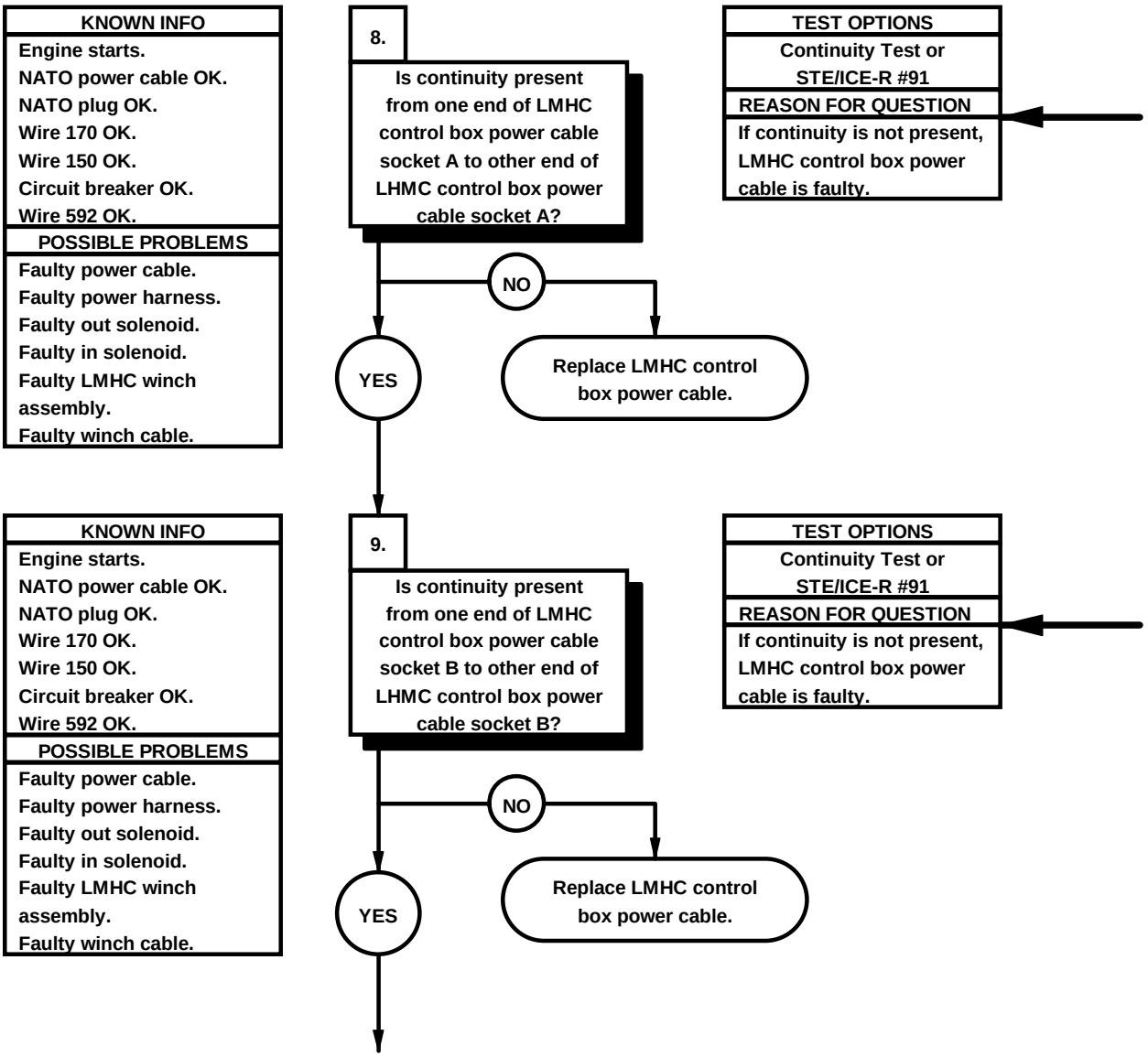
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to one end of LMHC control box circuit breaker.
(3) Connect negative (-) probe of multimeter to other end of LMHC control box circuit breaker.
(4) Position LMHC control box circuit breaker to ON and note reading on multimeter.
(5) If continuity is not present, replace LMHC control box circuit breaker (para 20-77).
(6) Position LMHC control box circuit breaker to OFF.

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to LMHC control box circuit breaker outlet post.
(3) Connect negative (-) probe of multimeter to LMHC control box connector pin A and note reading on multimeter.
(4) If continuity is not present, replace wire 592 (para 20-63).
(5) Close cover on LMHC control box.
(6) Connect LMHC control box power cable to LMHC control box connector.



u19. LIGHT MATERIAL HANDLING CRANE (LMHC) DOES NOT OPERATE (CONT)

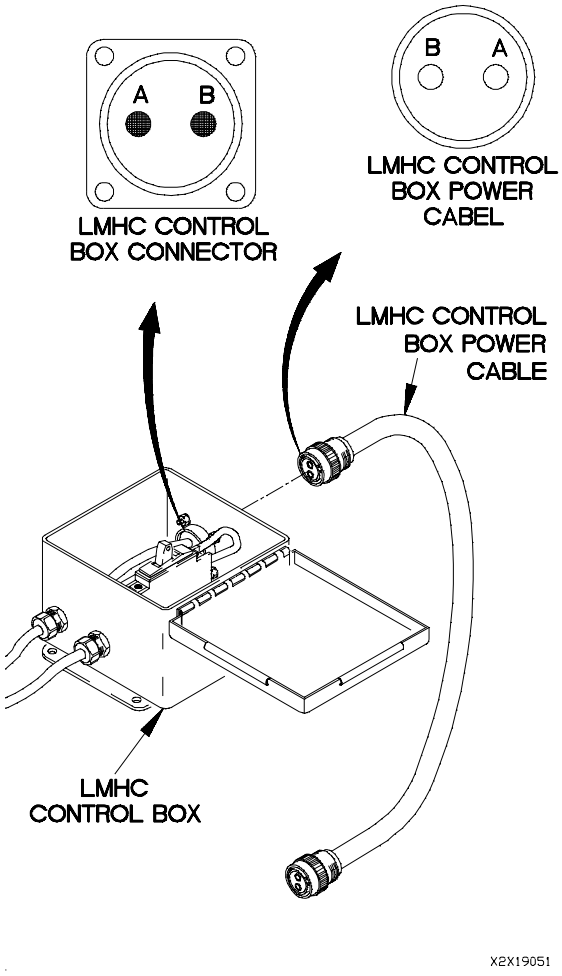


CONTINUITY TEST

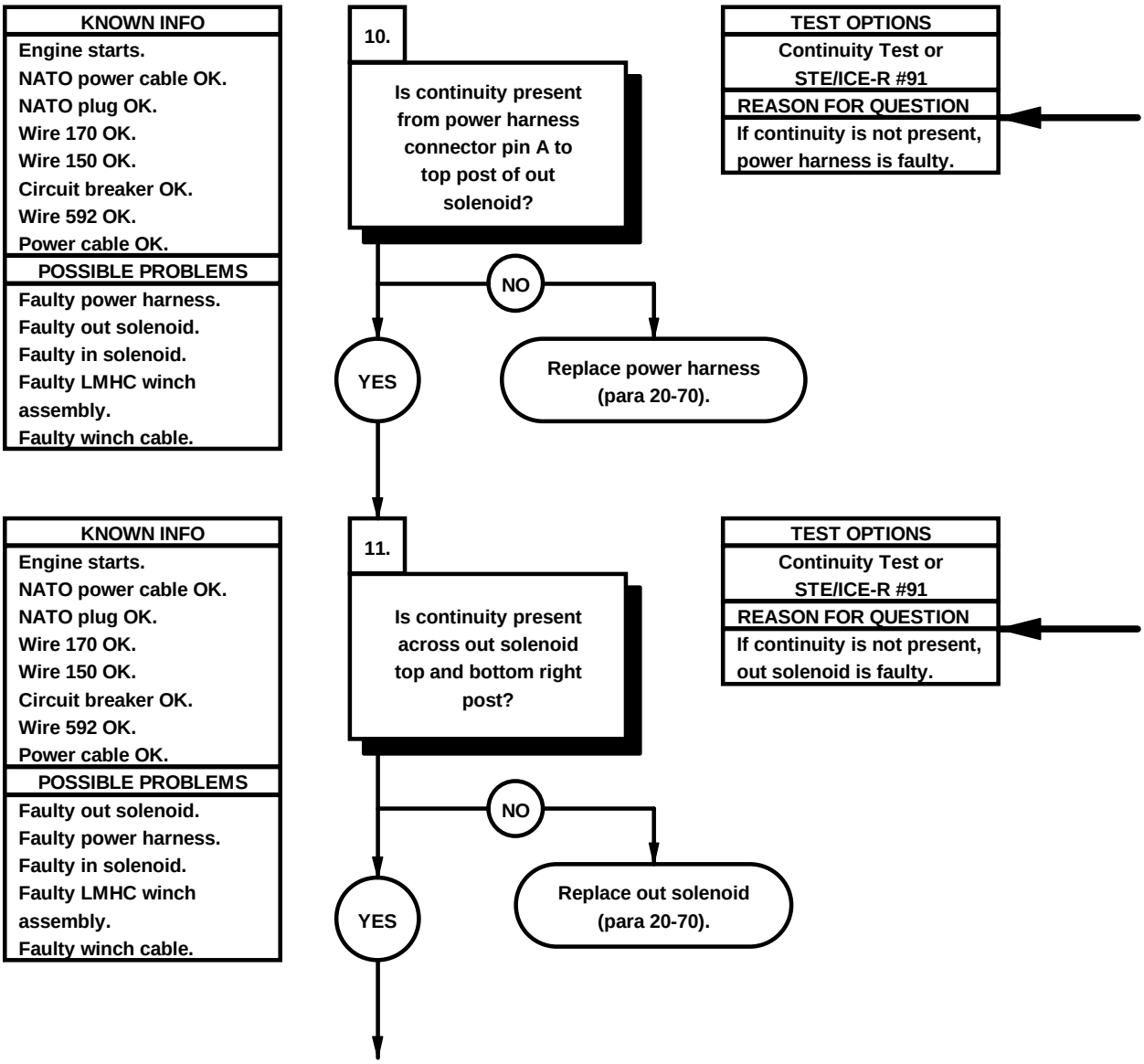
(1) Disconnect LMHC control power cable from LMHC winch assembly power connector.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to one end of LMHC control box power cable socket A.
(4) Connect negative (-) probe of multimeter to other end of LMHC control box power cable socket A and note reading on multimeter.
(5) If continuity is not present, replace LMHC control box power cable.

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to LMHC control box power cable socket B.
(4) Connect negative (-) probe of multimeter to LMHC control box power cable socket B and note reading on multimeter.
(5) If continuity is not present, replace LMHC control box power cable.



u19. LIGHT MATERIAL HANDLING CRANE (LMHC) DOES NOT OPERATE (CONT)

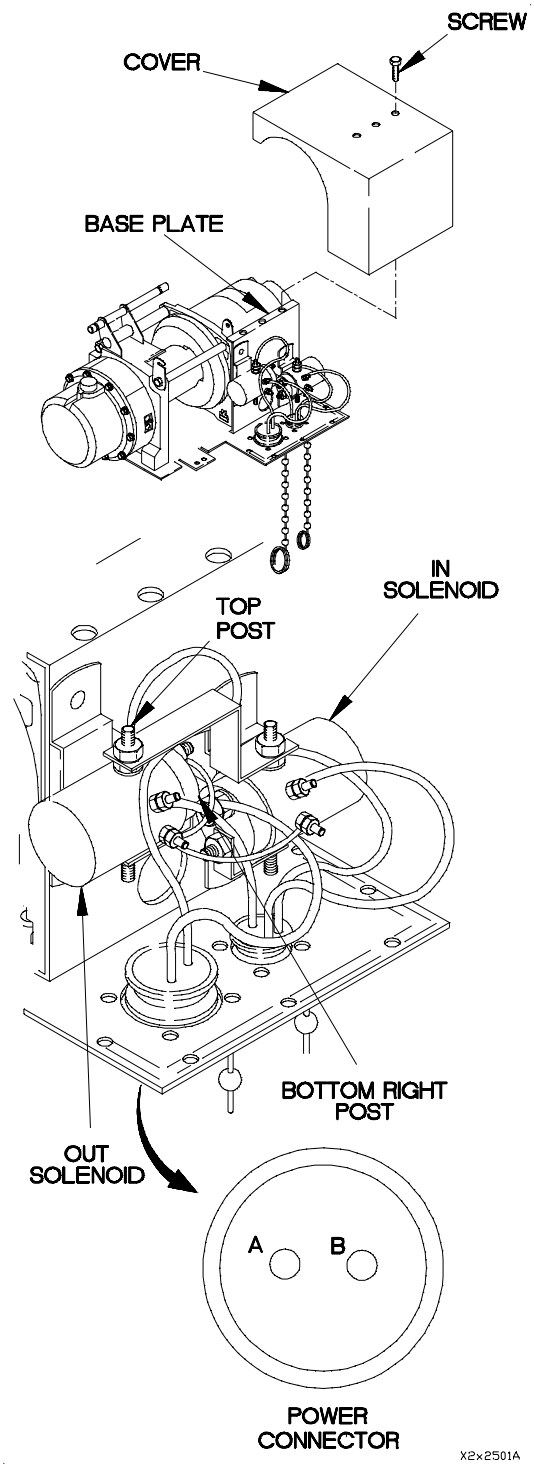


CONTINUITY TEST

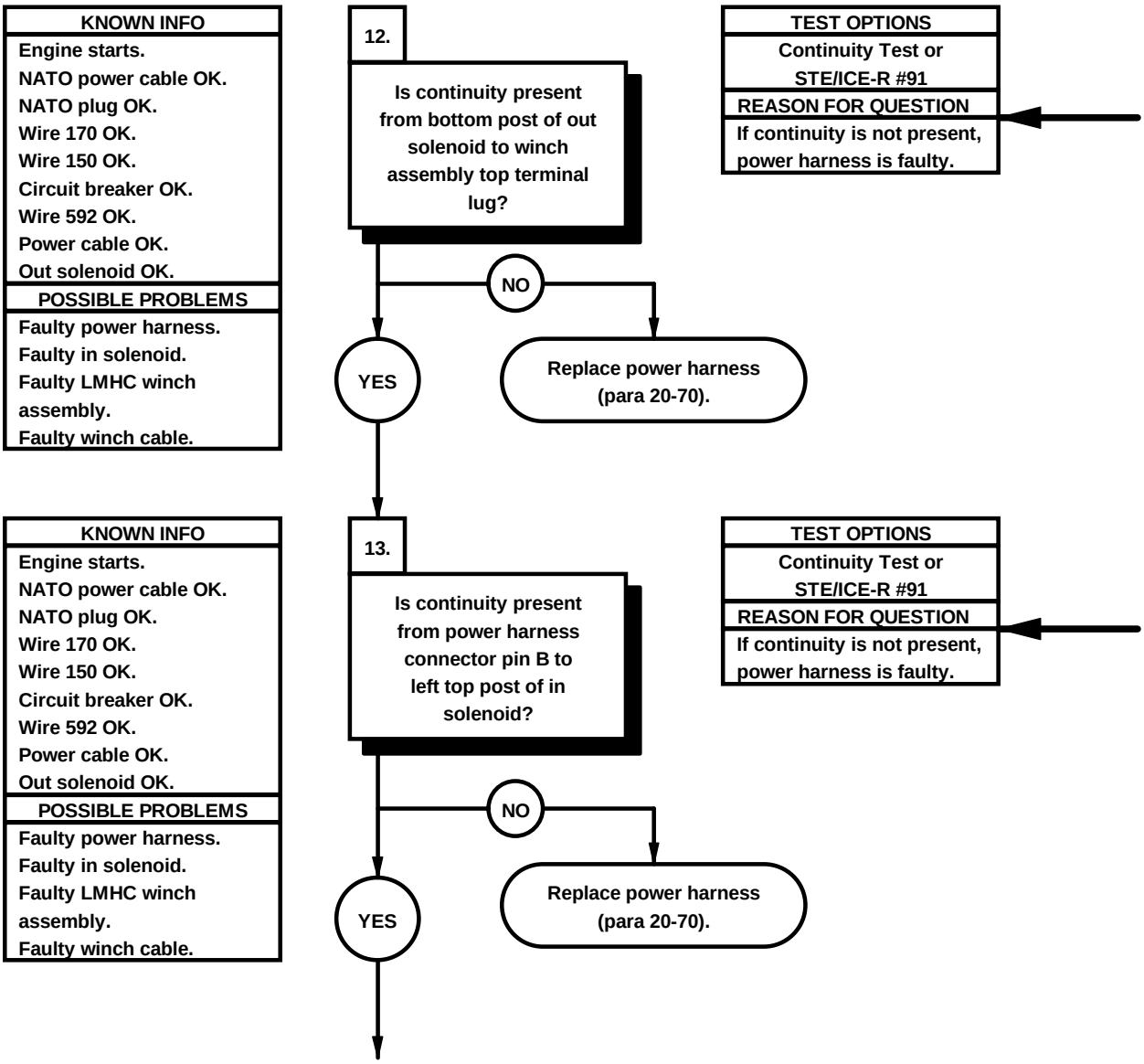
(1) Remove 18 screws and cover from base plate.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to power harness connector pin A.
(4) Connect negative (-) probe of multimeter to top post of out solenoid and note reading on multimeter.
(5) If continuity is not present, replace power harness (para 20-70).

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to top right post of out solenoid.
(3) Connect negative (-) probe of multimeter to bottom right post of out solenoid and note reading on multimeter.
(4) If continuity is not present, replace out solenoid (para 20-70).



u19. LIGHT MATERIAL HANDLING CRANE (LMHC) DOES NOT OPERATE (CONT)

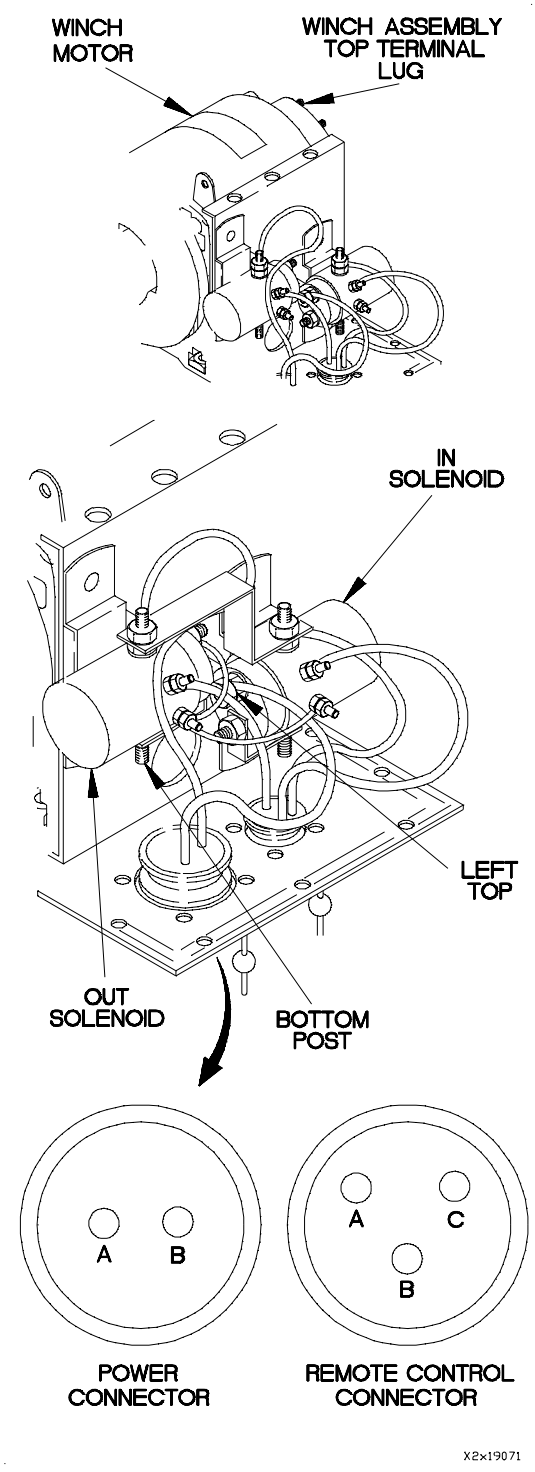


CONTINUITY TEST

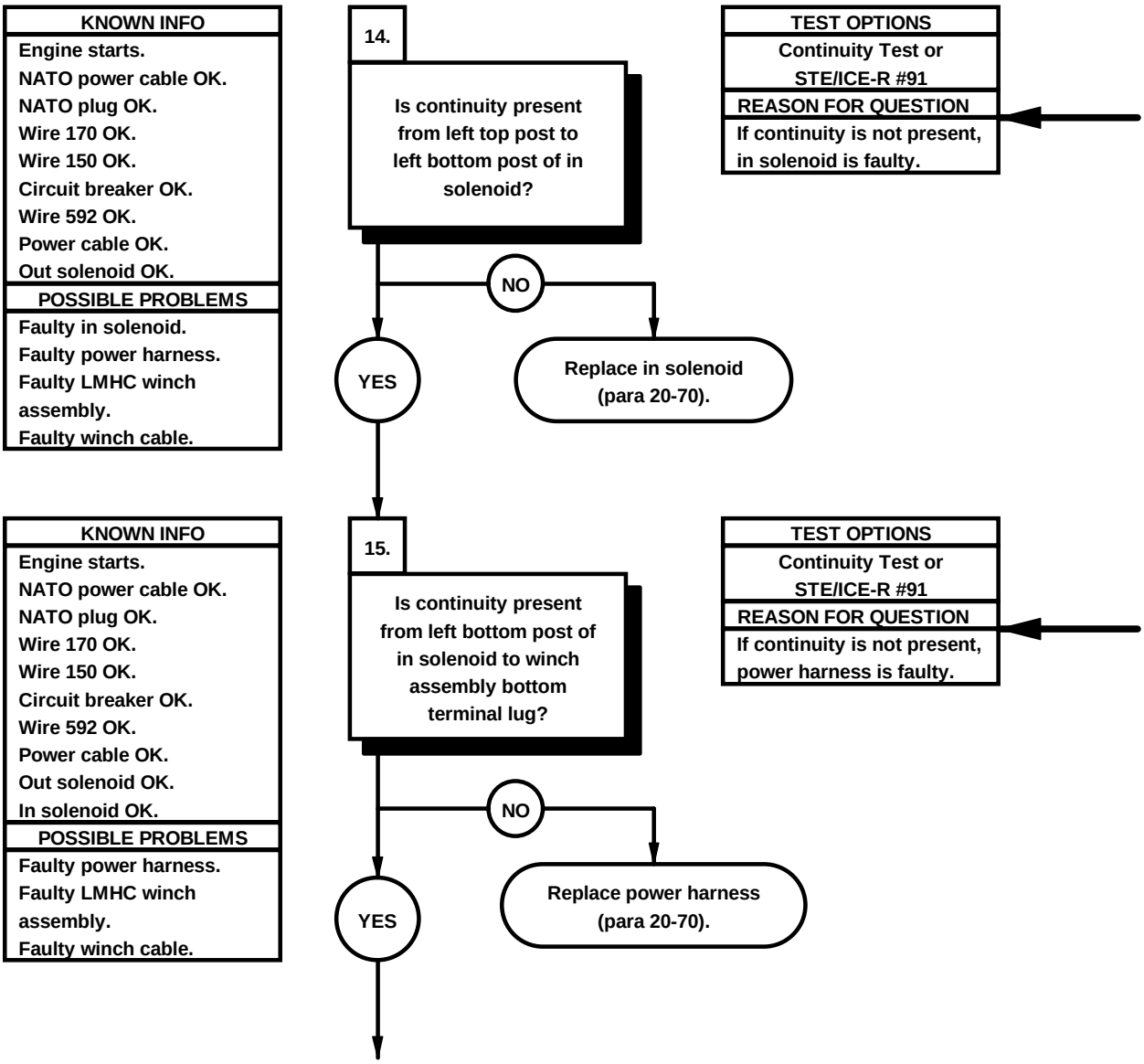
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to bottom post of out solenoid.
(3) Connect negative (-) probe of multimeter to winch assembly top terminal lug and note reading on multimeter.
(4) If continuity is not present, replace power harness (para 20-70).

CONTINUITY TEST

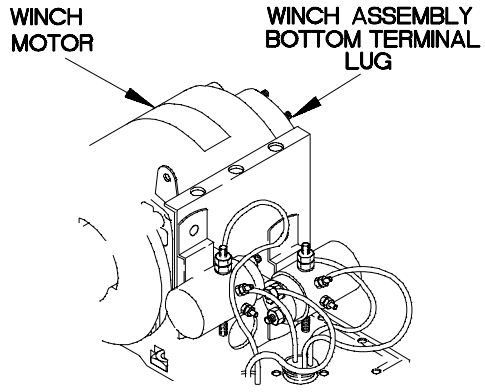
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to power harness connector pin B.
(3) Connect negative (-) probe of multimeter to left top post of in solenoid and note reading on multimeter.
(4) If continuity is not present, replace power harness (para 20-70).



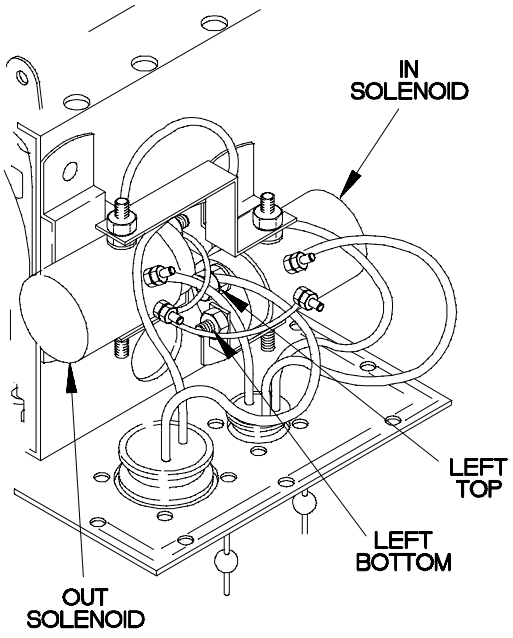
u19. LIGHT MATERIAL HANDLING CRANE (LMHC) DOES NOT OPERATE (CONT)



CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to left top post of in solenoid.
(3) Connect negative (-) probe of multimeter to left bottom post of in solenoid and note reading on multimeter.
(4) If continuity is not present, replace in solenoid (para 20-70).

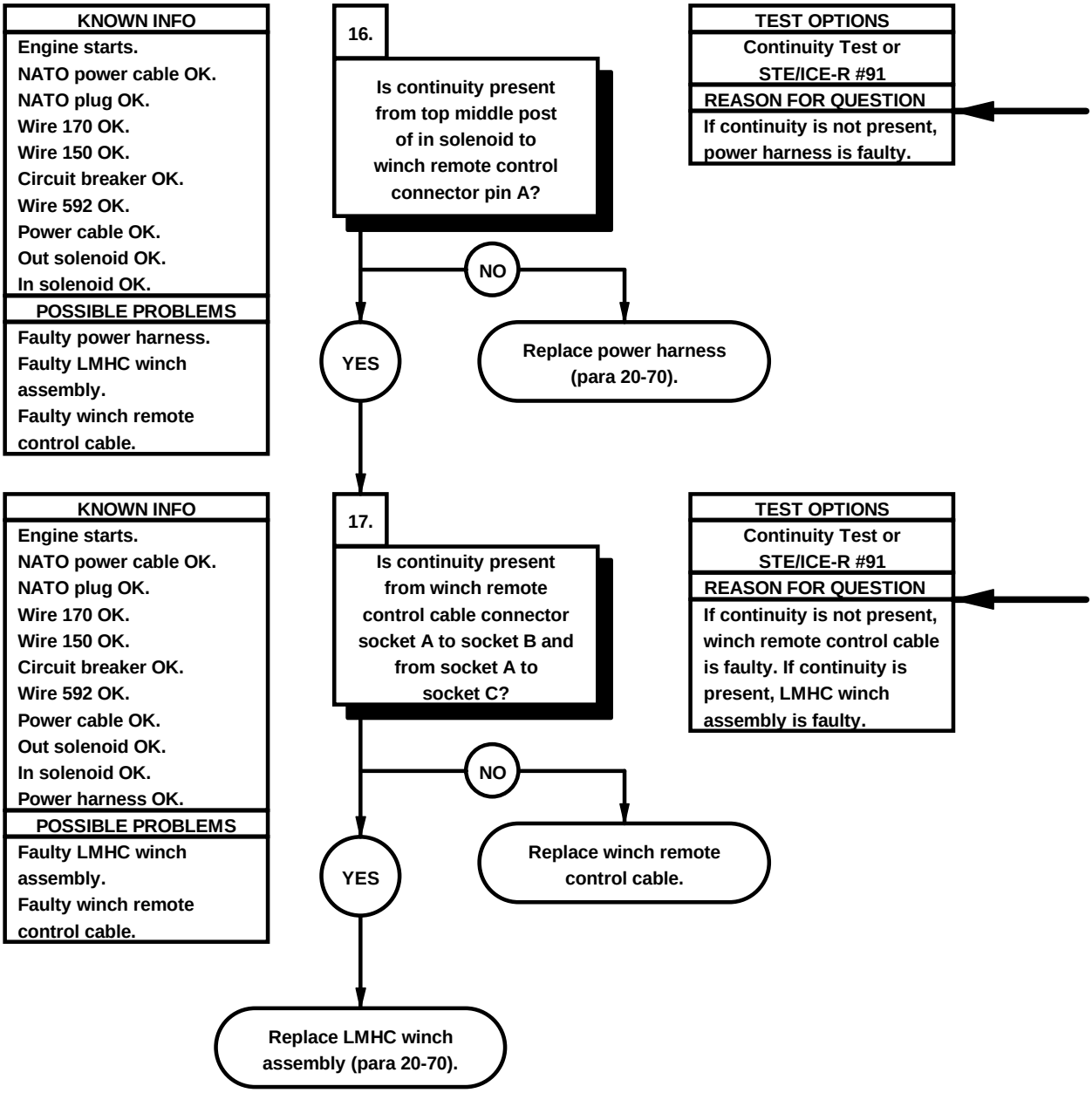


CONTINUITY TEST
(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to left bottom post of in solenoid.
(3) Connect negative (-) probe of multimeter to winch assembly bottom terminal lug and note reading on multimeter.
(4) If continuity is not present, replace power harness (para 20-70).



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u19. LIGHT MATERIAL HANDLING CRANE (LMHC) DOES NOT OPERATE (CONT)

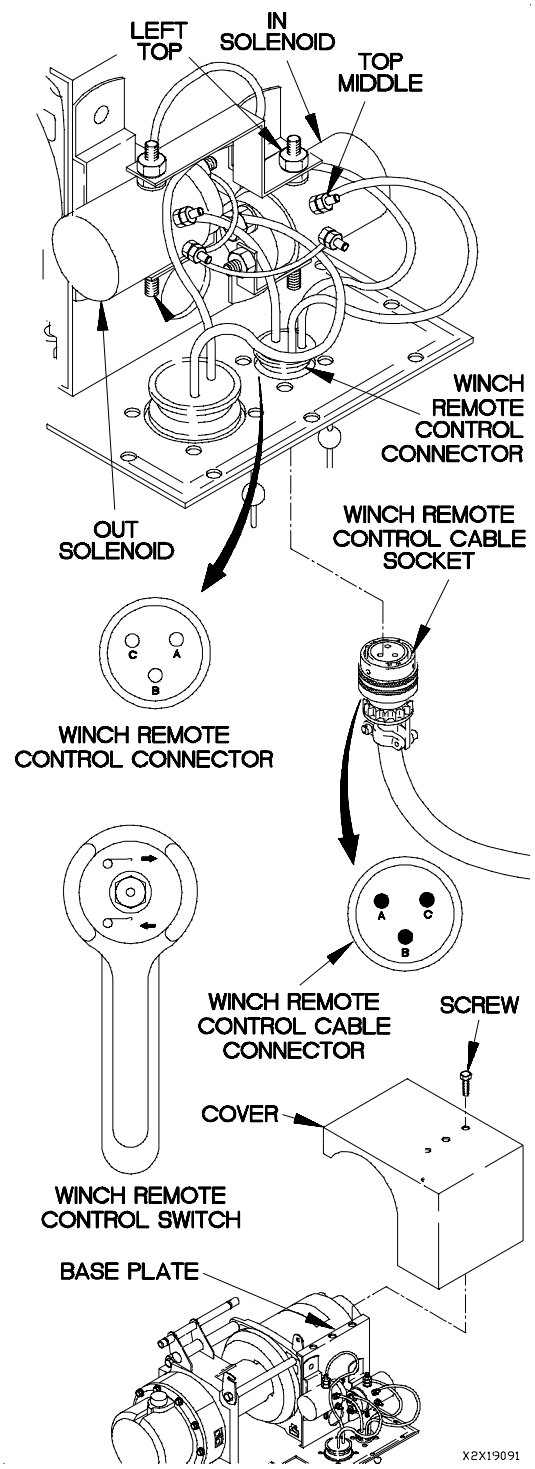


CONTINUITY TEST

(1) Disconnect winch remote control cable from winch remote control connector.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to top middle post of in solenoid.
(4) Connect negative (-) probe of multimeter to winch remote control connector pin A and note reading on multimeter.
(5) If continuity is not present, replace power harness (para 20-70).

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to winch remote control cable connector socket A.
(3) Connect negative (-) probe of multimeter to winch remote control cable connector socket B.
(4) Position winch remote control switch to OUT and note reading on multimeter.
(5) Connect positive (+) probe of multimeter to winch remote control cable connector socket A.
(6) Connect negative (-) probe of multimeter to winch remote control cable connector socket C.
(7) Position winch remote control switch to in and note reading on multimeter.
(8) If continuity is not present, replace winch remote control cable.
(9) If continuity is present, replace LMHC winch assembly (para 20-70).
(10) Connect LMHC control power cable to LMHC winch assembly power connector.
(11) Connect winch remote control cable to winch remote control connector.
(12) Install cover on base plate with 18 screws.



u20. LIGHT MATERIAL HANDLING CRANE (LMHC) HOIST IN DOES NOT OPERATE

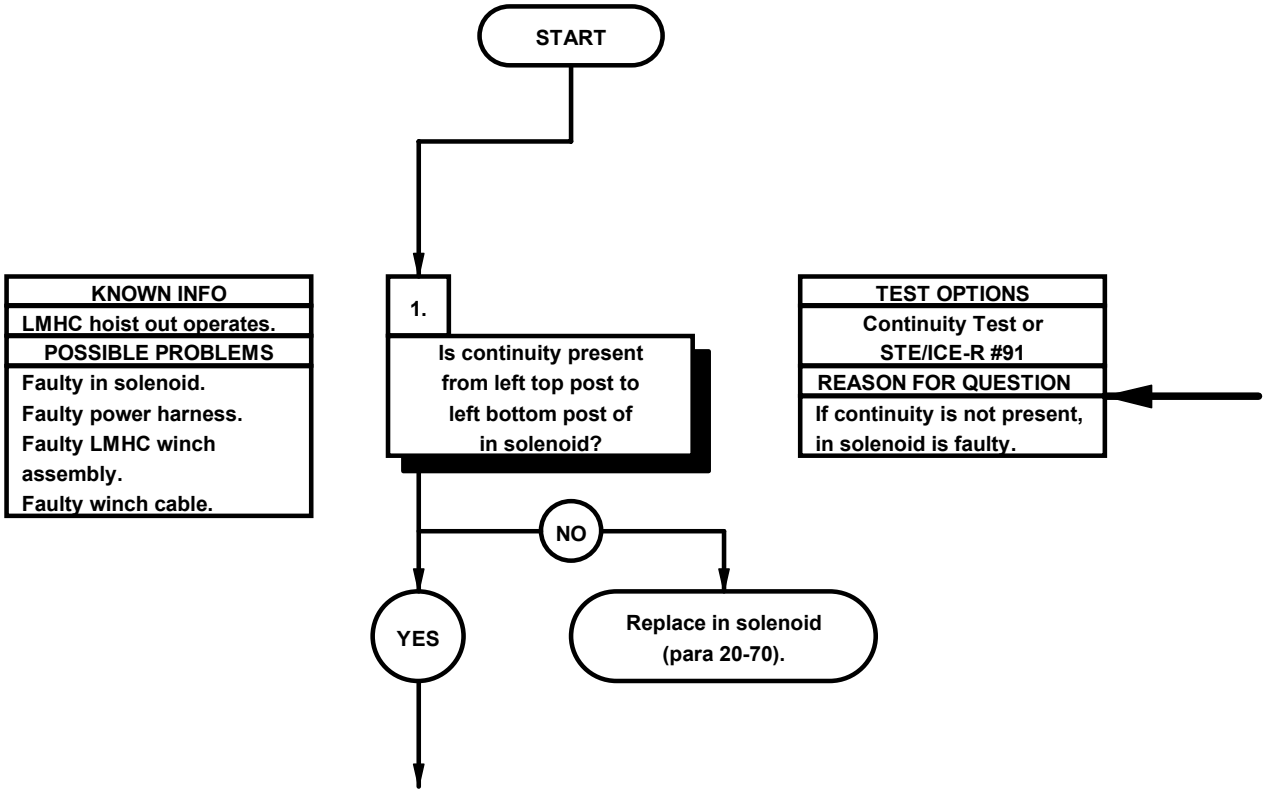
INITIAL SETUP

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

Personnel Required
(2)

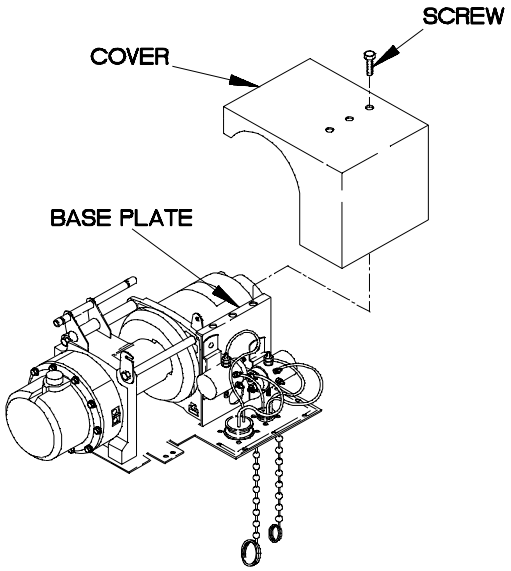
Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

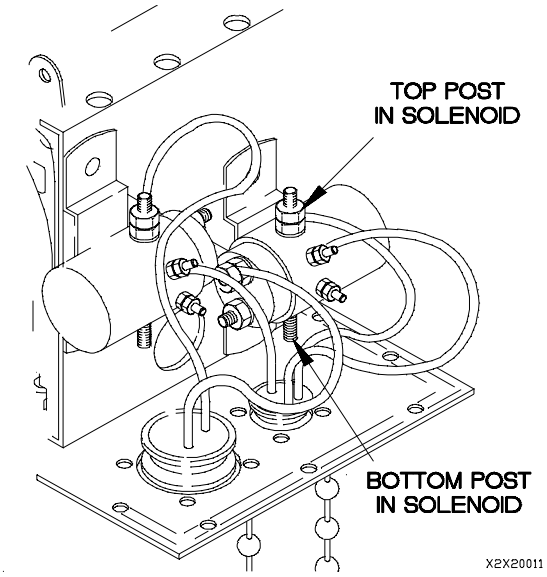
References
TM 9-4910-571-12&P



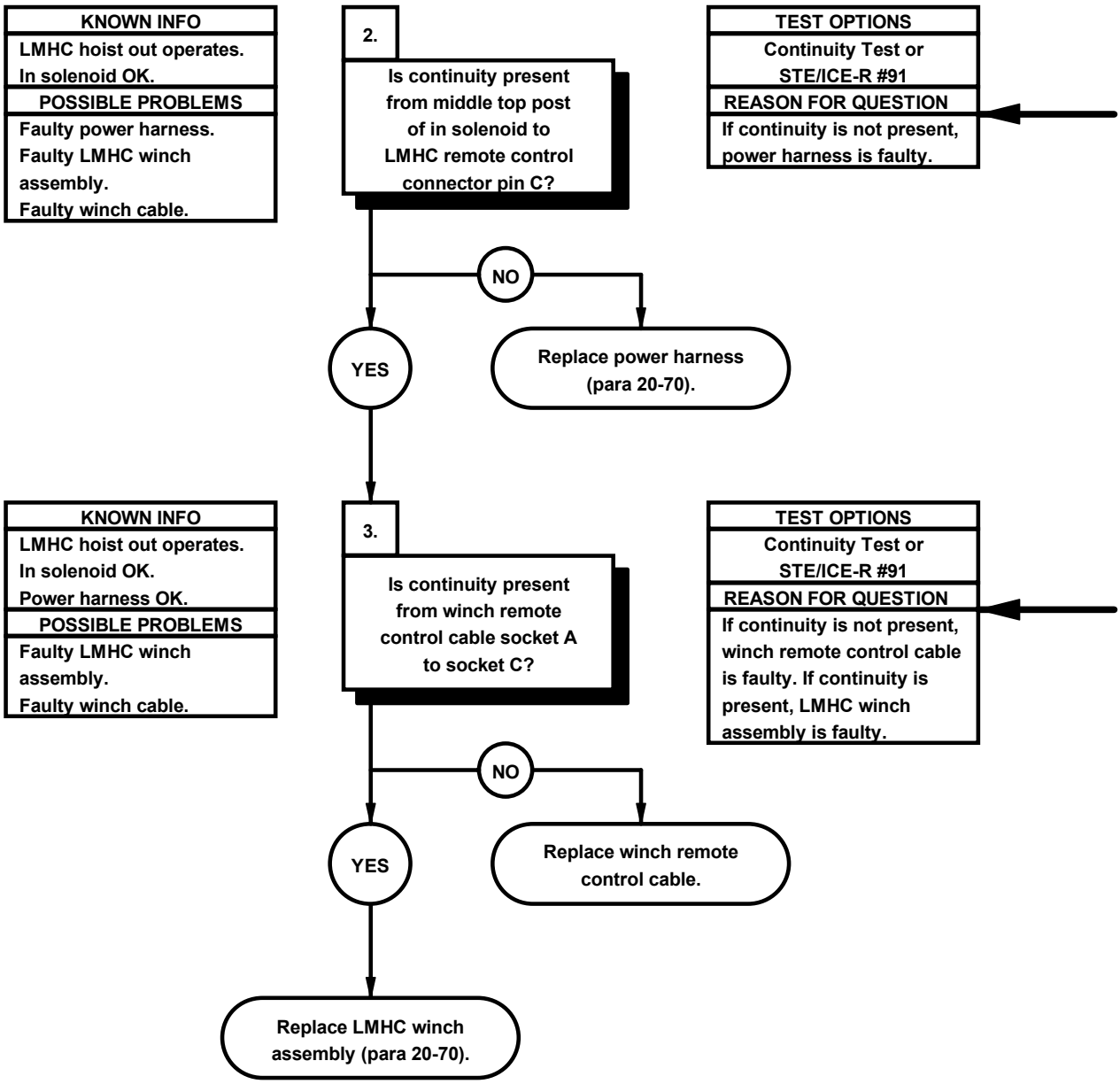
CONTINUITY TEST

(1) Remove 18 screws and cover from base plate.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to left top post of in solenoid.
(4) Connect negative (-) probe of multimeter to left bottom post of in solenoid and note reading on multimeter.
(5) If continuity is not present, replace in solenoid (para 20-70).





u20. LIGHT MATERIAL HANDLING CRANE (LMHC) HOIST IN DOES NOT OPERATE (CONT)

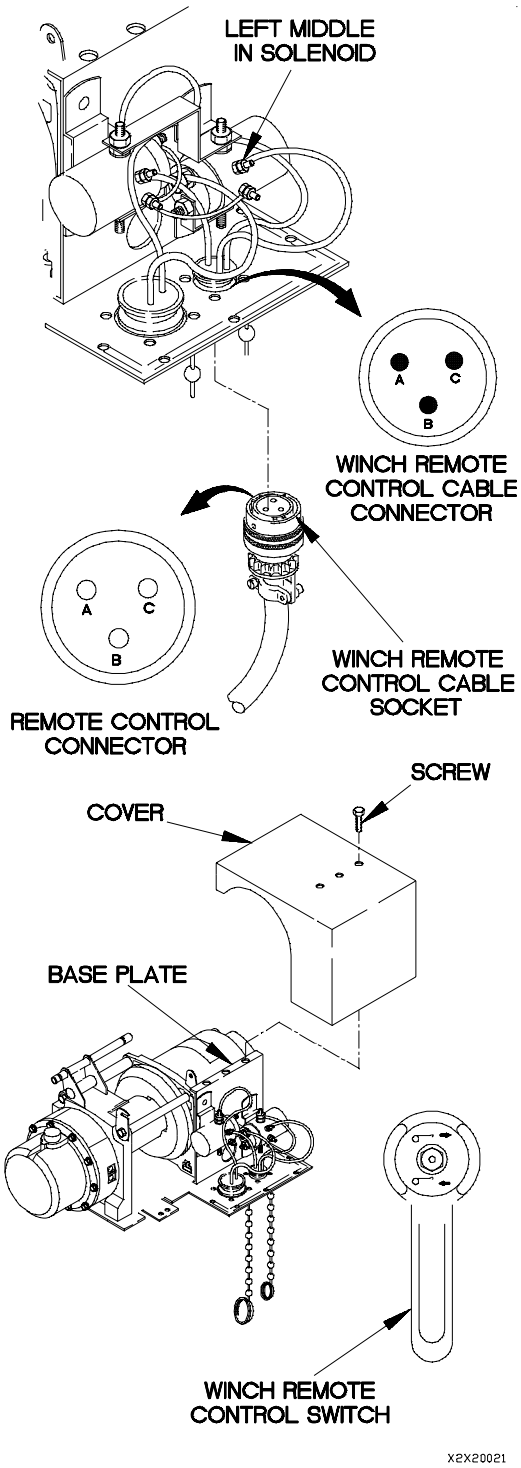


CONTINUITY TEST

(1) Disconnect winch remote control cable from winch remote control connector.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to left middle post of in solenoid.
(4) Connect negative (-) probe of multimeter to winch remote control connector pin C and note reading on multimeter.
(5) If continuity is not present, replace power harness (para 20-70).

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to winch remote control cable socket A.
(3) Connect negative (-) probe of multimeter to winch remote control cable socket C.
(4) Position winch remote control switch to in and note reading on multimeter.
(5) If continuity is not present, replace winch remote control cable.
(6) If continuity is present, replace LMHC winch assembly (para 20-70).
(7) Connect winch remote control cable to winch remote control connector.
(8) Install cover on base plate with 18 screws.



u21. LIGHT MATERIAL HANDLING CRANE (LMHC) HOIST OUT DOES NOT OPERATE

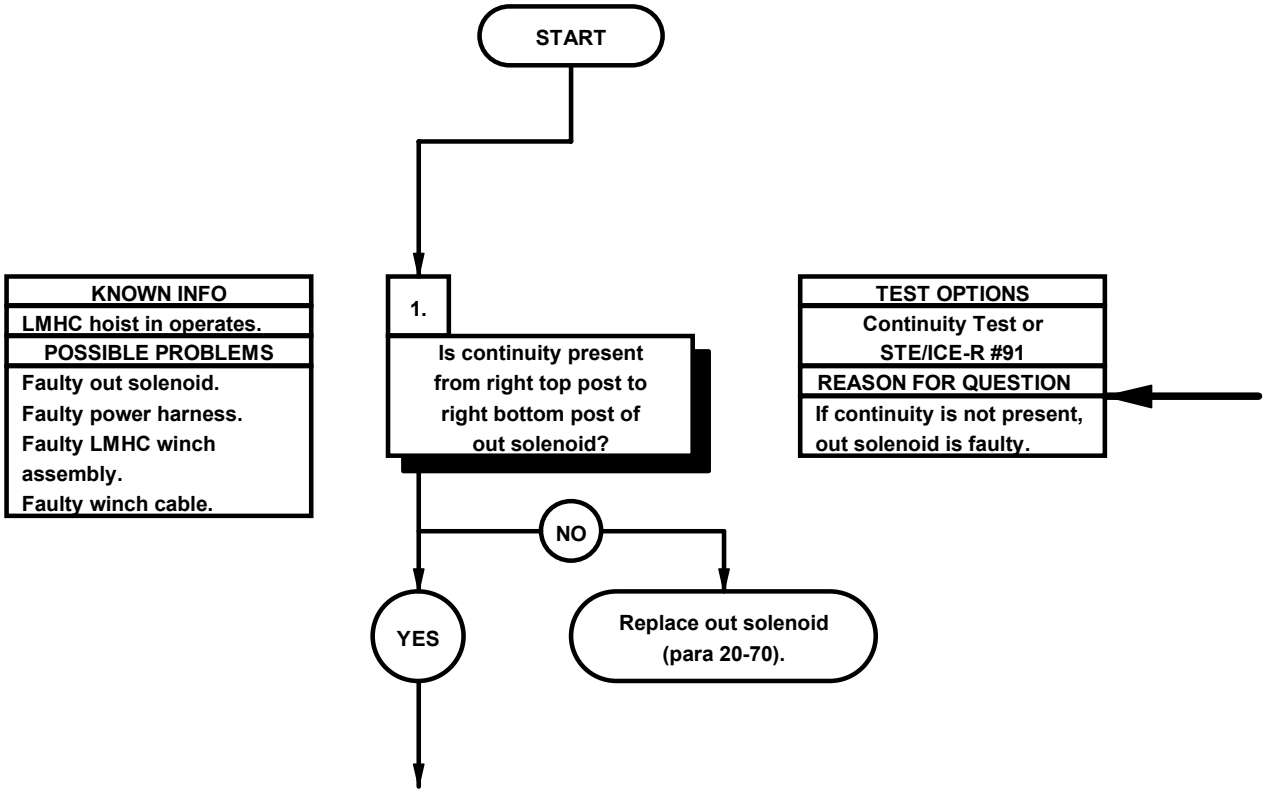
INITIAL SETUP

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

Personnel Required
(2)

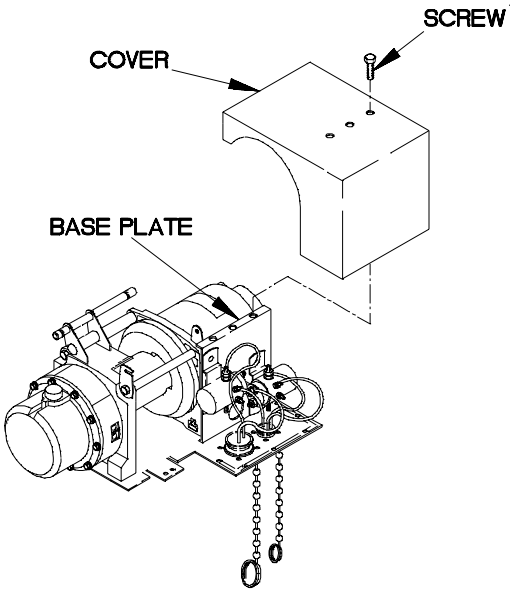
Tools and Special Tools
Tool Kit, Genl Mech (Item 46, Appendix C)
STE/ICE-R (Item 41, Appendix C)
Multimeter, Digital (Item 22, Appendix C)

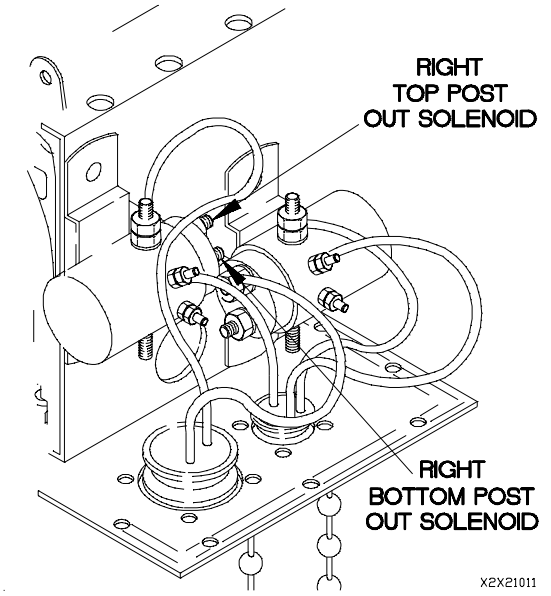
References
TM 9-4910-571-12&P



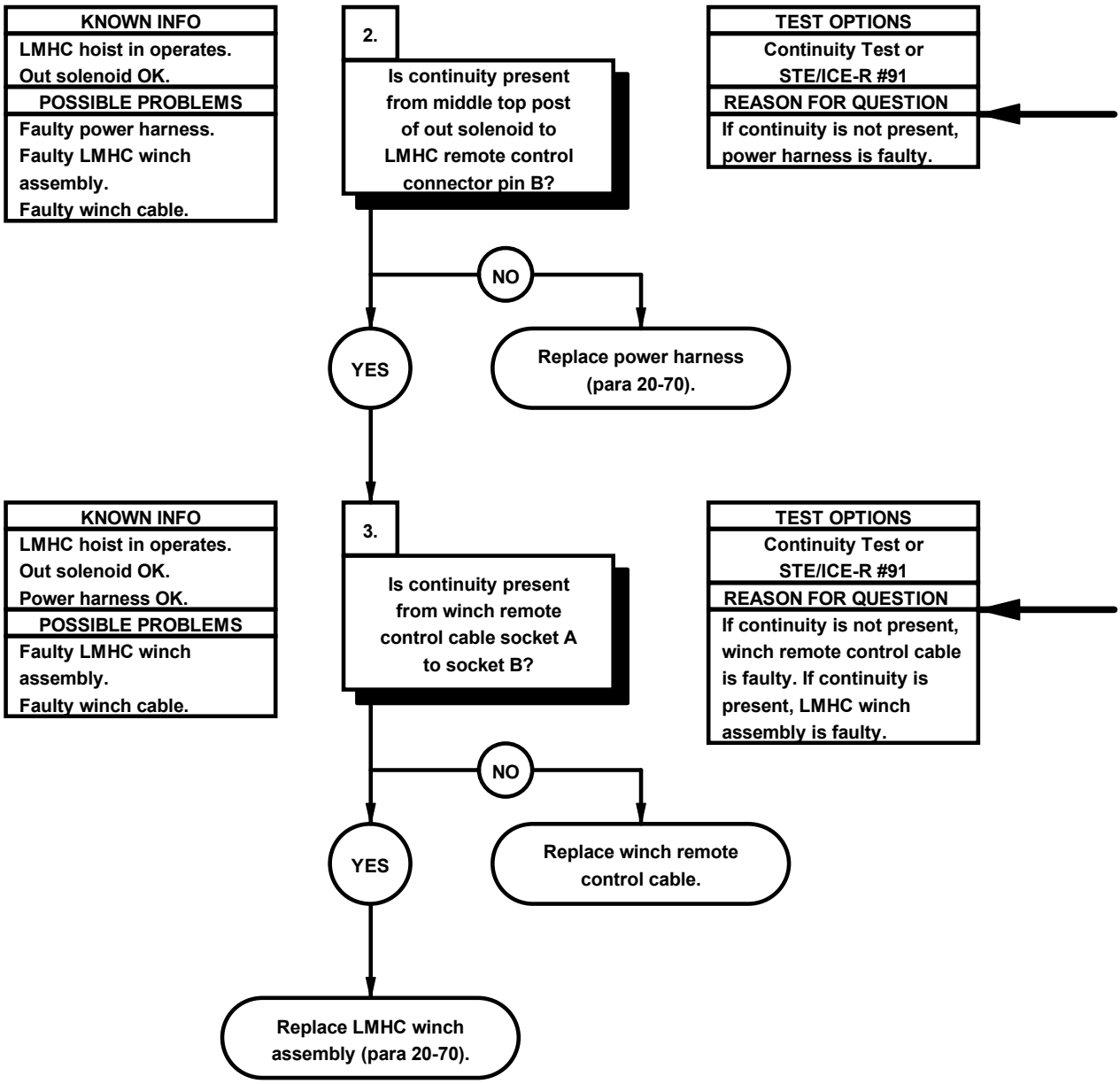
CONTINUITY TEST

(1) Remove 18 screws and cover from base plate.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to right top post of out solenoid.
(4) Connect negative (-) probe of multimeter to right bottom post of out solenoid and note reading on multimeter.
(5) If continuity is not present, replace out solenoid (para 20-70).





u21. LIGHT MATERIAL HANDLING CRANE (LMHC) HOIST OUT DOES NOT OPERATE (CONT)

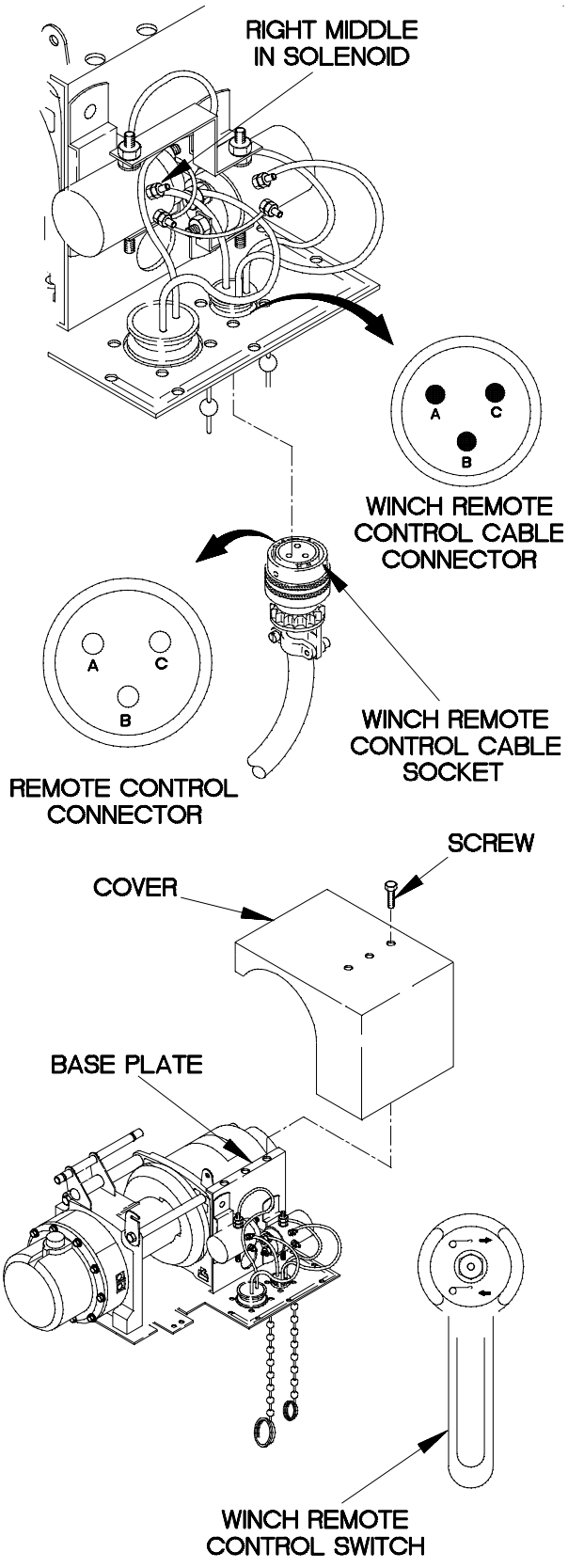


CONTINUITY TEST

(1) Disconnect winch remote control cable from winch remote control connector.
(2) Set multimeter to ohms.
(3) Connect positive (+) probe of multimeter to right middle post of out solenoid.
(4) Connect negative (-) probe of multimeter to winch remote control connector pin B and note reading on multimeter.
(5) If continuity is not present, replace power harness (para 20-70).

CONTINUITY TEST

(1) Set multimeter to ohms.
(2) Connect positive (+) probe of multimeter to winch remote control cable socket A.
(3) Connect negative (-) probe of multimeter to winch remote control cable socket B.
(4) Position winch remote control switch to out and note reading on multimeter.
(5) If continuity is not present, replace winch remote control cable.
(6) If continuity is present, replace LMHC winch assembly (para 20-70).
(7) Connect winch remote control cable to winch remote control connector.
(8) Install cover on base plate with 18 screws.



2-32. CAB AND SPARE TIRE RETAINER TROUBLESHOOTING

This paragraph covers Cab and Spare Tire Retainer Troubleshooting. The Cab and Spare Tire Retainer Fault Index, Table 2-58, lists faults for the cab and spare tire retainer of the vehicle.

Table 2-58. Cab and Spare Tire Retainer Fault Index

Fault No.	Description	Page
v1.	Cab Does Not Raise	2-2116
v2.	Cab Does Not Lower	2-2116.8
v3.	Spare Tire Retainer Does Not Raise	2-2118
v4.	Spare Tire Retainer Does Not Lower	2-2118.6

v1. CAB DOES NOT RAISE

INITIAL SETUP

Equipment Condition
Engine shut down (TM 9-2320-365-10).
Air tanks drained (TM 9-2320-365-10).

Personnel Required
(2)

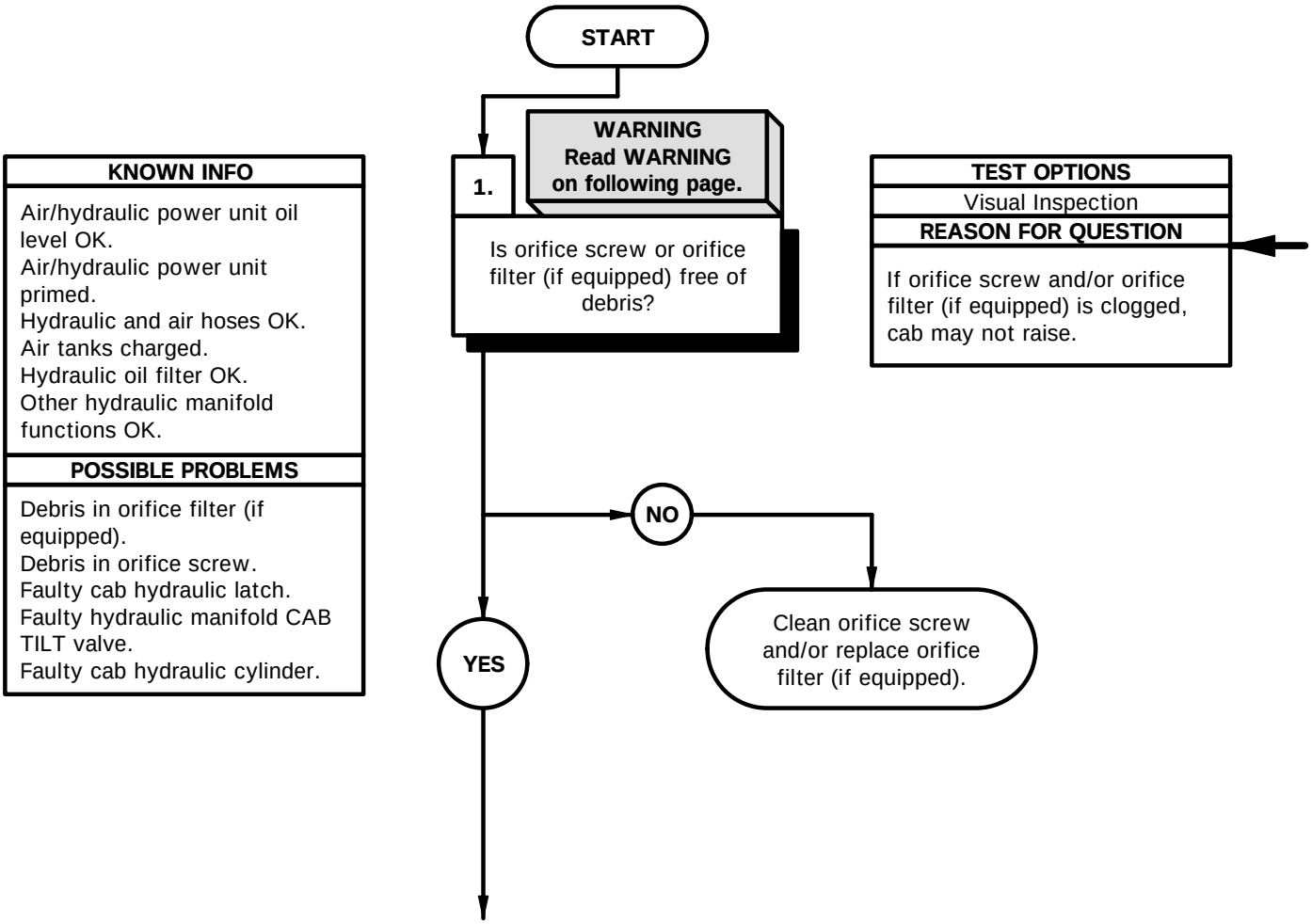
Material/Parts
Rag, Wiping (Item 51, Appendix D)
Filter Element, Fluid (Item 14.1, Appendix G)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Pan, Drain (Item 24, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Transmitter, Pressure (Item 1, Appendix J)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Key, Socket Head Screw (Item 35.1, Appendix B)

References
TM 9-4910-571-12&P

NOTE

Vehicles S/N 0001 through 7558, with hydraulic manifold P/N HFC32598, were not originally equipped with an orifice filter. However, an orifice filter may have been installed during previous maintenance to the hydraulic manifold.



WARNING

Drop hydraulic pressure to zero before disconnecting any hydraulic hoses. Failure to comply may result in injury to personnel.

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 into contact with hydraulic fluid should be washed immediately. Saturated clothing should be removed immediately. Failure to comply may result in injury to personnel.

Compressed air used for cleaning purposes will not exceed 30 psi (270 kPa). Use only with effective chip guarding and personal protective equipment (goggles, shields, gloves, etc.). Failure to comply may result in injury to personnel.

NOTE

Perform steps (1) through (11) on hydraulic manifolds P/N HFC32598.

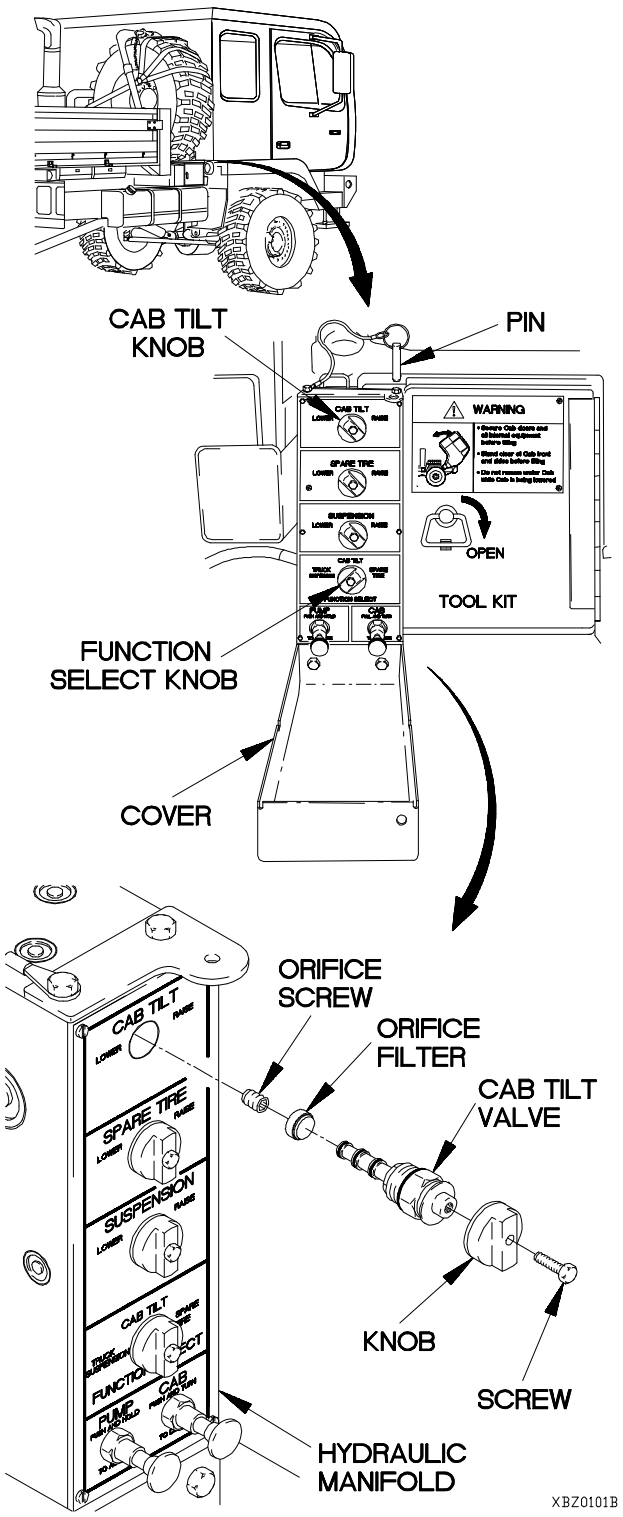
(1) Remove pin from hydraulic manifold cover and lower cover.
(2) Cycle FUNCTION SELECT knob through all settings.
(3) Cycle CAB TILT knob through both selector settings.
(4) Remove screw, knob, and CAB TILT valve from hydraulic manifold.
(5) Remove orifice filter (if equipped) from hydraulic manifold.
(6) If debris is present in orifice filter, replace orifice filter.
(7) Remove orifice screw from hydraulic manifold.
(8) If debris is present in orifice screw, clean orifice screw with compressed air.

NOTE

If no orifice filter was previously installed, install orifice filter at this time.

(9) Install orifice screw and orifice filter in hydraulic manifold.
(10) Position CAB TILT valve and knob on hydraulic manifold with screw.
(11) Tighten screw to 5-15 lb-in. (1-2 N·m).

Cont. on page 2-2116.3.



Cont. from page 2-2116.1.

WARNING

Drop hydraulic pressure to zero before disconnecting any hydraulic hoses. Failure to comply may result in injury to personnel.

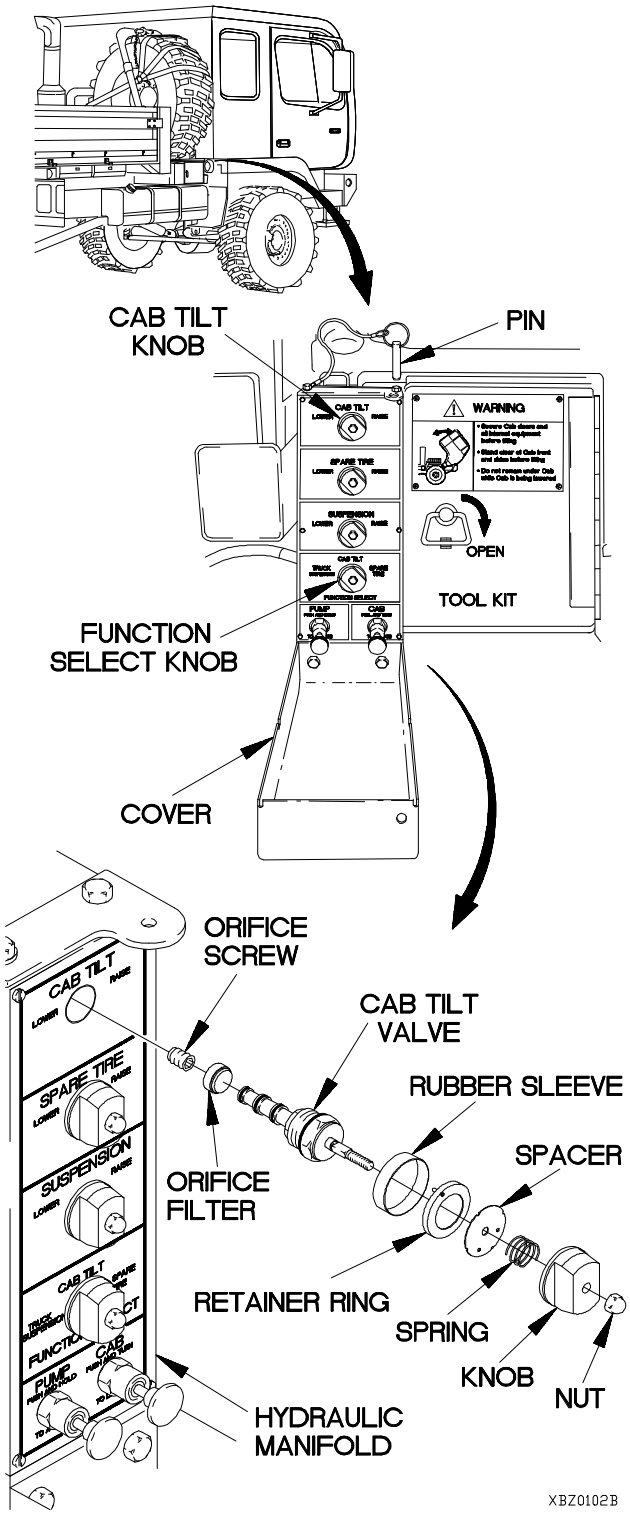
Hydraulic fluid (MIL-H-5606) is TOXIC. Wear protective goggles and gloves; use only in well ventilated area; avoid contact with skin, eyes, and clothes. Skin and clothing that come into contact with hydraulic fluid should be washed immediately. Saturated clothing should be removed immediately. Failure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

Compressed air used for cleaning purposes will not exceed 30 psi (270 kPa). Use only with effective chip guarding and personal protective equipment (goggles, shields, gloves, etc.). Failure to comply may result in injury to personnel.

NOTE

Perform steps (12) through (23) on hydraulic manifolds P/N 65234.

(12) Remove pin from hydraulic manifold cover and lower cover.
(13) Cycle FUNCTION SELECT knob through all settings.
(14) Cycle CAB TILT knob through both selector settings.
(15) Remove nut, knob, spring, spacer, retainer ring, and rubber sleeve from CAB TILT valve.
(16) Remove CAB TILT valve from hydraulic manifold.
(17) Remove orifice filter from hydraulic manifold.
(18) If debris is present in orifice filter, replace orifice filter.
(19) Remove orifice screw from hydraulic manifold.
(20) If debris is present in orifice screw, clean orifice screw with compressed air.
(21) Install orifice screw and orifice filter in hydraulic manifold.
(22) Install CAB TILT valve in hydraulic manifold.
(23) Install rubber sleeve, retainer ring, spacer, spring, knob, and nut on hydraulic manifold.



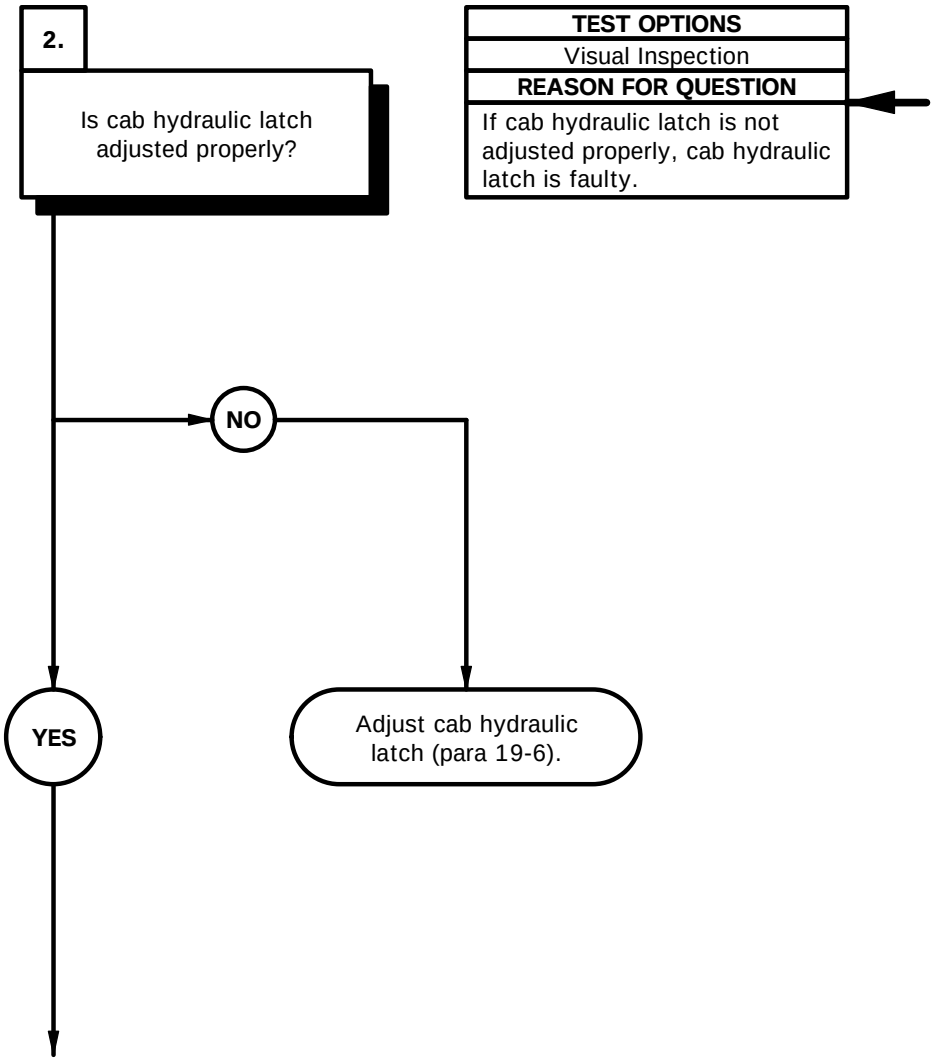
v1. CAB DOES NOT RAISE (CONT)

KNOWN INFO

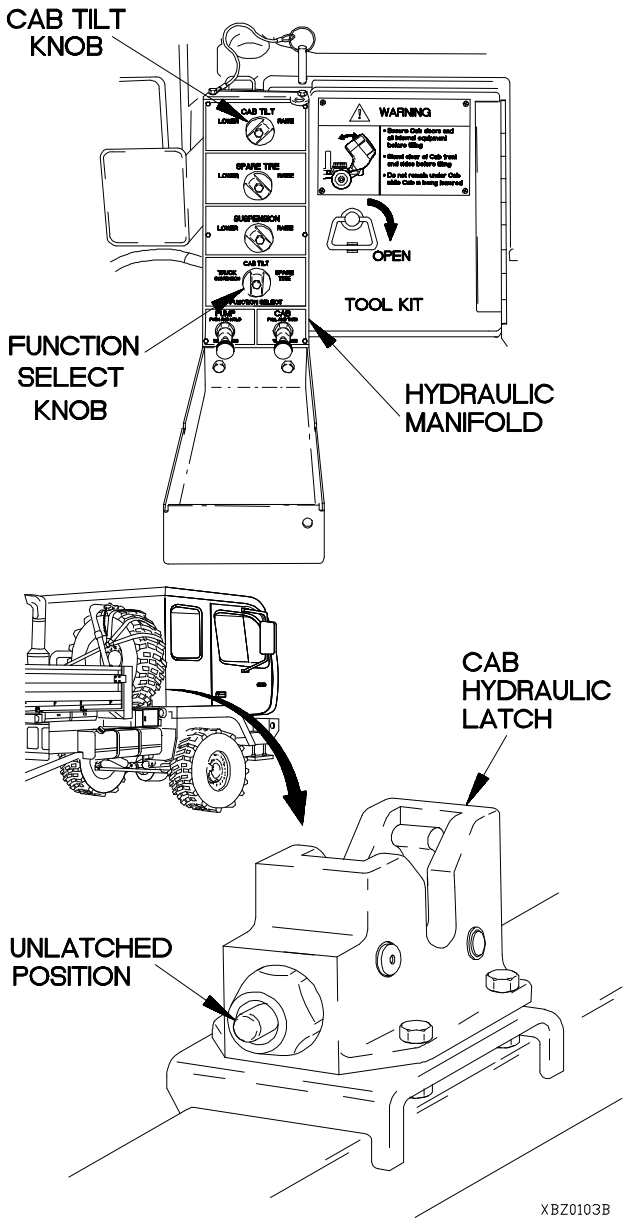
Air/hydraulic power unit oil level OK.
Air/hydraulic power unit primed.
Hydraulic and air hoses OK.
Air tanks charged.
Hydraulic oil filter OK.
Other hydraulic manifold functions OK.
Orifice filter OK.
Orifice screw OK.

