

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

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HEADQUARTERS, DEPARTMENTS OF THE ARMY AND THE AIR FORCE
15 SEPTEMBER 1998

*Supersedes copy dated October 1995.

WARNING SUMMARY

WARNING

EXHAUST GASES CAN KILL

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

Headache

Dizziness

Sleepiness

Loss of Muscular Control

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

Remove person from area.

Expose to open air.

Keep person warm.

Do not permit person to move.

Administer cardiopulmonary resuscitation, if necessary. *

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

WARNING

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

WARNING

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

WARNING SUMMARY (CONT)

WARNING

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

WARNING

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

WARNING

Dry Cleaning Solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in well ventilated area; avoid contact with skin, eyes, and clothes, and do not breathe vapors. Keep away from heat or flame. Never smoke when using solvent; the flashpoint for Type I Dry Cleaning Solvent is 100°F (38°C) and for Type II is 130°F (50°C). Failure to comply may result in serious injury or death to personnel.

If personnel become dizzy while using Dry Cleaning Solvent, immediately get fresh air and medical help. If Dry Cleaning Solvent contacts skin or clothes, flush with cold water. If Dry Cleaning Solvent contacts eyes, immediately flush eyes with water and get immediate medical attention. Failure to comply may result in injury to personnel.

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING SUMMARY (CONT)

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING SUMMARY (CONT)

WARNING

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

WARNING

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

WARNING

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

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING SUMMARY (CONT)

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

Cargo sling must be placed under charge air cooler inlet and outlet ports. Failure to comply may result in injury to personnel or damage to equipment.

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING SUMMARY (CONT)

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING SUMMARY (CONT)

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

Excess coolant may splash out when hoses are removed from swingfire pump. Wear appropriate eye protection. Failure to comply may result in injury to personnel.

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING SUMMARY (CONT)

WARNING

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

WARNING

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

WARNING

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

WARNING

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

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NO. 9-2320-366-20-2

HEADQUARTERS
DEPARTMENTS OF THE ARMY
AND THE AIR FORCE

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

Washington D.C., 15 September 1998

Unit Maintenance Manual
**M1083 SERIES, 5-TON, 6 x 6,
MEDIUM TACTICAL VEHICLES (MTV)**
VOLUME NO. 2 OF 5

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

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of any way to improve the procedures, please let us know. Mail your letter, DA Form 2082 (Recommended Changes to Publications and Blank Forms), or DA form 2028-2 located in the back of this manual direct to: Commander, U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-AC-NMLI, Rock Island, Ill, 61299. A reply will be furnished to you.

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

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HOW TO USE THIS MANUAL

OVERVIEW

This Technical Manual (TM) is provided to help you maintain the MTV at the Unit Maintenance level. Because of its size, it is divided into five volumes. Volume 2 contains the following major sections in order of appearance:

- **WARNING SUMMARY.** Provides a summary of the most important warnings that apply throughout the manual.

- **CHAPTER 2, VEHICLE MAINTENANCE.** This chapter contains the continuation of the troubleshooting tables.
- **APPENDIX A, REFERENCES.** Lists publications used with the MTV.
- **APPENDIX B, MAINTENANCE ALLOCATION CHART.** The maintenance allocation chart denotes the level of maintenance which performs specific maintenance tasks and the time required. It also lists tools and special tools required for each task.
- **APPENDIX C, TOOLS IDENTIFICATION LIST.** Lists equipment used in the performance of maintenance and references publications which contain information regarding the equipment.
- **APPENDIX D, EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST.** Lists expendable and durable items used in the performance of maintenance.
- **APPENDIX E, ILLUSTRATED LIST OF MANUFACTURED ITEMS.** Illustrates and describes items that must be fabricated from bulk materials for repair of the MTV.
- **APPENDIX F, TORQUE LIMITS.** Lists the standard torque values for specific attaching hardware.
- **APPENDIX G, MANDATORY REPLACEMENT PARTS.**
- **APPENDIX H, LUBRICATION ORDER.**
- **APPENDIX J, ADDITIONAL AUTHORIZATION LIST (AAL).**
- **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 thru 24. The PMCS and troubleshooting tables often reference you to these procedures. When you perform maintenance, look over the entire procedure before starting. Make sure you have the necessary tools and materials at hand. Always follow the **WARNINGS** and **CAUTIONS**.

FOLLOW THESE GUIDELINES WHEN USING THIS MANUAL:

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

2-16. ELECTRICAL SYSTEM TROUBLESHOOTING (CONT)

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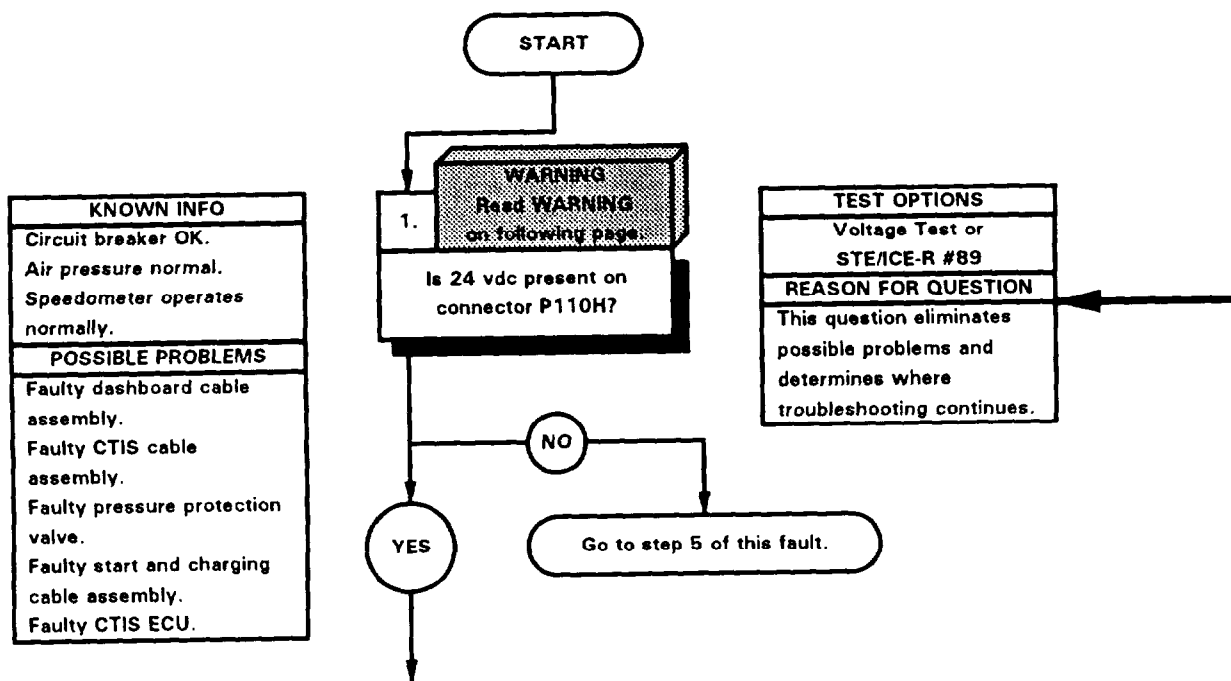
2-16. ELECTRICAL SYSTEM TROUBLESHOOTING (CONT)

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

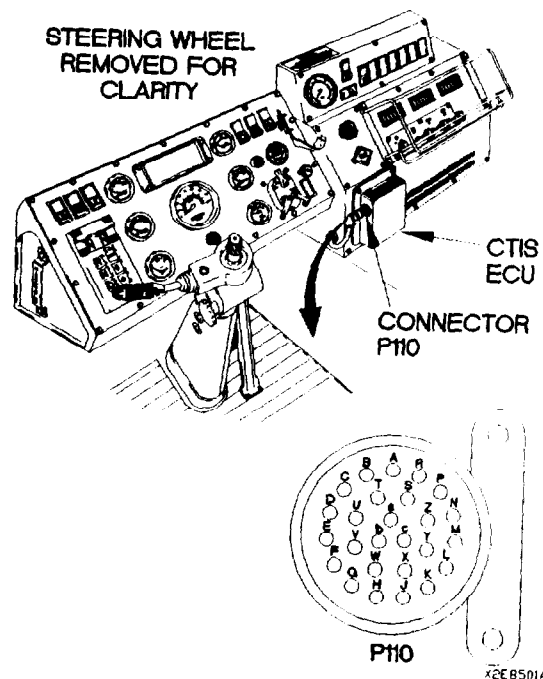


WARNING

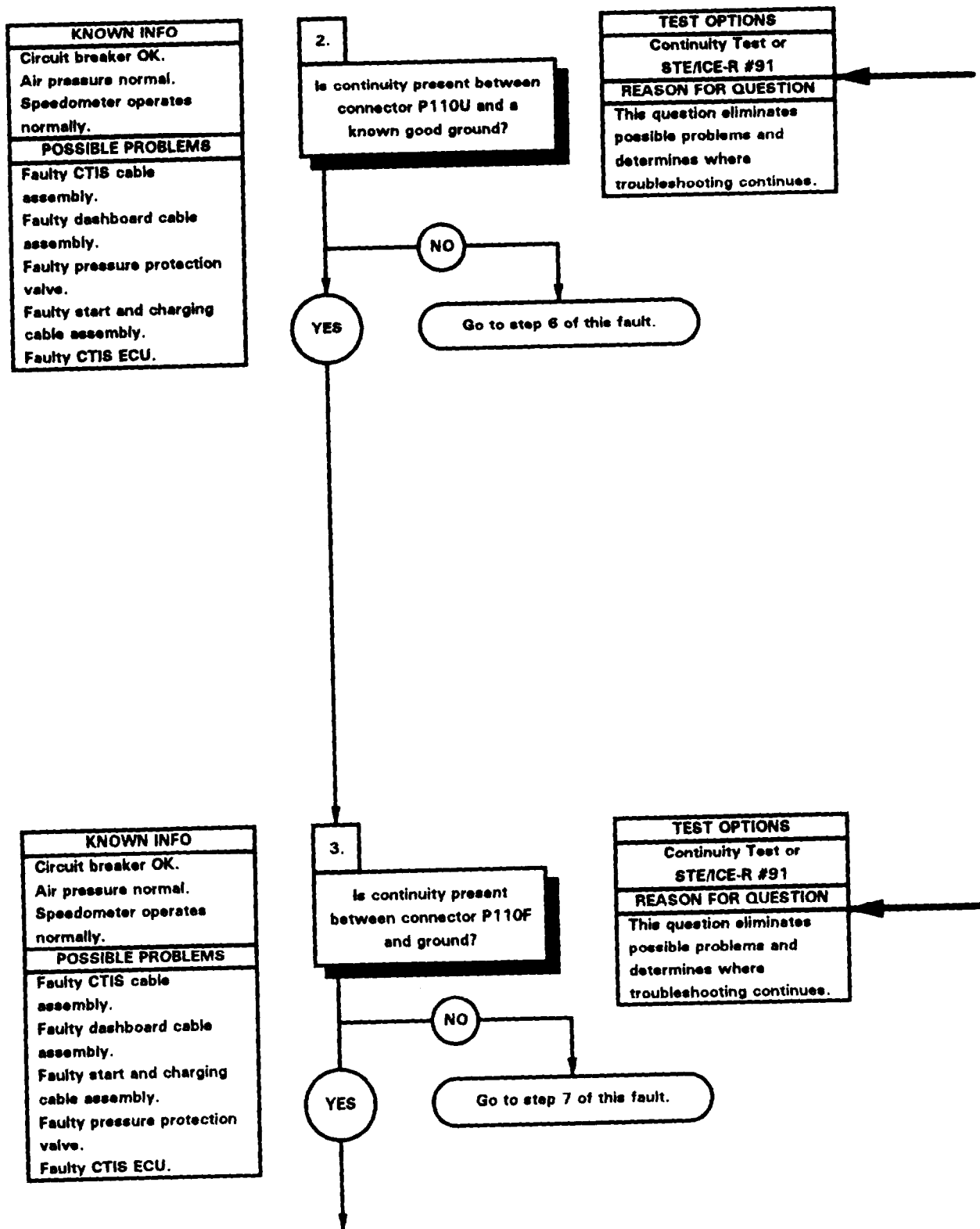
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

- (1) Disconnect connector P110 from CTIS ECU.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector P110H.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
- (6) If 24 vdc is not present, go to step 5 of this fault.
- (7) Position master power switch to off (TM 9-2320-366-10-1).

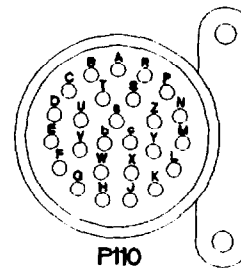


85. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT OPERATE (CONT)



CONTINUITY TEST

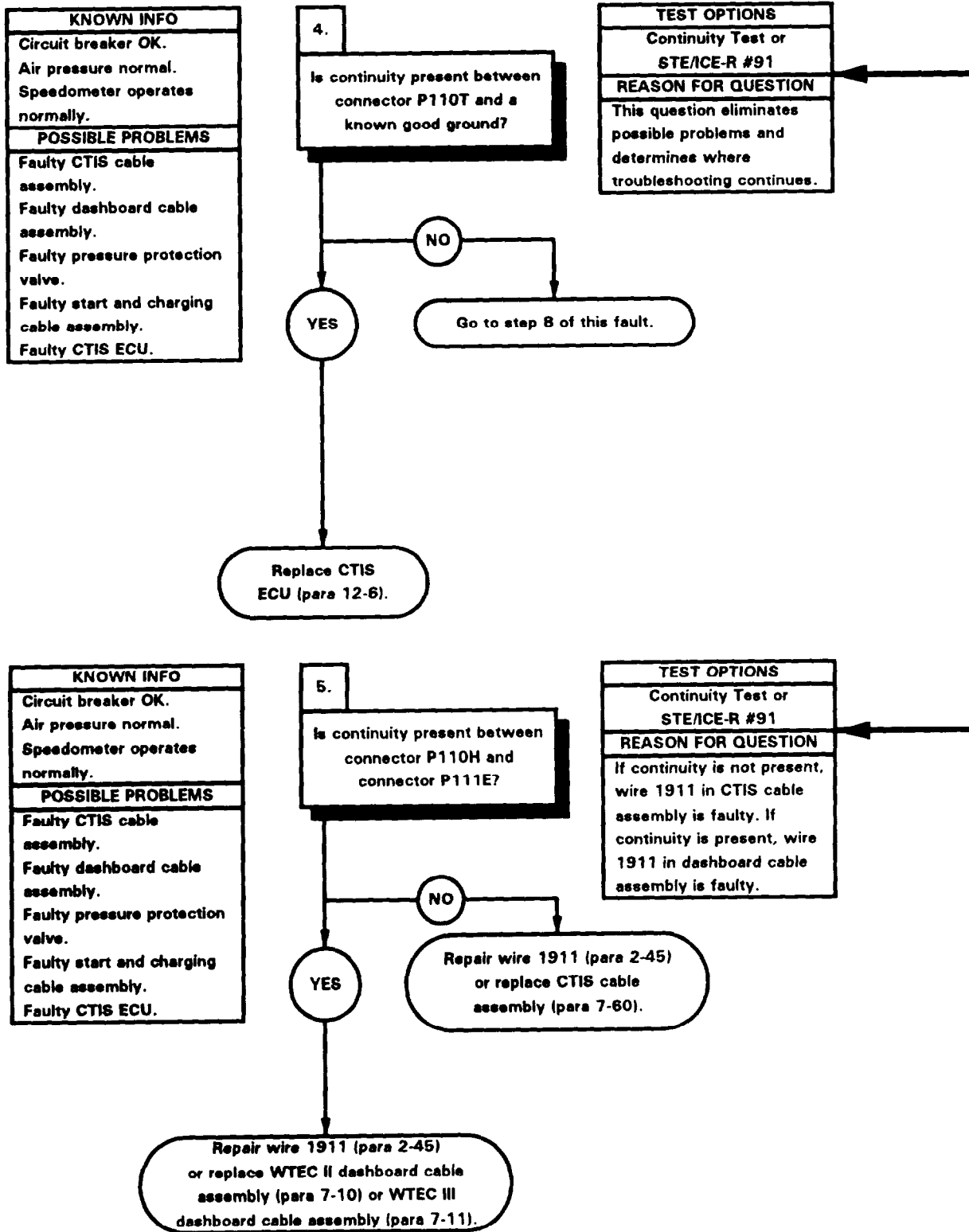
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P110U.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, go to step 6 of this fault.



CONTINUITY TEST

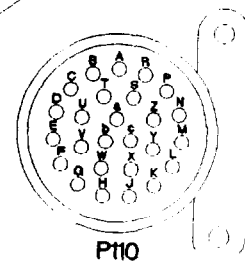
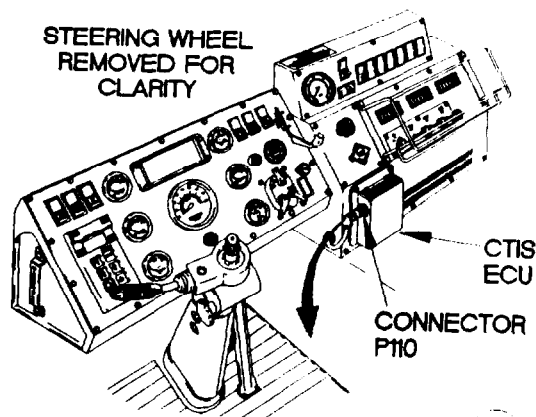
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P110F.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, go to step 7 of this fault.

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



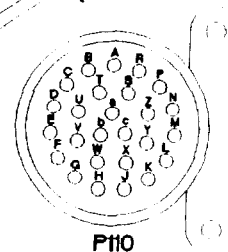
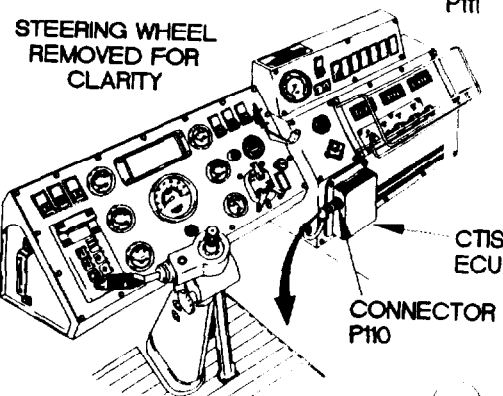
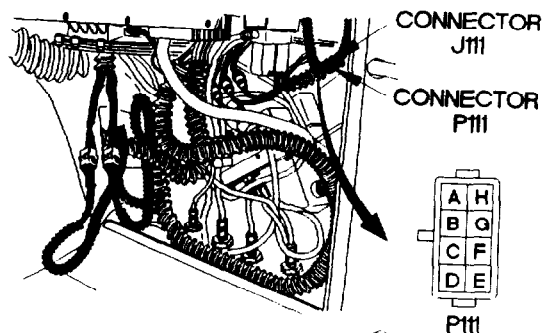
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P110T.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, go to step 8 of this fault.
- (5) If continuity is present, replace CTIS ECU (para 12-8).
- (6) Connect connector P110 to CTIS ECU.

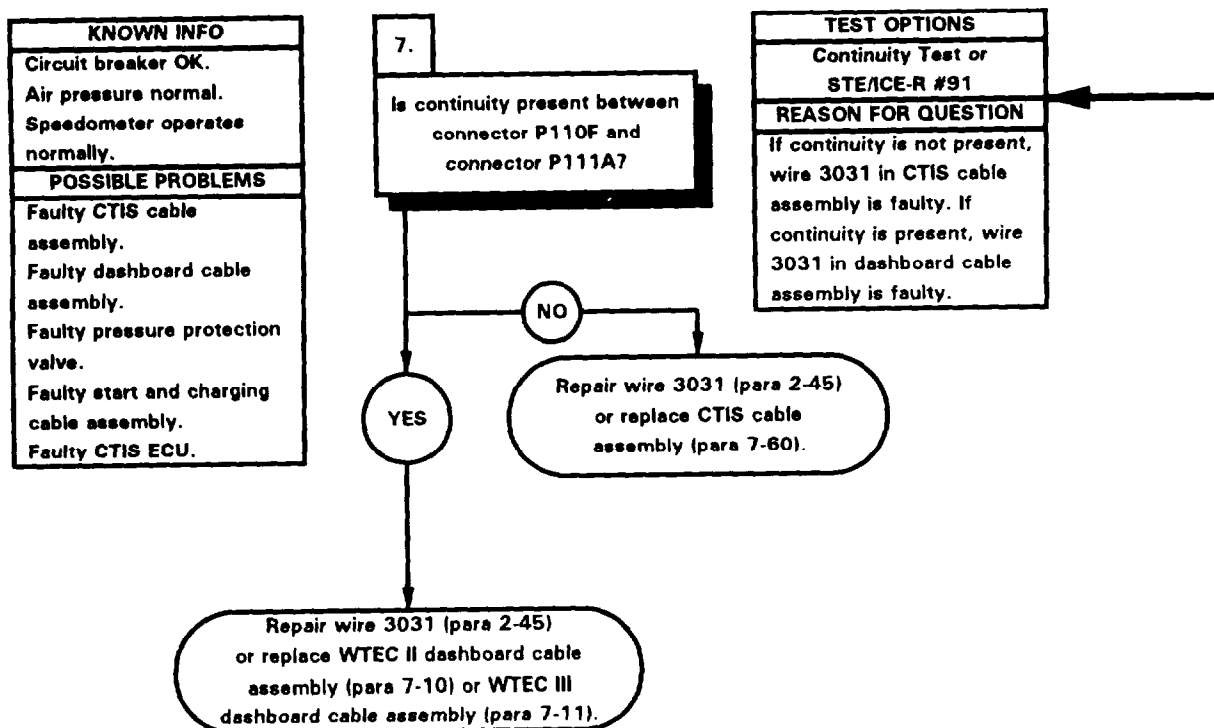
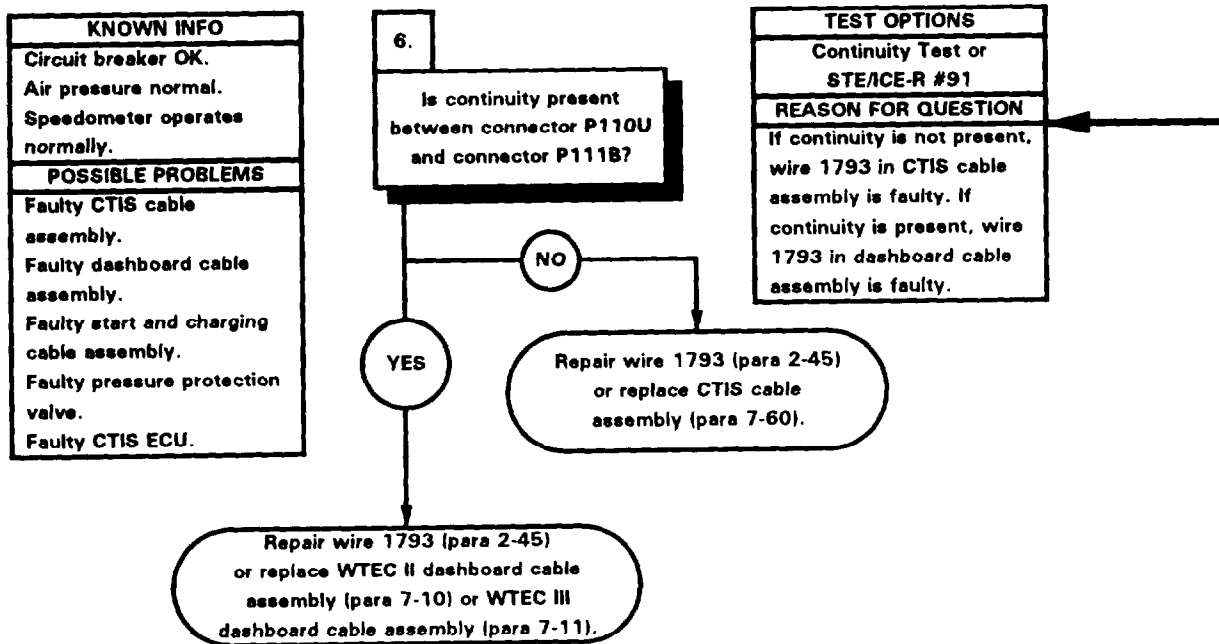


CONTINUITY TEST

- (1) Remove kick panel (para 16-3).
- (2) Disconnect connector P111 from connector J111.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to connector P110H.
- (5) Connect negative (-) probe of multimeter to connector P111E and note reading on multimeter.
- (6) If continuity is not present, repair wire 1911 (para 2-45) or replace CTIS cable assembly (para 7-60).
- (7) If continuity is present, repair wire 1911 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (8) Connect connector P111 to connector J111.
- (9) Install kick panel (para 16-3).
- (10) Connect connector P110 to CTIS ECU.

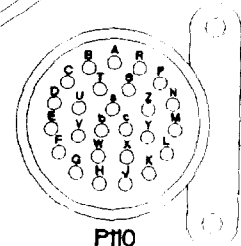
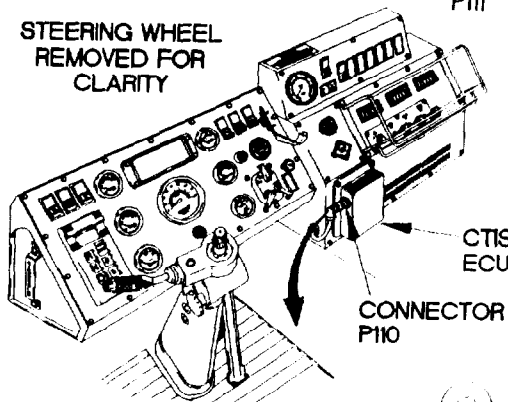
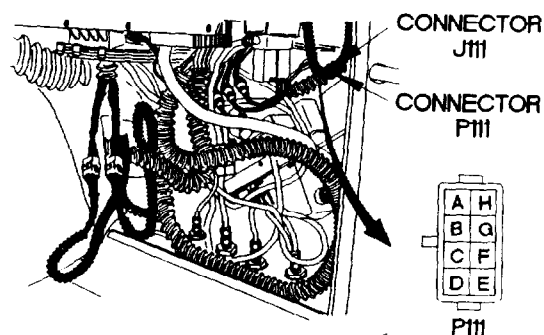


85. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT OPERATE (CONT)



CONTINUITY TEST

- (1) Remove kick panel (para 16-3).
- (2) Disconnect connector P111 from connector J111.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to connector P110U.
- (5) Connect negative (-) probe of multimeter to connector P111B and note reading on multimeter.
- (6) If continuity is not present, repair wire 1793 (para 2-45) or replace CTIS cable assembly (para 7-60).
- (7) If continuity is present, repair wire 1793 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (8) Connect connector P111 to connector J111.
- (9) Install kick panel (para 16-3).
- (10) Connect connector P110 to CTIS ECU.

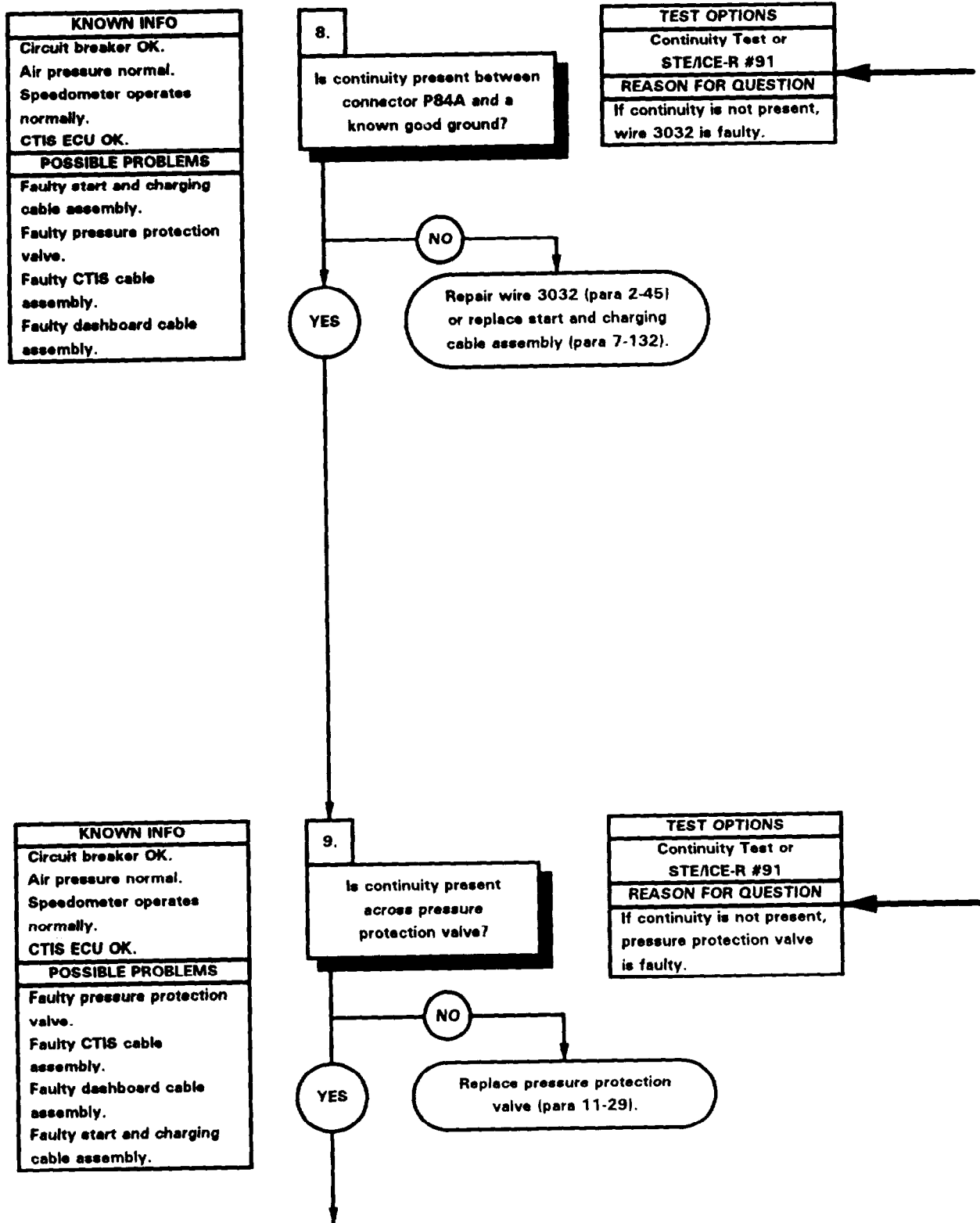


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CONTINUITY TEST

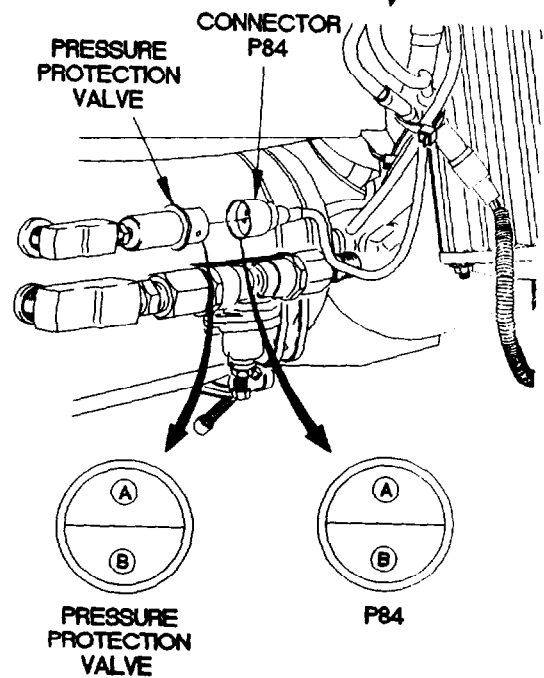
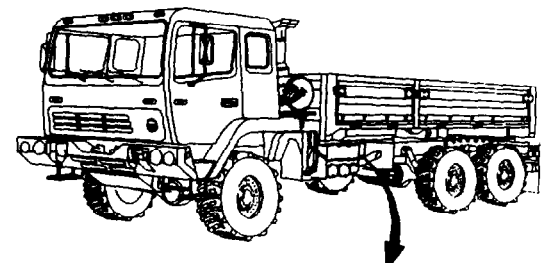
- (1) Remove kick panel (para 16-3).
- (2) Disconnect connector P111 from connector J111.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to connector P110F.
- (5) Connect negative (-) probe of multimeter to connector P111A and note reading on multimeter.
- (6) If continuity is not present, repair wire 3031 (para 2-45) or replace CTIS cable assembly (para 7-60).
- (7) If continuity is present, repair wire 3031 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (8) Connect connector P111 to connector J111.
- (9) Install kick panel (para 16-3).
- (10) Connect connector P110 to CTIS ECU.

ø85. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT OPERATE (CONT)



CONTINUITY TEST

- (1) Disconnect connector P84 from pressure protection valve.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector P84A.
- (4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (5) If continuity is not present, repair wire 3032 (para 2-45) or replace start and charging cable assembly (para 7-132).

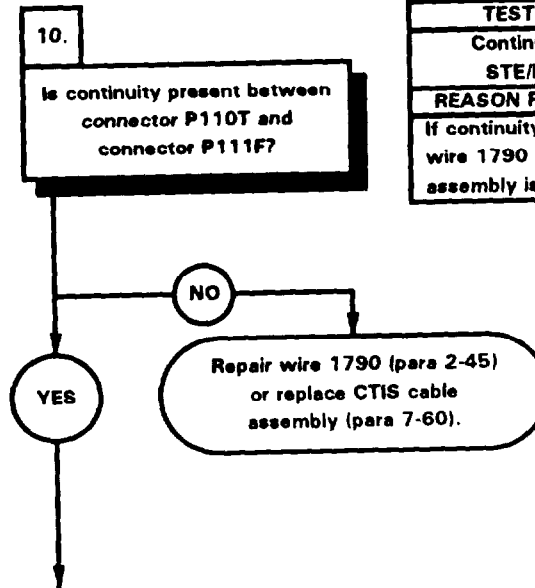


CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pressure protection valve terminal A.
- (3) Connect negative (-) probe of multimeter to pressure protection valve terminal B and note reading on multimeter.
- (4) If continuity is not present, replace pressure protection valve (para 11-29).
- (5) Connect connector P84 to pressure protection valve.

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

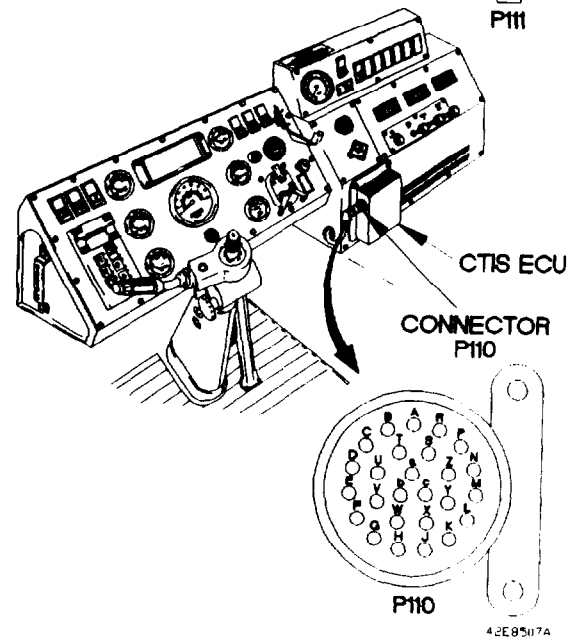
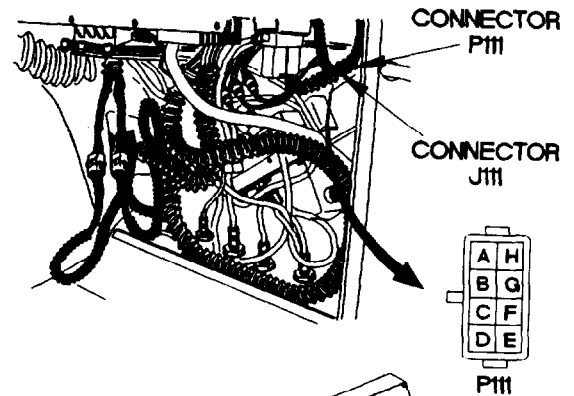
KNOWN INFO
Circuit breaker OK. Air pressure normal. Speedometer operates normally. CTIS ECU OK. Pressure protection valve OK.
POSSIBLE PROBLEMS
Faulty CTIS cable assembly. Faulty dashboard cable assembly. Faulty start and charging cable assembly.



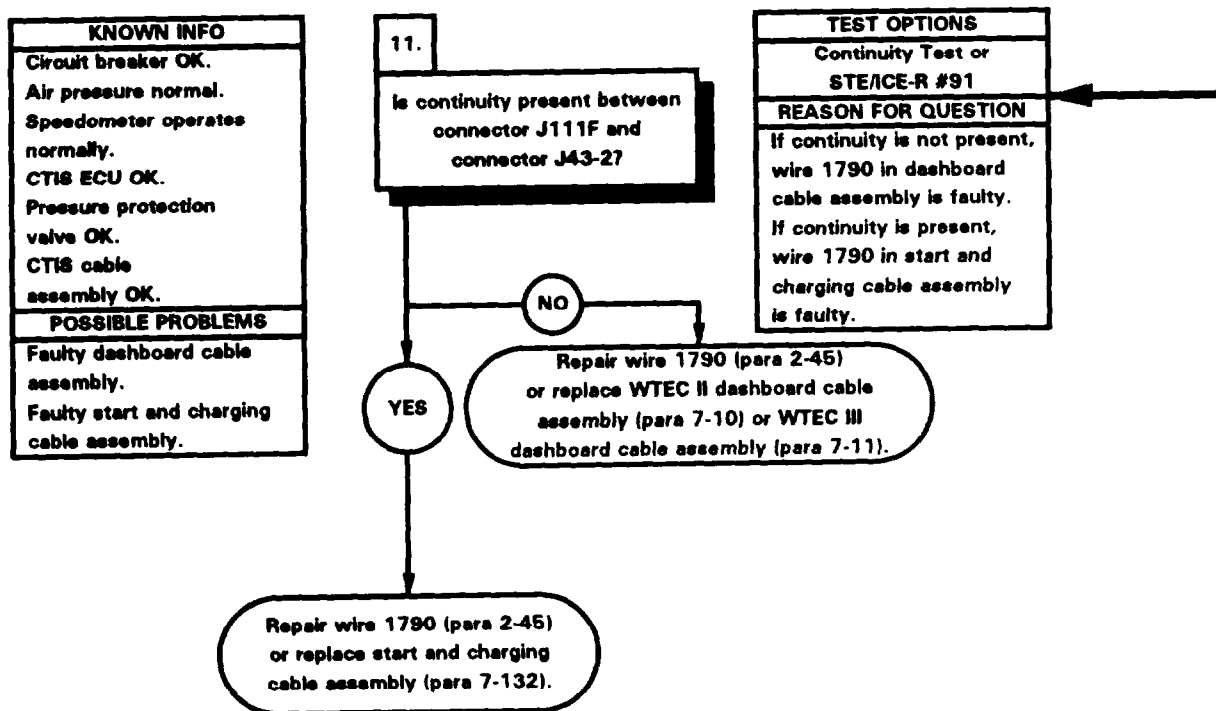
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 1790 in CTIS cable assembly is faulty.

CONTINUITY TEST

- (1) Remove kick panel (para 16-3).
- (2) Disconnect connector P111 from connector J111.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to connector P110T.
- (5) Connect negative (-) probe of multimeter to connector P111F and note reading on multimeter.
- (6) If continuity is not present, repair wire 1790 (para 2-45) or replace CTIS cable assembly (para 7-60).
- (7) Connect connector P110 to CTIS ECU.

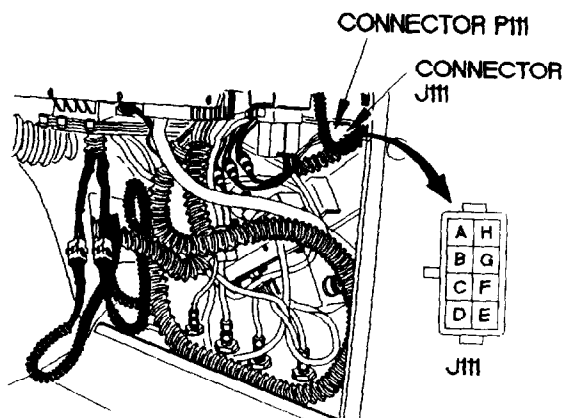
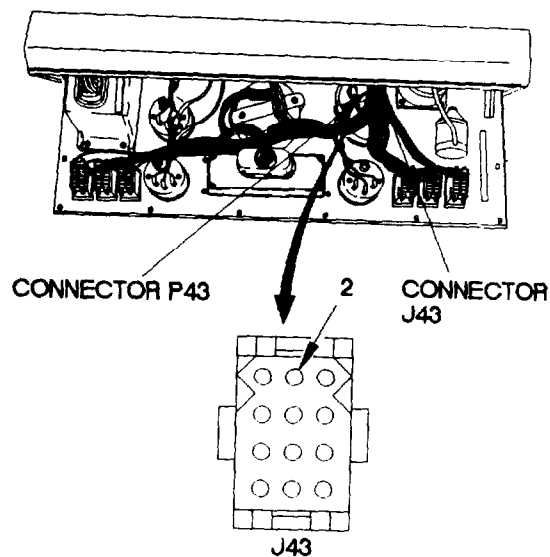


85. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT OPERATE (CONT)



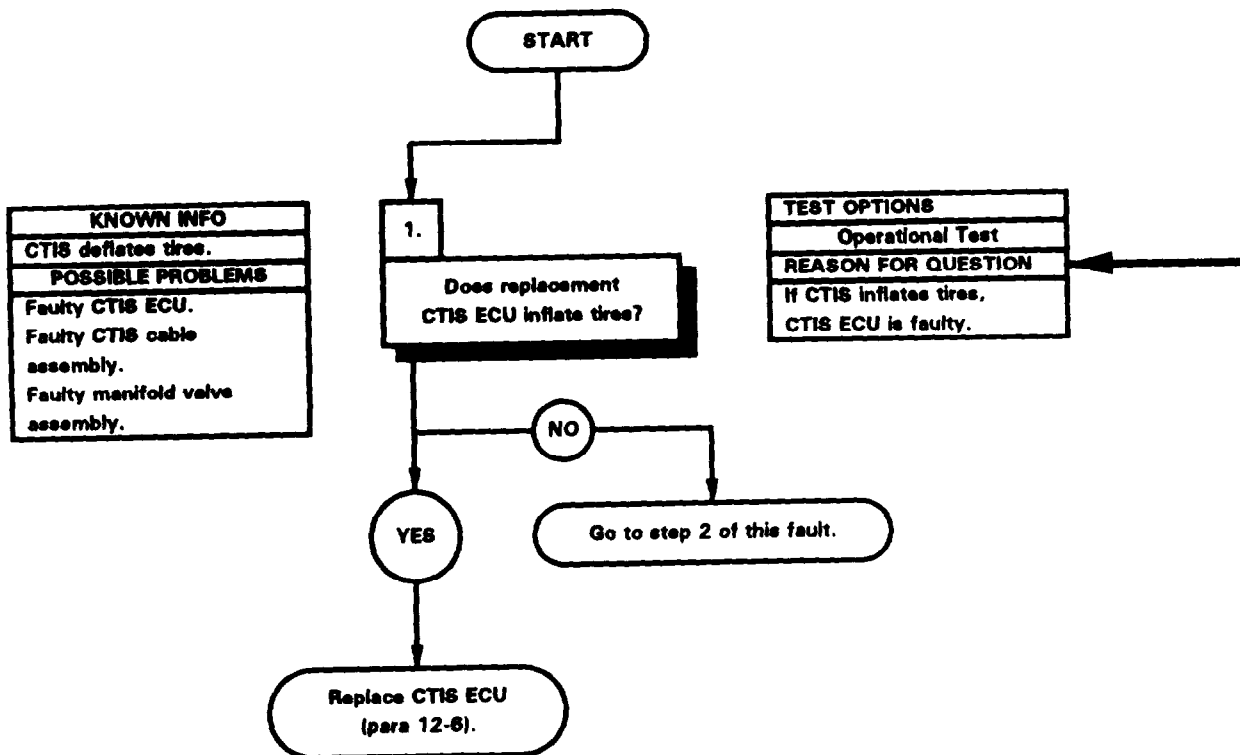
CONTINUITY TEST

- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Disconnect connector J43 from connector P43.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to connector J111F.
- (5) Connect negative (-) probe of multimeter to connector J43-2 and note reading on multimeter.
- (6) If continuity is not present, repair wire 1790 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (7) If continuity is present, repair wire 1790 (para 2-45) or replace start and charging cable assembly (para 7-132).
- (8) Connect connector J43 to connector P43.
- (9) Install instrument panel assembly (para 7-15).
- (10) Connect connector P111 to connector J111.
- (11) Install kick panel (para 16-3).



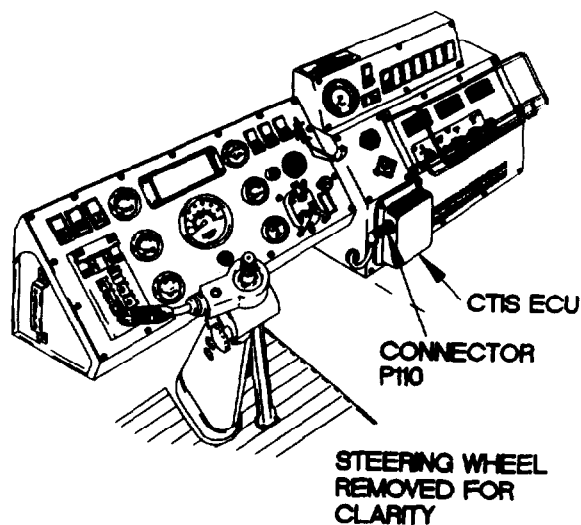
42C8508A

e86. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT INFLATE TIRES	
INITIAL SETUP	
Equipment Condition Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) STE/ICE-R (Item 41, Appendix C) Multimeter, Digital (Item 22, Appendix C)
Personnel Required (2)	Materials/Parts Wire, Elect, 50 ft (Item 71, Appendix D)
References TM 9-4910-571-12&P	



OPERATIONAL TEST

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



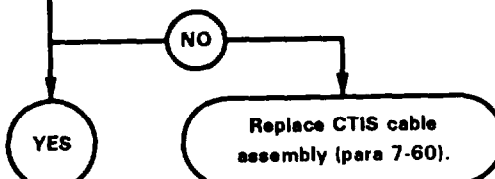
X2C8601A

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

KNOWN INFO
CTIS deflates tires.
CTIS ECU OK.
POSSIBLE PROBLEMS
Faulty CTIS cable assembly.
Faulty manifold valve assembly.

2.
Is continuity present between connector P110-B and connector P112-F?

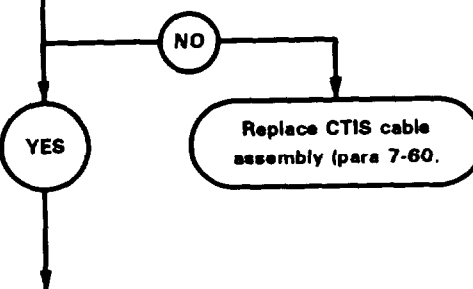
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, CTIS cable assembly is faulty.



KNOWN INFO
CTIS deflates tires.
CTIS ECU OK.
POSSIBLE PROBLEMS
Faulty CTIS cable assembly.
Faulty manifold valve assembly.

3.
Is continuity present between connector P110-F and connector P112-A?

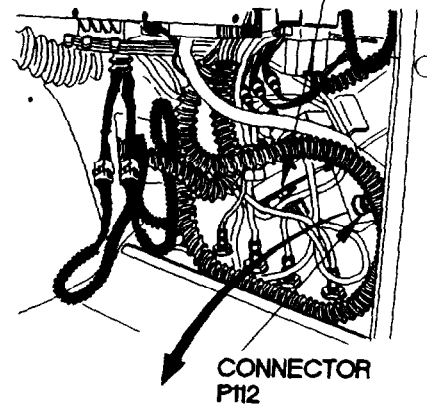
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, CTIS cable assembly is faulty.



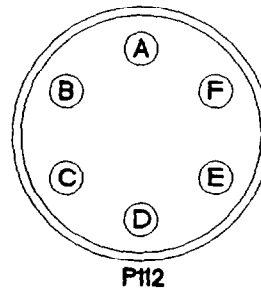
CONTINUITY TEST

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

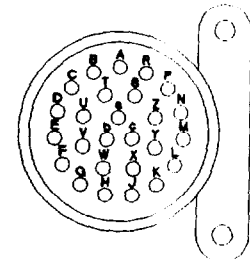
MANIFOLD
VALVE ASSEMBLY



CONNECTOR
P112



P112



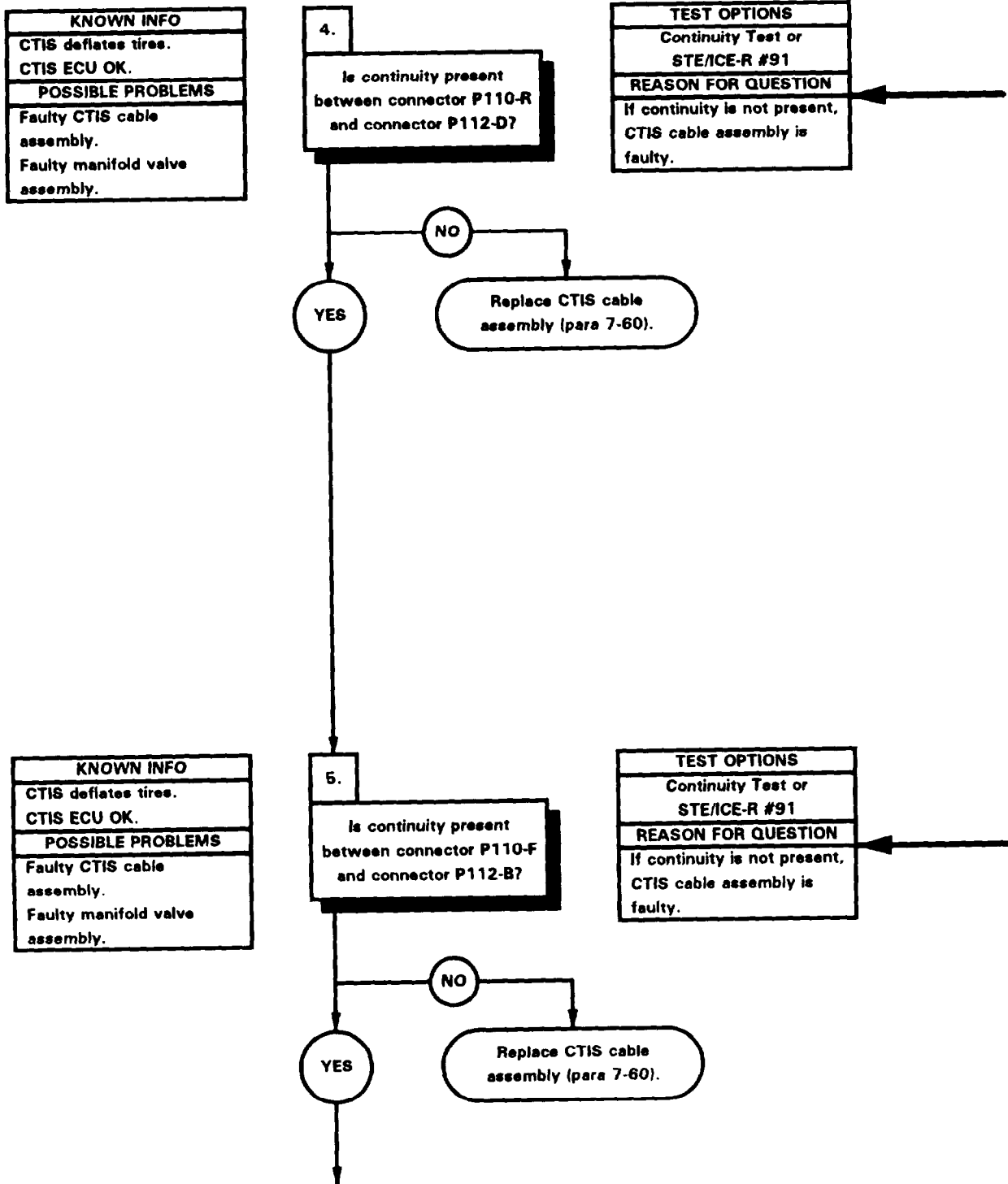
P110

42EB602A

CONTINUITY TEST

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

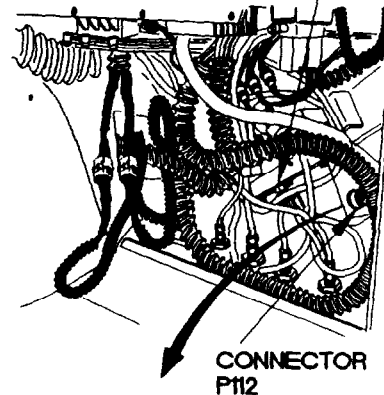
86. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT INFLATE TIRES (CONT)



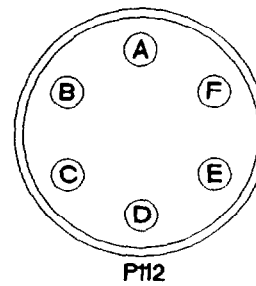
CONTINUITY TEST

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

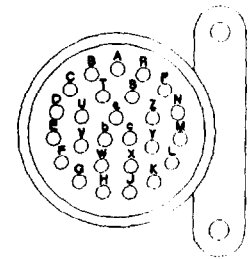
MANIFOLD
VALVE ASSEMBLY



CONNECTOR
P112



P112



P110

42E8603A

CONTINUITY TEST

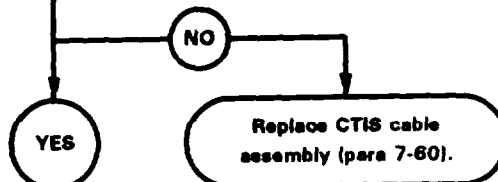
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P110-F.
- (3) Connect negative (-) probe of multimeter to connector P112-B and note reading on multimeter.
- (4) If continuity is not present, replace CTIS cable assembly (para 7-60).
- (5) Connect connector P112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

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

KNOWN INFO
CTIS deflates tires. CTIS ECU OK.
POSSIBLE PROBLEMS
Faulty CTIS cable assembly. Faulty manifold valve assembly.

6.
Is continuity present between connector P110-b and connector P113-B?

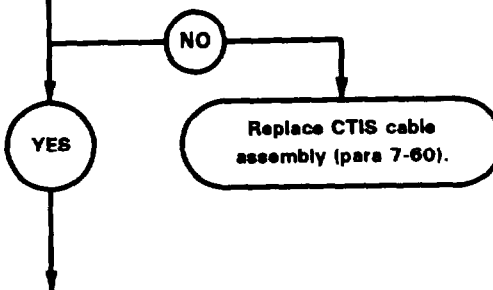
TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, CTIS cable assembly is faulty.



KNOWN INFO
CTIS deflates tires. CTIS ECU OK.
POSSIBLE PROBLEMS
Faulty CTIS cable assembly. Faulty manifold valve assembly.

7.
Is continuity present between connector P110-c and connector P113-C?

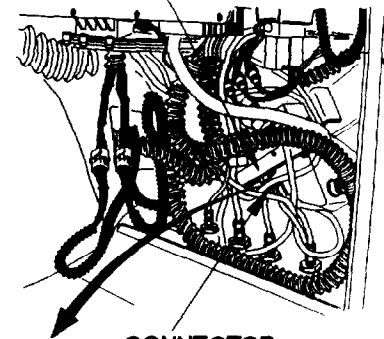
TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, CTIS cable assembly is faulty.



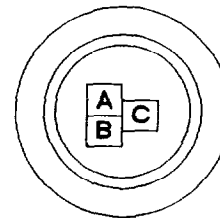
CONTINUITY TEST

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

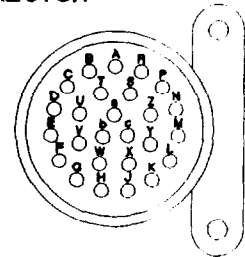
MANIFOLD
VALVE ASSEMBLY



CONNECTOR
P113



P113



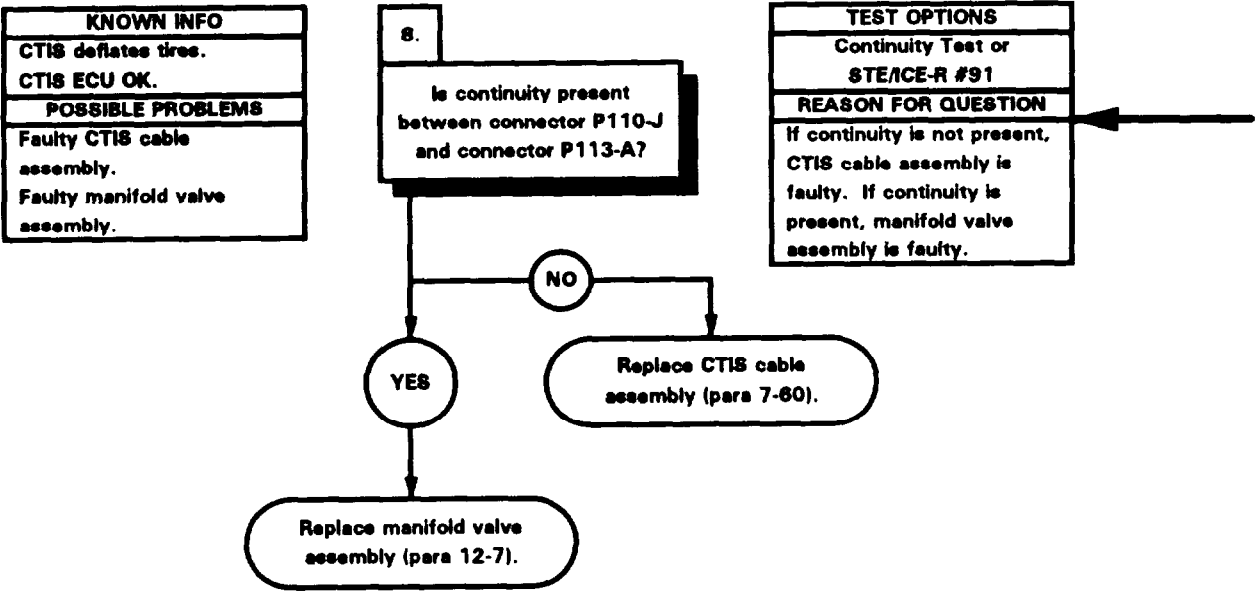
P110

42E8604A

CONTINUITY TEST

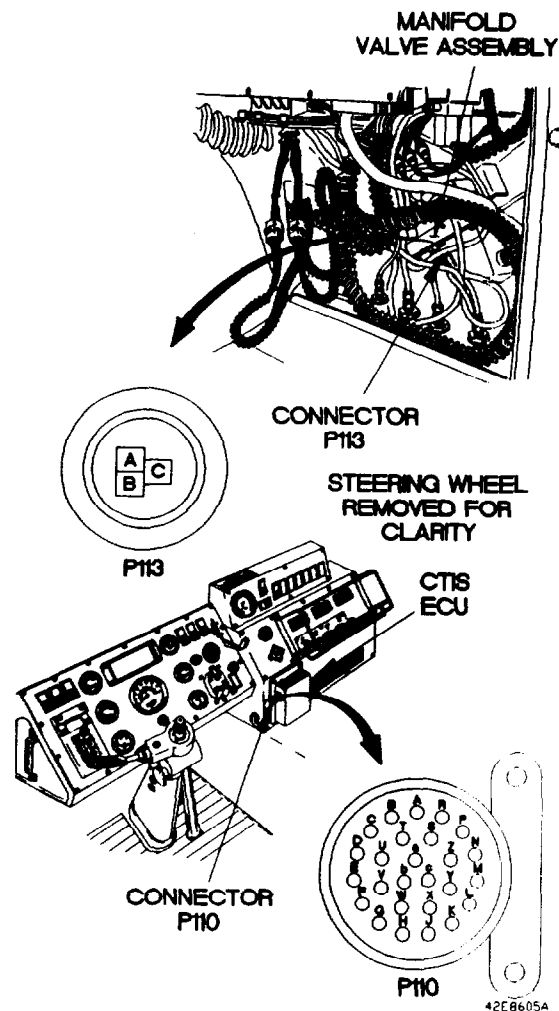
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P110-c.
- (3) Connect negative (-) probe of multimeter to connector P113-C and note reading on multimeter.
- (4) If continuity is not present, replace CTIS cable assembly (para 7-60).

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

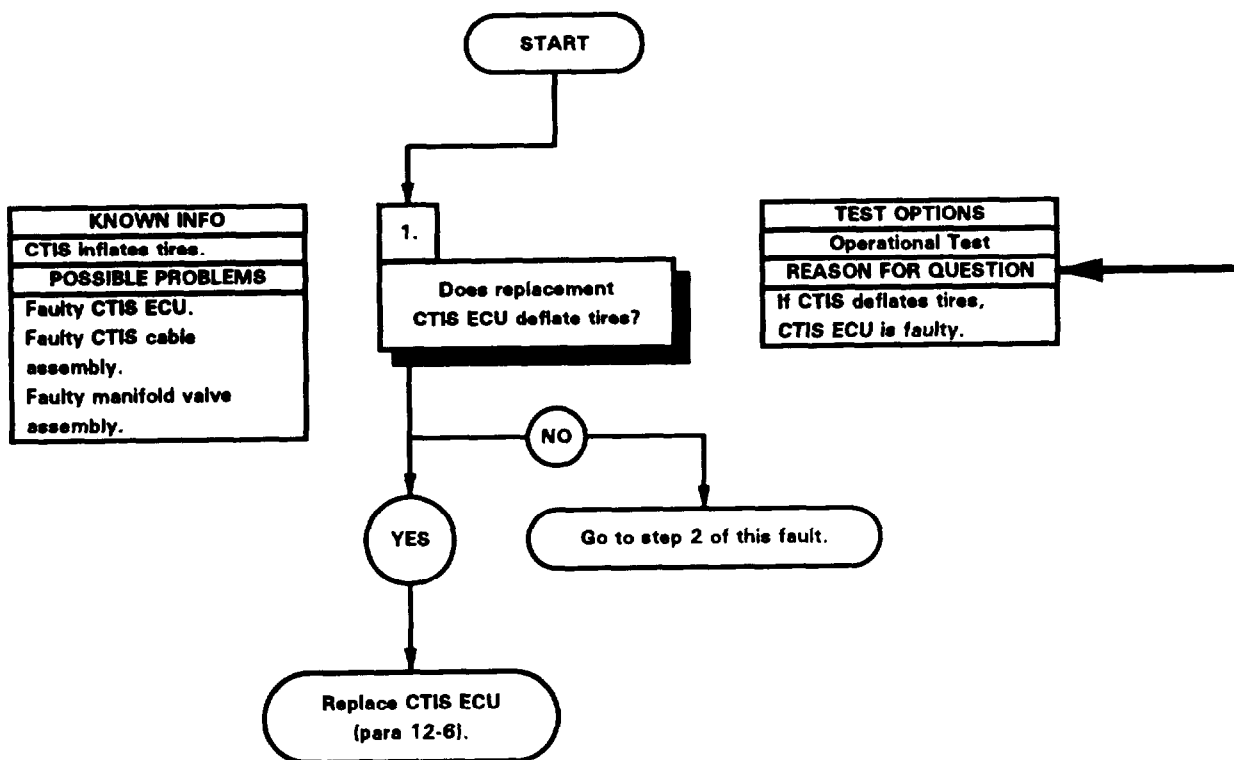


CONTINUITY TEST

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

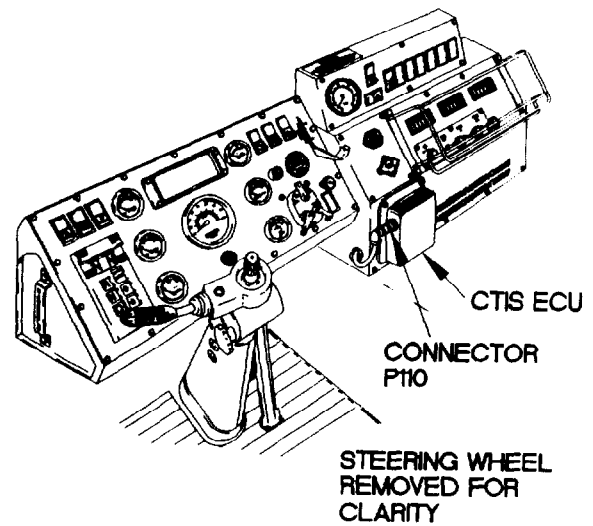


e87. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT DEFLATE TIRES	
INITIAL SETUP	
Equipment Condition Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) STE/CE-R (Item 41, Appendix C) Multimeter, Digital (Item 22, Appendix C)
Personnel Required (2)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



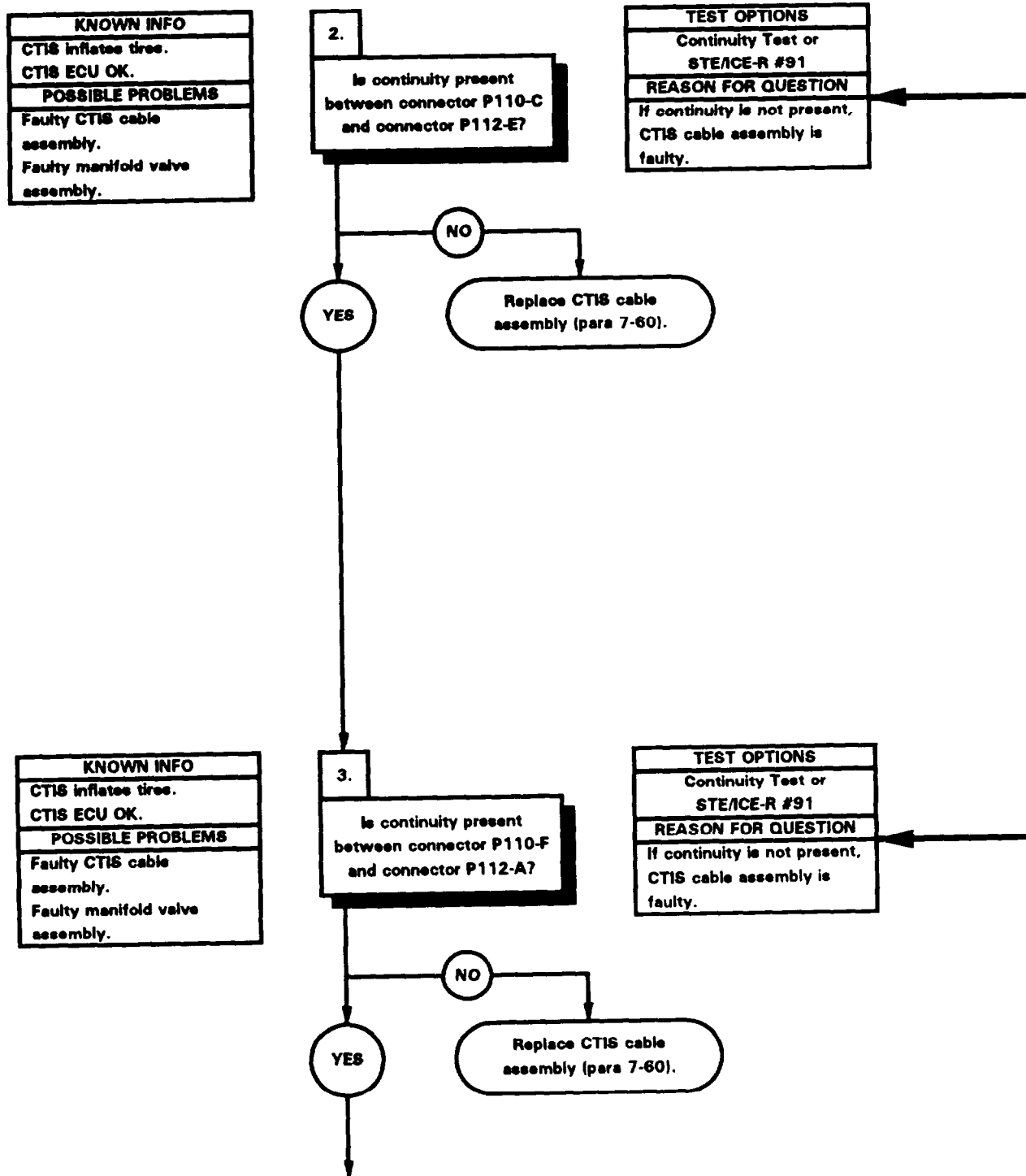
OPERATIONAL TEST

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



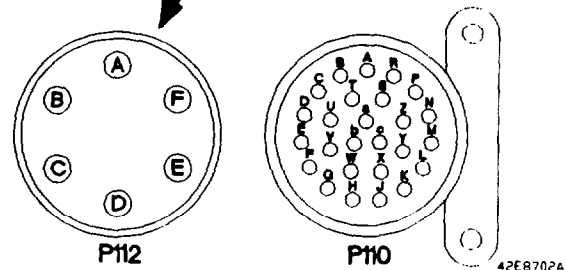
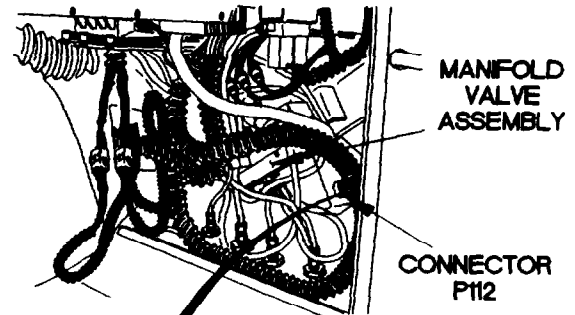
X2E970JA

ø87. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT DEFLATE TIRES (CONT)



CONTINUITY TEST

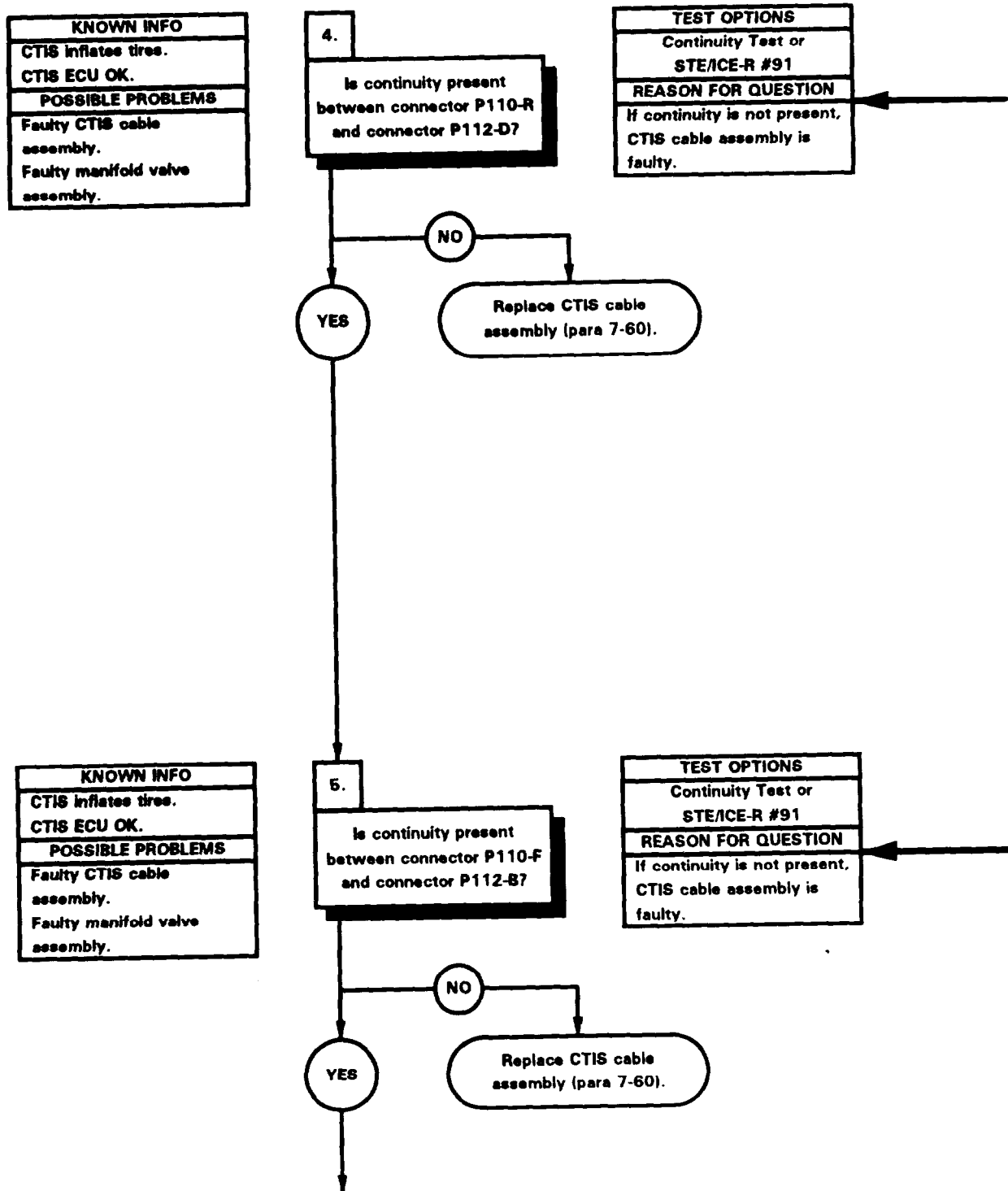
- (1) Remove kick panel (para 16-3).
- (2) Disconnect connector P112 from manifold valve assembly.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to connector P110-C.
- (5) Connect negative (-) probe of multimeter to connector P112-E and note reading on multimeter.
- (6)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



CONTINUITY TEST

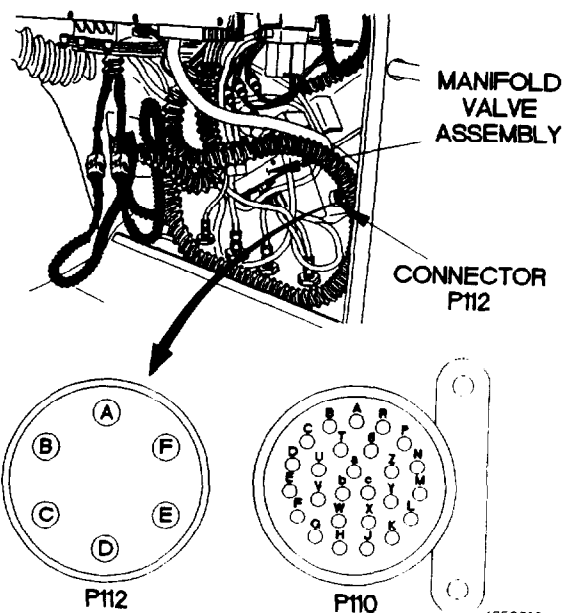
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P110-F.
- (3) Connect negative (-) probe of multimeter to connector P112-A and note reading on multimeter.
- (4) If continuity is not present, replace CTIS cable assembly (para 7-60).

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



CONTINUITY TEST

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

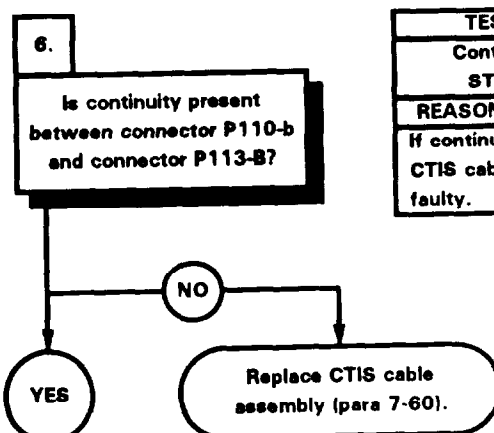


CONTINUITY TEST

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

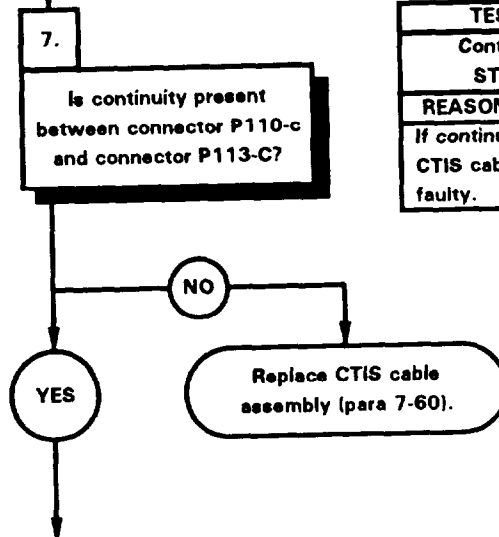
687. CENTRAL TIRE INFLATION SYSTEM (CTIS) DOES NOT DEFLATE TIRES (CONT)

KNOWN INFO
CTIS inflates tires.
CTIS ECU OK.
POSSIBLE PROBLEMS
Faulty CTIS cable assembly.
Faulty manifold valve assembly.



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

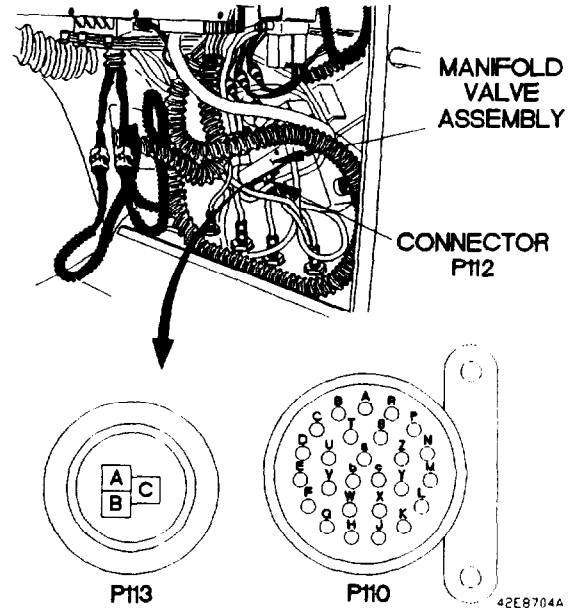
KNOWN INFO
CTIS inflates tires.
CTIS ECU OK.
POSSIBLE PROBLEMS
Faulty CTIS cable assembly.
Faulty manifold valve assembly.



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

CONTINUITY TEST

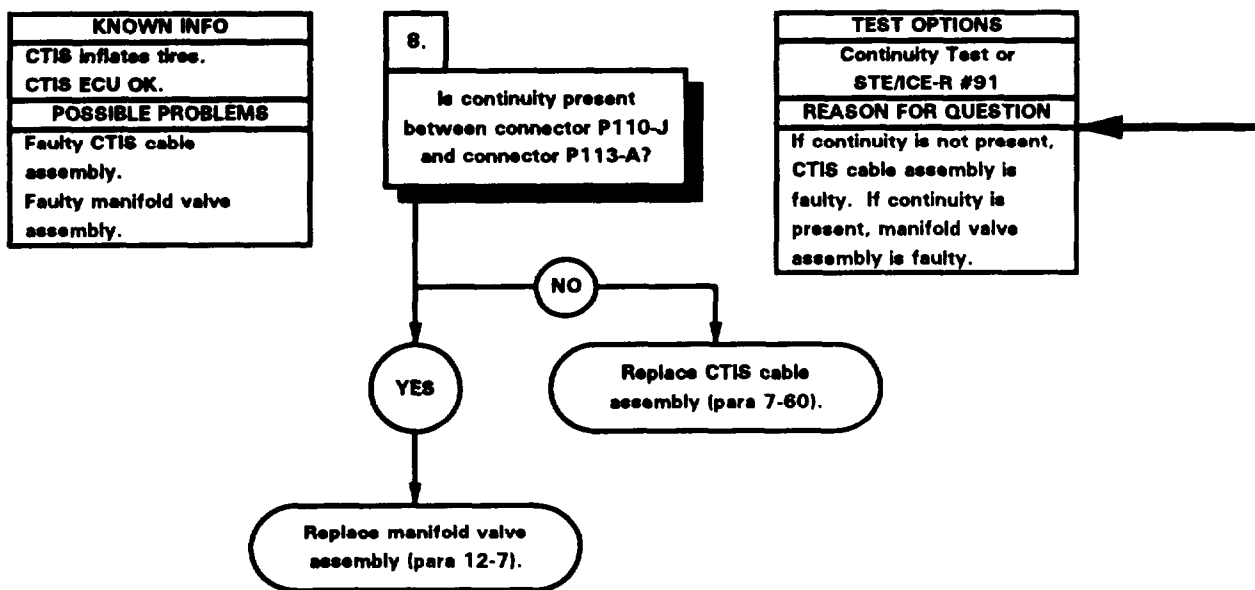
- (1) Disconnect connector P113 from manifold valve assembly.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector P110-b.
- (4) Connect negative (-) probe of multimeter to connector P113-B and note reading on multimeter.
- (5) If continuity is not present, replace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



CONTINUITY TEST

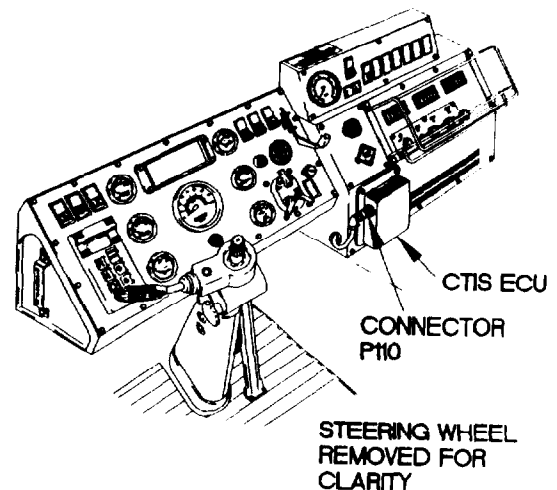
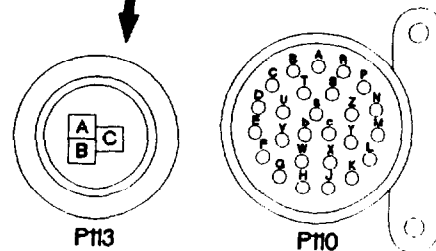
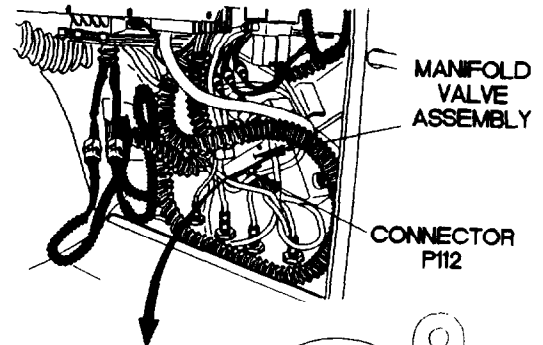
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P110-c.
- (3) Connect negative (-) probe of multimeter to connector P113-C and note reading on multimeter.
- (4) If continuity is not present, replace CTIS cable assembly (para 7-60).

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



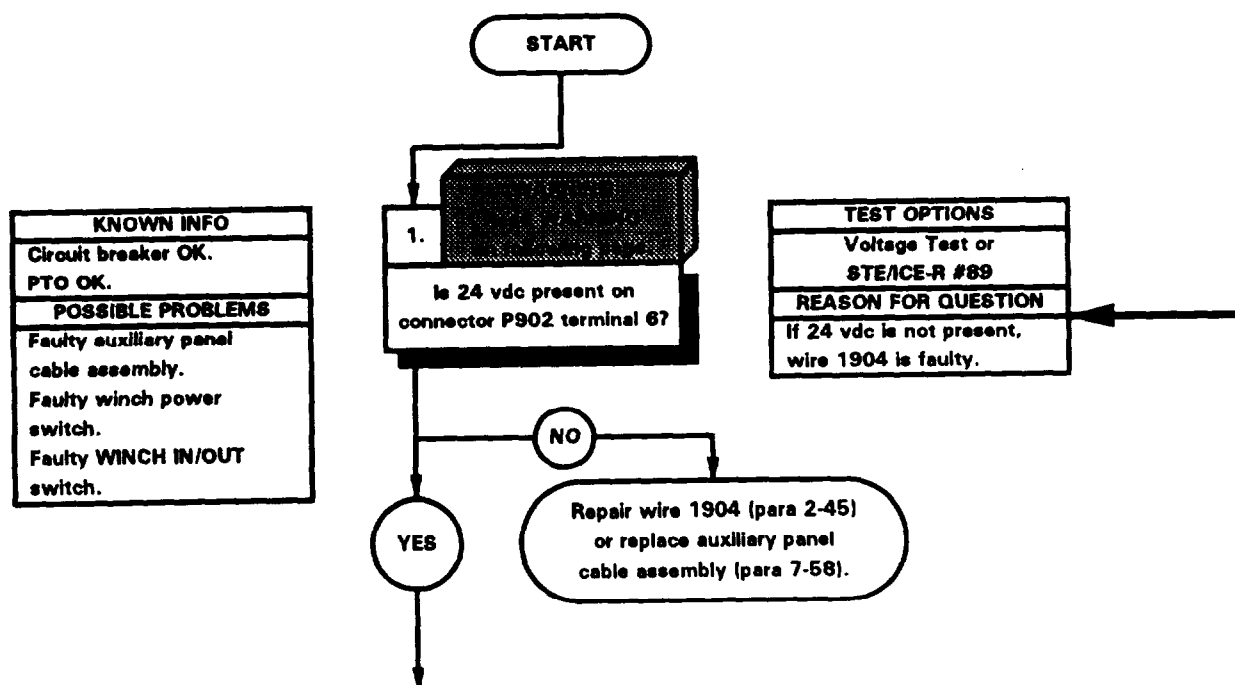
CONTINUITY TEST

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



42EB705A

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

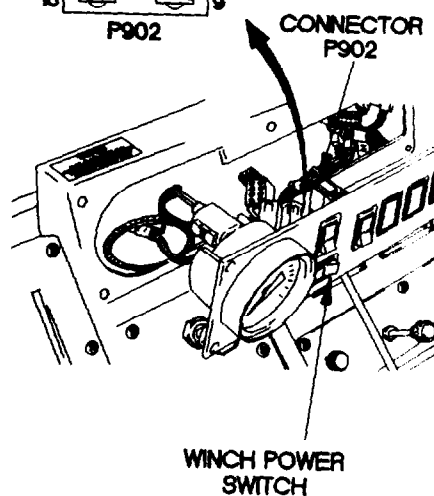
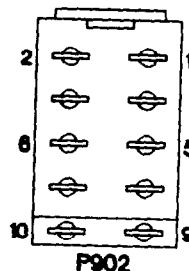
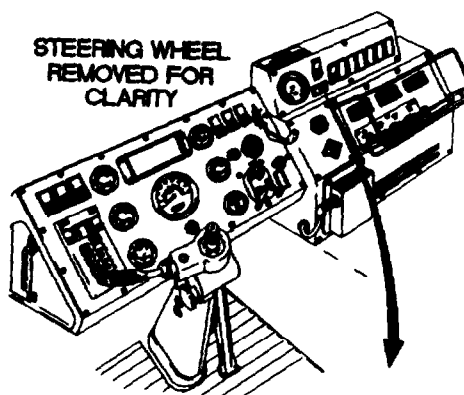


WARNING

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

VOLTAGE TEST

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

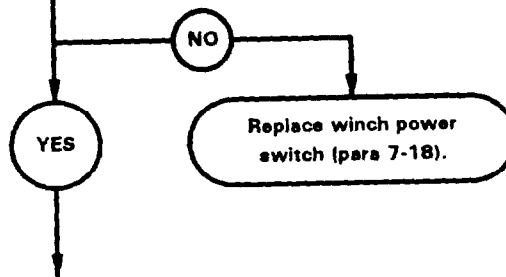


K2E9801A

ø88. 15K SELF-RECOVERY WINCH (SRW) DOES NOT REEL IN OR PAY OUT (CONT)

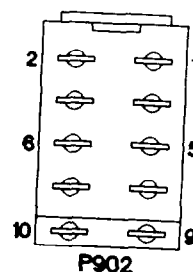
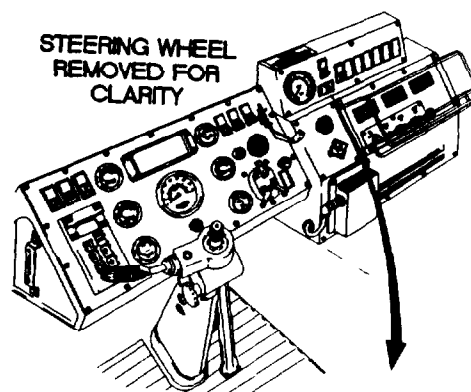
KNOWN INFO
Circuit breaker OK. PTO OK.
POSSIBLE PROBLEMS
Faulty winch power switch. Faulty auxiliary panel cable assembly. Faulty WINCH IN/OUT switch.

2.
Is continuity present between winch power switch terminals 6 and 27

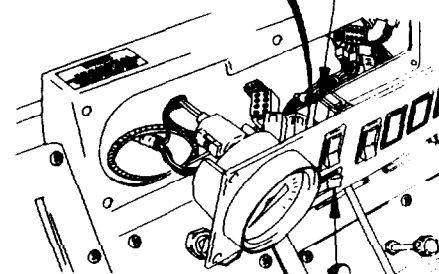


TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, winch power switch is faulty.

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

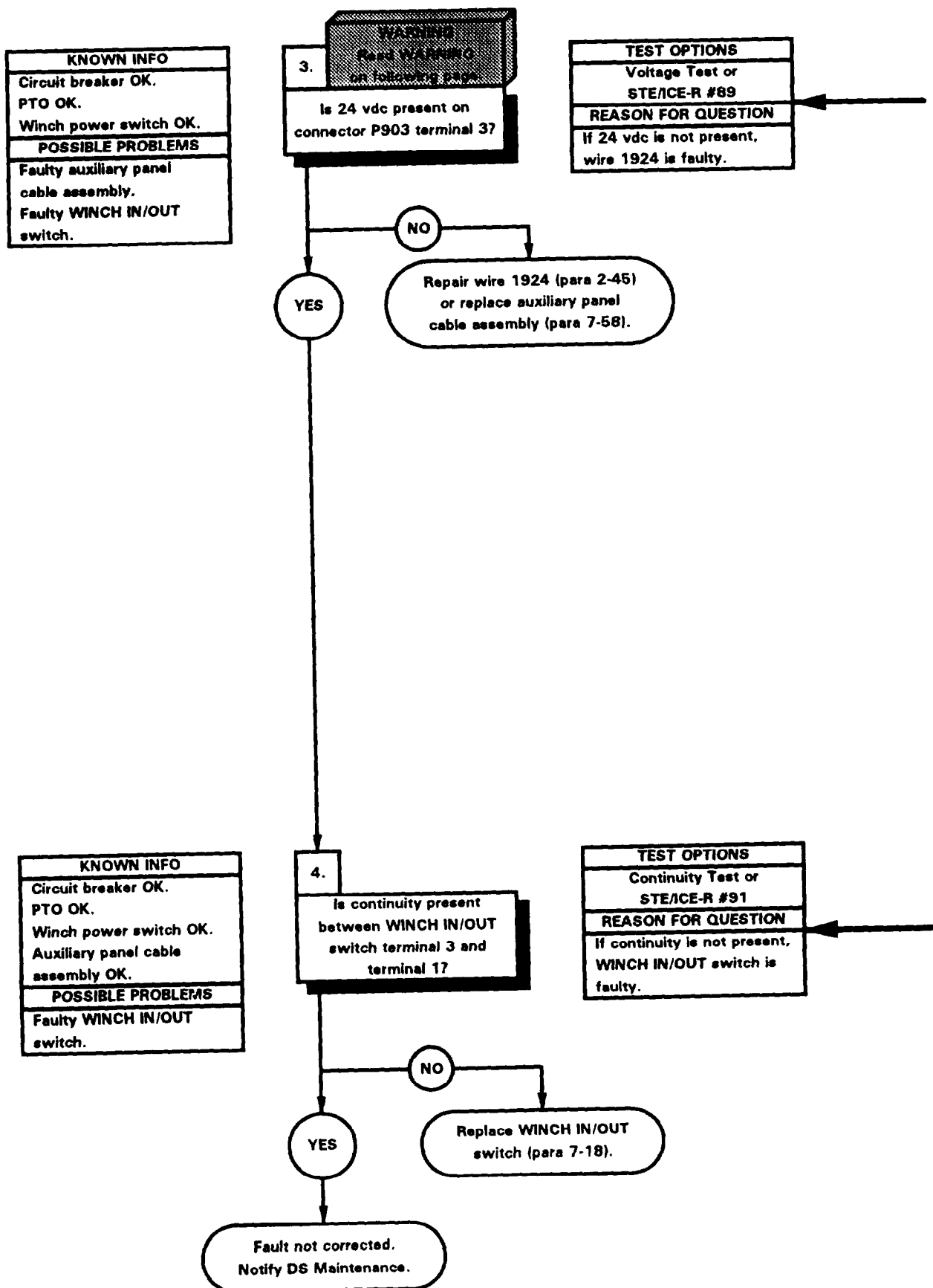


CONNECTOR
P902



X2E8802A

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



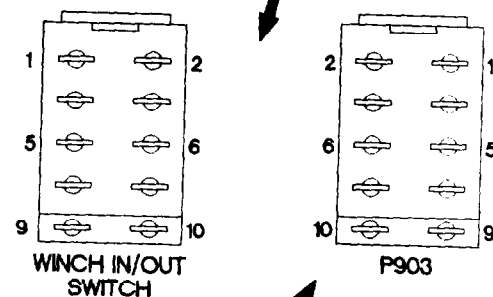
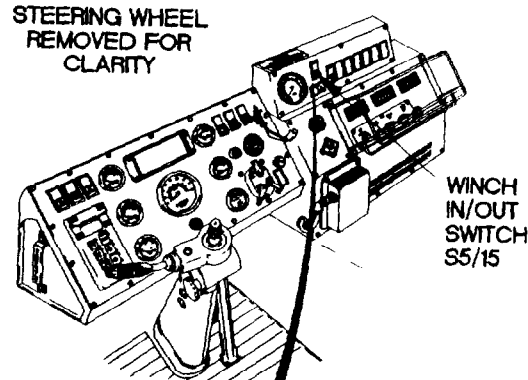
WARNING

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

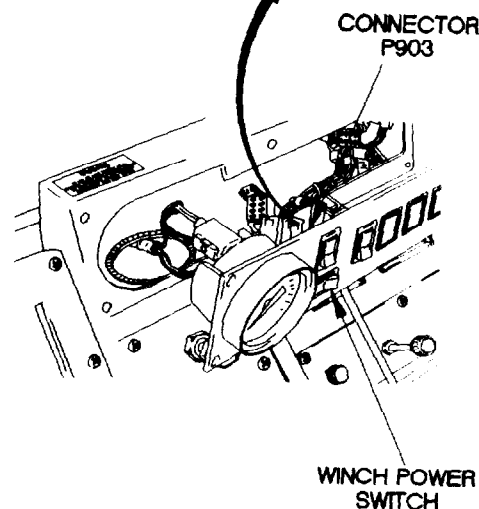
VOLTAGE TEST

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

STEERING WHEEL
REMOVED FOR
CLARITY

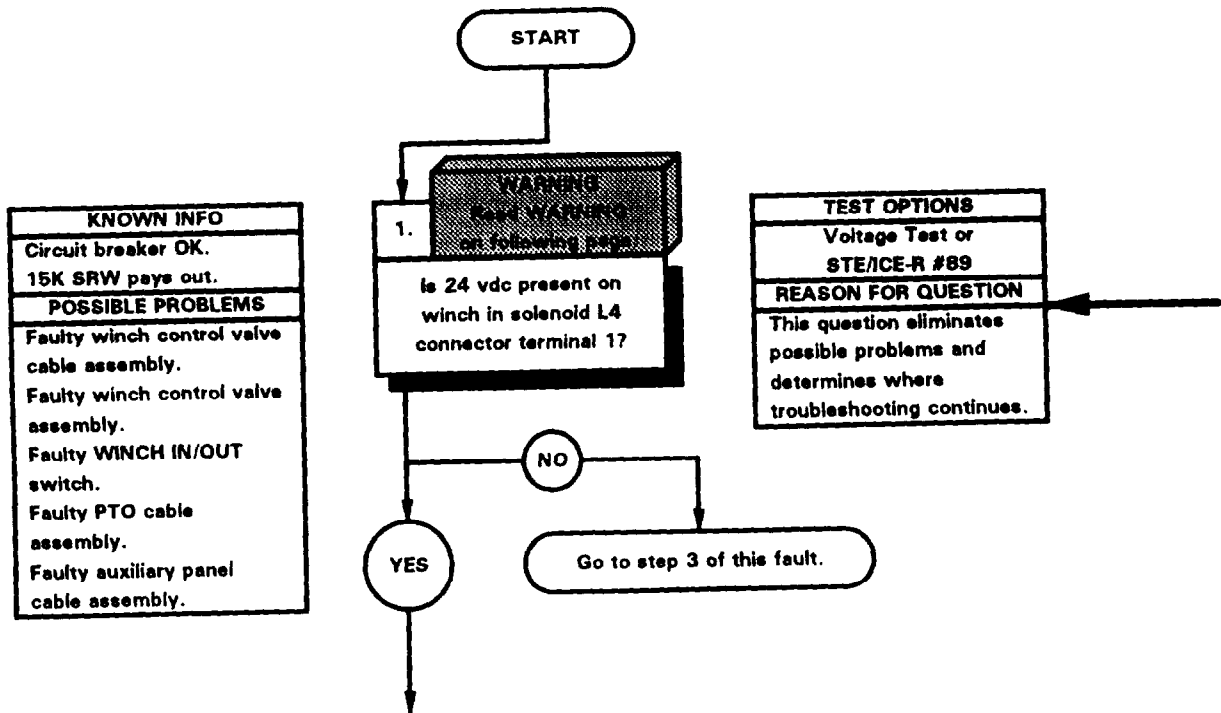
**CONTINUITY TEST**

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



K2E8803A

89. 15K SELF-RECOVERY WINCH (SRW) DOES NOT REEL IN			
INITIAL SETUP			
Equipment Condition Engine shut down (TM 9-2320-366-10-1).		Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) STE/CE-R (Item 41, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)	
Personnel Required (2)		Materials/Parts Wire, Elect, 50 ft (Item 71, Appendix D)	
References TM 9-4910-571-12&P			

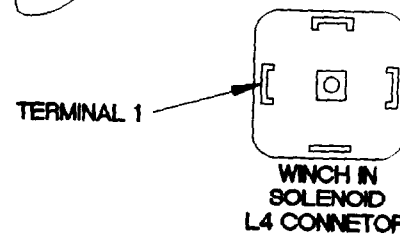
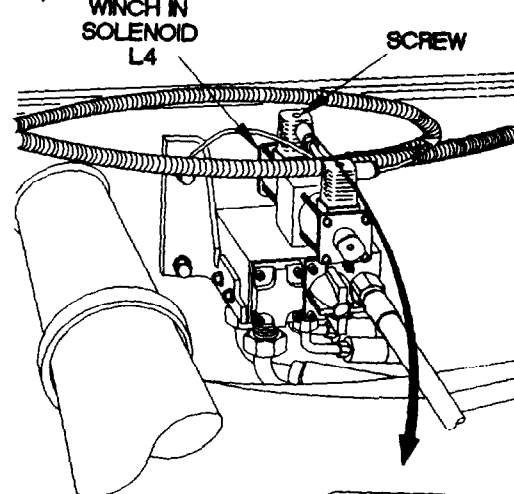
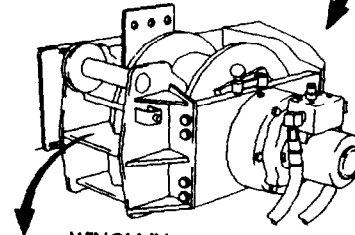
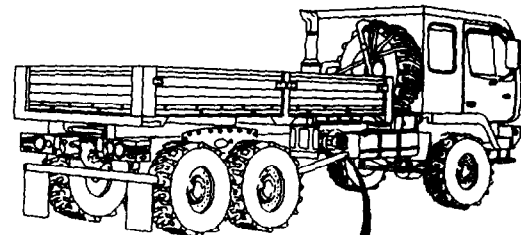


WARNING

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

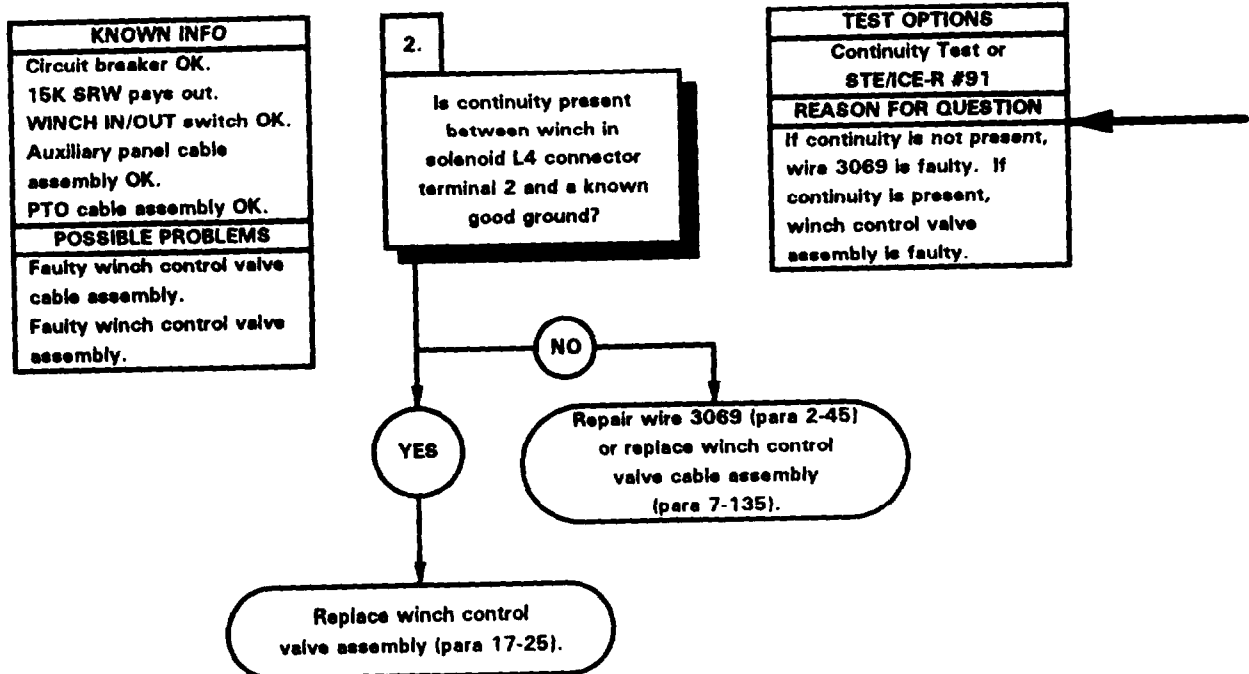
VOLTAGE TEST

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



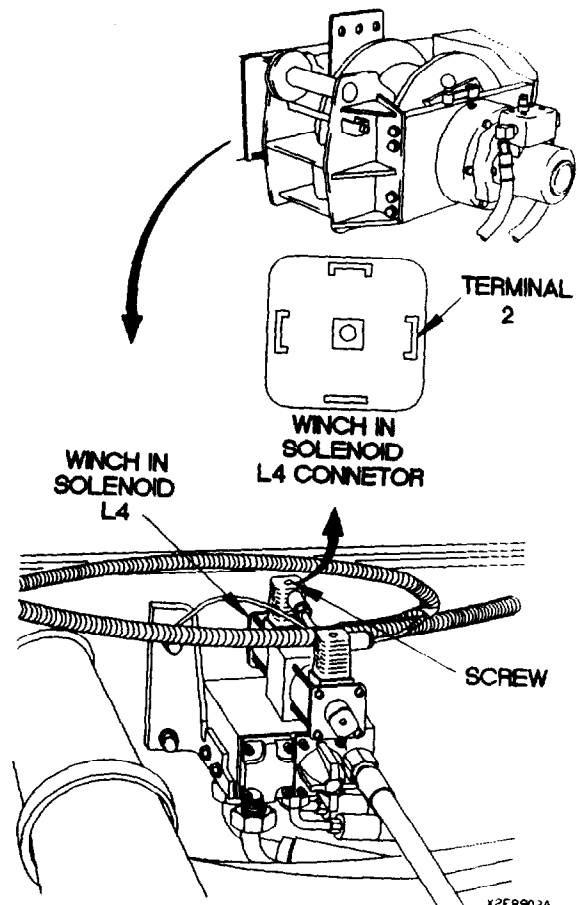
42C8901A

689. 15K SELF-RECOVERY WINCH (SRW) DOES NOT REEL IN (CONT)



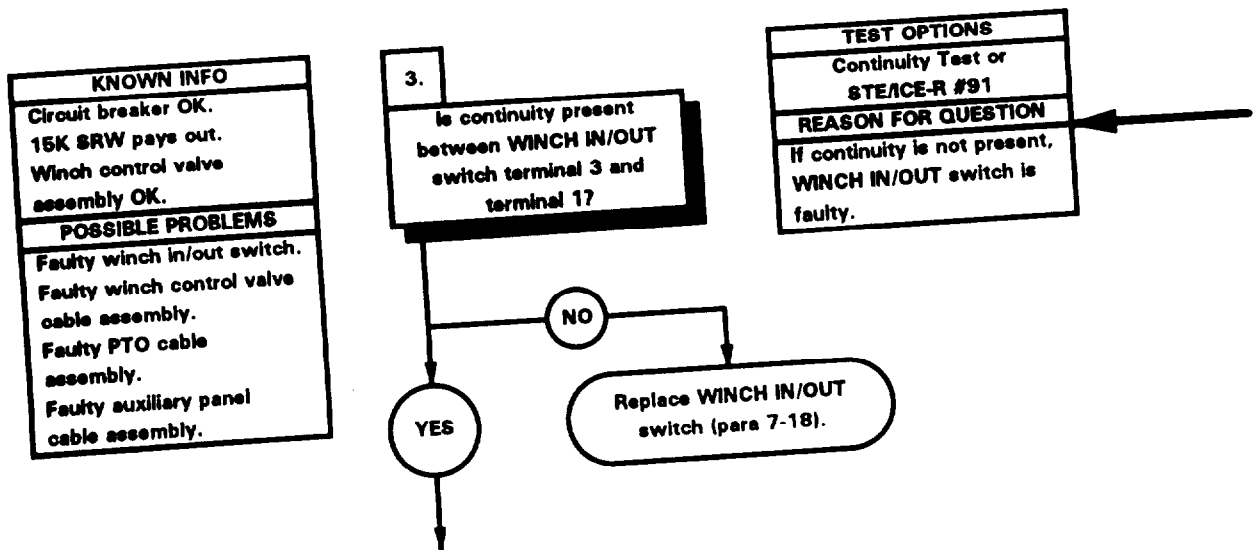
CONTINUITY TEST

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



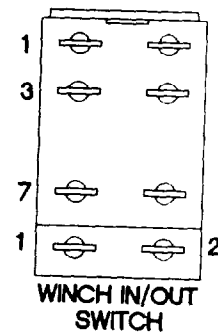
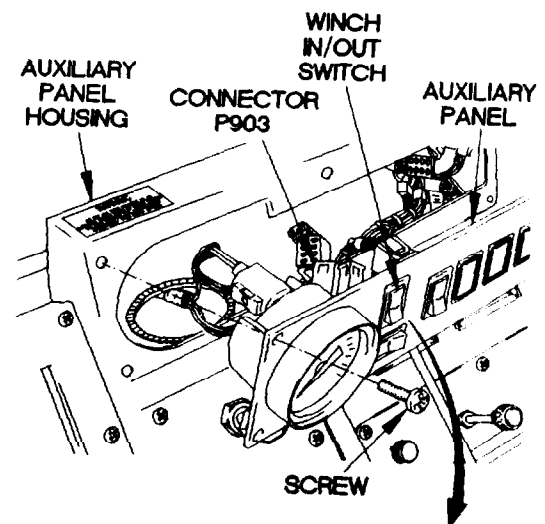
X2E8902A

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



CONTINUITY TEST

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



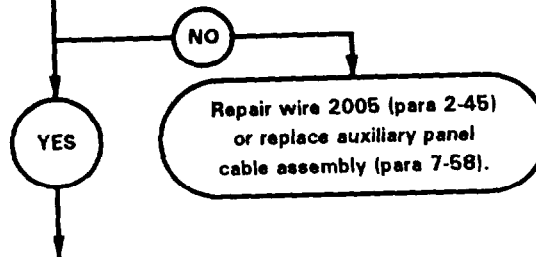
X2E8903A

89. 15K SELF-RECOVERY WINCH (SRW) DOES NOT REEL IN (CONT)

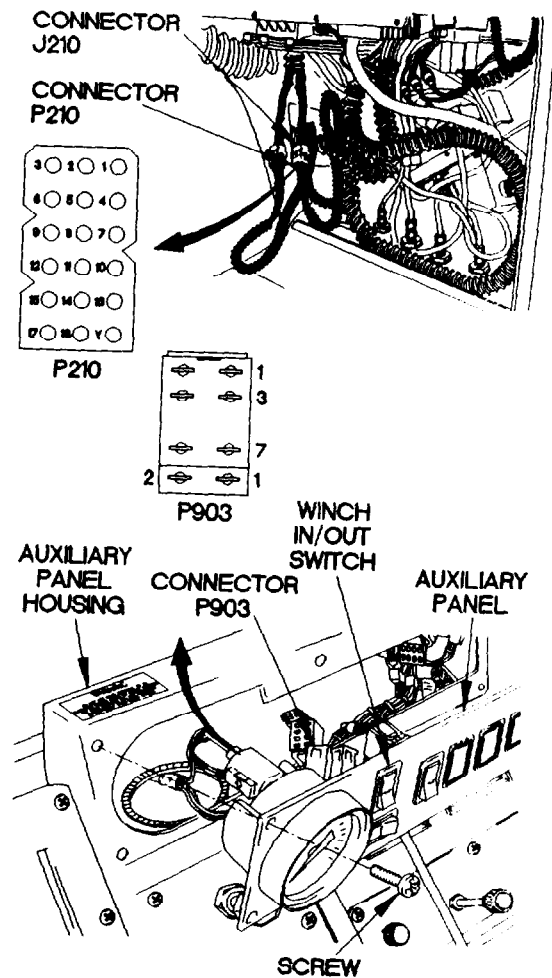
KNOWN INFO
Circuit breaker OK. 15K SRW pays out. Winch control valve assembly OK. WINCH IN/OUT switch OK.
POSSIBLE PROBLEMS
Faulty winch control valve cable assembly. Faulty PTO cable assembly. Faulty auxiliary panel cable assembly.

4.
Is continuity present between connector P903-1 and connector P210-14?

TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 2005 is faulty.



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

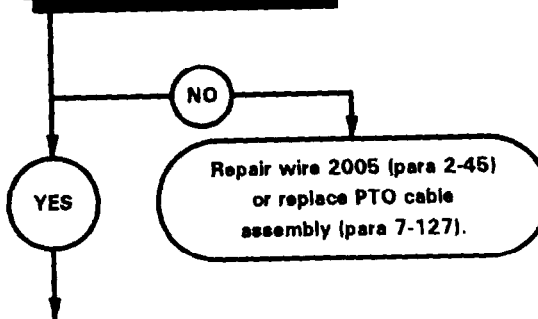


42E8904A

89. 15K SELF-RECOVERY WINCH (SRW) DOES NOT REEL IN (CONT)

KNOWN INFO
Circuit breaker OK. 15K SRW pays out. Winch control valve assembly OK. WINCH IN/OUT switch OK. Auxiliary panel cable assembly OK.
POSSIBLE PROBLEMS
Faulty winch control valve cable assembly. Faulty PTO cable assembly.

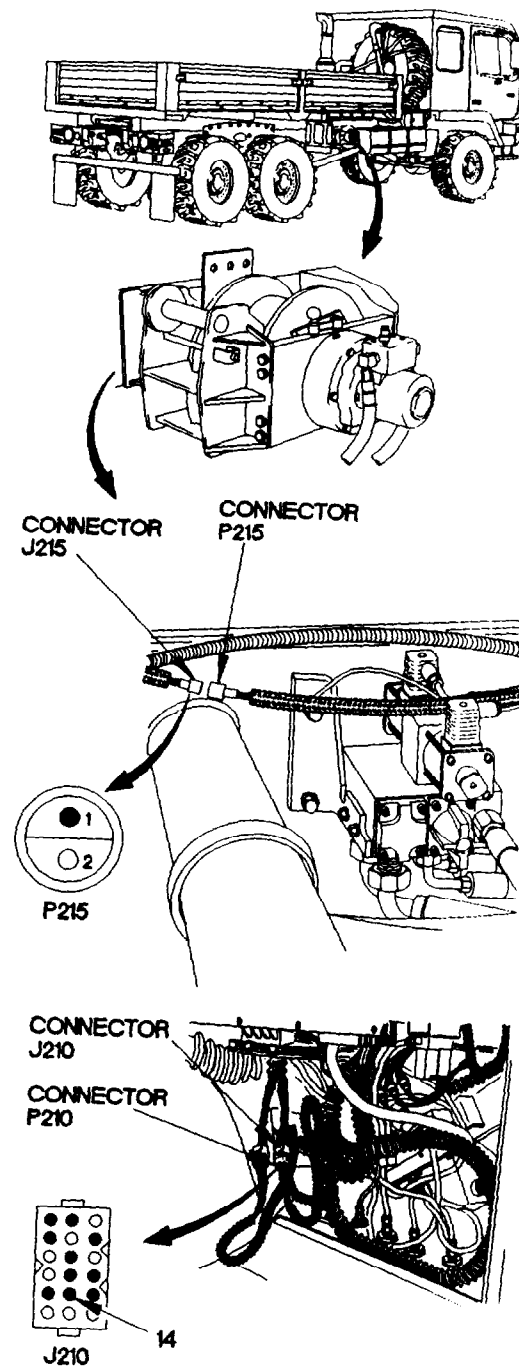
5.
Is continuity present between connector J210-14 and connector P215-27?



TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, wire 2005 is faulty.

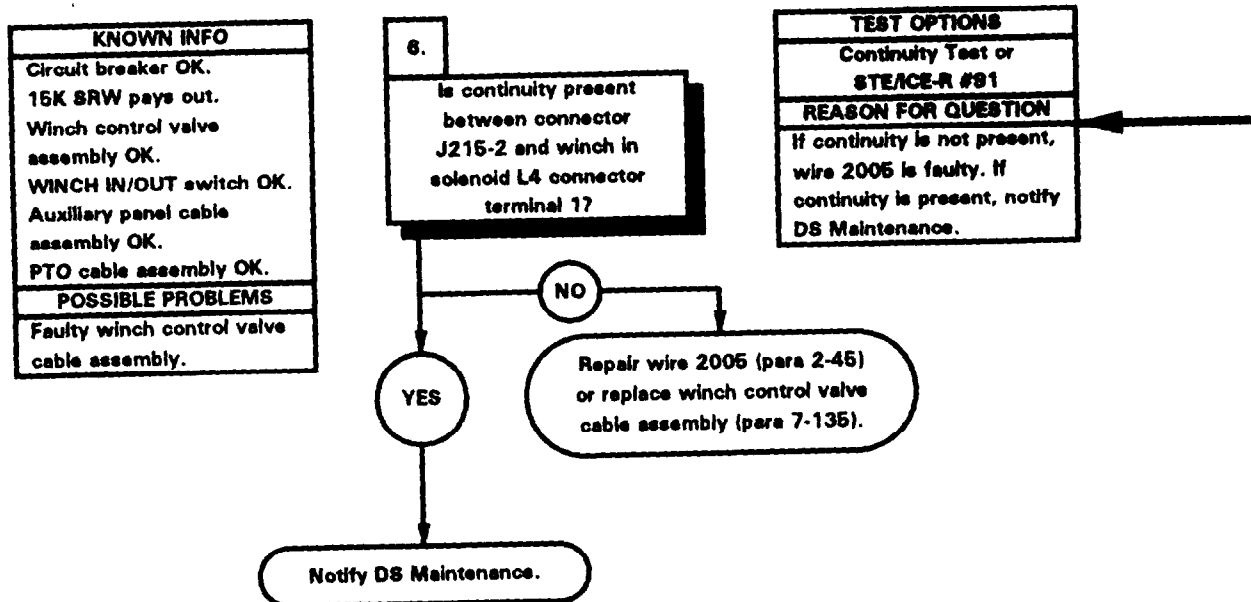
CONTINUITY TEST

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



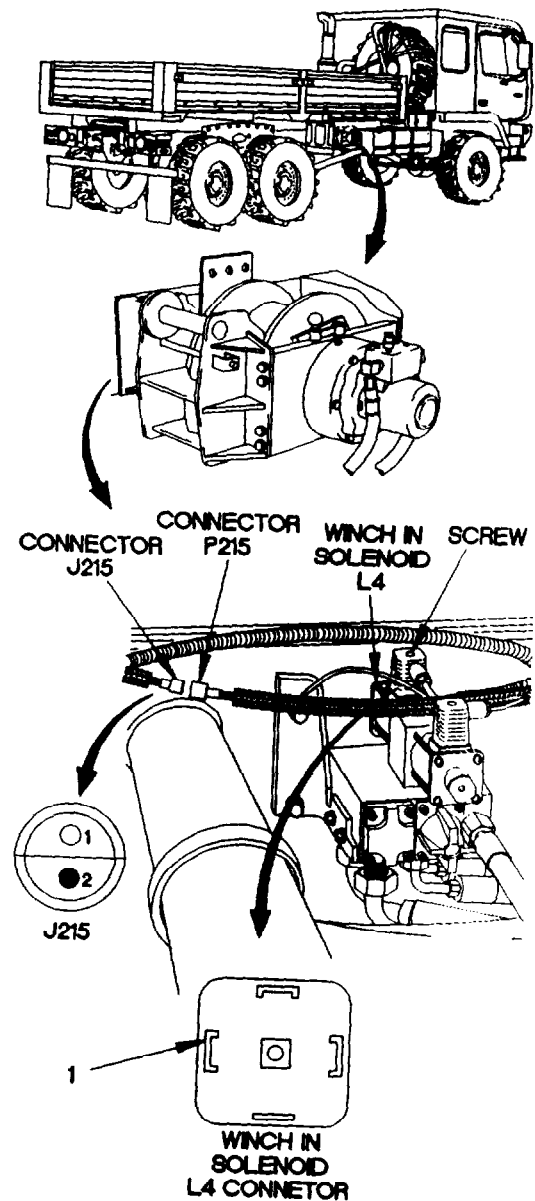
42E9806A

ø89. 15K SELF-RECOVERY WINCH (SRW) DOES NOT REEL IN (CONT)



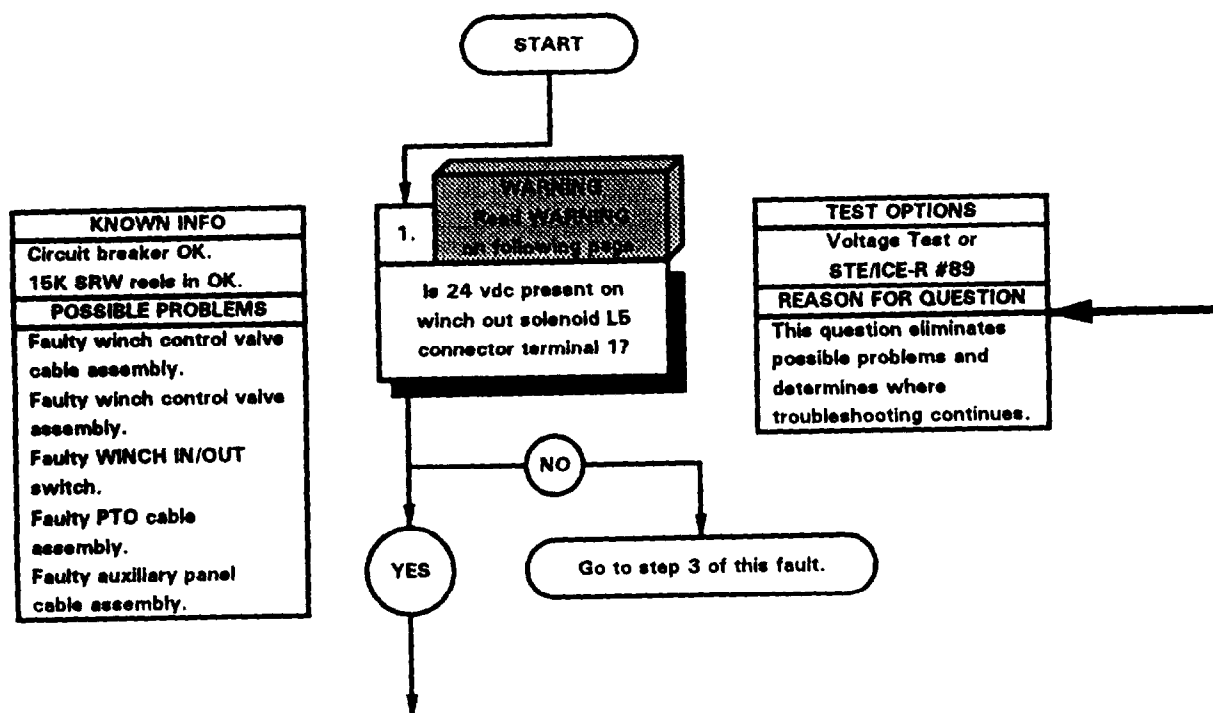
CONTINUITY TEST

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



42C8807A

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

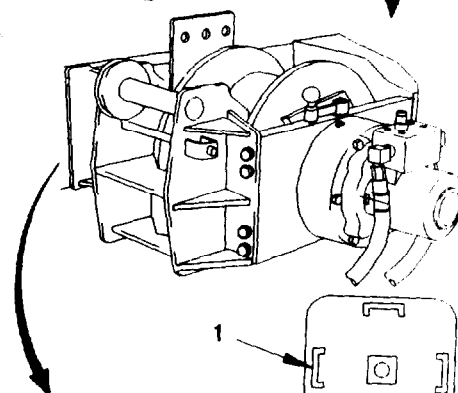
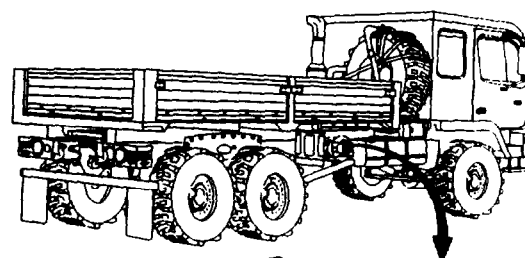


WARNING

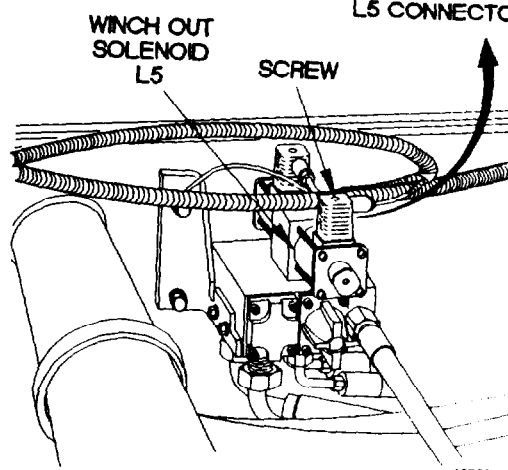
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

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

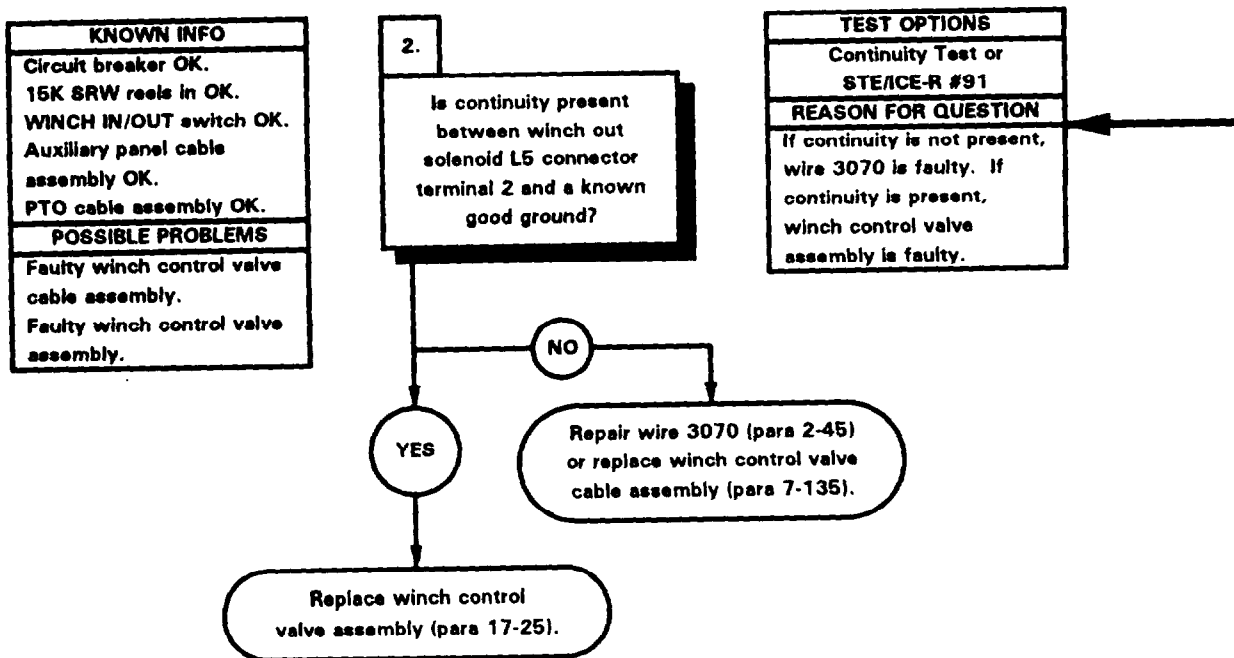


WINCH OUT
SOLENOID
L5 CONNECTOR



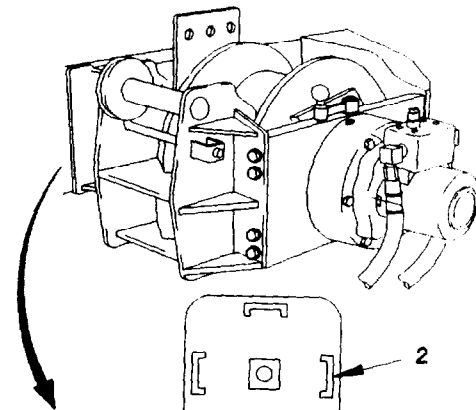
42E 9001A

90. 15K SELF-RECOVERY WINCH (SRW) DOES NOT PAY OUT (CONT)

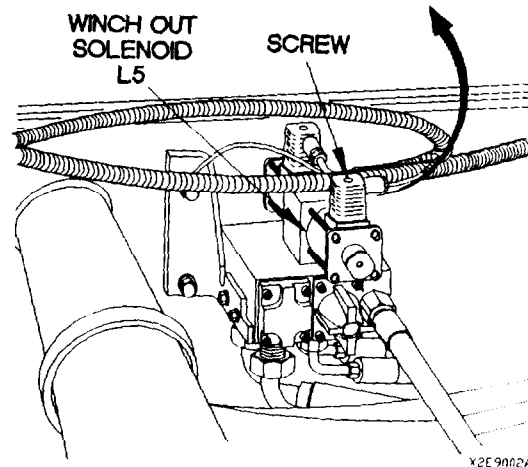


CONTINUITY TEST

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

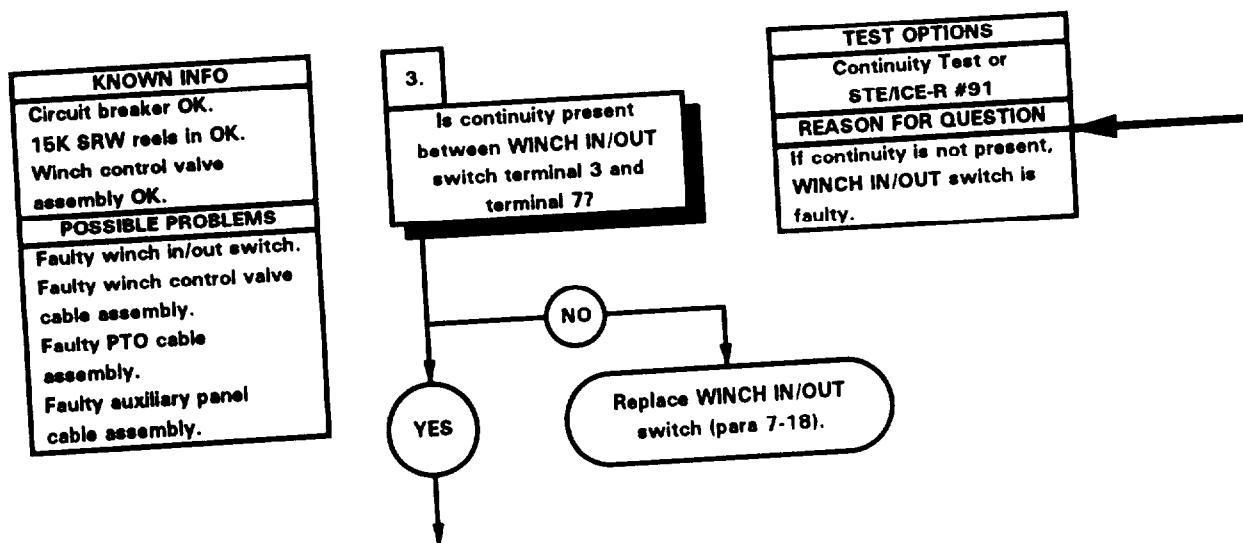


WINCH OUT
SOLENOID
L5 CONNECTOR



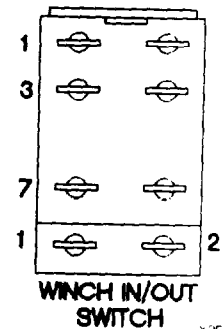
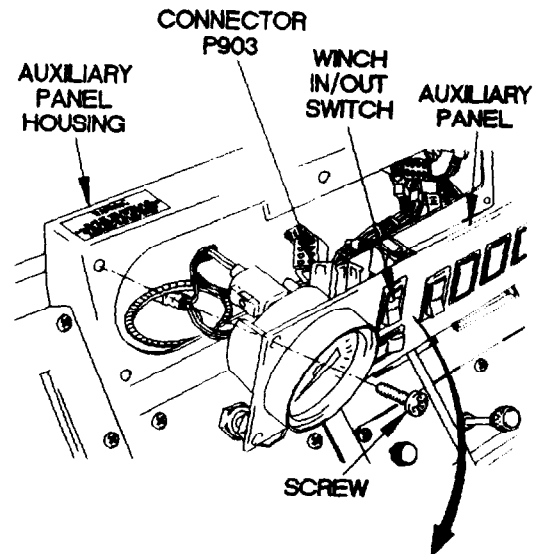
X2E9002A

90. 15K SELF-RECOVERY WINCH (SRW) DOES NOT PAY OUT (CONT)



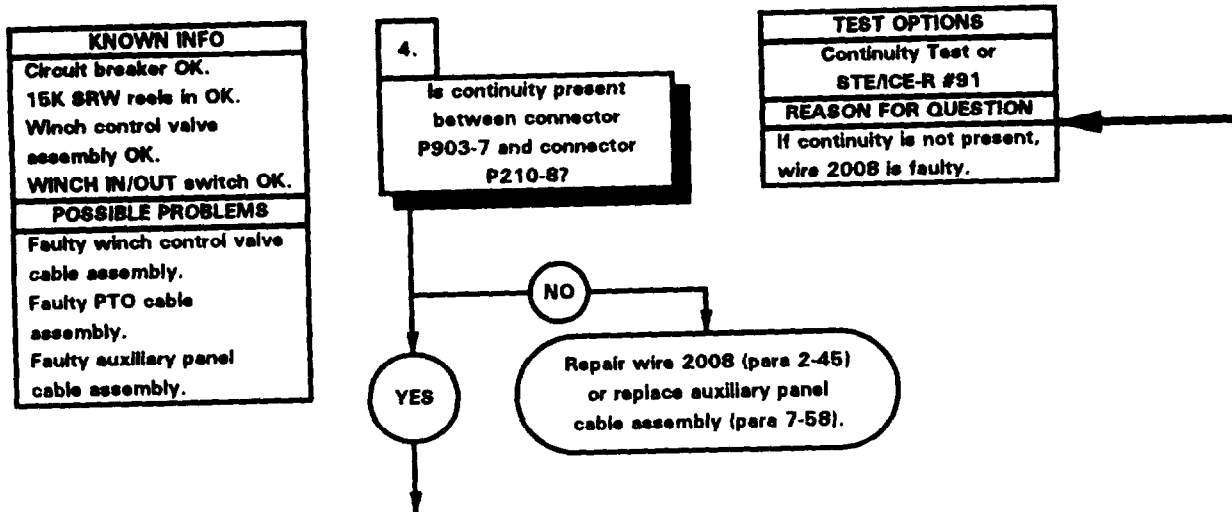
CONTINUITY TEST

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



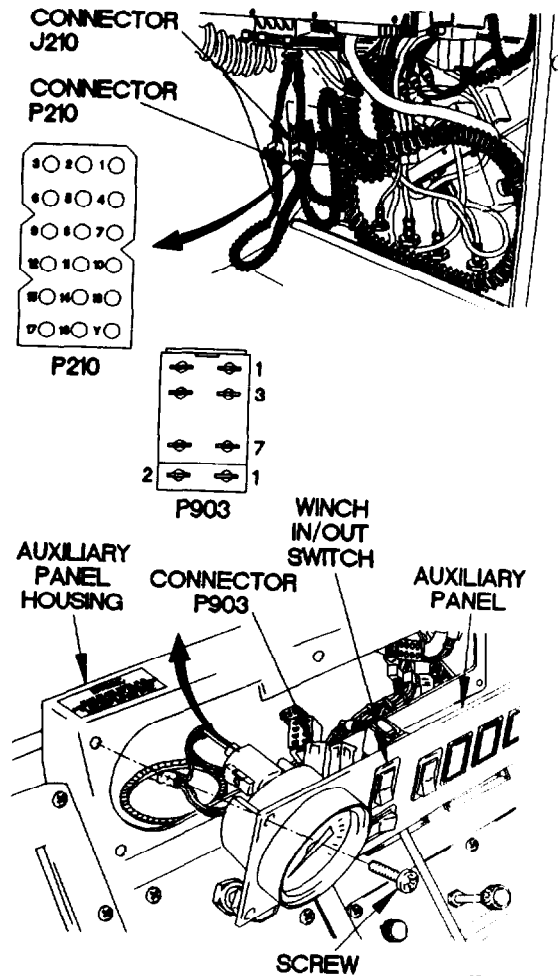
X2C9003A

90. 15K SELF-RECOVERY WINCH (SRW) DOES NOT PAY OUT (CONT)



CONTINUITY TEST

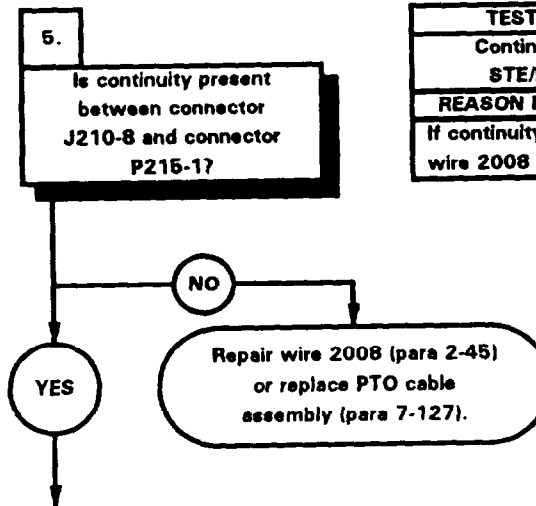
- (1) Remove kick panel (para 16-3).
- (2) Disconnect connector P210 from connector J210.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to connector P903-7.
- (5) Connect negative (-) probe of multimeter to connector P210-8 and note reading on multimeter.
- (6) If continuity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



42E8914A

690. 15K SELF-RECOVERY WINCH (SRW) DOES NOT PAY OUT (CONT)

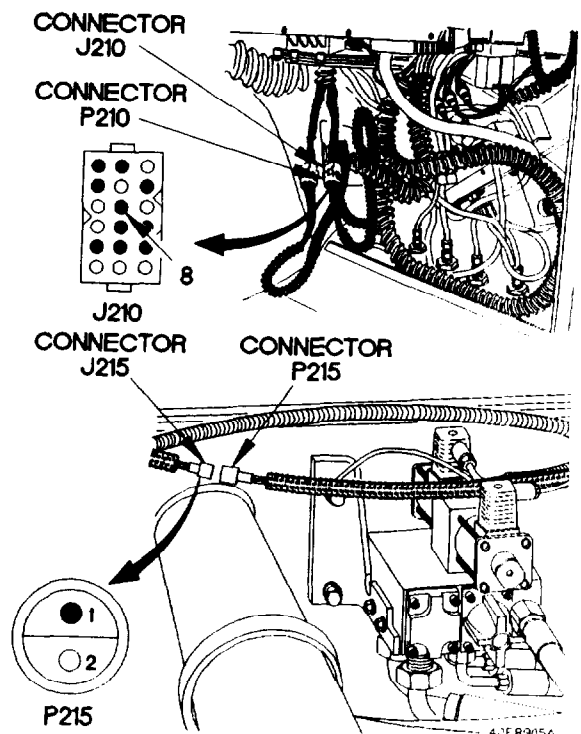
KNOWN INFO
Circuit breaker OK. 15K SRW reels in OK. Winch control valve assembly OK. WINCH IN/OUT switch OK. Auxiliary panel cable assembly OK.
POSSIBLE PROBLEMS
Faulty winch control valve cable assembly. Faulty PTO cable assembly.



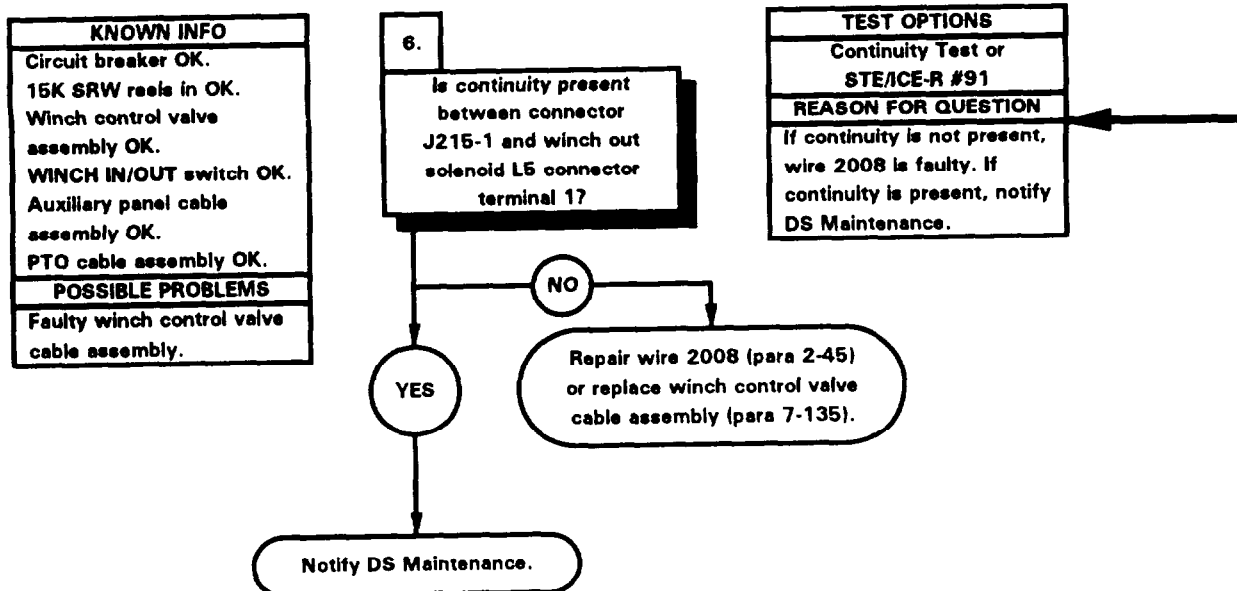
TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, wire 2008 is faulty.

CONTINUITY TEST

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

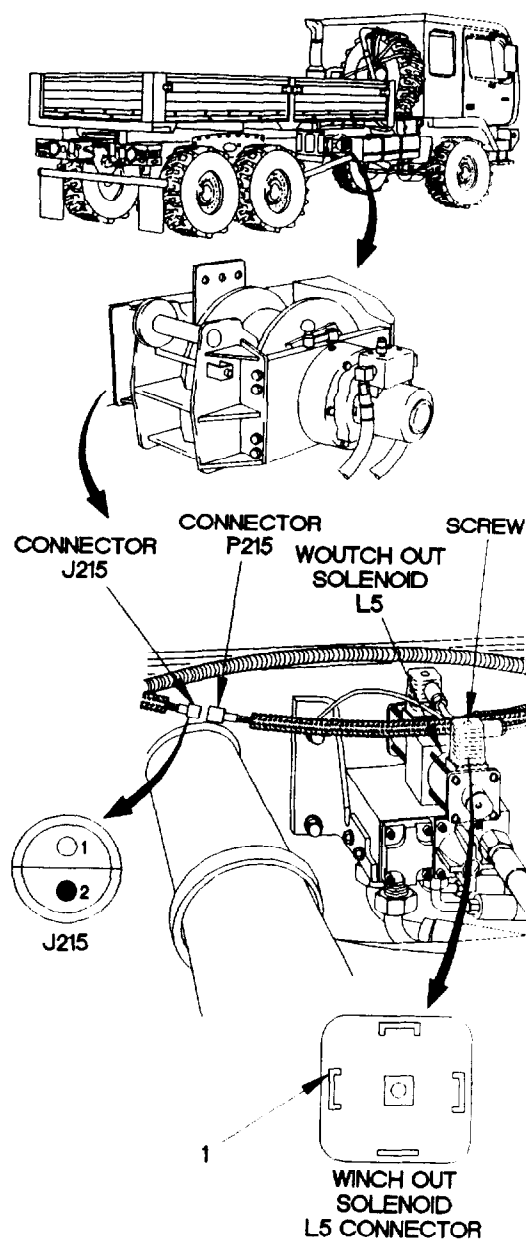


690. 15K SELF-RECOVERY WINCH (SRW) DOES NOT PAY OUT (CONT)

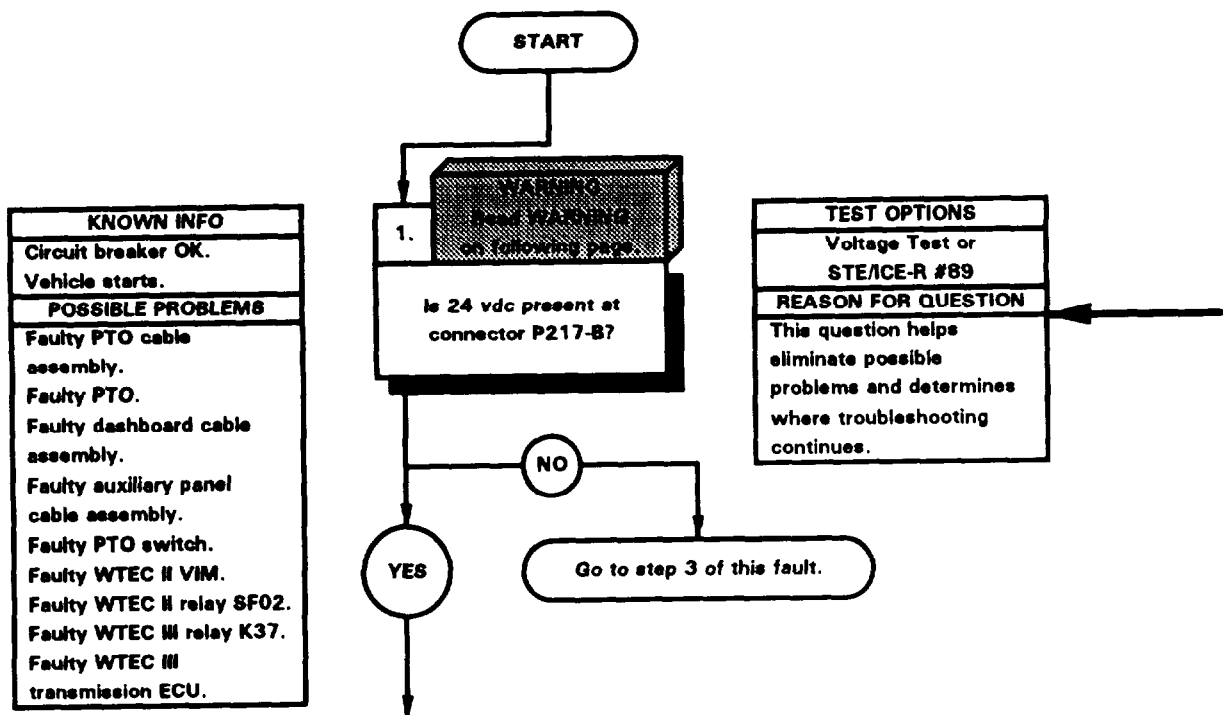


CONTINUITY TEST

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



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

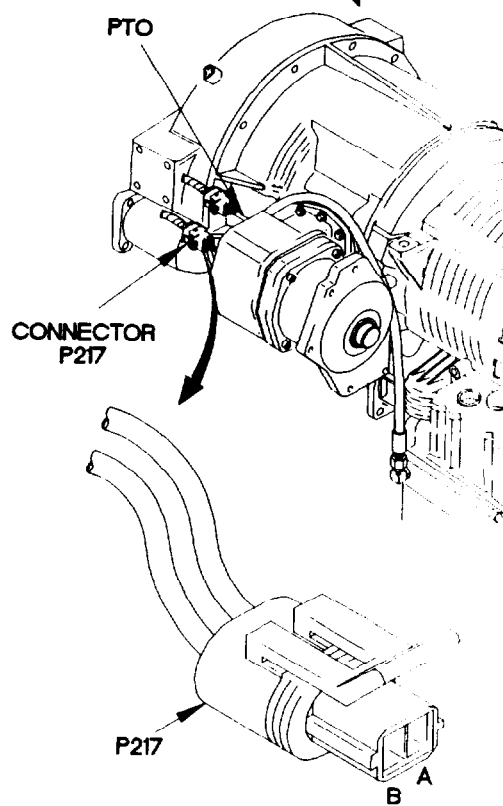


WARNING

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

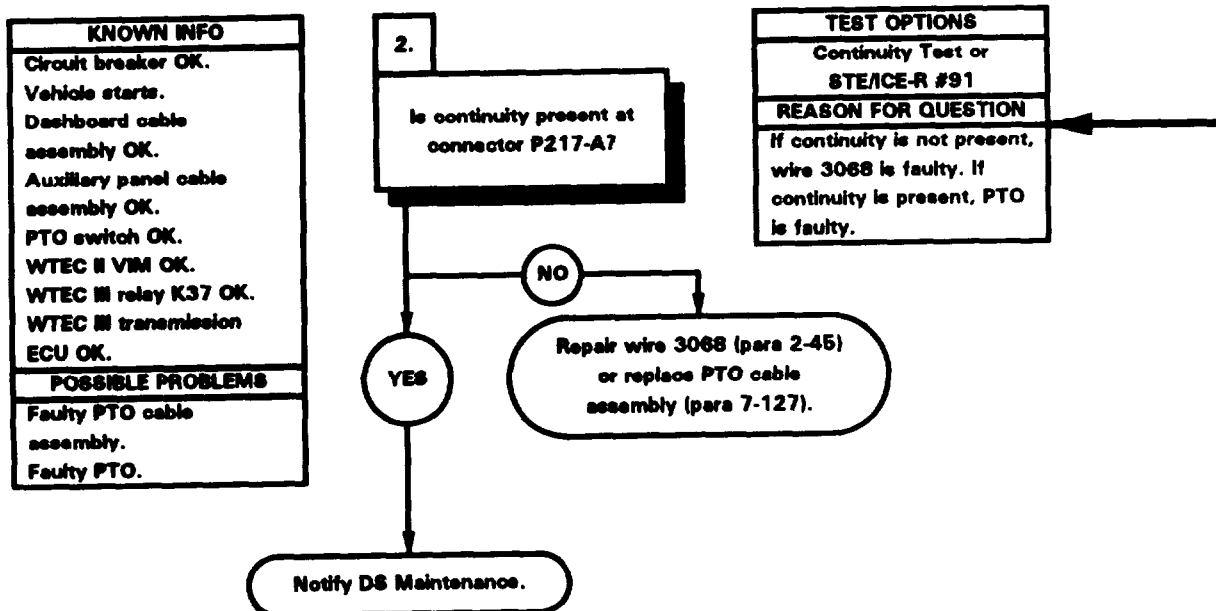
VOLTAGE TEST

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



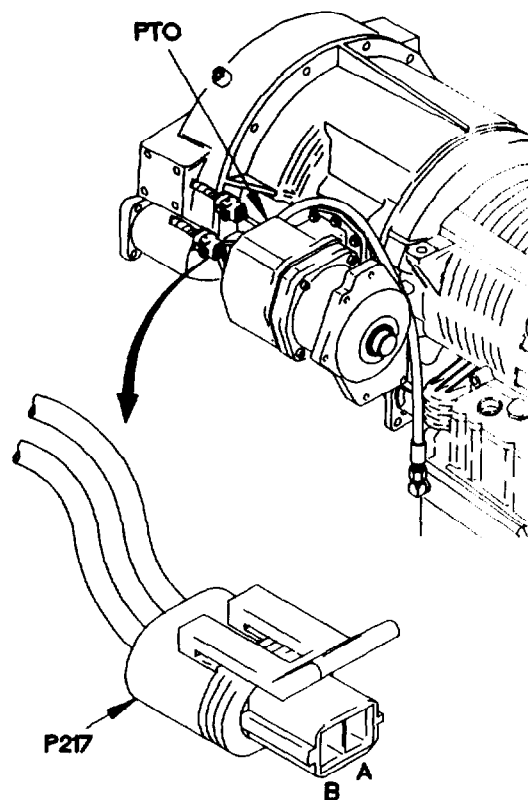
K2E91011

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



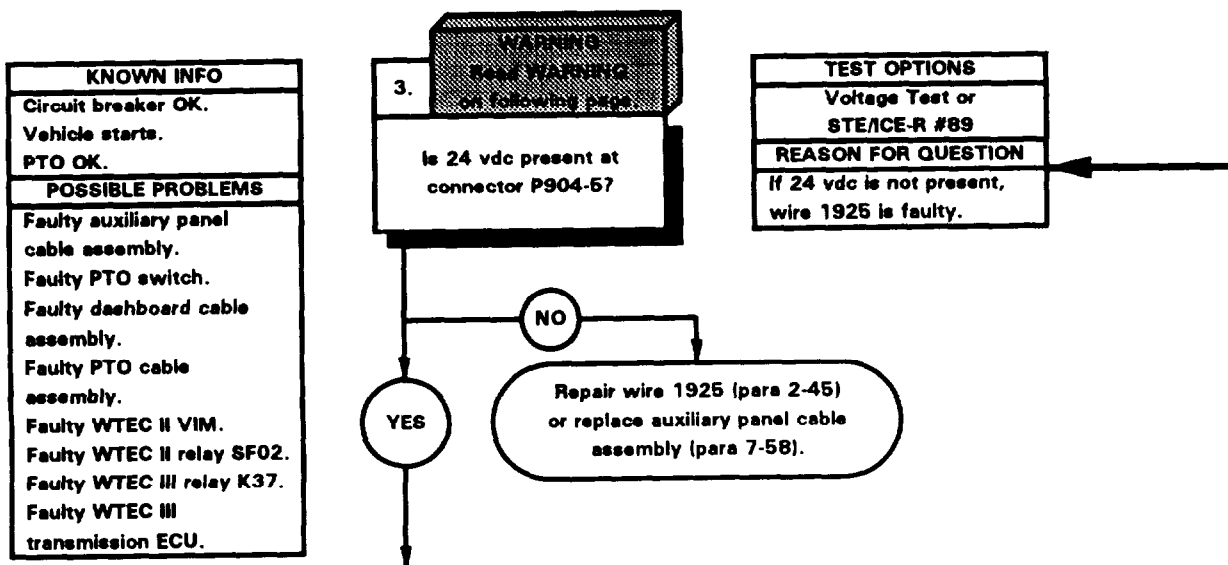
CONTINUITY TEST

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



K2E91021

ø91. POWER TAKE-OFF (PTO) DOES NOT OPERATE (CONT)

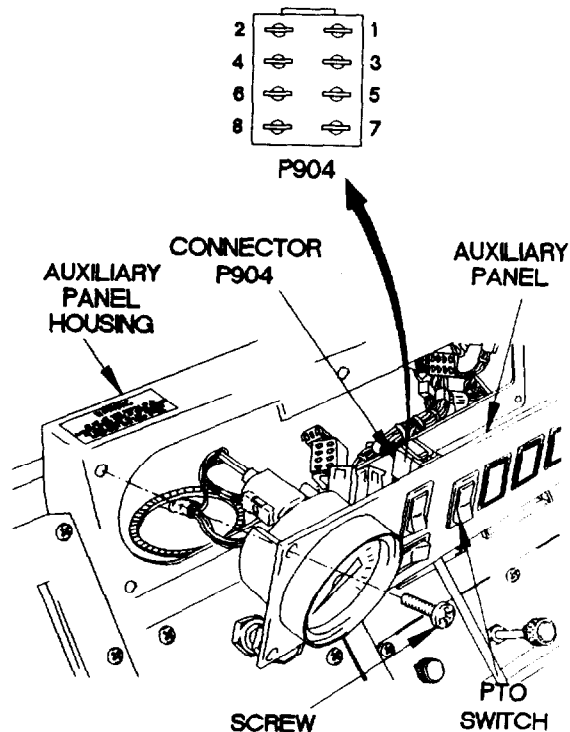


WARNING

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

VOLTAGE TEST

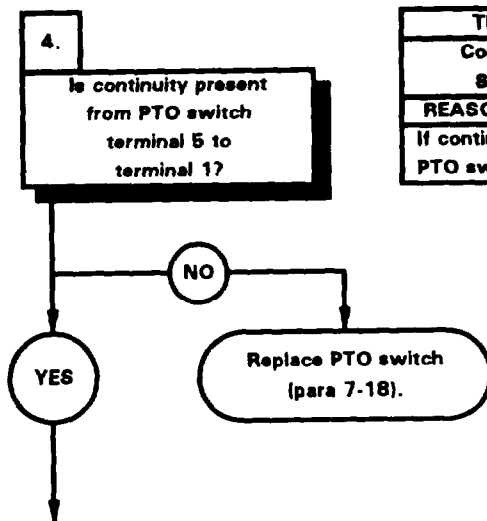
- (1) Remove six screws from auxiliary panel.
- (2) Lift auxiliary panel from auxiliary panel housing to gain access.
- (3) Disconnect connector P904 from PTO switch.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to connector P904-5.
- (6) Connect negative (-) probe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



X2E9104A

ø91. POWER TAKE-OFF (PTO) DOES NOT OPERATE (CONT)

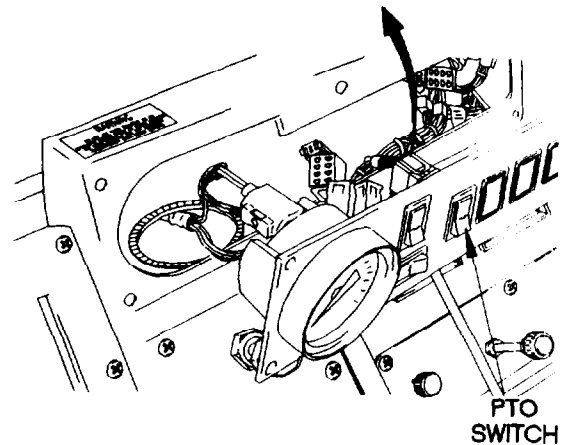
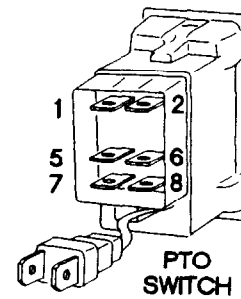
KNOWN INFO
Circuit breaker OK. Vehicle starts. PTO OK.
POSSIBLE PROBLEMS
Faulty PTO switch. Faulty auxiliary panel cable assembly. Faulty dashboard cable assembly. Faulty PTO cable assembly. Faulty WTEC II VIM. Faulty WTEC II relay SF02. Faulty WTEC III relay K37. Faulty WTEC III transmission ECU.



TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, PTO switch is faulty.

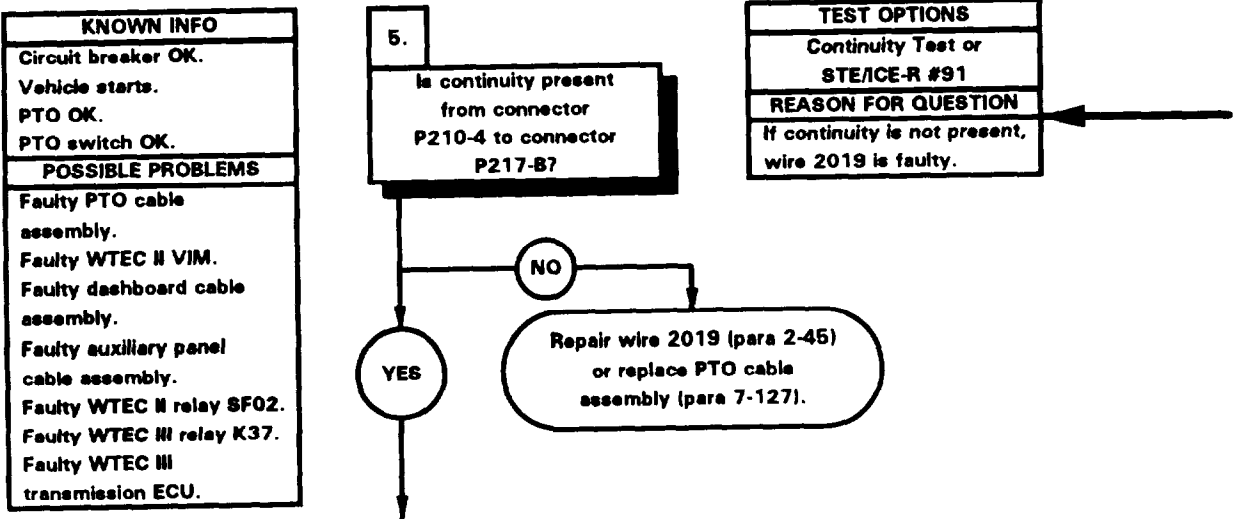
CONTINUITY TEST

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



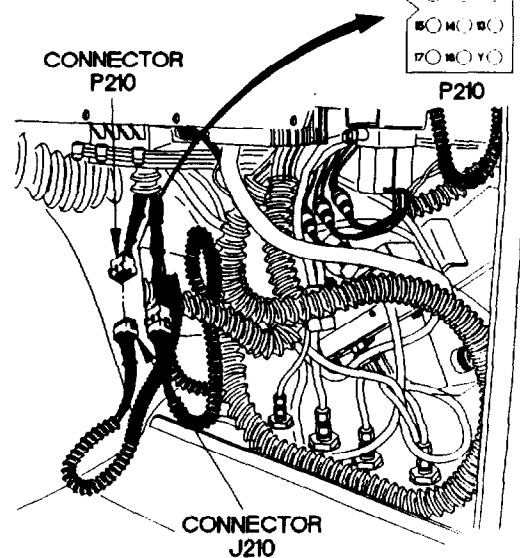
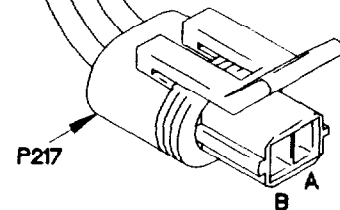
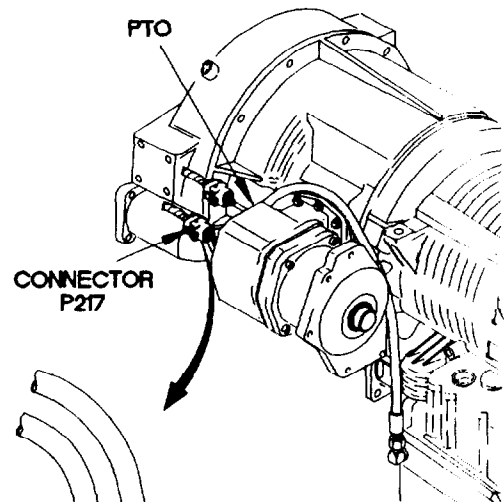
X2E91051

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



CONTINUITY TEST

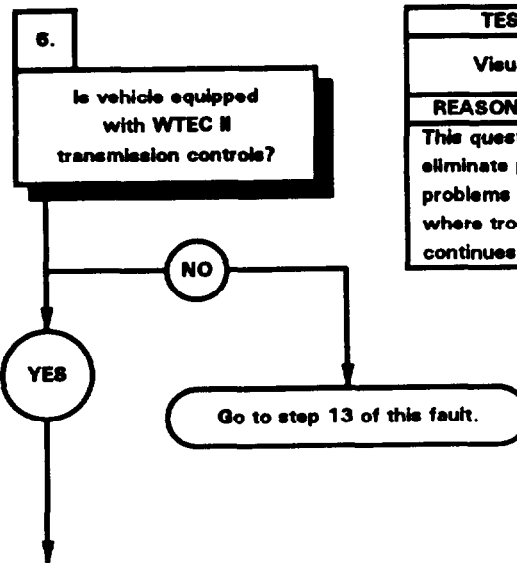
- (1) Remove kick panel (para 16-3).
- (2) Disconnect connector P210 from connector J210.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to connector P210-4.
- (5) Disconnect connector P217 from PTO.
- (6) Connect negative (-) probe of multimeter to connector P217-B and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



K2E 91101

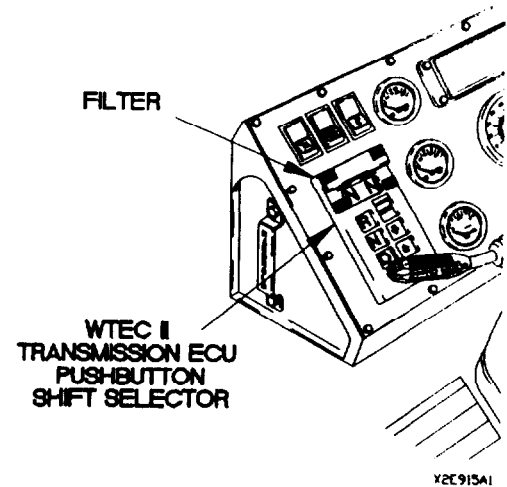
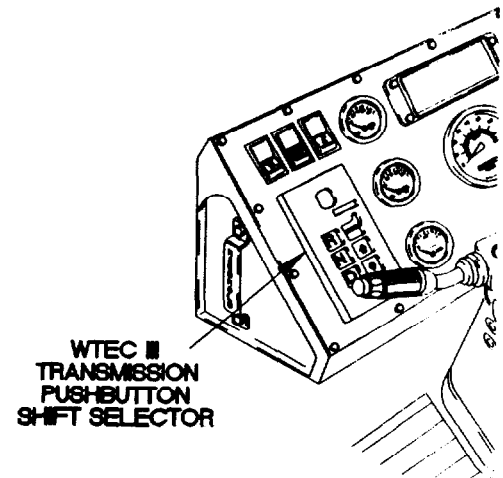
91. POWER TAKE-OFF (PTO) DOES NOT OPERATE (CONT)

KNOWN INFO
Circuit breaker OK. Vehicle starts. PTO OK. PTO switch OK. PTO cable assembly OK.
POSSIBLE PROBLEMS
Faulty WTEC II VIM. Faulty dashboard cable assembly. Faulty auxiliary panel cable assembly. Faulty WTEC II relay SF02. Faulty WTEC III relay K37. Faulty WTEC III cab transmission harness. Faulty WTEC III transmission ECU.



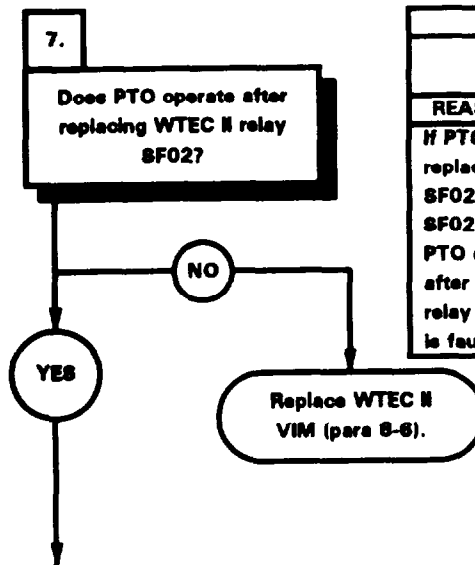
TEST OPTIONS
Visual inspection
REASON FOR QUESTION
This question helps eliminate possible problems and determines where troubleshooting continues.

- (1) Check if vehicle is equipped with WTEC II TEPSS.
- (2) If transmission pushbutton shift selector is not mounted with four screws and does not have a filter cover, go to step 13.



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

KNOWN INFO
Circuit breaker OK. Vehicle starts. PTO OK. PTO switch OK. PTO cable assembly OK.
POSSIBLE PROBLEMS
Faulty WTEC II VIM. Faulty WTEC II dashboard cable assembly. Faulty auxiliary panel cable assembly. Faulty WTEC II relay SF02.

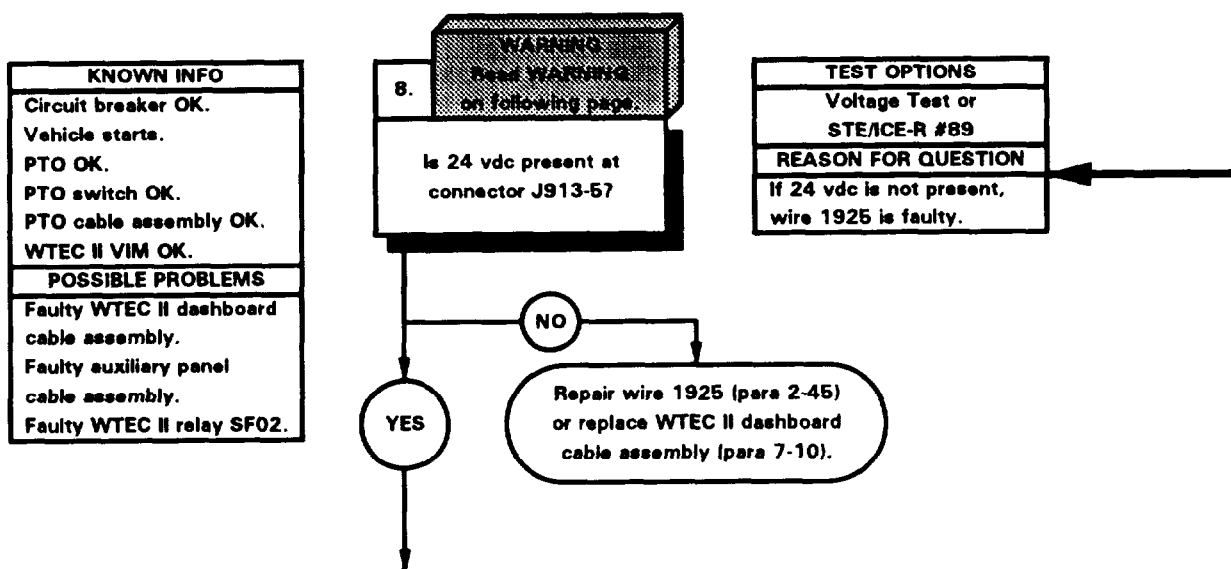


TEST OPTIONS
Operational Test
REASON FOR QUESTION
If PTO operates after replacing WTEC II relay SF02, WTEC II relay SF02 is faulty. If PTO does not operate after replacing WTEC II relay SF02, WTEC II VIM is faulty.

OPERATIONAL TEST

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

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

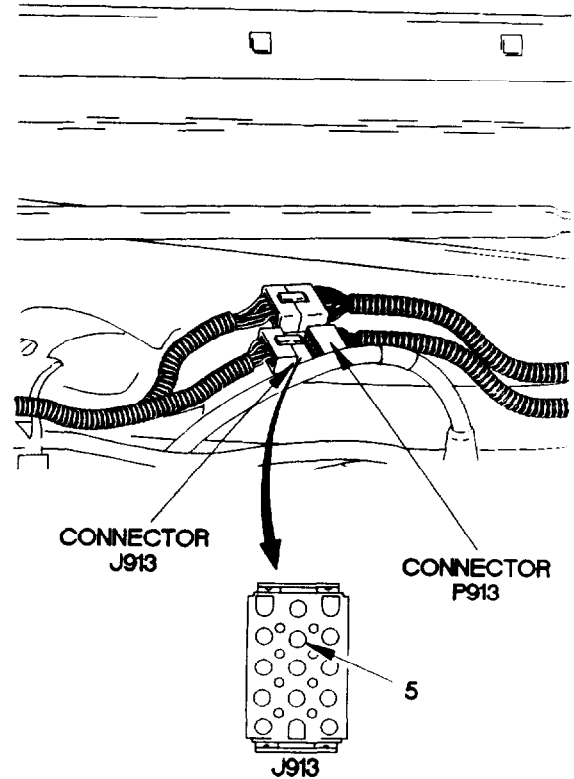


WARNING

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

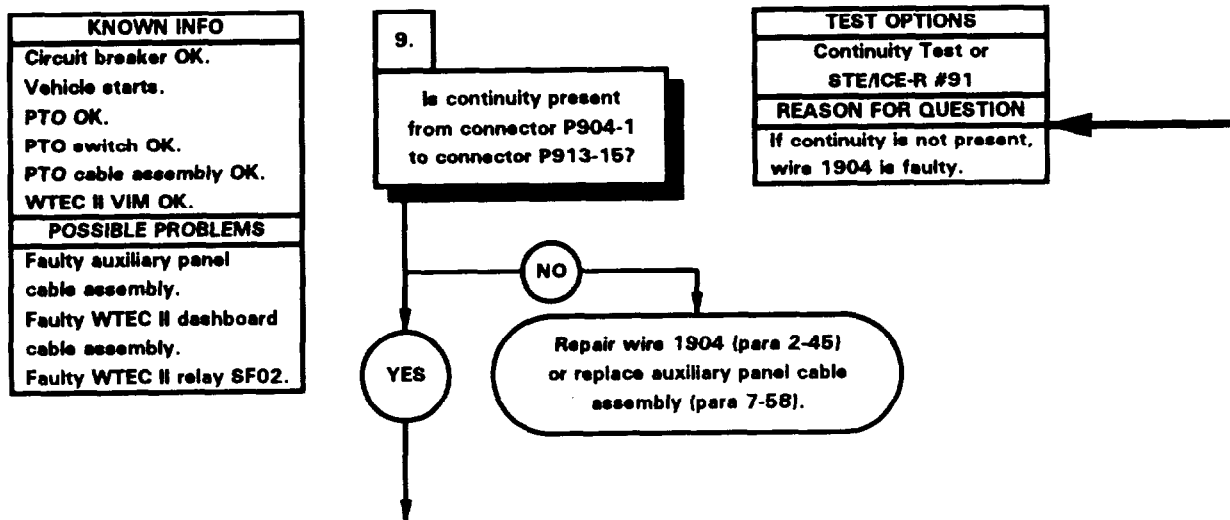
VOLTAGE TEST

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



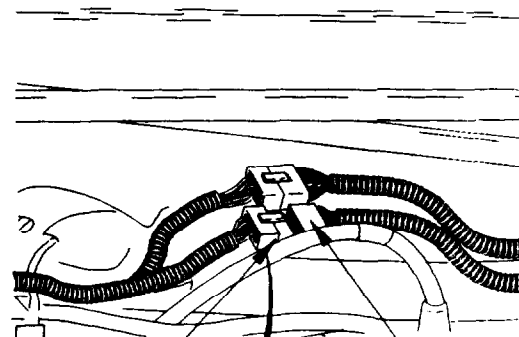
X2E 91031

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



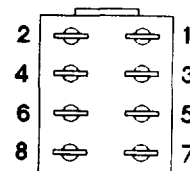
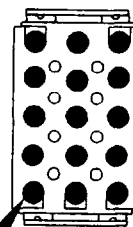
CONTINUITY TEST

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



CONNECTOR J913

CONNECTOR P913

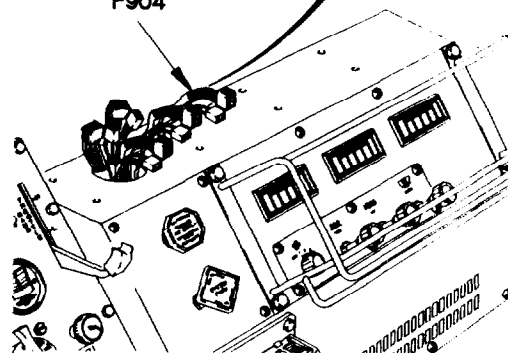


P913

P904

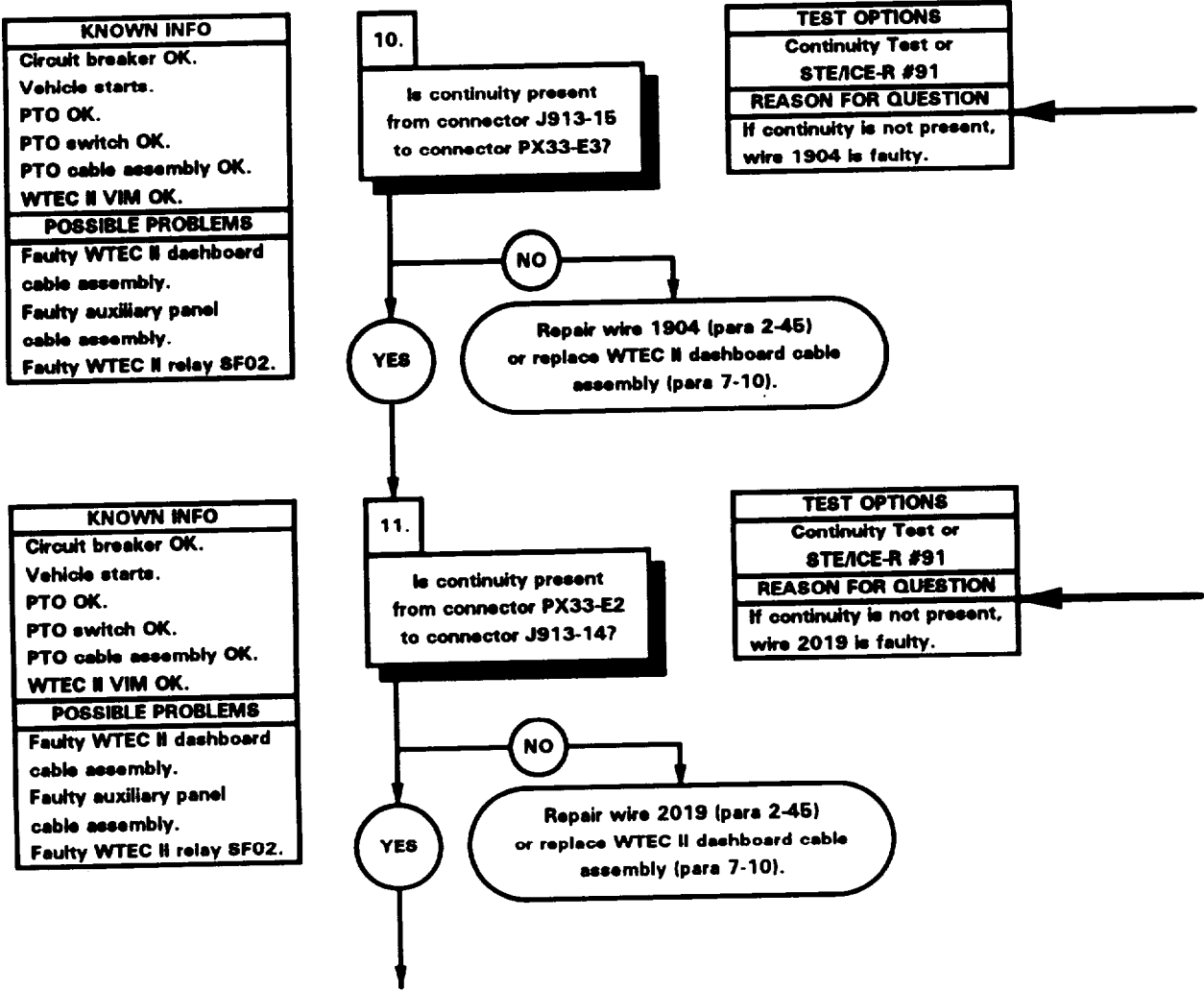
15

CONNECTOR P904



x2E91061

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

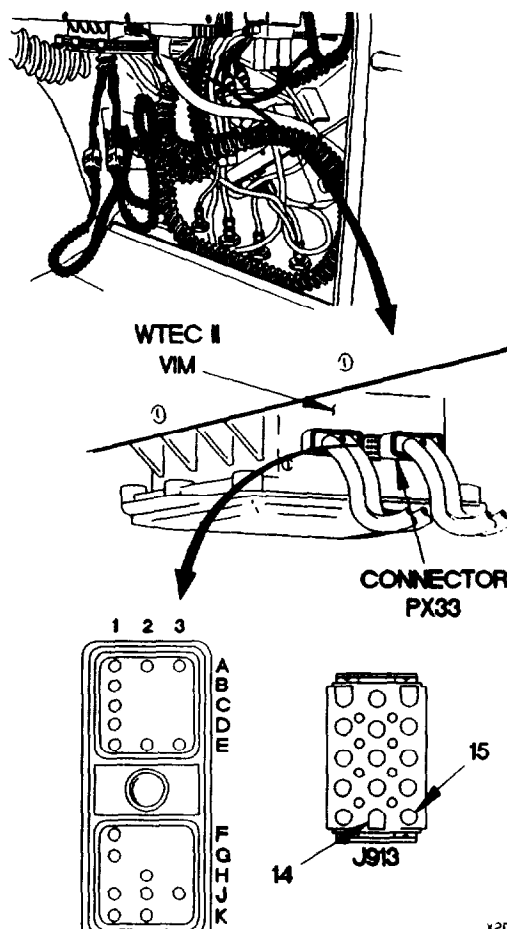


CONTINUITY TEST

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

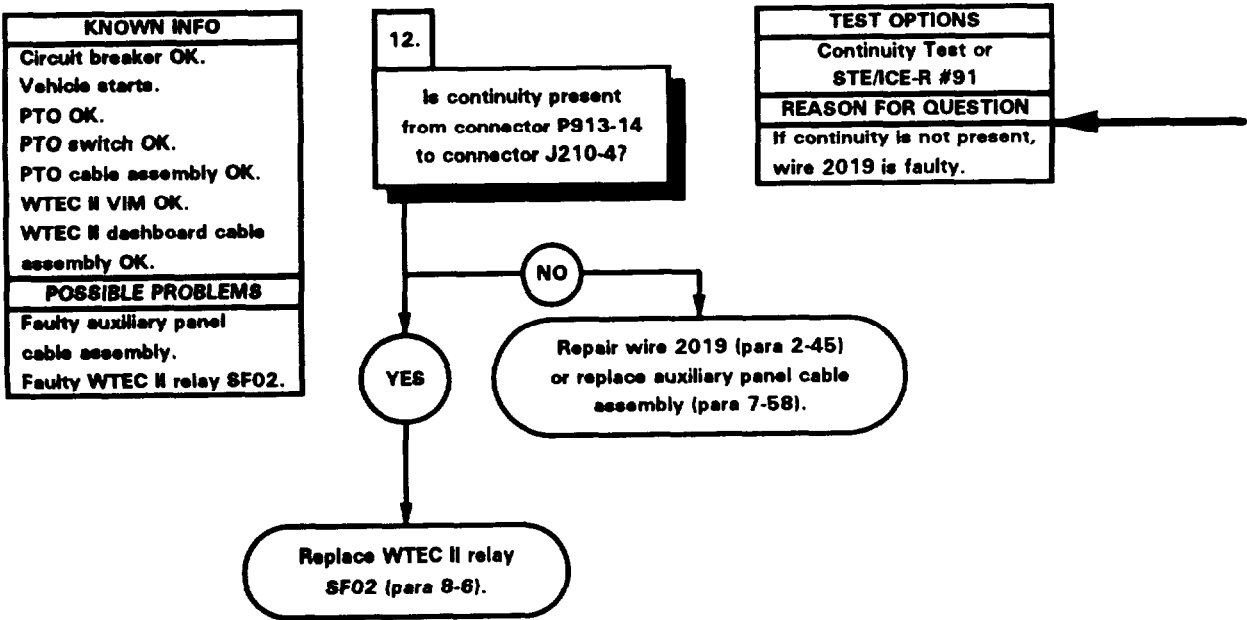
CONTINUITY TEST

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



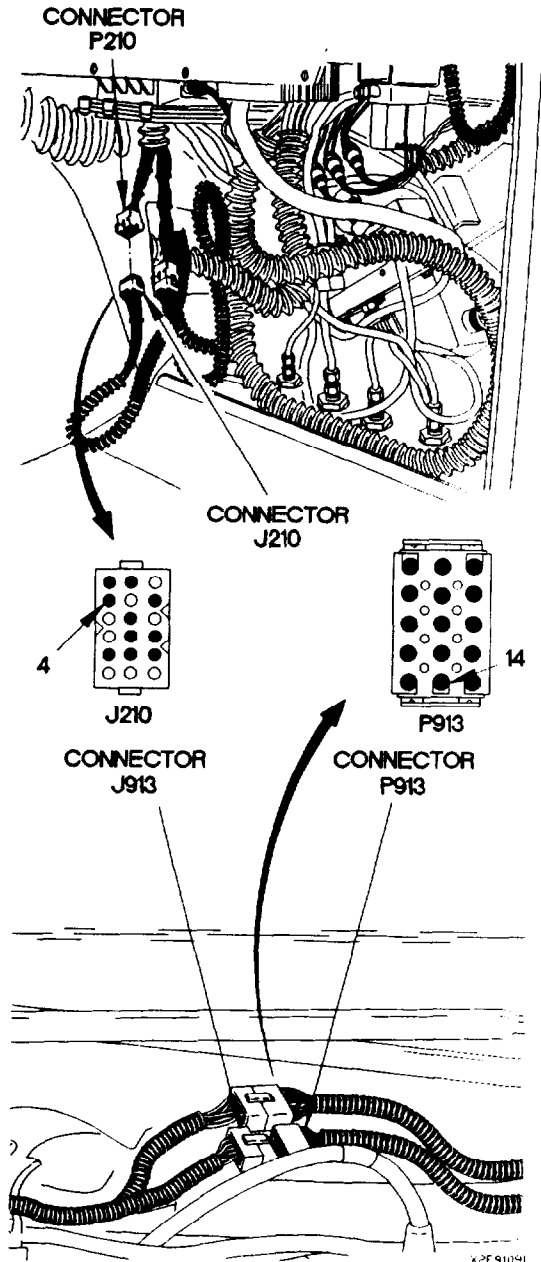
x2E91071

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

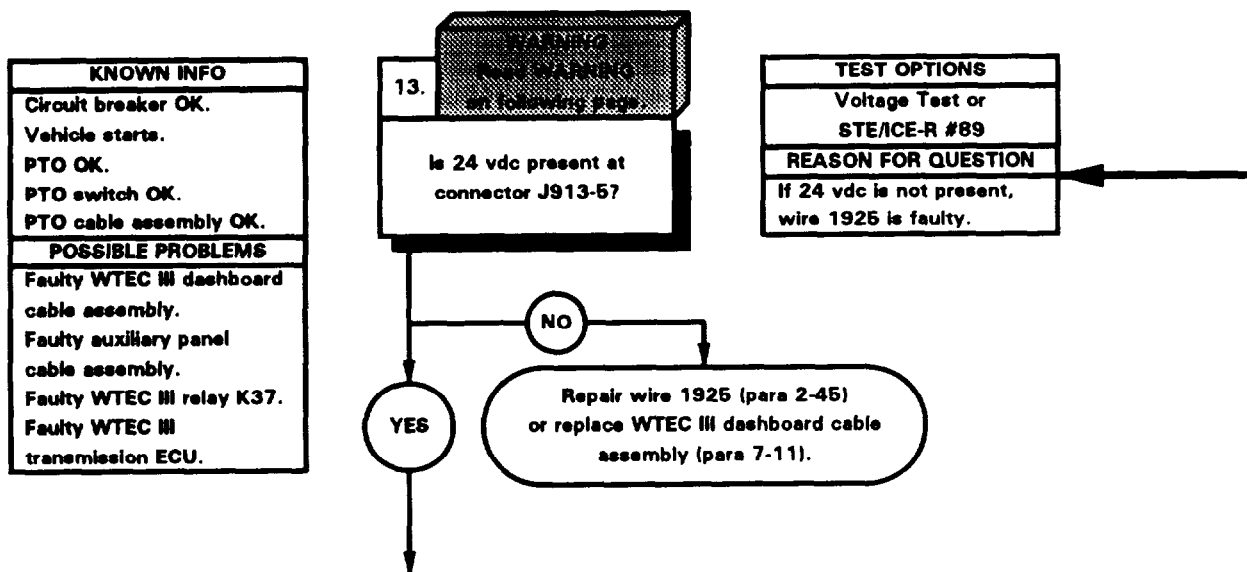


CONTINUITY TEST

- (1) Disconnect connector P210 from connector J210.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector P913-14.
- (4) Connect negative (-) probe of multimeter to connector J210-4 and note reading on multimeter.
- (5) If continuity is not present, repair wire 2019 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
- (6) If continuity is present, replace WTEC II relay 8F02 (para 8-6).
- (7) Connect connector P913 to connector J913.
- (8) Connect connector J210 to connector P210.
- (9) Install personnel heater (para 18-9).



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

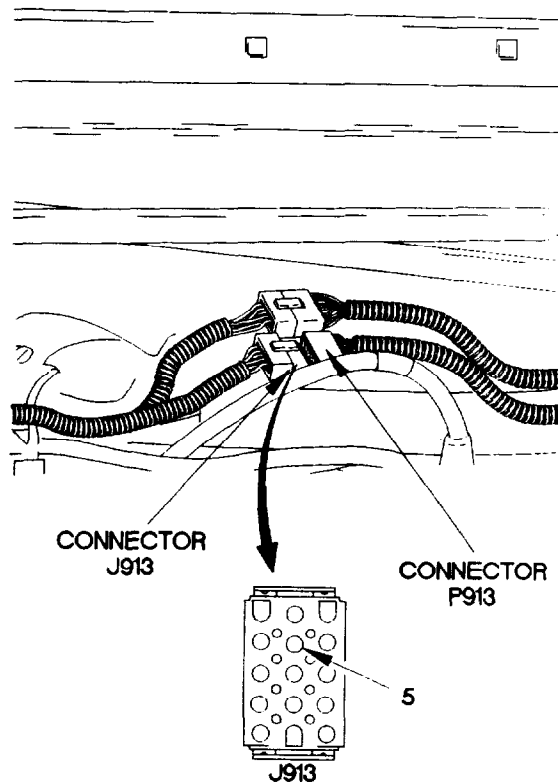


WARNING

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

VOLTAGE TEST

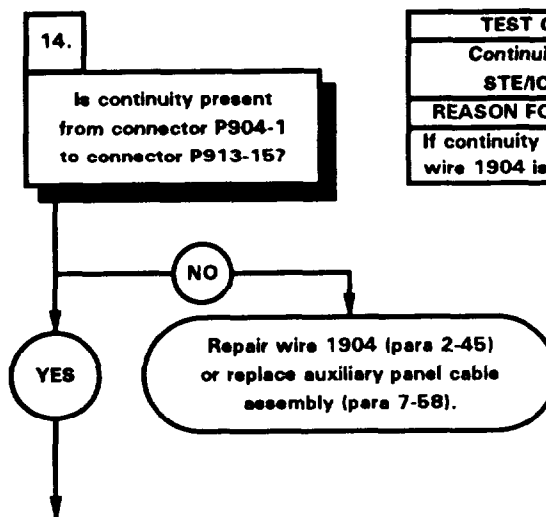
- (1) Remove personnel heater for access (para 18-9).
- (2) Disconnect connector J913 from connector P913.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to connector J913-5.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position master power switch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



(2E9103)

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

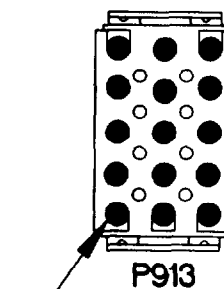
KNOWN INFO
Circuit breaker OK. Vehicle starts. PTO OK. PTO switch OK. PTO cable assembly OK.
POSSIBLE PROBLEMS
Faulty auxiliary panel cable assembly. Faulty WTEC III dashboard cable assembly. Faulty WTEC III relay K37. Faulty WTEC III transmission ECU.



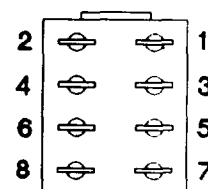
TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, wire 1904 is faulty.

CONTINUITY TEST

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



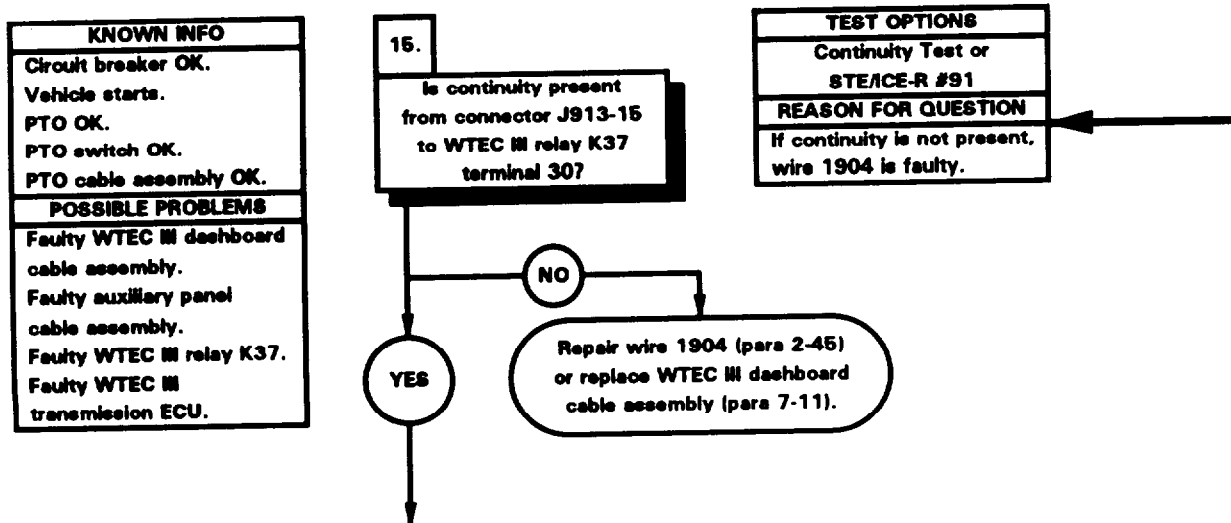
15



P904

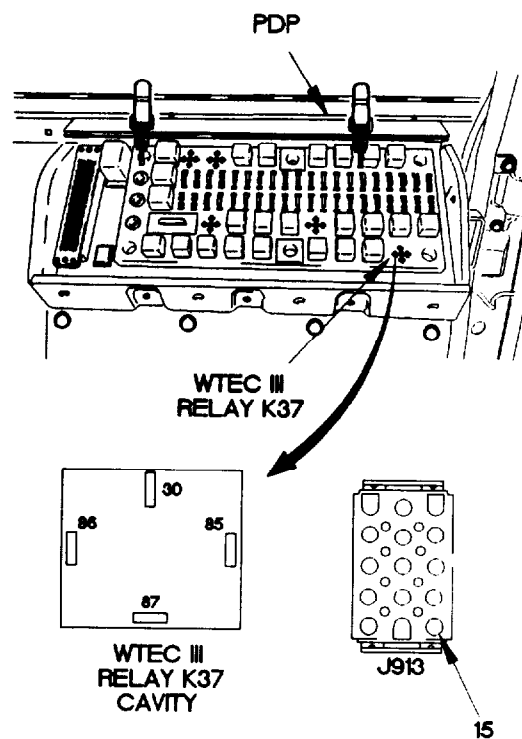
X2C91131

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



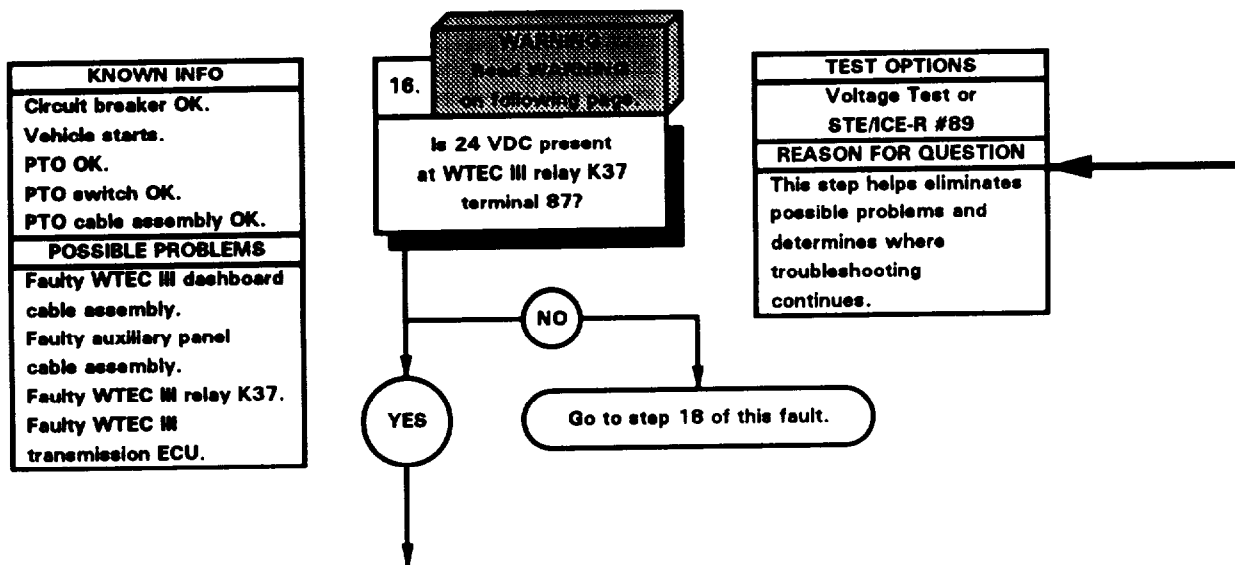
CONTINUITY TEST

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



x2E91141

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

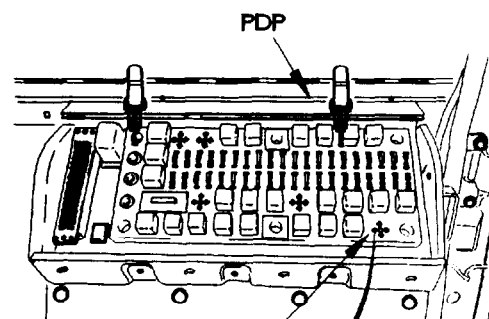


WARNING

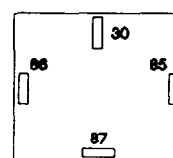
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

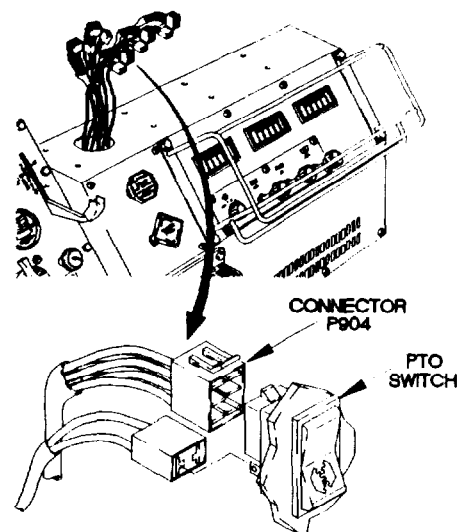
- (1) Install personnel heater hoses (para 18-9).
- (2) Remove PTO switch from auxiliary panel.
- (3) Install PTO switch on connector P904.
- (4) Remove WTEC III relay K37 from PDP.
- (5) Insert relay test wire in PDP terminal 87, where WTEC III relay K37 was removed.
- (6) Install WTEC III relay K37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



WTEC III
RELAY K37



WTEC III
RELAY K37
CAVITY

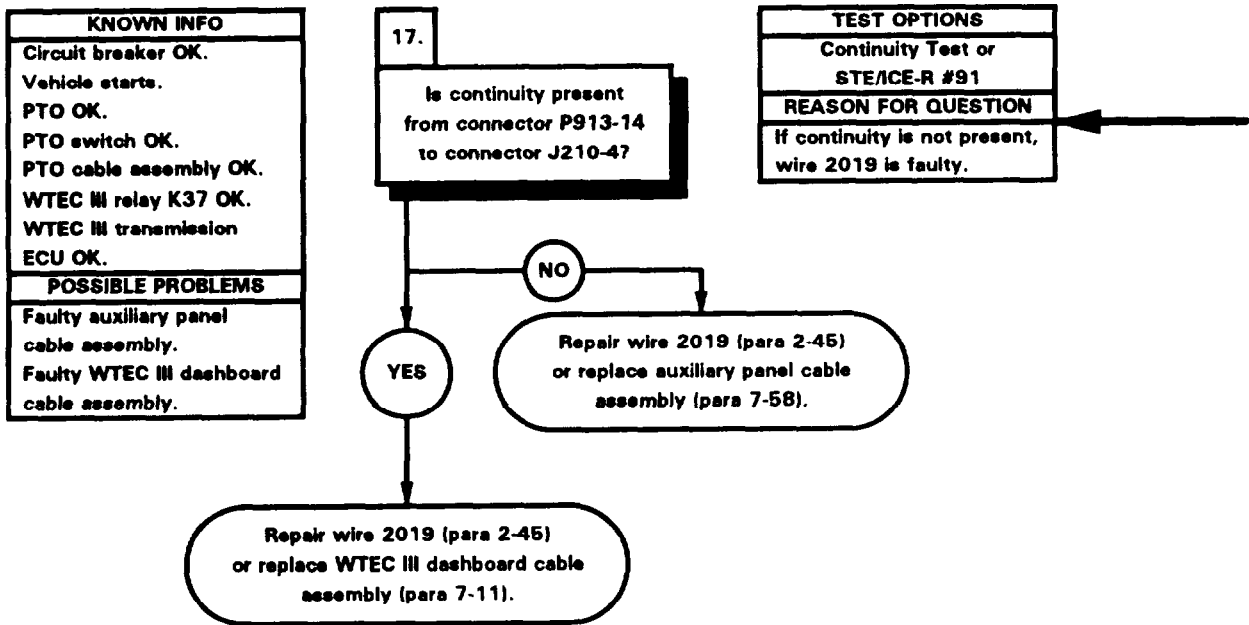


CONNECTOR
P904

PTO
SWITCH

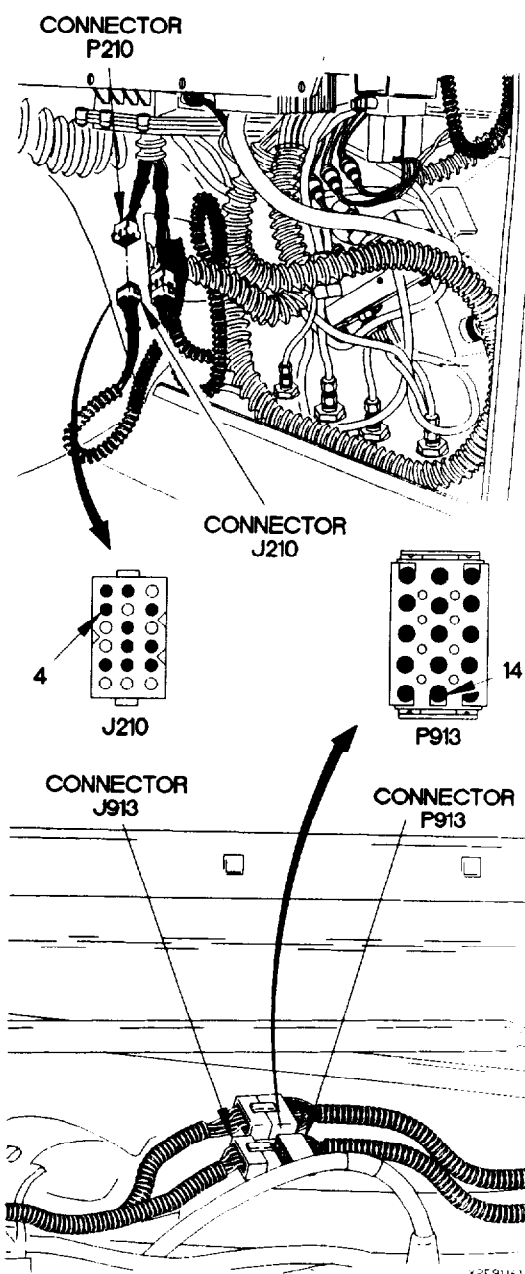
x2E91151

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

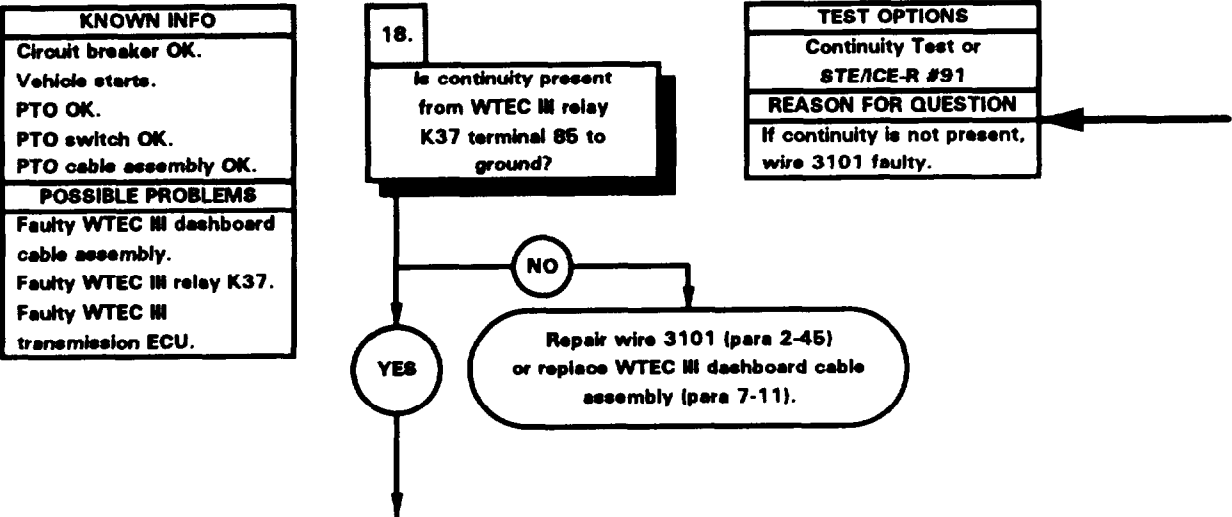


CONTINUITY TEST

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

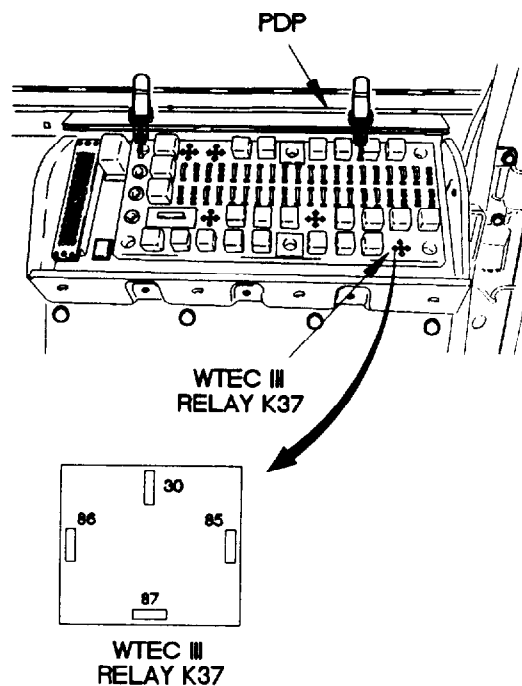


91. POWER TAKE-OFF (PTO) DOES NOT OPERATE (CONT)



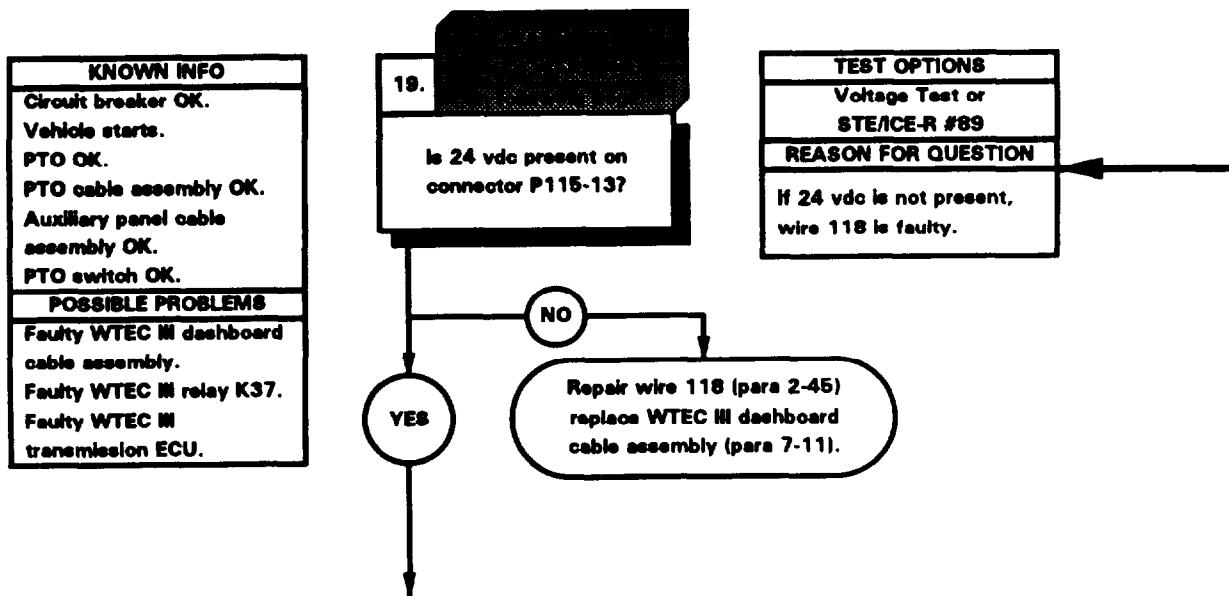
CONTINUITY TEST

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



x2E91171

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

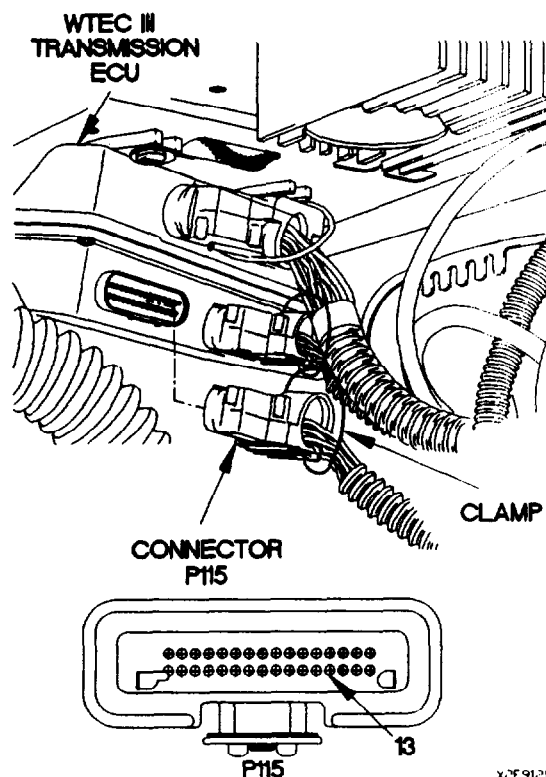


WARNING

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

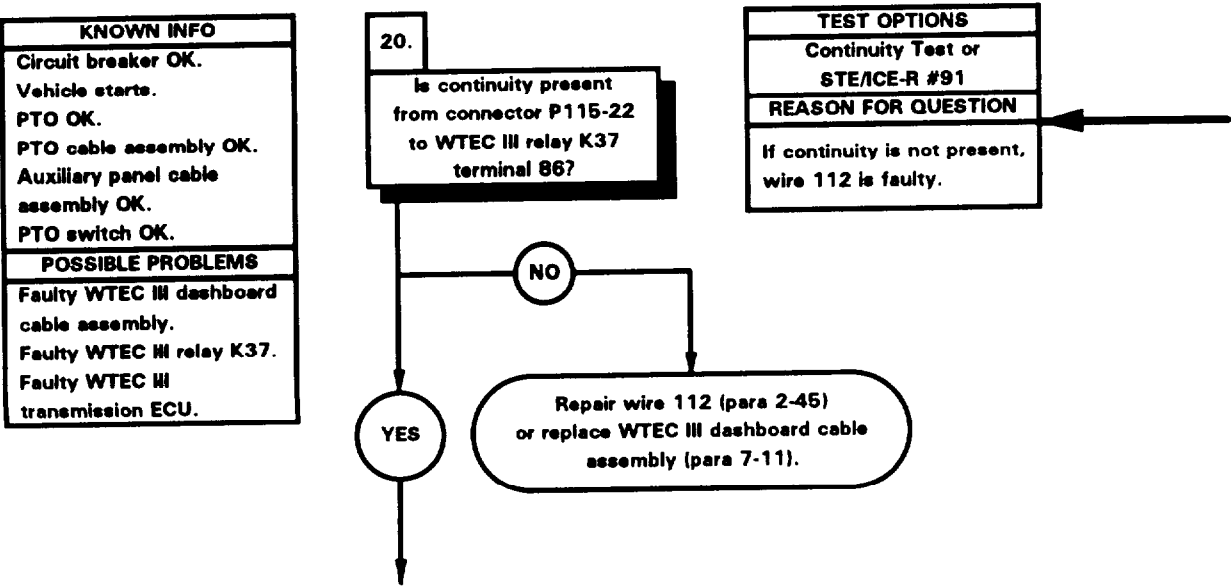
VOLTAGE TEST

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



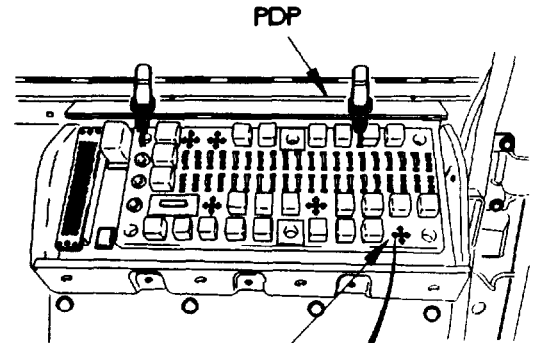
X2E91211

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

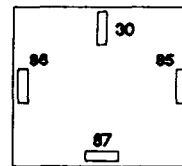


CONTINUITY TEST

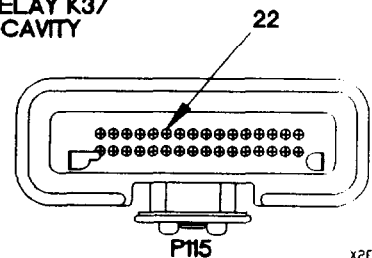
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P115-22.
- (3) Connect negative (-) probe of multimeter to PDP, where WTEC III relay K37 terminal 86 was removed, and note reading on multimeter.
- (4) If continuity is not present, repair wire 112 (para 2-45) or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



WTEC III
RELAY K37

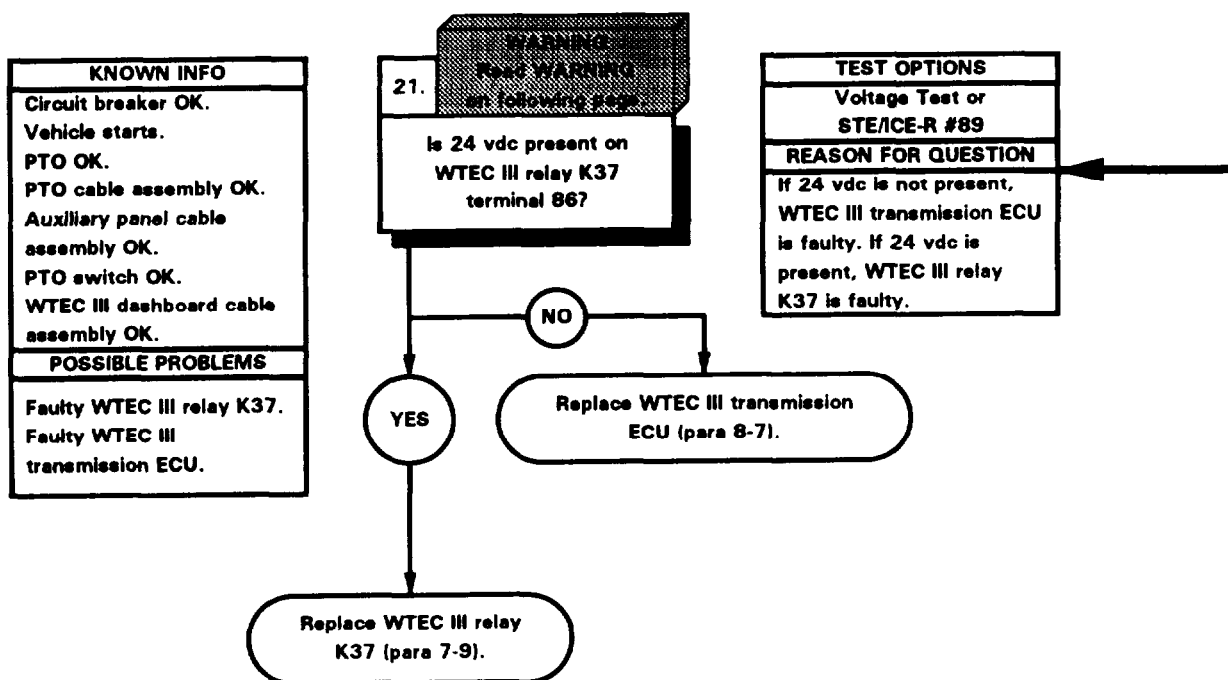


WTEC III
RELAY K37
CAVITY



X2E 91221

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

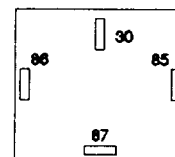
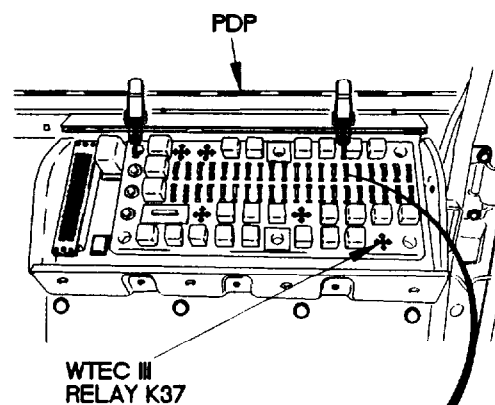


WARNING

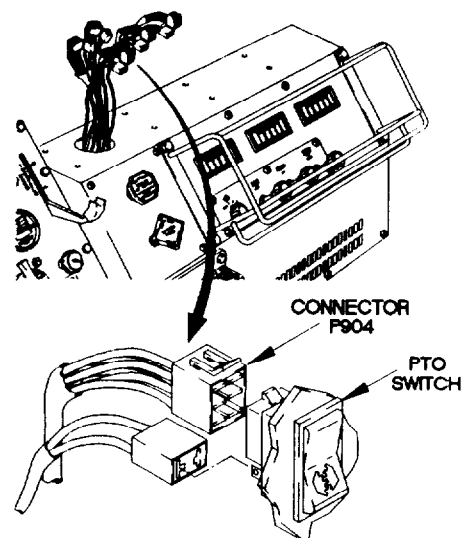
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

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



WTEC III
RELAY K37
CAVITY



x2E91201

•92. ELECTRICAL SYSTEM DOES NOT MAINTAIN A CHARGE

INITIAL SETUP

Equipment Condition

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

Personnel Required

(2)

Materials/Parts

Nut, Self-Locking (Item 143, Appendix G)

Wire, Elect, 50 ft (Item 71, Appendix D)

Tools and Special Tools

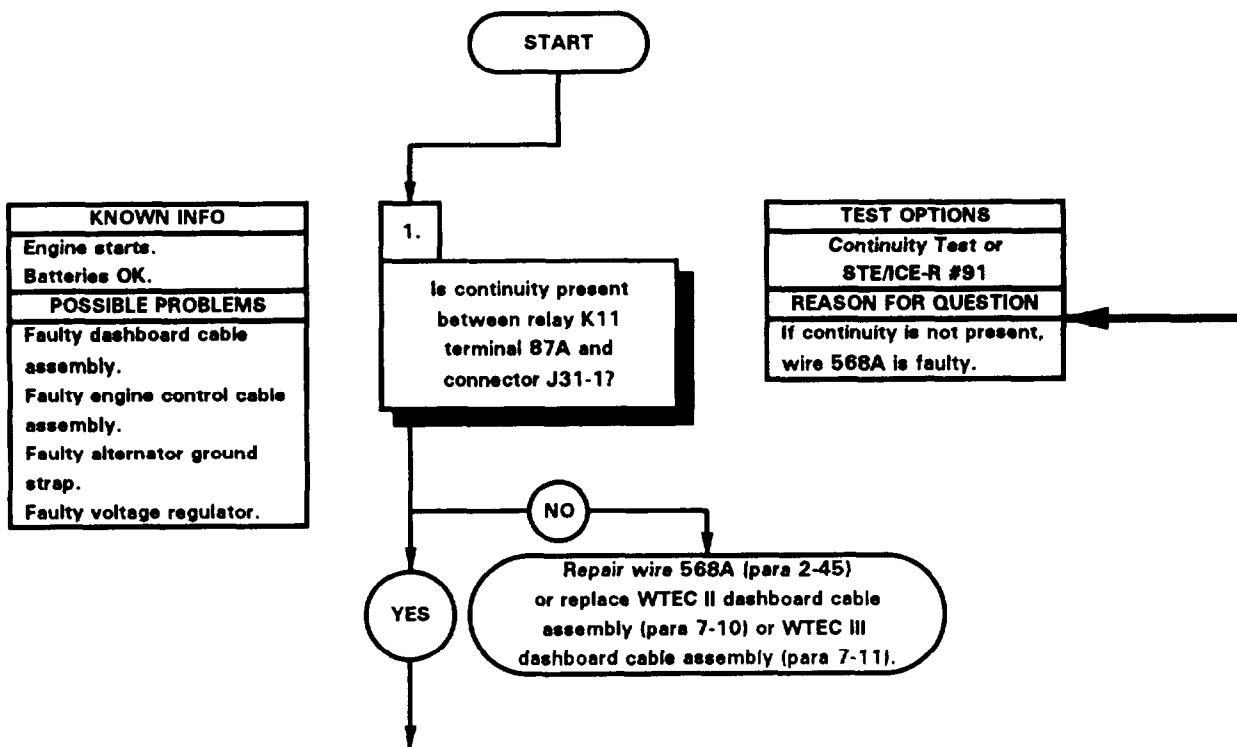
Tool Kit, Genl Mech (Item 46, Appendix C)

STE/ICE-R (Item 41, Appendix C)

Multimeter, Digital (Item 22, Appendix C)

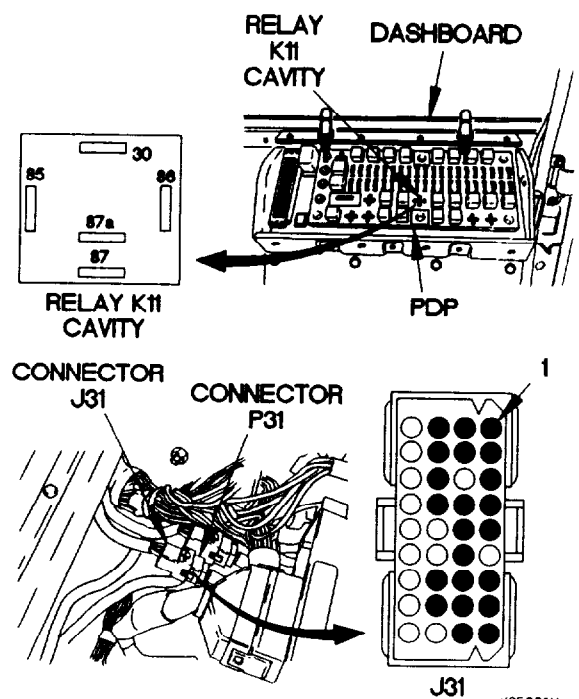
References

TM 9-4910-571-12&P



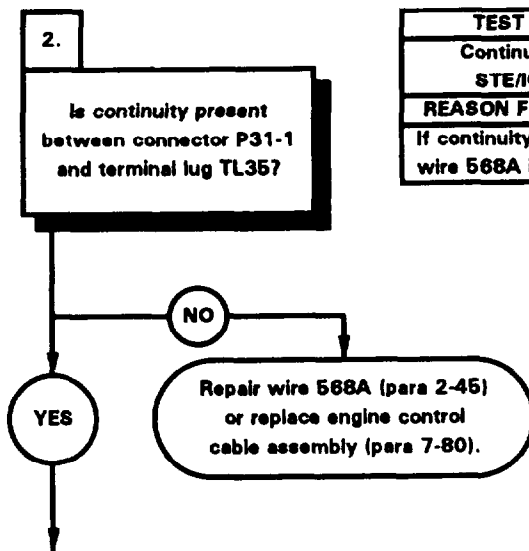
CONTINUITY TEST

- (1) Remove PDP cover (para 16-2).
- (2) Remove relay K11 from PDP.
- (3) Remove instrument panel assembly for access (para 7-15).
- (4) Disconnect connector P31 from connector J31.
- (5) Set multimeter to ohms.
- (6) Connect positive (+) probe of multimeter to connector J31-1.
- (7) Connect negative (-) probe of multimeter to PDP, terminal 87A, where relay K11 was removed.
- (8) If continuity is not present, repair wire 568A (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (9) Install relay K11 in PDP.
- (10) Install PDP cover (para 16-2).



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

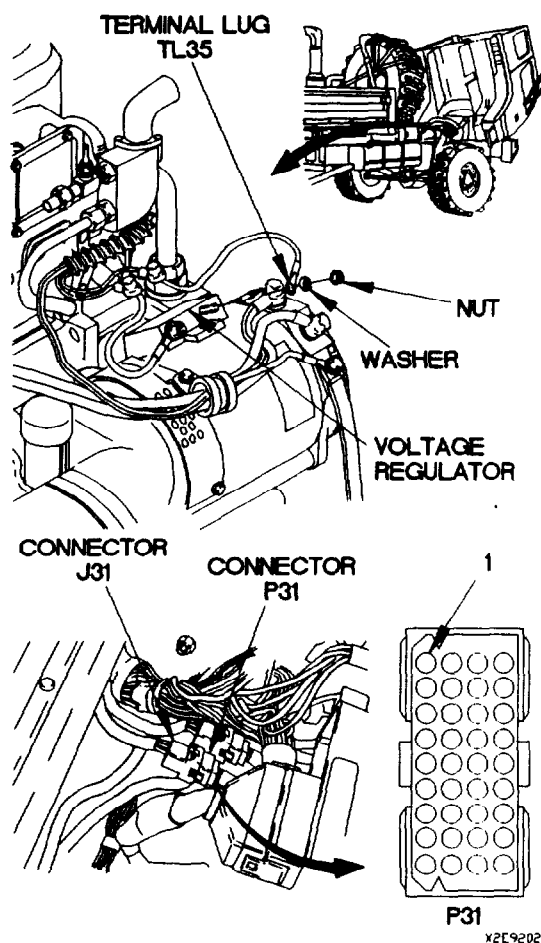
KNOWN INFO
Engine starts. Batteries OK. Dashboard cable assembly OK.
POSSIBLE PROBLEMS
Faulty engine control cable assembly. Faulty alternator ground strap. Faulty voltage regulator.



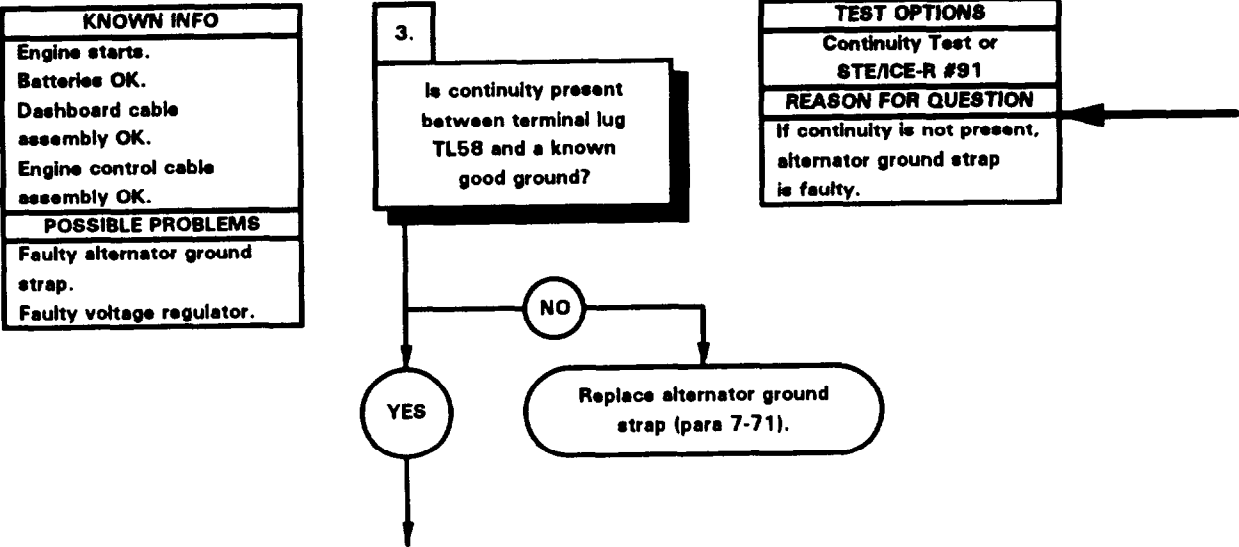
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 568A is faulty.

CONTINUITY TEST

- (1) Raise cab (TM 9-2320-366-10-1).
- (2) Remove self-locking nut, washer, and terminal lug TL35 from voltage regulator. Discard self-locking nut.
- (3) Connect terminal lug TL35 to a known good ground.
- (4) Lower cab (TM 9-2320-366-10-1).
- (5) Set multimeter to ohms.
- (6) Connect positive (+) probe of multimeter to connector P31-1.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If continuity is not present, repair wire 568A (para 2-45) or replace engine control cable assembly (para 7-80).
- (9) Raise cab (TM 9-2320-366-10-1).
- (10) Install terminal lug TL35, washer, and self-locking nut on voltage regulator.
- (11) Lower cab (TM 9-2320-366-10-1).
- (12) Connect connector P31 to connector J31.
- (13) Install instrument panel assembly (para 7-15).

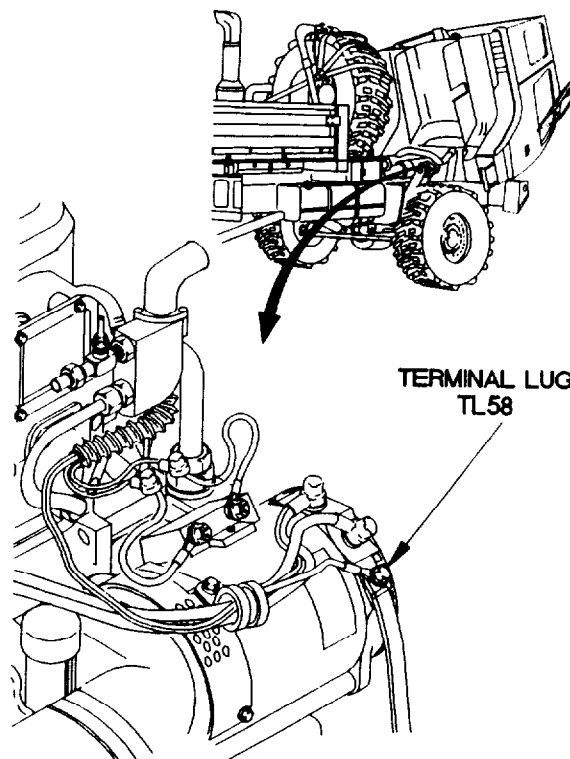


692. ELECTRICAL SYSTEM DOES NOT MAINTAIN A CHARGE (CONT)



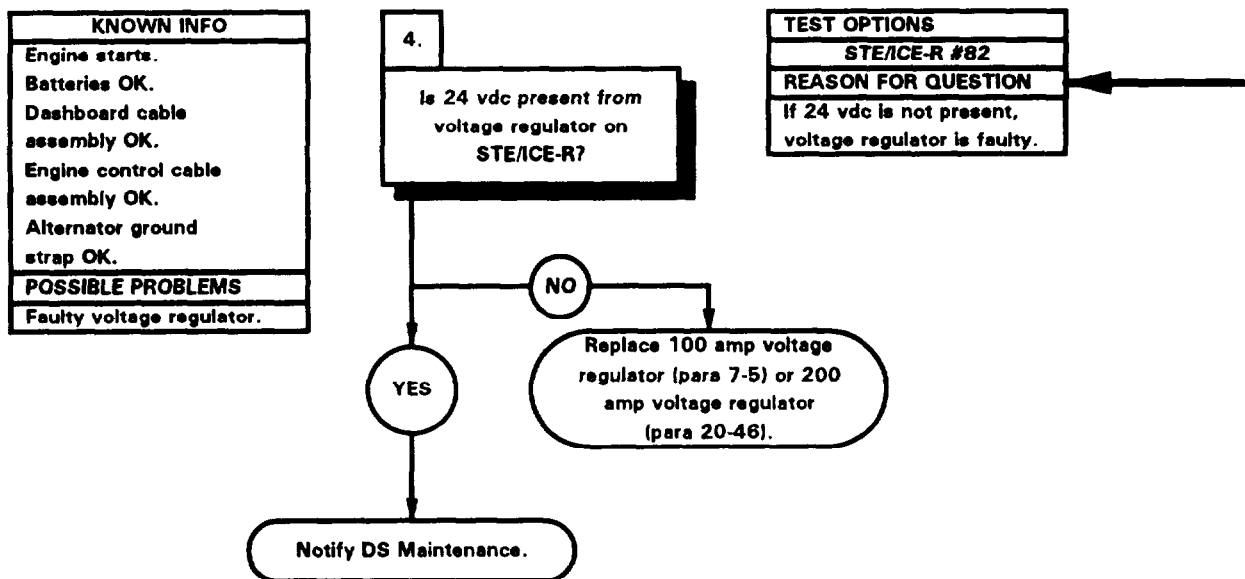
CONTINUITY TEST

- (1) Raise cab (TM 9-2320-366-10-1).
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to terminal lug TL58.
- (4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (5) If continuity is not present, replace alternator ground strap (para 7-71).
- (6) Lower cab (TM 9-2320-366-10-1).



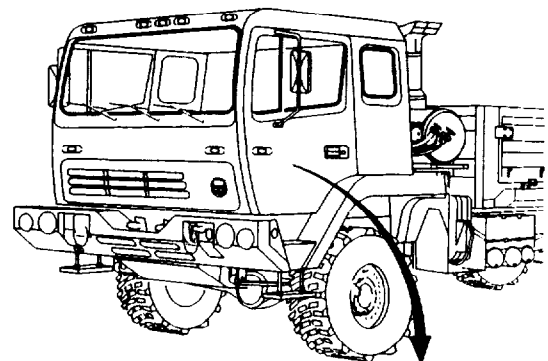
X2E9203A

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



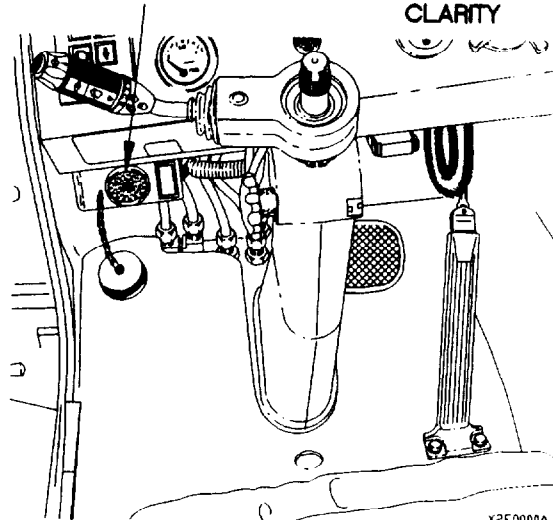
STE/ICE-R #82

- (1) Remove dust cover from DCA-1 connector.
- (2) Connect DCA cable W1 to the Vehicle Test Meter (VTM) and DCA-1 connector.
- (3) Power up STE/ICE-R VTM in the DCA mode (TM 9-4910-571-12&P).
- (4) Position TEST SELECT switches to #82.
- (5) Position master power switch to on (TM 9-2320-366-10-1).
- (6) Start engine (TM 9-2320-366-10-1).
- (7) Press and release test button.
- (8) Observe VTM display for test results.
- (9) If voltage regulator output voltage is not 6 to 28 vdc, replace 100 amp voltage regulator (para 7-5) or 200 amp voltage regulator (para 20-46).
- (10) If voltage regulator output voltage is 6 to 28 vdc, notify DS Maintenance.
- (11) Position master power switch to off (TM 9-2320-366-10-1).
- (12) Disconnect DCA cable W1 from VTM and DCA-1 connector.
- (13) Install dust cover on DCA-1 connector.



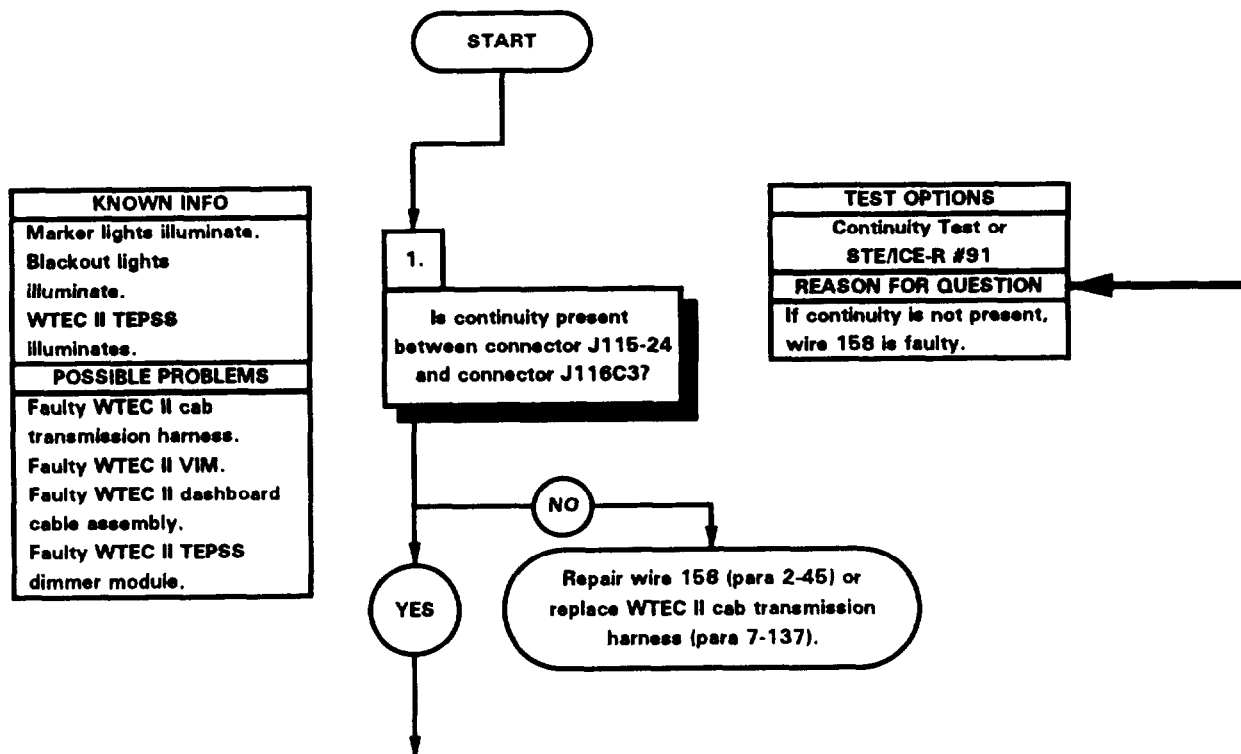
DCA CONNECTOR

STEERING WHEEL
REMOVED FOR
CLARITY



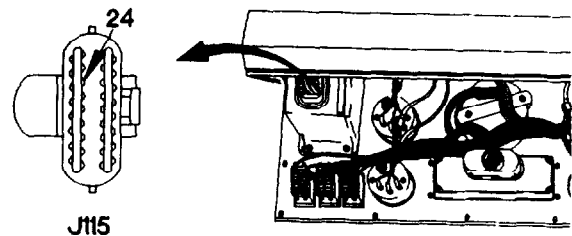
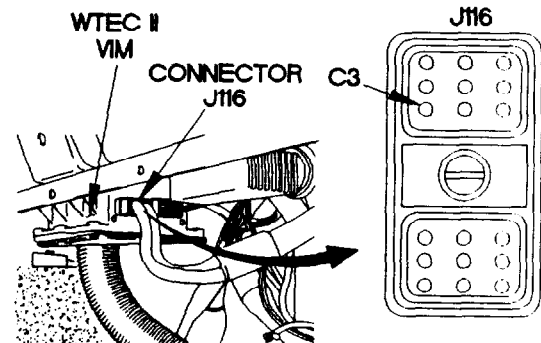
x2E0000A

93. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) ILLUMINATION DOES NOT DIM	
INITIAL SETUP	
Equipment Condition Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) STE/ICE-R (Item 41, Appendix C) Multimeter, Digital (Item 22, Appendix C)
Personnel Required (2)	Materials/Parts Wire, Elect, 50 ft (Item 71, Appendix D)
References TM 9-4910-571-12&P	



CONTINUITY TEST

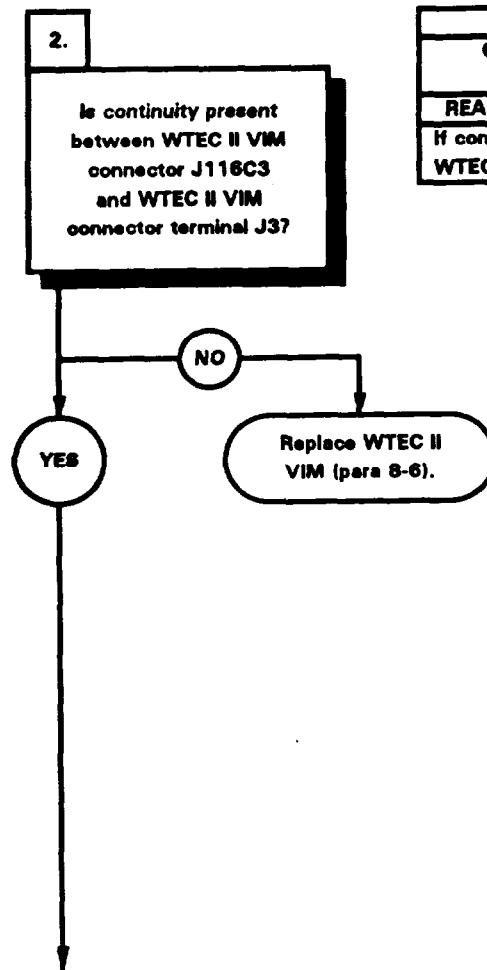
- (1) Remove kick panel (para 16-3).
- (2) Disconnect connector J116 from WTEC II VIM.
- (3) Remove instrument panel assembly for access (para 7-15).
- (4) Disconnect connector J115 (top connector) from WTEC II TEPSS.
- (5) Set multimeter to ohms.
- (6) Connect positive (+) probe of multimeter to connector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



x2E93011

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

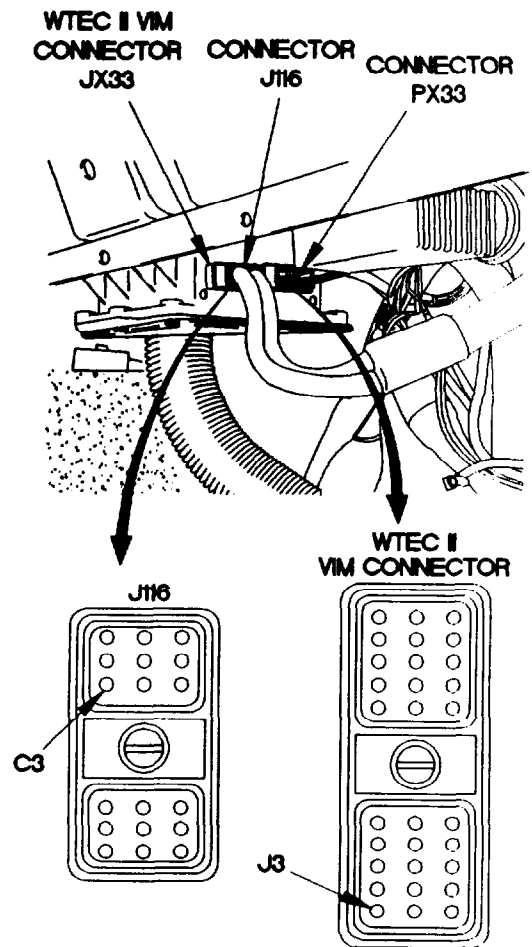
KNOWN INFO
Marker lights illuminate. Blackout lights illuminate. WTEC II TEPSS illuminates. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty WTEC II VIM. Faulty WTEC II dashboard cable assembly. Faulty WTEC II TEPSS dimmer module.



TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, WTEC II VIM is faulty.

CONTINUITY TEST

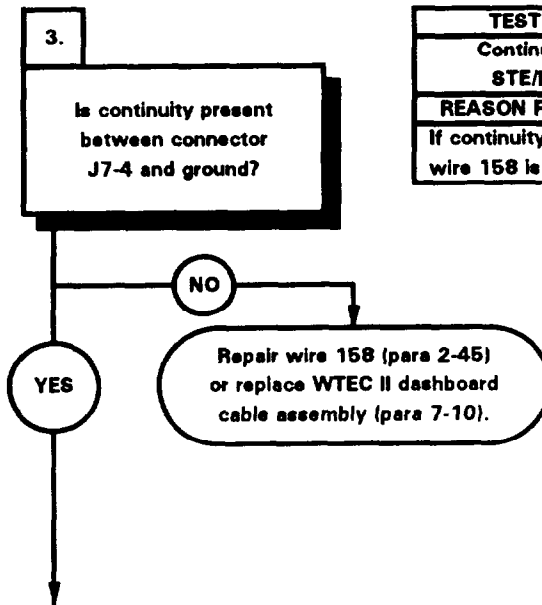
- (1) Loosen screw and disconnect connector PX33 from WTEC II VIM.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to WTEC II VIM connector J116C3.
- (4) Connect negative (-) probe of multimeter to WTEC II VIM connector terminal J3 and note reading on multimeter.
- (5) If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



X2E 93021

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

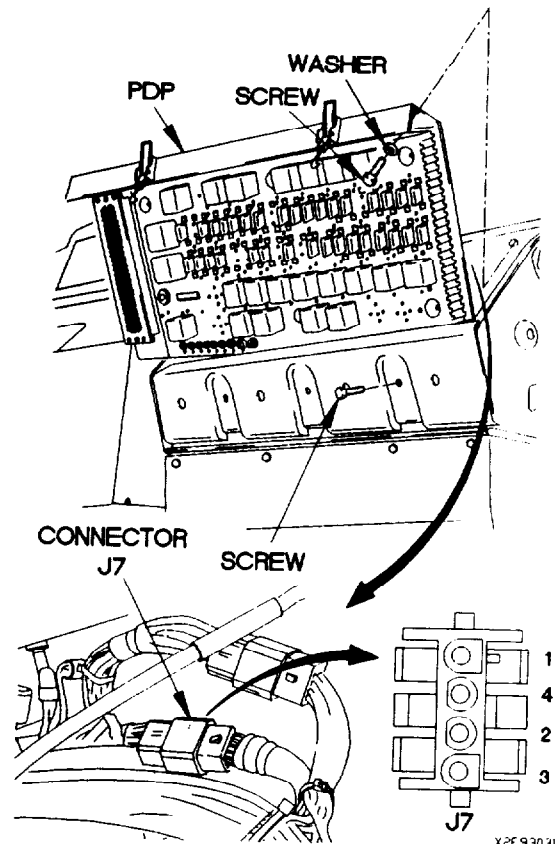
KNOWN INFO
Marker lights illuminate. Blackout lights illuminate. WTEC II TEPSS illuminates. WTEC II VIM OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty WTEC II dashboard cable assembly. Faulty WTEC II TEPSS dimmer module.



TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 158 is faulty.

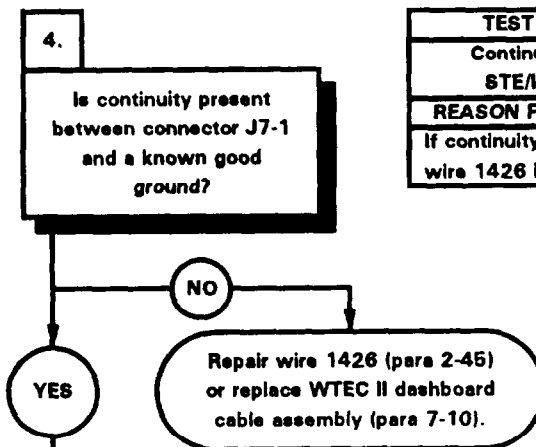
CONTINUITY TEST

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



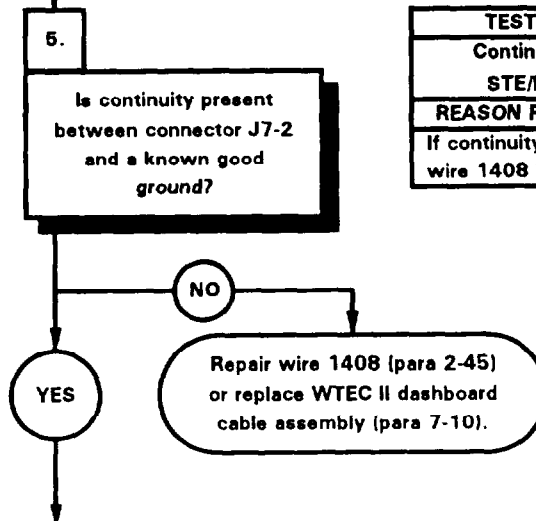
693. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) ILLUMINATION DOES NOT DIM
(CONT)

KNOWN INFO
Marker lights illuminate. Blackout lights illuminate. WTEC II TEPSS illuminates. WTEC II cab transmission harness OK. WTEC II VIM OK.
POSSIBLE PROBLEMS
Faulty WTEC II dashboard cable assembly. Faulty WTEC II TEPSS dimmer module.



TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 1426 is faulty.

KNOWN INFO
Marker lights illuminate. Blackout lights illuminate. WTEC II TEPSS illuminates. WTEC II cab transmission harness OK. WTEC II VIM OK.
POSSIBLE PROBLEMS
Faulty WTEC II dashboard cable assembly. Faulty WTEC II TEPSS dimmer module.



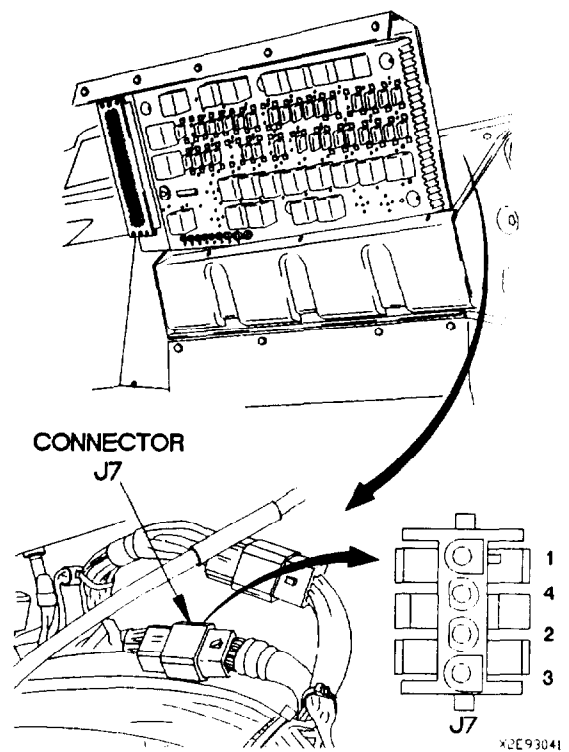
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 1408 is faulty.

CONTINUITY TEST

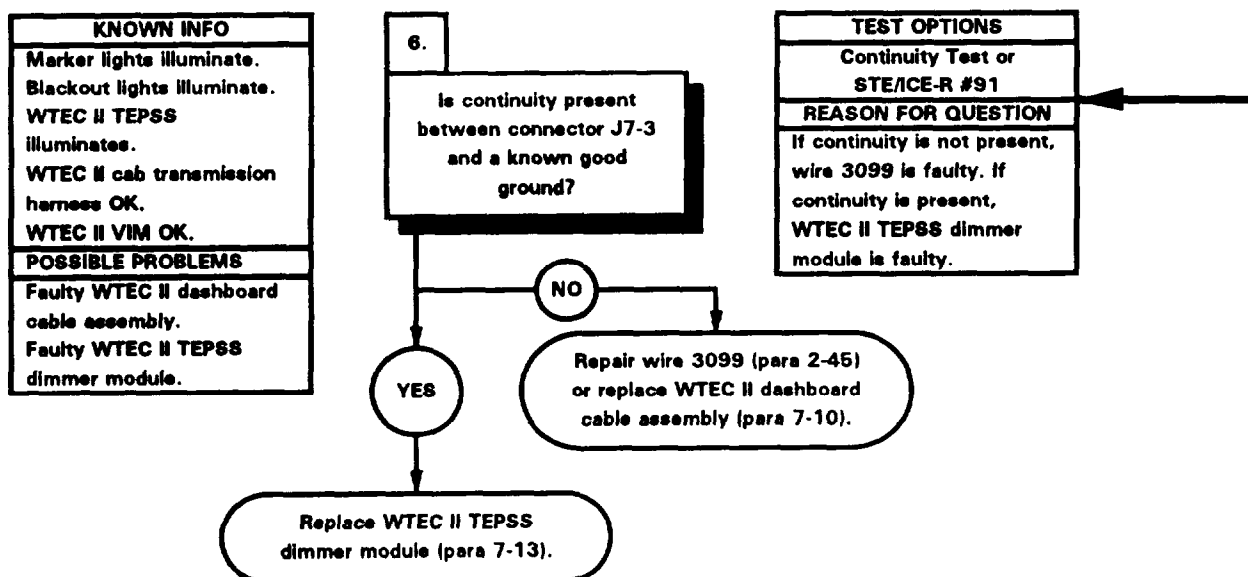
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector J7-1.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 1426 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10).

CONTINUITY TEST

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

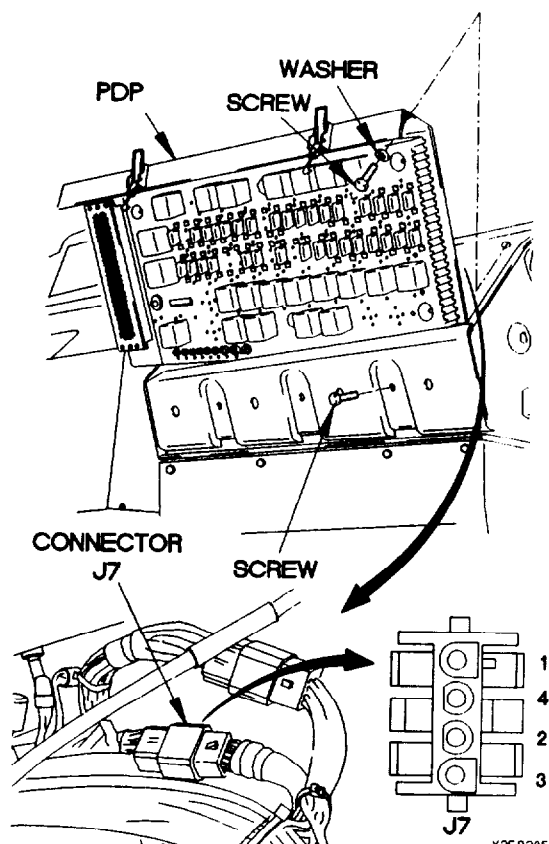


93. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) ILLUMINATION DOES NOT DIM (CONT)



CONTINUITY TEST

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



X2E 93051

•94. DIFFERENTIAL LOCK SOLENOID DOES NOT OPERATE

INITIAL SETUP

Equipment Condition

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

Personnel Required

(2)

Tools and Special Tools

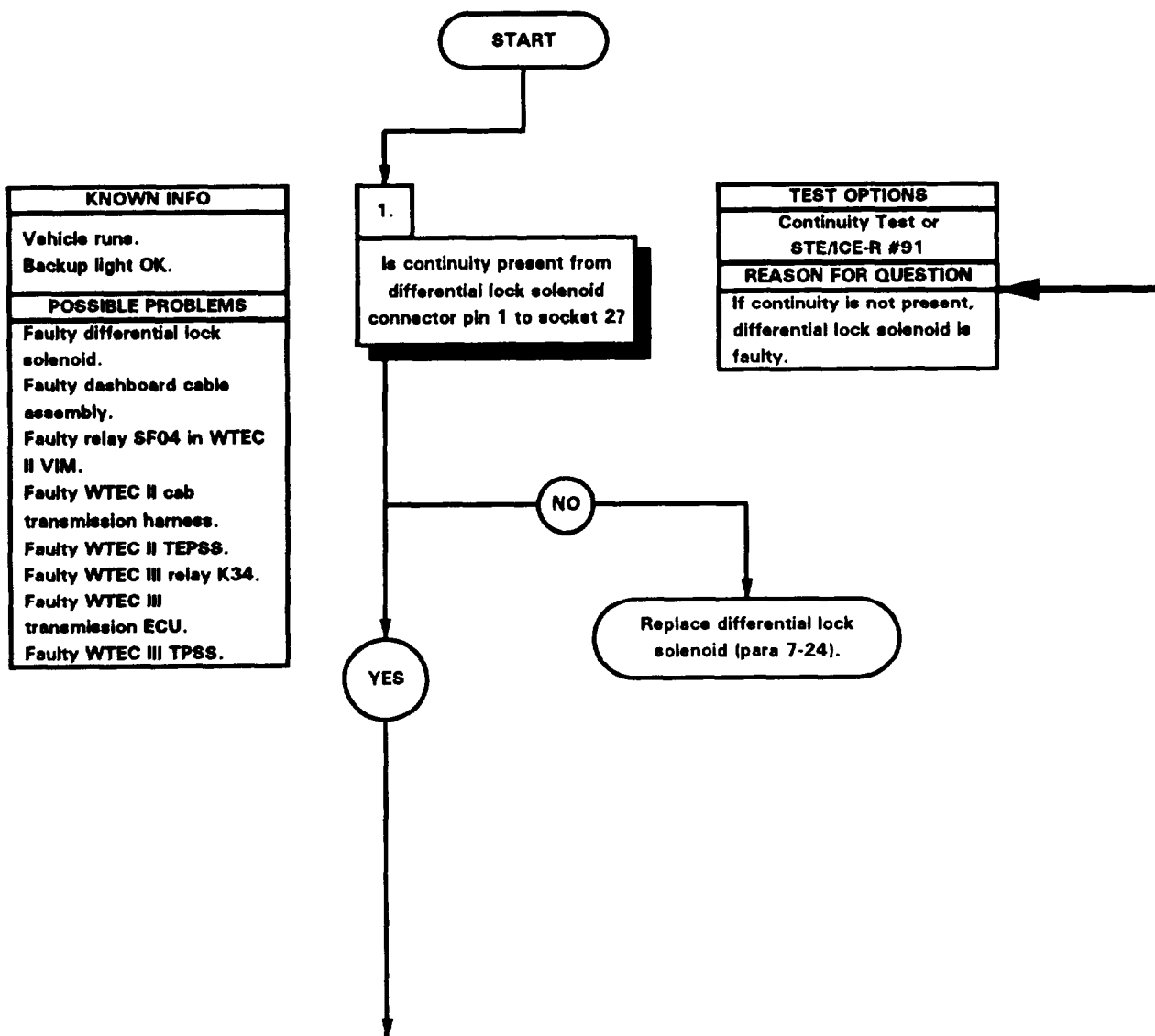
Tool Kit, Genl Mech (Item 46, Appendix C)

STE/ICE-R (Item 41, Appendix C)

Multimeter, Digital (Item 22, Appendix C)

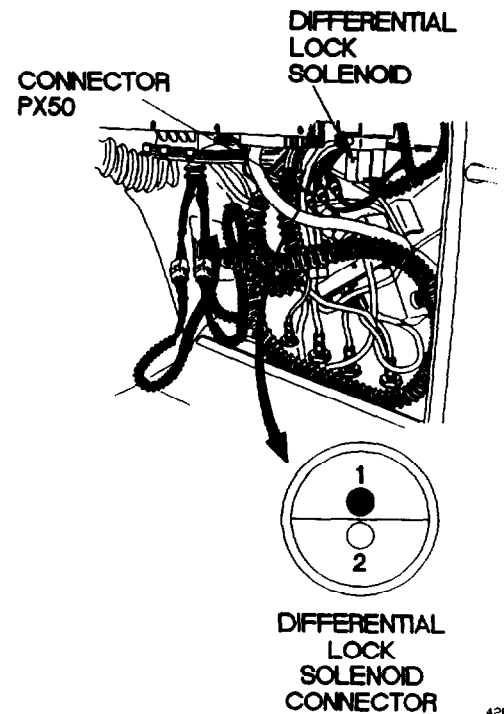
References

TM 9-4910-571-12&P



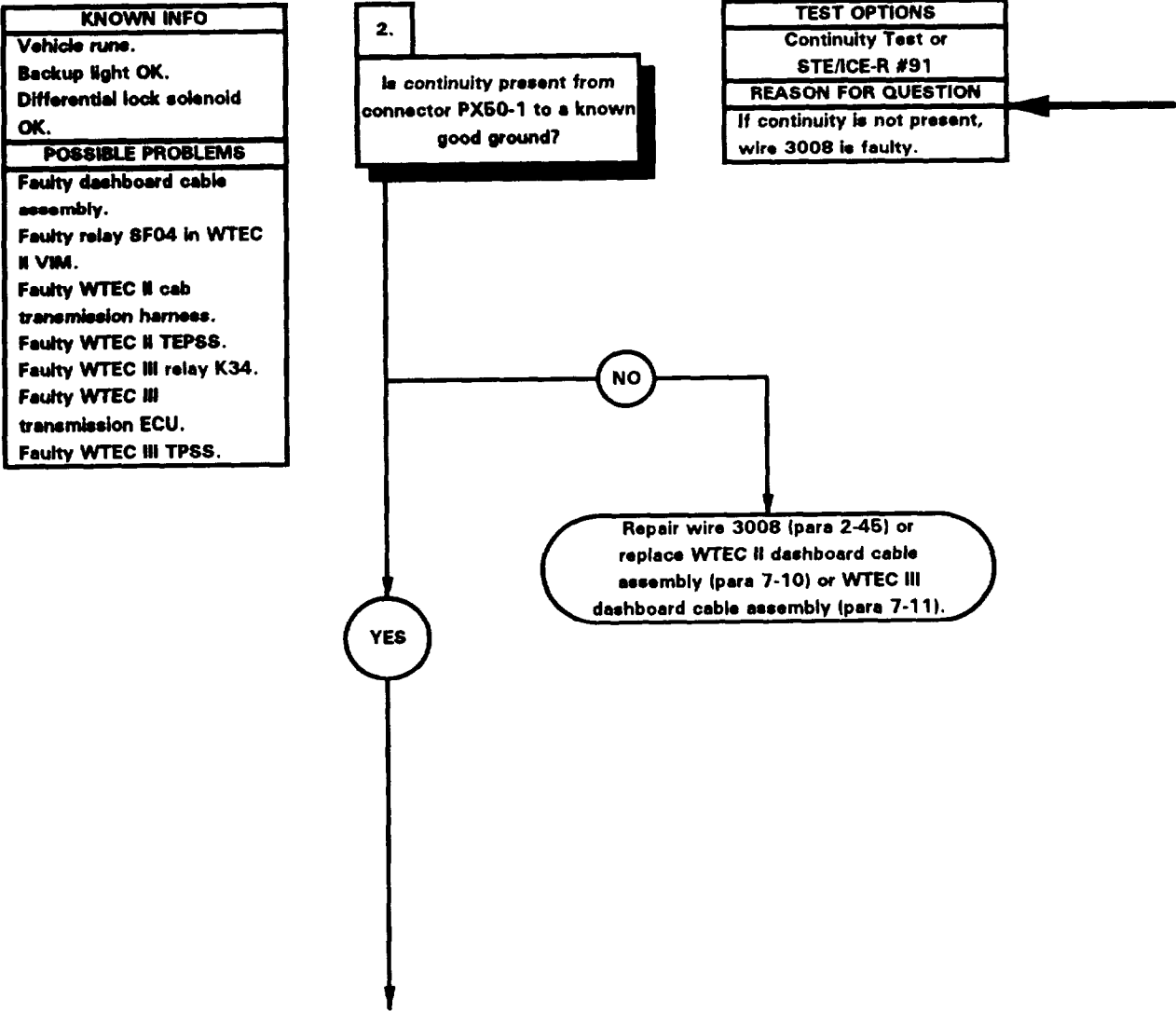
CONTINUITY TEST

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



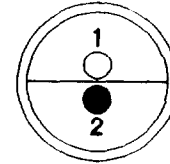
42E 92011

94. DIFFERENTIAL LOCK SOLENOID DOES NOT OPERATE (CONT)



CONTINUITY TEST

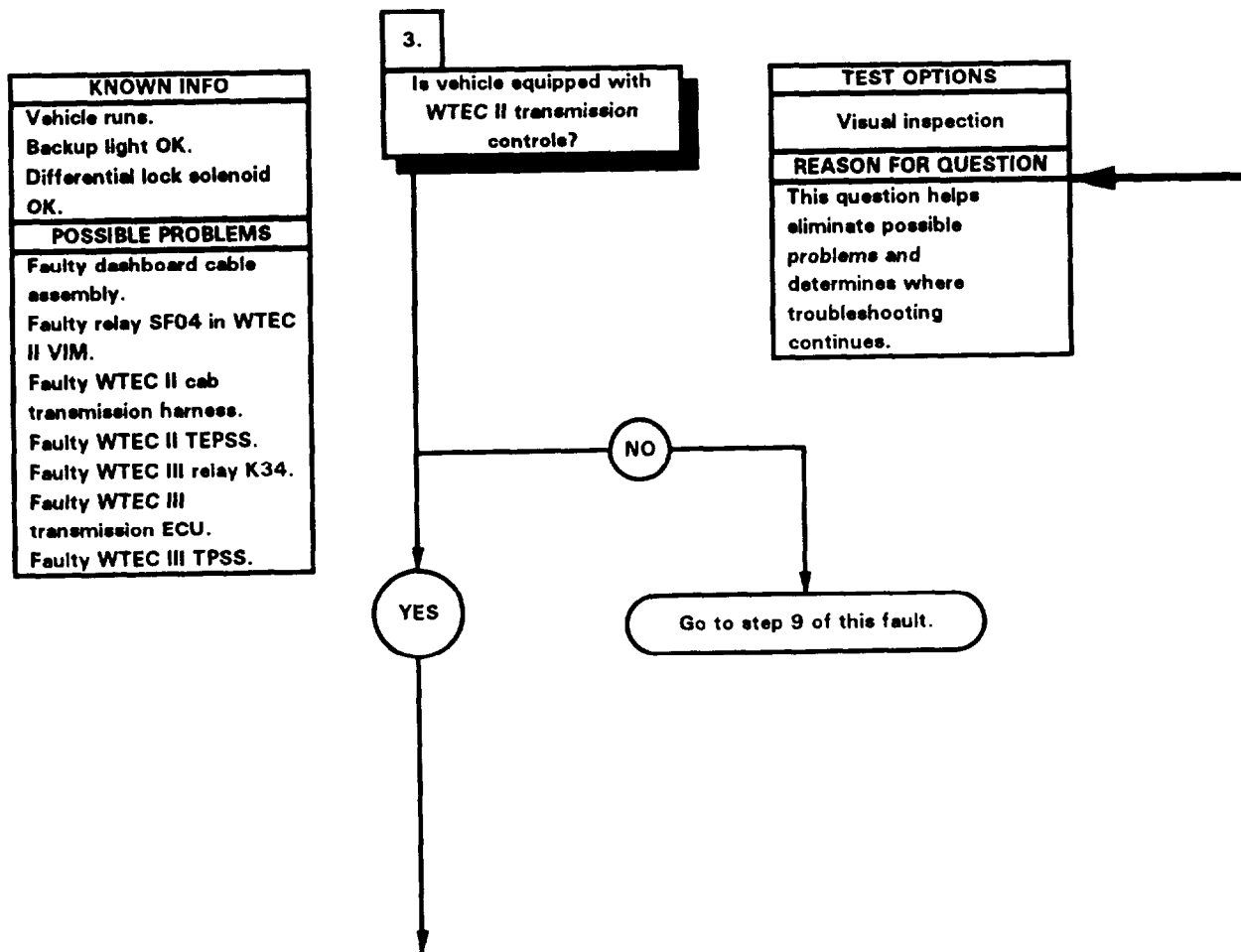
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector PX50-1.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3008 (para 2-45) or replace WTEC II dashboard cable assembly (para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



PX50

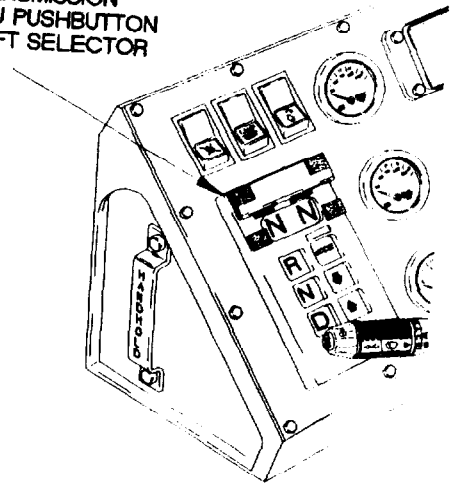
43E92021

e94. DIFFERENTIAL LOCK SOLENOID DOES NOT OPERATE (CONT)

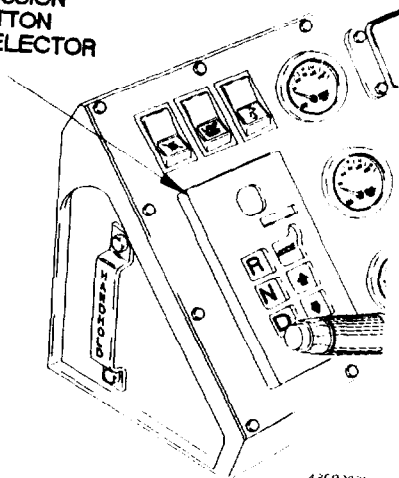


- (1) Check if vehicle is equipped with WTEC II TEPSS.
- (2) If transmission pushbutton shift selector is not mounted with four screws and does not have a filter cover, go to step 9 of this fault.

WTEC II
TRANSMISSION
ECU PUSHBUTTON
SHIFT SELECTOR

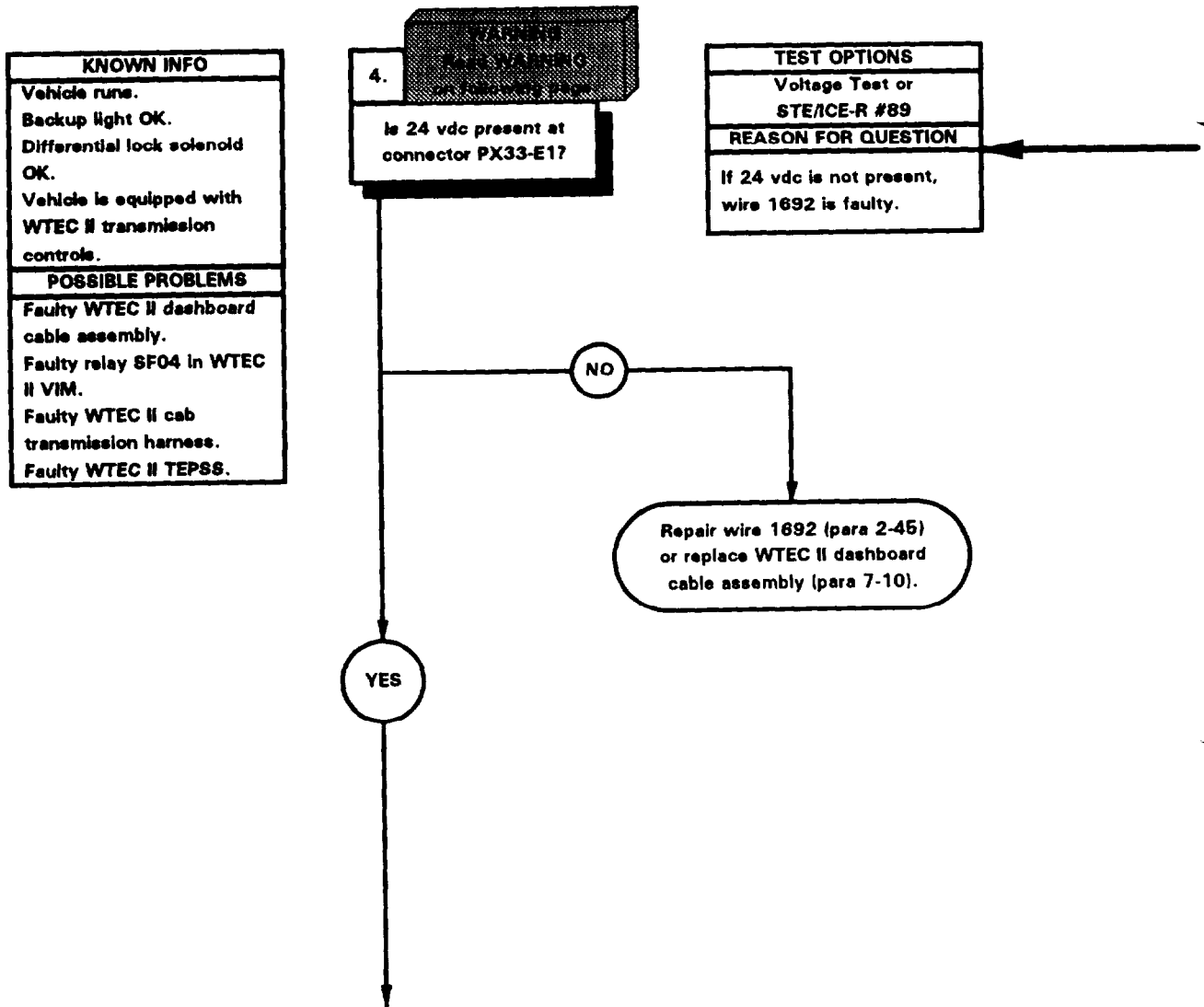


WTEC III
TRANSMISSION
PUSHBUTTON
SHIFT SELECTOR



42C 920 31

94. DIFFERENTIAL LOCK SOLENOID DOES NOT OPERATE (CONT)

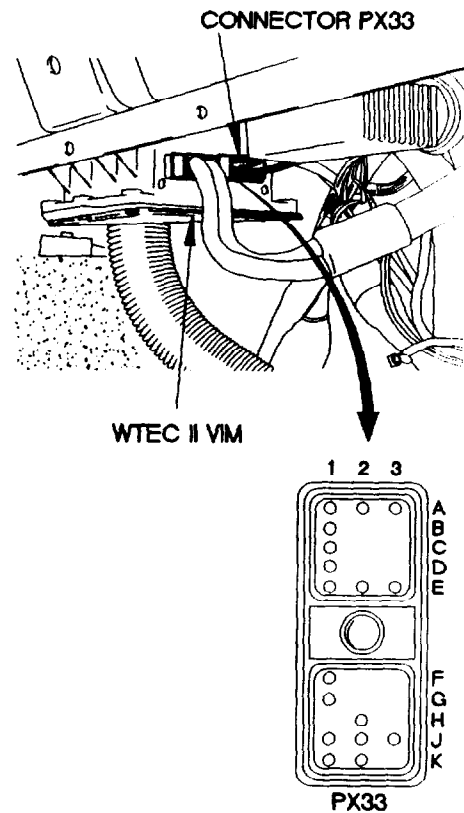


WARNING

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

VOLTAGE TEST

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



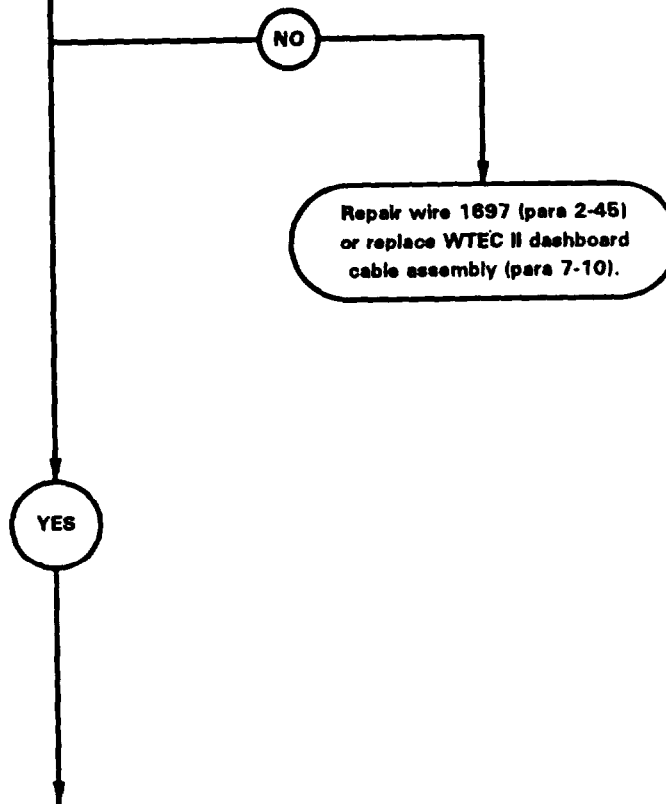
42E 92041

694. DIFFERENTIAL LOCK SOLENOID DOES NOT OPERATE (CONT)

KNOWN INFO
Vehicle runs. Backup light OK. Differential lock solenoid OK. Vehicle is equipped with WTEC II transmission controls.
POSSIBLE PROBLEMS
Faulty WTEC II dashboard cable assembly. Faulty relay SF04 in WTEC II VIM. Faulty WTEC II cab transmission harness. Faulty WTEC II TEPSS.

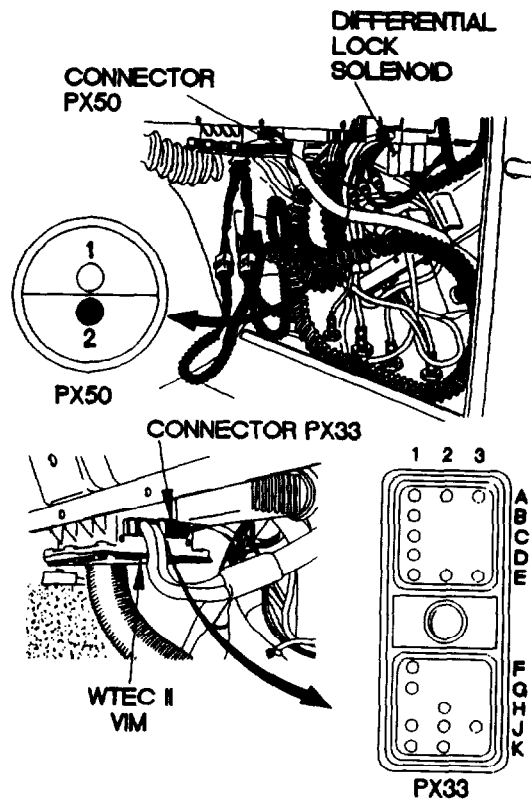
5.
Is continuity present from connector PX33-D1 to connector PX50-2?

TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 1697 is faulty.



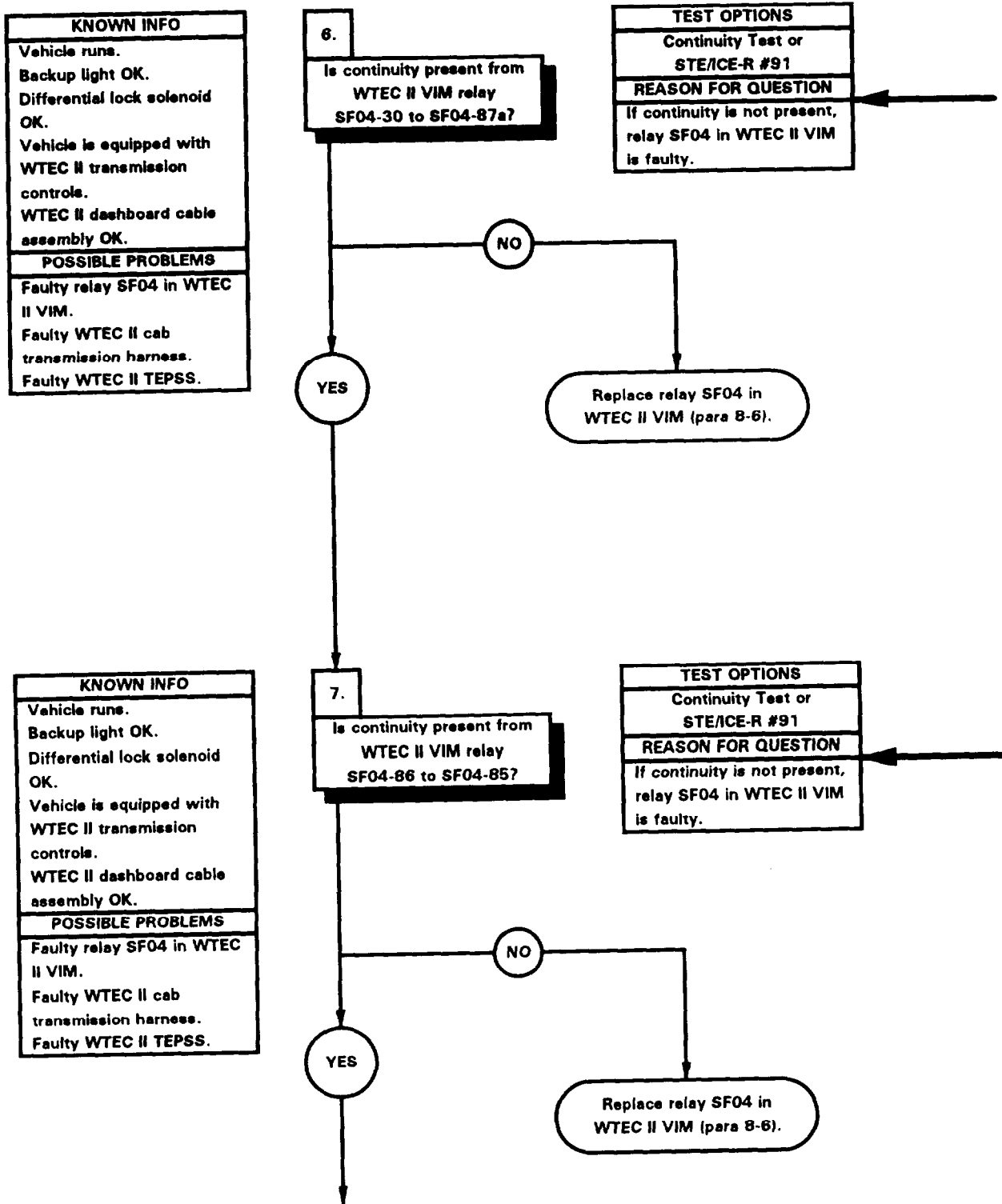
CONTINUITY TEST

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



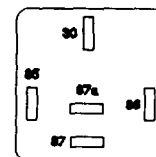
42E 92051

e94. DIFFERENTIAL LOCK SOLENOID DOES NOT OPERATE (CONT)

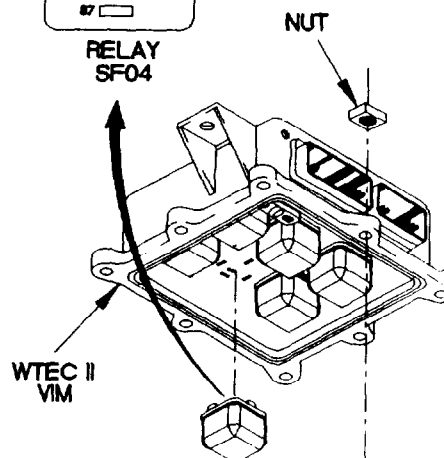


CONTINUITY TEST

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

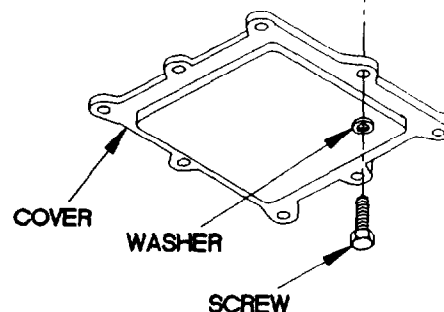


RELAY SF04



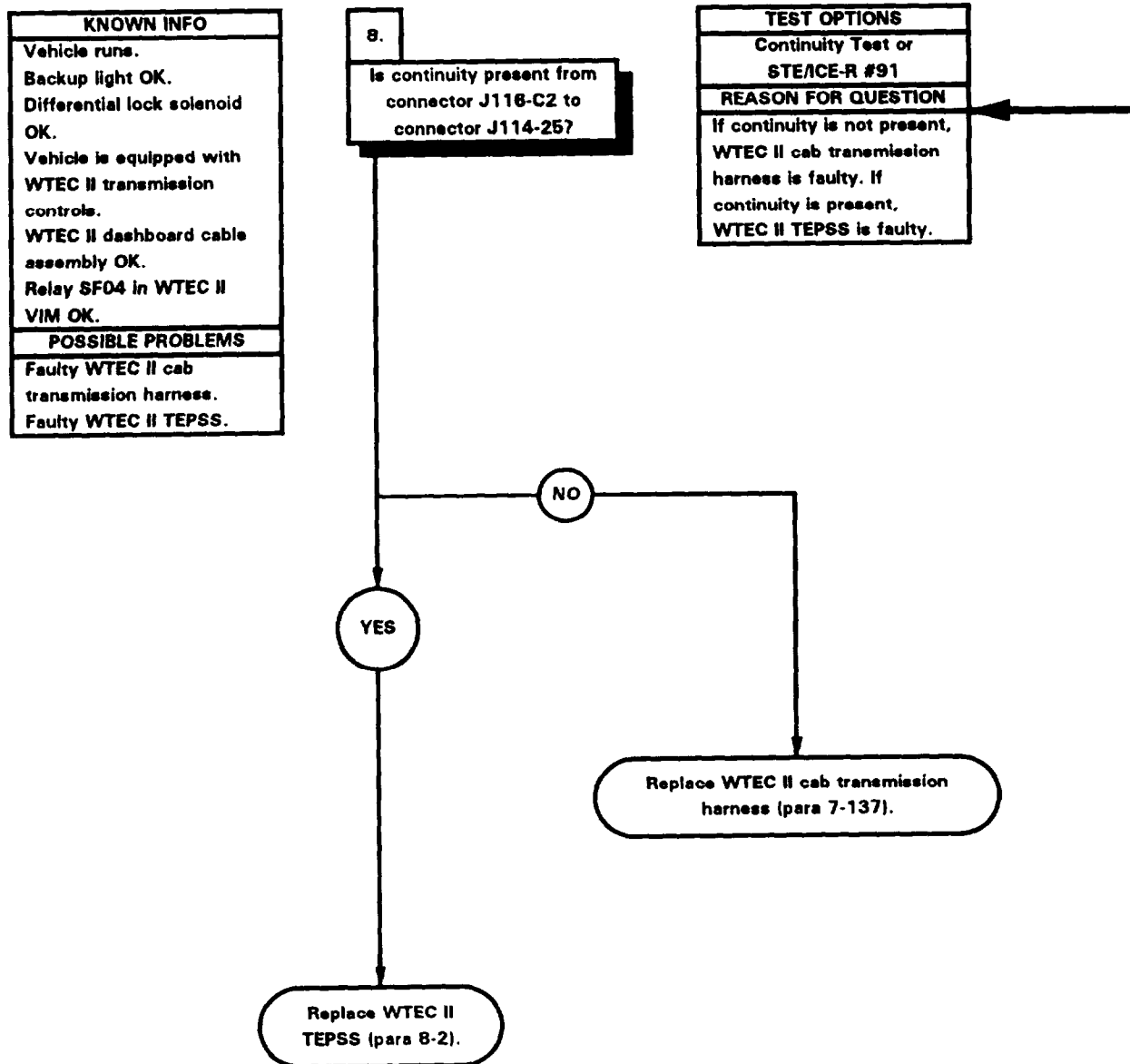
CONTINUITY TEST

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



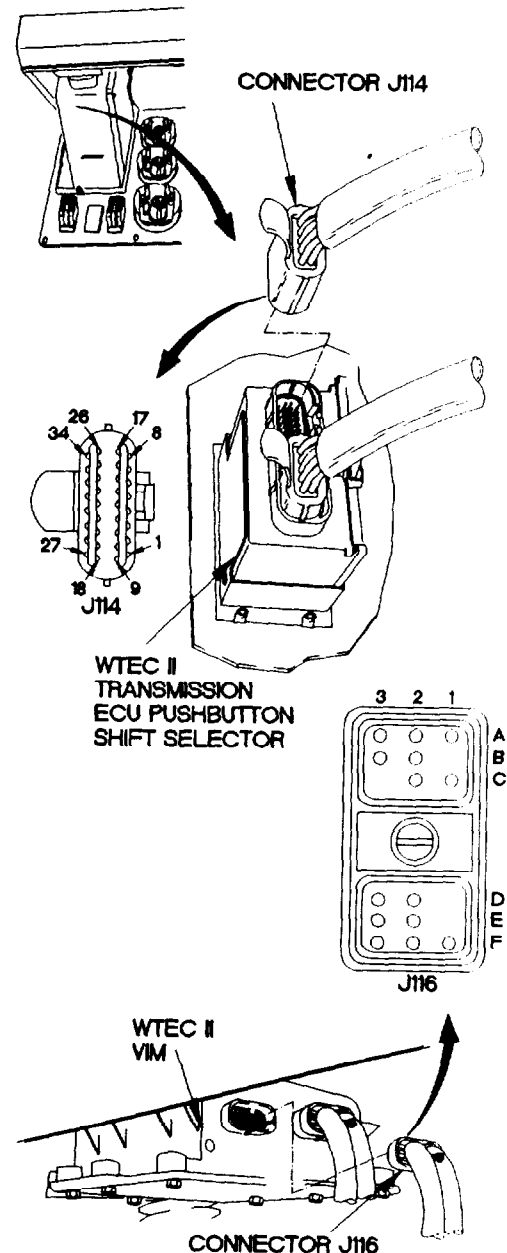
42E92061

94. DIFFERENTIAL LOCK SOLENOID DOES NOT OPERATE (CONT)



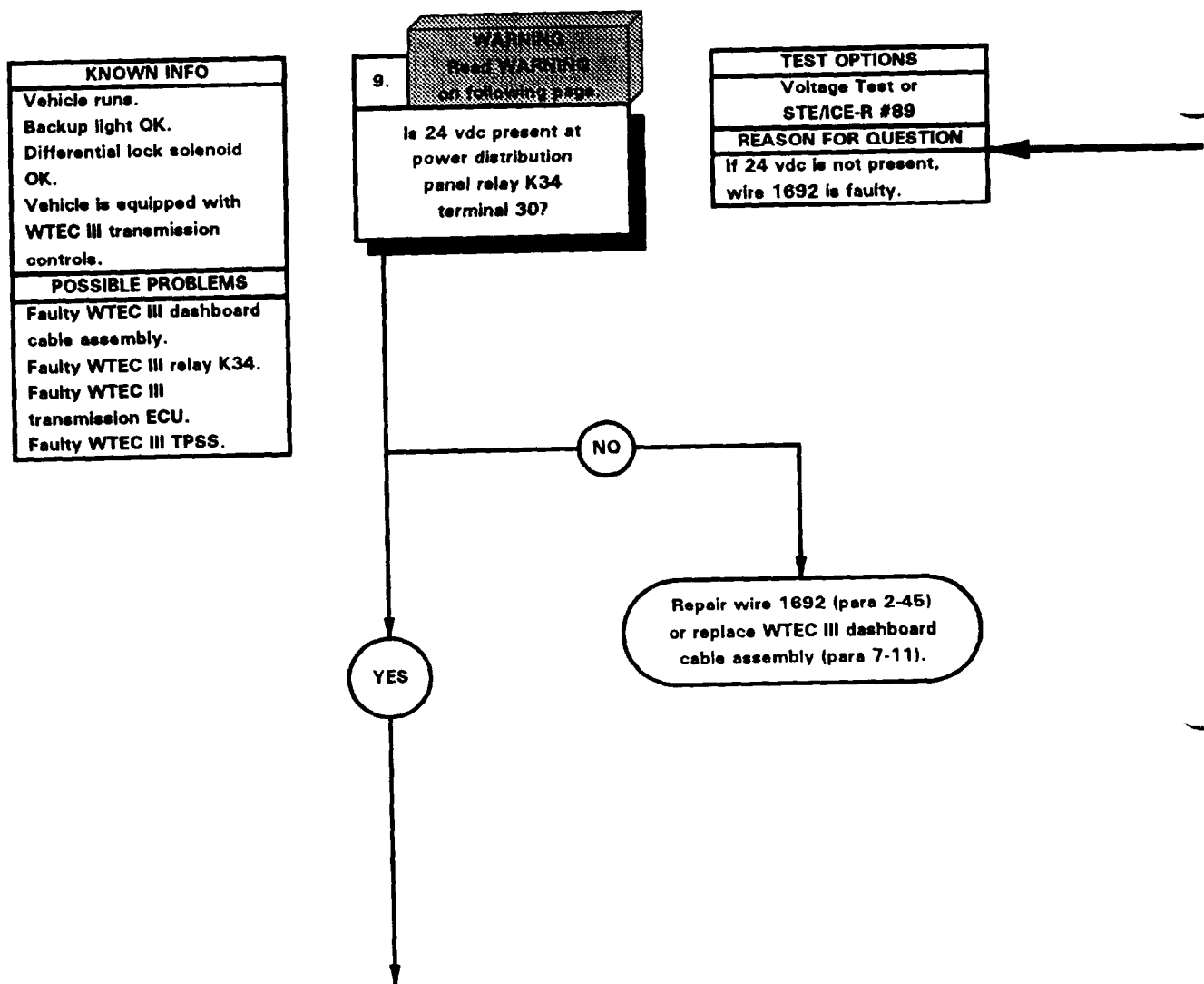
CONTINUITY TEST

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



42E92671

94. DIFFERENTIAL LOCK SOLENOID DOES NOT OPERATE (CONT)

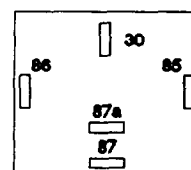
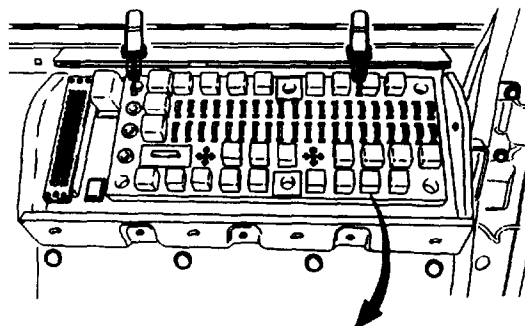


WARNING

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

VOLTAGE TEST

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



WTEC III
RELAY K34
CAVITY

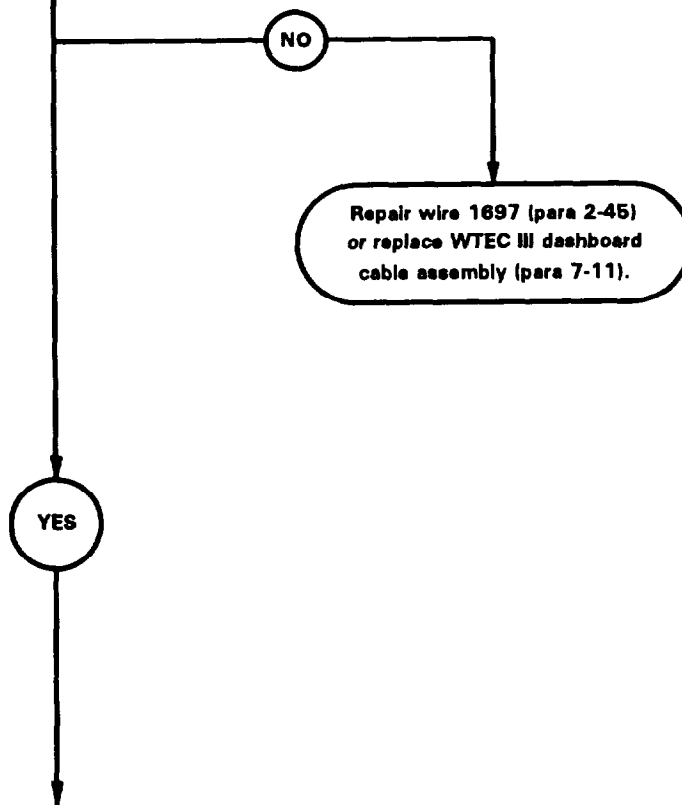
42E92081

694. DIFFERENTIAL LOCK SOLENOID DOES NOT OPERATE (CONT)

KNOWN INFO
Vehicle runs. Backup light OK. Differential lock solenoid OK. Vehicle is equipped with WTEC III transmission controls.
POSSIBLE PROBLEMS
Faulty WTEC III dashboard cable assembly. Faulty WTEC III relay K34. Faulty WTEC III transmission ECU. Faulty WTEC III TPSS.

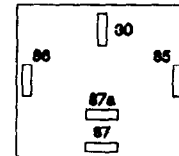
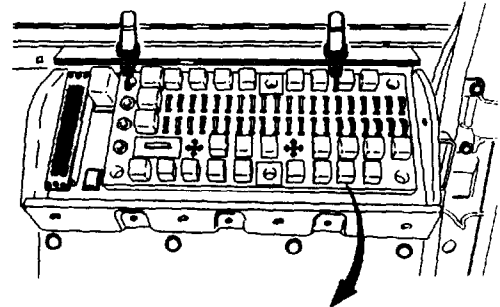
10.
Is continuity present from PDP relay K34 terminal 87a to connector PX50-27

TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, wire 1697 is faulty.

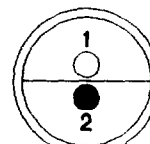


CONTINUITY TEST

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



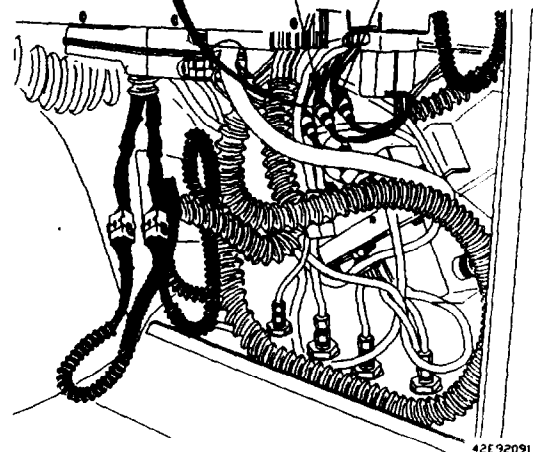
WTEC III
RELAY K34
CAVITY



PX50

CONNECTOR PX50

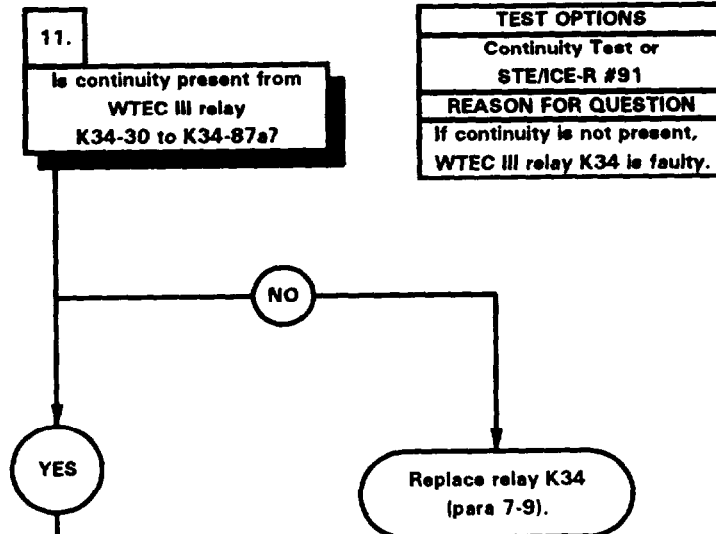
DIFFERENTIAL
LOCK SOLENOID
CONNECTOR



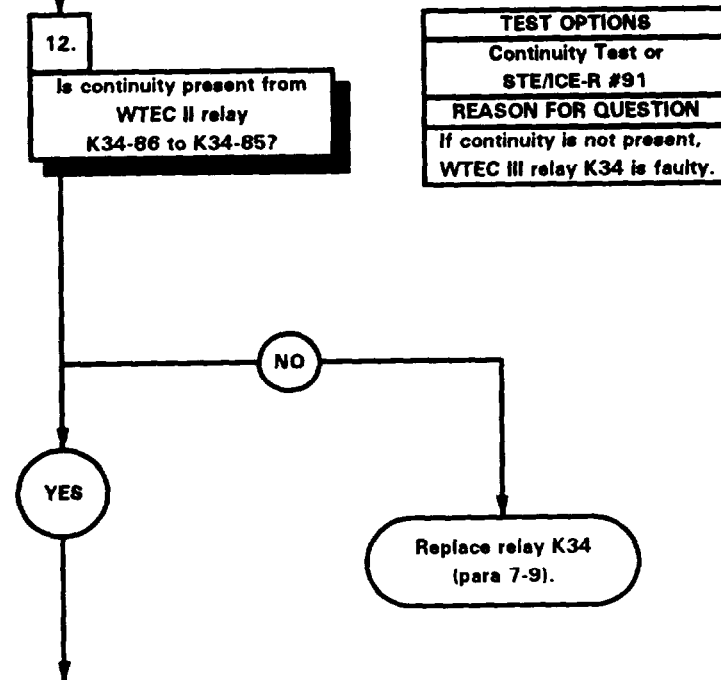
42E 92091

e94. DIFFERENTIAL LOCK SOLENOID DOES NOT OPERATE (CONT)

KNOWN INFO
Vehicle runs. Backup light OK. Differential lock solenoid OK. Vehicle is equipped with WTEC III transmission controls.
POSSIBLE PROBLEMS
Faulty WTEC III relay K34. Faulty WTEC III dashboard cable assembly. Faulty WTEC III transmission ECU. Faulty WTEC III TPSS.

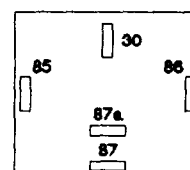


KNOWN INFO
Vehicle runs. Backup light OK. Differential lock solenoid OK. Vehicle is equipped with WTEC III transmission controls.
POSSIBLE PROBLEMS
Faulty WTEC III relay K34. Faulty WTEC III dashboard cable assembly. Faulty WTEC III transmission ECU. Faulty WTEC III TPSS.



CONTINUITY TEST

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



**WTEC III
RELAY K34**

42E92101

CONTINUITY TEST

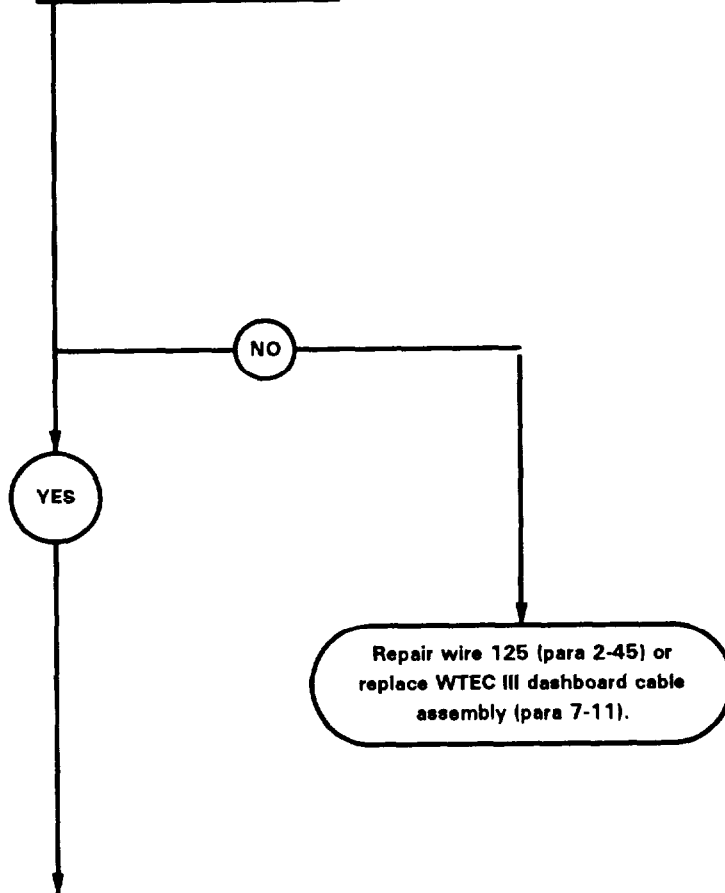
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to WTEC III relay K34 terminal 86.
- (3) Connect negative (-) probe of multimeter to WTEC III relay K34 terminal 85 and note reading on multimeter.
- (4) If continuity is not present, replace WTEC III relay K34 (para 7-9).

e94. DIFFERENTIAL LOCK SOLENOID DOES NOT OPERATE (CONT)

KNOWN INFO
Vehicle runs.
Backup light OK.
Differential lock solenoid OK.
Vehicle is equipped with WTEC III transmission controls.
WTEC III relay K34 OK.
POSSIBLE PROBLEMS
Faulty WTEC III dashboard cable assembly.
Faulty WTEC III transmission ECU.
Faulty WTEC III TPSS.

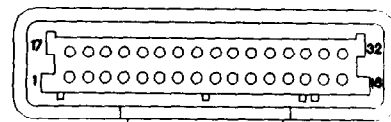
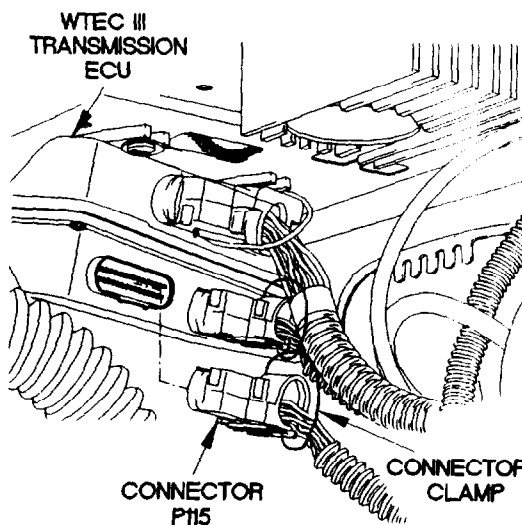
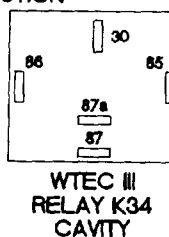
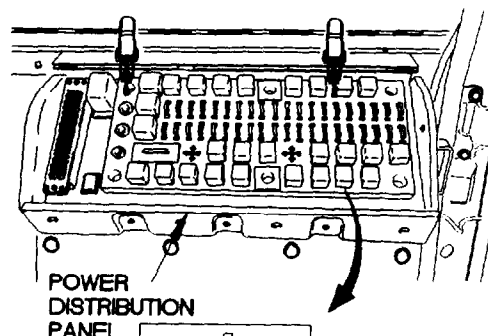
13.
Is continuity present from PDP relay K34 terminal 85 to connector P115-18?

TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 125 is faulty.



CONTINUITY TEST

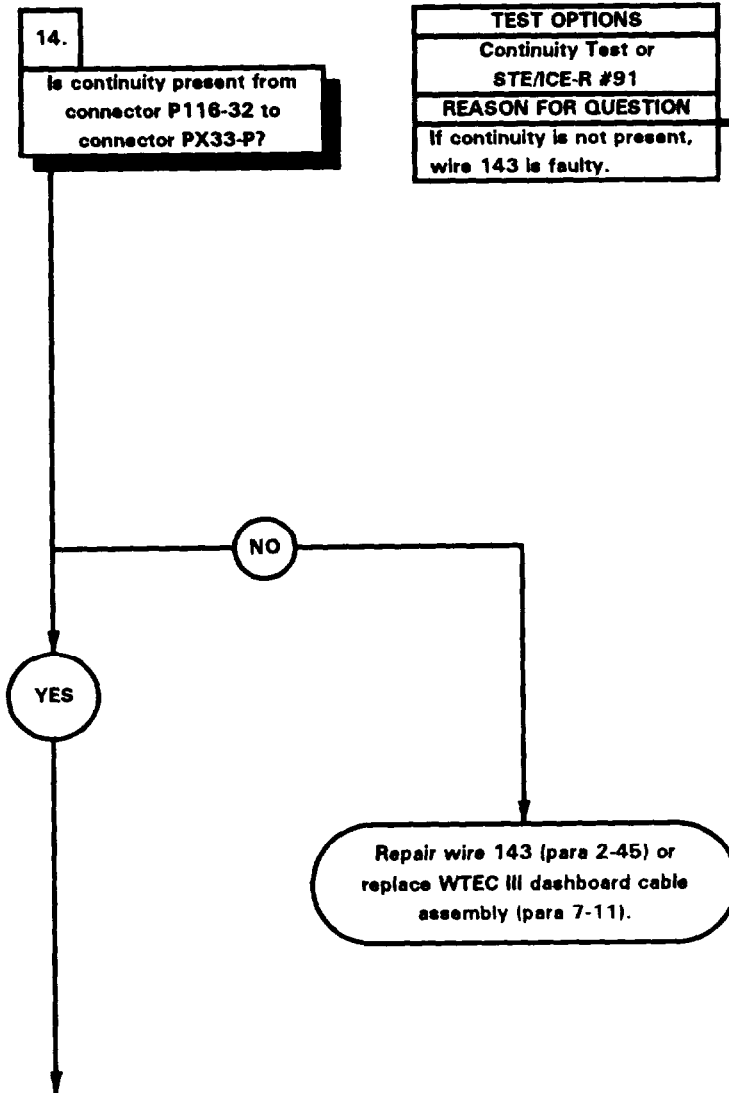
- (1) Disconnect connector clamp from connector P115.
- (2) Disconnect connector P115 from WTEC III transmission ECU.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to connector P115-18.
- (5) Connect negative (-) probe of multimeter to PDP, terminal 85, where WTEC III relay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



42F92111

94. DIFFERENTIAL LOCK SOLENOID DOES NOT OPERATE (CONT)

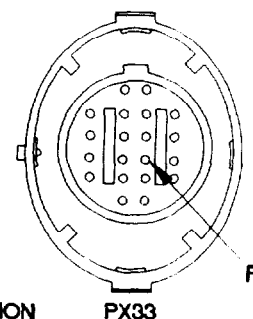
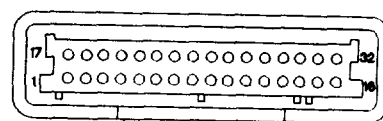
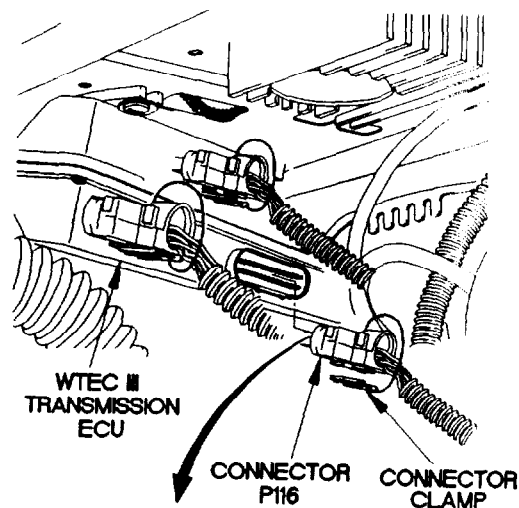
KNOWN INFO
Vehicle runs. Backup light OK. Differential lock solenoid OK. Vehicle is equipped with WTEC III transmission controls. WTEC III relay K34 OK.
POSSIBLE PROBLEMS
Faulty WTEC III dashboard cable assembly. Faulty WTEC III transmission ECU. Faulty WTEC III TPSS.



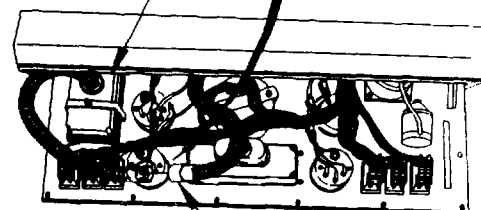
TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, wire 143 is faulty.

CONTINUITY TEST

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



WTEC III TRANSMISSION
PUSHBUTTON
SHIFT SELECTOR



CONNECTOR
PX33

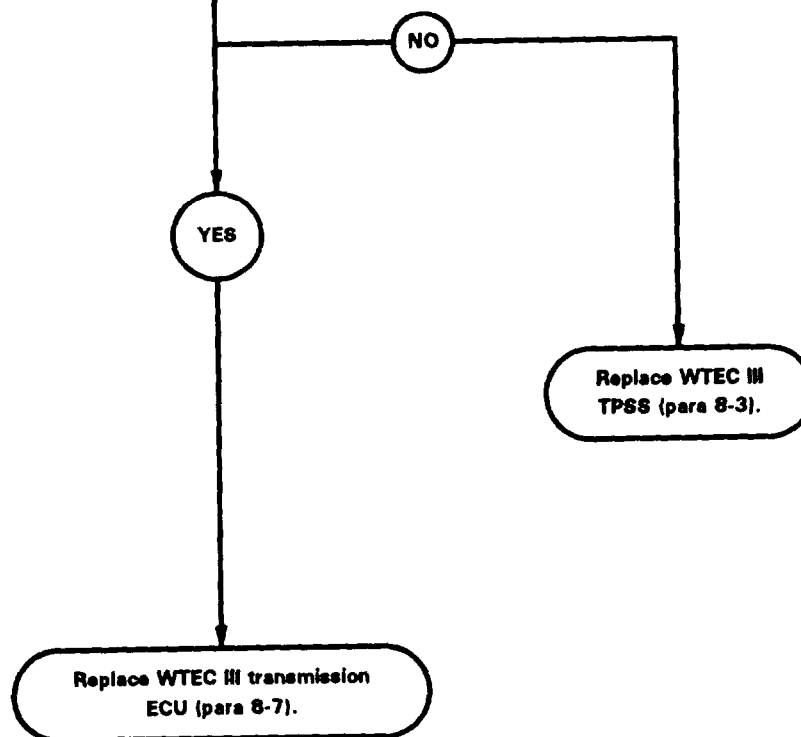
42E 92121

e94. DIFFERENTIAL LOCK SOLENOID DOES NOT OPERATE (CONT)

KNOWN INFO
Vehicle runs. Backup light OK. Differential lock solenoid OK. Vehicle is equipped with WTEC III transmission controls. WTEC III relay K34 OK. WTEC III dashboard cable assembly OK.
POSSIBLE PROBLEMS
Faulty WTEC III transmission ECU. Faulty WTEC III TPSS.

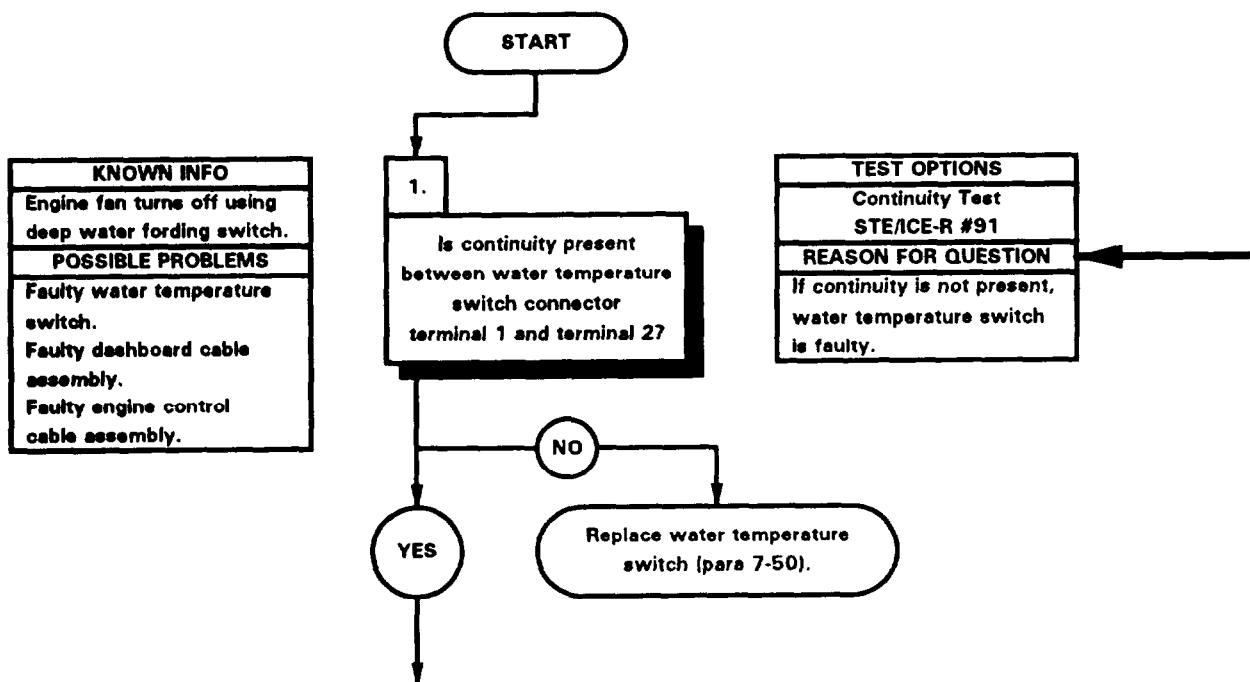
15.
Does differential lock solenoid operate with replacement WTEC III transmission ECU installed?

TEST OPTIONS
WTEC III Transmission ECU Replacement Check
REASON FOR QUESTION
If differential lock solenoid operates with replacement WTEC III transmission ECU installed, WTEC III transmission ECU is faulty. If differential lock solenoid does not operate with replacement WTEC III transmission ECU installed, WTEC III TPSS is faulty.



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

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

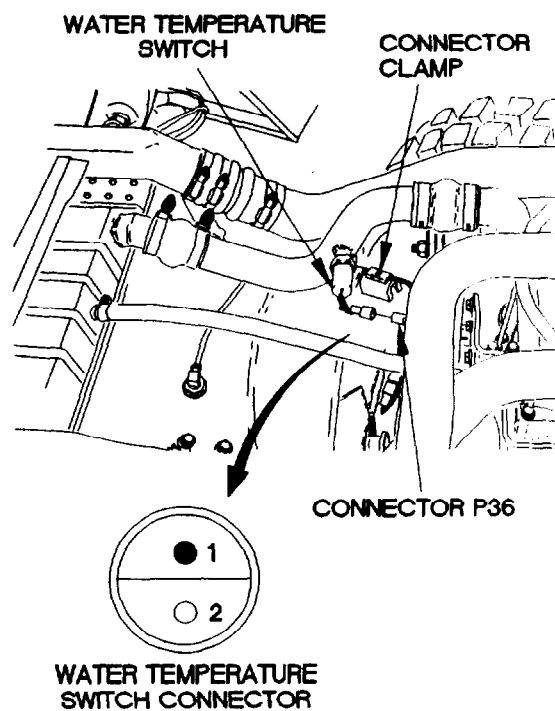


CONTINUITY TEST

NOTE

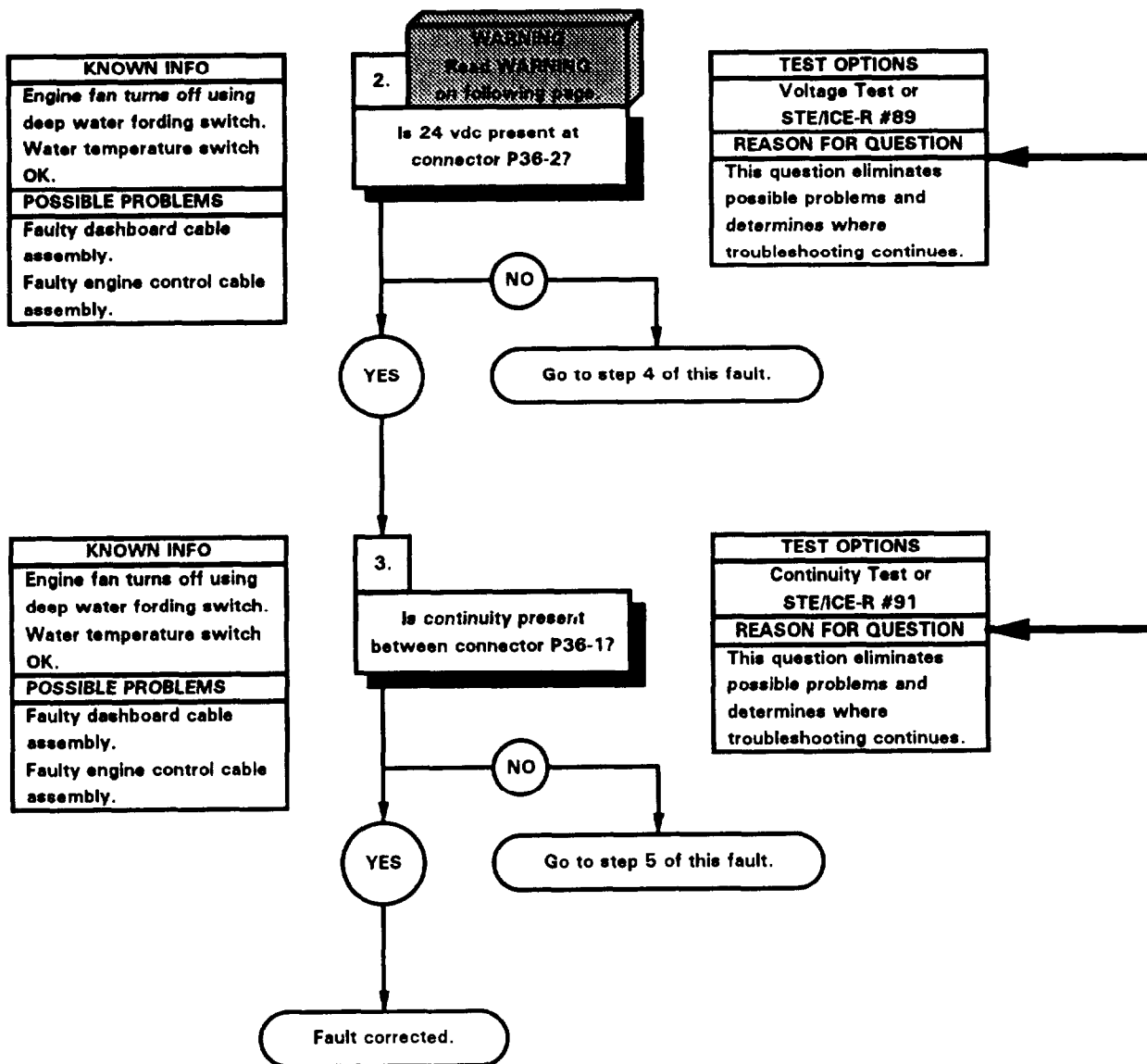
Engine must be cool during test.

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



X2E95/11A

e95. ENGINE FAN RUNS CONSTANTLY (CONT)



WARNING

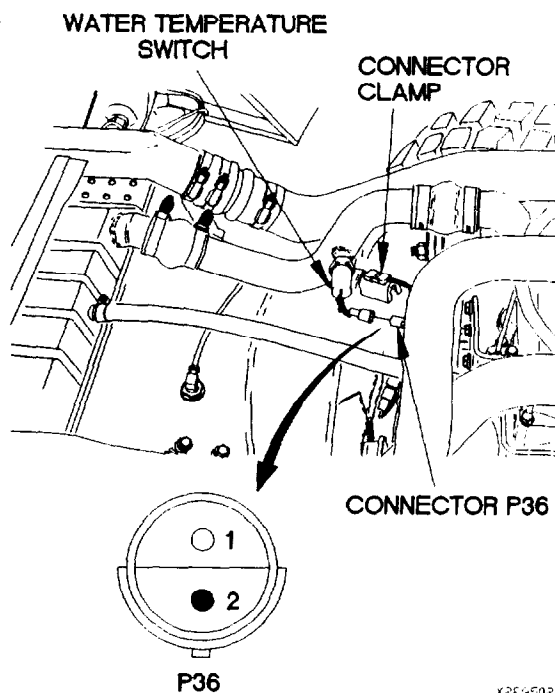
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

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

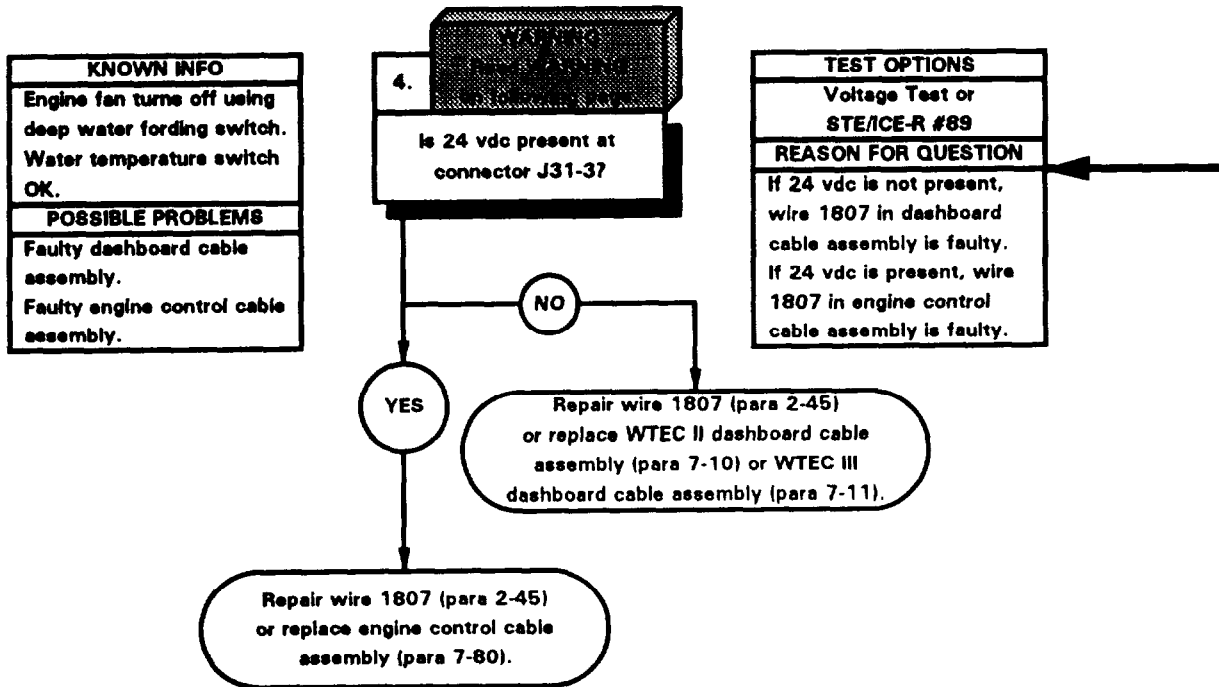
CONTINUITY TEST

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



K2E-5024

95. ENGINE FAN RUNS CONSTANTLY (CONT)

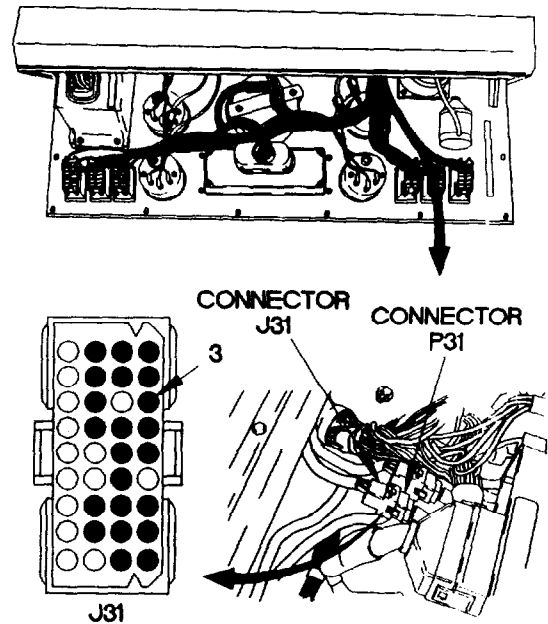


WARNING

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

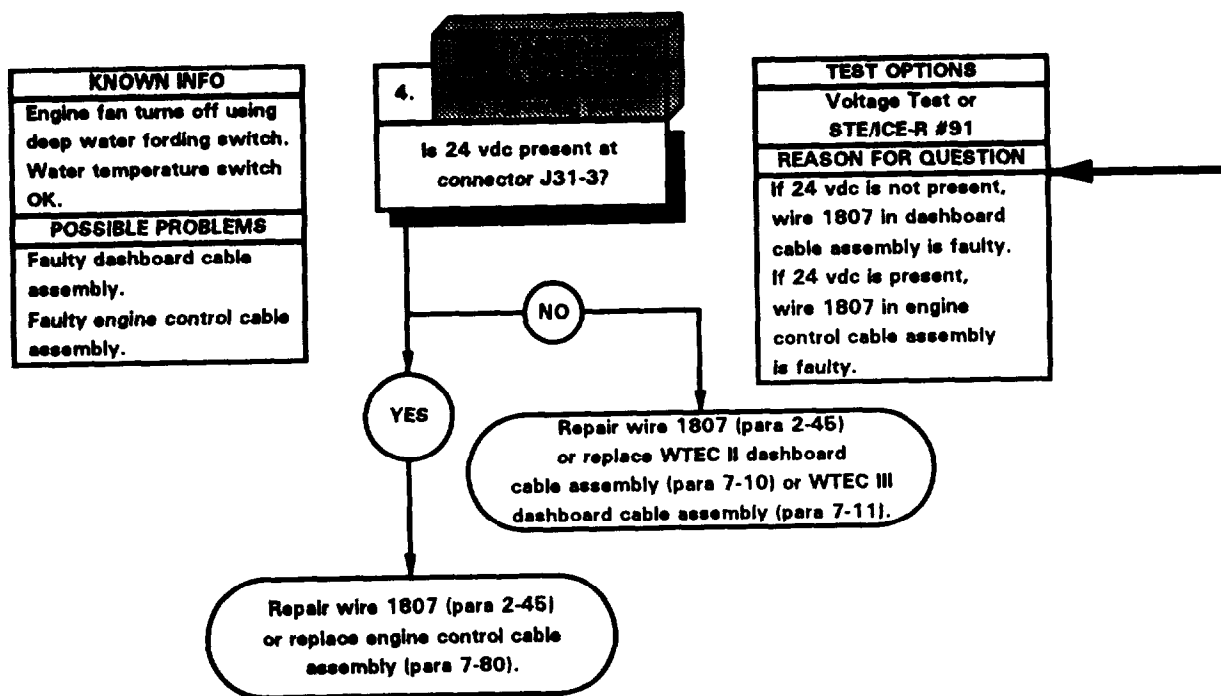
VOLTAGE TEST

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



X2E9503A

e95. ENGINE FAN RUNS CONSTANTLY (CONT)

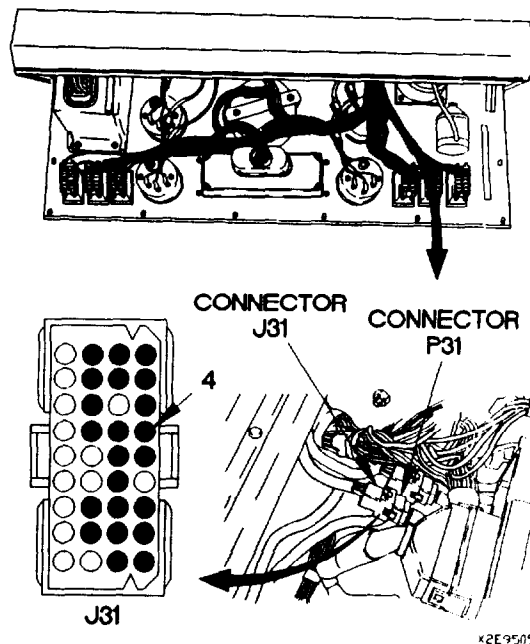


WARNING

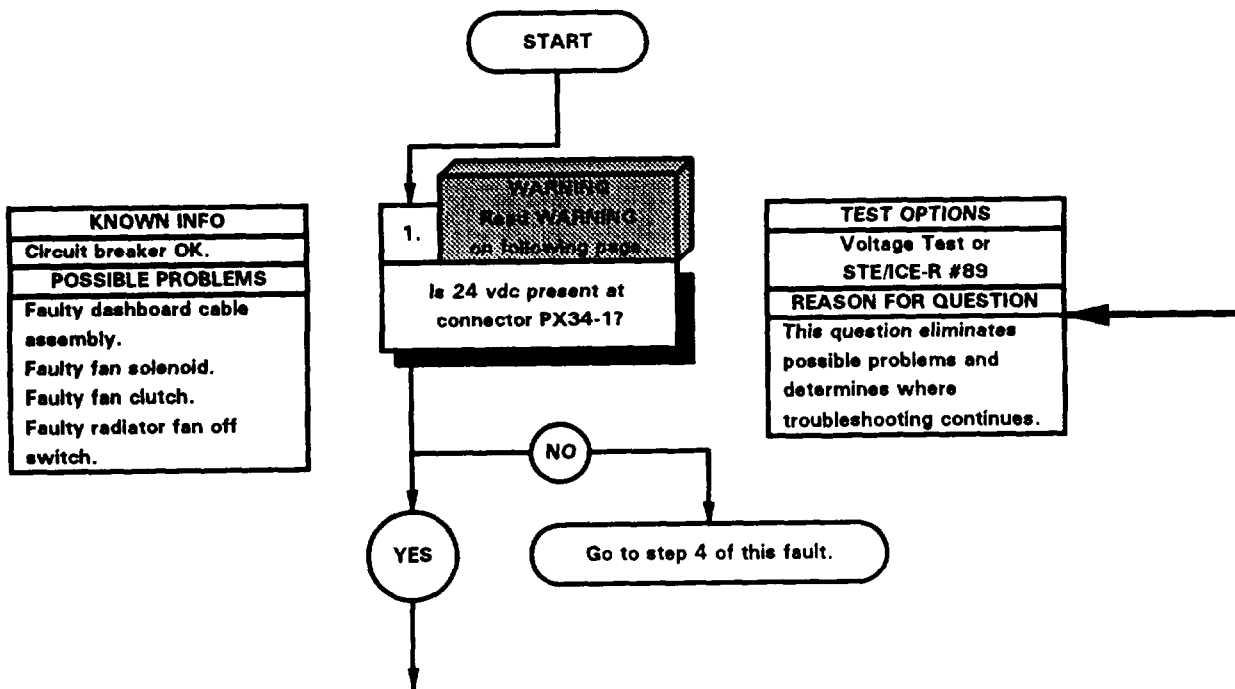
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

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



e96. ENGINE FAN DOES NOT TURN OFF USING RADIATOR FAN OFF SWITCH	
INITIAL SETUP	
Equipment Condition Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) STE/ICE-R (Item 41, Appendix C) Multimeter, Digital (Item 22, Appendix C)
Personnel Required (2)	References TM 9-4910-571-12&P

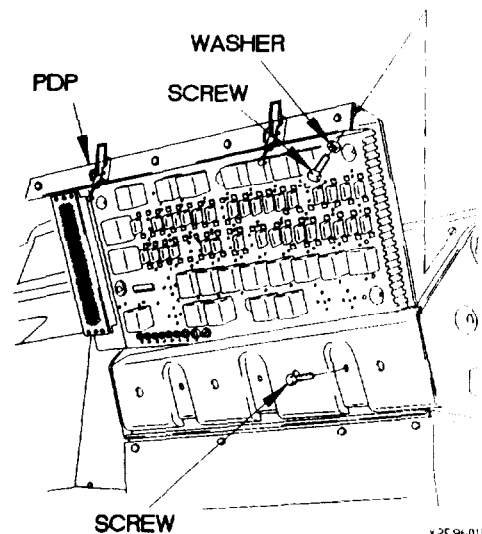
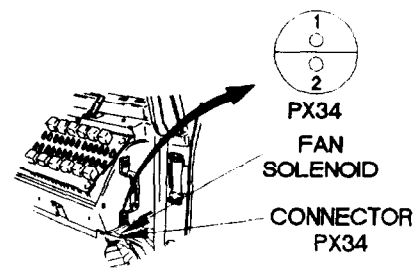
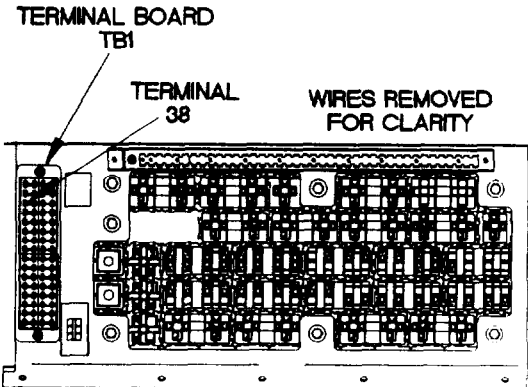


WARNING

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

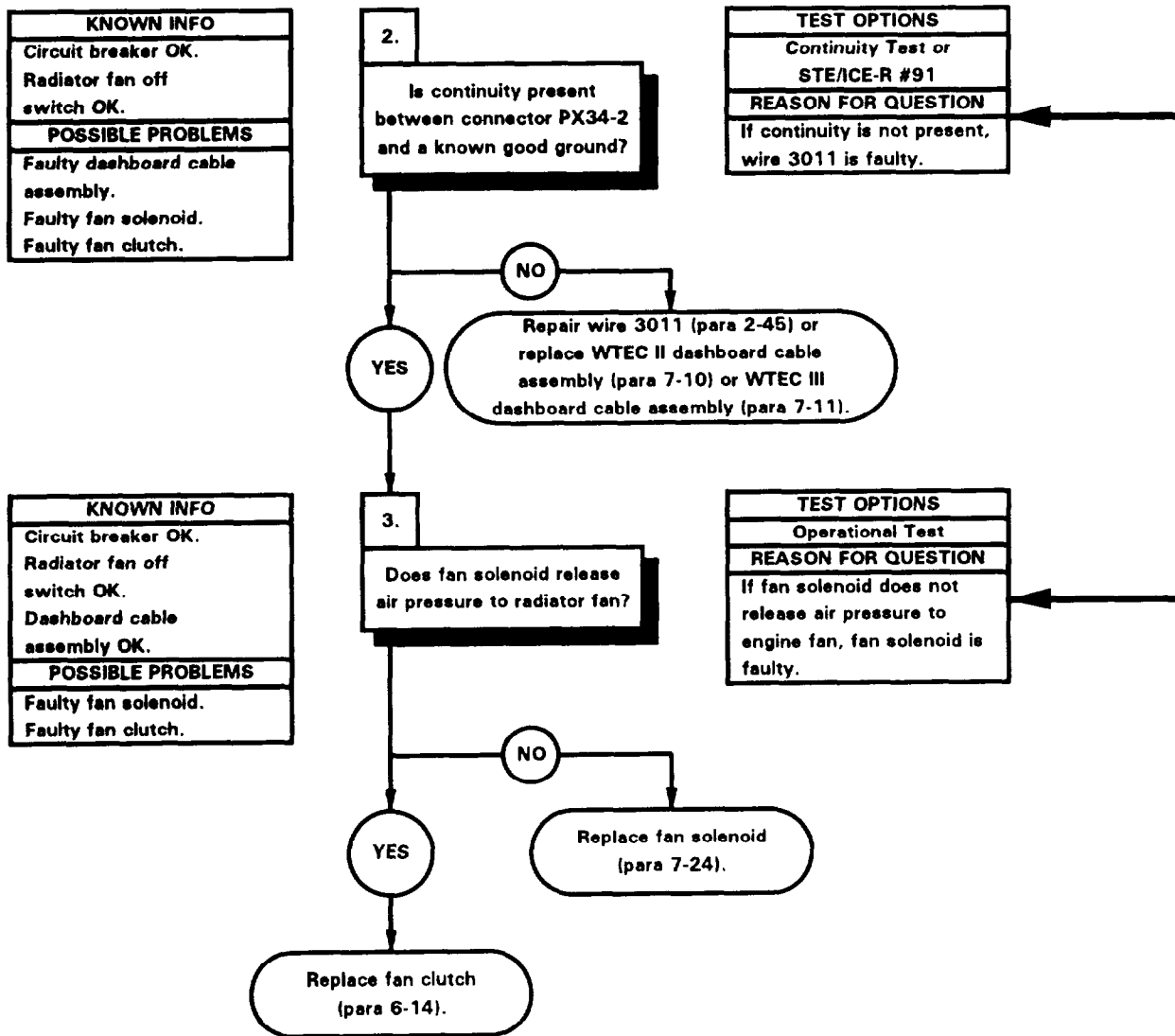
VOLTAGE TEST

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



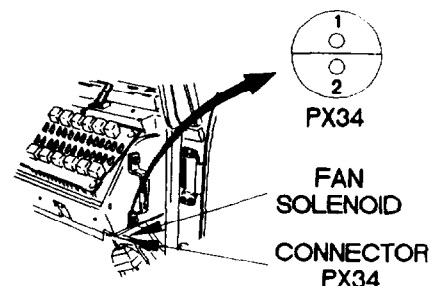
K2E94-011

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



CONTINUITY TEST

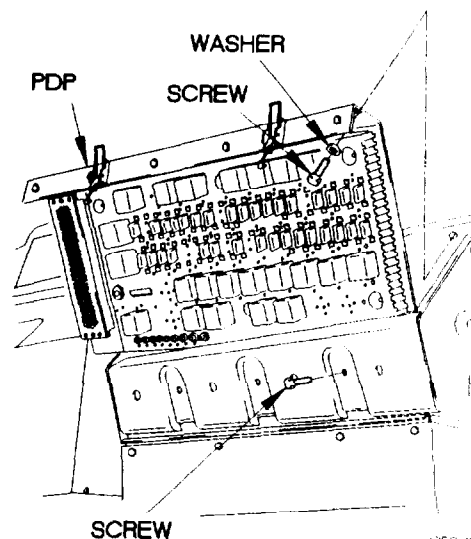
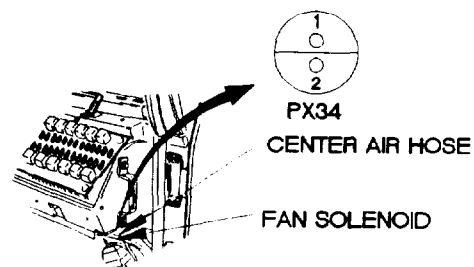
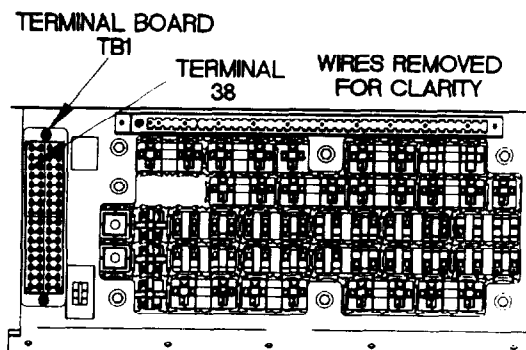
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector PX34-2.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3011 (para 2-45) or replace WTEC II dashboard cable assembly (para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



K2E 96/021

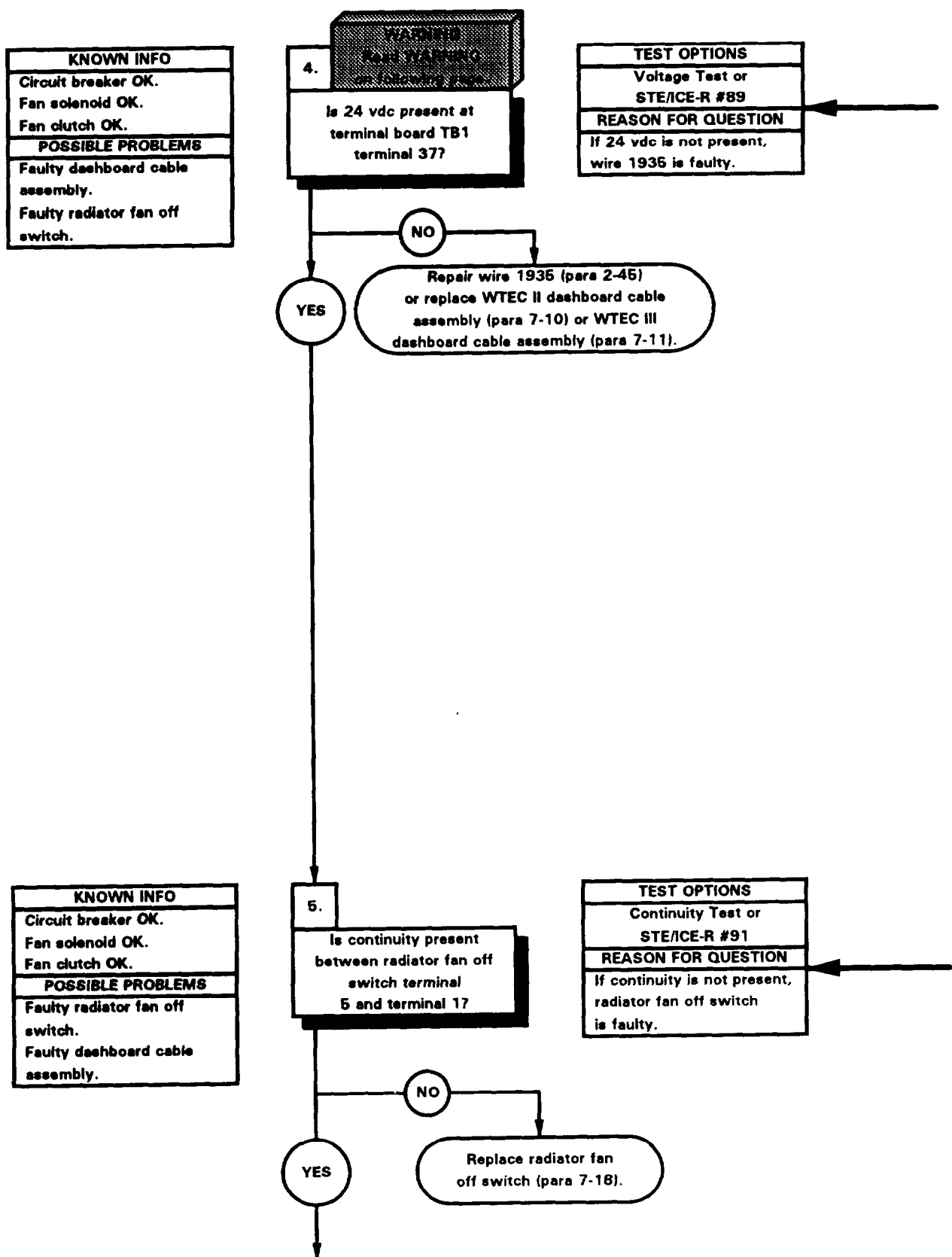
OPERATIONAL TEST

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



K2E 96/031

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

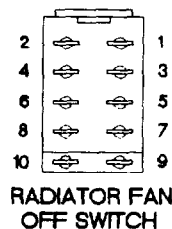
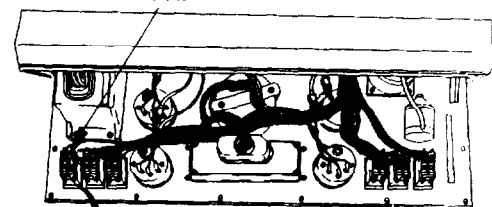
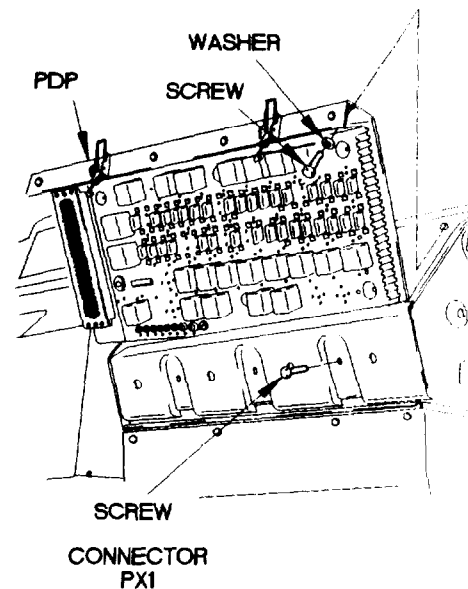
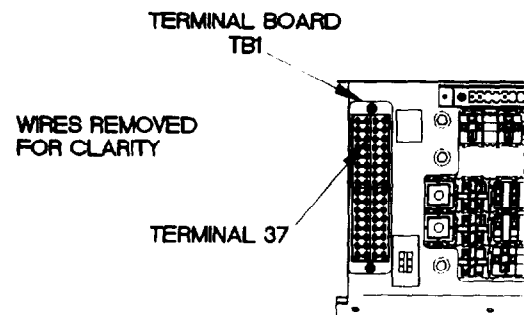


WARNING

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

VOLTAGE TEST

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

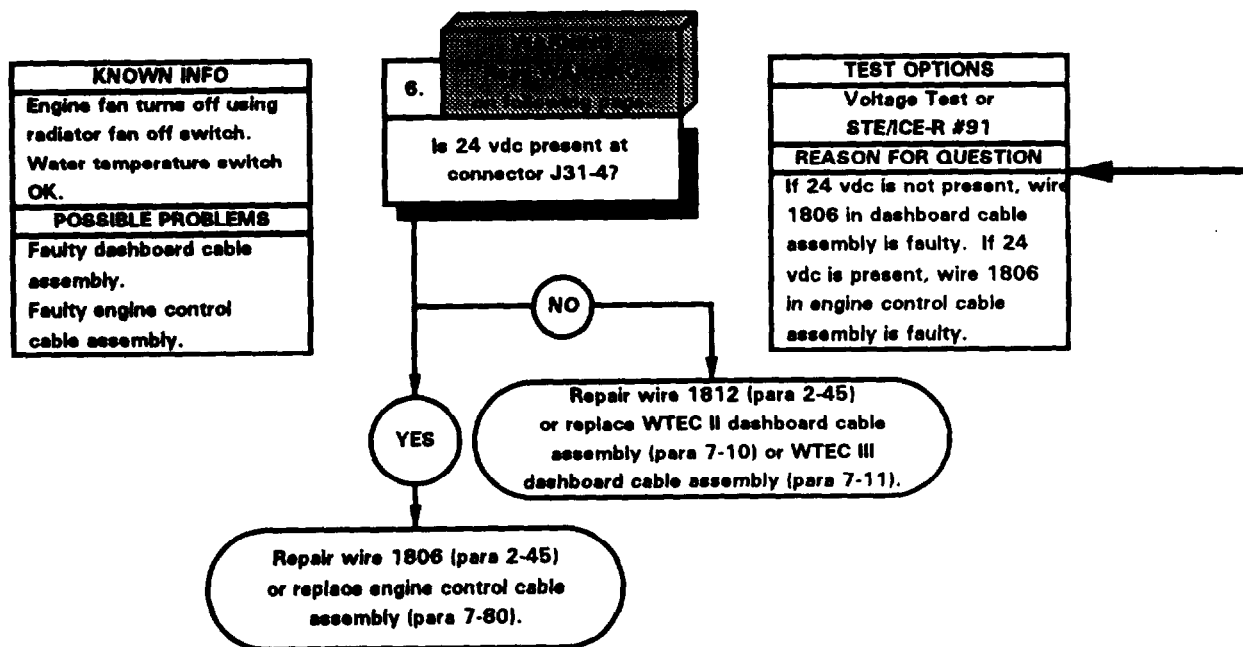


CONTINUITY TEST

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

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

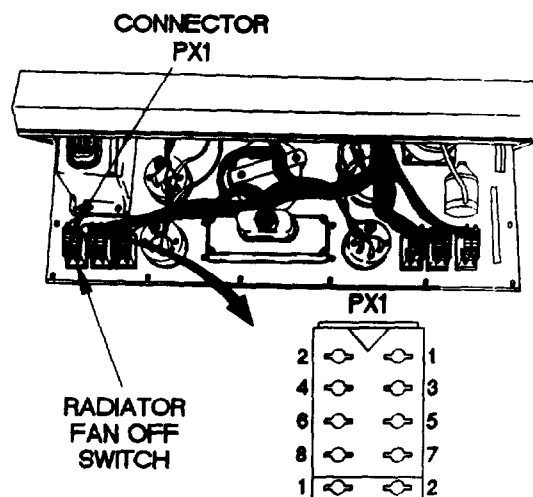


WARNING

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

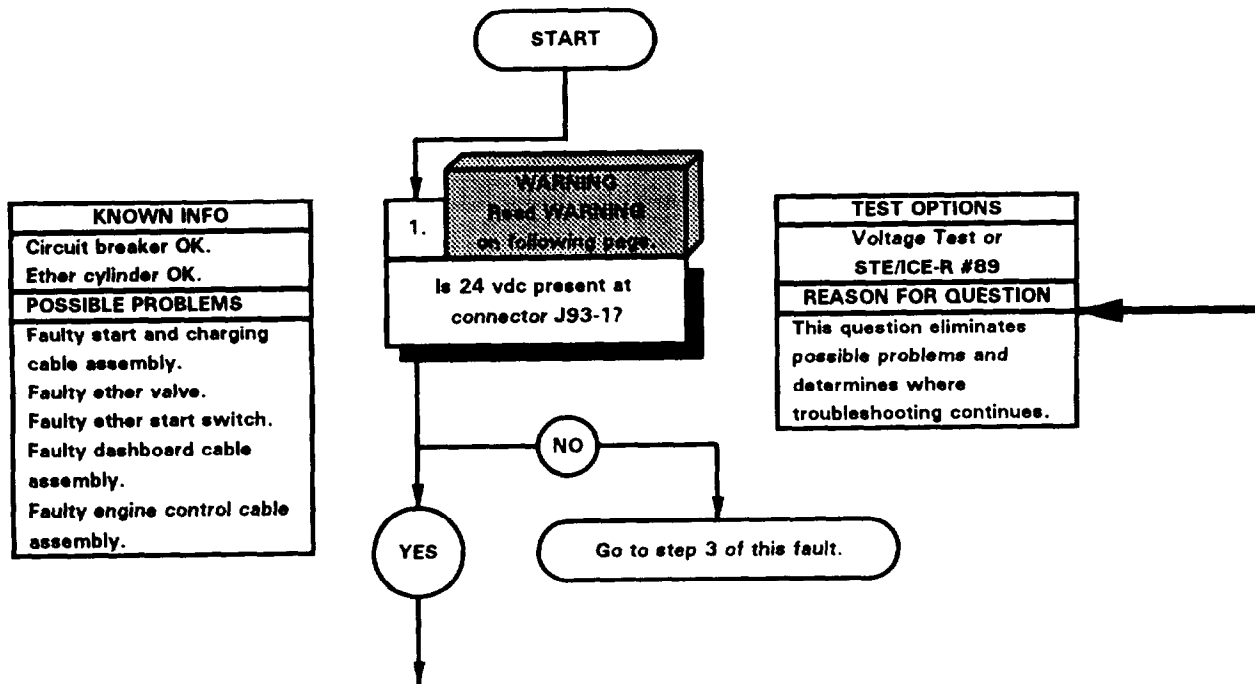
VOLTAGE TEST

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



x2E96051

e97. ETHER START DOES NOT OPERATE	
INITIAL SETUP	
Equipment Condition Engine shut down (TM 9-2320-366-10-1). Spare tire lowered (TM 9-2320-366-10-2).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) STE/ICE-R (Item 41, Appendix C) Multimeter, Digital (Item 22, Appendix C)
Personnel Required (2)	References TM 9-4910-571-12&P
Materials/Parts Wire, Elect, 50 ft (Item 71, Appendix D)	

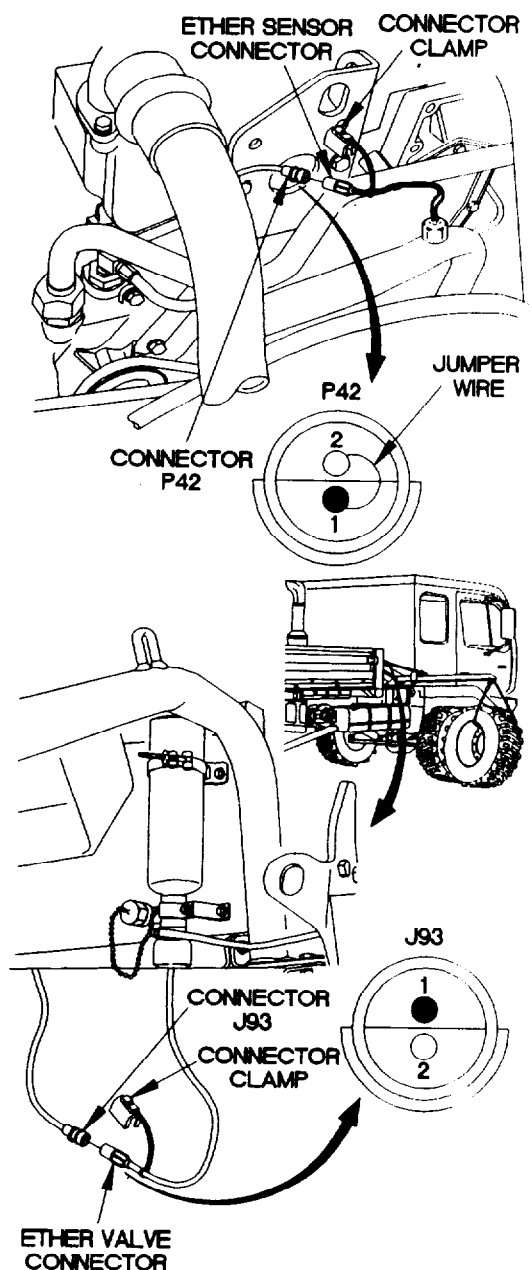


WARNING

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

VOLTAGE TEST

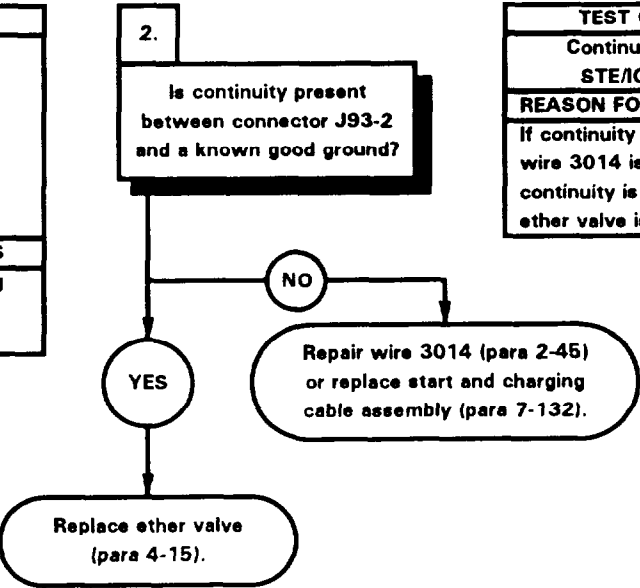
- (1) Disconnect connector clamp from ether valve connector.
- (2) Disconnect ether valve connector from connector J93.
- (3) Disconnect connector clamp from ether sensor connector.
- (4) Disconnect connector P42 from ether sensor connector.
- (5) Install jumper wire from connector P42-1 to connector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



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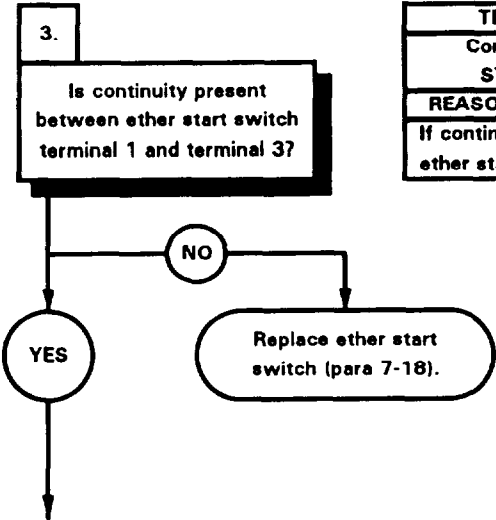
e97. ETHER START DOES NOT OPERATE (CONT)

KNOWN INFO
Circuit breaker OK. Ether cylinder OK. Ether start switch OK. Dashboard cable assembly OK. Engine control cable assembly OK.
POSSIBLE PROBLEMS
Faulty start and charging cable assembly. Faulty ether valve.



TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3014 is faulty. If continuity is present, ether valve is faulty.

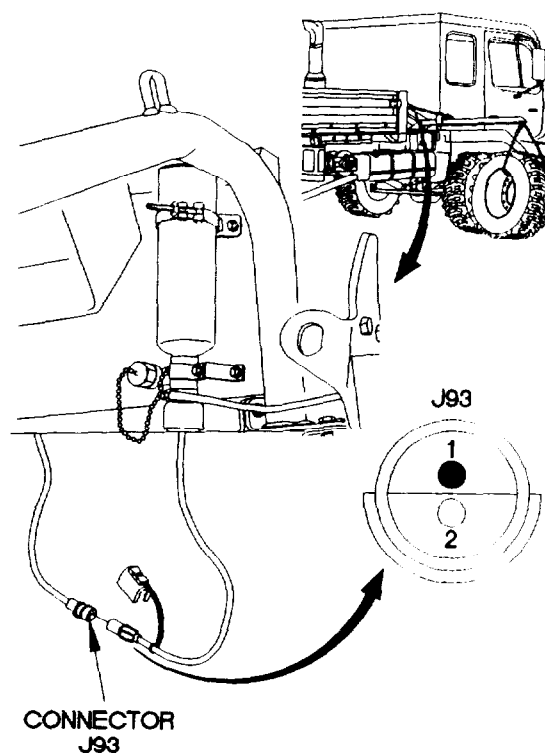
KNOWN INFO
Circuit breaker OK. Ether cylinder OK. Start and charging cable assembly OK. Ether valve OK.
POSSIBLE PROBLEMS
Faulty ether start switch. Faulty dashboard cable assembly. Faulty engine control cable assembly.



TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, ether start switch is faulty.

CONTINUITY TEST

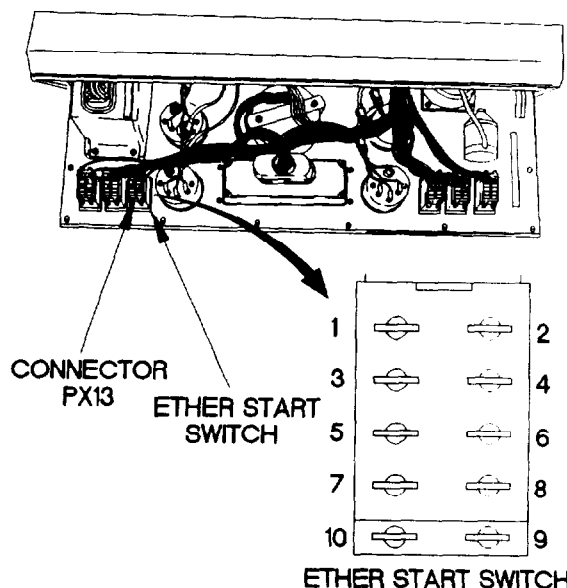
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector J93-2.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3014 (para 2-45) or replace start and charging cable assembly (para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



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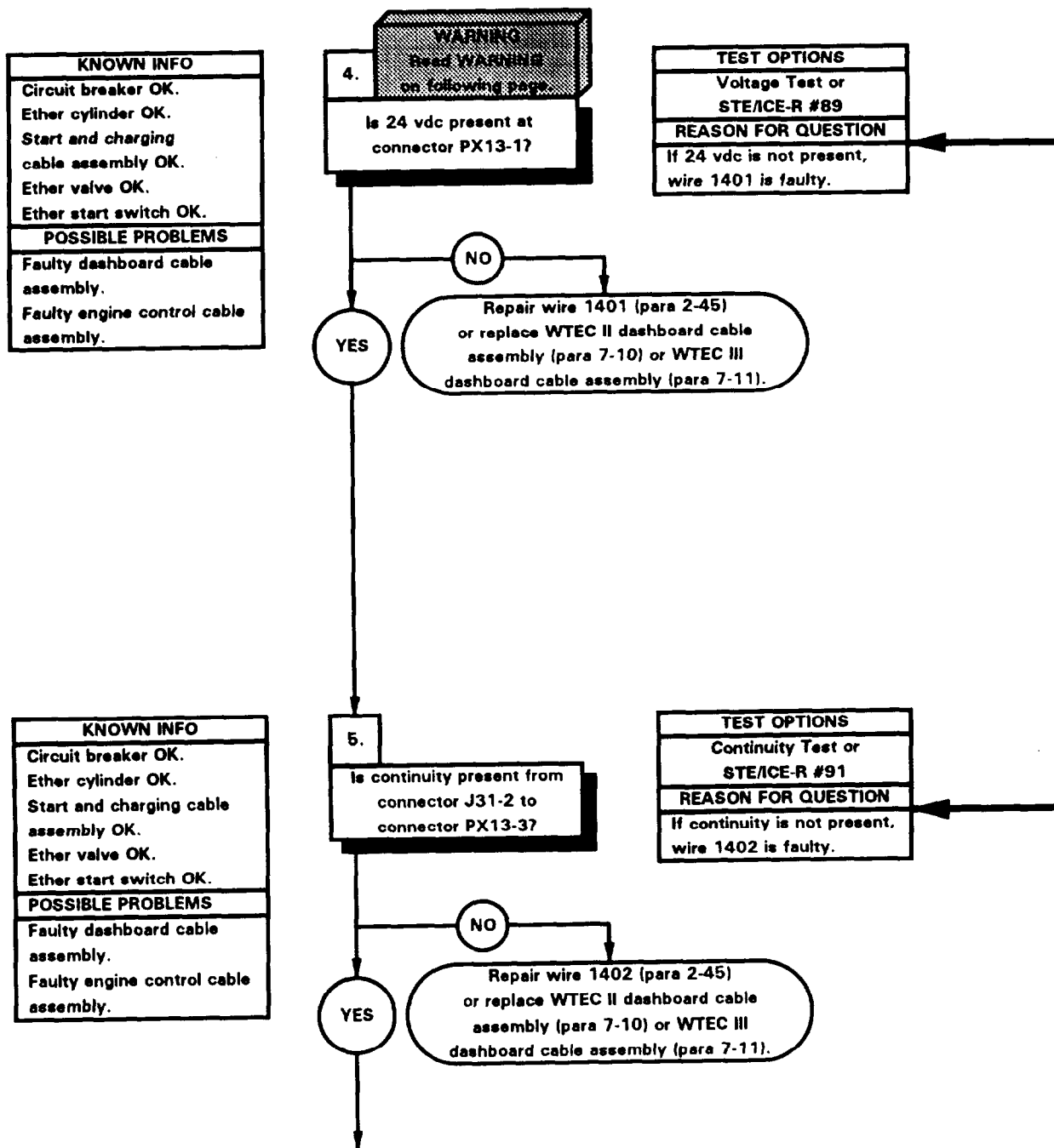
CONTINUITY TEST

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



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e97. ETHER START DOES NOT OPERATE (CONT)



WARNING

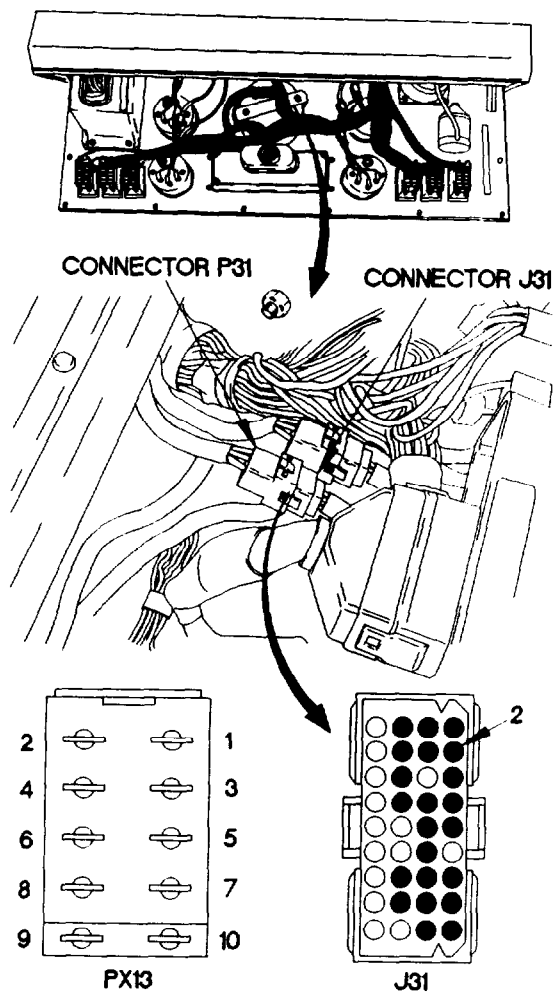
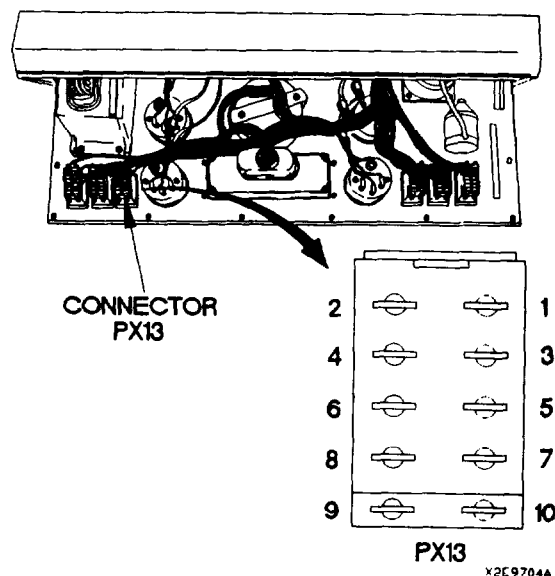
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

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

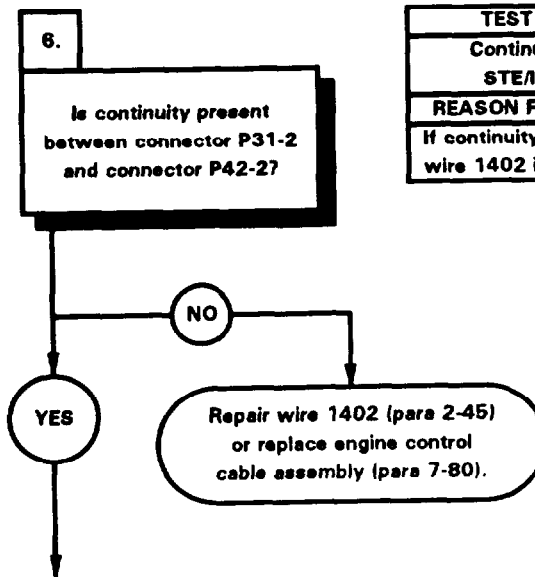
CONTINUITY TEST

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



e97. ETHER START DOES NOT OPERATE (CONT)

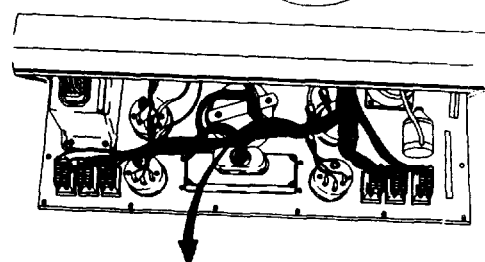
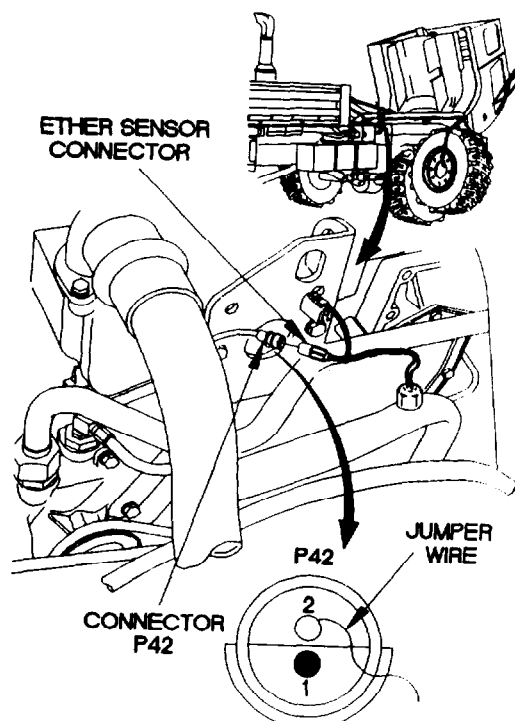
KNOWN INFO
Circuit breaker OK. Ether cylinder OK. Start and charging cable assembly OK. Ether valve OK. Ether start switch OK.
POSSIBLE PROBLEMS
Faulty engine control cable assembly. Faulty ether sensor. Faulty dashboard cable assembly.



TEST OPTIONS
Continuity Test or STE/CE-R #91
REASON FOR QUESTION
If continuity is not present, wire 1402 is faulty.

CONTINUITY TEST

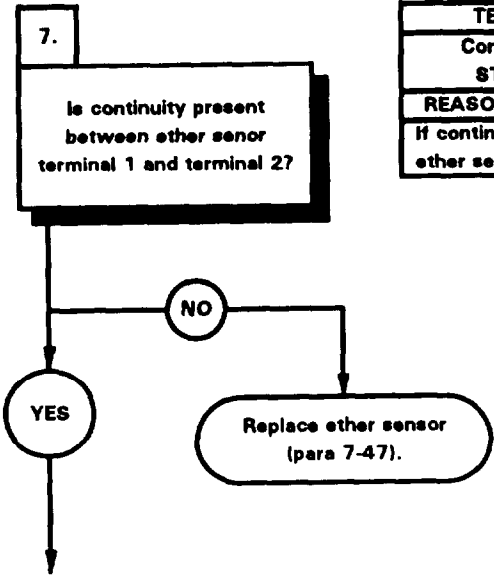
- (1) Raise cab (TM 9-2320-366-10).
- (2) Disconnect connector P42 from ether sensor connector.
- (3) Connect jumper wire to connector P42-2.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to connector P31-2.
- (6) Connect negative (-) probe of multimeter to jumper wire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



X2CE9706A

697. ETHER START DOES NOT OPERATE (CONT)

KNOWN INFO
Circuit breaker OK. Ether cylinder OK. Start and charging cable assembly OK. Ether valve OK. Ether start switch OK. Dashboard cable assembly OK.
POSSIBLE PROBLEMS
Faulty engine control cable assembly. Faulty ether sensor.

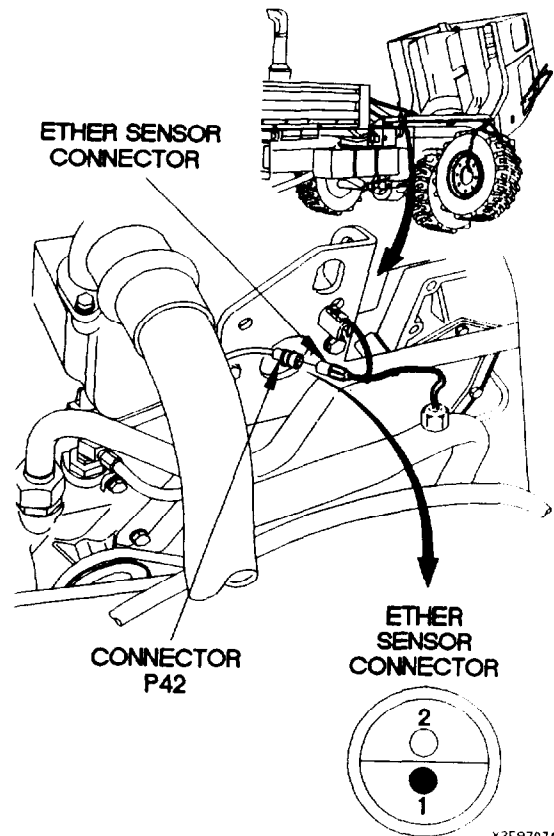


TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, ether sensor is faulty.



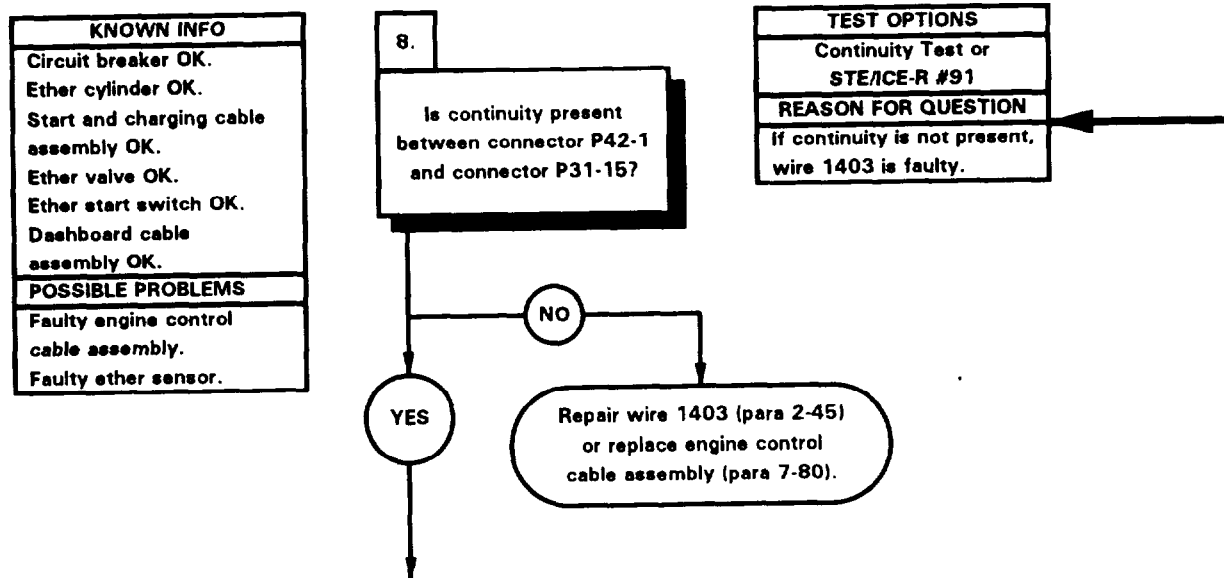
CONTINUITY TEST

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



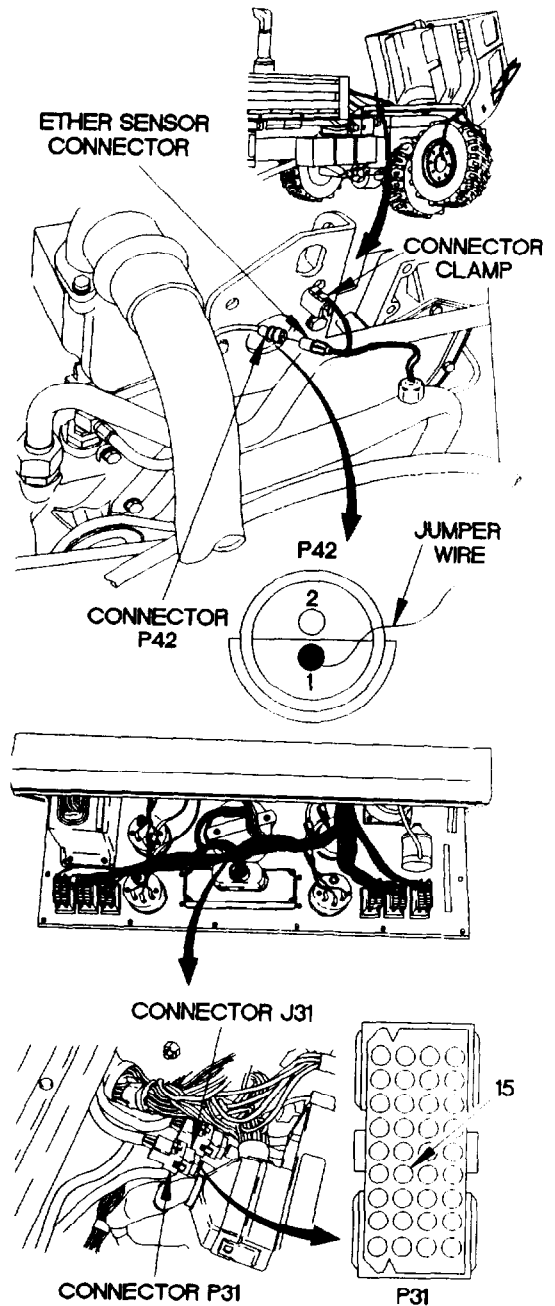
K2E9767A

e97. ETHER START DOES NOT OPERATE (CONT)

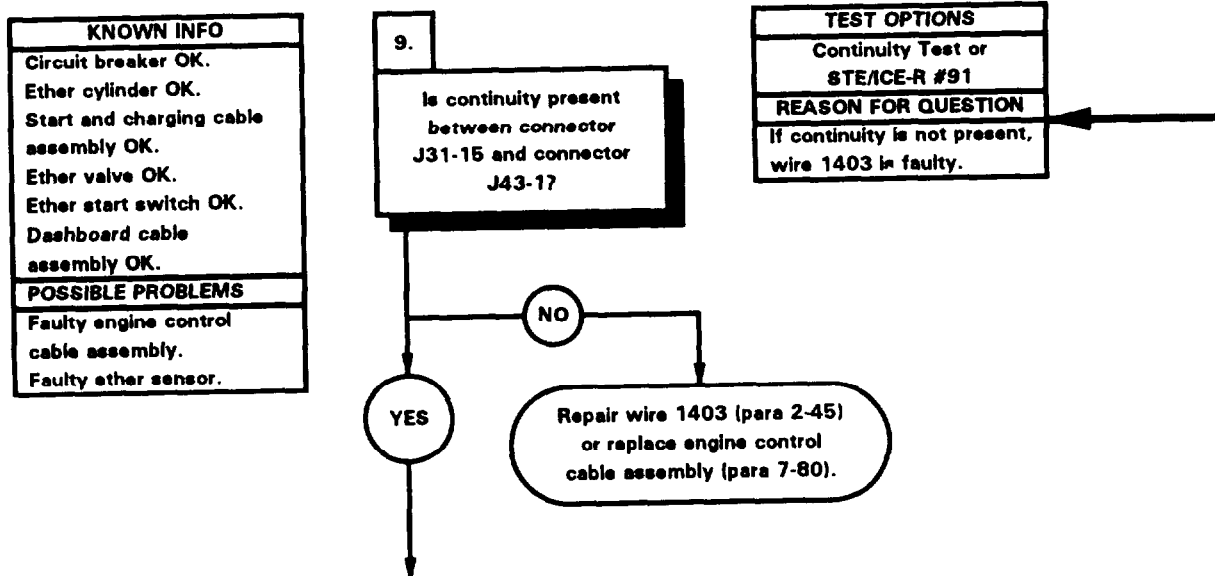


CONTINUITY TEST

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

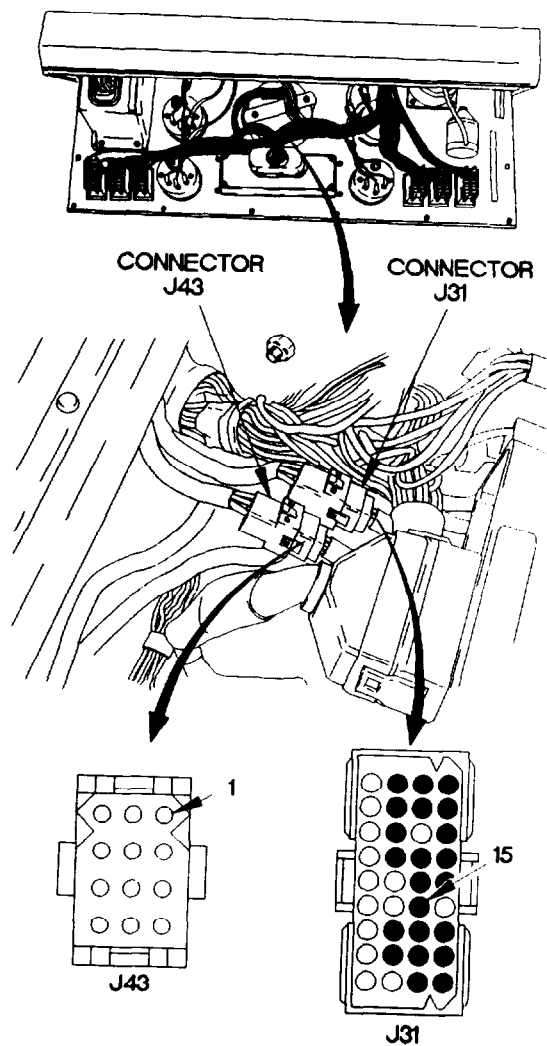


97. ETHER START DOES NOT OPERATE (CONT)



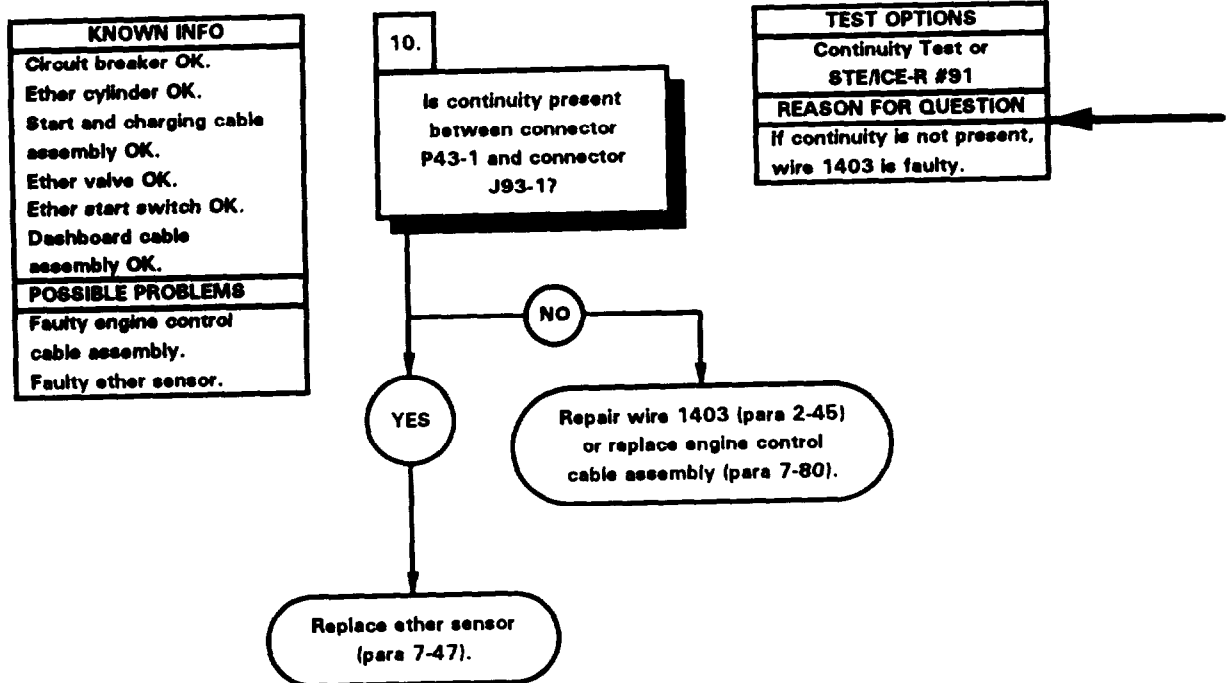
CONTINUITY TEST

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



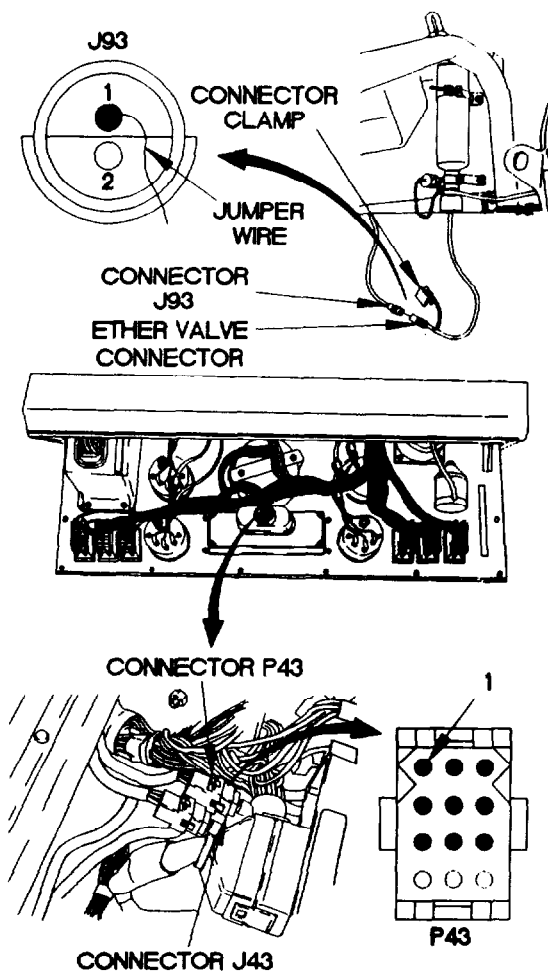
X2E9709A

ø97. ETHER START DOES NOT OPERATE (CONT)



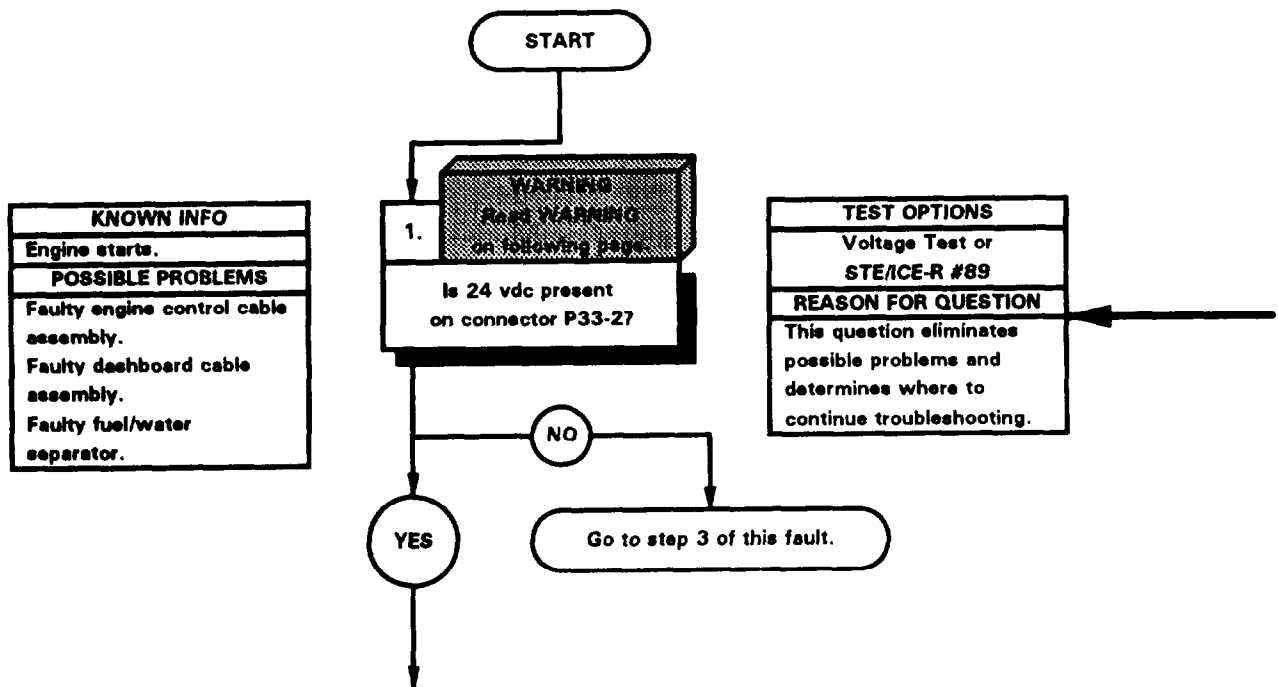
CONTINUITY TEST

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



x2E9710A

•98. EXCESSIVE CONDENSATION IN FUEL	
INITIAL SETUP	
Equipment Condition Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) STE/ICE-R (Item 41, Appendix C) Multimeter, Digital (Item 22, Appendix C)
Personnel Required (2)	Materials/Parts Wire, Elect, 50 ft (Item 71, Appendix D)
References TM 9-4910-571-12&P	

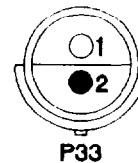
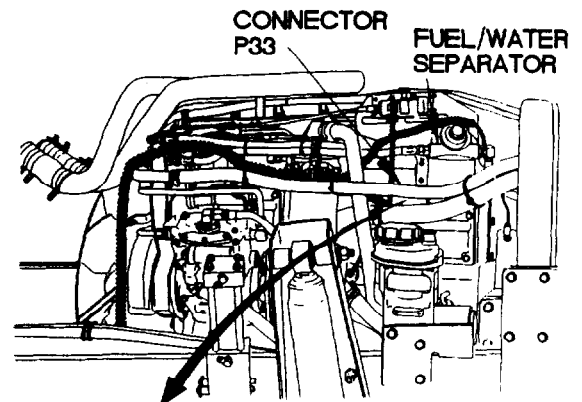


WARNING

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

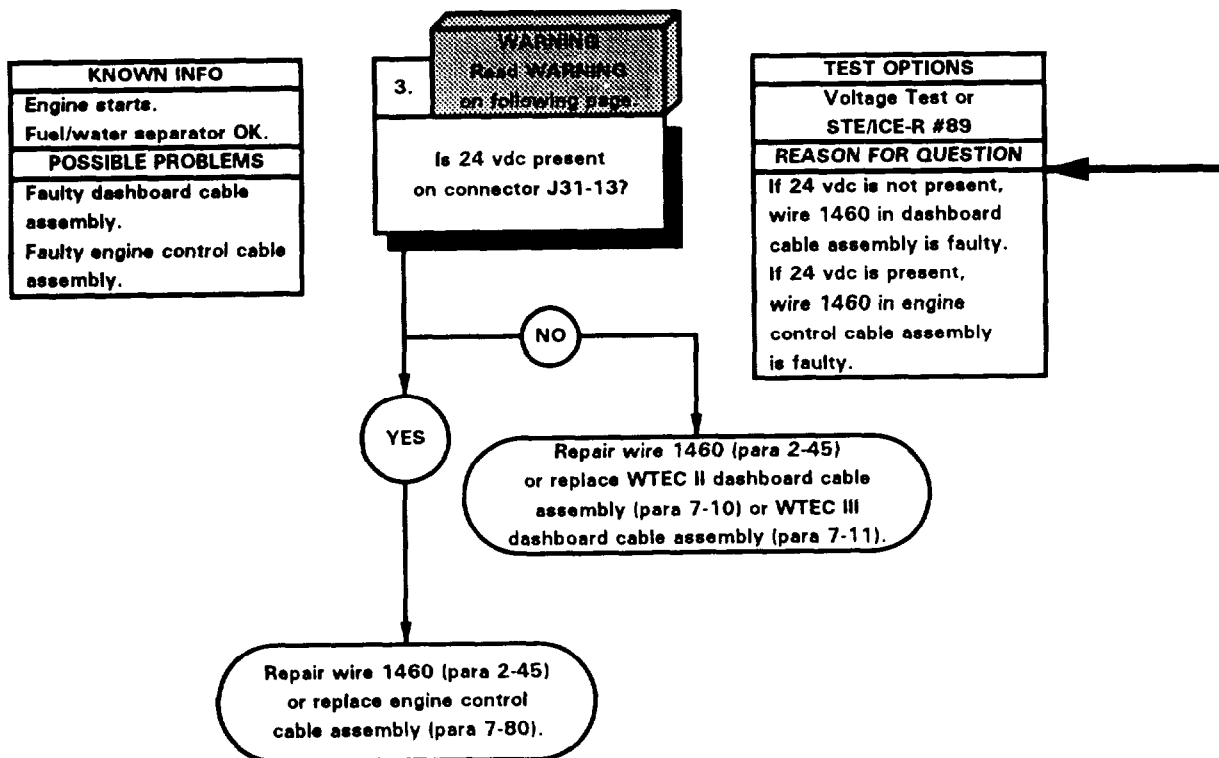
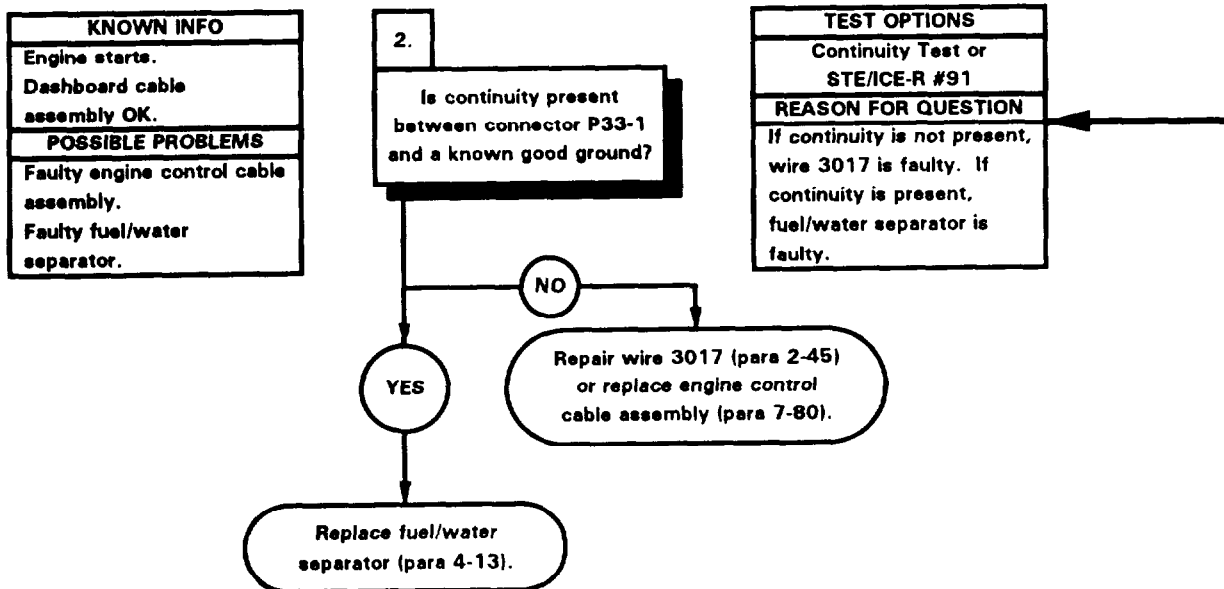
VOLTAGE TEST

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



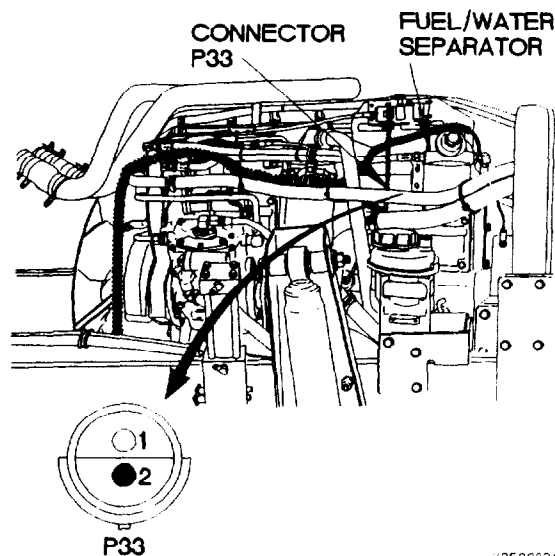
X2E9801A

e98. EXCESSIVE CONDENSATION IN FUEL (CONT)



CONTINUITY TEST

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



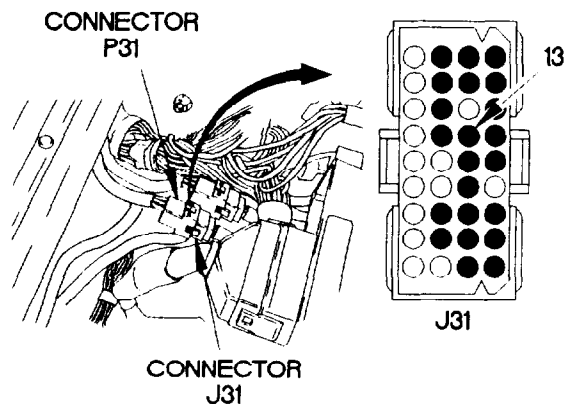
*2E9802A

WARNING

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

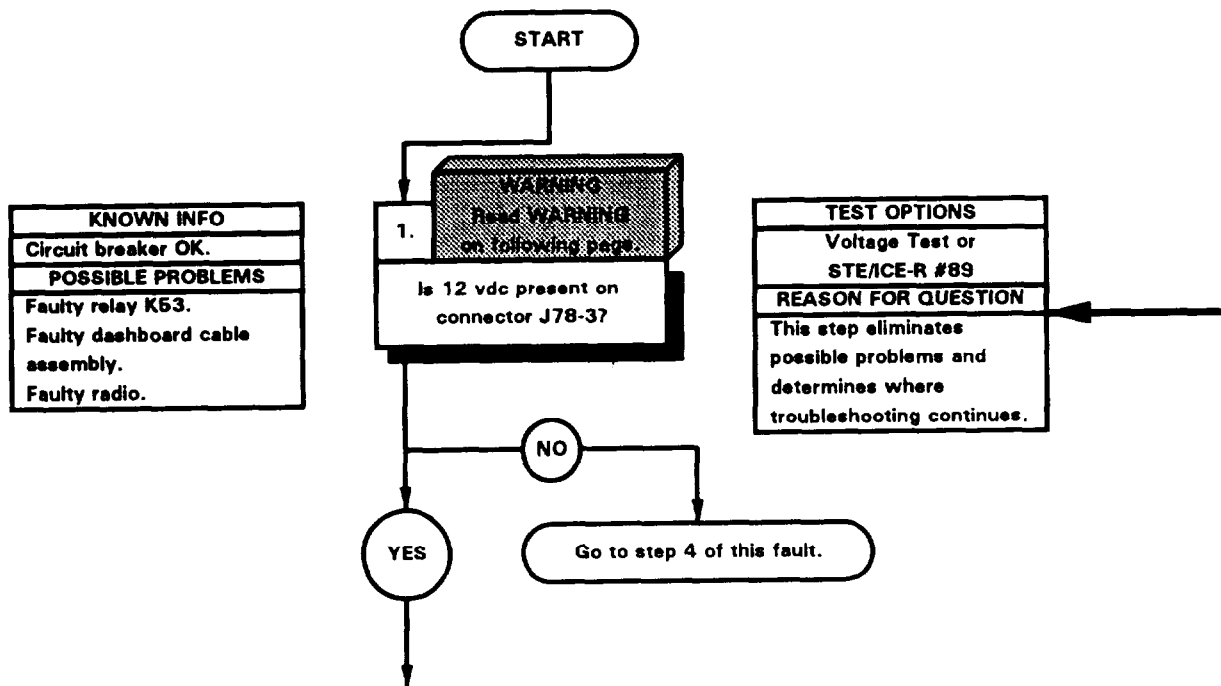
VOLTAGE TEST

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



*2E9803A

99. RADIO DOES NOT OPERATE	
INITIAL SETUP	
Equipment Condition Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) STE/ICE-R (Item 41, Appendix C) Multimeter, Digital (Item 22, Appendix C)
Personnel Required (2)	References TM 9-4910-571-12&P



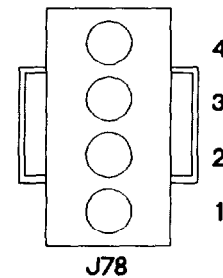
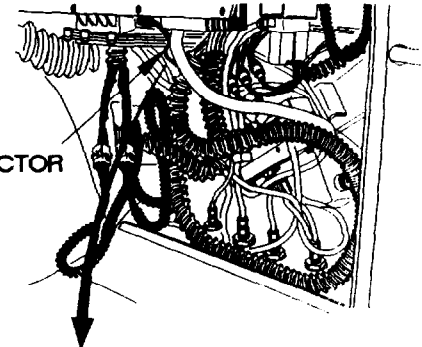
WARNING

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

VOLTAGE TEST

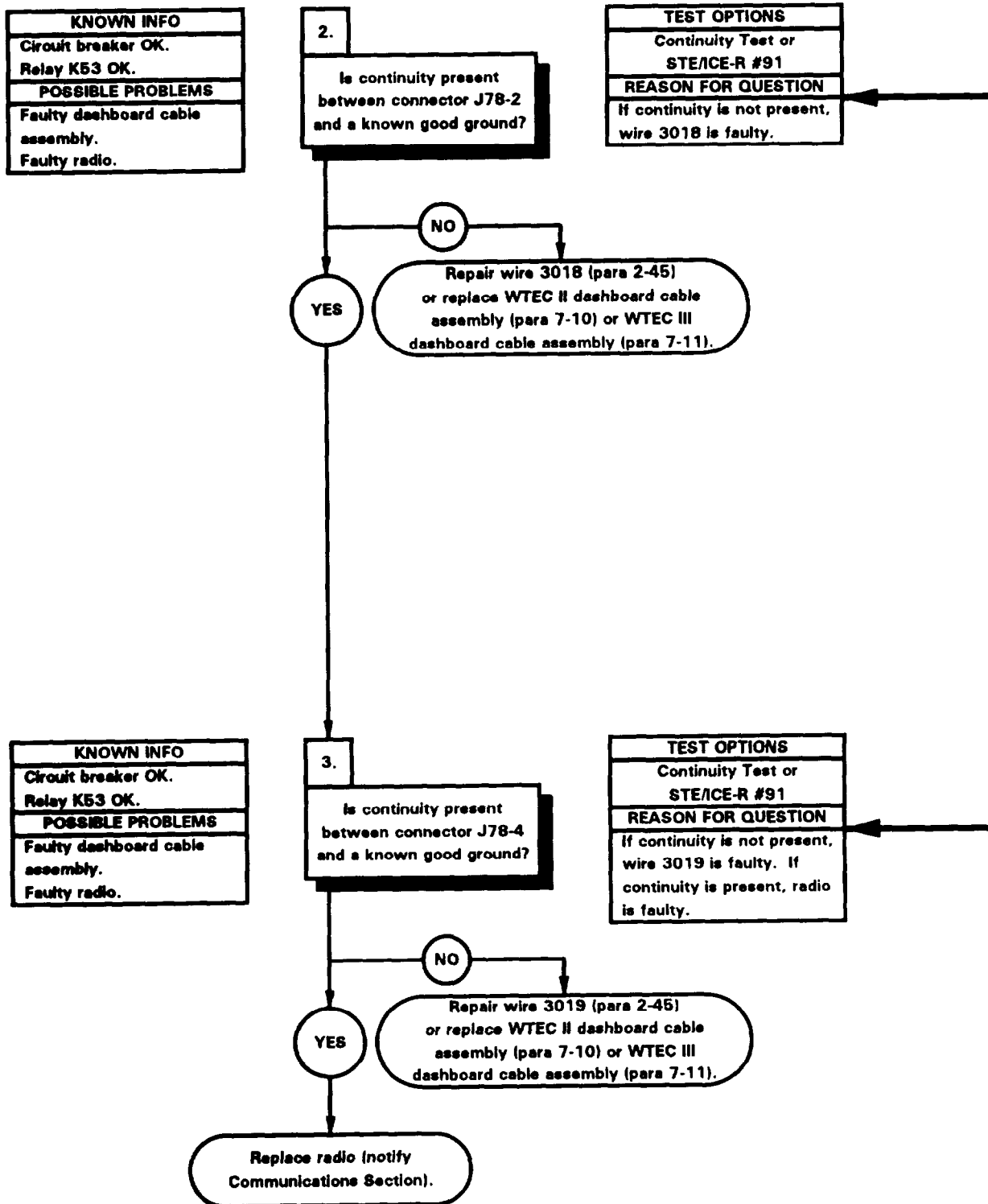
- (1) Remove kick panel (para 16-3).
- (2) Disconnect connector J78 from radio.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to connector J78-3.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position master power switch to on (TM 9-2320-366-10-1)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

CONNECTOR J78



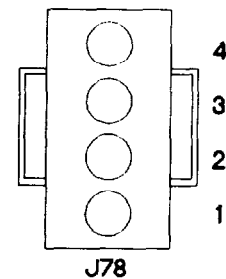
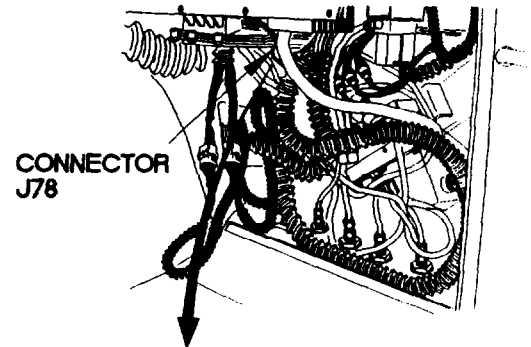
42E990JA

699. RADIO DOES NOT OPERATE (CONT)



CONTINUITY TEST

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

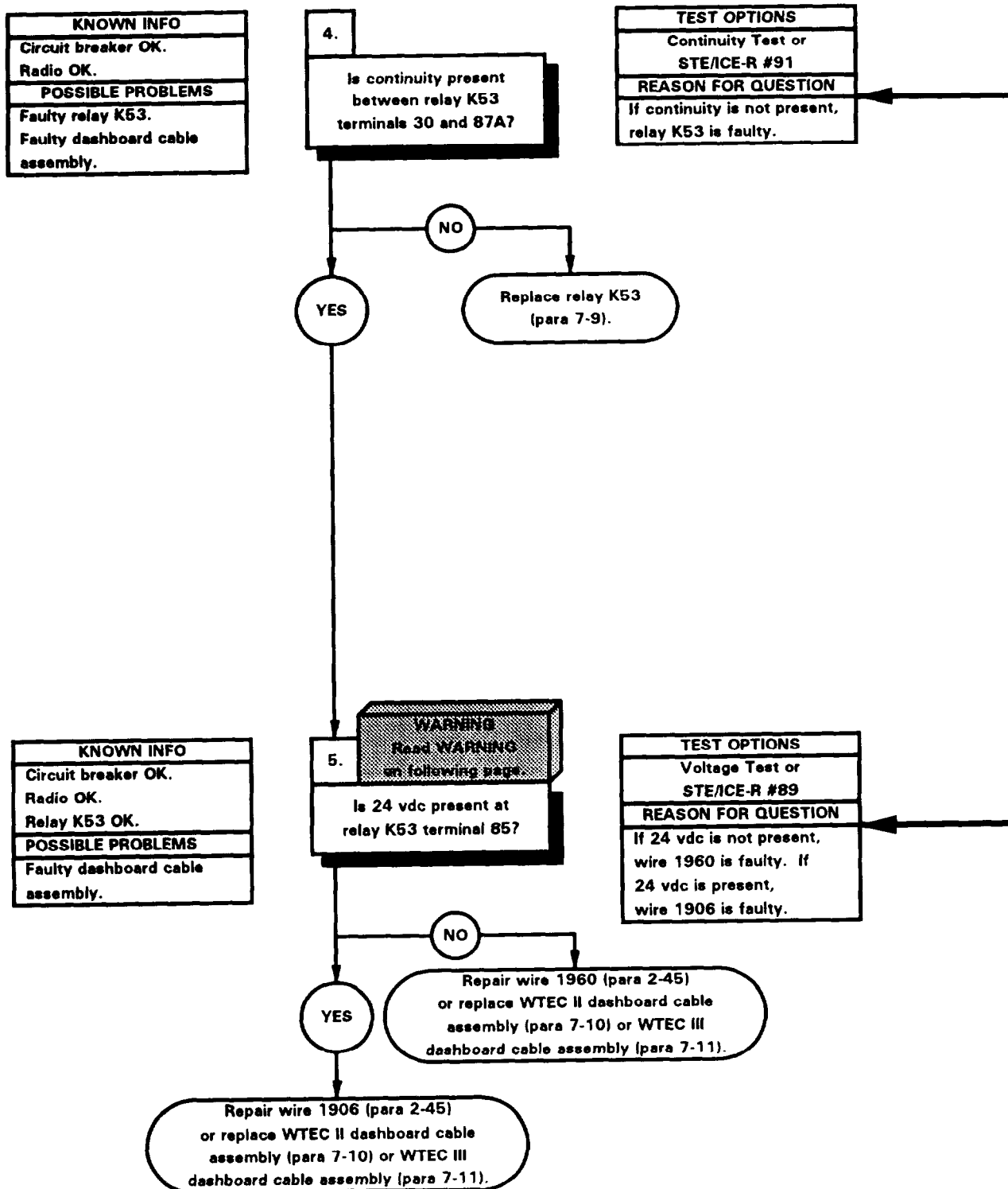


42E9901A

CONTINUITY TEST

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

e99. RADIO DOES NOT OPERATE (CONT)



CONTINUITY TEST

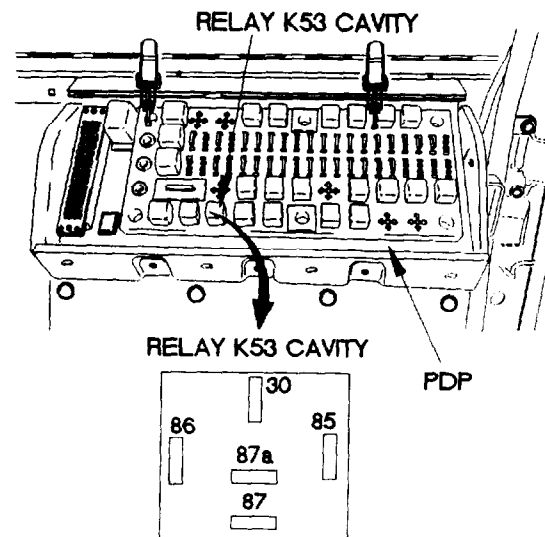
- (1) Remove relay K53 from PDP.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to relay K53 terminal 30.
- (4) Connect negative (-) probe of multimeter to relay K53 terminal 87A and note reading on multimeter.
- (5) If continuity is not present, replace relay K53 (para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

WARNING

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

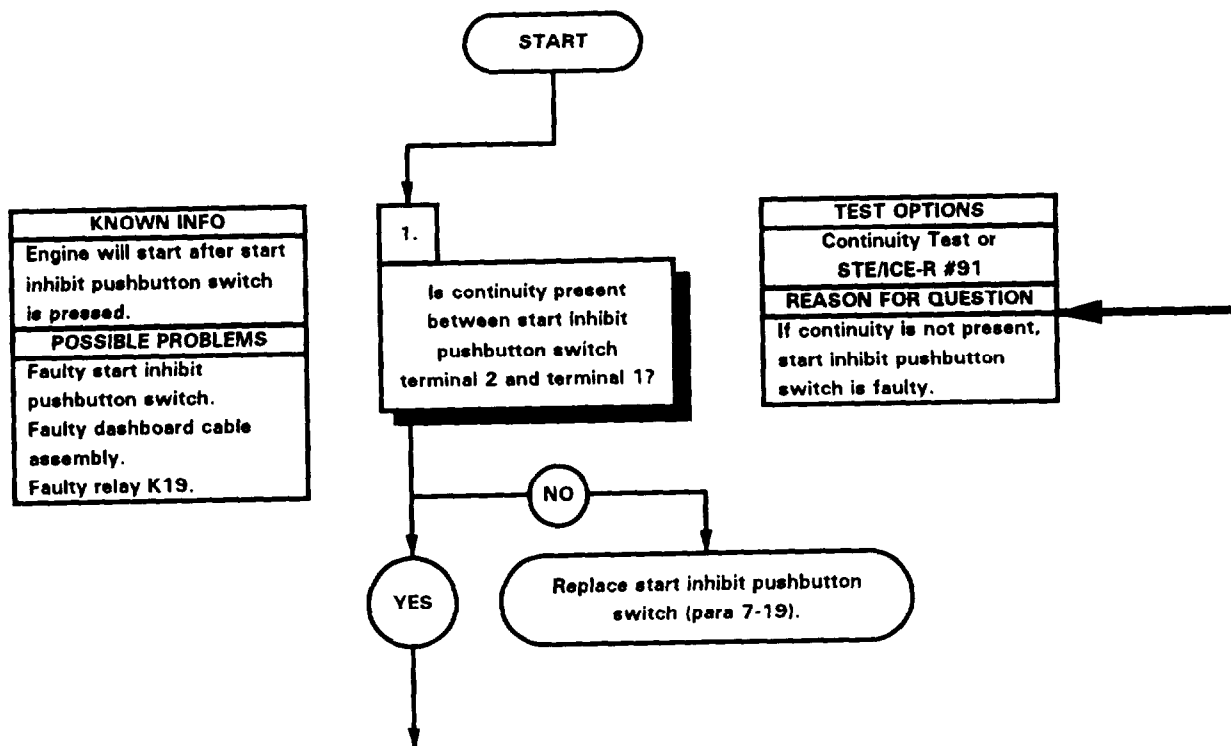
VOLTAGE TEST

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



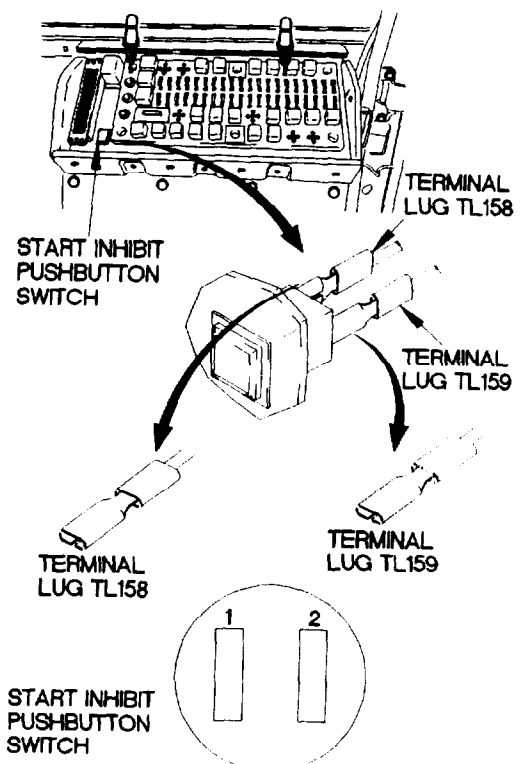
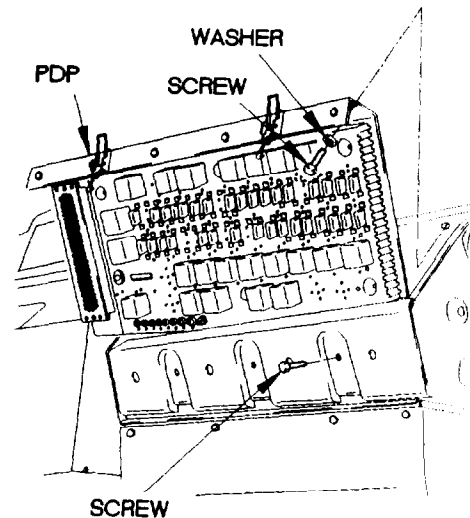
42E99621

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



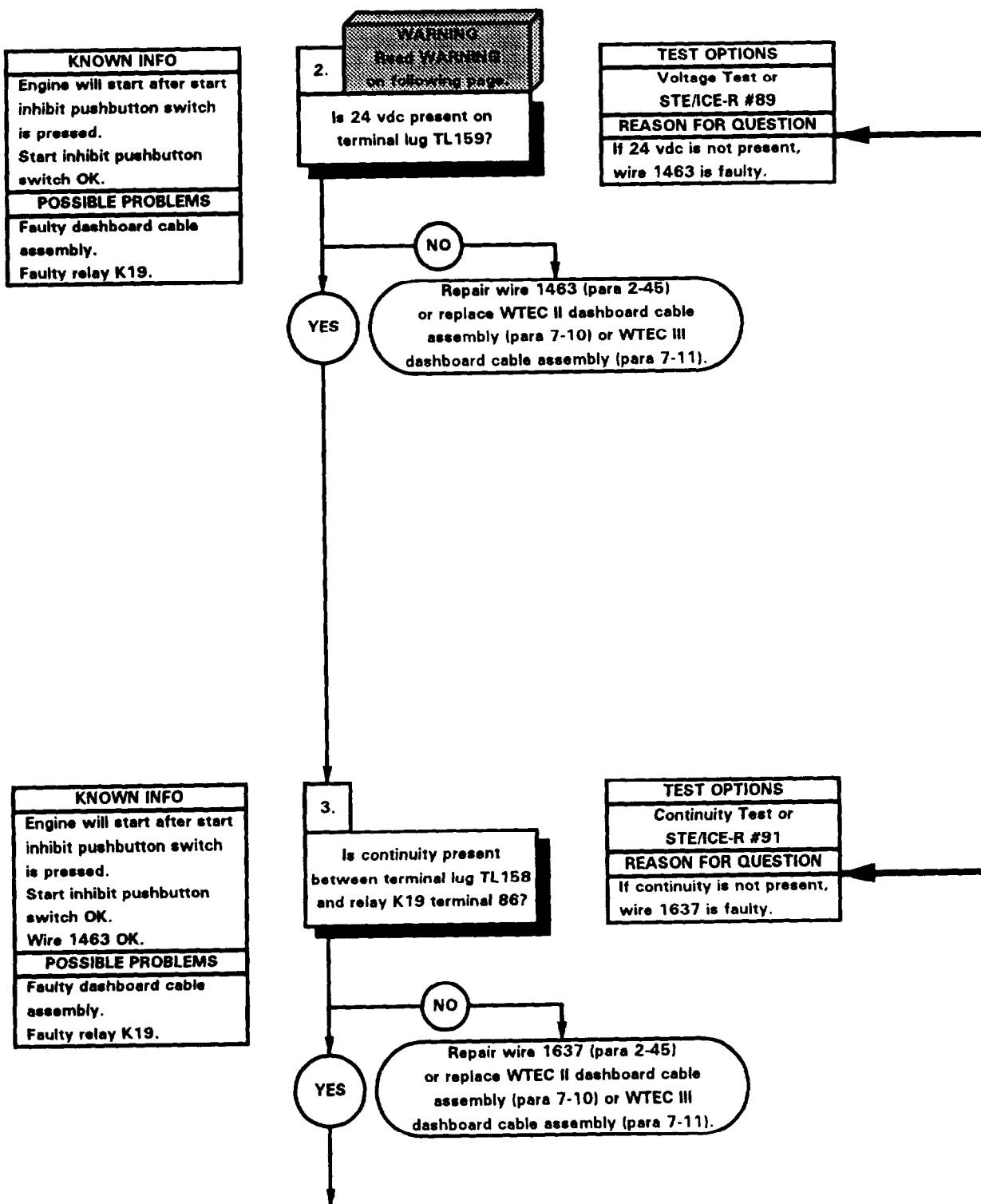
CONTINUITY TEST

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



x2EJ0011

ø100. START INHIBIT PUSHBUTTON DOES NOT OPERATE (CONT)



WARNING

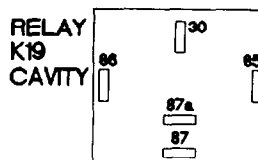
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

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

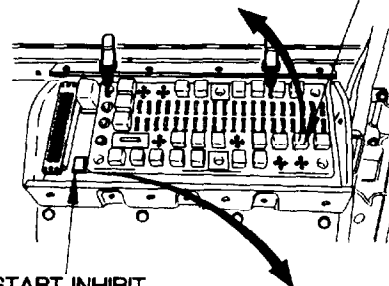
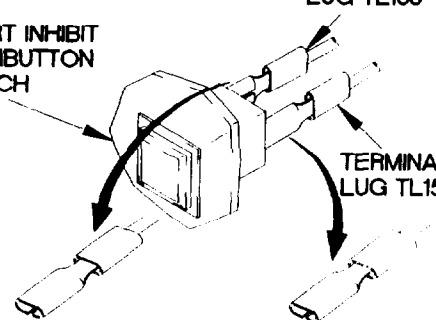
CONTINUITY TEST

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



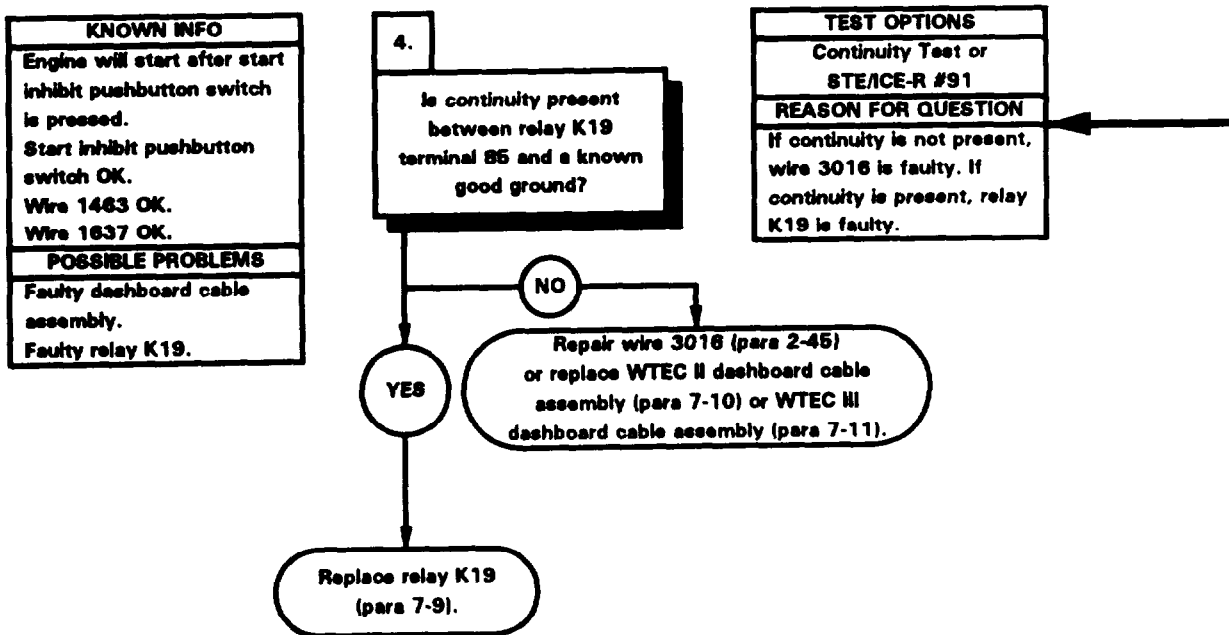
FRONT

RELAY K19 CAVITY

START INHIBIT
PUSHBUTTON
SWITCHTERMINAL
LUG TL158START INHIBIT
PUSHBUTTON
SWITCHTERMINAL
LUG TL159

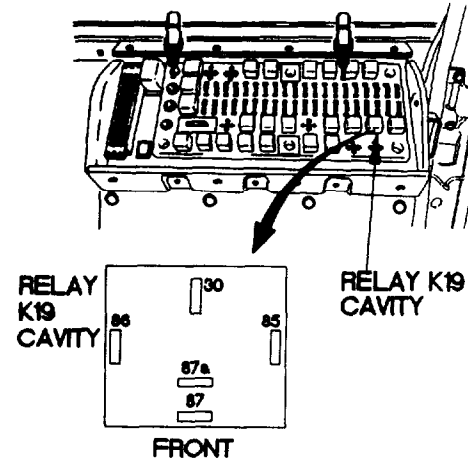
K/E J002A

¶100. START INHIBIT PUSHBUTTON DOES NOT OPERATE (CONT)



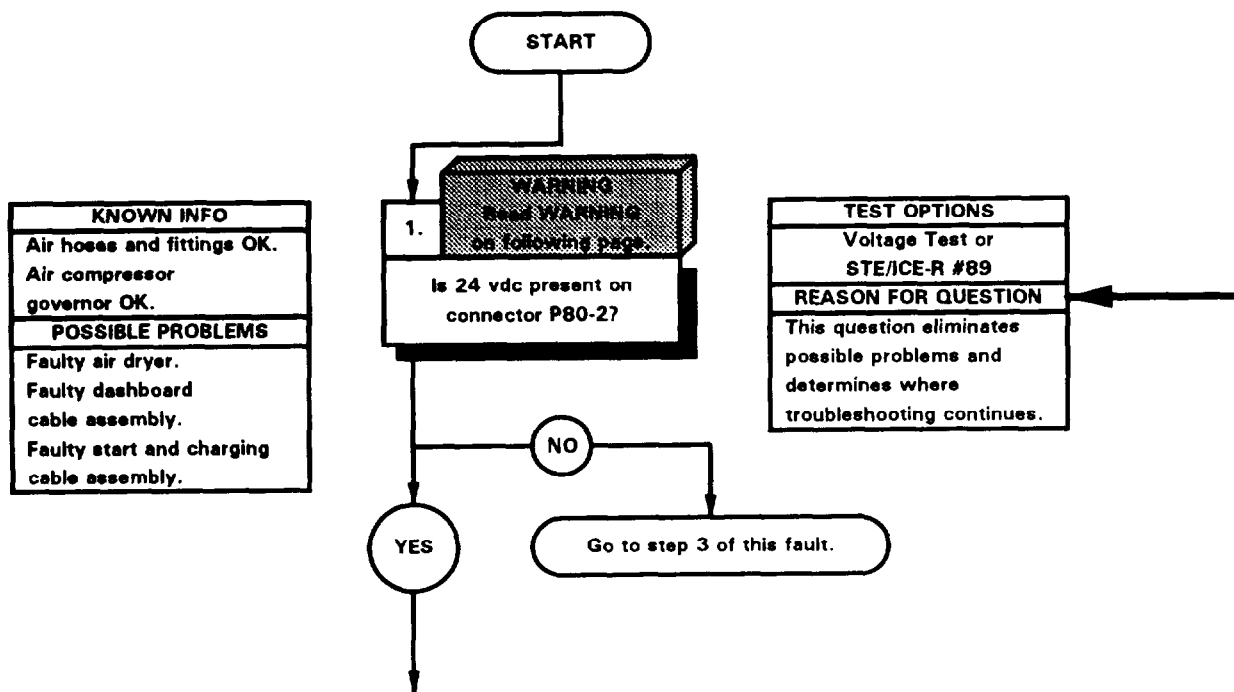
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to PDP, terminal 85, where relay K19 was removed.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3016 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (5) If continuity is present, replace relay K19 (para 7-8).
- (6) Install relay K19 in PDP.
- (7) Install PDP cover (para 16-2).



2E.0034

101. AIR DRYER DOES NOT OPERATE (ALL MODELS EXCEPT M1090/M1094)	
INITIAL SETUP	
Equipment Condition Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) STE/ICE-R (Item 41, Appendix C) Multimeter, Digital (Item 22, Appendix C)
Personnel Required (2)	References TM 9-4910-571-12&P

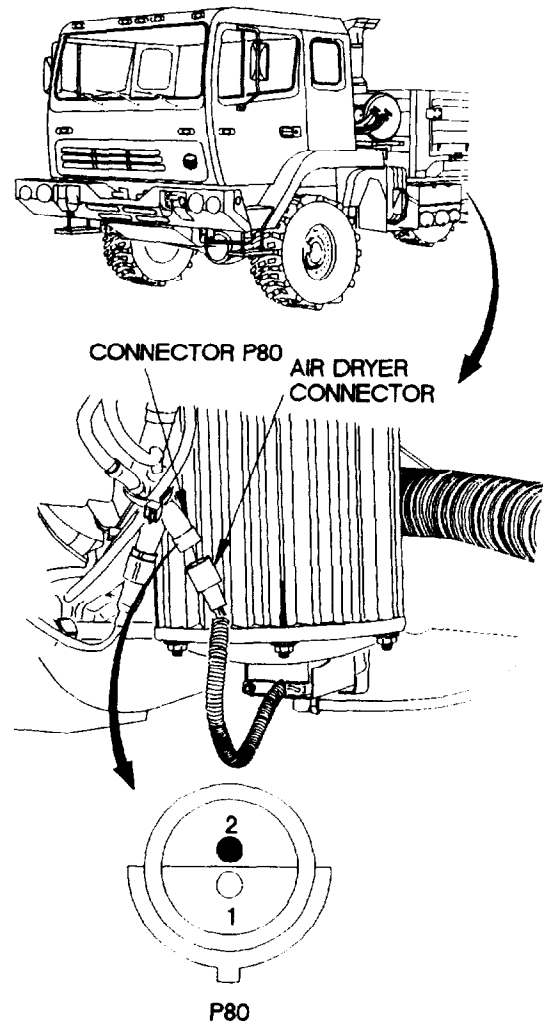


WARNING

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

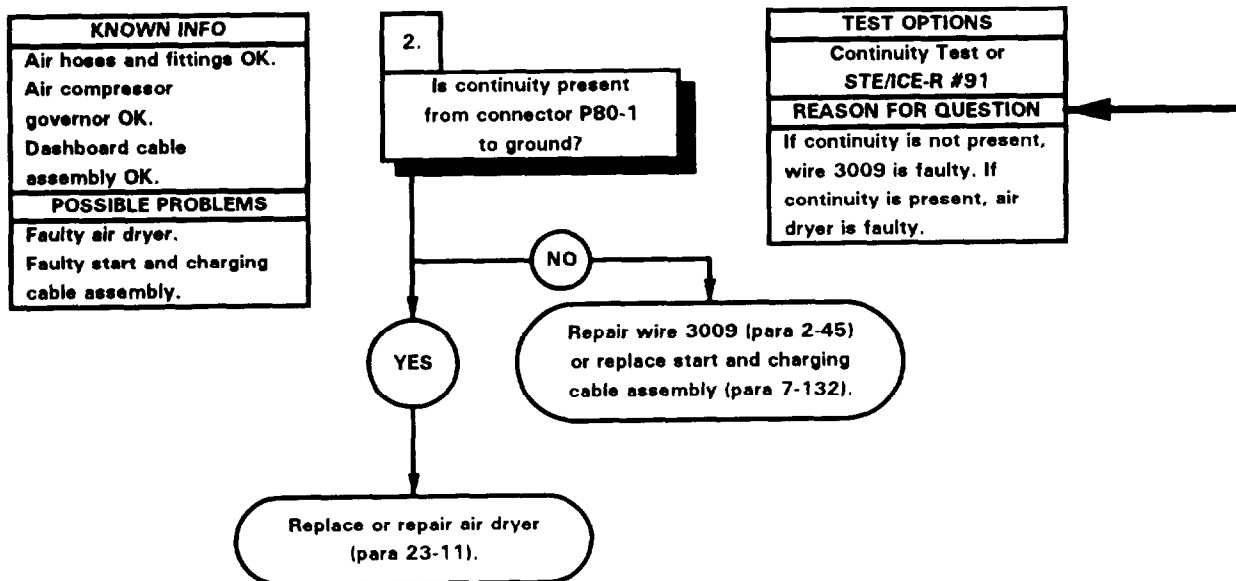
VOLTAGE TEST

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



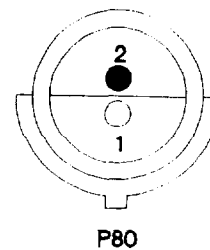
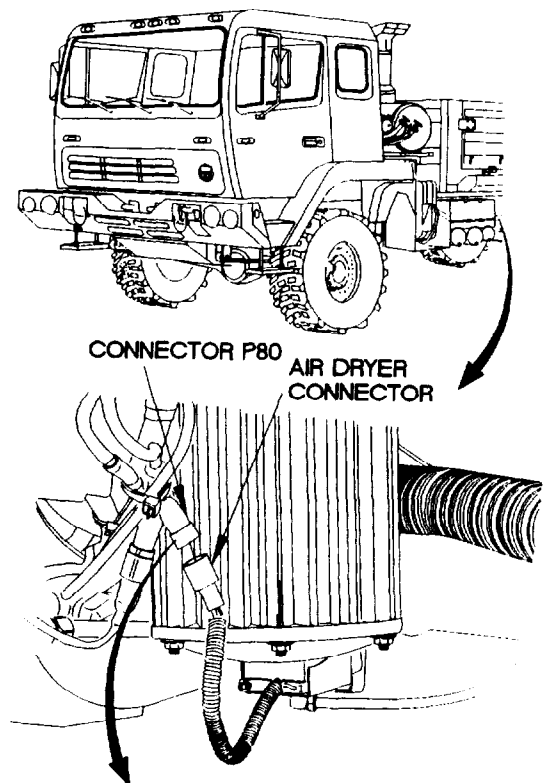
42E J101A

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



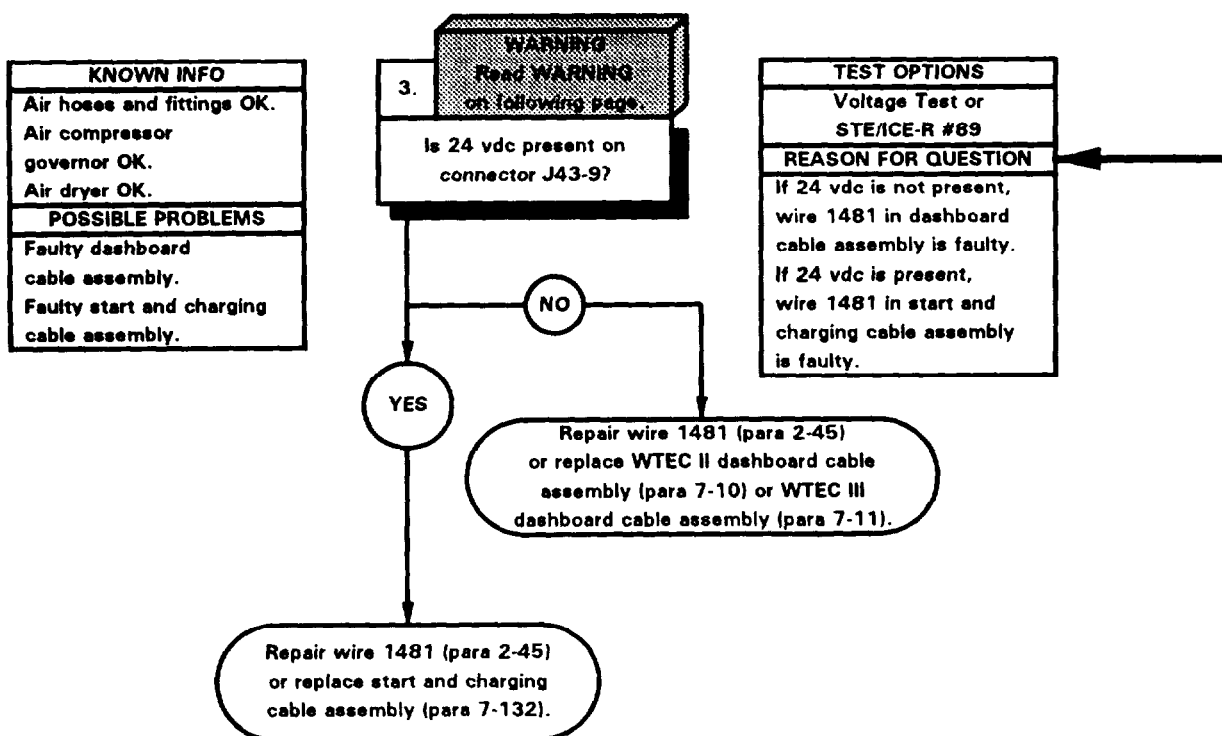
CONTINUITY TEST

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



42E J1112A

ø101. AIR DRYER DOES NOT OPERATE (ALL MODELS EXCEPT M1090/M1094) (CONT)

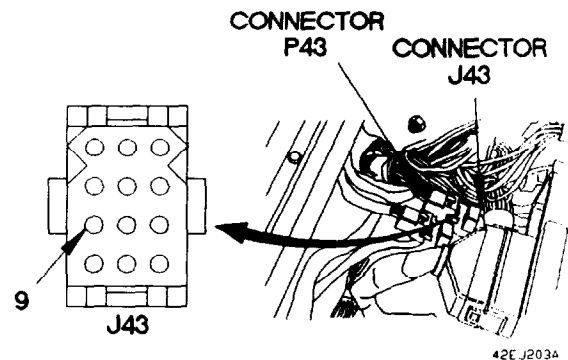


WARNING

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

VOLTAGE TEST

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



•102. M1090/M1094 AIR DRYER DOES NOT OPERATE

INITIAL SETUP

Equipment Condition

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

Personnel Required

(2)

Tools and Special Tools

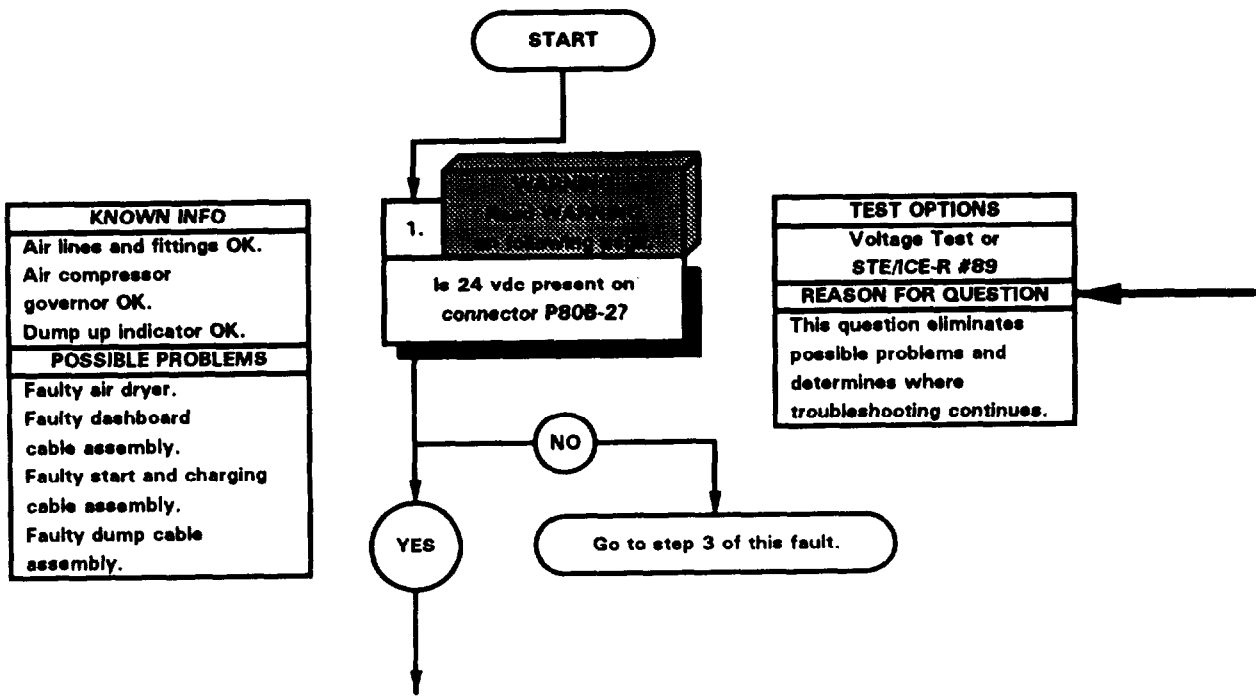
Tool Kit, Genl Mech (Item 46, Appendix C)

STE/ICE-R (Item 41, Appendix C)

Multimeter, Digital (Item 22, Appendix C)

References

TM 9-4910-571-12&P

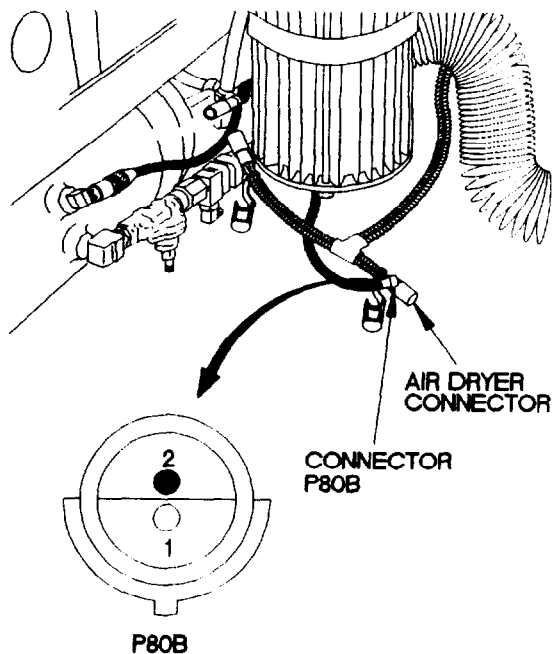
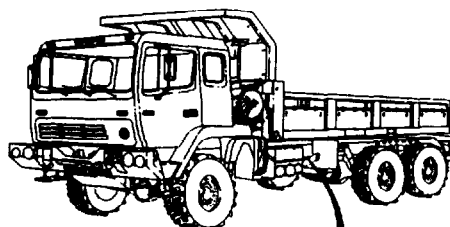


WARNING

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

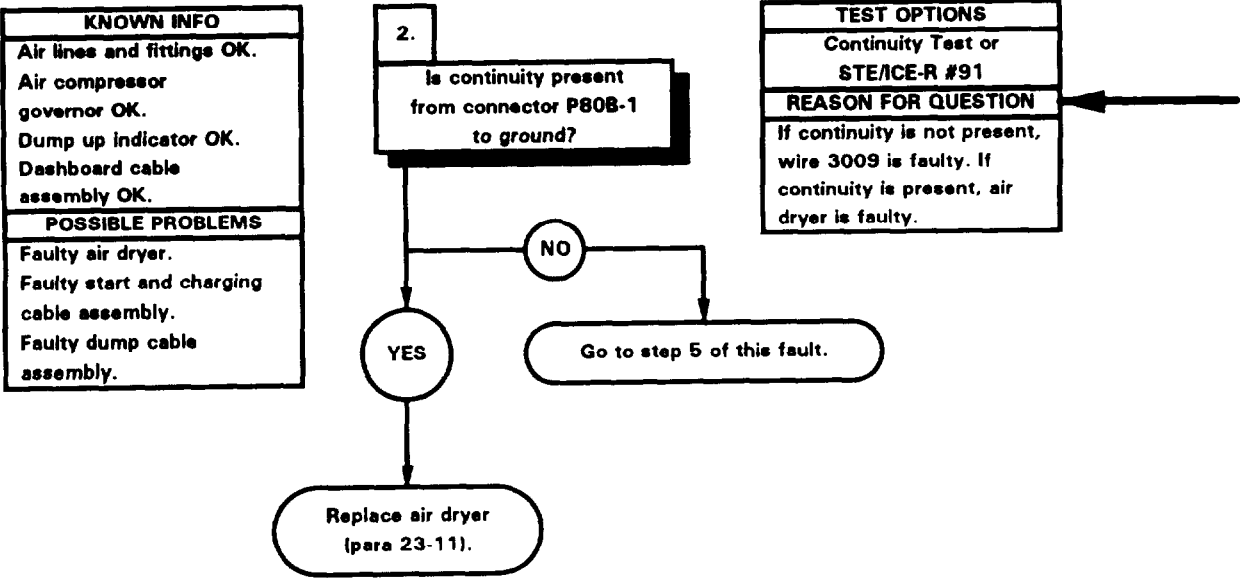
VOLTAGE TEST

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



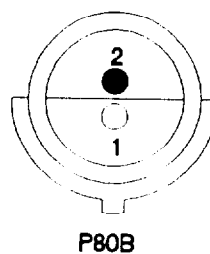
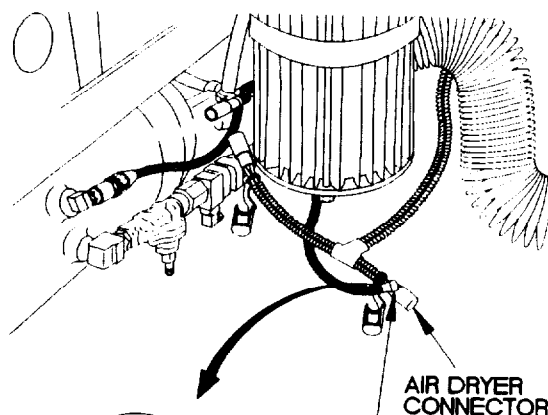
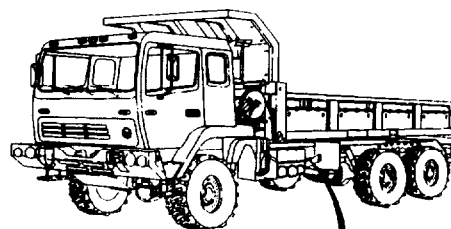
42E J2011

ø102. M1090/M1094 AIR DRYER DOES NOT OPERATE (CONT)



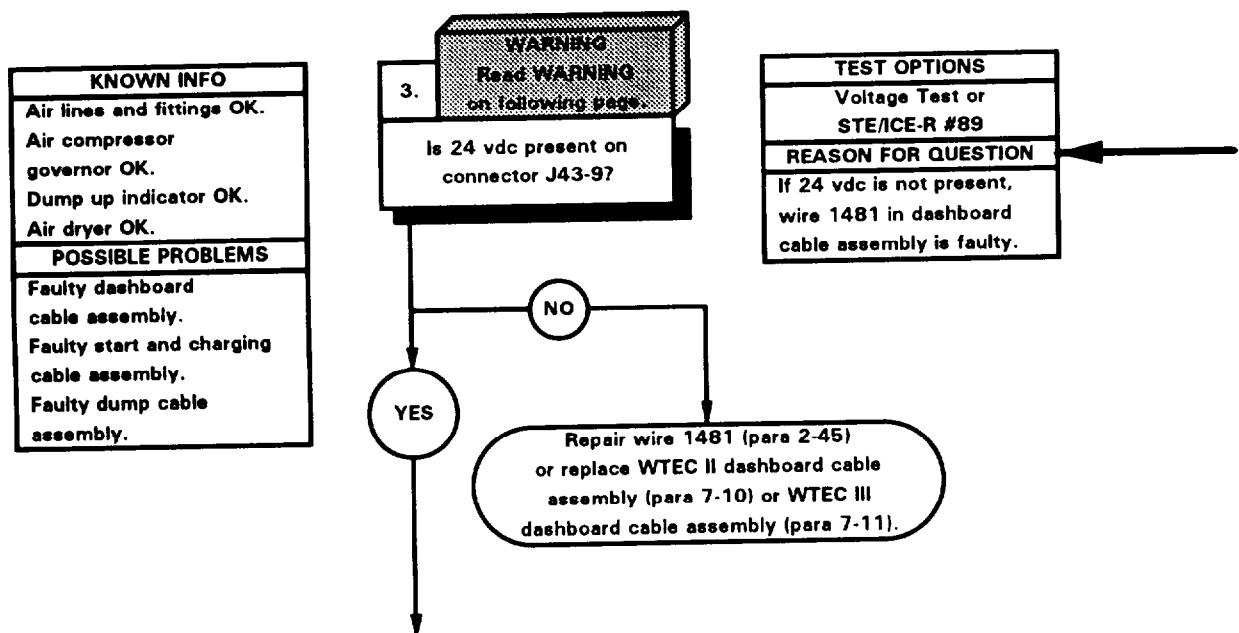
CONTINUITY TEST

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



4CE J2021

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

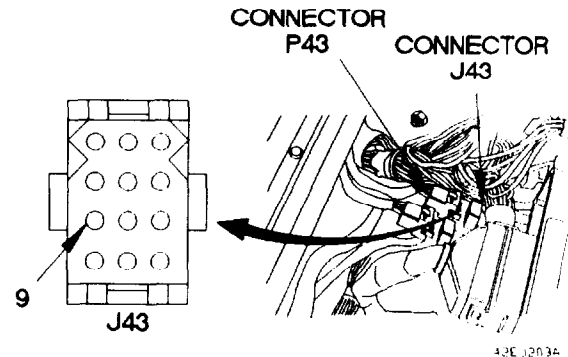


WARNING

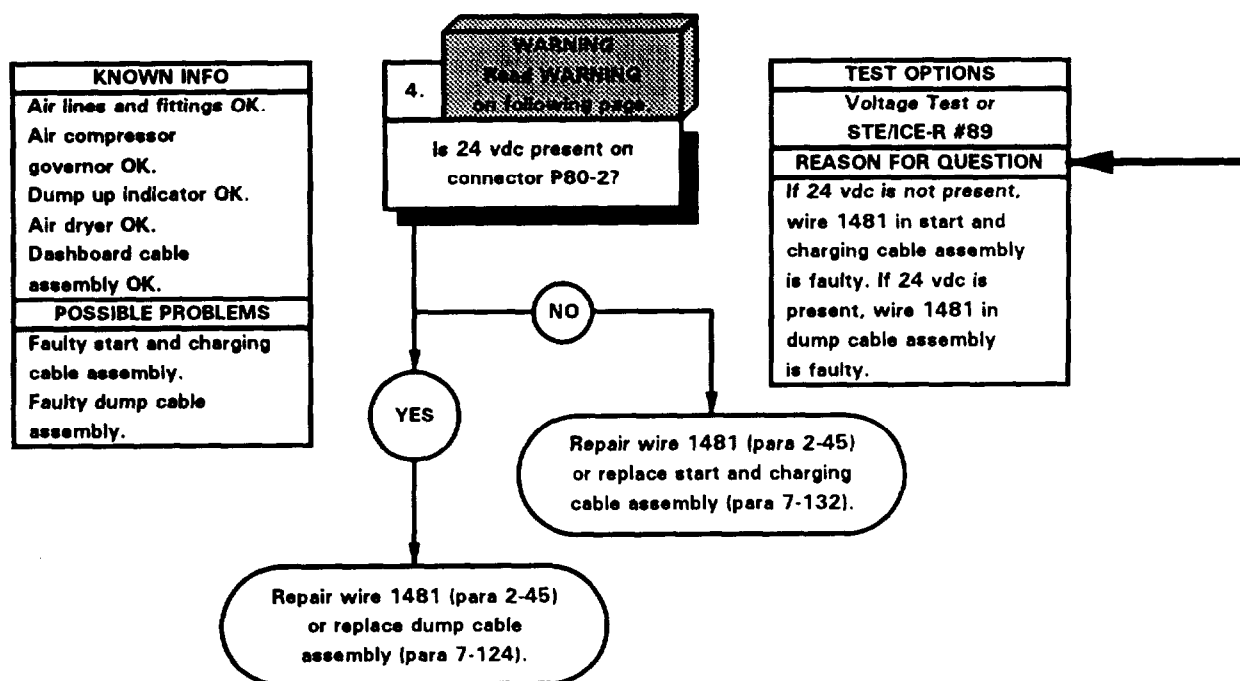
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

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



6102. M1090/M1094 AIR DRYER DOES NOT OPERATE (CONT)

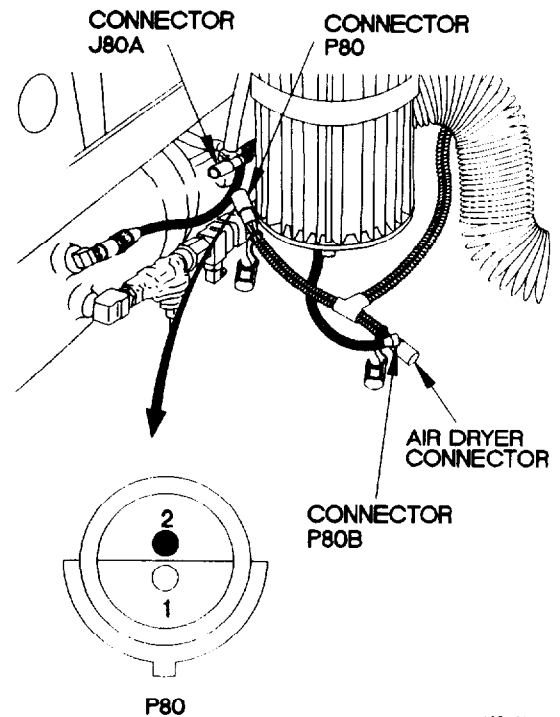
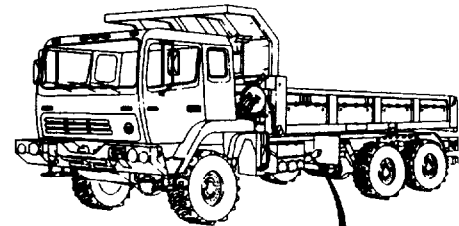


WARNING

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

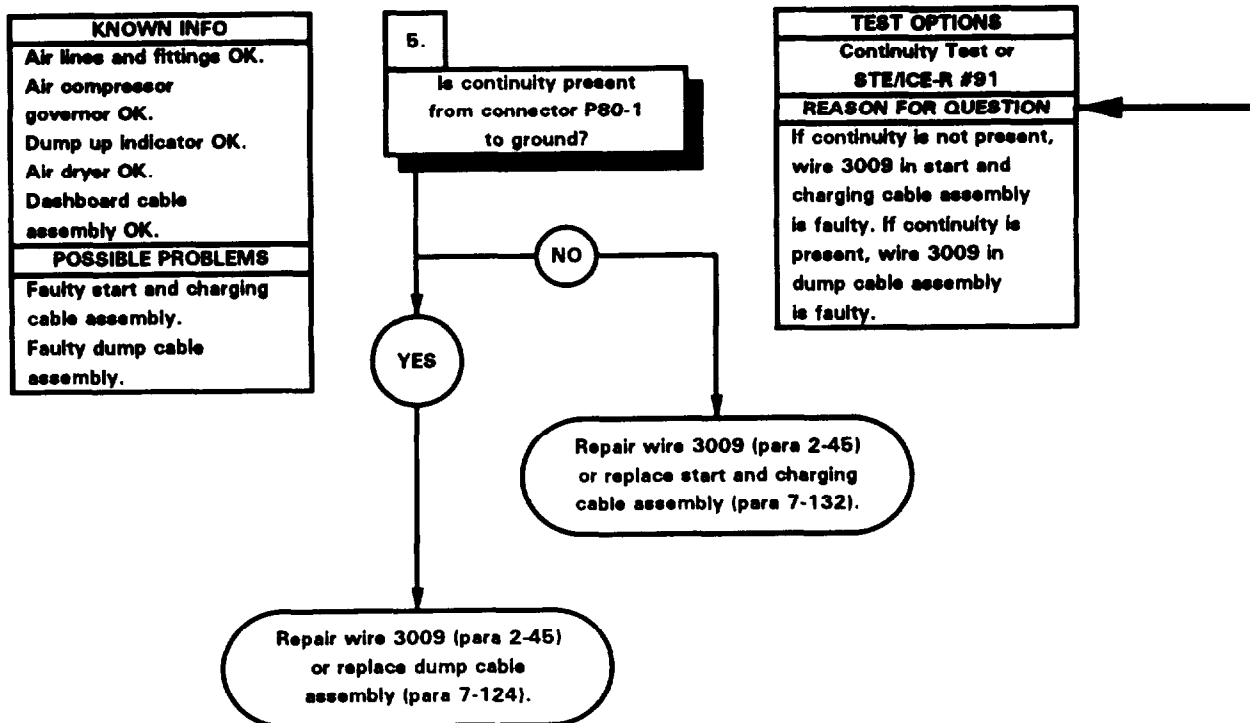
VOLTAGE TEST

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



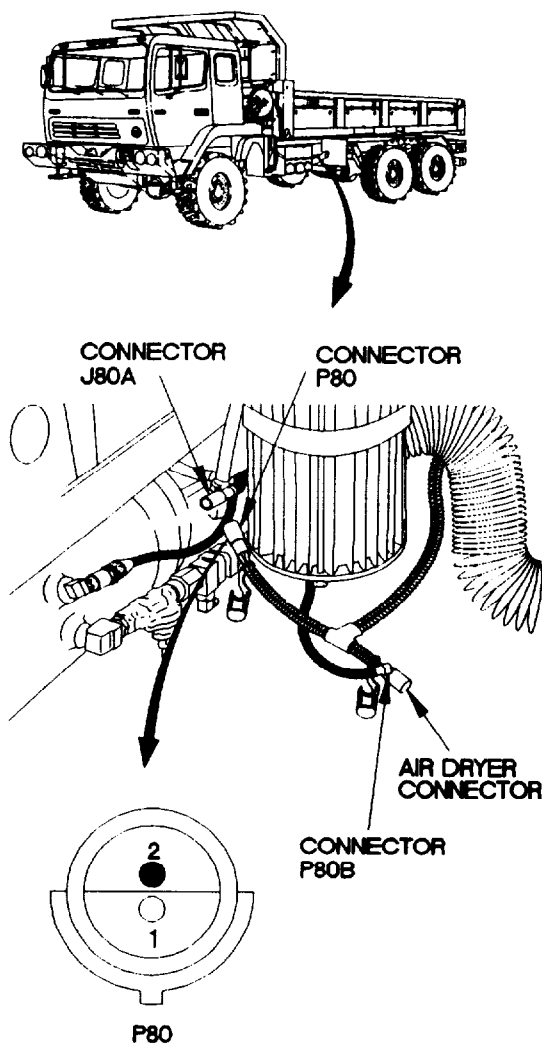
42E J2041

6102. M1090/M1094 AIR DRYER DOES NOT OPERATE (CONT)



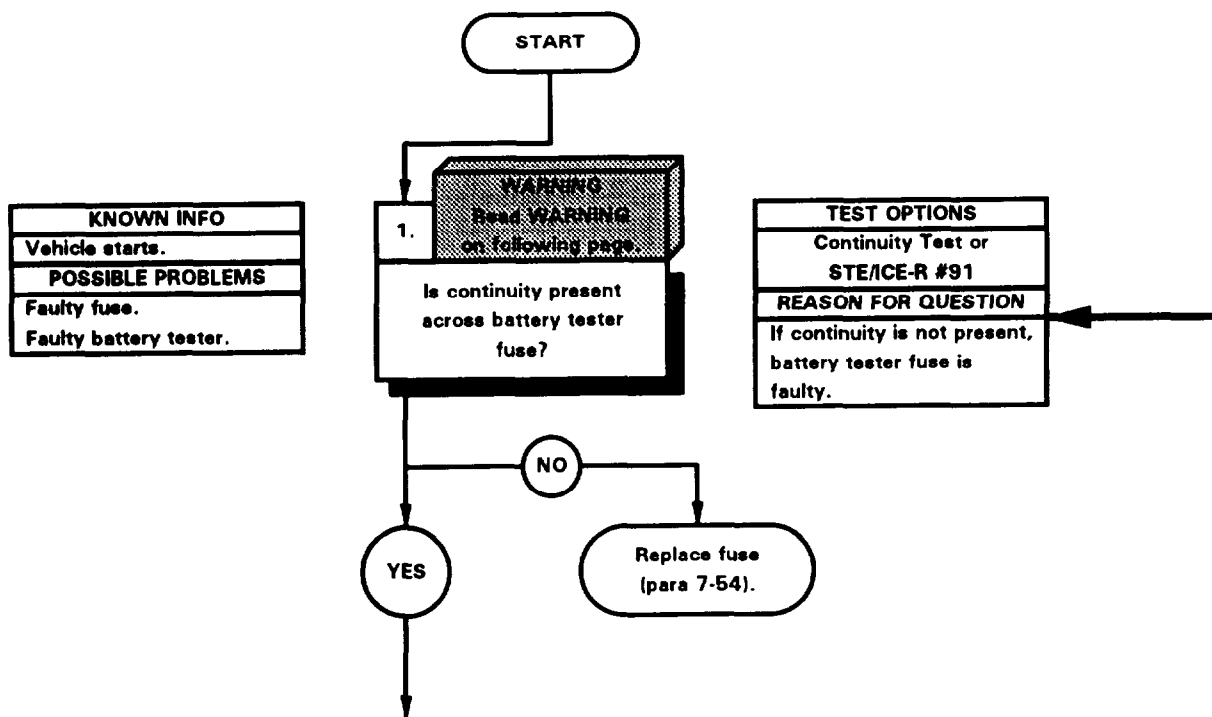
CONTINUITY TEST

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



42E J2051

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

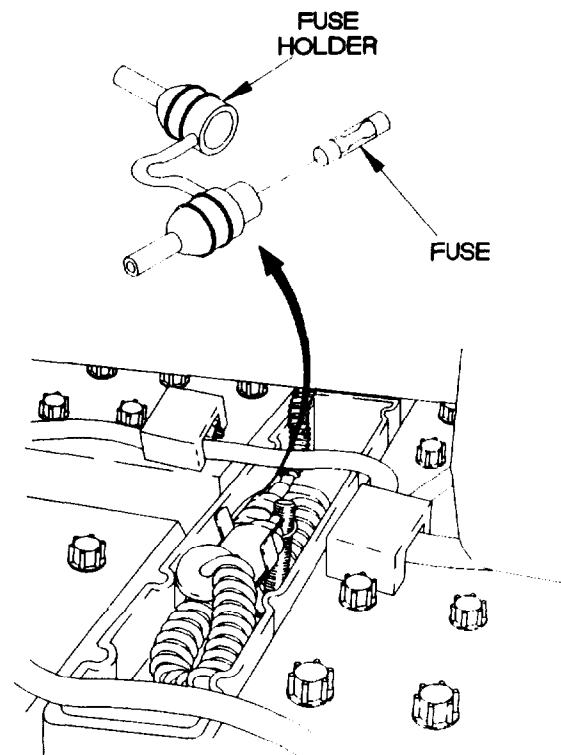


WARNING

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

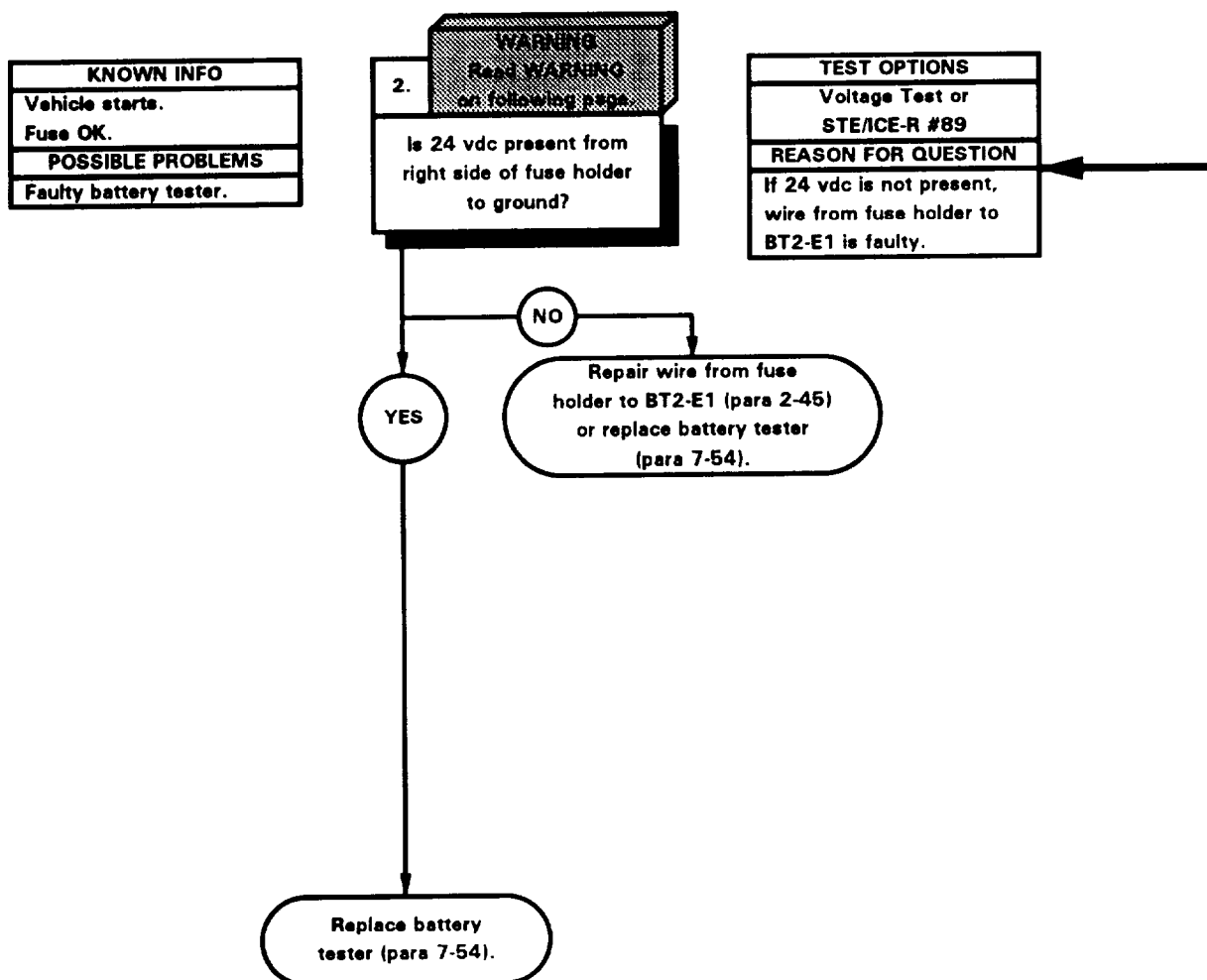
CONTINUITY TEST

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



KCE J 301A

§103. BATTERY TESTER DOES NOT OPERATE (CONT)

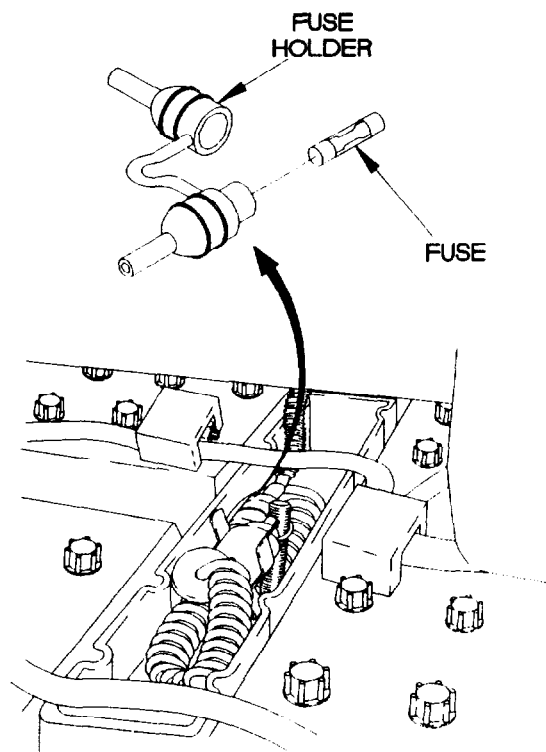


WARNING

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

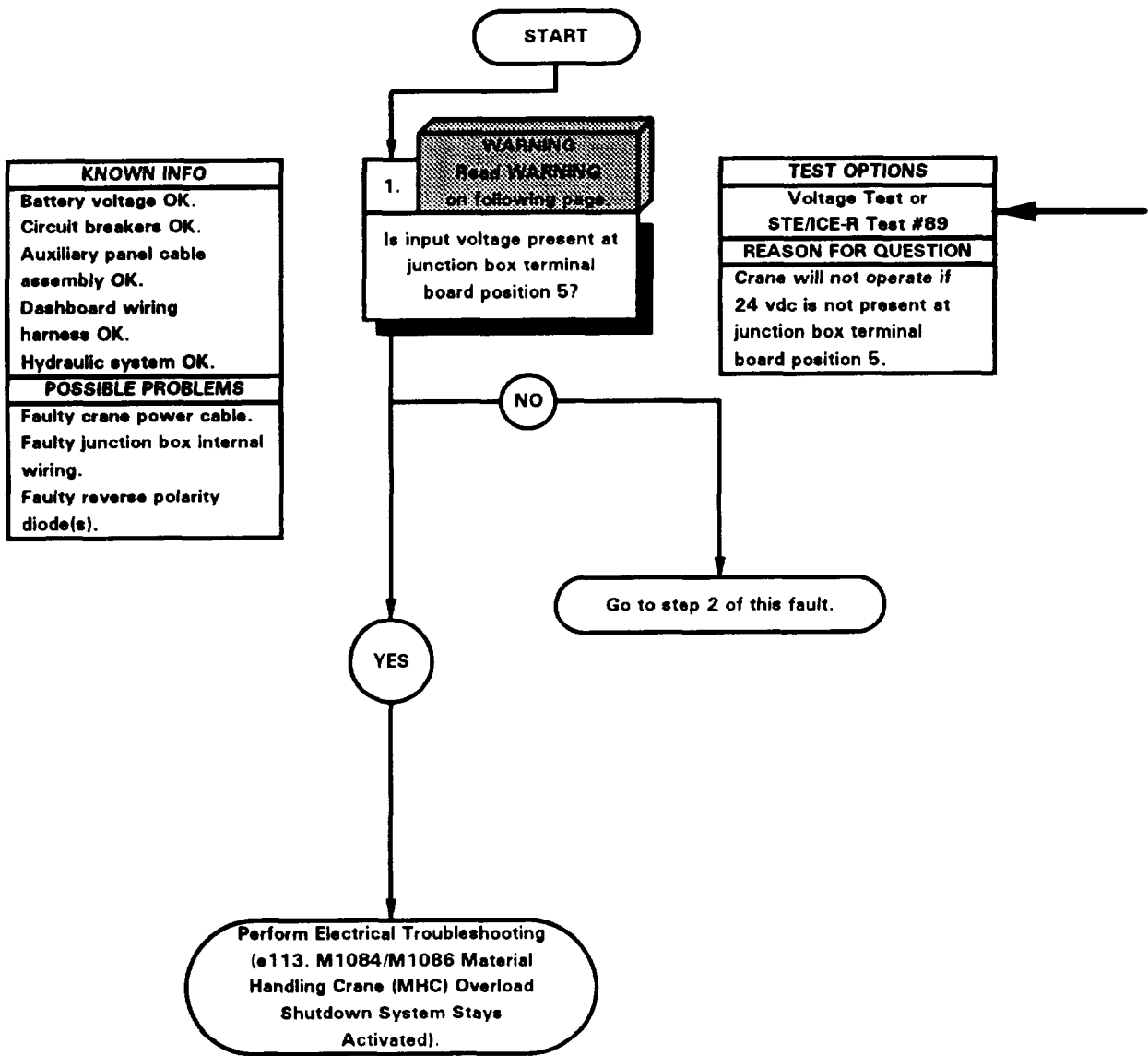
VOLTAGE TEST

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



K2E J302A

e104. M1084/M1086 MATERIAL HANDLING CRANE (MHC) DOES NOT OPERATE			
INITIAL SETUP			
Equipment Conditions		Tools and Special Tools	
Engine shut down (TM 9-2320-366-10-1).		Tool Kit, Genl Mech (Item 46, Appendix C)	
Personnel Required		Multimeter, Digital (Item 22, Appendix C)	
(2)		STE/ICE-R (Item 41, Appendix C)	
References		TM 9-4910-571-12&P	

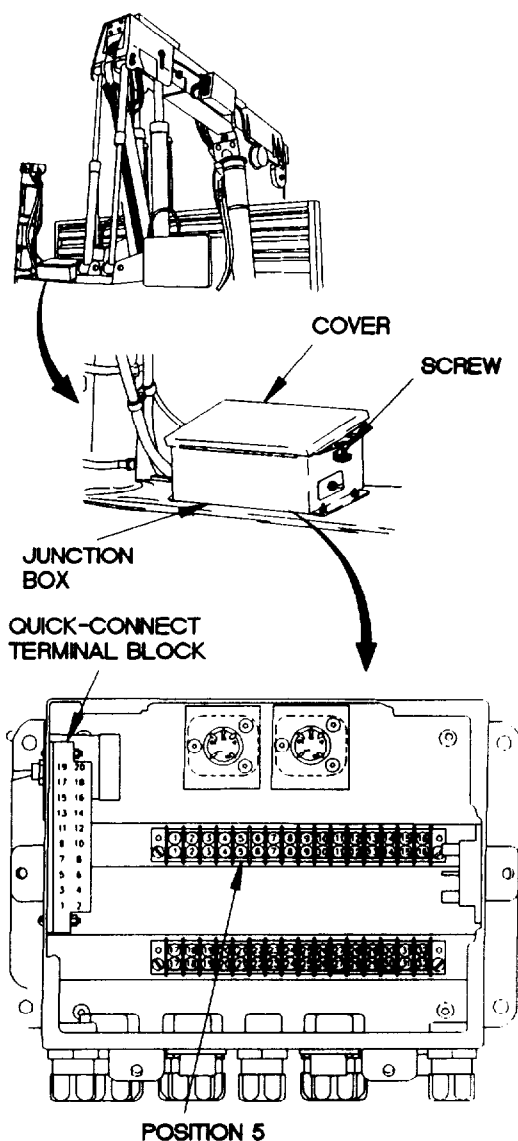


WARNING

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

VOLTAGE TEST

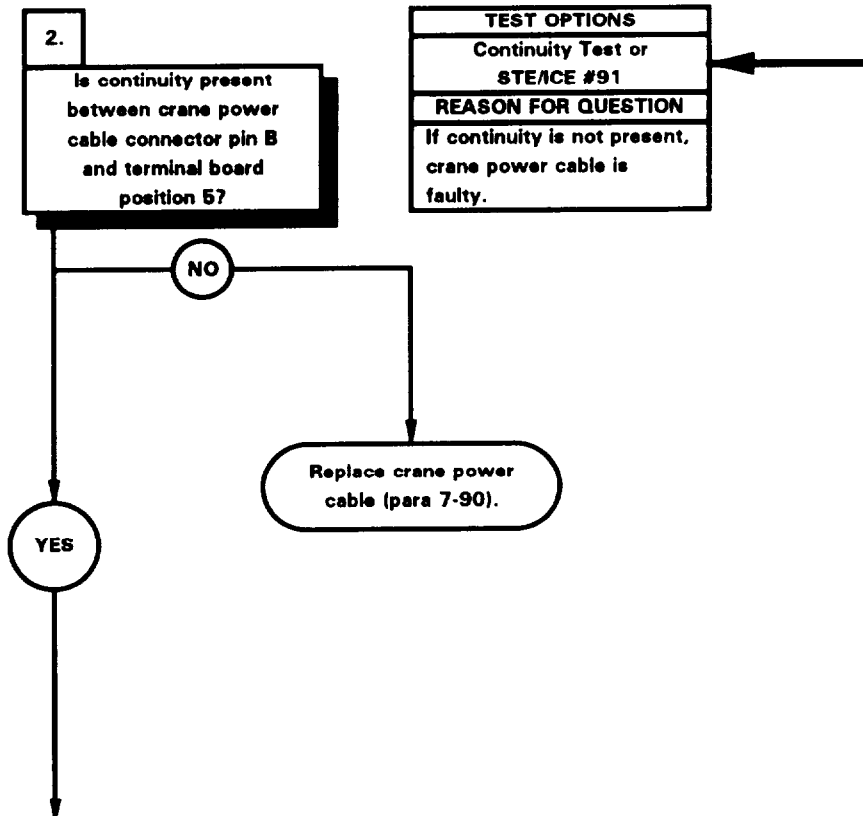
- (1) Loosen four screws on junction box cover.
- (2) Open cover on junction box.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter on terminal board position 5.
- (5) Connect negative (-) probe of multimeter on ground quick-connect terminal block (above main power switch) and note reading on multimeter.
- (6) If 24 vdc is not present, go to step 2 of this fault.



A2E8911A

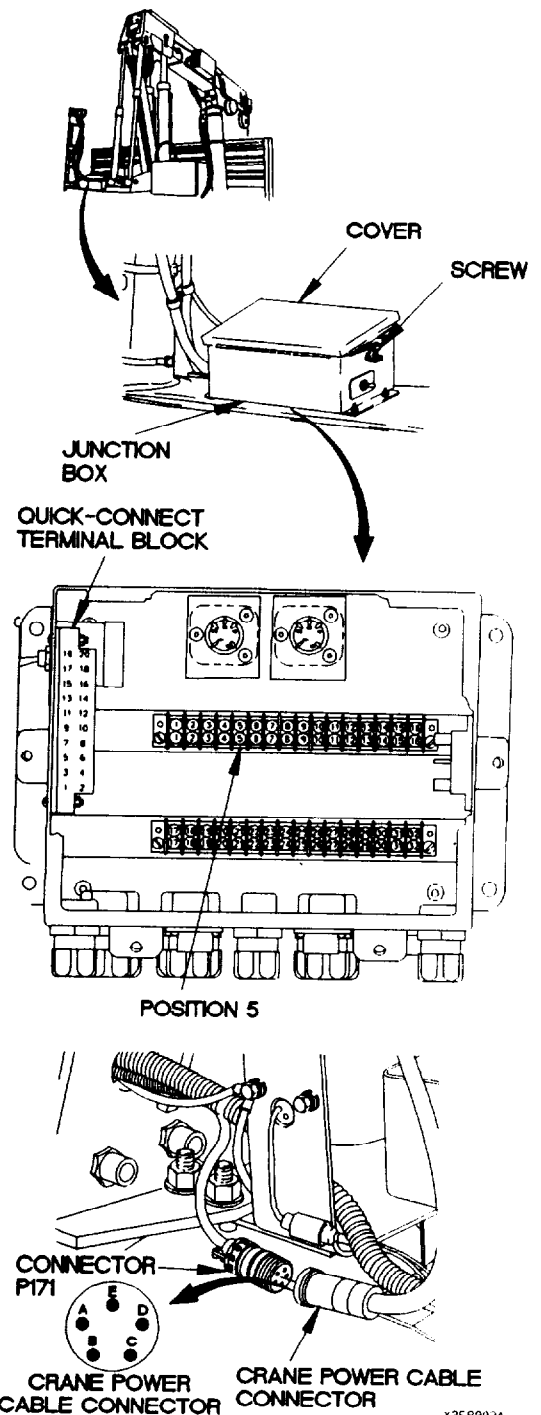
e104. M1084/M1086 MATERIAL HANDLING CRANE (MHC) DOES NOT OPERATE (CONT)

KNOWN INFO
Battery voltage OK. Circuit breakers OK. Auxiliary panel cable assembly OK. Dashboard wiring harness OK. Hydraulic system OK.
POSSIBLE PROBLEMS
Faulty crane power cable. Faulty junction box internal wiring. Faulty reverse polarity diode(s).

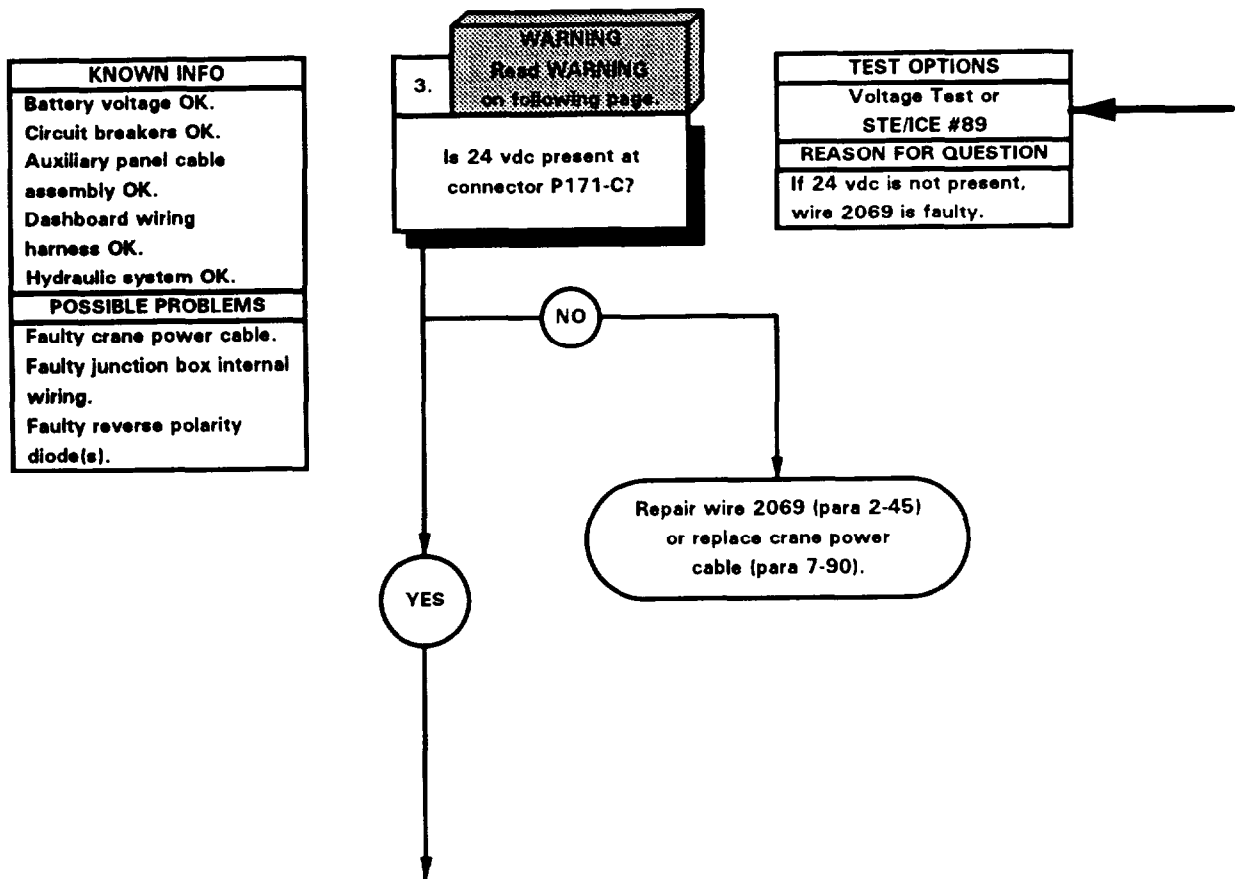


CONTINUITY TEST

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



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

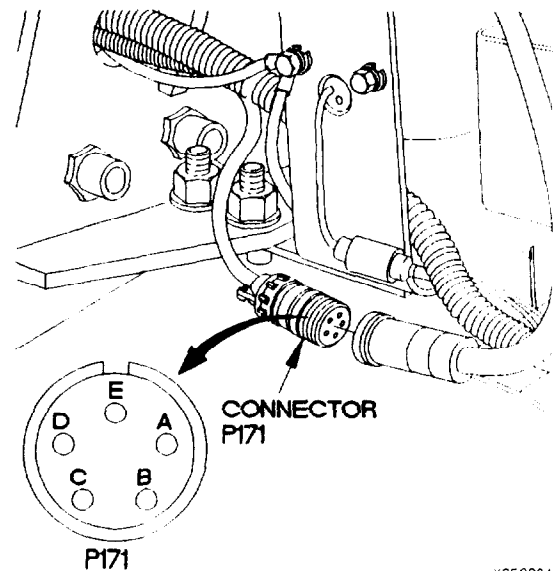


WARNING

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

VOLTAGE TEST

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



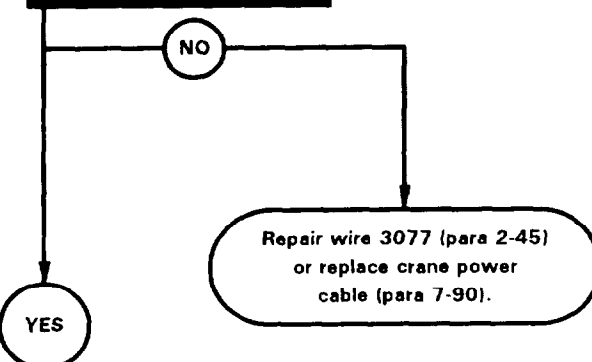
Y2E8904A

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

KNOWN INFO
Battery voltage OK.
Circuit breakers OK.
Auxiliary panel cable assembly OK.
Dashboard wiring harness OK.
Hydraulic system OK.
POSSIBLE PROBLEMS
Faulty crane power cable.
Faulty junction box internal wiring.
Faulty reverse polarity diode(s).

4.
Is continuity present between connector P171-B and ground?

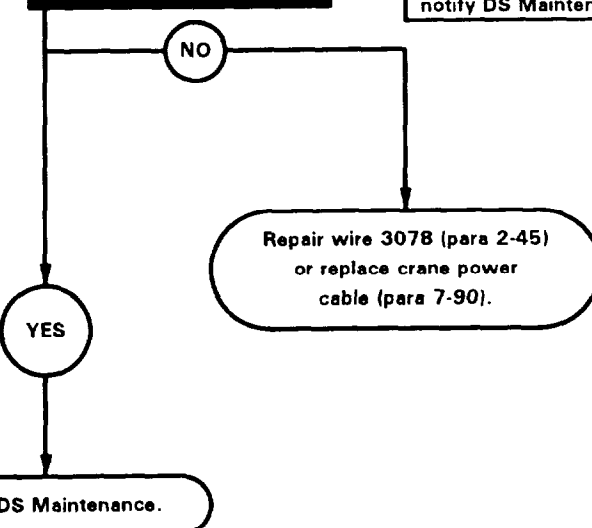
TEST OPTIONS
Continuity Test or STE/ICE #91
REASON FOR QUESTION
If continuity is not present, wire 3077 is faulty.



KNOWN INFO
Battery voltage OK.
Circuit breakers OK.
Auxiliary panel cable assembly OK.
Dashboard wiring harness OK.
Hydraulic system OK.
POSSIBLE PROBLEMS
Faulty crane power cable.
Faulty junction box internal wiring.
Faulty reverse polarity diode(s).

5.
Is continuity present between connector P171-E and ground?

TEST OPTIONS
Continuity Test or STE/ICE #91
REASON FOR QUESTION
If continuity is not present, wire 3078 is faulty. If continuity is present, notify DS Maintenance.

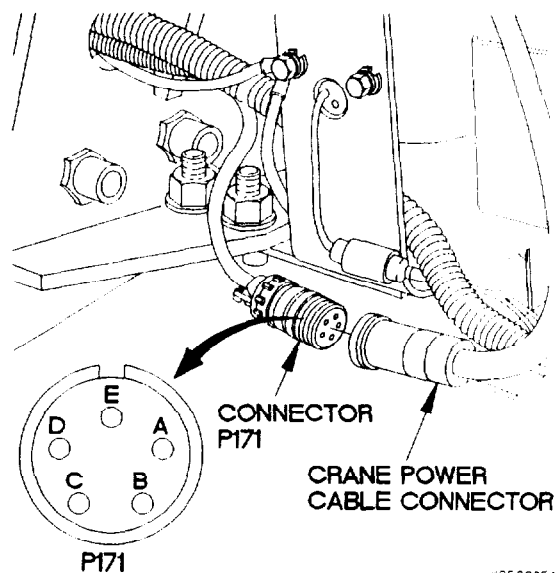


CONTINUITY TEST

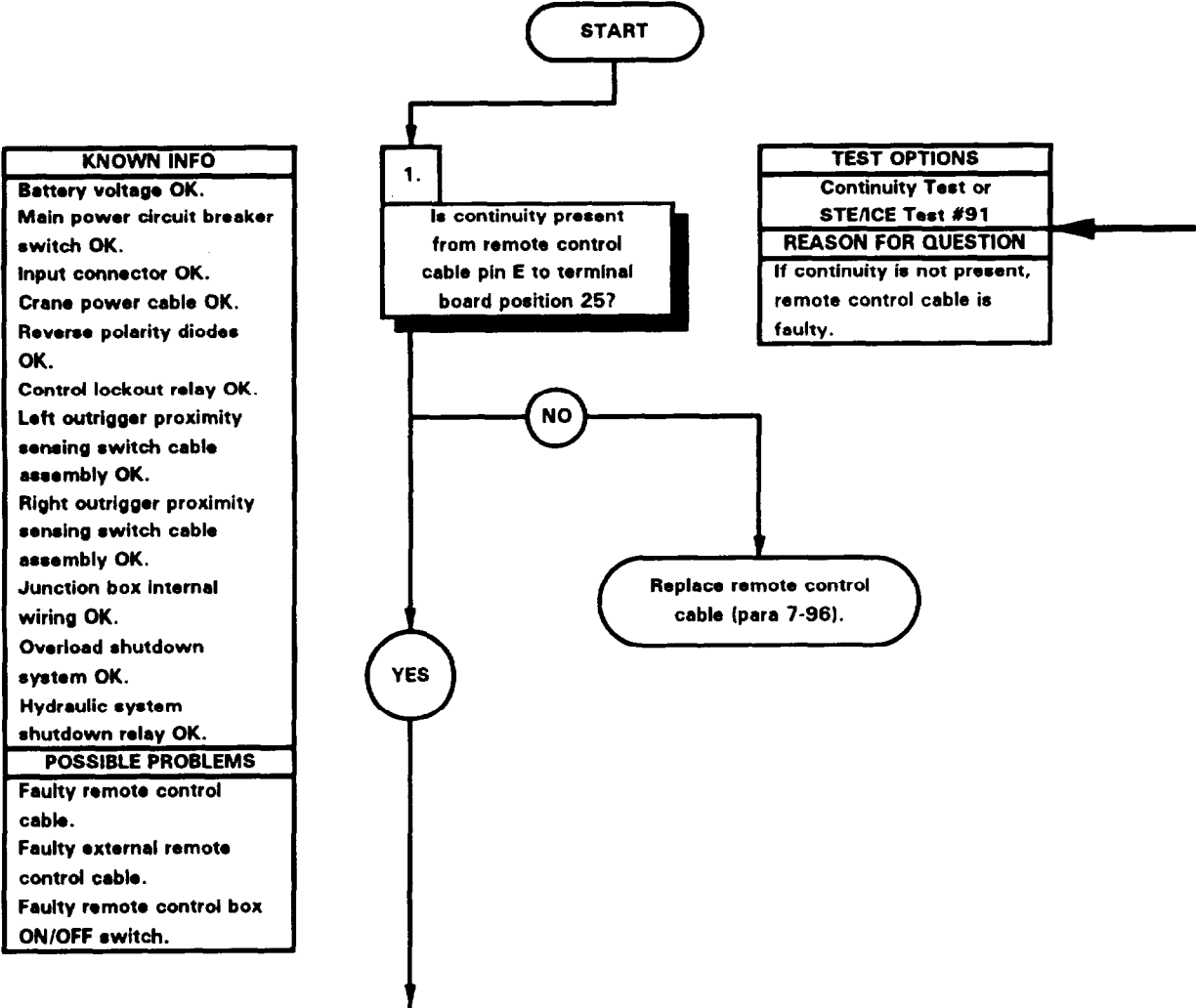
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P171-B.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3077 (para 2-45) or replace crane power cable (para 7-90).

CONTINUITY TEST

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

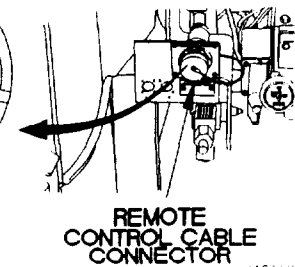
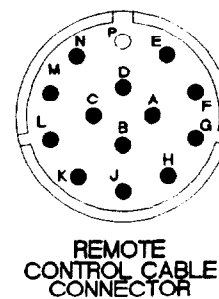
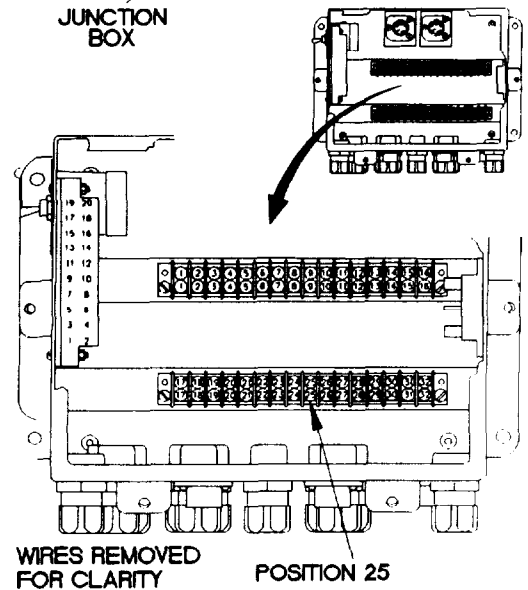
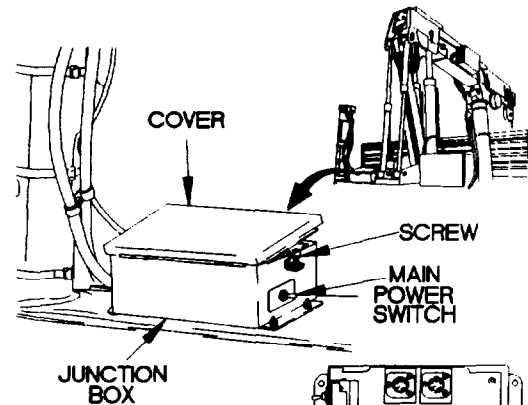


•105. M1084/M1086 MATERIAL HANDLING CRANE (MHC) DOES NOT OPERATE FROM REMOTE CONTROL	
INITIAL SETUP	
Equipment Condition	Tools and Special Tools
Engine shut down (TM 9-2320-366-10-1).	Tool Kit, Genl Mech (Item 46, Appendix C)
	STE/ICE-R (Item 41, Appendix C)
Personnel Required	Multimeter, Digital (Item 22, Appendix C)
(2)	
	References
	TM 9-4910-571-12&P



CONTINUITY TEST

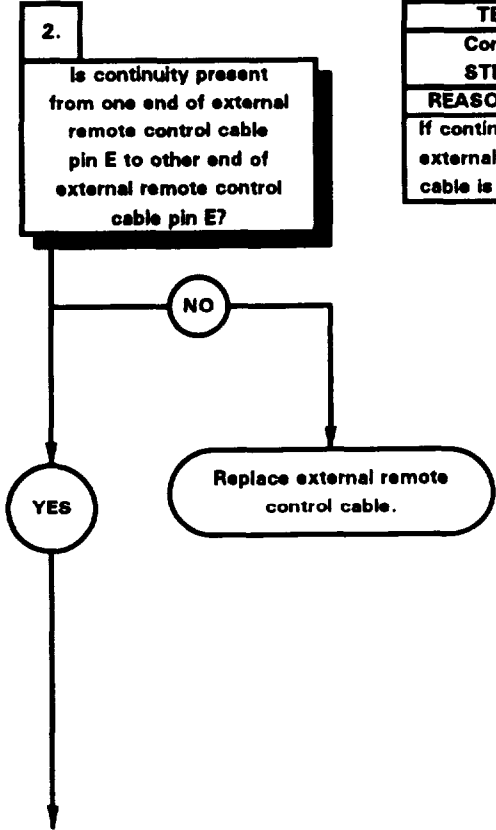
- (1) Loosen four screws on junction box cover.
- (2) Open cover on junction box.
- (3) Disconnect remote control cable from remote control box.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter on pin E of connector on remote control cable.
- (6) Connect negative (-) probe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



42C-0011-

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

KNOWN INFO
Battery voltage OK.
Main power circuit breaker switch OK.
Input connector OK.
Crane power cable OK.
Reverse polarity diodes OK.
Control lockout relay OK.
Left outrigger proximity sensing switch cable assembly OK.
Right outrigger proximity sensing switch cable assembly OK.
Junction box internal wiring OK.
Overload shutdown system OK.
Hydraulic system shutdown relay OK.
Remote control cable OK.
POSSIBLE PROBLEMS
Faulty external remote control cable.
Faulty remote control box ON/OFF switch.

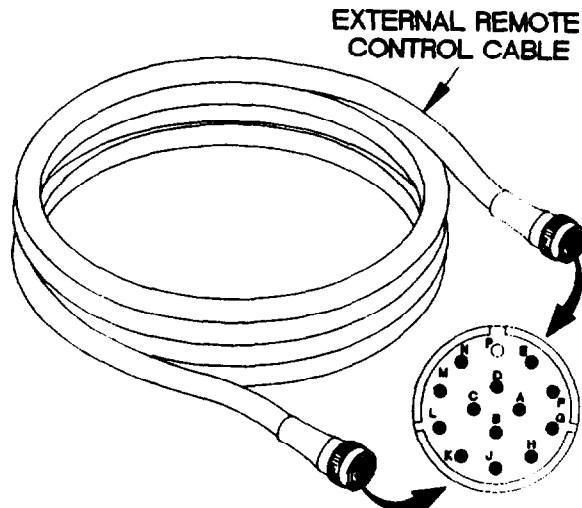


TEST OPTIONS
Continuity Test or STE/CE Test #91
REASON FOR QUESTION
If continuity is not present, external remote control cable is faulty.



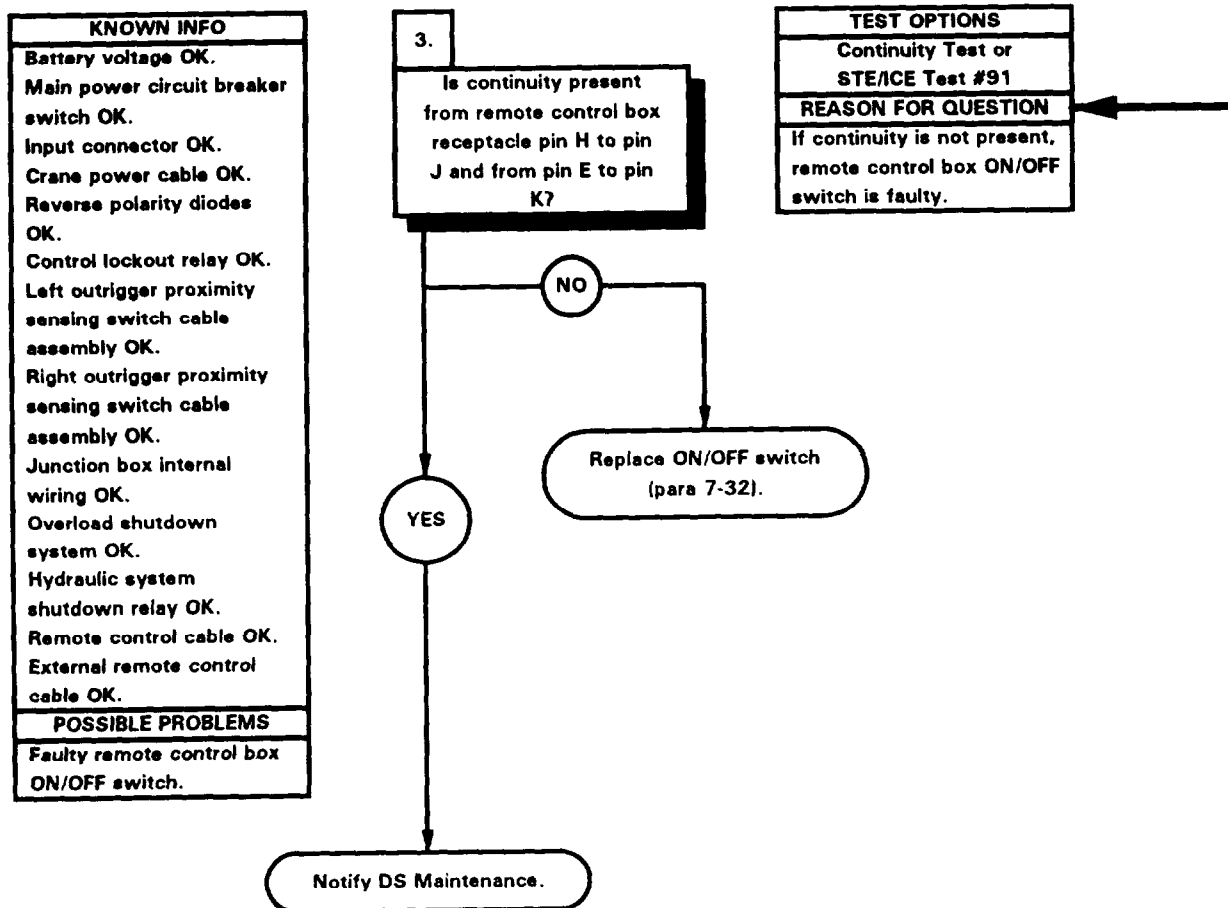
CONTINUITY TEST

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



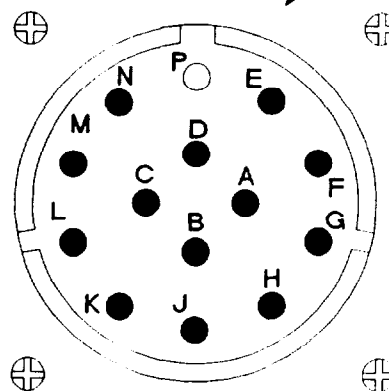
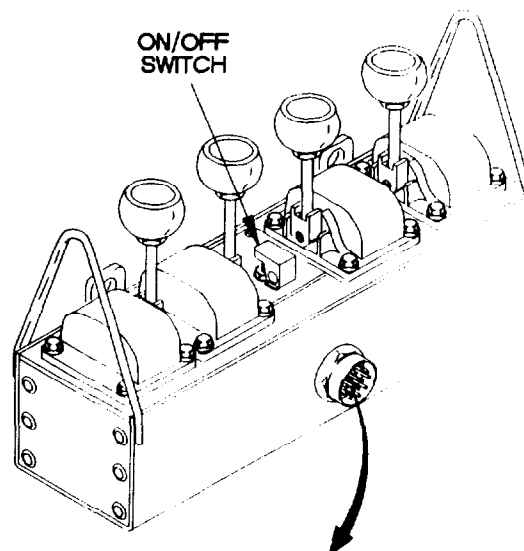
42E9002-

ø105. M1084/M1086 MATERIAL HANDLING CRANE (MHC) DOES NOT OPERATE FROM REMOTE CONTROL
(CONT)



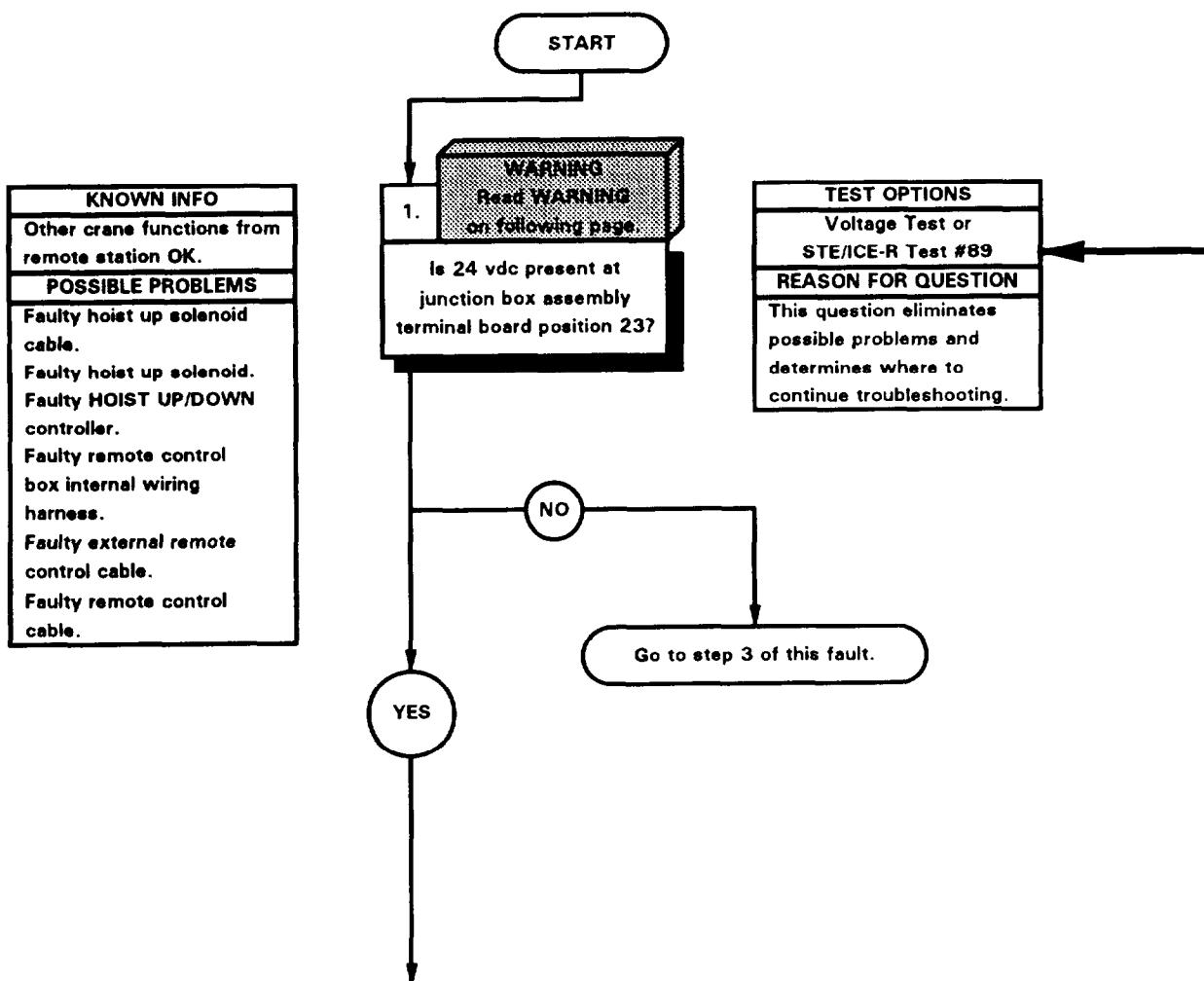
CONTINUITY TEST

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

**REMOTE CONTROL
BOX CONNECTOR**

42E 90013-

●106. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HOIST UP DOES NOT OPERATE FROM REMOTE STATION	
INITIAL SETUP	
Equipment Conditions Outriggers lowered (TM 9-2320-366-10-1). Crane erected with approximately five feet of cable payed out (TM 9-2320-366-10-1). Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/ICE-R (Item 41, Appendix C)
Personnel Required (2)	References TM 9-4910-571-12&P



WARNING

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

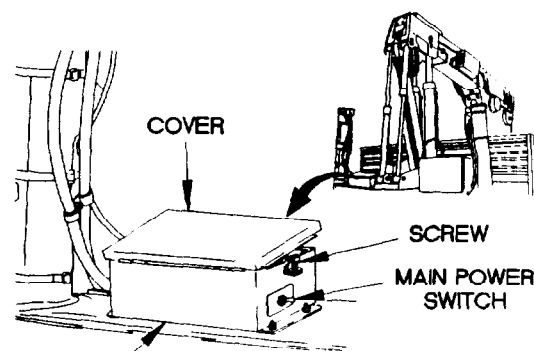
OUTPUT VOLTAGE TEST

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

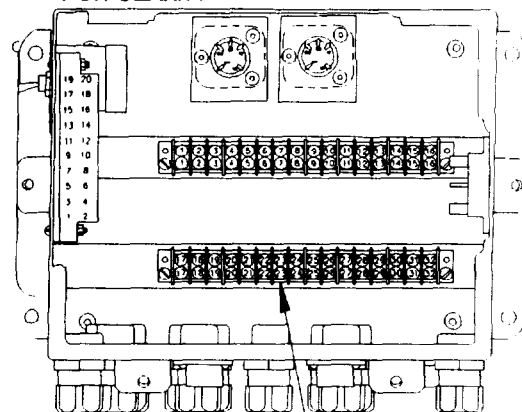
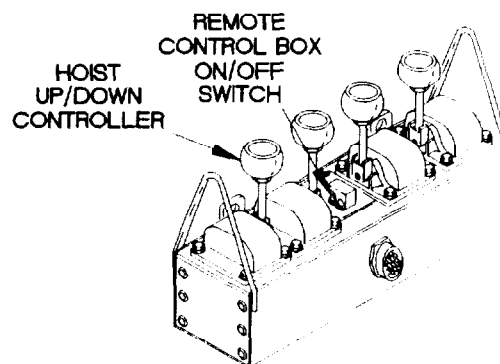
NOTE

Step (9) requires the aid of an assistant.

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

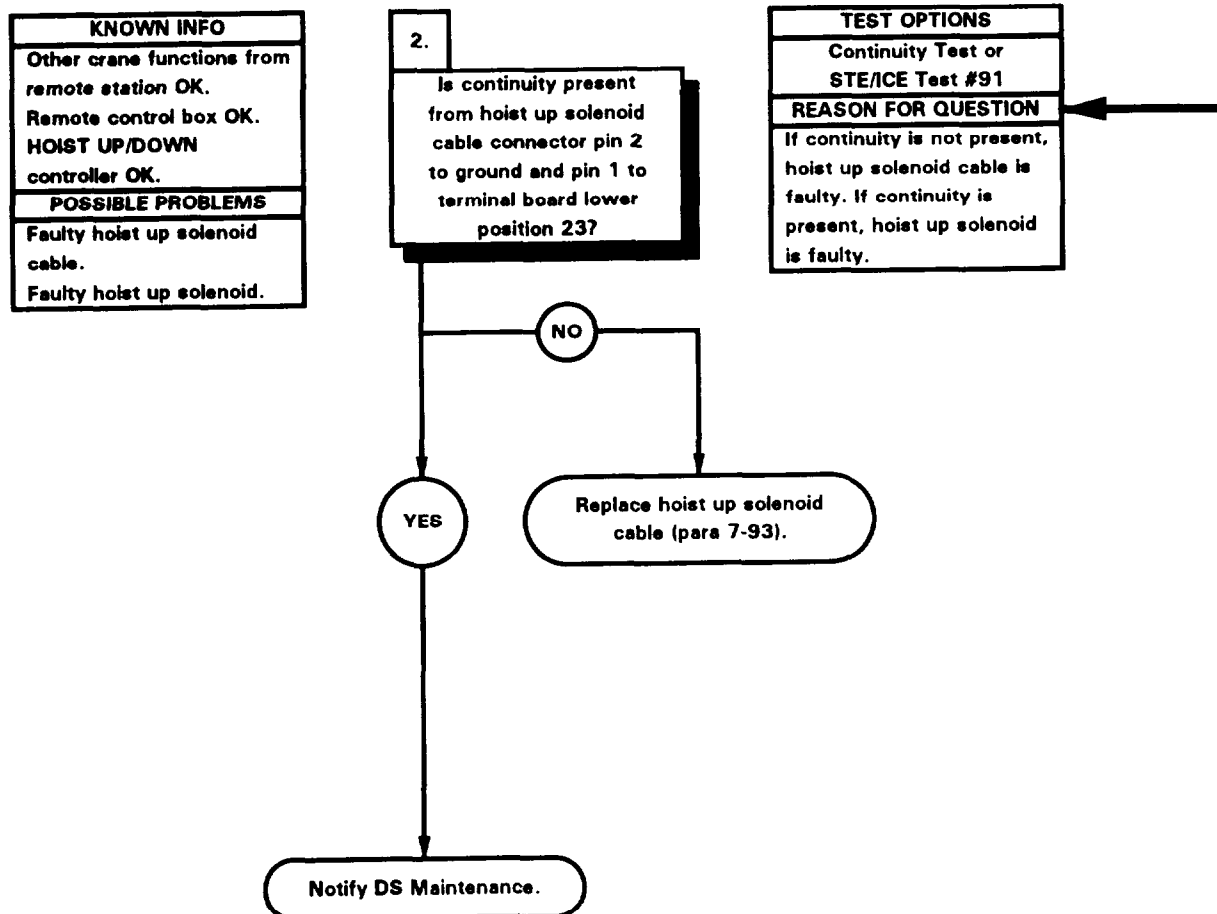
**JUNCTION BOX**

WIRES REMOVED FOR CLARITY

**POSITION 23**

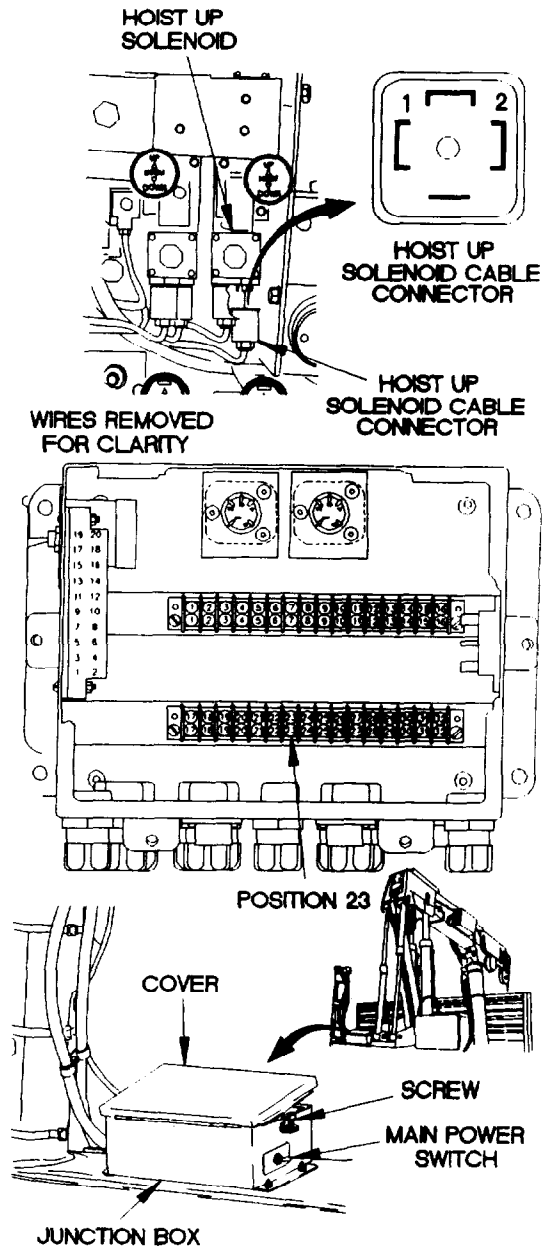
42E13-1A

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



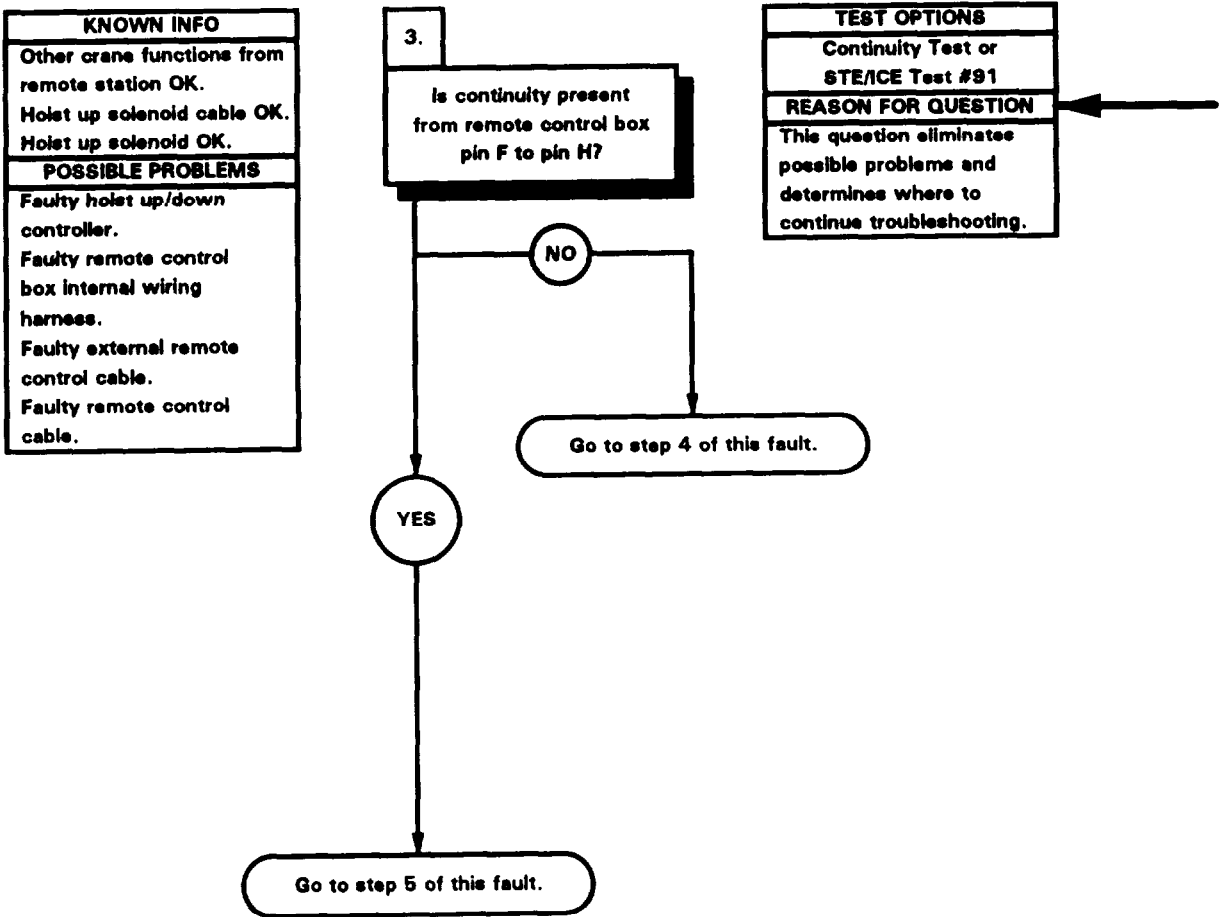
CONTINUITY TEST

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



42E1362A

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



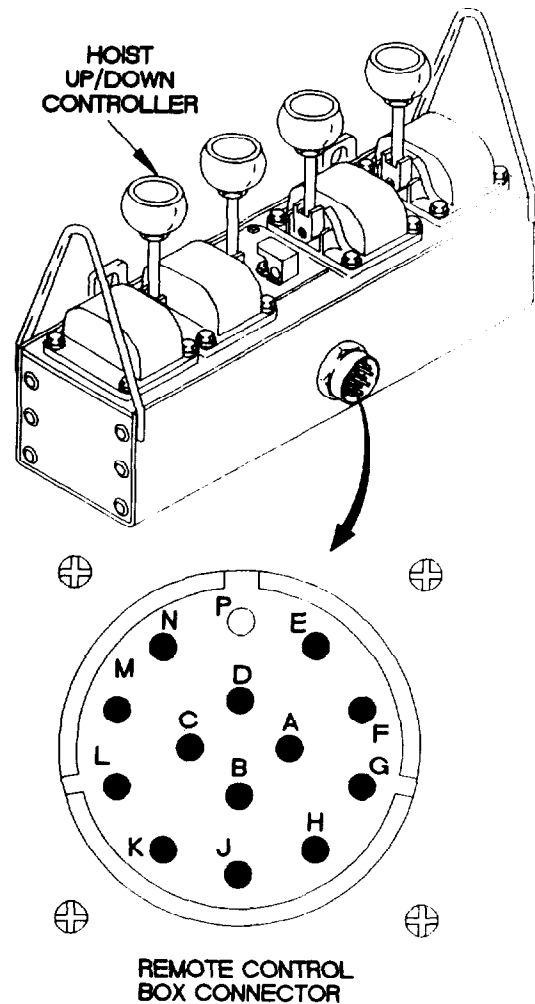
CONTINUITY TEST

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

NOTE

Step (5) requires the aid of an assistant.

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



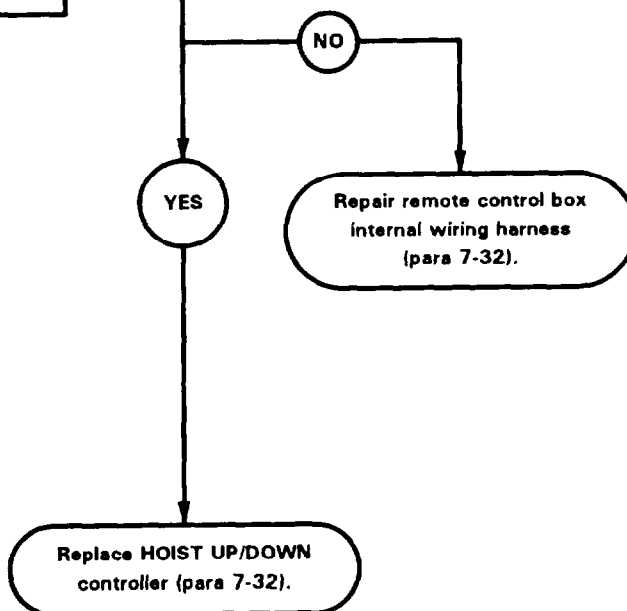
42E1363A

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

KNOWN INFO
Other crane functions from remote station OK.
Hoist up solenoid cable OK.
Hoist up solenoid OK.
External remote control cable OK.
Remote control cable OK.
POSSIBLE PROBLEMS
Faulty remote control box internal wiring harness.
Faulty hoist up/down controller.

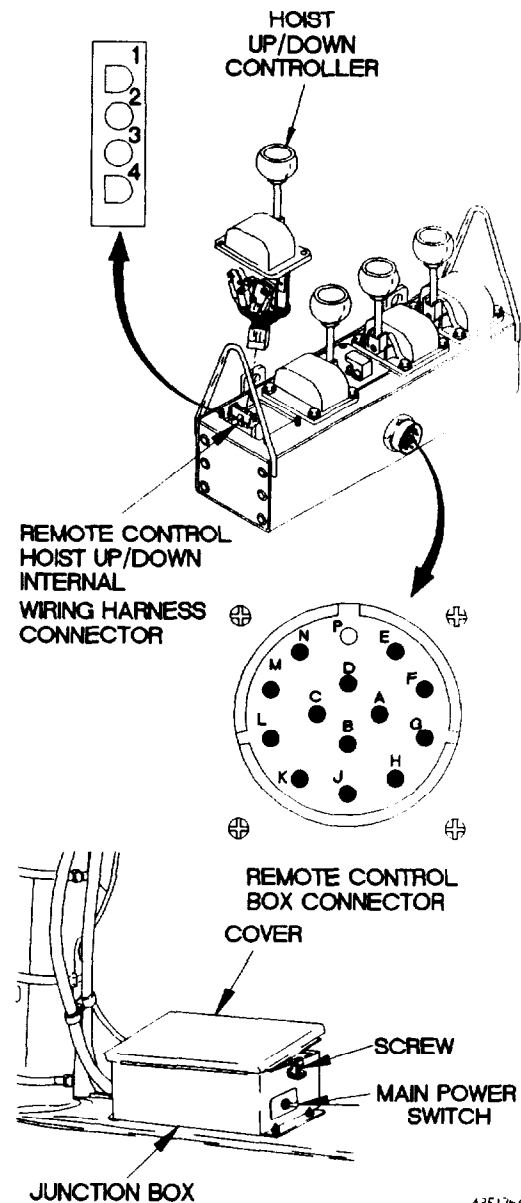
4.
Is continuity present from remote control box connector pin F to HOIST UP/DOWN controller internal wiring harness pin 3 and remote control box connector pin H to HOIST UP/DOWN controller internal wiring harness pin 17

TEST OPTIONS
Continuity Test or STE/CE Test #91
REASON FOR QUESTION
If continuity is not present, remote control box internal wiring harness is faulty.
If continuity is present, HOIST UP/DOWN controller is faulty.



CONTINUITY TEST

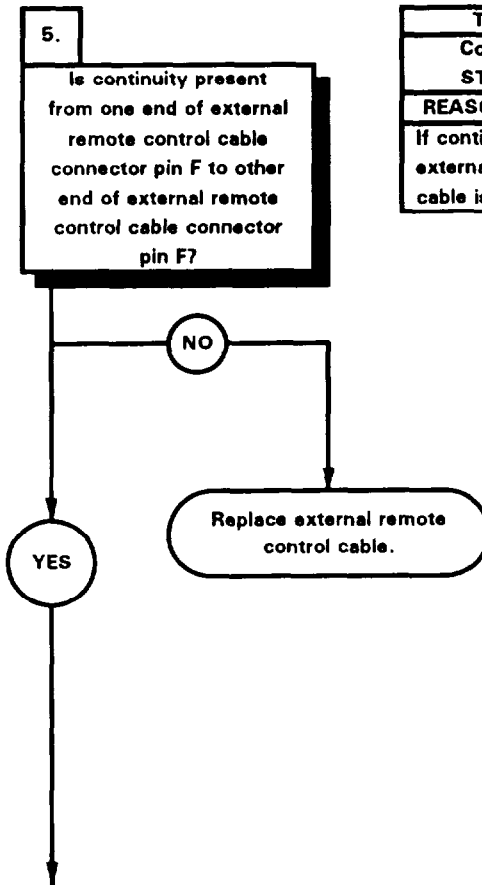
- (1) Remove HOIST UP/DOWN controller (para 7-32).
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter on pin F of remote control box connector.
- (4) Connect negative (-) probe of multimeter on pin 3 of HOIST UP/DOWN controller internal wiring harness and note reading on multimeter.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



42E1364-

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

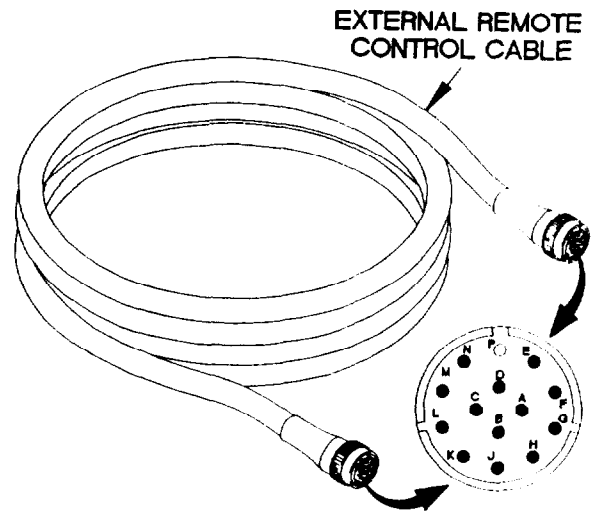
KNOWN INFO
Other crane functions from remote station OK.
Hoist up solenoid cable OK.
Hoist up solenoid OK.
Remote control box internal wiring harness OK.
HOIST UP/DOWN controller OK.
POSSIBLE PROBLEMS
Faulty external remote control cable.
Faulty remote control cable.



TEST OPTIONS
Continuity Test or STE/CE Test #91
REASON FOR QUESTION
If continuity is not present, external remote control cable is faulty.

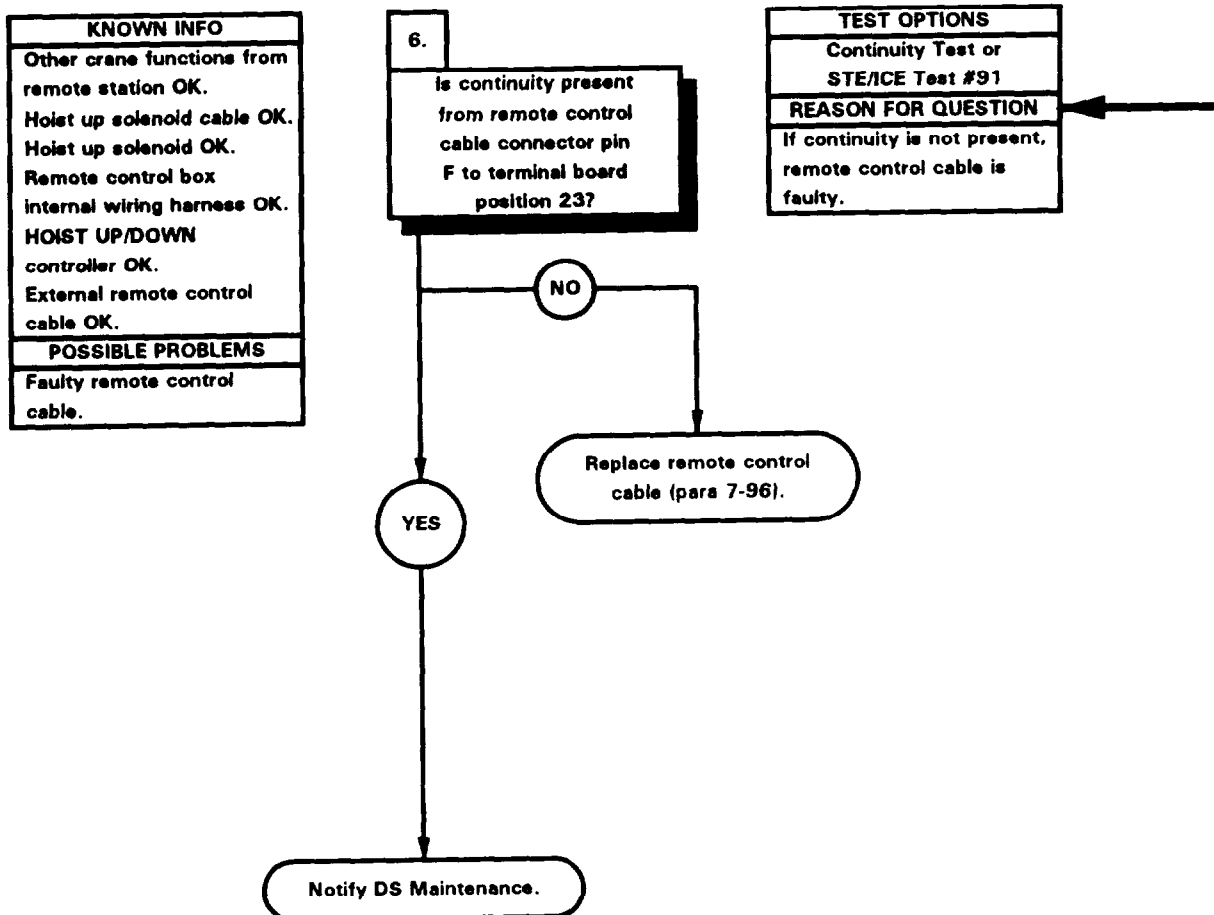
CONTINUITY TEST

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



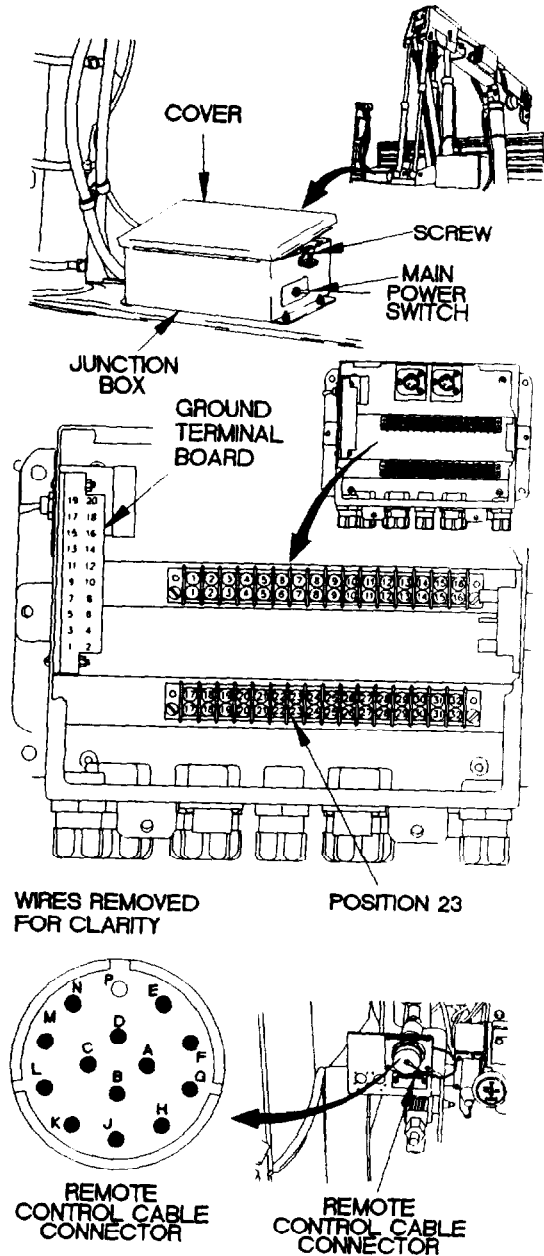
42E1365

6106. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HOIST UP DOES NOT OPERATE FROM REMOTE STATION (CONT)

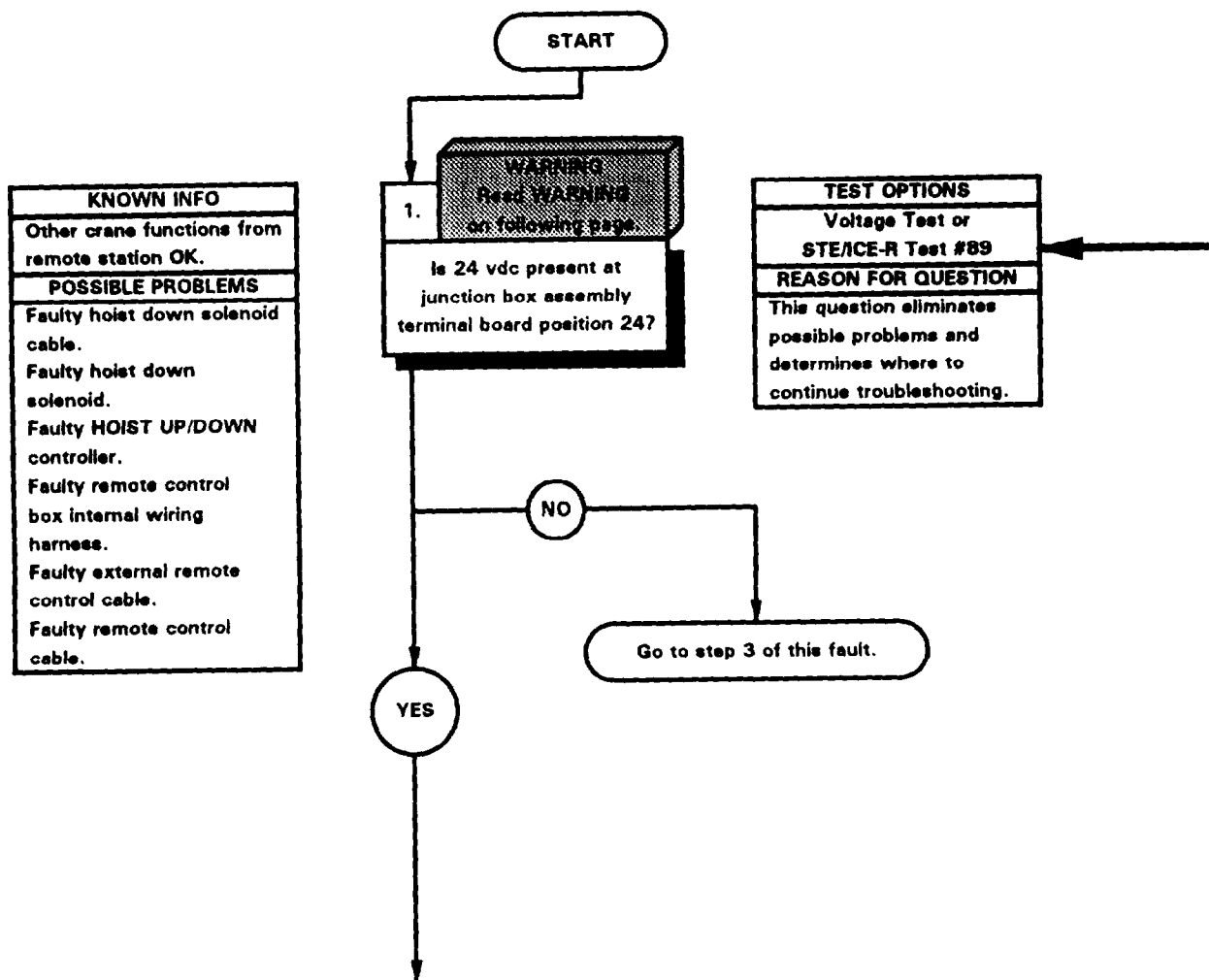


CONTINUITY TEST

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



•107. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HOIST DOWN DOES NOT OPERATE FROM REMOTE STATION	
INITIAL SETUP	
Equipment Conditions Outriggers lowered (TM 9-2320-366-10-1). Crane erected with approximately five feet of cable payed out (TM 9-2320-366-10-1). Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/CE-R (Item 41, Appendix C)
Personnel Required (2)	References TM 9-4910-571-12&P



WARNING

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

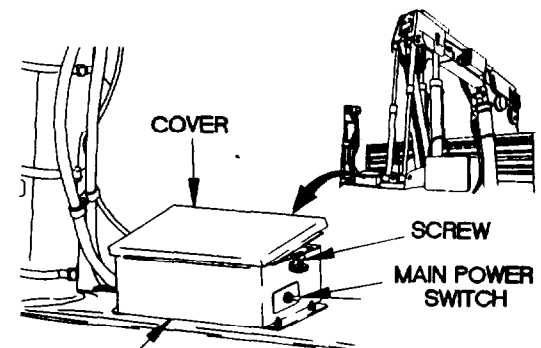
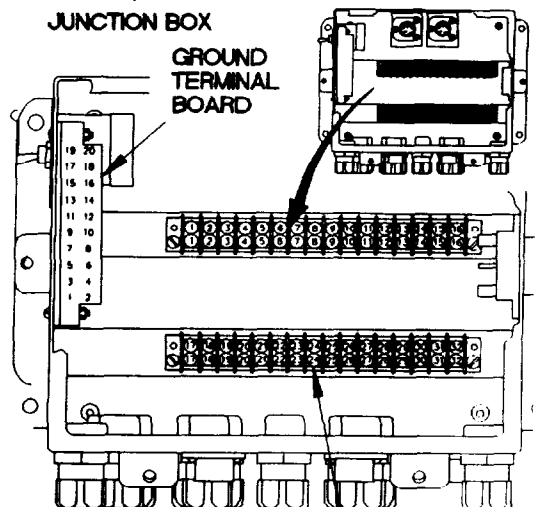
OUTPUT VOLTAGE TEST

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

NOTE

Step (9) requires the aid of an assistant.

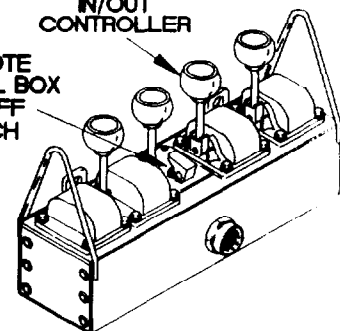
- (9) Position HOIST UP/DOWN to DOWN and note reading on multimeter.
- (10) If 24 volts dc is not present, go to step 3 of this fault.

**JUNCTION BOX****GROUND
TERMINAL
BOARD**

WIRES REMOVED
FOR CLARITY

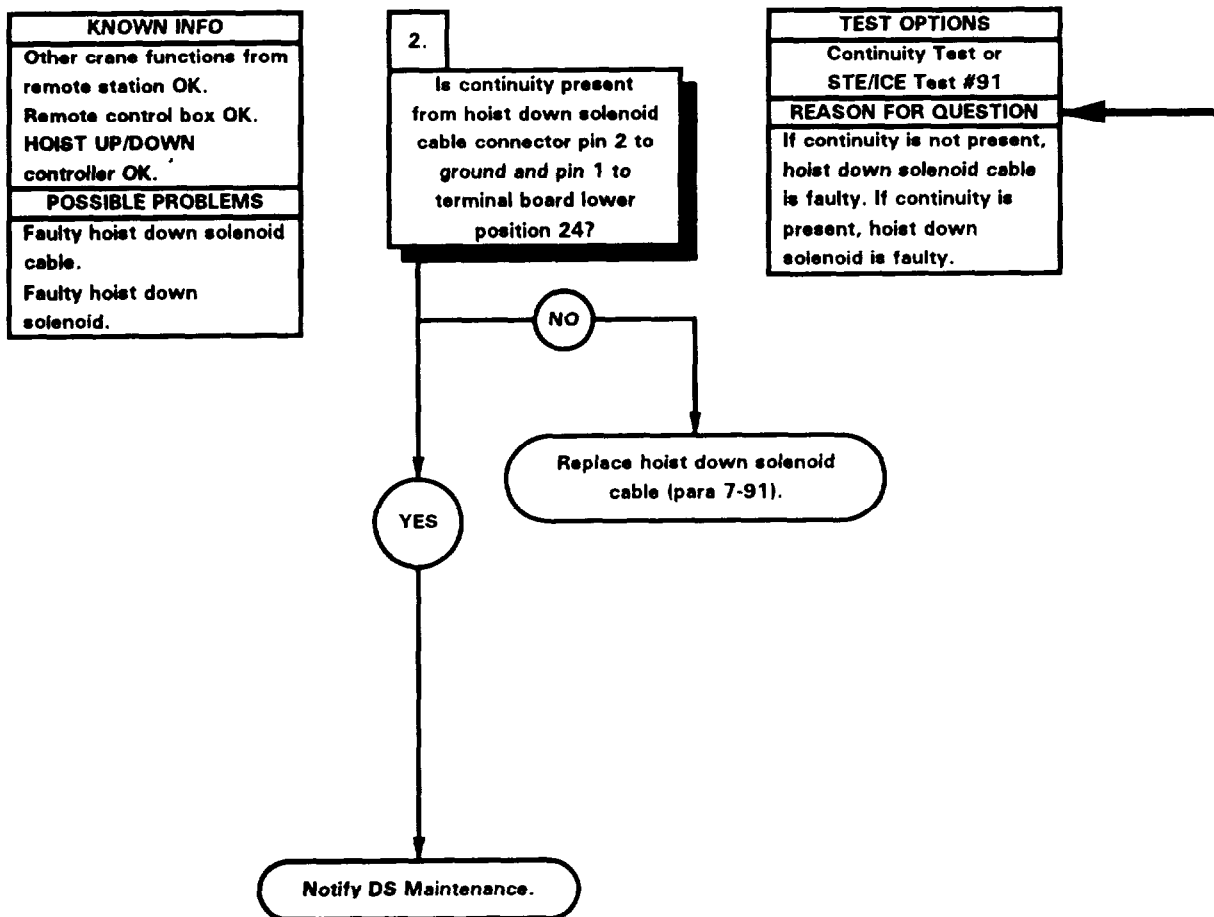
TELESCOPE
IN/OUT
CONTROLLER

REMOTE
CONTROL BOX
ON/OFF
SWITCH



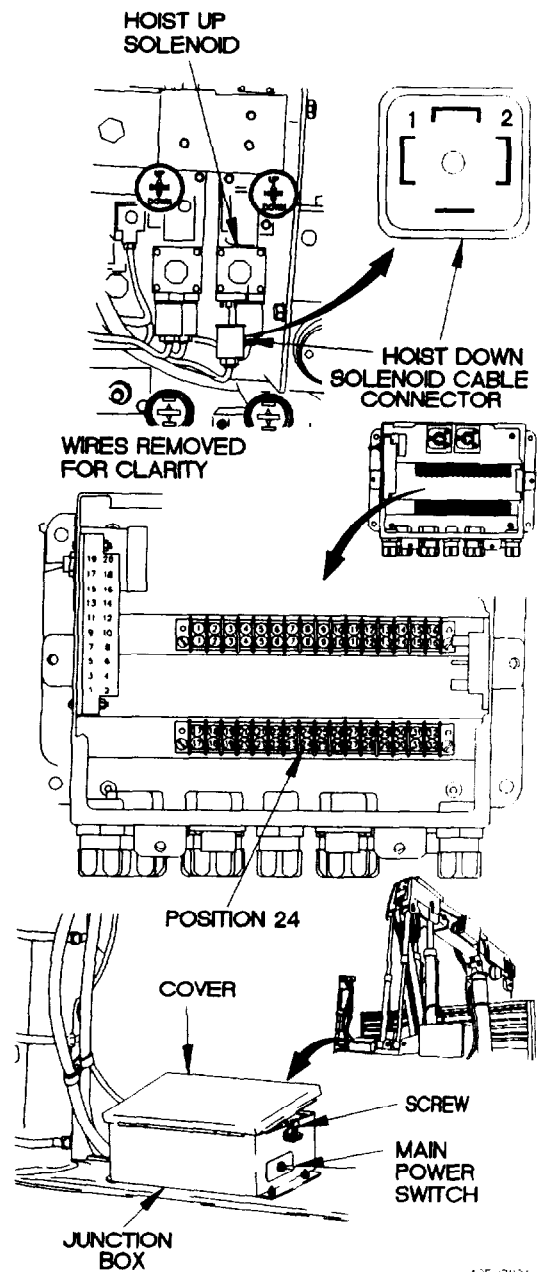
42E1371A

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



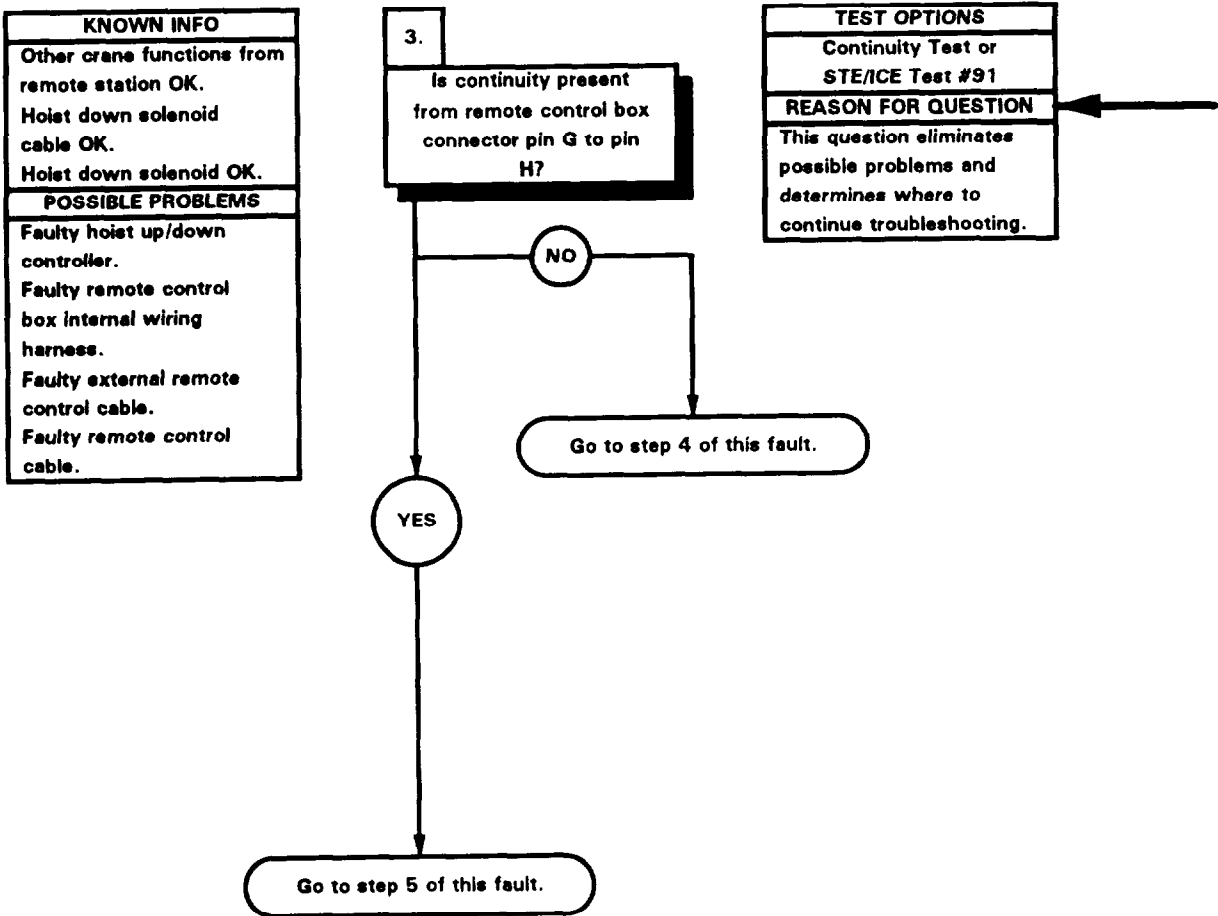
CONTINUITY TEST

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



42E J7024

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



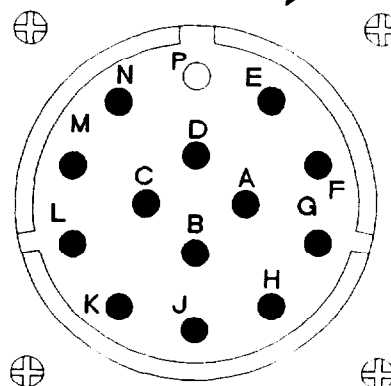
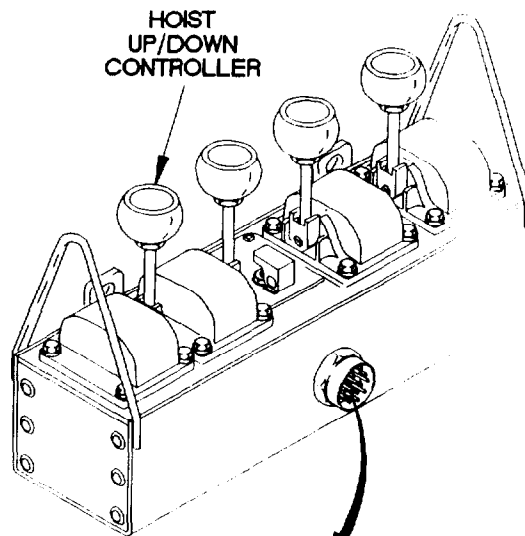
CONTINUITY TEST

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

NOTE

Step (5) requires the aid of an assistant.

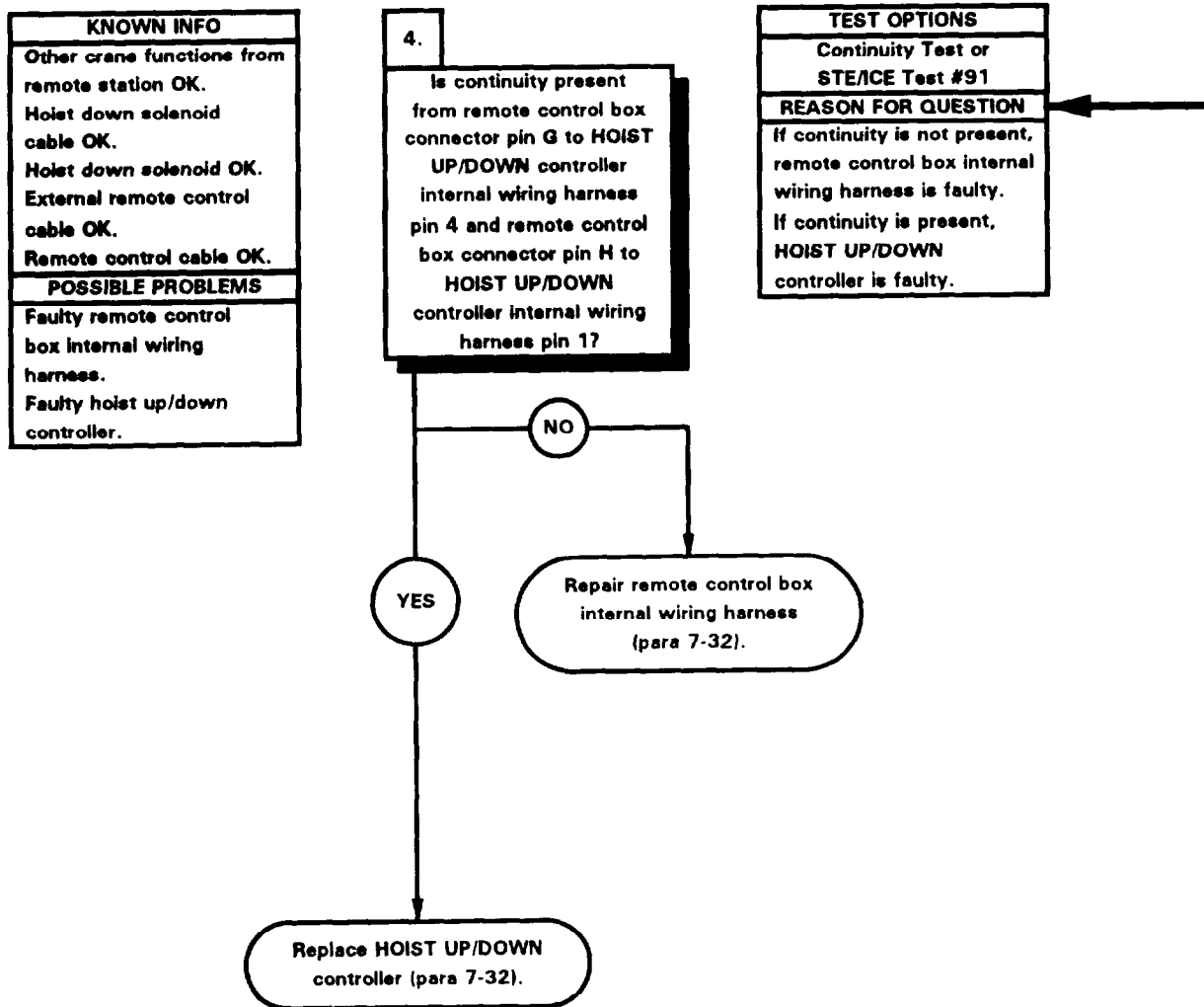
- (5) Position HOIST UP/DOWN controller to DOWN and note reading on multimeter.
- (6) If continuity is not present, go to step 4 of this fault.
- (7) If continuity is present, go to step 5 of this fault.



REMOTE CONTROL
BOX CONNECTOR

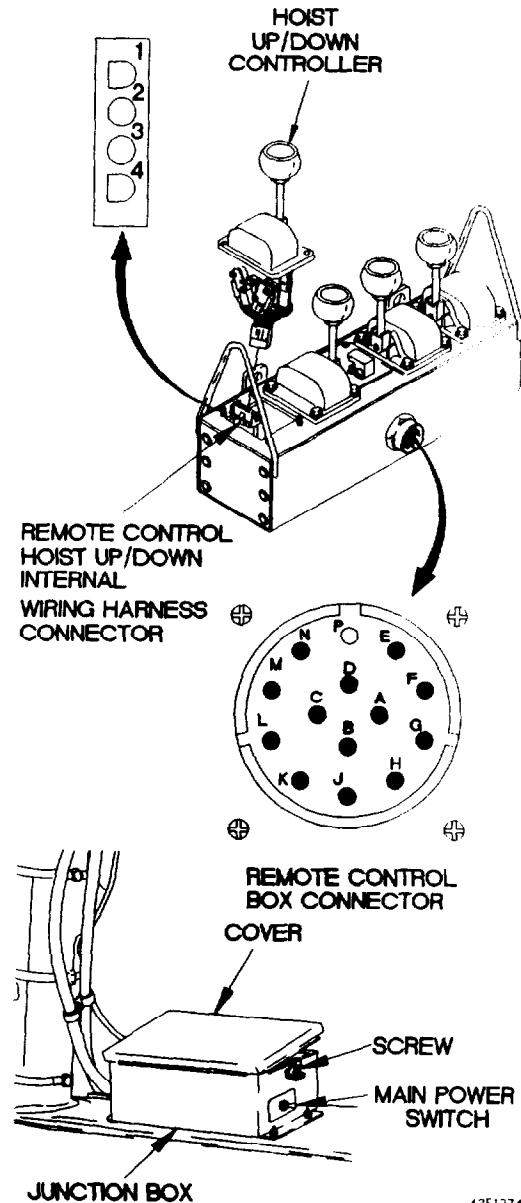
40E1373-

ø107. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HOIST DOWN DOES NOT OPERATE FROM REMOTE STATION (CONT)



CONTINUITY TEST

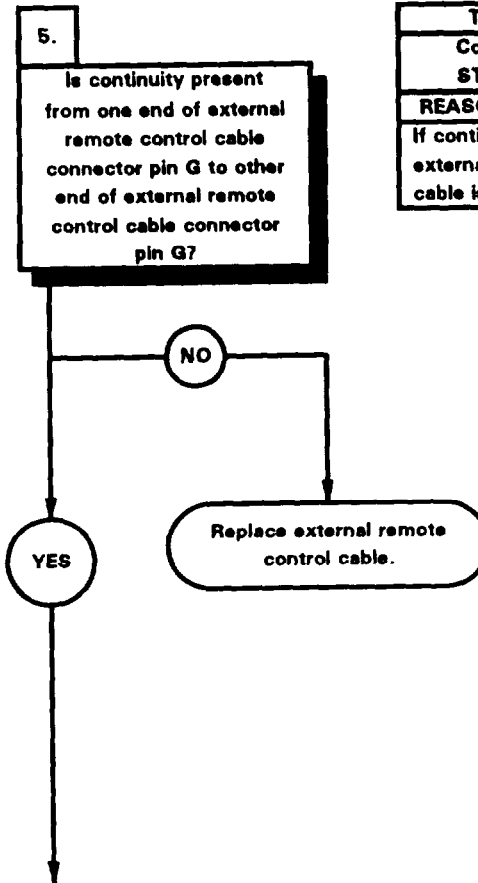
- (1) Remove HOIST UP/DOWN controller (para 7-32).
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter on pin G of remote control box connector.
- (4) Connect negative (-) probe of multimeter on pin 4 of HOIST UP/DOWN controller internal wiring harness and note reading on multimeter.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



42E1374-

ø107. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HOIST DOWN DOES NOT OPERATE FROM REMOTE STATION (CONT)

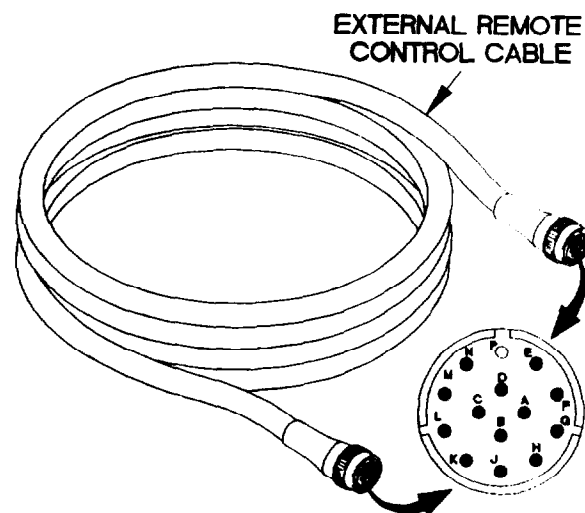
KNOWN INFO
Other crane functions from remote station OK. Hoist down solenoid cable OK. Hoist down solenoid OK. Remote control box internal wiring harness OK. HOIST UP/DOWN controller OK.
POSSIBLE PROBLEMS
Faulty external remote control cable. Faulty remote control cable.



TEST OPTIONS
Continuity Test or STE/CE Test #91
REASON FOR QUESTION
If continuity is not present, external remote control cable is faulty.

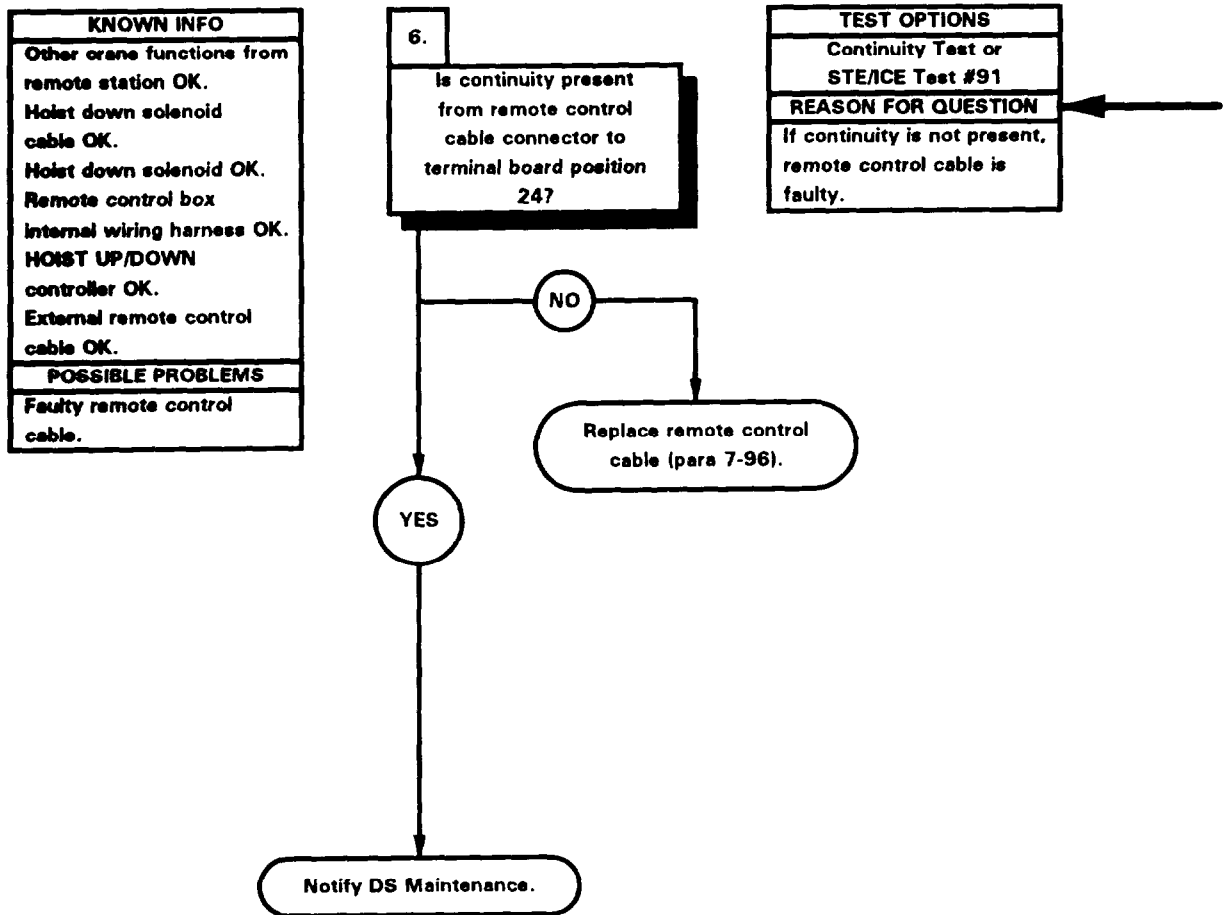
CONTINUITY TEST

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



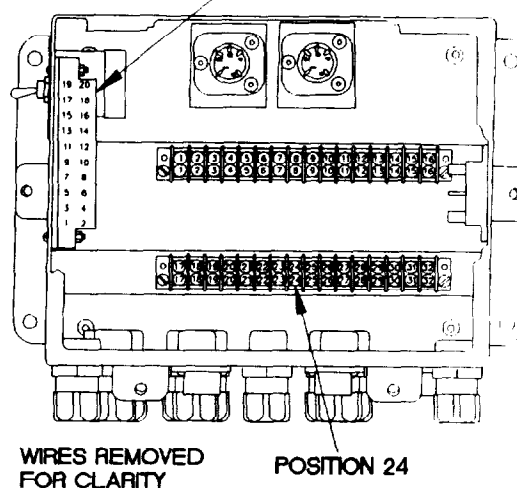
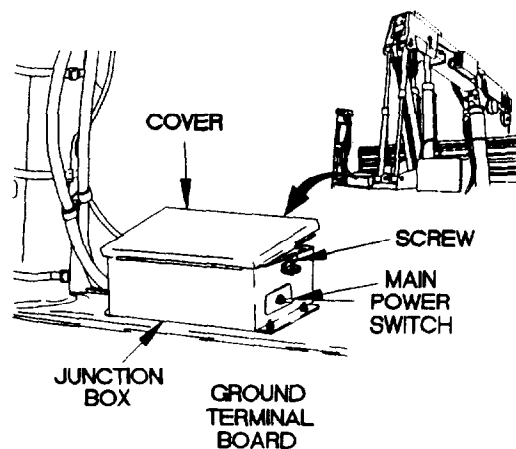
42E1375-

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



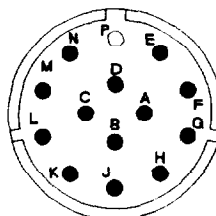
CONTINUITY TEST

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

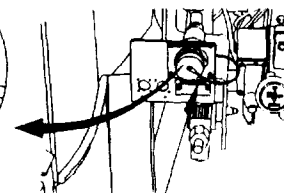


WIRES REMOVED FOR CLARITY

POSITION 24



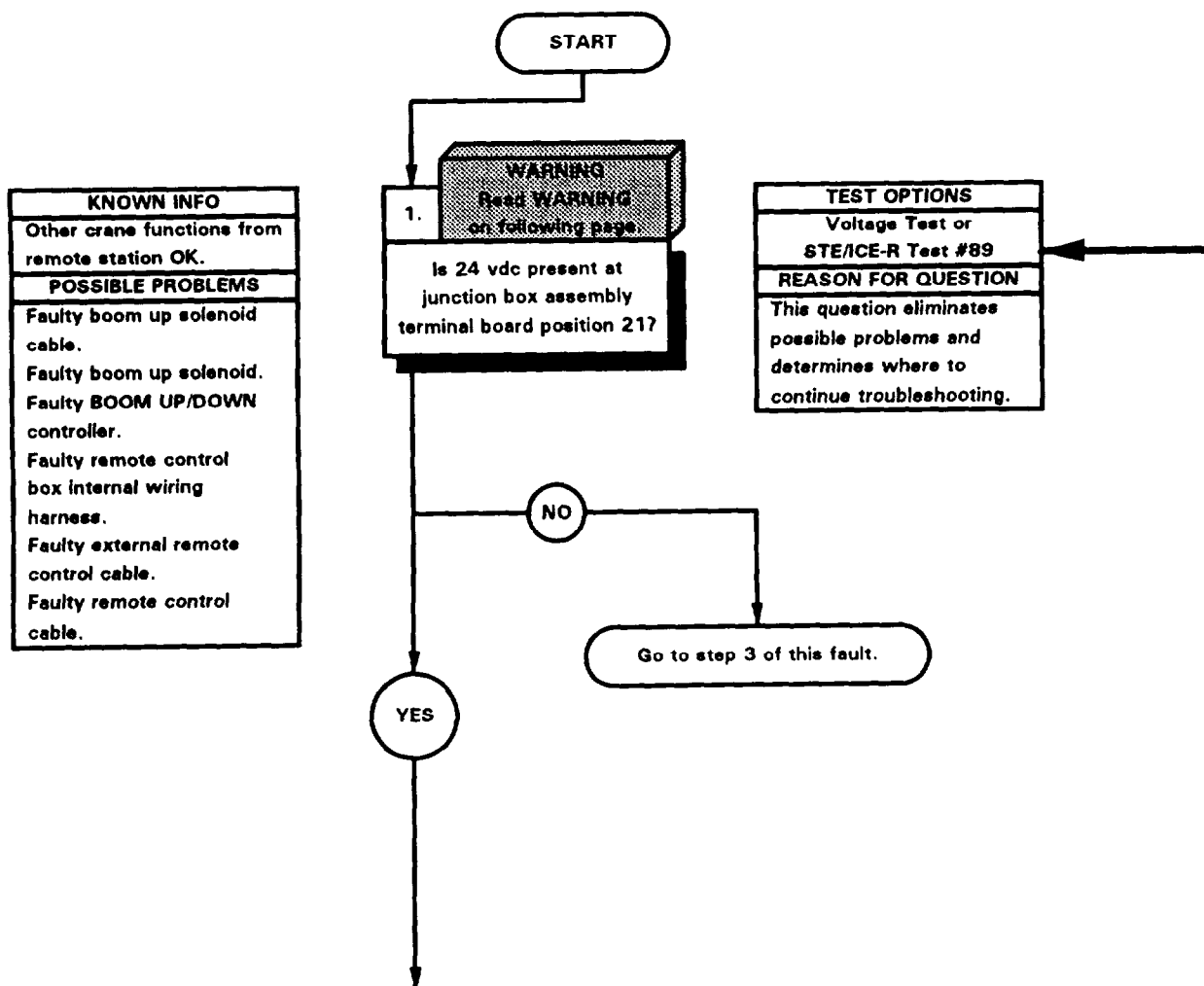
REMOTE CONTROL CABLE CONNECTOR



REMOTE CONTROL CABLE CONNECTOR

42E1376-

•108. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM UP DOES NOT OPERATE FROM REMOTE STATION	
INITIAL SETUP	
Equipment Conditions Outriggers lowered (TM 9-2320-366-10-1). Crane erected with approximately five feet of cable payed out (TM 9-2320-366-10-1). Engine shut down (TM 9-2320-366-10-1). Personnel Required (2)	Tools and Special Tools Tool Kit, Genl Mech (Item 48, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/ICE-R (Item 41, Appendix C) References TM 9-4910-571-12&P



WARNING

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

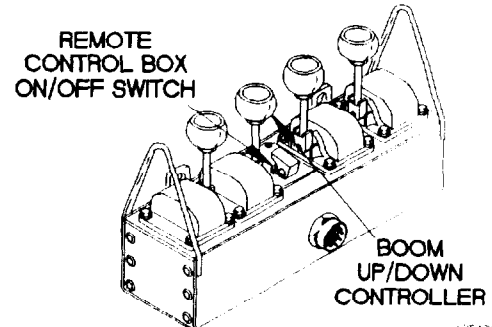
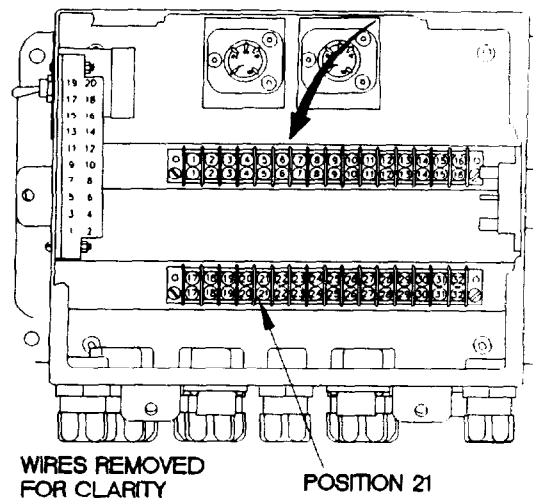
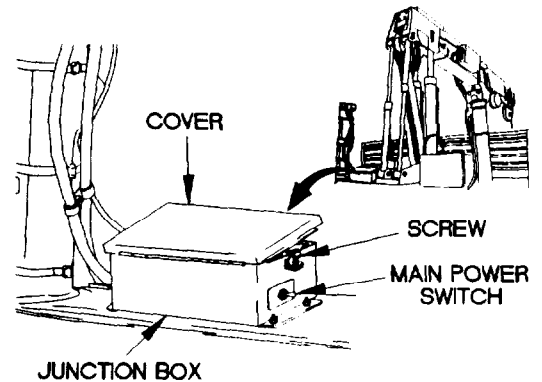
OUTPUT VOLTAGE TEST

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

NOTE

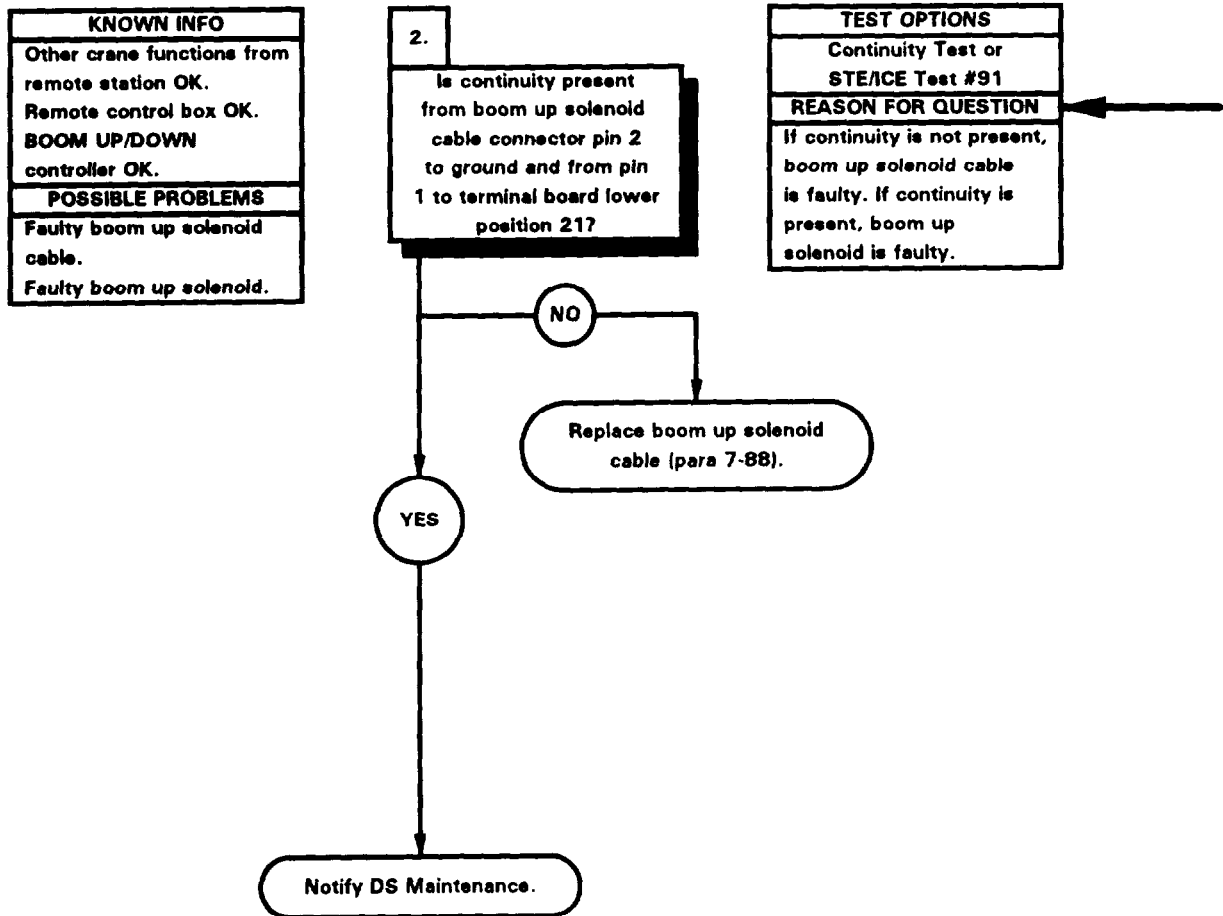
Step (9) requires the aid of an assistant.

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



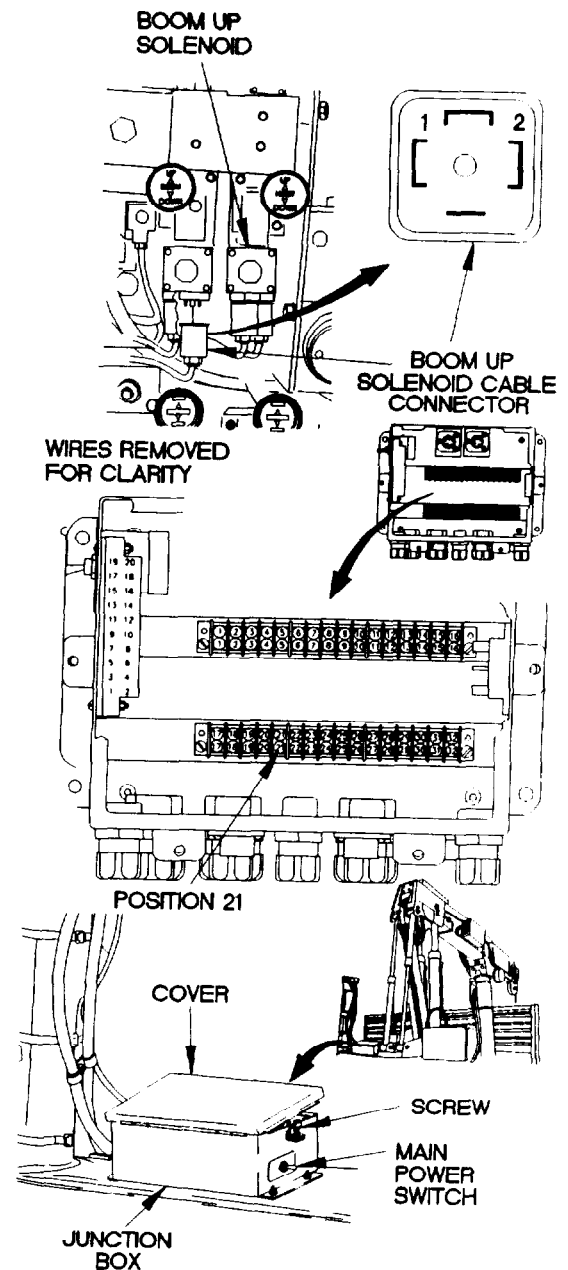
42E1381-

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



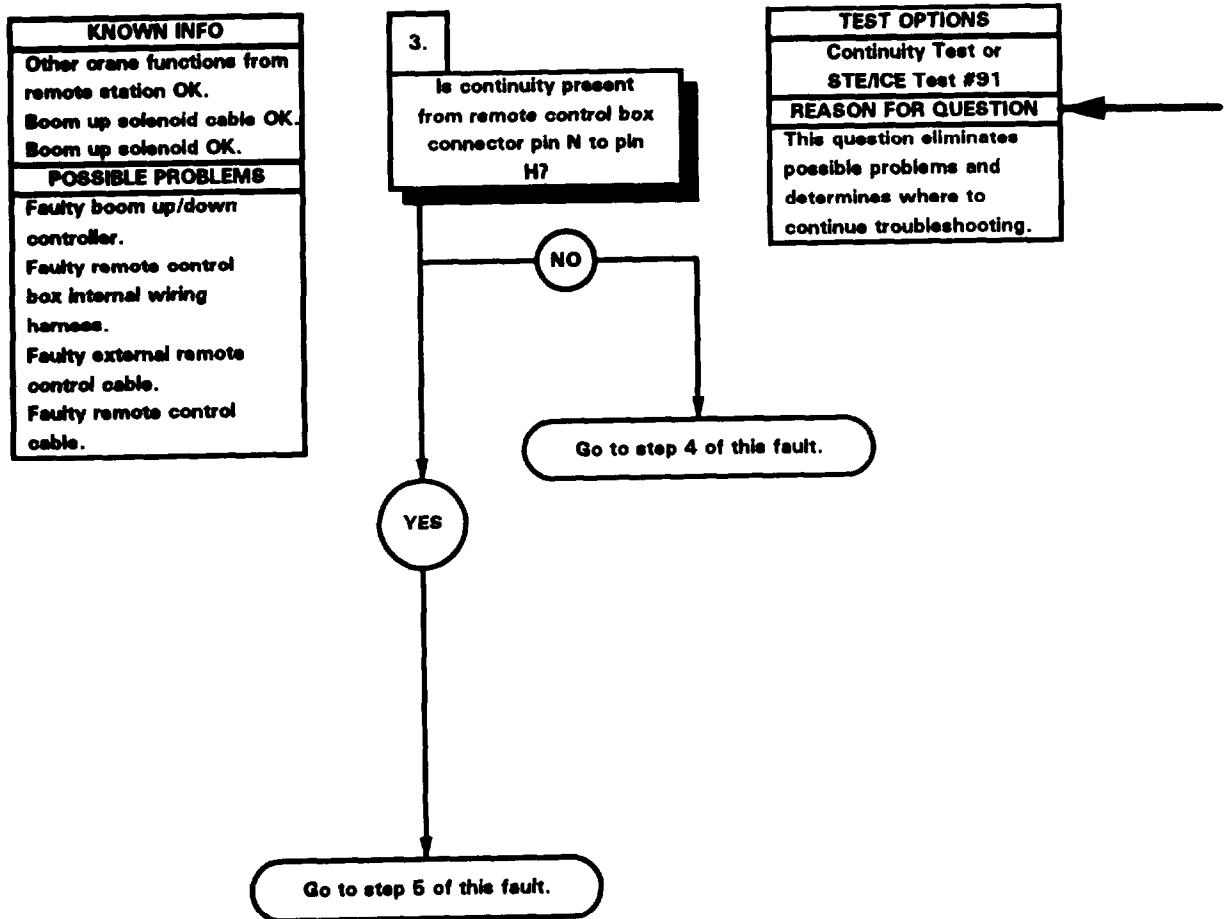
CONTINUITY TEST

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



42E J8112A

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



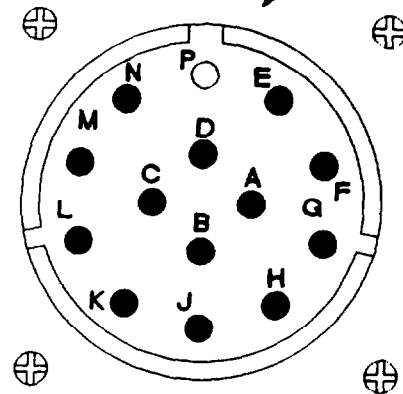
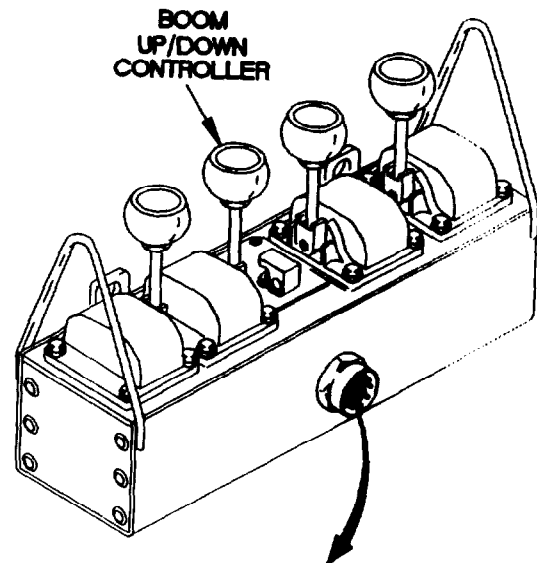
CONTINUITY TEST

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

NOTE

Step (5) requires the aid of an assistant.

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



REMOTE CONTROL BOX CONNECTOR

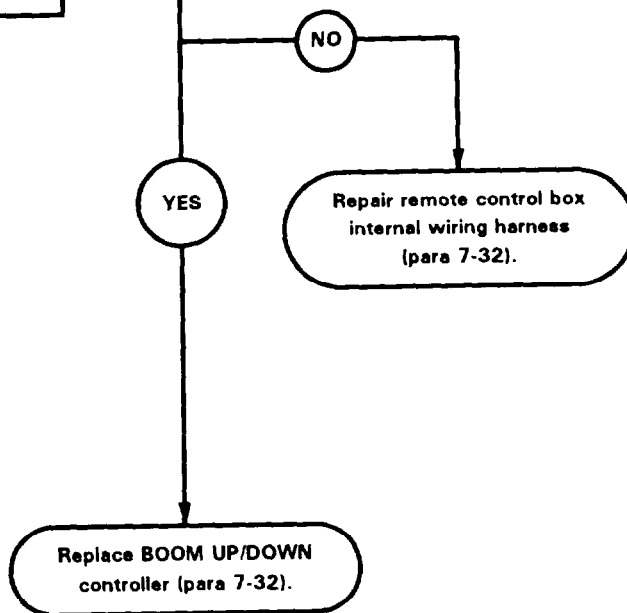
42E1383-

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

KNOWN INFO
Other crane functions from remote station OK. Boom up solenoid cable OK. Boom up solenoid OK. External remote control cable OK. Remote control cable OK.
POSSIBLE PROBLEMS
Faulty remote control box internal wiring harness. Faulty boom up/down controller.

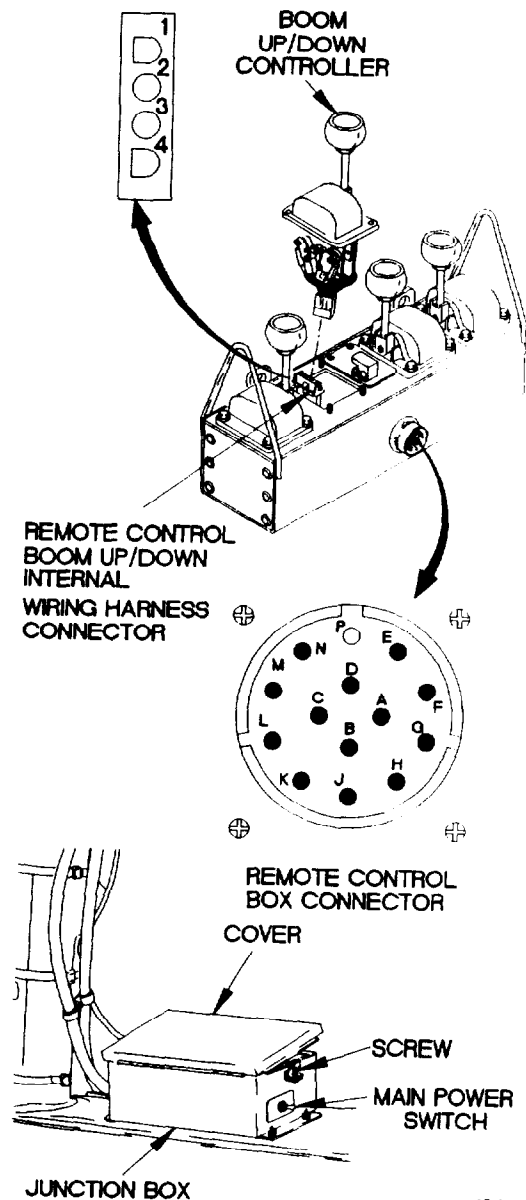
4.
Is continuity present from remote control box connector pin N to BOOM UP/DOWN controller internal wiring harness pin 3 and remote control box connector pin H to BOOM UP/DOWN controller internal wiring harness pin 1?

TEST OPTIONS
Continuity Test or STE/ICE Test #91
REASON FOR QUESTION
If continuity is not present, remote control box internal wiring harness is faulty. If continuity is present, BOOM UP/DOWN controller is faulty.



CONTINUITY TEST

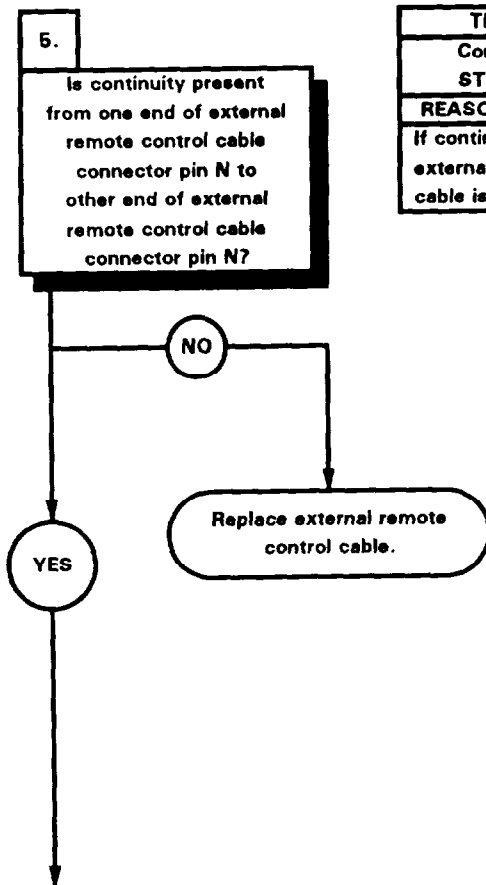
- (1) Remove BOOM UP/DOWN controller (para 7-32).
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter on pin N of remote control box connector.
- (4) Connect negative (-) probe of multimeter on pin 3 of BOOM UP/DOWN controller internal wiring harness and note reading on multimeter.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



42E1384-

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

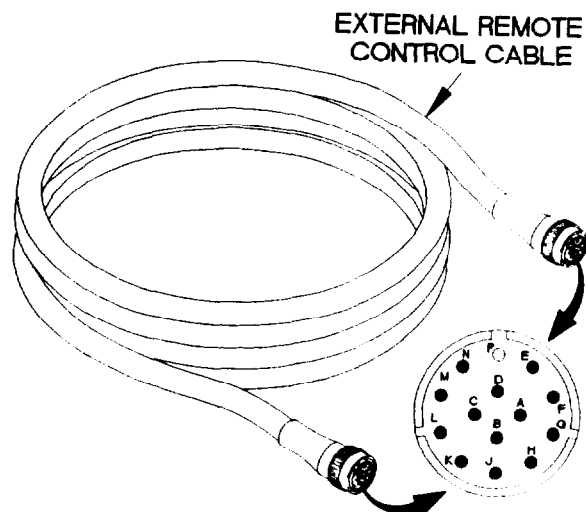
KNOWN INFO
Other crane functions from remote station OK. Boom up solenoid cable OK. Boom up solenoid OK. Remote control box internal wiring harness OK. BOOM UP/DOWN controller OK.
POSSIBLE PROBLEMS
Faulty external remote control cable. Faulty remote control cable.



TEST OPTIONS
Continuity Test or STE/ICE Test #91
REASON FOR QUESTION
If continuity is not present, external remote control cable is faulty.

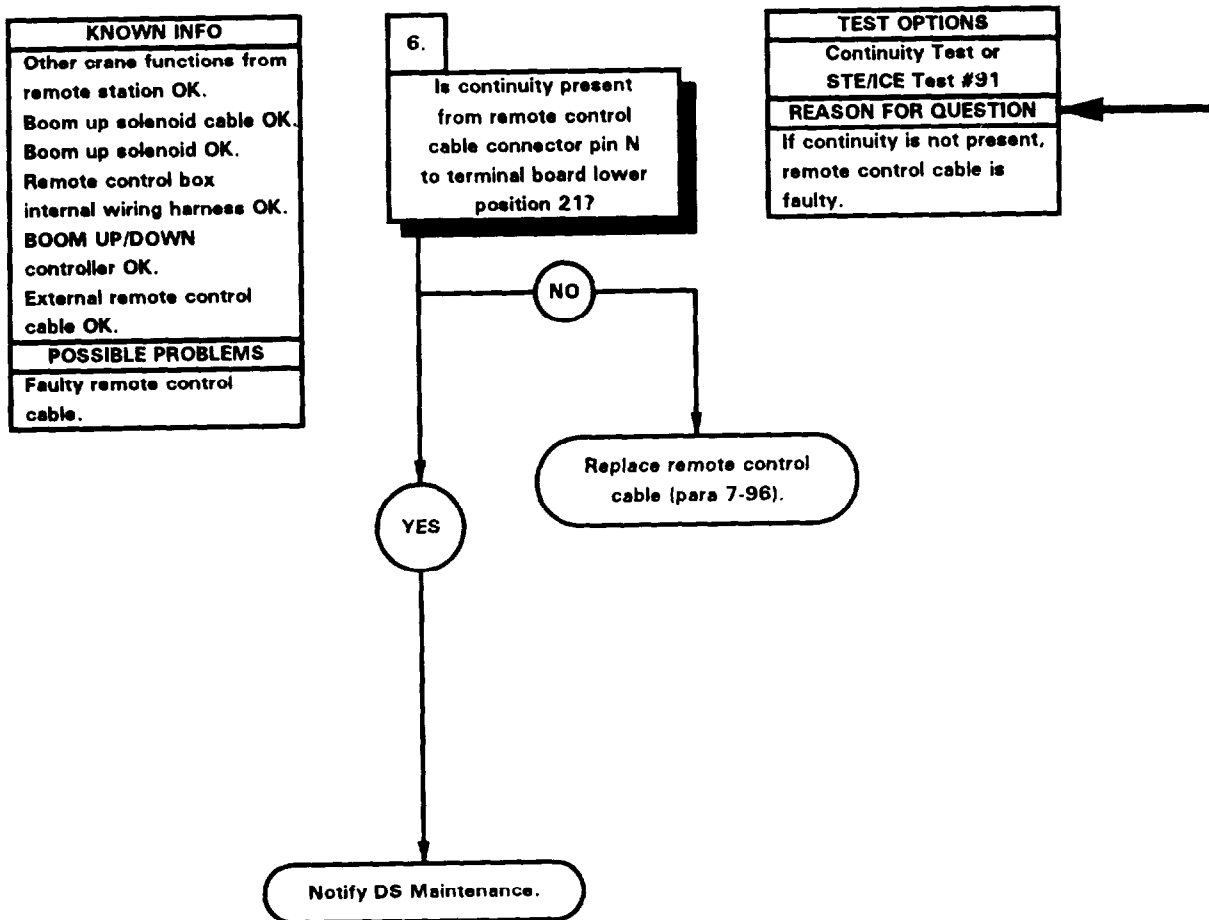
CONTINUITY TEST

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



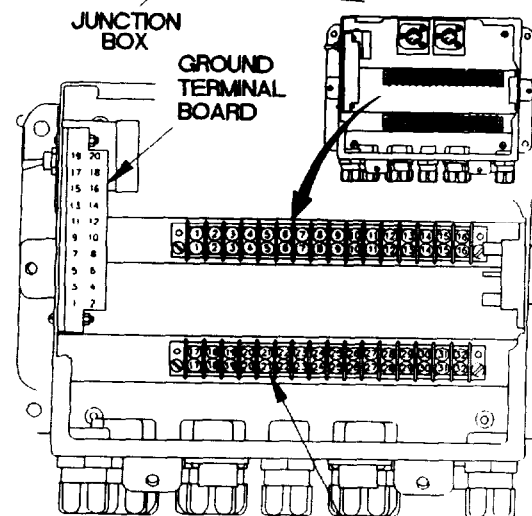
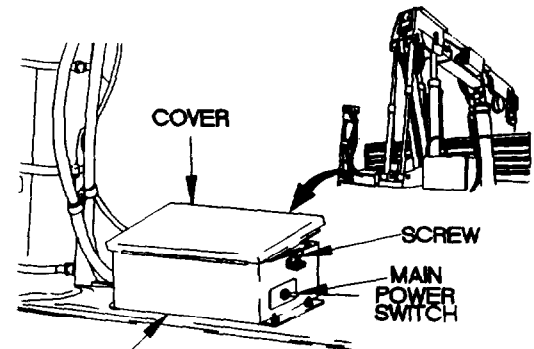
42E1385-

ø108. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM UP DOES NOT OPERATE FROM REMOTE STATION (CONT)



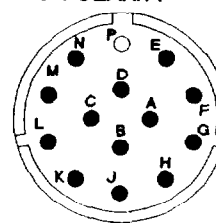
CONTINUITY TEST

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

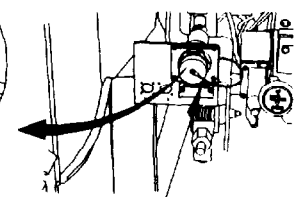


WIRES REMOVED FOR CLARITY

POSITION 21



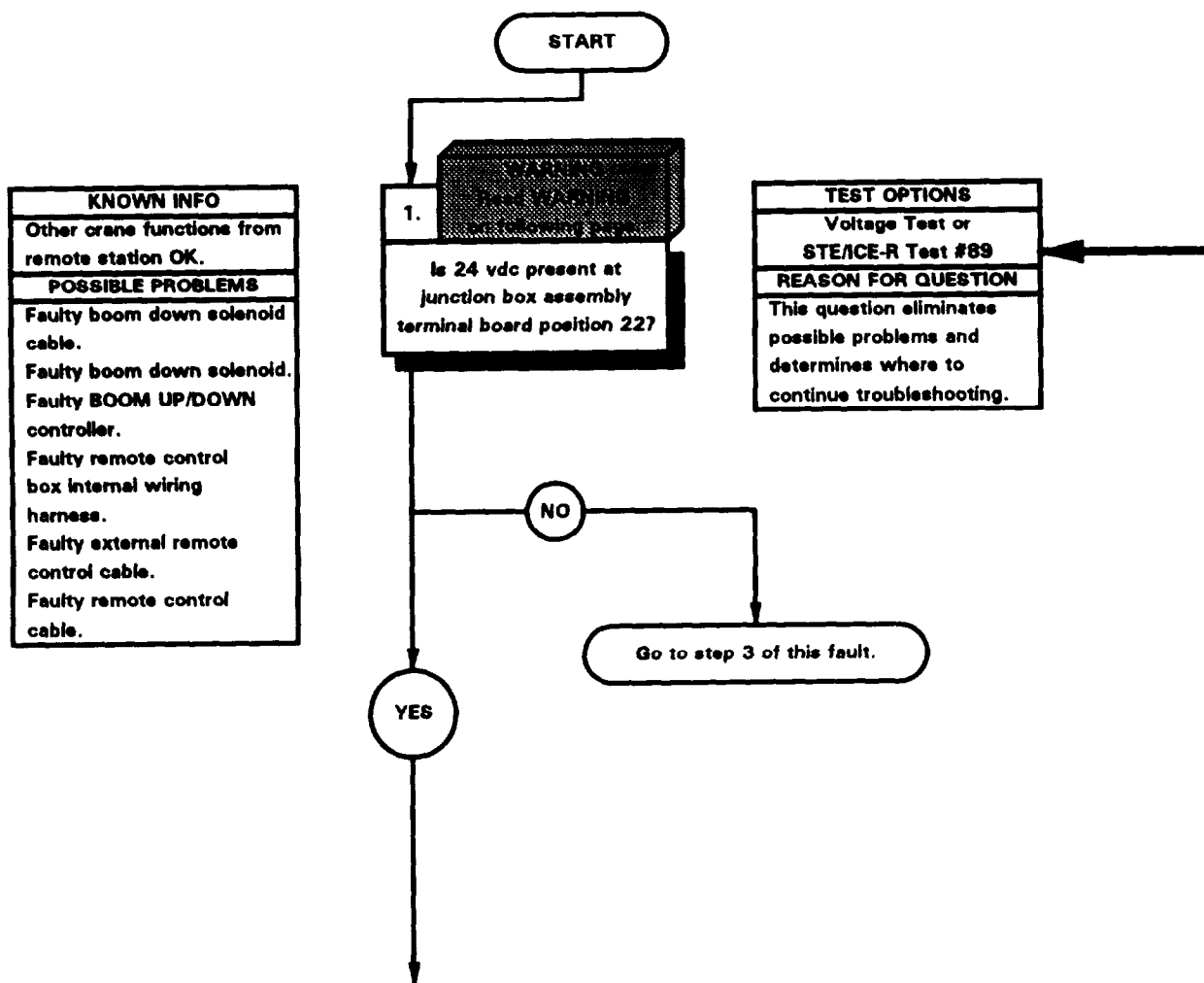
REMOTE CONTROL CABLE CONNECTOR



REMOTE CONTROL CABLE CONNECTOR

42E1386-

•109. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM DOWN DOES NOT OPERATE FROM REMOTE STATION	
INITIAL SETUP	
Equipment Conditions Outriggers lowered (TM 9-2320-366-10-1). Crane erected with approximately five feet of cable payed out (TM 9-2320-366-10-1). Engine shut down (TM 9-2320-366-10-1). Personnel Required (2)	Tools and Special Tools Tool Kit, Genl Mech (Item 48, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/CE-R (Item 41, Appendix C) References TM 9-4910-571-12&P



WARNING

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

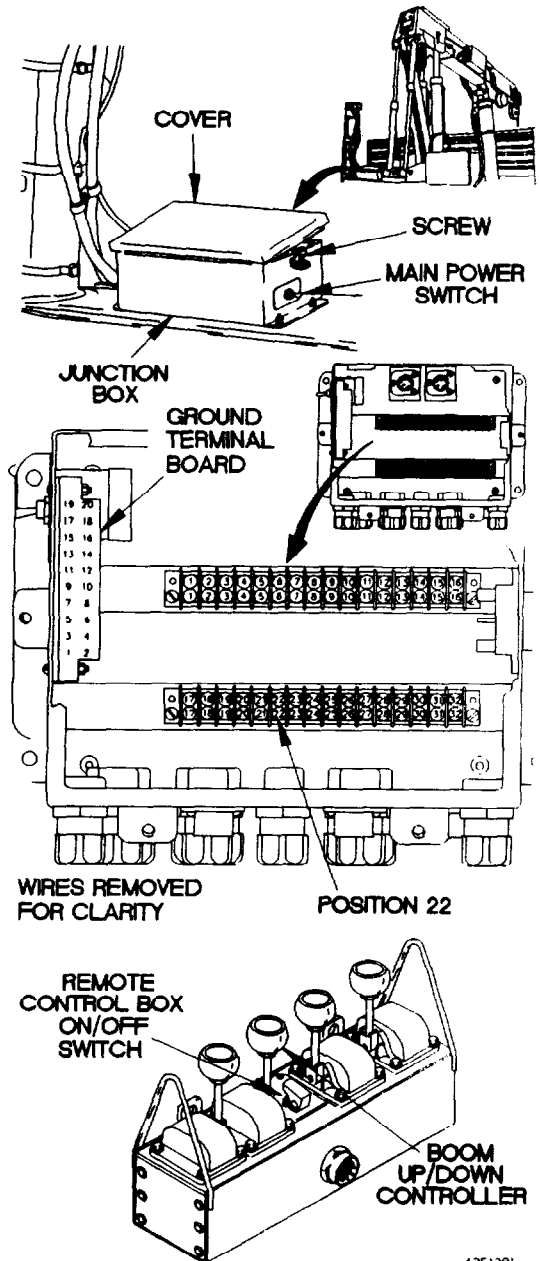
OUTPUT VOLTAGE TEST

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

NOTE

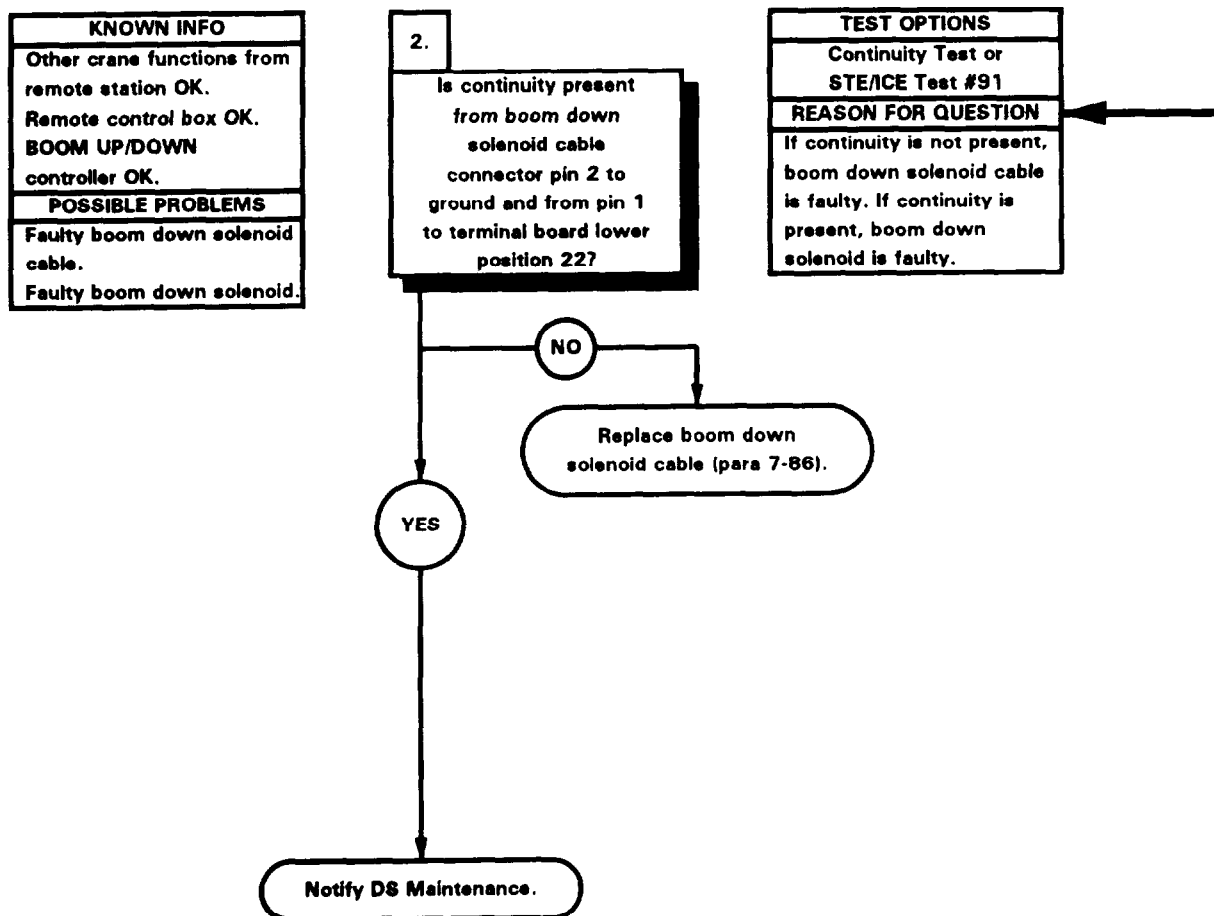
Step (9) requires the aid of an assistant.

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



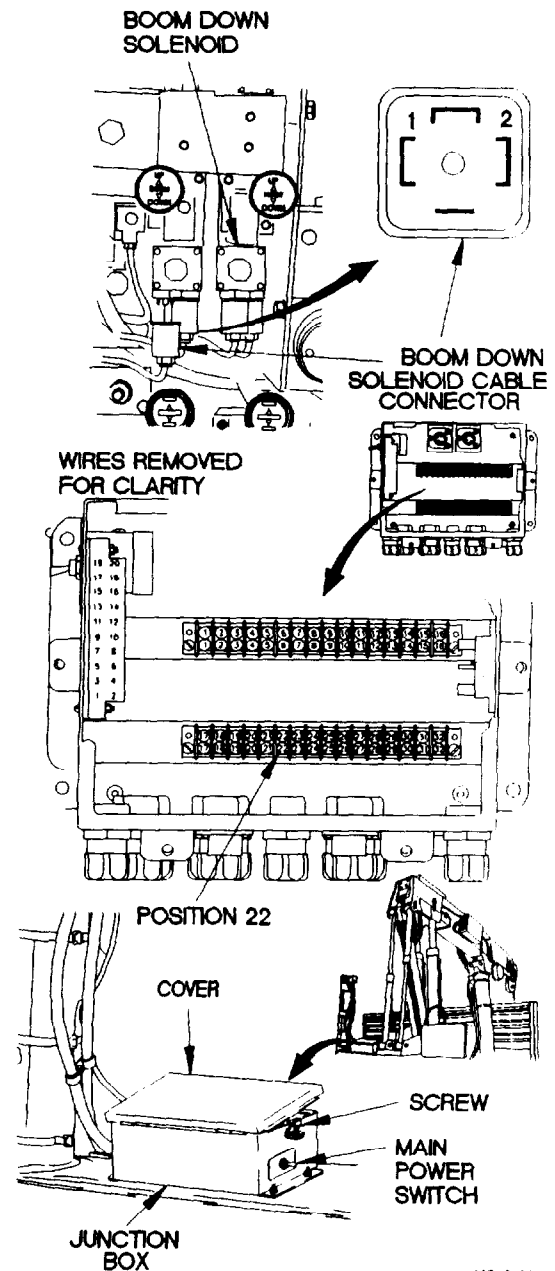
42E1391-

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



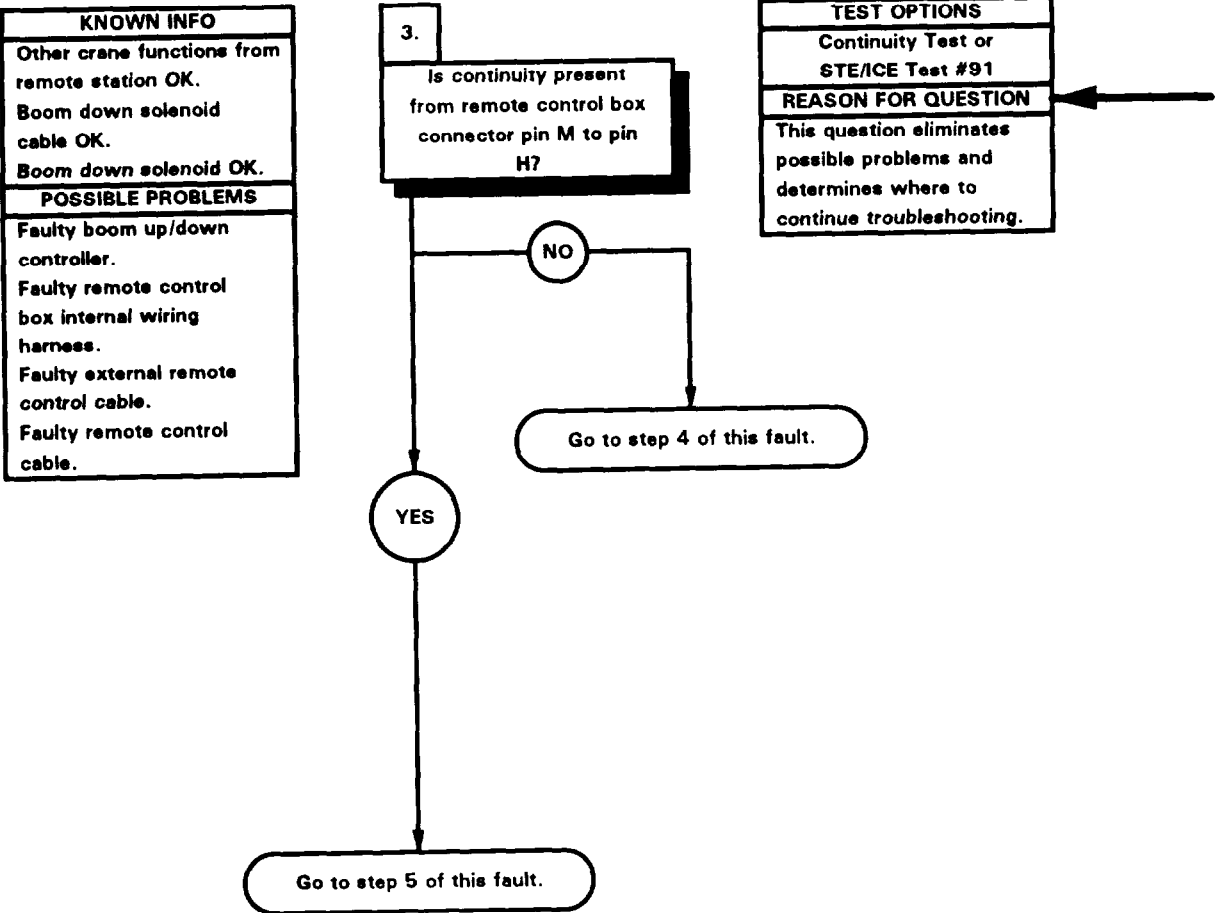
CONTINUITY TEST

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



43EJ902A

6109. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM DOWN DOES NOT OPERATE FROM REMOTE STATION (CONT)



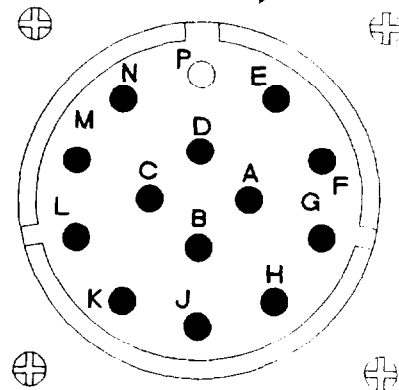
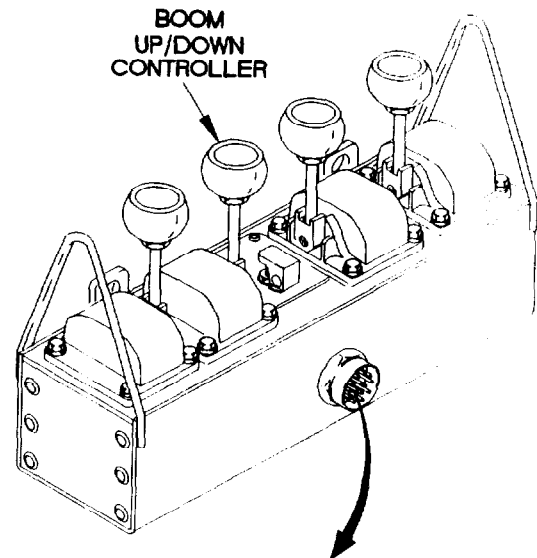
CONTINUITY TEST

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

NOTE

Step (5) requires the aid of an assistant.

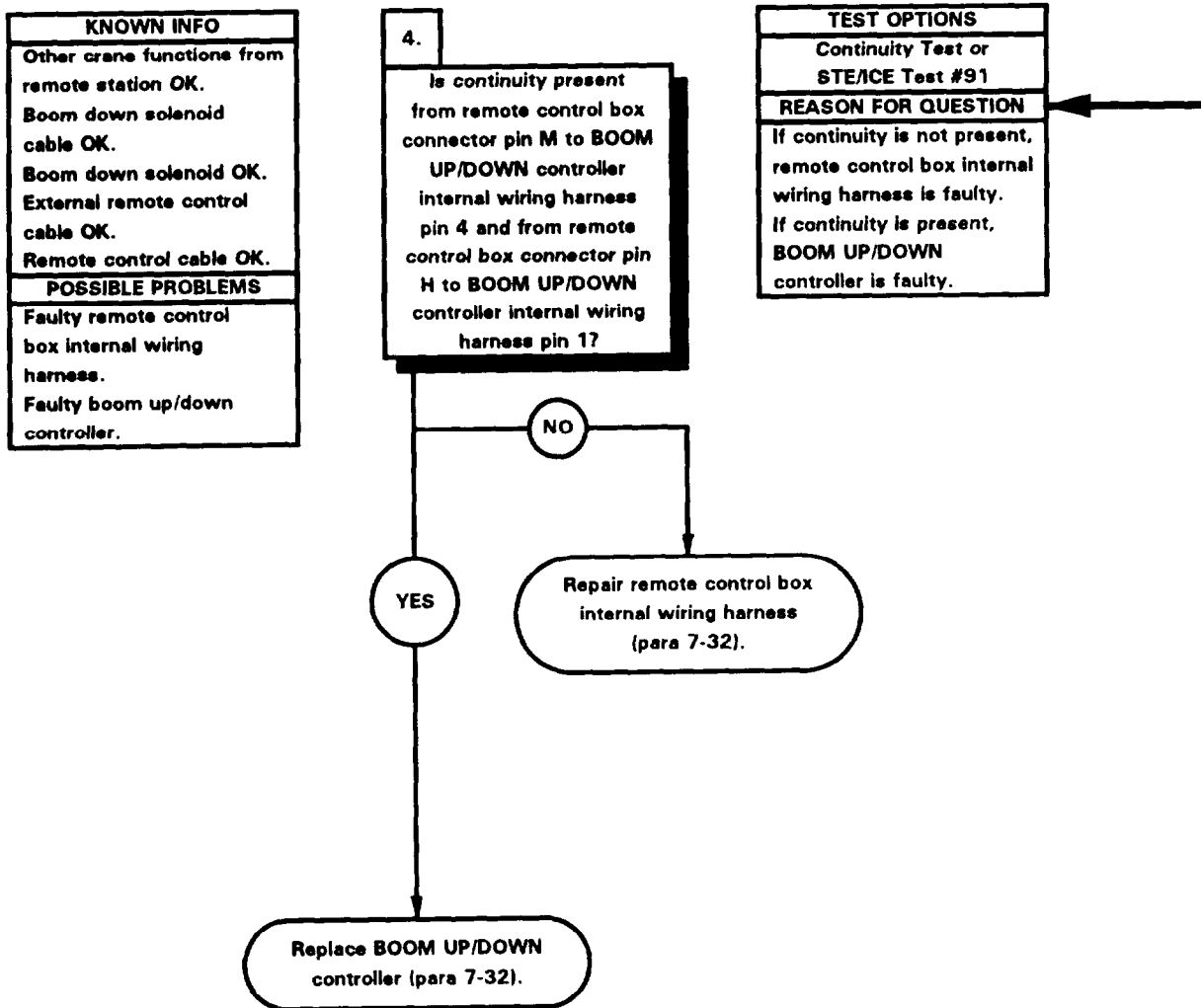
- (5) Position BOOM UP/DOWN controller to DOWN and note reading on multimeter.
- (6) If continuity is not present, go to step 4 of this fault.
- (7) If continuity is present, go to step 5 of this fault.



REMOTE CONTROL BOX CONNECTOR

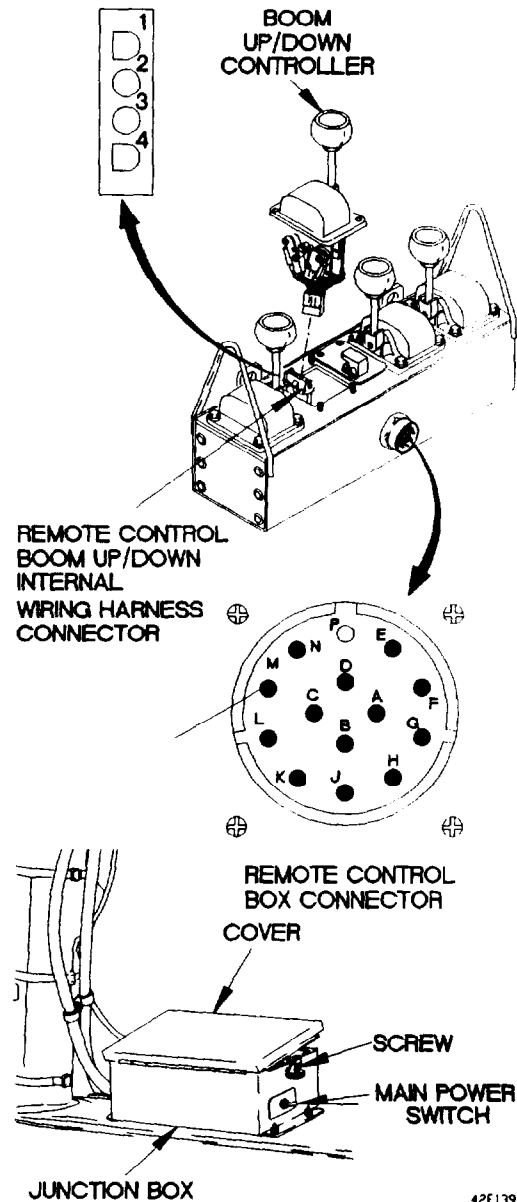
42E1393-

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



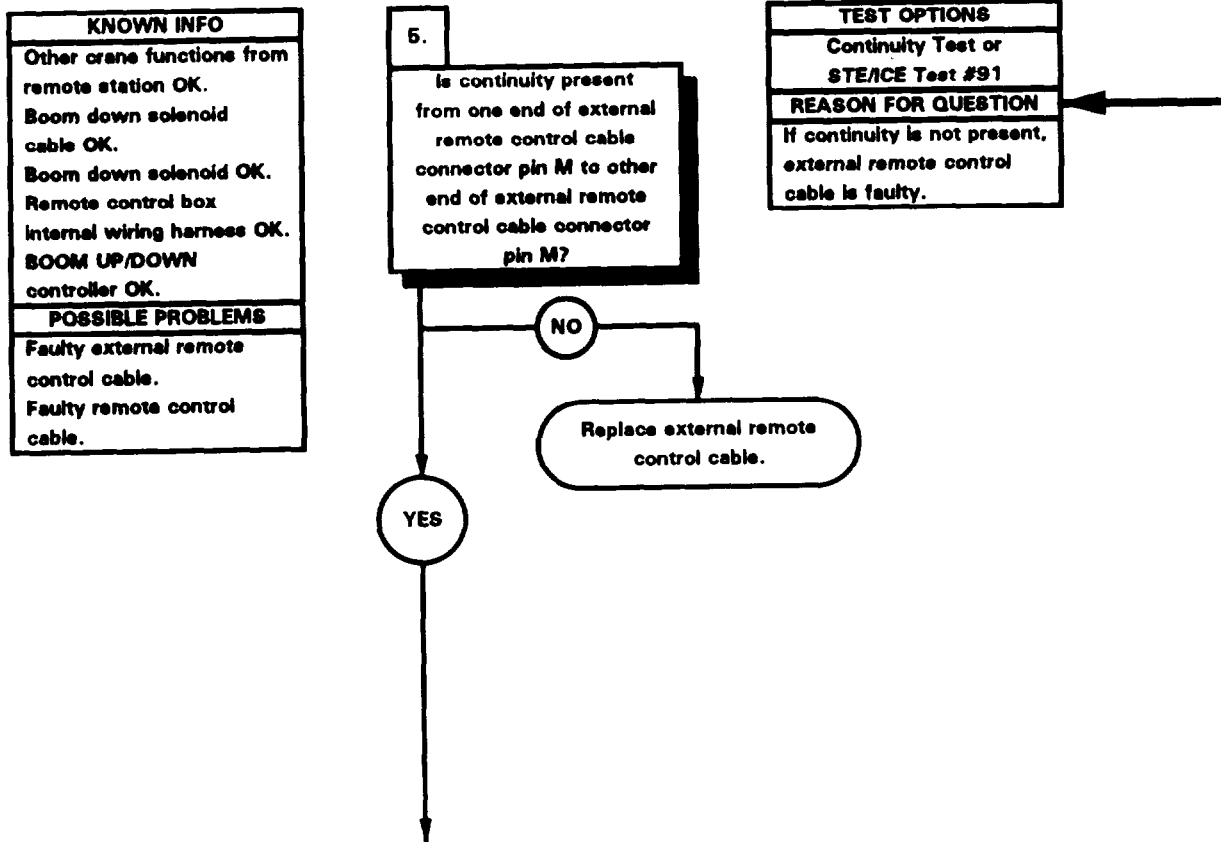
CONTINUITY TEST

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



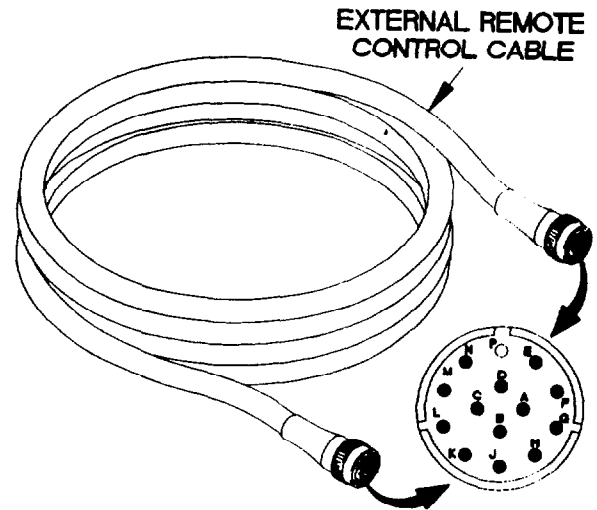
42E1394-

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



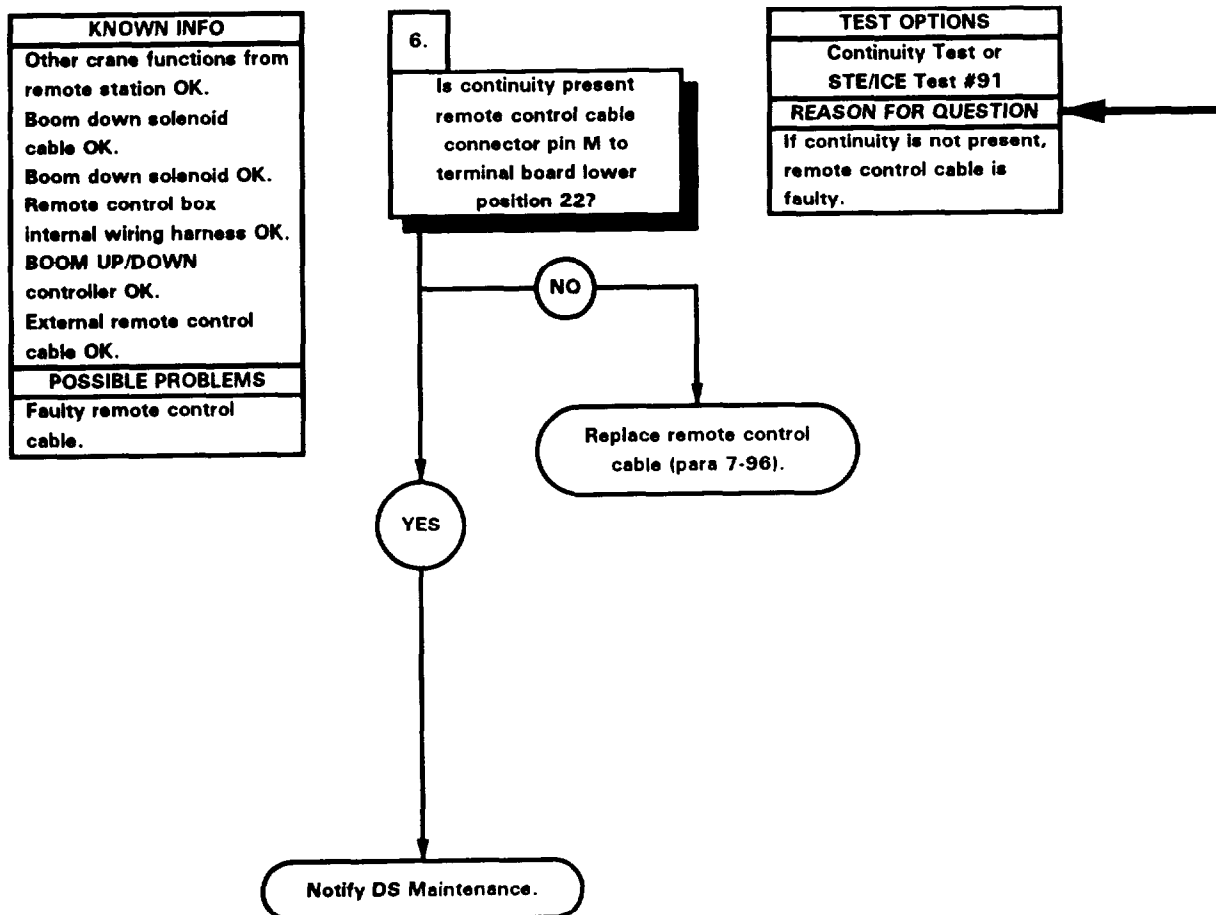
CONTINUITY TEST

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



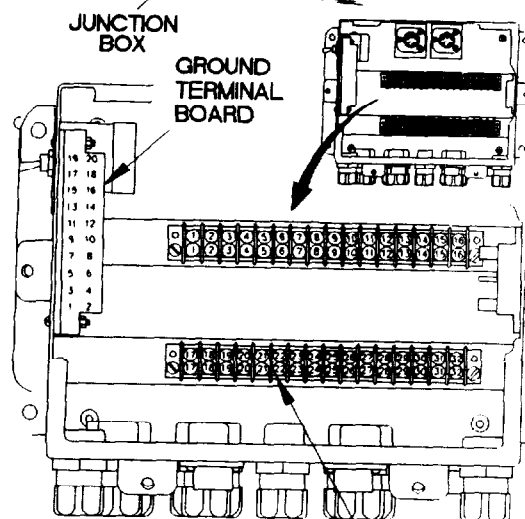
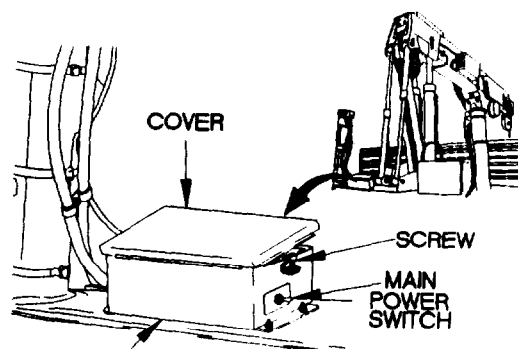
42E1395-

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



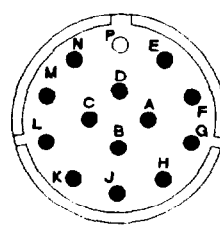
CONTINUITY TEST

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

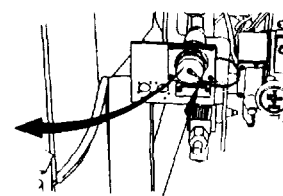


WIRES REMOVED FOR CLARITY

POSITION 22



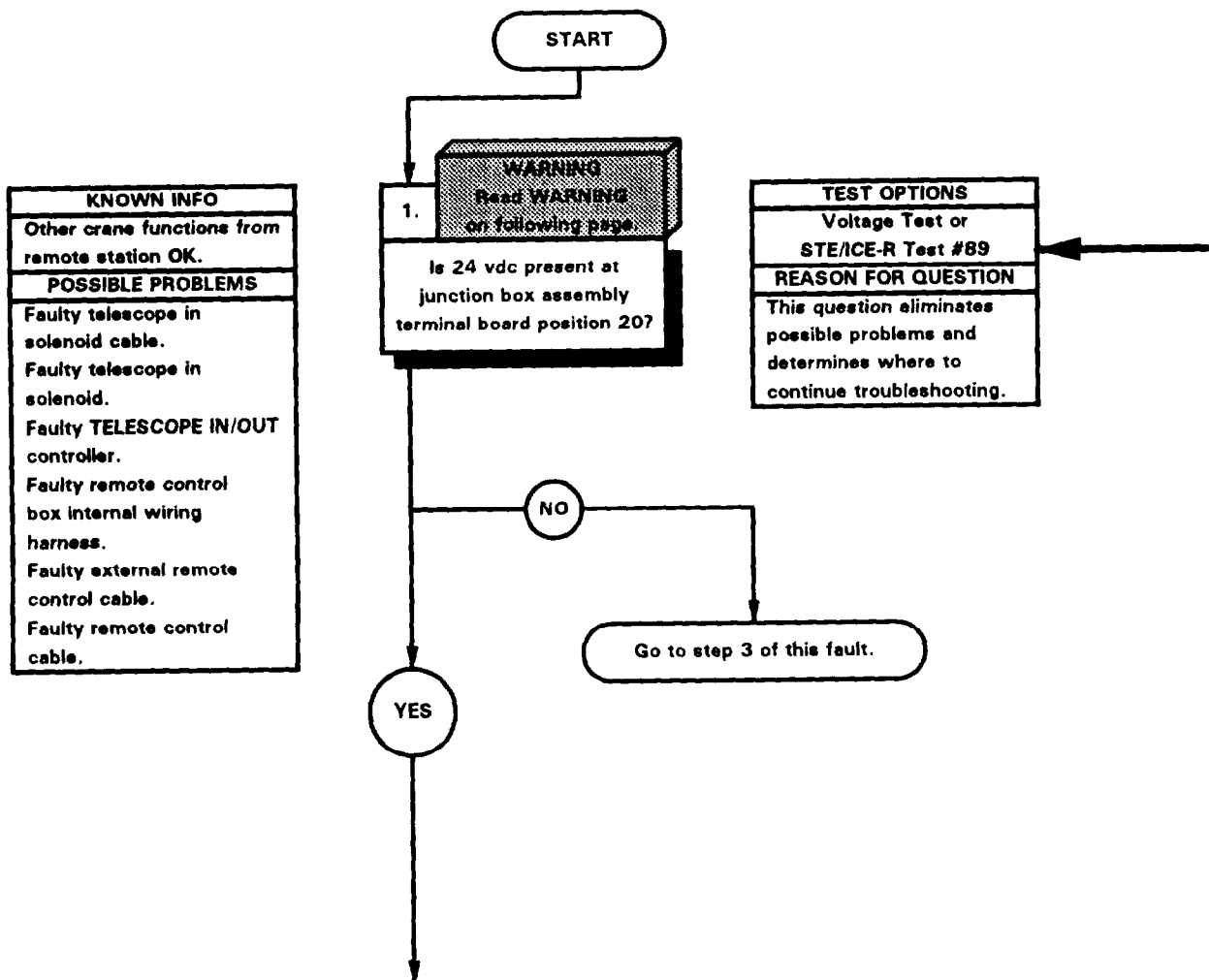
REMOTE CONTROL CABLE CONNECTOR



REMOTE CONTROL CABLE CONNECTOR

42E1394

•110. M1084/M1086 MATERIAL HANDLING CRANE (MHC) TELESCOPE IN DOES NOT OPERATE FROM REMOTE STATION	
INITIAL SETUP	
Equipment Conditions Outriggers lowered (TM 9-2320-366-10-1). Crane erected with approximately five feet of cable payed out (TM 9-2320-366-10-1). Engine shut down (TM 9-2320-366-10-1). Personnel Required (2)	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/ICE-R (Item 41, Appendix C) References TM 9-4910-671-12&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 circuit across electrical circuits and cause severe burns or electrical shock.

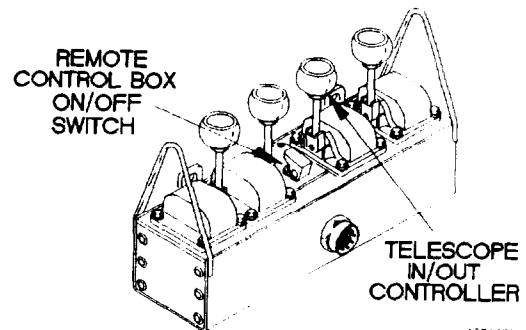
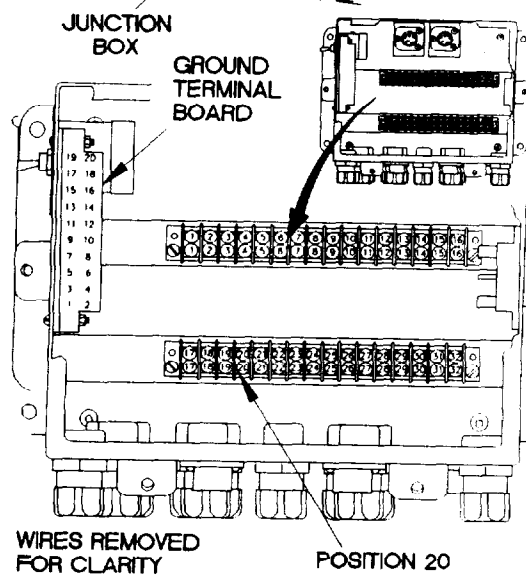
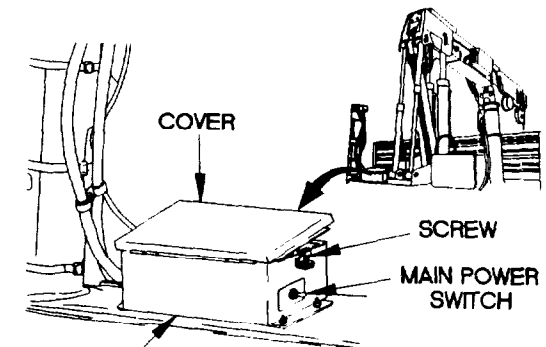
OUTPUT VOLTAGE TEST

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

NOTE

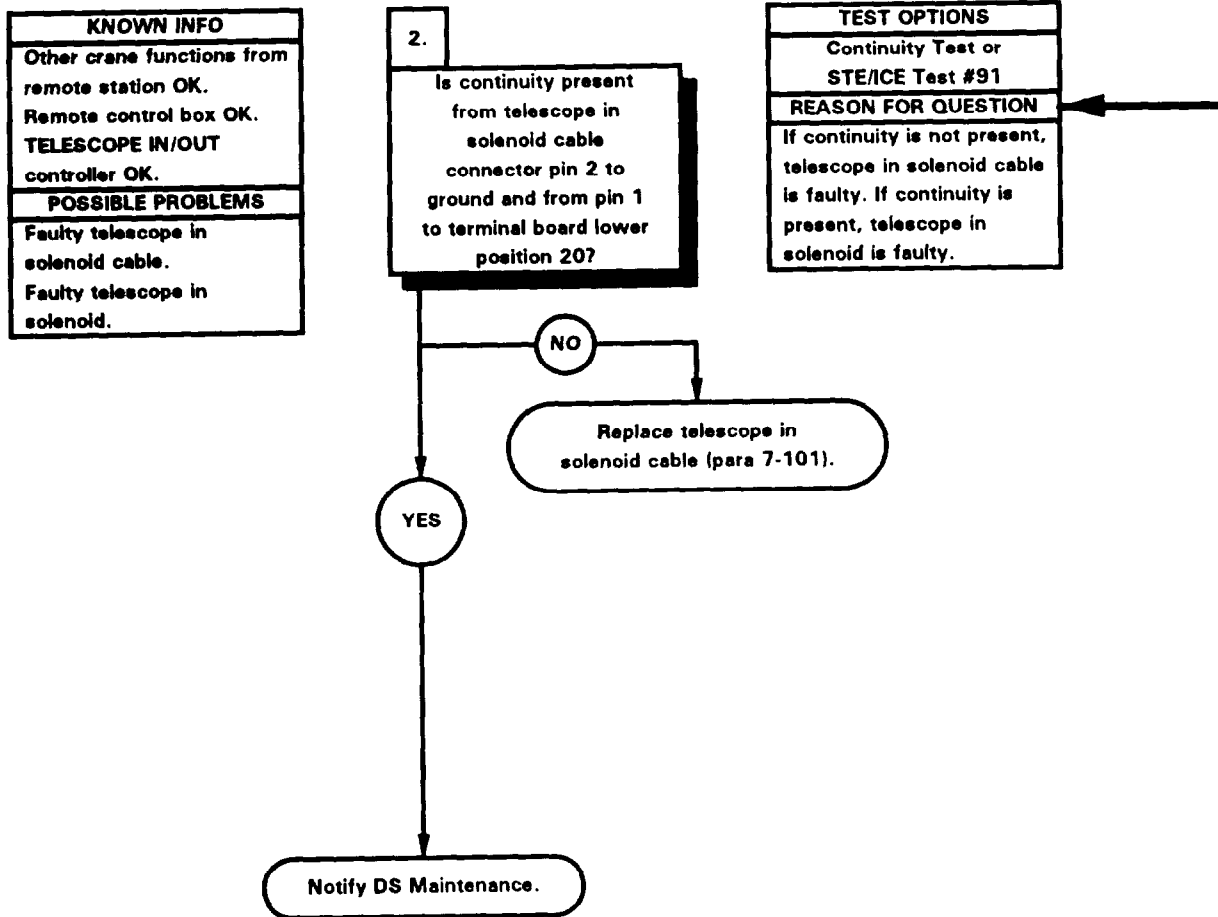
Step (9) requires the aid of an assistant.

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



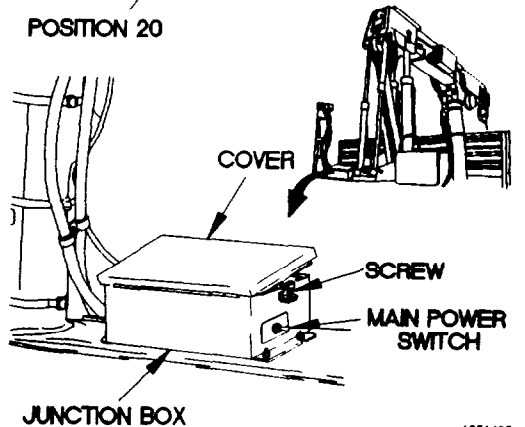
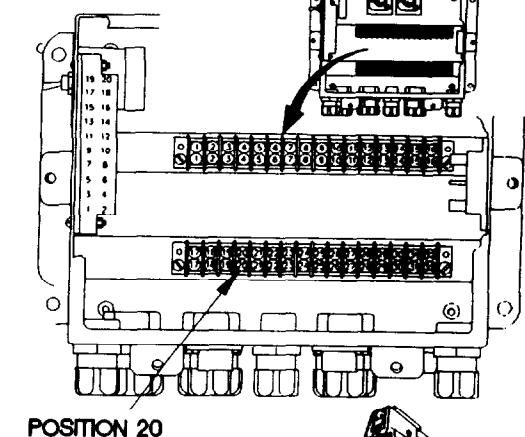
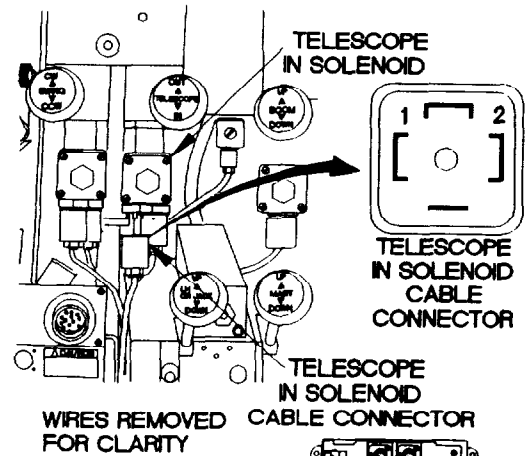
42E1401-

ø110. M1084/M1086 MATERIAL HANDLING CRANE (MHC) TELESCOPE IN DOES NOT OPERATE FROM REMOTE STATION (CONT)



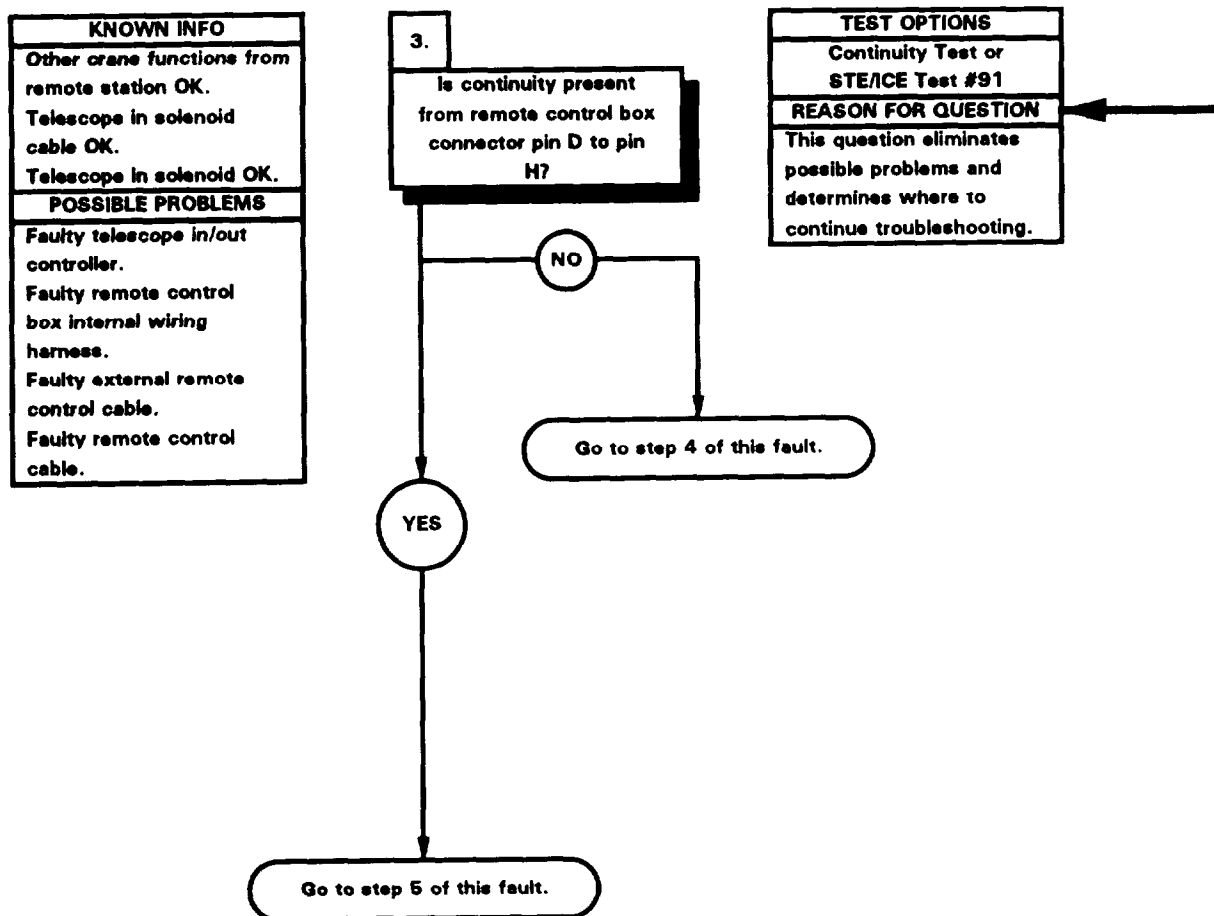
CONTINUITY TEST

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



42E1402-

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



CONTINUITY TEST

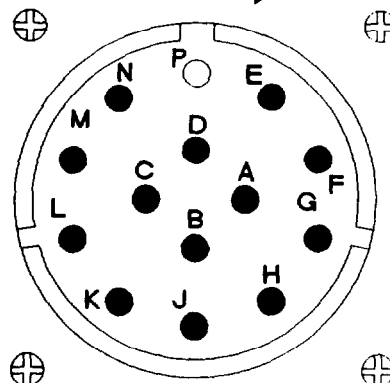
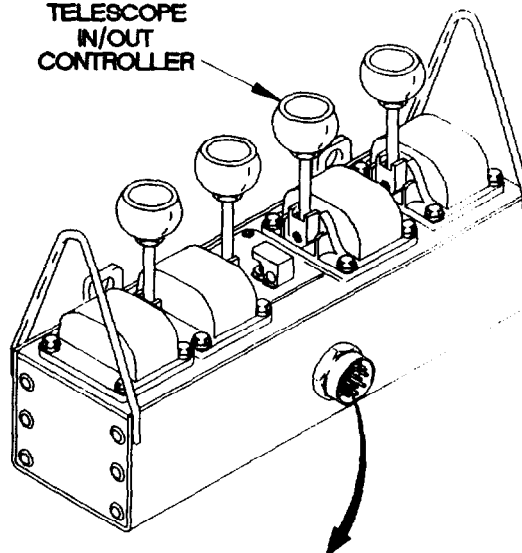
- (1) Disconnect external remote control cable from remote control box.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter on pin D of connector on remote control box.
- (4) Connect negative (-) probe of multimeter on pin H of connector on remote control box.

NOTE

Step (5) requires the aid of an assistant.

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

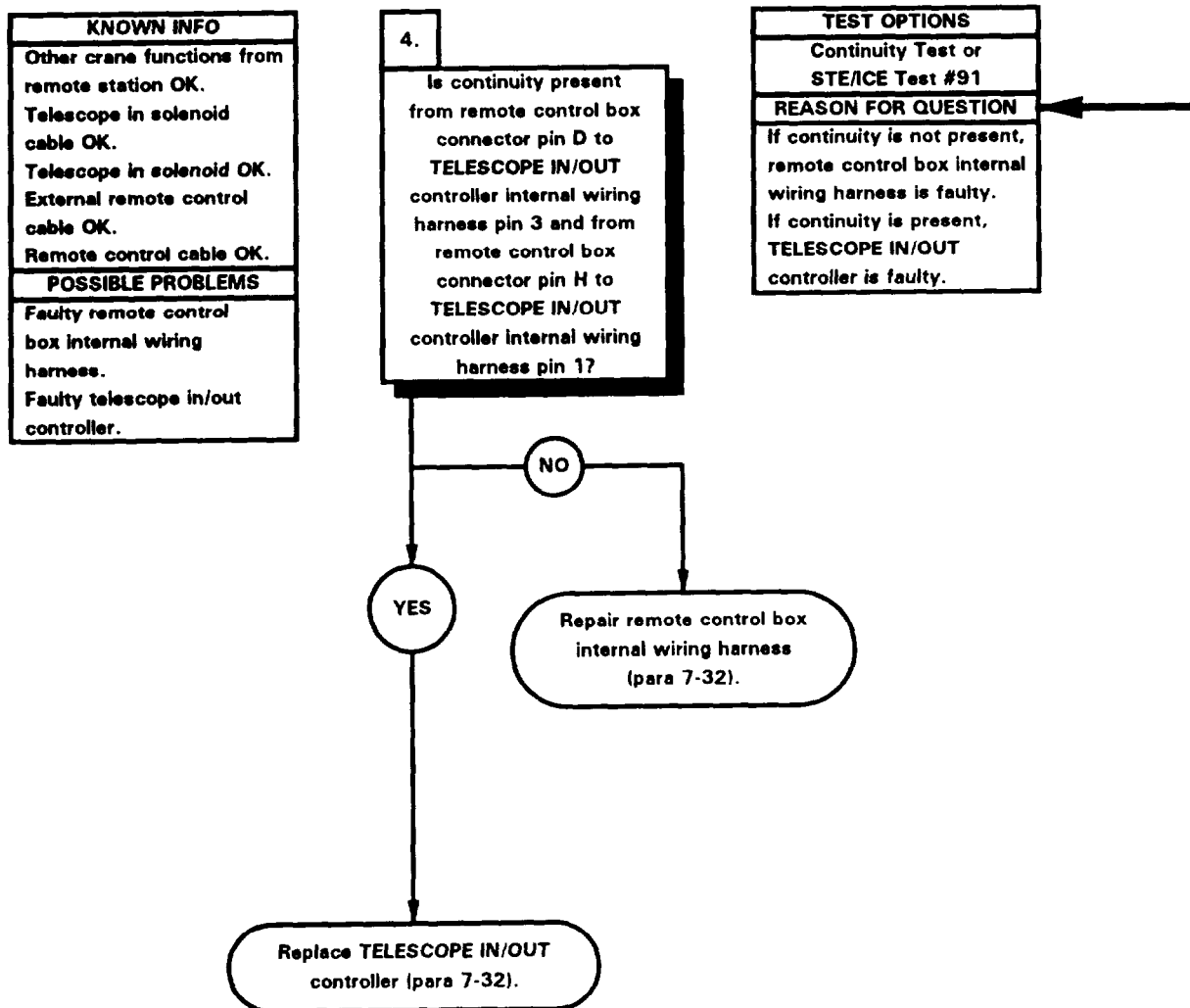
TELESCOPE
IN/OUT
CONTROLLER



REMOTE CONTROL
BOX CONNECTOR

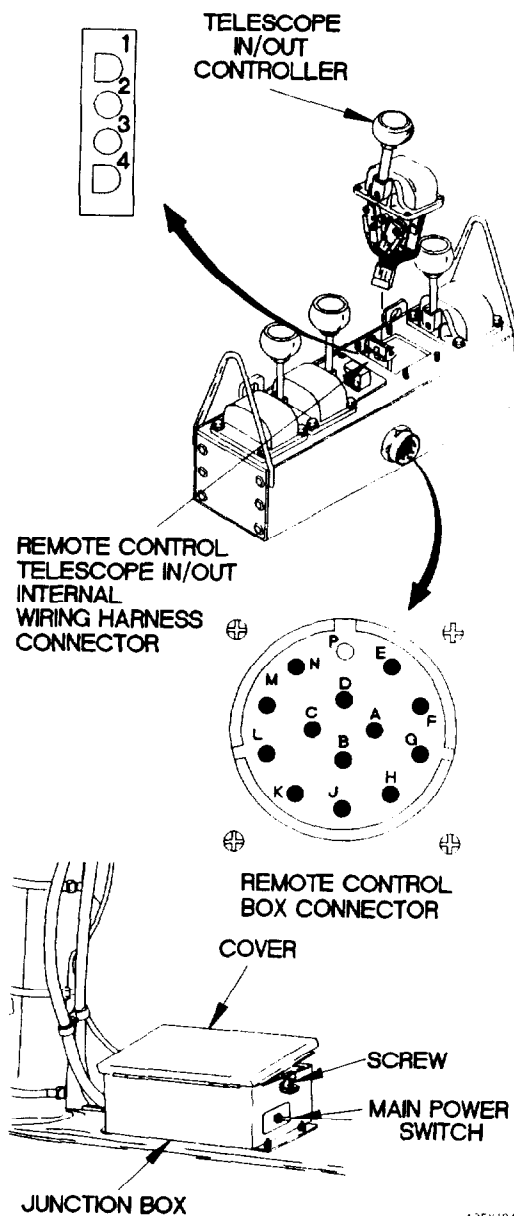
42E1403-

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



CONTINUITY TEST

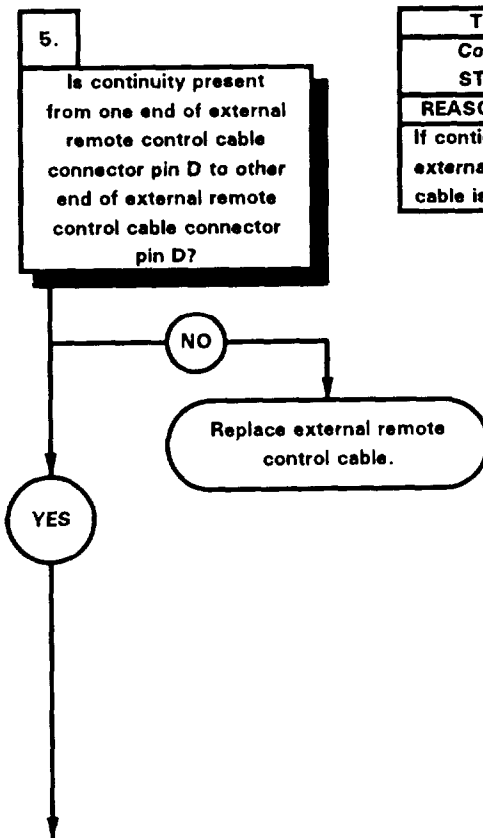
- (1) Remove TELESCOPE IN/OUT controller (para 7-32).
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter on pin D of remote control box connector.
- (4) Connect negative (-) probe of multimeter on pin 3 of TELESCOPE IN/OUT controller internal wiring harness and note reading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



42EV 104A

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

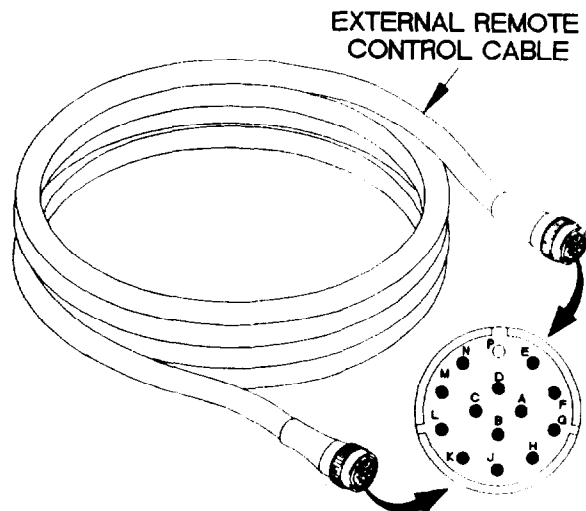
KNOWN INFO
Other crane functions from remote station OK. Telescope in solenoid cable OK. Telescope in solenoid OK. Remote control box internal wiring harness OK. TELESCOPE IN/OUT controller OK.
POSSIBLE PROBLEMS
Faulty external remote control cable. Faulty remote control cable.



TEST OPTIONS
Continuity Test or STE/ICE Test #91
REASON FOR QUESTION
If continuity is not present, external remote control cable is faulty.

CONTINUITY TEST

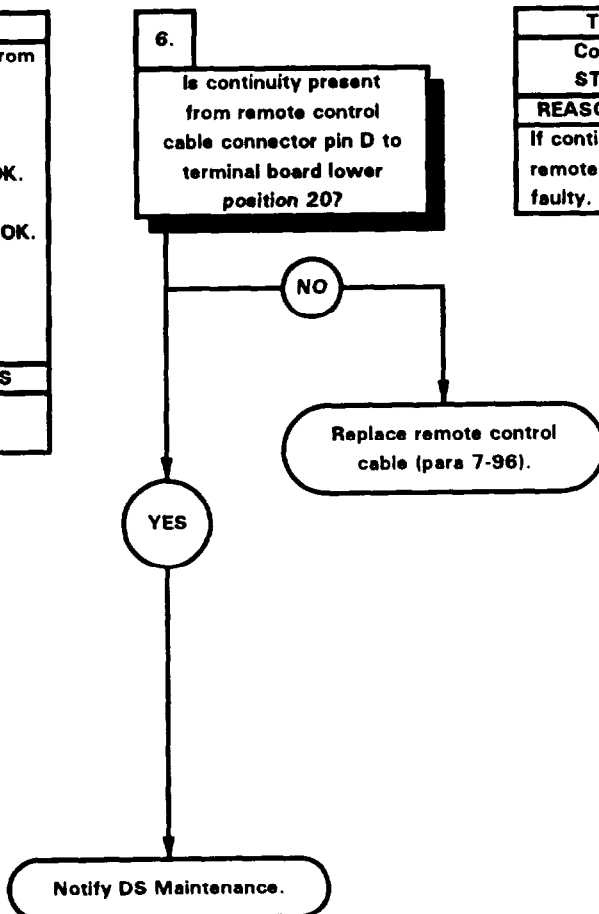
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter on pin D of one end of external remote control cable connector.
- (3) Connect negative (-) probe of multimeter on pin D of other end of external remote control cable and note reading on multimeter.
- (4) If continuity is not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



42E1405-

ø110. M1084/M1086 MATERIAL HANDLING CRANE (MHC) TELESCOPE IN DOES NOT OPERATE FROM REMOTE STATION (CONT)

KNOWN INFO
Other crane functions from remote station OK.
Telescope in solenoid cable OK.
Telescope in solenoid OK.
Remote control box internal wiring harness OK.
TELESCOPE IN/OUT controller OK.
External remote control cable OK.
POSSIBLE PROBLEMS
Faulty remote control cable.

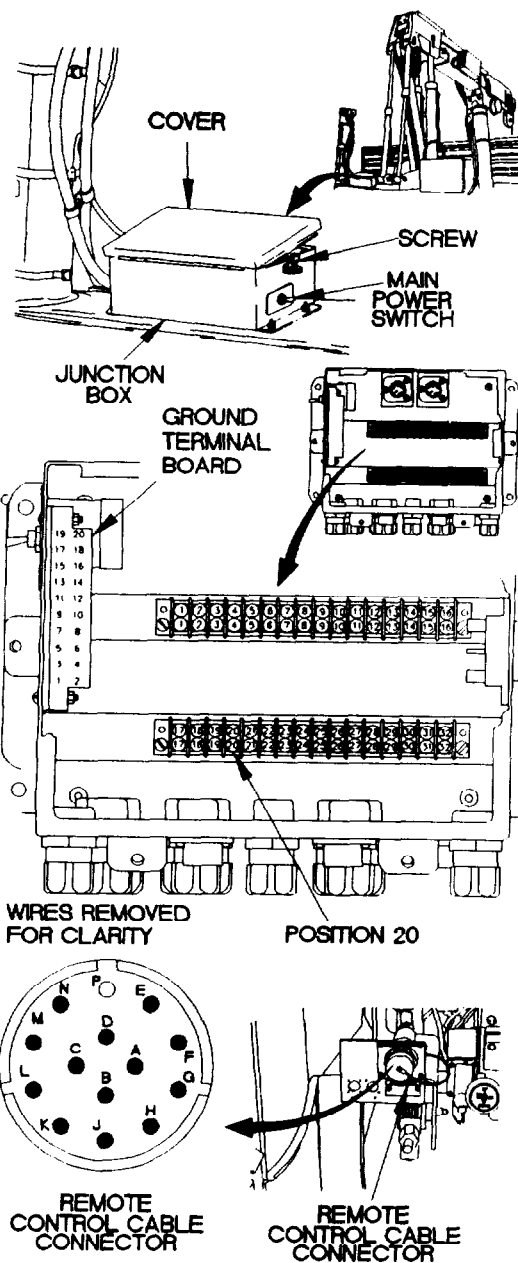


TEST OPTIONS
Continuity Test or STE/CE Test #91
REASON FOR QUESTION
If continuity is not present, remote control cable is faulty.

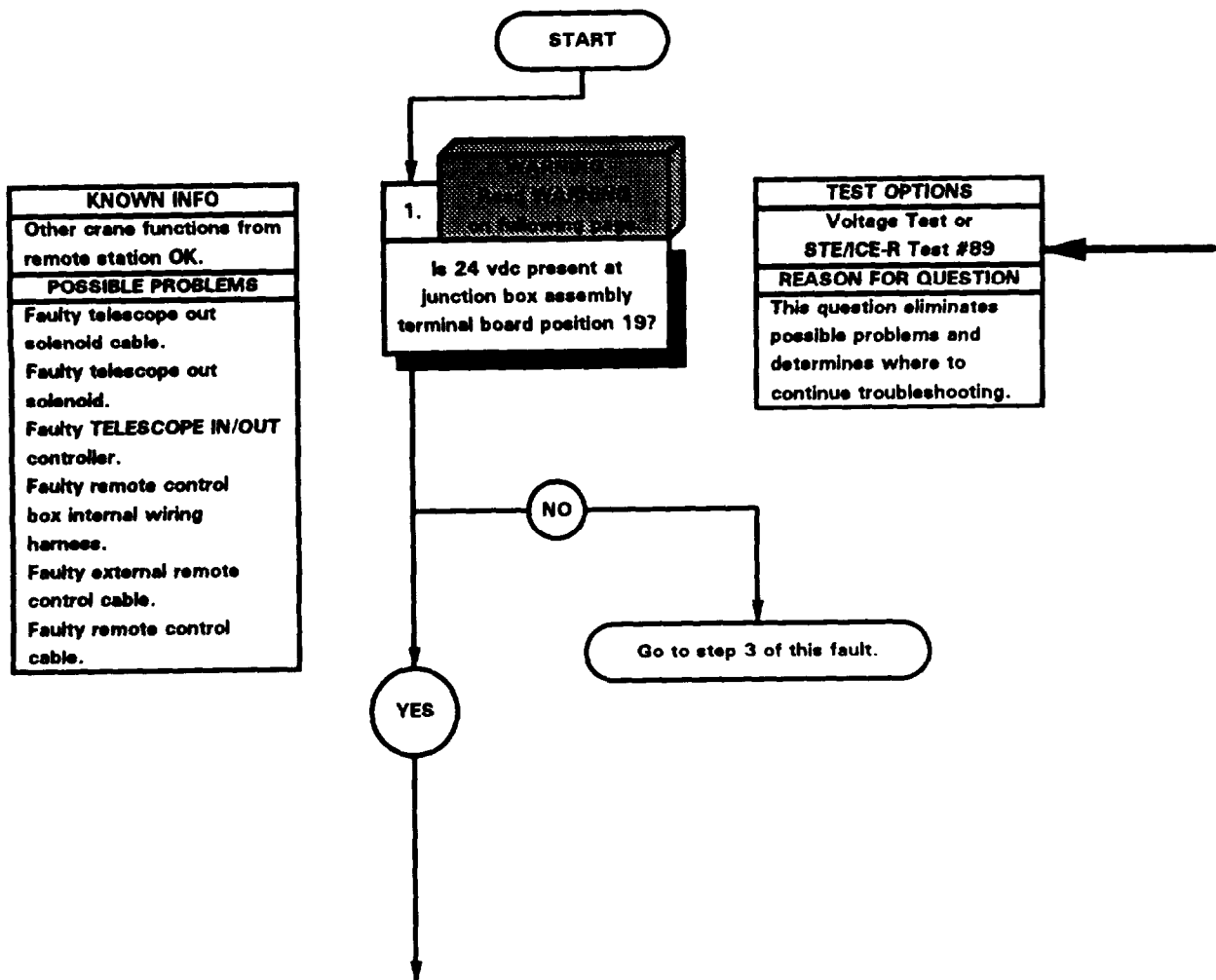


CONTINUITY TEST

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



111. M1084/M1086 MATERIAL HANDLING CRANE (MHC) TELESCOPE OUT DOES NOT OPERATE FROM REMOTE STATION	
INITIAL SETUP	
Equipment Conditions Outriggers lowered (TM 9-2320-366-10-1). Crane erected with approximately five feet of cable payed out (TM 9-2320-366-10-1). Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/ICE-R (Item 41, Appendix C)
Personnel Required (2)	References TM 9-4910-571-12&P



WARNING

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

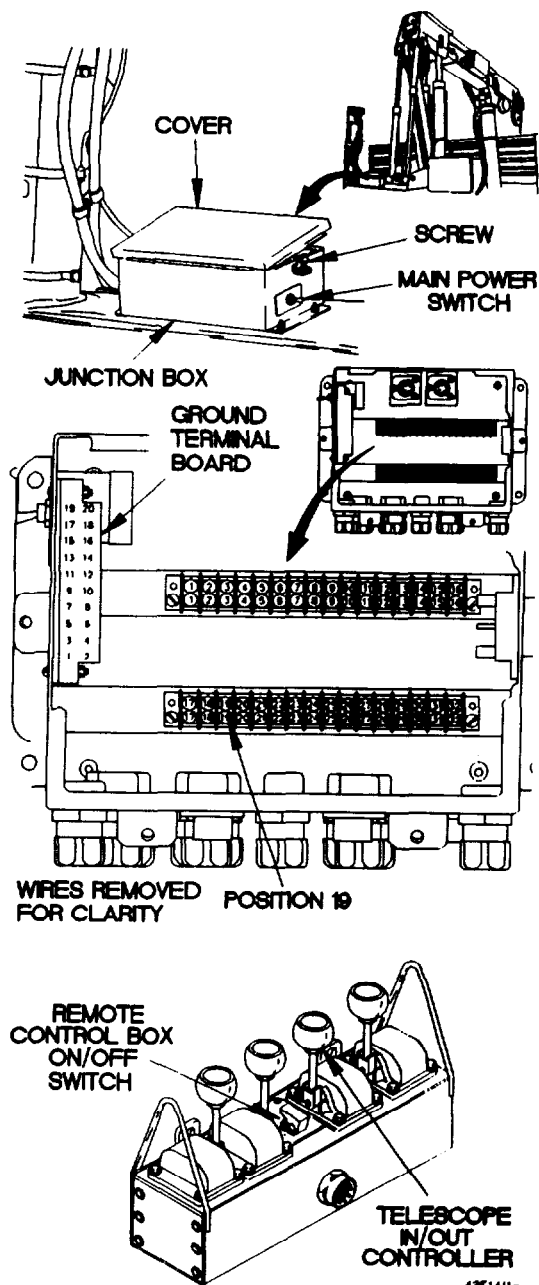
OUTPUT VOLTAGE TEST

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

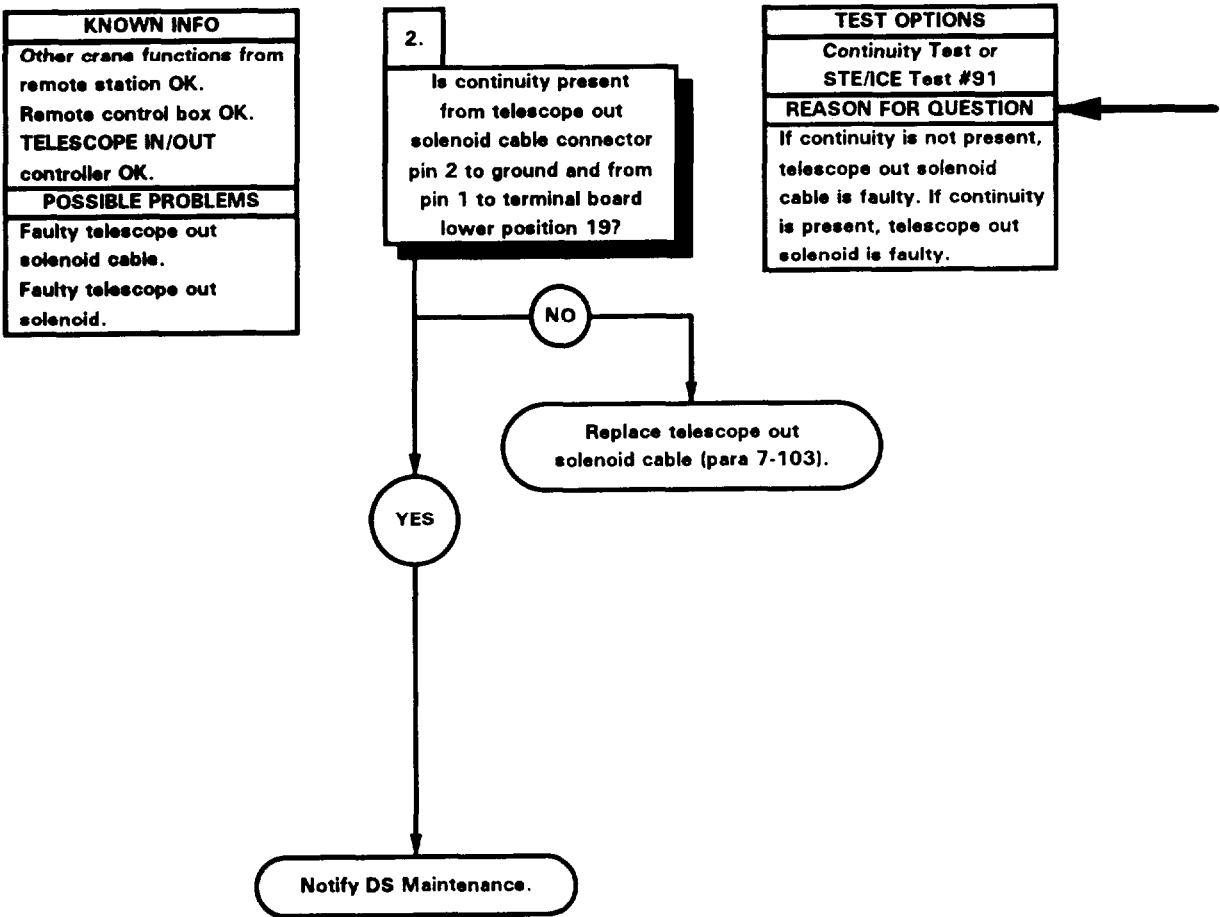
NOTE

Step (9) requires the aid of an assistant.

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

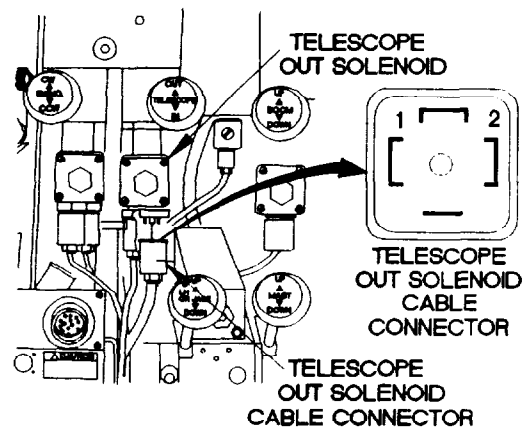


e111. M1084/M1086 MATERIAL HANDLING CRANE (MHC) TELESCOPE OUT DOES NOT OPERATE FROM REMOTE STATION (CONT)

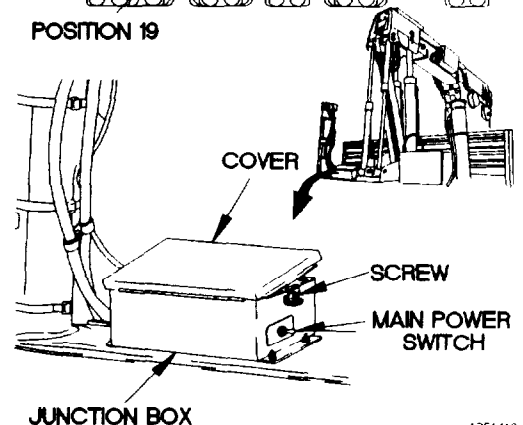
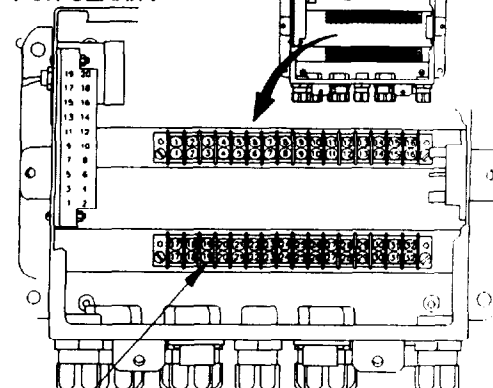


CONTINUITY TEST

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

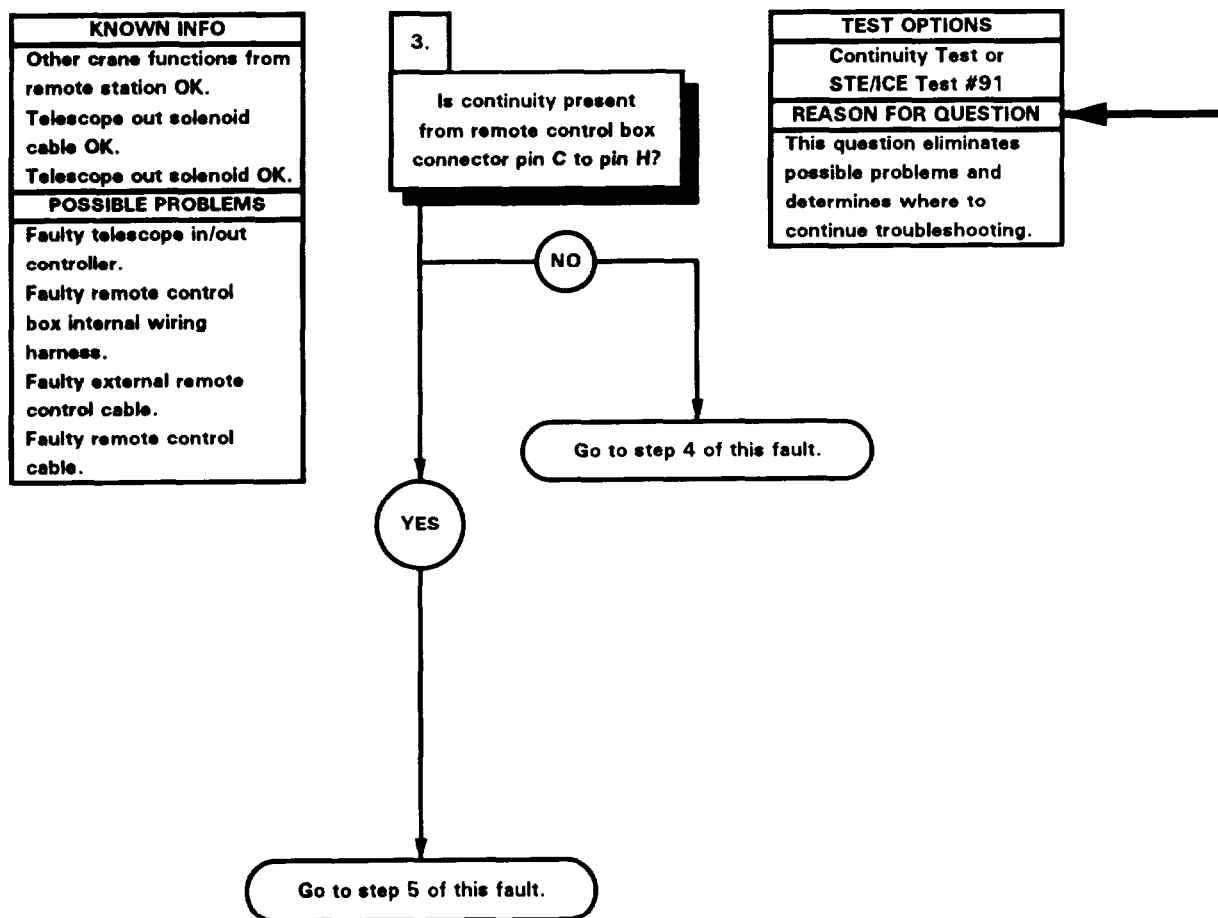


WIRES REMOVED FOR CLARITY



42E1412-

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



CONTINUITY TEST

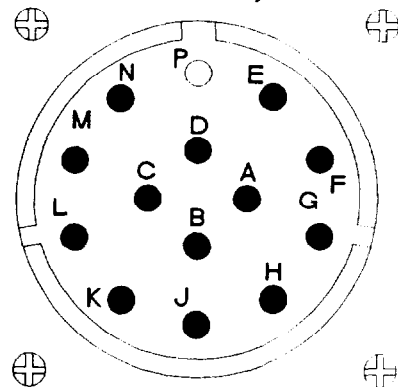
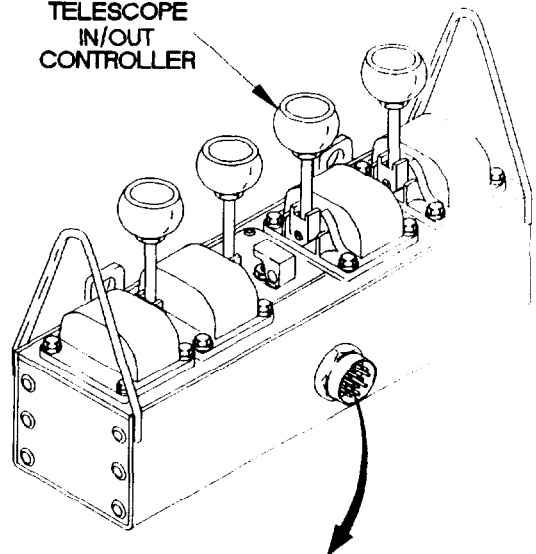
- (1) Disconnect external remote control cable from remote control box.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter on pin C of connector on remote control box.
- (4) Connect negative (-) probe of multimeter on pin H of connector on remote control box.

NOTE

Step (5) requires the aid of an assistant.

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

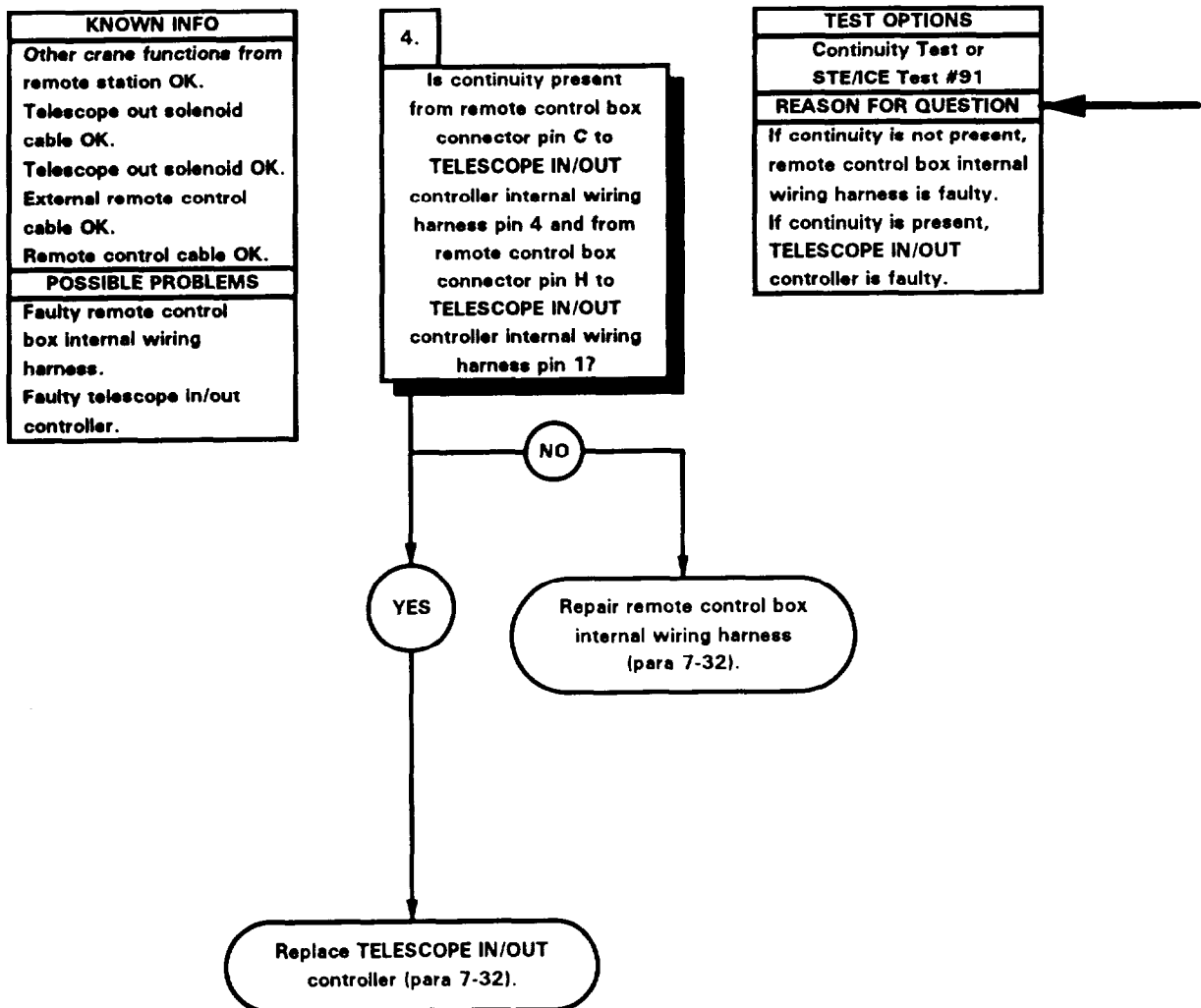
TELESCOPE
IN/OUT
CONTROLLER



REMOTE CONTROL
BOX CONNECTOR

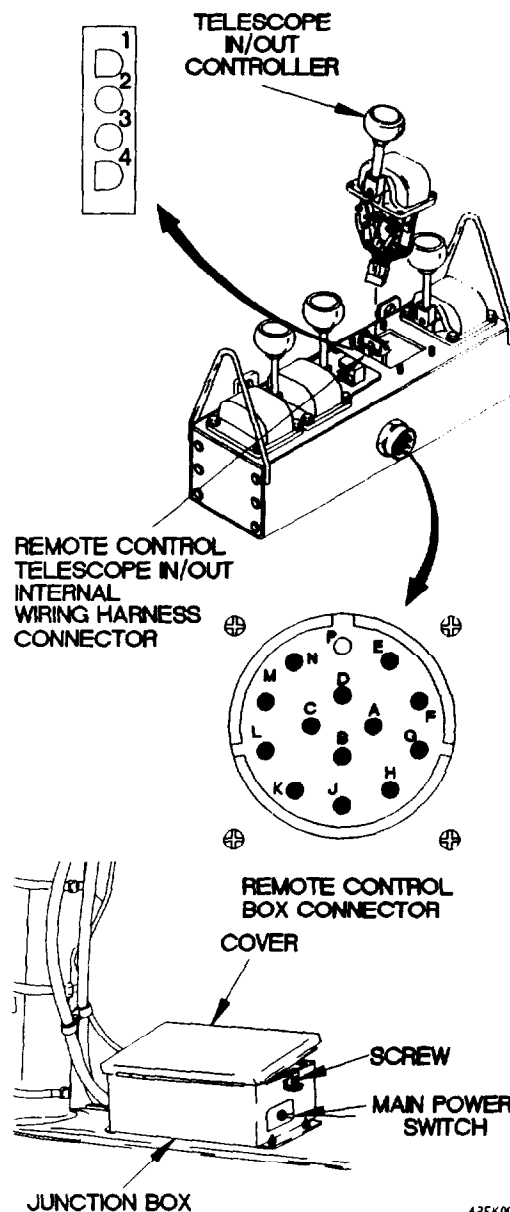
40E1413-

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



CONTINUITY TEST

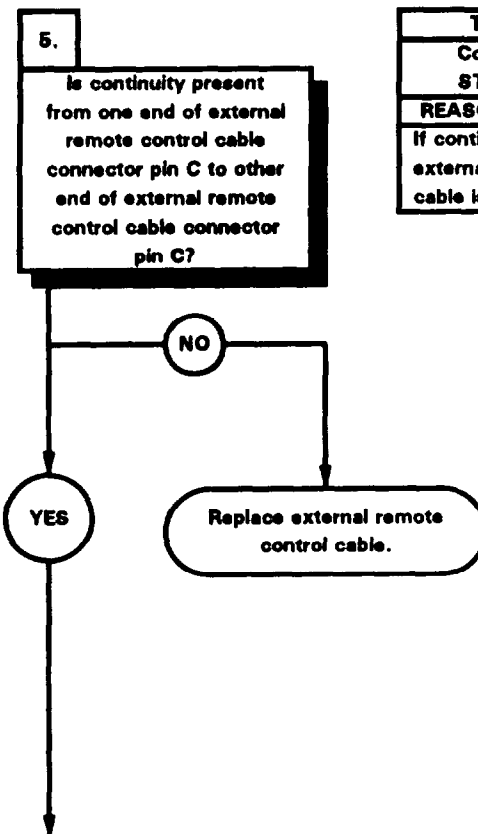
- (1) Remove TELESCOPE IN/OUT controller (para 7-32).
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter on pin C of remote control box connector.
- (4) Connect negative (-) probe of multimeter on pin 4 of TELESCOPE IN/OUT controller internal wiring harness and note reading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



42EK004A

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

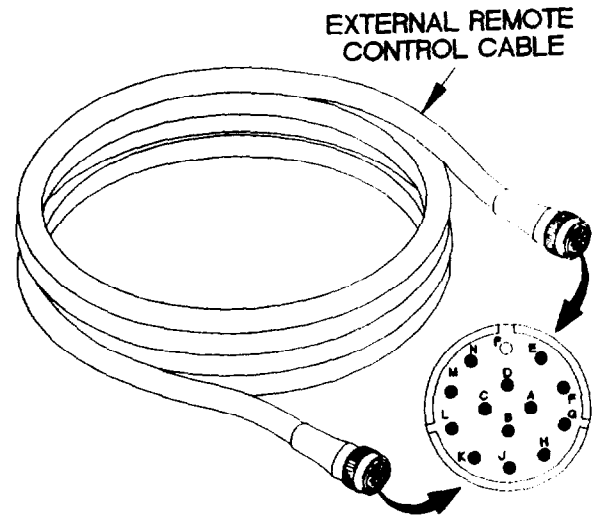
KNOWN INFO
Other crane functions from remote station OK.
Telescope out solenoid cable OK.
Telescope out solenoid OK.
Remote control box internal wiring harness OK.
TELESCOPE IN/OUT controller OK.
POSSIBLE PROBLEMS
Faulty external remote control cable.
Faulty remote control cable.



TEST OPTIONS
Continuity Test or STE/ICE Test #91
REASON FOR QUESTION
If continuity is not present, external remote control cable is faulty.

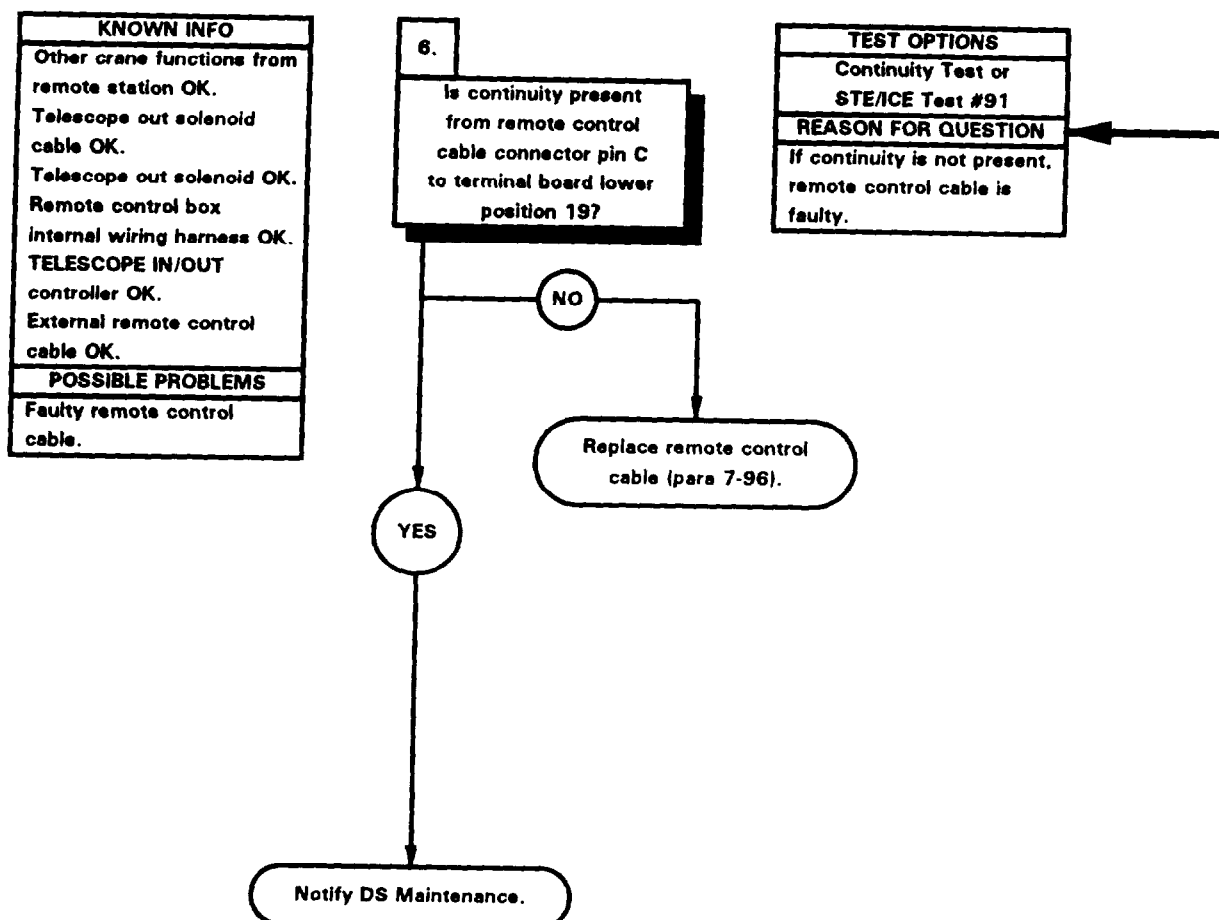
CONTINUITY TEST

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



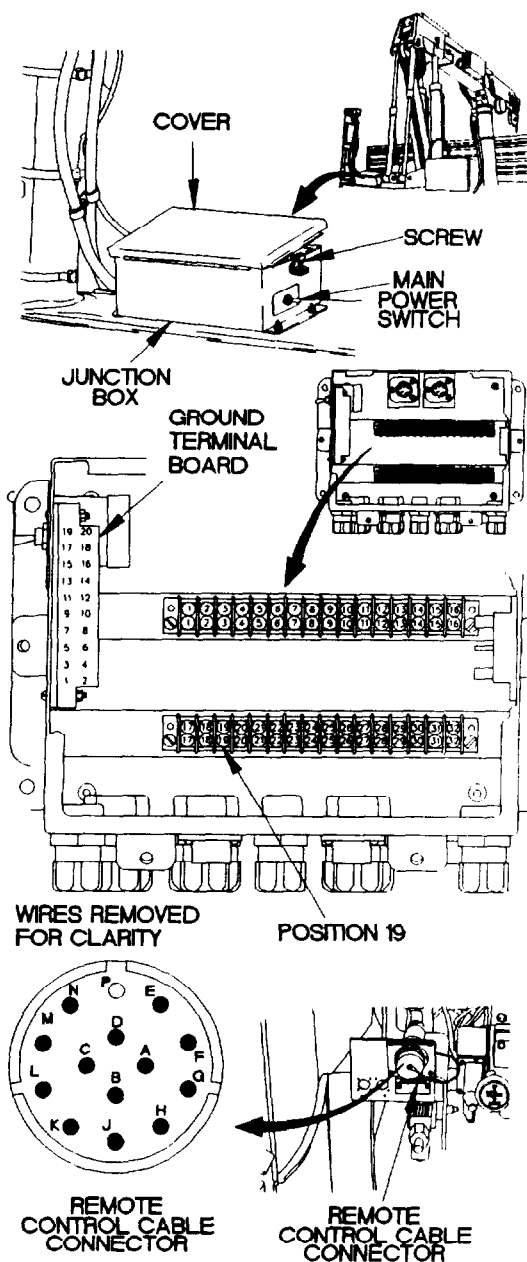
42E1415-

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



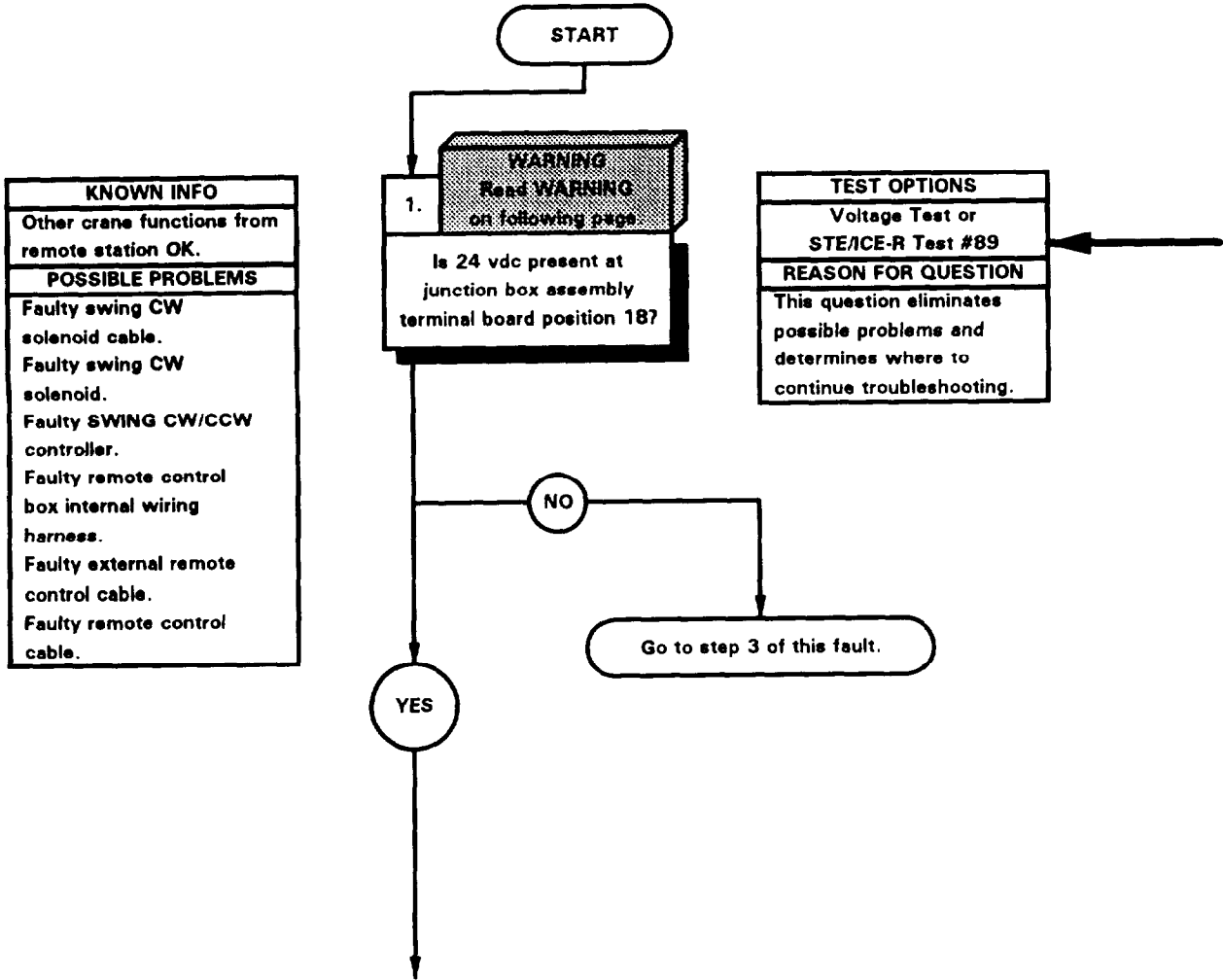
CONTINUITY TEST

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



42E1416-

•112. M1084/M1086 MATERIAL HANDLING CRANE (MHC) SWING CW DOES NOT OPERATE FROM REMOTE STATION	
INITIAL SETUP	
Equipment Conditions Outriggers lowered (TM 9-2320-366-10-1). Crane erected with approximately five feet of cable payed out (TM 9-2320-366-10-1). Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/ICE-R (Item 41, Appendix C)
Personnel Required (2)	References TM 9-4910-571-12&P



WARNING

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

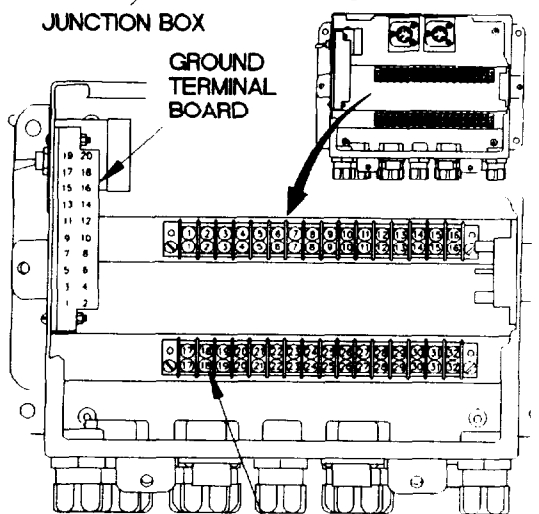
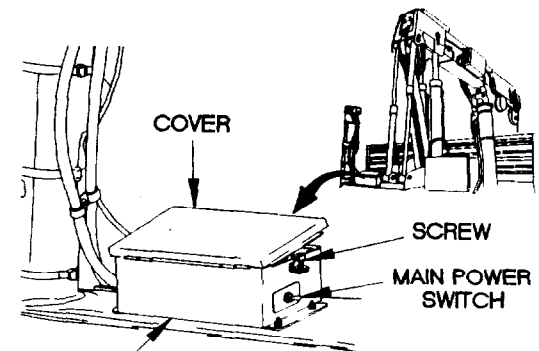
OUTPUT VOLTAGE TEST

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

NOTE

Step (9) requires the aid of an assistant.

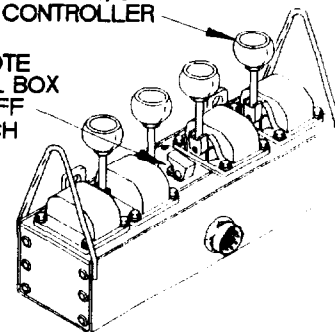
- (9) Position SWING CW/CCW to CW and note reading on multimeter.
- (10) If 24 volts dc is not present, go to step 3 of this fault.



WIRES REMOVED FOR CLARITY

SWING CW/CCW CONTROLLER

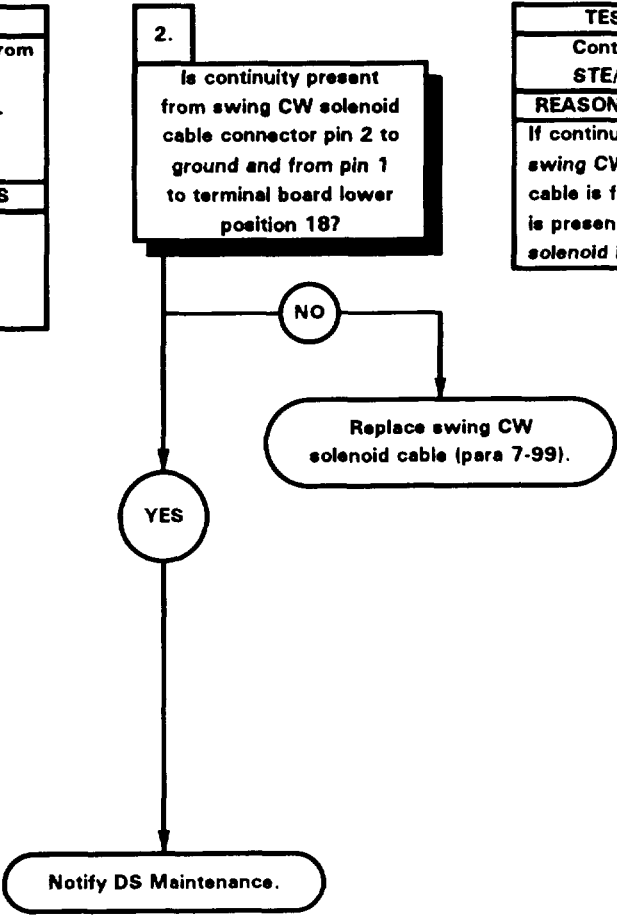
REMOTE CONTROL BOX ON/OFF SWITCH



42E1421-

ø112. M1084/M1086 MATERIAL HANDLING CRANE (MHC) SWING CW DOES NOT OPERATE FROM REMOTE STATION (CONT)

KNOWN INFO
Other crane functions from remote station OK. Remote control box OK. SWING CW/CCW controller OK.
POSSIBLE PROBLEMS
Faulty swing CW solenoid cable. Faulty swing CW solenoid.

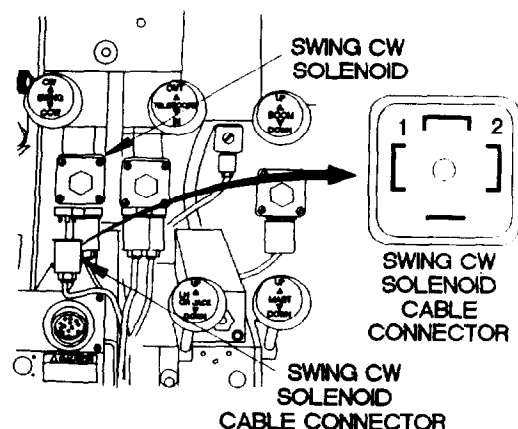


TEST OPTIONS
Continuity Test or STE/ICE Test #91
REASON FOR QUESTION
If continuity is not present, swing CW solenoid cable is faulty. If continuity is present, swing CW solenoid is faulty.

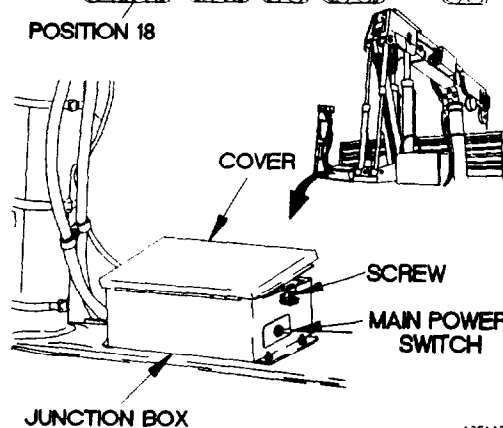
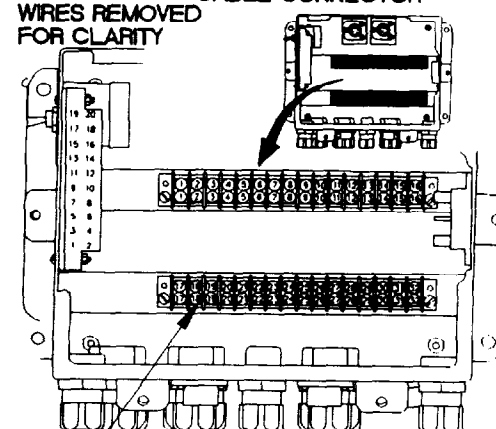


CONTINUITY TEST

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

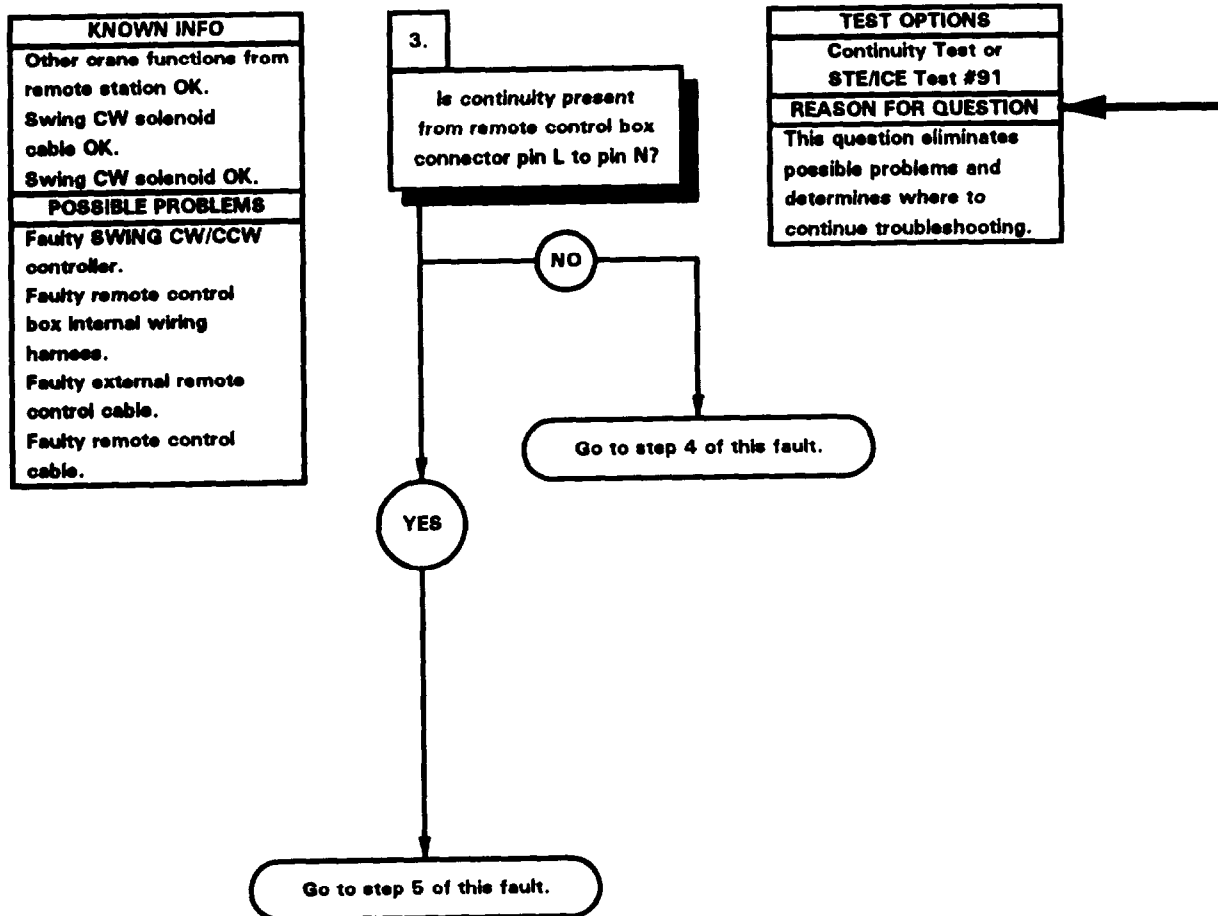


WIRES REMOVED FOR CLARITY



42E1422-

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



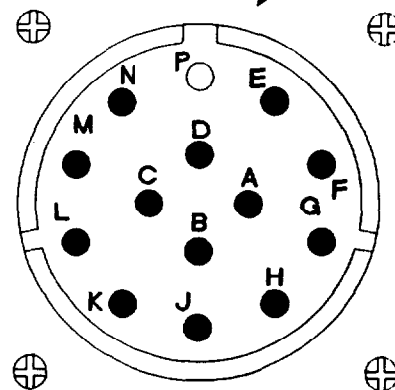
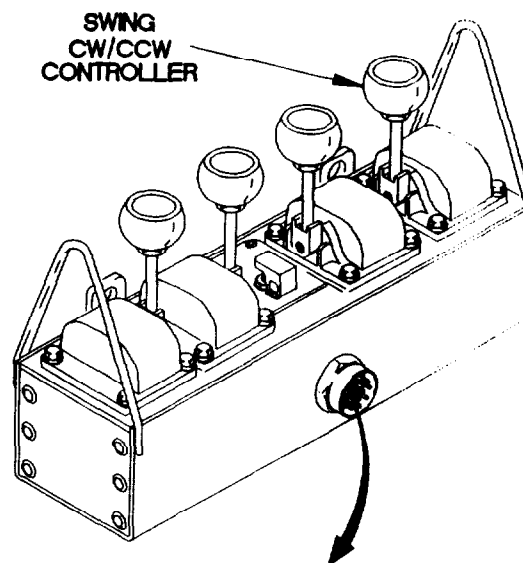
CONTINUITY TEST

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

NOTE

Step (5) requires the aid of an assistant.