POSSIBLE PROBLEMS

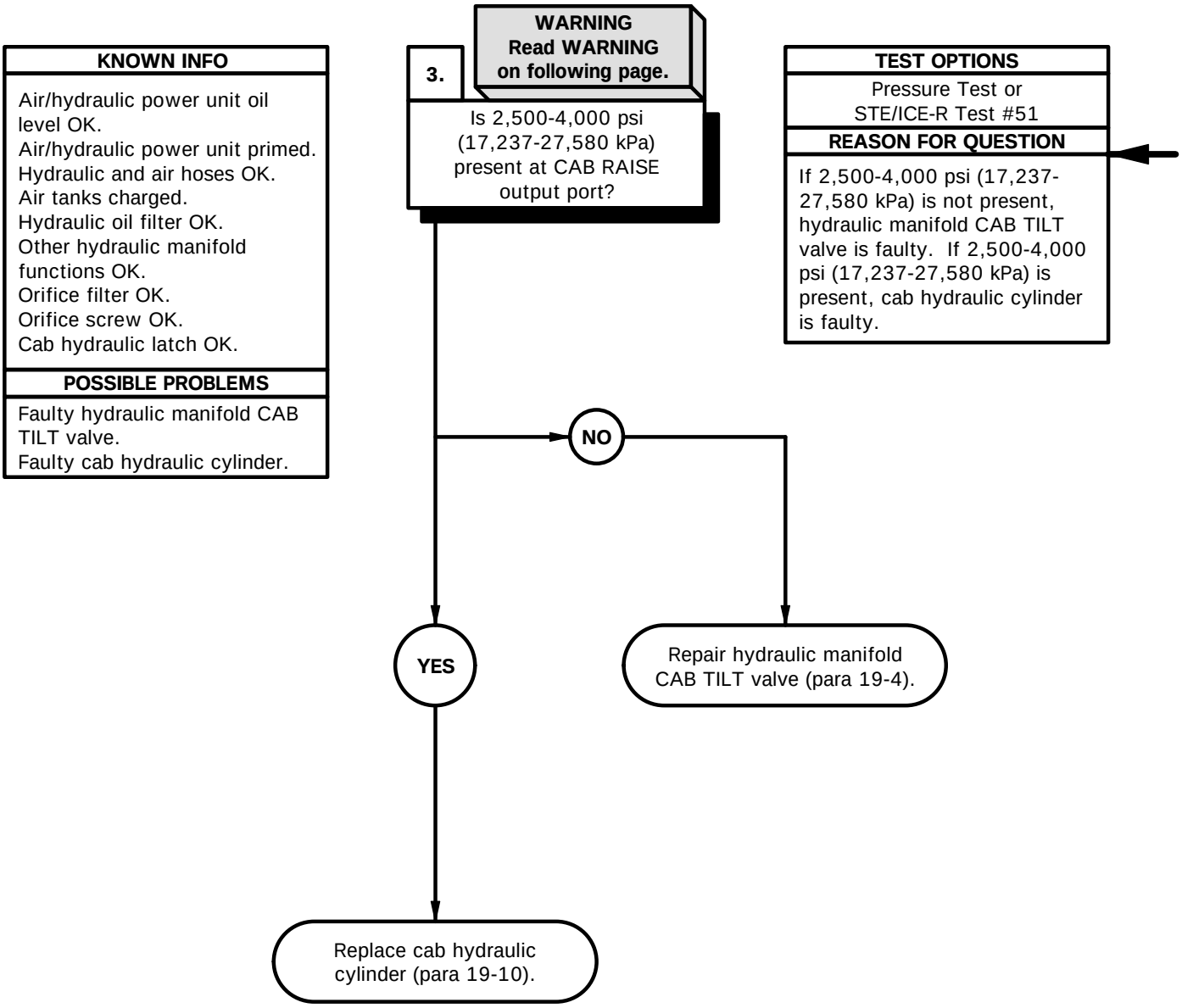
Faulty cab hydraulic latch.
Faulty hydraulic manifold CAB TILT valve.
Faulty cab hydraulic cylinder.



(1) Start engine and charge air tanks (TM 9-2320-365-10).
(2) Position CAB TILT knob to RAISE.
(3) Position FUNCTION SELECT knob to CAB TILT.
(4) Check to see if cab hydraulic latch indicator button is in the unlatched position.
(5) If cab hydraulic latch indicator button does not unlatch, adjust cab hydraulic latch (para 19-6).



v1. CAB DOES NOT RAISE (CONT)



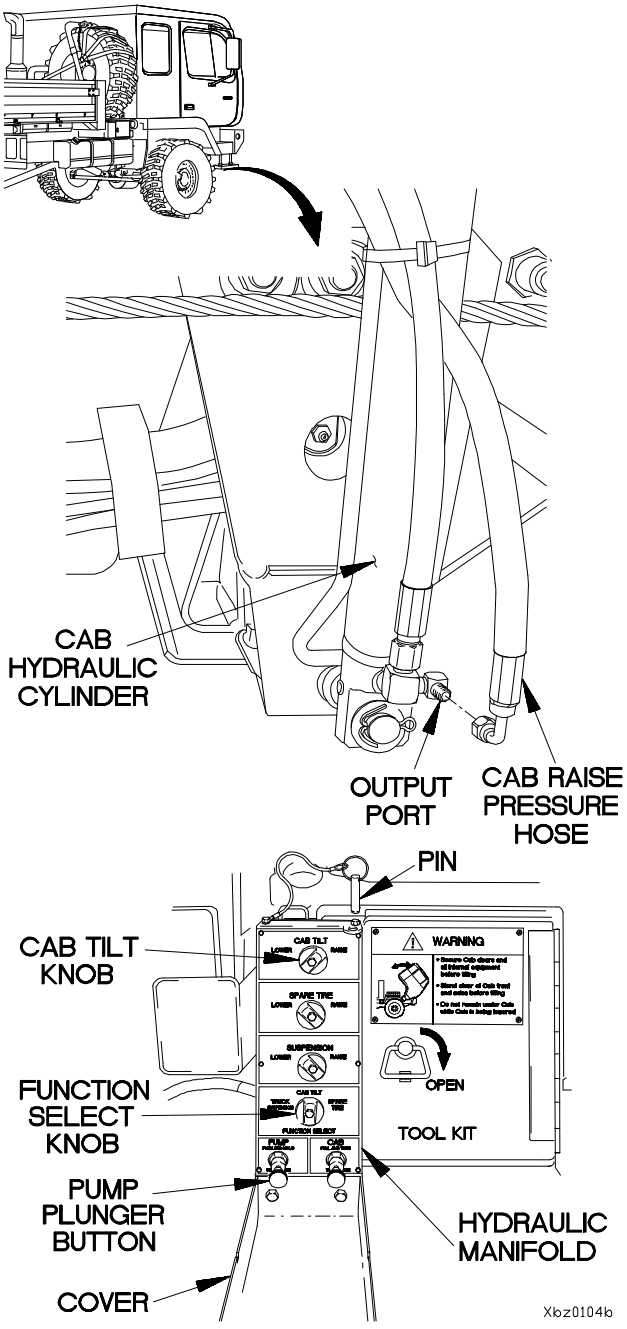
WARNING

Drop hydraulic pressure to zero before disconnecting any hydraulic hoses. Failure to comply may result in injury to personnel.

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 into contact with hydraulic fluid should be washed immediately. Saturated clothing should be removed immediately. Failure to comply may result in injury to personnel.

PRESSURE TEST

(1) Position drain pan under cab hydraulic cylinder.
(2) Disconnect CAB RAISE pressure hose from cab hydraulic cylinder output port.
(3) Connect STE/ICE-R to CAB RAISE pressure hose.
(4) Start engine and charge air tanks (TM 9-2320-365-10).
(5) Position CAB TILT knob to RAISE.
(6) Position FUNCTION SELECT knob to CAB TILT.
(7) Push and hold PUMP plunger button and perform STE-ICE-R Test #51 (TM 9-4910-571-12&P).
(8) If pressure is not 2,500-4,000 psi (17,237-27,580 kPa), repair hydraulic manifold CAB TILT valve (para 19-4).
(9) If pressure is 2,500-4,000 psi (17,237-27,580 kPa), replace cab hydraulic cylinder (para 19-10).
(10) Drain air tanks (TM 9-2320-365-10).
(11) Disconnect STE/ICE-R from pressure hose.
(12) Connect pressure hose to cab hydraulic cylinder output port.
(13) Close hydraulic manifold cover and install pin.



v2. CAB DOES NOT LOWER

INITIAL SETUP

Equipment Condition
Engine shut down (TM 9-2320-365-10).
Air tanks drained (TM 9-2320-365-10).

Personnel Required
(2)

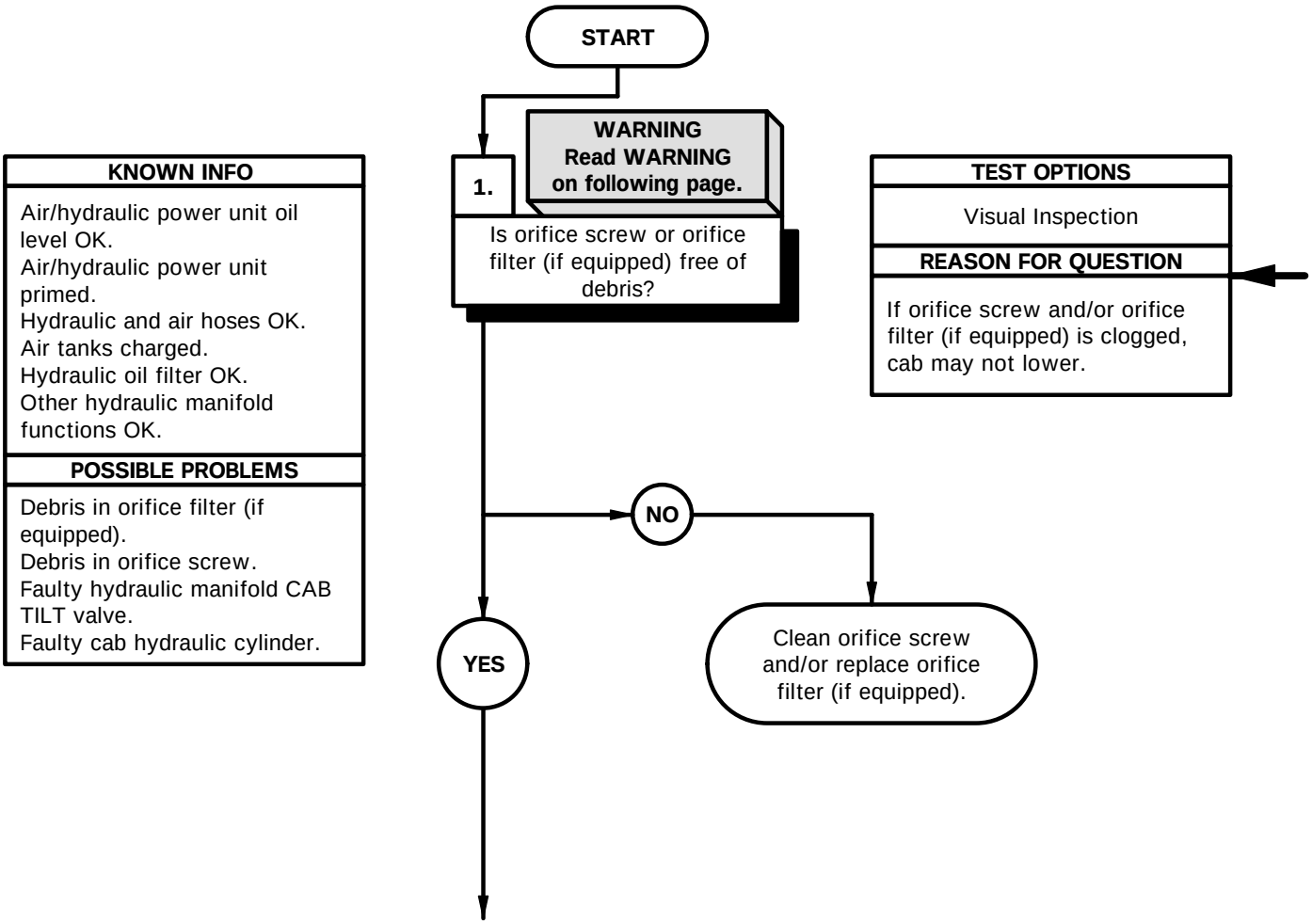
Material/Parts
Rag, Wiping (Item 51, Appendix D)
Filter Element, Fluid (Item 14.1, Appendix G)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Pan, Drain (Item 24, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Transmitter, Pressure (Item 1, Appendix J)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Key, Socket Head Screw (Item 35.1, Appendix B)

References
TM 9-4910-571-12&P

NOTE

Vehicles S/N 0001 through 7558, with hydraulic manifold P/N HFC32598, were not originally equipped with an orifice filter. However, an orifice filter may have been installed during previous maintenance to the hydraulic manifold.



WARNING

Drop hydraulic pressure to zero before disconnecting any hydraulic hoses. Failure to comply may result in injury to personnel.

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 into contact with hydraulic fluid should be washed immediately. Saturated clothing should be removed immediately. Failure to comply may result in injury to personnel.

Compressed air used for cleaning purposes will not exceed 30 psi (270 kPa). Use only with effective chip guarding and personal protective equipment (goggles, shields, gloves, etc.). Failure to comply may result in injury to personnel.

NOTE

Perform steps (1) through (11) on hydraulic manifolds P/N HFC32598.

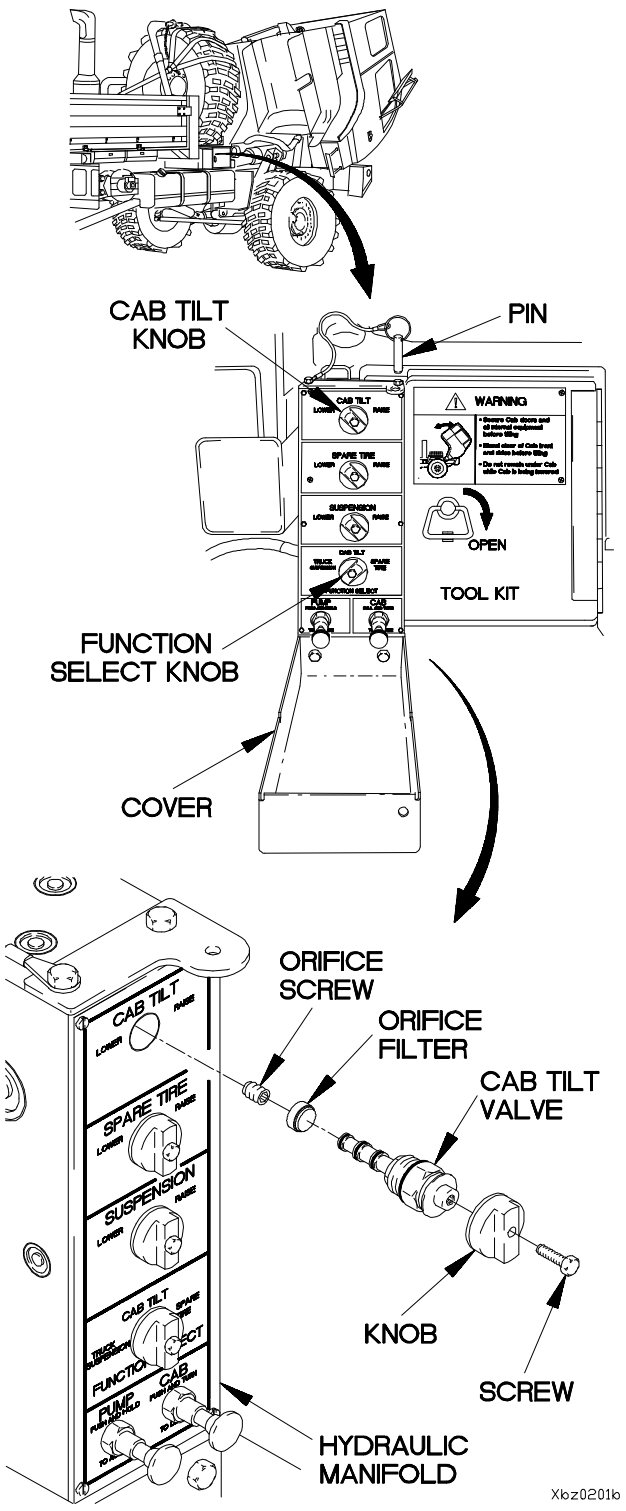
(1) Remove pin from hydraulic manifold cover and lower cover.
(2) Cycle FUNCTION SELECT knob through all settings.
(3) Cycle CAB TILT knob through both selector settings.
(4) Remove screw, knob, and CAB TILT valve from hydraulic manifold.
(5) Remove orifice filter (if equipped) from hydraulic manifold.
(6) If debris is present in orifice filter, replace orifice filter.
(7) Remove orifice screw from hydraulic manifold.
(8) If debris is present in orifice screw, clean orifice screw with compressed air.

NOTE

If no orifice filter was previously installed, install orifice filter at this time.

(9) Install orifice screw and orifice filter in hydraulic manifold.
(10) Position CAB TILT valve and knob on hydraulic manifold with screw.
(11) Tighten screw to 5-15 lb-in. (1-2 N·m).

Cont. on page 2-2116.11.



Cont. from page 2-2116.9.

WARNING

Drop hydraulic pressure to zero before disconnecting any hydraulic hoses. Failure to comply may result in injury to personnel.

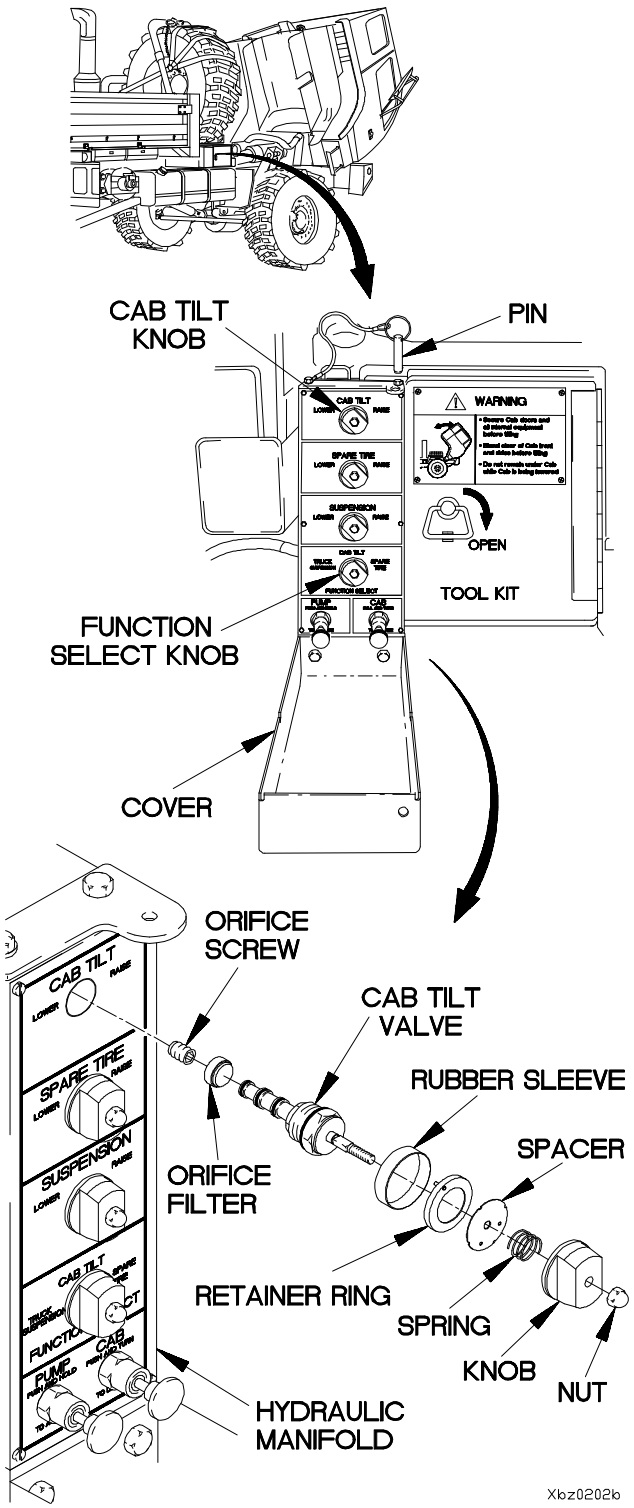
Hydraulic fluid (MIL-H-5606) is TOXIC. Wear protective goggles and gloves; use only in well ventilated area; avoid contact with skin, eyes, and clothes. Skin and clothing that come into contact with hydraulic fluid should be washed immediately. Saturated clothing should be removed immediately. Failure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

Compressed air used for cleaning purposes will not exceed 30 psi (270 kPa). Use only with effective chip guarding and personal protective equipment (goggles, shields, gloves, etc.). Failure to comply may result in injury to personnel.

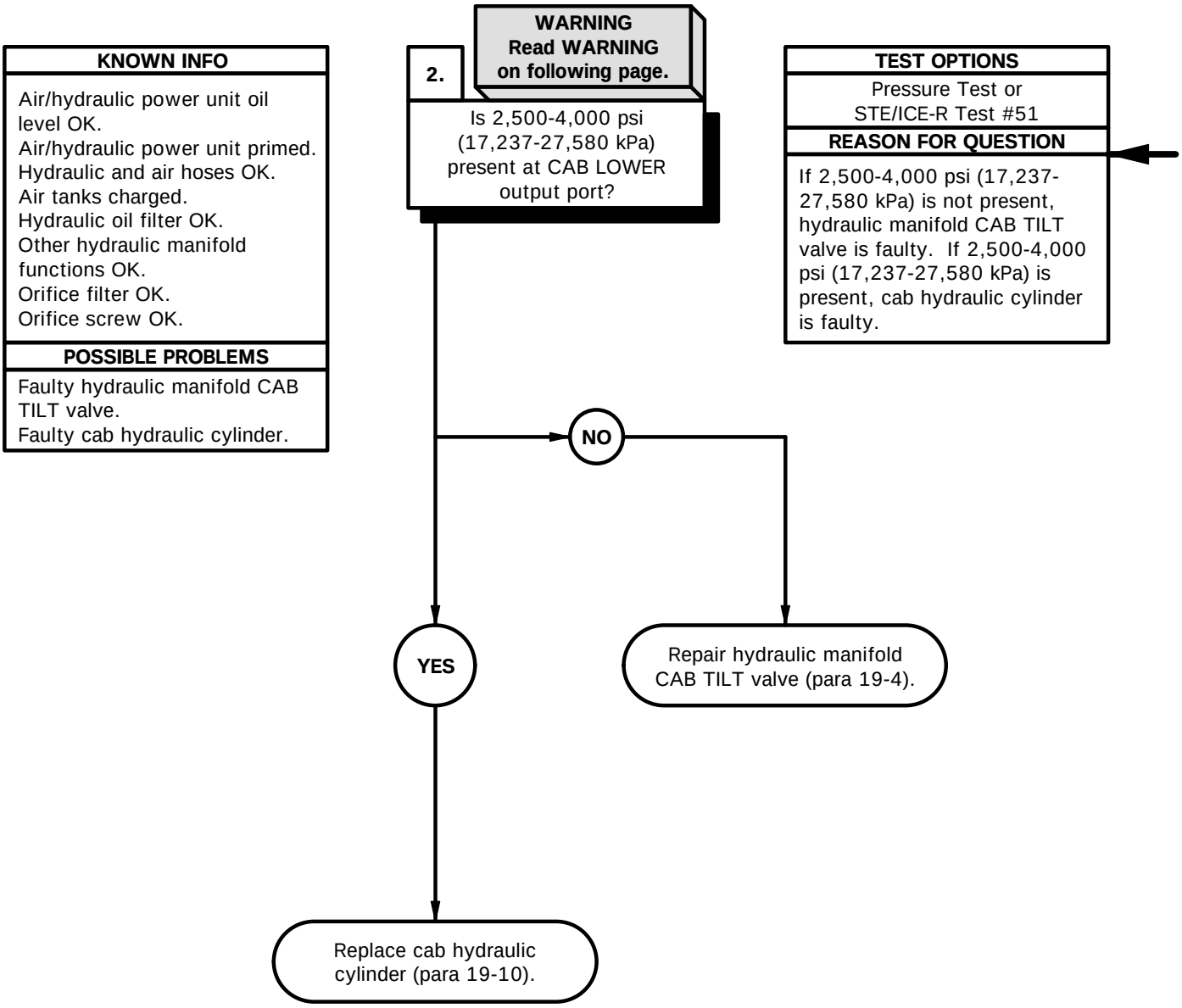
NOTE

Perform steps (12) through (23) on hydraulic manifolds P/N 65234.

(12) Remove pin from hydraulic manifold cover and lower cover.
(13) Cycle FUNCTION SELECT knob through all settings.
(14) Cycle CAB TILT knob through both selector settings.
(15) Remove nut, knob, spring, spacer, retainer ring, and rubber sleeve from CAB TILT valve.
(16) Remove CAB TILT valve from hydraulic manifold.
(17) Remove orifice filter from hydraulic manifold.
(18) If debris is present in orifice filter, replace orifice filter.
(19) Remove orifice screw from hydraulic manifold.
(20) If debris is present in orifice screw, clean orifice screw with compressed air.
(21) Install orifice screw and orifice filter in hydraulic manifold.
(22) Install CAB TILT valve in hydraulic manifold.
(23) Install rubber sleeve, retainer ring, spacer, spring, knob, and nut on hydraulic manifold.



v2. CAB DOES NOT LOWER (CONT)



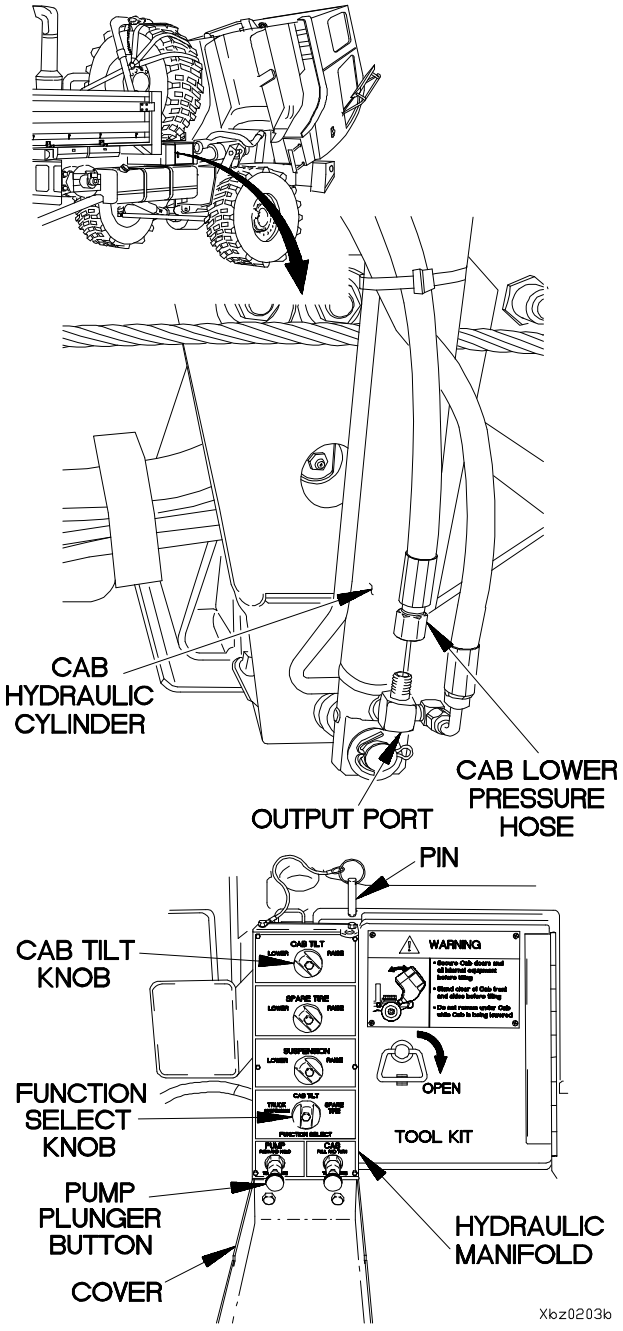
WARNING

Drop hydraulic pressure to zero before disconnecting any hydraulic hoses. Failure to comply may result in injury to personnel.

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 into contact with hydraulic fluid should be washed immediately. Saturated clothing should be removed immediately. Failure to comply may result in injury to personnel.

PRESSURE TEST

(1) Position drain pan under cab hydraulic cylinder.
(2) Disconnect CAB LOWER pressure hose from cab hydraulic cylinder output port.
(3) Connect STE/ICE-R to CAB LOWER pressure hose.
(4) Start engine and charge air tanks (TM 9-2320-365-10).
(5) Position CAB TILT knob to LOWER.
(6) Position FUNCTION SELECT knob to CAB TILT.
(7) Push and hold PUMP plunger button and perform STE-ICE-R Test #51 (TM 9-4910-571-12&P).
(8) If pressure is not 2,500-4,000 psi (17,237-27,580 kPa), repair hydraulic manifold CAB TILT valve (para 19-4).
(9) If pressure is 2,500-4,000 psi (17,237-27,580 kPa), replace cab hydraulic cylinder (para 19-10).
(10) Drain air tanks (TM 9-2320-365-10).
(11) Disconnect STE/ICE-R from pressure hose.
(12) Connect pressure hose to cab hydraulic cylinder output port.
(13) Close hydraulic manifold cover and install pin.



v3. SPARE TIRE RETAINER DOES NOT RAISE

INITIAL SETUP

Equipment Condition
Engine shut down (TM 9-2320-365-10).
Air tanks drained (TM 9-232-365-10).

Personnel Required
(2)

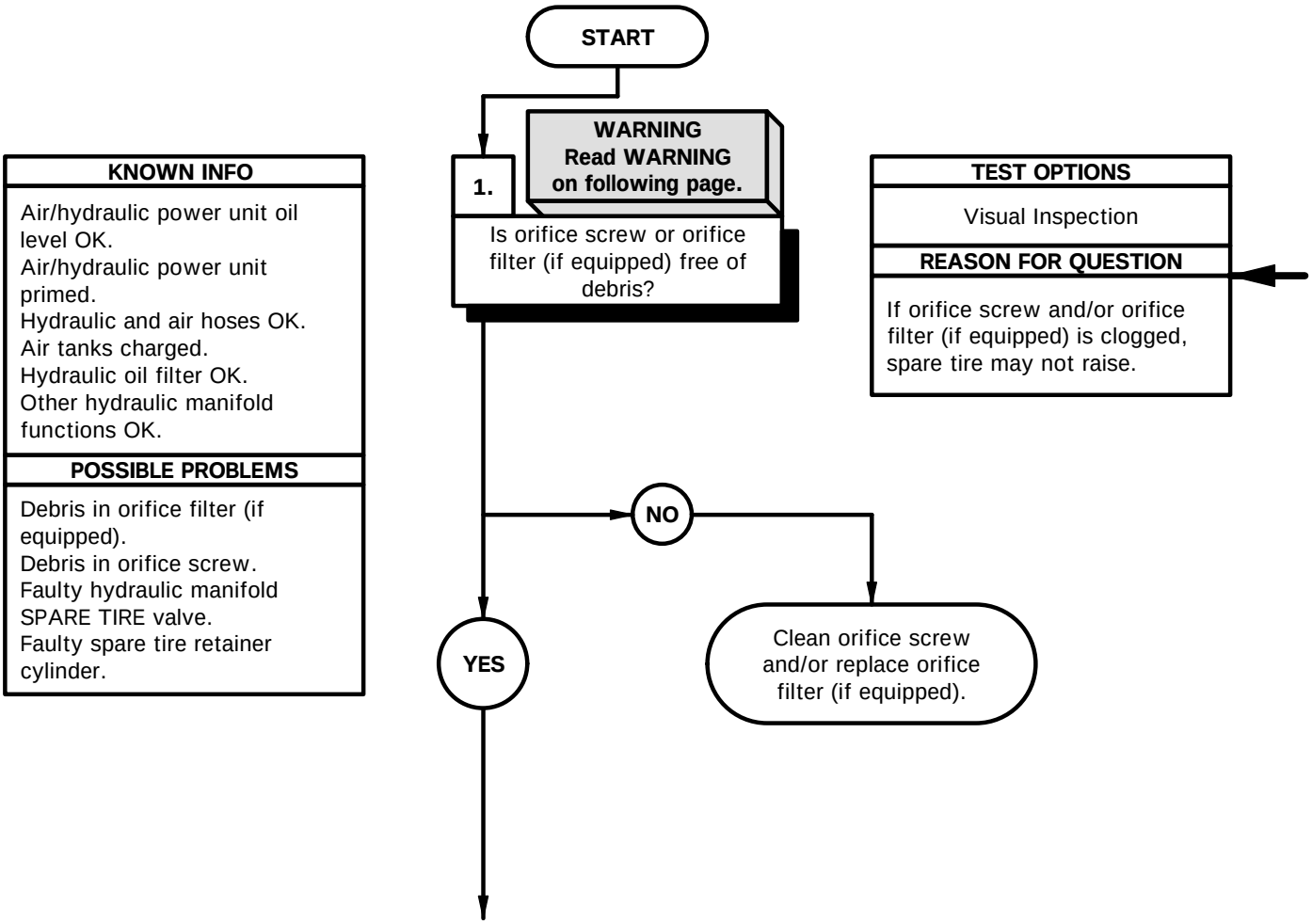
Material/Parts
Rag, Wiping (Item 51, Appendix D)
Filter Element, Fluid (Item 14.1, Appendix G)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Pan, Drain (Item 24, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Transmitter, Pressure (Item 1, Appendix J)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Key, Socket Head Screw (Item 35.1, Appendix B)

References
TM 9-4910-571-12&P

NOTE

Vehicles S/N 0001 through 7558, with hydraulic manifold P/N HFC32598, were not originally equipped with an orifice filter. However, an orifice filter may have been installed during previous maintenance to the hydraulic manifold.



WARNING

Drop hydraulic pressure to zero before disconnecting any hydraulic hoses. Failure to comply may result in injury to personnel.

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 into contact with hydraulic fluid should be washed immediately. Saturated clothing should be removed immediately. Failure to comply may result in injury to personnel.

Compressed air used for cleaning purposes will not exceed 30 psi (270 kPa). Use only with effective chip guarding and personal protective equipment (goggles, shields, gloves, etc.). Failure to comply may result in injury to personnel.

NOTE

Perform steps (1) through (11) on hydraulic manifolds HFC32598.

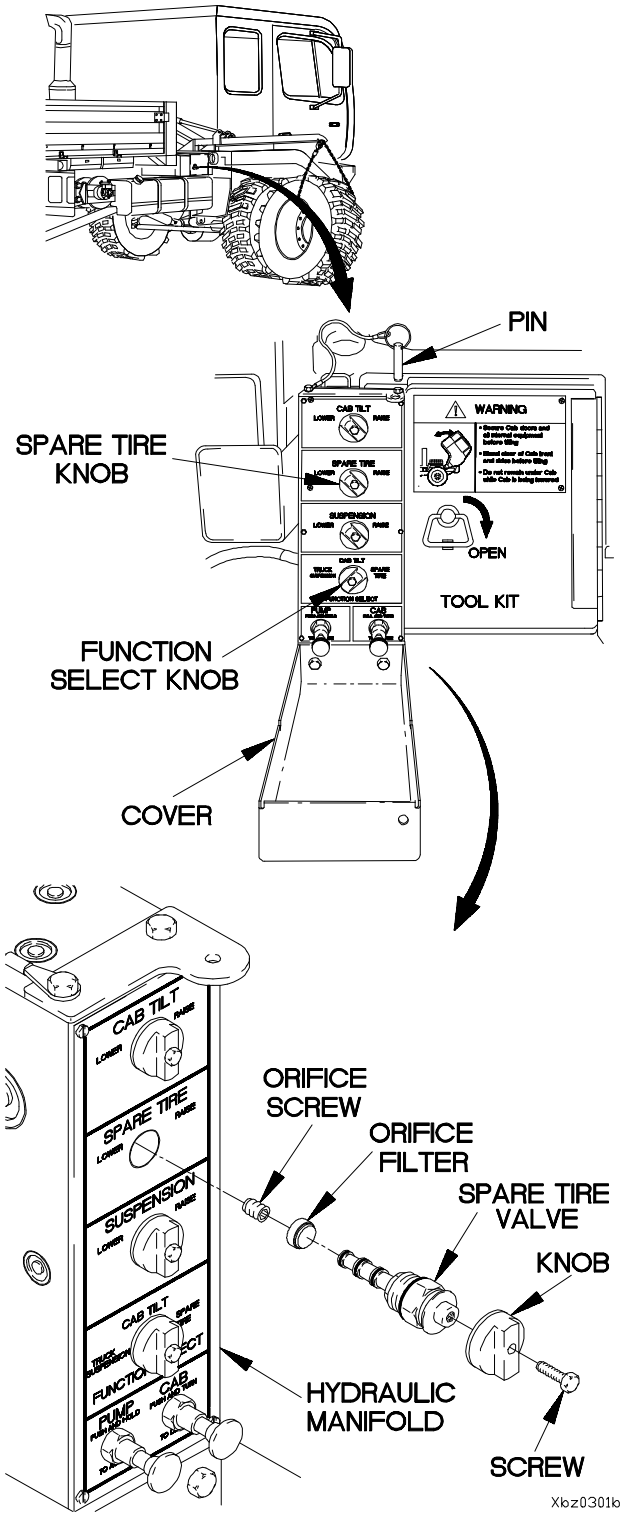
(1) Remove pin from hydraulic manifold cover and raise cover.
(2) Cycle FUNCTION SELECT knob through all settings.
(3) Cycle SPARE TIRE knob through both selector settings.
(4) Remove screw, knob, and SPARE TIRE valve from hydraulic manifold.
(5) Remove orifice filter (if equipped) from hydraulic manifold.
(6) If debris is present in orifice filter, replace orifice filter.
(7) Remove orifice screw from hydraulic manifold.
(8) If debris is present in orifice screw, clean orifice screw with compressed air.

NOTE

If no orifice filter was previously installed, install orifice filter at this time.

(9) Install orifice screw and orifice filter in hydraulic manifold.
(10) Position SPARE TIRE valve and knob on hydraulic manifold with screw.
(11) Tighten screw to 5-15 lb-in. (1-2 N·m).

Cont. on page 2-2118.3.



Cont. from page 2-2118.1.

WARNING

Drop hydraulic pressure to zero before disconnecting any hydraulic hoses. Failure to comply may result in injury to personnel.

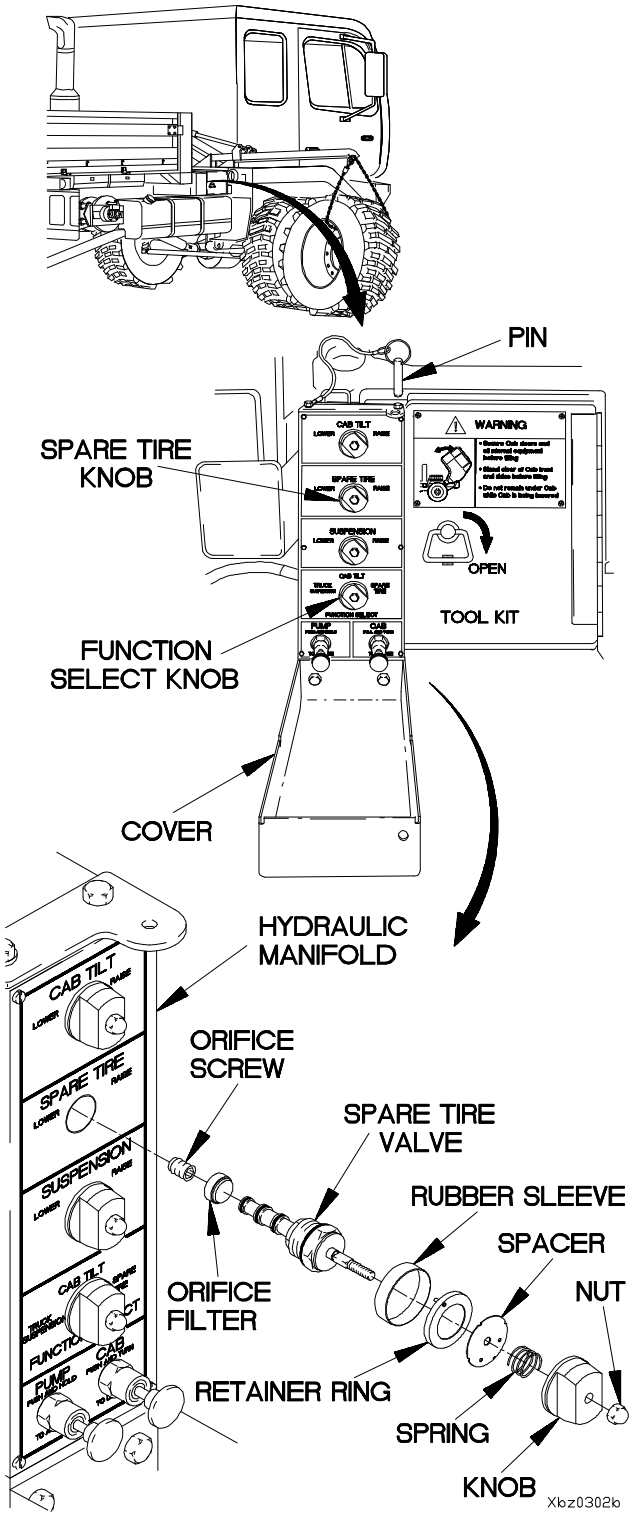
Hydraulic fluid (MIL-H-5606) is TOXIC. Wear protective goggles and gloves; use only in well ventilated area; avoid contact with skin, eyes, and clothes. Skin and clothing that come into contact with hydraulic fluid should be washed immediately. Saturated clothing should be removed immediately. Failure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

Compressed air used for cleaning purposes will not exceed 30 psi (270 kPa). Use only with effective chip guarding and personal protective equipment (goggles, shields, gloves, etc.). Failure to comply may result in injury to personnel.

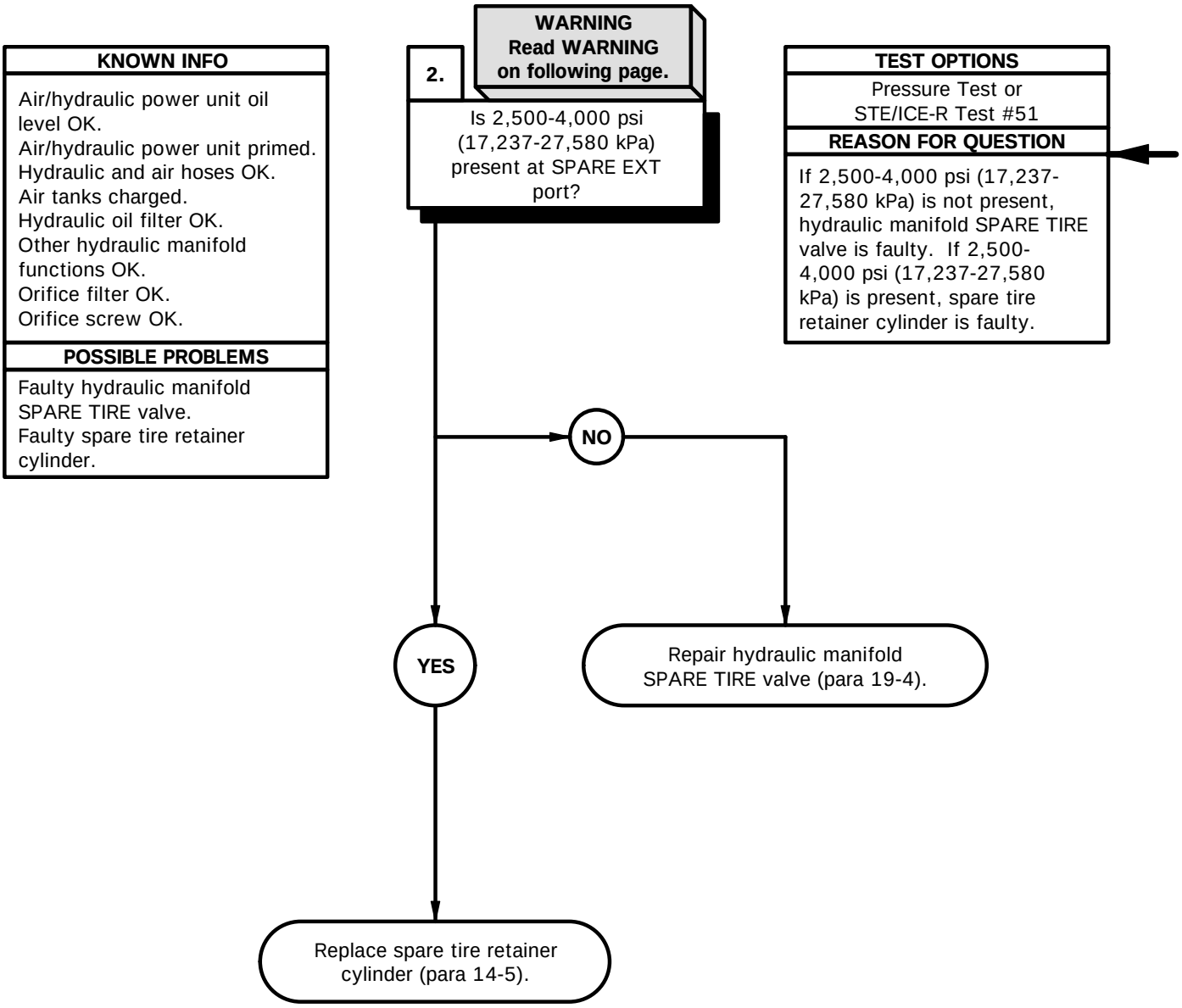
NOTE

Perform steps (12) through (23) on hydraulic manifolds P/N 65234.

(12) Remove pin from hydraulic manifold cover and lower cover.
(13) Cycle FUNCTION SELECT knob through all settings.
(14) Cycle SPARE TIRE knob through both selector settings.
(15) Remove nut, knob, spring, spacer, retainer ring, and rubber sleeve from SPARE TIRE valve.
(16) Remove SPARE TIRE valve from hydraulic manifold.
(17) Remove orifice filter from hydraulic manifold.
(18) If debris is present in orifice filter, replace orifice filter.
(19) Remove orifice screw from hydraulic manifold.
(20) If debris is present in orifice screw, clean orifice screw with compressed air.
(21) Install orifice screw and orifice filter in hydraulic manifold.
(22) Install SPARE TIRE valve in hydraulic manifold.
(23) Install rubber sleeve, retainer ring, spacer, spring, knob, and nut on hydraulic manifold.



v3. SPARE TIRE RETAINER DOES NOT RAISE (CONT)



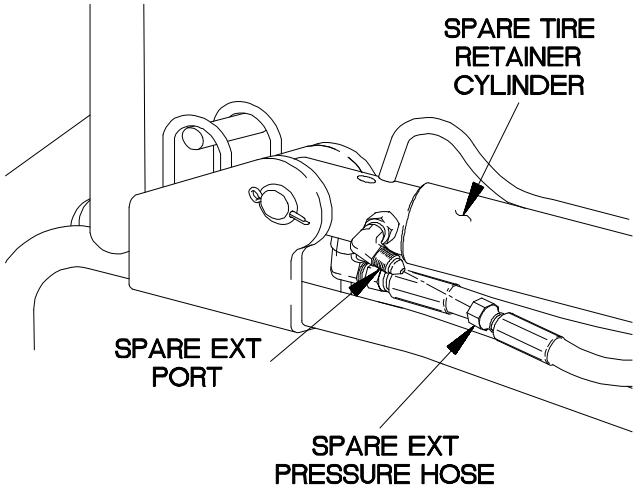
WARNING

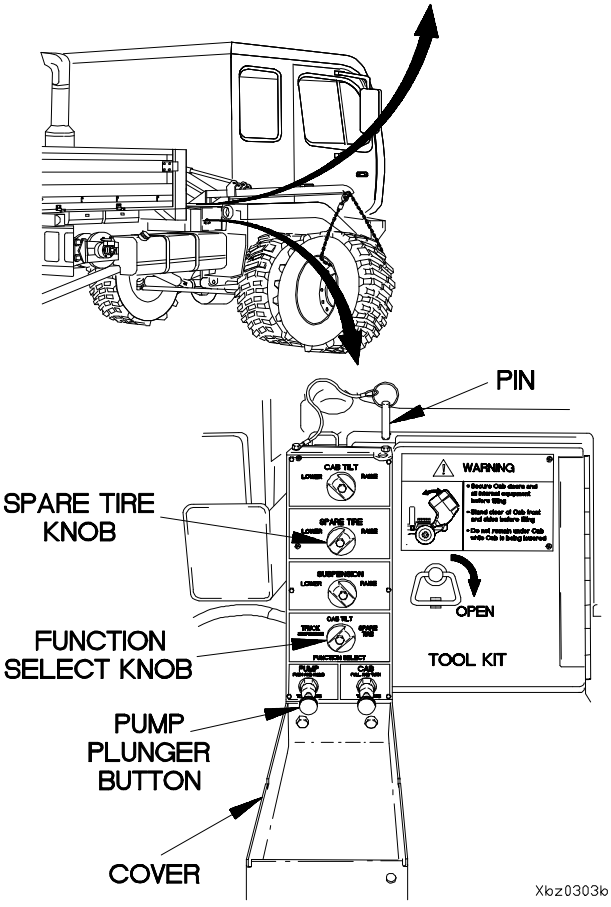
Drop hydraulic pressure to zero before disconnecting any hydraulic hoses. Failure to comply may result in injury to personnel.

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 into contact with hydraulic fluid should be washed immediately. Saturated clothing should be removed immediately. Failure to comply may result in injury to personnel.

PRESSURE TEST

(1) Position drain pan under spare tire retainer cylinder.
(2) Disconnect SPARE EXT pressure hose from spare tire retainer cylinder port.
(3) Connect STE/ICE-R to SPARE EXT pressure hose.
(4) Start engine and charge air tanks (TM 9-2320-365-10).
(5) Position SPARE TIRE knob to RAISE.
(6) Position FUNCTION SELECT knob to SPARE TIRE.
(7) Push and hold PUMP plunger button and perform STE-ICE-R Test #51 (TM 9-4910-571-12&P).
(8) If pressure is not 2,500-4,000 psi (17,237-27,580 kPa), repair hydraulic manifold SPARE TIRE valve (para 19-4).
(9) If pressure is 2,500-4,000 psi (17,237-27,580 kPa), replace spare tire retainer cylinder (para 14-5).
(10) Drain air tanks (TM 9-2320-365-10).
(11) Disconnect STE/ICE-R from pressure hose.
(12) Connect pressure hose to spare tire retainer cylinder port.
(13) Close hydraulic manifold cover and install pin.





v4. SPARE TIRE RETAINER DOES NOT LOWER

INITIAL SETUP

Equipment Condition
Engine shut down (TM 9-2320-365-10).
Air tanks drained (TM 9-232-365-10).

Personnel Required
(2)

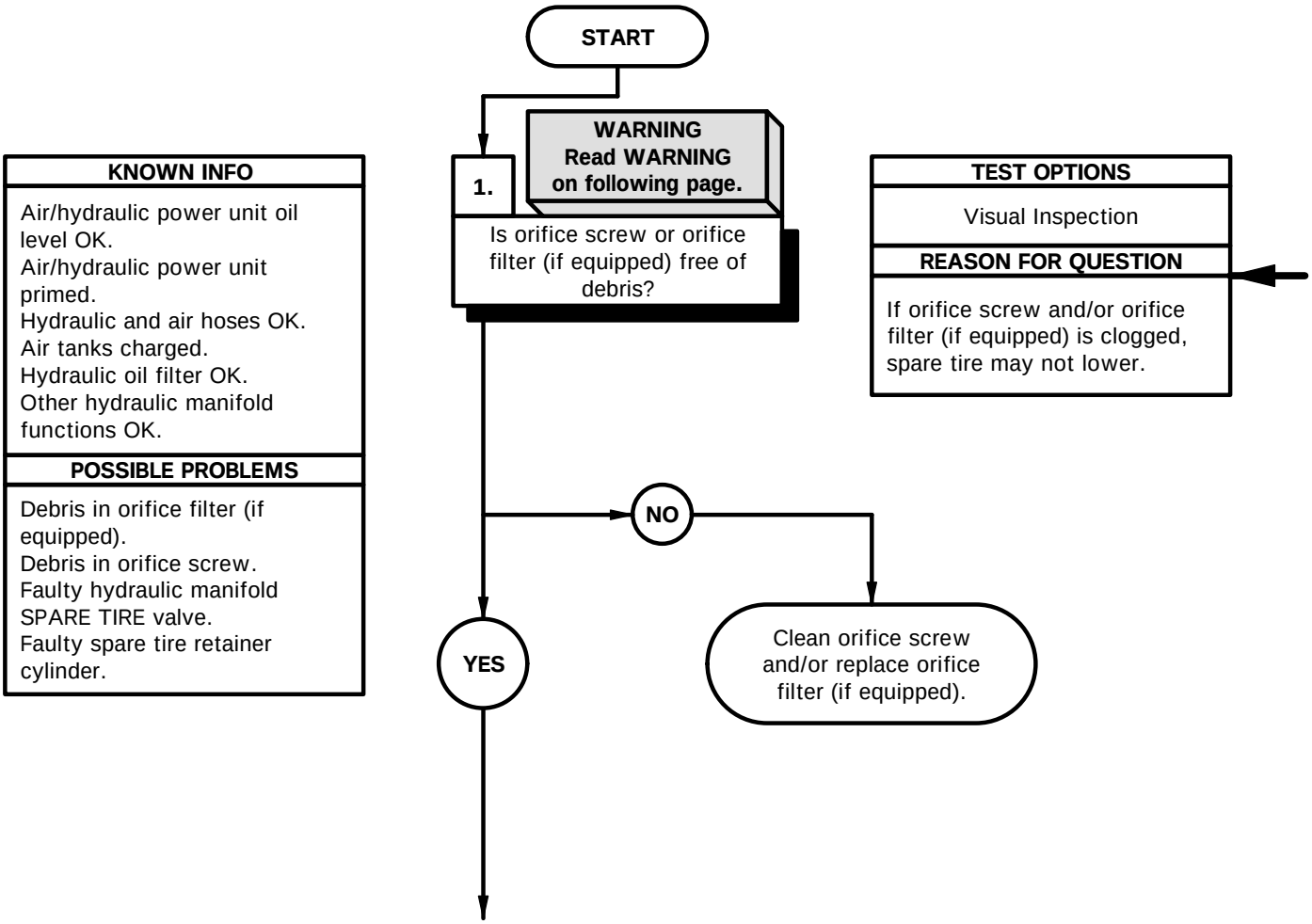
Material/Parts
Rag, Wiping (Item 51, Appendix D)
Filter Element, Fluid (Item 14.1, Appendix G)

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
STE/ICE-R (Item 39, Appendix C)
Pan, Drain (Item 24, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Transmitter, Pressure (Item 1, Appendix J)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Key, Socket Head Screw (Item 35.1, Appendix B)

References
TM 9-4910-571-12&P

NOTE

Vehicles S/N 0001 through 7558, with hydraulic manifold P/N HFC32598, were not originally equipped with an orifice filter. However, an orifice filter may have been installed during previous maintenance to the hydraulic manifold.



WARNING

Drop hydraulic pressure to zero before disconnecting any hydraulic hoses. Failure to comply may result in injury to personnel.

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 into contact with hydraulic fluid should be washed immediately. Saturated clothing should be removed immediately. Failure to comply may result in injury to personnel.

Compressed air used for cleaning purposes will not exceed 30 psi (270 kPa). Use only with effective chip guarding and personal protective equipment (goggles, shields, gloves, etc.). Failure to comply may result in injury to personnel.

NOTE

Perform steps (1) through (11) on hydraulic manifolds P/N HFC32598.

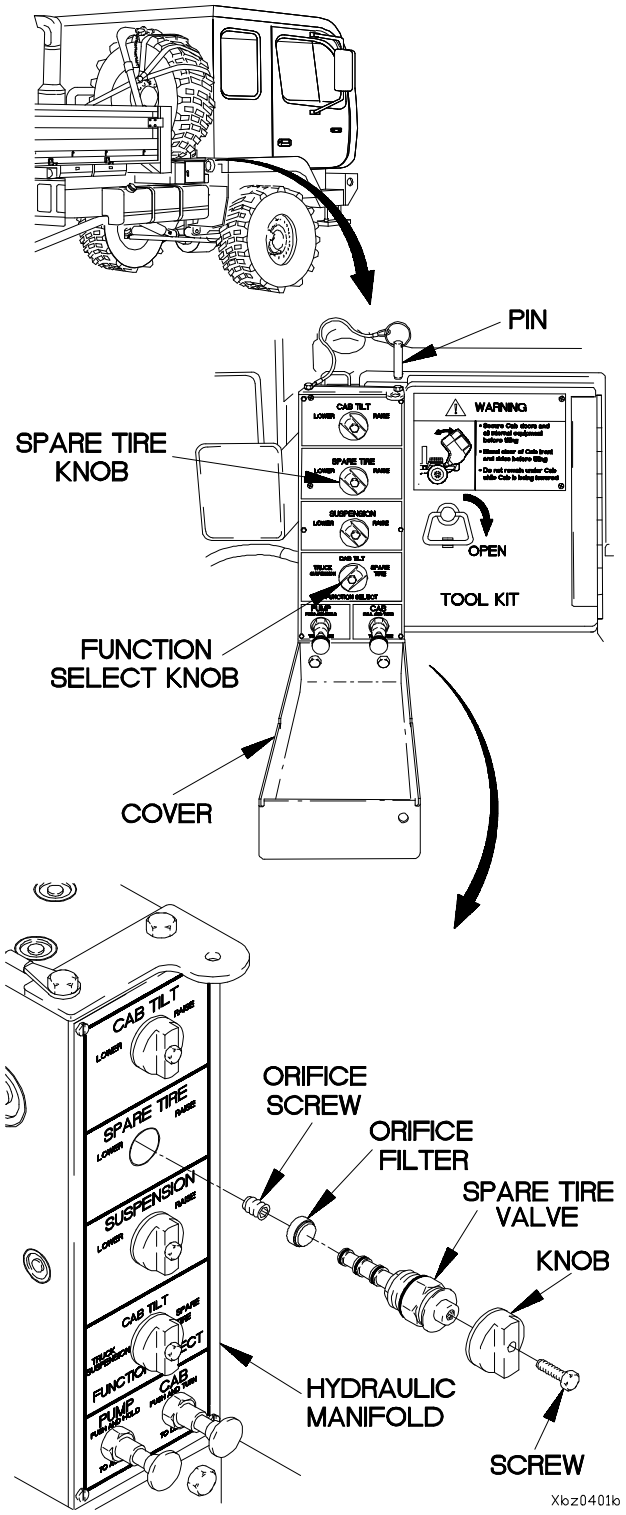
(1) Remove pin from hydraulic manifold cover and lower cover.
(2) Cycle FUNCTION SELECT knob through all settings.
(3) Cycle SPARE TIRE knob through both selector settings.
(4) Remove screw, knob, and SPARE TIRE valve from hydraulic manifold.
(5) Remove orifice filter (if equipped) from hydraulic manifold.
(6) If debris is present in orifice filter, replace orifice filter.
(7) Remove orifice screw from hydraulic manifold.
(8) If debris is present in orifice screw, clean orifice screw with compressed air.

NOTE

If no orifice filter was previously installed, install orifice filter at this time.

(9) Install orifice screw and orifice filter in hydraulic manifold.
(10) Position SPARE TIRE valve and knob on hydraulic manifold with screw.
(11) Tighten screw to 5-15 lb-in. (1-2 N·m).

Cont. on page 2-2118.9.



Cont. from page 2-2118.7.

WARNING

Drop hydraulic pressure to zero before disconnecting any hydraulic hoses. Failure to comply may result in injury to personnel.

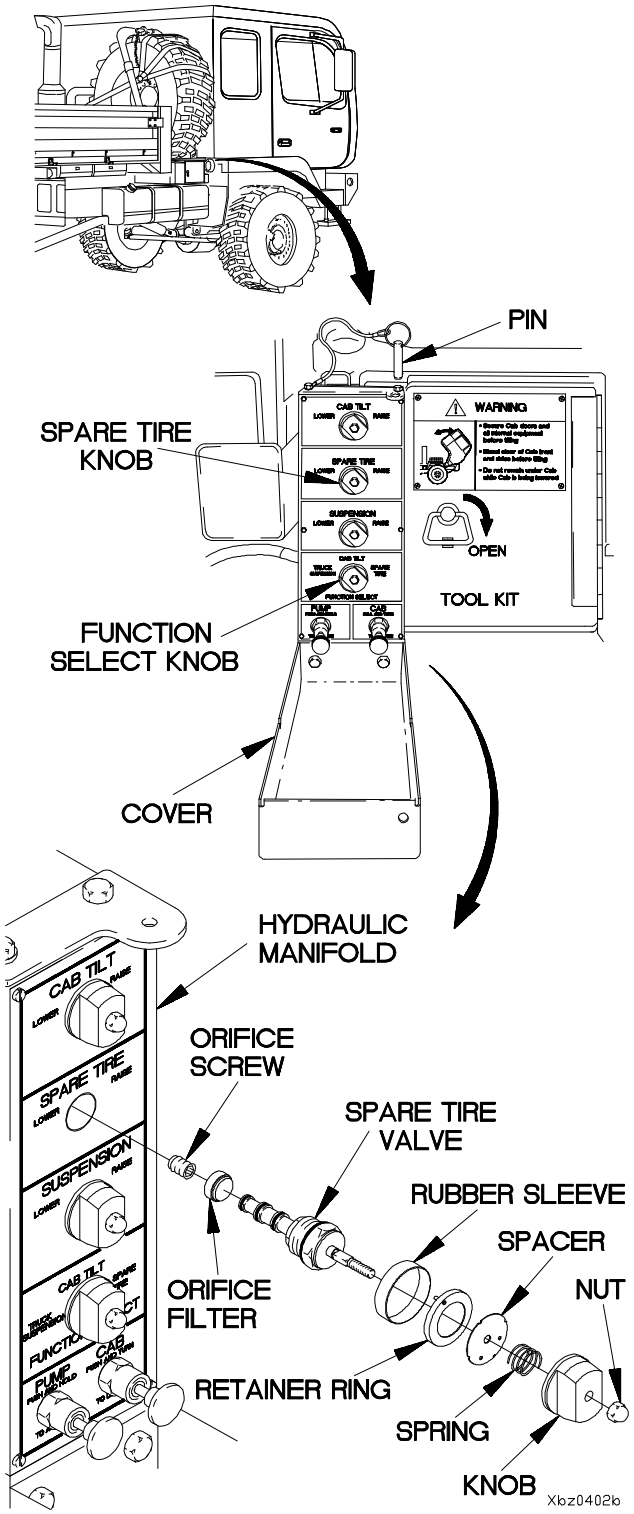
Hydraulic fluid (MIL-H-5606) is TOXIC. Wear protective goggles and gloves; use only in well ventilated area; avoid contact with skin, eyes, and clothes. Skin and clothing that come into contact with hydraulic fluid should be washed immediately. Saturated clothing should be removed immediately. Failure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

Compressed air used for cleaning purposes will not exceed 30 psi (270 kPa). Use only with effective chip guarding and personal protective equipment (goggles, shields, gloves, etc.). Failure to comply may result in injury to personnel.

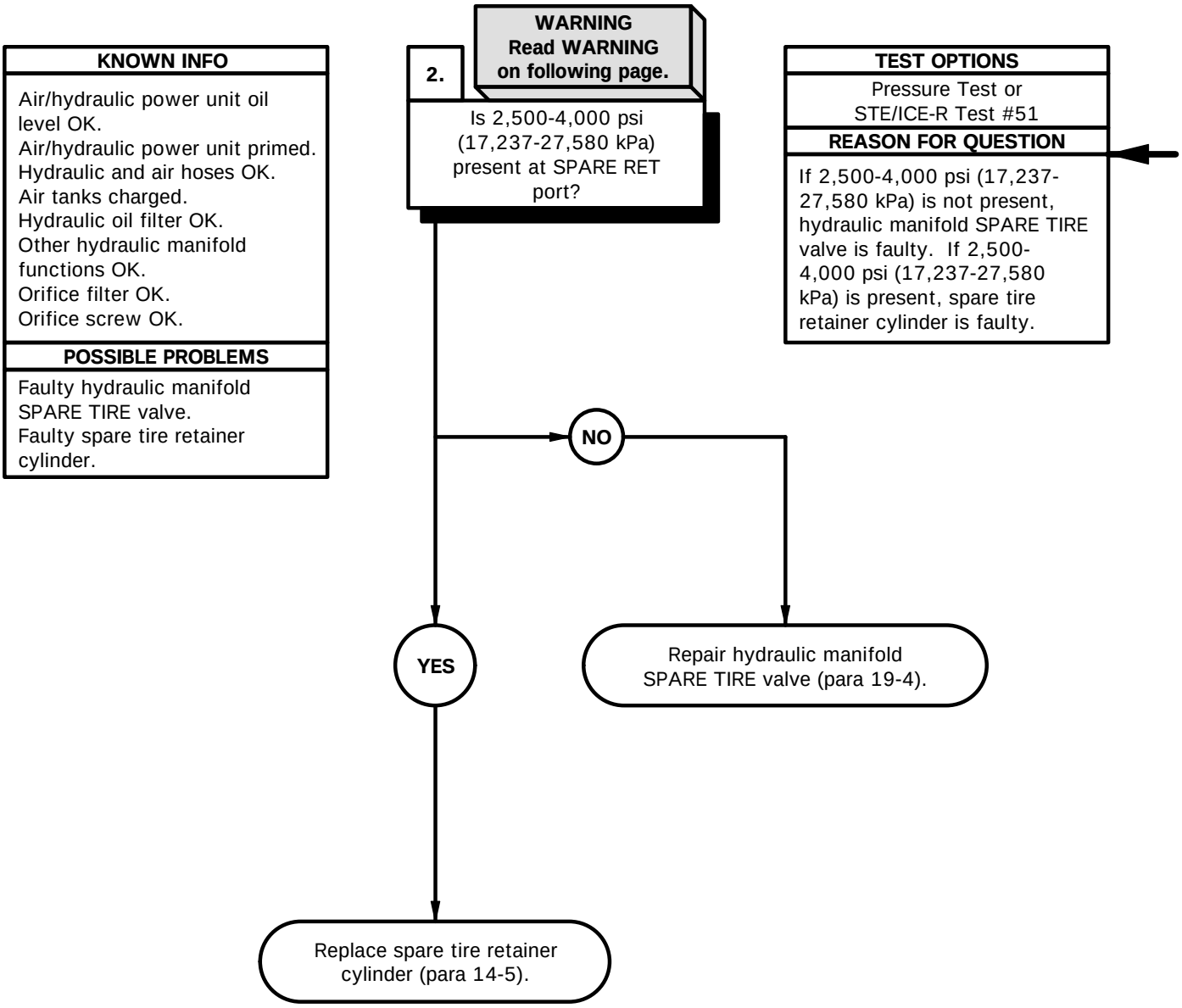
NOTE

Perform steps (12) through (23) on hydraulic manifolds P/N 65234.

(12) Remove pin from hydraulic manifold cover and lower cover.
(13) Cycle FUNCTION SELECT knob through all settings.
(14) Cycle SPARE TIRE knob through both selector settings.
(15) Remove nut, knob, spring, spacer, retainer ring, and rubber sleeve from SPARE TIRE valve.
(16) Remove SPARE TIRE valve from hydraulic manifold.
(17) Remove orifice filter from hydraulic manifold.
(18) If debris is present in orifice filter, replace orifice filter.
(19) Remove orifice screw from hydraulic manifold.
(20) If debris is present in orifice screw, clean orifice screw with compressed air.
(21) Install orifice screw and orifice filter in hydraulic manifold.
(22) Install SPARE TIRE valve in hydraulic manifold.
(23) Install rubber sleeve, retainer ring, spacer, spring, knob, and nut on hydraulic manifold.



v4. SPARE TIRE RETAINER DOES NOT LOWER (CONT)



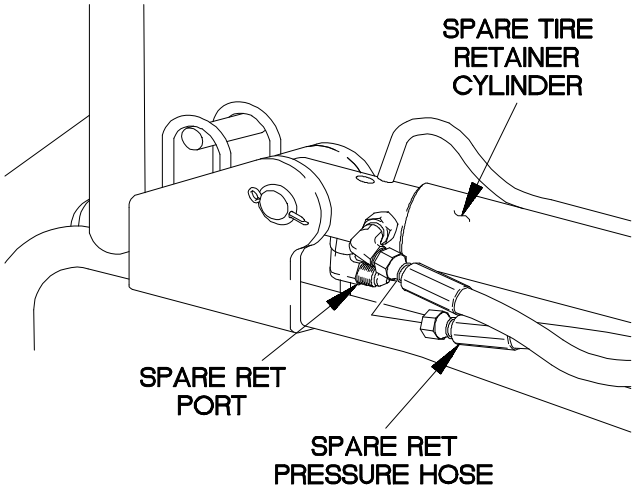
WARNING

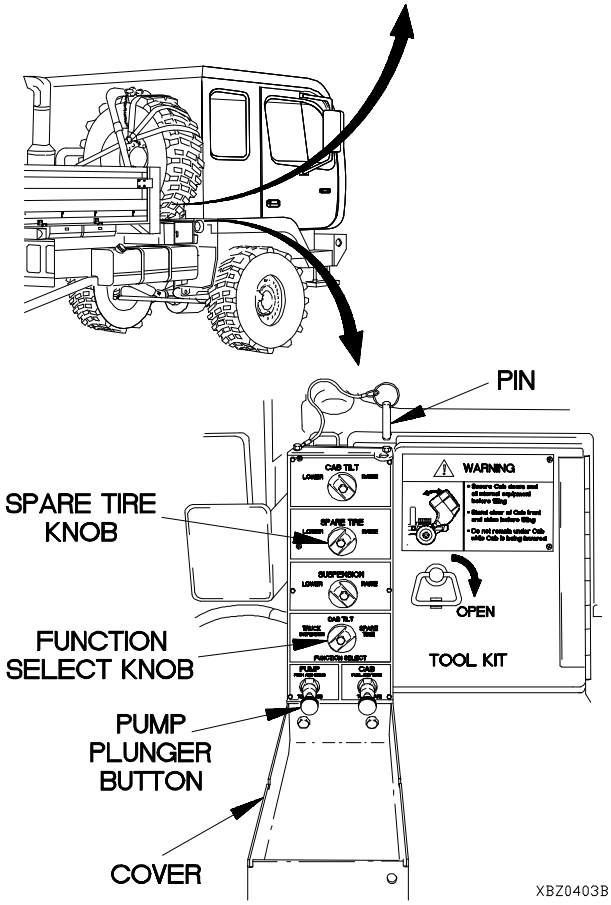
Drop hydraulic pressure to zero before disconnecting any hydraulic hoses. Failure to comply may result in injury to personnel.

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 into contact with hydraulic fluid should be washed immediately. Saturated clothing should be removed immediately. Failure to comply may result in injury to personnel.

PRESSURE TEST

(1) Position drain pan under spare tire retainer cylinder.
(2) Disconnect SPARE RET pressure hose from spare tire retainer cylinder port.
(3) Connect STE/ICE-R to SPARE RET pressure hose.
(4) Start engine and charge air tanks (TM 9-2320-365-10).
(5) Position SPARE TIRE knob to LOWER.
(6) Position FUNCTION SELECT knob to SPARE TIRE.
(7) Push and hold PUMP plunger button and perform STE-ICE-R Test #51 (TM 9-4910-571-12&P).
(8) If pressure is not 2,500-4,000 psi (17,237-27,580 kPa), repair hydraulic manifold SPARE TIRE valve (para 19-4).
(9) If pressure is 2,500-4,000 psi (17,237-27,580 kPa), replace spare tire retainer cylinder (para 14-5).
(10) Drain air tanks (TM 9-2320-365-10).
(11) Disconnect STE/ICE-R from pressure hose.
(12) Connect pressure hose to spare tire retainer cylinder port.
(13) Close hydraulic manifold cover and install pin.





2-33. FRAME TROUBLESHOOTING

This paragraph covers Frame Troubleshooting. The Frame Fault Index, Table 2-59, lists faults for the frame of the vehicle.

Table 2-59. Frame Fault Index

Fault No.	Description	Page
w1.	Tires Continue To Wear After Front End Alignment and/or Vehicle Drives Sideways Down Road	2-2122

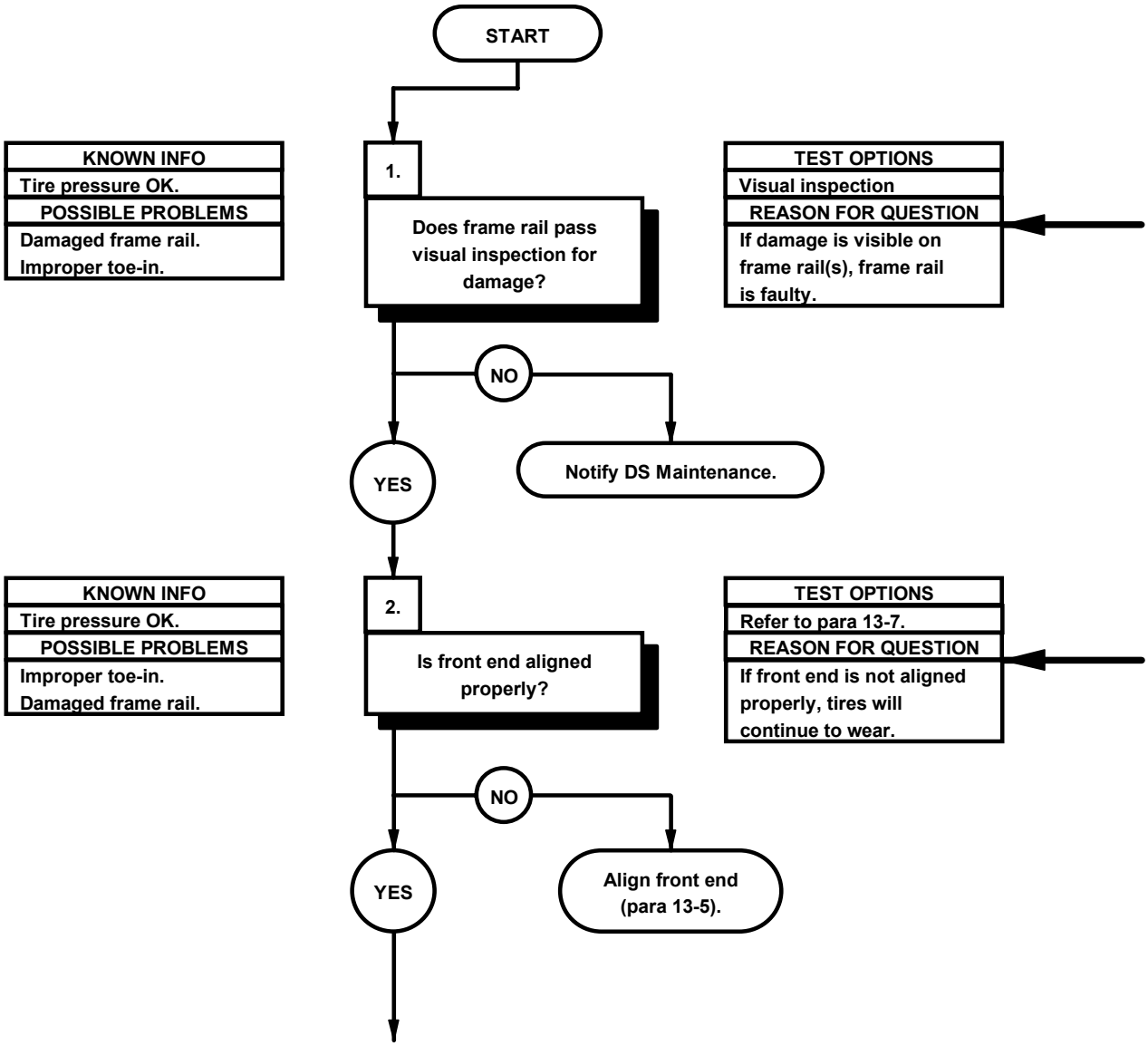
w1. TIRES CONTINUE TO WEAR AFTER FRONT END ALIGNMENT AND/OR VEHICLE DRIVES SIDEWAYS DOWN ROAD

INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)

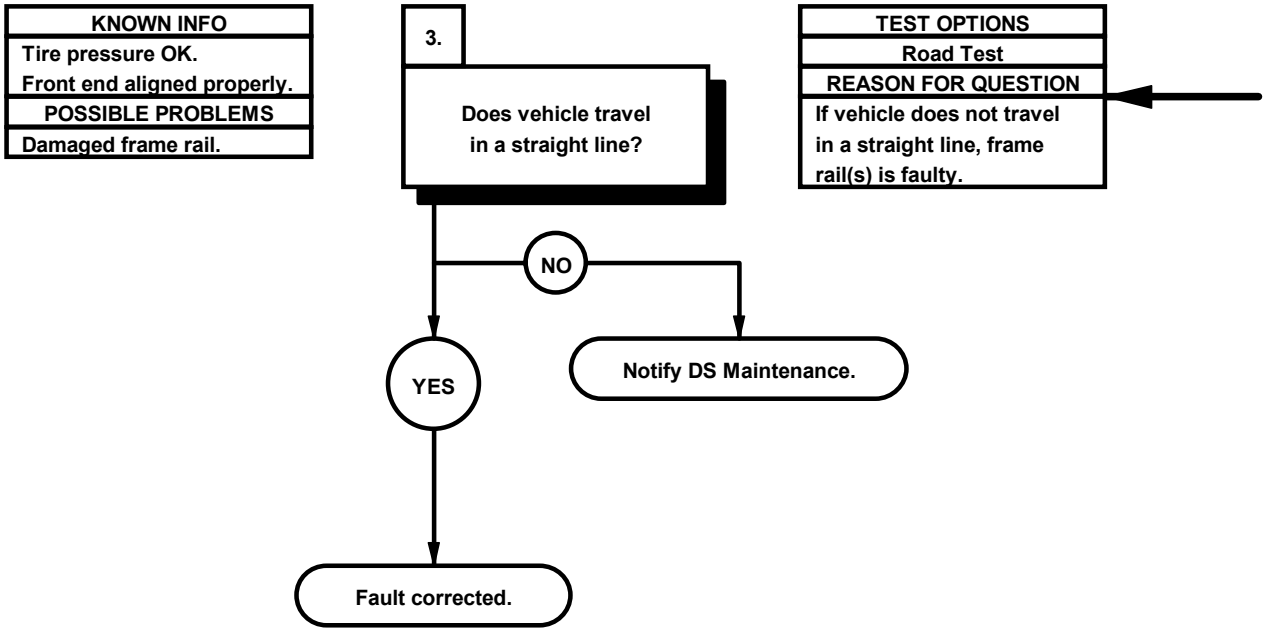
Personnel Required
(4)



Inspect frame rails and cross members for visible damage. If frame rail(s) and/or cross member(s) show any evidence of damage or bends, notify DS Maintenance.