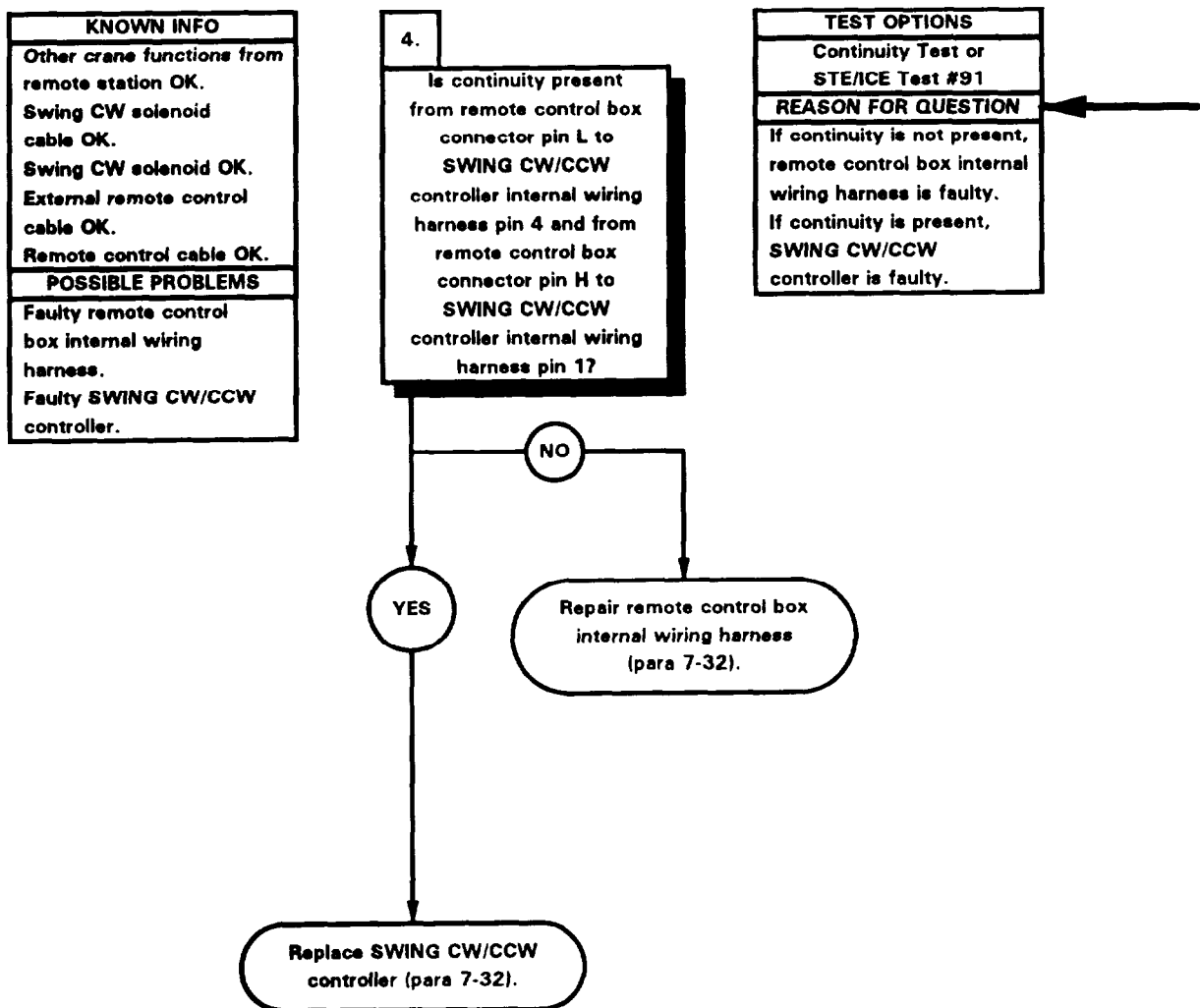
- (5) Position SWING CW/CCW controller to CW and note reading on multimeter.
- (6) If continuity is not present, go to step 4 of this fault.
- (7) If continuity is present, go to step 5 of this fault.



**REMOTE CONTROL
BOX CONNECTOR**

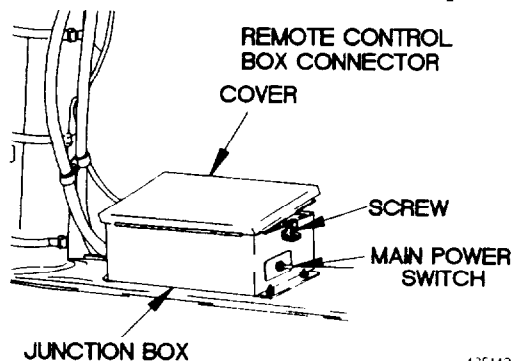
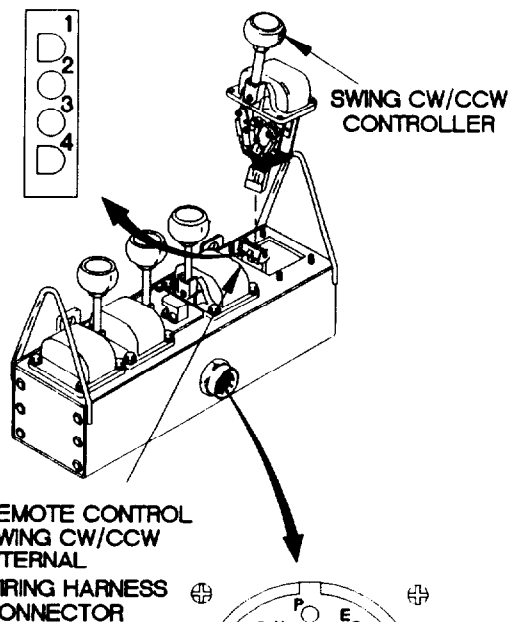
42E1423-

ø112. M1084/M1086 MATERIAL HANDLING CRANE (MHC) SWING CW DOES NOT OPERATE FROM REMOTE STATION (CONT)



CONTINUITY TEST

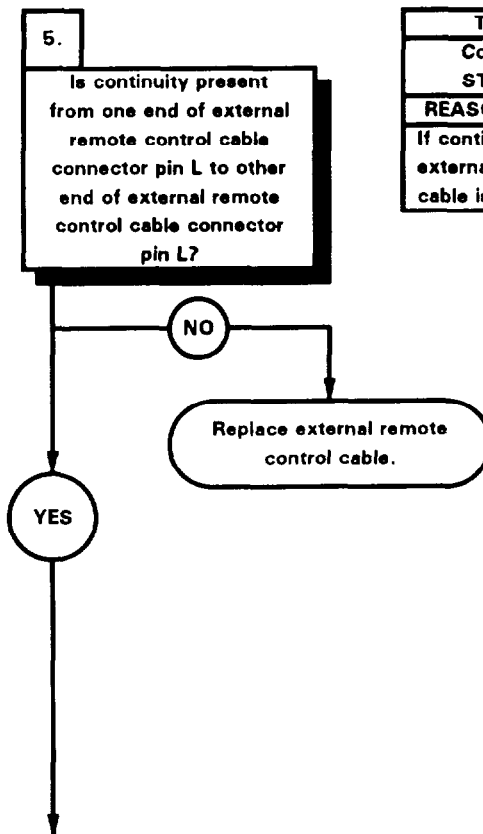
- (1) Remove SWING CW/CCW controller (para 7-32).
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter on pin L of remote control box connector.
- (4) Connect negative (-) probe of multimeter on pin 4 of SWING CW/CCW controller internal wiring harness and note reading on multimeter.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



42E1424-

ø112. M1084/M1086 MATERIAL HANDLING CRANE (MHC) SWING CW DOES NOT OPERATE FROM REMOTE STATION (CONT)

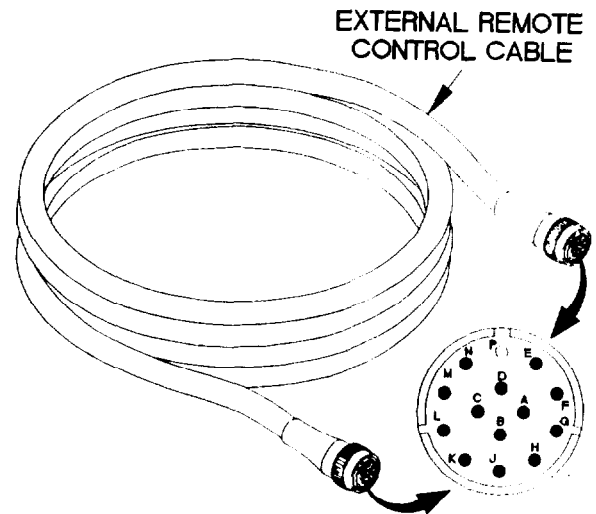
KNOWN INFO
Other crane functions from remote station OK.
Swing CW solenoid cable OK.
Swing CW solenoid OK.
Remote control box internal wiring harness OK.
SWING CW/CCW controller OK.
POSSIBLE PROBLEMS
Faulty external remote control cable.
Faulty remote control cable.



TEST OPTIONS
Continuity Test or STE/CE Test #91
REASON FOR QUESTION
If continuity is not present, external remote control cable is faulty.

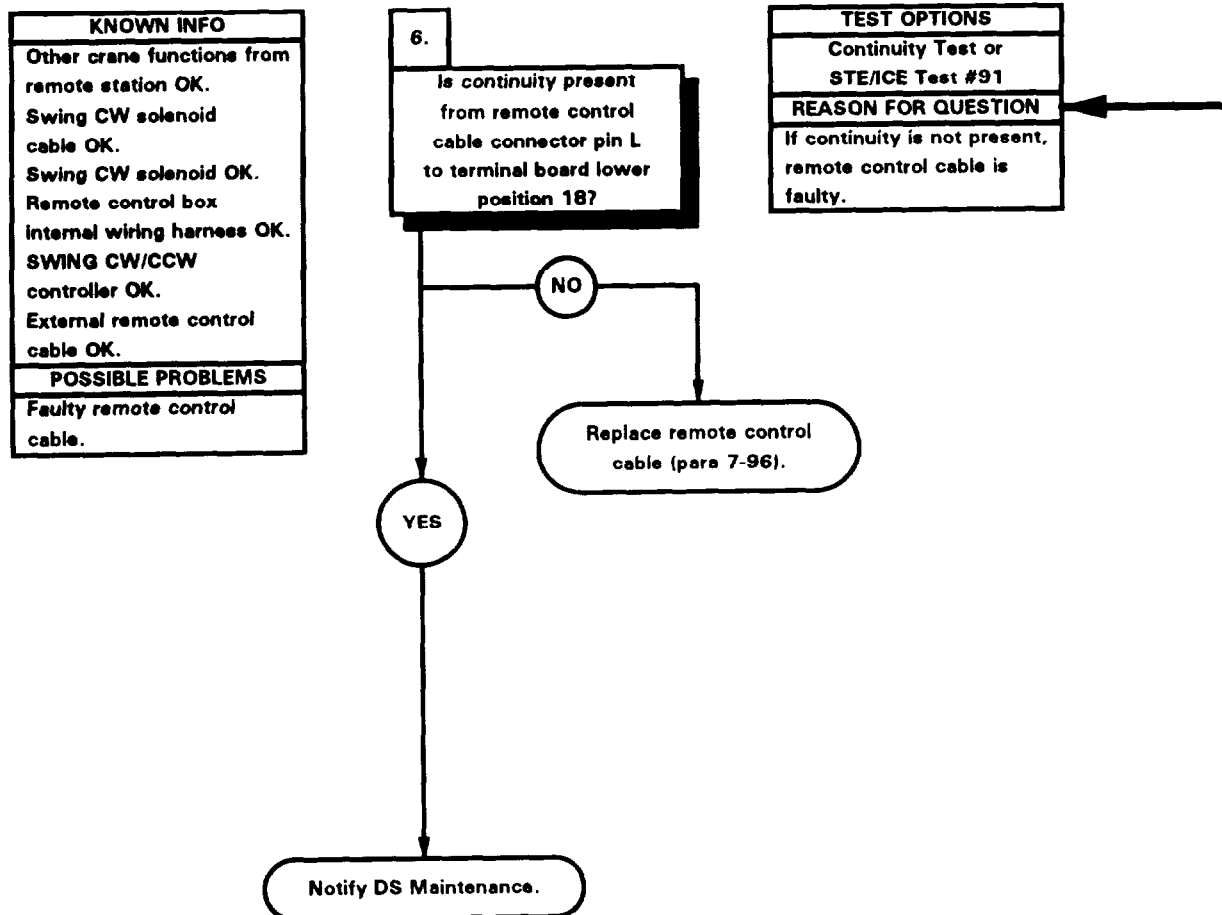
CONTINUITY TEST

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



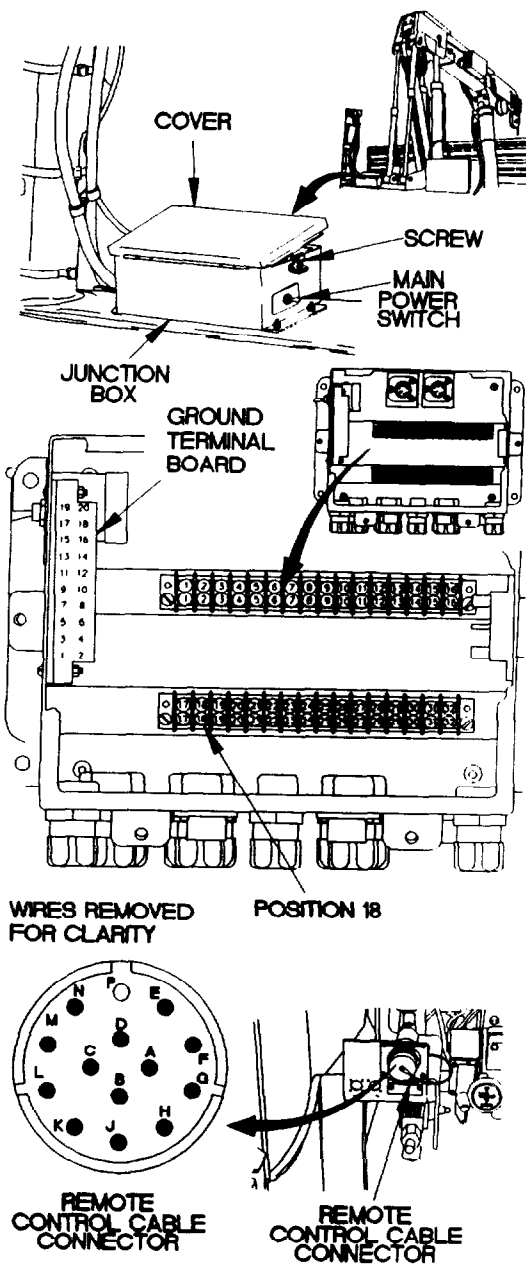
42E1425-

6112. M1084/M1086 MATERIAL HANDLING CRANE (MHC) SWING CW DOES NOT OPERATE FROM REMOTE STATION (CONT)

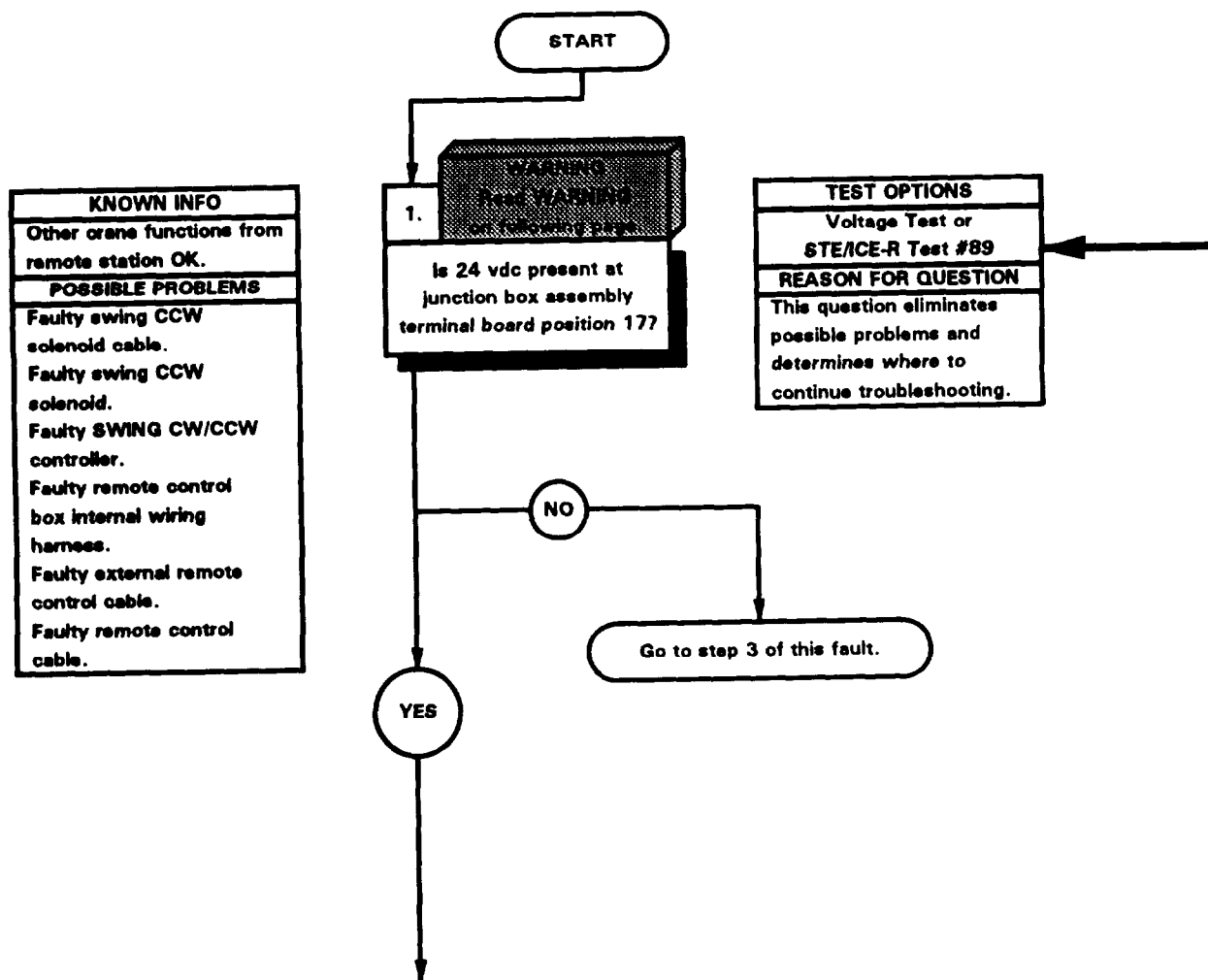


CONTINUITY TEST

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



•113. M1084/M1086 MATERIAL HANDLING CRANE (MHC) SWING CCW DOES NOT OPERATE FROM REMOTE STATION	
INITIAL SETUP	
Equipment Conditions Outriggers lowered (TM 9-2320-366-10-1). Crane erected with approximately five feet of cable payed out (TM 9-2320-366-10-1). Engine shut down (TM 9-2320-366-10-1). Personnel Required (2)	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/ICE-R (Item 41, Appendix C) References TM 9-4910-571-12&P



WARNING

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

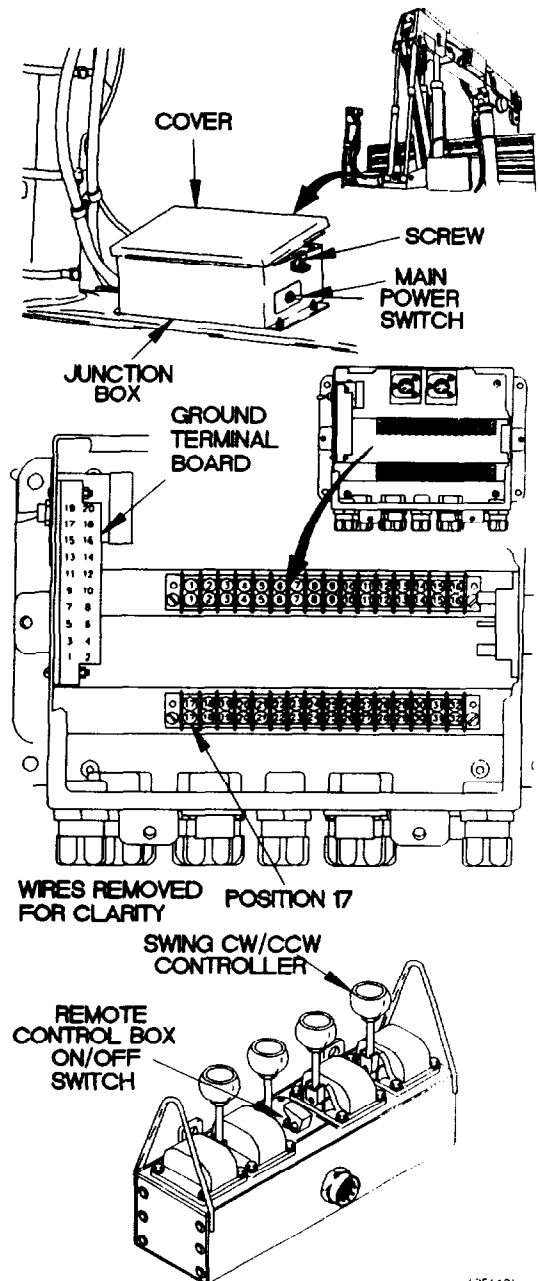
OUTPUT VOLTAGE TEST

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

NOTE

Step (9) requires the aid of an assistant.

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



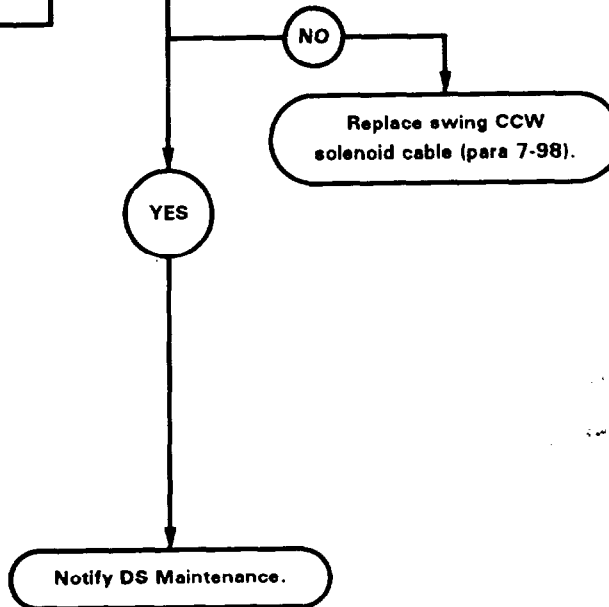
42E1431-

ø113. M1084/M1086 MATERIAL HANDLING CRANE (MHC) SWING CCW DOES NOT OPERATE FROM REMOTE STATION (CONT)

KNOWN INFO
Other crane functions from remote station OK. Remote control box OK. SWING CW/CCW controller OK.
POSSIBLE PROBLEMS
Faulty swing CCW solenoid cable. Faulty swing CCW solenoid.

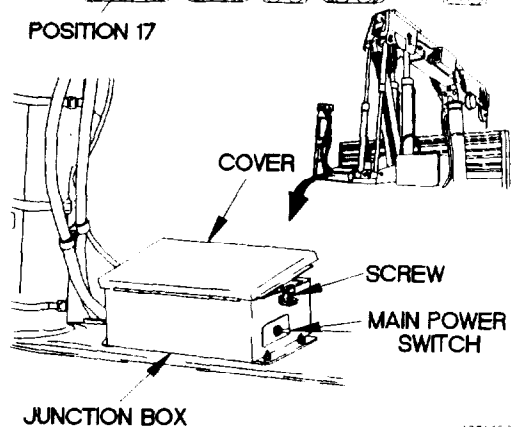
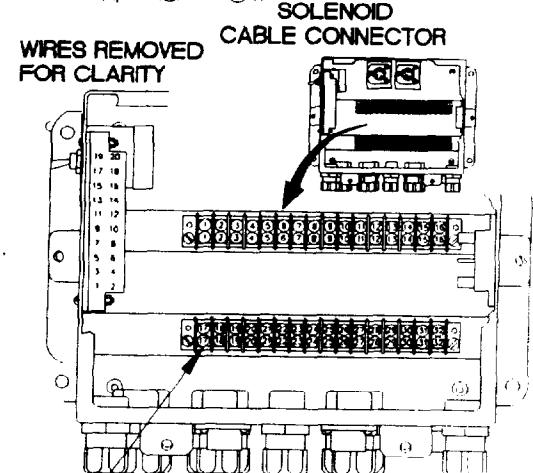
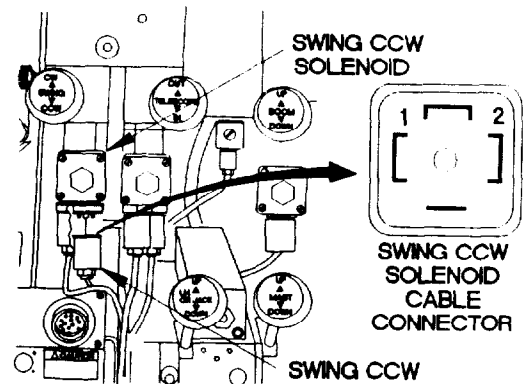
2.
Is continuity present from swing CCW solenoid cable connector pin 2 to ground and from pin 1 to terminal board lower position 17?

TEST OPTIONS
Continuity Test or STE/ICE Test #91
REASON FOR QUESTION
If continuity is not present, swing CCW solenoid cable is faulty. If continuity is present, swing CCW solenoid is faulty.



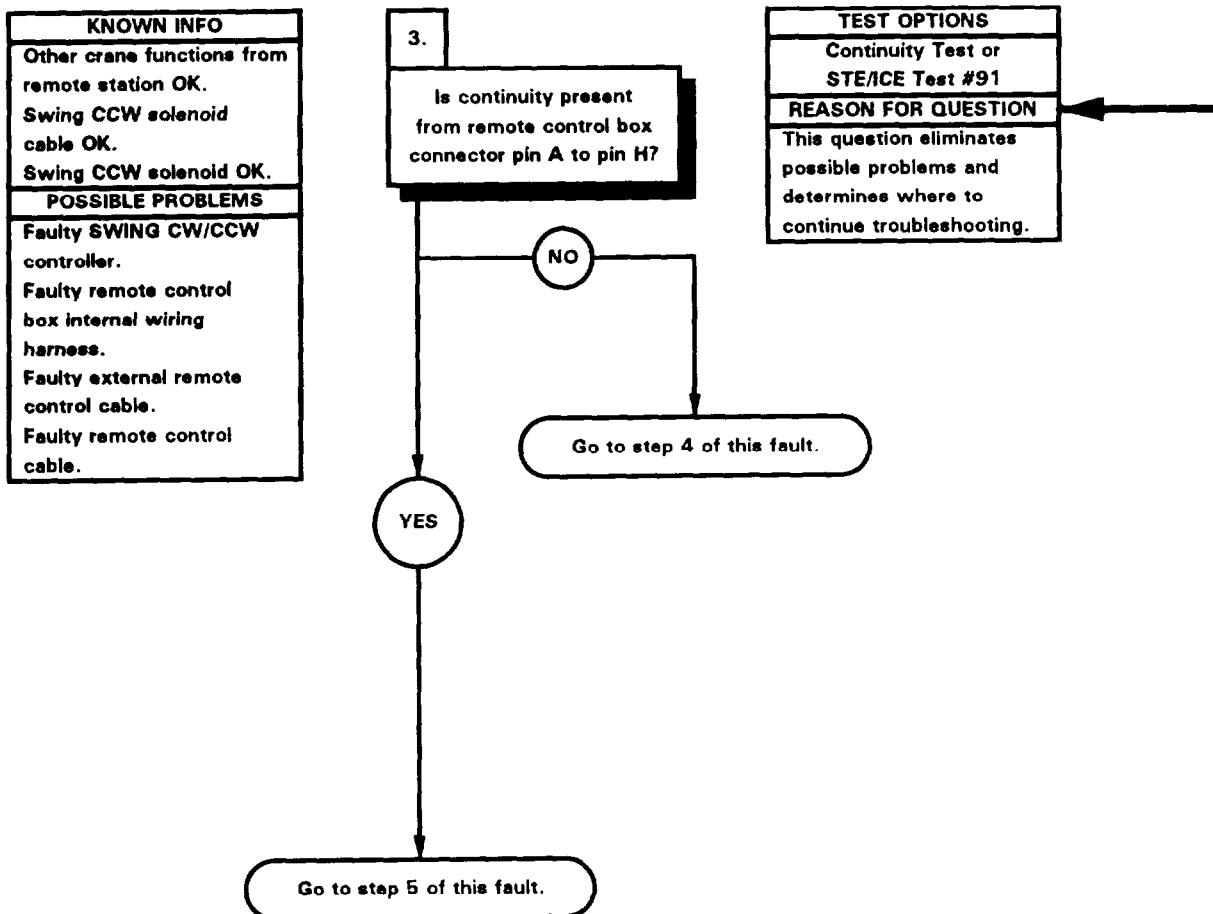
CONTINUITY TEST

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



4CE1432-

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



CONTINUITY TEST

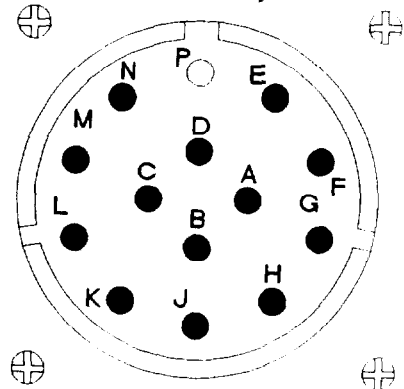
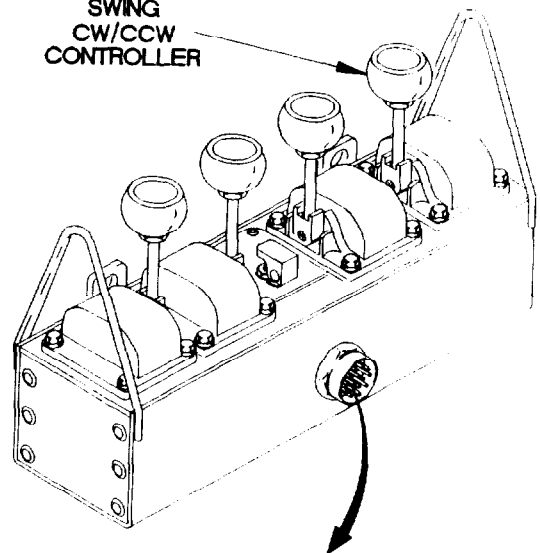
- (1) Disconnect external remote control cable from remote control box.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter on pin A of connector on remote control box.
- (4) Connect negative (-) probe of multimeter on pin H of connector on remote control box.

NOTE

Step (5) requires the aid of an assistant.

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

SWING
CW/CCW
CONTROLLER



REMOTE CONTROL
BOX CONNECTOR

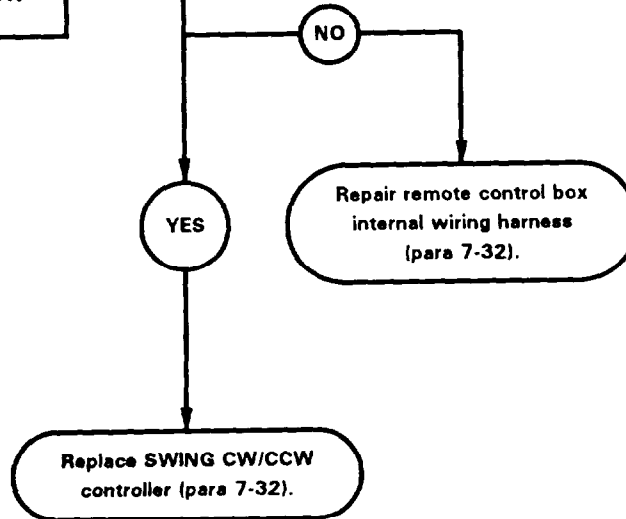
42E1433

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

KNOWN INFO
Other crane functions from remote station OK. Swing CCW solenoid cable OK. Swing CCW solenoid OK. External remote control cable OK. Remote control cable OK.
POSSIBLE PROBLEMS
Faulty remote control box internal wiring harness. Faulty SWING CW/CCW controller.

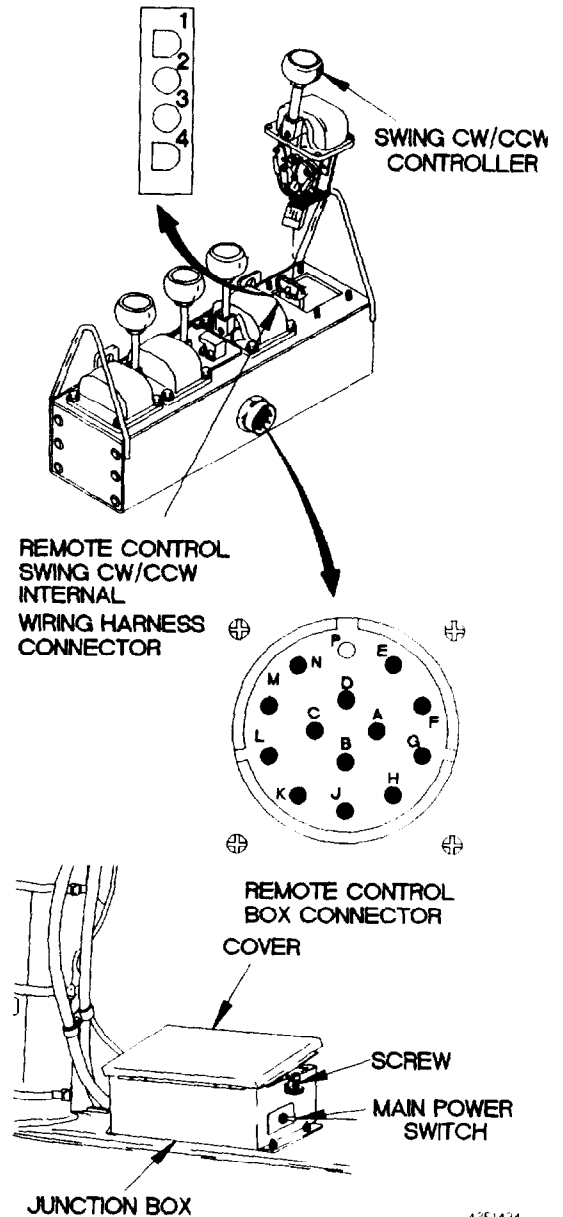
4.
Is continuity present from remote control box connector pin A to SWING CW/CCW controller internal wiring harness pin 3 and from remote control box connector pin H to SWING CW/CCW controller internal wiring harness pin 1?

TEST OPTIONS
Continuity Test or STE/ICE Test #91
REASON FOR QUESTION
If continuity is not present, remote control box internal wiring harness is faulty. If continuity is present, SWING CW/CCW controller is faulty.



CONTINUITY TEST

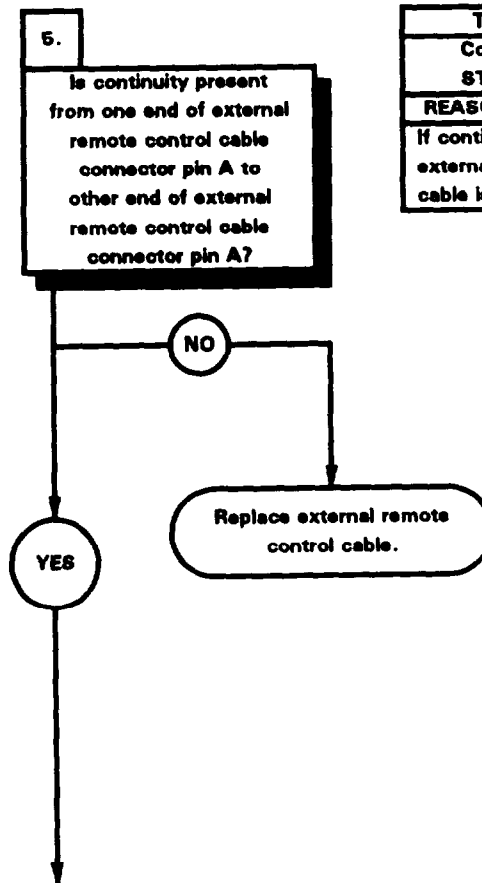
- (1) Remove SWING CW/CCW controller (para 7-32).
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter on pin A of remote control box connector.
- (4) Connect negative (-) probe of multimeter on pin 3 of SWING CW/CCW controller internal wiring harness and note reading on multimeter.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



42E1434-

6113. M1084/M1086 MATERIAL HANDLING CRANE (MHC) SWING CCW DOES NOT OPERATE FROM REMOTE STATION (CONT)

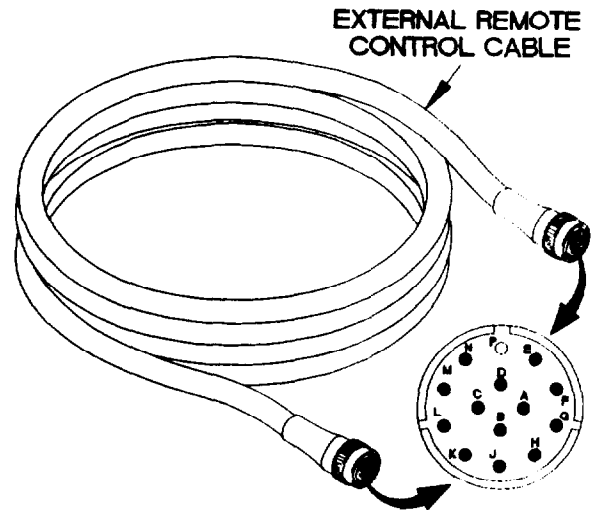
KNOWN INFO
Other crane functions from remote station OK. Swing CCW solenoid cable OK. Swing CCW solenoid OK. Remote control box internal wiring harness OK. SWING CW/CCW controller OK.
POSSIBLE PROBLEMS
Faulty external remote control cable. Faulty remote control cable.



TEST OPTIONS
Continuity Test or STE/ICE Test #91
REASON FOR QUESTION
If continuity is not present, external remote control cable is faulty.

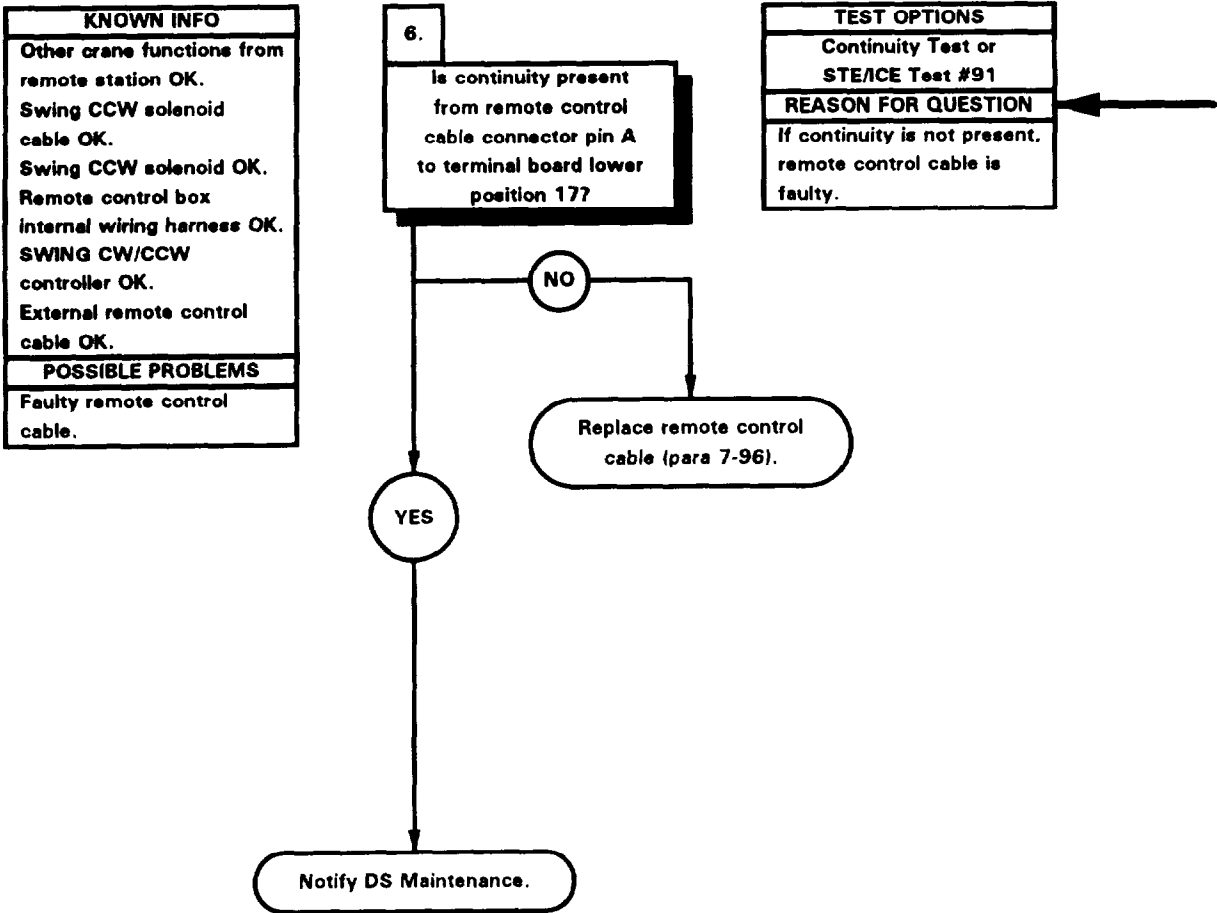
CONTINUITY TEST

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



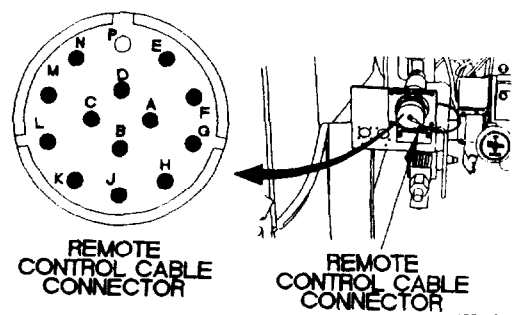
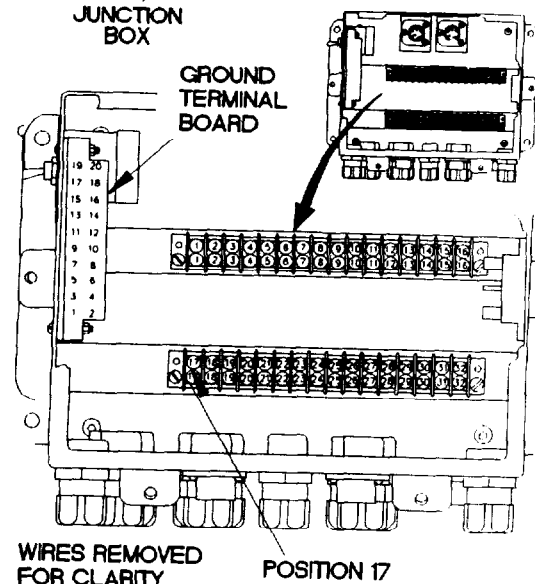
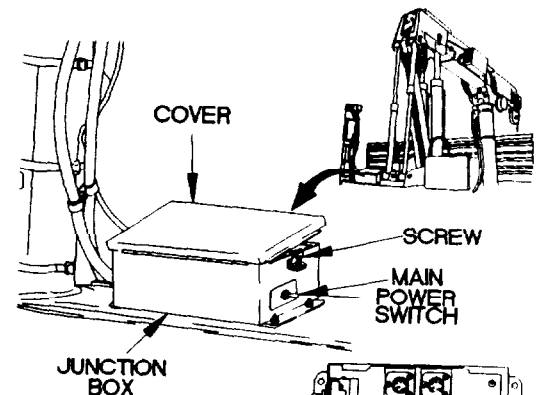
42E1435-

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

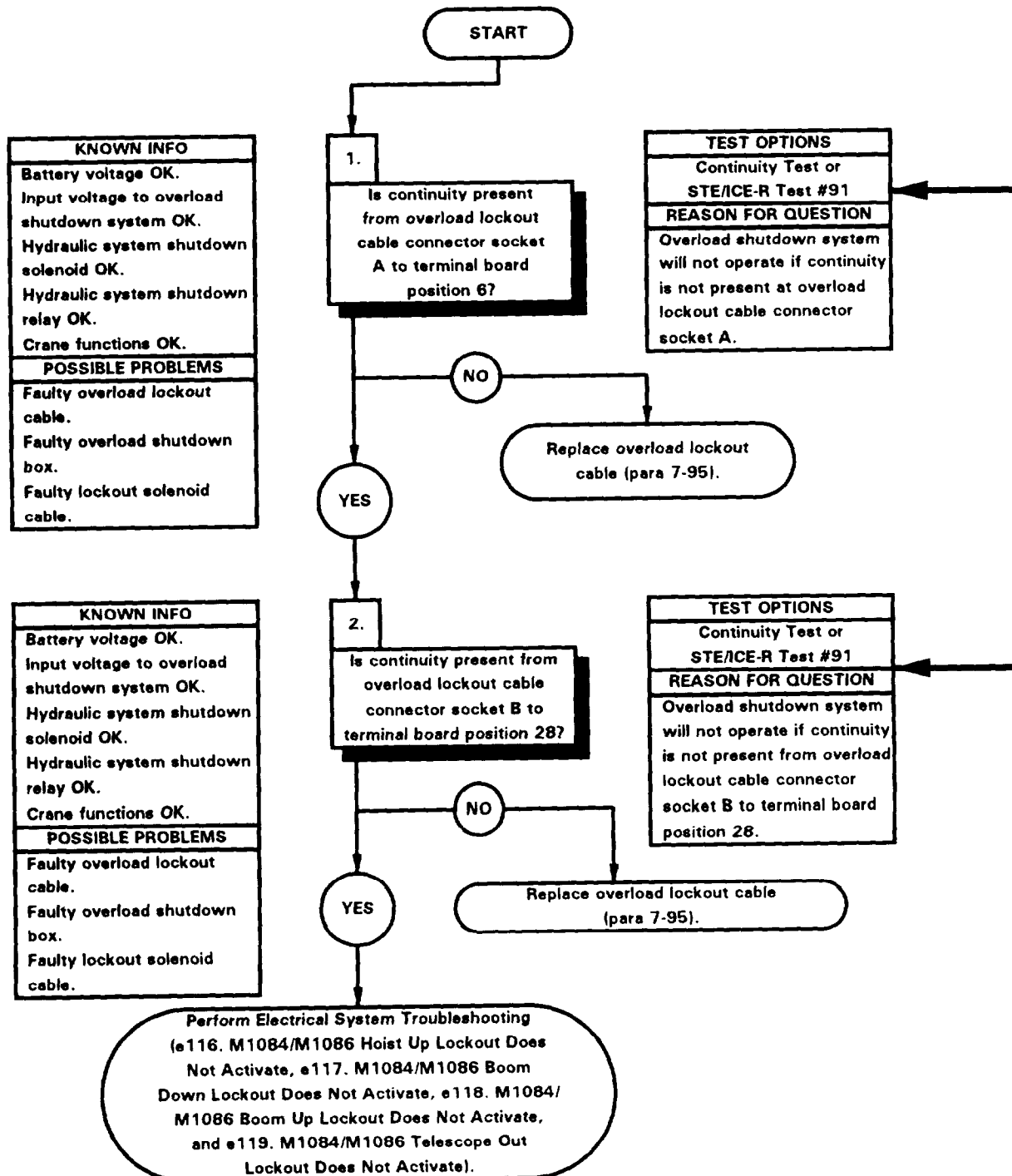


CONTINUITY TEST

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

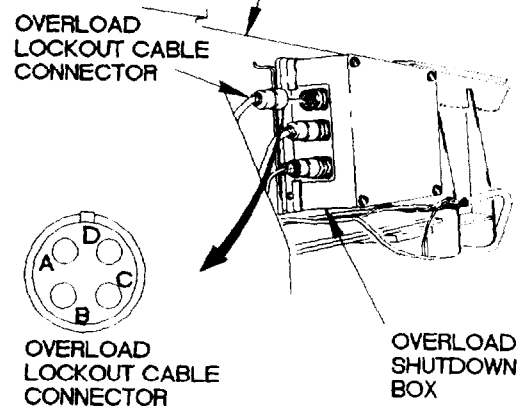
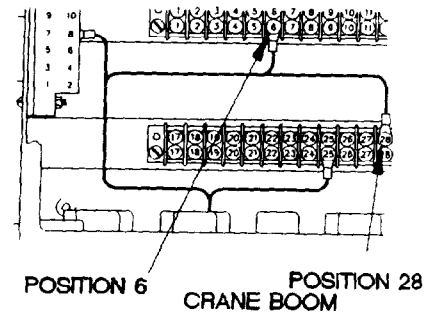
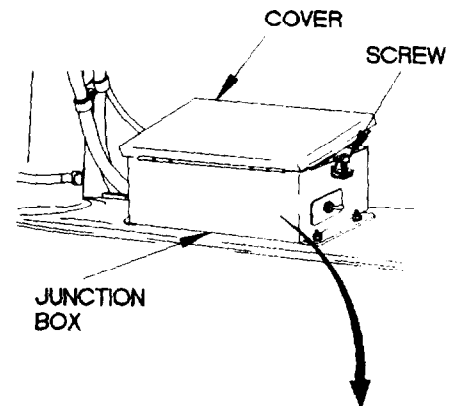


e114. M1084/M1086 MATERIAL HANDLING CRANE (MHC) OVERLOAD SHUTDOWN SYSTEM DOES NOT ACTIVATE	
INITIAL SETUP	
Equipment Conditions Batteries disconnected (para 7-57).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/ICE-R (Item 41, Appendix C)
References TM 9-4910-571-12&P	



CONTINUITY TEST

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

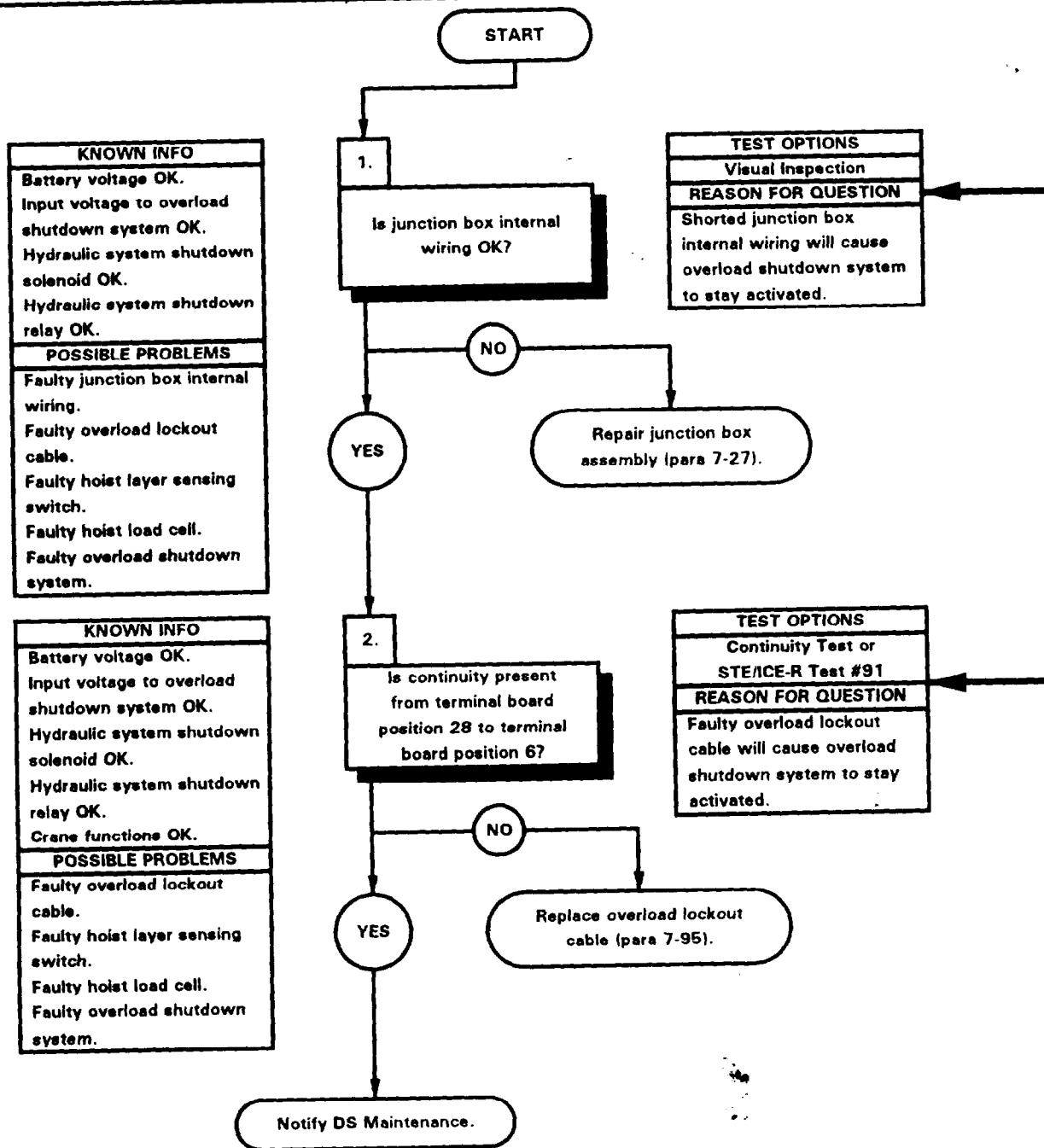


42E99012

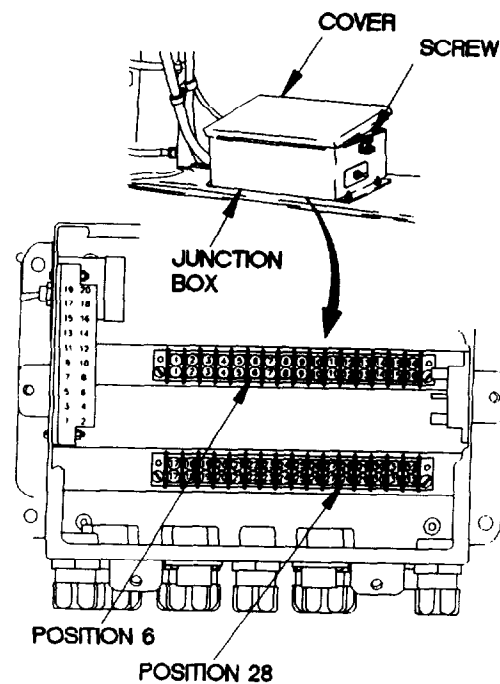
CONTINUITY TEST

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

●115. M1084/M1086 MATERIAL HANDLING CRANE (MHC) OVERLOAD SHUTDOWN SYSTEM STAYS ACTIVATED	
INITIAL SETUP	
Equipment Conditions Batteries disconnected (para 7-57).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/ICE-R (Item 41, Appendix C)
References TM 9-4910-571-12&P	

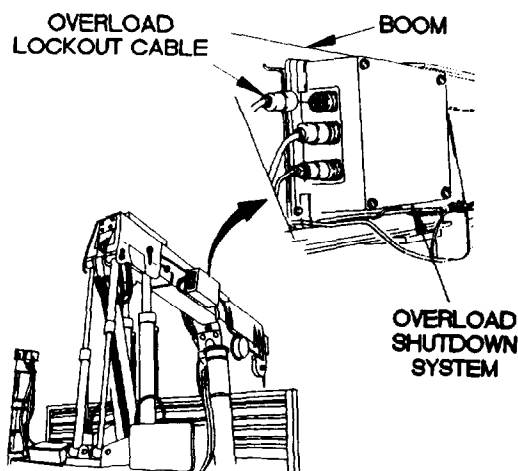


- (1) Loosen four screws on junction box.
- (2) Open cover on junction box.
- (3) Visually inspect the wiring around terminal board position 28 for shorted wires that could put 24 vdc on position 28.



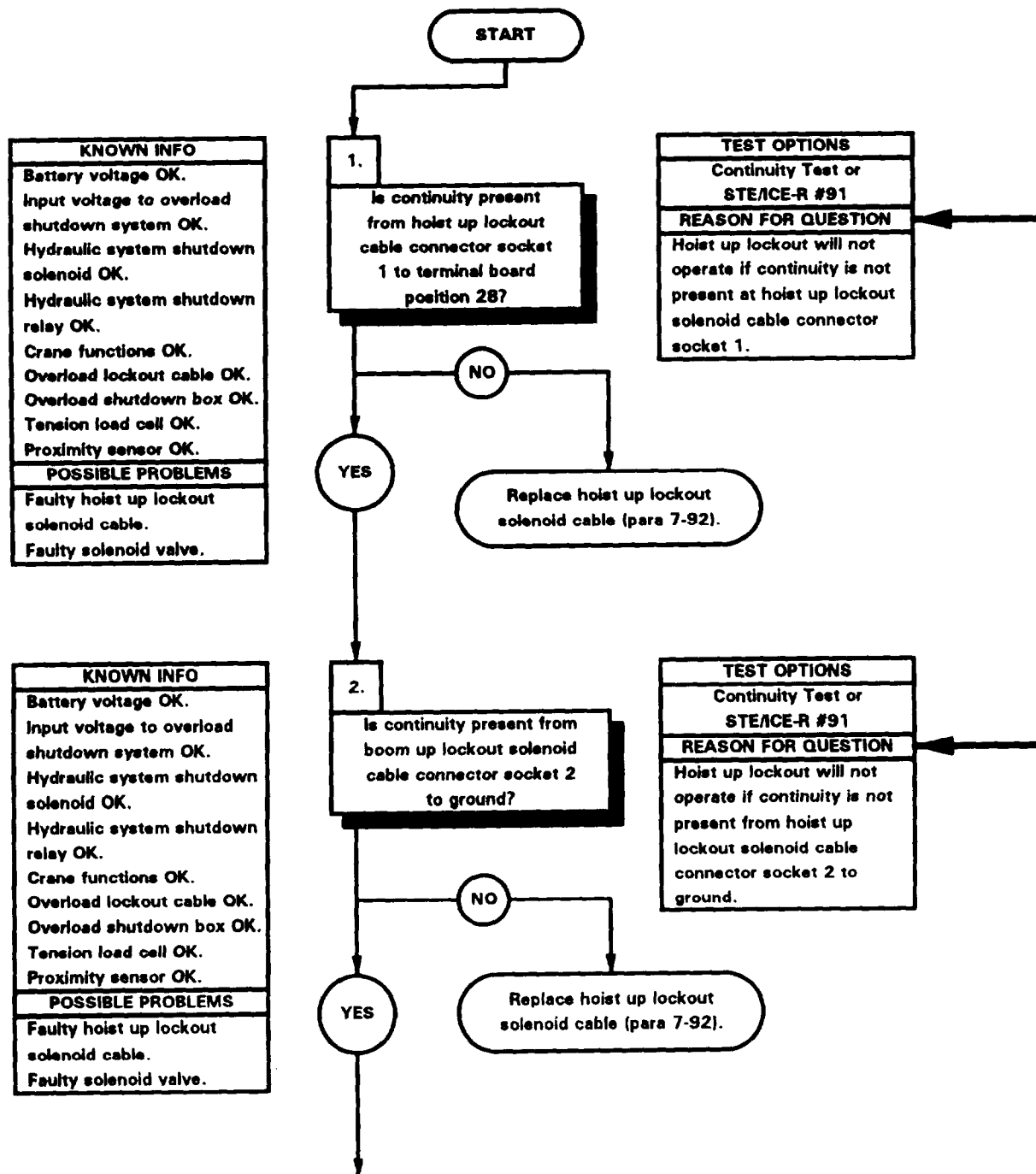
CONTINUITY TEST

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



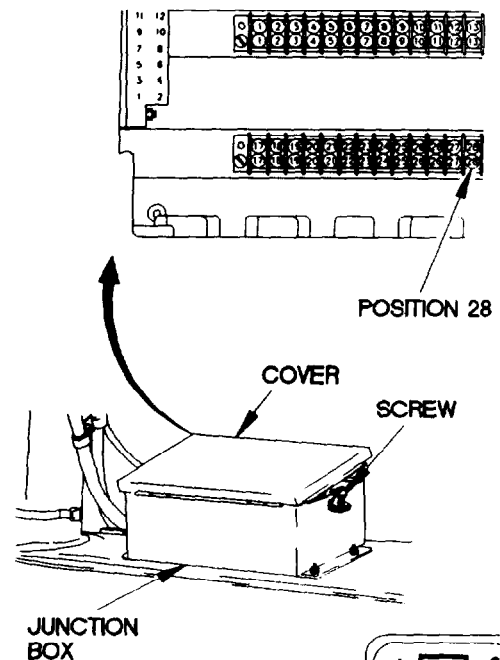
E 90--1-

e116. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HOIST UP LOCKOUT DOES NOT ACTIVATE	
INITIAL SETUP	
Equipment Conditions Batteries disconnected (para 7-57).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/ICE-R (Item 41, Appendix C)
References TM 9-4910-571-12&P	



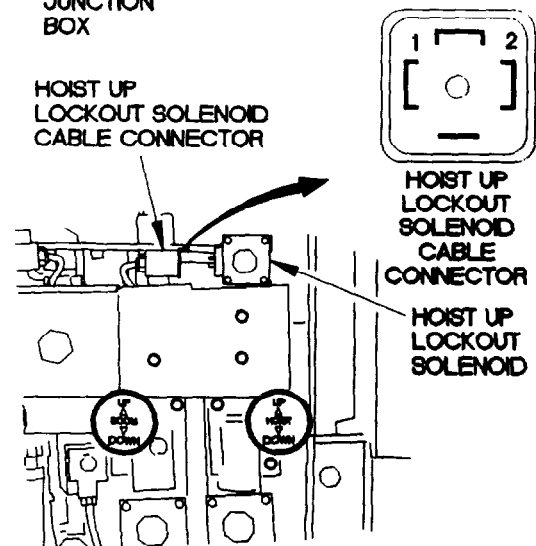
CONTINUITY TEST

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



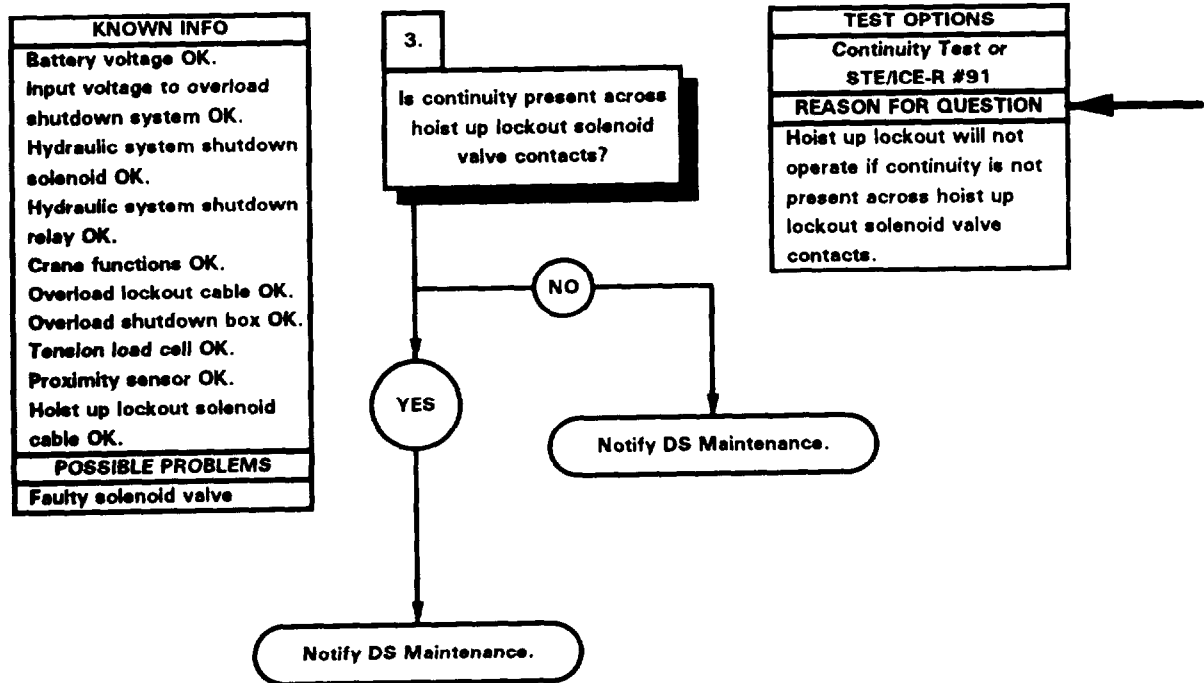
CONTINUITY TEST

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



2E12201-

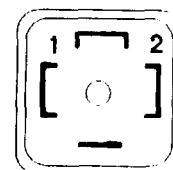
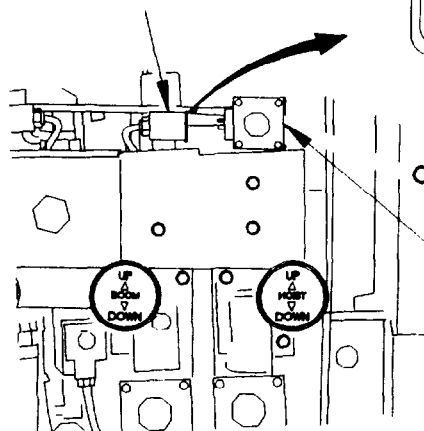
•116. M1084/M1086 MATERIAL HANDLING CRANE (MHC) HOIST UP LOCKOUT DOES NOT ACTIVATE (CONT)



CONTINUITY TEST

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

HOIST UP
LOCKOUT SOLENOID
CABLE CONNECTOR

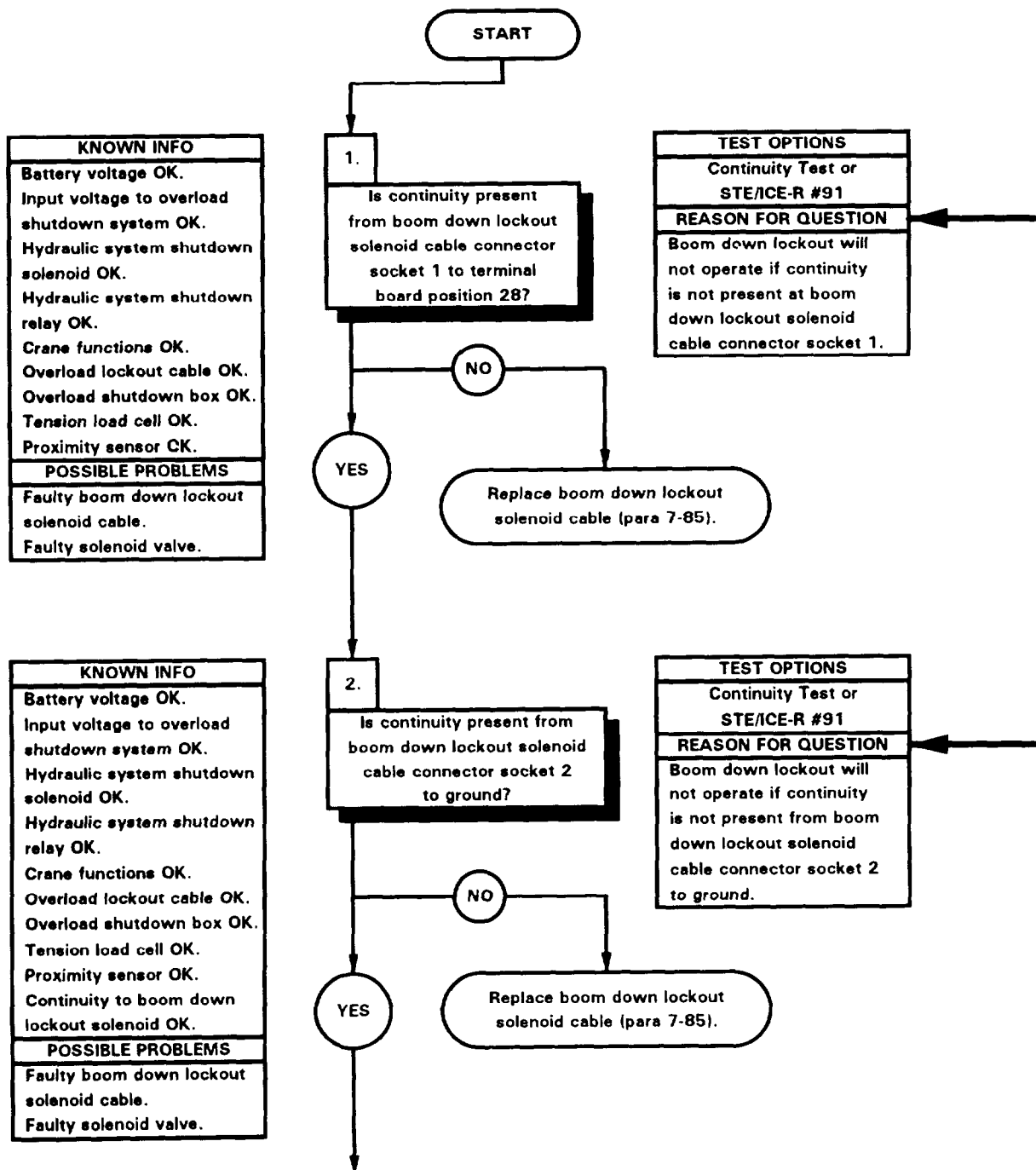


HOIST UP
LOCKOUT SOLENOID
CABLE
CONNECTOR

HOIST UP
LOCKOUT
SOLENOID

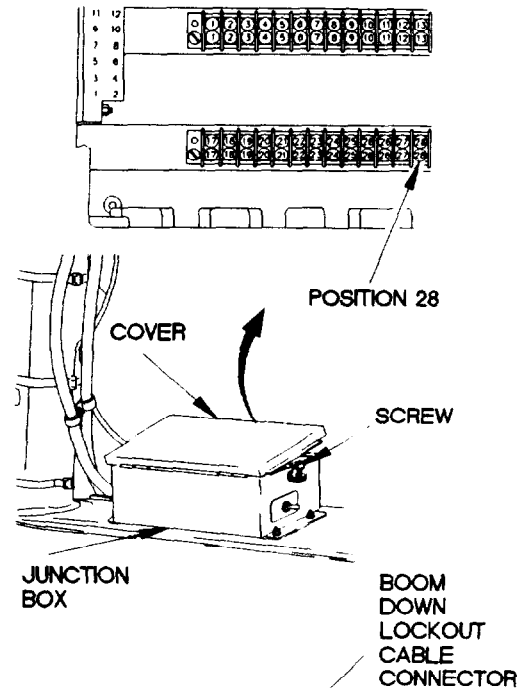
3E12202-

•117. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM DOWN LOCKOUT DOES NOT ACTIVATE	
INITIAL SETUP	
Equipment Conditions Batteries disconnected (para 7-57).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/ICE-R (Item 41, Appendix C)
References TM 9-4910-571-12&P	



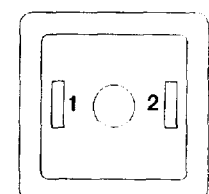
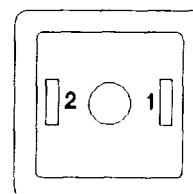
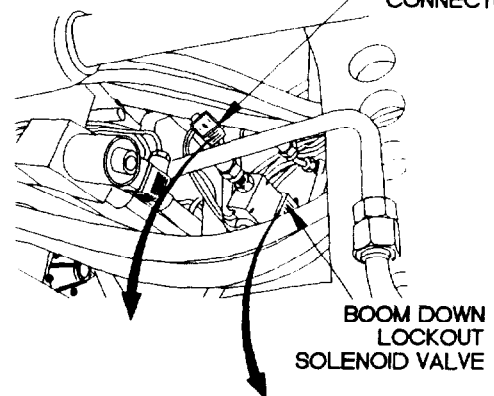
CONTINUITY TEST

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



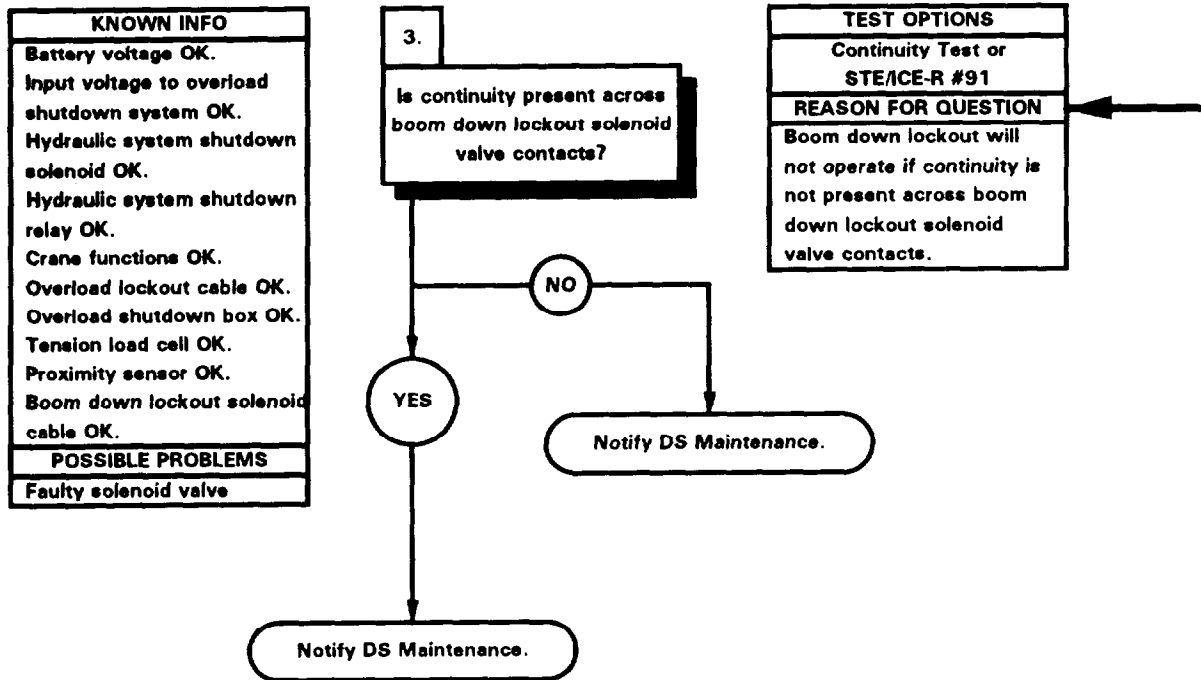
CONTINUITY TEST

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



8C12301-

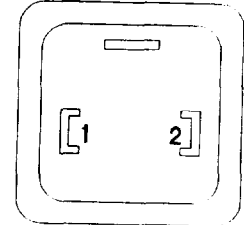
e117. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM DOWN LOCKOUT DOES NOT ACTIVATE (CONT)



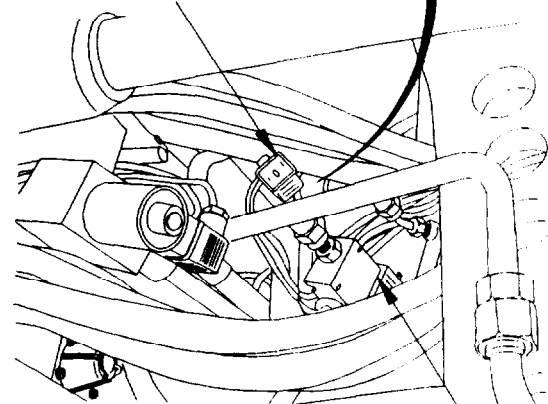
CONTINUITY TEST

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

BOOM DOWN LOCKOUT
CABLE CONNECTOR



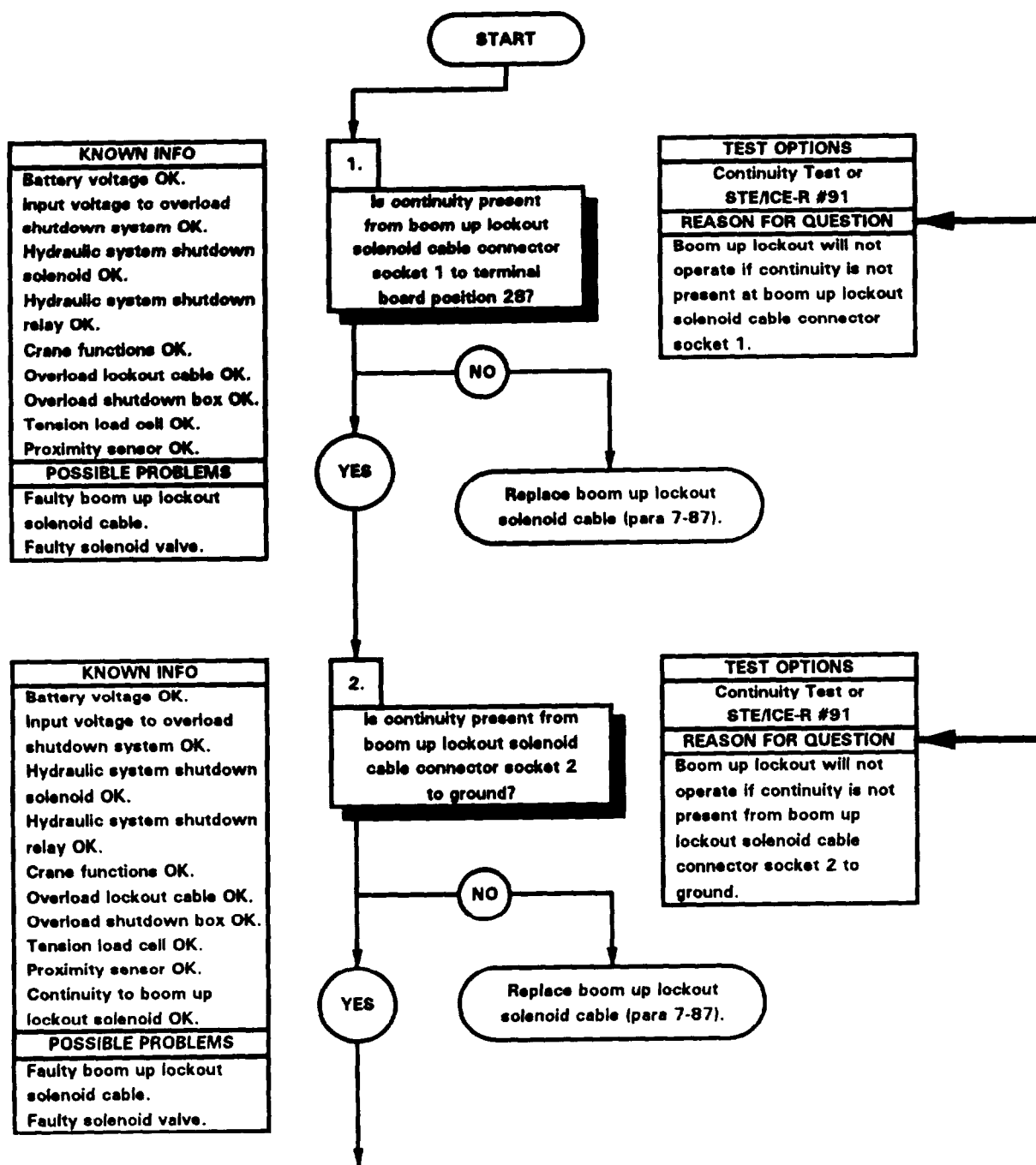
BOOM DOWN LOCKOUT
CABLE CONNECTOR



BOOM DOWN LOCKOUT
SOLENOID VALVE CONTACTS

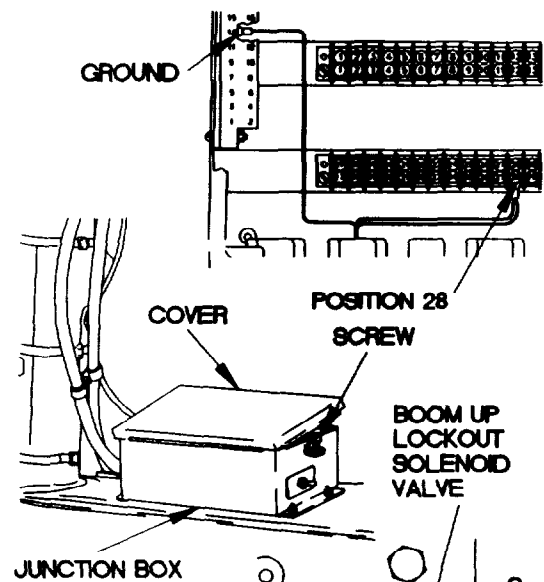
2E12302-

•118. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM UP LOCKOUT DOES NOT ACTIVATE	
INITIAL SETUP	
Equipment Conditions Batteries disconnected (para 7-57).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/ICE-R (Item 41, Appendix C)
References TM 9-4910-571-12&P	



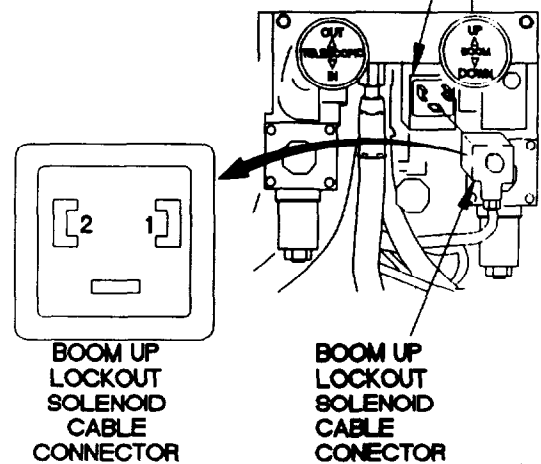
CONTINUITY TEST

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



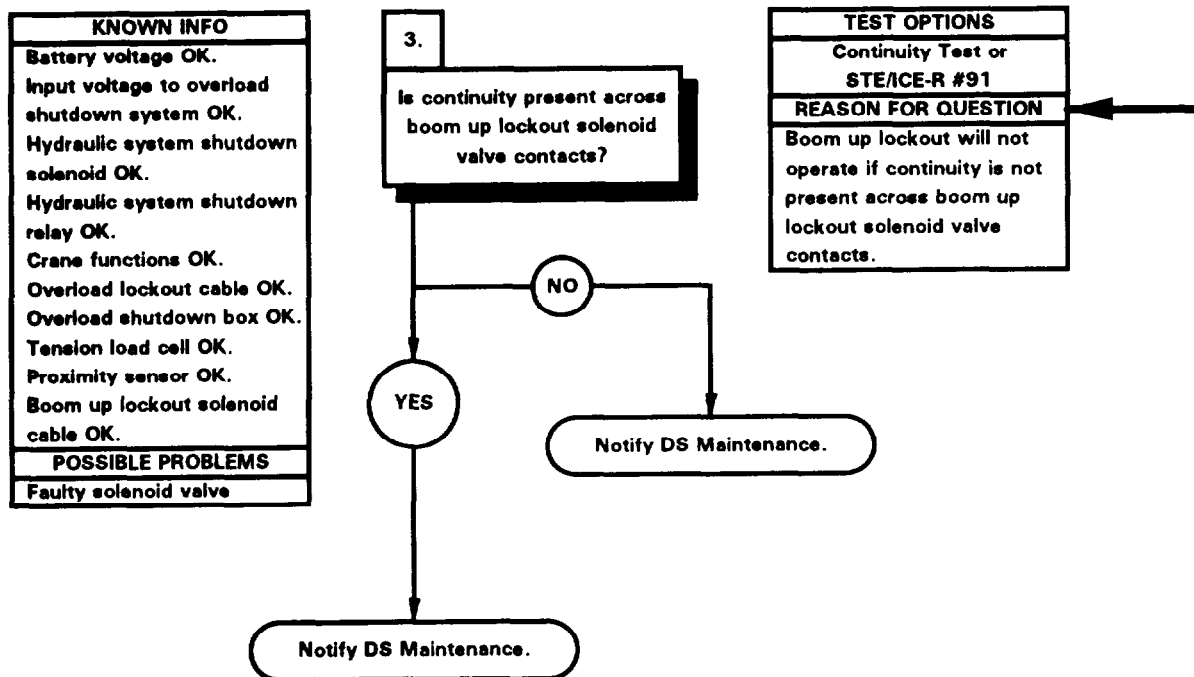
CONTINUITY TEST

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



42EK801A

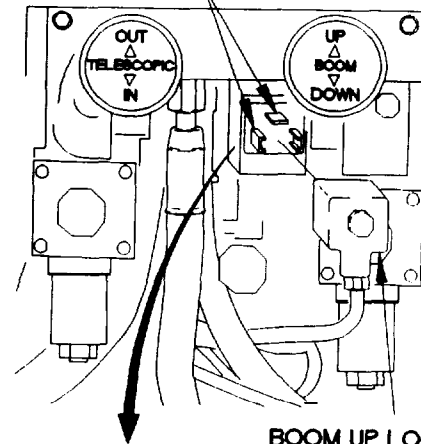
6118. M1084/M1086 MATERIAL HANDLING CRANE (MHC) BOOM UP LOCKOUT DOES NOT ACTIVATE
(CONT)



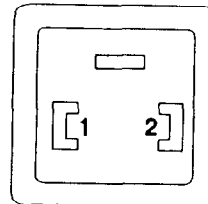
CONTINUITY TEST

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

BOOM UP LOCKOUT SOLENOID VALVE CONTACTS



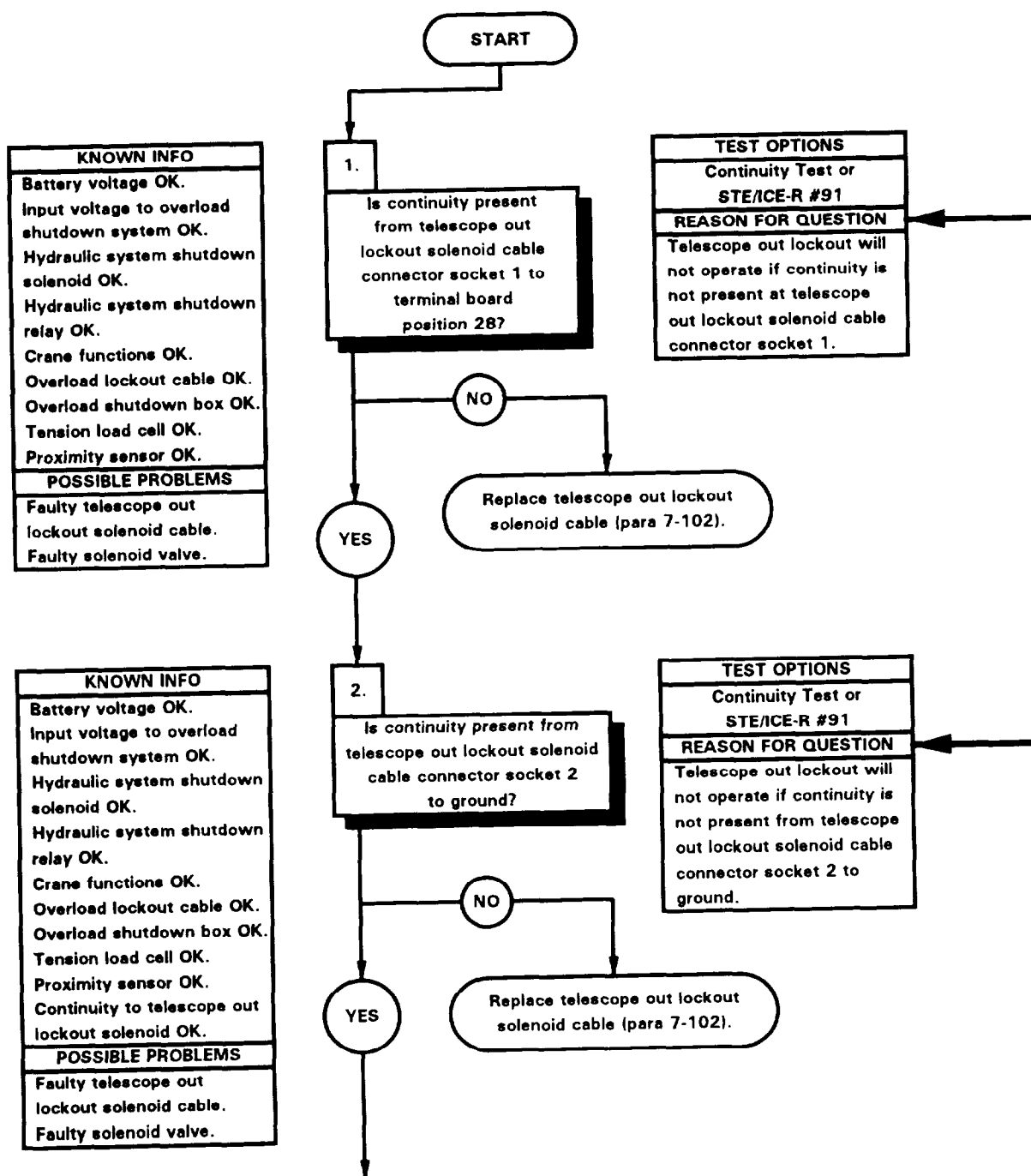
BOOM UP LOCKOUT CABLE CONNECTOR



BOOM UP LOCKOUT SOLENOID VALVE

3E10402-

e119. M1084/M1086 MATERIAL HANDLING CRANE (MHC) TELESCOPE OUT LOCKOUT DOES NOT ACTIVATE	
INITIAL SETUP	
Equipment Conditions Batteries disconnected (para 7-57).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/ICE-R (Item 41, Appendix C)
References TM 9-4910-571-12&P	

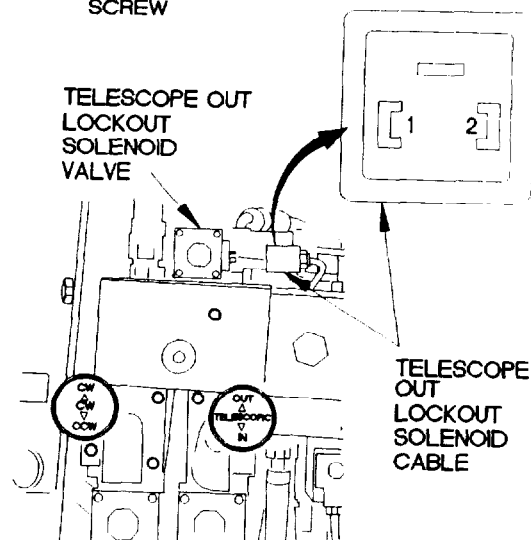
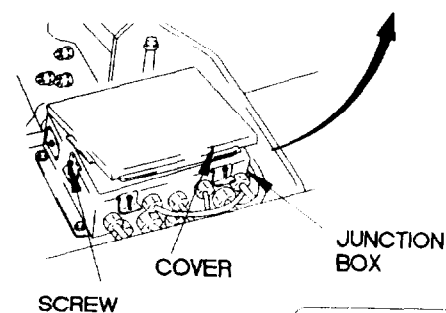
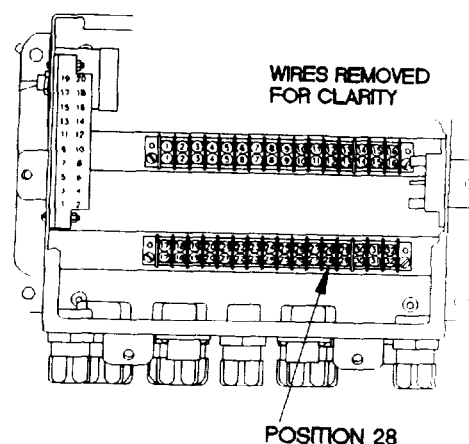


CONTINUITY TEST

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

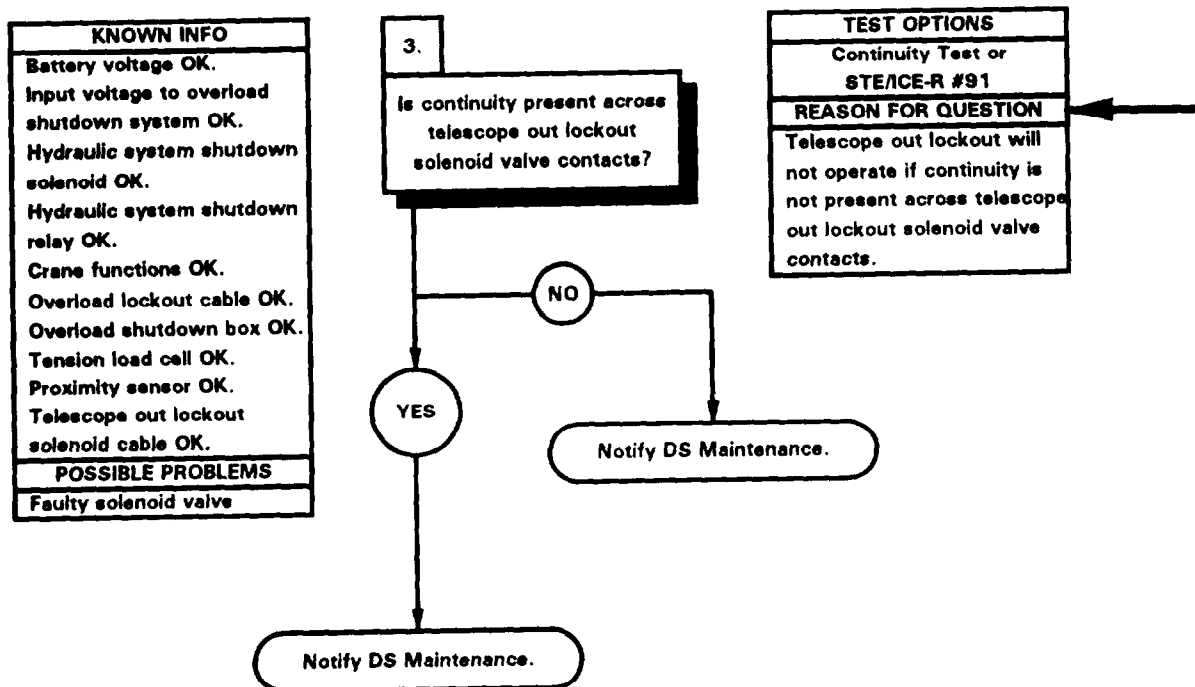
CONTINUITY TEST

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



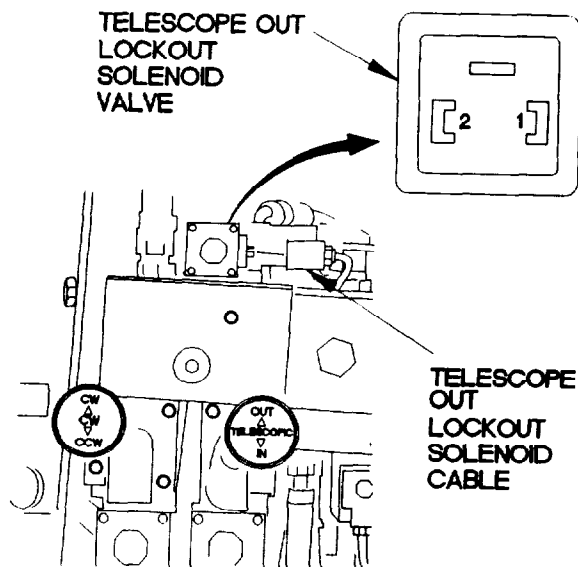
2E125M-

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

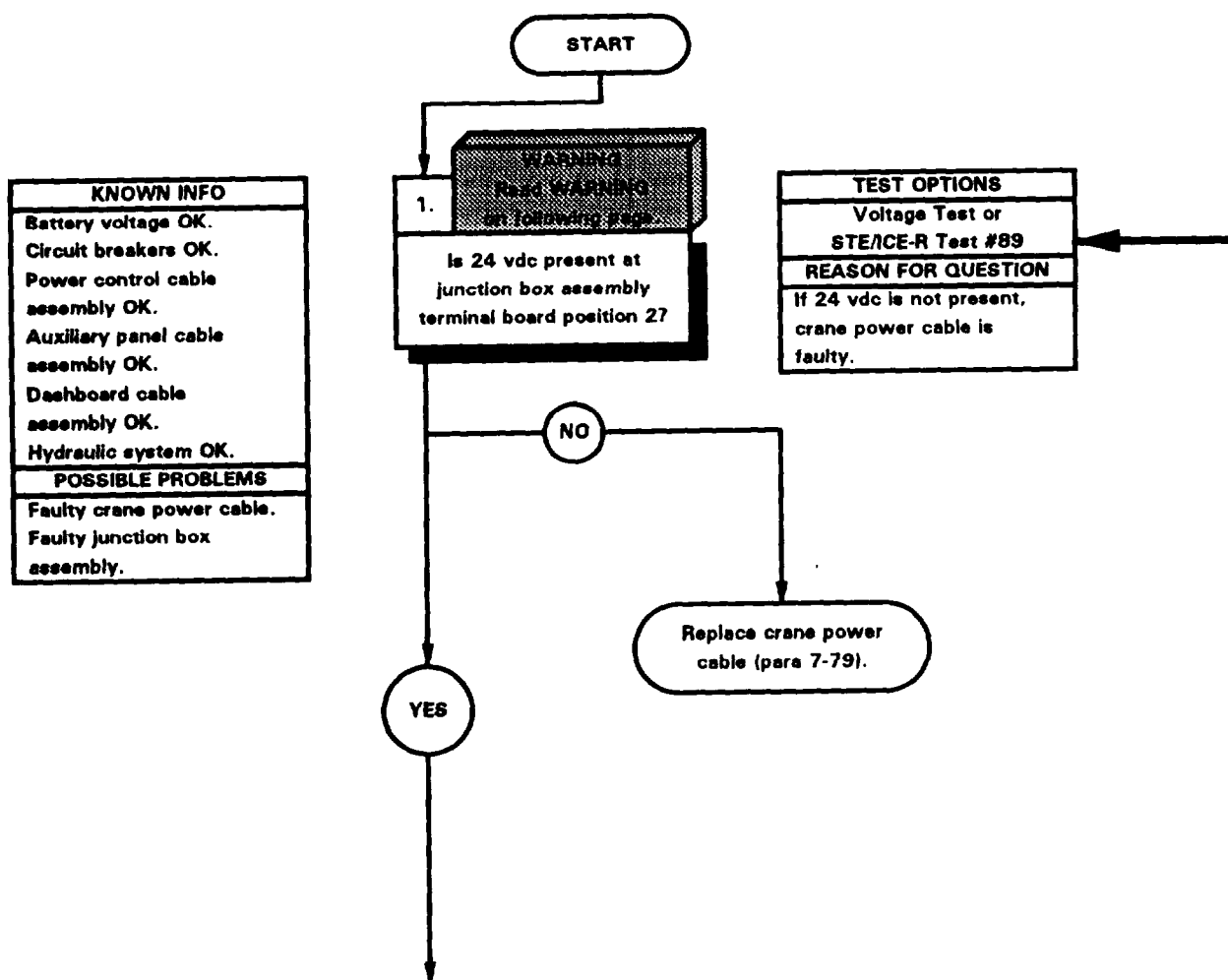


CONTINUITY TEST

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



e120. M1089 MATERIAL HANDLING CRANE (MHC) DOES NOT OPERATE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/ICE-R (Item 41, Appendix C)
Personnel Required (2)	References TM 9-491-571-12&P

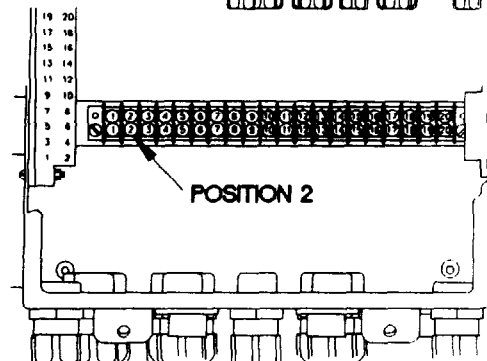
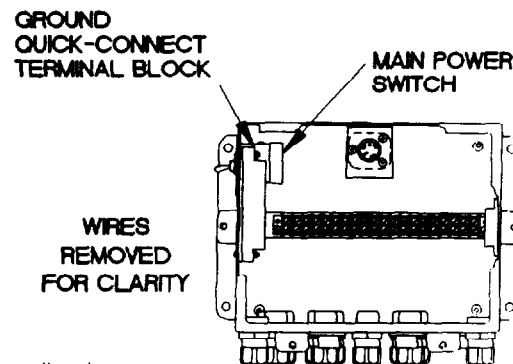
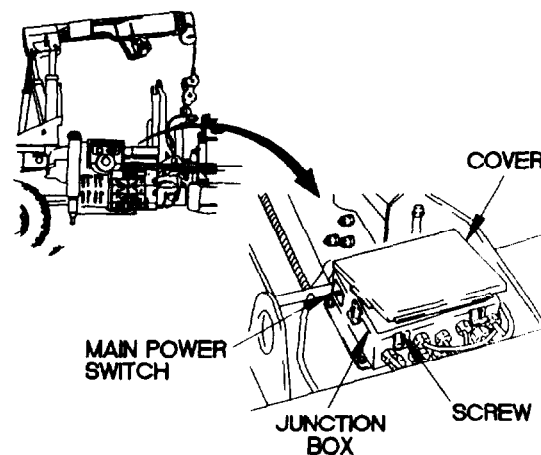


WARNING

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

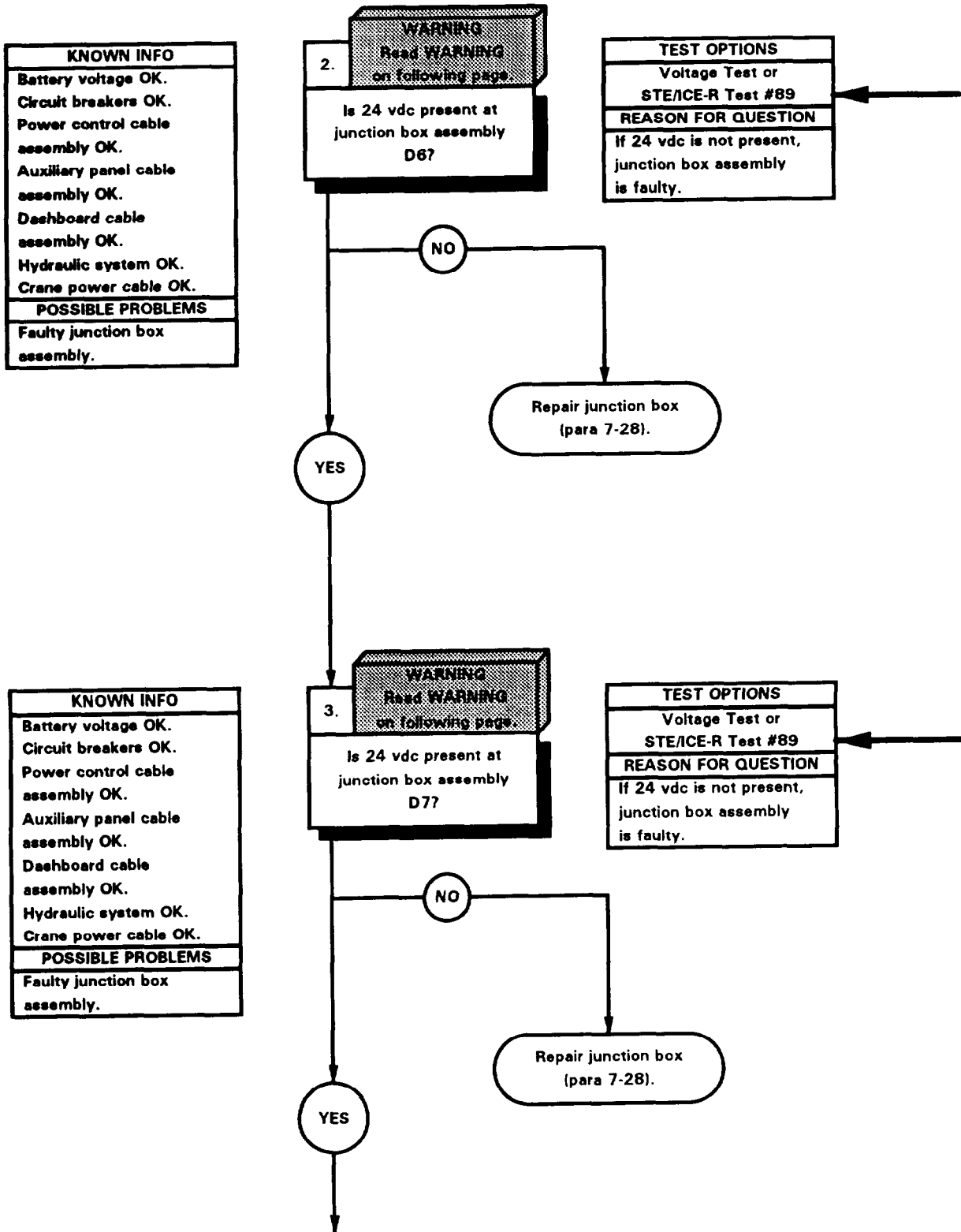
VOLTAGE TEST

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



42E1051A

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

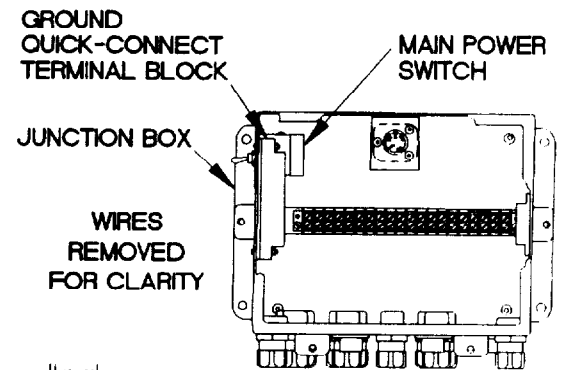


WARNING

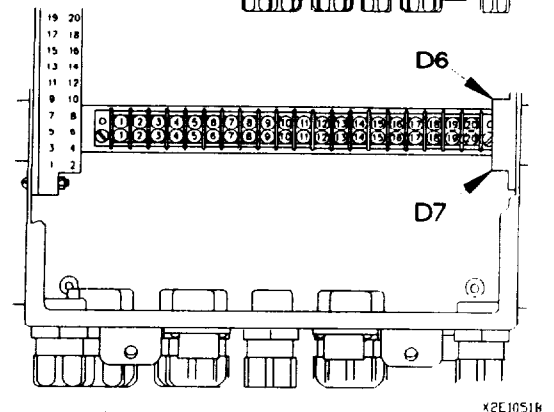
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

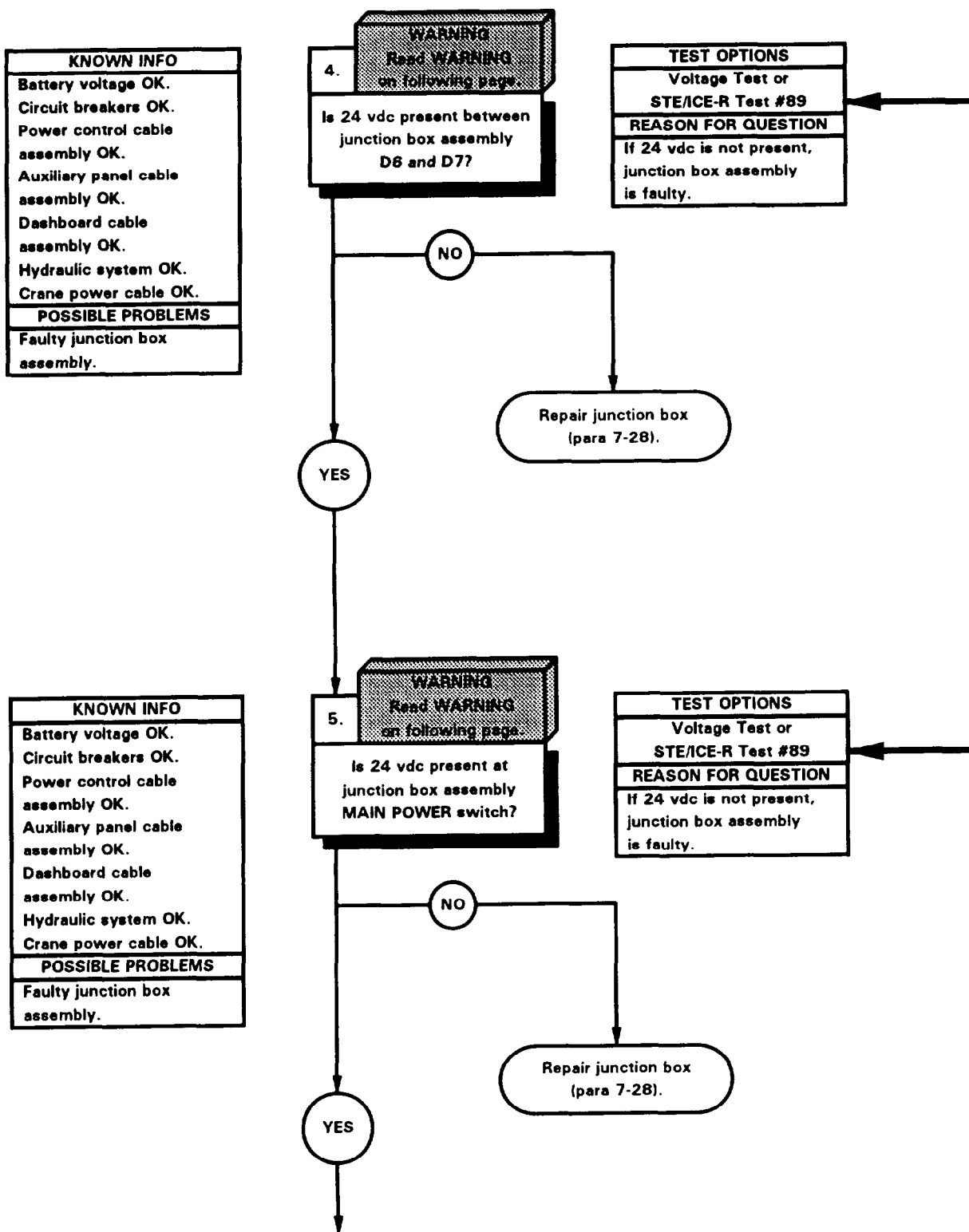
- (1) Set multimeter to vdc.
- (2) Connect positive (+) probe of multimeter to D6 of junction box.
- (3) Connect negative (-) probe of multimeter to GROUND quick-connect terminal block (above main power switch) and note reading on multimeter.
- (4) If 24 vdc is not present, repair junction box assembly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


VOLTAGE TEST

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



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

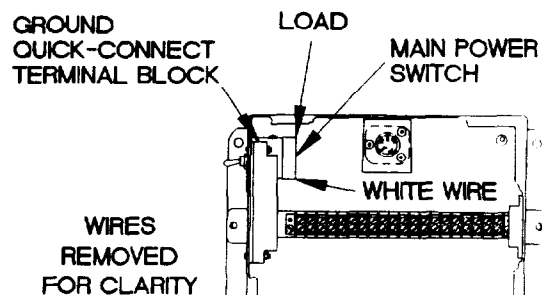


WARNING

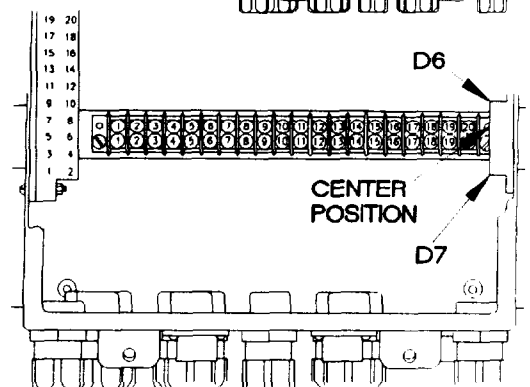
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

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

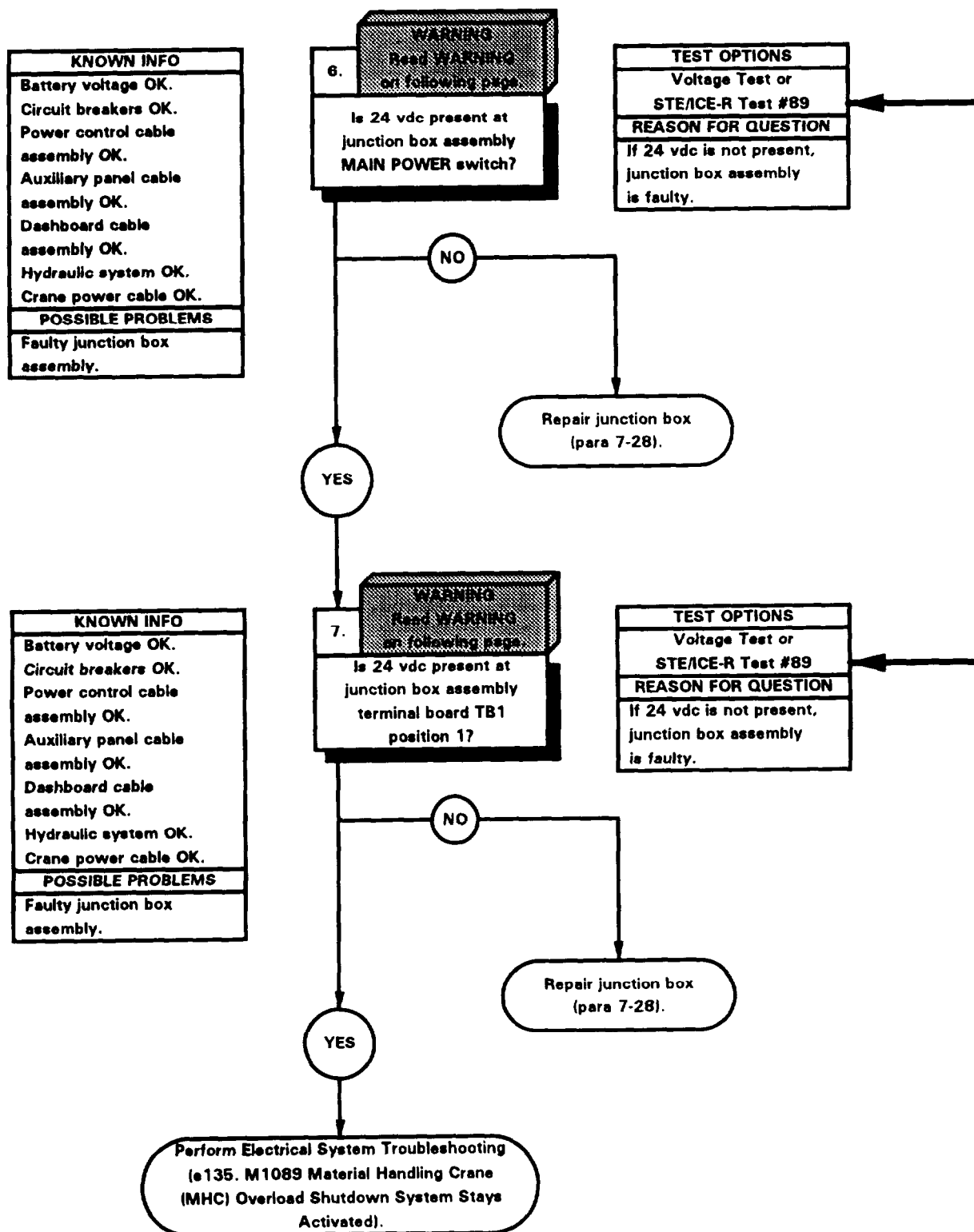
**VOLTAGE TEST**

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



K2E10517

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



WARNING

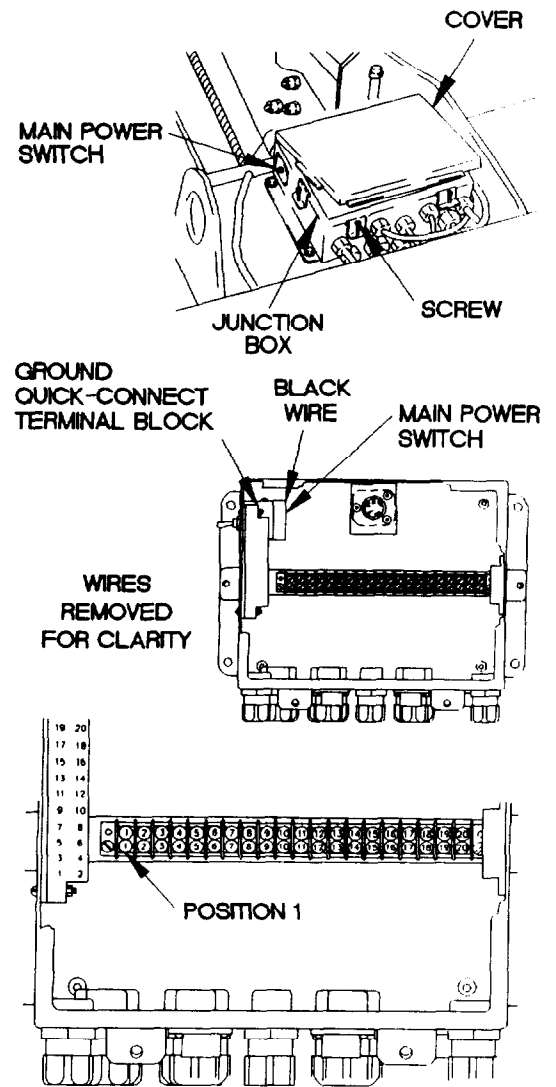
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

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

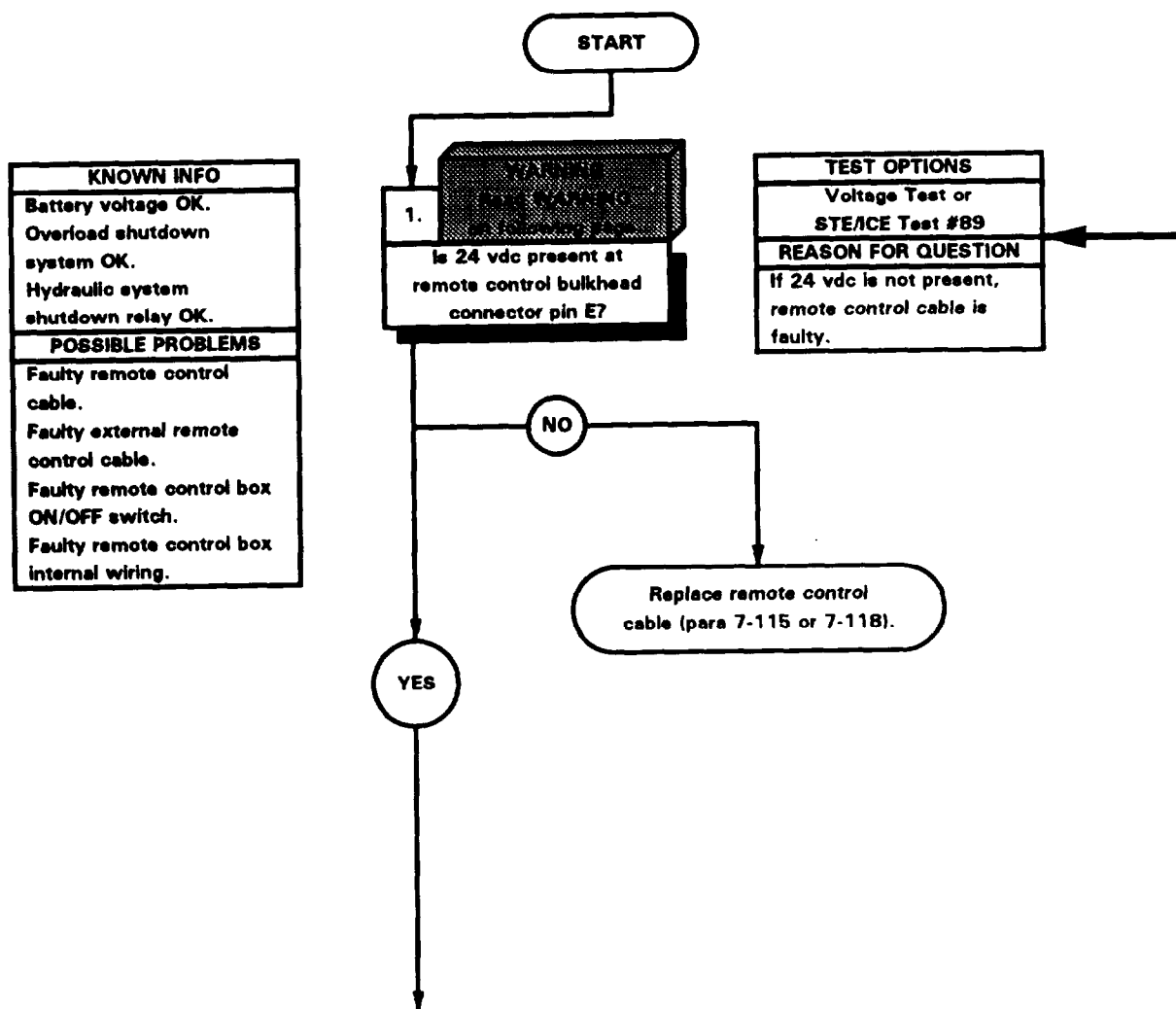
VOLTAGE TEST

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



K2E1051-

•121. M1089 MATERIAL HANDLING CRANE (MHC) DOES NOT OPERATE FROM REMOTE CONTROL	
INITIAL SETUP	
Equipment Condition Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) STE/CE-R (Item 41, Appendix C) Multimeter, Digital (Item 22, Appendix C)
Personnel Required (2)	References TM 9-4910-571-12&P

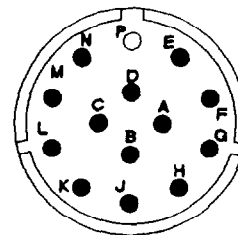
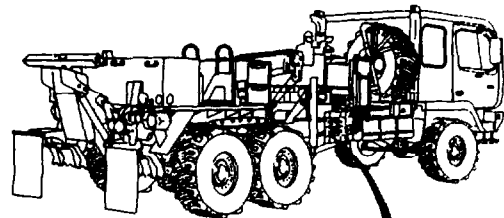


WARNING

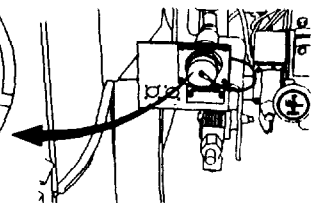
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

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



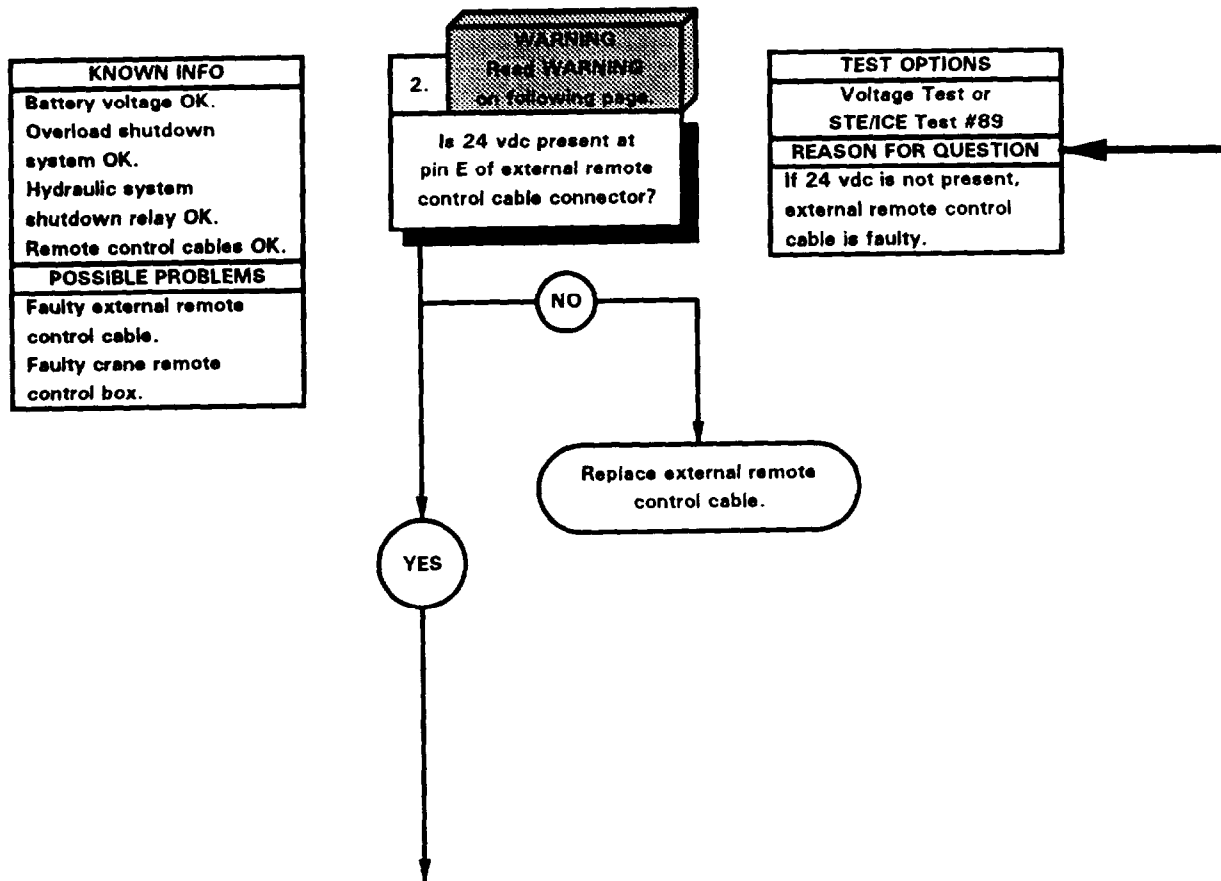
REMOTE CONTROL
CABLE BULKHEAD
CONNECTOR



REMOTE CONTROL
CABLE BULKHEAD
CONNECTOR

42EL101A

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

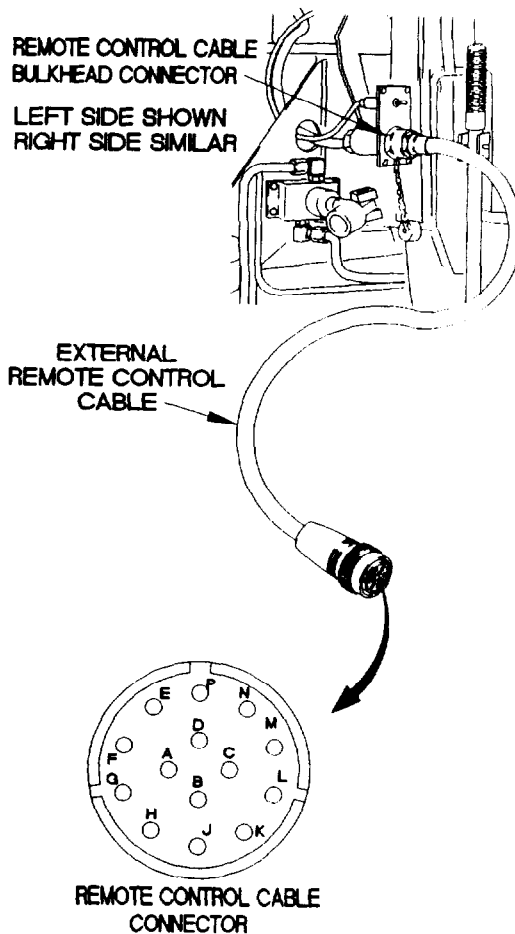


WARNING

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

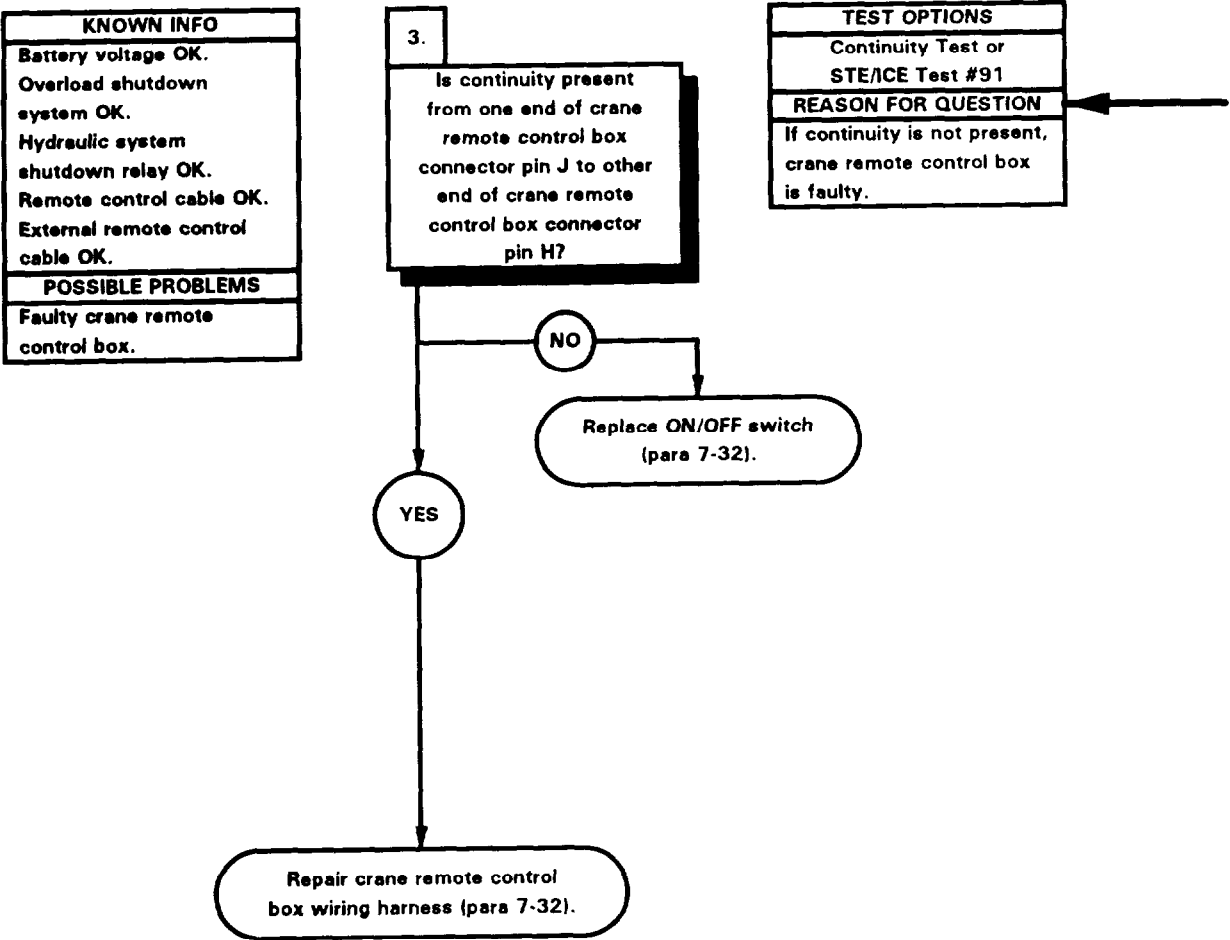
CONTINUITY TEST

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



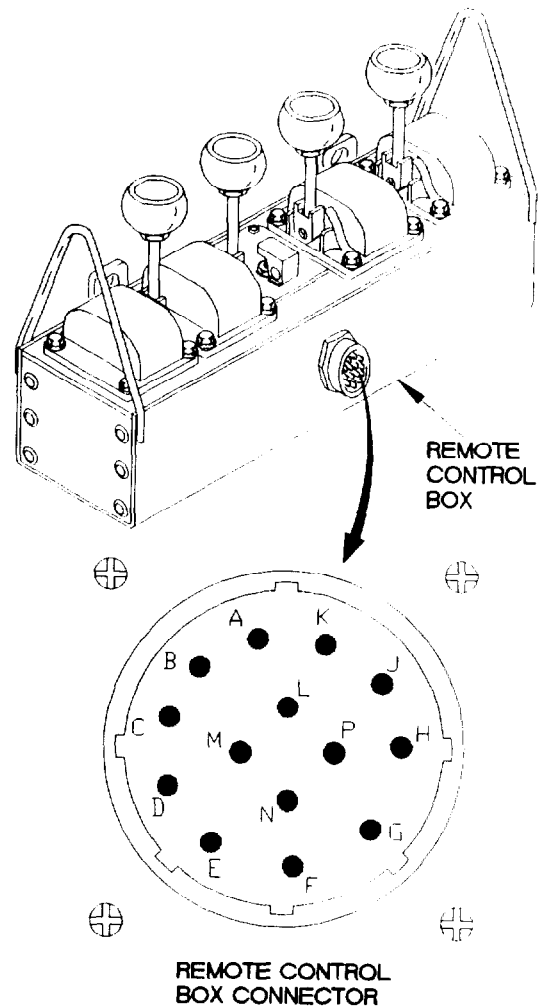
42E1062-

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



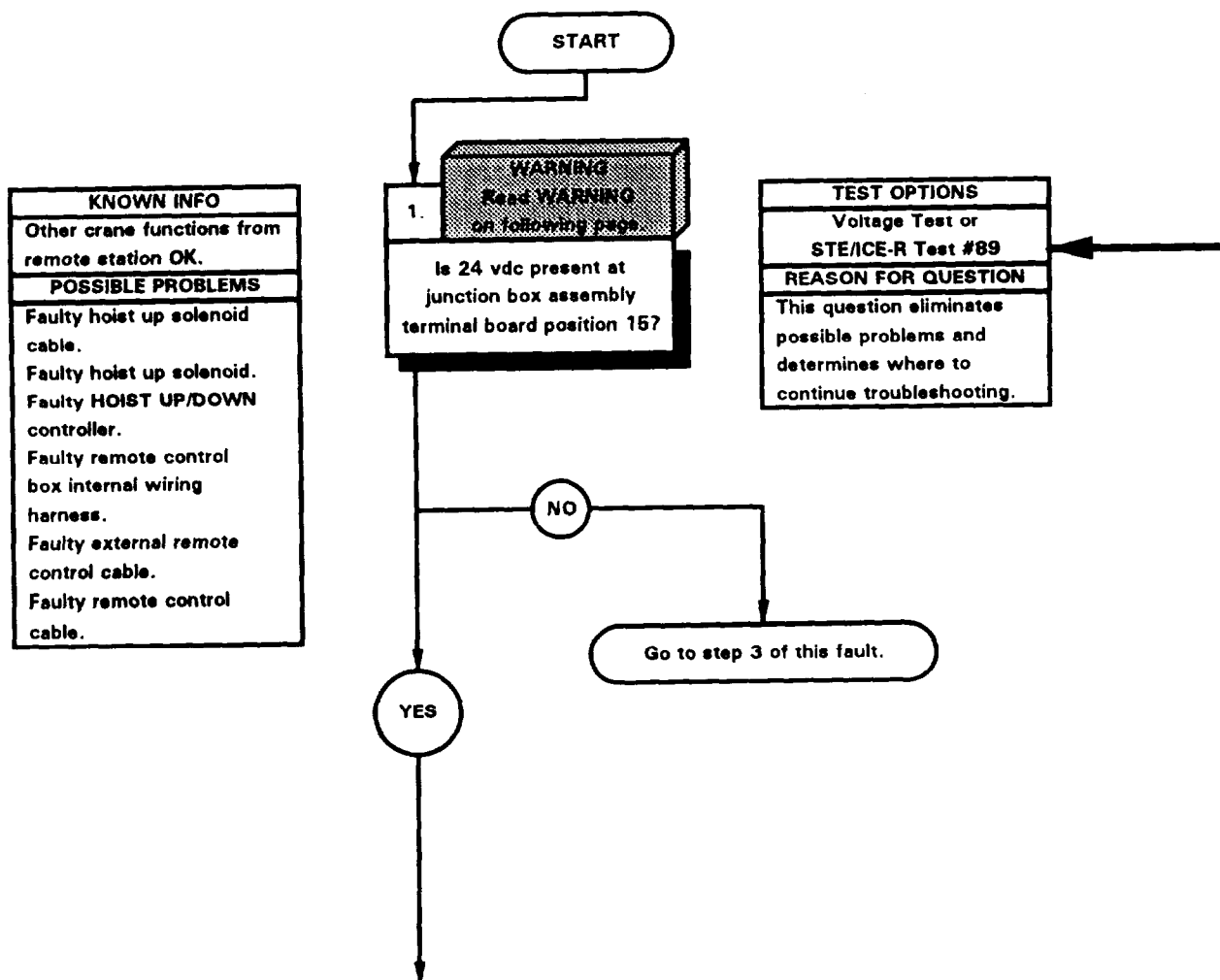
CONTINUITY TEST

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



X 2E1116-3-

•122. M1089 MATERIAL HANDLING CRANE (MHC) HOIST UP DOES NOT OPERATE FROM REMOTE STATION	
INITIAL SETUP	
Equipment Conditions Outriggers lowered (TM 9-2320-366-10-1). Crane erected with approximately five feet of cable payed out (TM 9-2320-366-10-1). Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/ICE-R (Item 41, Appendix C)
Personnel Required (2)	References TM 9-4910-571-12&P



WARNING

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

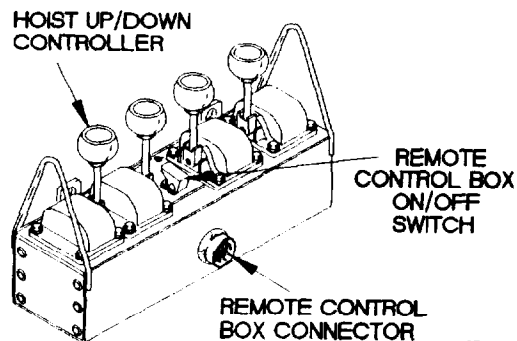
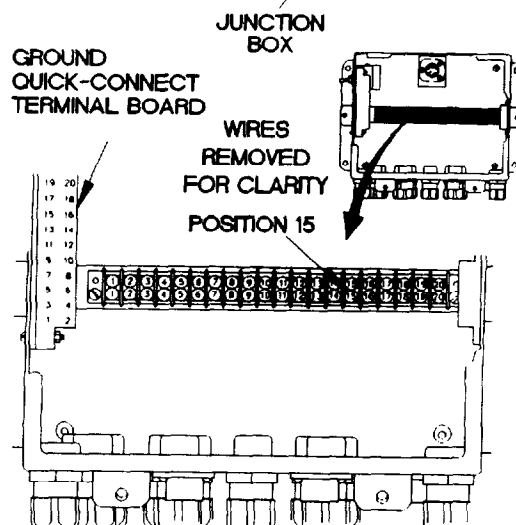
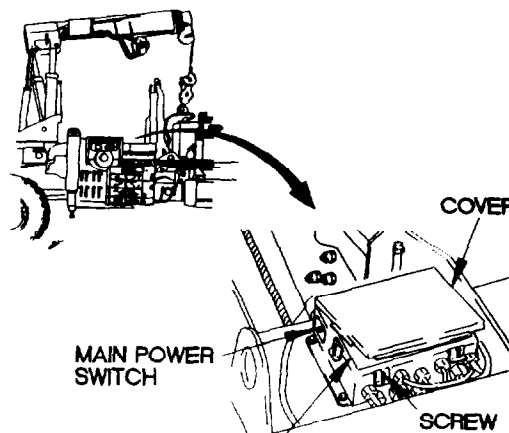
OUTPUT VOLTAGE TEST

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

NOTE

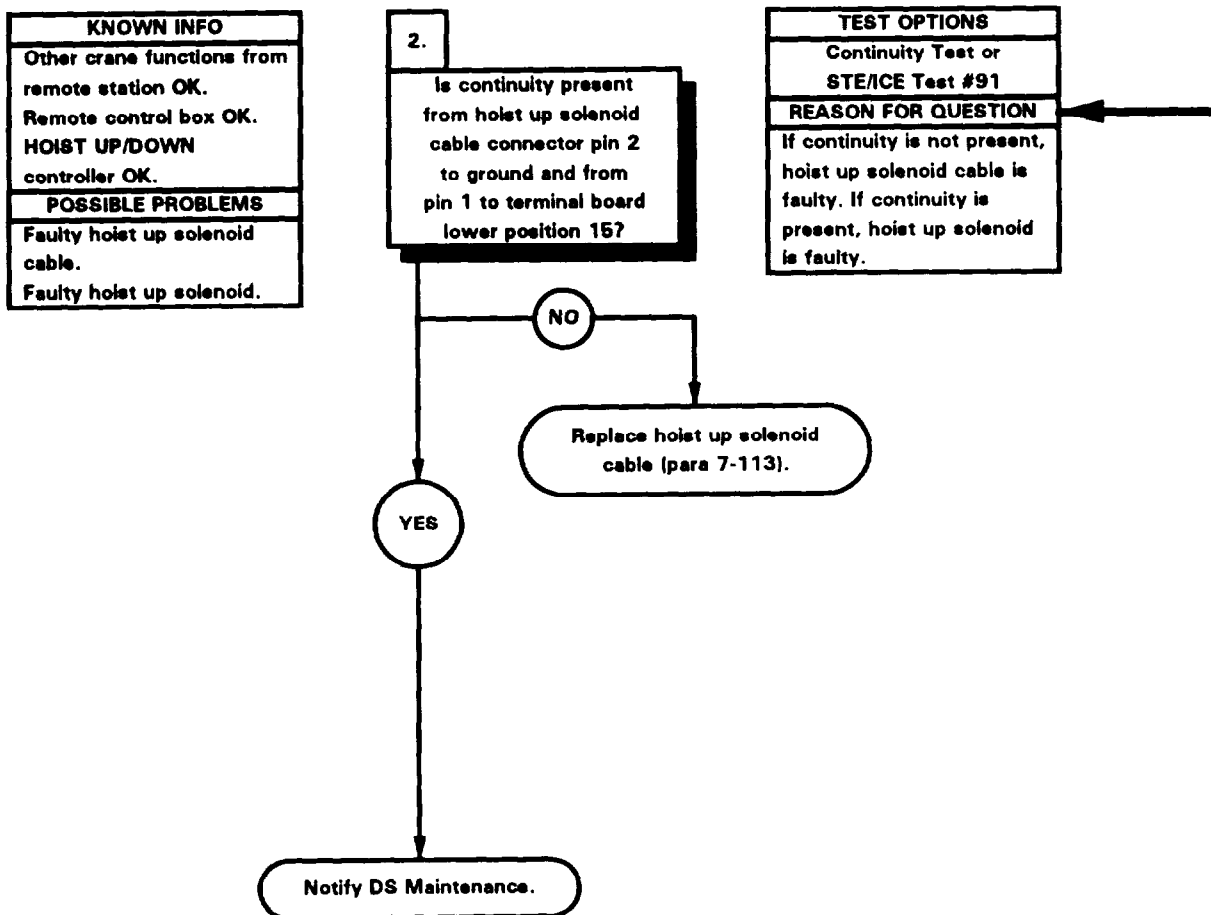
Step (9) requires the aid of an assistant.

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



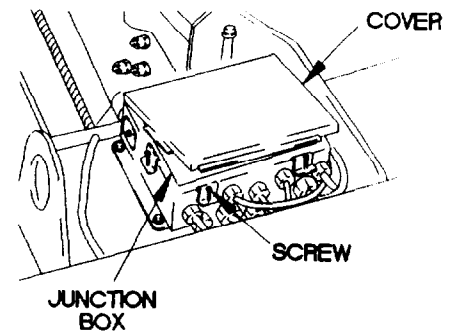
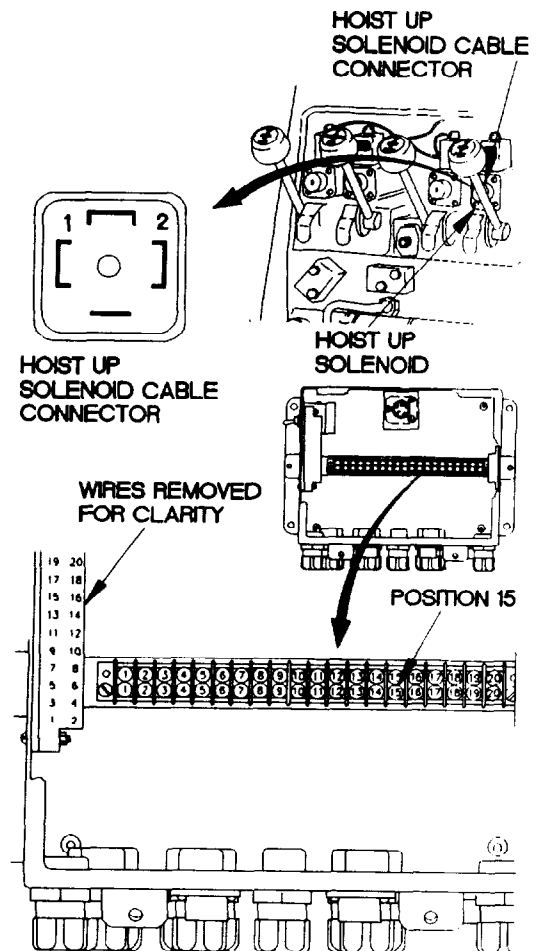
x2E1071-

6122. M1089 MATERIAL HANDLING CRANE (MHC) HOIST UP DOES NOT OPERATE FROM REMOTE STATION (CONT)



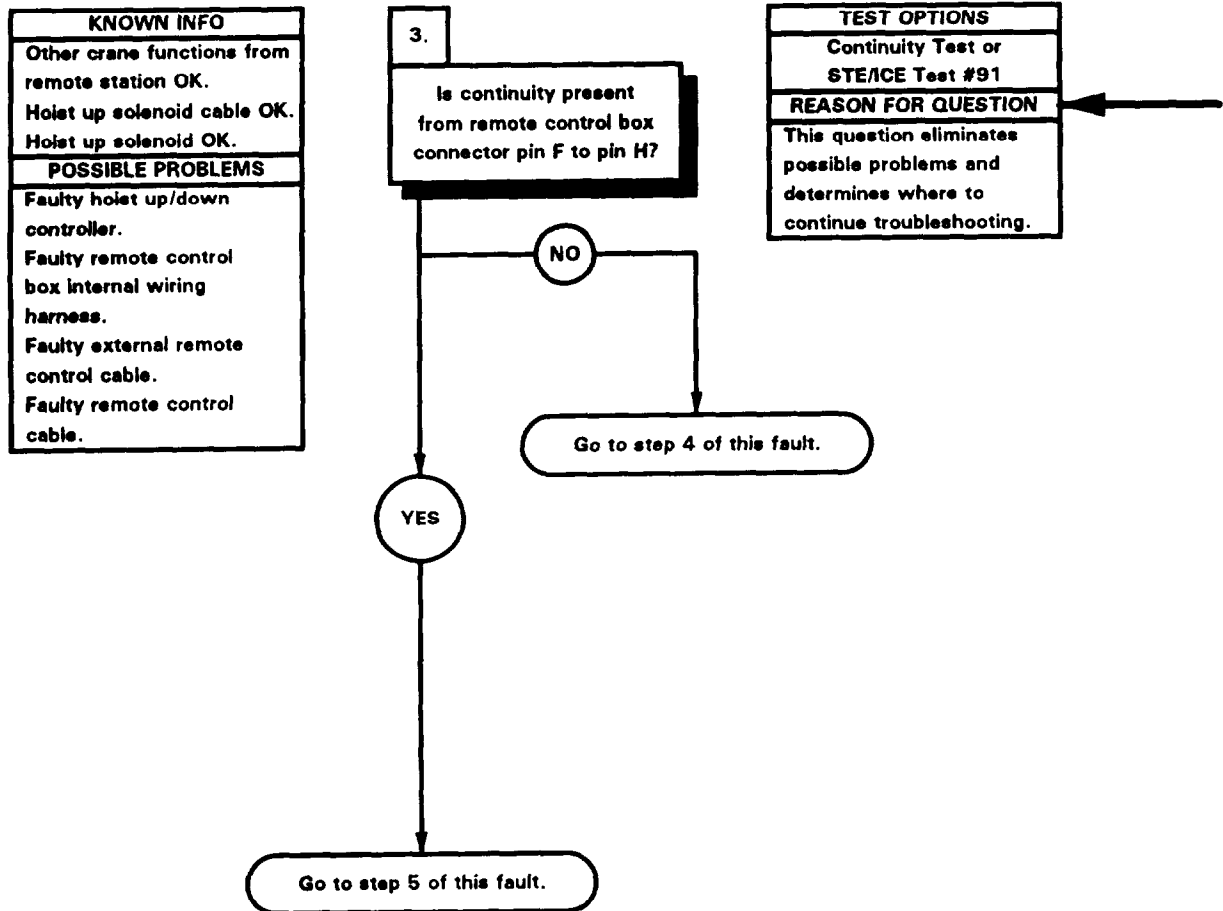
CONTINUITY TEST

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



X2E1072-

ø122. M1089 MATERIAL HANDLING CRANE (MHC) HOIST UP DOES NOT OPERATE FROM REMOTE STATION (CONT)



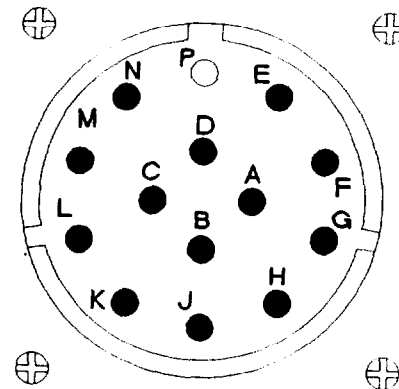
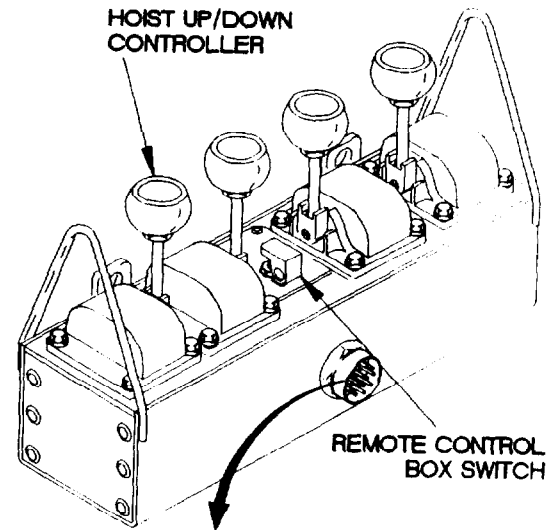
CONTINUITY TEST

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

NOTE

Step (6) requires the aid of an assistant.

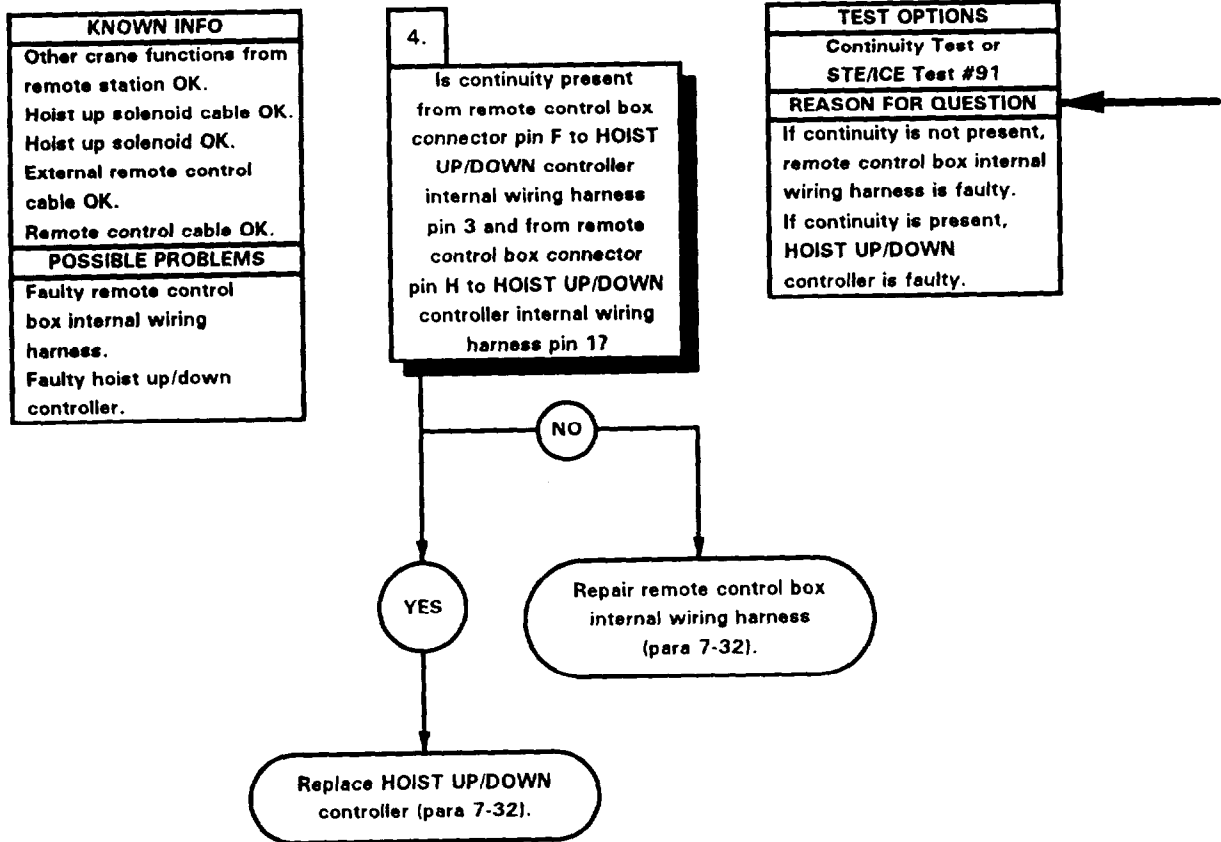
- (6) Position HOIST UP/DOWN controller to UP and note reading on multimeter.
- (7) If continuity is not present, go to step 4 of this fault.
- (8) If continuity is present, go to step 5 of this fault.
- (9) Position remote control box switch to OFF.



REMOTE CONTROL BOX CONNECTOR

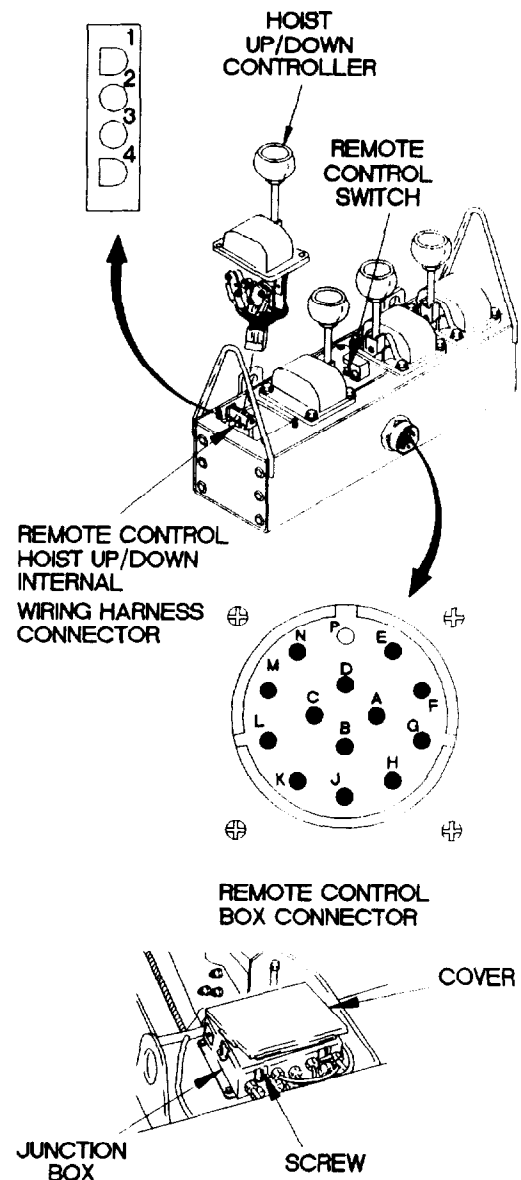
x2E1073-

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



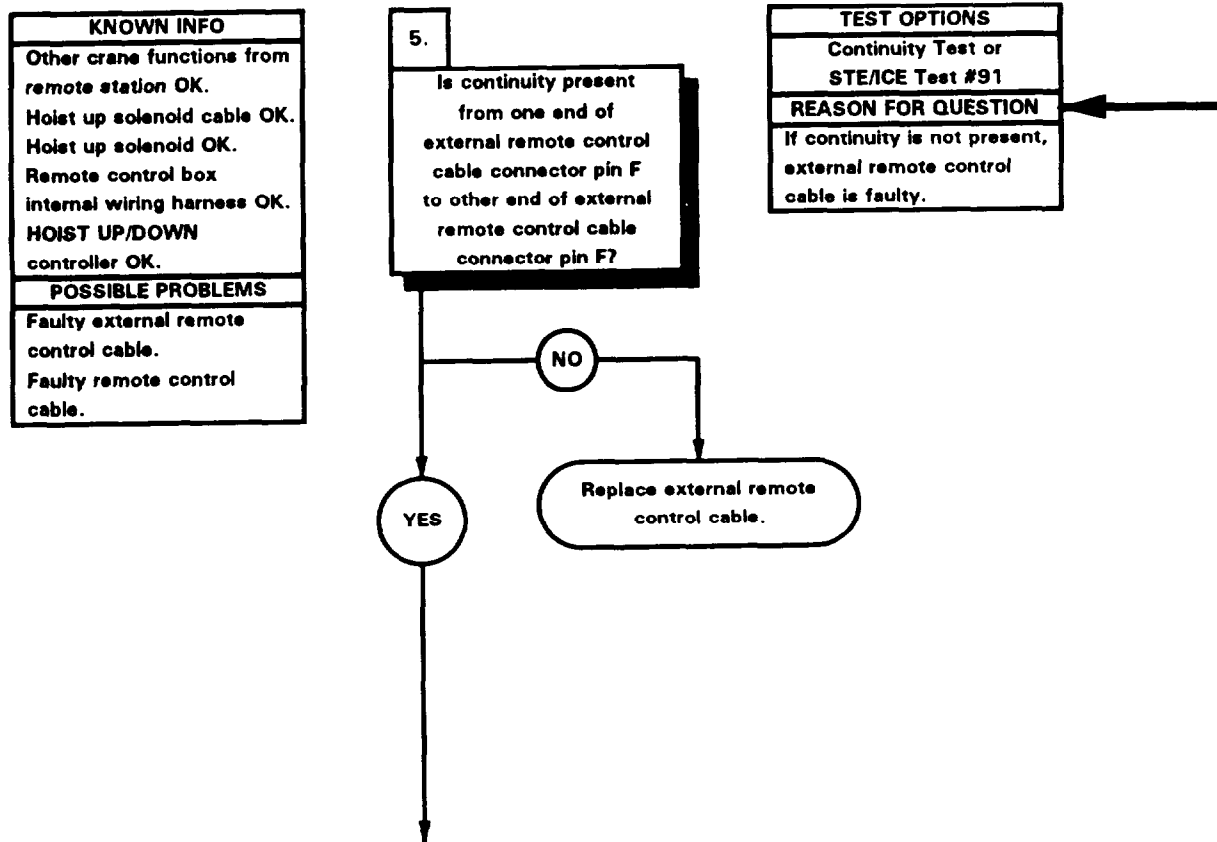
CONTINUITY TEST

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



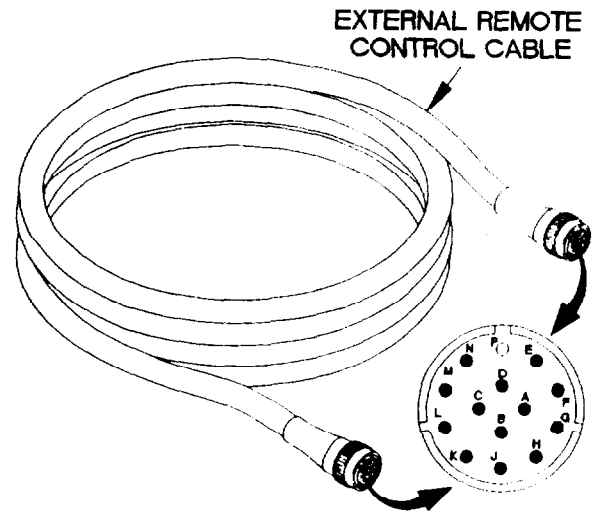
x261074-

ø122. M1089 MATERIAL HANDLING CRANE (MHC) HOIST UP DOES NOT OPERATE FROM REMOTE STATION (CONT)



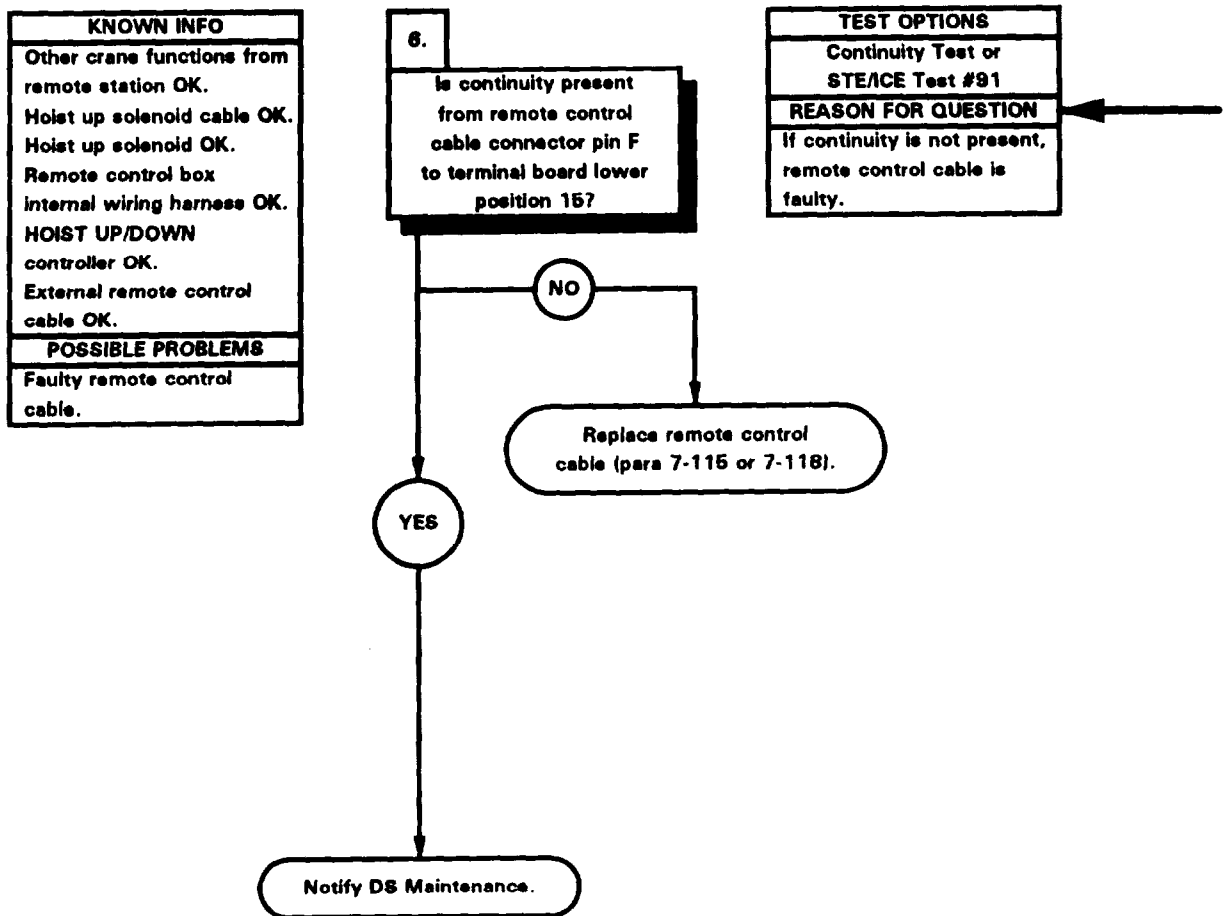
CONTINUITY TEST

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



42E1075-

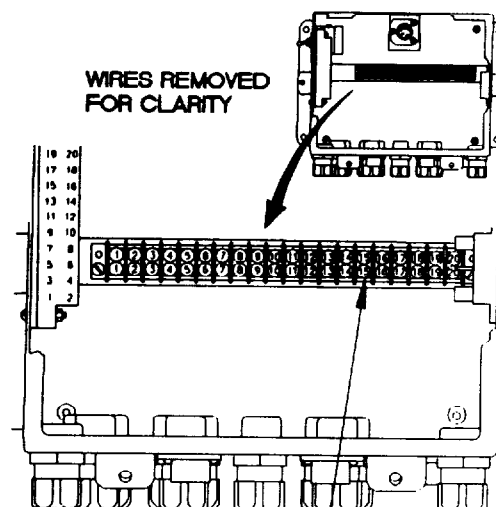
e122. M1089 MATERIAL HANDLING CRANE (MHC) HOIST UP DOES NOT OPERATE FROM REMOTE STATION (CONT)



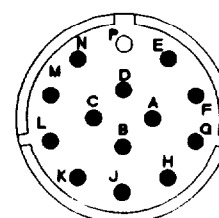
CONTINUITY TEST

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

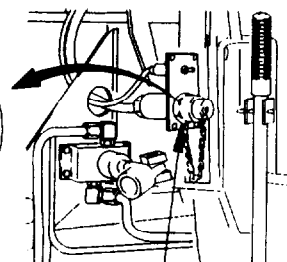
WIRES REMOVED FOR CLARITY



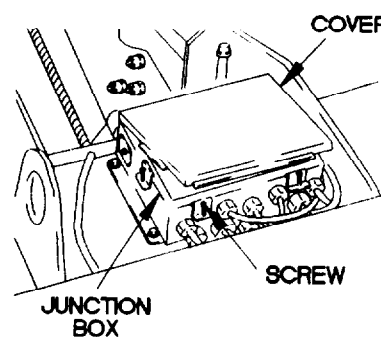
POSITION 15



REMOTE CONTROL CABLE CONNECTOR



REMOTE CONTROL CABLE CONNECTOR



JUNCTION BOX

SCREW

42E1076-

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

INITIAL SETUP

Equipment Conditions

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

Tools and Special Tools

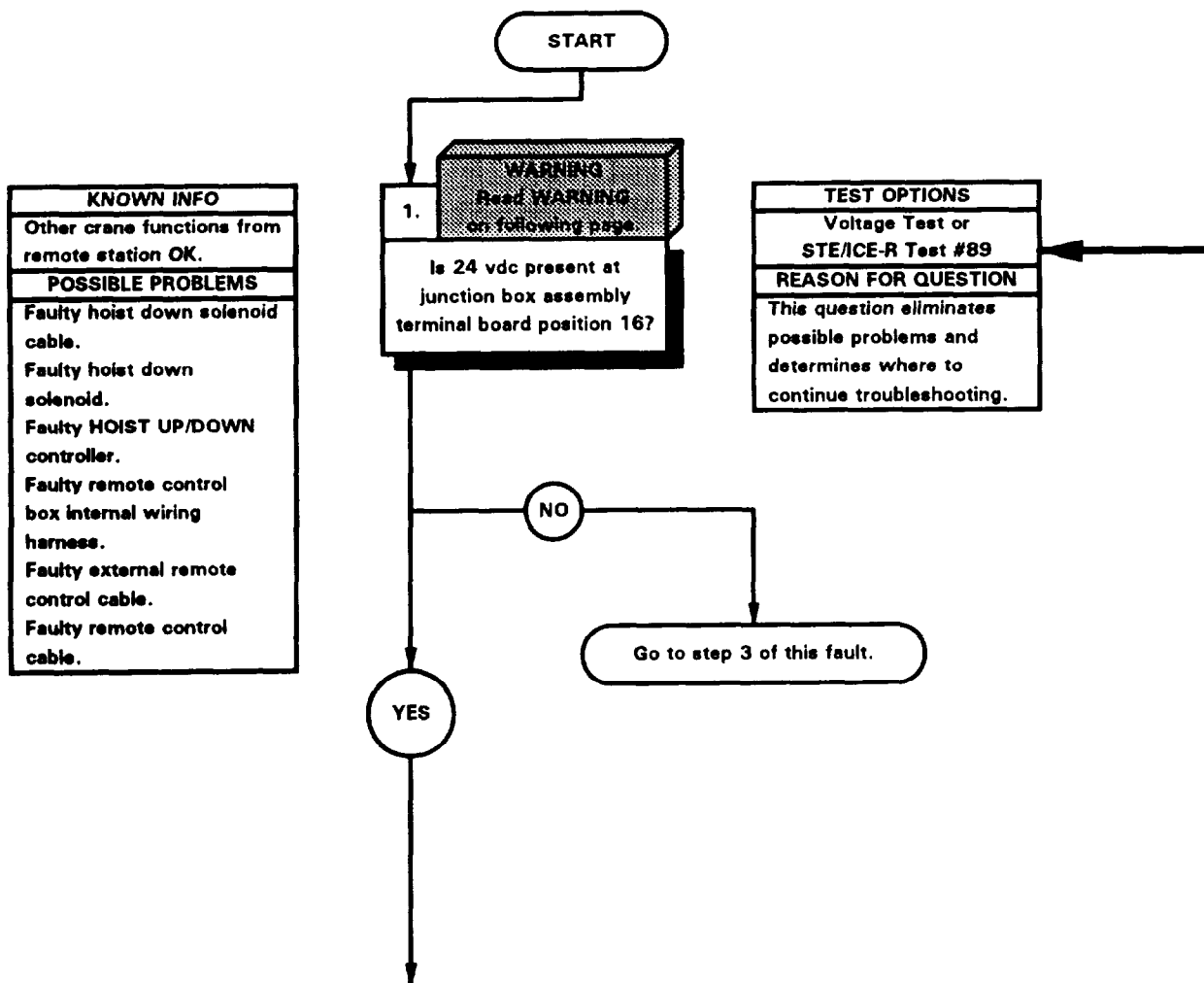
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

References

TM 9-4910-571-12&P

Personnel Required

(2)



WARNING

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

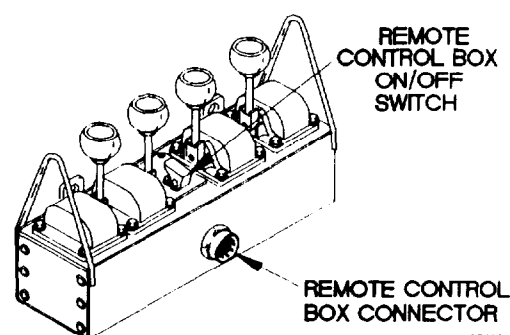
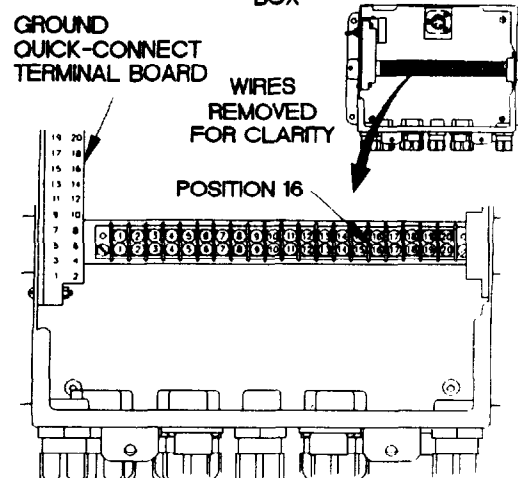
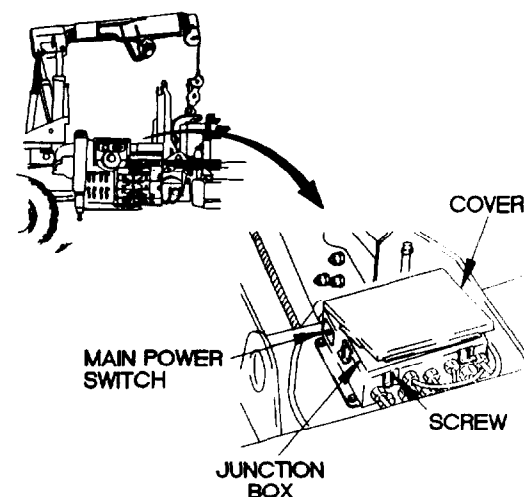
OUTPUT VOLTAGE TEST

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

NOTE

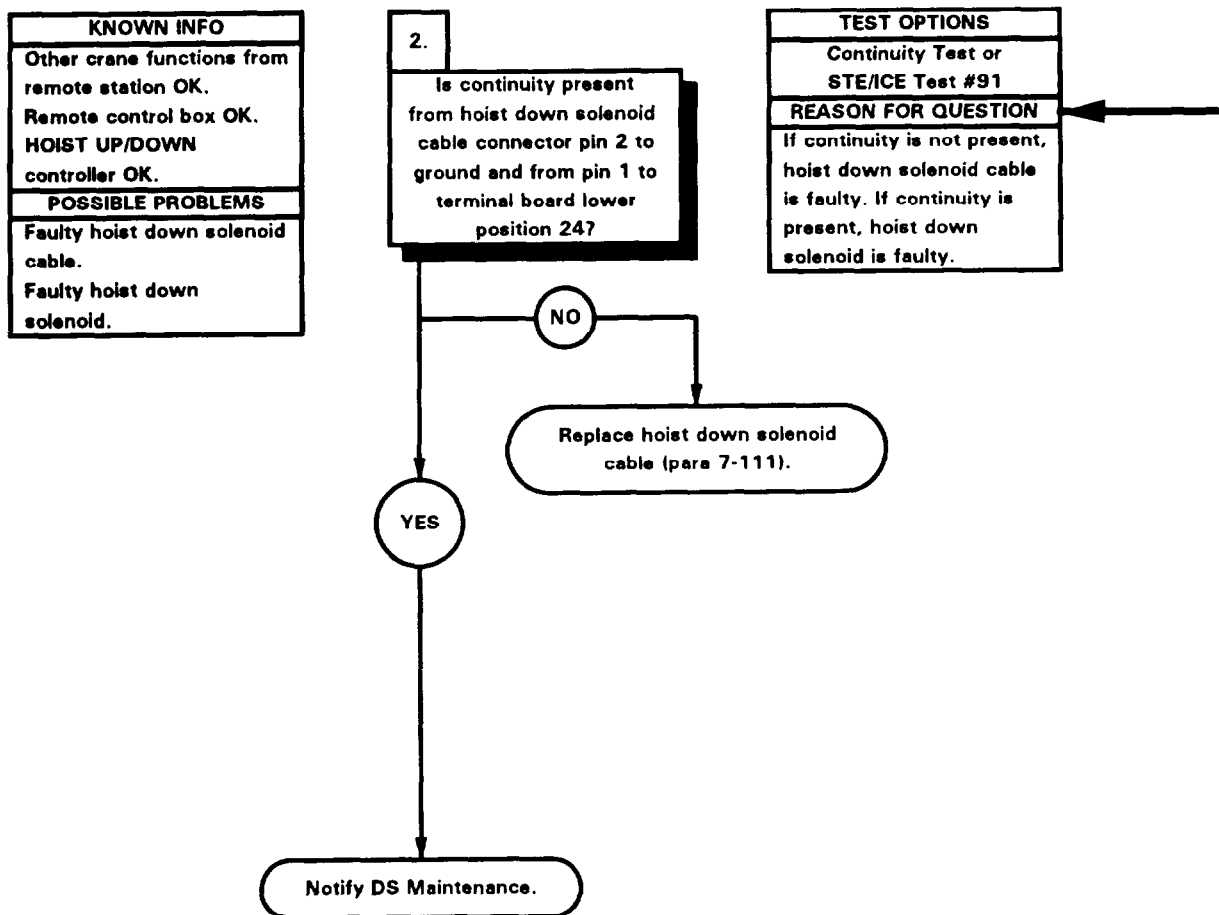
Step (9) requires the aid of an assistant.

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



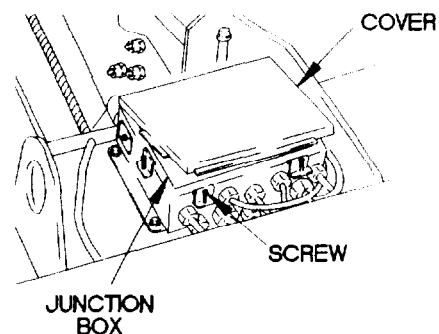
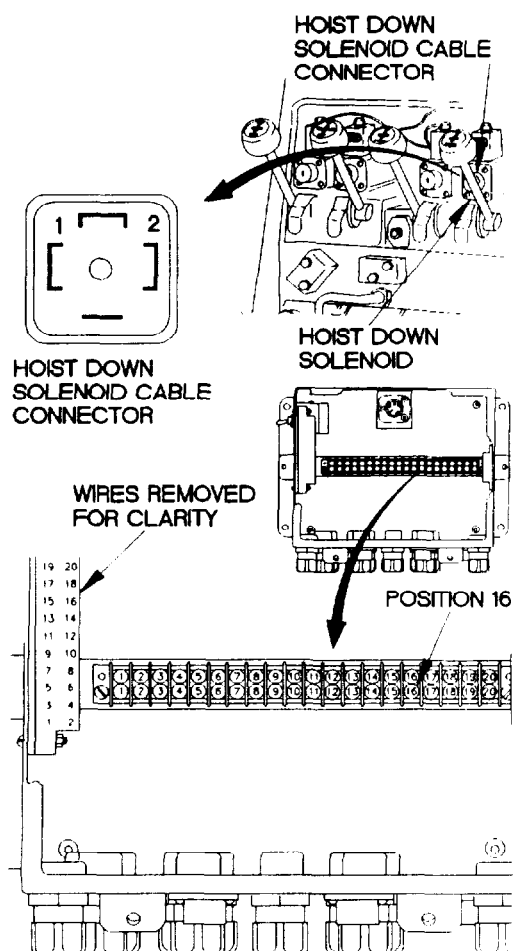
X2C1081-

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



CONTINUITY TEST

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



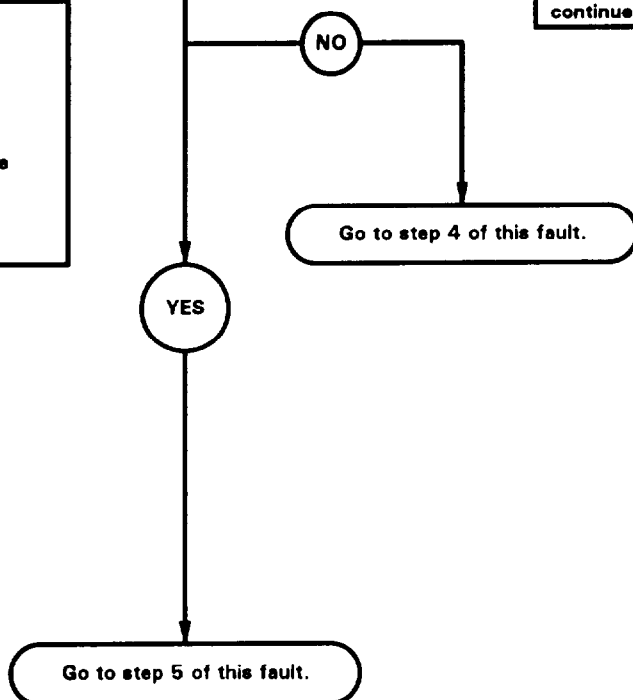
*2E1084-

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

KNOWN INFO
Other crane functions from remote station OK. Hoist down solenoid cable OK. Hoist down solenoid OK.
POSSIBLE PROBLEMS
Faulty hoist up/down controller. Faulty remote control box internal wiring harness. Faulty external remote control cable. Faulty remote control cable.

3.
Is continuity present from remote control box connector pin G to pin H7?

TEST OPTIONS
Continuity Test or STE/ICE Test #91
REASON FOR QUESTION
This question eliminates possible problems and determines where to continue troubleshooting.



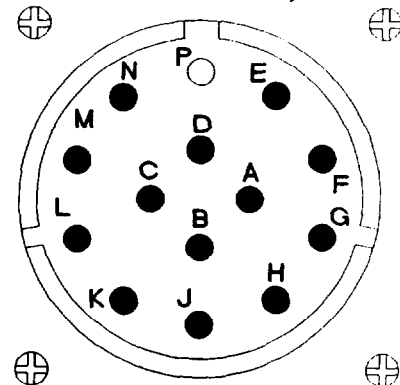
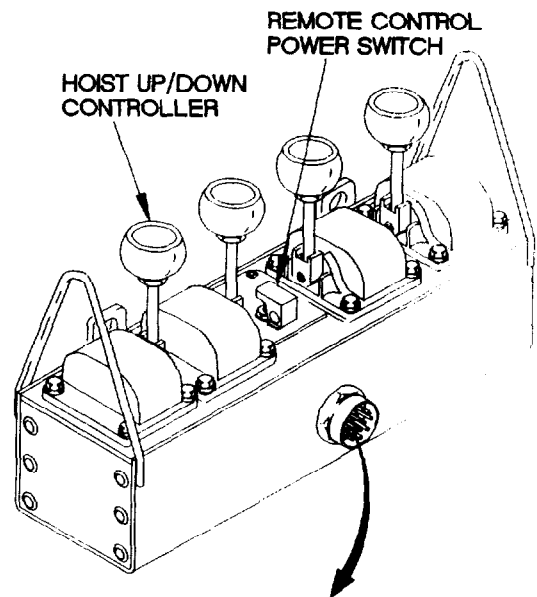
CONTINUITY TEST

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

NOTE

Step (6) requires the aid of an assistant.

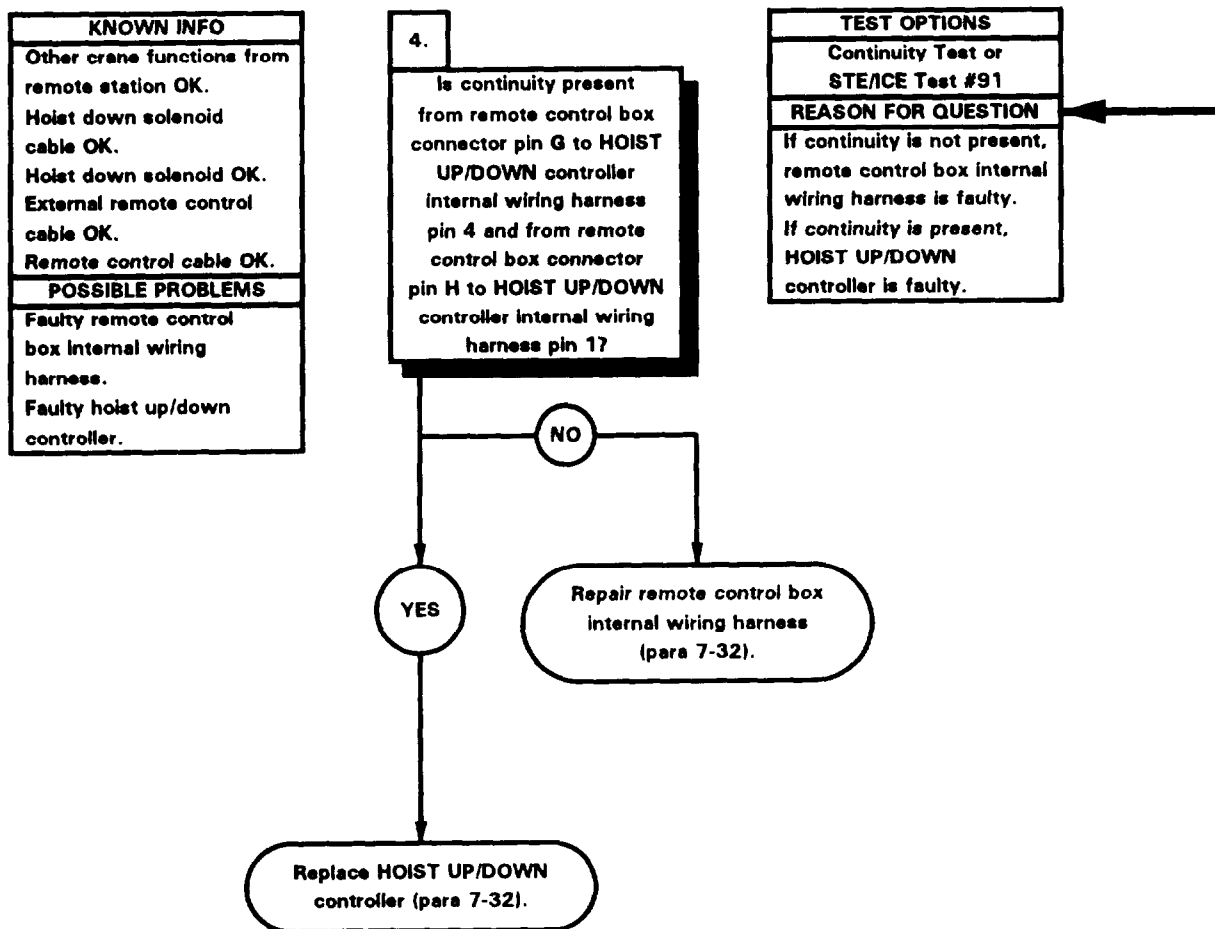
- (6) Position HOIST UP/DOWN controller to DOWN and note reading on multimeter.
- (7) If continuity is not present, go to step 4 of this fault.
- (8) If continuity is present, go to step 5 of this fault.
- (9) Position remote control box switch to OFF.



REMOTE CONTROL
BOX CONNECTOR

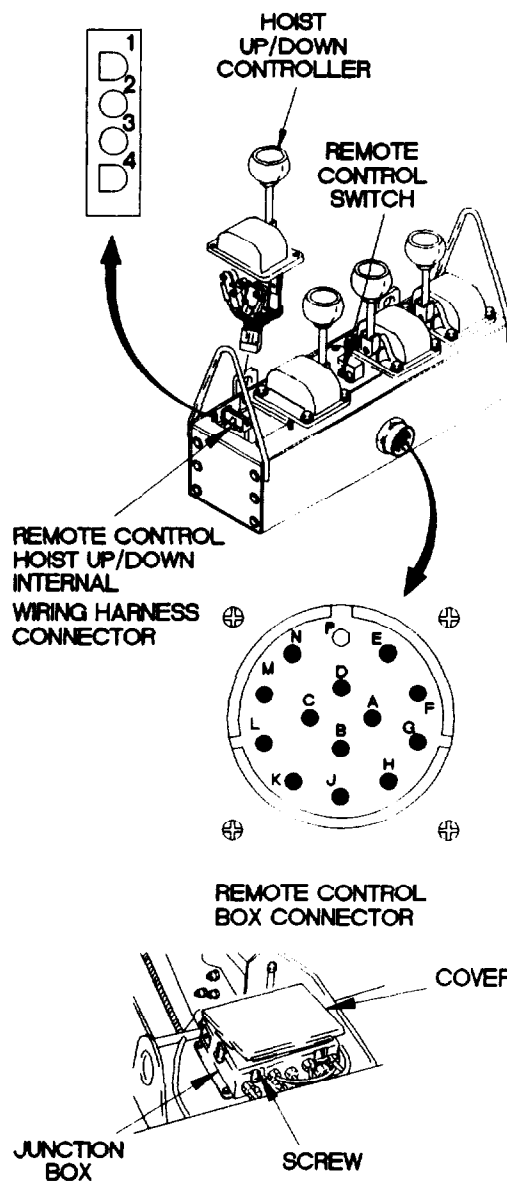
42E1503

ø123. M1089 MATERIAL HANDLING CRANE (MHC) HOIST DOWN DOES NOT OPERATE FROM REMOTE STATION (CONT)



CONTINUITY TEST

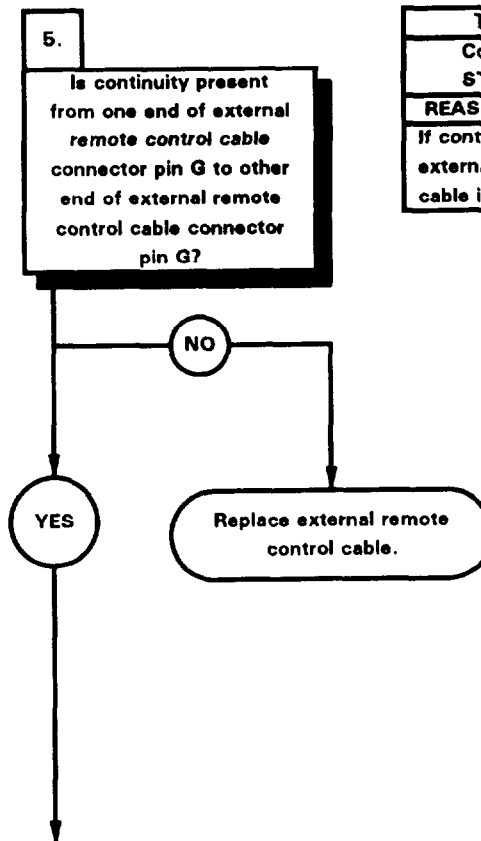
- (1) Remove HOIST UP/DOWN controller (para 7-32).
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter on pin G of remote control box connector.
- (4) Connect negative (-) probe of multimeter on pin 4 of HOIST UP/DOWN controller internal wiring harness and note reading on multimeter.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



K2E1082-

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

KNOWN INFO
Other crane functions from remote station OK. Hoist down solenoid cable OK. Hoist down solenoid OK. Remote control box internal wiring harness OK. HOIST UP/DOWN controller OK.
POSSIBLE PROBLEMS
Faulty external remote control cable. Faulty remote control cable.

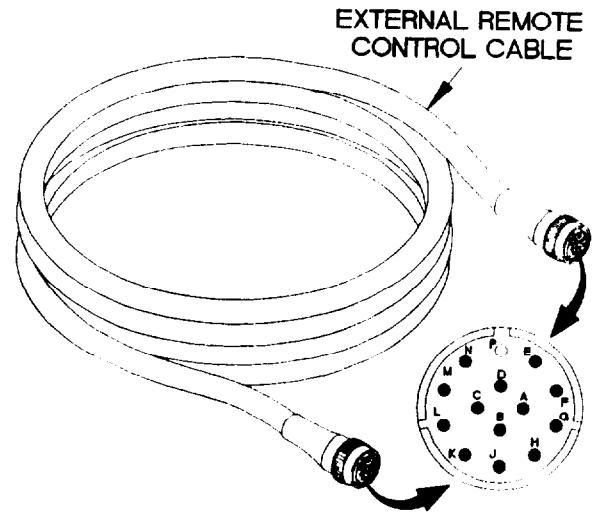


TEST OPTIONS
Continuity Test or STE/CE Test #91
REASON FOR QUESTION
If continuity is not present, external remote control cable is faulty.



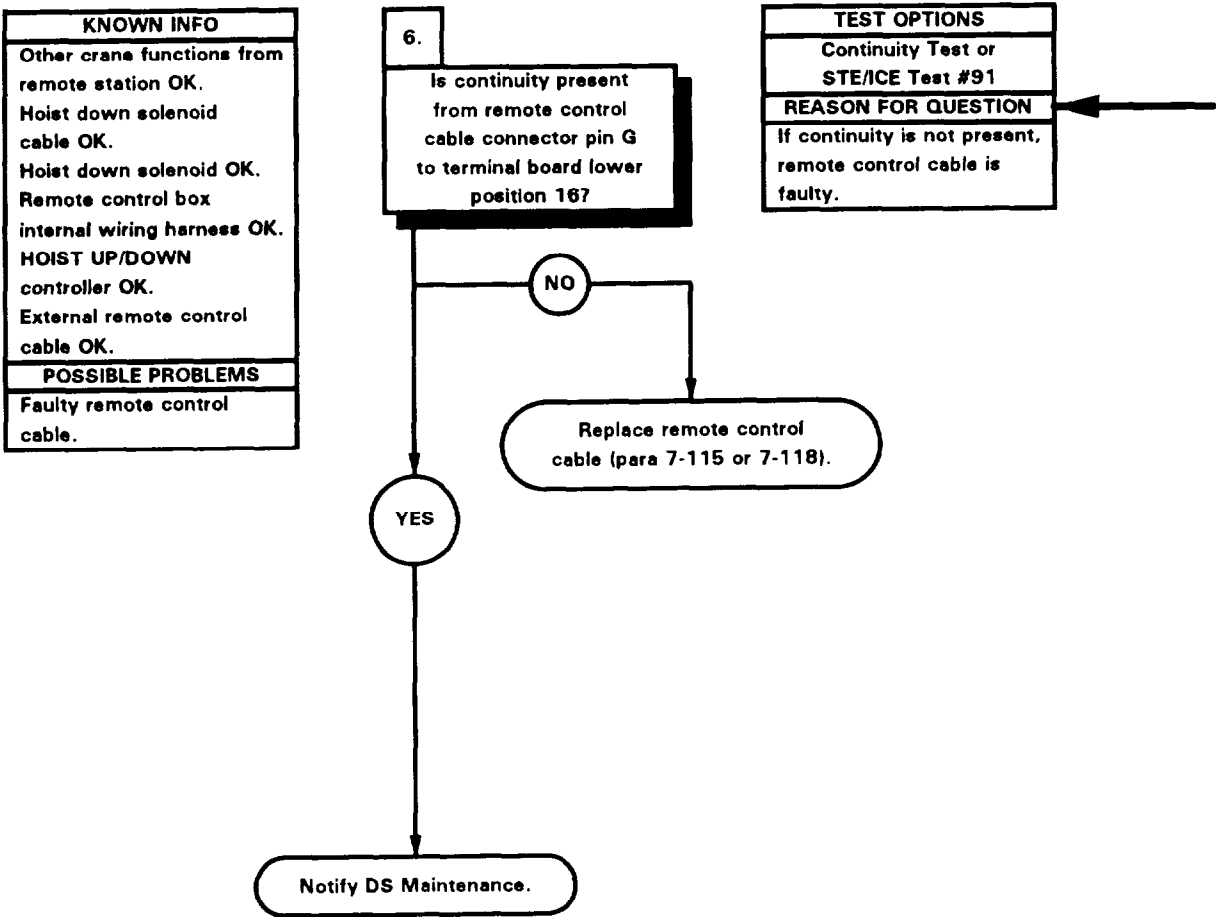
CONTINUITY TEST

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



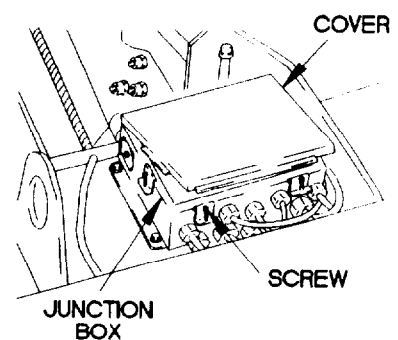
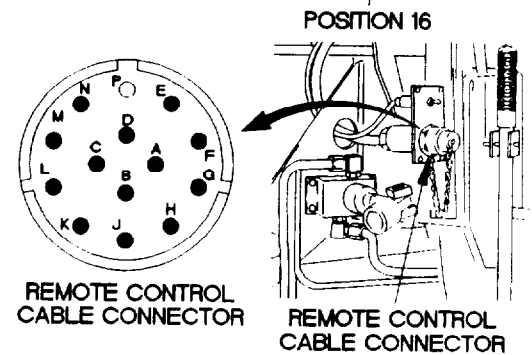
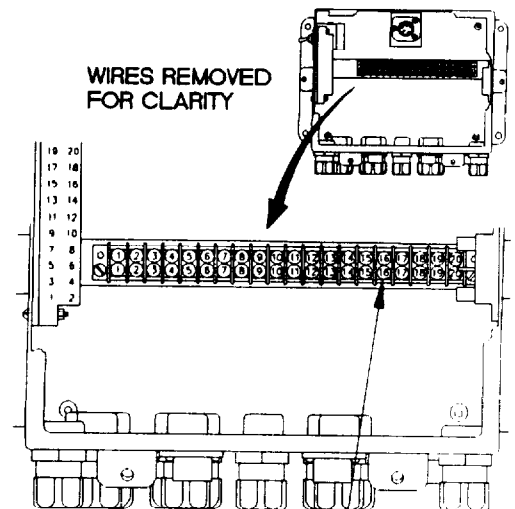
X2E1087-

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



CONTINUITY TEST

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



42E10/Re-

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

INITIAL SETUP

Equipment Conditions

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

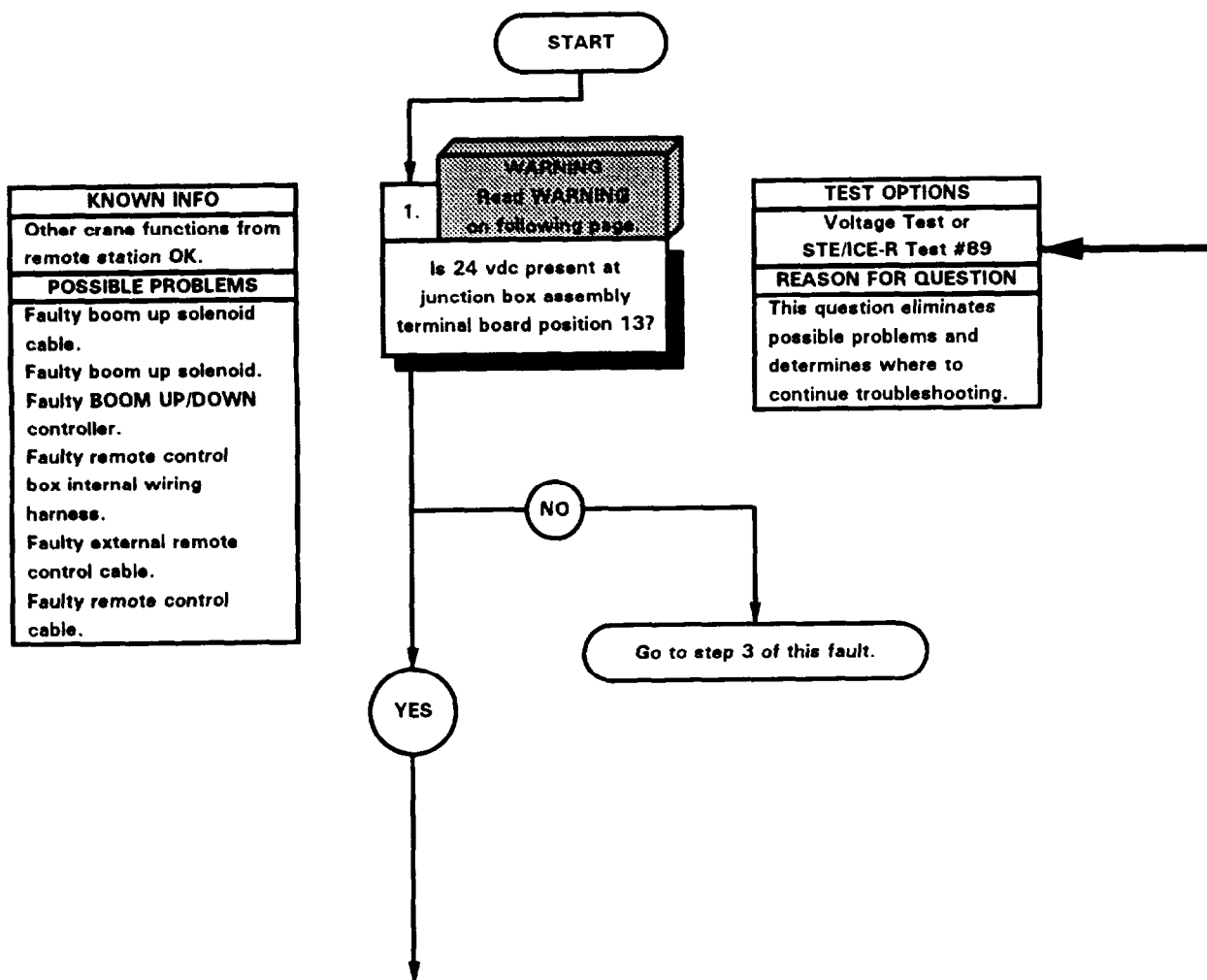
Personnel Required
(2)

Tools and Special Tools

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

References

TM 9-4910-571-12&P



WARNING

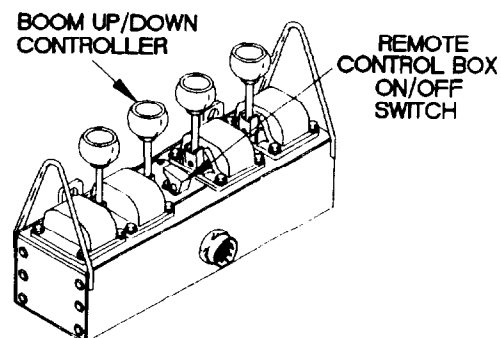
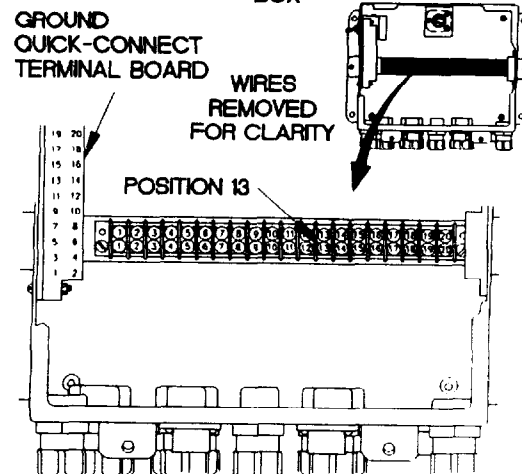
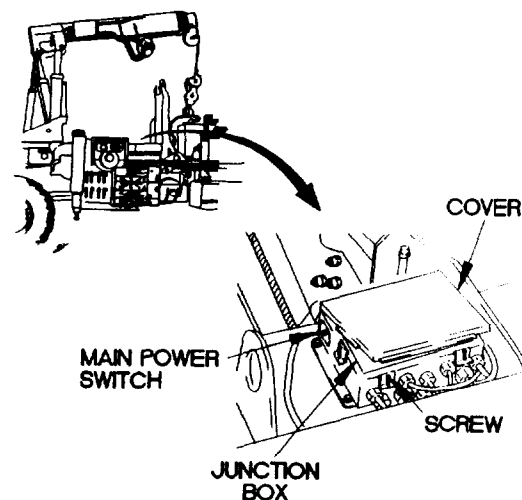
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short circuit across electrical circuits and cause severe burns or electrical shock.

OUTPUT VOLTAGE TEST

- (1) Connect external remote control cable to remote control box (TM 9-2320-366-10-1).
- (2) Loosen four screws on junction box.
- (3) Open cover on junction box.
- (4) Position MAIN POWER switch to ON.
- (5) Lift guard and position remote control box ON/OFF switch to ON.
- (6) Set multimeter to volts dc.
- (7) Connect positive (+) probe of multimeter on terminal board lower position 13.
- (8) Connect negative (-) probe of multimeter on ground quick-connect terminal board (above MAIN POWER switch).
- (9) Position BOOM UP/DOWN controller to UP and note reading on multimeter.
- (10) If 24 volts dc is not present, go to step 3 of this fault.
- (11) Position MAIN POWER switch to OFF.

NOTE

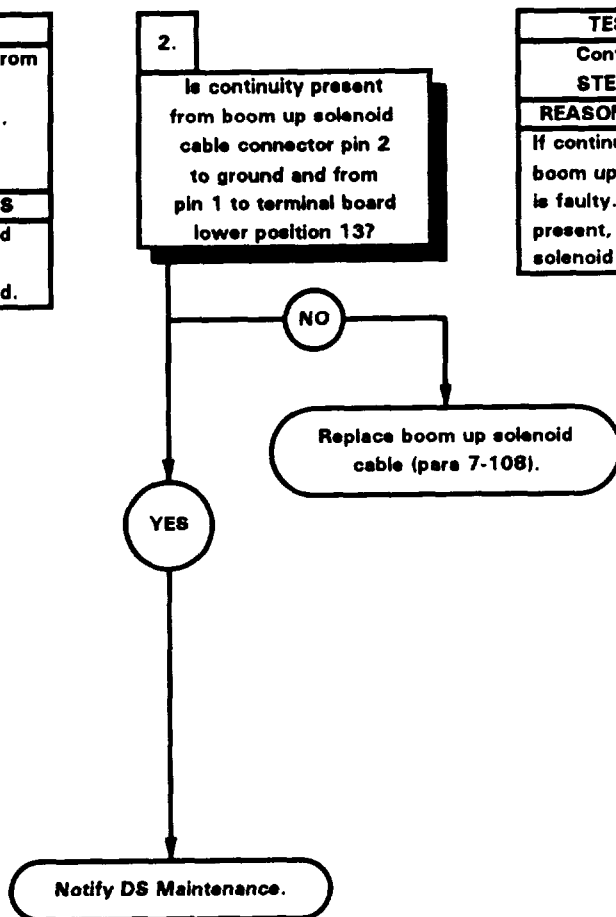
Step (9) requires the aid of an assistant.



A2E1091-

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

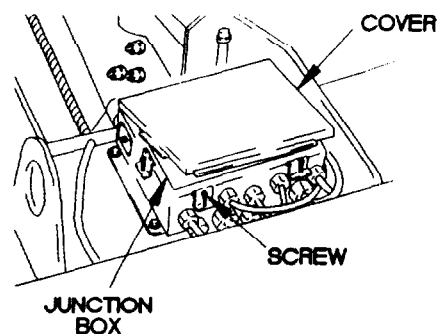
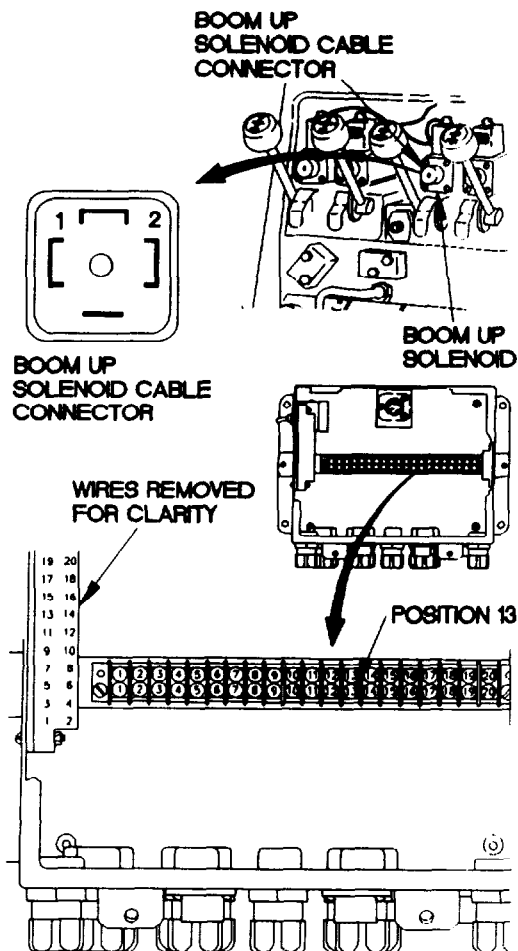
KNOWN INFO
Other crane functions from remote station OK. Remote control box OK. BOOM UP/DOWN controller OK.
POSSIBLE PROBLEMS
Faulty boom up solenoid cable. Faulty boom up solenoid.



TEST OPTIONS
Continuity Test or STE/CE Test #91
REASON FOR QUESTION
If continuity is not present, boom up solenoid cable is faulty. If continuity is present, boom up solenoid is faulty.

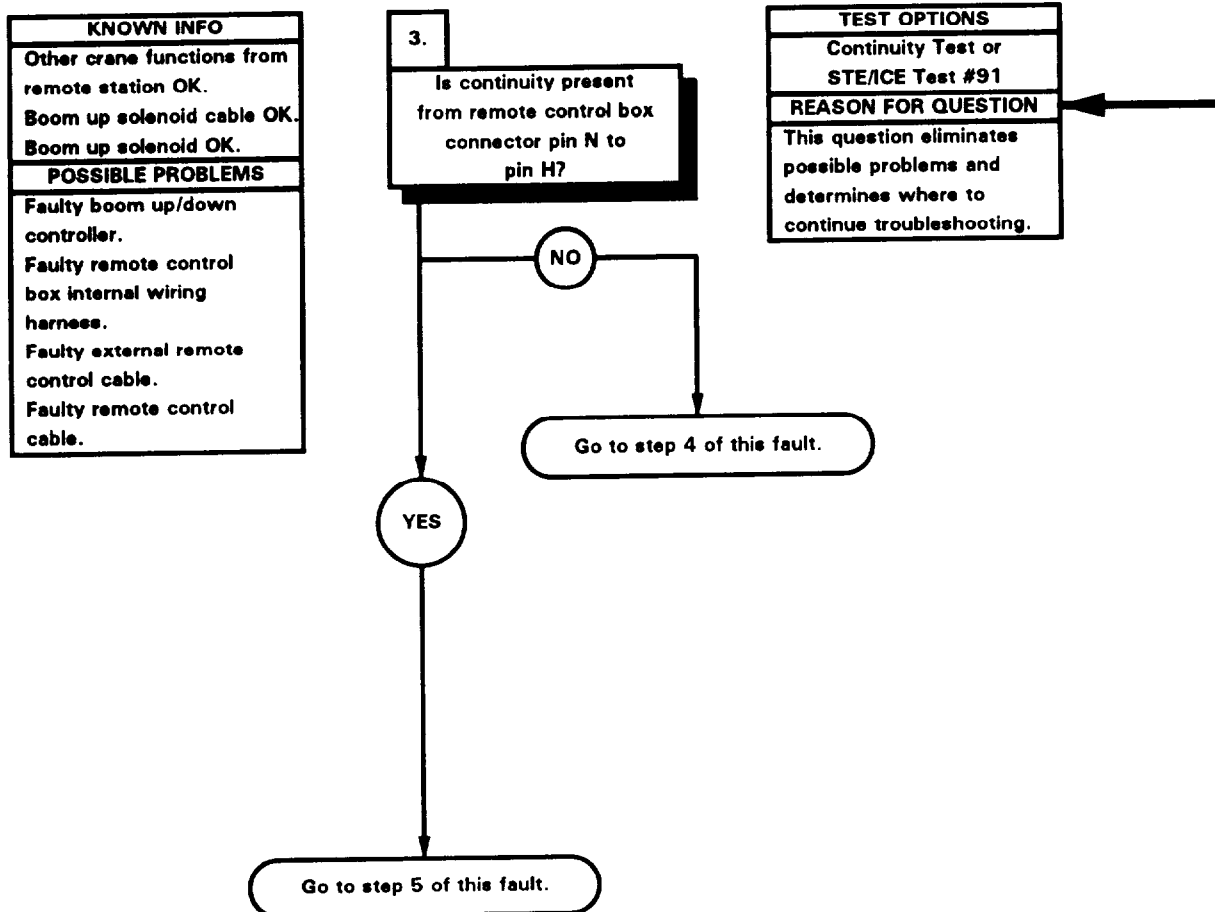
CONTINUITY TEST

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



x2E1092-

ø124. M1089 MATERIAL HANDLING CRANE (MHC) BOOM UP DOES NOT OPERATE FROM REMOTE STA-
TION (CONT)



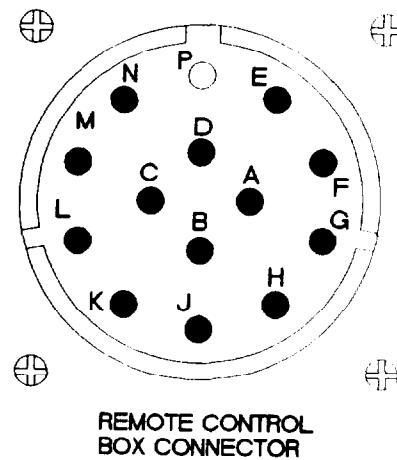
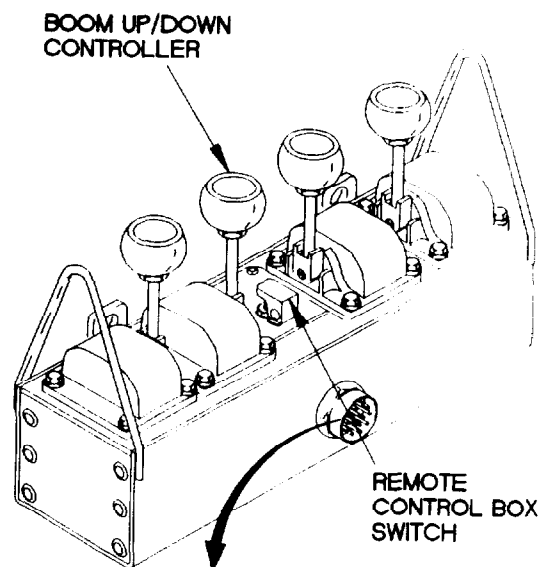
CONTINUITY TEST

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

NOTE

Step (6) requires the aid of an assistant.

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



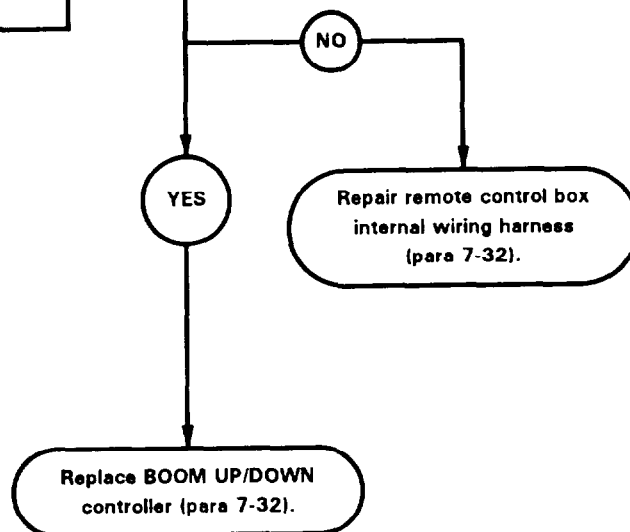
K2E1093-

ø124. M1089 MATERIAL HANDLING CRANE (MHC) BOOM UP DOES NOT OPERATE FROM REMOTE STATION (CONT)

KNOWN INFO
Other crane functions from remote station OK. Boom up solenoid cable OK. Boom up solenoid OK. External remote control cable OK. Remote control cable OK.
POSSIBLE PROBLEMS
Faulty remote control box internal wiring harness. Faulty boom up/down controller.

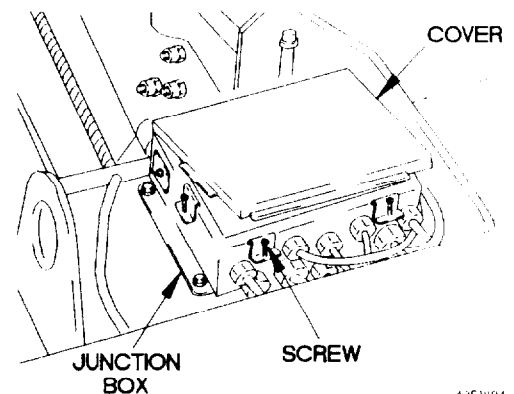
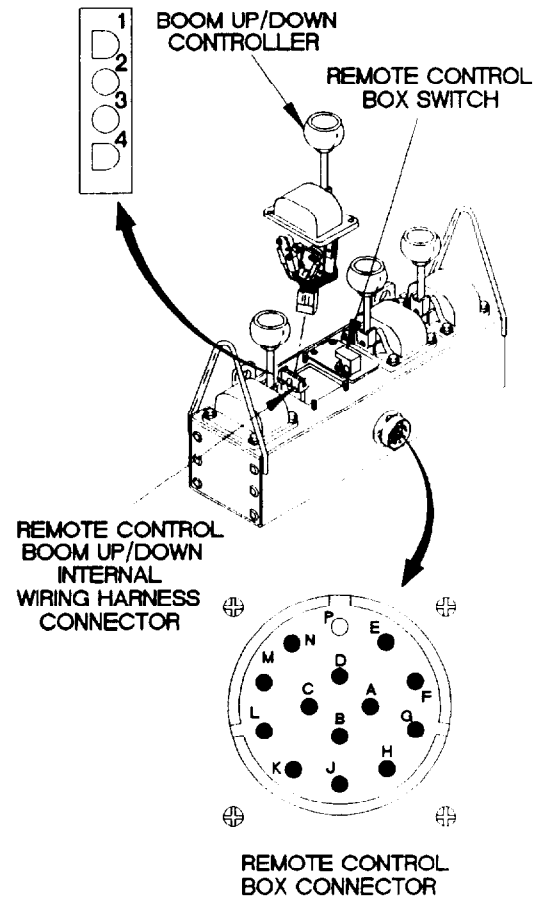
4.
Is continuity present from remote control box connector pin N to BOOM UP/DOWN controller internal wiring harness pin 3 and from remote control box connector pin N to BOOM UP/DOWN controller internal wiring harness pin 1?

TEST OPTIONS
Continuity Test or STE/CE Test #91
REASON FOR QUESTION
If continuity is not present, remote control box internal wiring harness is faulty. If continuity is present, BOOM UP/DOWN controller is faulty.



CONTINUITY TEST

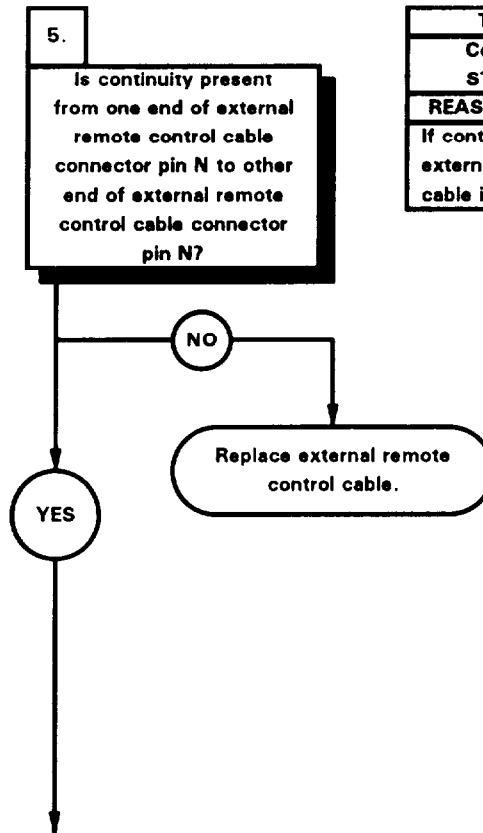
- (1) Remove BOOM UP/DOWN controller (para 7-32).
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter on pin N of remote control box connector.
- (4) Connect negative (-) probe of multimeter on pin 3 of BOOM UP/DOWN controller internal wiring harness and note reading on multimeter.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



42E1194-

ø124. M1089 MATERIAL HANDLING CRANE (MHC) BOOM UP DOES NOT OPERATE FROM REMOTE STA-
TION (CONT)

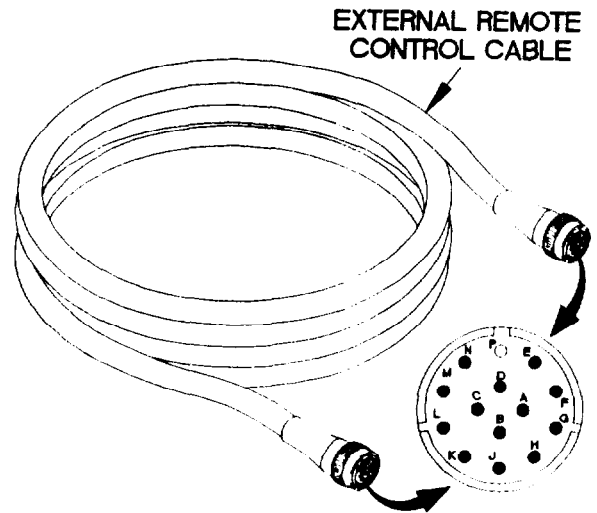
KNOWN INFO
Other crane functions from remote station OK. Boom up solenoid cable OK. Boom up solenoid OK. Remote control box internal wiring harness OK. BOOM UP/DOWN controller OK.
POSSIBLE PROBLEMS
Faulty external remote control cable. Faulty remote control cable.



TEST OPTIONS
Continuity Test or STE/ICE Test #91
REASON FOR QUESTION
If continuity is not present, external remote control cable is faulty.

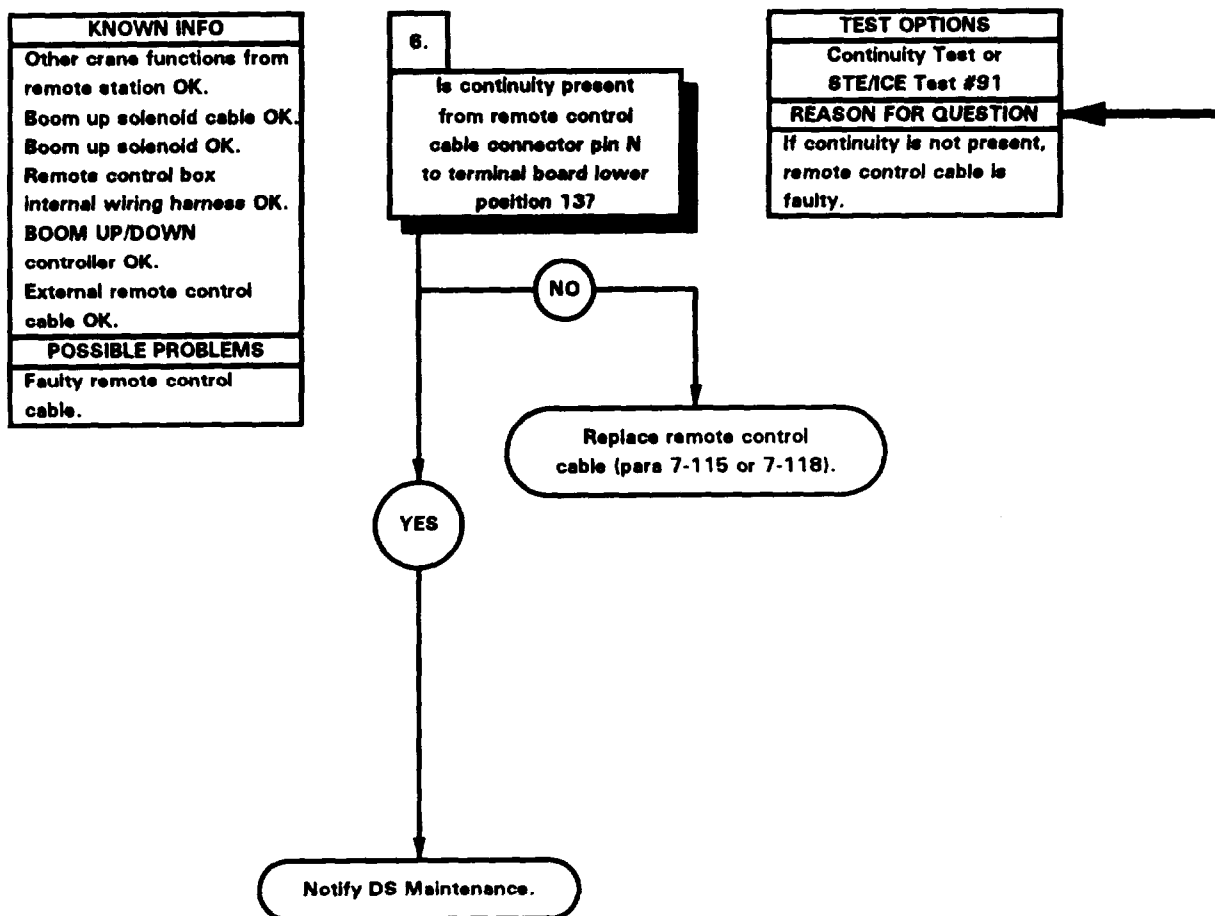
CONTINUITY TEST

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



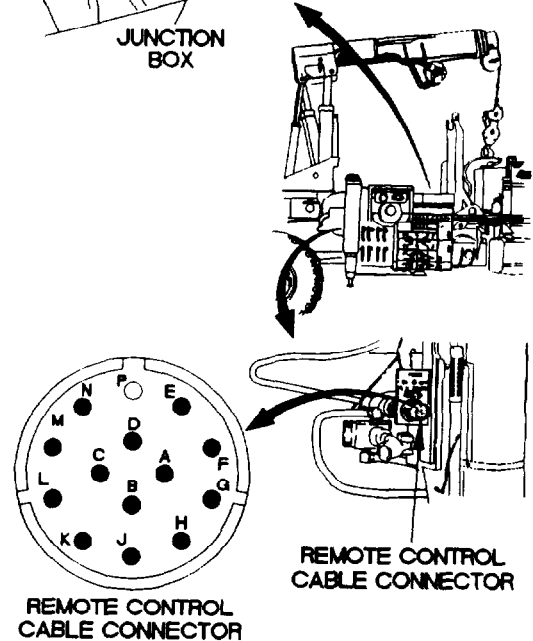
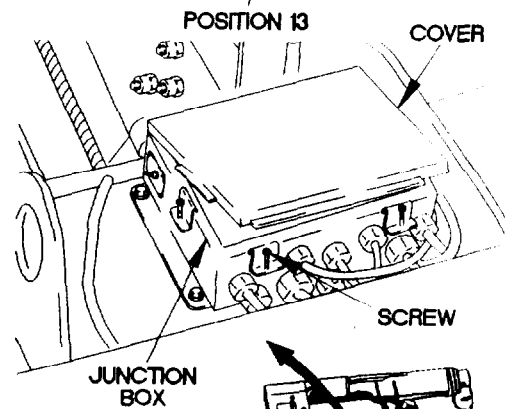
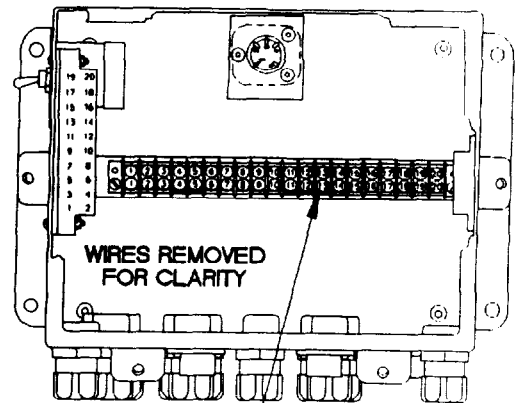
x2E1095-

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



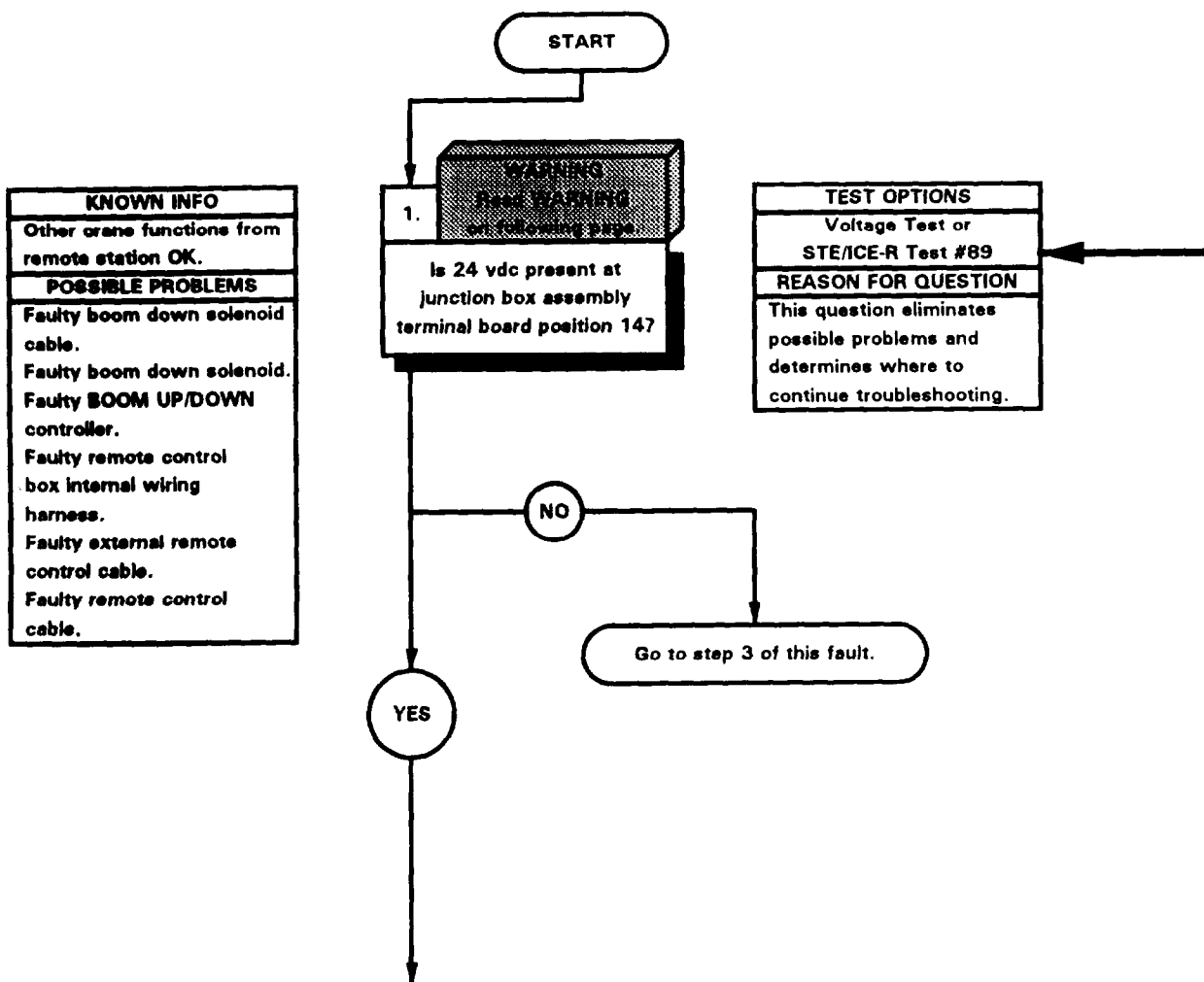
CONTINUITY TEST

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



42E1096-

•125. M1089 MATERIAL HANDLING CRANE (IMHC) BOOM DOWN DOES NOT OPERATE FROM REMOTE STATION	
INITIAL SETUP	
Equipment Conditions Outriggers lowered (TM 9-2320-366-10-1). Crane erected with approximately five feet of cable payed out (TM 9-2320-366-10-1). Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/ICE-R (Item 41, Appendix C)
Personnel Required (2)	References TM 9-4910-571-12&P



WARNING

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

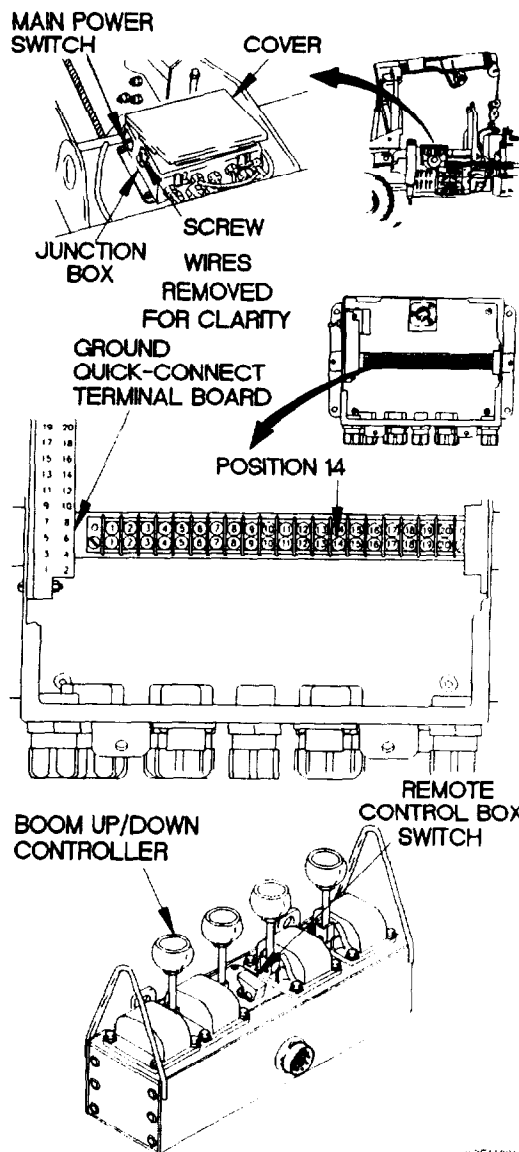
OUTPUT VOLTAGE TEST

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

NOTE

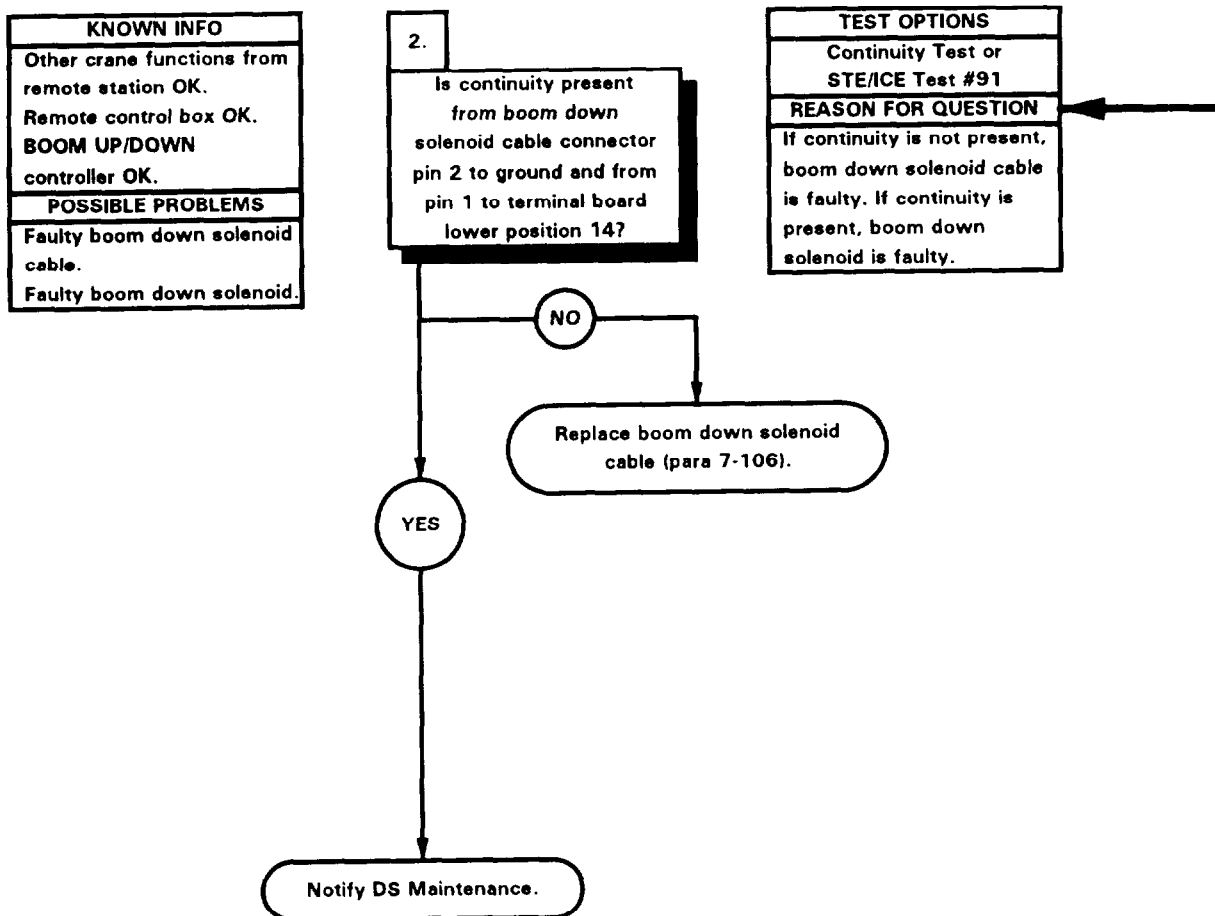
Step (9) requires the aid of an assistant.

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



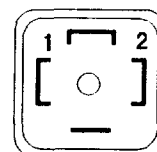
X2E11011

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

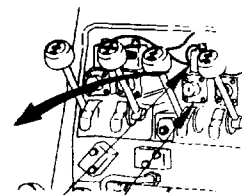


CONTINUITY TEST

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



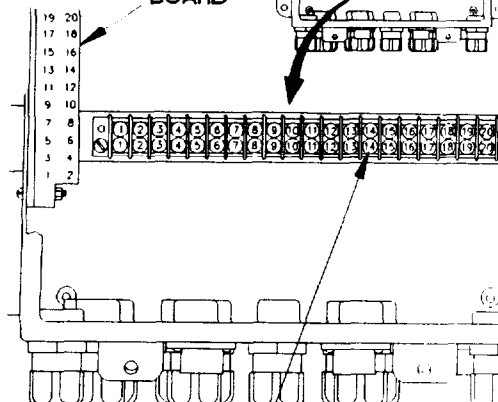
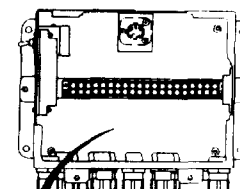
BOOM DOWN
SOLENOID
CABLE
CONNECTOR



BOOM DOWN
SOLENOID
BOOM DOWN
SOLENOID CABLE
CONNECTOR

WIRES REMOVED
FOR CLARITY

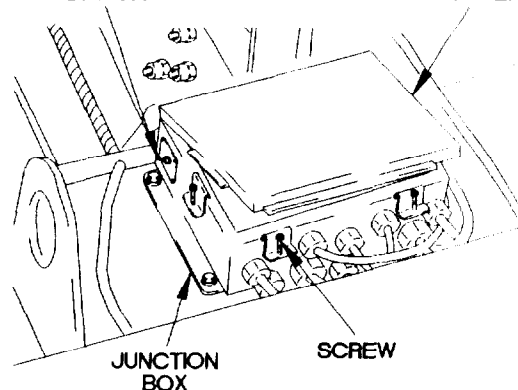
GROUND
TERMINAL
BOARD



POSITION 14

MAIN
POWER
SWITCH

COVER

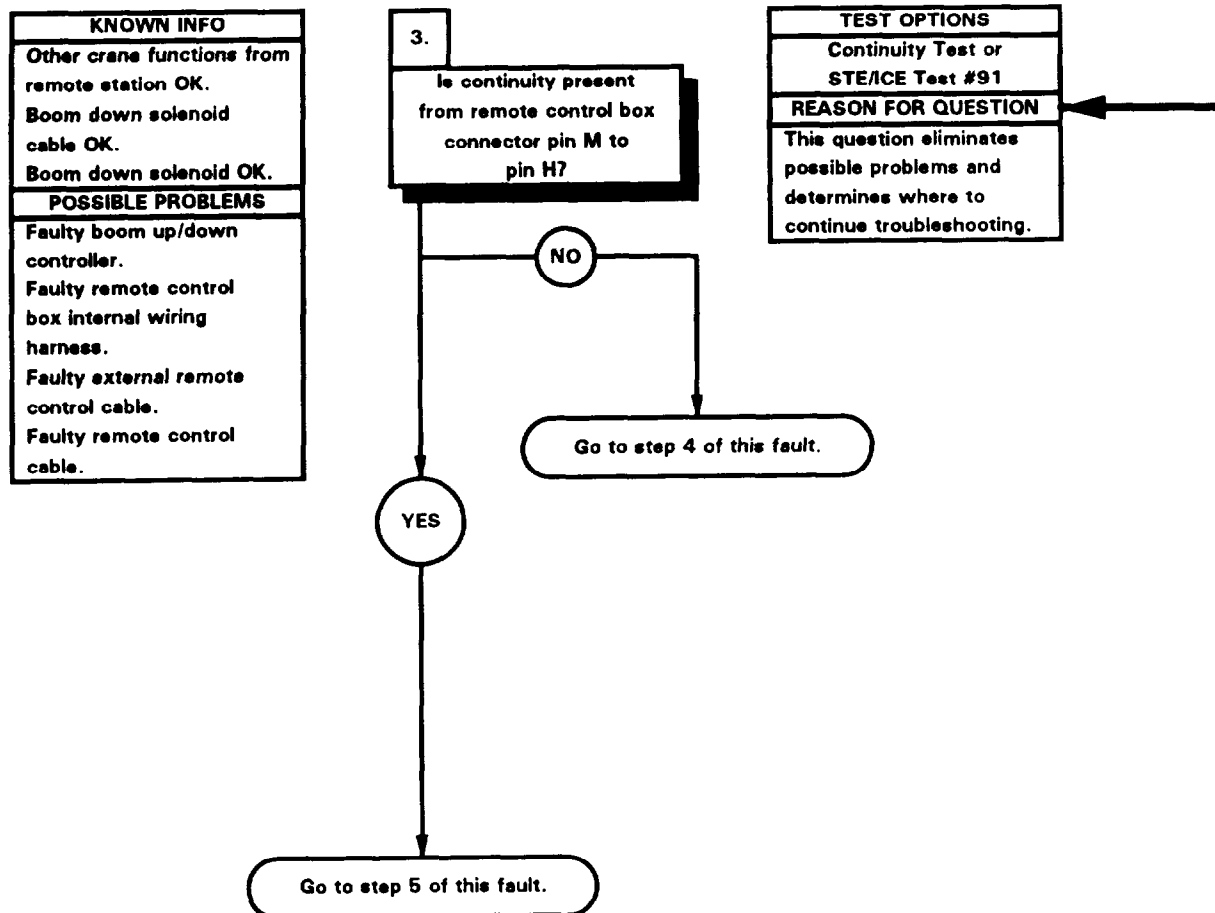


JUNCTION
BOX

SCREW

42E111002

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



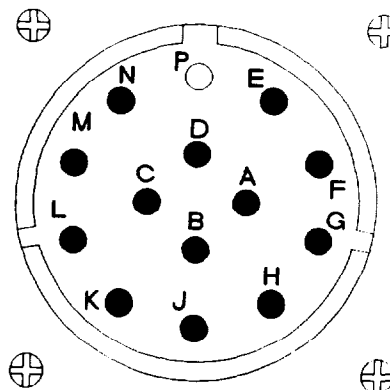
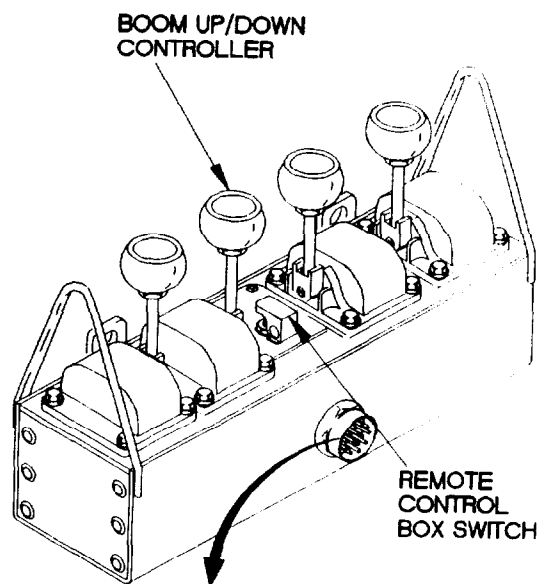
CONTINUITY TEST

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

NOTE

Step (6) requires the aid of an assistant.

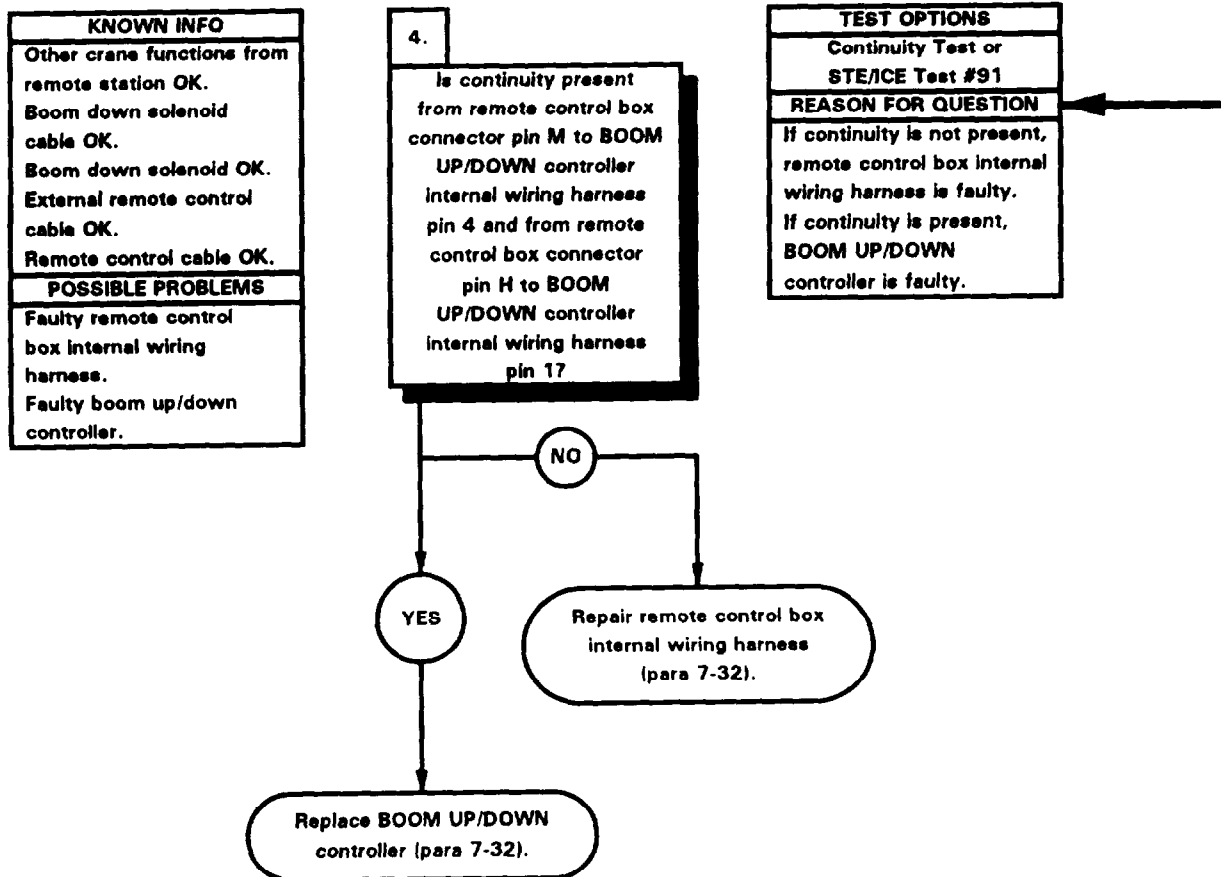
- (6) Position BOOM UP/DOWN controller to DOWN and note reading on multimeter.
- (7) If continuity is not present, go to step 4 of this fault.
- (8) If continuity is present, go to step 5 of this fault.
- (9) Position remote control box switch to OFF.



REMOTE CONTROL BOX CONNECTOR

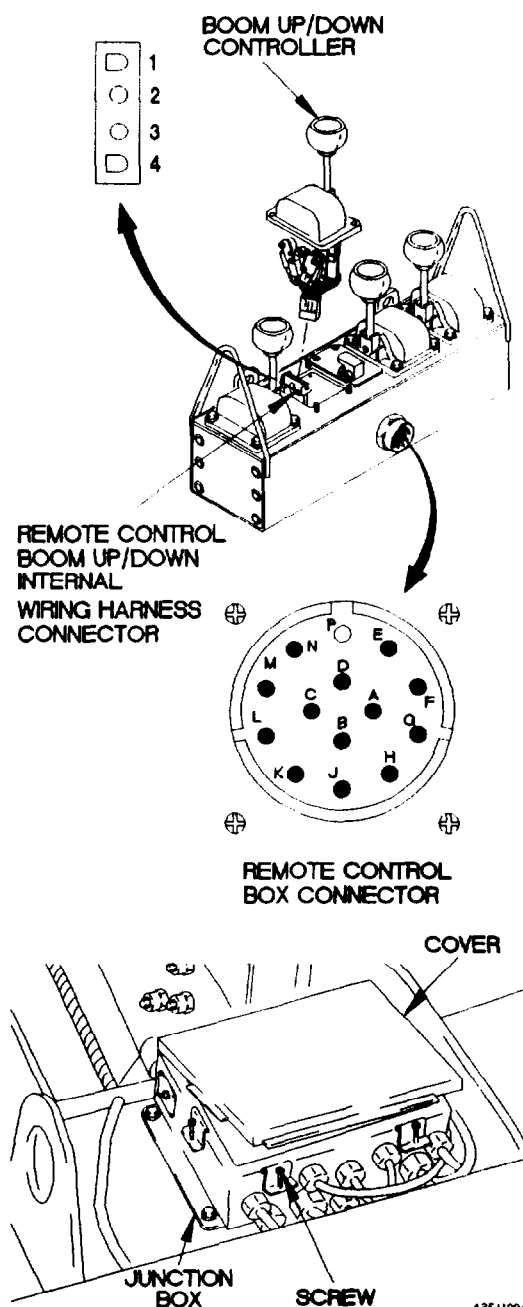
K2E11003

6125. M1089 MATERIAL HANDLING CRANE (MHC) BOOM DOWN DOES NOT OPERATE FROM REMOTE STATION (CONT)



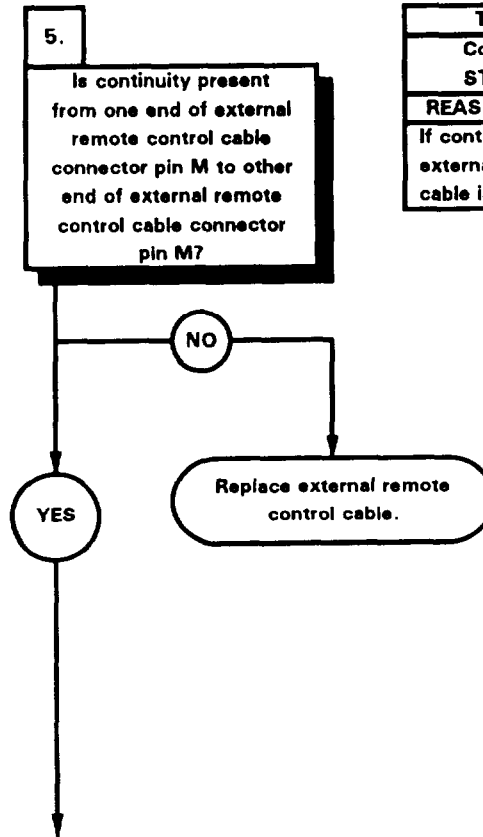
CONTINUITY TEST

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



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

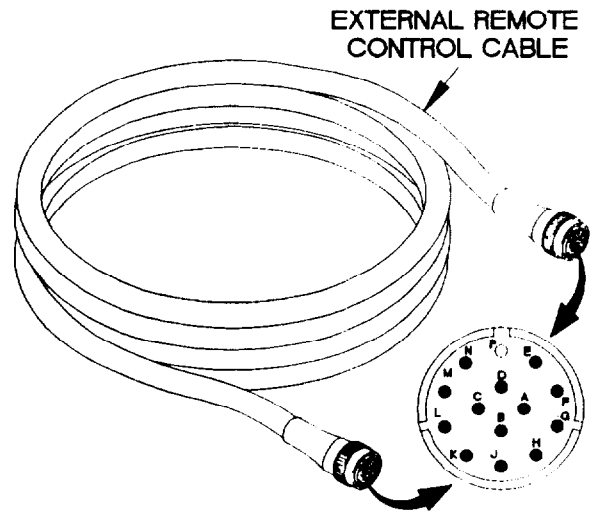
KNOWN INFO
Other crane functions from remote station OK. Boom down solenoid cable OK. Boom down solenoid OK. Remote control box internal wiring harness OK. BOOM UP/DOWN controller OK.
POSSIBLE PROBLEMS
Faulty external remote control cable. Faulty remote control cable.



TEST OPTIONS
Continuity Test or STE/ICE Test #91
REASON FOR QUESTION
If continuity is not present, external remote control cable is faulty.

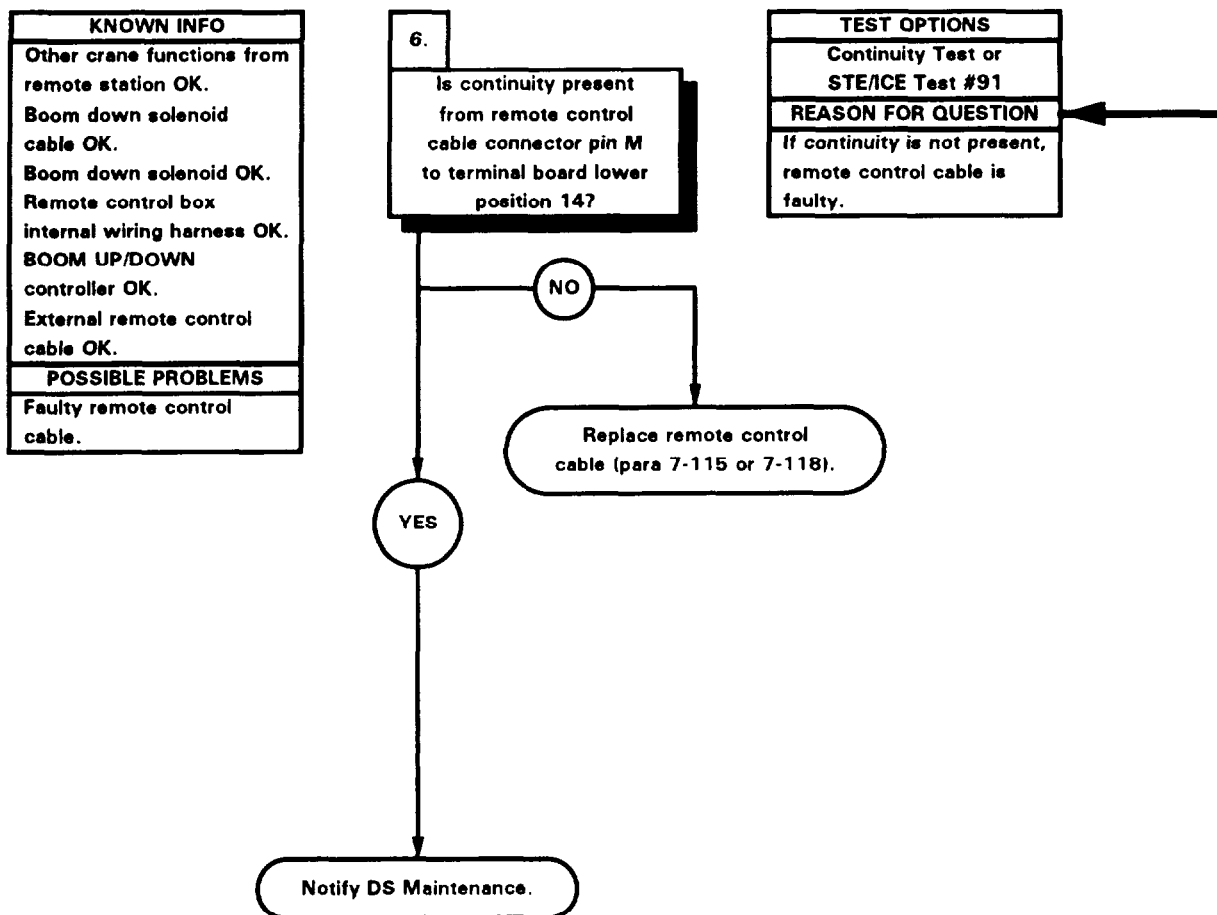
CONTINUITY TEST

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



X2E11005

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

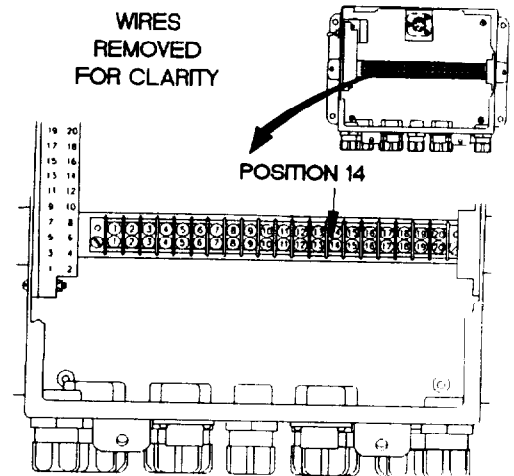


CONTINUITY TEST

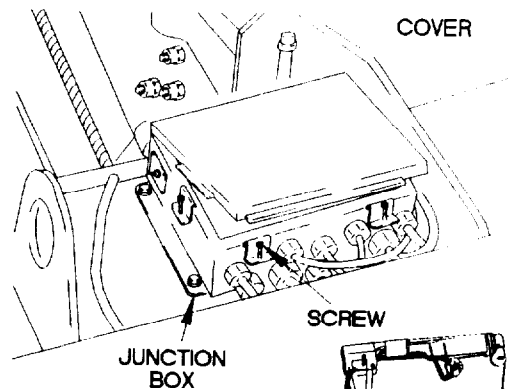
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter on pin M of remote control cable connector.
- (3) Connect negative (-) probe of multimeter on terminal board lower position 14 and note reading on multimeter.
- (4) If continuity is not present, replace remote control cable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

WIRES
REMOVED
FOR CLARITY

POSITION 14

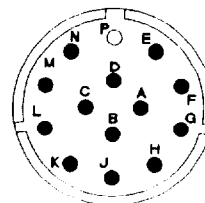


COVER



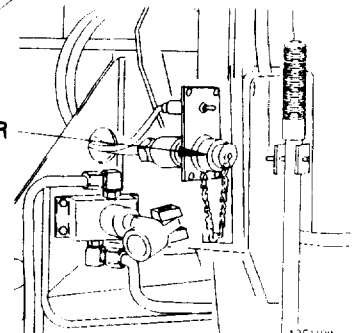
JUNCTION
BOX

SCREW



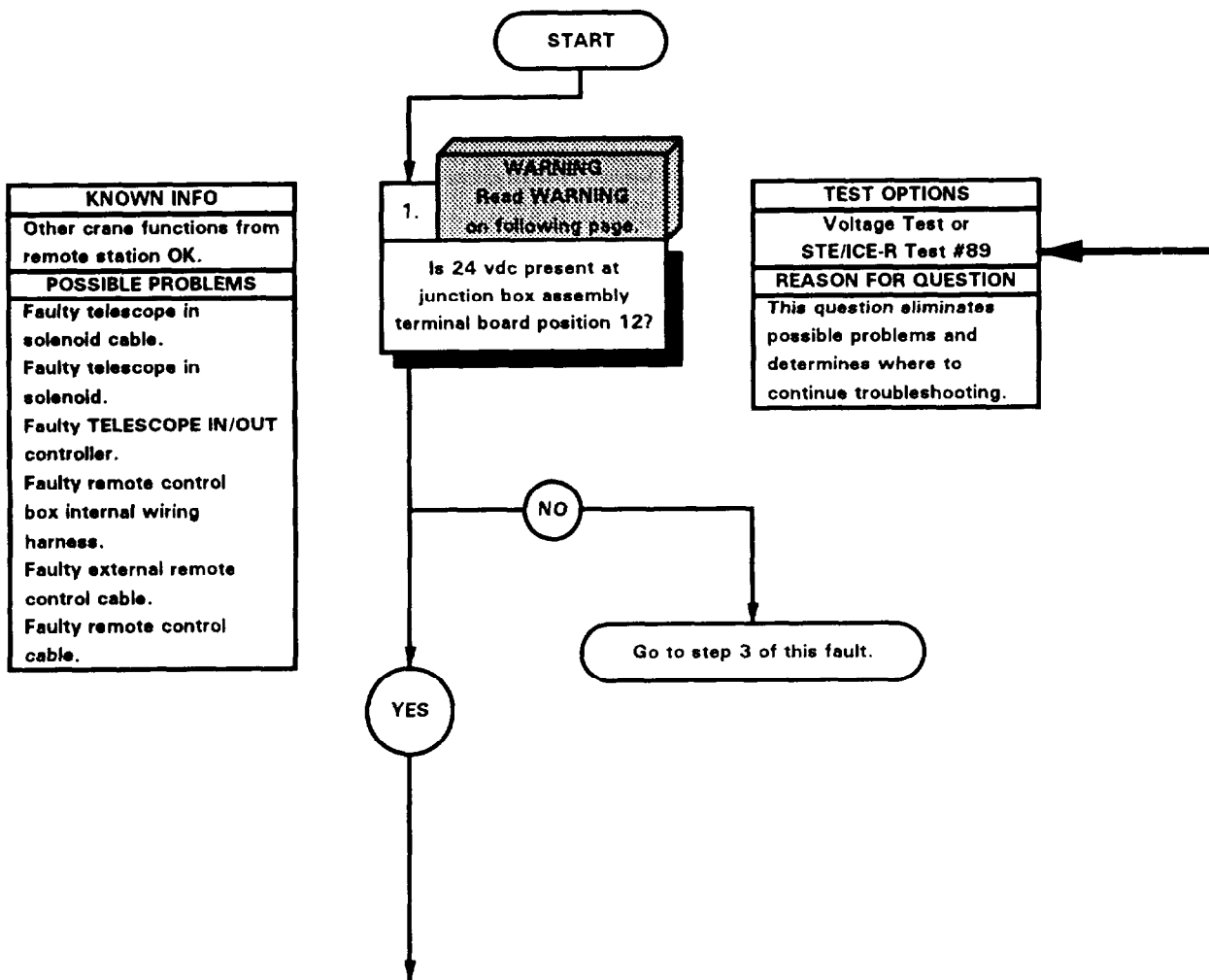
REMOTE
CONTROL
CABLE
CONNECTOR

LEFT SIDE
SHOWN
RIGHT SIDE
SIMILAR



42E1100

•126. M1089 MATERIAL HANDLING CRANE (MHC) TELESCOPE IN DOES NOT OPERATE FROM REMOTE STATION	
INITIAL SETUP	
Equipment Conditions Outriggers lowered (TM 9-2320-366-10-1). Crane erected with approximately five feet of cable payed out (TM 9-2320-366-10-1). Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/ICE-R (Item 41, Appendix C)
Personnel Required (2)	References TM 9-4910-571-12&P



WARNING

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

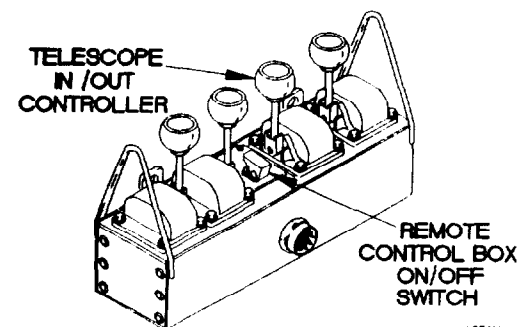
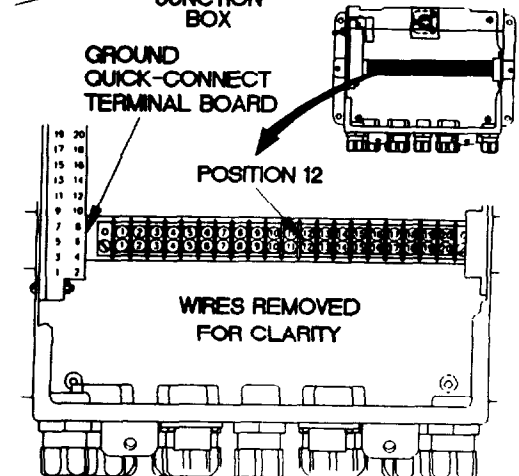
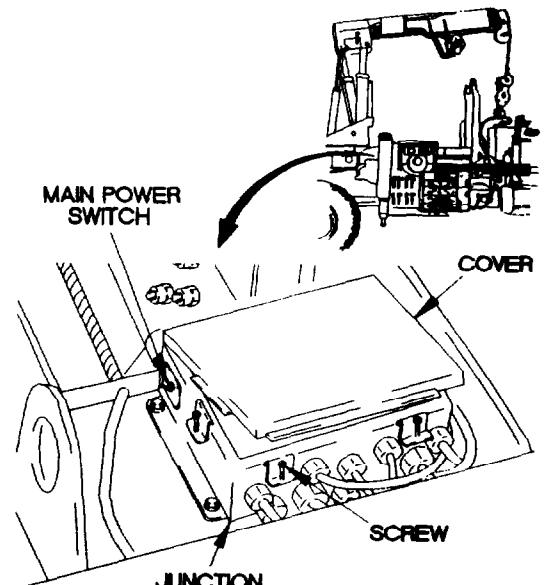
OUTPUT VOLTAGE TEST

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

NOTE

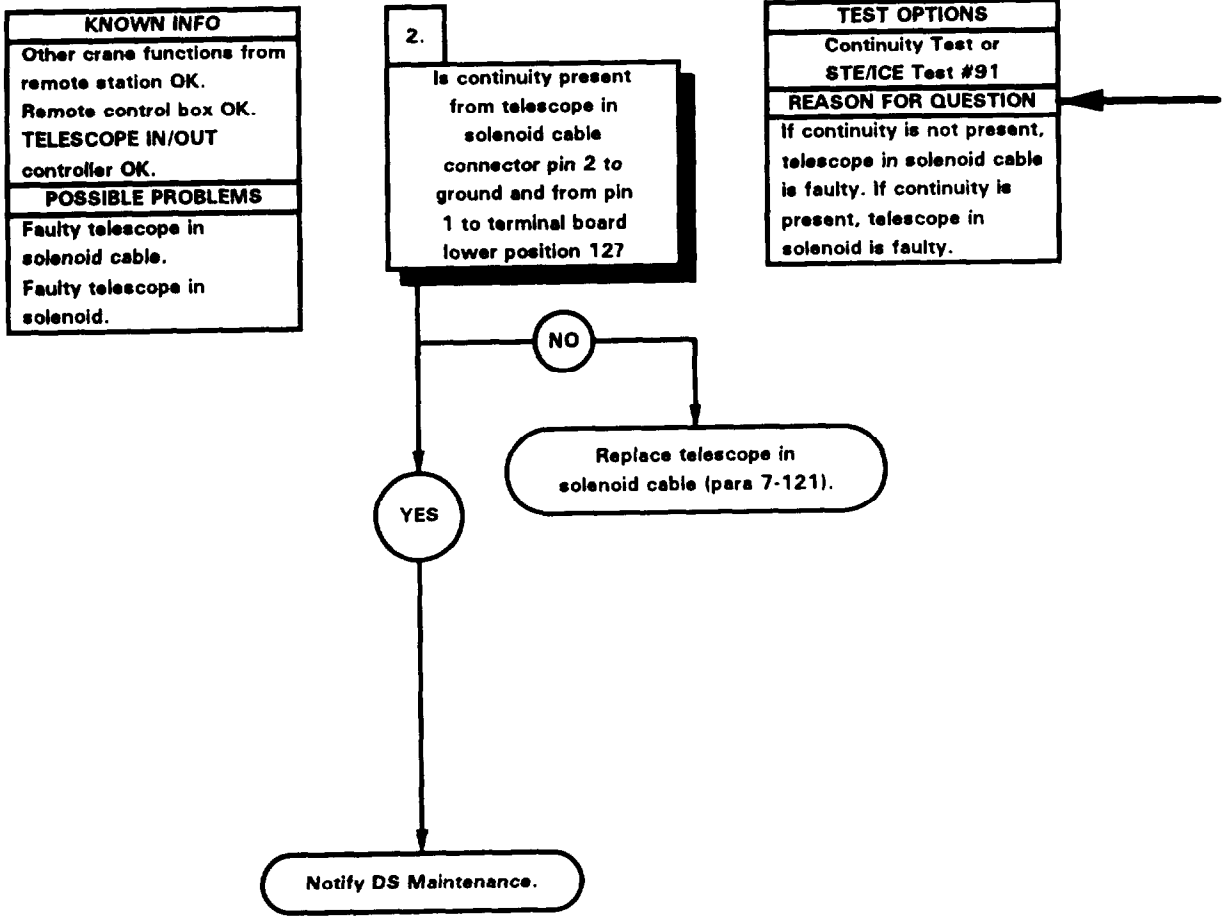
Step (9) requires the aid of an assistant.

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



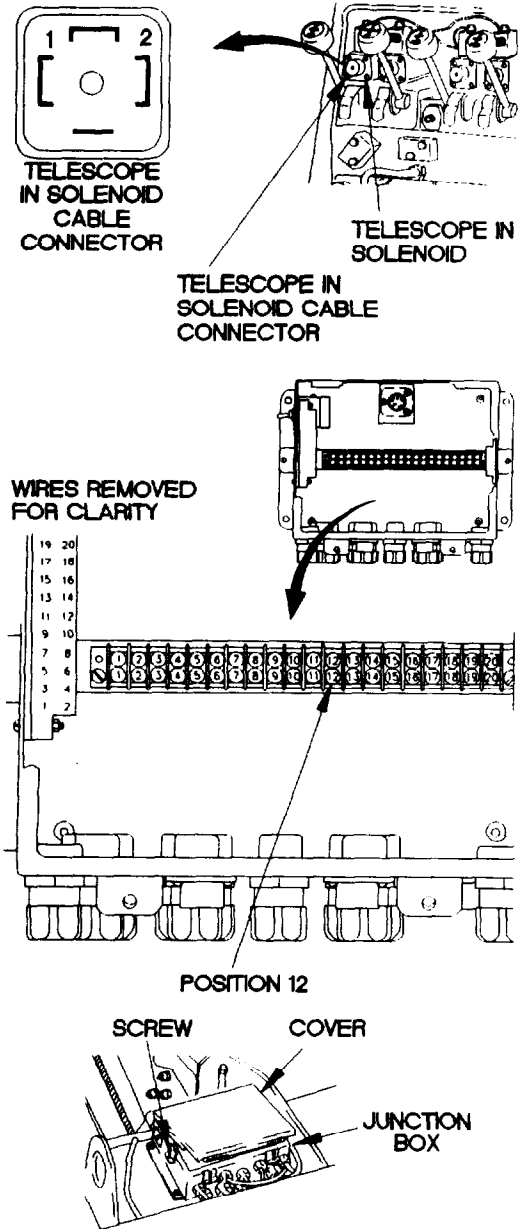
42E1111-

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



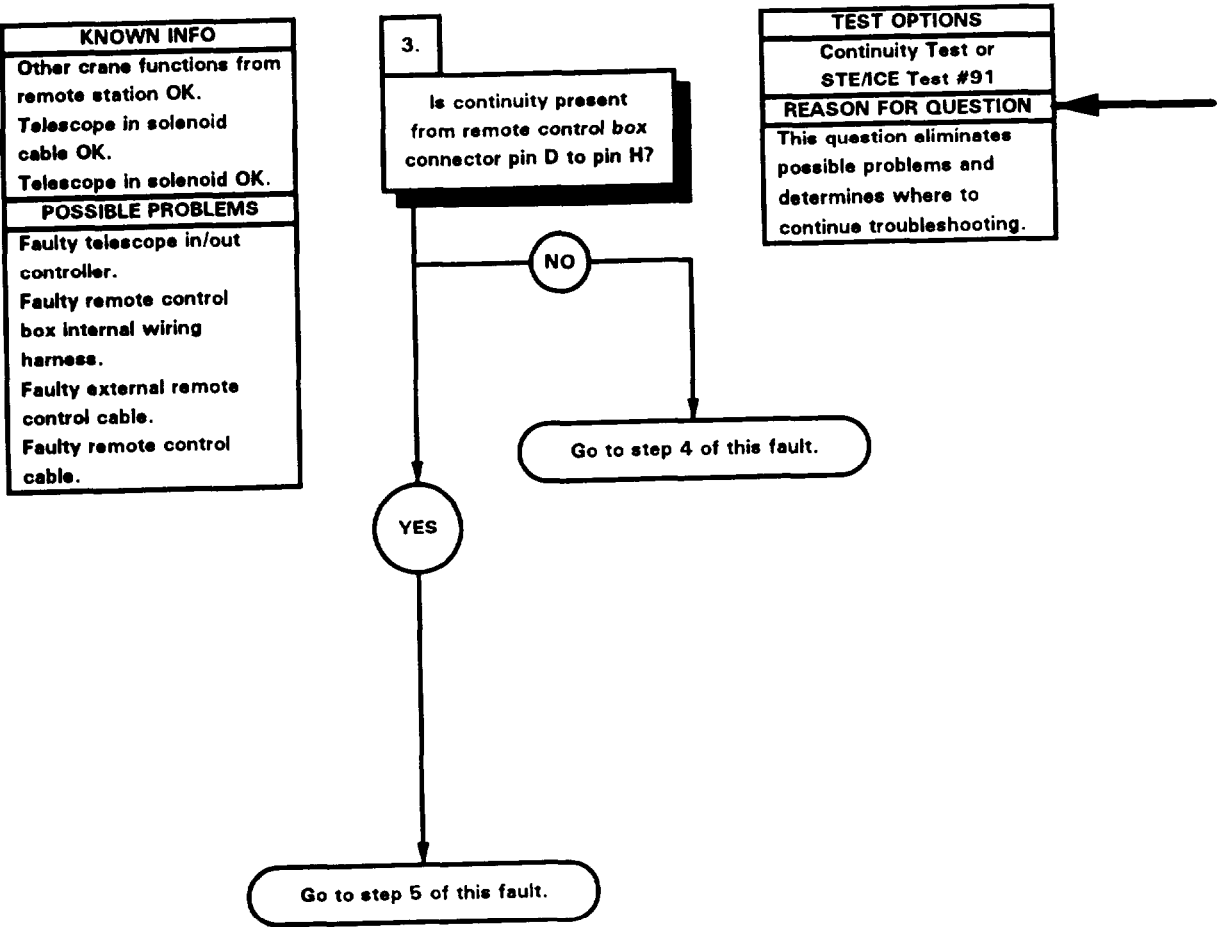
CONTINUITY TEST

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



K2E1112-

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



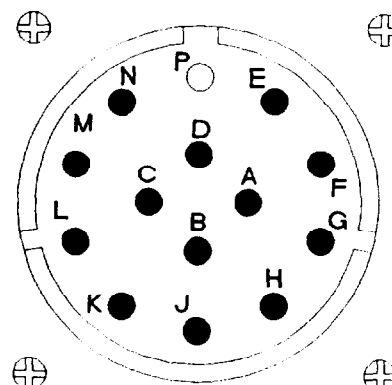
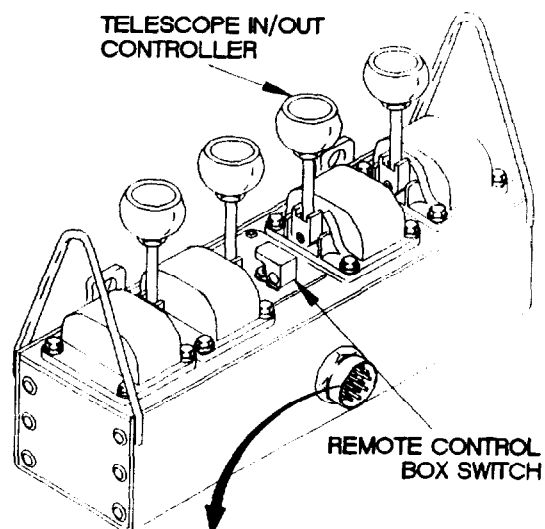
CONTINUITY TEST

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

NOTE

Step (6) requires the aid of an assistant.

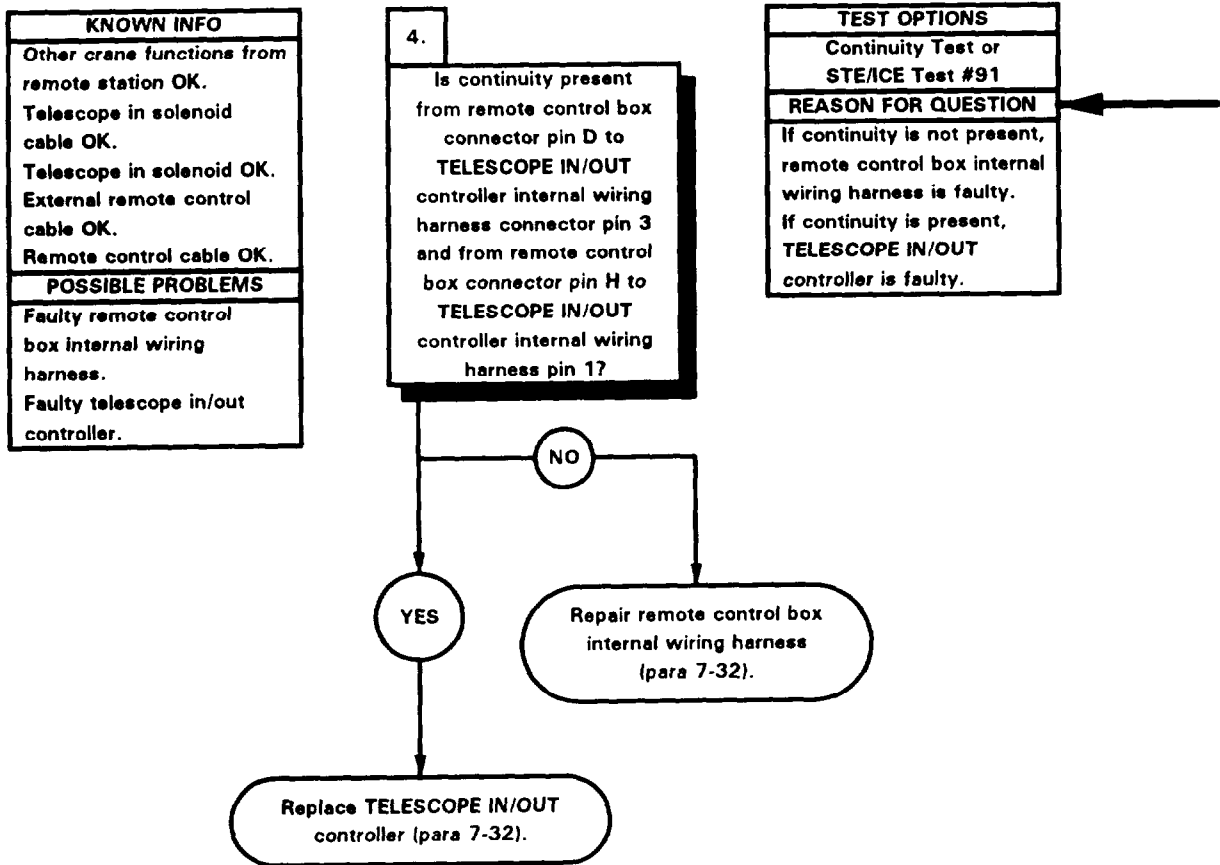
- (6) Position TELESCOPE IN/OUT controller to IN and note reading on multimeter.
- (7) If continuity is not present, go to step 4 of this fault.
- (8) If continuity is present, go to step 5 of this fault.
- (9) Position remote control box switch to OFF.



REMOTE CONTROL BOX CONNECTOR

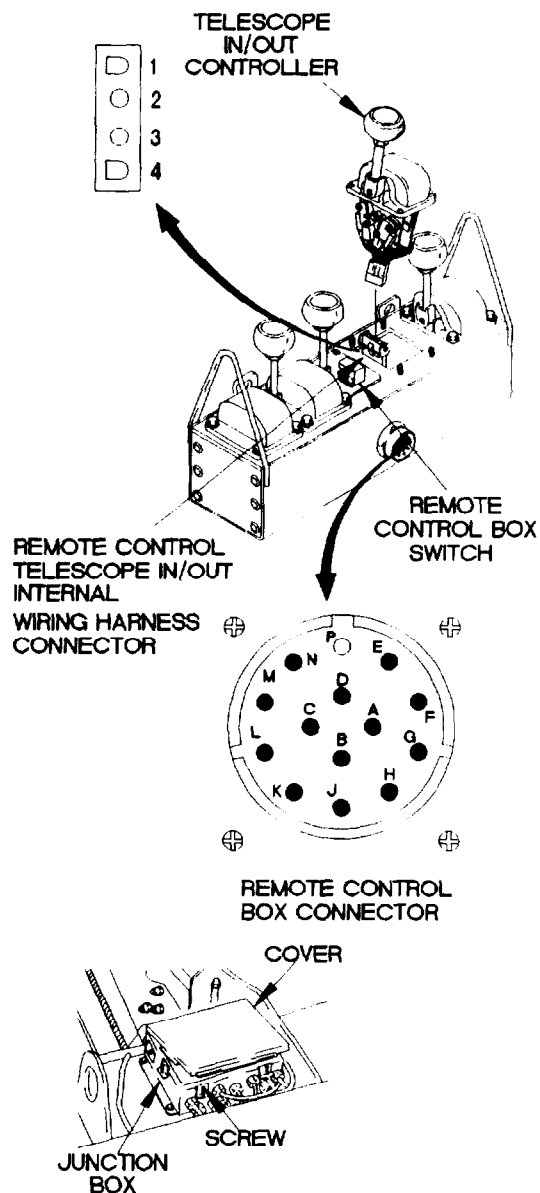
X2E1113-

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



CONTINUITY TEST

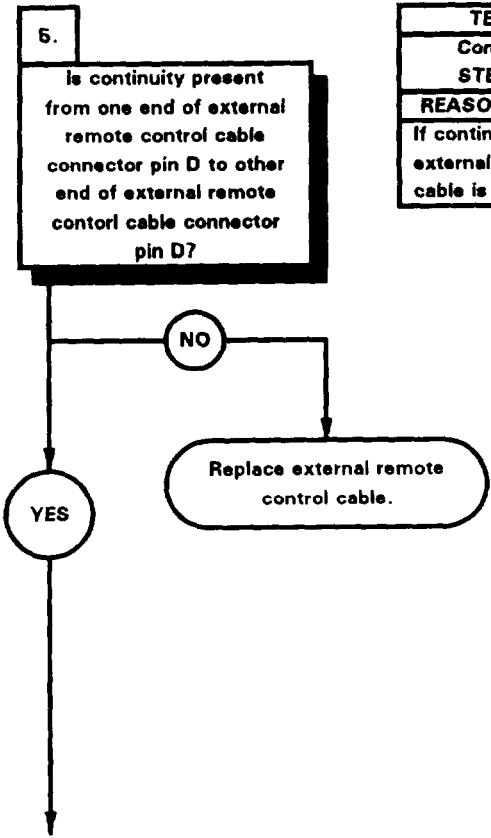
- (1) Remove TELESCOPE IN/OUT controller (para 7-32).
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter on pin D of remote control box connector.
- (4) Connect negative (-) probe of multimeter on pin 3 of TELESCOPE IN/OUT controller internal wiring harness and note reading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



K2E1114-

ø126. M1089 MATERIAL HANDLING CRANE (MHC) TELESCOPE IN DOES NOT OPERATE FROM REMOTE STATION (CONT)

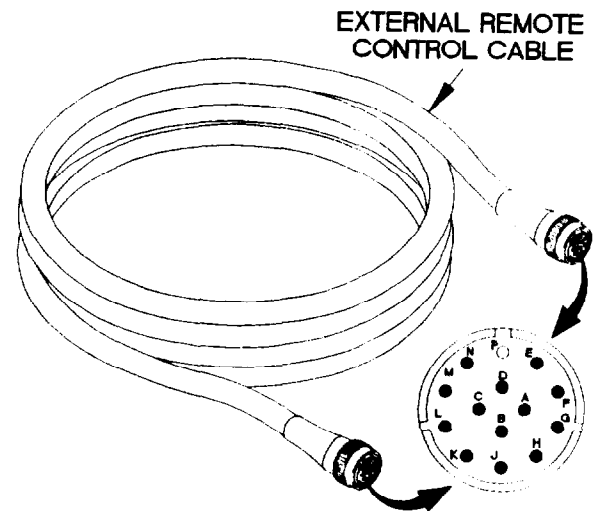
KNOWN INFO
Other crane functions from remote station OK. Telescope in solenoid cable OK. Telescope in solenoid OK. Remote control box internal wiring harness OK. TELESCOPE IN/OUT controller OK.
POSSIBLE PROBLEMS
Faulty external remote control cable. Faulty remote control cable.



TEST OPTIONS
Continuity Test or STE/ICE Test #91
REASON FOR QUESTION
If continuity is not present, external remote control cable is faulty.

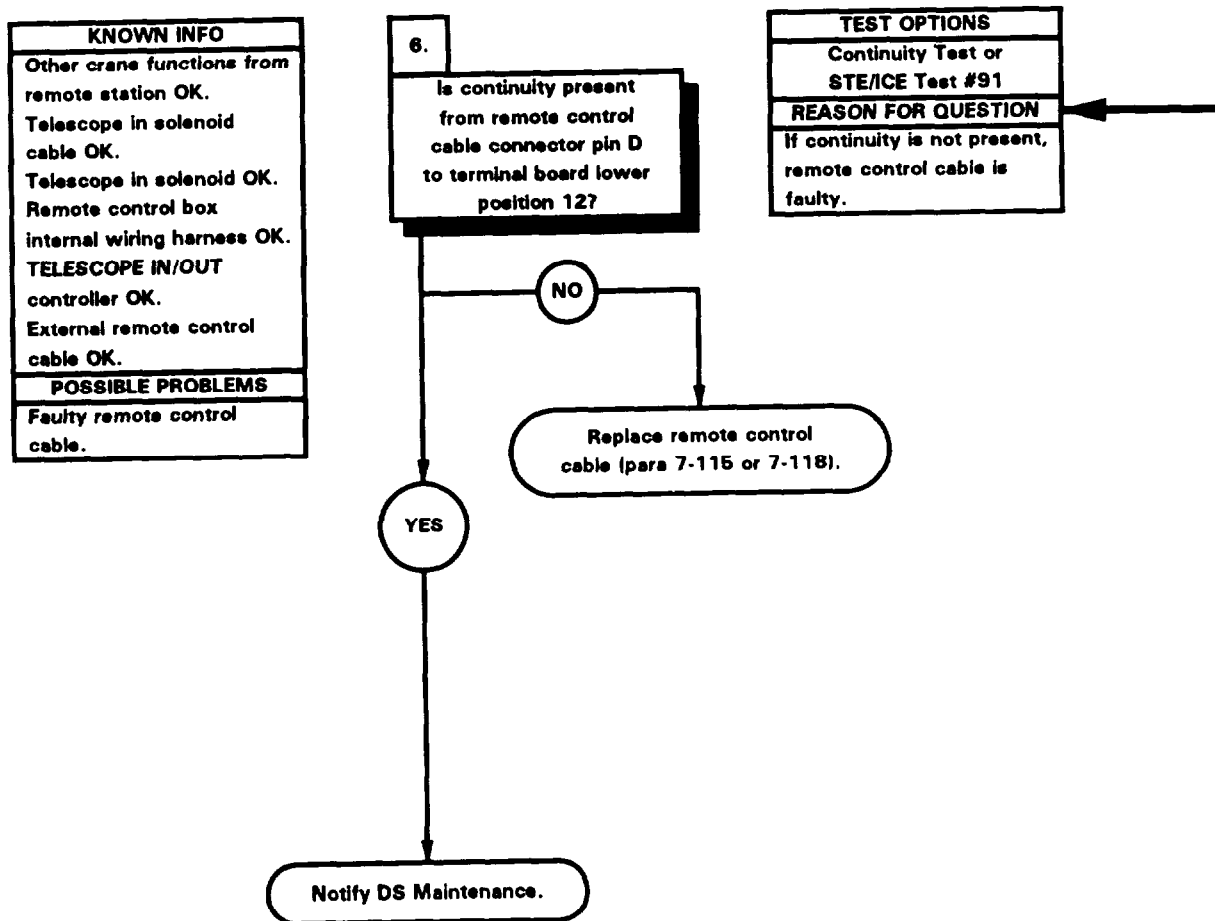
CONTINUITY TEST

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



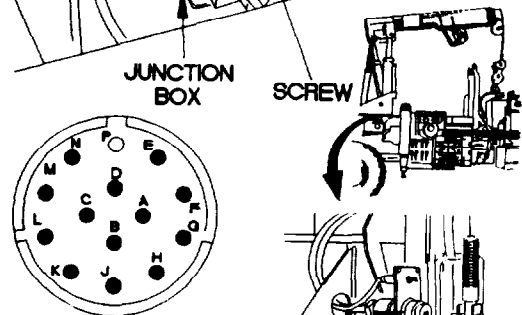
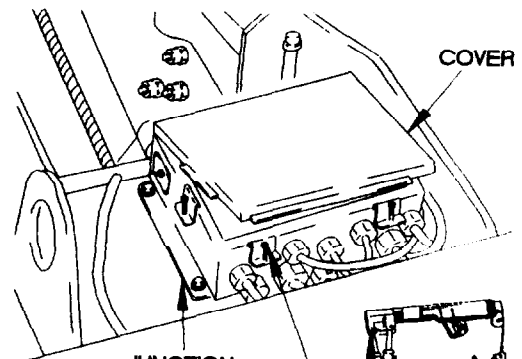
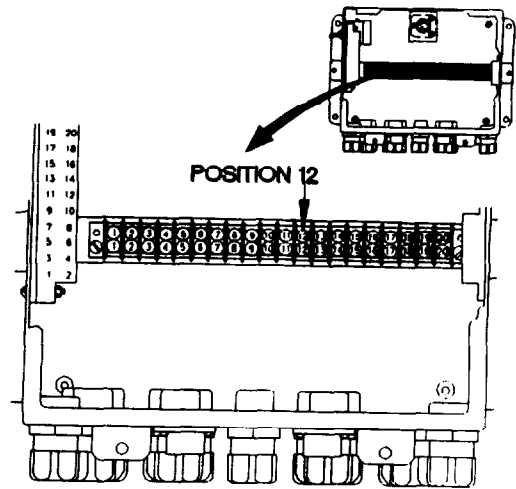
X2E1115-

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



CONTINUITY TEST

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

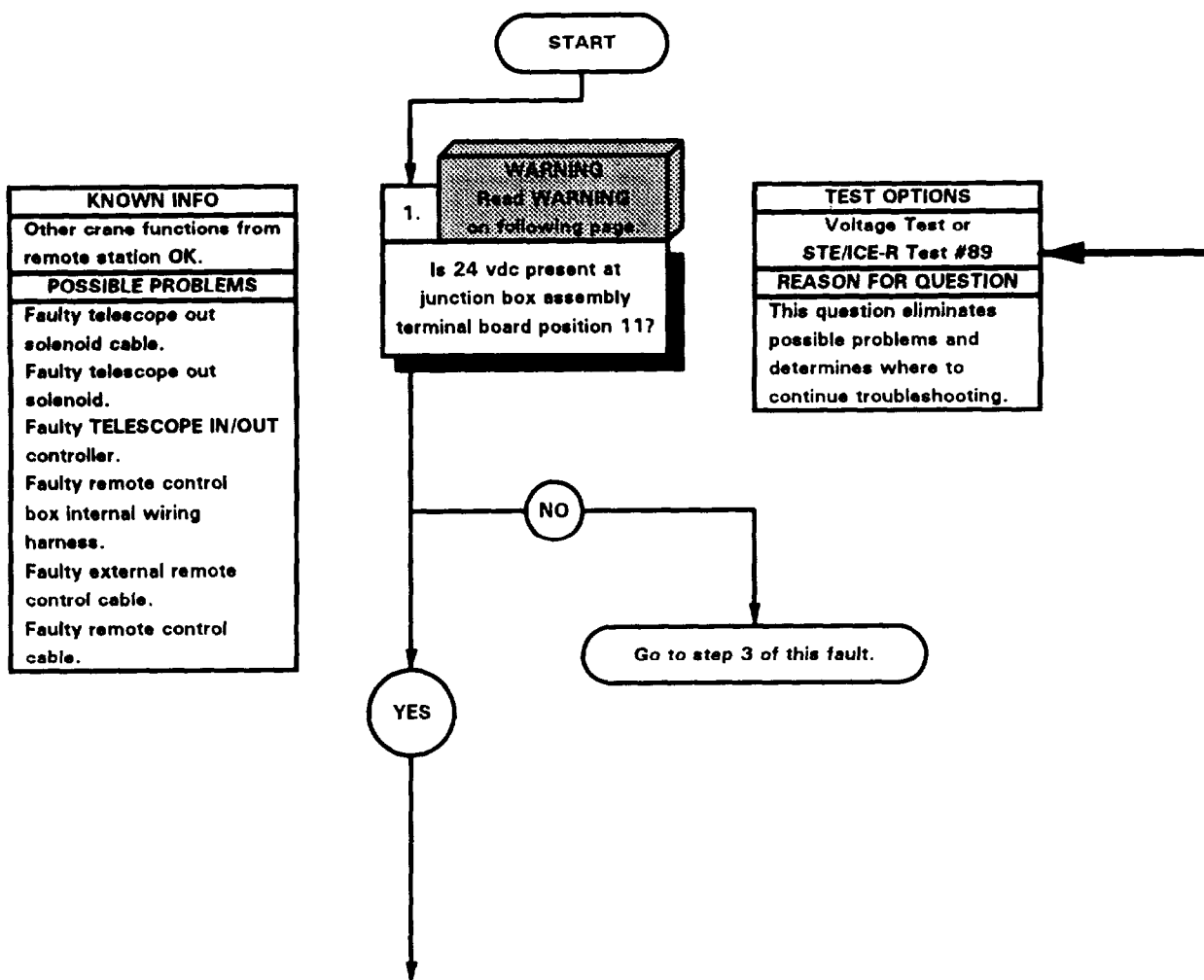


REMOTE CONTROL
CABLE CONNECTOR

LEFT SIDE SHOWN
RIGHT SIDE SIMILAR

42E1116-

•127. M1089 MATERIAL HANDLING CRANE (MHC) TELESCOPE OUT DOES NOT OPERATE FROM REMOTE STATION	
INITIAL SETUP	
Equipment Conditions Outriggers lowered (TM 9-2320-366-10-1). Crane erected with approximately five feet of cable payed out (TM 9-2320-366-10-1). Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/ICE-R (Item 41, Appendix C)
Personnel Required (2)	References TM 9-4910-571-12&P



WARNING

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

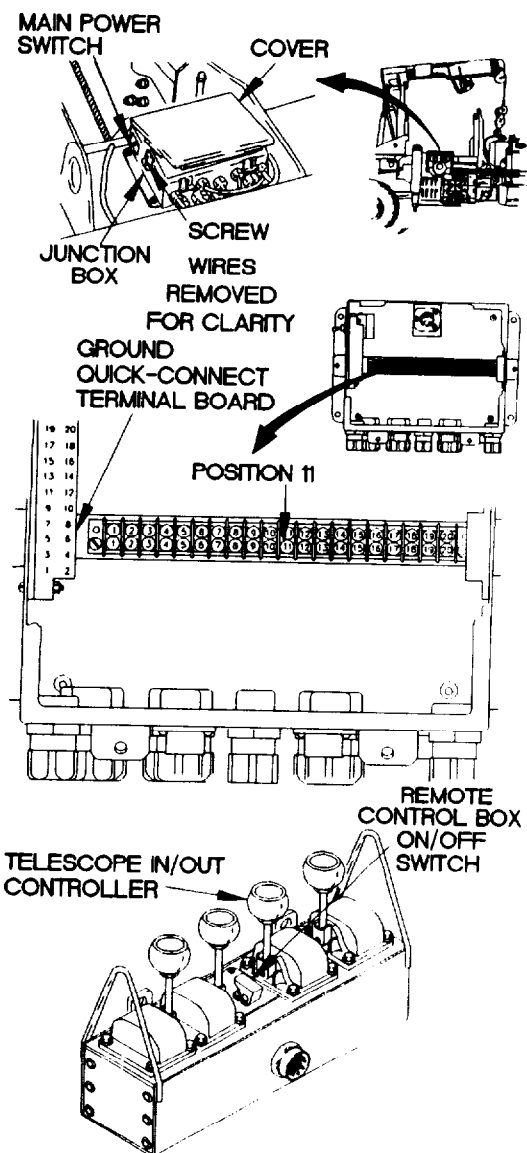
OUTPUT VOLTAGE TEST

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

NOTE

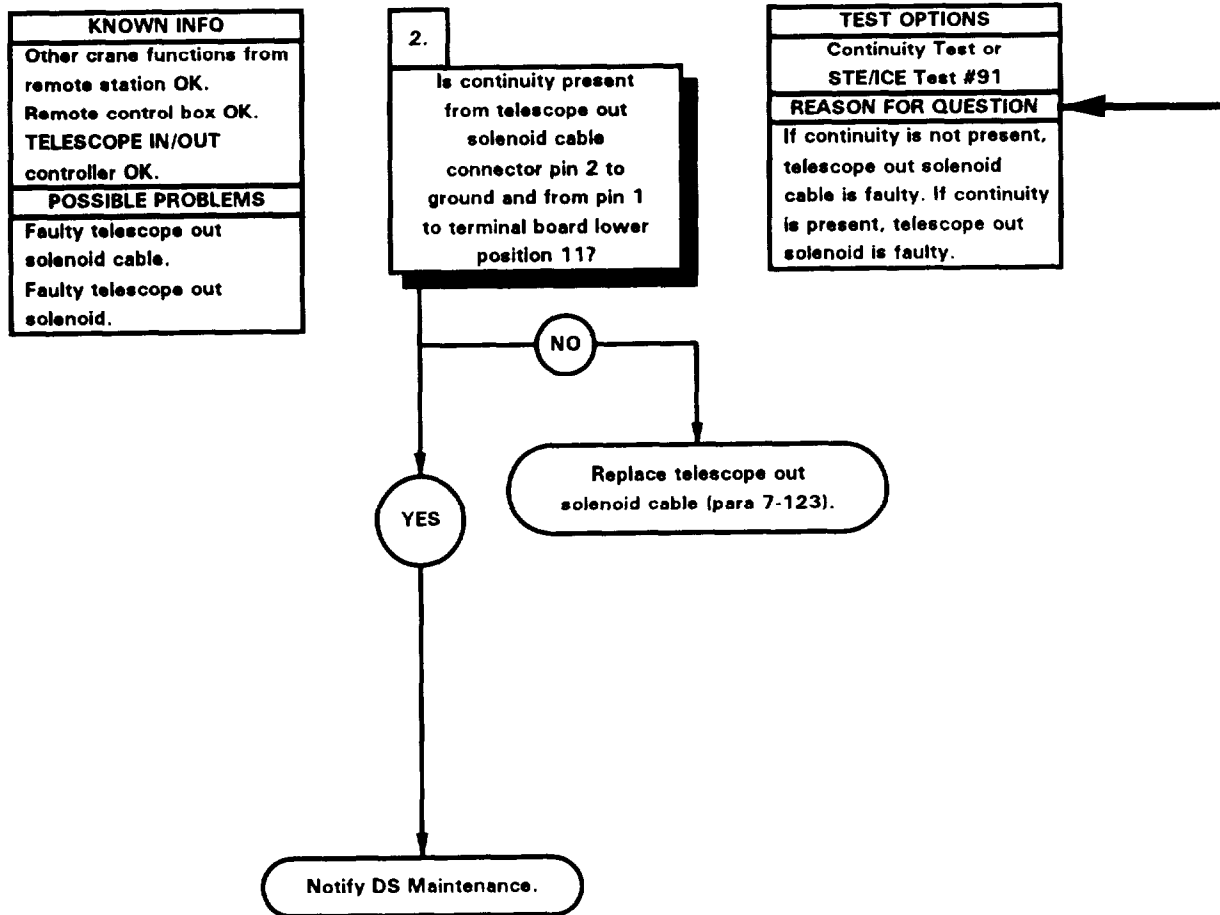
Step (9) requires the aid of an assistant.

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



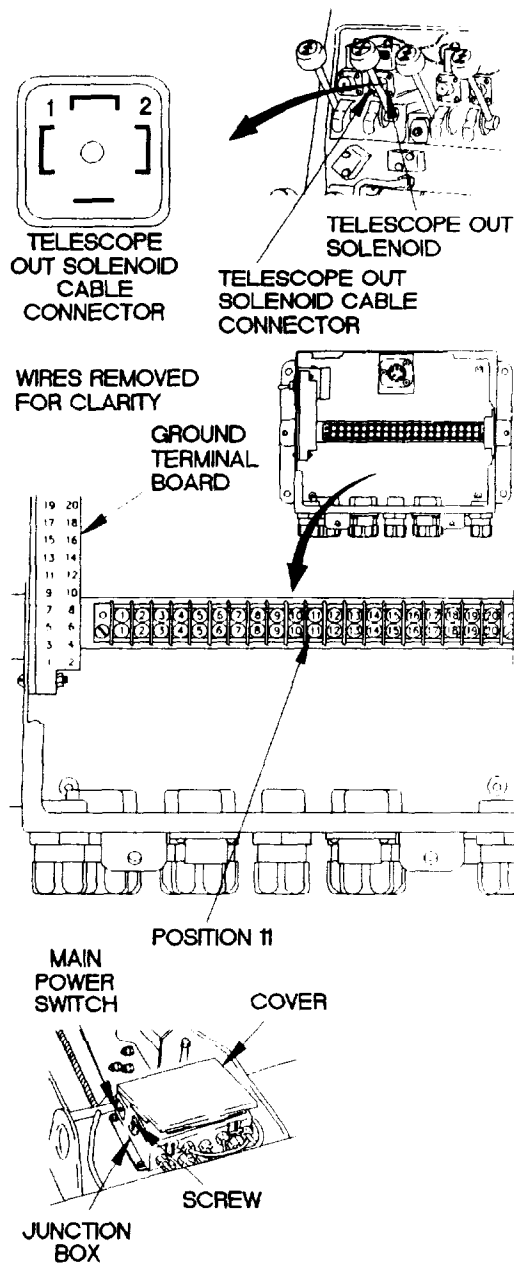
x2E1121-

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



CONTINUITY TEST

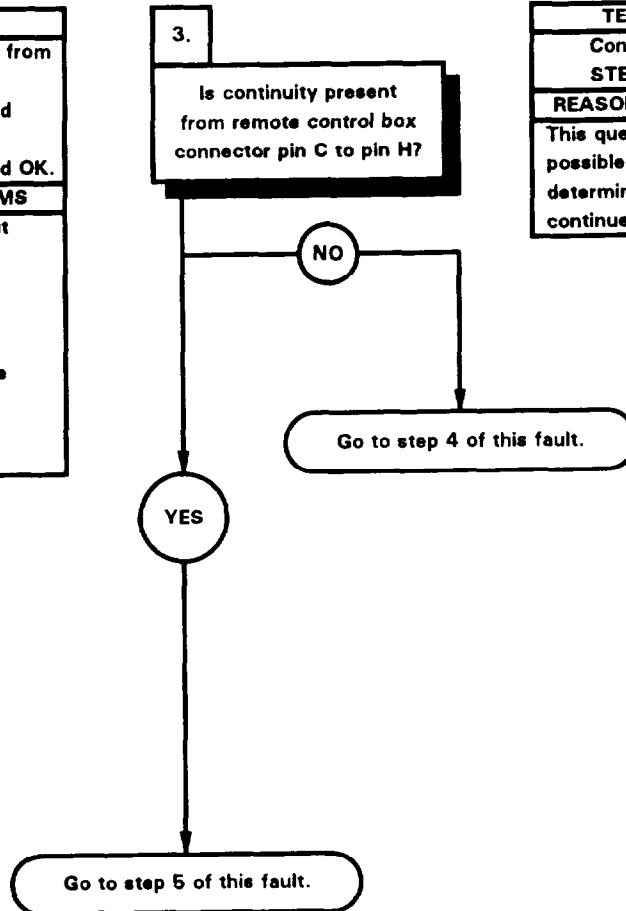
- (1) Disconnect telescope out solenoid connector from telescope out solenoid.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter on pin 2 of telescope out solenoid cable connector.
- (4) Connect negative (-) probe of multimeter on ground and note reading on multimeter.
- (5)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



K2E11201

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

KNOWN INFO
Other crane functions from remote station OK. Telescope out solenoid cable OK. Telescope out solenoid OK.
POSSIBLE PROBLEMS
Faulty telescope in/out controller. Faulty remote control box internal wiring harness. Faulty external remote control cable. Faulty remote control cable.



TEST OPTIONS
Continuity Test or STE/CE Test #91
REASON FOR QUESTION
This question eliminates possible problems and determines where to continue troubleshooting.

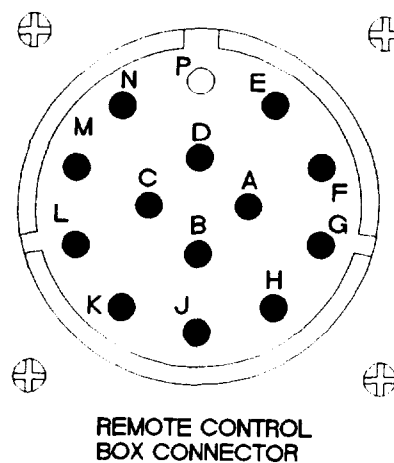
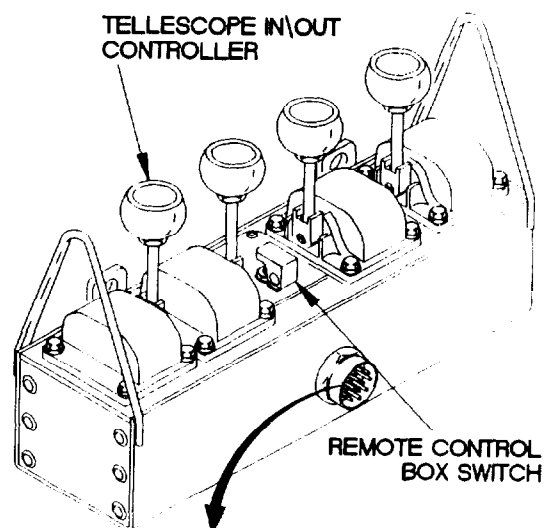
CONTINUITY TEST

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

NOTE

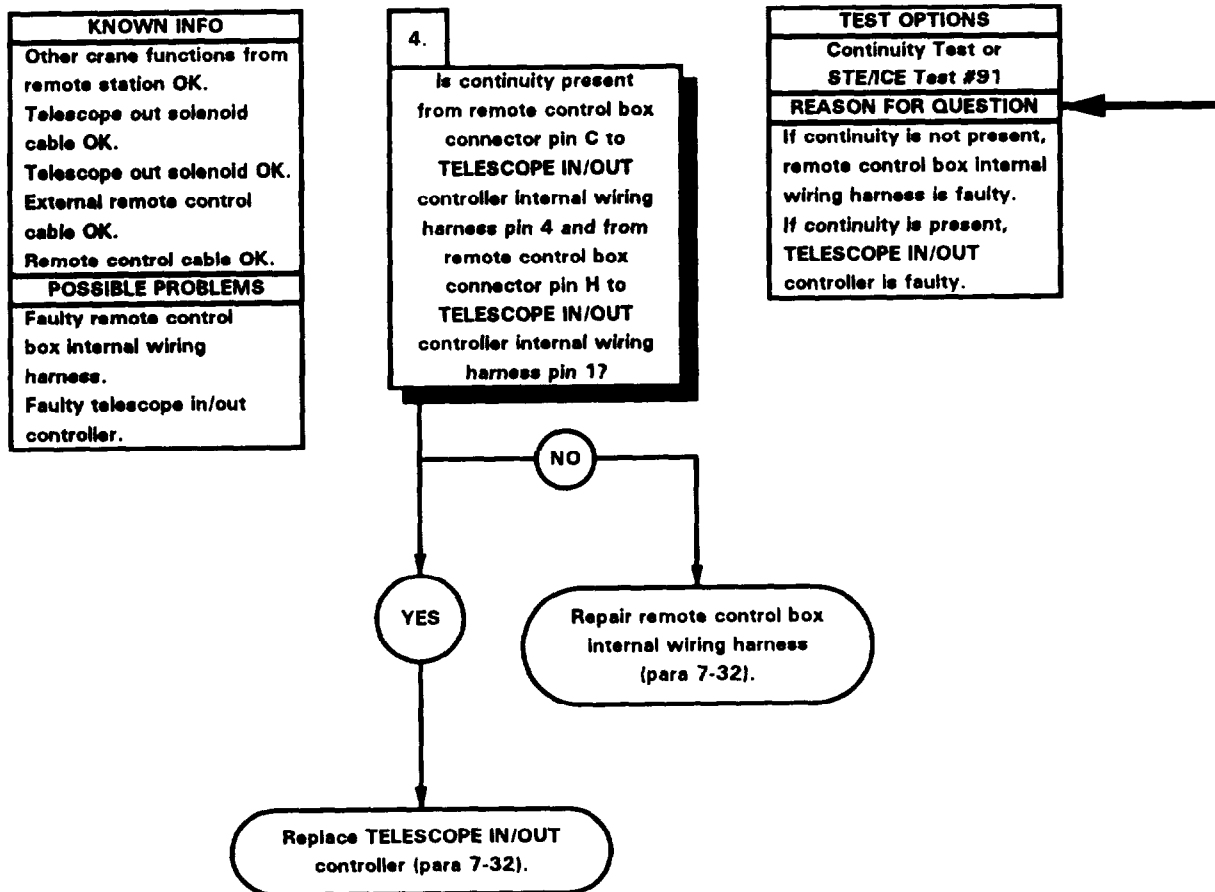
Step (6) requires the aid of an assistant.

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



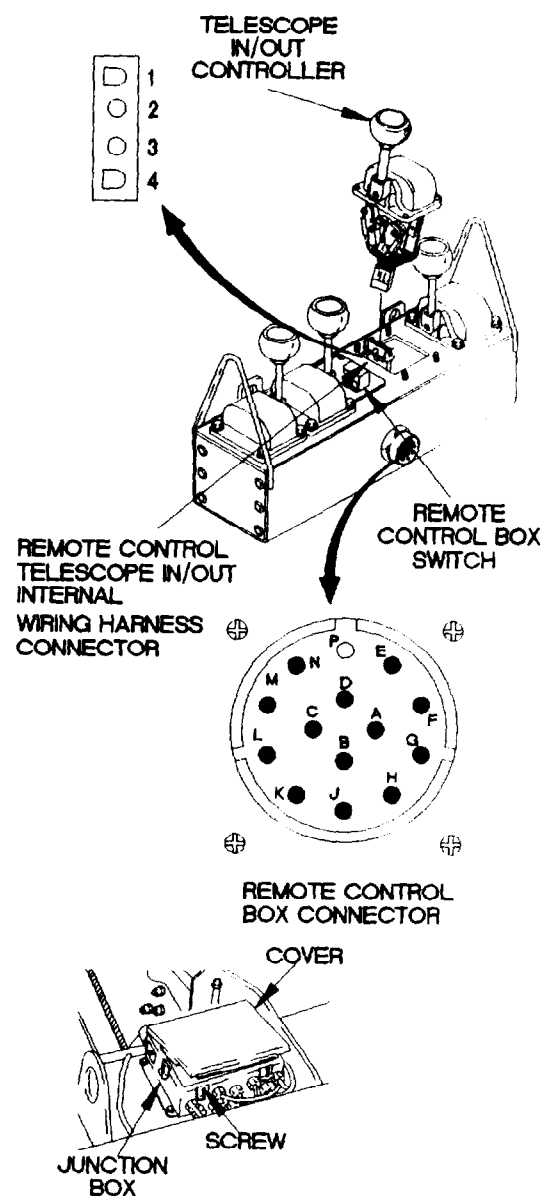
X2E1143-

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



CONTINUITY TEST

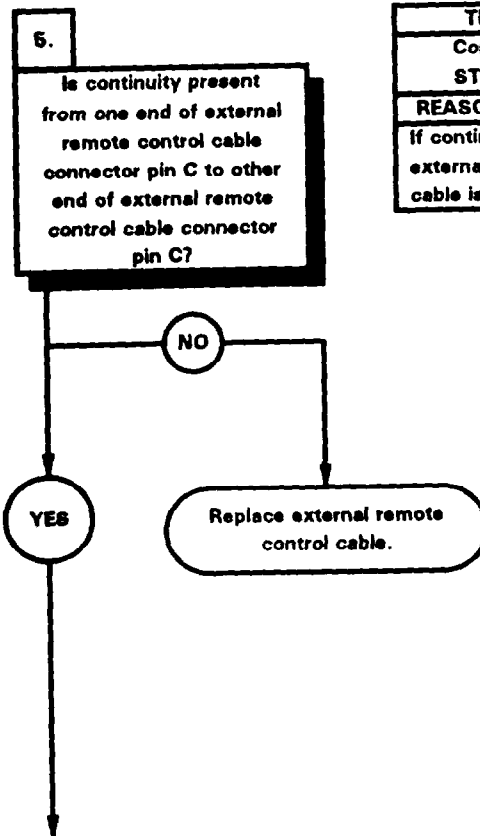
- (1) Remove TELESCOPE IN/OUT controller (para 7-32).
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter on pin C of remote control box connector.
- (4) Connect negative (-) probe of multimeter on pin 4 of TELESCOPE IN/OUT controller internal wiring harness and note reading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



K2E1124-

6127. M1089 MATERIAL HANDLING CRANE (MHC) TELESCOPE OUT DOES NOT OPERATE FROM REMOTE STATION (CONT)

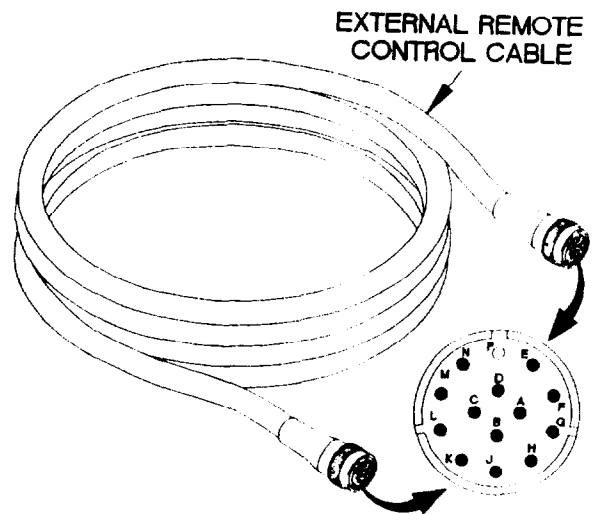
KNOWN INFO
Other crane functions from remote station OK. Telescope out solenoid cable OK. Telescope out solenoid OK. Remote control box internal wiring harness OK. TELESCOPE IN/OUT controller OK.
POSSIBLE PROBLEMS
Faulty external remote control cable. Faulty remote control cable.



TEST OPTIONS
Continuity Test or STE/CE Test #91
REASON FOR QUESTION
If continuity is not present, external remote control cable is faulty.

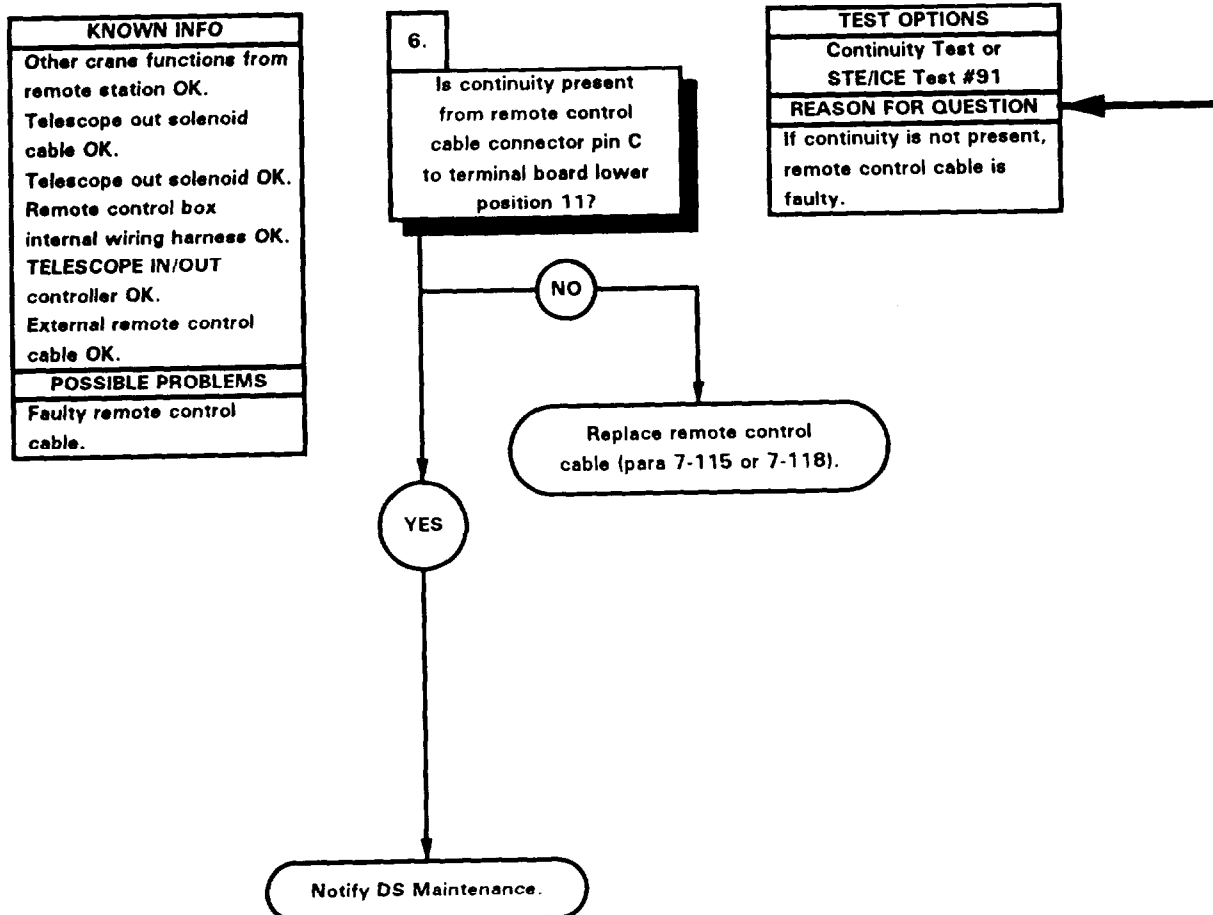
CONTINUITY TEST

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



62E1125-

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



CONTINUITY TEST

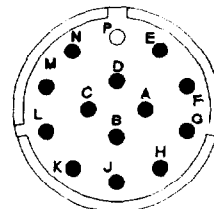
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter on pin C of remote control cable connector.
- (3) Connect negative (-) probe of multimeter on terminal board lower position 11 and note reading on multimeter.
- (4) If continuity is not present, replace remote control cable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

WIRES REMOVED FOR CLARITY

POSITION 11

COVER JUNCTION BOX

SCREW

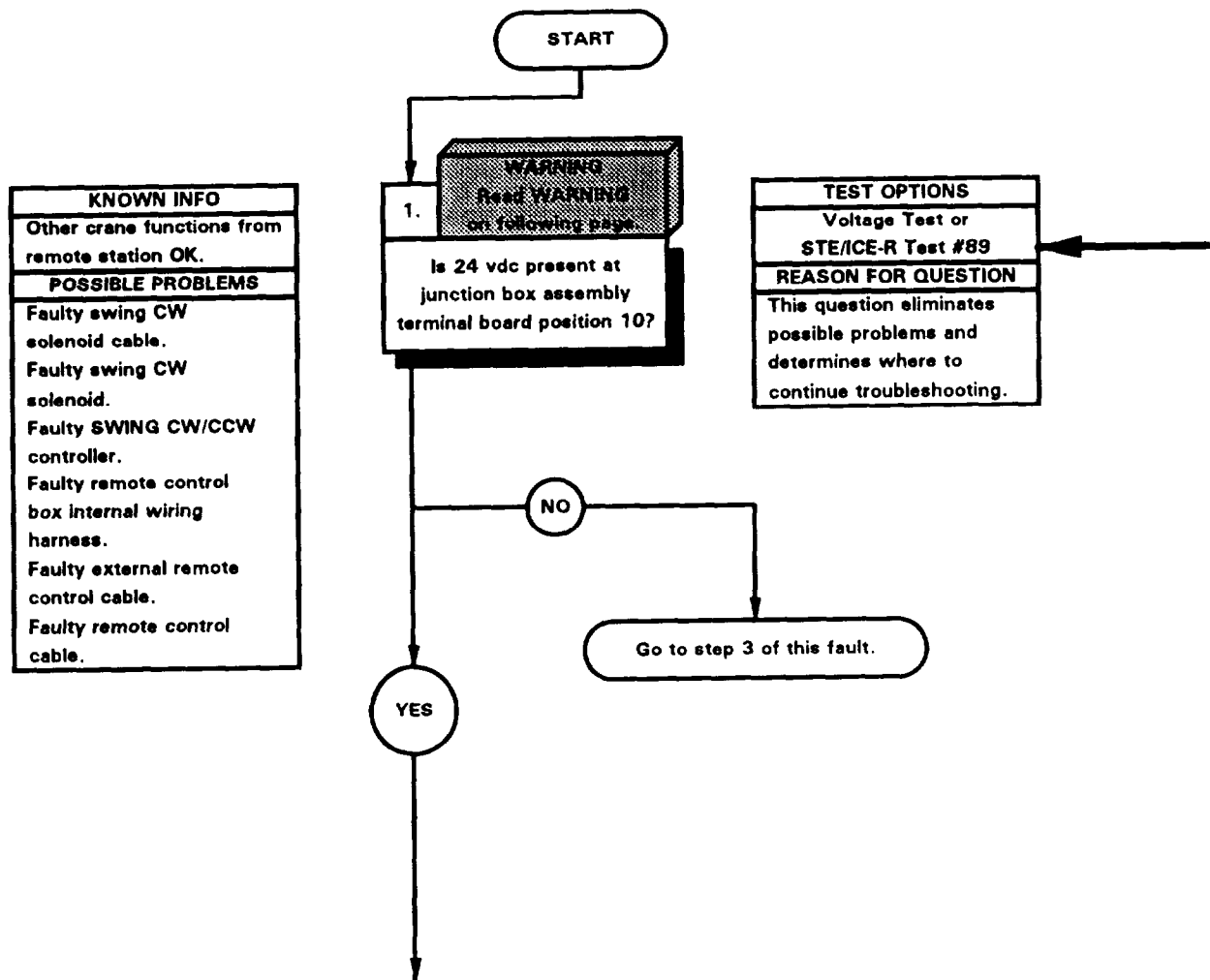


REMOTE CONTROL CABLE CONNECTOR

LEFT SIDE SHOWN
RIGHT SIDE SIMILAR

42E1126-

●128. M1089 MATERIAL HANDLING CRANE (MHC) SWING CW DOES NOT OPERATE FROM REMOTE STATION	
INITIAL SETUP	
Equipment Conditions Outriggers lowered (TM 9-2320-366-10-1). Crane erected with approximately five feet of cable payed out (TM 9-2320-366-10-1). Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/ICE-R (Item 41, Appendix C)
Personnel Required (2)	References TM 9-4910-571-12&P



WARNING

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

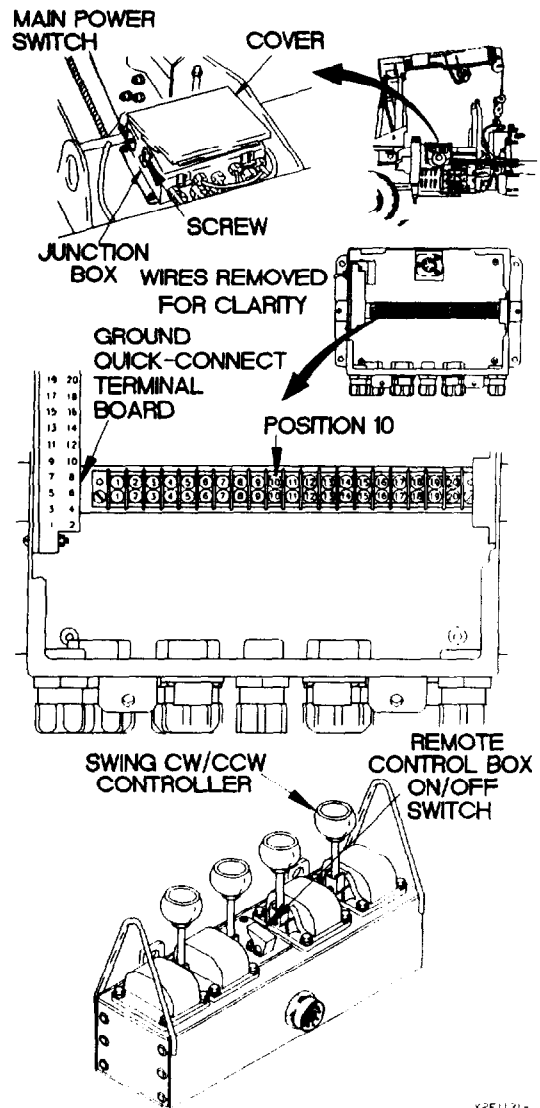
OUTPUT VOLTAGE TEST

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

NOTE

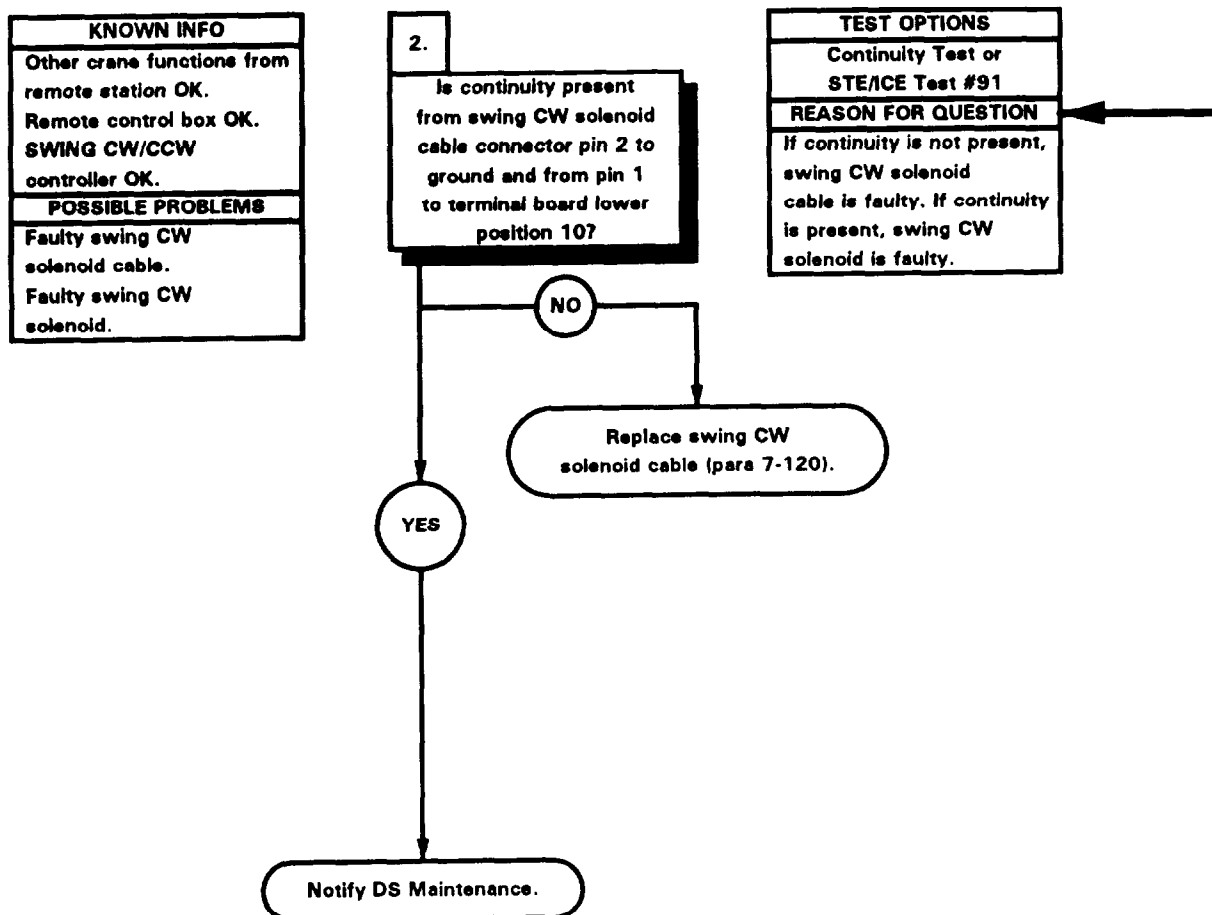
Step (9) requires the aid of an assistant.

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



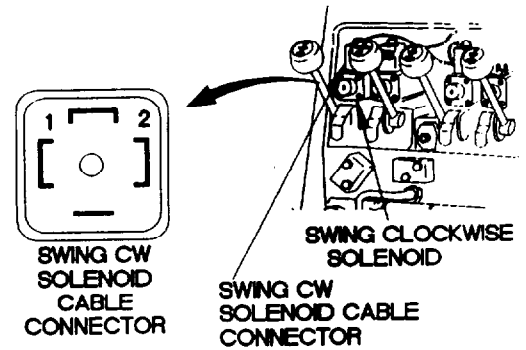
X2E1131-

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

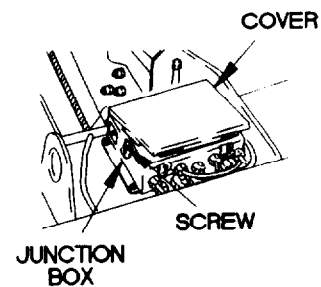
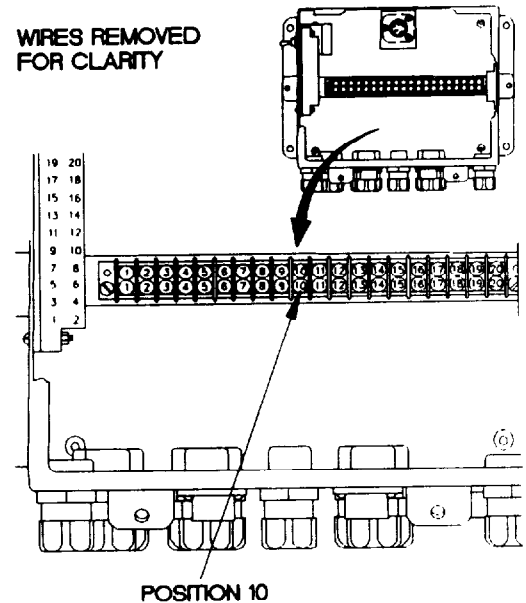


CONTINUITY TEST

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

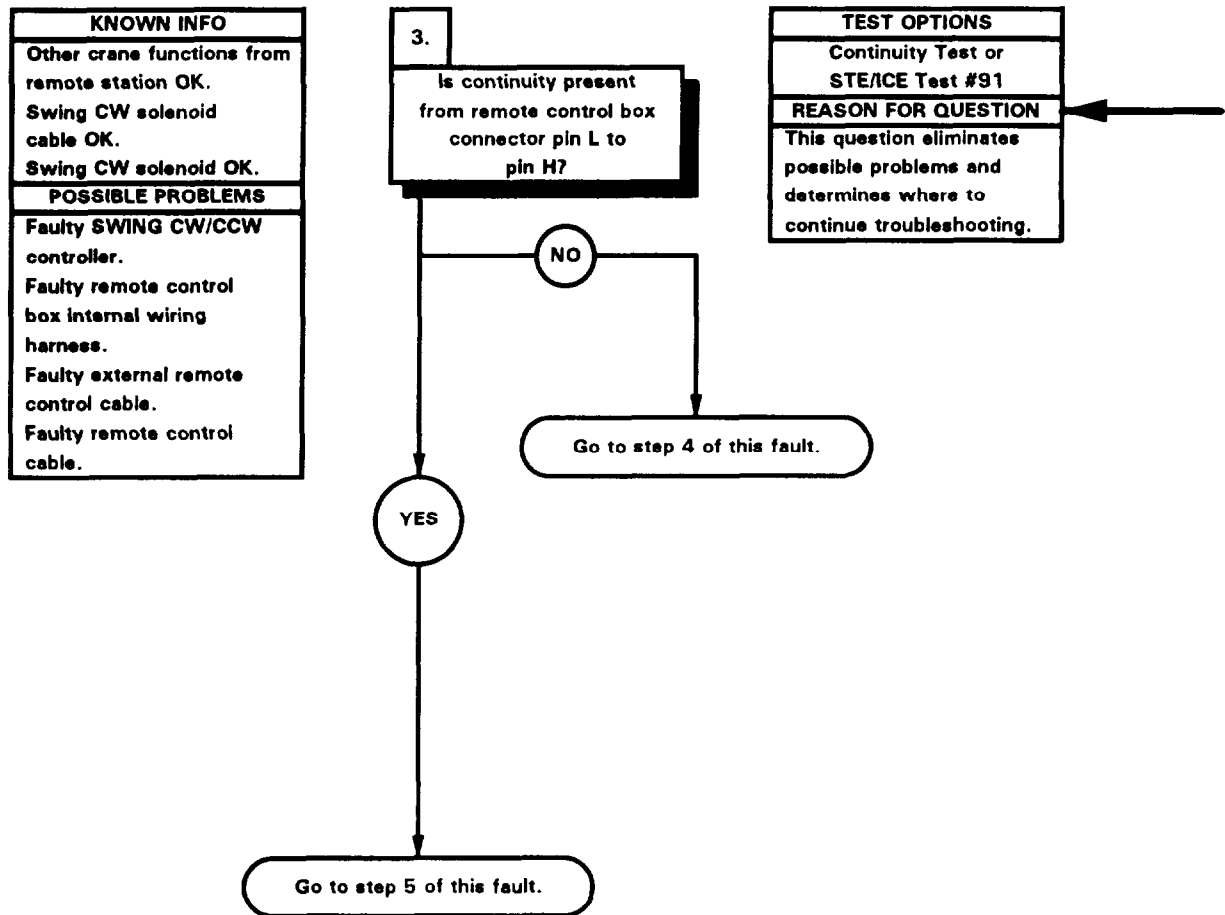


WIRES REMOVED FOR CLARITY



42E1132-

ø128. M1089 MATERIAL HANDLING CRANE (MHC) SWING CW DOES NOT OPERATE FROM REMOTE STATION (CONT)



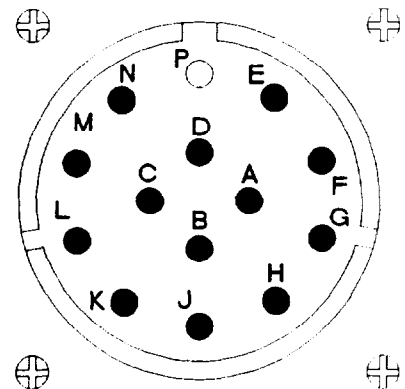
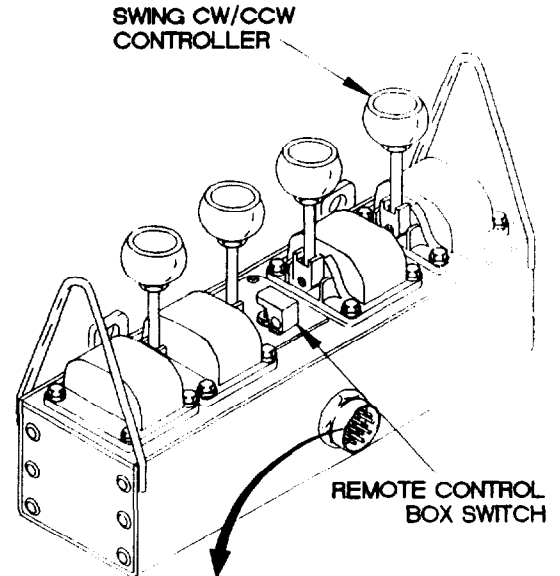
CONTINUITY TEST

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

NOTE

Step (6) requires the aid of an assistant.

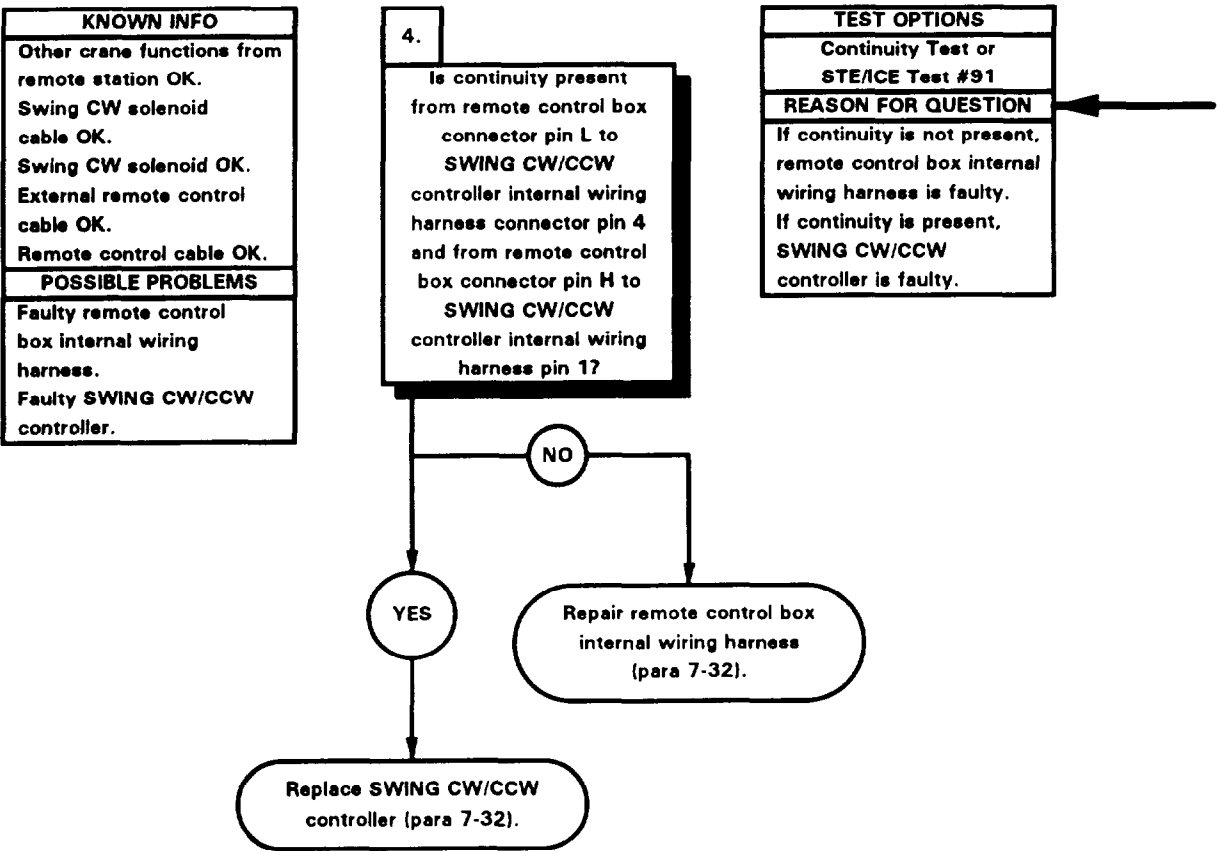
- (6) Position SWING CW/CCW controller to CW and note reading on multimeter.
- (7) If continuity is not present, go to step 4 of this fault.
- (8) If continuity is present, go to step 5 of this fault.
- (9) Position remote control box switch to OFF.



REMOTE CONTROL BOX CONNECTOR

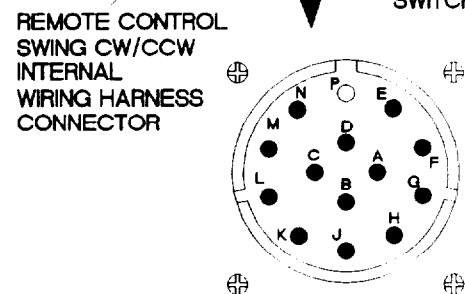
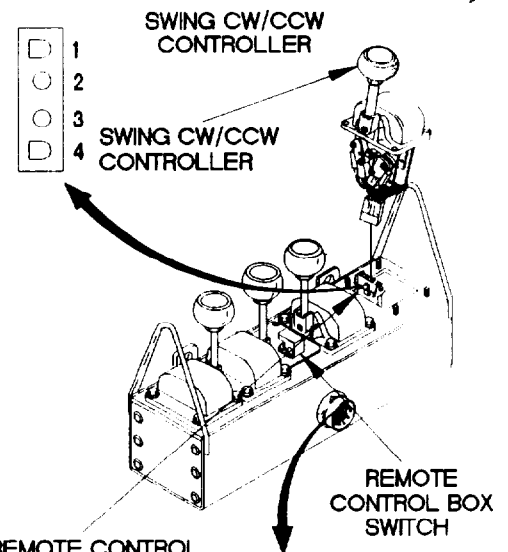
A2E1133-

6128. M1089 MATERIAL HANDLING CRANE (MHC) SWING CW DOES NOT OPERATE FROM REMOTE STATION (CONT)

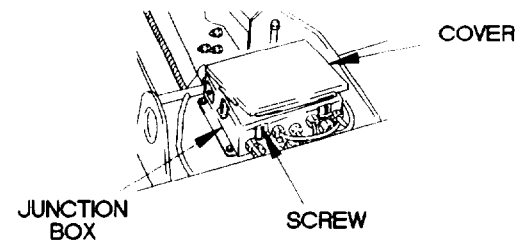


CONTINUITY TEST

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

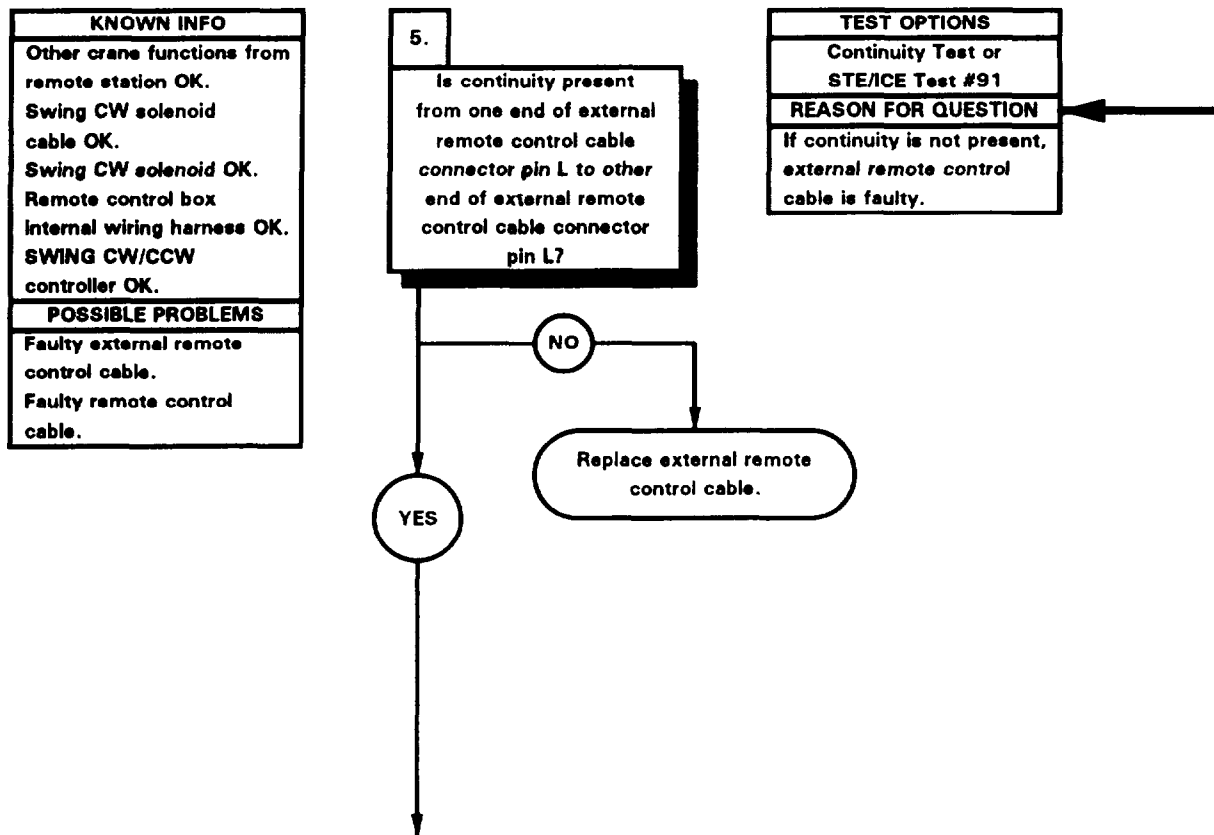


REMOTE CONTROL BOX CONNECTOR



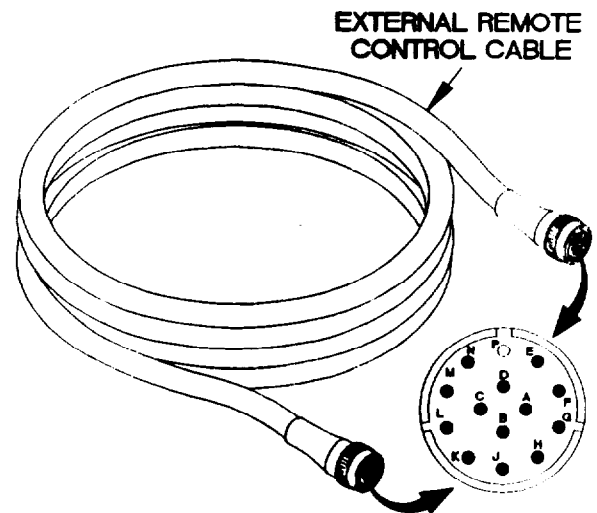
42E1134-

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



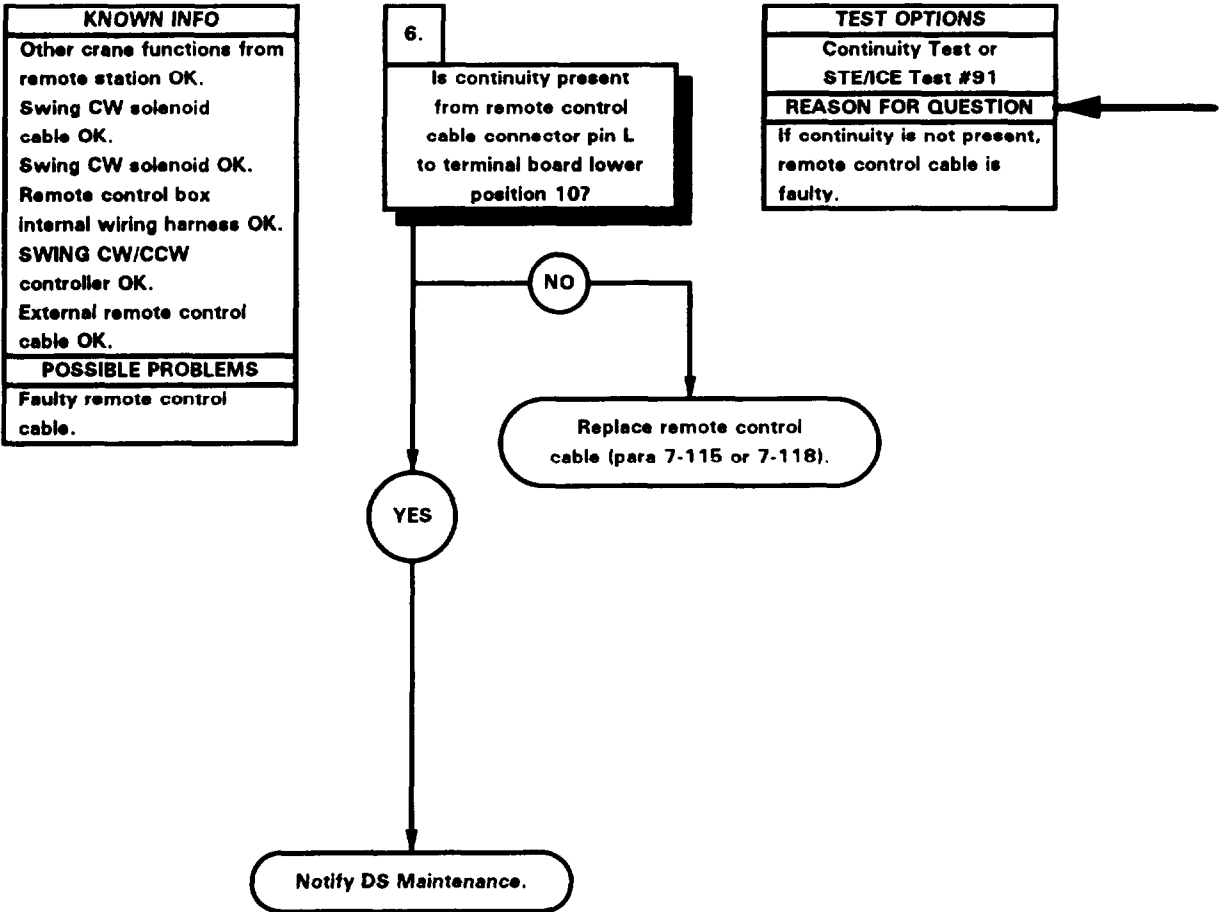
CONTINUITY TEST

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



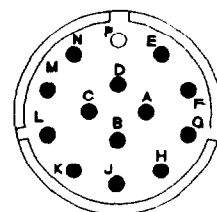
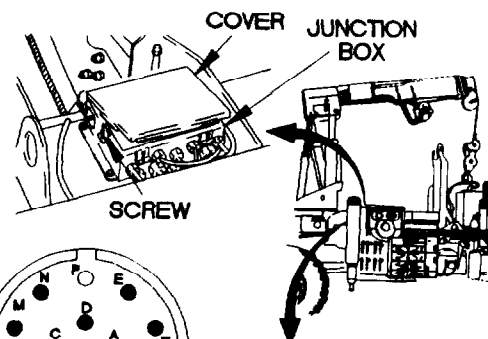
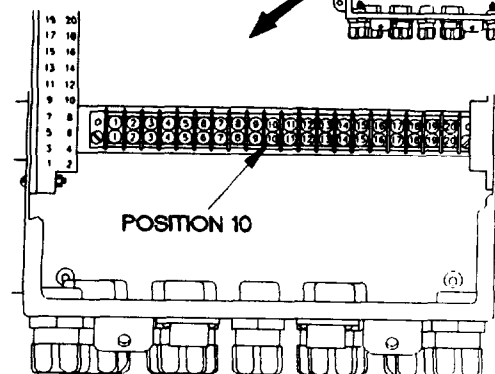
K2E1075-

•128. M1089 MATERIAL HANDLING CRANE (MHC) SWING CW DOES NOT OPERATE FROM REMOTE STA-
TION (CONT)



CONTINUITY TEST

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

WIRES REMOVED
FOR CLARITYREMOTE CONTROL
CABLE CONNECTORLEFT SIDE SHOWN
RIGHT SIDE SIMILAR

42E1136-

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

INITIAL SETUP

Equipment Conditions

Outriggers lowered (TM 9-2320-366-10-1).

Crane erected with approximately five feet of cable payed out (TM 9-2320-366-10-1).

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

Tools and Special Tools

Tool Kit, Genl Mech (Item 46, Appendix C)

Multimeter, Digital (Item 22, Appendix C)

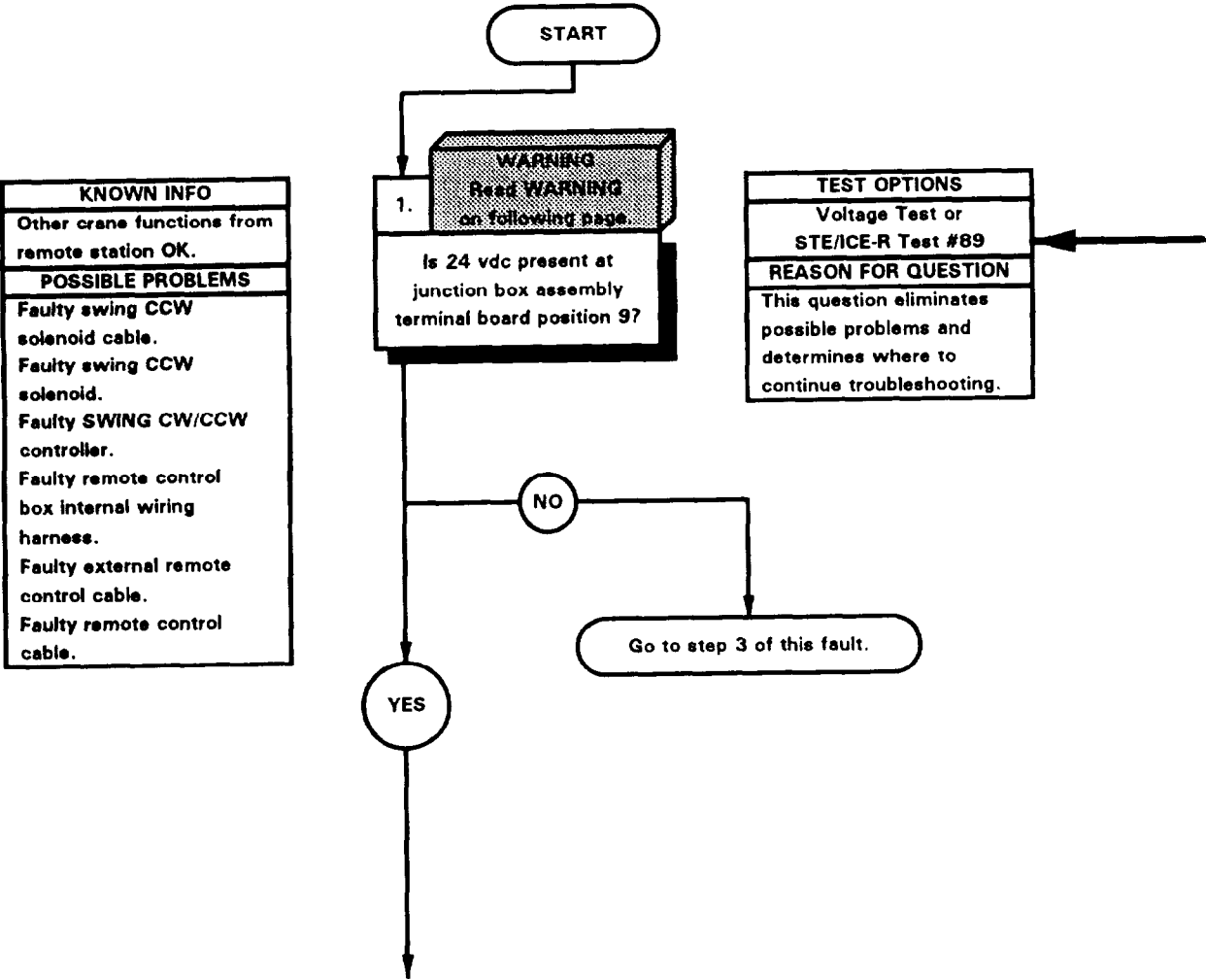
STE/ICE-R (Item 41, Appendix C)

References

TM 9-4910-571-12&P

Personnel Required

(2)



WARNING

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

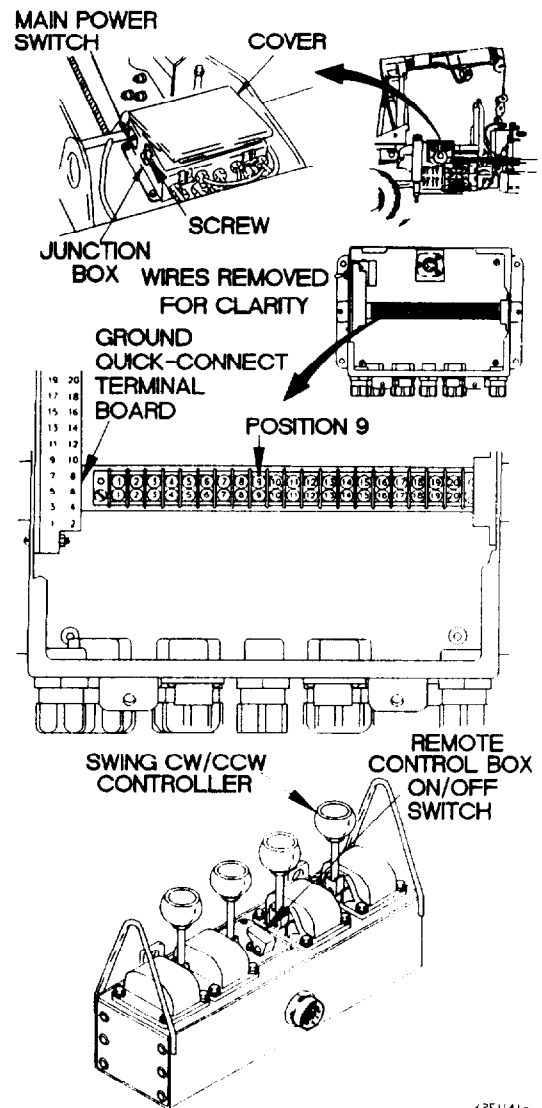
OUTPUT VOLTAGE TEST

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

NOTE

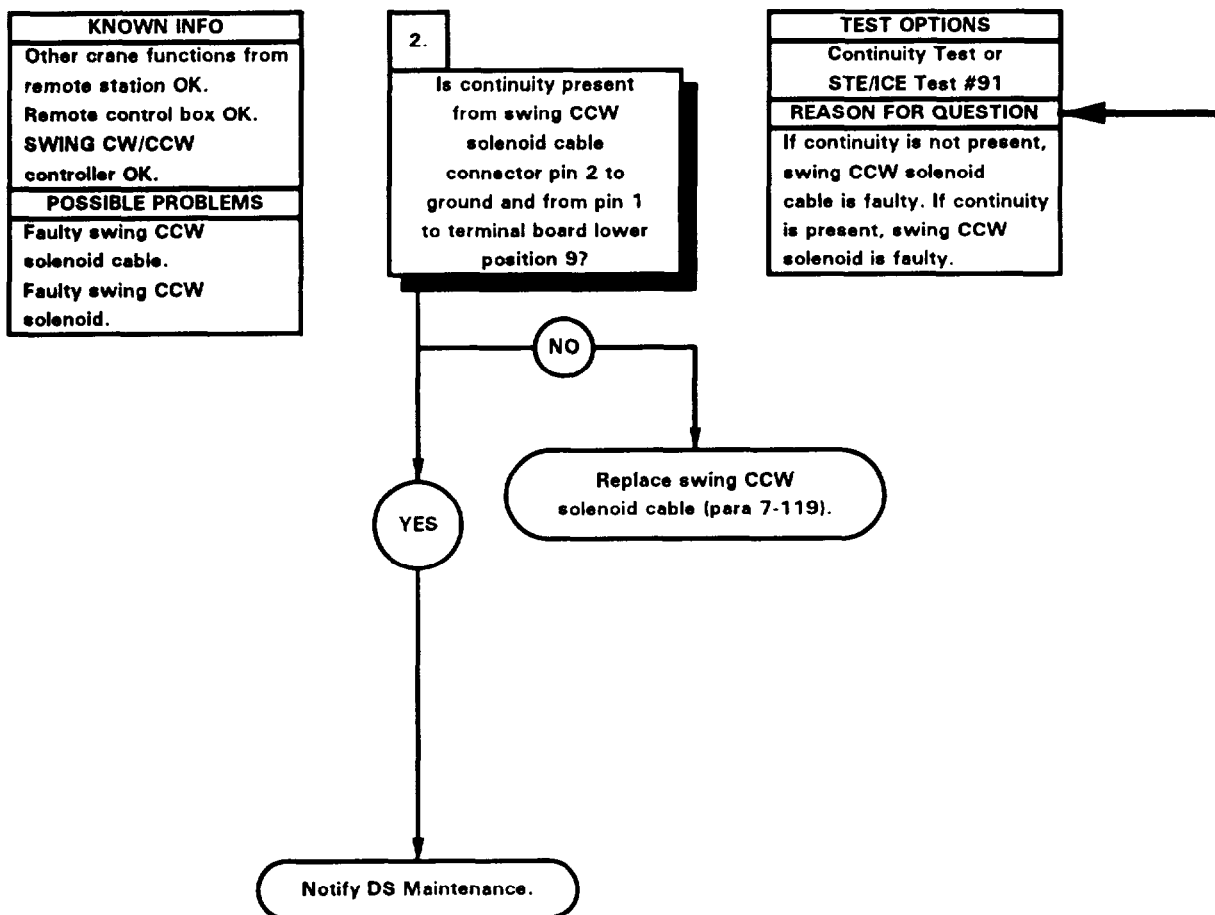
Step (9) requires the aid of an assistant.

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



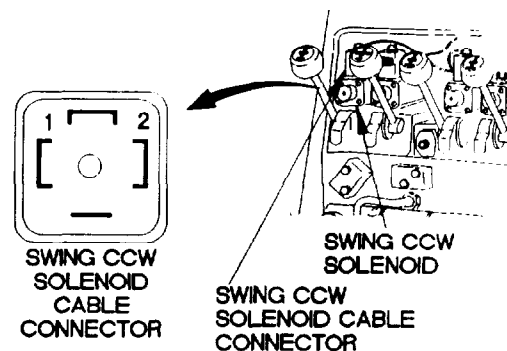
42E1141-

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

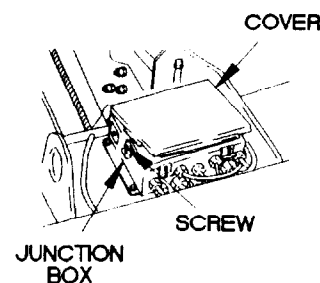
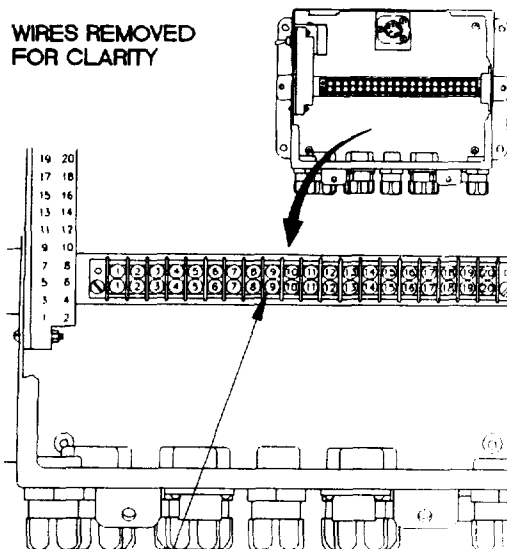


CONTINUITY TEST

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

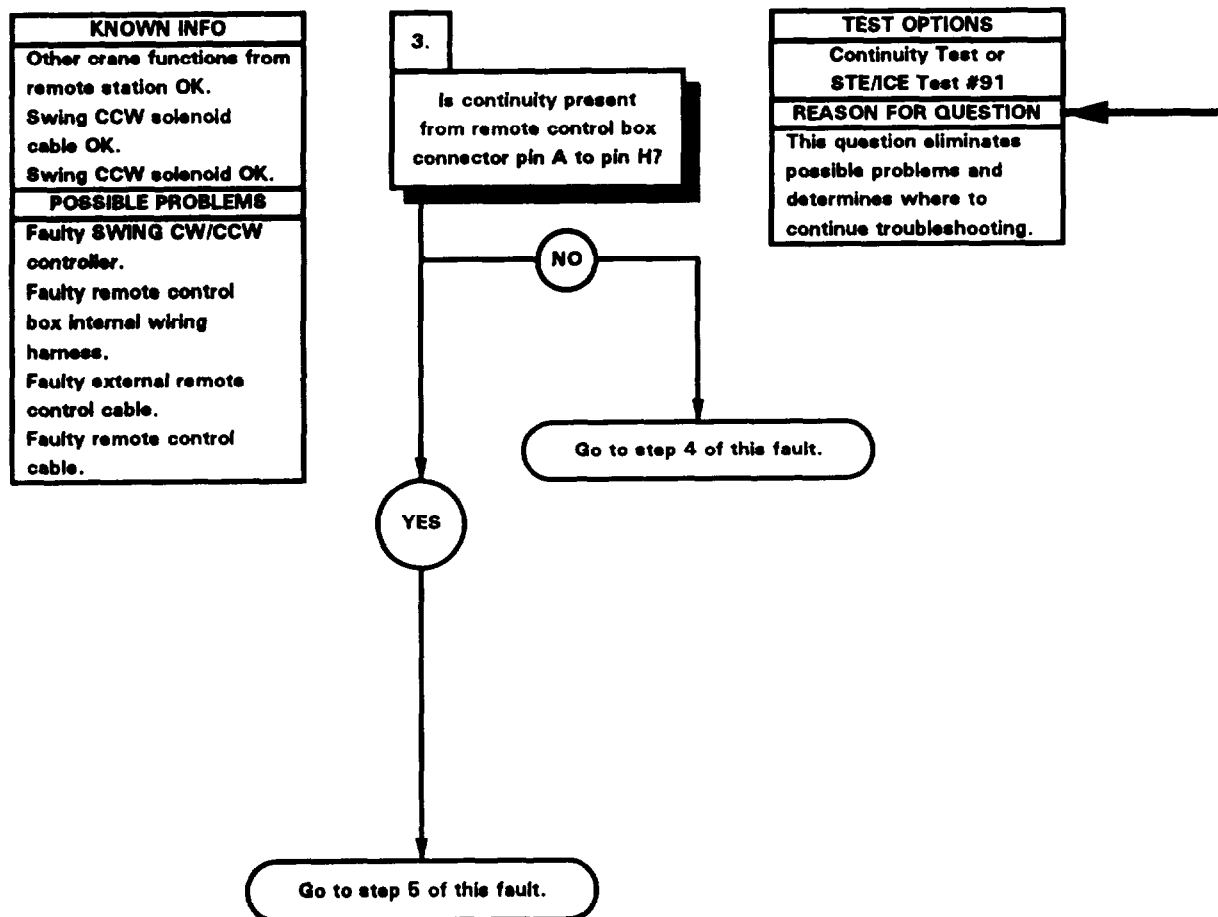


WIRES REMOVED FOR CLARITY



42E1142-

6129. M1089 MATERIAL HANDLING CRANE (MHC) SWING CCW DOES NOT OPERATE FROM REMOTE STATION (CONT)



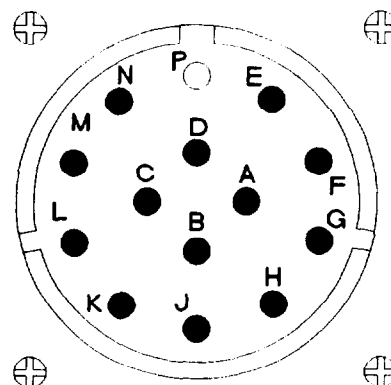
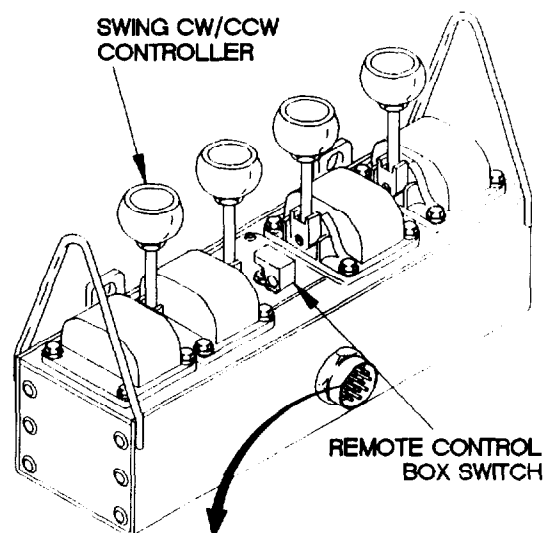
CONTINUITY TEST

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

NOTE

Step (6) requires the aid of an assistant.

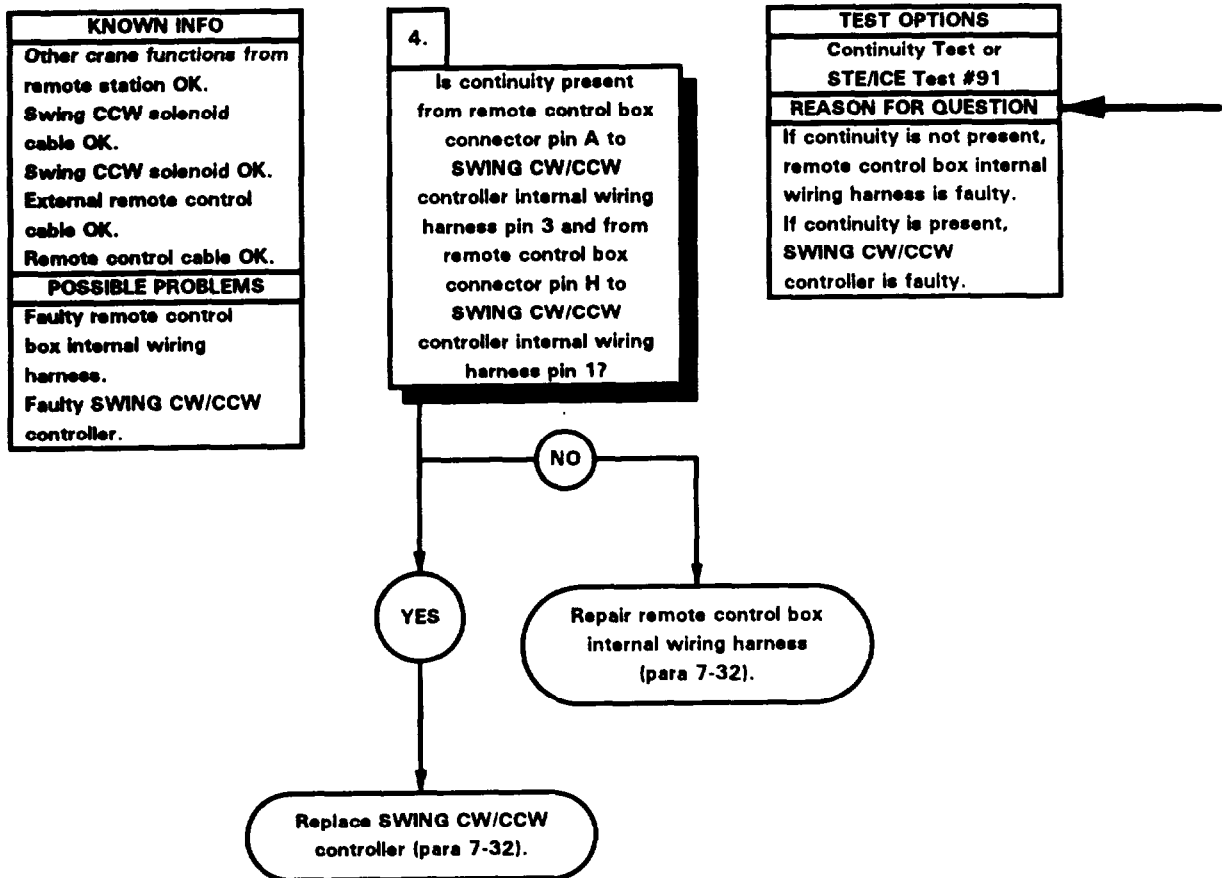
- (6) Position SWING CW/CCW controller to CCW and note reading on multimeter.
- (7) If continuity is not present, go to step 4 of this fault.
- (8) If continuity is present, go to step 5 of this fault.
- (9) Position remote control box switch to OFF.



**REMOTE CONTROL
BOX CONNECTOR**

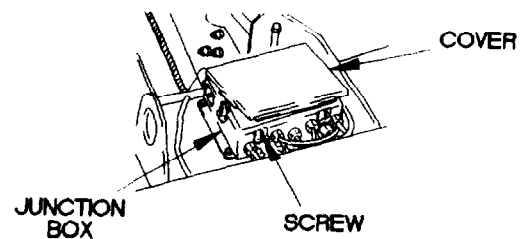
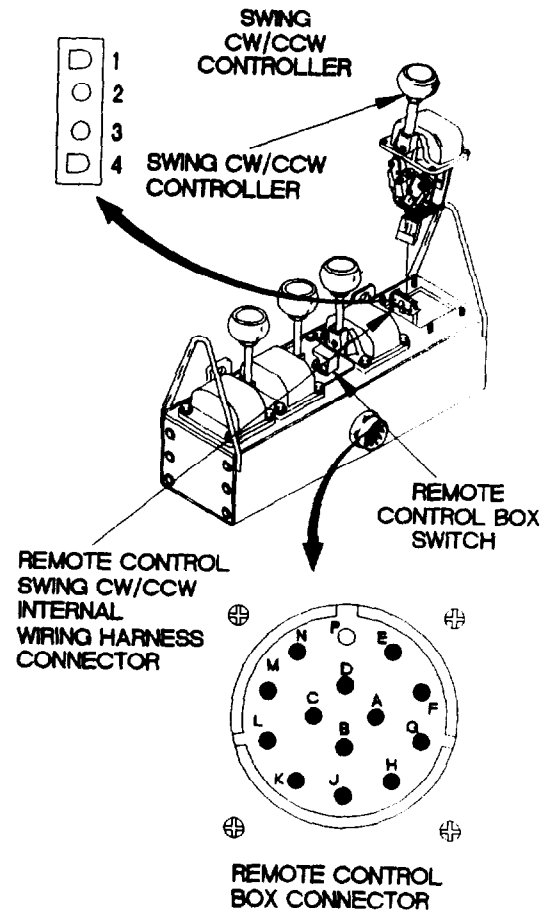
(2E1143)

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



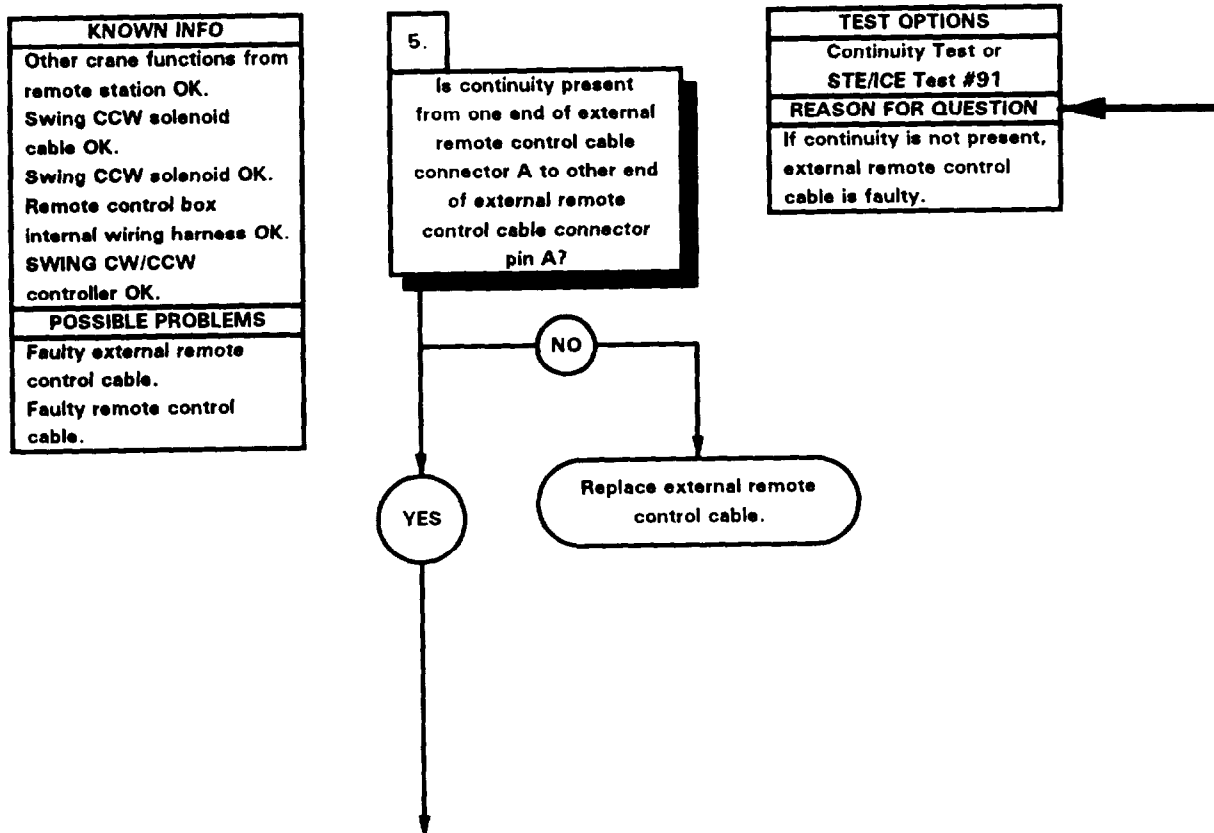
CONTINUITY TEST

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



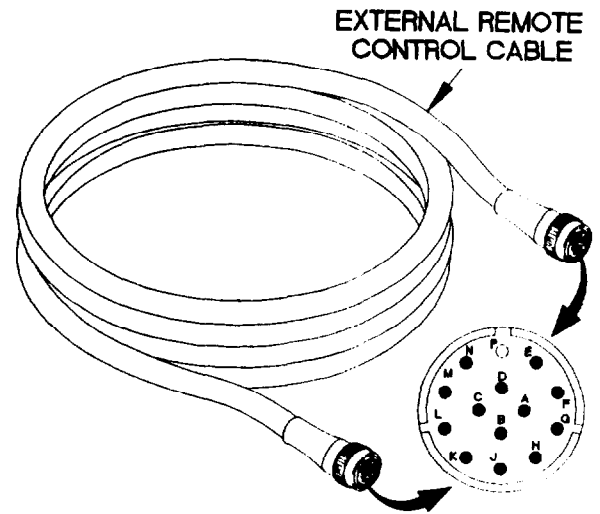
X2E1144-

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



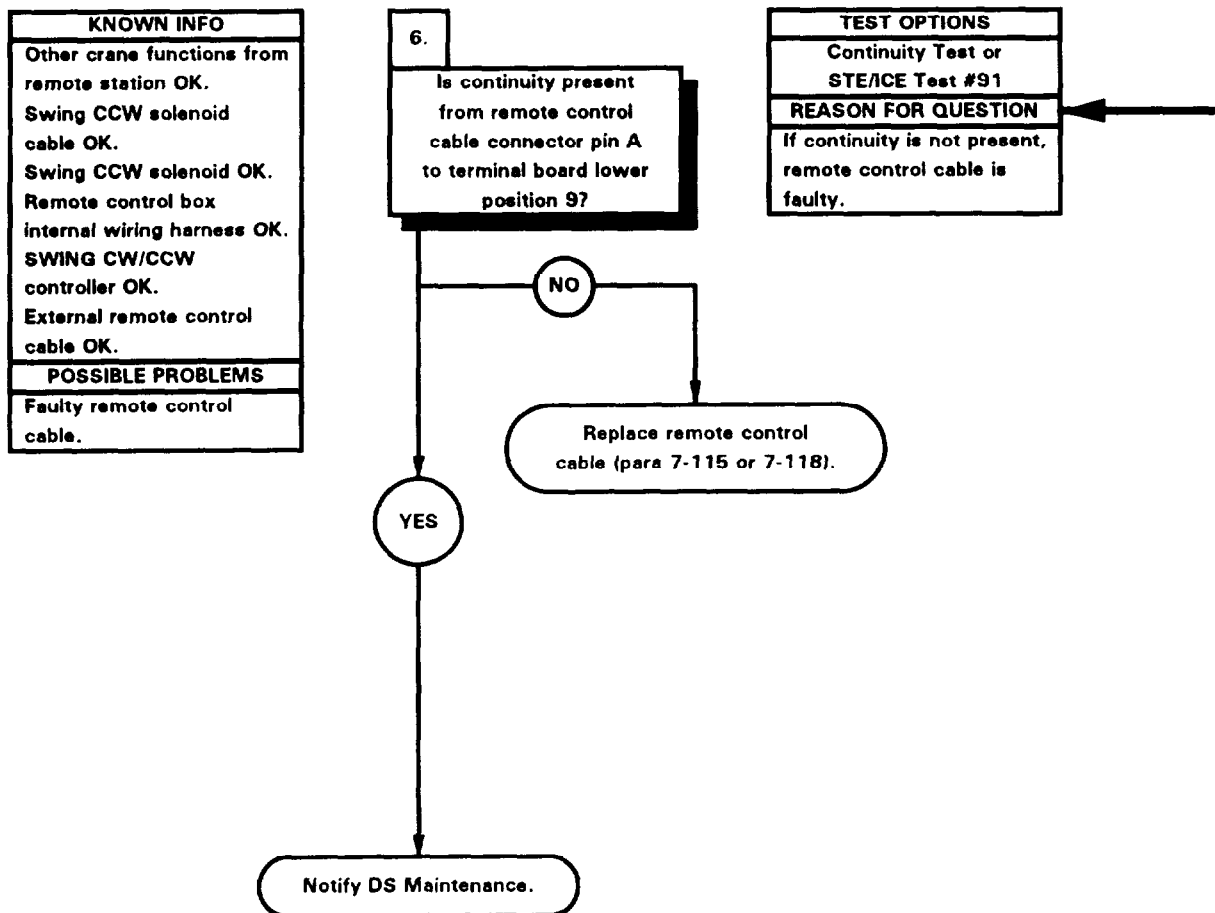
CONTINUITY TEST

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



x2E1145-

ø129. M1089 MATERIAL HANDLING CRANE (MHC) SWING CCW DOES NOT OPERATE FROM REMOTE STATION (CONT)

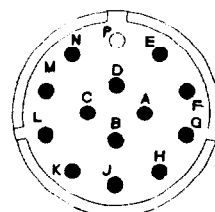


CONTINUITY TEST

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

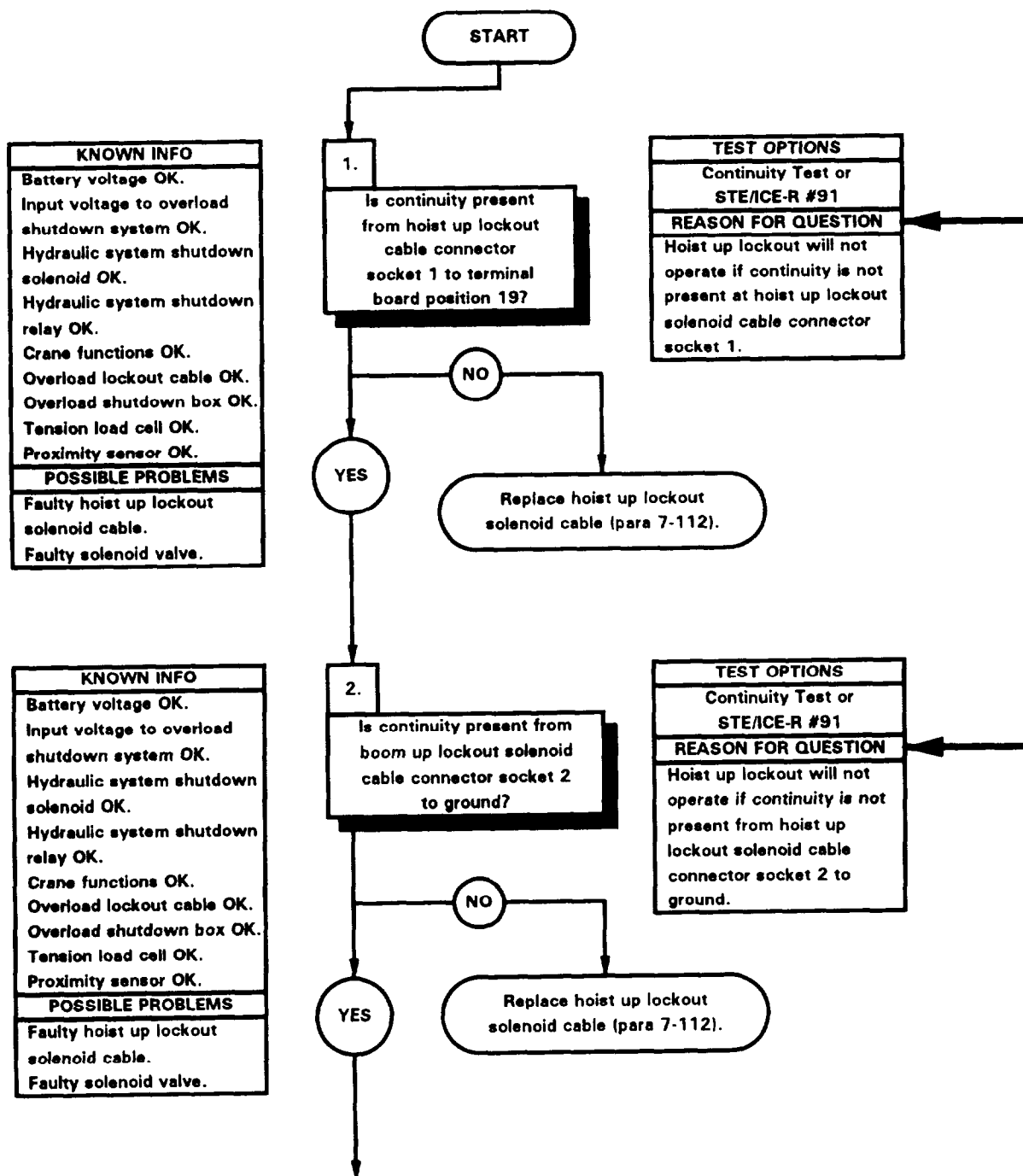
WIRES REMOVED
FOR CLARITYGROUND TERMINAL
BOARD

POSITION 9

COVER JUNCTION
BOX
SCREWREMOTE CONTROL
CABLE CONNECTORLEFT SIDE SHOWN
RIGHT SIDE SIMILAR

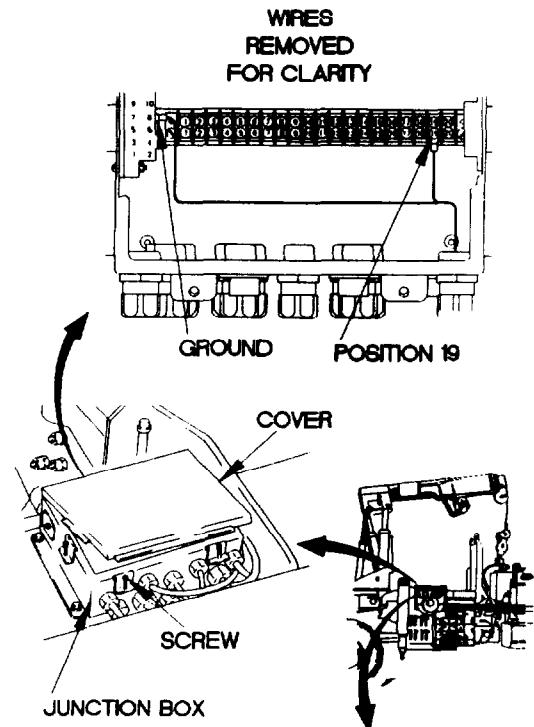
42E1146

e130. M1089 MATERIAL HANDLING CRANE (MHC) HOIST UP LOCKOUT DOES NOT ACTIVATE	
INITIAL SETUP	
Equipment Conditions Batteries disconnected (para 7-57).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/ICE-R (Item 41, Appendix C)
References TM 9-4910-571-12&P	



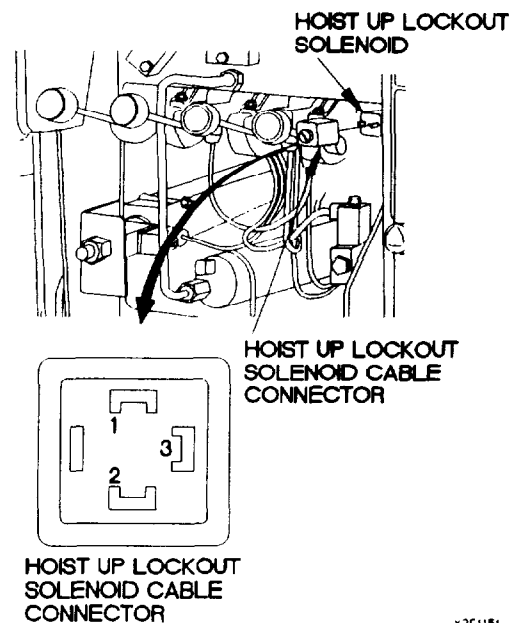
CONTINUITY TEST

- (1) Loosen four screws on junction box.
- (2) Open cover on junction box.
- (3) Disconnect hoist up lockout solenoid cable connector from hoist up lockout solenoid.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter in socket 1 of hoist up lockout solenoid cable.
- (6) Connect negative (-) probe of multimeter to terminal board position 19 and note reading on multimeter.
- (7) If continuity is not present, replace hoist up lockout solenoid cable (para 7-112).



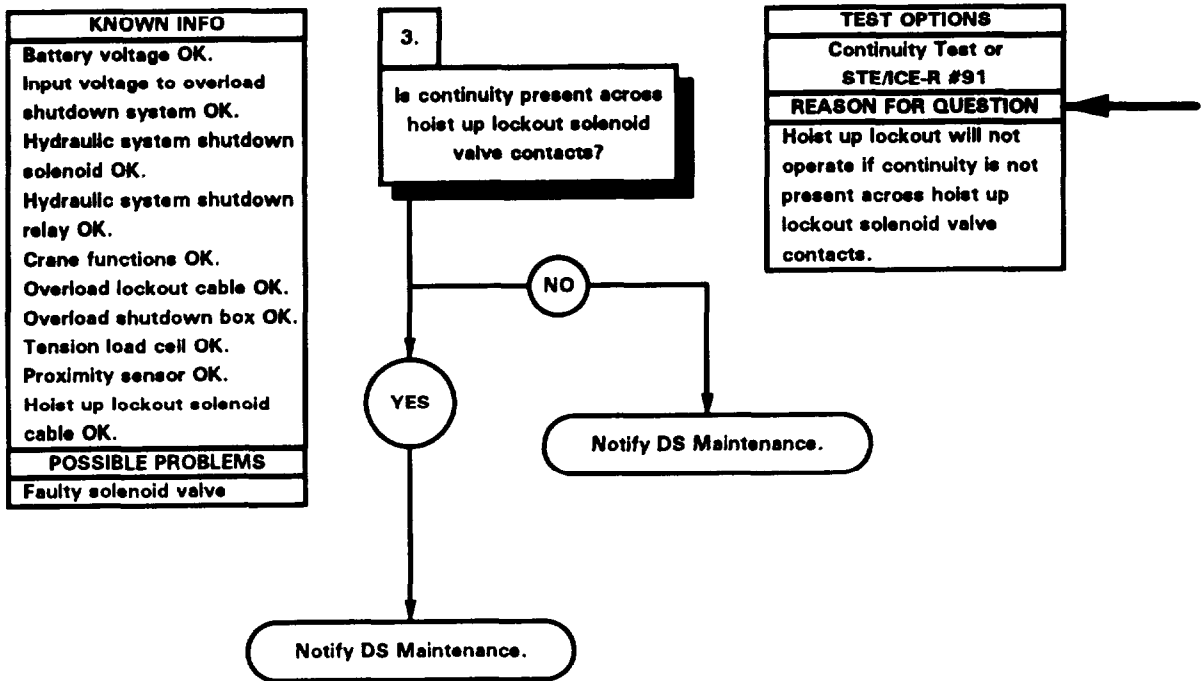
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter in socket 2 of hoist up lockout solenoid cable connector.
- (3) Connect negative (-) probe of multimeter on ground in junction box and note reading on multimeter.
- (4) If continuity is not present, replace hoist up lockout solenoid cable (para 7-112).
- (5) Connect hoist up lockout solenoid cable connector to hoist up lockout solenoid valve.
- (6) Close cover on junction box.
- (7) Tighten four screws on junction box cover.



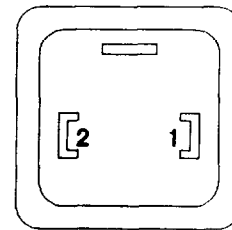
x2E1151-

6130. M1089 MATERIAL HANDLING CRANE (MHC) HOIST UP LOCKOUT DOES NOT ACTIVATE (CONT)



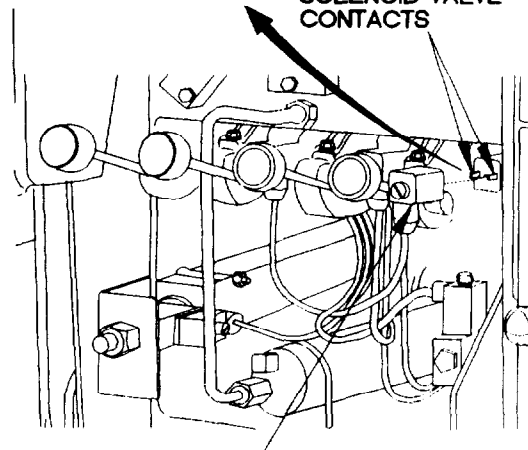
CONTINUITY TEST

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



HOIST UP LOCKOUT SOLENOID VALVE

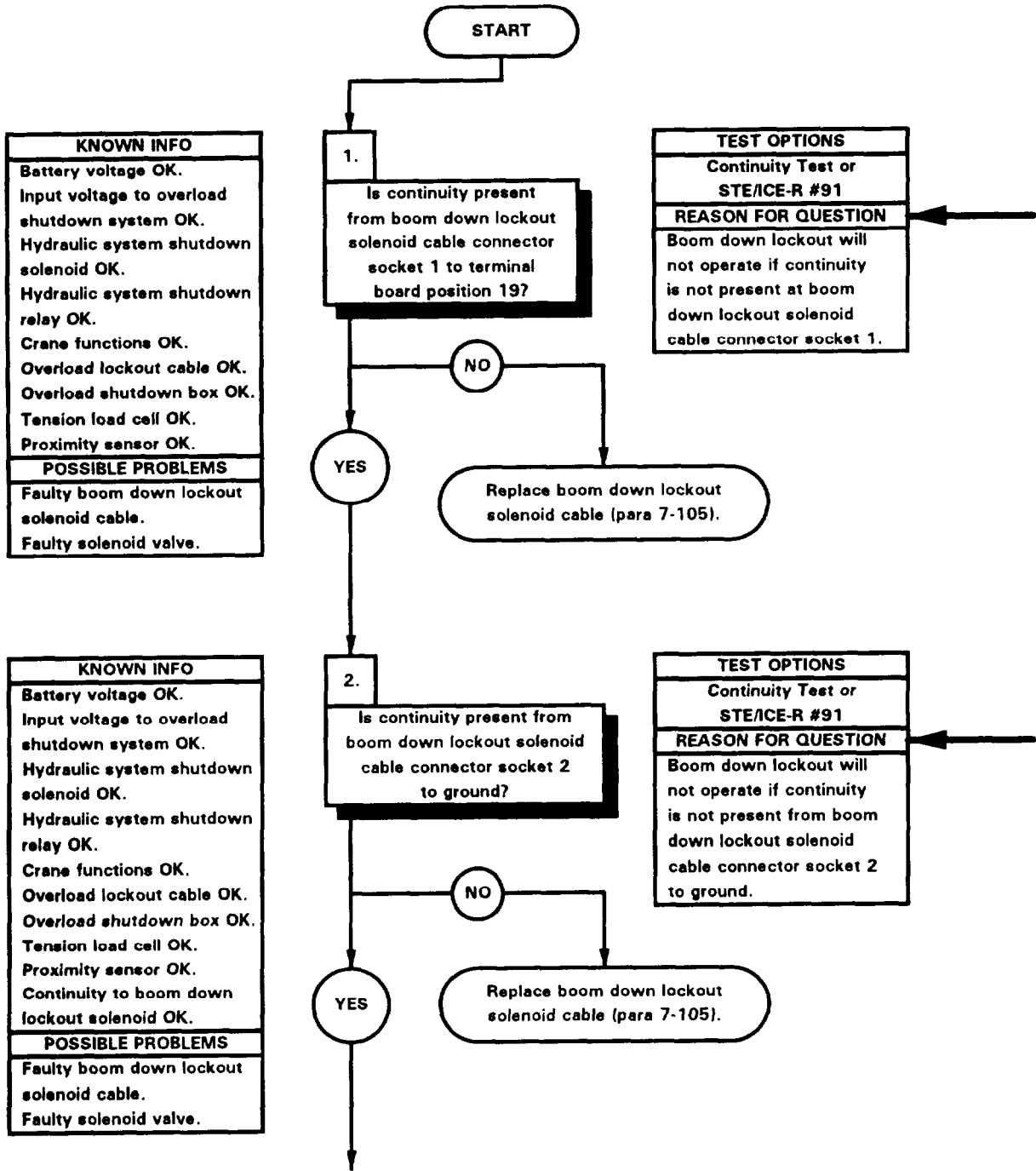
HOIST UP LOCKOUT SOLENOID VALVE CONTACTS



HOIST UP LOCKOUT SOLENOID SOLENOID CONNECTOR

K2E1152-

131. M1089 MATERIAL HANDLING CRANE (MHC) BOOM DOWN LOCKOUT DOES NOT ACTIVATE	
INITIAL SETUP	
Equipment Conditions	Tools and Special Tools
Batteries disconnected (para 7-57).	Tool Kit, Genl Mech (Item 46, Appendix C)
	Multimeter, Digital (Item 22, Appendix C)
References	STE/ICE-R (Item 41, Appendix C)
TM 9-4910-571-12&P	

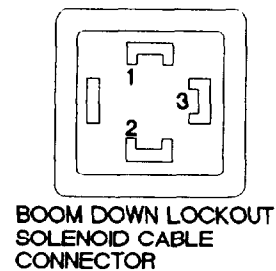
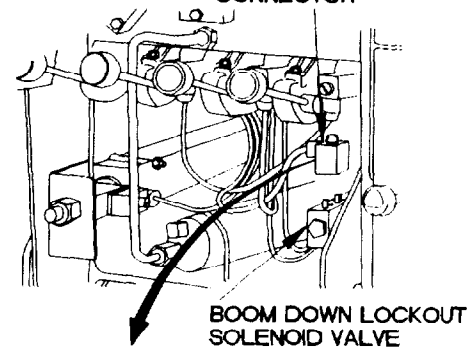
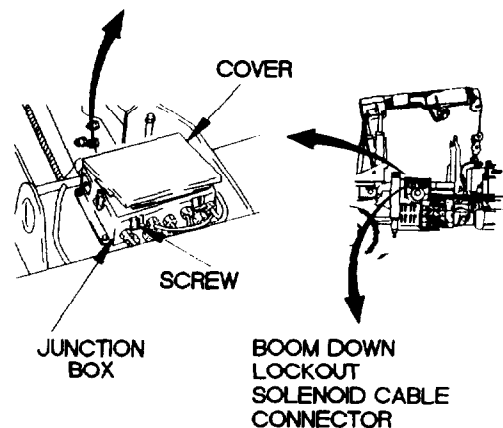
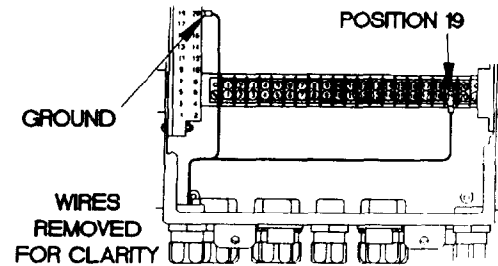


CONTINUITY TEST

- (1) Loosen four screws on junction box.
- (2) Open cover on junction box.
- (3) Disconnect boom down lockout solenoid cable connector from boom down lockout solenoid valve.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter in socket 1 of boom down lockout solenoid cable.
- (6) Connect negative (-) probe of multimeter to terminal board position 19 and note reading on multimeter.
- (7) If continuity is not present, replace boom down lockout solenoid cable (para 7-105).

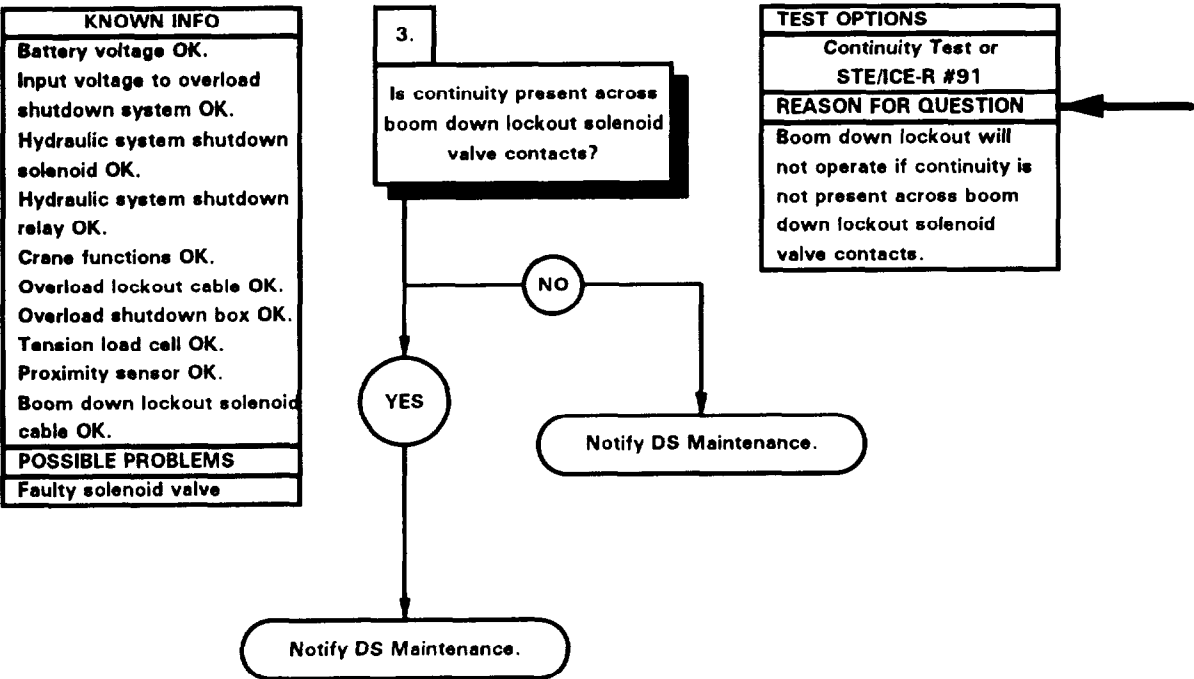
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter in socket 2 of boom down lockout solenoid cable connector.
- (3) Connect negative (-) probe of multimeter on ground in junction box and note reading on multimeter.
- (4) If continuity is not present, replace boom down lockout solenoid cable (para 7-105).
- (5) Connect boom down lockout solenoid cable connector to boom down lockout solenoid valve.
- (6) Close cover on junction box.
- (7) Tighten four screws on junction box cover.



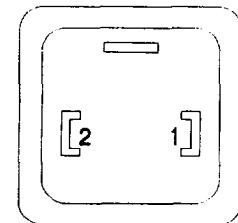
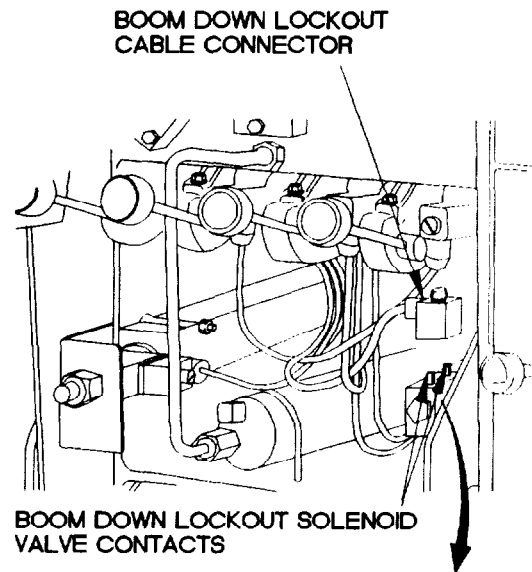
x2E1161-

e131. M1089 MATERIAL HANDLING CRANE (MHC) BOOM DOWN LOCKOUT DOES NOT ACTIVATE (CONT)



CONTINUITY TEST

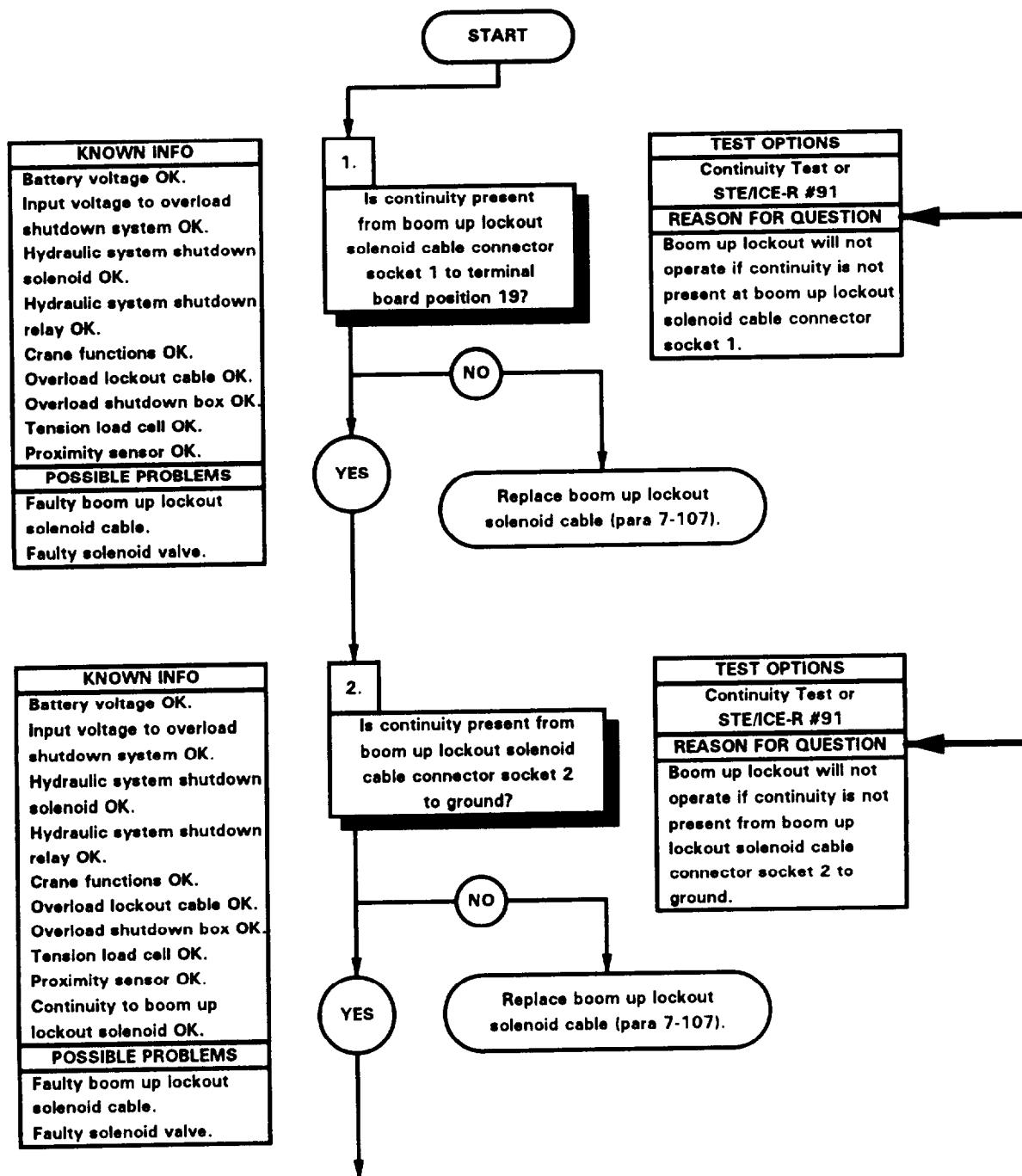
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter on contact two of boom down lockout solenoid valve.
- (3) Connect negative (-) probe of multimeter to contact one of boom down lockout solenoid valve and note reading on multimeter.
- (4) If continuity is not present, notify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



BOOM DOWN LOCKOUT SOLENOID VALVE

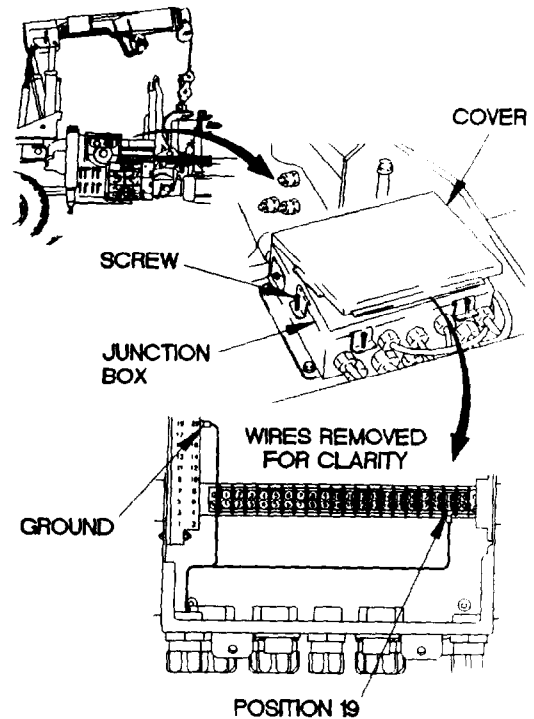
*2E1162-

132. M1089 MATERIAL HANDLING CRANE (MHC) BOOM UP LOCKOUT DOES NOT ACTIVATE	
INITIAL SETUP	
Equipment Conditions Batteries disconnected (para 7-57).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/ICE-R (Item 41, Appendix C)
References TM 9-4910-571-12&P	



CONTINUITY TEST

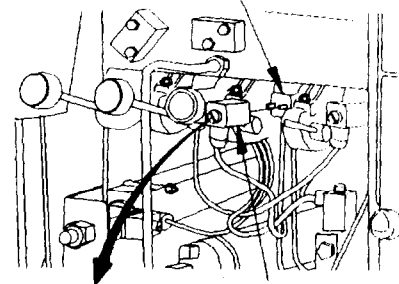
- (1) Loosen four screws on junction box.
- (2) Open cover on junction box.
- (3) Disconnect boom up lockout solenoid cable connector from boom up lockout solenoid valve.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter in socket 1 of boom up lockout solenoid cable.
- (6) Connect negative (-) probe of multimeter to terminal board position 19 and note reading on multimeter.
- (7) If continuity is not present, replace boom up lockout solenoid cable (para 7-107).



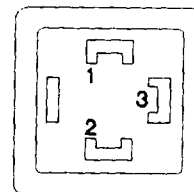
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter in socket 2 of boom up lockout solenoid cable connector.
- (3) Connect negative (-) probe of multimeter on ground in junction box and note reading on multimeter.
- (4) If continuity is not present, replace boom up lockout solenoid cable (para 7-107).
- (5) Connect boom up lockout solenoid cable connector to boom up lockout solenoid valve.
- (6) Close cover on junction box.
- (7) Tighten four screws on junction box cover.

BOOM UP LOCKOUT SOLENOID VALVE



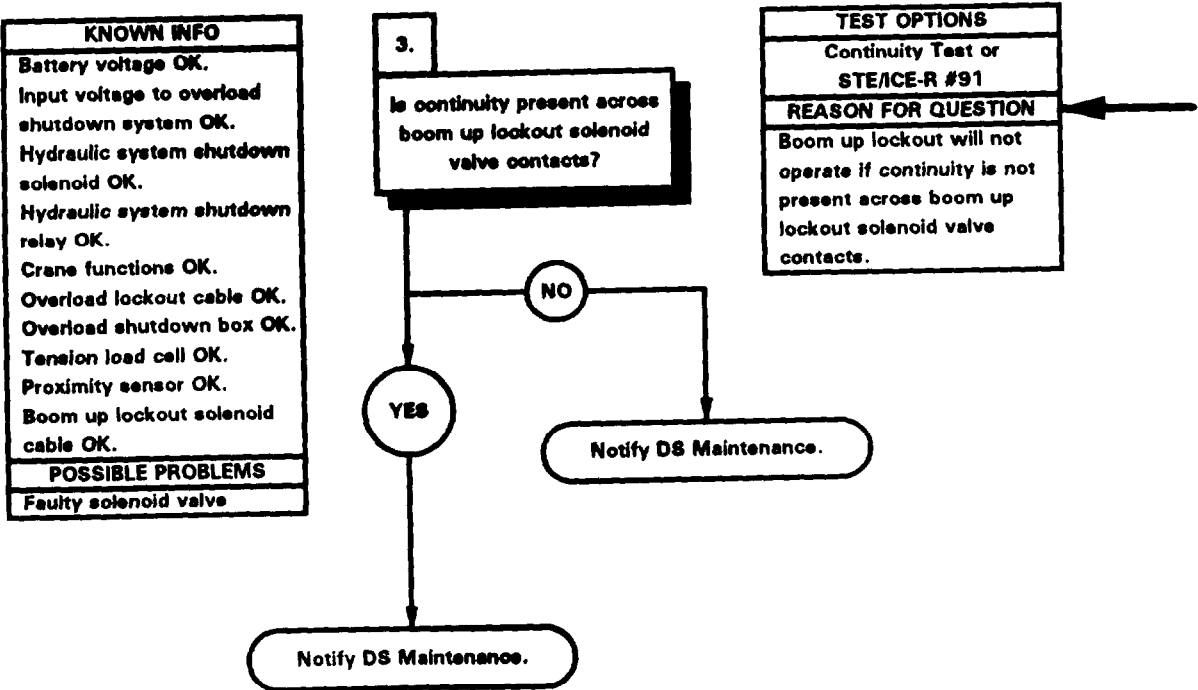
BOOM UP LOCKOUT SOLENOID CABLE CONNECTOR



BOOM UP LOCKOUT SOLENOID CABLE CONNECTOR

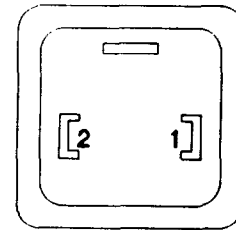
K2E1171-

e132. M1089 MATERIAL HANDLING CRANE (MHC) BOOM UP LOCKOUT DOES NOT ACTIVATE (CONT)



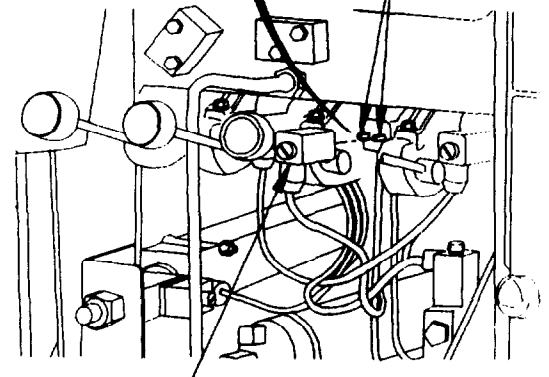
CONTINUITY TEST

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



BOOM UP LOCKOUT
SOLENOID VALVE

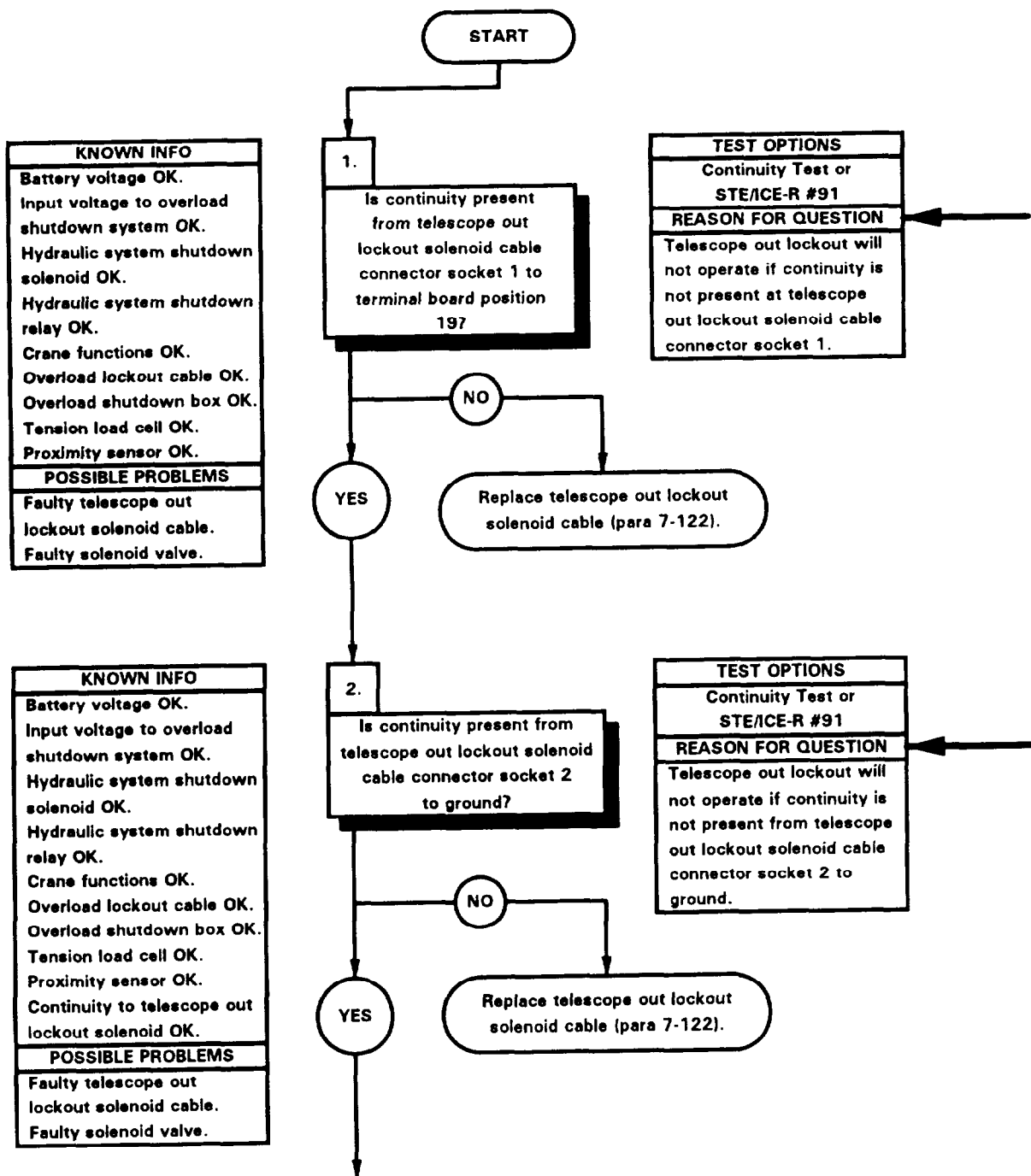
BOOM UP LOCKOUT
SOLENOID VALVE
CONTACTS



BOOM UP LOCKOUT
CABLE CONNECTOR

x2E1172-

133. M1089 MATERIAL HANDLING CRANE (MHC) TELESCOPE OUT LOCKOUT DOES NOT ACTIVATE	
INITIAL SETUP	
Equipment Conditions Batteries disconnected (para 7-57).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/ICE-R (Item 41, Appendix C)
References TM 9-4910-571-12&P	

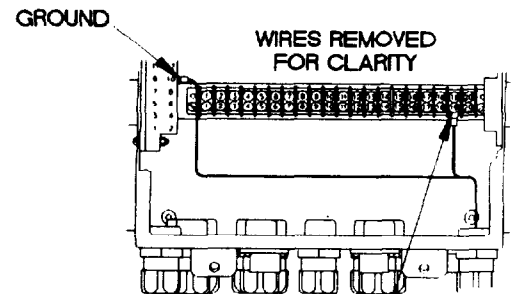
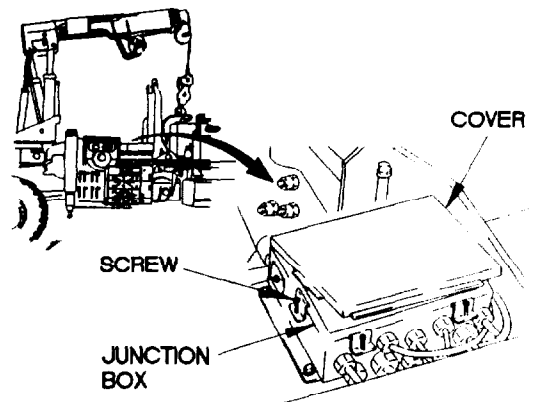


CONTINUITY TEST

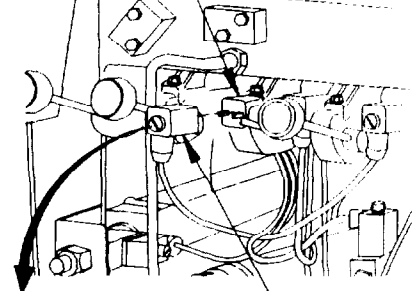
- (1) Loosen four screws on junction box.
- (2) Open cover on junction box.
- (3) Disconnect telescope out lockout solenoid cable connector from telescope out lockout solenoid valve.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter in socket 1 of telescope out lockout solenoid cable.
- (6) Connect negative (-) probe of multimeter to terminal board position 19 and note reading on multimeter.
- (7) If continuity is not present, replace telescope out lockout solenoid cable (para 7-122).

CONTINUITY TEST

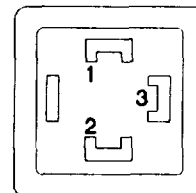
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter in socket 2 of telescope out lockout solenoid cable connector.
- (3) Connect negative (-) probe of multimeter on ground in junction box and note reading on multimeter.
- (4) If continuity is not present, replace telescope out lockout solenoid cable (para 7-122).
- (5) Connect telescope out lockout solenoid cable connector to telescope out lockout solenoid valve.
- (6) Close cover on junction box.
- (7) Tighten four screws on junction box cover.



TELESCOPE OUT
LOCKOUT SOLENOID
VALVE



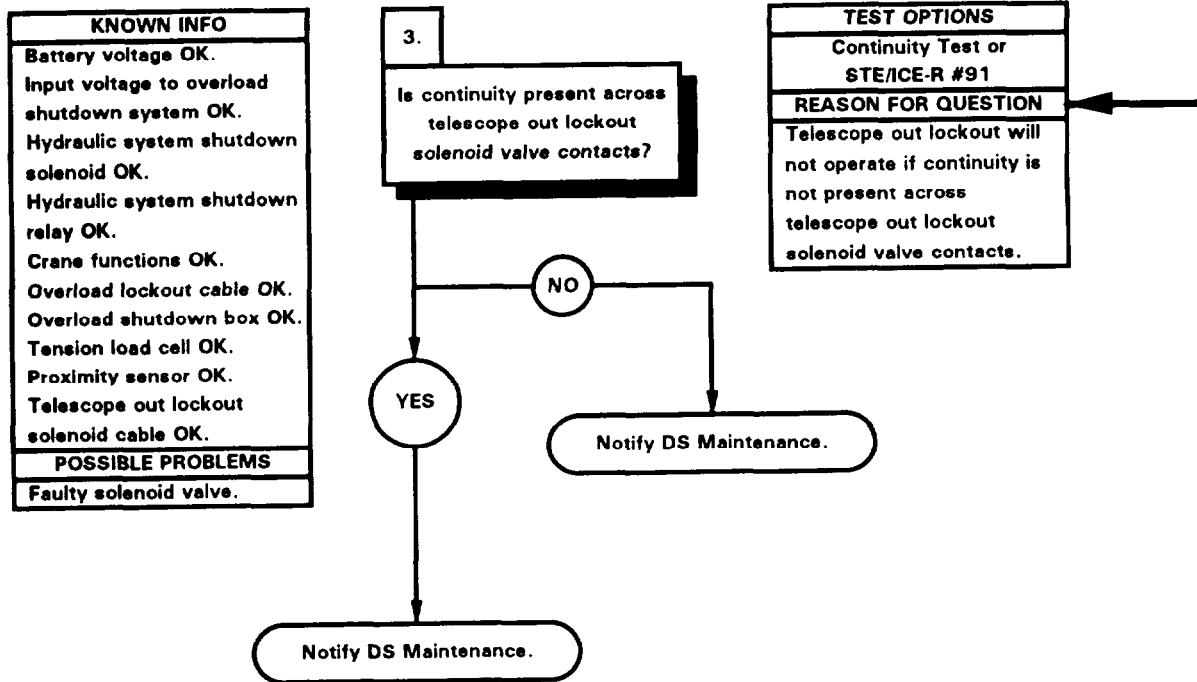
TELESCOPE OUT
LOCKOUT SOLENOID
CABLE CONNECTOR



TELESCOPE OUT
LOCKOUT SOLENOID
CABLE CONNECTOR

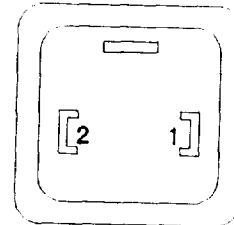
•2E1191-

e133. M1089 MATERIAL HANDLING CRANE (MHC) TELESCOPE OUT LOCKOUT DOES NOT ACTIVATE
(CONT)

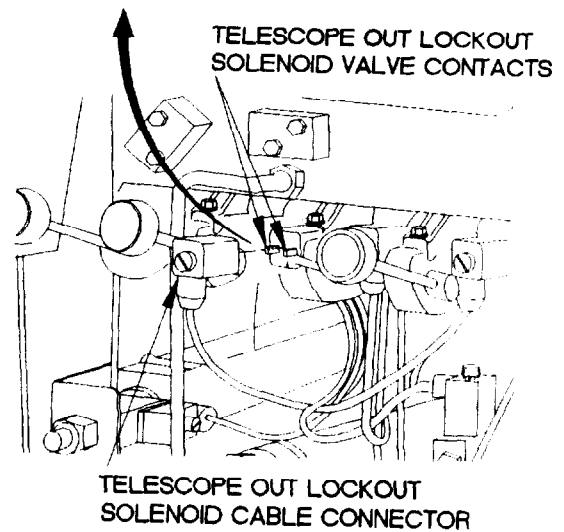


CONTINUITY TEST

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

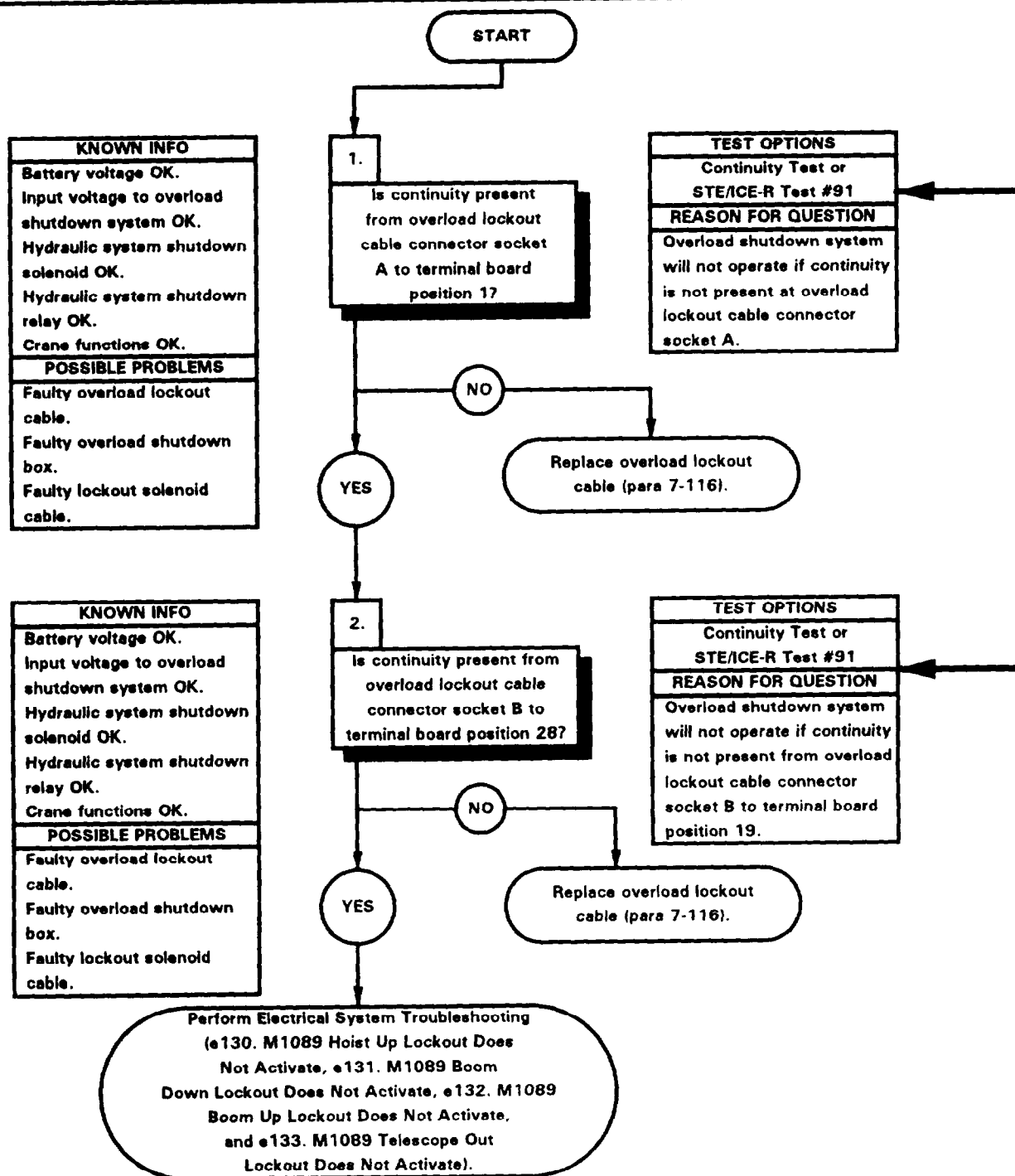


TELESCOPE OUT LOCKOUT SOLENOID VALVE



-2E1182-

e134. M1089 MATERIAL HANDLING CRANE (MHC) OVERLOAD SHUTDOWN SYSTEM DOES NOT ACTIVATE	
INITIAL SETUP	
Equipment Conditions Batteries disconnected (para 7-57).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/ICE-R (Item 41, Appendix C)
References TM 9-4910-471-12&P	

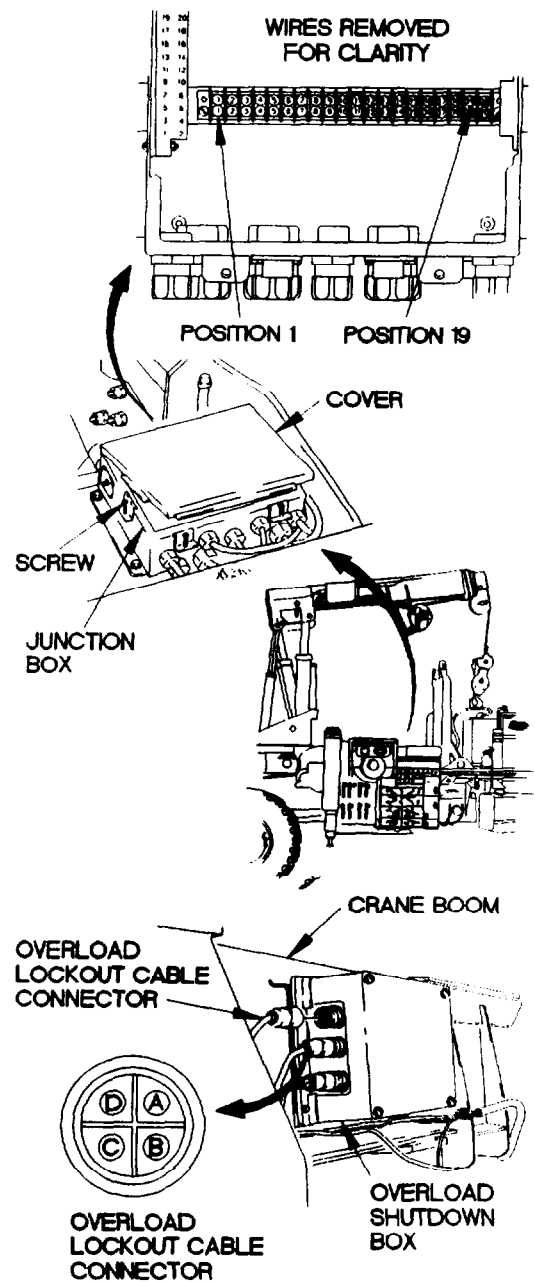


CONTINUITY TEST

- (1) Loosen four screws on junction box.
- (2) Open cover on junction box.
- (3) Disconnect overload lockout cable connector from overload shutdown box.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter in socket A of overload lockout cable connector.
- (6) Connect negative (-) probe of multimeter to terminal board position 1 and note reading on multimeter.
- (7) If continuity is not present, replace overload lockout cable (para 7-116).

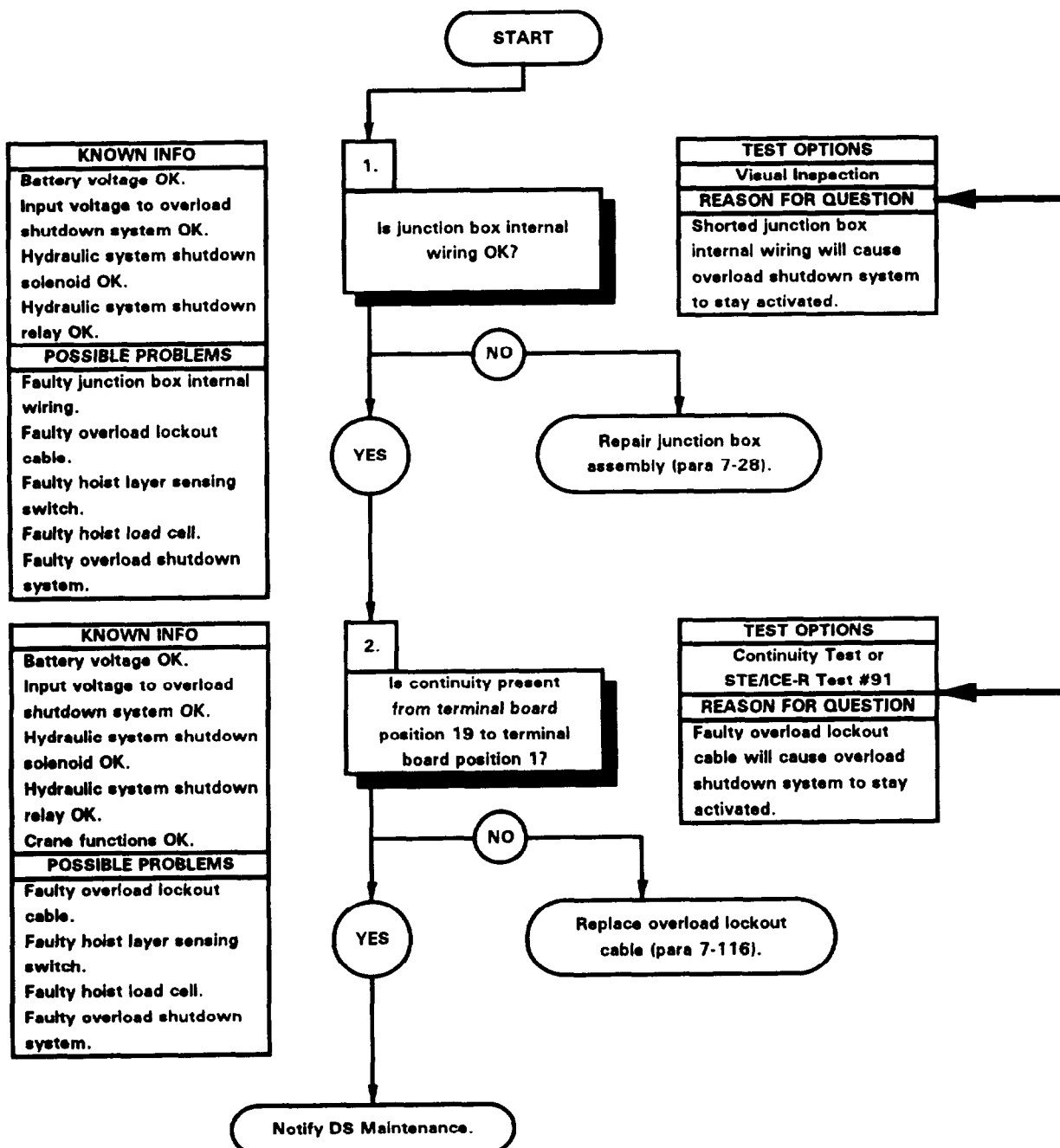
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter in socket B of overload lockout cable connector.
- (3) Connect negative (-) probe of multimeter on terminal board position 19 and note reading on multimeter.
- (4) If continuity is not present, replace overload lockout cable (para 7-116).
- (5) If continuity is present, perform Electrical System Troubleshooting (e130. M1089 Hoist Up Lockout Does Not Activate, e131. M1089 Boom Down Lockout Does Not Activate, e132. M1089 Boom Up Lockout Does Not Activate, and e133. M1089 Telescope Out Lockout Does Not Activate).
- (6) Connect overload lockout cable connector to overload shutdown box.
- (7) Close cover on junction box.
- (8) Tighten four screws on junction box.
- (9) Connect batteries (para 7-57).

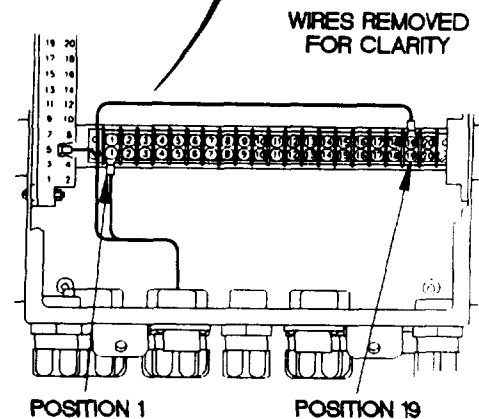
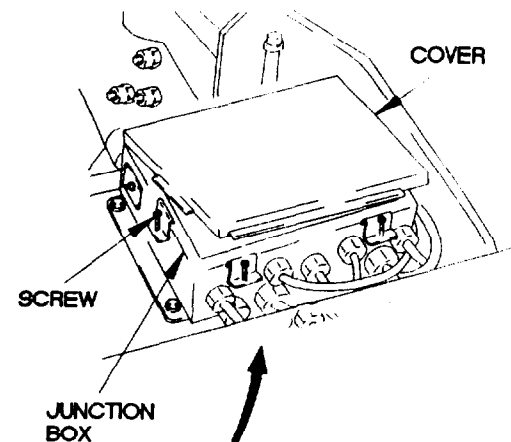
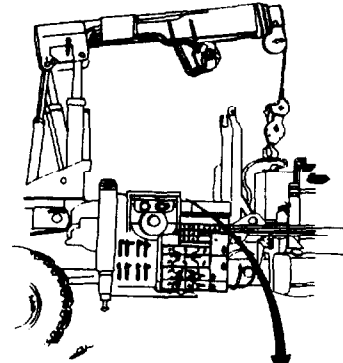


2E1191

e135. M1089 MATERIAL HANDLING CRANE (MHC) OVERLOAD SHUTDOWN SYSTEM STAYS ACTIVATED	
INITIAL SETUP	
Equipment Conditions Batteries disconnected (para 7-57).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/ICE-R (Item 41, Appendix C)
References TM 9-4910-571-12&P	



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

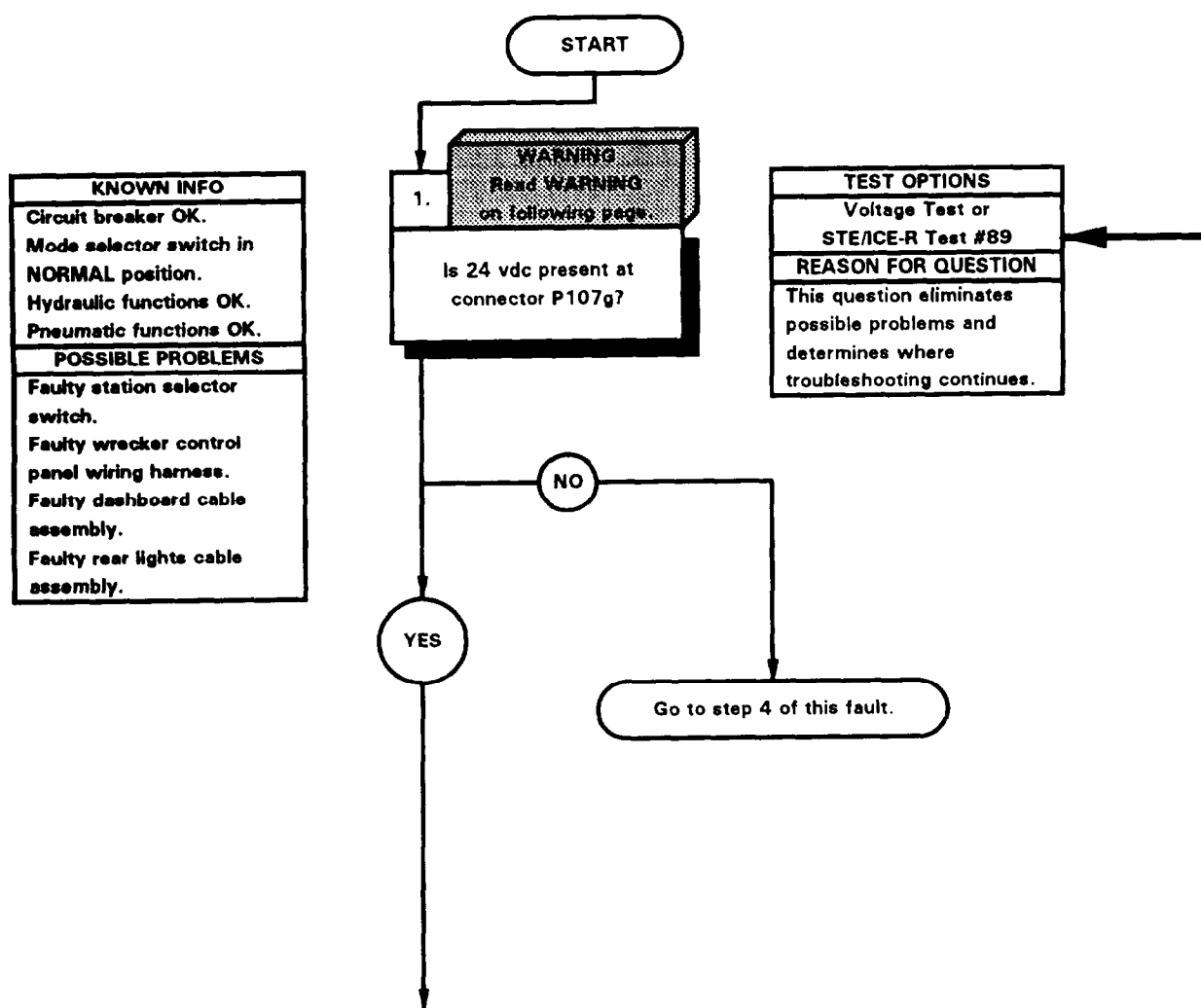


CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to terminal board position 19.
- (3) Connect negative (-) probe of multimeter to terminal board position 1 and note reading on multimeter.
- (4) If continuity is not present, replace overload lockout cable (para 7-116).
- (5) If continuity is present, notify DS Maintenance.
- (6) Close cover on junction box.
- (7) Tighten four screws on junction box.
- (8) Connect batteries (para 7-57).

2E1201A

e136. ALL M1089 CONTROL FUNCTIONS DO NOT OPERATE FROM WRECKER CONTROL PANEL AND WRECKER REMOTE CONTROL	
INITIAL SETUP	
Equipment Conditions Top control panel cover removed (para 17-20). Personnel Required (2)	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/ICE-R (Item 41, Appendix C) References TM 9-4910-571-12&P

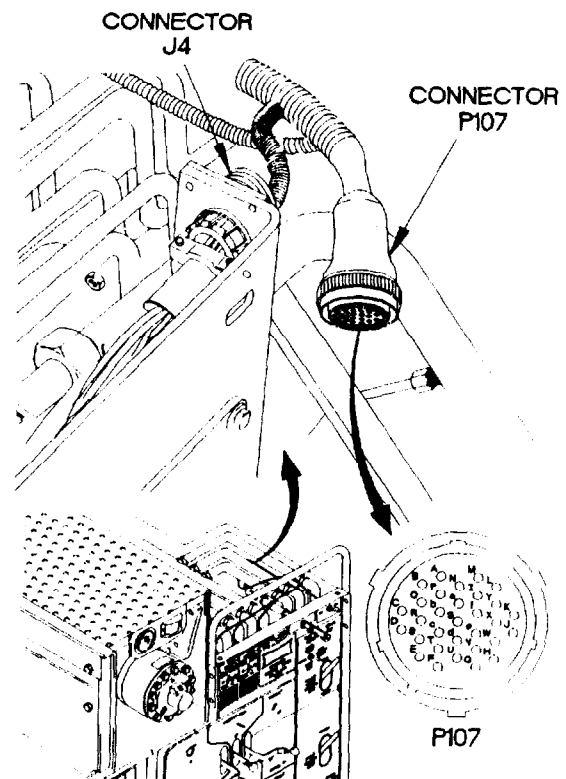


WARNING

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

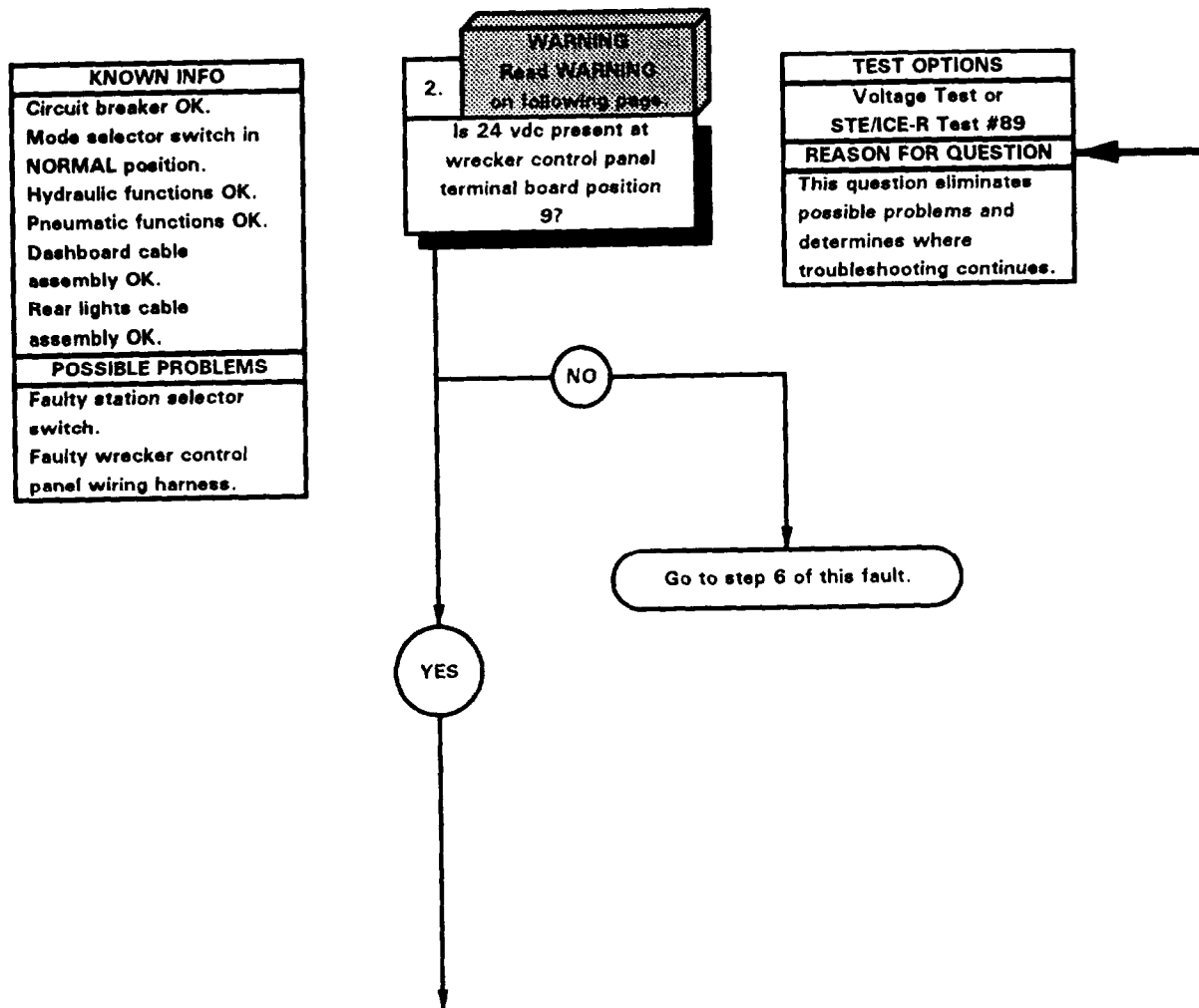
VOLTAGE TEST

- (1) Disconnect connector P107 from connector J4.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector P107g.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
- (6) If 24 vdc is not present, go to step 4 of this fault.
- (7) Position master power switch to off (TM 9-2320-366-10-1).
- (8) Connect connector P107 to connector J4.



4-156-111A

6136. ALL M1089 CONTROL FUNCTIONS DO NOT OPERATE FROM WRECKER CONTROL PANEL AND WRECKER REMOTE CONTROL (CONT)

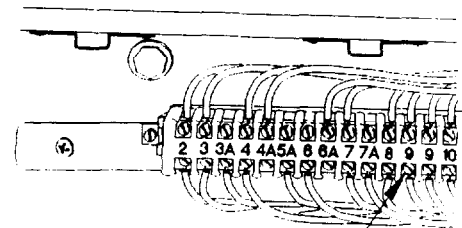


WARNING

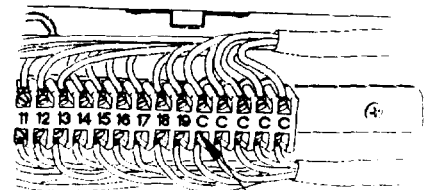
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

STATION SELECTOR SWITCH VOLTAGE TEST

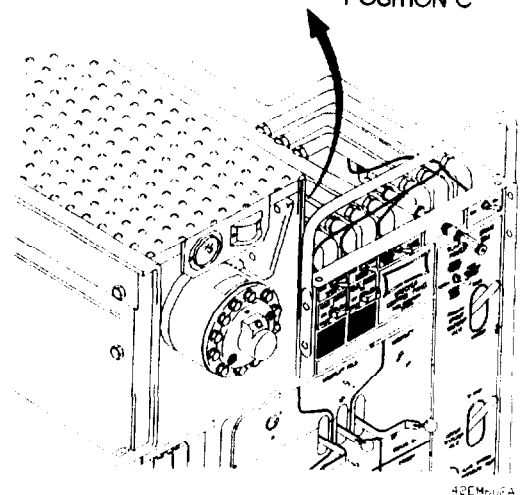
- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to wrecker control panel terminal board position 9.
- (3) Connect negative (-) probe of multimeter to wrecker control panel terminal board position C.
- (4) Position master power switch to on (TM 9-2320-366-10-1) and note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



POSITION 9

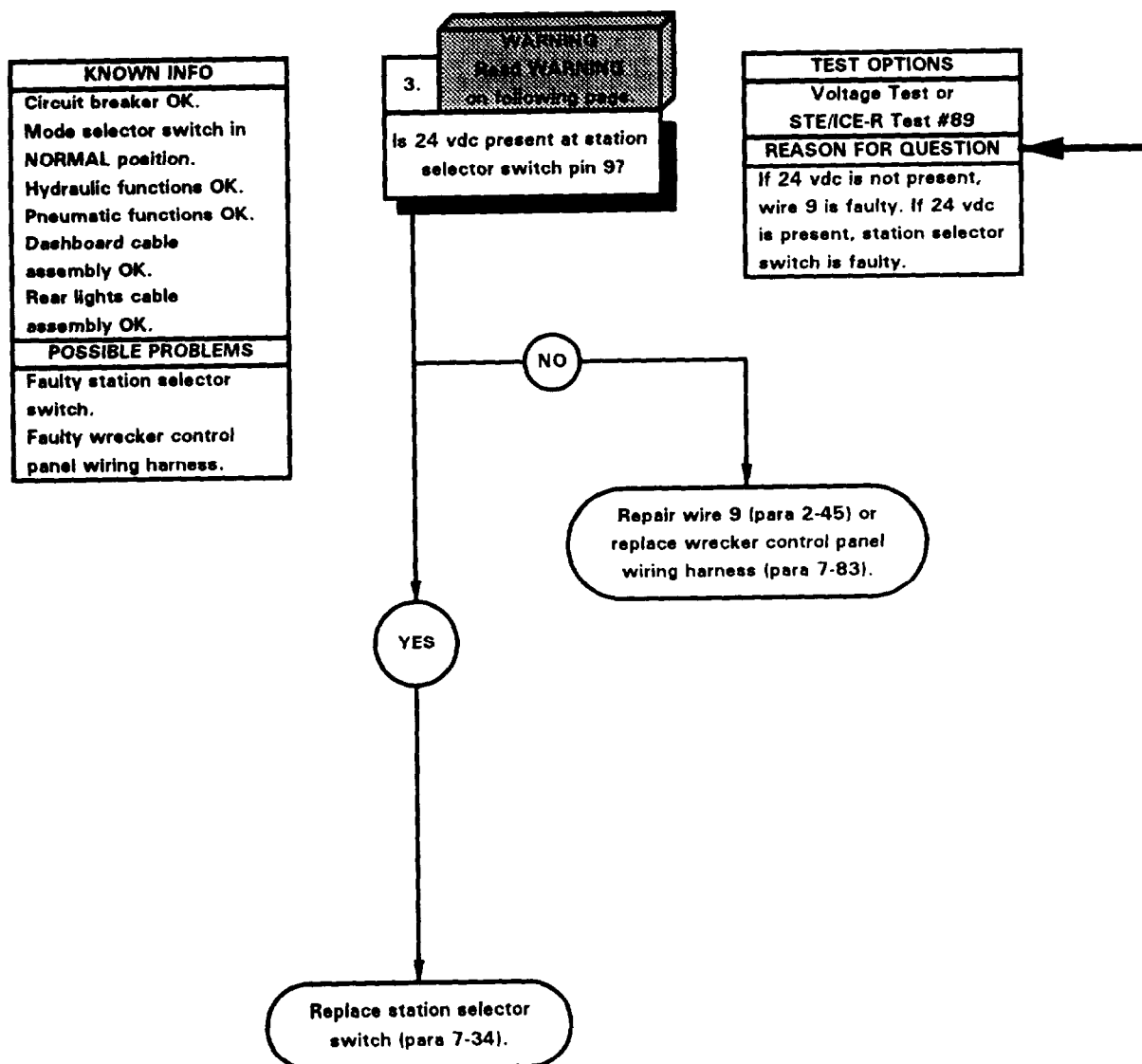


POSITION C



42EM516A

6136. ALL M1089 CONTROL FUNCTIONS DO NOT OPERATE FROM WRECKER CONTROL PANEL AND WRECKER REMOTE CONTROL (CONT)

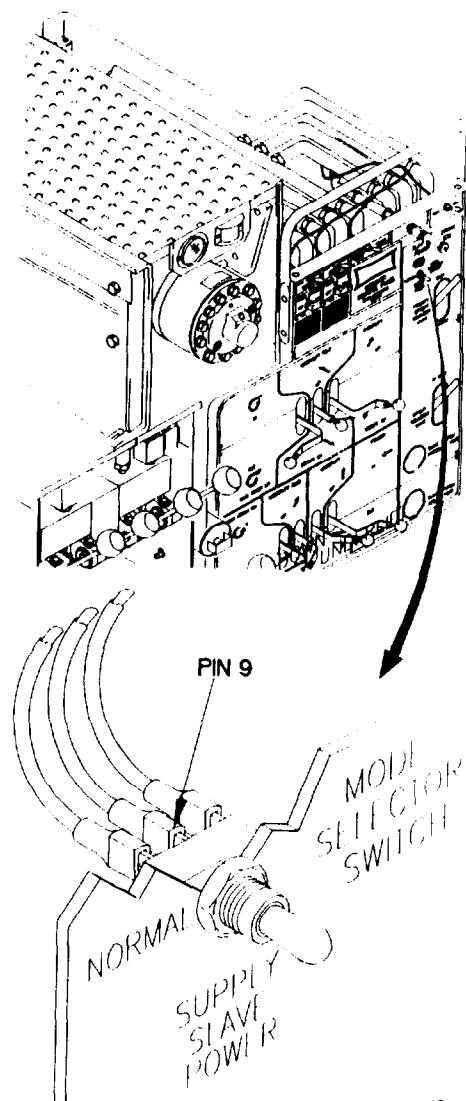


WARNING

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

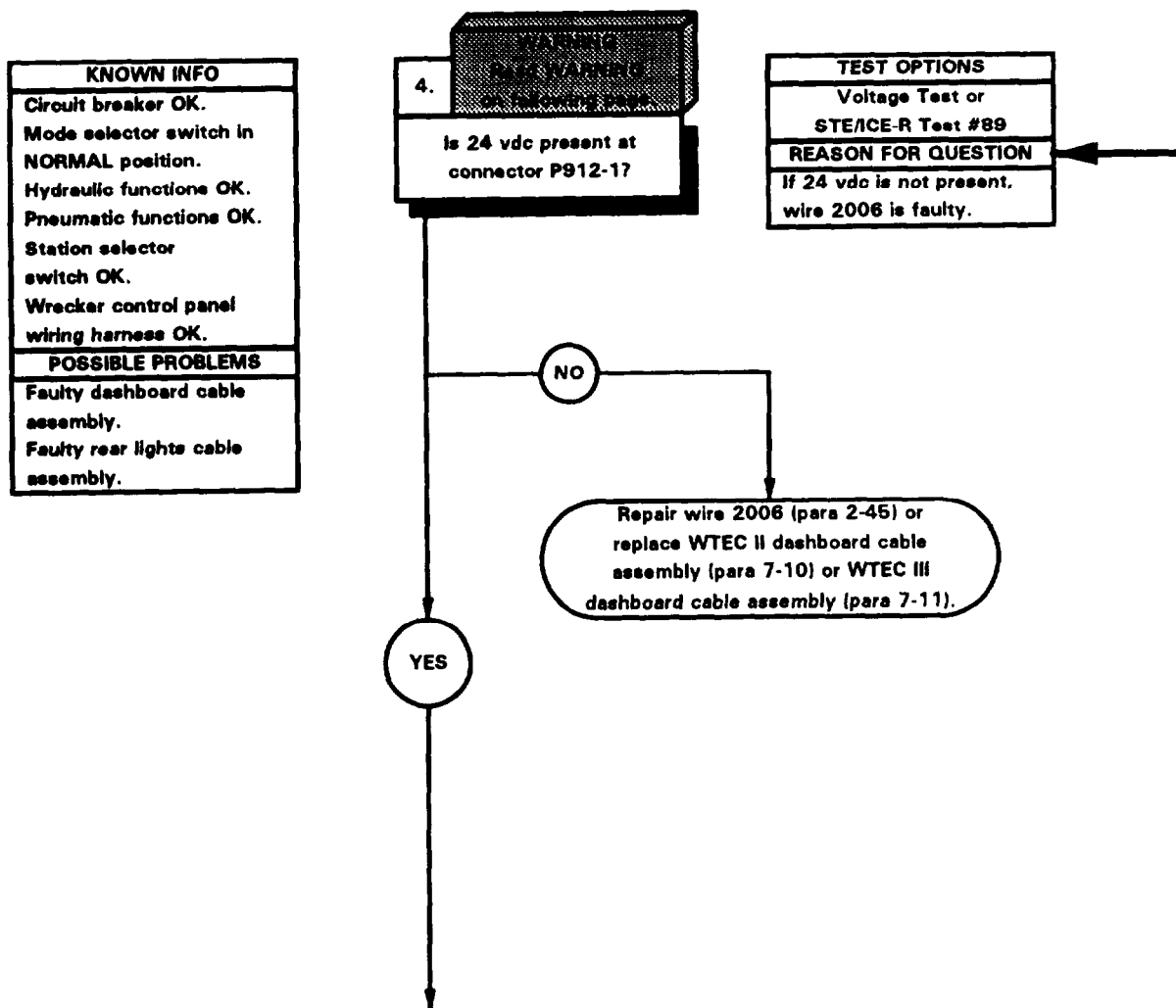
VOLTAGE TEST

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to station selector switch center pin 9.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
- (5) If 24 vdc is not present, repair wire 9 (para 2-45) or replace wrecker control panel wiring harness (para 7-83).
- (6) If 24 vdc is present, replace station selector switch (para 7-34).
- (7) Position master power switch to off (TM 9-2320-366-10-1).
- (8) Install top control panel cover (para 17-20).



40E6003A

•136. ALL M1089 CONTROL FUNCTIONS DO NOT OPERATE FROM WRECKER CONTROL PANEL AND WRECKER REMOTE CONTROL (CONT)

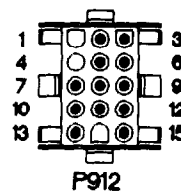
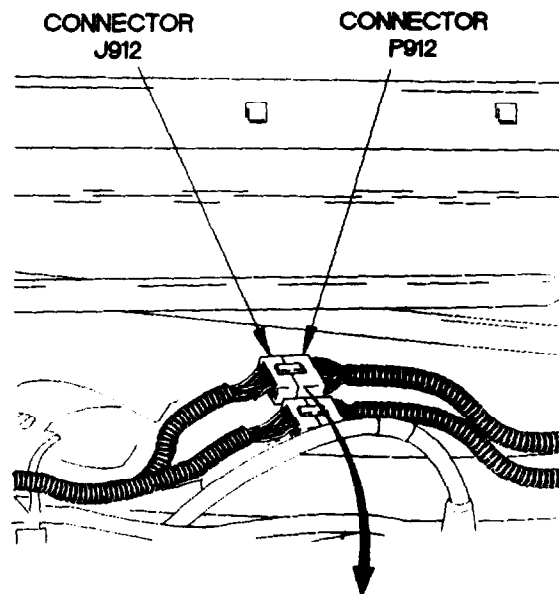


WARNING

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

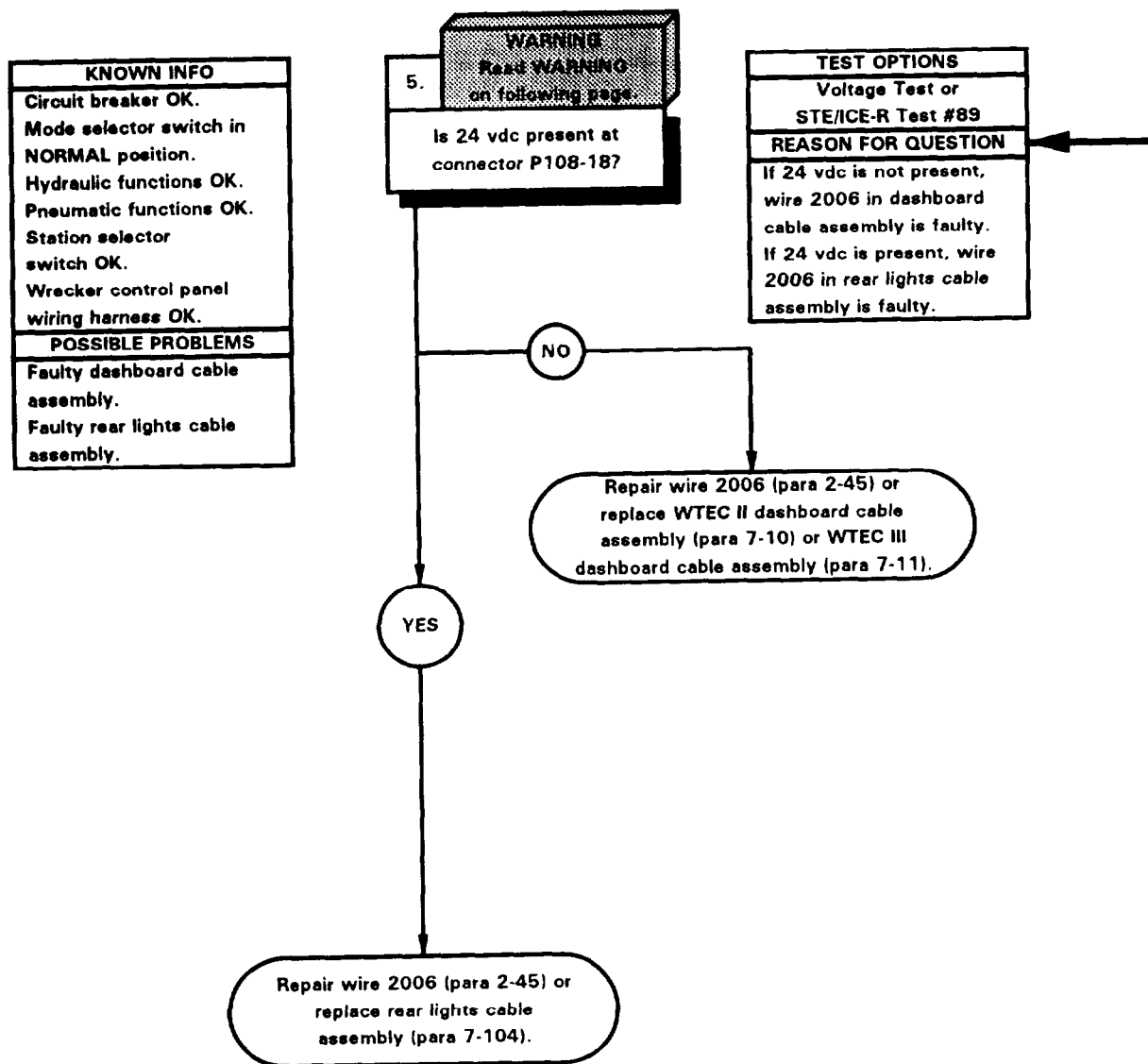
VOLTAGE TEST

- (1) Remove personnel heater for access (para 18-9).
- (2) Disconnect connector P912 from connector J912.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to connector P912-1.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
- (7) If 24 vdc is not present, repair wire 2006 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (8) Position master power switch to off (TM 9-2320-366-10-1).
- (9) Connect connector P912 to connector J912.



42EM61144

e136. ALL M1089 CONTROL FUNCTIONS DO NOT OPERATE FROM WRECKER CONTROL PANEL AND WRECKER REMOTE CONTROL (CONT)

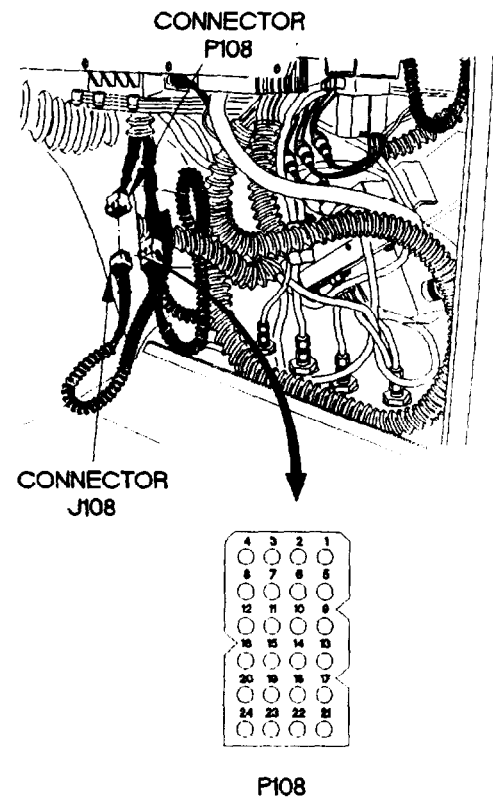


WARNING

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

VOLTAGE TEST

- (1) Disconnect connector P108 from connector J108.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector P108-18.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
- (6) If 24 vdc is not present, repair wire 2006 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (7) If 24 vdc is present, repair wire 2006 (para 2-45) or replace rear lights cable assembly (para 7-104).
- (8) Position master power switch to off (TM 9-2320-366-10-1).
- (9) Connect connector P108 to connector J108.
- (10) Install personnel heater (para 18-9).
- (11) Install top control panel cover (para 17-20).



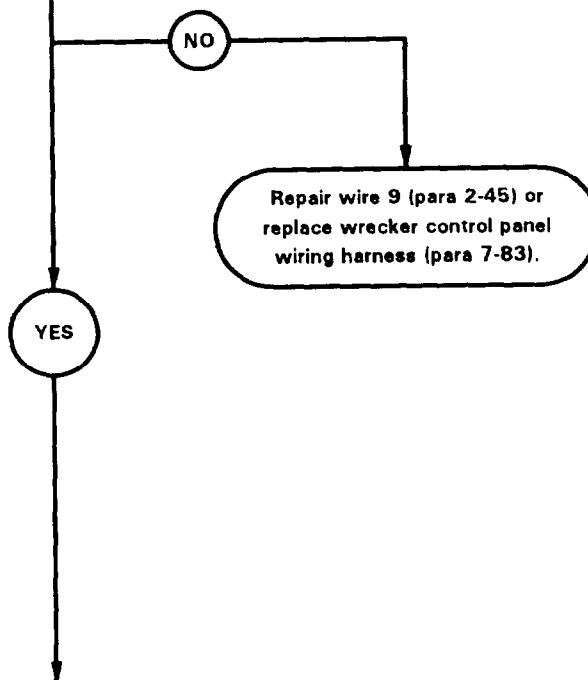
42E Mod 01A

e136. ALL M1089 CONTROL FUNCTIONS DO NOT OPERATE FROM WRECKER CONTROL PANEL AND WRECKER REMOTE CONTROL (CONT)

KNOWN INFO
Circuit breaker OK. Mode selector switch in NORMAL position. Hydraulic functions OK. Pneumatic functions OK. Station selector switch OK. Dashboard cable assembly OK.
POSSIBLE PROBLEMS
Faulty wrecker control panel wiring harness. Faulty rear lights cable assembly.

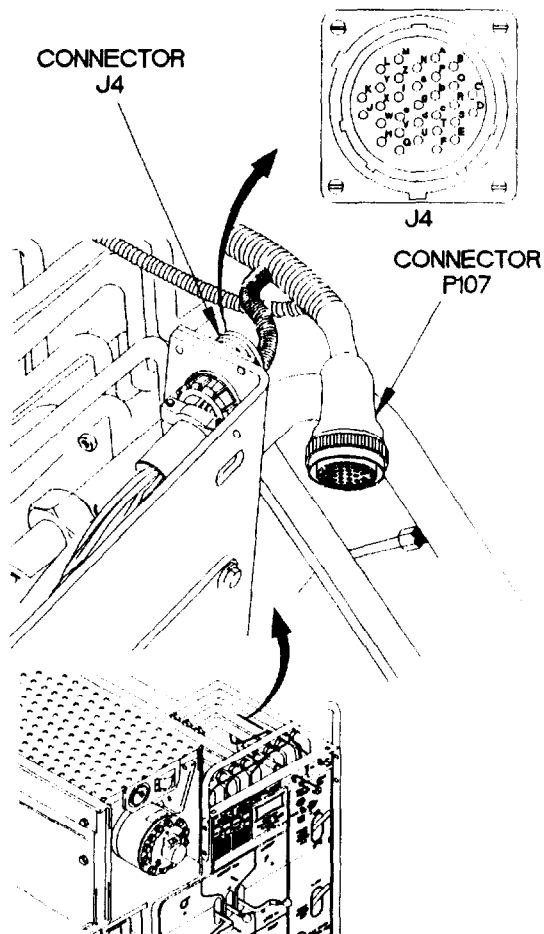
6.
Is continuity present between connector J4-g and wrecker control panel terminal board position 9?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, wire 9 is faulty.



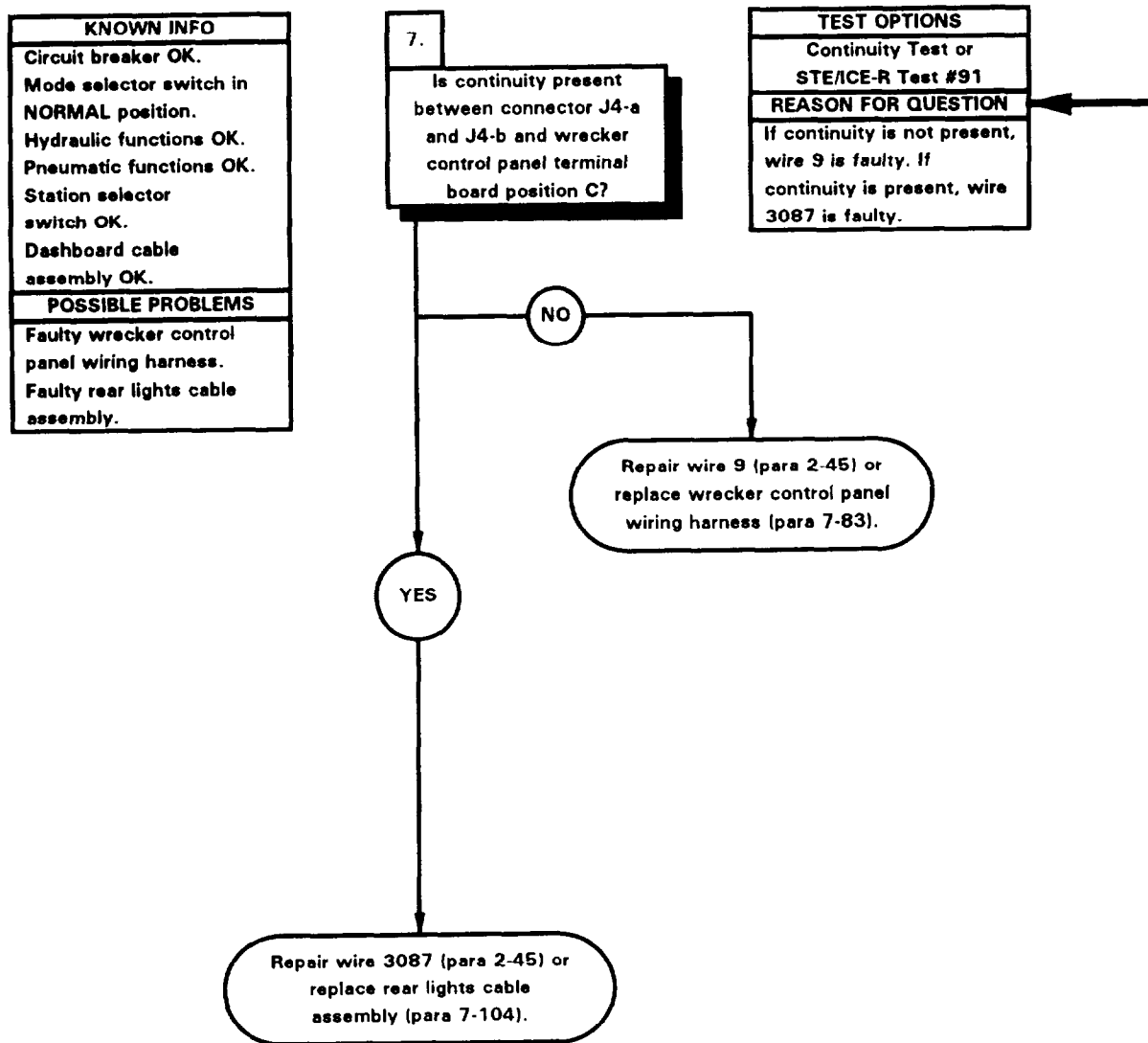
CONTINUITY TEST

- (1) Disconnect connector P107 from connector J4.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector J4-g.
- (4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (5) If continuity is not present, repair wire 9 (para 2-45) or replace wrecker control panel wiring harness (para 7-83).



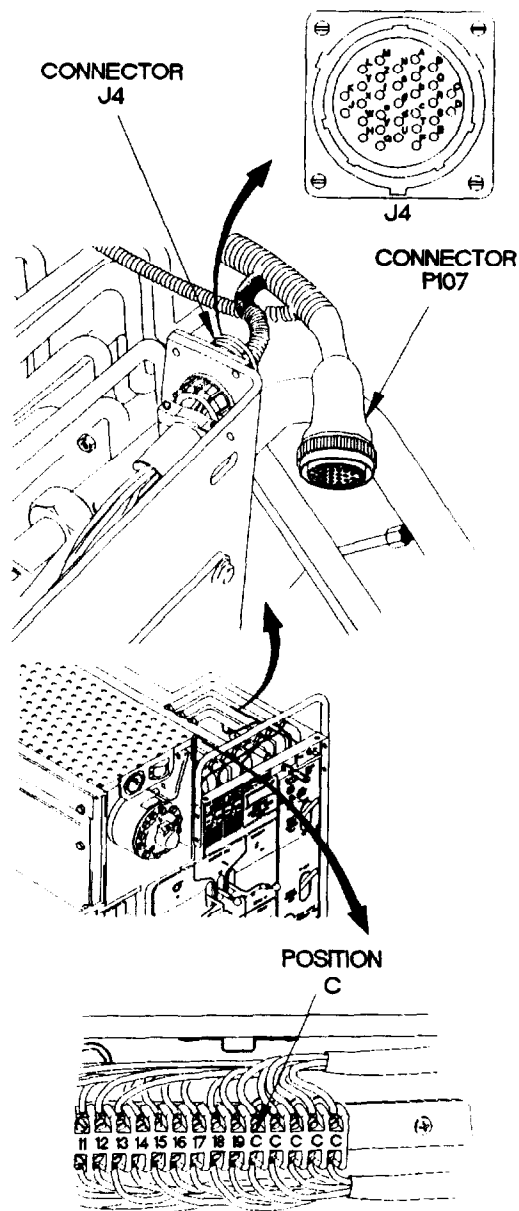
42EM606A

e136. ALL M1089 CONTROL FUNCTIONS DO NOT OPERATE FROM WRECKER CONTROL PANEL AND WRECKER REMOTE CONTROL (CONT)



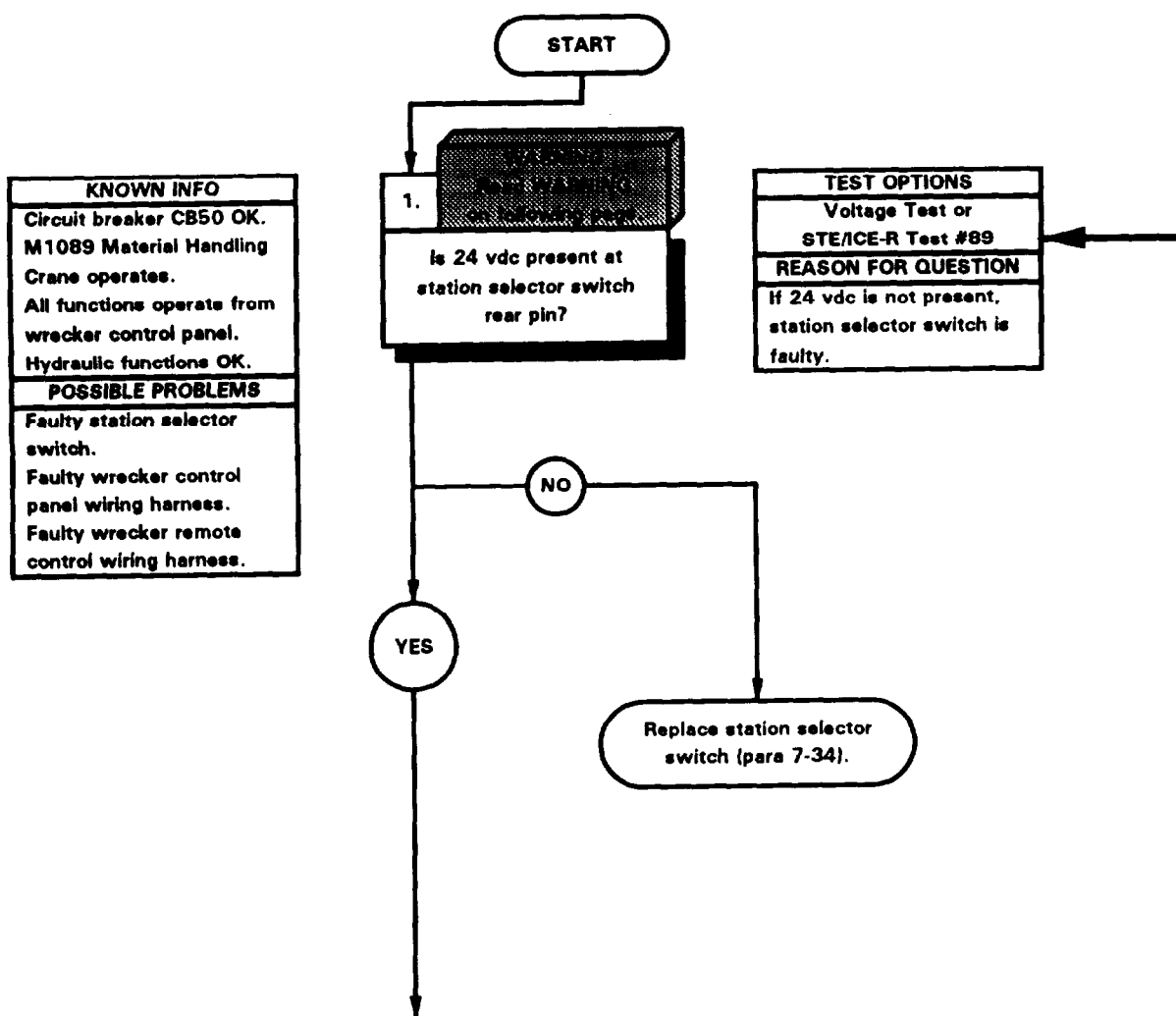
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector J4-a.
- (3) Connect negative (-) probe of multimeter to wrecker control panel terminal board position C and note reading on multimeter.
- (4) Connect positive (+) probe of multimeter to connector J4-b.
- (5) Connect negative (-) probe of multimeter to wrecker control panel terminal board position C and note reading on multimeter.
- (6) If continuity is not present at connector J4-a and/or J4-b, repair wire 9 (para 2-45) or replace wrecker control panel wiring harness (para 7-83).
- (7) If continuity is present, repair wire 3087 (para 2-45) or replace rear lights cable assembly (para 7-104).
- (8) Connect connector P107 to connector J4.
- (9) Install top control panel cover (para 17-20).



42EM6117A

*137. ALL WRECKER FUNCTIONS DO NOT OPERATE FROM WRECKER REMOTE CONTROL			
INITIAL SETUP			
Equipment Conditions		Tools and Special Tools	
Engine shut down (TM 9-2320-366-10-1).		Tool Kit, Genl Mech (Item 46, Appendix C)	
Top control panel cover removed (para 17-20).		Multimeter, Digital (Item 22, Appendix C)	
		STE/ICE-R (Item 41, Appendix C)	
Personnel Required		References	
(2)		TM 9-4910-571-12&P	

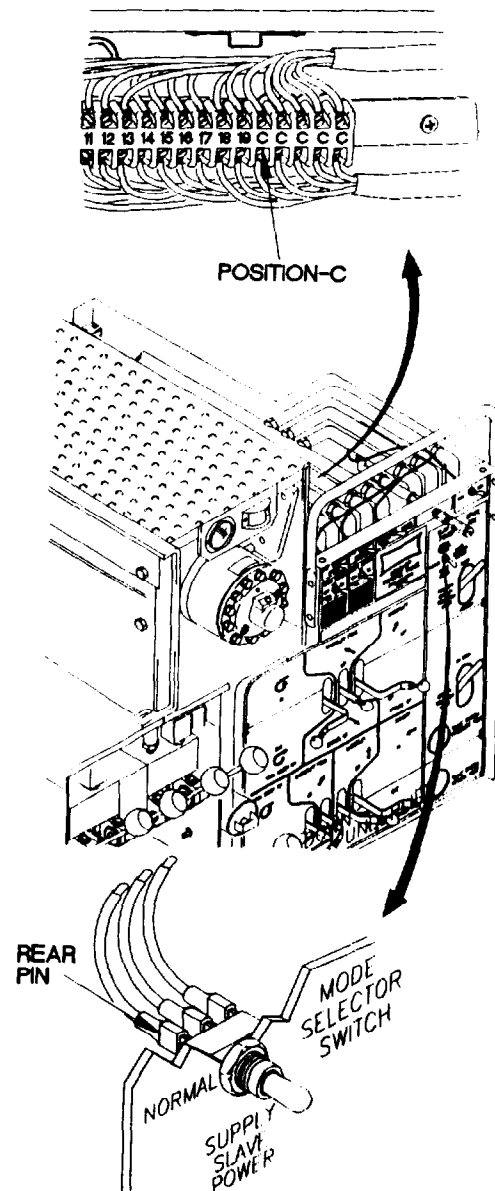


WARNING

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

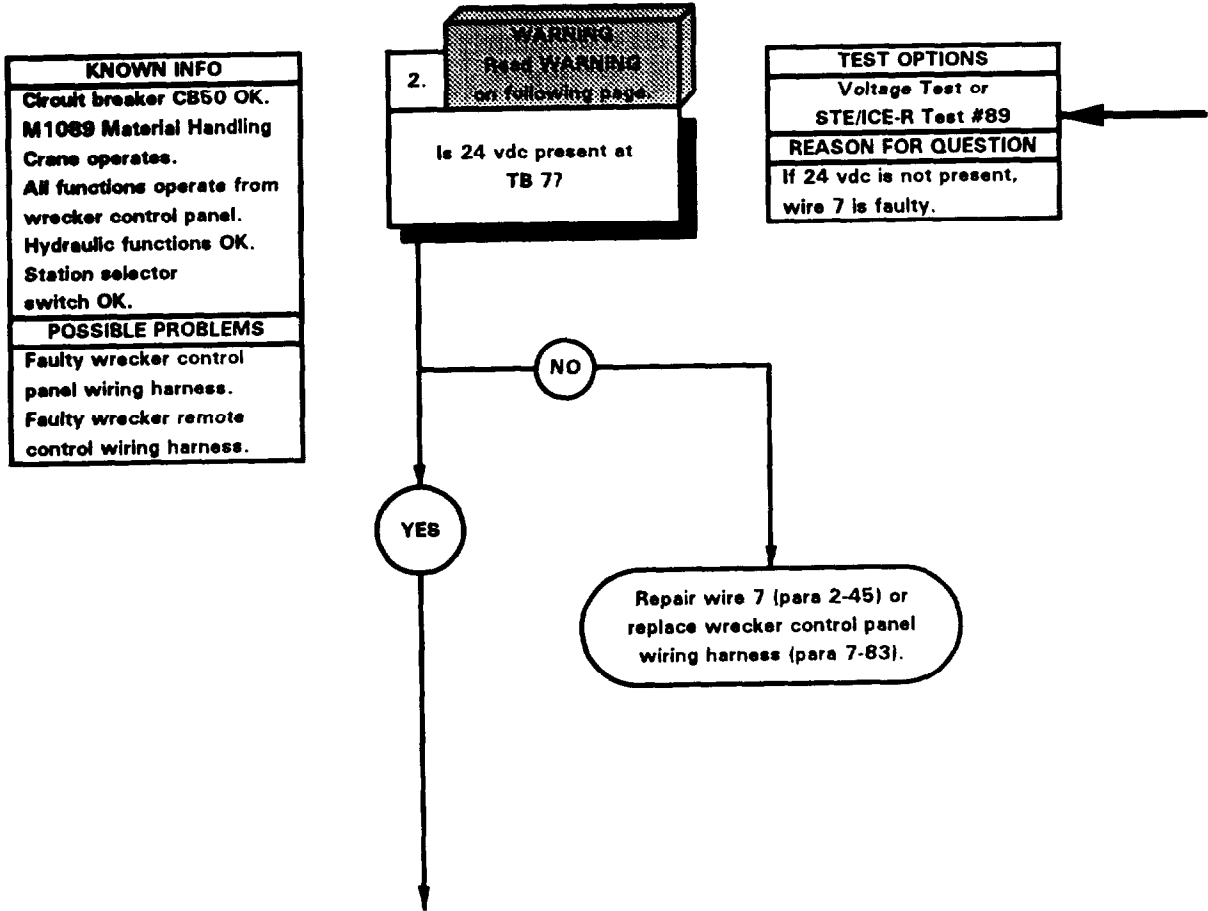
VOLTAGE TEST

- (1) Set multimeter to vdc.
- (2) Connect positive (+) probe of multimeter to station selector switch rear pin.
- (3) Connect negative (-) probe of multimeter to wrecker control panel terminal board position C.
- (4) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
- (5) If 24 vdc is not present, replace station selector switch (para 7-34).
- (6) Position master power switch to off (TM 9-2320-366-10-1).



42EM701A

137. ALL WRECKER FUNCTIONS DO NOT OPERATE FROM WRECKER REMOTE CONTROL (CONT)

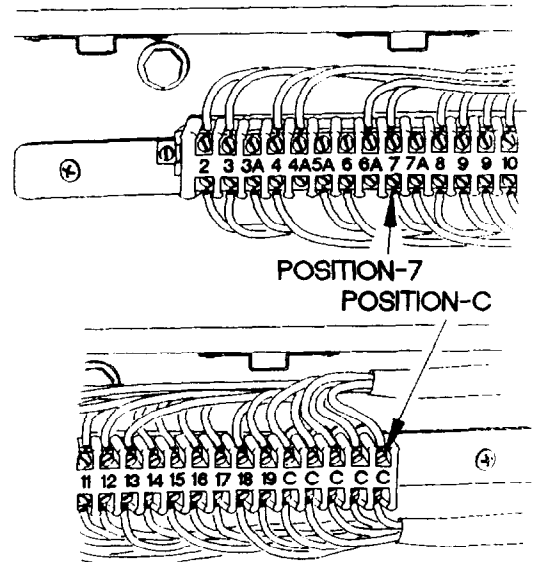


WARNING

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

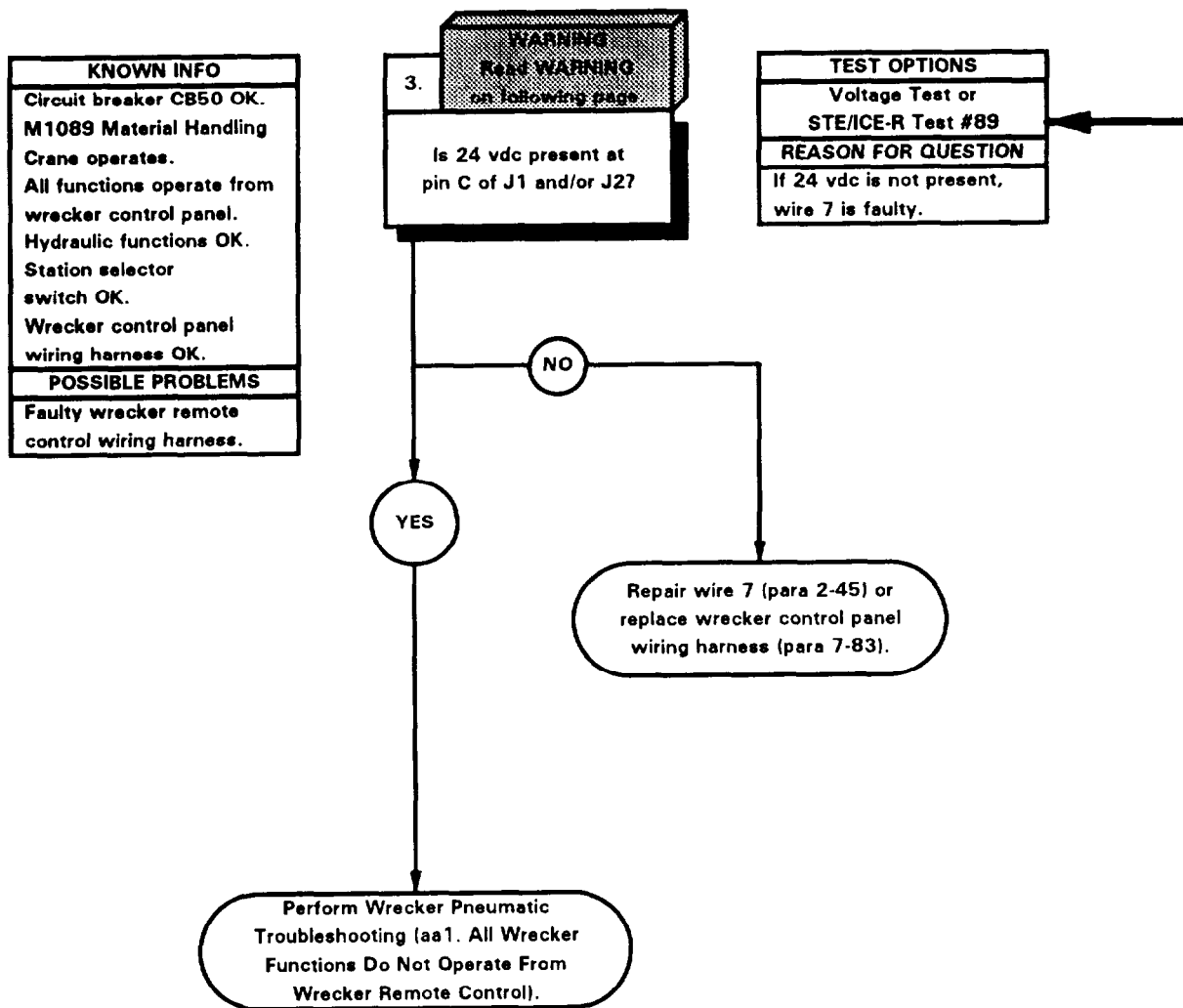
VOLTAGE TEST

- (1) Set multimeter to vdc.
- (2) Connect positive (+) probe of multimeter to wrecker control panel terminal board position 7.
- (3) Connect negative (-) probe of multimeter to wrecker control panel terminal board position C.
- (4) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
- (5) If 24 vdc is not present, repair wire 7 (para 2-45), or replace wrecker control panel wiring harness (para 7-83).
- (6) Position master power switch to off (TM 9-2320-366-10-1).
- (7) Install wrecker control panel top cover (para 17-20).



42EM702A

¶137. ALL WRECKER FUNCTIONS DO NOT OPERATE FROM WRECKER REMOTE CONTROL (CONT)

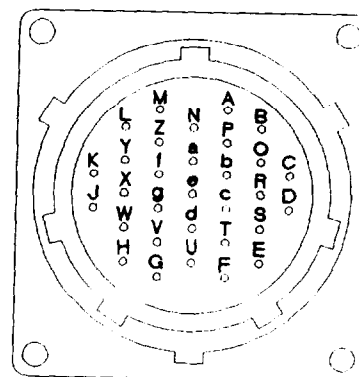
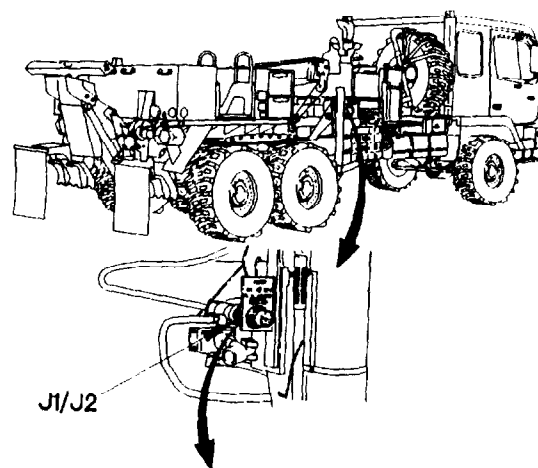


WARNING

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

VOLTAGE TEST

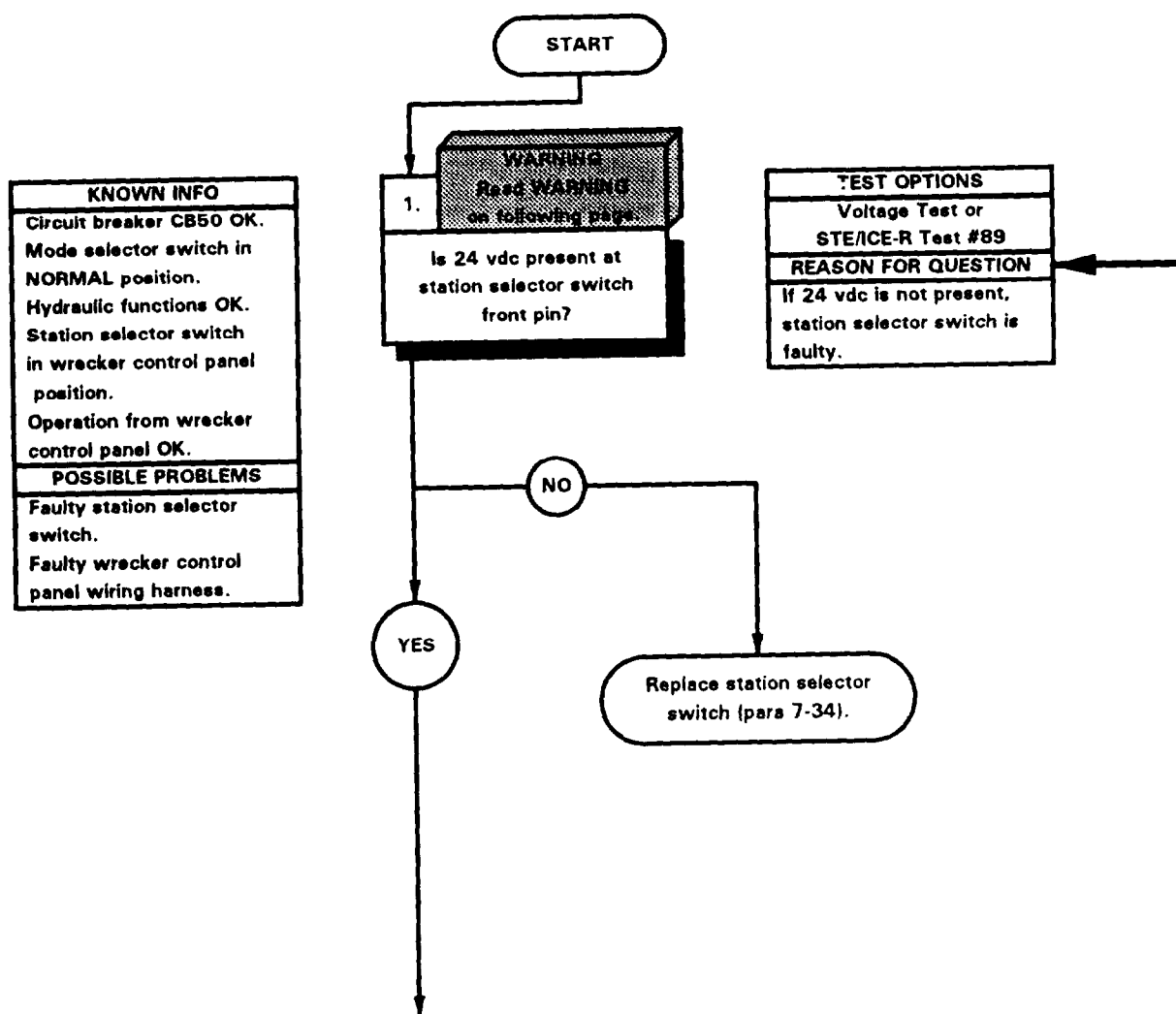
- (1) Set multimeter to vdc.
- (2) Position station selector switch to REMOTE CONTROL (TM 9-2320-366-10-1).
- (3) Connect positive (+) probe of multimeter to pin C of connector J1 and/or J2.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
- (5) If 24 vdc is not present, repair wire 7 (para 2-45), or replace wrecker control panel wiring harness (para 7-83).
- (6) If 24 vdc is present, perform Wrecker Pneumatic Troubleshooting (as 1. All Wrecker Functions Do Not Operate From Wrecker Remote Control).
- (7) Position master power switch to off (TM 9-2320-366-10-1).



J1/J2

42EM703A

●138. ALL WRECKER FUNCTIONS DO NOT OPERATE FROM WRECKER CONTROL PANEL			
INITIAL SETUP			
Equipment Conditions		Tools and Special Tools	
Engine shut down (TM 9-2320-366-10-1).		Tool Kit, Genl Mech (Item 46, Appendix C)	
Wrecker control panel top cover removed (para 17-20).		Multimeter, Digital (Item 22, Appendix C)	
		STE/ICE-R (Item 41, Appendix C)	
Personnel Required		References	
(2)		TM 9-4910-571-12&P	



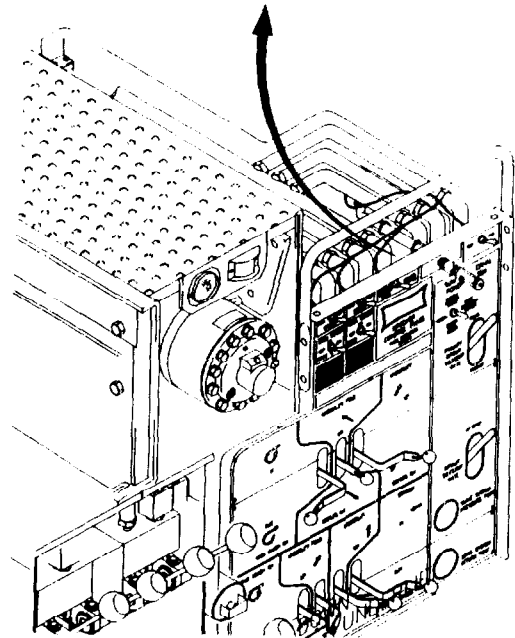
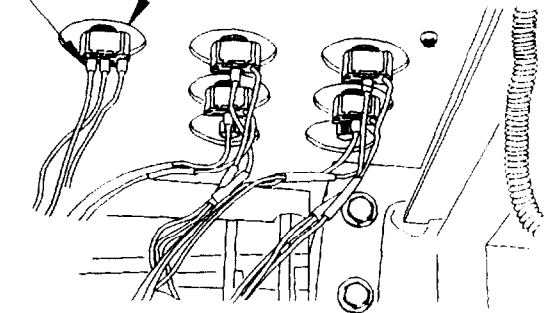
WARNING

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

VOLTAGE TEST

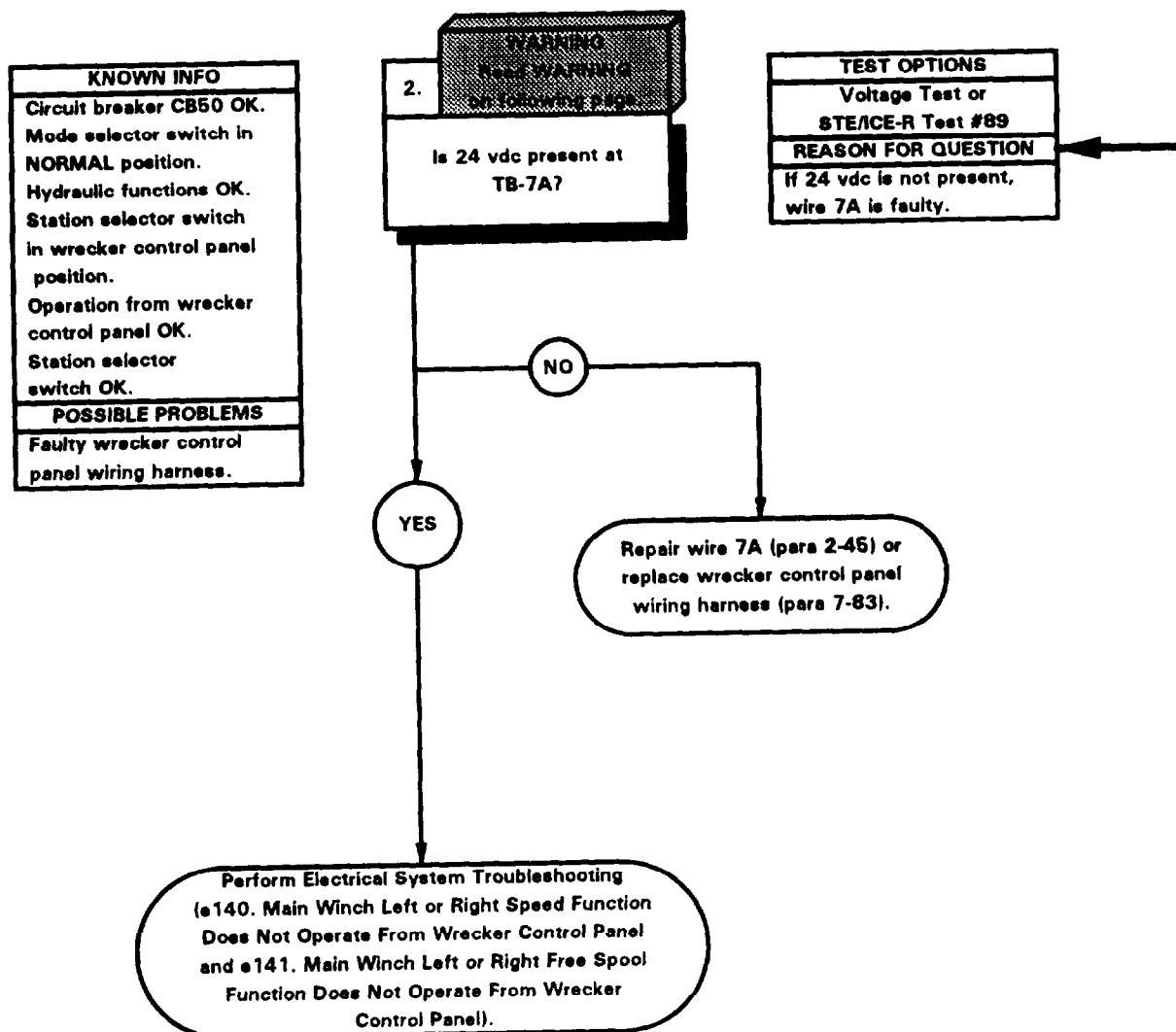
- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to station selector switch front pin.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
- (5) If 24 vdc is not present, replace station selector switch (para 7-34).
- (6) Position master power switch to off (TM 9-2320-366-10-1).

STATION SELECTOR
SWITCH
FRONT PIN



42EMR01A

¶138. ALL WRECKER FUNCTIONS DO NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)

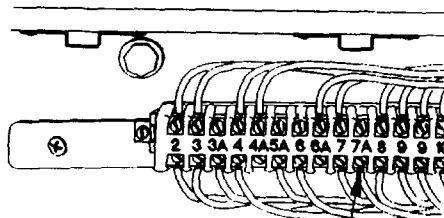


WARNING

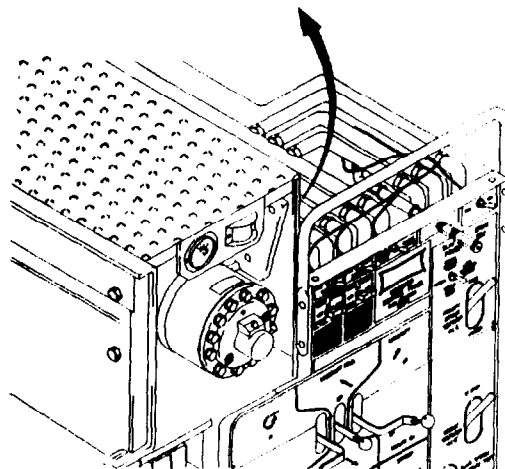
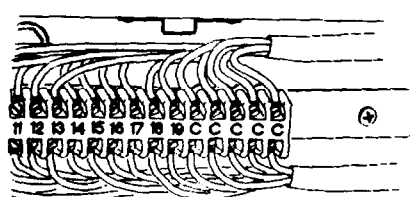
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to TB-7A.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
- (5) If 24 vdc is not present, repair wire 7A (para 2-45) or replace wrecker control panel wiring harness (para 7-83).
- (6) If 24 vdc is present, perform Electrical System Troubleshooting (e140. Main Winch Left or Right Speed Function Does Not Operate From Wrecker Control Panel or e141. Main Winch Left or Right Free Spool Function Does Not Operate From Wrecker Control Panel).
- (7) Position master power switch to off (TM 9-2320-366-10-1).
- (8) Install wrecker control panel top cover (para 17-20).



TB-7A



42EM802A

●139. 30K WINCH LEFT OR RIGHT SPEED FUNCTION DOES NOT OPERATE FROM WRECKER CONTROL PANEL

INITIAL SETUP

Equipment Conditions

Engine shut down (TM 9-2320-366-10-1).
Wrecker control panel top cover removed
(para 17-20).

Tools and Special Tools

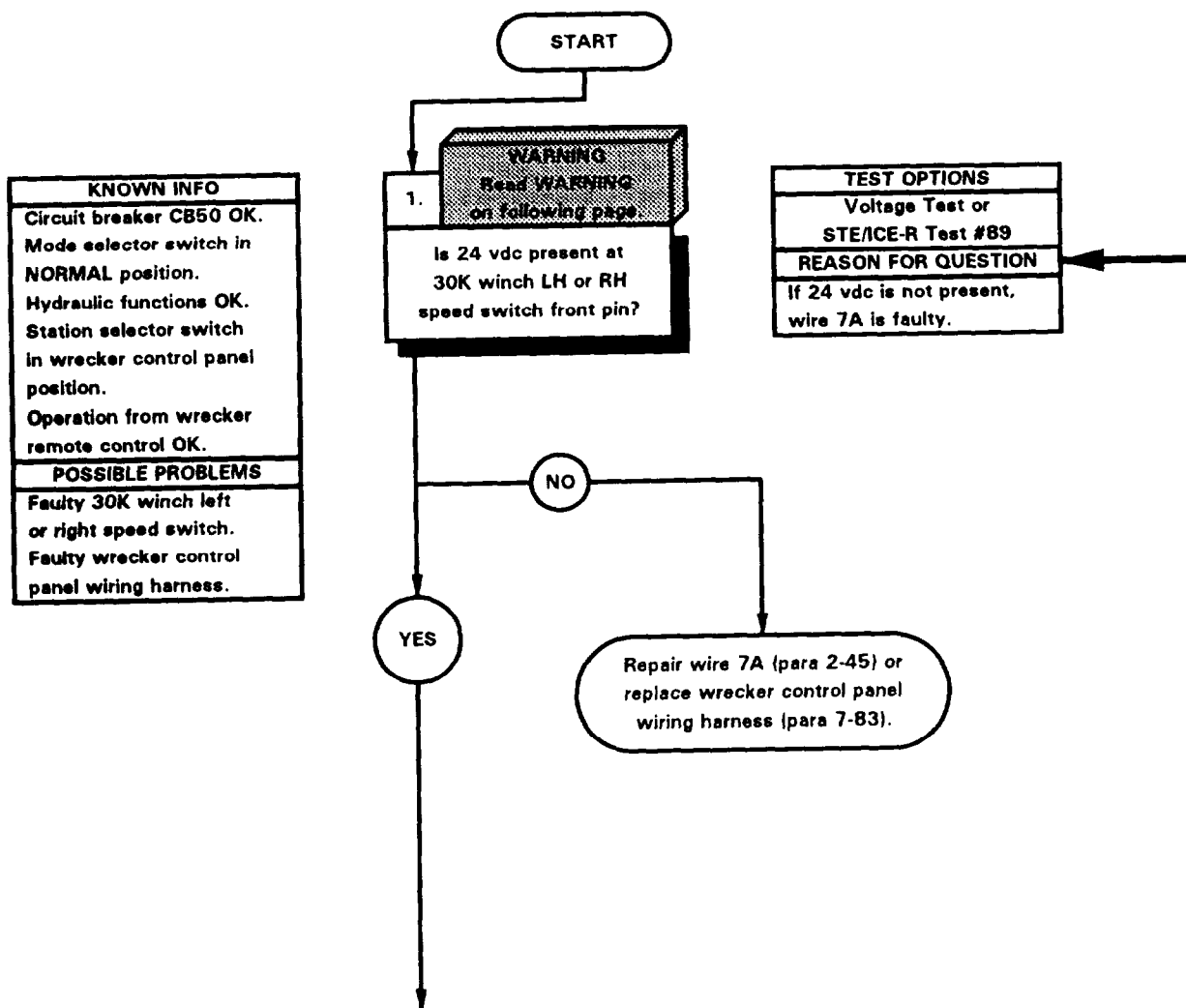
Tool Kit, Genl Mech (Item 46, Appendix C)
Multimeter, Digital (Item 22, Appendix C)
STE/ICE-R (Item 41, Appendix C)

Personnel Required

(2)

References

TM 9-4910-571-12&P

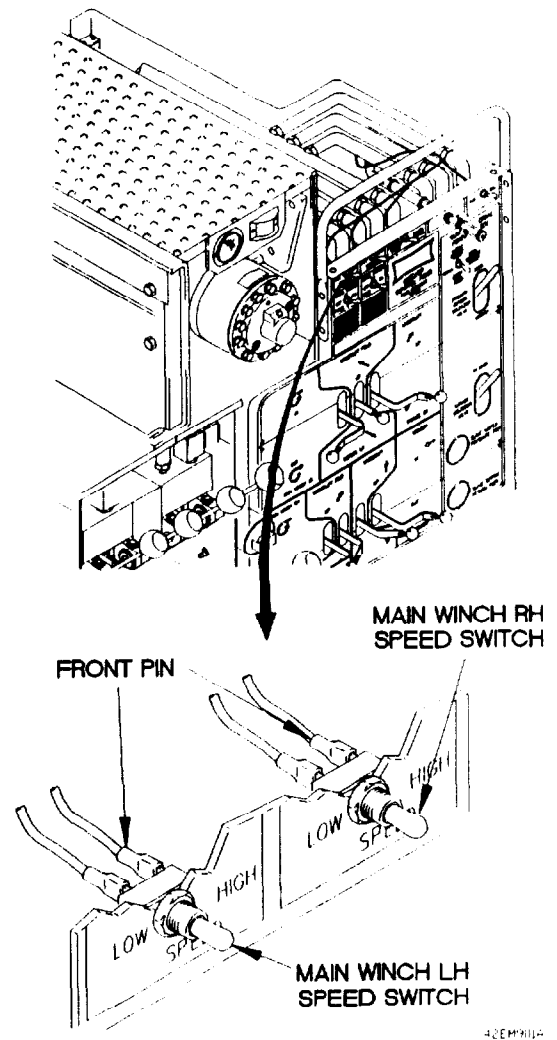


WARNING

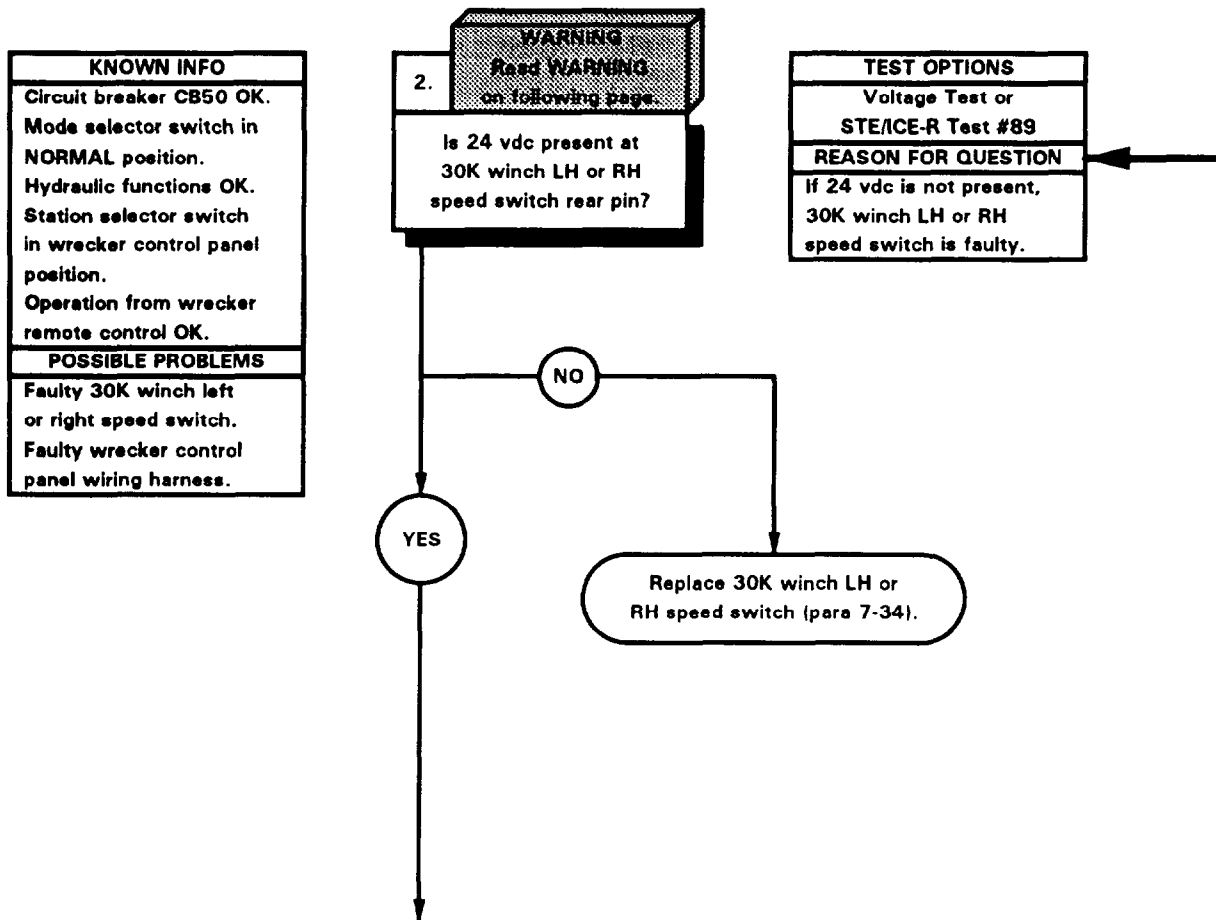
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to 30K winch LH or RH speed switch front pin.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
- (5) If 24 vdc is not present, repair wire 7A (para 2-45) or replace wrecker control panel wiring harness (para 7-83).
- (6) Position master power switch to off (TM 9-2320-366-10-1).



•139. 30K WINCH LEFT OR RIGHT SPEED FUNCTION DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)

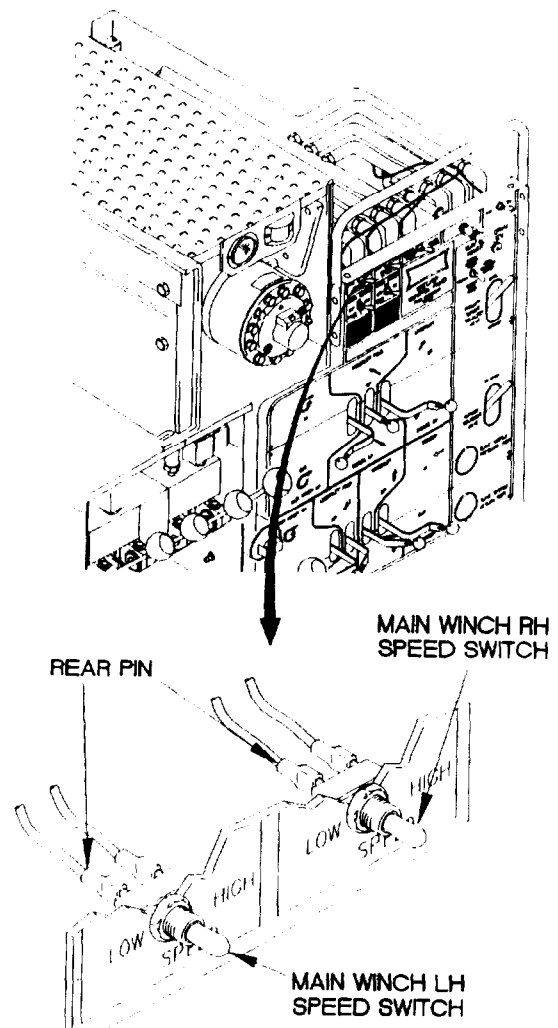


WARNING

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

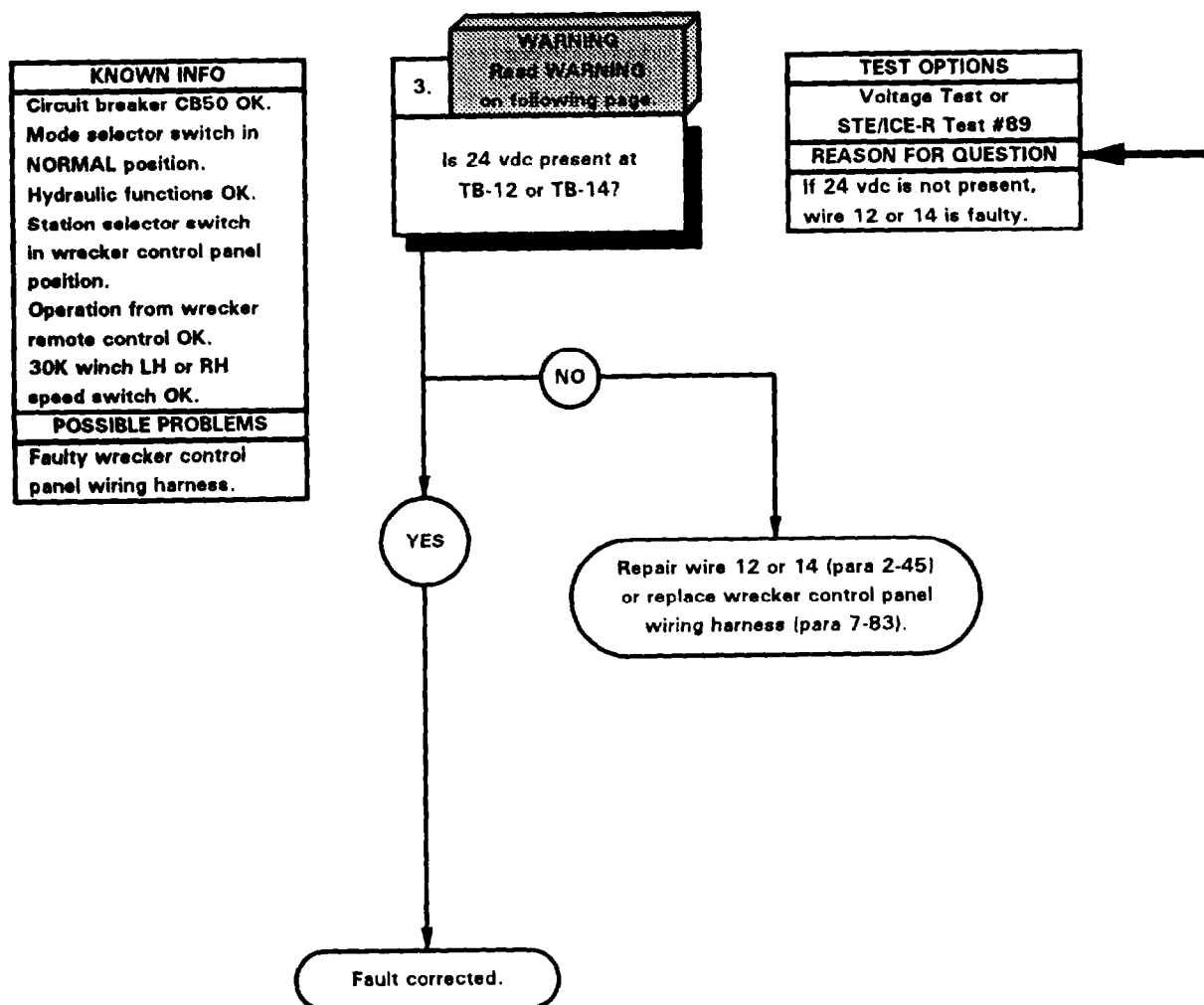
VOLTAGE TEST

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to 30K winch LH or RH speed switch rear pin.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-366-10-1).
- (5) Position 30K winch LH/RH SPEED switch to HIGH and note reading on multimeter.
- (6) If 24 vdc is not present, replace 30K winch LH or RH SPEED switch (para 7-34).
- (7) Position 30K winch LH/RH SPEED switch to LOW.
- (8) Position master power switch to off (TM 9-2320-366-10-1).



42EM912A

6139. 30K WINCH LEFT OR RIGHT SPEED FUNCTION DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)

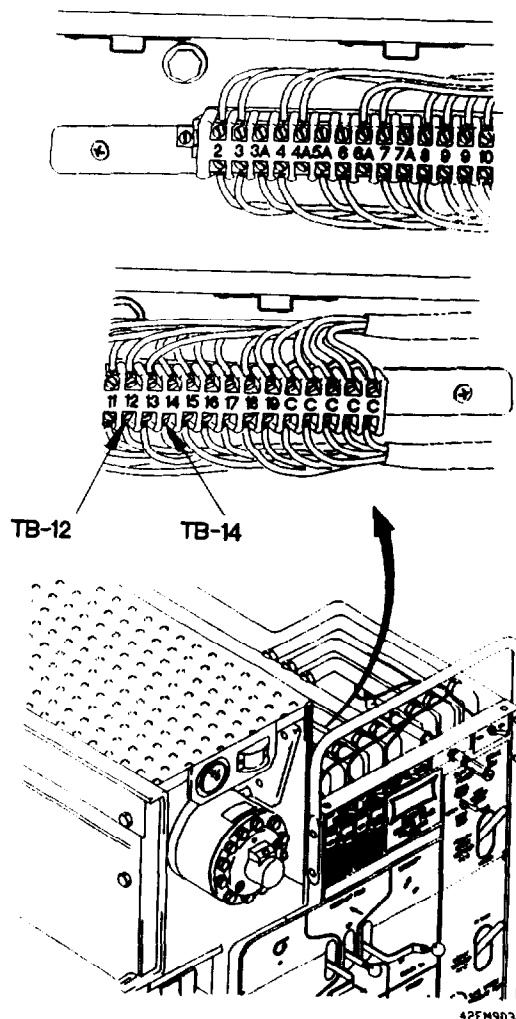


WARNING

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

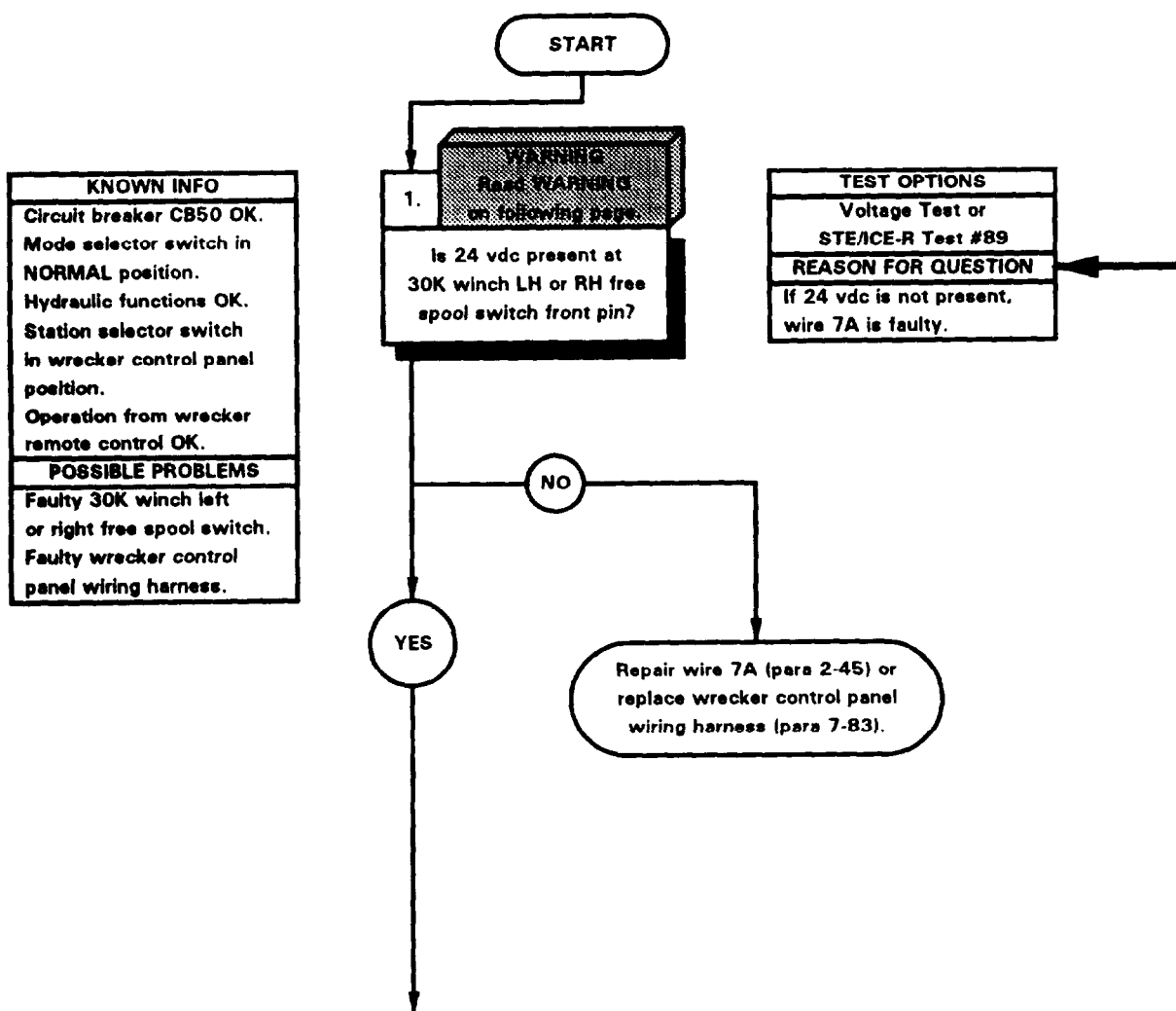
VOLTAGE TEST

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to TB-12 (LH) or TB-14 (RH).
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-366-10-1).
- (5) Position 30K winch LH or RH speed switch to HIGH (TM 9-2320-366-10-2) and note reading on multimeter.
- (6) If 24 vdc is not present, repair wire 12 or 14 (para 2-45) or replace wrecker control panel wiring harness (para 7-83).
- (7) Position 30K winch LH or RH speed switch to LOW (TM 9-2320-366-10-2).
- (8) Position master power switch to off (TM 9-2320-366-10-1).
- (9) Install wrecker control panel top cover (para 17-20).



42EM903A

140. 30K WINCH LEFT OR RIGHT FREESPOOL FUNCTION DOES NOT OPERATE FROM WRECKER CONTROL PANEL	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1). Wrecker control panel top cover removed (para 17-20).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/ICE-R (Item 41, Appendix C)
Personnel Required (2)	References TM 9-4910-571-12&P

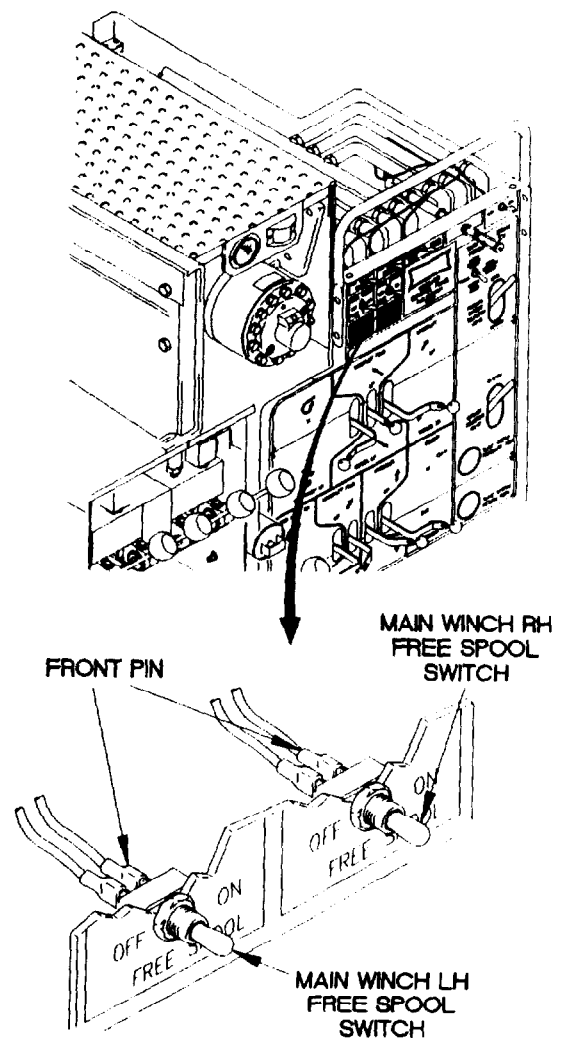


WARNING

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

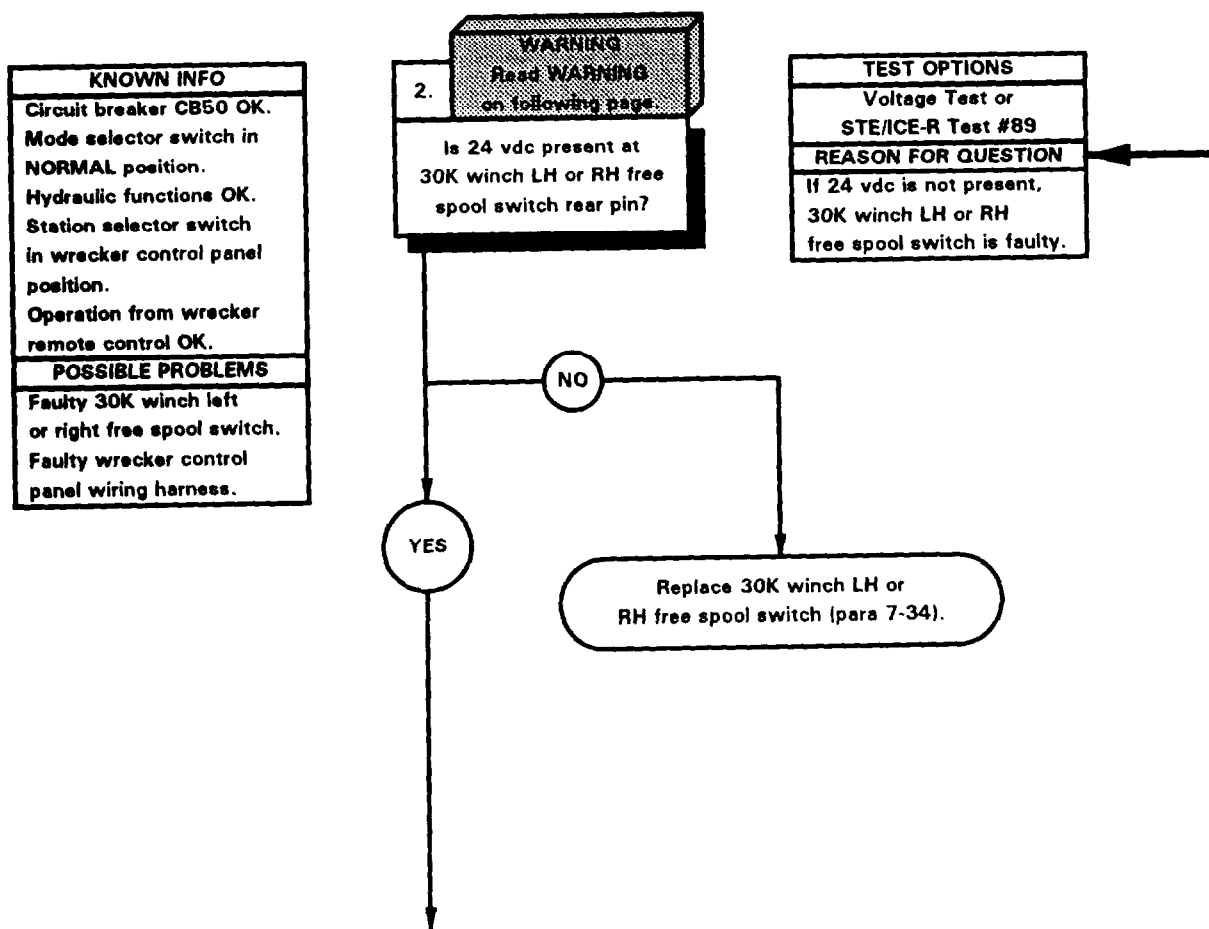
VOLTAGE TEST

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to 30K winch LH or RH free spool switch front pin.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
- (5) If 24 vdc is not present, repair wire 7A (para 2-45) or replace wrecker control panel wiring harness (para 7-83).
- (6) Position master power switch to off (TM 9-2320-366-10-1).



42ENH01A

•140. 30K WINCH LEFT OR RIGHT FREESPOOL FUNCTION DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)

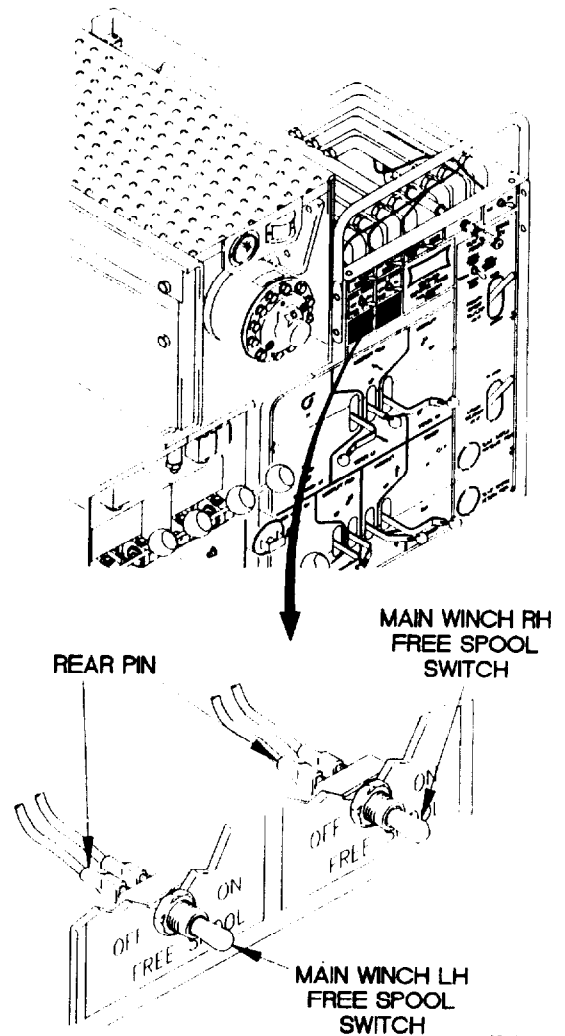


WARNING

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

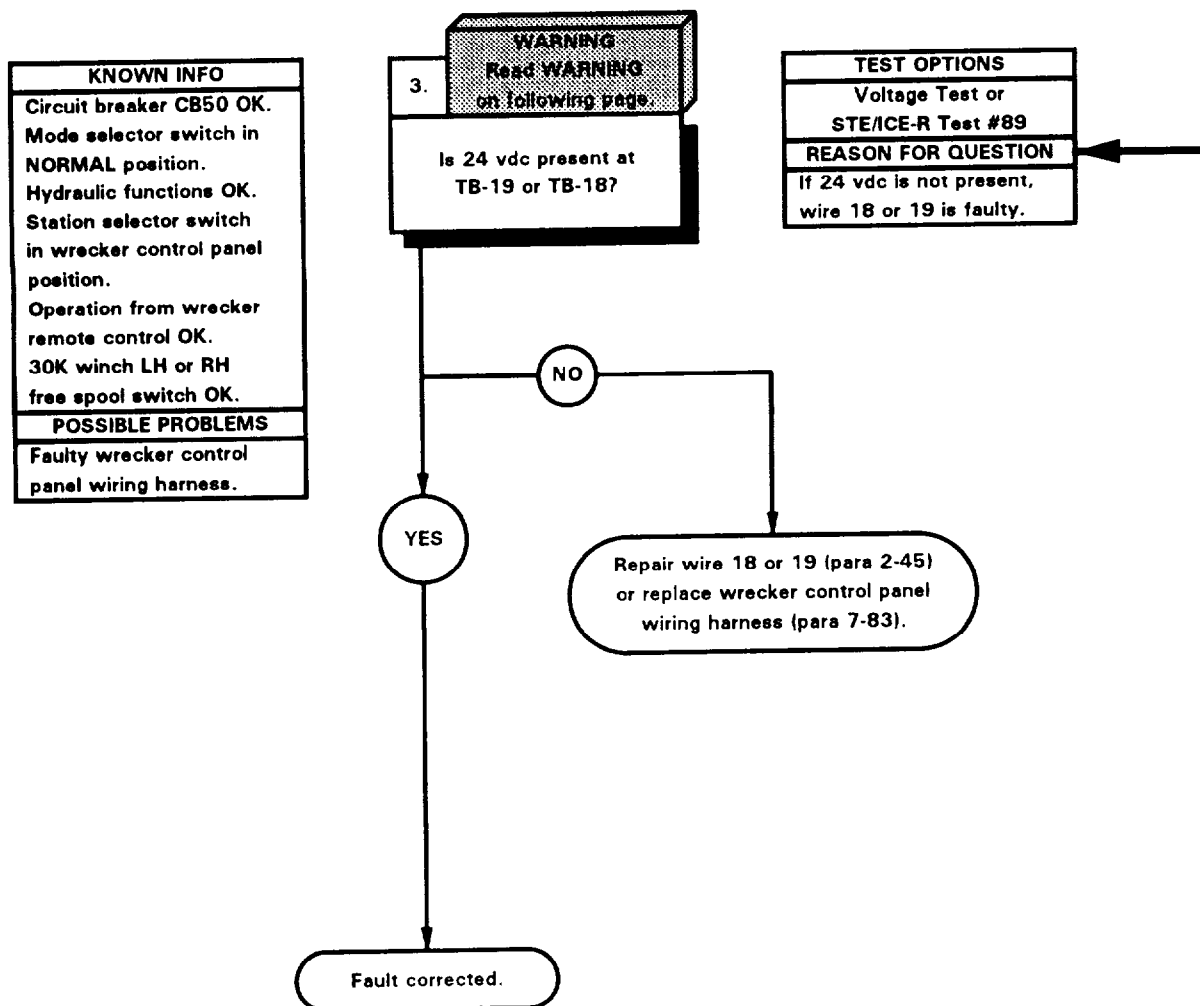
VOLTAGE TEST

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to 30K winch LH or RH free spool switch rear pin.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-366-10-1).
- (5) Position 30K winch free spool switch to ON (TM 9-2320-366-10-1) and note reading on multimeter.
- (6) If 24 vdc is not present, replace 30K winch LH or RH free spool switch (para 7-34).
- (7) Position 30K winch LH or RH free spool switch to OFF (TM 9-2320-366-10-1).
- (8) Position master power switch to off (TM 9-2320-366-10-1).



42ENR62A

e140. 30K WINCH LEFT OR RIGHT FREESPOOL FUNCTION DOES NOT OPERATE FROM WRECKER CONTROL PANEL (CONT)

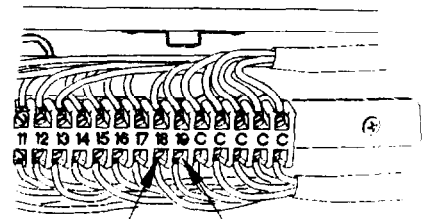
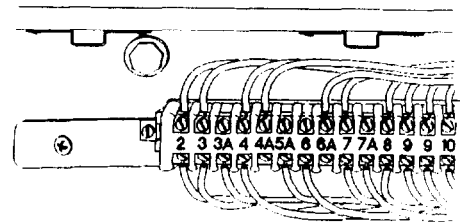


WARNING

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

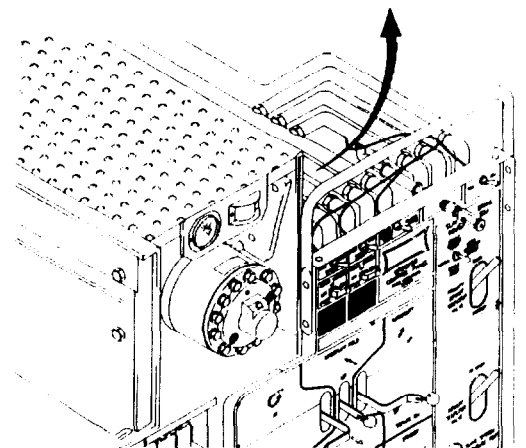
VOLTAGE TEST

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to TB-19 (LH) or TB-18 (RH).
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position master power switch to on (TM 9-2320-366-10-1).
- (5) Position 30K winch LH or RH free spool switch to ON (TM 9-2320-366-10-1) and note reading on multimeter.
- (6) If 24 vdc is not present, repair wire 18 or 19 (para 2-45) or replace wrecker control panel wiring harness (para 7-83).
- (7) Position 30K winch LH or RH free spool switch to OFF (TM 9-2320-366-10-1).
- (8) Position master power switch to off (TM 9-2320-366-10-1).
- (9) Install wrecker control panel top cover (para 17-20).



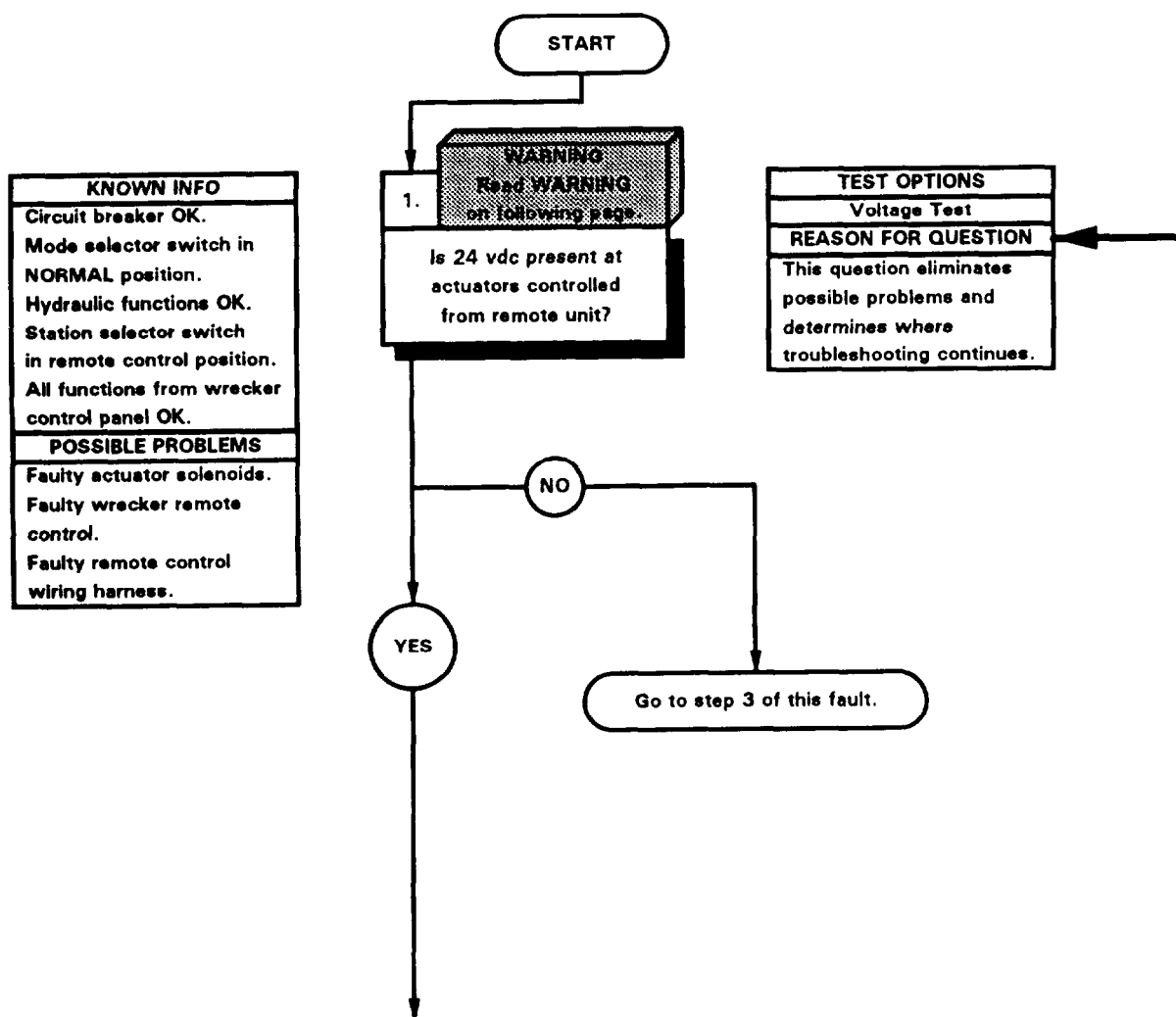
TB2-18

TB2-19



42EN013A

•141. ONE WRECKER FUNCTION DOES NOT OPERATE FROM WRECKER REMOTE CONTROL	
INITIAL SETUP	
Equipment Conditions Top control panel cover removed (para 17-20). Personnel Required (2)	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/ICE-R (Item 41, Appendix C) Materiale/Parts Wire, Electrical, 50 ft (Item 67, Appendix D) References TM 9-4910-571-12&P



WARNING

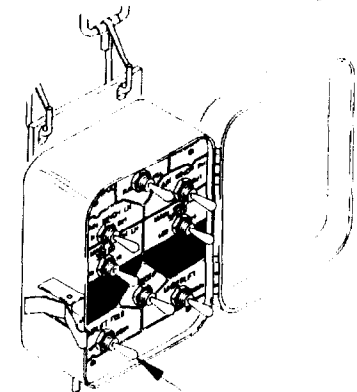
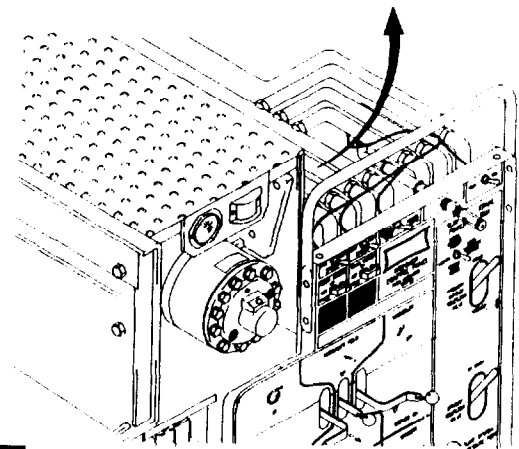
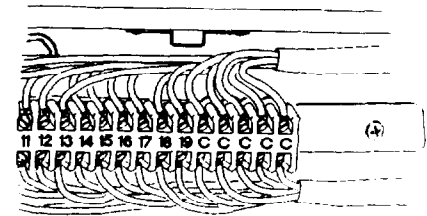
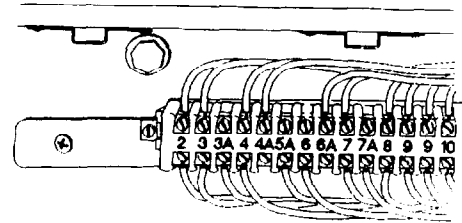
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

- (1) Connect wrecker remote control cable to RH remote control bulkhead connector (TM 9-2320-366-10-1).
- (2) Set multimeter to vdc.
- (3) Connect positive (+) probe of multimeter to terminal listed in Table 2-13. Actuator Voltage Test.
- (4) Connect negative (-) probe of multimeter on ground.
- (5) Position master power switch to on (TM 9-2320-366-10-1).
- (6) Position remote control box switch to position listed in Table 2-13. Actuator Voltage Test and note reading on multimeter.
- (7) If 24 vdc is not present, go to step 3 of this fault.
- (8) Position master power switch to off (TM 9-2320-366-10-1).
- (9) Disconnect remote control cable from RH remote control bulkhead connector (TM 9-2320-366-10-1).

TABLE 2-13. ACTUATOR VOLTAGE TEST

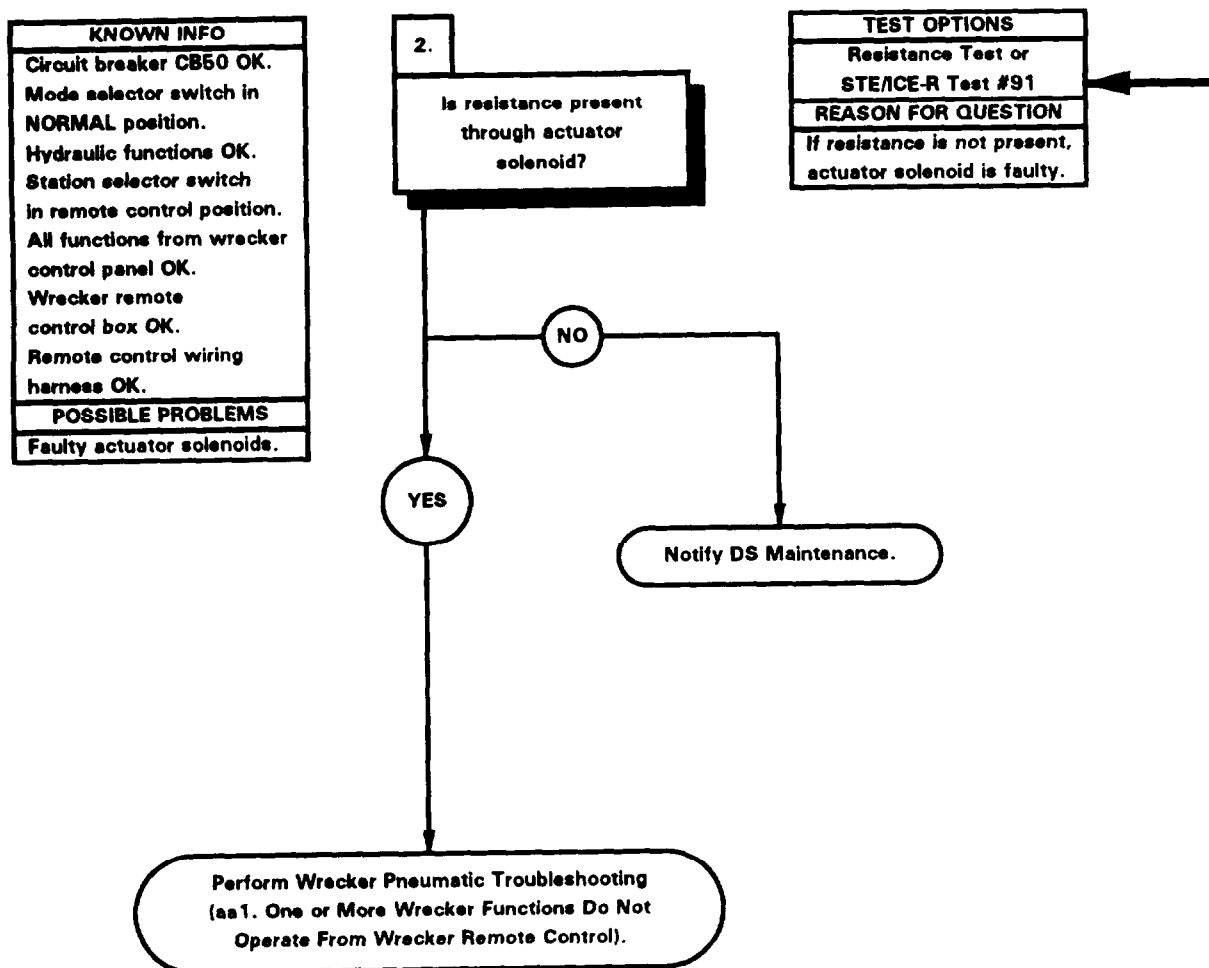
TB No.	ACTUATOR NAME	Remote Control Box Switch Position
2	Underlift fold up	UP
3	Stinger in	IN
4	Underlift up	UP
6	Main winch LH in	IN
8	Main winch RH in	IN
11	Main winch RH out	OUT
12	Main winch speed RH high	HIGH
13	Main winch LH out	OUT
14	Main winch speed LH high	HIGH
15	Underlift down	DOWN
16	Stinger out	OUT
17	Underlift fold down	DOWN



REMOTE CONTROL
UNDERLIFT FOLD
UP SWITCH

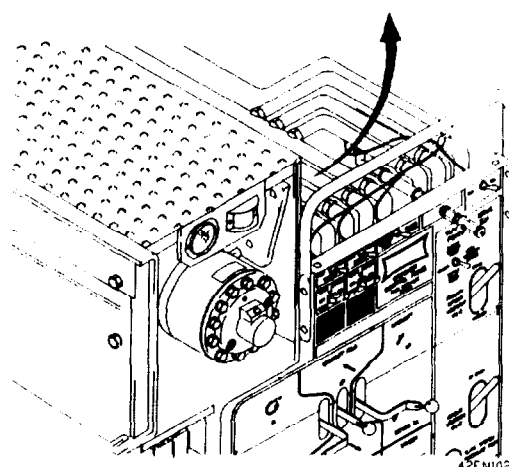
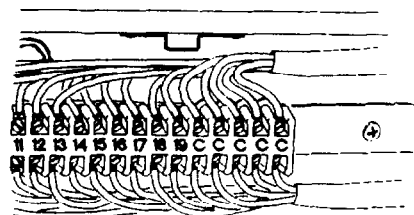
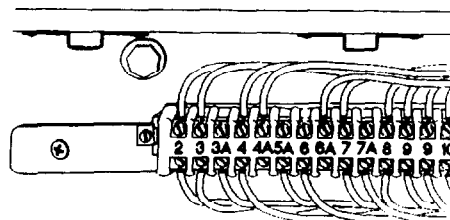
42EN111A

•141. ONE WRECKER FUNCTION DOES NOT OPERATE FROM WRECKER REMOTE CONTROL (CONT)



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to terminal listed in Table 2-14. Actuator Solenoid Resistance Test.
- (3) Connect negative (-) probe of multimeter on terminal block TB-C and note reading on multimeter.
- (4) If resistance is less or greater than value listed in Table 2-14. Actuator Solenoid Resistance Test, notify DS Maintenance.
- (5) Install wrecker control panel top cover (para 17-20).

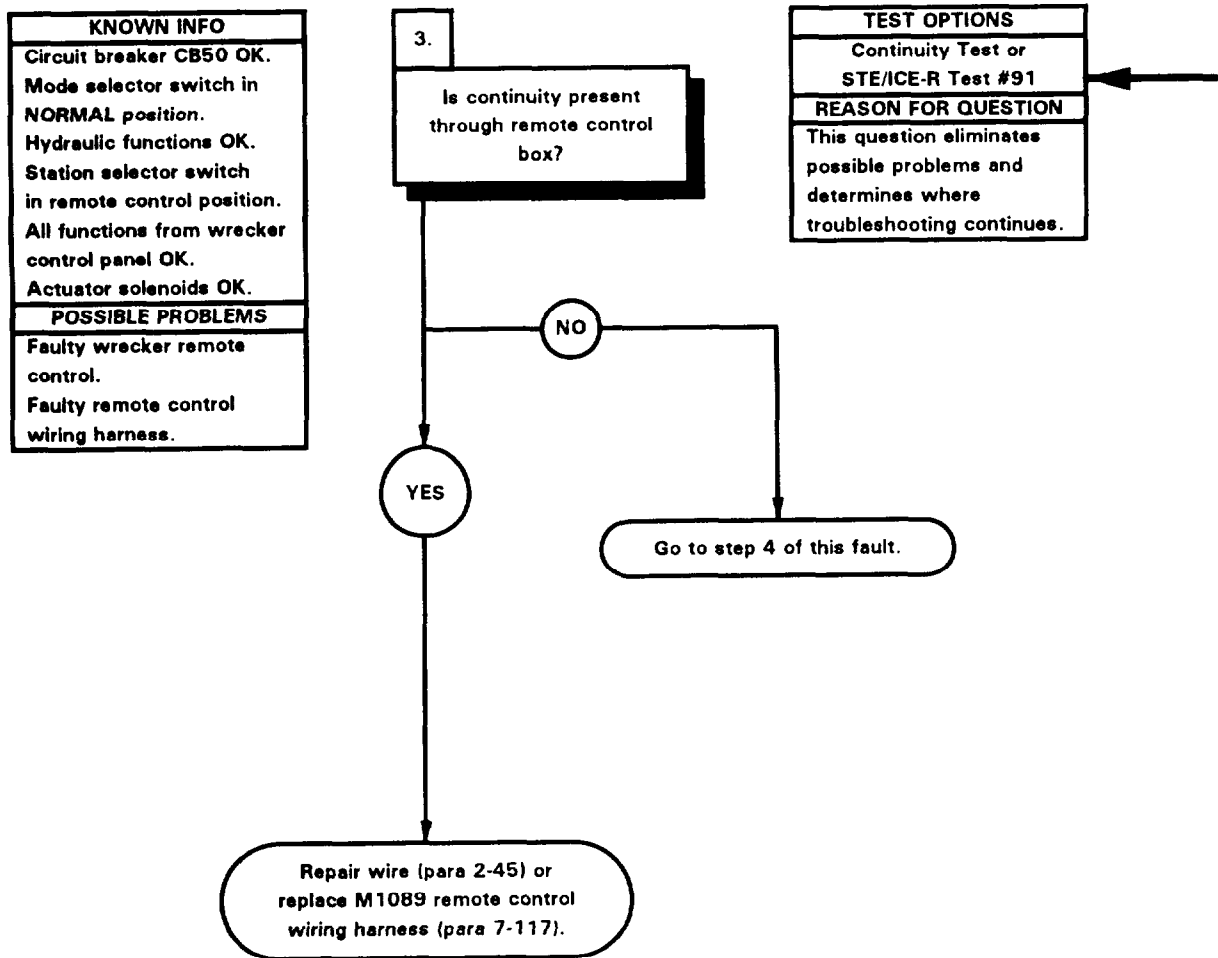


42EN102A

TABLE 2-14. ACTUATOR SOLENOID RESISTANCE TEST

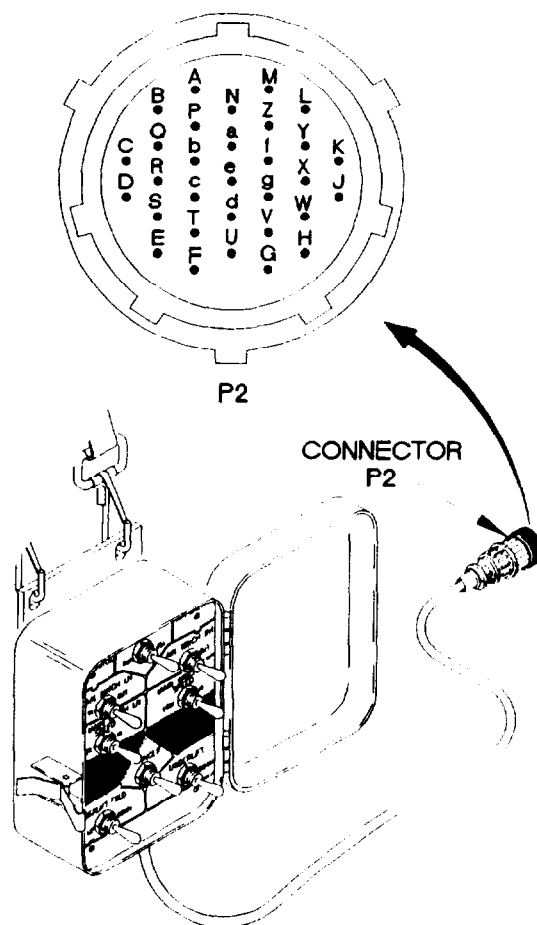
Function/Solenoid	Terminal Board (+) Position	Solenoid Resistance in Ohms
Underlift fold up - L18	2	81-101
Stinger in - L13	3	81-101
Underlift up - L14	4	81-101
Main winch LH in - L6	6	81-101
Main winch RH in - L1	8	81-101
Main winch RH out - L2	11	81-101
Main winch speed RH high	12	35-45
Main winch LH out - L5	13	81-101
Main winch speed LH high	14	35-45
Underlift down - L11	15	81-101
Stinger out - L16	16	81-101
Underlift fold down - L15	17	81-101

e141. ONE WRECKER FUNCTION DOES NOT OPERATE FROM WRECKER REMOTE CONTROL (CONT)



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to pin listed in Table 2-15. Remote Control Box Continuity Test.
- (3) Connect negative (-) probe of multimeter to pin listed in Table 2-15. Remote Control Box Continuity Test.
- (4) Position remote control box switch to position listed in Table 2-15. Remote Control Box Continuity Test and note reading on multimeter.
- (5) If continuity is not present, go to step 4 of this fault.
- (6) If continuity is present, repair wire (para 2-45) or replace M1089 remote control wiring harness (para 7-117).

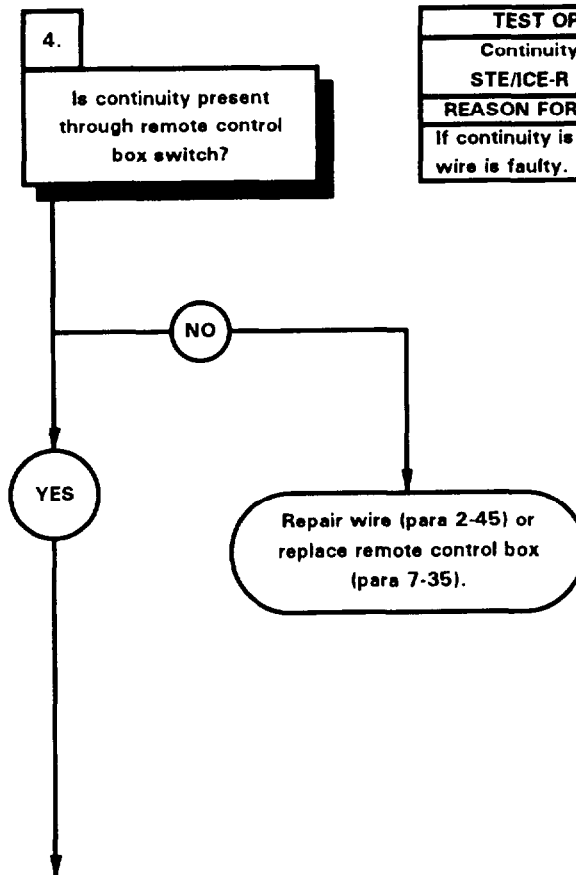
**TABLE 2-15. REMOTE CONTROL BOX CONTINUITY TEST**

Function	Remote Control Box Position	P2 Pin Positive (+)	P2 Pin Negative (-)
Underlift fold up	UP	c	e
Stinger in	IN	c	f
Underlift up	UP	c	g
Main winch LH in	IN	c	d
Main winch RH in	IN	c	b
Main winch RH out	OUT	c	Y
Main winch speed RH high	HIGH	c	X
Main winch LH out	OUT	c	W
Main winch speed LH high	HIGH	c	V
Underlift down	DOWN	c	U
Stinger out	OUT	c	T
Underlift fold down	DOWN	c	S
Emergency stop	KILL	a	Z

42EN103A

e141. ONE WRECKER FUNCTION DOES NOT OPERATE FROM WRECKER REMOTE CONTROL (CONT)

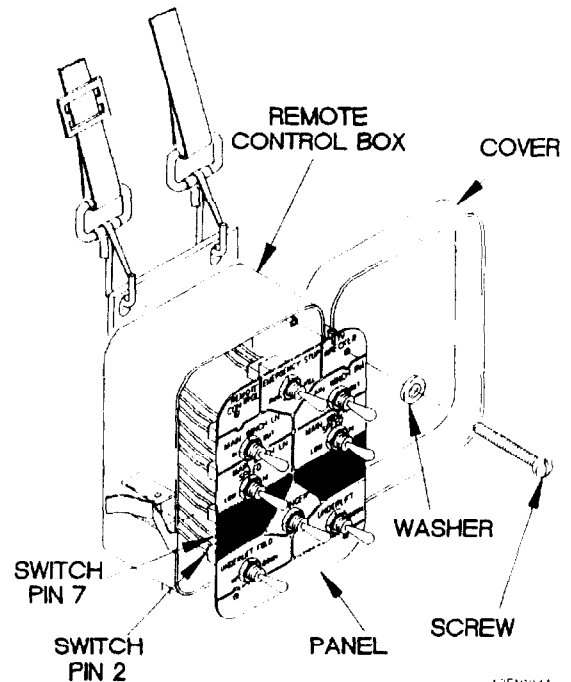
KNOWN INFO
Circuit breaker CB50 OK. Mode selector switch in NORMAL position. Hydraulic functions OK. Station selector switch in remote control position. All functions from wrecker control panel OK. Actuator solenoids OK.
POSSIBLE PROBLEMS
Faulty remote control box. Faulty remote control wiring harness.



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

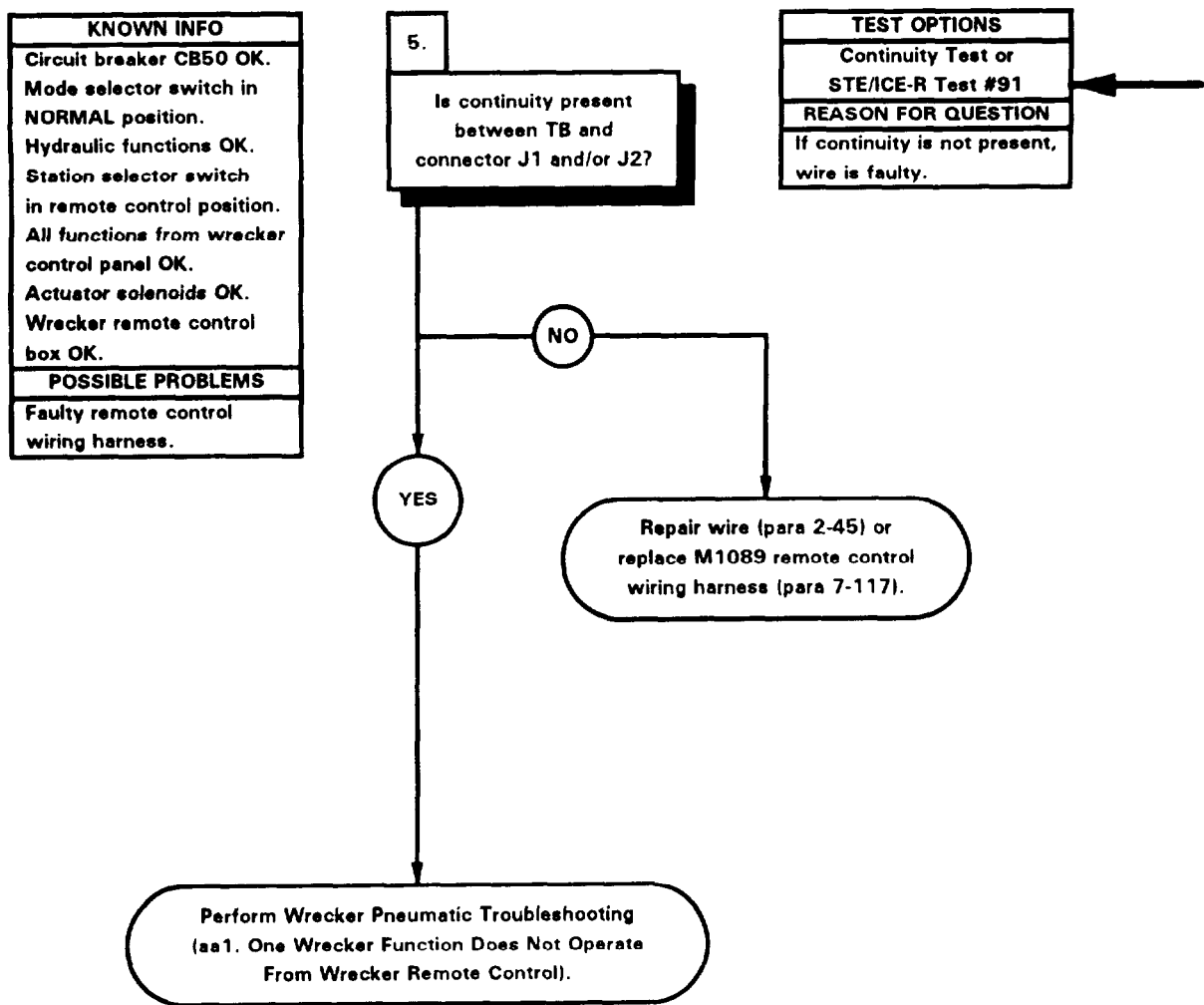
CONTINUITY TEST

- (1) Open cover on remote control box.
- (2) Remove four screws, washers, and panel from remote control box.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to pin listed in Table 2-16. Remote Control Box Switch Continuity Test.
- (5) Connect negative (-) probe of multimeter to pin listed in Table 2-16. Remote Control Box Switch Continuity Test.
- (6) Position remote control box switch to position listed in Table 2-16. Remote Control Box Switch Continuity Test and note reading on multimeter.
- (7) If continuity is not present, repair wire (para 2-45) or replace remote control box switch (para 7-35).
- (8) Install panel on remote control box with four washers and screws.

**TABLE 2-16. REMOTE CONTROL BOX SWITCH CONTINUITY TEST**

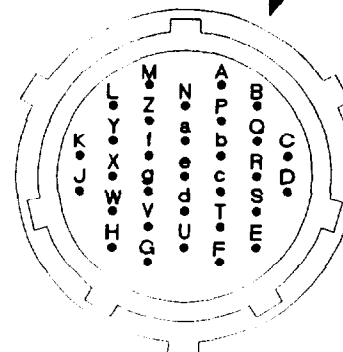
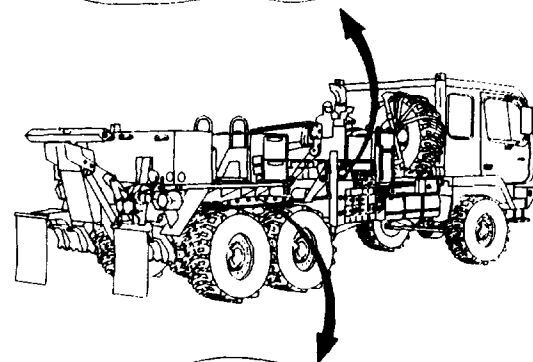
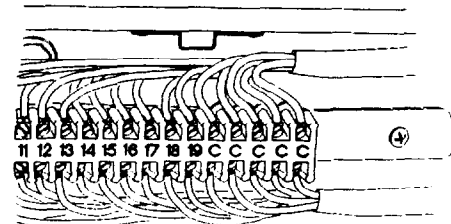
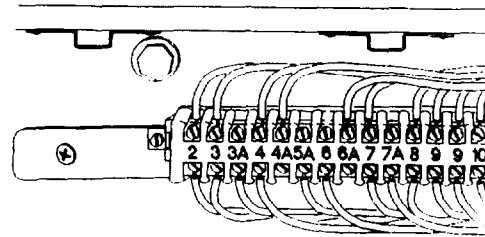
Function	REF DES	Remote Control Box Position and Switch Number	Switch Pin Positive (+)	Switch Pin Negative (-)
Underlift fold up	S15	UP	7	2
Stinger in	S14	IN	7	3
Underlift up	S13	UP	7	4
Main winch LH in	S10	IN	7	6
Main winch RH in	S8	IN	7	8
Main winch RH out	S8	OUT	7	11
Main winch speed RH high	S9	HIGH	7	12
Main winch LH out	S10	OUT	7	13
Main winch speed LH high	S11	HIGH	7	14
Underlift down	S13	DOWN	7	15
Stinger out	S14	OUT	7	16
Underlift fold down	S15	DOWN	7	17
Emergency stop	S7	KILL	9	10

e141. ONE WRECKER FUNCTION DOES NOT OPERATE FROM WRECKER REMOTE CONTROL (CONT)



CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to terminal block position listed in Table 2-17. Continuity Table.
- (3) Connect negative (-) probe of multimeter to J1/J2 pin listed in Table 2-17. Continuity Table and note reading on multimeter.
- (4) If continuity is not present, repair wire (para 2-45) or replace remote control wiring harness (para 7-117).
- (5) If continuity is present, perform Wrecker Pneumatic Troubleshooting (as 1. One Wrecker Function Does Not Operate From Wrecker Remote Control).
- (6) Install wrecker control panel top cover (para 17-20).



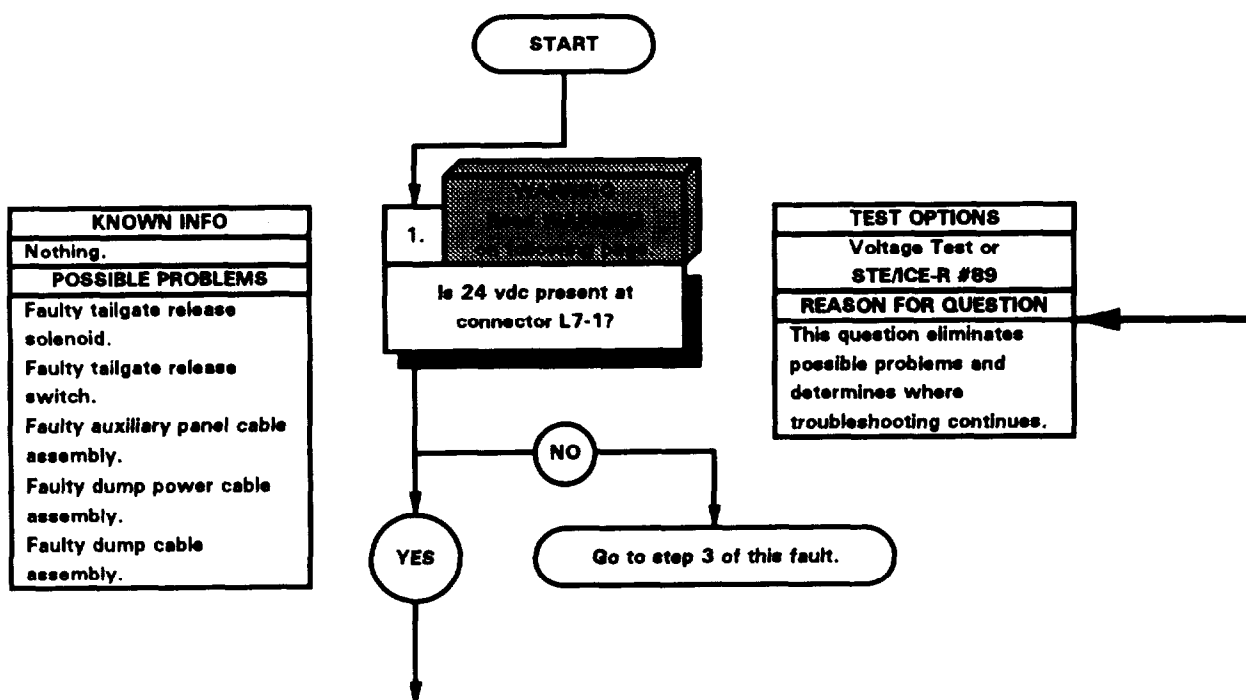
J1/J2

42EN1105A

TABLE 2-17. REMOTE CONTROL BOX SWITCH CONTINUITY TEST

Function	TB Position	J1/J2 Pin
Underlift fold up	2	g
Stinger in	3	f
Underlift up	4	e
Main winch LH in	6	d
Main winch RH in	8	b
Main winch RH out	11	Y
Main winch speed RH high	12	X
Main winch LH out	13	W
Main winch speed LH high	14	V
Underlift down	15	U
Stinger out	16	T
Underlift fold down	17	S
Emergency shutdown run	9	a
Emergency shutdown kill	10	Z
Remote control box power	7	c

•142. M1090/M1094 TAILGATE RELEASE DOES NOT OPERATE	
INITIAL SETUP	
Equipment Condition Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) STE/ICE-R (Item 41, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Personnel Required (2)	
References TM 9-4910-571-12&P	Materials/Parts Wire, Elect, 50 ft (Item 71, Appendix D)

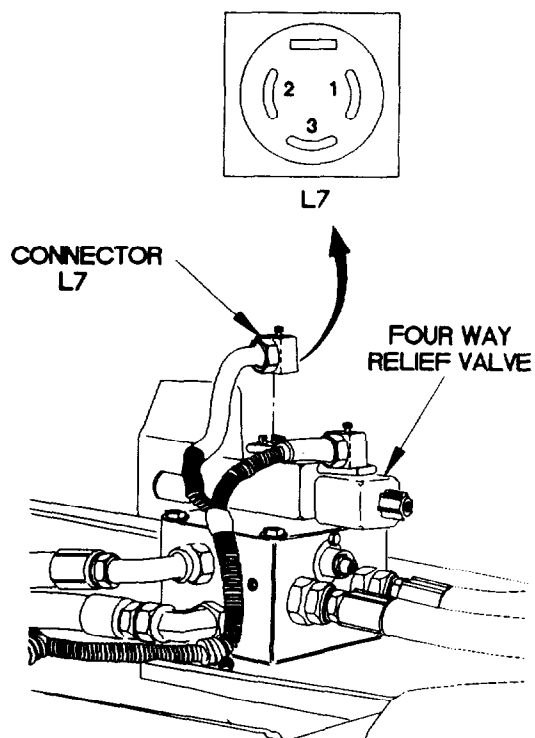


WARNING

- Wear appropriate eye protection when working under vehicle due to possibility of falling debris. Failure to comply may result in injury to personnel.
- Dump body weighs approximately 3,034 lbs (1,376 kgs). Attach a suitable lifting device prior to lifting. Failure to comply may result in injury to personnel or damage to equipment.
- Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

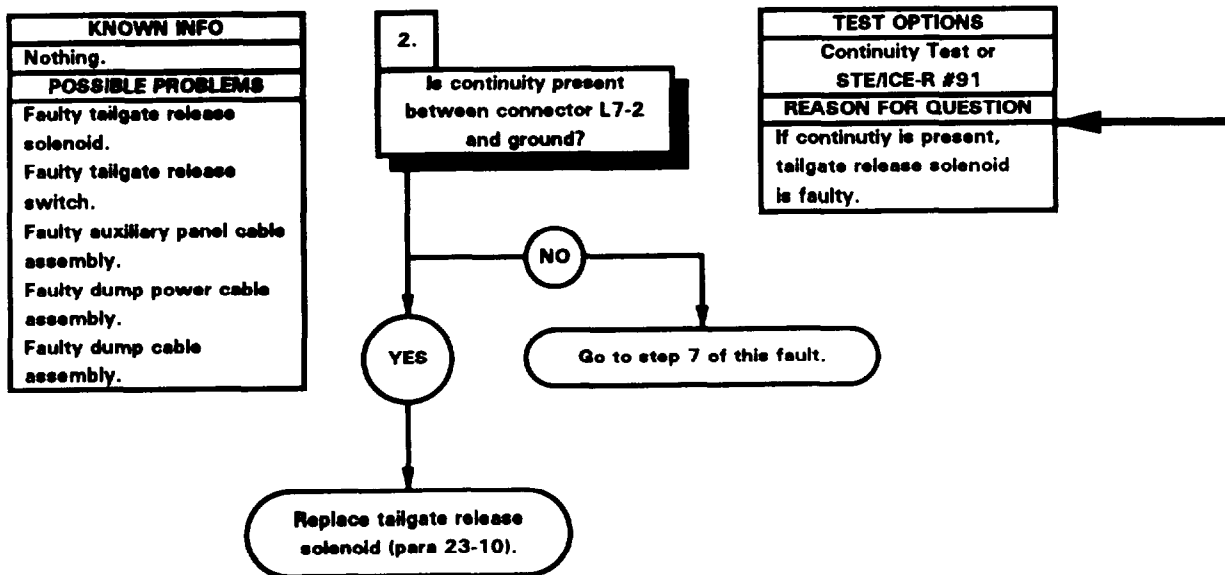
VOLTAGE TEST

- (1) Raise dump bed (TM 9-2320-366-10-1).
- (2) Disconnect connector L7 from four way relief valve tailgate release solenoid.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to connector L7-1.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position master power switch to on (TM 9-2320-366-10-1).
- (7) Press and hold tailgate release switch (TM 9-2320-366-10-1) and note reading on multimeter.
- (8) If 24 vdc is not present, go to step 3 of this fault.



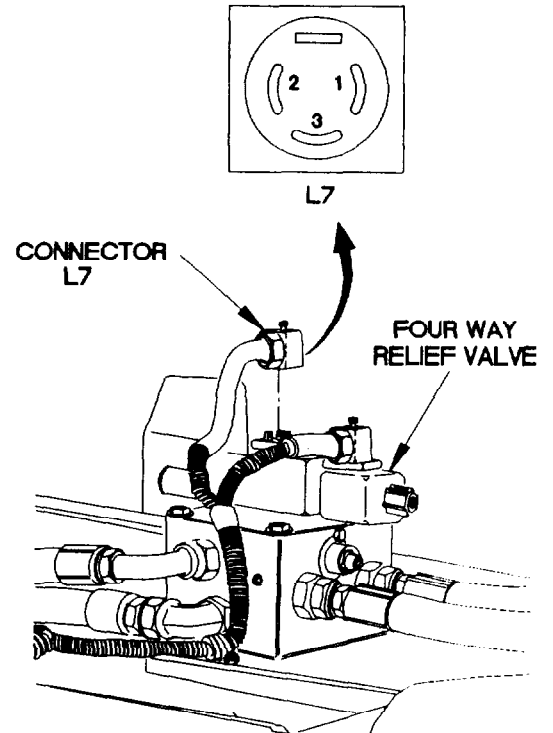
42EN201A

ø142. M1090/M1094 TAILGATE RELEASE DOES NOT OPERATE (CONT)



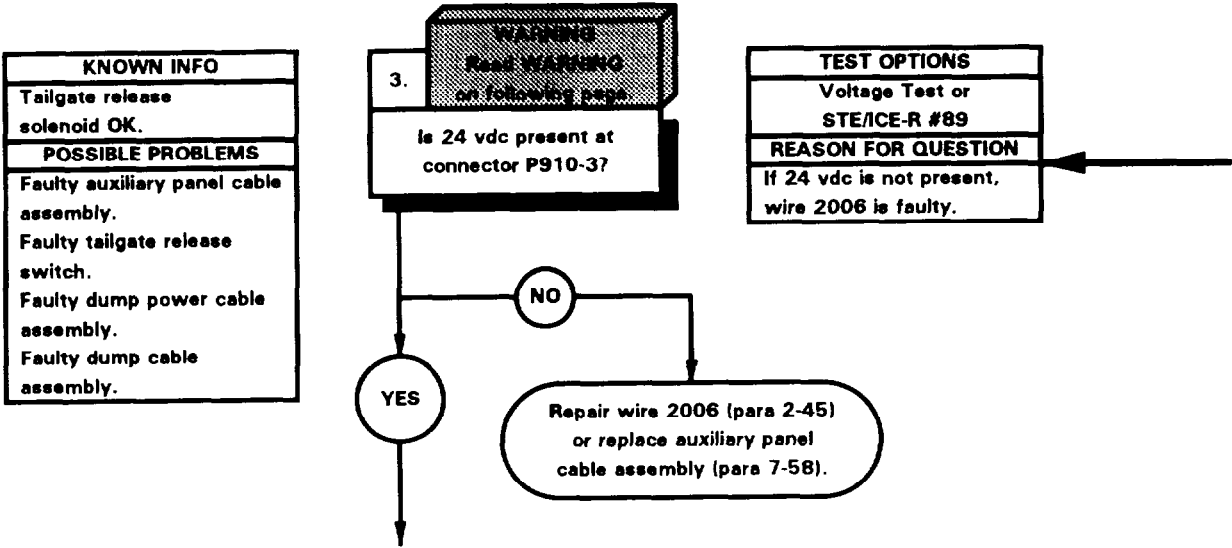
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector L7-2.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, go to step 7 of this fault.
- (5) If continuity is present, replace tailgate release solenoid (para 23-10).
- (6) Connect connector L7 to four way relief valve up solenoid.



42EN201A

e142. M1090/M1094 TAILGATE RELEASE DOES NOT OPERATE (CONT)

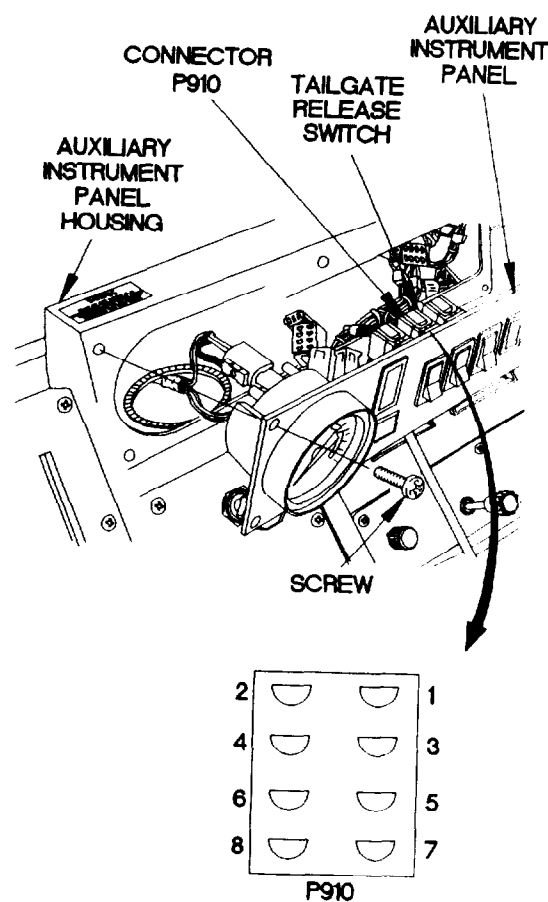


WARNING

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

VOLTAGE TEST

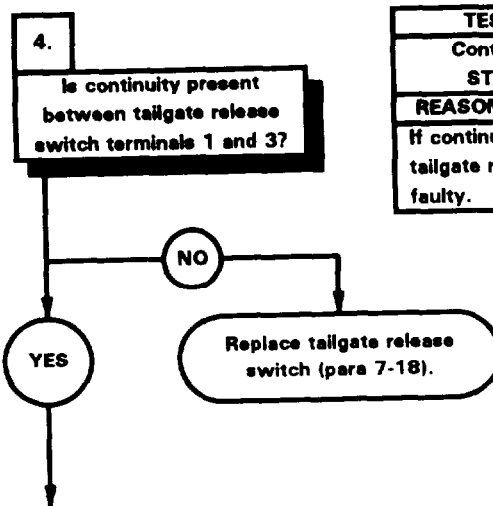
- (1) Remove six screws from auxiliary panel.
- (2) Lift auxiliary panel outward to gain access.
- (3) Disconnect connector P910 from tailgate release switch.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to connector P910-3.
- (6) Connect negative (-) probe of multimeter to ground.
- (7) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
- (8) If 24 vdc is not present, repair wire 2006 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
- (9) Position master power switch to off (TM 9-2320-366-10-1).



42EN202A

e142. M1090/M1094 TAILGATE RELEASE DOES NOT OPERATE (CONT)

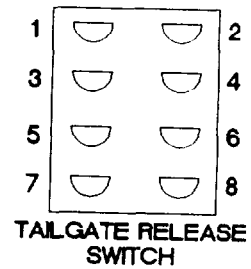
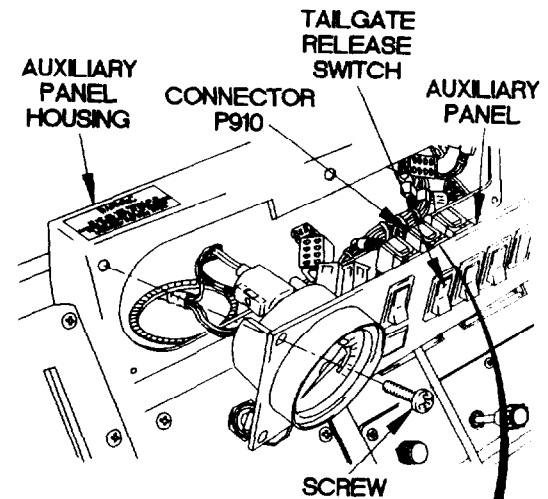
KNOWN INFO
Tailgate release switch OK.
POSSIBLE PROBLEMS
Faulty tailgate release switch.
Faulty auxiliary panel cable assembly.
Faulty dump power cable assembly.
Faulty dump cable assembly.



TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, tailgate release switch is faulty.

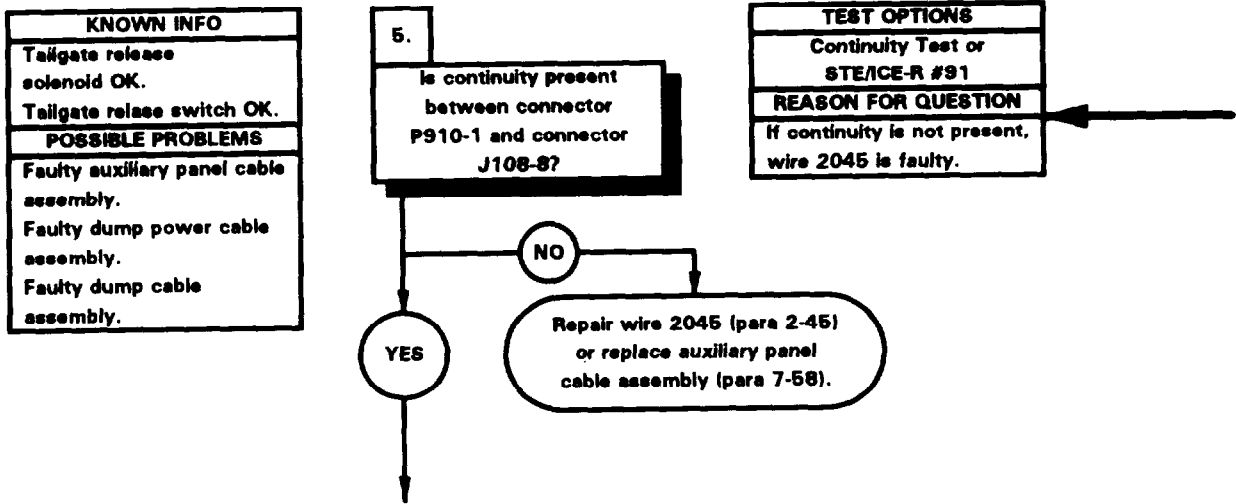
CONTINUITY TEST

- (1) Disconnect connector P910 from tailgate release switch.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to terminal 1 of tailgate release switch.
- (4) Connect negative (-) probe of multimeter to terminal 3 of tailgate release switch.
- (5) Push and hold tailgate release switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
- (6) If continuity is not present, tailgate release switch (para 7-18).



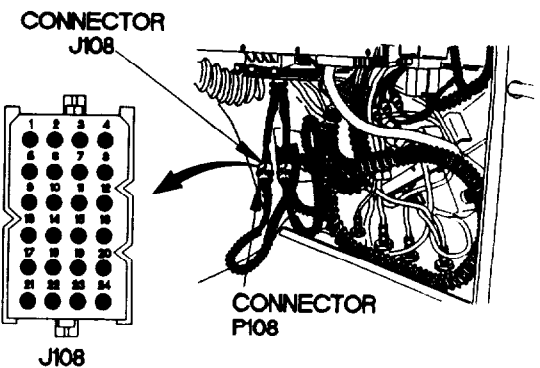
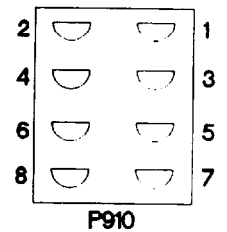
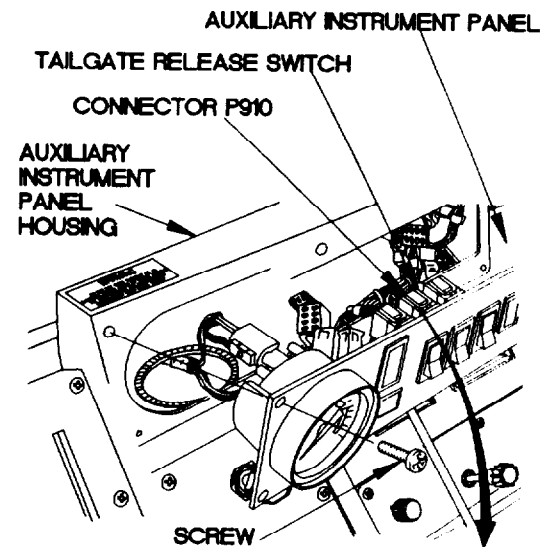
42EN2113A

e142. M1090/M1094 TAILGATE RELEASE DOES NOT OPERATE (CONT)



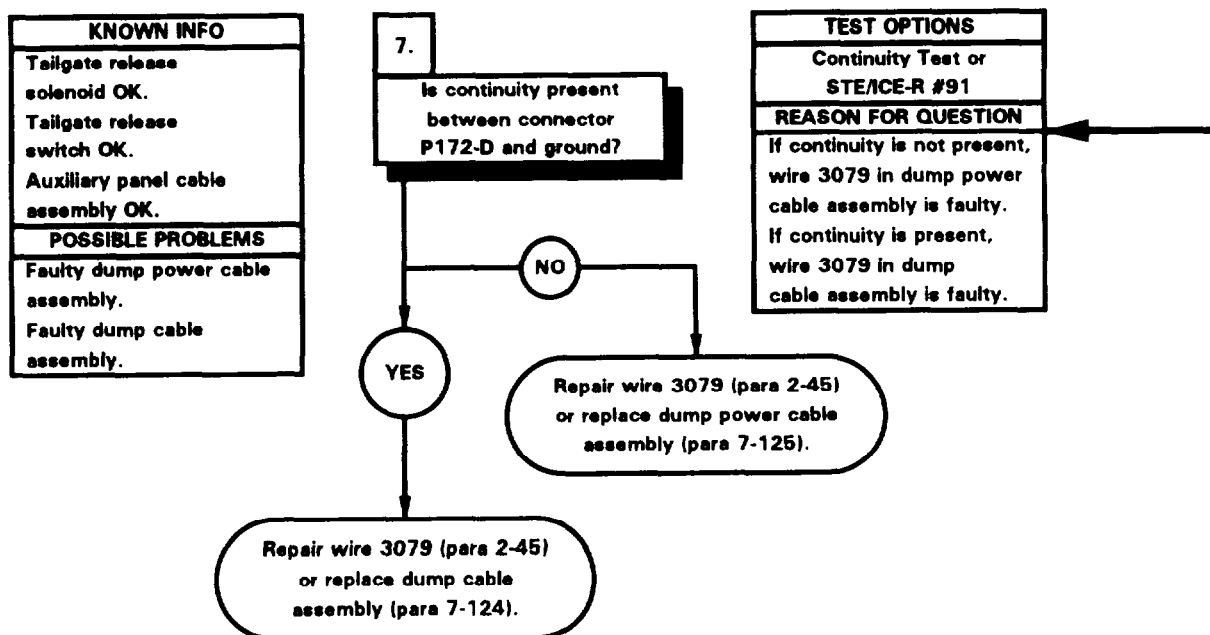
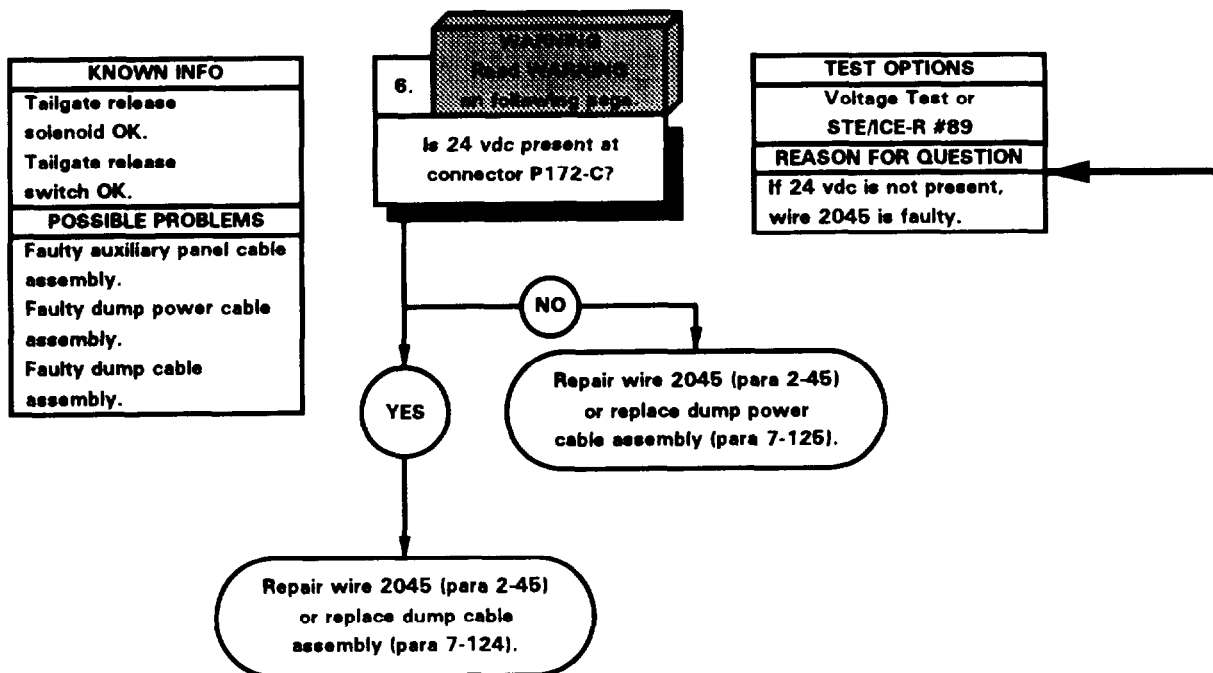
CONTINUITY TEST

- (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 P910-1.
- (5) Connect negative (-) probe of multimeter to connector J108-8 and note reading on multimeter.
- (6) If continuity is not present, repair wire 2045 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
- (7) Connect connector P108 to connector J108.
- (8) Install kick panel (para 16-3).
- (9) Connect connector P910 to tailgate release switch.
- (10) Position auxiliary panel on auxiliary panel housing with six screws.
- (11) Tighten six screws to 24 lb-in. (3 N-m).



42EN204A

e142. M1090/M1094 TAILGATE RELEASE DOES NOT OPERATE (CONT)



WARNING

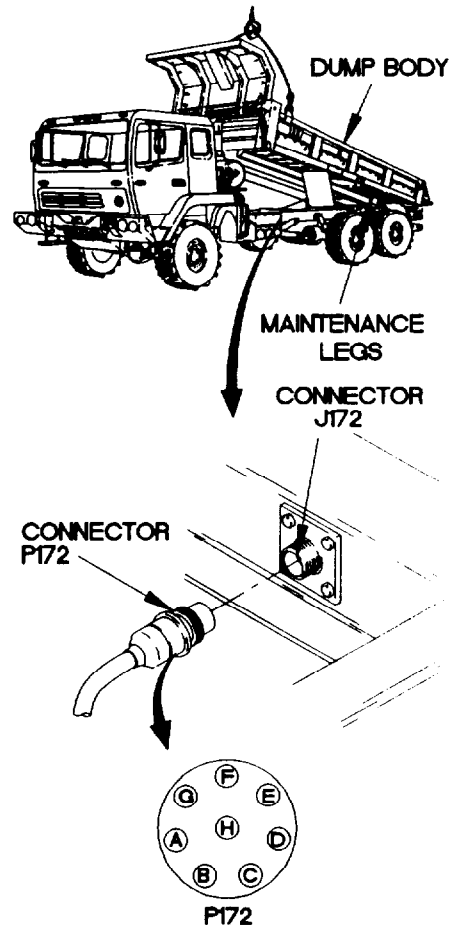
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

- (1) Disconnect connector P172 from connector J172.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector P172-C.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-366-10-1).
- (6) Press and hold tailgate release switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
- (7) If 24 vdc is not present, repair wire 2045 (para 2-45) or replace dump power cable assembly (para 7-125).
- (8) If 24 vdc is present, repair wire 2045 (para 2-45) or replace dump cable assembly (para 7-124).
- (9) Position master power switch to off (TM 9-2320-366-10-1).
- (10) Connect connector P172 to connector J172.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P172-D.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3079 (para 2-45) or replace dump power cable assembly (para 7-125).
- (5) If continuity is present, repair wire 3079 (para 2-45) or replace dump cable assembly (para 7-124).
- (6) Connect connector P172 to connector J172.
- (7) Start engine (TM 9-2320-366-10-1).
- (8) Engage PTO (TM 9-2320-366-10-1).
- (9) Lower dump bed (TM 9-2320-366-10-1).
- (10) Disengage PTO (TM 9-2320-366-10-1).
- (11) Shut down engine (TM 9-2320-366-10-1).



42EN205A

•143. DUMP BED UP DOES NOT OPERATE

INITIAL SETUP

Equipment Condition

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

Personnel Required

(2)

References

TM 9-4910-571-12&P

Tools and Special Tools

Tool Kit, Genl Mech (Item 46, Appendix C)

STE/ICE-R (Item 41, Appendix C)

Multimeter, Digital (Item 22, Appendix C)

Goggles, Industrial (Item 15, Appendix C)

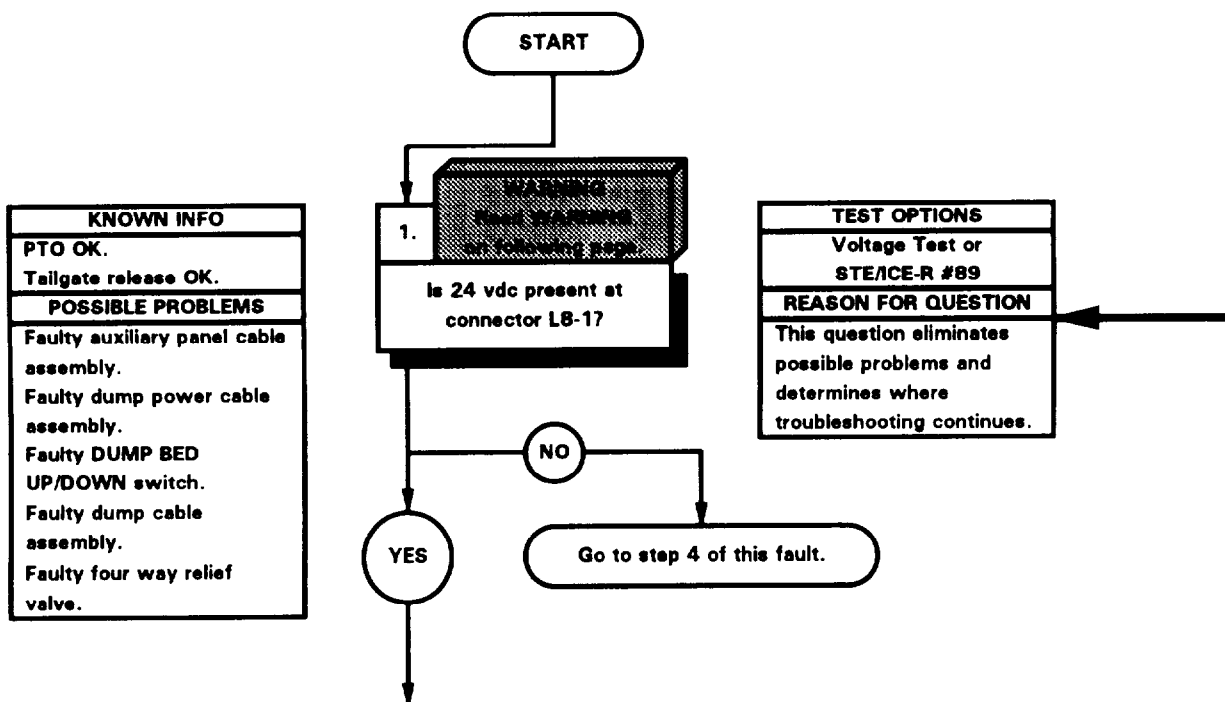
Sling, Cargo (Item 31, Appendix C)

Lifting Bracket, Dump Body (2) (Item E-24, Appendix E)

Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)

Materials/Parts

Wire, Elect, 50 ft (Item 71, Appendix D)



WARNING

- Wear appropriate eye protection when working under vehicle due to possibility of falling debris. Failure to comply may result in injury to personnel.
- Dump body weighs approximately 3,034 lbs (1,376 kgs). Attach a suitable lifting device prior to lifting. Failure to comply may result in injury to personnel or damage to equipment.
- Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

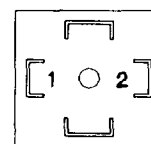
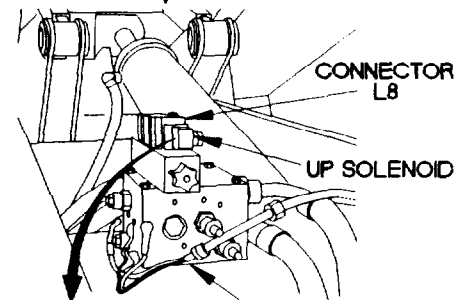
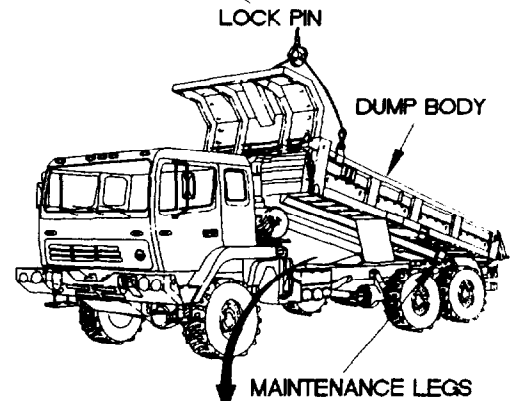
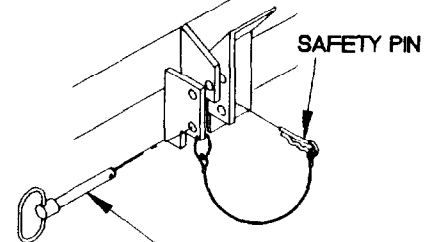
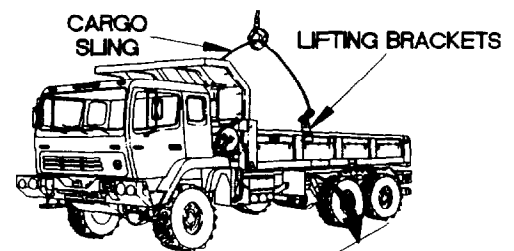
VOLTAGE TEST

- (1) Remove safety pins from two locking pins.
- (2) Remove two lock pins from dump body.
- (3) Install two dump body lifting brackets in slots in dump body.
- (4) Attach cargo sling to two dump body lifting brackets.
- (5) Lift dump body.
- (6) Raise two maintenance legs on frame.
- (7) Lower dump body on maintenance legs.
- (8) Disconnect connector L8 from four way relief valve up solenoid.
- (9) Set multimeter to volts dc.
- (10) Connect positive (+) probe of multimeter to connector L8-1.
- (11) Connect negative (-) probe of multimeter to ground.

NOTE

Steps (12) and (13) require the aid of an assistant.

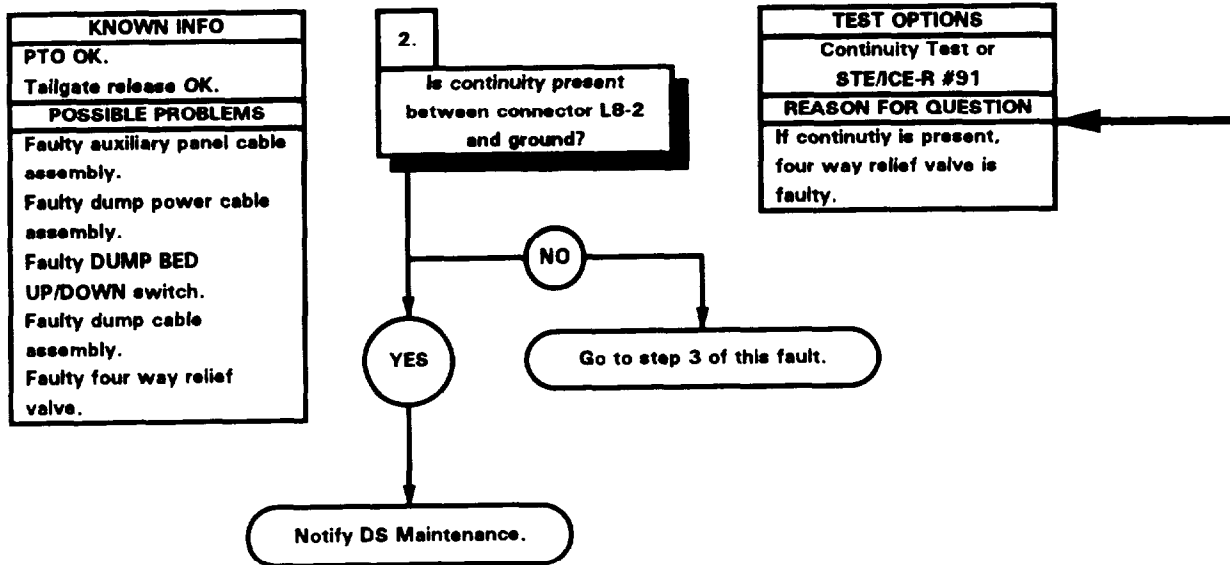
- (12) Position master power switch to on (TM 9-2320-366-10-1).
- (13) Push and hold DUMP BED UP/DOWN switch to UP (TM 9-2320-366-10-1) and note reading on multimeter.
- (14) If 24 vdc is not present, go to step 4 of this fault.
- (15) Release DUMP BED UP/DOWN switch (TM 9-2320-366-10-1).
- (16) Position master power switch to off (TM 9-2320-366-10-1).



FOUR WAY
RELIEF VALVE

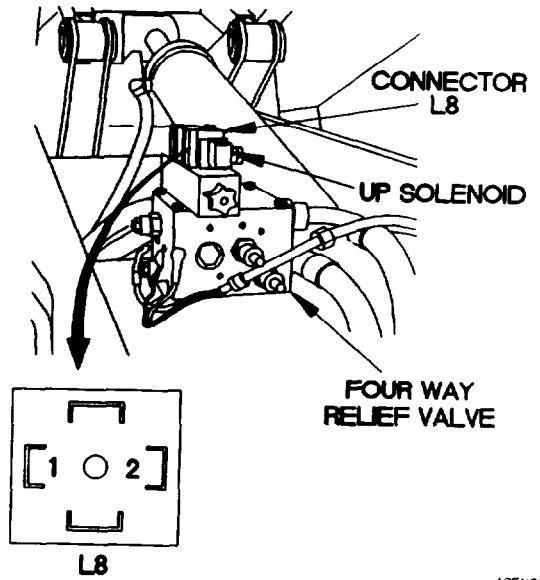
42EN 3011

e143. M1090/M1094 DUMP BED UP DOES NOT OPERATE (CONT)



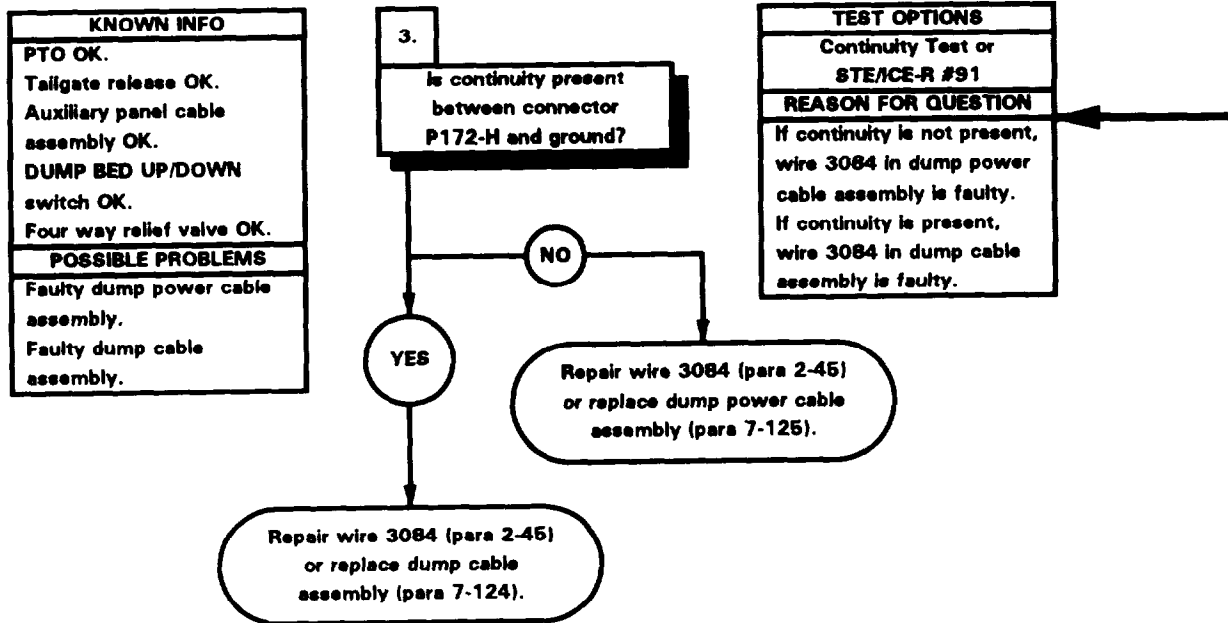
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector L8-2.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, go to step 3 of this fault.
- (5) If continuity is present, notify DS Maintenance.
- (6) Connect connector L8 to four way relief valve up solenoid.



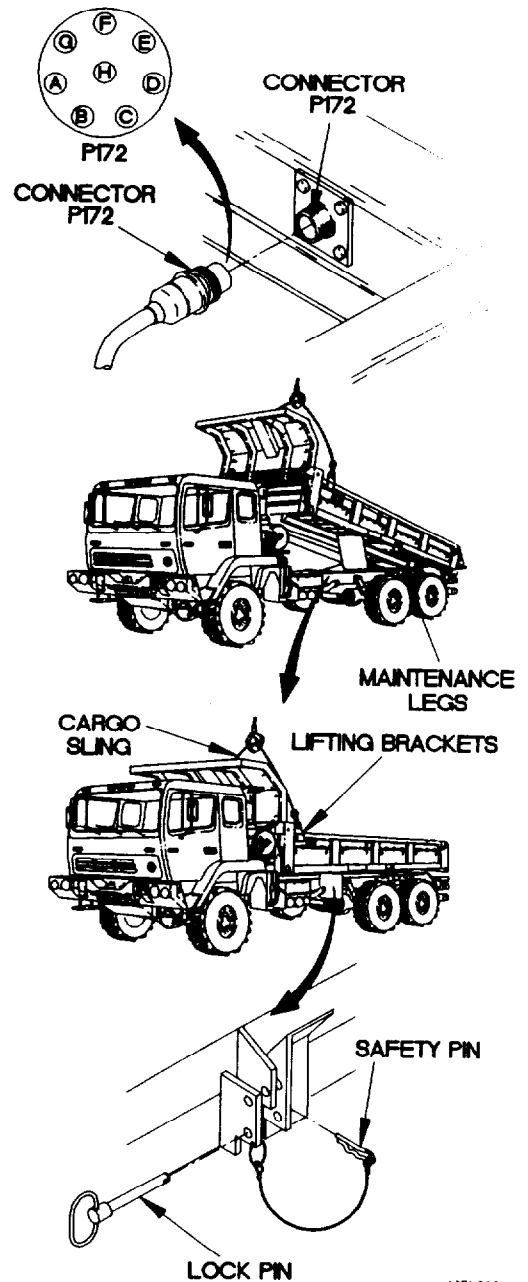
42EN302A

143. M1090/M1094 DUMP BED UP DOES NOT OPERATE (CONT)



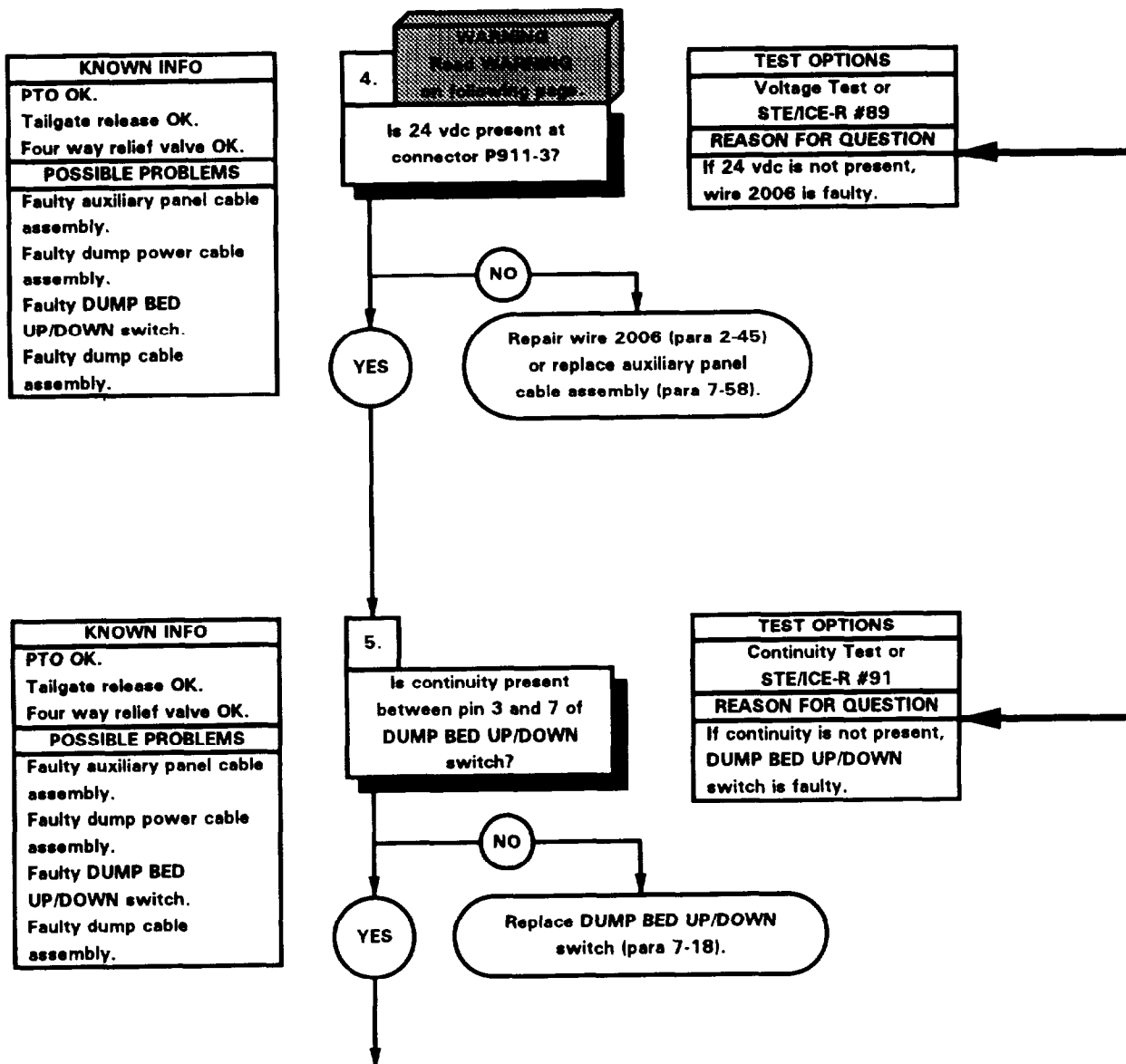
CONTINUITY TEST

- (1) Disconnect connector P172 from connector J172.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector P172-H.
- (4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (5) If continuity is not present, repair wire 3084 (para 2-45) or replace dump power cable assembly (para 7-125).
- (6) If continuity is present, repair wire 3084 (para 2-45) or replace dump cable assembly (para 7-124).
- (7) Connect connector P172 to connector J172.
- (8) Lift dump body.
- (9) Place maintenance legs in stowed position.
- (10) Lower dump body.
- (11) Remove cargo sling from two dump body lifting brackets.
- (12) Remove two dump body lifting brackets from dump body.
- (13) Position two locking pins in dump body.
- (14) Install safety pin in two locking pins.



42EN3031

e143. M1090/M1094 DUMP BED UP DOES NOT OPERATE (CONT)

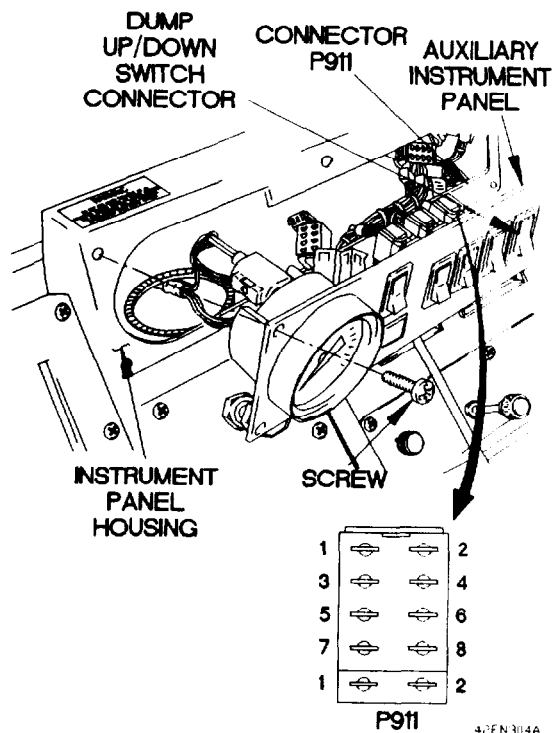


WARNING

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

VOLTAGE TEST

- (1) Remove six screws from auxiliary panel.
- (2) Lift auxiliary panel outward to gain access.
- (3) Disconnect connector P911 from DUMP BED UP/DOWN switch connector.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to connector P911-3.
- (6) Connect negative (-) probe of multimeter to ground.
- (7) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
- (8) If 24 vdc is not present, repair wire 2006 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
- (9) Position master power switch to off (TM 9-2320-366-10-1).

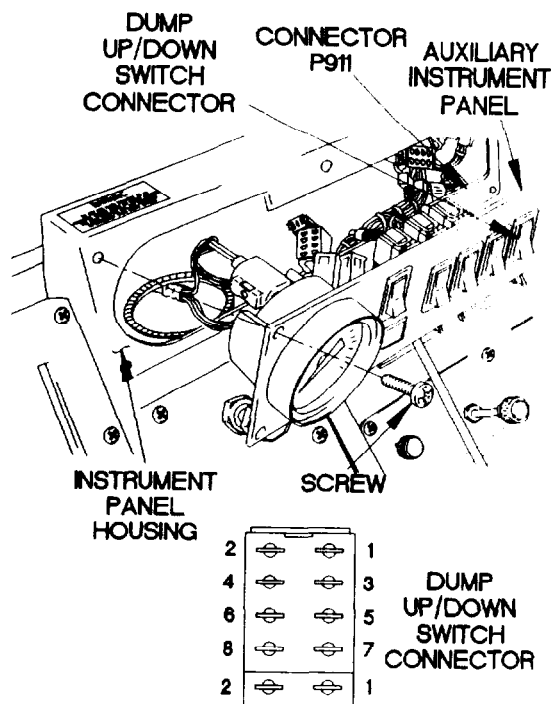
**CONTINUITY TEST**

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to DUMP BED UP/DOWN switch pin 3.
- (3) Connect negative (-) probe of multimeter to DUMP BED UP/DOWN switch pin 7.

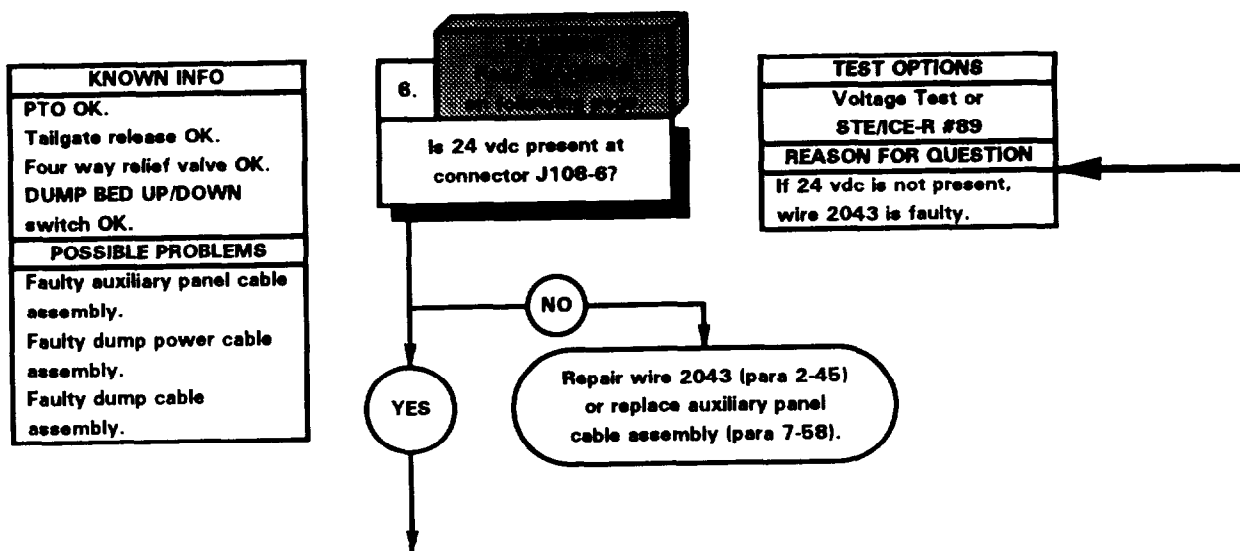
NOTE

Step (3) requires the aid of an assistant.

- (4) Push and hold DUMP BED UP/DOWN switch to UP and note reading on multimeter.
- (5) If continuity is not present, replace DUMP BED UP/DOWN switch (para 7-18).
- (6) Release DUMP BED UP/DOWN switch.
- (7) Connect connector P911 to DUMP BED UP/DOWN switch.
- (8) Position auxiliary panel on auxiliary panel housing with six screws.
- (9) Tighten six screws to 24 lb-in. (3 N·m).



e143. M1090/M1094 DUMP BED UP 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.

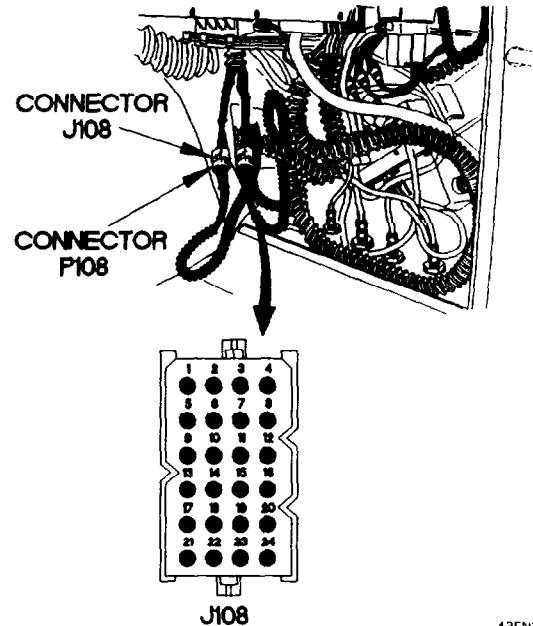
VOLTAGE TEST

- (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 J108-6.
- (5) Connect negative (-) probe of multimeter to ground.

NOTE

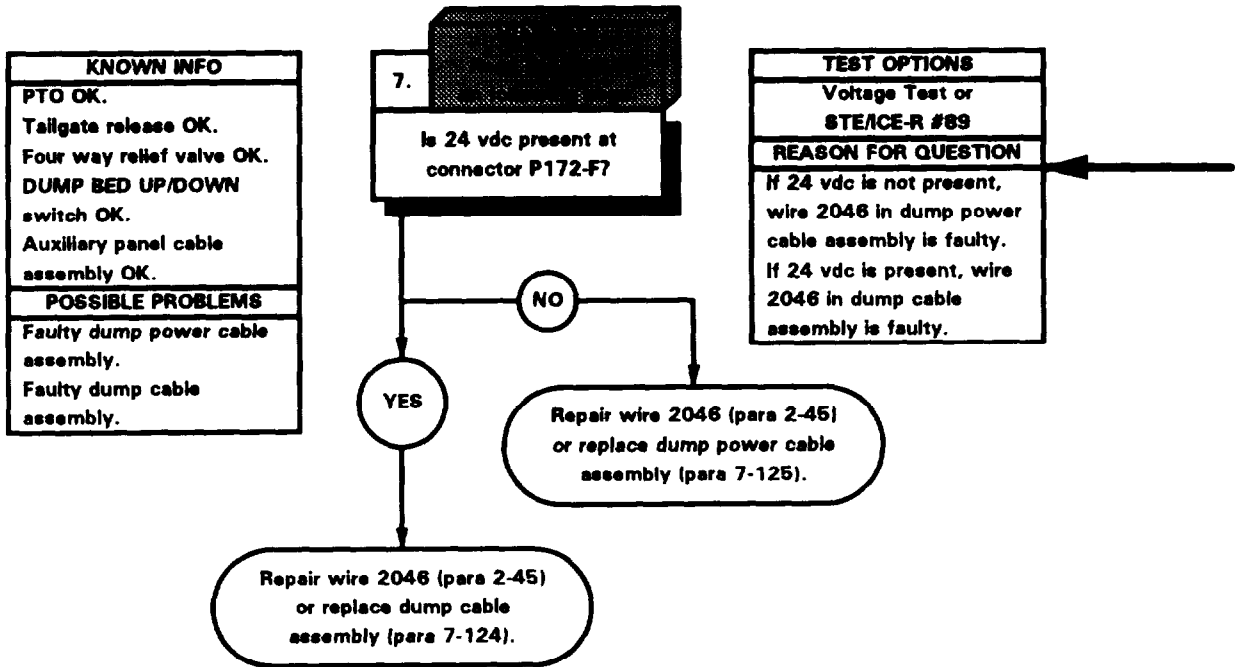
Steps (6) and (7) require the aid of an assistant.

- (6) Position master power switch to on (TM 9-2320-366-10-1).
- (7) Push and hold DUMP BED UP/DOWN switch to UP and note reading on multimeter.
- (8) If 24 vdc is not present, repair wire 2043 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
- (9) Release DUMP BED UP/DOWN switch.
- (10) Position master power switch to off (TM 9-2320-366-10-1).
- (11) Connect connector P108 to connector J108.
- (12) Install kick panel (para 16-3).



42EN306-A

e143. M1090/M1094 DUMP BED UP 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.

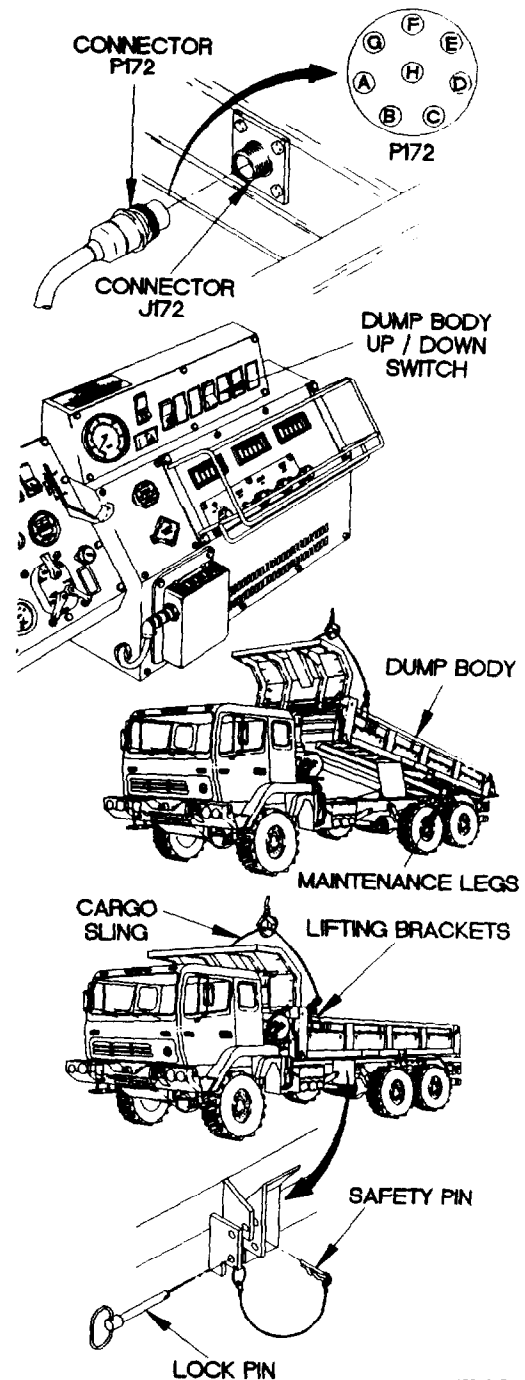
VOLTAGE TEST

- (1) Disconnect connector P172 from connector J172.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector P172-F.
- (4) Connect negative (-) probe of multimeter to ground.

NOTE

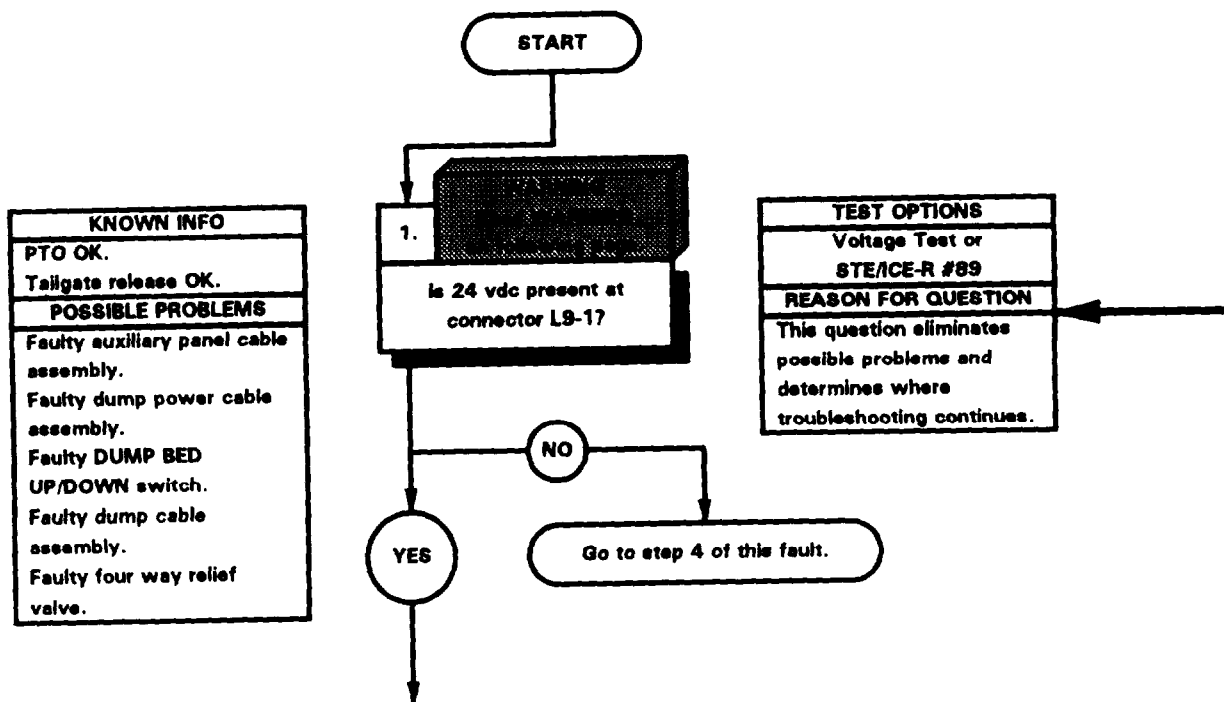
Steps (5) and (6) require the aid of an assistant.

- (5) Position master power switch to on (TM 9-2320-366-10-1).
- (6) Push and hold DUMP BED UP/DOWN switch to UP and note reading on multimeter.
- (7) If 24 vdc is not present, repair wire 2046 (para 2-45) or replace dump power cable assembly (para 7-125).
- (8) If 24 vdc is present, repair wire 2046 (para 2-45) or replace dump cable assembly (para 7-124).
- (9) Release DUMP BED UP/DOWN switch.
- (10) Position master power switch to off (TM 9-2320-366-10-1).
- (11) Connect connector P172 to connector J172.
- (12) Lift dump body.
- (13) Place maintenance legs in stowed position.
- (14) Lower dump body.
- (15) Remove cargo sling from dump body lifting brackets.
- (16) Remove two dump body lifting brackets from dump body.
- (17) Position two locking pins in dump body.
- (18) Install safety pin in two locking pins.



42EN3071

e144. DUMP BED DOWN DOES NOT OPERATE	
INITIAL SETUP	
Equipment Condition Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) STE/CE-R (Item 41, Appendix C) Multimeter, Digital (Item 22, Appendix C) Goggles, Industrial (Item 15, Appendix C) Sling, Cargo (Item 31, Appendix C) Lifting Bracket, Dump Body (2) (Item E-24, Appendix E) Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Personnel Required (2)	
References TM 9-4910-571-12&P	Materials/Parts Wire, Elect, 50 ft (Item 71, Appendix D)



WARNING

- Wear appropriate eye protection when working under vehicle due to possibility of falling debris. Failure to comply may result in injury to personnel.
- Dump body weighs approximately 3,034 lbs (1,376 kgs). Attach a suitable lifting device prior to lifting. Failure to comply may result in injury to personnel or damage to equipment.
- Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

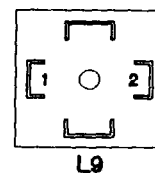
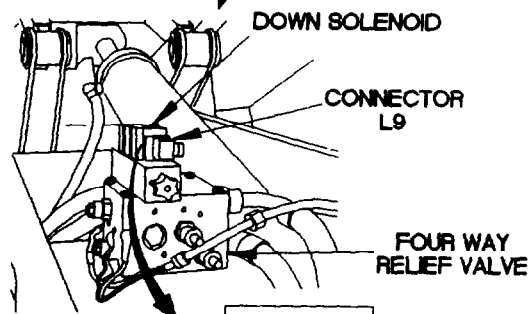
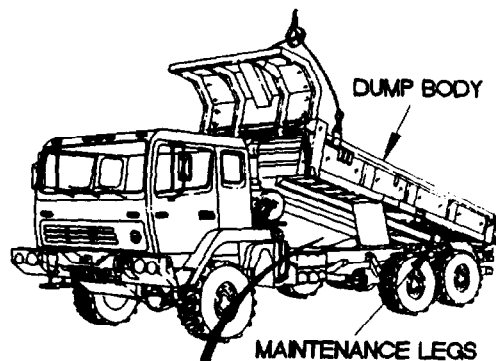
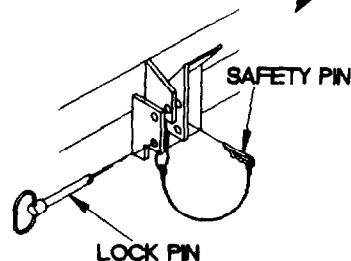
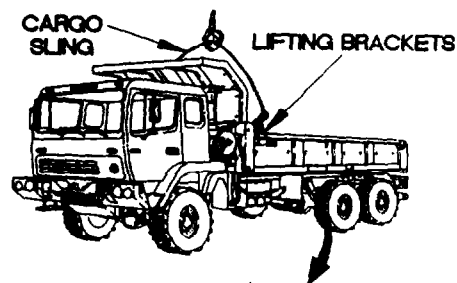
VOLTAGE TEST

- (1) Remove safety pins from two locking pins.
- (2) Remove two lock pins from dump body.
- (3) Install two dump body lifting brackets in slots in dump body.
- (4) Attach cargo sling to two dump body lifting brackets.
- (5) Lift dump body.
- (6) Raise two maintenance legs on frame.
- (7) Lower dump body on maintenance legs.
- (8) Disconnect connector L9 from four way relief valve down solenoid.
- (9) Set multimeter to volts dc.
- (10) Connect positive (+) probe of multimeter to connector L9-1.
- (11) Connect negative (-) probe of multimeter to ground.

NOTE

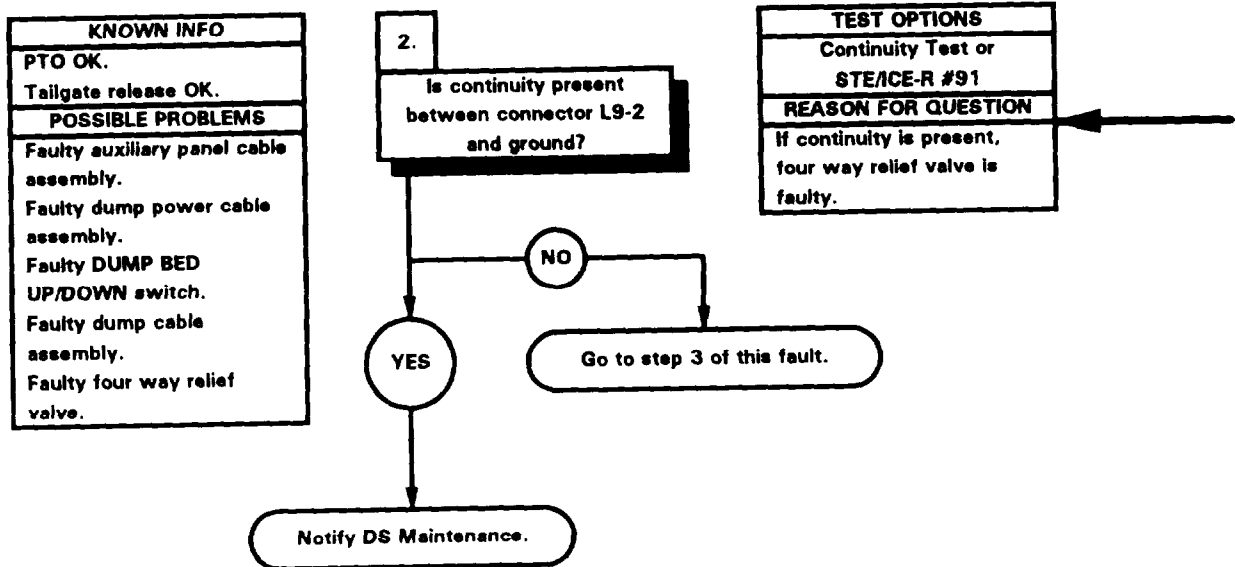
Steps (12) and (13) require the aid of an assistant.

- (12) Position master power switch to on (TM 9-2320-366-10-1).
- (13) Push and hold DUMP BED UP/DOWN switch to UP (TM 9-2320-366-10-1) and note reading on multimeter.
- (14) If 24 vdc is not present, go to step 4 of this fault.
- (15) Release DUMP BED UP/DOWN switch (TM 9-2320-366-10-1).
- (16) Position master power switch to off (TM 9-2320-366-10-1).



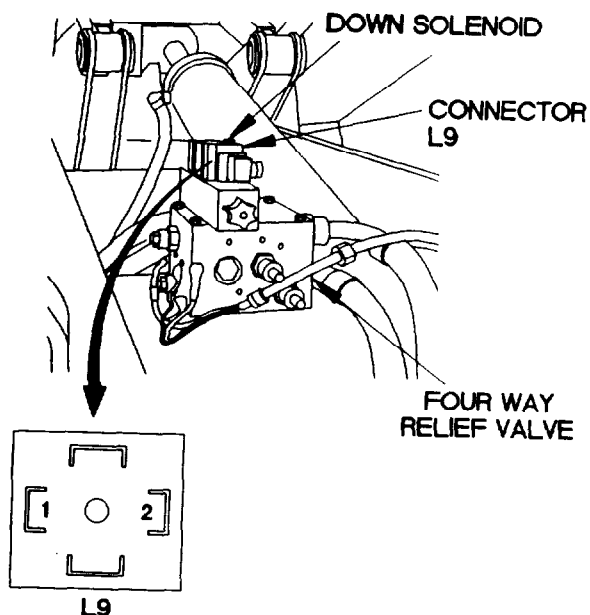
42EN401A

e144. M1090/M1094 DUMP BED DOWN DOES NOT OPERATE (CONT)



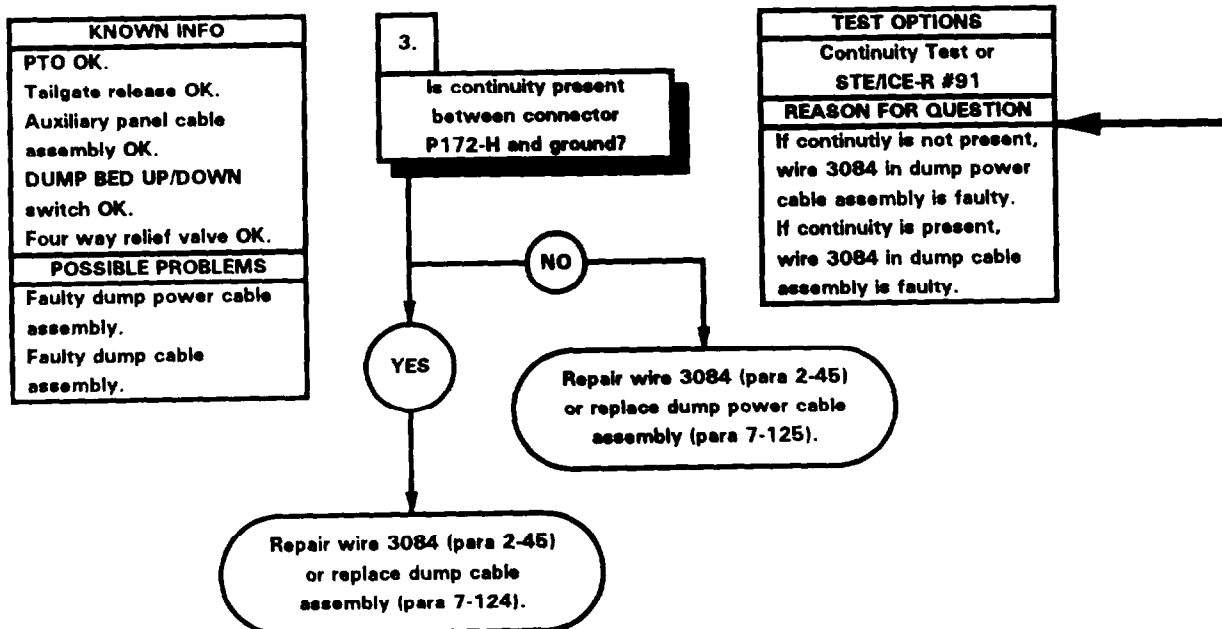
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector L9-2.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, go to step 3 of this fault.
- (5) If continuity is present, notify D6 Maintenance.
- (6) Connect connector L9 to four way relief valve down solenoid.



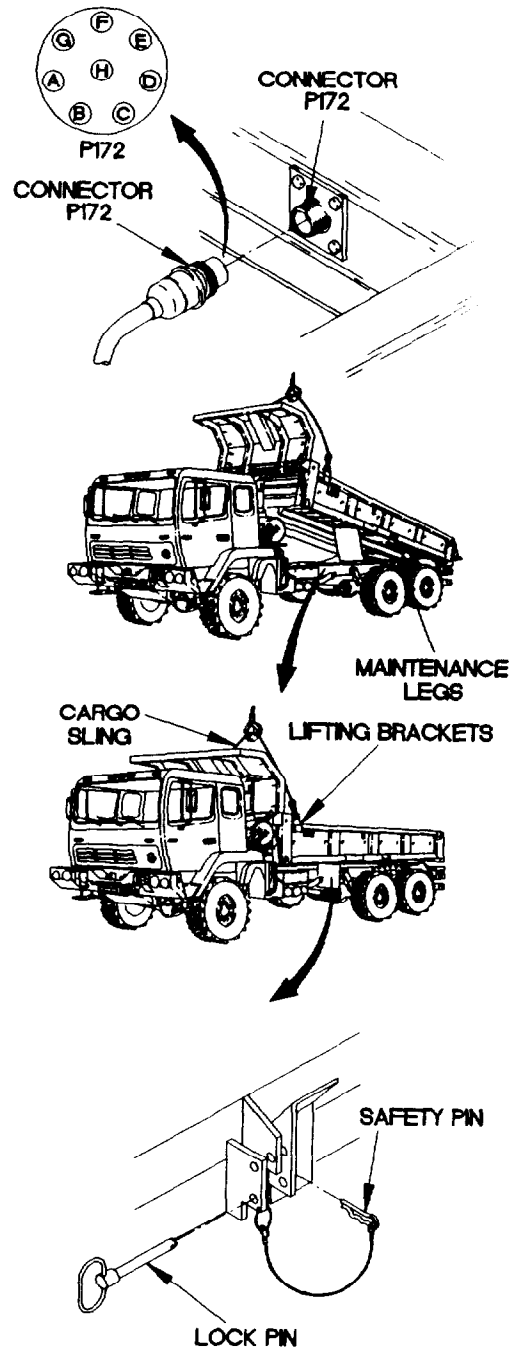
42EN402A

e144. M1090/M1094 DUMP BED DOWN DOES NOT OPERATE (CONT)



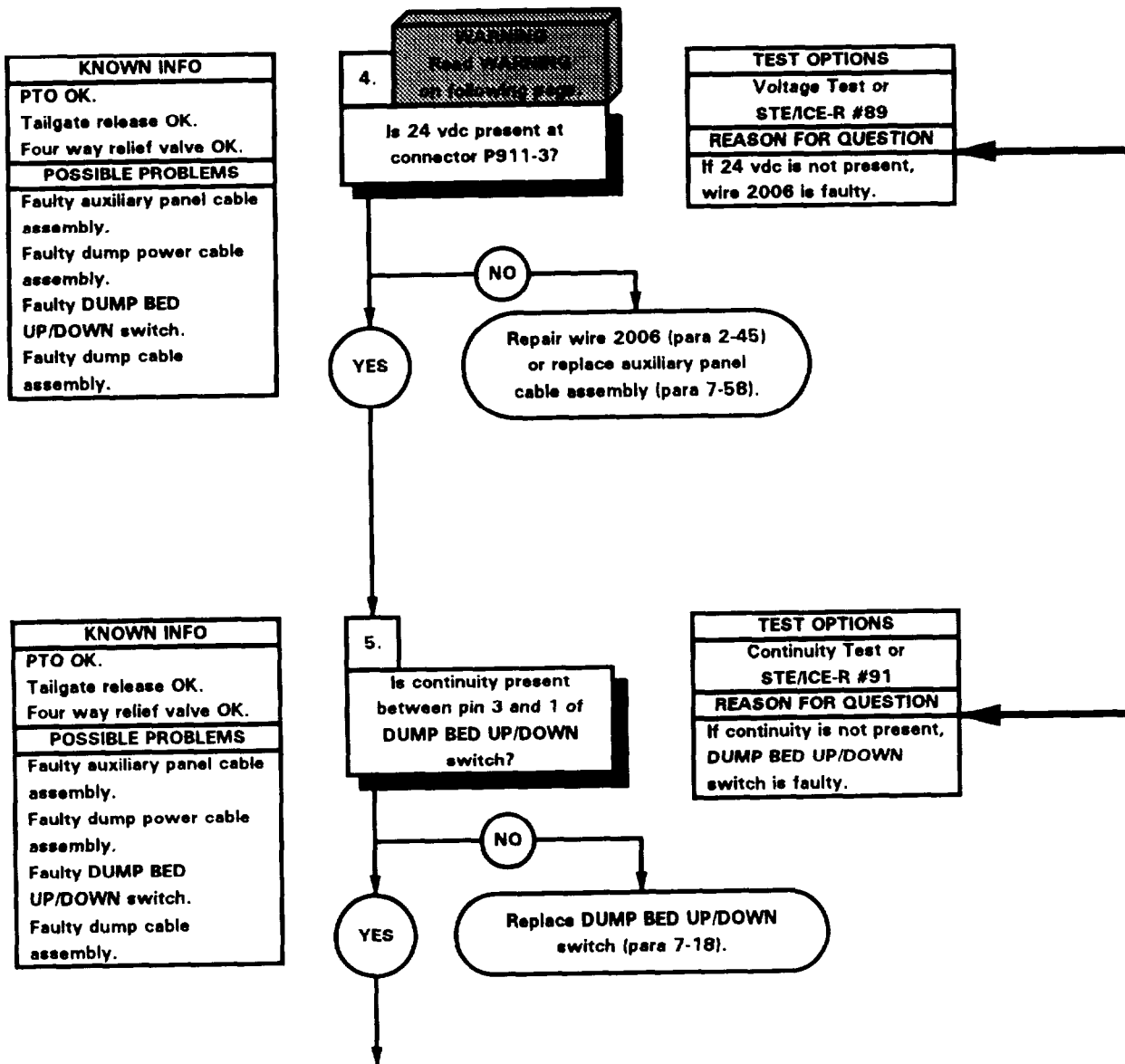
CONTINUITY TEST

- (1) Disconnect connector P172 from connector J172.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector P172-H.
- (4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (5) If continuity is not present, repair wire 3084 (para 2-45) or replace dump power cable assembly (para 7-125).
- (6) If continuity is present, repair wire 3084 (para 2-45) or replace dump cable assembly (para 7-124).
- (7) Connect connector P172 to connector J172.
- (8) Lift dump body.
- (9) Place maintenance legs in stowed position.
- (10) Lower dump body.
- (11) Remove cargo sling from two dump body lifting brackets.
- (12) Remove two dump body lifting brackets from dump body.
- (13) Position two locking pins in dump body.
- (14) Install safety pin in two locking pins.



42EN403A

e144. M1090/M1094 DUMP BED DOWN DOES NOT OPERATE (CONT)



WARNING

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

VOLTAGE TEST

- (1) Remove six screws from auxiliary panel.
- (2) Lift auxiliary panel outward to gain access.
- (3) Disconnect connector P911 from DUMP BED UP/DOWN switch connector.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to connector P911-3.
- (6) Connect negative (-) probe of multimeter to ground.
- (7) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
- (8) If 24 vdc is not present, repair wire 2006 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
- (9) Position master power switch to off (TM 9-2320-366-10-1).

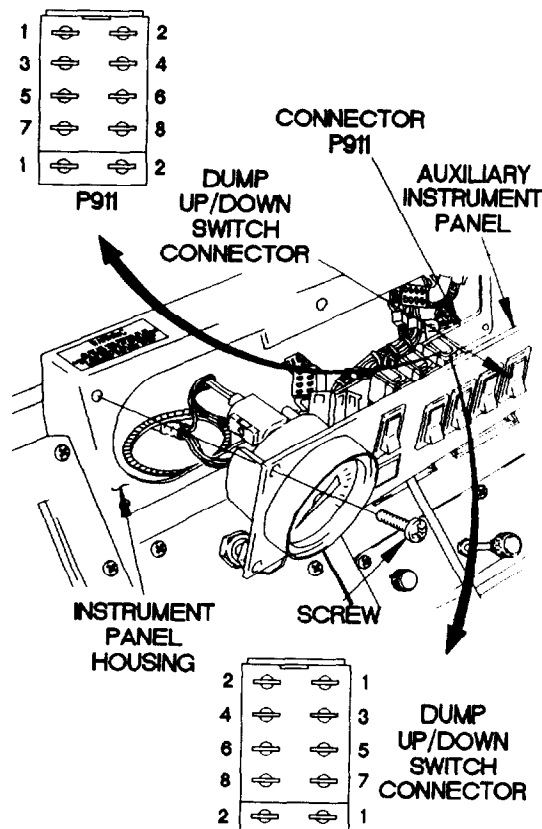
CONTINUITY TEST

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to DUMP BED UP/DOWN switch pin 3.
- (3) Connect negative (-) probe of multimeter to DUMP BED UP/DOWN switch pin 1.

NOTE

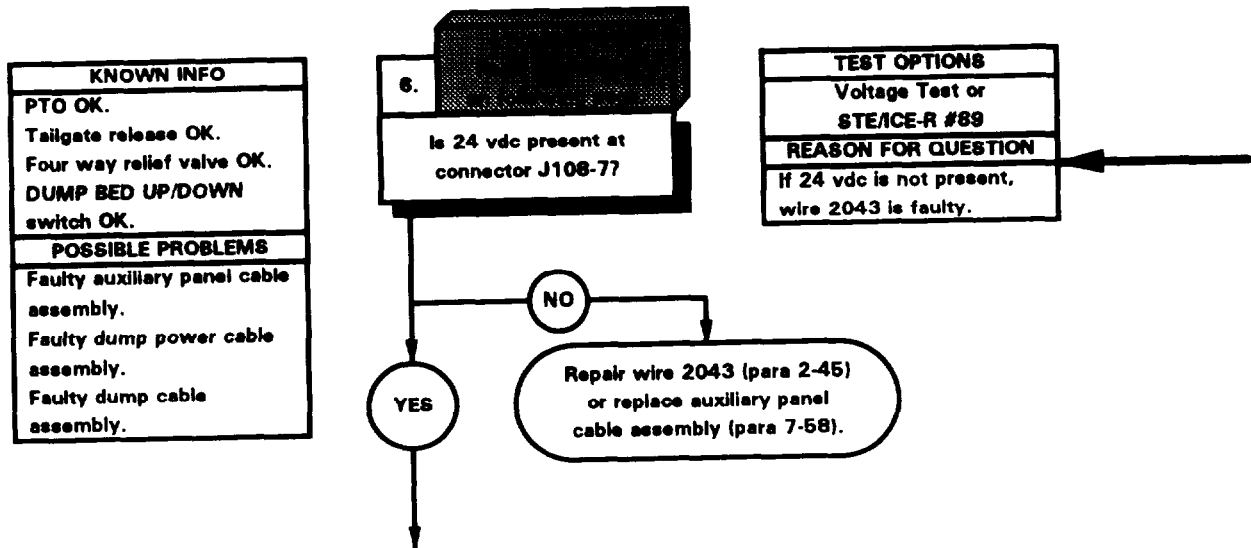
Step (4) requires the aid of an assistant.

- (4) Push and hold DUMP BED UP/DOWN switch to DOWN and note reading on multimeter.
- (5) If continuity is not present, replace DUMP BED UP/DOWN switch (para 7-18).
- (6) Release DUMP BED UP/DOWN switch.
- (7) Connect connector P911 to DUMP BED UP/DOWN switch.
- (8) Position auxiliary panel on auxiliary panel housing with six screws.
- (9) Tighten six screws to 24 lb-in. (3 N-m).



42EN405A

ø144. M1090/M1094 DUMP BED DOWN 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.

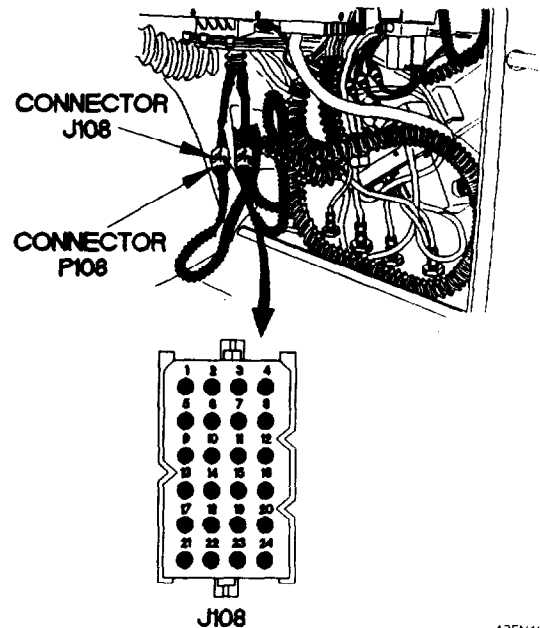
VOLTAGE TEST

- (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 J108-7.
- (5) Connect negative (-) probe of multimeter to ground.

NOTE

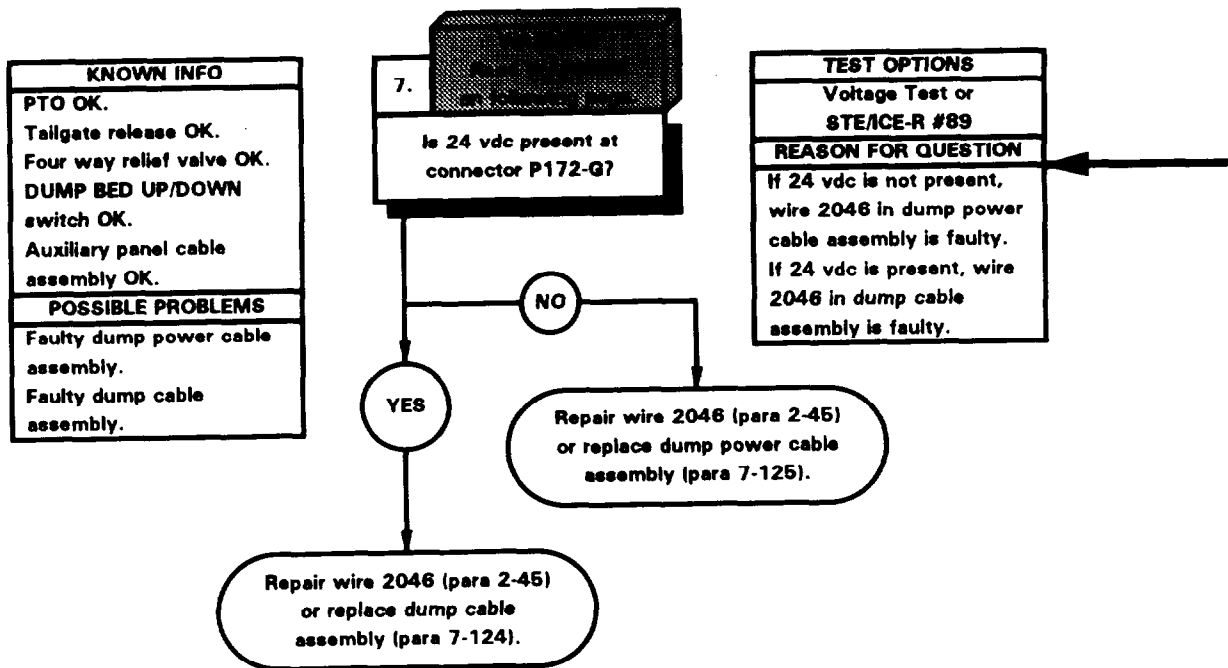
Steps (6) and (7) require the aid of an assistant.

- (6) Position master power switch to on (TM 9-2320-366-10-1).
- (7) Push and hold DUMP BED UP/DOWN switch to DOWN and note reading on multimeter.
- (8) If 24 vdc is not present, repair wire 2043 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
- (9) Release DUMP BED UP/DOWN switch.
- (10) Position master power switch to off (TM 9-2320-366-10-1).
- (11) Connect connector P108 to connector J108.
- (12) Install kick panel (para 16-3).



42EN406A

e144. M1090/M1094 DUMP BED DOWN 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.

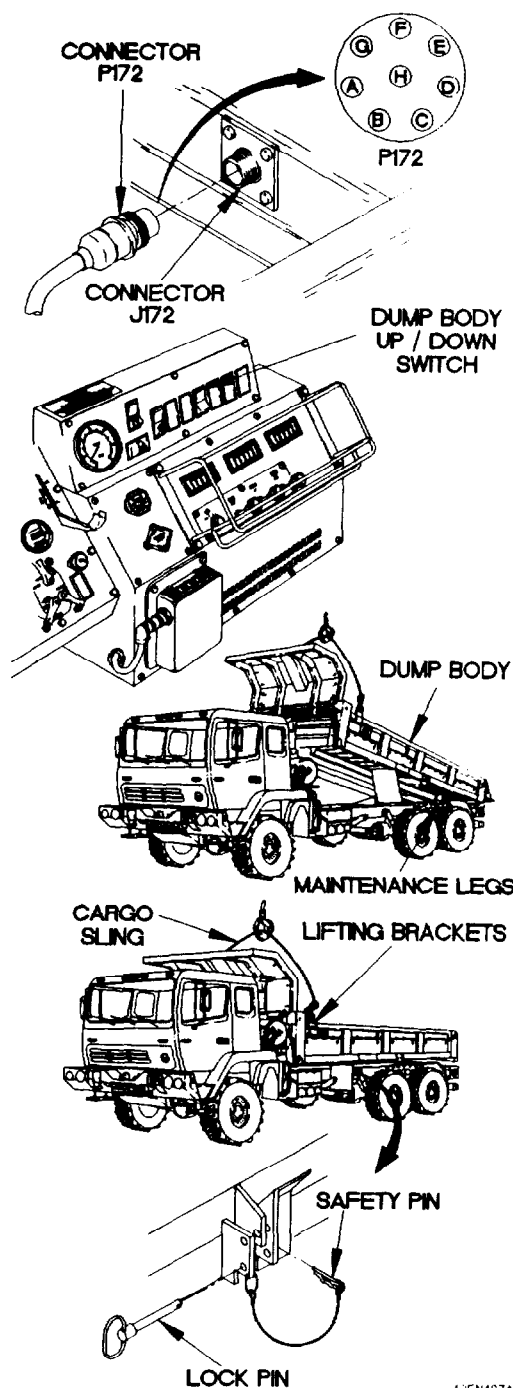
VOLTAGE TEST

- (1) Disconnect connector P172 from connector J172.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector P172-G.
- (4) Connect negative (-) probe of multimeter to ground.

NOTE

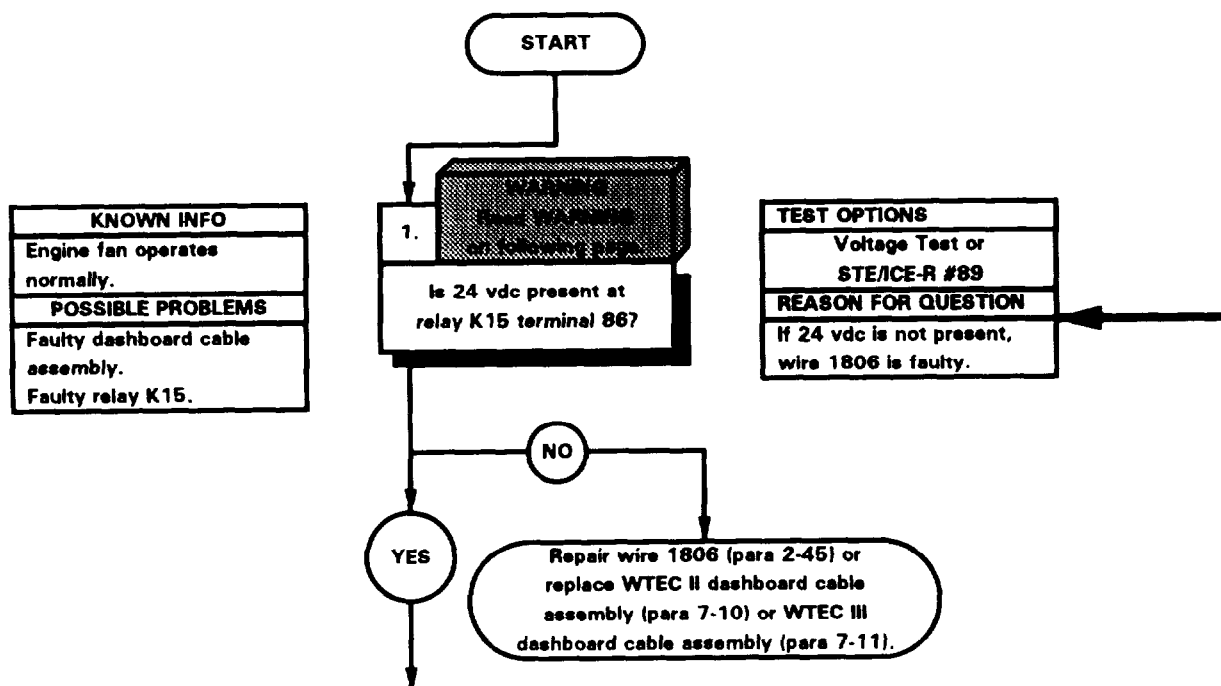
Steps (5) and (6) require the aid of an assistant.

- (5) Position master power switch to on (TM 9-2320-366-10-1).
- (6) Push and hold DUMP BED UP/DOWN switch to DOWN and note reading on multimeter.
- (7) If 24 vdc is not present, repair wire 2046 (para 2-45) or replace dump power cable assembly (para 7-125).
- (8) If 24 vdc is present, repair wire 2046 (para 2-45) or replace dump cable assembly (para 7-124).
- (9) Release DUMP BED UP/DOWN switch.
- (10) Position master power switch to off (TM 9-2320-366-10-1).
- (11) Connect connector P172 to connector J172.
- (12) Lift dump body.
- (13) Place maintenance legs in stowed position.
- (14) Lower dump body.
- (15) Remove cargo sling from dump body lifting brackets.
- (16) Remove two dump body lifting brackets from dump body.
- (17) Position two locking pins in dump body.
- (18) Install safety pin in two locking pins.



42EN407A

•145. TRANSMISSION AUXILIARY OIL COOLER FAN(S) RUN CONSTANTLY	
INITIAL SETUP	
Equipment Condition Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 48, Appendix C) STE/ICE-R (Item 41, Appendix C) Multimeter, Digital (Item 22, Appendix C)
Personnel Required (2)	References TM 9-4910-571-12&P

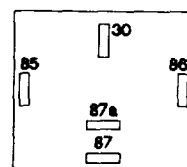
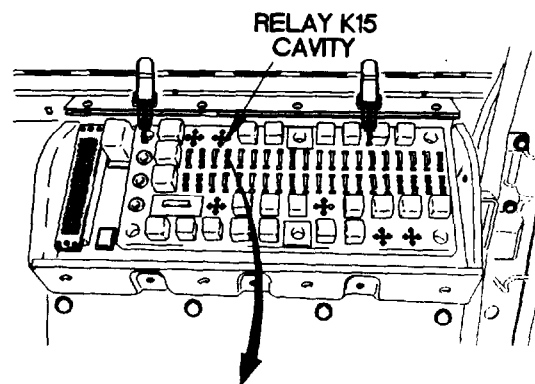


WARNING

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

VOLTAGE TEST

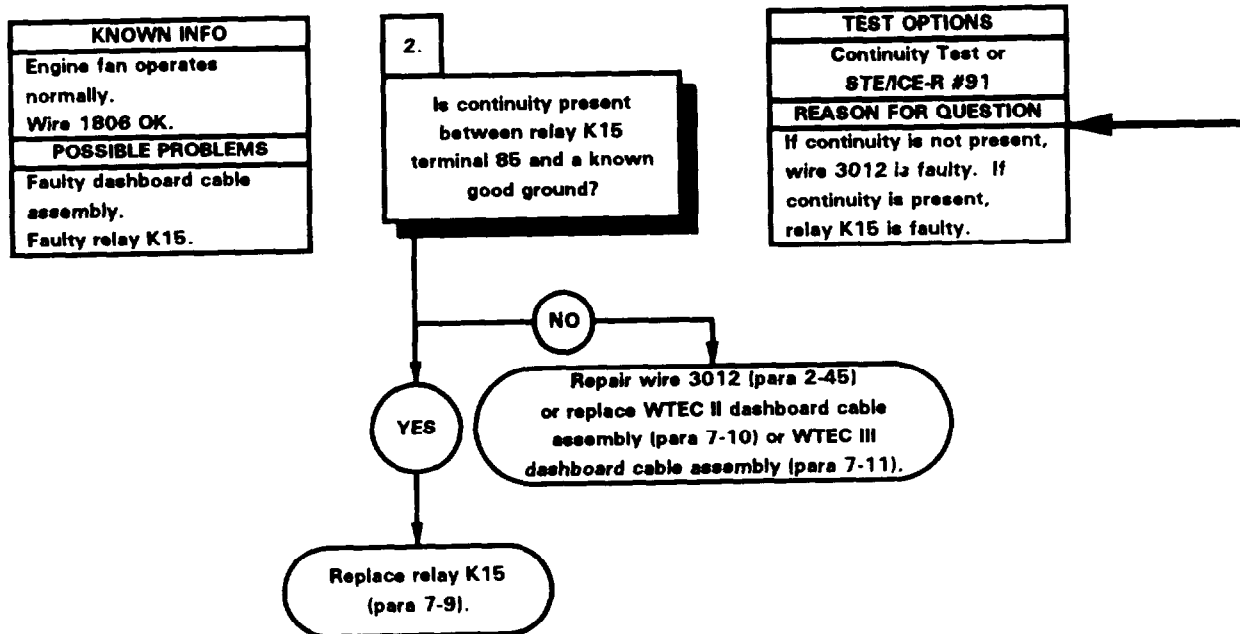
- (1) Remove PDP cover (para 16-2).
- (2) Remove relay K15 from PDP.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to PDP, where relay K15 terminal 86 was removed.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position master power switch to on (TM 9-2320-366-10-1).
- (7) Position radiator fan off switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
- (8) If 24 vdc is not present, repair wire 1806 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (9) Position master power switch to off (TM 9-2320-366-10-1).
- (10) Position radiator fan off switch to off (TM 9-2320-366-10-1).



RELAY K15 CAVITY

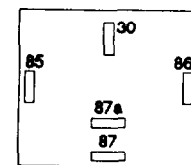
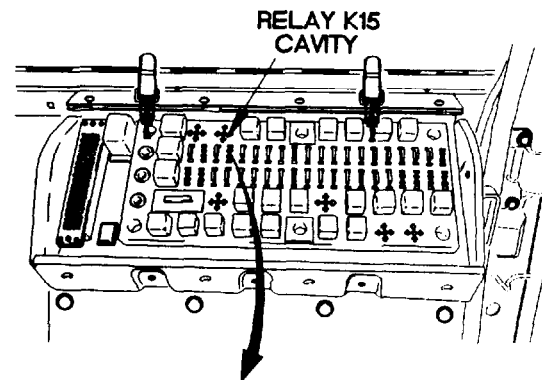
42EN501A

e145. TRANSMISSION AUXILIARY OIL COOLER FAN(S) RUN CONSTANTLY (CONT)



CONTINUITY TEST

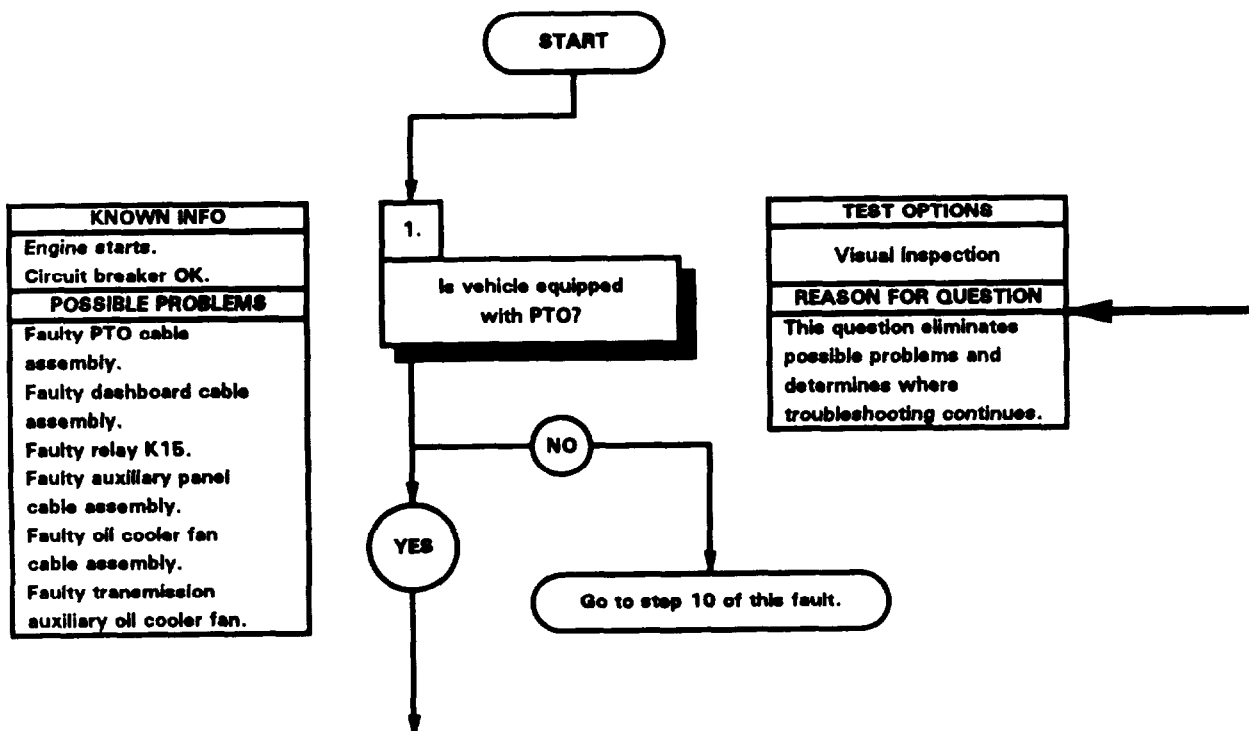
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to PDP, where relay K15 terminal 85 was removed.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3012 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (5) If continuity is present, replace relay K15 (para 7-9).
- (6) Install relay K15 in PDP.
- (7) Install PDP cover (para 16-2).



RELAY K15 CAVITY

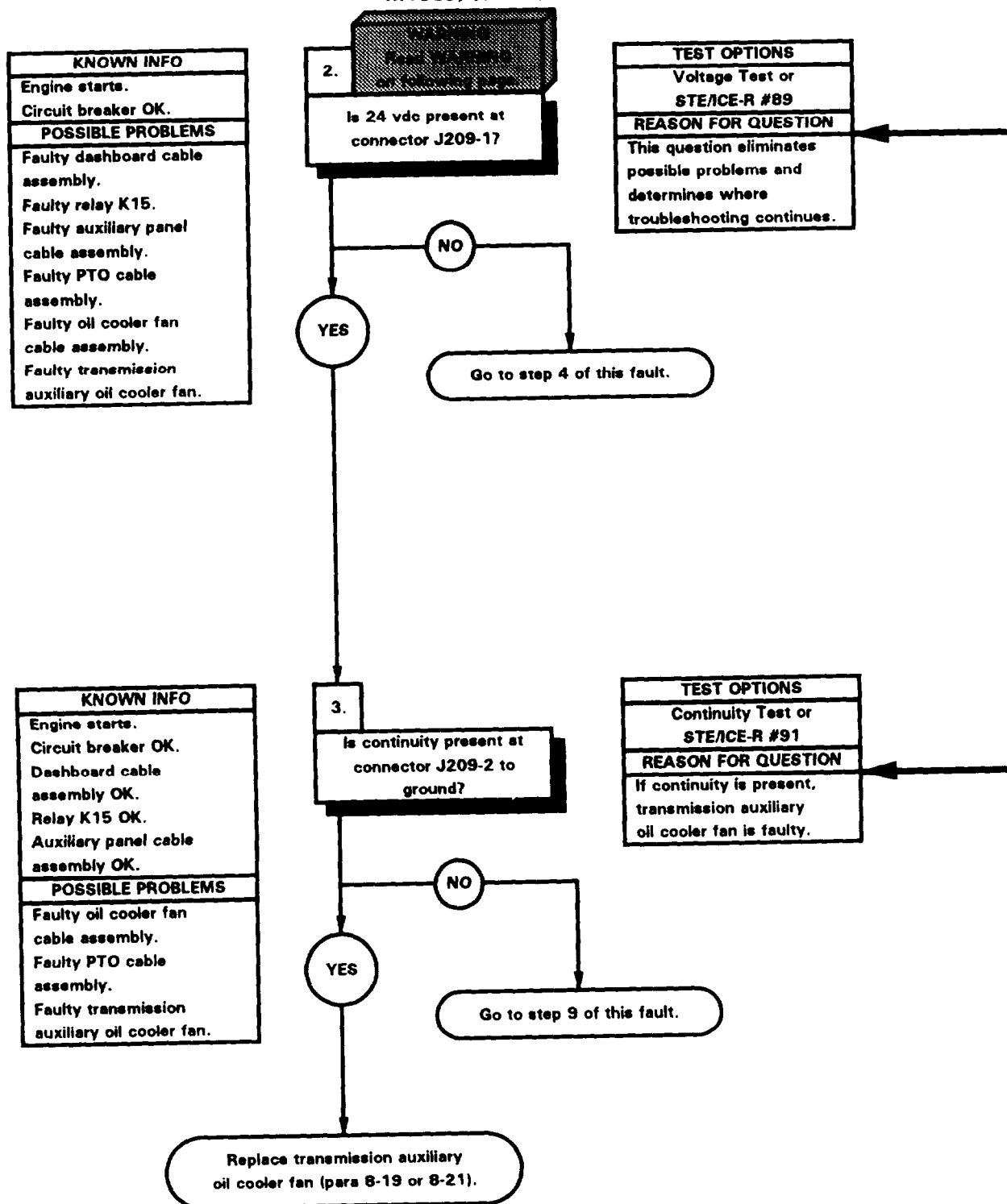
42EN502A

e146. TRANSMISSION AUXILIARY OIL COOLER FAN DOES NOT OPERATE (ALL MODELS EXCEPT M1088/M1089)	
INITIAL SETUP	
Equipment Condition Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) STE/CE-R (Item 41, Appendix C) Multimeter, Digital (Item 22, Appendix C)
Personnel Required (2)	References TM 9-4910-571-12&P



- 
- (1) Check if vehicle is equipped with PTO.
 - (2) If vehicle is not equipped with PTO, go to step 10 of this fault.

ø146. TRANSMISSION AUXILIARY OIL COOLER FAN DOES NOT OPERATE (ALL MODELS EXCEPT M1088/ M1089) (CONT)



WARNING

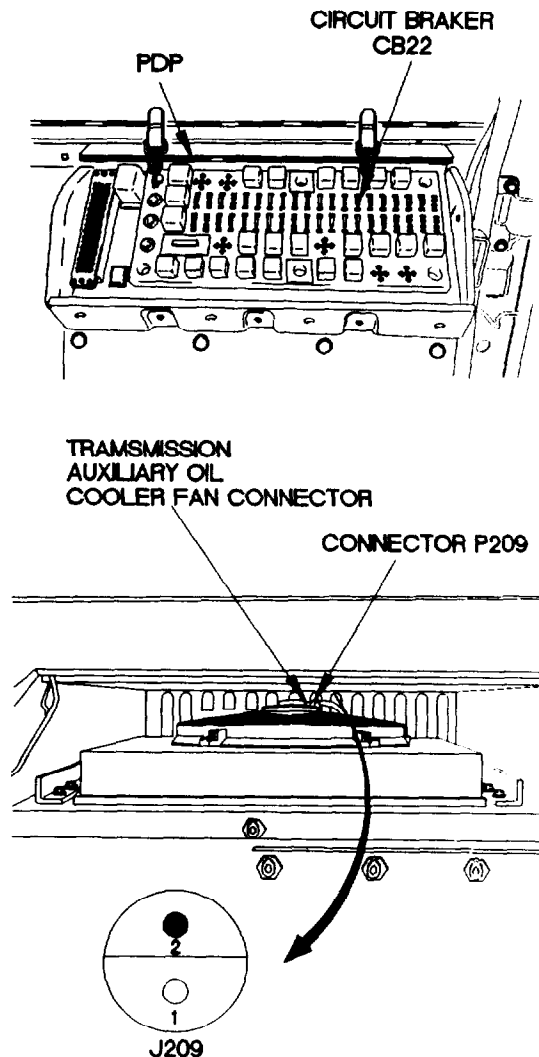
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

- (1) Remove PDP cover (para 16-2).
- (2) Remove circuit breaker CB22 from PDP.
- (3) Disconnect connector J209 from transmission auxiliary oil cooler fan connector.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to connector J209-1.
- (6) Connect negative (-) probe of multimeter to ground.
- (7) Start engine (TM 9-2320-366-10-1) and note reading on multimeter.
- (8) If 24 vdc is not present, go to step 4 of this fault.
- (9) Shut down engine (TM 9-2320-366-10-1).

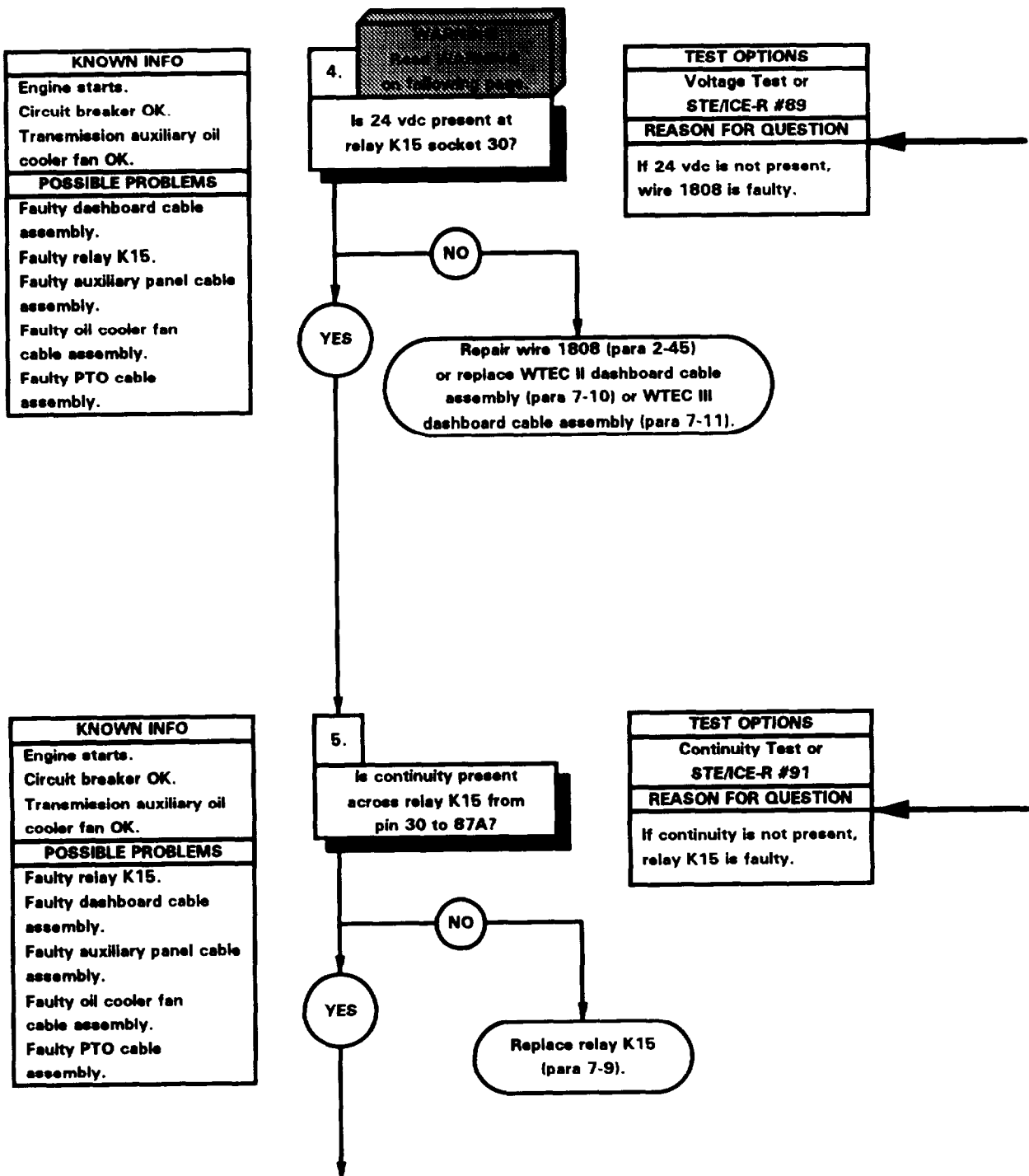
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector J209-2.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, go to step 9 of this fault.
- (5) If continuity is present, replace transmission auxiliary oil cooler fan (para 8-19 or 8-21).
- (6) Connect connector J209 to transmission auxiliary oil cooler fan connector.
- (7) Install circuit breaker CB22 in PDP.
- (8) Install PDP cover (para 16-2).



42E1W011

e146. TRANSMISSION AUXILIARY OIL COOLER FAN DOES NOT OPERATE (ALL MODELS EXCEPT M1088/ M1089) (CONT)

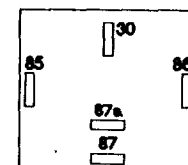
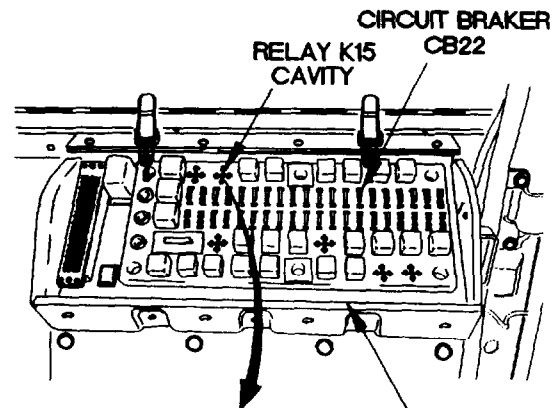


WARNING

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

VOLTAGE TEST

- (1) Remove relay K15 from PDP.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to relay K15 socket 30.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
- (6) If 24 vdc is not present, repair wire 1808 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (7) Position master power switch to off (TM 9-2320-366-10-1).
- (8) Install circuit breaker CB22 in PDP.



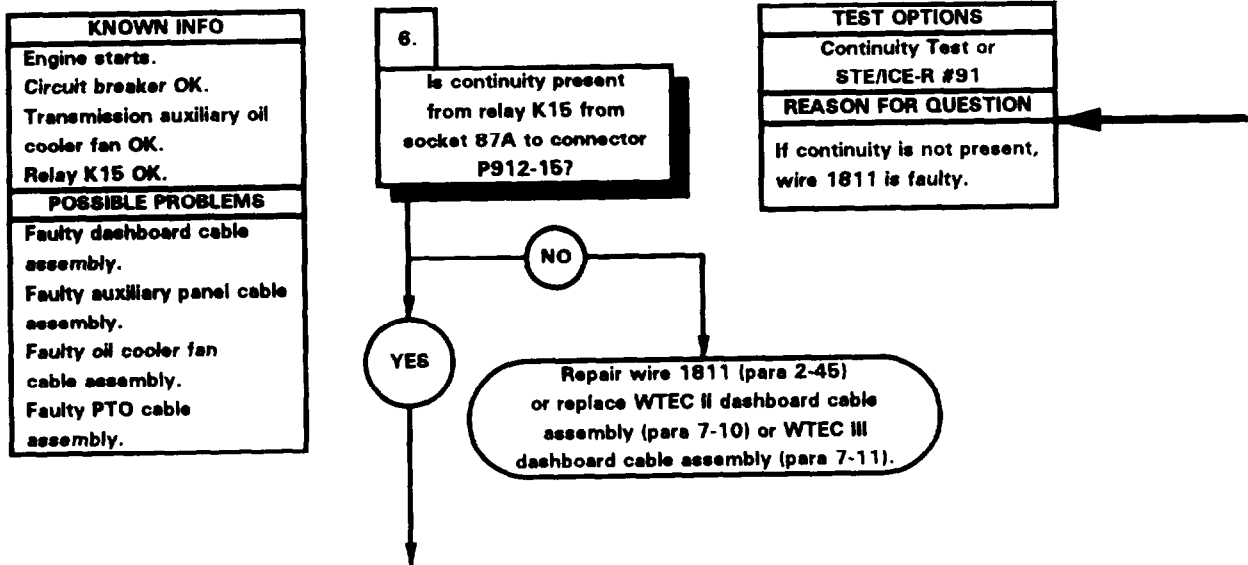
RELAY K15 CAVITY

42EN6021

CONTINUITY TEST

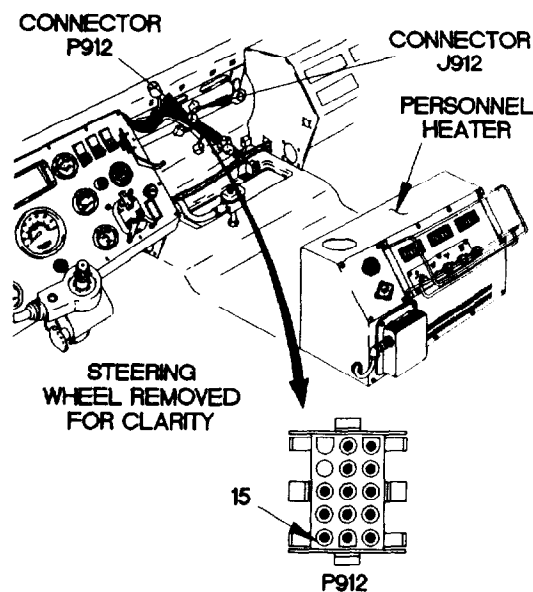
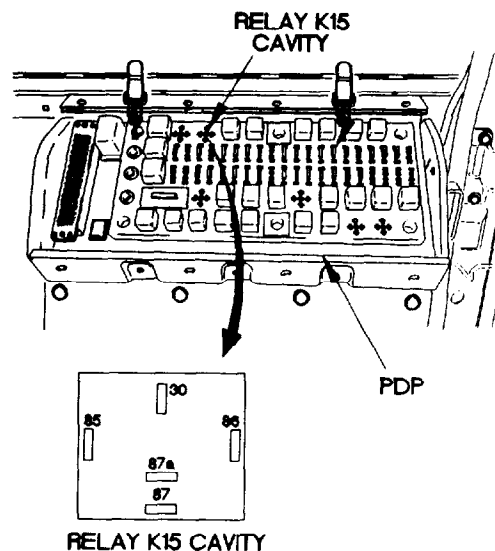
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to relay K15 pin 30.
- (3) Connect negative (-) probe of multimeter to relay K15 pin 87A and note reading on multimeter.
- (4) If continuity is not present, replace relay K15 (para 7-9).

e146. TRANSMISSION AUXILIARY OIL COOLER FAN DOES NOT OPERATE (ALL MODELS EXCEPT M1088/ M1089) (CONT)



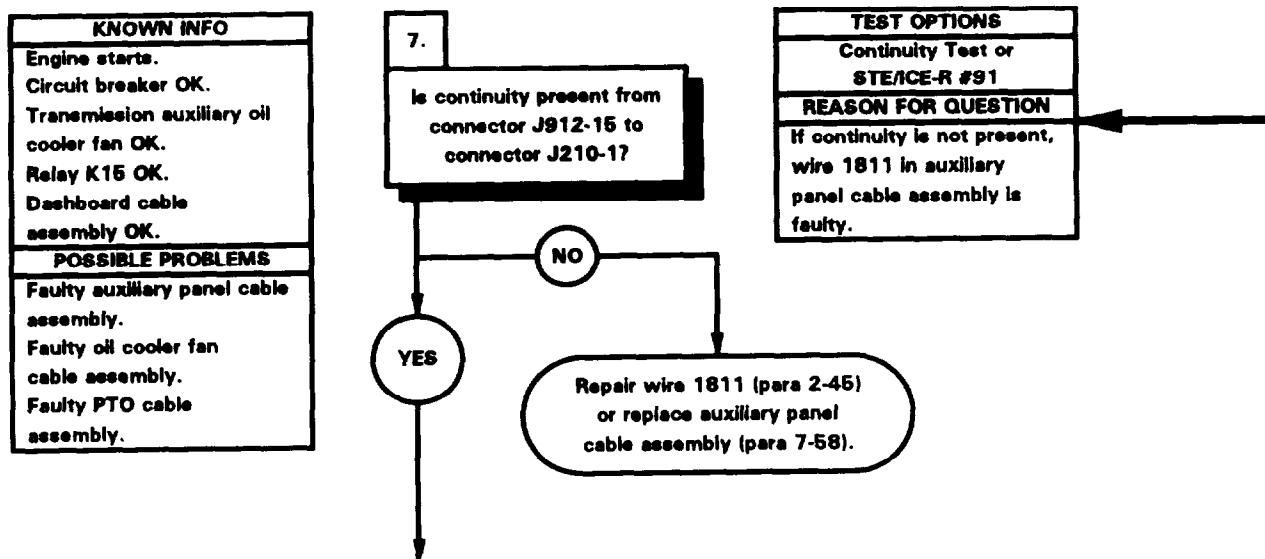
CONTINUITY TEST

- (1) Remove personnel heater to gain access (para 18-9).
- (2) Disconnect connector P912 from connector J912.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to relay K15 socket 87A.
- (5) Connect negative (-) probe of multimeter to connector P912-15 and note reading on multimeter.
- (6) If continuity is not present, repair wire 1811 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (7) Install relay K15 in PDP.



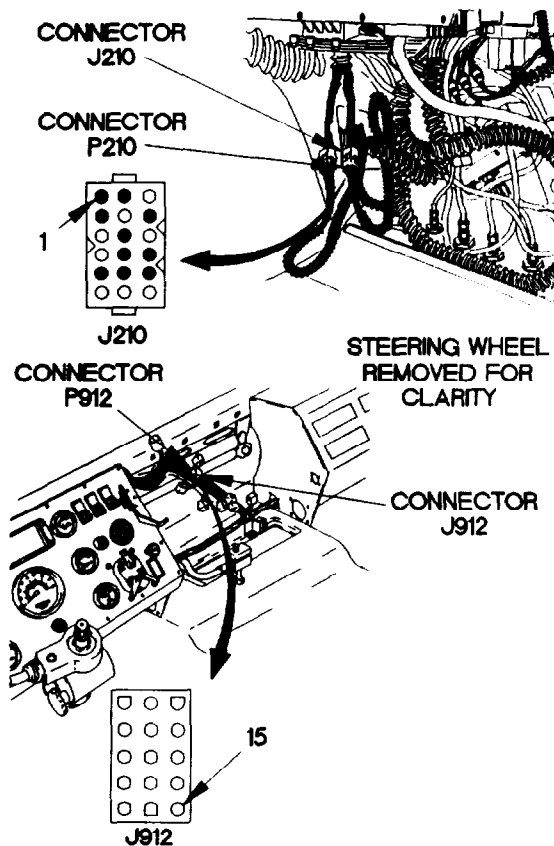
42E16031

e146. TRANSMISSION AUXILIARY OIL COOLER FAN DOES NOT OPERATE (ALL MODELS EXCEPT M1088/ M1089) (CONT)



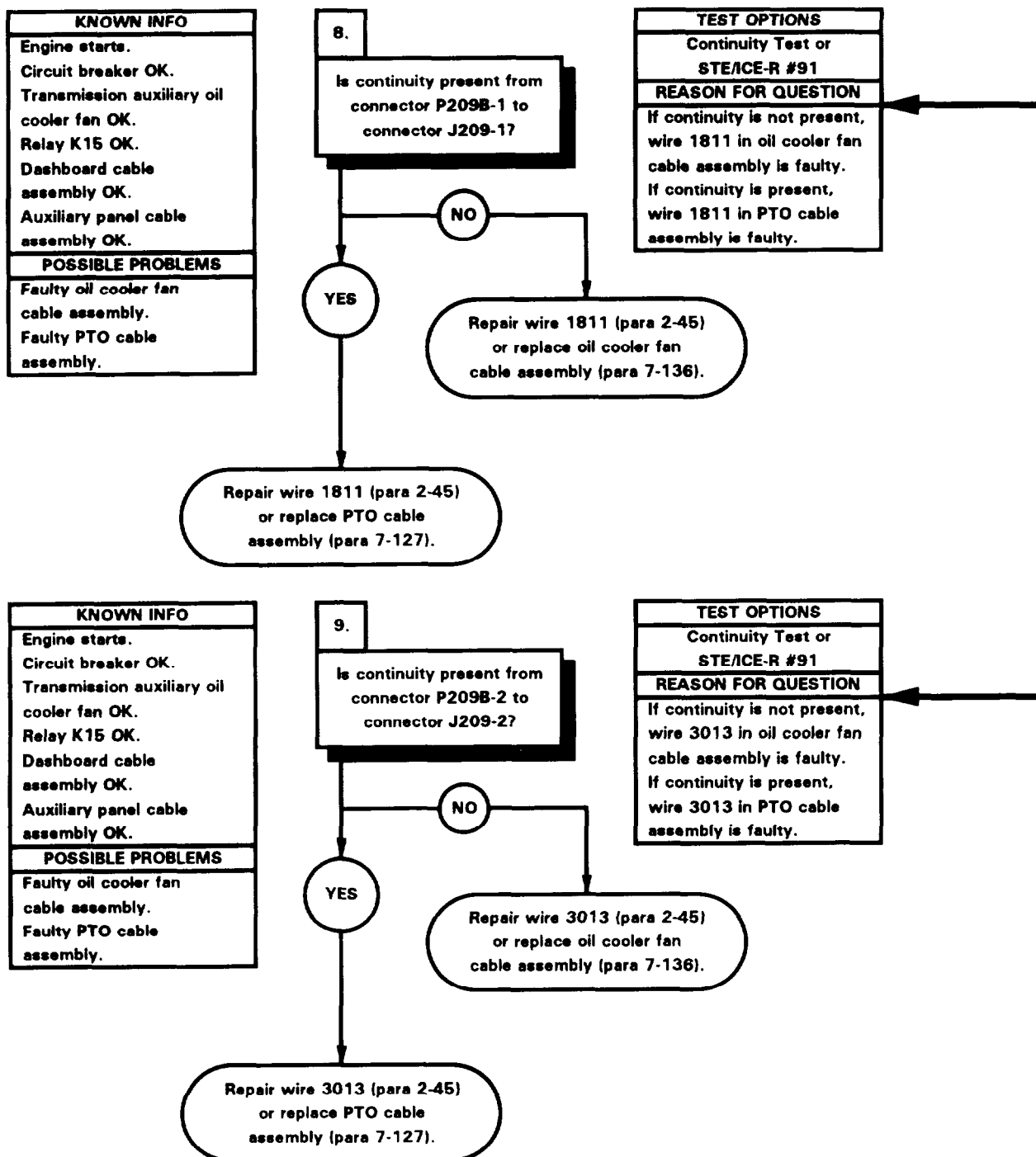
CONTINUITY TEST

- (1) Disconnect connector P210 from connector J210.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector J912-15.
- (4) Connect negative (-) probe of multimeter to connector J210-1 and note reading on multimeter.
- (5) If continuity is not present, repair wire 1811 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
- (6) Connect connector P210 to connector J210.
- (7) Connect connector P912 to connector J912.
- (8) Install personnel heater (para 18-9).



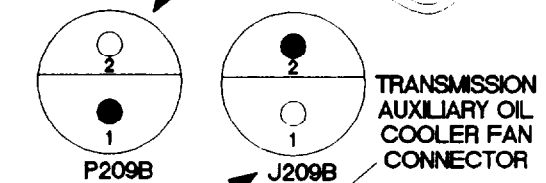
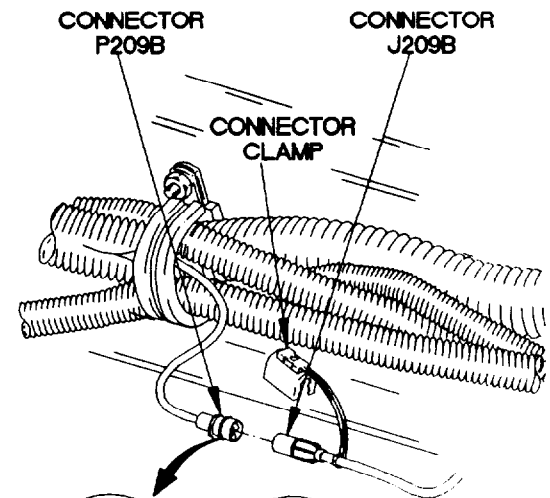
42ENC04A

e146. TRANSMISSION AUXILIARY OIL COOLER FAN DOES NOT OPERATE (ALL MODELS EXCEPT M1088/ M1089) (CONT)



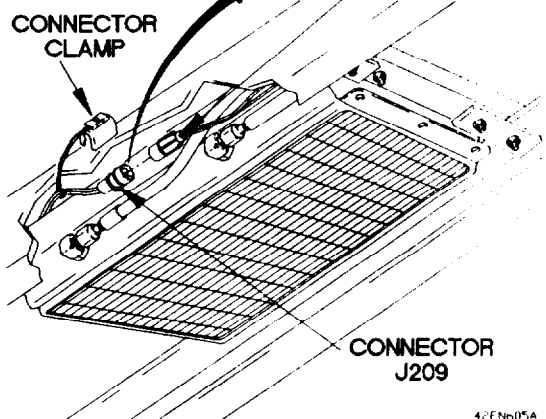
CONTINUITY TEST

- (1) Disconnect connector P209B from connector J209B.
- (2) Disconnect connector J209 from transmission auxiliary oil cooler fan connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to connector P209B-1.
- (5) Connect negative (-) probe of multimeter to connector J209-1 and note reading on multimeter.
- (6) If continuity is not present, repair wire 1811 (para 2-45) or replace oil cooler fan cable assembly (para 7-136).
- (7) If continuity is present, repair wire 1811 (para 2-45) or replace PTO cable assembly (para 7-127).
- (8) Connect connector J209 to transmission auxiliary oil cooler fan connector.
- (9) Connect connector P209B to connector J209B.



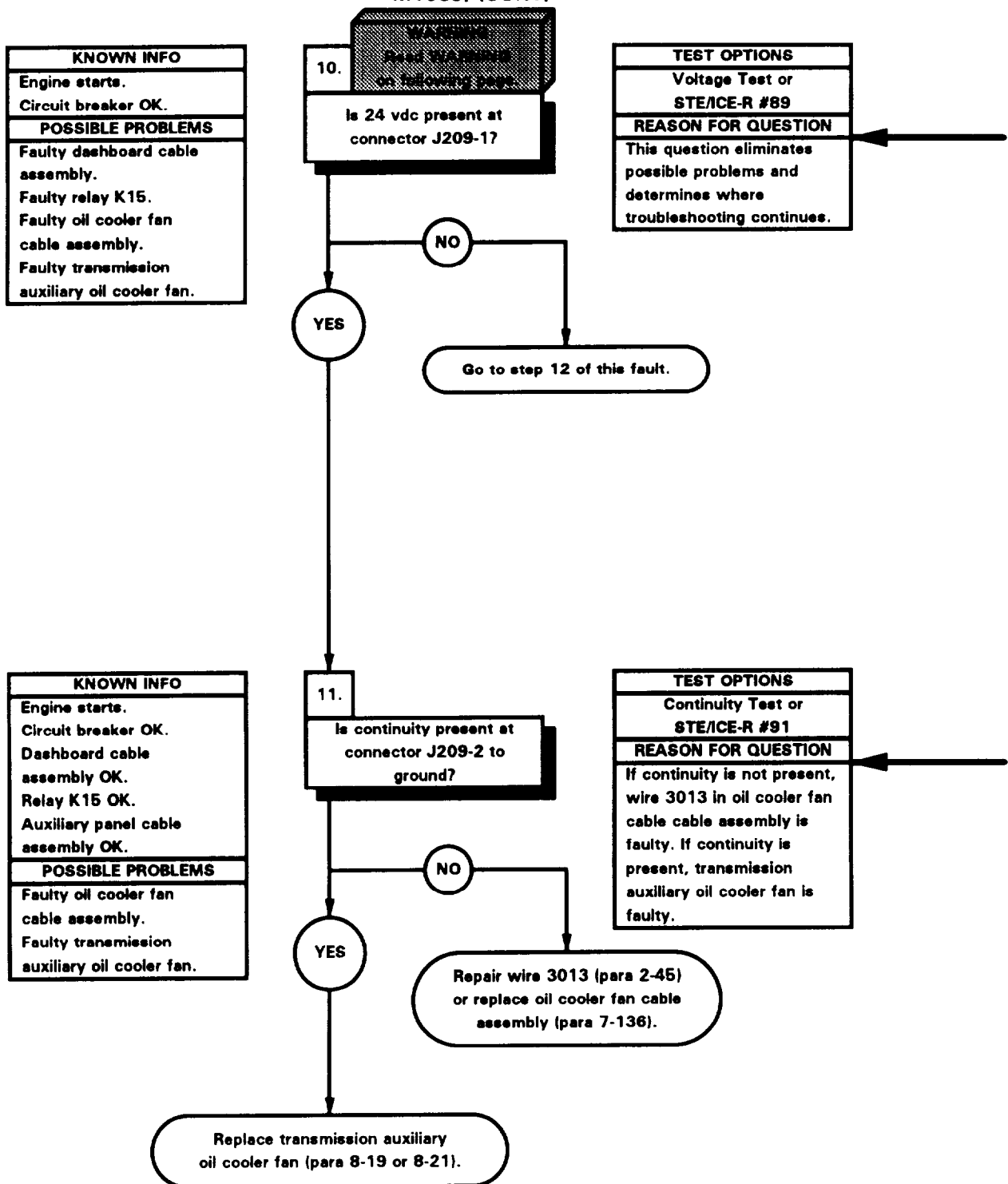
CONTINUITY TEST

- (1) Disconnect connector P209B from connector J209B.
- (2) Disconnect connector J209 from transmission auxiliary fan connector.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to connector P209B-2.
- (5) Connect negative (-) probe of multimeter to connector J209-2 and note reading on multimeter.
- (6) If continuity is not present, repair wire 3013 (para 2-45) or replace oil cooler fan cable assembly (para 7-136).
- (7) If continuity is present, repair wire 3013 (para 2-45) or replace PTO cable assembly (para 7-127).
- (8) Connect connector J209 to transmission auxiliary oil cooler fan connector.
- (9) Connect connector P209B to connector J209B.