Perform front end alignment and verify proper toe-in (para 13-5).

w1. TIRES CONTINUE TO WEAR AFTER FRONT END ALIGNMENT AND/OR VEHICLE DRIVES SIDEWAYS DOWN ROAD (CONT)



ROAD TEST

(1) Road test vehicle with additional vehicle following.
(2) Have following vehicle monitor path of lead vehicle.
(3) If front of vehicle can be seen while in direct line of rear of vehicle, notify DS Maintenance.

Section V. MAINTENANCE PROCEDURES

2-34. MAINTENANCE INTRODUCTION

This section provides general procedures to be followed for the Unit Maintenance level as specified in the Maintenance Allocation Chart (MAC). When a special procedure is used, the detailed procedure will be in the section covering that component.

2-35. GROUND HANDLING

a. Towing. Two towing eyes are located at front and two located at rear of vehicle.

b. Parking. Parking brakes are designed to hold GVW on a minimum of 7-9 percent grade, pointing either uphill or downhill per Federal Motor Carrier Safety Regulation 393.41.

c. Mooring and Transporting. For forward, aft, lateral and upward movements, vehicle has four tiedown rings. Refer to TM 9-2320-365-10 for mooring condition and tiedown locations.

d. Hoisting. Sling assemblies and towing eyes used for hoisting are found on the vehicle.

2-36. GENERAL REMOVAL INSTRUCTIONS

a. Work Required. Remove parts if repair or replacement is required. Do not disassemble a component any further than needed.

b. Preparation. Before removal of any electrical, hydraulic, or air system components, ensure system component is not energized or pressurized. Disconnect battery ground cables. Relieve air system pressure. Before removal of fasteners (nuts, self-locking nuts) remove any paint on threads to prevent binding of fastener.

c. Identification. To ease assembly and installation, tag and mark shims, connectors, wires and mating ends of lines before disconnecting them. Identify similar parts to ensure correct assembly.

d. Position of Valves. Before removing valve handles, mark or diagram their positions when open and closed. This will help during assembly.

e. Tire Removal. Before removing any tires, position jackstands under axles, walking beams or frame. This will secure the vehicle for safe tire removal.

f. Location. Before removing cable ties, cushion clamps, hoses, tubing, wiring etc., note the location, position and routing to ensure correct assembly.

2-36. GENERAL REMOVAL INSTRUCTIONS (CONT)

g. Data Plate Removal.

WARNING

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

CAUTION

Use appropriate size drill bit when removing rivets. Failure to comply may cause damage to equipment.

Remove rivets and data plate from vehicle.

h. Blind Rivet Nut Removal.

WARNING

Wear appropriate eye protection when removing blind rivet nuts. Failure to comply may result in injury to personnel.

CAUTION

Use appropriate size drill bit when removing blind rivet nuts. Failure to comply may cause damage to equipment.

Remove blind rivet nut from vehicle.

2-37. GENERAL DISASSEMBLY INSTRUCTIONS

a. Cleanliness. Work area must be as clean as possible to prevent contamination to components.

CAUTION

Self-locking fasteners that are loosened must be replaced, not tightened.

b. Locking Parts. Replace all lockwashers, cotter pins and self-locking nuts at time of reassembly.

c. Expendable Parts. All gaskets, preformed packings, and seals removed during repair must be discarded and replaced with new parts.

d. Removing Seals. Be sure all traces of oil, gaskets and sealants are removed from components. When possible, use wood or plastic probes and scrapers to prevent damage to machined surfaces.

CAUTION

Do not use tape to close off fuel or oil openings. Sticky surface of tape can mix with fuel and oil and cause engine malfunctions.

e. Parts Protection. To keep dust, dirt, moisture and other objects out of internal parts of systems or components, cap or tape all open tubes, hoses, air lines, fittings and components openings as soon as part is removed. Wrap all removed parts in clean paper or dip parts in preservation oil.

2-38. GENERAL CLEANING INSTRUCTIONS

WARNING

- **Dry Cleaning Solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in well ventilated area; avoid contact with skin, eyes, and clothes, and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flashpoint for Type I Dry Cleaning Solvent is 100°F (38°C) and for Type II is 130°F (50°C). Failure to comply may result in serious injury or death to personnel.**

- **If personnel become dizzy while using Dry Cleaning Solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.**

- **Never use fuel to clean parts. Fuel is highly flammable. Serious injury could result if fuel ignites during cleaning.**

a. Cleaning Solvents. Use only approved cleaning solvents to clean parts. Dry Cleaning Solvent P-D-680 (Item 71, Appendix D) is commonly used. Always work in a well-ventilated area.

WARNING

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

b. Removing Deposits. Soak parts in Dry Cleaning Solvent P-D-680 (Item 71, Appendix D), and wash away deposits by flushing or spraying. When necessary, brush with a soft bristle brush (not wire) moistened in solvent. Use compressed air to dry parts, except bearings, after cleaning. Bearings must drip and air dry.

c. Tools. Do not use wire brushes, abrasive wheels, or compounds to clean parts unless specifically approved in the detailed procedures. Parts may be scratched or altered and may weaken a highly stressed part.

d. Ball and Roller Bearings. When cleaning ball or roller bearings, place them in a basket and suspend them in a container of Dry Cleaning Solvent P-D-680 (Item 71, Appendix D). If needed, use a brush to remove caked grease, chips, etc. Avoid rotating bearing before solid particles are removed to prevent damaging races and balls. When bearings have been cleaned, coat them lightly with lubricating oil (Item 43, Appendix D) to remove Dry Cleaning Solvent.

CAUTION

Do not clean tires, lubricant seals, rubber hoses, or electrical components with solvent mixture. Failure to comply may result in damage to equipment.

e. Rubber Parts. Do not clean preformed packings or other rubber parts in Dry Cleaning Solvent. Wipe parts clean with a dry wiping rag (Item 51, Appendix D).

WARNING

Steam cleaning creates hazardous noise levels and severe burn potential. Eye, skin, and ear protection is required. Failure to comply may result in injury to personnel.

CAUTION

Steam cleaning may cause water to enter the transmission Electronic Control Unit (ECU) connector. Failure to dry off connector after steam cleaning may result in bad ECU codes.

f. Exterior Parts. Steam clean all exterior parts thoroughly before removing. This will make inspection and disassembly easier.

WARNING

Solvents used with a spray gun must be used in a spray booth with filter. Face shield must be used by personnel operating spray gun. Failure to comply may result in injury to personnel.

g. Engine, Cab, and Body. Use a spray gun and solvent mixture for cleaning exterior of engine, cab, and body. Allow mixture to remain on item surface for 10 minutes before rinsing. Rinse with hot water under 80 to 120 psi (550 to 830 Kpa), if available. An ordinary garden hose with nozzle may be used if other equipment is not available. Rinse thoroughly.

CAUTION

To prevent corrosion, parts should be dipped in rust preventive within two hours of degreasing. Failure to comply may result in damage to equipment.

h. Degreasing Machine. A degreasing machine may be used to remove heavy grease and oil from metal parts.

WARNING

- **Dry Cleaning Solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in well ventilated area; avoid contact with skin, eyes, and clothes, and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flashpoint for Type I Dry Cleaning Solvent is 100°F (38°C) and for Type II is 130°F (50°C). Failure to comply may result in serious injury or death to personnel.**

- **If personnel become dizzy while using Dry Cleaning Solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.**

- **Never use fuel to clean parts. Fuel is highly flammable. Serious injury could result if fuel ignites during cleaning.**

i. Passages. After degreasing, check all oil passages and cavities for dirt or blockage before coating with lubricating oil (Item 43, Appendix D). Run a thin, flexible wire through oil passages to make sure they are not clogged. Use a pressure spray gun and Dry Cleaning Solvent P-D-680 (Item 71, Appendix D) to clean dirty passages.

j. Electrical Parts. Electrical parts, such as coils, junction blocks, and switches should not be soaked or sprayed with cleaning solutions. Clean these parts with a clean wiping rag (Item 51, Appendix D) moistened with Dry Cleaning Solvent P-D-680 (Item 71, Appendix D).

CAUTION

Do not use soap or alkalies for cleaning tank interiors. Failure to comply may result in damage to equipment.

k. Fuel Tank. Pay special attention to all warnings and cautions when working on vehicle's fuel tank. Fuel tanks should be flushed, using a spray gun and Dry Cleaning Solvent P-D-680 (Item 71, Appendix D).

WARNING

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

l. Battery. Exterior surfaces of the electrical system and battery should be cleaned with a weak solution of baking soda and water. Apply solution with a bristle brush to remove any corrosion. Pay special attention to all warnings and cautions when working on batteries.

m. Hydraulic System. When cleaning hydraulic system parts use Dry Cleaning Solvent P-D-680 (Item 71, Appendix D). Clean and dry parts thoroughly to make sure no residue remains. If a coating of preservative is required before assembly, apply a light film of lubricating oil (Item 43, Appendix D).

2-39. GENERAL INSPECTION INSTRUCTIONS

a. Cleaning. Clean all parts before inspection. Check for defects such as physical distortion, wear, cracks, and pitting.

b. Sealing Surfaces. Inspect all surfaces in contact with gaskets, packings, or seals for nicks and burrs. If any defect is found, remove it before assembly.

c. Bearings. Inspect bearings for rusted or pitted balls, races, or separators. Inspect balls and races for brinelling, abrasion, and serious discoloration. The following are conditions for bearing rejection:

(1) Cuts or grooves parallel to ball or roller rotation.

(2) Fatigue pits (not minor machine marks or scratches).

(3) Cracks.

d. Gears and Splined Shafts. Inspect gears and splined shafts for wear, pitting, rolling, peening, scoring, burning, brinnelling and fatigue cracks.

e. Tubing and Hoses. Inspect all hose surfaces for broken or frayed fabric. Check for breaks caused by sharp kinks or contact with other parts of the vehicle. Inspect copper tubing lines for kinks. Inspect fitting threads and mating surfaces for damage. Replace any defective part. After assembly and during initial vehicle operation period, check for leaks.

f. Electrical Parts. Inspect all wiring harnesses for broken, chafed, or burned wiring. Inspect all terminal connectors for loose connections and broken parts.

g. Metal Parts. Visually inspect all castings and weldments for cracks. Parts that carry a great load should receive magnetic particle inspection. Critical non-ferrous parts may be inspected with fluorescent penetrant.

h. Drain Plugs. When removing drain plugs from transmission, engine, hydraulic system components, or axle differential and planetary hubs, check amount of sediment on plugs. Accumulations of grit or fine metal particles may indicate actual or potential component failure. A few fine particles are normal. This inspection helps to determine if there are defective parts prior to internal inspection of the component and to predict degradation of the equipment.

2-40. GENERAL REPAIR INSTRUCTIONS

a. Burrs. Remove burrs from surface teeth with a fine-cut file or crocus cloth.

b. Exterior Parts. Chassis and exterior painted parts may be resurfaced when paint is damaged, or where parts have been repaired (TB 43-0242).

NOTE

Polished and machined steel parts not protected by cadmium, tin, copper, or other plating or surface treatment require protection. Bare metal parts must be free of moisture when protective coating is applied.

c. Protecting Parts. Protect bare steel surfaces from rust when not actually undergoing repair work. Dip parts in, or spray them with, corrosion preventive compound (Item 18, Appendix D). Aluminum parts may require protection in atmospheres having a high salt content.

d. Screws, Nuts and Fittings. Replace any screw, nut, or fitting with damaged threads. Inspect tapped holes for thread damage. If cross-threading is evident retap the hole for the next oversize screw or stud. If the retapping will weaken the part, or if the cost of the part makes retapping impractical, replace the part. Chasing the threads with proper size tap or die may be adequate.

e. Stud Installation. When installing studs use a proper driver. A worn stud driver may damage the end thread. Then a chasing die must be used before a nut can be screwed on. This procedure will remove cadmium plating and allow corrosion. Before installing a stud, inspect the hole for chips. Blow out foreign matter and start stud by hand. Before final insertion, coat thread with a film of antiseize compound (Item 14, Appendix D). Install stud to proper "setting height", which is the total projecting length.

f. Dents. Straighten minor body dents by tapping with a soft-faced hammer while using a wooden block backing.

g. Sheet Metal Repair. Repair minor skin cracks by installing patches.

h. Wire Repair. Replace all broken, worn, or burned electrical wiring. Wires with several broken strands must be replaced. Broken strands will increase the resistance of the wire and impair efficiency of electrical components, especially the ignition system. Wire numbers must be permanently identified on any new wiring.

i. Repair of Wires with Female Sockets. Strip insulation from wire to equal depth of terminal well. Slide shell and sleeve over wire insulation. Insert wire into terminal well. Crimp terminal well on wire. Slide sleeve and shell over terminal.

j. Repair of Wires with Male Plugs. Strip insulation from wire to equal depth of terminal well. Slide shell over wire insulation. Insert wire into terminal well. Crimp terminal well on wire. Place slotted washer over crimped terminal well. Slide shell over slotted washer and terminal.

k. Repair of Wires with Terminals of Various Configurations. Strip insulation from wire to equal depth of terminal well. Slide insulator over insulation. Insert wire into terminal well. Crimp terminal well on wire. Slide insulator over crimped terminal well.

l. Repair of Cables with Multiple Conductor Receptacle Connectors. Remove insulation sleeving from cable. Discard insulation sleeving. Extract electrical contact from receptacle body. Strip insulation from wire to equal depth of well in electrical contact. Position insulation sleeving on cable. Crimp electrical contact on wire. Install electrical contact in receptacle body. Heat shrink insulation sleeving.

m. Repair of Cables with Multiple Conductor Plug Connectors. Remove insulation sleeving from cable. Discard insulation sleeving. Extract electrical contact from plug body. Strip insulation from wire to equal depth of well in electrical contact. Position insulation sleeving on cable. Crimp electrical contact on wire. Install electrical contact in plug body. Heat shrink insulation sleeving.

n. Repair of Cables with Multiple Conductor Mate-N-Lock Series Connectors. Remove electrical contact from connector body. Strip insulation equal to depth of well on electrical contact. Position wire end in electrical contact. Crimp electrical contact on wire end. Install electrical contact in connector body. Remove electrical contact from connector body. Strip insulation equal to depth of well on electrical contact. Position wire end in electrical contact. Crimp electrical contact on wire end. Install electrical contact in connector body.

o. Repair of Cables with Multi-Conductor Metri-Pack Series Connectors. Extract electrical contact from connector body. Strip insulation from wire to equal depth of well in electrical contact. Crimp electrical contact on wire. Install electrical contact in connector body.

p. Repair of Cables with Multi-Conductor Sure-Seal Series Plug and Receptacle Connectors. Remove insulation sleeving from connector body. Discard insulation sleeving. Extract electrical contact from connector body. Strip insulation from wire to equal depth of well in electrical contact. Position insulation sleeving on cable. Crimp electrical contact in connector body. Heat shrink insulation sleeving.

q. Repair of Cables with MIL-SPEC Solder-Type Terminal Connectors. Loosen two retaining screws on cable clamp. Remove cable clamp from connector body. Desolder wire from electrical contact. Remove wire from electrical contact. Strip insulation from wire to equal depth of well in electrical contact. Position wire in electrical contact. Solder wire to electrical contact. Install cable clamp on connector body with two retaining screws.

2-41. GENERAL ASSEMBLY INSTRUCTIONS

a. Preparation. Remove protective grease coatings from new parts before installation.

b. Preformed Packing Installation. Lubricate all preformed packings with a thin coat of lubricating oil (Item 43, Appendix D) before installing. To install a preformed packing, first clean the groove, then stretch packing and place into position. Place component on flat surface and uniformly press packing into position.

c. Pipe Joints and Fittings. Use nonhardening sealing compound (Item 64, Appendix D) or antiseizing tape (Item 73, Appendix D) to join piping and fittings.

d. Oil Seals. Coat oil seals evenly with oil or grease before installing. Install oil seals with seal lip facing toward lubricant, applying an even force to outer edge of seal. If oil seals are to be installed over keyed or splined shafts, use a guide to prevent sharp edge of keyway or splines from cutting the leather or neoprene seal. Construct guides of very thin gauge sheet metal and shape to the required diameter. Make certain guide edges are not sharp and are bent slightly inward so they do not cut the seal.

e. Bearings and Shafts. When mounting bearings on shafts always apply force to the inner races. When mounting bearings into housing always apply the force to the outer race.

f. Bearing Lubrication. Lubricate bearings before assembly with lubricant used in the related housing or container to provide the first run-in until lubricant from the system can reach the bearings.

WARNING

On direct contact, uncured silicone sealant irritates eyes. In case of contact, flush eyes with water and seek medical attention. In case of skin contact, wipe off and flush with water. Failure to comply may result in injury to personnel.

g. Silicone Sealant. Silicone sealant is often used instead of a gasket to seal mating parts. The mating parts must be clean, dry, and free of oil or grease for proper adhesion. After silicone sealant has been applied, the mating parts must be assembled immediately. Silicone sealant starts to set-up in 15 minutes and takes 24 hours to completely dry. Excess silicone sealant should be wiped off after assembling the mating parts.

h. Gaskets. Remove all traces of previous gasket and sealant before installing new gasket. Coat both sides of gasket with sealant to provide added sealing.

2-42. GENERAL INSTALLATION INSTRUCTIONS

a. Preparation. When unpacking items, remove all packing material, barrier paper, tape, plastic bags, protective caps and protective grease coatings. Handle and store removed components carefully.

CAUTION

Use sealing compound sparingly and only on threads. Do not apply compound to hose connections. Failure to comply may result in damage to equipment.

b. Sealing Compounds. Use sealing compounds as required in each maintenance task.

c. Torquing. Tighten nuts, bolts, screws, and fittings as required in Appendix F or in each maintenance task.

d. Identification Tags. Put hoses, tubes, lines, and electrical wiring in place by matching identification tags and markings on equipment.

e. Hoses, Air Lines and Wiring. After installing hoses, air lines and wiring, ensure that they do not contact moving parts or components edges. Secure in place, out of way with cable ties and cushion clamps.

f. Data Plate Installation.

Install data plate on vehicle with rivets.

g. Blind Rivet Nut Installation.

Install blind rivet nut on vehicle using blind rivet tool kit.

2-43. PREPARATION FOR STORAGE OR SHIPMENT INTRODUCTION

a. This section gives instructions for making the vehicle ready for shipment or storage.

b. Refer to AR 750-1 for detailed administrative storage instructions.

c. Refer to TB 9-2300-422-20 for security procedures.

2-44. PREPARATION FOR STORAGE OR SHIPMENT

a. Perform Preventive Maintenance Checks and Services (PMCS) listed in Table 2-1.

WARNING

- **Heavy objects/loads, such as tool boxes and heavy parts, must always be carried on the floor with the weight distributed as equally as possible between left and right sides of M1079 van. Failure to comply decreases the stability of the M1079 van and will increase the likelihood of a rollover.**
- **Heavy cabinets must always be mounted as low as possible with the weight distributed as equally as possible between left and right sides of M1079 van. Remember to consider the weight of the items that will be stored in the cabinets. Failure to comply decreases the stability of the M1079 van and will increase the likelihood of a rollover.**
- **Always keep in mind, when placing items inside the M1079 van, that heavier items must always be positioned as low as possible and the weight distributed as equally as possible between left and right sides of M1079 van. Failure to comply decreases the stability of the M1079 van and will increase the likelihood of a rollover.**

b. Correct all deficiencies noted during inspection, if facilities are available. If repairs are required beyond the scope of Unit Maintenance, refer the deficiencies to Direct or General Support Maintenance.

2-45. STORAGE MAINTENANCE PROCEDURES

a. Provide access to the vehicle during storage.

CAUTION

Ensure tires are not resting on surfaces containing grease or oil. Failure to comply may result in damage to equipment.

b. Do not block wheels, but do be sure tires are not resting on surfaces containing grease or oil.

c. Perform complete lubrication in accordance with TM 9-2320-365-10 and Appendix H.

d. If possible, store vehicles close together, out of direct sunlight and away from electrical or generating equipment.

e. Ensure the fuel tank contains at least 20 gallons (75.7 liters) of treated fuel. The fuel should be treated with Biobor J.F. The addition of 3 teaspoons of Biobor to 20 gallons of fuel will provide adequate protection against fungus growth. When storing a vehicle in freezing conditions, the addition of 3 ounces of isopropyl alcohol to every 20 gallons of diesel fuel will help prevent fuel-line freeze up.

f. Monthly Storage Maintenance Instructions.

(1) Conduct visual inspection of vehicle. Check lubricant, battery electrolyte, coolant level and tire pressures. Correct any discrepancies.

(2) Inspect oil can points. Lubricate if necessary.

2-45. STORAGE MAINTENANCE PROCEDURES (CONT)

(3) Start engine and idle for 10 minutes. After 10 minutes of engine idle, operate engine for 5 minutes at 1500 rpm or until engine water temperature reaches 180°F. Shift transmission slowly through all gear selector positions. Return transmission to neutral.

(4) Move vehicle 30 feet forward and reverse.

(5) Idle engine 10 minutes before shutdown.

(6) Check grease coating on all chromium plated and unpainted surfaces. If grease was wiped from chromium plates or unpainted surfaces when vehicle was moved, recoat these surfaces.

g. Quarterly Storage Maintenance Instructions.

(1) Move vehicle at least 1/4 mile. While driving, shift transmission through all gear ranges.

(2) Exercise all auxiliary equipment and winch. While operating winch or crane, lubricate hoist and cables.

h. Yearly Storage Maintenance Instructions.

(1) Clean exterior, engine and undercarriage. Clean interior of cab. Wash any oil or grease from tires.

(2) Visually inspect vehicle. Check lubricant levels and tire pressures. Correct all discrepancies.

(3) Lubricate chassis, auxiliary equipment, winch and hoist cable and oil can points.

CHAPTER 3
ENGINE MAINTENANCE

RESTRICTED MAINTENANCE NOTICE

Units not authorized SC 4910-95-CL-A72 (SHOP EQUIPMENT, COMMON NO. 2) in their T.O.E. may be unable to perform some of the maintenance in this chapter. If the required tools are not authorized, the equipment must be submitted to DS Maintenance for repair.

Section I. INTRODUCTION 3-1
3-1. INTRODUCTION 3-1

Section II. MAINTENANCE PROCEDURES 3-2
3-2. LIFTING PLATE REPLACEMENT 3-2
3-3. VALVE COVER AND GASKET REPLACEMENT 3-6
3-4. ENGINE OIL FILTER REPLACEMENT 3-10
3-5. CRANKCASE BREATHER REPLACEMENT 3-13
3-6. ENGINE AND TRANSMISSION OIL SAMPLING VALVES REPLACEMENT 3-15
3-7. ENGINE OIL FILL TUBE REPLACEMENT 3-19

Section I. INTRODUCTION

3-1. INTRODUCTION

This chapter contains maintenance instructions for replacing engine components authorized by the Maintenance Allocation Chart (MAC) at the Unit Maintenance level.

Section II. MAINTENANCE PROCEDURES

3-2. LIFTING PLATE REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

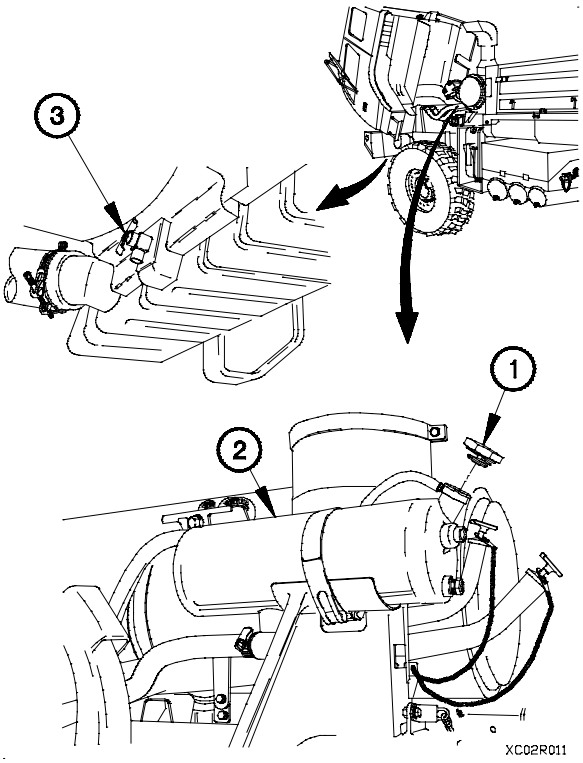
INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Container (40 qt (38 L) capacity)

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



a. Removal.

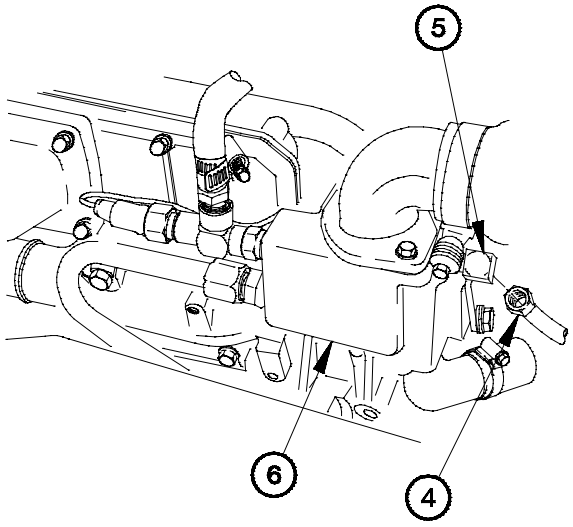
(1) Remove radiator cap (1) from radiator overflow tank (2).

(2) Position container under radiator draincock (3).

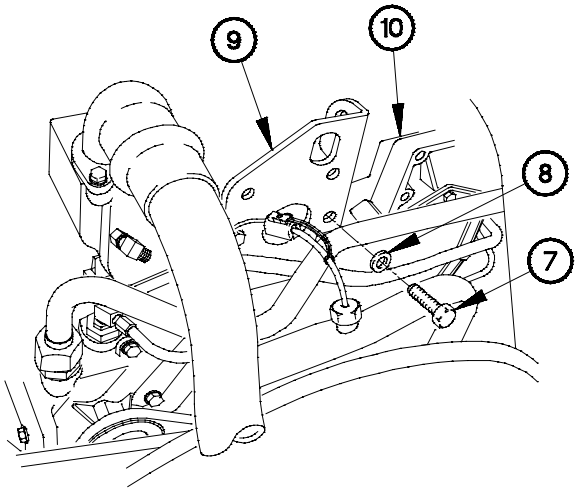
(3) Open radiator draincock (3) and drain approximately five gallons (19 L) of coolant.

(4) Close radiator draincock (3).

(5) Disconnect air compressor inlet coolant tube (4) from fitting (5) on thermostat housing (6).



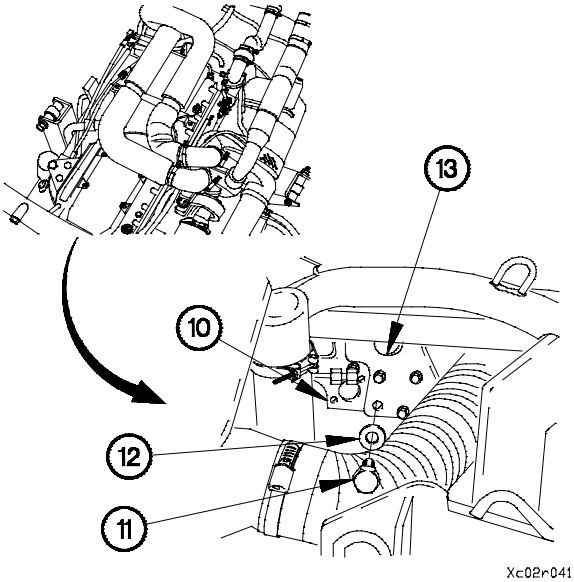
XC02R021



XC02R031

(6) Remove five screws (7), washers (8), and front lifting plate (9) from engine (10).

(7) Remove four screws (11), washers (12), and rear lifting plate (13) from engine (10).



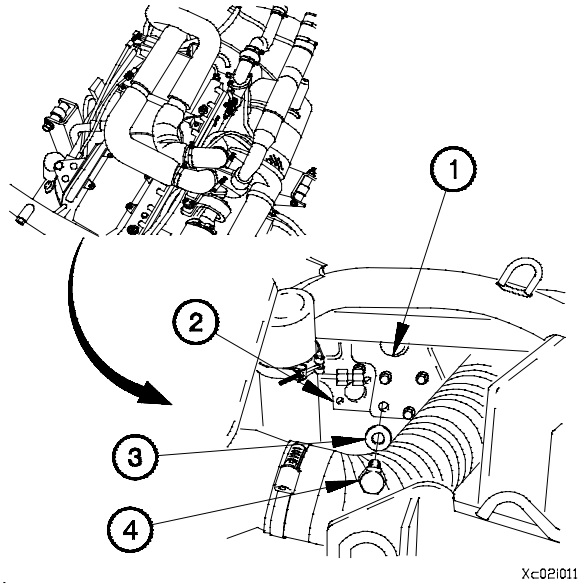
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3-2. LIFTING PLATE REPLACEMENT (CONT)

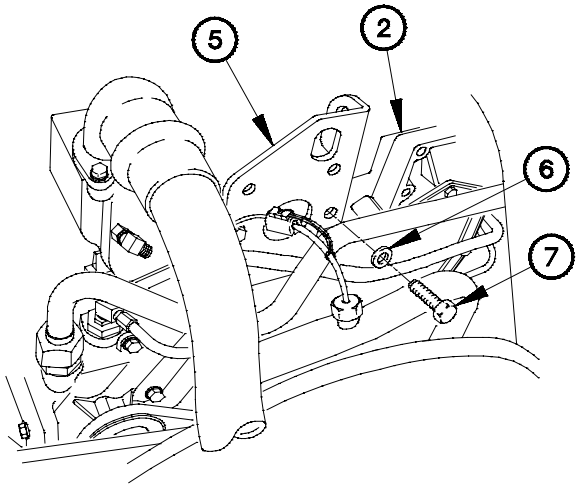
b. Installation.

(1) Position rear lifting plate (1) on engine (2) with four washers (3) and screws (4).

(2) Tighten four screws (4) to 47 lb-ft (64 N·m).



XC02I011

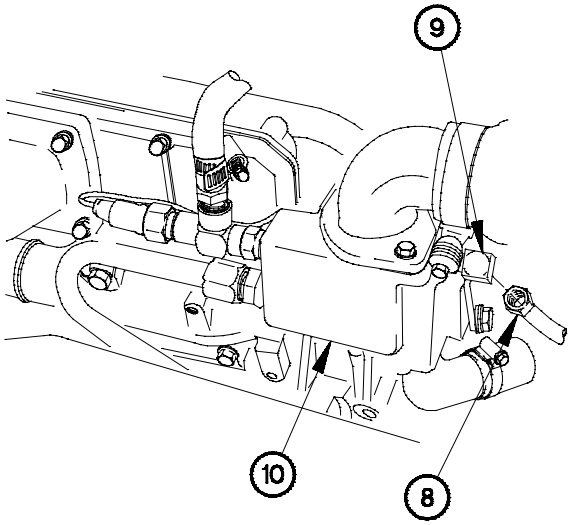


XC02I021

(3) Position front lifting plate (5) on engine (2) with five washers (6) and screws (7).

(4) Tighten five screws (7) to 47 lb-ft (64 N·m).

(5) Connect air compressor inlet coolant tube (8) to fitting (9) on thermostat housing (10).



XC02I031

c. Follow-On Maintenance.

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

(2) Start engine (TM 9-2320-365-10).

(3) Check for coolant leaks under vehicle.

(4) Add coolant to radiator overflow tank (TM 9-2320-365-10).

(5) Check coolant level after normal operating temperature is reached.

(6) Check for coolant leaks under vehicle.

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

(8) Check around thermostat housing for coolant leaks.

(9) Lower cab (TM 9-2320-365-10).

(10) Shut down engine (TM 9-2320-365-10).

End of Task.

3-3. VALVE COVER AND GASKET REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Charge air cooler to air inlet elbow tubes/hoses removed (para 4-5).

Tool and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 35, Appendix C)

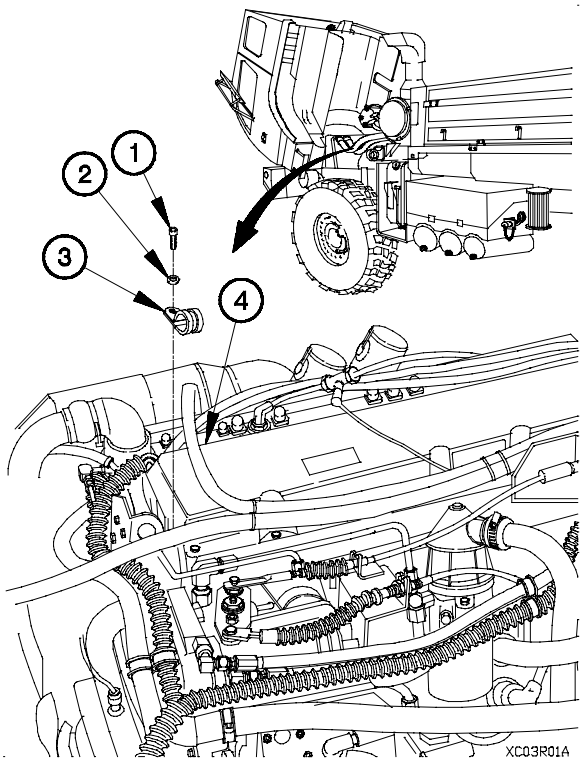
Materials/Parts
Rag, Wiping (Item 51, Appendix D)
Sealing Compound (Item 64, Appendix D)
Gasket (for valve cover 7W5627) (Item 42, Appendix G)
Gasket (for valve cover 119-2960) (Item 27, Appendix G)
Adhesive (Item 7, Appendix D)
Screw, Cap (14) (for replacement of valve cover 7W5627 with valve cover 119-2960) (Item 239, Appendix G)

a. Removal.

NOTE

Position hoses to allow access to valve cover.

(1) Remove screw (1), washer (2), and clamp (3) from valve cover (4).



CAUTION

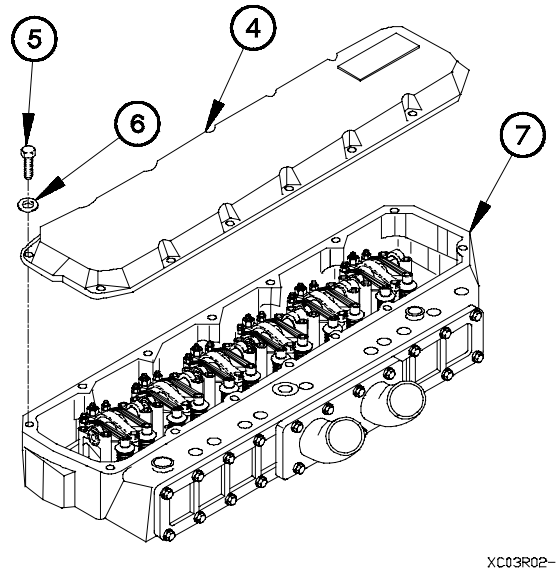
Area around valve cover must be clean before removing valve cover from inlet manifold to prevent contaminants from entering inlet manifold. Failure to comply may result in damage to equipment.

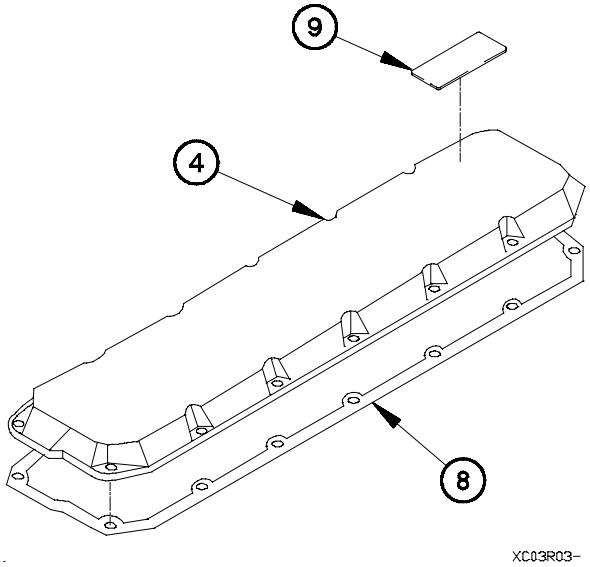
(2) Remove 13 screws (5) and washers (6) from valve cover (4).

CAUTION

Cover inlet manifold with wiping rags after valve cover is removed to prevent contamination of engine. Failure to comply may result in damage to equipment.

(3) Remove valve cover (4) from inlet manifold (7).





(4) Remove valve cover gasket (8) from valve cover (4). Discard gasket.

CAUTION

Engine data plate must remain with original engine. It contains engine serial number and other data for this engine. Failure to comply may result in damage to equipment.

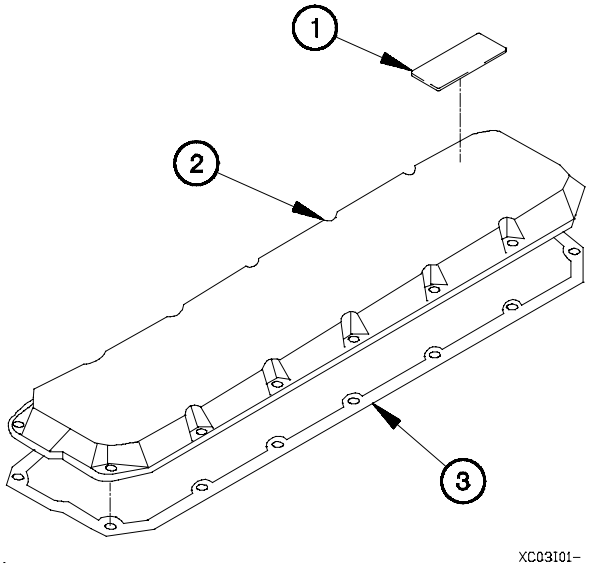
(5) Remove engine data plate (9) from valve cover (4).

3-3. VALVE COVER AND GASKET REPLACEMENT (CONT)

b. Installation.

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.

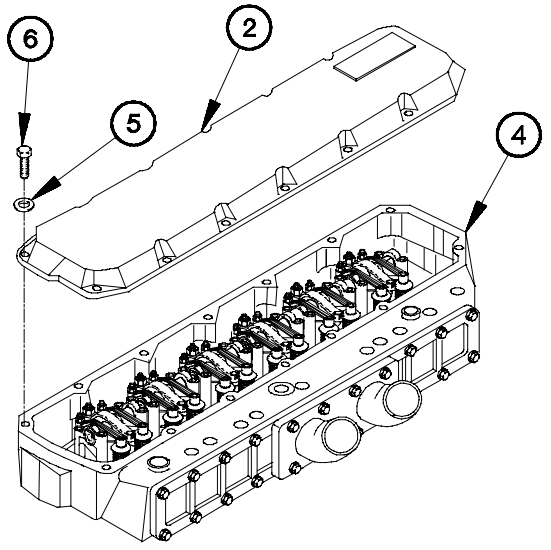


XC03I01-

(1) Install engine data plate (1) on valve cover (2) with adhesive.

(2) Apply sealing compound between screw holes of valve cover (2).

(3) Position valve cover gasket (3) on valve cover (2).



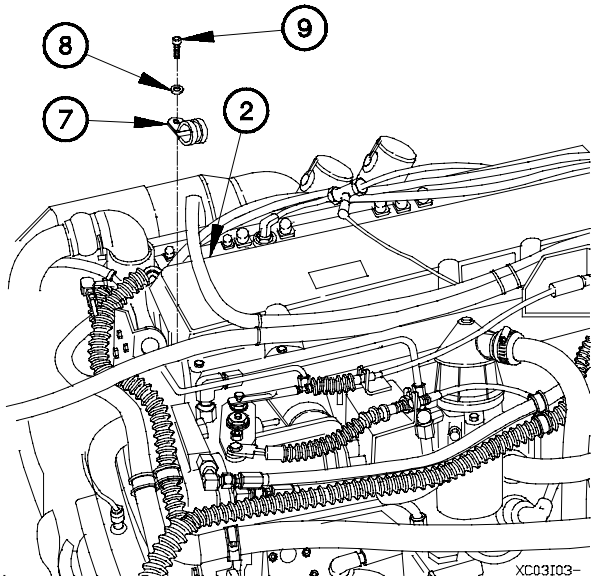
XC03I02-

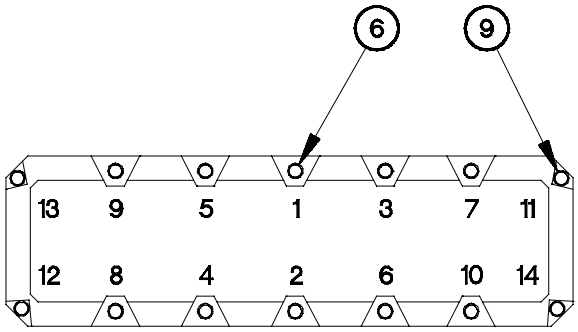
NOTE

Vehicle serial numbers 0001 through 3091 were originally equipped with valve cover part number 7W5627. Vehicle serial num-bers 3092 and higher serial numbers were originally equipped with valve cover part number 119-2960. If replacing valve cover part number 7W5627 with valve cover part number 119-2960, it will be necessary to use the longer screws.

(4) Position valve cover (2) on inlet manifold (4) with 13 washers (5) and screws (6).

(5) Position clamp (7) on valve cover (2) with washer (8) and screw (9).





TIGHTENING SEQUENCE

XC03I04-

(6) Tighten 13 screws (6) and screw (9) to 84-132 lb-in. (9-15 N·m) in sequence shown.

c. Follow-On Maintenance.

(1) Install charge air cooler to air inlet elbow tubes/hoses (para 4-5).

(2) Lower cab (TM 9-2320-365-10).

(3) Start engine (TM 9-2320-365-10).

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

(5) Check for oil leaks around valve cover gasket.

(6) Lower cab (TM 9-2320-365-10).

(7) Shut down engine (TM 9-2320-365-10).

End of Task.

3-4. ENGINE OIL FILTER REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Goggles, Industrial (Item 15, Appendix C)
Wrench, Strap, Adjustable (Item 56, Appendix C)
Container (40 qt (38 L) capacity)

Materials/Parts
Oil, Lubricating, OE/HDO 30 (Item 46, Appendix D)
Filter, Oil (Item 22, Appendix G)
Packing, Preformed (Item 180, Appendix G)

WARNING

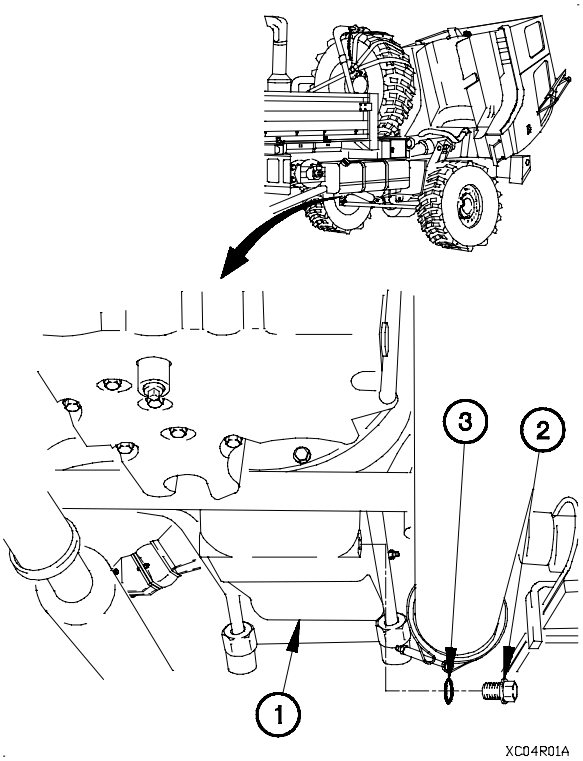
- **Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.**
- **Do not remove oil filter while engine is hot. Failure to comply may result in injury to personnel.**

a. Removal.

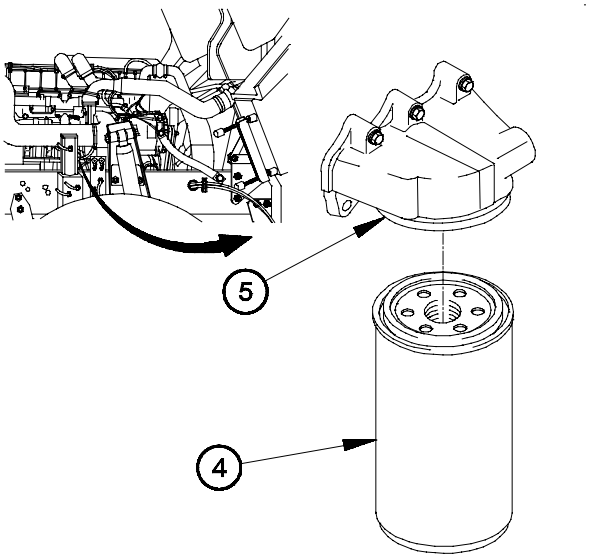
(1) Position container under oil pan (1).

(2) Remove oil pan plug (2) from oil pan (1).

(3) Remove preformed packing (3) from oil pan drain plug (2). Discard preformed packing.

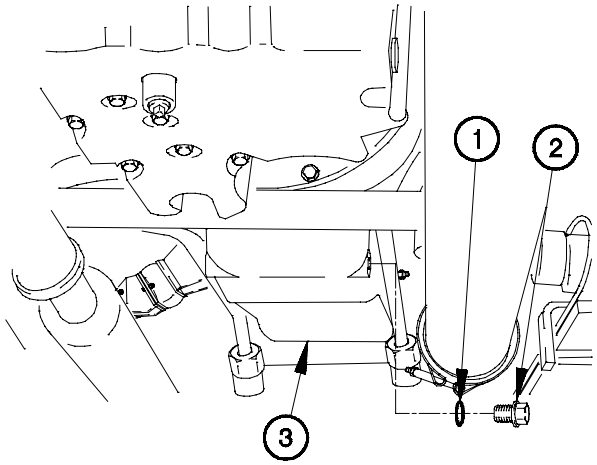


(4) Remove oil filter (4) from oil filter base (5). Discard oil filter.



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b. Installation.



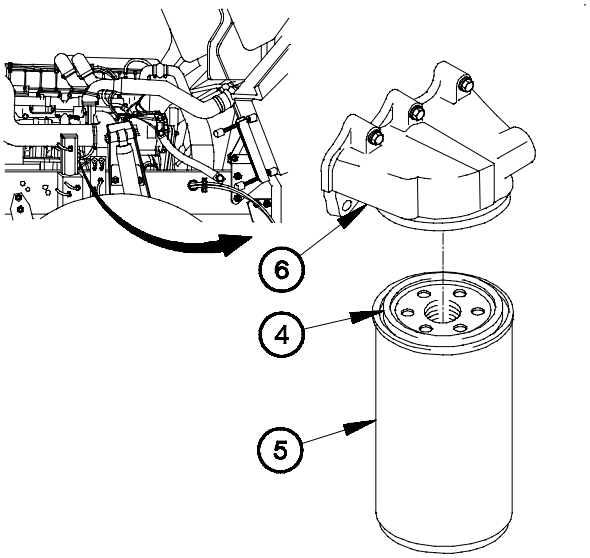
XC04I01A

(1) Install preformed packing (1) on oil pan drain plug (2).

(2) Install oil pan drain plug (2) in oil pan (3).

(3) Apply a thin coat of lubricating oil to oil filter gasket (4).

(4) Install oil filter (5) on oil filter base (6), hand tight.



XC04I02A

3-4. ENGINE OIL FILTER REPLACEMENT (CONT)

c. Follow-On Maintenance.

(1) Add oil to engine (Appendix H).

(2) Lower cab (TM 9-2320-365-10).

(3) Check for oil leaks under vehicle.

(4) Start engine (TM 9-2320-365-10).

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

(6) Check for oil leaks around oil filter and oil pan drain plug.

(7) Check engine oil level (TM 9-2320-365-10); if low, add oil (Appendix H).

(8) Lower cab (TM 9-2320-365-10).

(9) Shut down engine (TM 9-2320-365-10).

End of Task.

3-5. CRANKCASE BREATHER REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

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

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 35, Appendix C)

Materials/Parts
Rag, Wiping (Item 51, Appendix D)
Packing, Preformed (Item 184, Appendix G)
Oil, Lubricating, OE/HDO 30 (Item 46, Appendix D)

a. Removal.

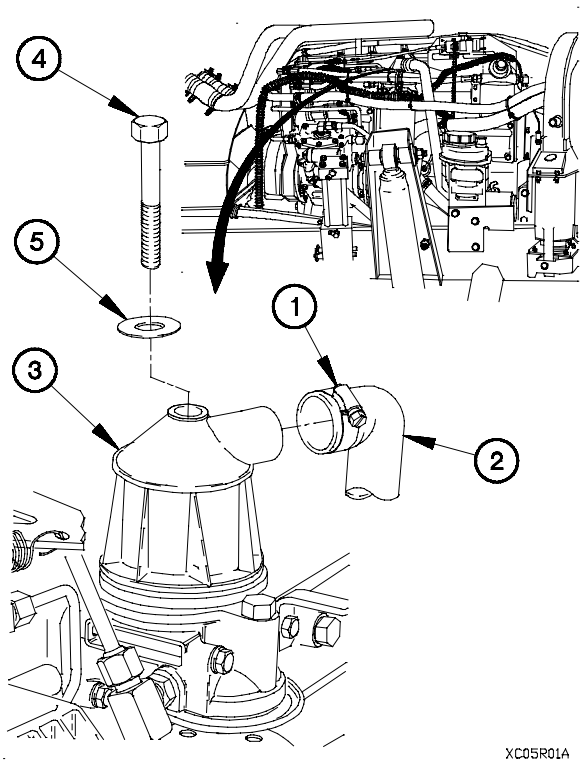
CAUTION

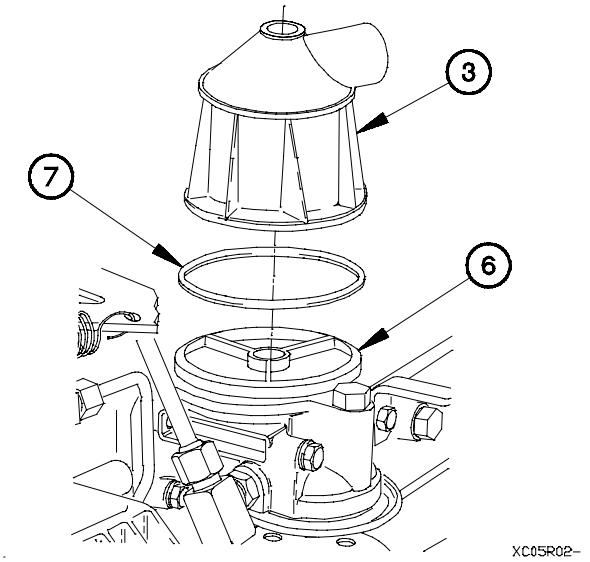
Wipe around fuel filter base before removing crankcase breather housing. Failure to comply may result in damage to equipment.

(1) Loosen hose clamp (1) on hose (2).

(2) Remove hose (2) from crankcase breather housing (3).

(3) Remove screw (4) and washer (5) from crankcase breather housing (3).





(4) Remove crankcase breather housing (3) from fuel filter base (6).

(5) Remove preformed packing (7) from fuel filter base (6). Discard preformed packing.

3-5. CRANKCASE BREATHER REPLACEMENT (CONT)

b. Installation.

(1) Apply a thin coat of lubricating oil to both sides of preformed packing (1).

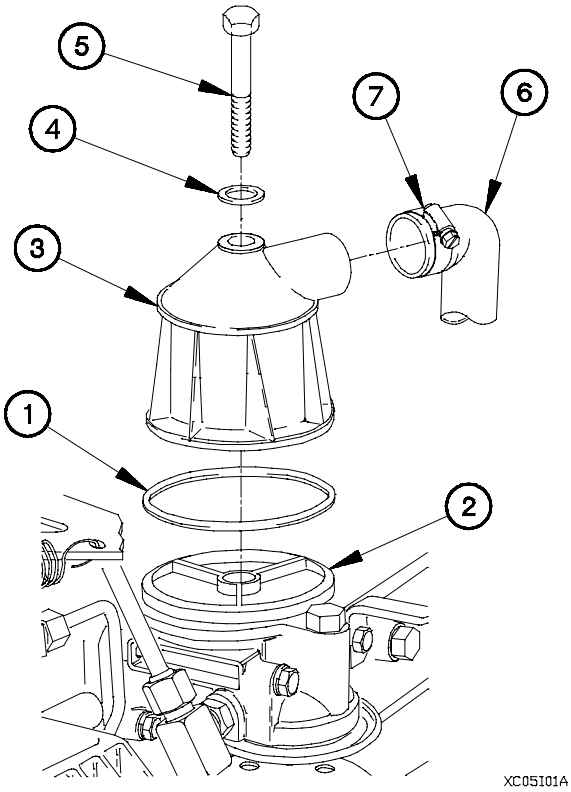
(2) Install preformed packing (1) on fuel filter base (2).

(3) Position crankcase breather housing (3) on fuel filter base (2) with washer (4) and screw (5).

(4) Tighten screw (5) to 96-144 lb-in. (11-16 N·m).

(5) Position hose (6) on crankcase breather housing (3) with clamp (7).

(6) Tighten clamp (7) to 35-45 lb-in. (4-5 N·m).



c. Follow-On Maintenance.

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

(2) Start engine (TM 9-2320-365-10).

(3) Check for oil leaks under vehicle.

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

(5) Check for oil leaks around breather housing gasket.

(6) Lower cab (TM 9-2320-365-10).

(7) Shut down engine (TM 9-2320-365-10).

End of Task.

3-6. ENGINE AND TRANSMISSION OIL SAMPLING VALVES REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

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

Tools and Special Tools
Goggles, Industrial (Item 15, Appendix C)
Pan, Drain (Item 24, Appendix C)
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Wrench Set, Socket (Item 49, Appendix C)

Materials/Parts
Dispenser, Pressure Sensitive Adhesive Tape (Item 21, Appendix D)
Packing, Preformed (Item 166, Appendix G)
Antiseize Compound (Item 63, Appendix D)

WARNING

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

a. Removal.

(1) Position drain pan under transmission oil sampling valve (1) and engine oil sampling valve (2).

NOTE

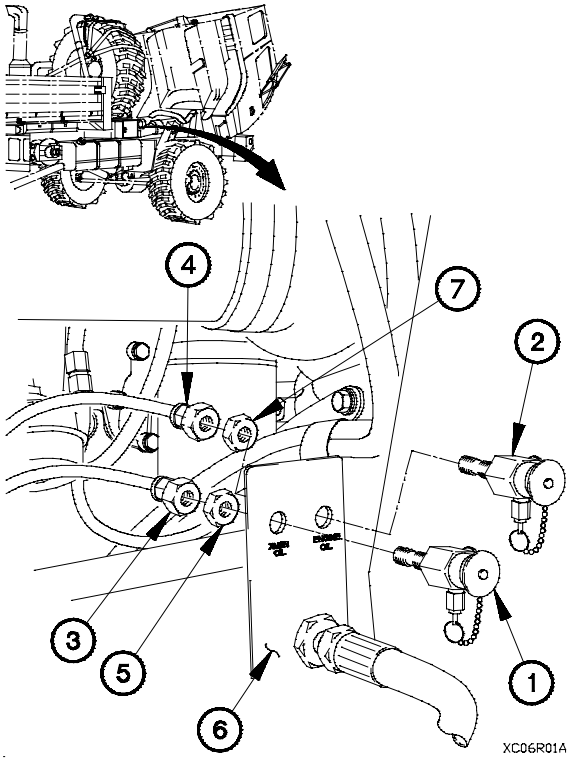
Tag hoses and connection points prior to disconnecting.

(2) Disconnect transmission oil sampling hose (3) from transmission oil sampling valve (1).

(3) Disconnect engine oil sampling hose (4) from engine oil sampling valve (2).

(4) Remove nut (5) and transmission oil sampling valve (1) from bracket (6).

(5) Remove nut (7) and engine oil sampling valve (2) from bracket (6).



3-6. ENGINE AND TRANSMISSION OIL SAMPLING VALVE REPLACEMENT (CONT)

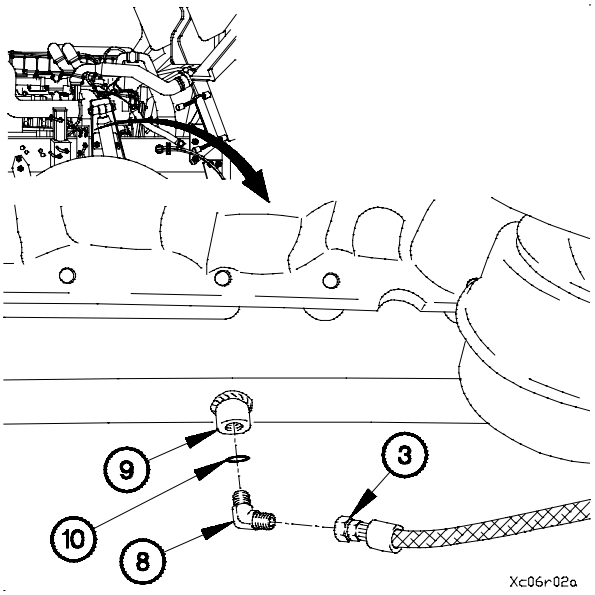
(6) Remove transmission oil sampling hose (3) from 45-degree fitting (8).

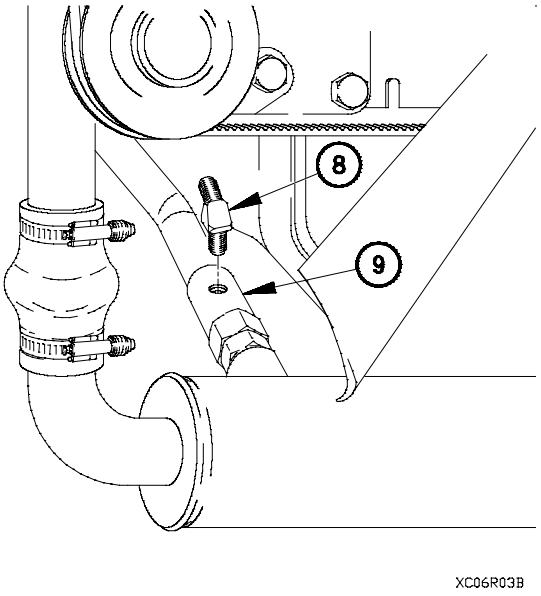
NOTE

- Note orientation of fitting prior to removal.
- Perform steps (7) and (8) on vehicles equipped with transmission oil cooler tubes.

(7) Remove 45-degree fitting (8) from transmission oil cooler tube (9).

(8) Remove preformed packing (10) from 45-degree fitting (8). Discard preformed packing.

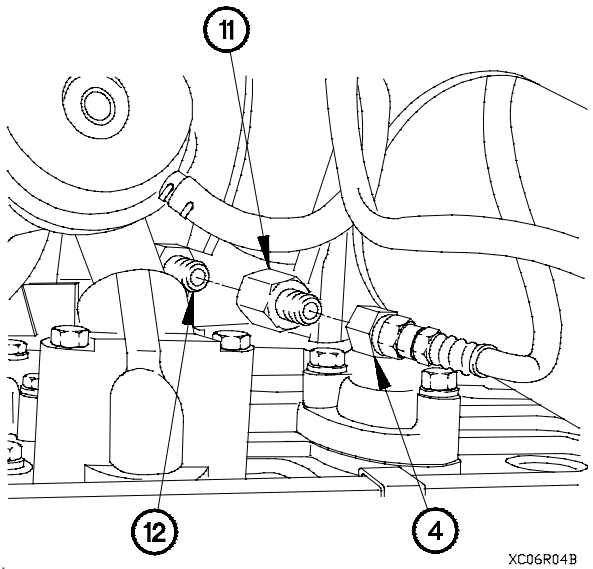




NOTE

Perform step (9) on vehicles equipped with transmission oil cooler hoses.

(9) Remove 45-degree fitting (8) from transmission oil cooler hose (9).



(10) Remove engine oil sampling hose (4) from adapter (11).

(11) Remove adapter (11) from 90-degree fitting (12).

b. Installation.

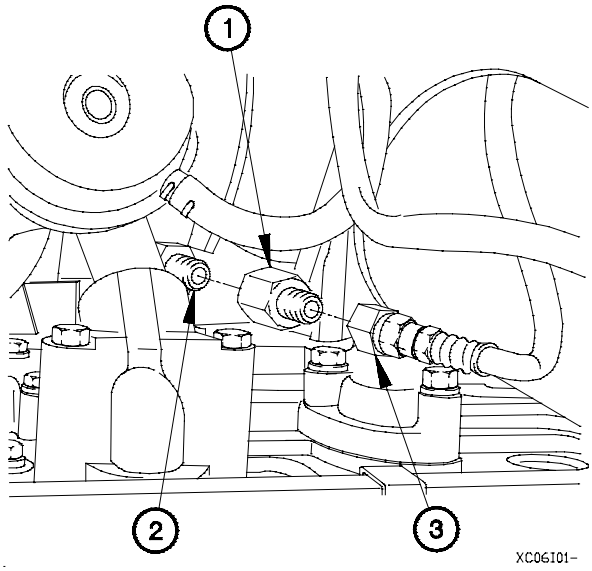
WARNING

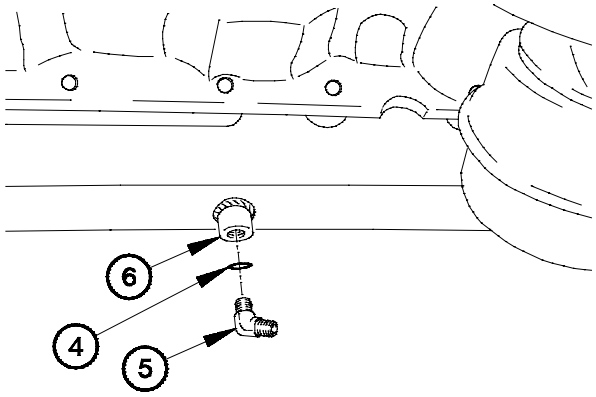
Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water. Failure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

(1) Apply antiseize compound to threads of adapter (1).

(2) Install adapter (1) on 90-degree fitting (2).

(3) Install engine oil sampling hose (3) on adapter (1).





NOTE

Perform step (5.1) and (5.2) on vehicles equipped with transmission oil cooler hoses.

(5.1) Apply antiseize compound to threads of 45-degree fitting (5).

(5.2) Install 45-degree fitting (5) in transmission oil cooler hose (6).

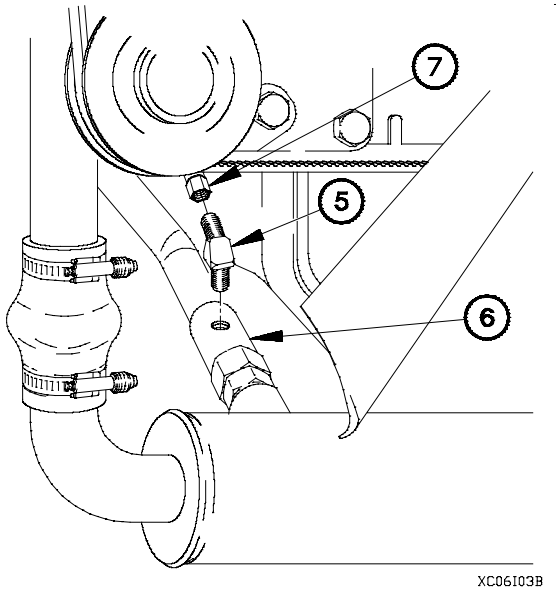
(6) Install transmission oil sampling hose (7) on 45-degree fitting (5).

NOTE

Perform steps (4) and (5) on vehicles equipped with transmission oil cooler tubes.

(4) Install preformed packing (4) on 45-degree fitting (5).

(5) Install 45-degree fitting (5) in transmission oil cooler tube (6).



3-6. ENGINE AND TRANSMISSION SAMPLING VALVE REPLACEMENT (CONT)

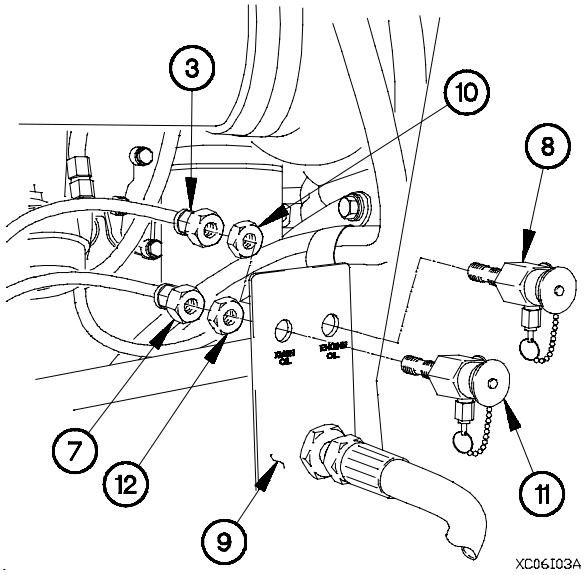
(7) Position engine oil sampling valve (8) on bracket (9) with nut (10).

(8) Position transmission oil sampling valve (11) on bracket (9) with nut (12).

(9) Tighten nuts (10 and 12) to 67 lb-in. (8 N·m).

(10) Install engine oil sampling hose (3) on engine oil sampling valve (8).

(11) Install transmission oil sampling hose (7) on transmission oil sampling valve (11).



c. Follow-On Maintenance.

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

(2) Check for oil leaks under vehicle.

(3) Start engine (TM 9-2320-365-10).

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

(5) Check for oil leaks around transmission and engine oil sampling hoses and valves.

(6) Lower cab (TM 9-2320-365-10).

(7) Shut down engine (TM 9-2320-365-10).

End of Task.

3-7. ENGINE OIL FILL TUBE REPLACEMENT

This task covers:

a. Removal
b. Installation
c. Follow-On Maintenance

INITIAL SETUP

Equipment Conditions
Engine shut down (TM 9-2320-365-10).
Cab raised (TM 9-2320-365-10).
Transmission oil fill tube removed (para 8-13).

Tools and Special Tools
Tool Kit, Genl Mech (Item 44, Appendix C)
Wrench, Torque, 0-175 lb-ft (Item 57, Appendix C)
Screwdriver Attachment, Socket Wrench (Item 46, Appendix B)

Tools and Special Tools (Cont)
Wrench, Torque, 0-200 lb-in. (Item 58, Appendix C)
Socket Set, Socket Wrench (Item 35, Appendix C)

Materials/Parts
Nut, Self-Locking (2) (all models except M1081) (Item 148, Appendix G)
Nut, Self-Locking (M1081) (Item 148, Appendix G)

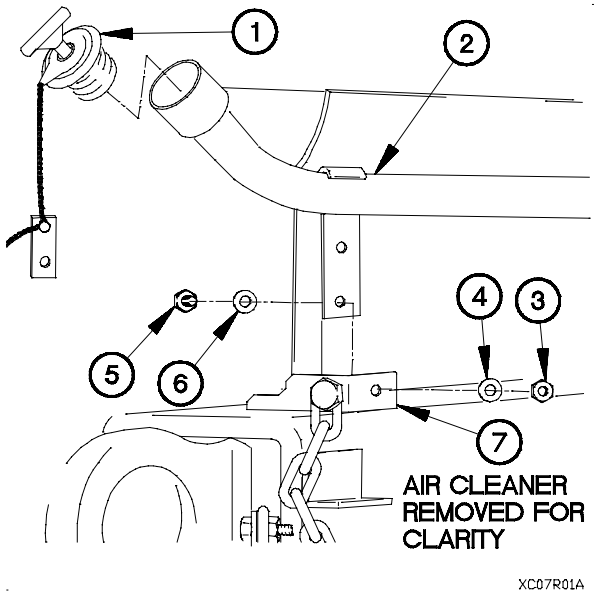
a. Removal.

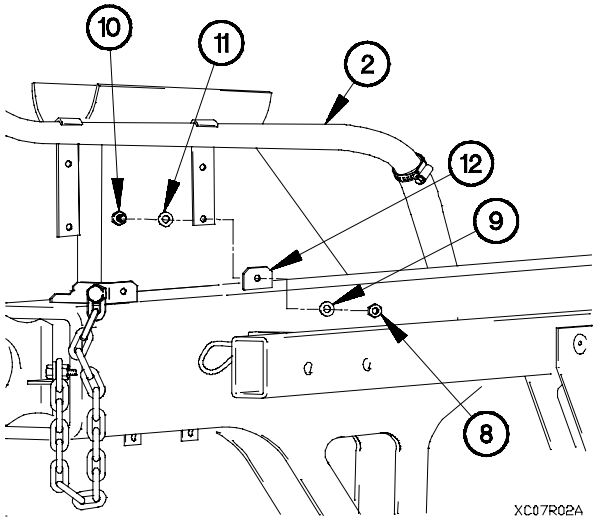
(1) Remove cap (1) from engine oil fill tube (2).

NOTE

Perform steps (2) and (3) on all models except M1081.

(2) Remove self-locking nut (3), washer (4), engine oil fill tube (2), screw (5), and washer (6) from radiator overflow tank bracket (7). Discard self-locking nut.





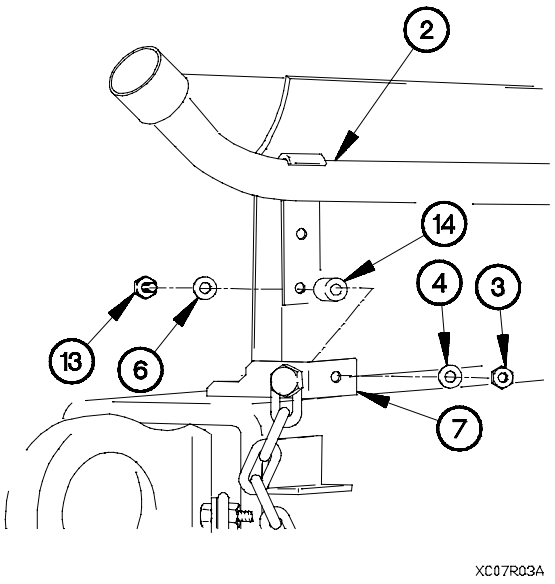
(3) Remove self-locking nut (8), washer (9), engine oil fill tube (2), screw (10), and washer (11) from front lifting beam (12). Discard self-locking nut.

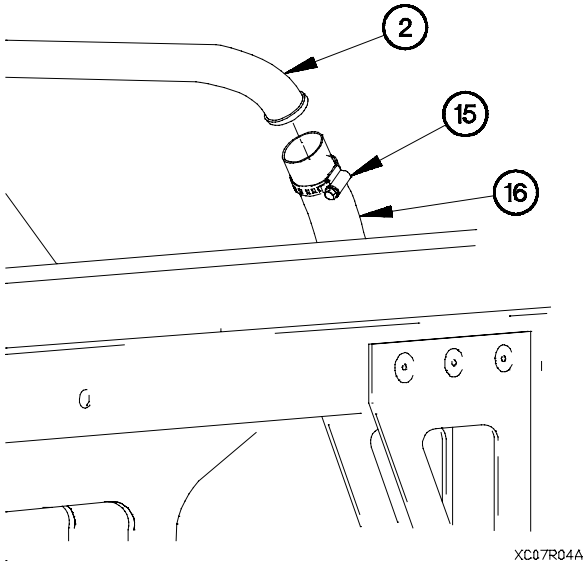
3-7. ENGINE OIL FILL TUBE REPLACEMENT (CONT)

NOTE

Perform step (4) on M1081.

(4) Remove self-locking nut (3), washer (4), engine oil fill tube (2), screw (13), washer (6), and spacer (14) from radiator overflow tank bracket (7). Discard self-locking nut.





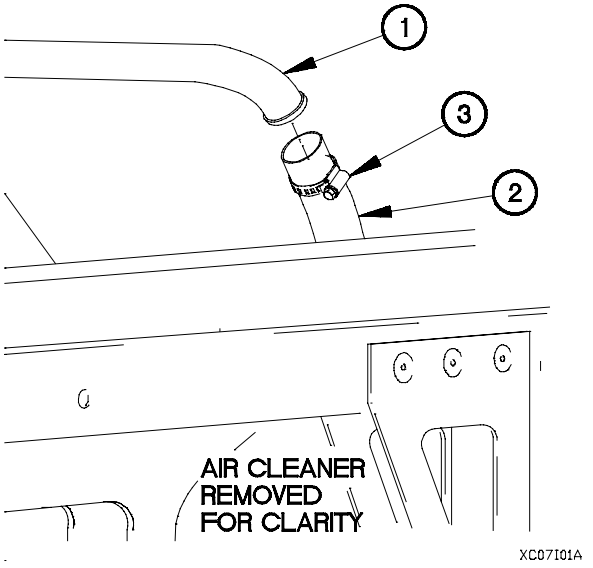
(5) Loosen clamp (15) on engine oil fill hose (16).

(6) Remove engine oil fill tube (2) from engine oil fill hose (16).

b. Installation.

(1) Position engine oil fill tube (1) in engine oil fill hose (2) with clamp (3).

(2) Tighten clamp (3) to 27-44 lb-in. (3-5 N·m).

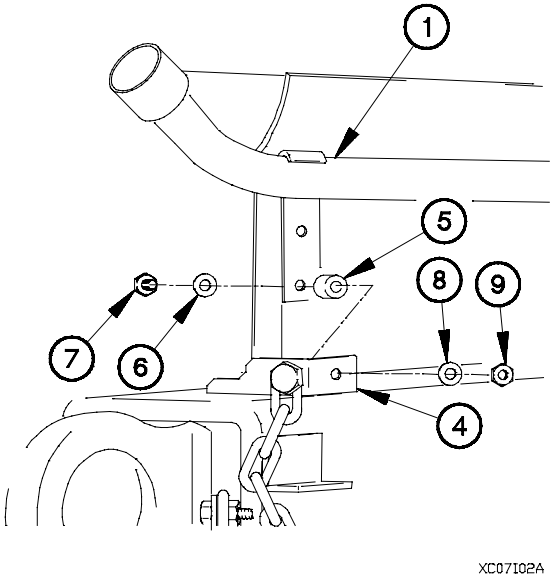


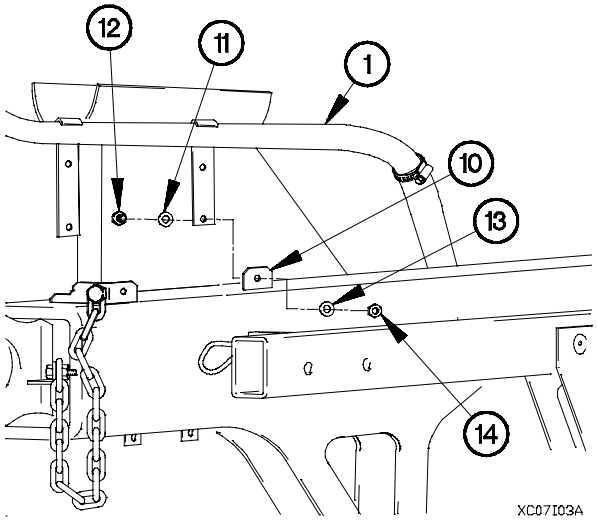
NOTE

Perform steps (3) and (4) on M1081.

(3) Position engine oil fill tube (1) on radiator overflow tank bracket (4) with spacer (5), washer (6), screw (7), washer (8), and self-locking nut (9).

(4) Tighten self-locking nut (9) to 21-26 lb-ft (29-35 N·m).





NOTE

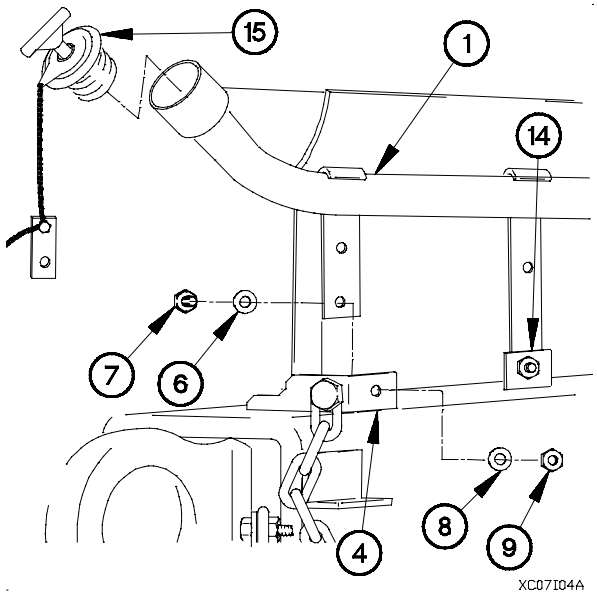
Perform steps (5) through (7) on all models except M1081.