42EN05A

e146. TRANSMISSION AUXILIARY OIL COOLER FAN DOES NOT OPERATE (ALL MODELS EXCEPT M1088/ M1089) (CONT)



WARNING

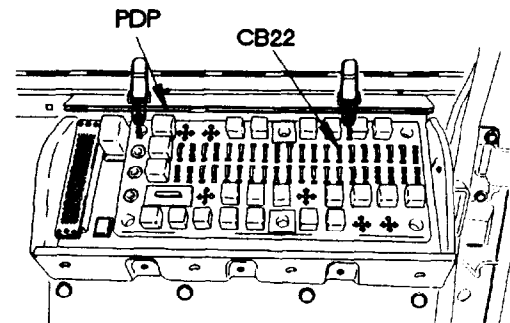
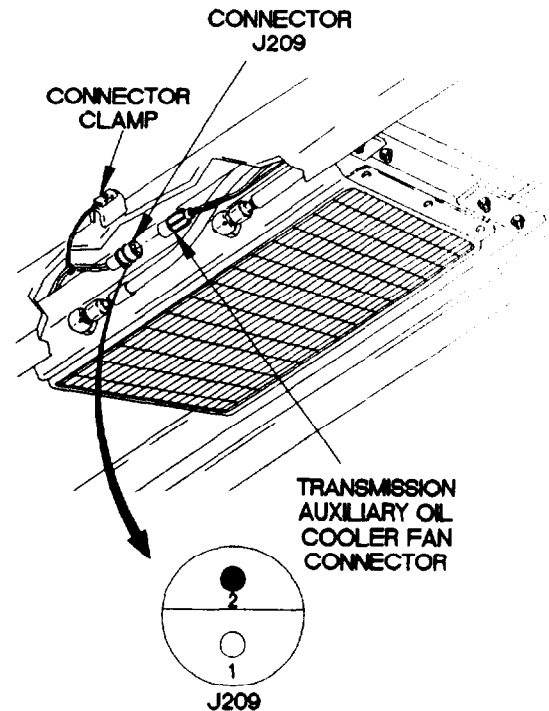
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

- (1) Remove PDP cover (para 16-2).
- (2) Remove circuit breaker CB22 from PDP.
- (3) Disconnect connector J209 from transmission auxiliary oil cooler fan connector.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to connector J209-1.
- (6) Connect negative (-) probe of multimeter to ground.
- (7) Start engine (TM 9-2320-366-10-1) and note reading on multimeter.
- (8) If 24 vdc is not present, go to step 12 of this fault.
- (9) Shut down engine (TM 9-2320-366-10-1).

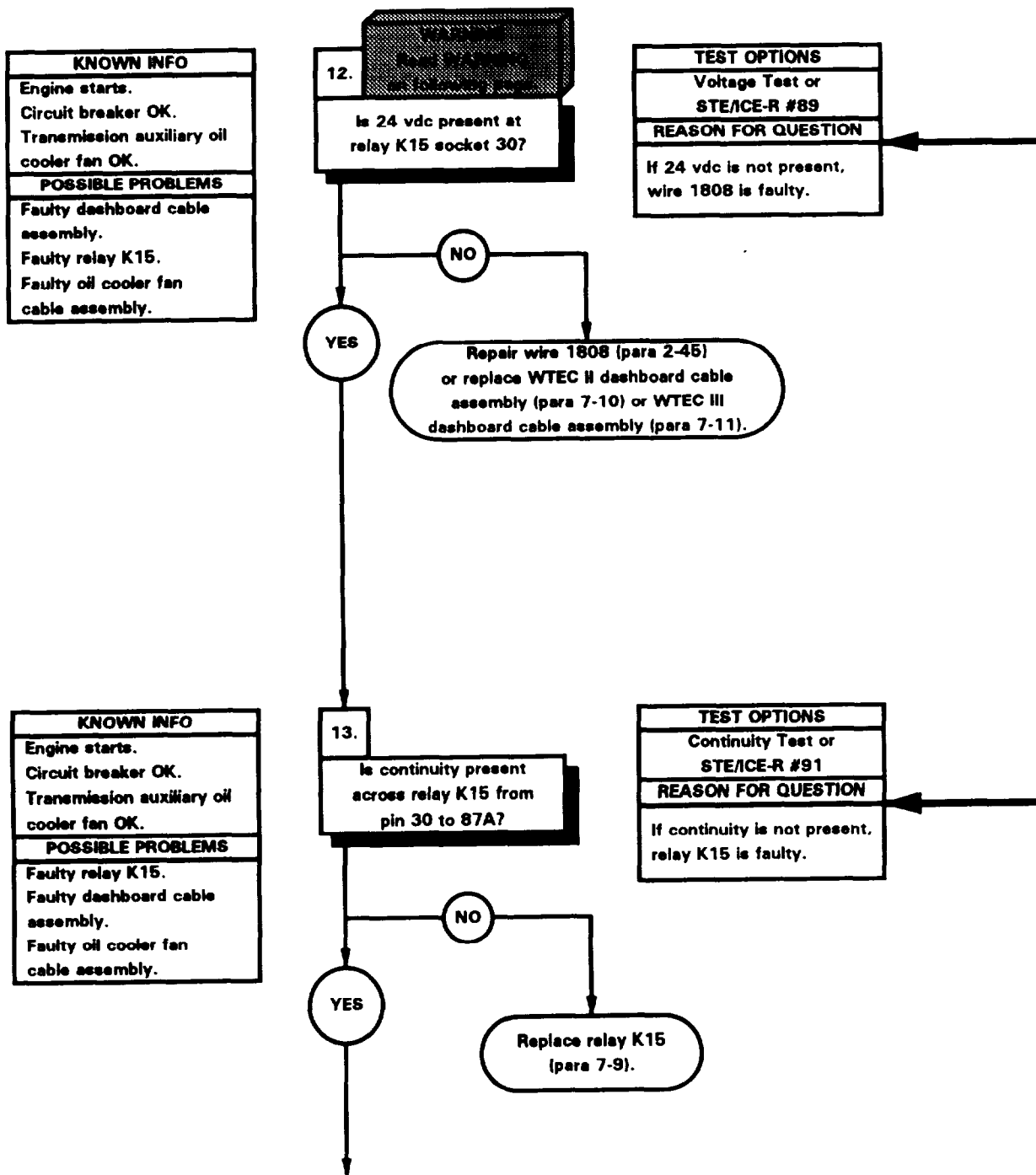
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector J209-2.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3013 (para 2-45) or replace oil cooler fan cable assembly (para 7-136).
- (5) If continuity is present, replace transmission auxiliary oil cooler fan (para 8-19 or 8-21).
- (6) Connect connector J209 to transmission auxiliary oil cooler fan connector.
- (7) Install circuit breaker CB22 in PDP.
- (8) Install PDP cover (para 16-2).



42ENb11b1

e146. TRANSMISSION AUXILIARY OIL COOLER FAN DOES NOT OPERATE (ALL MODELS EXCEPT M1088/ M1089) (CONT)



WARNING

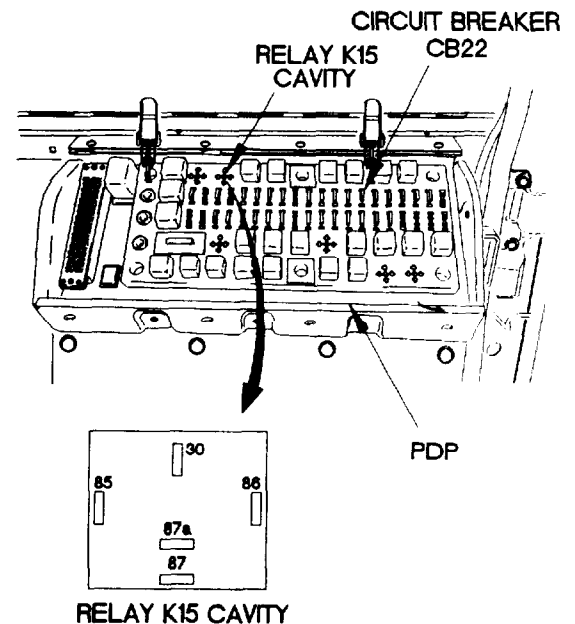
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

- (1) Remove relay K15 from PDP.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to relay K15 socket 30.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
- (6) If 24 vdc is not present, repair wire 1808 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (7) Position master power switch to off (TM 9-2320-366-10-1).
- (8) Install circuit breaker CB22 in PDP.

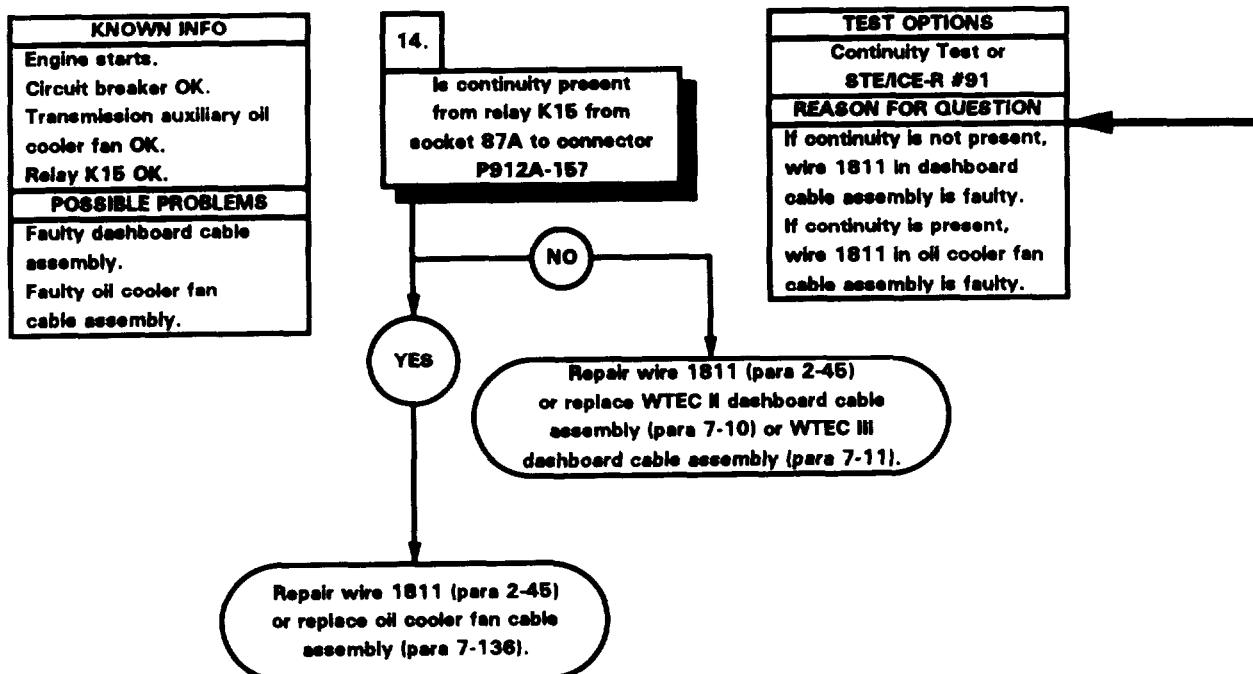
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to relay K15 pin 30.
- (3) Connect negative (-) probe of multimeter to relay K15 pin 87A and note reading on multimeter.
- (4) If continuity is not present, replace relay K15 (para 7-9).



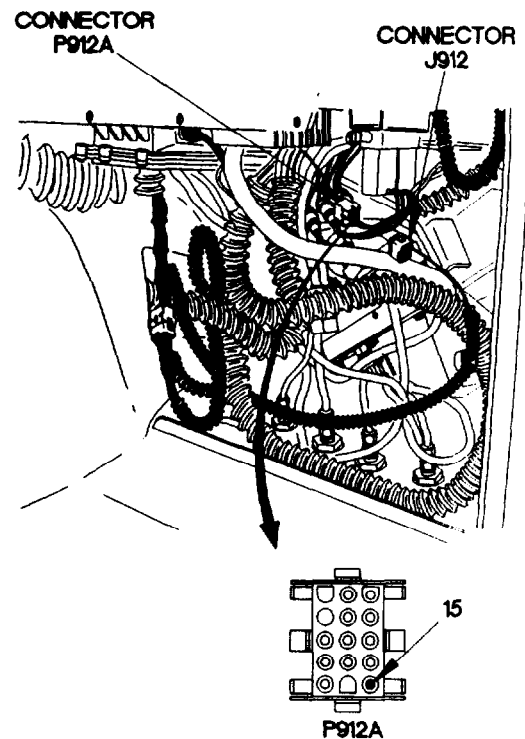
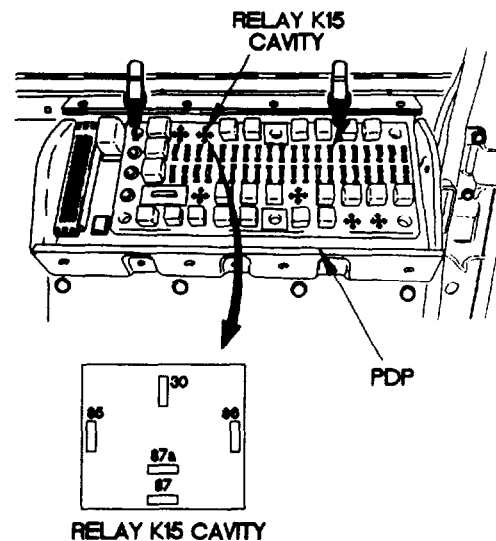
42EN6071

6146. TRANSMISSION AUXILIARY OIL COOLER FAN DOES NOT OPERATE (ALL MODELS EXCEPT M1088/ M1089) (CONT)



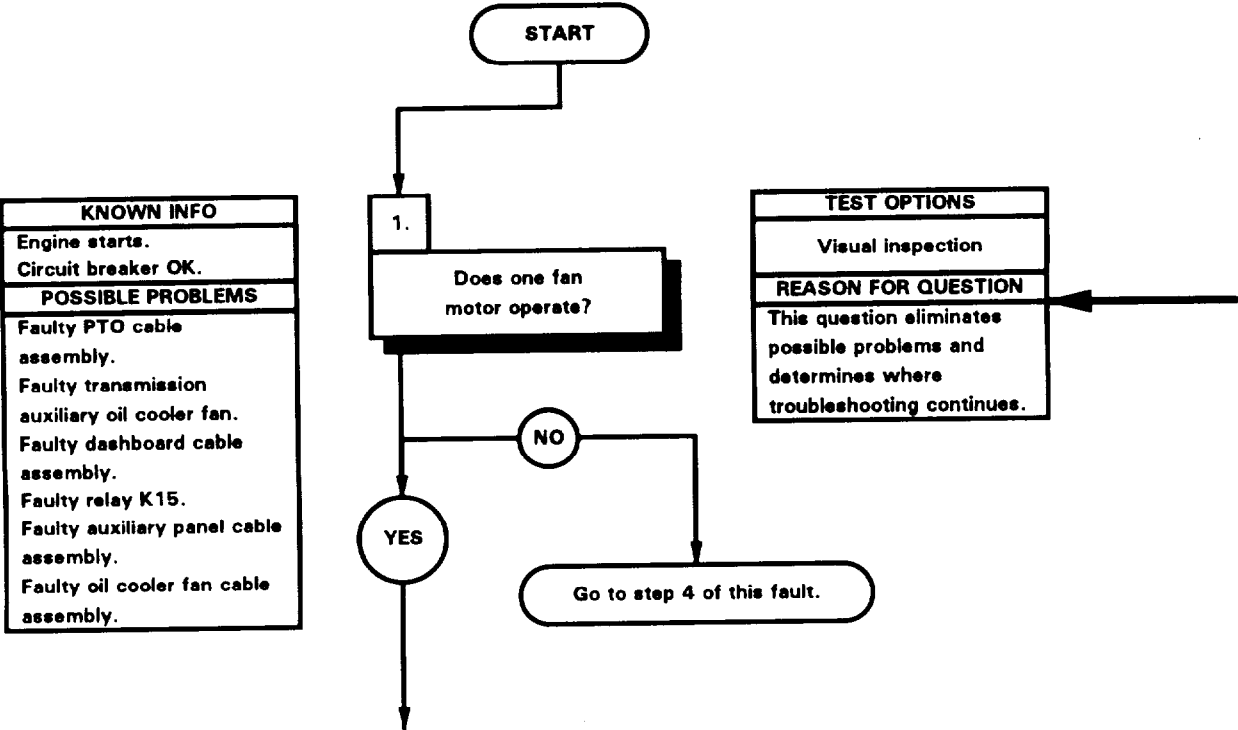
CONTINUITY TEST

- (1) Remove personnel heater to gain access (para 18-9).
- (2) Disconnect connector P912A from connector J912.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to relay K15 socket 87A.
- (5) Connect negative (-) probe of multimeter to connector P912A-15 and note reading on multimeter.
- (6) If continuity is not present, repair wire 1811 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (7) If continuity is present, repair wire 1811 (para 2-45) or replace oil cooler fan cable assembly (para 7-136).
- (8) Install relay K15 in PDP.
- (9) Connect connector P912A to connector J912.
- (10) Install personnel heater (para 18-9).



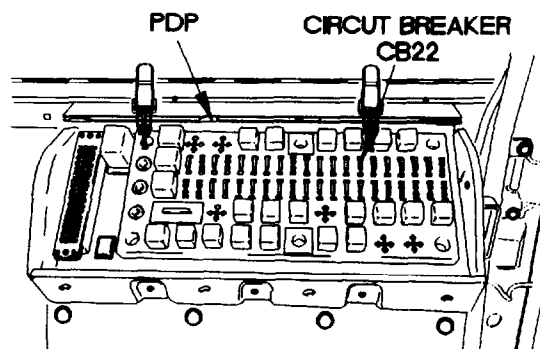
42EN6081

e147. M1088/M1089 TRANSMISSION AUXILIARY OIL COOLER FAN DOES NOT OPERATE	
INITIAL SETUP	
Equipment Condition Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) STE/CE-R (Item 41, Appendix C) Multimeter, Digital (Item 22, Appendix C)
Personnel Required (2)	
References TM 9-4910-571-12&P	



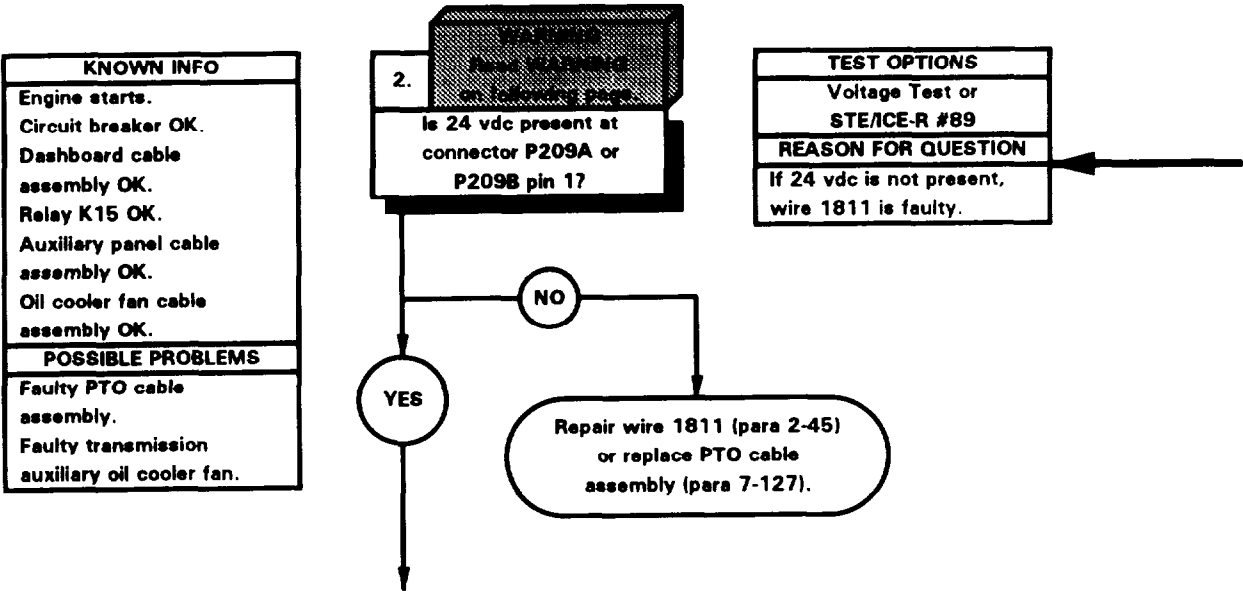
VOLTAGE TEST

- (1) Remove PDP cover (para 16-2).
- (2) Remove circuit breaker CB22 from PDP.
- (3) Start engine (TM 9-2320-366-10-1).
- (4) If both transmission auxiliary oil cooler fan motors do not operate, go to step 4 of this fault.
- (5) Shut down engine (TM 9-2320-366-10-1).



42EN7011

e147. M1088/M1089 TRANSMISSION AUXILIARY OIL COOLER FAN DOES NOT OPERATE (CONT)

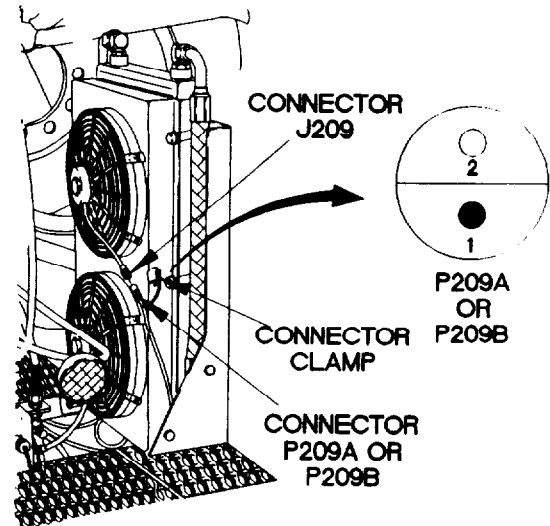


WARNING

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

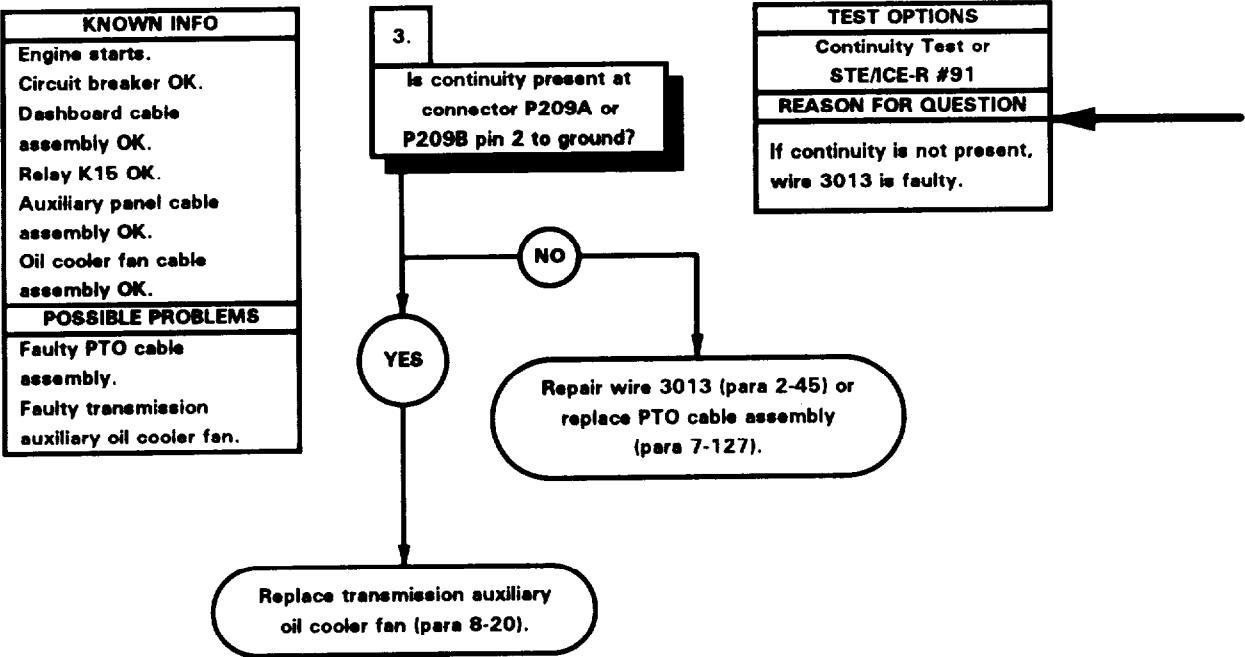
VOLTAGE TEST

- (1) Disconnect connector clamp from connector J209.
- (2) Disconnect connector P209A or P209B from connector J209.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to connector P209A or P209B pin 1.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Start engine (TM 9-2320-366-10-1) and note reading on multimeter.
- (7) If 24 vdc is not present, repair wire 1811 (para 2-45) or replace PTO cable assembly (para 7-127).
- (8) Shut down engine (TM 9-2320-366-10-1).



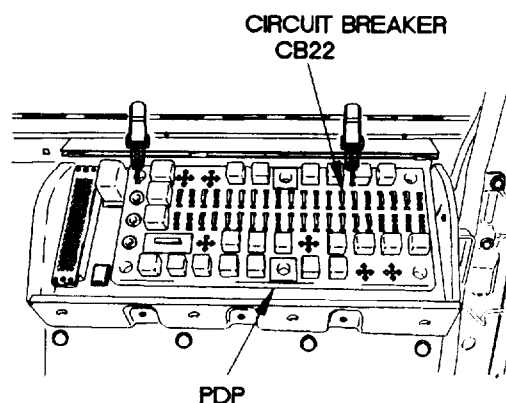
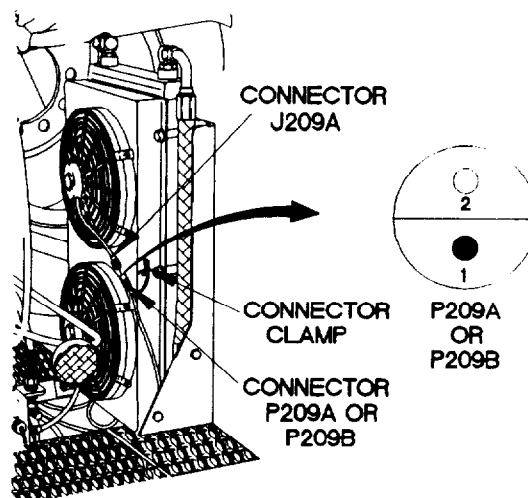
42EN702A

e147. M1088/M1089 TRANSMISSION AUXILIARY OIL COOLER FAN DOES NOT OPERATE (CONT)



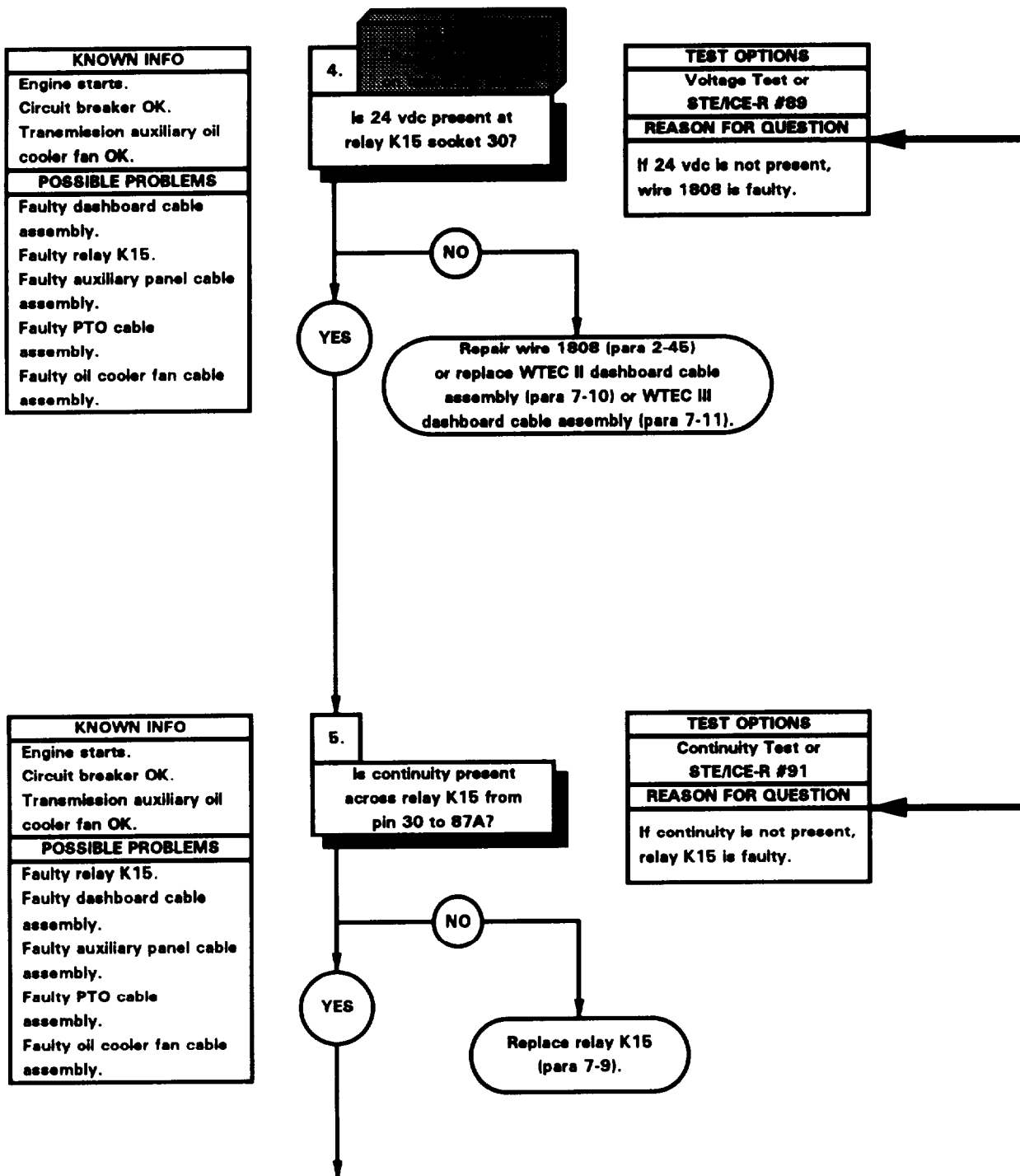
CONTINUITY TEST

- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to connector P209A or P209B pin 2.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3013 (para 2-45) or replace PTO cable assembly (para 7-127).
- (5) If continuity is present, replace transmission auxiliary oil cooler fan (para 8-20).
- (6) Connect connector P209A or P209B to transmission auxiliary oil cooler fan connector.
- (7) Connect connector clamp to connector J209.
- (8) Install circuit breaker CB22 in PDP.
- (9) Install PDP cover (para 16-2).



42EN7031

e147. M1088/M1089 TRANSMISSION AUXILIARY OIL COOLER FAN DOES NOT OPERATE (CONT)

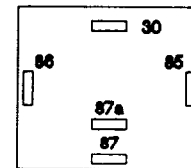
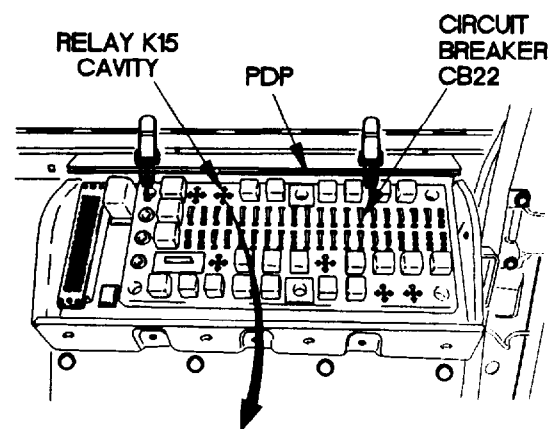


WARNING

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

VOLTAGE TEST

- (1) Install circuit breaker CB22 in PDP.
- (2) Remove relay K15 from PDP.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to relay K15 socket 30.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
- (7) If 24 vdc is not present, repair wire 1808 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (8) Position master power switch to off (TM 9-2320-366-10-1).



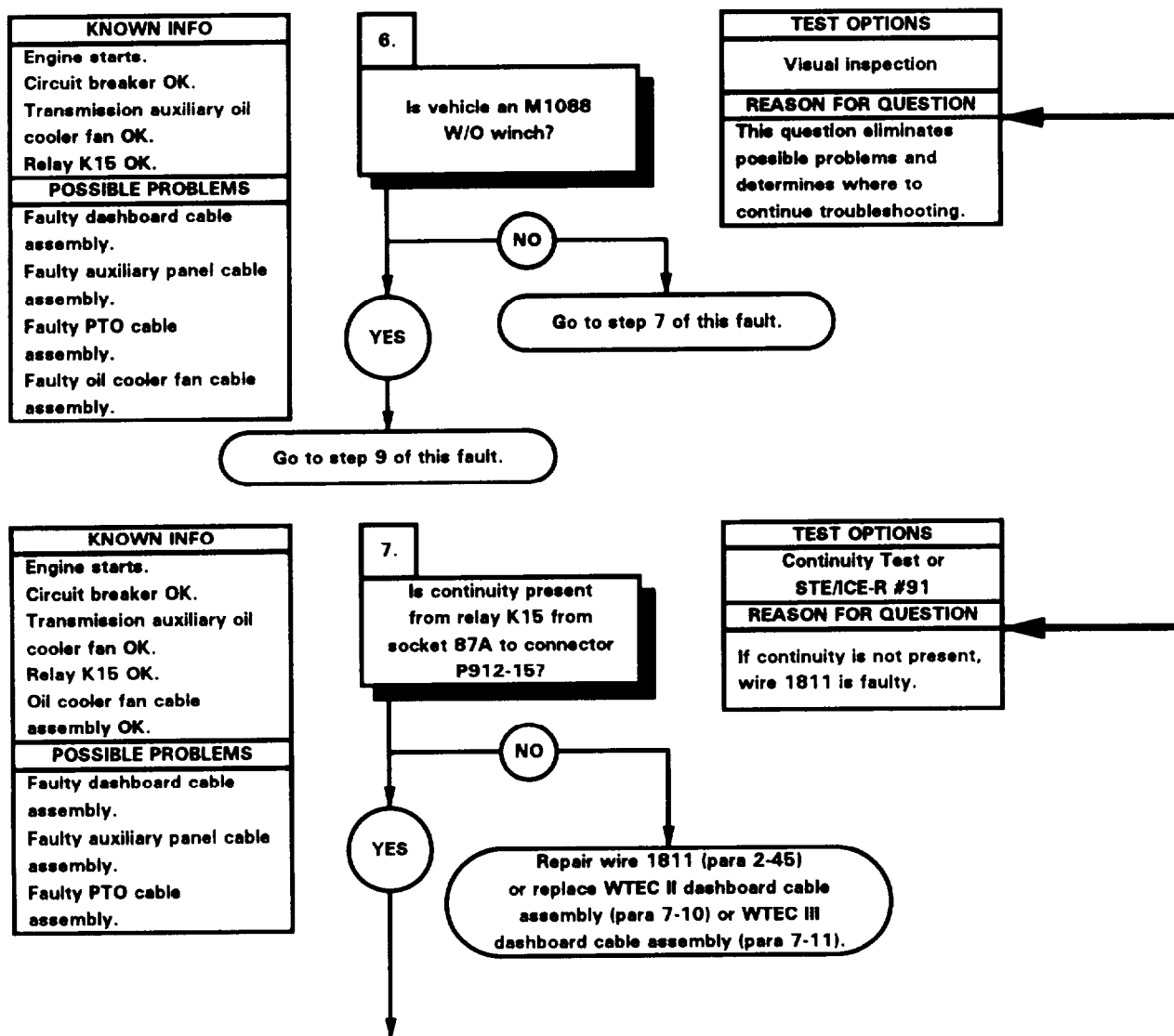
RELAY K15 CAVITY

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to relay K15 pin 30.
- (3) Connect negative (-) probe of multimeter to relay K15 pin 87A and note reading on multimeter.
- (4) If continuity is not present, replace relay K15 (para 7-9).

42EN7041

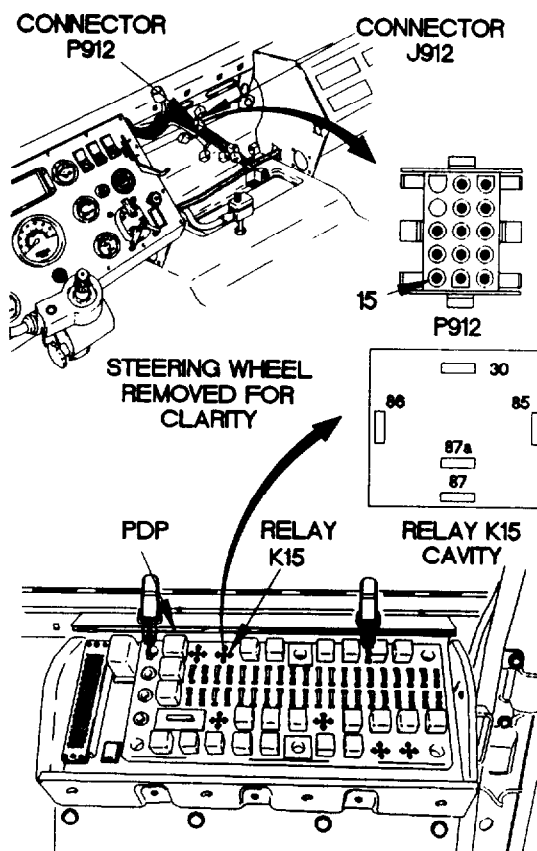
e147. M1088/M1089 TRANSMISSION AUXILIARY OIL COOLER FAN DOES NOT OPERATE (CONT)



- (1) Check if vehicle is M1088 W/O winch.
- (2) If vehicle is not an M1088 W/O winch, go to step 7 of this fault.
- (3) If vehicle is an M1088 W/O winch, go to step 9 of this fault.

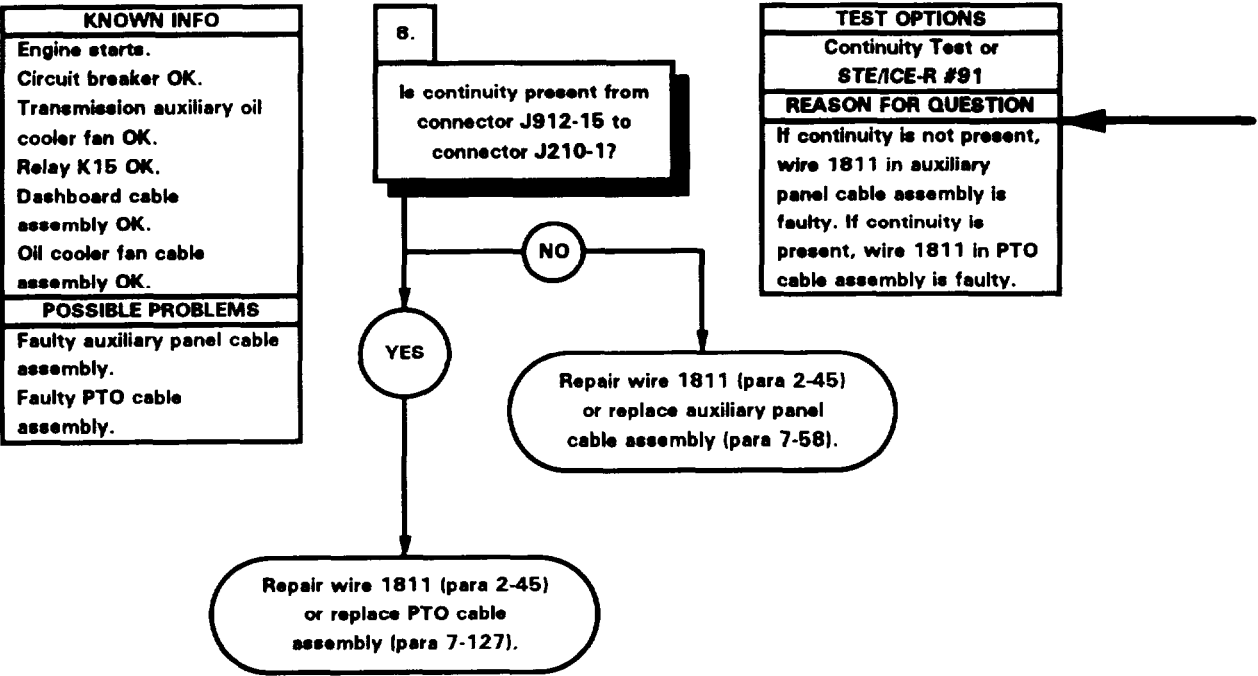
CONTINUITY TEST

- (1) Remove personnel heater for access (para 18-9).
- (2) Disconnect connector P912 from connector J912.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to relay K15 socket 87A.
- (5) Connect negative (-) probe of multimeter to connector P912-15 and note reading on multimeter.
- (6) If continuity is not present, repair wire 1811 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (7) Install relay K15 in PDP.



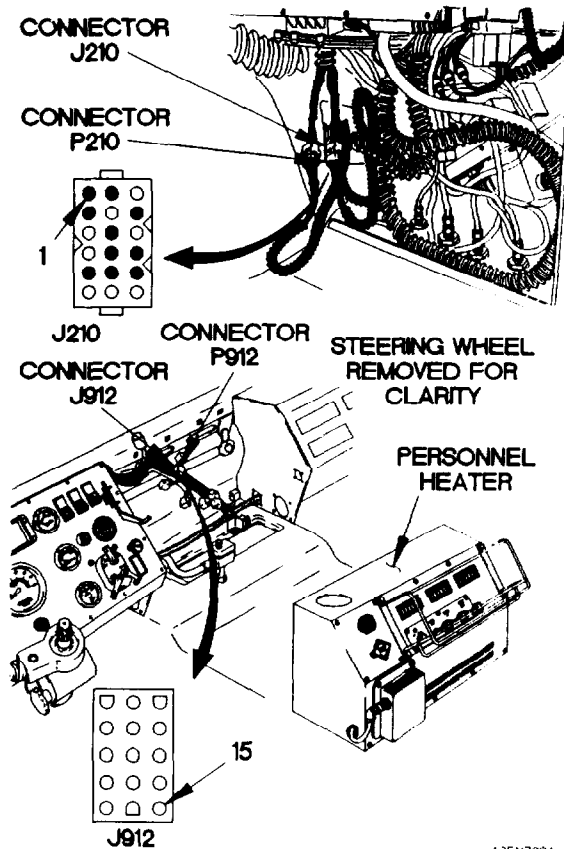
42EN7071

e147. M1088/M1089 TRANSMISSION AUXILIARY OIL COOLER FAN DOES NOT OPERATE (CONT)



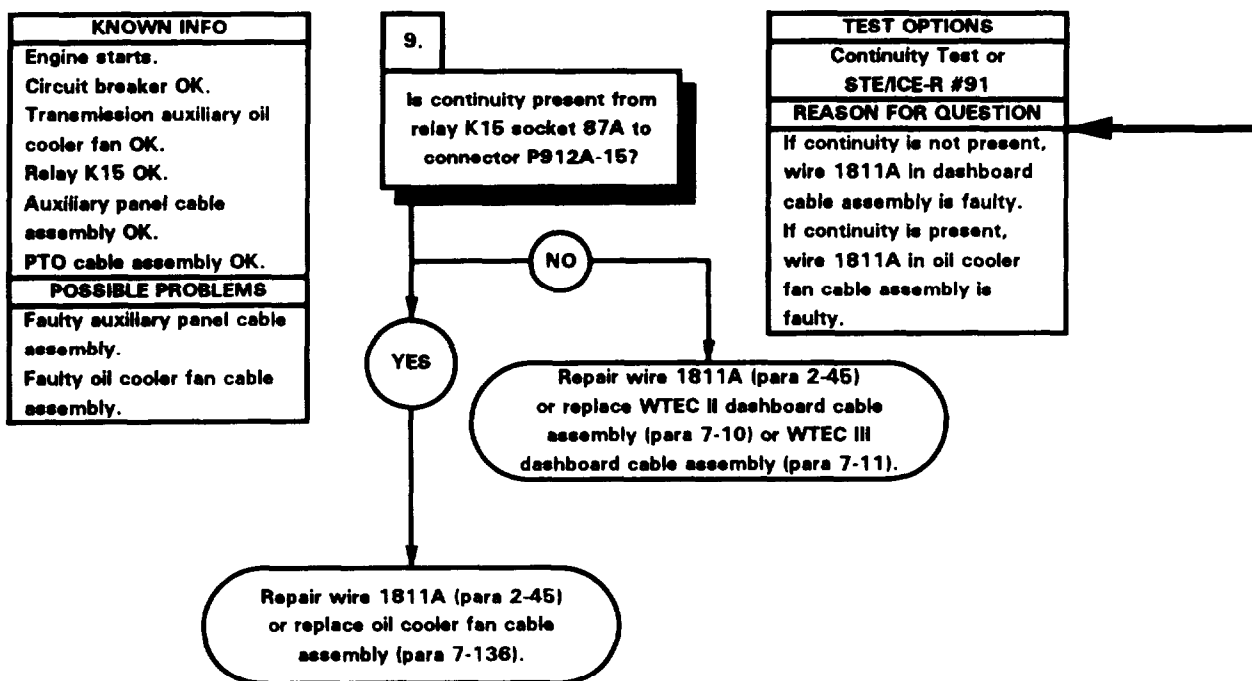
CONTINUITY TEST

- (1) Disconnect connector P210 from connector J210.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector J912-15.
- (4) Connect negative (-) probe of multimeter to connector J210-1 and note reading on multimeter.
- (5) If continuity is not present, repair wire 1811 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
- (6) If continuity is present, repair wire 1811 (para 2-45) or replace PTO cable assembly (para 7-127).
- (7) Connect connector P210 to connector J210.
- (8) Connect connector P912 to connector J912.
- (9) Install personnel heater (para 18-9).



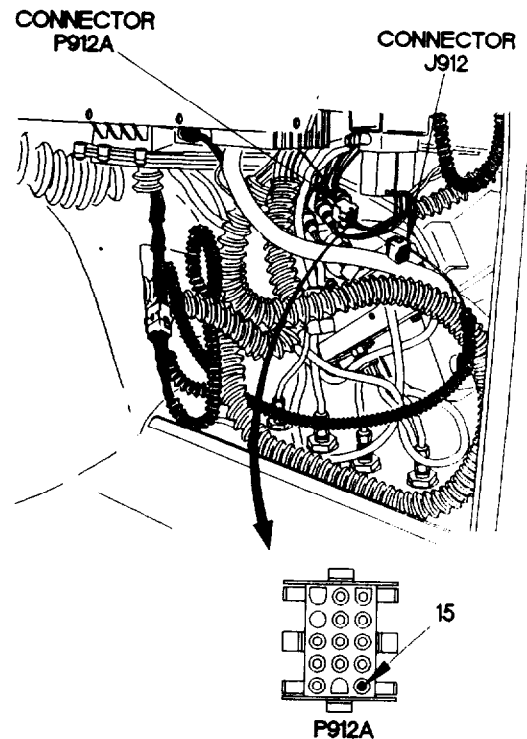
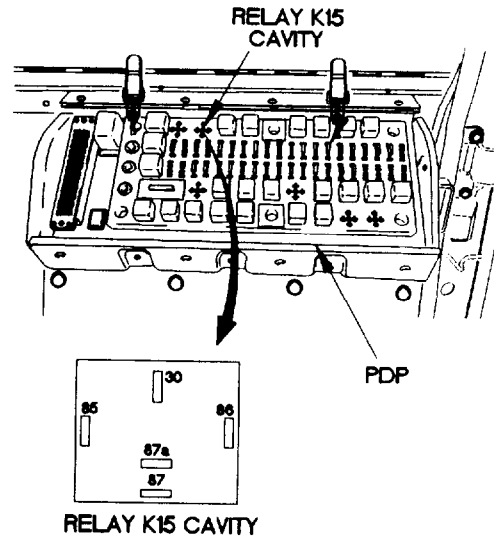
42EN708A

6147. M1088/M1089 TRANSMISSION AUXILIARY OIL COOLER FAN DOES NOT OPERATE (CONT)



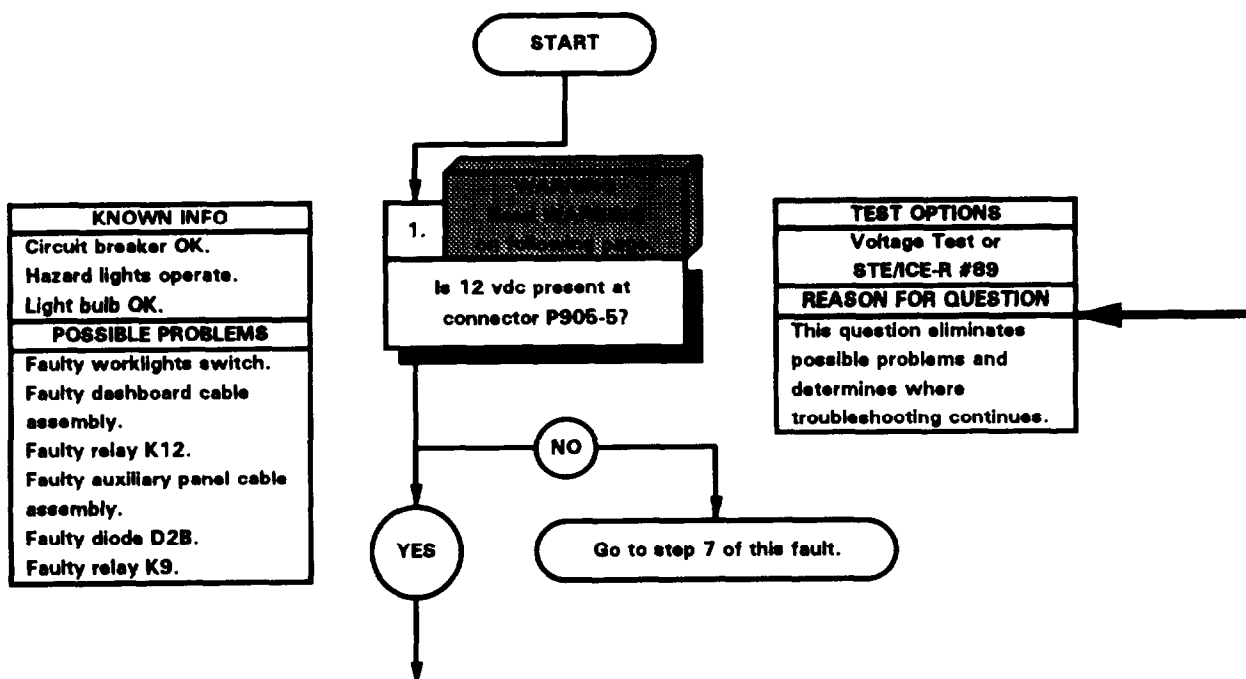
CONTINUITY TEST

- (1) Remove kick panel (para 16-3).
- (2) Disconnect connector P912A from connector J912.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to connector P912A-15.
- (5) Connect negative (-) probe of multimeter to relay K15 socket 87A and note reading on multimeter.
- (6) If continuity is not present, repair wire 1811A (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (7) If continuity is present, repair wire 1811A (para 2-45) or replace oil cooler fan cable assembly (para 7-136).
- (8) Connect connector P912A to connector J912.
- (9) Install kick panel (para 16-3).



42EN6181

e148. M1088/M1089 WORKLIGHTS DO NOT ILLUMINATE	
INITIAL SETUP	
Equipment Condition Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) STE/CE-R (Item 41, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Personnel Required (2)	Materials/Parts Wire, Elect, 50 ft (Item 71, Appendix D)
References TM 9-4910-571-12&P	

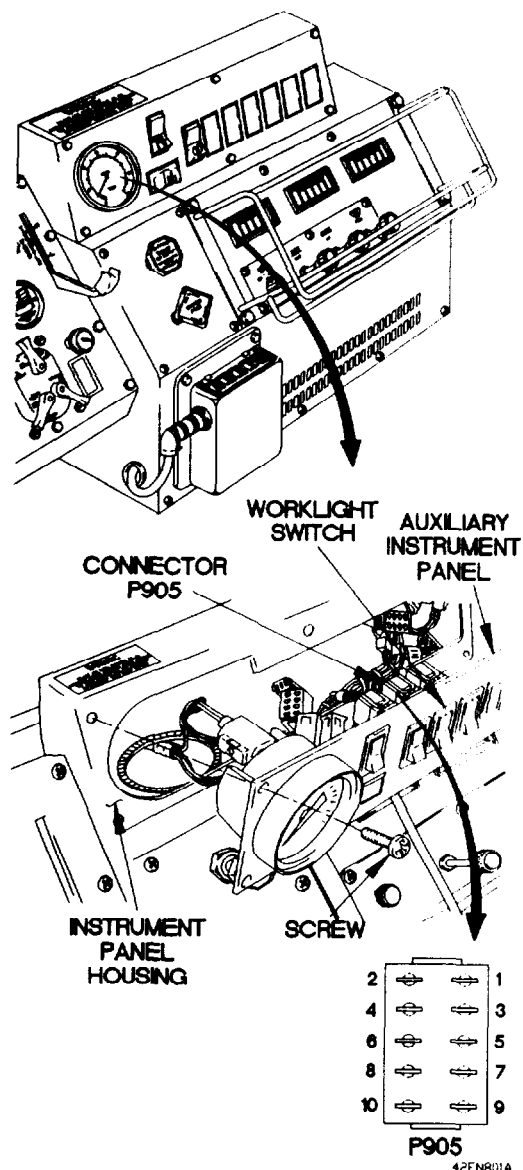


WARNING

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

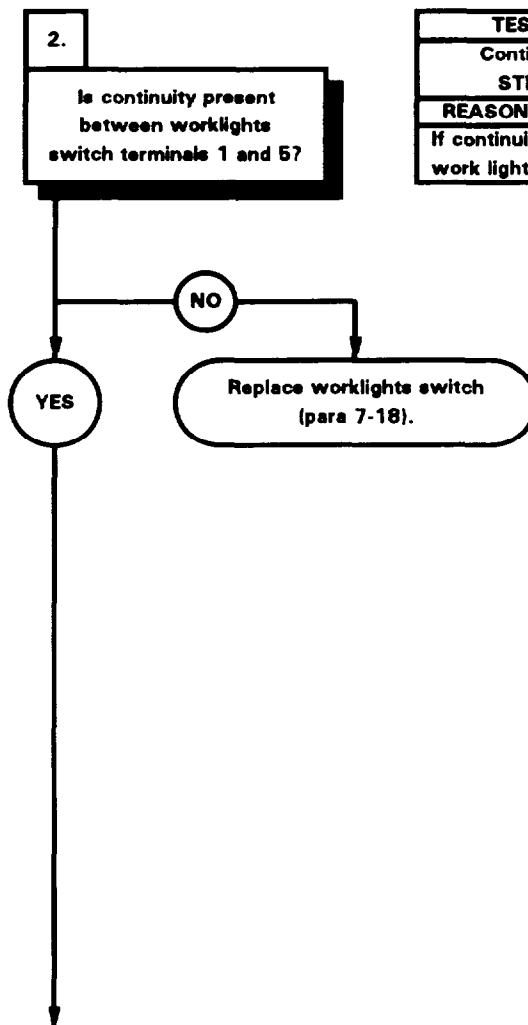
VOLTAGE TEST

- (1) Remove six screws from auxiliary panel.
- (2) Lift auxiliary panel from auxiliary panel housing to gain access.
- (3) Disconnect connector P905 from worklights switch.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to connector P905-5.
- (6) Connect negative (-) probe of multimeter to ground.
- (7) Position main light switch to STOP LIGHT (TM 9-2320-366-10-1) and note reading on multimeter.
- (8) If 12 vdc is not present, go to step 7 of this fault.
- (9) Position main light switch to OFF (TM 9-2320-366-10-1).



e148. M1088/M1089 WORKLIGHTS DO NOT ILLUMINATE (CONT)

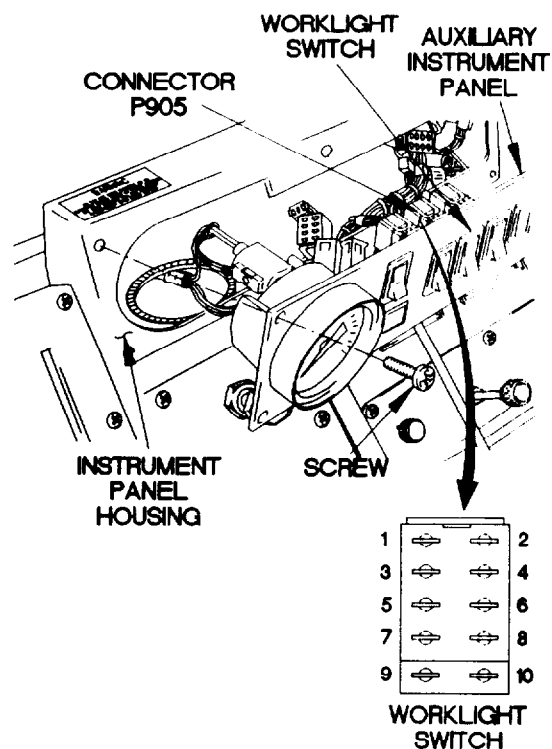
KNOWN INFO
Circuit breaker OK. Hazard lights operate. Light bulb OK. Auxiliary panel cable assembly OK. Relay K9 OK. Diode D2B OK.
POSSIBLE PROBLEMS
Faulty worklights switch. Faulty dashboard cable assembly. Faulty relay K12.



TEST OPTIONS
Continuity Test or STE/CE-R#91
REASON FOR QUESTION
If continuity is not present, work lights switch is faulty.

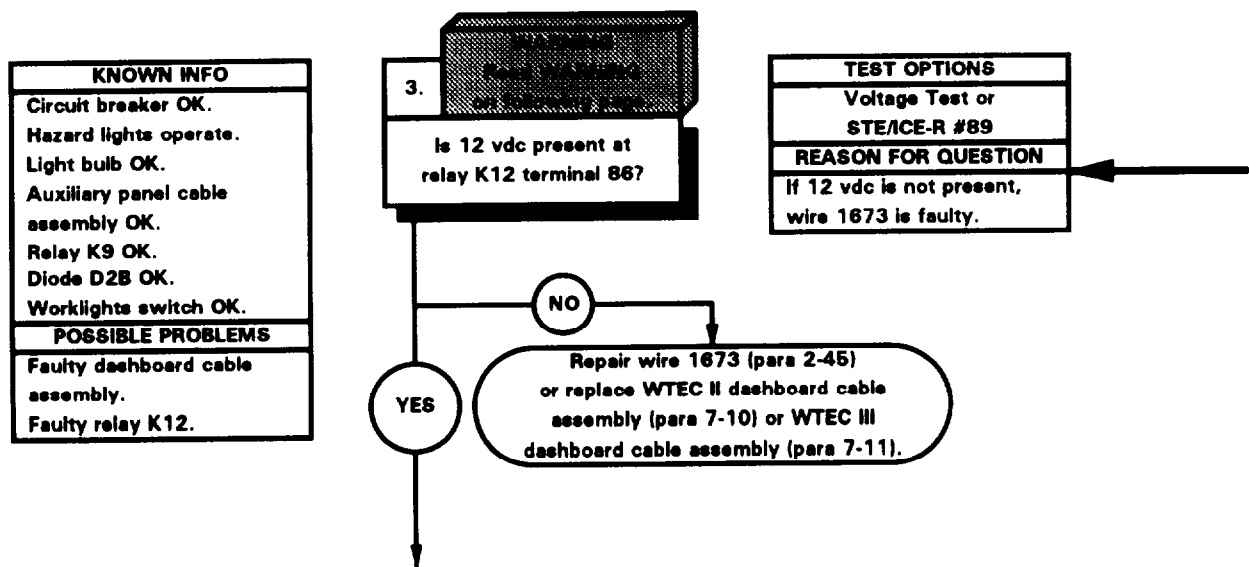
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to worklights switch terminal 1.
- (3) Connect negative (-) probe of multimeter to worklights switch terminal 5.
- (4) Position worklights switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
- (5) If continuity is not present, replace worklights switch (para 7-18).
- (6) Connect connector P905 to worklights switch.
- (7) Position auxiliary panel on auxiliary panel housing with six screws.
- (8) Tighten six screws to 24 lb-in. (3 N·m).



42EN802A

e148. M1088/M1089 WORKLIGHTS DO NOT ILLUMINATE (CONT)

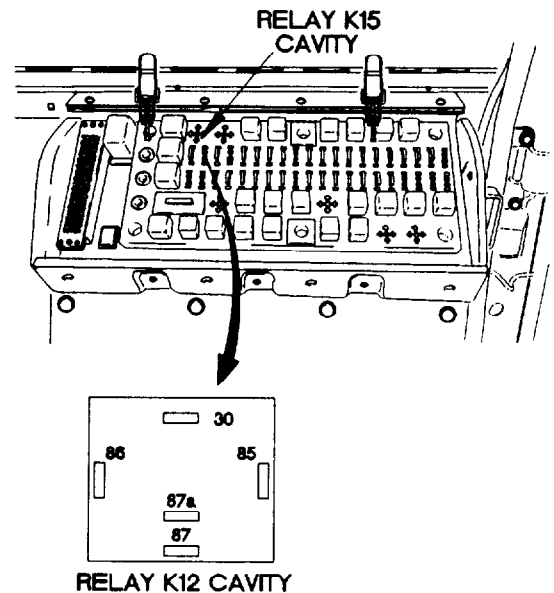


WARNING

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

VOLTAGE TEST

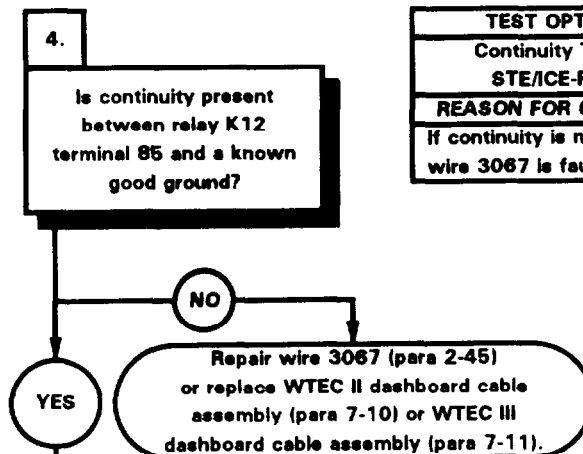
- (1) Remove PDP cover (para 16-2).
- (2) Remove relay K12 from PDP.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to PDP, where relay K12 terminal 86 was removed.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position main light switch to STOP LIGHT (TM 9-2320-366-10-1) and note reading on multimeter.
- (7) If 12 vdc is not present, repair wire 1673 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (8) Position main light switch to OFF (TM 9-2320-366-10-1).



42EN803A

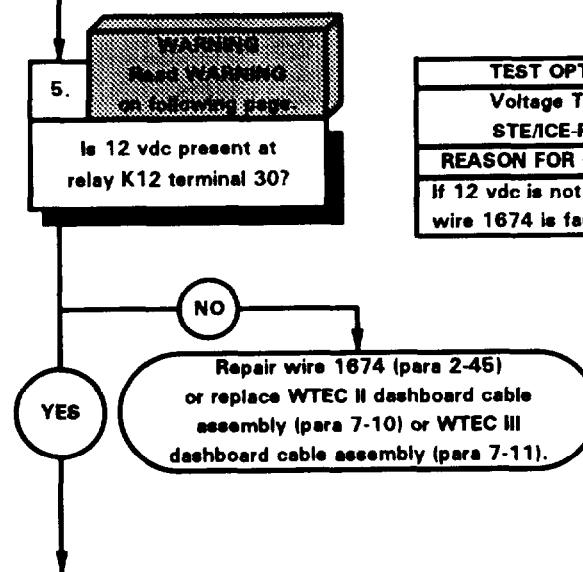
e148. M1088/M1089 WORKLIGHTS DO NOT ILLUMINATE (CONT)

KNOWN INFO
Circuit breaker OK. Hazard lights operate. Auxiliary panel cable assembly OK. Relay K9 OK. Diode D2B OK. Worklights switch OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty relay K12.



TEST OPTIONS
Continuity Test or STE/ICE-R#91
REASON FOR QUESTION
If continuity is not present, wire 3067 is faulty.

KNOWN INFO
Circuit breaker OK. Hazard lights operate. Auxiliary panel cable assembly OK. Relay K9 OK. Diode D2B OK. Worklights switch OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty relay K12.

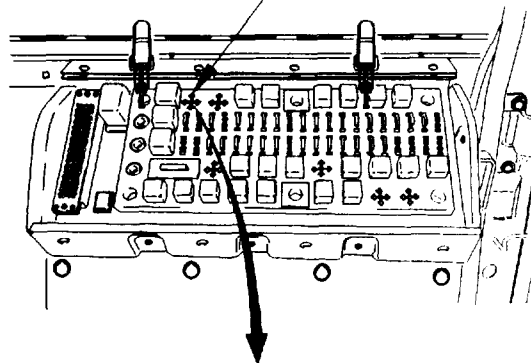


TEST OPTIONS
Voltage Test or STE/ICE-R #89
REASON FOR QUESTION
If 12 vdc is not present, wire 1674 is faulty.

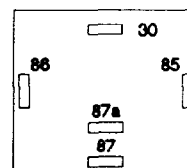
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to PDP, where relay K12 terminal 85 was removed.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3067 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

RELAY K12 CAVITY



RELAY K12 CAVITY



42EN804A

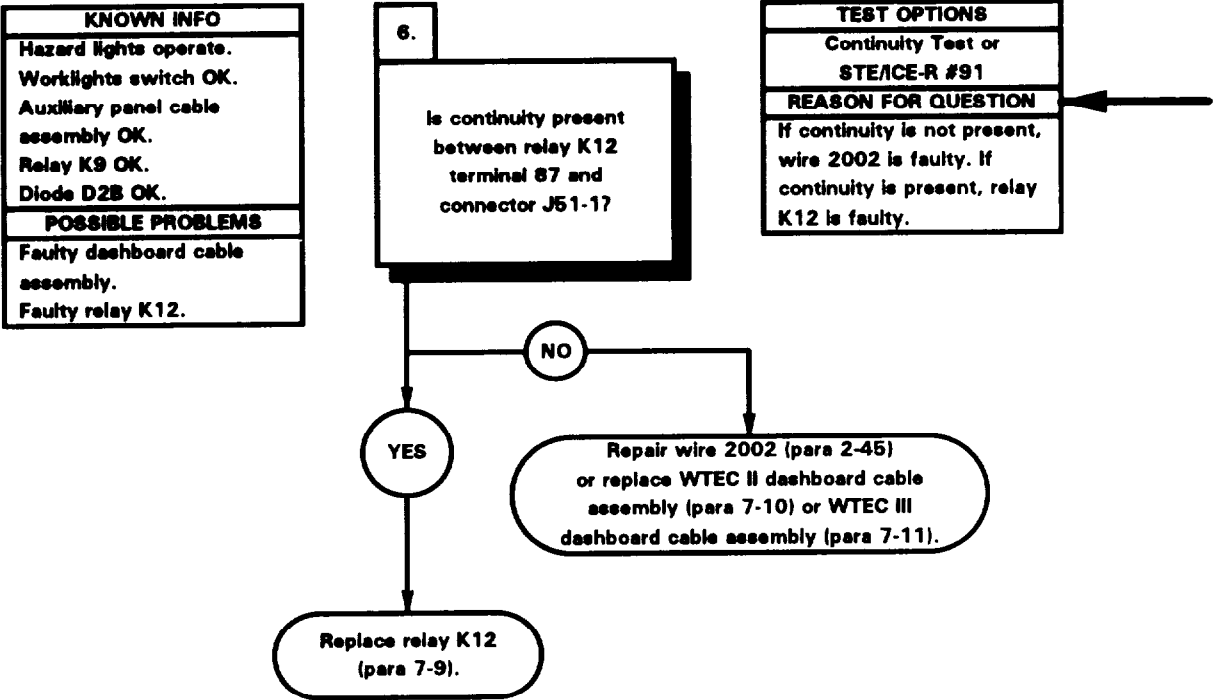
WARNING

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

VOLTAGE TEST

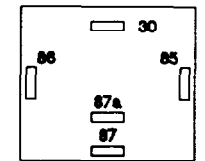
- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to PDP, where relay K12 terminal 30 was removed.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position main light switch to STOP LIGHT (TM 9-2320-366-10-1) and note reading on multimeter.
- (5) If 12 vdc is not present, repair wire 1674 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (6) Position main light switch to OFF (TM 9-2320-366-10-1).

ø148. M1088/M1089 WORKLIGHTS DO NOT ILLUMINATE (CONT)

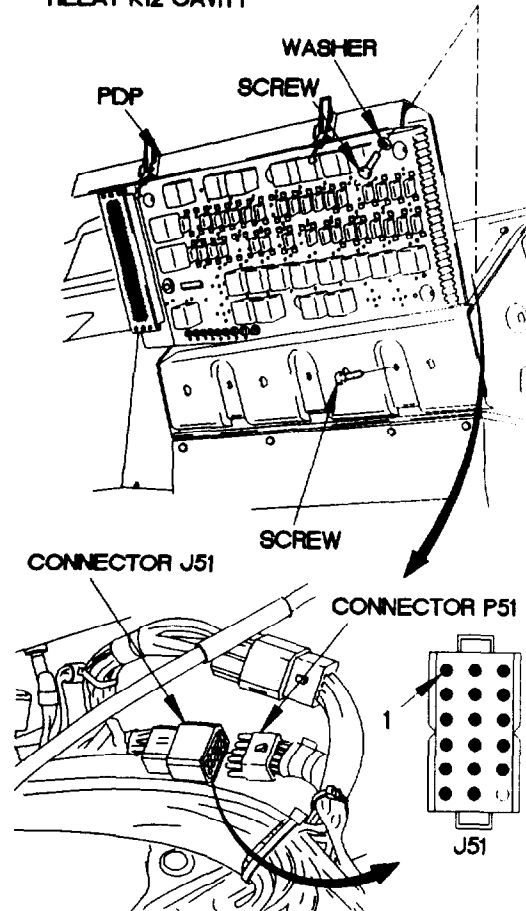


CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Install relay K12 in PDP.
- (3) Remove three screws and washers from PDP.
- (4) Remove three screws from PDP.
- (5) Lift PDP outward to gain access.
- (6) Disconnect connector P51 from connector J51.
- (7) Connect positive (+) probe of multimeter to PDP, where relay K12 terminal 87 was removed.
- (8) Connect negative (-) probe of multimeter to connector J51-1 and note reading on multimeter.
- (9) If continuity is not present, repair wire 2002 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (10) If continuity is present, replace relay K12 (para 7-9).
- (11) Install PDP on dashboard with three screws.
- (12) Install three washers and screws in PDP.
- (13) Install PDP cover (para 16-2).

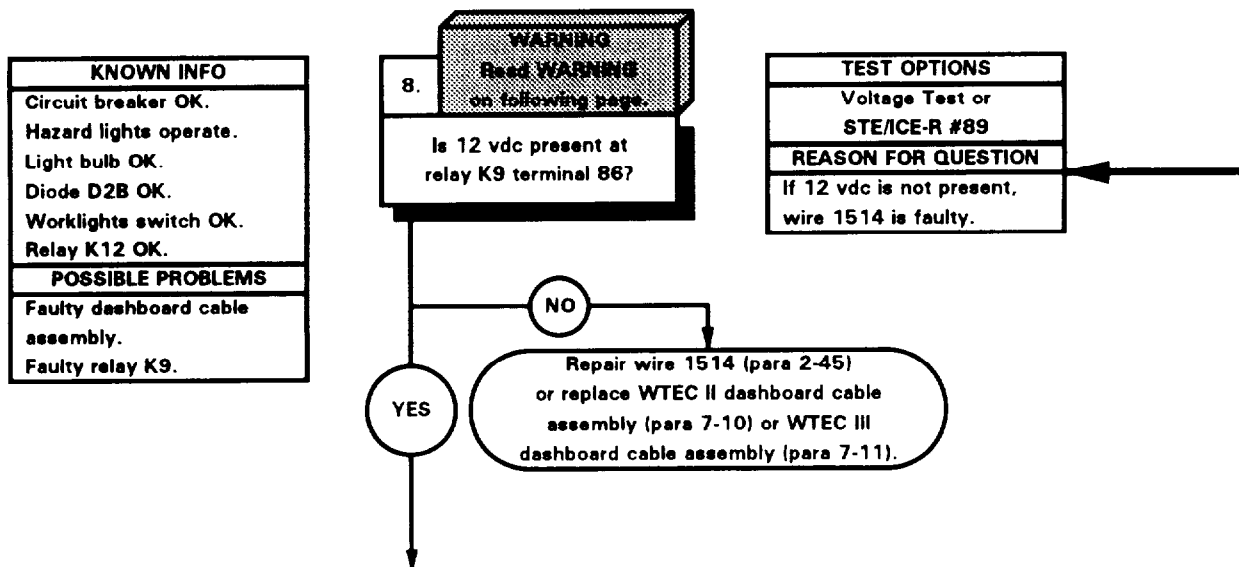
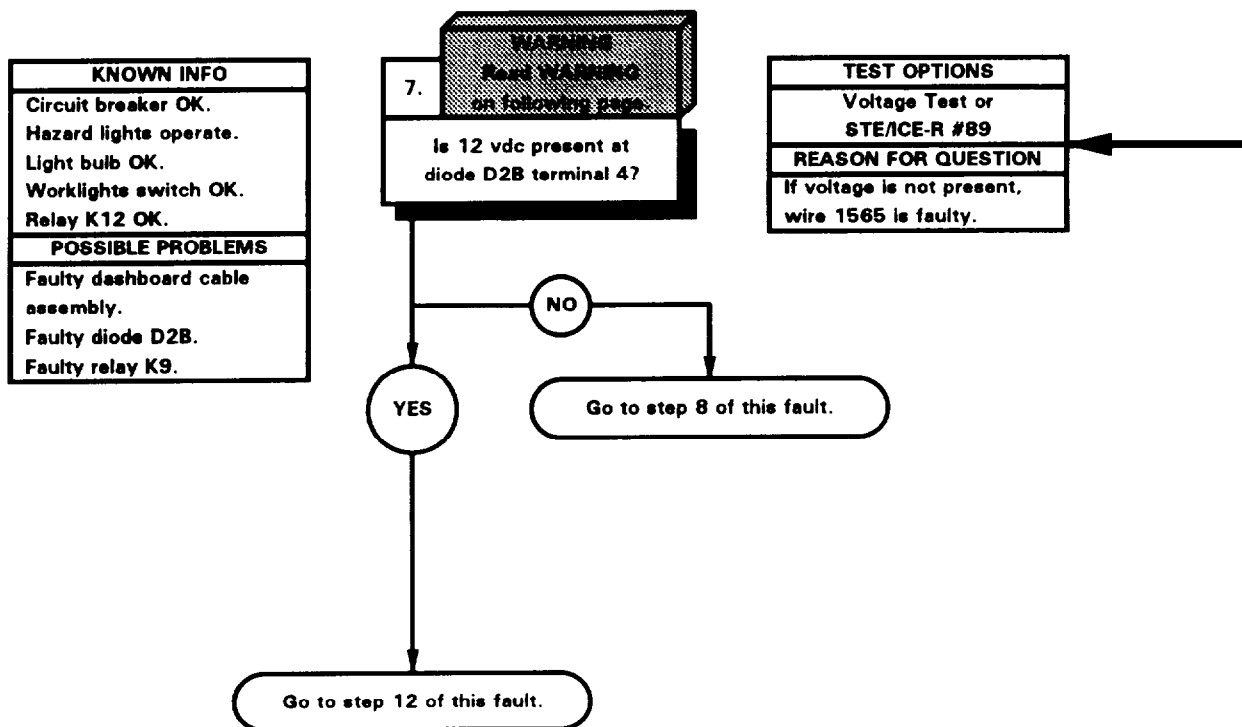


RELAY K12 CAVITY



42EN8051

e148. M1088/M1089 WORKLIGHTS DO NOT ILLUMINATE (CONT)

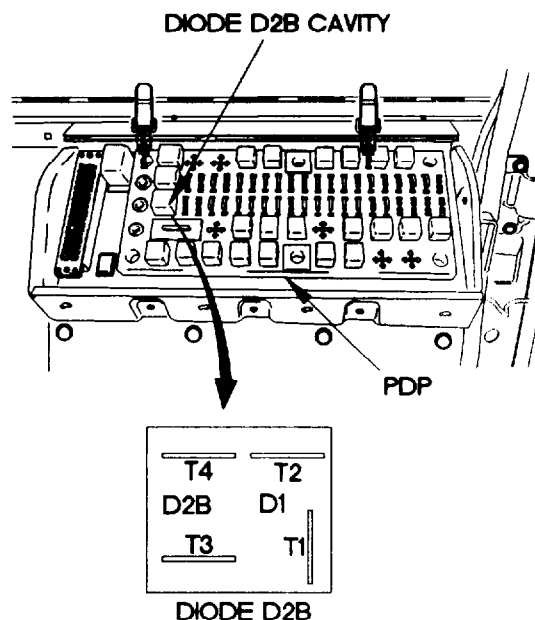


WARNING

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

VOLTAGE TEST

- (1) Remove PDP cover (para 16-2).
- (2) Remove diode D2B from PDP.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to PDP, where diode D2B terminal 4 was removed.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position main light switch to STOP LIGHT (TM 9-2320-366-10-1) and note reading on multimeter.
- (7) If 12 vdc is not present, go to step 8 of this fault.
- (8) If 12 vdc is present, go to step 12 of this fault.
- (9) Position main light switch to OFF (TM 9-2320-366-10-1).



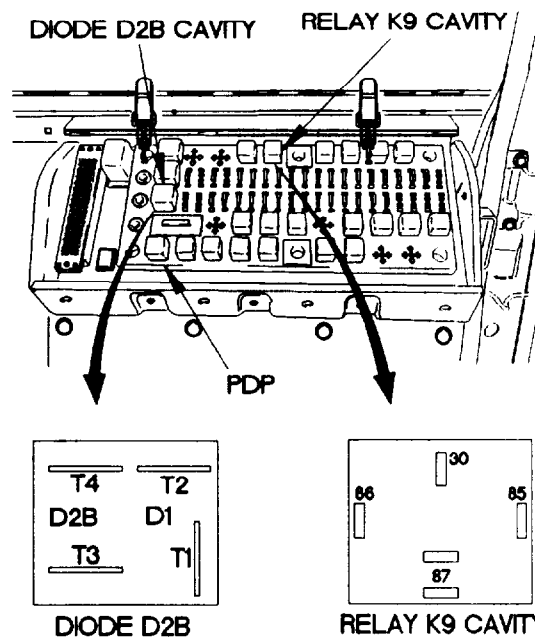
42EN80r-1

WARNING

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

VOLTAGE TEST

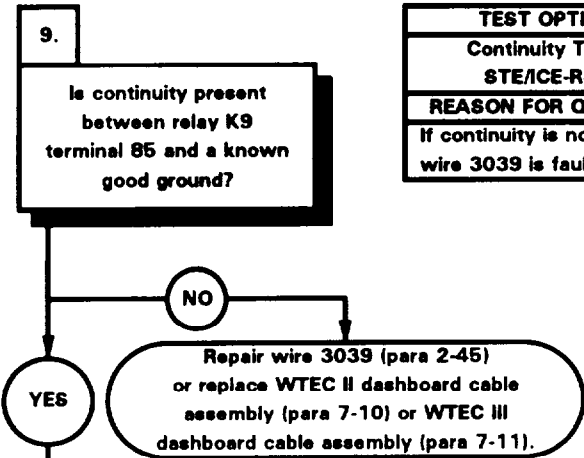
- (1) Install diode D2B in PDP.
- (2) Remove relay K9 from PDP.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to PDP, where relay K9 terminal 86 was removed.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position main light switch to STOP LIGHT (TM 9-2320-366-10-1) and note reading on multimeter.
- (7) If 12 vdc is not present, repair wire 1514 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (8) Position main light switch to OFF (TM 9-2320-366-10-1).



42EN80r-1

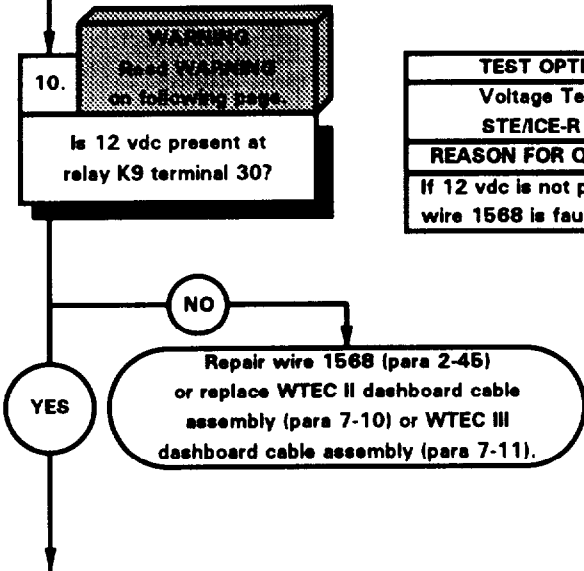
e148. M1088/M1089 WORKLIGHTS DO NOT ILLUMINATE (CONT)

KNOWN INFO
Circuit breaker OK. Hazard lights operate. Auxiliary panel cable assembly OK. Relay K12 OK. Diode D2B OK. Worklights switch OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty relay K9.



TEST OPTIONS
Continuity Test or STE/CE-R#91
REASON FOR QUESTION
If continuity is not present, wire 3039 is faulty.

KNOWN INFO
Circuit breaker OK. Hazard lights operate. Auxiliary panel cable assembly OK. Relay K12 OK. Diode D2B OK. Worklights switch OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty relay K9.

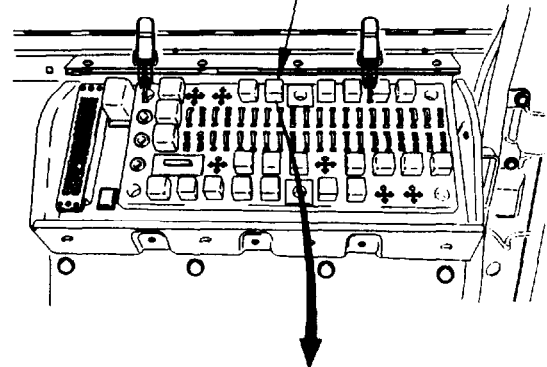


TEST OPTIONS
Voltage Test or STE/CE-R #89
REASON FOR QUESTION
If 12 vdc is not present, wire 1568 is faulty.

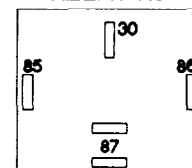
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to PDP, where relay K9 terminal 85 was removed.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3039 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

RELAY K9 CAVITY



RELAY K9



42EN8084

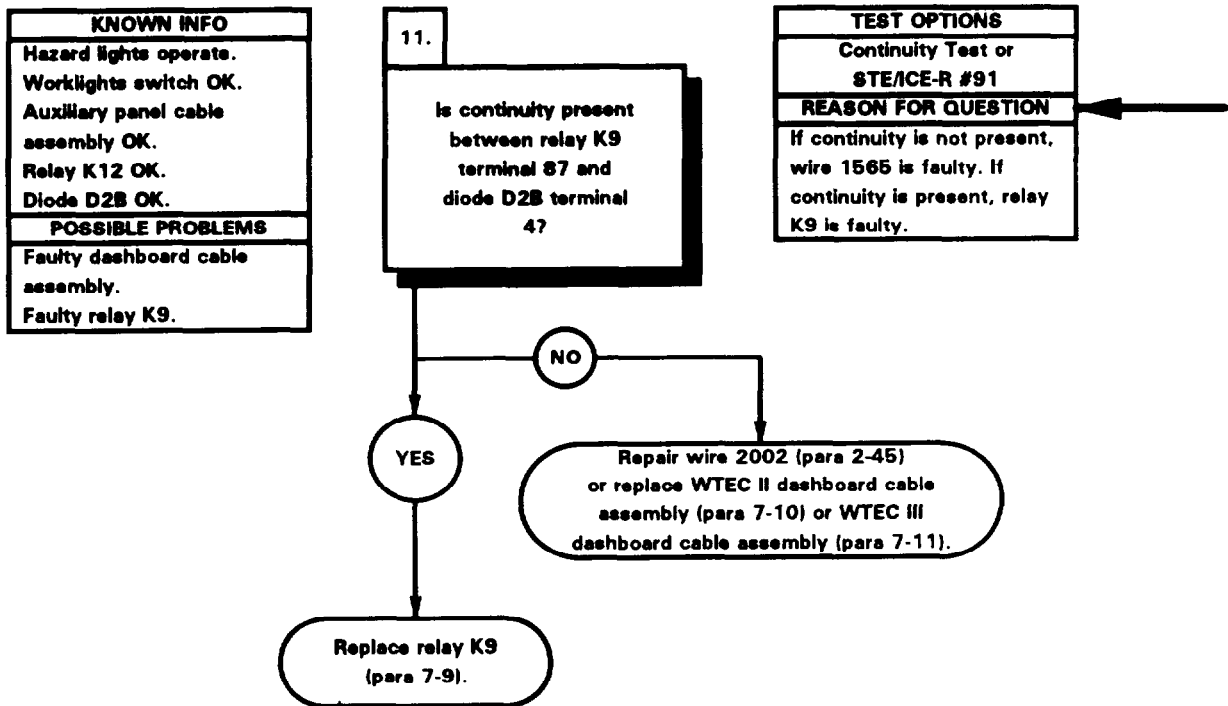
WARNING

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

VOLTAGE TEST

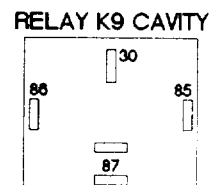
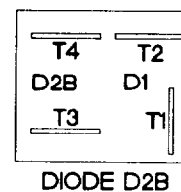
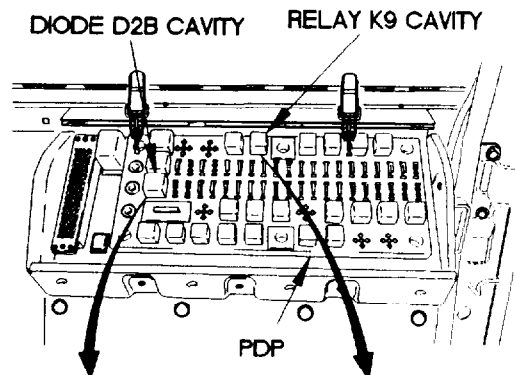
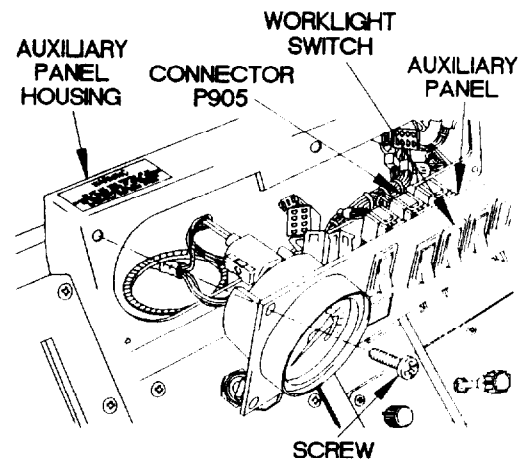
- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to PDP, where relay K9 terminal 30 was removed.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position main light switch to STOP LIGHT (TM 9-2320-366-10-1) and note reading on multimeter.
- (5) If 12 vdc is not present, repair wire 1568 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (6) Position main light switch to OFF (TM 9-2320-366-10-1).

ø148. M1088/M1089 WORKLIGHTS DO NOT ILLUMINATE (CONT)



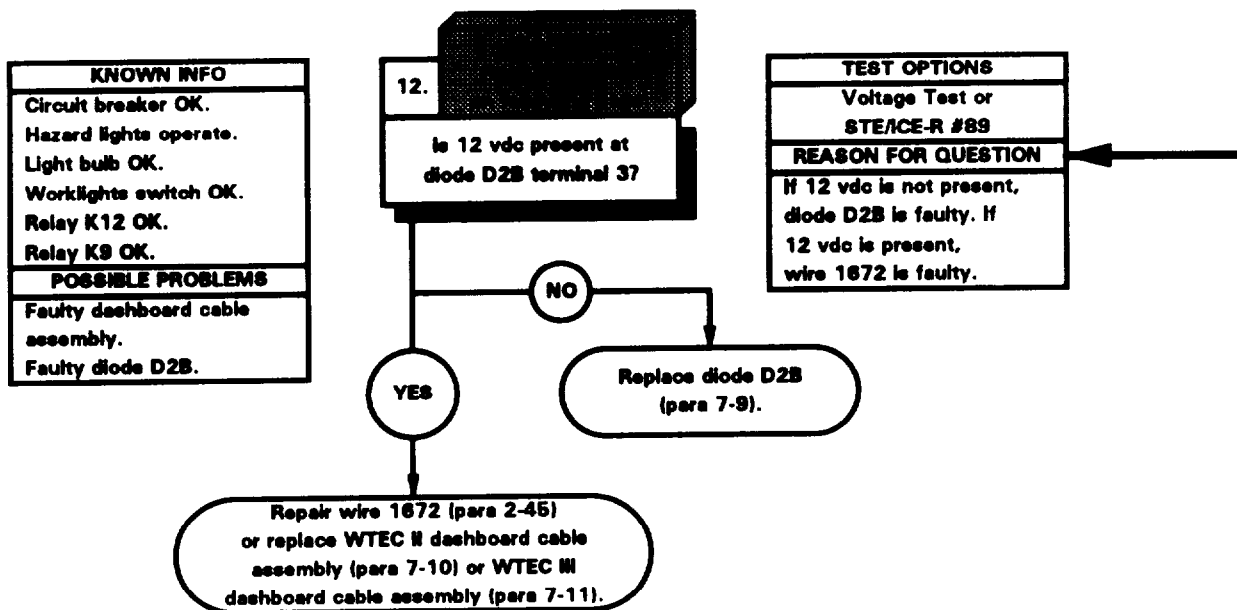
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Remove diode D2B from PDP.
- (3) Connect positive (+) probe of multimeter to PDP, where relay K9 terminal 87 was removed.
- (4) Connect negative (-) probe of multimeter to where diode D2B terminal 4 was removed and note reading on multimeter.
- (5) If continuity is not present, repair wire 1565 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (6) If continuity is present, replace relay K9 (para 7-9).
- (7) Install relay K9 in PDP.
- (8) Install diode D2B in PDP.
- (9) Install PDP cover (para 16-2).
- (10) Connect connector P905 to worklights switch.
- (11) Position auxiliary panel on auxiliary panel housing with six screws.
- (12) Tighten six screws to 24 lb-in. (3 N-m).



42 ENR001-1

¶148. M1088/M1089 WORKLIGHTS DO NOT ILLUMINATE (CONT)

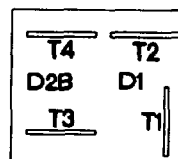
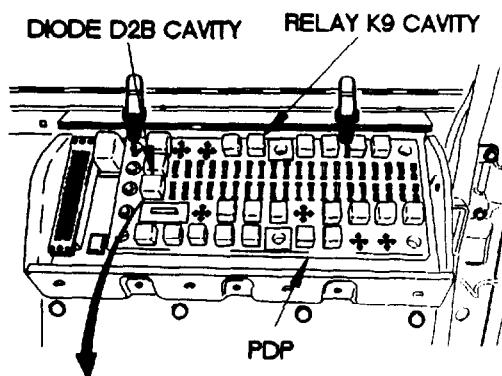
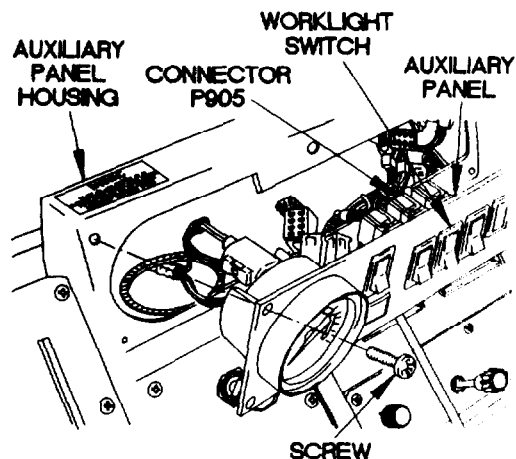


WARNING

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

VOLTAGE TEST

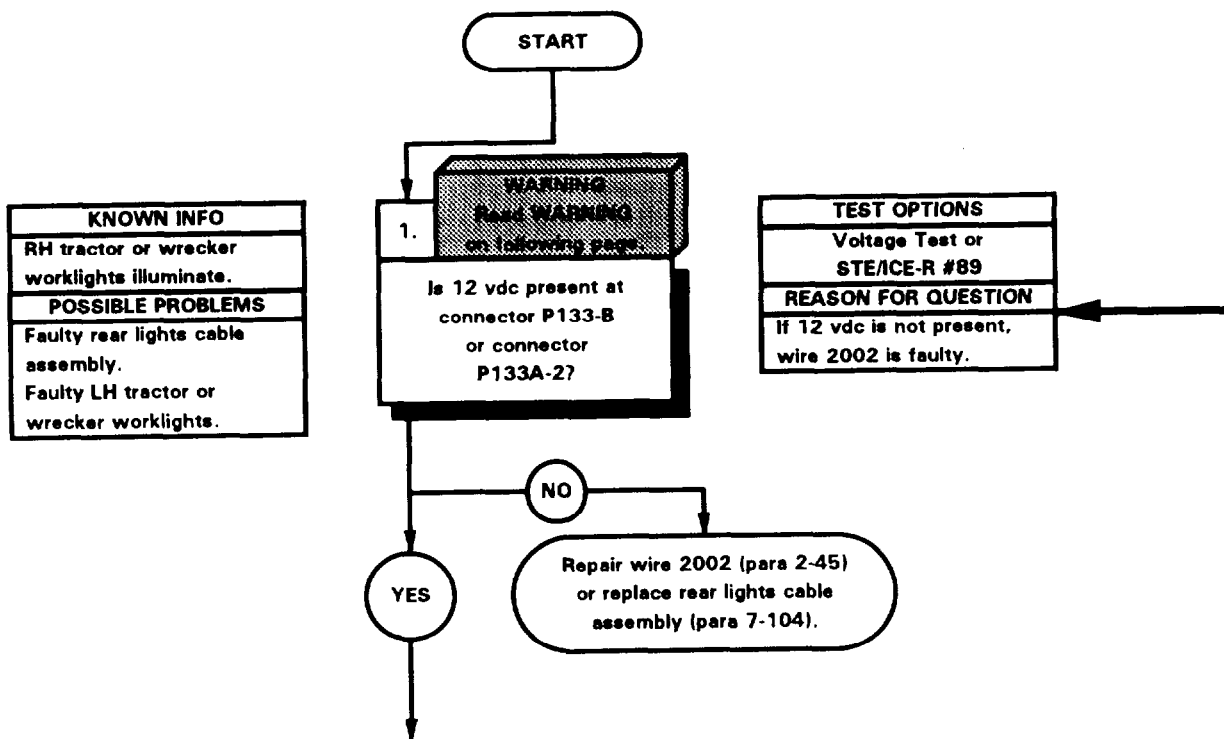
- (1) Set multimeter to volts dc.
- (2) Connect positive (+) probe of multimeter to PDP, where diode D2B terminal 3 was removed.
- (3) Connect negative (-) probe of multimeter to ground.
- (4) Position main light switch to STOP LIGHT (TM 9-2320-366-10-1) and note reading on multimeter.
- (5) If 12 vdc is not present, replace diode D2B (para 7-9).
- (6) If 12 vdc is present, repair wire 1672 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (7) Position main light switch to OFF (TM 9-2320-366-10-1).
- (8) Install diode D2B in PDP.
- (9) Install PDP cover (para 16-2).
- (10) Connect connector P905 to worklights switch.
- (11) Position auxiliary panel on auxiliary panel housing with six screws.
- (12) Tighten six screws to 24 lb-in. (3 Nm).



DIODE D2B

42EN8101

e149. M1088/M1089 (LH) WORKLIGHTS DO NOT ILLUMINATE	
INITIAL SETUP	
Equipment Condition Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) STE/ICE-R (Item 41, Appendix C) Multimeter, Digital (Item 22, Appendix C)
Personnel Required (2)	References TM 9-4910-571-12&P
Materials/Parts Wire, Elect, 50 ft (Item 71, Appendix D)	

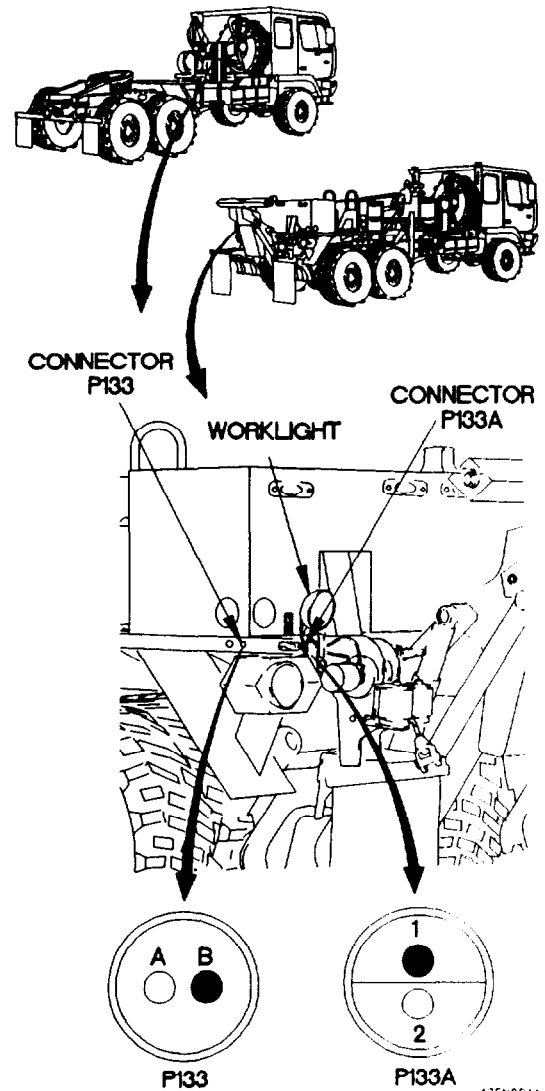


WARNING

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

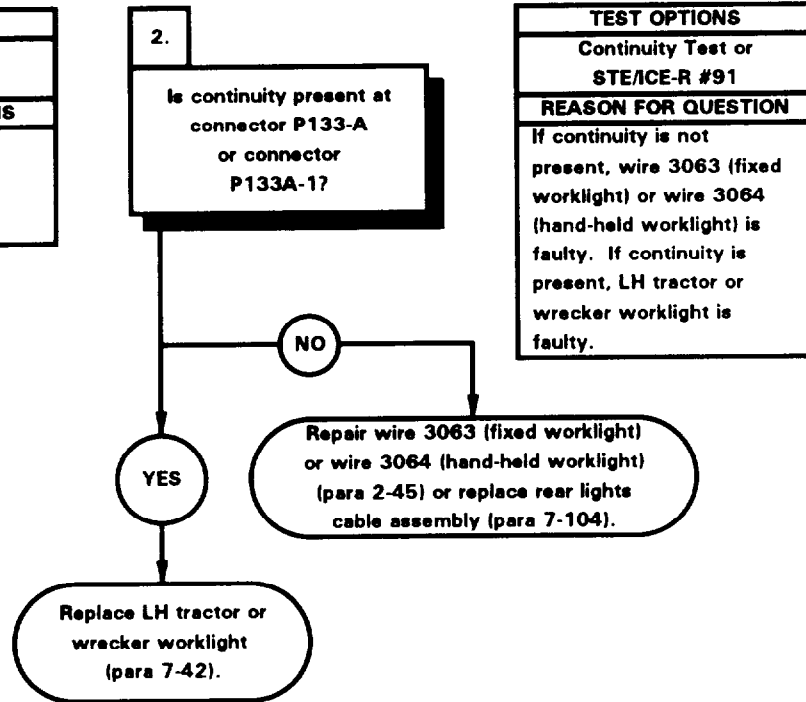
VOLTAGE TEST

- (1) Disconnect LH tractor or wrecker worklight from connector P133 or connector P133A.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector P133-B or connector P133A-2.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position main light switch to STOP/PARK (TM 9-2320-366-10-1).
- (6) Position work light switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
- (7) If 12 vdc is not present, repair wire 2002 (para 2-45) or replace rear lights cable assembly (para 7-104).
- (8) Position work light switch to off (TM 9-2320-366-10-1).
- (9) Position main light switch to OFF (TM 9-2320-366-10-1).



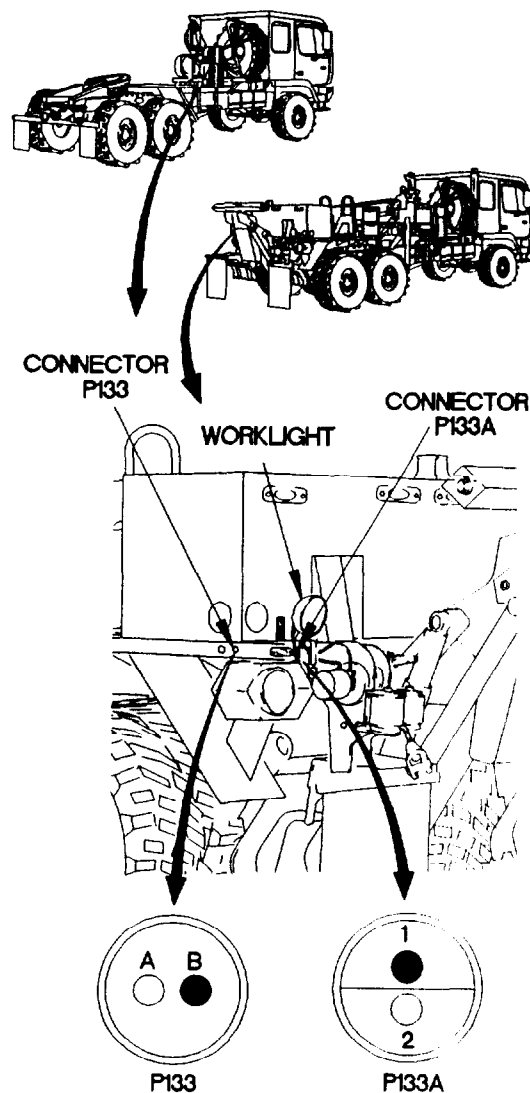
ø149. M1088/M1089 (LH) WORKLIGHTS DO NOT ILLUMINATE (CONT)

KNOWN INFO
RH tractor or wrecker worklights illuminate.
POSSIBLE PROBLEMS
Faulty rear ligs cable assembly.
Faulty LH tractor or wrecker worklights.



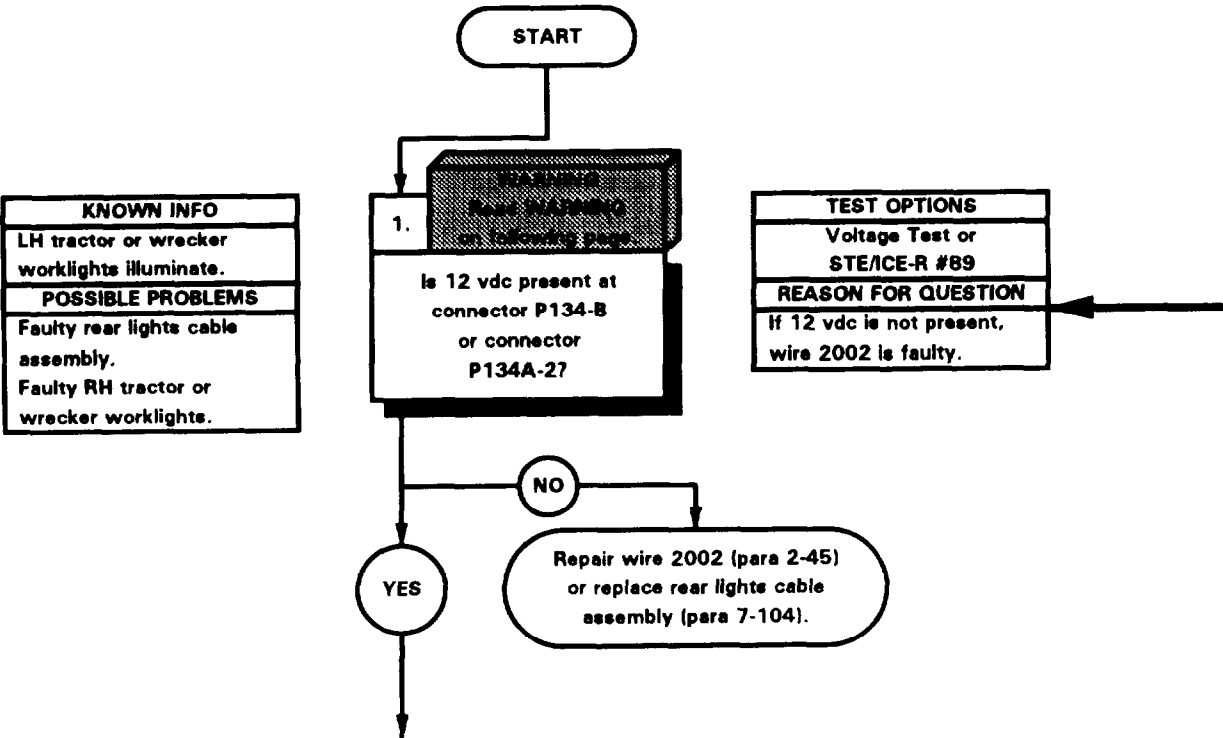
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3063 (fixed worklight) or wire 3064 (hand-held worklight) is faulty. If continuity is present, LH tractor or wrecker worklight is faulty.

CONTINUITY TEST	
(1)	Set multimeter to ohms.
(2)	Connect positive (+) probe of multimeter to connector P133-A or connector P133A-1.
(4)	Connect negative (-) probe of multimeter to ground and note reading on multimeter.
(5)	If continuity is not present, repair wire 3063 (fixed worklight) or wire 3064 (hand-held worklight) (para 2-45) or replace rear lights cable assembly (para 7-104).
(6)	If continuity is present, replace LH tractor or wrecker worklight (para 7-42).
(7)	Connect worklight to connector P133 or P133A on LH tractor or wrecker.



42EN901A

•150. M1088/M1089 (RH) WORKLIGHTS DO NOT ILLUMINATE	
INITIAL SETUP	
Equipment Condition Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) STE/ICE-R (Item 41, Appendix C) Multimeter, Digital (Item 22, Appendix C)
Personnel Required (2)	References TM 9-4910-571-12&P
Materials/Parts Wire, Elect, 50 ft (Item 71, Appendix D)	

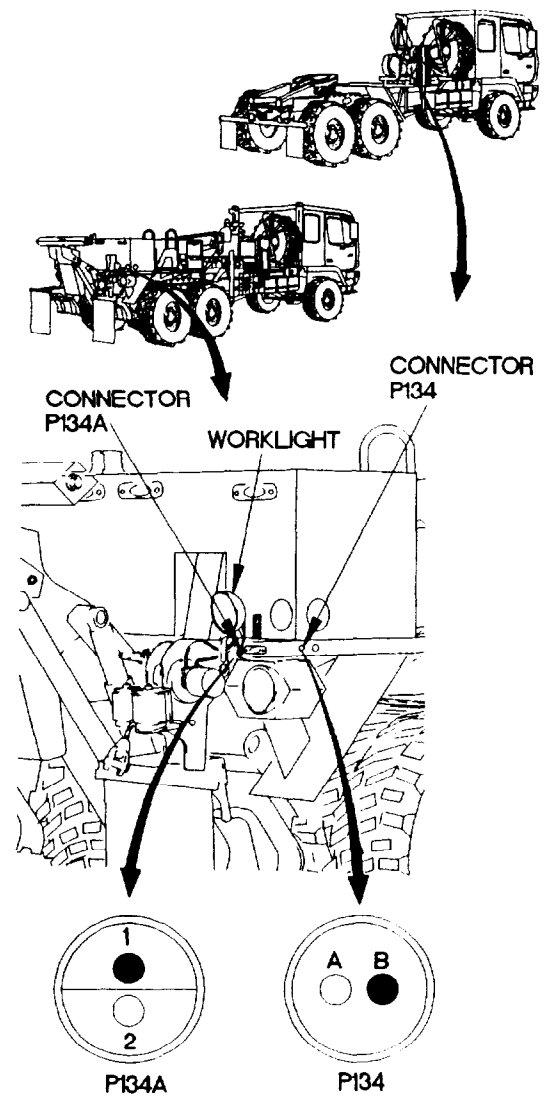


WARNING

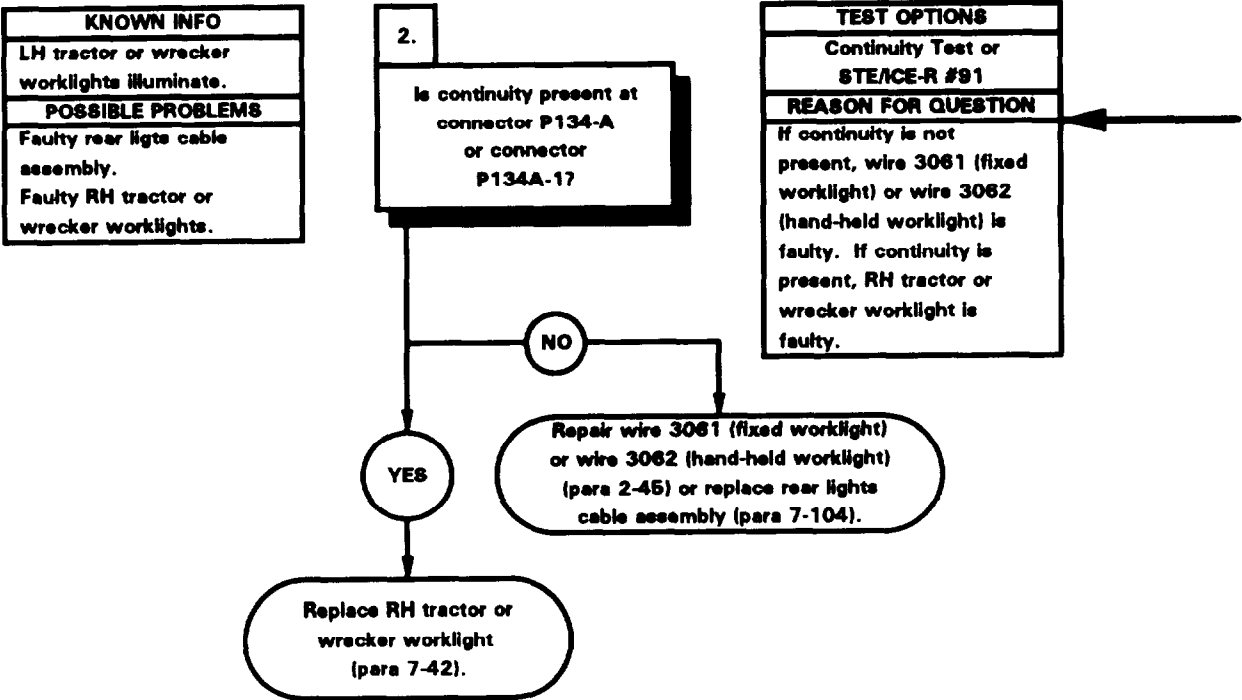
Remove rings, bracelets, watches, necklaces, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause injury or short across electrical circuit and cause severe burns or electrical shock.

VOLTAGE TEST

- (1) Disconnect RH tractor or wrecker worklight from connector P134 or connector P134A.
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector P134-B or connector P134A-2.
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position main light switch to STOP/PARK (TM 9-2320-366-10-1).
- (6) Position work light switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
- (7) If 12 vdc is not present, repair wire 2002 (para 2-45) or replace rear lights cable assembly (para 7-104).
- (8) Position work light switch to off (TM 9-2320-366-10-1).
- (9) Position main light switch to OFF (TM 9-2320-366-10-1).

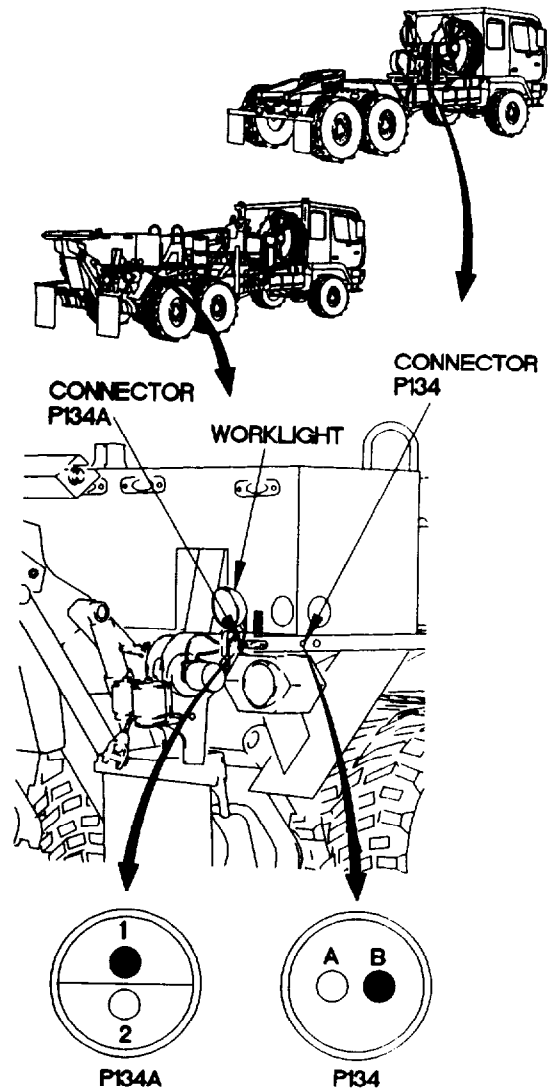


150. M1088/M1089 (RH) WORKLIGHTS DO NOT ILLUMINATE (CONT)

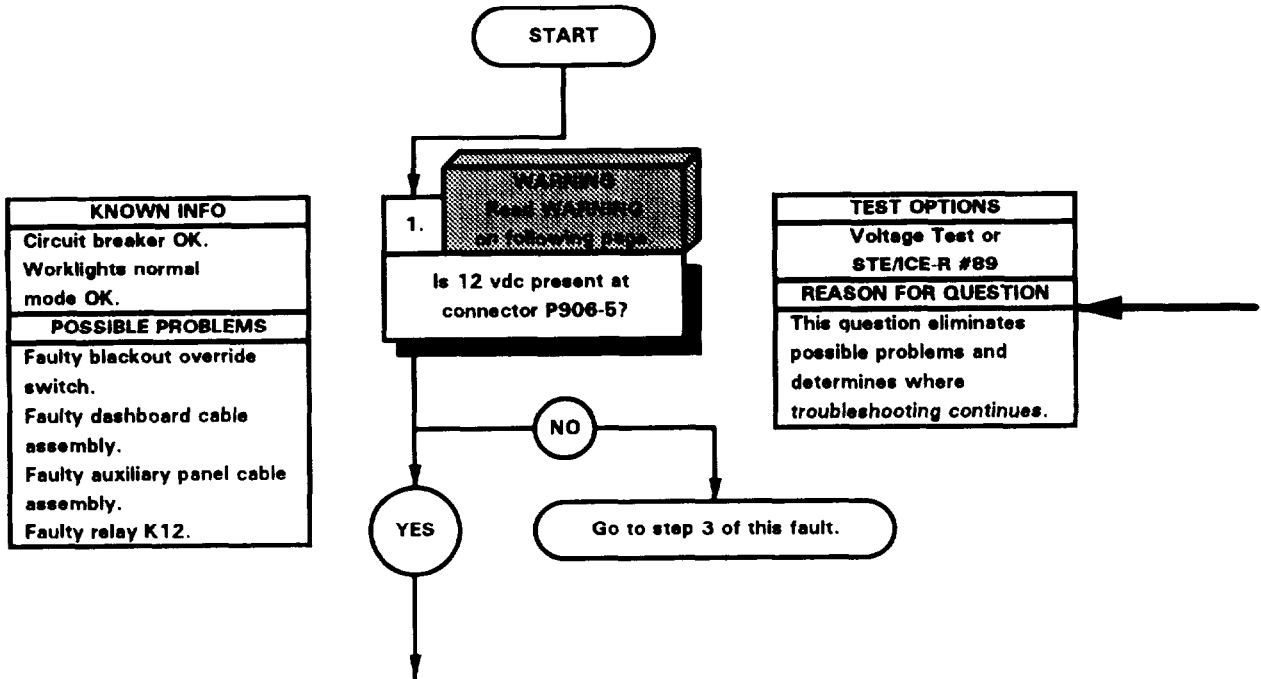


CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P134-A or connector P134A-1.
- (4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (5) If continuity is not present, repair wire 3061 (fixed worklight) or wire 3062 (hand-held worklight) (para 2-45) or replace rear lights cable assembly (para 7-104).
- (6) If continuity is present, replace RH tractor or wrecker worklight (para 7-42).
- (7) Connect worklight to connector P134 or P134A on RH tractor or wrecker.



151. M1088/M1089 WORKLIGHTS DO NOT ILLUMINATE IN BLACKOUT MODE WITH BLACKOUT OVERRIDE SWITCH ON	
INITIAL SETUP	
Equipment Condition Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) STE/CE-R (Item 41, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Personnel Required (2)	
References TM 9-4910-571-12&P	Materials/Parts Wire, Elect, 50 ft (Item 71, Appendix D)



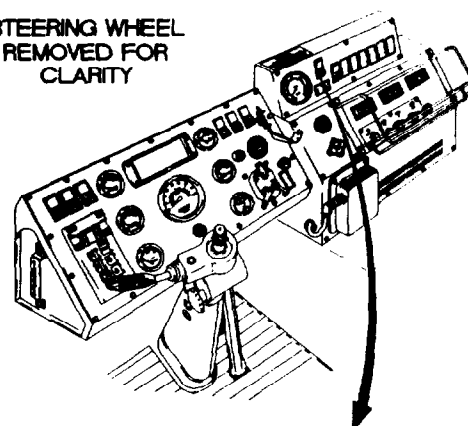
WARNING

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

VOLTAGE TEST

- (1) Remove six screws from auxiliary panel.
- (2) Lift auxiliary panel from auxiliary panel housing outward to gain access.
- (3) Disconnect connector P906 from blackout override switch.
- (4) Set multimeter to volts dc.
- (5) Connect positive (+) probe of multimeter to connector P906-5.
- (6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (7) If 12 vdc is not present, go to step 3 of this fault.

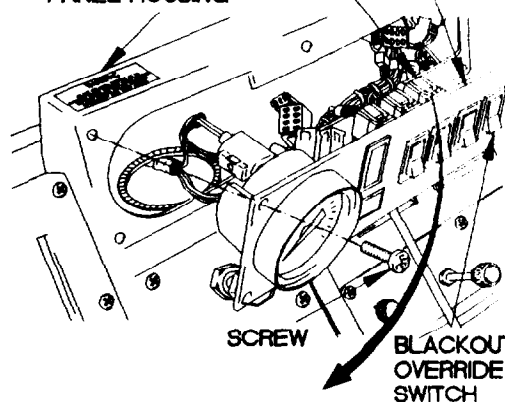
STEERING WHEEL
REMOVED FOR
CLARITY



CONNECTOR P906

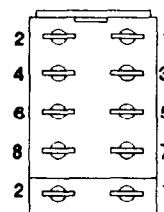
AUXILIARY
INSTRUMENT
PANEL

AUXILIARY INSTRUMENT
PANEL HOUSING



SCREW

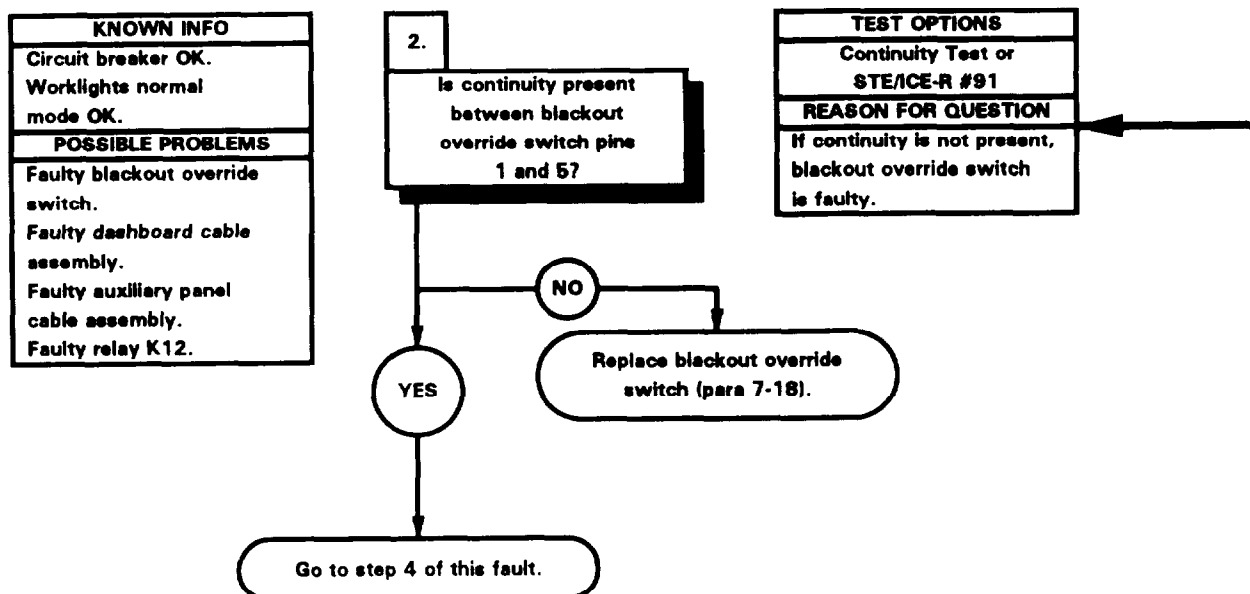
BLACKOUT
OVERRIDE
SWITCH



P906

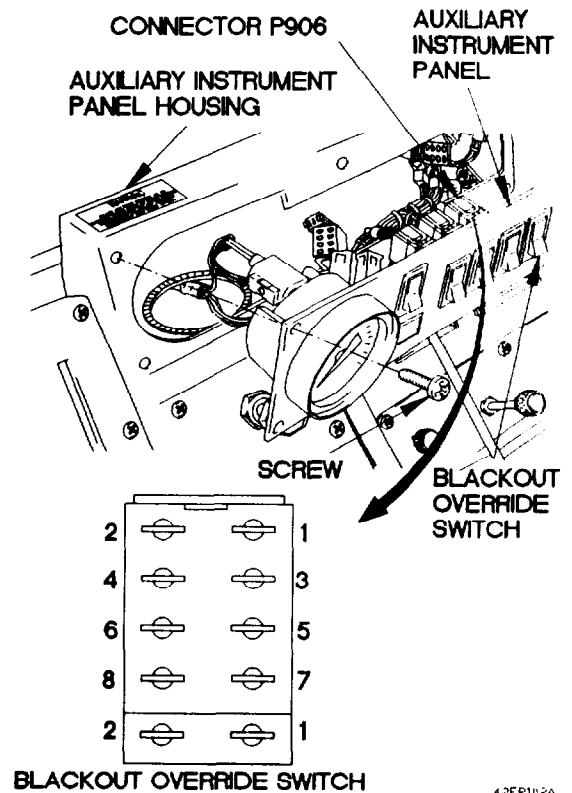
42CP(11)4

e151. M1088/M1089 WORKLIGHTS DO NOT ILLUMINATE IN BLACKOUT MODE WITH BLACKOUT OVERRIDE SWITCH ON (CONT)



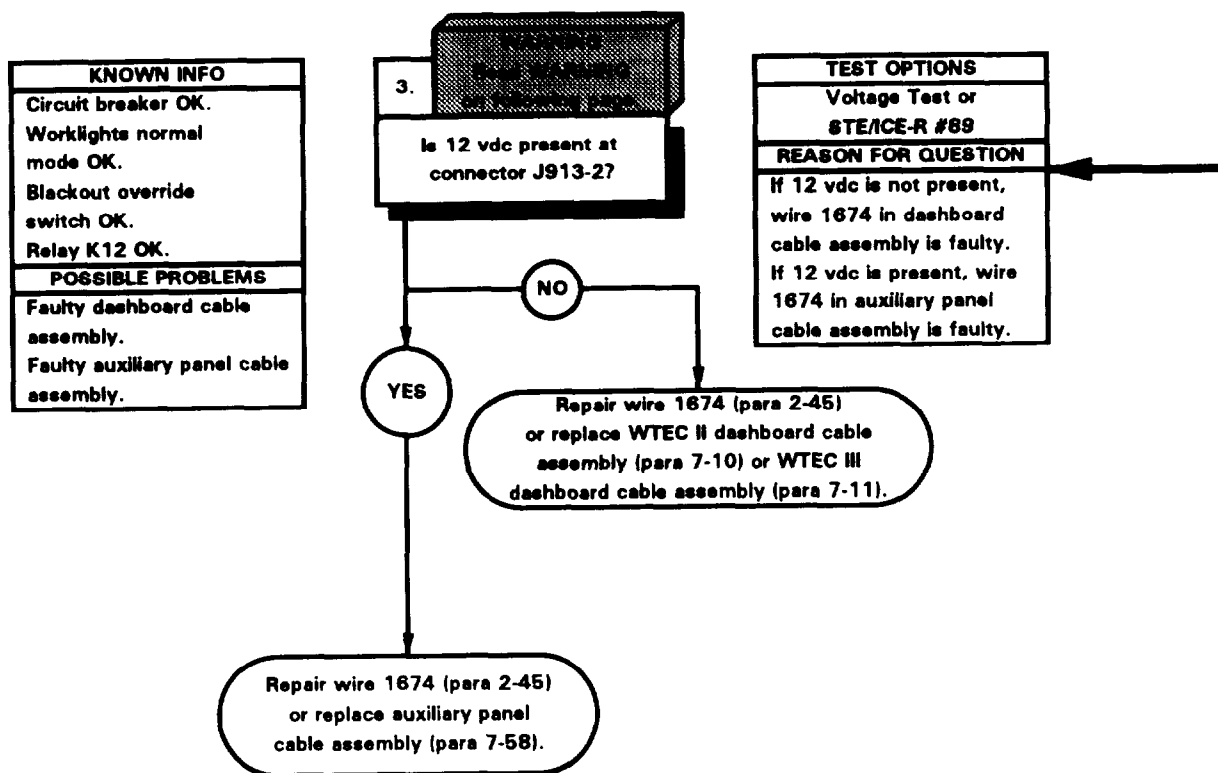
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Position blackout override switch to on.
- (3) Connect positive (+) probe of multimeter to blackout override switch pin 5.
- (4) Connect negative (-) probe of multimeter to blackout override switch pin 1 and note reading on multimeter.
- (5) If continuity is not present, replace blackout override switch (para 7-18).
- (6) If continuity is present, go to step 4 of this fault.
- (7) Position blackout override switch to off.



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e151. M1088/M1089 WORKLIGHTS DO NOT ILLUMINATE IN BLACKOUT MODE WITH BLACKOUT OVERRIDE SWITCH ON (CONT)

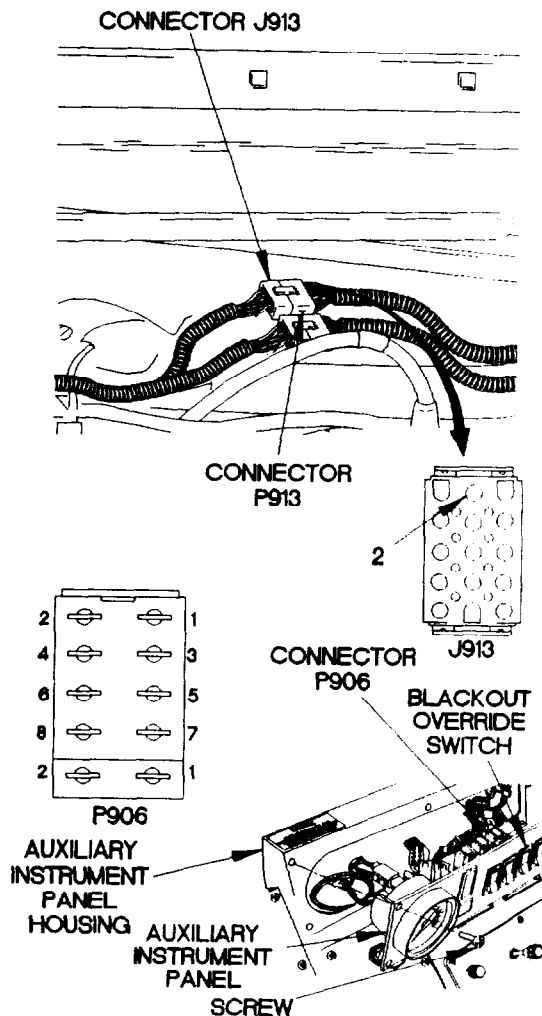


WARNING

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

VOLTAGE TEST

- (1) Remove personnel heater to gain access (para 18-9).
- (2) Disconnect connector P913 from connector J913.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to connector J913-2.
- (5) Connect negative (-) probe of multimeter to ground.
- (6) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
- (7) If 12 vdc is not present, repair wire 1674 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (8) If 12 vdc is present, repair wire 1674 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
- (9) Position master power switch to off (TM 9-2320-366-10-1).
- (10) Connect connector P913 to connector J913.
- (11) Install personnel heater (para 18-9).
- (12) Connect connector P906 to blackout override switch.
- (13) Position auxiliary panel on auxiliary panel housing with six screws.
- (14) Tighten six screws to 24 lb-in. (3 N·m).

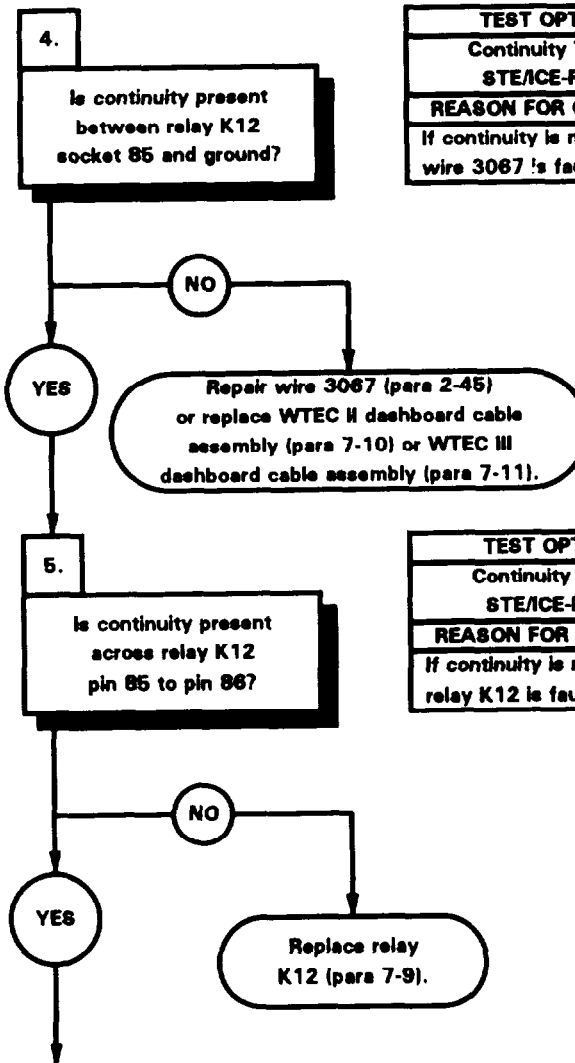


42EP103A

e151. M1088/M1089 WORKLIGHTS DO NOT ILLUMINATE IN BLACKOUT MODE WITH BLACKOUT OVERRIDE SWITCH ON (CONT)

KNOWN INFO
Circuit breaker OK. Worklights normal mode OK. Blackout override switch OK.
POSSIBLE PROBLEMS
Faulty dashboard cable assembly. Faulty auxiliary panel cable assembly. Faulty relay K12.

KNOWN INFO
Circuit breaker OK. Worklights normal mode OK. Blackout override switch OK.
POSSIBLE PROBLEMS
Faulty relay K12. Faulty dashboard cable assembly. Faulty auxiliary panel cable assembly.



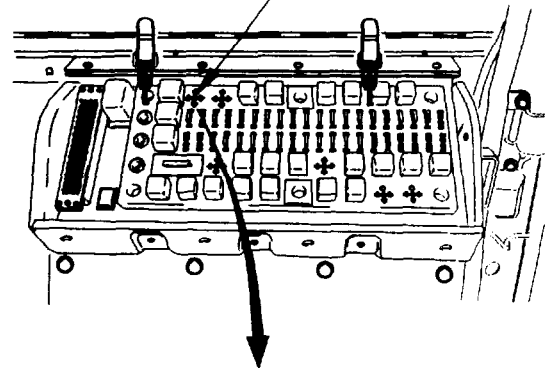
TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3067 is faulty.

TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, relay K12 is faulty.

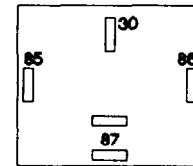
CONTINUITY TEST

- (1) Remove PDP cover (para 16-2).
- (2) Remove relay K12 from PDP.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to relay K12 socket 85.
- (5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (6) If continuity is not present, repair wire 3067 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).

RELAY K12 CAVITY



RELAY K12 CAVITY

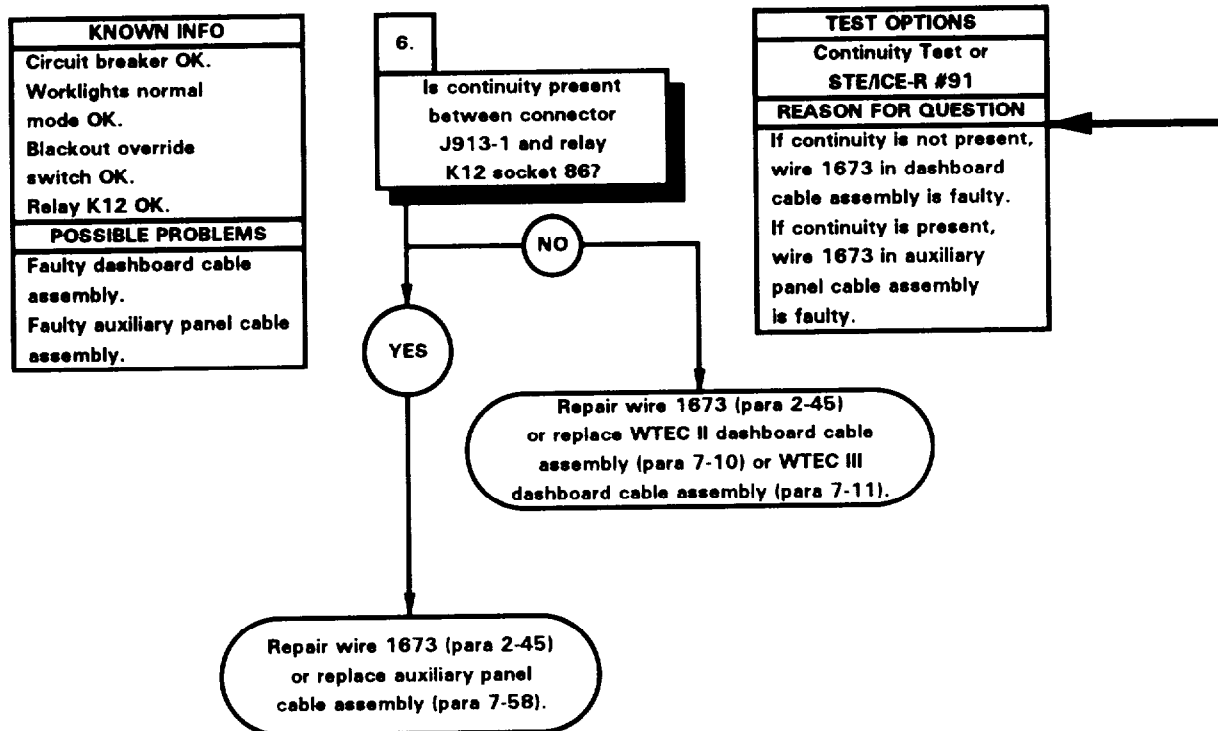


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CONTINUITY TEST

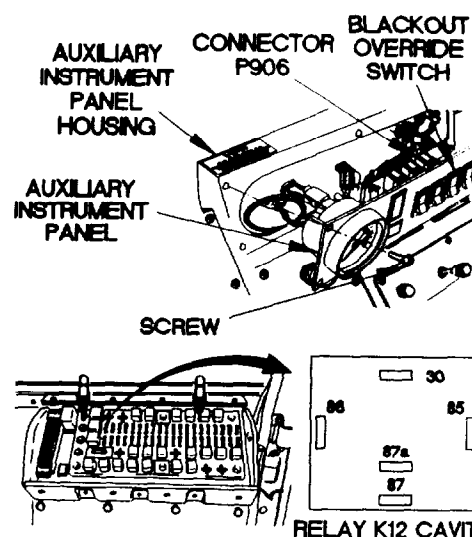
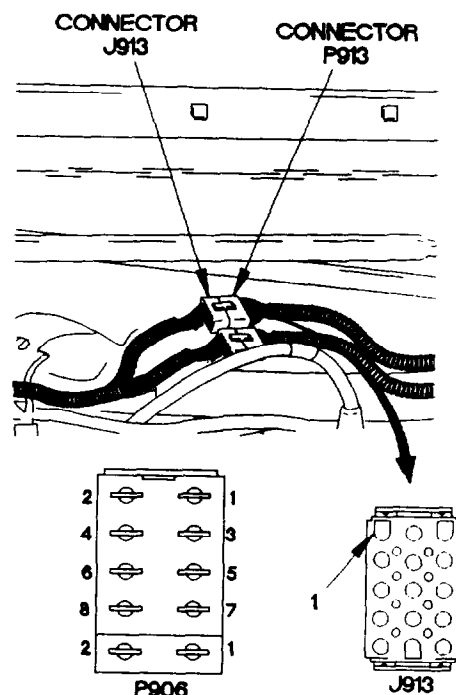
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to relay K12 pin 85.
- (3) Connect negative (-) probe of multimeter to relay K12 pin 86 and note reading on multimeter.
- (4) If continuity is not present, replace relay K12 (para 7-9).

e151. M1088/M1089 WORKLIGHTS DO NOT ILLUMINATE IN BLACKOUT MODE WITH BLACKOUT OVERRIDE SWITCH ON (CONT)



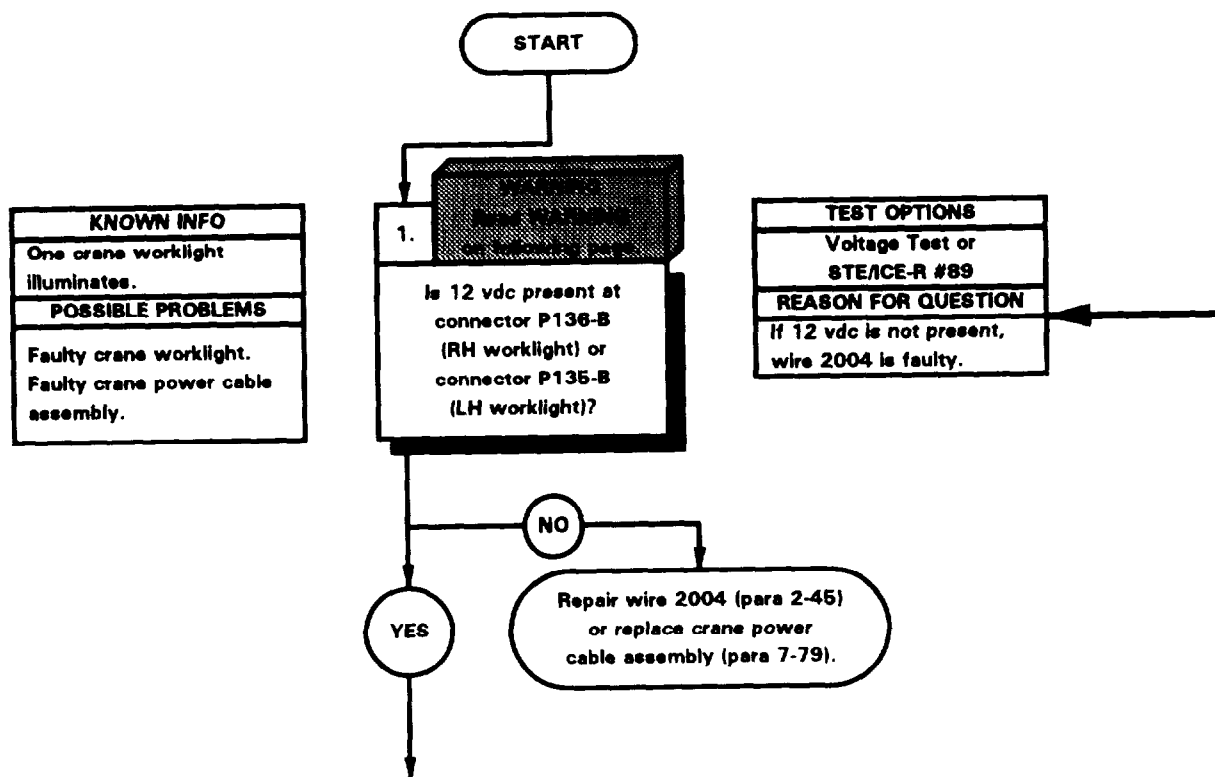
VOLTAGE TEST

- (1) Remove personnel heater to gain access (para 18-9).
- (2) Disconnect connector P913 from connector J913.
- (3) Set multimeter to ohms.
- (4) Connect positive (+) probe of multimeter to connector J913-1.
- (5) Connect negative (-) probe of multimeter to PDP, relay K12 socket 86 and note reading on multimeter.
- (6) If continuity is not present, repair wire 1673 (para 2-45) or replace WTEC II dashboard cable assembly (para 7-10) or WTEC III dashboard cable assembly (para 7-11).
- (7) If continuity is present, repair wire 1673 (para 2-45) or replace auxiliary panel cable assembly (para 7-58).
- (8) Connect connector P913 to connector J913.
- (9) Install relay K12 in PDP.
- (10) Install personnel heater (para 18-9).
- (11) Connect connector P906 to blackout override switch.
- (12) Position auxiliary panel on auxiliary panel housing with six screws.
- (13) Tighten six screws to 24 lb-in. (3 N-m).



42EP105A

e152. M1084/M1086 WORKLIGHTS DO NOT ILLUMINATE	
INITIAL SETUP	
Equipment Condition Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) STE/CE-R (Item 41, Appendix C) Multimeter, Digital (Item 22, Appendix C)
Personnel Required (2)	References TM 9-4910-571-12&P
Materials/Parts Wire, Elect, 50 ft (Item 71, Appendix D)	

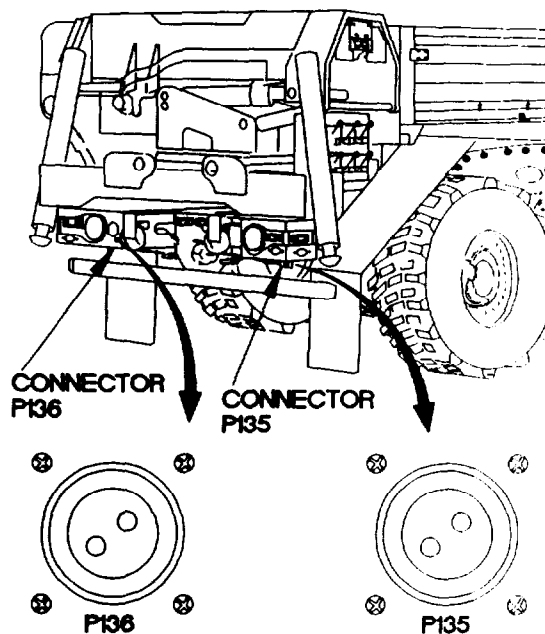


WARNING

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

VOLTAGE TEST

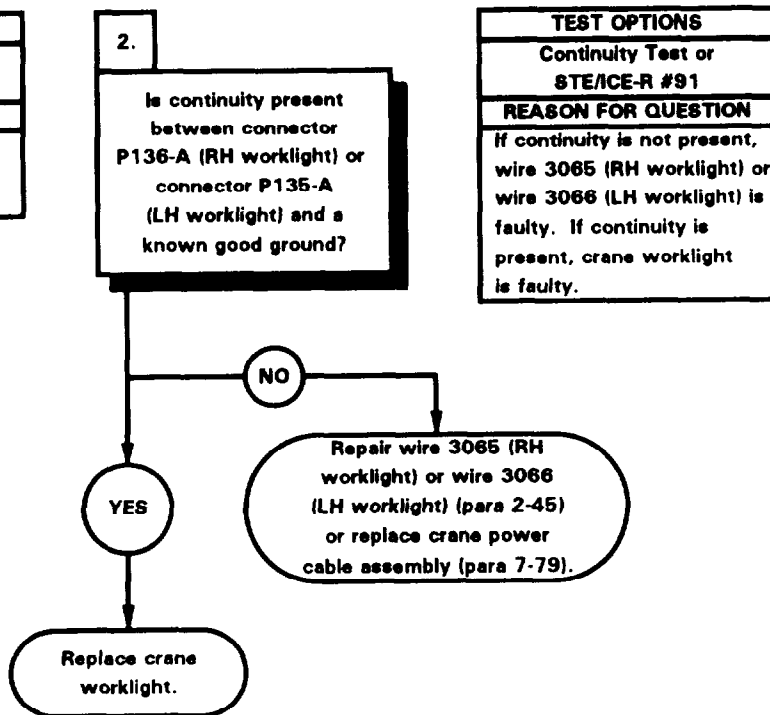
- (1) Disconnect connector P136 (RH worklight) or P135 (LH worklight).
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector P136-B (RH) or P135-B (LH).
- (4) Connect negative (-) probe of multimeter to ground.
- (5) Position master power switch to on (TM 9-2320-366-10-1) and note reading on multimeter.
- (6) If 12 vdc is not present, repair wire 2004 (para 2-45) or replace crane power cable assembly (para 7-79).
- (7) Position master power switch to off (TM 9-2320-366-10-1).



X2E1361-

6152. M1084/M1086 WORKLIGHTS DO NOT ILLUMINATE (CONT)

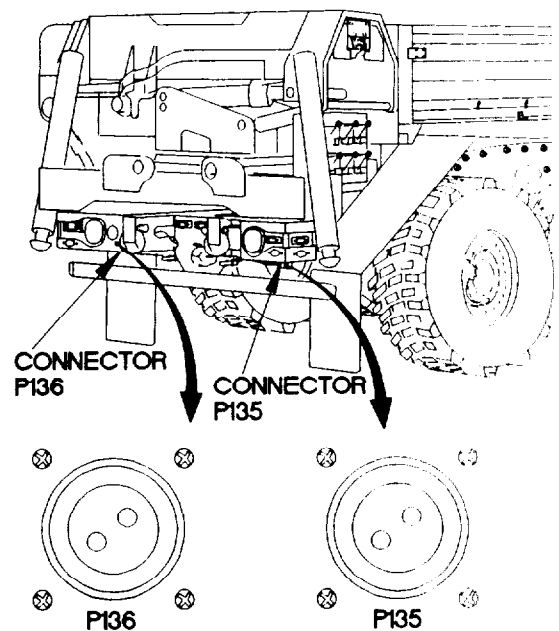
KNOWN INFO
One crane worklight illuminates.
POSSIBLE PROBLEMS
Faulty crane power cable assembly.
Faulty crane worklight.



TEST OPTIONS
Continuity Test or STE/ICE-R #91
REASON FOR QUESTION
If continuity is not present, wire 3065 (RH worklight) or wire 3066 (LH worklight) is faulty. If continuity is present, crane worklight is faulty.

CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to (RH) connector P136-A or (LH) connector P135-A.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) If continuity is not present, repair wire 3065 (RH) or wire 3066 (LH) (para 2-45) or replace crane power cable assembly (para 7-79).
- (5) If continuity is present, replace crane worklight.
- (6) Connect connector P136 (RH) or P135 (LH) crane worklight connector.



X2E17eC -

2-17. TRANSMISSION SYSTEM TROUBLESHOOTING

This paragraph covers Transmission System Troubleshooting. The Transmission System Fault Index, Table 2-18, lists faults for the transmission system of the vehicle.

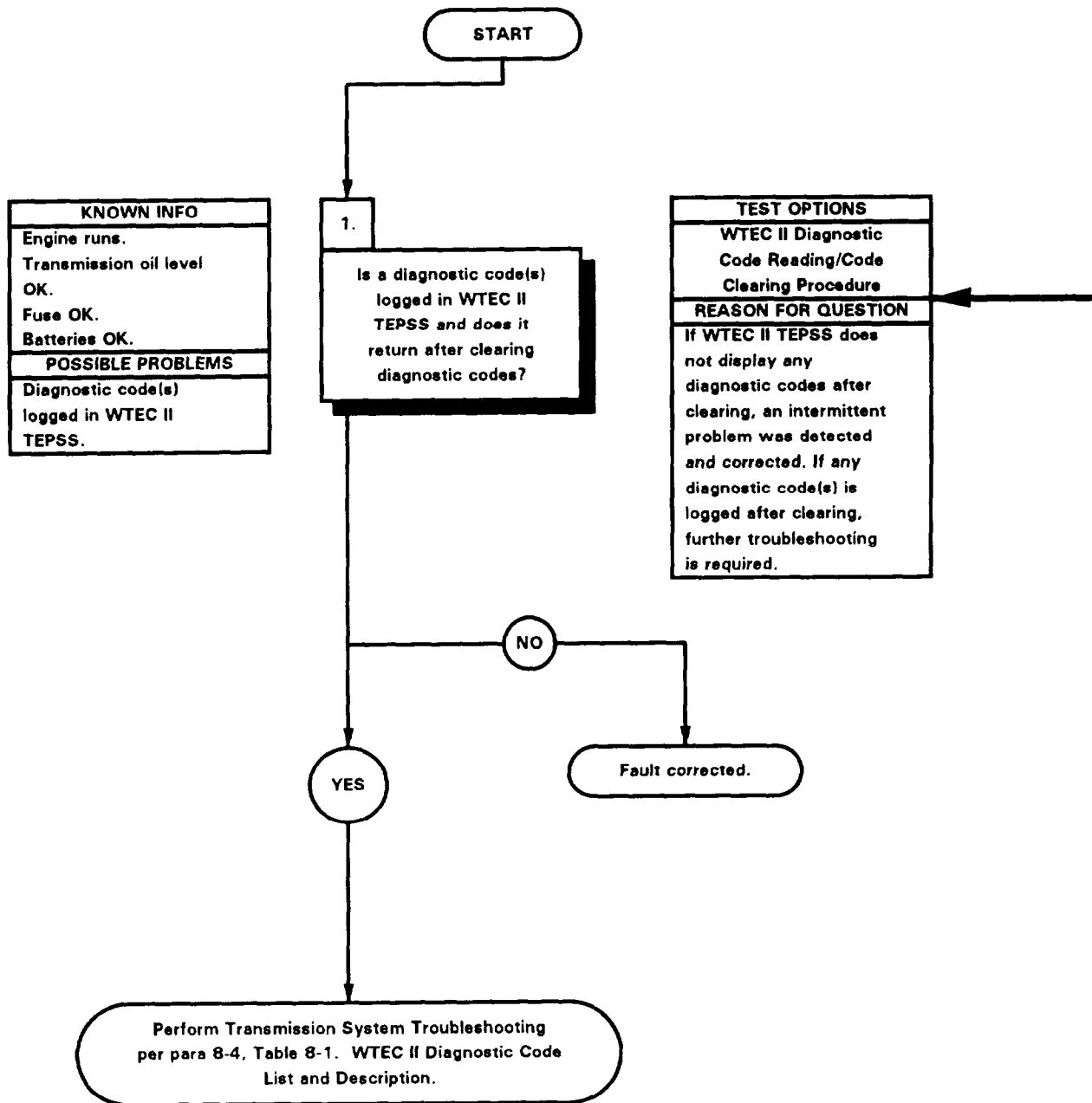
Table 2-18. Transmission System Fault Index

Fault No.	Description	Page
f1.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Emits Eight Seconds of Beeps and/or Transmission Does Not Shift Gears	2-1584
f2.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 14	2-1586
f3.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 15	2-1594
f4.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 22 Sub Code 16	2-1600
f5.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 24 and/or 33 and Any Sub Code	2-1606
f6.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 32 and Any Sub Code	2-1620
f7.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 41, 42, 44, and/or 45 and Any Sub Code	2-1624
f8.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 43 and Any Sub Code	2-1628
f9.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 52 and Any Sub Code	2-1634
f10.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 57 and Any Sub Code	2-1640
f11.	Transmission Unusually Noisy When Operating	2-1644
f12.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 21 and Any Sub Code	2-1654
f13.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code Sub Code 10, 12, 21, 43, 45, or 65	2-1668
f14.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 25 and Any Sub Code	2-1672
f15.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 53 and Any Sub Code	2-1676
f16.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 54 Sub Code 01, 07, 10, 12, 17, 21, 23, 27, 32, 34, 43, 45, 54, 56, 65, 70, 71, 72, 80, 81, 82, 83, 85, 86, 92, 93, 95, 96, or 97	2-1680
f17.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 55 and Any Sub Code	2-1686
f18.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 56 and Any Sub Code	2-1692
f19.	WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 13 and Any Sub Code	2-1698
f20.	Metal Particles Found During Transmission Oil Change	2-1708
f21.	Transmission Does Not Shift or is Slow to Shift When Cold	2-1710
f22.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 14	2-1712

2-17. TRANSMISSION SYSTEM TROUBLESHOOTING (CONT)*Table 2-18. Transmission System Fault Index (Cont)*

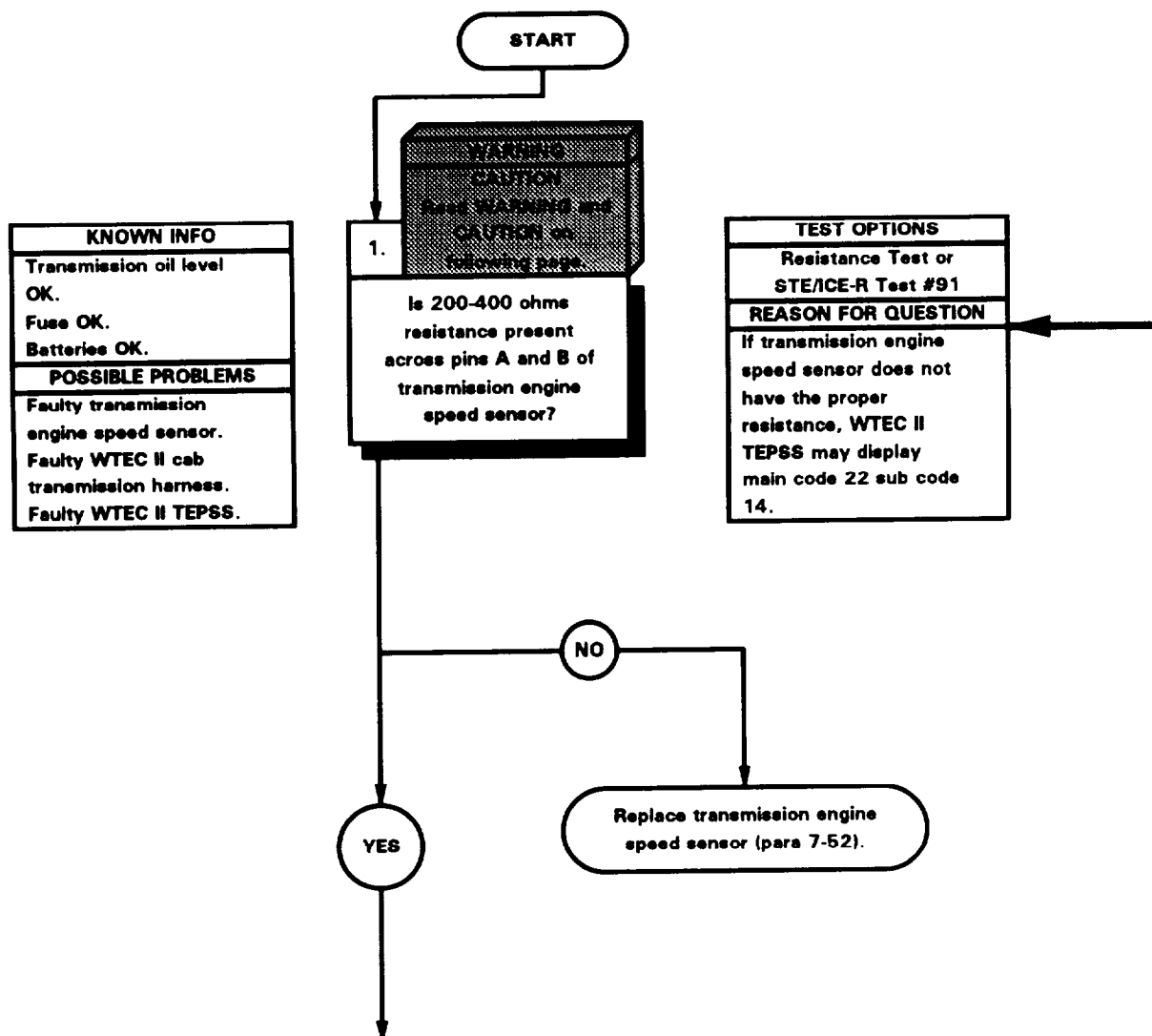
Fault No.	Description	Page
f23.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 15	2-1718
f24.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 22 Sub Code 16	2-1722
f25.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 24 and/or 33 and Any Sub Code	2-1728
f26.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 32 and Any Sub Code	2-1742
f27.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 42, 44, and/or 45 and Any Sub Code	2-1748
f28.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 52 and Any Sub Code	2-1752
f29.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 57 and Any Sub Code	2-1758
f30.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code and Any Sub Code	2-1762
f31.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 51 and Any Sub Code	2-1776
f32.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 25 and Any Sub Code	2-1780
f33.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 53 and Any Sub Code	2-1784
f34.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 54 and Any Sub Code	2-1788
f35.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 55 and Any Sub Code	2-1794
f36.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 56 and Any Sub Code	2-1800
f37.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Displays Main Code 13 and Any Sub Code	2-1806
f38.	WTEC III Transmission Pushbutton Shift Selector (TPSS) Indicator Displays "--" and/or Transmission Does Not Shift Gears	2-1820

f1. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) EMITS EIGHT SECONDS OF BEEPS AND/OR TRANSMISSION DOES NOT SHIFT GEARS
INITIAL SETUP Equipment Conditions Engine running (TM 9-2320-366-10-1).



- 
- (1) Perform WTEC II Code Reading and Code Clearing (para 8-4).
 - (2) If no diagnostic codes are logged after clearing, fault is corrected.
 - (3) If diagnostic codes are still logged, perform Transmission System Troubleshooting of active diagnostic codes per para 8-4, Table 8-1. WTEC II Diagnostic Code List and Description.

12. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 14	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Goggles, Industrial (Item 15, Appendix C) Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C) STE/ICE-R (Item 41, Appendix C)
References TM 9-4910-571-12&P	



RESISTANCE TEST

WARNING

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

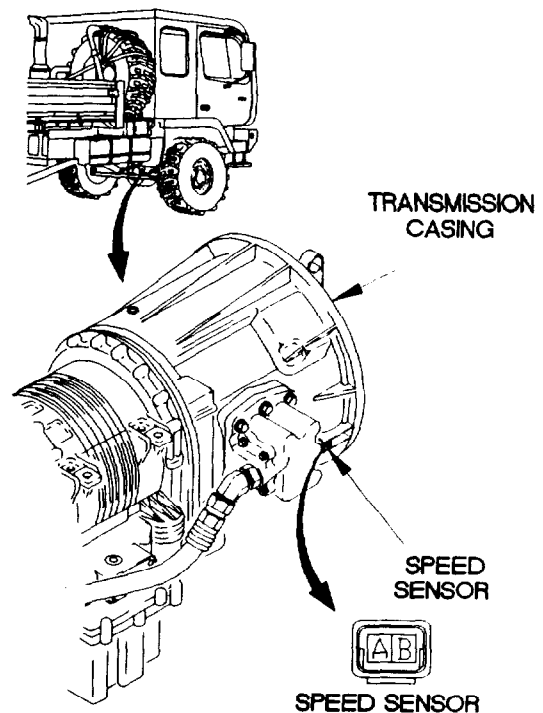
- (1) Disconnect transmission engine speed sensor connector from transmission engine speed sensor.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to terminal A of transmission engine speed sensor.
- (4) Connect negative (-) probe of multimeter to terminal B of transmission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

NOTE

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

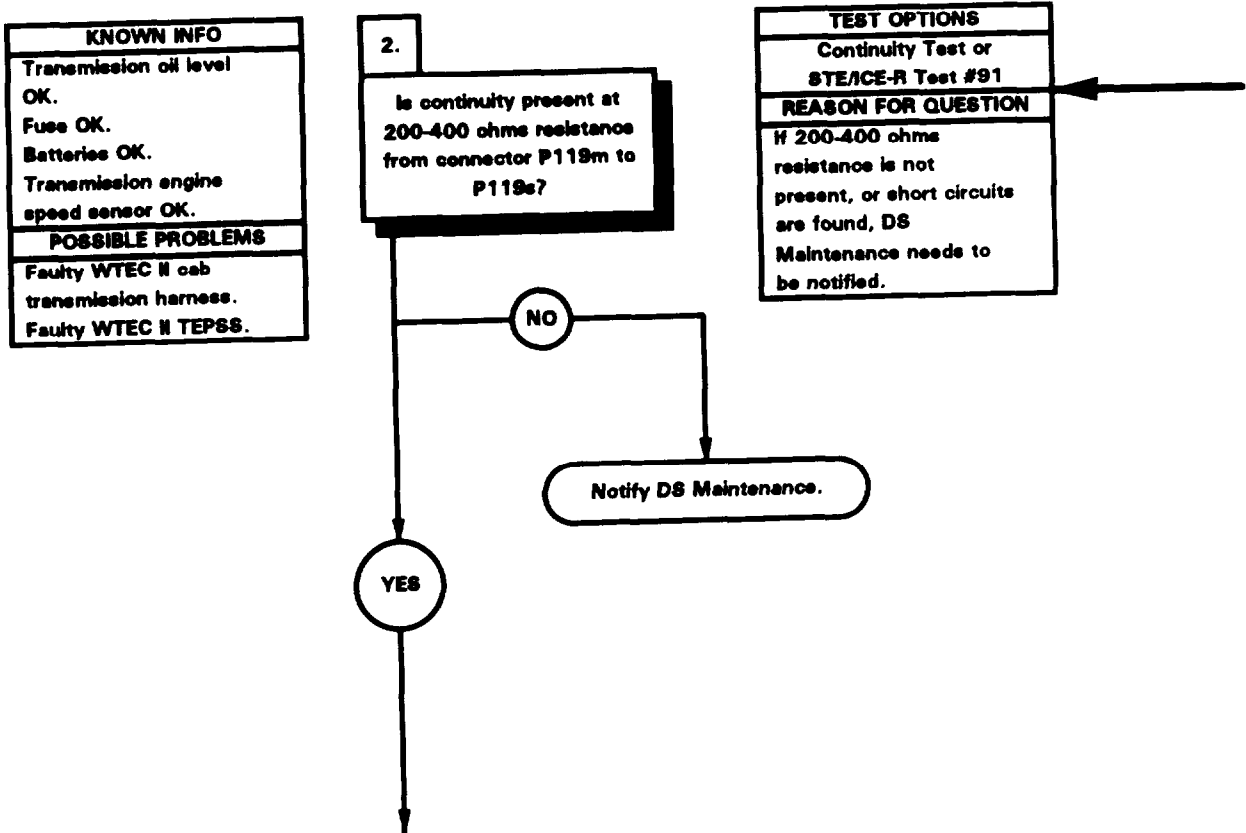
- a. 200 ohms at -40°F (-40°C).
- b. 300 ohms at 68°F (20°C).
- c. 400 ohms at 230°F (110°C).

- (5) If resistance is not 200-400 ohms, replace transmission engine speed sensor (para 7-52).
- (6) Connect transmission engine speed sensor connector to transmission engine speed sensor.



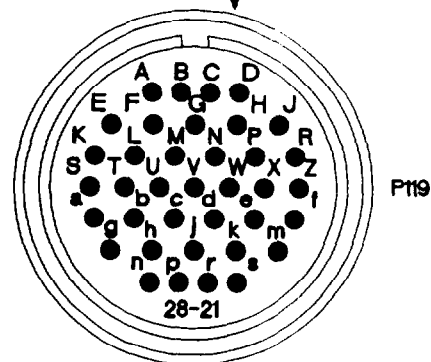
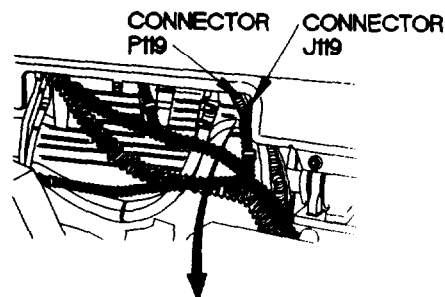
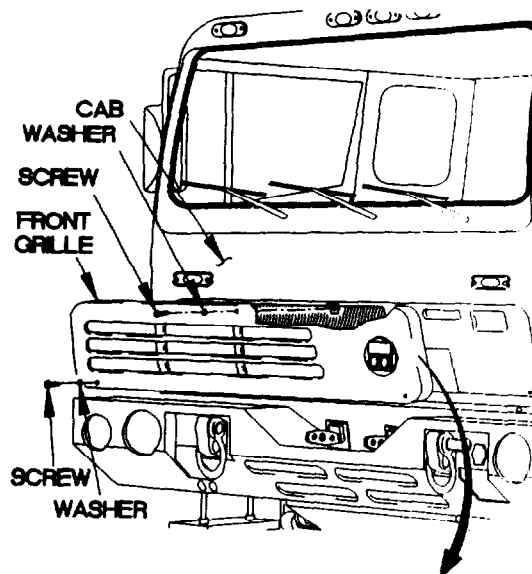
(2F010)4

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



CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Set multimeter to ohms.
- (6) Connect positive (+) probe of multimeter to connector P119m.
- (7) Connect negative (-) probe of multimeter to connector P119e 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 continuity is not present, at 200-400 ohms resistance in step 7, or continuity is present in step 8 or step 9, notify DS Maintenance.



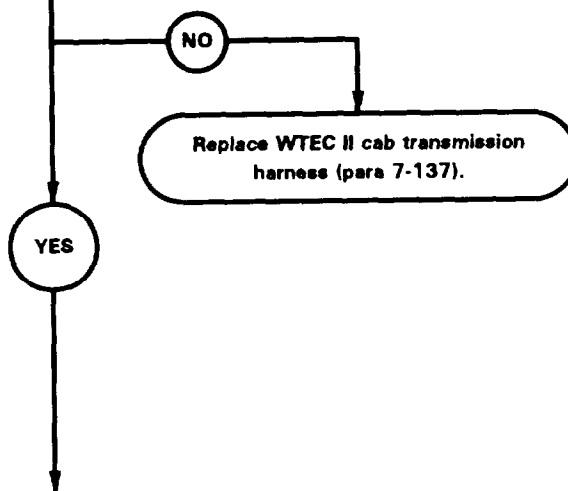
ACF0102A

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

KNOWN INFO
Transmission oil level OK.
Fuse OK.
Batteries OK.
Transmission engine speed sensor OK.
POSSIBLE PROBLEMS
Faulty WTEC II cab transmission harness.
Faulty WTEC II TEPSS.

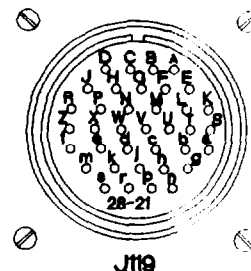
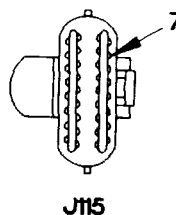
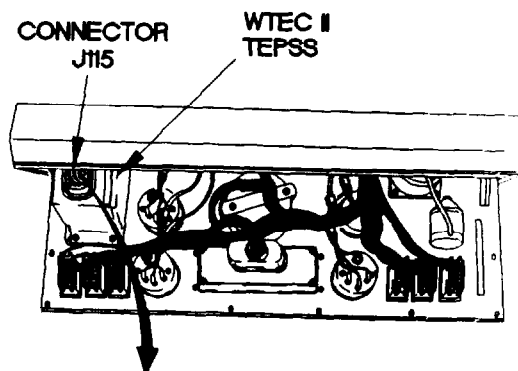
3.
Is continuity present from connector J119m to connector J115-7?

TEST OPTIONS
Continuity Test or STE/CE-R Test #91
REASON FOR QUESTION
If continuity is not present, or short circuits are found, WTEC II cab transmission harness is faulty.



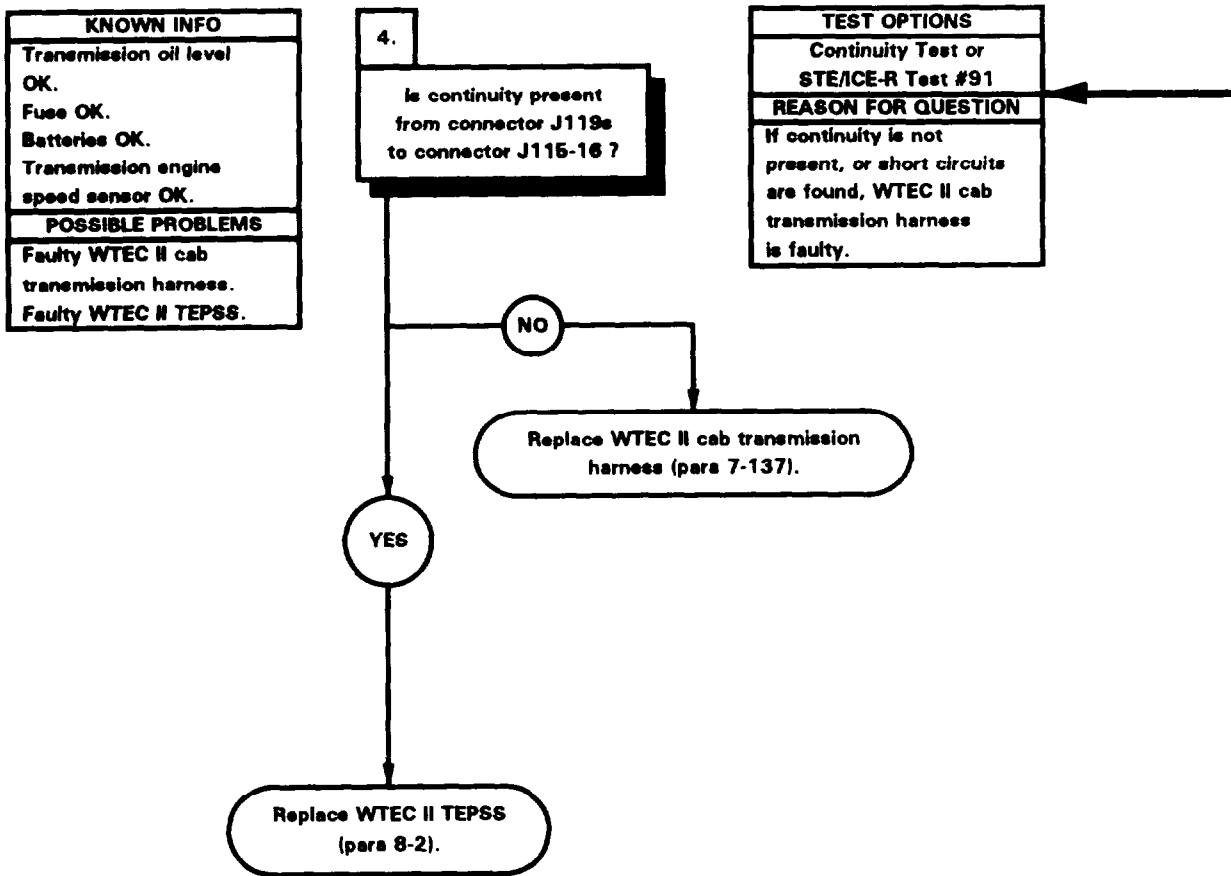
CONTINUITY TEST

- (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 J115-7.
- (5) Connect negative (-) probe of multimeter to connector J119m and note reading on multimeter.
- (6) Connect negative (-) probe of multimeter to all other sockets in connector J119m and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground to and note reading on multimeter.
- (8) If continuity is not present in step 5, or continuity is present in step 6 or step 7, replace WTEC II cab transmission harness (para 7-137).



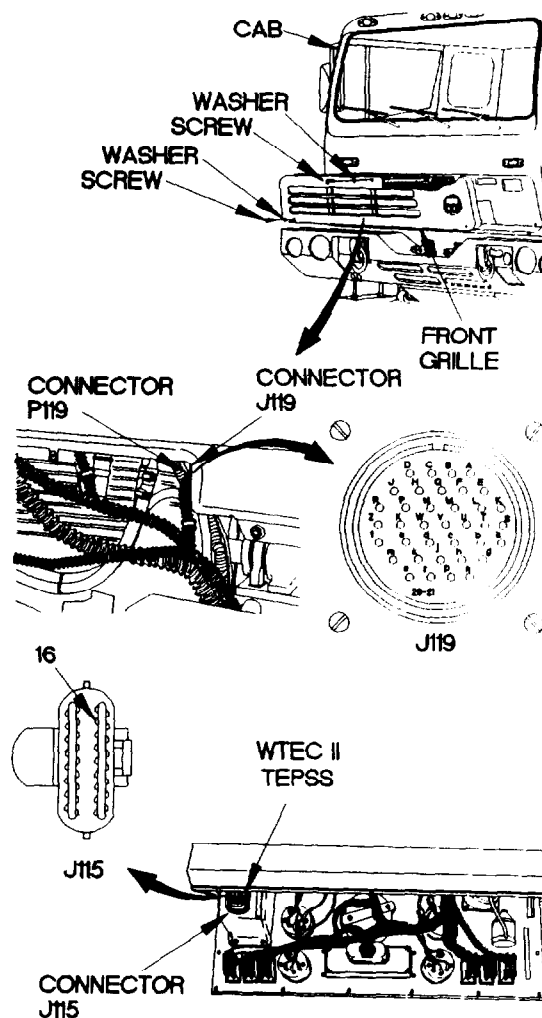
X2F02031

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



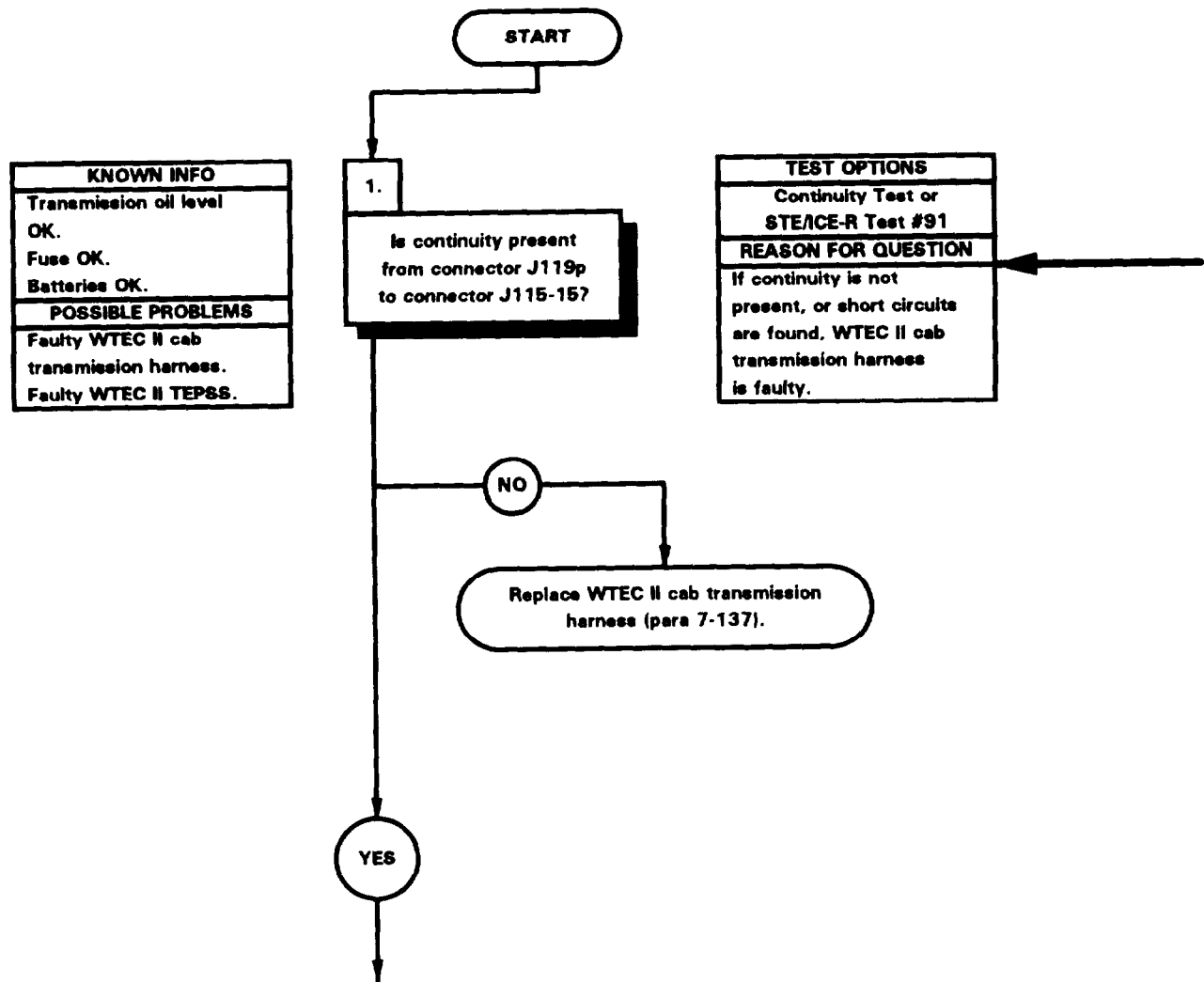
CONTINUITY TEST

- (1) Set multimeter to ohms position.
- (2) Connect positive (+) probe of multimeter to connector J115-16.
- (3) Connect negative (-) probe of multimeter to connector J119s and note reading on multimeter.
- (4) Connect negative (-) probe of multimeter to all other sockets in connector J119 and note reading on multimeter.
- (5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (6) If continuity is not present in step 3, or continuity is present in step 4 or step 5, replace WTEC II cab transmission harness (para 7-137).
- (7) If continuity is present in step 3 and no shorts circuits are found, replace WTEC II TEPSS (para 8-2).
- (8) Connect connector J115 to WTEC II TEPSS.
- (9) Install instrument panel assembly (para 7-15).
- (10) Connect connector P119 to connector J119.
- (11) Position front grille on cab with washer and screw.
- (12) Position two washers and screws in front grille.
- (13) Tighten screw to 48-60 lb-in. (5-7 N-m).
- (14) Tighten two screws to 24 lb-in. (3 N-m).
- (15) Clear diagnostic codes (para 8-4).



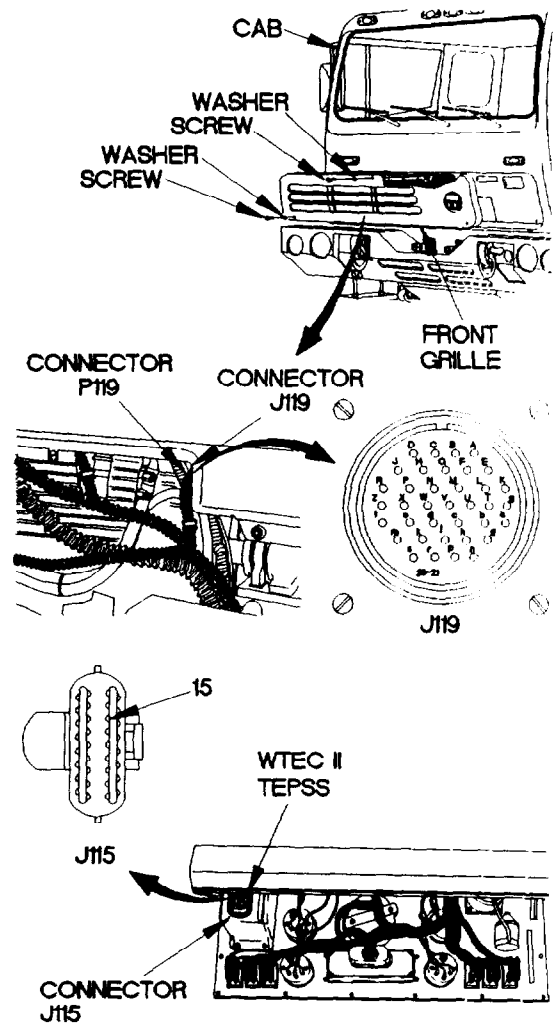
72F02141

13. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS	
MAIN CODE 22 SUB CODE 15	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C) STE/CE-R (Item 41, Appendix C)
References TM 9-4910-571-12&P	



CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Remove instrument panel assembly for access (para 7-15).
- (6) Disconnect connector J115 (top connector) from WTEC II TEPSS.
- (7) Set multimeter to ohms.
- (8) Connect positive (+) probe of multimeter to connector J115-15.
- (9) Connect negative (-) probe of multimeter to connector J119p and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to all other sockets in connector J119 and note reading on multimeter.
- (11) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (12) If continuity is not present in step 9, or continuity is present in step 10 or step 11, replace WTEC II cab transmission harness (para 7-137).



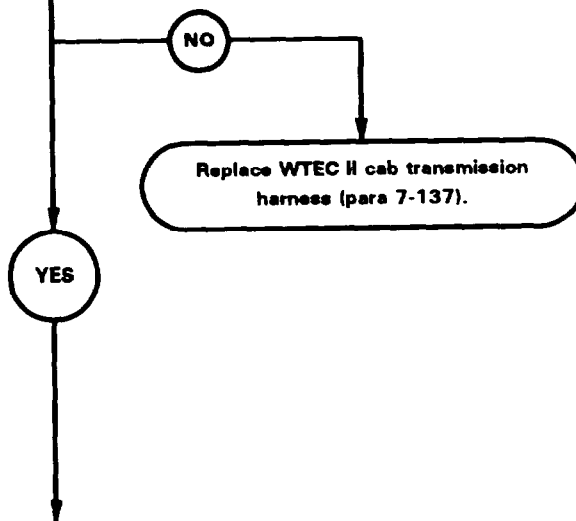
X2F03011

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

KNOWN INFO
Transmission oil level OK.
Fuse OK.
Batteries OK.
POSSIBLE PROBLEMS
Faulty WTEC II cab transmission harness.
Faulty WTEC II TEPSS.

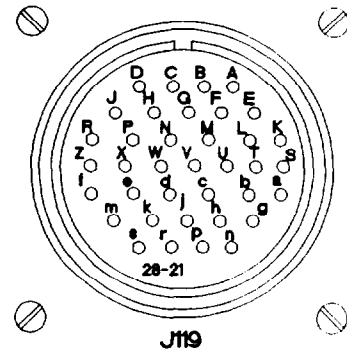
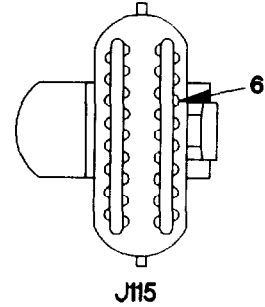
2.
Is continuity present from connector J118r to connector J115-87

TEST OPTIONS
Continuity Test or STE/CE-R Test #91
REASON FOR QUESTION
If continuity is not present, or short circuits are found, WTEC II cab transmission harness is faulty.



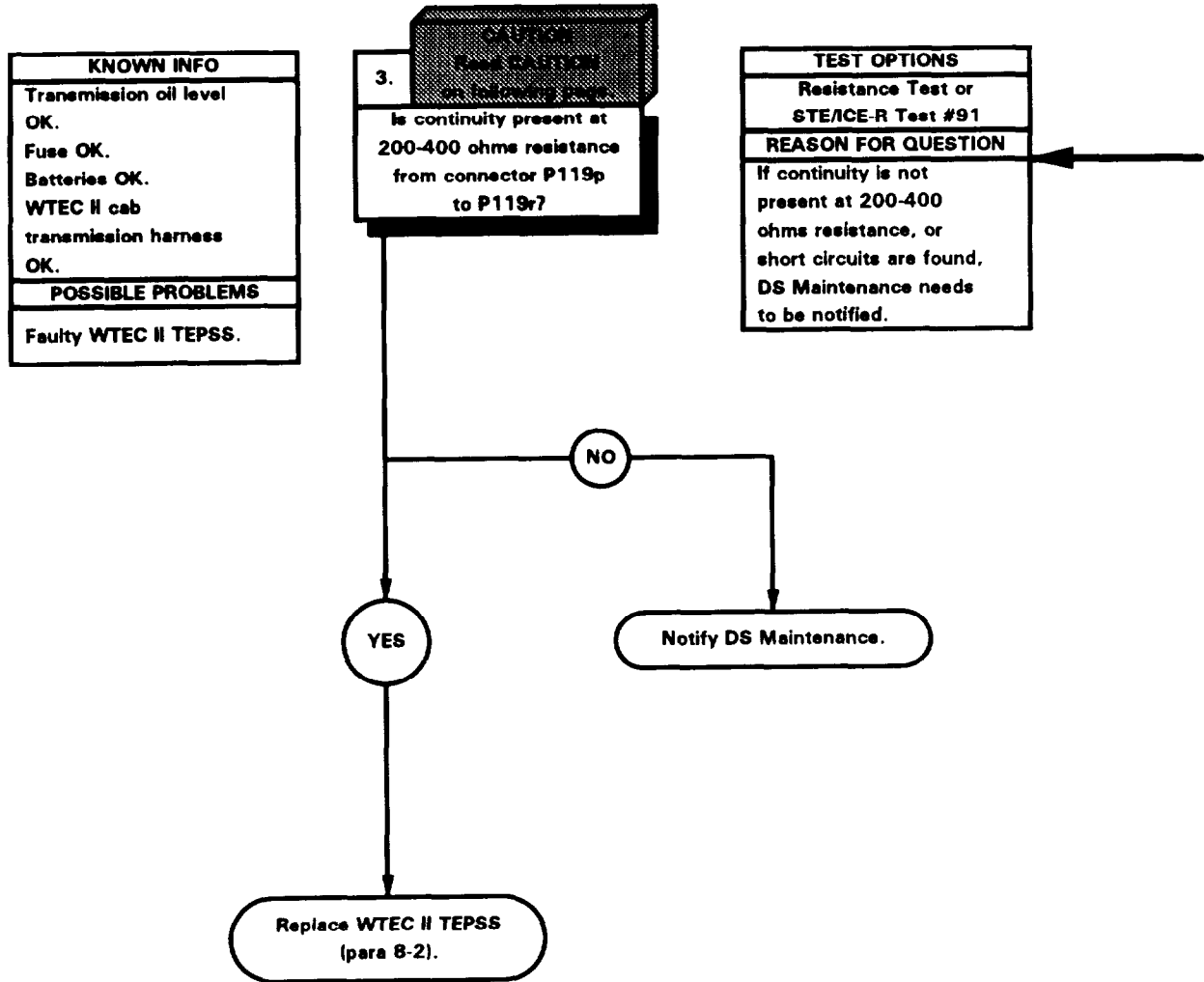
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector J115-6.
- (3) Connect negative (-) probe of multimeter to connector J119r 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 H cab transmission harness (para 7-137).



X2F0202A

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



RESISTANCE TEST

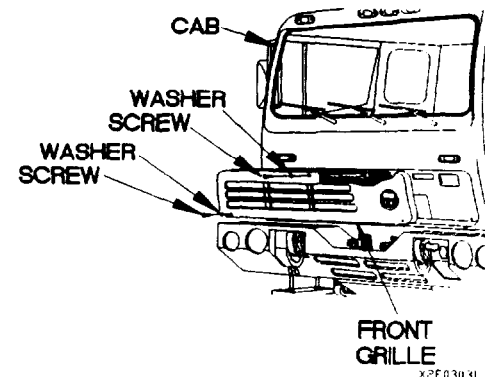
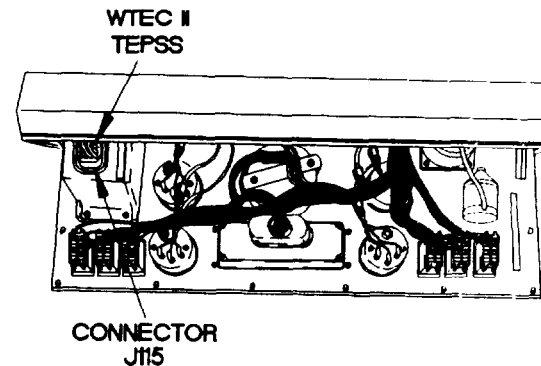
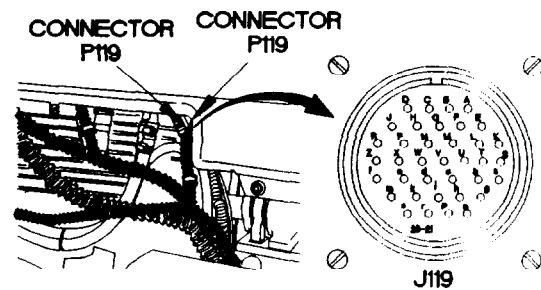
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119p.
- (3) Connect negative (-) probe of multimeter to connector P119r and note reading on multimeter.

NOTE

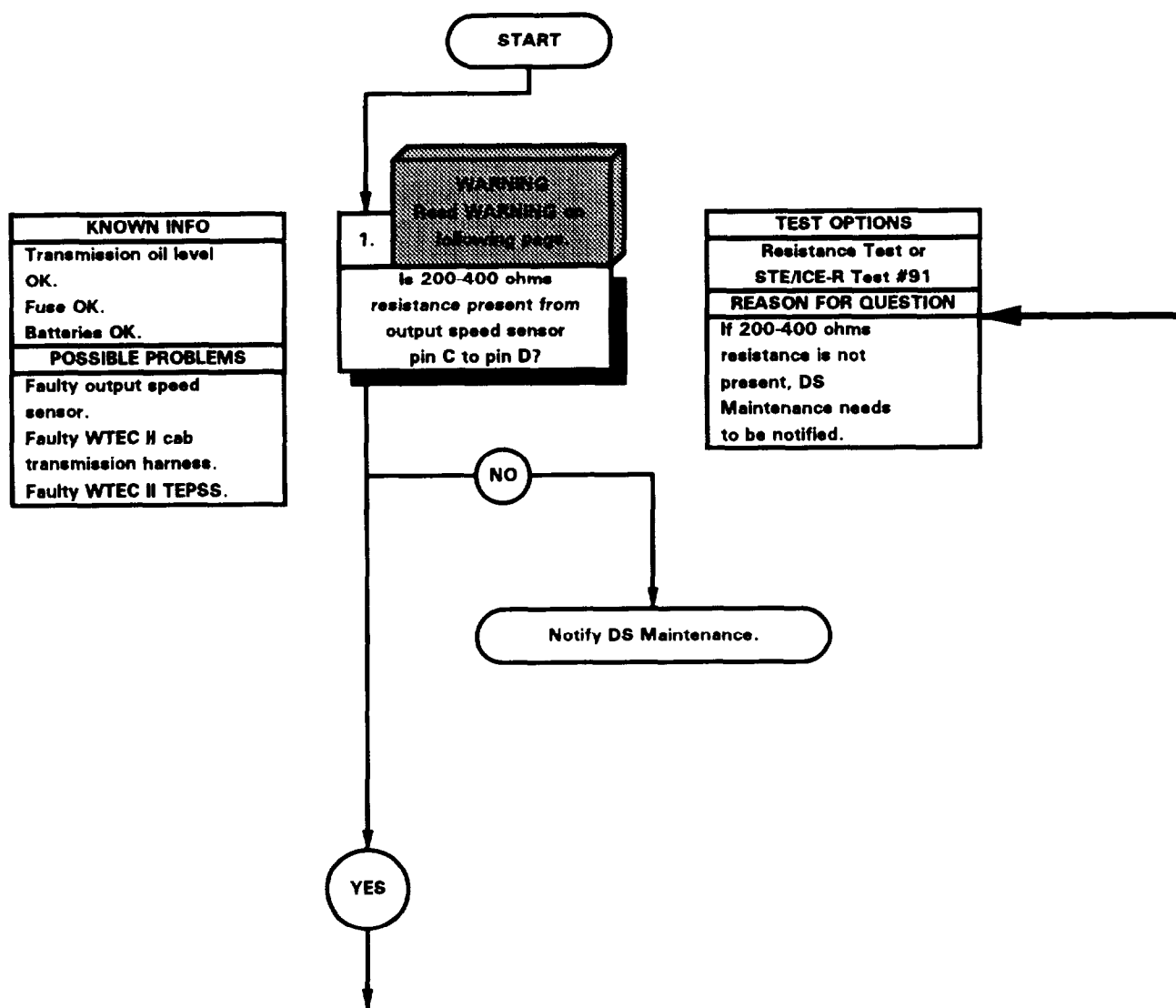
A good turbine speed sensor will return a reading of 200-400 ohms resistance as follows:

- a. 200 ohms at -40°F (-40°C).
- b. 300 ohms at 68°F (20°C).
- c. 400 ohms at 230°F (110°C).

- (5) Connect negative (-) probe of multimeter to all other pins in connector P119 and note reading on multimeter.
- (6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (7) If good resistance is not noted in step 4, or continuity is present in step 5 or step 6, notify DS Maintenance. If good resistance is noted 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).



14. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 22 SUB CODE 16	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Goggles, Industrial (Item 15, Appendix C) Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B) STE/ICE-R (Item 41, Appendix C)
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.

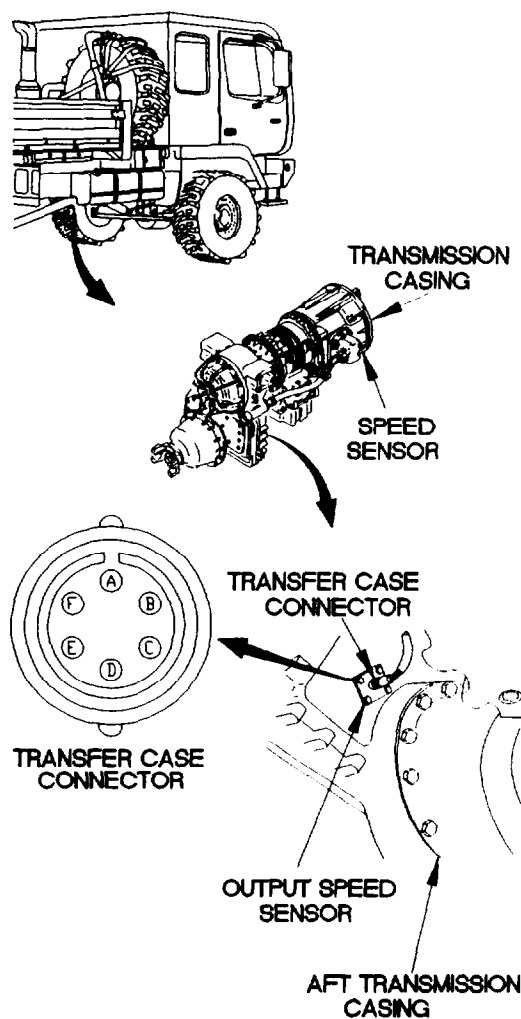
RESISTANCE TEST

- (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:

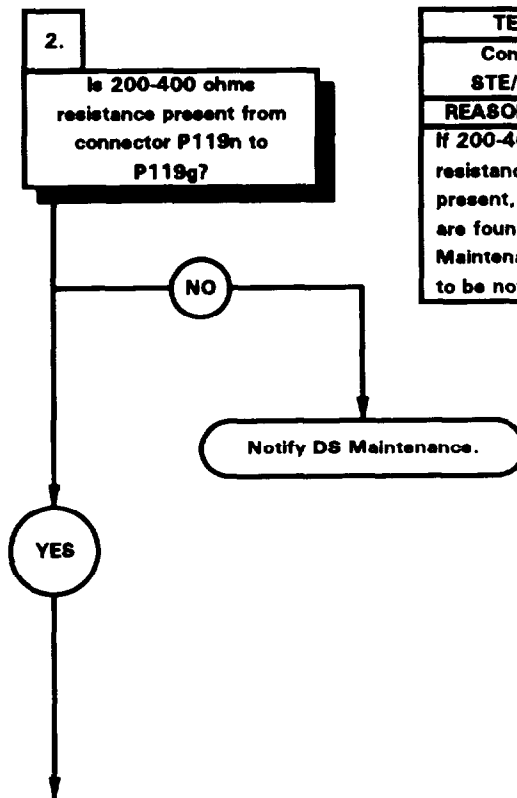
- a. 200 ohms at -40°F (-40°C)
 - b. 300 ohms at 68°F (20°C)
 - c. 400 ohms at 230°F (110°C)
- (4) Connect negative (-) probe of multimeter to pin D of transfer case connector and note reading on multimeter.
 - (5) If good resistance is not noted, notify DS Maintenance.
 - (6) Connect output speed sensor connector to transfer case connector.



x2f0301A

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

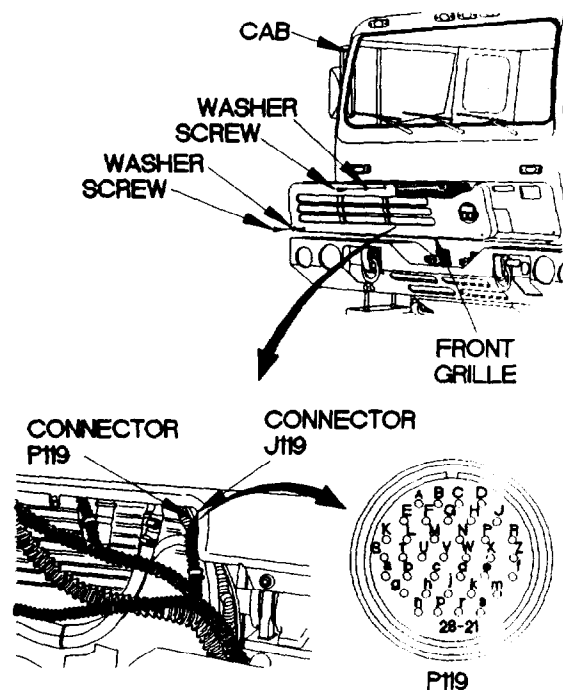
KNOWN INFO
Transmission oil level OK.
Fuse OK.
Batteries OK.
Output speed sensor OK.
POSSIBLE PROBLEMS
Faulty WTEC II cab transmission harness.
Faulty WTEC II TEPSS.



TEST OPTIONS
Continuity Test or STE/CE-R Test #91
REASON FOR QUESTION
If 200-400 ohms resistance is not present, or short circuits are found, DS Maintenance needs to be notified.

CONTINUITY TEST

- (1) Remove two screws and washers from 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 continuity 200-400 ohms resistance is not present in step 7, or continuity is present in step 8, 9, 11, or 12, notify DS Maintenance.



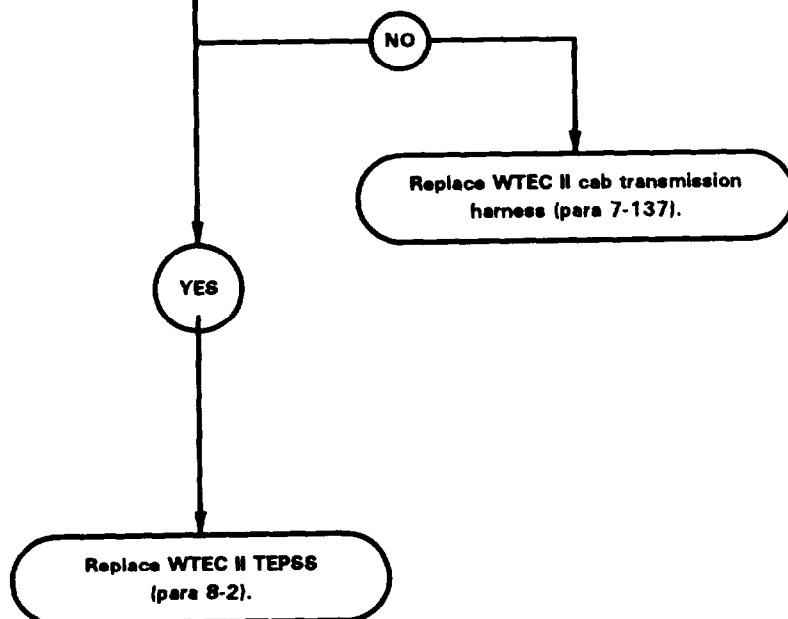
x270302A

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

KNOWN INFO
Transmission oil level OK.
Fuse OK.
Batteries OK.
Output speed sensor OK.
POSSIBLE PROBLEMS
Faulty WTEC II cab transmission harness.
Faulty WTEC II TEPSS.

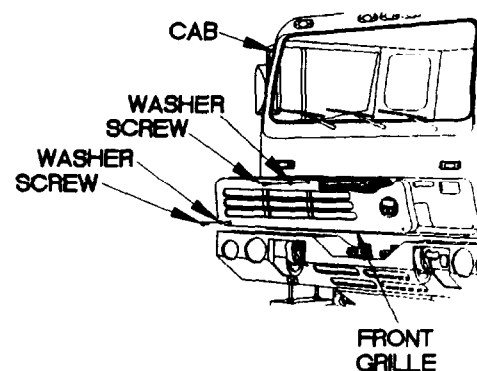
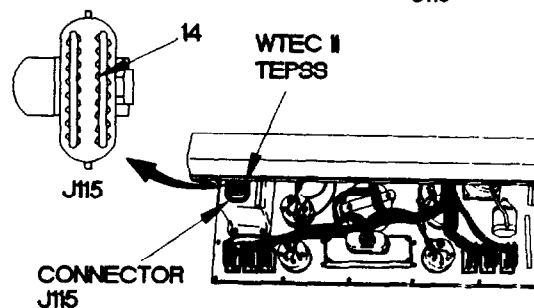
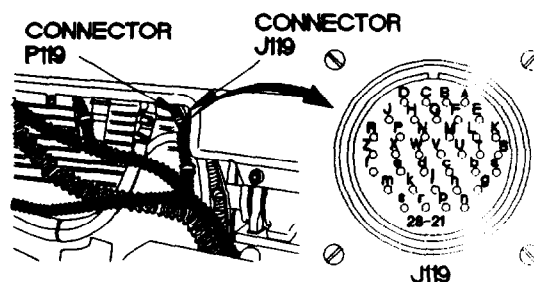
3.
Is continuity present from connector J119n and J119g to connector J115-5 and J115-14?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, or short circuits are found, WTEC II cab transmission harness is faulty. If continuity is present, and no short circuits are found, WTEC II TEPSS is faulty.



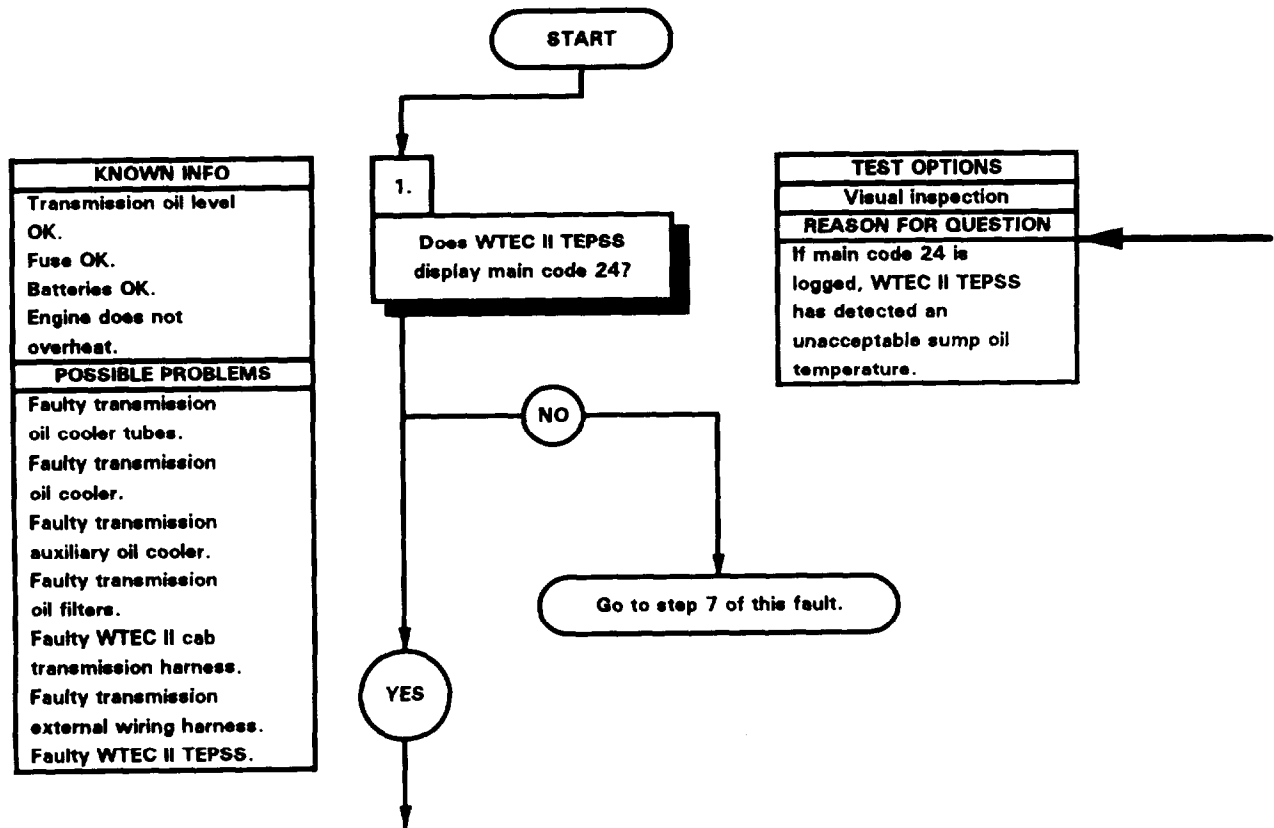
CONTINUITY TEST

- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Disconnect connector J115 (top connector) from WTEC II TEPSS.
- (3) Install jumper wire from connector J119g to J119n.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to connector J115-5.
- (6) Connect negative (-) probe of multimeter to connector J115-14 and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to all other sockets in connector J115, one at a time, and note reading on multimeter.
- (8) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (9) Connect positive (+) probe of multimeter to connector J115-14.
- (10) Connect negative (-) probe of multimeter to all other sockets in connector J115 (except J115-5), one at a time, and note reading on multimeter.
- (11) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (12) If continuity is not present in step 6, or continuity is present in step 7, 8, 10, or 11, replace WTEC II cab transmission harness (para 7-137).
- (13) If continuity is present in step 6, and continuity is not present in steps 7, 8, 10, and 11, replace WTEC II TEPSS (para 8-2).
- (14) Remove jumper wire from connector J119.
- (15) Connect connector J115 to WTEC II TEPSS.
- (16) Install instrument panel assembly (para 7-15).
- (17) Connect connector P119 to connector J119.
- (18) Position front grille on cab with washer and screw.
- (19) Position two washers and screws in front grille.
- (20) Tighten screw to 48-60 lb-in. (5-7 N-m).
- (21) Tighten two screws to 24 lb-in. (3 N-m).
- (22) Clear diagnostic codes (para 8-4).



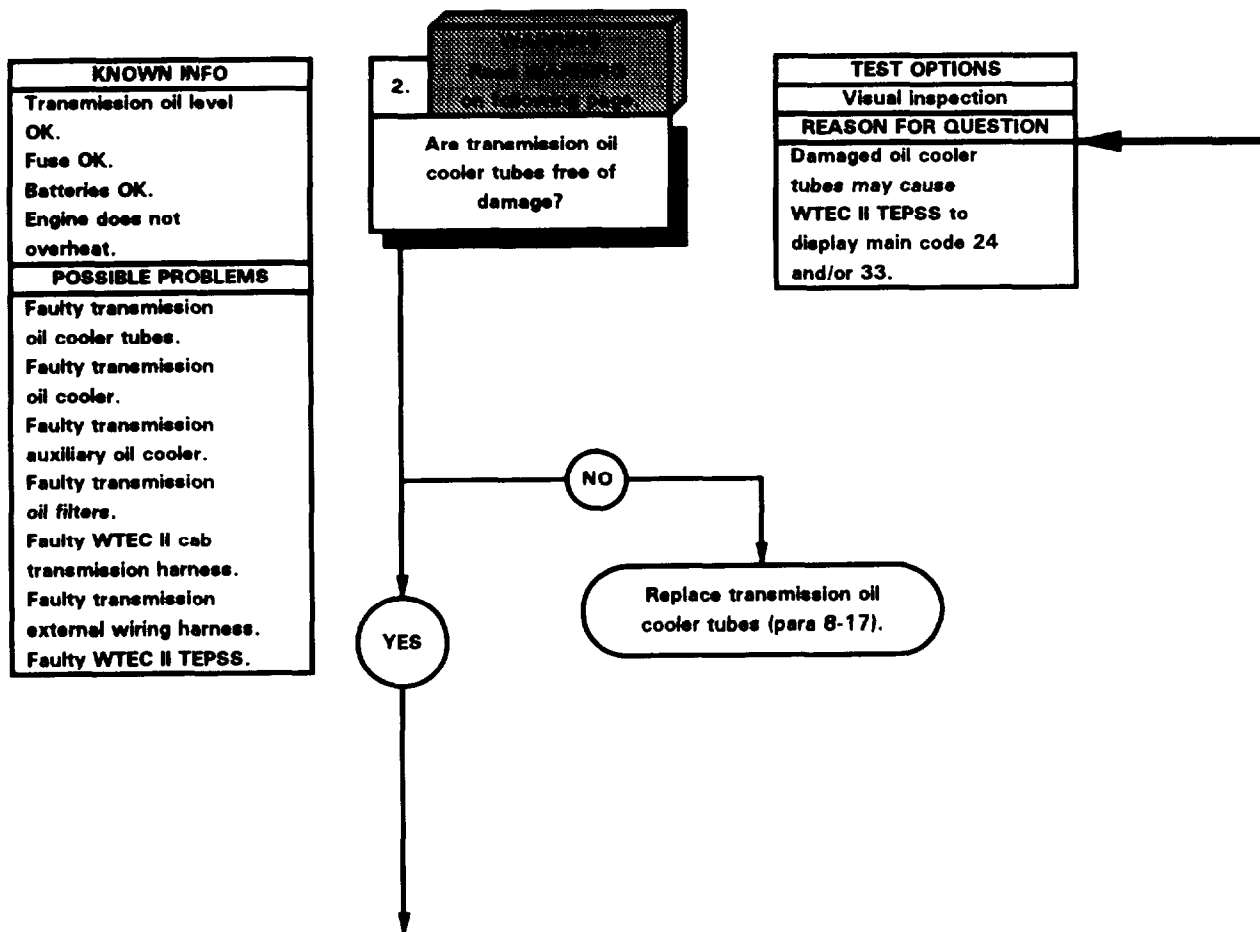
x2F04041

15. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 AND/OR 33 AND ANY SUB CODE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Goggles, Industrial (Item 15, Appendix C) Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) Pan, Drain (Item 24, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C) STE/CE-R (Item 41, Appendix C)
References TM 9-4910-571-12&P	



- (1) Position master power switch to on (TM 9-2320-366-10-1).
- (2) Check to see if main code 24 or main code 33 is logged in WTEC II TEPSS (para 8-4).
- (3) If main code 24 is logged:
 - (a) WTEC II TEPSS has detected a sump oil temperature above (subcode 23) or below (subcode 12) operating limits.
 - (b) Troubleshoot oil cooling system followed by sump oil temperature sensor and circuits.
- (4) If main code 33 is logged:
 - (a) WTEC II TEPSS has detected a fault with sump oil temperature sensor or its circuit.
 - (b) Troubleshoot electrical system.
- (5) Position master power switch to off (TM 9-2320-366-10-1).

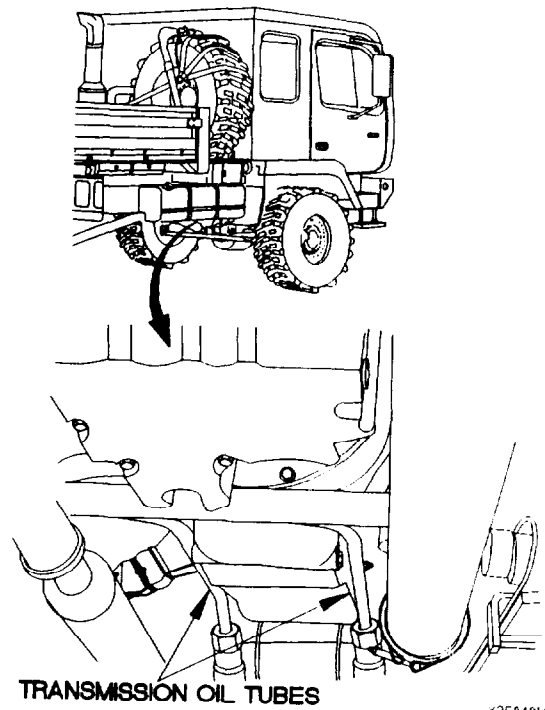
15. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 AND/OR 33 AND ANY SUB CODE (CONT)



WARNING

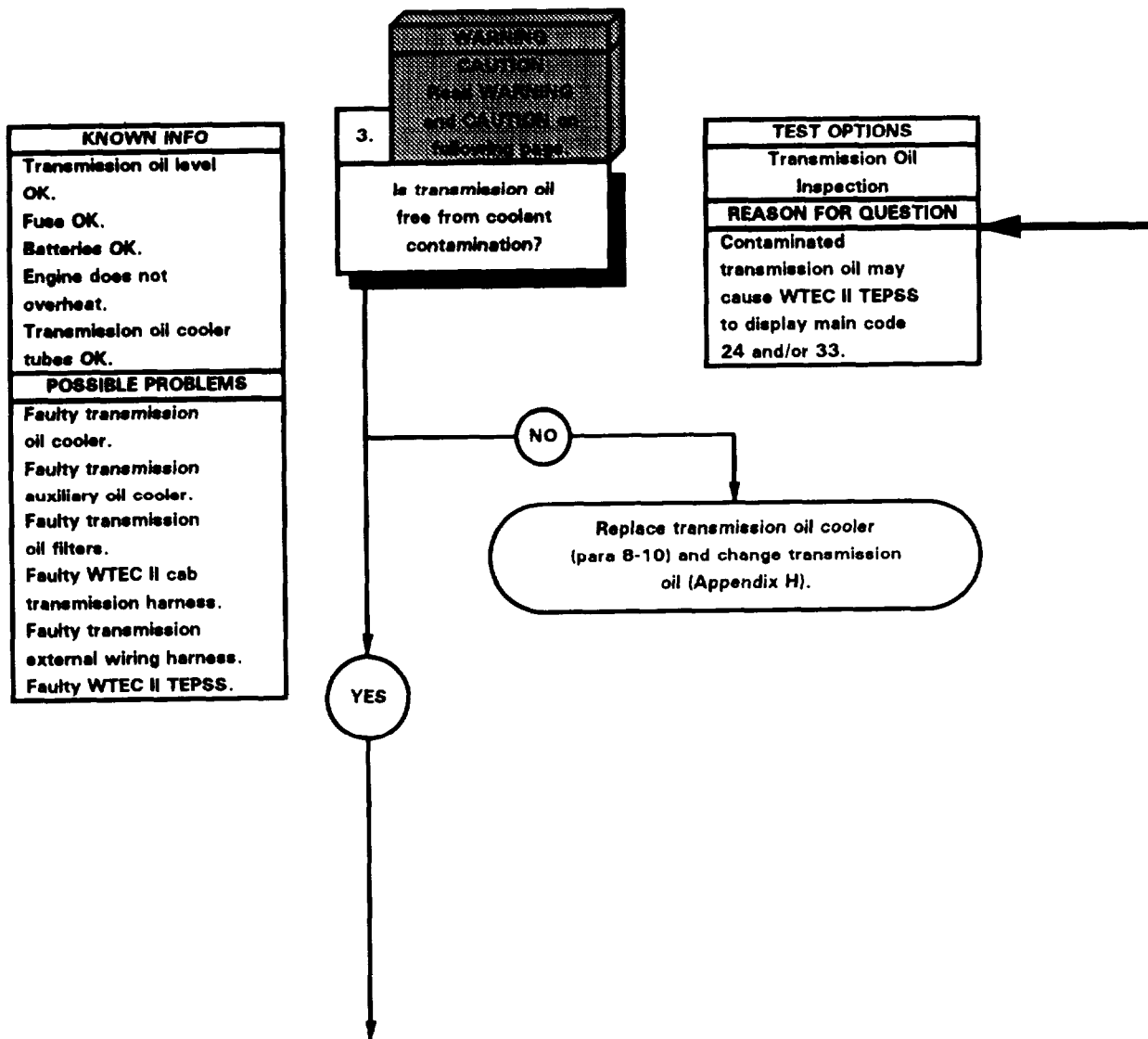
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

Check transmission oil cooler tubes for damage and restrictions.



X2F0401A

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



TRANSMISSION OIL INSPECTION

WARNING

- Do not drain transmission oil when transmission is hot. Failure to comply may 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.

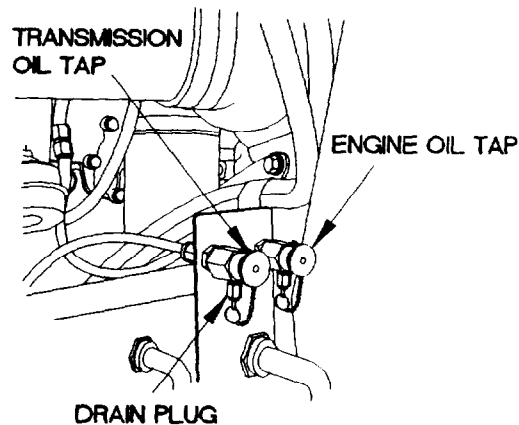
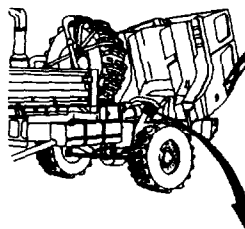
CAUTION

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

NOTE

Transmission fluid capacity is 42.3 qt (40 L).

- (1) Start engine (TM 9-2320-366-10-1).
- (2) Allow oil to circulate for a few minutes.
- (3) Position drain pan under transmission AOAP valve.
- (4) Remove drain plug from transmission AOAP valve and press plunger to extract oil from system.
- (5) Allow approximately 1 qt (0.9 L) of oil to drain into drain pan. Release plunger.
- (6) Install drain plug on transmission AOAP valve.
- (7) Inspect oil for coolant contamination.
- (8) If oil is contaminated, replace transmission oil cooler (para 8-10).
- (9) Shut down engine (TM 9-2320-366-10-1).
- (10) Add oil to transmission (Appendix H).



X2F0402A

15. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) 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 auxiliary oil cooler. Faulty transmission oil filters. Faulty WTEC II cab transmission harness. Faulty transmission external wiring harness. Faulty WTEC II TEPSS.

4.
Are transmission auxiliary oil cooler fins free from dirt, mud, or other debris and does fan operate?

NO

YES

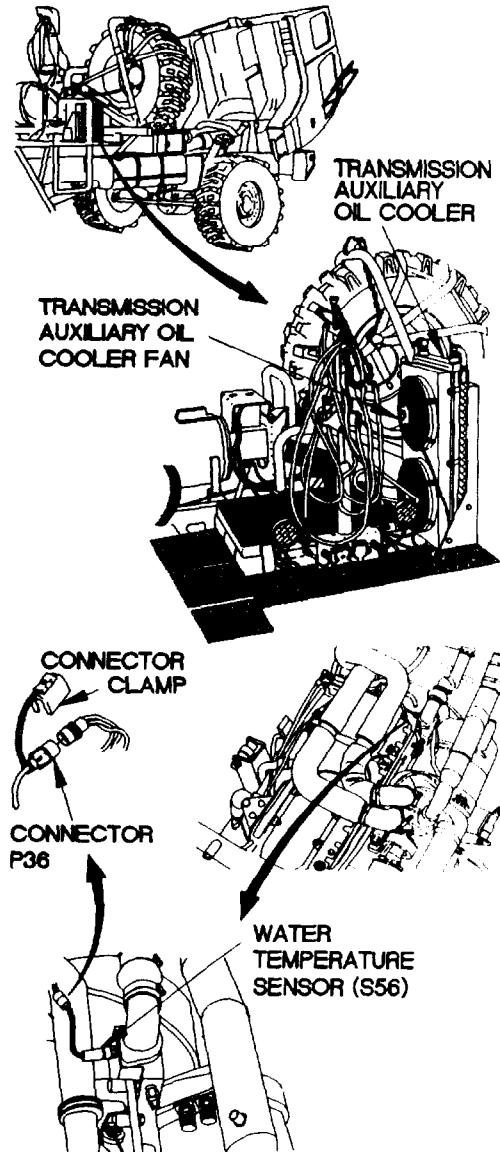
Clear transmission auxiliary oil cooler fins and/or perform Electrical System Troubleshooting (e148. Transmission Auxiliary Oil Cooler Fan Does Not Operate (All Models Except M1088/M1089) or e149. M1088/M1089 Transmission Auxiliary Oil Cooler Fan Does Not Operate).

TEST OPTIONS
Visual inspection and/or Auxiliary Oil Cooler Fan Test
REASON FOR QUESTION
Transmission may overheat if auxiliary oil cooler fins are plugged with debris or if fan does not operate which will cause WTEC II TEPSS to display main code 24 and/or 33 sub code 23.

Check if transmission auxiliary oil cooler
fine are plugged with dirt, mud, or other debris.

AUXILIARY OIL COOLER FAN TEST

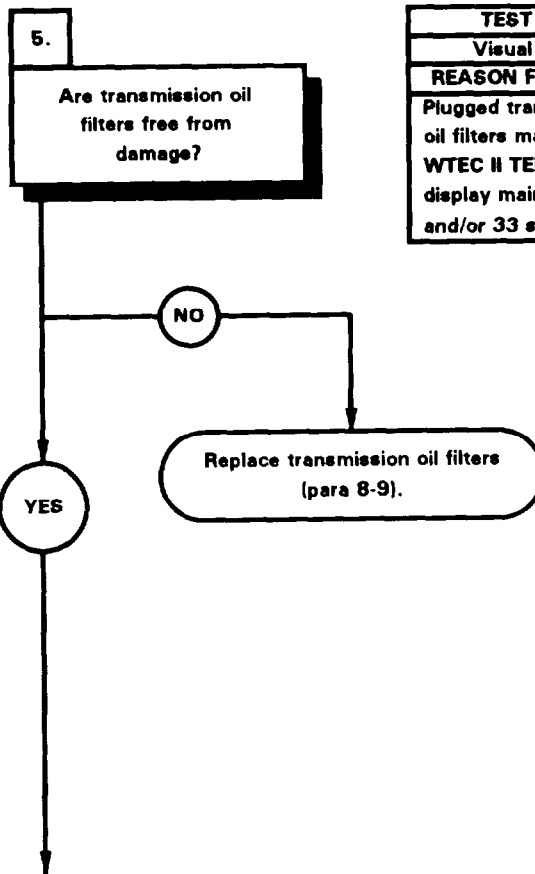
- (1) Raise cab (TM 9-2320-366-10-1).
- (2) Disconnect connector clamp from water temperature sensor.
- (3) Disconnect connector P36 from water temperature sensor (S56) to de-energize relay K15 and provide power to auxiliary oil cooler fan.
- (4) Position master power switch to on (TM 9-2320-366-10-1).
- (5) Check if auxiliary oil cooler fan comes on.
- (6) If fan does not come on, perform Electrical System Troubleshooting (e148. Transmission Auxiliary Oil Cooler Fan Does Not Operate (All Models Except M1088/M1089) or e149. M1088/M1089 Transmission Auxiliary Oil Cooler Fan Does Not Operate).
- (7) Position master power switch to off (TM 9-2320-366-10-1).
- (8) Connect connector P36 to water temperature sensor (S56).
- (9) Connect connector clamp on water temperature sensor.
- (10) Lower cab (TM 9-2320-366-10-1).



K2F05031

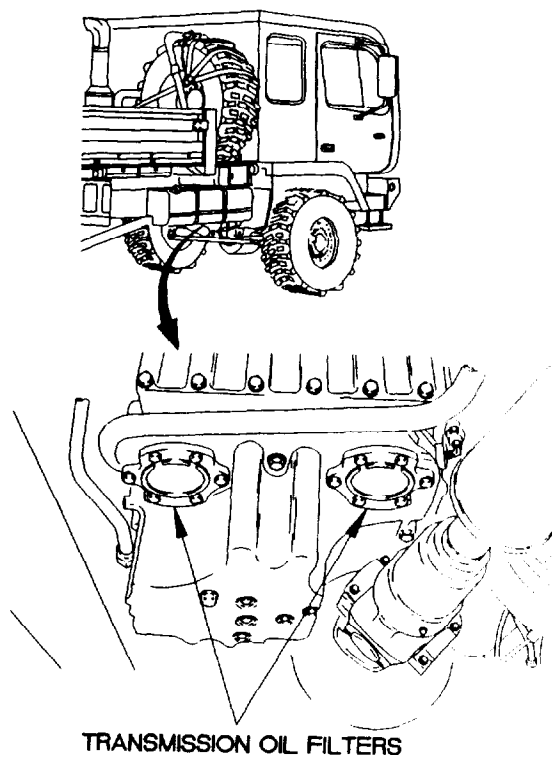
f5. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 24 AND/OR 33 AND ANY SUB CODE (CONT)

KNOWN INFO
Transmission oil level OK.
Fuse OK.
Batteries OK.
Engine does not overheat.
Transmission oil cooler tubes OK.
Transmission oil cooler OK.
Transmission auxiliary oil cooler OK.
POSSIBLE PROBLEMS
Faulty transmission oil filters.
Faulty WTEC II cab transmission harness.
Faulty transmission external wiring harness.
Faulty WTEC II TEPSS.



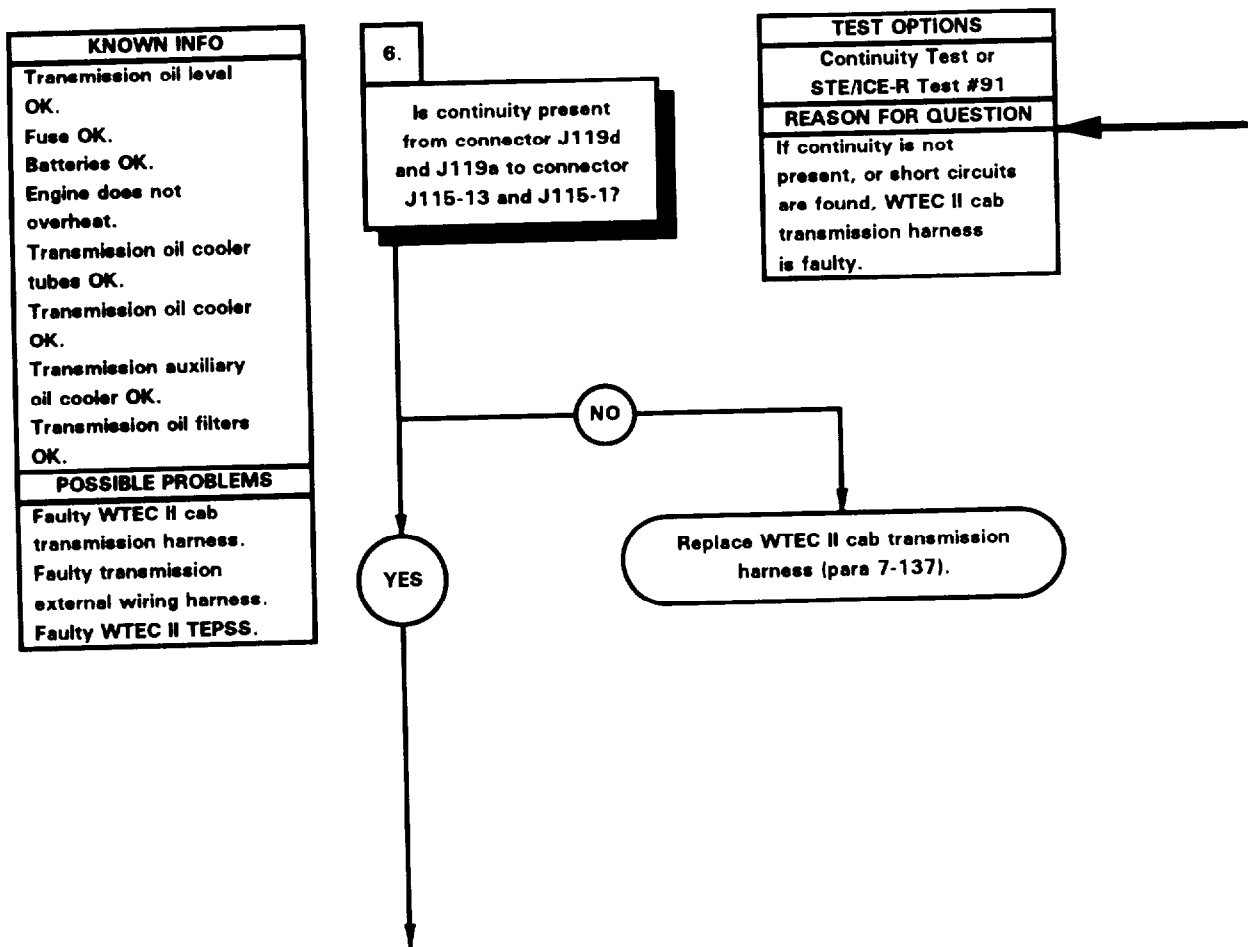
TEST OPTIONS
Visual inspection
REASON FOR QUESTION
Plugged transmission oil filters may cause WTEC II TEPSS to display main code 24 and/or 33 sub code 23.

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



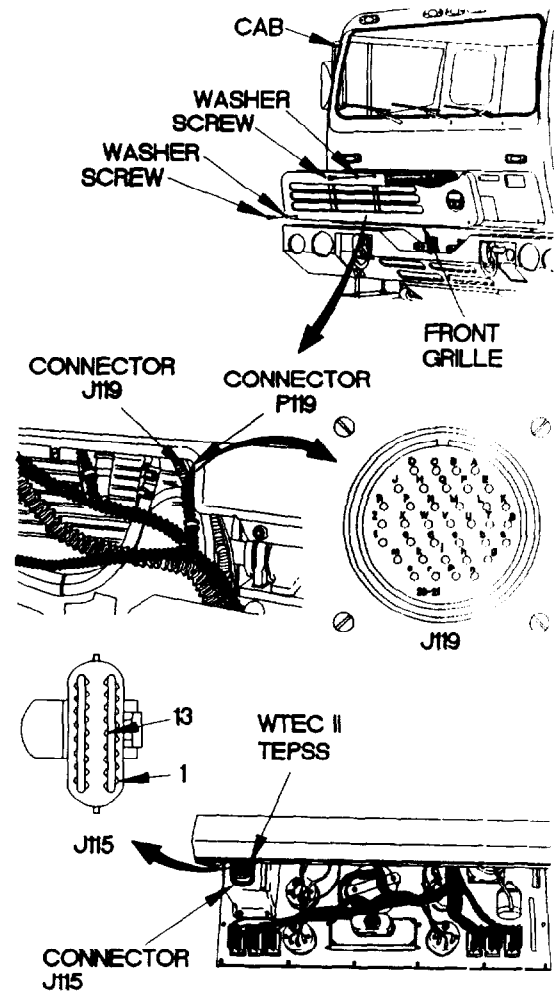
*2F05041

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



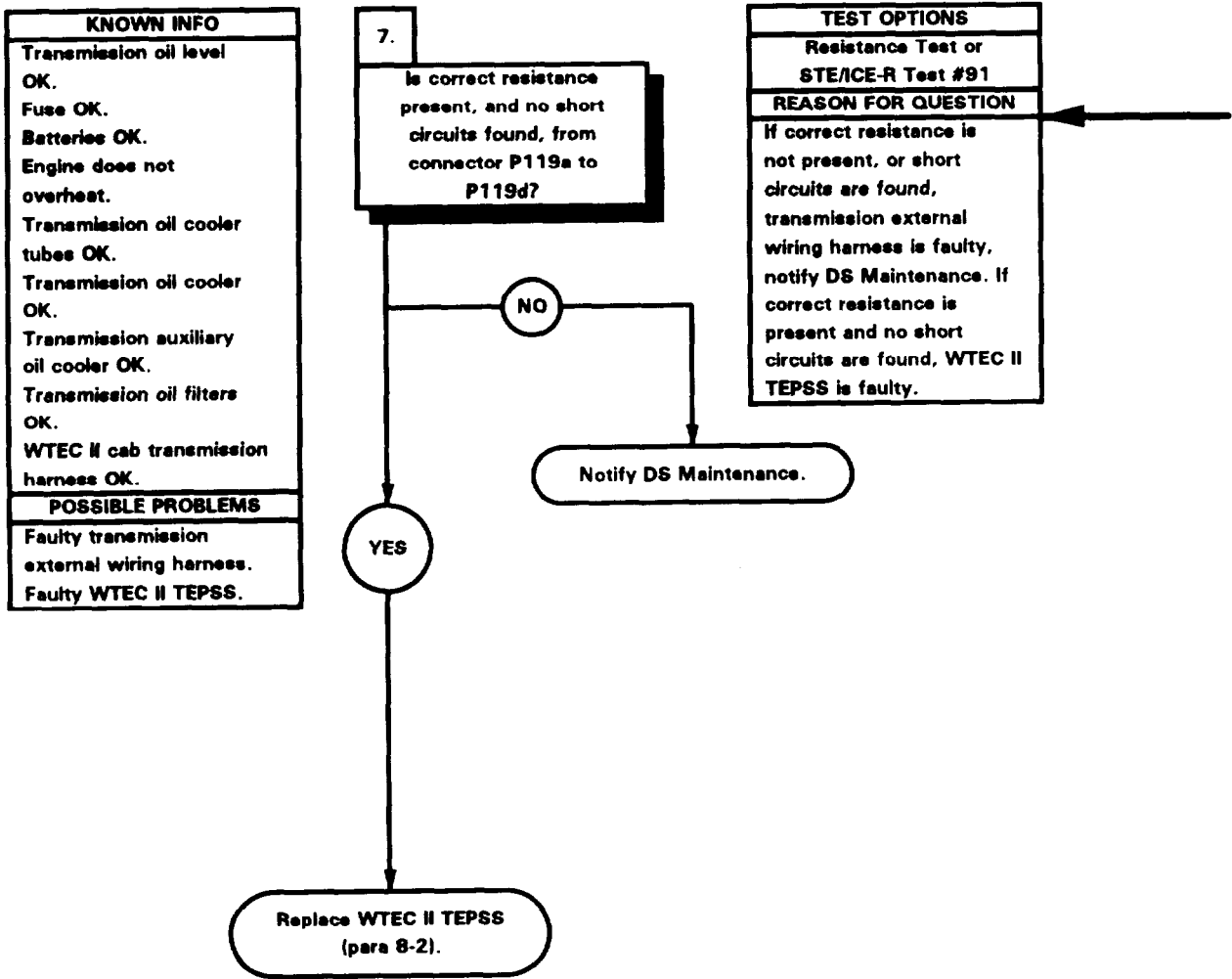
CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Remove instrument panel assembly for access (para 7-15).
- (6) Disconnect connector J115 (top connector) from WTEC II TEPSS.
- (7) Set multimeter to ohms.
- (8) Install jumper wire from connector J119d to J119a.
- (9) Connect positive (+) probe of multimeter to connector J115-13.
- (10) Connect negative (-) probe of multimeter on J115-1 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) Connect positive (+) probe of multimeter to connector J115-1.
- (14) Connect negative (-) probe of multimeter to all other sockets in connector J115 (except J115-13), one at a time, and note reading on multimeter.
- (15) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (16) If continuity is not present in step 10, or continuity is present in step 11, 12, 14, or 15, replace WTEC II cab transmission harness (para 7-137).
- (17) Connect connector J115 to WTEC II TEPSS.
- (18) Install instrument panel assembly (para 7-15).



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



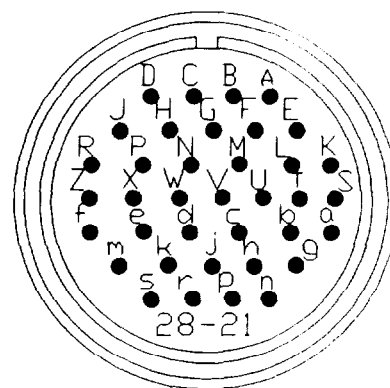
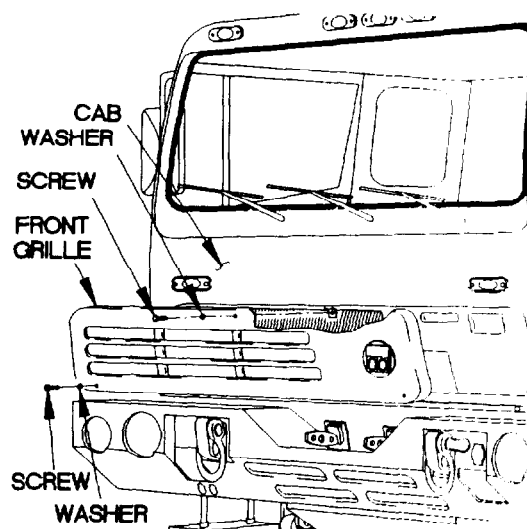
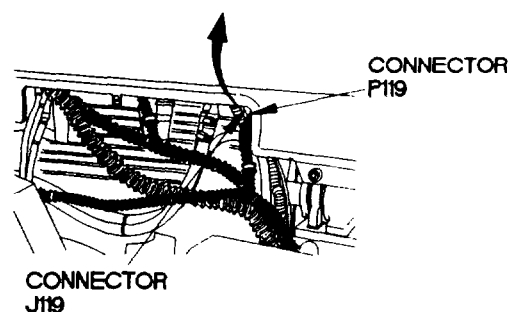
RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter on P119a.

NOTE

Transmission sump oil temperature sensor resistance reading is affected by temperature. Refer to Table 2-19. Transmission Sump Oil Temperature Sensor Resistance Readings for details.

- (3) Connect negative (-) probe 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 D6 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).

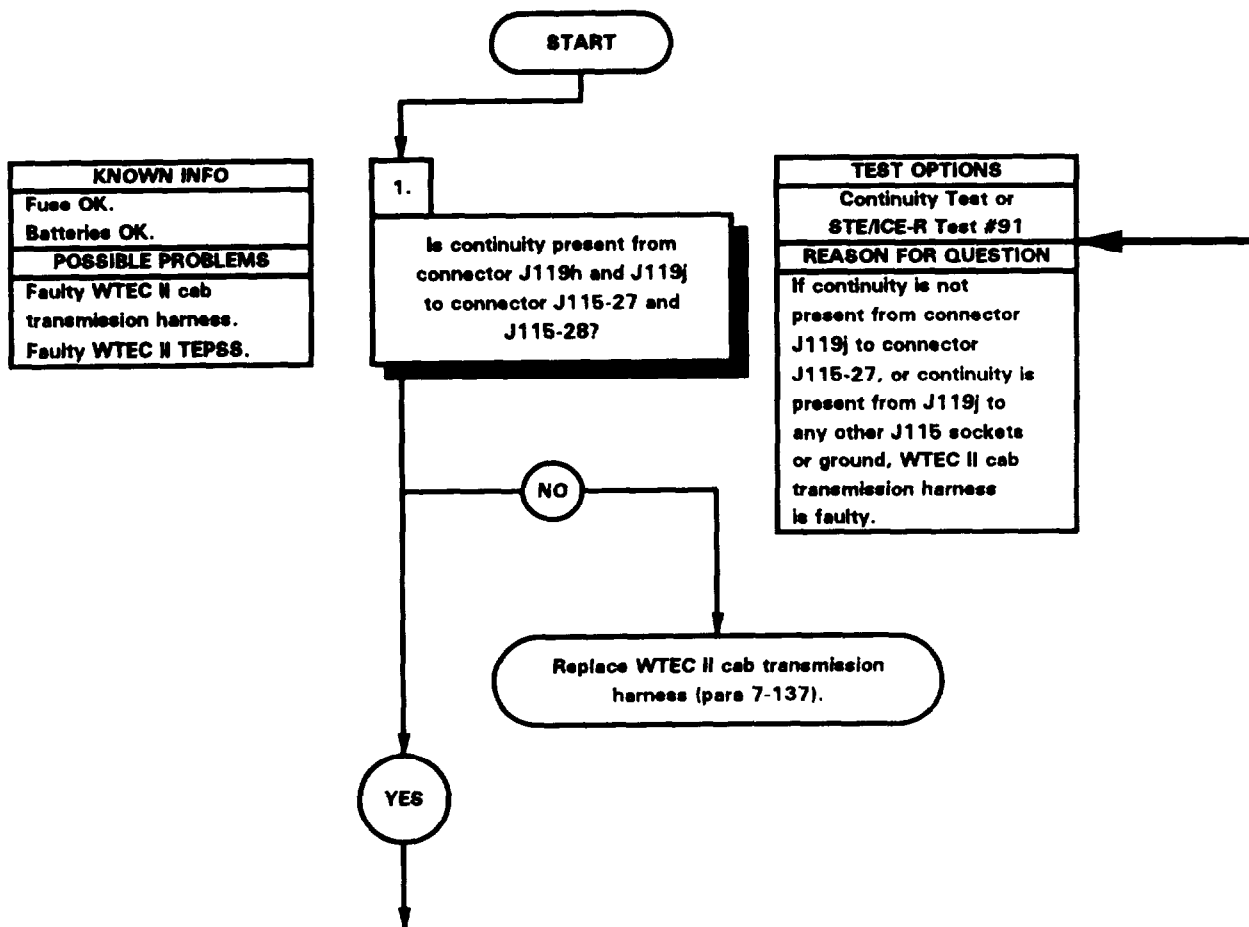
**P119**

K2F041N/A

TABLE 2-19. TRANSMISSION SUMP OIL TEMPERATURE SENSOR RESISTANCE READINGS

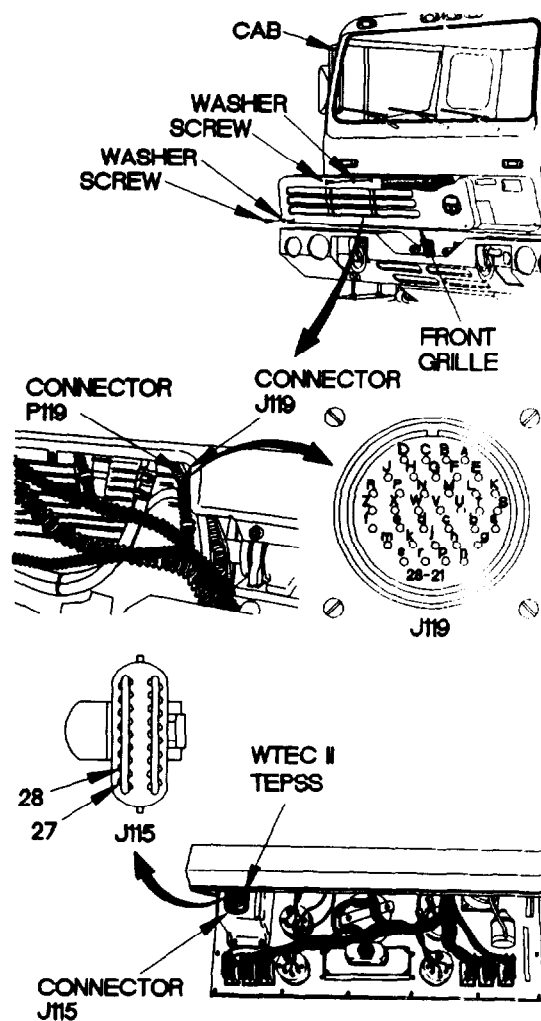
Temperature	Resistance
-4° to 14°F (-20° to -10°C)	691-754 ohms
14° to 32°F (-10° to 0°C)	754-820 ohms
32° to 50°F (0° to 10°C)	820-889 ohms
50° to 68°F (10° to 20°C)	889-962 ohms
68° to 86°F (20° to 30°C)	962-1039 ohms
86° to 104°F (30° to 40°C)	1039-1118 ohms
104° to 122°F (40° to 50°C)	1118-1202 ohms
122° to 140°F (50° to 60°C)	1202-1286 ohms

16. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C) STE/CE-R (Item 41, Appendix C)
References TM 9-4910-571-12&P	

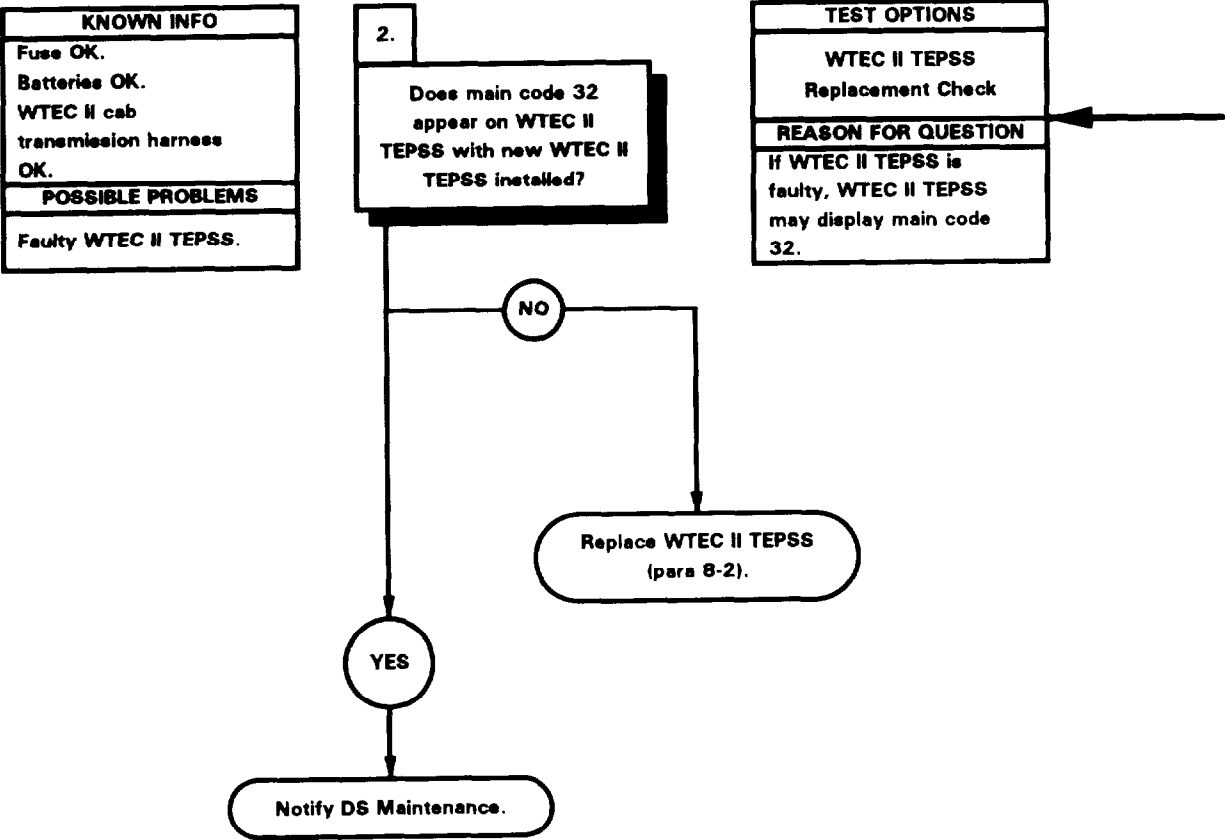


CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Remove instrument panel assembly for access (para 7-15).
- (6) Disconnect connector J115 (top connector) from WTEC II TEPSS.
- (7) Install jumper wire from connector J119h to J119j.
- (8) Set multimeter to ohms.
- (9) Connect positive (+) probe of multimeter to connector J115-27.
- (10) Connect negative (-) probe of multimeter to connector J115-28 and note reading on multimeter.
- (11) Connect negative (-) probe of multimeter to all other sockets in connector J115, one at a time, and note reading on multimeter.
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is not present in step 10, or continuity is present in step 11 or step 12, replace WTEC II cab transmission harness (para 7-137).
- (14) Connect connector P119 to connector J119.
- (15) Position front grille on cab with washer and screw.
- (16) Position two washers and screws in front grille.
- (17) Tighten screw to 48-60 lb-in. (5-7 N-m).
- (18) Tighten two screws to 24 lb-in. (3 N-m).



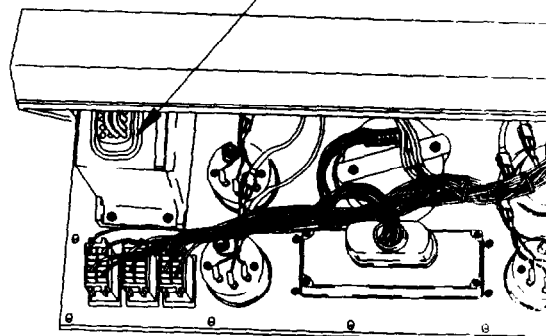
16. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (CONT)



WTEC II TEPSS REPLACEMENT CHECK

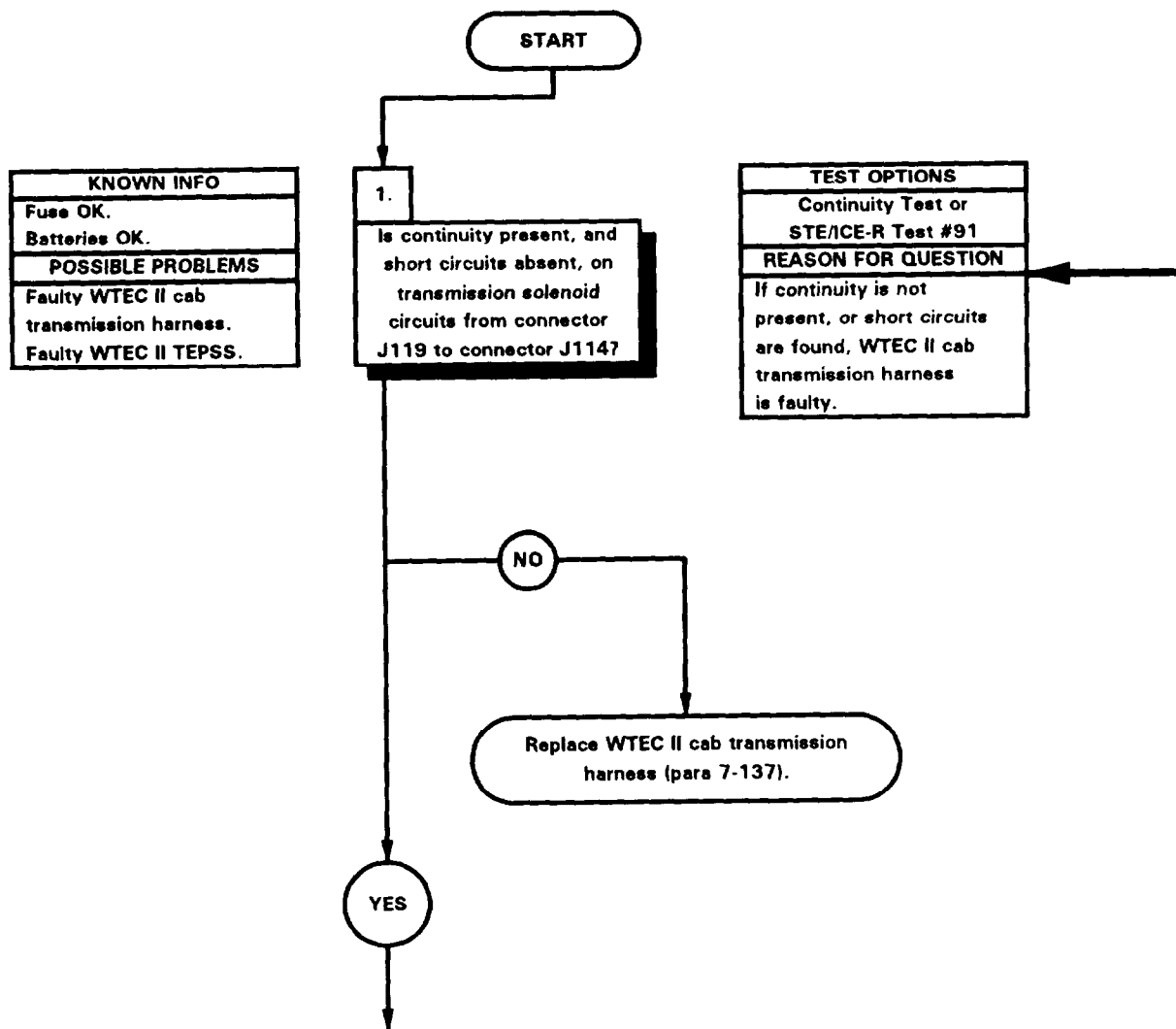
- (1) Remove original WTEC II TEPSS (para 8-2).
- (2) Install replacement WTEC II TEPSS (para 8-2).
- (3) Install instrument panel assembly (para 7-15).
- (4) Start engine (TM 9-2320-366-10-1).
- (5) Road test vehicle and read WTEC II TEPSS codes (para 8-4).
- (6) If main code 32 does not appear with replacement WTEC II TEPSS installed, replace original WTEC II TEPSS (para 8-2).
- (7) If main code 32 appears with replacement WTEC II TEPSS installed, notify DS Maintenance.
- (8) Shut down engine (TM 9-2320-366-10-1).
- (9) Clear diagnostic codes (para 8-4).

WTEC II
TEPSS



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17. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 41, 42, 44, AND/OR 45 AND ANY SUB CODE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B) STE/ICE-R (Item 41, Appendix C)
References TM 9-4910-571-12&P	



CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Remove instrument panel assembly for access (para 7-15).
- (6) Disconnect connector J114 (bottom connector) from WTEC II TEPSS.
- (7) Install jumper wire on connector J119 for appropriate sub code. Refer to Table 2-20. WTEC II Cab Transmission Harness Transmission Solenoid Test Points.
- (8) Set multimeter to ohms.
- (9) Connect positive (+) probe of multimeter to connector J114. Refer to Table 2-20. WTEC II Cab Transmission Harness Transmission Solenoid Test Points.
- (10) Connect negative (-) probe of multimeter to connector J114 and note reading on multimeter. Refer to Table 2-20. WTEC II Cab Transmission Harness Transmission Solenoid Test Points.
- (11) Connect negative (-) probe of multimeter to all other sockets in connector J115, one at a time, and note reading on multimeter.
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is not present in step 10, or continuity is present in step 11 or step 12, replace WTEC II cab transmission harness (para 7-137).
- (14) Connect connector J114 to WTEC II TEPSS.
- (15) Install instrument panel assembly (para 7-15).

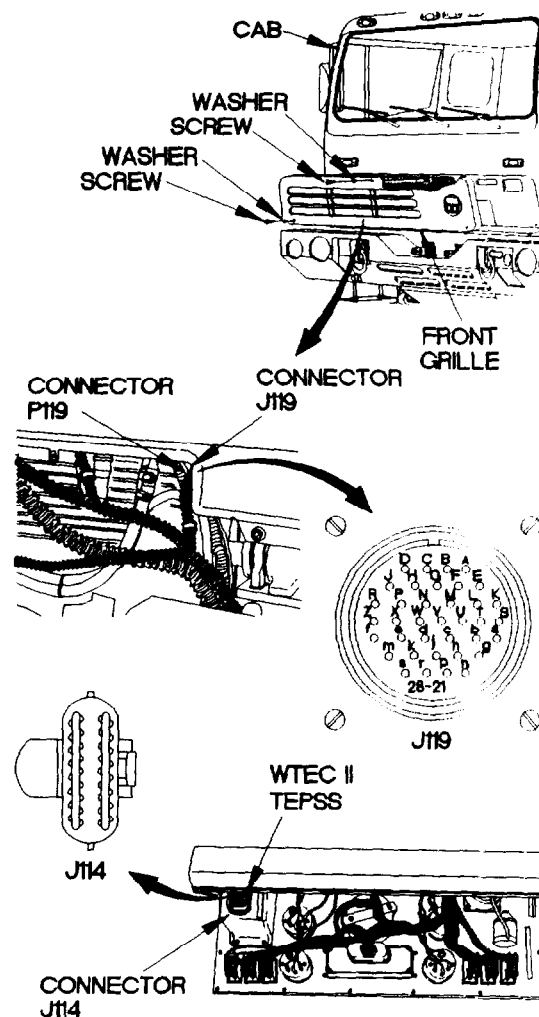
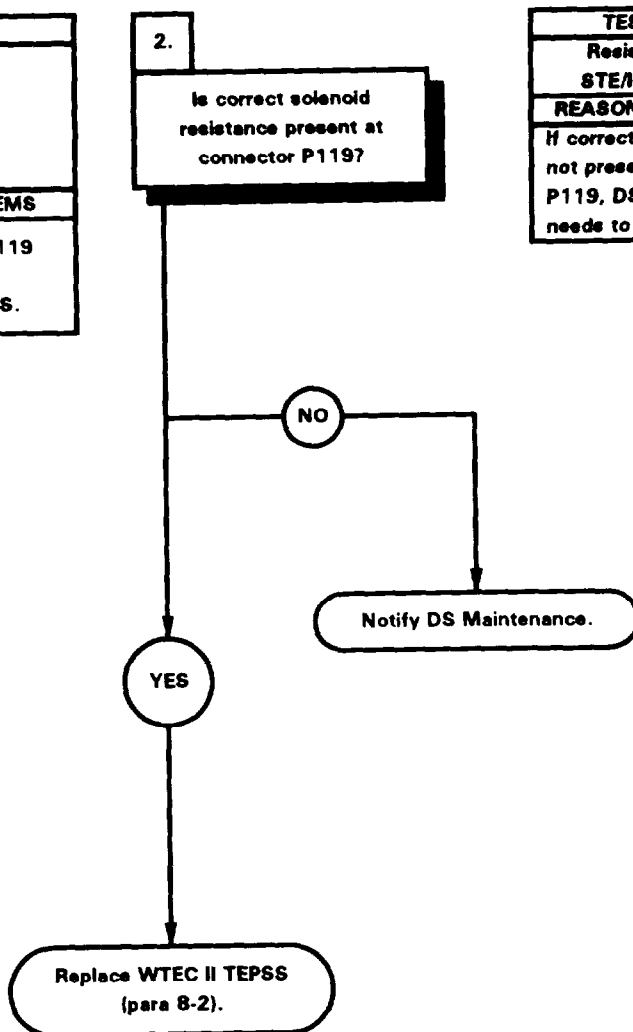


TABLE 2-20. WTEC II CAB TRANSMISSION HARNESS TRANSMISSION SOLENOID TEST POINTS

SUB CODE	JUMPER ACROSS	CONNECTOR J114	
		POSITIVE (+) PROBE	NEGATIVE (-) PROBE
12	J119M to J119B	J114-2	J114-20
13	J119T to J119N	J114-21	J114-28
14	J119C to J119V	J114-30	J114-3
15	J119W to J119B	J114-2	J114-31
16	J119U to J119N	J114-21	J114-29
21	J119F to J119H	J114-10	J114-7
22	J119D to J119V	J114-30	J114-4
23	J119P to J119S	J114-22	J114-27
24	J119J to J119B	J114-2	J114-11
26	J119K to J119A	J114-1	J114-16

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

KNOWN INFO
Fuse OK. Batteries OK. WTEC II cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty circuit from P119 to affected solenoid. Faulty WTEC II TEPSS.



TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If correct resistance is not present at connector P119, DS Maintenance needs to be notified.

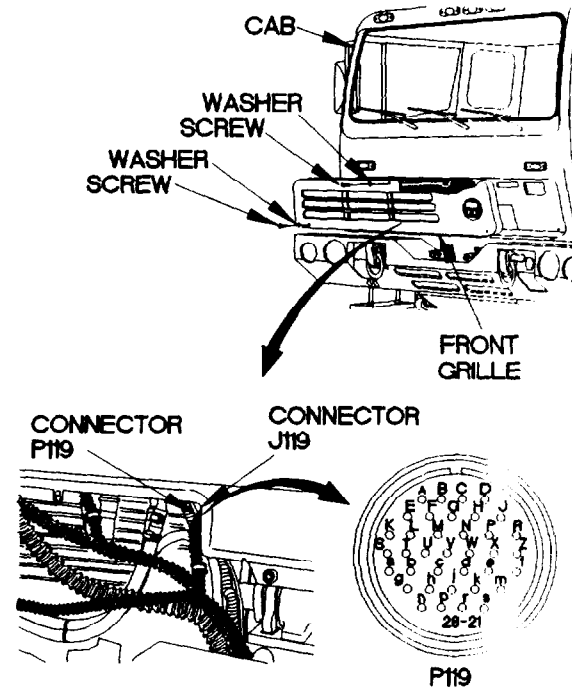
RESISTANCE TEST

- (1) Disconnect connector P119 from connector J119.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector P119. Refer to Table 2-21. Connector P119 Transmission Solenoid Resistance Test Points for appropriate sub code(s) and connector P119 pin(s).
- (4) Connect negative (-) probe of multimeter to connector P119 and note reading on multimeter. Refer to Table 2-21. Connector P119 Transmission Solenoid Resistance Test Points for appropriate sub code(s) and connector P119 pin(s).

NOTE

Transmission solenoid resistance is affected by temperature. Refer to Table 2-22. Transmission Solenoid Resistance Readings.

- (5) If resistance reading indicates transmission solenoid is good, replace WTEC II TEPSS (para 8-2).
- (6) If resistance reading indicates transmission solenoid is faulty, notify DS Maintenance.
- (7) Connect connector P119 to connector J119.
- (8) Position front grille on cab with washer and screw.
- (9) Position two washers and screws in front grille.
- (10) Tighten screw to 48-60 lb-in. (5-7 N-m).
- (11) Tighten two screws to 24 lb-in. (3 N-m).
- (12) Clear diagnostic codes (para 8-4).



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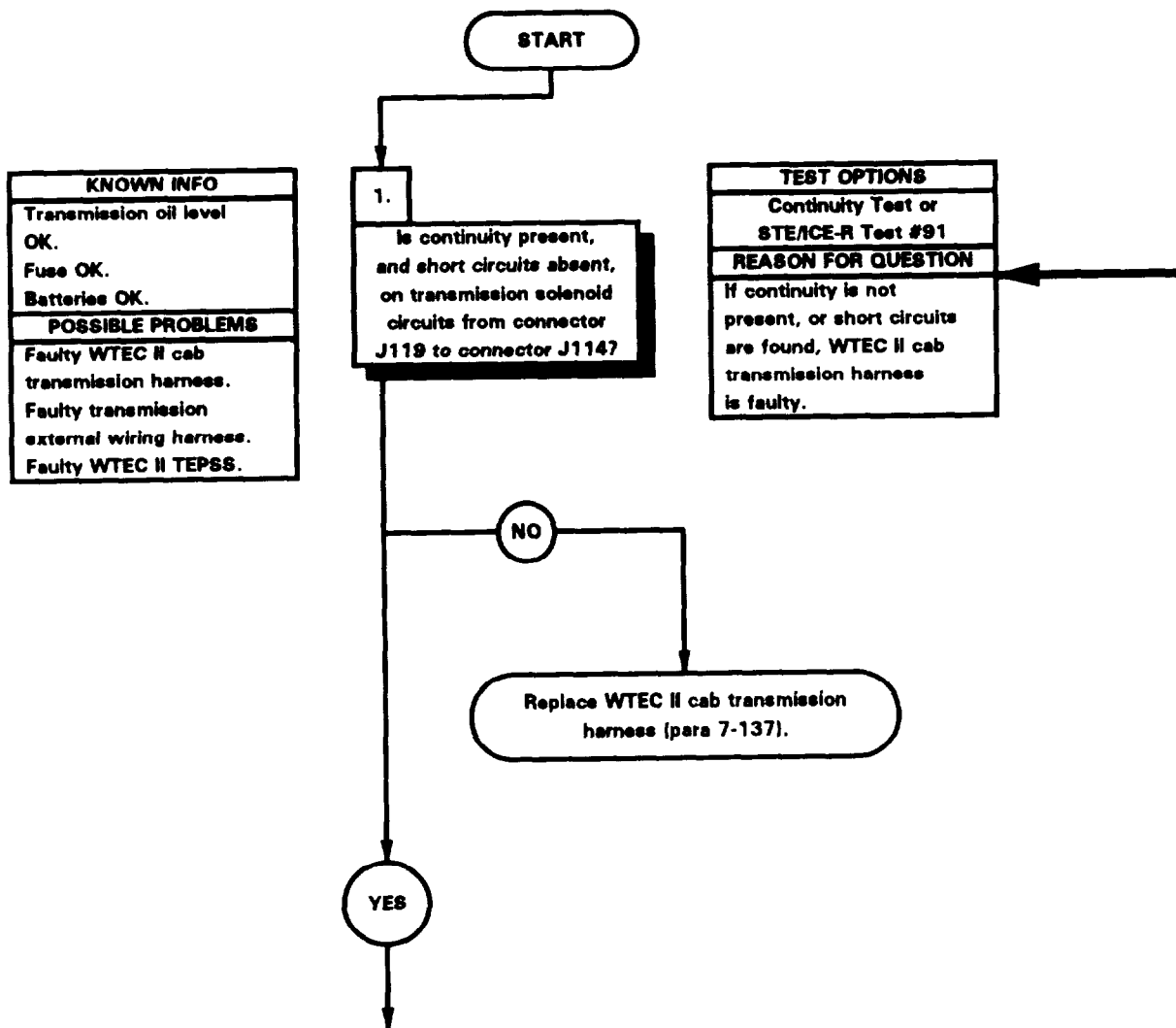
TABLE 2-21. CONNECTOR P119 TRANSMISSION SOLENOID RESISTANCE TEST POINTS

SUB CODE	CONNECTOR P119	
	positive (+) probe	negative (-) probe
12	P119M	P119B
13	P119T	P119N
14	P119C	P119V
15	P119W	P119B
16	P119U	P119N
21	P119F	P119H
22	P119D	P119V
23	P119P	P119S
24	P119J	P119B
26	P119K	P119A

TABLE 2-22. TRANSMISSION SOLENOID RESISTANCE READINGS

Temperature	Resistance
4° to 16°F (-20° to -10°C)	2.50-3.12 ohms
16° to 32°F (-10° to 0°C)	2.62-3.25 ohms
32° to 50°F (0° to 10°C)	2.74-3.38 ohms
50° to 68°F (10° to 20°C)	2.86-3.50 ohms
68° to 86°F (20° to 30°C)	2.98-3.62 ohms
86° to 104°F (30° to 40°C)	3.09-3.75 ohms
104° to 122°F (40° to 50°C)	3.21-3.88 ohms
122° to 140°F (50° to 60°C)	3.33-4.00 ohms

18. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 AND ANY SUB CODE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Goggles, Industrial (Item 15, Appendix C) Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C) STE/ICE-R (Item 41, Appendix C)
References TM 9-4910-571-12&P	

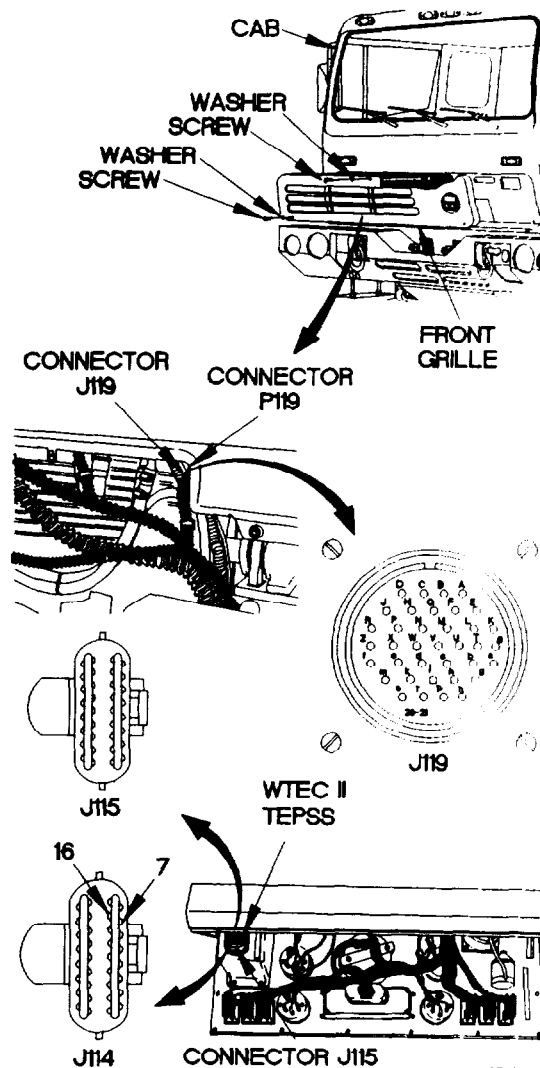


CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Remove instrument panel assembly for access (para 7-15).
- (6) Disconnect connectors J114 and J115 from WTEC II TEPSS.
- (7) Set multimeter to ohms.
- (8) Connect positive (+) probe of multimeter to High side socket of connector J119. Refer to Table 2-23. Main Code 43 Sub Code 21 and 26 High Side Test Points.
- (9) Connect negative (-) probe of multimeter to High side socket of connector J114 and note reading on multimeter. Refer to Table 2-23. Main Code 43 Sub Code 21 and 26 High Side Test Points.
- (10) Connect negative (-) probe of multimeter to all other sockets in connector J114, one at a time, and note reading on multimeter.
- (11) Connect negative (-) probe of multimeter to all sockets in connector J115, one at a time, and note reading on multimeter.
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is not present in step 9, or continuity is present in step 10, 11, or 12, replace WTEC II cab transmission harness (para 7-137).

**TABLE 2-23. MAIN CODE 43 SUB CODE
21 AND 26 HIGH SIDE TEST POINTS**

SUB CODE	CONNECTOR J114	CONNECTOR J119
21	7	F
26	16	K



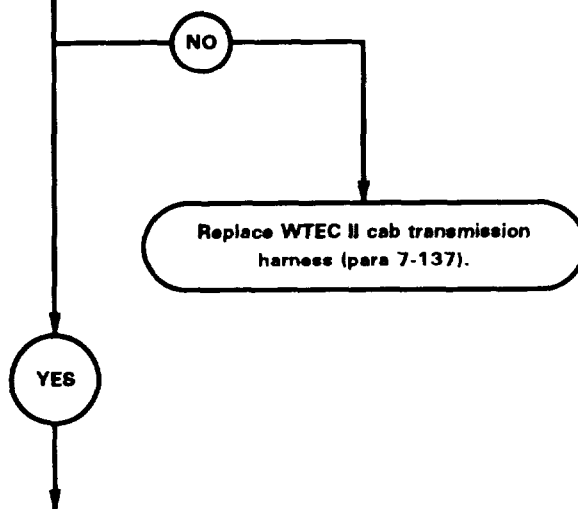
*2F 08011

18. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 AND ANY SUB CODE (CONT)

KNOWN INFO
Fuse OK. Batteries OK.
POSSIBLE PROBLEMS
Faulty WTEC II cab transmission harness. Faulty transmission external wiring harness. Faulty WTEC II TEPSS.

2.
Is continuity present, and short circuits absent, on transmission solenoid circuits from connector J119 to connector J114?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, or short circuits are found, WTEC II cab transmission harness is faulty.

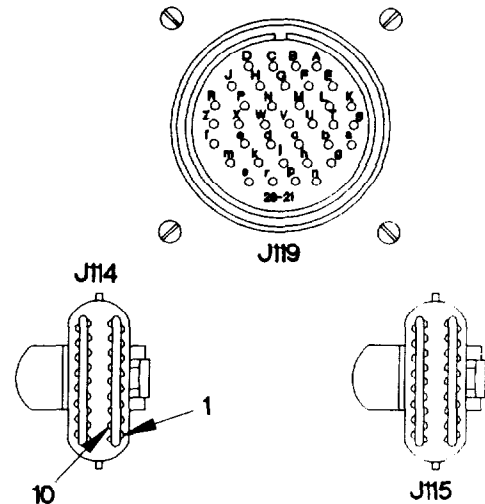


CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector J119. Refer to Table 2-24. Main Code 43 Sub Code 21 and 26 Low Side Test Points.
- (3) Connect negative (-) probe of multimeter to connector J114 and note reading on multimeter. Refer to Table 2-24. Main Code 43 Sub Code 21 and 26 Low Side Test Points.
- (4) Connect negative (-) probe of multimeter to all other sockets in connector J114, one at a time, and note reading on multimeter.
- (5) Connect negative (-) probe of multimeter to all sockets in connector J115, one at a time, and note reading on multimeter.
- (6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (7) If continuity is not present in step 3, or continuity is present in step 4, 5, or 6, replace WTEC II cab transmission harness (para 7-137).

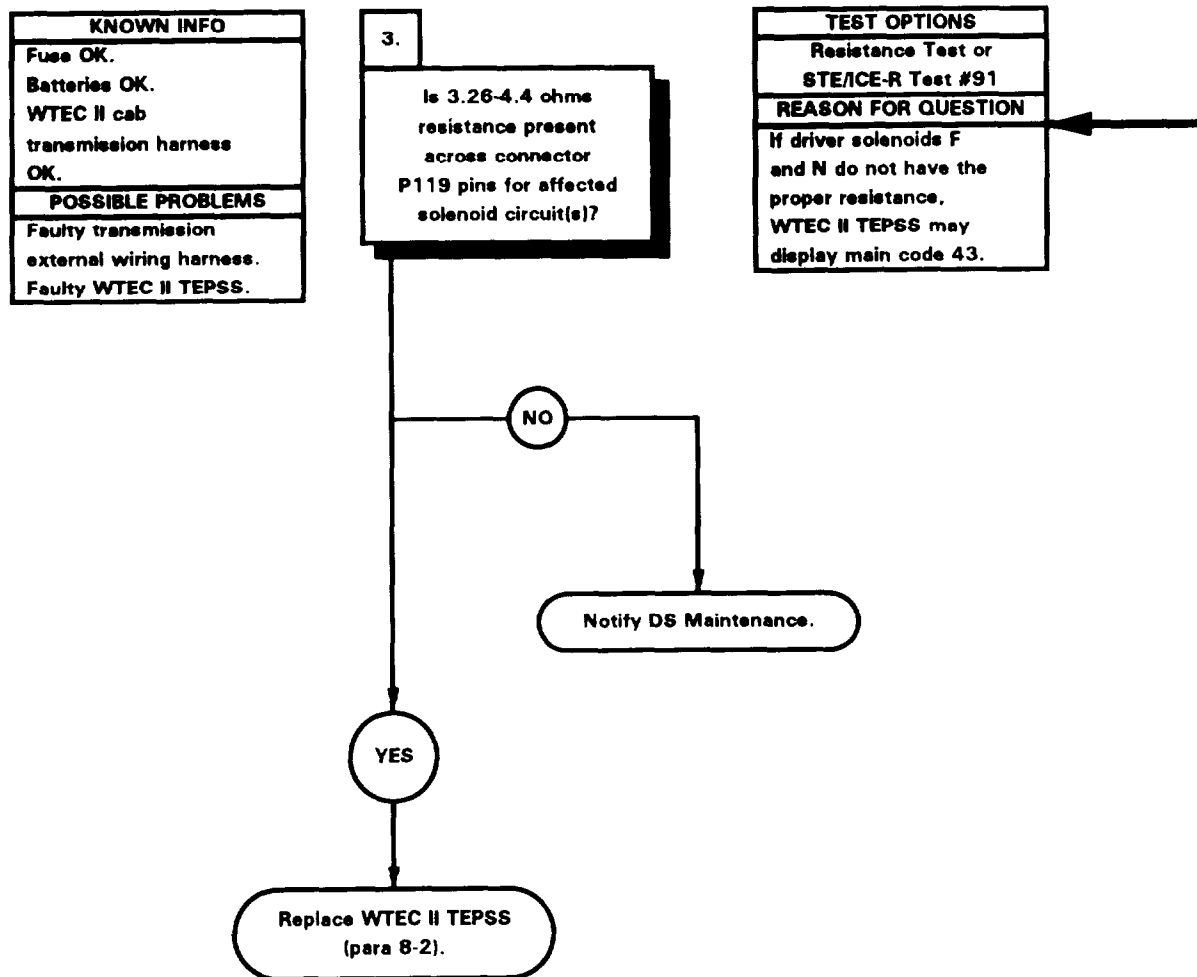
**TABLE 2-24. MAIN CODE 43 SUB CODE
21 AND 26 LOW SIDE TEST POINTS**

SUB CODE	CONNECTOR J114	CONNECTOR J119
21	10	H
26	1	A



*2F07024

18. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 43 AND ANY SUB CODE (CONT)

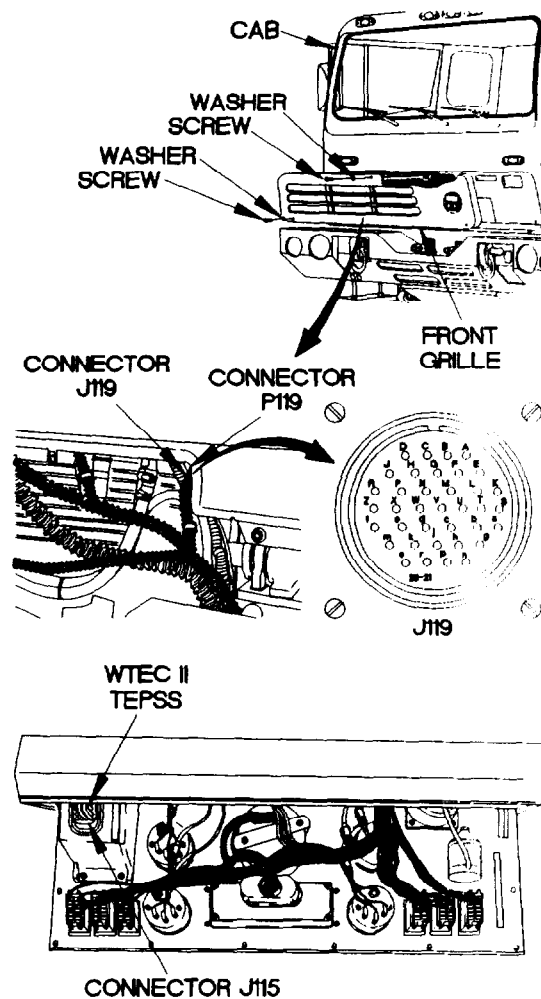


RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119. Refer to Table 2-25.
Transmission Solenoid F and G Resistance Test Points.
- (4) Connect negative (-) probe of multimeter to connector P119 on note reading on multimeter. Refer to Table 2-25.
Transmission Solenoid F and G Resistance Test Points.
- (5) Connect negative (-) probe of multimeter to all other pins in connector P119, one at a time, and note reading on multimeter.
- (6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (7) If good resistance is not noted in step 4, or continuity is present in step 5 or step 6, transmission harness external wiring harness may be faulty, notify DS Maintenance.
- (8) If good resistance is noted in step 4, and continuity is not present in step 5 or step 6, replace WTEC II TEPSS (para 8-2).
- (9) Connect connector P119 to connector J119.
- (10) Position front grille on cab with washer and screw.
- (11) Position two washers and screws in front grille.
- (12) Tighten screw to 48-60 lb-in. (5-7 N-m).
- (13) Tighten two screws to 24 lb-in. (3 N-m).
- (14) Connect connectors J114 and J115 to WTEC II TEPSS.
- (15) Install instrument panel assembly (para 7-15).
- (16) Clear diagnostic codes (para 8-4).

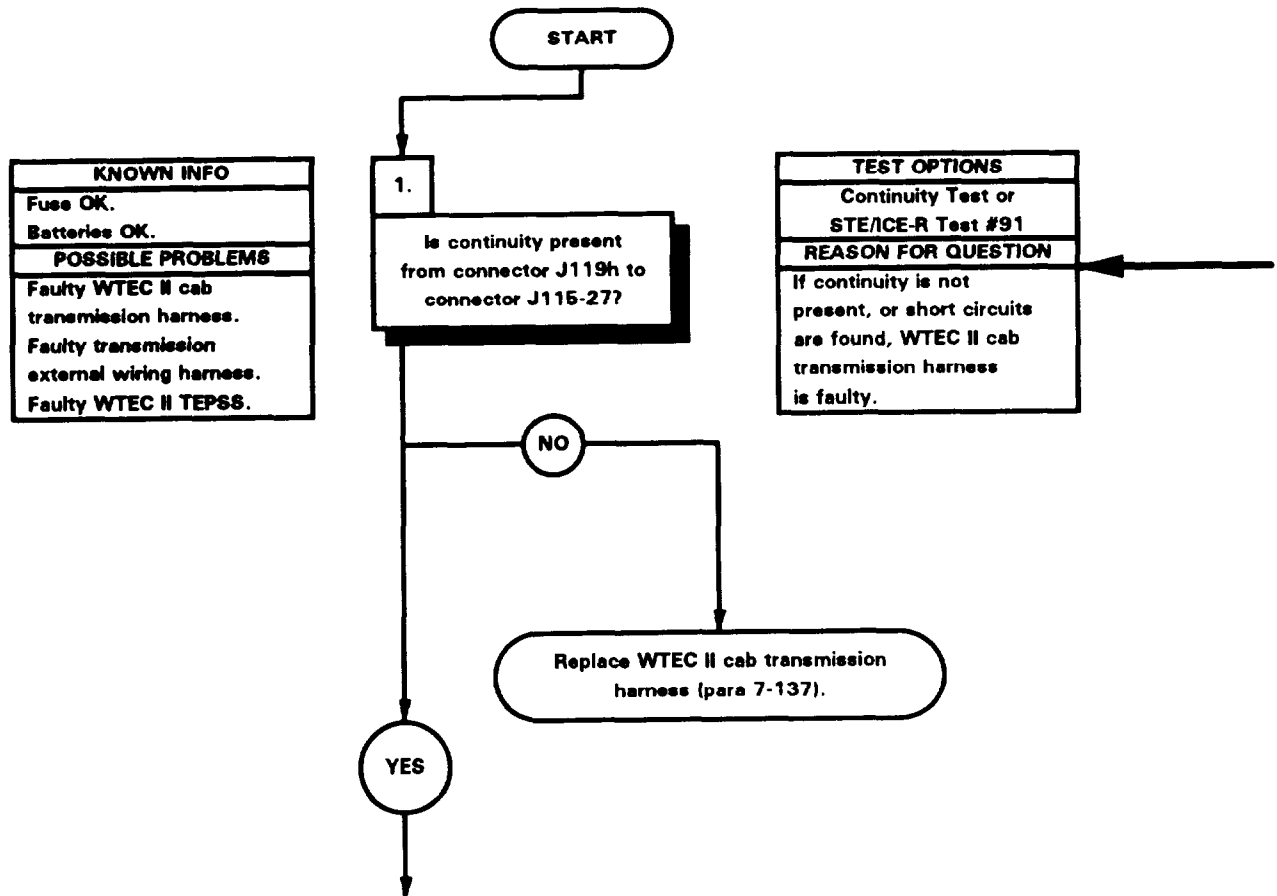
TABLE 2-25. TRANSMISSION SOLENOID F AND G RESISTANCE TEST POINTS

SUB CODE	AFFECTED SOLENOID	CONNECTOR P119 HIGH	CONNECTOR P119 LOW
21	F	F	H
26	N	K	A



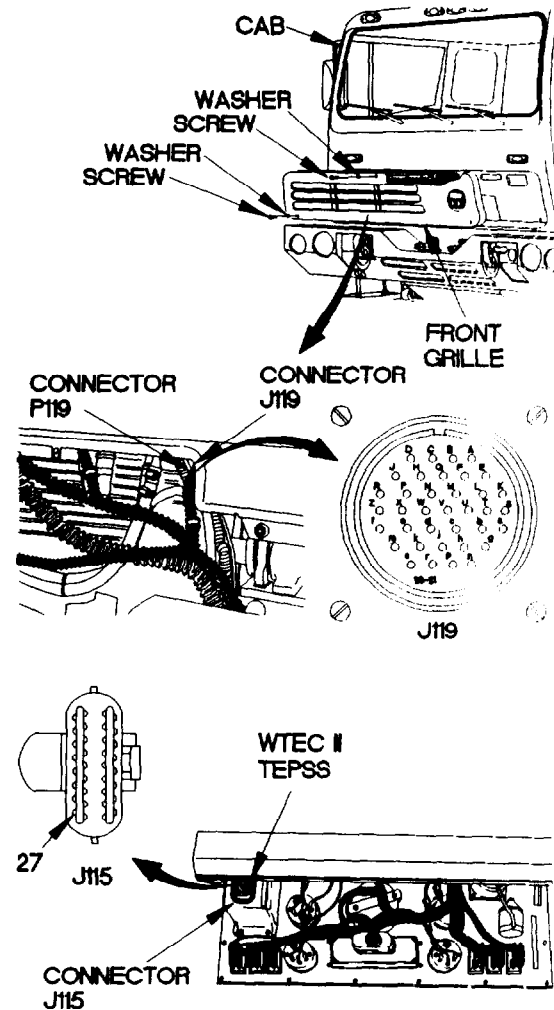
*2F n90 31

19. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B) STE/ICE-R (Item 41, Appendix C)
References TM 9-4910-571-12&P	



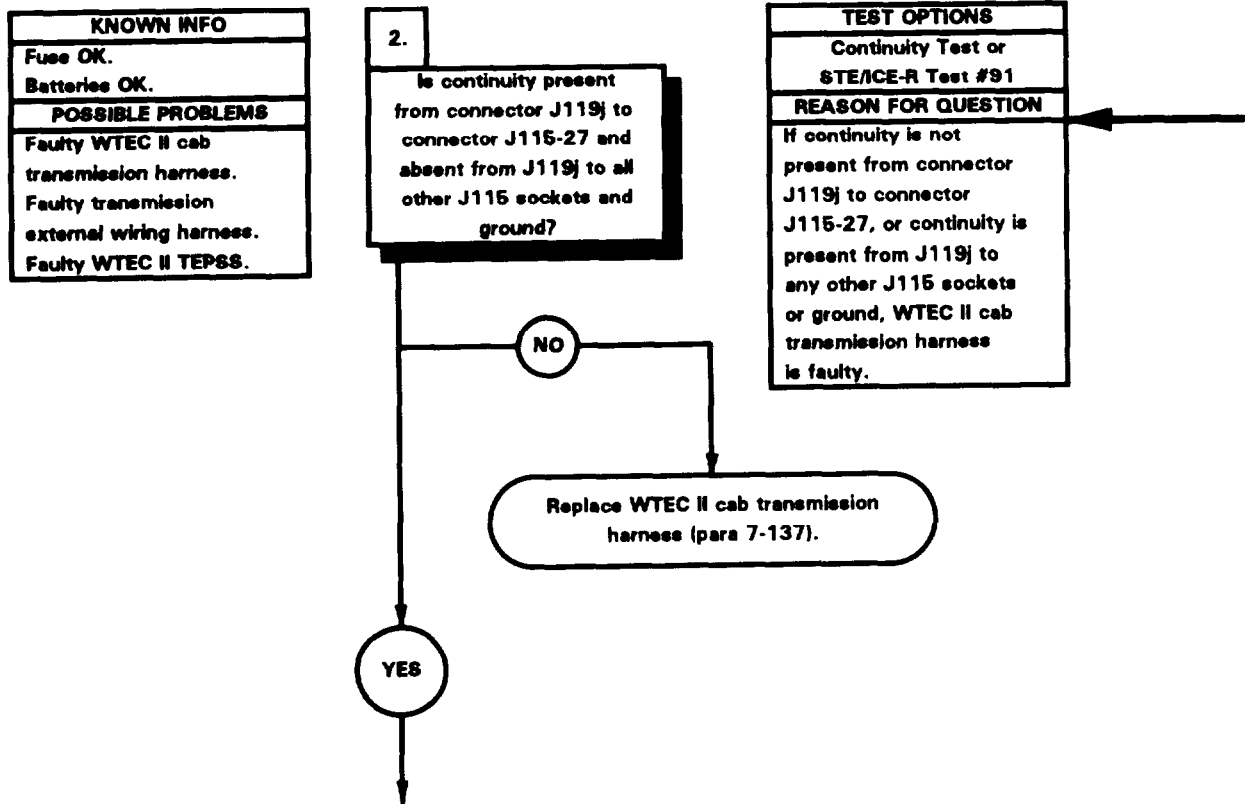
CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille on cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Remove instrument panel assembly for access (para 7-15).
- (6) Disconnect connector J115 (top connector) from WTEC II TEPSS.
- (7) Set multimeter to ohms.
- (8) Connect positive (+) probe of multimeter to connector J119h.
- (9) Connect negative (-) probe of multimeter to connector J115-27 and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to all other sockets in connector J115, one at a time, and note reading on multimeter.
- (11) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (12) If continuity is not present in step 9, or continuity is present in step 10 or step 11, replace WTEC II cab transmission harness (para 7-137).



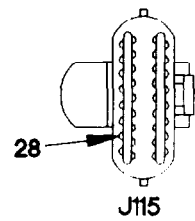
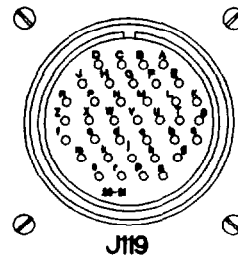
X2F09011

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



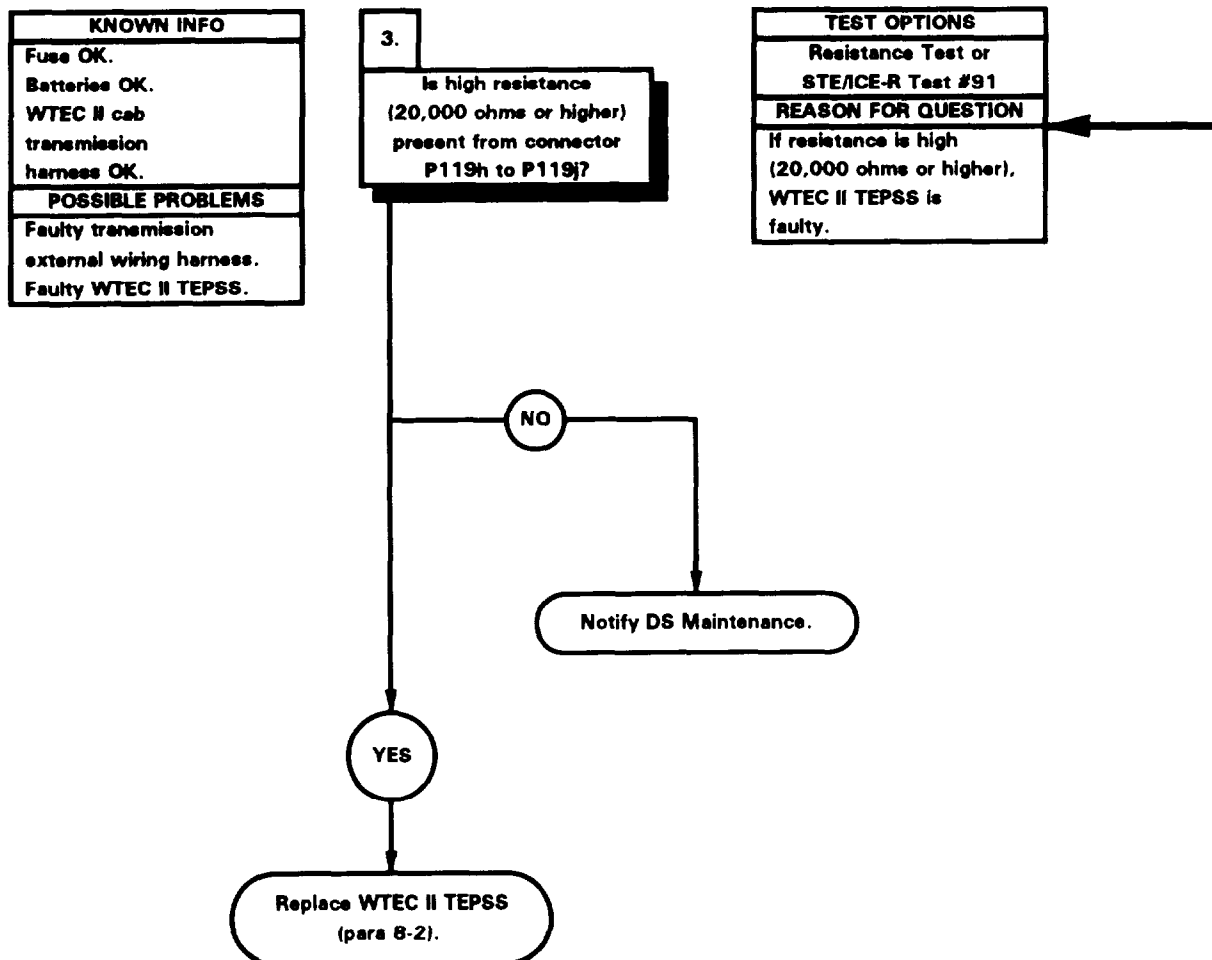
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector J119j.
- (3) Connect negative (-) probe of multimeter to connector J115-28 and note reading on multimeter.
- (4) Connect negative (-) probe of multimeter to all other sockets in connector J115, one at a time, and note reading on multimeter.
- (5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (6) If continuity is not present in step 3, or continuity is present in step 4 or step 5, replace WTEC II cab transmission harness (para 7-137).



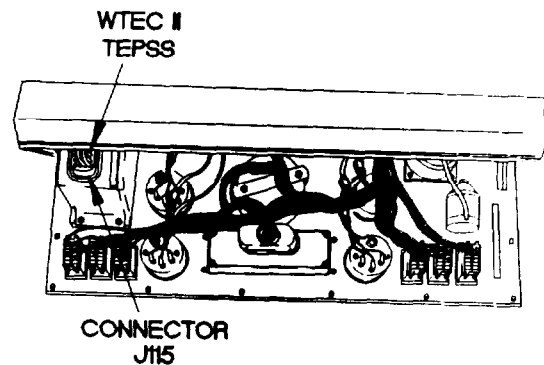
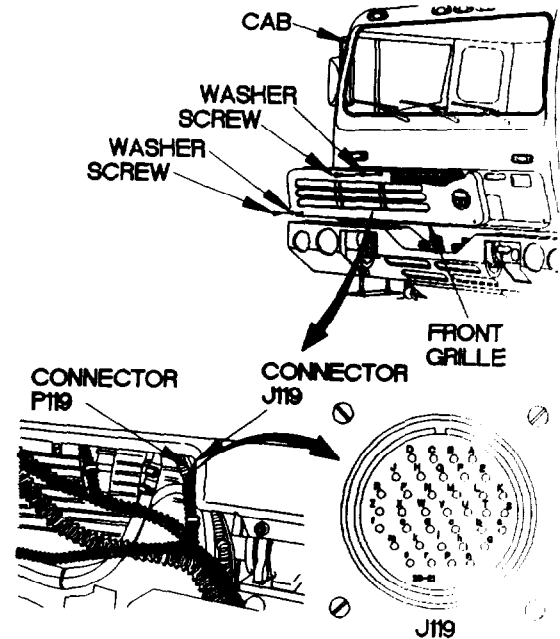
x2f 06024

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



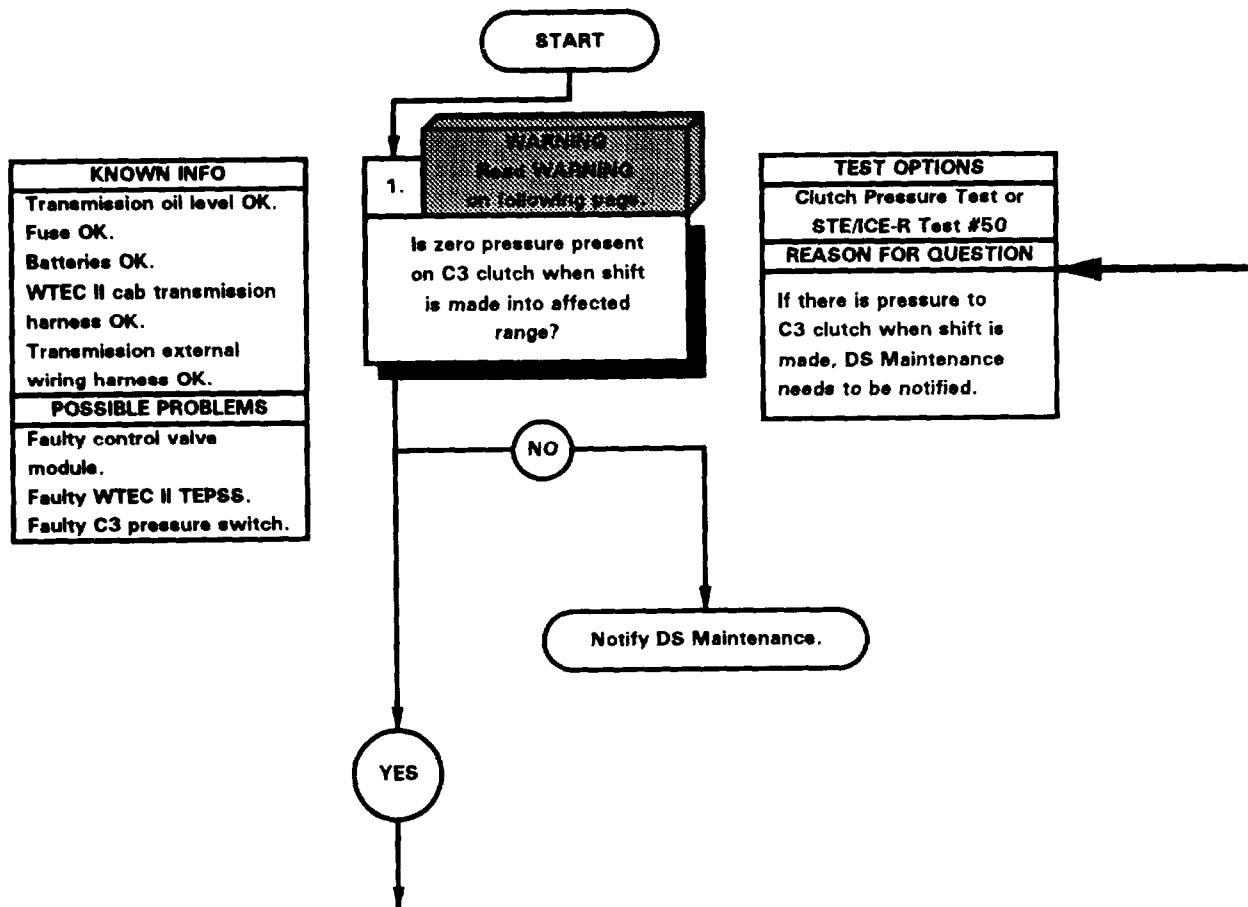
RESISTANCE TEST

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



x2509031

110. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 57 AND ANY SUB CODE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Goggles, Industrial (Item 15, Appendix C) Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/ICE-R (Item 41, Appendix C) Pan, Drain (Item 24, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Reference TM 9-491-571-12&P	
Materials/Parts Packing, Preformed (Item 197, Appendix G)	



CLUTCH PRESSURE TEST

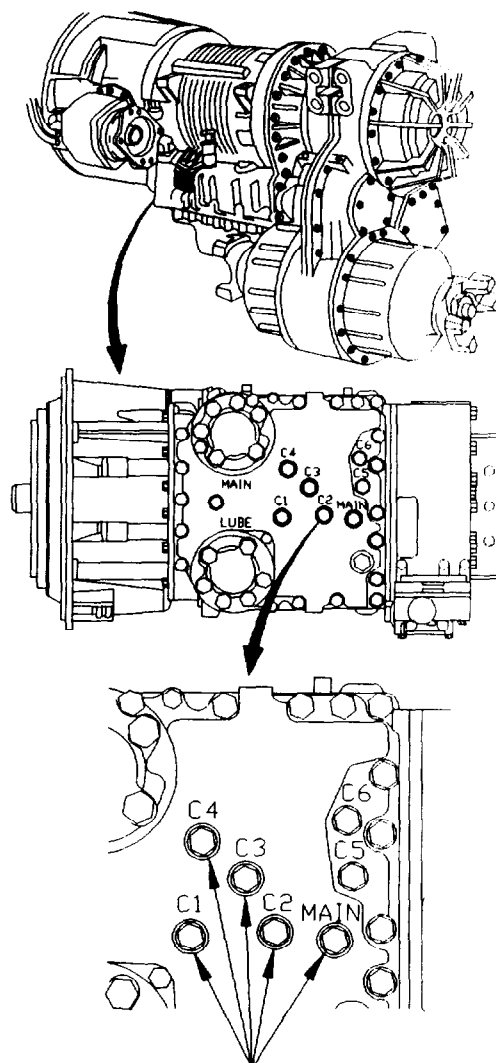
WARNING

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.

- (1) Remove transmission front and rear output 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 adapter and snubber to C3 pressure tap.
- (5) Perform STE/ICE-R Test # 50 (TM 9-4910-571-12&P).
- (6) Start engine (TM 9-2320-366-10-1) and run at idle.
- (7) With parking brake applied, make shift indicated by sub code while assistant notes reading on STE/ICE-R.
- (8) If pressure does not drop to zero in selected range indicated by code values, gaskets or C solenoid may be faulty in control valve module, notify D5 Maintenance.
- (9) Shut down engine (TM 9-2320-366-10-1).
- (10) Remove adapter and snubber 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 transmission front and rear output propeller shafts (para 9-2).

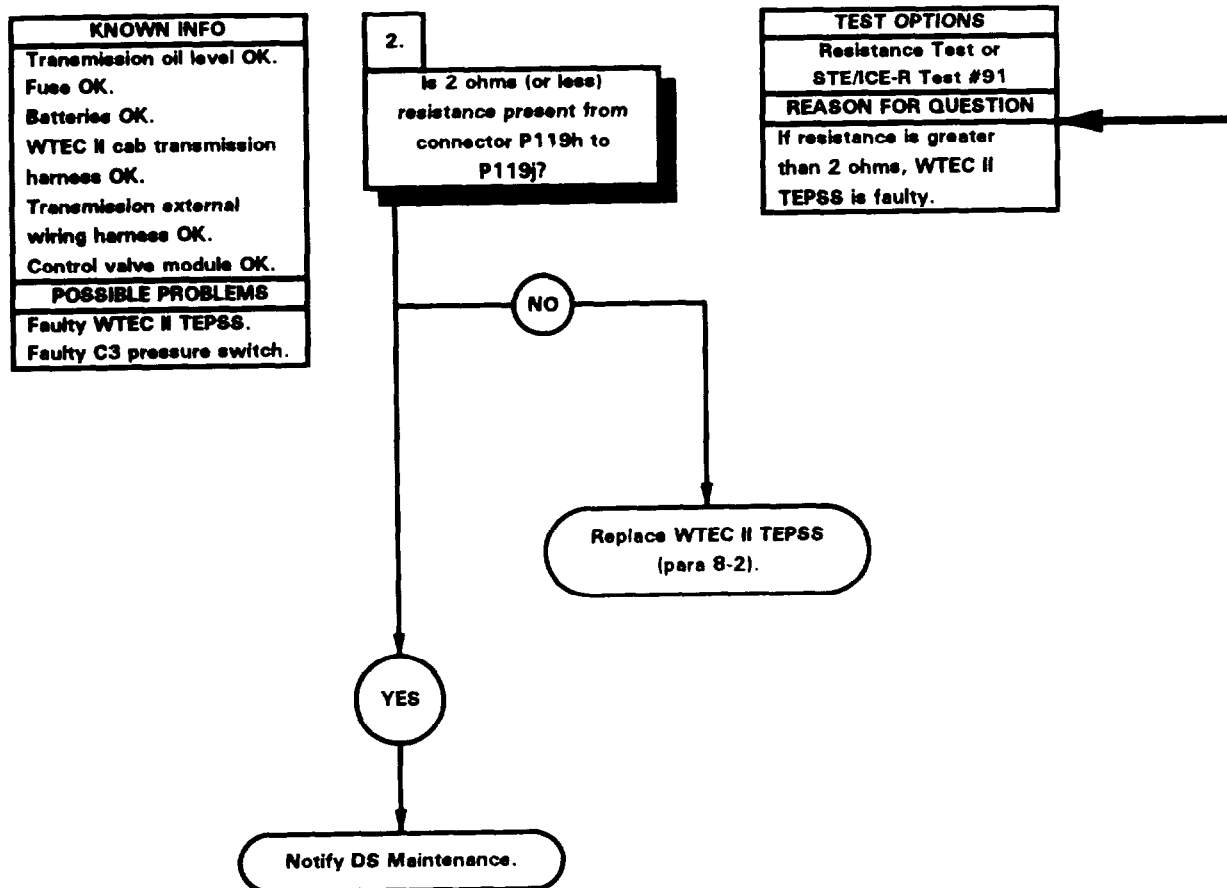
TABLE 2-26. SUB CODE RANGE

SUB CODE	SUB CODE MEANING	
11	1st	Range VER
22	2nd	Range VER
44	4th	Range VER
66	6th	Range VER
88	N1	Range VER
99	N2/N4	Range VER

CLUTCH PRESSURE TAPS
C1-C6 AND MAIN

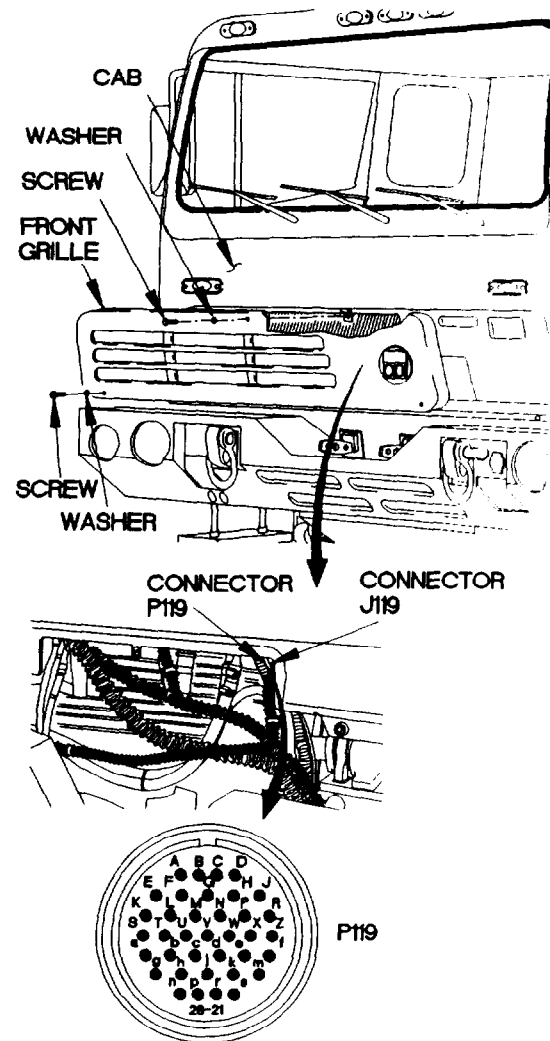
42F0901-

110. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 57 AND ANY SUB CODE (CONT)



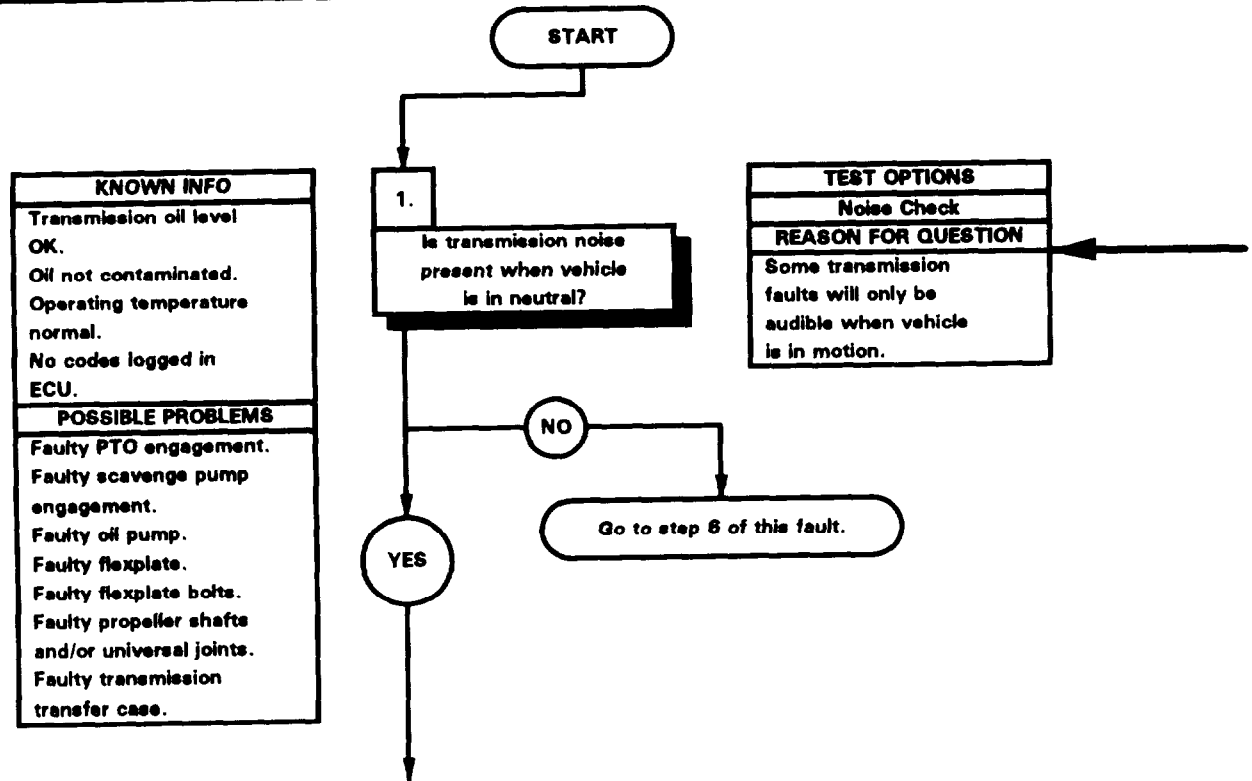
RESISTANCE TEST

- (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 P119h.
- (7) Connect negative (-) probe of multimeter to connector P119j and note reading on multimeter.
- (8) If 2 ohms (or less) resistance is present, the C3 pressure switch may be faulty, notify DS Maintenance.
- (9) If resistance is greater than 2 ohms, replace WTEC II TEPSS (para 8-2).
- (10) Connect connector P119 to connector J119.
- (11) Position front grille on cab with washer and screw.
- (12) Position two washers and screws in front grille.
- (13) Tighten screw to 48-60 lb-in. (5-7 N-m).
- (14) Tighten two screws to 24 lb-in. (3 N-m).
- (15) Clear diagnostic codes (para 8-4).



K2F0942-

11. TRANSMISSION UNUSUALLY NOISY WHEN OPERATING	
INITIAL SETUP	
Equipment Conditions	Tools and Special Tools
Engine shut down (TM 9-2320-366-10-1).	Goggles, Industrial (Item 15, Appendix C)
Reference	Tool Kit, Genl Mech (Item 46, Appendix C)
TM 9-4910-571-12&P	STE/CE-R (Item 41, Appendix C)
	Wrench, Torque, 0-175 lb-ft (Item 58, Appendix C)
	Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Materials/Parts	
Packing, Preformed (Item 197, Appendix G)	



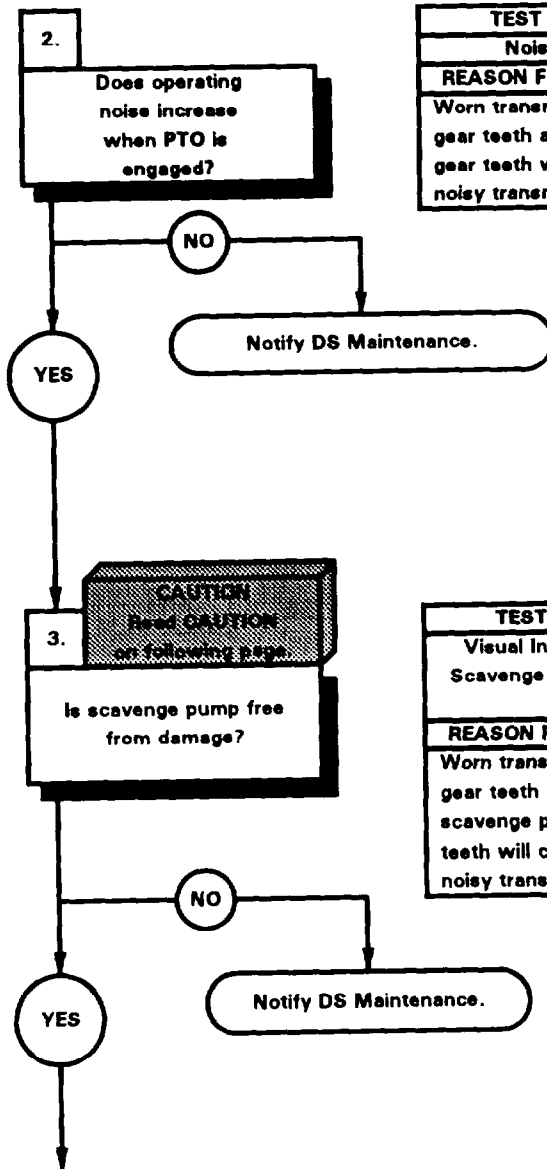
NOISE CHECK

- (1) Check if noise is heard when transmission is in neutral.
- (2) If noise occurs 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.

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. Faulty flexplate bolts. Faulty propeller shafts and/or universal joints. Faulty transmission transfer case.

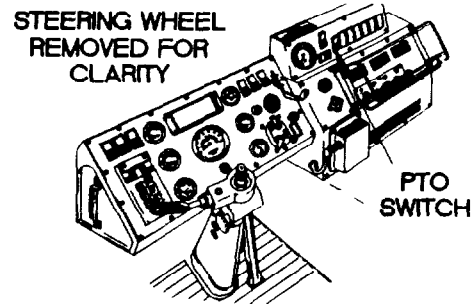


TEST OPTIONS
Noise Check
REASON FOR QUESTION
Worn transmission gear teeth and/or PTO gear teeth will cause a noisy transmission.

TEST OPTIONS
Visual Inspection and Scavenge Pump Suction Test
REASON FOR QUESTION
Worn transmission gear teeth and/or scavenge pump gear teeth will cause a noisy transmission.

NOISE CHECK

- (1) Engage PTO (TM 9-2320-366-10-1).
- (2) Listen for unusual noise or increase in noise from PTO.
- (3) If transmission is noisy when PTO is engaged, transmission gear teeth are faulty and/or PTO gear teeth are faulty. Notify DS Maintenance.
- (4) Disengage PTO (TM 9-2320-366-10-1).
- (5) Shut down engine (TM 9-2320-366-10-1).



x2f10m1A

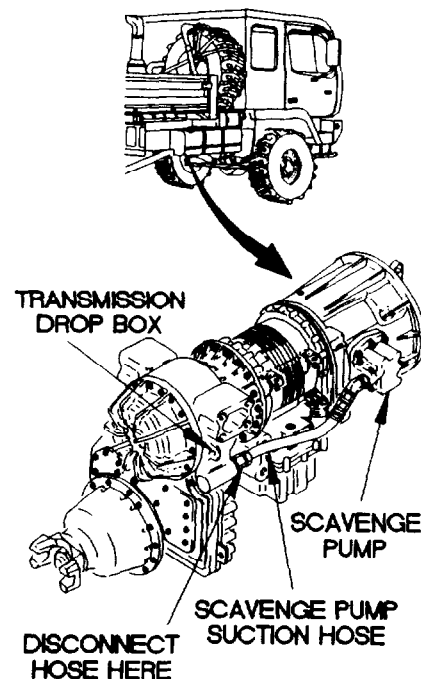
- (1) Place drain pan under transfer case.
- (2) Disconnect scavenge pump suction hose at transfer case.
- (3) Start engine (TM 9-2320-366-10-1).
- (4) If oil drips or runs from fitting on transfer case, scavenge pump is not picking up oil from transmission transfer case causing it to overflow.
- (5) Perform scavenge pump suction test.
- (6) Shut down engine (TM-2320-366-10-1).

SCAVENGE PUMP SUCTION TEST

CAUTION

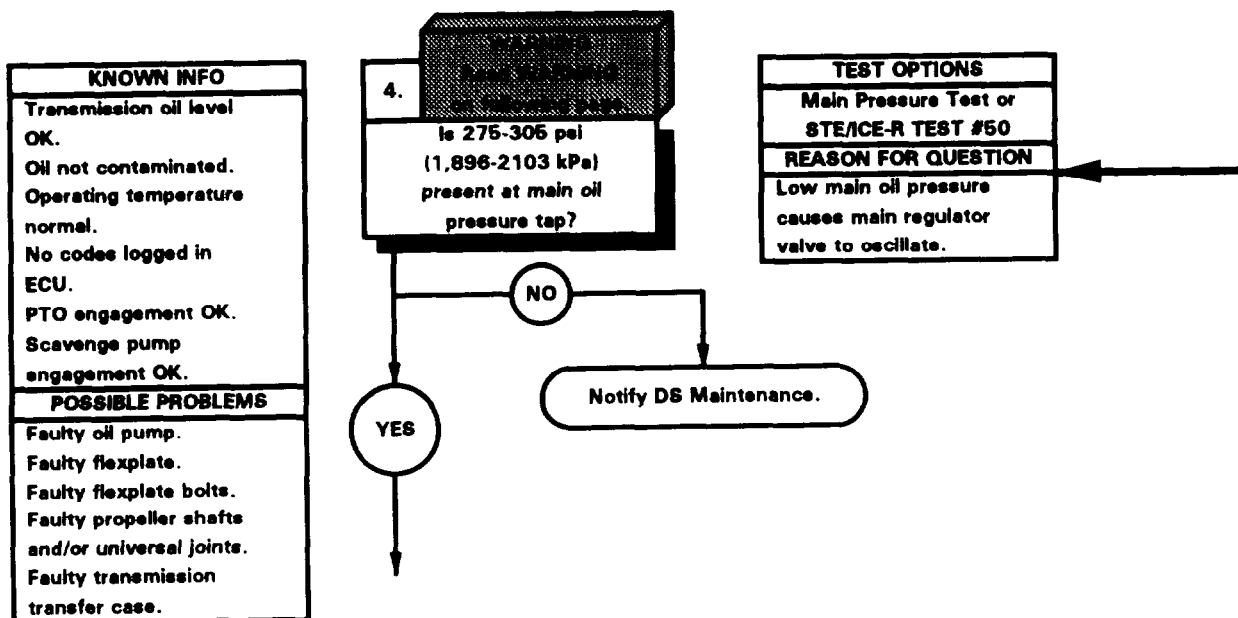
Be sure to shut down engine immediately after test has been completed. Failure to comply may result in damage to transmission.

- (1) Place end of hose in cup containing approximately one pint of oil.
- (2) Start engine (TM 9-2320-366-10-1).
- (3) Select neutral at pushbutton shift selector (TM 9-2320-366-10-1) and check if oil is immediately sucked into hose by scavenge pump.
- (4) Shut down engine (TM 9-2320-366-10-1).
- (5) If oil is not immediately removed from cup by scavenge pump, scavenge pump is faulty due to worn gears. Notify DS Maintenance.
- (6) Connect scavenge pump section hose to transfer case.
- (7) Remove drain pan under transfer case.



x2f10m2A

†11. TRANSMISSION UNUSUALLY NOISY WHEN OPERATING (CONT)

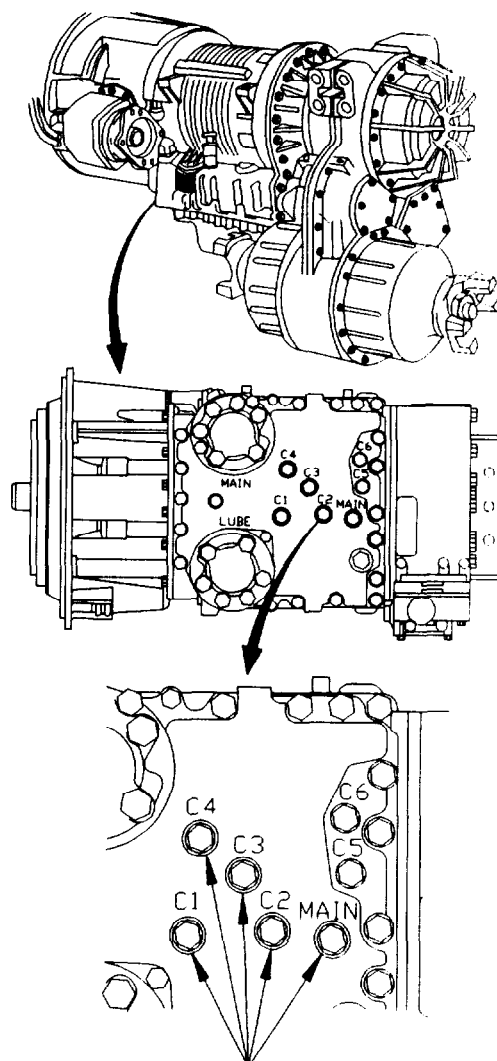


MAIN OIL PRESSURE TEST

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.

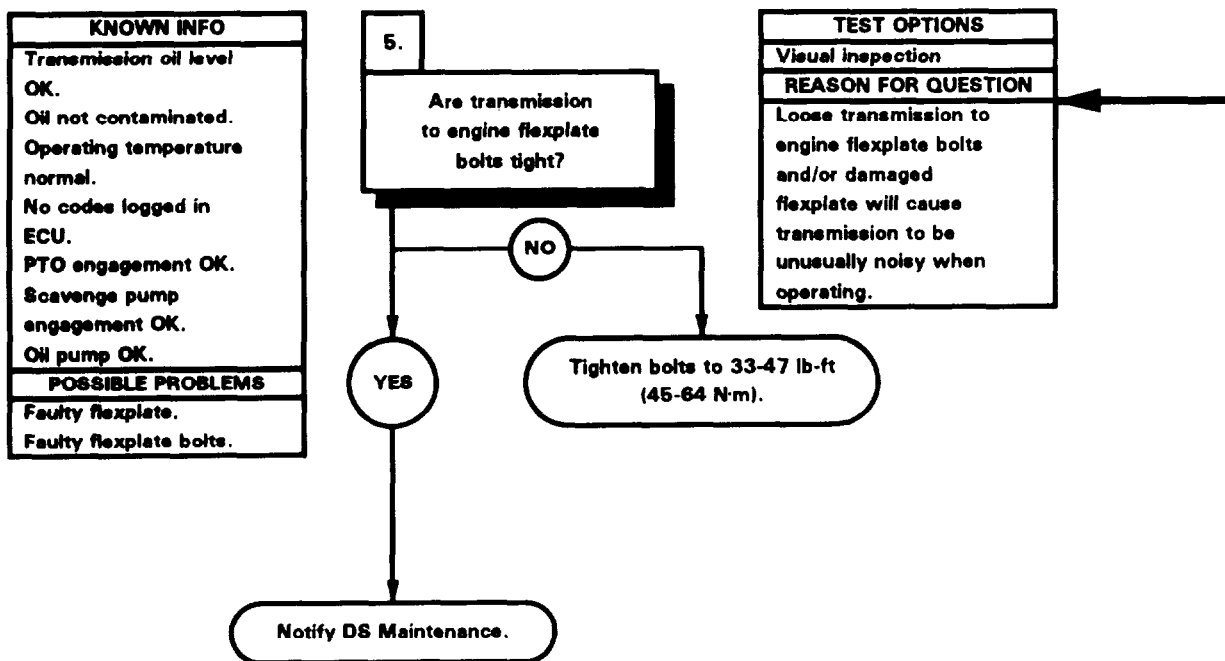
- (1) Position drain pan under pressure tap.
- (2) Remove main pressure tap plug and preformed packing from control valve module. Discard preformed packing.
- (3) Connect STE/ICE-R adapter and enubber to main pressure tap.
- (4) Perform STE/ICE-R Test #50 (TM 9-4910-571-12&P).
- (5) Start engine (TM 9-2320-366-10-1) and run at idle.
- (6) With parking brake applied, position WTEC II TEPSS to R position then to N position (TM 9-2320-366-10-1) while assistant checks reading on STE/ICE-R.
- (7) Shut down engine (TM 9-2320-366-10-1).
- (8) If main oil pressure is low, oil pump is faulty. Notify DS Maintenance.
- (9) If oil pressure is good, moving components in transmission are faulty. Notify DS Maintenance.
- (10) Remove STE/ICE-R adapter and enubber.
- (11) Position preformed packing and main pressure tap plug in control valve module.
- (12) Tighten main pressure tap plug to 84-120 lb-in. (9-14 N·m).
- (13) Remove drain pan under pressure tap.



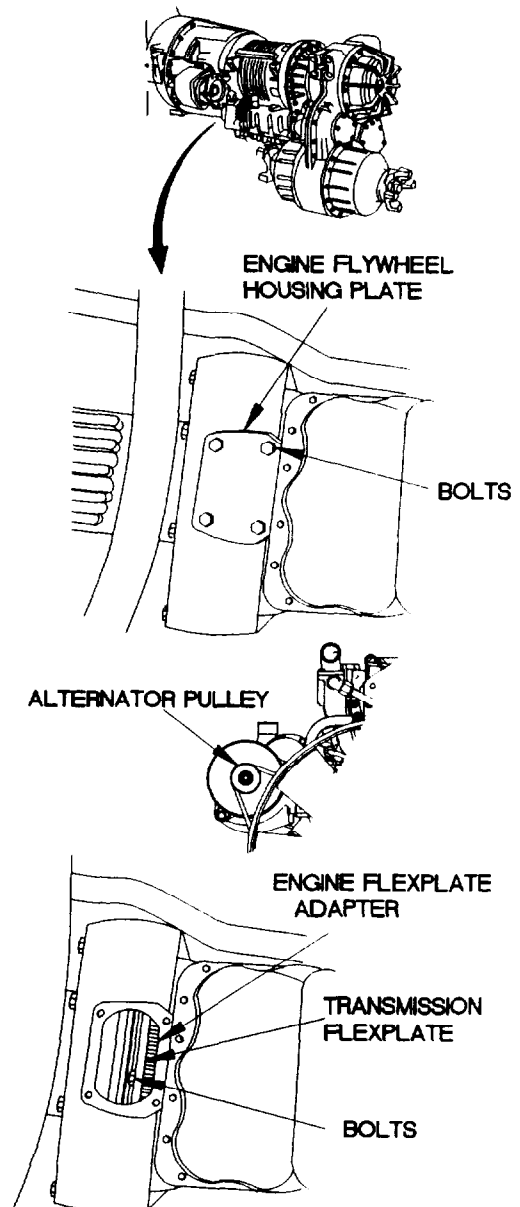
CLUTCH PRESSURE TAPS
C1-C6 AND MAIN

X2F10034

11. TRANSMISSION UNUSUALLY NOISY WHEN OPERATING (CONT)

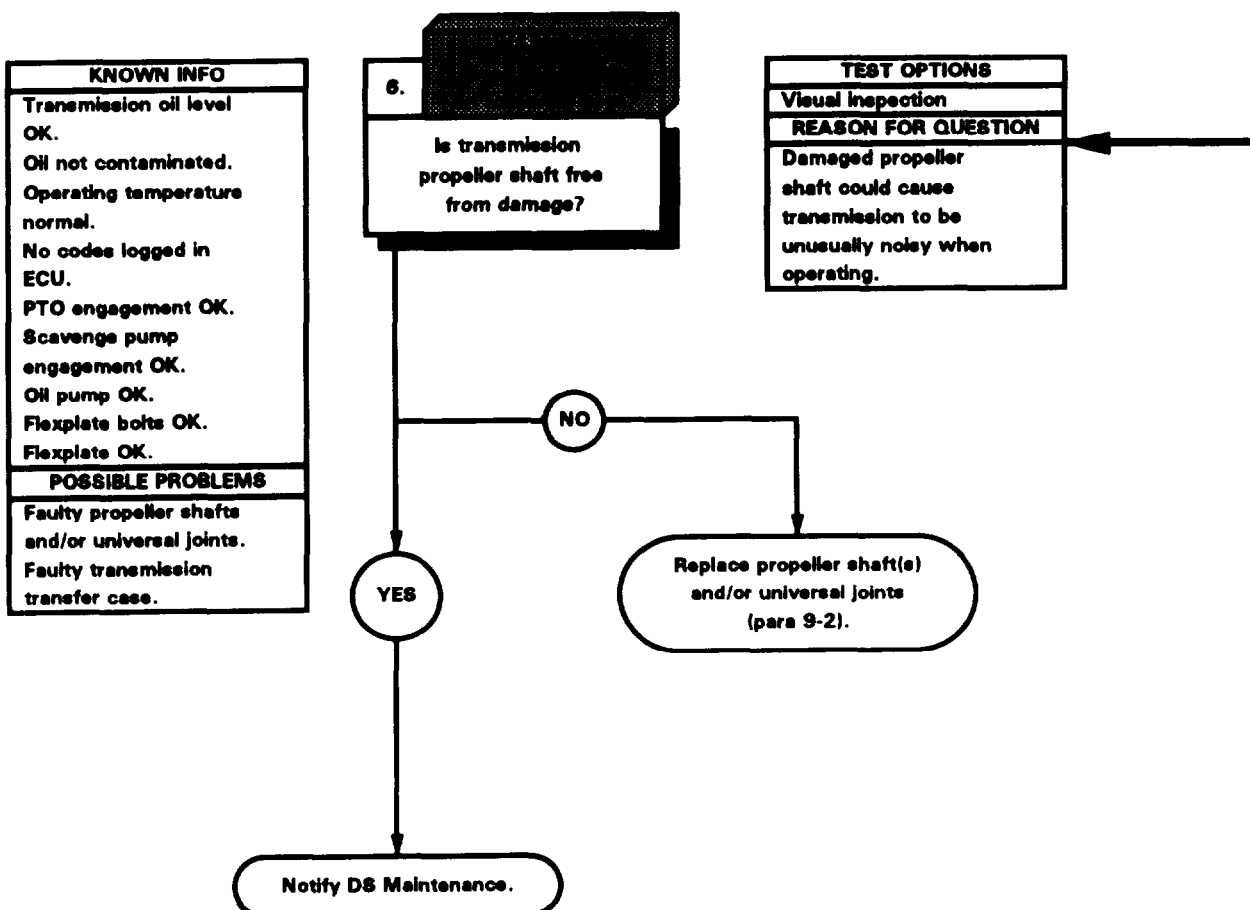


- (1) Remove four bolts from engine flywheel housing plate.
- (2) Turn engine alternator pulley in clockwise arcs to reposition transmission flexplate for transmission to engine flexplate bolt inspection.
- (3) Inspect bolts in flexplate for looseness.
- (4) Inspect flexplate for play or damage.
- (5) If bolts are loose, transmission will make noise.
- (6) Tighten bolts in flexplate.
- (7) If flexplate has play or visible signs of damage, flexplate is faulty.



2F1004A

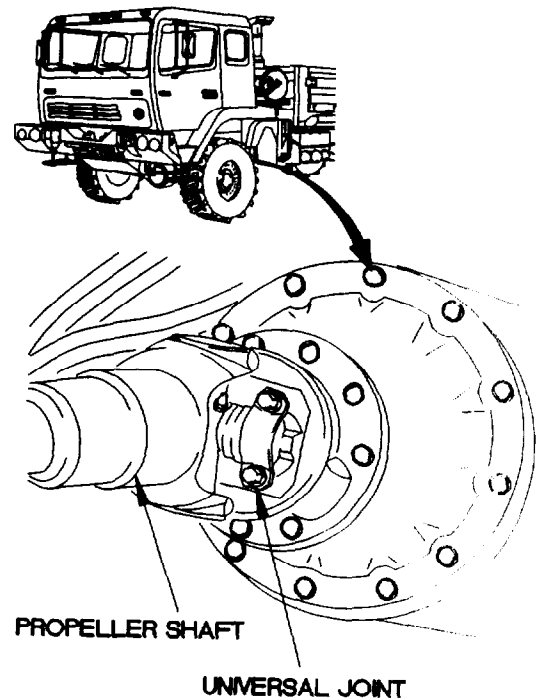
111. TRANSMISSION UNUSUALLY NOISY WHEN OPERATING (CONT)



WARNING

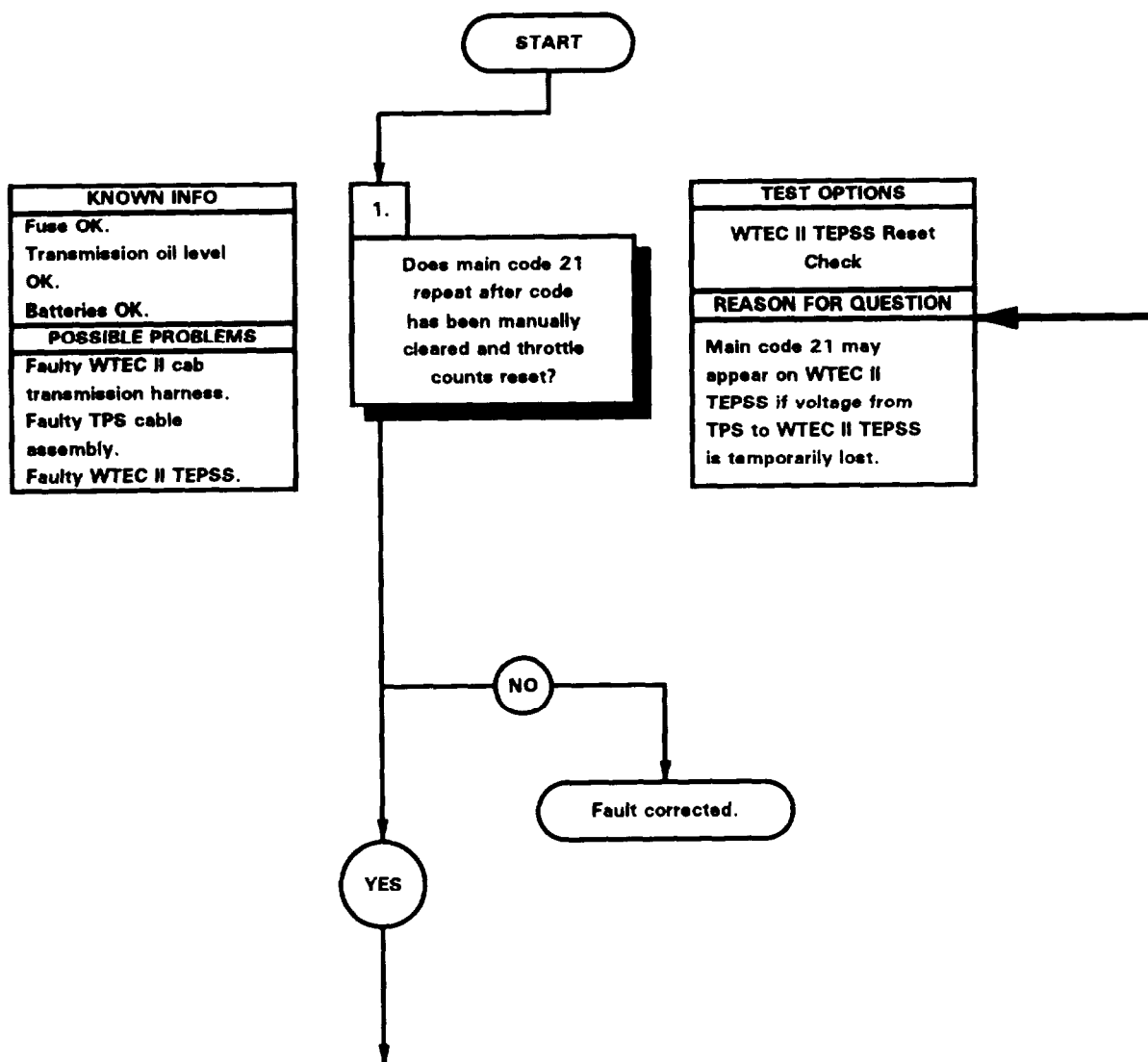
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

- (1) Inspect propeller shafts 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.



x2f10054

112. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 21 AND ANY SUB CODE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/ICE-R (Item 41, Appendix C)
Personnel Required (2)	References TM 9-4910-571-12&P

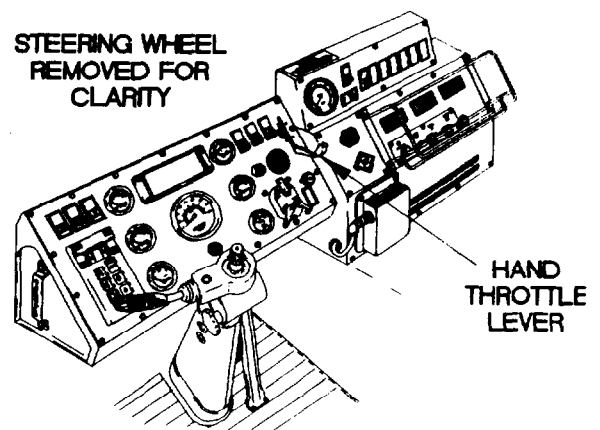


NOTE

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).

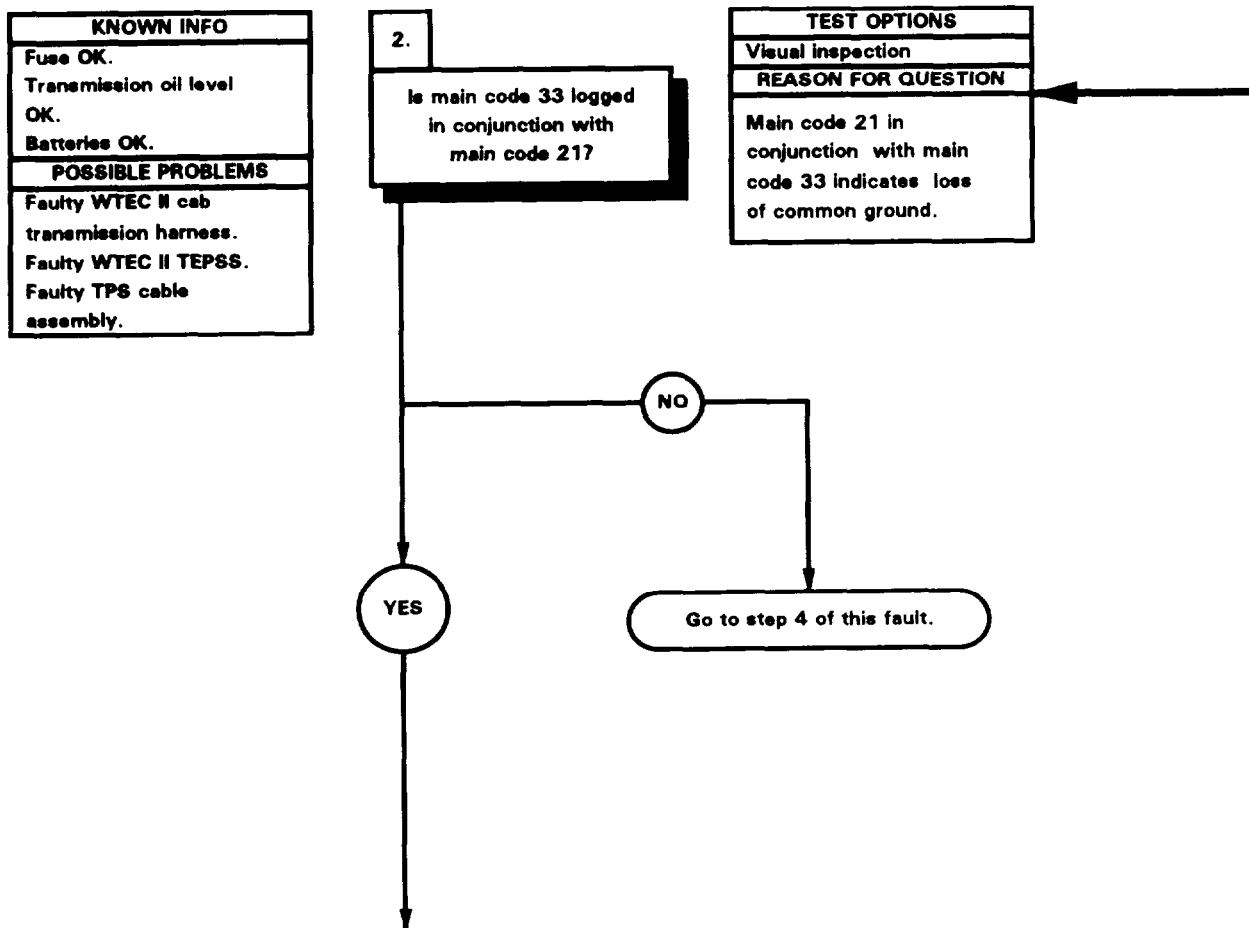
WTEC II TEPSS RESET CHECK

- (1) Cycle master power switch to on (TM 9-2320-366-10-1), then to off five times to clear existing throttle count settings.
- (2) Position master power switch to on (TM 9-2320-366-10-1).
- (3) Depress accelerator pedal from idle position to full throttle position (TM 9-2320-366-10-1) to set new 0% and 100% throttle count values in WTEC 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 9-2320-366-10-1).

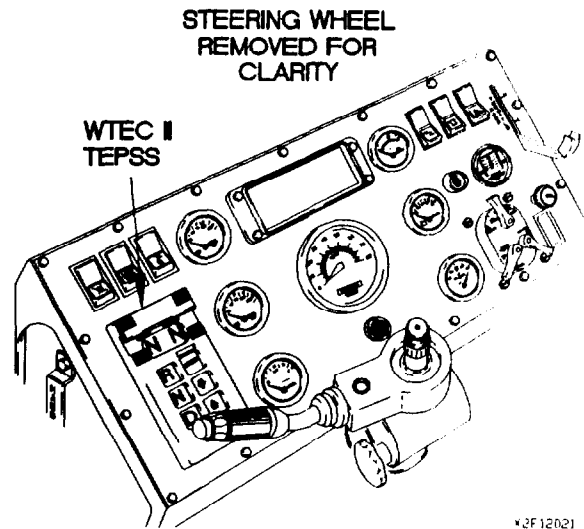


*2F11014

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

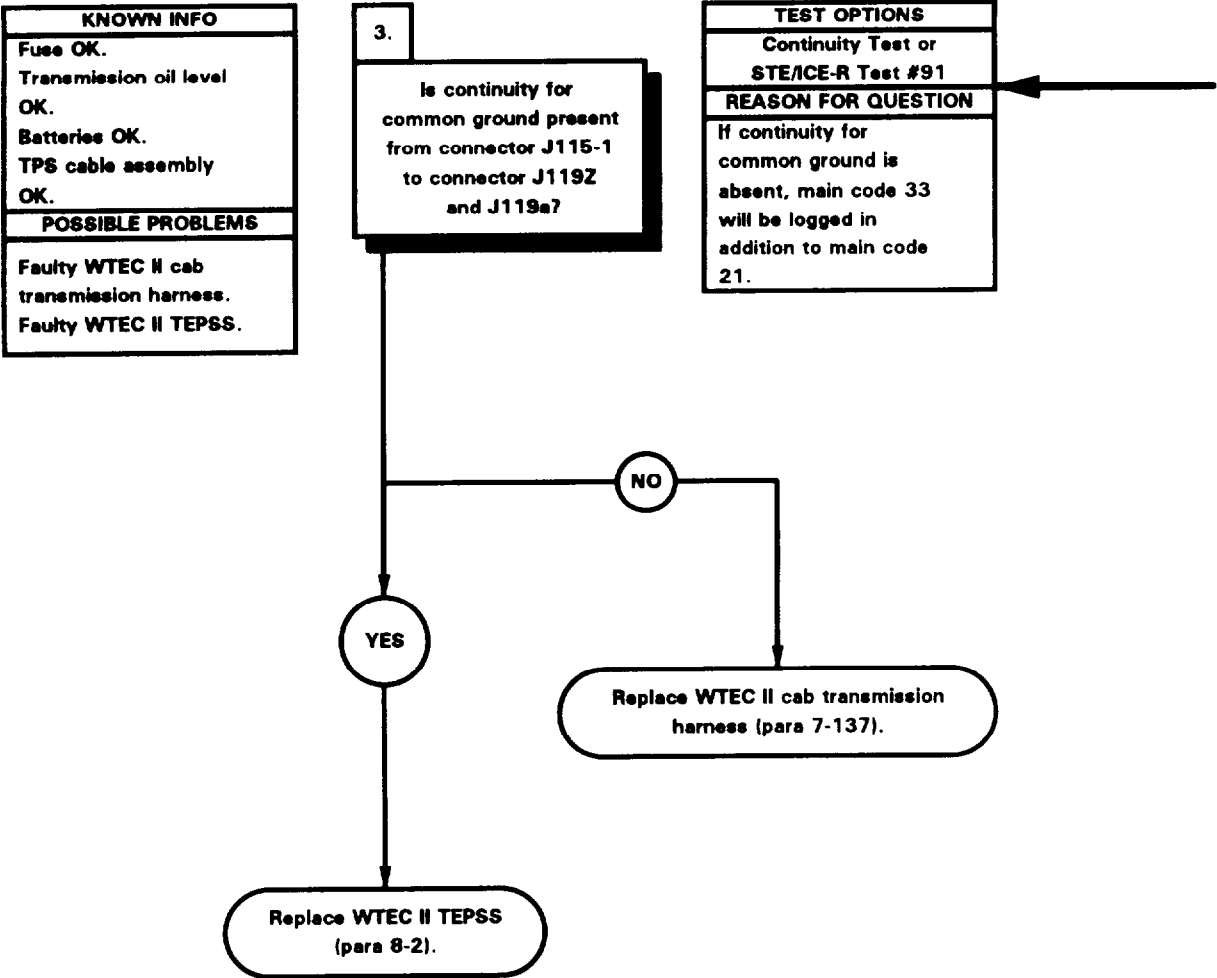


- (1) Position master power switch to on (TM 9-2320-366-10-1).
- (2) Press MODE button on WTEC II TEPSS to bring up second code (if any).
- (3) If main code 33 displays at WTEC II TEPSS, common ground may have been lost.
- (4) If main code 21 is the only code displayed, TPS may be faulty. Go to step 4 of this fault.
- (5) Position master power switch to off (TM 9-2320-366-10-1).



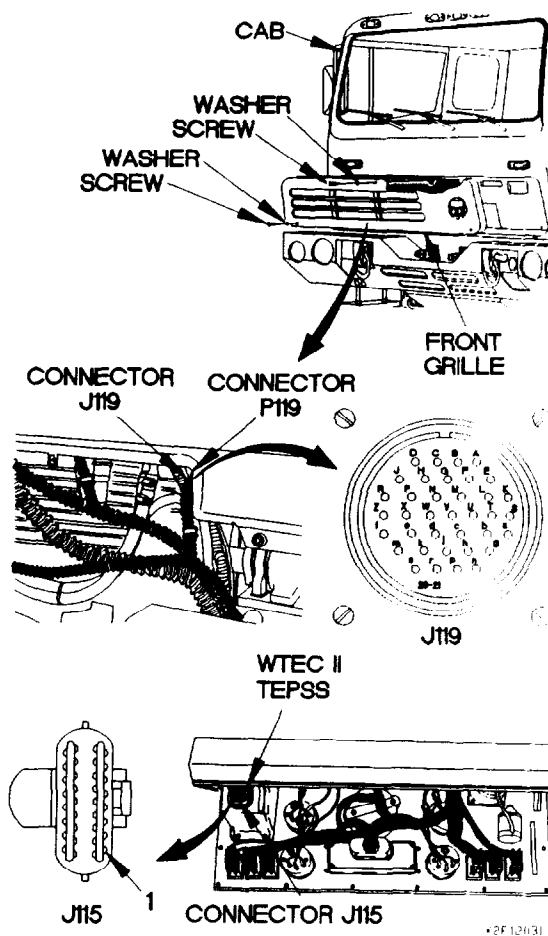
*2F12021

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

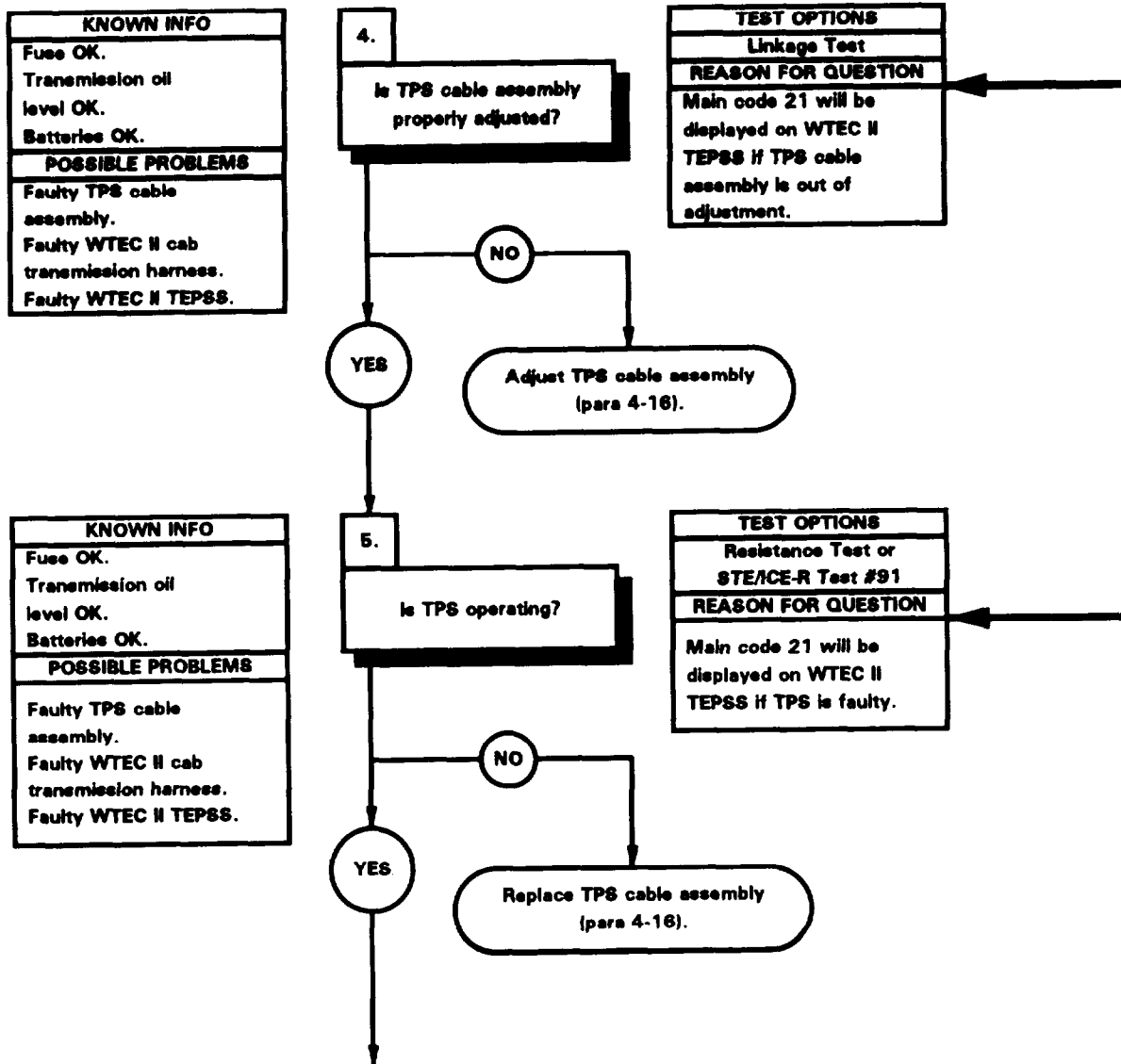


CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Remove instrument panel assembly for access (para 7-15).
- (6) Disconnect connector J115 (top connector) from WTEC II TEPSS.
- (7) Set multimeter to ohms.
- (8) Connect positive (+) probe of multimeter to connector J115-1.
- (9) Connect negative (-) probe of multimeter to connector J119a and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to connector J119Z and note reading on multimeter.
- (11) If continuity is not present from connector J115-1 to connector J119a and J119Z, replace WTEC II cab transmission harness (para 7-137).
- (12) If continuity is present, replace WTEC II TEPSS (para 8-2).
- (13) Install instrument panel assembly (para 7-15).
- (14) Connect connector P119 to connector J119.
- (15) Position front grille on cab with washer and screw.
- (16) Position two washers and screws in front grille.
- (17) Tighten screw to 48-60 lb-in. (5-7 N-m).
- (18) Tighten two screws to 24 lb-in. (3 N-m).
- (19) Clear diagnostic codes (para 8-4).