(5) Position engine oil fill tube (1) on front lifting beam (10) with washer (11), screw (12), washer (13), and self-locking nut (14).

(6) Position engine oil fill tube (1) on radiator overflow tank bracket (4) with washer (6), screw (15), washer (8), and self-locking nut (9).

(7) Tighten self-locking nuts (9 and 14) to 21-26 lb-ft (29-35 N·m).

(8) Install cap (15) on engine oil fill tube (1).



c. Follow-On Maintenance.

(1) Install transmission oil fill tube (para 8-13).

(2) Lower cab (TM 9-2320-365-10).

End of Task.

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.

Equipment Control Record . . . . . DA Form 2408-9
Equipment Inspection and Maintenance Worksheet . . . . . DA Form 2404
Maintenance Request . . . . . DA Form 2407
Packaging Improvement Report . . . . . DD Form 6
Processing and Deprocessing Record of Shipping, Storage, and Issue of Vehicles and Spare Engines . . . . . DD Form 1397
Product Quality Deficiency Report . . . . . SF 368
Recommended Changes to DA Publications and Blank Forms . . . . . DA Form 2028-2
Report of Item Discrepancy (ROID) . . . . . SF 364

A-4. OTHER PUBLICATIONS

The following publications contain information pertinent to the LMTV and associated equipment.

a. Safety.

First Aid for Soldiers . . . . . FM 21-11
Security of Tactical Wheeled Vehicles . . . . . TB 9-2300-422-20
Safety Inspection and Testing of Lifting Devices . . . . . TB 43-0142

A-4. OTHER PUBLICATIONS (CONT)

b. LMTV.

Direct Support and General Support Maintenance Manual for M1078 Series, 2 1/2-Ton, 4x4, Light Medium Tactical Vehicle (LMTV) . . . . . TM 9-2320-365-34
Hand Receipt Covering Contents of Components of End Item (COEI), Basic Issue Items (BII), and Additional Authorization List (AAL), for M1078 Series, 2 1/2-Ton, 4x4, Light Medium Tactical Vehicles (LMTV) . . . . . TM 9-2320-365-10-HR
Operator's Manual for M1078 Series, 2 1/2-Ton, 4x4, Light Medium Tactical Vehicle (LMTV) . . . . . TM 9-2320-365-10
Unit, Direct Support, and General Support Repair Parts and Special Tools List for M1078 Series, 2 1/2-Ton, 4x4, Light Medium Tactical Vehicle (LMTV) . . . . . TM 9-2320-365-24P
Warranty Program for M1078 Series, 2 1/2-Ton, 4x4, Light Medium Tactical Vehicle (LMTV) . . . . . TB 9-2300-365-15

c. General Vehicle Operation.

Army Motor Transport Units and Operations . . . . . FM 55-30
Deleted
Manual for the Wheeled Vehicle Driver . . . . . FM 21-305
Safety Prevention of Motor Vehicle Accidents . . . . . AR 385-55
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
Metal Body Repair and Related Operations . . . . . FM 43-2
Materials Used for Cleaning, Preserving, Abrading, and Cementing Ordnance Materiel and Related Materials Including Chemicals . . . . . TM 9-247
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 Protection . . . . . FM 3-4
NBC Decontamination . . . . . FM 3-5

g. Maintenance of Special Purpose Kits.

Operator and Organizational Maintenance Manual for Chemical Alarm . . . . . TM 3-6665-225-12
Operator's and Unit Maintenance Manual Including Repair Parts and Special Tools
List for Decontaminating Apparatus: M13 . . . . . TM 3-4230-214-12&P
Operator's, 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
Operator's, Organizational, Direct Support, and General Support Maintenance
Manual, Air Conditioner, Horizontal Compact, 18,000 BTU/HR, 208 Volt, 3 Phase,
50/60 Hertz, Model F18H-3S . . . . . TM 5-4120-384-14
Unit and Direct Support Maintenance, Repair Parts and Special Tools List for
Heater, Space, Multifuel with Blower, 60,000 BTU/HR, 120V, Model UH-68G,
NSN 4520-01-203-4410, and Model UH-68GI, NSN 4520-01-297-6803 . . . . . TM 5-4520-253-23P

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

A-4. OTHER PUBLICATIONS (CONT)

i. Land, Sea, and Air Shipment.

Airdrop of Supplies and Equipment: Rigging 2 1/2-Ton Trucks . . . . . FM 10-520
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
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 LMTV 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
0100	ENGINE ASSEMBLY	Inspect		0.1				78	
		Test		1.5	0.3			78,79	
		Adjust			3.0			56,60,78, 80	
		Service		0.8				57,59,78	
		Replace			7.0			16,56,59, 61,78,79	
		Repair		0.4	1.6	3.3		16,31,32, 44,56,59,60, 61,78,79	
0101	CYLINDER HEAD ASSEMBLY	Inspect			0.1			78	
		Replace			2.0			44,56,59, 60,78	
		Repair				2.5		56,59,60, 61,62,78,81	
0102	CRANKSHAFT	Replace				16.0		56,57,60, 71,78	
		Repair			3.8	16.0		16,31,32, 56,59,60,61, 78	
0103	FLEXPLATE, ENGINE	Replace			6.5			56,59,78	
		Repair			1.0			56,49,78	
0104	PISTON ASSEMBLY	Replace				9.0		56,57,59, 60,62,78,79	
		Repair				0.6		78	
0105	CAMSHAFT ASSEMBLY	Replace				3.1		14,56,57, 49,60,78	
		Repair				1.2		56,78	
0105	ROCKER ARM AND PUSH RODS	Replace			2.0			44,59,60, 61,78	
		Repair			0.3			44,78	
0106	COOLER, ENGINE OIL	Replace			1.3			56,78	
		Repair			0.3			56,78	
0108	MANIFOLDS, INLET AND EXHAUST	Replace			1.5			56,60,61, 78,79	
0301	INJECTOR ASSEMBLY, FUEL	Replace			2.1			44,57,78, 80	
		Adjust			1.6			56,78,79, 80	
0304	AIR INTAKE SYSTEM	Service		0.3					
		Repair		0.3				46,57	

Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV VEHICLE (CONT)

(1)	(2)	(3)	(4) Maintenance Level					(5)	(6)
			Unit		Direct Support	General Support	Depot	Tools and Equipment Ref Code	Remarks Code
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D		
0304	INTAKE AIR CLEANER	Service		0.2					
		Replace		0.8				6,46,57, 78	
		Repair		0.4				57,78	
0305	TURBOCHARGER	Replace			0.8			56,61,78, 79	
0306	FUEL TANK	Inspect	0.1						
		Replace		1.5				57,59,78	
0308	GOVERNOR, ENGINE SPEED	Replace			1.0			57,60,76, 78,79	
		Repair		0.5	0.7			57,78	
0309	FILTER, FUEL/WATER SEPARATOR	Inspect	0.2						
		Service	0.2	0.3				78	
		Replace		0.5				57,78	
0311	ETHER STARTING AID	Replace		0.6				57,59,78	
0312	ACCELERATOR/HAND THROTTLE	Replace		0.5				57,78	
		Adjust		0.2				57,78	
0401	EXHAUST MUFFLER/PIPES	Inspect	0.1	0.2					
		Replace		0.9				57,59,78	
0501	RADIATOR/CHARGE AIR COOLER	Inspect	0.1						
		Replace		2.5				2,27,53, 59,78	
		Service		1.5				59,79	
		Repair		0.6	2.0			2,27,53, 59,78	
0501	RADIATOR OVERFLOW TANK	Replace		0.5				46,57,78	
		Repair		0.3				78	
0502	SHROUD, FAN	Replace		1.0				57,59,78, 86	
0503	HOSES, WATER	Replace		0.5				57,59,78, 86	
0504	PUMP, WATER	Replace		0.8				15,57,59, 78,86	
0505	CLUTCH, ENGINE FAN	Inspect		1.0				57	
		Service		0.2				59	
		Replace		1.5				2,53,57, 78	
		Repair			1.2			56,59,60, 61,78,79	

Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV VEHICLE (CONT)

(1)	(2)	(3)	(4) Maintenance Level					(5)	(6)
			Unit		Direct Support	General Support	Depot	Tools and Equipment Ref Code	Remarks Code
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D		
0601	ALTERNATOR, 100 AMP	Inspect		0.2					
		Test		0.5	1.5			59,63,78	
		Replace		1.0				59,78	
		Repair		0.2	0.5			38,56,57, 59,63,78,79	
0603	STARTING MOTOR, ENGINE	Inspect		0.1					
		Test		0.5	0.5			57,63	
		Replace		1.5				2,9,57, 59,78	
		Repair			2.1			52,56,59, 60,76,78	
0606	SOLENOID, FUEL SHUTOFF	Replace			1.0			60,78,80	
0607	CABLE ASSEMBLY, DASHBOARD	Test		0.5				56	
		Replace		2.9				57,59,76, 78	
		Repair		1.0	0.6			56,57,61, 78	
0607	DISPLAY, LIGHTED INDICATOR	Test		0.3					
		Replace		0.5				78,86	
		Repair		0.3				78	
0609	LIGHT ASSEMBLY, BACKUP	Inspect	0.1						
		Replace		0.8				57,78	
		Repair		0.3				78	
0609	LIGHT, BLACKOUT DRIVE	Inspect	0.1						
		Replace		0.8				57,59,78	
		Repair		0.5				78	
0609	TAILLIGHT ASSEMBLY, COMPOSITE	Inspect	0.1						
		Replace		0.8				57,59,78	
		Repair		0.5				78	
0609	LIGHT ASSEMBLY, FRONT TURN SIGNAL AND PARK	Inspect	0.1						
		Replace		0.8				57,59,78	
		Repair		0.5				78	
0609	HEADLIGHT	Inspect	0.1						
		Adjust		0.4				78	
		Replace		1.0				57,59,78	
0610	AUDIBLE ALARM	Inspect	0.1						
		Replace		0.6				78	
0611	HORN, CAB	Inspect	0.1						

Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV VEHICLE (CONT)

(1)	(2)	(3)	(4) Maintenance Level					(5)	(6)
			Unit		Direct Support	General Support	Depot	Tools and Equipment Ref Code	Remarks Code
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D		
		Replace		0.4				57,78	
0612	BOX ASSEMBLY, BATTERY	Inspect	0.1						
		Test		0.5				57,78	
		Service		0.3				57	A
		Replace		1.0				57,59,78	
		Repair		0.2				63	
0613	CABLE ASSEMBLY, LH/RH CAB AND DOOR MARKER LIGHTS	Inspect	0.1						
		Replace		0.8				78	
		Repair		0.7				63	
0613	CABLE ASSEMBLY, LOWER, CAB MARKER LIGHTS, M1081	Inspect	0.1						
		Replace		0.6				78,86	
		Repair		0.5				63	
0613	CABLE ASSEMBLY, UPPER, CAB CLEARANCE AND MARKER LIGHTS, M1081	Inspect	0.1						
		Replace		0.8				78,86	
		Repair		0.5				63	
0613	CABLE ASSEMBLY, STE/ICE-R	Replace		1.0				78	
		Repair		0.5	0.8			63	
0613	CABLE ASSEMBLY, CAB CLEARANCE AND MARKER LIGHTS	Inspect	0.1						
		Replace		1.2				57,78	
		Repair		0.5	0.8			63	
0613	CABLE ASSEMBLY, WARNING LIGHT	Replace		0.5				48,78,86	
		Repair		0.3	0.5			63	
0613	CABLE ASSEMBLY, WINDSHIELD WASHER PUMP/EMI	Replace		0.5				78	
		Repair		0.3				63	
0613	CABLE ASSEMBLY, ENGINE CONTROL	Inspect	0.1						
		Replace		2.3				57,78	
		Repair		0.5	0.5			63	
0613	CABLE ASSEMBLY, FRONT INTERVEHICULAR, 12 VDC	Replace		0.8				59,78	
		Repair		0.2	1.3			63	

Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV 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 ASSEMBLY, FRONT LIGHTS	Replace		2.0				57,59,78,86	
		Repair		0.5	0.5			63	
0613	CABLE ASSEMBLY, REAR LIGHTS	Replace		2.8				57,59,78	
		Repair		0.5	0.5			63	
0613	CABLE ASSEMBLY, PTO	Replace		1.6				57,59,78	
		Repair		0.5	0.8			63	
0613	CABLE ASSEMBLY, REAR INTERVEHICULAR, 24 VDC	Replace		0.6				59,78	
		Repair		0.5	0.8			63	
0613	CABLE ASSEMBLY, START AND CHARGING	Replace		2.0				57,78	
		Repair		0.5	0.8			63	
0613	CABLE ASSEMBLY, WINCH CONTROL VALVE	Replace		1.8				57,59,78	
		Repair		0.5	0.8			63	
0705	WTEC II VEHICLE INTERFACE MODULE (VIM)	Replace		0.6				78	
		Repair		0.8				78	
0708	TORQUE CONVERTER	Adjust			0.9			18,59,60,78	
		Remove/ Install			0.8			56,59,60,61, 78	
		Repair			1.3			30,56,59,60, 62,78	
0710	TRANSMISSION	Inspect		0.4				78	
		Service		1.5				57,59,78	
		Replace			7.0			56,59,60,61, 78,79,84	
		Repair		0.4	2.7	1.9		3,18,19, 24,25,27,41, 56,57,59,60, 61,78,79,84	
0710	MODULE, FRONT SUPPORT	Remove/ Install				2.0		56,57,59,60, 61,78	
		Repair				0.7		30,56,57,59, 60,61,78	
0710	MODULE, PLANETARY GEAR (P1)	Remove/ Install				2.0		59,60,71,78	

Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV 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				1.5		59,60,71,78	
0710	MODULE, PLANETARY (P2)	Remove/ Install				2.0		3,56,59, 60,61,78	
		Repair				1.9		3,19,56, 59,60,61,71, 78	
0710	PLANETARY CARRIER (P3)	Remove/ Install				2.0		3,56,60, 78	
		Repair				1.9		3,27,56, 60,78	
0710	MODULE, MAIN SHAFT	Remove/ Install				2.0		59,60,78	
		Repair				0.4		59,60,78	
0710	MODULE, CONVERTER HOUSING	Remove/ Install				4.3		3,56,57, 59,60,78	
		Repair				2.0		3,19,25, 56,57,59,60, 78	
0713	CLUTCH ASSEMBLY, C3/C4/C5, TRANSMISSION	Remove/ Install				2.0		56,57,59,60, 78	
		Repair				1.0		41,56,57,59, 60,78	
0713	MODULE, ROTATING CLUTCH	Remove/ Install				2.0		3,56,59, 60,78	
		Repair				2.4		3,19,24, 56,59,60,78	
0714	VALVE ASSEMBLY, CONTROL MODULE	Remove/ Install			2.0			56,59,60,61, 78,79	
		Repair		1.0	2.5			59,61,78,79	
0714	BODY ASSEMBLY, MAIN VALVE	Service		1.5				57,59,78	
		Remove/ Install			2.0			56,59,60,61, 78,79	
		Repair		1.5	2.5			56,59,60,61, 78,79	
0801	MODULE, TRANSFER CASE	Adjust				1.0			
		Remove/ Install				2.0		21,56,57,59, 60,61,71,74, 78,79	
		Repair				1.1		23,27,33,50, 56,57,60,78	

Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV 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
0802	HOUSING ASSEMBLY, C6 AND C7 CLUTCH	Remove/ Install				2.0		56,59,60,61, 78	
		Repair				0.8		19,23,26,27, 28,29,56,59, 60,61,62,71, 78	
0802	CONTROL VALVE ASSEMBLY	Remove/ Install				2.0		56,59,61,78, 79	
		Repair				1.0		56,59,61,78, 79	
0804	PUMP ASSEMBLY, OIL	Replace				1.0		79	
		Repair				0.8		79	
0900	PROPELLER SHAFT	Inspect		0.1					
		Service		0.5				59	
		Repair		0.6				57,59,78	
		Replace		0.5				57,59,78	
1000	AXLE ASSEMBLY, FRONT	Inspect	0.1	0.3	0.7			78	
		Adjust			1.0			57,79	
		Service		0.5				59,78	
		Replace			4.5			56,57,59,60, 61,70,78	
		Repair		2.3	2.2	6.0		56,57,59,60, 61,78	
1002	CARRIER ASSEMBLY, DIFFERENTIAL	Inspect		0.1	0.1	0.1		78,79	
		Service			0.3			78	
		Replace				4.6		21,56,57,59, 60,78,79	
		Repair				2.7		56,57,59,60, 78,79	
1004	STEERING KNUCKLE, AXLE	Inspect			0.2				
		Adjust			2.5			79	
		Service			0.3			79	
		Replace			5.1			56,57,59,60, 71,78	
1100	AXLE ASSEMBLY, REAR	Inspect	0.1	0.4	0.7				
		Service		0.8				57,59,78	
		Replace			4.5			34,56,57,59, 60,78,84	

Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV 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			0.9	6.0		21,56,57,59, 60,78,84,85	
1102	CARRIER ASSEMBLY, DIFFERENTIAL	Inspect		0.1	0.1	1.0		78,79	
		Service			0.3			78	
		Replace				4.6		21,56,57,59, 60,78,79,85	
		Repair				2.7		21,37,56,57, 59,60,71,73, 78	
1202	BRAKE ASSEMBLY, FRONT AXLE	Inspect		0.1	1.0			59,78,79	
		Adjust		0.4				57,59,78	
		Repair		1.5	0.5			57,59,78,83	
1202	BRAKE ASSEMBLY, REAR AXLE	Inspect		0.1	1.0			59,78,79	
		Adjust		0.4				57,59,78	
		Repair		1.5	0.5			57,59,78,83	
1208	BRAKE AIR CHAMBER	Inspect		0.1					
		Replace		0.5				57,59,78	
1209	AIR COMPRESSOR	Adjust		0.6				59,78	
		Replace			1.2			56,60,61,78, 79	
1311	WHEEL ASSEMBLY, PNEUMATIC TIRE	Inspect	0.1					57	B
		Replace	1.0	1.2				57,59	
		Repair		2.0				57,59	
1313	TIRE, PNEUMATIC	Replace		2.0				57,59	
1401	STEERING SYSTEM	Inspect		0.2					
		Adjust			1.0			56,60,78	
		Repair		1.0	1.5			54,56,57,59, 60,61,78,79	
1407	STEERING GEAR ASSEMBLY	Replace			4.0			56,60,78	
1410	PUMP, POWER STEERING	Replace			1.5			47,56,59,60, 78	
1411	HOSES, POWER STEERING	Replace		0.3				57,59,78,88	
1413	HYDRAULIC RESERVOIR, POWER STEERING	Service	0.1	0.5				78	
		Replace		0.8				59,78,86	

Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV 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
1501	FRAME ASSEMBLY	Inspect	0.1	0.3					
		Repair		0.8	14.0			56,57,59,60, 61,78,79	
1504	RETAINER, SPARE TIRE	Inspect	0.1	0.1					
		Replace		3.0				57,59,78	
		Repair		0.6				57,59,78	
1601	LEAF SPRING ASSEMBLIES	Inspect	0.1	0.2					
		Service		0.3				57	
		Replace			2.7			56,57,59,60, 78,79	
1604	SHOCK ABSORBERS	Inspect	0.1	0.3					
		Replace		0.5				57,59,78	
1605	STABILIZER BAR, REAR	Inspect		0.2					
		Replace		2.0				57,59,68,78	
		Repair		1.5				57,78	
1801	CAB BODY, STANDARD	Inspect	0.1						
		Replace			60.0			56,57,60,61, 78,79	
		Repair		0.6				57,59,78	
1801	CAB BODY, AIR DROP	Inspect	0.1						
		Replace			60.0			56,57,60,61, 78,79	
		Repair		0.6				57,59,78	
1801	CAB DOORS, STANDARD	Inspect	0.1						
		Replace			1.0			55,59,78	
		Repair		2.7				49,57,78	
1801	CAB DOORS, AIR DROP	Inspect	0.1						
		Replace			1.0			55,59,78	
		Repair		2.7				49,57,78	
1801	SUPPORT ASSEMBLY, CAB FRONT	Inspect	0.1						
		Repair		1.1				57,59,78	
		Replace			3.0			8,13,57, 59,60,78, 79	
1801	SUPPORT ASSEMBLY, CAB REAR	Inspect	0.1						
		Replace		1.0				57,59,78	
		Repair		0.8				57,78	
1802	WINDSHIELD	Replace			0.6			55,59,78	

Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV 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
1802	FENDER, VEHICULAR, FRONT	Inspect	0.1						
		Replace		2.0				57,59,78	
		Repair		0.5				57,78	
1803	ROOF, CAB, M1081	Replace		1.0				45,50,57,59, 78	
1805	FLOOR COVERING, CAB	Replace		1.0				57,78	
1806	SEATS	Replace							
1808	TOOL BOX ASSEMBLY	Inspect	0.1						
		Replace		0.5				47,57,59,78	
		Repair		0.5				57,59,78	
1808	STOWAGE BOX, CAB	Replace		0.8				57,78	
		Repair		0.5				57,78	
1810	BODY, CARGO	Inspect	0.1						
		Replace			4.0			56,57,59,60, 78	
		Repair		0.5				57,59,78	
1812	BODY ASSEMBLY, VAN	Inspect	0.1	0.1					
		Repair		0.5				20,35,36,42, 43,47,57,59, 64,72,76,78	
		Replace		1.9				36,64,78	
1812	DOOR, ACCESS, LEFT	Inspect	0.1						
		Replace		2.3				78	
		Repair		0.1				57,59,78	
1812	DOOR, ACCESS, RIGHT	Inspect	0.1						
		Replace		1.4				78	
		Repair		0.4				57,59,78	
1812	WINDOW SASH ASSEMBLY	Inspect	0.1						
		Replace		0.2				78	
		Repair		0.4				57,59,78	
1812	BOX ASSEMBLY, RELAY	Inspect	0.1	0.1					
		Replace		0.6				78	
		Repair		0.1				78	
		Test	0.1	0.5				59,78	
1812	FAN ASSEMBLY	Inspect	0.1						
		Replace		1.8				20,76,78	
		Repair		0.5				78	
2001	WINCH, 11K SELF-RECOVERY (SRW)	Inspect	0.1	4.0					

Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV 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		0.2				59	
		Replace			1.0			59,60,78	
		Repair			0.9			59,60,78	
2004	POWER TAKEOFF ASSEMBLY (PTO)	Inspect	0.1						
		Replace			1.0			56,57,59,60, 78	
		Repair			0.8			56,57,59,60, 78	
2202	MOTOR, WIPER, WINDSHIELD	Test		0.5					
		Replace		1.0				78	
2207	HEATER ASSEMBLY, PERSONNEL	Replace		2.0				57,59,78	
		Repair		1.0				57,59,78	
2210	DECALS	Inspect	0.1						
		Replace		1.0				78	
2401	POWER UNIT, AIR/HYDRAULIC	Inspect	0.1						
		Test		0.2					
		Service		1.0					
		Replace		3.0				57,59,78	
		Repair			2.0			57,59,60,69, 78,79	
2402	MANIFOLD, HYDRAULIC	Inspect	0.1						
		Test		0.2					
		Replace		1.5				51,57,59,78	
		Repair		1.0				51,57,59,78	
2402	LATCH, HYDRAULIC, CAB	Inspect	0.1						
		Adjust		0.5				57,59,78	
		Replace		0.5				57,59,78	
2404	SUSPENSION CYLINDER	Inspect							
		Replace							
2406	FILTER, HYDRAULIC	Service		0.3				59,78	
		Replace		0.2				59,78	
2408	RESERVOIR, HYDRAULIC	Replace		1.0				57,59,78	
		Repair		0.5				57,59,78	
3303	HEATER KIT, M1079	Inspect	0.1						
		Remove/ Install		2.5				78	
3307	ALTERNATOR KIT, 200 AMP	Inspect	0.1	0.2					

Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV 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
		Test		0.5				59	
		Remove/ Install		2.0				57,59,78	
		Replace		1.0				57,59,78	
		Repair			0.5			56,57,60, 62,78	
3307	ALTERNATOR, 200 AMP	Inspect		0.2					
		Test		0.5	1.5			59,63,78	
		Replace		1.0				57,59,78	
		Repair		0.2	0.5			56,57,60, 61,63,78	
3307	CRANE (LMHC), MATERIAL HANDLING, LIGHT	Inspect	0.1	0.1					
		Repair		0.5				59,76,78	
		Replace		0.5					
		Test		0.5					
3307	WEIGHT BLOCK AND WIRE ROPE, LMHC	Inspect	0.1						
		Replace		0.1				59,78	
		Repair		0.5				59,78	
		Test			0.5				
3307	WINCH, LMHC	Inspect	0.1						
		Replace			0.5			59,78	
		Repair			1.0			59,78	
		Test		0.5					
3307	MAST/SWING ASSEMBLY, LMHC	Inspect	0.1						
		Repair		1.0				59,78	
		Test		0.5					
3307	CONTROL BOX, LMHC	Inspect	0.1						
		Replace		0.1					
		Repair		0.5				76,78	
		Test	0.1	0.5					
3307	TROOPSEAT KIT	Remove/ Install	1.0						
		Inspect	0.1						
		Replace		1.0					
		Repair		0.5				78	
3307	COVER KIT, CARGO SOFT TOP	Remove/ Install	1.5						
		Inspect	0.1						
		Replace		2.0					

Section II. MAINTENANCE ALLOCATION CHART FOR THE LMTV 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					
3307	AIR CONDITIONER KIT, M1079	Inspect	0.1						
		Remove/ Install		1.5				59,78	
3307	WARNING LIGHT ASSEMBLY, AMBER	Inspect	0.1						
		Repair		0.4				78	
		Test		0.2					
3401	MACHINE GUN RING KIT	Inspect	0.1						
		Remove/ Install			4.0			56,57,60, 78,79,84	
		Repair		1.1				10,57,78	
3402	MOUNT, SMALL ARMS	Inspect	0.1						
		Replace		0.3				78	
3909	CABLE ASSEMBLY, WARNING LIGHT	Inspect	0.1						
		Replace		0.5				78	
4316	AIR HOSE, CTIS	Inspect	0.1						
		Replace		0.4				59,78	
4317	VALVE, INVERSION	Replace		0.5				59,78	
4321	AIR DRYER	Inspect	0.1	0.1					
		Replace		1.0				57,59,78	
		Repair		0.6				57,59,78	
4702	GAUGE, AIR FILTER RESTRICTION	Replace		0.5				78	

Section III. TOOLS AND TEST EQUIPMENT FOR LMTV 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

Section III. TOOLS AND TEST EQUIPMENT FOR LMTV VEHICLES (CONT)

Tool or Test Equipment REF Code	Maintenance Level	Nomenclature	National Stock Number	Tool Number
7	F	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-00-181-6754	GGG-C-1507
8	F	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-074-7557	FCOM19
9	O	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-236-9996	FCOM15
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
13	F	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-348-9473	AN8508-19A
13.1	O	DISPENSER, SEALANT	5120-00-061-1283	45RCT
14	H	DRIVER KIT, BEARING	4910-01-032-3128	8S0602
14.1	O	FRAME, HAND HACKSAW	5110-00-289-9657	163-20
15	O	GAGE, BELT TENSION	6635-01-092-7462	0755-0101
16	O,F	GAGE, BELT TENSION	6635-01-143-2237	GA-424
17	O,F	GAGE, PRESSURE, 0-150 psi	6685-00-474-5721	111T1D05A01
18	F,H	GAGE, PROFILE	5220-01-388-1460	J-38548-1
19	H	HANDLE, DRIVE	5120-00-377-2259	J8092
20	O	HEATER, GUN TYPE, ELECTRIC	4940-00-561-1002	500A
21	F,H	HOLDING BAR, PINION	5120-01-166-0573	J3453
21.1	O	INDICATOR, DIAL		P36491
22	O	INSERTER AND REMOVER, ELECTRICAL CONTACT	5120-00-915-4588	MS3447-16
23	H	INSERTER AND REMOVER, SPRING	5120-01-388-3660	J38573
24	H	INSERTER AND REMOVER, SPRING	5120-01-388-4436	J35923
25	H	INSERTER, BEARING AND BUSHING	5120-01-388-7841	J-38565
26	H	INSERTER, BEARING AND BUSHING	5120-01-389-0658	J35921-1
27	H	INSERTER, BEARING AND BUSHING	5120-01-390-1104	J 38569
28	H	INSERTER, BEARING AND BUSHING	5120-01-390-1105	J 38568-3
29	H	INSERTER, BEARING AND BUSHING	5120-01-391-5133	J 38579
30	F,H	INSERTER, BEARING AND BUSHING	5120-01-414-7398	J38566
31	F	INSERTER, SEAL	5120-01-362-2026	1U7430
32	F	INSERTER, SEAL	5120-01-362-2027	1U7598
33	F	INSTALLER, SEAL	N/A	J38574
34	F	JACK, LEVELING SUPPORT, VEHICLE	2590-00-231-7418	10876244
35	O	KEY, SOCKET HEAD SCREW	5120-00-984-0247	58010

Section III. TOOLS AND TEST EQUIPMENT FOR LMTV VEHICLES

Tool or Test Equipment REF Code	Maintenance Level	Nomenclature	National Stock Number	Tool Number
35.1	O	KEY, SOCKET HEAD SCREW	5120-01-355-1670	AWML2.5
36	O	LINK, CHAIN, END	4010-00-932-5013	NAS1049-16
36.1	F	NOSE ASSEMBLY		99-3307
36.2	O	PLIERS, HOG RING STAPLE	5120-01-413-8837	0012
37	H	PULLER KIT, UNIVERSAL	5180-00-089-3660	A57QB
38	F	PULLER KIT, UNIVERSAL	5180-01-124-1903	1P3075
39	O	REMOVER, ELECTRICAL CONTACT	5120-00-148-9844	MS3448-001B
40	F	RIVETER, BLIND, HAND	5120-01-289-4310	HP-2
40.1	F	RIVETER, BLIND, PNEUMATIC	5130-01-232-4042	245
41	H	RIVETER, YOKE, HAND	5120-01-415-3558	J-39354
42	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-00-180-0881	5120-00-180-0881
43	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-053-4158	FAM5A
44	O,F,H	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-055-1308	ANSIB18.3.2M
45	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-079-8032	SAM8A
46	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-160-8862	S 6 HBS
47	O,F	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3462	SA10A
47.1	O,F	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3483	FA5LE
48	O,F	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3497	TMP12A
49	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3519	F23D
50	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3526	FP24
51	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3527	FP32A
52	F,H	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3536	FTX40A
53	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3574	GFA8A
53.1	F	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-430-5715	SZ-21
54	O	SEPARATOR, BALL JOINT	5120-01-255-8238	2287
55	F	SETTING TOOL, WINDSHIELD	5120-01-316-4995	CRL216
56	O,F	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-348-7696	SC4910-95CLA02
57	O,F,H	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-754-0650	SC4910-95CLA72
58	O	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-754-0653	SC4910-95CLA73

Section III. TOOLS AND TEST EQUIPMENT FOR LMTV VEHICLES

Tool or Test Equipment REF Code	Maintenance Level	Nomenclature	National Stock Number	Tool Number
59	O,F,H	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-754-0654	SC4910-95CLA74
60	F,H	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-754-0705	SC4910-95CLA31
61	F,H	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-754-0706	SC4910-95CLA62
62	O,F,H	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-754-0707	SC4910-95CLA63
63	O,F	SHOP EQUIPMENT, FUEL AND ELECTRICAL	4910-00-754-0714	SC4910-95CLA01
64	O	SLING, EYE	3940-01-334-0749	EE1-202
65	F	SLING, MULTIPLE LEG	3940-00-777-5744	A170
66	H	SOCKET SET, SOCKET WRENCH	5120-01-195-0640	208FA
67	F,H	SOCKET, SOCKET WRENCH	5120-01-068-5643	5555M
68	O	SOCKET, SOCKET WRENCH	5120-01-161-5907	GLDH382
69	F	SOCKET, SOCKET WRENCH	5120-01-335-0784	TW321
70	O	SOCKET, SOCKET WRENCH	5120-01-359-9521	TV940009
71	F	SOLDERING AND BRAZING OUTFIT, RESISTANCE HEATING	3439-00-460-7198	SC4940-95-CLB20
72	O	SOLDERING IRON, ELECTRIC	3439-01-036-3308	3112-S3-40W
73	H	STAND, DIFFERENTIAL CARRIER REPAIR	4910-01-085-7729	J3409-D
74	H	STAND, MAINTENANCE, AUTOMOTIVE ENGINE	4910-00-808-3372	J29109
75	F	TOOL, DISTORTER	5120-01-119-1748	5P-7312
76	O,F	TOOL KIT, AUTO FUEL AND ELECTRICAL SYSTEM REPAIR	5180-00-754-0655	SC4910-95CLA50
77	F	TOOL KIT, BODY AND FENDER	5180-00-754-0643	SC5180-90-N34
78	O,F,H	TOOL KIT, GENERAL MECHANIC'S	5180-00-177-7033	SC5180-90-CL-N26
79	F,H	TOOL KIT, GENERAL MECHANIC'S	5180-00-699-5273	SC5180-90-CL-N05
80	F	TOOL KIT, INTERNAL COMBUSTION ENGINE	5180-01-356-8155	1U6680
81	H	TOOL KIT, SLEEVE REPAIR	5180-01-415-5896	4C4462
82	F	TOOL OUTFIT, HYDRAULIC	4940-01-036-5784	SC4940-95-CL-B07
83	O	TOOL, SPRING REMOVAL	5120-01-360-1918	TV940010
84	F	WRENCH SET, CROWFOOT, RATCHETING	5120-00-293-0013	GGG-W-646
85	F	WRENCH SET, SOCKET	5120-00-148-3706	ANSI-B107.5
86	O	WRENCH, TORQUE, 0-75 LB-IN.	5120-01-112-9532	TQSC6A

Section IV. REMARKS FOR THE LMTV 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	5120-00-154-3029	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-A74

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	5210-00-529-1205	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-A72
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-5-133	SC 4910-95-CL-A72
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-A72

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	5120-01-117-3876	221FSMY	SC 4910-95-CL-A02
36	SOCKET, SOCKET WRENCH	5120-00-181-6813	5530	SC 4910-95-CL-A74
37	SOCKET, SOCKET WRENCH	5120-00-232-5681	1242	SC 4910-95-CL-A74
38	SOCKET, SOCKET WRENCH	5120-01-112-0581	SIMM190	SC 4910-95-CL-A74
39	STE/ICE-R	4910-01-222-6589	12259266	SC 4910-95-CL-A74
40	TAPE, MEASURING	5210-00-081-4719	GA508A	CTA 50-970
40.1	TEST KIT, RADIATOR	4910-00-728-8227		SC 4910-95-CL-A74
41	TESTER, ANTIFREEZE AND BATTERY	6630-00-105-1418	10425	SC 4910-95-CL-A74
42	TOOL KIT, AUTO FUEL	5780-00-754-0655		SC 5180-95-CL-A50
43	TOOL KIT, BLIND RIVET	5180-01-201-4978	D-100-MIL-1	SC 4910-95-CL-A72
44	TOOL KIT, GENERAL MECHANIC'S	5180-00-177-7033		SC 5180-90-N26
45	TRESTLE, MOTOR VEHICLE MAINTENANCE	4910-00-251-8013	306	SC 4910-95-CL-A72
46	VISE, MACHINIST	5120-00-293-1439	504M2	SC 4910-95-CL-A74
47	WRENCH SET, SOCKET	5120-00-081-2305	GGG-W-641	SC 4910-95-CL-A74
48	WRENCH SET, SOCKET	5120-00-204-1999	GGG-W-641	SC 4910-95-CL-A74
49	WRENCH SET, SOCKET	5120-00-322-6231	51200017510	SC 4910-95-CL-A74
50	WRENCH, ADJUSTABLE	5120-00-264-3793	2117080	SC 4910-95-CL-A72
51	WRENCH, ADJUSTABLE, AUTOMOTIVE	5120-00-449-8083	1B7536	SC 4910-95-CL-A74
51.1	WRENCH, BOX AND OPEN END	5120-00-228-9518	1174	SC 4910-95-CL-A74
52	WRENCH, BOX AND OPEN END	5120-00-277-8833	1244	SC 4910-95-CL-A74
53	WRENCH, BOX AND OPEN END	5120-00-277-8834	GGG-W-636	SC 4910-95-CL-A74
54	WRENCH, PIPE	5120-00-277-1461		SC 4910-95-CL-A74
55	WRENCH, PIPE	5120-00-277-1485		SC 4910-95-CL-A74
56	WRENCH, STRAP, ADJUSTABLE	5120-00-020-2947	A91C	SC 4910-95-CL-A74
57	WRENCH, TORQUE, 0-175 lb-ft	5120-00-640-6364	1753LDF	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
58	WRENCH, TORQUE, 0-200 lb-in.	5120-00-853-4538	F2001	SC 4910-95-CL-A72
58.1	WRENCH, TORQUE, 0-300 lb-in.	5120-00-776-1841	2163993	SC 4910-95-CL-A74
59	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 LMTV 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 TY 3	bt
4	O	8040-01-250-3969	Adhesive (05972) 242	ea
5	O	8040-01-117-7872	Adhesive (04963) 08031	tu
6	O	8040-00-117-8510	Adhesive (71984) 3145 RTV Clear	tu
7	O	8040-00-776-9602	Adhesive (73168) 80055-31	kt
8	O	8040-00-118-2695	Adhesive (72799) RTV162	kt

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
9	O	8040-01-446-7842	Adhesive (01139) RTV123	ca
10	O	8040-01-331-7473	Adhesive (81349) (MIL-A-46106 GP3TY1)	tu
11	O	8040-01-331-7470	Adhesive (81349) (MIL-A-46106 GP1TY1)	tu
11.1	O	8040-00-728-3088	Adhesive (78500) 1199-T-3842 6 oz	kt
12	C	6850-00-174-1806	Antifreeze, Arctic Type (81349) (MIL-A-11755) 55 gl drum	dr
13	C	6850-00-181-7940	Antifreeze, Ethylene Glycol, Permanent (81349) (MIL-A-46153) 55 gl drum	dr
14	O	8030-00-597-5367	Antiseize Compound (81349) (MIL-A-907)	lb
14.1	O	5110-00-277-4588	Blade, Hand Hacksaw (54940) 31-51024	ea
14.2	O	5340-01-454-4336	Bracket, Angle (0FW39) 12421859-001	ea
15	O	5340-00-450-5718	Cap and Plug Set 10935405	ea
15.1	O	5340-01-423-0972	Clamp, Loop (18076) S630H-20	ea
16	O	6850-00-926-2275	Cleaning Compound, Windshield (81349) O-C-1901 16 oz bottle	bt
17	O	7920-00-044-9281	Cloth, Cleaning (81349) (MIL-C-85043)	bx
18	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
19	O	8030-00-033-4291	Corrosion Preventive Compound (MIL-C-82594) 8 oz can	bt
19.1	O	2540-01-460-8048	Cover, Seat, Vehicular (27797) WM1059	ea
19.2	O	2540-01-463-8394	Cover, Seat, Vehicular (0FW39) WM1058	ea
20	C	9150-00-664-0047	Damping Fluid (81348) VV-D-1078 1 lb can	lb
21	O	7520-01-209-1152	Dispenser, Pressure Sensitive Adhesive Tape (75037) STD-0-9	ea
21.1	O	4730-01-454-1233	Elbow, Pipe to Boss (19207) 12421891-001	ea
21.2	O	4730-00-863-9098	Elbow, Pipe to Tube (30780) 4VBTXB	ea
22	O	5330-01-325-6993	Gasket Forming Compound (05972) 515	ea

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
23	C		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
24	O	9150-00-530-6814	Grease, Wire Rope-Exposed Gear (81349) (MIL-G-18458) 35 lb can	cn
25	O	9150-00-935-4018	Grease, Molybenum Disulfide (81349) (MIL-G-21164) 14 oz cartridge	ca
25.1	O	4720-00-988-3842	Hose Assembly, Nonmetallic (50599) R25679-1	ea
25.2	O	4720-01-384-0995	Hose Assembly, Nonmetallic (19207) 12421858-006	ea
25.3	O	4720-01-453-9530	Hose Assembly, Nonmetallic (0FW39) 12421857	ea
25.4	O	4720-01-469-9208	Hose Assembly, Nonmetallic (19207) 12418004-002	ea
26	C		Hydraulic Fluid A (MIL-H-5606)	
		9150-00-252-6383	1 qt can	cn
		9150-00-223-4134	1 gl can	cn
27	O	7510-00-145-0559	Ink, Marking Stencil (MIL-l-43553)	oz
28	O	7510-01-386-0787	Inking Pad, Rubber Stamp	ea
29	O	9150-01-360-1905	Insulating Compound, Electrical	tu
30	O	5970-00-838-5951	Insulation Sleeving, Electrical (06090) CRN3-16BLACK	ft
30.1	O	5970-01-378-3018	Insulation Sleeving, Electrical (06090) ATUM-1/4-0-4FT	lg
31	O	5970-01-422-3579	Insulation Sleeving, Electrical (06090) ATUM 1/2 4 ft length	lg
32	O	1650-00-166-4834	Lockwire (90166) 68A32	ea
33	O	9150-01-360-1905	Lubricant, Solid Film (MIL-L-46147) 16 oz can	cn
34	O	4730-00-019-0608	Nipple, Pipe	ea
35	O	4730-00-825-7304	Nipple, Tube MS51501B4	ea
36	O	5310-00-059-4265	Nut, Plain, Hex	ea

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
36.1	C		Oil, Commercial Burner Fuel, Grade FO-1 (ASTM D396)	
36.2	C		Oil, Commercial Burner Fuel, Grade FO-2 (ASTM D396)	
37	C		Oil, Fuel Diesel, DF-A, Arctic (VV-F-800) (81348)	
		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
38	C		Oil, Fuel, Diesel, DF-1, Winter (VV-F-800) (81348)	
		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
39	C		Oil, Fuel, Diesel, DF-2, Regular (VV-F-800) (81348)	
		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
40	C		Oil, Lubricating, Arctic (MIL-L-46167)	
		9150-00-402-2372	5 gl can	cn
		9150-00-491-7197	55 gl drum	dr
41	C		Oil, Lubricating, Gear, GO 75W (MIL-L-2105C)	
		9150-00-035-5390	1 qt can	cn
		9150-00-035-5391	5 gl can	cn
42	C		Oil, Lubricating, Gear, 80W-90 (MIL-L-2105C)	
		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
43	C		Oil, Lubricating, OE/HDO 10 (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
44	C	9150-00-189-6727	Oil, Lubricating, OE/HDO 10W (MIL-L-2104) 1 qt can	cn
45	C		Oil, Lubricating, OE/HDO 15W-40 (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

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
46	C		Oil, Lubricating, OE/HDO 30 (SAE 30) (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
47	C		Oil, Lubricating, OE/HDO 40 (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
48	O	5350-00-067-7639	Paper, Abrasive (28124) 02347 pg contains 100 sheets	pg
49	O	8010-01-146-2650	Polyurethane Coating (MIL-C-46168)	kt
50	O	8030-00-181-8372	Primer, Sealing Compound (05972) 747-56	cn
51	C	7920-00-205-1711	Rag, Wiping A-A-531	be
52		DELETED		
53	O	4020-00-855-2767	Rope, Fibrous (MIL-R-17343) 75 ft	cl
54	O	7520-00-634-2442	Rubber Stamp Set, Fixed Type	ea
55	O	5330-01-337-1108	Rubber Strip (12624) V4062	ft
56	O	5330-01-181-6482	Rubber Strip (19207) 12328583-3	ft
56.1	O	5305-00-021-3740	Screw, Cap, Hex Hd (97942) 645A560H43	ea
56.2	O	5305-01-299-4602	Screw, Cap, Hex Hd (64678) 000933 006058	ea
56.3	O	5305-01-454-5938	Screw, Cap, Hex Hd (19207) 12419954-093	ea
57	O	5305-01-296-0019	Screw, Cap, Socket Head (06888) SHCM75275 50 ct box	bx
58	O	1015-01-255-4144	Sealant, Pipe, Teflon (19207) 12297953 50 ml tube	tu
59	O	8030-00-081-2327	Sealing Compound (05972) 079-21	bx
60	O	8030-00-111-2762	Sealing Compound (05972) 290-31	bt
61	O	8030-00-133-3164	Sealing Compound (05972) 571-31	bt
62	O	8030-00-148-9833	Sealing Compound (05972) 271-21	bx
63	O	8030-00-204-9149	Sealing Compound (05972) 592-41	tu
64	O	8030-00-656-1426	Sealing Compound (81349) (MIL-S-45180)	pt
65	O	8030-01-025-1692	Sealing Compound (05972) 242-41 (MIL-S-46163)	bt
66	O	8030-01-088-8140	Sealing Compound (52571) 9001512-0011	bt

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
67	O		Sealing Compound (81349) (MIL-S-8802TY2CLB-2)	
		8030-00-753-5006	2 oz cartridge	ca
		8030-00-753-4599	6 oz can	kt
		8030-00-723-2746	12 oz can	kt
		8030-00-685-0915	24 oz can	kt
68	O	8030-01-155-3238	Sealing Compound (11083) 6V6640	ml
68.1	O	8030-01-371-8405	Sealing Compound (83574) PR-1422 B-1/2 6 oz	ca
69	C	7930-00-634-3935	Soap, Laundry (81348) P-S-1792	lb
70	O	3439-00-006-7764	Solder, Tin Alloy (81348) SN63WRAP3	sl
71	C		Solvent, Dry Cleaning SD (P-D-680)	
		6850-00-281-1985	1 gl can	cn
		6850-00-664-5685	1 qt can	cn
71.1	O		Strap, Tiedown, Electrical Components (06383) PLP2S	ea
72	O		Tape, Adhesive (0SHR6) 70P00002	ea
72.1	O	9320-01-244-0046	Tape, Adhesive, Rubber (18876) MIS-41157-08 180 ft	ro
73	O	8030-00-889-3534	Tape, Antiseizing (81349) (MIL-T-27730)	ea
74	O	5640-00-103-2254	Tape, Duct (39428) 1791K70	ea
75	O	5970-00-644-3167	Tape, Insulation, Electrical (80063) TL83	ro
75.1	O	4730-00-138-8050	Tee, Pipe (81343) 8-8-8 140424C	ea
76	O	5975-01-379-4997	Ties, Cable, Plastic (06383) PLT 35-C-O	hd
	C		Turbine Fuel, Aviation, Kerosene Type (MIL-T-83133), Grade JP-8	
	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
	C		Turbine Fuel, (MIL-F-5624), Grade JP-4 (NATO Code No. F40)	
		9130-00-273-2380	Drum, 16 gage	dr
	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
77	O	6145-01-148-2263	Wire, Electrical (80009) 175-0825-00 50 ft	ft

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

ITEM NAME/PART NUMBER	ITEM DESCRIPTION	PARA NO.
Brake Adjusting Tool Support		E-2
Brake Plunger Seal Driver		E-3
Cab Support Tool		E-4
Headlight Adjustment Screen		E-5
M1079 Blackout Shield Seals		E-6
M1079 Door Gaskets		E-7
M1079 Window Sash Glazing Seals		E-8
Relay Test Wire		E-9
Wheel Bearing Shim Tool Rest		E-10
12414690-001	Pneumatic Tube	E-11
12414690-002	Pneumatic Tube	E-11
12414690-004	Pneumatic Tube	E-11
12414690-005	Pneumatic Tube	E-11
12414690-010	Pneumatic Tube	E-11
12414690-101	Pneumatic Tube	E-11
12414690-102	Pneumatic Tube	E-11
12414690-103	Pneumatic Tube	E-11
12414690-104	Pneumatic Tube	E-11
12414690-105	Pneumatic Tube	E-11
12414690-106	Pneumatic Tube	E-11
12414690-107	Pneumatic Tube	E-11
12414690-108	Pneumatic Tube	E-11
12414690-109	Pneumatic Tube	E-11
12414690-112	Pneumatic Tube	E-11
12414690-113	Pneumatic Tube	E-11
12414690-115	Pneumatic Tube	E-11
12414690-117	Pneumatic Tube	E-11
12414690-118	Pneumatic Tube	E-11
12414690-119	Pneumatic Tube	E-11
12414690-120	Pneumatic Tube	E-11
12414690-121	Pneumatic Tube	E-11
12414690-122	Pneumatic Tube	E-11
12414690-123	Pneumatic Tube	E-11
12414690-124	Pneumatic Tube	E-11
12414690-125	Pneumatic Tube	E-11
12414690-126	Pneumatic Tube	E-11
12414690-127	Pneumatic Tube	E-11
12414690-201	Pneumatic Tube	E-11
12414690-202	Pneumatic Tube	E-11

Section II. MANUFACTURED ITEMS INDEX (CONT)

ITEM NAME/PART NUMBER	ITEM DESCRIPTION	PARA NO.
12414690-203	Pneumatic Tube	E-11
12414690-205	Pneumatic Tube	E-11
12414690-206	Pneumatic Tube	E-11
12414690-207	Pneumatic Tube	E-11
12414690-208	Pneumatic Tube	E-11
12414690-209	Pneumatic Tube	E-11
12414690-210	Pneumatic Tube	E-11
12414690-211	Pneumatic Tube	E-11
12414690-212	Pneumatic Tube	E-11
12414690-213	Pneumatic Tube	E-11
12414690-214	Pneumatic Tube	E-11
12414690-215	Pneumatic Tube	E-11
12414690-216	Pneumatic Tube	E-11
12414690-217	Pneumatic Tube	E-11
12414690-218	Pneumatic Tube	E-11
12414690-219	Pneumatic Tube	E-11
12414690-220	Pneumatic Tube	E-11
12414690-221	Pneumatic Tube	E-11
12414690-222	Pneumatic Tube	E-11
12414690-223	Pneumatic Tube	E-11
12414690-224	Pneumatic Tube	E-11
12414690-225	Pneumatic Tube	E-11
12414690-226	Pneumatic Tube	E-11
12414690-227	Pneumatic Tube	E-11
12414690-228	Pneumatic Tube	E-11
12414690-229	Pneumatic Tube	E-11
12414690-230	Pneumatic Tube	E-11
12414690-231	Pneumatic Tube	E-11
12414690-301	Pneumatic Tube	E-11
12414690-302	Pneumatic Tube	E-11
12414690-303	Pneumatic Tube	E-11
12416381P1	Non-Metallic Electrical Cable Conduit	E-12
12416381P10	Non-Metallic Electrical Cable Conduit	E-12
12416381P11	Non-Metallic Electrical Cable Conduit	E-12
12416381P12	Non-Metallic Electrical Cable Conduit	E-12
12416381P13	Non-Metallic Electrical Cable Conduit	E-12
12416381P14	Non-Metallic Electrical Cable Conduit	E-12
12416381P15	Non-Metallic Electrical Cable Conduit	E-12
12416381P16	Non-Metallic Electrical Cable Conduit	E-12
12416381P17	Non-Metallic Electrical Cable Conduit	E-12
12416381P2	Non-Metallic Electrical Cable Conduit	E-12
12416381P20	Non-Metallic Electrical Cable Conduit	E-12
12416381P21	Non-Metallic Electrical Cable Conduit	E-12
12416381P22	Non-Metallic Electrical Cable Conduit	E-12
12416381P23	Non-Metallic Electrical Cable Conduit	E-12
12416381P26	Non-Metallic Electrical Cable Conduit	E-12
12416381P3	Non-Metallic Electrical Cable Conduit	E-12
12416381P30	Non-Metallic Electrical Cable Conduit	E-12
12416381P32	Non-Metallic Electrical Cable Conduit	E-12
12416381P34	Non-Metallic Electrical Cable Conduit	E-12
12416381P35	Non-Metallic Electrical Cable Conduit	E-12

ITEM NAME/PART NUMBER	ITEM DESCRIPTION	PARA NO.
12416381P36	Non-Metallic Electrical Cable Conduit	E-12
12416381P37	Non-Metallic Electrical Cable Conduit	E-12
12416381P38	Non-Metallic Electrical Cable Conduit	E-12
12416381P4	Non-Metallic Electrical Cable Conduit	E-12
12416381P5	Non-Metallic Electrical Cable Conduit	E-12
12416381P6	Non-Metallic Electrical Cable Conduit	E-12
12416381P7	Non-Metallic Electrical Cable Conduit	E-12
12416381P8	Non-Metallic Electrical Cable Conduit	E-12
12416381P9	Non-Metallic Electrical Cable Conduit	E-12
12418037	Steering Gear Return Hose	E-13
12418460-001	Transmission Oil Cooler Hose	E-13
12418460-002	Transmission Oil Cooler Hose	E-13
12418763	Lanyard Assembly	E-14
12420196	Lanyard Assembly	E-14
12420197-001	Non-Metallic Vent Air Hose	E-15
12420197-002	Non-Metallic Vent Air Hose	E-15
12420197-003	Non-Metallic Vent Air Hose	E-15
12420197-004	Non-Metallic Vent Air Hose	E-15
12420197-005	Non-Metallic Vent Air Hose	E-15
12420197-006	Non-Metallic Vent Air Hose	E-15
12420198-001	Non-Metallic Vent Air Hose	E-15
12420198-002	Non-Metallic Vent Air Hose	E-15
12420308-457	Personnel Heater Air Duct Hose	E-16
12420308-760	Personnel Heater Air Duct Hose	E-16
12420489	Block Seal	E-17
3256-H-1048	CTIS Seal Driver	E-18
3256-K-1051	Wheel Hub Grease Seal Driver	E-19
Dimmer Switch Test Wire		E-20
Purge Valve Tool		E-21

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

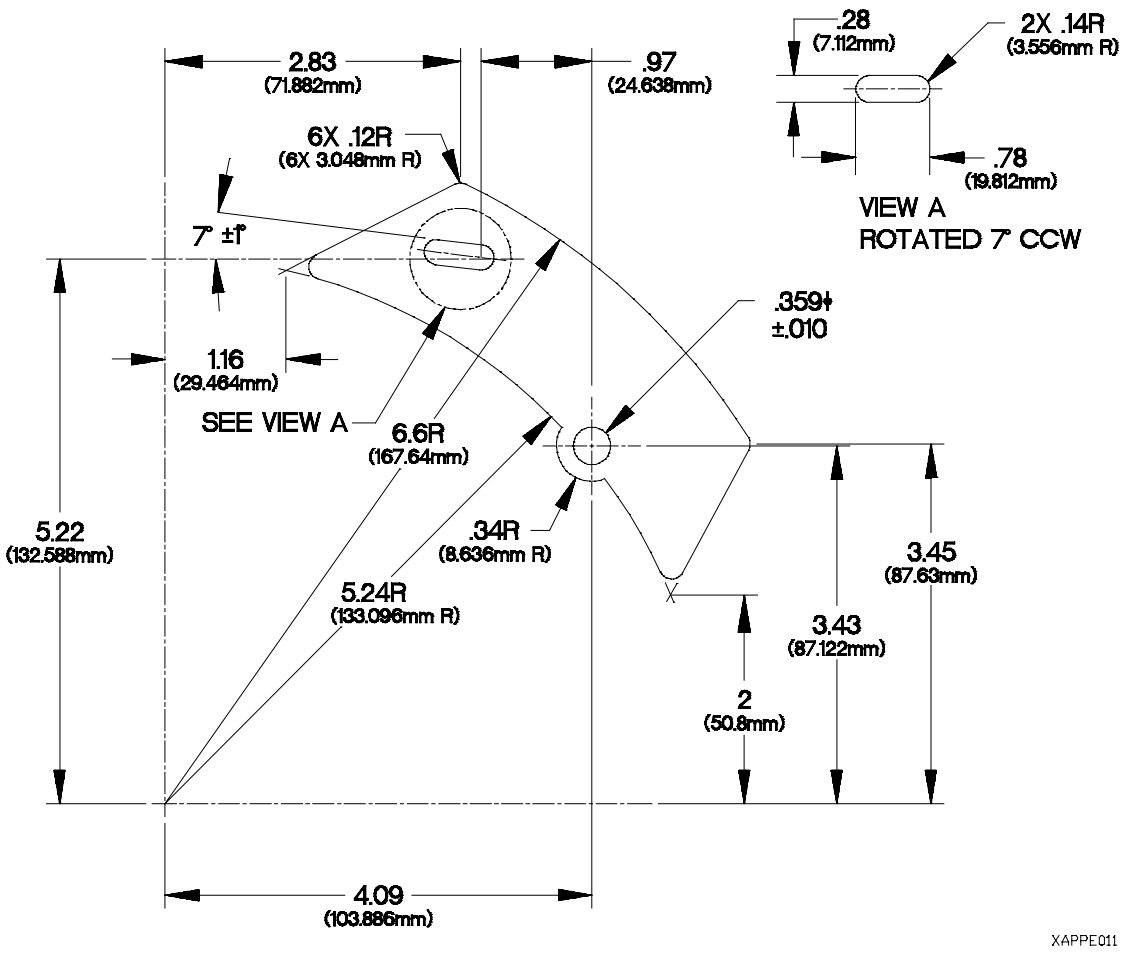


Figure E-1. Brake Adjusting Tool Support

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

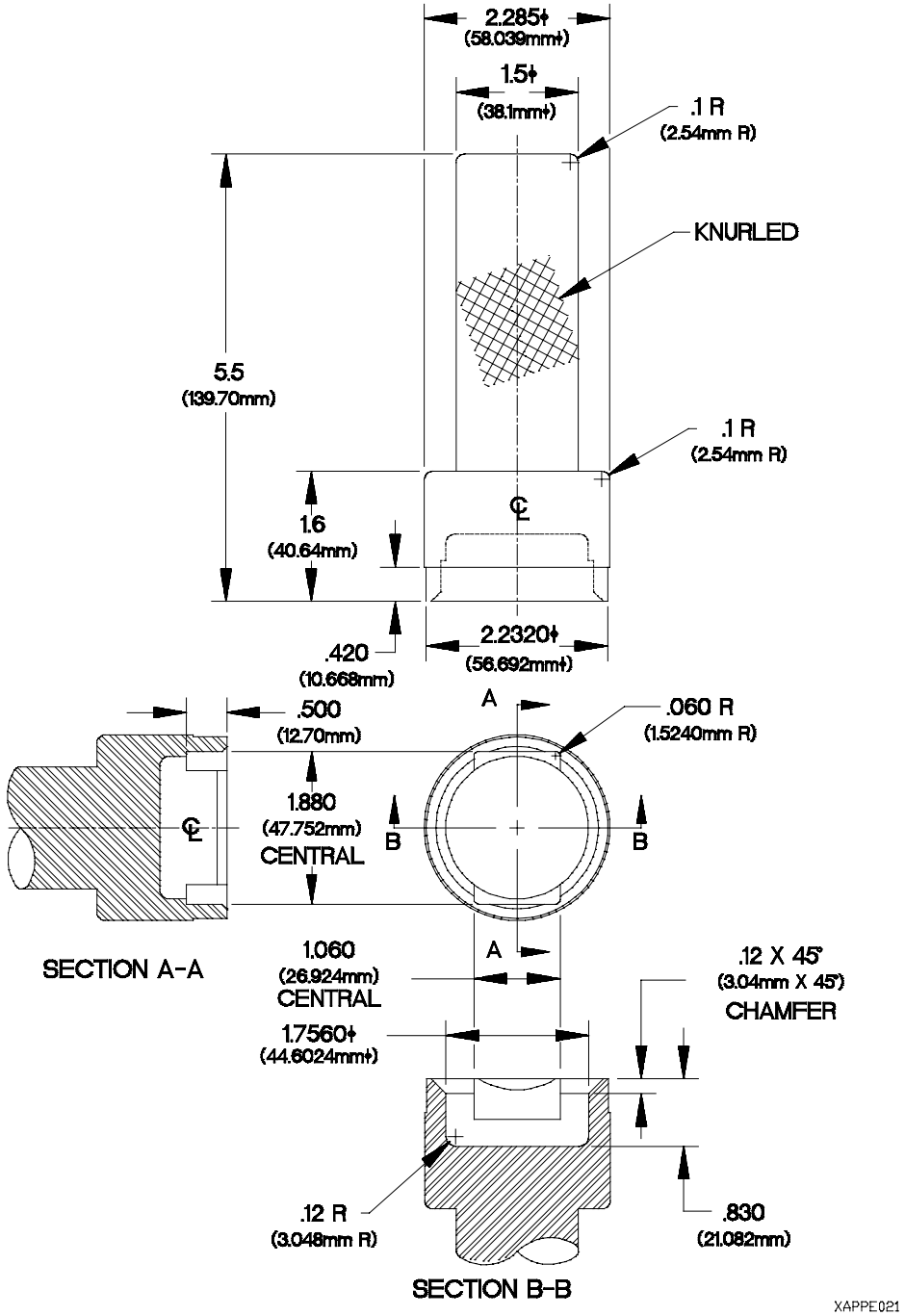


Figure E-2. Brake Plunger Seal Driver

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		

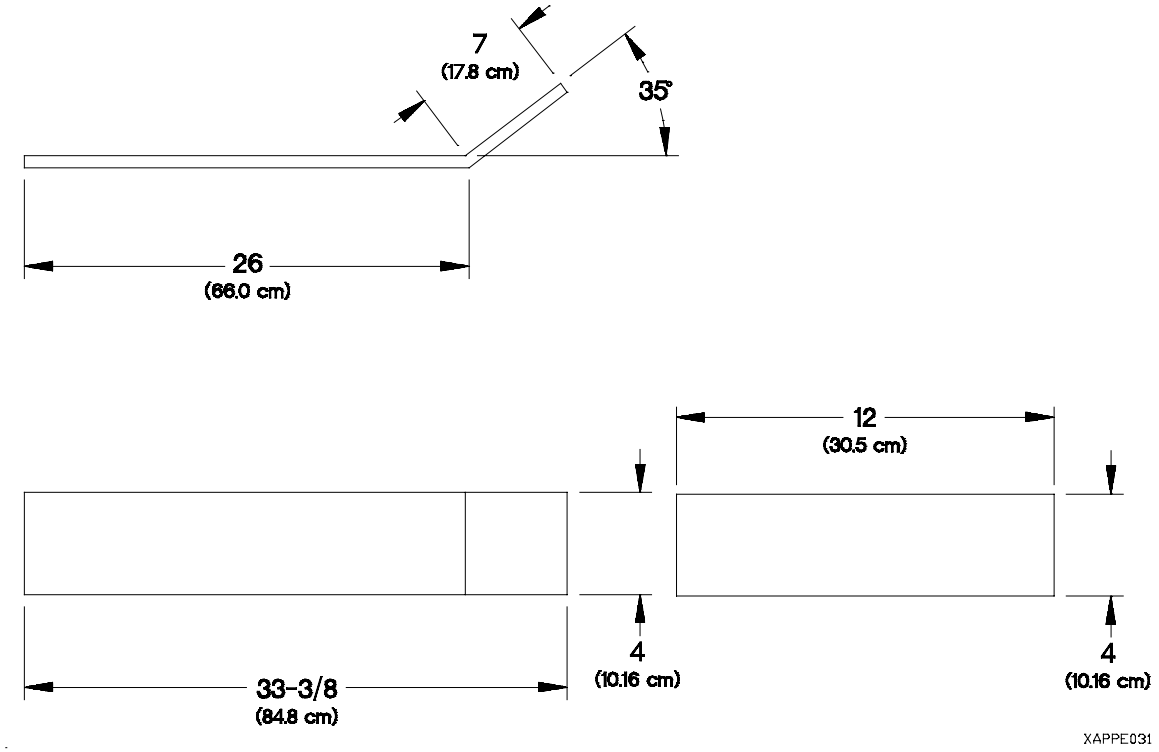


Figure E-3. Cab Support Tool Strut and Cab Rest

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.

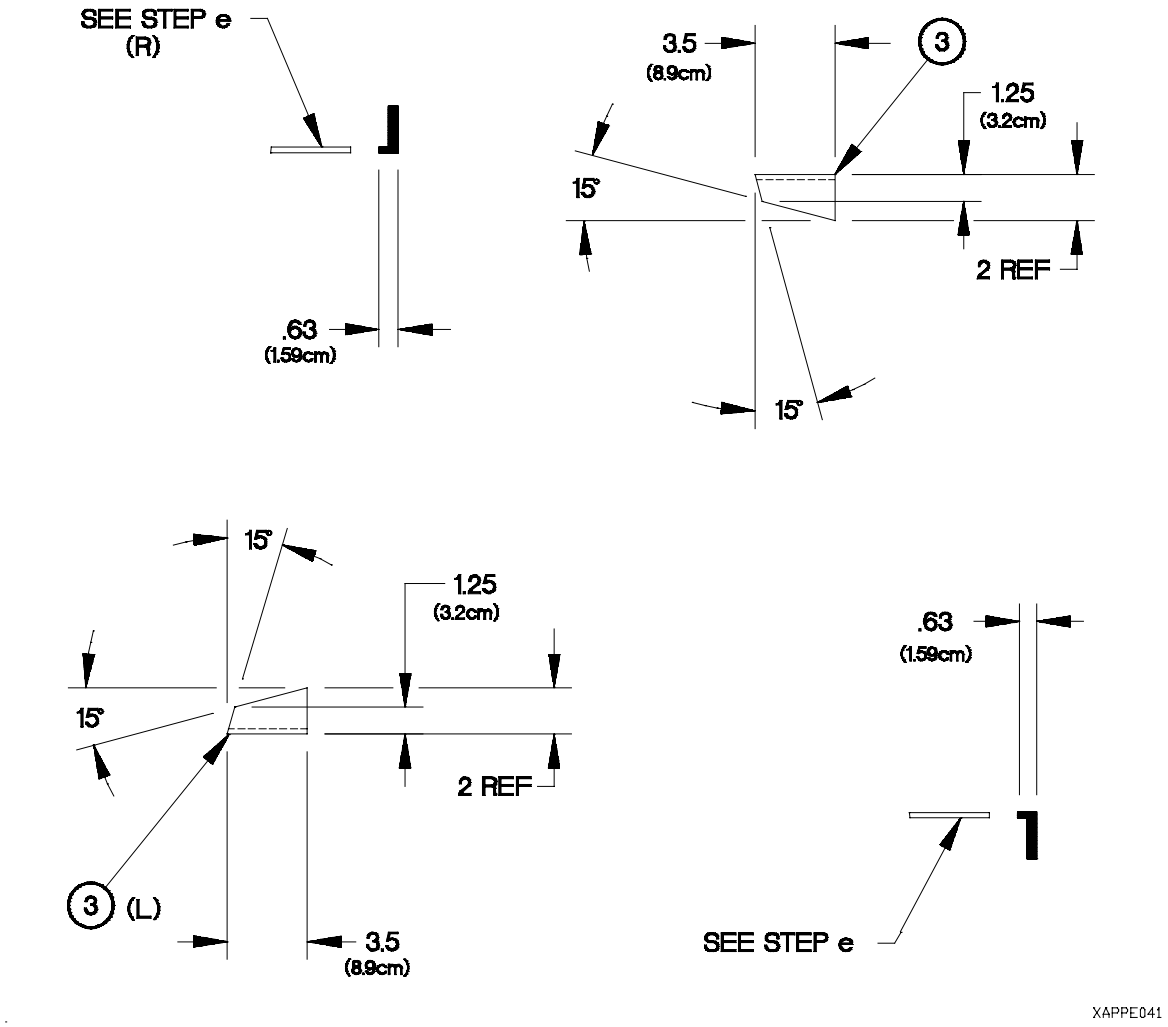


Figure E-4. Cab Support Tool Seat

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.

E-4. CAB SUPPORT TOOL (CONT)

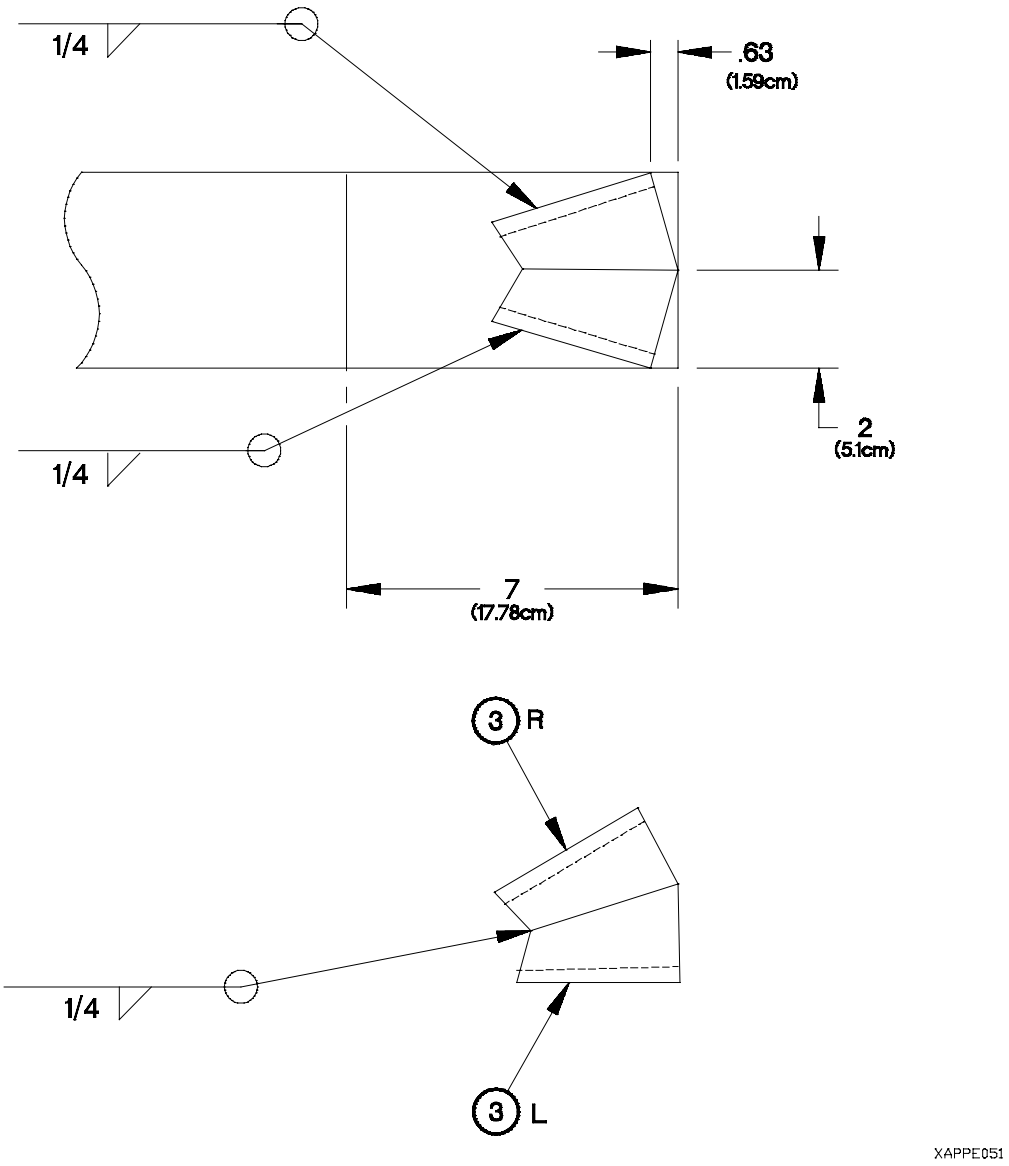


Figure E-5. Cab Support Tool Seat Layout

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.

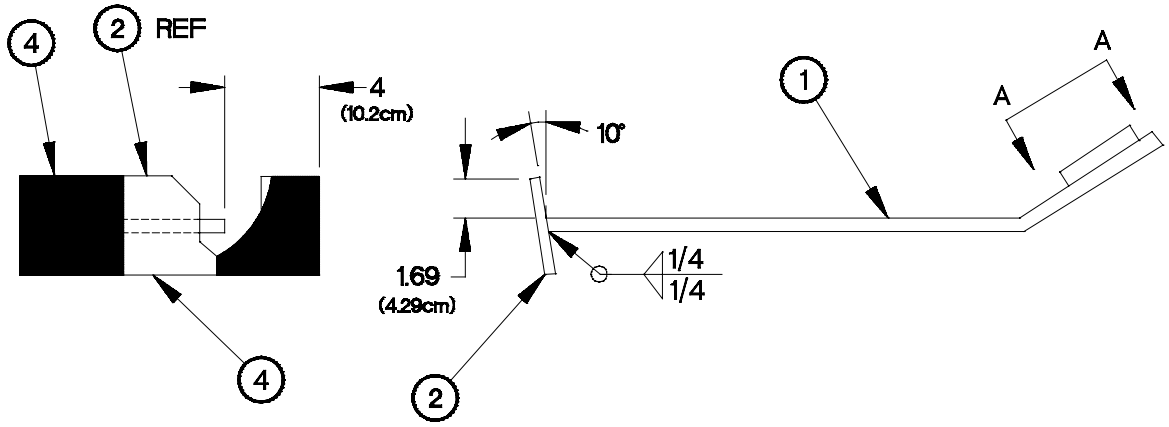


Figure E-6. Cab Support Tool Assembly

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. 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).

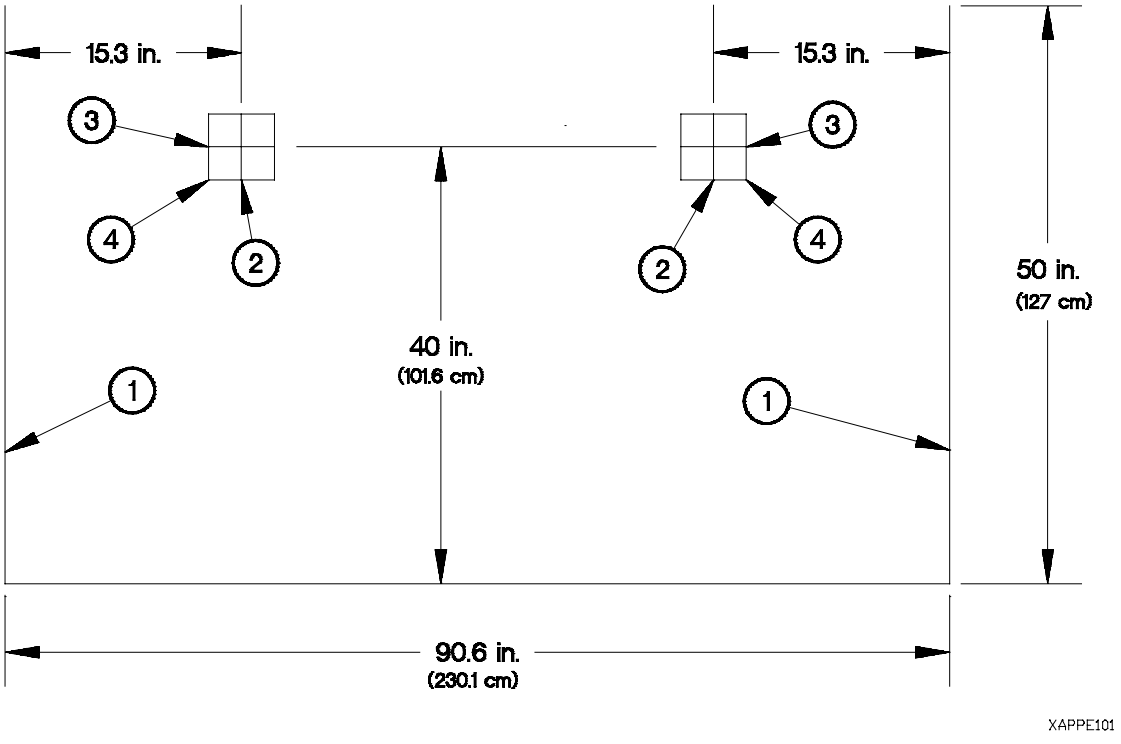


Figure E-7. Headlight Adjustment Screen

E-6. M1079 BLACKOUT SHIELD SEALS

Fabricate the M1079 blackout shield seals according to the following steps. Refer to the following parts list for materials.

Description	Material Part Number	CAGE Code	Cut Length
Blackout Shield Header Seal	942P00001	0SHR6	28-3/4 in. (730 mm)
Blackout Shield Jamb Seal (van body serial numbers 001 through 190)	942P00001	0SHR6	63-3/8 in. (1610 mm)
Blackout Shield Jamb Seal (van body serial number 191 and higher)	942P00001	0SHR6	33 in. (838 mm)

a. Dimensions are in inches (millimeters).
b. Cut seal material to the specified length using a fine-toothed hacksaw or other suitable cutting tool.

E-7. M1079 DOOR GASKETS

Fabricate the M1079 door gaskets according to the following steps. Refer to the following parts list for materials.

Description	Material Part Number	CAGE Code	Cut Length
LH Door Gasket	12416417	19207	214 in. (5435 mm)
RH Door Gasket	12416417	19207	197 in. (5004 mm)

a. Dimensions are in inches (millimeters).
b. Cut seal material to the specified length using a fine-toothed hacksaw or other suitable cutting tool.
c. Glue ends of gasket to each other using adhesive MIL-A-46106 GP1TY1 (Item 11, Appendix D).

E-8. M1079 WINDOW SASH GLAZING SEALS

Fabricate the M1079 window sash glazing seals according to the following steps. Refer to the following parts list for materials.

Description	Material Part Number	CAGE Code	Cut Length
Window Sash Top/Bottom Seal	941P00001	0SHR6	26-13/16 in. (681 mm)
Window Sash Side Seal (van body serial numbers 001 through 190)	941P00001	0SHR6	28-1/2 in. (724 mm)
Window Sash Side Seal (van body serial number 191 and higher)	941P00001	0SHR6	12-11/16 in. (322 mm)

a. Dimensions are in inches (millimeters).
b. Cut seal material to the specified length using a fine-toothed hacksaw or other suitable cutting tool.

NOTE

Cut miters so that short side of seal faces toward glass.

c. Cut 45-degree miters on ends of window sash seals.

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. 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-11. PNEUMATIC TUBES FABRICATION

Cut pneumatic tubes from bulk tubing stock listed **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
12414690-004	NT-100-4 (79470)	74.8	190.0
12414690-005	NT-100-4 (79470)	69.7	177.0
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
12414690-117	J844TYBSIZE 3/8 (81343)	156.5	397.5
12414690-118	J844TYBSIZE 3/8 (81343)	11.8	30.0
12414690-119	J844TYBSIZE 3/8 (81343)	269.5	684.5
12414690-120	J844TYBSIZE 3/8 (81343)	11.9	30.2
12414690-121	J844TYBSIZE 3/8 (81343)	43.0	109.2
12414690-122	J844TYBSIZE 3/8 (81343)	44.1	112.0
12414690-123	J844TYBSIZE 3/8 (81343)	259.4	659.0
12414690-124	J844TYBSIZE 3/8 (81343)	288.2	732.0
12414690-125	J844TYBSIZE 3/8 (81343)	10.8	27.3
12414690-126	J844TYBSIZE 3/8 (81343)	17.0	43.2
12414690-127	J844TYBSIZE 3/8 (81343)	17.0	43.2

E-11. PNEUMATIC TUBES FABRICATION (CONT)

Table E-1. Pneumatic Tube Lengths (Cont)

Tube Part Number	Bulk Tubing Part Number	Cut Length	
		inches	cm
12414690-201	C608-100BLK (13174)	14.8	37.5
12414690-202	C608-100BLK (13174)	14.0	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)	14.9	37.7
12414690-207	C608-100BLK (13174)	15.5	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)	16.9	43.0
12414690-213	C608-100BLK (13174)	118.5	301.0
12414690-214	C608-100BLK (13174)	124.0	315.0
12414690-215	C608-100BLK (13174)	163.0	414.0
12414690-216	C608-100BLK (13174)	160.0	406.4
12414690-217	C608-100BLK (13174)	62.6	159.0
12414690-218	C608-100BLK (13174)	119.8	304.2
12414690-219	C608-100BLK (13174)	69.0	175.3
12414690-220	C608-100BLK (13174)	45.5	115.6
12414690-221	C608-100BLK (13174)	12.6	32.0
12414690-222	C608-100BLK (13174)	5.5	14.0
12414690-223	C608-100BLK (13174)	14.6	37.1
12414690-224	C608-100BLK (13174)	170.0	431.8
12414690-225	C608-100BLK (13174)	174.0	442.0
12414690-226	C608-100BLK (13174)	103.5	263.0
12414690-227	C608-100BLK (13174)	32.8	83.2
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
12414690-301	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-12. 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-13. 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-14. 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-8. 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

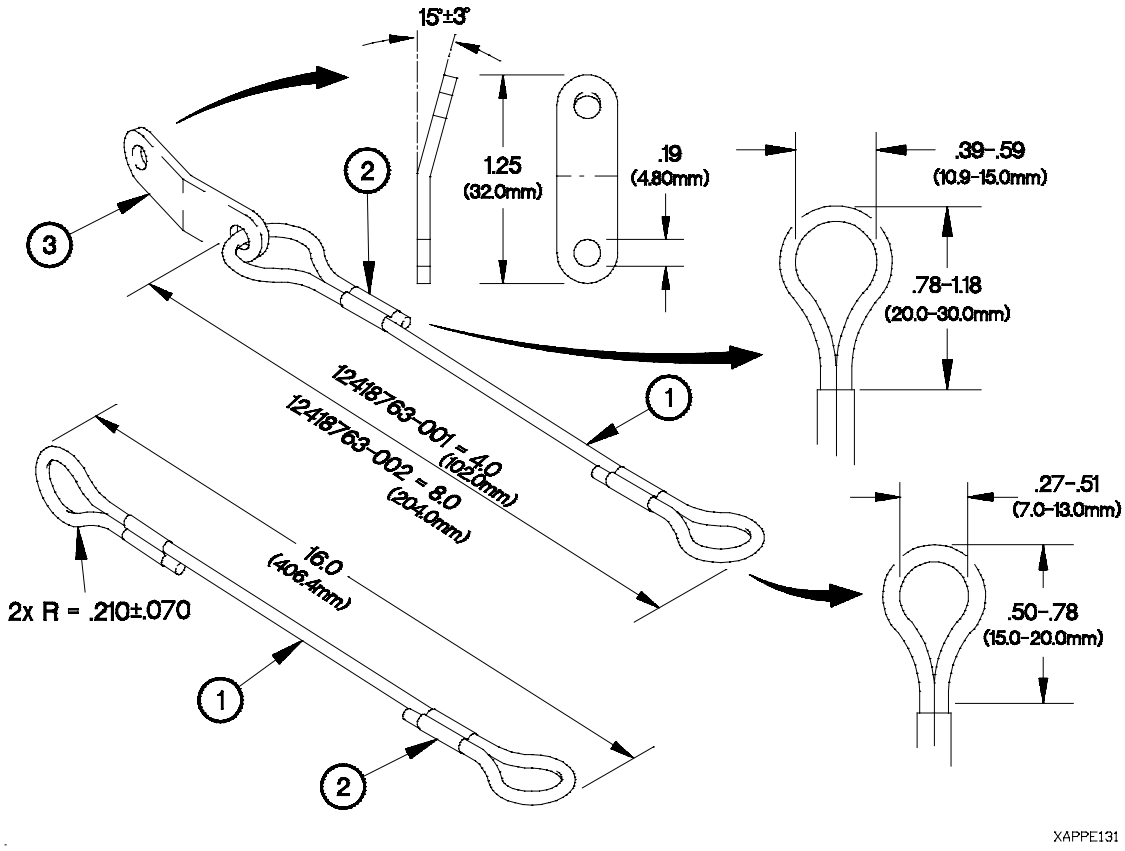


Figure E-8. Lanyard Assembly

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-15. 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-16. 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-17. 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-18. CTIS SEAL DRIVER 3256-H-1048

Used on Front and Rear Axle CTIS Seals.

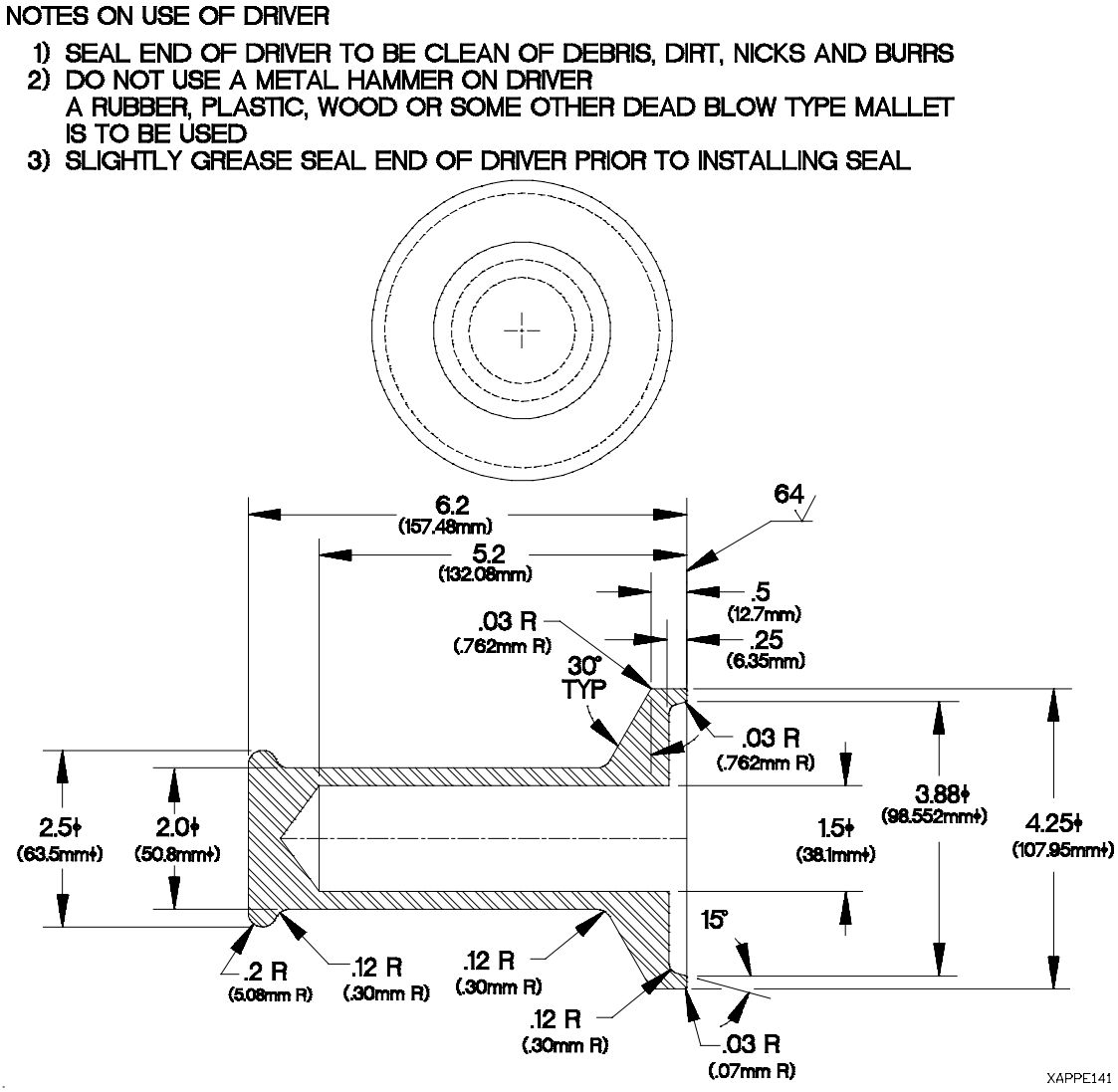


Figure E-9. CTIS Seal Driver

a. All dimensions are in inches (millimeters).
b. Manufacture from round steel stock.
c. De-burr and remove sharp edges.

E-19. 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

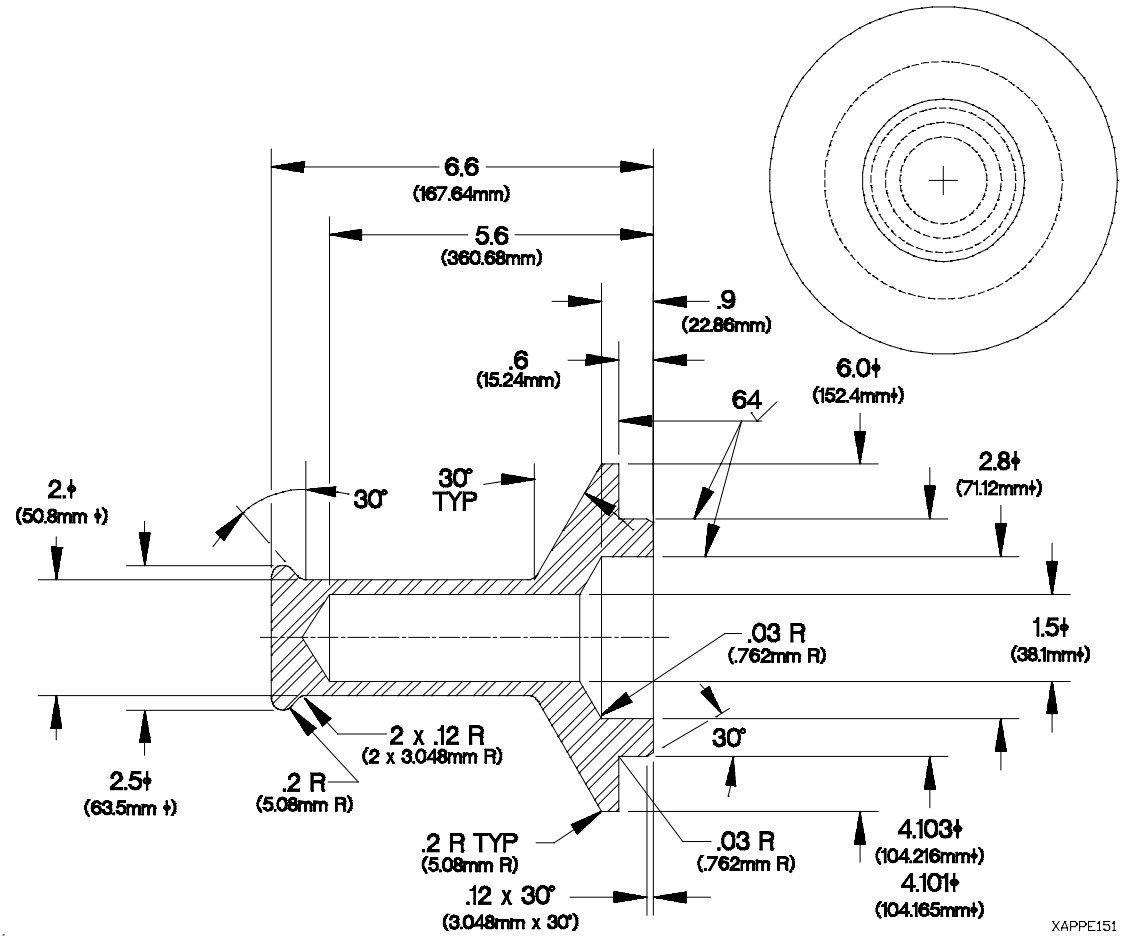


Figure E-10. Wheel Hub Grease Seal Driver

a. All dimensions are in inches (millimeters).
b. Manufacture from round steel stock.
c. De-burr and remove sharp edges.

E-20. 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-21. PURGE VALVE TOOL

Fabricate Purge Valve Tool according to the following instructions. Refer to Figure E-11. 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

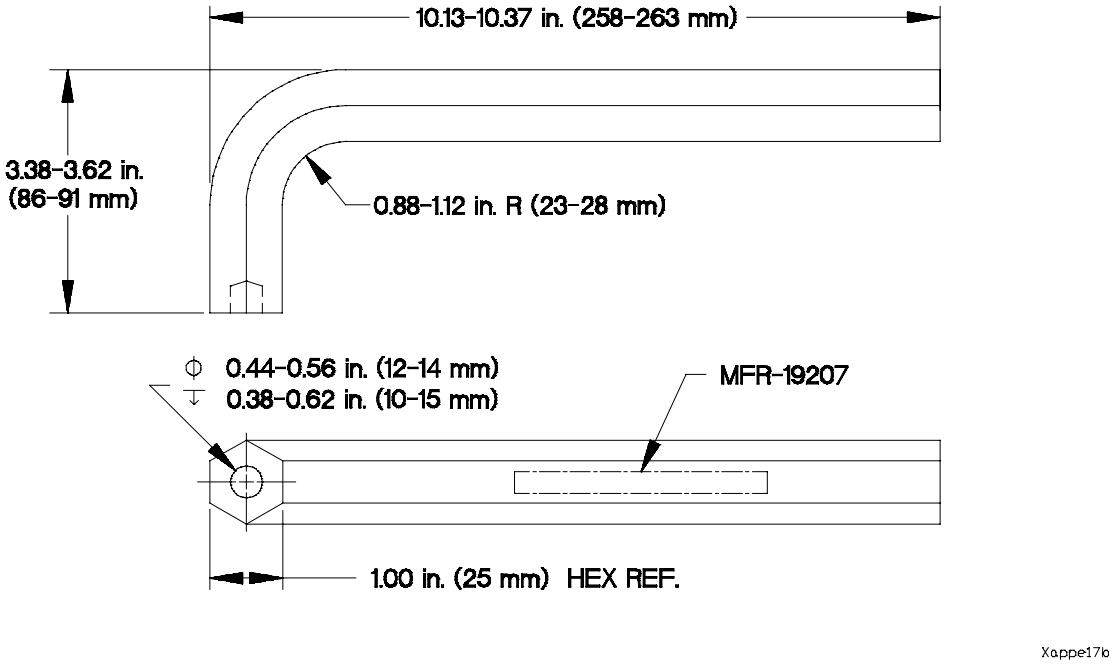


Figure E-11. Purge Valve Tool

a. All dimensions are in inches (cm).
b. Cut steel bar (1) and bend to shape as shown in Figure E-11.
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.

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.

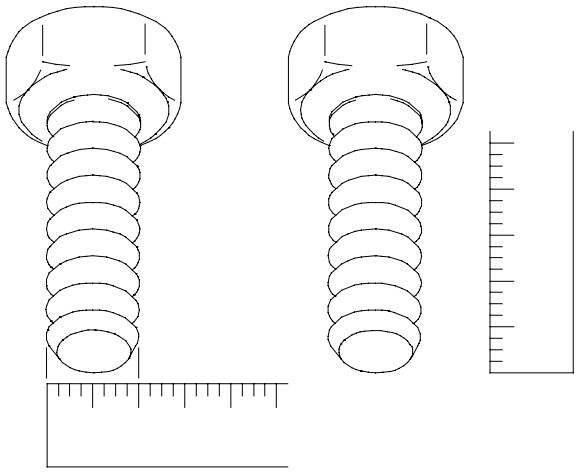
(2) Count the number of threads per inch.

(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.



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APPENDIX F
TORQUE LIMITS

Table F-1. Dry Torque Limits for SAE and ANSI Screws and Free Spinning Nuts

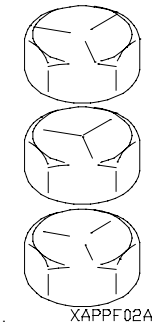
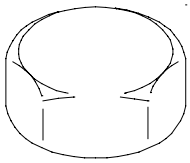
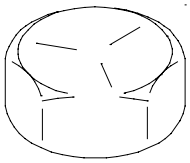
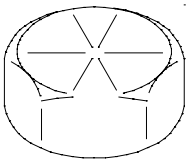
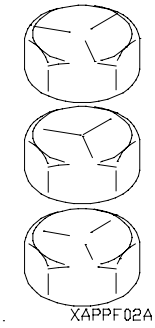
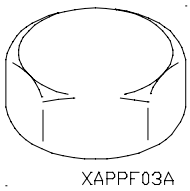
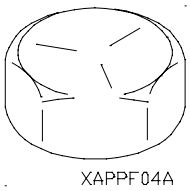
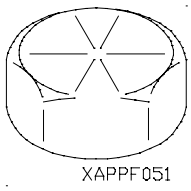
 XAPPF02A **NOTE Manufacturer's marks may vary. These are all SAE Grade 5.**		Material Grade Markings					
		 XAPPF03A **SAE Grade 2**		 XAPPF04A **SAE Grade 5**		 XAPPF051 **SAE Grade 8**	
Diameter	**Threads per inch**	**Torque**					
inch		**lb-ft**	**N·m**	**lb-ft**	**N·m**	**lb-ft**	**N·m**
1/4	20	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

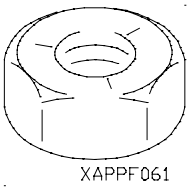
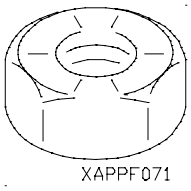
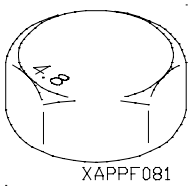
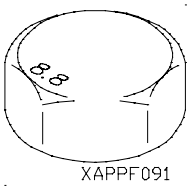
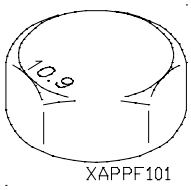
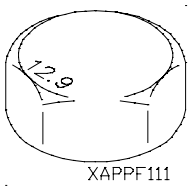
		Material Grade Markings			
		 XAPPF061		 XAPPF071	
		SAE Grade 5		SAE Grade 8	
Hole Diameter	Threads per inch	Torque			
inch		lb-ft	N·m	lb-ft	N·m
1/4	20	10-12	14-16	15-17	20-24
1/4	28	12-14	16-18	14-18	21-25
5/16	18	20-24	27-33	26-32	36-44
5/16	24	22-26	30-36	29-35	40-48
3/8	16	35-41	47-55	48-58	65-77
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

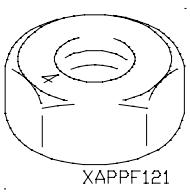
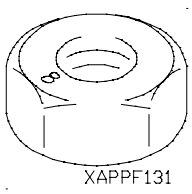
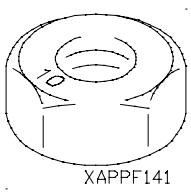
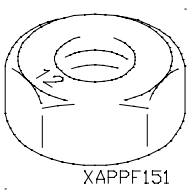
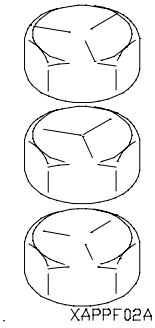
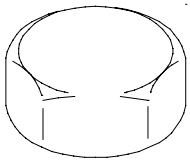
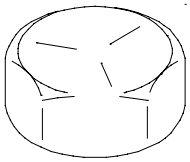
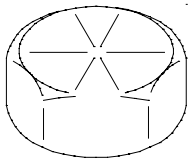
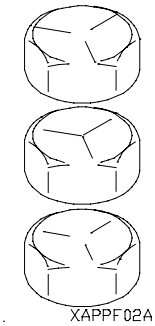
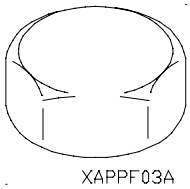
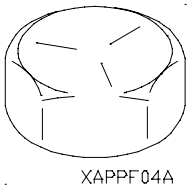
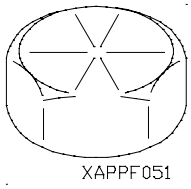
		Material Grade Markings							
		 Metric Grade 4.8		 Metric Grade 8.8		 Metric Grade 10.9		 Metric Grade 12.9	
Diameter	Thread Pitch	Torque							
mm		lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m
6	1	5-6	7-8	7-9	10-12	10-12	14-17	11-14	15-19
8	1.25	12-14	16-18	18-22	24-30	24-30	32-40	27-33	36-46
8	1	12-14	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 LMTV 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, RUBBER	12419182	5340-01-410-8397
5	BUSHING, SLEEVE	7-199-002668	3120-01-367-6894
6	CHANNEL, RUBBER	ZZR765/2-001A7	9390-01-420-4560
7	CLAMP	024S9	4730-01-447-4312
8	CLAMP	032S9	4730-01-447-4313
9	DECAL	12340917	7690-01-256-4909
10	FASTENER TAPE	MIL-F-21840	8315-00-006-9855
11	FASTENER TAPE	50-534718-19	8315-00-935-6762
12	FILTER ASSEMBLY	75223-11	2940-01-417-9333
13	FILTER ELEMENT	1048011	2940-01-385-8931
14	FILTER ELEMENT, FLUID	R22146	2910-01-360-6366
14.1	FILTER ELEMENT, FLUID	ST117073098-000	2910-01-467-4594
15	FILTER ELEMENT, FLUID	29507750	2940-01-361-2406
16	FILTER ELEMENT, FLUID	599791	4460-01-284-2344

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
17	FILTER ELEMENT, FLUID	931558	2940-01-363-4377
18	FILTER ELEMENT, INTAKE AIR CLEANER	P52-7750	2940-01-361-2407
19	FILTER, AIR	12416539	
20	FILTER, AIR	12416563	4730-01-398-5654
21	FILTER, FUEL	7E9763	2940-01-363-3089
22	FILTER, OIL	1R0739	2940-00-029-0388
23	GASKET	F337576M6	
24	GASKET	M28840/24HA	5935-01-421-9754
25	GASKET	QS-1181	5330-01-058-3788
26	GASKET	10-36675-18	5330-00-298-0190
26.1	GASKET	11446	5330-00-247-4174
27	GASKET	119-2940	5330-01-424-7905
28	GASKET	12421469	5330-01-453-2980
29	GASKET	12422254	
30	GASKET	13848	5330-01-211-0717
31	GASKET	350700	5330-01-295-3053
32	GASKET	350903	5330-00-576-4626
33	GASKET	352200	5330-01-421-6105
34	GASKET	352302	5330-01-421-6107
35	GASKET	353400	5330-01-421-6102
36	GASKET	353806	5330-01-421-6103
37	GASKET	353810	5330-01-450-6666
38	GASKET	355148	5330-01-423-0596
39	GASKET	355175	5330-01-423-0623
40	GASKET	3K3257	5330-01-305-6550
40.1	GASKET	3N4087	5330-01-061-8003
41	GASKET	4P1624	5330-01-360-5934
42	GASKET	9Y8103	5330-01-360-5931
42.1	GASKET AND PREFORMED PACKING SET	9X8318	5330-01-360-9098
43	GASKET, FUEL FILTER	7C1159	5330-01-360-5941
44	NOT USED		

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
45	GASKET, THERMOSTAT	2W7212	5330-01-347-3206
46	GROMMET, NONMETALLIC	MS35489-6	5325-00-263-6632
47	GROMMET, NONMETALLIC	12417598	5325-01-375-1299
48	GROMMET, NONMETALLIC	12421402	5325-01-440-2178
49	GROMMET, NONMETALLIC	4082-37634-01	5325-01-194-3076
50	GROMMET, NONMETALLIC	50S12-1-1AA	5325-01-145-0105
51	GROMMET, NONMETALLIC	8741442	5325-00-088-6147
52	INSULATOR, TANK	A1394J	5970-01-385-7317
53	INSULATOR, TANK	A1394K	5970-01-385-7262
54	KIT, FILTER	29503829	
55	KIT, FILTER	29526899	5330-01-453-0770
56	NOT USED		
57	LAMP, INCANDESCENT	CM7-7373	6240-00-270-6824
58	LAMP, INCANDESCENT	CM7376	6240-00-499-6278
59	LATCH, BAIL HEAD	68-20-101-10	2540-01-232-2470
60	LOCKNUT	0770-023-003	5310-01-423-3725
61	LOCKWASHER	ABCH207-LW-1/2	
62	LOCKWASHER	ABCH207-LW-3/8	
63	LOCKWASHER	B7949000161	
64	LOCKWASHER	D70336/1-20	5310-01-110-7933
65	LOCKWASHER	D70336/3-50	5310-01-439-2542
66	LOCKWASHER	D70336/3-52	5310-01-439-2543
66.1	LOCKWASHER	MS35333-78	5310-01-110-7953
67	LOCKWASHER	MS35335-30	5310-00-209-0788
68	LOCKWASHER	MS35335-31	5310-00-596-7693
69	LOCKWASHER	MS35335-33	5310-00-209-0786
70	LOCKWASHER	MS35335-36	5310-00-550-3503
71	LOCKWASHER	MS35335-38	5310-00-616-6354
72	LOCKWASHER	MS35335-58	5310-00-209-1366
73	LOCKWASHER	MS35335-61	5310-00-527-3634
74	LOCKWASHER	MS35335-62	5310-00-184-9562

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
75	LOCKWASHER	MS35337-25	5310-00-013-8502
76	LOCKWASHER	MS35338-100	5310-00-261-8278
77	LOCKWASHER	MS35338-102	5310-00-167-0671
78	LOCKWASHER	MS35338-103	5310-00-184-8971
79	LOCKWASHER	MS35338-135	5310-00-933-8118
80	LOCKWASHER	MS35338-136	5310-00-929-6395
81	LOCKWASHER	MS35338-137	5310-00-933-8119
82	LOCKWASHER	MS35338-138	5310-00-933-8120
83	LOCKWASHER	MS35338-139	5310-00-933-8121
84	LOCKWASHER	MS35338-140	5310-00-974-6623
85	LOCKWASHER	MS35338-141	5310-00-984-7042
86	LOCKWASHER	MS35338-143	5310-00-933-8778
87	LOCKWASHER	MS35338-158	5310-00-883-9417
88	LOCKWASHER	MS35338-171	5310-01-130-9066
89	LOCKWASHER	MS35338-42	5310-00-045-3299
90	LOCKWASHER	MS35338-43	5310-00-045-3296
91	LOCKWASHER	MS35338-45	5310-00-407-9566
92	LOCKWASHER	MS35338-46	5310-01-334-4710
93	LOCKWASHER	MS35338-51	5310-00-584-7888
94	LOCKWASHER	MS35340-44	5310-00-682-5930
95	LOCKWASHER	MS51414-1	5310-01-235-2057
96	LOCKWASHER	MS51414-2	5310-01-310-1098
97	LOCKWASHER	MS51848-50	5310-01-033-8615
98	LOCKWASHER	N9015	5310-01-369-6073
99	LOCKWASHER	N9018	5310-01-032-4827
100	LOCKWASHER	N9459	5310-01-348-8393
101	LOCKWASHER	N9461	5310-01-348-8392
101.1	LOCKWASHER	XP1113	5310-01-460-5991
101.2	LOCKWASHER	10241	5310-01-416-3010
102	LOCKWASHER	1229-S-513C	5310-01-062-3384
102.1	LOCKWASHER	12414570-011	5310-01-374-3292

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
102.2	LOCKWASHER	12414570-013	5310-01-374-4515
103	LOCKWASHER	12414570-015	5310-01-388-2043
104	LOCKWASHER	12414570-021	5310-01-374-4516
105	NOT USED		
106	NOT USED		
107	NOT USED		
108	LOCKWASHER	1729B262	5310-00-964-7811
109	NOT USED		
110	NUT, BLIND RIVET	MS27130-S136	5310-01-409-4435
111	NUT, BLIND RIVET	MS27130-S148	5310-01-370-5548
112	NUT, BLIND RIVET	12421403-060	
113	NUT, BLIND RIVET	12421403-065	
114	NUT, BLIND RIVET	12421634-017	
115	NUT, BLIND RIVET	12442158-5	
115.1	NUT, PLAIN, ROUND	1727N40	5310-00-123-2572
116	NUT, SELF-LOCKING	DIN-934STM6	5310-01-342-2739
117	NUT, SELF-LOCKING	MS16228-10C	5310-00-245-8826
118	NUT, SELF-LOCKING	MS16228-5C	5310-00-584-7992
119	NUT, SELF-LOCKING	MS20500-524	5310-00-208-4023
120	NUT, SELF-LOCKING	MS21042-04	5310-00-811-6419
121	NUT, SELF-LOCKING	MS21042-5	5310-00-807-1469
122	NUT, SELF-LOCKING	MS21044C08	5310-00-982-6814
122.1	NUT, SELF-LOCKING	MS21045L5	5310-00-857-5559
123	NUT, SELF-LOCKING	MS21083N08	5310-00-941-6019
124	NUT, SELF-LOCKING	MS21083N6	5310-00-926-1852
125	NUT, SELF-LOCKING	MS51922-1	5310-00-088-1251
126	NUT, SELF-LOCKING	MS51922-2	5310-00-929-1807
127	NUT, SELF-LOCKING	MS51922-33	5310-00-225-6993
128	NUT, SELF-LOCKING	MS51922-5	5310-00-959-7600
129	NUT, SELF-LOCKING	N9406	5310-01-362-6171
130	NUT, SELF-LOCKING	N9410	5310-01-348-8398

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
130.1	NUT, SELF-LOCKING	N9453	5310-01-348-8314
131	NUT, SELF-LOCKING	N9467	5310-01-350-4257
131.1	NUT, SELF-LOCKING	N9556	5310-01-423-0880
132	NUT, SELF-LOCKING	12301125	5310-01-210-0199
133	NUT, SELF-LOCKING	12412476-04	5310-01-466-0565
134	NUT, SELF-LOCKING	12414308-002	5310-01-381-2819
135	NUT, SELF-LOCKING	12414308-003	5310-01-377-1549
136	NUT, SELF-LOCKING	12414308-004	5310-01-369-5703
137	NUT, SELF-LOCKING	12414308-007	5310-01-046-0186
138	NUT, SELF-LOCKING	12414308-017	5310-01-381-9830
139	NUT, SELF-LOCKING	12414308-018	5310-01-369-3337
140	NUT, SELF-LOCKING	12414308-019	5310-01-369-9522
141	NUT, SELF-LOCKING	12414308-020	5310-01-381-9849
142	NUT, SELF-LOCKING	12414308-021	5310-01-369-3338
143	NUT, SELF-LOCKING	12414308-022	5310-01-417-1262
144	NUT, SELF-LOCKING	12414308-025	5310-01-367-6706
145	NUT, SELF-LOCKING	12414308-027	5310-01-369-3339
146	NUT, SELF-LOCKING	12414315-003	5310-01-374-1382
147	NUT, SELF-LOCKING	12414315-005	5310-01-372-3023
148	NUT, SELF-LOCKING	12414315-006	5310-01-369-3332
149	NUT, SELF-LOCKING	12414315-009	5310-01-365-7236
150	NUT, SELF-LOCKING	12414315-012	5310-01-369-3331
151	NUT, SELF-LOCKING	12414315-017	5310-01-368-8065
152	NUT, SELF-LOCKING	12414420-004	5310-01-370-0010
153	NUT, SELF-LOCKING	12419003	5310-01-376-0773
154	NUT, SELF-LOCKING	270W10000	
155	NUT, SELF-LOCKING	29514660	
156	NUT, SELF-LOCKING	7951286	5310-00-789-0398
157	PACKING, PREFORMED	A82777	5330-00-579-6495
158	PACKING, PREFORMED	F4001-16	5331-01-466-0354
158.1	PACKING, PREFORMED	J515-16-3	5331-01-465-3634

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
158.2	PACKING, PREFORMED	J515-4-1	5331-01-387-9490
159	PACKING, PREFORMED	J515-8-1	5330-00-292-8171
160	PACKING, PREFORMED	5999807	5331-01-456-9156
161	PACKING, PREFORMED	MS28775-011	5330-00-582-2133
162	PACKING, PREFORMED	MS28775-227	5330-00-576-9731
162.1	PACKING, PREFORMED	MS28775-910	5331-00-448-6753
163	PACKING, PREFORMED	MS28778-10	5330-00-285-9842
164	PACKING, PREFORMED	MS28778-12	5330-00-251-8839
165	PACKING, PREFORMED	MS28778-16	5330-00-816-3546
166	PACKING, PREFORMED	MS28778-4	5330-00-805-2966
166.1	PACKING, PREFORMED	MS28778-6	5331-00-804-5695
167	PACKING, PREFORMED	MS9955-113	5330-01-374-2325
168	PACKING, PREFORMED	M25988/1-246	5330-01-189-6351
168.1	PACKING, PREFORMED	M83461/1-442	5330-01-183-0987
169	PACKING, PREFORMED	OR42OA	5330-01-389-6028
170	PACKING, PREFORMED	11639519-1	5330-00-463-0200
171	PACKING, PREFORMED	1509	5330-00-172-1919
171.1	PACKING, PREFORMED	195045	5331-00-618-5361
171.2	PACKING, PREFORMED	19755	5331-01-415-9632
171.3	PACKING, PREFORMED	198336	5331-00-584-1840
172	PACKING, PREFORMED	2M4453	5330-00-074-3768
173	PACKING, PREFORMED	22617-16	5330-01-168-0885
174	PACKING, PREFORMED	23043446	5330-01-424-6629
174.1	PACKING, PREFORMED	250192	5331-01-417-5105
174.2	PACKING, PREFORMED	251216	5330-01-417-5107
175	PACKING, PREFORMED	29500969	5330-01-360-7852
176	PACKING, PREFORMED	29503383	5330-01-360-6017
177	PACKING, PREFORMED	3-906N522-90	5330-01-104-1093
178	PACKING, PREFORMED	3-908N522-90	5330-00-929-8171
179	PACKING, PREFORMED	3D2824	5330-00-944-8281
180	PACKING, PREFORMED	3J1907	5330-01-333-6444

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
181	PACKING, PREFORMED	3J7354	5330-00-954-8008
182	PACKING, PREFORMED	3K0360	5330-00-948-6482
183	PACKING, PREFORMED	4J5477	5330-00-855-8059
184	PACKING, PREFORMED	4L9564	5330-00-828-8639
184.1	PACKING, PREFORMED	420828	5340-01-417-3788
185	PACKING, PREFORMED	5-X-1155	5330-01-392-1637
186	PACKING, PREFORMED	5F7054	5330-00-339-6224
187	PACKING, PREFORMED	5P7813	5330-01-335-0042
188	PACKING, PREFORMED	6V8397	5330-00-579-6495
189	PACKING, PREFORMED	673268	
190	PACKING, PREFORMED	673269	5330-01-395-1252
191	PACKING, PREFORMED	7F8267	5330-01-291-7353
192	PACKING, PREFORMED	7320658	5330-00-297-7106
193	PACKING, PREFORMED	9604792-001	5330-01-429-3089
194	PAD, CUSHIONING	12416479-001	2590-01-397-7844
195	PAD, CUSHIONING	12416479-002	2590-01-412-2663
196	PARTS KIT, DEHYDRATOR	RN-60-A	4440-01-337-7324
197	PARTS KIT, SEAL REPLACEMENT	SK10-2	5330-01-350-4474
198	PARTS KIT, SEAL REPLACEMENT	SK10-3	5330-01-350-4472
199	PARTS KIT, SEAL REPLACEMENT	SK10-4	5330-01-343-2745
200	PIN, COTTER	K-2412-Z	5315-01-179-9882
201	PIN, COTTER	MS171659	5315-00-846-8337
202	PIN, COTTER	MS24665-151	5315-00-815-1405
203	PIN, COTTER	MS24665-298	5315-00-234-1861
204	PIN, COTTER	MS24665-385	5315-00-187-9382
205	PIN, COTTER	MS24665-423	5315-00-013-7228
206	PIN, COTTER	MS24665-457	5315-00-187-9393
207	PIN, COTTER	MS24665-459	5315-00-187-9394
208	PIN, COTTER	MS24665-69	5315-00-828-8190
208.1	PIN, COTTER	XB-781-1	5315-01-369-1346
209	NOT USED		

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
210	PIN, SPRING	MS16562-142	5315-00-058-6115
211	PIN, SPRING	MS16552-146	5315-00-853-3814
212	PLASTIC STRIP	352700	5330-01-296-2109
213	RECEPTACLE	50R4-1-1AA	5325-01-049-2049
213.1	REPAIR KIT, GOVERNOR	RN32W	
213.2	RETAINER, PACKING	11863-012	5330-01-417-7795
213.3	RETAINER, PACKING	202624	5330-01-417-7794
214	NOT USED		
215	RIVET, BLIND	AK42H	5320-00-874-4477
216	RIVET, BLIND	AK43H	5320-00-143-6149
217	RIVET, BLIND	MS20600AD5W12	5320-01-047-0467
217.1	RIVET, BLIND	MS20601B4W2	5320-00-616-5274
218	RIVET, BLIND	MS20604B3W2	5320-00-721-9075
219	RIVET, BLIND	M24243/1-A806	5320-00-850-3256
220	RIVET, BLIND	M24243/1-B302	5320-00-999-0397
221	RIVET, BLIND	M24243/1-D502	5320-00-850-3248
222	RIVET, BLIND	M24243/1-D608	5320-00-850-3246
223	RIVET, BLIND	M24243/1-F402	5320-00-129-9706
223.1	RIVET, BLIND	M24243/1-F608	5320-01-392-0699
223.2	RIVET, BLIND	M24243/1-F610	
224	RIVET, BLIND	M24243/6-A403H	5320-00-882-8388
225	RIVET, BLIND	M24243/6-A405H	5320-01-291-9121
226	RIVET, BLIND	M24243/6-A406H	5320-01-421-0484
227	RIVET, BLIND	M24243/6-A602H	5320-00-956-7362
228	RIVET, BLIND	M24243/6-A604H	5320-00-956-7355
229	RIVET, BLIND	M24243/6-A606H	5320-00-882-8385
230	RIVET, BLIND	M24243/6-A608H	5320-01-032-6534
231	RIVET, BLIND	M24243/7-A402H	5320-00-874-4477
232	RIVET, BLIND	M24243/7-A403H	5320-00-143-6149
233	RIVET, BLIND	M24243/7-A604H	5320-00-420-2165
234	RIVET, BLIND	M24243/7-A606H	5320-00-490-5523

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
235	RIVET, BLIND	SD64BSLF	5320-01-397-3347
236	RIVET, BLIND	206057	5320-01-411-0081
237	RIVET, COMPRESSION	12418469	5320-01-376-0699
237.1	SCREW, CAP	CSH5-24-39	5305-01-479-7857
238	SCREW, CAP	12414475-131	5303-01-363-0703
239	SCREW, CAP	6V-2315	5306-01-433-4753
240	SCREW, MACHINE	MS24693-144	
241	SCREW, MACHINE	MS51958-83	5305-00-071-2095
242	SCREW, SELF-LOCKING	MS16998-61L	5305-01-211-3097
243	SEAL	VC08G1R0B	5330-01-389-6109
244	SEAL	12421431	9320-01-398-6317
245	SEAL	125128-5	
246	SEAL	125128-6	
247	SEAL	355150	5330-01-423-0689
248	SEAL ASSEMBLY, CTIS	A1205-Q-2435	5330-01-360-7753
249	SEAL ASSEMBLY, HUB	A1205-R-2254	5330-01-360-5252
250	SEAL, DOOR	12416467	5330-01-385-3769
251	SEAL RING, METAL	29505809	5330-01-360-5329
252	SEAL, NONMETALLIC	CC3550	5330-01-431-7575
253	SEAL, NONMETALLIC	12417725	5330-01-375-2908
254	SEAL, NONMETALLIC	2418974-1	5330-01-257-1709
255	SEAL, NONMETALLIC	673999	5310-01-454-5553
255.1	SEAL, PLAIN	N72143	5330-01-453-4462
255.2	SEAL, SHAFT	SERUR25-2	5330-01-135-3376
256	SEAL, URETHANE FOAM	12420420-001	5680-01-453-8912
257	SEAL, URETHANE FOAM	12420420-002	5680-01-453-8485
258	SEAL, URETHANE FOAM	12420420-003	5680-01-453-8486
259	SEAL, WEATHER	147P00039	
260	SPACER, RING	4P2987	5365-01-433-8407
260.1	SPIDER, UNIVERSAL JOINT, VEHICULAR	R279X	
261	SPLICE, CONDUCTOR	12420927-001	5940-01-456-1319

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
262	SPLICE, CONDUCTOR	12420927-002	5940-01-421-6955
263	STRAIN RELIEF	10280870-3	5975-00-376-1585
264	TERMINAL, LUG	MS20659-163	5940-00-113-3145
265	TERMINAL, LUG	MS20659-164	5940-00-113-3148
266	TERMINAL, LUG	MS25036-108	5940-00-143-4780
267	TERMINAL, LUG	MS25036-122	5940-00-113-8190
268	TERMINAL, LUG	12414275-001	
269	TERMINAL, LUG	12416409-006	
270	WASHER, FLAT	MS27183-10	5310-00-809-4058
270.1	WASHER, FLAT	12414473-010	5310-01-374-6990
271	WASHER, FLAT	12417948-004	5365-01-436-8308
271.1	WASHER, FLAT	251391	5310-01-417-1041
272	WASHER, FLAT RUBBER	900.032	5330-01-378-7541
273	WASHER, NYLON	MS51859-16	5310-00-964-7811
274	WASHER, SPRING	D63474/1-30	5310-01-413-8475
275	WASHER, SPRING	WW579S18	
276	WASHER, SPRING	110 7289	5310-01-246-1387
277	WASHER, SPRING	12414559-021	5310-01-374-4517
278	WASHER, SPRING	12414560-017	5310-01-395-0820
279	WASHER, SPRING	12414560-018	5310-01-381-3281
280	WASHER, SPRING	12414560-019	5310-01-369-6074
281	WASHER, SPRING	12417503	5310-01-406-6326
282	WASHER, SPRING	12418220	5310-01-372-3495

APPENDIX H
LUBRICATION ORDER

SECTION I. INTRODUCTION

H-1. GENERAL

The information contained in this appendix provides the lubrication requirements for the LMTV 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 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 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 71, 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-9.

H-1. GENERAL (CONT)

g. Interval Symbols. The lubrications 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.**

Engine/transmission oil must be sampled every 90 days as prescribed by DA Pam 738-750. Hydraulic fluids must be sampled annually as prescribed by DA Pam 738-750.

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 CHART

H-5. LUBRICATION 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)	43.3 qt (41 L)	OE/HDO-15/40	OE/HDO-10	OEA
Transmission (at oil change)	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	27 gal (102.2 L)	OE/HDO-10	OE/HDO-10	OEA
Front axle differential (maximum capacity)	9.5 qt (9.0 L)	GO-80/90	GO-80/90	SAE 75W90 OR GO-75
Rear axle differential (maximum capacity)	18.05 qt (17.1 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
11K Self-Recovery Winch (SRW)	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
Spring bolts and spring shackles	As Required	GAA	GAA	GAA
Front axle shaft U-joints and steering knuckles	As Required	GAA	GAA	GAA

H-5. LUBRICATION 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)
Front 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
11K Self-Recovery Winch (SRW) cable	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**
MIL-A-46153	Antifreeze, Ethylene Glycol, Inhibited, Heavy Duty, Single Package
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)	MIL-A-46153	MIL-A-46153	N/A
Cooling system (total system)	43.8 qt (41.5 L)	MIL-A-46153	MIL-A-46153	N/A
Cooling system, Arctic (total system)	58.3 qt (55.2 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 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).*	2.5
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).**	4.0
24K	Lubrication performed once every 24,000 mi (38,616 km).**	0.5

* Whichever occurs first.
** No calendar interval.

H-7. LUBRICATION LOCATOR VIEWS

LUBRICANT INTERVAL **INTERVAL LUBRICANT**

Engine Crankcase Breather (O)
(See note 17 and view A)

Fuel Filter (O)
(See note 6 and view A)

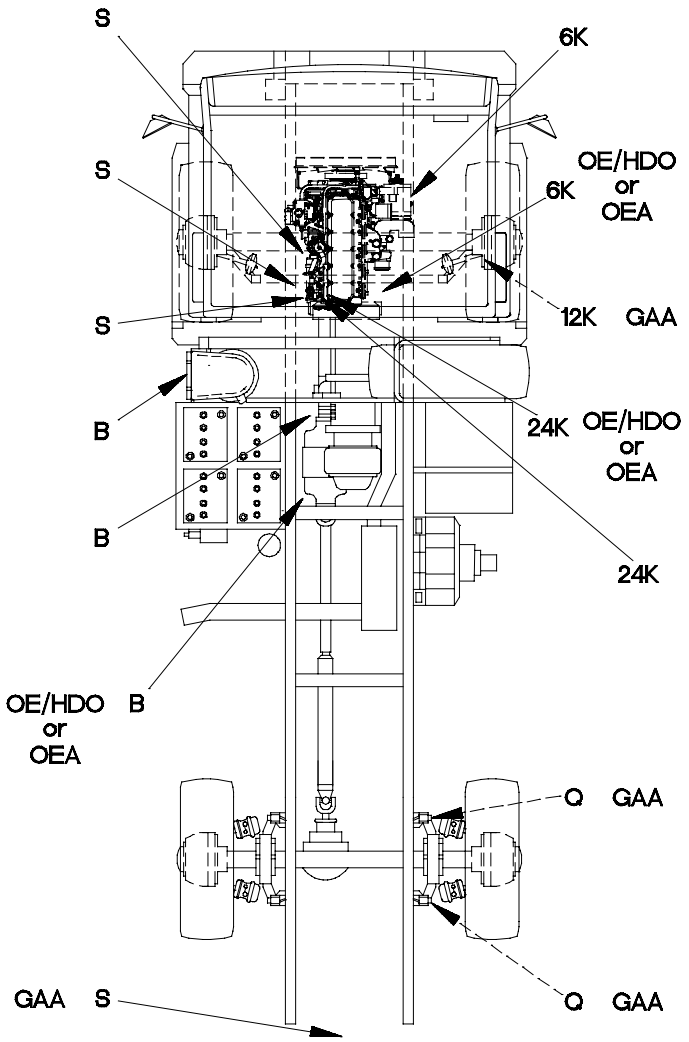
Fuel/Water Separator (O)
(See note 5 and view B)

Cooling System (O)
(See note 7)

Transmission Filter (O)
(See note 3 and view F)

Transmission Drain and Fill (O)
(See note 3 and views D, E, and F)

Towing Pintle Fill (O)
(See note 16 and views J and K)



Engine Oil Filter (O)
(See note 2 and view C)

Crankcase Drain and Fill (O)
(See note 1 and views C and D)

Front Axle Inner Wheel Bearing Repack (O)
(See note 22)

Power Steering Reservoir Drain and Fill (O)
(See note 4 and view G)

Power Steering Filter (O)
(See note 4 and view G)

Spring Bolt Fill (O)
(See note 18 and view H)

Spring Shackle Fill (O)
(See note 18 and view AE)

CHASSIS

NOTE: Dashed arrows indicate lubrication on both sides of vehicle.

LUBRICANT	INTERVAL	LUBRICANT	INTERVAL

Spring Bolt
Fill (O)
(See note 18 and view H)

Spring Shackle
Fill (O)
(See note 18 and view I)

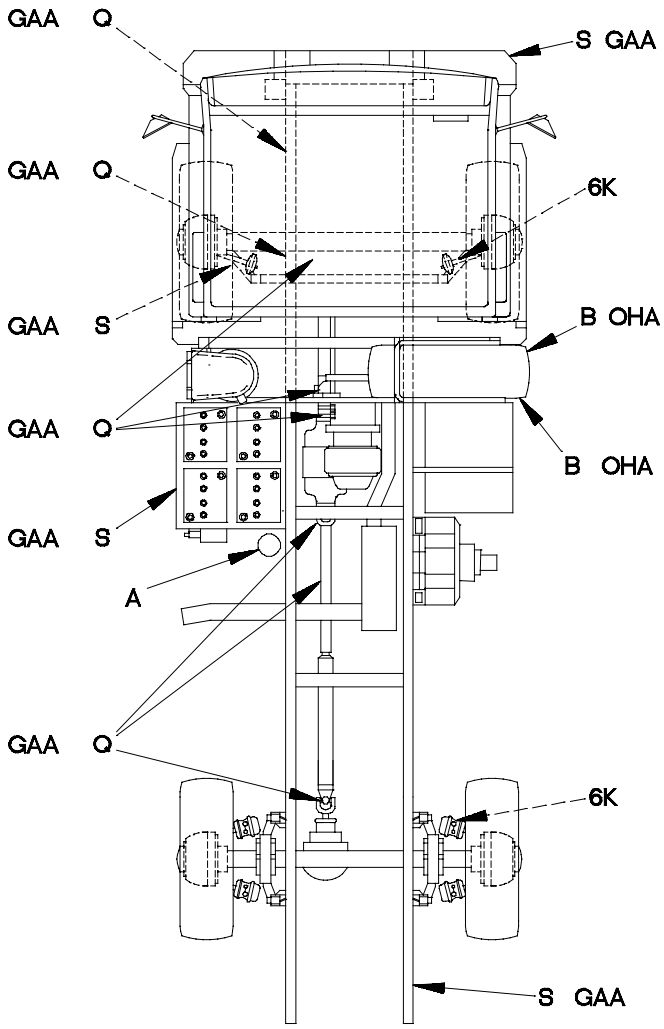
Tie Rod Ends
Fill (O)
(See note 13 and view N)

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 25 and view AF)

Universal and Slip Joints
Fill (O)
(See note 9 and view P)



11K Self-Recovery Winch (SRW) Cable Front Roller Fairlead
Fill (O)
(See note 23 and views Z and AA)

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)

11K Self-Recovery Winch (SRW) Cable Rear Roller Fairlead
Fill (O)
(See note 23 and views AB and AC)

CHASSIS

NOTE: Dashed arrows indicate lubrication on both sides of vehicle.

H-7. LUBRICATION 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)

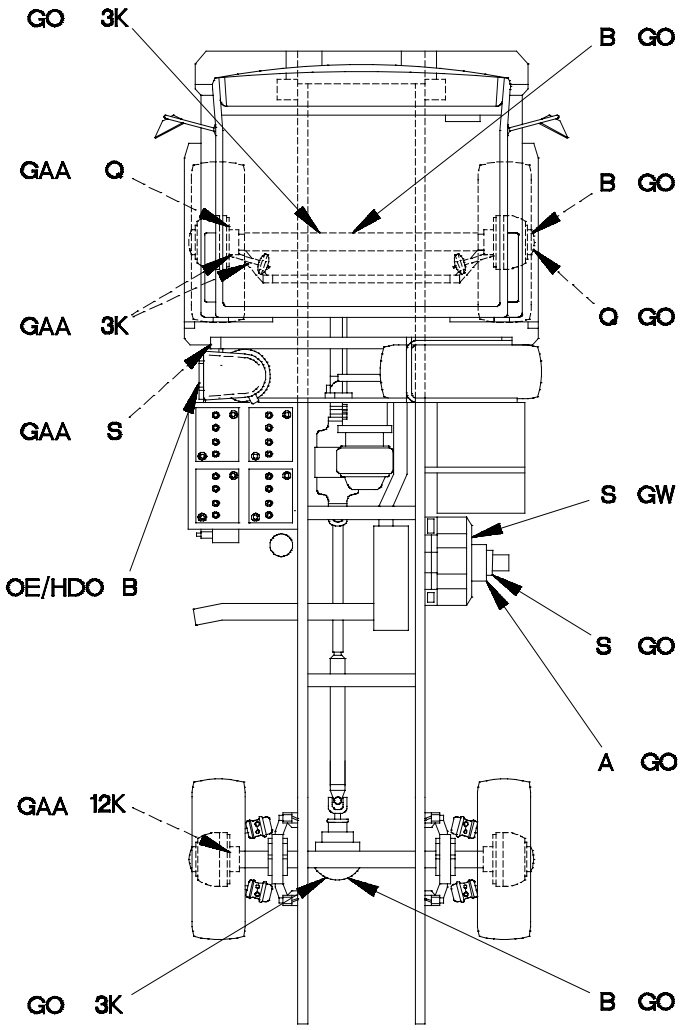
Steering Knuckles
Fill (O)
(See note 20 and view U)

Front Lifting Beam
Clean and Grease (O)
(See note 24 and view AD)

Hydraulic Reservoir and Filter
Drain and Fill (O)
(See note 8 and view X)

Rear Axle Inner Wheel Bearing Repack (O)
(See note 22)

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)

11K Self-Recovery Winch (SRW) Cable
Fill (O)
(See note 14 and view W)

11K Self-Recovery Winch (SRW)
Check and Fill (O)
(See note 15 and view Y)

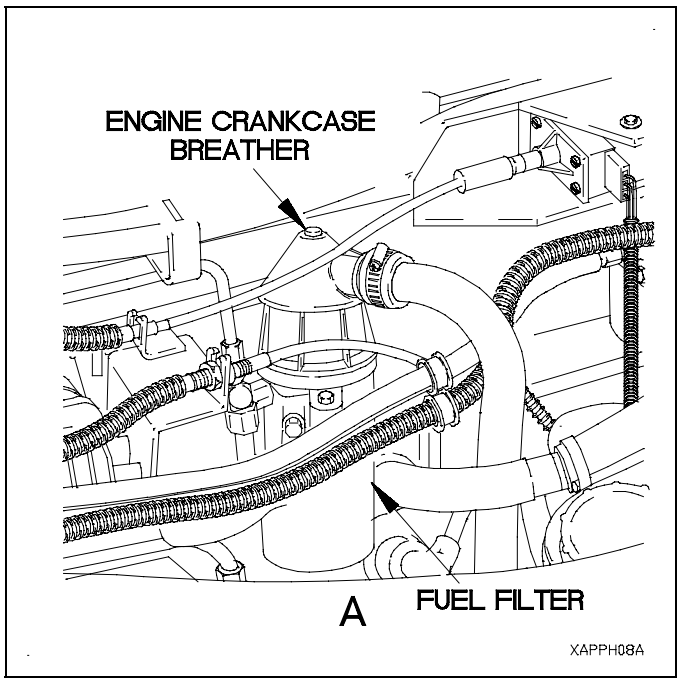
11K Self-Recovery Winch (SRW)
Drain and Fill (O)
(See note 15 and view Y)

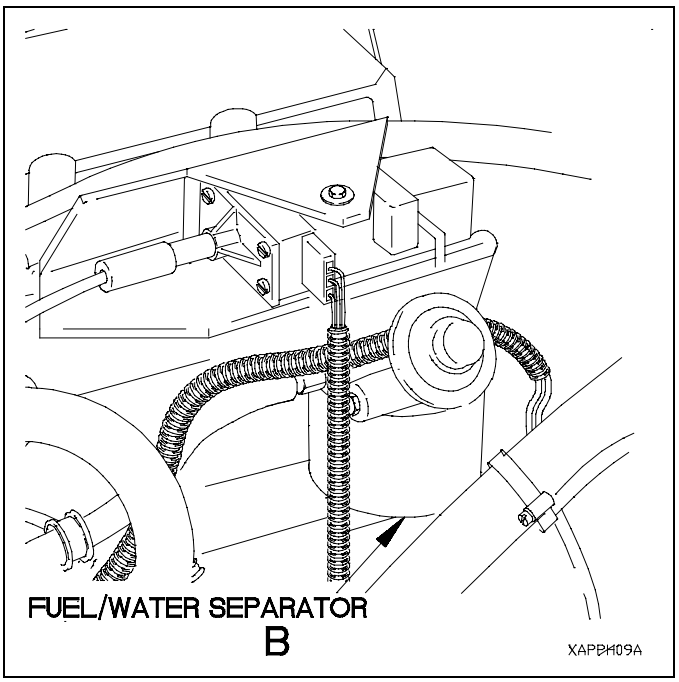
Rear Axle
Drain and Fill (O)
(See note 11 and view T)

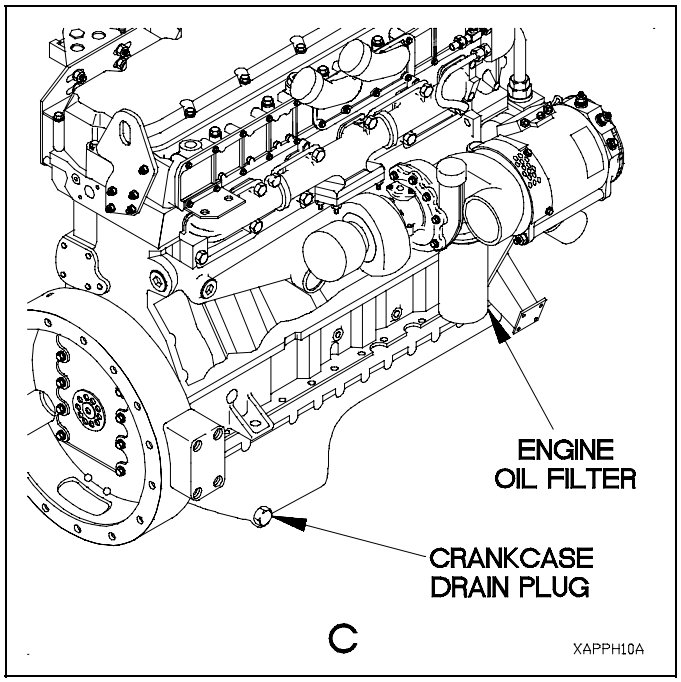
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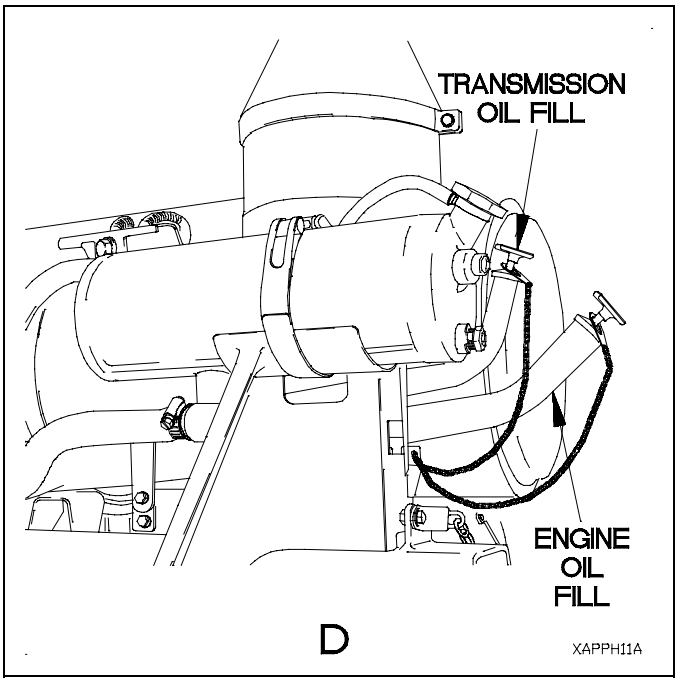
NOTE: Dashed arrows indicate lubrication on both sides of vehicle.

H-8. LUBRICATION LOCAL VIEWS

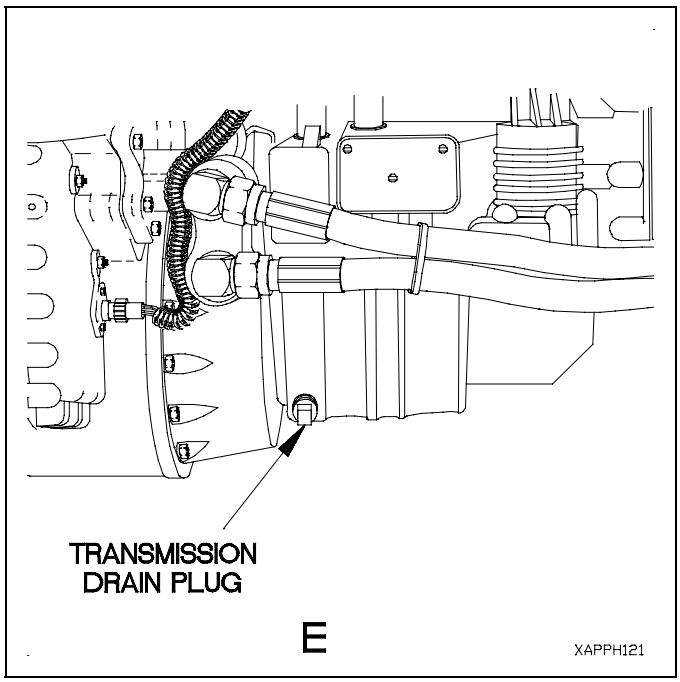


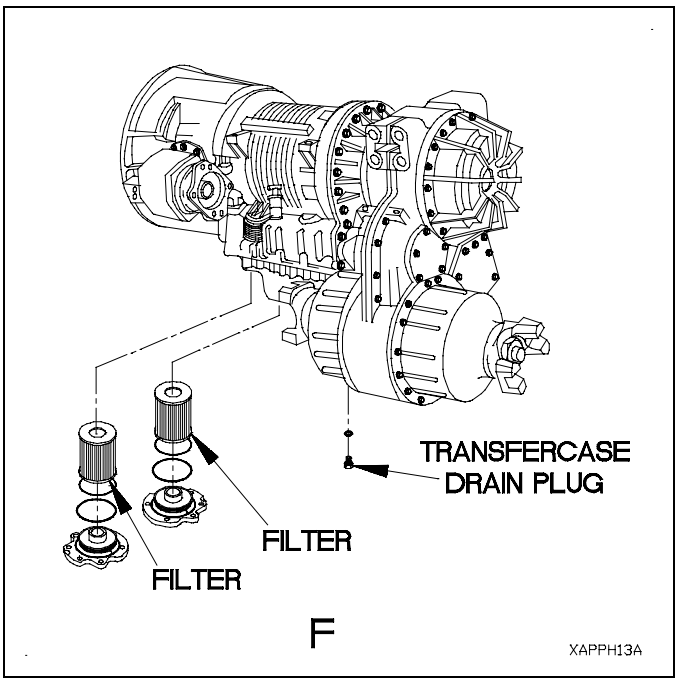


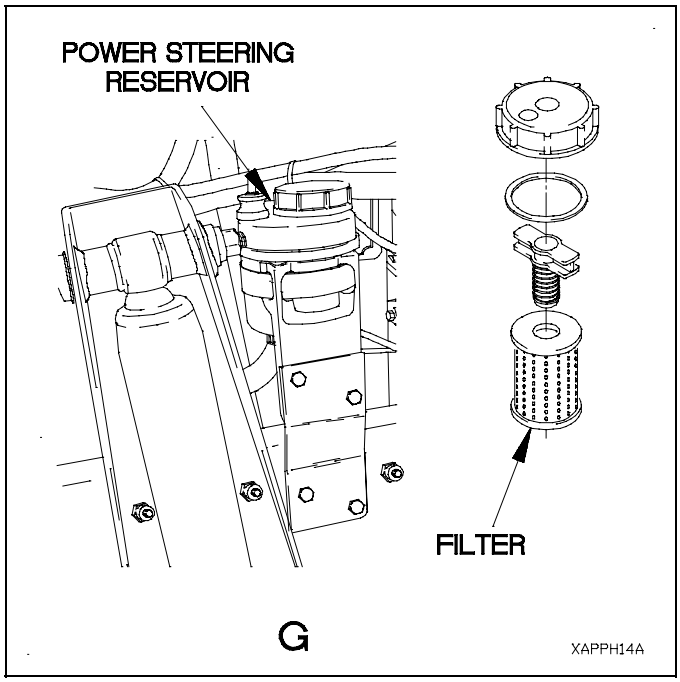


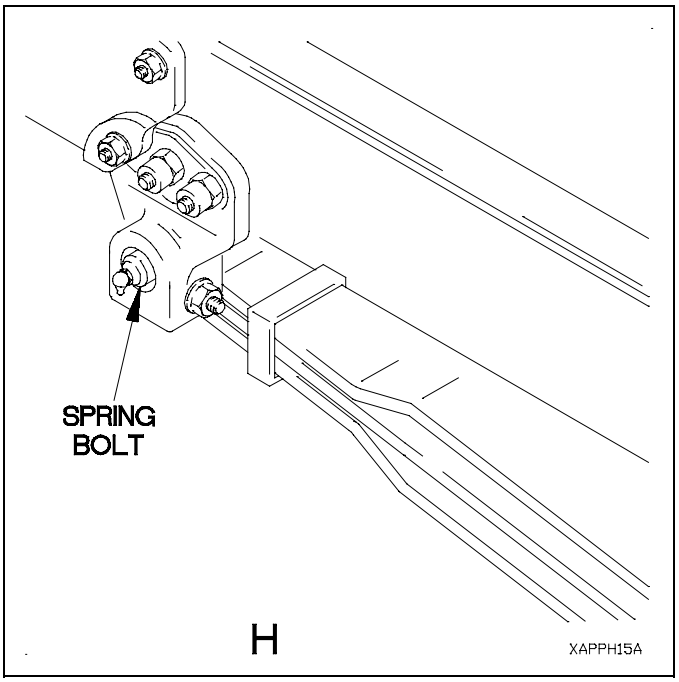


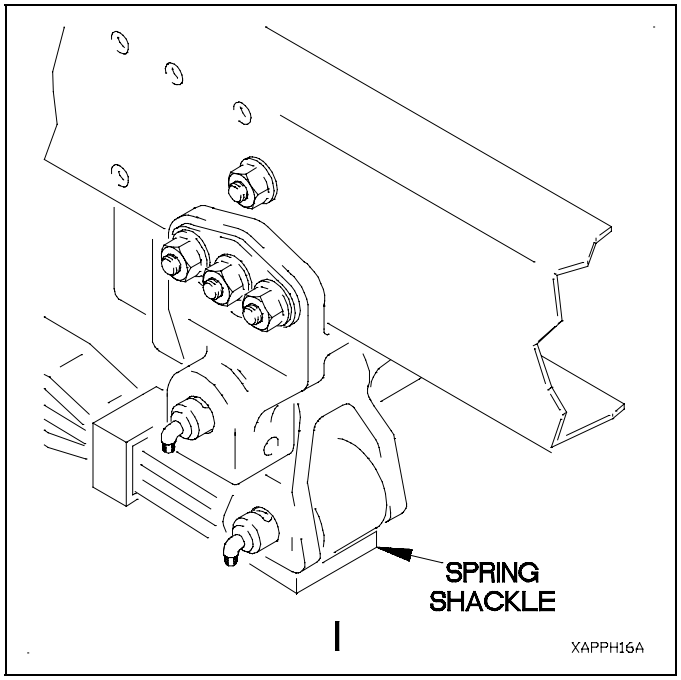
H-8. LUBRICATION LOCAL VIEWS (CONT)



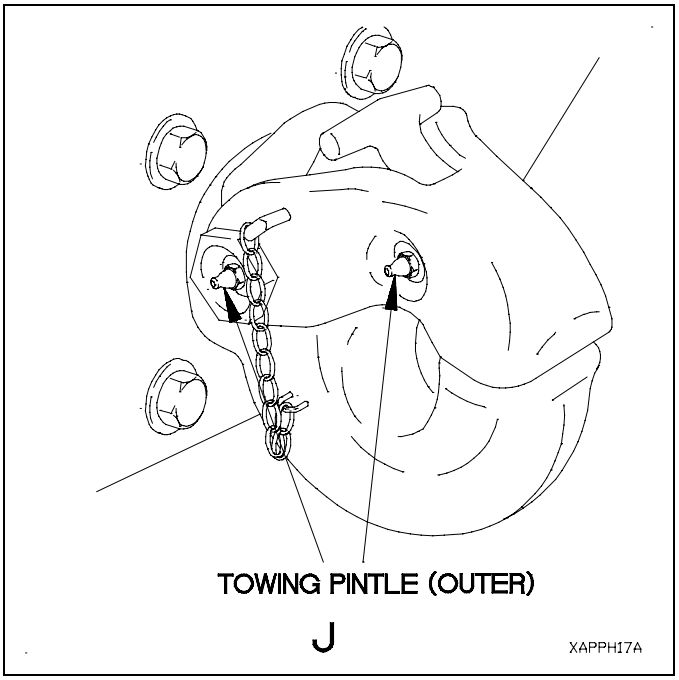




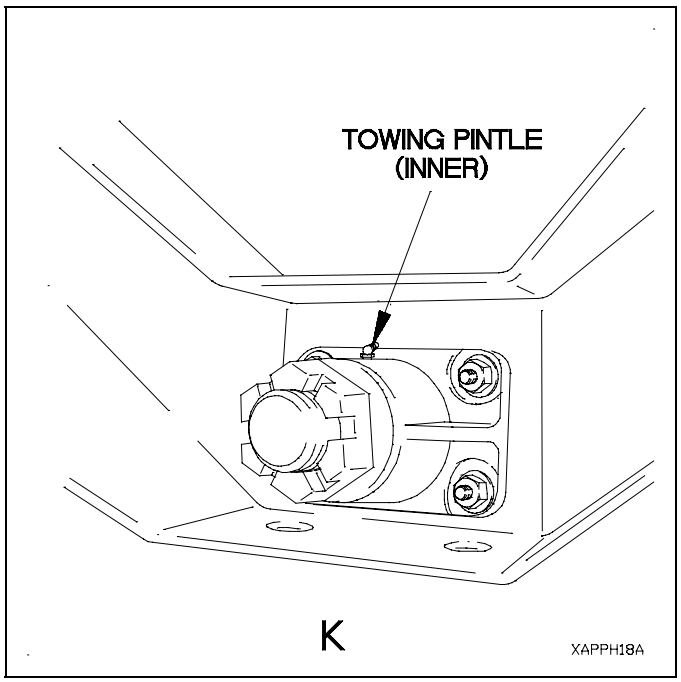



SPRING
SHACKLE
XAPPH16A

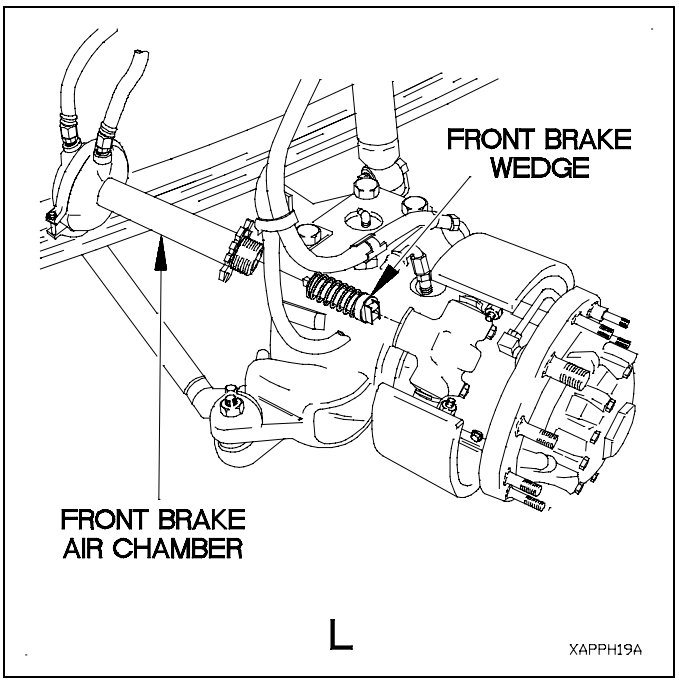
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TOWING PINTLE (OUTER)
XAPPH17A

J

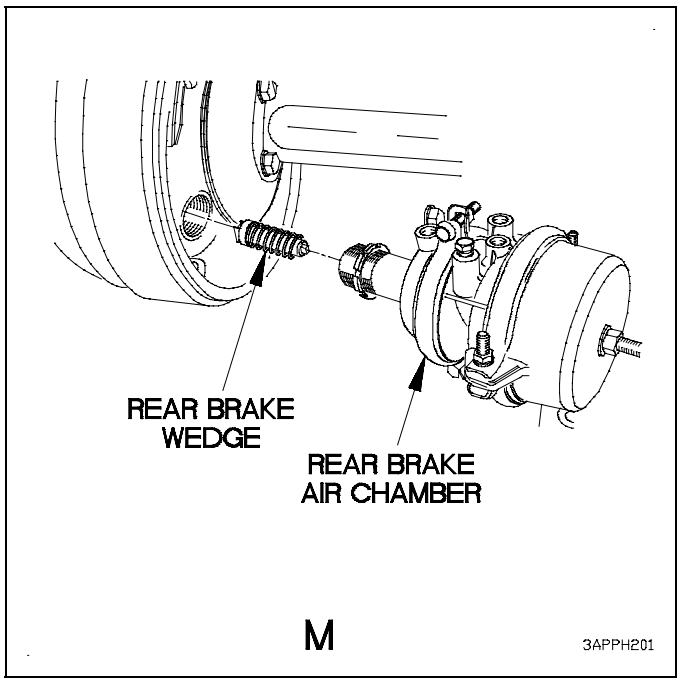

TOWING PINTLE
(INNER)
XAPPH18A

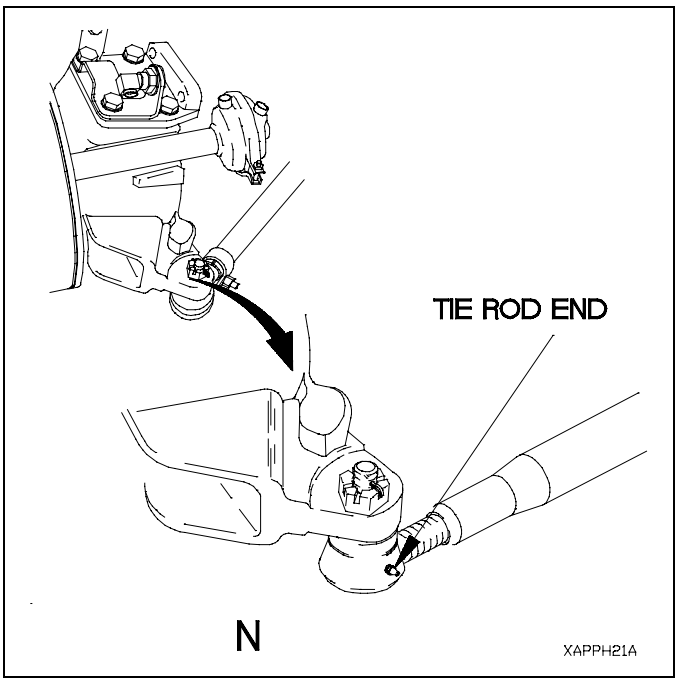
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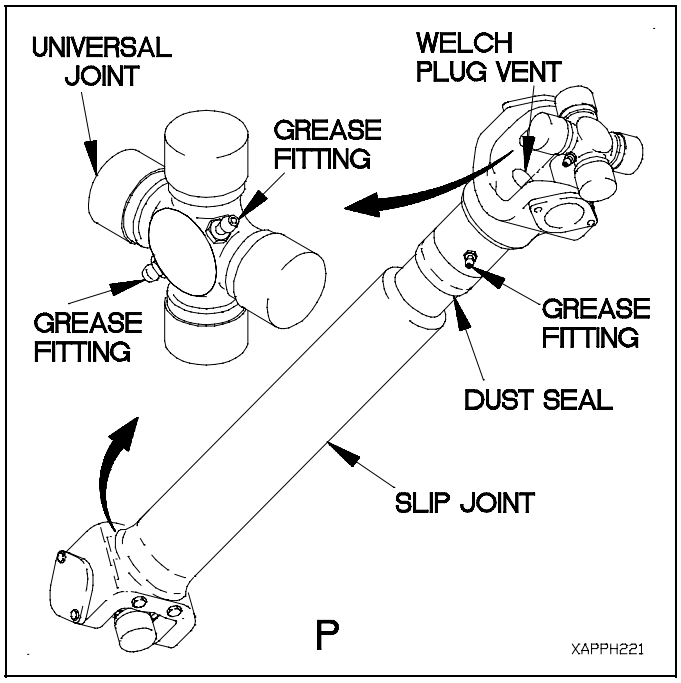

FRONT BRAKE
WEDGE
FRONT BRAKE
AIR CHAMBER
XAPPH19A

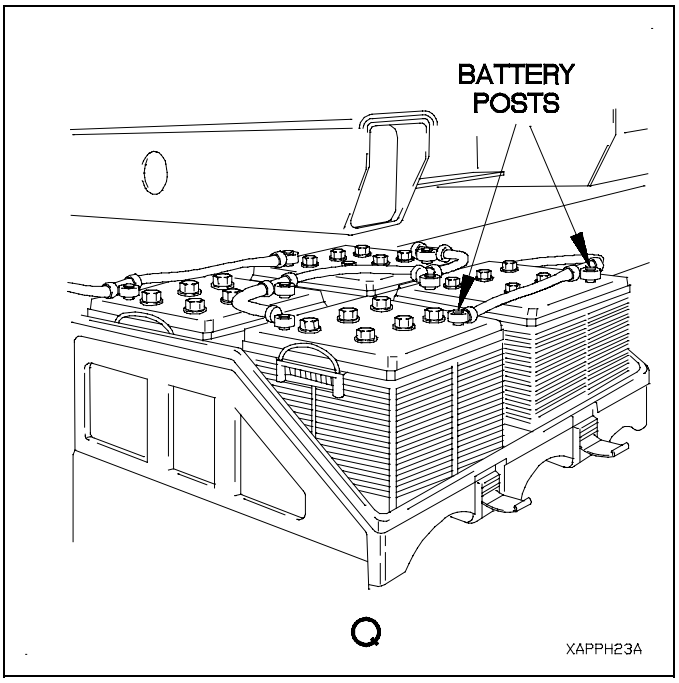
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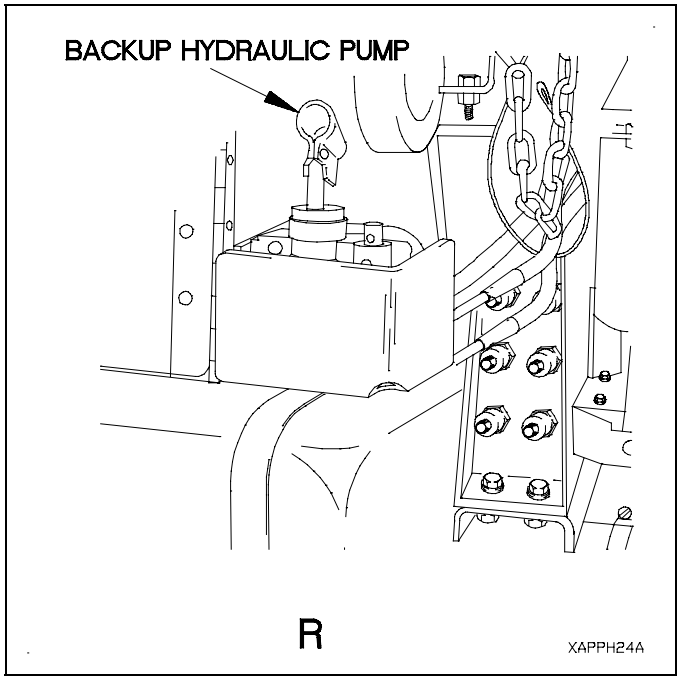
H-8. LUBRICATION LOCAL VIEWS (CONT)