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

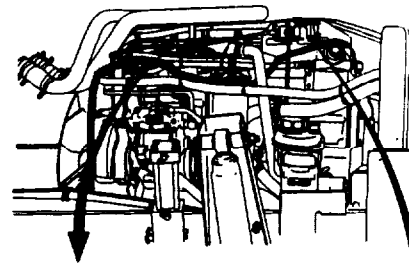


LINKAGE TEST

- (1) Raise cab (TM 9-2320-366-10-1).
- (2) Verify distance between hitch pin clip on end of sensor rod and center of cable groove in ferrule is 4 in. (10 cm).
- (3) If distance is not 4 in. (10 cm), adjust TPS cable assembly (para 4-16).

RESISTANCE TEST

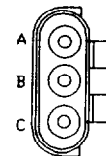
- (1) Disconnect TPS connector from TPS.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to TPS terminal A.
- (4) Connect negative (-) probe of multimeter to TPS terminal C and verify multimeter reads between 9,000-15,000 ohms across terminals A and C.
- (5) Disconnect negative (-) 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).



CENTER
OF GROOVE
IN FERRULE
BRACKET

HITCH PIN CLIP

THROTTLE
POSITION SENSOR

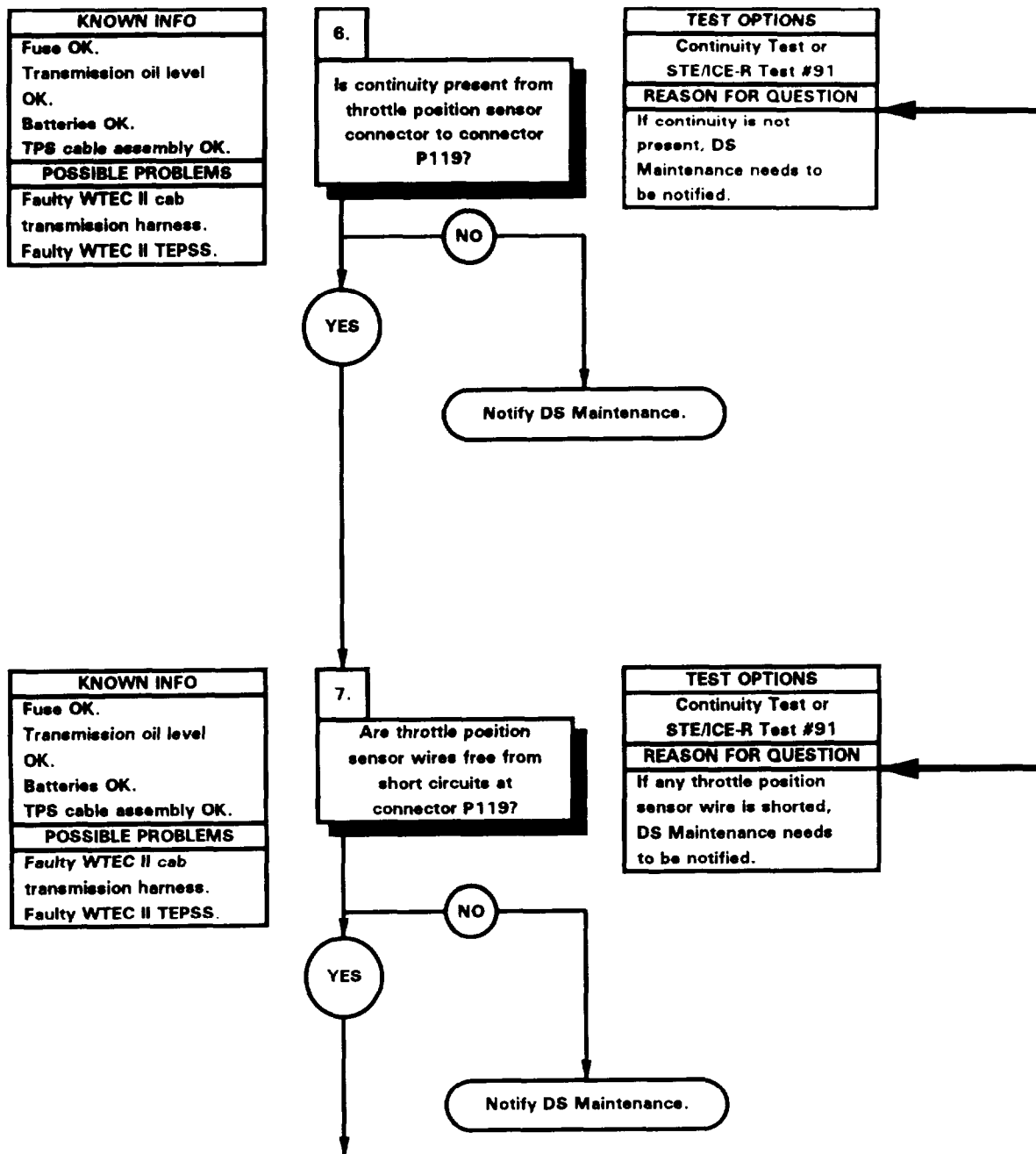


THROTTLE
POSITION SENSOR
CONNECTOR

THROTTLE
LINKAGE CONNECTOR

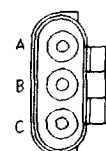
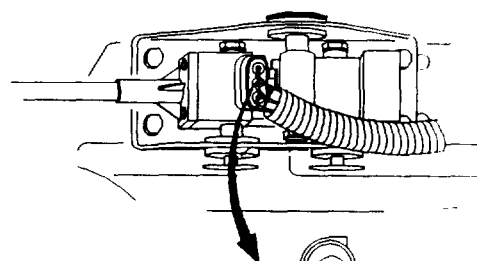
X2F1104A

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

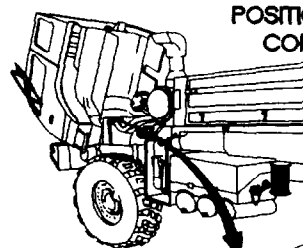


CONTINUITY TEST

- (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 TPS connector pin C and note reading on multimeter.
- (5) Connect positive (+) probe of multimeter to connector P119f.
- (6) Connect negative (-) probe of multimeter to TPS connector pin B and note reading on multimeter.
- (7) Connect positive (+) probe of multimeter to connector P119Z.
- (8) Connect negative (-) probe of multimeter to TPS connector pin A and note reading on multimeter.
- (9) If continuity is not present on one or more wires, notify DS Maintenance.

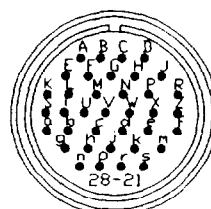


THROTTLE
POSITION SENSOR
CONNECTOR



CONNECTOR
P119

CONNECTOR
J119



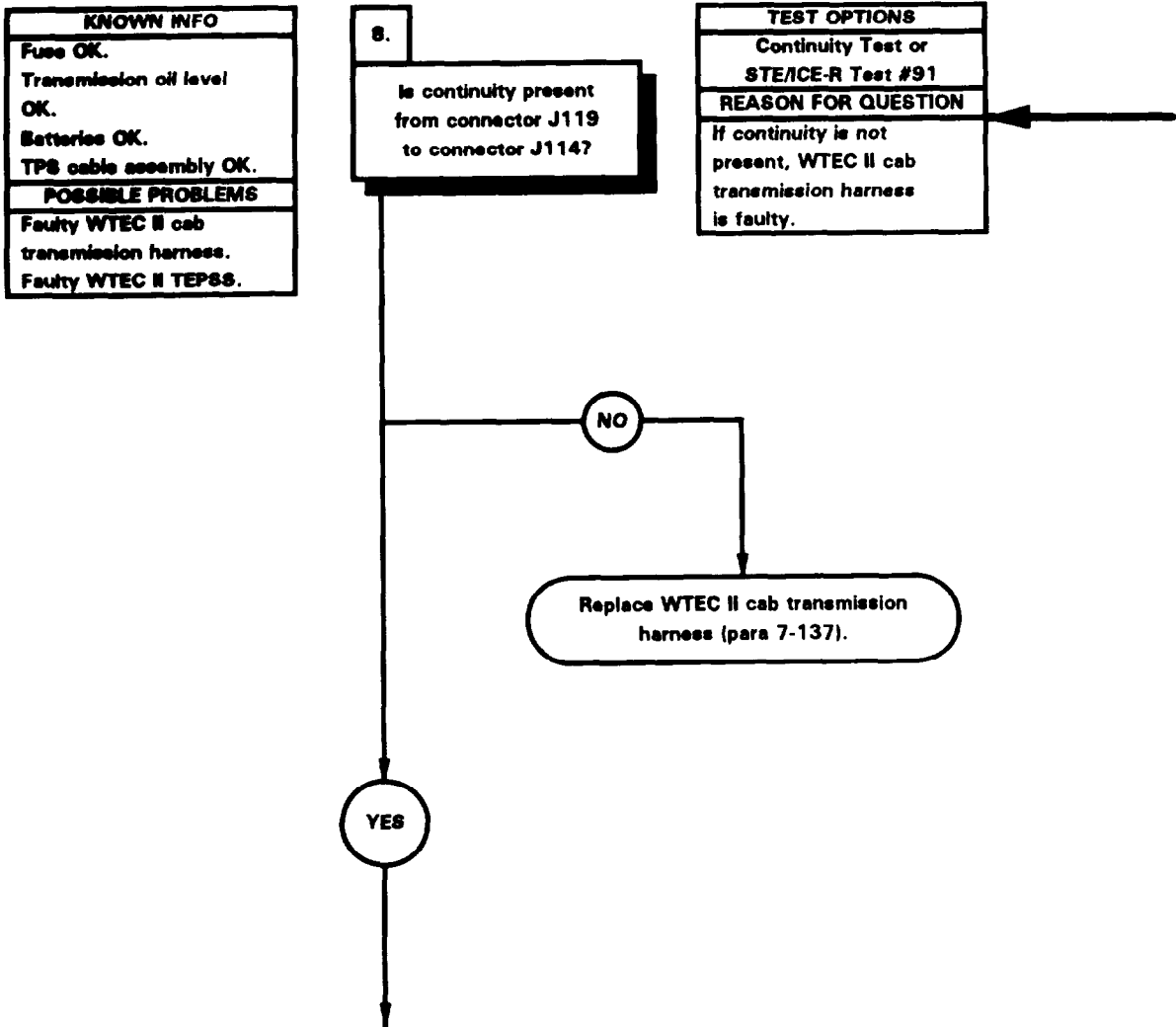
P119

X2F1105A

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 TPS connector to TPS.

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

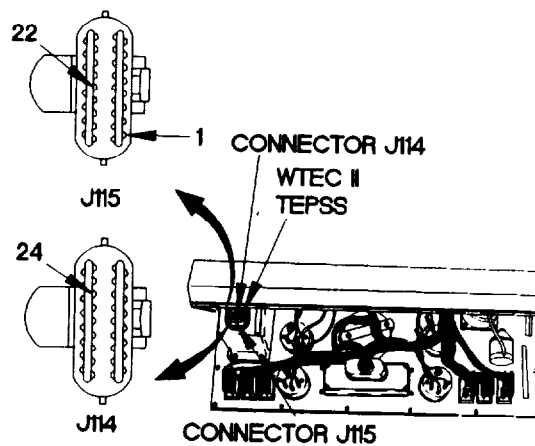
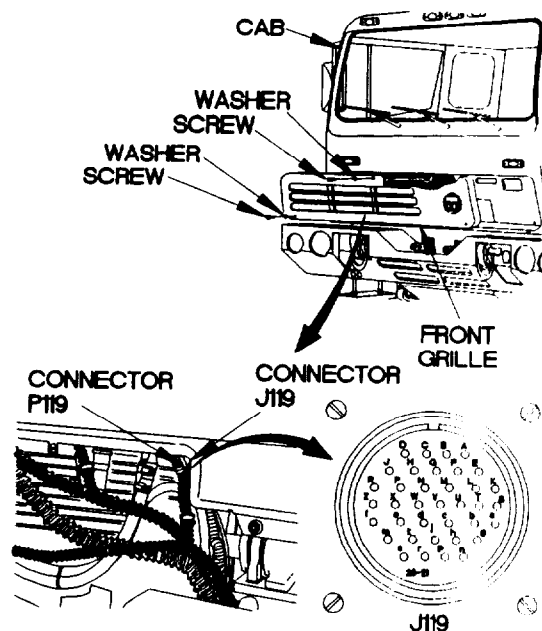


CONTINUITY TEST

- (1) Lower cab (TM 9-2320-366-10-1).
- (2) Remove two screws and washers from front grille.
- (3) Remove screw and washer from front grille.
- (4) Remove front grille from cab.
- (5) Remove instrument panel assembly for access (para 7-15).
- (6) Disconnect connector J114 (bottom connector) at WTEC II TEPSS.
- (7) Set multimeter to ohms.
- (8) For each line of Table 2-27. WTEC II Cab Transmission Harness Continuity Check:
 - (a) Install jumper wire across sockets in column 1.
 - (b) Connect positive (+) probe of multimeter to socket in column 2.
 - (c) Connect negative (-) probe of multimeter to socket in column 3 and note reading on multimeter.
- (9) If continuity is not present on any wire in Table 2-27. WTEC II Cab Transmission Harness Continuity Check, replace WTEC II cab transmission harness (para 7-137).
- (10) Remove jumper wire from connector J119.

**TABLE 2-27. WTEC II CAB TRANSMISSION
HARNESS CONTINUITY CHECK**

COLUMN 1 Jumper across:	COLUMN 2 Positive (+) probe to:	COLUMN 3 Negative (-) probe to:
J119F to J119Z	J115-1	J115-22
J119Z to J119R	J115-1	J114-24
J119F to J119R	J115-22	J114-24



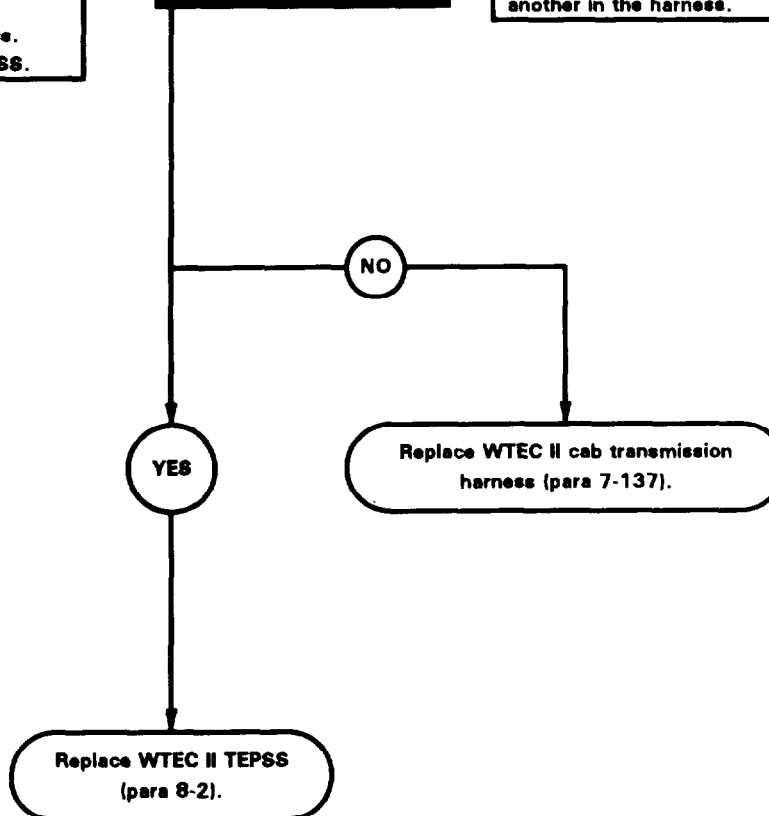
K2F12071

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. TPS cable assembly OK.
POSSIBLE PROBLEMS
Faulty WTEC II cab transmission harness. Faulty WTEC II TEPSS.

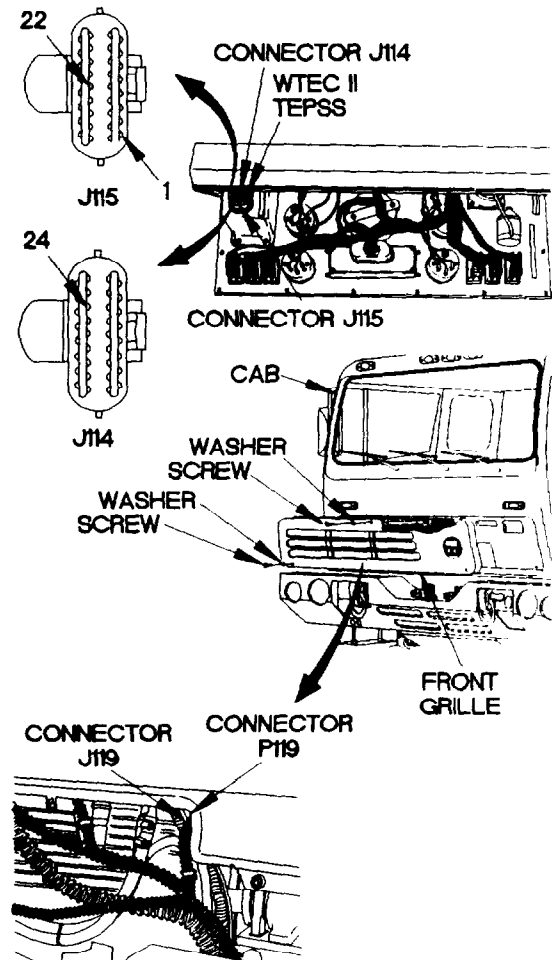
9.
Are TPS wires free from short circuits at connectors J114 and J115?

TEST OPTIONS
Continuity Test or STE/CE-R Test #91
REASON FOR QUESTION
WTEC II TEPSS may display main code 21 if wire is shorted to another in the harness.



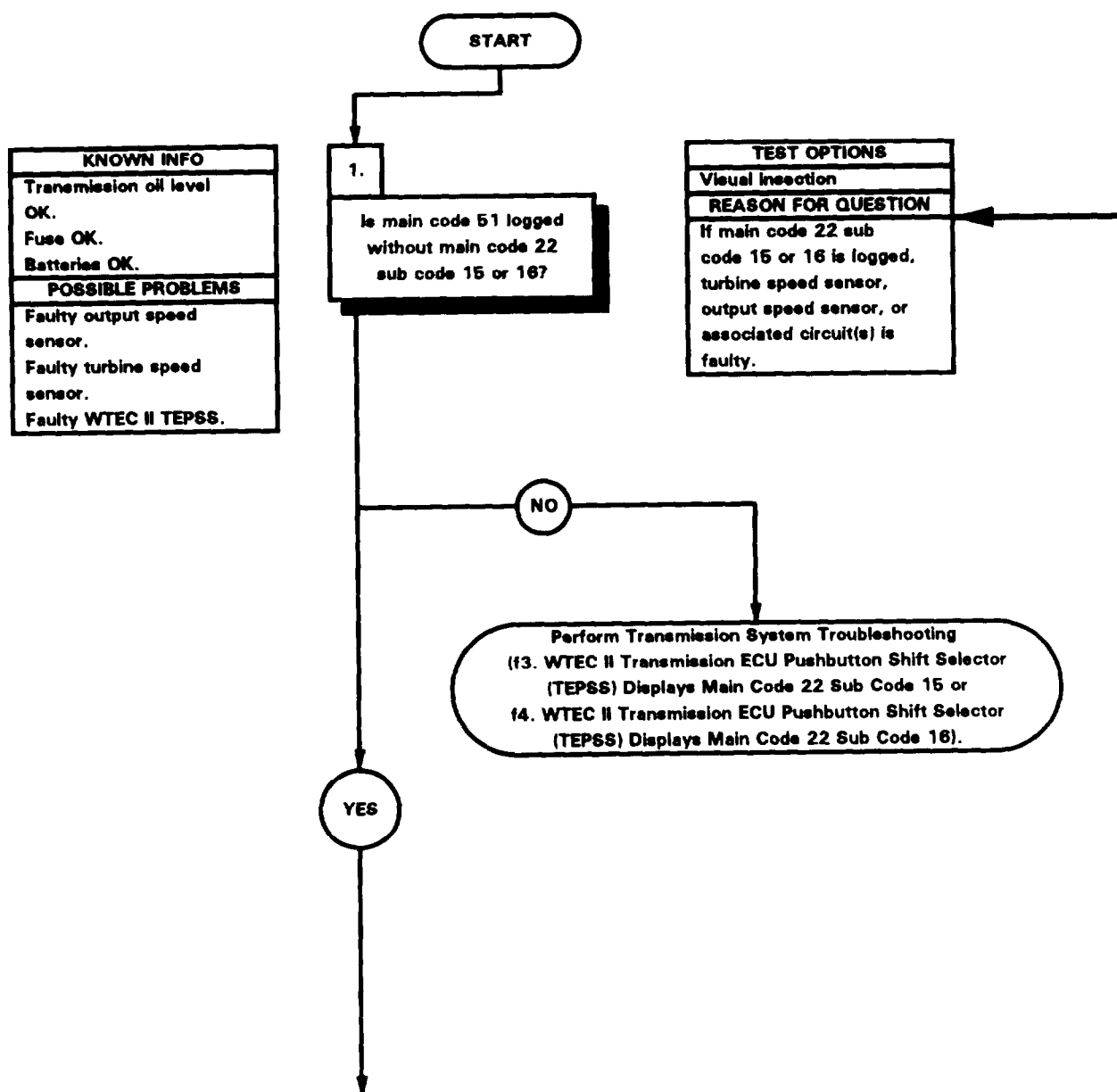
CONTINUITY TEST

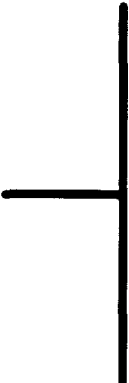
- (1) Disconnect connector J115 (top connector) from WTEC II TEPSS.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector J114-24.
- (4) Connect negative (-) probe of multimeter to all other sockets in connector J114, one at a time, and all sockets in connector J115, one at a time, and note readings on multimeter.
- (5) Connect positive (+) probe of multimeter to connector J115-1.
- (6) Connect negative (-) probe of multimeter to all other sockets in connector J115, one at a time, and all sockets in connector J114, one at a time, and note readings on multimeter.
- (7) Connect positive (+) probe of multimeter to connector J115-22.
- (8) Connect negative (-) probe of multimeter to all other sockets in connector J115, one at a time, and all sockets in connector J114, one at a time, note readings on multimeter.
- (9) If continuity is present in step 4, 6, or 8, replace WTEC II cab transmission harness (para 7-137).
- (10) If continuity is not present in step 4, 6, and 8, replace WTEC II TEPSS (para 8-2).
- (11) Connect connector J114 (bottom connector) to WTEC II TEPSS.
- (12) Connect connector J115 (top connector) to WTEC II TWPSS.
- (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).



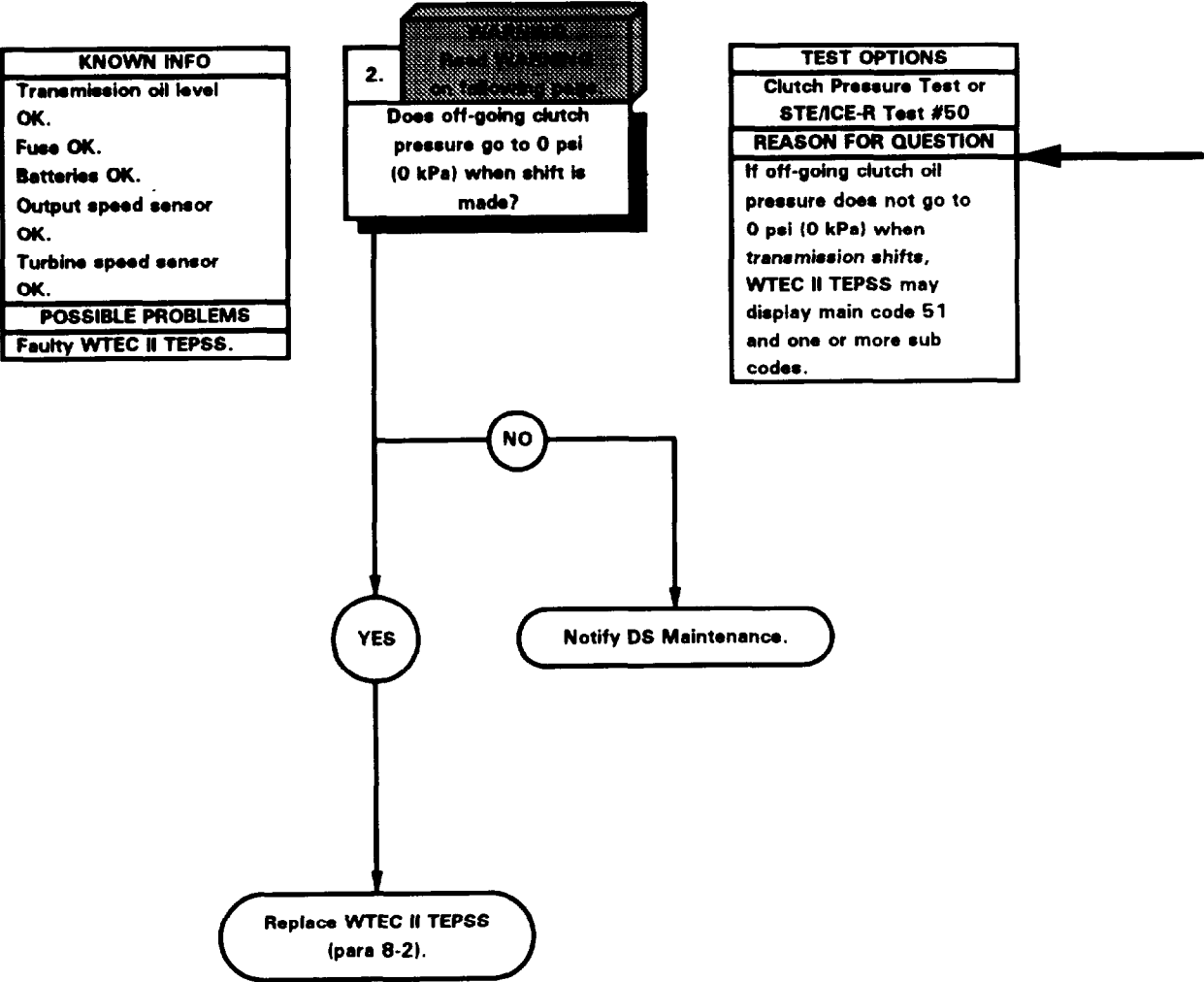
x2F12081

113. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 51 SUB CODE 10, 12, 21, 43, 45, or 65	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Goggles, Industrial (Item 15, Appendix C) Tool Kit, Genl Mech (Item 48, Appendix C) STE/CE-R (Item 41, Appendix C) Pan, Drain (Item 24, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Personnel Required (2)	Materials/Parts Packing, Preformed (Item 197, Appendix G) Reducer, Boss (Item 51, Appendix D)
Reference TM 9-4910-571-12&P	



- 
- (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).

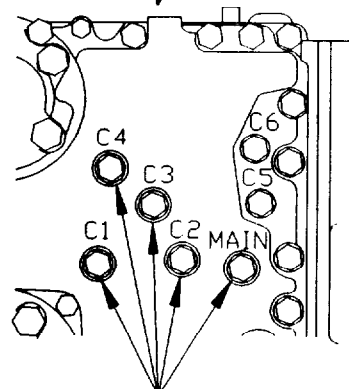
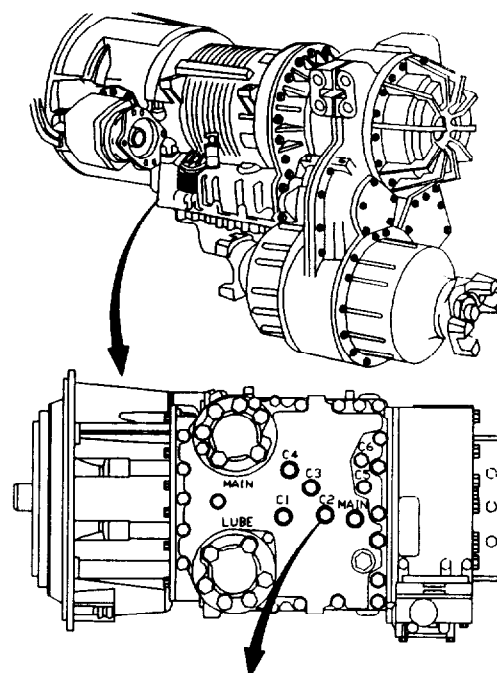
†13. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 51 SUB CODE 10, 12, 21, 43, 45, OR 65 (CONT)



CLUTCH PRESSURE TEST**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.

- (1) Remove transmission front and rear output 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 reducer, STE/ICE-R adapter, and snubber to clutch pressure tap.
- (5) Perform STE/ICE-R Test # 50 (TM 9-4910-571-12&P).
- (6) Start engine (TM 9-2320-366-10-1) and run at idle.
- (7) With parking brake applied, make shift indicated by sub code while assistant notes reading on STE/ICE-R.
- (8) If one or more off-going clutches fail to loose pressure, notify DS Maintenance.
- (9) Shut down engine (TM 9-2320-366-10-1).
- (10) Remove STE/ICE-R adapter, snubber, and reducer 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 transmission front and rear output propeller shaft (para 9-2).
- (15) Clear diagnostic codes (para 8-4).



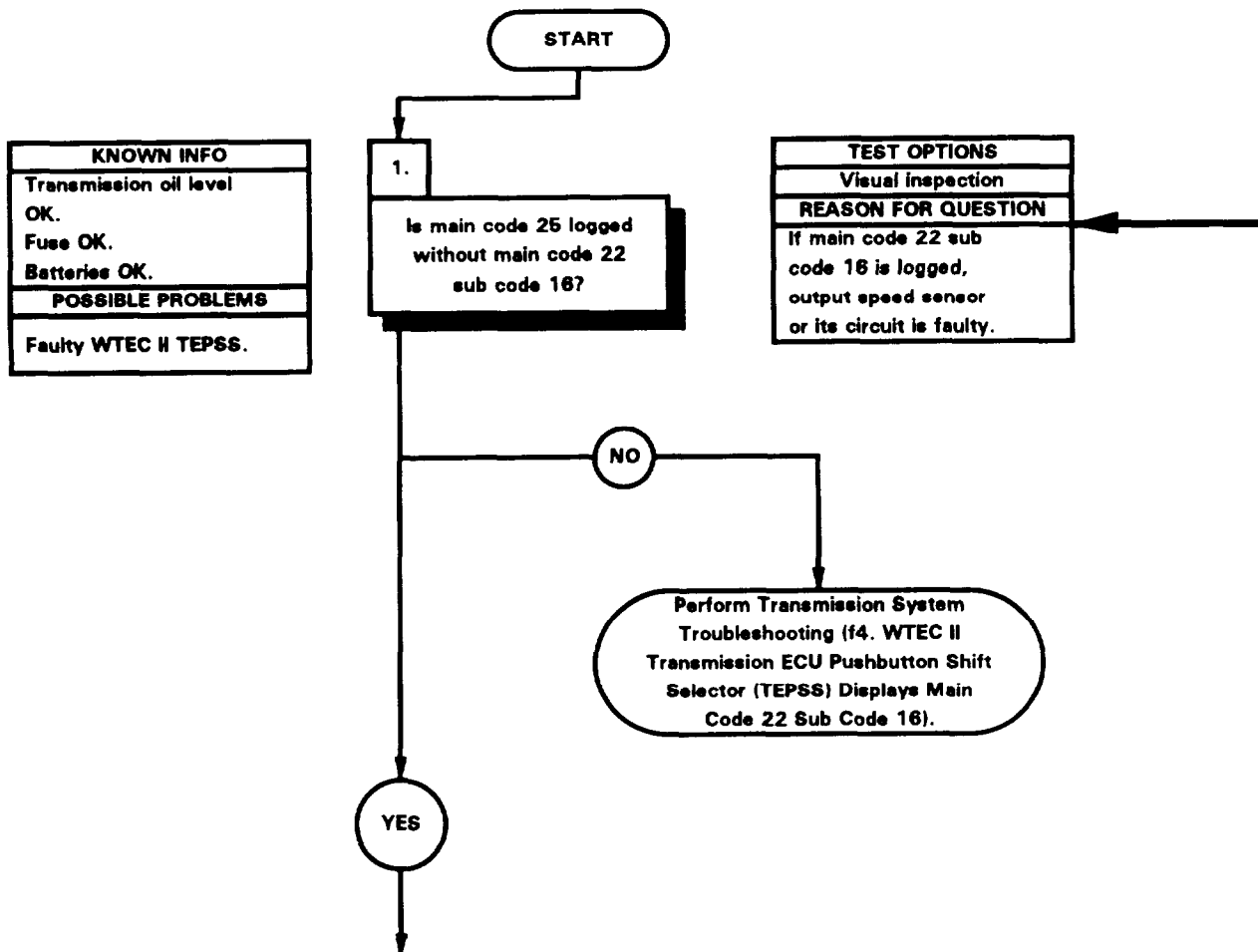
**CLUTCH PRESSURE TAPS
C1-C6 AND MAIN**

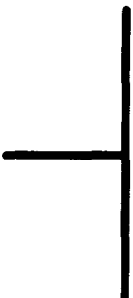
X2F1101-

TABLE 2-28. OFF-GOING CLUTCH PRESSURE TAP

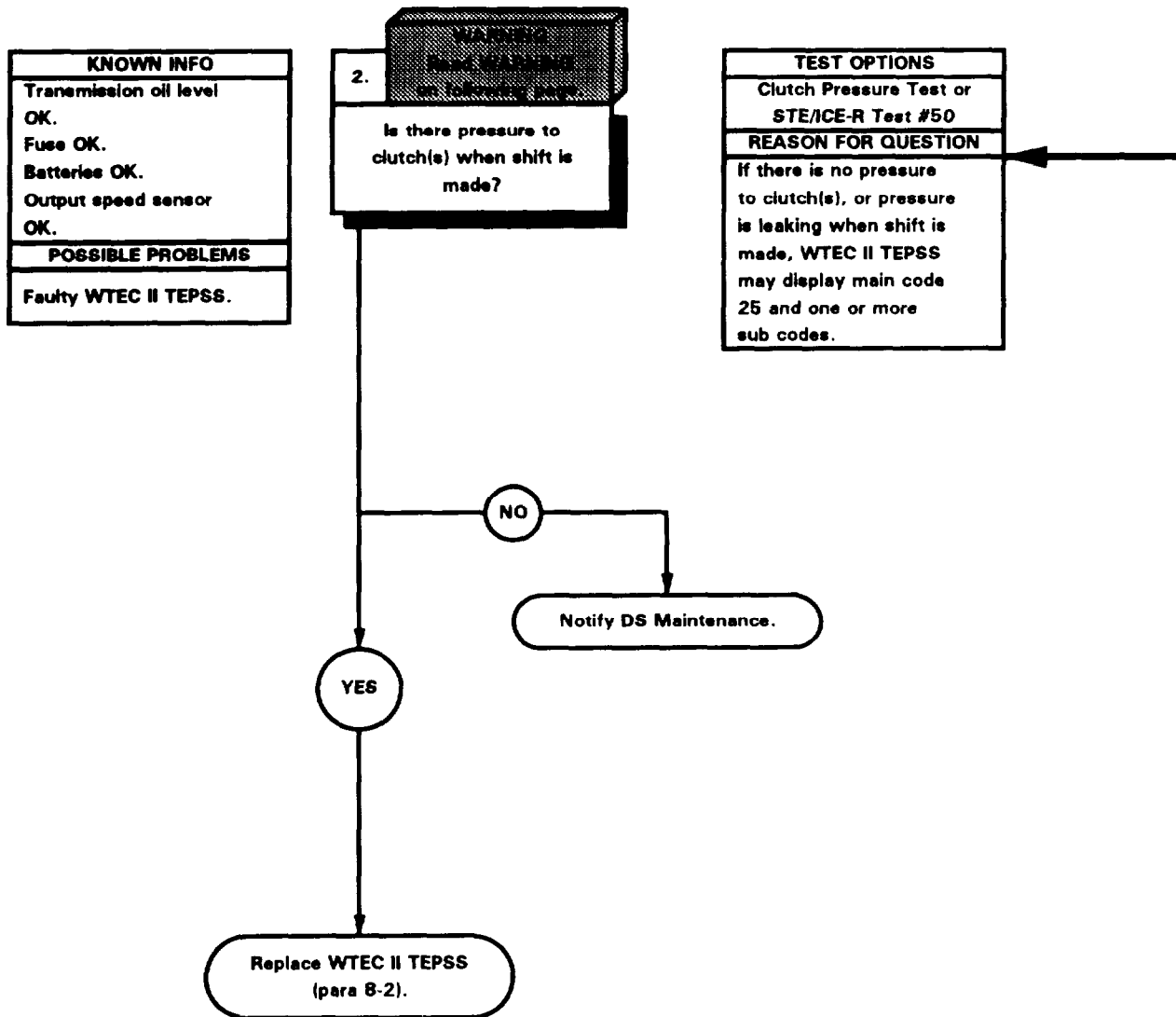
SUB CODE	SUB CODE MEANING	OFF-GOING CLUTCH	SOLENOID LOCATION
10	2-1 Downshift	C5	Stationary Clutch
12	2-3 Upshift	C5	Stationary Clutch
21	3-2 Downshift	C4	Stationary Clutch
23	3-4 Upshift	C4	Stationary Clutch
43	5-4 Downshift	C2	Rotating Clutch
45	5-6 Upshift	C1	Rotating Clutch
65	7-6 Downshift	C4	Stationary Clutch

f14. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 25 AND ANY SUB CODE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1). Personnel Required (2) Reference TM 9-4910-571-12&P	Tools and Special Tools Goggles, Industrial (Item 15, Appendix C) Tool Kit, Genl Mech (Item 46, Appendix C) STE/ICE-R (Item 41, Appendix C) Pan, Drain (Item 24, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C) Materials/Parts Packing, Preformed (Item 197, Appendix G) Reducer, Boss (Item 51, Appendix D)



- 
- (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).

114. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 25 AND ANY SUB CODE (CONT)

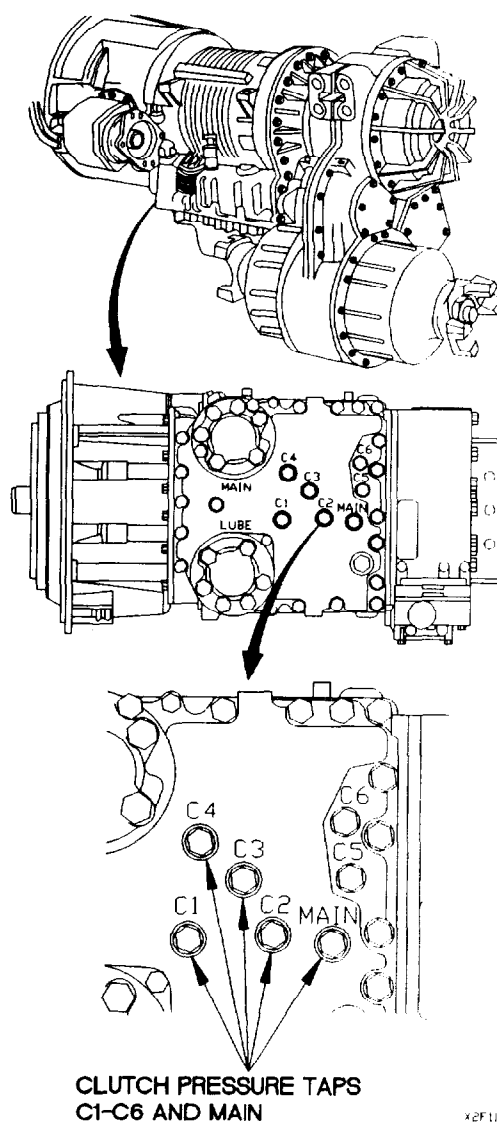


CLUTCH PRESSURE TEST

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.

- (1) Remove transmission front and rear output propeller shafts (para 9-2).
- (2) Position drain pan under pressure tap.
- (3) Remove pressure tap plug and preformed packing from clutch pressure tap indicated by the sub code. Refer to Table 2-29. Clutch Pressure Tap. Discard preformed packing.
- (4) Connect reducer, STE/ICE-R adapter, and snubber to clutch pressure tap.
- (5) Perform STE/ICE-R Test # 50 (TM 9-4910-571-12&P).
- (6) Start engine (TM 9-2320-366-10-1).
- (7) With brake applied, make shift indicated by sub code. Refer to Table 2-29. Clutch Pressure Tap.
- (8) Accelerate engine until WTEC II TEPSS displays desired range. Refer to Table 2-29. Clutch Pressure Tap.
- (9) Maintain engine speed to keep desired transmission range while assistant notes reading on STE/ICE-R.
- (10) Let engine return to idle.
- (11) Shift transmission into neutral.
- (12) Shut down engine (TM 9-2320-366-10-1).
- (13) Remove STE/ICE-R adapter, snubber, and reducer from pressure tap.
- (14) Position preformed packing and pressure tap plug in control valve module.
- (15) Tighten pressure tap plug to 84-120 lb-in. (9-14 N·m).
- (16) Remove drain pan.
- (17) Install transmission front and rear output propeller shafts (para 9-2).
- (18) If one or more clutches failed to indicate proper pressure, notify DS Maintenance.
- (19) If all clutches indicate proper pressure, replace WTEC II TEPSS (para 8-2).
- (20) Clear diagnostic codes (para 8-4).

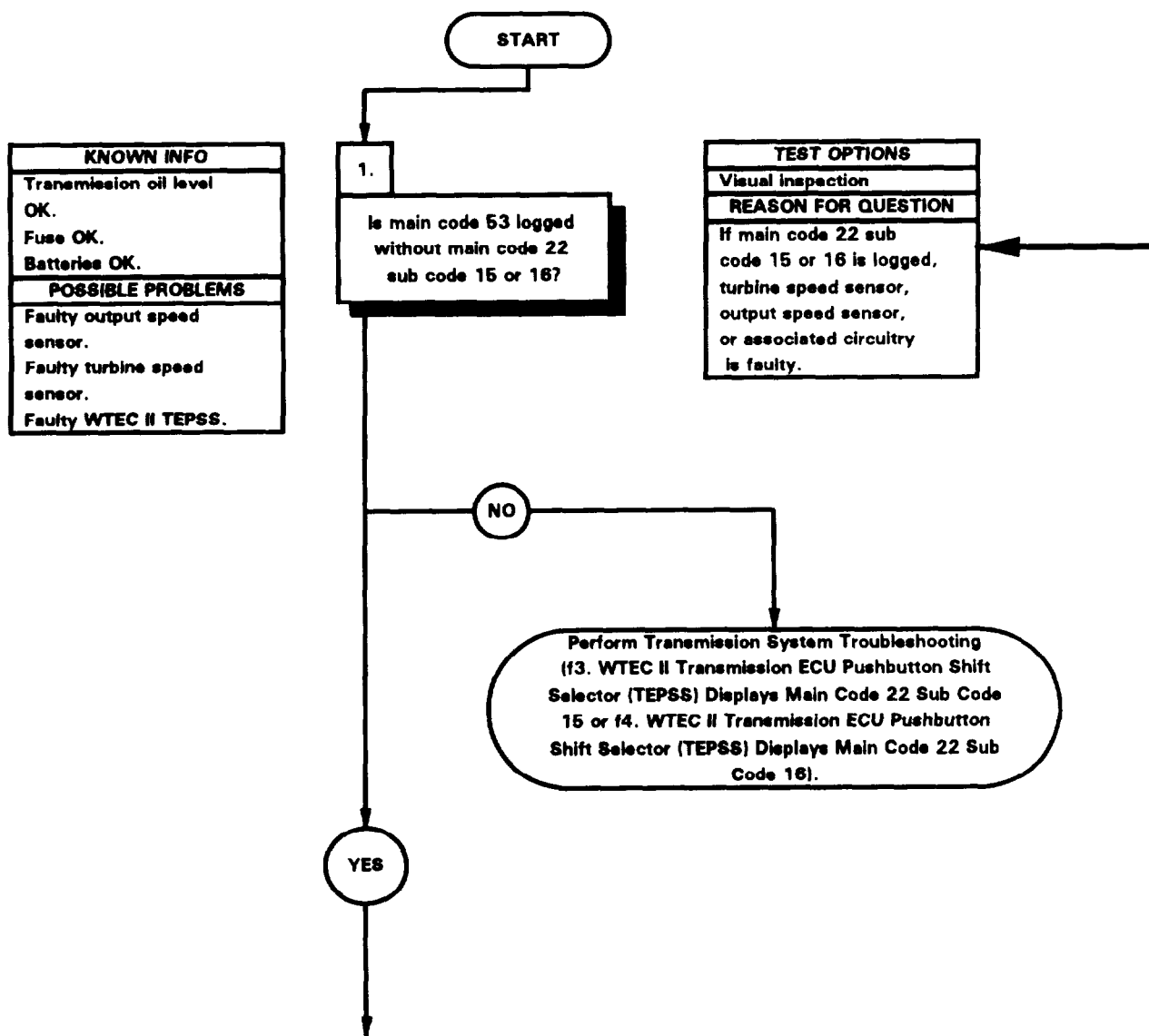


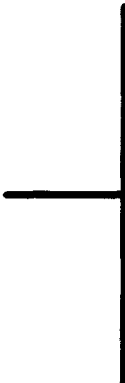
X2F1101-

TABLE 2-29. CLUTCH PRESSURE TAP

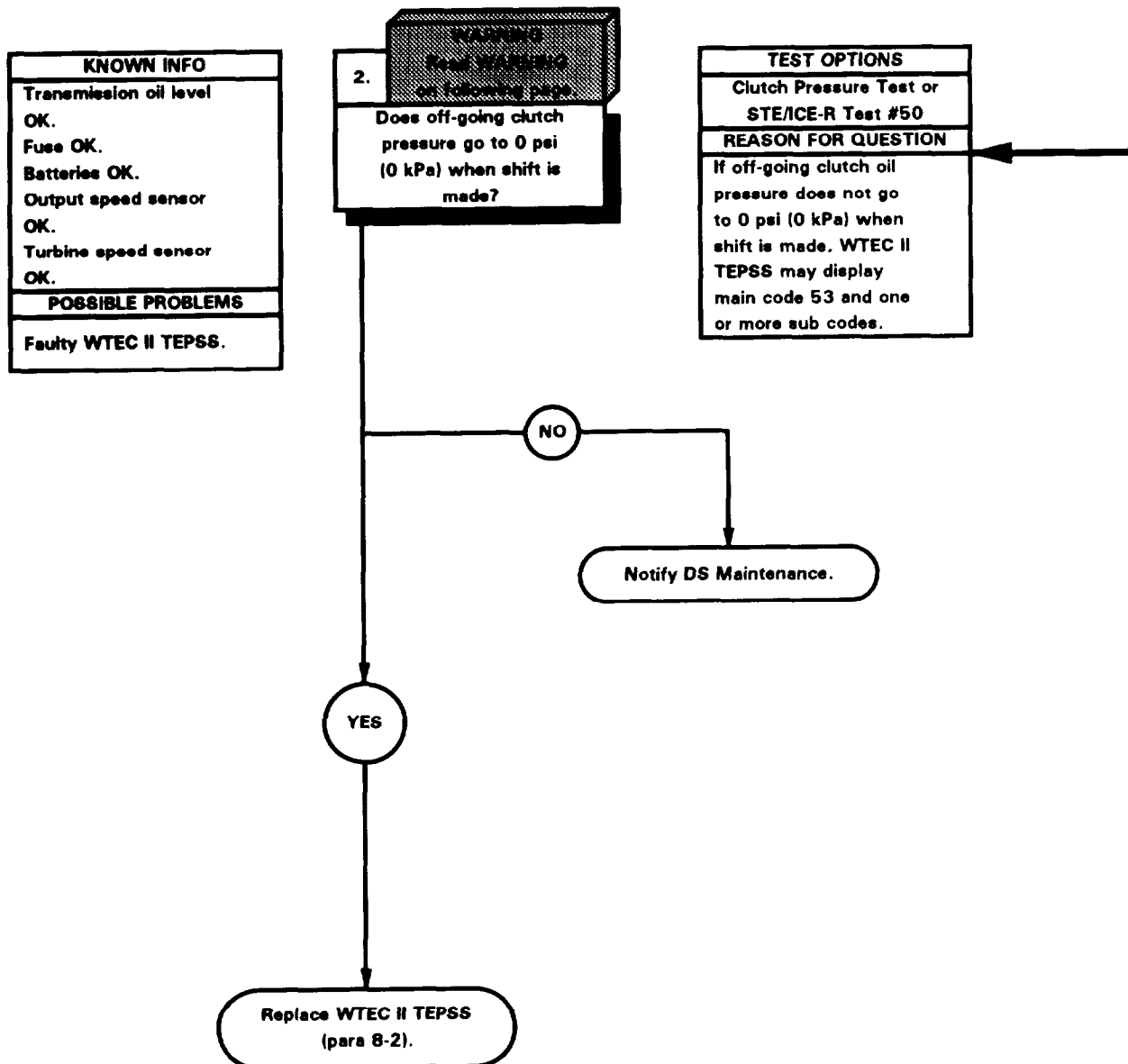
SUB CODE	SUB CODE MEANING	PRESSURE at CLUTCH(S)	SOLENOID ASSEMBLY LOCATION	PRESSURE READINGS at TAPS
00	Speed Zero in 1st	C3 & C6	ROT & C6 Clutch	215-334 psi (1480-2300 kPa)
11	Speed Zero in 2nd	C1 & C5	ROT & STA Clutch	215-334 psi (1480-2300 kPa)
22	Speed Zero in 3rd	C1 & C4	ROT & STA Clutch	142-203 psi (980-1400 kPa)
33	Speed Zero in 4th	C1 & C3	ROT & STA Clutch	142-203 psi (980-1400 kPa)
44	Speed Zero in 5th	C1 & C2	Rotating Clutch	142-203 psi (980-1400 kPa)
55	Speed Zero in 6th	C2 & C3	ROT & STA Clutch	128-189 psi (880-1300 kPa)
66	Speed Zero in 7th	C2 & C4	ROT & STA Clutch	128-189 psi (880-1300 kPa)
77	Speed Zero in R	C3 & C5	Stationary Clutch	215-334 psi (1480-2300 kPa)

115. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 53 AND ANY SUB CODE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1). Personnel Required (2) Reference TM 9-4910-571-12&P	Tools and Special Tools Goggles, Industrial (Item 15, Appendix C) Tool Kit, Genl Mech (Item 46, Appendix C) STE/CE-R (Item 41, Appendix C) Pan, Drain (Item 24, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C) Materials/Parts Packing, Preformed (Item 197, Appendix G) Reducer, Boss (Item 51, Appendix D)



- 
- (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).

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

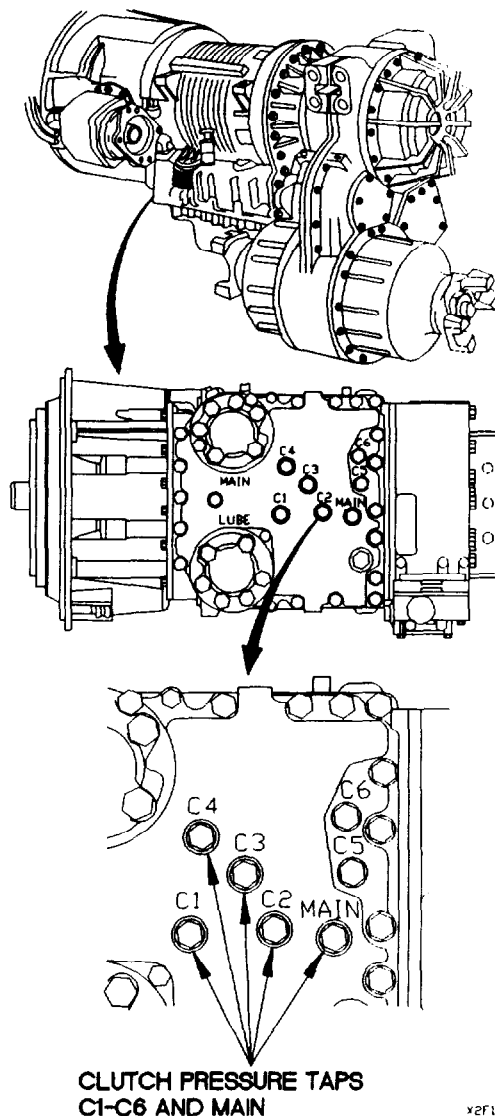


CLUTCH PRESSURE TEST

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.

- (1) Remove transmission front and rear output propeller shafts (para 9-2).
- (2) Position drain pan under pressure tap.
- (3) Remove pressure tap plug and preformed packing from off-going clutch indicated by the sub code. Refer to Table 2-30. Off-Going Clutch Pressure Tap. Discard preformed packing.
- (4) Connect reducer, STE/ICE-R adapter, and snubber to clutch pressure tap.
- (5) Perform STE/ICE-R Test # 50 (TM 9-4910-571-12&P).
- (6) Start engine (TM 9-2320-366-10-1) and run at idle.
- (7) With parking brake applied, make shift indicated by sub code while assistant notes reading on STE/ICE-R.
- (8) If off-going clutch pressure does not go to 0 psi (0 kPa) when shift is made, notify DS Maintenance.
- (9) If off-going clutch pressure does go to 0 psi (0 kPa) when shift is made, replace WTEC III TEPSS (para 8-2).
- (10) Shut down engine (TM 9-2320-366-10-1).
- (11) Remove STE/ICE-R adapter, snubber, and reducer 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 transmission front and rear output propeller shafts (para 9-2).
- (16) Clear diagnostic codes (para 8-4).



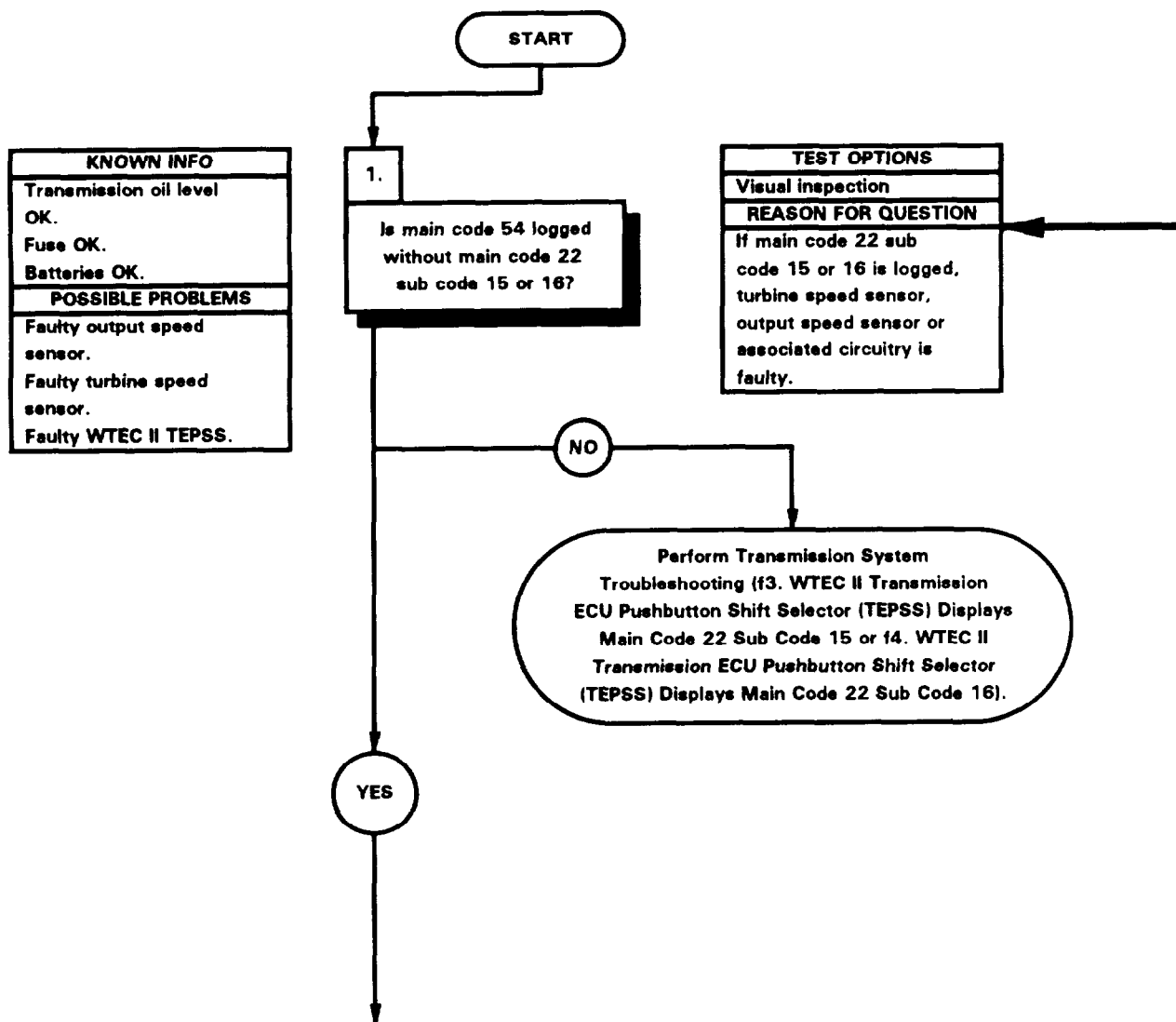
CLUTCH PRESSURE TAPS
C1-C6 AND MAIN

X2F1101-

TABLE 2-30. OFF-GOING CLUTCH PRESSURE TAP

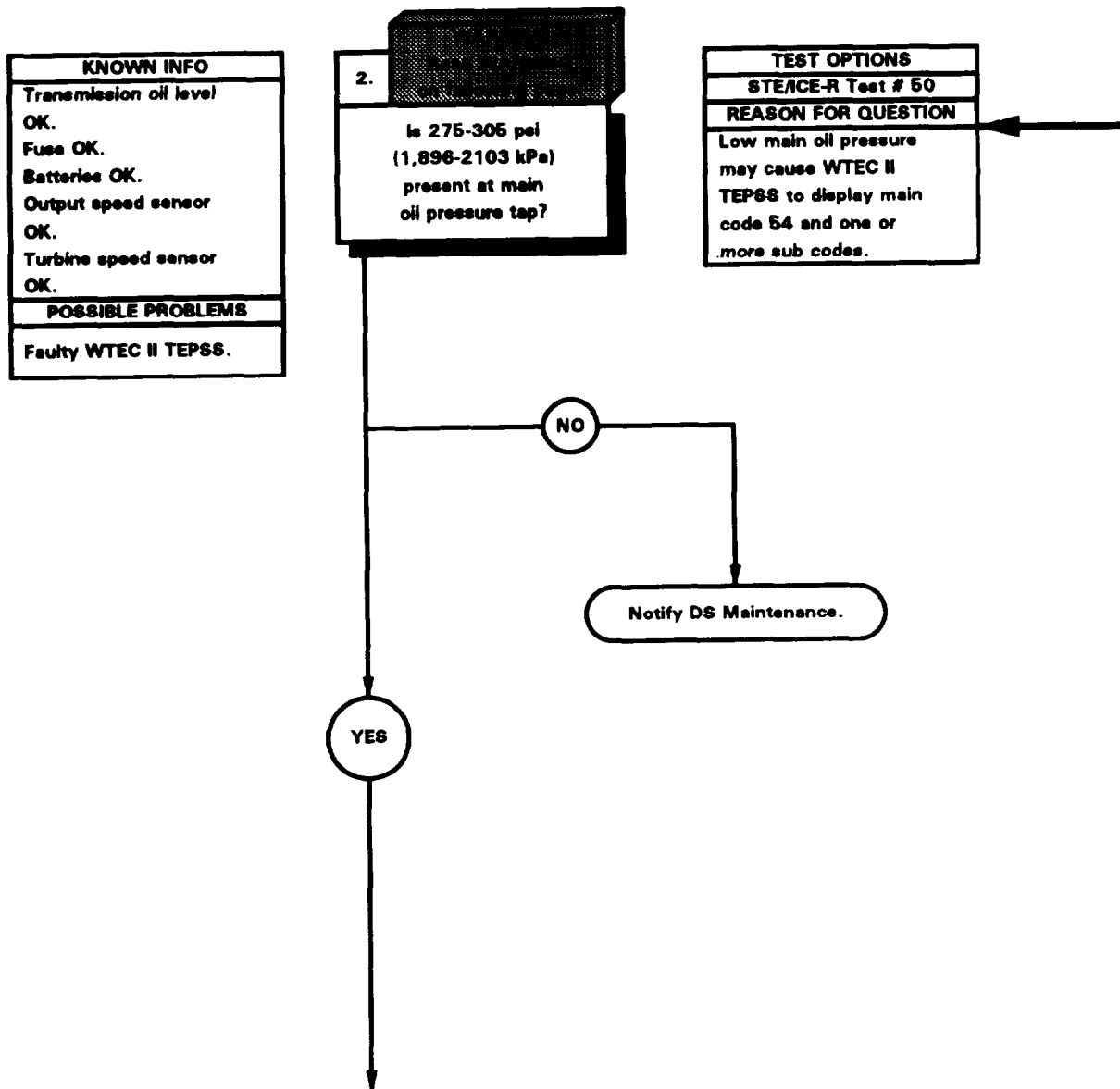
SUB CODE	SUB CODE MEANING	OFF-GOING CLUTCH(S)	SOLENOID ASSEMBLY LOCATION
08	L-N1 Shift	C3	Stationary Clutch
18	1-N1 Shift	C1	Rotating Clutch
28	2-N1 Shift	C1 & C4	ROT & STA Clutch
29	2-N2 Shift	C1	Rotating Clutch
38	3-N1 Shift	C1 & C3	ROT & STA Clutch
39	3-N3 Shift	C1	Rotating Clutch
48	4-N1 Shift	C1 & C2	Rotating Clutch
49	4-N3 Shift	C1 & C2	Rotating Clutch
58	5-N1 Shift	C2 & C3	ROT & STA Clutch
59	5-N3 Shift	C2	Rotating Clutch
68	6-N1 Shift	C2 & C4	ROT & STA Clutch
69	6-N4 Shift	C2	Rotating Clutch
78	R-N1 Shift	C3	Stationary Clutch
99	N3-N2 or N2-N3 Shift	C2 or C4	ROT or STA Clutch

116. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 54 SUB CODE 01, 07, 10, 12, 17, 21, 23, 27, 32, 34, 43, 45, 54, 56, 65, 70, 71, 72, 80, 81, 82, 83, 85, 86, 92, 93, 95, 96, or 97	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Goggles, Industrial (Item 15, Appendix C) Tool Kit, Genl Mech (Item 46, Appendix C) STE/CE-R (Item 41, Appendix C) Pan, Drain (Item 24, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Personnel Required (2)	Materials/Parts Packing, Preformed (Item 197, Appendix G) Reducer, Boss (Item 51, Appendix D)
Reference TM 9-4910-571-12&P	



- 
- (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).

116. 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)

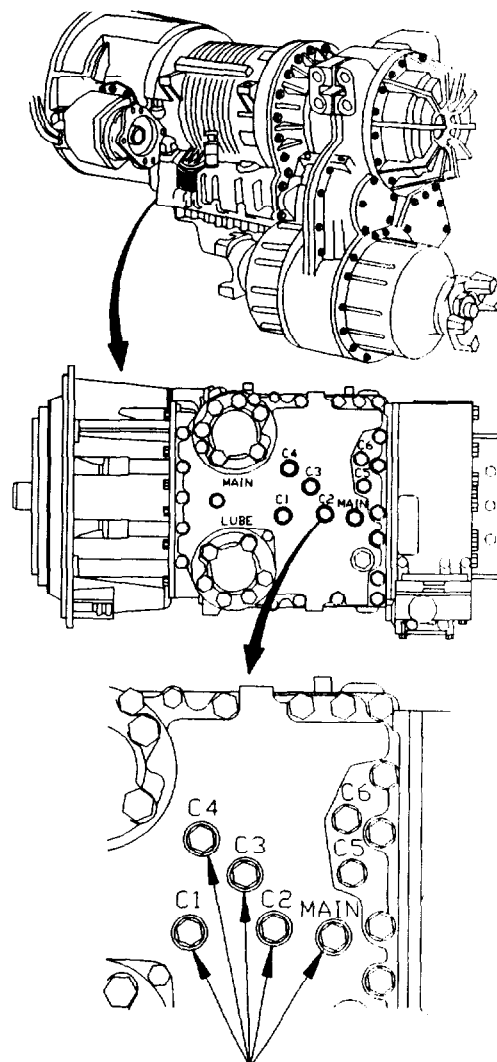


STE/ICE-R TEST #50

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.

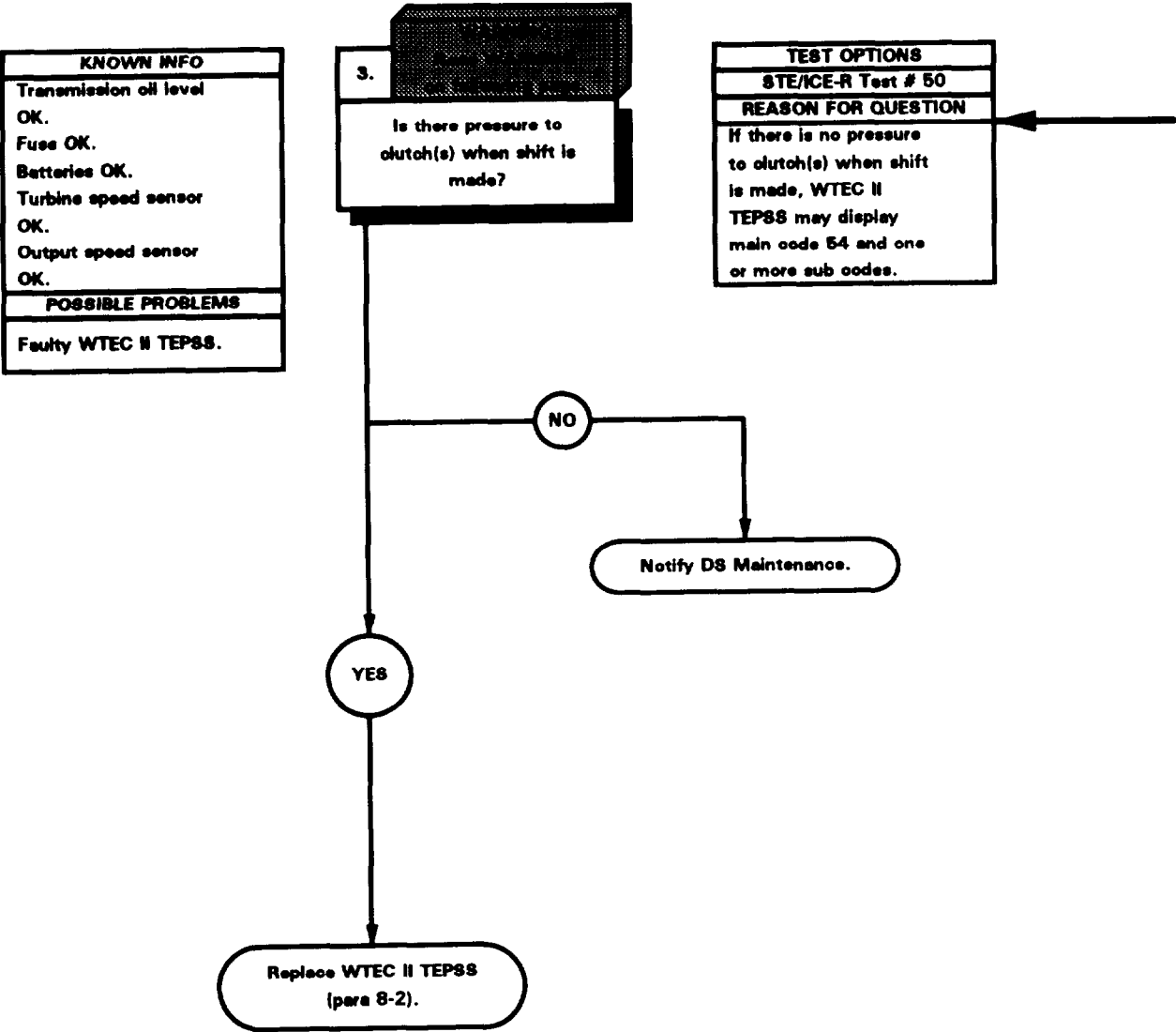
- (1) Position drain pan under pressure tap.
- (2) Remove main pressure tap plug and preformed packing from control valve module.
- (3) Connect STE/ICE-R adapter, snubber, and reducer to main pressure tap.
- (4) Perform STE/ICE-R Test # 50 (TM 9-4910-571-12&P).
- (5) Start engine (TM 9-2320-366-10-1) and run at idle.
- (6) With parking brake applied, position WTEC II TEPSS to R position then to N position while assistant checks reading on STE/ICE-R.
- (7) Shut down engine (TM 9-2320-366-10-1).
- (8) If main oil pressure is low, notify DS Maintenance.
- (9) Remove reducer, STE/ICE-R adapter, and snubber 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.



CLUTCH PRESSURE TAPS
C1-C6 AND MAIN

X2F1101-

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

WARNING

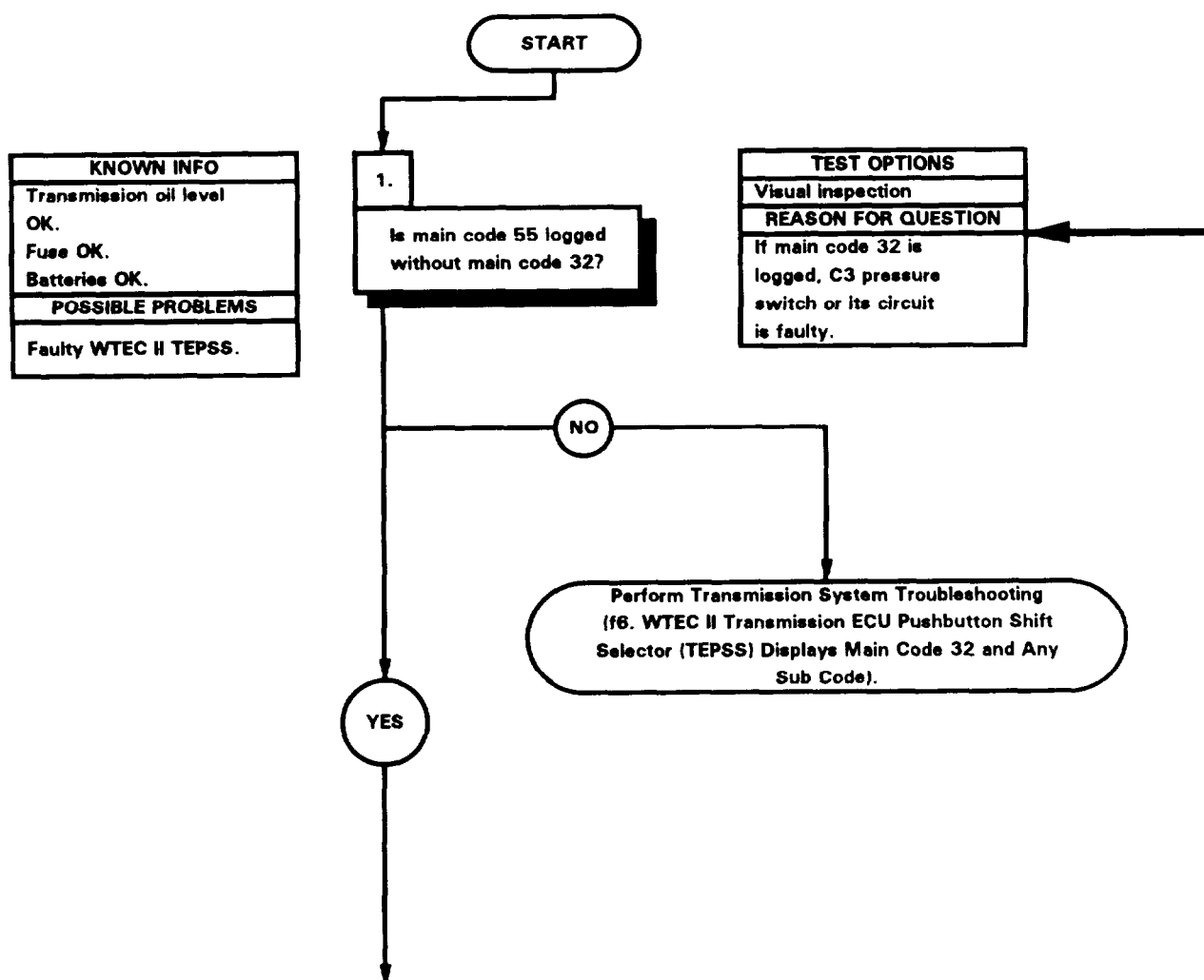
Wear approved eye protection when performing transmission pressure checks. If oil contacts eyes, seek medical attention immediately.
Failure to comply may result in injury to personnel.

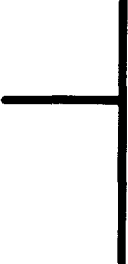
- (1) Remove transmission front and rear output propeller shafts (para 9-2).
- (2) Position drain pan under pressure tap.
- (3) Remove pressure tap plug and preformed packing from clutch pressure tap indicated by the sub code. Refer to Table 2-31. Clutch Pressure Tap.
- (4) Connect STE/ICE-R adapter, snubber, and reducer to clutch pressure tap.
- (5) Start engine (TM 9-2320-366-10-1).
- (6) Perform STE/ICE-R Test # 50 (TM 9-4910-571-12&P).
- (7) With parking brake applied, make shift indicated by sub code. Refer to Table 2-31. Clutch Pressure Tap.
- (8) Accelerate engine until WTEC II TEPSS displays 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 WTEC II TEPSS into neutral.
- (12) If one or more clutches failed to indicate proper pressure, notify DS Maintenance.
- (13) If all clutches indicate proper pressure, replace WTEC II TEPSS (para 8-2).
- (14) Shut down engine (TM 9-2320-366-10-1).
- (15) Remove reducer, STE/ICE-R adapter, and snubber from 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 Nm).
- (18) Remove drain pan under pressure tap.
- (19) Install transmission front and rear output propeller shafts (para 9-2).
- (20) Clear diagnostic codes (para 8-4).

TABLE 2-31. CLUTCH PRESSURE TAP

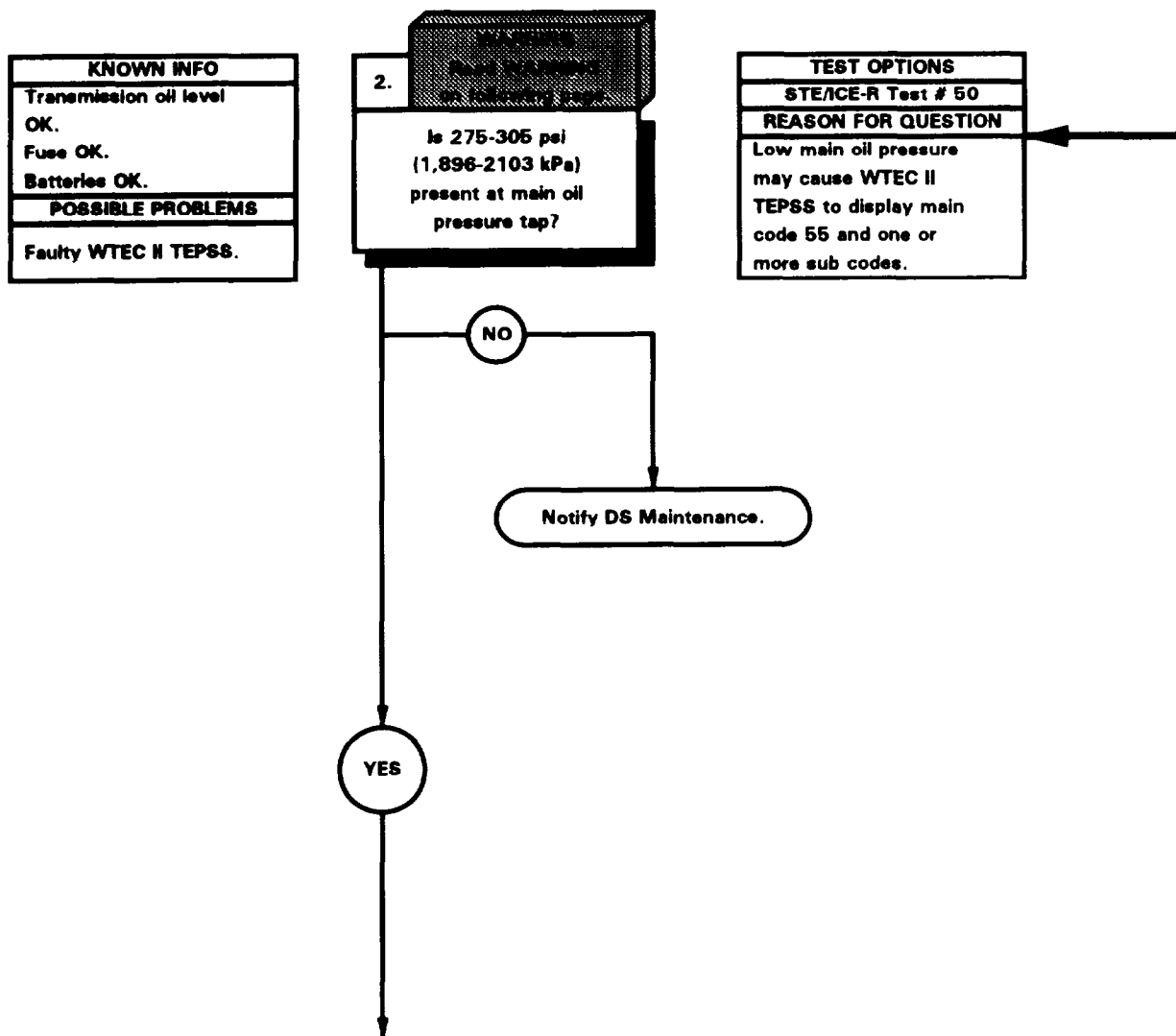
SUB CODE	SUB CODE MEANING	PRESSURE at CLUTCH(S)	SOLENOID ASSEMBLY LOCATION	PRESSURE READINGS at TAPS
01	L-1 Upshift	C1 & C5	ROT & STA Clutch	235-265 psi (1620-1827 kPa)
07	L-R Shift	C3 & C5	Stationary Clutch	275-305 psi (1896-2103 kPa)
10	1-L Downshift	C3 & C6	ROT & C6 Clutch	235-265 psi (1620-1827 kPa)
12	1-2 Upshift	C1 & C4	ROT & STA Clutch	235-265 psi (1620-1827 kPa)
17	1-R Shift	C3 & C5	Stationary Clutch	275-305 psi (1896-2103 kPa)
21	2-1 Downshift	C1 & C5	ROT & STA Clutch	235-265 psi (1620-1827 kPa)
23	2-3 Upshift	C1 & C3	ROT & STA Clutch	170-194 psi (1172-1338 kPa)
27	2-R Shift	C3 & C5	Stationary Clutch	275-305 psi (1896-2103 kPa)
32	3-2 Downshift	C1 & C4	ROT & STA Clutch	170-194 psi (1172-1338 kPa)
34	3-4 Upshift	C1 & C2	Rotating Clutch	170-194 psi (1172-1338 kPa)
43	4-3 Downshift	C1 & C3	ROT & STA Clutch	170-194 psi (1172-1338 kPa)
45	4-5 Upshift	C2 & C3	ROT & STA Clutch	160-178 psi (1103-1227 kPa)
54	5-4 Downshift	C1 & C2	Rotating Clutch	170-194 psi (1172-1338 kPa)
56	5-6 Upshift	C2 & C4	ROT & STA Clutch	160-178 psi (1103-1227 kPa)
65	6-5 Downshift	C2 & C3	ROT & STA Clutch	160-178 psi (1103-1227 kPa)
70	R-L Shift	C3 & C6	ROT & C6 Clutch	235-265 psi (1620-1827 kPa)
71	R-1 Shift	C1 & C5	ROT & STA Clutch	235-265 psi (1620-1827 kPa)
72	R-2 Shift	C1 & C4	ROT & STA Clutch	235-265 psi (1620-1827 kPa)
80	N1-L Shift	C3 & C6	ROT & C6 Clutch	235-265 psi (1620-1827 kPa)
81	N1-1 Shift	C1 & C5	ROT & STA Clutch	235-265 psi (1620-1827 kPa)
82	N1-2 Shift	C1 & C4	ROT & STA Clutch	170-194 psi (1172-1338 kPa)
83	N1-3 Shift	C1 & C3	ROT & STA Clutch	170-194 psi (1172-1338 kPa)
85	N1-5 Shift	C2 & C3	ROT & STA Clutch	160-178 psi (1103-1227 kPa)
86	N1-6 Shift	C2 & C4	ROT & STA Clutch	160-178 psi (1103-1227 kPa)
92	N2-2 Shift	C1 & C4	ROT & STA Clutch	235-265 psi (1620-1827 kPa)
93	N3-3 Shift	C1 & C3	ROT & STA Clutch	170-194 psi (1172-1338 kPa)
95	N3-5 Shift	C2 & C3	ROT & STA Clutch	160-178 psi (1103-1227 kPa)
96	N4-6 Shift	C2 & C4	ROT & STA Clutch	160-178 psi (1103-1227 kPa)
97	2-R Shift	C3 & C5	Stationary Clutch	275-305 psi (1896-2103 kPa)

117. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 55 AND ANY SUB CODE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Goggles, Industrial (Item 15, Appendix C) Tool Kit, Genl Mech (Item 46, Appendix C) STE/ICE-R (Item 41, Appendix C) Pan, Drain (Item 24, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Personnel Required (2)	Materials/Parts Packing, Preformed (Item 197, Appendix G) Reducer, Boes (Item 51, Appendix D)
Reference TM 9-4910-571-12&P	



- 
- (1) Check if main code 32 is logged in WTEC II TEPSS (para 8-4).
 - (2) If main code 32 is logged, WTEC II TEPSS has sensed a fault C3 pressure switch or its circuit. Perform Transmission System Troubleshooting (f6. WTEC II Transmission ECU Pushbutton Shift Selector (TEPSS) Displays Main Code 32 and Any Sub Code).

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

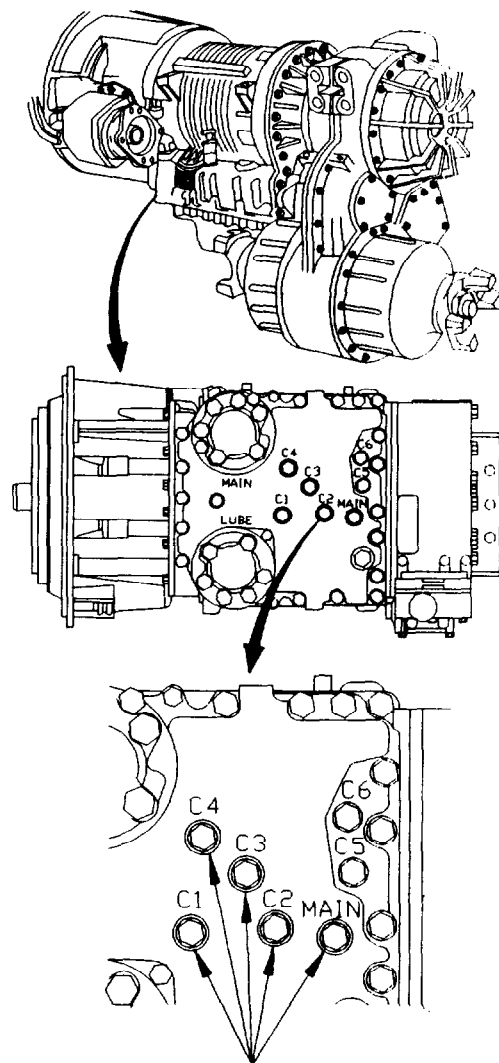


STE/ICE TEST # 50

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.

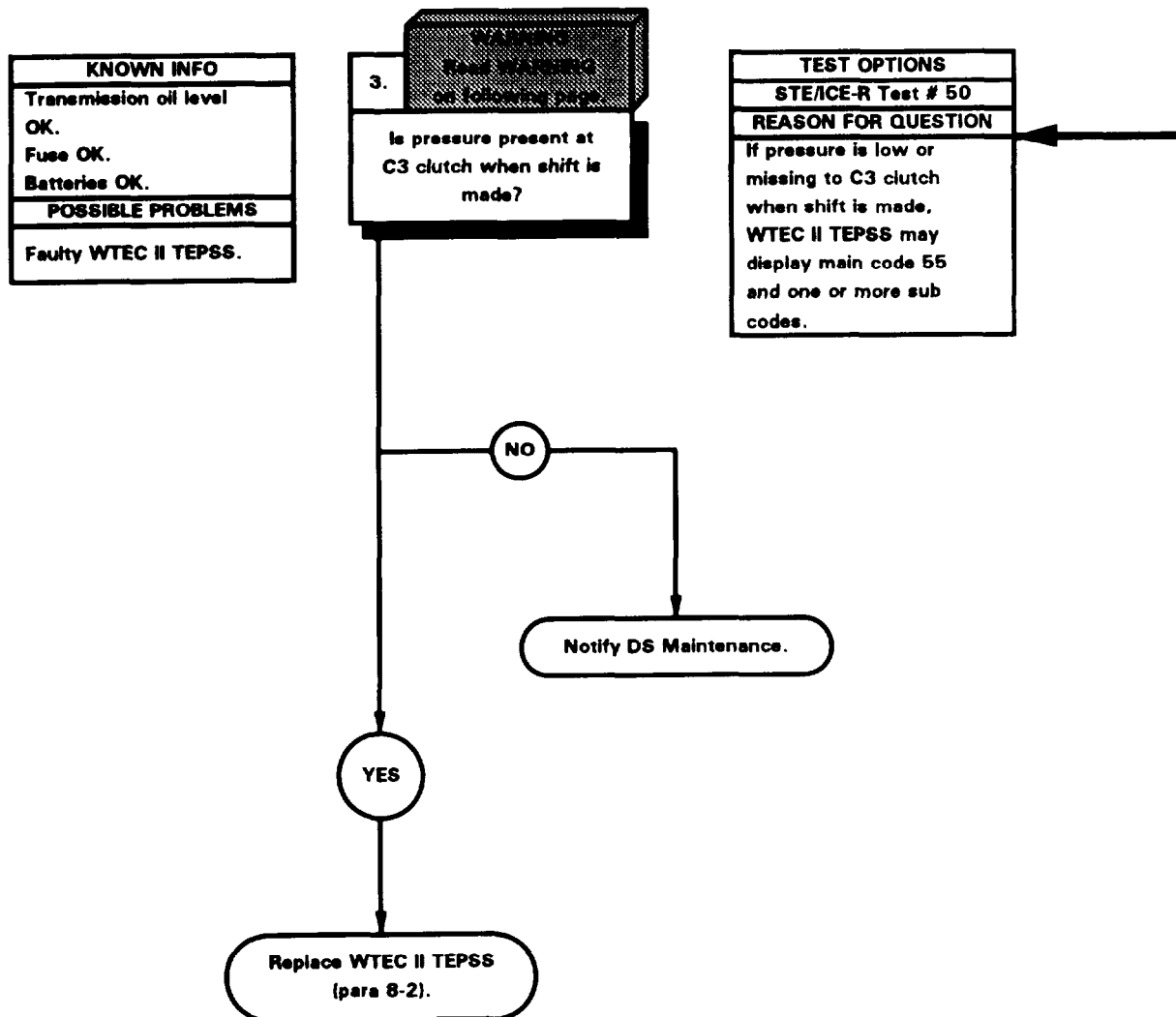
- (1) Position drain pan under pressure tap.
- (2) Remove main pressure tap plug and preformed packing from control valve module.
- (3) Connect STE/ICE-R adapter, snubber, and reducer to clutch pressure tap.
- (4) Perform STE/ICE-R Test # 50 (TM 9-4910-571-12&P).
- (5) Start engine (TM 9-2320-366-10-1) and run at idle.
- (6) With parking brake applied, position WTEC II TEPSS to R position then to N position while assistant checks reading on STE/ICE-R.
- (7) Shut down engine (TM 9-2320-366-10-1).
- (8) If main oil pressure is low, notify DS Maintenance.
- (9) Remove reducer, STE/ICE-R adapter, and snubber 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.



CLUTCH PRESSURE TAPS
C1-C6 AND MAIN

X2F1101-

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

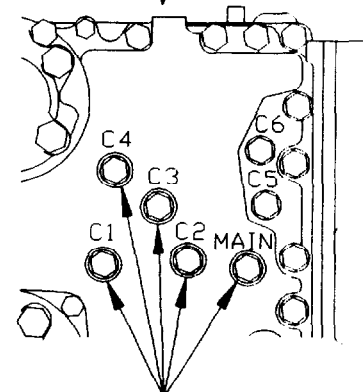
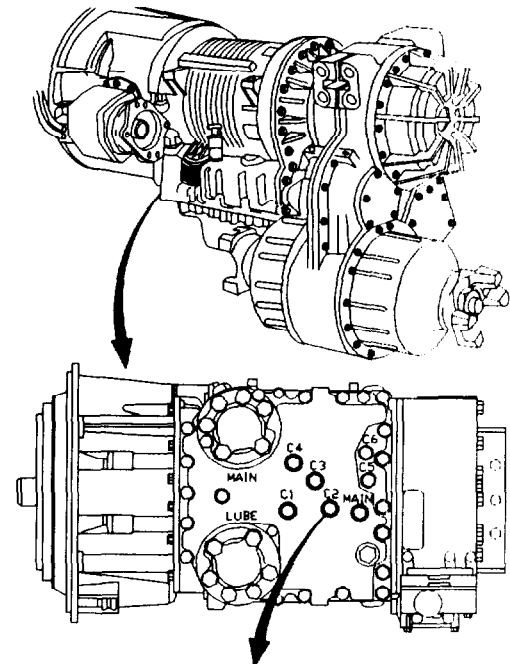


STE/ICE TEST # 50

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.

- (1) Remove transmission front and rear output 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 STE/ICE-R adapter, snubber, and reducer to C3 pressure tap.
- (5) Perform STE/ICE-R test # 50 (TM 9-4910-571-12&P).
- (6) Start engine (TM 9-2320-366-10-1) and run at idle.
- (7) With parking brake applied, make shift indicated by sub code while assistant notes reading on STE/ICE-R. Refer to Table 2-32. Clutch Pressure Tap.
- (8) Shut down engine (TM 9-2320-366-10-1).
- (9) If 275-305 psi pressure is not obtained for affected code, notify DS Maintenance.
- (10) If 275-305 psi pressure is obtained, replace WTEC II TEPSS (para 8-2).
- (11) Remove reducer, STE/ICE-R adapter, and snubber 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 transmission front and rear output propeller shafts (para 9-2).
- (16) Clear diagnostic codes (para 8-4).



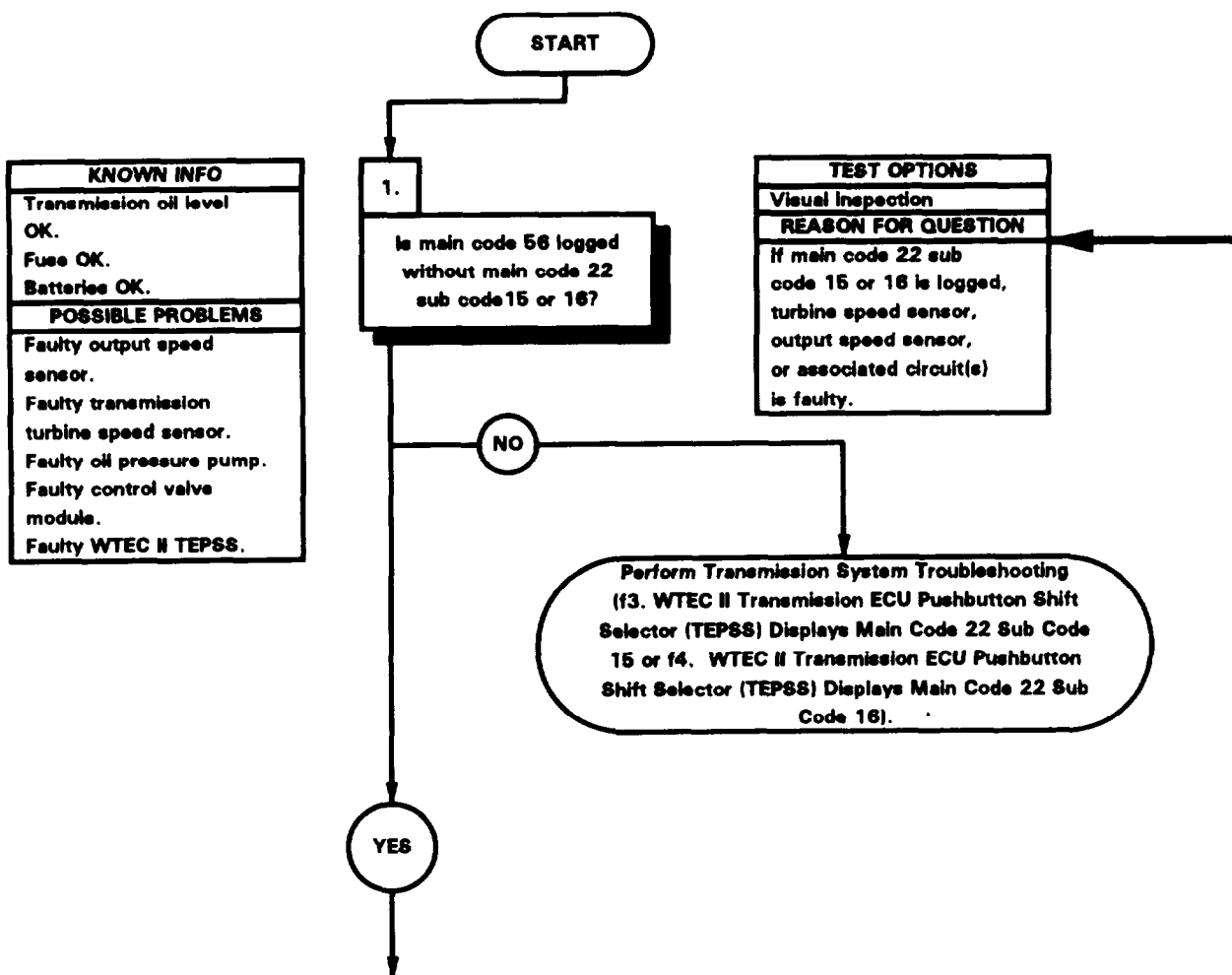
CLUTCH PRESSURE TAPS
C1-C6 AND MAIN

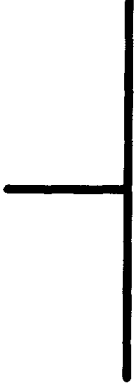
K2F1101-

TABLE 2-32. CLUTCH PRESSURE TAP

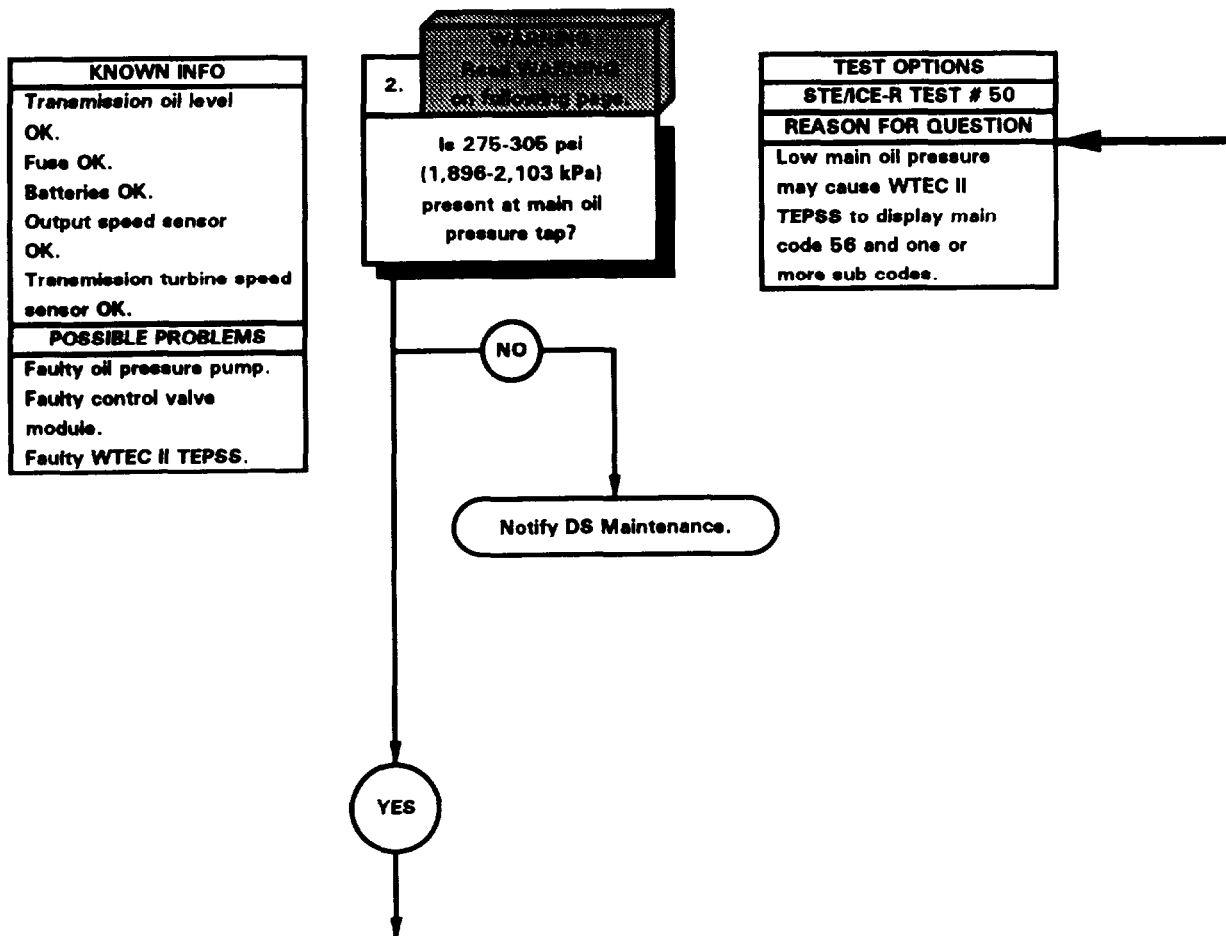
SUB CODE	SUB CODE MEANING	PRESSURE READINGS C3 TAP
17	1-R Shift	275-305 psi (1896-2103 kPa)
27	2-R Shift	275-305 psi (1896-2103 kPa)
80	N1-L Shift	235-265 psi (1620-1827 kPa)
87	N1-R Shift	275-305 psi (1896-2103 kPa)
97	2-R Shift	275-305 psi (1896-2103 kPa)

118. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 56 AND ANY SUB CODE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Goggles, Industrial (Item 15, Appendix C) Tool Kit, Genl Mech (Item 46, Appendix C) STE/CE-R (Item 41, Appendix C) Pan, Drain (Item 24, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Personnel Required (2)	Materials/Parts Packing, Preformed (Item 197, Appendix G) Reducer, Boss (Item 51, Appendix D)
Reference TM 9-4910-571-12&P	



- 
- (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).

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

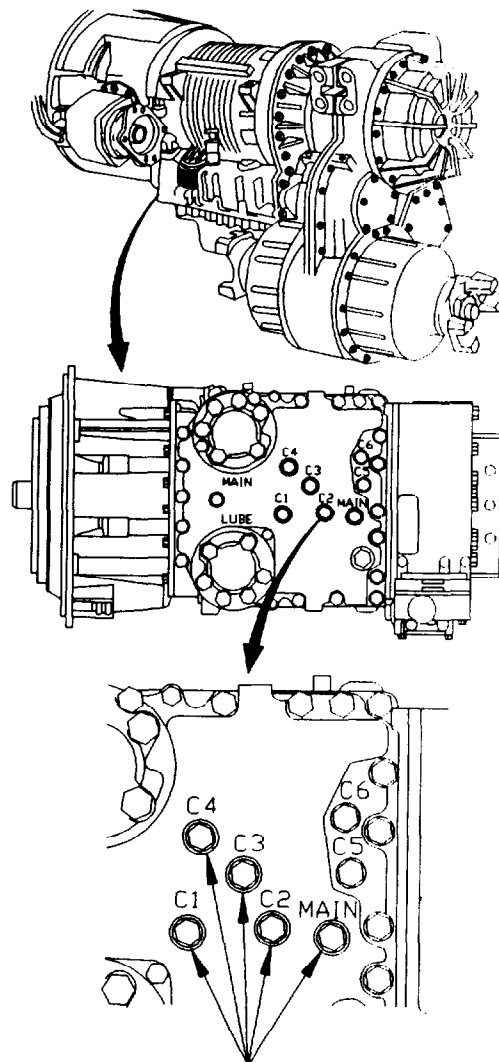


STE/ICE-R TEST #50

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.

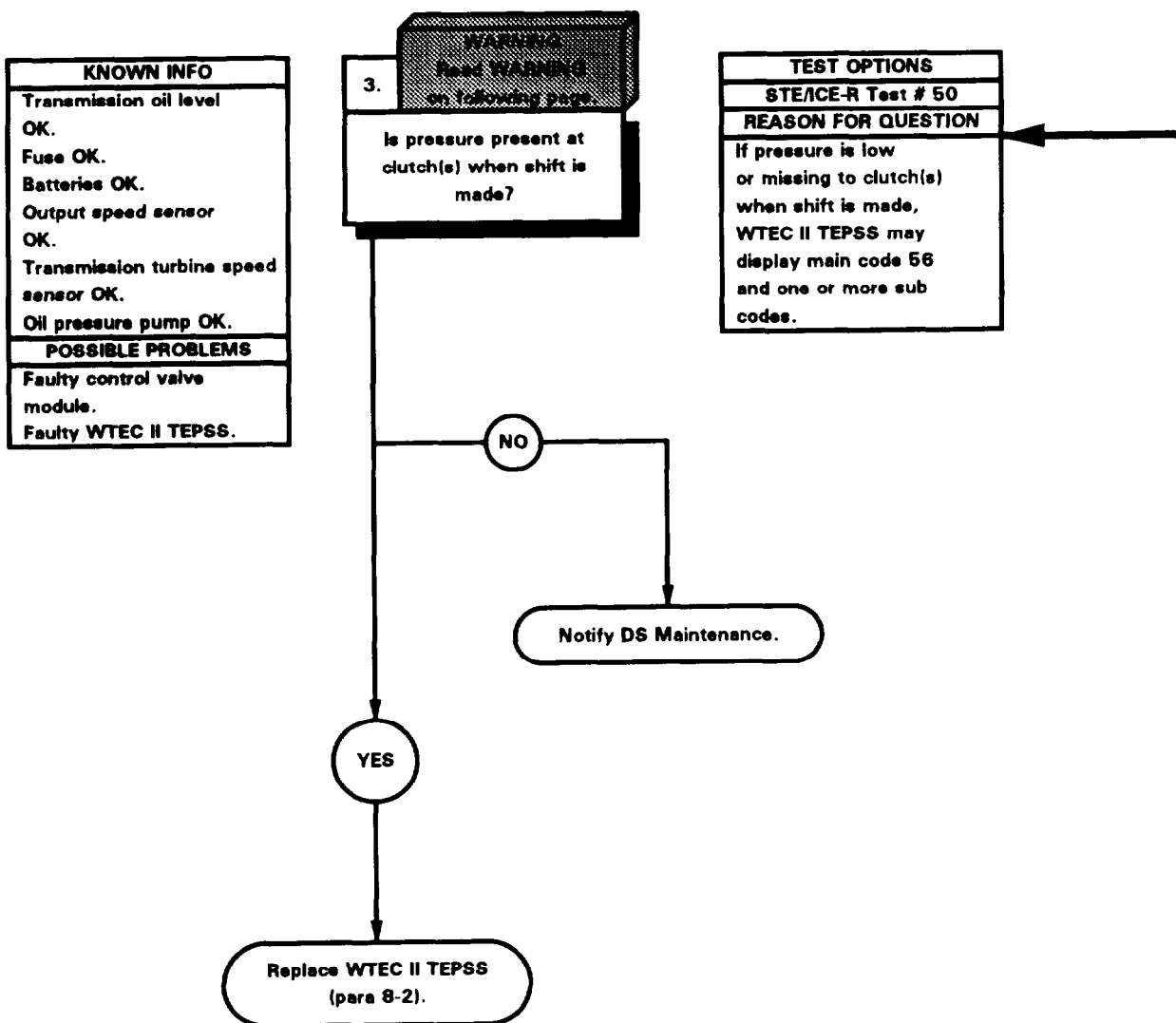
- (1) Position drain pan under pressure tap.
- (2) Remove main pressure tap plug and preformed packing from control valve module.
- (3) Install STE/ICE-R adapter, snubber, and reducer on main pressure tap.
- (4) Perform STE/ICE-R test #50 (TM 9-4910-571-12&P).
- (5) Start engine (TM 9-2320-366-10-1) and run at idle.
- (6) With parking brake applied, position WTEC II TEPSS to R position then to N position while assistant checks reading on STE/ICE-R.
- (7) Shut down engine (TM 9-2320-366-10-1).
- (8) If main oil pressure is low, notify DS Maintenance.
- (9) Remove reducer, STE/ICE-R adapter, and snubber 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.



CLUTCH PRESSURE TAPS
C1-C6 AND MAIN

101-112

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

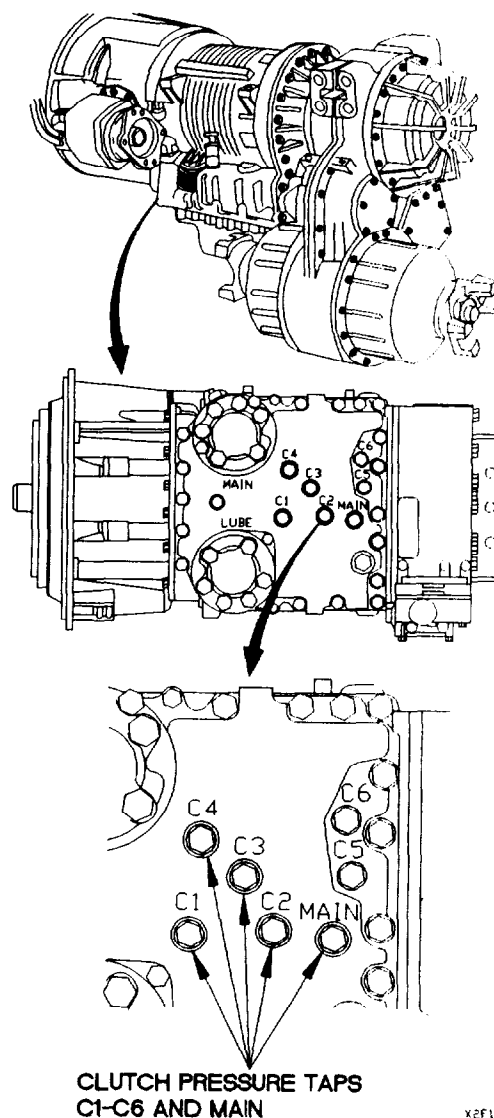


STE/ICE-R TEST #50

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.

- (1) Remove transmission front and rear output propeller shafts (para 9-2).
- (2) Position drain pan under pressure tap.
- (3) Remove pressure tap plug and preformed packing from clutch pressure tap indicated by the sub code. Refer to Table 2-33. Clutch Pressure Tap.
- (4) Connect STE/ICE-R adapter, snubber, and reducer to clutch pressure tap.
- (5) Perform STE/ICE-R test #50 (TM 9-4910-571-12&P).
- (6) Start engine (TM 9-2320-366-10-1).
- (7) Make shift indicated by sub code. Refer to Table 2-33. Clutch Pressure Tap.
- (8) Accelerate engine until WTEC II TEPSS displays desired range. Refer to Table 2-33. Clutch Pressure Tap.
- (9) Maintain sufficient engine speed to keep desired transmission range while assistant notes reading on STE/ICE-R.
- (10) Let engine return to idle.
- (11) Shift transmission into neutral (TM 9-2320-366-10-1).
- (12) Shut down engine (TM 9-2320-366-10-1).
- (13) If one or more of clutches failed to indicate proper pressure, notify DS Maintenance.
- (14) If all clutches indicate proper pressure, replace WTEC II TEPSS (para 8-2).
- (15) Remove reducer, STE/ICE-R adapter, and snubber 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 8-4).

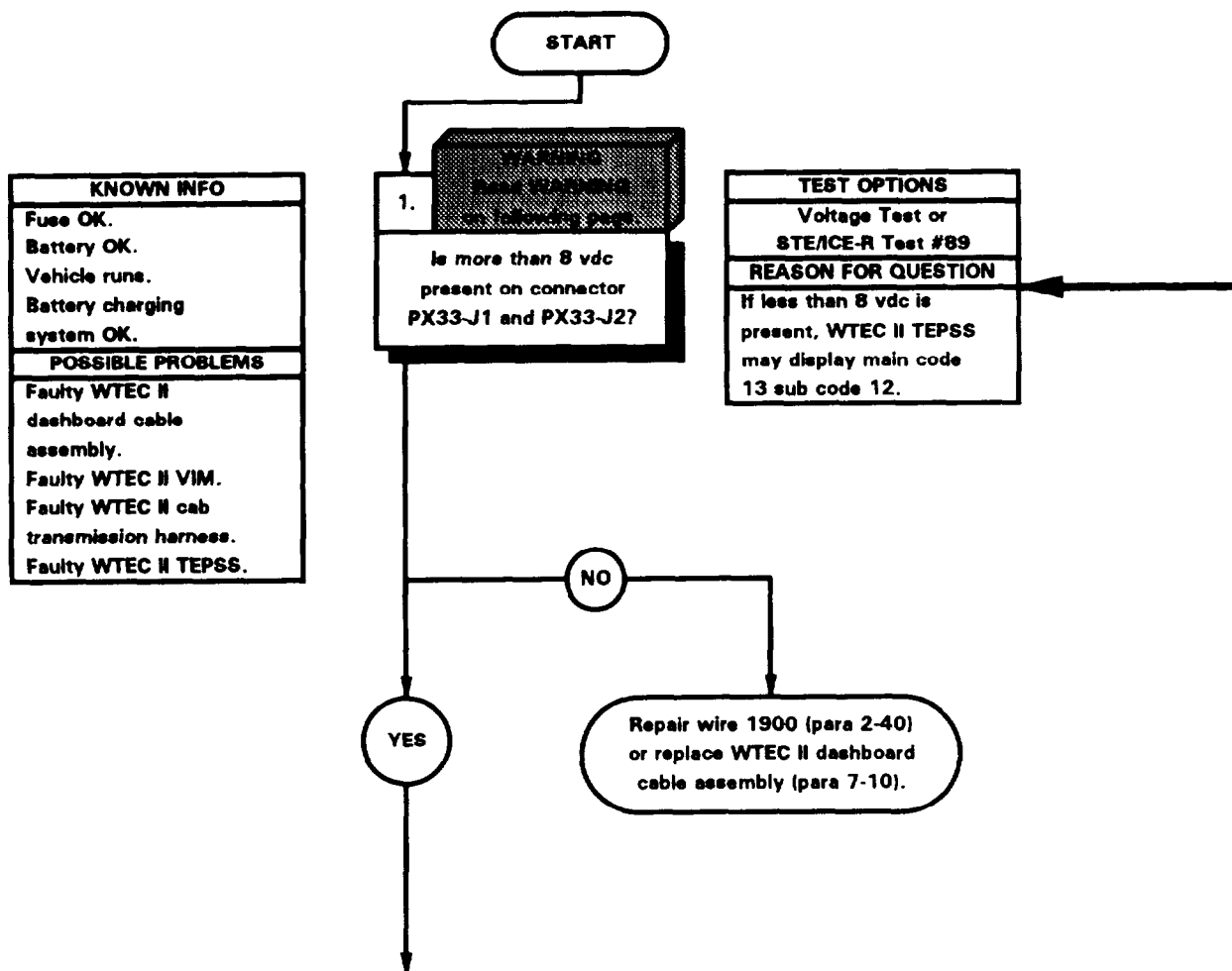


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TABLE 2-33. CLUTCH PRESSURE TAP

SUB CODE	SUB CODE MEANING	PRESSURE at CLUTCH(S)	SOLENOID ASSEMBLY LOCATION	PRESSURE READINGS at TAPS
00	L Range Test	C3 & C6	STA & C6 Clutch	235-265 psi (1620-1827 kPa)
11	1 Range Test	C1 & C5	ROT & STA Clutch	235-265 psi (1620-1827 kPa)
22	2 Range Test	C1 & C4	ROT & STA Clutch	170-265 psi (1172-1827 kPa)
33	3 Range Test	C1 & C3	ROT & STA Clutch	170-194 psi (1172-1338 kPa)
44	4 Range Test	C1 & C2	Rotating Clutch	170-194 psi (1172-1338 kPa)
55	5 Range Test	C2 & C3	ROT & STA Clutch	160-178 psi (1103-1227 kPa)
66	6 Range Test	C2 & C4	ROT & STA Clutch	160-178 psi (1103-1227 kPa)
77	R Range Test	C3 & C5	Stationary Clutch	275-305 psi (1896-2103 kPa)

119. WTEC II TRANSMISSION ECU PUSHBUTTON SHIFT SELECTOR (TEPSS) DISPLAYS MAIN CODE 13 AND ANY SUB CODE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C) STE/CE-R (Item 41, Appendix C)
Personnel Required (2)	References TM 9-4910-571-12&P

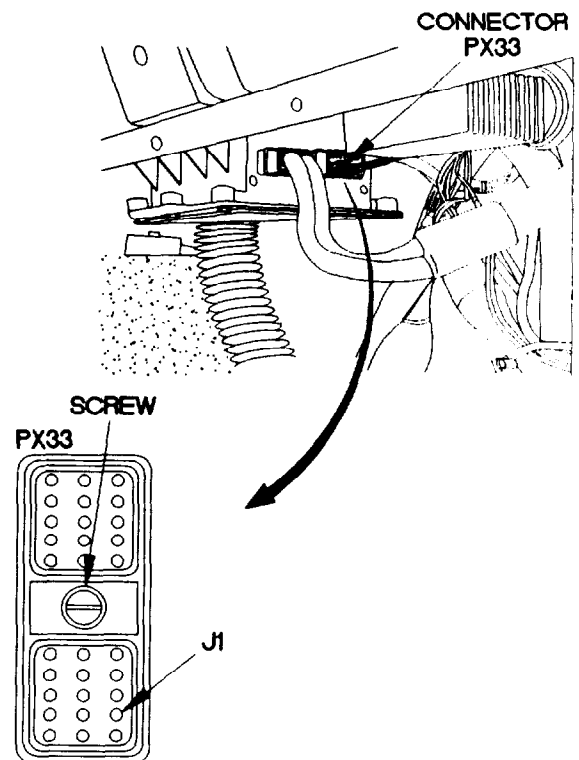


WARNING

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

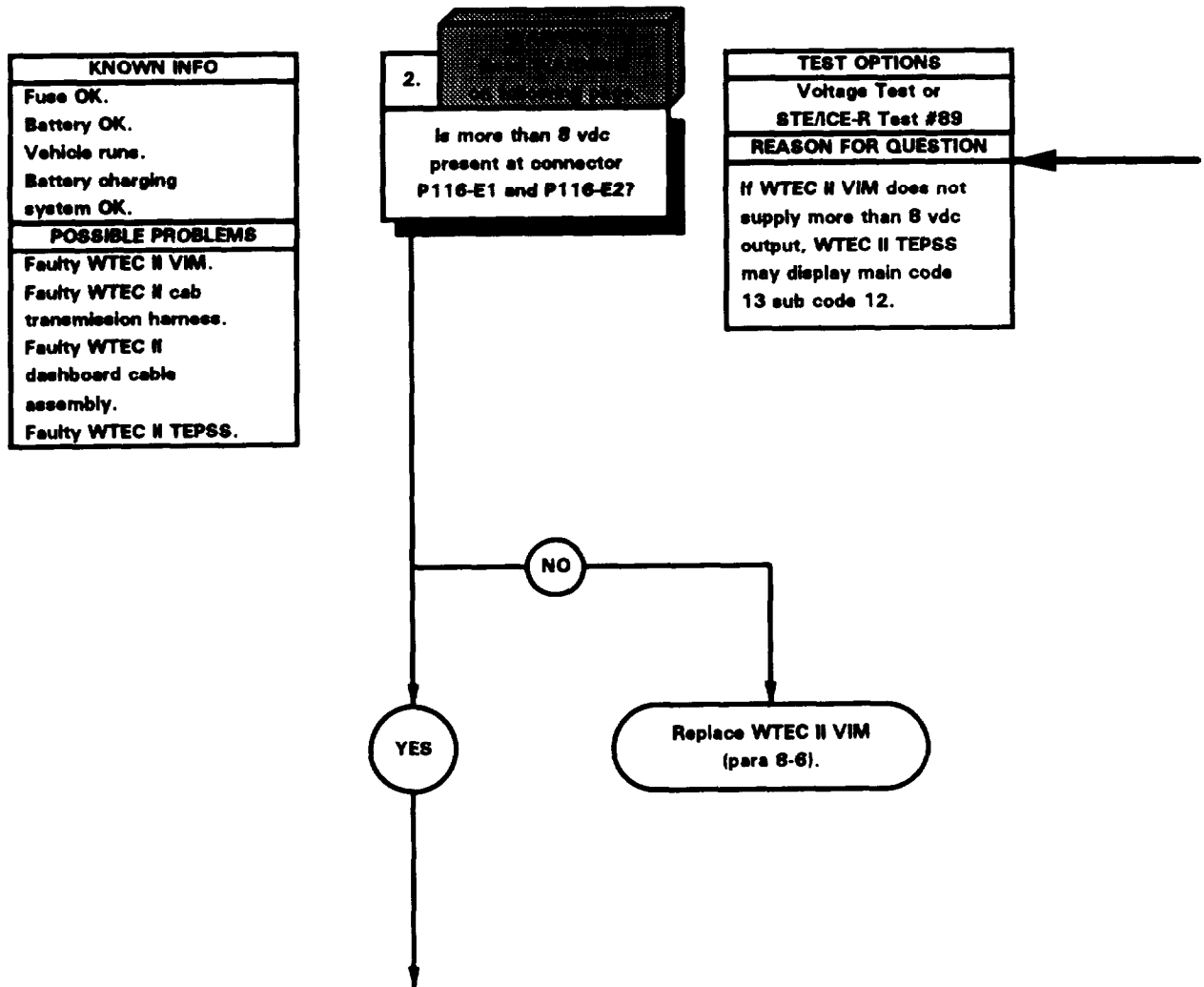
VOLTAGE TEST

- (1) Remove kick panel (para 16-3).
- (2) Set multimeter to volts dc.
- (3) Start engine (TM 9-2320-366-10-1).
- (4) Connect positive (+) probe of multimeter to connector PX33-J1.
- (5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (6) Connect positive (+) probe of multimeter to connector PX33-J2.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) If 12 to 14.5 vdc is not verified, repair wire 1900 (para 2-40) or replace WTEC II dashboard cable assembly (para 7-10).
- (9) Shut down engine (TM 9-2320-366-10-1).



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

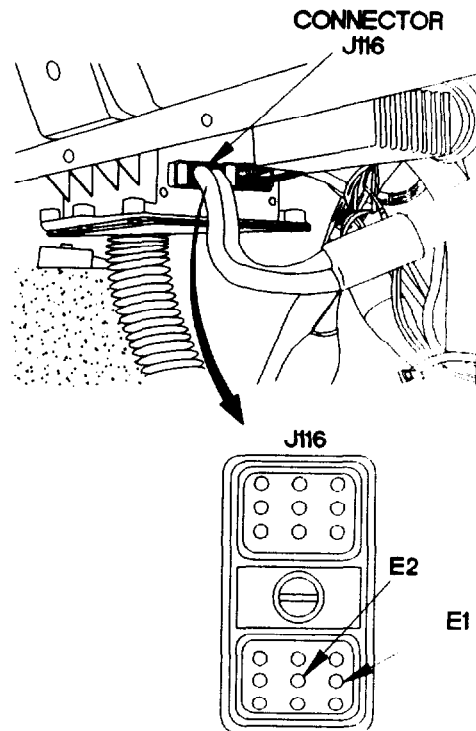


WARNING

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.

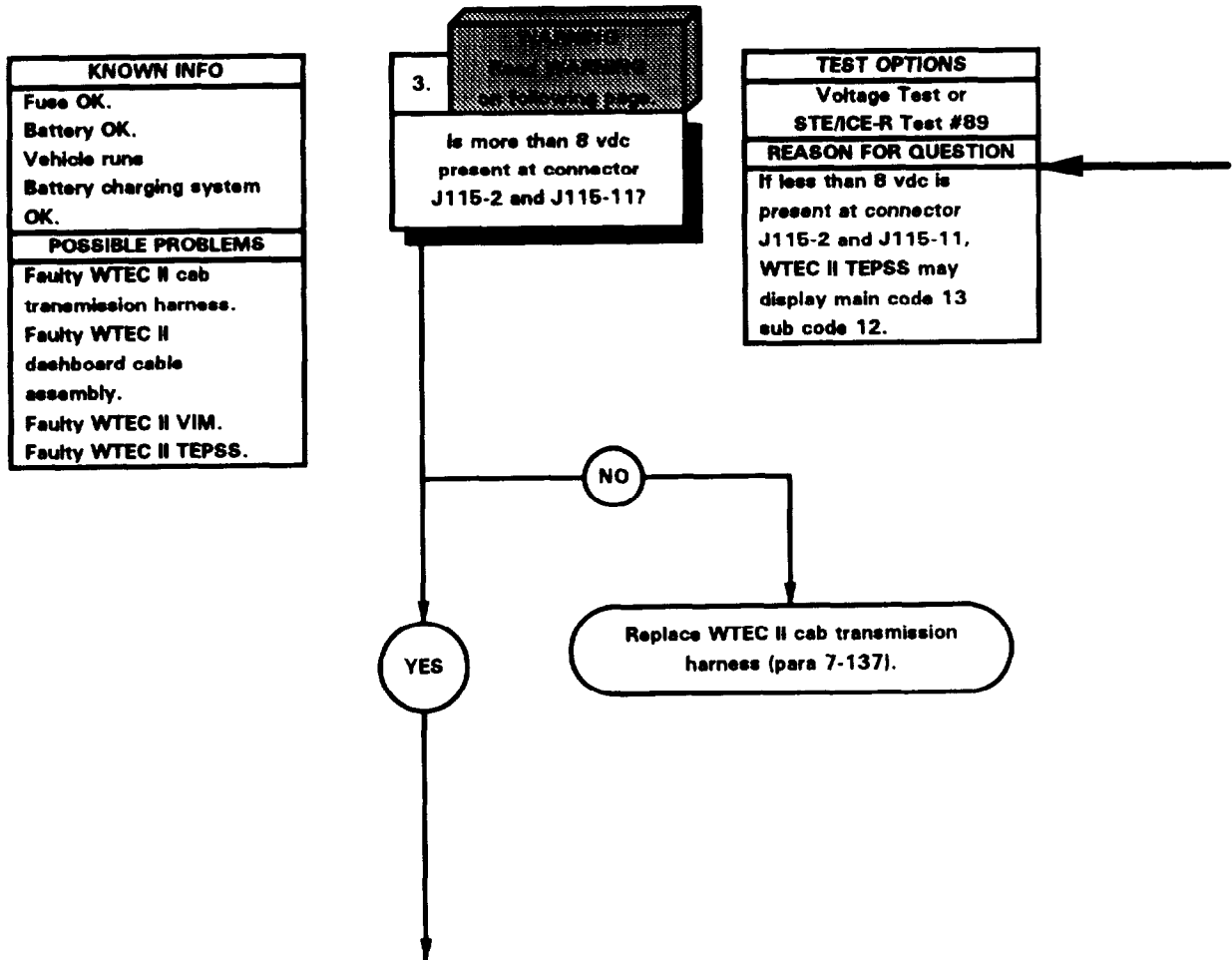
VOLTAGE TEST

- (1) Start engine (TM 9-2320-366-10-1).
- (2) Set multimeter to volts dc.
- (3) Connect positive (+) probe of multimeter to connector P116-E1.
- (4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (5) Connect positive (+) probe of multimeter to connector P116-E2.
- (6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (7) If 12 to 14.5 vdc is not present, replace WTEC II VIM (para 8-6).
- (8) Shut down engine (TM 9-2320-366-10-1).



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

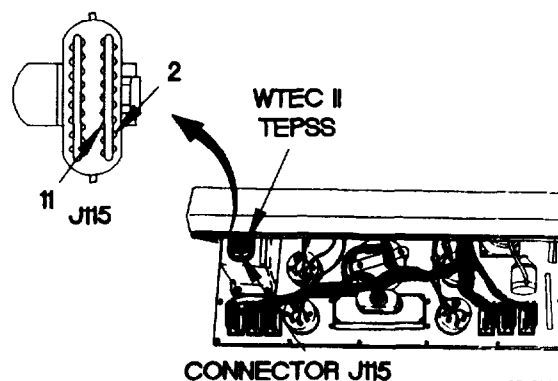


WARNING

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

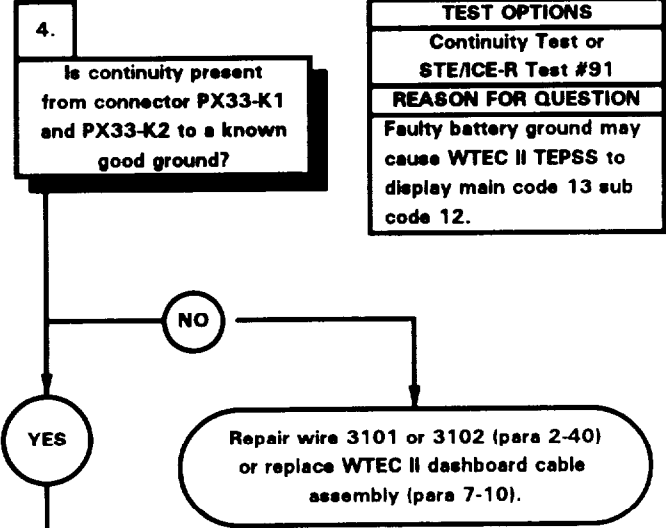
- (1) Remove instrument panel assembly for access (para 7-15).
- (2) Start engine (TM 9-2320-366-10-1).
- (3) Set multimeter to volts dc.
- (4) Disconnect connector J115 (top connector) from WTEC II TEPSS.
- (5) Connect positive (+) probe of multimeter to connector J115-2.
- (6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (7) Connect positive (+) probe of multimeter to connector J115-11.
- (8) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (9) If 12 to 14.5 vdc is not present connector J115-2 and J115-11, replace WTEC II cab transmission harness (para 7-137).
- (10) Shut down engine (TM 9-2320-366-10-1).



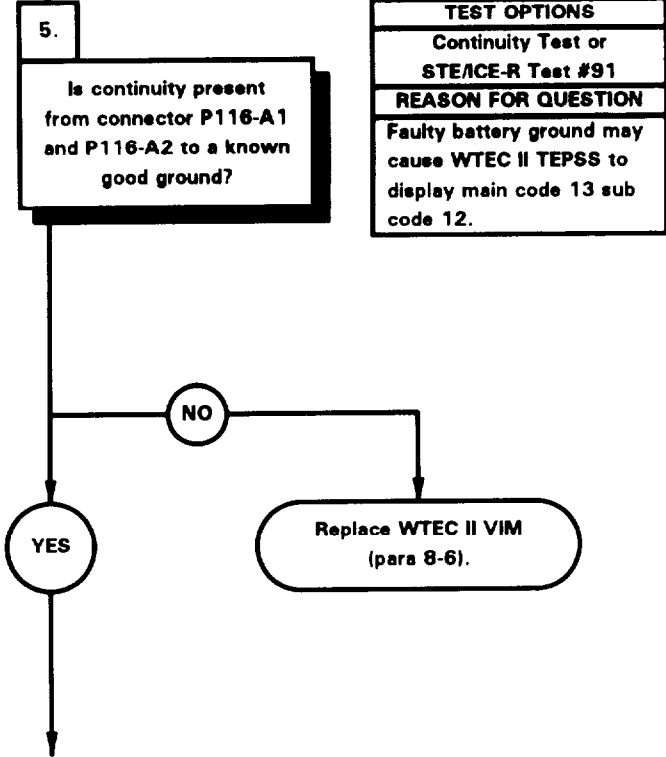
x2F19031

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

KNOWN INFO
Fuse OK. Battery OK. Vehicle runs. Battery charging system OK.
POSSIBLE PROBLEMS
Faulty WTEC II dashboard cable assembly. Faulty WTEC II cab transmission harness. Faulty WTEC II VIM. Faulty WTEC II TEPSS.

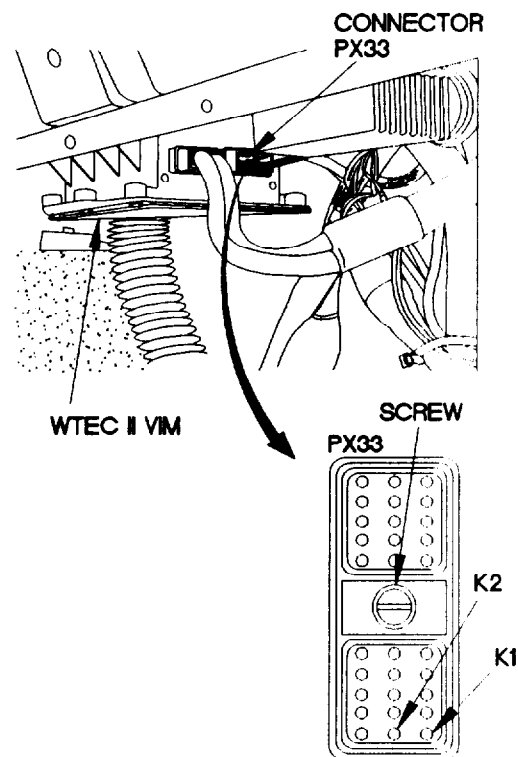


KNOWN INFO
Fuse OK. Battery OK. Vehicle runs. Battery charging system OK. WTEC II dashboard cable assembly OK.
POSSIBLE PROBLEMS
Faulty WTEC II VIM. Faulty WTEC II cab transmission harness. Faulty WTEC II TEPSS.



CONTINUITY TEST

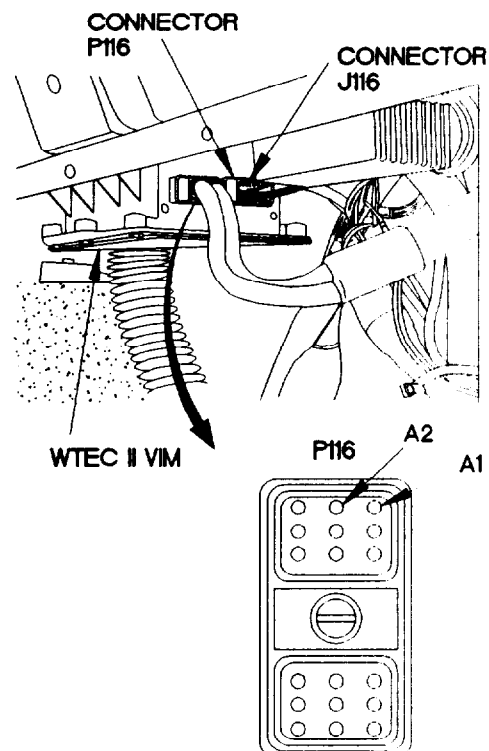
- (1) Loosen center screw and disconnect connector PX33 from WTEC II VIM.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector PX33-K1.
- (4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (5) Connect positive (+) probe of multimeter to connector PX33-K2.
- (6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (7) 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).
- (8) 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).
- (9) Connect connector PX33 to WTEC II VIM and tighten center screw.



X2F18041

CONTINUITY TEST

- (1) Loosen center screw and disconnect connector J116 from WTEC II VIM.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to WTEC II VIM connector P116-A1.
- (4) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (5) Connect positive (+) probe of multimeter to WTEC II VIM connector P116-A2.
- (6) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (7) If continuity is not present, replace WTEC II VIM (para 8-6).
- (8) Connect connector J116 to WTEC II VIM and tighten center screw.
- (9) Install kick panel (para 16-3).



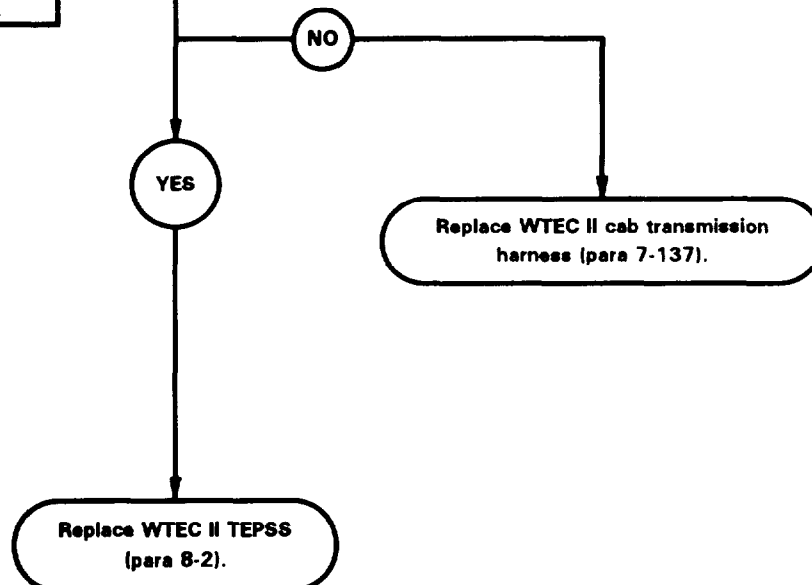
X2F18051

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

KNOWN INFO
Fuse OK. Battery OK. Vehicle runs. Battery charging system OK. WTEC II dashboard cable assembly OK. WTEC II VIM OK.
POSSIBLE PROBLEMS
Faulty WTEC II cab transmission harness. Faulty WTEC II TEPSS.

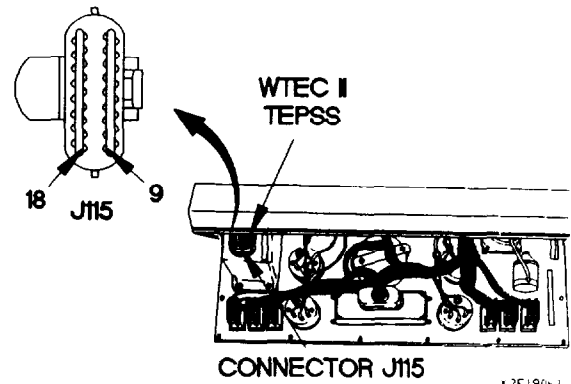
6.
Is continuity present from connector J115-9 and J115-18 to a known good ground?

TEST OPTIONS
Continuity Test or STE/CE-R Test #91
REASON FOR QUESTION
Faulty battery ground may cause WTEC II TEPSS to display main code 13 sub code 12.

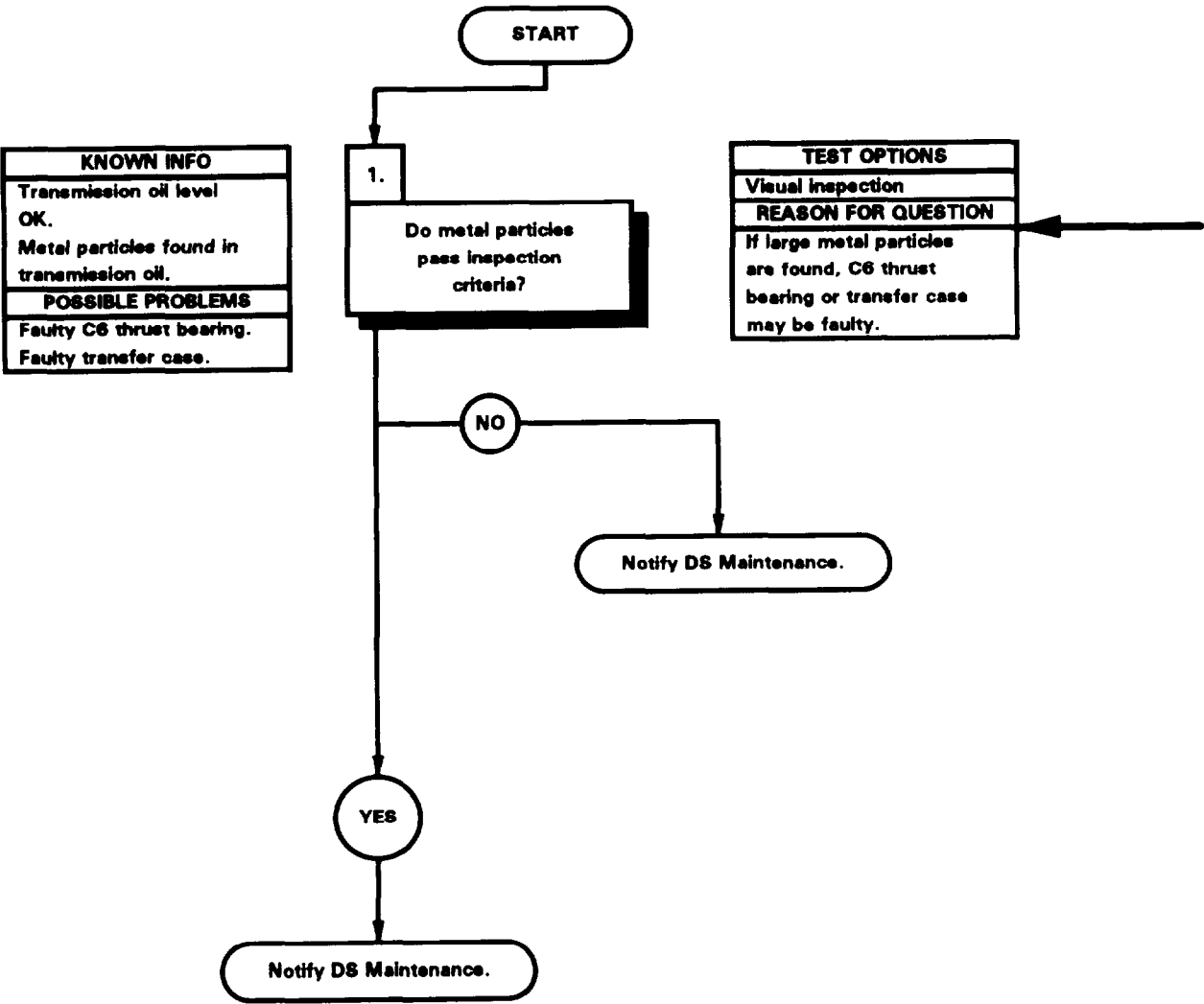


CONTINUITY TEST

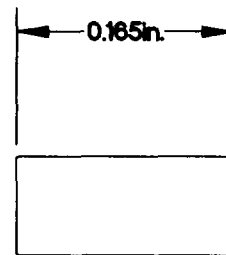
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector J115-9.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) Connect positive (+) probe of multimeter to connector J115-18.
- (5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (6) If continuity is not present, replace WTEC II cab transmission harness (para 7-137).
- (7) If continuity is present, replace WTEC II TEPSS (para 8-2).
- (8) Connect connector J115 (top connector) to WTEC II TEPSS.
- (9) Install instrument panel assembly (para 7-15).
- (10) Clear diagnostic codes (para 8-4).



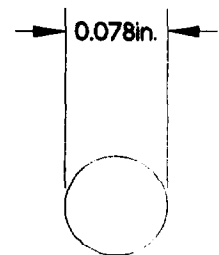
120. METAL PARTICLES FOUND DURING TRANSMISSION OIL CHANGE	
INITIAL SETUP	
Equipment Conditions	Tools and Special Tools
Engine shut down (TM 9-2320-366-10-1).	Tool Kit, Genl Mech (Item 46, Appendix C)



— 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.



NEEDLE - SIDE VIEW

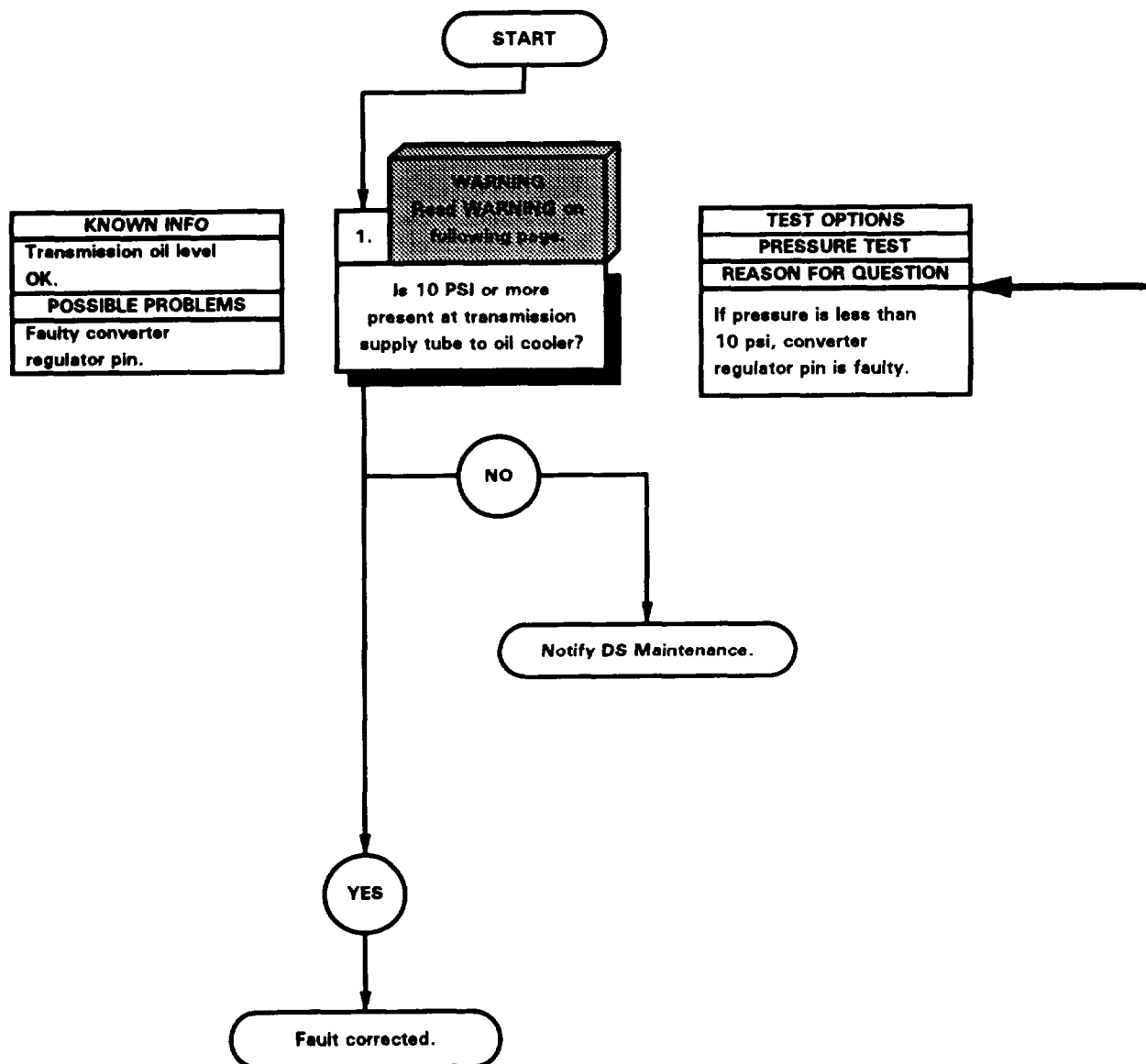


NEEDLE - END VIEW

METAL PARTICLES

42F2001A

121. TRANSMISSION DOES NOT SHIFT OR IS SLOW TO SHIFT WHEN COLD	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl, Mech (Item 46, Appendix C) STE/ICE-R (Item 41, Appendix C) Goggles, Industrial (Item 15, Appendix C)
Personnel Required (2)	Materials/Parts Adapter, Pipe to Tube (Item 1, Appendix D) Packing, Preformed (Item 184, Appendix G)
References (TM 9-4910-571-12&P)	

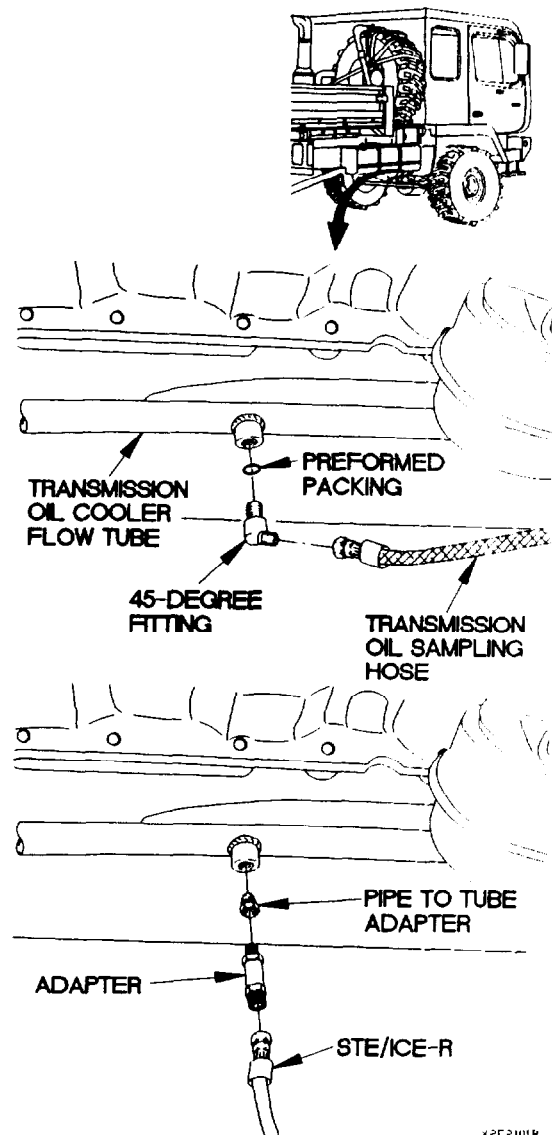


WARNING

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.

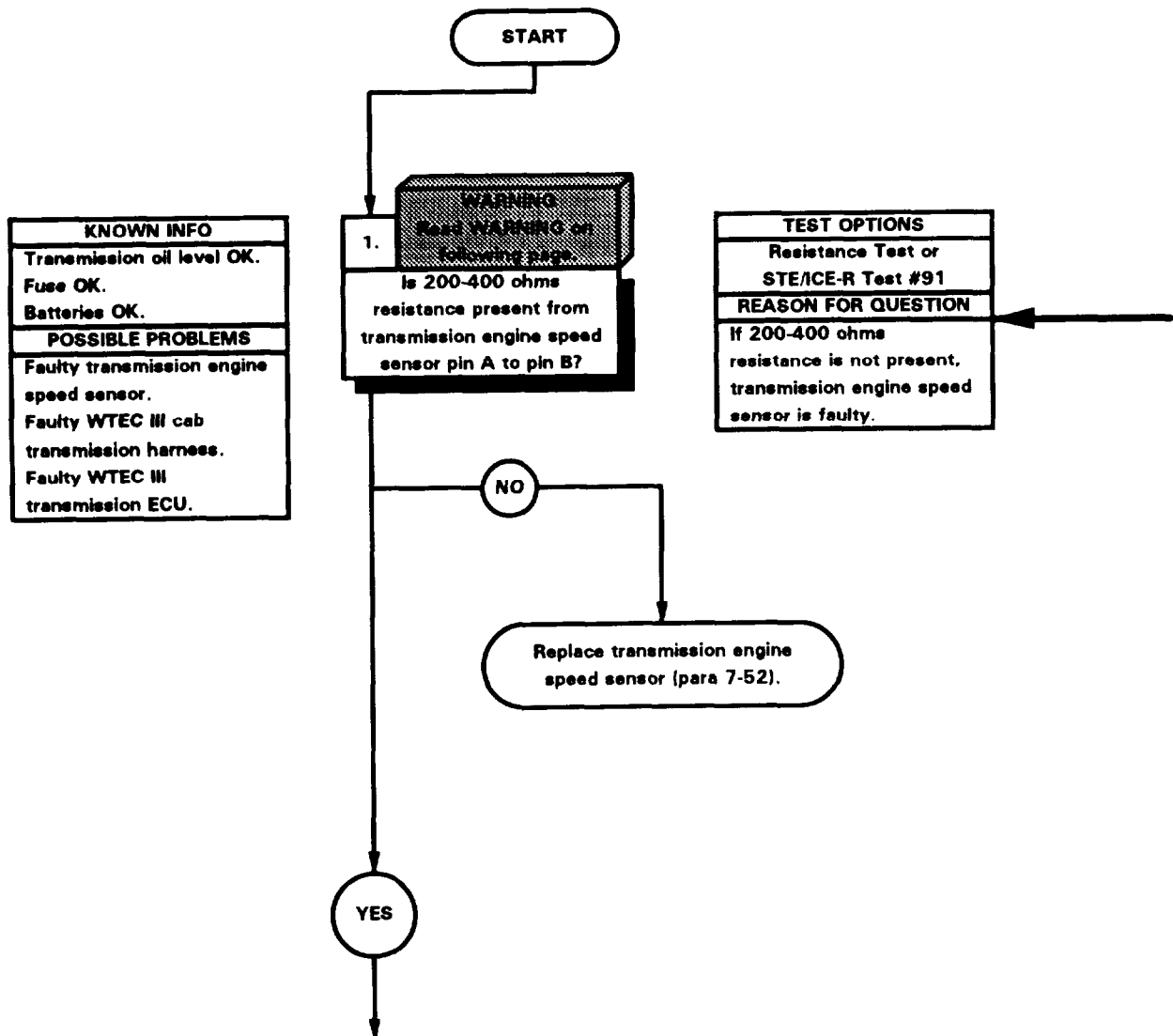
PRESSURE TEST

- (1) Place drain pan under transmission oil cooler flow tube.
- (2) Disconnect transmission oil sampling hose from 45-degree fitting.
- (3) Remove 45-degree fitting from transmission oil cooler flow tube.
- (4) Remove preformed packing from 45-degree fitting. Discard preformed packing.
- (5) Install pipe to tube adapter in transmission oil cooler flow tube.
- (6) Connect STE/ICE-R with adapter to pipe to tube adapter.
- (7) Start engine (TM 9-2320-366-10-1).
- (8) Perform STE/ICE-R Test # 50.
- (9) Check if pressure is 10 psi or more.
- (10) If pressure is less than 10 psi, notify DS Maintenance.
- (11) Shut down engine (TM 9-2320-366-10-1).
- (12) Disconnect STE/ICE-R and adapter from pipe to tube adapter.
- (13) Remove pipe to tube adapter from transmission oil cooler flow tube.
- (14) Install preformed packing on 45-degree fitting.
- (15) Install 45-degree fitting in transmission oil cooler flow tube.
- (16) Connect transmission oil sampling hose to 45-degree fitting.
- (17) Remove drain pan from under oil cooler flow tube.



42F2101R

122. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS	
MAIN CODE 22 SUB CODE 14	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B) STE/ICE-R (Item 41, Appendix C)
References TM 9-4910-571-12&P	



RESISTANCE TEST

WARNING

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

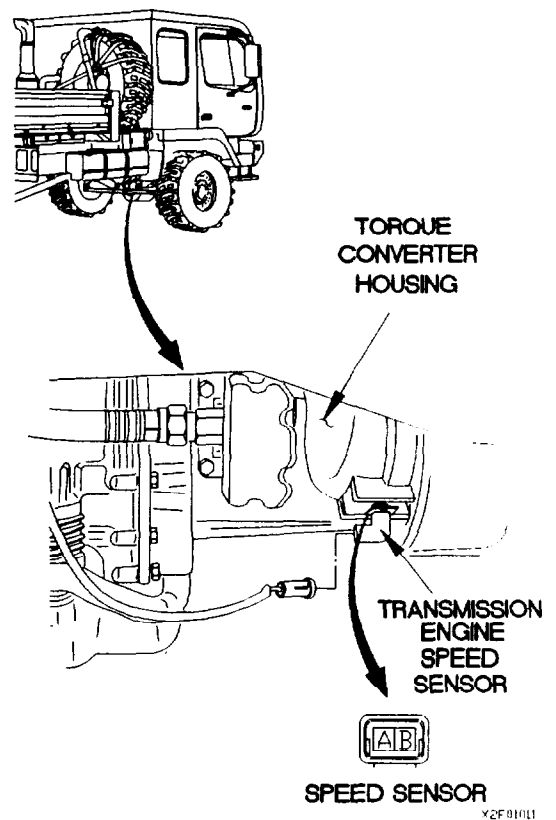
- (1) Disconnect connector P72 from transmission engine speed sensor.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to pin A of transmission engine speed sensor.

NOTE

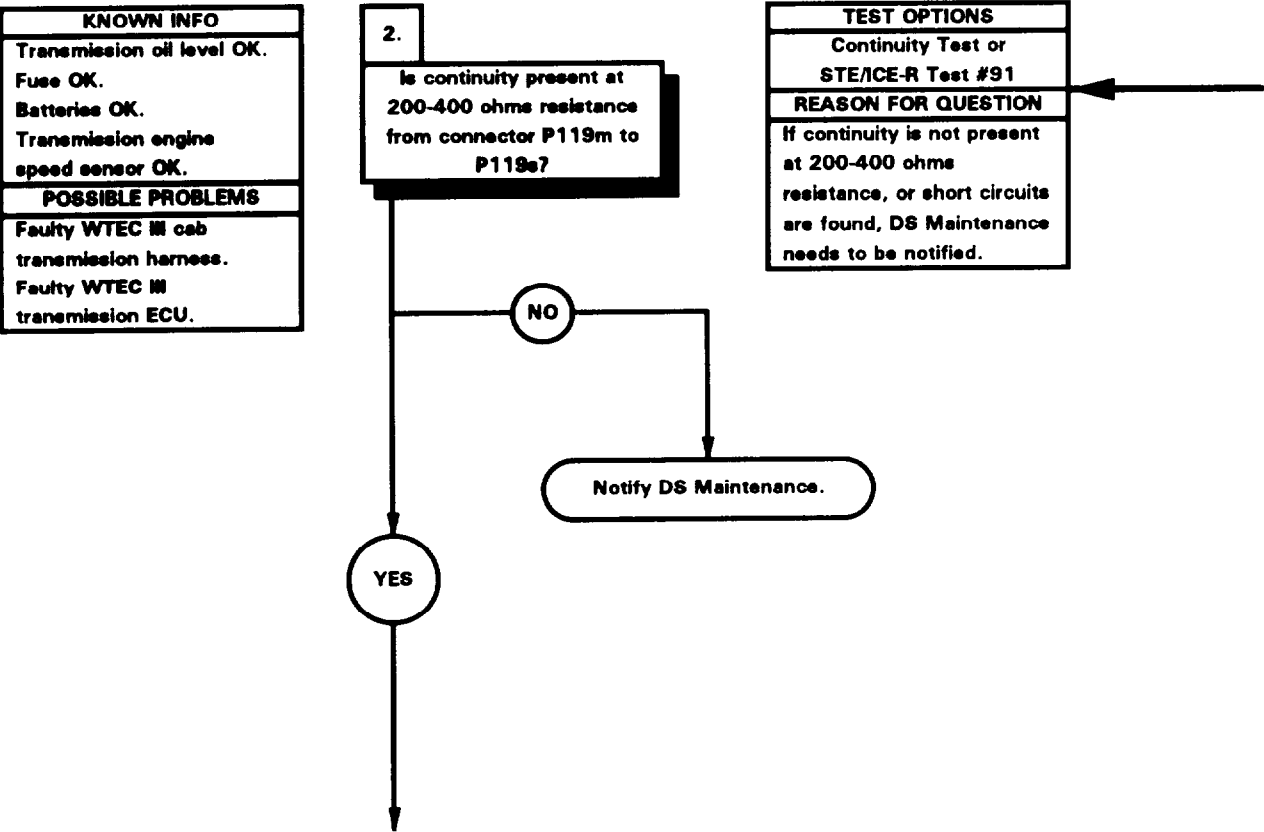
A good transmission engine speed sensor will return a reading of 200-400 ohms resistance as follows:

- 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 7-52).
- (6) Connect connector P72 to transmission engine speed sensor.

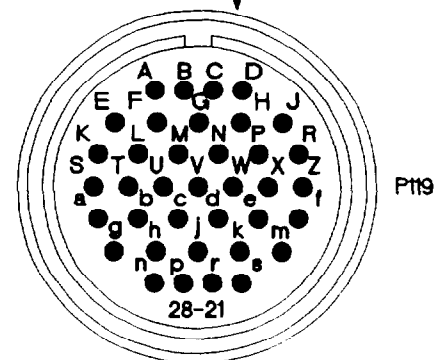
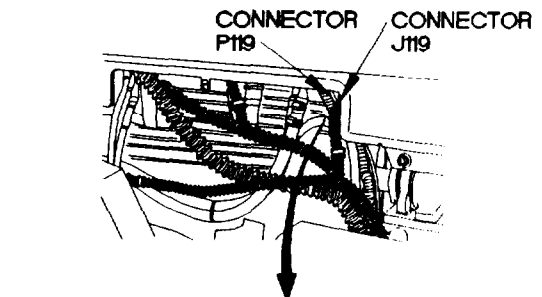
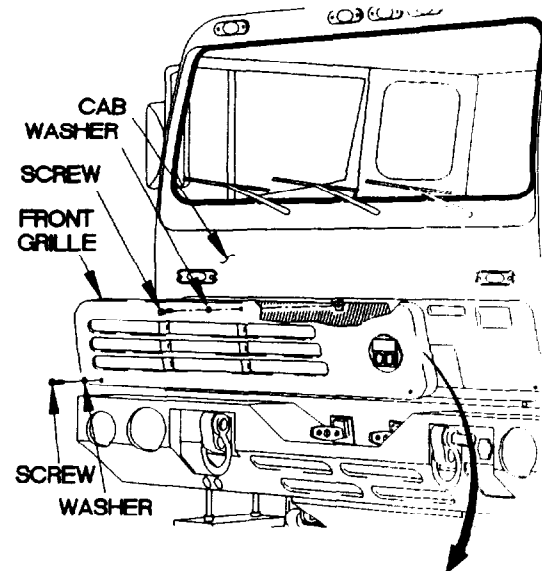


122. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 14 (CONT)



CONTINUITY TEST

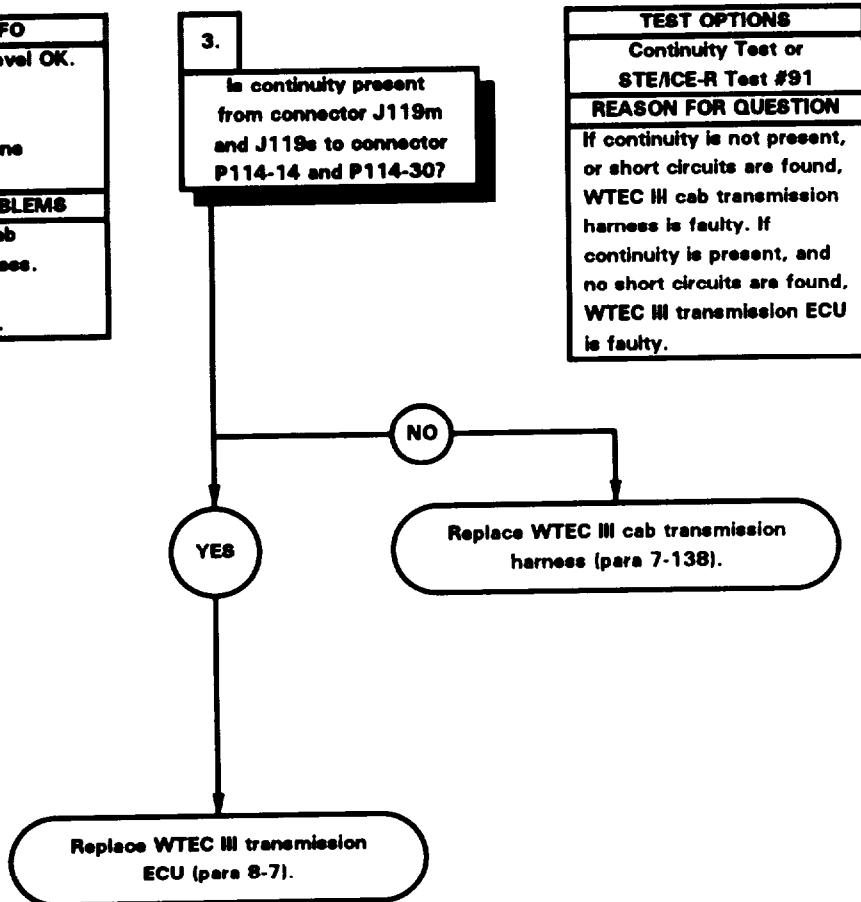
- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Set multimeter to ohms.
- (6) Connect positive (+) probe of multimeter to connector P119m.
- (7) Connect 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.



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

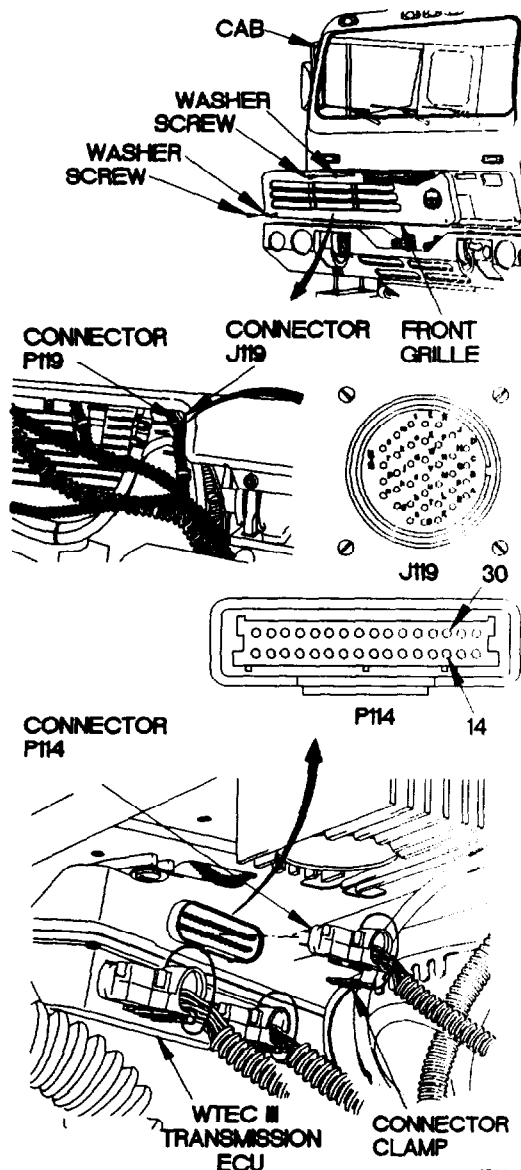
KNOWN INFO
Transmission oil level OK. Fuse OK. Batteries OK. Transmission engine speed sensor OK.
POSSIBLE PROBLEMS
Faulty WTEC III cab transmission harness. Faulty WTEC III transmission ECU.



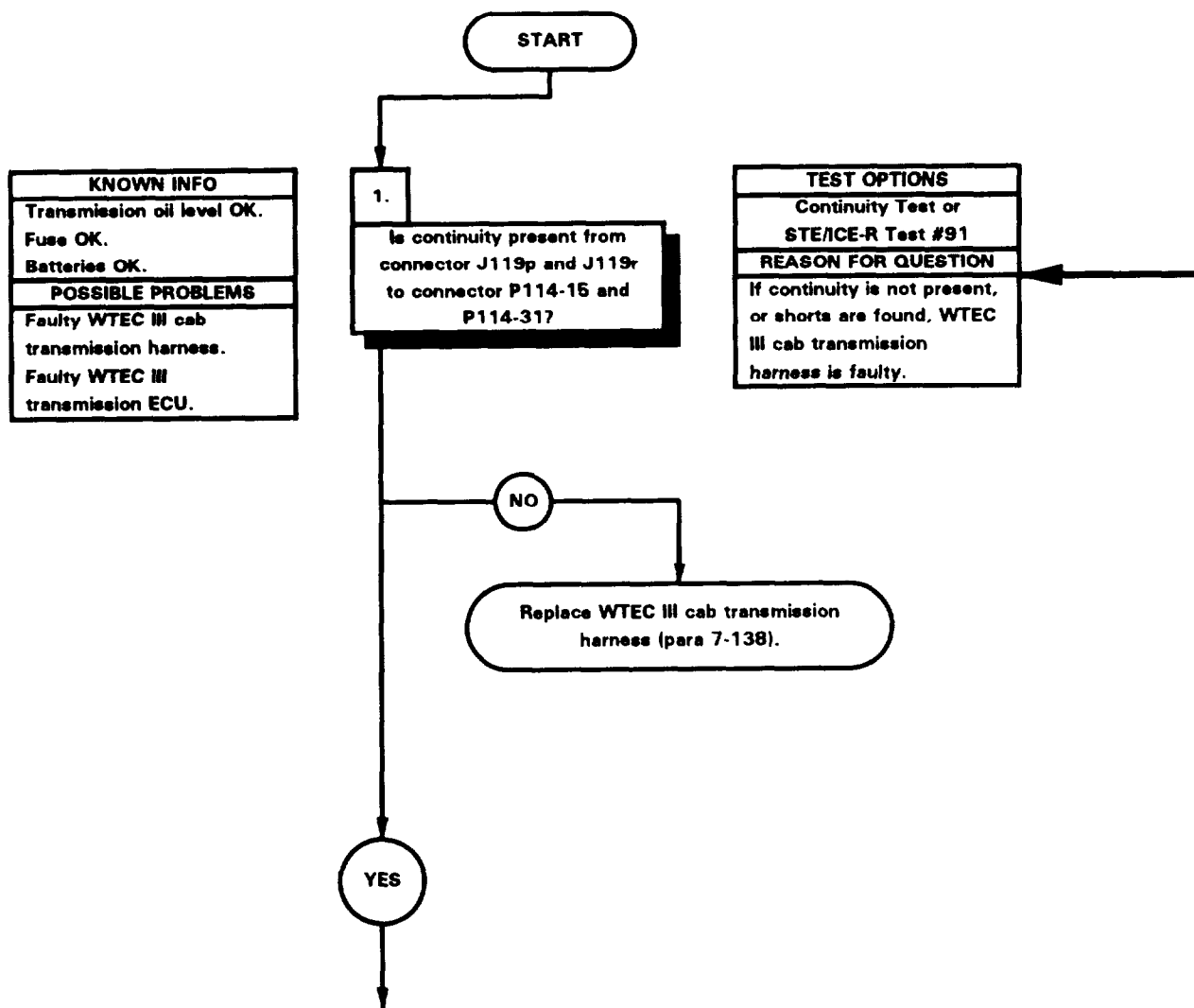
TEST OPTIONS
Continuity Test or STE/CE-R Test #91
REASON FOR QUESTION
If continuity is not present, or short circuits are found, WTEC III cab transmission harness is faulty. If continuity is present, and no short circuits are found, WTEC III transmission ECU is faulty.

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 J119e.
- (5) Set multimeter to ohms.
- (6) Connect positive (+) probe of multimeter to connector P114-14.
- (7) Connect negative (-) probe of multimeter to connector P114-30 and note reading on multimeter.
- (8) Connect negative (-) probe of multimeter to all other sockets in connector P114, one at a time, and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) Connect positive (+) probe of multimeter to connector P114-30.
- (11) Connect negative (-) probe of multimeter to all other sockets in connector P114 (except P114-14), one at a time, and note reading on multimeter.
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is not present in step 7, or continuity is present in step 8, 9, 11, or 12, replace WTEC III cab transmission harness (para 7-138).
- (14) If continuity is present in step 7, and continuity is not present in step 8, 9, 11, and 12, replace WTEC III transmission ECU (para 8-7).
- (15) Remove jumper wire from connector J119e and J119m.
- (16) Connect connector P119 to connector J119.
- (17) Position front grille on cab with washer and screw.
- (18) Position two washers and screws in front grille.
- (19) Tighten screw to 48-60 lb-in. (5-7 N-m).
- (20) Tighten two screws to 24 lb-in. (3 N-m).
- (21) Connect connector P114 to WTEC III transmission ECU.
- (22) Connect connector clamp to connector P114.
- (23) Install kick panel (para 16-3).
- (24) Clear diagnostic codes (para 8-5).

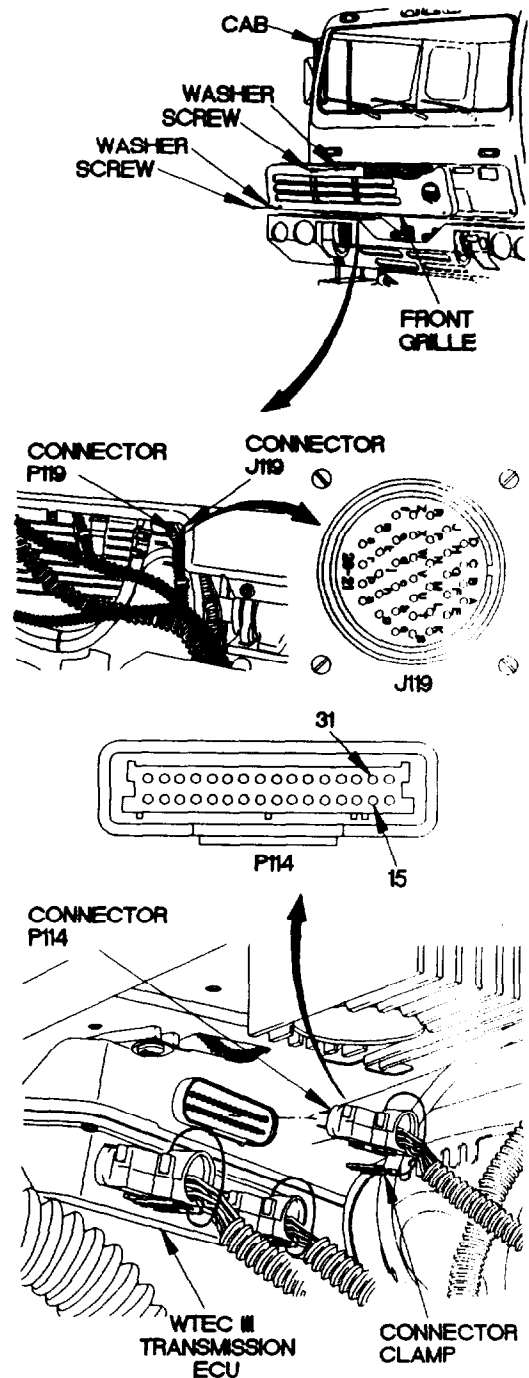


123. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 15	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B) STE/CE-R (Item 41, Appendix C)
References TM 9-4910-571-12&P	



CONTINUITY TEST

- (1) Remove two screws and washers from 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.
- (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).



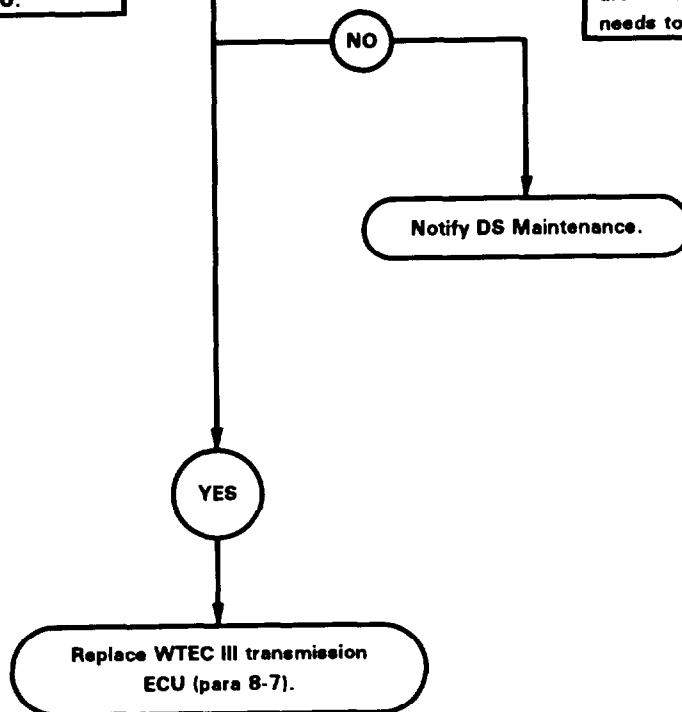
1-2F 2 3011

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

KNOWN INFO
Transmission oil level OK.
Fuse OK.
Batteries OK.
WTEC III cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty WTEC III transmission ECU.

2.
Is 200 - 400 ohms resistance present from connector P119p to P119r?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If 200-400 ohms resistance is not present from connector P119p to P119r, or short circuits are found, DS Maintenance needs to be notified.



RESISTANCE TEST

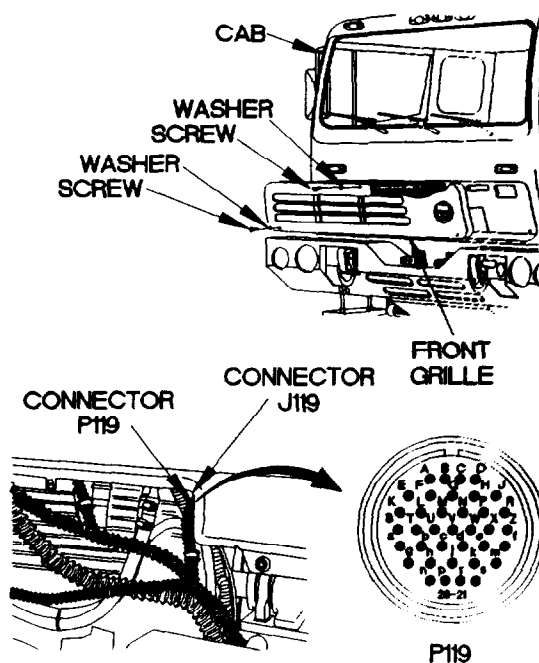
- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119p.
- (3) Connect negative (-) probe of multimeter to connector P119r and note reading on multimeter.

NOTE

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

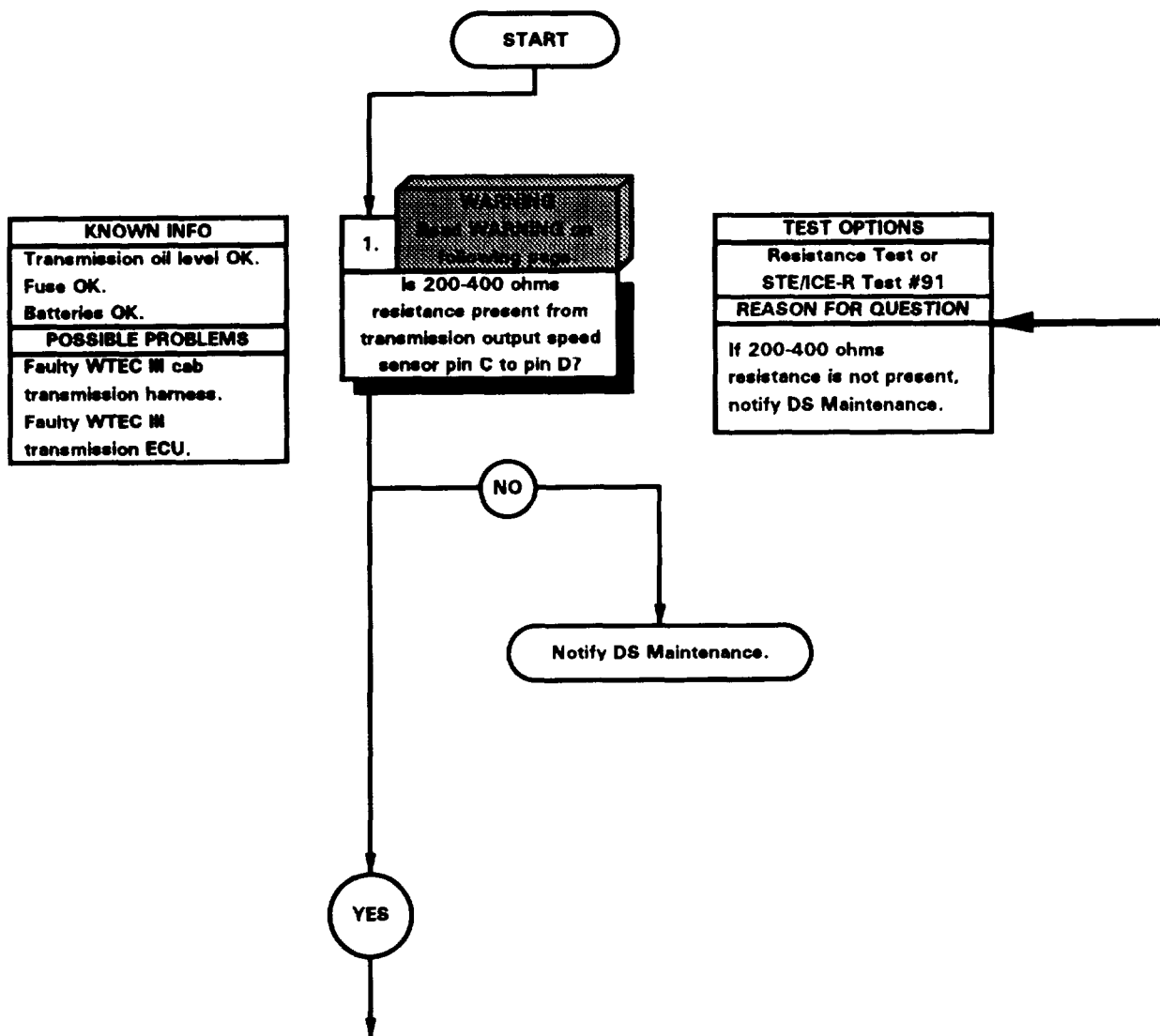
- a. 200 ohms at -40°F (-40°C).
- b. 300 ohms at 68°F (20°C).
- c. 400 ohms at 230°F (110°C).

- (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).



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124. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 22 SUB CODE 16	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Goggles, Industrial (Item 15, Appendix C) Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B) STE/ICE-R (Item 41, Appendix C)
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.

RESISTANCE TEST

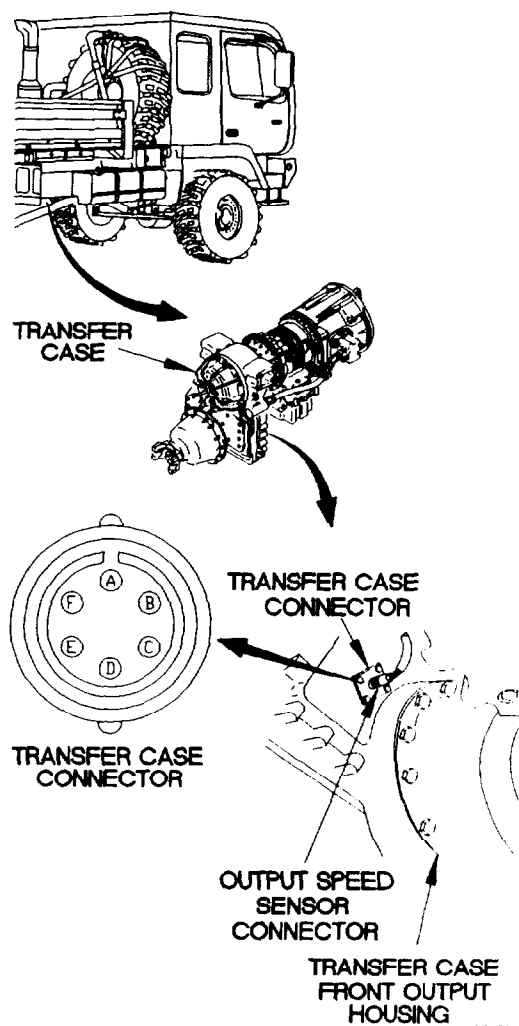
- (1) Disconnect output speed sensor connector from transfer case connector.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to pin C of transfer case connector.

NOTE

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

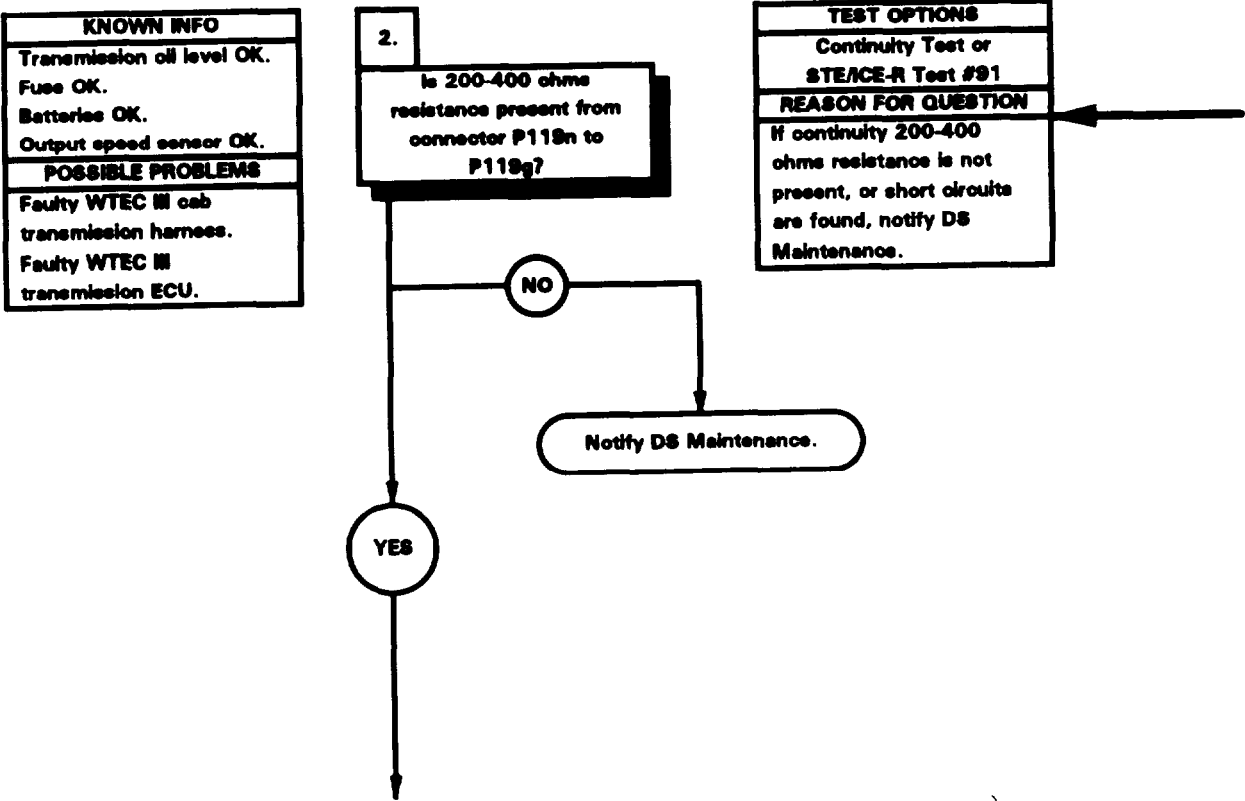
- a. 200 ohms at -40° F (-40° C)
- b. 300 ohms at 68° F (20° C)
- c. 400 ohms at 230° F (110° C)

- (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.



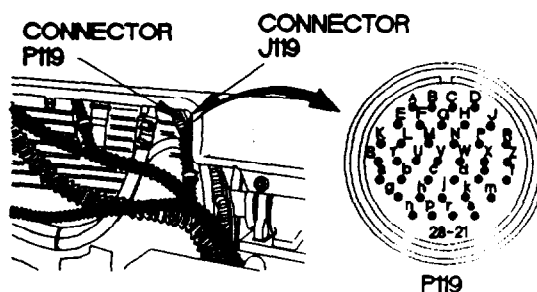
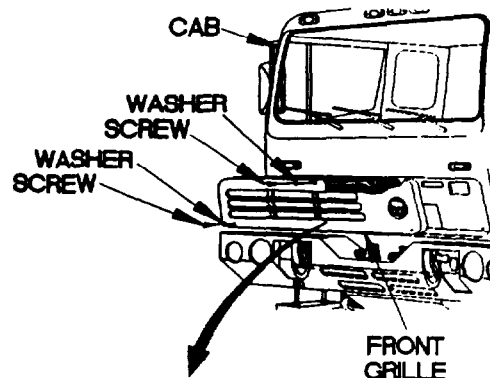
K2F03011

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



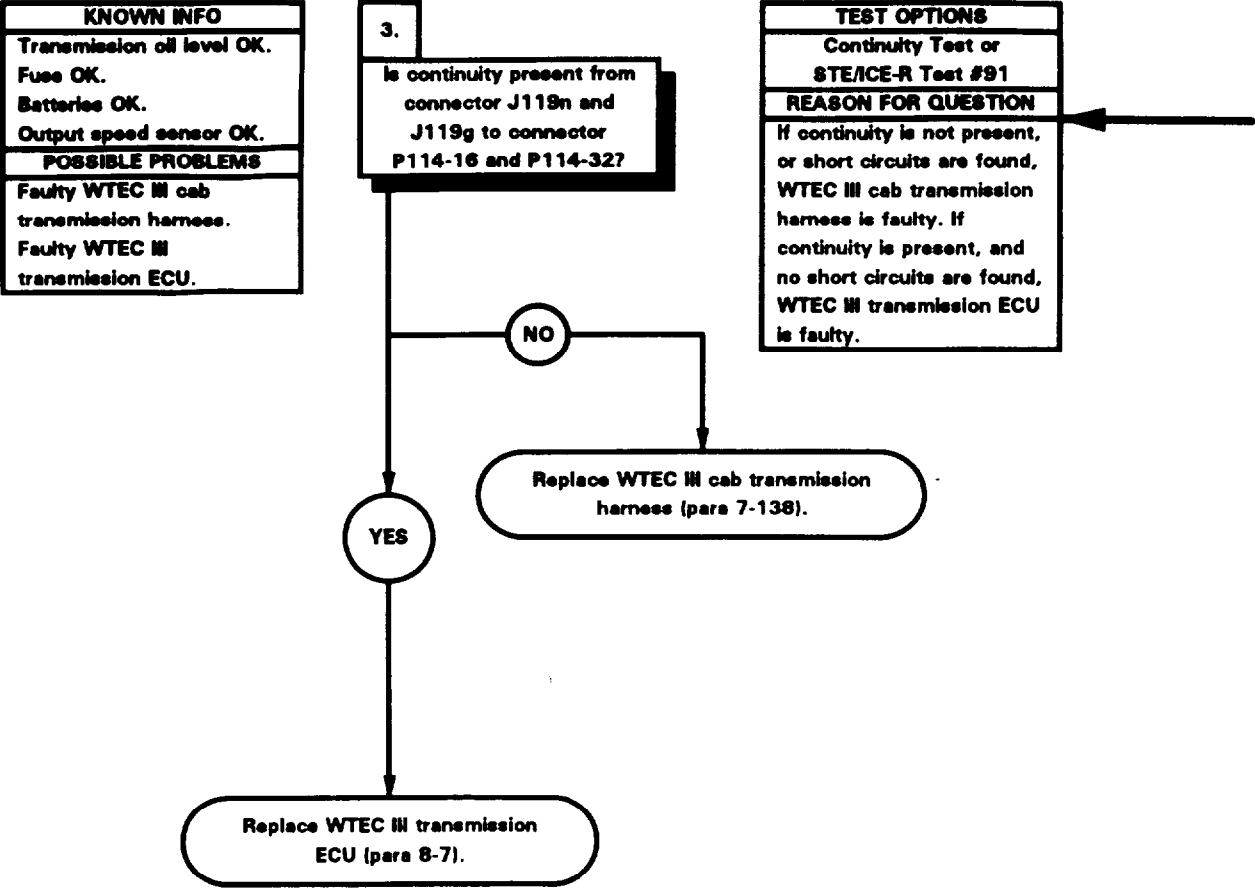
CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Set multimeter to ohms.
- (6) Connect positive (+) probe of multimeter to connector P119n.
- (7) Connect negative (-) probe of multimeter 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 continuity 200-400 ohms resistance is not present in step 7, or continuity is present in step 8, 9, 11, or 12, notify DS Maintenance.



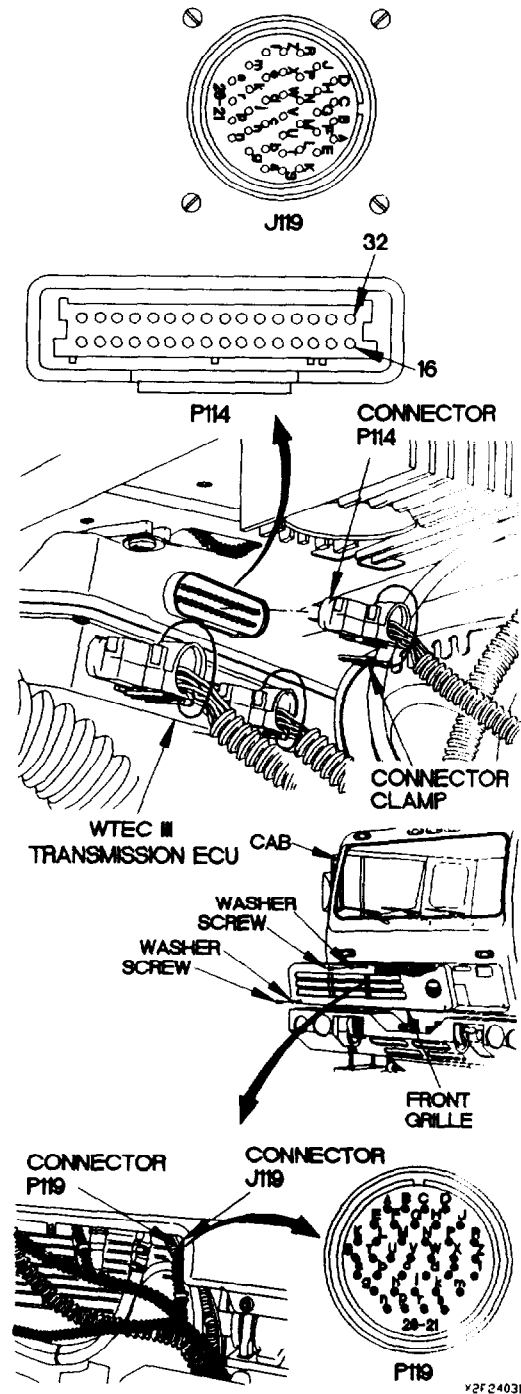
KZF 03021

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

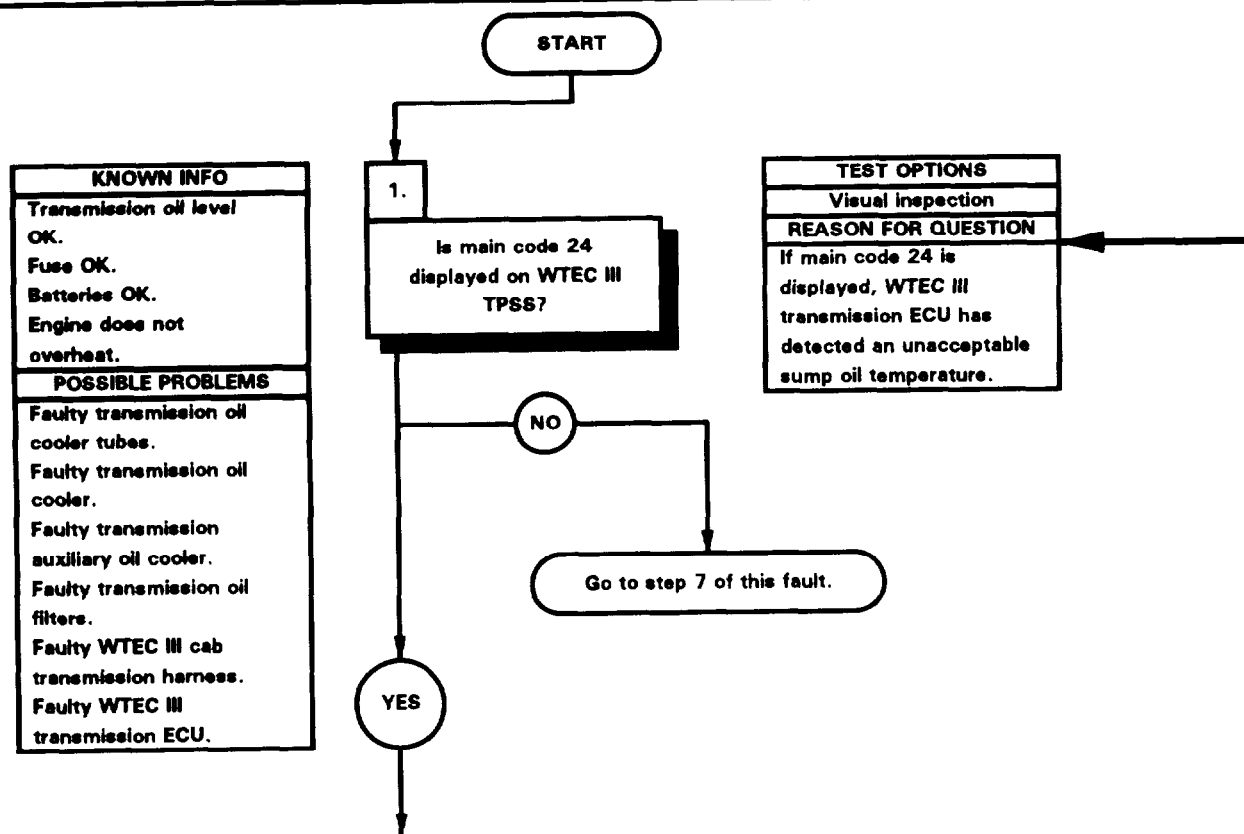


CONTINUITY TEST

- (1) Remove kick panel (para 16-3).
- (2) Disconnect connector clamp from connector P114.
- (3) Disconnect connector P114 from WTEC III transmission ECU.
- (4) Install jumper wire from connector J119g to J119n.
- (5) Set multimeter to ohms.
- (6) Connect positive (+) probe of multimeter to connector P114-32.
- (7) Connect negative (-) probe of multimeter to connector P114-16 and note reading on multimeter.
- (8) Connect negative (-) probe of multimeter to all other sockets in connector P114, one at a time, and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) Connect positive (+) probe of multimeter to connector P114-16.
- (11) Connect negative (-) probe of multimeter to all other sockets in connector P114 (except P114-32), one at a time, and note reading on multimeter.
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is not present in step 7, or continuity is present in step 8, 9, 11, or 12, replace WTEC III cab transmission harness (para 7-138).
- (14) If continuity is present in step 7, and continuity is not present in step 8, 9, 11, and 12, replace WTEC III transmission ECU (para 8-7).
- (15) Remove jumper wire from connector J119n and J119g.
- (16) Connect connector P119 to connector J119.
- (17) Position front grille on cab with washer and screw.
- (18) Position two washers and screws in front grille.
- (19) Tighten screw to 48-60 lb-in. (5-7 N·m).
- (20) Tighten two screws to 24 lb-in. (3 N·m).
- (21) Connect connector P114 to WTEC III transmission ECU.
- (22) Connect connector clamp to connector P114.
- (23) Install kick panel (para 16-3).
- (24) Clear diagnostic codes (para 8-5).

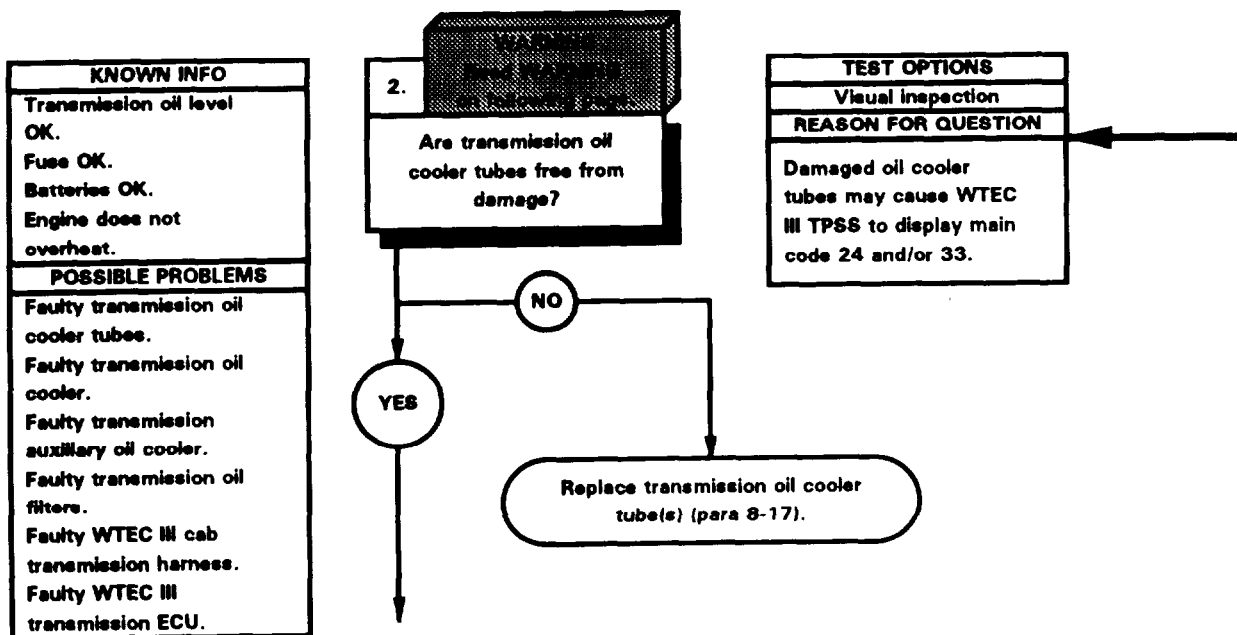


125. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 AND/OR 33 AND ANY SUB CODE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1). References TM 9-4910-571-12&P	Tools and Special Tools Goggles, Industrial (Item 15, Appendix C) Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) Pan, Drain (Item 24, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C) STE/CE-R (Item 41, Appendix C)



- (1) Position master power switch to on
(TM 9-2320-366-10-1).
- (2) Check to see if main code 24 or main code 33
is displayed on WTEC III TPSS (para 8-5).
- (3) If main code 24 is displayed:
 - (a) WTEC III transmission ECU has detected
a sump oil temperature above (sub code 23)
or below (sub code 12) operating limits.
 - (b) Troubleshoot oil cooling system followed
by sump oil temperature sensor and circuits.
- (4) If main code 33 is displayed:
 - (a) WTEC III transmission ECU has detected a
fault with sump oil temperature sensor or its
circuit.
 - (b) Troubleshoot electrical system.
- (5) Position master power switch to off
(TM 9-2320-366-10-1).

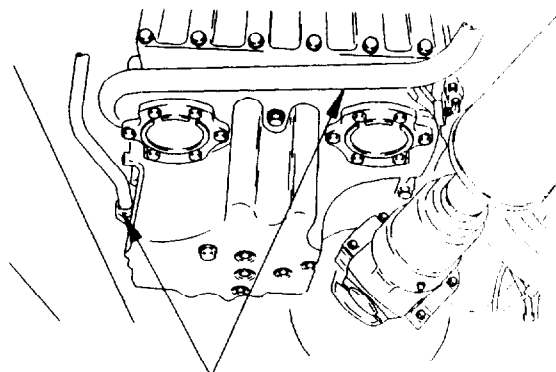
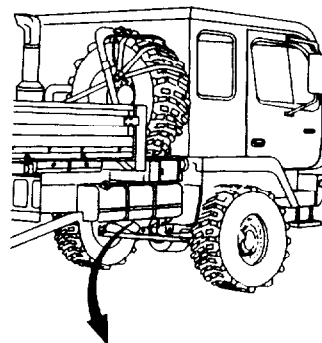
†25. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 AND/OR 33 AND ANY SUB CODE (CONT)



WARNING

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

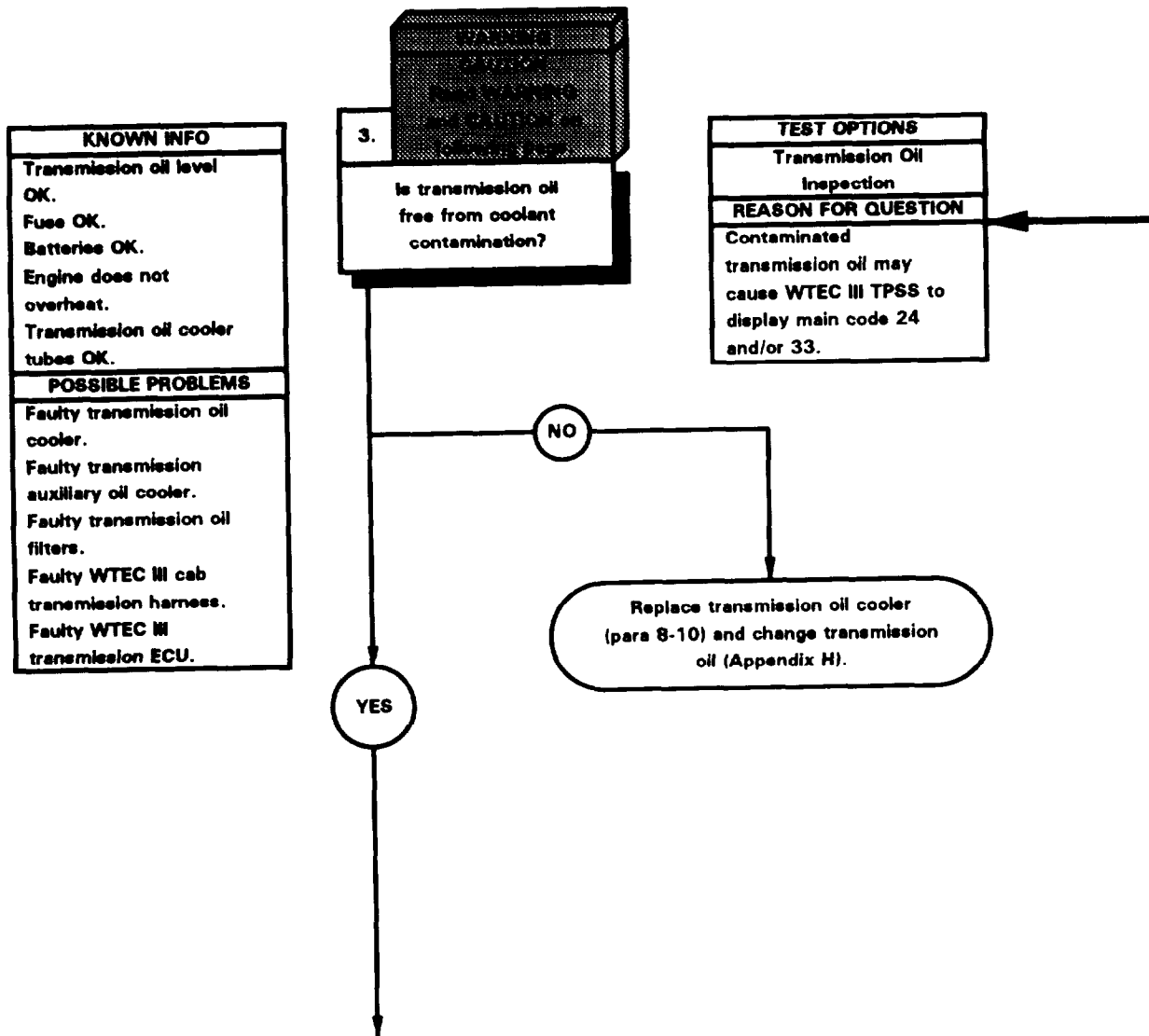
- (1) Check transmission oil cooler tubes for damage and restrictions.
- (2) If damage or restrictions are found, replace transmission oil cooler tube(s) (para 8-17).



TRANSMISSION OIL COOLER TUBES

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



TRANSMISSION OIL INSPECTION

WARNING

- Do not drain transmission oil when transmission is hot. Failure to comply may cause severe injury to personnel.
- Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

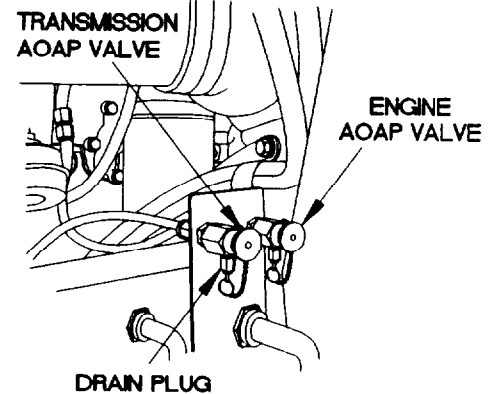
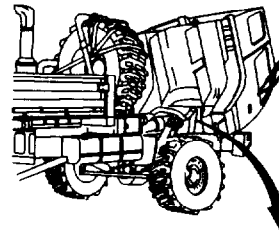
CAUTION

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

NOTE

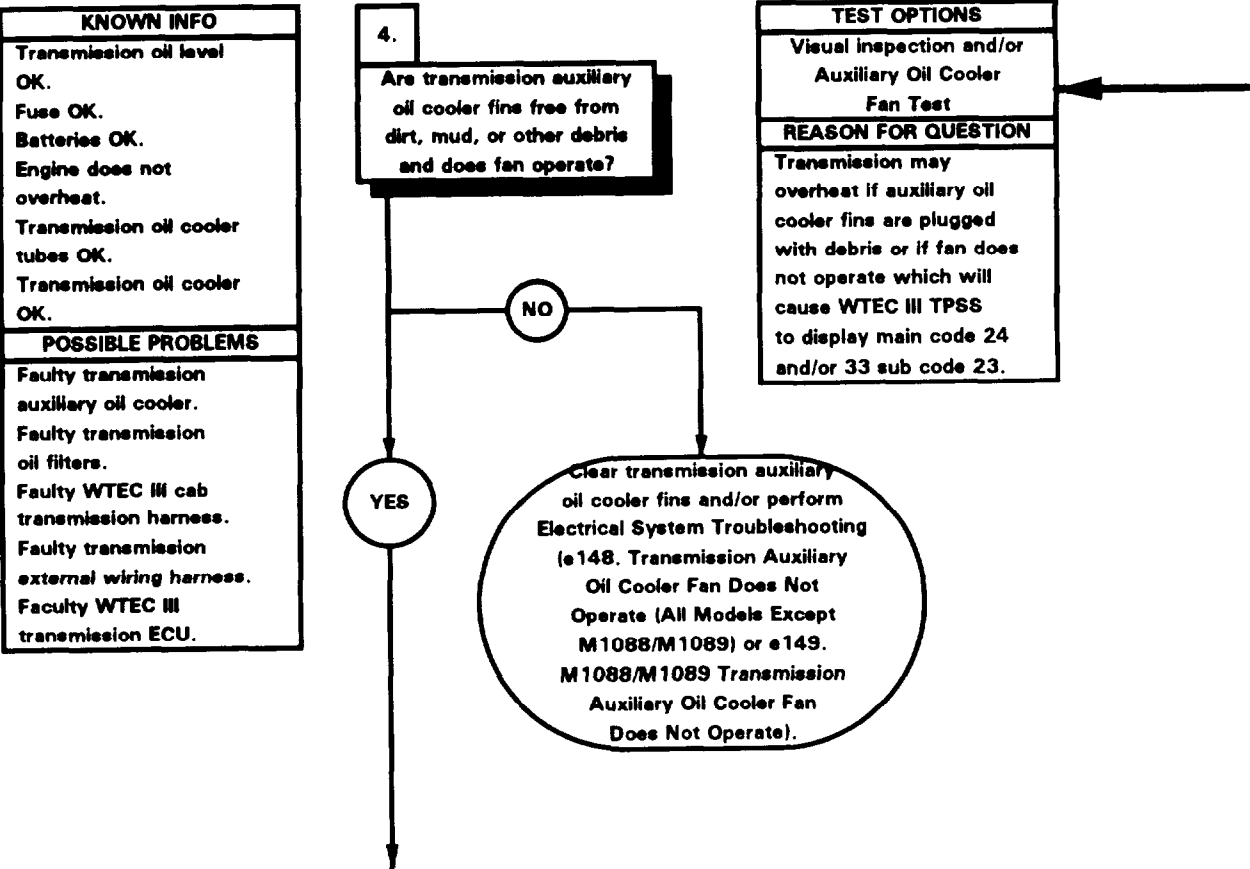
Transmission fluid capacity is 42.3 qt (40 L).

- (1) Start engine (TM 9-2320-366-10-1).
- (2) Allow oil to circulate for a few minutes.
- (3) Place drain pan under transmission AOAP valve.
- (4) Remove drain plug from transmission AOAP valve and press plunger to extract oil from system.
- (5) Allow approximately 1 qt (0.9 L) of oil to drain into drain pan. Release plunger.
- (6) Install drain plug on transmission AOAP valve.
- (7) Inspect oil for coolant contamination.
- (8) If oil is contaminated, replace transmission oil cooler (para 8-10).
- (9) Shut down engine (TM 9-2320-366-10-1).
- (10) Fill transmission (Appendix H).



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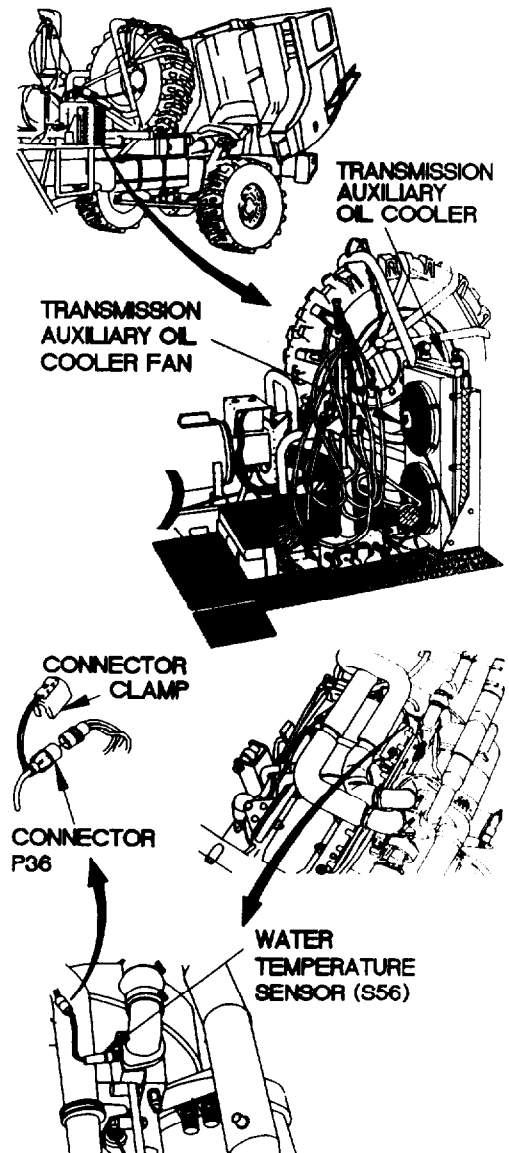
125. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 AND/OR 33 AND ANY SUB CODE (CONT)



Check if transmission auxiliary oil cooler fins are plugged with dirt, mud, or other debris.

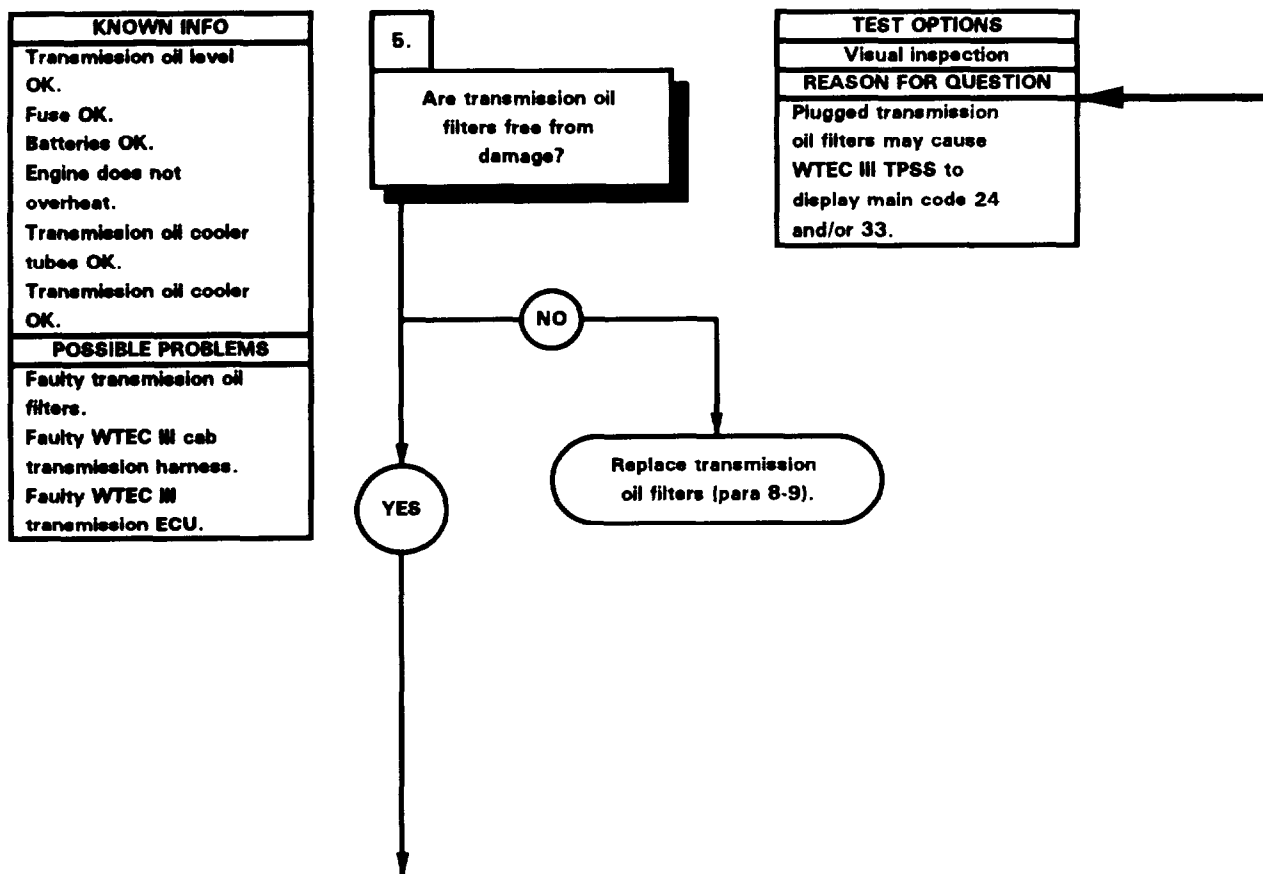
AUXILIARY OIL COOLER FAN TEST

- (1) Raise cab (TM 9-2320-366-10-1).
- (2) Disconnect connector clamp from water temperature sensor.
- (3) Disconnect connector P36 from water temperature sensor (S56) to de-energize relay K15 and provide power to auxiliary oil cooler fan.
- (4) Position master power switch to on (TM 9-2320-366-10-1).
- (5) Check if auxiliary oil cooler fan comes on.
- (6) If fan does not come on, perform Electrical System Troubleshooting (e148. Transmission Auxiliary Oil Cooler Fan Does Not Operate (All Models Except M1088/M1089) or e149. M1088/M1089 Transmission Auxiliary Oil Cooler Fan Does Not Operate).
- (7) Position master power switch to off (TM 9-2320-366-10-1).
- (8) Connect connector P36 to water temperature sensor (S56).
- (9) Connect connector clamp on water temperature sensor.
- (10) Lower cab (TM 9-2320-366-10-1).

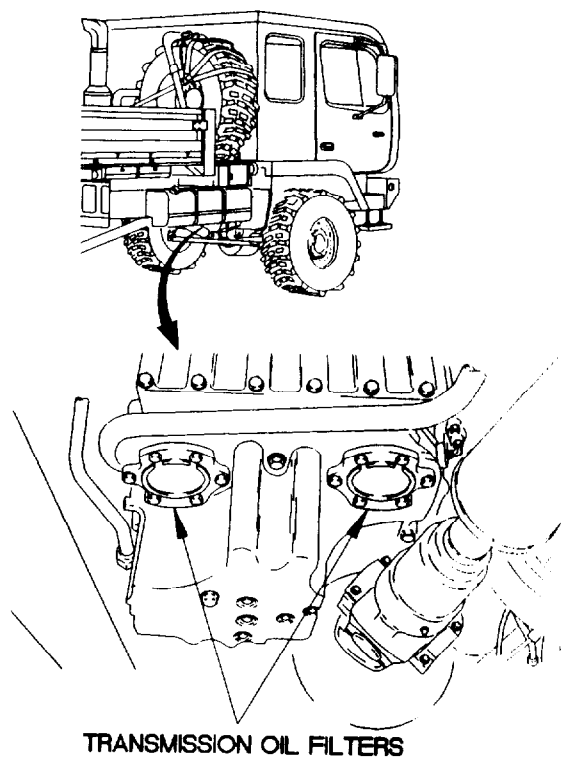


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125. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 24 AND/OR 33 AND ANY SUB CODE (CONT)

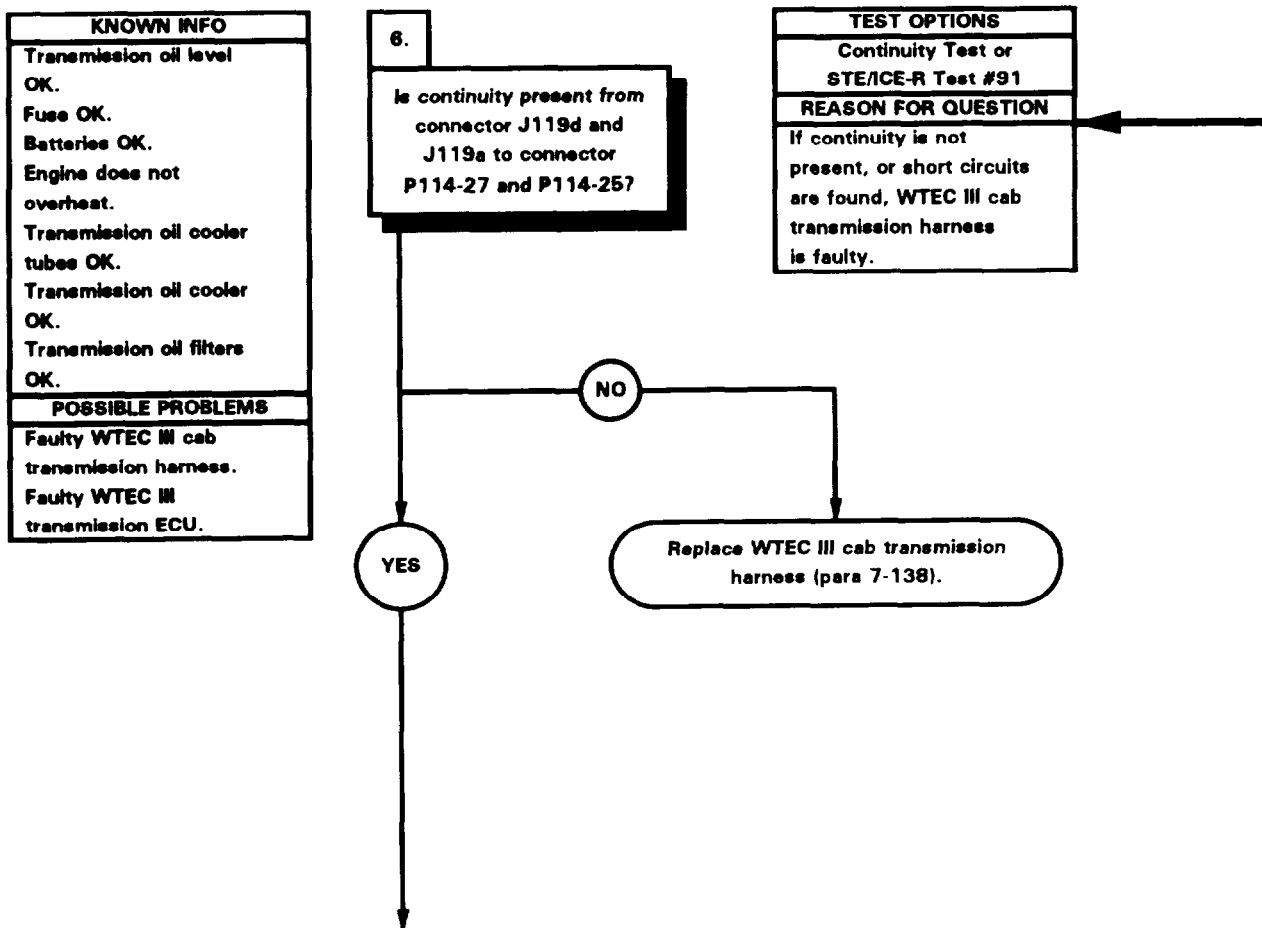


— | Check transmission oil filters for damage (para 8-9).



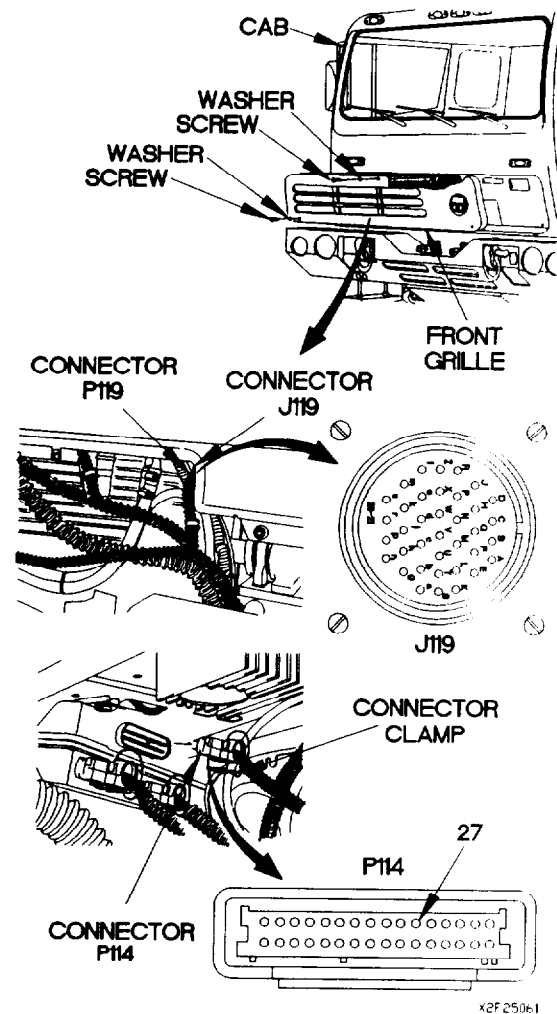
X2F04041

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

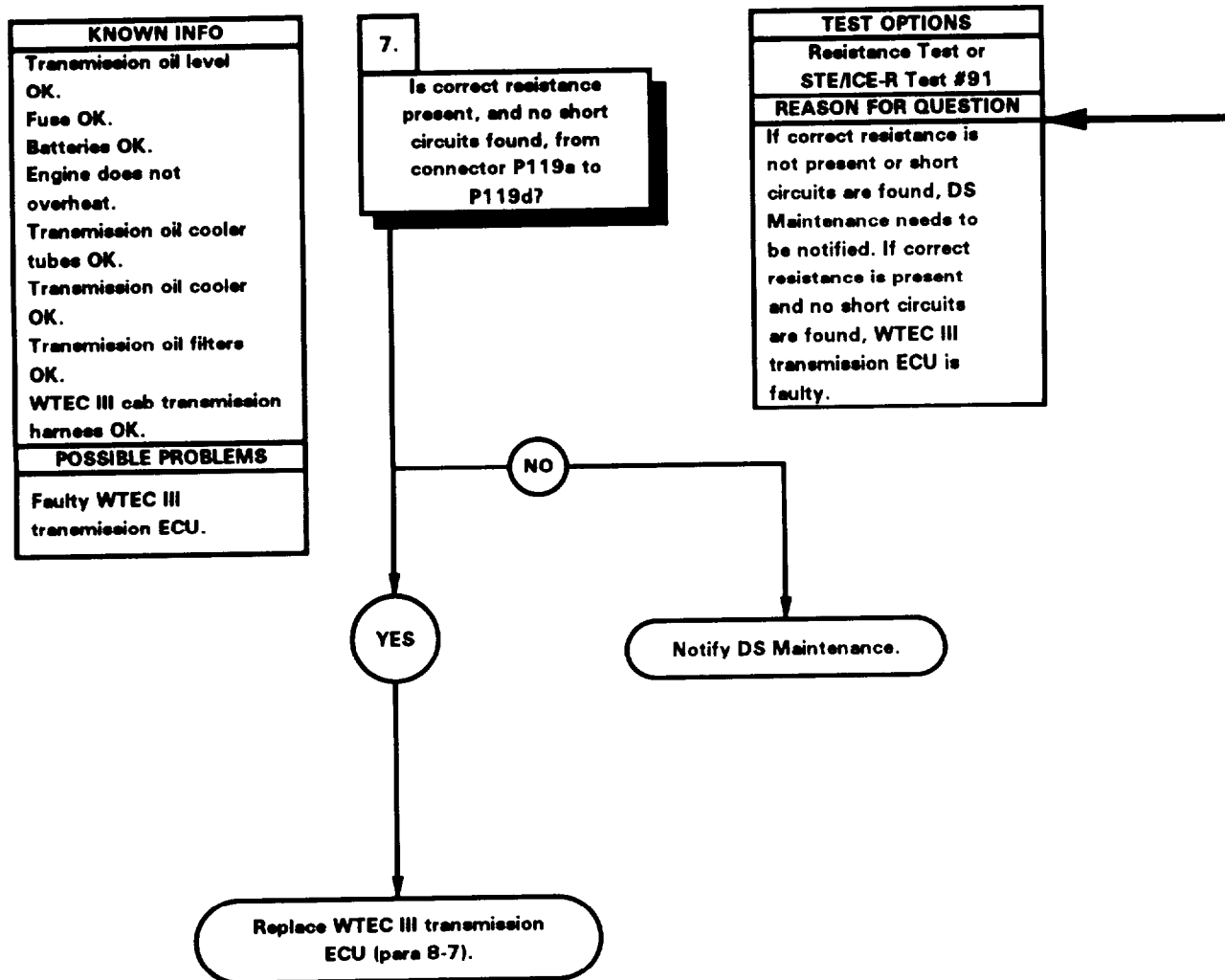


CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Remove kick panel (para 16-3).
- (6) Disconnect connector clamp from connector P114.
- (7) Disconnect connector P114 from WTEC III transmission ECU.
- (8) Install jumper wire from connector J119d to connector J119a.
- (9) Set multimeter to ohms.
- (10) Connect positive (+) probe of multimeter to P114-27.
- (11) Connect negative (-) probe of multimeter to connector P114-25 and note reading on multimeter.
- (12) Connect negative (-) probe of multimeter to all other sockets in connector P114, one at a time, and note reading on multimeter.
- (13) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (14) Connect positive (+) probe of multimeter to connector P114-25.
- (15) Connect negative (-) probe of multimeter to all sockets in connector P114 (except P114-27), one at a time, and note reading on multimeter.
- (16) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (17) If continuity is not present in step 11, or continuity is present in step 12, 13, 15, or 16, replace WTEC III cab transmission harness (para 7-138).
- (18) Remove jumper wire from connector J119.
- (19) Connect connector P114 to WTEC III transmission ECU.
- (20) Connect connector clamp on connector P114.
- (21) Install kick panel (para 16-3).



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



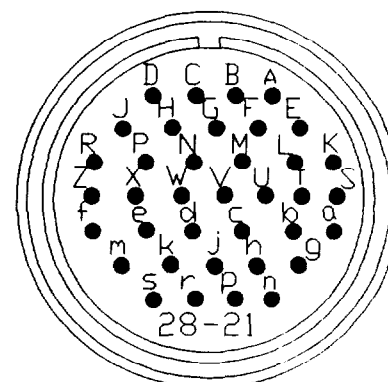
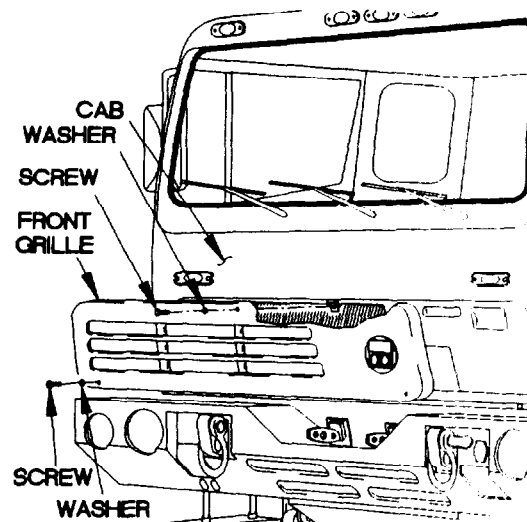
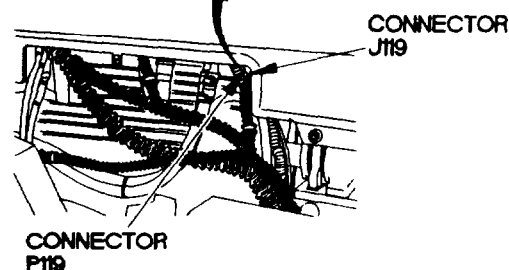
RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119a.

NOTE

Transmission sump oil temperature sensor resistance reading is affected by temperature. Refer to Table 2-34. Transmission Sump Oil Temperature Sensor Resistance Readings for details.

- (3) Connect negative (-) probe of multimeter to connector P119d and note reading on multimeter.
- (4) Connect negative (-) probe of multimeter to all other pins in connector P119, one at a time, and note reading on multimeter.
- (5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (6) Connect positive (+) probe of multimeter to connector P119d.
- (7) Connect negative (-) probe of multimeter to all other pins in connector P119 (except P119a), one at a time, and note reading on multimeter.
- (8) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (9) If correct resistance is not present in step 3, or continuity is present in step 4, 5, 7, or 8, notify DS Maintenance.
- (10) If correct resistance is present in step 3 and continuity is not present in step 4, 5, 7, or 8, replace WTEC III transmission ECU (para 8-7).
- (11) Connect connector P119 to connector J119.
- (12) Position front grille on cab with washer and screw.
- (13) Position two washers and screws in front grille.
- (14) Tighten screw to 48-60 lb-in. (5-7 Nm).
- (15) Tighten two screws to 24 lb-in. (3 Nm).
- (16) Clear diagnostic codes (para 8-5).

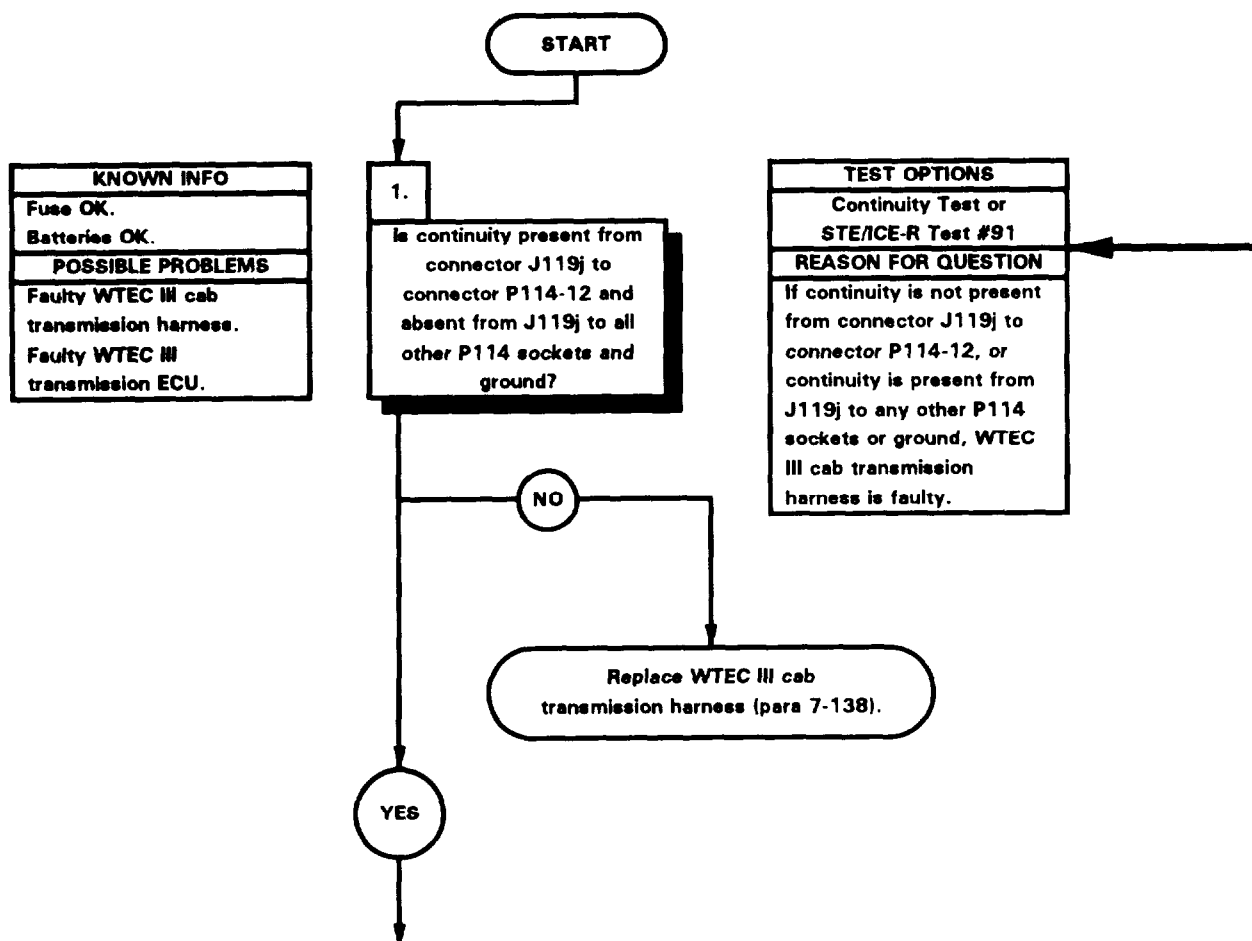
**P119**

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TABLE 2-34. TRANSMISSION SUMP OIL TEMPERATURE SENSOR RESISTANCE READINGS

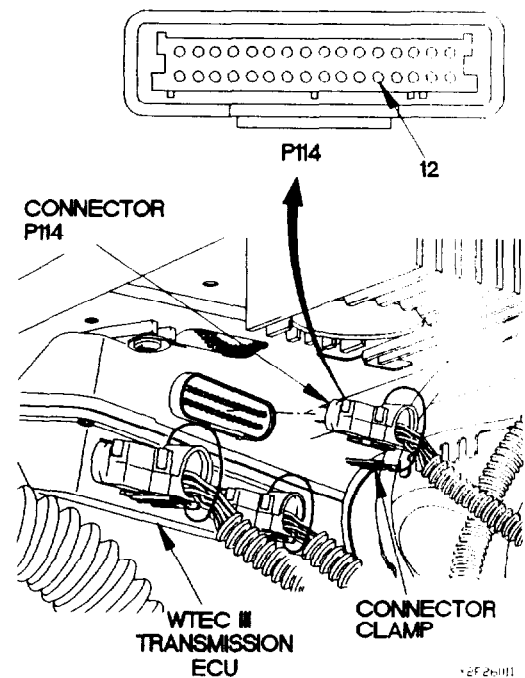
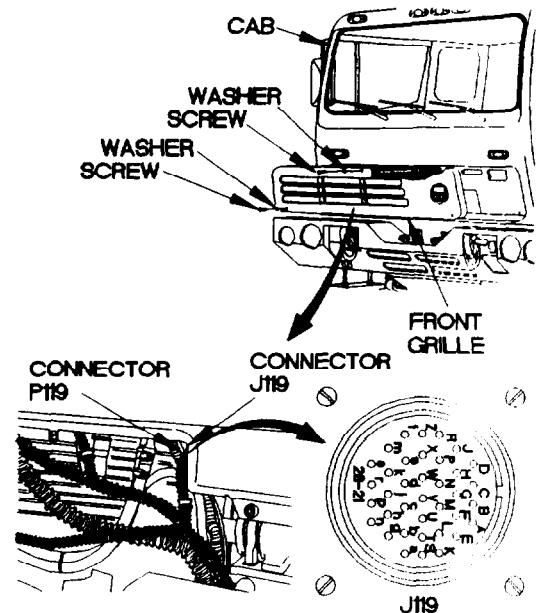
Temperature	Resistance
-4° to 14°F (-20° to -10°C)	691-754 ohms
14° to 32°F (-10° to 0°C)	754-820 ohms
32° to 50°F (0° to 10°C)	820-889 ohms
50° to 68°F (10° to 20°C)	889-962 ohms
68° to 86°F (20° to 30°C)	962-1039 ohms
86° to 104°F (30° to 40°C)	1039-1118 ohms
104° to 122°F (40° to 50°C)	1118-1202 ohms
122° to 140°F (50° to 60°C)	1202-1286 ohms

126. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C) STE/ICE-R (Item 41, Appendix C)
References TM 9-4910-571-12&P	

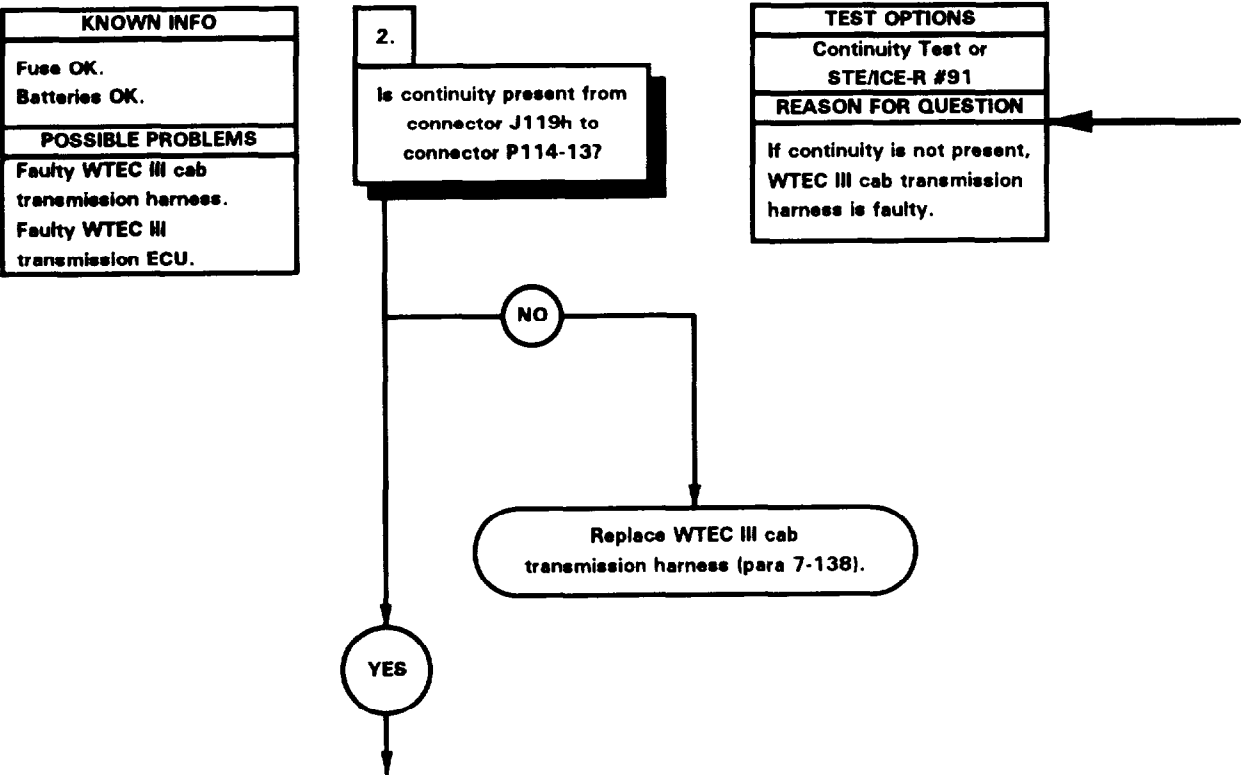


CONTINUITY TEST

- (1) Remove two screws and washers from 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 J119.
- (10) Connect negative (-) probe of multimeter to connector P114-12 and note reading on multimeter.
- (11) Connect negative (-) probe of multimeter to all other sockets in connector P114, one at a time, and note reading on multimeter.
- (12) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (13) If continuity is not present in step 10, or continuity is present in step 11 or 12, replace WTEC III cab transmission harness (para 7-138).

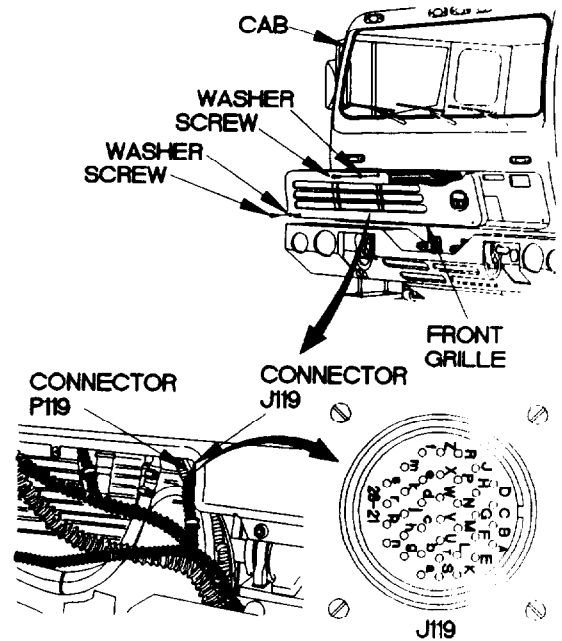
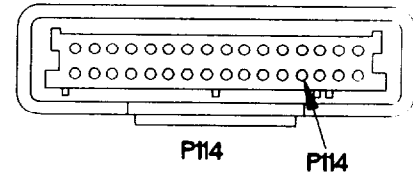


126. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (CONT)



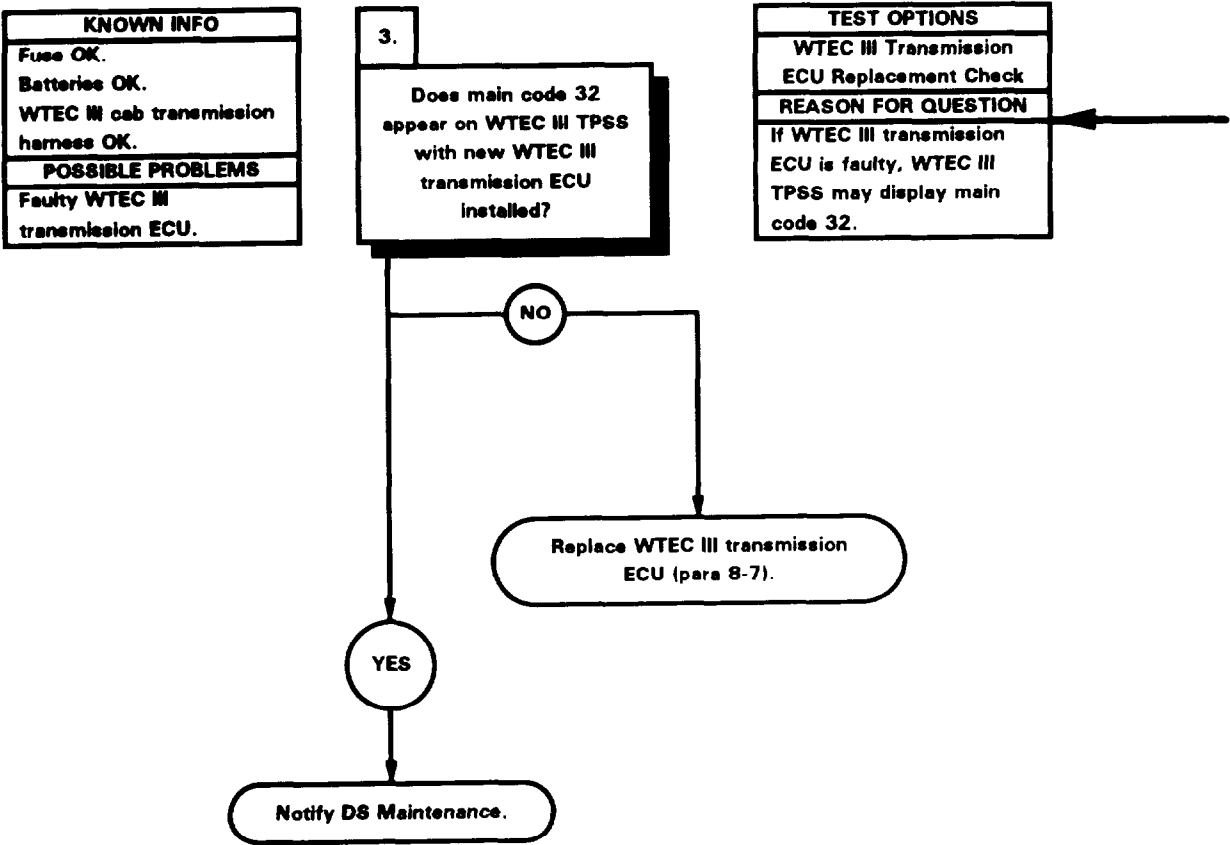
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector J119h.
- (3) Connect negative (-) probe of multimeter to connector P114-13 and note reading on multimeter.
- (4) If continuity is not present, replace WTEC III cab transmission harness (para 7-138).
- (5) Connect connector P119 to connector J119.
- (6) Position front grille on cab with washer and screw.
- (7) Position two washers and screws in front grille.
- (8) Tighten screw to 48-60 lb-in. (5-7 N-m).
- (9) Tighten two screws to 24 lb-in. (3 N-m).



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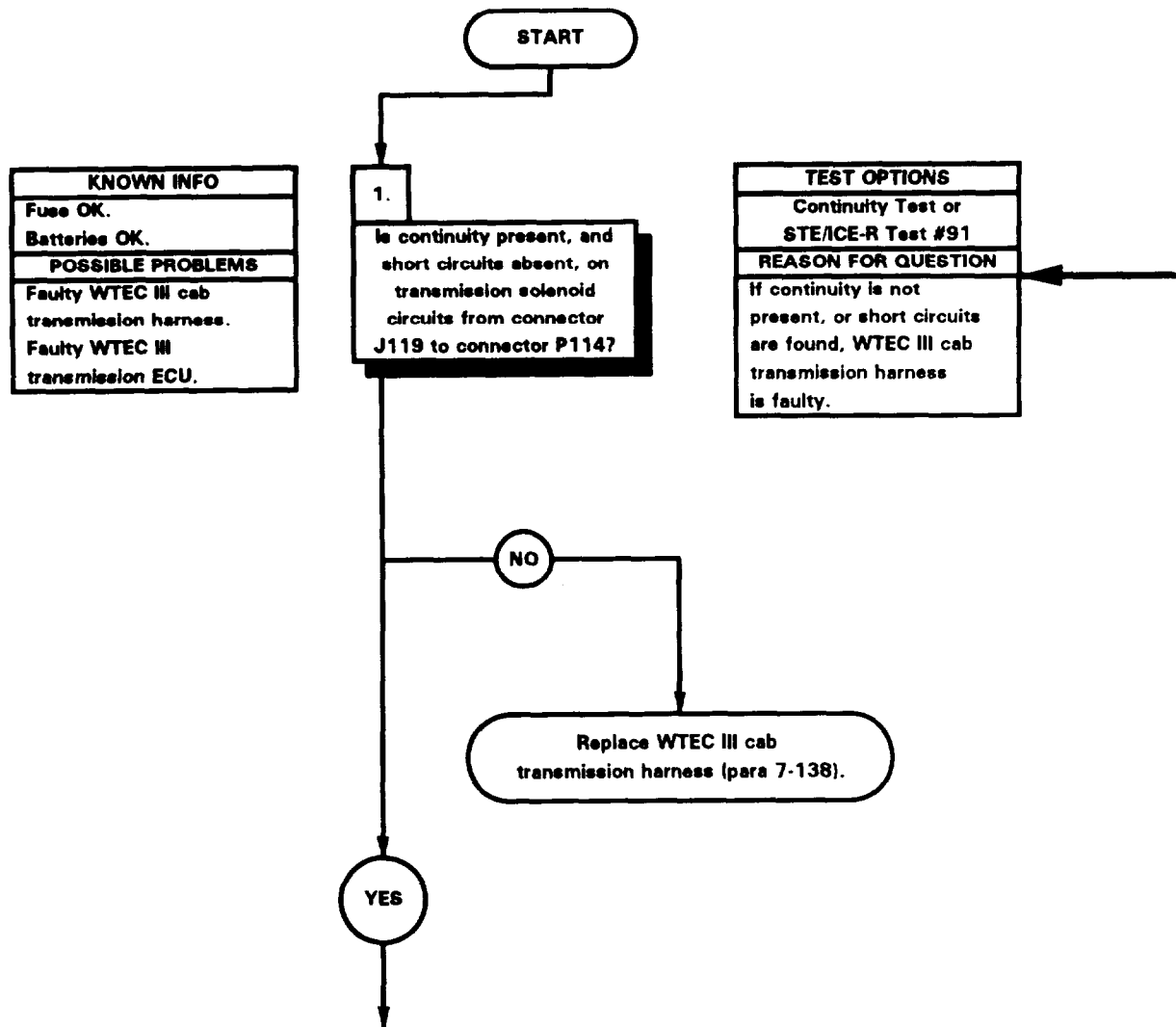
f26. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 32 AND ANY SUB CODE (CONT)



**WTEC III TRANSMISSION ECU
REPLACEMENT CHECK**

- (1) Remove original WTEC III transmission ECU (para 8-7).
- (2) Install replacement WTEC III transmission ECU (para 8-7).
- (3) Install kick panel (para 16-3).
- (4) Start engine (TM 9-2320-366-10-1).
- (5) Road test vehicle and read WTEC III transmission ECU codes (para 8-5).
- (6) If main code 32 does not appear with new WTEC III transmission ECU, replace WTEC III transmission ECU (para 8-7).
- (7) If main code 32 does appear with new WTEC III transmission ECU, notify DS Maintenance.
- (8) Shut down engine (TM 9-2320-366-10-1).
- (9) Install original WTEC III transmission ECU (para 8-7).
- (10) Clear diagnostic codes (para 8-5).

127. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, and/or 45 AND ANY SUB CODE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-75 lb-in. (Item 90, Appendix B) STE/ICE-R (Item 41, Appendix C)
References TM 9-4910-571-12&P	



CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Remove kick panel (para 16-3).
- (6) Disconnect connector clamp from connector P114.
- (7) Disconnect connector P114 from WTEC III transmission ECU.
- (8) Install jumper wire on connector J119 for appropriate sub code. Refer to Table 2-35. WTEC III Cab Transmission Harness Transmission Solenoid Test Points.
- (9) Set multimeter to ohms.
- (10) Connect positive (+) probe of multimeter to connector P114. Refer to Table 2-35. WTEC III Cab Transmission Harness Transmission Solenoid Test Points.
- (11) Connect negative (-) probe of multimeter to connector P114 and note reading on multimeter. Refer to Table 2-35. WTEC III Cab Transmission Harness Transmission Solenoid Test Points.
- (12) Connect negative (-) probe of multimeter to all other sockets in connector P114, one at a time, and note reading on multimeter.
- (13) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (14) If continuity is not present, in step 11, or continuity is present in step 12 or 13, replace WTEC III cab transmission harness (para 7-138).
- (15) Remove jumper wire from connector J119.
- (16) Connect connector P119 to connector J119.

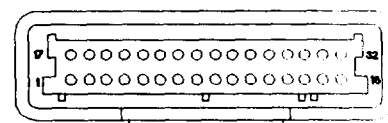
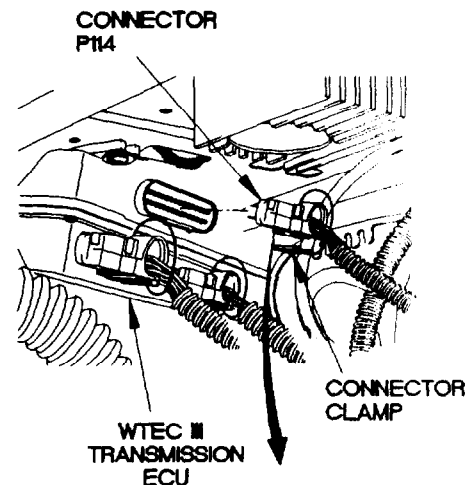
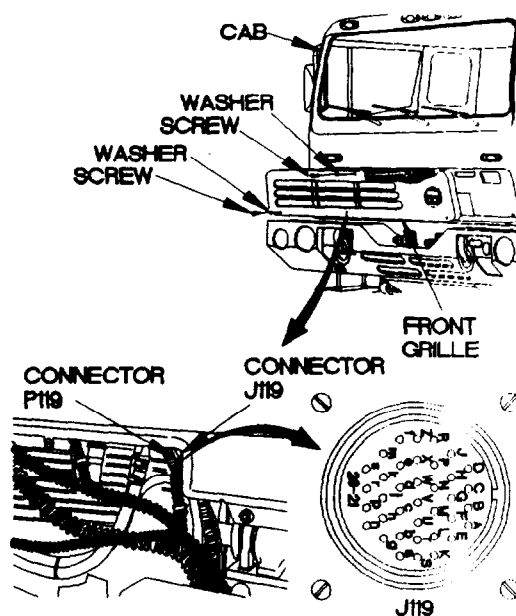


TABLE 2-35. WTEC III CAB TRANSMISSION HARNESS TRANSMISSION SOLENOID TEST POINTS

SUB CODE	JUMPER ACROSS	CONNECTOR P114	
		POSITIVE (+) PROBE	NEGATIVE (-) PROBE
12	J119M to J119B	P114-1	P114-4
13	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

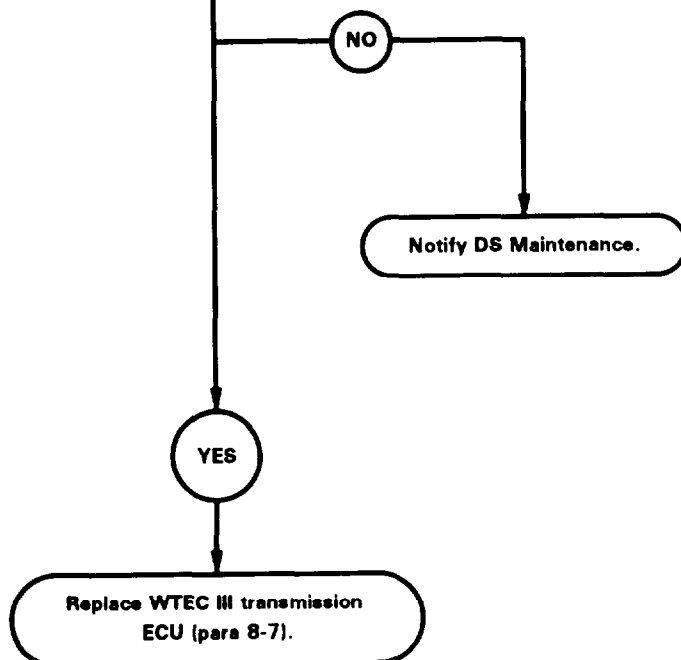
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127. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 42, 44, AND/OR 45 AND ANY SUB CODE (CONT)

KNOWN INFO
Fuse OK. Batteries OK. WTEC III cab transmission harness OK.
POSSIBLE PROBLEMS
Faulty circuit from P119 to affected solenoid. Faulty WTEC III transmission ECU.

2.
Is correct solenoid resistance present at connector P119?

TEST OPTIONS
Resistance Test or STE/ICE-R Test #91
REASON FOR QUESTION
If correct resistance is not present at connector P119, DS Maintenance needs to be notified.



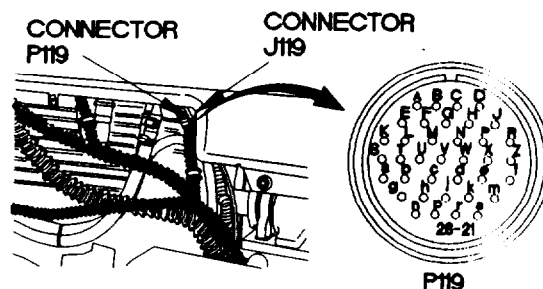
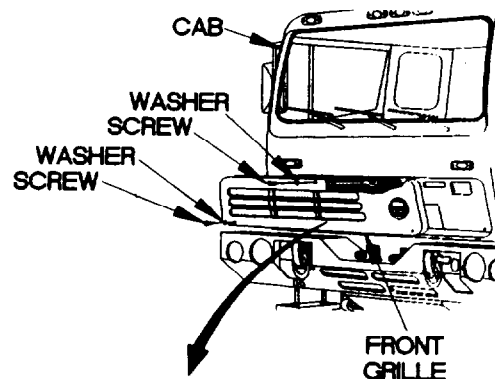
RESISTANCE TEST

- (1) Disconnect connector P119 from connector J119.
- (2) Set multimeter to ohms.
- (3) Connect positive (+) probe of multimeter to connector P119. Refer to Table 2-36. Connector P119 Transmission Solenoid Resistance Test Points for appropriate sub code(s) and connector P119 pin(s).
- (4) Connect negative (-) probe of multimeter to connector P119 and note reading on multimeter. Refer to Table 2-36. Connector P119 Transmission Solenoid Resistance Test Points for appropriate sub code(s) and connector P119 pin(s).

NOTE

Transmission solenoid resistance is affected by temperature. Refer to Table 2-37. Transmission Solenoid Resistance Readings.

- (5) If resistance reading indicates transmission solenoid is good, replace WTEC III transmission ECU (para 8-7).
- (6) If resistance reading indicates transmission solenoid is faulty, notify DS Maintenance.
- (7) Connect connector P119 to connector J119.
- (8) Position front grille on cab with washer and screw.
- (9) Position two washers and screws in front grille.
- (10) Tighten screw to 48-60 lb-in. (5-7 N-m).
- (11) Tighten two screws to 24 lb-in. (3 N-m).
- (12) Clear diagnostic codes (para 8-5).



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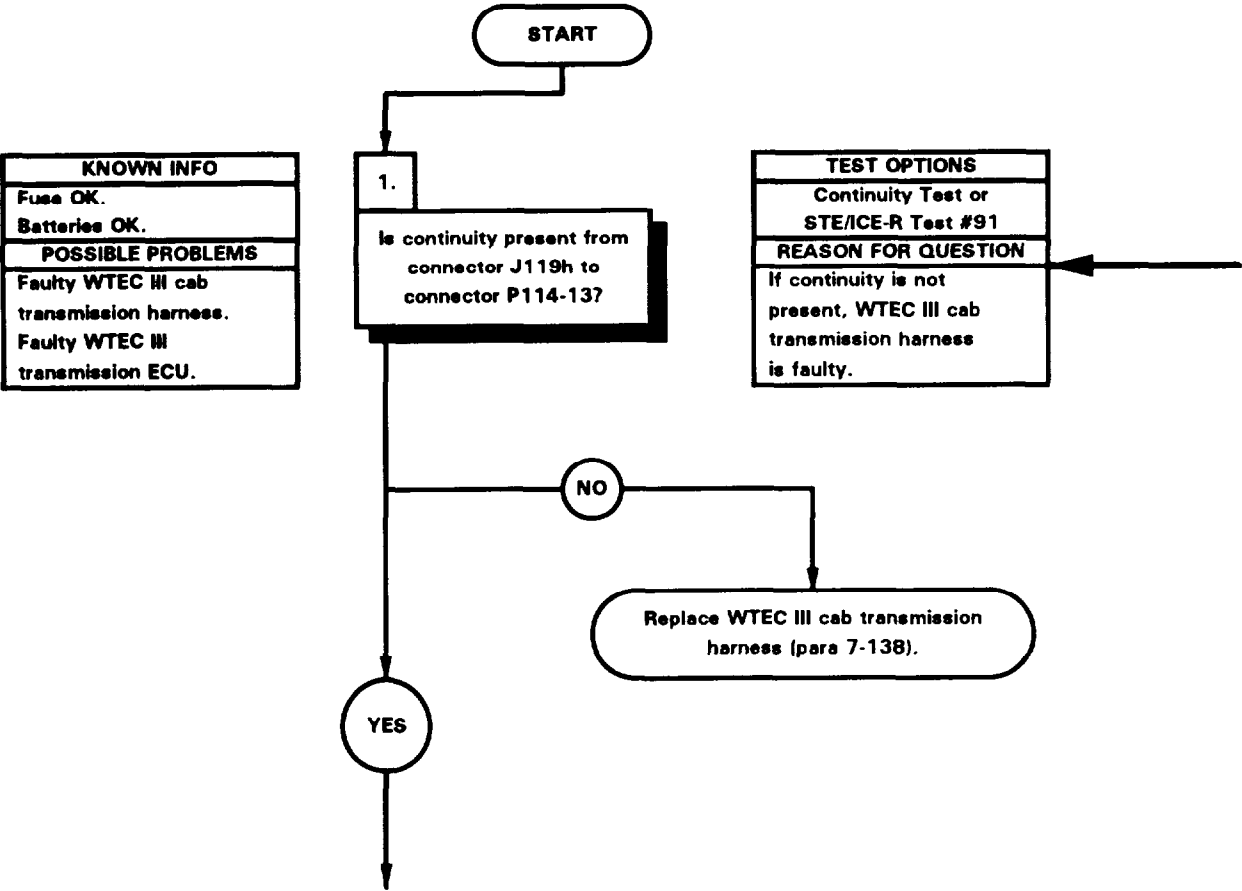
TABLE 2-36. CONNECTOR P119 TRANSMISSION SOLENOID RESISTANCE TEST POINTS

SUB CODE	CONNECTOR P119	
	positive (+) probe	negative (-) probe
12	P119M	P119B
13	P119T	P119N
14	P119C	P119V
15	P119W	P119B
16	P119U	P119N
21	P119F	P119H
22	P119D	P119V
23	P119P	P119S
24	P119J	P119B
26	P119K	P119A

TABLE 2-37. TRANSMISSION SOLENOID RESISTANCE READINGS

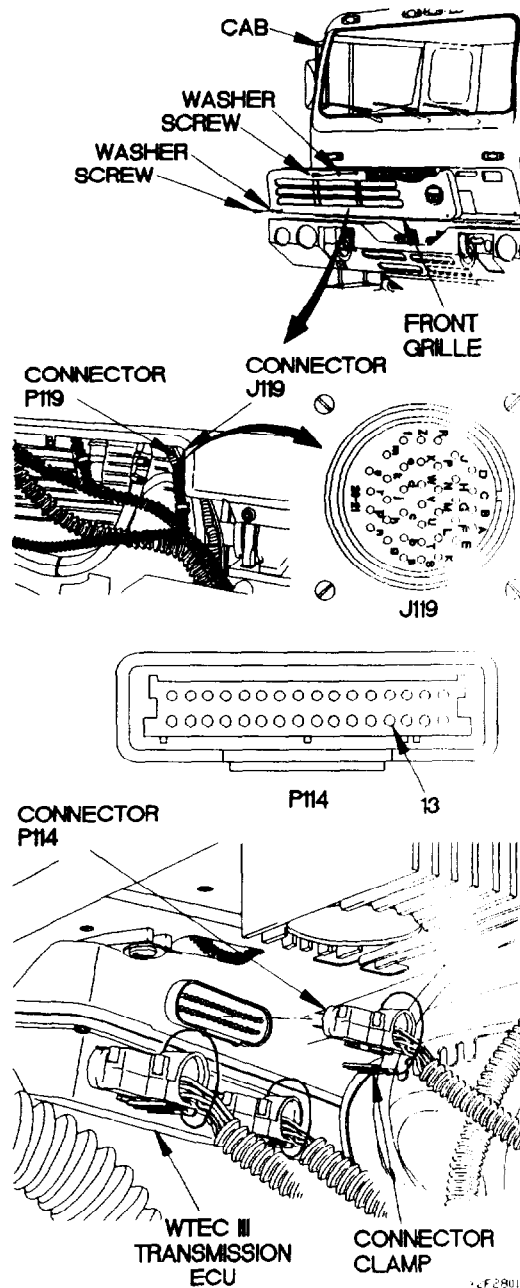
Temperature	Resistance
4° to 16°F (-20° to -10°C)	2.50-3.12 ohms
16° to 32°F (-10° to 0°C)	2.62-3.25 ohms
32° to 50°F (0° to 10°C)	2.74-3.38 ohms
50° to 68°F (10° to 20°C)	2.86-3.50 ohms
68° to 86°F (20° to 30°C)	2.98-3.62 ohms
86° to 104°F (30° to 40°C)	3.09-3.75 ohms
104° to 122°F (40° to 50°C)	3.21-3.88 ohms
122° to 140°F (50° to 60°C)	3.33-4.00 ohms

128. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 52 AND ANY SUB CODE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C) STE/ICE-R (Item 41, Appendix C)
References TM 9-4910-571-12&P	



CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille on cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Remove kick panel (para 16-3).
- (6) Disconnect connector clamp from connector P114.
- (7) Disconnect connector P114 from WTEC III transmission ECU.
- (8) Set multimeter to ohms.
- (9) Connect positive (+) probe of multimeter to connector J199h.
- (10) Connect negative (-) probe of multimeter to connector P114-13 and note reading on multimeter.
- (11) If continuity is not present, replace WTEC III cab transmission harness (para 7-138).



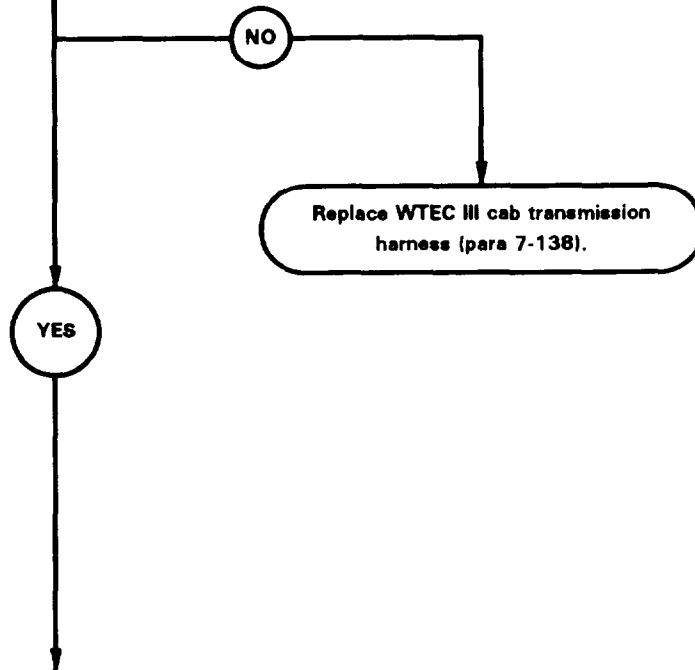
4F28011

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

KNOWN INFO
Fuse OK.
Batteries OK.
POSSIBLE PROBLEMS
Faulty WTEC III cab transmission harness.
Faulty WTEC III transmission ECU.

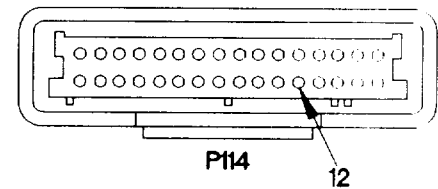
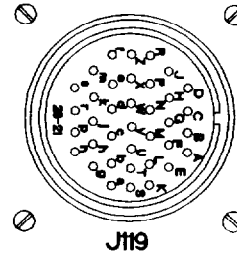
2.
Is continuity present from connector J119j to connector P114-12 and absent from J119j to all other P114 sockets and ground?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present from connector J119j to connector P114-12, or continuity is present from J119j to any other P114 sockets or ground, WTEC III cab transmission harness is faulty.



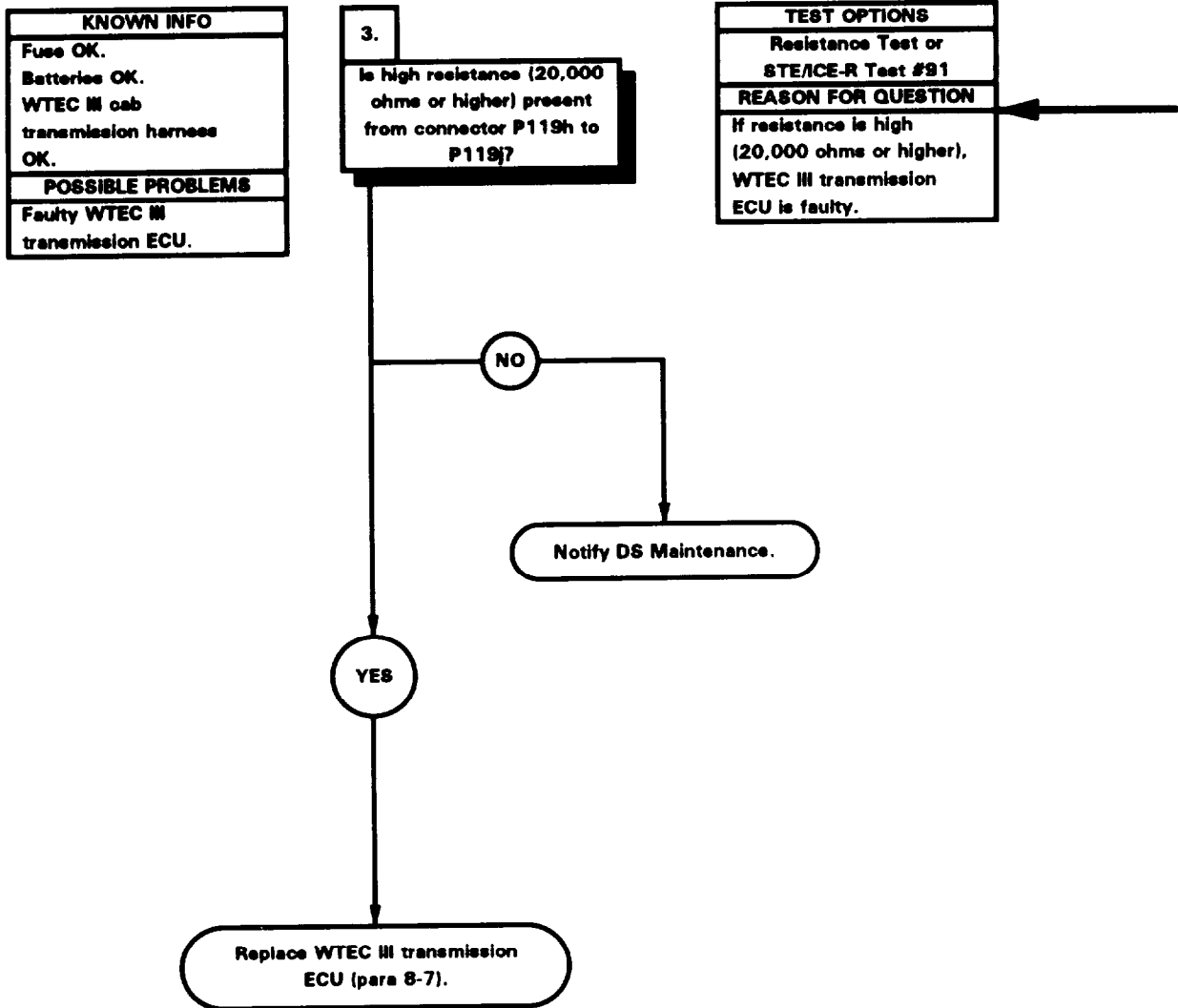
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector J119j.
- (3) Connect negative (-) probe of multimeter to connector P114-12 and note reading on multimeter.
- (4) Connect negative (-) probe of multimeter to all other sockets in connector P114, one at a time, and note reading on multimeter.
- (5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (6) If continuity is not present in step 3, or continuity is present in step 4 or 5, replace WTEC III cab transmission harness (para 7-138).



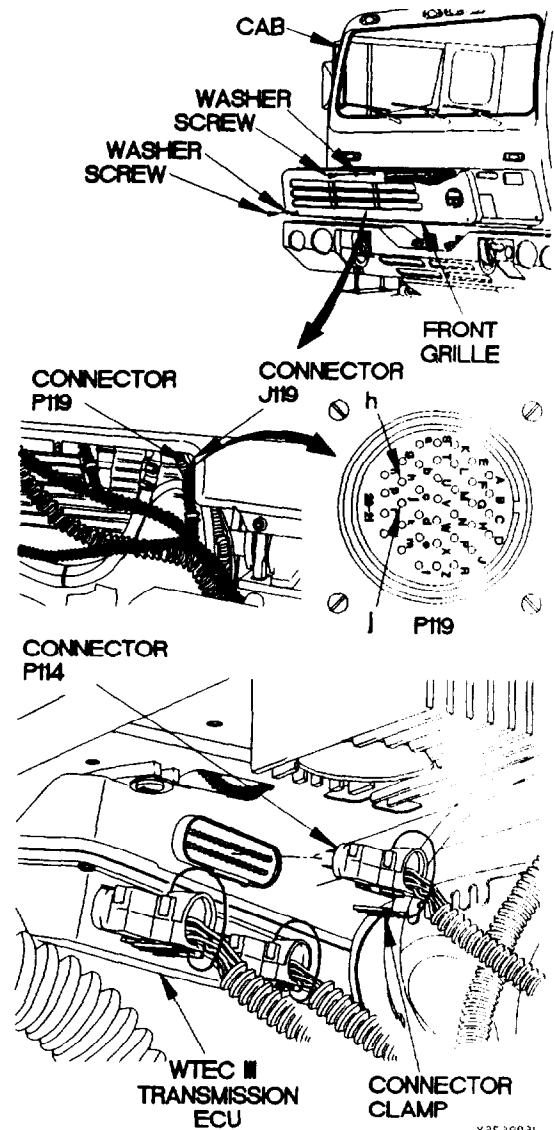
Y2F26021

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

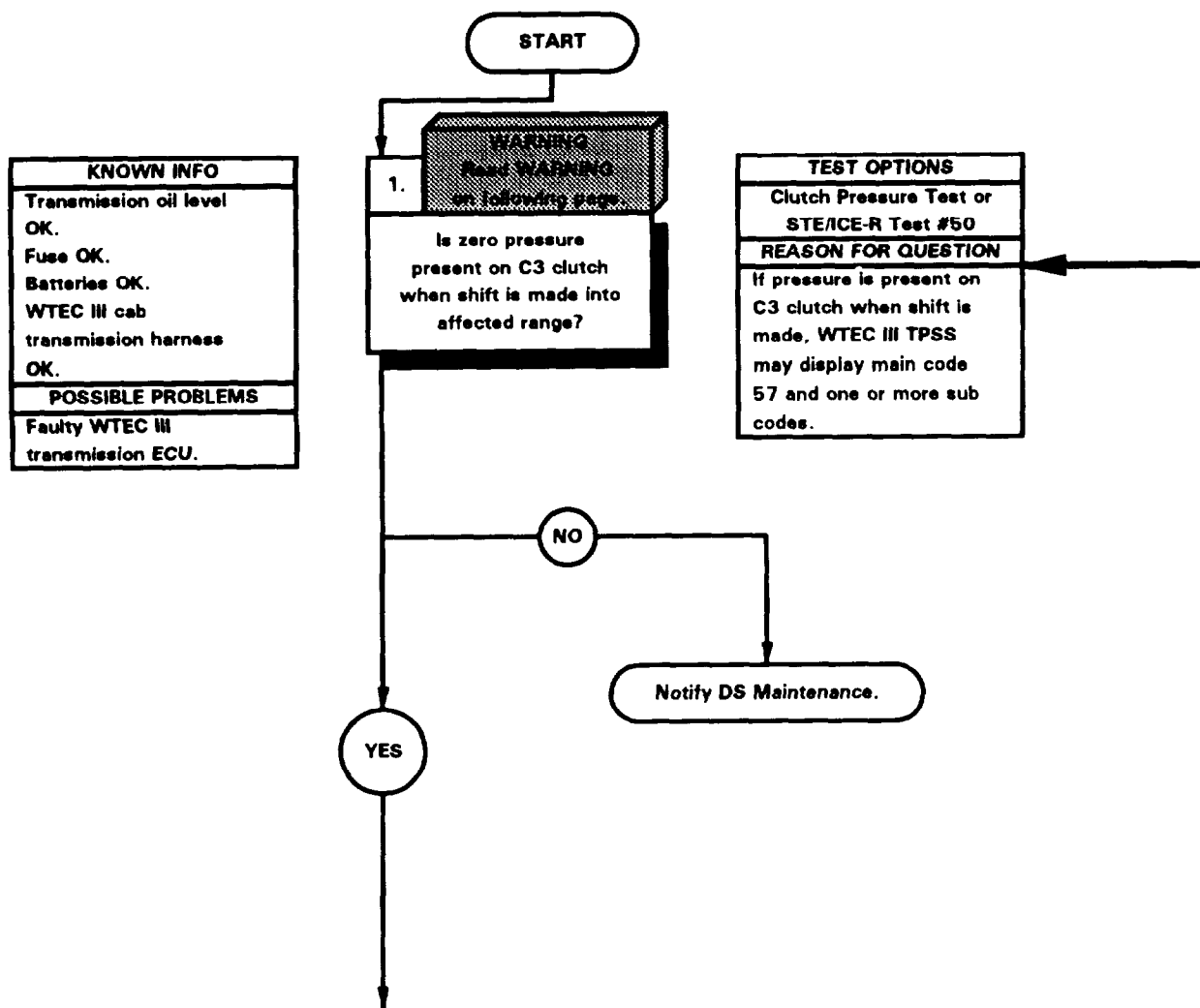


RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P119h.
- (3) Connect negative (-) probe of multimeter to connector P119j and note reading on multimeter.
- (4) If resistance is high (20,000 ohms or higher), replace WTEC III transmission ECU (para 8-7).
- (5) If resistance is low (less than 20,000 ohms), notify DS maintenance.
- (6) Install instrument panel assembly (para 7-15).
- (7) Connect connector P119 to connector J119.
- (8) Position front grille on cab with washer and screw.
- (9) Position two washers and screws in front grille.
- (10) Tighten screw to 48-60 lb-in. (5-7 N-m).
- (11) Tighten two screws to 24 lb-in. (3 N-m).
- (12) Connect connector P114 to WTEC III transmission ECU.
- (13) Connect connector clamp on connector P114.
- (14) Install kick panel (para 16-3).
- (15) Clear diagnostic codes (para 8-5).



129. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 57 AND ANY SUB CODE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1). Reference TM 9-491-571-12&P Materials/Parts Packing, Preformed (Item 197, Appendix G)	Tools and Special Tools Goggles, Industrial (Item 15, Appendix C) Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/ICE-R (Item 41, Appendix C) Pan, Drain (Item 24, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)



CLUTCH PRESSURE TEST

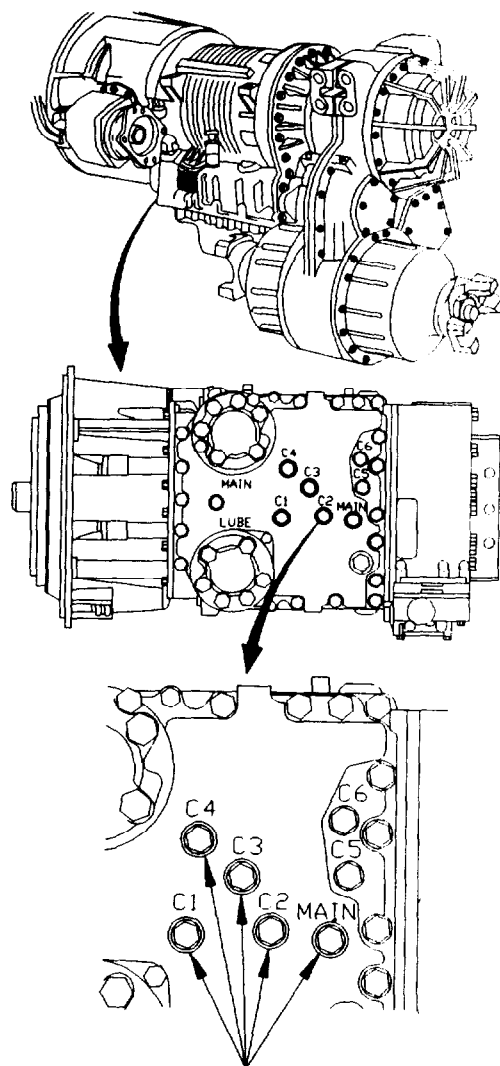
WARNING

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.

- (1) Remove transmission front and rear output 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 adapter and snubber to C3 pressure tap.
- (5) Perform STE/CE-R Test # 50 (TM 9-4910-571-12&P).
- (6) Start engine (TM 9-2320-366-10-1) and run at idle.
- (7) With parking brake applied, make shift indicated by sub code while assistant notes reading on STE/CE-R. Refer to Table 2-38. Sub Code Range.
- (8) If pressure does not drop to zero in selected range indicated by code values, notify DS Maintenance.
- (9) Shut down engine (TM 9-2320-366-10-1).
- (10) Remove adapter and snubber from C3 pressure tap.
- (11) Position preformed packing and C3 pressure tap plug in control valve module.
- (12) Tighten C3 pressure tap plug to 84-120 lb-in. (9-14 N-m).
- (13) Remove drain pan under C3 pressure tap plug.
- (14) Install transmission front and rear output propeller shafts (para 9-2).

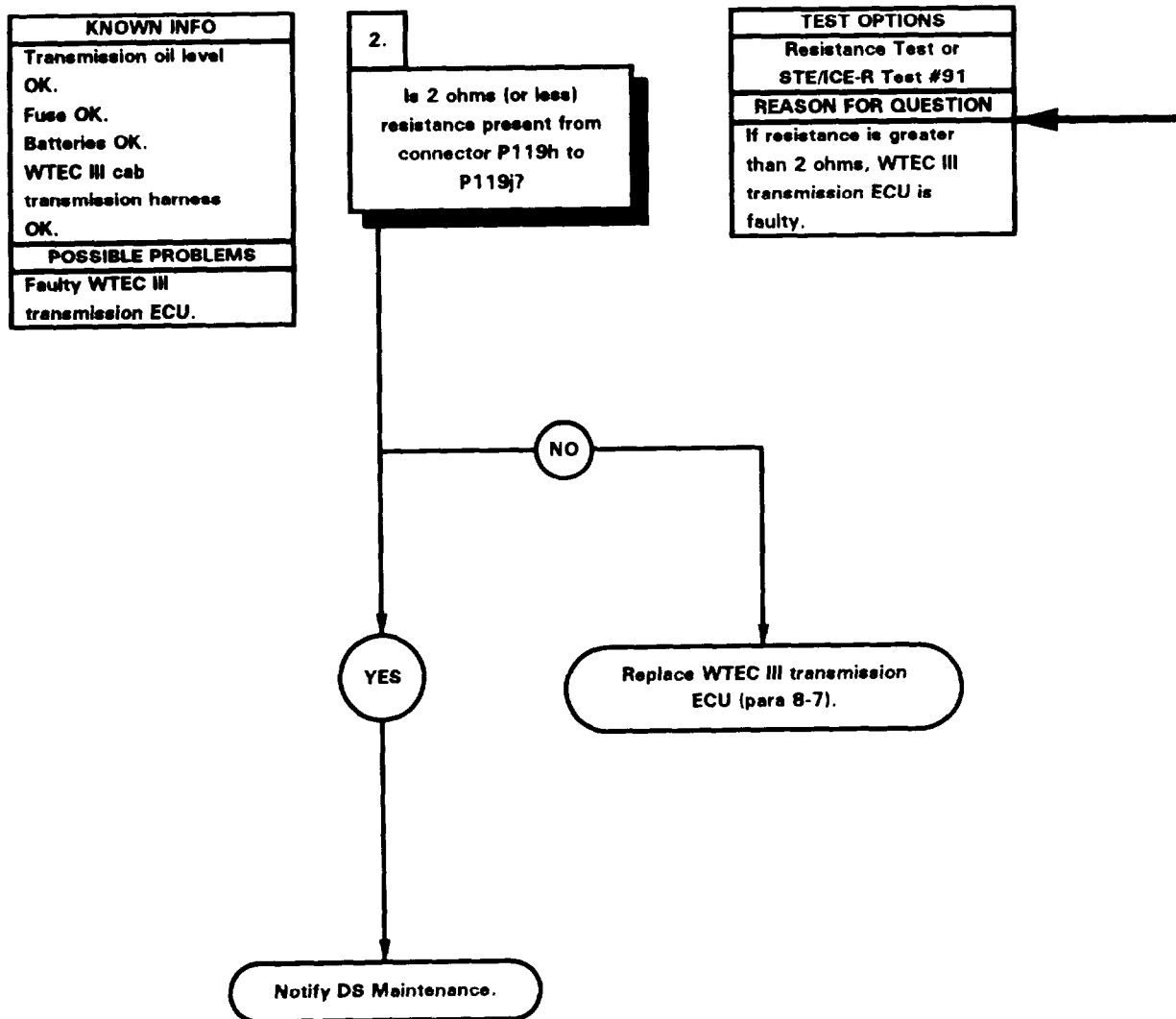
TABLE 2-38. SUB CODE RANGE

SUB CODE	SUB CODE MEANING	
11	1st	Range VER
22	2nd	Range VER
44	4th	Range VER
66	6th	Range VER
88	N1	Range VER
99	N2/N4	Range VER

CLUTCH PRESSURE TAPS
C1-C6 AND MAIN

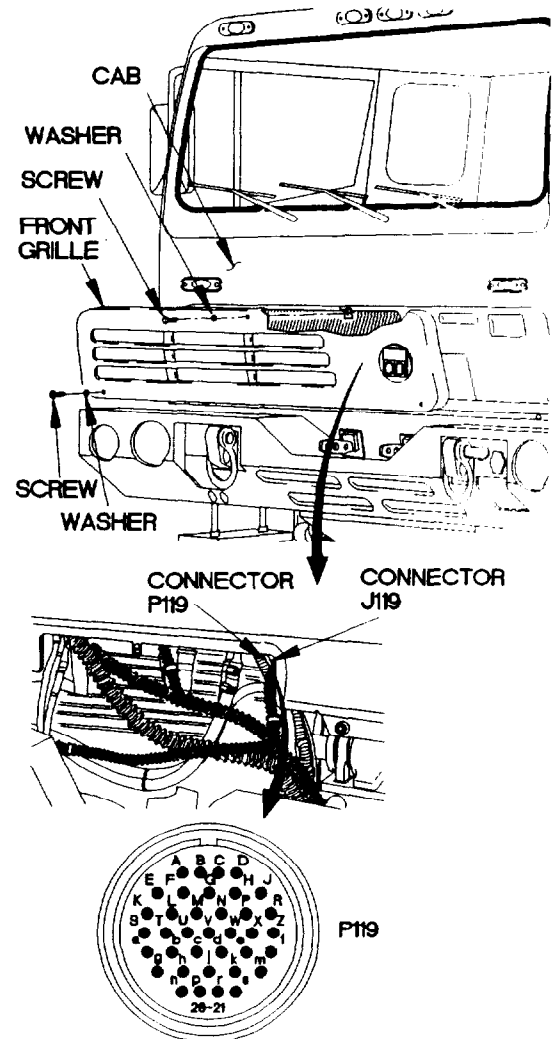
x2F0901-

129. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 57 AND ANY SUB CODE (CONT)



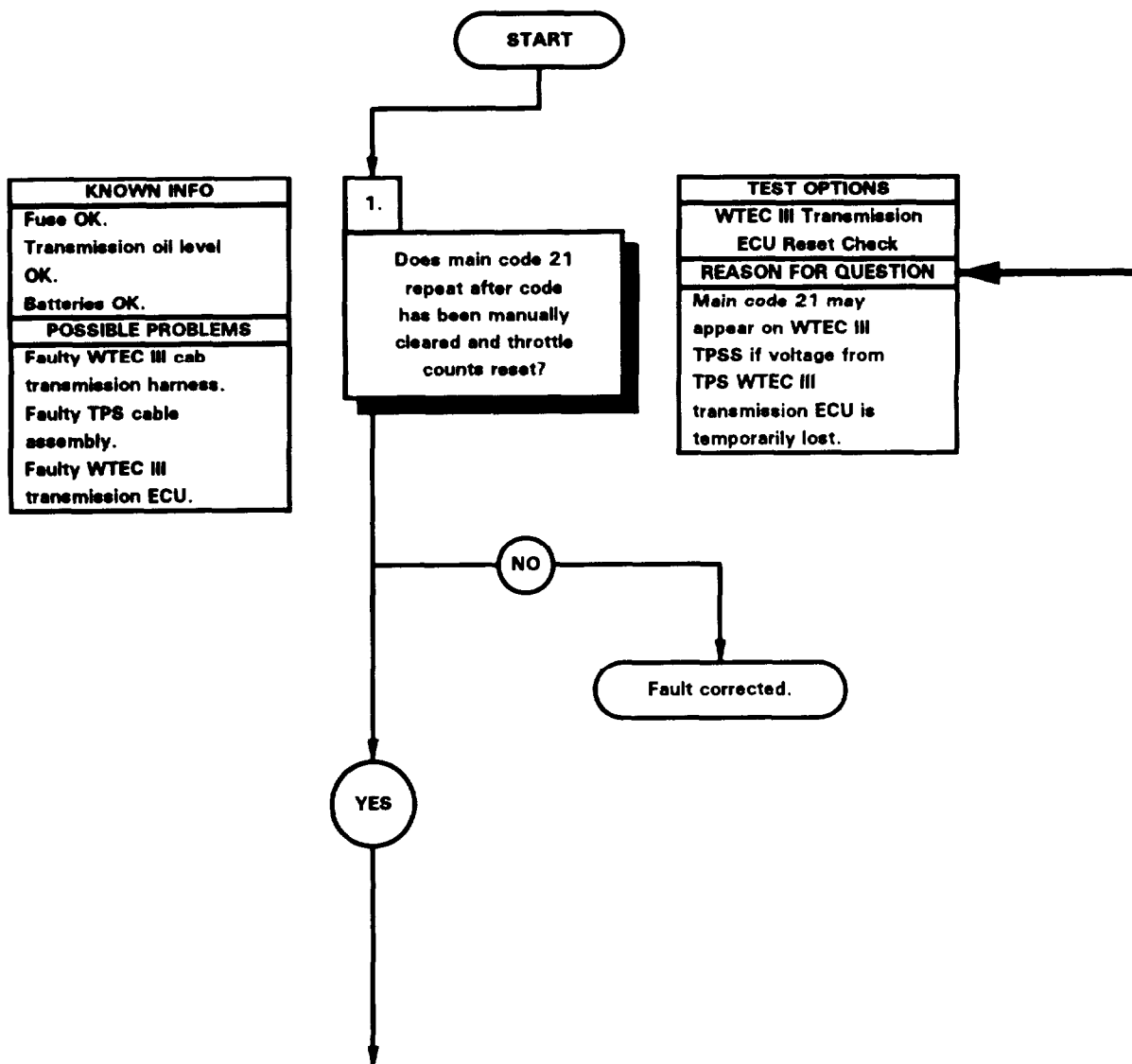
RESISTANCE TEST

- (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 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).



42F0902-

130. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 21 AND ANY SUB CODE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1). Personnel Required (2)	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/CE-R (Item 41, Appendix C) References TM 9-4910-571-12&P



NOTE

Main display code 21 needs to be cleared manually from WTEC III transmission ECU after a maintenance task has been performed and before vehicle is returned to service (para 8-5).

WTEC III TRANSMISSION ECU RESET CHECK

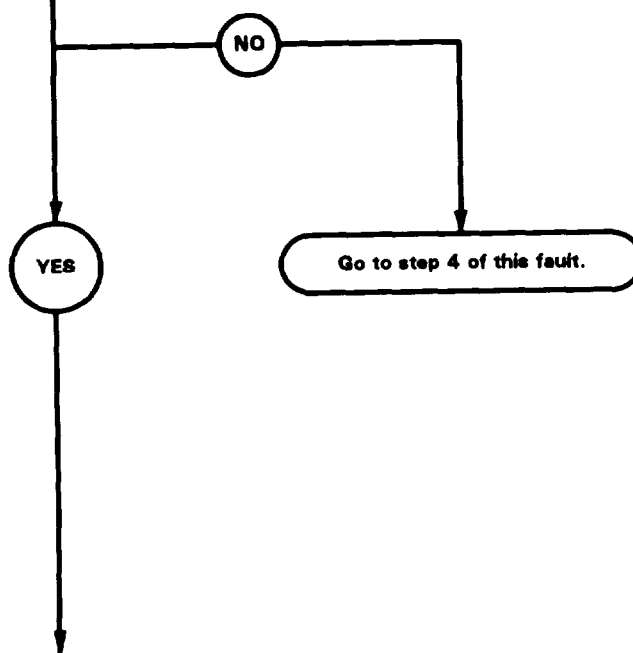
- (1) Cycle master power switch to on (TM 9-2320-366-10-1), then to off five times to clear existing throttle count settings.
- (2) Position master power switch to on (TM 9-2320-366-10-1).
- (3) Depress accelerator pedal from idle position to full throttle position (TM 9-2320-366-10-1) to set new 0% and 100% throttle count values in WTEC III transmission ECU.
- (4) Clear diagnostic code from WTEC III transmission ECU display (para 8-5).
- (5) If main code 21 does not reappear, electrical communication between WTEC III transmission ECU and TPS may be faulty.
- (6) If main code 21 reappears, TPS may be faulty.
- (7) Position master power switch to off (TM 9-2320-366-10-1).

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

KNOWN INFO
Fuse OK.
Transmission oil level OK.
Batteries OK.
POSSIBLE PROBLEMS
Faulty WTEC III cab transmission harness.
Faulty WTEC III transmission ECU.
Faulty TPSS cable assembly.

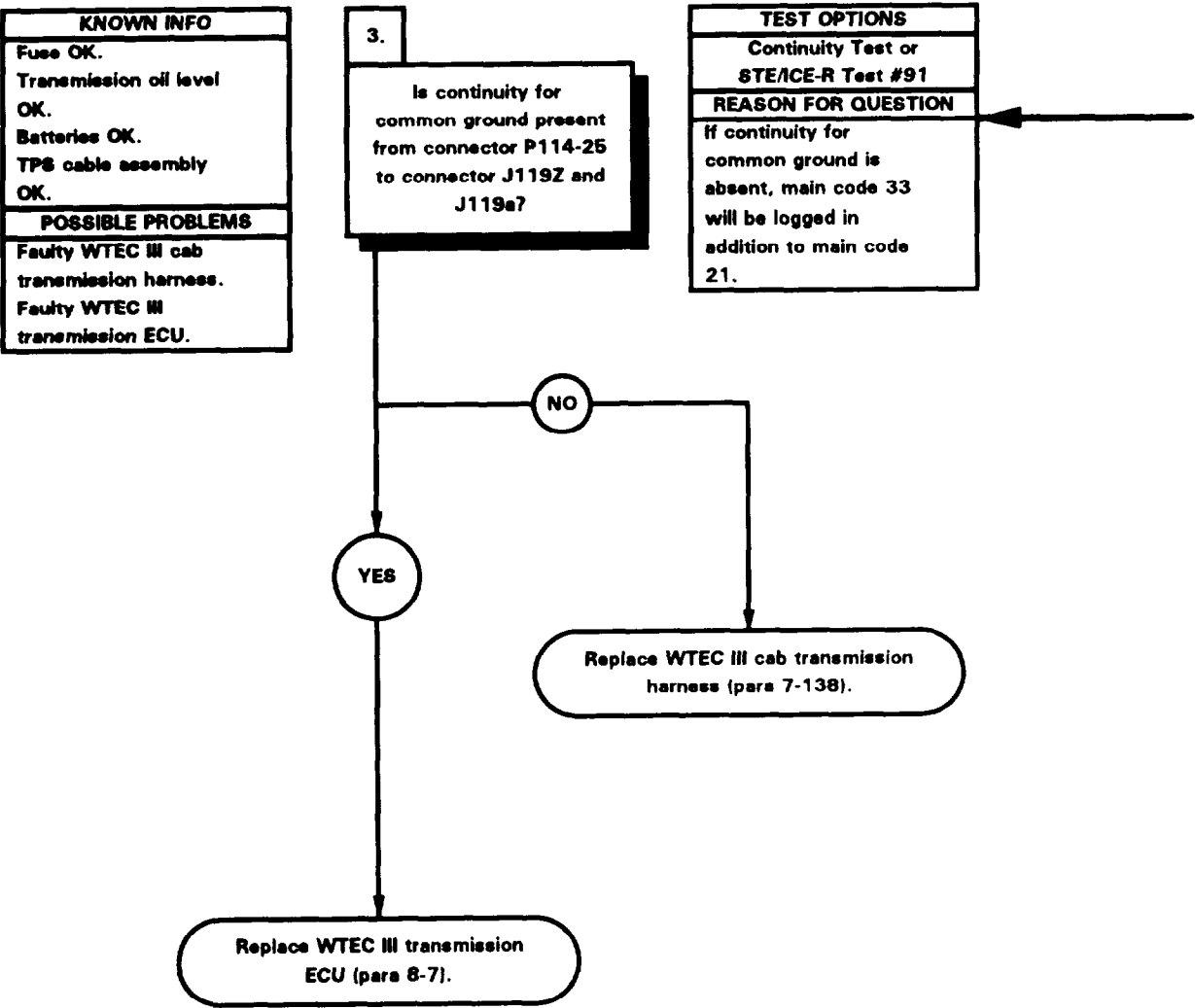
2.
Is main code 33 logged in conjunction with main code 21?

TEST OPTIONS
Visual Inspection
REASON FOR QUESTION
Main code 21 in conjunction with main code 33 indicates loss of common ground.



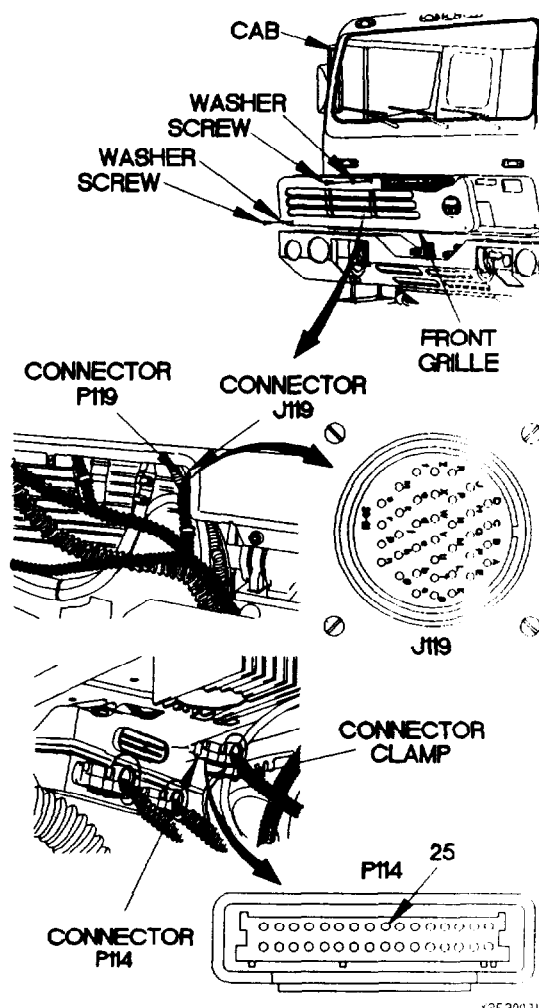
- 
- (1) Position master power switch to on (TM 9-2320-366-10-1).
 - (2) Press MODE button on WTEC III TPSS to bring up second code (if any) (para 8-5).
 - (3) If main code 33 displays on WTEC III TPSS, common ground may have been lost.
 - (4) If main code 21 is the only code displayed, TPSS may be faulty. Go to step 4 of this fault.
 - (5) Position master power switch to off (TM 9-2320-366-10-1).

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



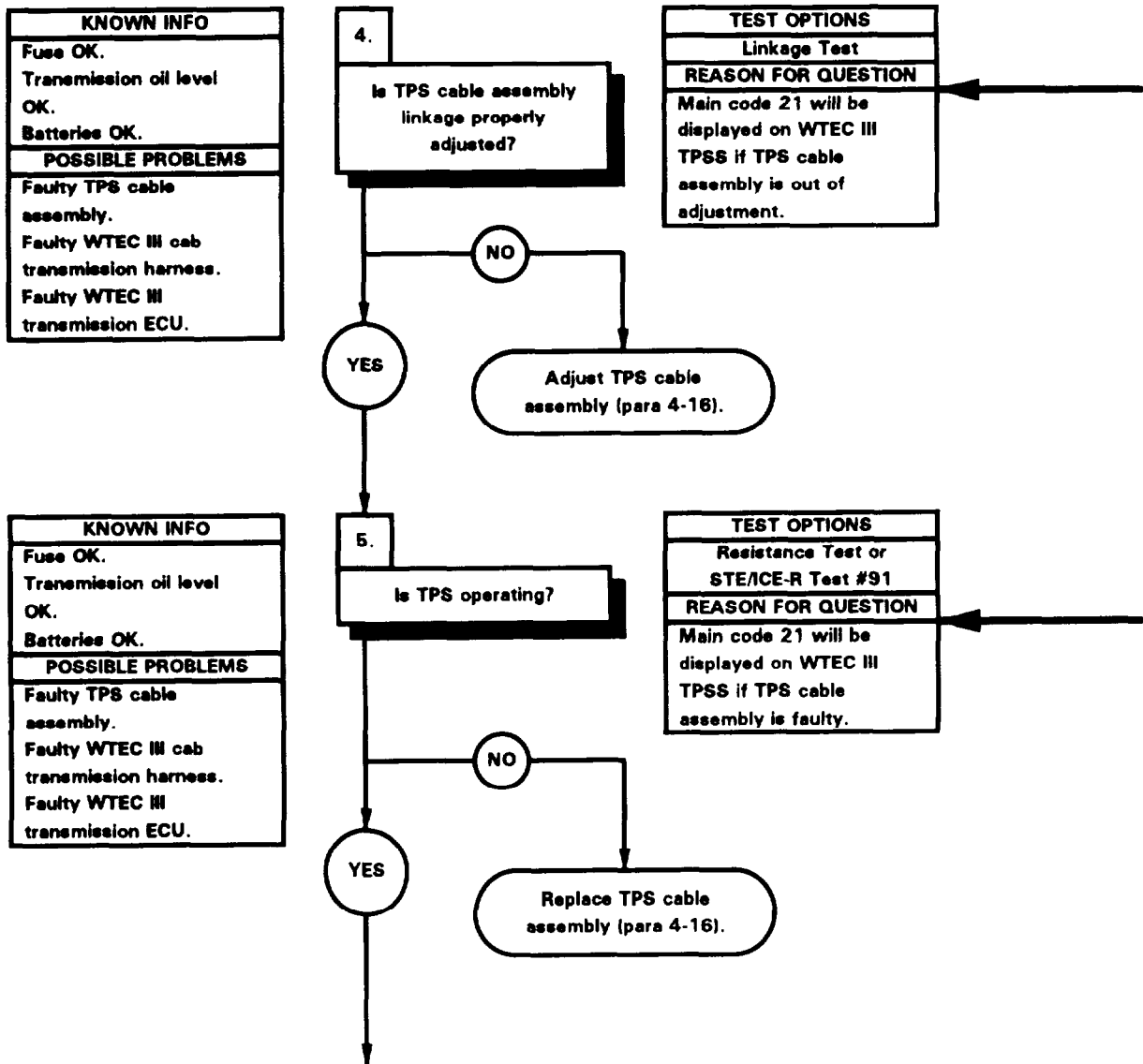
CONTINUITY TEST

- (1) Remove two screws and washers from front grille.
- (2) Remove screw and washer from front grille.
- (3) Remove front grille from cab.
- (4) Disconnect connector P119 from connector J119.
- (5) Remove kick panel (para 16-3).
- (6) Disconnect connector clamp from connector P114.
- (7) Disconnect connector P114 from WTEC III transmission ECU.
- (8) Set multimeter to ohms.
- (9) Connect positive (+) probe of multimeter to connector P114-25.
- (10) Connect negative (-) probe of multimeter to connector J119a and note reading on multimeter.
- (11) Connect negative (-) probe of multimeter to connector J119Z and note reading on multimeter.
- (12) If continuity is not present from connector P114-25 to connector J119a and J119Z, replace WTEC III cab transmission harness (para 7-138).
- (13) If continuity is present, replace WTEC III transmission ECU (para 8-7).
- (14) Connect connector P114 to WTEC III transmission ECU.
- (15) Connect connector clamp on connector P114.
- (16) Install kick panel (para 16-3).
- (17) Connect connector P119 to connector J119.
- (18) Position front grille on cab with washer and screw.
- (19) Position two washers and screws in front grille.
- (20) Tighten screw to 48-60 lb-in. (5-7 N-m).
- (21) Tighten two screws to 24 lb-in. (3 N-m).
- (22) Clear diagnostic codes (para 8-5).



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

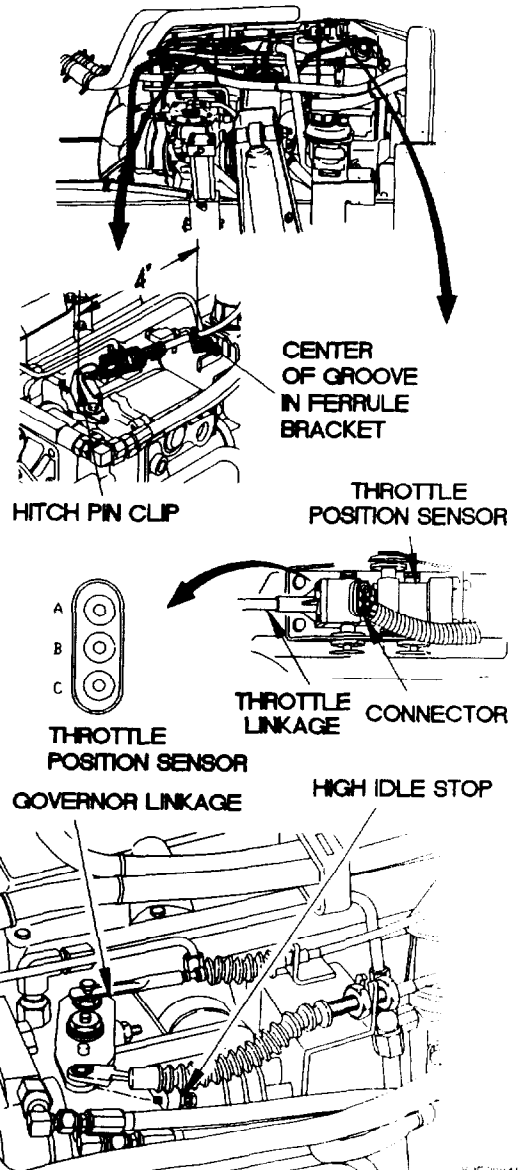


LINKAGE TEST

- (1) Raise cab (TM 9-2320-366-10-1).
- (2) Verify distance between hitch pin clip on end of sensor rod and center of cable groove in ferrule is 4 in. (10 cm).
- (3) If distance is not 4 in. (10 cm), adjust TPS cable assembly (para 4-16).

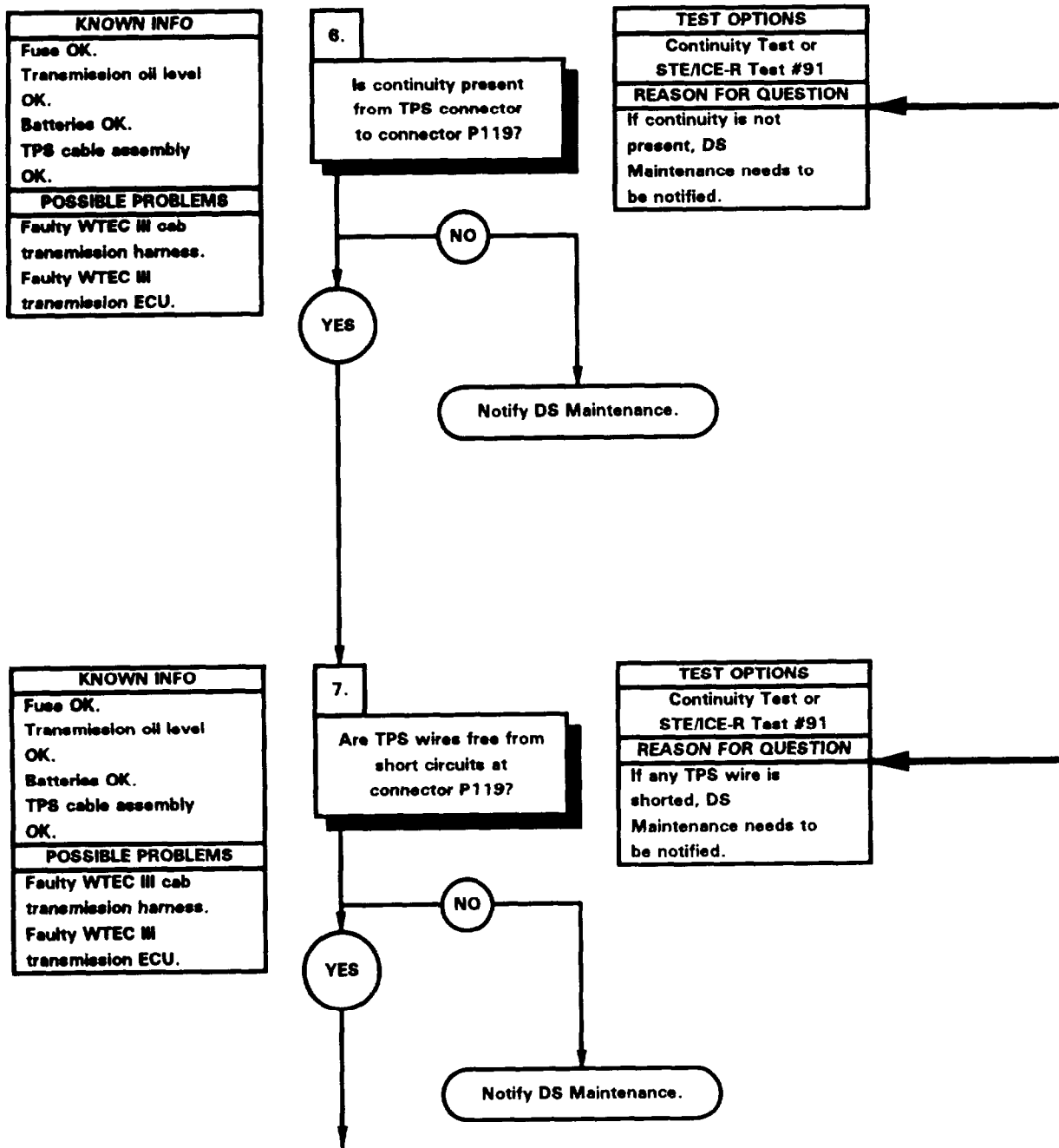
RESISTANCE TEST

- (1) Disconnect TPS connector from TPS.
- (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 TPS terminal C.
- (6) Connect negative (-) probe of multimeter to TPS terminal B and record reading 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).



9-2320-366-20-2

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

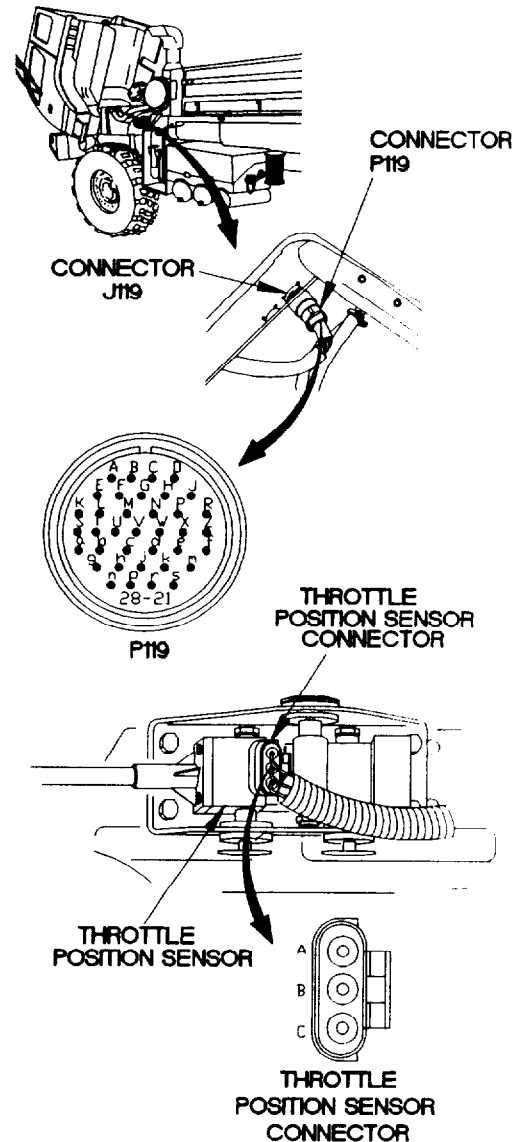


CONTINUITY TEST

- (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 TPS connector pin C and note reading on multimeter.
- (5) Connect positive (+) probe of multimeter to connector P119f.
- (6) Connect negative (-) probe of multimeter to TPS connector pin B and note reading on multimeter.
- (7) Connect positive (+) probe of multimeter to connector P119Z.
- (8) Connect negative (-) probe of multimeter to TPS connector pin A and note reading on multimeter.
- (9) If continuity is not present on one or more wires, notify DS Maintenance.

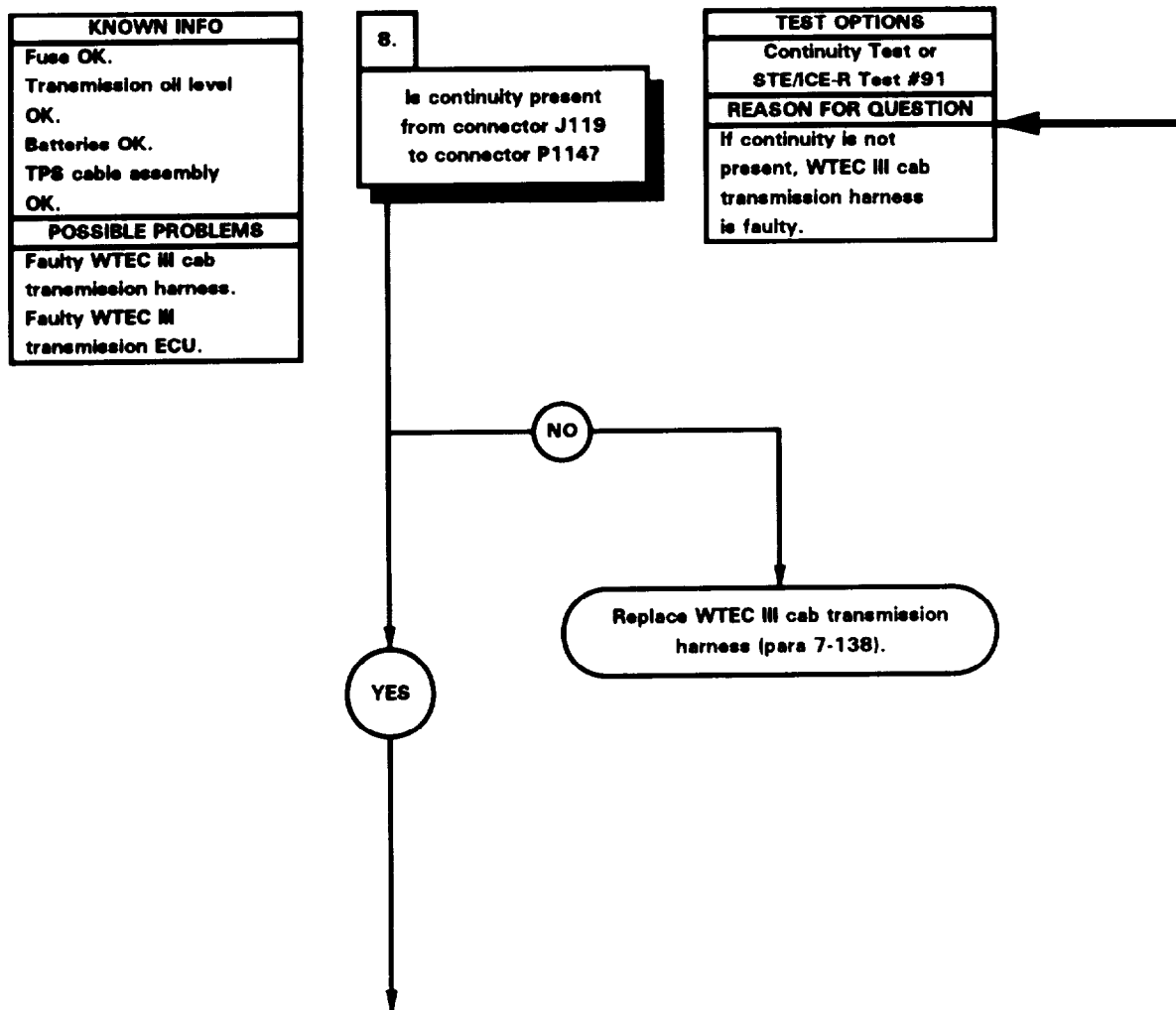
CONTINUITY TEST

- (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 TPS connector to TPS.



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

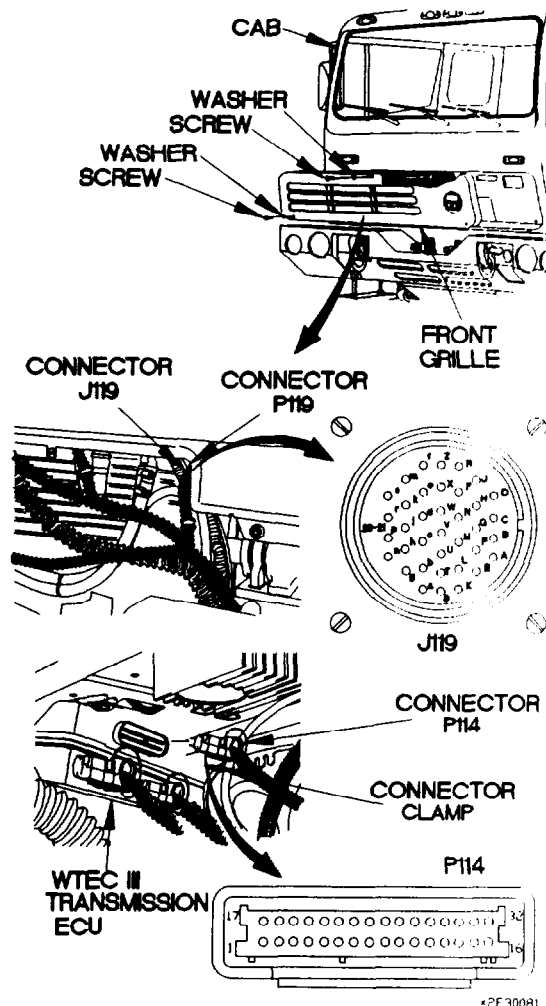


CONTINUITY TEST

- (1) Lower cab (TM 9-2320-366-10-1).
- (2) Remove two screws and washers from front grille.
- (3) Remove screw and washer from front grille.
- (4) Remove front grille from cab.
- (5) Remove kick panel (para 16-3).
- (6) Disconnect connector clamp from connector P114.
- (7) Disconnect connector P114 from WTEC III transmission ECU.
- (8) Set multimeter to ohms.
- (9) For each line of Table 2-39. Cab Transmission Harness Continuity Check:
 - (a) Install jumper wire across sockets in column 1.
 - (b) Connect positive (+) probe of multimeter to socket in column 2.
 - (c) Connect negative (-) probe of multimeter to socket in column 3 and note reading on multimeter.
- (10) If continuity is not present on any wire in Table 2-39. Cab Transmission Harness Continuity Check, replace WTEC III cab transmission harness (para 7-138).
- (11) Remove jumper wire from connector J119.

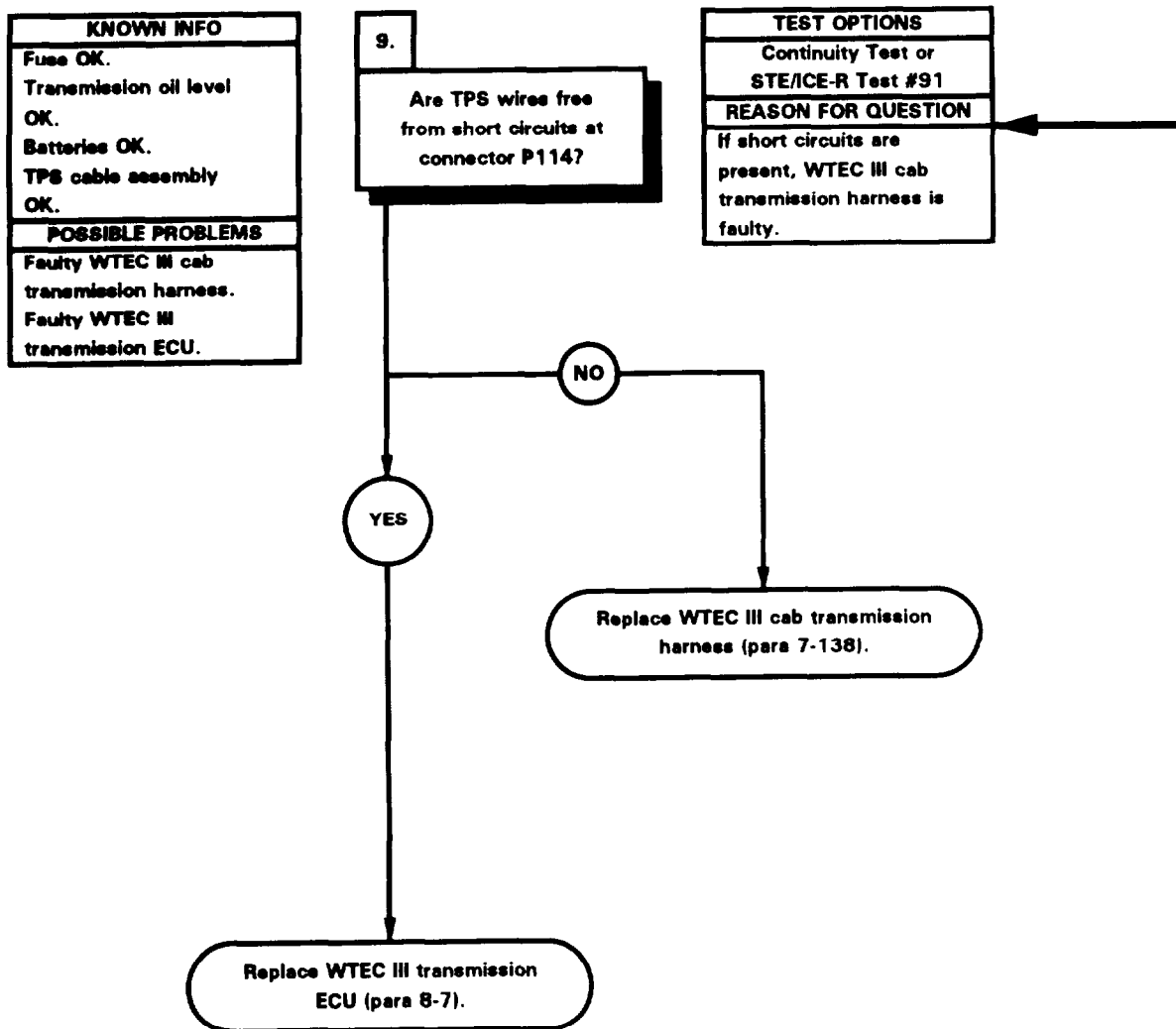
TABLE 2-39. CAB TRANSMISSION HARNESS CONTINUITY CHECK

COLUMN 1 Jumper across:	COLUMN 2 Positive (+) probe to:	COLUMN 3 Negative (-) probe to:
J119f to J119Z	P114-10	P114-25
J119f to J119R	P114-10	P114-9
J119R to J119Z	P114-25	P114-9



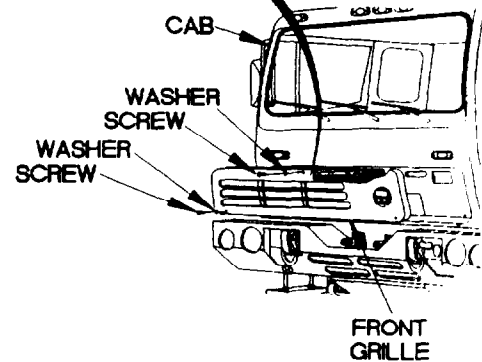
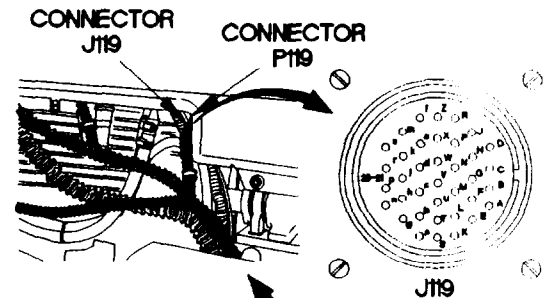
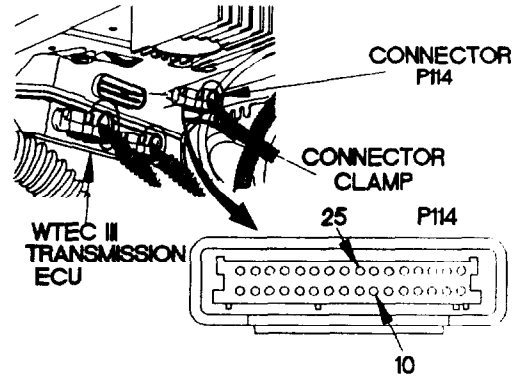
*2F 300A1

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



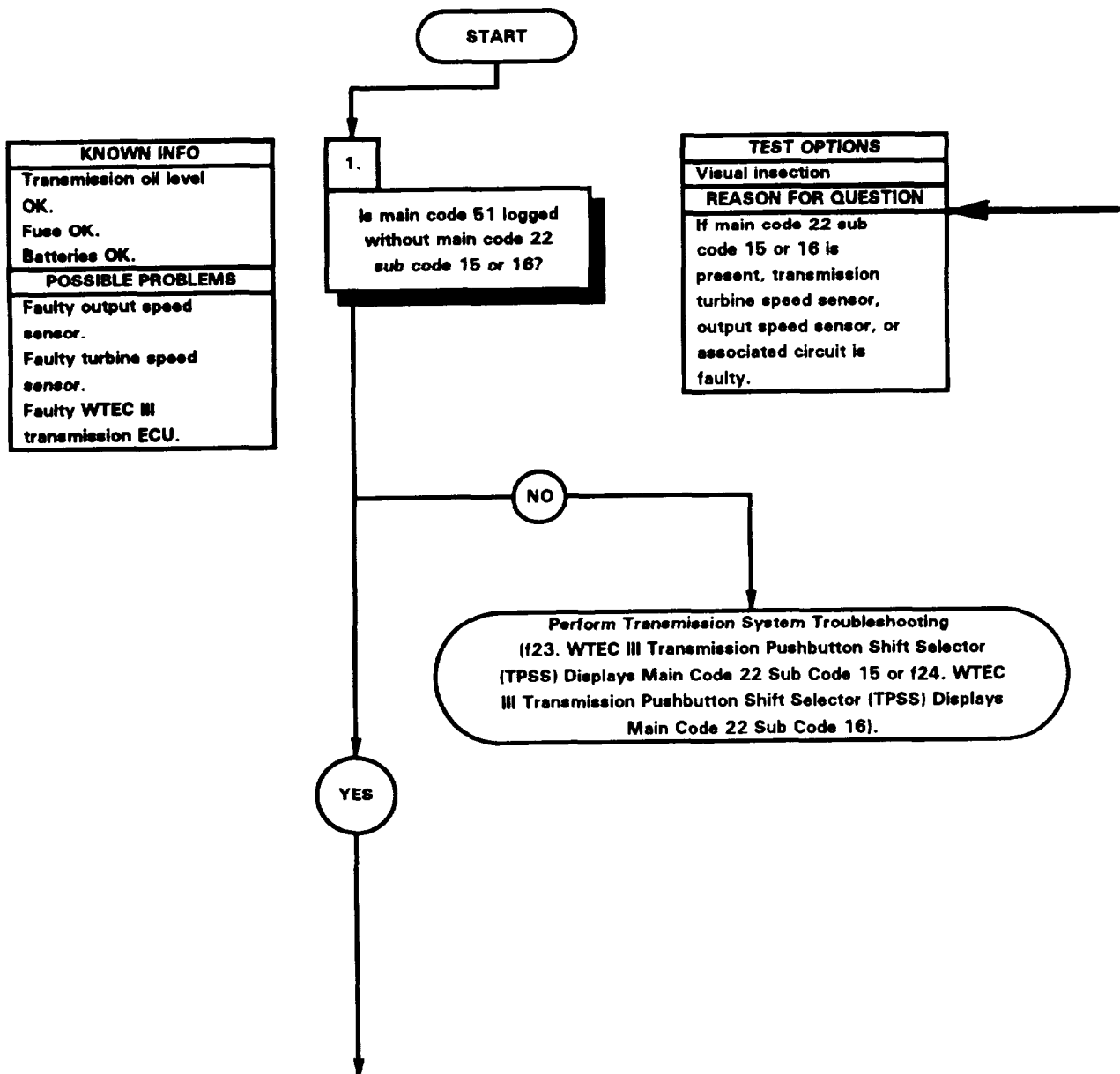
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P114-9.
- (3) Connect negative (-) probe of multimeter to all other sockets of connector P114, one at a time, and note reading on multimeter.
- (4) Connect positive (+) probe of multimeter to connector P114-10.
- (5) Connect negative (-) probe of multimeter to all other sockets of connector P114, one at a time, and note reading on multimeter.
- (6) Connect positive (+) probe of multimeter to connector P114-25.
- (7) Connect negative (-) probe of multimeter to all other sockets of connector P114 (except P114-13), one at a time, and note reading on multimeter.
- (8) If continuity is present in step 3, 5, or 7, replace WTEC III cab transmission harness (para 7-138).
- (9) If no short circuits are found, replace WTEC III transmission ECU (para 8-7).
- (10) Connect connector P114 to WTEC III transmission ECU.
- (11) Connect connector clamp on connector P114.
- (12) Install kick panel (para 16-3).
- (13) Connect connector P119 to connector J119.
- (14) Position front grille on cab with washer and screw.
- (15) Position two washers and screws in front grille.
- (16) Tighten screw to 48-60 lb-in. (5-7 N-m).
- (17) Tighten two screws to 24 lb-in. (3 N-m).
- (18) Clear diagnostic codes (para 8-5).



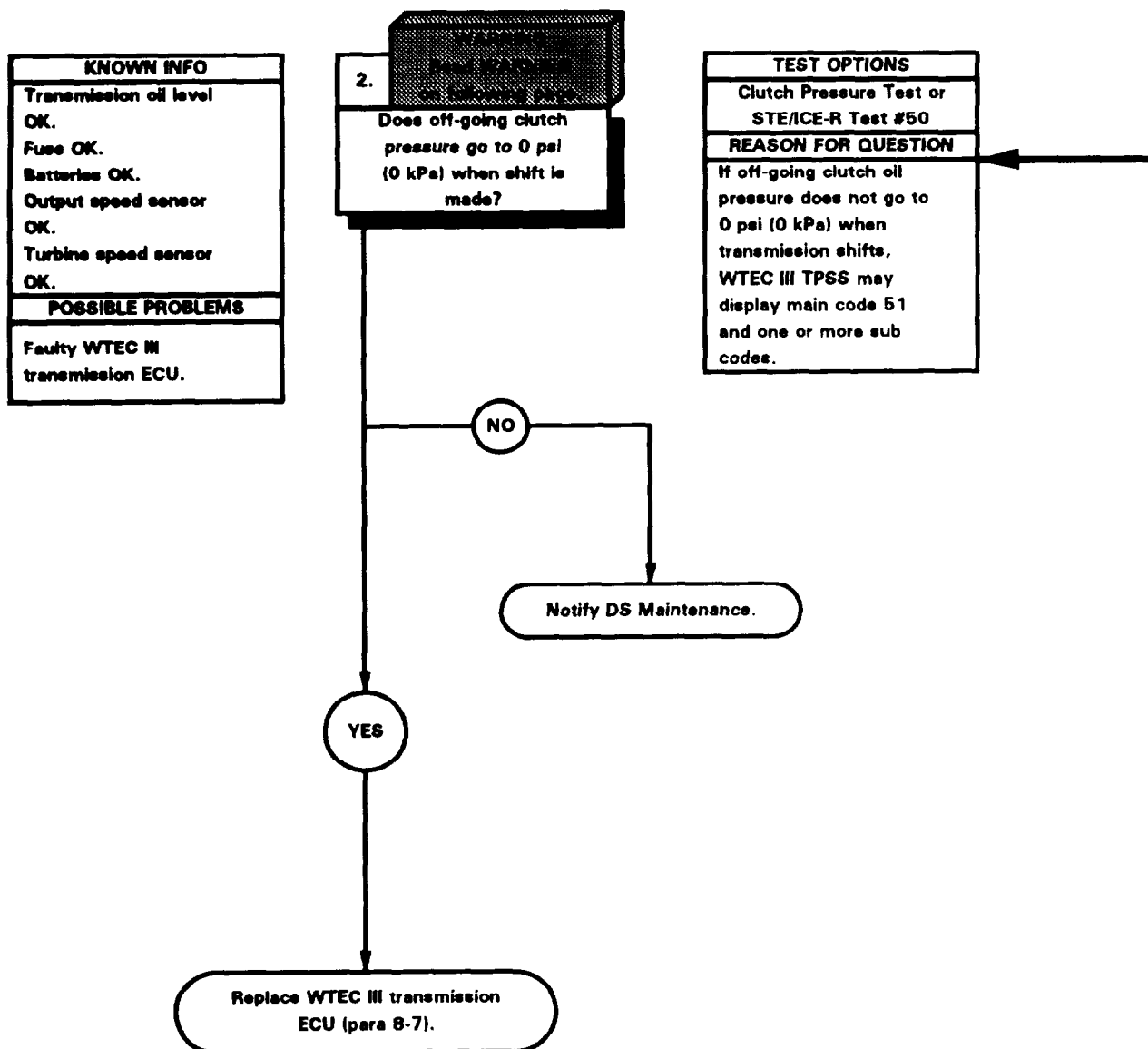
K2F 300191

f31. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 51 AND ANY SUB CODE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Goggles, Industrial (Item 15, Appendix C) Tool Kit, Genl Mech (Item 46, Appendix C) STE/CE-R (Item 41, Appendix C) Pan, Drain (Item 24, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Personnel Required (2)	Materials/Parts Packing, Preformed (Item 197, Appendix G) Reducer, Boes (Item 51, Appendix D)
Reference TM 9-4910-571-12&P	



- 
- (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 Code 16).

131. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 51 AND ANY SUB CODE (CONT)

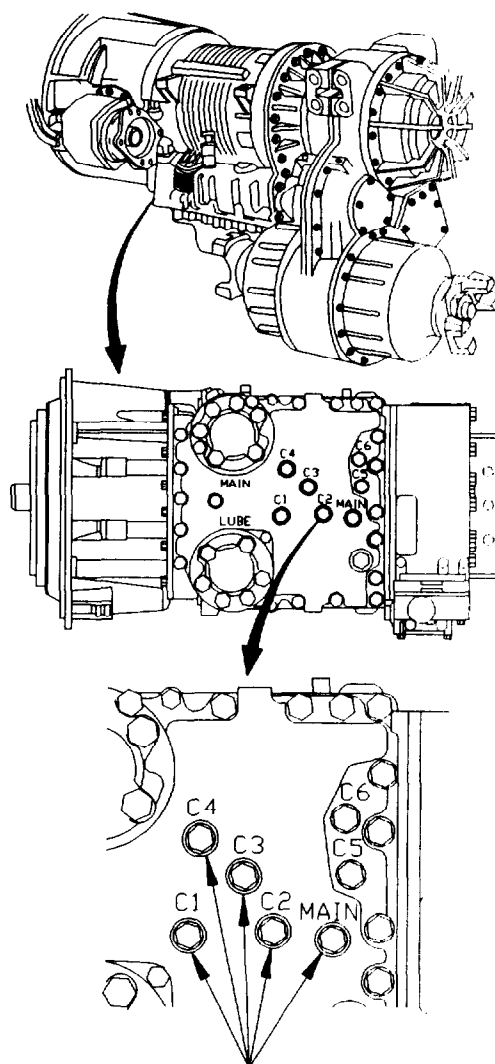


CLUTCH PRESSURE TEST

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.

- (1) Remove transmission front and rear output 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 reducer, STE/ICE-R adapter, and snubber to clutch pressure tap.
- (5) Perform STE/ICE-R Test # 50 (TM 9-4910-571-12&P).
- (6) Start engine (TM 9-2320-366-10-1) and run at idle.
- (7) With parking brake applied, make shift indicated by sub code while assistant notes reading on STE/ICE-R. Refer to Table 2-40. Off-Going Clutch Pressure Tap.
- (8) If one or more off-going clutches fail to loose pressure, notify DS Maintenance.
- (9) Shut down engine (TM 9-2320-366-10-1).
- (10) Remove STE/ICE-R adapter, snubber, and reducer 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 transmission front and rear output propeller shaft (para 9-2).
- (15) Clear diagnostic codes (para 8-5).



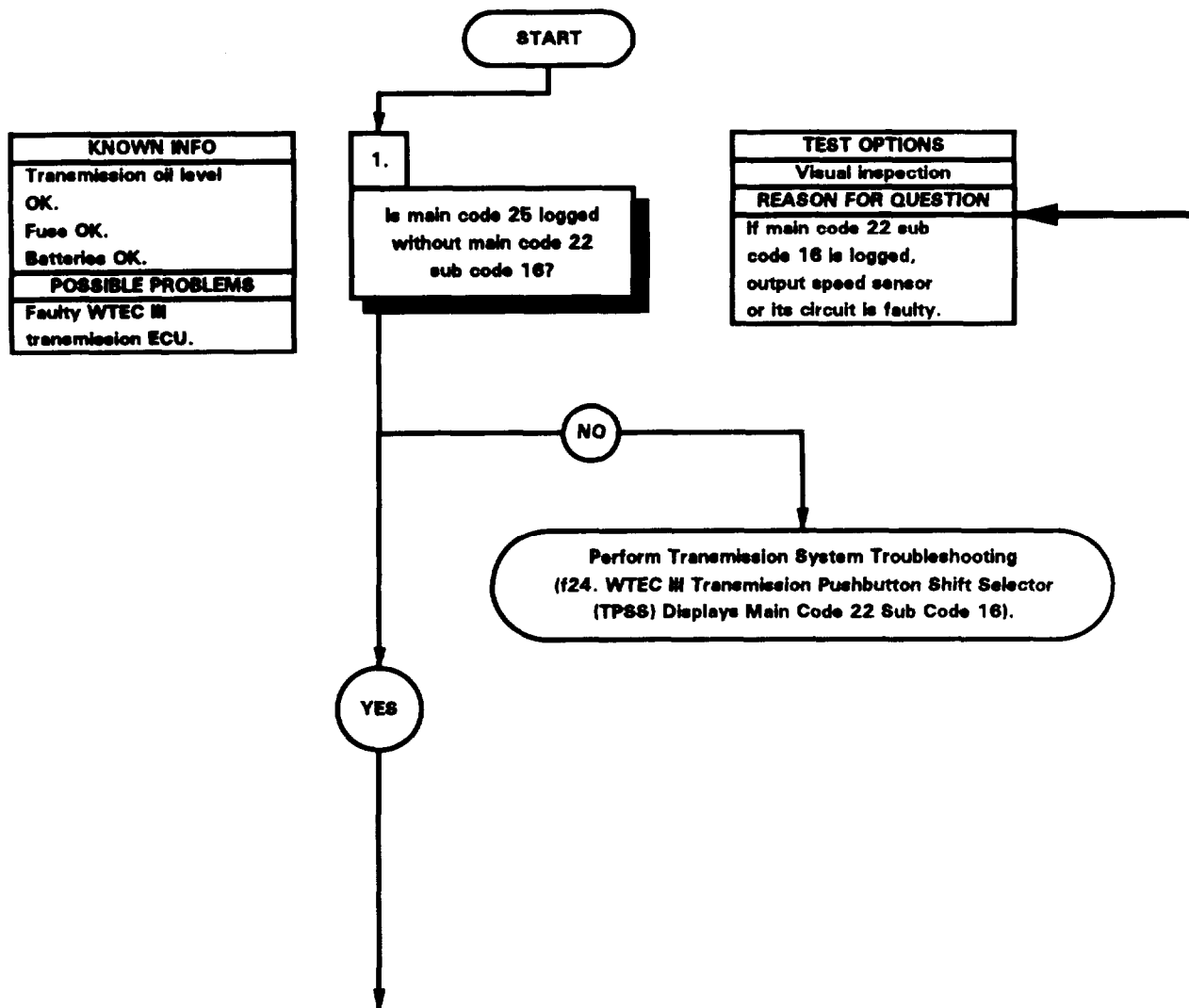
CLUTCH PRESSURE TAPS
C1-C6 AND MAIN

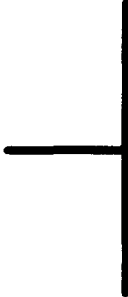
12F1001

TABLE 2-40. OFF-GOING CLUTCH PRESSURE TAP

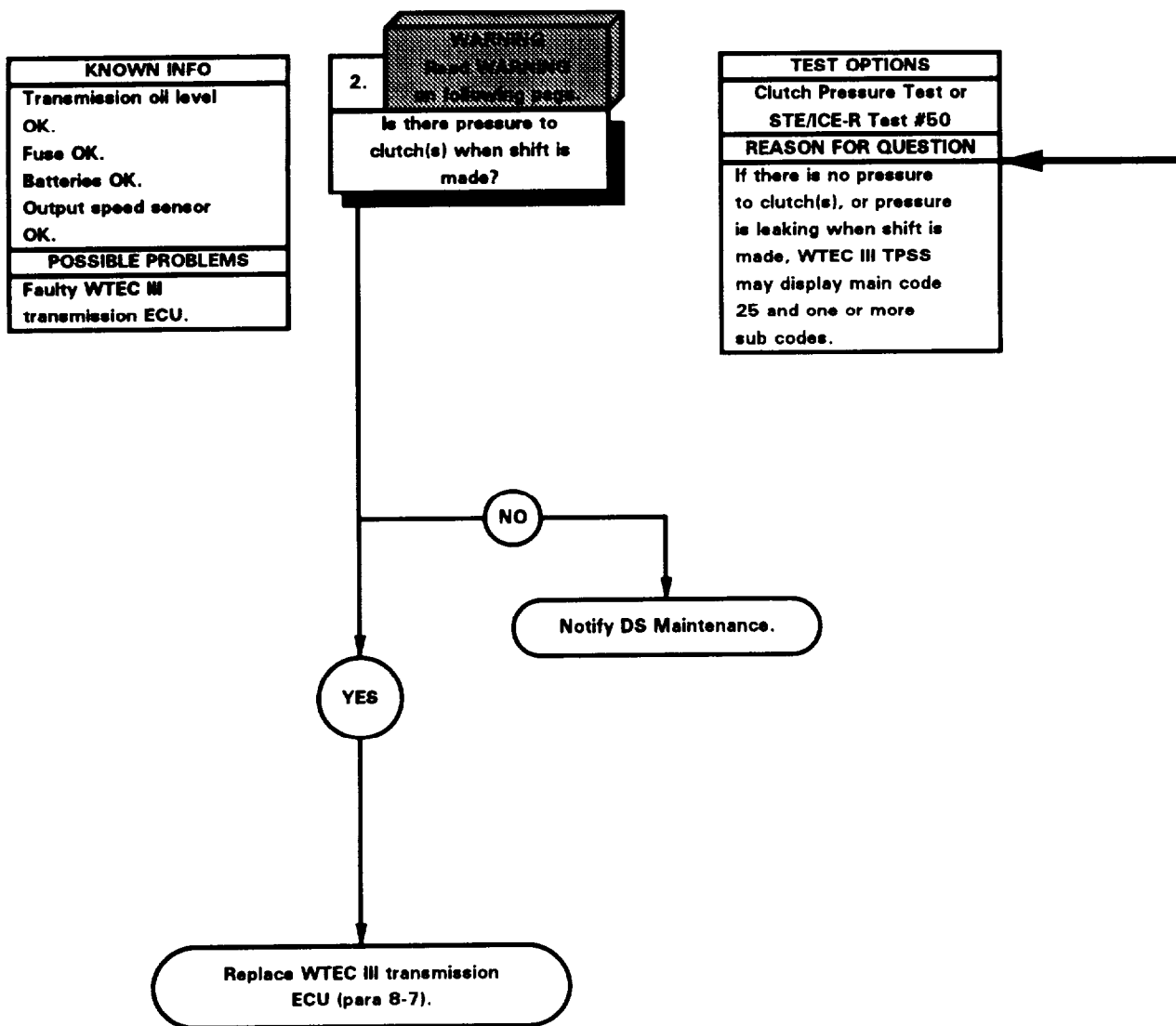
SUB CODE	SUB CODE MEANING	OFF-GOING CLUTCH	SOLENOID ASSEMBLY LOCATION
10	2-1 Downshift	C5	Stationary Clutch
12	2-3 Upshift	C5	Stationary Clutch
21	3-2 Downshift	C4	Stationary Clutch
23	3-4 Upshift	C4	Stationary Clutch
43	5-4 Downshift	C2	Rotating Clutch
45	5-6 Upshift	C1	Rotating Clutch
65	7-6 Downshift	C4	Stationary Clutch

132. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 25 AND ANY SUB CODE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1). Personnel Required (2) Reference TM 9-4910-571-12&P	Tools and Special Tools Goggles, Industrial (Item 15, Appendix C) Tool Kit, Genl Mech (Item 48, Appendix C) STE/CE-R (Item 41, Appendix C) Pan, Drain (Item 24, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C) Materials/Parts Packing, Preformed (Item 197, Appendix G) Reducer, Boos (Item 51, Appendix D)



- 
- (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)

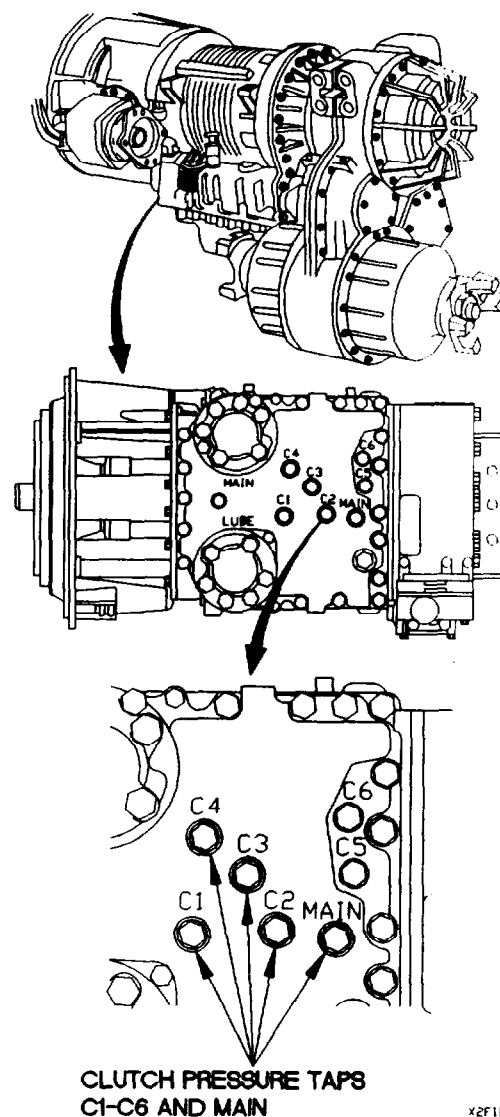


CLUTCH PRESSURE TEST

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.

- (1) Remove transmission front and rear output propeller shafts (para 9-2).
- (2) Position drain pan under pressure tap.
- (3) Remove pressure tap plug and preformed packing from clutch pressure tap indicated by the sub code. Refer to Table 2-41. Clutch Pressure Tap. Discard preformed packing.
- (4) Connect reducer, STE/ICE-R adapter, and snubber to clutch pressure tap.
- (5) Perform STE/ICE-R Test # 50 (TM 9-4910-571-12&P).
- (6) Start engine (TM 9-2320-366-10-1).
- (7) With brake applied, make shift indicated by sub code. Refer to Table 2-41. Clutch Pressure Tap.
- (8) Accelerate engine until WTEC III TPSS displays desired range. Refer to Table 2-41. Clutch Pressure Tap.
- (9) Maintain engine speed to keep desired transmission range while assistant notes reading on STE/ICE-R.
- (10) Let engine return to idle.
- (11) Shift transmission into neutral.
- (12) Shut down engine (TM 9-2320-366-10-1).
- (13) Remove STE/ICE-R adapter, snubber, and reducer from pressure tap.
- (14) Position preformed packing and pressure tap plug in control valve module.
- (15) Tighten pressure tap plug to 84-120 lb-in. (9-14 N-m).
- (16) Remove drain pan under pressure tap.
- (17) Install transmission front and rear output propeller shafts (para 9-2).
- (18) If one or more clutches fail to indicate proper pressure, notify DS Maintenance.
- (19) If all clutches indicate proper pressure, replace WTEC III transmission ECU (para 8-7).
- (20) Clear diagnostic codes (para 8-5).



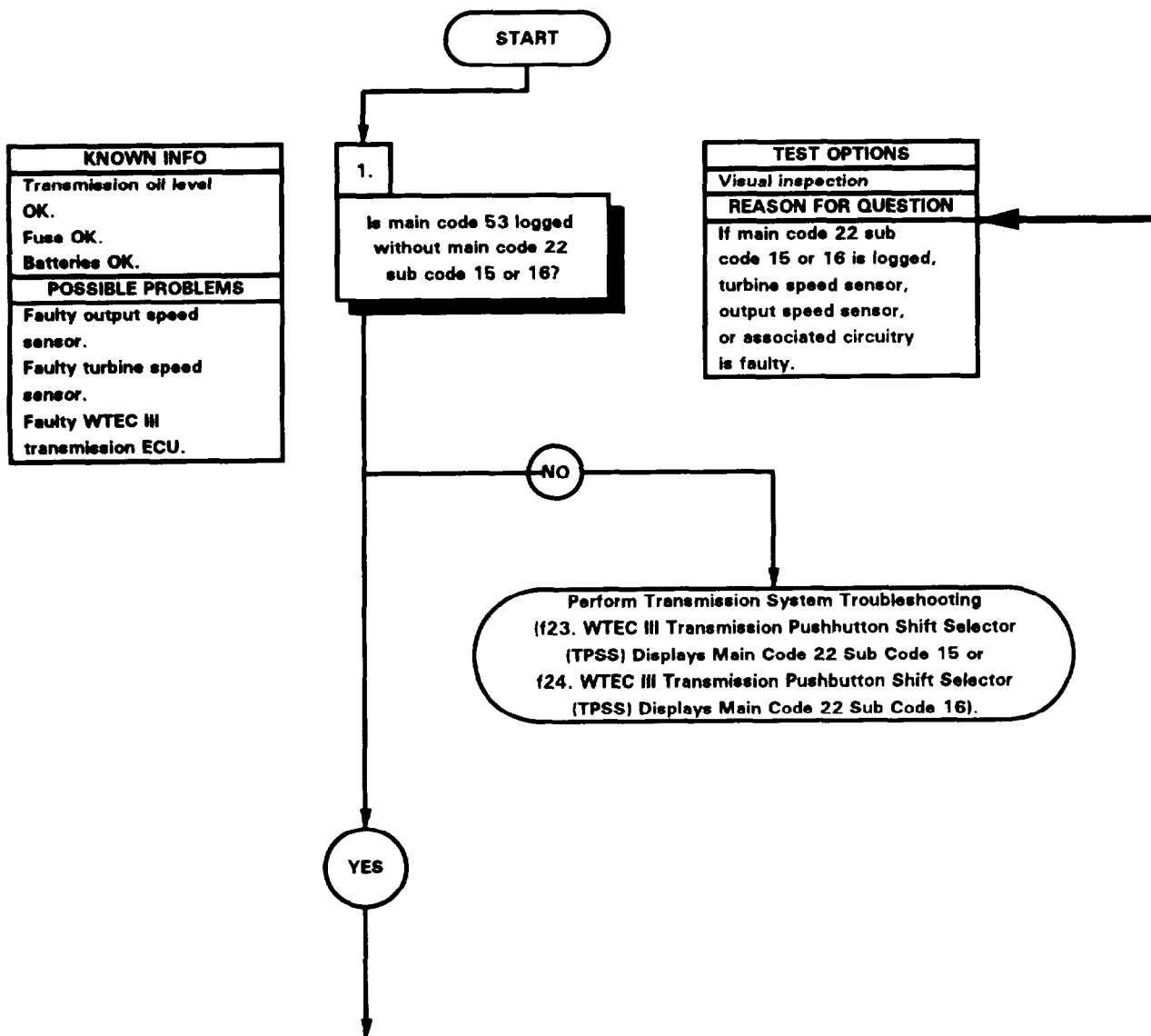
CLUTCH PRESSURE TAPS
C1-C6 AND MAIN

X2F1101-

TABLE 2-41. CLUTCH PRESSURE TAP

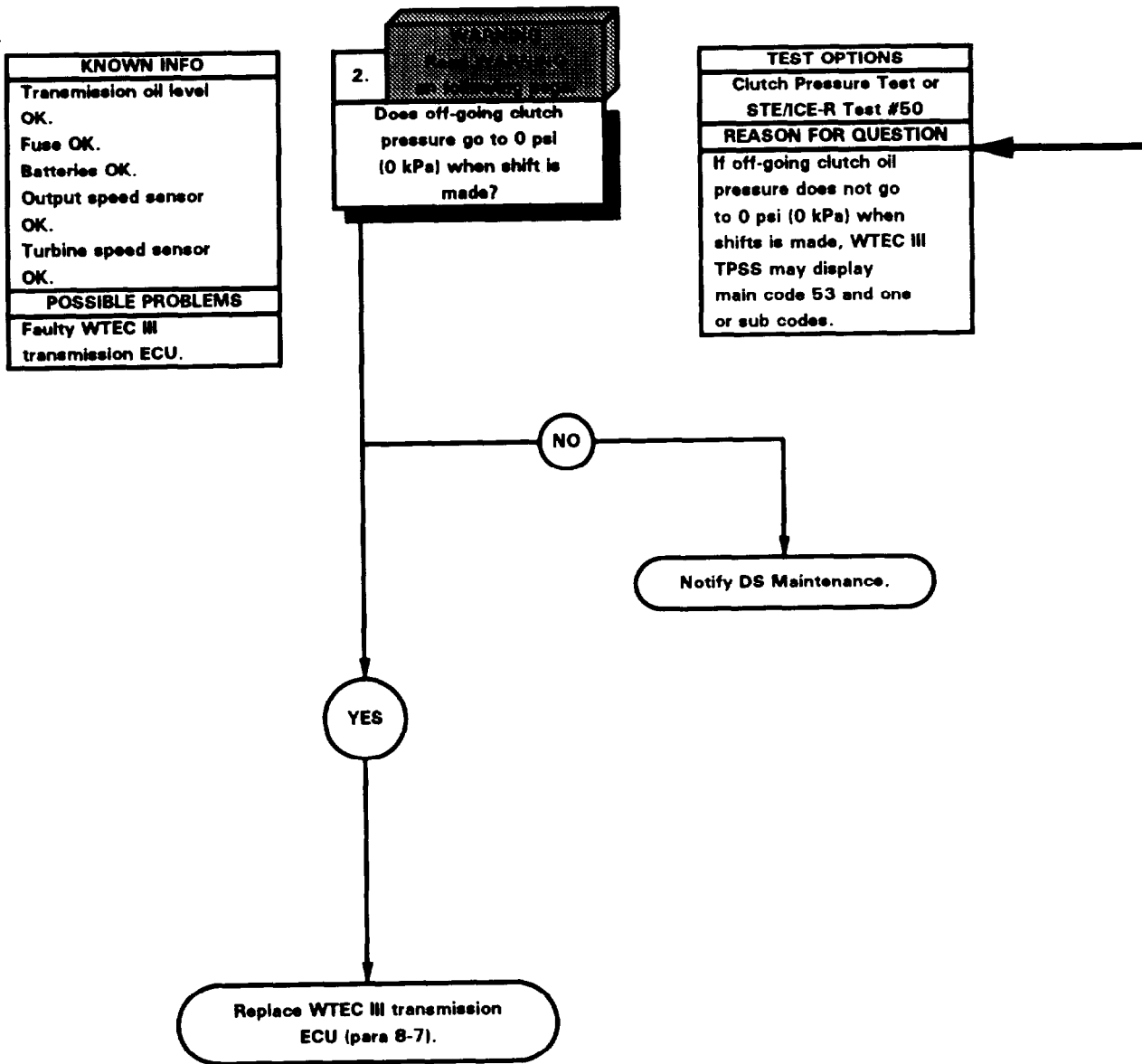
SUB CODE	SUB CODE MEANING	PRESSURE at CLUTCH(6)	SOLENOID ASSEMBLY LOCATION	PRESSURE READINGS at TAPS
00	Speed Zero in 1st	C3 & C6	ROT & C6 Clutch	215-334 psi (1480-2300 kPa)
11	Speed Zero in 2nd	C1 & C5	ROT & STA Clutch	215-334 psi (1480-2300 kPa)
22	Speed Zero in 3rd	C1 & C4	ROT & STA Clutch	142-203 psi (980-1400 kPa)
33	Speed Zero in 4th	C1 & C3	ROT & STA Clutch	142-203 psi (980-1400 kPa)
44	Speed Zero in 5th	C1 & C2	Rotating Clutch	142-203 psi (980-1400 kPa)
55	Speed Zero in 6th	C2 & C3	ROT & STA Clutch	128-189 psi (880-1300 kPa)
66	Speed Zero in 7th	C2 & C4	ROT & STA Clutch	128-189 psi (880-1300 kPa)
77	Speed Zero in R	C3 & C5	Stationary Clutch	215-334 psi (1480-2300 kPa)

133. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 53 AND ANY SUB CODE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Goggles, Industrial (Item 15, Appendix C) Tool Kit, Genl Mech (Item 46, Appendix C) STE/ICE-R (Item 41, Appendix C) Pan, Drain (Item 24, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Personnel Required (2)	
Reference TM 9-4910-571-12&P	Materials/Parts Packing, Preformed (Item 197, Appendix G) Reducer, Boss (Item 51, Appendix D)



- (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).

133. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 53 AND ANY SUB CODE (CONT)

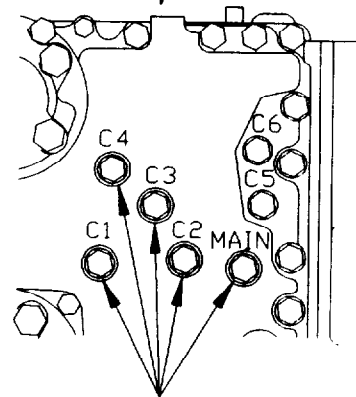
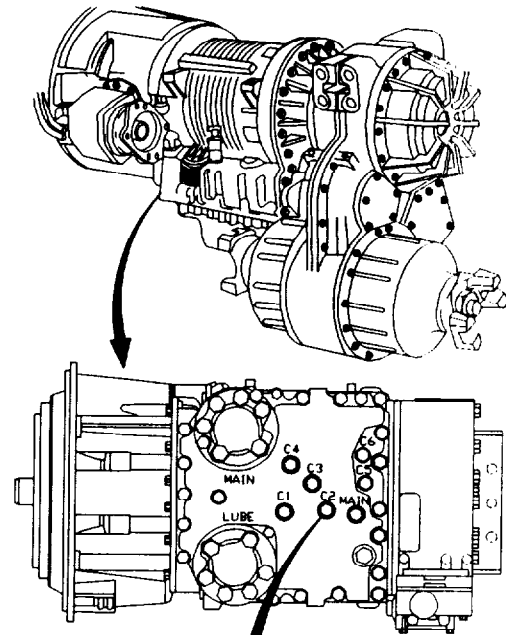


CLUTCH PRESSURE TEST

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.

- (1) Remove transmission front and rear output propeller shafts (para 9-2).
- (2) Position drain pan under pressure tap.
- (3) Remove pressure tap plug and preformed packing from off-going clutch indicated by the sub code. Refer to Table 2-42. Off-Going Clutch Pressure Tap. Discard preformed packing.
- (4) Connect reducer, STE/ICE-R adapter, and snubber to clutch pressure tap.
- (5) Perform STE/ICE-R Test # 50 (TM 9-4910-571-12&P).
- (6) Start engine (TM 9-2320-366-10-1) and run at idle.
- (7) With parking brake applied, make shift indicated by sub code while assistant notes reading on STE/ICE-R. Refer to Table 2-42. Off-Going Clutch Pressure Tap.
- (8) If off-going clutch pressure does not go to 0 psi (0 kPa) when shift is made, notify DS Maintenance.
- (9) If off-going clutch pressure does go to 0 psi (0 kPa) when shift is made, replace WTEC III transmission ECU (para 8-7).
- (10) Shut down engine (TM 9-2320-366-10-1).
- (11) Remove STE/ICE-R adapter, snubber, and reducer 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 transmission front and rear output propeller shafts (para 9-2).
- (16) Clear diagnostic codes (para 8-5).



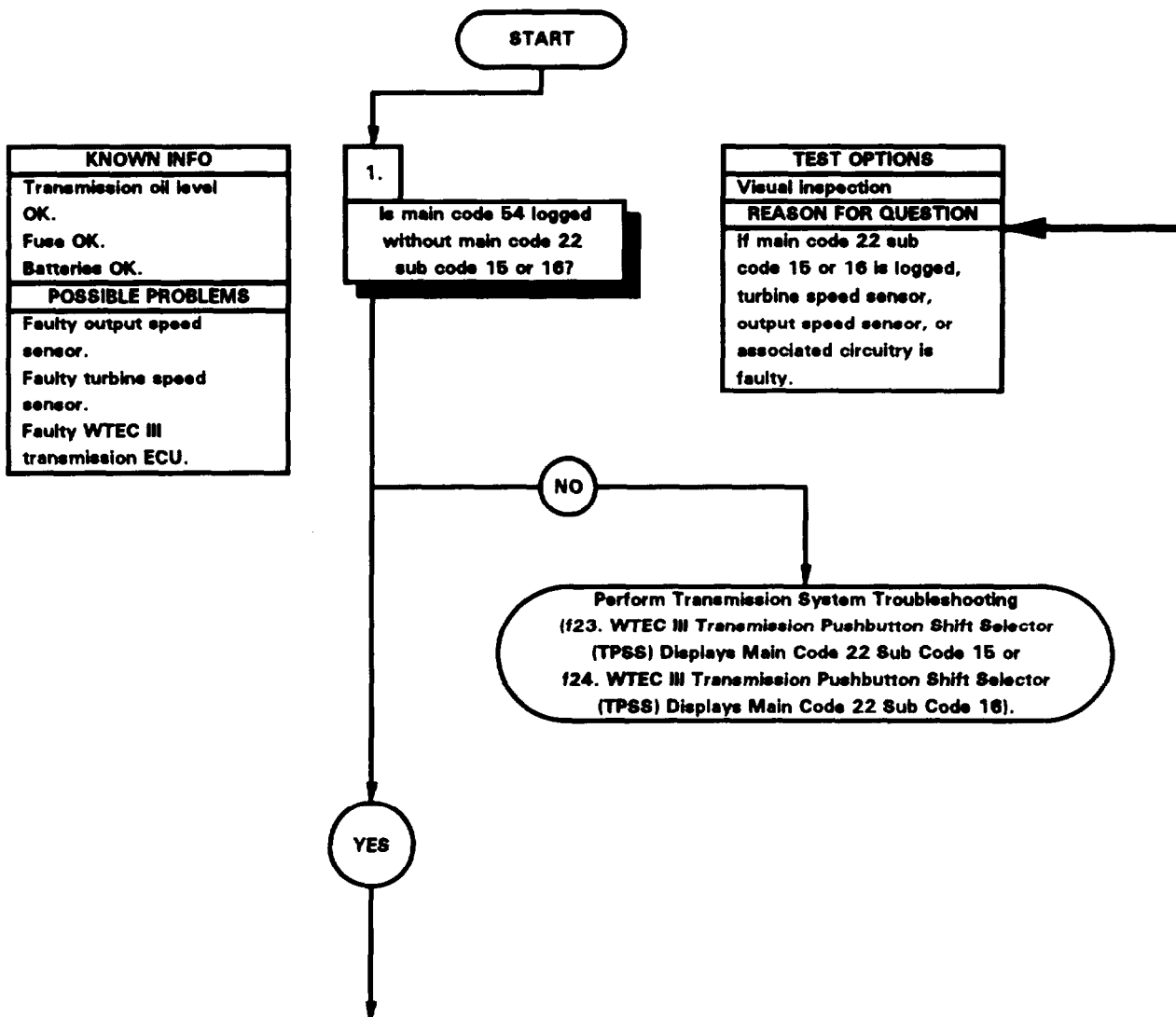
CLUTCH PRESSURE TAPS
C1-C6 AND MAIN

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TABLE 2-42. OFF-GOING CLUTCH PRESSURE TAP

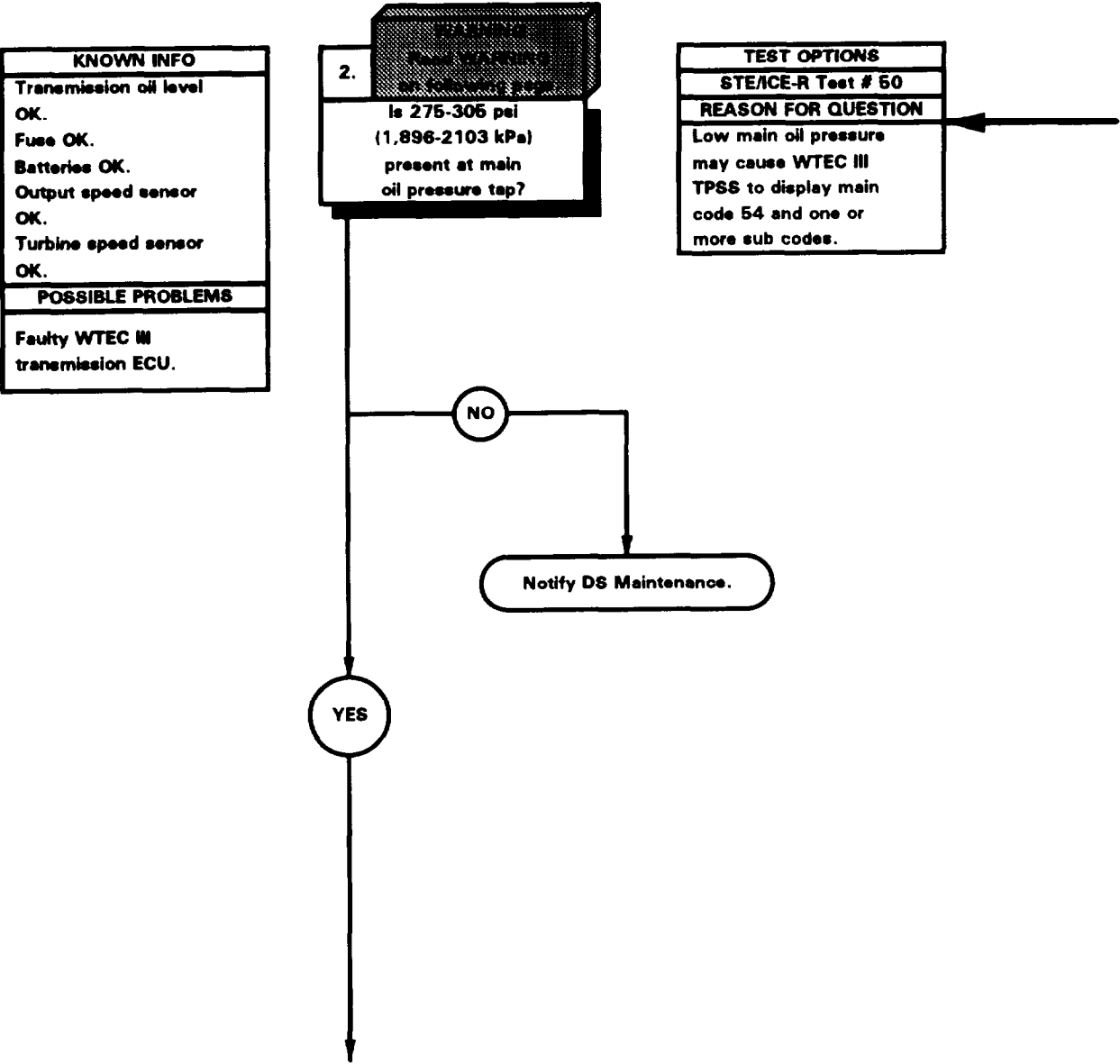
SUB CODE	SUB CODE MEANING	OFF-GOING CLUTCH(S)	SOLENOID ASSEMBLY LOCATION
08	L-N1 Shift	C3	Stationary Clutch
18	1-N1 Shift	C1	Rotating Clutch
28	2-N1 Shift	C1 & C4	ROT & STA Clutch
29	2-N2 Shift	C1	Rotating Clutch
38	3-N1 Shift	C1 & C3	ROT & STA Clutch
39	3-N3 Shift	C1	Rotating Clutch
48	4-N1 Shift	C1 & C2	Rotating Clutch
49	4-N3 Shift	C1 & C2	Rotating Clutch
58	5-N1 Shift	C2 & C3	ROT & STA Clutch
59	5-N3 Shift	C2	Rotating Clutch
68	6-N1 Shift	C2 & C4	ROT & STA Clutch
69	6-N4 Shift	C2	Rotating Clutch
78	R-N1 Shift	C3	Stationary Clutch
99	N3-N2 or N2-N3 Shift	C2 or C4	ROT or STA Clutch

134. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 54 AND ANY SUB CODE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Goggles, Industrial (Item 15, Appendix C) Tool Kit, Genl Mech (Item 46, Appendix C) STE/ICE-R (Item 41, Appendix C) Pan, Drain (Item 24, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Personnel Required (2)	Materials/Parts Packing, Preformed (Item 197, Appendix G) Reducer, Boes (Item 51, Appendix D)
Reference TM 9-4910-571-12&P	



- (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).

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

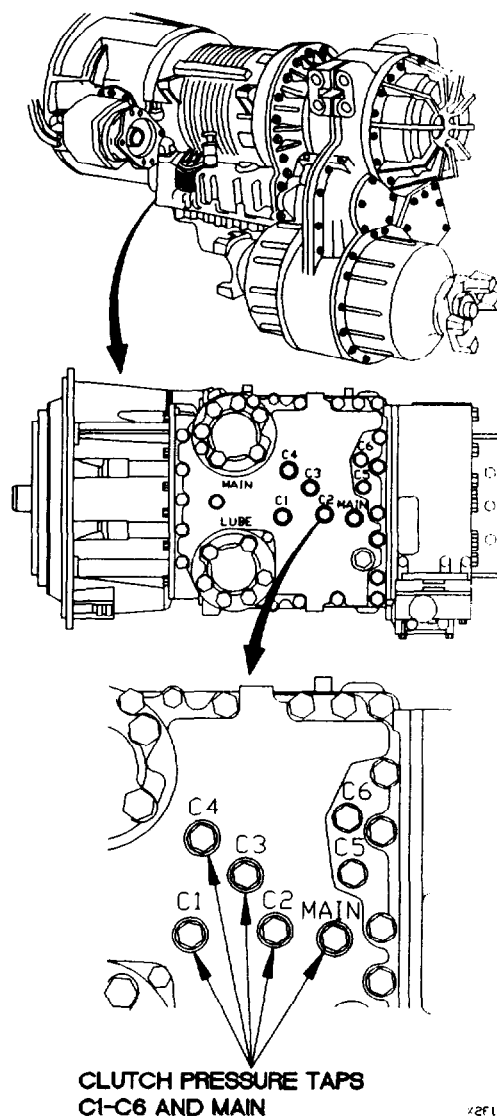


STE/CE-R TEST #50

WARNING

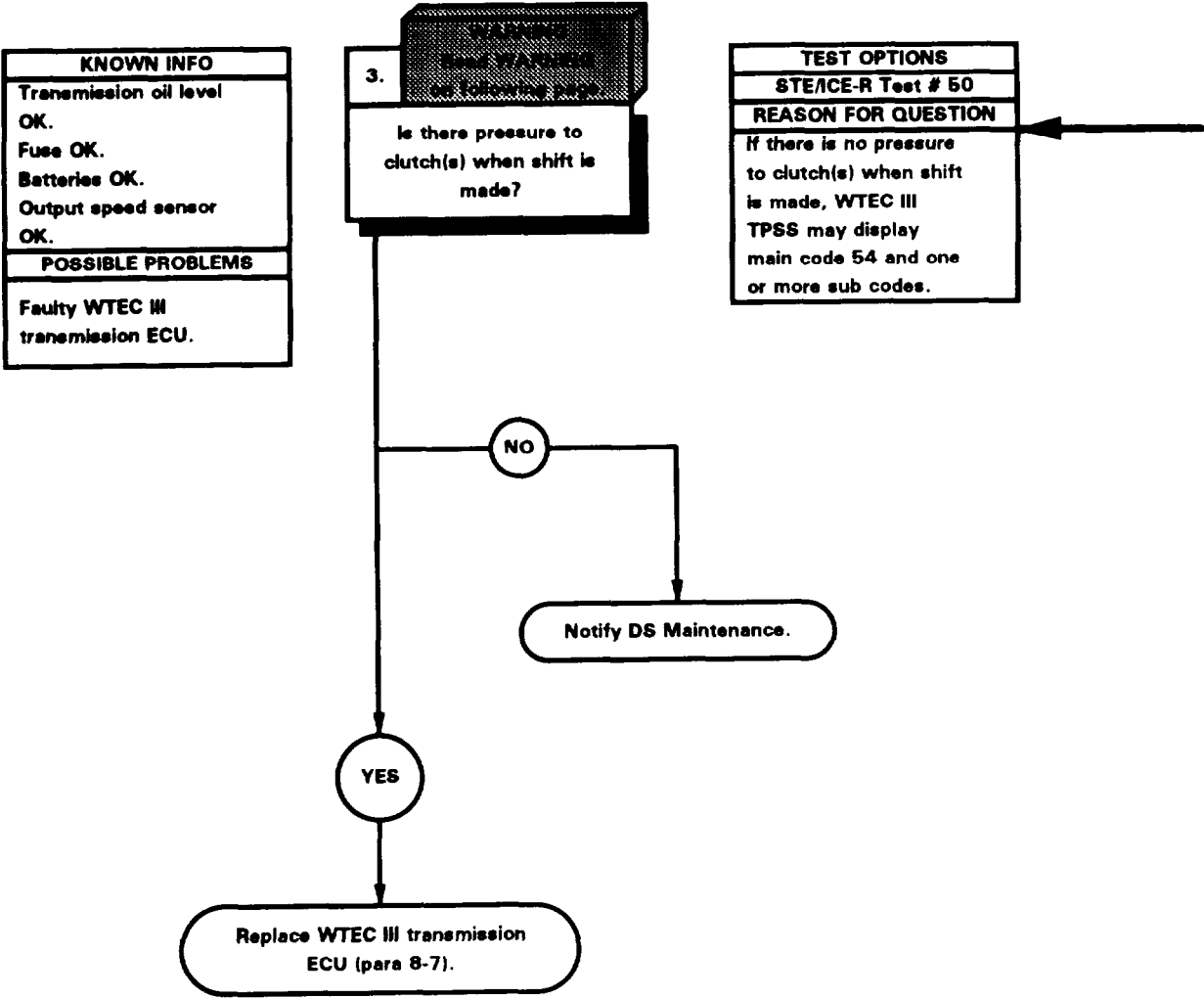
Wear approved eye protection when performing transmission pressure checks. If oil contacts eyes, seek medical attention immediately. Failure to comply may result in injury to personnel.

- (1) Place drain pan under transmission tap.
- (2) Remove main pressure tap plug and preformed packing from control valve assembly.
- (3) Connect STE/CE-R adapter, snubber, and reducer to clutch pressure tap.
- (4) Perform STE/CE-R Test # 50 (TM 9-4910-571-12&P).
- (5) Start engine (TM 9-2320-366-10-1) and run at idle.
- (6) With parking brake applied, position WTEC III TPSS to R position then to N position while assistant checks reading on STE/CE-R.
- (7) Shut down engine (TM 9-2320-366-10-1).
- (8) If main oil pressure is low, notify DS Maintenance.
- (9) Remove reducer, STE/CE-R adapter, and snubber 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).



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



CLUTCH PRESSURE TEST

WARNING

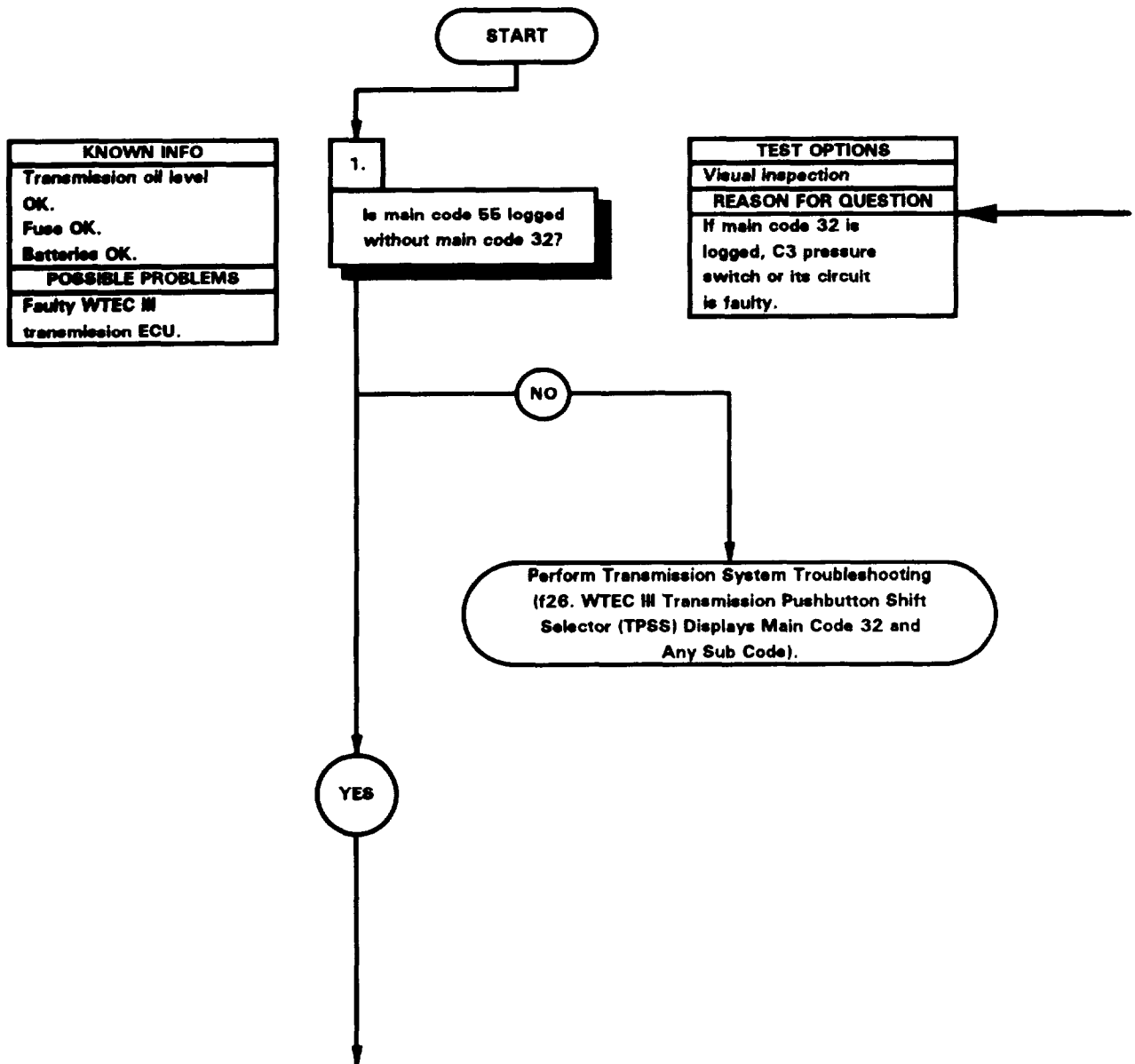
Wear approved eye protection when performing transmission pressure checks. If oil contacts eyes, seek medical attention immediately. Failure to comply may result in injury to personnel.

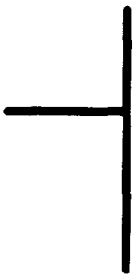
- (1) Remove transmission front and rear output propeller shafts (para 9-2).
- (2) Position drain pan under pressure tap.
- (3) Remove pressure tap plug and preformed packing from clutch pressure tap indicated by the sub code. Refer to Table 2-43. Clutch Pressure Tap.
- (4) Connect STE/ICE-R adapter, snubber, and reducer to clutch pressure tap.
- (5) Start engine (TM 9-2320-366-10-1).
- (6) Perform STE/ICE-R Test # 50 (TM 9-4910-571-12&P).
- (7) With parking brake applied, make shift indicated by sub code. Refer to Table 2-43. Clutch Pressure Tap.
- (8) Accelerate engine until WTEC III TPSS displays denied range. Refer to Table 2-43. Clutch Pressure Tap.
- (9) Maintain sufficient engine speed to keep desired transmission range while assistant notes reading on STE/ICE-R.
- (10) Let engine return to idle.
- (11) Shift WTEC III TPSS into neutral.
- (12) If one or more clutches failed to indicate proper pressure, notify DS Maintenance.
- (13) If all clutches indicate proper pressure, replace WTEC III transmission ECU (para 8-7).
- (14) Shut down engine (TM 9-2320-366-10-1).
- (15) Remove reducer, STE/ICE-R adapter, and snubber from 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 2-43. CLUTCH PRESSURE TAP

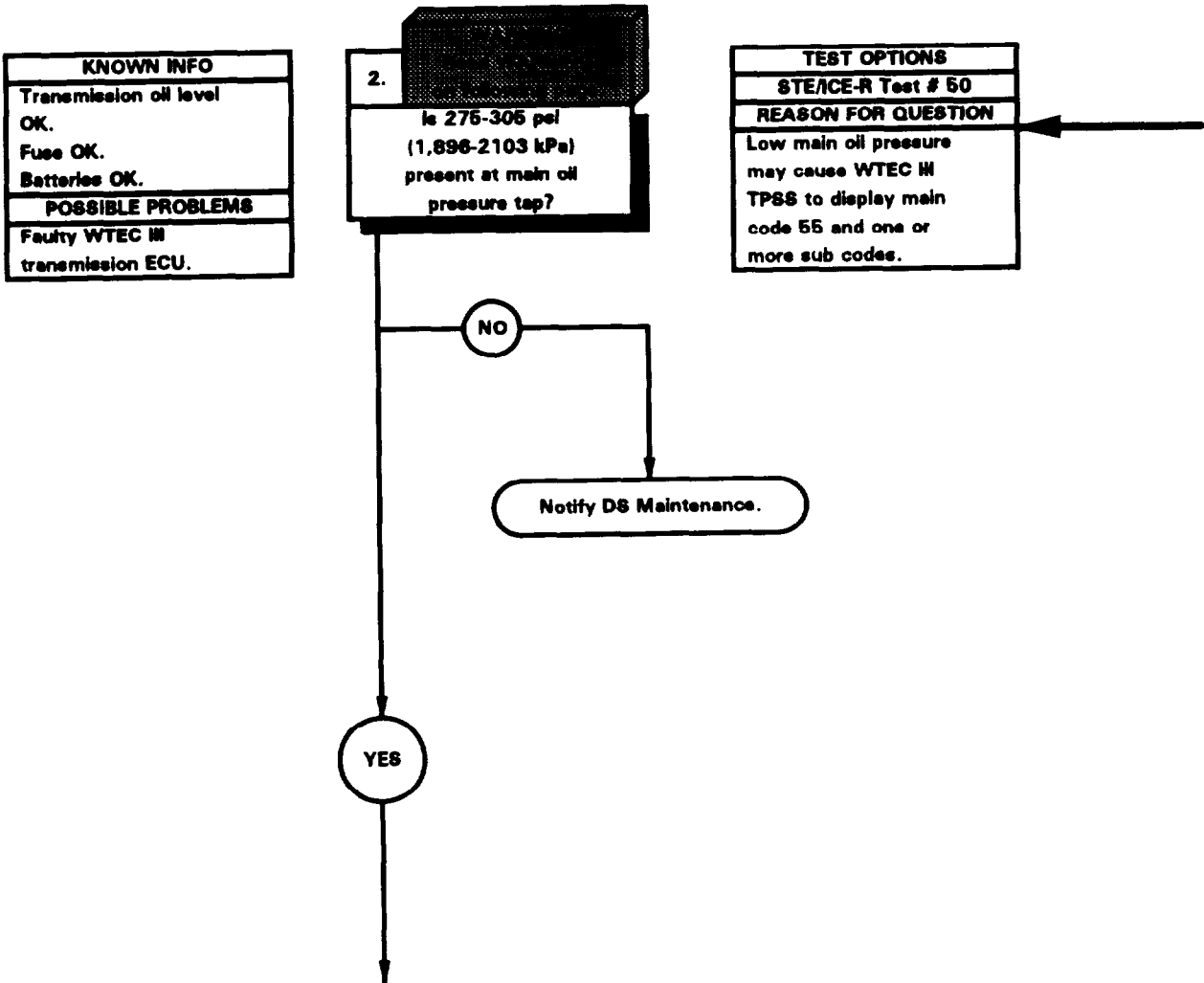
SUB CODE	SUB CODE MEANING	PRESSURE at CLUTCH(S)	SOLENOID ASSEMBLY LOCATION	PRESSURE READINGS at TAPS
01	L-1 Upshift	C1 & C5	ROT & STA Clutch	235-265 psi (1620-1827 kPa)
07	L-R Shift	C3 & C5	Stationary Clutch	275-305 psi (1896-2103 kPa)
10	1-L Downshift	C3 & C6	ROT & C6 Clutch	235-265 psi (1620-1827 kPa)
12	1-2 Upshift	C1 & C4	ROT & STA Clutch	235-265 psi (1620-1827 kPa)
17	1-R Shift	C3 & C5	Stationary Clutch	275-305 psi (1896-2103 kPa)
21	2-1 Downshift	C1 & C5	ROT & STA Clutch	235-265 psi (1620-1827 kPa)
23	2-3 Upshift	C1 & C3	ROT & STA Clutch	170-194 psi (1172-1338 kPa)
27	2-R Shift	C3 & C5	Stationary Clutch	275-305 psi (1896-2103 kPa)
32	3-2 Downshift	C1 & C4	ROT & STA Clutch	170-194 psi (1172-1338 kPa)
34	3-4 Upshift	C1 & C2	Rotating Clutch	170-194 psi (1172-1338 kPa)
43	4-3 Downshift	C1 & C3	ROT & STA Clutch	170-194 psi (1172-1338 kPa)
45	4-5 Upshift	C2 & C3	ROT & STA Clutch	160-178 psi (1103-1227 kPa)
54	5-4 Downshift	C1 & C2	Rotating Clutch	170-194 psi (1172-1338 kPa)
56	5-6 Upshift	C2 & C4	ROT & STA Clutch	160-178 psi (1103-1227 kPa)
65	6-5 Downshift	C2 & C3	ROT & STA Clutch	160-178 psi (1103-1227 kPa)
70	R-L Shift	C3 & C6	ROT & C6 Clutch	235-265 psi (1620-1827 kPa)
71	R-1 Shift	C1 & C5	ROT & STA Clutch	235-265 psi (1620-1827 kPa)
72	R-2 Shift	C1 & C4	ROT & STA Clutch	235-265 psi (1620-1827 kPa)
80	N1-L Shift	C3 & C6	ROT & C6 Clutch	235-265 psi (1620-1827 kPa)
81	N1-1 Shift	C1 & C5	ROT & STA Clutch	235-265 psi (1620-1827 kPa)
82	N1-2 Shift	C1 & C4	ROT & STA Clutch	170-194 psi (1172-1338 kPa)
83	N1-3 Shift	C1 & C3	ROT & STA Clutch	170-194 psi (1172-1338 kPa)
85	N1-5 Shift	C2 & C3	ROT & STA Clutch	160-178 psi (1103-1227 kPa)
86	N1-6 Shift	C2 & C4	ROT & STA Clutch	160-178 psi (1103-1227 kPa)
92	N2-2 Shift	C1 & C4	ROT & STA Clutch	235-265 psi (1620-1827 kPa)
93	N3-3 Shift	C1 & C3	ROT & STA Clutch	170-194 psi (1172-1338 kPa)
95	N3-5 Shift	C2 & C3	ROT & STA Clutch	160-178 psi (1103-1227 kPa)
96	N4-6 Shift	C2 & C4	ROT & STA Clutch	160-178 psi (1103-1227 kPa)
97	2-R Shift	C3 & C5	Stationary Clutch	275-305 psi (1896-2103 kPa)

f36. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 55 AND ANY SUB CODE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Goggles, Industrial (Item 15, Appendix C) Tool Kit, Genl Mech (Item 46, Appendix C) STE/CE-R (Item 41, Appendix C) Pan, Drain (Item 24, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Personnel Required (2)	Materials/Parts Packing, Preformed (Item 197, Appendix G) Reducer, Boss (Item 51, Appendix D)
Reference TM 9-4910-571-12&P	



- 
- (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).

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

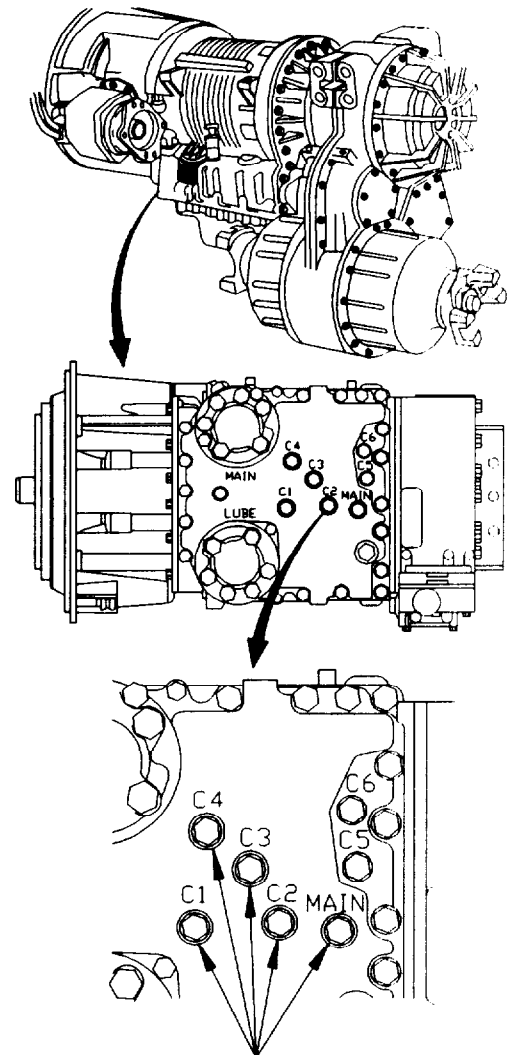


STE/CE TEST # 50

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.

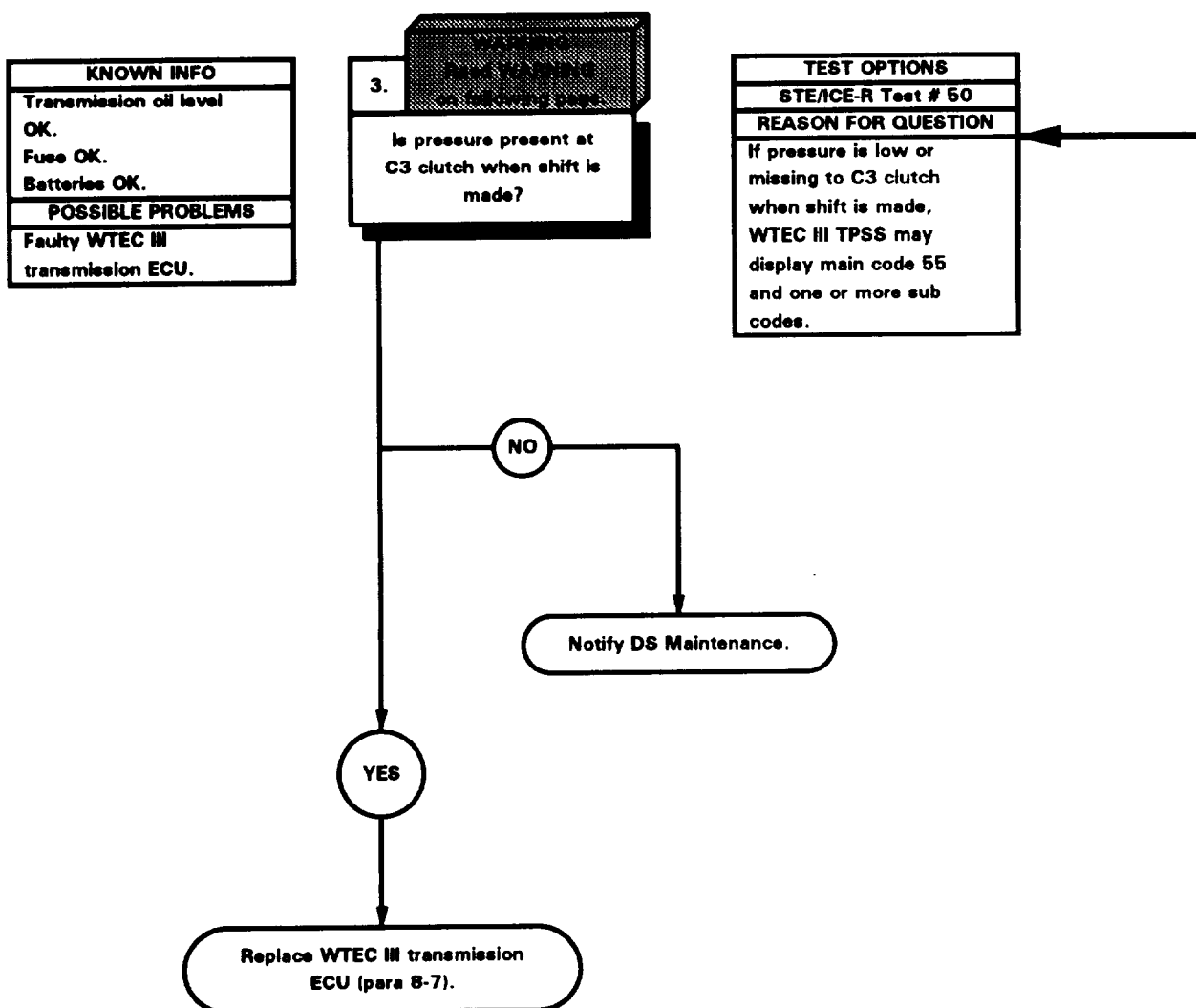
- (1) Position drain pan under pressure tap.
- (2) Remove main pressure tap plug and preformed packing from control valve module.
- (3) Connect STE/CE-R adapter, snubber, and reducer to main pressure tap.
- (4) Perform STE/CE-R Test # 50 (TM 9-4910-571-12&P).
- (5) Start engine (TM 9-2320-366-10-1) and run at idle.
- (6) With parking brake applied, position WTEC III TPSS to R position then to N position while assistant checks reading on STE/CE-R.
- (7) Shut down engine (TM 9-2320-366-10-1).
- (8) If main oil pressure is low, notify DS Maintenance.
- (9) Remove reducer, STE/CE-R adapter, and snubber 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.



CLUTCH PRESSURE TAPS
C1-C6 AND MAIN

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

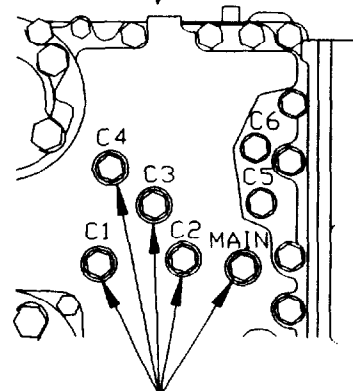
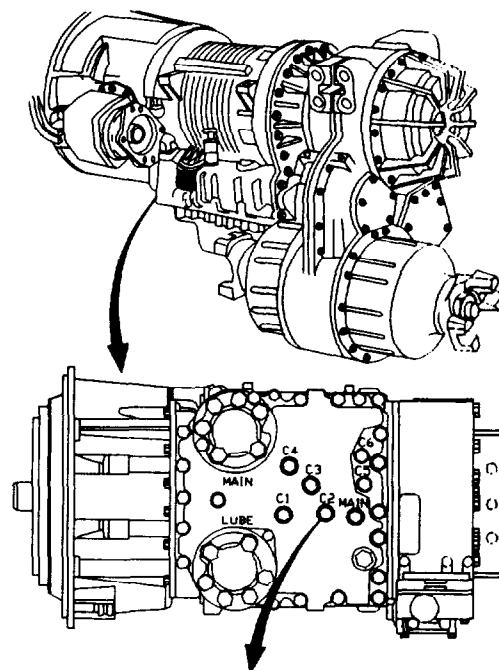


STE/ACE TEST # 50

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.

- (1) Remove transmission front and rear output 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 STE/ACE-R adapter, snubber, and reducer to C3 pressure tap.
- (5) Perform STE/ACE-R test # 50 (TM 9-4910-571-12&P).
- (6) Start engine (TM 9-2320-366-10-1) and run at idle.
- (7) With parking brake applied, make shift indicated by sub code while assistant notes reading on STE/ACE-R.
- (8) Shut down engine (TM 9-2320-366-10-1).
- (9) If 275-305 psi pressure is not obtained for affected code, notify D8 Maintenance.
- (10) If 275-305 psi pressure is obtained, replace WTEC transmission ECU (para 8-7).
- (11) Remove reducer, STE/ACE-R adapter, and snubber from C3 pressure tap.
- (12) Position preformed packing and C3 pressure tap plug.
- (13) Tighten C3 pressure tap plug to 84-120 lb-in. (9-14 N-m).
- (14) Remove drain pan under pressure tap.
- (15) Install transmission front and rear output propeller shafts (para 9-2).
- (16) Clear diagnostic codes (para 8-5).



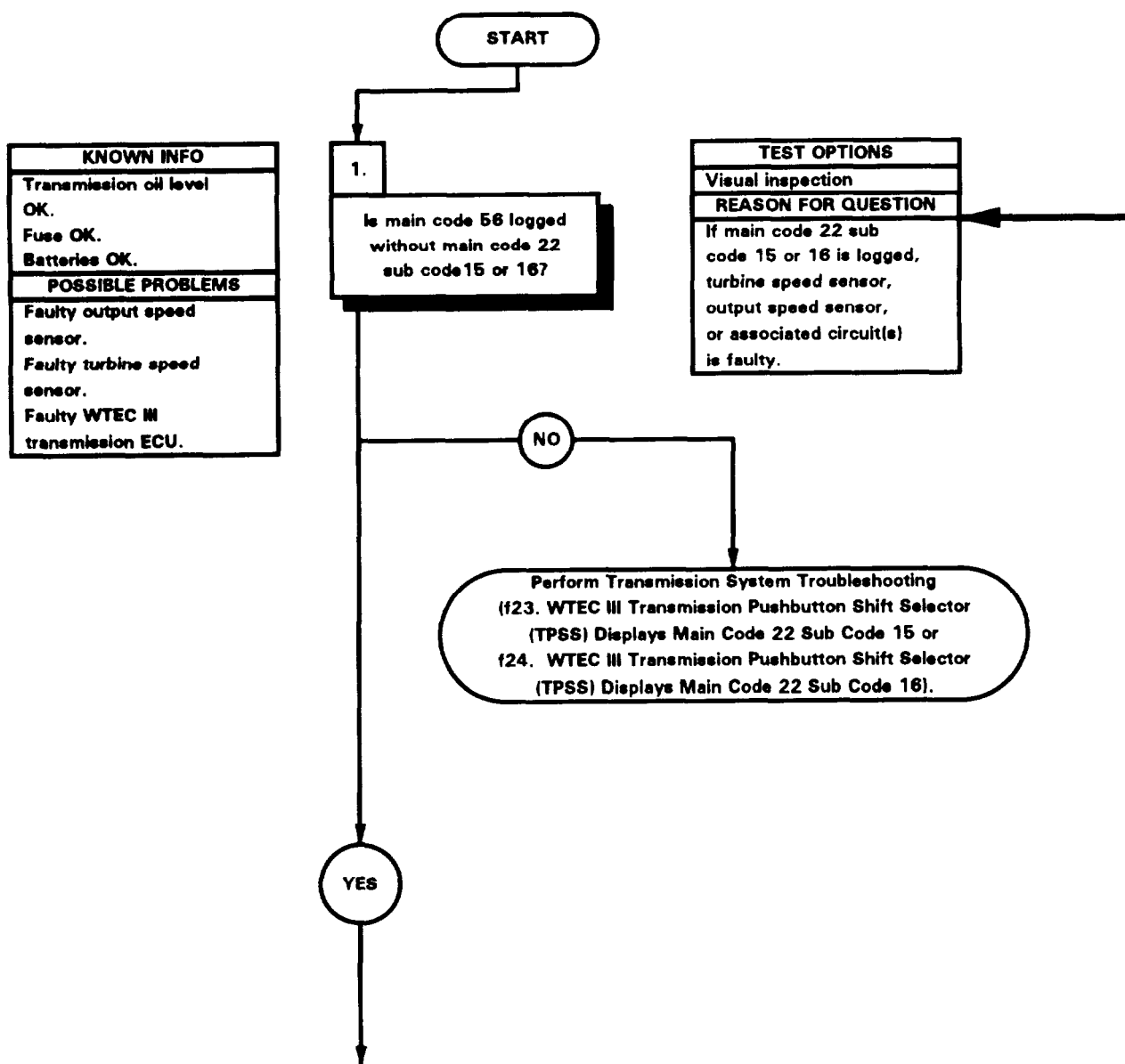
CLUTCH PRESSURE TAPS
C1-C6 AND MAIN

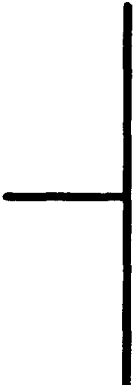
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TABLE 2-44. CLUTCH PRESSURE TAP

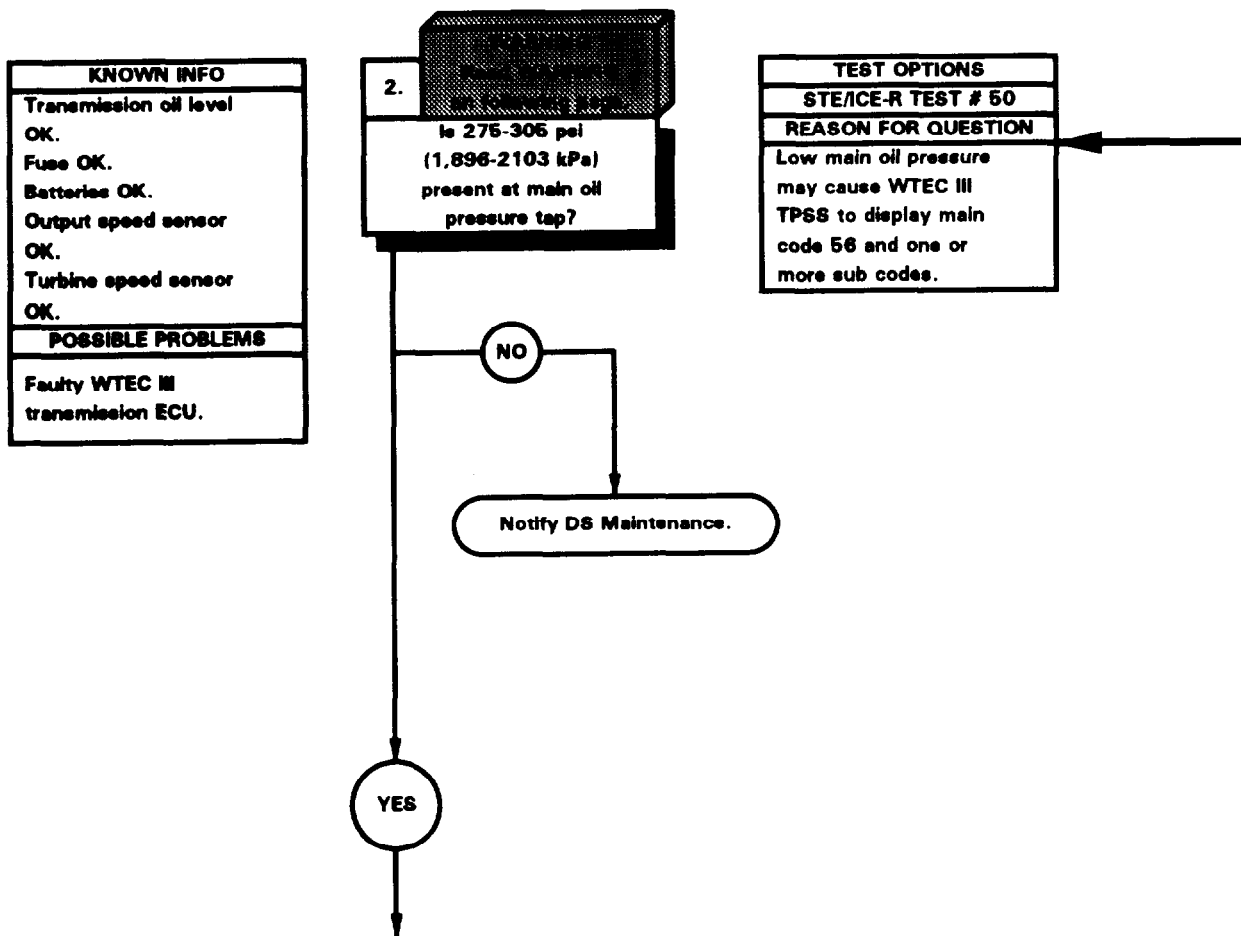
SUB CODE	SUB CODE MEANING	PRESSURE READINGS C3 TAP
17	1-R Shift	275-305 psi (1896-2103 kPa)
27	2-R Shift	275-305 psi (1896-2103 kPa)
90	N1-L Shift	235-265 psi (1620-1827 kPa)
87	N1-R Shift	275-305 psi (1896-2103 kPa)
97	2-R Shift	275-305 psi (1896-2103 kPa)

f36. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 56 AND ANY SUB CODE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1). Personnel Required (2) Reference TM 9-4910-571-12&P	Tools and Special Tools Goggles, Industrial (Item 15, Appendix C) Tool Kit, Genl Mech (Item 46, Appendix C) STE/CE-R (Item 41, Appendix C) Pan, Drain (Item 24, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C) Materials/Parts Packing, Preformed (Item 197, Appendix G) Reducer, Boss (Item 51, Appendix D)



- 
- (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).

136. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 56 AND ANY SUB CODE (CONT)

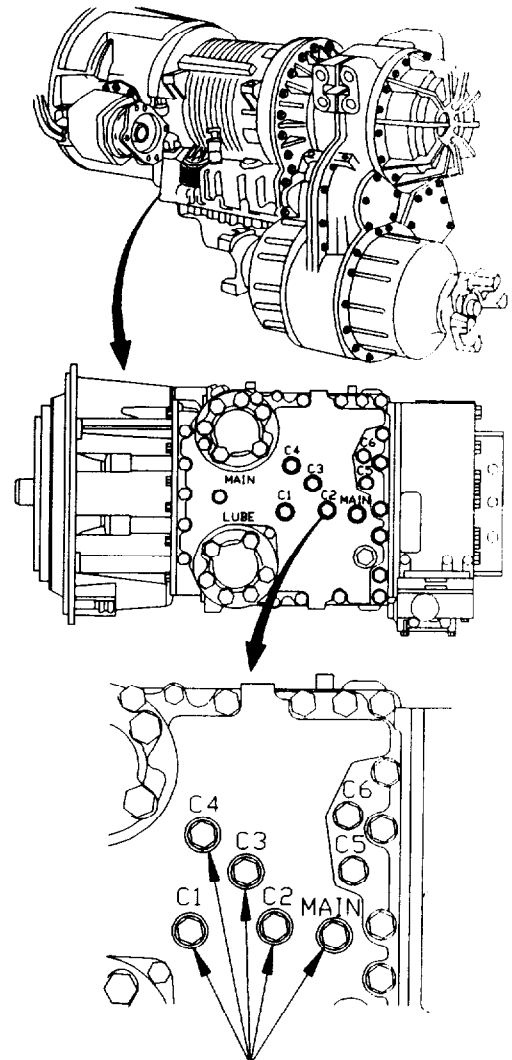


STE/ICE-R TEST #50

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.

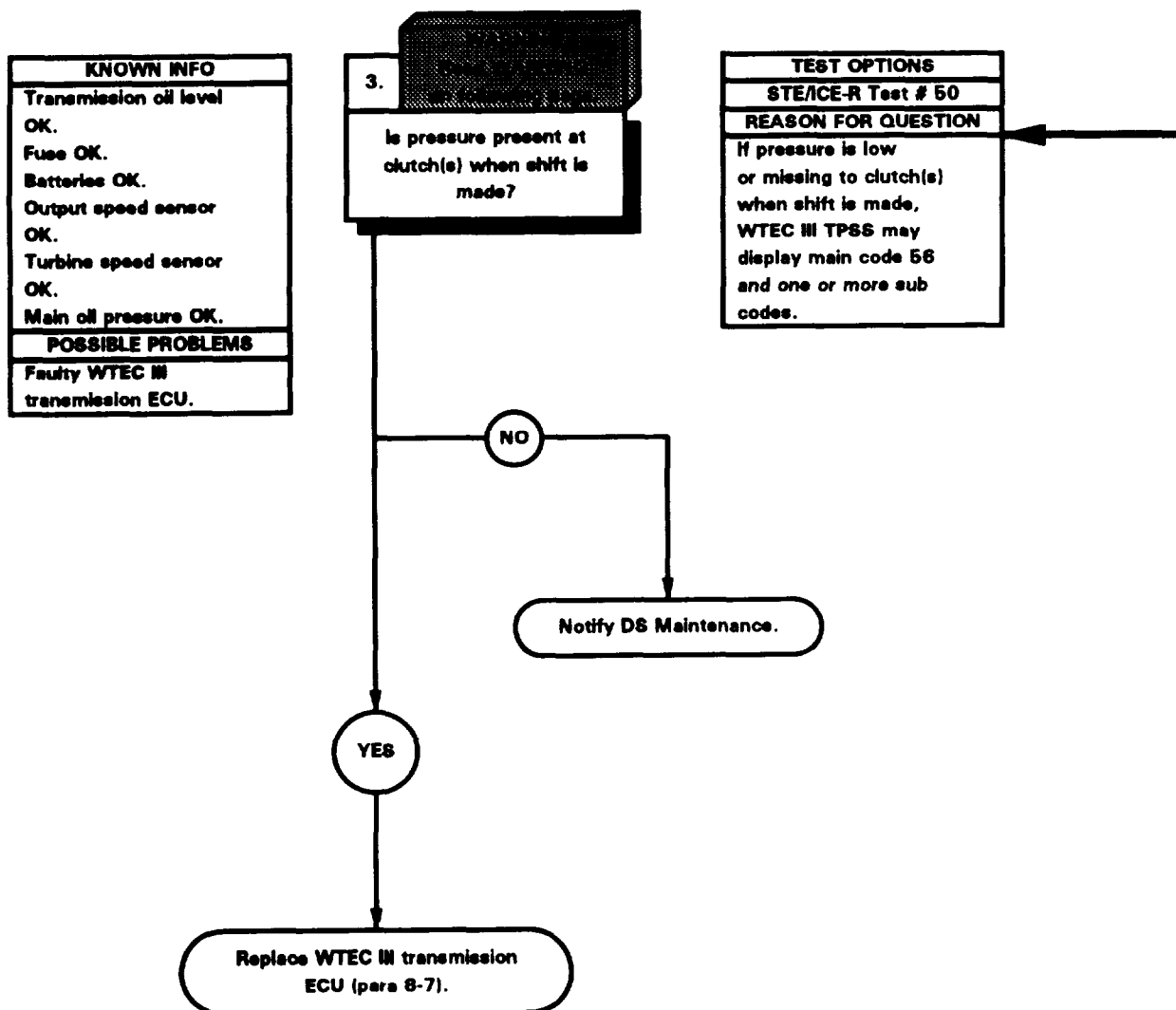
- (1) Position drain pan under pressure tap.
- (2) Remove main pressure tap plug and preformed packing from control valve module.
- (3) Install STE/ICE-R adapter, snubber, and reducer on main pressure tap.
- (4) Perform STE/ICE-R test #50 (TM 9-4910-571-12&P).
- (5) Start engine (TM 9-2320-366-10-1) and run at idle.
- (6) With parking brake applied, position WTEC III TPSS to R position then to N position while assistant checks reading on STE/ICE-R.
- (7) Shut down engine (TM 9-2320-366-10-1).
- (8) If main oil pressure is low, notify DS Maintenance.
- (9) Remove reducer, STE/ICE-R adapter, and snubber 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.



**CLUTCH PRESSURE TAPS
C1-C6 AND MAIN**

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f36. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 56 AND ANY SUB CODE (CONT)

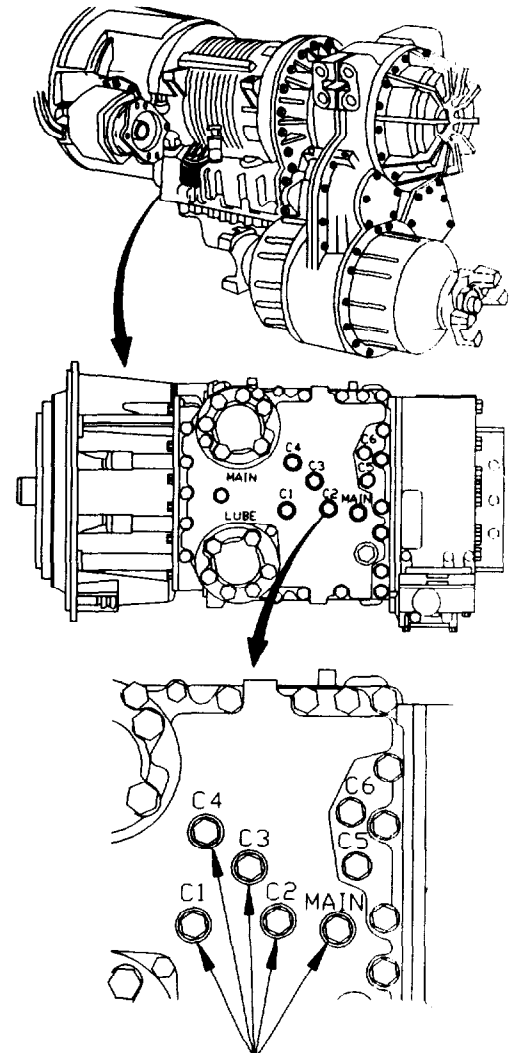


STE/ICE-R TEST #50

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.

- (1) Remove transmission front and rear output propeller shafts (para 9-2).
- (2) Position drain pan under pressure tap.
- (3) Remove pressure tap plug and preformed packing from clutch pressure tap indicated by the sub code. Refer to Table 2-45. Clutch Pressure Tap.
- (4) Connect STE/ICE-R adapter, snubber, and reducer to clutch pressure tap.
- (5) Perform STE/ICE-R test #50 (TM 9-4910-571-12&P).
- (6) Start engine (TM 9-2320-366-10-1).
- (7) Make shift indicated by sub code. Refer to Table 2-45. Clutch Pressure Tap.
- (8) Accelerate engine until WTEC III TPSS displays desired range. Refer to Table 2-45. Clutch Pressure Tap.
- (9) Maintain sufficient engine speed to keep desired transmission range while assistant notes reading on STE/ICE-R.
- (10) Let engine return to idle.
- (11) Shift transmission into neutral (TM 9-2320-366-10-1).
- (12) Shut down engine (TM 9-2320-366-10-1).
- (13) If one or more of clutches failed to indicate proper pressure, notify D8 Maintenance.
- (14) If all clutches indicate proper pressure, replace WTEC III transmission ECU (para 8-7).
- (15) Remove reducer, STE/ICE-R adapter, and snubber 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).



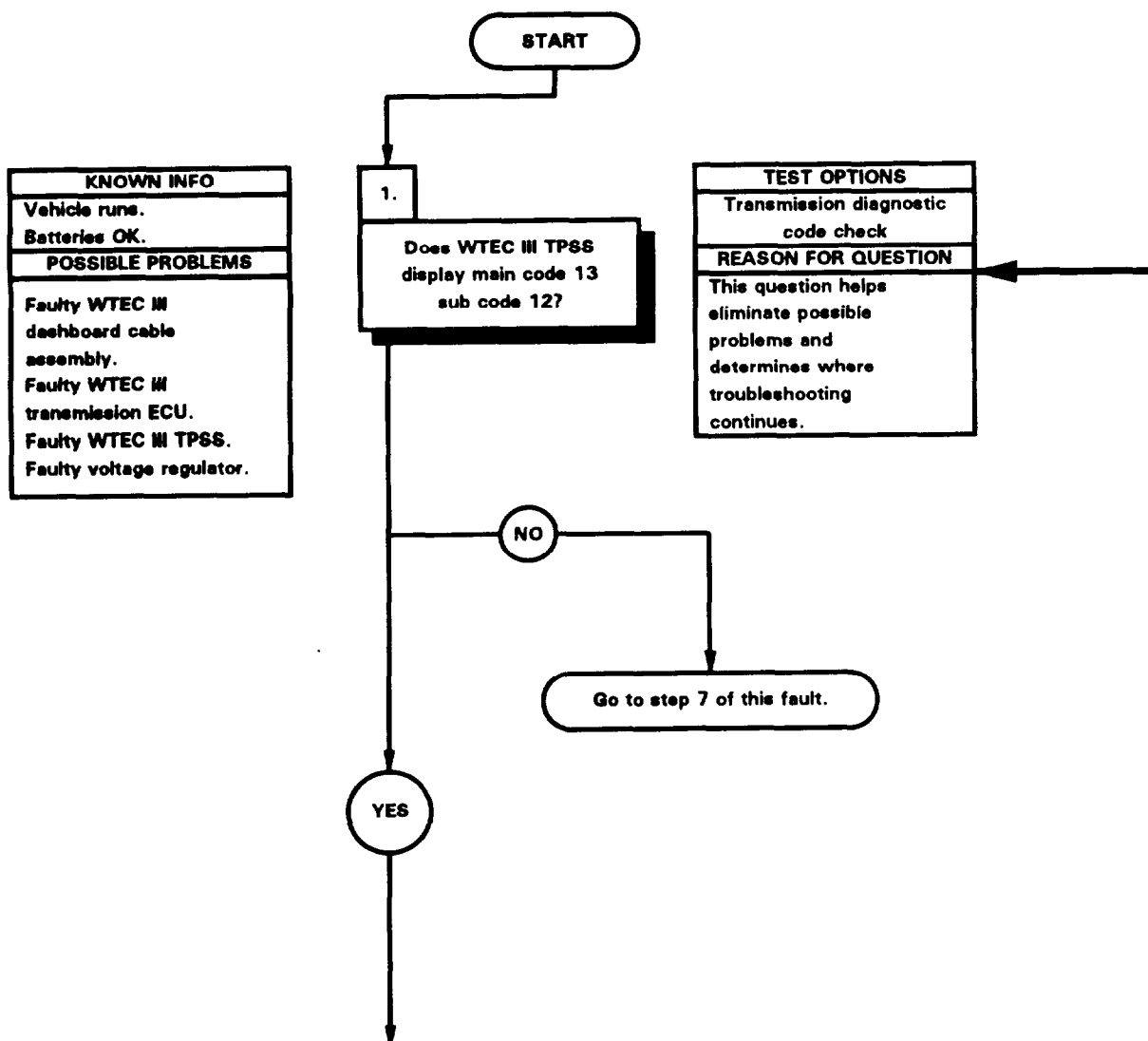
CLUTCH PRESSURE TAPS
C1-C6 AND MAIN

x2f1101-

TABLE 2-45. CLUTCH PRESSURE TAP

SUB CODE	SUB CODE MEANING	PRESSURE at CLUTCH(S)	SOLENOID ASSEMBLY LOCATION	PRESSURE READINGS at TAPS
00	L Range Test	C3 & C6	STA & C6 Clutch	235-265 psi (1620-1827 kPa)
11	1 Range Test	C1 & C5	ROT & STA Clutch	235-265 psi (1620-1827 kPa)
22	2 Range Test	C1 & C4	ROT & STA Clutch	170-265 psi (1172-1827 kPa)
33	3 Range Test	C1 & C3	ROT & STA Clutch	170-194 psi (1172-1338 kPa)
44	4 Range Test	C1 & C2	Rotating Clutch	170-194 psi (1172-1338 kPa)
55	5 Range Test	C2 & C3	ROT & STA Clutch	160-178 psi (1103-1227 kPa)
66	6 Range Test	C2 & C4	ROT & STA Clutch	160-178 psi (1103-1227 kPa)
77	R Range Test	C3 & C5	Stationary Clutch	275-305 psi (1896-2103 kPa)

137. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 13 AND ANY SUB CODE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1). Personnel Required (2)	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multimeter, Digital (Item 22, Appendix C) STE/CE-R (Item 41, Appendix C) References TM 9-4910-571-12&P



4.3.1

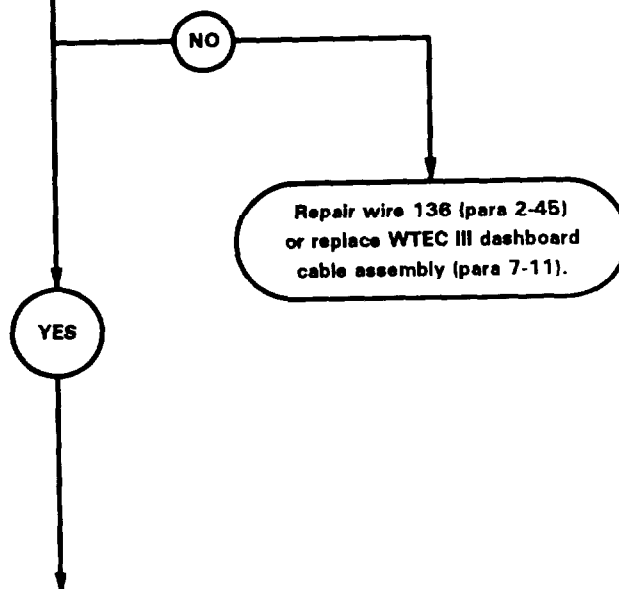
- 
- (1) Check to see if main code 13 sub code 12 is active in WTEC III TPSS (para 8-5).
 - (2) If main code 13 sub code 12 is not active in WTEC III TPSS, go to step 7 of this fault.

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

KNOWN INFO
Vehicle runs. Batteries OK.
POSSIBLE PROBLEMS
Faulty WTEC III dashboard cable assembly. Faulty WTEC III transmission ECU. Faulty WTEC III TPSS.

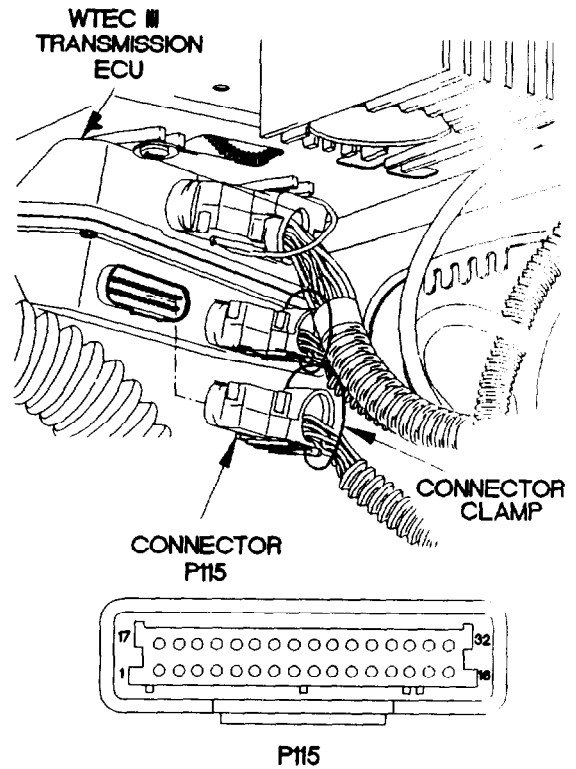
2.
Are connectors P115-1 and P115-16 free from short circuits to ground or to other wires?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If short circuits to ground or other wires are present, wire 136 is faulty.



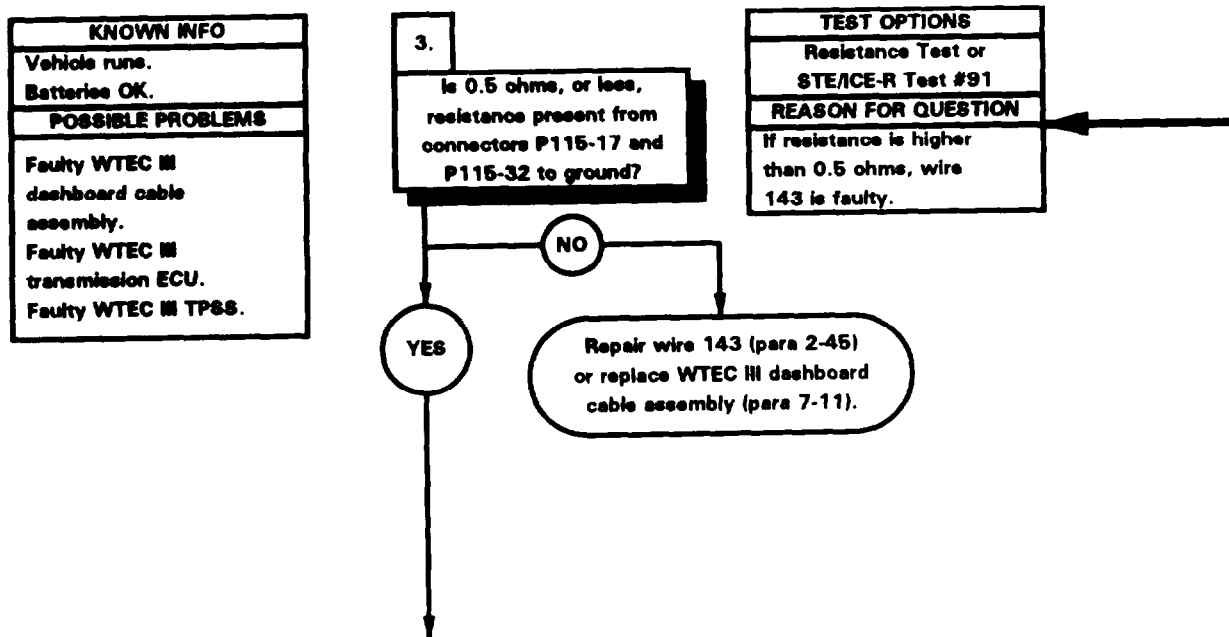
CONTINUITY TEST

- (1) Remove kick panel (para 16-3).
- (2) Disconnect connector clamp from connector P115.
- (3) Disconnect connector P115 from WTEC III transmission ECU.
- (4) Set multimeter to ohms.
- (5) Connect positive (+) probe of multimeter to connector P115-1.
- (6) Connect negative (-) probe of multimeter to all other sockets in connector P115 (except P115-16), one at a time, and note reading on multimeter.
- (7) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (8) Connect positive (+) probe of multimeter to connector P115-16.
- (9) Connect negative (-) probe of multimeter to all other sockets in connector P115 (except P115-1), one at a time, and note reading on multimeter.
- (10) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (11) If continuity is present repair wire 136 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).



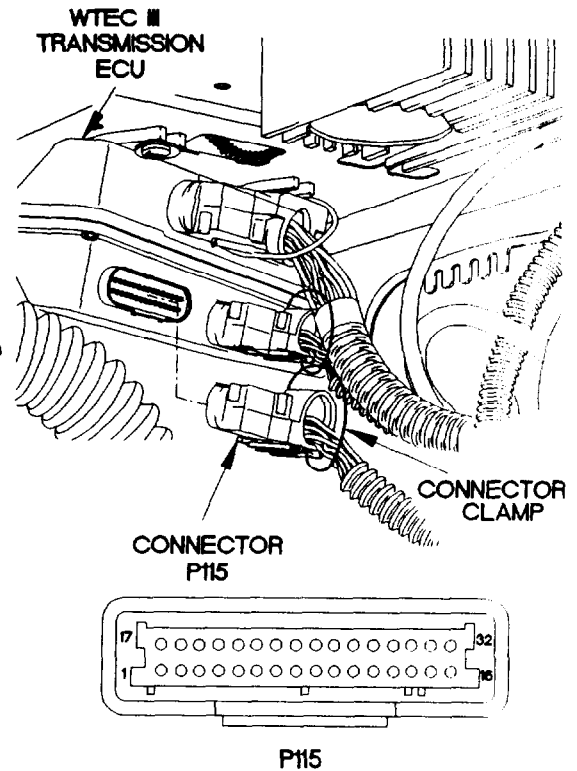
XUF 37421

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



RESISTANCE TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P115-17.
- (3) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (4) Connect positive (+) probe of multimeter to connector P115-32.
- (5) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (6) If resistance noted in step 3 or step 5 is higher than 0.5 ohms, repair wire 143 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).
- (7) Connect connector P115 to WTEC III transmission ECU.
- (8) Connect connector clamp on connector P115.



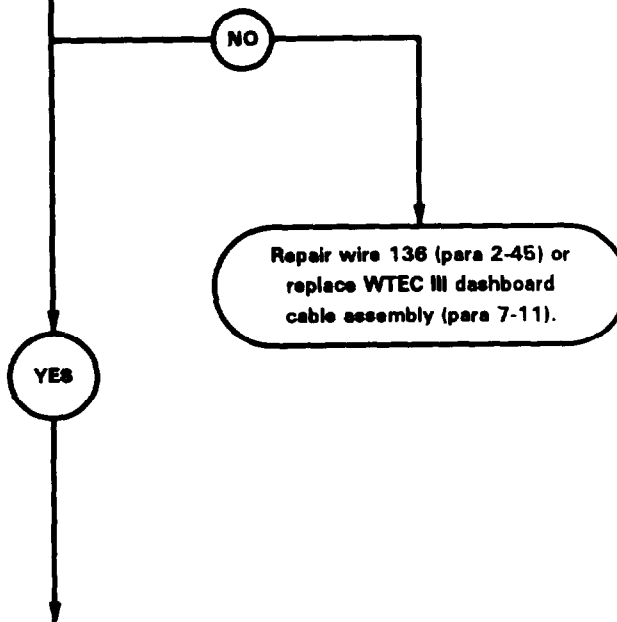
K2F 37031

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

KNOWN INFO
Vehicle runs. Batteries OK.
POSSIBLE PROBLEMS
Faulty WTEC III dashboard cable assembly. Faulty WTEC III transmission ECU. Faulty WTEC III TPSS.

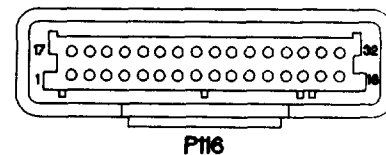
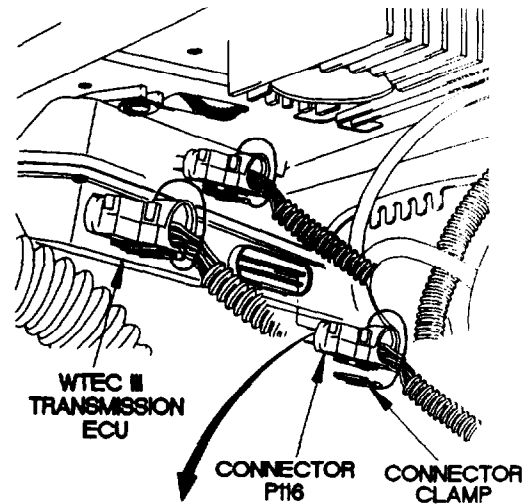
4.
Is continuity present from connector P116-16 to connector PX33R and no short circuits found?

TEST OPTIONS
Continuity Test or STE/ICE-R Test #91
REASON FOR QUESTION
If continuity is not present, or short circuits are found, wire 136 is faulty.

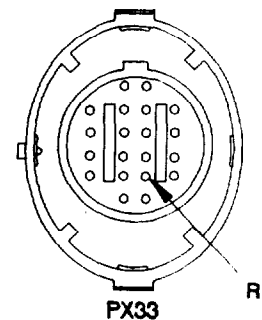


CONTINUITY TEST

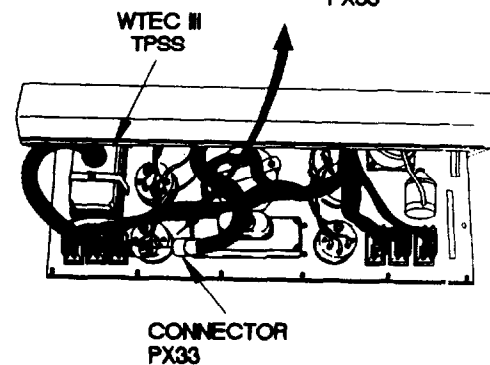
- (1) Disconnect connector clamp from connector P116.
- (2) Disconnect connector P116 from WTEC III transmission ECU.
- (3) Remove instrument panel assembly for access (para 7-15).
- (4) Disconnect connector PX33 from WTEC III TPSS.
- (5) Set multimeter to ohms.
- (6) Connect positive (+) probe of multimeter to connector P116-16.
- (7) Connect negative (-) probe of multimeter to connector PX33R and note reading on multimeter.
- (8) Connect negative (-) probe of multimeter to all other sockets in connector PX33, one at a time, and note reading on multimeter.
- (9) Connect negative (-) probe of multimeter to ground and note reading on multimeter.
- (10) If continuity is not present in step 7, or continuity is present in step 8 or step 9, repair wire 136 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).



P116



PX33



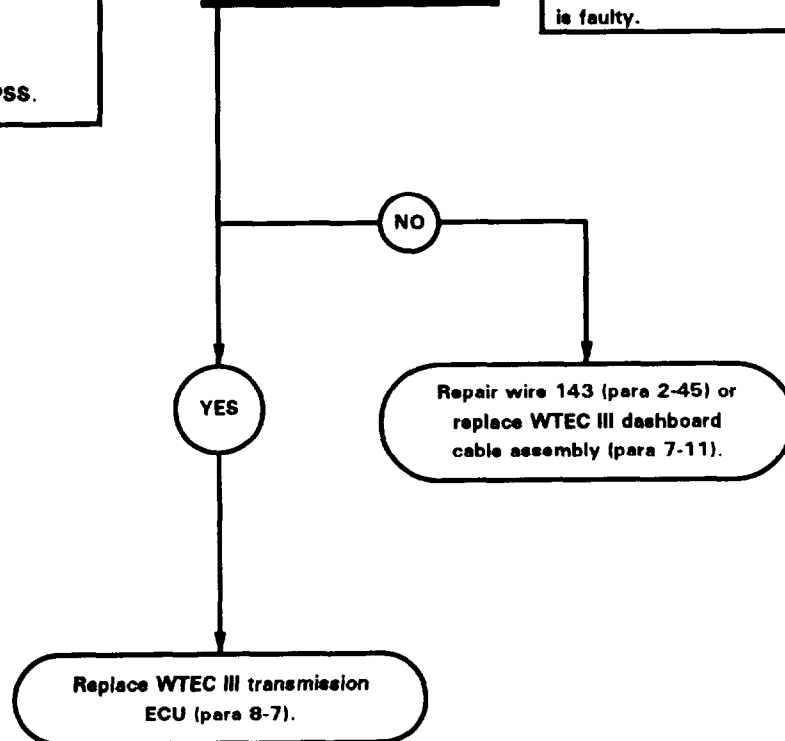
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137. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 13 AND ANY SUB CODE (CONT)

KNOWN INFO
Vehicle runs. Batteries OK.
POSSIBLE PROBLEMS
Faulty WTEC III dashboard cable assembly. Faulty WTEC III transmission ECU. Faulty WTEC III TPSS.

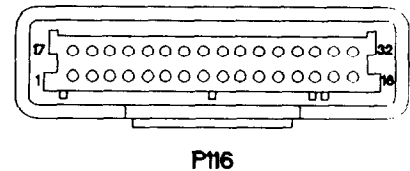
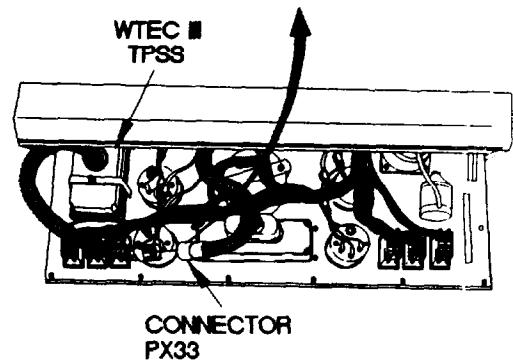
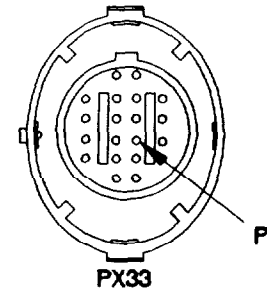
5.
Is continuity present from connector P116-32 to connector PX33P and no short circuits found?

TEST OPTIONS
Continuity Test or STE/CE-R Test #91
REASON FOR QUESTION
If continuity is not present, or short circuits are found, wire 143 is faulty.



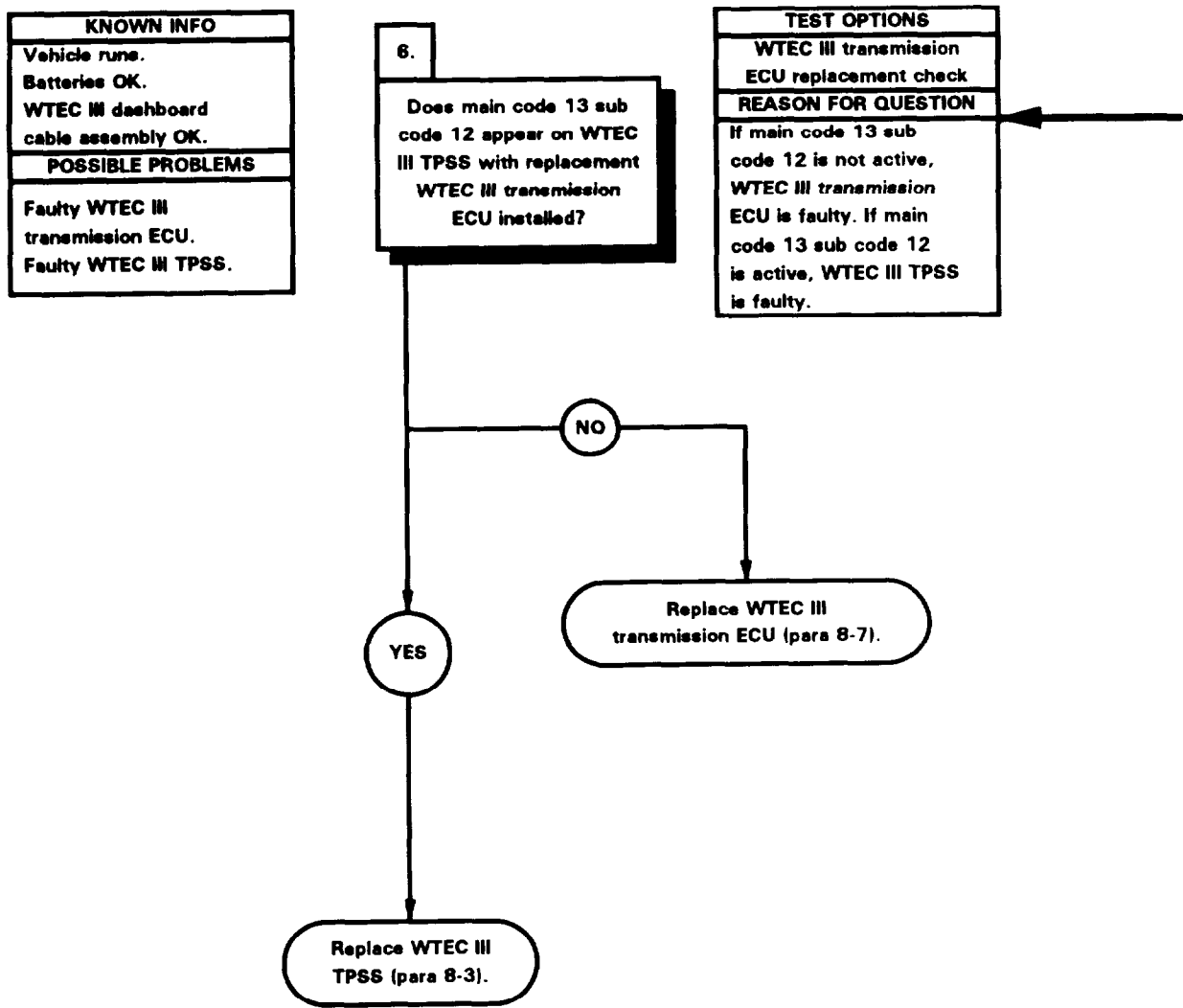
CONTINUITY TEST

- (1) Set multimeter to ohms.
- (2) Connect positive (+) probe of multimeter to connector P116-32.
- (3) Connect negative (-) probe of multimeter to connector PX33P and note reading on multimeter.
- (4) Connect negative (-) probe of multimeter to all other sockets in connector PX33, one at a time, and note reading on multimeter.
- (5) If continuity is not present in step 3, or continuity is present in step 4, repair wire 143 (para 2-45) or replace WTEC III dashboard cable assembly (para 7-11).
- (6) Connect connector PX33 to WTEC III TPSS.
- (7) Install instrument panel assembly (para 7-15).



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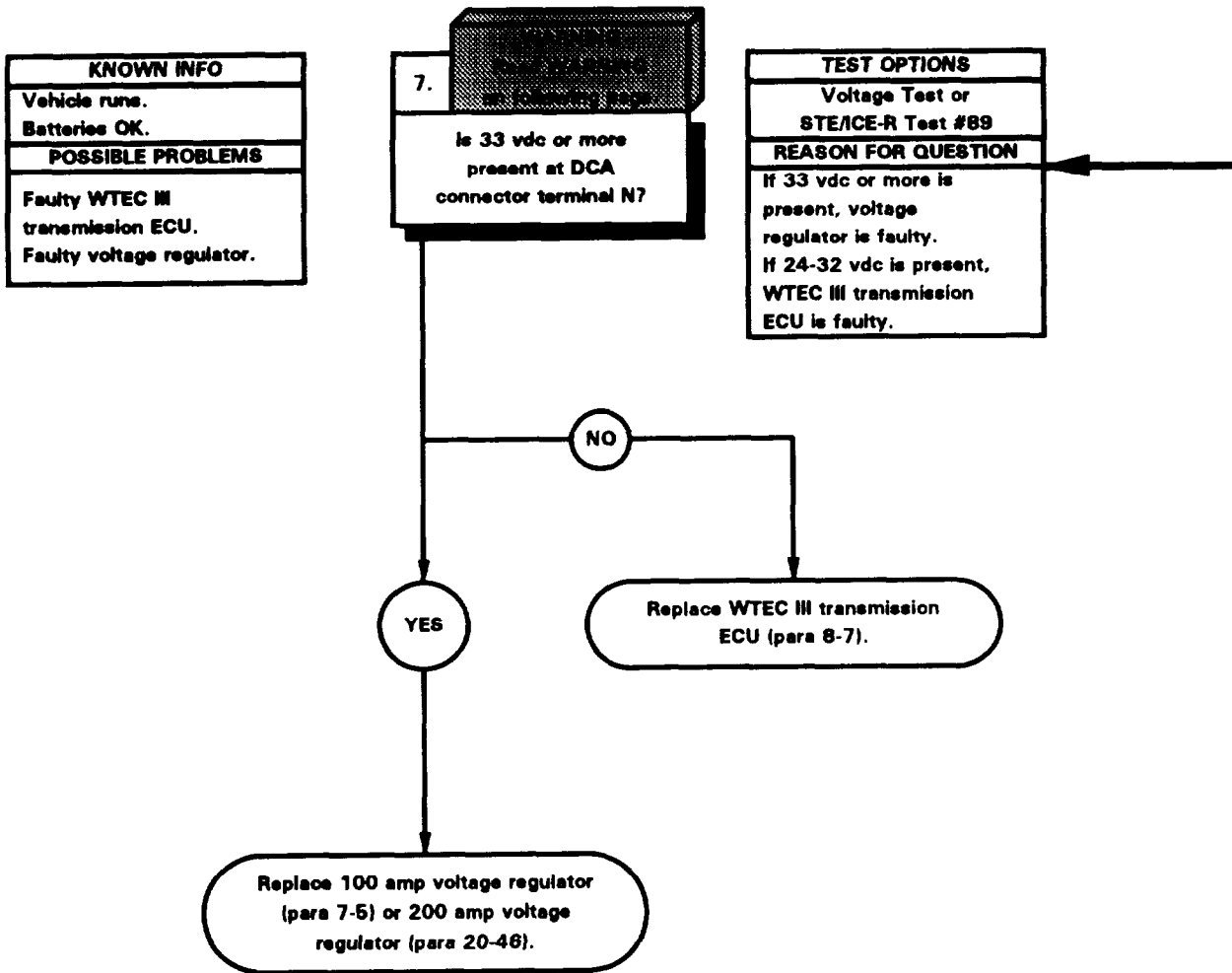
f37. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) DISPLAYS MAIN CODE 13 AND ANY SUB CODE (CONT)



**WTEC III TRANSMISSION ECU
REPLACEMENT CHECK**

- (1) Install replacement WTEC III transmission ECU (para 8-7).
- (2) Start engine (TM 9-2320-366-10-1).
- (3) Check to see if main code 13 sub code 12 appears on WTEC III TPSS (para 8-5).
- (4) If main code 13 sub code 12 does not appear, replace WTEC III transmission ECU (para 8-7).
- (5) If main code 13 sub code 12 does appear, replace WTEC III TPSS (para 8-3).
- (6) Shut down engine (TM 9-2320-366-10-1).
- (7) Install original WTEC III transmission ECU (para 8-7).

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

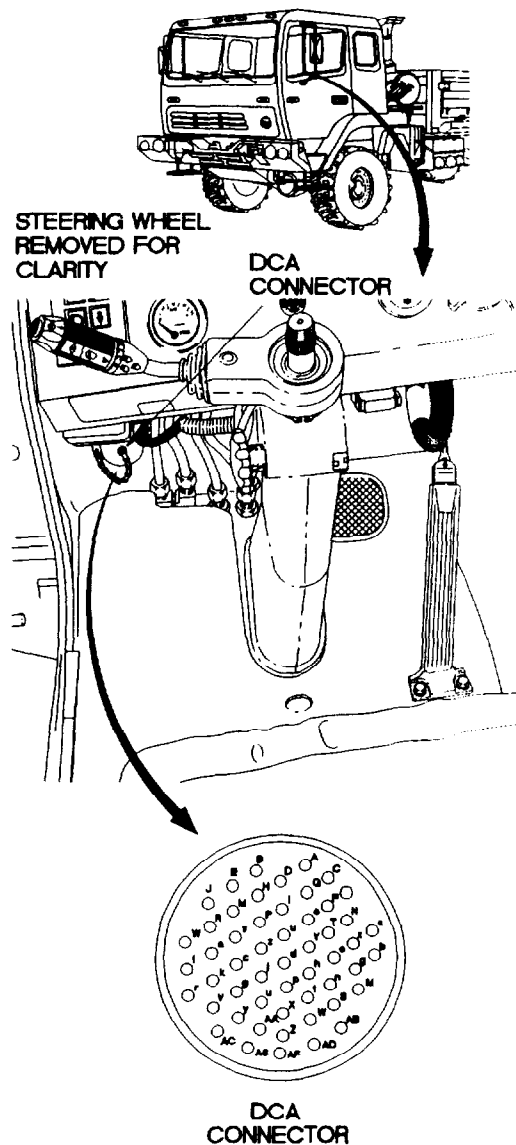


WARNING

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

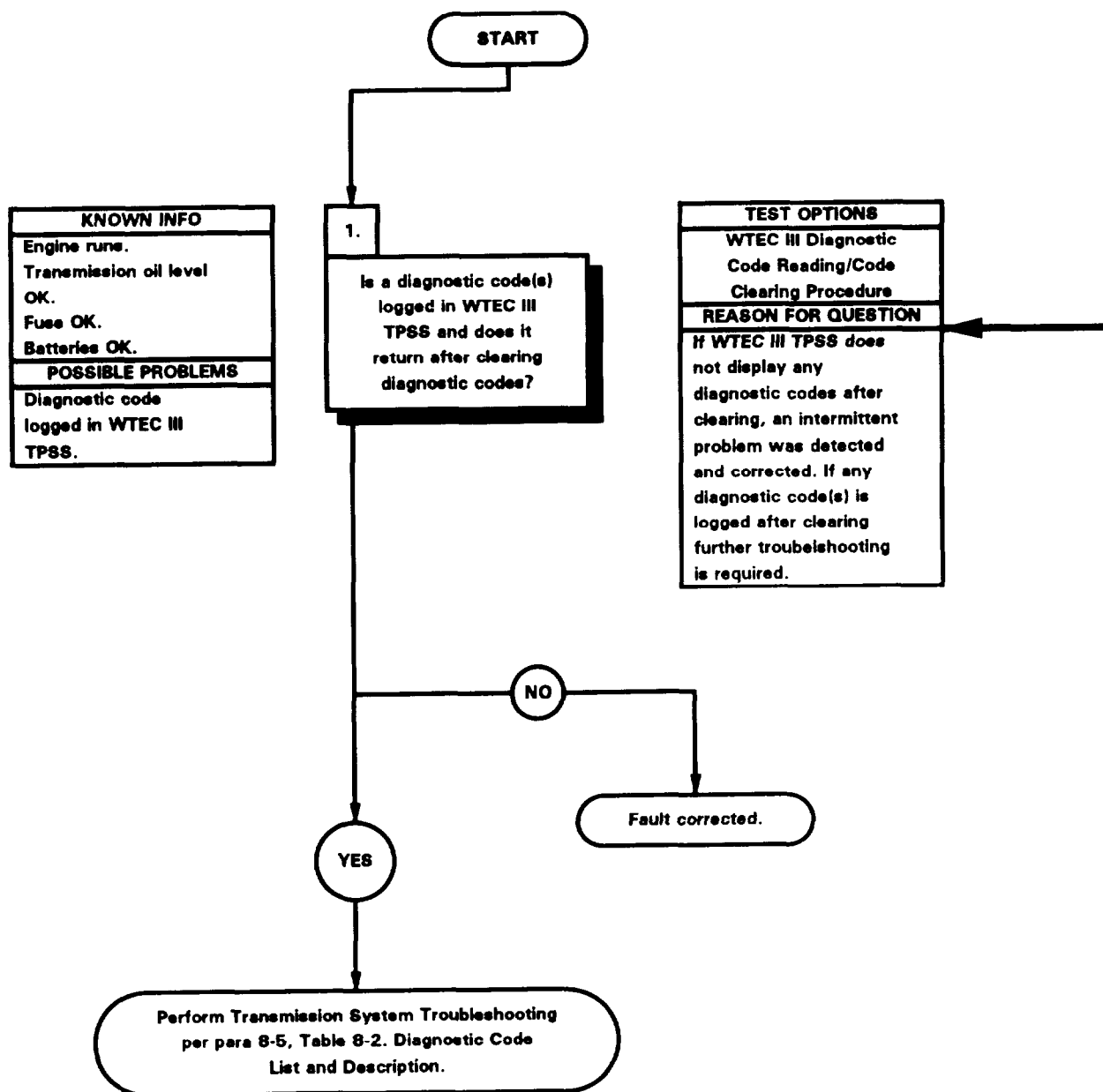
VOLTAGE TEST

- (1) Start engine (TM 9-2320-366-10-1).
- (2) Remove dust cap from DCA connector.
- (3) Set multimeter to volts dc.
- (4) Connect positive (+) probe of multimeter to DCA connector terminal N.
- (5) Connect negative (-) probe of multimeter to DCA connector terminal P and note reading on multimeter.
- (6) If 33 vdc or more is present, replace 100 amp voltage regulator (para 7-5) or 200 amp voltage regulator (para 20-46).
- (7) If 24-32 is present, replace WTEC III transmission ECU (para 8-7).
- (8) Install dust cap on DCA connector.
- (9) Shut down engine (TM 9-2320-366-10-1).



REF 37071

138. WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR (TPSS) LED DISPLAYS "-.-" AND/OR TRANSMISSION DOES NOT SHIFT GEARS
INITIAL SETUP Equipment Conditions Engine running (TM 9-2320-366-10-1).



- 
- (1) Perform WTEC III Code Reading and Code Clearing (para 8-5).
 - (2) If no diagnostic codes are logged after clearing, fault is corrected.
 - (3) If diagnostic codes are still logged, perform Transmission System Troubleshooting of active diagnostic codes per para 8-25, Table 8-2. WTEC III Diagnostic Code List and Description.

2-18. PROPELLER SHAFT TROUBLESHOOTING

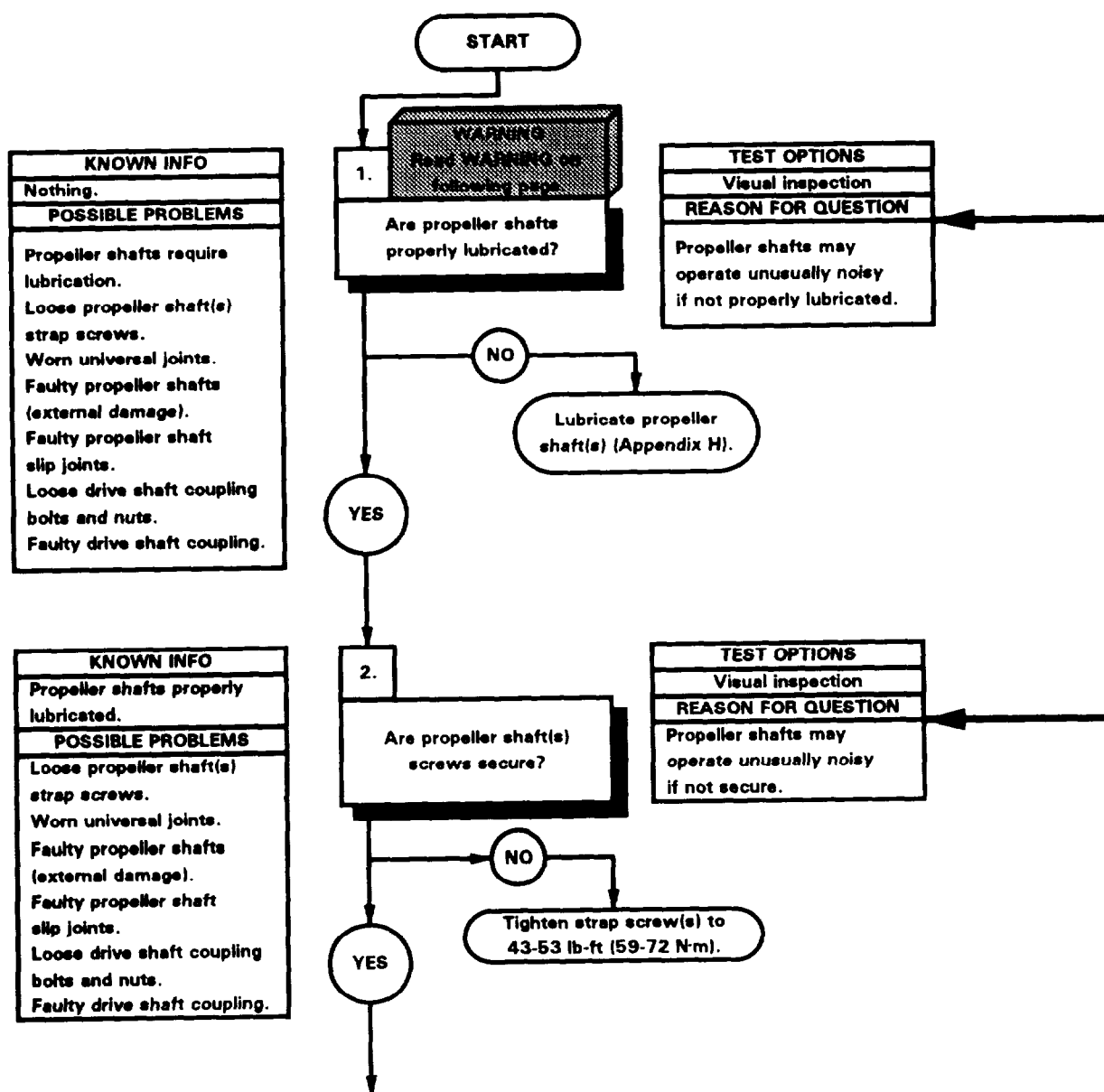
This paragraph covers Propeller Shaft Troubleshooting. The Propeller Shaft Fault Index, Table 2-46, lists faults for the propeller shafts of the vehicle.

Table 2-46. Propeller Shaft Fault Index

Fault No.	Description	Page
g1.	Propeller Shafts or Universal Joints Unusually Noisy When Operating	2-1824



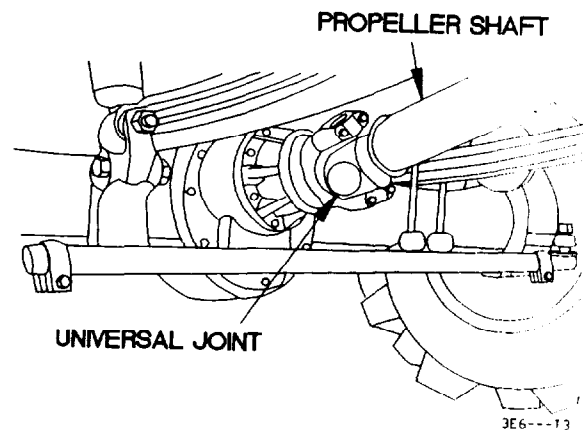
g1. PROPELLER SHAFTS OR UNIVERSAL JOINTS UNUSUALLY NOISY WHEN OPERATING	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Goggles, Industrial (Item 15, Appendix C) Tool Kit, Genl Mech (Item 46, Appendix C) Wrench, Torque, 0-175 lb-ft (Item 58, Appendix C)



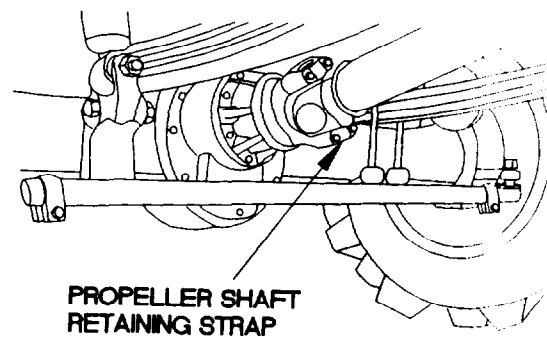
WARNING

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

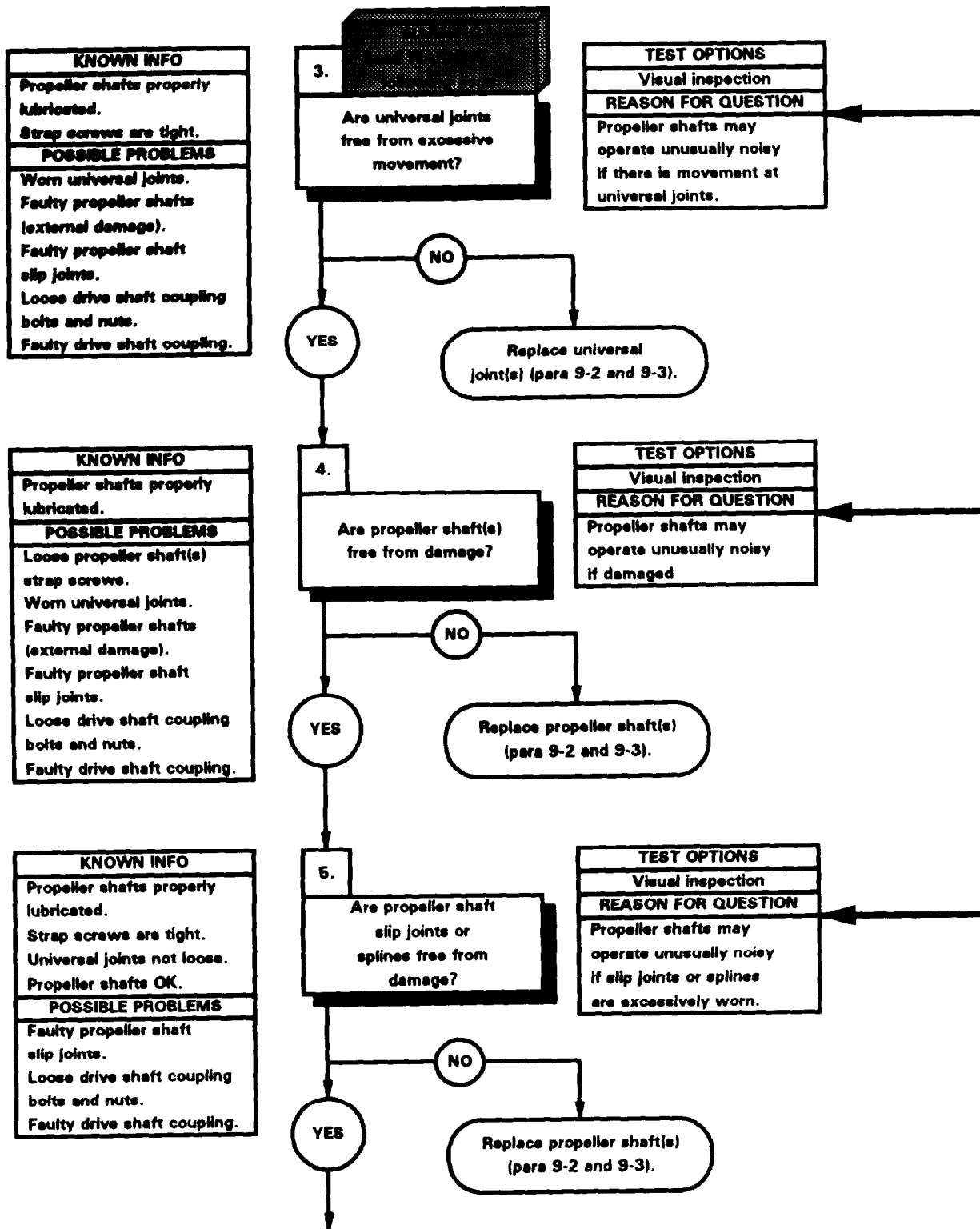
Lubricate propeller shaft lubrication fittings with grease.



Check propeller shaft(s) strap screws for tightness. Tighten all screws to 43-53 lb-ft (59-72 N-m).



g1. PROPELLER SHAFTS OR UNIVERSAL JOINTS UNUSUALLY NOISY WHEN OPERATING (CONT)

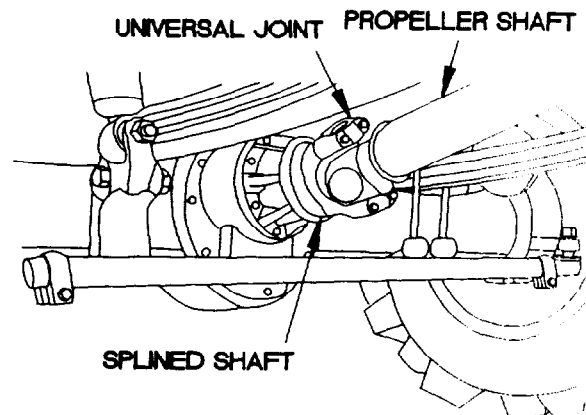


WARNING

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 propeller shaft(s) for excessive movement at universal joints.
- (2) If universal joints show any movement, replace universal joint(s) (para 9-2 or 9-3).

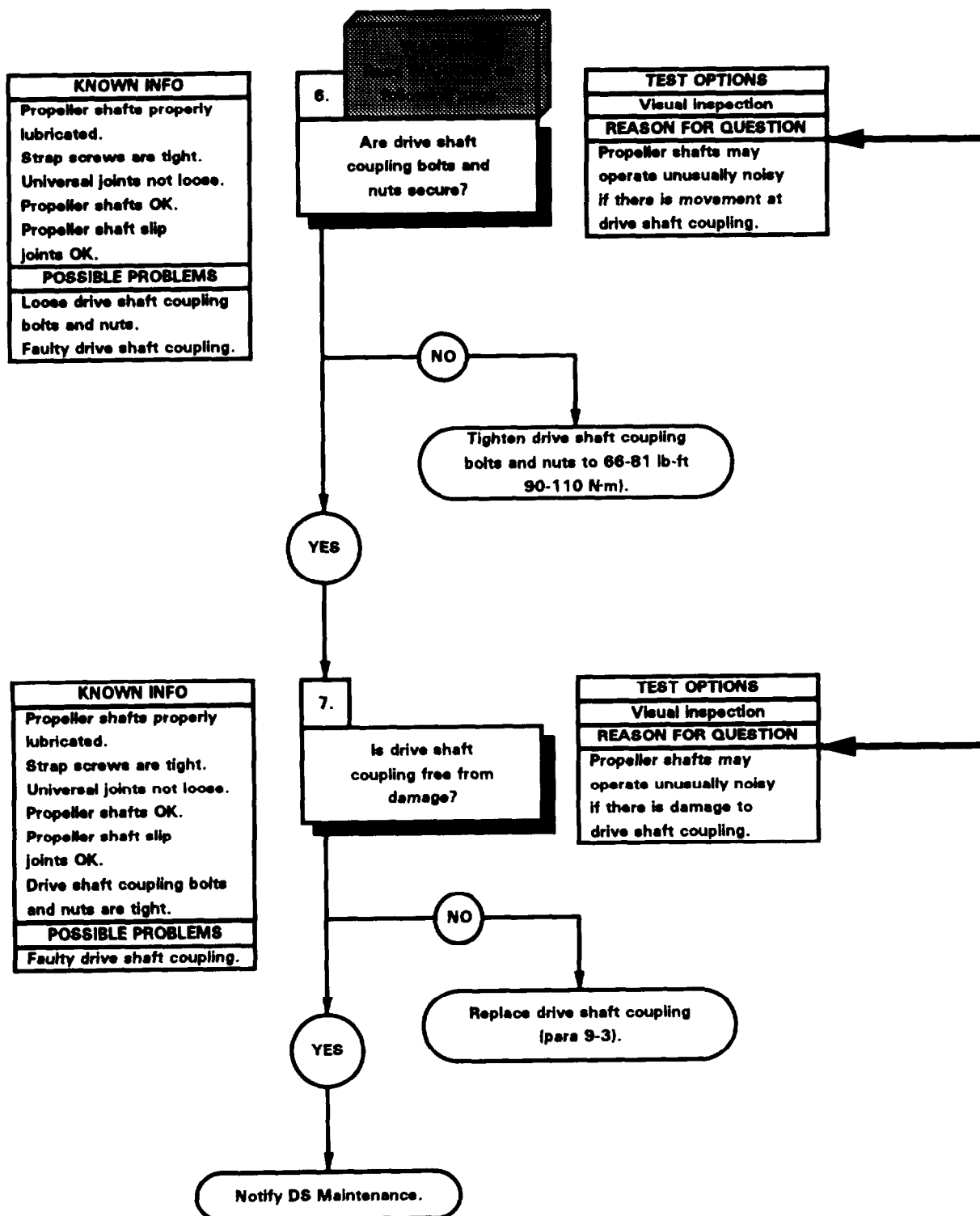
- (1) Check propeller shaft(s) for damaged spline shaft, bent tubing, or missing balance weights.
- (2) If propeller shaft(s) is damaged, replace propeller shaft(s) (para 9-2 or 9-3).



3E6---15

- (1) Inspect slip joints for broken, damaged, or missing teeth.
- (2) Check universal joint cross for wear.
- (3) If propeller shaft slip joints or splines are damaged, replace propeller shaft(s) (para 9-2 or 9-3).

g1. PROPELLER SHAFTS OR UNIVERSAL JOINTS UNUSUALLY NOISY WHEN OPERATING (CONT)

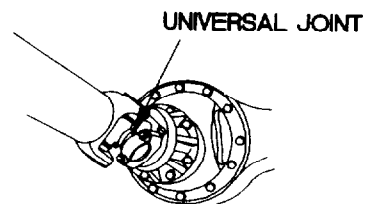
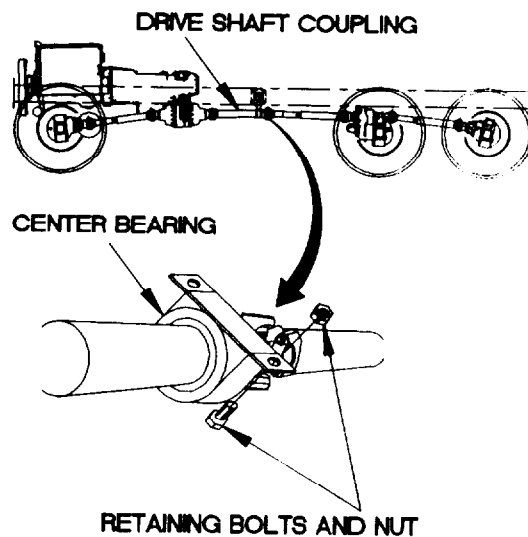


WARNING

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

Inspect drive shaft coupling retaining bolts and nuts for tightness. Tighten bolts and nuts to 66-81 lb-ft (90-110 Nm).

- (1) Inspect drive shaft coupling for bent tubing, missing balance weights, and worn center bearing. Check universal joint cross for wear.
- (2) If drive shaft coupling is damaged, replace drive shaft coupling (para 9-3).
- (3) If drive shaft coupling is not damaged, notify DS Maintenance.



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2-19. POWER TAKE-OFF (PTO) TROUBLESHOOTING

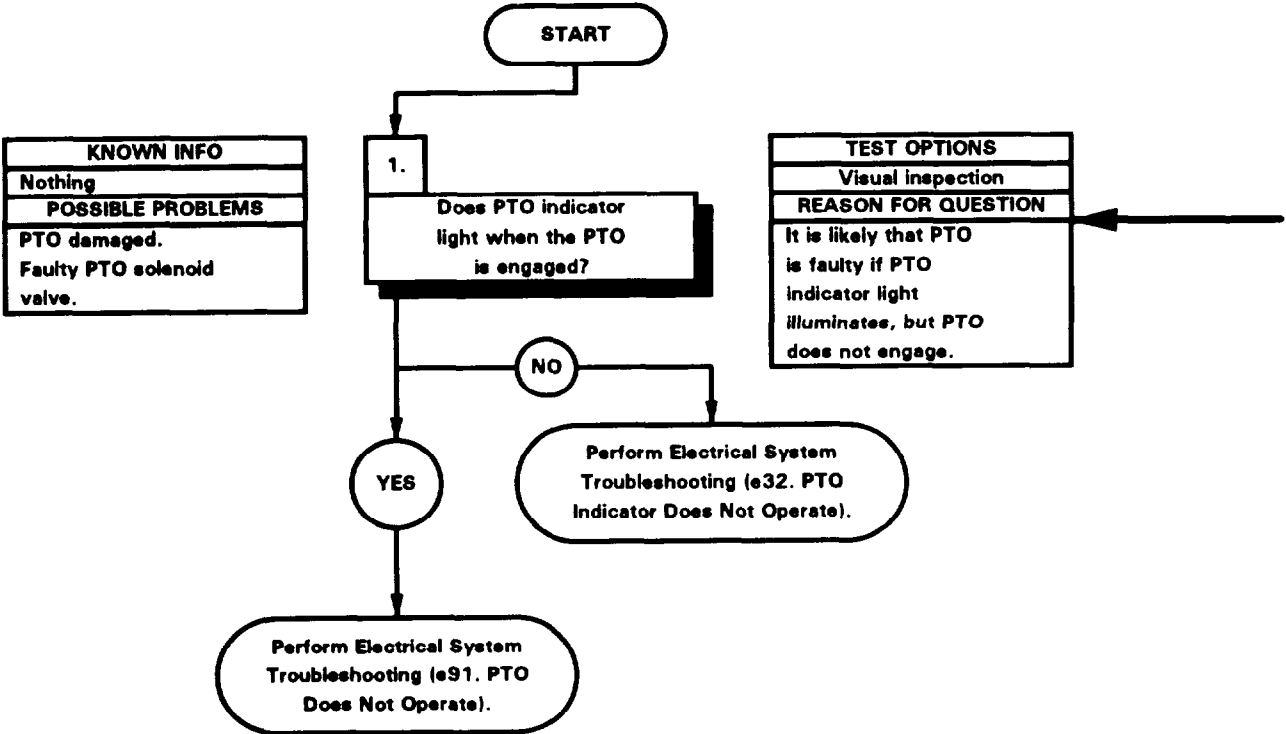
This paragraph covers Power Take-Off (PTO) Troubleshooting. The PTO Fault Index, Table 2-47, lists faults for the PTO.

Table 2-47. PTO Fault Index

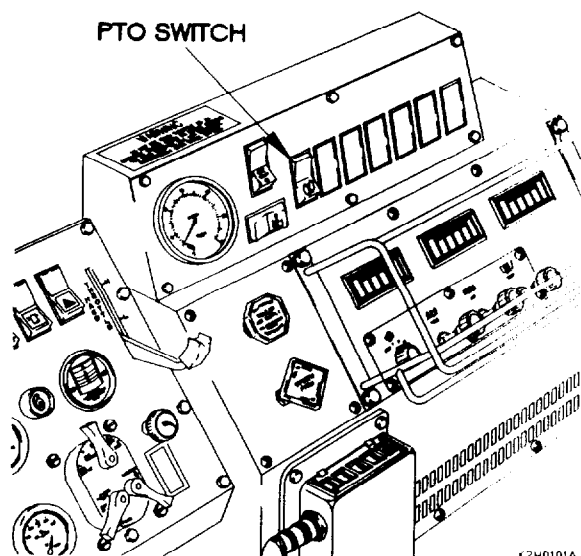
Fault No.	Description	Page
h1.	Power Take-Off (PTO) Does Not Engage	2-1832



h1. POWER TAKE-OFF (PTO) DOES NOT ENGAGE	
INITIAL SETUP	
Equipment Conditions	Tools and Special Tools
Engine running (TM 9-2320-366-10-1).	Tool Kit, Genl Mech (Item 46, Appendix C)
Parking brake on (TM 9-2320-366-10-1).	
Wheels chocked (TM 9-2320-366-10-1).	



- (1) Engage PTO (TM 9-2320-366-10-1).
- (2) Check if PTO indicator lights.
- (3) If PTO indicator does not light, perform Electrical System Troubleshooting (e32. PTO Indicator Does Not Operate).
- (4) If PTO indicator does light, perform Electrical System Troubleshooting (e91. PTO Does Not Operate).
- (5) Disengage PTO (TM 9-2320-366-10-1).
- (6) Shut down engine (TM 9-2320-366-10-1).



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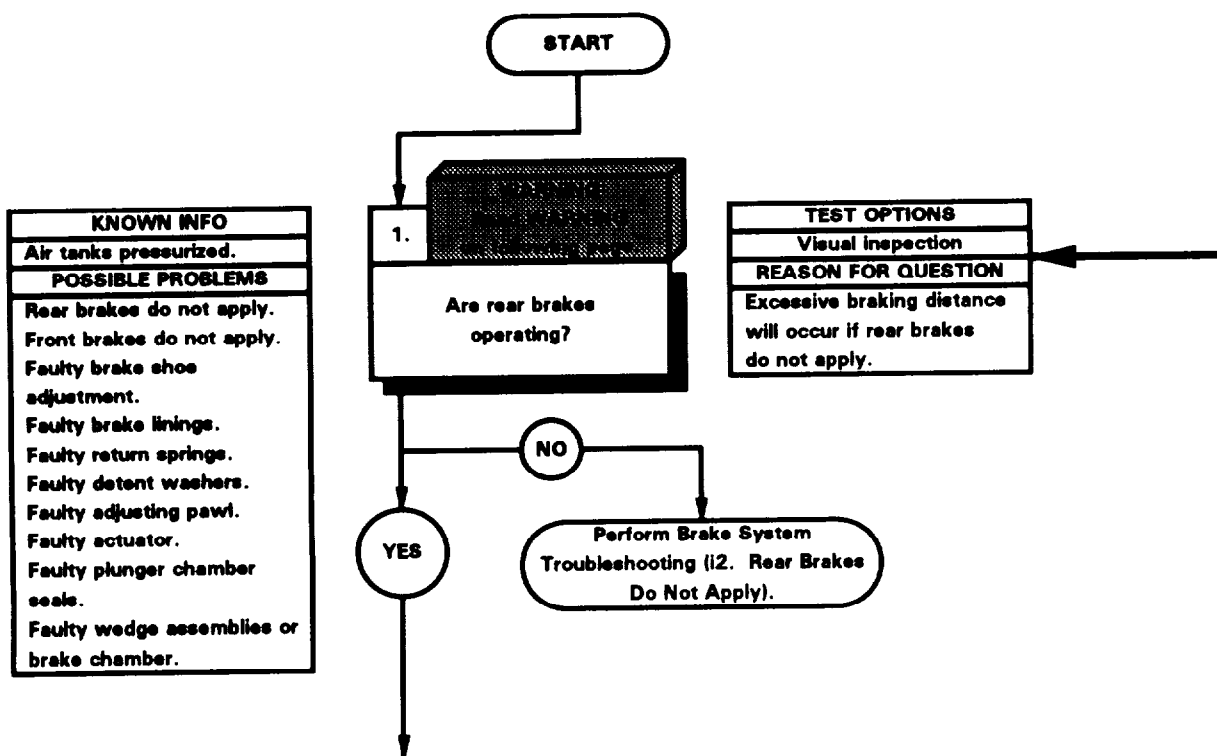
2-20. BRAKE SYSTEM TROUBLESHOOTING

This paragraph covers Brake System Troubleshooting. The Brake System Fault index, Table 2-48, lists faults for the Brake Svstem of the vehicle.

Table 2-48. Brake System Fault Index

Fault No.	Description	Page
i1.	Excessive Braking Distance	2-1836
i2.	Rear Brakes Do Not Appiy	2-1848
i3.	Parking Brake(s) Will Not Release	2-1878
i4.	Front Brakes Overheat	2-1904
i5.	Vehicle Brakes Unevenly, Brakes Pull to One Side or Grab	2-1910
i6.	Front Brakes Do Not Apply	2-1924
i7.	Rear Brakes Overheat	2-1934
i8.	Parking Brake Does Not Apply	2-1942

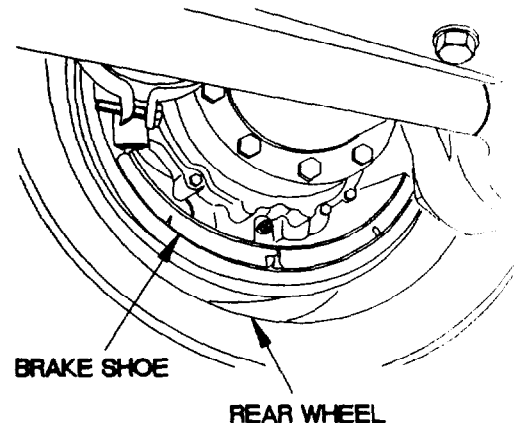
11. EXCESSIVE BRAKING DISTANCE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Goggles, Industrial (Item 15, Appendix C) Tool Kit, Genl Mech (Item 46, Appendix C) Jack, Hydraulic, Hand (Item 21, Appendix C) Trestle, Motor Vehicle Maintenance (2) (Item 47, Appendix C) Tool, Spring Removal (Item 86, Appendix B)
Personnel Required (2)	



WARNING

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

- (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 (12. Rear Brakes Do Not Apply).

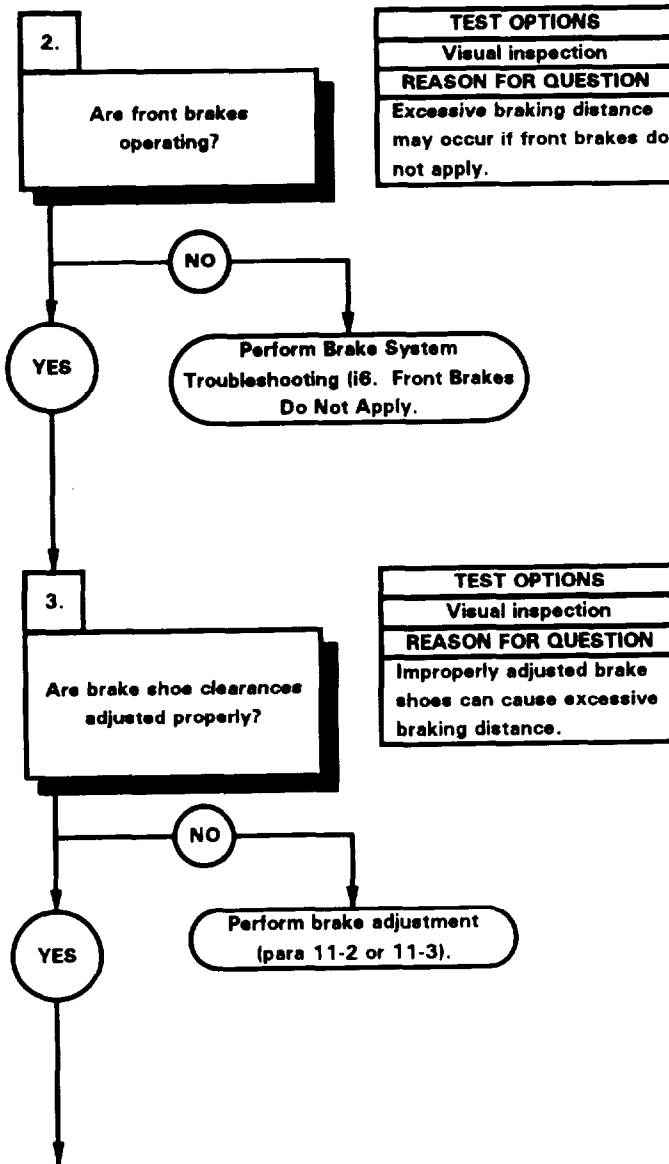


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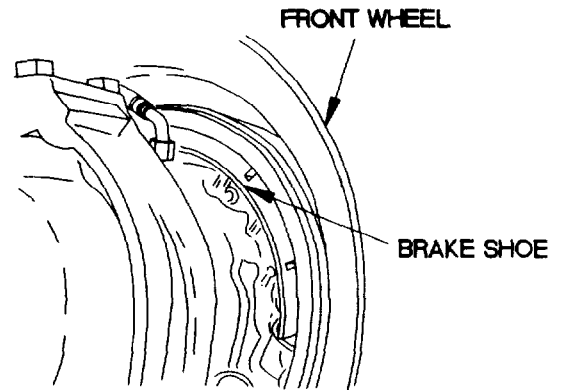
11. EXCESSIVE BRAKING DISTANCE (CONT)

KNOWN INFO
Air tanks pressurized.
Rear brakes apply OK.
POSSIBLE PROBLEMS
Front brakes do not apply.
Faulty brake shoe adjustment.
Faulty brake linings.
Faulty return springs.
Faulty detent washers.
Faulty adjusting pawl.
Faulty actuator.
Faulty plunger chamber seals.
Faulty wedge assemblies or brake chamber.

KNOWN INFO
Air tanks pressurized.
Rear brakes apply OK.
Front brakes apply OK.
POSSIBLE PROBLEMS
Faulty brake shoe adjustment.
Faulty brake linings.
Faulty return springs.
Faulty detent washers.
Faulty adjusting pawl.
Faulty actuator.
Faulty plunger chamber seals.
Faulty wedge assemblies or brake chamber.



- (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).

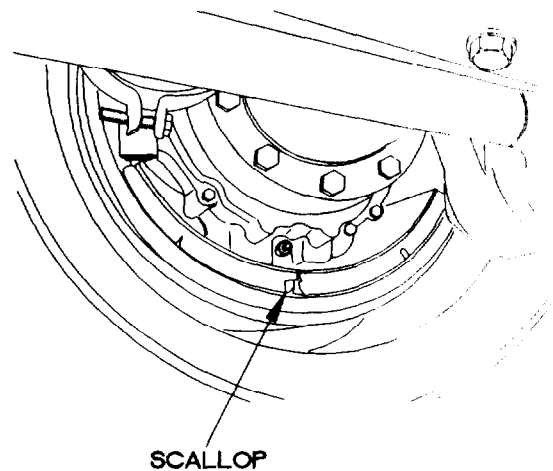


- (1) Jack up axle with affected brakes and support with trestles.
- (2) Make periodic brake applications to position floating shoes.

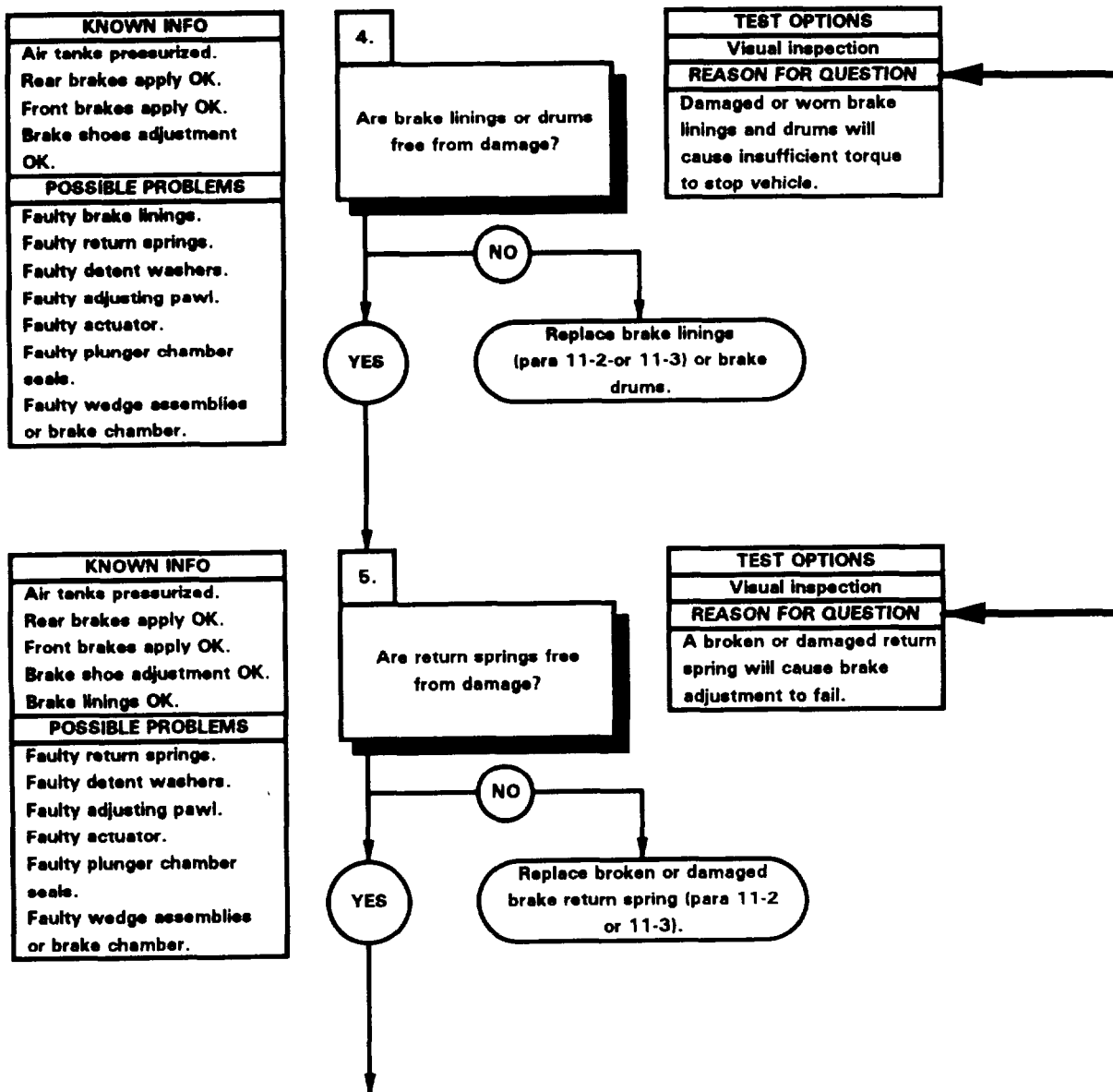
NOTE

Over time a ridge will form on the outer edge of the brake shoes. This is normal and does not affect brake shoe serviceability.

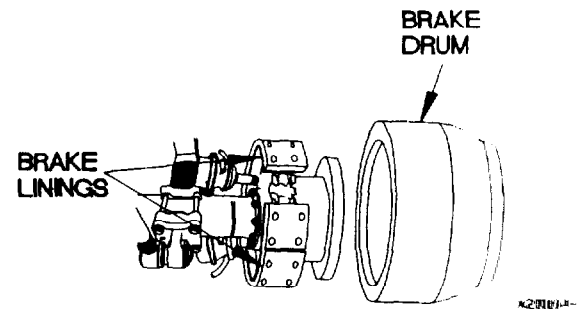
- (3) Measure shoe clearance checking along centerline of shoe at scallop. Rotate wheel during check.
- (4) If clearance is not between .020" and .040", adjust brakes (para 11-2 or 11-3).



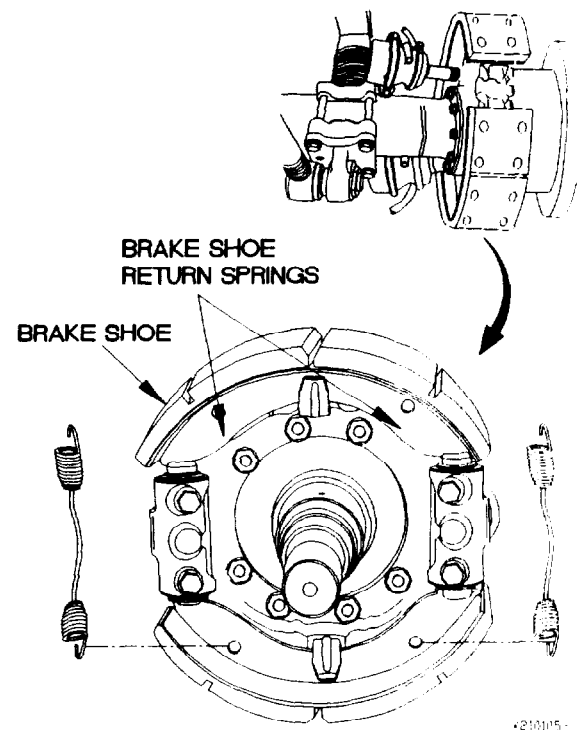
11. EXCESSIVE BRAKING DISTANCE (CONT)



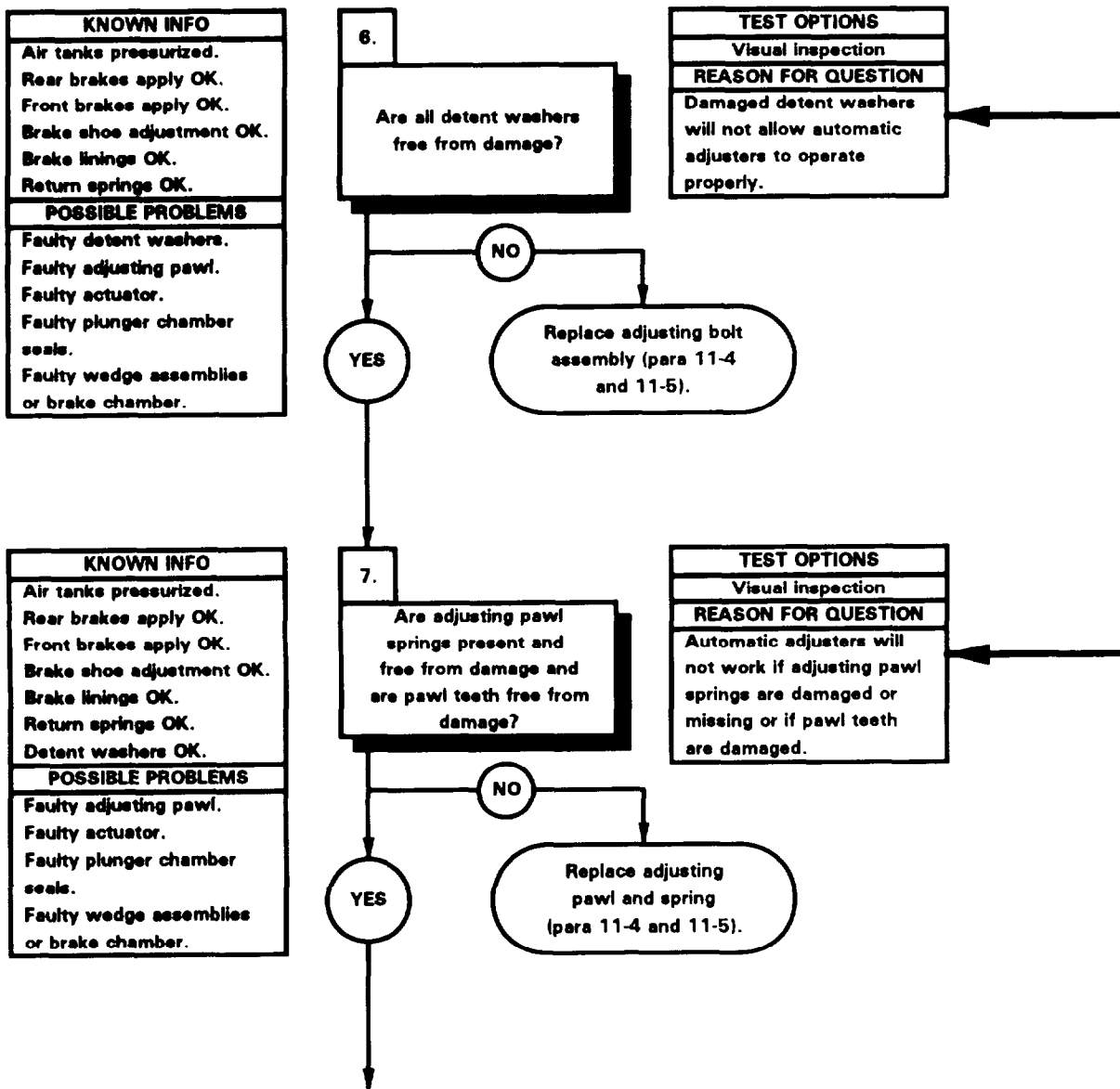
- (1) Remove lugnuts and lift off wheel.
- (2) Slide brake drum off axle.
- (3) Inspect brake linings for worn, glazed, damaged condition, or contamination (para 11-2).
- (4) Inspect brake drum for, out of round, scoring, pitting, heat cracks, and blue scorch marks.



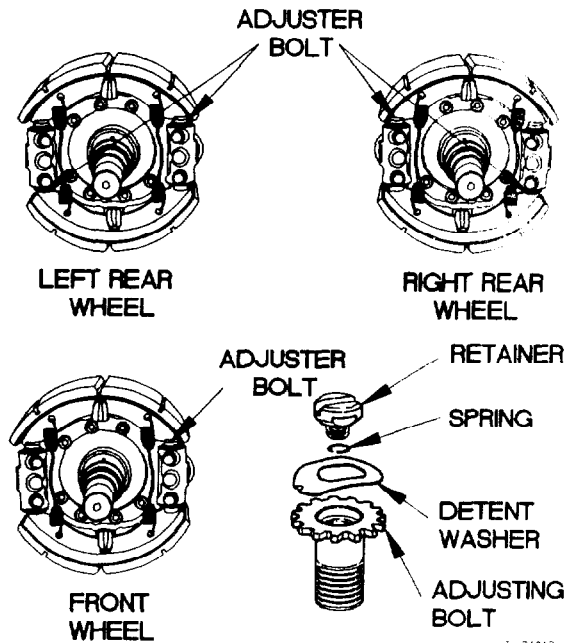
- (1) Detach each return spring from brake shoe.
- (2) Examine return spring for stretching, bluing, damage or breakage.
- (3) If return spring(s) is damaged, replace broken or damaged return spring (s) (para 11-2 or 11-3).



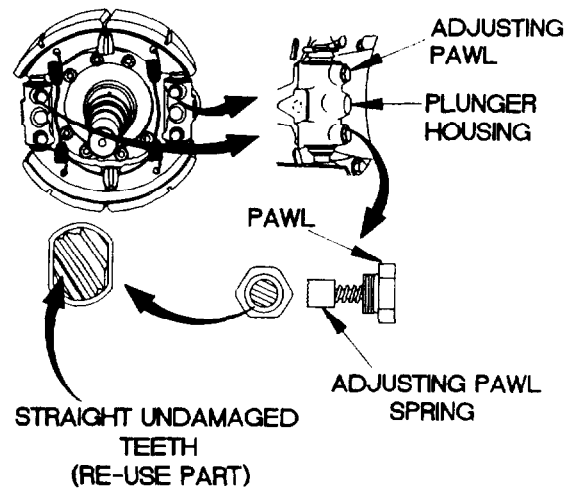
11. EXCESSIVE BRAKING DISTANCE (CONT)



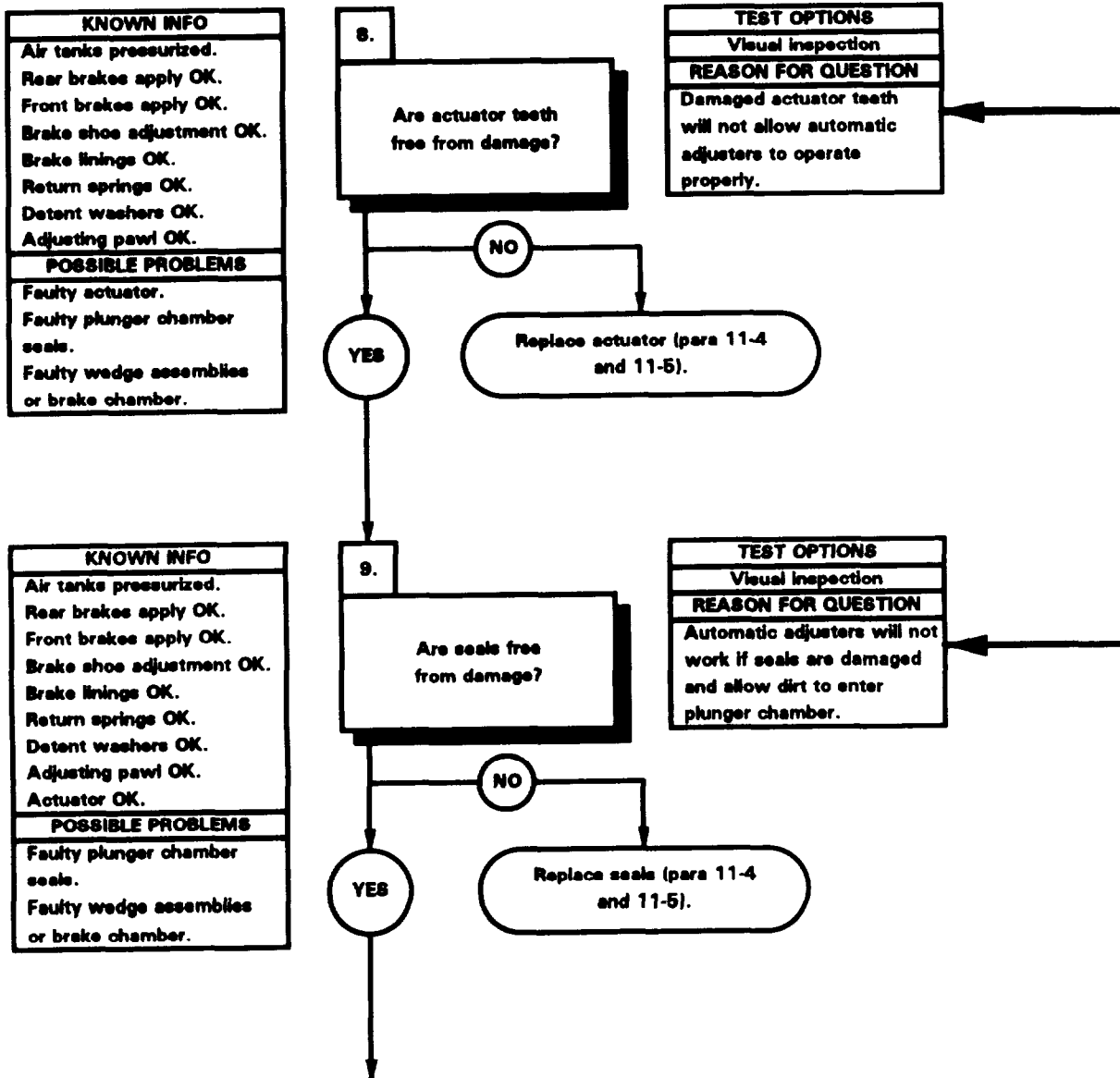
- (1) Remove brake shoes from clips on wheel hub.
- (2) Screw adjuster bolt out of plunger housing.
- (3) Check if detent washer is damaged or broken.
- (4) If detent washer is damaged, replace adjusting bolt assembly (para 11-4 or 11-5).



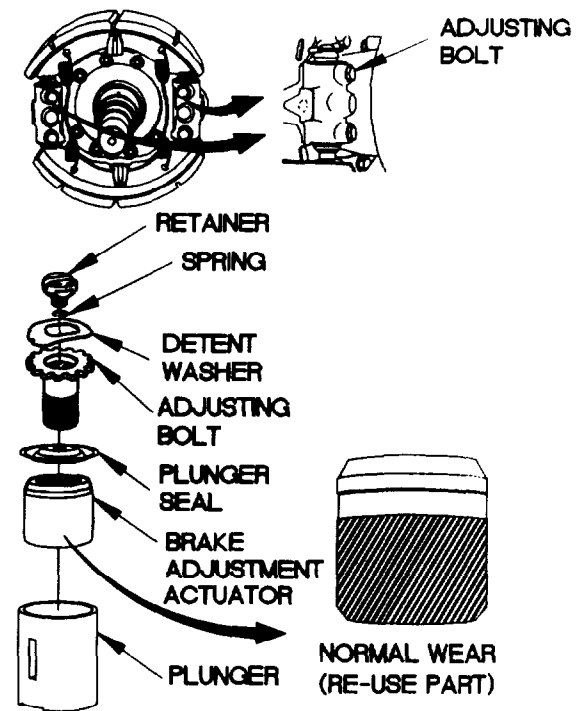
- (1) Unscrew adjusting pawl from plunger housing.
- (2) Check adjusting pawl springs for damage. Ensure that springs are not missing or broken.
- (3) Check adjusting pawl teeth for damage and abrasion.



11. EXCESSIVE BRAKING DISTANCE (CONT)

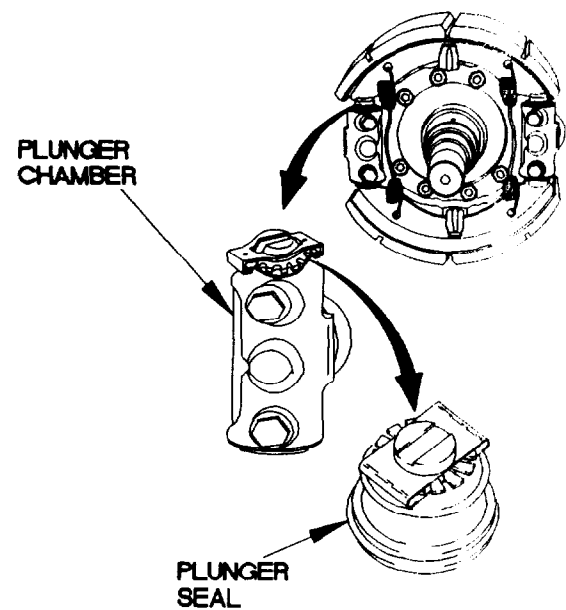


- (1) Lift actuator from plunger housing.
- (2) Check actuator teeth for damage.

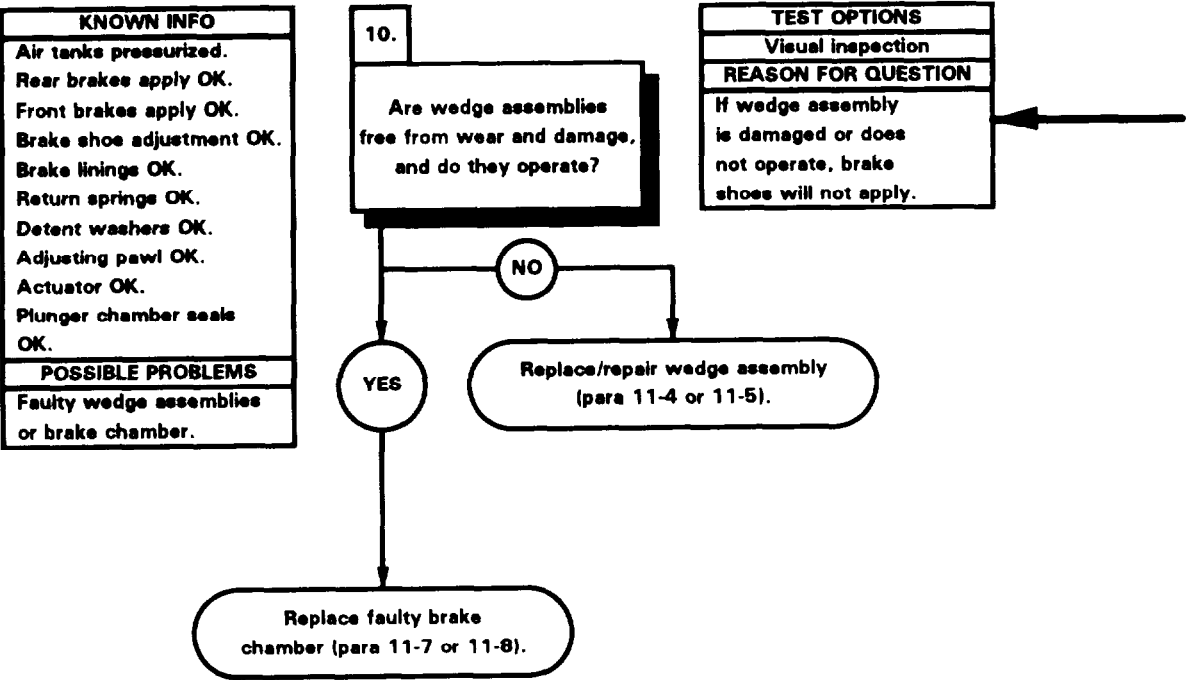


x210108-

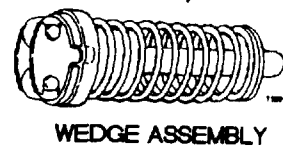
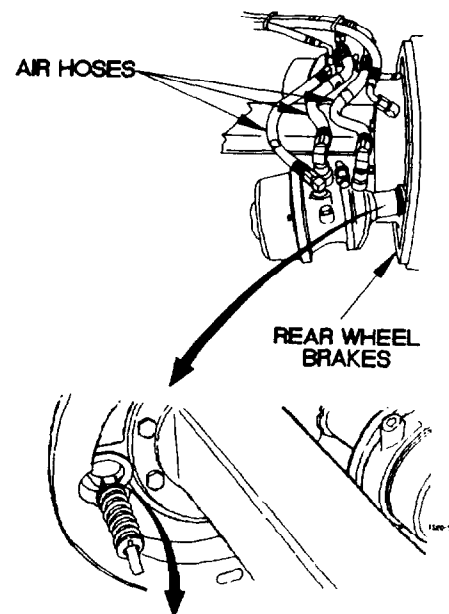
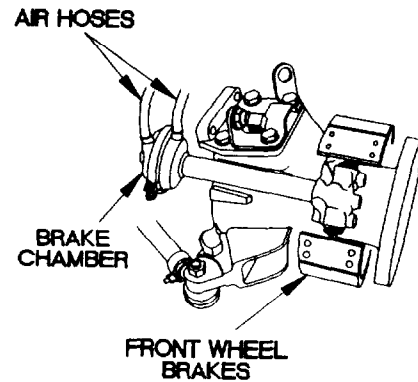
- (1) Check that seal elements are not damaged or broken.
- (2) A damaged seal may permit dirt to enter plunger chamber and interfere with adjustment.



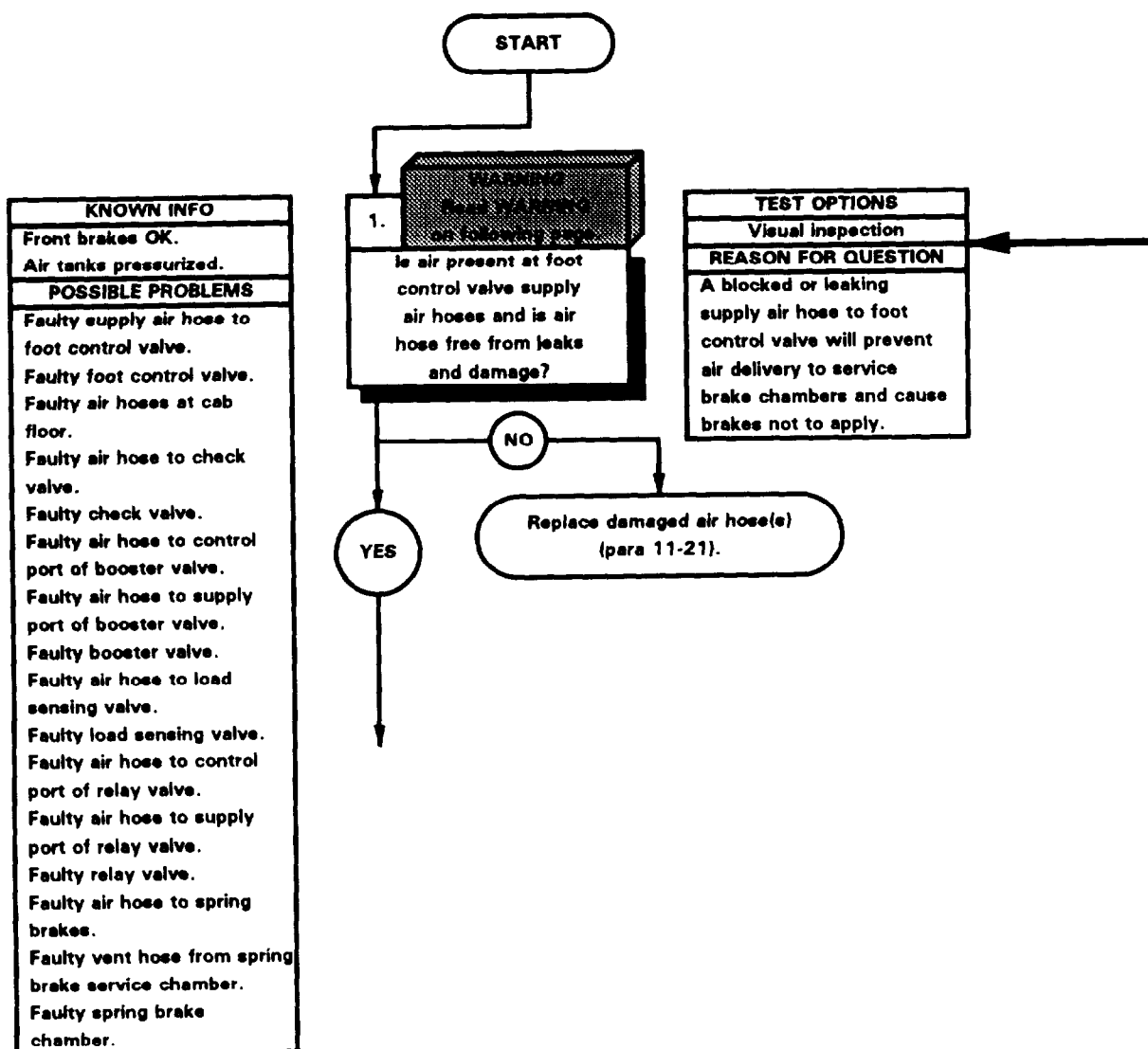
11. EXCESSIVE BRAKING DISTANCE (CONT)



- (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.



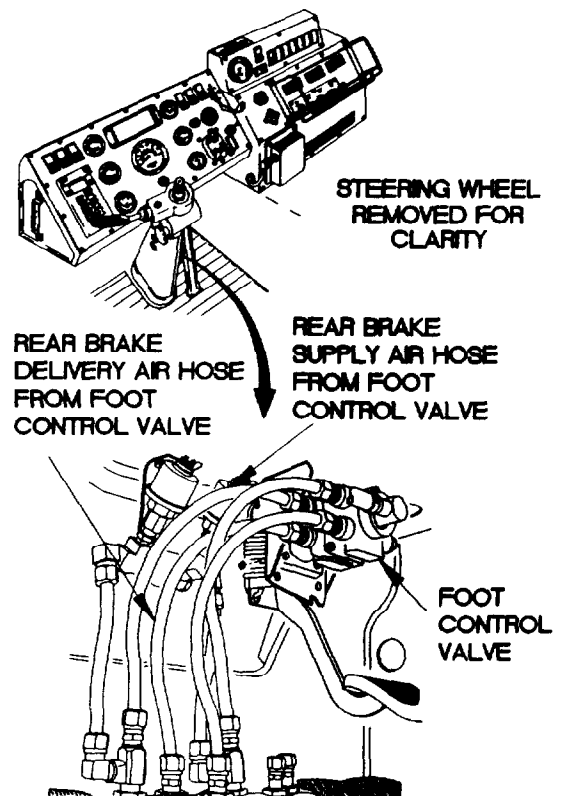
12. REAR BRAKES DO NOT APPLY	
INITIAL SETUP	
Equipment Conditions	Tools and Special Tools
Engine shut down (TM 9-2320-366-10-1).	Tool Kit, Genl Mech (Item 46, Appendix C)
Personnel Required	Goggles, Industrial (Item 15, Appendix C)
(2)	



WARNING

- When working on parking brake control system vehicle may roll. Wheel shocks must be positioned in front of and behind one of the rear wheels to prevent it from rolling. Failure to comply may cause serious injury or death to personnel.
- Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

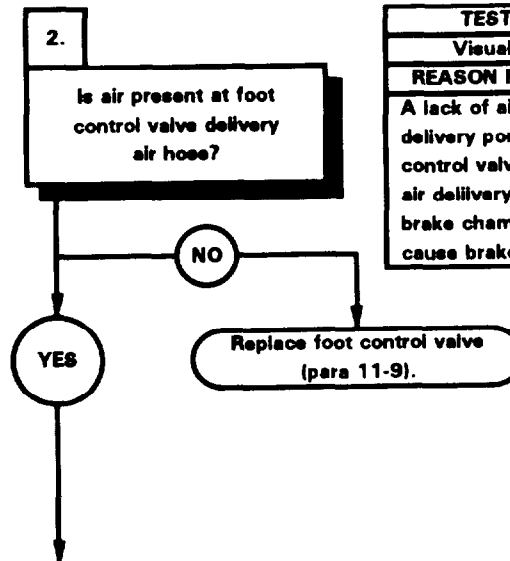
- (1) Loosen supply air hose at foot control valve.
- (2) Check for presence of air. If no air is present, replace air hose (para 11-21).
- (3) Tighten supply air hose to foot control valve.



Y2102014

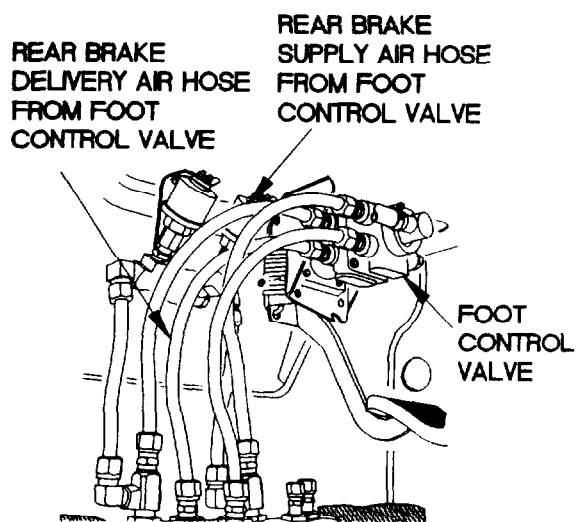
12. REAR BRAKES DO NOT APPLY (CONT)

KNOWN INFO
Front brakes OK. Air tanks pressurized. Supply air hose to foot control valve OK.
POSSIBLE PROBLEMS
Faulty foot control valve. Faulty air hoses at cab floor. Faulty air hose to check valve. Faulty check valve. Faulty air hose to control port of booster valve. Faulty air hose to supply port of booster valve. Faulty booster valve. Faulty air hose to load sensing valve. Faulty load sensing valve. Faulty air hose to control port of relay valve. Faulty air hose to supply port of relay valve. Faulty relay valve. Faulty air hoses to spring brakes. Faulty vent hose from spring brake service chamber. Faulty spring brake chamber.



TEST OPTIONS
Visual inspection
REASON FOR QUESTION
A lack of air from delivery port of foot control valve will prevent air delivery to service brake chambers and cause brakes not to apply.

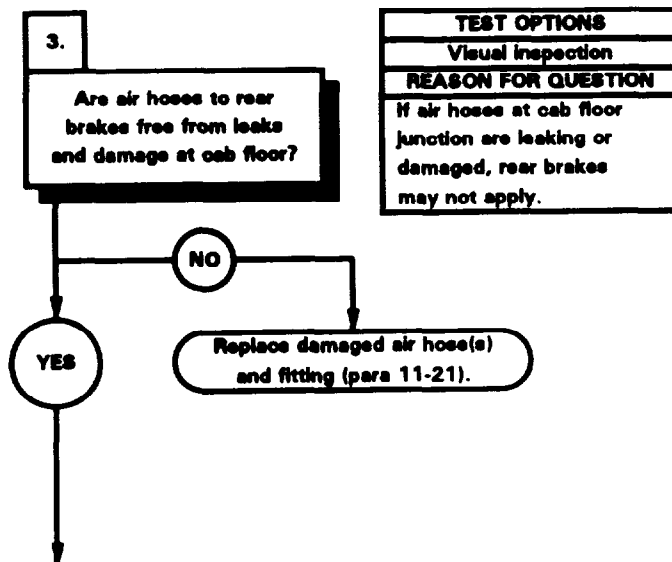
- (1) Loosen delivery air hose at foot control valve.
- (2) Apply brake and check for presence of air.
- (3) If no air is present, replace foot control valve (para 11-9).
- (3) Tighten delivery air hose on foot control valve.



x210202-

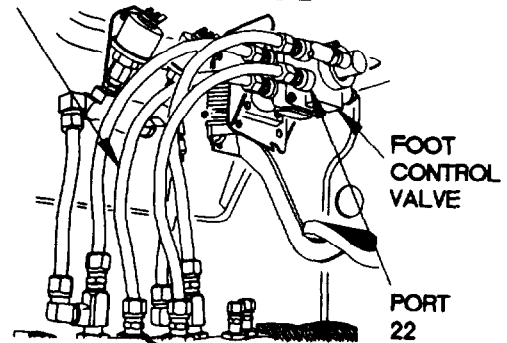
12. REAR BRAKES DO NOT APPLY (CONT)

KNOWN INFO
Front brakes OK. Air tanks pressurized. Supply air hose to foot control valve OK. Foot control valve OK.
POSSIBLE PROBLEMS
Faulty air hoses at cab floor. Faulty air hose to check valve. Faulty check valve. Faulty air hose to control port of booster valve. Faulty air hose to supply port of booster valve. Faulty booster valve. Faulty air hose to load sensing valve. Faulty load sensing valve. Faulty air hose to control port of relay valve. Faulty air hose to supply port of relay valve. Faulty relay valve. Faulty air hoses to spring brakes. Faulty vent hose from spring brake service chamber. Faulty spring brake chamber.

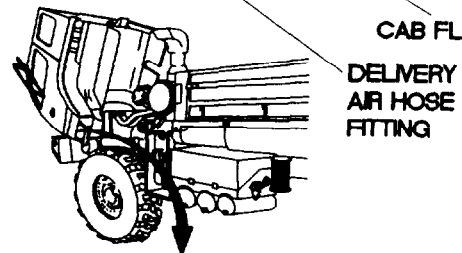


- (1) Loosen delivery air hose at cab floor.
- (2) Apply brakes.
- (3) Check for presence of air from air hose when brake is applied.
- (4) If no air is present, replace air hose (para 11-21).
- (5) Tighten air hose at cab floor.
- (6) Raise cab (TM 9-2320-366-10-1).
- (7) Loosen delivery air hose under cab floor.
- (8) Apply foot brake.
- (9) Check for presence of air from fitting when brake is applied.
- (10) If no air is present, replace air hose and fitting (para 11-21).
- (11) Tighten air hose and fitting.

REAR BRAKE
DELIVERY AIR HOSE
FROM FOOT CONTROL VALVE

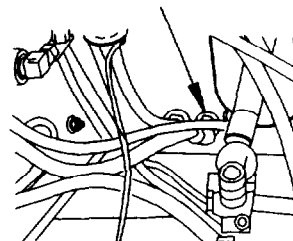


CAB FLOOR



DELIVERY
AIR HOSE
FITTING

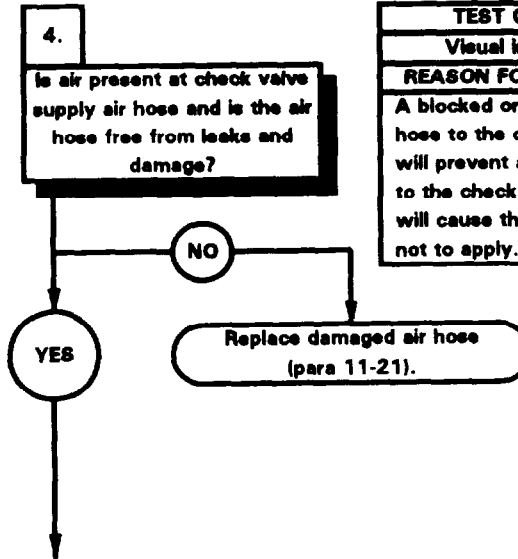
FOOT BRAKE CONTROL VALVE
DELIVERY AIR HOSE FITTING
UNDER CAB FLOOR



X210203-

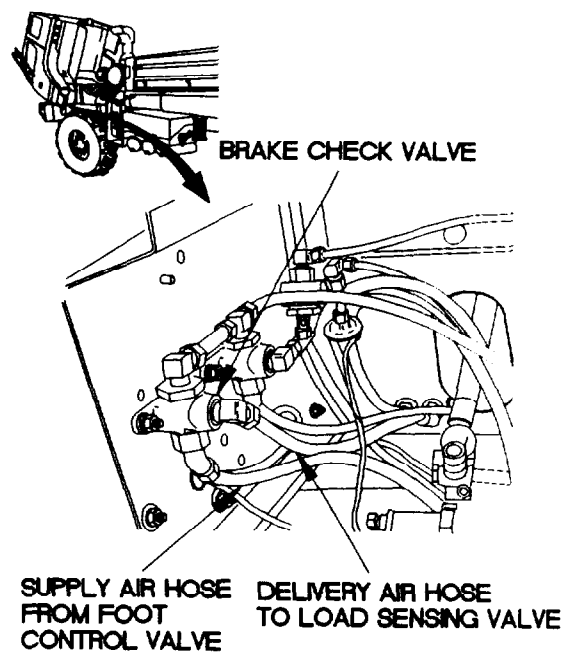
i2. REAR BRAKES DO NOT APPLY (CONT)

KNOWN INFO
Front brakes OK. Air tanks pressurized. Supply air hose to foot control valve OK. Foot control valve OK. Air hoses at cab floor OK.
POSSIBLE PROBLEMS
Faulty air hose to check valve. Faulty check valve. Faulty air hose to control port of booster valve. Faulty air hose to supply port of booster valve. Faulty booster valve. Faulty air hose to load sensing valve. Faulty load sensing valve. Faulty air hose to control port of relay valve. Faulty air hose to supply port of relay valve. Faulty relay valve. Faulty air hoses to spring brakes. Faulty vent hose from spring brake service chamber. Faulty spring brake chamber.



TEST OPTIONS
Visual Inspection
REASON FOR QUESTION
A blocked or leaking air hose to the check valve will prevent air delivery to the check valve and will cause the rear brakes not to apply.

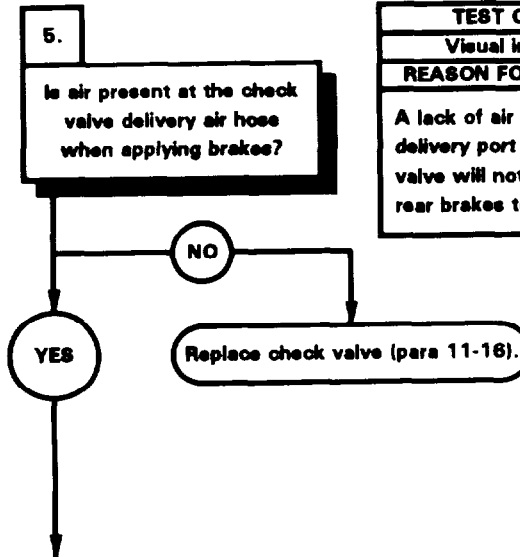
- (1) Loosen supply air hose at check valve.
- (2) Apply brakes.
- (3) Check for presence of air at air hose when brake is applied.
- (4) If no air is present, replace air hose (para 11-21).
- (5) Tighten air hose at supply port of check valve.



x210204-

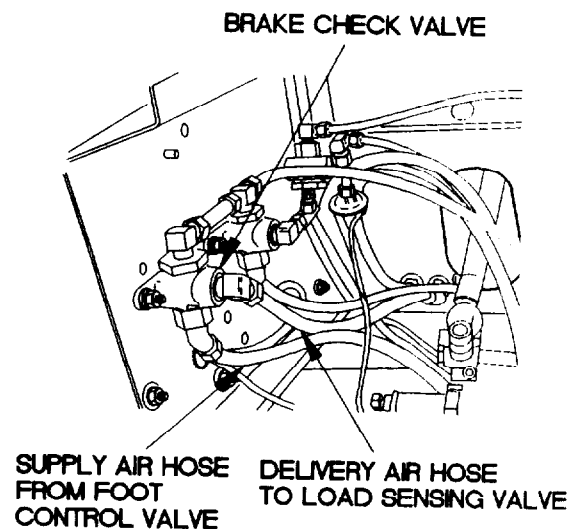
12. REAR BRAKES DO NOT APPLY (CONT)

KNOWN INFO
Front brakes OK. Air tanks pressurized. Supply air hose to foot control valve OK. Foot control valve OK. Air hoses at cab floor OK. Air hose to check valve OK.
POSSIBLE PROBLEMS
Faulty check valve. Faulty air hose to control port of booster valve. Faulty air hose to supply port of booster valve. Faulty booster valve. Faulty air hose to load sensing valve. Faulty load sensing valve. Faulty air hose to control port of relay valve. Faulty air hose to supply port of relay valve. Faulty relay valve. Faulty air hoses to spring brakes. Faulty vent hose from spring brake service chamber. Faulty spring brake chamber.



TEST OPTIONS
Visual inspection
REASON FOR QUESTION
A lack of air from the air delivery port of the check valve will not allow the rear brakes to be applied.

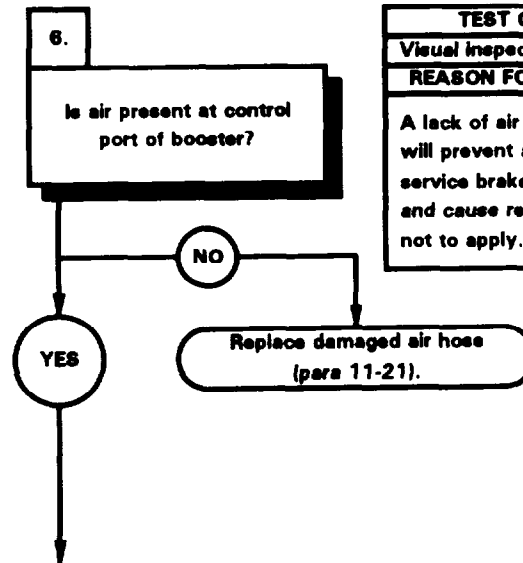
- (1) Loosen delivery air hose on check valve.
- (2) Apply brakes.
- (3) Check for presence of air from air hose when brake is applied.
- (4) If no air is present, replace check valve (para 11-16).
- (5) Tighten delivery air hose on check valve.



X210205-

i2. REAR BRAKES DO NOT APPLY (CONT)

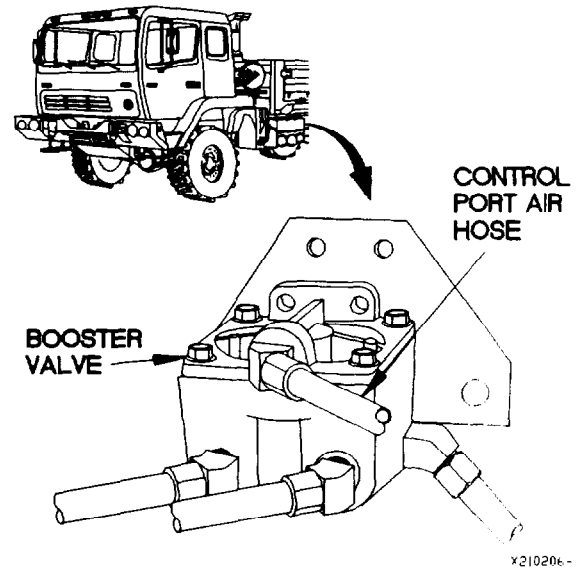
KNOWN INFO
Front brakes OK. Air tanks pressurized. Supply air hose to foot control valve OK. Foot control valve OK. Air hoses at cab floor OK. Air hose to check valve OK. Check valve OK.
POSSIBLE PROBLEMS
Faulty air hose to control port of booster valve. Faulty air hose to supply port of booster valve. Faulty booster valve. Faulty air hose to load sensing valve. Faulty load sensing valve. Faulty air hose to control port of relay valve. Faulty air hose to supply port of relay valve. Faulty relay valve. Faulty air hoses to spring brakes. Faulty vent hose from spring brake service chamber. Faulty spring brake chamber.



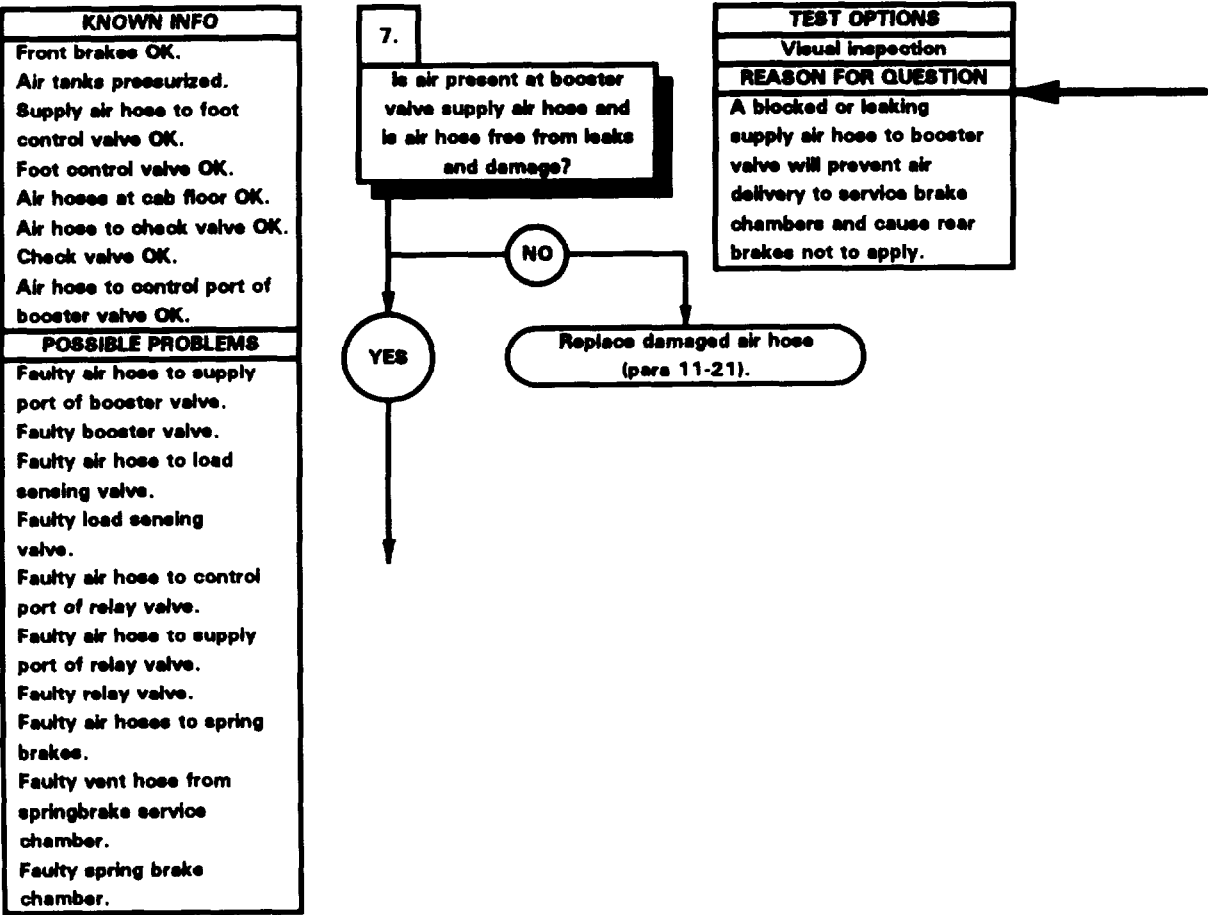
TEST OPTIONS
Visual inspection
REASON FOR QUESTION
A lack of air at control port will prevent air delivery to service brake chambers and cause rear brakes not to apply.



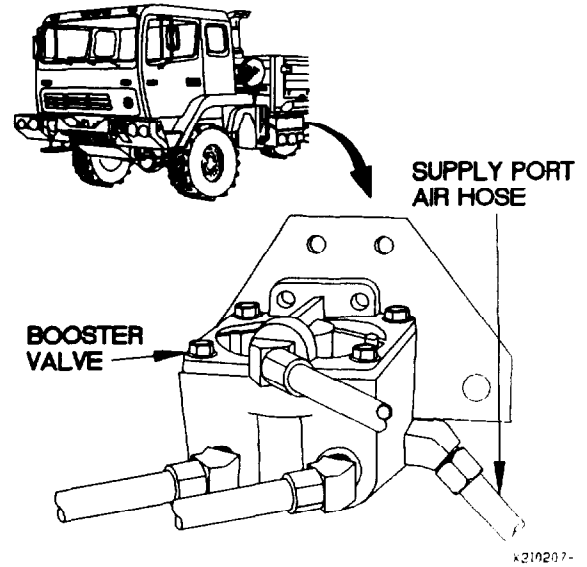
- (1) Loosen control port air hose at booster valve
- (2) Apply brakes.
- (3) Check for presence of air.
- (4) If no air is present, replace damaged air hose (para 11-21).
- (5) Tighten control port air hose on booster valve.



12. REAR BRAKES DO NOT APPLY (CONT)

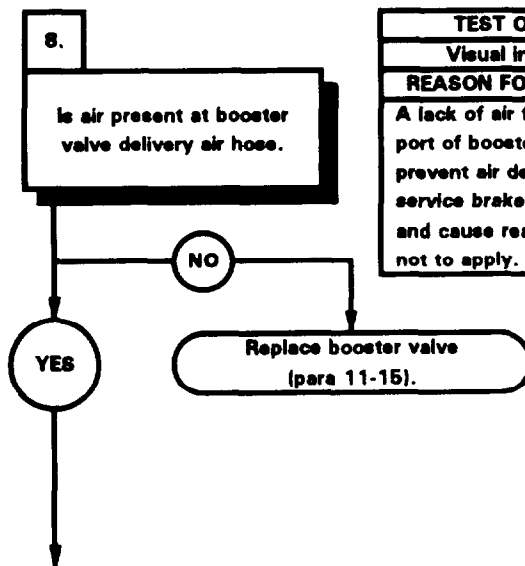


- (1) Loosen supply air hose at booster valve.
- (2) Check for presence of air.
- (3) If no air is present, replace air hose (para 11-21).
- (4) Tighten supply air hose to booster valve.



12. REAR BRAKES DO NOT APPLY (CONT)

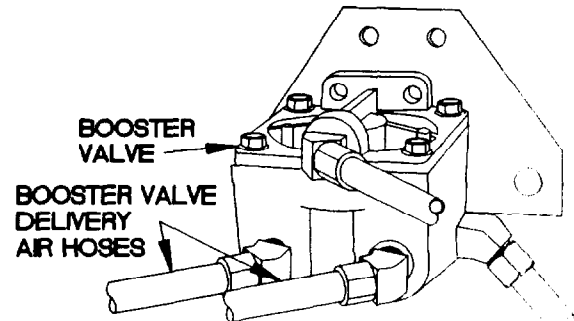
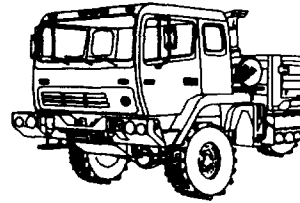
KNOWN INFO
Front brakes OK.
Air tanks pressurized.
Supply air hose to foot control valve OK.
Foot control valve OK.
Air hoses at cab floor OK.
Air hose to check valve OK.
Check valve OK.
Air hose to control port of booster valve OK.
Air hose to supply port of booster valve OK.
POSSIBLE PROBLEMS
Faulty booster valve.
Faulty air hose to load sensing valve.
Faulty load sensing valve.
Faulty air hose to control port of relay valve.
Faulty air hose to supply port of relay valve.
Faulty relay valve.
Faulty air hoses to spring brakes.
Faulty vent hose from spring brake service chamber.
Faulty spring brake chamber.



TEST OPTIONS
Visual inspection
REASON FOR QUESTION
A lack of air from delivery port of booster valve will prevent air delivery to service brake chambers and cause rear brakes not to apply.



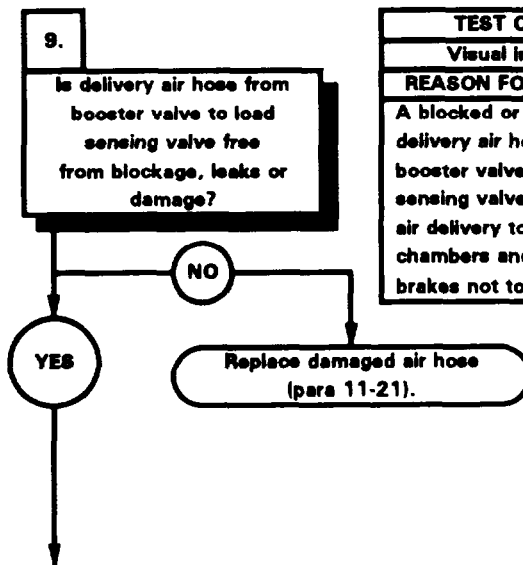
- (1) Loosen booster valve delivery air hose at booster valve.
- (2) Apply brakes.
- (3) Check for presence of air.
- (4) If no air is present, replace booster valve (para 11-15).
- (5) Tighten delivery air hose on booster valve.



x210208-

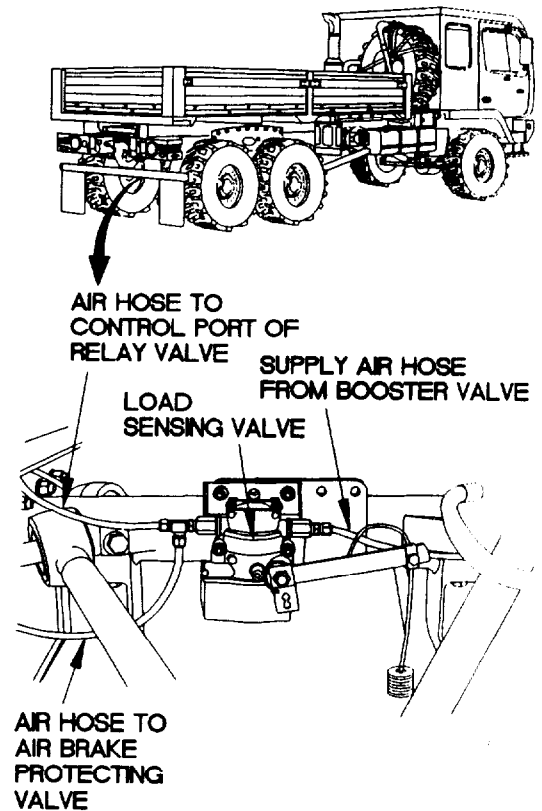
i2. REAR BRAKES DO NOT APPLY (CONT)

KNOWN INFO
Front brakes OK. Air tanks pressurized. Supply air hose to foot control valve OK. Foot control valve OK. Air hoses at cab floor OK. Air hose to check valve OK. Check valve OK. Air hose to control port of booster valve OK. Air hose to supply port of booster valve OK. Booster valve OK.
POSSIBLE PROBLEMS
Faulty air hose to load sensing valve. Faulty load sensing valve. Faulty air hose to control port of relay valve. Faulty air hose to supply port of relay valve. Faulty relay valve. Faulty air hoses to spring brakes. Faulty vent hose from spring brake service chamber. Faulty spring brake chamber.



TEST OPTIONS
Visual Inspection
REASON FOR QUESTION
A blocked or leaking delivery air hose from booster valve to load sensing valve will prevent air delivery to service brake chambers and cause rear brakes not to apply.

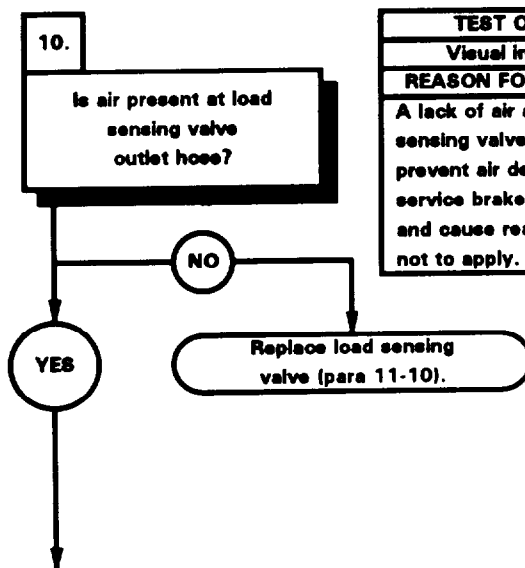
- (1) Loosen delivery air hose at load sensing valve.
- (2) Apply brakes.
- (3) Check for presence of air.
- (4) If no air is present, replace air hose (para 11-21).
- (5) Tighten delivery air hose on load sensing valve.



x210209A

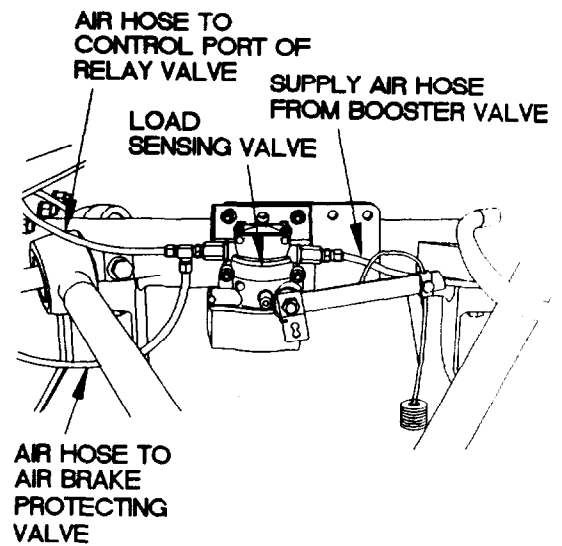
12. REAR BRAKES DO NOT APPLY (CONT)

KNOWN INFO
Front brakes OK. Air tanks pressurized. Supply air hose to foot control valve OK. Foot control valve OK. Air hoses at cab floor OK. Air hose to check valve OK. Check valve OK. Air hose to control port of booster valve OK. Air hose to supply port of booster valve OK. Booster valve OK. Air hose to load sensing valve OK.
POSSIBLE PROBLEMS
Faulty load sensing valve. Faulty air hose to control port of relay valve. Faulty air hose to supply port of relay valve. Faulty relay valve. Faulty air hoses to spring brakes. Faulty vent hose from spring brake service chamber. Faulty spring brake chamber.



TEST OPTIONS
Visual inspection
REASON FOR QUESTION
A lack of air at load sensing valve will prevent air delivery to service brake chambers and cause rear brakes not to apply.

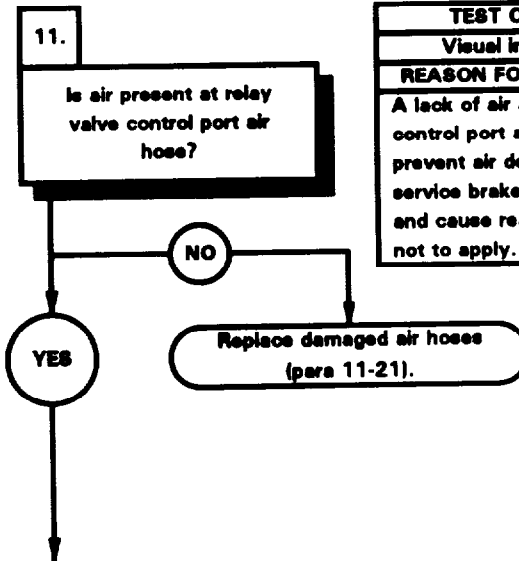
- (1) Loosen outlet air hose at load sensing valve.
- (2) Apply brakes.
- (3) Check for presence of air.
- (4) If no air is present, replace load sensing valve (para 11-10).
- (5) Tighten outlet air hose on load sensing valve.



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12. REAR BRAKES DO NOT APPLY (CONT)

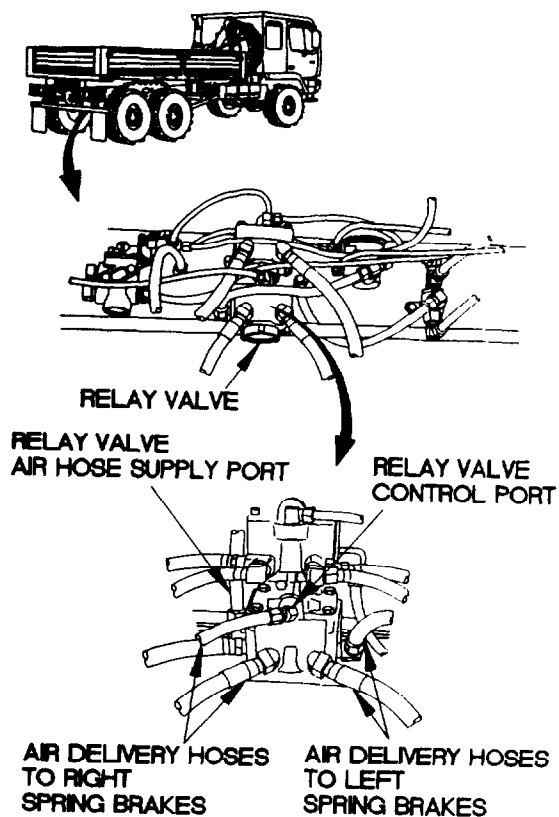
KNOWN INFO
Front brakes OK. Air tanks pressurized. Supply air hose to foot control valve OK. Foot control valve OK. Air hoses at cab floor OK. Air hose to check valve OK. Check valve OK. Air hose to control port of booster valve OK. Air hose to supply port of booster valve OK. Booster valve OK. Air hose to load sensing valve OK. Load sensing valve OK.
POSSIBLE PROBLEMS
Faulty air hose to control port of relay valve. Faulty air hose to supply port of relay valve. Faulty relay valve. Faulty air hoses to spring brakes. Faulty vent hose from spring brake service chamber. Faulty spring brake chamber.



TEST OPTIONS
Visual inspection
REASON FOR QUESTION
A lack of air at relay valve control port air hose will prevent air delivery to service brake chambers and cause rear brakes not to apply.



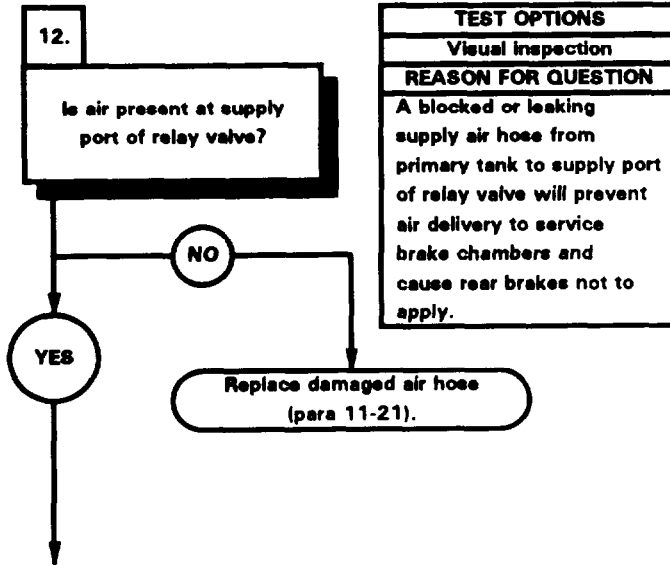
- (1) Loosen control port air hoses at relay valve.
- (2) Apply brakes.
- (3) Check for presence of air.
- (4) If no air is present, replace air hose(s) (para 11-21).
- (5) Tighten inlet air hoses on relay valve.



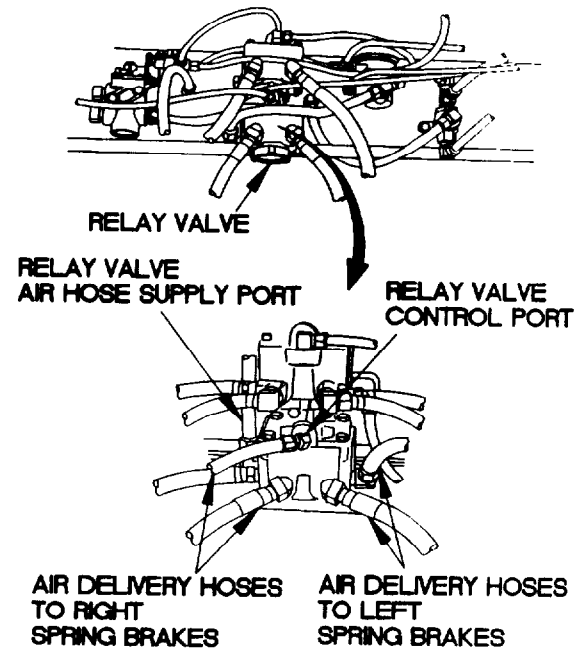
*210211-

i2. REAR BRAKES DO NOT APPLY (CONT)

KNOWN INFO
Front brakes OK. Air tanks pressurized. Supply air hose to foot control valve OK. Foot control valve OK. Air hoses at cab floor OK. Air hose to check valve OK. Check valve OK. Air hose to control port of booster valve OK. Air hose to supply port of booster valve OK. Booster valve OK. Air hose to load sensing valve OK. Load sensing valve OK. Air hose to control port of relay valve OK.
POSSIBLE PROBLEMS
Faulty air hose to supply port of relay valve. Faulty relay valve. Faulty air hoses to spring brakes. Faulty vent hose from spring brake service chamber. Faulty spring brake chamber.



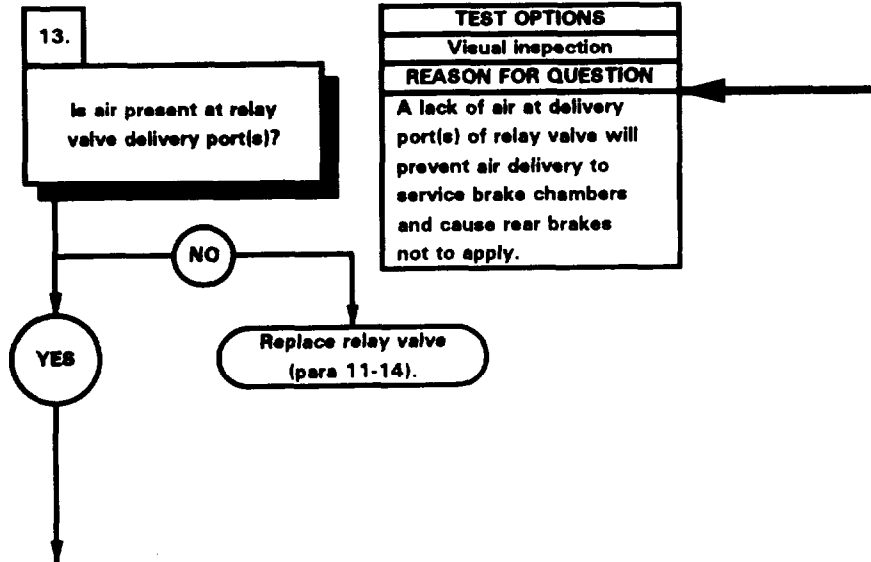
- (1) Loosen supply air hose at supply port of relay valve.
- (2) Apply brakes.
- (3) Check for presence of air.
- (4) If no air is present, replace air hose (para 11-21).
- (5) Tighten supply air hose to relay valve.



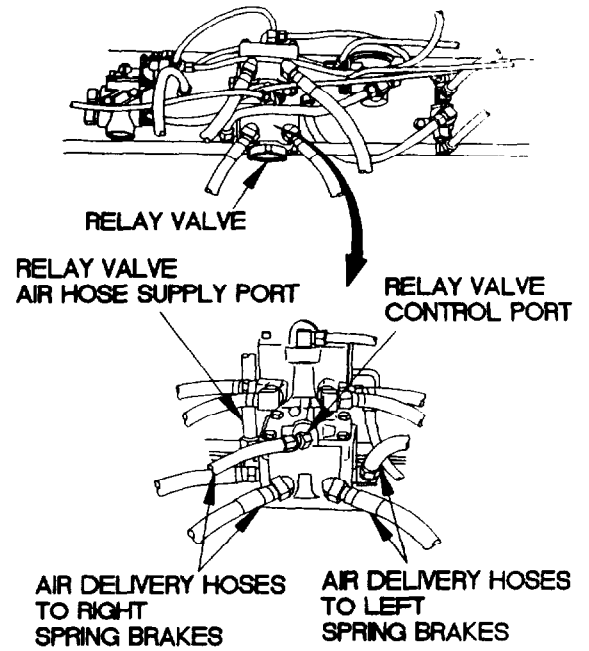
x210210

12. REAR BRAKES DO NOT APPLY (CONT)

KNOWN INFO
Front brakes OK. Air tanks pressurized. Supply air hose to foot control valve OK. Foot control valve OK. Air hoses at cab floor OK. Air hose to check valve OK. Check valve OK. Air hose to control port of booster valve OK. Air hose to supply port of booster valve OK. Booster valve OK. Air hose to load sensing valve OK. Load sensing valve OK. Air hose to control port of relay valve OK. Air hose to supply port relay valve OK.
POSSIBLE PROBLEMS
Faulty relay valve. Faulty air hoses to spring brakes. Faulty vent hose from spring brake service chamber. Faulty spring brake chamber.



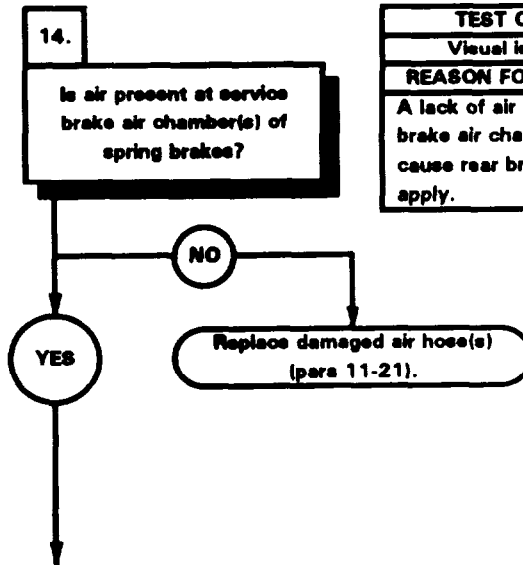
- (1) Loosen delivery air hose(s) at relay valve.
- (2) Apply brakes.
- (3) Check for presence of air.
- (4) If no air is present, replace relay valve (para 11-14).
- (5) Tighten delivery air hose(s) to relay valve.



x210213-

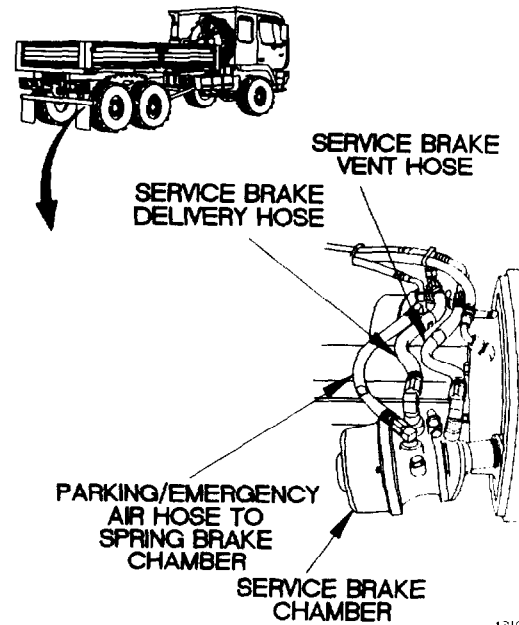
12. REAR BRAKES DO NOT APPLY (CONT)

KNOWN INFO
Front brakes OK. Air tanks pressurized. Supply air hose to foot control valve OK. Foot control valve OK. Air hoses at cab floor OK. Air hose to check valve OK. Check valve OK. Air hose to control port of booster valve OK. Air hose to supply port of booster valve OK. Booster valve OK. Air hose to load sensing valve OK. Load sensing valve OK. Air hose to control port of relay valve OK. Air hose to supply port relay valve OK. Relay valve OK.
POSSIBLE PROBLEMS
Faulty air hoses to spring brakes. Faulty vent hose from spring brake service chamber. Faulty spring brake chamber.



TEST OPTIONS
Visual inspection
REASON FOR QUESTION
A lack of air at service brake air chambers will cause rear brakes not to apply.

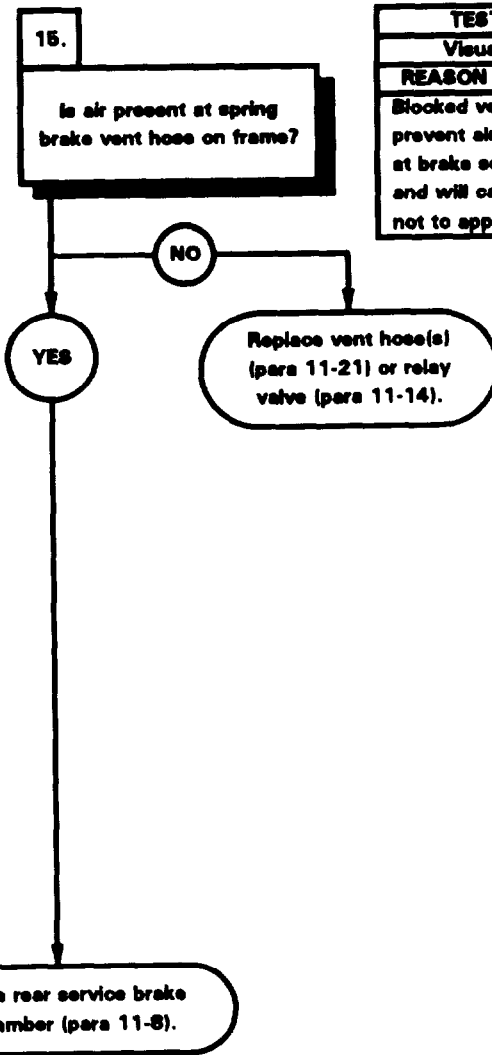
- (1) Loosen service brake air hose at spring brake chamber.
- (2) Apply brakes.
- (3) Check for presence of air.
- (4) If no air is present, replace air hose (para 11-21).
- (5) Tighten service brake air hose on spring brake chamber.



4219214

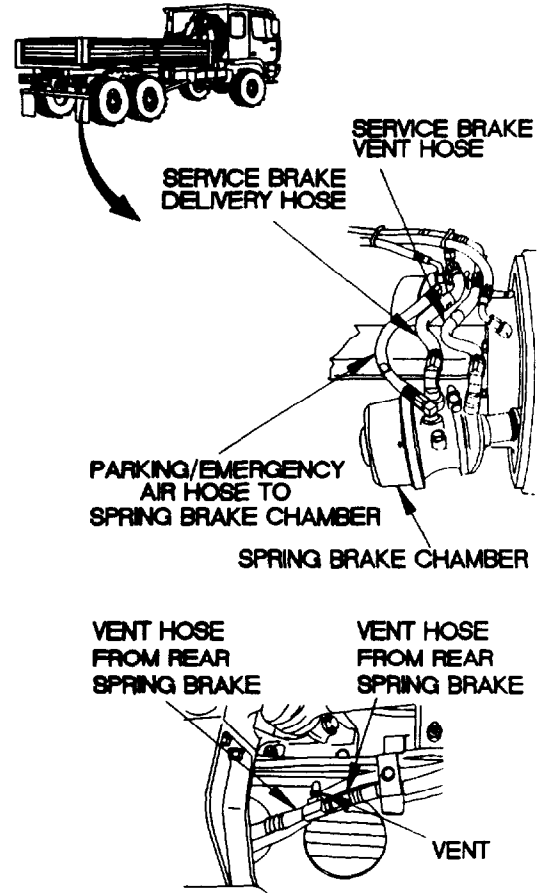
12. REAR BRAKES DO NOT APPLY (CONT)

KNOWN INFO
Front brakes OK.
Air tanks pressurized.
Supply air hose to foot control valve OK.
Foot control valve OK.
Air hoses at cab floor OK.
Air hose to check valve OK.
Check valve OK.
Air hose to control port of booster valve OK.
Air hose to supply port of booster valve OK.
Booster valve OK.
Air hose to load sensing valve OK.
Load sensing valve OK.
Air hose to control port of relay valve OK.
Air hose to supply port relay valve OK.
Relay valve OK.
Air hoses to spring brakes OK.
POSSIBLE PROBLEMS
Faulty vent hose from spring brake service chamber.
Faulty spring brake chamber.



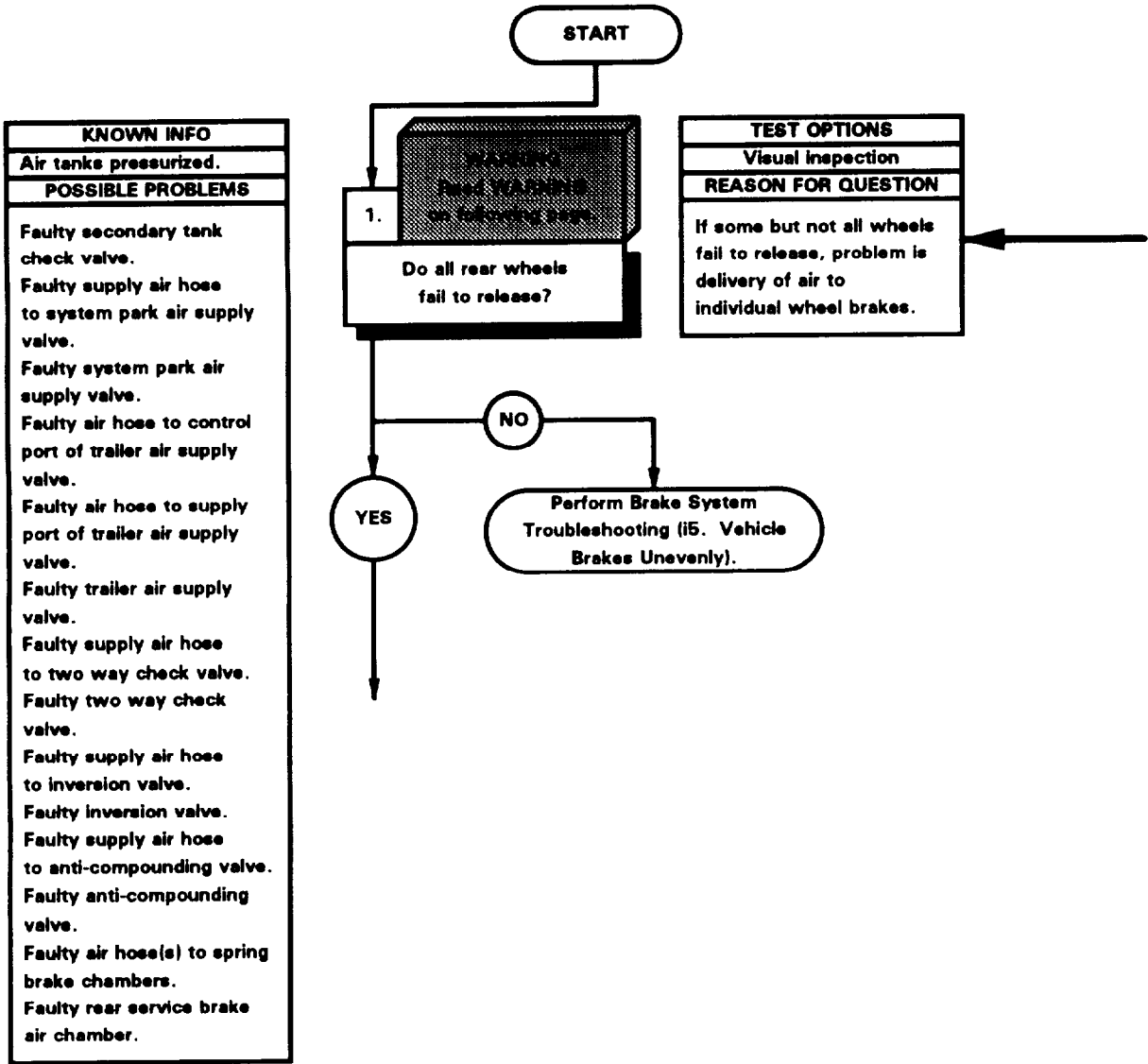
TEST OPTIONS
Visual inspection
REASON FOR QUESTION
Blocked vent hoses will prevent air from escaping at brake service chambers and will cause rear brakes not to apply.

- (1) Disconnect vent hose(s) at brake chamber(s).
- (2) Blow compressed air through vent hoses.
- (3) Check for air escaping at vent valve.
- (4) If air does not escape from vent hose, replace vent hose(s) (para 11-21) or relay valve (para 11-14).
- (5) If air does escape from vent hose, replace rear service brake air chamber (para 11-8).
- (6) Connect vent hose(s) at brake chamber(s).
- (7) Lower cab (TM 9-2320-366-10-1).



4210215-

13. PARKING BRAKE(S) WILL NOT RELEASE	
INITIAL SETUP	
Equipment Conditions	Tools and Special Tools
Engine shut down (TM 9-2320-366-10-1).	Tool Kit, Genl Mech (Item 46, Appendix C)
	Goggles, Industrial (Item 15, Appendix C)

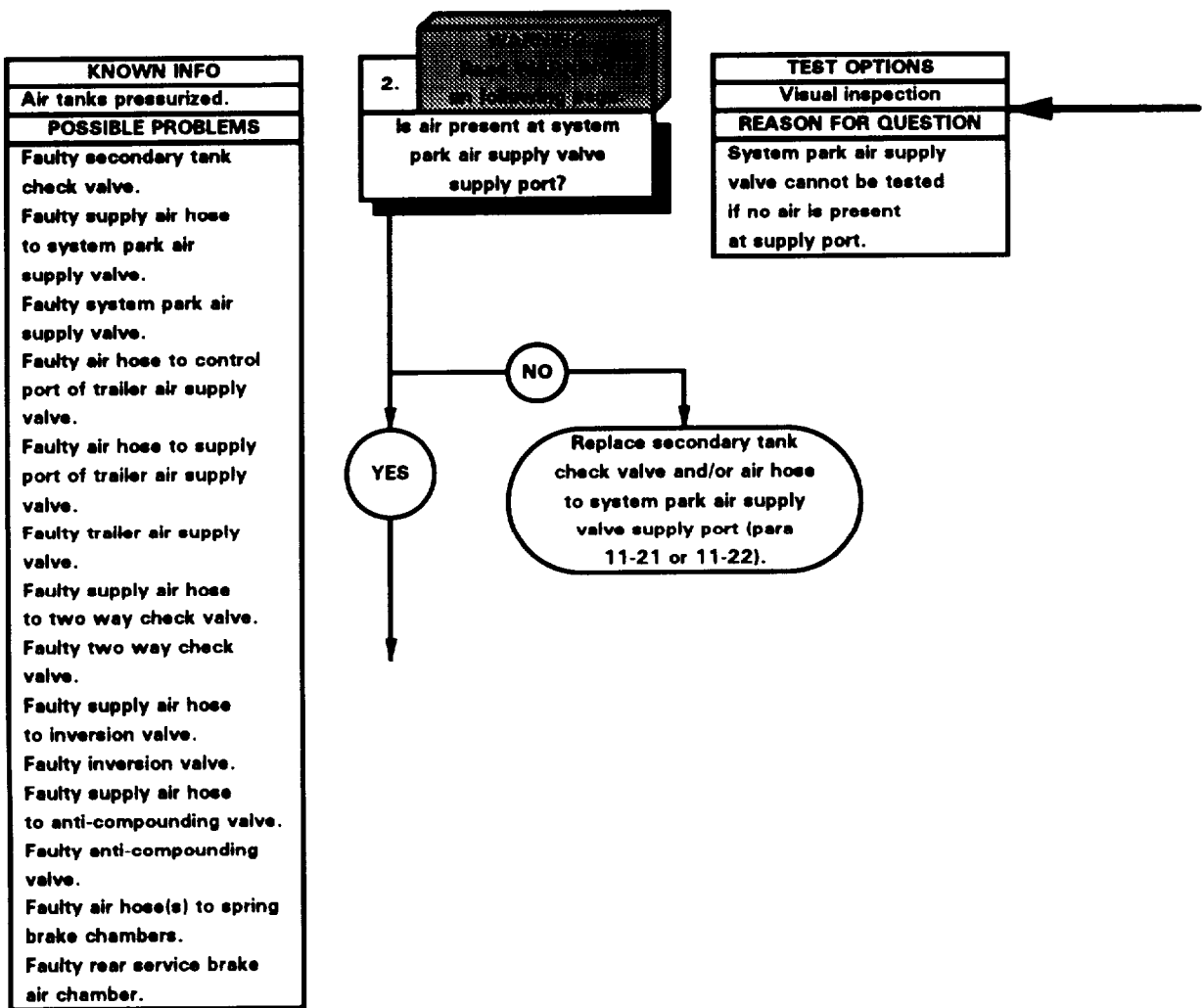


WARNING

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 injury to personnel.

- (1) Start engine (TM 9-2320-366-10-1).
- (2) Release parking brake (TM 9-2320-366-10-1).
- (3) Check if vehicle moves.
- (4) If vehicle moves, locate locked wheel(s) and troubleshoot individual wheel(s).
- (5) If vehicle does not move and all wheels are locked, perform Brake System Troubleshooting (15. Vehicle Brakes Unevenly).

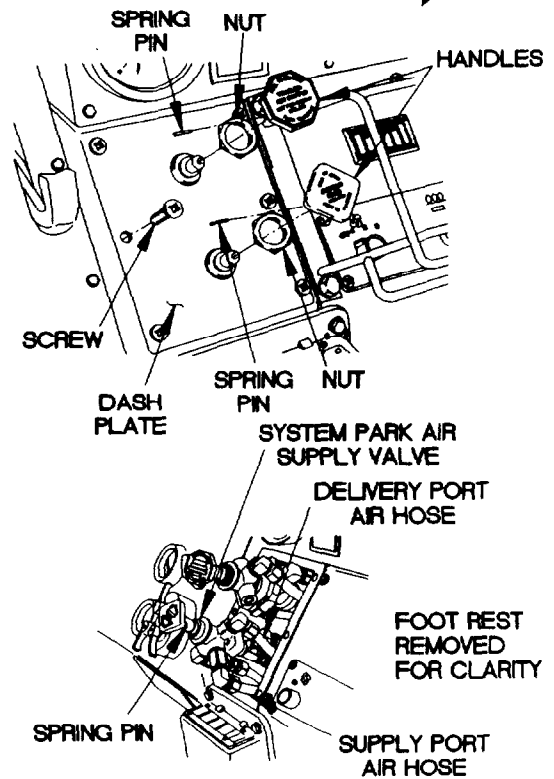
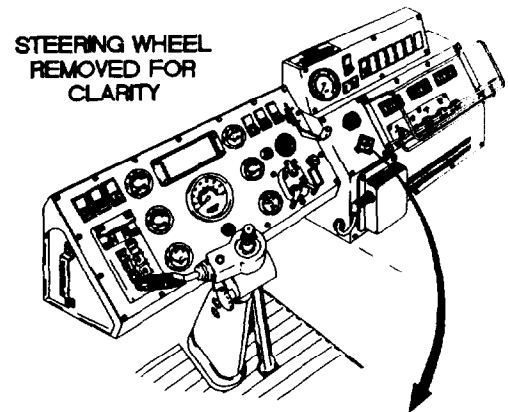
13. PARKING BRAKE(S) WILL NOT RELEASE (CONT)



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.

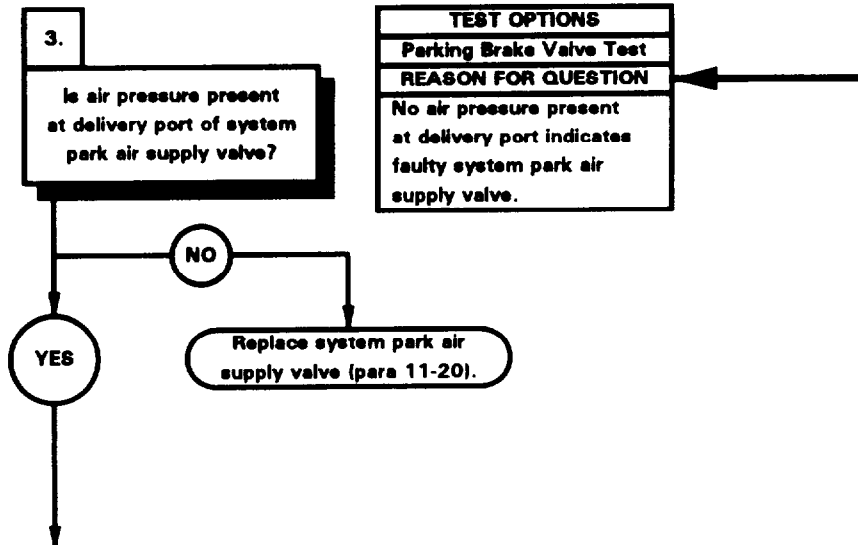
- (1) Remove roll pins from handles of parking brake and trailer supply valves on dash.
- (2) Remove parking brake and trailer supply valve handles.
- (3) Unscrew nut at base of handle stem on each valve.
- (4) Remove six screws securing dash plate.
- (5) Remove dash plate.
- (6) Pull out system park air supply valve from dashboard.
- (7) Loosen air hose at system park air supply valve supply port.
- (8) Check air hose for escaping air.
- (9) If no air escapes, replace secondary tank check valve (para 11-22) or air hose (para 11-21).
- (10) Tighten air hose at system park air supply valve supply port.



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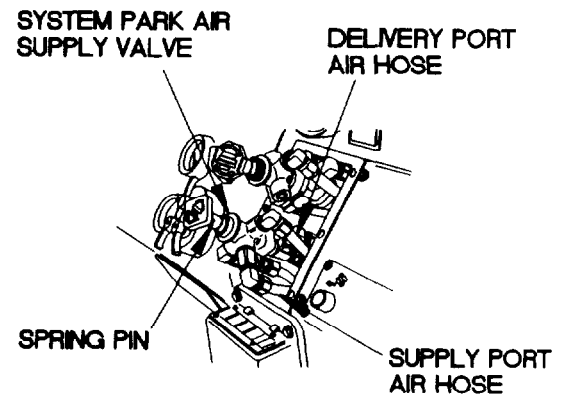
13. PARKING BRAKE(S) WILL NOT RELEASE (CONT)

KNOWN INFO
Air tanks pressurized. Secondary tank check valve OK. Supply air hose to system park air supply valve OK.
POSSIBLE PROBLEMS
Faulty system park air supply valve. Faulty air hose to control port of trailer air supply valve. Faulty air hose to supply port of trailer air supply valve. Faulty trailer air supply valve. Faulty supply air hose to two way check valve. Faulty two way check valve. Faulty supply air hose to inversion valve. Faulty inversion valve. Faulty supply air hose to anti-compounding valve. Faulty anti-compounding valve. Faulty air hose(s) to spring brake chambers. Faulty rear service brake air chamber.



PARKING BRAKE VALVE TEST

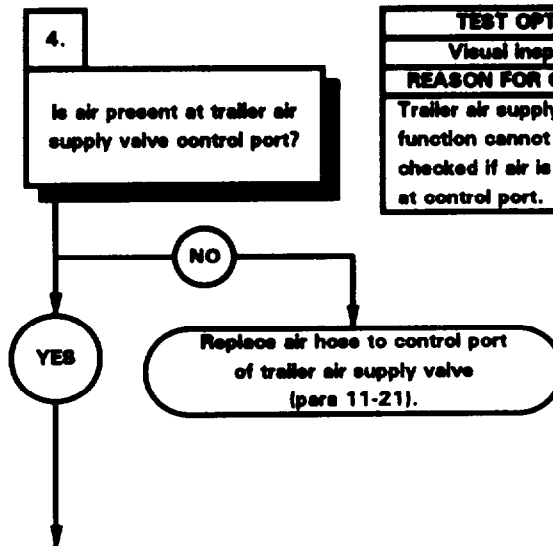
- (1) Loosen air hose at system park air supply valve delivery port.
- (2) Check for presence of air from system park air supply valve.
- (3) If no air escapes, replace system park air supply valve (para 11-20).
- (4) Tighten system park air supply valve delivery air hose.



x210303-

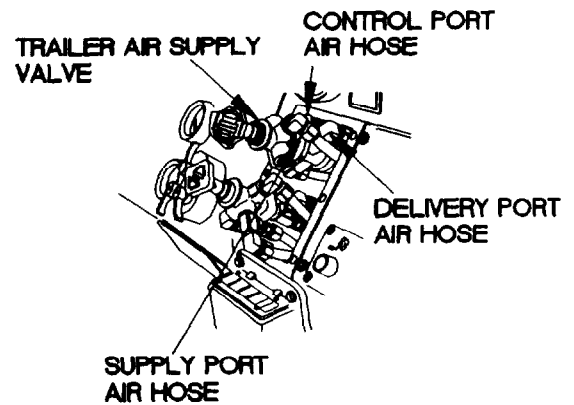
13. PARKING BRAKE(S) WILL NOT RELEASE (CONT)

KNOWN INFO
Air tanks pressurized. Secondary tank check valve OK. Supply air hose to system park air supply valve OK. System park air supply valve OK.
POSSIBLE PROBLEMS
Faulty air hose to control port of trailer air supply valve. Faulty air hose to supply port of trailer air supply valve. Faulty trailer air supply valve. Faulty supply air hose to two way check valve. Faulty two way check valve. Faulty supply air hose to inversion valve. Faulty inversion valve. Faulty supply air hose to anti-compounding valve. Faulty anti-compounding valve. Faulty air hose(s) to spring brake chambers. Faulty rear service brake air chamber.



TEST OPTIONS
Visual inspection
REASON FOR QUESTION
Trailer air supply valve function cannot be checked if air is absent at control port.

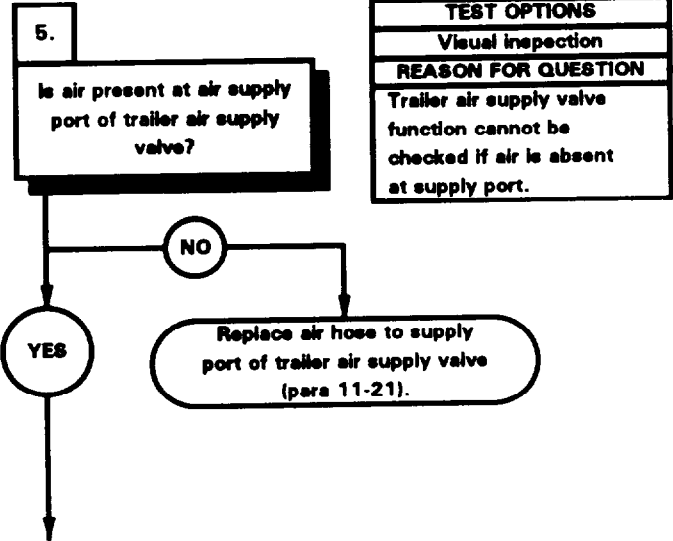
- (1) Pull out trailer air supply valve.
- (2) Loosen air hose at control port of trailer air supply valve.
- (3) Check for presence of air at air hose.
- (4) If no air escapes, replace air hose (para 11-21).
- (5) Tighten air hose at control port of trailer air supply valve.



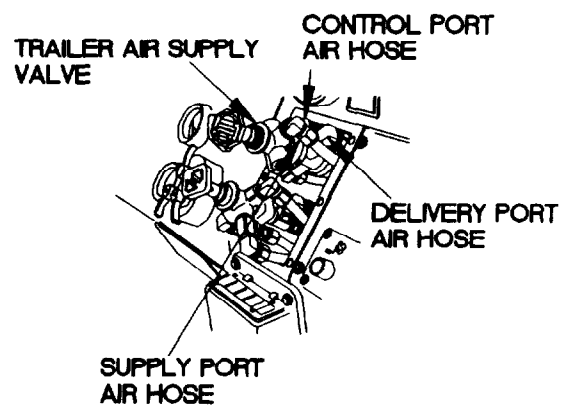
x210304-

13. PARKING BRAKE(S) WILL NOT RELEASE (CONT)

KNOWN INFO
Air tanks pressurized. Secondary tank check valve OK. Supply air hose to system park air supply valve OK. System park air supply valve OK. Air hose to control port of trailer air supply valve OK.
POSSIBLE PROBLEMS
Faulty air hose to supply port of trailer air supply valve. Faulty trailer air supply valve. Faulty supply air hose to two way check valve. Faulty two way check valve. Faulty supply air hose to inversion valve. Faulty inversion valve. Faulty supply air hose to anti-compounding valve. Faulty anti-compounding valve. Faulty air hose(s) to spring brake chambers. Faulty rear service brake air chamber.

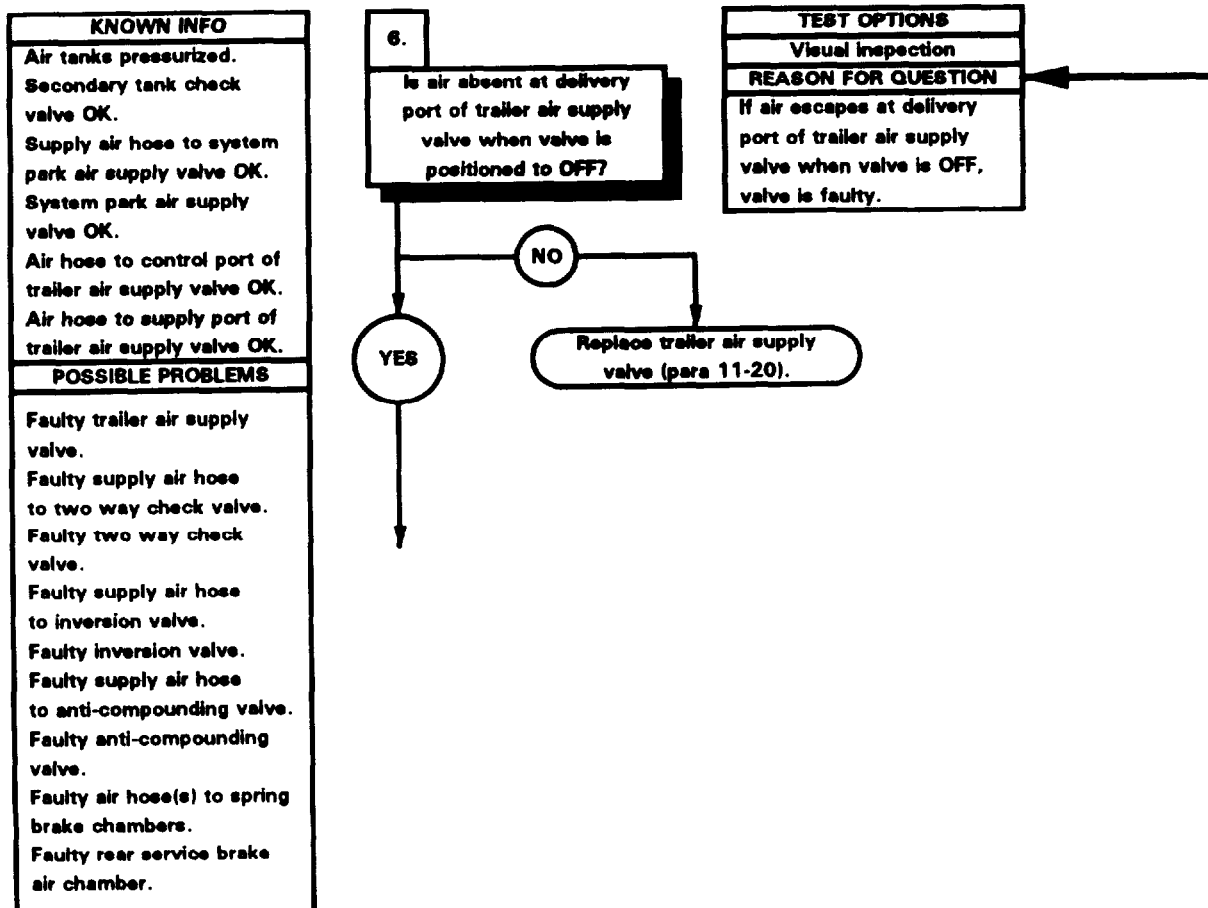


- (1) Loosen air hose at supply port of trailer air supply valve.
- (2) Check for presence of air at air hose.
- (3) If no air escapes, replace air hose (para 11-21).
- (4) Tighten air hose to supply port of trailer air supply valve.

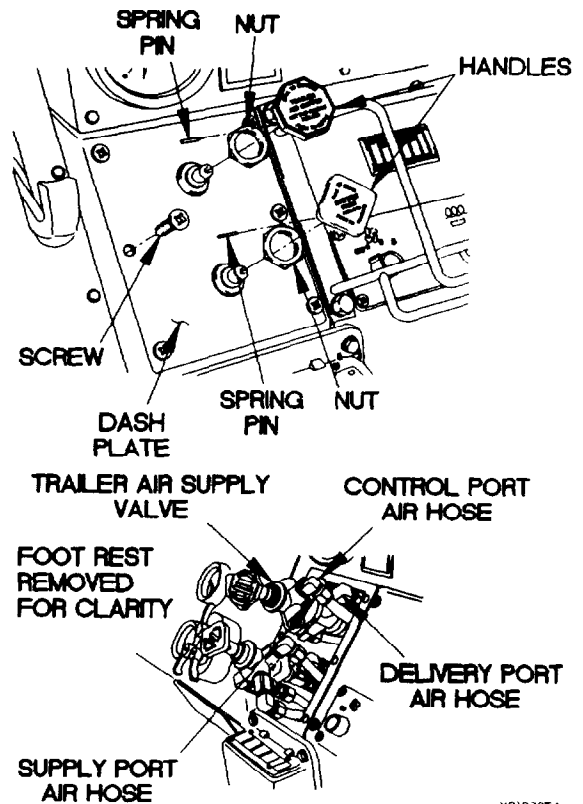


4210305

13. PARKING BRAKE(S) WILL NOT RELEASE (CONT)



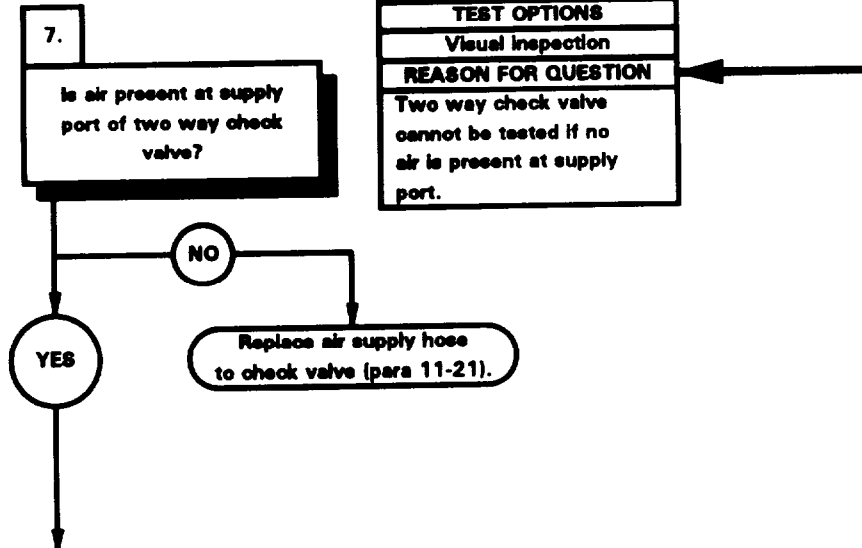
- (1) Position trailer air supply valve to EXHAUST.
- (2) Loosen air hose at delivery port of trailer air supply valve.
- (3) Check for air escaping at port.
- (4) If air escapes at delivery port, replace trailer air supply valve (para 11-20).
- (5) Push system park and trailer air supply valves back into dash housing.
- (6) Replace dash plate over valve stems and attach with six screws.
- (7) Tighten locknuts onto valve stems at dash plate.
- (8) Replace system park and trailer air supply valve handles.
- (9) Secure handles with new spring pins.



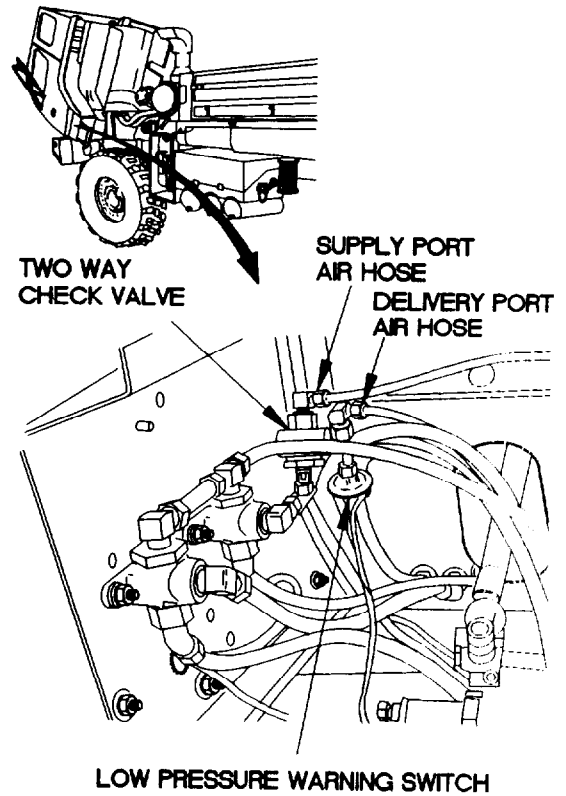
x210 30% A

13. PARKING BRAKE(S) WILL NOT RELEASE (CONT)

KNOWN INFO
Air tanks pressurized.
Secondary tank check valve OK.
Supply air hose to system park air supply valve OK.
System park air supply valve OK.
Air hose to control port of trailer air supply valve OK.
Air hose to supply port of trailer air supply valve OK.
Trailer air supply valve OK.
POSSIBLE PROBLEMS
Faulty supply air hose to two way check valve.
Faulty two way check valve.
Faulty supply air hose to inversion valve.
Faulty inversion valve.
Faulty supply air hose to anti-compounding valve.
Faulty anti-compounding valve.
Faulty air hose(s) to spring brake chambers.
Faulty rear service brake air chamber.

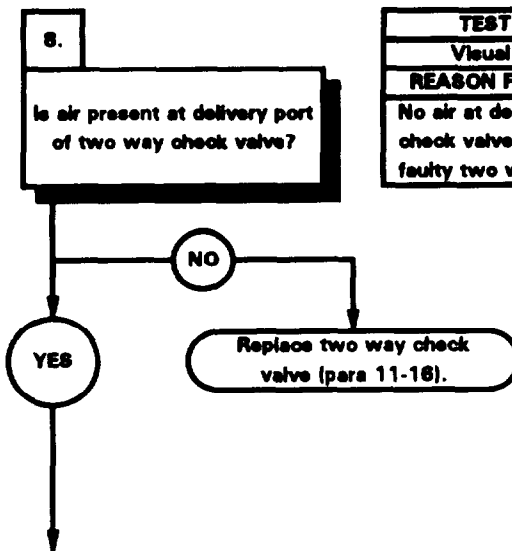


- (1) Raise cab (TM 9-2320-366-10-1).
- (2) Loosen air hose at supply port of two way check valve.
- (3) Check air hose for presence of air.
- (4) If no air escapes, replace air hose (para 11-21).
- (5) Tighten air hose at two way check valve supply port.



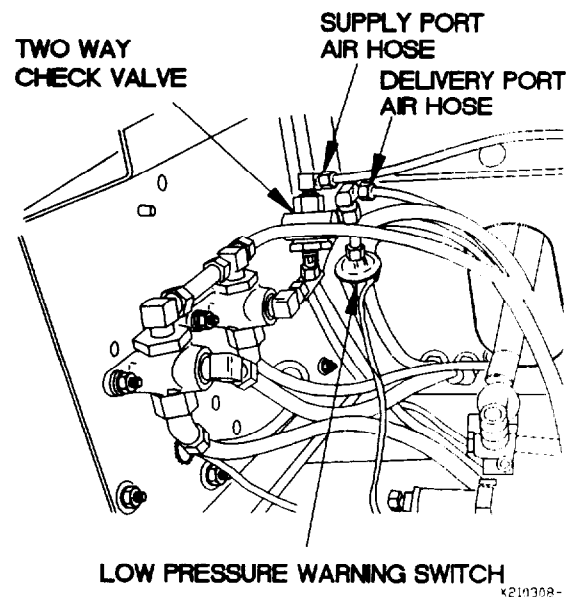
13. PARKING BRAKE(S) WILL NOT RELEASE (CONT)

KNOWN INFO
Air tanks pressurized. Secondary tank check valve OK. Supply air hose to system park air supply valve OK. System park air supply valve OK. Air hose to control port of trailer air supply valve OK. Air hose to supply port of trailer air supply valve OK. Trailer air supply valve OK. Supply air hose to two way check valve OK.
POSSIBLE PROBLEMS
Faulty two way check valve. Faulty supply air hose to inversion valve. Faulty inversion valve. Faulty supply air hose to anti-compounding valve. Faulty anti-compounding valve. Faulty air hose(s) to spring brake chambers. Faulty rear service brake air chamber.



TEST OPTIONS
Visual inspection
REASON FOR QUESTION
No air at delivery port of check valve indicates a faulty two way check valve.

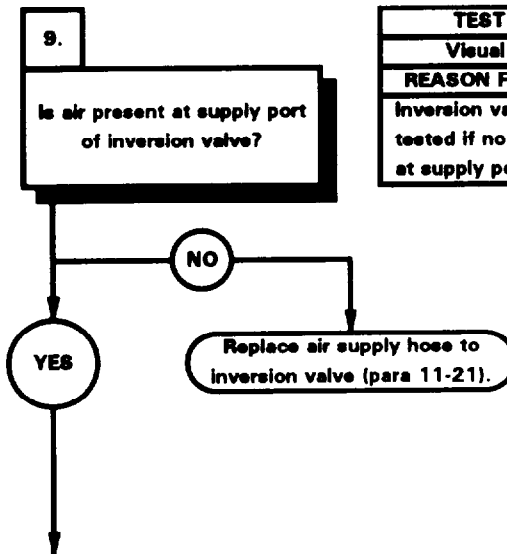
- (1) Loosen air hose at delivery port of two way check valve.
- (2) Check two way check valve for presence of air.
- (3) If no air escapes, replace two way check valve (para 11-16).
- (4) Tighten air hose at two way check valve delivery port.
- (5) Lower cab (TM 9-2320-366-10-1).



x214308-

13. PARKING BRAKE(S) WILL NOT RELEASE (CONT)

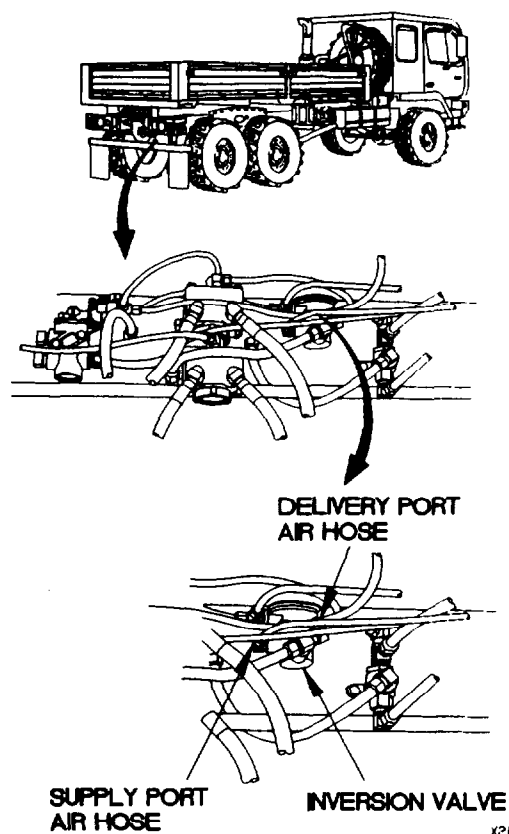
KNOWN INFO
Air tanks pressurized. Secondary tank check valve OK. Supply air hose to system park air supply valve OK. System park air supply valve OK. Air hose to control port of trailer air supply valve OK. Air hose to supply port of trailer air supply valve OK. Trailer air supply valve OK. Supply air hose to two way check valve OK. Two way check valve OK.
POSSIBLE PROBLEMS
Faulty supply air hose to inversion valve. Faulty inversion valve. Faulty supply air hose to anti-compounding valve. Faulty anti-compounding valve. Faulty air hose(s) to spring brake chambers. Faulty rear service brake air chamber.



TEST OPTIONS
Visual inspection
REASON FOR QUESTION
Inversion valve cannot be tested if no air is present at supply port.



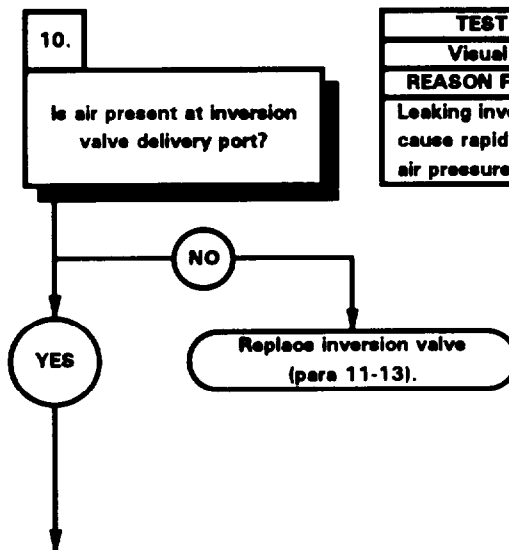
- (1) Loosen air hose at inversion valve supply port.
- (2) Check air hose for presence of air.
- (3) If no air escapes, replace air hose (para 11-21).
- (4) Tighten air hose at inversion valve supply port.



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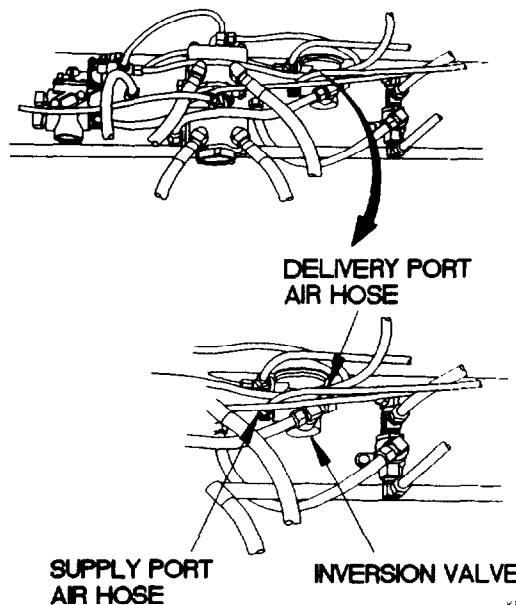
13. PARKING BRAKE(S) WILL NOT RELEASE (CONT)

KNOWN INFO
Air tanks pressurized. Secondary tank check valve OK. Supply air hose to system park air supply valve OK. System park air supply valve OK. Air hose to control port of trailer air supply valve OK. Air hose to supply port of trailer air supply valve OK. Trailer air supply valve OK. Supply air hose to two way check valve OK. Two way check valve OK. Supply air hose to inversion valve OK.
POSSIBLE PROBLEMS
Faulty inversion valve. Faulty supply air hose to anti-compounding valve. Faulty anti-compounding valve. Faulty air hose(s) to spring brake chambers. Faulty rear service brake air chamber.



TEST OPTIONS
Visual inspection
REASON FOR QUESTION
Leaking inversion valve may cause rapid loss of system air pressure.

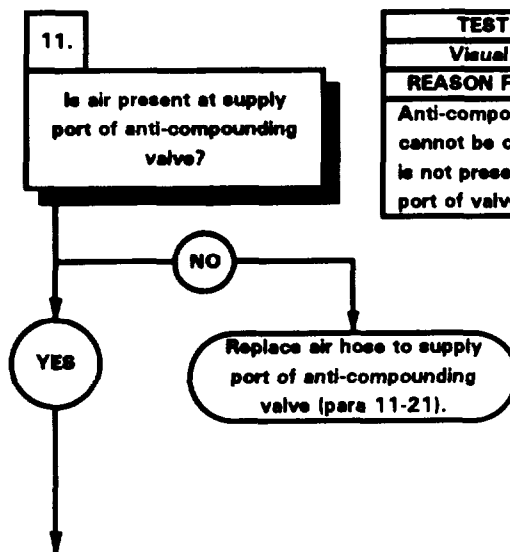
- (1) Loosen air hose at inversion valve delivery port.
- (2) Check delivery port for presence of air.
- (3) If no air escapes, replace inversion valve (para 11-13).
- (4) Tighten air hose at inversion valve delivery port.



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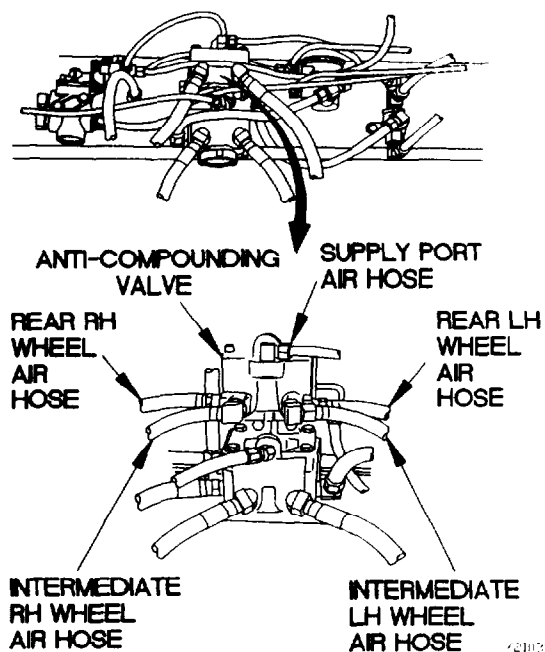
13. PARKING BRAKE(S) WILL NOT RELEASE (CONT)

KNOWN INFO
Air tanks pressurized.
Secondary tank check valve OK.
Supply air hose to system park air supply valve OK.
System park air supply valve OK.
Air hose to control port of trailer air supply valve OK.
Air hose to supply port of trailer air supply valve OK.
Trailer air supply valve OK.
Supply air hose to two way check valve OK.
Two way check valve OK.
Supply air hose to inversion valve OK.
Inversion valve OK.
POSSIBLE PROBLEMS
Faulty supply air hose to anti-compounding valve.
Faulty anti-compounding valve.
Faulty air hose(s) to spring brake chambers.
Faulty rear service brake air chamber.



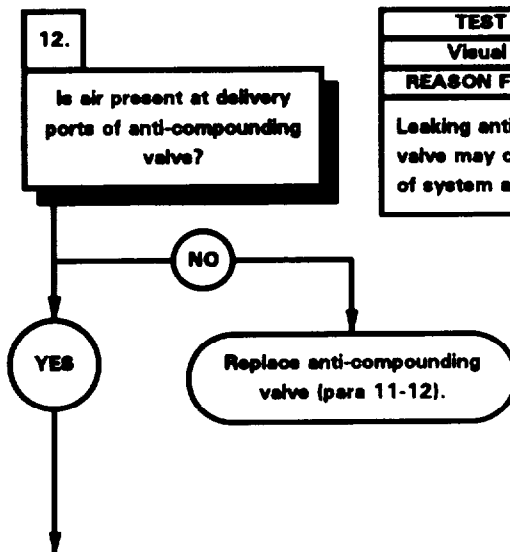
TEST OPTIONS
Visual inspection
REASON FOR QUESTION
Anti-compounding valve cannot be checked if air is not present at supply port of valve.

- (1) Loosen air hose at supply port of anti-compounding valve.
- (2) Check air hose for presence of air.
- (3) If no air escapes, replace air hose (para 11-21).
- (4) Tighten air hose at anti-compounding valve supply port.



13. PARKING BRAKE(S) WILL NOT RELEASE (CONT)

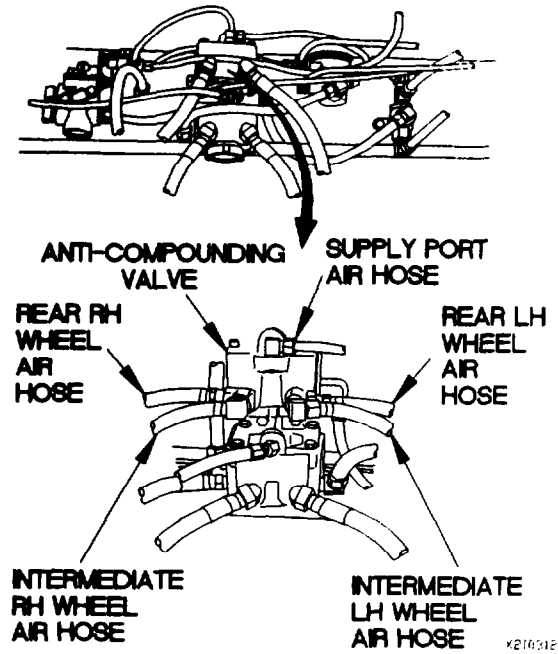
KNOWN INFO
Air tanks pressurized. Secondary tank check valve OK. Supply air hose to system park air supply valve OK. System park air supply valve OK. Air hose to control port of trailer air supply valve OK. Air hose to supply port of trailer air supply valve OK. Trailer air supply valve OK. Supply air hose to two way check valve OK. Two way check valve OK. Supply air hose to inversion valve OK. Inversion valve OK. Supply air hose to anti-compounding valve OK.
POSSIBLE PROBLEMS
Faulty anti-compounding valve. Faulty air hose(s) to spring brake chambers. Faulty rear service brake air chamber.



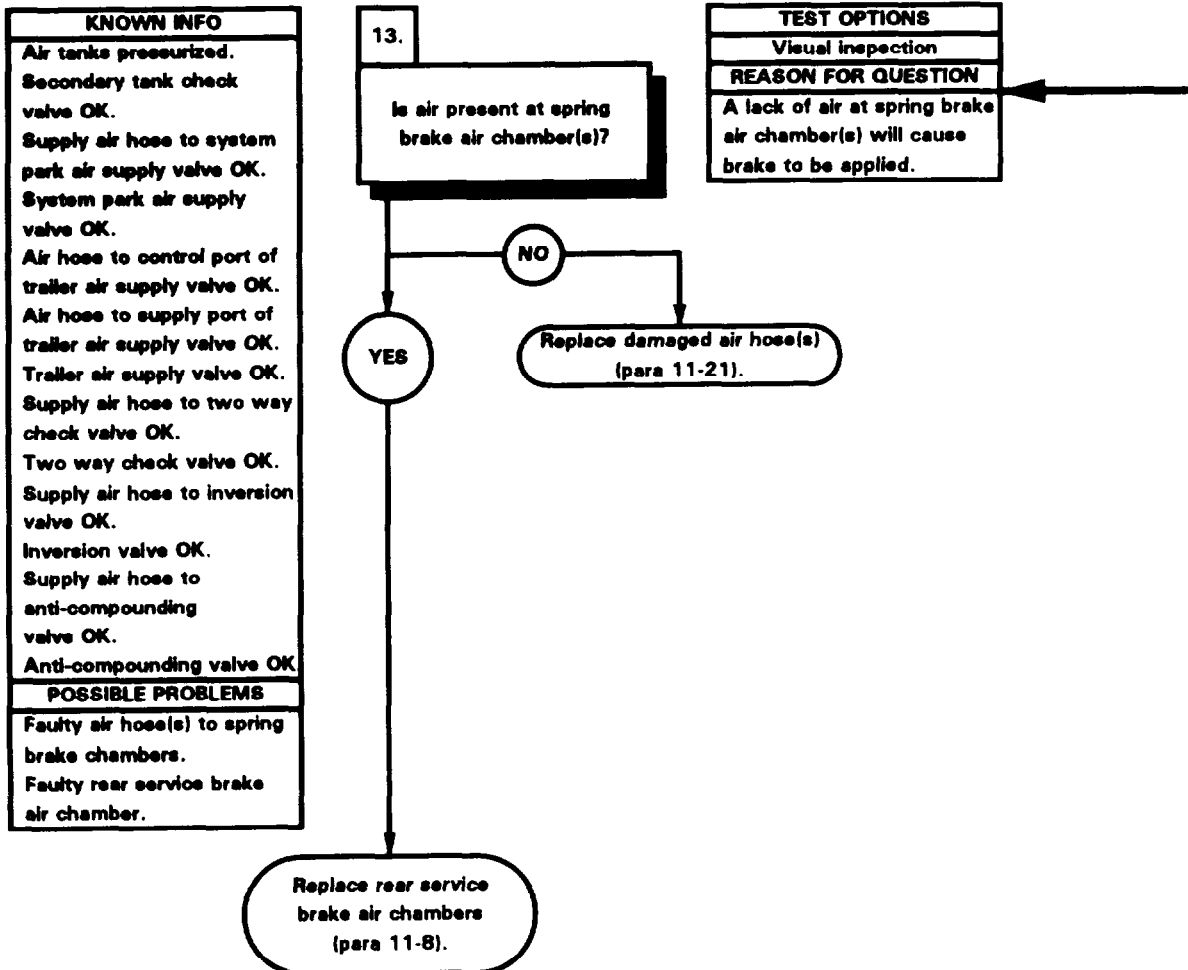
TEST OPTIONS
Visual inspection
REASON FOR QUESTION
Leaking anti-compounding valve may cause rapid loss of system air pressure.



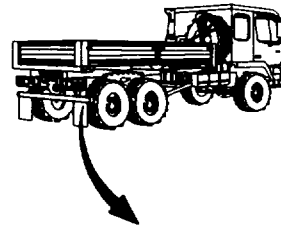
- (1) Loosen air delivery hoses at anti-compounding valve and check for presence of air.
- (2) If air does not escape from delivery ports, replace anti-compounding valve (para 11-12).
- (3) Tighten air delivery hoses at anti-compounding valve.



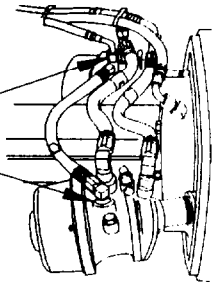
13. PARKING BRAKE(S) WILL NOT RELEASE (CONT)



- (1) Loosen air hoses at each spring brake chamber and check for presence of air.
- (3) If no air is present, replace air hose (para 11-21).
- (4) Tighten air hoses on spring brake chambers.
- (5) Apply parking brake.
- (6) Shut down engine (TM 9-2320-366-10-1).

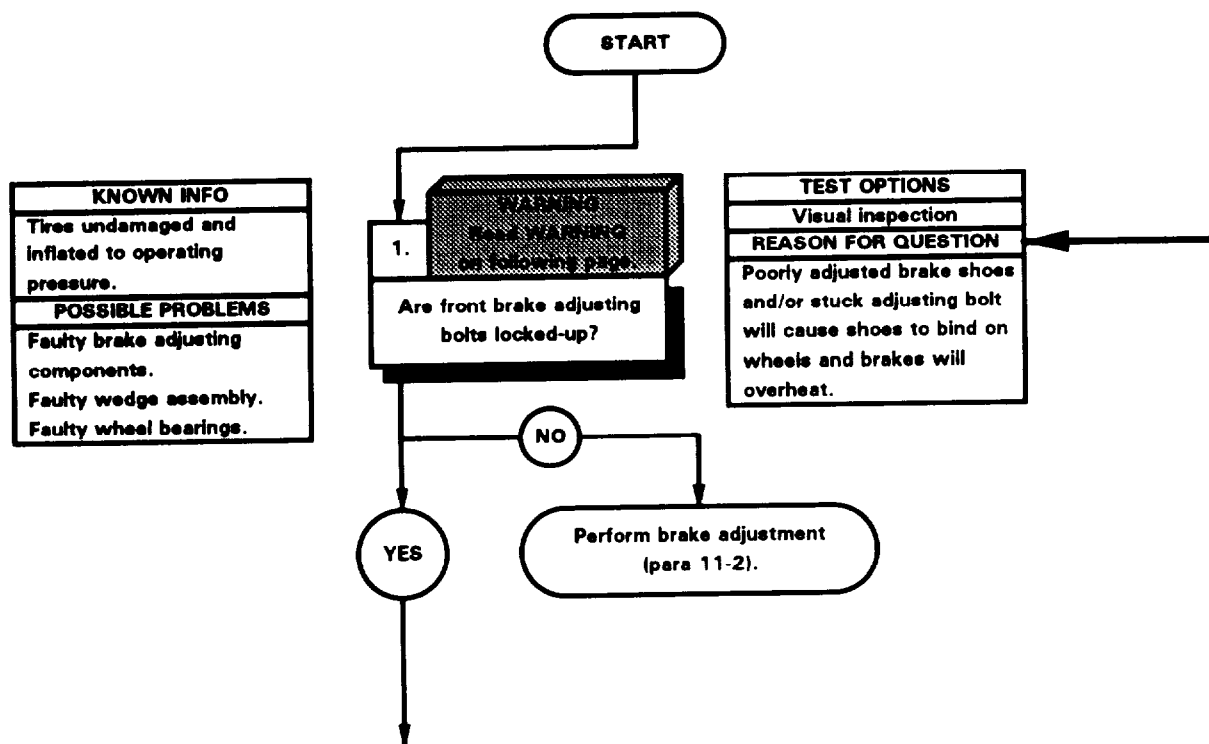


SPRING BRAKE
CHAMBER
AIR HOSE
SUPPLY PORTS



x2103124

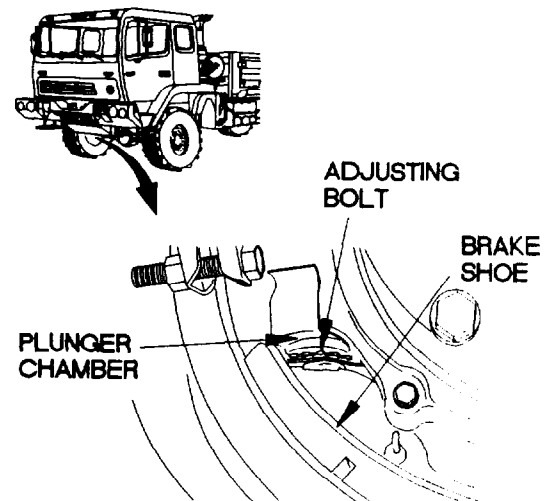
14. FRONT BRAKES OVERHEAT	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Goggles, Industrial (Item 15, Appendix C) Tool Kit, Genl Mech (Item 46, Appendix C) Trestle, Motor Vehicle Maintenance (2) (Item 47, Appendix C) Adjusting Tool, Brake Shoe (Item 2, Appendix C)
Personnel Required (2)	



WARNING

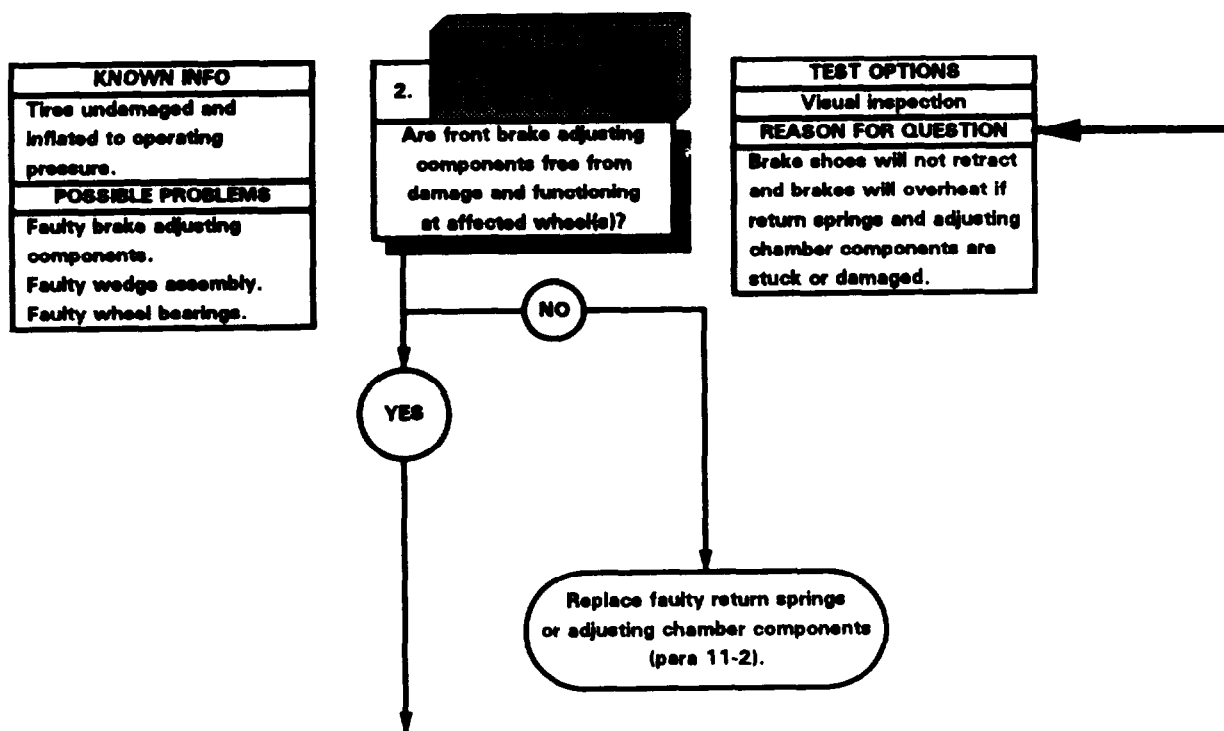
Overheated brakes can cause severe burns. Perform task only when brakes have cooled. Failure to comply may result in injury to personnel.

- (1) Jack up axle with overheated brakes, and support with trestle stands.
- (2) 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, adjust brakes (para 11-2).



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14. FRONT BRAKES OVERHEAT (CONT)

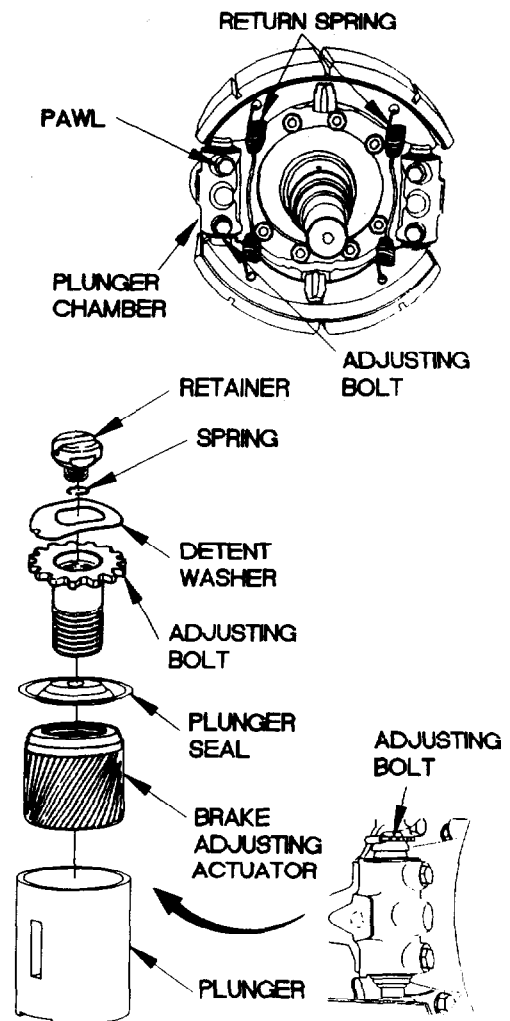


- (1) Remove wheel(s) with affected brakes, and disassemble brake components (para 11-2).
- (2) Inspect return springs for stretching, bluing, damage or breakage. If spring(s) is damaged, replace spring(s) (para 11-2).
- (3) Check adjusting pawl spring for damage. Ensure spring is not missing or broken.
- (4) Check adjusting pawl teeth for damage and abrasion.
- (5) Ensure seal elements are not damaged or broken.

CAUTION

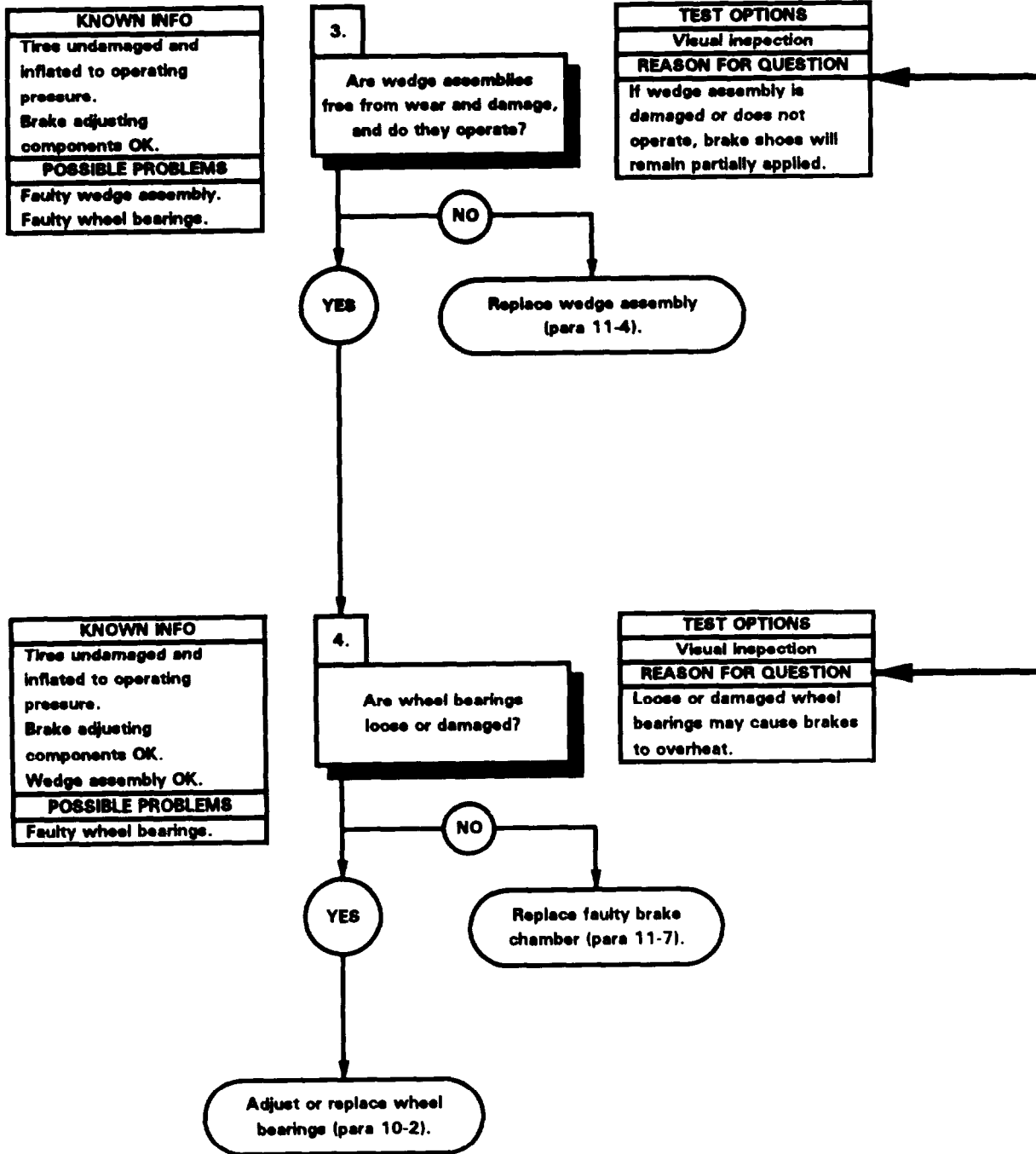
Ensure seal is free from damage. Failure to comply may result in dirt entering plunger chamber and interfering with adjustment.

- (6) Check actuator teeth for damage.
- (7) Check plunger for freedom of movement inside plunger housing.

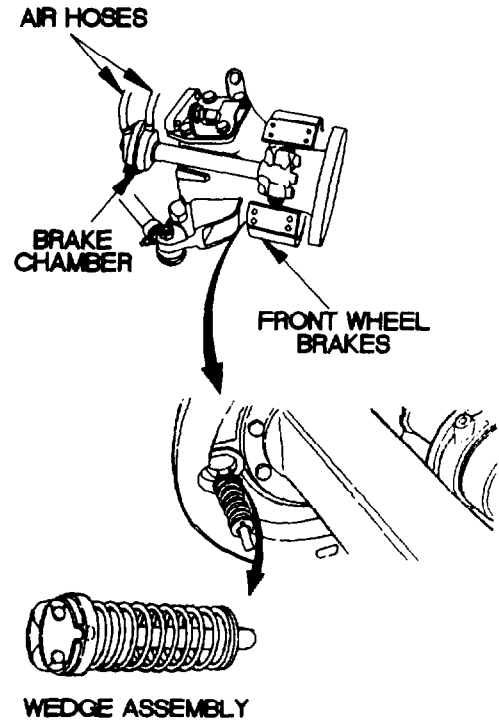


x210402-

14. FRONT BRAKES OVERHEAT (CONT)



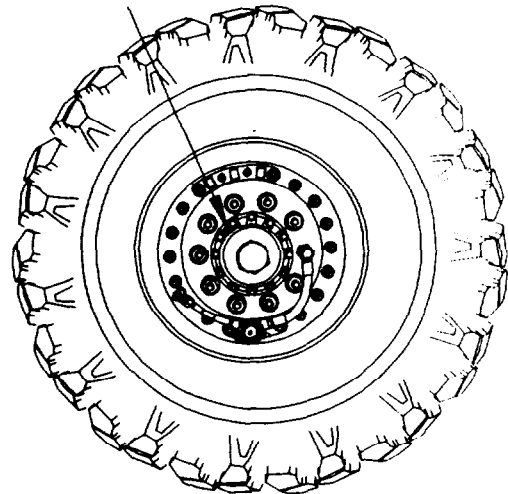
- (1) Disconnect and tag air hoses to brake chambers at wheel.
- (2) Unscrew brake chamber(s) from hub and remove wedge assembly from wheel (para 11-4).
- (3) Inspect wedge spring for damage.
- (4) Inspect rollers for flattening or damage.
- (5) Manually check operation of wedge assembly in plunger chamber.
- (6) Install wedge assembly and brake chamber (para 11-4).
- (7) Install front wheel brake components and adjust brakes (para 11-2).



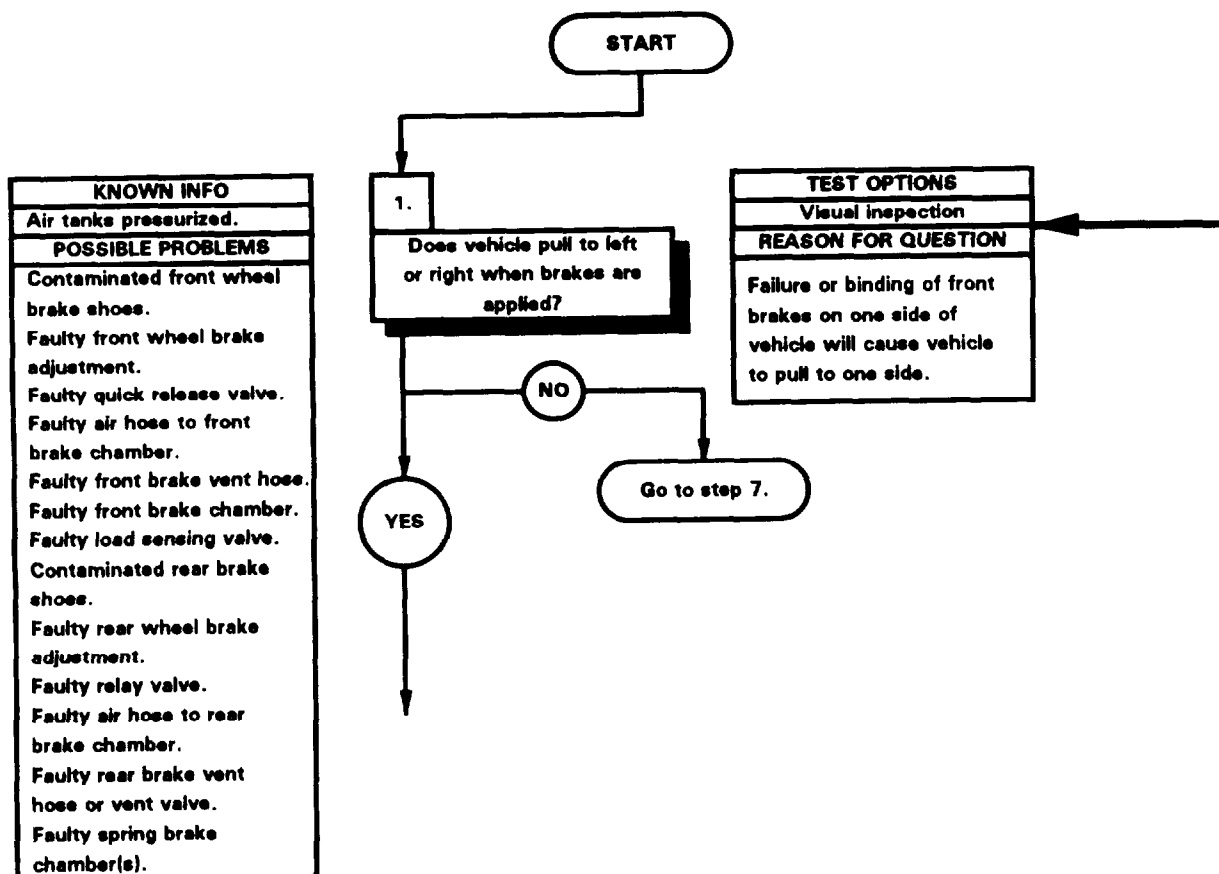
x210403-

- (1) Install wheel(s) (TM 9-2320-366-10-1).
- (2) Rotate affected wheel by hand and listen for loose or damaged bearings. If wheel makes grinding sound during rotation, 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, replace wheel bearings (para 10-2).
- (4) Check wheel hub oil level (Appendix H). If oil level is low, replace wheel bearings (para 10-2).
- (5) Lower wheels to ground and remove trestle stands.

HUB OIL PLUG

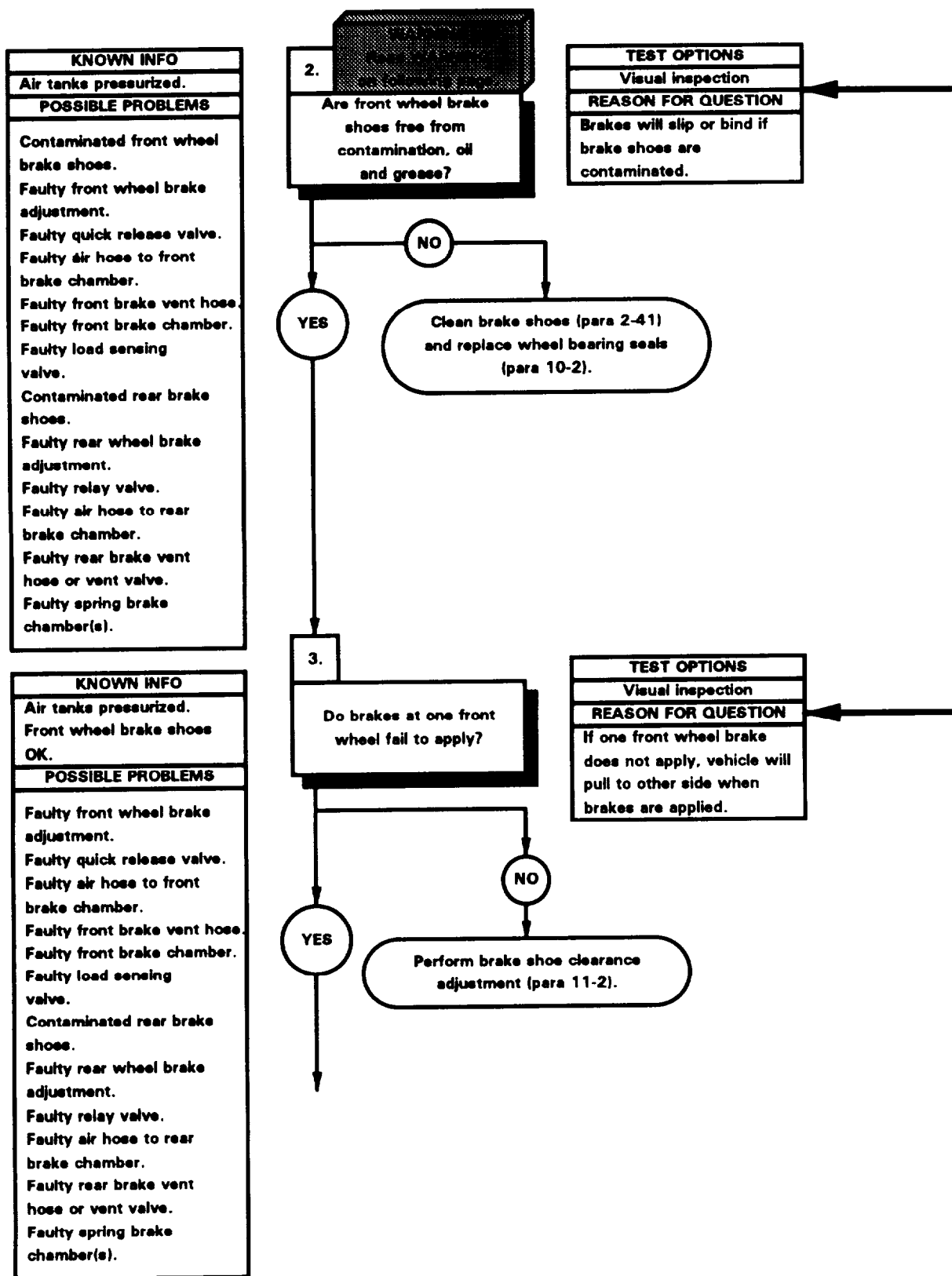


15. VEHICLE BRAKES UNEVENLY, BRAKES PULL TO ONE SIDE OR GRAB	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Goggles, Industrial (Item 15, Appendix C) Tool Kit, Genl Mech (Item 46, Appendix C) Trestle, Motor Vehicle Maintenance (2) (Item 47, Appendix C) Wrench, Torque, 0-175 lb-ft (Item 58, Appendix C)
Personnel Required (2)	



- 
- (1) Start engine (TM 9-2320-366-10-1).
 - (2) Test drive unloaded vehicle and apply brakes.
 - (3) Note response of brakes at each wheel.
 - (4) If vehicle pulls to one side when brakes are applied, front brakes are faulty.
 - (5) If all rear wheels lock up before front wheels, load sensing valve may need adjustment or is faulty.
 - (6) If individual rear wheels lock up or drag, individual rear wheel brakes may need adjustment.

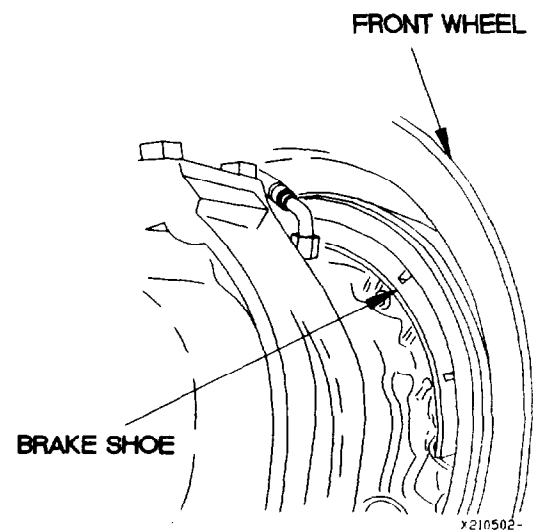
15. VEHICLE BRAKES UNEVENLY, BRAKES PULLS TO ONE SIDE OR GRAB (CONT)



WARNING

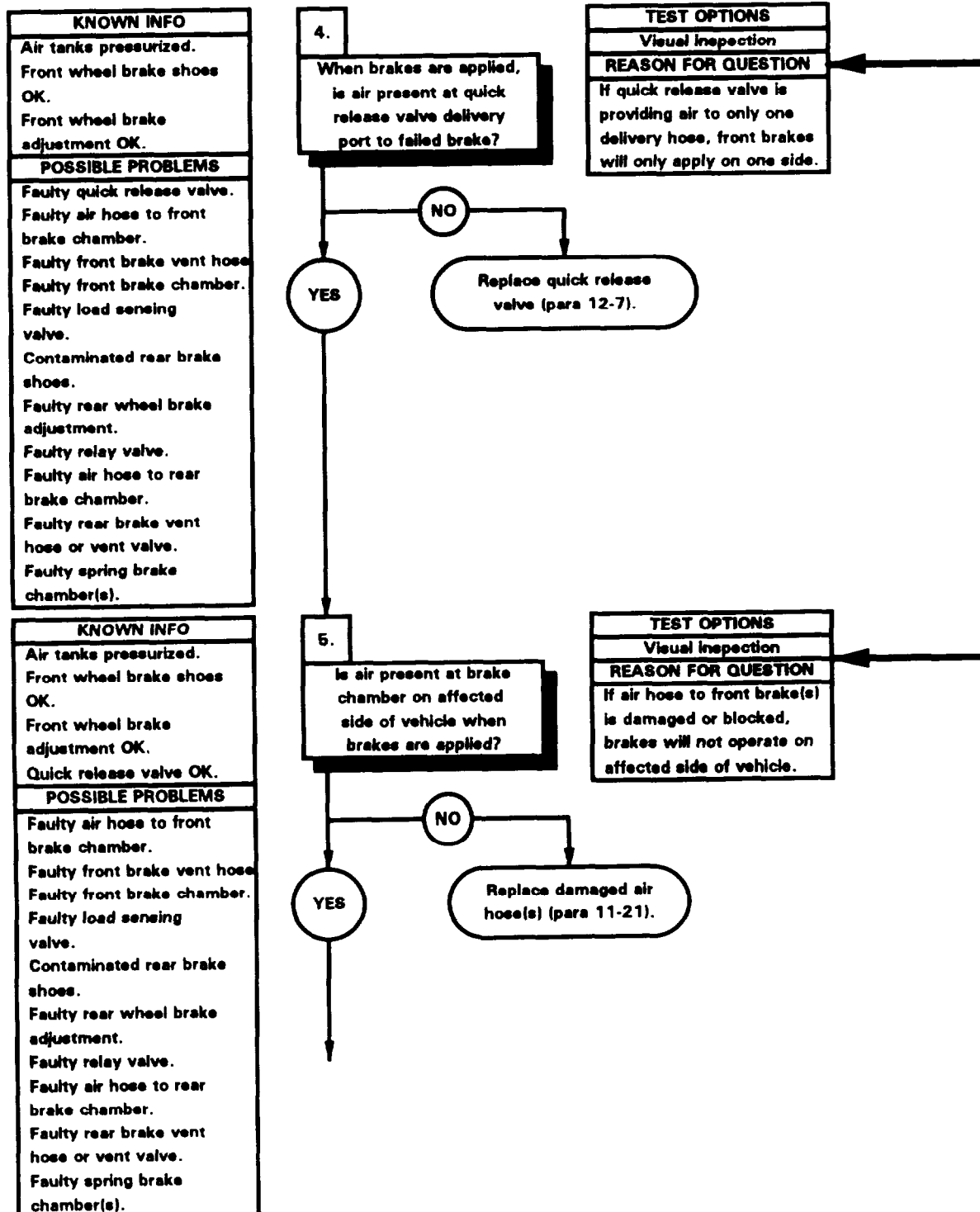
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

- (1) Jack up axle of front wheels and support with trestle stands.
- (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).

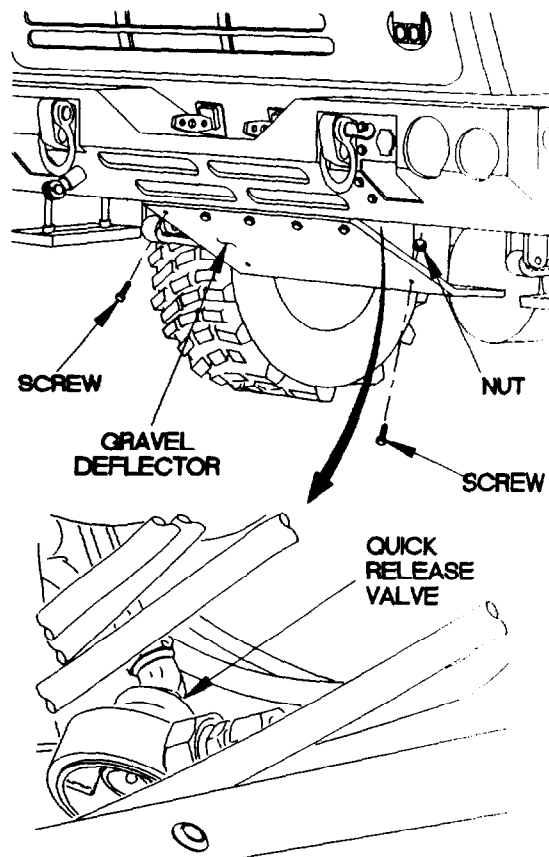


- (1) Apply brakes and observe operation of brake shoes at both front wheels.
- (2) If brake shoes fail to apply on one side, brake air delivery system or brake chamber is faulty on that side.
- (3) If both wheel brakes apply, adjust brake shoe clearance (para 11-2).
- (4) Rotate wheel on affected side 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).

15. VEHICLE BRAKES UNEVENLY, BRAKES PULLS TO ONE SIDE OR GRAB (CONT)

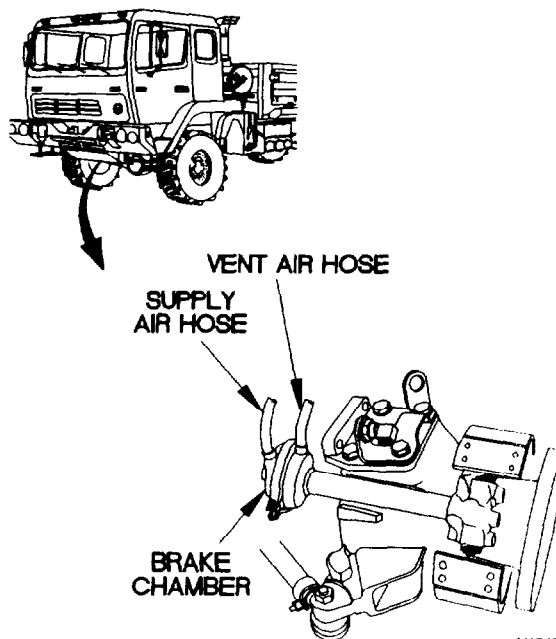


- (1) Remove five screws from top edge of gravel deflector.
- (2) Remove five screws and self-locking nuts from bottom edge of gravel deflector. Discard self-locking nuts.
- (3) Loosen air delivery line on affected side of quick release valve.
- (4) Apply brakes.
- (5) Check for presence of air at delivery port when brake is applied.
- (6) If air does not escape at delivery port for affected side, quick release valve is faulty.
- (7) Tighten air delivery line at quick release valve.
- (8) Position five screws to top edge of gravel deflector.
- (9) Tighten five screws to 42-52 lb-ft (59-71 N-m).
- (10) Position five screws and self-locking nuts to lower edge of gravel deflector.
- (11) Tighten five self-locking nuts to 75-93 lb-ft (103-127 N-m).



X210504-

- (1) Loosen supply air hose(s) at brake chamber(s).
- (2) Apply brakes.
- (3) Check for air escaping at supply air hose(s) when brakes are applied.
- (4) Tighten supply air hose(s) at brake chamber(s).

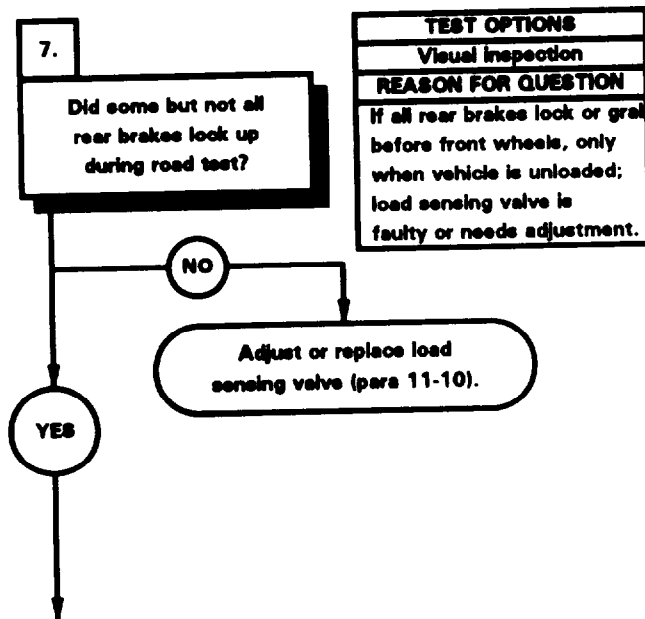
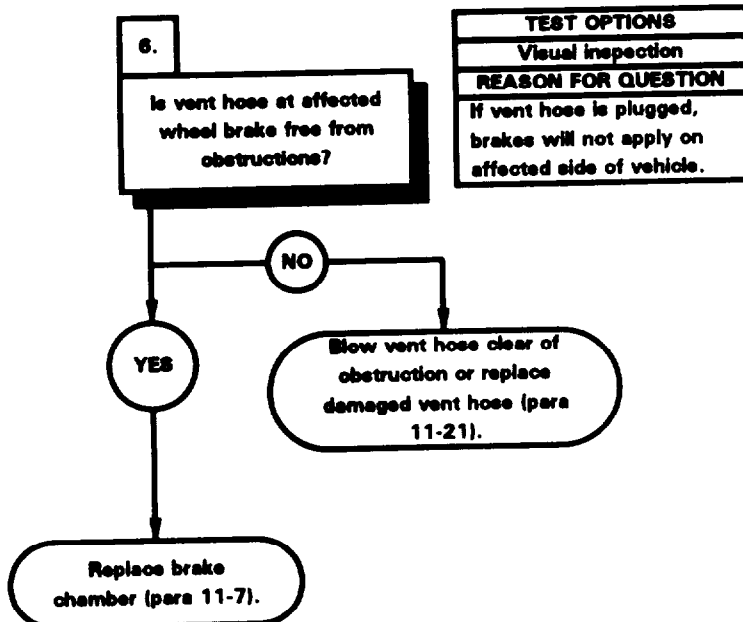


X210505-

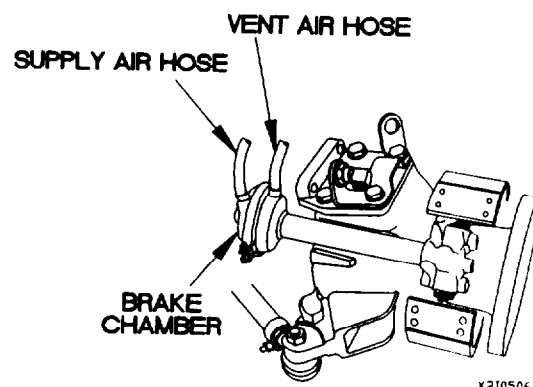
15. VEHICLE BRAKES UNEVENLY, BRAKES PULLS TO ONE SIDE OR GRAB (CONT)

KNOWN INFO
Air tanks pressurized. Front wheel brake shoes OK. Front wheel brake adjustment OK. Quick release valve OK. Air hose to front brake chamber OK.
POSSIBLE PROBLEMS
Faulty front brake vent hose Faulty front brake chamber. Faulty load sensing valve. Contaminated rear brake shoes. Faulty rear wheel brake adjustment. Faulty relay valve. Faulty air hose to rear brake chamber. Faulty rear brake vent hose or vent valve. Faulty spring brake chamber(s).

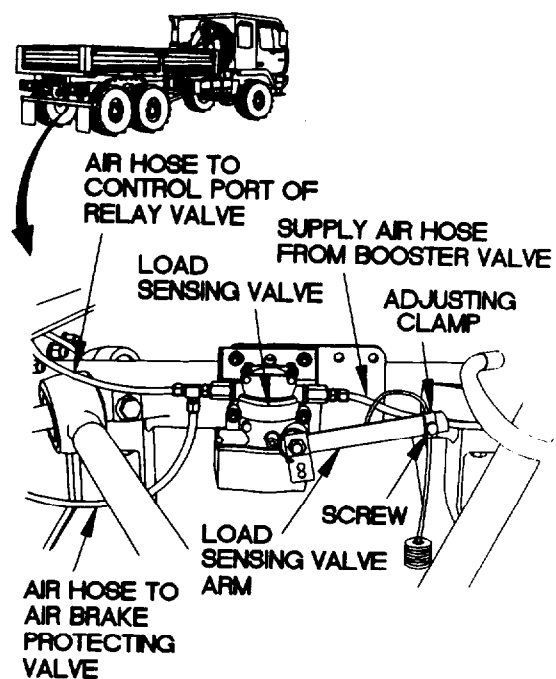
KNOWN INFO
Air tanks pressurized. Front wheel brake shoes OK. Front wheel brake adjustment OK. Quick release valve OK. Air hose to front brake chamber OK. Front brake vent hose OK. Front brake chamber OK.
POSSIBLE PROBLEMS
Faulty load sensing valve. Contaminated rear brake shoes. Faulty rear wheel brake adjustment. Faulty relay valve. Faulty air line to rear brake chamber. Faulty rear brake vent line or vent valve. Faulty spring brake chamber(s).



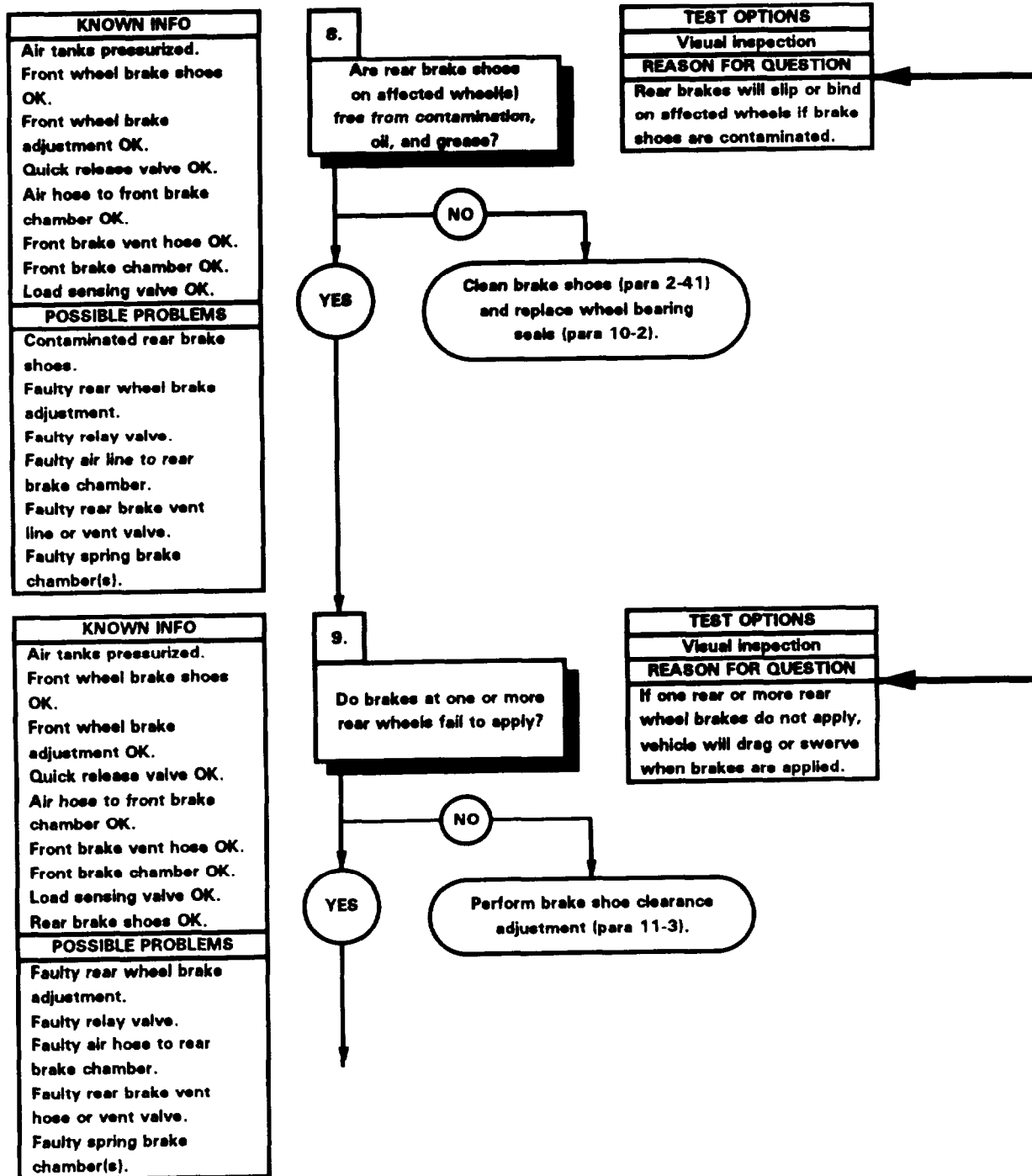
- (1) Disconnect vent hose at brake chamber.
- (2) Blow compressed air through vent hose.
- (3) Check for air escaping at vent.
- (4) Attach vent hose at brake chamber.
- (5) Remove trestle and lower front wheels to ground.



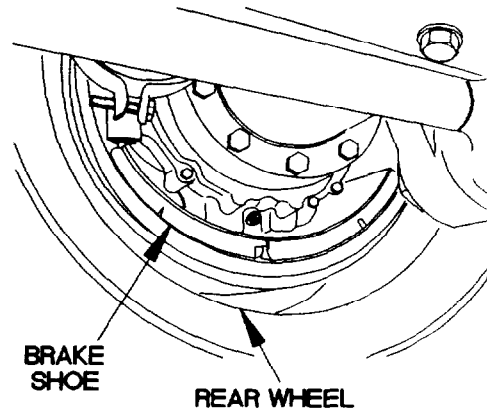
- (1) If all rear wheels locked on road test of unloaded vehicle, check load sensing valve hardware components condition, arm position, adjusting clamp, and cable.
- (2) If valve arm is in full up position (valve spring rest position), adjust or replace load sensing valve (para 11-10).



i5. VEHICLE BRAKES UNEVENLY, BRAKES PULLS TO ONE SIDE OR GRAB (CONT)



- (1) Jack up axle of each affected rear wheel and support with trestle stands.
- (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) Remove trestle stands and lower wheels to ground.

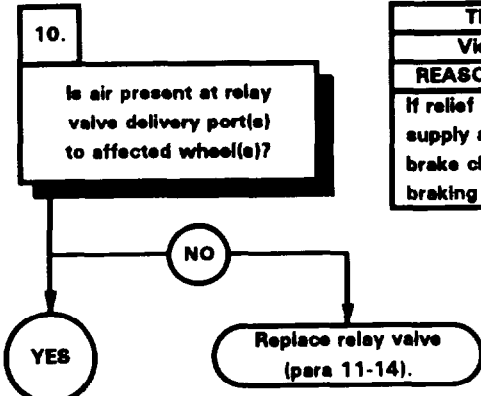


x210508-

- (1) Chock wheels.
- (2) Release parking brake (TM 9-2320-366-10-1).
- (3) Apply brakes and observe operation of brake shoes at rear wheels.
- (4) If brake shoes fail to apply on one side or at one wheel, brake air delivery system or brake chamber, is faulty on that side or at that wheel.
- (5) If all rear wheel brakes apply, adjust brake shoe clearance (para 11-3).

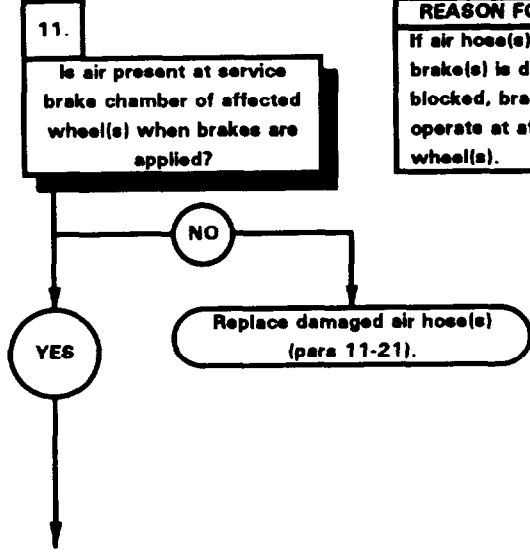
i5. VEHICLE BRAKES UNEVENLY, BRAKES PULLS TO ONE SIDE OR GRAB (CONT)

KNOWN INFO
Air tanks pressurized. Front wheel brake shoes OK. Front wheel brake adjustment OK. Quick release valve OK. Air hose to front brake chamber OK. Front brake vent hose OK. Front brake 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 chamber. Faulty rear brake vent hose or vent valve. Faulty spring brake chamber(s).



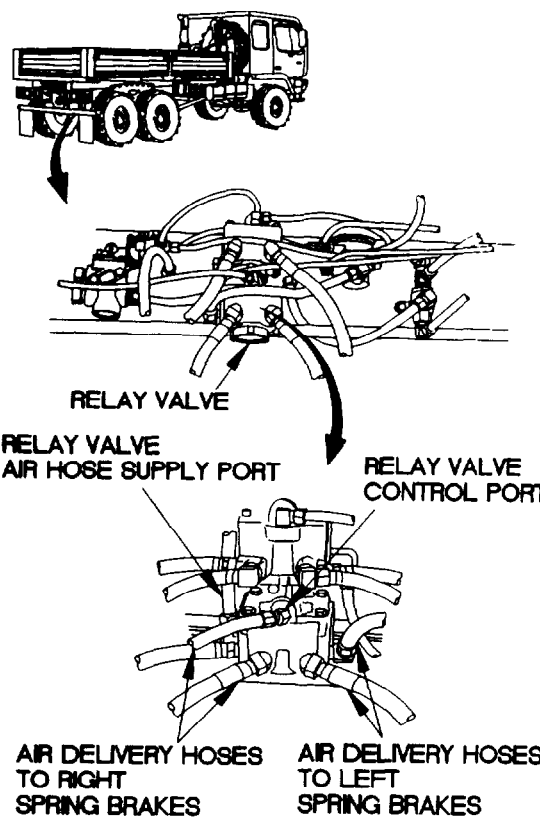
TEST OPTIONS
Visual inspection
REASON FOR QUESTION
If relief valve does not supply air to all rear brake chambers, braking will be uneven.

KNOWN INFO
Air tanks pressurized. Front wheel brake shoes OK. Front wheel brake adjustment OK. Quick release valve OK. Air hose to front brake chamber OK. Front brake vent hose OK. Front brake 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 chamber. Faulty rear brake vent hose or vent valve. Faulty spring brake chamber(s).



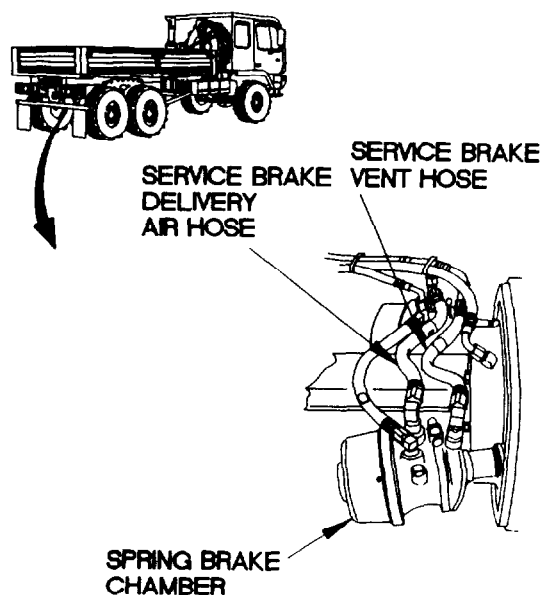
TEST OPTIONS
Visual inspection
REASON FOR QUESTION
If air hose(s) to affected brake(s) is damaged or blocked, brakes will not operate at affected wheel(s).

- (1) Loosen delivery air hoses at delivery ports of relay valve.
- (2) Apply brakes.
- (3) Check for presence of air. If no air is present, replace relay valve (para 11-14).
- (4) Tighten delivery air hoses to relay valve delivery ports.



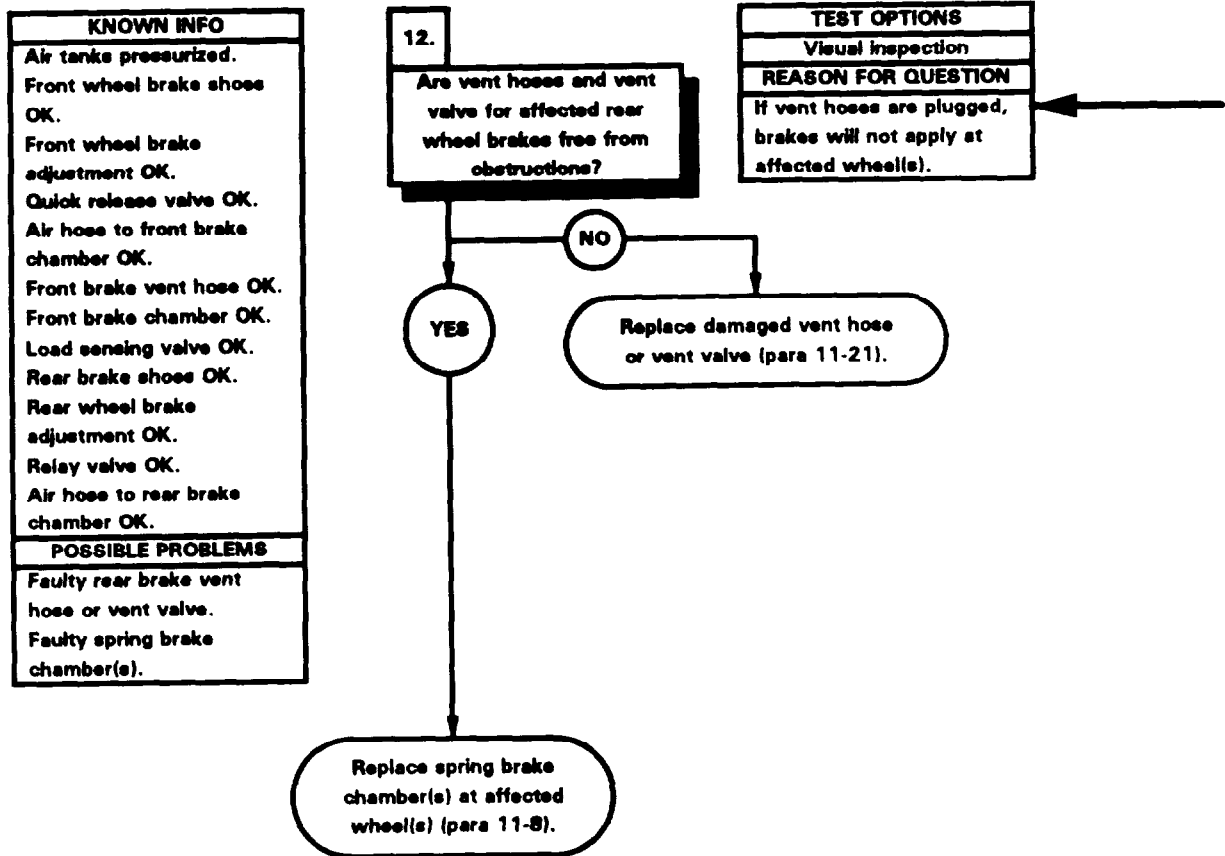
4210507A

- (1) Loosen service brake air hose at spring brake chamber.
- (2) Apply brakes.
- (3) Check for presence of air. If no air is present, replace air hose (para 11-21).
- (4) Tighten air hose on spring brake chamber.
- (5) Apply parking brake (TM 9-2320-366-10-1).

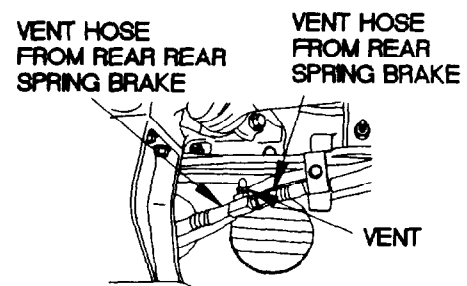
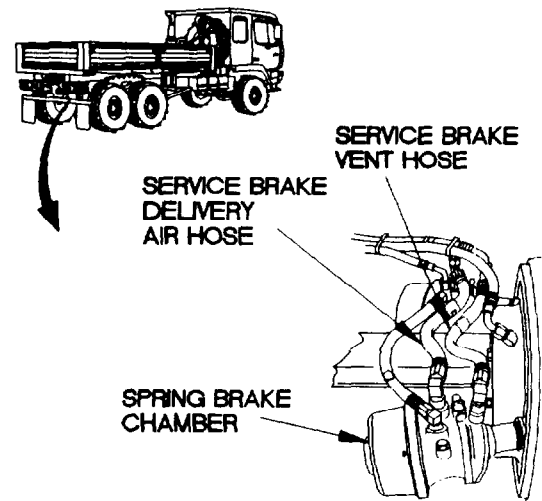


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15. VEHICLE BRAKES UNEVENLY, BRAKES PULLS TO ONE SIDE OR GRAB (CONT)

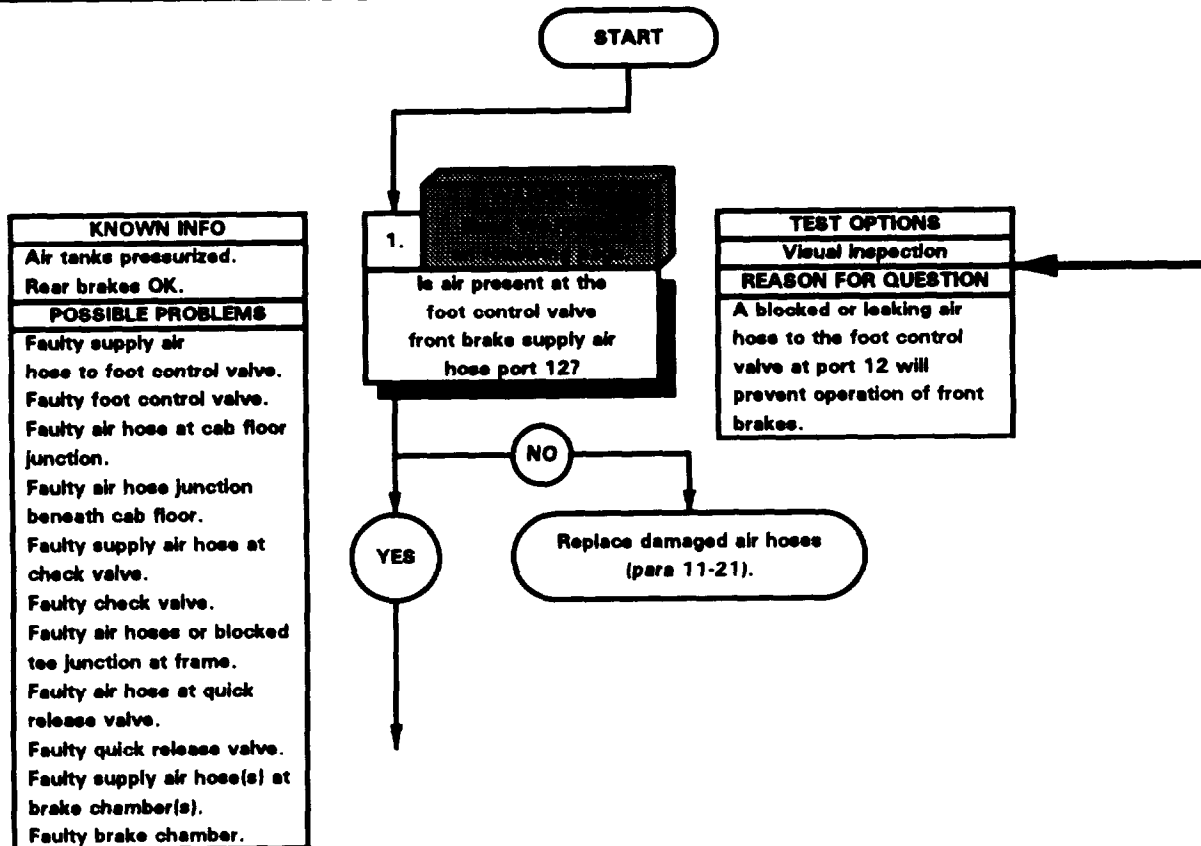


- (1) Disconnect vent hose(s) at spring brake chamber(s).
- (2) Blow compressed air through vent hoses.
- (3) Check for presence of air at vent valve.
- (4) Connect vent hose(s) at spring brake chamber(s).
- (5) Remove wheel chocks (TM 9-2320-366-10-1).



4210509A

16. FRONT BRAKES DO NOT APPLY	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Goggles, Industrial (Item 15, Appendix C) Wrench, Torque, 0-175 lb-ft (Item 58, Appendix C) Wrench, Torque, 0-200 lb-in. (Item 59, Appendix C)
Personnel Required (2)	Materials/Parts Nut, Self-locking (5) (Item 157, Appendix G)



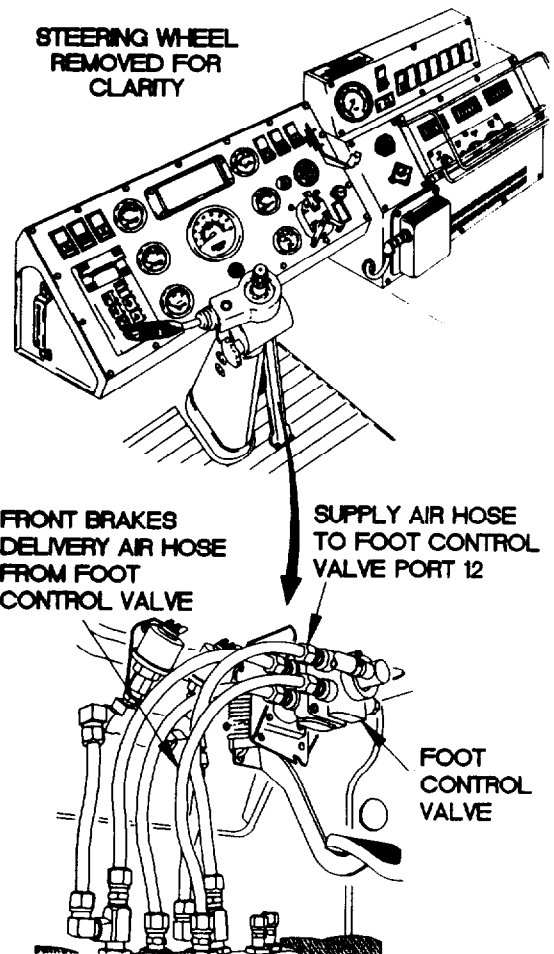
WARNING

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

NOTE

Air system pressure must be in the 90-120 psi operating range to begin brake system troubleshooting. If the air pressure cannot be maintained within operating range, proceed to Air System Troubleshooting.

- (1) Loosen supply air hose to the foot control valve and check for presence of air.
- (2) Tighten supply air hose on the foot control valve.

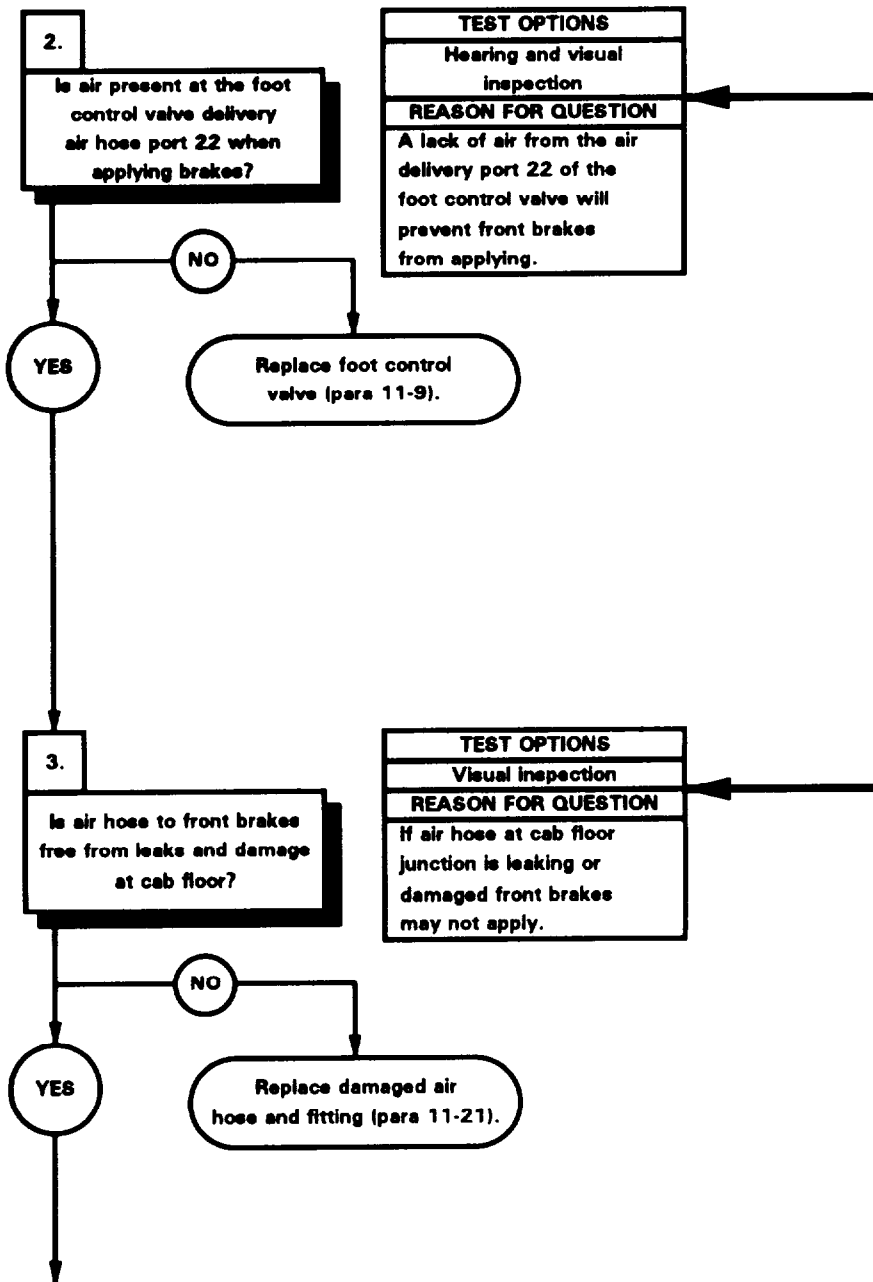


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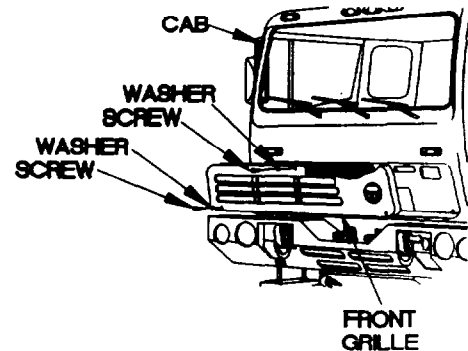
16. FRONT BRAKES DO NOT APPLY (CONT)

KNOWN INFO
Air tanks pressurized. Rear brakes OK. Supply air hose to foot control valve OK.
POSSIBLE PROBLEMS
Faulty foot control valve. Faulty air hose at cab floor junction. Faulty air hose junction beneath cab floor. Faulty supply air hose at check valve. Faulty check valve. Faulty air hoses or blocked tee junction at frame. Faulty air hose at quick release valve. Faulty quick release valve. Faulty supply air hose(s) at brake chamber(s). Faulty brake chamber.

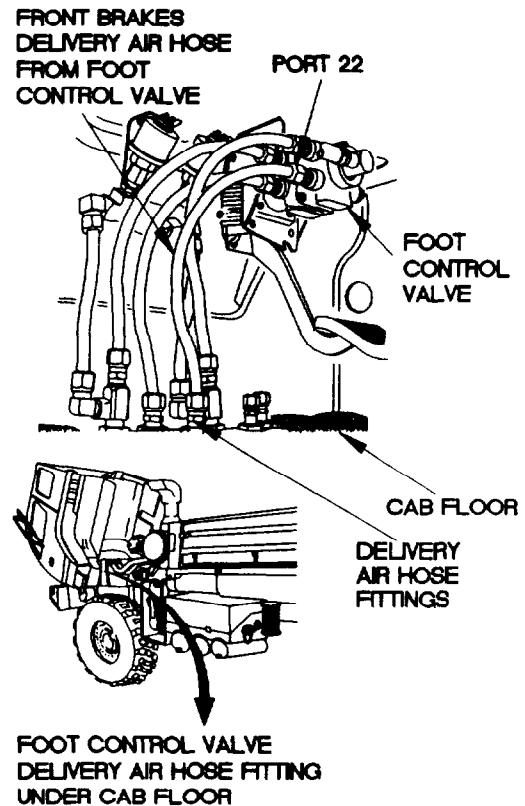
KNOWN INFO
Air tanks pressurized. Rear brakes OK. Supply air hose to foot control valve OK. Foot control valve OK.
POSSIBLE PROBLEMS
Faulty air hose at cab floor junction. Faulty air hose junction beneath cab floor. Faulty supply air hose at check valve. Faulty check valve. Faulty air hoses or blocked tee junction at frame. Faulty air hose at quick release valve. Faulty quick release valve. Faulty supply air hose(s) at brake chamber(s). Faulty brake chamber.



- (1) Loosen delivery hose (port 22) on foot control valve and check for presence of air each time pedal is depressed.
- (2) Tighten delivery hose on foot control valve.

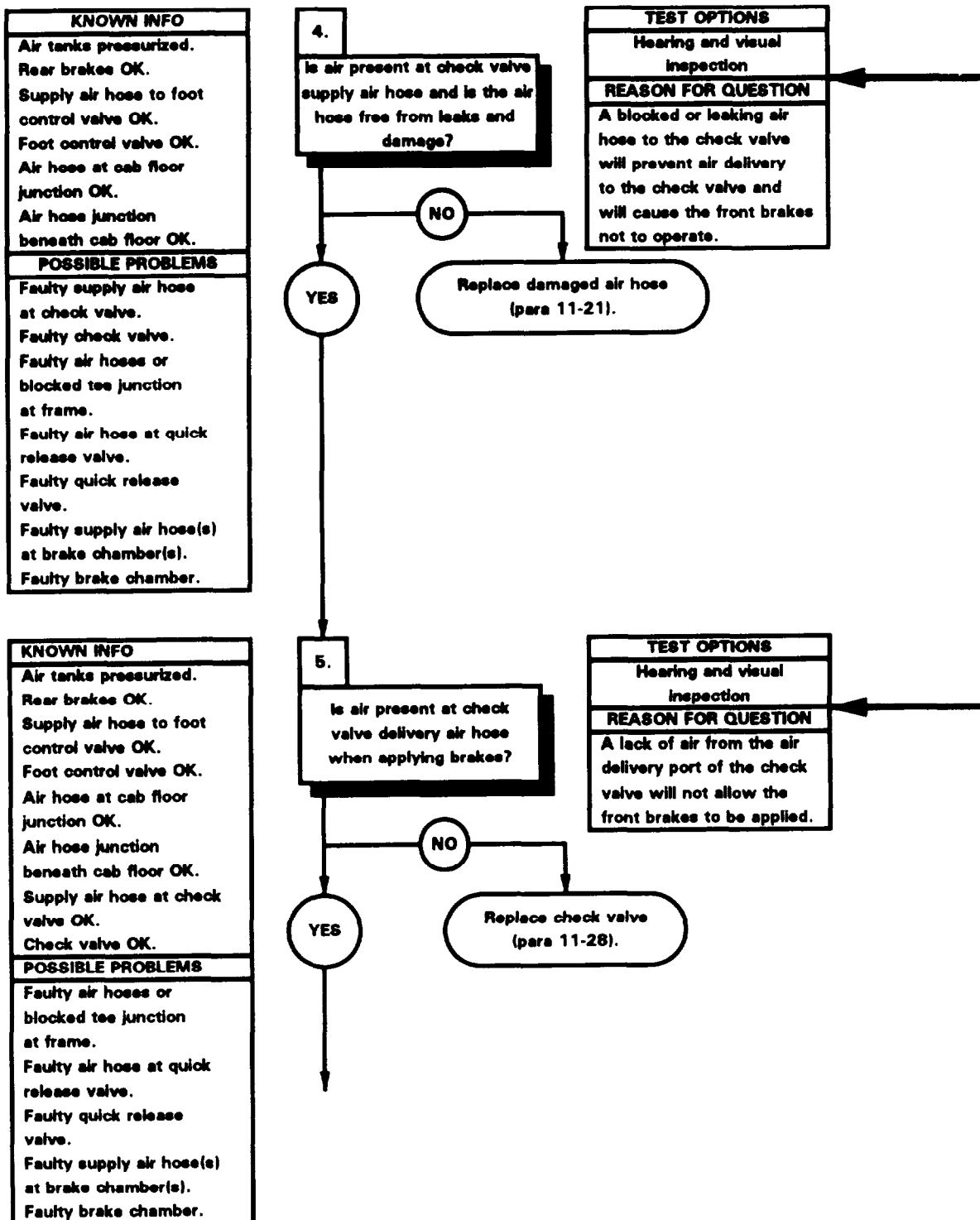


- (1) Loosen air delivery hose (from port 22) at floor of cab.
- (2) Apply foot brake.
- (3) Check for presence of air at delivery hose when brake is applied.
- (4) Tighten fittings.
- (5) Remove two screws and washers from front grille.
- (6) Remove screw and washer from front grille.
- (7) Remove front grille from cab.
- (8) Loosen air delivery hose at fitting beneath cab floor.
- (9) Apply foot brake.
- (10) Check for presence of air at air hose when brake is applied.
- (11) Tighten fittings.
- (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).

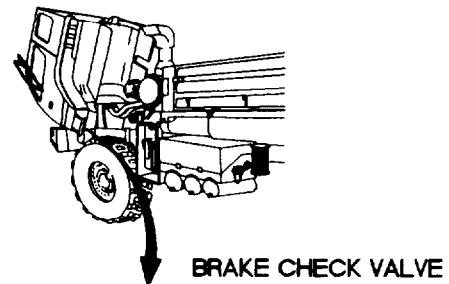


X210602A

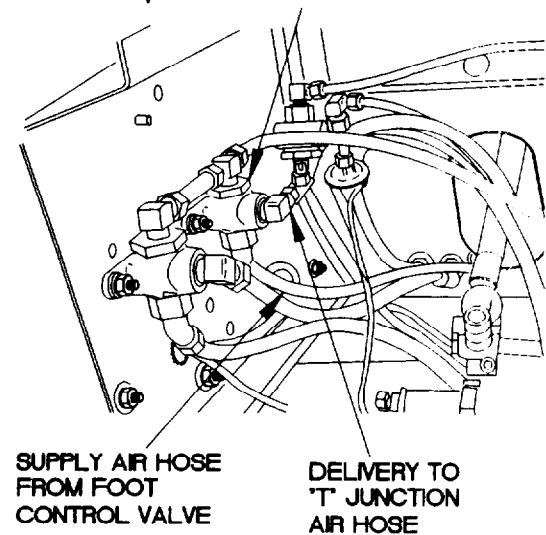
16. FRONT BRAKES DO NOT APPLY (CONT)



- (1) Raise cab (TM 9-2320-366-10-1).
- (2) Loosen air line at check valve supply port.
- (3) Lower cab (TM 9-2320-366-10-1).
- (4) Apply foot brake.
- (5) Check for presence of air from air line when brake is applied.
- (6) Raise cab (TM 9-2320-366-10-1).
- (7) Tighten air line fitting.

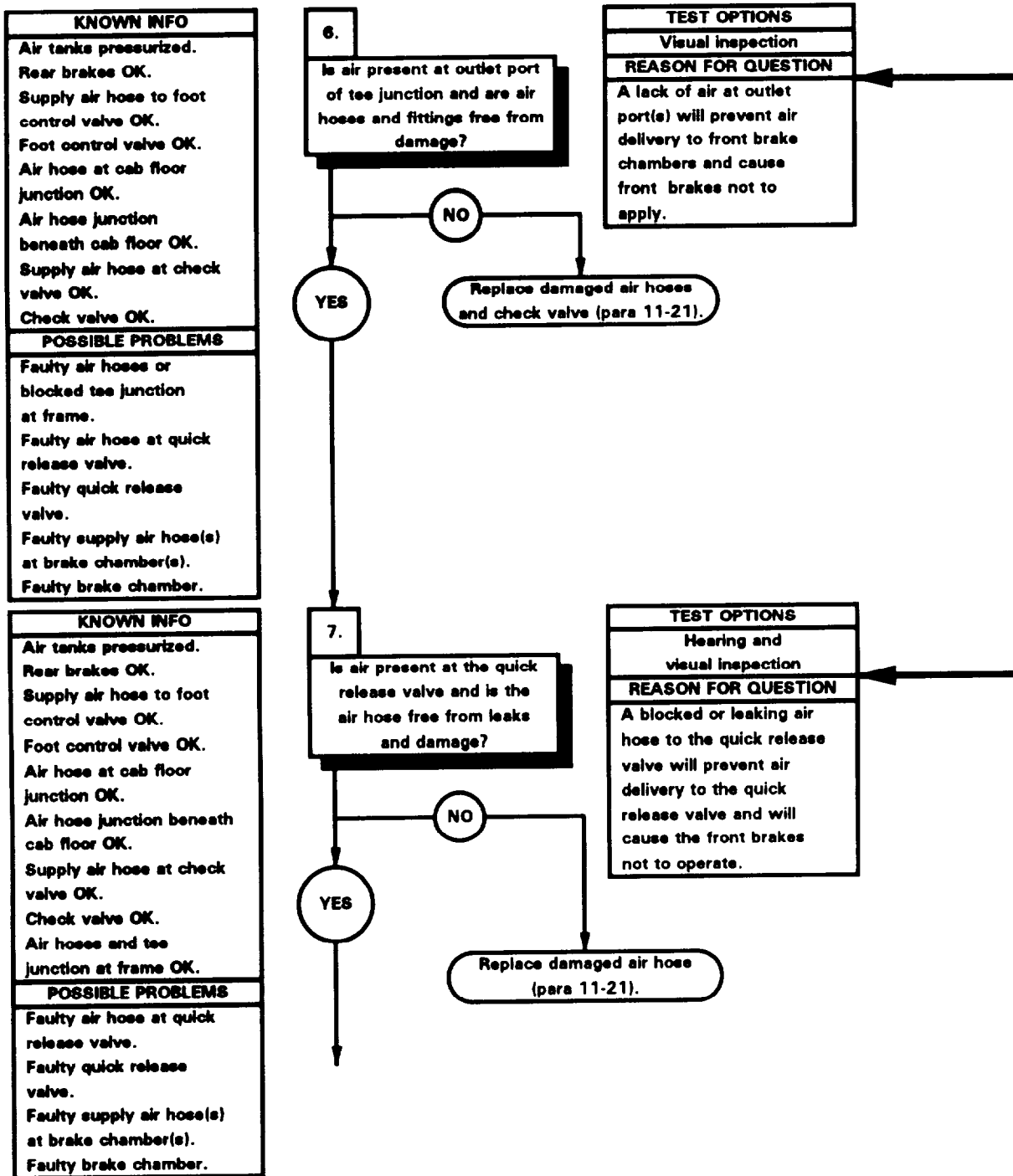


- (1) Loosen delivery line on check valve.
- (2) Lower cab (TM 9-2320-366-10-1).
- (3) Apply brakes and check for presence of air.
- (4) Raise cab (TM 9-2320-366-10-1).
- (5) Tighten delivery line on check valve.

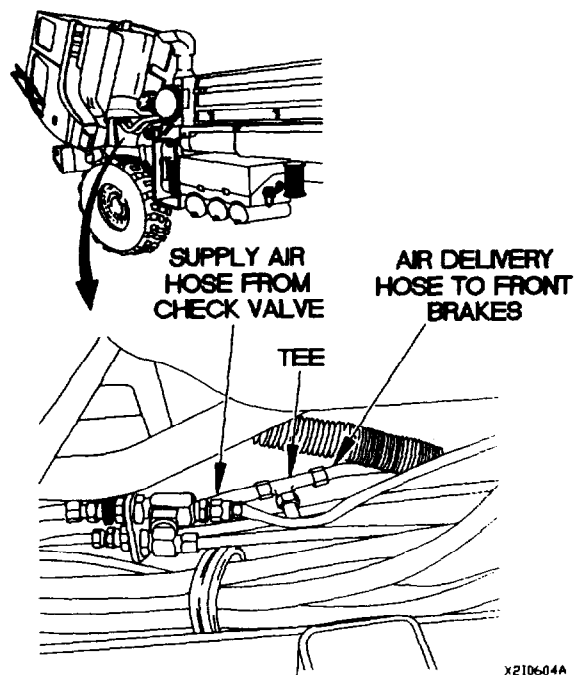


x210604-

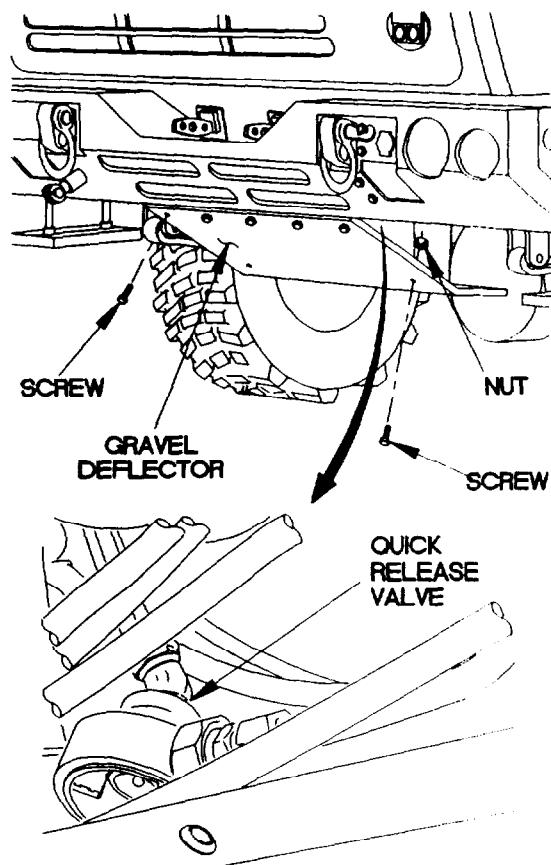
16. FRONT BRAKES DO NOT APPLY (CONT)



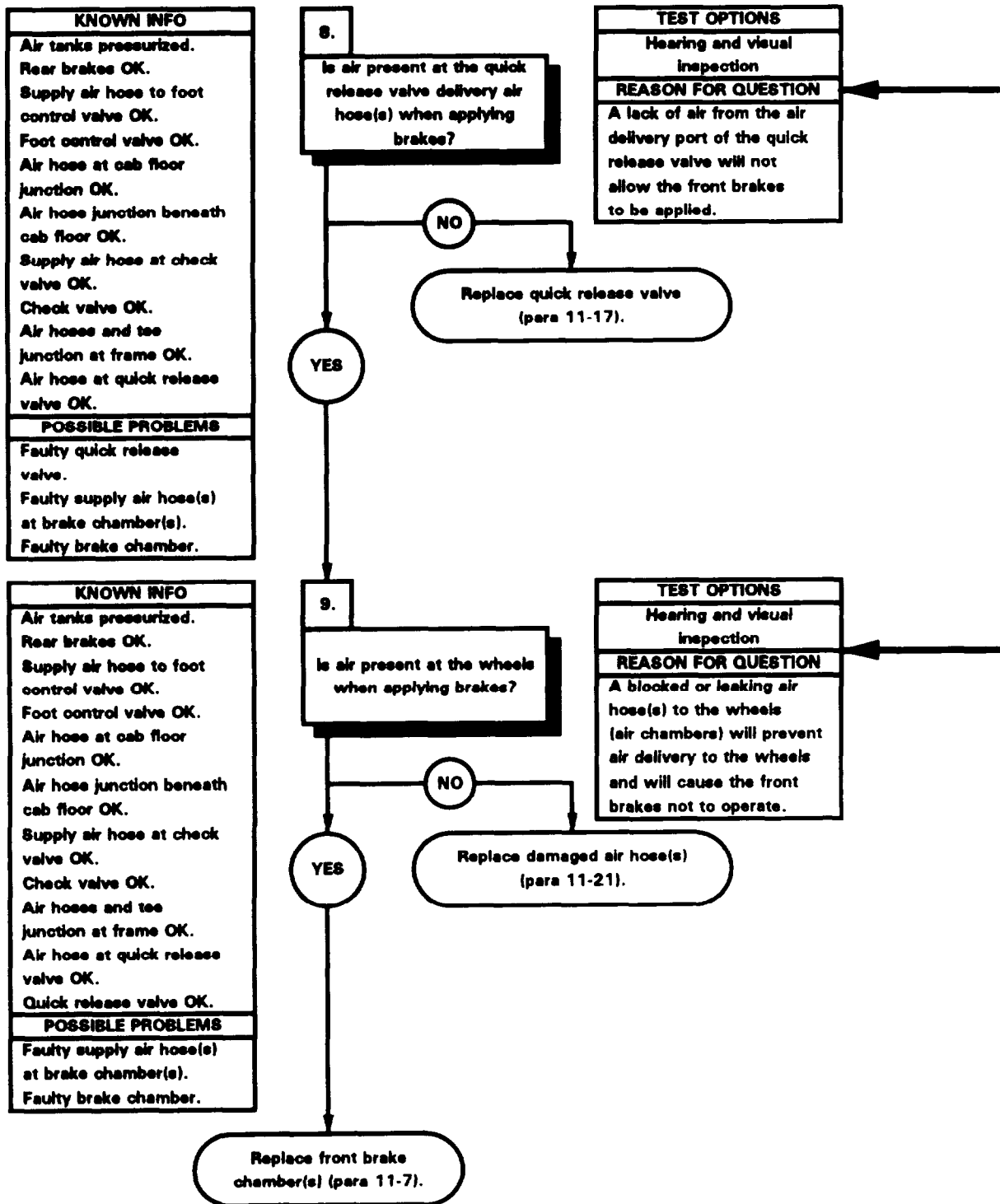
- (1) Loosen delivery line at tee junction.
- (2) Lower cab (TM 9-2320-366-10-1).
- (3) Apply brakes.
- (4) Check for presence of air when brake is applied.
- (5) Raise cab (TM 9-2320-366-10-1).
- (6) Tighten delivery line at tee junction.
- (7) Lower cab (TM 9-2320-366-10-1).



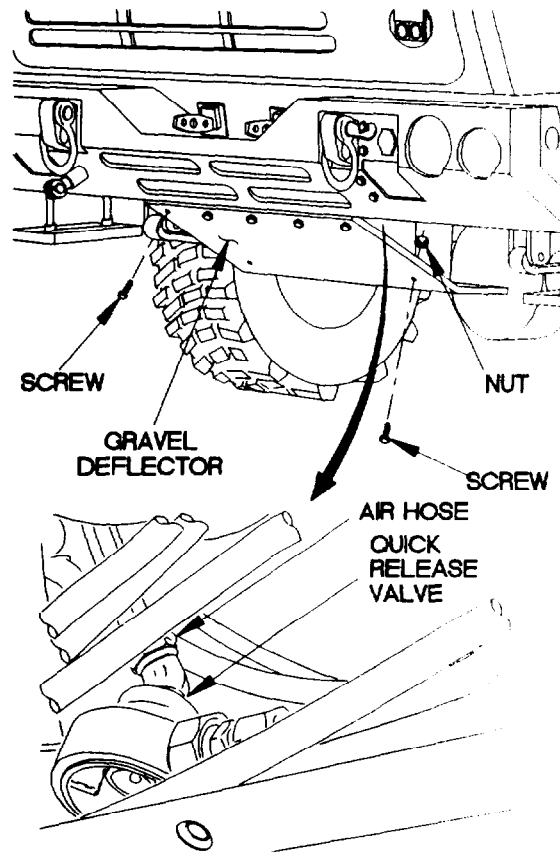
- (1) Remove five screws from top edge of gravel deflector.
- (2) Remove five self-locking nuts, screws, and gravel deflector. Discard self-locking nuts.
- (3) Loosen air supply line at quick release valve.
- (4) Apply brakes.
- (5) Check for presence of air at supply line when brake is applied.
- (6) Tighten air supply line at quick release valve.



16. FRONT BRAKES DO NOT APPLY (CONT)

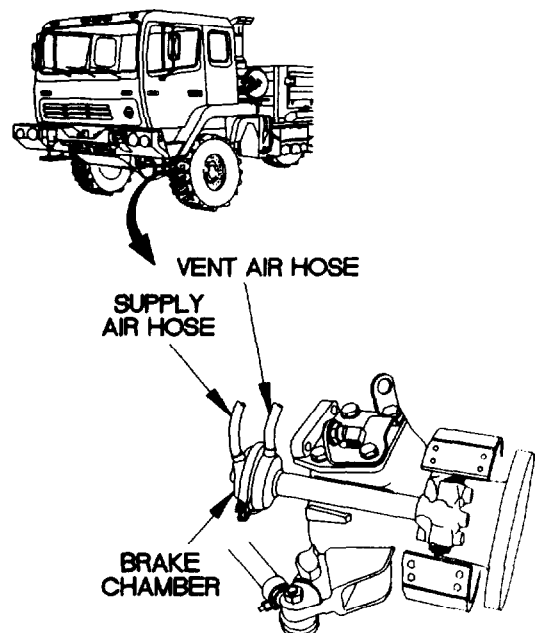


- (1) Loosen delivery hoses on quick release valve.
- (2) Apply brakes.
- (3) Check for presence of air at delivery ports of quick release valve when brakes are applied.
- (4) Tighten delivery hoses on check valve.
- (5) Position gravel deflector on vehicle with five screws and self-locking nuts.
- (6) Tighten five self-locking nuts to 76-94 lb-ft (103-127 N-m).
- (7) Position five screws in top edge of gravel deflector.
- (8) Tighten five screws to 43-52 lb-ft (58-71 N-m).



K210608-

- (1) Loosen supply air hose(s) at brake chamber(s).
- (2) Apply brakes.
- (3) Check for presence of air at supply air hose(s) when brakes are applied.
- (4) Tighten supply air hose(s) at brake chamber(s).



K210609-

17. REAR BRAKES OVERHEAT

INITIAL SETUP

Equipment Conditions

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

Personnel Required

(2)

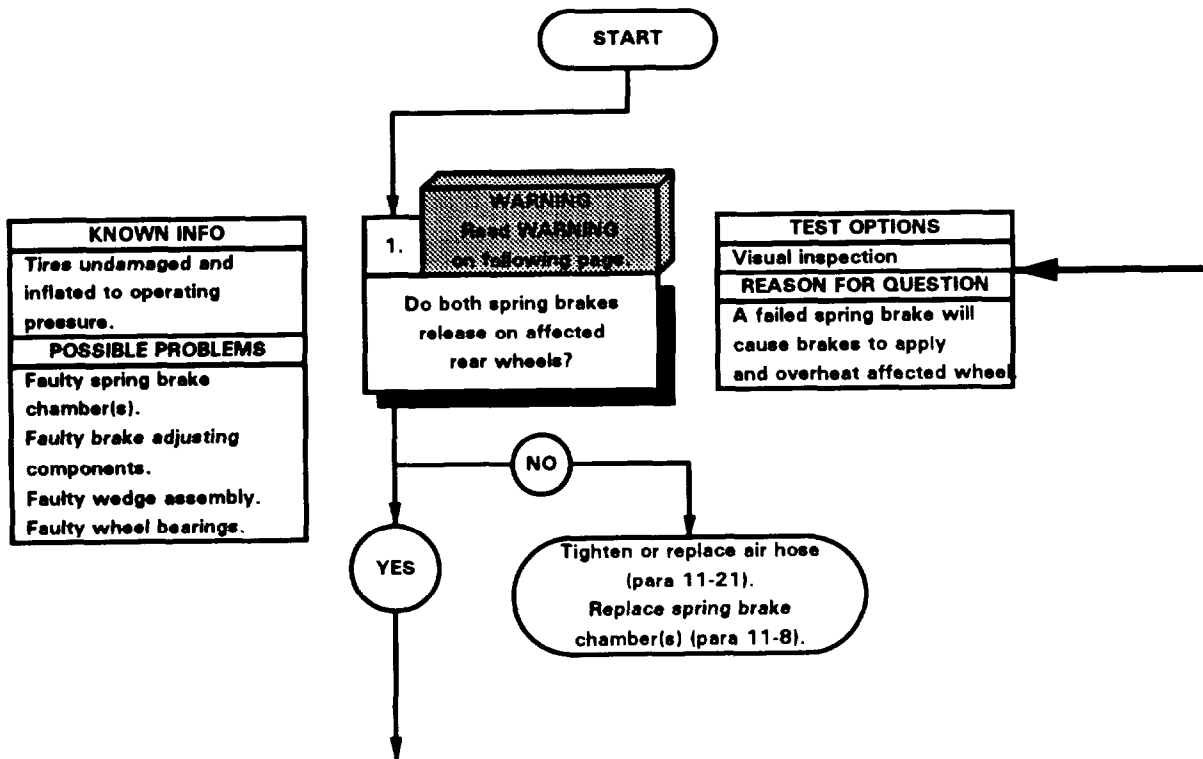
Tools and Special Tools

Goggles, Industrial (Item 15, Appendix C)

Tool Kit, Genl Mech (Item 46, Appendix C)

Trestle, Motor Vehicle Maintenance (2) (Item 47, Appendix C)

Adjusting Tool, Brake Shoe (Item 2, Appendix C)



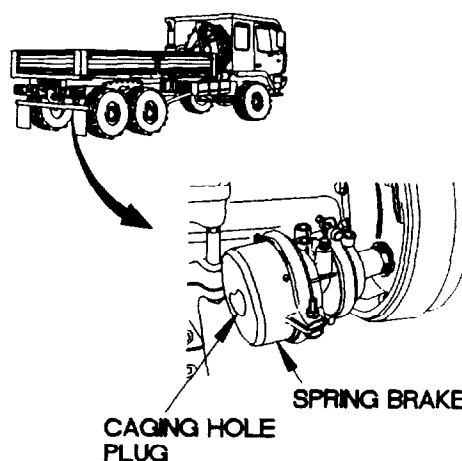
WARNING

- Overheated brakes can cause severe burns. Perform task only when brakes have cooled. Failure to comply may result in injury to personnel.
- Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

NOTE

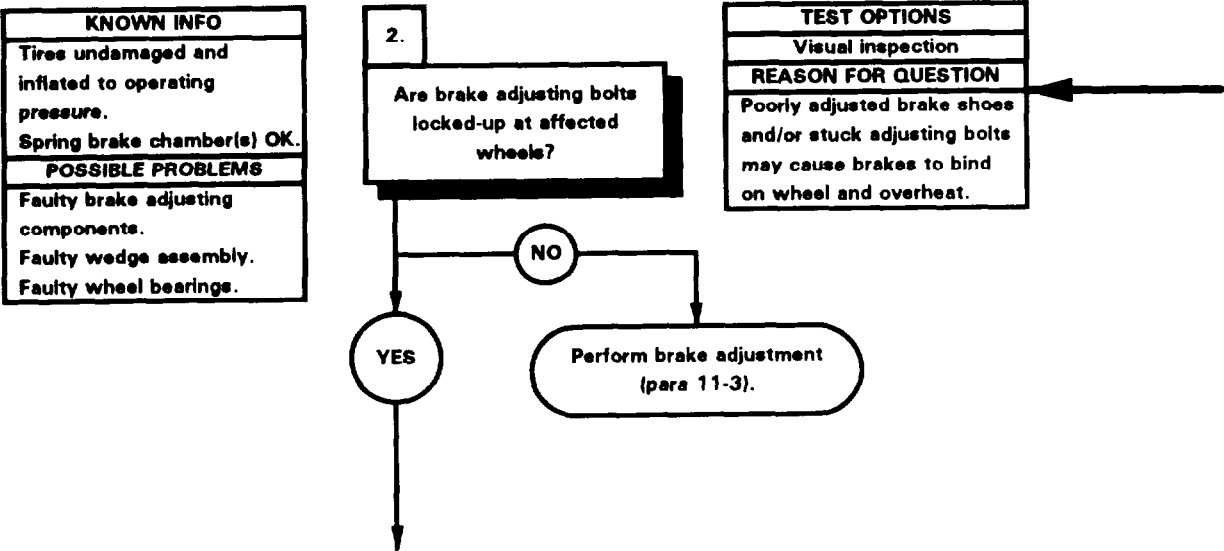
If wheel drums are too hot for hand touch after road test of vehicle, brakes are overheated.

- (1) Release parking brake (TM 9-2320-366-10-1).
- (2) Check for presence of air at air hose to spring brake chamber. If air is present at spring brake chamber, replace fittings or air hose (para 11-21).
- (3) Remove cover plug from caging hole at back of spring brake chamber (TM 9-2320-366-10-2).
- (4) With flashlight directed at caging hole, apply and release parking brake. Check if spring retracts when air is supplied by releasing parking brake. If brake does not cage (retract) when air is supplied to spring brake chamber, replace spring brake chamber (para 11-8).
- (5) Replace plug in caging hole of spring brake chamber (TM 9-2320-366-10-2).
- (6) Apply parking brake (TM 9-2320-366-10-1).