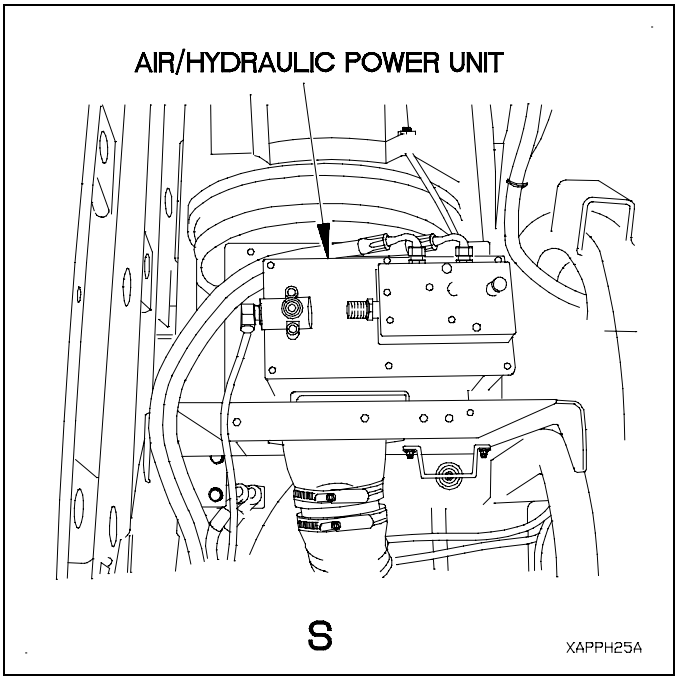


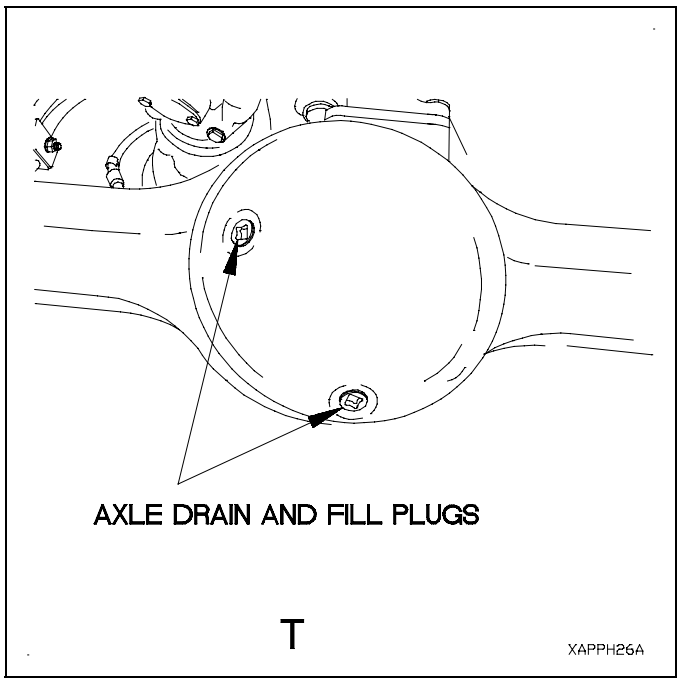


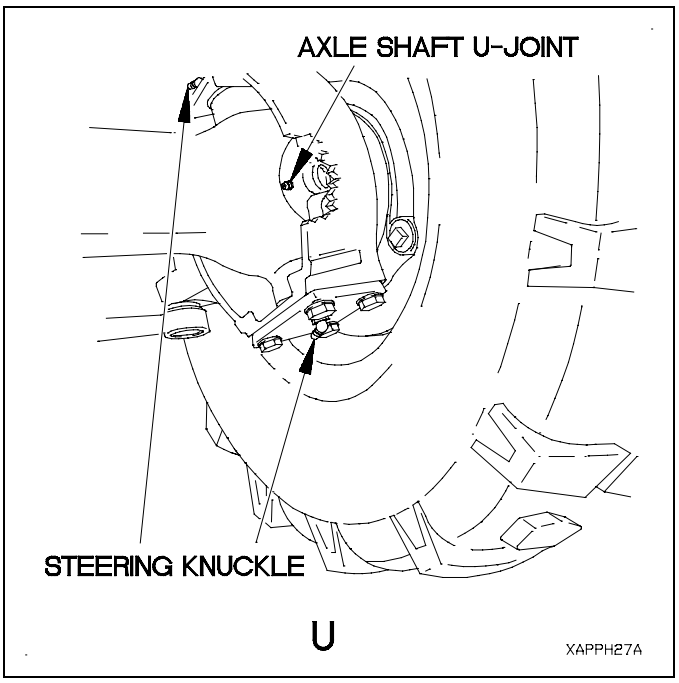




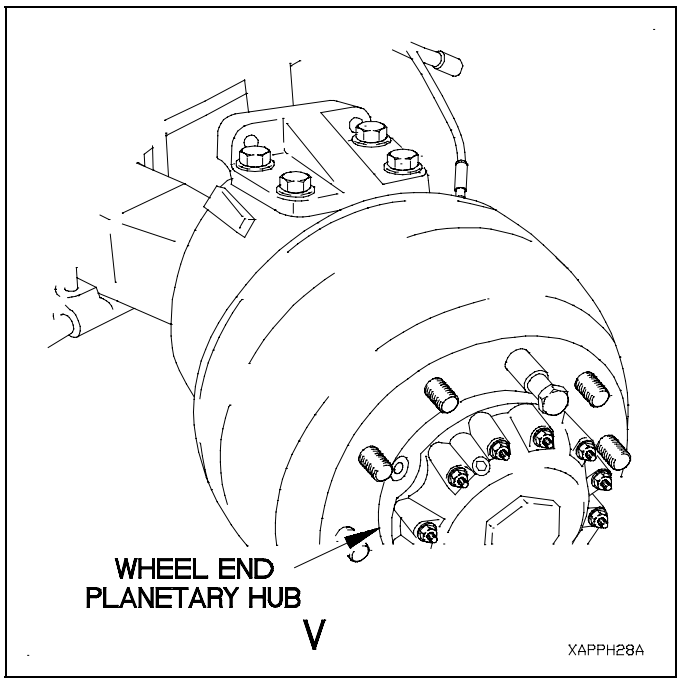

BACKUP HYDRAULIC PUMP
R
XAPPH24A

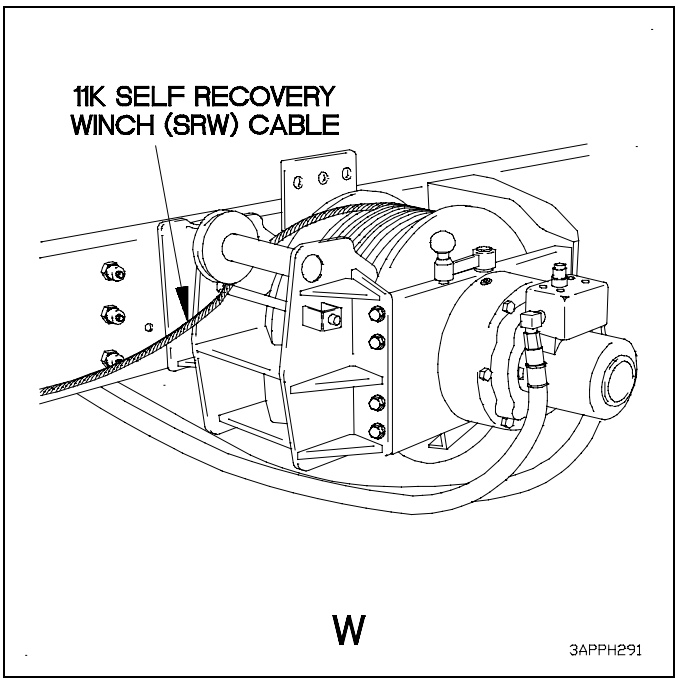

AIR/HYDRAULIC POWER UNIT
S
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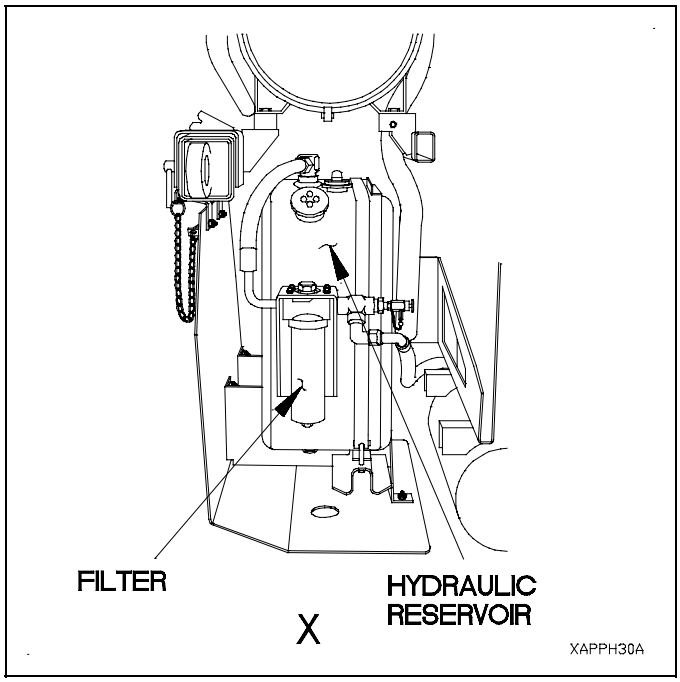

AXLE DRAIN AND FILL PLUGS
T
XAPPH26A

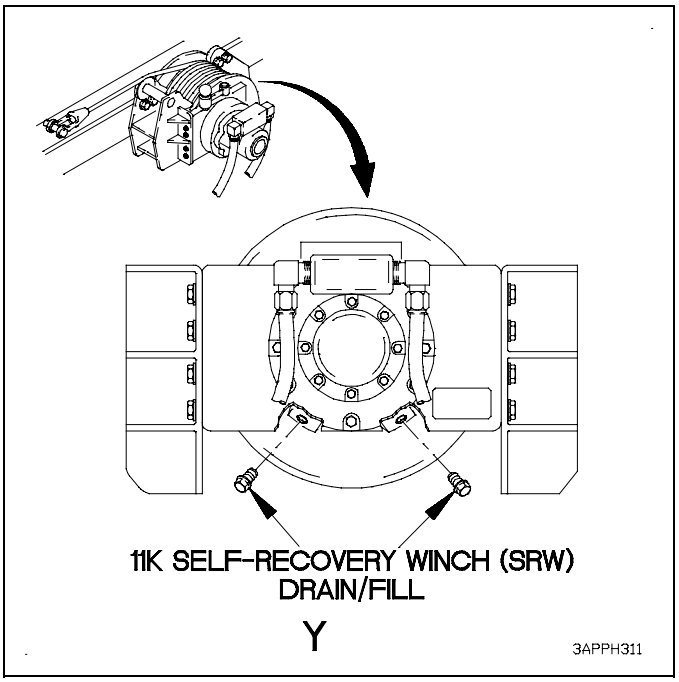

AXLE SHAFT U-JOINT
STEERING KNUCKLE
U
XAPPH27A

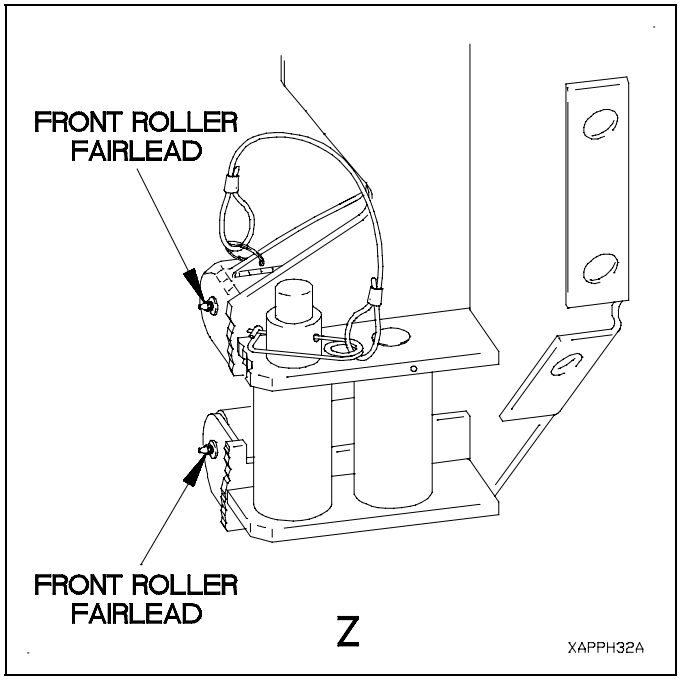
H-8. LUBRICATION LOCAL VIEWS (CONT)

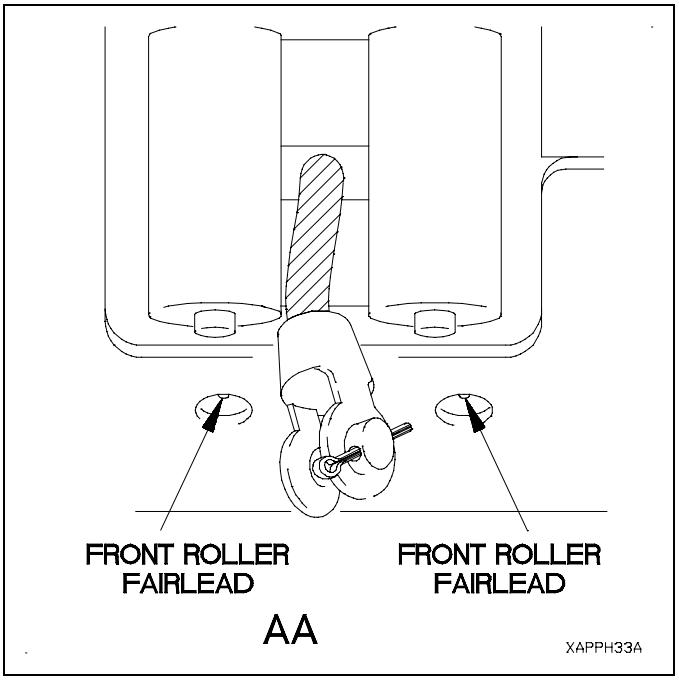


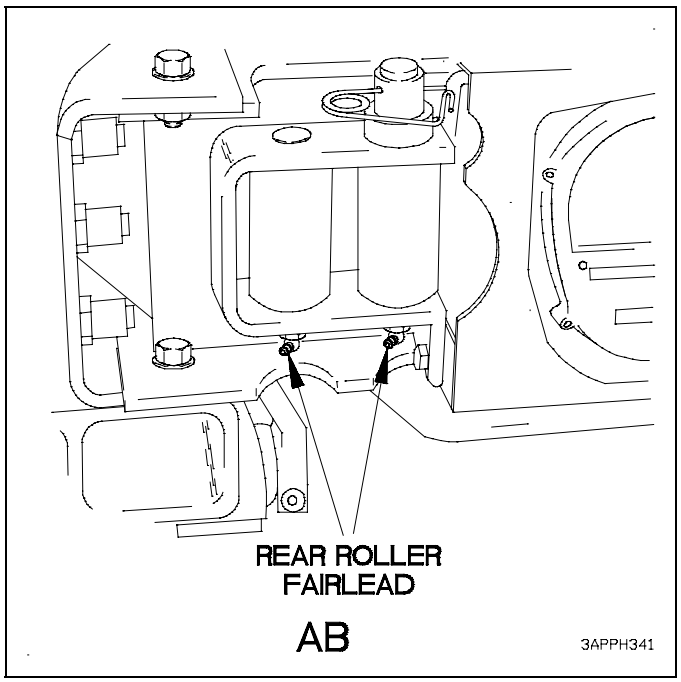


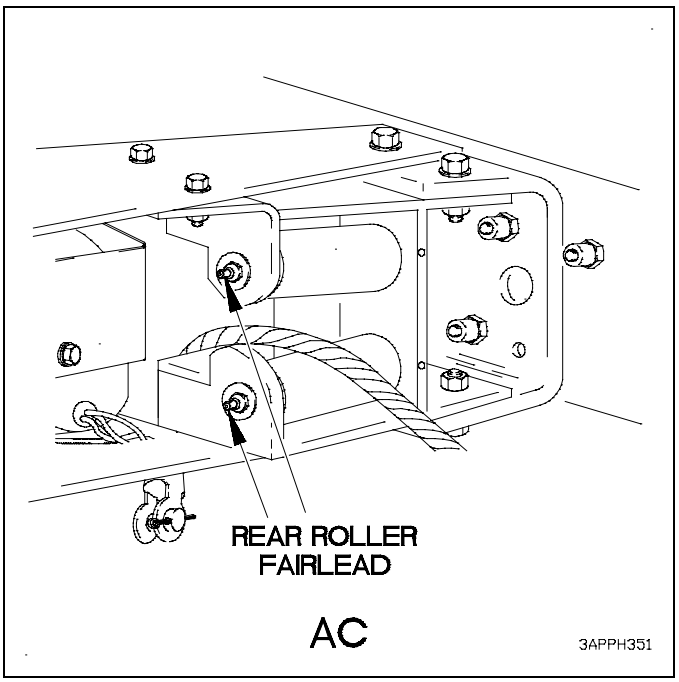




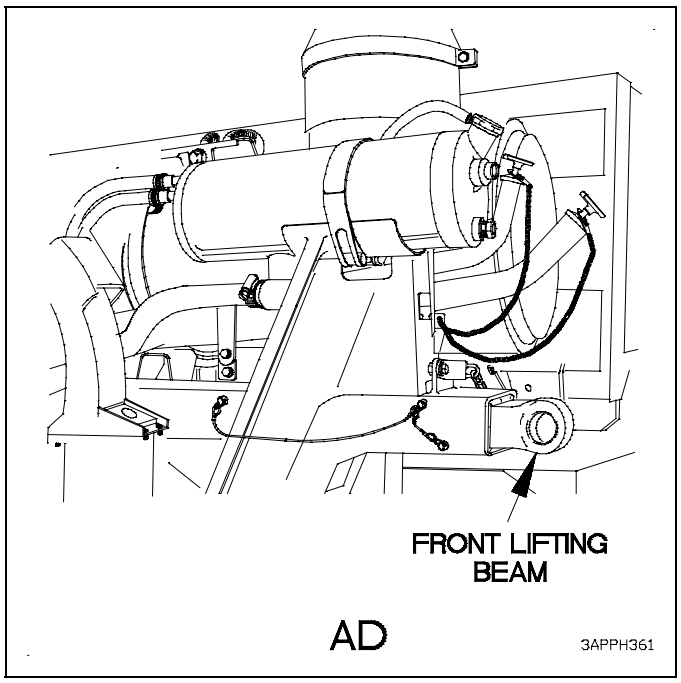

FRONT ROLLER
FAIRLEAD
FRONT ROLLER
FAIRLEAD
Z
XAPPH32A

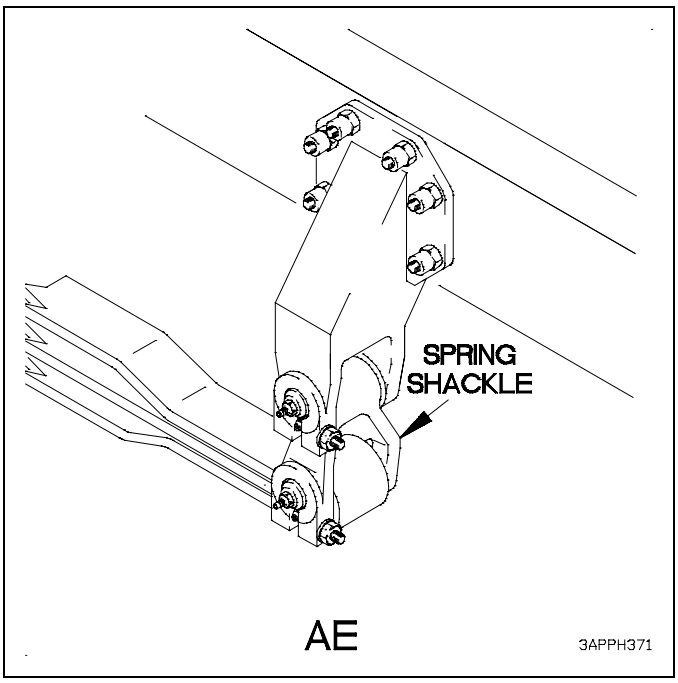

FRONT ROLLER
FAIRLEAD
FRONT ROLLER
FAIRLEAD
AA
XAPPH33A

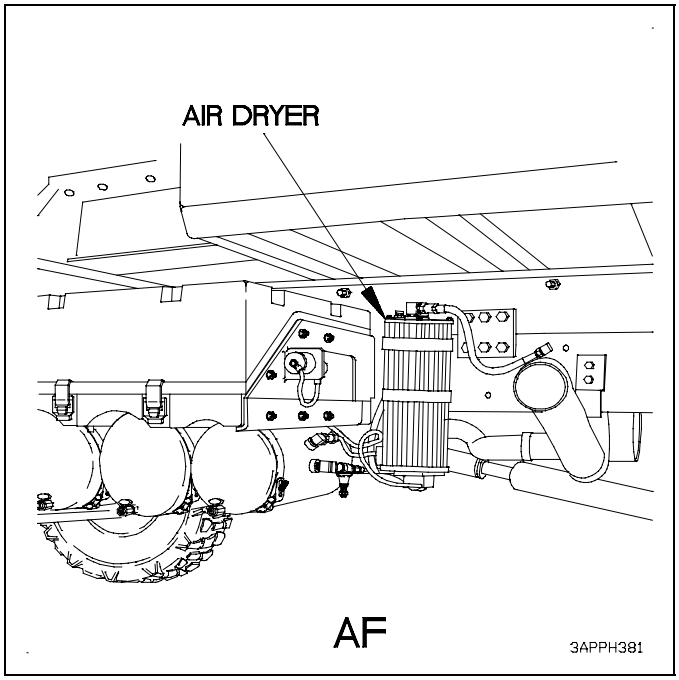

REAR ROLLER
FAIRLEAD
AB
3APPH341


REAR ROLLER
FAIRLEAD
AC
3APPH351

H-8. LUBRICATION LOCAL VIEWS (CONT)







H-9. LUBRICATION 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 change engine oil every 6,000 miles (9,654 km). 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.

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 perform transmission oil change 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 9-2320-365-10). Do not overfill. Replace oil filters each time transmission oil is changed.

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.

5. FUEL/WATER SEPARATOR. Replace filter element every 6,000 miles (9,654 km) or once every six months, whichever occurs first.

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.

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. 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.

H-9. LUBRICATION NOTES (CONT)

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 paragraph number 19-7. 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.

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. 11K SELF-RECOVERY WINCH (SRW) CABLE:

CAUTION

Do not use dry cleaning solvent to clean 11K Self-Recovery Winch (SRW) cables. Use of dry cleaning solvent will remove lubricant from inner strands of 11K SRW 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 11K SRW cable (TM 9-2320-365-10).
(2) Soak and clean 11K SRW cable with new OE/HDO 30.
(3) Wipe off excess OE/HDO 30.
(4) Coat 11K SRW cable with GW.
(5) Rewind 11K SRW cable (TM 9-2320-365-10).

15. 11K SRW. Check 11K SRW gear oil level every 6,000 miles (9,654 km) or once every six months, whichever occurs first. Refill 11K 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 11K 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 11K 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 2, Appendix D) to plug and position plug in top hole.
(6) Rotate drum until open hole is at top.
(7) Apply adhesive (Item 2, Appendix D) to plug and position plug in top hole.
(8) Tighten plugs to 13-15 lb-ft (18-20 N·m).

H-9. LUBRICATION NOTES (CONT)

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 11K 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 11K SRW. Remove the plug.
(4) Position drain pan (Item 17, Appendix C) under 11K SRW.
(5) Rotate the drum until either hole is straight down to the bottom of the 11K 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 2, Appendix D) to plug and position plug in top hole.
(9) Rotate drum until open hole is at top.
(10) Apply adhesive (Item 2, 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.

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 71, Appendix D) or equivalent, and replace o-ring seal every 6,000 miles (9,654 km) or once every six months, whichever occurs first.

18. FRONT and REAR AXLE SPRING BOLT and SPRING SHACKLE. Lubricate front and rear axle spring bolts and spring shackles 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, 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:

- Seals are replaced
- Plungers are removed
- Brakes are relined
- Grease becomes contaminated or hardened

22. FRONT 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).

23. 11K 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.

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.**

24. FRONT LIFTING BEAM. Remove left and right lifting beams and clean with Dry Cleaning Solvent (SD P-D-680) (Item 71, 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.

25. AIR DRYER. Service air dryer (para 23-6) every 12,000 miles (19,308 km) or annually, whichever occurs first.

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 LMTV.

J-2. GENERAL

This list identifies items that do not have to accompany the LMTV and that do not have to be turned in with it. These items are all authorized to you by Common Tables of Allowance (CTA), Modification Table of Organization and Equipment (MTOE), Tables of Distribution and Allowances (TDA), or Joint Table of Allowance (JTA).

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 9-2320-365-20-3 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 to October 1999) [3]	PRE-ID w/ 24-pin connector (transmission serial number prior to 6510032369)	Install adapter cable assembly and ID harness.
WTEC III (with ECU manufactured after to October 1999) [3]	PRE-ID w/ 31-pin connector (transmission serial number 6510032369 to 6510090785)	Install ID harness.
WTEC III (with ECU manufactured after to October 1999) [3]	TID 1 (transmission serial number 6510090786 to 6510142171)	No modification required.

[1] Reprogramming can only be accomplished by an authorized Allison Transmission distributor. You must provide the transmission serial number of the transmission being installed to ensure correct reprogramming. If at a later time, an earlier version transmission is installed in a WTEC II equipped vehicle, WTEC II TEPSS will require reprogramming again.
[2] Vehicle serial number 012477 and lower. Refer to Figure 1.
[3] Vehicle serial number 012478 and higher. Refer to Figure 1.

(1) Installed Controls or Controls Being Installed	(2) Installed Transmission or Transmission Being Installed	(3) Required Modification (Refer to Section III)
WTEC III (with ECU manufactured after to October 1999) [3]	TID 2 (transmission serial number 6510142172 to 6510262116)	No modification required.
WTEC III (with ECU manufactured after to October 1999) [3]	TID 3 (transmission serial number 6510262117 and subsequent)	No modification required.

Section III.

MODIFICATION PARTS IDENTIFICATION

Identification	Part Number	Description
31-pin connector	29519127	Converts a transmission external wiring harness from a 24-pin ("D" type) connector to a 31-pin (round type) connector.
Transmission internal wiring harness	29529474	Converts a TID 2 transmission to a TID 1 configuration to allow WTEC II controls to communicate with the transmission.
ID harness	200100	Allows WTEC III controls to communicate with a PRE-ID transmission.
Adapter cable assembly	29519210	Adapts a PRE-ID transmission with 24-pin ("D" type) connector to a transmission external wiring harness with a 31-pin (round) connector.

MODIFICATION PARTS IDENTIFICATION (CONT)

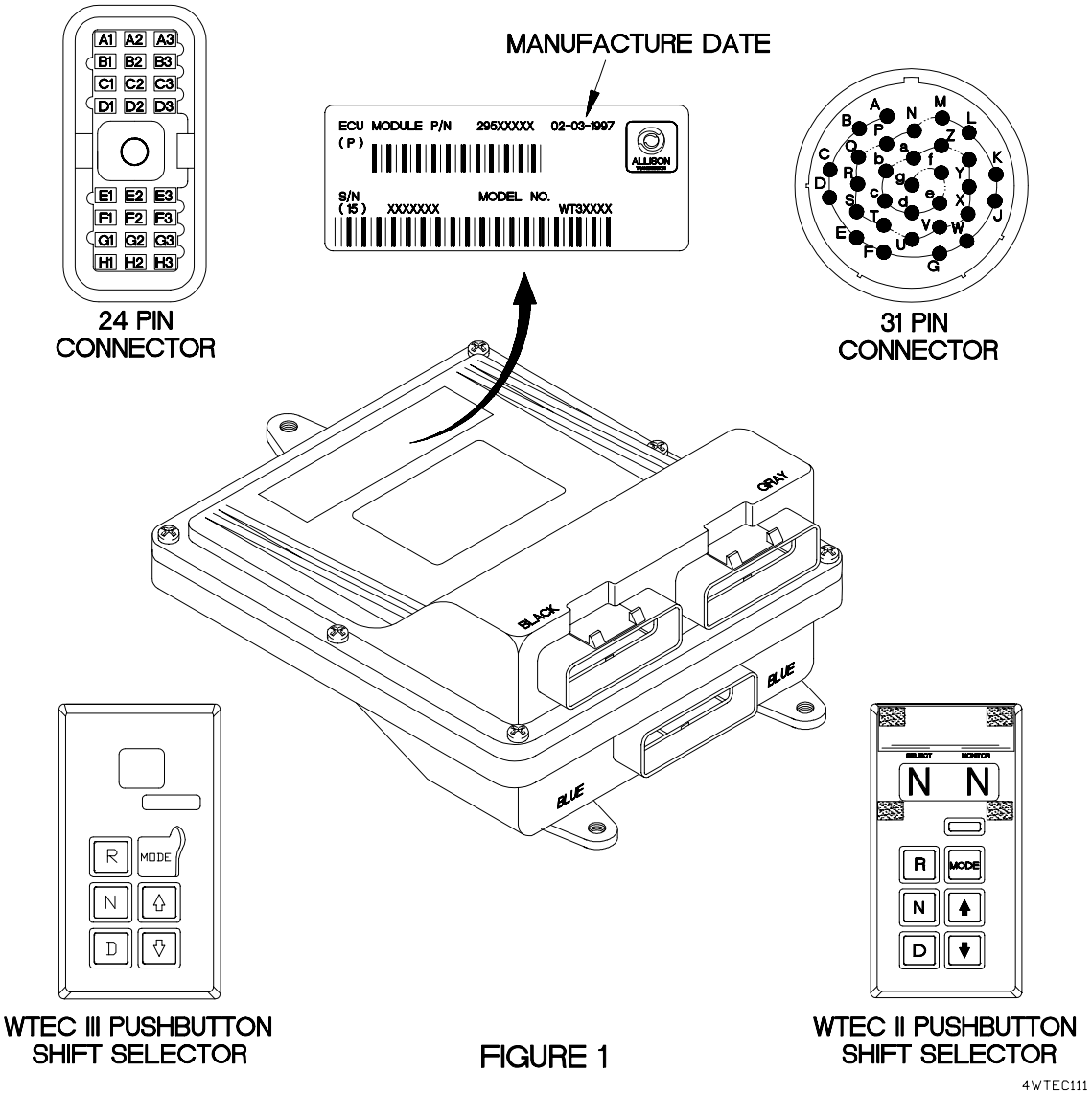


FIGURE 1

SUBJECT INDEX

Subject Para

A

Air
- Brake System Loses Air When Brakes Are Applied . . . 2-20
- Cab Leveling Air Springs Do Not Operate . . . 2-30
- Large Quantity of Moisture Expelled From Air Reservoirs . . . 2-21
- M1079 Air Conditioner Does Not Operate . . . 2-16
- No Air Pressure Present At Rear Gladhands . . . 2-21
- Noisy Air Compressor Operation . . . 2-21
- System Loses Pressure During Operation/Slow, No, or Incorrect Air Pressure Buildup . . . 2-21
- System Pressure Builds Up to More Than 120 psi (827 kPa) (Compressor Fails to Unload) . . . 2-21
- System Troubleshooting . . . 2-21
- Transport Troubleshooting . . . 2-30

Alarm
- M1079 Van Door Open Light Does Not Illuminate and Audible Alarm Does Not Operate . . . 2-16
- Troop Transport Alarm Does Not Operate . . . 2-31

Assembly
- General Assembly Instructions . . . 2-41

Axle
- Differential(s) Noisy . . . 2-25
- Troubleshooting . . . 2-25

B

Blackout
- M1079 Blackout Light(s) Does Not Operate . . . 2-16
- M1079 Fluorescent Lights Do Not Operate In Blackout Override Mode . . . 2-16
- M1079 110 VAC Outlet J232 and J233 Do Not Operate In Blackout Override Mode . . . 2-16

Subject Para

B (Cont)

Body
- All M1079 Van Body Marker Lights Do Not Operate . . . 2-16
- M1079 Van Body Clearance Marker Light Does Not Illuminate . . . 2-16

Brake
- Parking Brake Does Not Release . . . 2-20
- System Loses Air When Brakes Are Applied . . . 2-20
- System Troubleshooting . . . 2-20

Braking
- Excessive Braking Distance . . . 2-20

Brakes
- Brake System Loses Air When Brakes Are Applied . . . 2-20
- Front Brakes Do Not Apply . . . 2-20
- Front Brakes Overheat and/or Do Not Release . . . 2-20
- Parking Brakes Does Not Apply . . . 2-20
- Rear Brakes Do Not Apply . . . 2-20
- Rear Brakes Overheat . . . 2-20
- Vehicle Brakes Unevenly, Brakes Pull to One Side or Grab . . . 2-20

Breather
- Crankcase Breather Replacement . . . 3-5

C

Cab
- Does Not Lower . . . 2-32
- Does Not Raise . . . 2-32
- Exhaust Fumes in Cab . . . 2-14
- Leveling Air Springs Do Not Operate . . . 2-30
- Tilt and Spare Tire Retainer Troubleshooting . . . 2-32
- Tilt, Spare Tire Retainer, and Suspension Compression Will Not Work . . . 2-30
- Will Not Raise or Lower Properly . . . 2-32

Central
- Tire Inflation System (CTIS) ECU Indicates No Fault Code But Fails to Inflate or Deflate . . . 2-24
- Tire Inflation System (CTIS) Repeatedly Resumes Cycling 30 Seconds After Indicator Lights Stop Flashing . . . 2-24

SUBJECT INDEX (CONT)

Subject Para

C (Cont)

Central (Cont)
Tire Inflation System (CTIS) Troubleshooting 2-24
Cleaning
General Cleaning Instructions 2-38
Code
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Emits Eight Seconds of Beeps and/or Transmission Does Not Shift Gears 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 14 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 15 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 16 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 24 and/or 33 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 32 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45, and/or 69 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 43 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 52 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 57 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 21 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 51 Sub Code 10, 12, 21, 43, 45, or 65 2-17

Subject Para

C (Cont)

Code (Cont)
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 25 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 53 and Any Sub Code 2-17
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 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 55 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 56 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 13 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 23 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Does Not Illuminate 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 14 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 15 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 16 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 24 and/or 33 and Any Sub Code 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 32 and Any Sub Code 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, 45, 46, and/or 69 and Any Sub Code 2-17

Subject Para

C (Cont)

Code (Cont)
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 52 and Any Sub Code 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 57 and Any Sub Code 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 21 and Any Sub Code 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 51 and Any Sub Code 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 25 and Any Sub Code 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 53 and Any Sub Code 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 54 and Any Sub Code 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 55 and Any Sub Code 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 56 and Any Sub Code 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 13 and Any Sub Code 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Indicator Displays "--" and/or Transmission Does Not Shift Gears 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 23 and Any Sub Code 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Does Not Illuminate 2-17
Compressor
Noisy Air Compressor Operation 2-21
Cover
Valve Cover and Gasket Replacement 3-3
Crane
Light Material Handling Crane (LMHC) Does Not Operate 2-31
Light Material Handling Crane (LMHC) Hoist IN Does Not Operate 2-31
Light Material Handling Crane (LMHC) Hoist OUT Does Not Operate 2-31

Subject Para

C (Cont)

Crankcase Breather Replacement 3-5
CTIS
Central Tire Inflation System (CTIS) Troubleshooting 2-24
Central Tire Inflation System (CTIS) ECU Indicates No Fault Code But Fails to Inflate or Deflate 2-24
Five Central Tire Inflation System (CTIS) ECU Indicator Lights Flashing 2-24
Four CTIS ECU Indicator Lights Flashing 2-24
Repeatedly Resumes Cycling 30 Seconds After Indicator Lights Stop Flashing 2-24
Differential
Axle Differential(s) Noisy 2-25
Disassembly
General Disassembly Instructions 2-37
Door
M1079 Van Door Open Light Does Not Illuminate and Audible Alarm Does Not Operate 2-16
Dryer
Air Dryer Purges Constantly 2-21

E

ECU
Central Tire Inflation System (CTIS) ECU Indicates No Fault Code But Fails to Inflate or Deflate 2-24
Five Central Tire Inflation System (CTIS) ECU Indicator Lights Flashing 2-24
Four CTIS ECU Indicator Lights Flashing 2-24
Electrical
System Troubleshooting 2-16
Emergency
M1079 Emergency Light(s) Does Not Operate 2-16
Engine
And Transmission Oil Sampling Valves Replacement 3-6
Introduction, Engine Maintenance 3-1
Oil Filter Replacement 3-4
Excessive
Braking Distance 2-20
Play When Turning Steering Wheel 2-26

SUBJECT INDEX (CONT)

Subject Para

F

Fan
M1079 Fan Does Not Operate 2-16
Filter
Oil Filter Replacement 3-4
Five Central Tire Inflation System
(CTIS) ECU Indicator Lights Flashing 2-24
Fluorescent
All M1079 Fluorescent Lights Do Not
Operate 2-16
M1079 Fluorescent Lights Do Not
Operate In Blackout Override Mode 2-16
Four CTIS ECU Indicator Lights Flashing 2-24
Frame
Troubleshooting 2-33
Front
Brakes Do Not Apply 2-20
Brakes Overheat and/or
Do Not Release 2-20

G

General
Assembly Instructions 2-41
Cleaning Instructions 2-38
Disassembly Instructions 2-37
Inspection Instructions 2-39
Installation Instructions 2-42
Removal Instructions 2-36
Repair Instructions 2-40
Gladhands
No Air Pressure Present At
Rear Gladhands 2-21
Ground Handling 2-35

H

Hard to Steer 2-26
Heater
M1079 Heater Does Not Operate 2-16
Hoist
Light Material Handling Crane (LMHC)
Hoist IN Does Not Operate 2-31
Light Material Handling Crane (LMHC)
Hoist OUT Does Not Operate 2-31

Subject Para

H (Cont)

Hydraulic
Loss of Hydraulic Pressure (Single Stage
Pump) 2-23
System Troubleshooting 2-23
Steering Hydraulic System
Troubleshooting 2-29

I

Indicator
CTIS Repeatedly Resumes Cycling 30
Seconds After Indicator Lights Stop
Flashing 2-24
Five Central Tire Inflation System
(CTIS) ECU Indicator Lights Flashing 2-24
Four CTIS ECU Indicator Lights
Flashing 2-24
Inspection
General Inspection Instructions 2-39
Installation
General Installation Instructions 2-42
Instructions
General Assembly Instructions 2-41
General Cleaning Instructions 2-38
General Disassembly Instructions 2-37
General Inspection Instructions 2-39
General Installation Instructions 2-42
General Removal Instructions 2-36
General Repair Instructions 2-40
Introduction
Engine Maintenance 3-1

J

Joint
Drive Shaft or Universal Joint
Unusually Noisy When Operating 2-18

L

Large Quantity of Moisture Expelled From
Air Reservoirs 2-21
Leans to One Side or Rear Of Vehicle
Sags 2-27
Lifting Plate Replacement 3-2

Subject Para

L (Cont)

Light
- Material Handling Crane (LMHC) Does Not Operate . . . 2-31
- Material Handling Crane (LMHC) Hoist IN Does Not Operate . . . 2-31
- Material Handling Crane (LMHC) Hoist OUT Does Not Operate . . . 2-31
- M1079 Van Body Clearance Marker Light Does Not Illuminate . . . 2-16
- M1079 Van Door Open Light Does Not Illuminate and Audible Alarm Does Not Operate . . . 2-16
- No Overspeed Warning Light and/or Overspeed Pressure Change . . . 2-24

Lighting
- M1079 Lighting Fixture(s) DS80 and/or DS81 Do Not Operate . . . 2-16
- M1079 Lighting Fixture(s) DS82 and/or DS83 Do Not Operate . . . 2-16

Lights
- All M1079 Van Body Fluorescent Lights Do Not Operate . . . 2-16
- All M1079 Van Body Marker Lights Do Not Operate . . . 2-16
- Five Central Tire Inflation System (CTIS) ECU Indicator Lights Flashing . . . 2-24
- Four CTIS ECU Indicator Lights Flashing . . . 2-24
- M1079 Blackout Light(s) Does Not Operate . . . 2-16
- M1079 Emergency Light(s) Does Not Operate . . . 2-16
- M1079 Clearance and Marker Lights Replacement . . . 16-60
- M1079 Fluorescent Lights Do Not Operate In Blackout Override Mode . . . 2-16
- Two Steady Mode Lights Illuminate on Central Tire Inflation System (CTIS) ECU . . . 2-24

LMHC
- Light Material Handling Crane (LMHC) Does Not Operate . . . 2-31
- Light Material Handling Crane (LMHC) Hoist IN Does Not Operate . . . 2-31
- Light Material Handling Crane (LMHC) Hoist OUT Does Not Operate . . . 2-31

Loss of Hydraulic Pressure (Single Stage Pump) . . . 2-23

Subject Para

L (Cont)

Lubrication
- AOAP Sampling Intervals . . . H-3
- General . . . H-1
- Intervals . . . H-6
- Key . . . H-5
- Local Views . . . H-8
- Locator Views . . . H-7
- Notes . . . H-9
- Oil Filters . . . H-2
- Warranty Hardtime Statement . . . H-4

M

Maintenance Introduction . . . 2-34

Marker
- M1079 Clearance and Marker Lights Replacement . . . 16-60

M1079
- Air Conditioner Does Not Operate . . . 2-16
- All M1079 Fluorescent Lights Do Not Operate . . . 2-16
- All M1079 Van Body Marker Lights Do Not Operate . . . 2-16
- Blackout Light(s) Does Not Operate . . . 2-16
- Emergency Light(s) Does Not Operate . . . 2-16
- Fan Does Not Operate . . . 2-16
- Field Phone 1 and/or 2 Binding Post Does Not Operate . . . 2-16
- Fluorescent Lights Do Not Operate In Blackout Override Mode . . . 2-16
- Heater Does Not Operate . . . 2-16
- Lighting Fixture(s) DS80 and/or DS81 Do Not Operate . . . 2-16
- Lighting Fixture(s) DS82 and/or DS83 Do Not Operate . . . 2-16
- Van Body Clearance Marker Light Does Not Illuminate . . . 2-16
- 110 VAC Outlet J230 Does Not Operate . . . 2-16
- 110 VAC Outlet J231 Does Not Operate . . . 2-16
- 110 VAC Outlet J232 and J233 Do Not Operate In Blackout Override Mode . . . 2-16
- 110 VAC Outlet J232 Does Not Operate . . . 2-16
- 110 VAC Outlet J232 Does Not Operate In Normal Mode . . . 2-16
- 110 VAC Outlet J233 Does Not Operate . . . 2-16

SUBJECT INDEX (CONT)

Subject Para

M (Cont)

M1079 (Cont)
110 VAC Outlet J234 Does Not Operate 2-16
110 VAC Outlet J235 Does Not Operate 2-16
110 VAC Power Does Not Operate 2-16
24 VDC Binding Post Does Not Operate 2-16

N

No
Air Pressure Present At Rear Gladhands 2-21
Overspeed Warning Light and/or Overspeed Pressure Change 2-24
Response When Turning Steering Wheel 2-26
Noisy Air Compressor Operation 2-21

O

Oil
Engine and Transmission Oil Sampling Valves Replacement 3-6
Engine Oil Filter Replacement 3-4
Overheat
Front Brakes Overheat and/or Do Not Release 2-20
Rear Brakes Overheat 2-20
Overspeed
No Overspeed Warning Light and/or Overspeed Pressure Change 2-24

P

Parking
Brake Does Not Release 2-20
Brake Does Not Apply 2-20
Power
M1079 110/208 VAC Power Does Not Operate 2-16
Take Off (PTO) Troubleshooting 2-19
Preparation
for Storage or Shipment 2-44
for Storage or Shipment Introduction 2-43
Propeller Shaft Troubleshooting 2-18

Subject Para

P (Cont)

PTO
Does Not Engage 2-19
Indicator Does Not Operate 2-16
Power Take Off (PTO) Troubleshooting 2-19
Pulls
Wanders, Pulls to One Side, or Shimmies 2-26
Wanders, Pulls to One Side, or Shimmies 2-27
Pump
Loss of Hydraulic Pressure (Single Stage Pump) 2-23
Pushbutton
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Emits Eight Seconds of Beeps and/or Transmission Does Not Shift Gears 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 14 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 15 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 16 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 24 and/or 33 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 32 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45, and/or 69 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 43 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 52 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 57 and Any Sub Code 2-17

Subject Para

P (Cont)

Pushbutton (Cont)
- WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 21 and Any Sub Code 2-17
- WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 51 Sub Code 10, 12, 21, 43, 45, or 65 2-17
- WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 25 and Any Sub Code 2-17
- WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 53 and Any Sub Code 2-17
- 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 2-17
- WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 55 and Any Sub Code 2-17
- WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 56 and Any Sub Code 2-17
- WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 13 and Any Sub Code 2-17
- WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 23 and Any Sub Code 2-17
- WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Does Not Illuminate 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 14 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 15 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 16 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 24 and/or 33 and Any Sub Code 2-17

Subject Para

P (Cont)

Pushbutton (Cont)
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 32 and Any Sub Code 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, 45, 46, and/or 69 and Any Sub Code 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 52 and Any Sub Code 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 57 and Any Sub Code 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 21 and Any Sub Code 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 51 and Any Sub Code 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 25 and Any Sub Code 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 53 and Any Sub Code 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 54 and Any Sub Code 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 55 and Any Sub Code 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 56 and Any Sub Code 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 13 and Any Sub Code 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Indicator Displays "--" and/or Transmission Does Not Shift Gears 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 23 and Any Sub Code 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Does Not Illuminate 2-17

SUBJECT INDEX (CONT)

Subject Para

R

Rear
Brakes Do Not Apply 2-20
Brakes Overheat 2-20
Leans to One Side or Rear Of Vehicle Sags 2-27
No Air Pressure Present At Rear Gladhands 2-21
Removal
General Removal Instructions 2-36
Repair
General Repair Instructions 2-40
Reservoirs
Large Quantity of Moisture Expelled From Air Reservoirs 2-21

S

Sampling
Engine and Transmission Oil Sampling Valves Replacement 3-6
Self-Recovery
11K Self-Recovery Winch (SRW) Does Not Work 2-28
11K Self-Recovery Winch (SRW) System Troubleshooting 2-28
Shaft
Drive Shaft or Universal Joint Unusually Noisy When Operating 2-18
Shift
Transmission Does Not Shift or Is Slow to Shift When Cold 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Emits Eight Seconds of Beeps and/or Transmission Does Not Shift Gears 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 14 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 15 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 16 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 24 and/or 33 and Any Sub Code 2-17

S (Cont)

Shift (Cont)
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 32 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45, and/or 69 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 43 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 52 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 57 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 21 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 51 Sub Code 10, 12, 21, 43, 45, or 65 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 25 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 53 and Any Sub Code 2-17
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 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 55 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 56 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 13 and Any Sub Code 2-17

Subject Para

S (Cont)

Shift (Cont)
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 23 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Does Not Illuminate 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 14 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 15 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 16 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 24 and/or 33 and Any Sub Code 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 32 and Any Sub Code 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, 45, 46, and/or 69 and Any Sub Code 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 52 and Any Sub Code 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 57 and Any Sub Code 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 21 and Any Sub Code 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 51 and Any Sub Code 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 25 and Any Sub Code 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 53 and Any Sub Code 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 54 and Any Sub Code 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 55 and Any Sub Code 2-17

Subject Para

S (Cont)

Shift (Cont)
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 56 and Any Sub Code 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 13 and Any Sub Code 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Indicator Displays "--" and/or Transmission Does Not Shift Gears 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 23 and Any Sub Code 2-17
WTEC III Transmission Pushbutton Shift Selector (TPSS) Does Not Illuminate 2-17
Shimmies
Wanders, Pulls to One Side, or Shimmies 2-26
Wanders, Pulls to One Side, or Shimmies 2-27
Shipment
Preparation for Storage or Shipment 2-44
Preparation for Storage or Shipment Introduction 2-43
Spare
Tire Retainer Does Not Lower 2-32
Tire Retainer Does Not Raise 2-32
Special Purpose Kit Troubleshooting 2-31
SRW
11K Self-Recovery Winch (SRW) Does Not Work 2-28
11K Self-Recovery Winch (SRW) System Troubleshooting 2-28
Steering
Excessive Play When Turning Steering Wheel 2-26
Hard or Does Not Work 2-29
Hydraulic System Troubleshooting 2-29
No Response When Turning Steering Wheel 2-26
Troubleshooting 2-26
Storage
Preparation for Storage or Shipment 2-44
Preparation for Storage or Shipment Introduction 2-43
Storage Maintenance Procedures 2-45

SUBJECT INDEX (CONT)

Subject Para

S (Cont)

Suspension
System Troubleshooting 2-27
Does Not Compress and/or Return to Normal 2-30
System
11K Self-Recovery Winch (SRW) System Troubleshooting 2-28
Air System Loses Pressure During Operation/Slow, No, or Incorrect Air Pressure Buildup 2-21
Air System Troubleshooting 2-21
Brake System Loses Air When Brakes Are Applied 2-20
Brake System Troubleshooting 2-20
Electrical System Troubleshooting 2-16
Hydraulic System Troubleshooting 2-23
Steering Hydraulic System Troubleshooting 2-29
Suspension System Troubleshooting 2-27
Transmission System Troubleshooting 2-17

T

Tilt
Cab Tilt and Spare Tire Retainer Troubleshooting 2-32
Cab Tilt, Spare Tire Retainer, and Suspension Compression Will Not Work 2-30
Tire
Spare Tire Retainer Does Not Lower 2-32
Spare Tire Retainer Does Not Raise 2-32
Tires
Wear Unevenly or Excessively 2-22
Transmission
Does Not Shift or Is Slow to Shift When Cold 2-17
Engine and Transmission Oil Sampling Valves Replacement 3-6
Metal Particles Found During Transmission Oil Change 2-17
System Troubleshooting 2-17
Unusually Noisy When Operating 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Emits Eight Seconds of Beeps and/or Transmission Does Not Shift Gears 2-17

Subject Para

T (Cont)

Transmission (Cont)
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 14 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 15 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 16 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 24 and/or 33 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 32 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, 45, and/or 69 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 43 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 52 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 57 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 21 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 51 Sub Code 10, 12, 21, 43, 45, or 65 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 25 and Any Sub Code 2-17
WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 53 and Any Sub Code 2-17

Subject Para

T (Cont)

Transmission (Cont)
- 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 2-17
- WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 55 and Any Sub Code 2-17
- WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 56 and Any Sub Code 2-17
- WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 13 and Any Sub Code 2-17
- WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 23 and Any Sub Code 2-17
- WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Does Not Illuminate 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 14 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 15 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 16 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 24 and/or 33 and Any Sub Code 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 32 and Any Sub Code 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, 45, 46, and/or 69 and Any Sub Code 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 52 and Any Sub Code 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 57 and Any Sub Code 2-17

Subject Para

T (Cont)

Transmission (Cont)
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 21 and Any Sub Code 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 51 and Any Sub Code 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 25 and Any Sub Code 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 53 and Any Sub Code 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 54 and Any Sub Code 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 55 and Any Sub Code 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 56 and Any Sub Code 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 13 and Any Sub Code 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Indicator Displays "--" and/or Transmission Does Not Shift Gears 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 23 and Any Sub Code 2-17
- WTEC III Transmission Pushbutton Shift Selector (TPSS) Does Not Illuminate 2-17

Transport/Transportability
- Air Transport Troubleshooting 2-30
- Troop Transport Alarm Does Not Operate 2-31

Troubleshooting
- Axle Troubleshooting 2-25
- Electrical System Troubleshooting 2-16
- Hydraulic System Troubleshooting 2-23
- Power Take Off (PTO) Troubleshooting 2-19
- Special Purpose Kit Troubleshooting 2-31
- Steering Hydraulic System Troubleshooting 2-29
- Steering Troubleshooting 2-26
- Suspension System Troubleshooting 2-27

SUBJECT INDEX (CONT)

Subject Para

T (Cont)

Troubleshooting (Cont)
Transmission System Troubleshooting 2-17
Wheel Troubleshooting 2-22
11K Self-Recovery Winch (SRW) System Troubleshooting 2-28
Tube
Engine Oil Fill Tube Replacement 3-7
Two
Steady Mode Lights Illuminate on Central Tire Inflation System (CTIS) ECU 2-24

U

Universal
Drive Shaft or Universal Joint Unusually Noisy When Operating 2-18

V

Valve
Cover and Gasket Replacement 3-3
Van
All M1079 Van Body Marker Lights Do Not Operate 2-16
M1079 Van Body Clearance Marker Light Does Not Illuminate 2-16
Van
M1079 Van Door Open Light Does Not Illuminate and Audible Alarm Does Not Operate 2-16
Vehicle
Brakes Unevenly, Brakes Pull to One Side or Grab 2-20

W

Wanders
Pulls to One Side, or Shimmies 2-26
Pulls to One Side, or Shimmies 2-27
Warning
No Overspeed Warning Light and/or Overspeed Pressure Change 2-24
Wheel
No Response When Turning Steering Wheel 2-26
Troubleshooting 2-22
Wheels
Wobbles or Shimmies 2-22

Subject Para

W (Cont)

Winch
11K Self-Recovery Winch (SRW) Does Not Work 2-28
11K Self-Recovery Winch (SRW) System Troubleshooting 2-28

GLOSSARY
ABBREVIATIONS

A/C	Air Conditioner
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
NATO	North Atlantic Treaty Organization
NBC	Nuclear, Biological, or Chemical
NO/NC	Normally Open/Normally Closed
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
TPS	Throttle Position Sensor
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:

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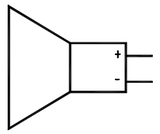
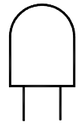
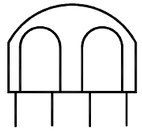
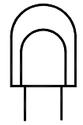
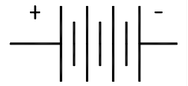
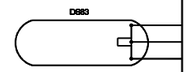
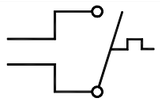
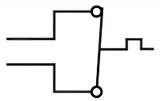
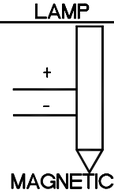
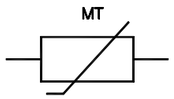
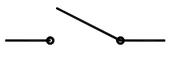
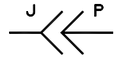
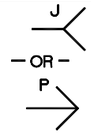
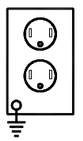
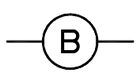
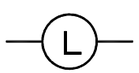
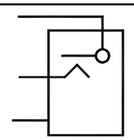
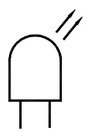
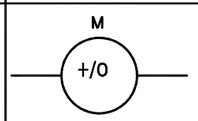
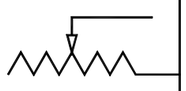
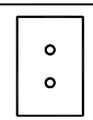
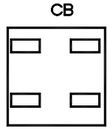
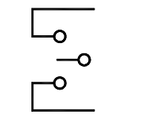
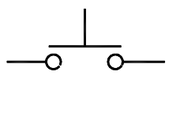
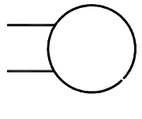
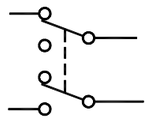
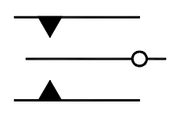
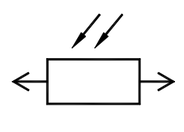
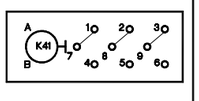
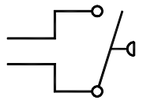
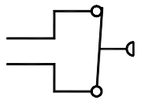
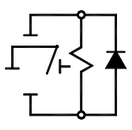
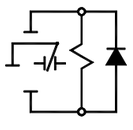
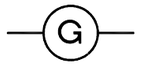
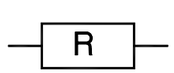
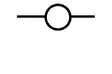
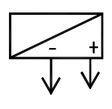
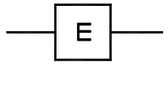
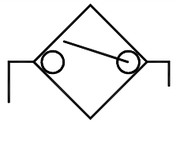
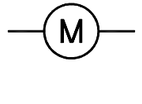
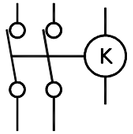
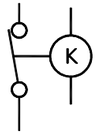
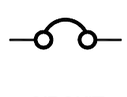
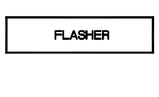
 HORN	 BLACKOUT LAMP	 LAMP	 DUALBEAM LAMP	 GROUND	 POWER LAMP	 OPEN CONTACT	 BATTERY	 FLUORESCENT LIGHT
 TEMPERATURE SWITCH OPEN	 TEMPERATURE SWITCH CLOSED	 MAGNETIC PICKUP	 SENSOR	 NORMALLY OPEN	 NORMALLY CLOSED	 CONNECTOR	 RECEPTACLE	 ELECTRICAL OUTLET
 MOTOR	 SOLENOID	 LEVEL SENSOR	 FILTER	 LED	 METER OR GAGE	 CLOSED CONTACT	 DIMMER MODULE	 TELEPHONE RECEPTACLE
 CIRCUIT BREAKER	 TWO-WAY SWITCH	 PUSHBUTTON	 CIRCULATING PUMP	 DPDT SWITCH	 DPST SWITCH	 PHOTOCELL	 FUSE	 RELAY
 PRESSURE SWITCH OPEN	 PRESSURE SWITCH CLOSED	 NORMALLY OPEN	 NORMALLY CLOSED	 ALTERNATOR	 RESISTOR	 TERMINAL LUG	 ELECTRONIC IGNITION UNIT	
 DIODE	 SPLICE	 SENSING SWITCH	 MOTOR	 GROUND RELAY	 RELAY	 CIRCUIT BREAKER	 FLASHER	

FIGURE FO-1 ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 1 OF 34

SIZE	ILL. NO.	
B	5WD01L1B	FP-1/ (FP-2 BLANK)

CONNECTORS			
NUMBER	ZONE	SH	DESCRIPTION
A13	A66	8	WTEC II TRANSMISSION CONNECTOR A
A13	A70	8	WTEC II TRANSMISSION CONNECTOR B
A13	A74	9	WTEC II TRANSMISSION CONNECTOR C
J1	D285	32	VAN 110 VAC POWER ENTRY
J2	A185	21	EMI FILTER
J2	E285	32	VAN 110 VAC POWER ENTRY
J3	D205	23	AIRDROP ONLY
J5	A38	5	VEHICLE HORN
J6	A38	5	VEHICLE HORN
J7	A188	21	WTEC II TRANSMISSION DIMMER MODULE
J8	B38	5	BLACKOUT MARKER RIGHT FRONT
J9	C38	5	FRONT RIGHT TURN SIGNAL
J10	B38	5	PARKING LIGHT FRONT RIGHT
J12	D38	5	RIGHT HEADLIGHT
J13	C38	5	RIGHT HEADLIGHT
J14	C38	5	RIGHT HEADLIGHT
J17	H38	5	BLACKOUT DRIVE LIGHT
J18	D38	5	LEFT HEADLIGHT
J19	E38	5	LEFT HEADLIGHT
J19	C177	20	CAB - DASH - LEFT - UNDERDASH
J20	D38	5	LEFT HEADLIGHT
J22	G38	5	PARKING LIGHT FRONT LEFT
J23	F38	5	FRONT LEFT TURN SIGNAL
J24	H38	5	BLACKOUT MARKER LEFT FRONT
J25	G85	10	WINDSHIELD WASHER ROTARY PUMP (B3)
J27	A43	5	CHASSIS - FRONT
J31	E55	7	ENGINE
J31X	F175	20	CAB - DASH - LEFT - UNDERDASH
J39	G61	7	ENGINE
J43	G42	5	CHASSIS - FRONT
J43X	F42	5	CHASSIS - FRONT
J43X	G175	20	CAB - DASH - LEFT - UNDERDASH
J50	E85	10	CAB MARKER LIGHT FRONT UPPER LEFT
J51	D42	5	CHASSIS - FRONT
J52	E38	5	CHASSIS - FRONT BUMPER
J52	B203	23	CHASSIS - FRONT
J53	F200	23	AIRDROP ONLY
J55	C85	10	CAB MARKER LIGHT FRONT UPPER RIGHT
J57	D85	10	CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT
J59	C85	10	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT
J60	D85	10	CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE
J62	E88	10	ROTARY WARNING LIGHT CONNECTOR
J65	E186	21	ROTARY WARNING LIGHT CONNECTOR
J78	F185	21	CAB RADIO CONNECTOR
J80	D78	9	AIR DRYER (EXCEPT DUMP)
J93	B50	6	CHASSIS - SPARE TIRE
J95	E38	5	12V INTERVEHICULAR
J95	B206	23	ENGINE
J99	E187	21	CHEMICAL ALARM CONNECTOR
J106	F50	6	CHEMICAL DETECTOR RECEPTACLE
J108	B222	25	CAB - DASH - CENTER - OPTIONS PANEL
J111	E122	14	CTIS ELECTRONIC CONTROL UNIT
J113	G186	21	CTIS PRESSURE TRANSDUCER
J114	B165	21	CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS
J114	D298	34	WTEC III TRANSMISSION HARNESS (TID1)
J114	D303	34	WTEC III TRANSMISSION HARNESS (TID2)
J115	C154	18	CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS
J116	C159	18	CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS
J117	F161	18	CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS
J117	B289	33	WTEC III DIAGNOSTIC CONNECTOR
J118	D161	18	CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS
J119	B169	19	CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS
J119	D301	34	WTEC III CAB TRANSMISSION HARNESS (TID1)
J119	D305	34	WTEC III CAB TRANSMISSION HARNESS (TID2)
J129	F85	10	CAB MARKER LIGHT FRONT LOWER LEFT
J130	F85	10	CAB MARKER LIGHT LEFT DOOR
J130	F202	23	12 PIN CONNECTOR
J131	B85	10	CAB MARKER LIGHT RIGHT DOOR
J132	B85	10	CAB MARKER LIGHT FRONT LOWER RIGHT
J150	B271	31	VAN FRONT MARKER LIGHT
J151	B271	31	VAN FRONT MARKER LIGHT
J152	B271	31	VAN FRONT MARKER LIGHT
J153	A271	31	VAN FRONT MARKER LIGHT

CONNECTORS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
J154	A271	31	VAN FRONT MARKER LIGHT
J155	B287	32	VAN CURBSIDE MARKER LIGHT
J156	B287	32	VAN CURBSIDE MARKER LIGHT
J157	C287	32	VAN ROADSIDE MARKER LIGHT
J158	C287	32	VAN ROADSIDE MARKER LIGHT
J159	D287	32	VAN REAR CENTER MARKER LIGHT
J160	E287	32	VAN REAR CENTER MARKER LIGHT
J161	E287	32	VAN REAR CENTER MARKER LIGHT
J162	B273	31	VAN CURBSIDE BLACKOUT LIGHT
J163	B274	31	VAN CURBSIDE EMERGENCY LIGHT
J164	H274	31	VAN ROADSIDE BLACKOUT LIGHT
J165	H275	31	VAN ROADSIDE EMERGENCY LIGHT
J166	C271	31	VAN FRONT EMERGENCY LIGHT
J167	D287	32	VAN REAR EMERGENCY LIGHT
J173	G272	31	VAN 12/24 VDC POWER RECEPTACLE
J209A	C230	26	PTO EQUIPPED
J209B	D230	26	PTO EQUIPPED
J210	F222	25	CAB - DASH - CENTER - OPTIONS PANEL
J215	E230	26	PTO EQUIPPED
J230	A282	32	VAN CURBSIDE 110 VAC OUTLET
J231	A283	32	VAN CURBSIDE 110 VAC OUTLET
J232	A284	32	VAN CURBSIDE 110 VAC OUTLET
J233	H282	32	VAN ROADSIDE 110 VAC OUTLET
J234	H283	32	VAN ROADSIDE 110 VAC OUTLET
J235	H284	32	VAN ROADSIDE 110 VAC OUTLET
J236	H275	31	VAN ROADSIDE 24 VDC OUTLET
J237	275	31	VAN CURBSIDE 24 VDC OUTLET
J242	D271	31	VAN A/C
J244	F271	31	VAN THERMOSTAT
J245	E271	31	VAN HEATER
J912	B124	14	CAB - DASH - CENTER - HEATER / CTIS ECU
J912	D209	24	CAB - DASH - CENTER - OPTIONS PANEL
J913	B122	14	CAB - DASH - CENTER - HEATER / CTIS ECU
J921	G62	7	TROOP TRANSPORT ALARM
P2	A185	21	EMI FILTER
P3	D204	23	AIRDROP ONLY
P5	A38	5	VEHICLE HORN
P6	A38	5	VEHICLE HORN
P8	B38	5	BLACKOUT MARKER RIGHT FRONT
P9	C38	5	FRONT RIGHT TURN SIGNAL
P10	B38	5	PARKING LIGHT FRONT RIGHT
P12	D38	5	RIGHT HEADLIGHT
P13	C38	5	RIGHT HEADLIGHT
P14	C38	5	RIGHT HEADLIGHT
P17	H38	5	BLACKOUT DRIVE LIGHT
P18	D38	5	LEFT HEADLIGHT
P18	A177	20	CAB - DASH - LEFT - UNDERDASH
P19	E38	5	LEFT HEADLIGHT
P20	D38	5	LEFT HEADLIGHT
P22	G38	5	PARKING LIGHT FRONT LEFT
P23	F38	5	FRONT LEFT TURN SIGNAL
P24	H38	5	BLACKOUT MARKER LEFT FRONT
P25	G85	10	WINDSHIELD WASHER ROTARY PUMP (B3)
P27	A43	5	CHASSIS - FRONT
P31	E56	7	ENGINE
P31X	D56	7	ENGINE
P32	F59	7	ENGINE OIL PRESSURE SENSOR
P33	H59	7	FUEL/WATER SEPARATOR
P34	E59	7	OIL PRESSURE WARNING LIGHT SWITCH
P36	A57	7	WATER COOLER TEMPERATURE
P37	C57	7	WATER TEMPERATURE SWITCH
P38	F61	7	ENGINE SPEED MAGNETIC PICKUP
P39	G61	7	ENGINE
P41	B57	7	WATER TEMPERATURE SENSOR
P410	E240	27	ARCTIC KIT W/PTO EQUIPPED
P42	F57	7	ETHER SENSOR SWITCH
P43	G42	5	CHASSIS - FRONT
P43X	F42	5	CHASSIS - FRONT
P50	E85	10	CAB MARKER LIGHT FRONT UPPER LEFT
P50	F206	23	LH FRONT TOP CAB MARKER LIGHT
P51	D190	22	CAB - DASH - RIGHT - POWER DISTRIBUTION PANEL
P52F	E38	5	CHASSIS - FRONT
P52R	E196	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE

CONNECTORS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
P53R	D196	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
P54	D197	22	LEFT REAR MARKER
P55	C85	10	CAB MARKER LIGHT FRONT UPPER RIGHT
P55	D206	23	RH FRONT TOP CAB MARKER LIGHT
P56	E197	22	MIDDLE REAR MARKER
P57	D85	10	CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT
P57	F206	23	LH FRONT TOP CAB CLEARANCE LIGHT
P58	E197	22	RIGHT REAR MARKER
P59	C85	10	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT
P59	D206	23	RH FRONT TOP CAB CLEARANCE LIGHT
P60	D85	10	CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE
P60	E206	23	MIDDLE FRONT TOP CLEARANCE LIGHT
P61	F197	22	RH COMPOSITE LIGHT
P62	F197	22	RH COMPOSITE LIGHT
P63	G197	22	RH COMPOSITE LIGHT
P64	F197	22	RH COMPOSITE LIGHT
P65	E186	21	ROTARY WARNING LIGHT CONNECTOR
P67	A74	9	PRE-BLOCK SEVEN W/PIGTAIL TRANSMISSION EXTERNAL
P67	B69	8	WIRING HARNESS TO TRANSMISSION CONNECTOR TID1, TID2, AND TID3 TRANSMISSION EXTERNAL WIRING
			HARNESS TO TRANSMISSION CONNECTOR
P69	D59	7	ENGINE
P71	E66	8	PRE-BLOCK SEVEN TRANSMISSION OUTPUT SPEED SENSOR
P71	E70	8	CONNECTOR TID1, TID2, AND TID3 TRANSMISSION OUTPUT SPEED
P71	E75	9	SENSOR CONNECTOR PRE-BLOCK SEVEN W/PIGTAIL TRANSMISSION OUTPUT
F72	F66	8	SPEED SENSOR CONNECTOR PRE-BLOCK SEVEN TRANSMISSION ENGINE SPEED
F72	F70	8	SENSOR CONNECTOR TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED
F72	E75	9	SENSOR CONNECTOR PRE-BLOCK SEVEN W/PIGTAIL TRANSMISSION ENGINE
F73	F66	8	SPEED SENSOR CONNECTOR PRE-BLOCK SEVEN TRANSMISSION THROTTLE POSITION
F73	F70	8	SENSOR CONNECTOR TID1, TID2, AND TID3 TRANSMISSION THROTTLE POSITION
F73	F75	9	SENSOR CONNECTOR PRE-BLOCK SEVEN W/PIGTAIL TRANSMISSION THROTTLE
			POSITION SENSOR CONNECTOR
P74	B197	22	LH COMPOSITE LIGHT
P76	C197	22	LH COMPOSITE LIGHT
P77	C197	22	LH COMPOSITE LIGHT
P78	B197	22	LH COMPOSITE LIGHT
P80	G51	6	CHASSIS - REAR
P81	C47	6	CHASSIS - FRONT
P81	D62	7	STARTER THERMO SWITCH
P82	B51	6	FUEL TANK LEVEL SENSOR
P83	B172	20	CAB - DASH - LEFT - UNDERDASH
P84	F51	6	CHASSIS - REAR
P85	A197	22	LH SIDE MARKER LIGHT
P86	A197	22	LH REAR MARKER LIGHT
P87	C197	22	BACKUP LIGHT
P88	H197	22	RH SIDE MARKER LIGHT
P89	G197	22	RH REAR MARKER LIGHT
P99	F186	21	CHEMICAL ALARM CONNECTOR
P10	B38	5	PARKING LIGHT FRONT RIGHT
P110	E119	14	CTIS ELECTRONIC CONTROL UNIT
P111	E122	14	CTIS ELECTRONIC CONTROL UNIT
P112	G123	14	CAB - DASH - CENTER - HEATER / CTIS ECU
P113	F123	14	CTIS ELECTRONIC CONTROL UNIT
P115	C290	33	WTEC III - CAB - DASH - RIGHT - KICK PANEL
P116	C185	21	CAB - DASH - RIGHT - UNDERDASH
P118	D161	18	CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS
P116	E291	33	WTEC III - CAB - DASH - RIGHT - KICK PANEL
P119	A64	8	PRE-BLOCK SEVEN TRANSMISSION CONNECTOR
P119	A69	8	TID1, TID2, AND TID3 TRANSMISSION CONNECTOR
P119	A73	9	PRE-BLOCK SEVEN W/PIGTAIL TRANSMISSION CONNECTOR
P119	B169	19	CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS
P125	G84	10	WINDSHIELD WASHER ROTARY PUMP (B3)
P129	F85	10	CAB MARKER LIGHT FRONT LOWER LEFT
P130	F85	10	CAB MARKER LIGHT LEFT DOOR
P131	A85	10	CAB MARKER LIGHT RIGHT DOOR

CONNECTORS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
P132	B85	10	CAB MARKER LIGHT FRONT LOWER RIGHT
P150	B272	31	VAN FRONT MARKER LIGHT
P151	B272	31	VAN FRONT MARKER LIGHT
P152	B272	31	VAN FRONT MARKER LIGHT
P153	A272	31	VAN FRONT MARKER LIGHT
P154	A272	31	VAN FRONT MARKER LIGHT
P155	B287	32	VAN CURBSIDE MARKER LIGHT
P156	B287	32	VAN CURBSIDE MARKER LIGHT
P157	C287	32	VAN ROADSIDE MARKER LIGHT
P158	C287	32	VAN ROADSIDE MARKER LIGHT
P159	D287	32	VAN REAR CENTER MARKER LIGHT
P160	E287	32	VAN REAR CENTER MARKER LIGHT
P161	D287	32	VAN REAR CENTER MARKER LIGHT
P162	B273	31	VAN CURBSIDE BLACKOUT LIGHT
P163	B274	31	VAN CURBSIDE EMERGENCY LIGHT
P164	G274	31	VAN ROADSIDE BLACKOUT LIGHT
P165	G275	31	VAN ROADSIDE EMERGENCY LIGHT
P166	C272	32	VAN FRONT EMERGENCY LIGHT
P167	D287	31	VAN REAR EMERGENCY LIGHT
P172	E264	30	DUMP BODY CONNECTOR
P173	G271	31	VAN 12/24 VDC POWER
P201	G61	7	ENGINE
P210	F222	25	CAB - DASH - CENTER - OPTIONS PANEL
P210	C227	26	PTO EQUIPPED
P215	E230	26	PTO EQUIPPED
P216	E229	26	PTO EQUIPPED
P217	C229	26	PTO EQUIPPED
P217	B268	30	PTO EQUIPPED
P901	A209	24	CAB - DASH - CENTER - OPTIONS PANEL
P902A	D214	24	CAB - DASH - CENTER - OPTIONS PANEL
P903	C212	24	CAB - DASH - CENTER - OPTIONS PANEL
P903A	D212	24	CAB - DASH - CENTER - OPTIONS PANEL
P904	C211	24	CAB - DASH - CENTER - OPTIONS PANEL
P904A	D211	24	CAB - DASH - CENTER - OPTIONS PANEL
P905	A211	24	CAB - DASH - CENTER - OPTIONS PANEL
P905A	B211	24	CAB - DASH - CENTER - OPTIONS PANEL
P906	A212	24	CAB - DASH - CENTER - OPTIONS PANEL
P906A	B212	24	CAB - DASH - CENTER - OPTIONS PANEL
P908	A215	24	CAB - DASH - CENTER - OPTIONS PANEL
P908A	B215	24	CAB - DASH - CENTER - OPTIONS PANEL
P909	A220	25	CAB - DASH - CENTER - OPTIONS PANEL
P909A	B220	25	CAB - DASH - CENTER - OPTIONS PANEL
P910	C215	24	CAB - DASH - CENTER - OPTIONS PANEL
P910A	D215	24	CAB - DASH - CENTER - OPTIONS PANEL
P911	C220	25	CAB - DASH - CENTER - OPTIONS PANEL
P911A	D220	25	CAB - DASH - CENTER - OPTIONS PANEL
P912	B124	14	CAB - DASH - CENTER - HEATER / CTIS ECU
P913	B122	14	CAB - DASH - CENTER - HEATER / CTIS ECU
P913	F209	24	CAB - DASH - CENTER - OPTIONS PANEL
P914	A214	24	CAB - DASH - CENTER - OPTIONS PANEL
P914A	B214	24	CAB - DASH - CENTER - OPTIONS PANEL
P921	G62	7	TROOP TRANSPORT ALARM
PBSS	C93	11	WTEC II PUSHBUTTON SHIFT SELECTOR
PX1	A92	11	ENGINE FAN OFF SWITCH
PX10	D107	12	CAB - DASH - LEFT - INSTRUMENT PANEL
PX11	G107	12	CAB - DASH - LEFT - INSTRUMENT PANEL
PX12	C112	13	ROTATING WARNING LIGHT SWITCH
PX12A	E112	13	CAB - DASH - LEFT - INSTRUMENT PANEL
PX13	F92	11	ETHER STARTER SWITCH
PX13A	G92	11	CAB - DASH - LEFT - INSTRUMENT PANEL
PX14	F112	13	FULL HAZARD WARNING SWITCH
PX14A	H112	13	CAB - DASH - LEFT - INSTRUMENT PANEL
PX15	C115	13	MAIN LIGHT SWITCH
PX17	A112	13	IGNITION SWITCH
PX17A	C112	13	CAB - DASH - LEFT - INSTRUMENT PANEL
PX1A	B92	11	CAB - DASH - LEFT - INSTRUMENT PANEL
PX2	D92	11	LAMP TEST SWITCH
PX20	C188	21	TURN SIGNAL FLASHER
PX21	A134	15	WIPER DELAY MODULE

FIGURE FO-1 ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 2 OF 34

SIZE B | ILL. NO. 5WD01L2B | FP-3/ (FP-4 BLANK)

CONNECTORS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
PX22	A184	21	EMI FILTER
PX24	G115	13	INSTRUMENT PANEL LIGHTS DIMMER MODULE
PX25	C119	14	CAB DASH CENTER HEATER / CTIS ECU
PX26	B179	20	CAB - DASH - LEFT - UNDERDASH
PX2A	E92	11	CAB - DASH - LEFT - INSTRUMENT PANEL
PX33	B182	21	CAB - DASH - RIGHT - UNDERDASH
PX33	G292	33	WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR
PX34	E188	21	FRONT AIR PRESSURE METER
PX4	F97	11	FAN SOLENOID
PX5	B97	11	REAR AIR PRESSURE METER
PX6	B107	12	CAB - DASH - LEFT - INSTRUMENT PANEL
PX7	A104	12	CAB - DASH - LEFT - INSTRUMENT PANEL
PX8	G102	12	CAB - DASH - LEFT - INSTRUMENT PANEL
PX9	D97	11	FUEL LEVEL METER

LIGHTS			
NUMBER	ZONE	SH	DESCRIPTION
D51	B257	29	POWER LAMP
D52	B257	29	POWER LAMP
DS1	D96	11	CAB - DASH - LEFT - INSTRUMENT PANEL
DS2	G106	12	CAB - DASH - LEFT - INSTRUMENT PANEL
DS3	F96	11	CAB - DASH - LEFT - INSTRUMENT PANEL
DS4	B96	11	CAB - DASH - LEFT - INSTRUMENT PANEL
DS5	B106	12	CAB - DASH - LEFT - INSTRUMENT PANEL
DS6	G101	12	CAB - DASH - LEFT - INSTRUMENT PANEL
DS7	D106	12	CAB - DASH - LEFT - INSTRUMENT PANEL
DS8	C91	11	CAB - DASH - LEFT - INSTRUMENT PANEL
DS9	B101	12	DUMP BODY UP
DS10	E111	13	CAB - DASH - LEFT - INSTRUMENT PANEL
DS11	G91	11	CAB - DASH - LEFT - INSTRUMENT PANEL
DS12	H111	13	CAB - DASH - LEFT - INSTRUMENT PANEL
DS13	C111	13	CAB - DASH - LEFT - INSTRUMENT PANEL
DS14	B101	12	LEFT TURN SIGNAL
DS15	B101	12	RIGHT TURN SIGNAL
DS16	E101	12	HIGH BEAM
DS17	D119	14	HEATER CONTROL PANEL ILLUMINATION
DS18	A208	24	CAB - DASH - CENTER - OPTIONS PANEL
DS19	E101	12	RADIATOR FAN OFF
DS21	C101	12	EMERGENCY BRAKE
DS22	D101	12	PARKING BRAKE
DS23	C101	12	PTO ON
DS24	D101	12	OIL PRESSURE
DS25	C101	12	WATER TEMPERATURE
DS27	C101	12	REAR BRAKE AIR
DS28	E101	12	FRONT AIR BRAKE
DS29	D101	12	ENGINE OIL LEVEL
DS30	F101	12	MASTER STOP
DS31	D213	24	CAB - DASH - CENTER - OPTIONS PANEL
DS32	B101	12	CHEMICAL DETECT
DS34	C101	12	CTIS OVERSPEED
DS35	C198	22	REAR LH COMPOSITE LIGHT
DS36	G198	22	REAR RH COMPOSITE LIGHT
DS37	B198	22	REAR LH COMPOSITE LIGHT
DS38	F198	22	REAR RH COMPOSITE LIGHT
DS39	F37	5	FRONT LEFT TURN SIGNAL
DS41	D101	12	TRANSMISSION OIL TEMPERATURE
DS42	C38	5	FRONT RIGHT TURN SIGNAL
DS43	D212	24	CAB - DASH - CENTER - OPTIONS PANEL
DS44	D37	5	RIGHT HEADLIGHT
DS45	C198	22	BACKUP LIGHT
DS46	D210	24	CAB - DASH - CENTER - OPTIONS PANEL
DS47	G37	5	PARKING LIGHT FRONT LEFT
DS48	B38	5	PARKING LIGHT FRONT RIGHT
DS49	G37	5	BLACKOUT MARKER LEFT FRONT
DS50	B38	5	BLACKOUT MARKER RIGHT FRONT
DS51	C198	22	REAR LH COMPOSITE LIGHT
DS52	F198	22	REAR RH COMPOSITE LIGHT
DS53	H37	5	BLACKOUT DRIVE LIGHT
DS54	D84	10	CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT
DS54	F206	23	LH FRONT TOP CAB CLEARANCE LIGHT
DS55	D84	10	CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE
DS55	E206	23	MIDDLE FRONT TOP CLEARANCE LIGHT

LIGHTS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
DS56	C84	10	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT
DS56	D206	23	RH FRONT TOP CAB CLEARANCE LIGHT
DS57	C84	10	CAB MARKER LIGHT FRONT UPPER RIGHT
DS57	D206	23	RH FRONT TOP CAB MARKER LIGHT
DS58	E84	10	CAB MARKER LIGHT FRONT UPPER LEFT
DS58	F206	23	LH FRONT TOP CAB MARKER LIGHT
DS59	B84	10	CAB MARKER LIGHT RIGHT DOOR
DS60	F84	10	CAB MARKER LIGHT FRONT LOWER LEFT
DS61	A84	10	CAB MARKER LIGHT RIGHT DOOR
DS62	F84	10	CAB MARKER LIGHT LEFT DOOR
DS63	B210	24	CAB - DASH - CENTER - OPTIONS PANEL
DS64	B212	24	CAB - DASH - CENTER - OPTIONS PANEL
DS65	A198	22	LH SIDE MARKER LIGHT
DS66	A198	22	LH REAR MARKER LIGHT
DS67	H198	22	RH SIDE MARKER LIGHT
DS68	G198	22	RH REAR MARKER LIGHT
DS69	D198	22	LEFT REAR MARKER
DS70	E198	22	MIDDLE REAR MARKER
DS71	E198	22	RIGHT REAR MARKER
DS72	B198	22	REAR LH COMPOSITE LIGHT
DS73	F198	22	REAR RH COMPOSITE LIGHT
DS74	D37	5	LEFT HEADLIGHT
DS75	A273	31	VAN CURBSIDE BLACKOUT LIGHT
DS76	H274	31	VAN ROADSIDE BLACKOUT LIGHT
DS78	A274	31	VAN CURBSIDE EMERGENCY LIGHT
DS79	H275	31	VAN ROADSIDE EMERGENCY LIGHT
DS80	H284	32	VAN ROADSIDE FLUORESCENT LIGHT
DS81	H286	32	VAN ROADSIDE FLUORESCENT LIGHT
DS82	A286	32	VAN CURBSIDE FLUORESCENT LIGHT
DS83	A284	32	VAN CURBSIDE FLUORESCENT LIGHT
DS84	B271	31	VAN FRONT MARKER LIGHT
DS85	B271	31	VAN FRONT MARKER LIGHT
DS86	B271	31	VAN FRONT MARKER LIGHT
DS87	A271	31	VAN FRONT MARKER LIGHT
DS88	A271	31	VAN FRONT MARKER LIGHT
DS89	B288	32	VAN CURBSIDE MARKER LIGHT
DS90	B288	32	VAN CURBSIDE MARKER LIGHT
DS91	C288	32	VAN ROADSIDE MARKER LIGHT
DS92	C288	32	VAN ROADSIDE MARKER LIGHT
DS93	D288	32	VAN REAR CENTER MARKER LIGHT
DS94	E288	32	VAN REAR CENTER MARKER LIGHT
DS95	E288	32	VAN REAR CENTER MARKER LIGHT
DS96	B215	24	CAB - DASH - CENTER - OPTIONS PANEL
DS96	C271	31	VAN FRONT EMERGENCY LIGHT
DS97	B219	25	CAB - DASH - CENTER - OPTIONS PANEL
DS97	C271	32	VAN REAR EMERGENCY LIGHT
DS100	B213	24	CAB - DASH - CENTER - OPTIONS PANEL
DS101	D119	14	HEATER CONTROL PANEL ILLUMINATION
DS108	E91	11	CAB - DASH - LEFT - INSTRUMENT PANEL

CIRCUIT BREAKERS			
NUMBER	ZONE	SH	DESCRIPTION
CB1	C285	32	VAN 110 VAC MAIN CIRCUIT BREAKER
CB2	C284	32	VAN A/C
CB3	D284	32	VAN 110 VAC POWER OUT
CB4	D284	32	VAN NOT USED
CB5	E284	32	VAN BLACKOUT OVERRIDE
CB6	E284	32	VAN LIGHTS
CB7	E284	32	VAN 110 VAC OUTLETS
CB8	E284	32	VAN THERMOSTAT/FAN
CB9	E284	32	VAN 110 VAC OUTLETS
CB10	D277	31	VAN BLACKOUT LIGHTS
CB11	D277	31	VAN EMERGENCY/BLACKOUT LIGHTS
CB20	C140	16	CAB RADIO
CB21	C149	17	WTEC II VIM STE/ICE
CB22	C149	17	FAN/ETHER
CB23	C147	17	HEATER BLOWER
CB30	C139	16	CHEMICAL ALARM
CB35	D149	17	WTEC II VIM POWER
CB36	C147	17	HORN POWER
CB37	C151	17	WINDSHIELD WIPER/WASHER
CB38	D147	17	ROTATING BEACON
CB39	C146	17	TRAILER BLACKOUT STOP

CIRCUIT BREAKERS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
CB40	C150	17	CTIS COOLER
CB41	C142	16	TRAILER REAR LIGHTS POWER
CB42	C142	16	BLACKOUT MARKER LIGHTS POWER
CB43	C143	16	REAR COMPOSITE LIGHTS/WTEC III ECU
CB44	C143	16	REAR COMPOSITE LIGHTS
CB45	C139	16	FUEL PREHEAT
CB48	C140	16	ARCTIC CAB/ENGINE KILL
CB49	C151	17	PTO POWER
CB50	F256	29	MAIN POWER CIRCUIT BREAKER SWITCH
CB53	D140	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB54	D142	16	BLACKOUT HEADLIGHT
CB61	D153	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB62	D153	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB63	D151	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB64	D151	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB65	D140	16	PARKING LIGHTS
CB66	D143	16	BLACKOUT MARKER POWER
CB67	D139	16	MARKER LIGHTS
CB68	C152	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB70	D146	17	IGNITION/MAIN LIGHT SWITCH
CB71	D149	17	HAZARD/FLASHER WORKLIGHTS
CB72	D139	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB73	D150	17	BACK-UP LIGHT POWER
CB74	D150	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
CB76	D143	16	BLACKOUT STOP RELAY POWER
CB77	C152	17	ENGINE INSTR POWER
CB78	D147	17	HEADLIGHTS
CB79	C150	17	WTEC II VIM POWER/WTEC III REVERSE WARNING RELAY
CB80	D142	16	TAILLIGHTS

TERMINAL LUGS			
NUMBER	ZONE	SH	DESCRIPTION
TL1	B54	6	POLARITY PROTECTION
TL1	E60	7	ALTERNATOR
TL2	B53	6	POLARITY PROTECTION
TL2	D60	7	ALTERNATOR
TL2	D53	6	POLARITY PROTECTION (P/P)
TL3	C85	10	CAB MARKER LIGHT FRONT UPPER RIGHT
TL3	D206	23	RH FRONT TOP CAB MARKER LIGHT
TL4	C85	10	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT
TL4	D206	23	RH FRONT TOP CAB CLEARANCE LIGHT
TL5	D60	7	ALTERNATOR
TL6	D60	7	ALTERNATOR
TL8	D85	10	CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE
TL8	E206	23	MIDDLE FRONT TOP CLEARANCE LIGHT
TL9	D47	6	24V AUXILIARY STARTER SOLENOID
TL10	C52	6	CHASSIS - REAR (REF E1)
TL12	C49	6	BATTERIES
TL12	C62	7	STARTER/STARTER SOLENOID
TL14	E88	10	ROTARY WARNING LIGHT CONNECTOR
TL15	A198	22	LH SIDE MARKER LIGHT
TL16	A198	22	LH REAR MARKER LIGHT
TL17	C198	22	BACKUP LIGHT
TL18	C198	22	LONG WHEEL BASE
TL19	H198	22	RH SIDE MARKER LIGHT
TL20	G198	22	RH REAR MARKER LIGHT
TL21	G198	22	RH COMPOSITE LIGHT
TL22	D85	10	CAB MARKER LIGHTS
TL22	E206	23	LH FRONT TOP CAB CLEARANCE LIGHT
TL23	D47	6	24V AUXILIARY STARTER SOLENOID
TL24	D47	6	24V AUXILIARY STARTER SOLENOID
TL25	C47	6	CHASSIS - FRONT
TL25	C62	7	STARTER/STARTER SOLENOID
TL26	C47	6	CHASSIS - FRONT
TL26	C62	7	STARTER/STARTER SOLENOID
TL27	E85	10	CAB MARKER LIGHT FRONT UPPER RIGHT
TL27	F206	23	CAB MARKER LIGHTS FRONT UPPER RIGHT
TL28	G57	7	FUEL SOLENOID
TL29	H57	7	FUEL SOLENOID
TL30	D198	22	LEFT REAR MARKER

TERMINAL LUGS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
TL31	E198	22	MIDDLE REAR MARKER
TL32	E198	22	RIGHT REAR MARKER
TL33	E47	6	24V AUXILIARY STARTER SOLENOID
TL35	D61	7	ALTERNATOR
TL36	B54	6	POLARITY PROTECTION
TL37	F54	6	POLARITY PROTECTION
TL37	C54	6	POLARITY PROTECTION
TL38	E50	6	SHUNT
TL39	C52	6	CHASSIS - REAR (REF E1)
TL41	C53	6	POLARITY PROTECTION
TL42	B54	6	POLARITY PROTECTION
TL44	B54	6	POLARITY PROTECTION
TL44	E54	6	POLARITY PROTECTION
TL45	D50	6	SHUNT
TL46	D49	6	SHUNT
TL46	D62	7	STARTER/STARTER SOLENOID
TL47	C54	6	POLARITY PROTECTION
TL48	E52	6	CHASSIS - REAR (REF E2)
TL49A	D52	6	CHASSIS - REAR (REF E1)
TL49A	F52	6	NATO SLAVE RECEPTACLE
TL50	G121	14	CHASSIS GROUND
TL50A	F52	6	NATO SLAVE RECEPTACLE
TL51	E50	6	SHUNT
TL52	E50	6	SHUNT
TL53	B47	6	CHASSIS - FRONT
TL53	B62	7	STARTER/STARTER SOLENOID
TL55	B47	6	CHASSIS - FRONT
TL55	C62	7	STARTER/STARTER SOLENOID
TL56	F136	16	X3 GROUND
TL57	F136	16	CAB GROUND
TL58	D60	7	ALTERNATOR
TL59	C61	7	ALTERNATOR
TL60	C53	6	POLARITY PROTECTION
TL60	D60	7	ALTERNATOR
TL61	C54	6	POLARITY PROTECTION
TL61	E60	7	ALTERNATOR
TL62	C47	6	CHASSIS - FRONT
TL63	C47	6	CHASSIS - FRONT
TL63	B62	7	STARTER/STARTER SOLENOID
TL66	H61	7	ENGINE (REF P201)
TL68	D224	25	CAB - DASH - CENTER - OPTIONS PANEL
TL69	E224	25	CAB - DASH - CENTER - OPTIONS PANEL
TL70	B38	5	FRONT RH COMPOSITE LIGHT
TL71	A85	10	CAB MARKER LIGHT RIGHT DOOR
TL72	H38	5	BLACKOUT DRIVE LIGHT
TL73	B86	10	CAB - MARKER LIGHTS
TL74	D86	10	CAB - MARKER LIGHTS
TL74	E204	23	AIRDROP ONLY
TL75	F87	10	CAB - MARKER LIGHTS
TL76	D229	26	PTO EQUIPPED
TL79	F38	5	FRONT LH COMPOSITE LIGHT
TL80	C54	6	POLARITY PROTECTION
TL80	F54	6	200 AMP
TL81	C39	5	CHASSIS GROUND
TL82	F38	5	CHASSIS GROUND
TL83	B52	6	FUEL TANK LEVEL SENSOR
TL84	B49	6	CHASSIS - SPARE TIRE (REF J93)
TL85	G52	6	CHASSIS - REAR
TL86	C86	10	CAB - MARKER LIGHTS
TL86	D204	23	AIRDROP ONLY
TL87	F86	10	CAB - MARKER LIGHTS
TL92	F195	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
TL93	G194	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
TL94	G85	10	WINDSHIELD WASHER ROTARY PUMP (B3)
TL96	H271	31	VAN BODY GROUND
TL97	B88	10	CHEMICAL ALARM CONNECTOR
TL98	B88	10	CHEMICAL ALARM CONNECTOR

TERMINAL LUGS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
TL99	D52	6	CHASSIS - REAR (REF E2)
TL100	E54	6	POLARITY PROTECTION
TL110	D61	7	ALTERNATOR
TL111	D230	26	PTO EQUIPPED
TL123	E38	5	CHASSIS - FRONT (REF J19)
TL126	E126	14	CHASSIS GROUND
TL130	F85	10	CAB - MARKER LIGHTS
TL131	A85	10	CAB - MARKER LIGHTS
TL133	F85	10	CAB - MARKER LIGHTS
TL134	B85	10	CAB - MARKER LIGHTS
TL150	F177	20	SENSOR/FRONT AIR PRESSURE TRANSMITTER
TL151	G177	20	SENSOR/REAR AIR PRESSURE TRANSMITTER
TL152	C179	20	STOPLIGHT SWITCH
TL153	C179	20	STOPLIGHT SWITCH
TL154	D179	20	STOPLIGHT SWITCH
TL154	D179	20	STOPLIGHT SWITCH
TL155	D179	20	STOPLIGHT SWITCH
TL156	F177	20	SWITCH/FRONT AIR PRESSURE TRANSMITTER
TL157	G177	20	SWITCH/REAR AIR PRESSURE TRANSMITTER
TL158	E137	16	START INHIBIT PUSHBUTTON
TL159	E136	16	START INHIBIT PUSHBUTTON
TL160	H102	12	AUDIBLE ALARM
TL161	H102	12	AUDIBLE ALARM
TL162	B114	13	STARTER PUSHBUTTON
TL163	B114	13	STARTER PUSHBUTTON
TL164	G62	7	ENGINE (REF J921)
TL165	G62	7	ENGINE (REF J921)
TL166	F54	6	TERMINAL BLOCK
TL167	E54	6	TERMINAL BLOCK
TL169	D53	6	POLARITY PROTECTION (P/P)
TL171	F54	6	TERMINAL BLOCK
TL172	F54	6	TERMINAL BLOCK
TL173	E54	6	POLARITY PROTECTION (P/P)
TL174	D54	6	POLARITY PROTECTION (P/P)
TL190	D290	33	WTEC III PRESSURE SWITCH GROUND
TL201	E125	14	PARKING BRAKE SWITCH
TL202	E125	14	PARKING BRAKE SWITCH
TL320	E232	26	PTO EQUIPPED
TL320	C241	27	ARCTIC KIT W/PTO EQUIPPED

SWITCHES			
NUMBER	ZONE	SH	DESCRIPTION
S3	A177	20	COLUMN SWITCH
S3	C177	20	COLUMN SWITCH
S4	D114	13	MAIN LIGHT SWITCH
S5/1	B111	13	IGNITION SWITCH
S5/11	A91	11	ENGINE FAN OFF SWITCH
S5/14	C213	24	WINCH ON OFF
S5/15	B212	24	WINCH IN-OUT
S5/16	F91	11	ETHER STARTER SWITCH
S5/2	D91	11	LAMP TEST SWITCH
S5/2	D111	13	ROTATING WARNING LIGHT SWITCH
S5/22	G111	13	FULL HAZARD WARNING SWITCH
S5/25	A219	25	SWINGFIRE PUMP SWITCH
S5/6	B210	24	PTO ON/OFF SWITCH
S5/8	A213	24	BLACKOUT OVERRIDE SWITCH
S5/9	A214	24	FUEL PRE-HEAT SWITCH
S6	A114	13	STARTER PUSHBUTTON
S7	F137	16	START INHIBIT PUSHBUTTON
S10A	C179	20	STOPLIGHT SWITCH
S10B	D179	20	STOPLIGHT SWITCH
S11	A287	32	VAN CURBSIDE WINDOW BLACKOUT SWITCH
S12	A287	32	VAN CURBSIDE WINDOW BLACKOUT SWITCH
S13	G288	32	VAN ROADSIDE WINDOW BLACKOUT SWITCH
S14	G288	32	VAN ROADSIDE WINDOW BLACKOUT SWITCH
S15	G288	32	VAN ROADSIDE WINDOW BLACKOUT SWITCH
S17	G288	32	VAN DOOR WINDOW BLACKOUT SWITCH (S/N 191 AND HIGHER)

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 3 OF 34

SIZE B | ILL. NO. 5WD01L3B | FP-5/ (FP-6 BLANK)

28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36

A B C D E F G H

SWITCHES (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
S17	G288	32	VAN CURBSIDE WINDOW BLACKOUT SWITCH (S/N 001 THROUGH 190)
S18	D269	30	PTO PRESSURE SWITCH
S20	E177	20	SWITCH/FRONT AIR PRESSURE TRANSMITTER
S23	F52	6	AIR PRESSURE SWITCH FOR CTIS
S24	E125	14	PARKING BRAKE SWITCH
S26	C57	7	WATER TEMPERATURE SENSOR
S27	E59	7	OIL PRESSURE WARNING LIGHT SWITCH
S29	G177	20	SWITCH/REAR AIR PRESSURE TRANSMITTER
S31	A216	24	ARCTIC TROOP HEATER SWITCH
S32	F288	32	VAN LIGHTS ON/OFF SWITCH
S33	E277	31	VAN BLACKOUT SWITCH
S34	D278	31	VAN BLACKOUT SWITCH
S35	H273	31	VAN BLACKOUT OVERRIDE SWITCH
S40	F58	7	ETHER SENSOR SWITCH
S45	E62	7	TROOP ALARM SWITCH
S45	G62	31	VAN FAN ON/OFF SWITCH
S56	A57	7	WATER TEMPERATURE SWITCH
S57	G77	9	LMHC IN/OUT SWITCH

GAGES			
NUMBER	ZONE	SH	DESCRIPTION
M2	D106	12	VOLTMETER
M3	B106	12	ENGINE OIL PRESSURE METER
M4	F96	11	FRONT AIR PRESSURE METER
M5	B96	11	REAR AIR PRESSURE METER
M6	G107	12	WATER TEMPERATURE METER
M7	D96	11	FUEL LEVEL METER
M8	G102	12	SPEEDOMETER
M9	A210	24	TACHOMETER

RELAYS			
NUMBER	ZONE	SH	DESCRIPTION
K1	F149	17	STARTER RELAY
K2	B143	16	CONTROL PANEL RELAY
K6	F144	16	STOPLIGHT RELAY
K7	G153	17	HEADLIGHT RELAY
K8	G151	17	HEADLIGHT LO/HI-BEAM RELAY
K9	A142	16	HAZARD FLASHER BLACKOUT OVERRIDE
K10	F150	17	STOP HAZARD FLASHER RELAY
K11	F146	17	ALTERNATOR EXCITATION RELAY
K12	B139	16	WORKLIGHT RELAY
K13	B149	17	ROTATING BEACON BLACKOUT OVERRIDE RELAY
K15	B140	16	AUXILIARY COOLER RELAY
K19	B150	17	START INHIBIT RELAY
K20	H138	16	MARKER LIGHTS RELAY
K24	B151	17	CRANKING LOCKOUT RELAY
K25	B292	33	WTEC III REVERSE WARNING RELAY
K26	B290	33	WTEC III NEUTRAL START RELAY
K27	H143	16	BLACKOUT STOP RELAY
K28	H142	16	TRAILER REAR LIGHTS RELAY
K29	F142	16	BLACKOUT MARKER RELAY/WTEC III BLACKOUT DRIVE RELAY
K30	H147	17	REAR LEFT COMPOSITE LAMP RELAY
K31	H149	17	REAR RIGHT COMPOSITE LAMP RELAY
K32	B147	17	HORN RELAY
K35	E277	31	VAN 110 VAC OUTLETS
K36	F277	31	VAN FLUORESCENT LIGHTS
K37	B294	33	WTEC III PTO ENABLE OUTPUT RELAY
K52	H139	16	CTIS OVERSPEED INDICATION RELAY
K53	H140	16	RADIO POWER RELAY

RESISTORS			
NUMBER	ZONE	SH	DESCRIPTION
R2	E172	20	CAB - DASH - LEFT - UNDERDASH
R4	D175	20	CAB - DASH - LEFT - UNDERDASH
R5	C175	20	CAB - DASH - LEFT - UNDERDASH
R6	F172	20	CAB - DASH - LEFT - UNDERDASH

SOLENOIDS			
NUMBER	ZONE	SH	DESCRIPTION
KS	D47	6	24V AUXILIARY STARTER SOLENOID
L1	E189	21	FAN SOLENOID
L2	H57	7	FUEL SOLENOID
L3	D269	30	PTO SOLENOID
L4	E233	26	WINCH IN SOLENOID
L5	D233	26	SOLENOID
L15	B51	6	CHASSIS - SPARE TIRE
	E80	9	LMHC IN SOLENOID
	F80	9	LMHC OUT SOLENOID

HORNS AND ALARMS			
NUMBER	ZONE	SH	DESCRIPTION
LS1	A37	5	VEHICLE HORN
LS2	H101	12	AUDIBLE ALARM

MOTORS			
NUMBER	ZONE	SH	DESCRIPTION
B2	A183	21	WINDSHIELD WIPER MOTOR
B4	C118	14	FAN MOTOR
	F81	9	LMHC HOIST MOTOR

BATTERIES			
NUMBER	ZONE	SH	DESCRIPTION
BT1	C52	6	BATTERY
BT2	D52	6	BATTERY
BT3	D52	6	BATTERY
BT4	E52	6	BATTERY

MISCELLANEOUS			
NUMBER	ZONE	SH	DESCRIPTION
10A	C183	21	WTECII VEHICLE INTERFACE MODULE
10A	E183	21	WTECII VEHICLE INTERFACE MODULE
A2	F118	14	CTIS ELECTRONIC CONTROL UNIT
A3	G114	13	INSTRUMENT PANEL LIGHTS DIMMER MODULE
A5	A135	15	WIPER DELAY MODULE
A7	B179	20	FREQUENCY DIVIDER
A18	A103	12	LIGHTED INDICATOR DISPLAY
A20	H59	7	FUEL/WATER SEPARATOR
B1	C63	7	STARTER/STARTER SOLENOID
B3	G83	10	WINDSHIELD WASHER ROTARY PUMP
B10	E67	8	WTEC II TRANSFER CASE (SERIAL # 29513233)
B10	E70	8	WTEC II TRANSFER CASE (SERIAL # 29513233)
B10	E66	8	WTEC II TRANSMISSION (SERIAL # 29513233)
B10	E71	8	WTEC II TRANSFER CASE (SERIAL # 29517497)
B10	E70	8	WTEC II TRANSMISSION (SERIAL # 29517497)
B10	E76	9	WTEC II TRANSFER CASE (SERIAL # 29513233)
B10	E74	9	WTEC II TRANSMISSION (SERIAL # 29513233)
BJ1	A175	20	JUNCTION BOX
BL1	F257	29	FURNACE CONTROL UNIT
BL2	F256	29	FURNACE CONTROL UNIT
BL3	F256	29	FURNACE CONTROL UNIT
D1A	C138	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D1B	C138	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D2A	D138	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D2B	D138	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D3A	B138	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
D3B	B138	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
E1	C52	6	BATTERY
E1	D52	6	BATTERY
E1	D52	6	BATTERY
E1	E52	6	BATTERY
E2	C43	5	CHASSIS FRONT BUMPER (REF J27)
E2	C52	6	BATTERY
E2	D52	6	BATTERY
E2	E52	6	BATTERY
E2	E52	6	BATTERY
E3	H148	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
E4	H150	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
E5	B151	17	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
E14	E194	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE

MISCELLANEOUS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
E15	E197	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E16	A197	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E17	G195	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E18	G194	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E19	F194	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E20	E194	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E21	D195	22	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE
E22	B86	10	CAB - MARKER LIGHTS
E23	D86	10	CAB - MARKER LIGHTS
E23	D205	23	AIRDROP ONLY
E24	C85	10	CAB - MARKER LIGHTS
E24	D205	23	AIRDROP ONLY
E25	F86	10	CAB - MARKER LIGHTS
E60	B41	31	24 VDC VAN POWER
E65	B41	5	CHASSIS - FRONT
E66	C41	5	CHASSIS - FRONT
E66	D300	34	WTEC III CAB TRANSMISSION HARNESS (TID1)
E66	D305	34	WTEC III CAB TRANSMISSION HARNESS (TID2)
E67	D38	5	CHASSIS - FRONT
E68	D40	5	CHASSIS - FRONT
E70	C229	26	PTO EQUIPPED
E71	F173	20	CAB - DASH - LEFT - UNDERDASH
E88	B106	12	CAB - DASH - LEFT - INSTRUMENT PANEL
E89	C106	12	CAB - DASH - LEFT - INSTRUMENT PANEL
E90	D300	34	WTEC III CAB TRANSMISSION HARNESS (TID1)
E90	D305	34	WTEC III CAB TRANSMISSION HARNESS (TID2)
E91	C300	34	WTEC III CAB TRANSMISSION HARNESS (TID1)
E91	C305	34	WTEC III CAB TRANSMISSION HARNESS (TID2)
E501	B275	31	VAN EMERGENCY/BLACKOUT LIGHT/24 VDC OUTLET
E502	G274	31	VAN EMERGENCY/BLACKOUT LIGHT
E503	B273	31	VAN MARKER LIGHT
E504	B272	31	VAN MARKER LIGHT
E505	B287	32	VAN REAR MARKER LIGHTS
E506	C287	32	VAN REAR MARKER LIGHTS
E514	C274	31	VAN EMERGENCY LIGHT
E516	H272	31	VAN 24 VDC
F2	H271	31	VAN 24 VDC POWER
FL	E183	21	WTEC II VEHICLE INTERFACE MODULE
FL1	G85	10	EMI FILTER
FL2	A184	21	EMI FILTER
FL3	C118	14	FAN MOTOR
G1	D60	7	ALTERNATOR
MPU1	F61	7	ENGINE SPEED MAGNETIC PICKUP
MT3	F60	7	ENGINE OIL PRESSURE SENSOR
MT4	E177	20	SENSOR/FRONT AIR PRESSURE TRANSMITTER
MT5	G177	20	SENSOR/REAR AIR PRESSURE TRANSMITTER
MT6	B57	7	WATER COOLER TEMPERATURE
MT7	B52	6	FUEL TANK LEVEL SENSOR
NS	E183	21	WTEC II VEHICLE INTERFACE MODULE
P/P	B54	6	POLARITY PROTECTION
P/P	D54	6	POLARITY PROTECTION
R11	D50	6	SHUNT
R1	D79	9	AIR DRYER
TB1	C128	15	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
TB2	F130	15	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
X1	C137	16	24 VDC
X11	F52	6	NATO SLAVE RECEPTACLE
X2	D137	16	24 VDC
X3	F137	16	GROUND
X5	D137	16	24 VDC
X7	D137	16	24 VDC
PHONE 1	A285	32	VAN PHONE 1
PHONE 2	H287	32	VAN PHONE 2

MISCELLANEOUS (CONTINUED)			
NUMBER	ZONE	SH	DESCRIPTION
	E77	9	LIGHT MATERIAL HANDLING CRANE (LMHC)
	E77	9	LMHC REMOTE CONTROL BOX
	E77	9	LMHC POWER CABLE
	G78	9	LMHC REMOTE CONTROL IN/OUT
	G302	34	WTEC III TRANSMISSION PRESSURE SWITCH
	B304	34	WTEC III OUTPUT SPEED SENSOR
	C304	34	WTEC III ENGINE SPEED SENSOR
	E304	34	WTEC III SUMP TEMP SENSOR

TRANSMISSION			
NUMBER	ZONE	SH	DESCRIPTION
A10	B183	21	WTEC II VEHICLE INTERFACE MODULE
A13	B67	8	WTEC II TRANSMISSION A13 (SERIAL # 29513233)
A13	A72	8	WTEC II TRANSMISSION A13 (SERIAL # 29517497)
A13	A76	9	WTEC II TRANSMISSION A13 (SERIAL # 29513233)
B10	E67	8	PRE-BLOCK SEVEN TRANSMISSION OUTPUT SPEED SENSOR
B10	E72	8	TID1, TID2, AND TID3 TRANSMISSION OUTPUT SPEED SENSOR
B10	E76	9	PRE-BLOCK SEVEN W/PIGTAIL TRANSMISSION OUTPUT SPEED SENSOR
MT9	F67	8	PRE-BLOCK SEVEN TRANSMISSION ENGINE SPEED SENSOR
MT9	F72	8	TID1, TID2, AND TID3 TRANSMISSION ENGINE SPEED SENSOR
MT9	F76	9	PRE-BLOCK SEVEN W/PIGTAIL TRANSMISSION ENGINE SPEED SENSOR
MT11	F67	8	PRE-BLOCK SEVEN TRANSMISSION THROTTLE POSITION SENSOR
MT11	F72	8	TID1, TID2, AND TID3 TRANSMISSION THROTTLE POSITION SENSOR
MT11	F76	9	PRE-BLOCK SEVEN W/PIGTAIL TRANSMISSION THROTTLE POSITION SENSOR
REV	C183	21	WTEC II VEHICLE INTERFACE MODULE
RW	D183	21	WTEC II VEHICLE INTERFACE MODULE
S02	F183	21	WTEC II VEHICLE INTERFACE MODULE
S03	F183	21	WTEC II VEHICLE INTERFACE MODULE
SF01	D183	21	WTEC II VEHICLE INTERFACE MODULE
SF01	D183	21	WTEC II VEHICLE INTERFACE MODULE
SF02	C183	21	WTEC II VEHICLE INTERFACE MODULE
SF02	D183	21	WTEC II VEHICLE INTERFACE MODULE
SF04	C183	21	WTEC II VEHICLE INTERFACE MODULE
SF3	F183	21	WTEC II VEHICLE INTERFACE MODULE
SF4	D183	21	WTEC II VEHICLE INTERFACE MODULE

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 4 OF 34

SIZE B | ILL. NO. 5WD01L4B | FP-7/ (FP-8 BLANK)

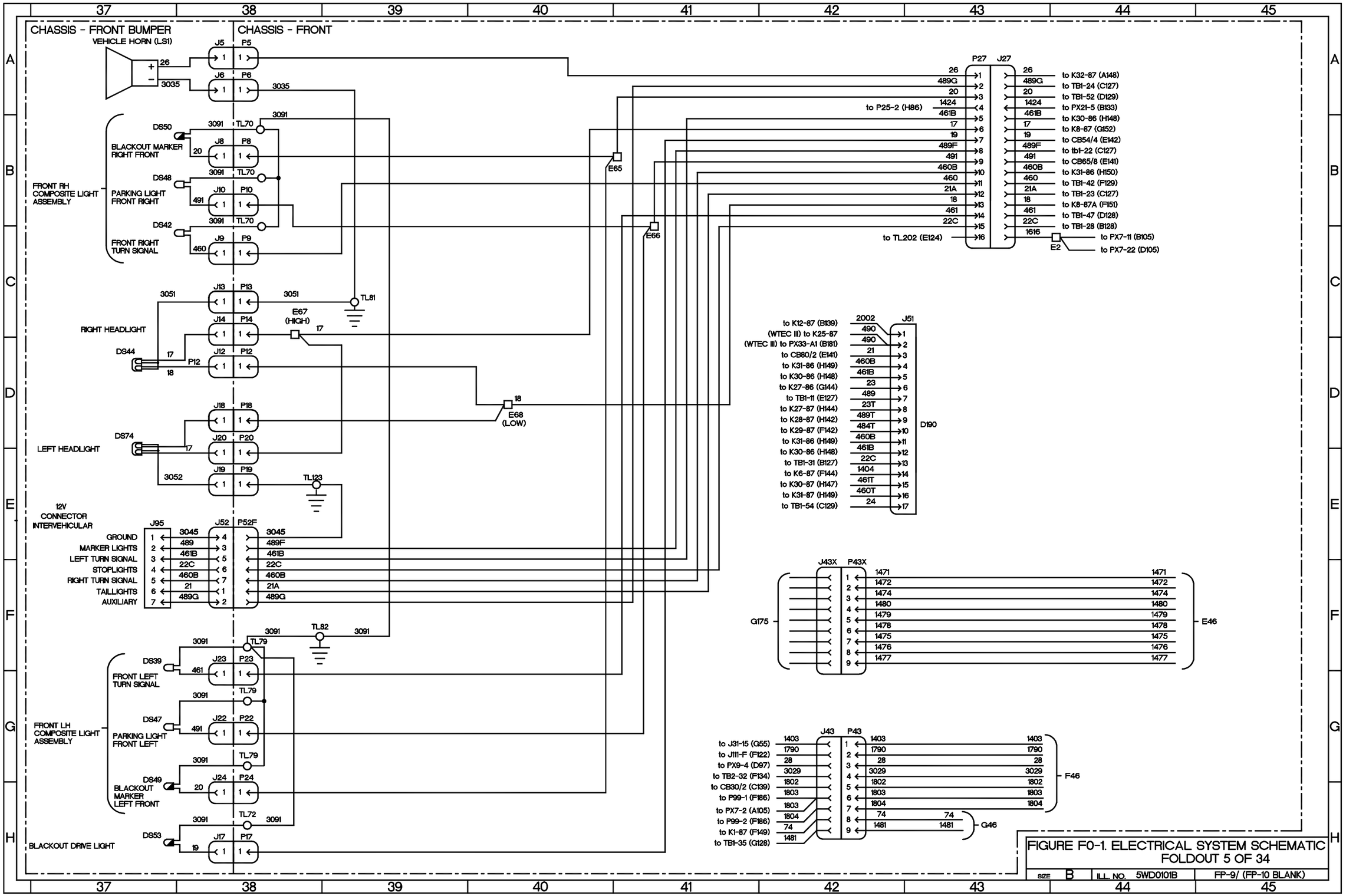


FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 5 OF 34

SIZE B | ILL. NO. 5WD0101B | FP-9/ (FP-10 BLANK)

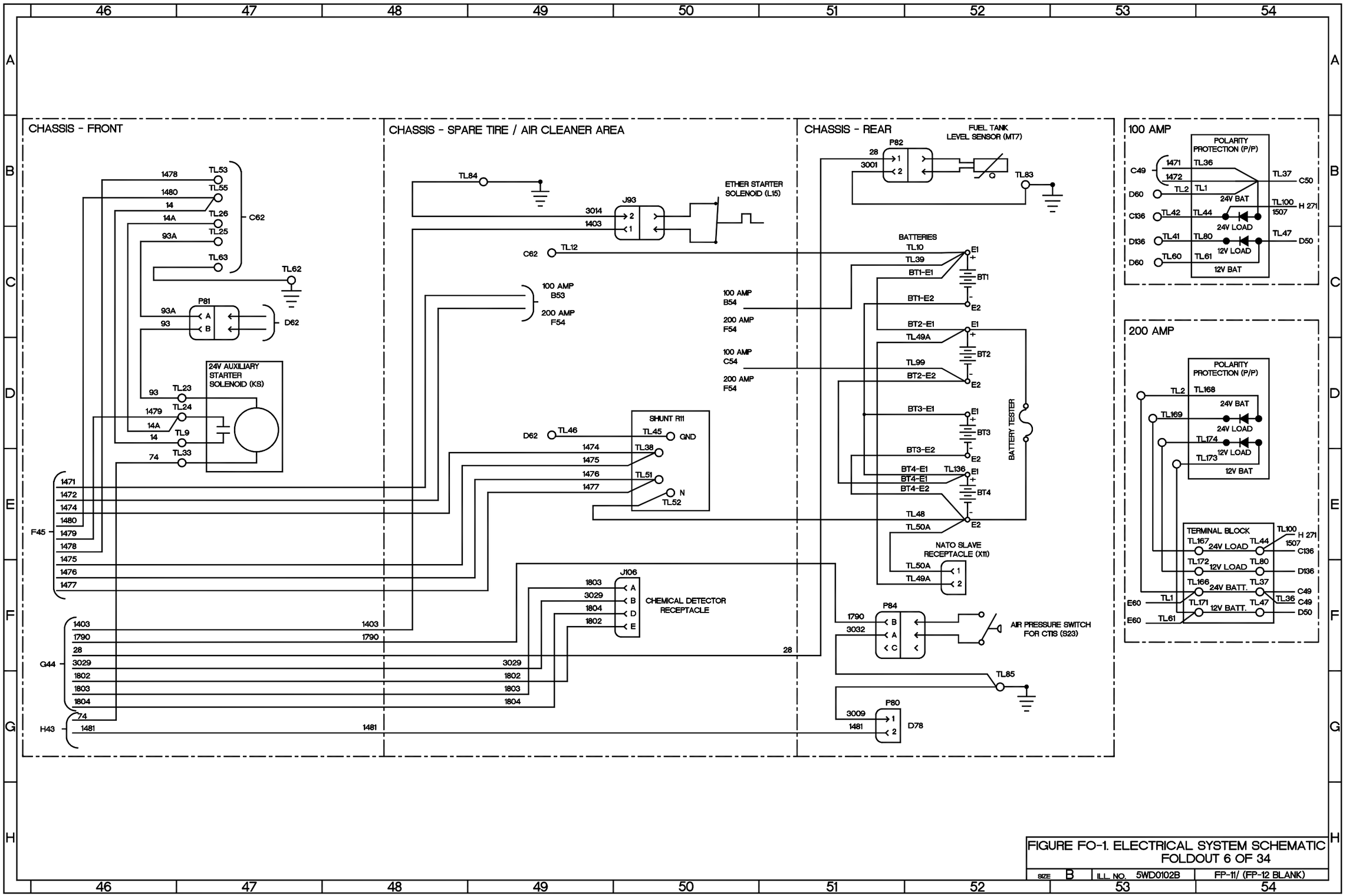


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 6 OF 34

SIZE	ILL. NO.	
B	5WD0102B	FP-11/ (FP-12 BLANK)

ENGINE

WATER COOLER TEMPERATURE (S56)
P36
1807
1805

WATER TEMPERATURE SENSOR (MT6)
P41
33
MT6

WATER TEMPERATURE SWITCH (S26)
P37
3026
35

P31X
F176
1441
1452
3A
1432
1433
1430
1435
1434
1428
1453

P69
Not Used

TL59
100 AMP/200 AMP ALTERNATOR (G1)
VOLTAGE REGULATOR
TL6
TL2
TL58
TL5
TL60
24V
GND
G1
12V
TL35
TL110
1452
3A
1453
568A
TL61
F53 (200 AMP) C53 (100 AMP)
TL1
F53 (200 AMP) B53 (100 AMP)

MT11
F66
F70
F75
124
135A
156
C
A
B
THROTTLE POSITION SENSOR (MT11)

STARTER/STARTER SOLENOID (B1)
TL63
TL53
TL55
B47
L
B1
TL26
TL25
C49
TL12
TL46
D49

STARTER THERMO SWITCH
P81
C47
A
B

P31
J31
to K11-87A (F146) 568A 1 568A
to PX13-3 (F92) 1402 2 1402
to TB1-38 (F129) 1807 3 1807
to PX1-1 (A92) 1806 4 1805
to TB2-18 (F132) 3015 5 3015
to TB2-10 (F131) 3006 7 3006
to PX26-1 (B180) 1444 8 1444
to TB2-36 (F135) 3028 9 3028
to TB2-28 (F134) 3026 10 3026
to PX6-4 (B107) 36 11 36
to CB49/3 (C152) 1460 13 1460
to K19-87B (B151) 54 14 54
to J43-1 (G42) 1403 15 1403
to PX26-4 (B180) 3083 16 3083
to TL178 (D102) 32 17 32
to K11-87 (F146) 1538 18 1538
to PX7-1 (A105) 1523 19 1523
to PX11-4 (H107) 33 20 33
to K11-85 (H146) 34 21 34
to PX7-12 (C106) 35 22 35
to PX26-5 (B180) 1432 25 1432
to PX26-2 (B180) 1433 26 1433

P42
1402
1403
ETHER SENSE SWITCH (S40)

P34
34
3006
OIL PRESSURE WARNING LIGHT SWITCH (S27)

ENGINE SPEED MAGNETIC PICKUP (MPU1)
P38
3083
1444
(-)
(+)

P32
36
P
ENGINE OIL PRESSURE SENSOR (MT3)

TROOP TRANSPORT ALARM
P39
J39
P921
J921
3028
32
1538
TL164
TL165
1
2
TROOP ALARM SWITCH (S45)

1441
54
3015
3017
TL28
TL29
TL29
L
FUEL SOLENOID (L2)

P33
1460
3017
FUEL/WATER SEPARATOR (A20)

P201
1523
3027
TL66
NOT USED

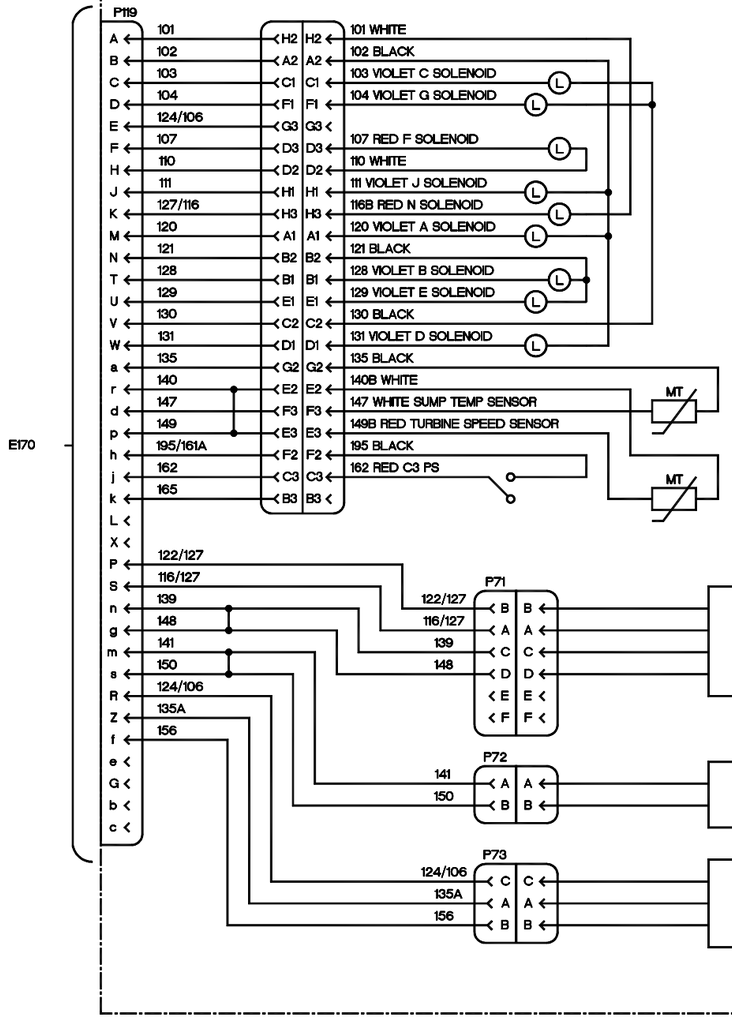
FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 7 OF 34

SIZE B | ILL. NO. 5WD0103B | FP-13/ (FP-14 BLANK)

PRIOR TO SERIAL NUMBER 6510032369

PRE-BLOCK SEVEN TRANSMISSION

EXTERNAL WIRING HARNESS TO TRANSMISSION CONNECTOR



SERIAL NUMBER 6510032369 AND HIGHER

TID1, TID2, AND TID3 TRANSMISSIONS

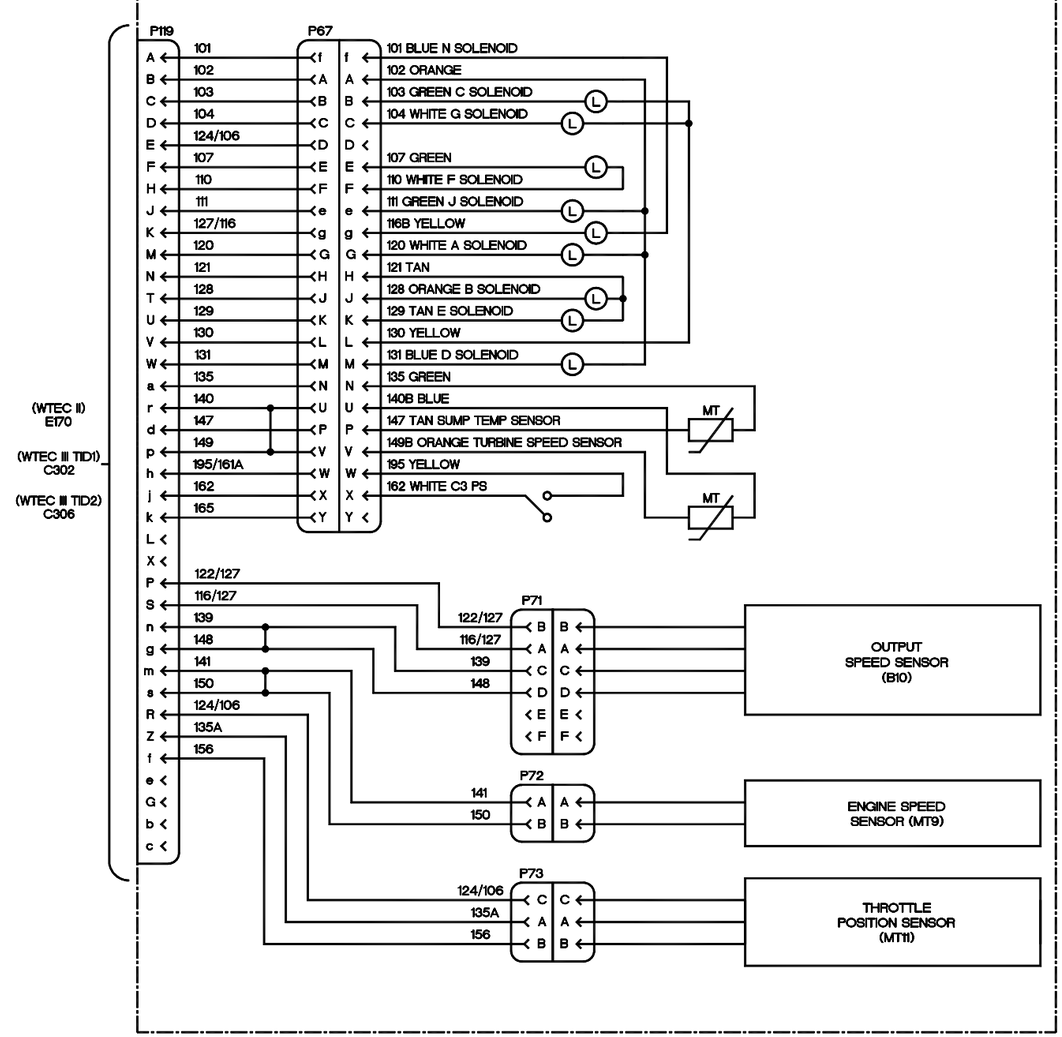
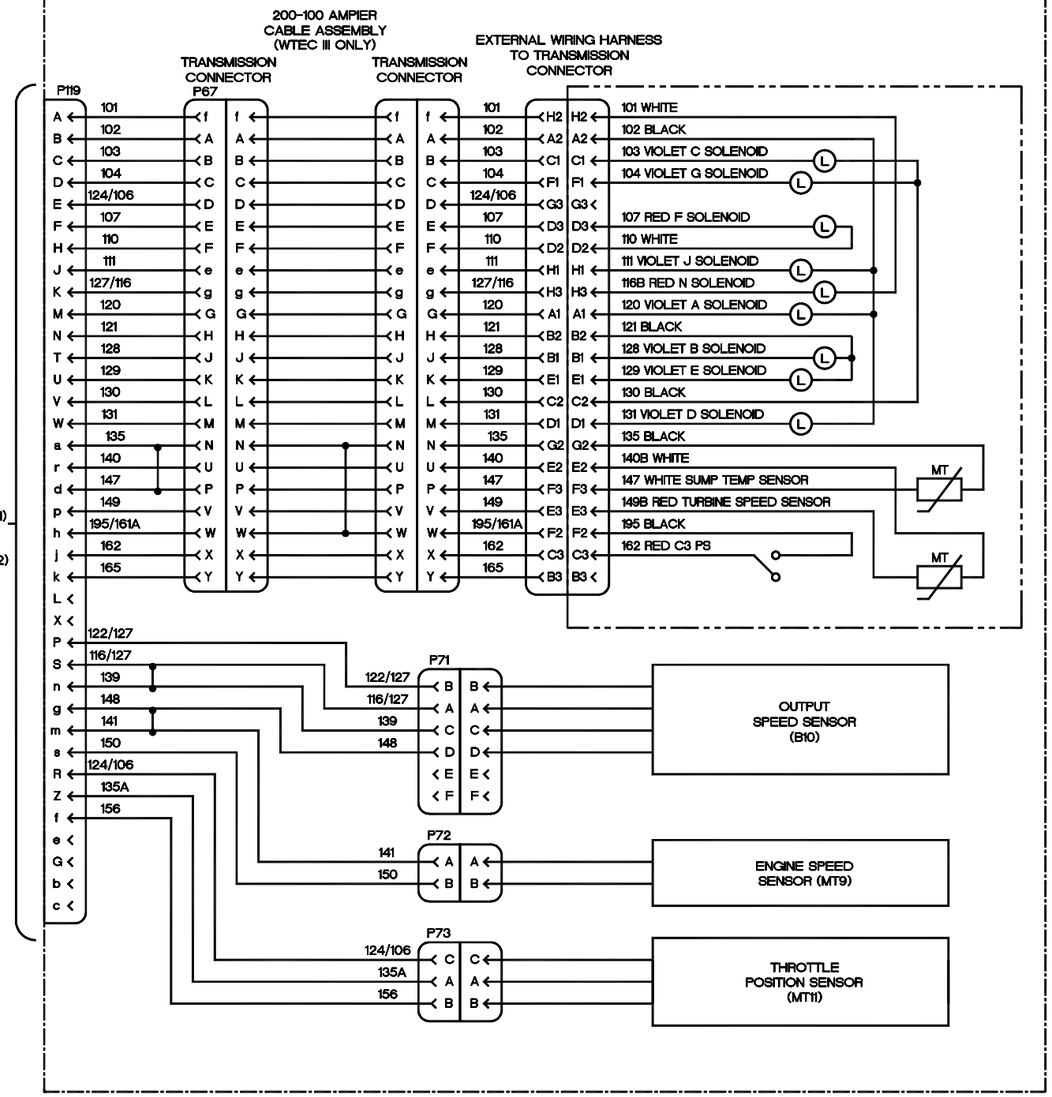


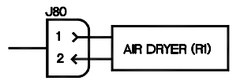
FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 8 OF 34

SIZE	B	ILL. NO. 5WD0104B	FP-15/ (FP-16 BLANK)

PRIOR TO SERIAL NUMBER 6510032369 WITH ADAPTER CABLE ASSEMBLY

PRE-BLOCK SEVEN WITH PIGTAIL TRANSMISSION





LIGHT MATERIAL HANDLING CRANE (LMHC)

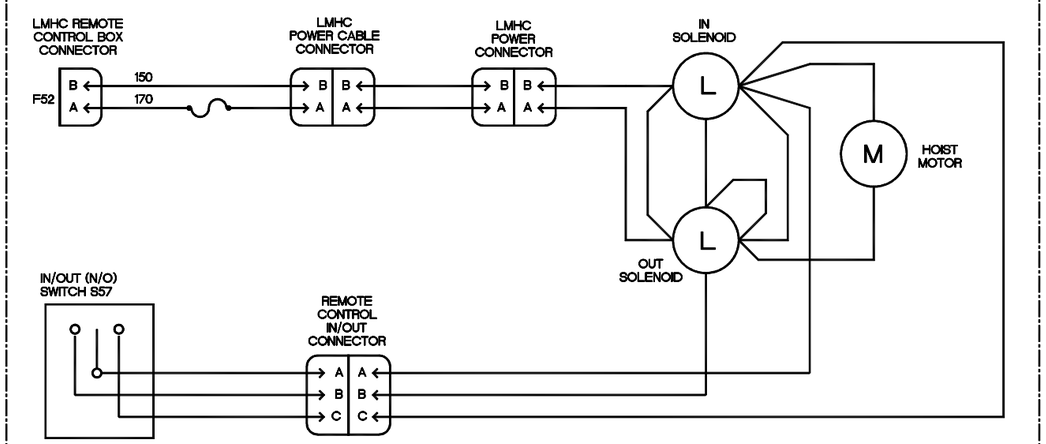


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 9 OF 34

SIZE	ILL. NO.	
B	5WD0105B	FP-17/ (FP-18 BLANK)

CAB - MARKER LIGHTS

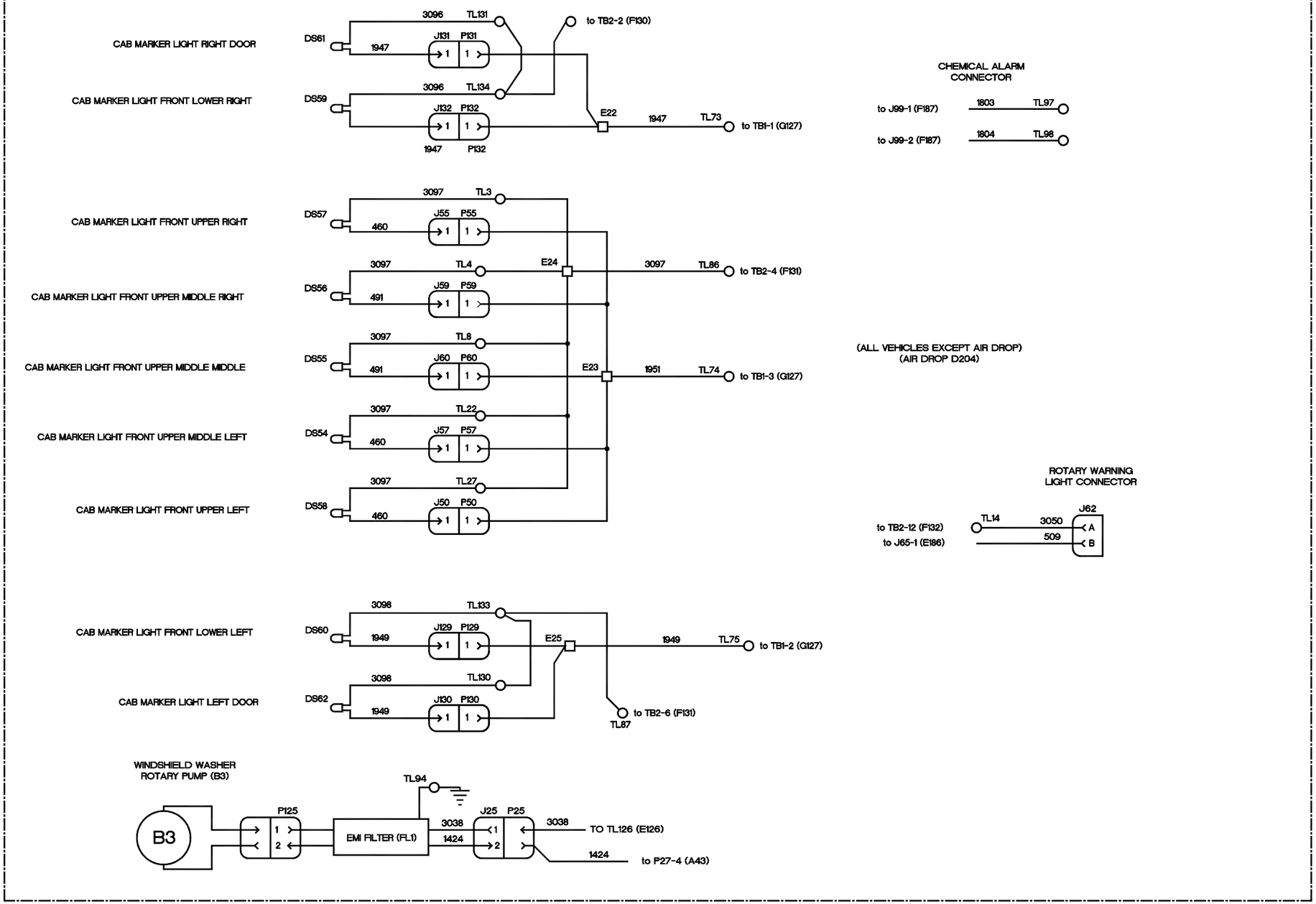


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 10 OF 34

SIZE	ILL. NO.	
B	5WD0106B	FP-19/ (FP-20 BLANK)

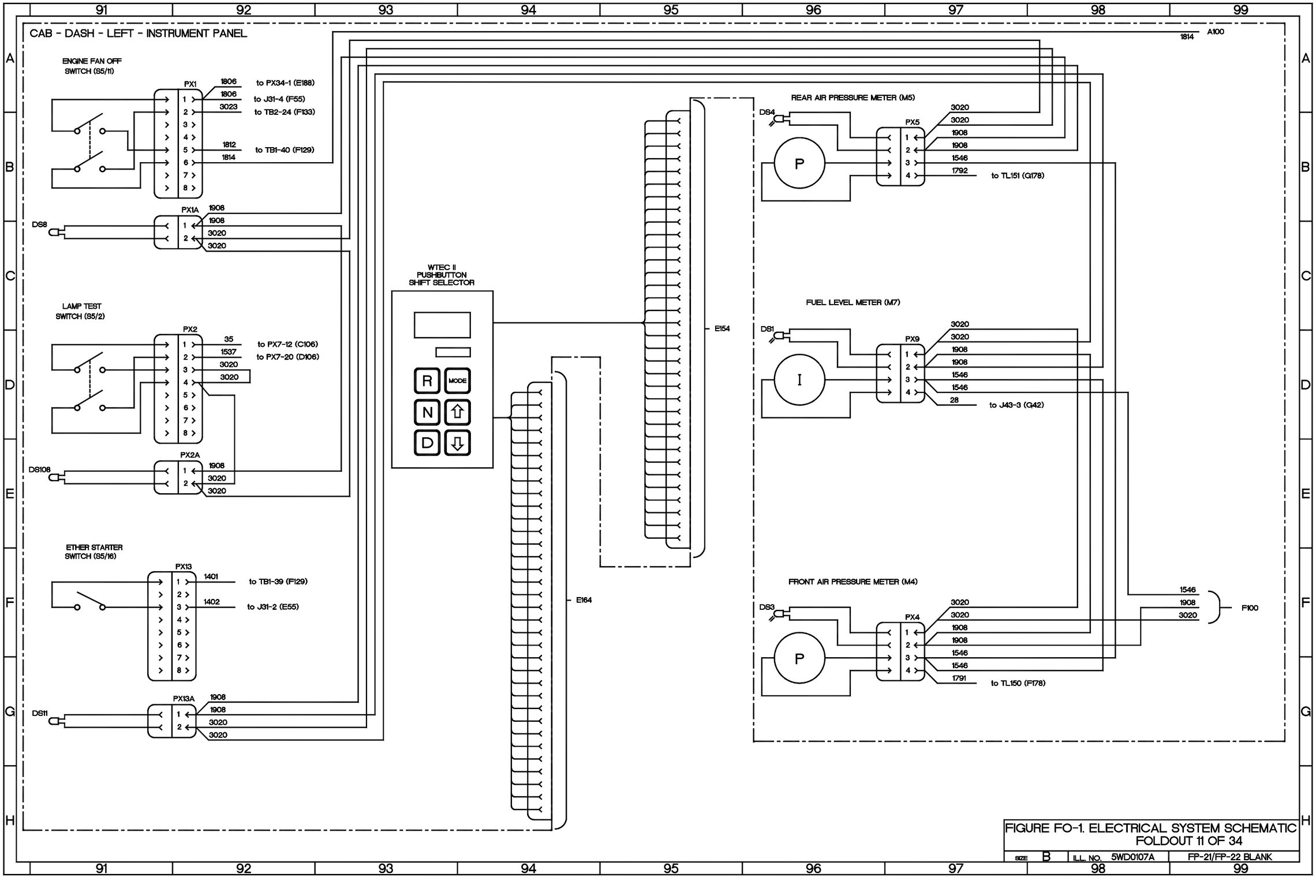


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 11 OF 34

SIZE	ILL. NO.	
B	5WD0107A	FP-21/FP-22 BLANK

CAB - DASH - LEFT - INSTRUMENT PANEL

A99 — 1814

LIGHTED INDICATOR DISPLAY (A18)

		PX7	
CHEM DETECT	DS32	1	1523 to J31-19 (G55)
RIGHT TURN SIGNAL	DS15	2	1803 to J43-6 (H42)
LEFT TURN SIGNAL	DS14	4	1580 to TB1-41 (E129)
	DS9	6	1570 to TB1-47 (E129)
CTIS OVRSPD	DS34	7	3021 to TB2-25 (G133)
PTO ON	DS23	8	2034 to P912-9 (C124)
EMER BRAKE	DS21	9	1528 to J111-D (F122)
WATER TEMPERATURE	DS25	10	2021 to J913-13 (C121)
REAR BRAKE AIR	DS27	11	1616 to J27-16 (C43)
TRANS OIL TEMP	DS41	12	35
ENGINE OIL LEVEL	DS29	13	1525 to TL157 (H178)
PARK BRAKE	DS22	16	1532
OIL PRESSURE	DS24	17	3030 to TB2-33 (G134)
HIGH BEAM	DS16	19	1536
FRONT AIR BRAKE	DS28	20	1537
RADIATOR FAN OFF	DS19	22	1616 to J27-16 (C43)
MASTER STOP	DS30	23	34A to D3B-4 (A138)
		24	1681 to K8-87 (F152)
		25	1530 to TL156 (F178)
		26	1814
		27	1658 to TB1-61 (B129)
		28	2010 to P912-7 (B124)

ENGINE OIL PRESSURE METER (M3)

DS5 — OP — PX6: 1 3020, 2 3020, 3 1908, 4 1908 → B109; 1546, 1546, 36 to J31-11 (F55)

E88: 35 to PX2-1 (D92); 35 to J31-22 (H55)

E89: 1537 to PX2-2 (D92); 1537 to J118-1 (D162); 105 to P115-19

VOLTMETER (M2)

DS7 — V — PX10: 1 3020, 2 3020, 3 1908, 4 1908 → D109; 1546, 1546 to J913-9 (C121) → E109; 3004 to TB2-9 (G131)

F99: 1546, 1908, 3020 → 3020, 1908 F109

SPEEDOMETER (M8)

DS6 — KM — PX8: 1 3020, 2 3020, 3 1908, 4 1908; 1546, 1546, 1793 to PX33-H2 (E181) (WTEC II), 1793 to J111-B (F122) (WTEC II), 157 to J111-B (F122) (WTEC III), 157 to P116-30 (F291) (WTEC III)

AUDIBLE ALARM (LS2)

32 TL178 32 to J31-17 (G55); 1536 TL160; 1532 TL161

WATER TEMPERATURE METER (M6)

DS2 — t° — PX11: 1 3020, 2 3020, 3 1908, 4 1908 → G109; 1546, 1546, 33 to J31-20 (G55)

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 12 OF 34

SIZE	ILL. NO.	
B	5WD0108B	FP-23/ (FP-24 BLANK)

CAB - DASH - LEFT - INSTRUMENT PANEL

IGNITION SWITCH (S5/1)

PX17
1 1548 to K2-86 (A143)
2
3
4
5 1586 to CB70/4 (E146)
6
7
8

B108: 3020, 3020, 1908, 1908, 1546, 1546

PX17A
DS13: 1 1908, 1908; 2 3020, 3020

STARTER PUSHBUTTON (S6)

TL163 — TL162 — 1405 to K24-87 (A152); 3007 to TB2-11 (G131)

ROTATING WARNING LIGHT SWITCH (S5/2)

PX12
1 1559 to K13-86 (A149)
2
3
4
5 1575 1575 to K20-86 (G138)
6
7
8

PX12A
DS10: 1 1908, 1908; 2 3020, 3020

D108: 3020, 3020, 1908, 1908, 1546
E108: 1546

MAIN LIGHT SWITCH (S4)

PX15
A
B 1542
C 22 to D1A-2 (C138)
D 19 to CB54/3 (D142)
E 1572 to CB66/1 (D143)
F 1586 to CB70/4 (D146)
H 1575
J 1577 to CB74/5 (D150)
K 1404 to K6-87 (F143)
L 491 to CB65/7 (D141)
M 16 to P18-3 (B178)
N 23 to K27-86 (G143)

F108: 3020, 1908

FULL HAZARD WARNING SWITCH (S5/22)

PX14
1 1565 to K9-87 (B142)
2 1566 to J19-5 (D177)
3 1566 to K10-87A (F150)
4
5 1567 to PX20-B (C188)
6 1568 to J19-12 (E177)
7 1568 to PX20-A (C188)
8 1514 to CB74/6 (E150)

PX14A
DS12: 1 1908, 1908 to J913-11 (C121); 2 3020, 3020 to J913-10 (C121)

G108: 3020, 3020, 1908, 1908, 1546

INSTRUMENT PANEL LIGHTS DIMMER MODULE (A3)

PX24
2 1908, 1908
1 1542

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 13 OF 34

SIZE B | ILL. NO. 5WD0109A | FP-25/FP-26 BLANK

CAB - DASH - CENTER - HEATER / CTIS ECU

PERSONNEL HEATER

FAN MOTOR
B4
FL3
3 HIGH
2 MED
1 LOW
OFF

PX25
1 1601 to CB23/7 (C147)
2 1908
3 3003
4 3003 to TB2-8 (F131)

HEATER CONTROL PANEL ILLUMINATION
DS17
DS101

J913 P913
to K12-86 (A139) 1673 — 1 1673
to CB72/2 (D139) 1674 — 2 1674
to D2B-3 (D138) 1672 — 3 1672
to CB45/4 (C139) 1670 — 4 1670
to CB49/3 (C152) 1925 — 5 1925
to J118-9 (E162) 1954 — 6 1954
(WTEC II) to PX33-A3 (C181) 161 — 7 161
(WTEC II) to J118-13 (E162) 161 — 8 153
(WTEC III) to P115-31 (D291) 161/1952 — 9 1546
(WTEC II) to J118-8 (D162) 153 — 10 3020
(WTEC III) to P115-12 (D291) 153 — 11 1908
to TB1-61 (B129) 1546 — 12 1550
to PX10-3 (E107) 1546 — 13 2021
to TB2-31 (G134) 3020 — 14 2019
to PX14A-2 (H112) 3020 — 15 1904
to PX14A-1 (H112) 1908 — G208
to PX26-1 (B179) 1908
to PX7-10 (B105) 1550
(WTEC II) to PX33-E2 (D181) 2021
(WTEC III) to K37-87 (B294) 2019
(WTEC II) to PX33-E3 (D181) 2019
(WTEC III) to K37-30 (B294) 1904
1904

P912 J912 E208
to CB50/2 (C145) 2006 — 1 1 — 2006
to CB48/8 (C141) 2069 — 2 2 — 2006
3 3 — 2069
to K12-87 (B139) 2004 — 4 4 — 2069
to CB63/1 (D151) 1328 — 5 5 — 2012
6 6 — 2004
to PX7-28 (D105) 2010 — 7 7 — 1328
to CB53/6 (E140) 2033 — 8 8 — 2010
to PX7-8 (B105) 2034 — 9 9 — 2033
to TB1-20 (D127) 2040 — 10 10 — 2033
to TB1-50 (D129) 2041 — 11 11 — 2034
to X1 (C136) 1650 — 12 12 — 2040
to X1 (C136) 1653 — 13 13 — 2041
to K19-87 (B150) 2037 — 14 14 — 1650
to K15-87A (A140) 1811 — 15 15 — 1653
2037
1811

PARKING BRAKE SWITCH

C42 — TL202 — 1616 — S24 — 3024 — TL201 — TL126
3038
to P25-1 (G86)

CTIS ELECTRONIC CONTROL UNIT (A2)

P110
H 01
F 02
Z
M 01
U 03
S 04
E 05
T 06
P 07
b 08
c 09
j 10
R 11
B 12
C 13

P111 J111
01 E E 1911 to CB40/7 (C150)
02 A A 3031 to TB2-35 (G135)
03 B B 1793 to PX8-4 (G103) (WTEC II)
04 G G 157 to PX8-4 (G103) (WTEC III)
05 D D 1911 to K52-87A (G139)
06 F F 1528 to PX7-9 (B105)
1790 to J43-2 (G42)

P113
B
C
A

P112
D
F
E
A
B
G186

TL50
CHASSIS GROUND

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 14 OF 34

SIZE B | ILL. NO. 5WD0110B | FP-27/ (FP-28 BLANK)

CAB - DASH - RIGHT - POWER DISTRIBUTION PANEL

PX21

to P18-9 (B178) 1599
to CB37/1 (C152) 1569
to J2-4 (B185) 1916
to TB2-37 (G135) 3034
to P18-8 (B178) 1424
to J27-4 (A43) 1424
to P18-7 (B178) 1597

WIPER DELAY MODULE (A5)

22C J51-13 (E42)
1940 K10-87 (F150)
1940 K10-86 (F150)
22 D1A-1 (C138)
22C J27-15 (C43)
1912 CB67-4 (E139)
21A J27-12 (B43)
489G J27-2 (A43)
489F J27-8 (B43)
2040 P912-10 (C124)
489 J51-7 (D42)
1426 J7-1 (A188)
1955 K28-86 (H142)
1951 TL74 (D86)
1951 TL74 (E205)
1947 TL73 (B86)
1949 TL75 (F86)

1930 K11-86 (F146)
1929 CB77/5 (C152)
1658 K11-30 (F146)
1546 J913-9 (C122)
1658 PX7-27 (D105)
1690 CB79/5 (C150)
1462 K19-30 (A150)
1460 PX33-C1 (C181) (WTEC II)
146 K25-86 (B292) (WTEC III)
1463 TL159 (E136)
146 J117-C (C289) (WTEC III)
1572 CB66/2 (E143)
1408 K29-86 (F142)
24 J51-17 (E42)
1329 K52-86 (H139)
20 J27-3 (A43)
2041 P912-11 (C124)
461 J27-14 (B43)
1570 PX7-6 (B105)
1581 J19-1 (C177)
1524 J19-4 (D178)
1580 PX7-4 (B105)
460 J27-11 (B43)
1401 PX13-1 (F92)
1812 PX1-5 (B92)
1935 CB22/3 (C149)
1807 J31-3 (F55)
1481 J43-9 (H42)
1692 CB21/1 (C149)
1692 PX26-3 (B179)
(WTEC II) 1692 PX33-E1 (D181)
(WTEC III) 1692 K34-30 (B293)
1692 PX33-F1 (D181) (WTEC II)
1692 K26-30 (B290) (WTEC III)

TB1

3101 K37-85 (B294) (WTEC III)
3054 K20-85 (H138)
3036 K32-85 (A147)
3047 K30-85 (H147)
3039 K9-85 (A142)
3099 J7-3 (B188)
3046 K10-85 (F150)
3016 K19-85 (A150)
3053 K8-85 (F151)
3002 K7-85 (F152)
3041 K2-85 (A143)
3043 TL153 (C180)
3048 K31-85 (G149)
3049 PX20-C (C189)
3012 K15-85 (A141)
3011 PX34-2 (E188)

1603 TB2-1 — F136

1603 X3
TB2

3096 TL71 (A86)
3097 TL86 (C86)
3098 TL87 (F86)
3003 PX25-3 (C120)
3006 J31-7 (F55)
3050 TL14 (E88)
3008 PX50-1 (D188)
3101 PX33-K1 (F181) (WTEC II)
143 P115-32 (D291) (WTEC III)
3015 J31-5 (F55)
3040 K29-85 (F142)
3056 K28-85 (G142)
3023 PX1-2 (B92)
3083 PX26-6 (B179)
3026 J31-10 (F55)
3067 K12-85 (A139)
3029 J43-4 (H42)
3044 K27-85 (H143)
3028 J31-9 (F55)
3045 K52-85 (H139)
3004 PX10-4 (E108)
3007 TL163 (B115)
(WTEC III) 188 TB2-13 (H292)
(WTEC III) 188 TB2-15 (H292)
(WTEC II) 3102 PX33-K2 (F181)
(WTEC III) 3102 K26-85 (B290)
3038 J78-2 (F185)
3019 J78-4 (F185)
3021 PX7-7 (B105)
(WTEC III) 143 P115-17 (D291)
(WTEC III) 143 J117-E (C289)
3020 J913-10 (C121)
3030 PX7-17 (C105)
3031 J117-A (F122)
3034 PX21-4 (A183)
3037 J2-3 (A185)

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 15 OF 34

SIZE	ILL. NO.	
B	5WD0111B	FP-29/ (FP-30 BLANK)

CAB - DASH - RIGHT
POWER DISTRIBUTION PANEL

34 K24-85 (A151)
34A PX7-23 (D105)
74 K24-30 (A151)
D3B
D3A
1674 CB72/2
3067 TB2-30 (F134)
2004 P912-4 (B124)
K12
WORKLIGHT RELAY
2002 J51-1 (D42)
1673 J913-1 (B121)
1808 CB68/7
1806 PX34-1 (E187)
1811 P912-15 (C134)
3039 TB2-56 (B132)
3012 TB2-77 (C135)
K15
AUX. COOLER RELAY
1566 CB71/4
1514 CB74/6
1565 D2B-4
1565 PX14-1 (F112)
K9
HAZARD FLASHER BO OVERIDE
1602 X1
1637
A145
1548 PX17-1 (A112)
3041 TB2-43 (C130)
K2
CONTROL PANEL RELAY
1548 CB76/3
1904 X6
B145
3054
1566
to CB43 (C289)
to CB79 (B289)
to P912-12 (C124)
1650
to P912-13 (C124)
1653
to TL44 (E54)
to TL44 (B53)
TL42
X1
+24 VDC
X4 1602 K2-30
1602 K1-30
461B J19-2 (C178)
22 PX15-C (D115)
D1B
D1A
461B K30-86
22 TB1-27 (B127)
+24V
CHEMICAL ALARM
CB30
CB45
FUEL PREHEAT
1670 J913-4 (B121)
1802 J43-5 (H42)
CAB RADIO
CB20
CB48
ARCTIC CAB/ ENGINE KILL
1906 K53-30
2069 P912-2 (B124)
TRAILER REAR LIGHTS POWER
CB41
CB42
BO MARKER LIGHTS POWER
1957 K28-30
1958 K29-30
REAR COMPOSITE LIGHTS
CB44
CB43
REAR COMPOSITE LIGHTS WTEC III ECU
136 P115-1 (C289)(WTEC III)
136 P115-1 (D289)(WTEC III)
1922 K30-30 (WTEC II)
1956 K31-30
1956
C145
X7 1601
X5 1601
1601
D145
+12V
19 PX15-D (D115)
1914A K20-87
TAIL LIGHTS
CB80
CB54
BO HEADLIGHT
21 J51-3 (D42)
19 J27-7 (B43)
1572 PX15-E (D115)
1548 K2-86
BO MARKER POWER
CB66
CB76
BO STOP RELAY POWER
1572 TB1-56 (C129)
1641 K6-30
TL41
X2
+12 VDC
to TL80 (C53)
to TL80 (F54)
1501
1565 K9-87
460B J19-3 (D178)
D2B
D2A
460B K31-86
1672 J913-3 (B121)
1674 K12-30
1914 K20-87
CB72
CB67
MARKER LIGHTS
1674 J913-2 (B121)
1912 TB1-26 (C128)
2033 P912-8 (C124)
491 PX15-L (E116)
CB53
CB65
PARKING LIGHTS
491 J27-9 (B43)
1514
1808
1911
E145
TL159
TL158
to TB1-57 (C129)
1463
1637 K19-86
START INHIBIT PUSHBUTTON (S7)
1958 CB42/4
178 P115-28 (D291)(WTEC III)
1408 J7-2 (B188)
1408 TB1-53 (C129)
484T J51-10 (D42)
K29
BO MARKER RELAY WTEC III BLACKOUT DRIVE RELAY
3040 TB2-20 (F133)
1641 CB76-4
1404 PX15-K (D115)
1404 J51-14 (E42)
K6
STOP LIGHT RELAY
1594 TL152 (C180)
D135
1603 TB2-1
TL57
TL56
CAB GND
X3
GROUND
1602
461B D1B-3
460B
1691
74
G145
1501
1691 K1-86
3054 K13-85
1575 PX12-5 (D113)
3054 TB2-44 (B131)
1914 CB67/3
1914A CB80/1
K20
MARKER LIGHTS RELAY
1911 CB40/7
1329 TB1-51 (D129)
1911 J111-G (F123)
3045 TB2-3 (G190)
K52
CTIS OVERSPEED INDICATION RELAY
1906 CB20/6
74 K1-85
1906 J78-3 (F185)
K53
RADIO POWER RELAY
1957 CB41/2
3056 TB2-22 (F133)
1955 TB1-5 (F127)
489T J51-9 (D42)
K28
TRAILER REAR LIGHTS RELAY
3044 TB2-34 (F135)
1959 CB39/4
23 PX15-N (E115)
23 J51-6 (D42)
23T J51-8 (D42)
K27
BO STOP RELAY

FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 16 OF 34

SIZE B | ILL. NO. 5WD0112B | FP-31/ (FP-32 BLANK)

CAB - DASH - RIGHT
POWER DISTRIBUTION PANEL

A144 1637
B144 1604 X6
3054
1566
C144
D144 1601
E144 1514 1808 1911
G145 1602 461B D1B-3 460B 1691 74 1959

1637 TL158
1658 K11-30
74 D3B-3(B137)
74 K1-85
34 K11-85
1405 TL162 (B115)

26 CB36/5
25 P18-12 (C178)
26 J27-1 (A43)
3036 TB2-46 (B131)
K32 HORN RELAY

509 CB38/8
3054 K20-85
K13 ROTATING BEACON BO OVRD RELAY
509 P65-1 (E186)
1559 PX12-1 (D113)

1462 TB1-59 (B129)
3016 TB2-62 (B133)
K19 START INHIBIT RELAY
2037 P912-14 (C124)
54 J31-14 (G55)

34 D3B-4 (B138)
K24 CRANKING LOCKOUT RELAY

+24V
SWING FIRE PUMP POWER CB50 CB39 TRAILER BO STOP LIGHTS
2006 P912-1 (B124)
1959 K27-30
1922
1956

26 K32-30
1601 PX25-1 (C120)
HORN POWER CB36 CB23 HEATER BLOWER

1692 TB1-36 (G129)
WTEC II VIM STE/ICE CB21 CB22 FAN/ ETHER
1935 TB1-37 (F129)

1690 TB1-62 (B129)
1911 J111-E (E123)
1911 K52-30
WTEC II VIM POWER CB79 CB40 CTIS COOLER

E5
1569 J2-2 (A185)
1569 P18-4 (B177)
1569 PX21-2 (A133)
1925 J913-5 (B121)
1460 J31-13 (F55)
WINDSHIELD WIPER/WASHER CB37 CB49 PTO POWER
1929 TB1-64 (B129)
1808 K15-30
ENGINE INSTR POWER CB77 CB68

+12V
IGNITION/MAIN LIGHT SWITCH CB70
1586 PX15-F (D115)
1586 PX17-5 (B112)

HEAD LIGHTS CB78 CB38 ROTATING BEACON
509 K13-30

VIM POWER CB35 CB71 HAZARD/ FLASHER WORKLIGHTS
1566 K9-30
1900 PX33-J1 (E182)
1900 PX33-J2 (E182)

1577 PX15-J (D115)
BACK-UP LIGHT POWER CB74 CB73
1514 PX14-7 (G113)
1903 PX33-B1 (C181)(WTEC II)
1903 K25-30 (B292)(WTEC III)
1514 K9-86

1328 P912-5 (B124)
CB63 CB64
CB61 CB62

1416 K7-30
1416
1911

34 K24-85
1658 K24-86
1658 TB1-64 (B129)
1930 TB1-63 (B129)
568A J31-1 (E55)
1538 J31-18 (G55)
34 J31-21 (G55)
K11 ALTERNATOR EXCITATION RELAY

1691 K26-87 (B290)(WTEC III)
1602 X1
1691 PX33-G1 (E181)(WTEC II)
1691 K53-86
74 K24-30
74 K53-85
74 J43-8 (H42)
K1 STARTER RELAY

1594 J19-6 (D178)
1940 TB1-30 (B128)
3046 TB2-60 (B133)
K10 STOP/HAZARD FLASHER RELAY
1940 TB1-29 (B127)
1566 PX14-2 (GN13)

1417 K7-87
16A P18-2 (B178)
18 J27-13 (B43)
3053 TB2-70 (B134)
K8 HEADLIGHT LO/HI-BEAM RELAY
17 J27-6 (B43)
1681 PX7-24 (DB05)

3002 TB2-74 (B135)
1416 CB78/6
16 P18-3 (B178)
1417 K8-30
K7 HEADLIGHT RELAY

1922 CB43/8
3047 TB2-50 (B131)
461T J51-15 (E42)
K30 REAR LEFT COMPOSITE LAMP RELAY
461B
461B J51-12 (E42)
461B J27-5 (B43)
461B J51-5 (D42)
461B D1B-3
E3

1956 CB44/6
3048 TB2-53 (C132)
K31 REAR RIGHT COMPOSITE LAMP RELAY
460T J51-16 (E42)
460B D2A-1
460B J51-4 (D42)
460B J51-11 (E42)
460B J27-10 (B43)
E4

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 17 OF 34

SIZE B | ILL. NO. 5WD0113B | FP-33/ (FP-34 BLANK)

CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS

G166: 123 118 115 113 105 / 125 119 117 114 112

H168: 135A/B 156 147 149 161A/B / 162 148 150 165

G167 G167 G167 G165

C95

J115
1 135A/B
2 136A/D
3 137
4
5 139
6 140
7 141
8 142A/B
9 143A/D
10 144
11 136C/D
12 146
13 147
14 148
15 149
16 150
17 151A/B
18 143C/D
19 153
20 154
21 155
22 156
23 157
24 158
25
26
27 161A/B
28 162
29 163
30
31 165
32
33
34

J116
143A A1
132 B1
C1
123 D1
136A E1
146 F1
143C A2
157 B2
125 C2
112 D2
136C E2
113 F2
115 A3
B3
158 C3
D3
E3
114 F3

D185

P118 J118
105 1 1537 PX7-20 (C105)
118 2
119 3
4
137 5
142B 6
151B 7
153 8 153 J913-8 (B121)
155 9 1954 J913-6 (B121)
10
11
154 12
161B 13 161 J913-7 (B121)
163 14 163 PX33-A2 (C181)
15
117 16

J117
143D A
B
C
D
E
F
WTEC II DIAGNOSTIC CONNECTOR
G
136D H
142A J
151A K
L
M

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 18 OF 34

SIZE B | ILL. NO. 5WD0114B | FP-35/ (FP-36 BLANK)

CAB - DASH - LEFT - WTEC II TRANSMISSION HARNESS

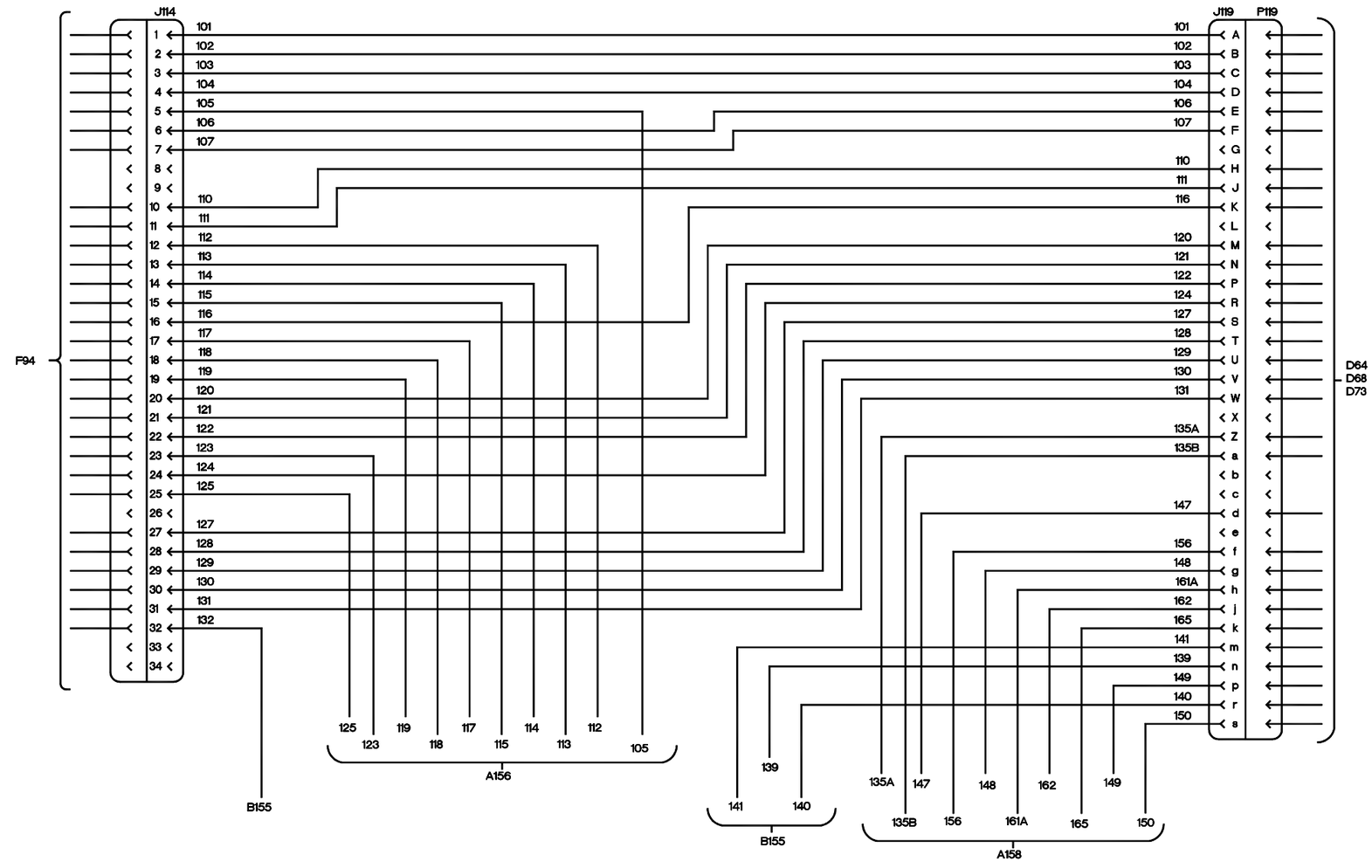


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 19 OF 34

SIZE	ILL. NO.	
B	5WD0115B	FP-37/ (FP-38 BLANK)

CAB - DASH - LEFT - UNDERDASH

JUNCTION BOX (BJ1)

STE / ICE RECEPTACLE

P83

f	1610	1610
AB	1437	1430
AD	1431	
z	1446	
x	1427	
p	1423	
m	1438	
AA	1436	
g	1612	
k	1439	1437
n	1421	1431
w	1425	1446
y	1447	1427
AC	1429	1423
R	1441	1438
N	1452	1436
P	3A	1612
d	1432	1434
c	1433	
v	1435	1439
u	1428	1421
O	1453	1425
E	1471	1447
V	1472	1429
Y	1474	
T	1480	
S	1479	
M	1478	
F	1475	
X	1476	
W	1477	
h	R2	
j		
s	R6	
U	1482	
Z	1482	E71
a	1482	
b	1482	

BLUE
BROWN
GREEN
RED
YELLOW
BLACK
WHITE

R5
R4

J31X

1441	1
1452	2
3A	3
1432	4
1433	5
1430	6
1435	7
1434	8
1428	9
1453	10

D55

J43X

1471	1
1472	2
1474	3
1480	4
1479	5
1478	6
1475	7
1476	8
1477	9

F42

COLUMN SWITCH (S3)

P18

1	16A	to K8-86 (F152)
2	16	to K7-86 (F153)
3	16	to PX15-M (E116)
4	1569	to CB37/1 (B152)
5	1527	to J2-5 (B186)
6	1590	to J2-1 (A186)
7	1597	to PX21-6 (B133)
8	1424	to PX21-5 (B133)
9	1599	to PX21-1 (A133)
10		
11		
12	25	to K32-86 (A147)

HORN PUSHBUTTON SWITCH

COLUMN SWITCH (S3)

J19

1	1581	to TB1-46 (E129)
2	461B	to D1B-4 (C138)
3	460B	to D2A-2 (D138)
4	1524	to TB1-43 (E129)
5	1566	to PX14-2 (G113)
6	1594	to K10-30 (F150)
7		
8		
9		
10		
11		
12	1568	to PX14-6 (G113)

FREQUENCY DIVIDER (A7)

PX26

INPUT (+)	1	1550 to J913-12 (C121)
OUTPUT (+)	2	1444 to J31-8 (F55)
+24V POWER	3	1433 to J31-26 (H55)
INPUT (-)	4	1692 to TB1-36 (G129)
OUTPUT (-)	5	3083 to J31-16 (G55)
GROUND	6	1432 to J31-25 (H55)
		3083 to TB2-26 (F133)

STOP LIGHT SWITCH (S10A)

TL152 — TL153 — 3043 — 3043 to TB2/47 (C131)
1594 — 1594 to K6-85 (F143)

STOP LIGHT SWITCH (S10B)

TL154 — TL155 — 3043
1594

FRONT AIR PRESSURE TRANSMITTER

SENSOR (MT4) / SWITCH (S20)

TL150 — 1791 — to PX4-4 (G97)
P
N/C
TL156 — 1530 — to PX7-25 (D105)

REAR AIR PRESSURE TRANSMITTER

SENSOR (MT5) / SWITCH (S29)

TL151 — 1792 — to PX5-4 (B97)
P
N/C
TL157 — 1525 — to PX7-13 (C105)

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 20 OF 34

SIZE B | ILL. NO. 5WD0116B | FP-39/ (FP-40 BLANK)

CAB - DASH - RIGHT - UNDERDASH

WINDSHIELD WIPER MOTOR (B2)

B2

PX22

EMI FILTER (FL2)

P2 J2

1590 to P18-6 (B178)
1569 to CB37/1 (B152)
3037 to TB2-39 (G135)
1916 to PX21-3 (A133)
1527 to P18-5 (B178)

TRANSMISSION DIMMER MODULE

J7

1426 to TB1-9 (F127)
1408 to K29-86 (F142)
3099 to TB2-58 (B132)
158

WTEC II VEHICLE INTERFACE MODULE (A10)

PX33

to J51-2 (D42) 490
to J118-14 (E162) 163
to J913-7 (B121) 161
to CB73/8 (E150) 1903
to TB1-60 (B129) 1460
1697
to TB1-33 (G129) 1692
to J913-14 (D121) 2019
to J913-15 (D121) 1904
to TB1-34 (G129) 1692
to K1-86 (F149) 1691
to PX8-4 (G103) 1793
to CB35/2 (E149) 1900
to CB35/2 (E149) 1900
158
to TB2-16 (F132) 3101
to TB2-17 (G132) 3102

A1 A2 A3 B1 B2 B3 C1 C2 C3 D1 D2 D3 E1 E2 E3 F1 F2 F3 G1 G2 G3 H1 H2 H3 J1 J2 J3 K1 K2 K3

490 REV
1903
SF02 132
SF04 125
1460 10A
146
RW 113
SF01 114
163 SF01
161
1697 SF4
1692
2019 SF02
1904
NS
1691
FL
1793 157
1900 136A
10A
1900 136C
158 158
3101 143A
143C
3102 NS 123
SF3 112
115
S02
S03

P116

143A A1 143A
132 B1 132
C1
123 D1 123
136A E1 136A
146 F1 146
143C A2 143C
157 B2 157
125 C2 125
112 D2 112
136C E2 136C
113 F2 113
115 A3 115
B3
158 C3 158
D3
E3
114 F3 114

D159

TURN SIGNAL FLASHER (A1)

OUTPUT
INPUT
GROUND

PX20

1568 to PX14-6 (G113)
1567 to PX14-5 (G113)
3049 to TB2-55 (C132)

PX50

to TB2-14 (F132) 3008
(WTEC II) 1697
(WTEC III) K34-87A (B293) 1697

ROTARY WARNING LIGHTS CONNECTION

P65 J65

to K13-87 (B149) 509 1 509 to J62-B (E88)

CHEMICAL ALARM CONNECTION

P99 J99

to J43-6 (H42) 1803 1 1803 to TL88 (B88)
to J43-7 (H42) 1804 2 1804 to TL98 (B88)

FAN SOLENOID (L1)

to K15-86 (A141) 1806
to PX1-1 (A92) 1806
to TB2-79 (C135) 3011

PX34

1 2

L

CAB RADIO CONNECTION

J78

to TB2-21 (G133) 3018
to K53-87A (H141) 1906
to TB2-23 (G133) 3019

1 2 3 4

J113

G123

CTIS PRESSURE TRANSDUCER

CTIS PNEUMATIC CONTROLLER

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 21 OF 34

SIZE B | ILL. NO. 5WD0117B | FP-41/ (FP-42 BLANK)

REAR LIGHTS

CAB-DASH-RIGHT-POWER DISTRIBUTION PANEL

D43 — P51

1	490
2	21
3	460B
4	461B
5	23
6	489
7	23T
8	489T
9	484T
10	460B
11	461B
12	22C
13	1404
14	461T
15	460T
16	24
17	

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 BLACKOUT MARKER LH REAR
P77 23 DS35 BLACKOUT STOP LH REAR; 3094 TL18
3094
P87 490 DS45 BACKUP LIGHT; 3094 TL17
LH REAR COMPOSITE LIGHT

E21 — P53R — F200

3094	1
489T	2
3094	3
1404	4
460T	5
23T	6
484T	7
461T	8
484T	9
484T	10

E14
E20 — P52R — B203

21	1
	2
489	3
3045	4
461B	5
22C	6
460B	7

3045 TL92
3095

E19
E18
TL93

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 BLACKOUT MARKER RH REAR
P63 23 DS36 BLACKOUT STOP RH REAR; 3095 TL21
3095
RH REAR COMPOSITE LIGHT
P89 489 DS68 RH REAR MARKER LIGHT; 3095 TL20
3095
E17
P88 489 DS67 RH SIDE MARKER LIGHT; 3095 TL19

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 22 OF 34

SIZE	ILL. NO.	
B	5WD0118B	FP-43/ (FP-44 BLANK)

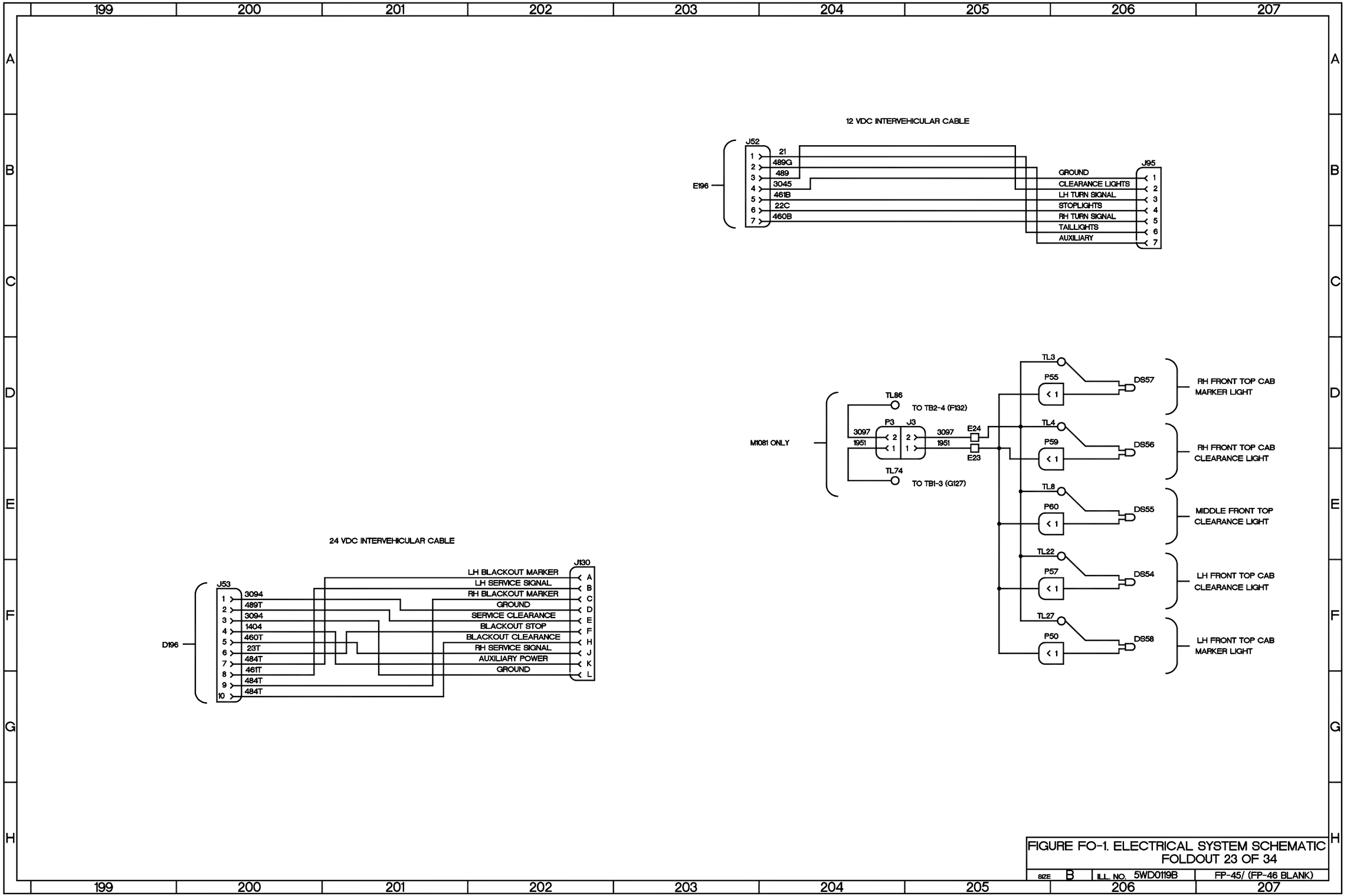


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 23 OF 34

SIZE	ILL. NO.	
B	5WD0119B	FP-45/ (FP-46 BLANK)

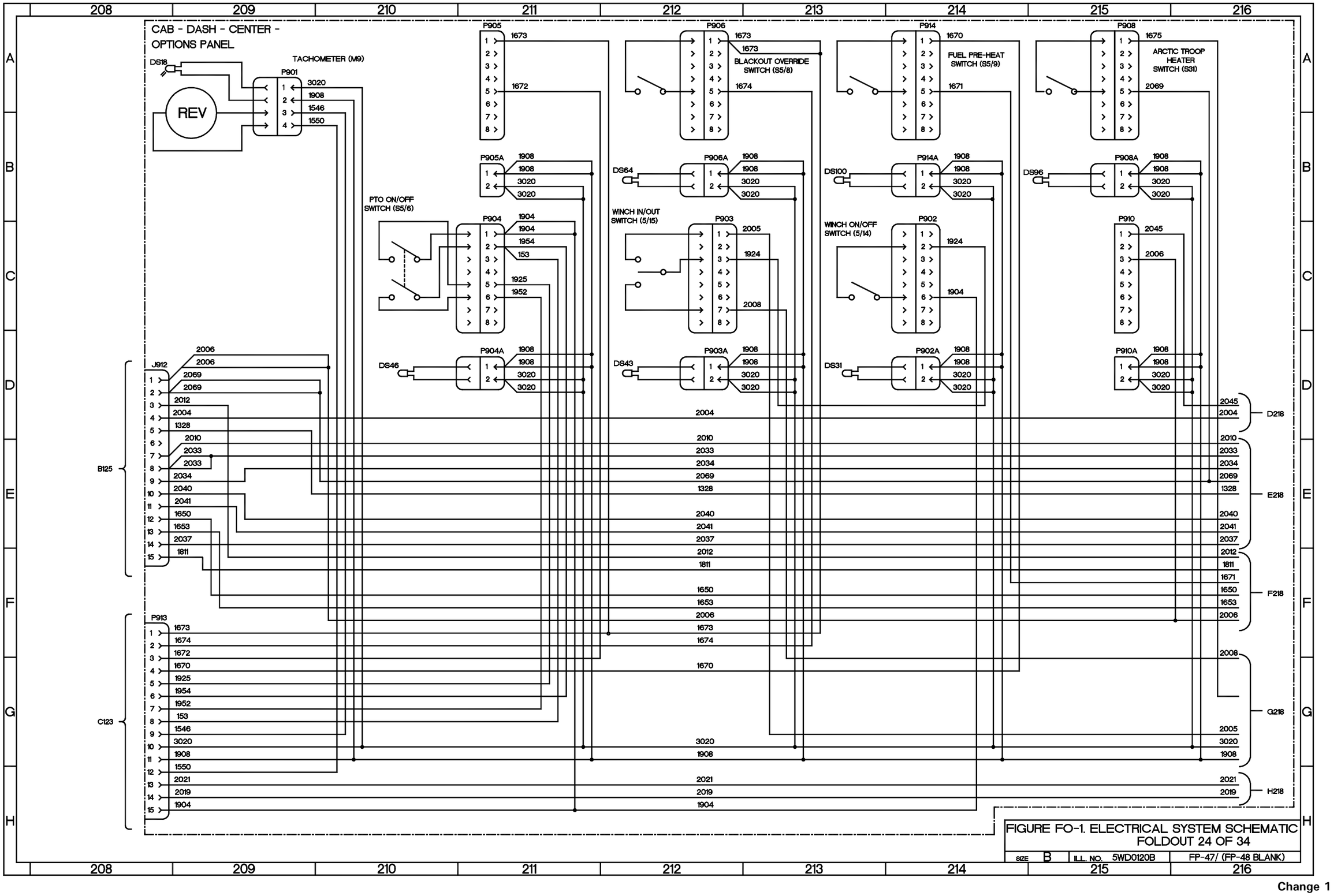


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 24 OF 34

SIZE B | ILL. NO. 5WD0120B | FP-47/ (FP-48 BLANK)

CAB - DASH - CENTER - OPTIONS PANEL

SWING FIRE PUMP SWITCH (S5/25)

P909
2007
2006
2006

P909A
1908
1908
3020
3020
DS97

P911
2044
2006
2006
2043

P911A
1908
1908
3020
3020

D216
2045
2004

E216
2010
2033
2034
2069
1328
2040
2041
2037

F216
2012
1811
1671
1650
1653
2006

G216
2008
1675
2005
3020
1908

H216
2021
2019

J108 P108
1328
2040
2041
2043
2044
2045
2033
2010
2037
2033
2069
2006
2034
2004
2040
2041
2010
2006
H 271
H 271
H 271
H 271

J210 P210
1811
1671
1650
2019
2021
2008
1675
2012
1653
2005
2007
C226

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 25 OF 34

SIZE B | ILL. NO. 5WD0121B | FP-49/ (FP-50 BLANK)

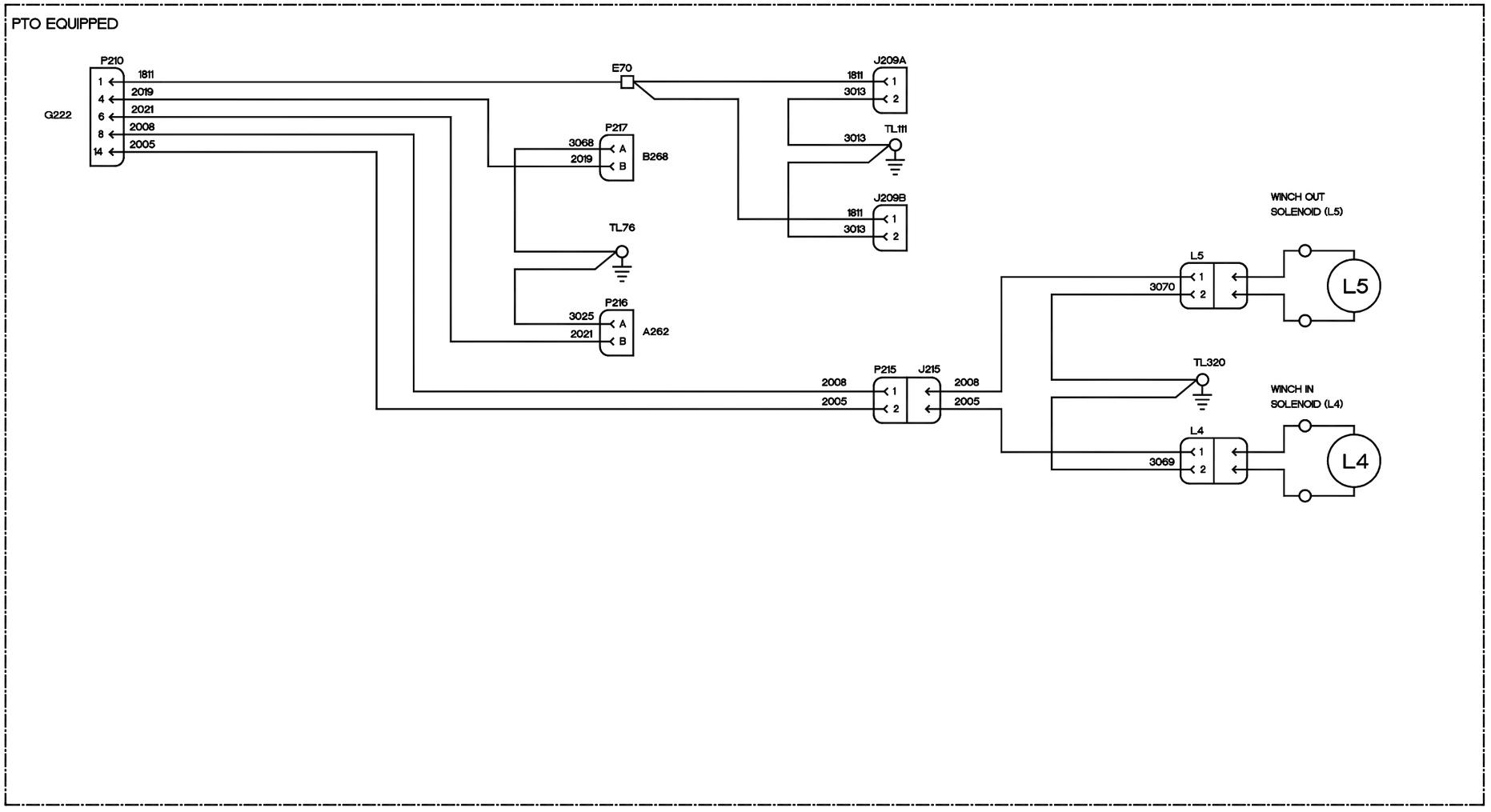


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 26 OF 34

SIZE	ILL NO.	
B	5WD0122B	FP-51/ (FP-52 BLANK)

DELETED

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 27 OF 34

SIZE B | ILL. NO. 5WD0123B | FP-53/ (FP-54 BLANK)

DELETED

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 28 OF 34

SIZE B | ILL. NO. 5WD0124B | FP-55/ (FP-56 BLANK)

DELETED

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 29 OF 34

SIZE B | ILL. NO. 5WD0125B | FP-57/ (FP-58 BLANK)

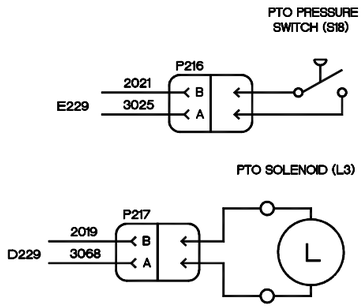


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 30 OF 34

SIZE B | ILL. NO. 5WD0126B | FP-59/ (FP-60 BLANK)

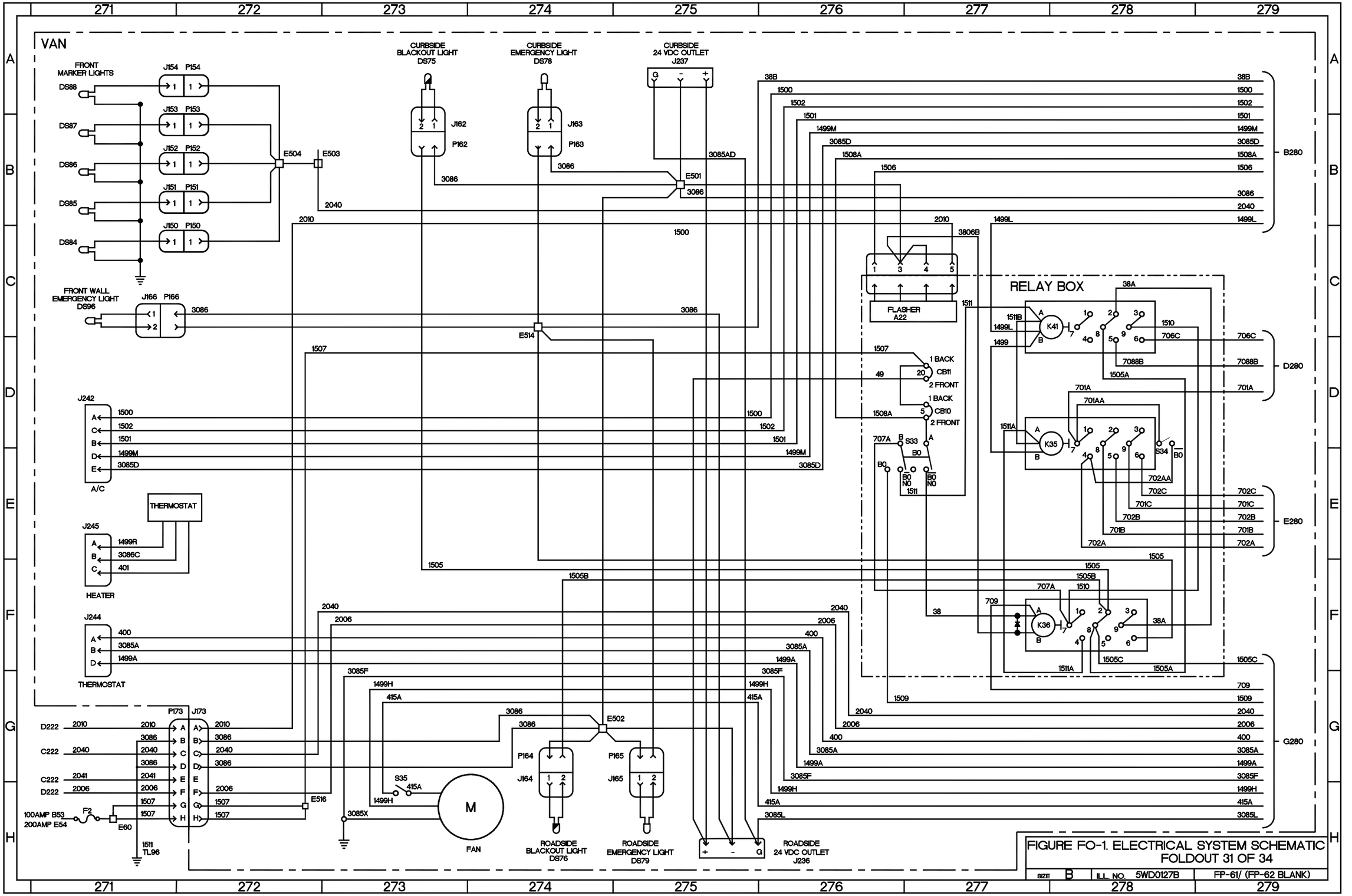


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 31 OF 34

SIZE B | ILL. NO. 5WD0127B | FP-61/ (FP-62 BLANK)

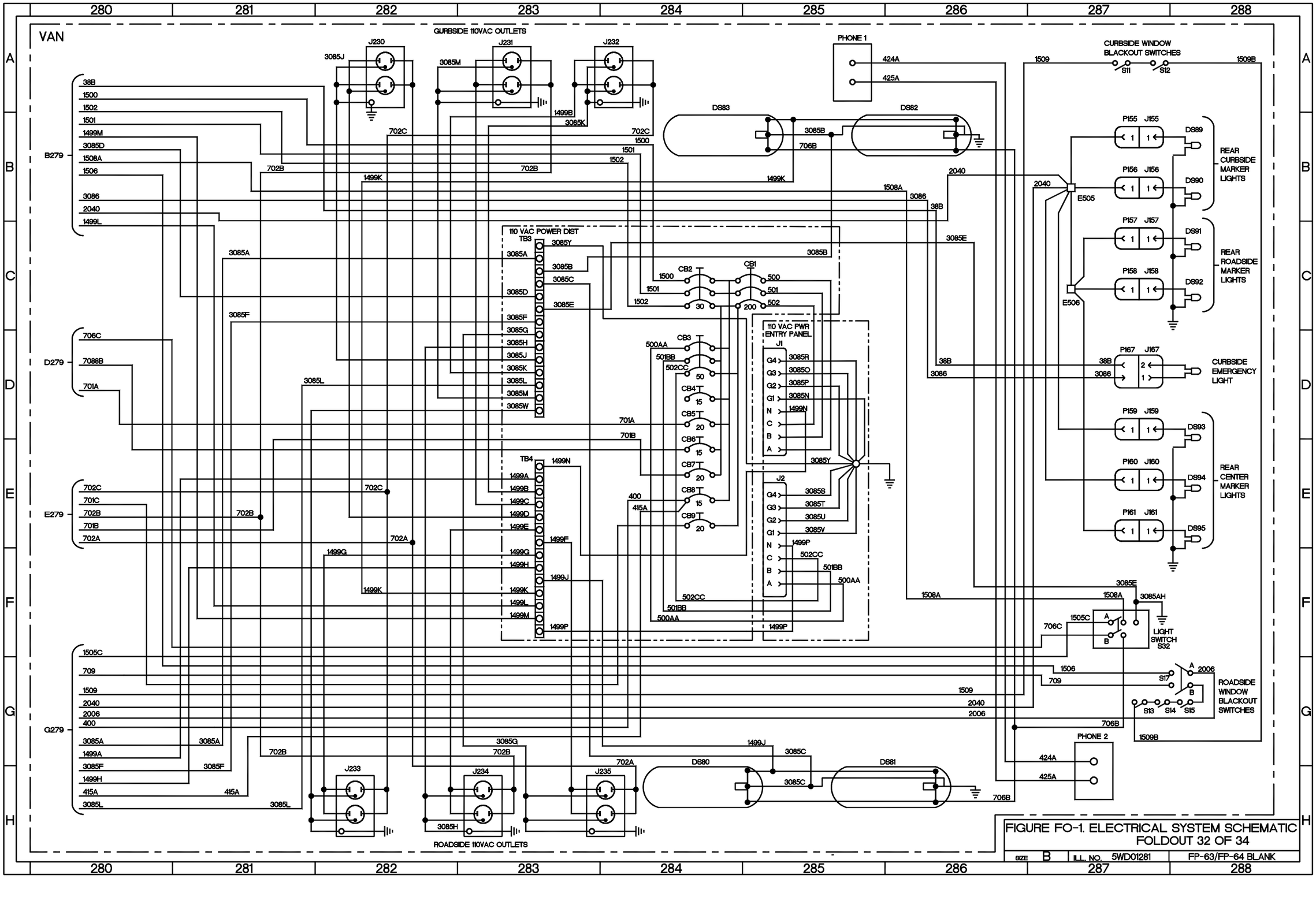


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 32 OF 34

SIZE	ILL. NO.	
B	5WD01281	FP-63/FP-64 BLANK

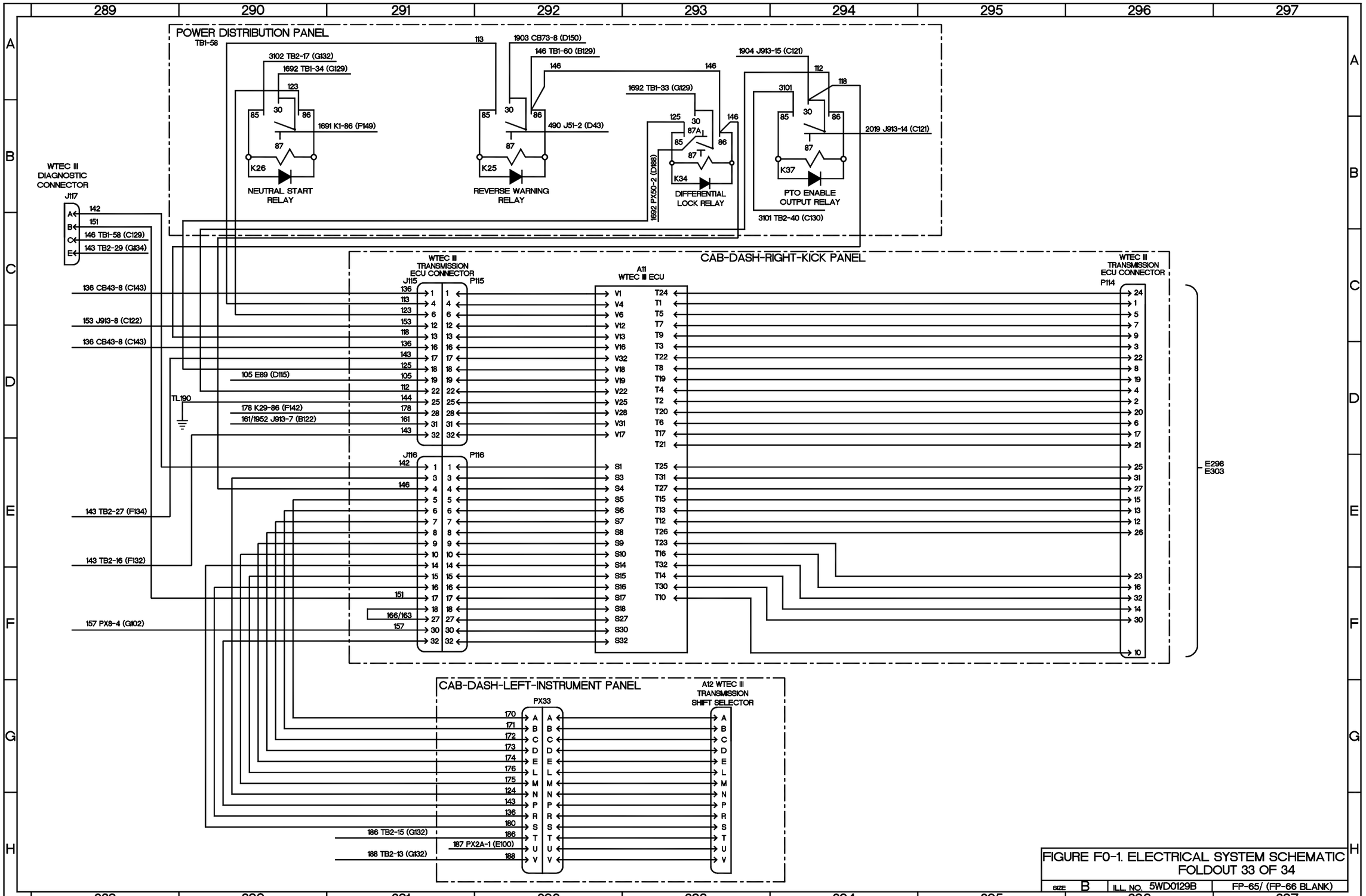


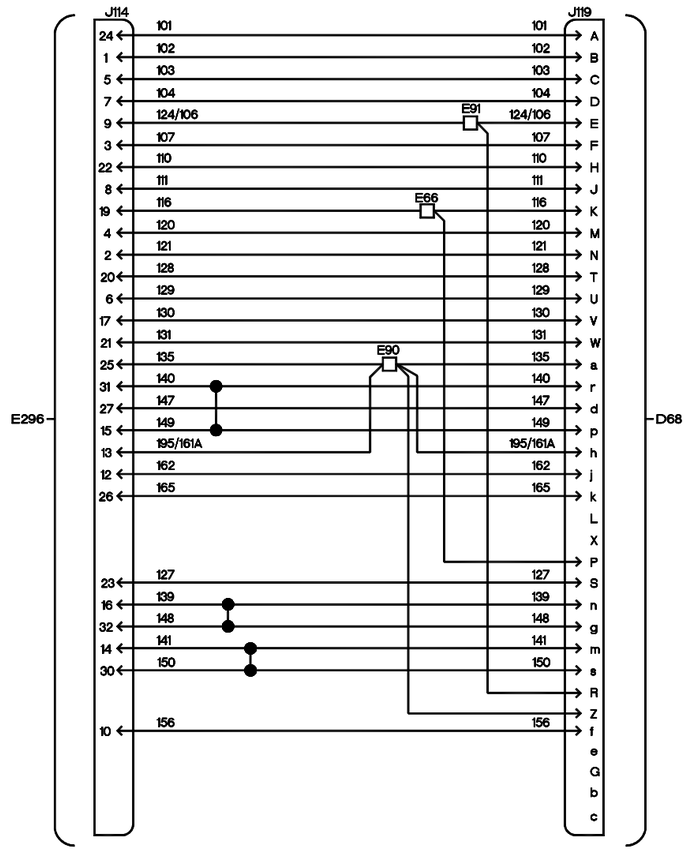
FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 33 OF 34

SIZE B | ILL. NO. 5WD0129B | FP-65/ (FP-66 BLANK)

298 299 300 301 302 303 304 305 306

TRANSMISSION SERIAL #: 6510090785 AND LOWER

WTEC III CAB TRANSMISSION HARNESS (TID1)



TRANSMISSION SERIAL #: 6510090786 AND HIGHER

WTEC III CAB TRANSMISSION HARNESS (TID2)

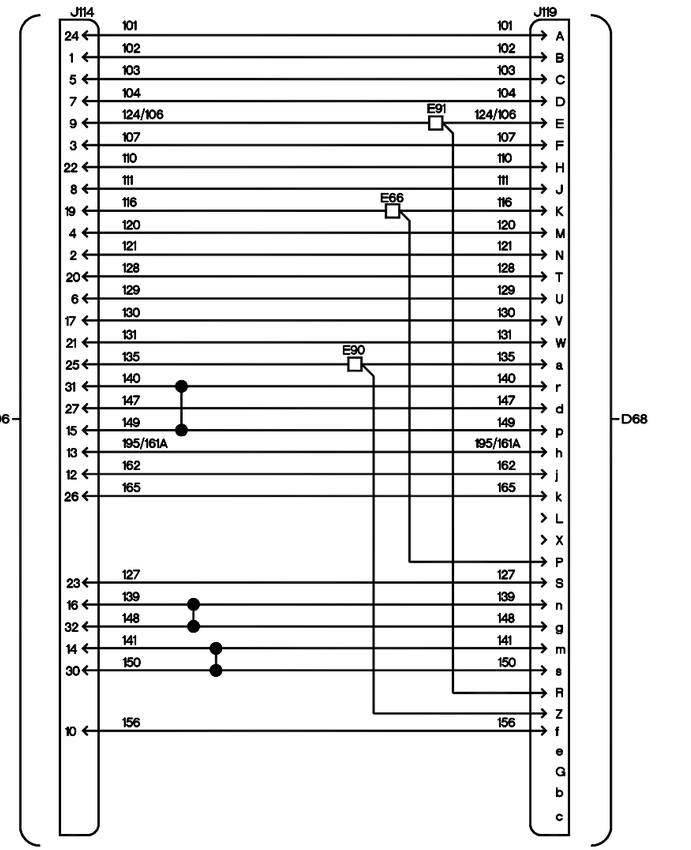


FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 34 OF 34

SIZE B | ILL. NO. 5WD0130B | FP-67/ (FP-68 BLANK)

REAR AXLE BRAKE CHAMBER	FRONT AXLE BRAKE CHAMBER	COUPLER AIR BRAKE	AIR DRYER	AIR CLEANER INTAKE	AIR COMPRESSOR WITH GOVERNOR	AIR TANKS	DASH GAUGE
MANUAL VALVE	ONE WAY CHECK VALVE	FAN CLUTCH	MODULATED CONTROL VALVE	QUICK RELEASE VAVLE	TWO WAY CHECK VALVE	TIRE	PRESSURE SWITCH
PRESSURE RELIEF VALVE	FOOT CONTROL VALVE	PARK CONTROL VALVE (HAND OPERATED)	TRAILER AIR SUPPLY VALVE (HAND OPERATED)	LOAD SENSING VALVE (MECHANICALLY CONTROLLED)	DIRECTIONAL RELAY VALVE	CONTROL VALVE WITH TWO WAY CHECK VALVE	STOPLIGHT SWITCH
CONNECTION	SUPPLY AIR HOSE	NO CONNECTION	DELIVERY AIR HOSE	PARK/EMERGENCY AIR HOSE	AIR BRAKE PROTECTING VALVE	CTIS MANIFOLD VALVE	AIR BR AKE PRESSURE TRANSMITTER
EXH KNEELING VALVE	AIR/HYDRAULIC INVERSION VALVE	DELIVERY AIR HOSE NO CONNECTION	WHEEL VALVE	EXH BLEED VALVE			

FIGURE F0-2 PNEUMATIC SYSTEM SCHEMATIC
FOLDOUT 1 OF 4

SIZE B | ILL. NO. 5PD01AL1 | FP-1/FP-2 BLANK

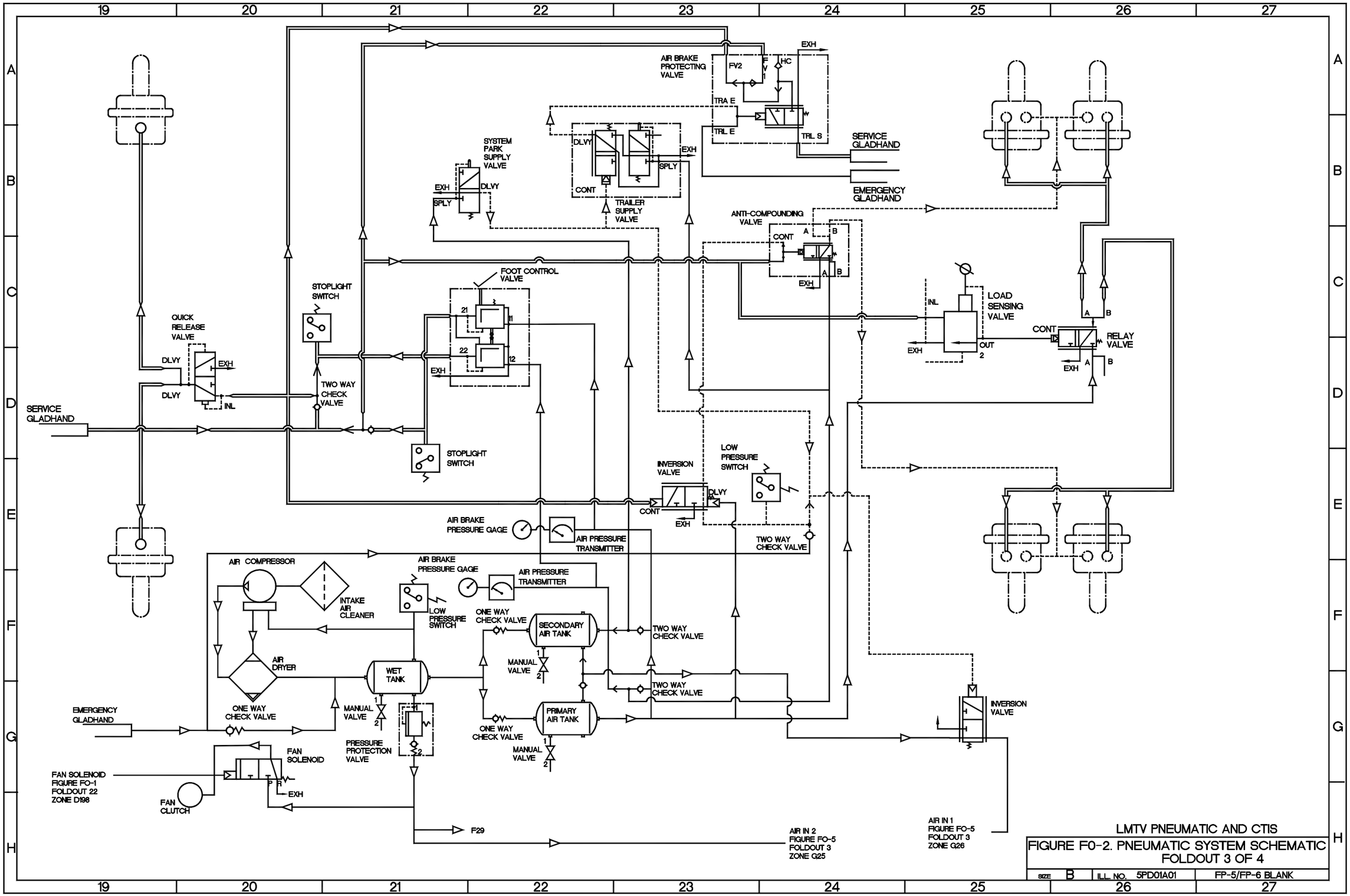
SH	ZONE	DESCRIPTION
3	E22	AIR BRAKE PRESSURE GAGE
3	F22	AIR BRAKE PRESSURE GAGE
3	A23	AIR BRAKE PROTECTING VALVE
3	F20	AIR COMPRESSOR
3	F20	AIR DRYER
3	E22	AIR PRESSURE TRANSMITTER
3	E22	AIR PRESSURE TRANSMITTER
3	C24	ANTI-COMPOUNDING VALVE
4	E31	CONTROL VALVE
4	E31	CTIS MANIFOLD VALVE
4	E32	DEFLATE VALVE
3	G19	EMERGENCY GLADHAND
3	B24	EMERGENCY GLADHAND
3	H20	FAN CLUTCH
3	G20	FAN SOLENOID
3	C22	FOOT CONTROL VALVE
3	F20	INTAKE AIR CLEANER
3	G25	INVERSION VALVE
3	E23	INVERSION VALVE
4	C28	KNEELING VALVE
4	E28	KNEELING VALVE
3	C25	LOAD SENSING VALVE
3	E23	LOW PRESSURE SWITCH
3	F21	LOW PRESSURE SWITCH
3	F22	MANUAL VALVE
3	G22	MANUAL VALVE
3	G21	MANUAL VALVE
3	F22	ONE WAY CHECK VALVE
3	G22	ONE WAY CHECK VALVE
3	G20	ONE WAY CHECK VALVE
3	G21	PRESSURE PROTECTION VALVE
3	G22	PRIMARY AIR TANK
3	C20	QUICK RELEASE VALVE
4	C34	QUICK RELEASE VALVE
4	D30	QUICK RELEASE VALVE
3	D26	RELAY VALVE
3	F22	SECONDARY AIR TANK

SH	ZONE	DESCRIPTION
3	D19	SERVICE GLADHAND
3	B24	SERVICE GLADHAND
3	C20	STOPLIGHT SWITCH
3	E21	STOPLIGHT SWITCH
4	F32	SUPPLY VALVE
3	B21	SYSTEM PARK SUPPLY VALVE
3	B22	TRAILER SUPPLY VALVE
3	D21	TWO WAY CHECK VALVE
3	E24	TWO WAY CHECK VALVE
3	F23	TWO WAY CHECK VALVE
3	G23	TWO WAY CHECK VALVE
3	F21	WET TANK
4	C29	WHEEL VALVE
4	C33	WHEEL VALVE
4	E29	WHEEL VALVE
4	E33	WHEEL VALVE

LMTV PNEUMATIC AND CTIS

FIGURE F0-2. PNEUMATIC SYSTEM SCHEMATIC FOLDOUT 2 OF 4

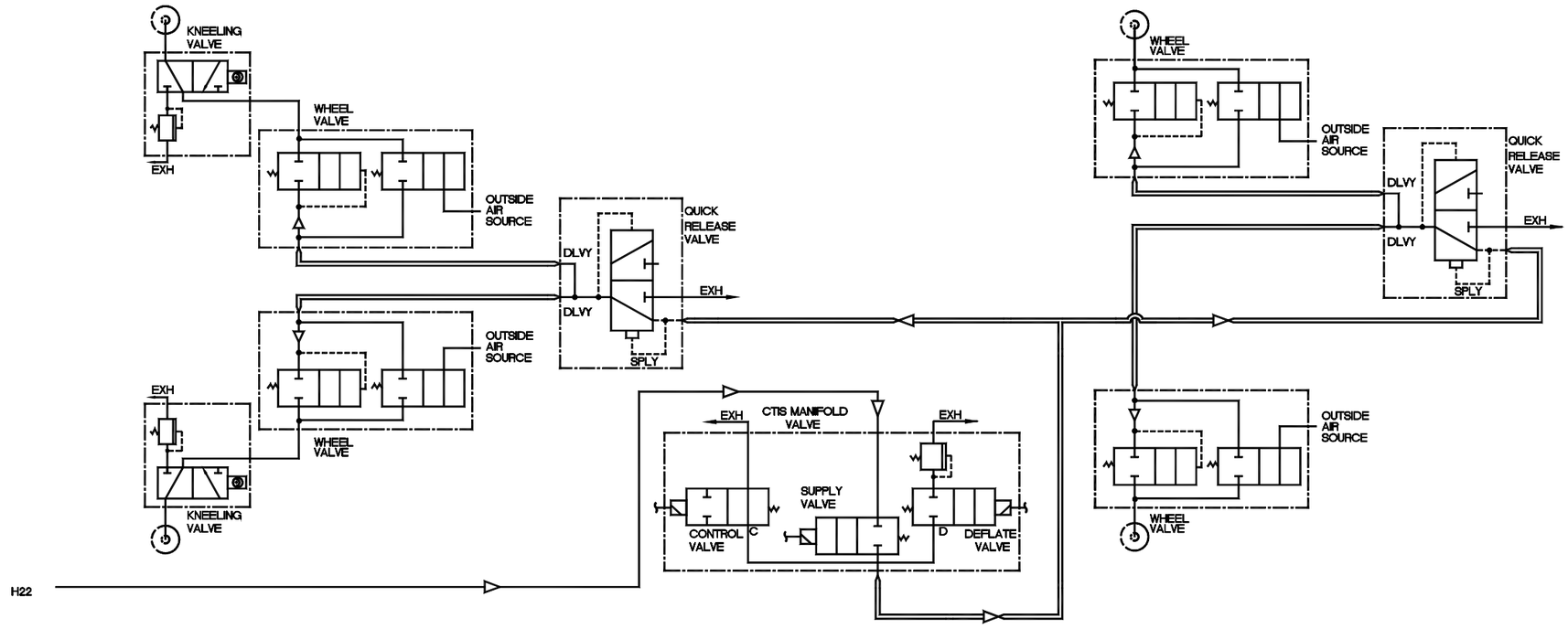
SIZE B | ILL. NO. 5PD01AL2 | FP-3/FP-4 BLANK



LMTV PNEUMATIC AND CTIS

FIGURE FO-2. PNEUMATIC SYSTEM SCHEMATIC FOLDOUT 3 OF 4

SIZE	ILL. NO.	
B	5PD01A01	FP-5/FP-6 BLANK



LMTV PNEUMATIC AND CTIS

FIGURE F0-2. PNEUMATIC SYSTEM SCHEMATIC FOLDOUT 4 OF 4

SIZE B | ILL. NO. 5PD01A02 | FP-7/FP-8 BLANK

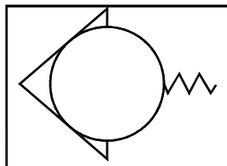
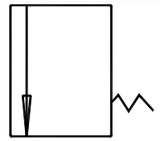
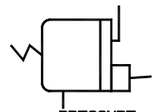
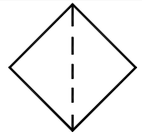
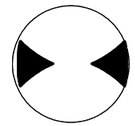
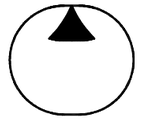
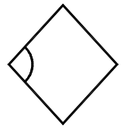
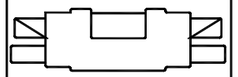
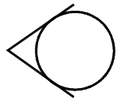
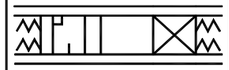
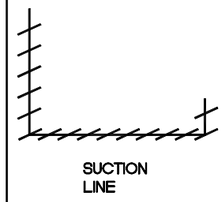
 CHECK VALVE	 BYPASS VALVE	 PRESSURE CONTROL VALVE	 AIR OR OIL FILTER	 MOTOR	 PUMP	 PTO
 AIR LINE LUBRICATOR	 CYLINDER	 CHECK VALVE	 FLOW CONTROL VALVE	 SUCTION LINE	 RESERVOIR	

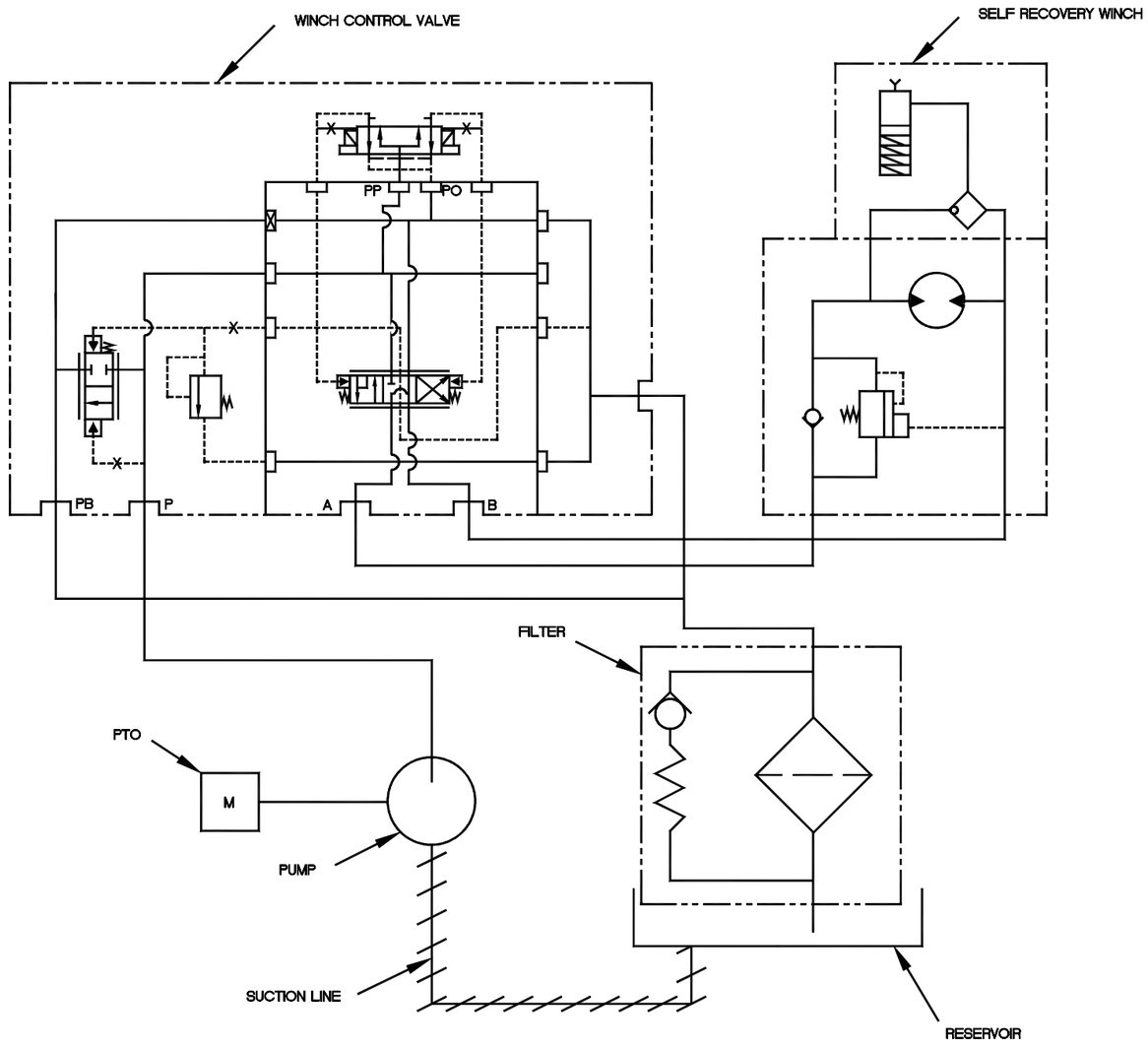
FIGURE FO-3 HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 1 OF 3

SIZE B | ILL. NO. 5HD01AL1 | FP-1/FP-2 BLANK

SHEET	ZONE	DESCRIPTION
3	B21	WINCH CONTROL VALVE
3	B24	SELF RECOVERY WINCH
3	F21	PTO
3	F22	PUMP
3	E23	FILTER
3	G23	RESERVOIR
3	G22	SUCTION LINE

FIGURE FO-3 HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 2 OF 3

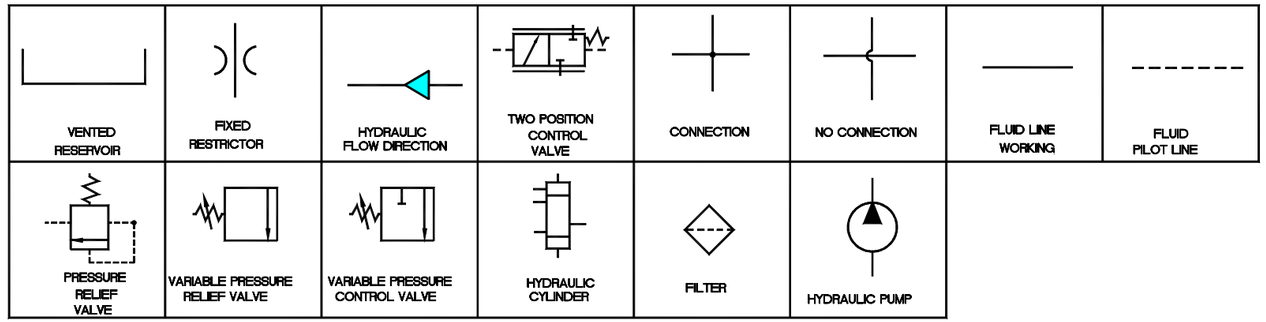
SIZE B | ILL NO. 5HD01-L2 | FP-3/FP-4 BLANK



LMTV TRUCK W/WINCH

FIGURE F0-3. HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 3 OF 3

SIZE	ILL. NO.	
B	5HD01-01	FP-5/FP-6 BLANK



SH	ZONE	DESCRIPTION
2	D11	FILTER
2	D14	FIXED RESTRICTOR
2	E17	HYDRAULIC CYLINDER
2	E13	HYDRAULIC PUMP
2	C13	PRESSURE RELIEF VALVE
2	D13	TWO POSITION CONTROL VALVE
2	E16	VARIABLE PRESSURE CONTROL VALVE
2	E16	VARIABLE PRESSURE RELIEF VALVE
2	C11	VENTED RESERVOIR

FIGURE FO-4 HYDRAULIC STEERING SYSTEM

FOLDOUT 1 OF 2

SIZE B | ILL NO. YSD01AL1 | FP-1/FP-2 BLANK

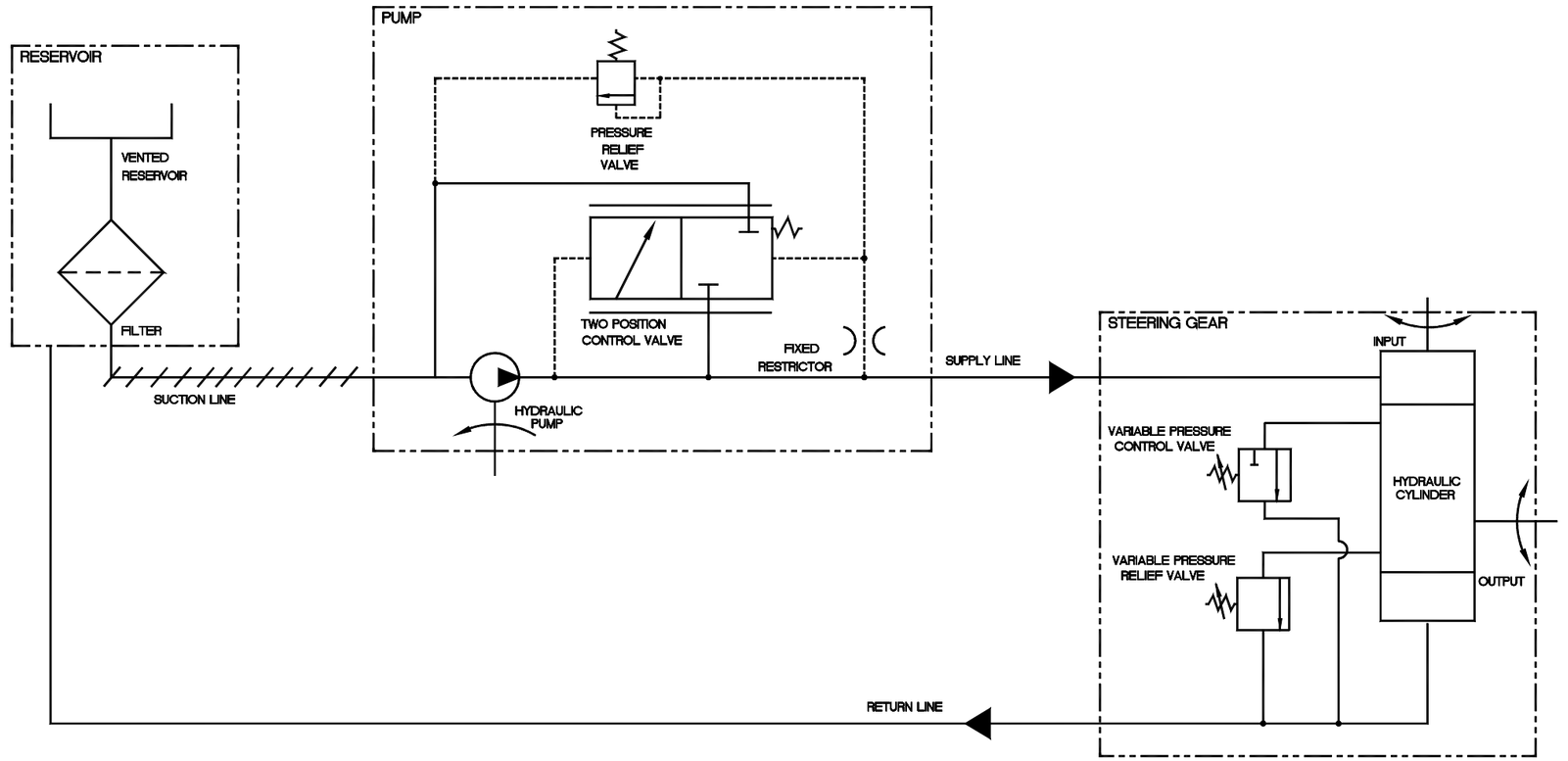


FIGURE FO-4 HYDRAULIC STEERING SYSTEM

FOLDOUT 2 OF 2

SIZE	ILL. NO.	
B	YSD01A01	FP-3/FP-4 BLANK

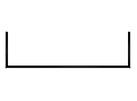
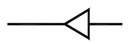
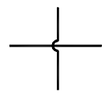
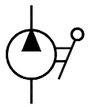
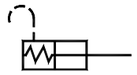
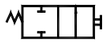
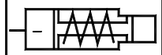
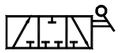
 VENTED RESERVOIR	 ABOVE FLUID LEVEL RESERVOIR	 HYDRAULIC FLOW DIRECTION	 PNEUMATIC FLOW DIRECTION	 CONNECTION	 NO CONNECTION	FLUID LINE WORKING	FLUID PILOT LINE
 FIXED RESTRICTOR	 CHECK VALVE	 VARIABLE CONTROL CHECK VALVE	 CHECK PILOT	 PRESSURE RELIEF VALVE	 FILTER	 HAND PUMP	 DETENT
 TWO POSITION CAB 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

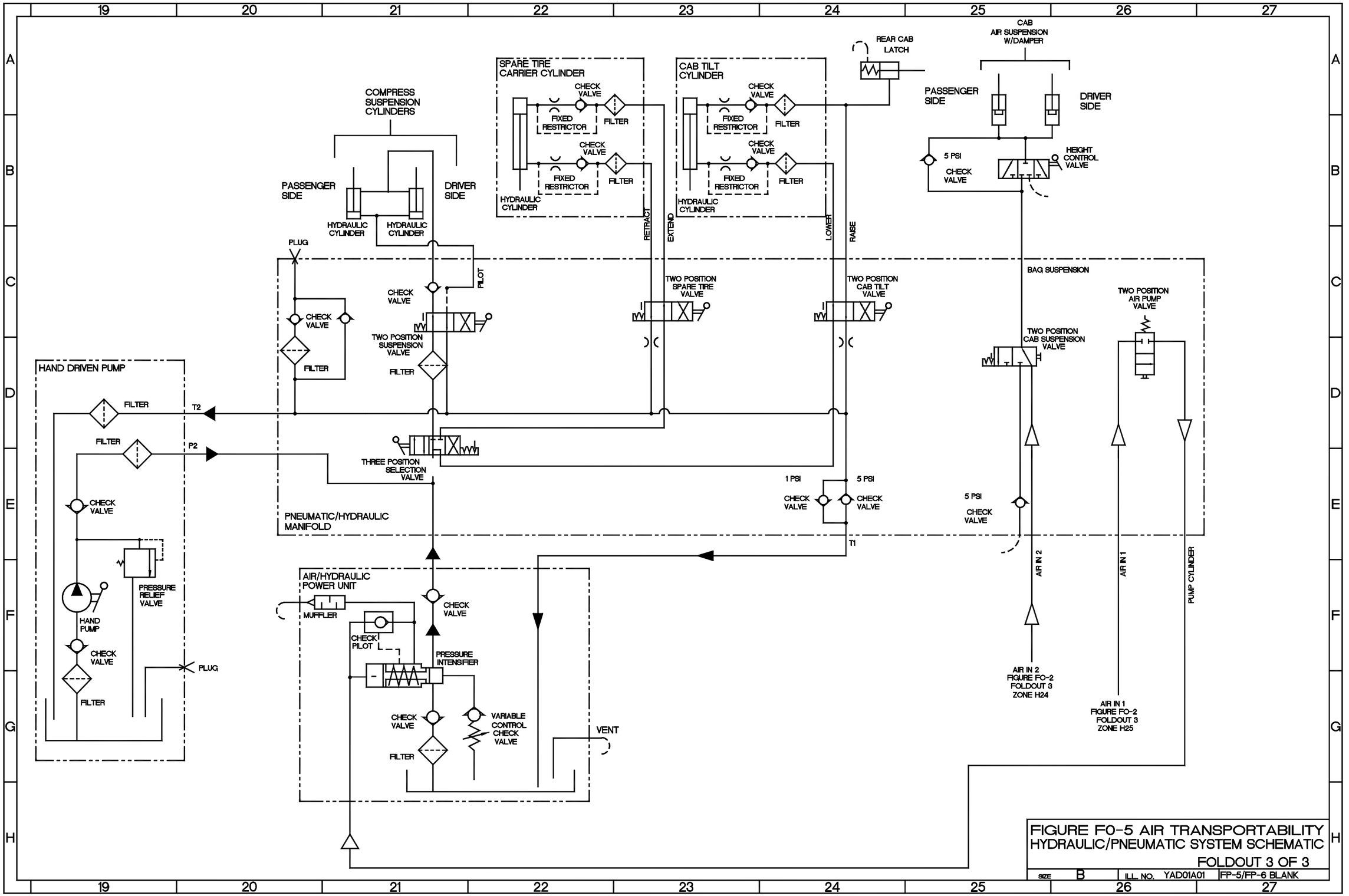


FIGURE FO-5 AIR TRANSPORTABILITY HYDRAULIC/PNEUMATIC SYSTEM SCHEMATIC
FOLDOUT 3 OF 3

SIZE B | ILL NO. YAD01A01 | FP-5/FP-6 BLANK

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is OAASA	Use Part II *(reverse)* for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE Date you filled out this form
TO: *(Forward to proponent of publication or form) (Include ZIP Code)*	FROM: *(Activity and location) (Include ZIP Code)* Enter your mailing address	

PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE
	Publication Date	Publication Title

ITEM	PAGE	PARA-GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON
10	15-33 19-6	15-7 19-2		4		Item 10. Change Illustration. Reason: Text calls out 90-degree fitting. Art shows straight fitting. Text is correct. Step (4) of removal says to disconnect four hydraulic hoses from manifold. The correct number of hydraulic hoses is five. correct the text to reflect the actual quantity of hydraulic hoses. The supporting illustration is correct.

SAMPLE

** Reference to line numbers within the paragraph or subparagraph.*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
Your title	Your telephone number	Your signature

TO: *(Forward direct to addressee listed in publication)*	FROM: *(Activity and location) (Include ZIP Code)*	DATE
	Enter your mailing address	Date you filled out this form.

PART II - REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION NUMBER	DATE	TITLE
	Publication Date	Your Title

PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

PART III - REMARKS *(Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
Your title	Your telephone number	Your signature

SAMPLE

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is OAASA	Use Part II *(reverse)* for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
TO: *(Forward to proponent of publication or form) (Include ZIP Code)*	**FROM:** *(Activity and location) (Include ZIP Code)*	

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THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE
1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
1 Kilometer = 1000 Meters = 0.621 Miles

SQUARE MEASURE
1 Sq Centimeter = 100 Sq Millimeters = 0.155 Sq Inches
1 Sq Meter = 10,000 Sq Centimeters = 10.76 Sq Feet
1 Sq Kilometer = 1,000,000 Sq Meters = 0.386 Sq Miles

WEIGHTS
1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
1 Kilogram = 1000 Grams = 2.2 Lb
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

CUBIC MEASURE
1 Cu Centimeter = 1000 Cu Millimeters = 0.06 Cu Inches
1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

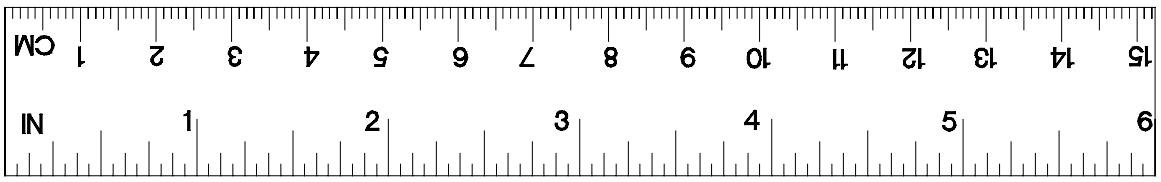
LIQUID MEASURE
1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

TEMPERATURE
5/9 (°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