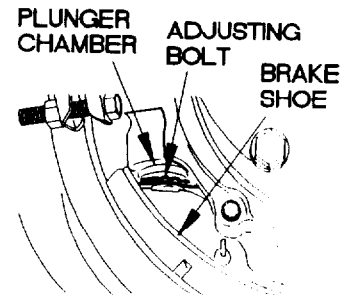
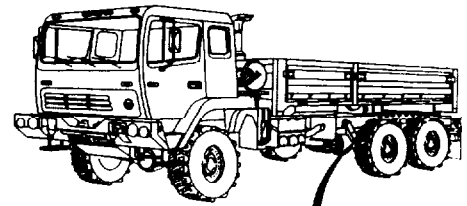


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i7. REAR BRAKES OVERHEAT (CONT)

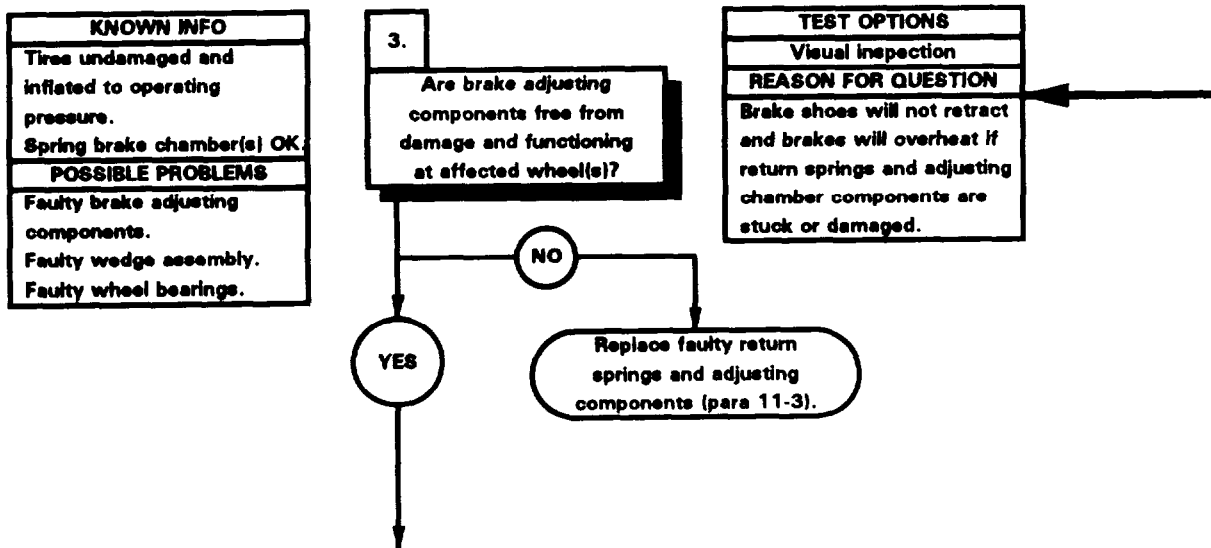


- (1) Jack up axle with overheated brakes, and support with trestle stands.
- (2) Release parking brake (TM 9-2320-366-10-1).
- (3) Turn adjusting bolt clockwise with adjusting tool. If bolt will not turn or if brake shoes do not move away from wheel when adjuster is turned, perform brake adjustment (para 11-3).



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i7. REAR BRAKES OVERHEAT (CONT)

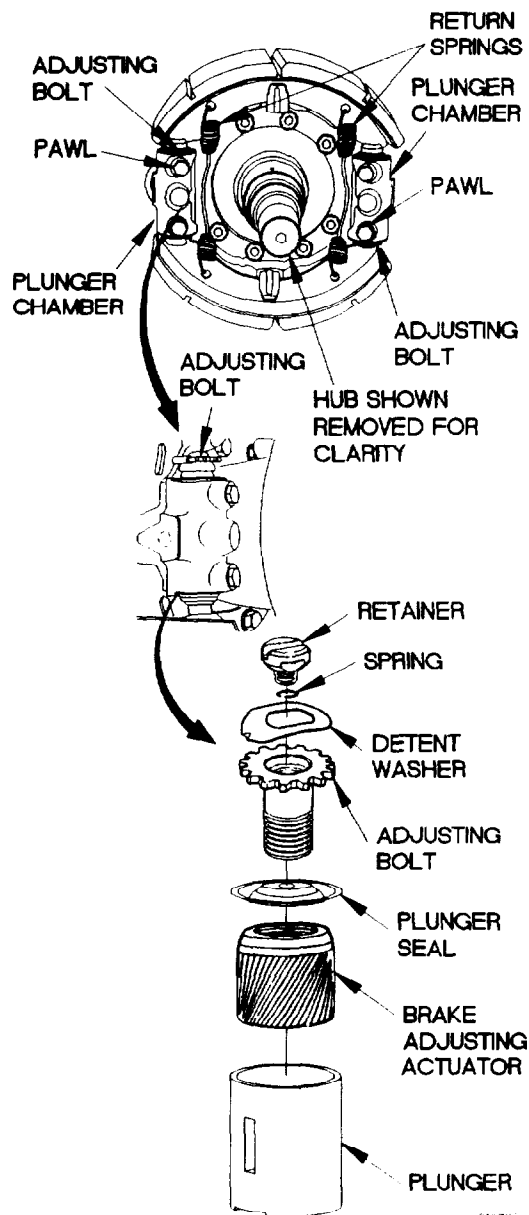


- (1) Remove wheel(s) with affected brakes (TM 9-2320-366-10-1).
- (2) Disassemble brakes (para 11-3).
- (3) Inspect spring for stretching, bluing, damage, or breakage. If spring(s) is damaged, brake shoes will not retract from wheel.
- (4) Check adjusting pawl spring for damage. Ensure springs are not missing or broken.
- (5) Check adjusting pawl teeth for damage and abrasion.

NOTE

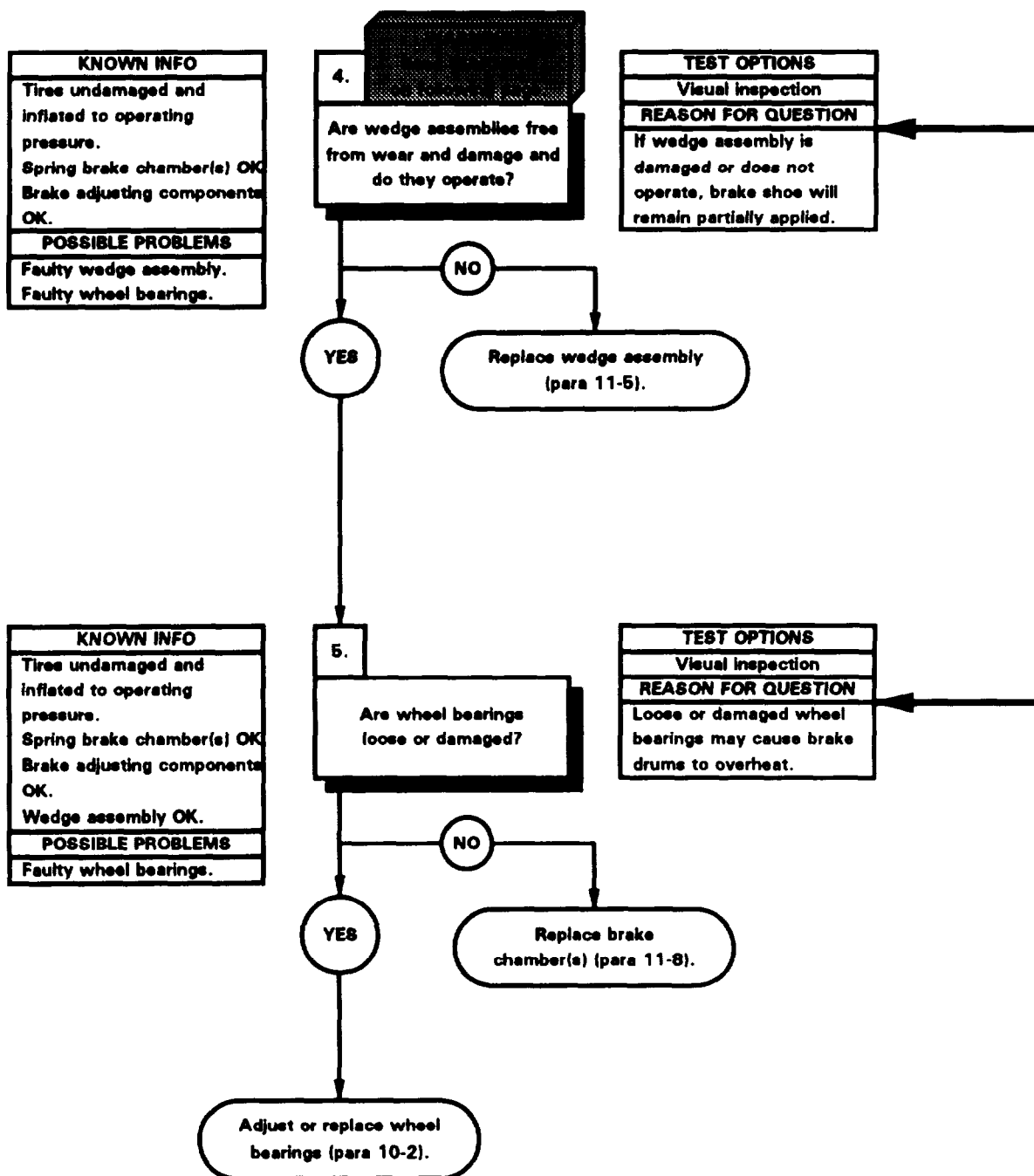
A damaged seal may permit dirt to enter plunger chamber and interfere with adjustment.

- (6) Ensure seal elements are not damaged or broken.
- (7) Check actuator teeth for damage.
- (8) Check plunger for freedom of movement inside plunger housing.



x210711-1

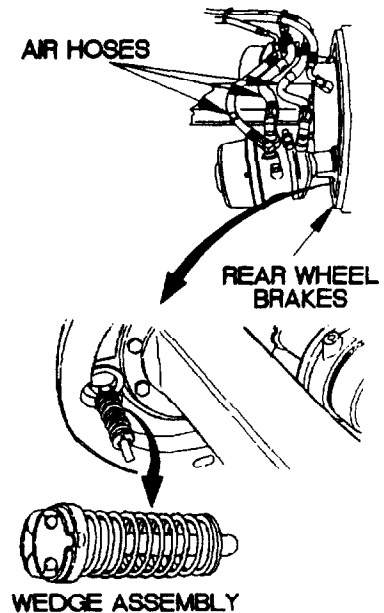
17. REAR BRAKES OVERHEAT (CONT)



WARNING

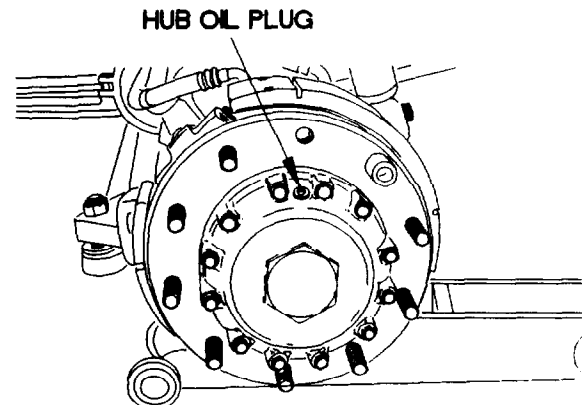
Spring brake chambers are very powerful. Cage spring brakes before removing chambers. Failure to comply may result in injury to personnel.

- (1) Disconnect and tag air lines to spring brake chambers at wheel.
- (2) Cage spring brakes on rear wheels (para 11-8).
- (3) Unscrew brake chamber(s) from hub and remove wedge assembly from wheel (para 11-5).
- (4) Inspect wedge spring for damage.
- (5) Inspect rollers for flattening or damage.
- (6) Manually check operation of wedge assembly in plunger chamber.
- (7) Install wedge assembly and brake chambers (para 11-5).
- (8) Install wheel brake components and adjust brakes (para 11-3).

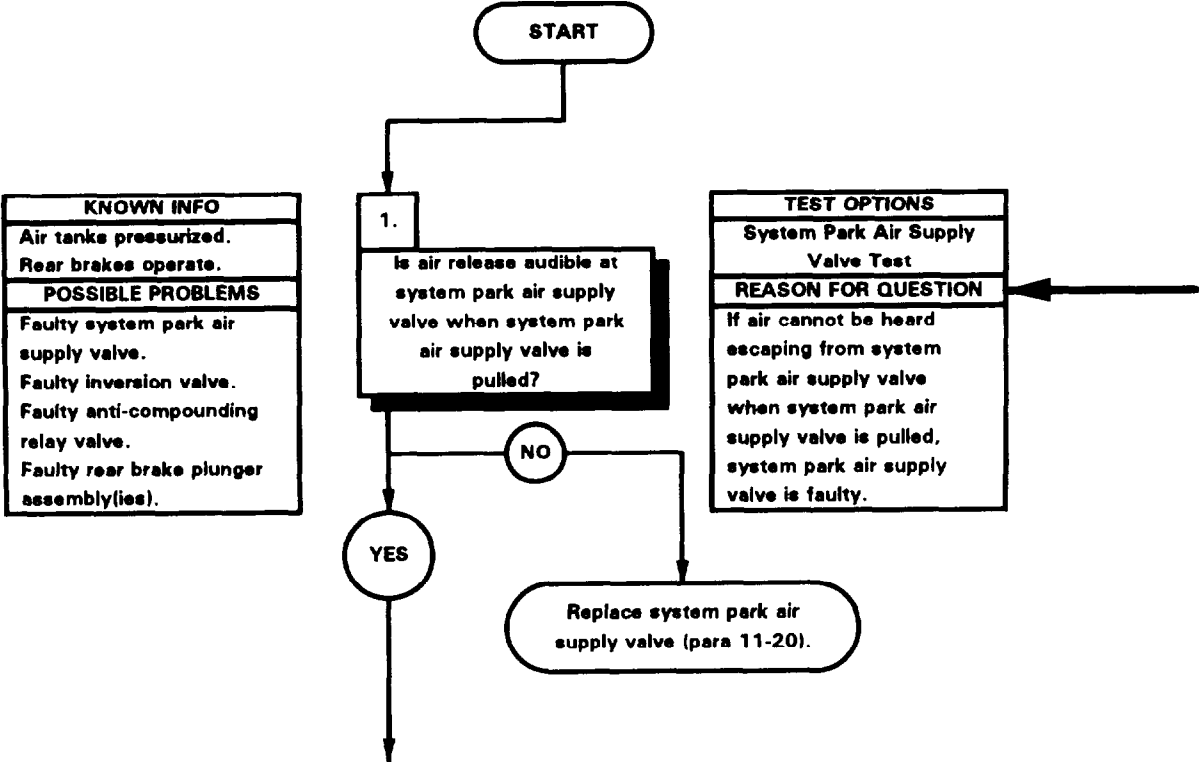


X210704A

- (1) Install wheels (TM 9-2320-366-10-1).
- (2) Rotate affected wheel and listen for loose or damaged wheel bearings. If wheel makes grinding sound during rotation, adjust or replace wheel bearings (para 10-2).
- (3) Grasp wheel on opposite sides, top and bottom, and pull in and out. If wheel has excessive play on the axle, adjust or replace wheel bearings (para 10-2).
- (4) If wheel bearings are good, replace brake chamber(s) (para 11-8).
- (5) Check wheel hub oil level (Appendix H). If oil level is low, replace wheel bearings (para 10-2).
- (6) Set parking brake (TM 9-2320-366-10-1).
- (7) Remove trestle stands and lower wheels to ground.



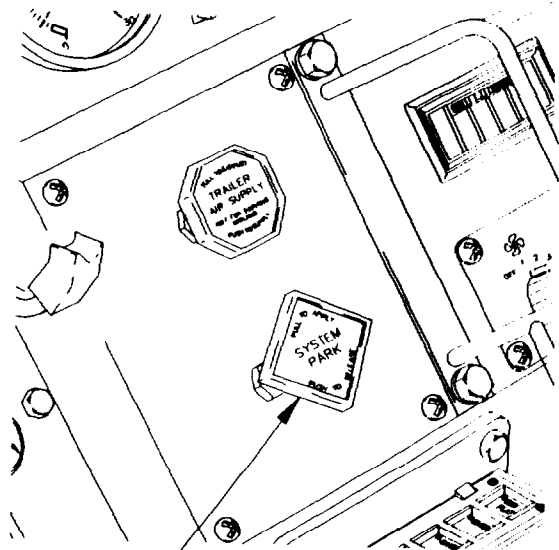
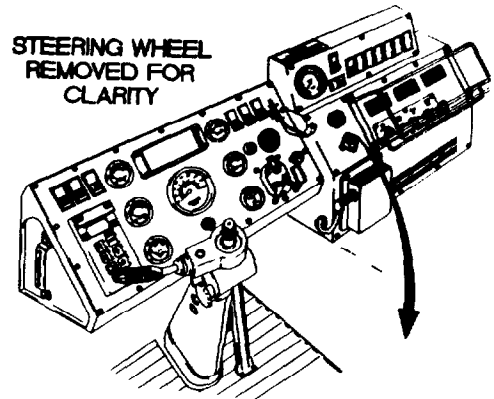
18. PARKING BRAKE DOES NOT APPLY	
INITIAL SETUP	
Equipment Conditions	Tools and Special Tools
Air tanks pressurized (TM 9-2320-366-10-1).	Tool Kit, Genl Mech (Item 46, Appendix C)
Engine shut down (TM 9-2320-366-10-1).	Goggles, Industrial (Item 15, Appendix C)
Personnel Required	
(2)	



SYSTEM PARK AIR SUPPLY VALVE TEST

- (1) Push in system park air supply valve.
- (2) Pull system park air supply valve out and note release of air.
- (3) If air is not heard escaping from system park air supply valve, replace system park air supply valve (para 11-20).

STEERING WHEEL
REMOVED FOR
CLARITY

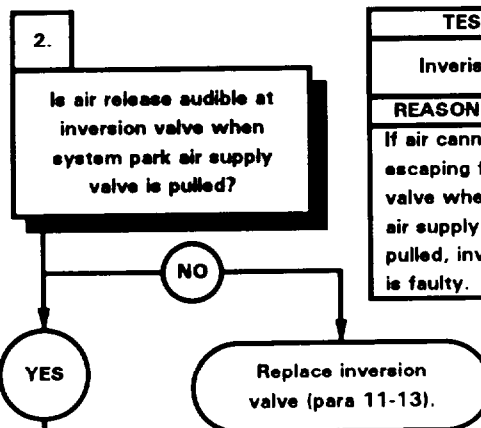


**SYSTEM PARK
AIR SUPPLY VALVE**

A210801A

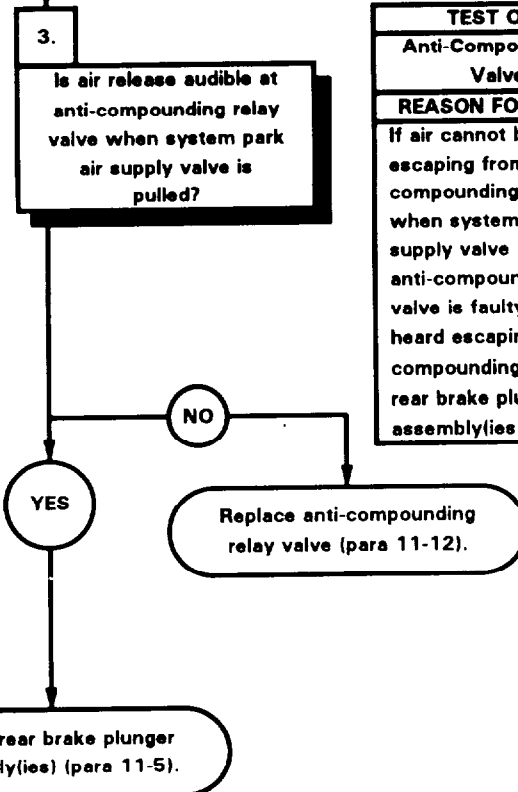
18. PARKING BRAKE DOES NOT APPLY (CONT)

KNOWN INFO
Air tanks pressurized. Rear brakes operate. System park air supply valve OK.
POSSIBLE PROBLEMS
Faulty inversion valve. Faulty anti-compounding relay valve. Faulty rear brake plunger assembly(ies).



TEST OPTIONS
Inversion Valve Test
REASON FOR QUESTION
If air cannot be heard escaping from inversion valve when system park air supply valve is pulled, inversion valve is faulty.

KNOWN INFO
Air tanks pressurized. Rear brakes operate. System park air supply valve OK. Inversion valve OK.
POSSIBLE PROBLEMS
Faulty anti-compounding relay valve. Faulty rear brake plunger assembly(ies).

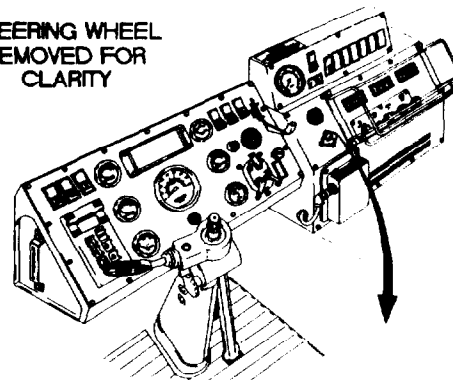


TEST OPTIONS
Anti-Compounding Relay Valve Test
REASON FOR QUESTION
If air cannot be heard escaping from anti-compounding relay valve when system park air supply valve is pulled, anti-compounding relay valve is faulty. If air can be heard escaping from anti-compounding relay valve, rear brake plunger assembly(ies) is faulty.

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 11-13).

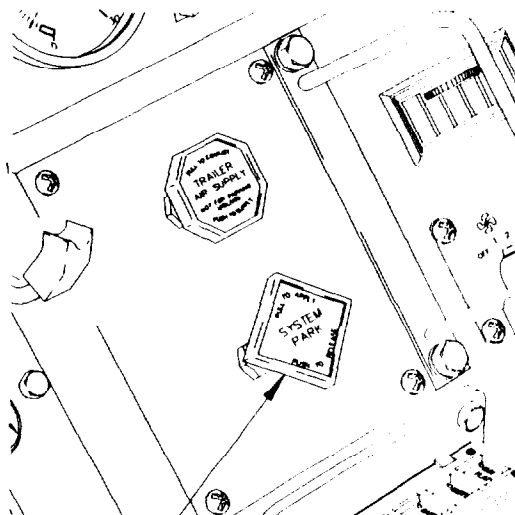
STEERING WHEEL
REMOVED FOR
CLARITY



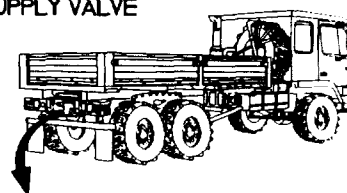
ANTI-COMPOUNDING RELAY VALVE TEST

- (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 11-12).
- (4) If air is heard escaping from anti-compounding relay valve, repair rear brake plunger assembly(ies) (para 11-5).
- (5) Pull system park air supply valve out.

SYSTEM PARK
AIR SUPPLY VALVE

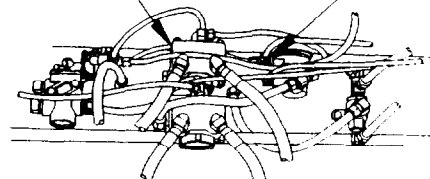


SYSTEM PARK
AIR SUPPLY VALVE



RELAY VALVE
AIR HOSE SUPPLY PORT

RELAY VALVE
CONTROL PORT



42108102A

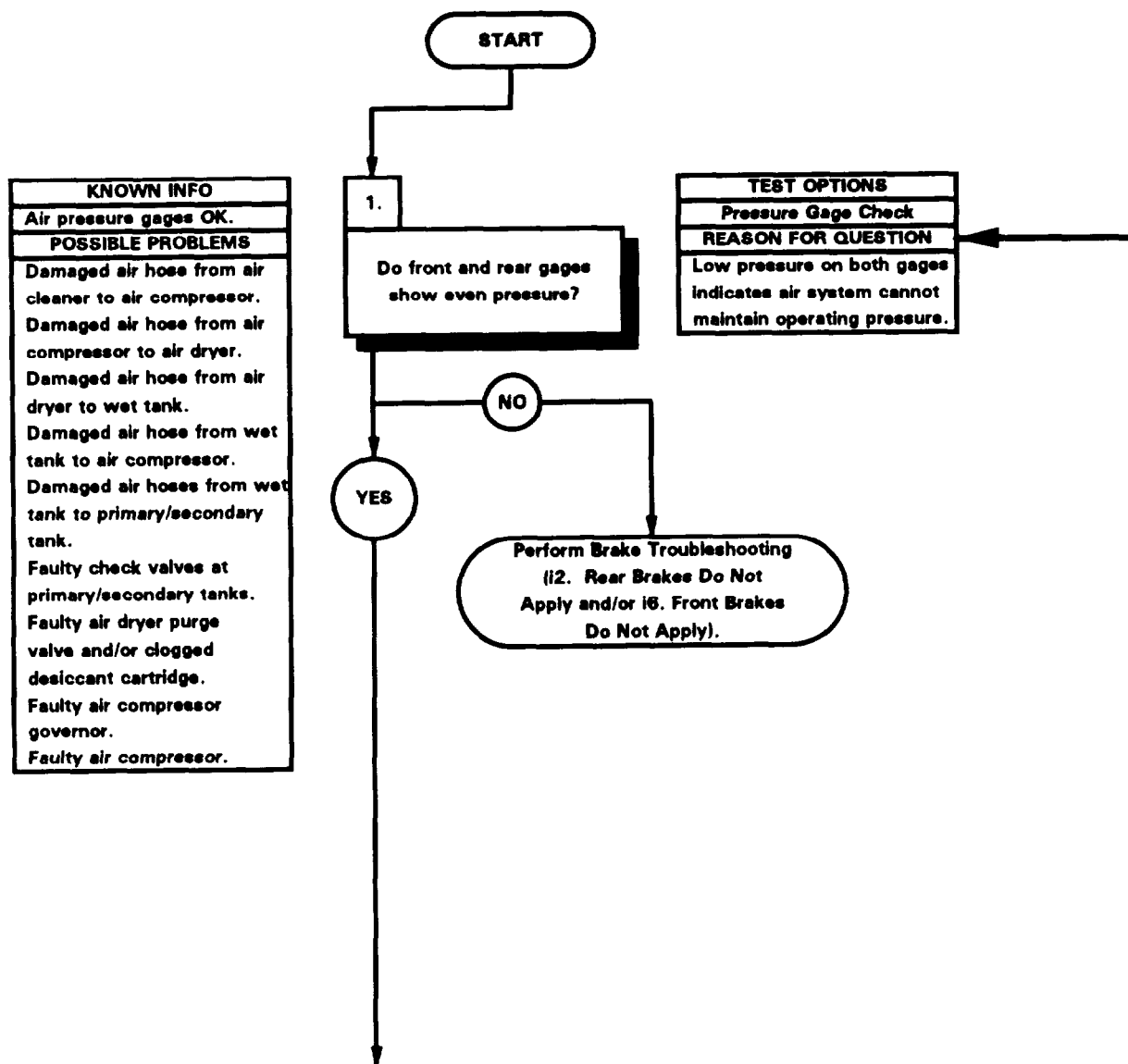
2-21. AIR SYSTEM TROUBLESHOOTING

This paragraph covers Air System Troubleshooting. The Air System Fault Index, Table 2-49, lists faults for the Air System of the vehicle.

Table 2-49. Air System Fault Index

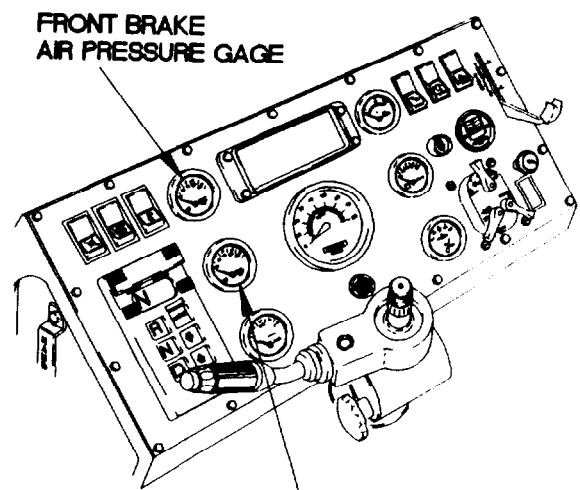
Fault No.	Description	Page
j1.	Air System Loses Pressure During Operation/Slow Air Pressure Buildup	2-1948
j2.	Large Quantity of Moisture Expelled From Air Reservoirs	2-1964
j3.	Air Dryer Purges Constantly	2-1968
j4.	No Air Pressure or Low Air Pressure Present at Rear Gladhands	2-1972
j5.	Air System Pressure Builds Up More Than 120 psi (827 kPa) (Compressor Fails to Unload)	2-1978
j6.	Noisy Air Compressor Operation	2-1982
j7.	M1088 Rear Gladhand(s) Leaks or Does Not Operate	2-1986

1. AIR SYSTEM LOSES PRESSURE DURING OPERATION/SLOW AIR PRESSURE BUILDUP	
INITIAL SETUP	
Equipment Conditions Engine running (TM 9-2320-366-10-1). Parking brake on (TM 9-2320-366-10-1). Wheels chocked (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Goggles, Industrial (Item 15, Appendix C) Pan, Wash (Item 25, Appendix C)
Materials/Parts Soap, Laundry (Item 63, Appendix D)	



PRESSURE GAGE CHECK

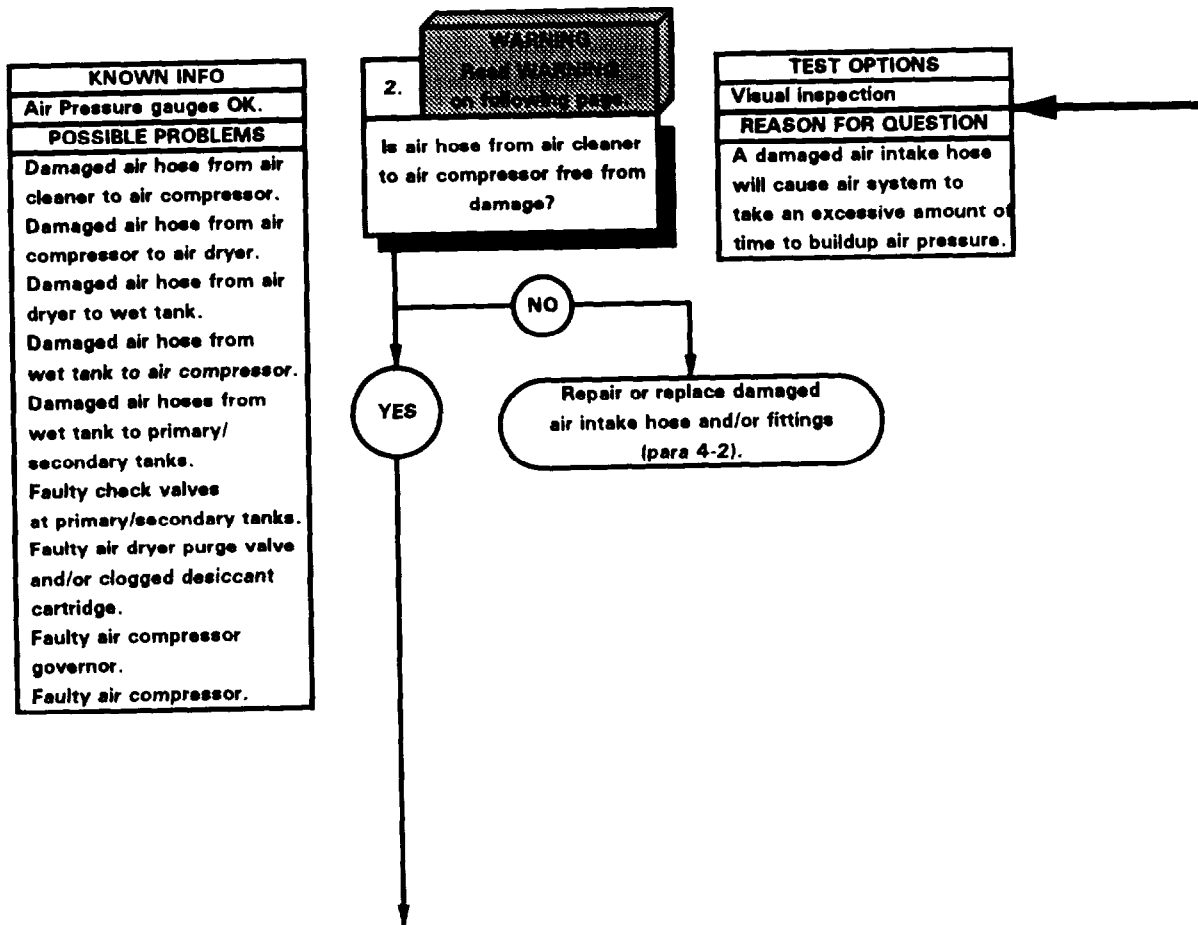
- (1) Check whether both pressure gages read below 120 psi.
- (2) If both gages read low, the pneumatic air system is failing to maintain operating pressure.
- (3) If only one of the gages reads low, brake hoses are leaking.



REAR BRAKE
AIR PRESSURE GAGE

STEERING WHEEL
REMOVED FOR
CLARITY

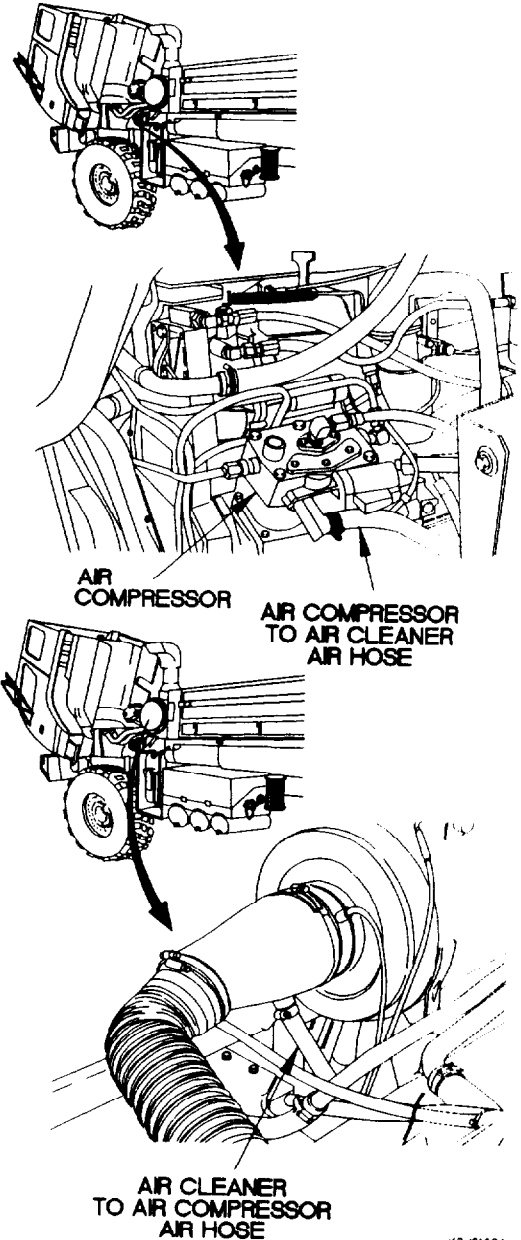
j1. AIR SYSTEM LOSES PRESSURE DURING OPERATION/SLOW AIR PRESSURE BUILDUP (CONT)



WARNING

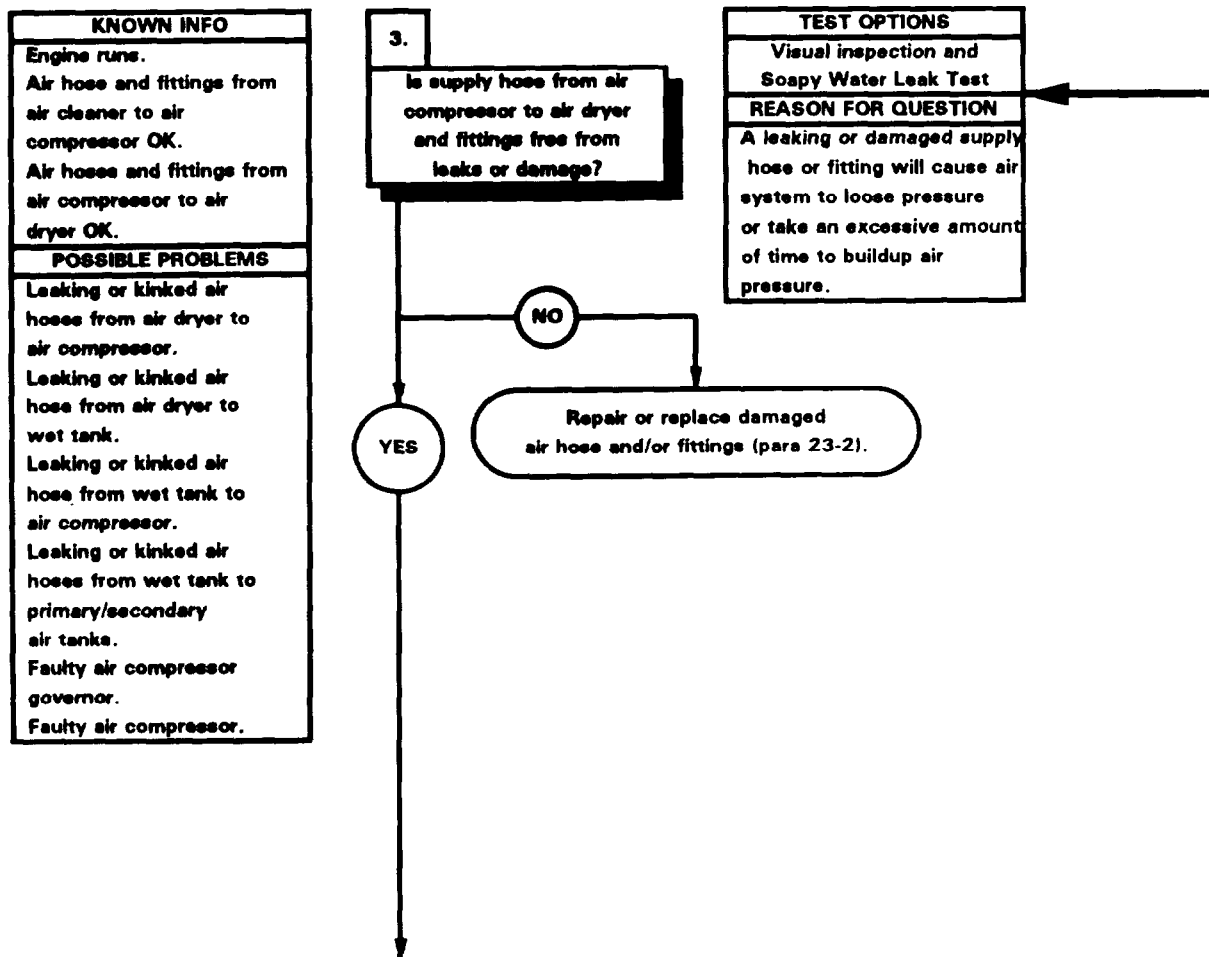
Wear appropriate eye protection when working under vehicle due to the possibility of falling debris. Failure to comply may result in injury to personnel.

- (1) Raise cab (TM 9-2320-366-10-1).
- (2) Check air intake hose from air cleaner to air compressor and fittings for damage.



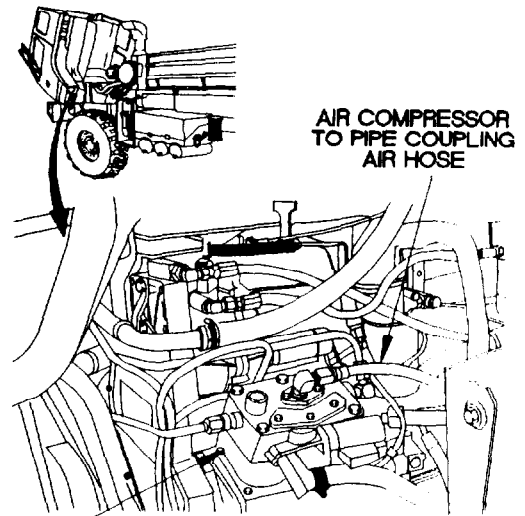
X2 J0102A

j1. AIR SYSTEM LOSES PRESSURE DURING OPERATION/SLOW AIR PRESSURE BUILDUP (CONT)



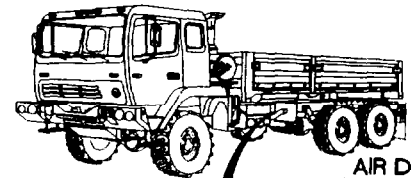
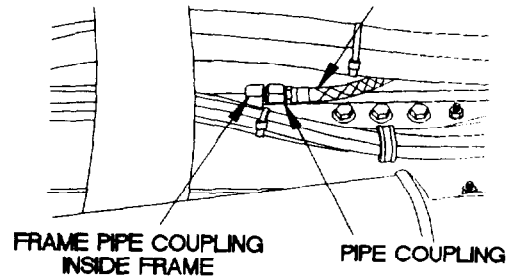
SOAPY WATER LEAK TEST

- (1) Apply soapy water solution to hoses, fittings, and couplings.
- (2) Check hoses and fittings for bubbles, indicating leaks.
- (1) Check air hose from 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.



AIR COMPRESSOR

COUPLING TO COMPRESSOR

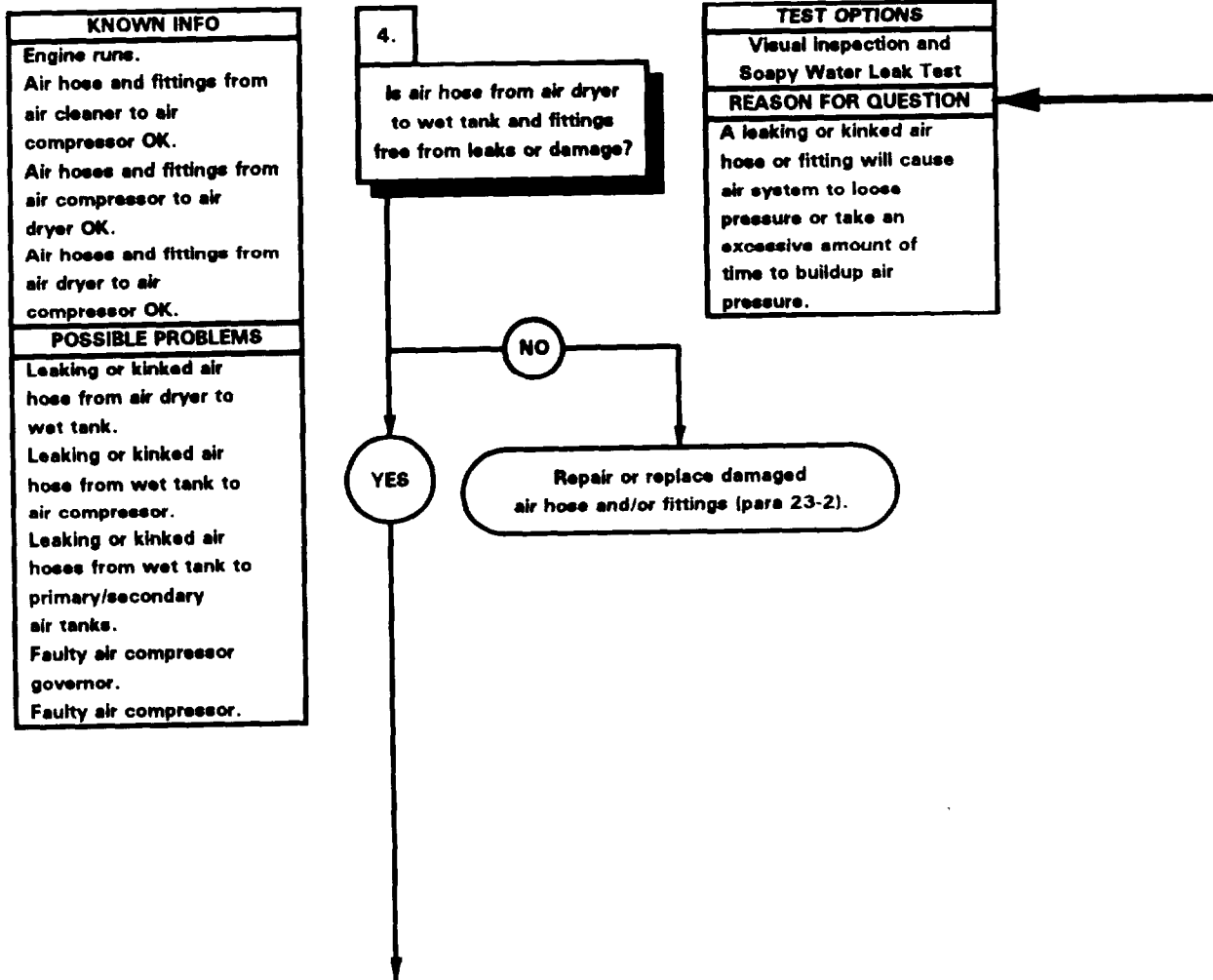


AIR DRYER

AIR DRYER TO FRAME COUPLING AIR HOSE

42 J0103A

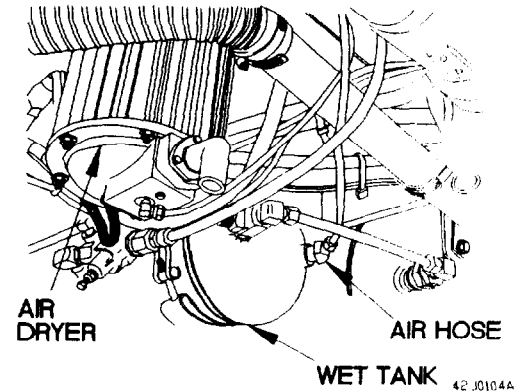
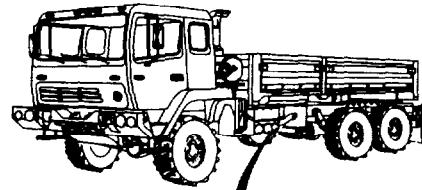
j1. AIR SYSTEM LOSES PRESSURE DURING OPERATION/SLOW AIR PRESSURE BUILDUP (CONT)



SOAPY WATER LEAK TEST

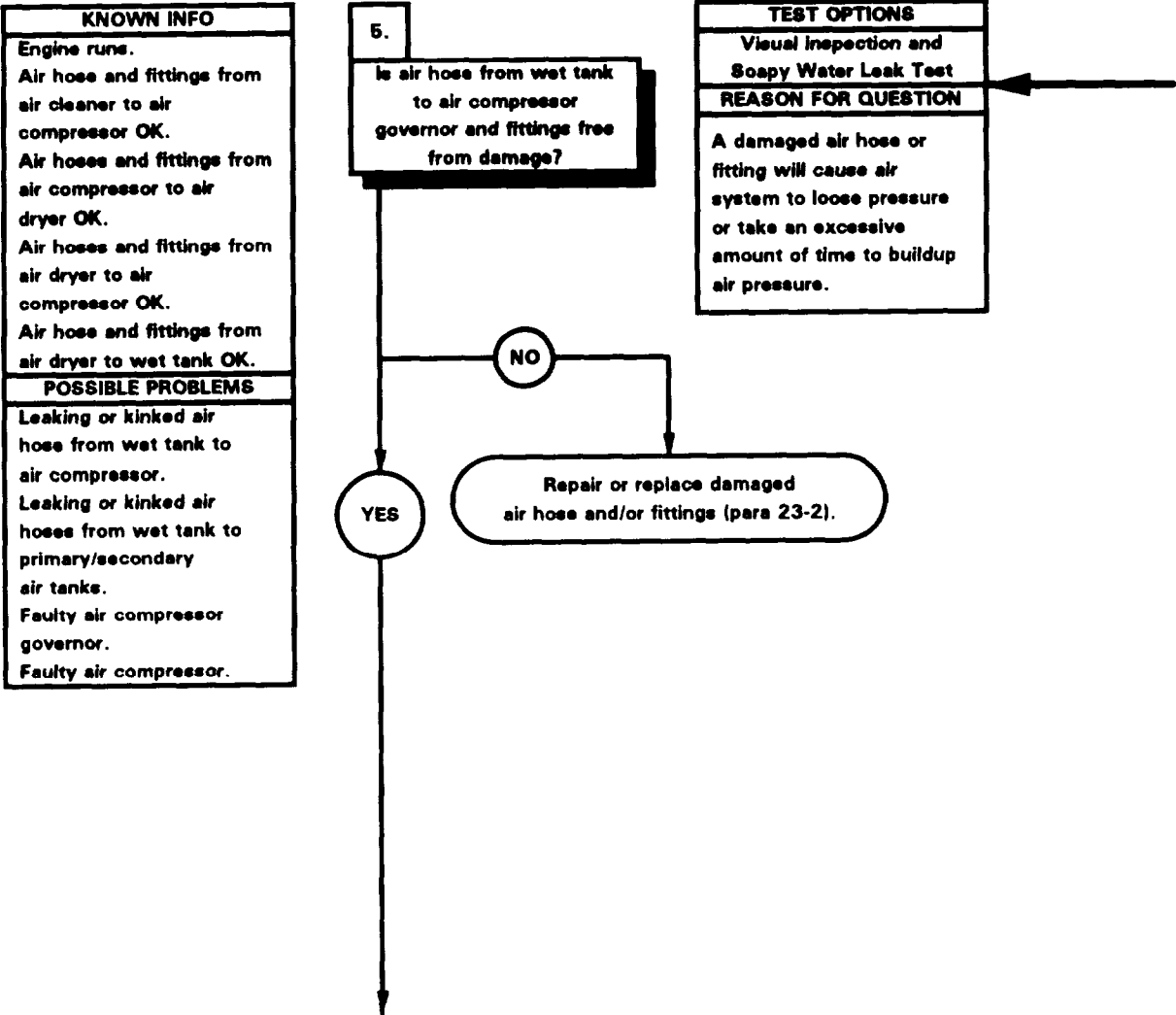
- (1) Apply soapy water solution to hoses, fittings, and couplings.
- (2) Check hoses and fittings for bubbles, indicating leaks.

Check air hose from air dryer to wet tank and fittings for leaks and kinks.



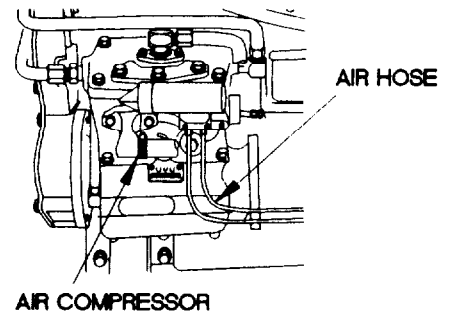
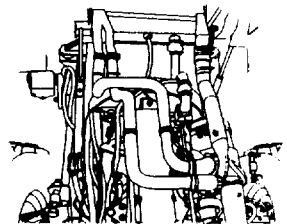
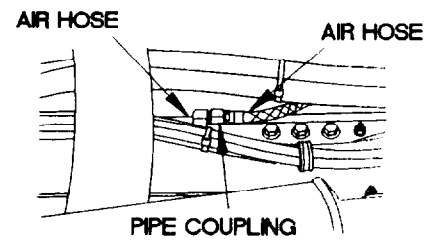
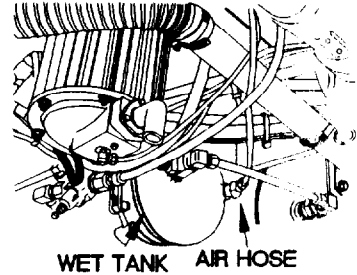
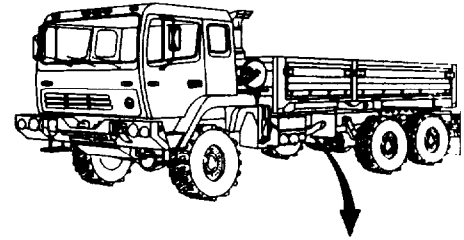
42 J0104A

j1. AIR SYSTEM LOSES PRESSURE DURING OPERATION/SLOW AIR PRESSURE BUILDUP (CONT)



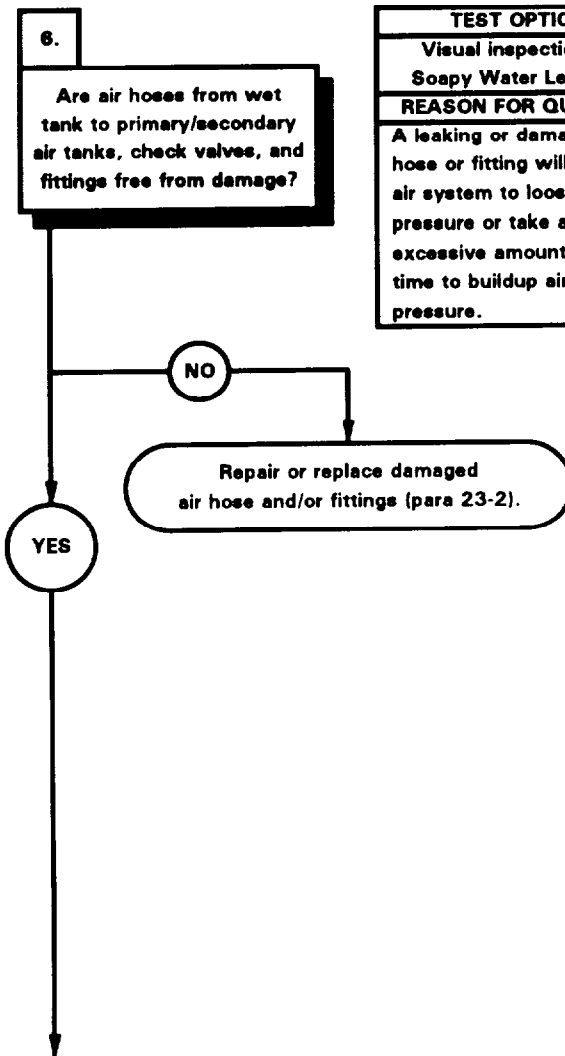
SOAPY WATER LEAK TEST

- (1) Apply soapy water solution to hoses, fittings, and couplings.
 - (2) Check hoses and fittings for bubbles, indicating leaks.
-
- (1) Check air hose from wet tank to 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) Lower cab (TM 9-2320-366-10-1).



j1. AIR SYSTEM LOSES PRESSURE DURING OPERATION/SLOW AIR PRESSURE BUILDUP (CONT)

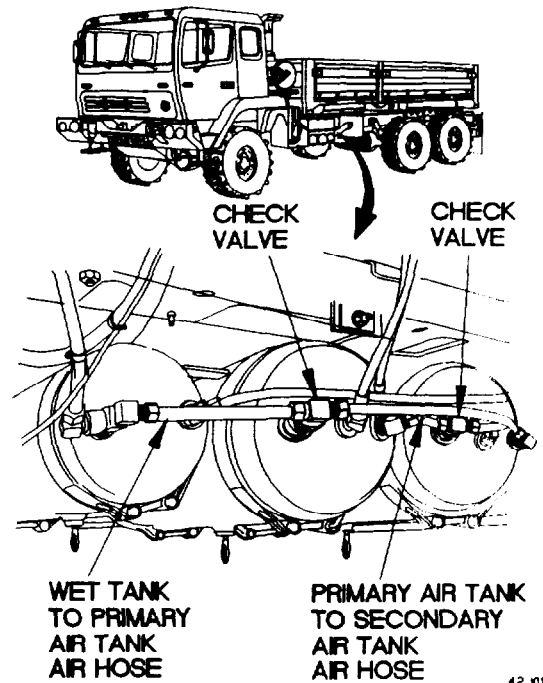
KNOWN INFO
Engine runs. Air hose and fittings from air cleaner to air compressor OK. Air hoses and fittings from air compressor to air dryer OK. Air hoses and fittings from air dryer to air compressor OK. Air hose and fittings from air dryer to wet tank OK. Air hoses and fittings from wet tank to air compressor OK.
POSSIBLE PROBLEMS
Leaking or kinked air hoses from wet tank to primary/secondary air tanks. Faulty air compressor governor. Faulty air compressor.



TEST OPTIONS
Visual inspection and Soapy Water Leak Test
REASON FOR QUESTION
A leaking or damaged air hose or fitting will cause air system to loose pressure or take an excessive amount of time to buildup air pressure.

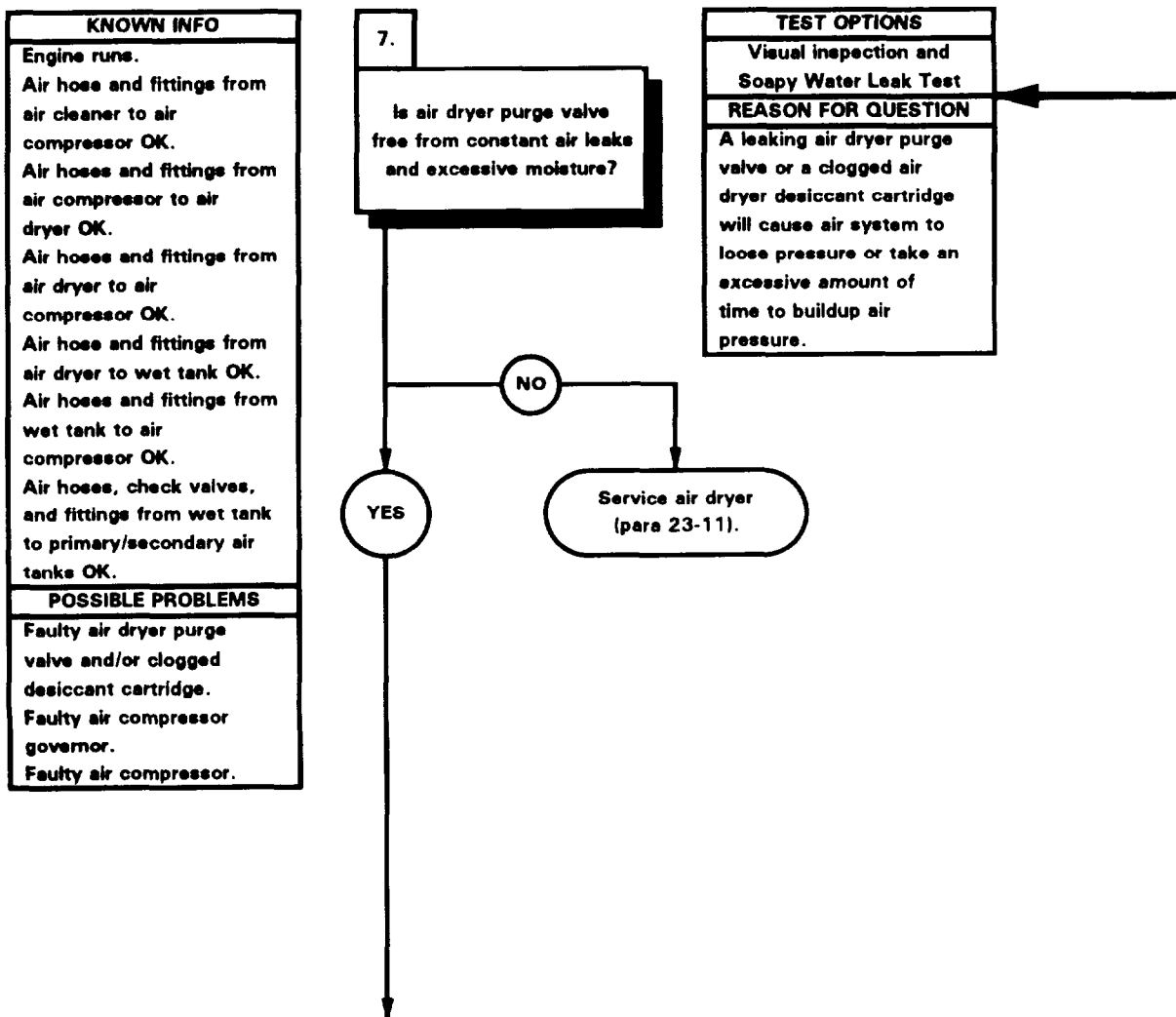
SOAPY WATER LEAK TEST

- (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.



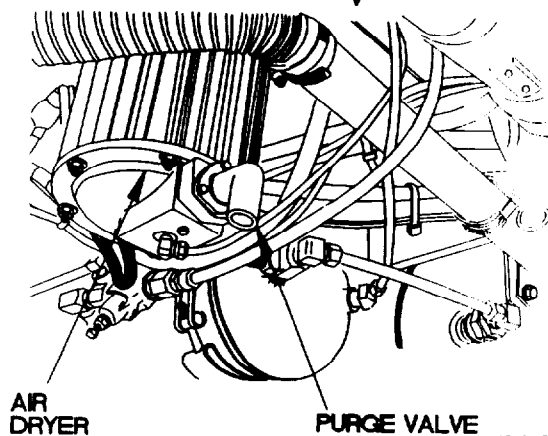
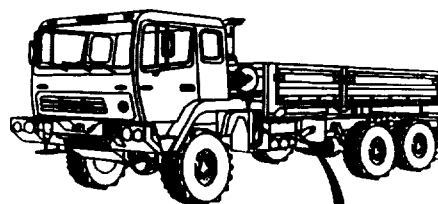
42 J0106A

j1. AIR SYSTEM LOSES PRESSURE DURING OPERATION/SLOW AIR PRESSURE BUILDUP (CONT)



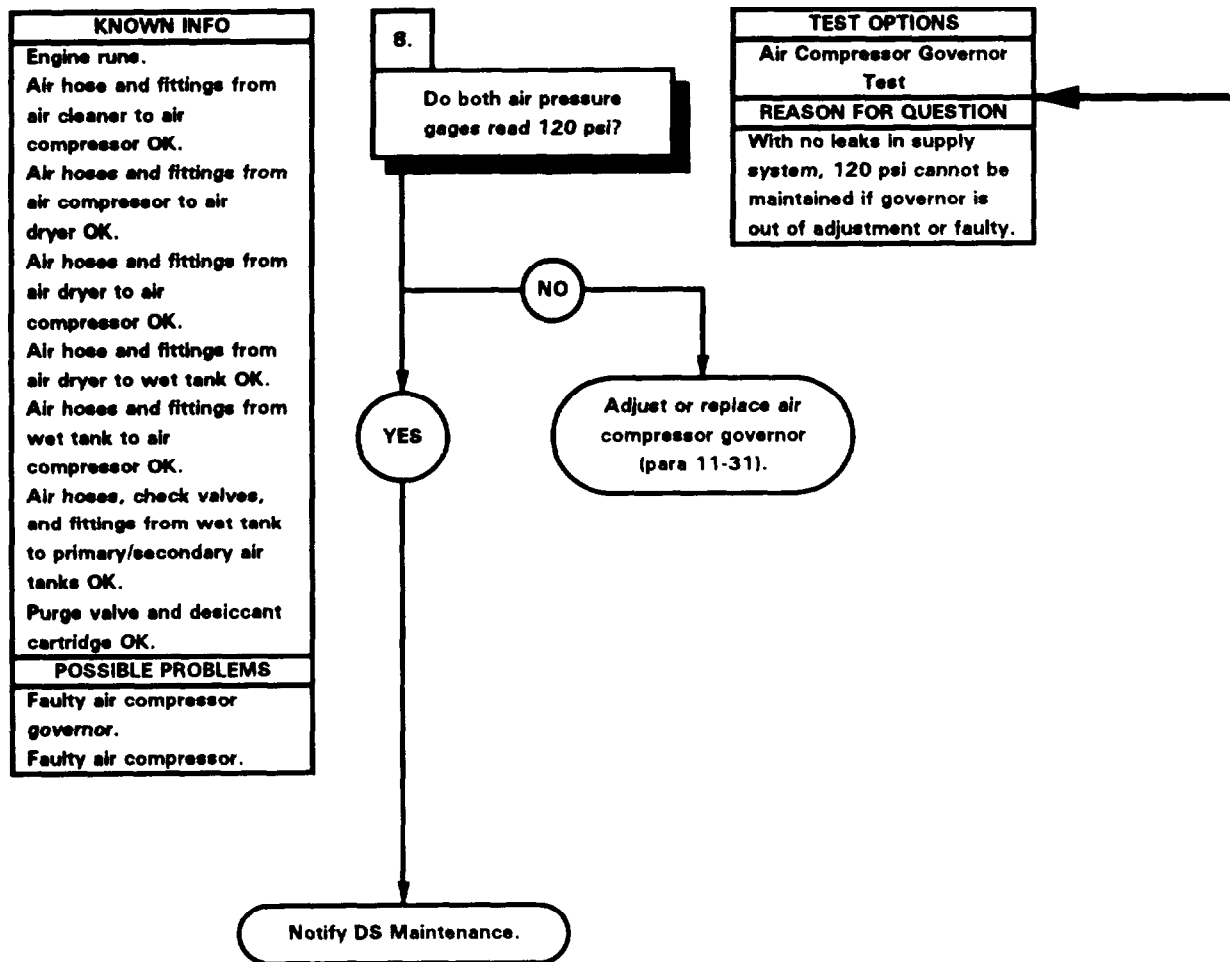
SOAPY WATER LEAK TEST

- (1) Apply soapy water solution to hoses, fittings, and couplings.
 - (2) Check hoses and fittings for bubbles, indicating leaks.
-
- (1) Open drain cock to wet tank and check for excessive amounts of moisture. If moisture exists in wet tank, service air dryer desiccant cartridge due to clogging.
 - (2) Close drain cock to wet tank.



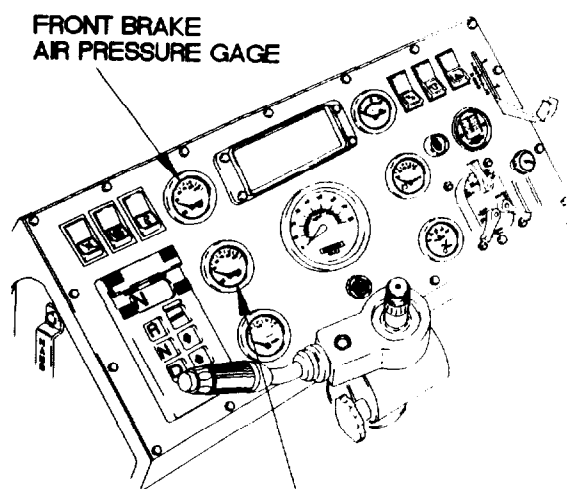
42 J0107A

j1. AIR SYSTEM LOSES PRESSURE DURING OPERATION/SLOW AIR PRESSURE BUILDUP (CONT)



AIR COMPRESSOR GOVERNOR TEST

- (1) Allow pneumatic system to build pressure and observe front brake/rear brake pressure gages without applying brakes or operating air system.
- (2) Check if air pressure stabilizes at 120 psi.
- (3) If air pressure remains below 120 psi, air compressor governor may need adjustment or is faulty.
- (4) Shut down engine (TM 9-2320-366-10-1).

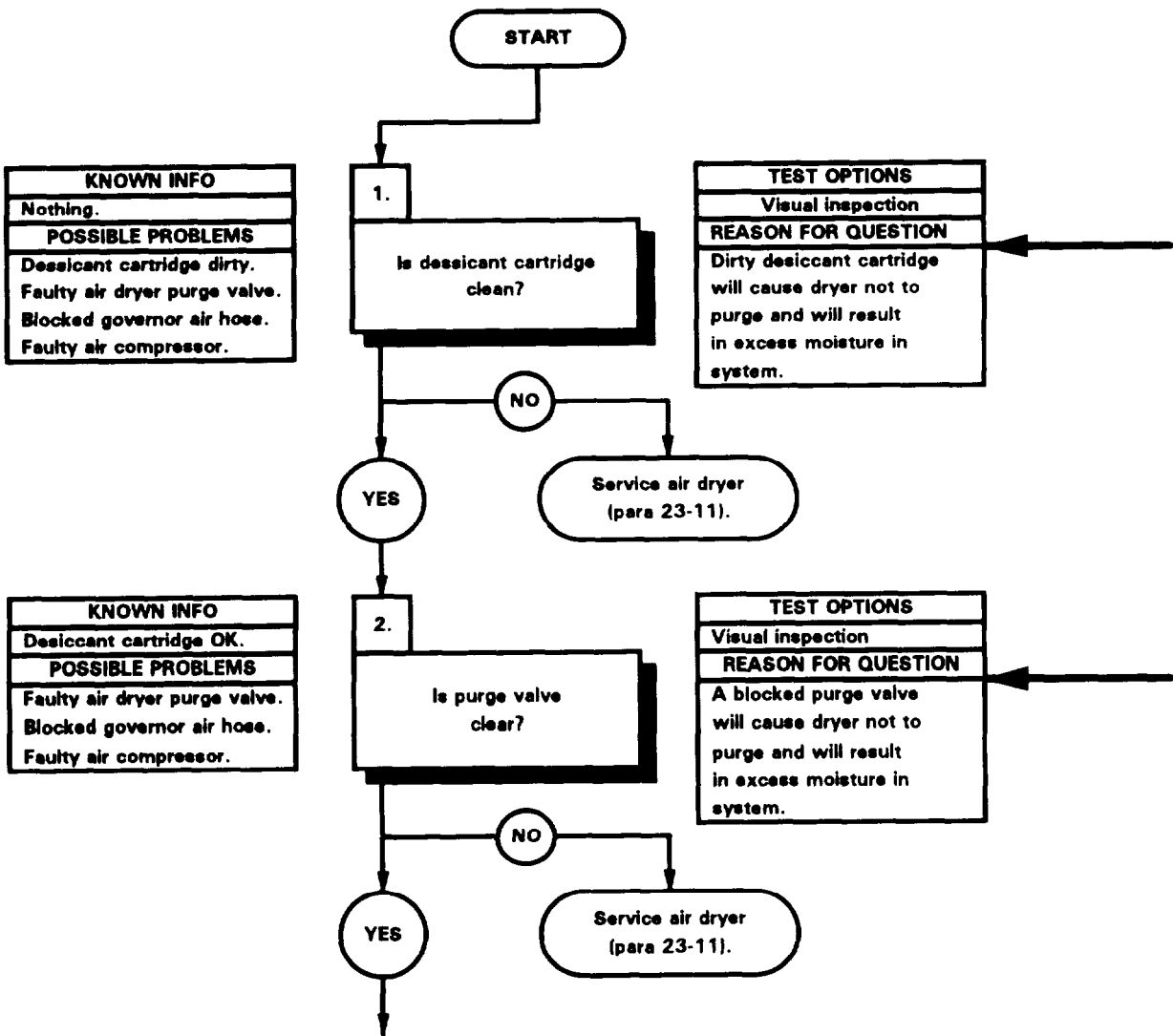


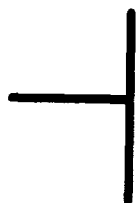
FRONT BRAKE
AIR PRESSURE GAGE

REAR BRAKE
AIR PRESSURE GAGE

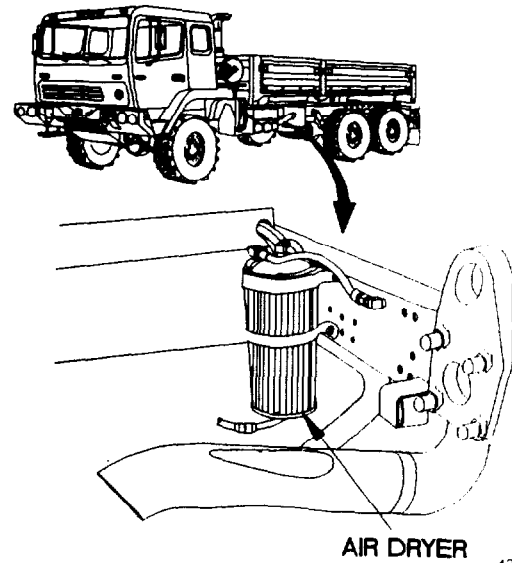
STEERING WHEEL
REMOVED FOR
CLARITY

J2. LARGE QUANTITY OF MOISTURE EXPELLED FROM AIR RESERVOIRS	
INITIAL SETUP	
Equipment Conditions	Tools and Special Tools
Engine shut down (TM 9-2320-366-10-1).	Tool Kit, Genl Mech (Item 46, Appendix C)
	Goggles, Industrial (Item 15, Appendix C)

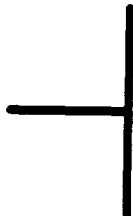




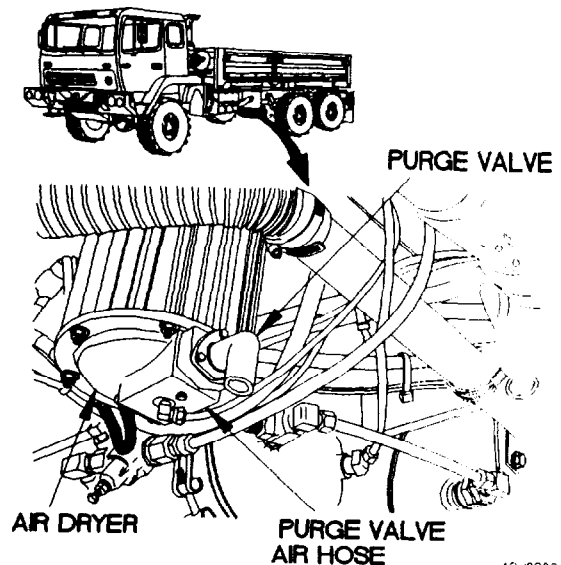
- (1) Remove desiccant cartridge from air dryer (para 23-11).
- (2) Inspect the desiccant cartridge for cleanliness.



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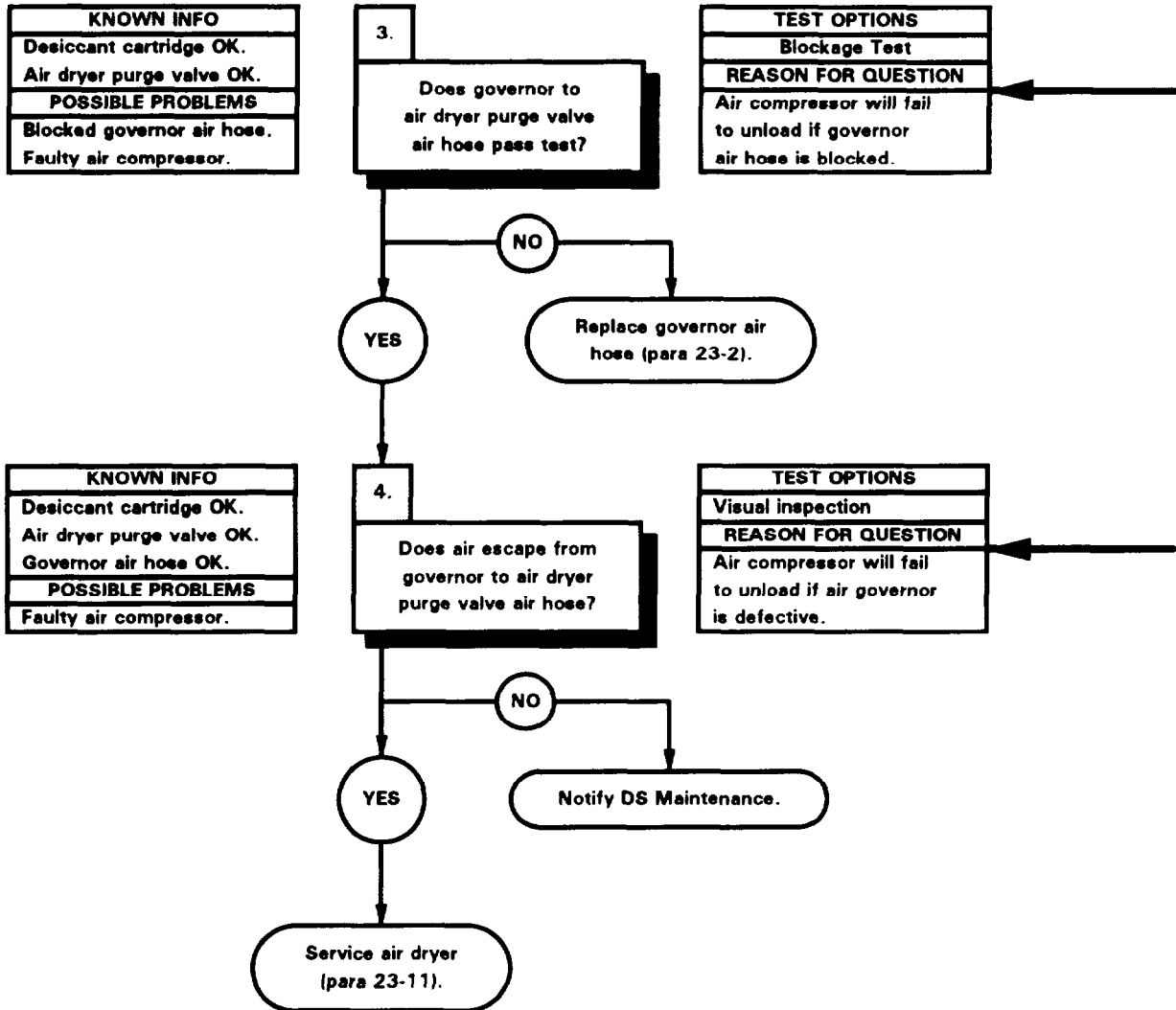


- (1) Remove three screws, purge valve, and exhaust boot.
- (2) Check purge valve for blockage. If blocked, purge valve is faulty.
- (3) Install exhaust boot, purge valve, and three screws.



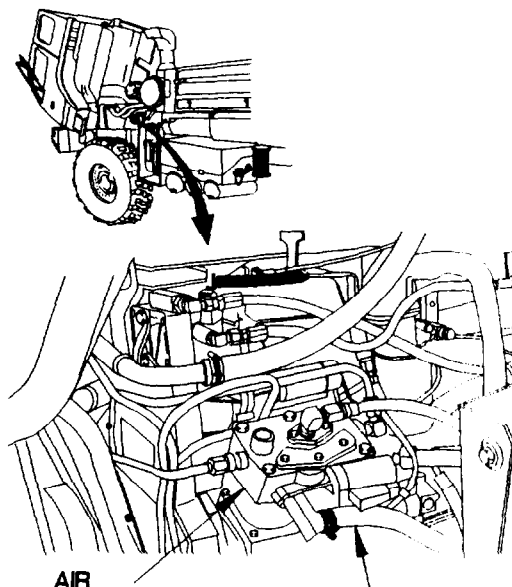
42 102024

j2. LARGE QUANTITY OF MOISTURE EXPELLED FROM AIR RESERVOIRS (CONT)



BLOCKAGE TEST

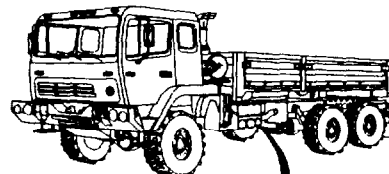
- (1) Disconnect governor to air dryer air hose at governor and at purge valve.
- (2) Blow through one end of air hose. If no air escapes from other end of air hose, air hose is blocked.
- (3) Connect governor to air dryer air hose to governor and purge valve.



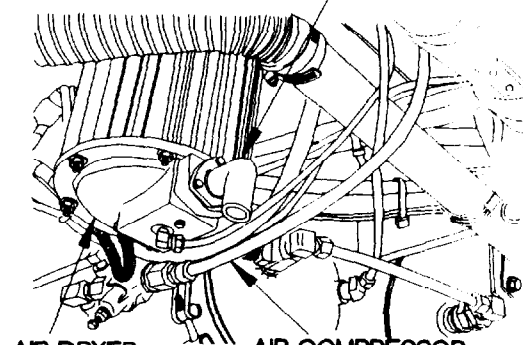
AIR COMPRESSOR
AIR COMPRESSOR
TO AIR DRYER
PURGE VALVE AIR HOSE

42 J0203A

- (1) Disconnect governor air hose at air dryer purge valve.
- (2) Start engine (TM 9-2320-366-10-1).
- (3) Check for presence of air at air hose. If no air escapes from air hose air compressor is defective. If air escapes, service air dryer for faulty purge valve.
- (4) Shut down engine (TM 9-2320-366-10-1).
- (5) Connect air compressor to air dryer air hose to air dryer.
- (6) Install desiccant cartridge in air dryer (para 23-11).



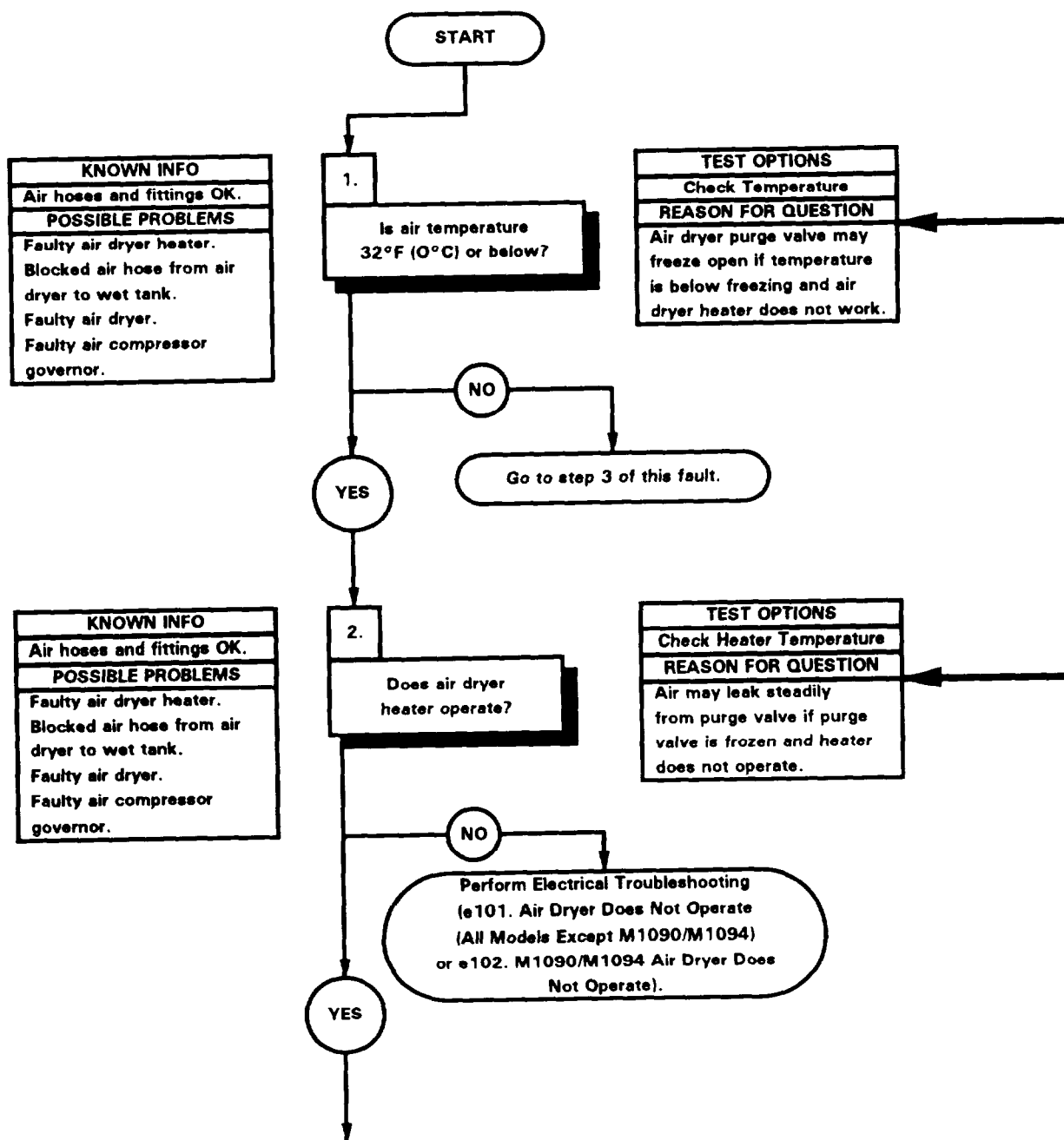
PURGE VALVE



AIR DRYER
AIR COMPRESSOR
TO AIR DRYER
PURGE VALVE AIR HOSE

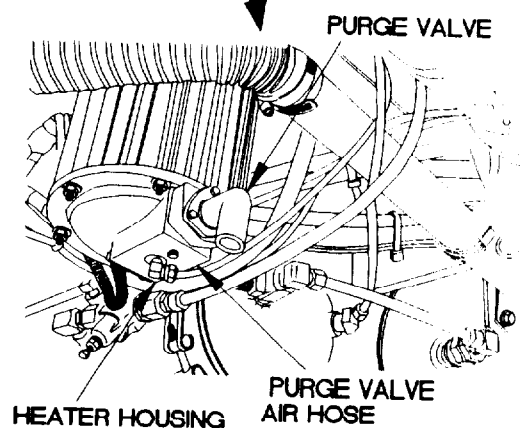
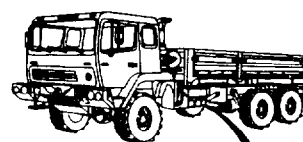
42 J0204A

J3. AIR DRYER CONTINUALLY PURGES	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 48, Appendix C) Goggles, Industrial (Item 15, Appendix C)



NOTE

- Air dryer heater cuts in at 32°F (0°C) and shuts off between 55-75°F (31-42°C).
- A failed air dryer heater will not affect operation of purge valve if vehicle is operating at temperature above freezing.



- (1) Start engine (TM 9-2320-366-10-1).
- (2) Bring engine to operating temperature.
- (3) Check bottom (heater) housing on air dryer.
- (4) If housing is not warm, heater is not receiving power or is faulty.
- (5) Shut down engine (TM 9-2320-366-10-1).

3. AIR DRYER CONTINUALLY PURGES (CONT)

KNOWN INFO
Air hoses and fittings OK.
Air dryer heater OK.
POSSIBLE PROBLEMS
Blocked air hose from air dryer to wet tank.
Faulty air dryer.
Faulty air compressor governor.

3.
Does air escape from air dryer to wet tank air hose?

TEST OPTIONS
Visual inspection
REASON FOR QUESTION
A blocked air hose from air dryer to wet tank will cause purge valve to release air.

NO

Replace damaged air hose (para 23-2).

YES

KNOWN INFO
Air hoses and fittings OK.
Air dryer heater OK.
Air hose from air dryer to wet tank OK.
POSSIBLE PROBLEMS
Faulty air dryer.
Faulty air compressor governor.

4.
Does air escape from compressor air hose at purge valve?

TEST OPTIONS
Check for air at purge valve air hose.
REASON FOR QUESTION
Air dryer will continually purge if air compressor governor is defective.

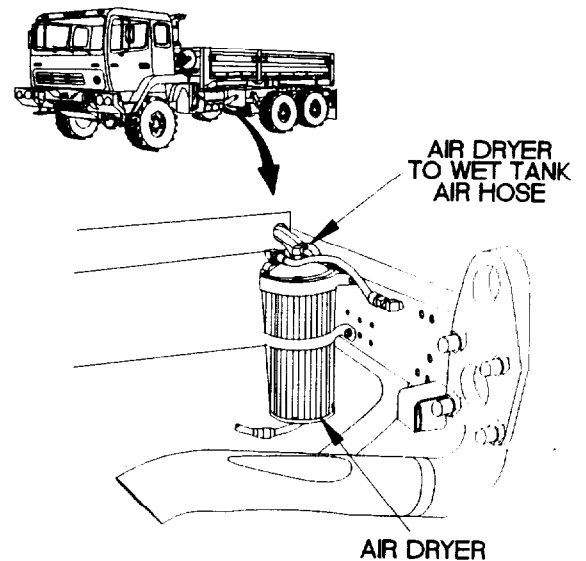
NO

Service air dryer (para 23-11).

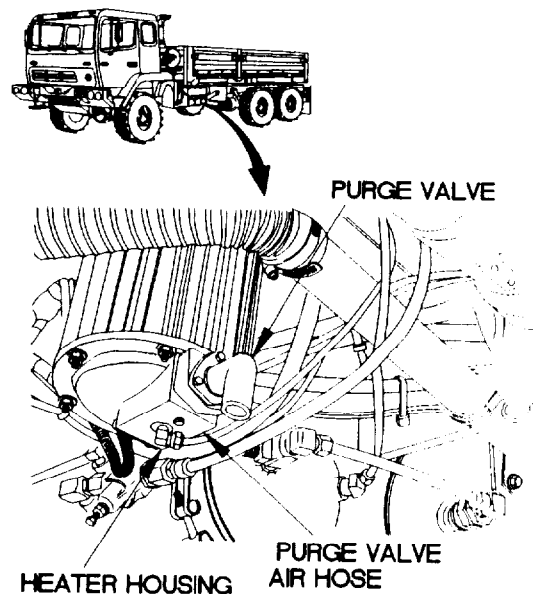
YES

Notify DS Maintenance.

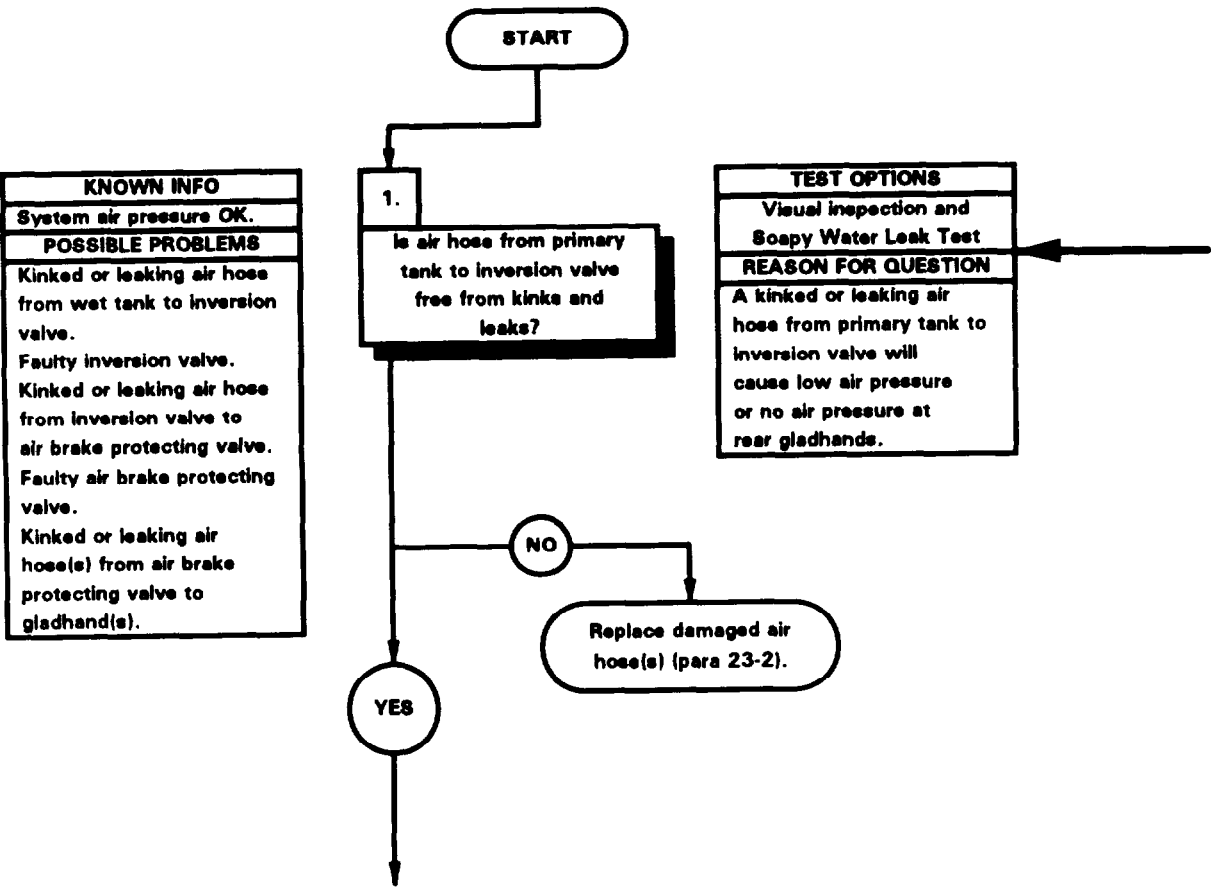
- (1) Disconnect air hose on wet tank coming from air dryer.
- (2) Start engine (TM 9-2320-366-10-1).
- (3) Check for presence of air at air hose. If no air escapes from air hose, air hose is faulty.
- (4) If air escapes, service air dryer (para 23-11).
- (5) Shut down engine (TM 9-2320-366-10-1).



- (1) Disconnect air hose from purge valve on air dryer.
- (2) Start engine (TM 9-2320-366-10-1).
- (3) Check for presence of air from air hose.
- (4) If air is steadily present from air hose and purge valve air has stopped, air compressor governor is defective.
- (5) Shut down engine (TM 9-2320-366-10-1).
- (6) Connect air hose to purge valve on air dryer.

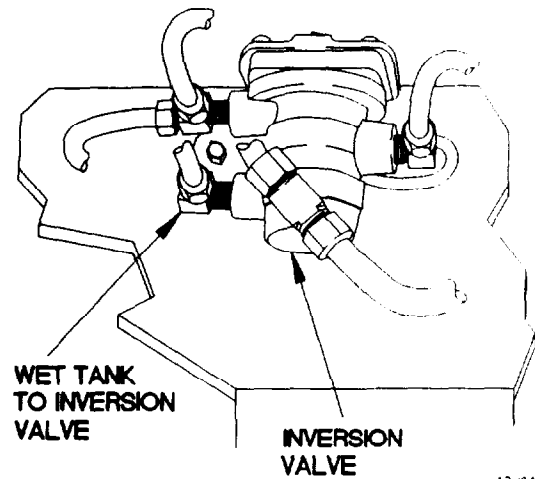
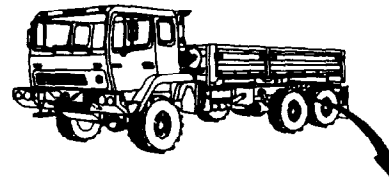


A. NO AIR PRESSURE OR LOW AIR PRESSURE PRESENT AT REAR GLADHANDS	
INITIAL SETUP	
Equipment Conditions	Tools and Special Tools
Engine shut down (TM 9-2320-366-10-1).	Tool Kit, Genl Mech (Item 46, Appendix C)
	Goggles, Industrial (Item 15, Appendix C)
Materials/Parts	Pan, Wash (Item 25, Appendix C)
Soap, Laundry (Item 63, Appendix D)	



SOAPY WATER LEAK TEST

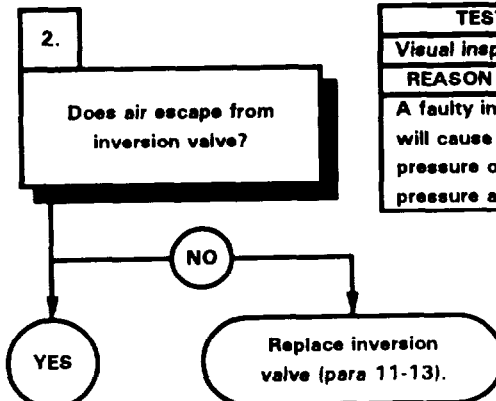
- (1) Apply soapy water solution to hoses, fittings, and couplings.
- (2) Check air hose between primary tank and inversion valve for kinks and leaks. Tighten loose connections. If kinked, replace air hose.
- (3) Check hoses and fittings for bubbles, indicating leaks.



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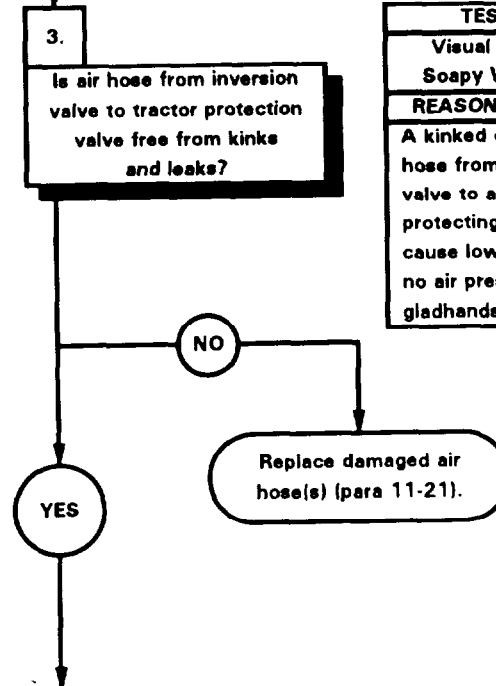
j4. NO AIR PRESSURE OR LOW AIR PRESSURE PRESENT AT REAR GLADHANDS (CONT)

KNOWN INFO
System air pressure OK. Air hose between wet tank and inversion valve OK.
POSSIBLE PROBLEMS
Faulty inversion valve. Kinked or leaking air hose from inversion valve to air brake protecting valve. Faulty air brake protecting valve. Kinked or leaking air hose(s) from air brake protecting valve to gladhand(s).



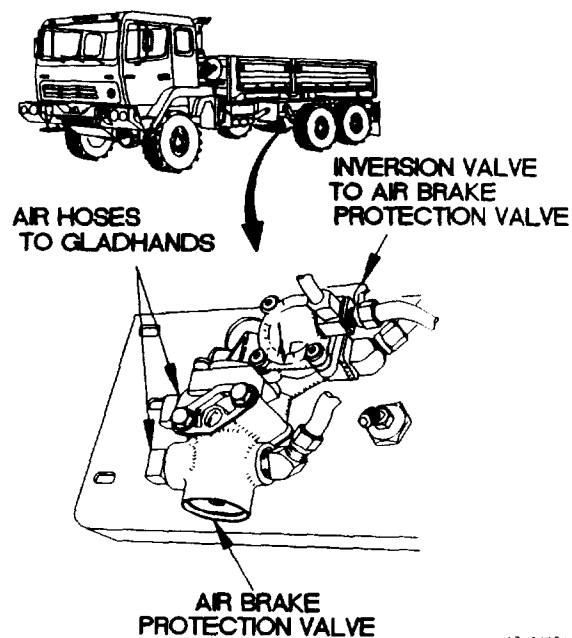
TEST OPTIONS
Visual inspection
REASON FOR QUESTION
A faulty inversion valve will cause low air pressure or no air pressure at rear gladhands.

KNOWN INFO
System air pressure OK. Air hose between wet tank and inversion valve OK. Inversion valve OK.
POSSIBLE PROBLEMS
Kinked or leaking air hose from inversion valve to air brake protecting valve. Faulty air brake protecting valve. Kinked or leaking air hose(s) from air brake protecting valve to gladhand(s).



TEST OPTIONS
Visual inspection and Soapy Water Leak Test
REASON FOR QUESTION
A kinked or leaking air hose from inversion valve to air brake protecting valve will cause low air pressure or no air pressure at rear gladhands.

- (1) Loosen delivery air hose on inversion valve.
- (2) Check for presence of air at inversion valve delivery air hose. If no air is present, replace inversion valve.
- (3) Tighten inversion valve delivery air hose.

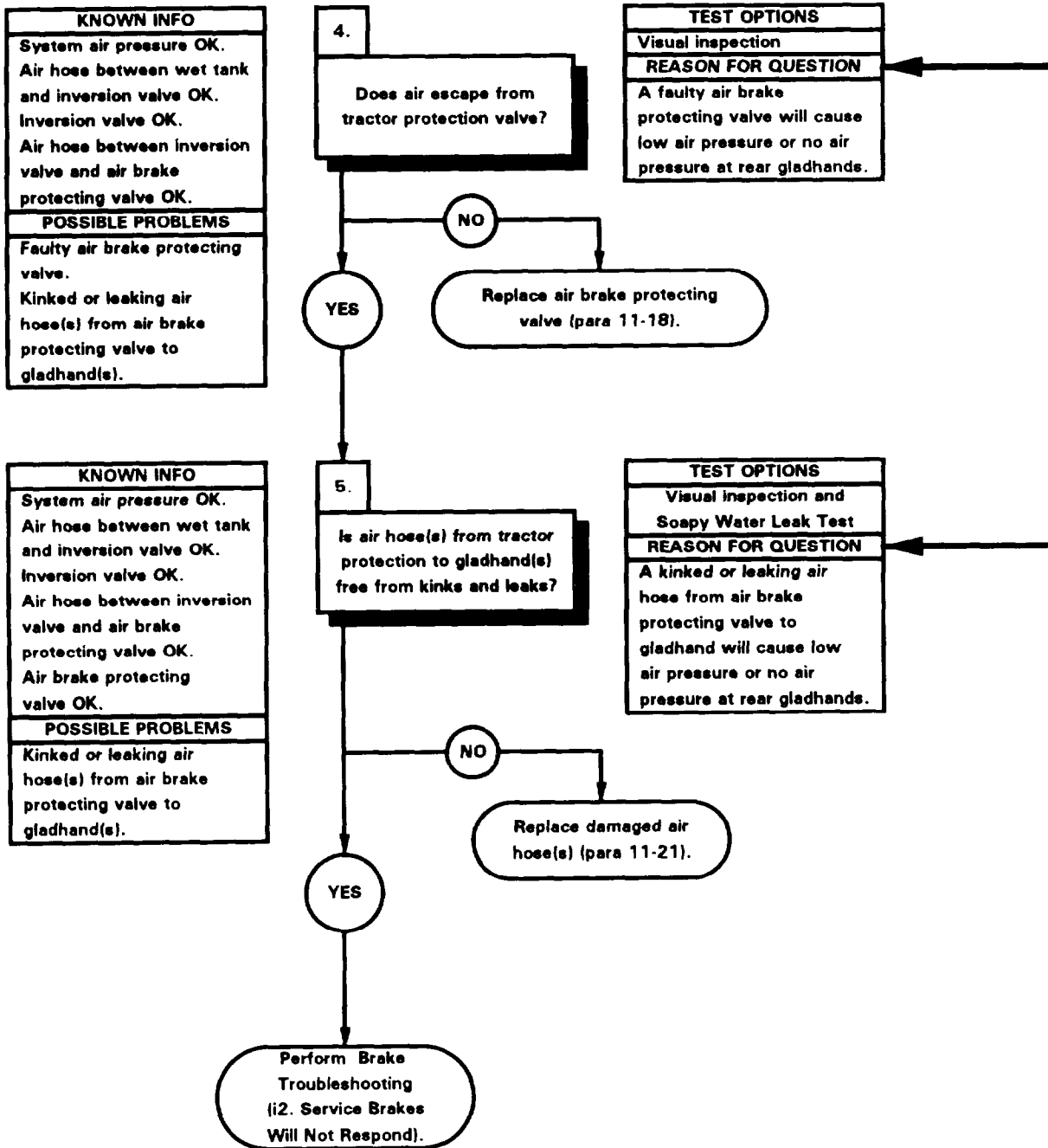


SOAPY WATER LEAK TEST

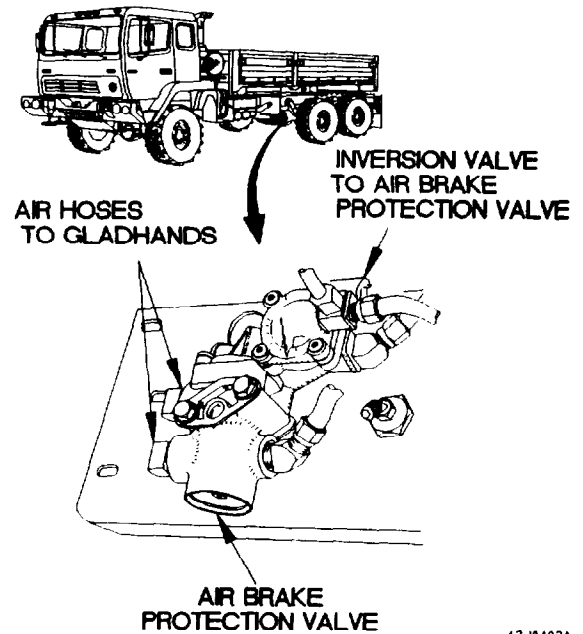
- (1) Apply soapy water solution to hoses, fittings, and couplings.
- (2) Check air hose between inversion valve and air brake protecting valve for kinks and leaks. Tighten loose connections. If kinked, replace air hose.
- (3) Check hoses and fittings for bubbles, indicating leaks.

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4. NO AIR PRESSURE OR LOW AIR PRESSURE PRESENT AT REAR GLADHANDS (CONT)

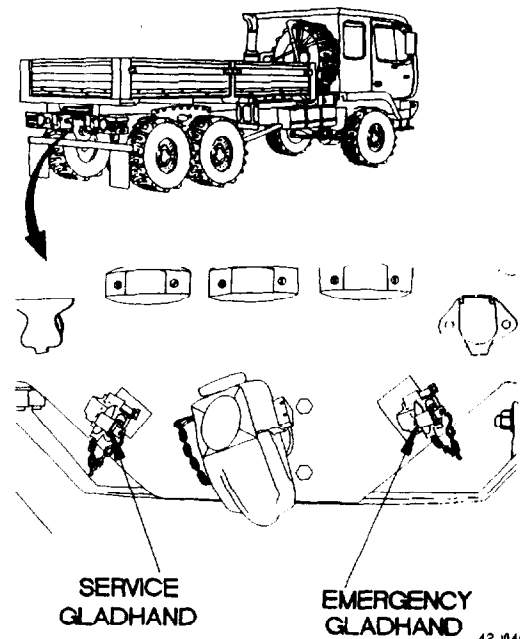


- (1) Loosen delivery air hose(s) on air brake protecting valve.
- (2) Check for presence of air at air brake protecting valve delivery air hose(s). If no air is present, replace air brake protecting valve (para 11-18).
- (3) Tighten air brake protecting valve delivery air hose(s).

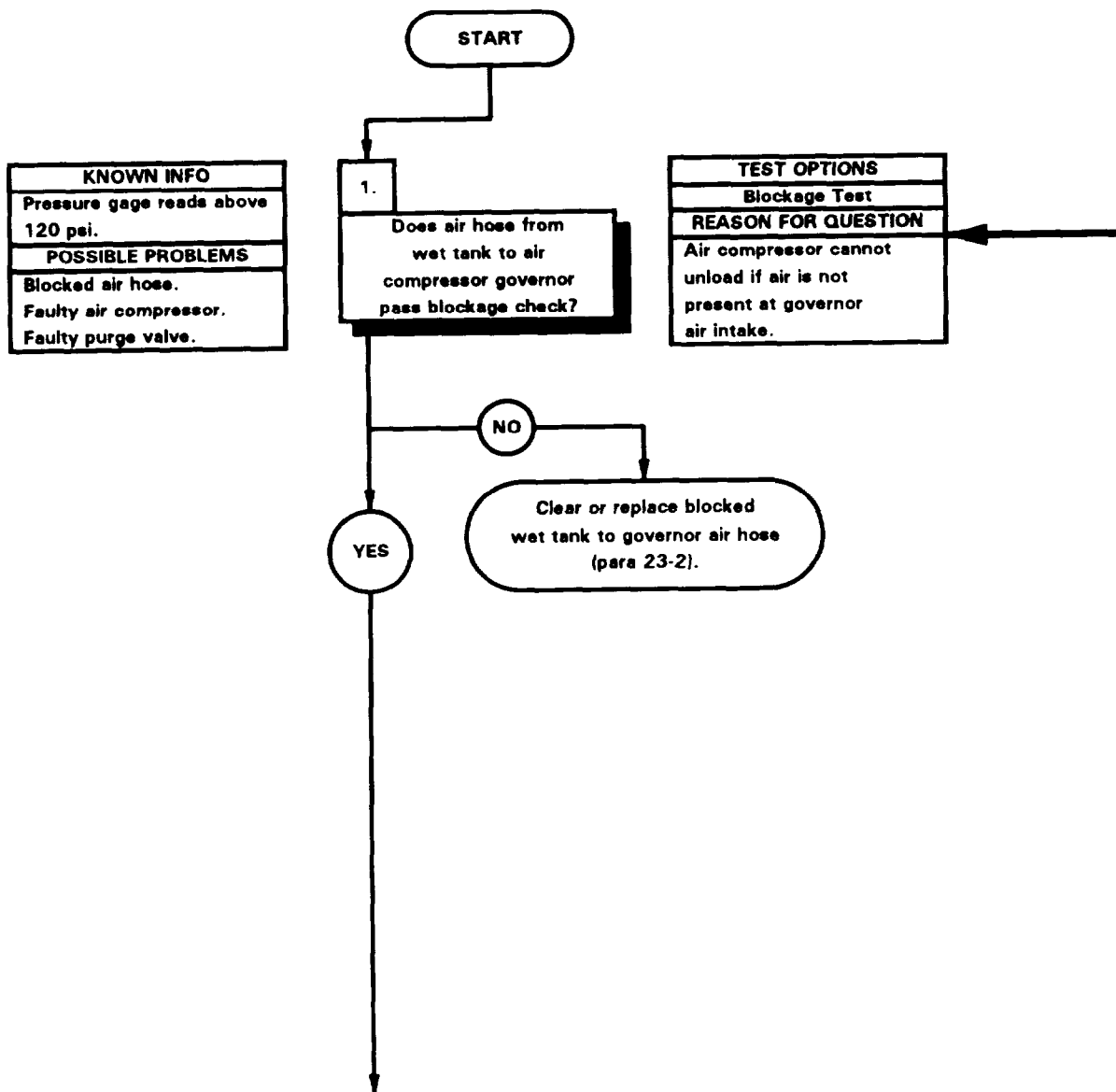


SOAPY WATER LEAK TEST

- (1) Apply soapy water solution to hoses, fittings, and couplings.
- (2) Check air hose(s) between air brake protecting valve and gladhand(s) for kinks and leaks. Tighten loose connections. If kinked, replace air hose(s).
- (3) Check hoses and fittings for bubbles, indicating leaks.

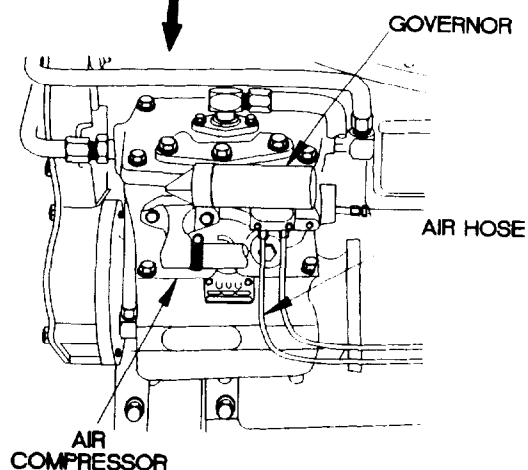
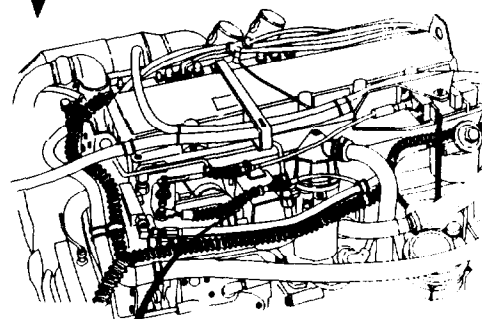
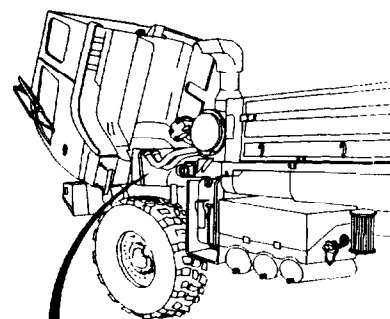


J5. AIR SYSTEM PRESSURE BUILDS UP TO MORE THAN 120 PSI (827 KPA) (COMPRESSOR FAILS TO UNLOAD)	
INITIAL SETUP	
Equipment Conditions	Tools and Special Tools
Engine shut down (TM 9-2320-366-10-1).	Tool Kit, Genl Mech (Item 46, Appendix C)
Air tanks drained (TM 9-2320-366-10-1).	Goggles, Industrial (Item 15, Appendix C)



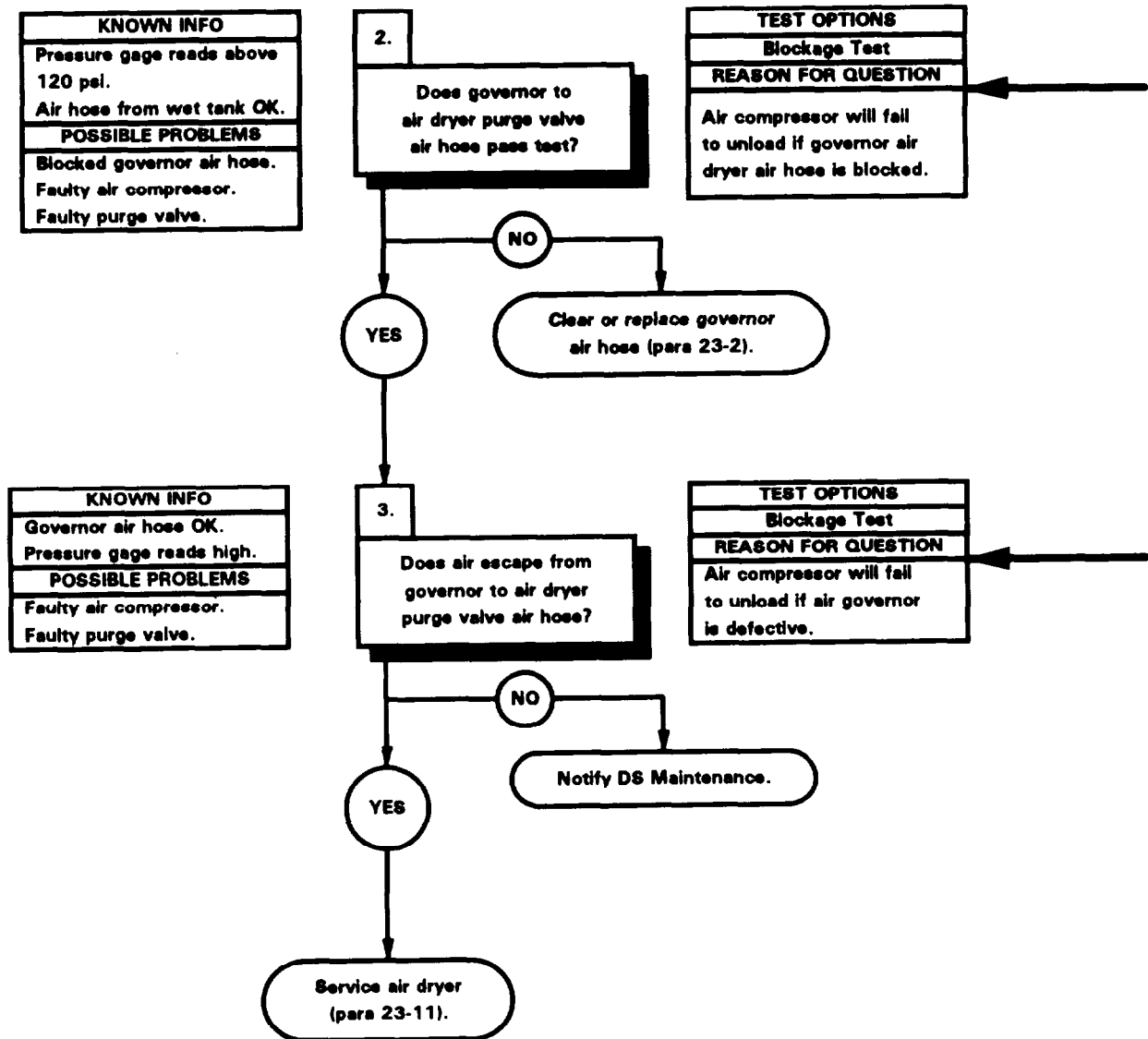
BLOCKAGE TEST

- (1) Raise cab (TM 9-2320-366-10-1).
- (2) Disconnect wet tank to governor air hose at governor.
- (3) Start engine (TM 9-2320-366-10-1).
- (4) Check for air escaping from air hose at governor end of hose.
- (5) If no air escapes, air hose is blocked.
- (6) Shut down engine (TM 9-2320-366-10-1).
- (7) Connect wet tank to governor air hose at governor.



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j5. AIR SYSTEM PRESSURE BUILDS UP TO MORE THAN 120 PSI (827 KPA) (COMPRESSOR FAILS TO UNLOAD) (CONT)

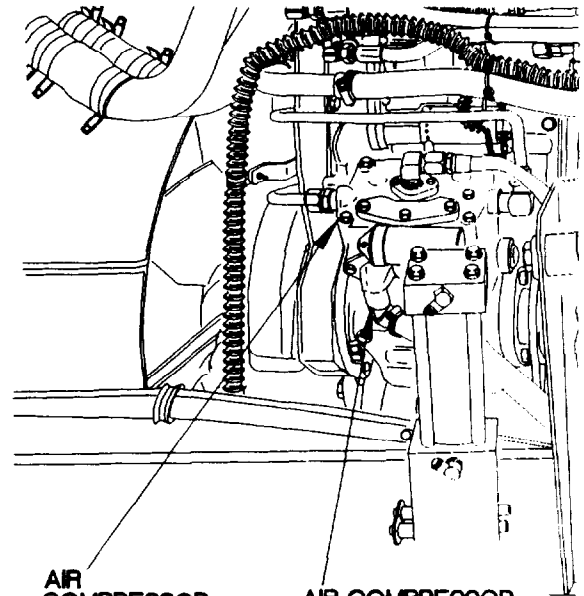


BLOCKAGE TEST

- (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.
- (4) Lower cab (TM 9-2320-366-10-1).

BLOCKAGE TEST

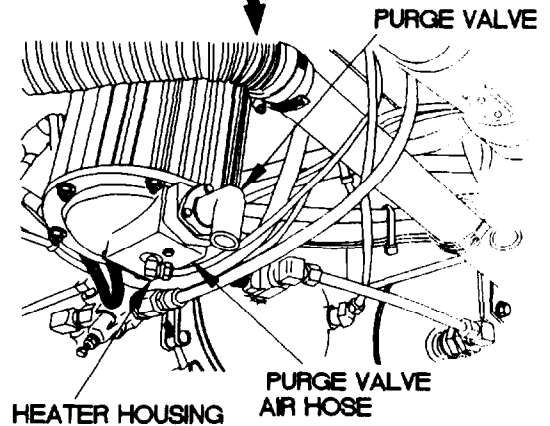
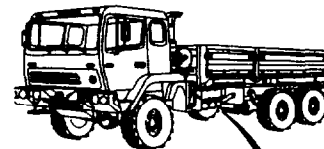
- (1) Disconnect governor air hose at air dryer purge valve.
- (2) Start engine (TM 9-2320-366-10-1).
- (3) Check for presence of air at air hose. If no air escapes from air hose, air compressor is defective. If air escapes, service air dryer for faulty purge valve (para 23-11).
- (4) Shut down engine (TM 9-2320-366-10-1).
- (5) Connect governor to air dryer purge valve air hose.



AIR
COMPRESSOR

AIR COMPRESSOR
TO AIR DRYER
PURGE VALVE AIR HOSE

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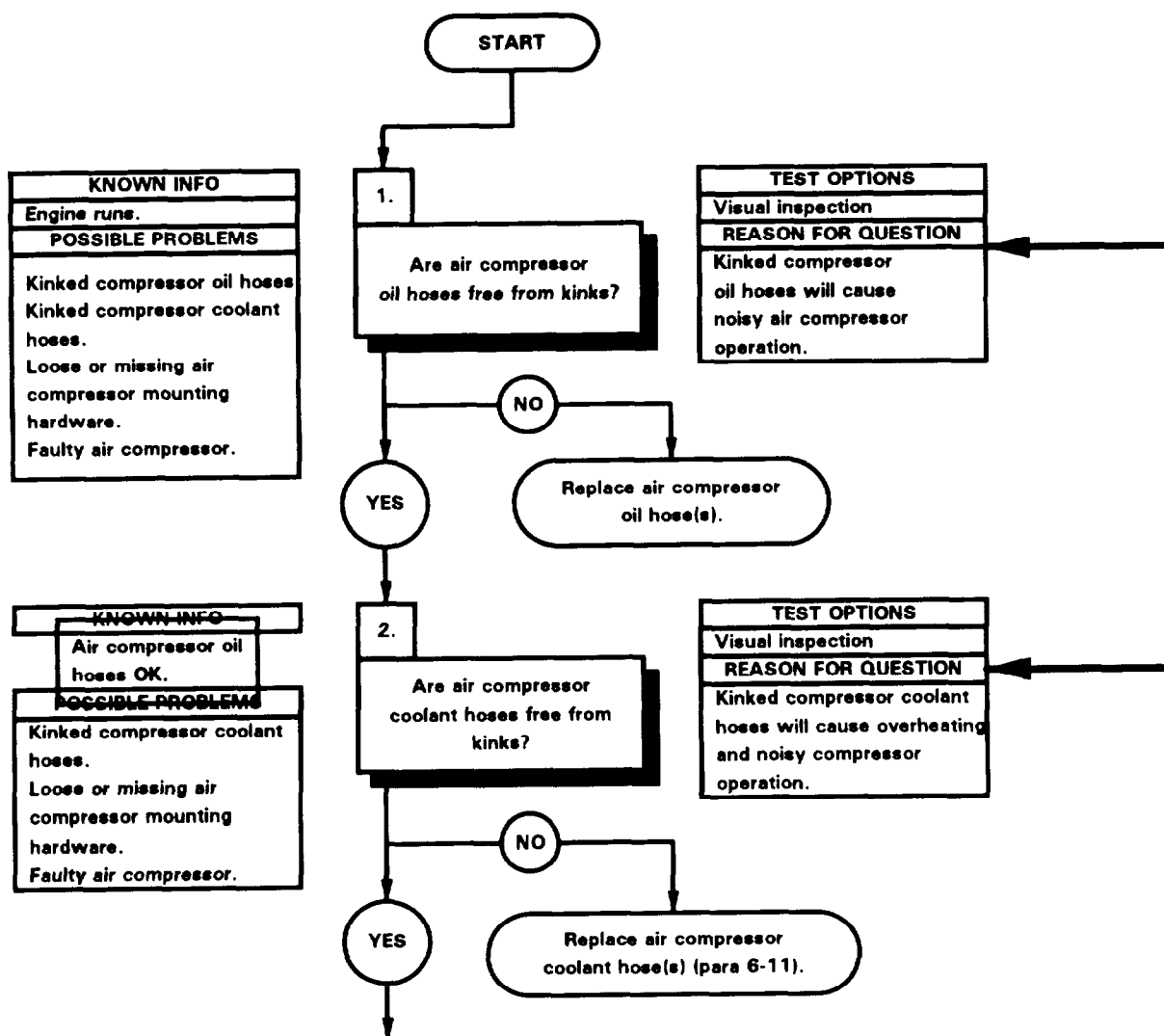


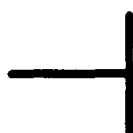
HEATER HOUSING

PURGE VALVE
AIR HOSE

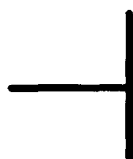
42 J0503A

j6. NOISY AIR COMPRESSOR OPERATION	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C)

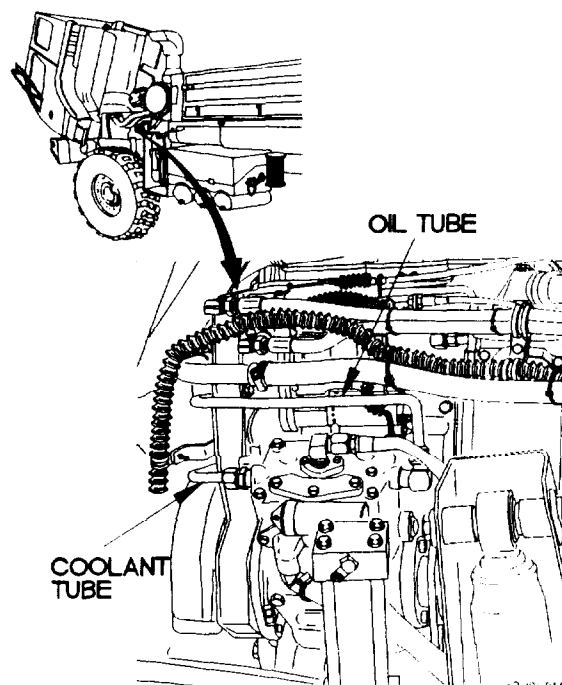




- (1) Raise cab (TM 9-2320-366-10-1).
- (2) Check air compressor oil hoses for kinks.

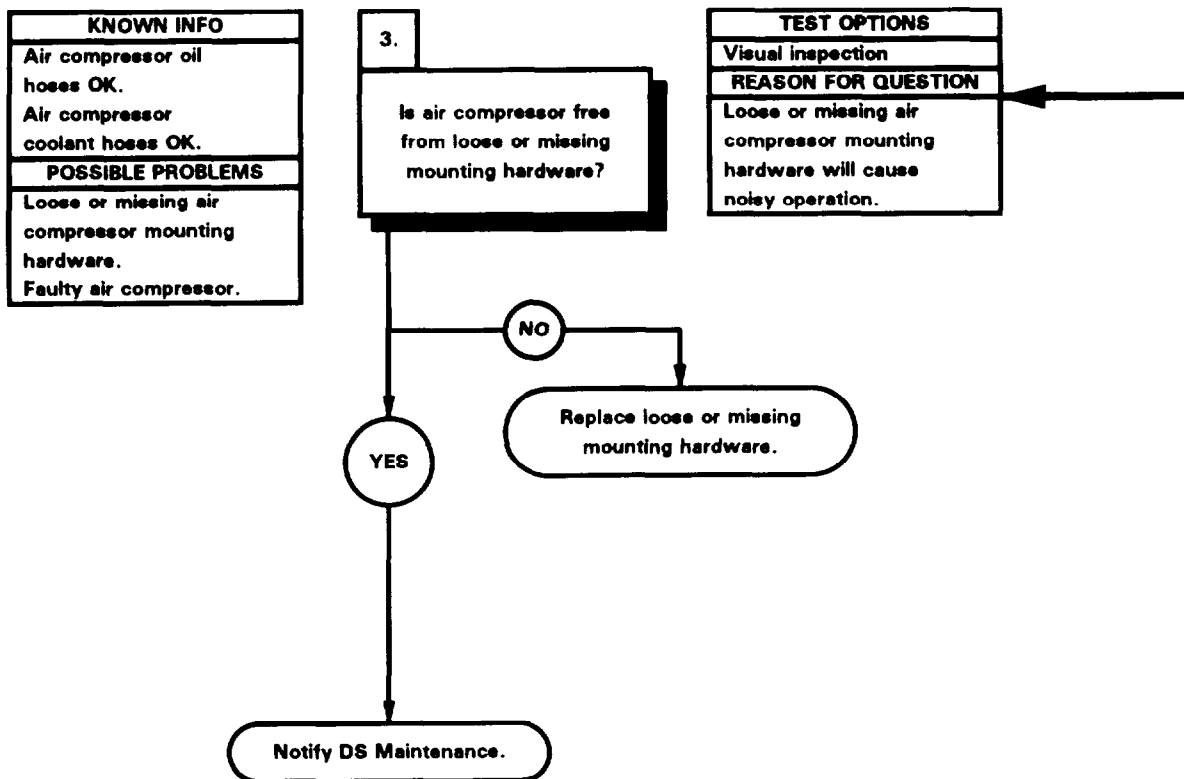


Check air compressor coolant hoses.

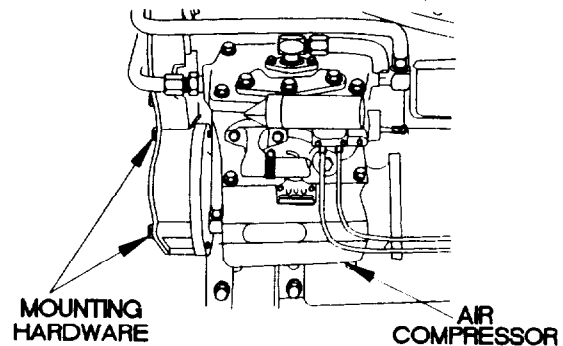
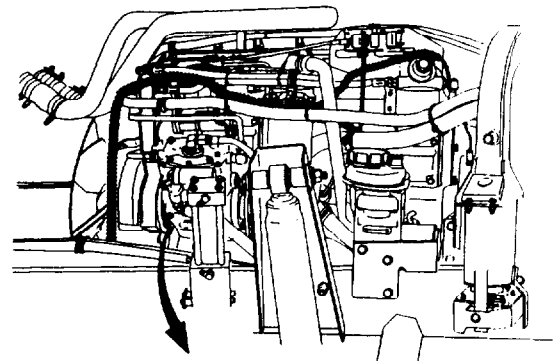


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j6. NOISY AIR COMPRESSOR OPERATION (CONT)

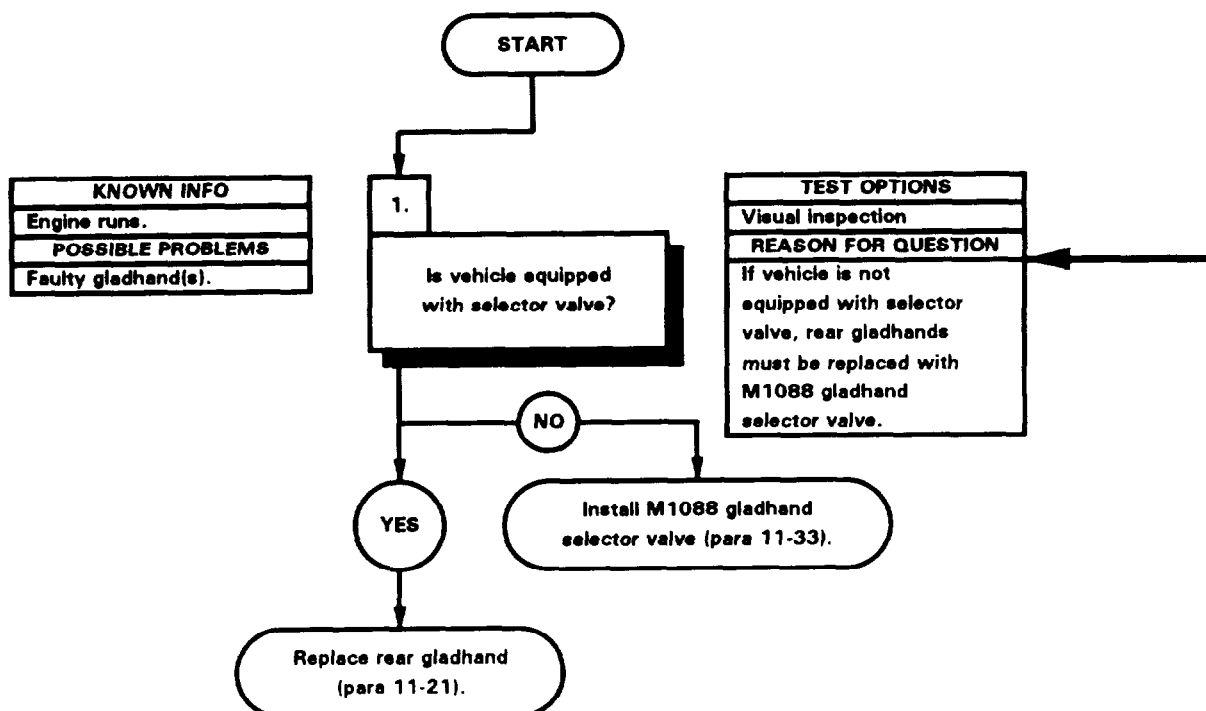


- (1) Check air compressor for loose or missing mounting hardware.
- (2) Lower cab (TM 9-2320-366-10-1).

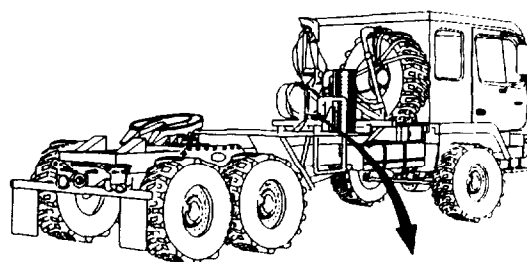


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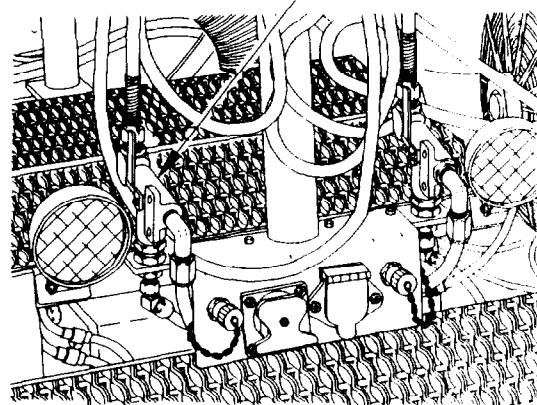
J7. M1088 REAR GLADHAND(S) LEAKS OR DOES NOT OPERATE	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C)



- (1) Check if vehicle is equipped with selector valve.
- (2) If vehicle is not equipped with selector valve, install M1088 gladhand selector valve (para 11-33).
- (3) If vehicle is equipped with selector valve, replace rear gladhand (para 11-21).



SELECTOR
VALVE



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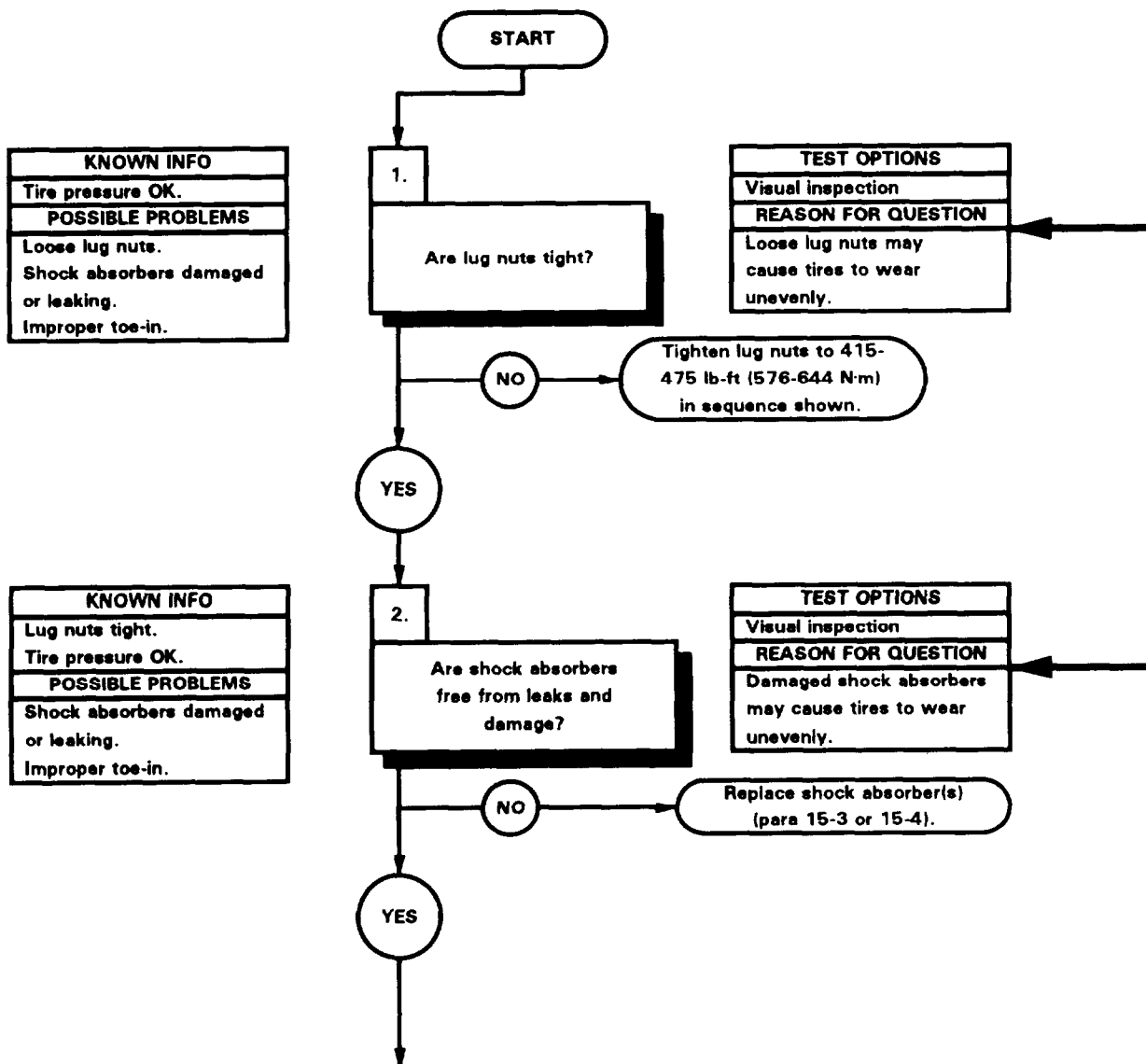
2-22. WHEEL TROUBLESHOOTING

This paragraph covers Wheel Troubleshooting. The Wheel Fault Index, Table 2-50, lists faults for the Wheel of the vehicle.

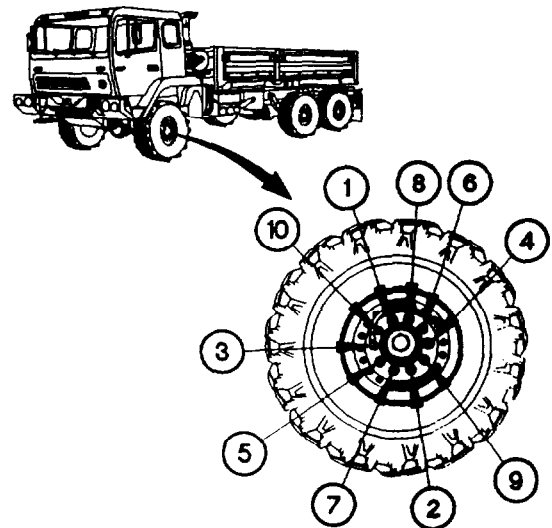
Table 2-50. Wheel Fault Index

Fault No.	Description	Page
k1.	Tires Wear Unevenly or Excessively	2-1990
k2.	Wheel Wobbles or Shimmies	2-1994

k1. TIRES WEAR UNEVENLY OR EXCESSIVELY	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Multiplier, Torque Wrench (Item 23, Appendix C) Wrench, Torque, 0-600 lb-ft (Item 60, Appendix C)

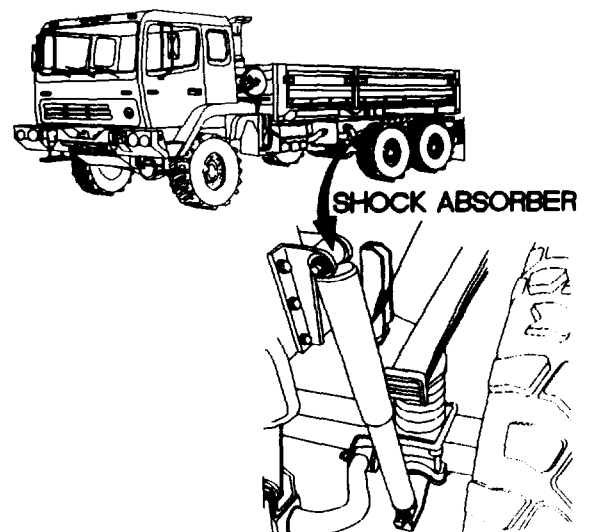


Inspect tires for excessive wear and for spacing between lug nuts and wheels. Tires that are worn unevenly may indicate that lug nuts need tightening.



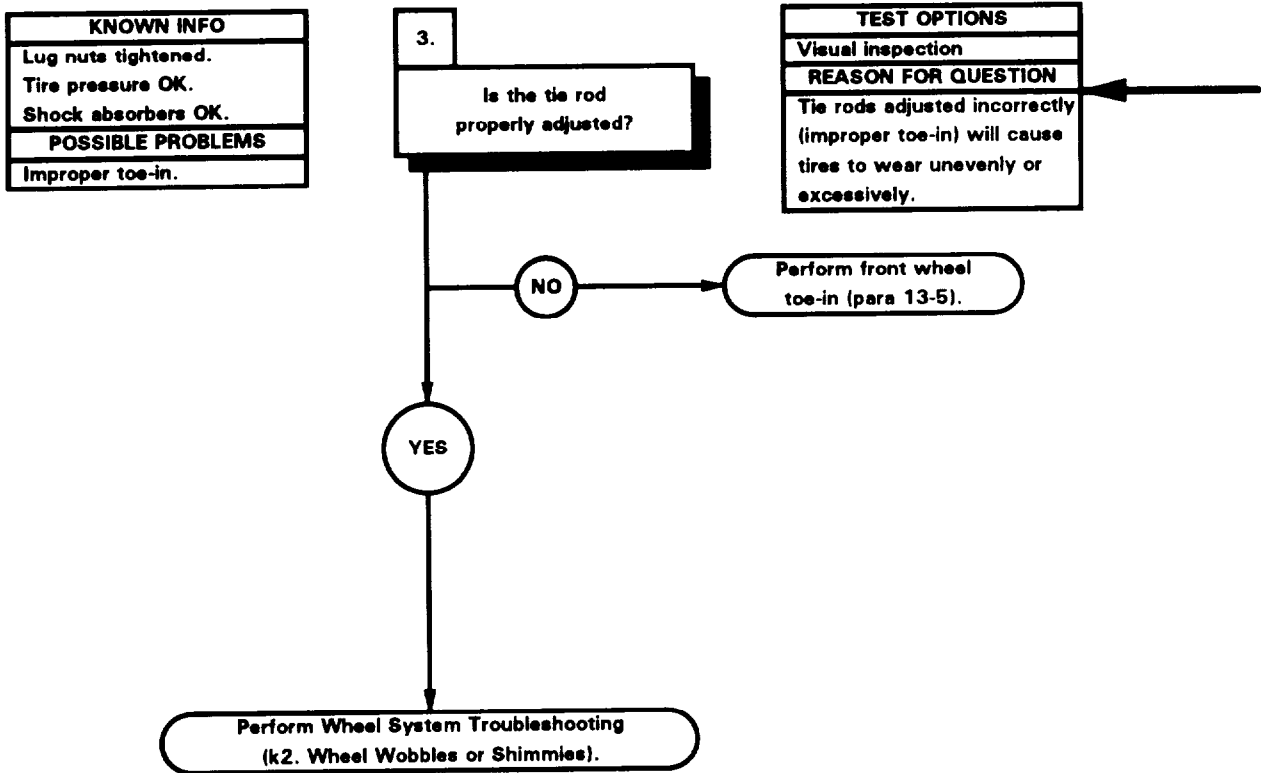
42K0101A

Inspect tires for excessive wear. Tires that have flat spots may indicate a defective shock absorber. Inspect shock absorbers for leaks or damage.



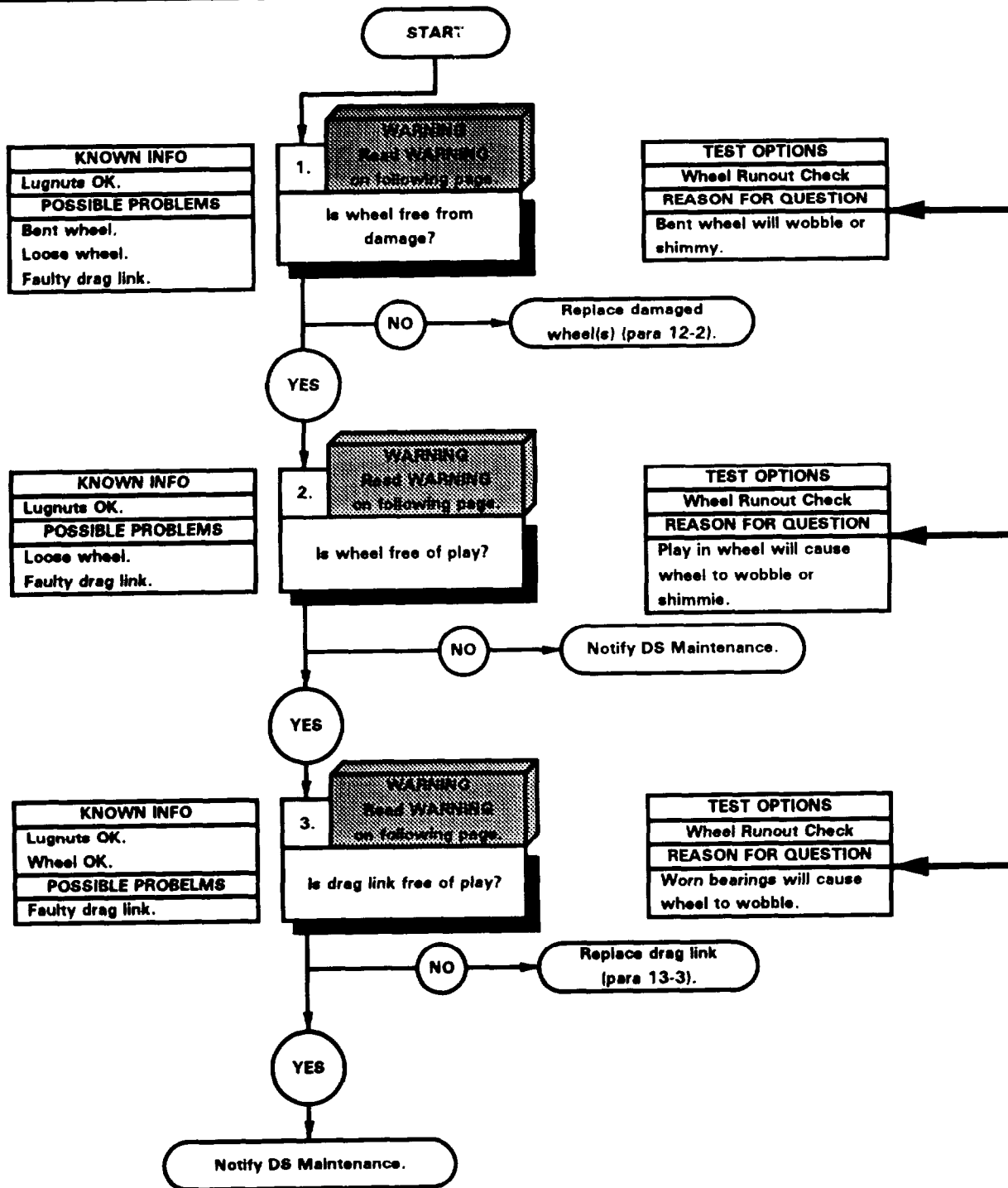
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k1. TIRES WEAR UNEVENLY OR EXCESSIVELY (CONT)





K2. WHEEL WOBBLES OR SHIMMIES	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C) Trestle, Motor Vehicle Maintenance (2) (Item 47, Appendix C)

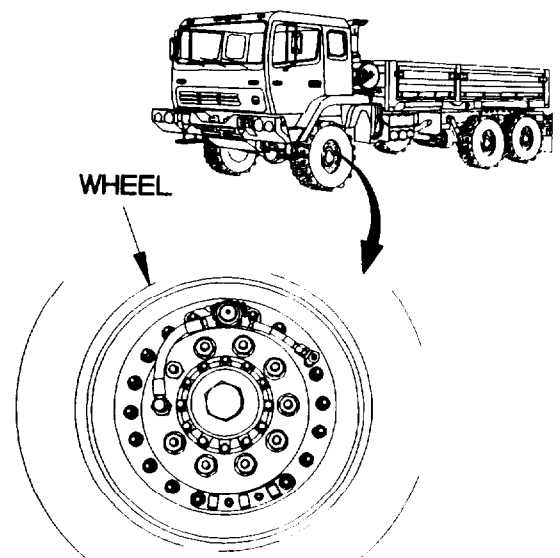


WHEEL RUNOUT CHECK

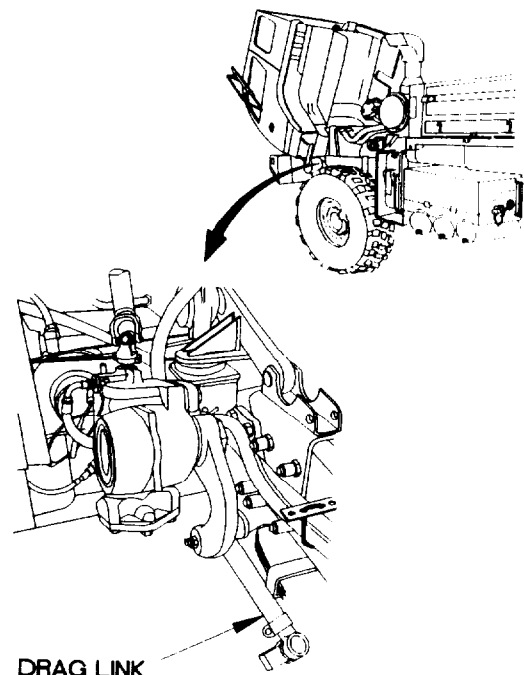
WARNING

Vehicle must be on level ground and wheels must be chocked. Failure to comply may result in injury to personnel.

- (1) Jack up vehicle (TM 9-2320-366-10-1) one wheel at a time.
- (2) Rotate tire to check for bent wheel.
- (3) Insert pry bar under tire and lift while observing wheel play.
- (4) Check drag link play.
- (5) Lower vehicle (TM 9-2320-366-10-1).



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2-23. HYDRAULIC SYSTEM TROUBLESHOOTING

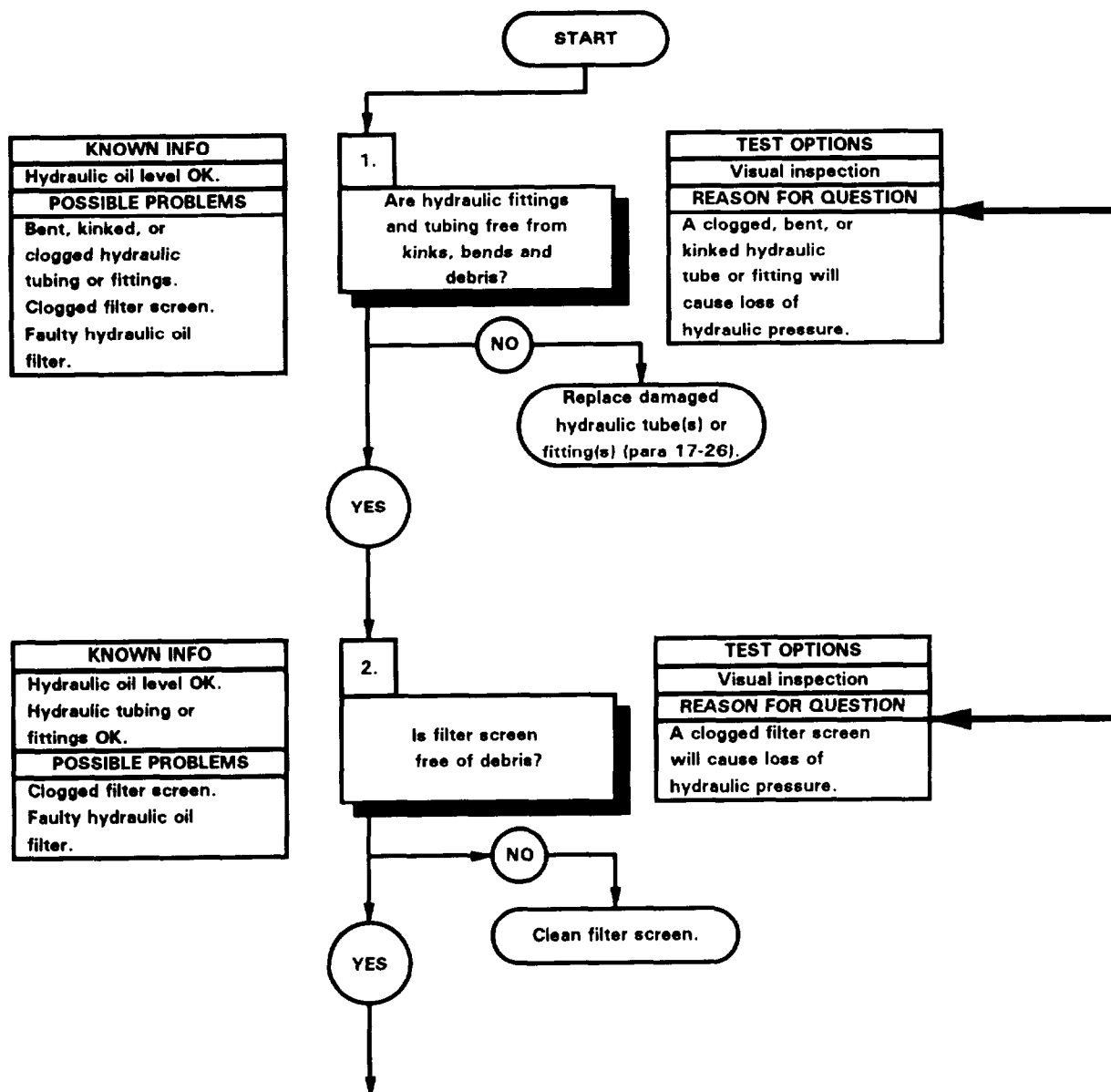
This paragraph covers Hydraulic System Troubleshooting. The Hydraulic System Fault Index, Table 2-51, lists faults for the Hydraulic System of the vehicle.

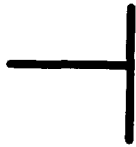
Table 2-51. Hydraulic System Fault Index

Fault No.	Description	Page
I1.	Loss of Hydraulic Pressure (Single Stage Pump)	2-1998
I2.	Loss of Hydraulic Pressure (Three Stage Pump)	2-2002

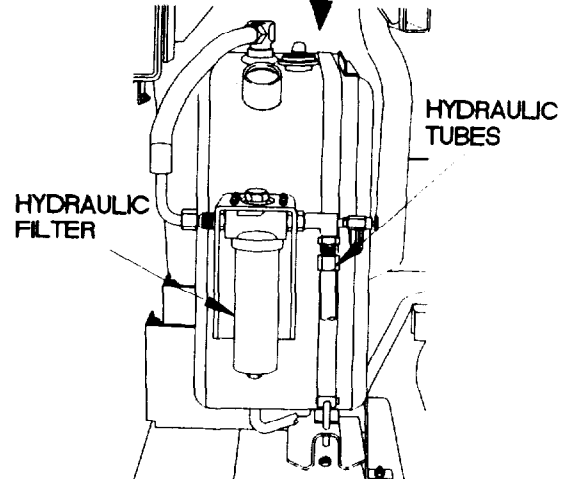
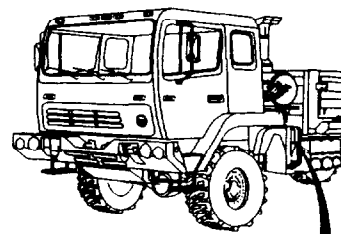


11. LOSS OF HYDRAULIC PRESSURE (SINGLE STAGE PUMP)	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C)

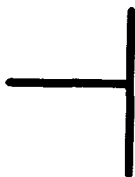




Check hydraulic tubes and fittings for kinks, bends, and debris.

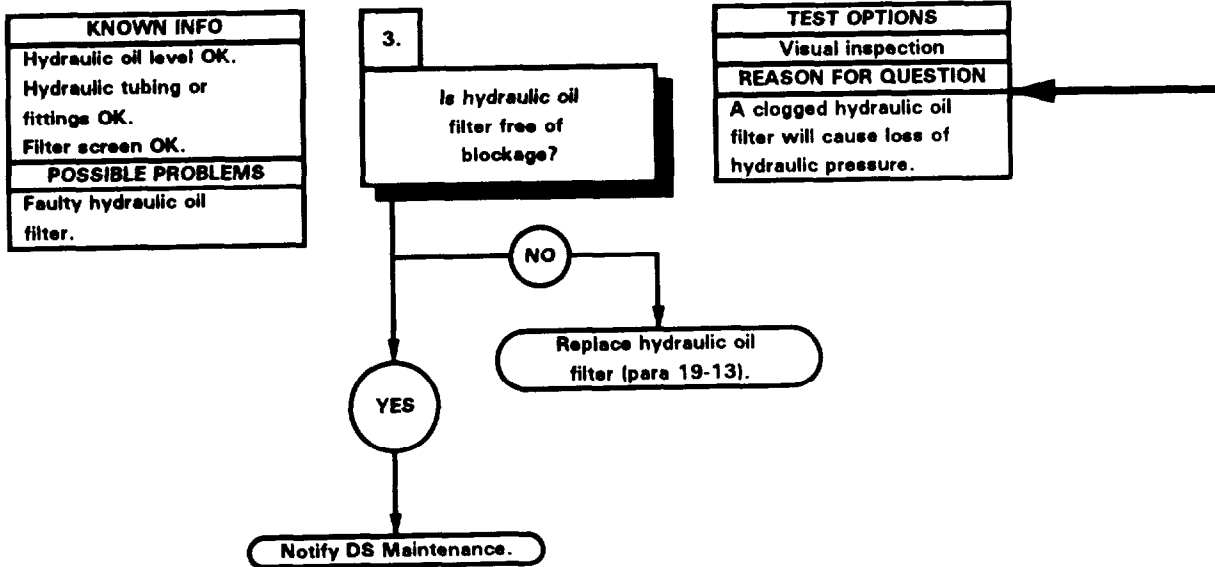


X BL 01111



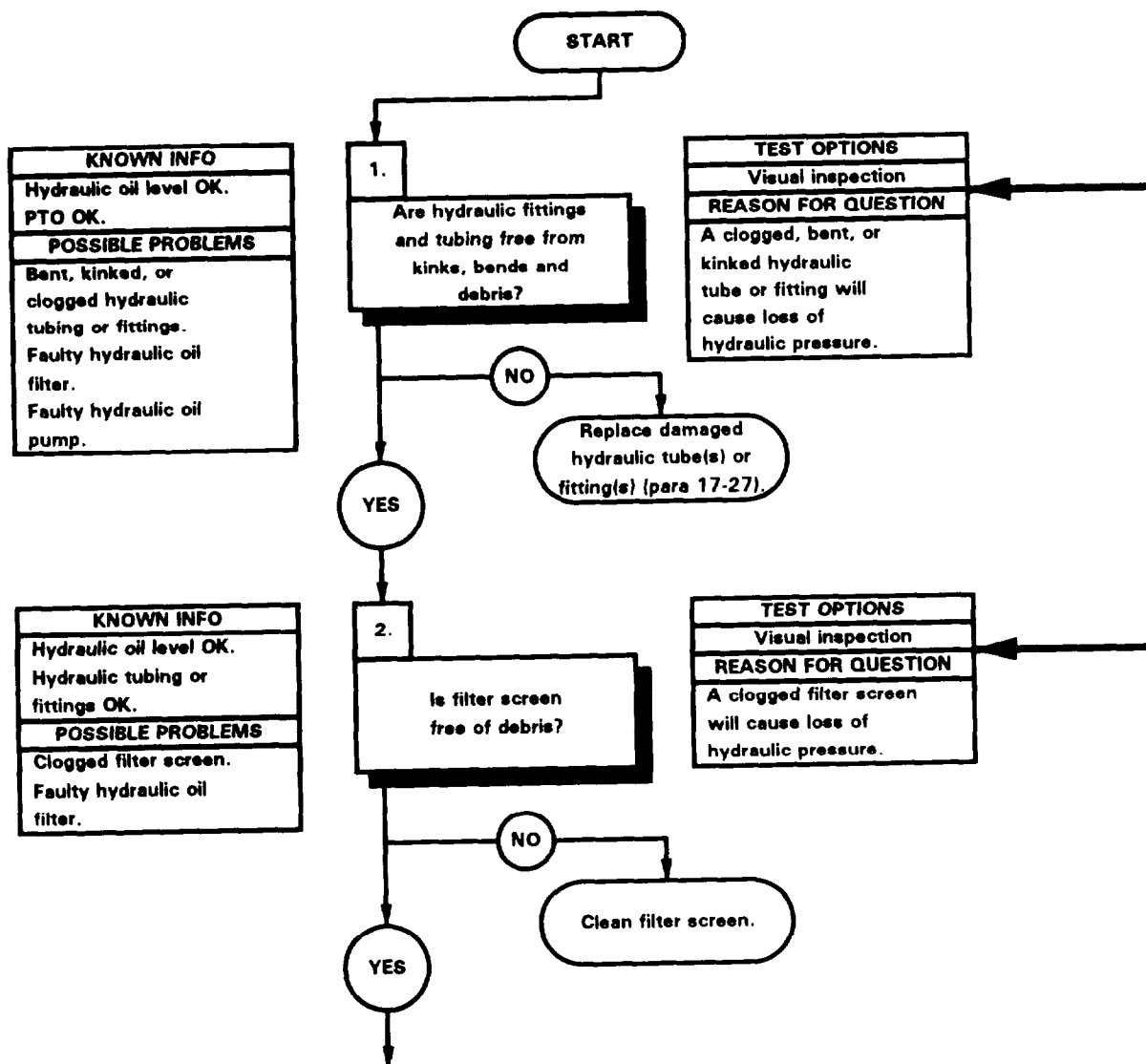
Check filter screen for debris.

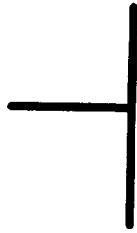
11. LOSS OF HYDRAULIC PRESSURE (SINGLE STAGE PUMP) (CONT)



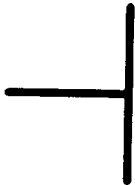
- 
- (1) Remove hydraulic oil filter (para 19-13).
 - (2) Check hydraulic oil filter for blockage.
 - (3) Install hydraulic oil filter (para 19-13).

12. LOSS OF HYDRAULIC PRESSURE (Three Stage Pump)	
INITIAL SETUP	
Equipment Conditions Engine shut down (TM 9-2320-366-10-1).	Tools and Special Tools Tool Kit, Genl Mech (Item 46, Appendix C)

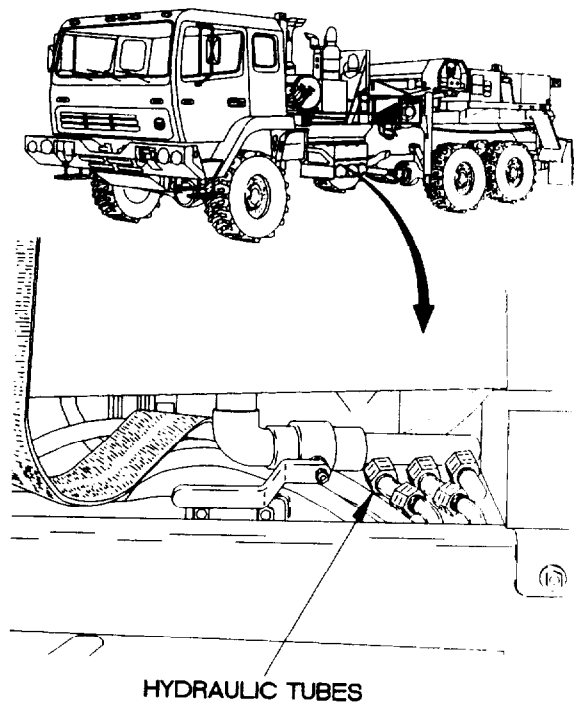




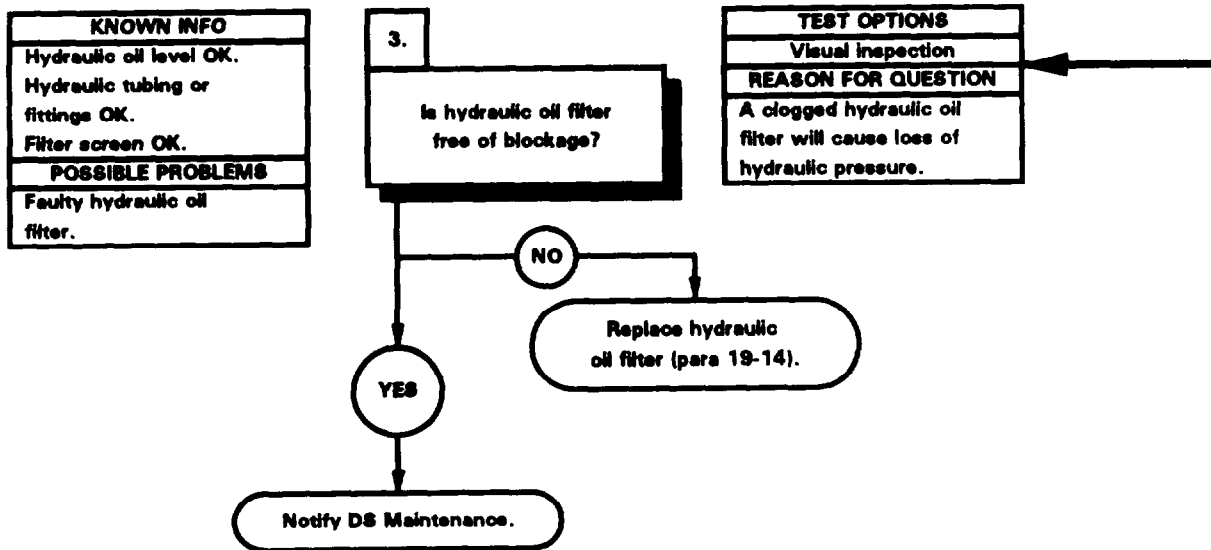
Check hydraulic tubes and fittings for kinks, bends, and debris.

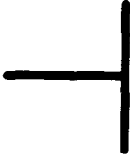


Check filter screen for debris.



12. LOSS OF HYDRAULIC PRESSURE (THREE STAGE PUMP) (CONT)



- 
- (1) Remove hydraulic oil filter (para 19-14).
 - (2) Check hydraulic oil filter for blockage.
 - (3) Install hydraulic oil filter (para 19-14).

APPENDIX A REFERENCES

A-1. SCOPE

This appendix lists all forms, field manuals, technical manuals, and other publications referenced in this manual. Those publications that should be consulted for additional information about vehicle operations are also listed.

A-2. PUBLICATIONS INDEX

The following index should be consulted frequently for latest changes or revisions and for new publications relating to material covered in this technical manual.

Consolidated Index of Army Publications and Blank Forms DA Pam 25-30

A-3. FORMS

The following forms pertain to this manual. See DA Pam 25-30 for index of blank forms. See DA Pam 738-750, The Army Maintenance Management System (TAMMS), for instructions on the use of maintenance forms pertaining to this material.

Recommended Changes to DA Publications and Blank Forms	DA Form 2028-2
Equipment Inspection and Maintenance Worksheet	DA Form 2404
Maintenance Request	DA Form 2407
Equipment Control Record	DA Form 2408-9
Processing and Deprocessing Record of Shipping, Storage, and Issue of Vehicles and Spare Engines	DD Form 1397
Packaging Improvement Report	DD Form 6
Report of Item Discrepancy (ROID)	SF 364
Product Quality Deficiency Report	SF 368

A-4. OTHER PUBLICATIONS

The following publications contain information pertinent to the MTV and associated equipment.

a. Safety.

First Aid for Soldiers	FM 21-11
Security of Tactical Wheeled Vehicles	TB 9-2300-422-20
Safety Inspection and Testing of Lifting Devices	TB 43-0142

A-4. OTHER PUBLICATIONS (CONT)

b. MTV.

Direct Support and General Support Maintenance Manual for M1083 Series, 5-Ton,
6x6, Medium Tactical Vehicle (MTV) TM 9-2320-366-34

Hand Receipt Covering Contents of Components of End Item (COEI), Basic Issue
Items (BII), and Additional Authorization List (AAL), for M1083 Series, 5-Ton,
6x6, Medium Tactical Vehicles (MTV) TM 9-2320-366-10-HR

Operator's Manual for M1083 Series, 5-Ton, 6x6, Medium Tactical Vehicle (MTV) TM 9-2320-366-10

Unit, Direct Support, and General Support Repair Parts and Special Tools List for
M1083 Series, 5-Ton, 6x6, Medium Tactical Vehicle (MTV) TM 9-2320-366-24P

Warranty Program for M1083 Series, 5-Ton, 6x6, Medium Tactical Vehicle (MTV) TB 9-2300-366-15

c. General Vehicle Operation.

Army Motor Transport Units and Operations FM 55-30

Deepwater Fording of Ordnance Material TM 9-238

Manual for the Wheeled Vehicle Driver FM 21-305

Petroleum Tank Vehicle Operations FM 10-71

Safety Prevention of Motor Vehicle Accidents AR 385-557

Vehicle Recovery Operations FM 20-22

d. General Maintenance and Repair.

Army Oil Analysis Program TB 43-0211

Camouflage Pattern Painting FM 5-20

Charging System Troubleshooting DA Pam 750-33

Color, Marking, and Camouflage Painting of Military Vehicles TB 43-0209

Cooling Systems: Tactical Vehicles TM 750-254

Corrosion Prevention and Control Including Rustproofing Procedures for Tactical
Vehicles and Trailers TB 43-0213

Description, Use, Bonding Techniques, and Properties of Adhesives TB ORD 1032

Equipment Improvement Report and Maintenance Digest: TACOM Equipment TB 43-0001-39-1

Equipment Improvement Report and Maintenance Summary TM 43-0143

Installation Instructions for Installation Kit, Electronic Equipment,
MK-2700/VRC (NSN 5895-01-421-0814) (EIC: N/A) to Permit Installation
of Radio Set AN/VRC-87/88/90 Series into M1078, M1080, M1081, M1083-
M1086, M1088-M1094 and M1096 Family of Medium Tactical Vehicles TB 11-5820-890-20-101

Installation Instructions for Installation Kit, Electronic Equipment,
MK-2715/VRC (NSN 5895-01-421-0812) (EIC: N/A) to Permit Installation
of Radio Set AN/VRC-89/91/92 Series into M1078, M1080, M1081, M1083-
M1086, M1088-M1094 and M1096 Family of Medium Tactical Vehicles TB 11-5820-890-20-92

Materials Used for Cleaning, Preserving, Abrading, and Cementing Ordnance Materiel
and Related Materials Including Chemicals TM 9-247

Metal Body Repair and Related Operations FM 43-2

Operator's and Organizational Maintenance Manual for Radio Sets TM 11-5820-498-12

Operator's and Organizational Maintenance Manual Including Repair Parts and
Special Tools List Simplified Test Equipment for Internal Combustion Engines
Reprogrammable (STE/ICE-R) (NSN 4910-01-222-6589) TM 9-4910-571-12&P

Operator's Manual, Radio Set, AN/VRC-46 TM 11-5820-401-10-1

Operator's Manual, Radio Set, AN/VRC-90A TM 11-5820-890-10-1

Operator's, Unit, Direct Support, and General Support Maintenance Manual
for Lead-Acid Storage Batteries TM 9-6140-200-14

Ordnance Tracked and Wheeled Vehicle Hull and Chassis Wiring, Repair of	TB ORD 650
Organizational Care, Maintenance, and Repair of Pneumatic Tires and Inner Tubes	TM 9-2610-200-14
Painting Instructions for Field Use	TM 43-0139
Purging, Cleaning, and Coating Interior Ferrous and Terne Sheet Vehicle Fuel Tanks	TB 43-0212
Repair of Tents, Canvas, and Webbing	FM 10-16
Rigging	FM 5-125
Use and Care of Hand Tools and Measuring Tools	TM 9-243
Use of Antifreeze Solutions and Cleaning Compounds in Engine Cooling Systems	TB 750-651
Welding Theory and Application	TM 9-237

e. Cold Weather Operation.

Basic Cold Weather Manual	FM 31-70
Northern Operations	FM 31-71
Operation and Maintenance of Ordnance Materiel in Cold Weather (0° to -65°F)	FM 9-207

f. Decontamination.

Decontamination Operations Facilities & Equipment	TB 700-4
NBC Decontamination	FM 3-5
NBC Protection	FM 3-4

g. Maintenance of Special Purpose Kits.

Operator and Organizational Maintenance Manual for Chemical Alarm	TM 3-6665-225-12
Operator's and Unit Maintenance Manual Including Repair Parts and Special Tools	
List for Decontaminating Apparatus: M13	TM 3-4230-214-12&P
Operator, Organizational, Direct Support, and General Support Maintenance Manual	
Including Repair Parts and Special Tools List for Various Machine Gun Mounts	TM 9-1005-245-14

h. General.

Operator's Manual (M998 Series)	TM 9-2320-280-10
Operator's Manual (M1008 Series)	TM 9-2320-289-10
Operator's Manual (M35 Series)	TM 9-2320-361-10
Operator's Manual (M939 Series)	TM 9-2320-272-10
Principles of Automotive Vehicles	TM 9-8000
Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use	
(US Army Tank-automotive and Armaments Command)	TM 750-244-6
Route Reconnaissance and Classification	FM 5-36
Soldier's Manual MOS 88M Motor Transport Operator, Skill Levels 1/2	STP 55-88-M12-SM

i. Land, Sea, and Air Shipment.

Airdrop of Supplies and Equipment: Rigging 5-Ton Trucks	FM 10-526
Containerization of Military Vehicles	MTMCTEA Ref 95-55-23
Lifting and Tiedown of U.S. Military Helicopters	MTMCTEA Ref 95-55-21
Marine Lifting and Lashing Handbook	MTMCTEA Ref 95-55-22
Marine Terminal Lifting Guidance	MTMCTEA Pam 56-1

A-4. OTHER PUBLICATIONS (CONT)

i. Land, Sea, and Air Shipment (Cont).

Multiservice Helicopter External Air Transport: Basic Operations and Equipment	FM 55-450-3
Multiservice Helicopter External Air Transport: Dual-Point Load Rigging Procedures	FM 55-450-5
Multiservice Helicopter External Air Transport: Single-Point Load Rigging Procedures	FM 55-450-4
Standard Characteristics (Dimensions, Weight, and Cube) for Transportability of Military Vehicles and Other Outsize/Overweight Equipment (in TOE Line Sequence)	TB 55-46-1
Tiedown Handbook for Rail Movements	MTMCTEA Pam 55-19
Tiedown Handbook for Truck Movements	MTMCTEA Ref 92-55-20

APPENDIX B MAINTENANCE ALLOCATION CHART (MAC)

SECTION I

INTRODUCTION

B-1. The Army Maintenance System MAC.

a. This introduction (Section I) provides a general explanation of all maintenance and repair functions authorized at various maintenance levels under the standard Army Maintenance System concept.

b. The Maintenance Allocation Chart (MAC) in Section II designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component will be consistent with the capacities and capabilities of the designated maintenance levels, which are shown on the MAC in column (4) as:

Unit - includes two subcolumns, C (Operator/Crew) and O (Unit) maintenance.

Direct Support - includes an F subcolumn.

General Support - includes an H subcolumn.

Depot - includes a D subcolumn.

c. Section III lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from Section II.

d. Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

B-2. Maintenance Functions. Maintenance functions are limited to and defined as follows:

a. **Inspect.** To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g. by sight, sound, or feel).

b. **Test.** To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. **Service.** Operations required periodically to keep an item in proper operating condition; e.g. to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemicals fluids, or gases.

d. **Adjust.** To maintain or regulate, within prescribed limits, by bringing into proper position, or by setting the operating characteristics to specified parameters.

e. **Align.** To adjust specified variable elements of an item to bring about optimum or desired performance.

f. **Calibrate.** To determine and cause corrections to be made or to be adjusted on instruments or Test, Measurement, and Diagnostic Equipment (TMDE) used in precision measurement. Consists of comparison of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Remove/Install. To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. Replace. To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and assigned maintenance level is shown as the 3d position code of the SMR code.

i. Repair. The application of maintenance services¹ including fault location/troubleshooting², removal/installation, and disassembly/assembly³ procedures, and maintenance actions⁴ 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.

¹Services - Inspect, test, service, adjust, align calibrate, and/or replace.

²Fault 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).

³Disassembly/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).

⁴Actions - 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.

⁵This maintenance level is not included in Section II, Column (4) of the Maintenance Allocation Chart. Functions to this level of maintenance are identified by a work-time figure in the "H" column of Section II, Column (4), and an associated reference code is used in the Remarks column (6). This code is keyed to Section IV, Remarks, and the SRA complete repair application is explained there.

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
0100	ENGINE ASSEMBLY	Inspect		0.1				80	
		Test		1.5	0.3			80,81	
		Adjust			3.0			58,62,80, 82	
		Service		0.8				59,61,80	
		Replace			3.0			19,58,61, 63,80,81	
		Repair		0.4	1.6	3.3		19,35,36, 46,58,61, 62,63,80, 81	
0101	CYLINDER HEAD ASSEMBLY	Inspect			0.1			80	
		Replace			2.0			46,58,61, 62,80	
		Repair				2.5		58,61,62, 63,64,80, 83	
0102	CRANKSHAFT	Replace				16.0		58,59,62, 73,80	
		Repair			3.8	16.0		19,35,36, 58,61,62, 63,80	
0103	FLEXPLATE, ENGINE	Replace			6.5			58,61,80	
		Repair			1.0			58,61,80	
0104	PISTON ASSEMBLY	Replace				9.0		58,59,61, 62,64,80, 81	
		Repair				0.6		80	
0105	CAMSHAFT ASSEMBLY	Replace				3.1		17,58,59, 61,62,80	
		Repair				1.2		58,80	
0105	ROCKER ARM AND PUSH RODS	Replace			2.0			46,61,62 63,80	
		Repair			0.3			59,80	
0106	COOLER, ENGINE OIL	Replace			1.3			58,80	
		Repair			0.3			58,80	
0108	MANIFOLDS, INLET AND EXHAUST	Replace			1.5			58,62,63, 80,81	
0301	INJECTOR ASSEMBLY, FUEL	Replace			2.1			46,59,80, 82	
		Adjust			1.6			58,80,81, 82	
0304	AIR INTAKE SYSTEM	Service		0.3					
		Repair		0.3				48,59,	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
0304	INTAKE AIR CLEANER	Service		0.2					
		Replace		0.8				6,48,59, 80	
		Repair		0.4				59,80	
0305	TURBOCHARGER	Replace			0.8			58,63,80, 81	
0306	FUEL TANK	Inspect	0.1						
		Replace		1.5				59,61,80	
0308	GOVERNOR, ENGINE SPEED	Replace			1.0			59,62,78, 80,81	
		Repair		0.5	0.7			59,80	
0309	FILTER, FUEL/WATER SEPARATOR	Inspect	0.2						
		Service	0.2	0.3				80	
		Replace		0.5				59,80	
0311	ETHER STARTING AID	Replace		0.6				59,61,80	
0312	ACCELERATOR/HAND THROTTLE	Replace		0.5				59,80	
		Adjust		0.2				59,80	
0401	EXHAUST MUFFLER/PIPES	Inspect	0.1	0.2					
		Replace		0.9				59,61,80	
0501	RADIATOR/CHARGE AIR COOLER	Inspect	0.1						
		Replace		2.5				2,31,55, 61,80	
		Service		1.5				61,80	
		Repair		0.6	2.0			2,31,55, 61,80	
0501	RADIATOR OVERFLOW TANK	Replace		0.5				48,59,80	
		Repair		0.3				80	
0502	SHROUD, FAN	Replace		1.0				59,61,80, 90	
0503	HOSES, WATER	Replace		0.5				59,61,80, 90	
0504	PUMP, WATER	Replace		0.8				18,59,61, 80,90	
0505	CLUTCH, ENGINE FAN	Inspect		1.0				59	
		Service		0.2				61	
		Replace		1.5				2,55,59, 80	
		Repair			1.2			58,61,62, 63,80,81	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
0601	ALTERNATOR, 100 AMP	Inspect		0.2					
		Test		0.5	1.5			61,65,80	
		Replace		1.0				61,80	
		Repair		0.2	0.5			40,58,59, 61,65,80, 81	
0603	STARTING MOTOR, ENGINE	Inspect		0.1					
		Test		0.5	0.5			59,65	
		Replace		1.5				2,8,59, 61,80	
		Repair			2.1			54,58,61, 62,78,80	
0606	SOLENOID, FUEL SHUTOFF	Replace			1.0			62,80,82	
0607	CABLE ASSEMBLY, DASHBOARD	Test		0.5				58	
		Replace		2.9				59,61,78, 80	
		Repair		1.0	0.6			58,59,63, 80	
0607	DISPLAY, LIGHTED INDICATOR	Test		0.3					
		Replace		0.5				80,90	
		Repair		0.3				80	
0608	JUNCTION BOX ASSEMBLY, M1084/M1086	Inspect	0.1						
		Replace		1.5				59,61,80, 90	
		Repair		1.5				59,61,65, 80	
0608	JUNCTION BOX ASSEMBLY, M1089	Inspect	0.1						
		Replace		1.5				59,61,80, 90	
		Repair		1.5				59,61,65, 80	
0609	LIGHT ASSEMBLY, BACKUP	Inspect	0.1						
		Replace		0.8				59,80	
		Repair		0.3				80	
0609	LIGHT, BLACKOUT DRIVE	Inspect	0.1						
		Replace		0.8				59,61,80	
		Repair		0.5				80	
0609	TAILLIGHT ASSEMBLY, COMPOSITE	Inspect	0.1						
		Replace		0.8				59,61,80	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
0609	LIGHT ASSEMBLY, FRONT TURN SIGNAL AND PARK	Repair		0.5				80	A
		Inspect	0.1						
		Replace		0.8				59,61,80	
		Repair		0.5				80	
0609	HEADLIGHT	Inspect	0.1						
		Adjust		0.4					
		Replace		1.0				59,61,80	
0609	WORKLIGHT ASSEMBLY, M1088/M1089 STATIONARY	Inspect	0.1						
		Replace		0.8				80	
		Repair		0.3				80	
0610	AUDIBLE ALARM	Inspect	0.1						
		Replace		0.6				80	
0611	HORN, CAB	Inspect	0.1						
		Replace		0.4				59,80	
0612	BOX ASSEMBLY, BATTERY	Inspect	0.1						
		Test		0.5				59,80	
		Service		0.3				59	
		Replace		1.0				59,61,80	
		Repair		0.2				65	
0613	CABLE ASSEMBLY, LH/RH CAB AND DOOR MARKER LIGHTS	Inspect	0.1						
		Replace		0.8				80	
		Repair		0.7				65	
0613	CABLE ASSEMBLY, LOWER, CAB MARKER LIGHTS, M1093/M1094	Inspect	0.1						
		Replace		0.6				80,90	
		Repair		0.5				65	
0613	CABLE ASSEMBLY, UPPER, CAB CLEARANCE AND MARKER LIGHTS, M1093/M1094	Inspect	0.1						
		Replace		0.8				80,90	
		Repair		0.5				65	
0613	CABLE ASSEMBLY, STE/ICE-R	Replace		1.0				80	
		Repair		0.5	0.8			65	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level				(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot	
			C	O	F	H	D	
0613	CABLE ASSEMBLY, CAB CLEARANCE AND MARKER LIGHTS	Inspect	0.1					
		Replace		1.2				59,80
		Repair		0.5	0.8			65
0613	CABLE ASSEMBLY, WARNING LIGHT	Replace		0.5				50,80,90
		Repair		0.3	0.5			65
0613	CABLE ASSEMBLY, WINDSHIELD WASHER PUMP/EMI	Replace		0.5				80
		Repair		0.3				65
0613	CABLE ASSEMBLY, ARCTIC KIT W/PTO	Replace		1.8				59,61,80
		Repair		0.5	0.5			65
0613	CABLE ASSEMBLY, CRANE POWER	Inspect	0.1					
		Replace		1.2				80
		Repair		0.5	0.5			65
0613	BOX ASSEMBLY, CRANE REMOTE CONTROL	Test		0.5				
		Repair		0.7				80,90
0613	CABLE ASSEMBLY, ENGINE CONTROL	Inspect	0.1					
		Replace		2.3				59,80
		Repair		0.5	0.5			65
0613	CABLE ASSEMBLY, FRONT INTERVEHICULAR, 12 VDC	Replace		0.8				61,80
		Repair		0.2	1.3			65
0613	CABLE ASSEMBLY, FRONT LIGHTS	Replace		2.0				59,61,80, 90
		Repair		0.5	0.5			65
0613	CABLE ASSEMBLY, REAR LIGHTS	Replace		2.8				59,61,80
		Repair		0.5	0.5			65
0613	CABLE, M1084/M1086 BOOM DOWN LOCKOUT SOLENOID	Replace		2.0				59,80
		Repair		0.5	0.8			65
0613	CABLE, M1084/M1086 BOOM DOWN SOLENOID	Replace		2.0				59,80
		Repair		0.5	0.8			65

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
0613	CABLE, M1084/M1086 BOOM UP LOCKOUT SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1084/M1086 BOOM UP SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1084/M1086 CONTROL LOCKOUT SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1084/M1086 CRANE POWER	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1084/M1086 HOIST DOWN SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1084/M1086 HOIST UP LOCKOUT SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1084/M1086 HOIST UP SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1084/M1086 LEFT JACK CYLINDER PROXIMITY SENSOR	Replace		1.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1084/M1086 OVERLOAD LOCKOUT	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1084/M1086 REMOTE CONTROL	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1084/M1086 SWING CCW SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1084/M1086 SWING CW SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1084/M1086 SYSTEM SHUTDOWN SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
0613	CABLE, M1084/M1086 TELESCOPE IN SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1084/M1086 TELESCOPE OUT LOCKOUT SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1084/M1086 TELESCOPE OUT SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1089 BOOM DOWN LOCKOUT SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1089 BOOM DOWN SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1089 BOOM UP LOCKOUT SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1089 BOOM UP SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE ASSEMBLY, M1089 CONTROL PANEL POWER	Replace		2.0				80	
		Repair		0.5	0.8			65	
0613	CABLE, M1089 CRANE POWER	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1089 HOIST DOWN SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1089 HOIST UP LOCKOUT SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1089 HOIST UP SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1089 HYDRAULIC SYSTEM SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1089 LEFT SIDE REMOTE CONTROL	Replace		2.0				59,80	
		Repair		0.5	0.8			65	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
0613	CABLE, 1089 OVERLOAD LOCKOUT	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	WIRING HARNESS, M1089 REMOTE CONTROL	Replace		2.0				80	
		Repair		0.5	0.8			65	
0613	CABLE, M1089 RIGHT SIDE REMOTE CONTROL	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1089 SWING CCW SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1089 SWING CW SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1089 TELESCOPE IN SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1089 TELESCOPE OUT LOCKOUT SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE, M1089 TELESCOPE OUT SOLENOID	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	BOX ASSEMBLY, WRECKER REMOTE CONTROL	Repair		1.6				59,80	
0613	CABLE ASSEMBLY, M1090/M1094 DUMP	Replace		0.8				59,61,80	
		Repair		0.5	0.8			65	
0613	CABLE ASSEMBLY, M1090/M1094 DUMP POWER	Replace		1.2				59,61,80	
		Repair		0.5	0.8			65	
0613	CABLE ASSEMBLY, PTO	Replace		1.6				59,61,80	
		Repair		0.5	0.8			65	
0613	CABLE ASSEMBLY, REAR INTERVEHICULAR, 24 VDC	Replace		0.6				61,80	
		Repair		0.5	0.8			65	
0613	CABLE, ASSEMBLY, START AND CHARGING	Replace		2.0				59,80	
		Repair		0.5	0.8			65	
0613	CABLE ASSEMBLY, WINCH CONTROL VALVE	Replace		1.8				59,61,80	
		Repair		0.5	0.8			65	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
0613	CABLE ASSEMBLY, TRANSMISSION AUXILIARY OIL COOLER FAN	Replace		1.8				59,61,80	
		Repair		0.5				65	
0705	VEHICLE INTERFACE MODULE	Replace		0.6				80	
		Repair		0.8				80	
0708	TORQUE CONVERTER	Adjust			0.9			22,61,62, 80	
		Remove/ Install			0.8			48,61,62, 64,80	
		Repair			1.3			34,58,61, 62,64,80	
0710	TRANSMISSION	Inspect		0.4				80	
		Service		1.5				59,61,80	
		Replace			7.0			58,61,62, 63,80,81, 87	
		Repair		0.4	2.7	1.9		3,22,23, 28,29,31, 43,58,59, 61,62,63, 80,81,87	
0710	MODULE, FRONT SUPPORT	Remove/ Install				2.0		58,59,61, 62,63,80	
		Repair				0.7		34,58,59, 61,62,63, 80	
0710	MODULE, PLANETARY GEAR (P1)	Remove/ Install				2.0		61,62,73, 80	
		Repair				1.5		61,62,73, 80	
0710	MODULE, PLANETARY (P2)	Remove/ Install				2.0		3,58,61, 62,63,80	
		Repair				1.9		3,23,58, 61,62,63, 73,80	
0710	PLANETARY CARRIER (P3)	Remove/ Install				2.0		3,58,62, 80	
		Repair				1.9		3,31,58, 62,80	
0710	MODULE, MAIN SHAFT	Remove/ Install				2.0		61,62,80	
		Repair				0.4		61,62,80	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
0710	MODULE, CONVERTER HOUSING	Remove/ Install				4.3		3,58,59, 61,62,80	
		Repair				2.0		3,23,29, 58,59,61, 62,80	
0713	CLUTCH ASSEMBLY, C3/C4/C5, TRANSMISSION	Remove/ Install				2.0		58,59,61, 62,80	
		Repair				1.0		43,58,59, 61,62,80	
0713	MODULE, ROTATING CLUTCH	Remove/ Install				2.0		3,58,61, 62,80	
		Repair				2.4		3,23,28, 58,61,62, 80	
0714	VALVE ASSEMBLY, CONTROL MODULE	Remove/ Install			2.0			58,61,62, 63,80,81	
		Repair		1.0	2.5			61,63,80, 81	
0714	BODY ASSEMBLY, MAIN VALVE	Service		1.5				59,61,80	
		Remove/ Install			2.0			58,61,62, 63,80,81	
		Repair		1.5	2.5			58,61,62, 63,80,81	
0801	MODULE, TRANSFER CASE	Adjust				1.0			
		Remove/ Install				2.0		25,58,59, 61,62,63, 73,76,80, 81	
		Repair				1.1		27,31,37, 52,58,59, 62,80	
0802	HOUSING ASSEMBLY, C6 AND C7 CLUTCH	Remove/ Install				2.0		58,61,62, 63,80	
		Repair				0.8		23,27,30, 31,32,33, 58,61,62, 63,64,73, 80	
0802	CONTROL VALVE ASSEMBLY	Remove/ Install				2.0		58,61,63, 80,81	
		Repair				1.0		58,61,63, 80,81	
0804	PUMP ASSEMBLY, OIL	Replace				1.0		81	
		Repair				0.8		81	
0900	PROPELLER SHAFT	Inspect		0.1					

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
1000	AXLE ASSEMBLY, FRONT	Service		0.5				61	
		Repair		0.6				59,61,80	
		Replace		0.5				59,61,80	
		Inspect	0.1	0.3	0.7			80	
		Adjust			1.0			59,81	
		Service		0.5				61,80	
		Replace			4.5			58,59,61, 62,63,72, 80	
1002	CARRIER ASSEMBLY, DIFFERENTIAL	Repair		2.3	2.2	6.0		58,59,61, 62,63,80	
		Inspect		0.1	0.1	0.1		80,81	
		Service			0.3			80	
		Replace				4.6		25,58,59, 61,62,80, 81	
		Repair				2.7		58,59,61, 62,80,81	
1004	STEERING KNUCKLE, AXLE	Inspect			0.2				
		Adjust			2.5			81	
		Service			0.3			81	
		Replace			5.1			58,59,61, 62,73,80	
1100	AXLE ASSEMBLY, INTERMEDIATE	Inspect	0.1	0.4	0.7				
		Service		0.8				59,61,80	
		Replace			4.5			58,59,61, 62,63,80, 87	
		Repair			1.6	6.0		25,58,59, 61,62,69, 80	
1100	AXLE ASSEMBLY, REAR	Inspect	0.1	0.4	0.7				
		Service		0.8				59,61,80	
		Replace			4.5			38,58,59, 61,62,80, 87	
		Repair			0.9	6.0		25,58,59, 61,62,80, 87,88	
1102	CARRIER ASSEMBLY, DIFFERENTIAL, INTERMEDIATE AXLE	Inspect		0.1	0.1	1.0		80,81	
		Service			0.3			80	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level				(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot	
			C	O	F	H	D	
1102	CARRIER ASSEMBLY, DIFFERENTIAL, REAR AXLE	Replace				4.6		25,58,59, 61,62,69, 80
		Repair				2.7		25,58,59, 61,62,63, 69,75,80
		Inspect		0.1	0.1	1.0		80,81
		Service Replace			0.3		4.6	80 25,58,59, 61,62,80, 81,88
		Repair				2.7		25,39,58, 59,61,62, 73,75,80
1202	BRAKE ASSEMBLY, FRONT AXLE	Inspect		0.1	1.0			61,80,81
		Adjust		0.4				59,61,80
		Repair		1.5	0.5			59,61,80, 85
1202	BRAKE ASSEMBLY, INTERMEDIATE AND REAR AXLE	Inspect		0.1	1.0			61,80,81
		Adjust		0.4				59,61,80
		Repair		1.5	0.5			59,61,80, 85
1208	AIR DRYER, BRAKE SYSTEM	Replace		0.5				59,61,80
1209	AIR COMPRESSOR	Repair		1.0				59,61,80
		Adjust		0.6				61,80
1311	WHEEL ASSEMBLY, PNEUMATIC TIRE	Replace			1.2			58,62,63, 80,81
		Inspect	0.1					59
		Replace	1.0	1.2				59,61
1313 1401	TIRE, PNEUMATIC STEERING SYSTEM	Repair		2.0				59,61
		Replace		2.0				59,61
		Inspect		0.2				
1407 1410	STEERING GEAR ASSEMBLY PUMP, POWER STEERING	Adjust			1.0			58,62,80
		Repair		1.0	1.5			56,58,59, 61,62,63, 80,81
		Replace			4.0			58,62,80
		Replace			1.5			49,58,61, 62,80

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
1411	HOSES, POWER STEERING	Replace		0.3				59,61,80, 90	
1413	HYDRAULIC RESERVOIR, POWER STEERING	Service	0.1	0.5				80	
1501	FRAME ASSEMBLY	Replace		0.8				61,80,90	
		Inspect	0.1	0.3					
		Repair		0.8	14.0			58,59,61, 62,63,80, 81	
1501	BOOM REST ASSEMBLY, CRANE	Inspect	0.1						
		Replace			2.0			58,59,61, 62,80,81, 87	
		Repair			0.7			58,59,61, 62,80,81, 87	
1504	RETAINER, SPARE TIRE	Inspect	0.1	0.1					
		Replace		3.0				59,61,80	
		Repair		0.6				59,61,80	
1506	FIFTH WHEEL ASSEMBLY	Inspect	0.1						
		Service		0.5				21,80	
		Replace			4.0			58,61,62, 80,81	
		Repair			2.5			21,58,61, 62,66,80, 81	
1601	LEAF SPRING ASSEMBLIES	Inspect	0.1	0.2					
		Service		0.3				59	
		Replace			2.7			58,59,61, 62,80,81	
1604	SHOCK ABSORBERS	Inspect	0.1	0.3					
1605	STABILIZER BAR, REAR	Replace		0.5				59,61,80	
		Inspect		0.2					
		Replace		2.0				59,61,70, 80	
1801	CAB BODY, STANDARD	Repair		1.5				59,80	
		Inspect	0.1						
		Replace			60.0			58,59,62, 63,80,81	
1801	CAB BODY, AIR DROP	Repair		0.6				59,61,80	
		Inspect	0.1						
		Replace			60.0			58,59,62, 63,80,81	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level				(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot	
			C	O	F	H	D	
1801	CAB DOORS, STANDARD	Repair		0.6				59,61,80
		Inspect	0.1					
		Replace			1.0			57,61,80
		Repair		2.7				51,59,80
1801	CAB DOORS, AIR DROP	Inspect	0.1					
		Replace			1.0			57,61,80
		Repair		2.7				51,59,80
1801	SUPPORT ASSEMBLY, CAB FRONT	Inspect	0.1					
		Repair		1.1				59,61,80
		Replace			3.0			7,15,59, 61,62,80, 81
1801	SUPPORT ASSEMBLY, CAB REAR	Inspect	0.1					
		Replace		1.0				59,61,80
		Repair		0.8				59,80
1802	WINDSHIELD	Replace			0.6			57,61,80
1802	FENDER, VEHICULAR, FRONT	Inspect	0.1					
		Replace		2.0				59,61,80
		Repair		0.5				59,80
1803	ROOF, CAB, M1093/M1094	Replace		1.0				47,52,59, 61,80
1805	STEP ASSEMBLY, CAB	Replace		1.0				59,80
		Repair		0.7				59,80
1808	TOOL BOX ASSEMBLY	Inspect	0.1					
		Replace		0.5				49,59,61, 80
		Repair		0.5				59,61,80
1808	STOWAGE BOX, CAB	Replace		0.8				59,80
		Repair		0.5				59,80
1810	BODY, CARGO, (W/MHC, LWB AND LWB W/MHC)	Inspect	0.1					
		Replace			4.0			58,59,61, 62,80
		Repair		0.5				59,61,80
1810	DUMP BODY ASSEMBLY	Inspect	0.1					
		Replace			4.0			58,61,62, 80
		Repair		0.5	4.0			58,59,61, 62,80

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
1810	DUMP HYDRAULIC CYLINDER	Inspect	0.1						
		Replace			1.0			59,62,80	
		Repair				2.5		59,61,62, 80,89	
1810	DUMP TAILGATE ASSEMBLY	Inspect	0.1						
		Replace		1.5				80	
		Repair		0.8				80	
1812	BOX ASSEMBLY, TOOL, M1089	Inspect	0.1						
		Remove/ Install		1.0				59,61,80	
		Repair		0.8				59,61,80	
2001	UNDERLIFT ASSEMBLY, M1089	Inspect	0.1						
		Test		0.5	0.1			61	
		Service		0.5				58,59,61,	
		Replace			6.0			62,80,87	
		Repair			1.0			54,58,59, 61,62,80, 81,86,87	
2001	CROSSBAR ASSEMBLY, M1089	Inspect			0.1				
		Replace			0.5			58,59,61, 62,80,81, 86	
		Repair			1.0			58,59,61, 62,81,86	
2001	LOWER ARM, UNDERLIFT	Inspect			0.1				
		Replace			2.0			58,59,61, 62,80,87	
		Repair			0.5			58,59,61, 62,80,87	
2001	CYLINDER, TELESCOPIC LIFT	Replace			1.5			59,61,80	
		Repair				1.0		61,62,63, 80	
2001	STIFFLEG ASSEMBLY	Inspect			0.1				
		Replace			2.0			59,61,62, 80,87	
		Repair			1.6	1.0		58,59,61, 62,63,68, 80,87	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
2001	BOOM FRAME, FOLDING, UNDERLIFT	Inspect			0.1				
		Repair			2.5			61,80	
2001	ARM ASSEMBLY, UPPER, UNDERLIFT	Repair			2.5			58,59,61, 62,80	
2001	CYLINDER, UNDERLIFT FOLD	Replace			0.5			59,61,80, 87	
		Repair				0.5		59,61,62, 63,80	
2001	CYLINDER, UNDERLIFT STINGER	Replace			0.5			59,61,62, 80,87	
		Repair				0.5		58,61,62, 63,68,80, 81	
2001	WINCH, 15K SELF- RECOVERY	Inspect	0.1	4.0					
		Service		0.2				61	
		Replace			1.0			61,62,80	
		Repair			0.9			61,62,80	
2001	MOTOR, HYDRAULIC, SELF- RECOVERY WINCH	Replace			0.5			59,80	
2001	MATERIAL HANDLING CRANE (MHC), M1089	Inspect	0.1	0.5				80	
		Test	0.2		0.3			59	
		Service		0.5				61	
		Replace			6.0			59,61,62, 80,87	
		Repair		0.5				9,58,59, 61,62,80	
2001	CYLINDER, LIFT, M1089 MHC	Inspect	0.1						
		Test			0.2			61	
		Replace			4.0			58,62,80	
		Repair				2.0		59,61,62, 63,80	
2001	CYLINDER, ERECTION, M1089 MHC	Inspect	0.1						
		Test			0.2			61	
		Replace			4.0			58,62,80	
		Repair				2.0		59,61,62, 63,80,81	
2001	HOIST ASSEMBLY, M1089 MHC	Inspect	0.1						
		Test			0.2			61	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level				(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot	
			C	O	F	H	D	
2001	HYDRAULIC MOTOR, HOIST, M1089 MHC	Replace			6.0			61,62,80
		Repair			3.0			59,61,62, 80
		Inspect	0.1					
		Test			0.1			59,65
		Replace			2.0			59,80
2001	GEAR SET, M1089 MHC	Repair				4.2		58,59,61, 62,63,80
		Inspect		0.2				
		Test			0.2			61
2001	BOOM ASSEMBLY, M1089 MHC	Repair			1.7			61,62,80
		Inspect	0.1					
		Test			0.2			
2001	CYLINDER, TELESCOPIC, BOOM, M1089 MHC	Replace			8.0			58,62,80
		Repair			2.0			58,61,62, 80
		Inspect	0.1					
		Test			0.2			61
		Replace			6.0			58,61,62, 80
2001	SWING DRIVE ASSEMBLY, M1089 MHC	Repair				2.0		59,61,62, 80
		Inspect	0.1	0.5				
		Test			0.2			61
		Service		0.3				
		Replace			4.0			59,61,62, 80
2001	MOTOR, ORBIT, HYDRAULIC, M1089 MHC	Repair			4.0			59,61,62, 80
		Inspect	0.1					
		Test			0.2			
		Replace			1.0			59,61,62, 80
		Repair				3.0		59,61,62, 63,80,81
2001	CYLINDER ASSEMBLY, EXTENSION, OUTRIGGER, M1089 MHC	Inspect	0.1					
		Test			0.2			61

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
2001	CYLINDER ASSEMBLY, JACK, M1089 MHC	Replace			3.0			80	
		Repair				5.0		61,62,80	
		Inspect	0.1						
	VALVE ASSEMBLY, EIGHT- BANK, M1089 MHC	Test			0.2			61	
		Replace			3.0			62,80	
		Repair				5.0		59,61,62, 80	
2001	VALVE ASSEMBLY, EIGHT- BANK, M1089 MHC	Inspect	0.1						
		Replace			0.5			58,59,61, 80	
		Repair			2.0			58,59,61, 80	
2001	WINCH ASSEMBLY, M1089 (30K)	Inspect	0.1						
		Test		0.5	0.2			63	
		Replace			9.0			20,59,61, 62,80,81	
	MOTOR ASSEMBLY, DRIVE, (30K) WINCH	Repair			0.5			59,61,62, 63,73,80, 81	
2001		Replace			0.5			59,61,62, 63,73,80, 81	
		Repair			8.0			59,61,62, 63,73,80, 81	
2001	VALVE ASSEMBLY, MAIN, UPPER, M1089	Replace			0.5			61,62,80	
	VALVE ASSEMBLY, MAIN, LOWER, M1089	Repair			0.5			61,62,80	
2001		Replace			0.5			61,62,80	
	VALVE ASSEMBLY, MONO, M1089	Repair			0.5			61,62,80	
2001		Replace			1.5			59,61,62, 80,87	
	MATERIAL HANDLING CRANE (MHC), M1084/M1086	Repair			1.0			59,61,62, 80,87	
2001		Inspect	0.1						
		Test			0.2			81	
		Service		2.0				61	
		Replace			4.0			58,59,61, 62,80	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
2001	CYLINDER, LIFT, M1084/M1086 MHC	Repair				5.0		58,59,61, 62,63,73, 80,81	
		Inspect	0.1						
		Test			2.0			65,81	
		Replace			2.0			58,59,62, 80	
2001	CYLINDER, ERECTION, M1084/M1086 MHC	Repair				4.0		58,59,62, 80	
		Inspect	0.1						
		Test			0.2			65,81	
		Replace			4.0			58,62,80	
2001	HOIST ASSEMBLY, M1084/M1086 MHC	Repair				4.0		59,61,63, 80,81	
		Inspect	0.1						
		Test			0.2			65,81	
		Replace			6.0			61,62,80	
2001	MOTOR, HYDRAULIC, HOIST, M1084/M1086 MHC	Repair				3.5		59,61,62, 80	
		Inspect	0.1						
		Test			0.1			65,81	
		Replace			2.0			59,80	
2001	GEAR SET, M1084/M1086 MHC	Repair				4.2		58,59,61, 62,63,80	
		Inspect		0.2					
		Test			0.2				
		Repair			4.5			61,62,80	
2001	CYLINDER, TELESCOPIC, BOOM, M1084/M1086 MHC	Inspect	0.1						
		Test			0.1			65,81	
		Replace			2.0			58,61,62, 80	
		Repair				4.0		59,61,62, 80	
2001	SWING DRIVE ASSEMBLY, M1084/M1086 MHC	Inspect	0.1	0.5				61	
		Test Service		0.3	0.1			65,81	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
2001	MOTOR, ORBIT, HYDRAULIC, M1084/M1086 MHC	Replace			4.0			59,61,62, 80	
		Replair			3.5	4.2		59,61,62, 80	
		Inspect	0.1					61	
		Test			0.1			65,81	
		Replace			2.0			59,61,80	
2001	VALVE ASSEMBLY, CONTROL, FOUR WAY, M1084/M1086 MHC	Repair				4.2		59,61,63, 73,80,81	
		Replace			0.8			59,61,62, 80	
2001	VALVE ASSEMBLY, CONTROL, THREE WAY, M1084/M1086 MHC	Repair			1.1			59,61,62, 80	
		Replace			0.8			59,61,62, 80,81	
2001	CYLINDER, JACK, M1084/M1086 MHC	Repair			1.1			59,61,62, 80,81	
		Inspect	0.1						
		Test			0.2			81	
2004	POWER TAKEOFF ASSEMBLY (PTO)	Replace			2.0			62,80	
		Repair				4.0		59,61,62, 80	
		Inspect	0.1						
2201	CAB PROTECTOR, M1090/M1094	Replace			1.0			58,59,61, 62,80	
		Repair			0.8			58,59,61, 62,80	
2202	MOTOR, WIPER, WINDSHIELD	Inspect	0.1						
		Replace			2.0			58,80	
2207	HEATER ASSEMBLY, PERSONNEL	Test		0.5					
		Replace		1.0				80	
2210	DECALS	Replace		2.0				59,61,80	
		Repair		1.0				59,61,80	
		Inspect	0.1						
		Replace		1.0				80	

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level				(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support		
			C	O	F	H	D	
2401	POWER UNIT, AIR/HYDRAULIC	Inspect	0.1					
		Test		0.2				
		Service		1.0				
		Replace		3.0				59,61,80
		Repair			2.0			59,61,62, 71,80,81
2402	MANIFOLD, HYDRAULIC	Inspect	0.1					
		Test		0.2				
		Replace		1.5				53,59,61, 80
		Repair		1.0				53,59,61, 80
2406	FILTER, HYDRAULIC	Service		0.3				61,80
		Replace		0.2				61,80
2407	LATCH, HYDRAULIC, CAB	Inspect	0.1					
		Adjust		0.5				59,61,80
		Replace		0.5				59,61,80
2408	RESERVOIR, HYDRAULIC	Replace		1.0				59,61,80
		Repair		0.5				59,61,80
2408	TANK ASSEMBLY, HYDRAULIC, M1089	Inspect	0.1					
		Service		2.0				59,61,80
		Replace		2.0				6,9,59, 61,80
		Repair		0.5				59,61,80
		Inspect	0.2					
3303	SWINGFIRE ADAPTER KIT	Test		1.0				
		Remove/ Install		3.0				59,61,80, 90
		Replace		1.0				59,61,80, 90
		Repair		1.7				59,61,80, 90
		Inspect	0.2					
3303	CAB ARTIC KIT	Test		1.0				
		Remove/ Install			6.0			58,59,61, 62,80,81, 90
		Replace		1.0				59,61,80, 90
		Repair		1.7				59,61,80, 90

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
3303	CARGO ARTIC KIT	Inspect	0.2						
		Test		1.0					
		Remove/ Install			12.0			58,59,61, 62,80,81, 90	
		Replace		1.0				59,61,80, 90	
		Repair		1.7				59,61,80, 90	
3303	FURNACE ASSEMBLY, CARGO	Replace		3.0				59,61,80, 90	
		Repair		0.5				59,61,80, 90	
3303	CABLE ASSEMBLY, FURNACE, CARGO	Inspect	0.1						
		Replace		0.5				59,61,80	
		Repair		0.7				59,61,80	
3303	CONTROL UNIT ASSEMBLY, FURNACE	Replace		1.5				59,61,80	
		Repair		0.5				4,24,26, 41,59,80	
3303	HEATER ASSEMBLY, VEHICULAR	Inspect	0.1						
		Test		0.5					
		Service		0.5				61,80	
		Replace		1.5				59,80,90	
		Repair		1.5				59,80,90	
3305	FORDING KIT, DEEP WATER	Inspect	0.1						
		Remove/ Install		4.0				59,61,80	
3307	ALTERNATOR KIT, 200 AMP	Inspect	0.1	0.2					
		Test		0.5					
		Remove/ Install		2.0				59,61,80	
		Replace		1.0				59,61,80	
		Repair			0.5			58,59,62, 63,80	
3307	ALTERNATOR, 200 AMP	Inspect		0.2					
		Test		0.5	1.5			61,65,80	
		Replace		1.0				59,61,80	
		Repair		0.2	0.5			58,59,62, 63,65,80	
3307	CRANE (LMHC), MATERIAL HANDLING, LIGHT	Inspect	0.1	0.1					

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level				(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support		
			C	O	F	H	D	
3307	WEIGHT BLOCK AND WIRE ROPE, LMHC	Replace		0.5				61,78,80
		Repair		0.5				
		Test		0.5				
		Inspect	0.1					
3307	WINCH, LMHC	Replace		0.1				61,80 61,80
		Repair		0.5				
		Test			0.5			
		Inspect	0.1					
3307	MAST/SWING ASSEMBLY, LMHC	Replace		0.5				61,80 61,80
		Repair		1.0				
		Test		0.5				
		Inspect	0.1					
3307	CONTROL BOX, LMHC	Repair		1.0				61,80
		Test		0.5				
		Inspect	0.1					
		Replace		0.1				
3307	TROOPSEAT KIT	Repair		0.5				78,80
		Test	0.1	0.5				
		Remove/ Install	1.0					
		Inspect	0.1					
3307	COVER KIT, CARGO SOFT TOP	Replace		1.0				80
		Repair		0.5				
		Remove/ Install	1.5					
		Inspect	0.1					
3307	WARNING LIGHT ASSEMBLY, AMBER	Replace		2.0				
		Repair		0.5				
		Inspect	0.1					
		Repair		0.4				
3401	MACHINE GUN RING KIT	Test		0.2				80
		Inspect	0.1					
		Remove/ Install			4.0			
		Repair		1.1				
3402	MOUNT, SMALL ARMS	Inspect	0.1					58,59,62, 80,81,87 10,59,80
		Replace		0.3				
3901	WARNING LIGHT ASSEMBLY, AMBER, M1089	Repair		0.8				80 59,61,80
		Repair						

Section II. MAINTENANCE ALLOCATION CHART FOR THE MTV VEHICLE (CONT)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level				(5) Tools and Equipment Ref Code	(6) Remarks Code
			Unit		Direct Support	General Support	Depot	
			C	O	F	H		
3903	MAST, WARNING LIGHT, AMBER, M1089	Replace		0.6				59,61,80
3909	CABLE ASSEMBLY, WARNING LIGHT	Inspect	0.1					
4316	AIR HOSE, CTIS	Replace		0.5				80
		Inspect	0.1					
4317	VALVE, INVERSION	Replace		0.4				61,80
		Replace		0.5				61,80
4318	CYLINDER, PNEUMATIC, TAILGATE, M1090/M1094	Replace		0.4				61,80
4321	AIR DRYER	Inspect	0.1	0.1				
		Replace		1.0				59,61,80
		Repair		0.6				59,61,80
4702	GUAGE, AIR FILTER RESTRICTION	Replace		0.5				80

Section III. TOOLS AND TEST EQUIPMENT FOR MTV VEHICLES

Tool or Test Equipment REF Code	Maintenance Level	Nomenclature	National Stock Number	Tool Number
1	O,F	ADAPTER, RADIATOR	4910-01-170-4928	J29003-A
2	O	ADAPTER, SOCKET WRENCH	5120-00-240-8702	11655788-2
3	H	BUSHING DRIVER SET	5120-01-391-3541	J35922
4	O	CRIMPING TOOL, TERMINAL, HAND	5120-00-165-3912	M22520/1-01
5	O	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-00-078-3809	10935497
6	O	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-00-293-1010	5120-293-1282
7	F	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-074-7557	FCOM 19
8	O	CROWFOOT ATTACHMENT, SOCKET WRENCH	6120-01-236-9996	FCOM 15
9	O	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-335-1089	FCO28
10	O	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-335-1091	FCO32
11	O	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-335-1119	SCO34

Section III. TOOLS AND TEST EQUIPMENT FOR MTV VEHICLES (CONT)

Tool or Test Equipment REF Code	Maintenance Level	Nomenclature	National Stock Number	Tool Number
12	O	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-335-1122	SCO40
13	O	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-335-1153	FCO20
14	O	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-335-1156	FCO26
15	F	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-01-348-9473	AN8508-19A
16	O	CUTTER, BOLT	5110-00-224-7057	GGG-C-740
17	H	DRIVER KIT, BEARING	4910-01-032-3128	8S0602
18	O	GAGE, BELT TENSION	6635-01-092-7462	0755-0101
19	O,F	GAGE, BELT TENSION	6635-01-143-2237	GA-424
20	O,F	GAGE, PRESSURE, 0-150 psi	6685-00-474-5721	111T1D05A01
21	O	GAGE, PROFILE	5220-01-357-4913	TF-0237
22	F,H	GAGE, PROFILE	5220-01-388-1460	J-38548-1
23	H	HANDLE, DRIVE	5120-00-377-2259	J8092
24	O	HEATER, GUN TYPE, ELECTRIC	4940-00-561-1002	500A
25	F,H	HOLDING BAR, PINION	5120-01-166-0573	J3453
26	O	INSERTER AND REMOVER, ELECTRICAL CONTACT	5120-00-915-4588	MS3447-16
27	H	INSERTER AND REMOVER, SPRING	5120-01-388-3660	J38573
28	H	INSERTER AND REMOVER, SPRING	5120-01-388-4436	J35923
29	H	INSERTER, BEARING AND BUSHING	5120-01-388-7841	J-38565
30	H	INSERTER, BEARING AND BUSHING	5120-01-389-0658	J35921-1
31	H	INSERTER, BEARING AND BUSHING	5120-01-390-1104	J 38569
32	H	INSERTER, BEARING AND BUSHING	5120-01-390-1105	J 38568-3
33	H	INSERTER, BEARING AND BUSHING	5120-01-391-5133	J 38579
34	F,H	INSERTER, BEARING AND BUSHING	5120-01-414-7398	J38566
35	F	INSERTER, SEAL	5120-01-362-2026	1U7430
36	F	INSERTER, SEAL	5120-01-362-2027	1U7598
37	F	INSTALLER, SEAL	N/A	J38574
38	F	JACK, LEVELING SUPPORT, VEHICLE	2590-00-231-7418	10876244
39	H	PULLER KIT, UNIVERSAL	5180-00-089-3660	A57QB
40	F	PULLER KIT, UNIVERSAL	5180-01-124-1903	1P3075
41	O	REMOVER, ELECTRICAL CONTACT	5120-00-148-9844	MS3448-001B
42	F	RIVERTER, BLIND, HAND	5120-01-289-4310	HP-2
43	H	RIVERTER, YOKE, HAND	5120-01-415-3558	J-39354
44	F	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-00-601-6934	LAW120A
45	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-053-4158	FAM5A
46	O,F,H	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-055-1308	ANSIB18.3.2M

Section III. TOOLS AND TEST EQUIPMENT FOR MTV VEHICLES (CONT)

Tool or Test Equipment REF Code	Maintenance Level	Nomenclature	National Stock Number	Tool Number
47	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-079-8032	SAM8A
48	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-160-8862	S 6 HBS
49	O,F	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3462	SA10A
50	O,F	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3497	TMP12A
51	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3519	F23D
52	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3526	FP24
53	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3527	FP32A
54	F,H	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3536	FTX40A
55	O	SCREWDRIVER ATTACHMENT, SOCKET WRENCH	5120-01-367-3574	GFA8A
56	O	SEPARATOR, BALL JOINT	5120-01-255-8238	2287
57	F	SETTING TOOL, WINDSHIELD	5120-01-316-4995	CRL216
58	O,F	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-348-7696	SC4910-95CLA02
59	O,F,H	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-754-0650	SC4910-95CLA72
60	O	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-754-0653	SC4910-95CLA73
61	O,F,H	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-754-0654	SC4910-95CLA74
62	F,H	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-754-0705	SC4910-95CLA31
63	F,H	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-754-0706	SC4910-95CLA62
64	O,F,H	SHOP EQUIPMENT, AUTOMOTIVE VEHICLE	4910-00-754-0707	SC4910-95CLA63
65	O,F	SHOP EQUIPMENT, FUEL AND ELECTRICAL	4910-00-754-0714	SC4910-95CLA01
66	F	SLIDER, SPRING COMPRESSOR	4910-01-165-6015	TF-TUN-J500
67	F	SLING, MULTIPLE LEG	3940-00-777-5744	A170
68	H	SOCKET SET, SOCKET WRENCH	5120-01-195-0640	208FA
69	F,H	SOCKET, SOCKET WRENCH	5120-01-068-5643	5555M
70	O	SOCKET, SOCKET WRENCH	5120-01-161-5907	GLDH382
71	F	SOCKET, SOCKET WRENCH	5120-01-335-0784	TW321
72	O	SOCKET, SOCKET WRENCH	5120-01-359-9521	TV940009
73	F	SOLDERING AND BRAZING OUTFIT, RESISTANCE HEATING	3439-00-460-7198	SC4940-95-CLB20
74	O	SOLDERING IRON, ELECTRIC	3439-01-036-3308	3112-S3-40W

Section III. TOOLS AND TEST EQUIPMENT FOR MTV VEHICLES (CONT)

Tool or Test Equipment REF Code	Maintenance Level	Nomenclature	National Stock Number	Tool Number
75	H	STAND, DIFFERENTIAL CARRIER REPAIR	4910-01-085-7729	J3409-D
76	H	STAND, MAINTENANCE, AUTOMOTIVE ENGINE	4910-00-808-3372	J29109
77	O	TESTING APPARATUS	4910-01-426-3974	440.28
78	O,F	TOOL KIT, AUTO FUEL AND ELECTRICAL SYSTEM REPAIR	5180-00-754-0655	SC4910-95CLA50
79	F	TOOL KIT, BODY AND FENDER	5180-00-754-0643	SC5180-90-N34
80	O,F,H	TOOL KIT, GENERAL MECHANIC'S	5180-00-177-7033	SC5180-90-CL-N26
81	F,H	TOOL KIT, GENERAL MECHANIC'S	5180-00-699-5273	SC5180-90-CL-N05
82	F	TOOL KIT, INTERNAL COMBUSTION ENGINE	5180-01-356-8155	1U6680
83	H	TOOL KIT, SLEEVE REPAIR	5180-01-415-5896	4C4462
84	F	TOOL OUTFIT, HYDRAULIC	4940-01-036-5784	SC4940-95-CL-B07
85	O	TOOL, SPRING REMOVAL	5120-01-360-1918	TV940010
86	F	WIRE TWISTER, PLIER	5120-00-542-4171	GGG-W-340
87	F	WRENCH SET, CROWFOOT, RATCHETING	5120-00-293-0013	GGG-W-646
88	F	WRENCH SET, SOCKET	5120-00-148-3706	ANSI-B107.5
89	H	WRENCH SET, SPANNER	5120-00-215-1882	46D7578
90	O	WRENCH, TORQUE, 0-75 LB-IN.	5120-01-112-9532	TQSC6A

Section IV. REMARKS FOR THE MTV VEHICLE

Remarks Code	Remarks
A	Battery service will be in accordance with TM 9-6140-200-14.
B	Repair of tires will be in accordance with TM 9-2610-200-14.

APPENDIX C TOOLS IDENTIFICATION LIST

Section I. INTRODUCTION

C-1. INTRODUCTION

This appendix lists common tools, supplements, and special tools/fixtures that are suggested for maintenance tasks performed at the Unit Maintenance level.

C-2. EXPLANATION OF COLUMNS

a. Column (1) - Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the item, e.g., "Bar, Pry (Item 1, Appendix C)."

b. Column (2) - Item Name. This column contains the nomenclature for the item.

c. Column (3) - National Stock Number. This is the national stock number assigned to the item which you can use to requisition it.

d. Column (4) - Part Number. This provides the Government, manufacturer, or vendor part number for the item.

e. Column (5) - Reference. This column contains the shop catalog (SC), technical manual, or other publication which provides an illustration and description of the item, or lists whether the item is fabricated.

APPENDIX C Section II. TOOLS IDENTIFICATION LIST

(1) ITEM NUMBER	(2) ITEM NAME	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) REFERENCE
1	ADAPTER, SOCKET WRENCH	5120-00-227-8088	A-A-2172	SC 4910-95-CL-A74
2	ADJUSTING TOOL, BRAKE SHOE	5120-01-154-3029	J34061	SC 4910-95-CL-A74
3	APRON, RUBBER	8145-00-082-6108	MIL-A-41829	SC 4910-95-CL-A74
4	CAPS, VISE JAW	5120-00-221-1506	GGG-C-137	SC 4910-95-CL-A74
5	DISPENSING PUMP, HAND DRIVEN	4930-00-263-9886	43D15069	SC 4910-95-CL-A74
6	DRILL SET, TWIST	5130-00-293-0983	58	SC 4910-95-CL-A74
7	DRILL, PORTABLE, ELECTRIC	5130-00-293-1849	W-D-661	SC 4910-95-CL-A74
8	DRILL, TWIST	5133-01-120-3519		SC 4910-95-CL-A72

Section II. TOOLS IDENTIFICATION LIST (CONT)

(1) ITEM NUMBER	(2) ITEM NAME	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) REFERENCE
9	FISHING TOOL, PNEUMATIC TIRE VALVE	5120-00-516-4220	991	SC 4910-95-CL-A74
10	GAGE, DEPTH, MICROMETER	5210-00-619-4045	445BZ-6RL	CTA 50-909
11	GAGE, TIRE PRESSURE	4910-01-117-2994	955	SC 4910-95-CL-A72
12	GAGE, WHEEL ALIGNMENT	5210-00-529-1205	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-S-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-A74

Section II. TOOLS IDENTIFICATION LIST (CONT)

(1) ITEM NUMBER	(2) ITEM NAME	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) REFERENCE
35	SOCKET SET, SOCKET WRENCH	5120-01-115-1149	315SIMMY	SC 4910-95-CL-A74
36	SOCKET SET, SOCKET WRENCH	5120-01-117-3876	221FSMY	SC 4910-95-CL-A72
37	SOCKET, SOCKET WRENCH	5120-00-181-6813	5530	SC 4910-95-CL-A74
38	SOCKET, SOCKET WRENCH	5120-00-232-5681	1242	SC 4910-95-CL-A74
39	SOCKET, SOCKET WRENCH	5120-00-243-7351	5316	SC 4910-95-CL-A72
40	SOCKET, SOCKET WRENCH	5120-01-112-0581	SIMM190	SC 4910-95-CL-A74
41	STE/ICE-R	4910-01-222-6589	12259266	SC 4910-95-CL-A74
42	TESTER, ANTIFREEZE AND BATTERY	6630-00-105-1418	10425	SC 4910-95-CL-A74
43	TOOL KIT, AUTO FUEL	5780-00-754-0655		SC 5180-95-CL-A50
44	TOOL KIT, BLIND RIVET	5180-01-201-4978	D-100-MIL-1	SC 4910-95-CL-A72
45	TOOL KIT, ELECTRICAL	5180-00-876-9336	7550526	SC 4910-95-CL-A72
46	TOOL KIT, GENERAL MECHANIC'S	5180-00-177-7033		SC 5180-90-N26
47	TRESTLE, MOTOR VEHICLE MAINTENANCE	4910-00-251-8013	306	SC 4910-95-CL-A72
48	WISE, MACHINIST	5120-00-293-1439	504M2	SC 4910-95-CL-A74
49	WRENCH SET, SOCKET	5120-00-081-2305	GGG-W-641	SC 4910-95-CL-A74
50	WRENCH SET, SOCKET	5120-00-204-1999	GGG-W-641	SC 4910-95-CL-A74
51	WRENCH SET, SOCKET	5120-00-322-6231	51200017510	SC 4910-95-CL-A74
52	WRENCH, ADJUSTABLE	5120-00-264-3793	2117080	SC 4910-95-CL-A72
53	WRENCH, ADJUSTABLE, AUTOMOTIVE	5120-00-449-8083	1B7536	SC 4910-95-CL-A74
54	WRENCH, BOX AND OPEN END	5120-00-277-8833	1244	SC 4910-95-CL-A74
55	WRENCH, BOX AND OPEN END	5120-00-277-8834	GG-W-636	SC 4910-95-CL-A74
56	WRENCH, PIPE	5120-00-277-1485		SC 4910-95-CL-A74
57	WRENCH, STRAP, ADJUSTABLE	5120-00-020-2947	A91C	SC 4910-95-CL-A74
58	WRENCH, TORQUE, 0-175 lb-ft	5120-00-640-6364	1753LDF	SC 4910-95-CL-A74

Section II. TOOLS IDENTIFICATION LIST (CONT)

(1) ITEM NUMBER	(2) ITEM NAME	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) REFERENCE
59	WRENCH, TORQUE, 0-200 lb-in.	5120-00-853-4538	F2001	SC 4910-95-CL-A72
60	WRENCH, TORQUE, 0-600 lb-ft	5120-00-221-7983	SW130-301	SC 4910-95-CL-A72

APPENDIX D EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

D-1. SCOPE

This appendix lists expendable and durable items that you will need to operate and maintain the MTV vehicle. This listing is for information only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (except medical, class V repair parts, and heraldic items), or CTA 8-100, Army Medical Department Expendable/Durable Items.

D-2. EXPLANATION OF COLUMNS

- a. **Column (1) - Item Number.** This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the item, e.g., "Oil, Lubricating (Item 25, Appendix D).
- b. **Column (2) - Level.** This column identifies the lowest level of maintenance that requires the item.
- c. **Column (3) - National Stock Number.** This is the national stock number assigned to the item which you can use to requisition it.
- d. **Column (4) - Item Name, Description, Commercial and Government Entity Code (CAGEC), and Part Number.** This provides the other information you need to identify the item.
- e. **Column (5) - Unit of Measure.** This code shows the physical measurement or count of an item, such as gallon, dozen, gross, etc.

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
1	O	4730-00-248-9340	Adapter, Pipe to Tube (81343) 4-4 010103B	ea
2	O	8040-00-273-8717	Adhesive (81348) MMM-A-121	pt
3	O	8040-00-152-0063	Adhesive (81348) MMM-A-1617 TY3	bt
4	O	8040-01-250-3969	Adhesive (05972) 242	ea
5	O	8040-00-117-8510	Adhesive (71984) 3145 RTV Clear	tu
6	O	8040-00-776-9602	Adhesive (73168) 80055-31	kt
7	O	8040-00-522-3429	Adhesive 181349) (MIL-A-46106)	oz
8	O	8040-00-118-2695	Adhesive (72799) RTV162	kt
9	O	8040-01-331-7473	Adhesive (81349) (MIL-A-46106 GP3TY1)	tu
10	O	8040-01-331-7470	Adhesive (81349) MIL-A-46106 5 oz tube	oz
11	C	6850-00-174-1806	Antifreeze, Arctic Type (81349) (MIL-A-11755) 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
12	C	6850-00-181-7940	Antifreeze, Ethylene Glycol, Permanent (81349) (MIL-A-46153_ 55 gl drum	dr
13	O	8030-00-597-5367	Antiseize Compound (81349) (MIL-A-907)	lb
14	O	5340-00-450-5718	Cap and Plug Set (19207) 10935405	ea
15	O	6850-00-926-2275	Cleaning Compound, Windshield (81349) O-C-1901 16 oz bottle	bt
16	O	7920-00-044-9281	Cloth, Cleaning (81349) (MIL-C-85043)	bx
17	O		Corrosion Preventive Compound (81349) (MIL-C-82594)	
		8030-00-062-6950	Grade 1 - 1 quart can	qt
		8030-01-149-1731	Grade 2 - 1 quart can	qt
		9030-00-837-6557	Grade 3 - 1 pint can	pt
		8030-00-903-0931	Grade 4 - 1 pint can	pt
18	O	9030-00-033-4291	Corrosion Preventive Compound (81349) (MIL-C-82594) 8 ounce can	bt
19	C	9150-00-024-9621	Damping Fluid (81348) VV--D-1078	pt
20	O	7520-01-209-1152	Dispenser, Pressure Sensitive Adhesive Tape (75037) STD-0-9	ea
21	O	5330-01-325-6993	Gasket Forming Compound (05972) 515	ea
22	O		Grease, Automotive and Artillery (GAA) (81349) (MIL-G-10924)	
		9150-01-197-7688	2-1/4 oz tube	tu
		9150-01-197-7690	1.75 lb can	cn
		9150-01-197-7689	6.5 lb can	cn
		9150-01-197-7692	35 lb can	cn
23	O	9150-00-180-6382	Grease, General Purpose (81349) (MIL-T-24139) 6.5 pound can	lb
24	O	9150-00-935-4018	Grease, Molybdenum Disulfide (81349) (MIL-G-21164)	ca
25	C	9150-00-265-9408	Hydraulic Fluid A (81349) (MIL-H-5606A) 55 gl drum	dr
26	O	7510-00-145-0559	Ink, Marking Stencil (81349) (MIL-I-43553)	oz
27	O	7510-01-386-0787	Inking Pad, Rubber Stamp (88001) 0603A	ea
28	O	5970-01-100-4464	Insulating Compound, Electrical (08800) RTV-102WHITE	tu
29	O	5970-00-838-5951	Insulation Sleeving, Electrical (06090) CRN3-16BLACK	ft

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
30	O	1650-00-166-4834	Lockwire (90166) 68A32	ea
31	O	9150-01-360-1905	Lubricant, Solid Film (81349) (MIL-L-46147) 16 oz can	cn
32	O	4730-00-019-0608	Nipple, Pipe (81996) A2303-12-52PC102	ea
33	O	4730-00-825-7304	Nipple, Tube (96906) MS51501B4	ea
34	O	5310-00-059-4265	Nut, Plain, Hex (89346) 98881R1	ea
35	C		Oil, Fuel, Diesel, DF-A Artic (81348) (VV-F-800)	
		9140-00-286-5283	Bulk	gl
		9140-00-286-5284	55 gl drum, 16 gauge	dr
		9140-00-286-5285	55 gl drum, 18 gauge	dr
36	C		Oil, Fuel, Diesel, DF-1, Winter (81348) (VV-F-800)	
		9140-00-286-5286	Bulk	gl
		9140-00-286-5288	55 gl drum, 16 gauge	dr
		9140-00-286-5289	55 gl drum, 18 gauge	dr
37	C		Oil, Fuel, Diesel, DF-2, Regular (81348) (VV-F-800)	
		9140-00-286-5294	Bulk	gl
		9140-00-286-5296	55 gl drum, 16 gauge	dr
		9140-00-286-5297	55 gl drum, 18 gauge	dr
38	C		Oil, Lubricating, Artic (81349) (MIL-L-46167)	
		9150-00-402-2372	5 gl can	cn
		9150-00-491-7197	55 gl drum	dr
39	C		Oil, Lubricating, Gear, GO 75W (81349) (MIL-L-2105)	
		9150-01-035-5390	1qt can	cn
		9150-01-035-5391	5 gl can	cn
40	C		Oil, Lubricating, Gear, 80W-90 (81349) (MIL-L-2105)	
		9150-01-035-5392	1 qt can	qt
		9150-01-035-5393	5 gl can	cn
		9150-01-035-5394	55 gl drum, 16 gauge	dr
41	O		Oil, Lubricating, Gear, 85W-140 (81349) (MIL-L-2105)	
		9150-01-048-4591	1 qt can	qt
		9150-01-035-5395	5 gl can	cn
		9150-01-035-5396	55 gl drum	dr
42	C		Oil, Lubricating, OE/HDO 10 (81349) (MIL-L-2104)	
		9150-00-183-7807	Bulk	gl
		9150-00-186-6668	5 gl can	cn
		9150-00-191-2772	55 gl drum	dr
43	C	9150-00-189-6727	Oil, Lubricating, OE/HDO 10 (81349) (MIL-L-2104) 1 qt can	cn

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
44	C	9150-01-152-4117 9150-01-152-4118 9150-01-152-4119	Oil, Lubricating, OE/HDO 15W-40 (81349) (MIL-L-2104) 1 qt can 5 gl can 55 gl drum	cn cn dr
45	C	9150-00-183-7808 9150-00-186-6681 9150-00-188-9858 9150-00-189-6729	Oil, Lubricating, OE/HDO 30 (SAE 30) (81349) (MIL-L-2104) Bulk 1 qt can 5 gl can 55 gl drum, 18 gauge	gl cn cn dr
46	C	9150-00-405-2987 9150-00-189-6730 9150-00-188-9862	Oil, Lubricating, OE/HDO 40 (81349) (MIL-L-2104) Bulk 1 qt can 5 gl can	gl cn cn
47	O	5350-00-067-7639	Paper, Abrasive (28124) 02347 pg contains 100 sheets	pg
48	O	8010-01-146-2650	Polyurethane Coating (81349) (MIL-C-46168)	kt
49	O	8030-00-181-8372	Primer, Sealing Compound (05972) 747-56	cn
50	C	7920-00-205-1711	Rag, Wiping (64067) 7920-00-205-1711 50 lb bale	be
51	O	4730-00-021-1788	Reducer, Boss (30780) 4-6F50G5	ea
52	O	4020-00-106-9342	Rope, Nylon (81349) (MIL-R-24050)	ro
53	O	7520-00-634-2442	Rubber Stamp Set, Fixed Type (02663) W-5-3/8-AZ SET	ea
54	O	5305-01-296-0019	Screw, Cap, Socket Head (06888) SHCM75275 50 ct box	bx
55	O	8030-00-111-2762	Sealing Compound (05972) 290-31	bt
56	O	8030-00-133-3164	Sealing Compound (05972) 571-31	bt
57	O	8030-00-148-9833	Sealing Compound (05972) 271-21	bx
58	O	8030-00-204-9149	Sealing Compound (05972) 592-41	tu
59	O	8030-00-656-1426	Sealing Compound (81349) (MIL-S-45180)	pt
60	O	8030-01-025-1692	Sealing Compound (05972) 242-41	bt
61	O	8030-01-088-8140	Sealing Compound (52571) 9001512-0011	bt
62	O	8030-01-155-3238	Sealing Compound (11083) 6V6640	ml
63	C	7930-00-634-3935	Soap, Laundry (81348) P-S-1792	lb
64	O	3439-00-006-7764	Solder, Tin Alloy (81348) SN63WRAP3 1lb spool	sl

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
65	C	6850-00-281-1985	Solvent, Dry Cleaning SD (P-D-680) 1 gl can	cn
		6850-00-664-5685	1 qt can	cn
66	O	8030-00-889-3534	Tape, Antiseizing (81349) (MIL-T-27730)	ea
67	O	5640-00-103-2254	Tape, Duct (39428) 1791K70	ea
68	O	5970-00-644-3167	Tape, Insulation, electrical (80063) TL83	ro
69	O	5975-01-379-4997	Ties, Cable, Plastic (06383) PLT 35-C-O	hd
70	O	8010-00-180-6343	Varnish, Oil (23667) 515320	pt
71	O	6145-01-148-2263	Wire, Electrical (8009) 175-0825-00 50 ft	ft
72	O	9505-00-555-8648	Wire, Nonelectrical (96906) MS20995C47 5 lb spool	sl

APPENDIX E

ILLUSTRATED LIST OF MANUFACTURED ITEMS

Section I. INTRODUCTION

E-1. INTRODUCTION

This appendix includes complete instructions for manufacturing or fabricating authorized items locally. All bulk materials needed to manufacture an item are listed by part number or specification number. Figures are provided as needed. See standards and specifications DoD-Std-00100D(AR) and ANSI Y14.5M1982 for required details.

Section II. MANUFACTURED ITEMS INDEX

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
Dump Body Lifting Bracket		E-5
Headlight Adjustment Screen		E-6
M1089 Main Winch Test Adapter		E-7
M1089 Solenoid Test Adapter		E-8
Relay Test Wire		E-9
Transmission Auxiliary Oil Cooler		
Rubber Seal		E-10
Wheel Bearing Shim Tool Rest		E-11
12414690-001	Pneumatic Tube	E-12
12414690-002	Pneumatic Tube	E-12
12414690-003	Pneumatic Tube	E-12
12414690-004	Pneumatic Tube	E-12
12414690-005	Pneumatic Tube	E-12
12414690-006	Pneumatic Tube	E-12
12414690-007	Pneumatic Tube	E-12
12414690-008	Pneumatic Tube	E-12
12414690-009	Pneumatic Tube	E-12
12414690-010	Pneumatic Tube	E-12
12414690-101	Pneumatic Tube	E-12
12414690-102	Pneumatic Tube	E-12
12414690-103	Pneumatic Tube	E-12
12414690-104	Pneumatic Tube	E-12
12414690-105	Pneumatic Tube	E-12
12414690-106	Pneumatic Tube	E-12
12414690-107	Pneumatic Tube	E-12
12414690-108	Pneumatic Tube	E-12
12414690-109	Pneumatic Tube	E-12
12414690-112	Pneumatic Tube	E-12
12414690-113	Pneumatic Tube	E-12
12414690-115	Pneumatic Tube	E-12
12414690-118	Pneumatic Tube	E-12
12414690-120	Pneumatic Tube	E-12
12414690-125	Pneumatic Tube	E-12
12414690-128	Pneumatic Tube	E-12
12414690-129	Pneumatic Tube	E-12
12414690-130	Pneumatic Tube	E-12

Section II. MANUFACTURED ITEMS INDEX (CONT)

ITEM NAME/PART NUMBER	ITEM DESCRIPTION	PARA NO.
12414690-131	Pneumatic Tube	E-12
12414690-132	Pneumatic Tube	E-12
12414690-133	Pneumatic Tube	E-12
12414690-134	Pneumatic Tube	E-12
12414690-135	Pneumatic Tube	E-12
12414690-136	Pneumatic Tube	E-12
12414690-137	Pneumatic Tube	E-12
12414690-138	Pneumatic Tube	E-12
12414690-139	Pneumatic Tube	E-12
12414690-140	Pneumatic Tube	E-12
12414690-141	Pneumatic Tube	E-12
12414690-142	Pneumatic Tube	E-12
12414690-143	Pneumatic Tube	E-12
12414690-144	Pneumatic Tube	E-12
12414690-145	Pneumatic Tube	E-12
12414690-146	Pneumatic Tube	E-12
12414690-147	Pneumatic Tube	E-12
12414690-148	Pneumatic Tube	E-12
12414690-149	Pneumatic Tube	E-12
12414690-150	Pneumatic Tube	E-12
12414690-151	Pneumatic Tube	E-12
12414690-152	Pneumatic Tube	E-12
12414690-153	Pneumatic Tube	E-12
12414690-154	Pneumatic Tube	E-12
12414690-155	Pneumatic Tube	E-12
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12414690-158	Pneumatic Tube	E-12
12414690-159	Pneumatic Tube	E-12
12414690-160	Pneumatic Tube	E-12
12414690-161	Pneumatic Tube	E-12
12414690-162	Pneumatic Tube	E-12
12414690-163	Pneumatic Tube	E-12
12414690-164	Pneumatic Tube	E-12
12414690-165	Pneumatic Tube	E-12
12414690-166	Pneumatic Tube	E-12
12414690-167	Pneumatic Tube	E-12
12414690-168	Pneumatic Tube	E-12
12414690-169	Pneumatic Tube	E-12
12414690-201	Pneumatic Tube	E-12
12414690-202	Pneumatic Tube	E-12
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12414690-206	Pneumatic Tube	E-12
12414690-207	Pneumatic Tube	E-12
12414690-208	Pneumatic Tube	E-12
12414690-209	Pneumatic Tube	E-12
12414690-210	Pneumatic Tube	E-12
12414690-211	Pneumatic Tube	E-12
12414690-212	Pneumatic Tube	E-12
12414690-215	Pneumatic Tube	E-12

ITEM NAME/PART NUMBER	ITEM DESCRIPTION	PARA NO.
12414690-216	Pneumatic Tube	E-12
12414690-217	Pneumatic Tube	E-12
12414690-218	Pneumatic Tube	E-12
12414690-219	Pneumatic Tube	E-12
12414690-220	Pneumatic Tube	E-12
12414690-221	Pneumatic Tube	E-12
12414690-222	Pneumatic Tube	E-12
12414690-223	Pneumatic Tube	E-12
12414690-224	Pneumatic Tube	E-12
12414690-225	Pneumatic Tube	E-12
12414690-228	Pneumatic Tube	E-12
12414690-229	Pneumatic Tube	E-12
12414690-230	Pneumatic Tube	E-12
12414690-231	Pneumatic Tube	E-12
12414690-232	Pneumatic Tube	E-12
12414690-233	Pneumatic Tube	E-12
12414690-234	Pneumatic Tube	E-12
12414690-235	Pneumatic Tube	E-12
12414690-236	Pneumatic Tube	E-12
12414690-237	Pneumatic Tube	E-12
12414690-238	Pneumatic Tube	E-12
12414690-239	Pneumatic Tube	E-12
12414690-240	Pneumatic Tube	E-12
12414690-241	Pneumatic Tube	E-12
12414690-242	Pneumatic Tube	E-12
12414690-243	Pneumatic Tube	E-12
12414690-244	Pneumatic Tube	E-12
12414690-245	Pneumatic Tube	E-12
12414690-246	Pneumatic Tube	E-12
12414690-247	Pneumatic Tube	E-12
12414690-248	Pneumatic Tube	E-12
12414690-249	Pneumatic Tube	E-12
12414690-301	Pneumatic Tube	E-12
12414690-302	Pneumatic Tube	E-12
12414690-303	Pneumatic Tube	E-12
1241638P1	Non-Metallic Electrical Cable Conduit	E-13
1241638P10	Non-Metallic Electrical Cable Conduit	E-13
1241638P11	Non-Metallic Electrical Cable Conduit	E-13
1241638P12	Non-Metallic Electrical Cable Conduit	E-13
1241638P13	Non-Metallic Electrical Cable Conduit	E-13
1241638P14	Non-Metallic Electrical Cable Conduit	E-13
1241638P15	Non-Metallic Electrical Cable Conduit	E-13
1241638P16	Non-Metallic Electrical Cable Conduit	E-13
1241638P17	Non-Metallic Electrical Cable Conduit	E-13
1241638P2	Non-Metallic Electrical Cable Conduit	E-13
1241638P20	Non-Metallic Electrical Cable Conduit	E-13
1241638P21	Non-Metallic Electrical Cable Conduit	E-13
1241638P22	Non-Metallic Electrical Cable Conduit	E-13
1241638P23	Non-Metallic Electrical Cable Conduit	E-13
1241638P26	Non-Metallic Electrical Cable Conduit	E-13
1241638P3	Non-Metallic Electrical Cable Conduit	E-13
1241638P30	Non-Metallic Electrical Cable Conduit	E-13
1241638P32	Non-Metallic Electrical Cable Conduit	E-13

Section II. MANUFACTURED ITEMS INDEX (CONT)

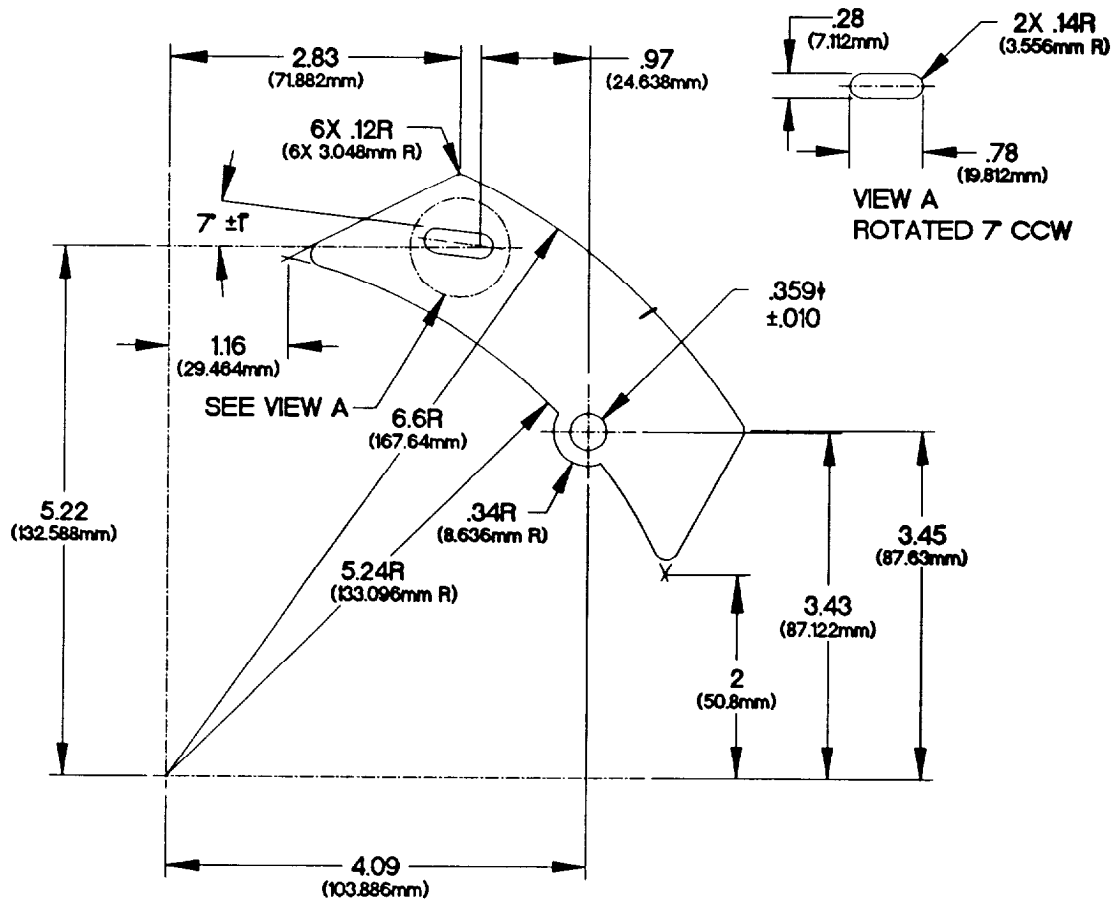
ITEM NAME/PART NUMBER	ITEM DESCRIPTION	PARA NO.
1241638P34	Non-Metallic Electrical Cable Conduit	E-13
1241638P35	Non-Metallic Electrical Cable Conduit	E-13
1241638P36	Non-Metallic Electrical Cable Conduit	E-13
1241638P37	Non-Metallic Electrical Cable Conduit	E-13
1241638P38	Non-Metallic Electrical Cable Conduit	E-13
1241638P4	Non-Metallic Electrical Cable Conduit	E-13
1241638P5	Non-Metallic Electrical Cable Conduit	E-13
1241638P6	Non-Metallic Electrical Cable Conduit	E-13
1241638P7	Non-Metallic Electrical Cable Conduit	E-13
1241638P8	Non-Metallic Electrical Cable Conduit	E-13
1241638P9	Non-Metallic Electrical Cable Conduit	E-13
12418037	Steering Gear Return Hose	E-14
12418460-001	Transmission Oil Cooler Hose	E-14
12418460-002	Transmission Oil Cooler Hose	E-14
12418763	Lanyard Assembly	E-15
12420196	Lanyard Assembly	E-15
12420197-001	Non-Metallic Vent Air Hose	E-16
12420197-002	Non-Metallic Vent Air Hose	E-16
12420197-003	Non-Metallic Vent Air Hose	E-16
12420197-004	Non-Metallic Vent Air Hose	E-16
12420197-005	Non-Metallic Vent Air Hose	E-16
12420197-006	Non-Metallic Vent Air Hose	E-16
12420198-001	Non-Metallic Vent Air Hose	E-16
12420198-002	Non-Metallic Vent Air Hose	E-16
12420308-457	Personnel Heater Air Duct Hose	E-17
12420308-760	Personnel Heater Air Duct Hose	E-17
12420489	Block Seal	E-18
3256-H-1048	CTIS Seal Driver	E-19
3256-K-1051	Wheel Hub Grease Seal Driver	E-20

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

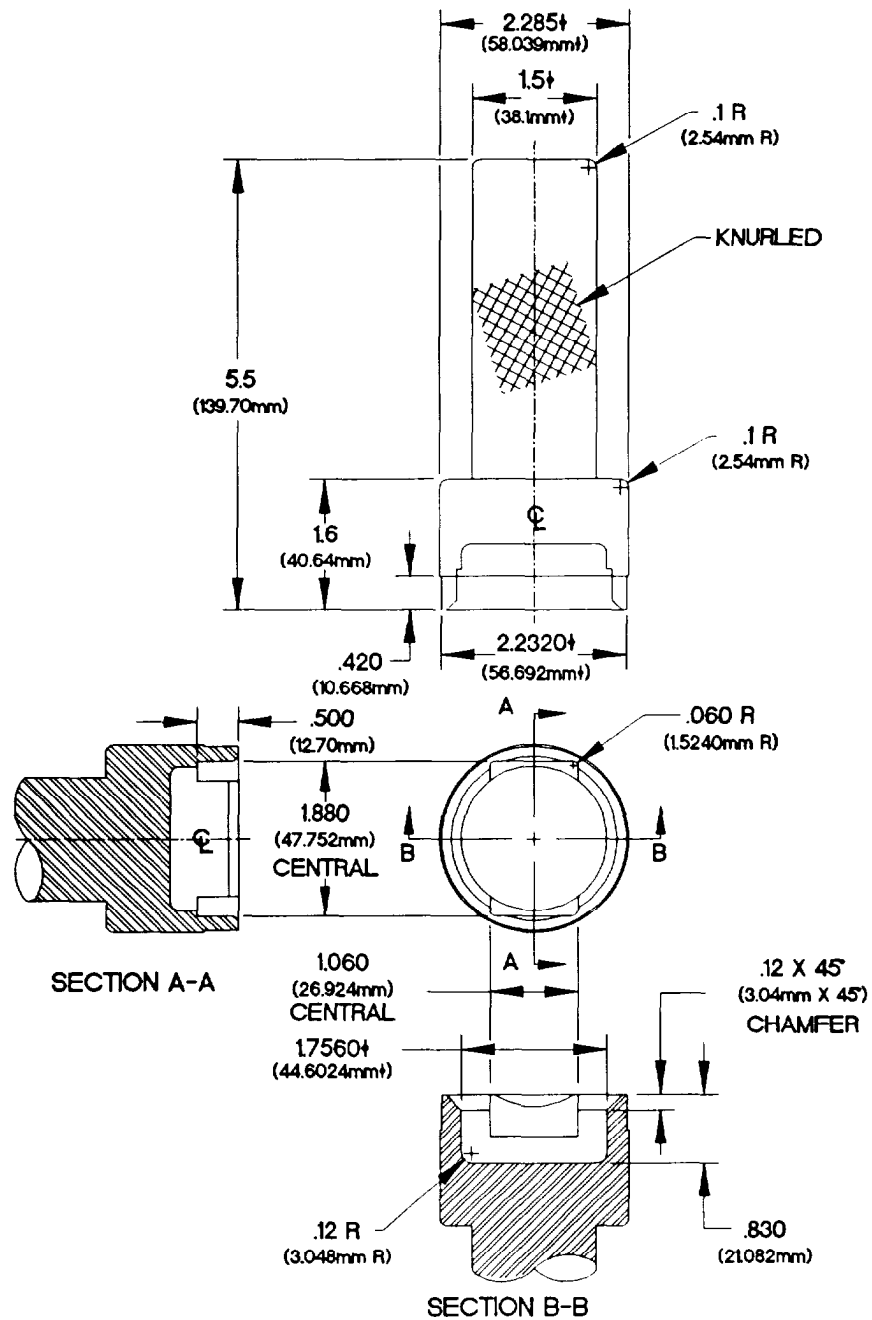


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Figure E-1. Brake Adjusting Tool Support

- All dimensions are in inches (millimeters).
- Cut steel sheet as shown by dimensions on **Figure E-1. Brake Adjusting Tool Support**.
- De-burr and remove sharp edges.

E-3. BRAKE PLUNGER SEAL DRIVER



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Figure E-2. Brake Plunger Seal Driver

- All dimensions are in inches (millimeters).
- Manufacture from round steel stock.
- 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		

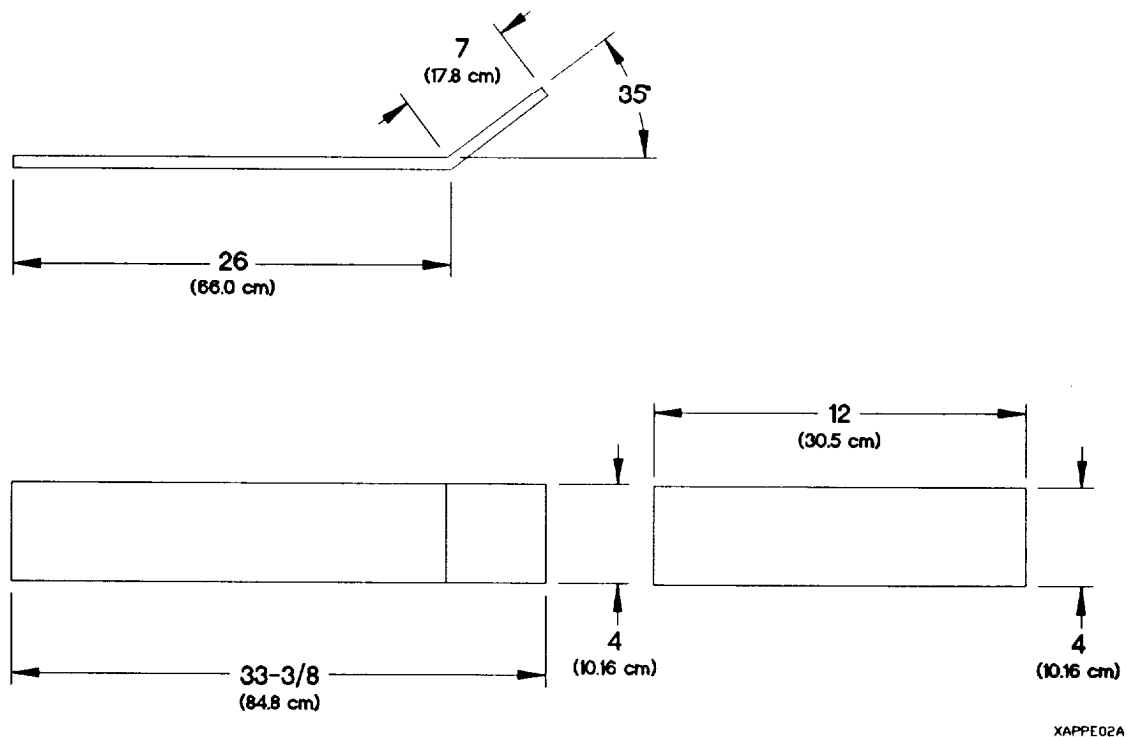
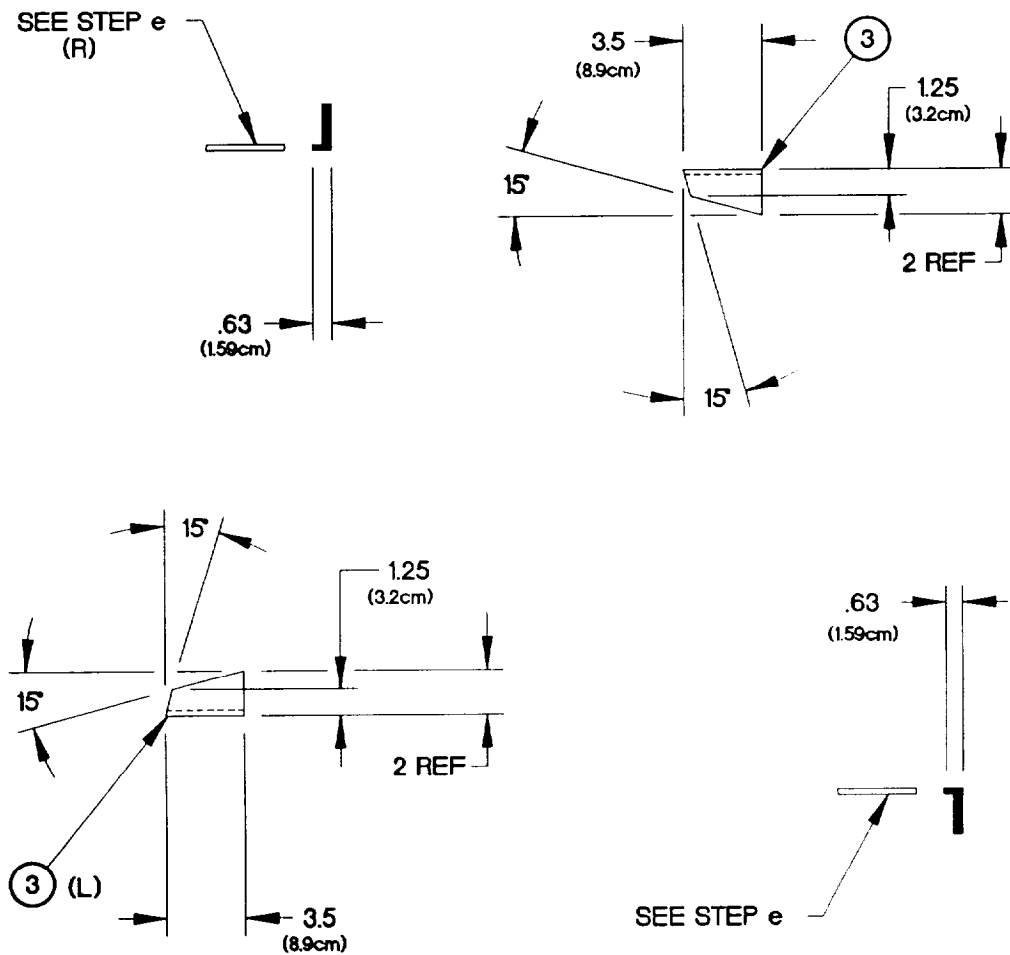


Figure E-3. Cab Support Tool Strut and Cab Rest

- All dimensions are in inches (centimeters).
- 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**.
- Cut cab support tool cab rest (2) from steel flat bar.
- De-burr and remove sharp edges.

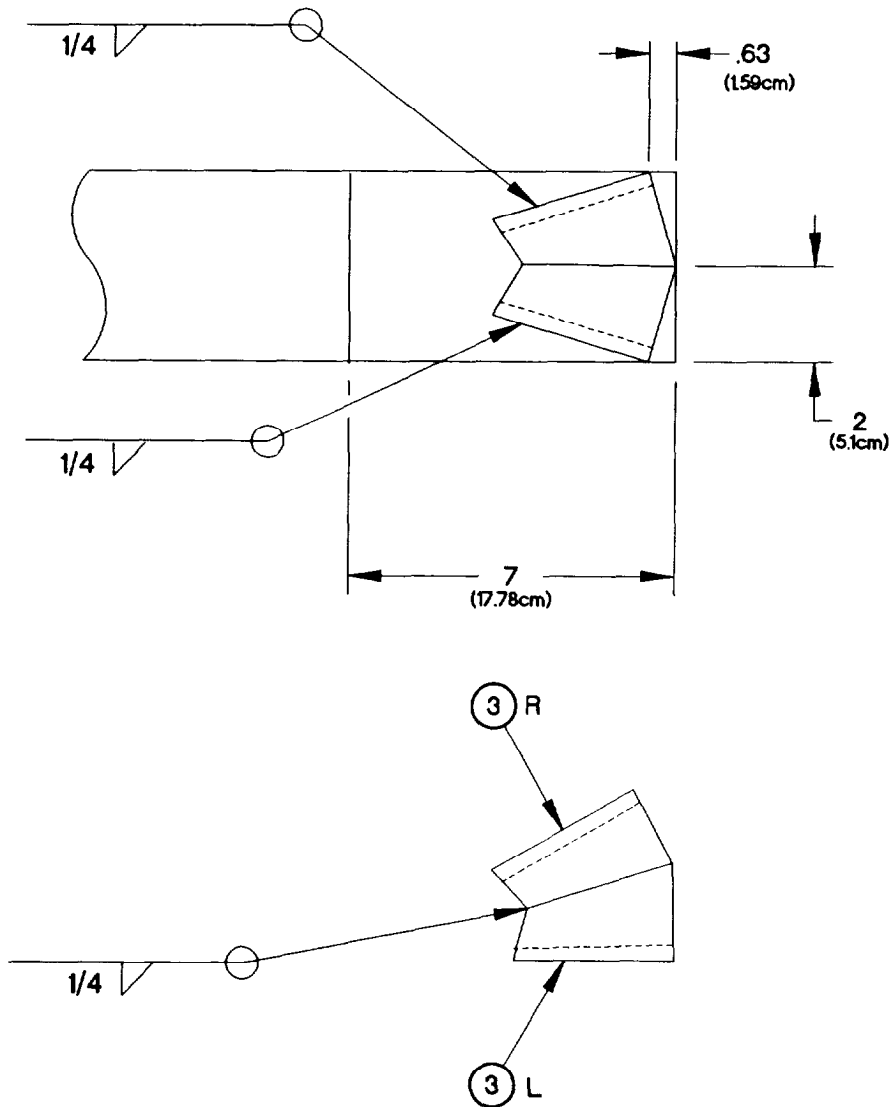
E-4. CAB SUPPORT TOOL (CONT)



XAPPE03A

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.

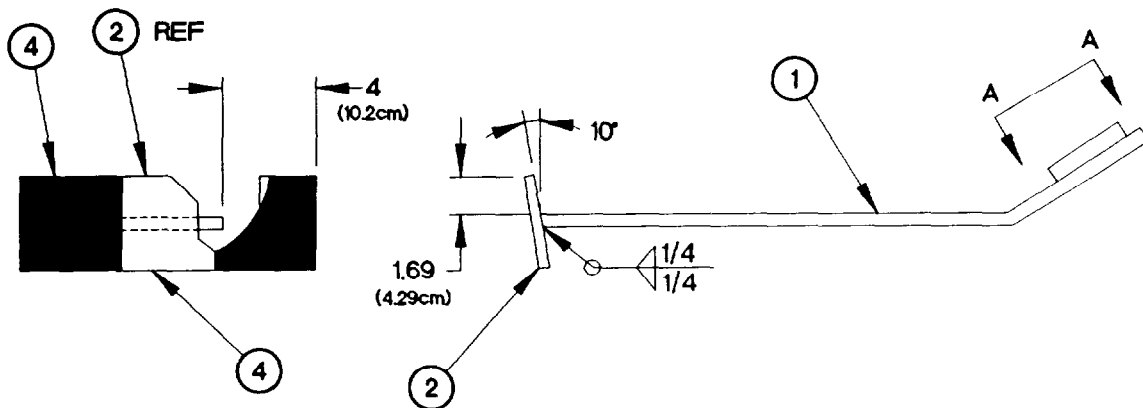


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Figure E-5. Cab Support Tool Seat Layout

- h. Position and clamp cab support tool seats (3) L and (3) R together as shown by dimensions on **Figure E-5. Cab Support Tool Seat Layout.**
- i. Weld cab support tool seat (3) L to cab support tool seat (3) R as identified on assembly table and **Figure E-5. Cab Support Tool Seat Layout.**
- j. Position and clamp cab support tool seats (3) L and (3) R to cab support tool strut (1) as shown by dimensions on **Figure E-5. Cab Support Tool Seat Layout.**
- k. Weld items clamped in step (f) as shown in **Figure E-5. Cab Support Tool Seat Layout.**
- l. De-burr and remove sharp edges.

E-4. CAB SUPPORT TOOL (CONT)



XAPPE05A

Figure E-6. Cab Support Tool Assembly

- m. Position and clamp cab support tool strut (1) to cab support tool cab rest (2) as shown by dimensions on **Figure E-6. Cab Support Tool Assembly**, before insulgrip (4) is applied.
- n. Weld cab support tool strut (1) to cab support tool cab rest (2).
- o. Apply Insulgrip (4) to cab support tool cab rest (2) as described on material container.

E-5. DUMP BODY LIFTING BRACKET

Make the dump body lifting bracket assembly from the front, rear, top, guide, and mount plates according to the following instructions. Refer to the parts list tables and accompanying figures for details.

Item	Part Number	Name/Description	Qty
1	N/A	Rear Plate	1
2	N/A	Top Plate	1
3	N/A	Front Plate	1
4	N/A	Guide Brace	1
5	N/A	Plate, Mounting	1

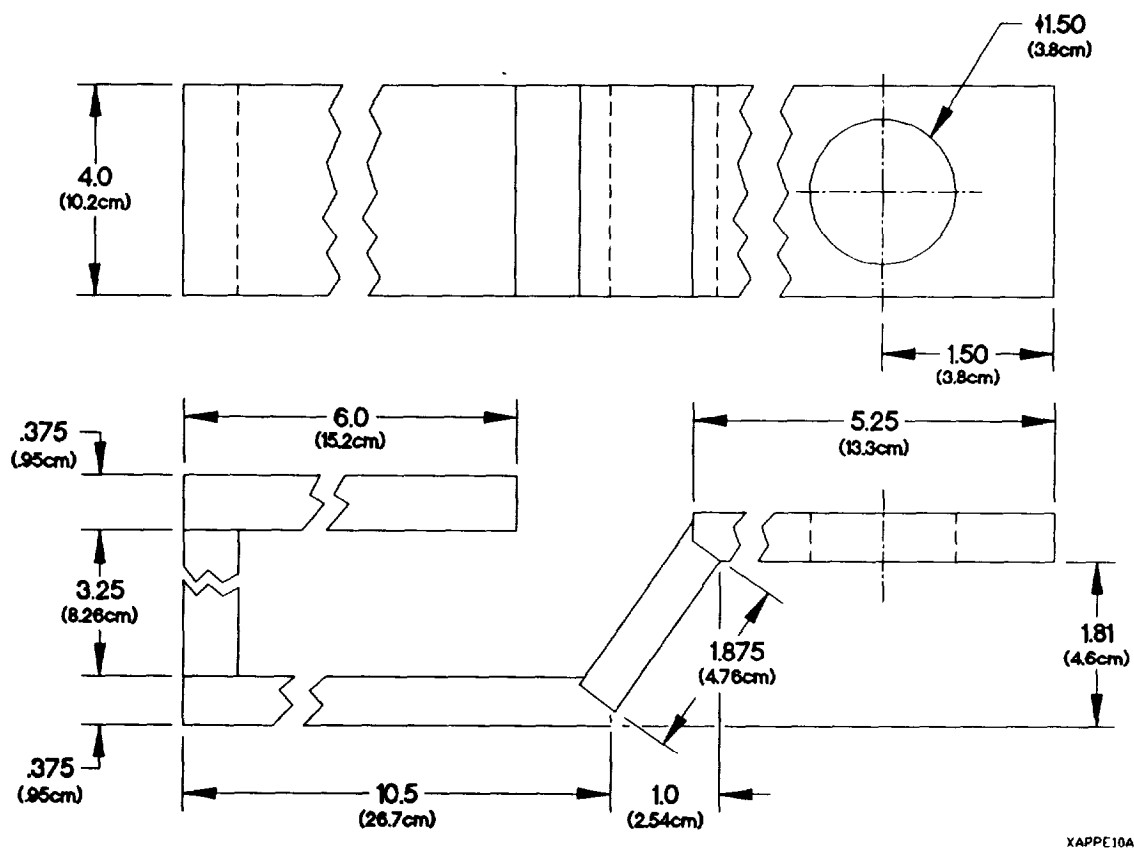
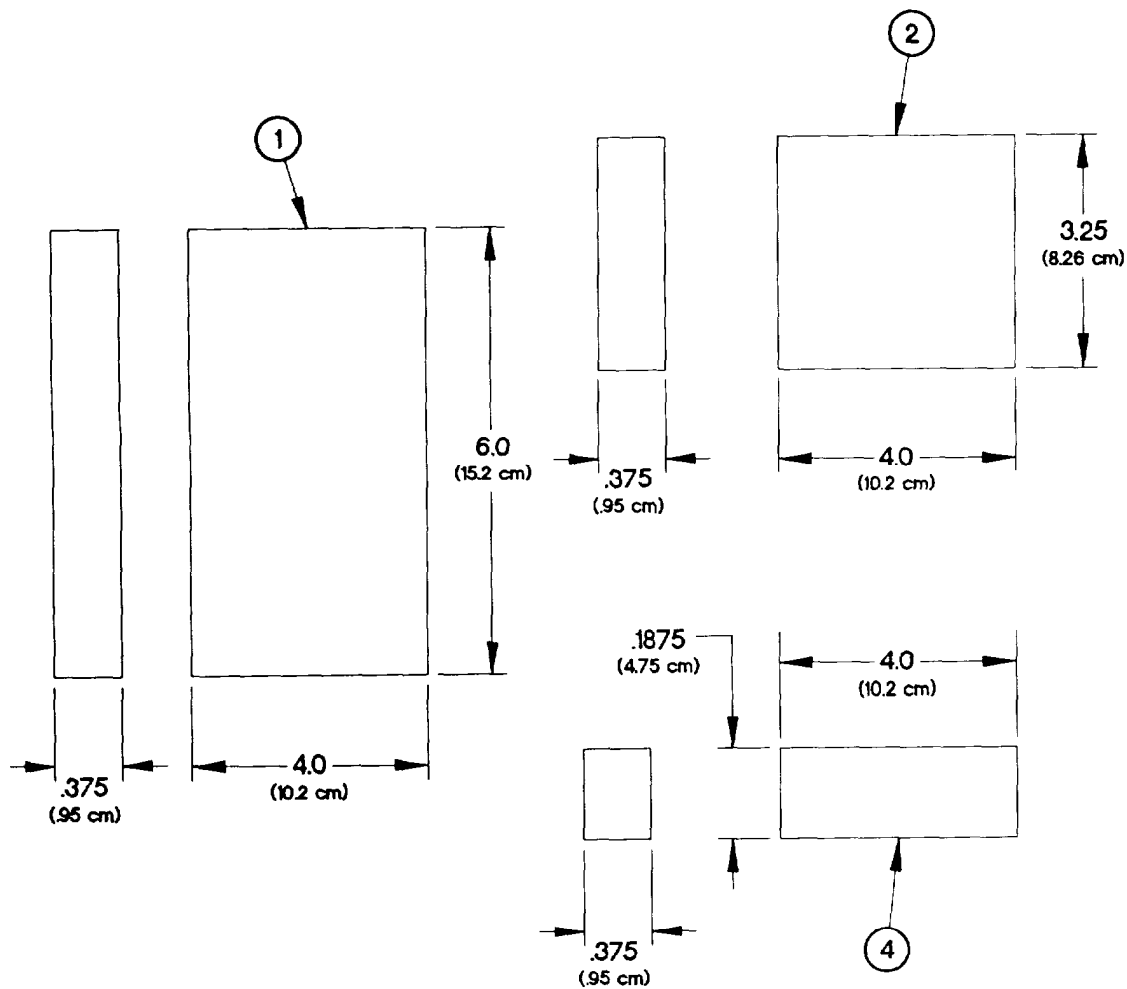


Figure E-7. Dump Body Lifting Bracket

- All dimensions are in inches (centimeters),
- Position and clamp pieces (1 through 5) together as shown by dimensions on **Figure E-7. Dump Body Lifting Bracket**.
- Weld pieces together as shown in **Figure E-7. Dump Body Lifting Bracket**.
- Coat all surfaces with Plastisol.

E-5. DUMP BODY LIFTING BRACKET (CONT)

Item	Part Number	Material Description	Size	Qty
1	N/A	Plate, steel, ASTM A-36	6.0 in. (15.2 cm) X 4.0 in. (10.2 cm) X 0.375 in. (0.95 cm)	1
2	N/A	Plate, steel, ASTM A-36	3.25 in. (8.26 cm) X 4.0 in. (10.2 cm) X 0.375 in. (0.95 cm)	1
4	N/A	Plate, steel, ASTM A-36	1.875 in. (4.75 cm) X 4.0 in. (10.2 cm) X 0.375 in. (0.95 cm)	1

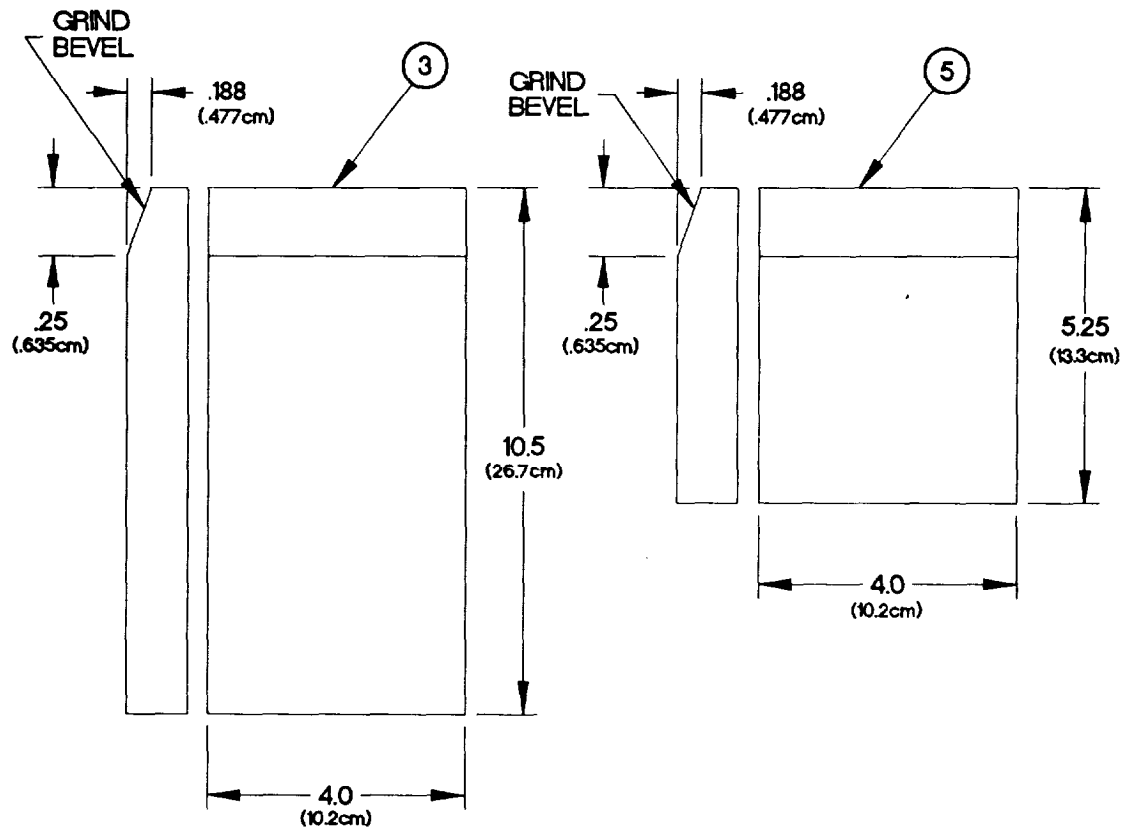


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Figure E-8. Rear, Top, and Guide Plate

- All dimensions are in inches (centimeters).
- Fabricate (1),(2), and (4) from ASTM A-36 steel plate as shown on **Figure E-8. Rear, Top, and Guide Plate**.
- De-burr and remove sharp edges.

Item	Part Number	Material Description	Size	Qty
3	N/A	Plate steel, ASTM A36	10.5 in. (26.7 cm) X 4.0 in. (10.2 cm) X 0.375 in. (0.95 cm)	1
5	N/A	Plate steel, ASTM A36	5.25 in. (13.3 cm) X 4.0 in. (10.2 cm) X 0.375 in. (0.95 cm)	1



XAPPE12A

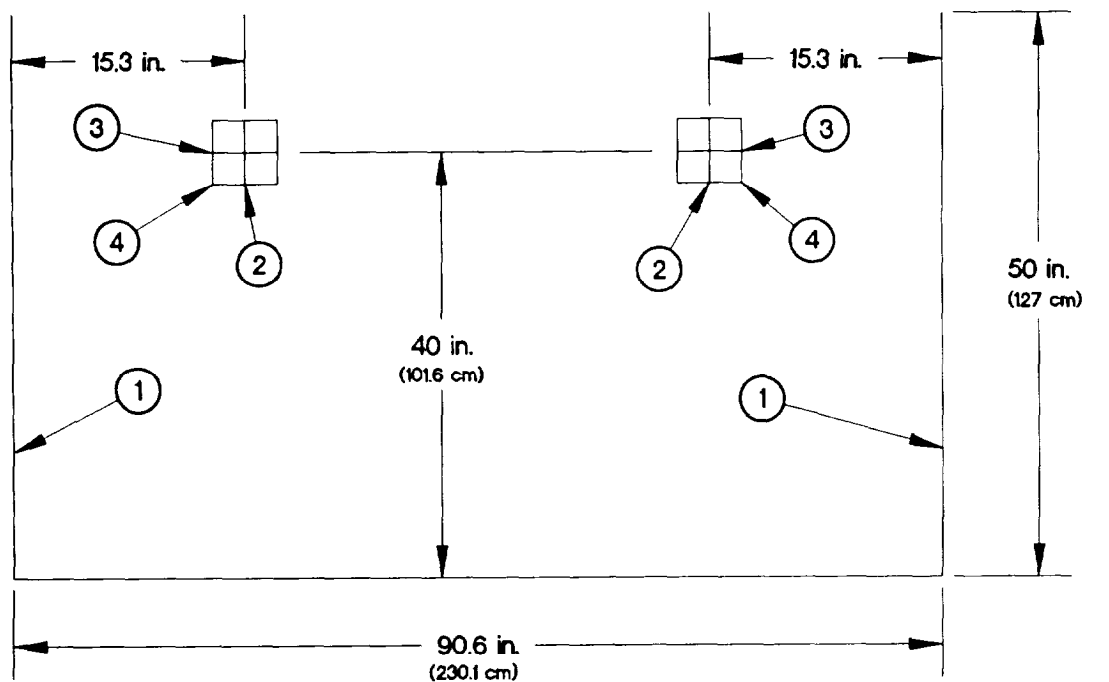
Figure E-9. Front and Mounting Plate

- All dimensions are in inches (centimeters).
- Fabricate (3) and (5) from ASTM A-36 steel plate.
- Drill 1-1/2 inch (3.84 cm) diameter hole in (5) as shown on **Figure E-9. Front and Mounting Plate**.
- Grind bevel edge of each plate for weld surface as shown on **Figure E-9. Front and Mounting Plate**.
- De-burr and remove sharp edges.

E-6. HEADLIGHT ADJUSTMENT SCREEN

The headlight adjustment screen may be drawn on any vertical surface at least 50 in. (127 cm) high and 100 in. (254 cm) wide.

- Draw two vertical lines (1) 50 in. (127 cm) high and 90.6 in. (230 cm) apart (centered on headlight adjustment screen).
- Locate two points 40 in. (101.6 cm) from floor and 13 in. (33 cm) toward the center from each vertical line (1).
- Draw vertical line (2) about 3-5 in. (8-13 cm) centered on each of the two points.
- Draw horizontal line (3) about 3-5 in. (8-13 cm) centered on each of the two points.
- 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).



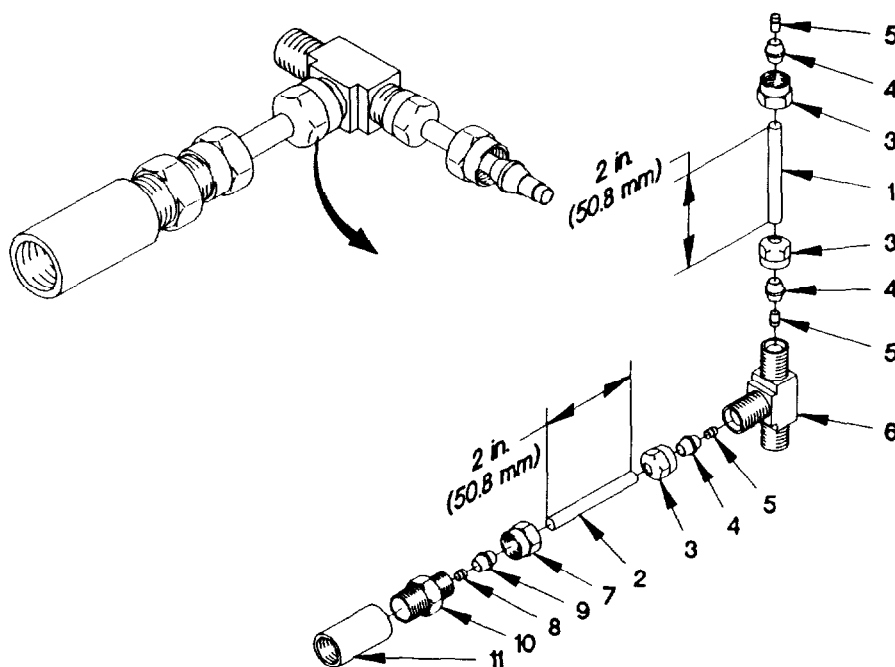
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Figure E-10. Headlight Adjustment Screen

E-7. M1089 MAIN WINCH TEST ADAPTER

Assemble the M1089 main winch test adapter according to the following steps. Refer to the following parts list and **Figure E-11. M1089 Main Winch Test Adapter** for details.

Part Number	Material Description	National Stock Number	Qty
4-4-4 100401BA	Tee, Tube	4730-01-095-3430	1
4-6 100102BA	Adapter, Straight, Pipe to Tube	4730-01-096-9398	1
207P-4	Coupling, Pipe	4730-00-881-1161	1
NB-4-035	Tubing, Nonmetallic	4720-01-071-4042	4 in.
MIL-T-27730	Tape, Antiseizing	8030-00-889-3534	1 roll



XAPPE16A

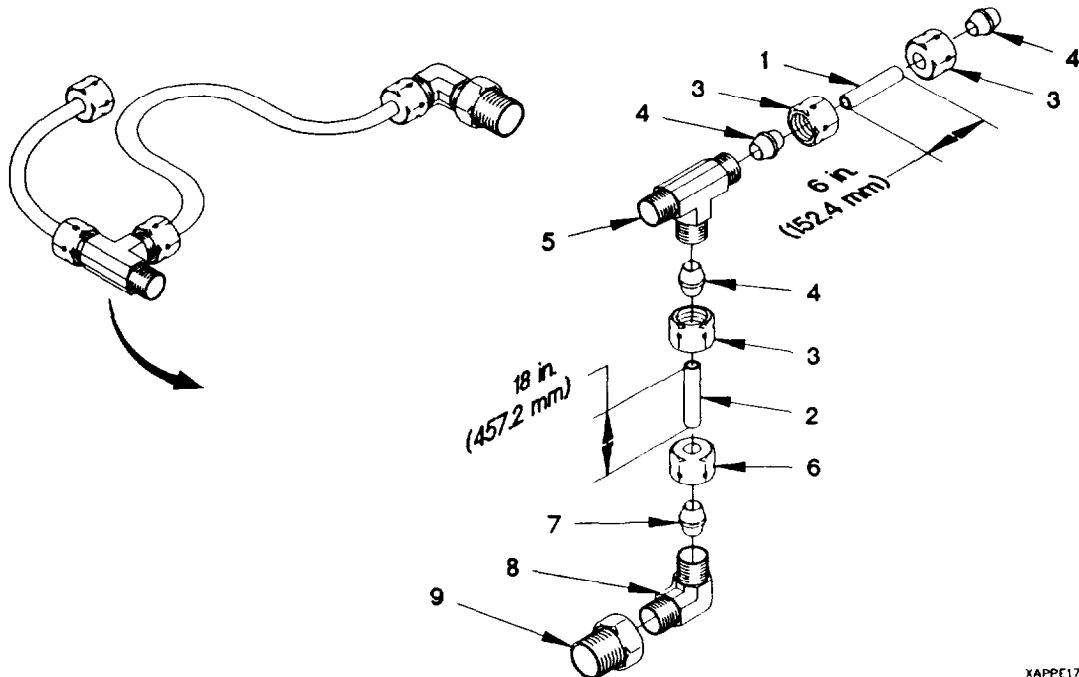
Figure E-11. M1089 Main Winch Test Adapter

- All dimensions are in inches (millimeters).
- Cut two pieces of nonmetallic tubing (1 and 2) to 2.0 in. (50.8 mm) long.
- Remove three nuts (3), sleeves (4), and ferrules (5) from tube tee (6).
- Install two nuts (3), sleeves (4), and ferrules (5) on nonmetallic tubing (1).
- Install nonmetallic tubing (1) on tube tee (6).
- Remove nut (7), sleeve (8), and ferrule (9) from straight adapter (10).
- Install two nuts (3 and 7), sleeves (4 and 8), and ferrules (5 and 9) on nonmetallic tubing (2).
- Install nonmetallic tubing (2) on tube tee (6).
- Install nut (9) on straight adapter (10).
- Apply one wrap of antiseizing tape to threads of straight adapter (10).
- Install pipe coupling (11) on straight adapter (10).

E-8. M1089 SOLENOID TEST ADAPTER

Assemble the M1089 solenoid test adapter according to the following steps. Refer to the following parts list and **Figure E-12. M1089 Solenoid Test Adapter** for details.

Part Number	Material Description	National Stock Number	Qty
2-2-2 080401CA	Tee, Tube	4730-01-214-6990	1
2-2 080202CA	Elbow, Pipe to Tube	4730-00-845-5345	1
4-2 130140B	Bushing, Pipe	4730-00-828-0171	1
NB-2-031	Tubing, Nonmetallic	4720-01-287-4499	24 in.



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Figure E-12. M1089 Solenoid Test Adapter

- All dimensions are in inches (millimeters).
- Cut one piece of nonmetallic tubing (1) to 6.0 in. (152.4 mm) long.
- Cut one piece of nonmetallic tubing (2) to 18.0 in. (457.2 mm) long.
- Remove three nuts (3) and ferrule sleeves (4) from tube tee (5).
- Install two nuts (3) and ferrule sleeves (4) on nonmetallic tubing (1).
- Install nonmetallic tubing (1) on tube tee (5).
- Remove nut (6) and ferrule sleeve (7) from pipe to tube elbow (8).
- Install two nuts (3 and 6) and ferrule sleeves (4 and 7) on nonmetallic tubing (2).
- Install nonmetallic tubing (2) on tube tee (5).
- Install nut (6) on pipe to tube elbow (8).
- Install pipe bushing (9) on pipe to tube elbow (8).

E-9. RELAY TEST WIRE

Fabricate the relay test wire according to the following steps. Refer to the following parts list for materials.

Material Description	National Stock Number	Cut Length
Wire, Electrical (MIL-W-16878)	6145-00-330-3318	6 in. (152 mm)

- Dimensions are in inches (millimeters).
- Cut a length of wire six inches (152 mm) long.
- Remove approximately 3/4 in. (19 mm) of electrical insulation from each end of wire.

E-10. TRANSMISSION AUXILIARY OIL COOLER RUBBER SEAL

Fabricate the transmission auxiliary oil cooler rubber seals in accordance with the following parts list.

Part Number	Description	National Stock Number	Cut Length	
			inches	mm
MIL-R-6130	Tape, Adhesive, Rubber	9320-00-501-7537	24.7	627

E-11. WHEEL BEARING SHIM TOOL REST

Fabricate the wheel bearing shim tool rest according to the following steps. Refer to the following parts list for materials.

Part Number	National Stock Number	Description
QQ-T-570	9510-00-866-1037	Bar, Metal

- Dimensions are in inches (millimeters)
- Cut metal bar to 9.0 inches (228.6 mm) long.
- De-burr and remove sharp edges from ends of metal bar.

E-12. PNEUMATIC TUBES FABRICATION

Cut pneumatic tubes from bulk tubing stock listed in **Table E-1. Pneumatic Tube Lengths**. Use a fine-toothed hacksaw or suitable cutting device and cut tubing to required length.

Table E-1. Pneumatic Tube Lengths

Tube Part Number	Bulk Tubing Part Number	Cut Length	
		inches	cm
12414690-001	NT-100-4 (79470)	18.1	46.0
12414690-002	NT-100-4 (79470)	16.0	40.6
12414690-003	NT-100-4 (79470)	15.0	38.1
12414690-004	NT-100-4 (79470)	74.8	190.0
12414690-005	NT-100-4 (79470)	69.7	177.0

E-12. PNEUMATIC TUBES FABRICATION (CONT)**Table E-1. Pneumatic Tube Lengths (Cont)**

Tube Part Number	Bulk Tubing Part Number	Cut Length	
		inches	cm
12414690-006	NT-100-4 (79470)	239.0	607.0
12414690-007	NT-100-4 (79470)	254.8	647.0
12414690-008	NT-100-4 (79470)	286.3	727.0
12414690-009	NT-100-4 (79470)	294.1	747.0
12414690-010	NT-100-4 (79470)	180.0	457.2
12414690-101	J844TYBSIZE 3/8 (81343)	18.0	45.7
12414690-102	J844TYBSIZE 3/8 (81343)	35.4	90.0
12414690-103	J844TYBSIZE 3/8 (81343)	20.9	53.0
12414690-104	J844TYBSIZE 3/8 (81343)	13.8	35.0
12414690-105	J844TYBSIZE 3/8 (81343)	11.8	30.0
12414690-106	J844TYBSIZE 3/8 (81343)	20.5	52.0
12414690-107	J844TYBSIZE 3/8 (81343)	39.0	99.0
12414690-108	J844TYBSIZE 3/8 (81343)	15.4	39.0
12414690-109	J844TYBSIZE 3/8 (81343)	23.0	58.4
12414690-112	J844TYBSIZE 3/8 (81343)	80.0	198.0
12414690-113	J844TYBSIZE 3/8 (81343)	11.4	29.0
12414690-115	J844TYBSIZE 3/8 (81343)	82.8	210.2
12414690-118	J844TYBSIZE 3/8 (81343)	11.8	30.0
12414690-120	J844TYBSIZE 3/8 (81343)	11.9	30.2
12414690-125	J844TYBSIZE 3/8 (81343)	10.8	27.3
12414690-128	J844TYBSIZE 3/8 (81343)	180.1	457.5
12414690-129	J844TYBSIZE 3/8 (81343)	39.3	99.7
12414690-130	J844TYBSIZE 3/8 (81343)	164.4	417.5
12414690-131	J844TYBSIZE 3/8 (81343)	180.1	457.5
12414690-132	J844TYBSIZE 3/8 (81343)	219.5	557.5
12414690-133	J844TYBSIZE 3/8 (81343)		
12414690-134	J844TYBSIZE 3/8 (81343)	277.4	704.5
12414690-135	J844TYBSIZE 3/8 (81343)	325.0	825.5
12414690-136	J844TYBSIZE 3/8 (81343)	332.5	844.6
12414690-137	J844TYBSIZE 3/8 (81343)	51.0	129.5
12414690-138	J844TYBSIZE 3/8 (81343)	67.0	170.2
12414690-139	J844TYBSIZE 3/8 (81343)	98.5	250.2
12414690-140	J844TYBSIZE 3/8 (81343)	106.0	269.2
12414690-141	J844TYBSIZE 3/8 (81343)	52.5	133.4
12414690-142	J844TYBSIZE 3/8 (81343)	68.5	174.0
12414690-143	J844TYBSIZE 3/8 (81343)	100.0	254.0
12414690-144	J844TYBSIZE 3/8 (81343)	107.5	273.0

Table E-1. Pneumatic Tube Lengths (Cont)

Tube Part Number	Bulk Tubing Part Number	Cut Length	
		inches	cm
12414690-145	J844TYBSIZE 3/8 (81343)		
12414690-146	J844TYBSIZE 3/8 (81343)	267.3	679.0
12414690-147	J844TYBSIZE 3/8 (81343)	283.1	719.0
12414690-148	J844TYBSIZE 3/8 (81343)	314.6	799.0
12414690-149	J844TYBSIZE 3/8 (81343)	322.4	819.0
12414690-150	J844TYBSIZE 3/8 (81343)	296.1	752.0
12414690-151	J844TYBSIZE 3/8 (81343)	343.5	872.5
12414690-152	J844TYBSIZE 3/8 (81343)	36.0	91.5
12414690-153	J844TYBSIZE 3/8 (81343)	32.0	81.3
12414690-154	J844TYBSIZE 3/8 (81343)	48.0	122.0
12414690-155	J844TYBSIZE 3/8 (81343)	79.5	202.0
12414690-156	J844TYBSIZE 3/8 (81343)	87.0	221.0
12414690-157	J844TYBSIZE 3/8 (81343)	59.5	151.1
12414690-158	J844TYBSIZE 3/8 (81343)	66.5	169.0
12414690-159	J844TYBSIZE 3/8 (81343)	98.0	249.0
12414690-160	J844TYBSIZE 3/8 (81343)	105.5	268.0
12414690-161	J844TYBSIZE 3/8 (81343)	48.0	122.0
12414690-162	J844TYBSIZE 3/8 (81343)	36.0	91.5
12414690-163	J844TYBSIZE 3/8 (81343)	161.5	410.2
12414690-164	J844TYBSIZE 3/8 (81343)	120.0	304.8
12414690-165	J844TYBSIZE 3/8 (81343)	78.0	198.1
12414690-166	J844TYBSIZE 3/8 (81343)	108.0	274.3
12414690-167	J844TYBSIZE 3/8 (81343)	168.0	426.7
12414690-168	J844TYBSIZE 3/8 (81343)	108.0	274.3
12414690-169	J844TYBSIZE 3/8 (81343)	72.0	182.9
12414690-201	C608-100BLK (13174)	14.8	37.5
12414690-202	C608-100BLK (13174)	14.1	35.7
12414690-203	C608-100BLK (13174)	6.5	16.5
12414690-205	C608-100BLK (13174)	14.5	36.8
12414690-206	C608-100BLK (13174)	14.8	37.7
12414690-207	C608-100BLK (13174)	15.6	39.5
12414690-208	C608-100BLK (13174)	6.7	17.0
12414690-209	C608-100BLK (13174)	19.5	49.5
12414690-210	C608-100BLK (13174)	15.5	39.3
12414690-211	C608-100BLK (13174)	8.0	20.3
12414690-212	C608-100BLK (13174)	17.0	43.0
12414690-215	C608-100BLK (13174)	163.0	414.0
12414690-216	C608-100BLK (13174)	160.0	406.4
12414690-217	C608-100BLK (13174)	62.6	159.0

E-12. PNEUMATIC TUBES FABRICATION (CONT)**Table E-1. Pneumatic Tube Lengths (Cont)**

Tube Part Number	Bulk Tubing Part Number	Cut Length	
		inches	cm
12414690-218	C608-100BLK (13174)	119.8	304.2
12414690-219	C608-100BLK (13174)	69.0	175.3
12414690-220	C608-100BLK (13174)	45.5	115.6
12414690-221	C608-100BLK (13174)	12.6	32.0
12414690-222	C608-100BLK (13174)	5.5	14.0
12414690-223	C608-100BLK (13174)	14.6	37.1
12414690-224	C608-100BLK (13174)	170.0	431.8
12414690-225	C608-100BLK (13174)	174.0	442.0
12414690-228	C608-100BLK (13174)	3.5	8.9
12414690-229	C608-100BLK (13174)	62.2	158.1
12414690-230	C608-100BLK (13174)	14.6	37.0
12414690-231	C608-100BLK (13174)	60.5	153.7
12414690-232	C608-100BLK (13174)	126.4	321.0
12414690-233	C608-100BLK (13174)	142.1	361.0
12414690-234	C608-100BLK (13174)		
12414690-235	C608-100BLK (13174)		
12414690-236	C608-100BLK (13174)	131.9	335.0
12414690-237	C608-100BLK (13174)	147.6	375.0
12414690-238	C608-100BLK (13174)	179.5	456.0
12414690-239	C608-100BLK (13174)	187.0	475.0
12414690-240	C608-100BLK (13174)	111.5	283.2
12414690-241	C608-100BLK (13174)	127.5	324.0
12414690-242	C608-100BLK (13174)	159.0	404.0
12414690-243	C608-100BLK (13174)	166.5	423.0
12414690-244	C608-100BLK (13174)	41.0	104.2
12414690-245	C608-100BLK (13174)	57.0	144.8
12414690-246	C608-100BLK (13174)	88.6	225.0
12414690-247	C608-100BLK (13174)	96.0	244.0
12414690-248	C608-100BLK (13174)	48.0	122.0
12414690-249	C608-100BLK (13174)	54.0	137.2
12414690-301	PFT-10B-BLK-100 (61424)	19.0	48.3
12414690-302	PFT-10B-BLK-100 (61424)	56.0	142.2
12414690-303	PFT-10B-BLK-100 (61424)	118.1	300.0

E-13. NON-METALLIC ELECTRICAL CABLE CONDUIT FABRICATION
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Make conduit to cover electrical cables described on 1241638 from bulk tube stock listed in **Table E-2. Non-Metallic Electrical Cable Conduit Lengths**. Use a fine-toothed hacksaw or suitable cutting device and cut hose/tube to required length.

Table E-2. Non-Metallic Electrical Cable Conduit Lengths

Tube Part Number	Bulk Tube Part Number	Cut Length	
		inch	cm
12416381P1	49008	8.9	22.6
12416381P10	49008	17.8	45.2
12416381P11	49008	29.9	75.9
12416381P12	49008	33.0	83.8
12416381P13	49008	13.9	35.3
12416381P14	49008	4.0	10.2
12416381P15	49008	17.4	44.2
12416381P16	49008	3.2	8.1
12416381P17	49008	4.5	11.4
12416381P2	49008	16.2	41.1
12416381P20	27413	32.8	83.3
12416381P21	27413	9.2	23.4
12416381P22	27413	8.0	20.3
12416381P23	27413	23.3	59.2
12416381P26	49008	2.5	6.4
12416381P3	27413	7.3	18.5
12416381P30	49007	17.0	43.2
12416381P32	49005	1.7	4.3
12416381P34	49005	20.7	52.6
12416381P35	49005	21.8	55.4
12416381P36	49005	5.5	14.0
12416381P37	49005	8.0	20.3
12416381P38	49008	3.7	9.4
12416381P4	49008	12.0	30.5
12416381P5	49008	26.0	66.0
12416381P6	49008	7.7	19.6
12416381P7	49008	26.7	67.8
12416381P8	49008	5.2	13.2
12416381P9	49008	16.8	42.7

E-14. STEERING GEAR RETURN HOSE AND TRANSMISSION OIL COOLER HOSES FABRICATION

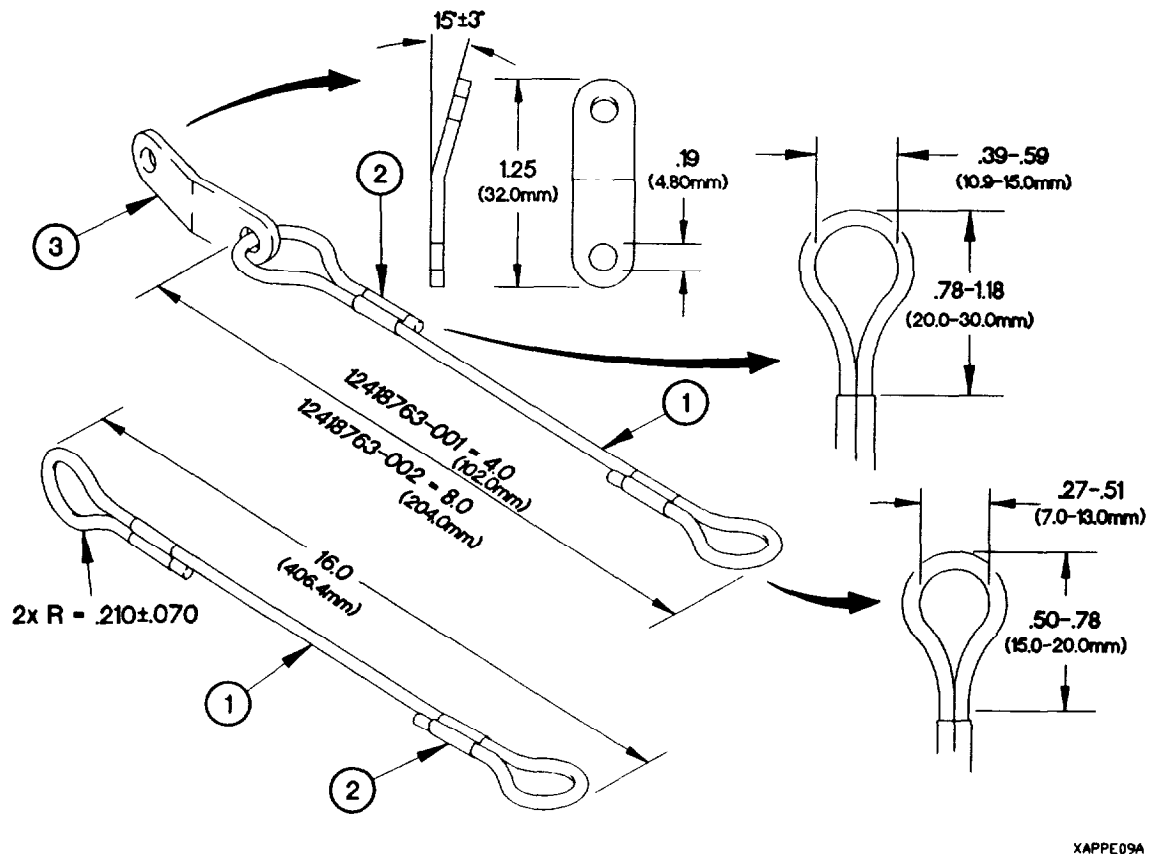
Cut the following hoses from bulk hose using a fine-toothed hacksaw or suitable cutting device.

Hose Part Number	Bulk Hose Part Number	Cut Length	
		inches	c m
12418037	A110 (30327)	75.5	191.7
12418460-001	MS521302B110360 (96906)	17.5	44.4
12418460-002	MS521301A206R (96906)	16.0	40.6

E-15. LANYARD ASSEMBLIES P/N 12418763 AND 12420196 FABRICATION

Make the following lanyard assemblies from bulk cable material, sleeves, and tab material and assemble according to **Figure E-14. Lanyard Assembly**. The following parts list identifies part numbers and lengths of cut pieces.

Item	Part Number	Material Description	Size	Qty
1	MIL-W-83420 Type 1, Comp B	1/16 in. stranded wire cable	4 in. (102 mm)	1
2	MS51844-22	Sleeve		2
3	N/A	Tab, Stainless Steel ASTM A617	.06 in. (16 cm) X .37 in. (9.5 mm) X 1.25 in. (32 mm)	1



XAPPE09A

Figure E-14. Lanyard Assembly

- All dimensions are in inches (millimeters).
- Make from bulk cable and flat steel material as identified in parts list.
- Drill two 0.19 in. (4.8 mm) diameter holes through tab material as shown on **Figure E-14. Lanyard Assembly**.
- De-burr and remove sharp edges.
- Bend tab as shown on **Figure E-14. Lanyard Assembly**.
- Form loops on cable ends and insert sleeve material over cable on one end of cable and over cable and through sleeve at other end of cable as shown in **Figure E-14. Lanyard Assembly**.
- Crimp two sleeves over cable ends.

E-16. NON-METALLIC VENT AIR HOSES FABRICATION

Cut the following vent air hoses from bulk hose using a fine-toothed hacksaw or suitable cutting device.

Hose Part Number	Bulk Hose Part Number	Cut Length	
		inches	cm
12420197-001	483666 (02280)	180.0	457.2
12420197-002	483666 (02280)	120.0	304.8
12420197-003	483666 (02280)	96.0	243.8
12420197-004	483666 (02280)	36.0	91.4
12420197-005	483666 (02280)	156.0	396.2
12420197-006	483666 (02280)	72.0	182.9
12420198-001	881-16 (98441)	120.0	304.8
12420198-002	11657469	36.0	91.4

E-17. PERSONNEL HEATER AIR DUCT HOSE FABRICATION

Cut the following hoses from bulk hose using a fine-toothed hacksaw or suitable cutting device.

Hose Part Number	Bulk Hose Part Number	Cut Length	
		inches	cm
12420308-457	8711054 (19207)	18.3	46.4
12420308-760	8711054 (19207)	30.4	77.2

E-18. BLOCK SEAL 12420489 FABRICATION

Make block seal from P/N (0VXY8) STN2.38X.5. Use a suitable cutting tool to cut seal to 0.52 inch (1.3 cm) long.

E-19. CTIS SEAL DRIVER 3256-H-1048

Used on Front, Intermediate, and Rear Axle CTIS Seals.

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

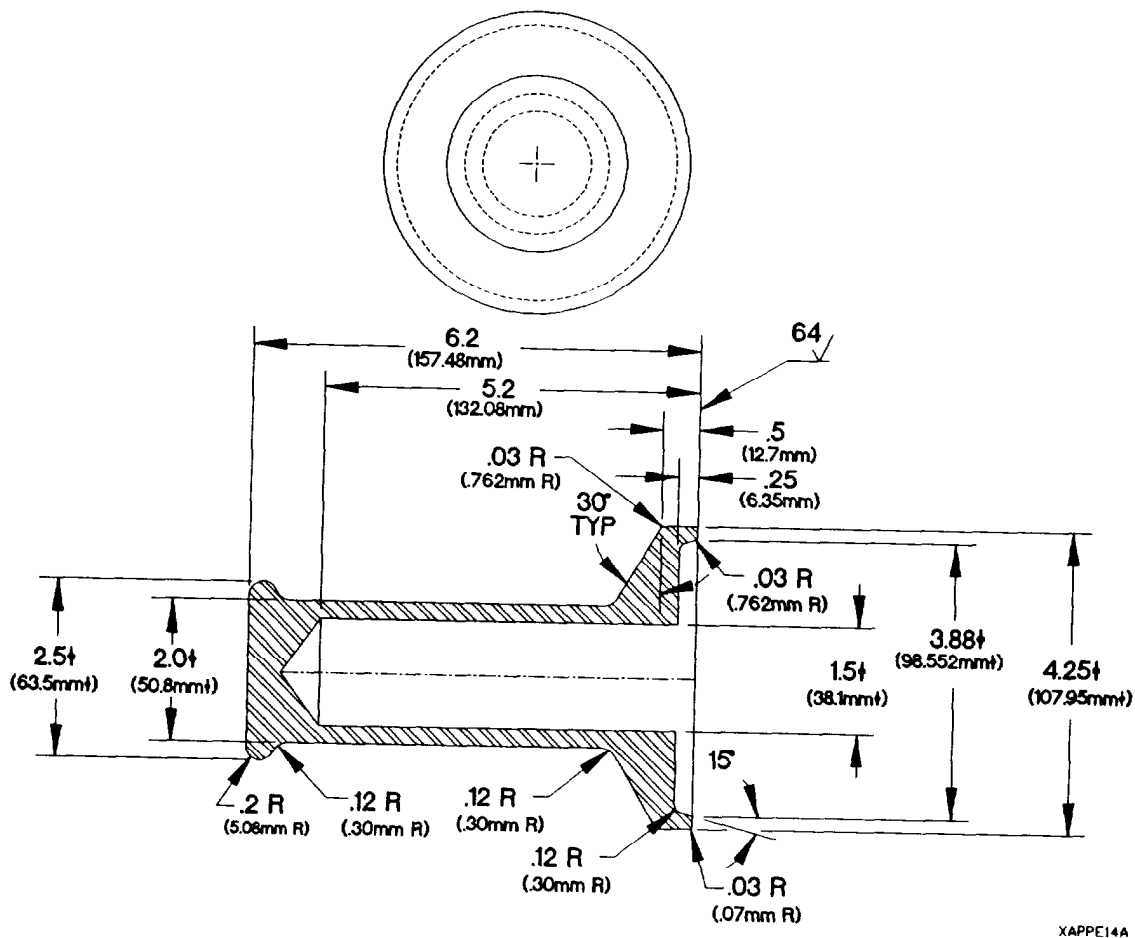


Figure E-15. CTIS Seal Driver

- All dimensions are in inches (millimeters).
- Manufacture from round steel stock.
- De-burr and remove sharp edges.

E-20. WHEEL HUB GREASE SEAL DRIVER 3256-K-1051

NOTES ON USE OF DRIVER

- 1) SEAL END OF DRIVER TO BE CLEAN OF DEBRIS, DIRT, NICKS AND BURRS
- 2) DO NOT USE A METAL HAMMER ON DRIVER
A RUBBER, PLASTIC, WOOD OR SOME OTHER DEAD BLOW TYPE Mallet
IS TO BE USED
- 3) SLIGHTLY GREASE SEAL END OF DRIVER PRIOR TO INSTALLING SEAL

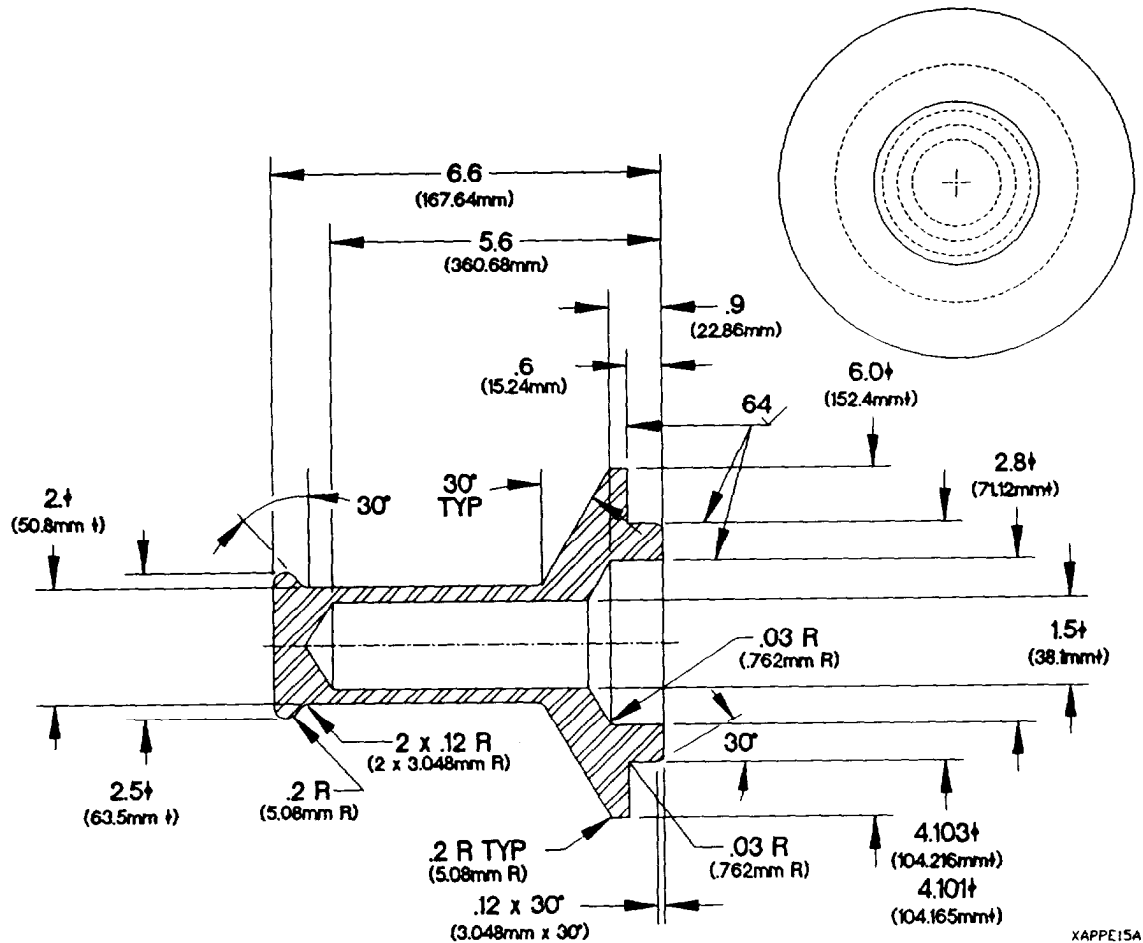


Figure E-16. Wheel Hub Grease Seal Driver

- a. All dimensions are in inches (millimeters).
- b. Manufacture from round steel stock.
- c. De-burr and remove sharp edges.

APPENDIX F TORQUE LIMITS

F-1. GENERAL

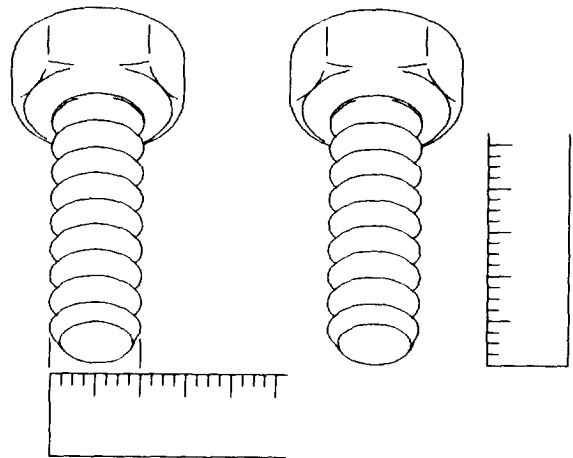
This appendix provides general torque limits for screws and nuts used on the vehicle. Special torque limits are shown in the maintenance procedures for applicable components. Use the general torque limit given in this appendix when specific torque limits are not given in the maintenance procedure. These general torque limits can not be applied to screws that retain rubber components. The rubber components will be damaged before the torque limit is reached. If a special torque limit is not given in the maintenance instructions for a fastener which retains a rubber component, tighten the screw or nut until it touches metal, then tighten one more turn. Whenever possible, the tightening force (torque) should be applied to the nut side of the fastener group.

F-2. TORQUE LIMITS

Refer to **Table F-1. Torque Limits for SAE and ANSI Fasteners** for torque limits on standard (SAE and ANSI) screws and free spinning nuts. Refer to **Table F-2. Torque Limits for SAE and ANSI Prevailing Torque Nuts** for torque limits on standard (SAE and ANSI) self-locking nuts. Refer to **Table F-3. Torque Limits for Metric Screws and Free Spinning Nuts** for torque limits on metric screws and free spinning nuts. Refer to **Table F-4. Torque Limits for Metric Prevailing Torque Nuts** for torque limits on metric self-locking nuts.

F-3. USE OF TORQUE TABLES

- (1) Measure the diameter of the screw to be installed.
- (2) Count the number of threads per inch.
- (3) Under the heading DIAMETER look down the column until the diameter of the screw is found. (There are usually two lines beginning with the same diameter.)
- (4) Under the heading THREADS PER INCH (SAE and ANSI) or THREAD PITCH (metric), find the number of threads per inch that matches the number counted in step (2).
- (5) To find the grade of the screw, match the markings on the head to the correct picture under CAPSCREW HEAD MARKINGS on the torque table.
- (6) Look down the column under the picture found in step (5) until the torque limit (lb-ft or N•m) for the diameter and threads per inch or thread pitch, in the case of metric fasteners) of the screw are located.



XAPPF01A

APPENDIX F TORQUE LIMITS

Table F-1. Dry Torque Limits for SAE and ANSI Screws and Free Spinning Nuts

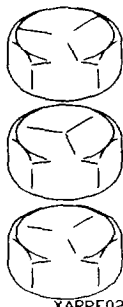
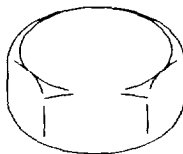
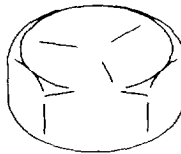
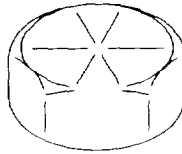
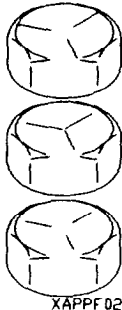
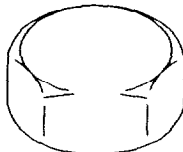
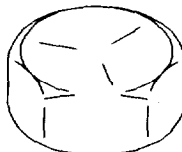
 NOTE Manufacturer's marks may vary. These are all SAE Grade 5.		Material Grade Markings					
		 XAPPF03A SAE Grade 2	 XAPPF04A SAE Grade 5	 XAPPF06A SAE Grade 8			
		Torque					
Diameter	Threads per inch						
Inch		lb-ft	N•m	lb-ft	N•m	lb-ft	N•m
1/4	20	3-5	5-7	5-7	8-10	8-10	10-14
1/4	28	4-6	5-7	6-8	9-11	8-12	12-16
1/4	32	4-6	5-7	7-9	9-11	9-13	12-16
5/16	18	7-9	9-13	11-15	15-21	15-21	21-29
5/16	24	8-10	11-15	12-16	17-23	17-23	24-32
5/16	32	9-11	12-16	14-18	18-24	19-25	27-34
3/8	16	13-17	17-23	20-26	27-35	28-38	38-50
3/8	24	15-19	20-26	22-30	31-41	32-42	43-57
3/8	32	15-21	21-27	24-32	33-43	33-45	55-61
7/16	14	20-28	28-38	32-42	43-57	44-60	61-81
7/16	20	23-31	31-41	35-47	48-64	49-67	68-90
7/16	28	25-33	33-45	37-51	51-69	54-72	73-97
1/2	13	32-42	43-57	49-65	66-88	68-92	93-123
1/2	20	35-47	48-64	55-73	74-98	77-103	105-139
1/2	28	38-50	51-67	58-78	79-105	82-110	111-149
9/16	12	55-61	62-82	70-94	95-127	98-132	134-178
9/16	18	50-68	69-91	78-104	105-141	109-147	149-199
9/16	24	53-71	72-96	82-110	111-149	115-155	158-210
5/8	11	62-84	85-113	95-129	131-175	136-182	184-246
5/8	18	70-94	96-128	108-146	148-198	154-206	209-279
5/8	24	73-99	100-134	114-154	155-207	161-217	219-293

Table F-1. Dry Torque Limits for SAE end ANSI Screws end Free Spinning Nuts (Cont)

 Manufacturer's marks may vary. These are all SAE Grade 5		Material Grade Markings					
		 XAPPF03A SAE Grade 2	 XAPPF04A SAE Grade 5	 XAPPF06A SAE Grade 8			
		Torque					
Diameter	Threads per inch						
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	1836-2447
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

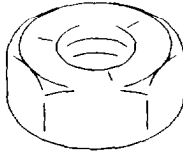
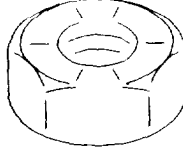
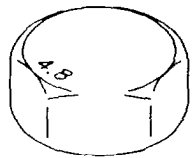
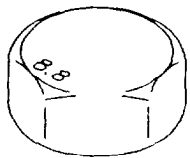
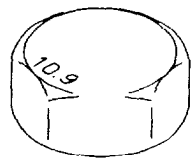
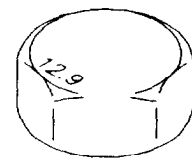
		Material Grade Markings			
		 XAPPF07A SAE Grade 5		 XAPPF08A SAE Grade 8	
Hole Diameter	Threads per inch	Torque			
inch		lb-ft	N•m	lb-ft	N•m
1/4	20	10-12	14-16	15-17	20-24
1/4	28	12-14	16-18	14-18	21-25
5/16	18	20-24	27-33	26-32	36-44
5/16	24	22-26	30-36	29-35	40-48
3/8	16	35-41	47-55	48-58	65-77
3/8	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							
									
		XAPPF09A		XAPPF10A		XAPPF11A		XAPPF12A	
		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

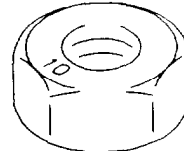
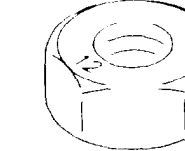
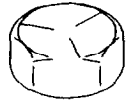
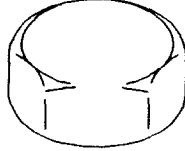
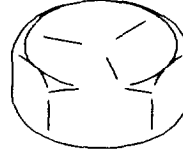
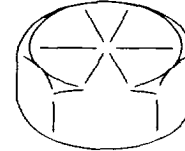
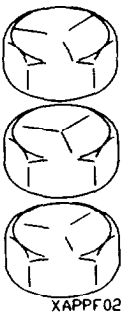
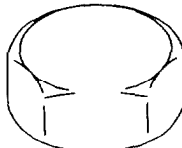
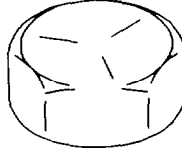
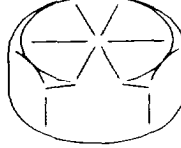
		Material Grade Markings							
									
		XAPPF13A	XAPPF14A	XAPPF15A	XAPPF16A				
		Metric Grade 4.8	Metric Grade 8.8	Metric Grade 10.9	Metric Grade 12.9				
Diameter	Thread Pitch	Torque							
mm		lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m
6	1	5-8	7-8	7-9	10-12	10-12	14-17	11-14	15-19
8	1.25	12-14	16-18	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	28-35	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 end ANSI Screws end 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		 XAPPF06A 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	76
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	 XAPPF06A 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	8	420	570	1100	1492	1780	2414
1-3/8	12	460	624	1260	1709	2040	2766

APPENDIX G MANDATORY REPLACEMENT PARTS

Section I. INTRODUCTION

G-1. SCOPE

This appendix lists mandatory replacement parts you will need to maintain the MTV vehicle.

G-2. EXPLANATION OF COLUMNS

- a. **Column (1) - Item Number.** This number is assigned to each entry in the listing and is referenced in the Initial Setup of the applicable task under Materials/Parts.
- b. **Column (2) - Nomenclature.** Name or identification of the part.
- c. **Column (3) - Part Number.** The manufacturer's part number.
- d. **Column (4) - National Stock Number.** The National stock number of the part.

Section II. MANDATORY REPLACEMENT PARTS LIST

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
1	BLADE, WINDSHIELD WIPER	105.384	2540-01-364-1621
2	BOLT, MACHINE	12414307-065	5306-01-382-5054
3	BOOT KIT, EXHAUST	DQ6025	4730-01-417-3197
4	BUMPER, NONMETALLIC	1011-05	5340-01-342-1110
5	BUMPER, RUBBER	12419182	5340-01-410-8397
6	BUSHING, SLEEVE	7-199-002668	3120-01-367-6894
7	CHANNEL, RUBBER	ZZR765/2-001A7	9390-01-420-4560
8	CLAMP	024S9	
9	CLAMP	032S9	
10	COVER, FLUID FILTER	12412628	2590-01-414-1243
11	DECAL	12340917	7690-01-256-4909
12	FASTENER TAPE	MIL-F-21840	8315-00-006-9855
13	FASTENER TAPE	50-534718-19	8315-00-935-6762
14	FILTER ASSEMBLY	75223-11	2940-01-417-9333

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
15	FILTER ELEMENT	1048011	2940-01-385-8931
16	FILTER ELEMENT, FLUID	K05-0104	2910-01-377-3128
17	FILTER ELEMENT, FLUID	R22146	2910-01-360-6366
18	FILTER ELEMENT, FLUID	29507750	2940-01-361-2405
19	FILTER ELEMENT, FLUID	599791	4460-01-284-2344
20	FILTER ELEMENT, FLUID	931558	2940-01-363-4377
21	FILTER ELEMENT, INTAKE AIR CLEANER	P52-7750	2940-01-361-2407
22	FILTER, FUEL	7E9763	2910-01-363-3089
23	FILTER, OIL	1R0739	2940-00-029-0388
24	GASKET	F337576M6	
25	GASKET	M28840/24HA	5935-01-421-9754
26	GASKET	QS-1181	5330-01-058-3788
27	GASKET	10-36675-18	5330-00-298-0190
28	GASKET	119-2940	
29	GASKET	12412394	5330-01-371-6199
30	GASKET	350700	5330-01-295-3053
31	GASKET	350903	5330-00-576-4626
32	GASKET	352200	5330-01-421-6105
33	GASKET	352302	5330-01-421-6107
34	GASKET	353400	5330-01-421-6102
35	GASKET	353806	5330-01-421-6103
36	GASKET	353810	
37	GASKET	355148	5330-01-423-0596
38	GASKET	355175	5330-01-423-0623
39	GASKET	3K3257	5330-01-305-6550
40	GASKET	4P1624	5330-01-360-5934
41	GASKET	4W0549	5330-01-347-3207
42	GASKET	9Y8103	5330-01-360-5931
43	GASKET and PREFORMED PACKING KIT	P4-4	5330-00-122-0624
44	GASKET, FUEL FILTER	7C1159	5330-01-360-5941
45	GASKET, RING	331.406	5330-01-395-4645

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
46	GASKET, THERMOSTAT	2W7212	5330-01-347-3206
47	GROMMET, NONMETALLIC	MS21266-3N	5325-00-926-1394
48	GROMMET, NONMETALLIC	MS35489-109	5325-00-290-0074
49	GROMMET, NONMETALLIC	MS35489-6	5325-00-263-6632
50	GROMMET, NONMETALLIC	12412334-2	
51	GROMMET, NONMETALLIC	12417598	5325-01-375-1299
52	GROMMET, NONMETALLIC	12421402	
53	GROMMET, NONMETALLIC	4082-37634-01	5325-01-194-3076
54	GROMMET, NONMETALLIC	50S12-1-1AA	5325-01-145-0105
55	GROMMET, NONMETALLIC	8741442	5325-00-088-6147
56	INDICATOR, SIGHT, LIQUID	SLT-1214	6680-01-356-8162
57	INSERT, NYLON	12SWS2520	
58	INSERT, NYLON	12SWS2542	
59	INSERT, NYLON	12421463-003	
60	INSULATOR, TANK	A1394J	5970-01-385-7317
61	INSULATOR, TANK	A1394K	5970-01-385-7262
62	KIT, PROPELLER SHAFT	KT-16SB	2520-01-370-1360
63	KIT, FILTER	29526899	
64	KIT, FILTER	29503829	
65	LAMP, INCANDESCENT	CM7-7373	6240-00-270-6824
66	LAMP, INCANDESCENT	CM7376	6240-00-499-6278
67	LATCH, BAIL HEAD	68-20-101-10	2540-01-232-2470
68	LOCKNUT	0770-023-003	5310-01-423-3725
69	LOCKWASHER	ABCH207-LW-1/2	
70	LOCKWASHER	ABCH207-LW-3/8	
71	LOCKWASHER	D70336/1-20	5310-01-110-7933
72	LOCKWASHER	D70336/3-50	5310-01-439-2542
73	LOCKWASHER	D70336/3-52	5310-01-439-2543
74	LOCKWASHER	MS35333-136	5310-01-078-9699
75	LOCKWASHER	MS35333-78	5310-00-261-7156
76	LOCKWASHER	MS35335-30	5310-00-209-0788

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
77	LOCKWASHER	MS35335-31	5310-00-596-7693
78	LOCKWASHER	MS35335-33	5310-00-209-0786
79	LOCKWASHER	MS35335-36	5310-00-550-3503
80	LOCKWASHER	MS35335-37	5310-00-209-5116
81	LOCKWASHER	MS35335-38	5310-00-616-6354
82	LOCKWASHER	MS35335-58	5310-00-209-1366
83	LOCKWASHER	MS35335-61	5310-00-527-3634
84	LOCKWASHER	MS35335-62	5310-00-184-9562
85	LOCKWASHER	MS35337-25	5310-00-012-1637
86	LOCKWASHER	MS35338-100	5310-00-261-8278
87	LOCKWASHER	MS35338-103	5310-00-184-8971
88	LOCKWASHER	MS35338-137	5310-00-933-8119
89	LOCKWASHER	MS35338-138	5310-00-933-8120
90	LOCKWASHER	MS35338-141	5310-00-984-7042
91	LOCKWASHER	MS35338-41	5310-00-045-4007
92	LOCKWASHER	MS35338-42	5310-00-045-3299
93	LOCKWASHER	MS35338-43	5310-00-045-3296
94	LOCKWASHER	MS35338-44	5310-00-582-5965
95	LOCKWASHER	MS35338-45	5310-00-407-9566
96	LOCKWASHER	MS35338-46	5310-01-334-4710
97	LOCKWASHER	MS35338-47	5310-00-209-0965
98	LOCKWASHER	MS35338-51	5310-00-584-7888
99	LOCKWASHER	MS35338-58	5310-00-702-6286
100	LOCKWASHER	MS51414-1	5310-01-235-2057
101	LOCKWASHER	MS51414-2	5310-01-310-1098
102	LOCKWASHER	MS51414-4	5310-01-251-9276
103	LOCKWASHER	N9015	5310-01-046-0186
104	LOCKWASHER	N9459	5310-01-348-8393
105	LOCKWASHER	N9461	5310-01-348-8392
106	LOCKWASHER	114021	5310-01-081-0798
107	LOCKWASHER	1229-S-513-C	5310-01-062-3384

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
108	LOCKWASHER	12412477-14	
109	LOCKWASHER	12412601-14	5310-01-387-1152
110	LOCKWASHER	12414570-005	
111	LOCKWASHER	12414570-011	5310-01-374-3292
112	LOCKWASHER	12414570-013	5310-01-374-4515
113	LOCKWASHER	12414570-015	5310-01-388-2043
114	LOCKWASHER	12414570-021	5310-01-374-4516
115	LOCKWASHER	152.269	5310-01-407-4764
116	LOCKWASHER	152.544	5310-01-395-0823
117	LOCKWASHER	152.552	5310-12-189-1721
118	LOCKWASHER	1729B262	5310-00-964-7811
119	LOCKWASHER	488.671	
120	MOUNT, RESILIENT	12413126	
121	MOUNT, RESILIENT	12418476	5340-01-377-0693
122	NUT, CLIP	MS90724-24	5310-01-074-5041
123	NUT, CONDUIT	BL75	5975-00-642-7261
124	NUT, CONDUIT	141	5975-00-152-1075
125	NUT, CONDUIT	143	5975-00-714-8031
126	NUT, PLAIN, BLIND RIVET	ALS7-632-80	
127	NUT, PLAIN, HEX	MS35649-282	5310-00-934-9757
128	NUT, SELF-LOCKING	DIN-934STM6	5310-01-342-2739
129	NUT, SELF-LOCKING	MS20500-524	5310-00-208-4023
130	NUT, SELF-LOCKING	MS21042-04	5310-00-811-6419
131	NUT, SELF-LOCKING	MS21083N08	5310-00-941-6019
132	NUT, SELF-LOCKING	MS21083N6	5310-00-926-1852
133	NUT, SELF-LOCKING	MS51922-1	5310-00-088-1251
134	NUT, SELF-LOCKING	MS51922-17	5310-00-087-4652
135	NUT, SELF-LOCKING	MS51922-2	5310-00-929-1807
136	NUT, SELF-LOCKING	MS51922-33	5310-00-225-6993
137	NUT, SELF-LOCKING	MS51922-49	5310-00-269-4040
138	NUT, SELF-LOCKING	MS51922-5	5310-00-959-7600

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
139	NUT, SELF-LOCKING	MS53922-57	5310-00-067-6356
140	NUT, SELF-LOCKING	MS51922-65	5310-00-225-6992
141	NUT, SELF-LOCKING	MS51922-9	5310-00-984-3806
142	NUT, SELF-LOCKING	N9406	5310-01-362-6171
143	NUT, SELF-LOCKING	N9410	5310-01-348-8398
144	NUT, SELF-LOCKING	N9467	5310-01-350-4257
145	NUT, SELF-LOCKING	12301125	5310-01-210-0199
146	NUT, SELF-LOCKING	12412476-09	
147	NUT, SELF-LOCKING	12412476-11	5310-01-407-7178
148	NUT, SELF-LOCKING	12412476-12	
149	NUT, SELF-LOCKING	12412478-04	
150	NUT, SELF-LOCKING	12414308-002	5310-01-381-9819
151	NUT, SELF-LOCKING	12414308-003	5310-01-377-1549
152	NUT, SELF-LOCKING	12414308-004	5310-01-369-5703
153	NUT, SELF-LOCKING	12414308-007	5310-01-369-6073
154	NUT, SELF-LOCKING	12414308-017	5310-01-381-9830
155	NUT, SELF-LOCKING	12414308-018	5310-01-369-3337
156	NUT, SELF-LOCKING	12414308-019	5310-01-369-9522
157	NUT, SELF-LOCKING	12414308-020	5310-01-381-9849
158	NUT, SELF-LOCKING	12414308-021	5310-01-369-3338
159	NUT, SELF-LOCKING	12414308-022	5310-01-417-1262
160	NUT, SELF-LOCKING	12414308-023	5310-01-369-6705
161	NUT, SELF-LOCKING	12414308-025	5310-01-369-6706
162	NUT, SELF-LOCKING	12414308-027	5310-01-369-3339
163	NUT, SELF-LOCKING	12414308-078	
164	NUT, SELF-LOCKING	12414315-002	5310-01-374-1381
165	NUT, SELF-LOCKING	12414315-003	5310-01-374-1382
166	NUT, SELF-LOCKING	12414315-005	5310-01-372-3023
167	NUT, SELF-LOCKING	12414315-006	5310-01-369-3332
168	NUT, SELF-LOCKING	12414315-009	5310-01-365-7236
169	NUT, SELF-LOCKING	12414315-015	

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
170	NUT, SELF-LOCKING	12414315-017	5310-01-368-8065
171	NUT, SELF-LOCKING	12414420-004	5310-01-370-0010
172	NUT, SELF-LOCKING	12419003	5310-01-376-0773
173	NUT, SELF-LOCKING	29514660	
174	NUT, SELF-LOCKING	7-660-081600	5310-01-390-8487
175	NUT, SELF-LOCKING	7-660-082504	5310-01-354-8734
176	NUT, SELF-LOCKING	7794625	5310-00-579-1031
177	NUT, SELF-LOCKING	7951286	5310-00-789-0398
178	PACKING, PREFORMED	A82777	5330-00-579-6495
179	PACKING, PREFORMED	J515-16-3	
180	PACKING, PREFORMED	MK0012510	
181	PACKING, PREFORMED	MS28775-011	5330-00-582-2133
182	PACKING, PREFORMED	MS28778-10	5330-00-285-9842
183	PACKING, PREFORMED	MS28778-12	5330-00-251-8839
184	PACKING, PREFORMED	MS28778-16	5330-00-804-5694
185	PACKING, PREFORMED	MS28778-20	5330-00-816-3546
186	PACKING, PREFORMED	MS28778-4	5330-00-805-2966
187	PACKING, PREFORMED	MS28778-6	5330-00-804-5695
188	PACKING, PREFORMED	MS9955-113	5330-01-374-2325
189	PACKING, PREFORMED	M25988/1-246	5330-01-189-6351
190	PACKING, PREFORMED	OR420A	5330-01-389-6028
191	PACKING, PREFORMED	11639519-1	5330-00-463-0200
192	PACKING, PREFORMED	1509	5330-00-172-1919
193	PACKING, PREFORMED	2-012N507-90	5330-01-092-5502
194	PACKING, PREFORMED	2-018N507-90	5330-01-092-5503
195	PACKING, PREFORMED	2M4453	5330-00-074-3768
196	PACKING, PREFORMED	22617-16	5330-01-168-0885
197	PACKING, PREFORMED	23043446	5330-01-424-6629
198	PACKING, PREFORMED	29500969	5330-01-360-7852
199	PACKING, PREFORMED	29503383	5330-01-360-6017
200	PACKING, PREFORMED	3-906N552-90	5330-01-104-1093

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
201	PACKING, PREFORMED	3-908N552-90	5330-00-929-8171
202	PACKING, PREFORMED	3D2824	5330-00-944-8281
203	PACKING, PREFORMED	3J1907	5330-01-333-6444
204	PACKING, PREFORMED	3J7354	5330-00-952-8008
205	PACKING, PREFORMED	3K0360	5330-00-948-6482
206	PACKING, PREFORMED	4J5477	5330-00-855-8059
207	PACKING, PREFORMED	4L9564	5330-00-828-8639
208	PACKING, PREFORMED	5-X-1155	5330-01-392-1637
209	PACKING, PREFORMED	5F7054	5330-00-339-6224
210	PACKING, PREFORMED	5P7813	5330-01-335-0042
211	PACKING, PREFORMED	6V8397	5330-00-579-6495
212	PACKING, PREFORMED	673268	
213	PACKING, PREFORMED	673269	5330-01-395-1252
214	PACKING, PREFORMED	7F8267	5330-00-291-7353
215	PACKING, PREFORMED	7320658	5330-00-297-7106
216	PACKING, PREFORMED	9604792-001	5330-01-429-3089
217	PAD, CUSHIONING	12413120	
218	PARTS KIT, DEHYDRATOR	RN-60-A	4440-01-337-7324
219	PARTS KIT, HYDRAULIC PUMP	P1-12RP	4320-00-125-3208
220	PARTS KIT, SEAL REPLACEMENT	SK10-2	5330-01-350-4474
221	PARTS KIT, SEAL REPLACEMENT	SK10-3	5330-01-350-4472
222	PARTS KIT, SEAL REPLACEMENT	SK10-4	5330-01-343-2745
223	PIN, COTTER	K-2412-Z	5315-01-179-9882
224	PIN, COTTER	MS24665-151	5315-00-815-1405
225	PIN, COTTER	MS24665-298	5315-00-234-1861
226	PIN, COTTER	MS24665-385	5315-00-187-9382
227	PIN, COTTER	MS24665-394	5315-00-234-1628
228	PIN, COTTER	MS24665-423	5315-00-013-7228
229	PIN, COTTER	MS24665-455	5315-00-187-9392
230	PIN, COTTER	MS24665-457	5315-00-187-9393
231	PIN, COTTER	MS24665-459	5315-00-187-9394

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
232	PIN, COTTER	MS24665-494	
233	PIN, COTTER	MS24665-498	5315-00-849-9854
234	PIN, COTTER	MS24665-628	5315-00-846-0126
235	PIN, COTTER	MS24665-654	5315-00-187-9413
236	PIN, COTTER	MS24665-69	5315-00-828-8190
237	PIN, COTTER	352.497	5315-01-394-3546
238	PIN, SPRING	MS16562-142	5315-00-058-6115
239	PIN, SPRING	MS16562-146	5315-00-853-3814
240	PLASTIC STRIP	352700	5330-01-396-2109
241	RECEPTACLE	50R4-1-1AA	5325-01-049-2049
242	RING, BUSHING	152.157	
243	RIVET, BLIND	AD66H	5320-01-008-8204
244	RIVET, BLIND	MS20604B3W2	5320-00-721-9075
245	RIVET, BLIND	M24243/1-B302	5320-00-999-0397
246	RIVET, BLIND	M24243/1-B610	5320-00-454-5156
247	RIVET, BLIND	M24243/1-D404	5320-00-865-8994
248	RIVET, BLIND	M24243/1-D502	5320-00-850-3248
249	RIVET, BLIND	M24243/1-D504	5320-01-020-9756
250	RIVET, BLIND	M24243/1-D506	5320-00-850-3225
251	RIVET, BLIND	M24243/1-D604	5320-00-850-3233
252	RIVET, BLIND	M24243/1-D608	5320-00-850-3246
253	RIVET, BLIND	M24243/1-D610	5320-01-030-3218
254	RIVET, BLIND	M24243/1-F402	5320-00-129-9706
255	RIVET, BLIND	M24243/6-A503H	5320-00-490-2238
256	RIVET, BLIND	NAS1398C5A4	5320-00-321-2521
257	RIVET, BLIND	SD64BSLF	5320-01-397-3347
258	RIVET, BLIND	206057	5320-01-411-0081
259	RIVET, COMPRESSION	12418469	5320-01-376-0699
260	RUBBER STRIP	12412581	9320-01-399-4888
261	SCREW, CAP	12414475-131	5303-01-363-0703
262	SCREW, CAP	6V-2315	5306-01-433-4753

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
263	SCREW, SELF-LOCKING	MS16998-61L	5305-01-211-3097
264	SEAL	VC08G1R0B	5330-01-389-6109
265	SEAL	355150	5330-01-423-0689
266	SEAL ASSEMBLY, CTIS	A1205-Q-2435	5330-01-360-7753
267	SEAL ASSEMBLY, HUB	A1205-R-2254	5330-01-360-5252
268	SEAL RING, METAL	29505809	5330-01-360-5329
269	SEAL, NONMETALLIC	CC3350	
270	SEAL, NONMETALLIC	12417725	5330-01-375-2908
271	SEAL, NONMETALLIC	673267	5330-01-395-1251
272	SEAL, URETHANE FOAM	12420420-001	
273	SEAL, URETHANE FOAM	12420420-002	
274	SEAL, URETHANE FOAM	12420420-003	
275	SPLICE, CONDUCTOR	23035	5940-01-210-9261
276	SPLICE, CONDUCTOR	23075	3830-01-210-9260
277	TERMINAL, LUG	MS20659-163	5940-00-113-3145
278	TERMINAL, LUG	MS20659-164	5940-00-113-3148
279	TERMINAL, LUG	MS25036-122	5940-00-113-8190
280	WASHER, FLAT	12417948-004	5365-01-436-8308
281	WASHER, FLAT RUBBER	900.032	5330-01-378-7541
282	WASHER, KEY	TW107	5310-01-014-5136
283	WASHER, NYLON	MS51859-16	5310-01-381-9990
284	WASHER, NYLON	12421464-001	
285	WASHER, NYLON	12421464-002	
286	WASHER, SPRING	D63474/1-30	5310-01-413-8475
287	WASHER, SPRING	110 7289	5310-01-246-1387
288	WASHER, SPRING	12414559-021	5310-01-374-4517
289	WASHER, SPRING	12414560-009	5310-01-333-5517
290	WASHER, SPRING	12414560-011	5310-01-421-9556
291	WASHER, SPRING	12414560-017	5310-01-395-0820
292	WASHER, SPRING	12414560-018	5310-01-381-3281
293	WASHER, SPRING	12414560-019	5310-01-369-6074

Section II. MANDATORY REPLACEMENT PARTS LIST (CONT)

(1) ITEM NO.	(2) NOMENCLATURE	(3) PART NUMBER	(4) NATIONAL STOCK NUMBER
294	WASHER, SPRING	12417503	5310-01-406-6326
295	WASHER, SPRING	12418220	5310-01-372-3495
296	WASHER, SPRING	128BSTM4	5310-01-333-5517

APPENDIX H LUBRICATION ORDER

SECTION I. INTRODUCTION

H-1. GENERAL

The information contained in this appendix provides the lubrication requirements for the MTV vehicle.

- a. Adherence.** Intervals (on-condition or hardtime) and the related man-hour times are based on normal operation. The man-hour time specified is the time needed to do all the services prescribed for a particular interval. On-condition (OC) oil sample intervals will be applied unless changed by the Army Oil Analysis Program (AOAP) laboratory. Change the hardtime interval if the lubricants are contaminated or if operating the equipment under adverse operating conditions, including longer-than-usual operating hours. The calendar interval may be extended during periods of low activity. If extended, adequate preservation precautions must be taken. Hardtime intervals will be applied in the event AOAP laboratory support is not available. Hardtime intervals must be applied during the warranty period.

Intervals shown in this lubrication order 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 65, Appendix D) or equivalent. Dry before lubricating. Dashed arrows indicate lubrication on both sides of the equipment.
- c. Lubricating after fording.** If fording occurs, lubricate all fittings below fording depth and check submerged gearboxes for presence of water.
- d. Lubricating after high-pressure washing.** After a thorough washing, lubricate all grease fittings and oil can points outside and underneath vehicle.
- e. Level of Maintenance.** The lowest level of maintenance authorized to lubricate a point is Operator/Unit Maintenance (O). Operator/crew (C) may lubricate points authorized for Unit Maintenance (O) when authorized by Unit Maintenance (O).
- f. Localized views.** A reference to the appropriate localized view is given after most lubrication entries. Localized views begin on page H-13.

H-1. GENERAL (CONT)

g. Interval Symbols. The lubrications 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-biannually/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	SAE 10W30 OR OE/HDO-10	OEA
Transmission (total system) (all models except M1088 and M1089)	49.3 qt (46.7 L)	OE/HDO-15/40	OE/HDO-10	OEA
Transmission (at oil change) (all models except M1088 and M1089)	36.8 qt (34.7 L)	OE/HDO-15/40	OE/HDO-10	OEA
Transmission (total system) (M1088 and M1089)	58.6 qt (55.4 L)	OE/HDO-15/40	OE/HDO-10	OEA
Transmission (at oil change) (M1088 and M1089)	31.8 qt (30.0 L)	OE/HDO-15/40	OE/HDO-10	OEA
Transmission (after overhaul)	39.0 qt (37.0 L)	OE/HDO-15/40	OE/HDO-10	OEA
Steering system	5 qt (4.8 L)	OE/HDO-10	OE/HDO-10	OEA
Hydraulic reservoir (except M1089)	27 gal (102.2 L)	OE/HDO-10	OE/HDO-10	OEA
Hydraulic tank (M1089)	74 gal (280 L)	OE/HDO-10	OE/HDO-10	OEA
Front axle differential (maximum capacity)	9.5 qt (9 L)	GO-80/90	GO-80/90	SAE 75W90 OR GO-75
Intermediate axle differential (maximum capacity)	14.7 qt (13.9 L)	GO-80/90	GO-80/90	SAE 75W90 OR GO-75
Rear axle differential (maximum capacity)	12.15 qt (11.5 L)	GO-80/90	GO-80/90	SAE 75W90 OR GO-75
Front axle planetary hubs	11-13 oz (0.33-0.38 L)	GO-80/90	GO-80/90	SAE 75W90 OR GO-75

H-5. LUBRICATION KEY (CONT)

DESCRIPTION	CAPACITY	EXPECTED TEMPERATURES		
		Above +40°F (Above +4°C)	+40°F to -15°F (+4°C to -26°C)	-15°F to -50°F (-26°C to -46°C)
Rear axle bogie	0.5 qt (0.5 L)	GO-85/140	GO-85/140	GO-85/140
15K Self-Recovery Winch (SRW)	As Required	GO-85/140	GO-80/90	GO-75
30K winches	As Required	GO-85/140	GO-80/90	GO-75
Propeller shaft universal and slip joints	As Required	GAA	GAA	GAA
Tie rod ends	As Required	GAA	GAA	GAA
Towing pintle assembly	As Required	GAA	GAA	GAA
Fifth wheel	As Required	GAA	GAA	GAA
Spring bolts and spring shackles	As Required	GAA	GAA	GAA
Front axle shaft U-joints and steering knuckles	As Required	GAA	GAA	GAA
Front axle inner wheel bearing	As Required	GAA	GAA	GAA
Intermediate axle inner wheel bearing	As Required	GAA	GAA	GAA
Rear axle inner wheel bearing	As Required	GAA	GAA	GAA
Front lifting beam	As Required	GAA	GAA	GAA
15K Self-Recovery Winch (SRW) cable	As Required	GW	GW	GW
30K winch cables	As Required	GW	GW	GW
Air/hydraulic power unit	3 pt (1.4 L)	OHA	OHA	OHA
Backup hydraulic pump	19 oz (562 ml)	OHA	OHA	OHA

COOLANT	
Specification	Type
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	
Cooling system (total system)	50.3 qt (47.6 L)	MIL-A-46153	MIL-A-46153	N/A
Cooling system (total system) (M1088, M1089)	52.8 qt (49.9 L)	MIL-A-46153	MIL-A-46153	N/A
Cooling system, Arctic (total system)	64.8 qt (61.3 L)	N/A	N/A	MIL-A-11755
Cooling system, Arctic (total system) (M1088, M1089)	76.5 qt (72.4 L)	N/A	N/A	MIL-A-11755

CLEANING AGENT	
Specification	Type
P-D-680	Dry Cleaning Solvent, SD-II
O-C-1901	Cleaning Compound, Windshield

DESCRIPTION	CAPACITY	EXPECTED TEMPERATURES		
		Above + 15°F (Above -9°C)	+ 15°F to -15°F (-9°C to -26°C)	-15°F to -50°F (-26°C to -48°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).*	6.0
Annually (A)	Lubrication performed once every year or every 12,000 mi. (19,308 km).*	1.5
Bi-annually (B)	Lubrication performed once every two years or every 24,000 mi. (38,616 km).*	3.5
3K	Lubrication performed once every 3,000 mi. (4,827 km).**	1.0
6K	Lubrication performed once every 6,000 mi. (9,654 km).**	1.0
12K	Lubrication performed once every 12,000 mi. (19,308 km).**	6.5
24K	Lubrication performed once every 24,000 mi. (38,616 km).**	0.5
* Whichever occurs first.		
** No calendar interval.		

H-7. 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)

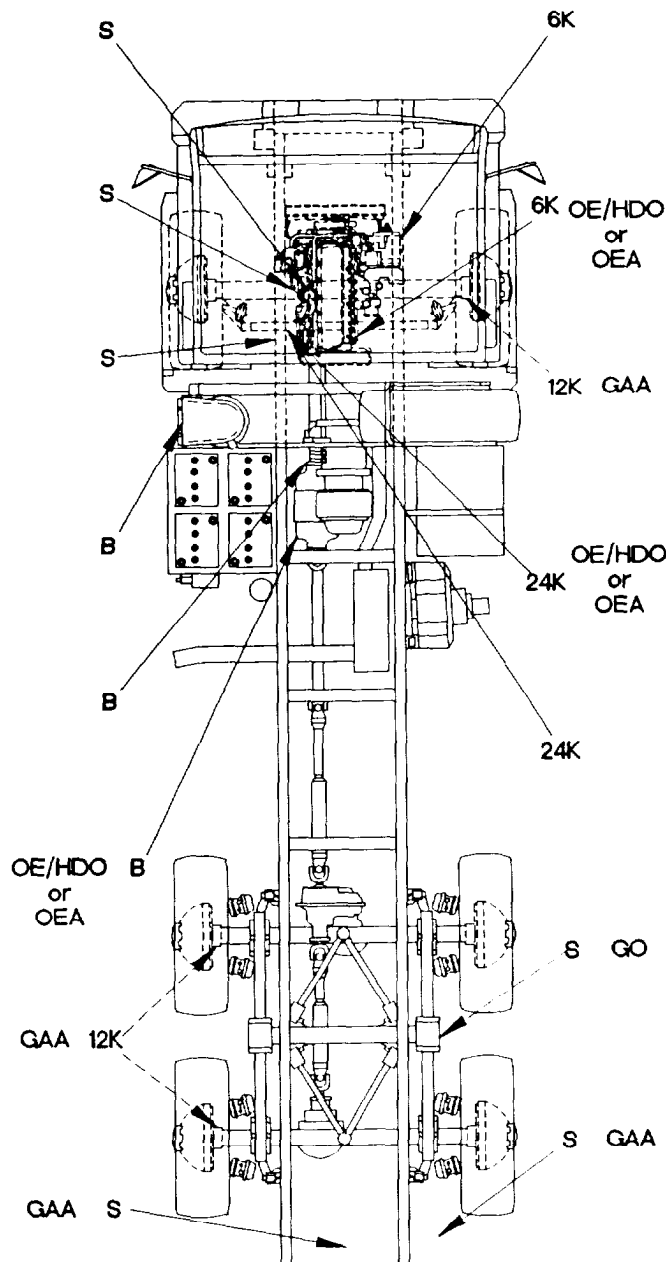
Cooling System (O)
(See note 7)

Transmission Filter (O)
(See note 3 and view F)

Transmission Drain and Fill (O)
(See note 3 and views D, E, and F)

Intermediate Axle and Rear Axle Inner Wheel Bearing Repack (O)
(See note 27)

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 27)

Power Steering Reservoir Drain and Fill (O)
(See note 4 and view G)

Power Steering Filter (O)
(See note 4 and view G)

Rear Axle Bogie Drain and Fill (O)
(See note 28 and view AG)

15K Self-Recovery Winch (SRW) Cable Rear Roller Fairlead Fill (O)
(See note 29 and views AE and AF)

CHASSIS

NOTE: Dashed arrows indicate lubrication on both sides of vehicle.

LUBRICANT INTERVAL

INTERVAL LUBRICANT

Spring Shackle
Fill (O)
(See note 18 and view I)

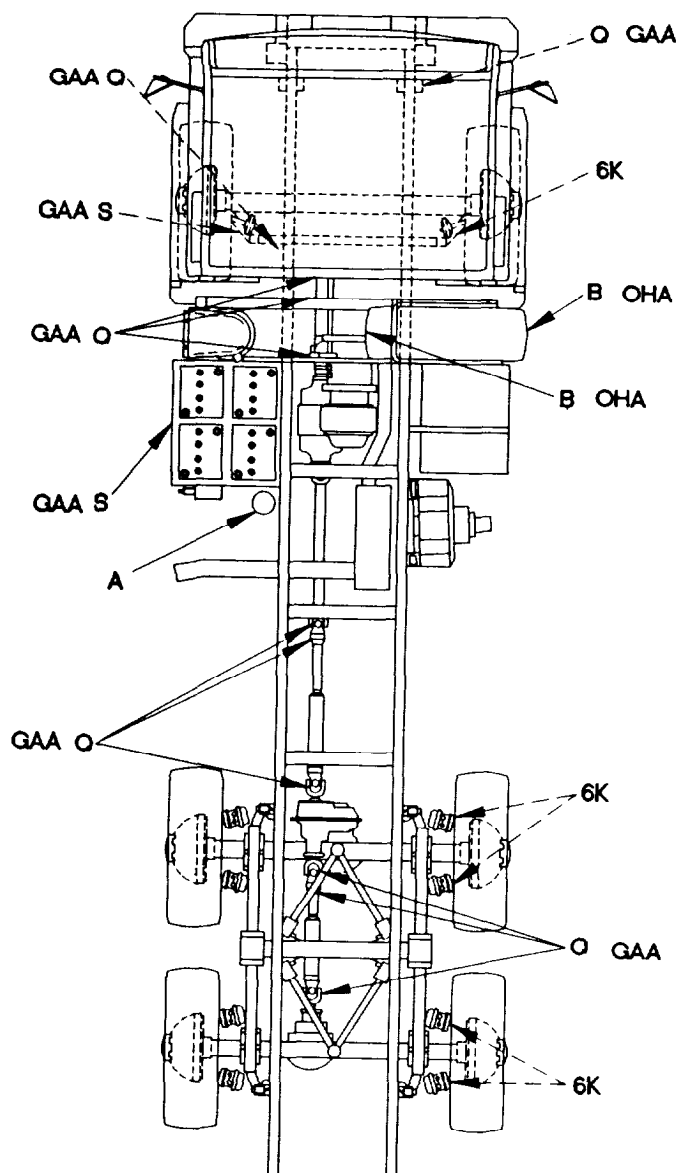
Tie Rod Ends
Fill (O)
(See note 13 and view N)

Universal and Slip Joints
Fill (O)
(See note 9 and view P)

Battery Posts (O)
(See note 19 and view Q)

Air Dryer (O)
(See note 37 and view BB)

Universal and Slip Joints
Fill (O)
(See note 9 and view P)



Spring Bolt
Fill (O)
(See note 18 and view H)

Brake Wedge and Air Chamber (O)
(See note 21 and view L)

Backup Hydraulic Pump Drain and Fill (O)
(See note 10 and view R)

Air/Hydraulic Power Unit Drain and Fill (O)
(See note 10 and view S)

Brake Wedge and Air Chamber (O)
(See note 21 and view M)

Universal Joint and Slip Joints
Fill (O)
(See note 9 and view P)

Brake Wedge and Air Chamber (O)
(See note 21 and view M)

CHASSIS

NOTE: Dashed arrows indicate lubrication on both sides of vehicle.

H-7. 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)

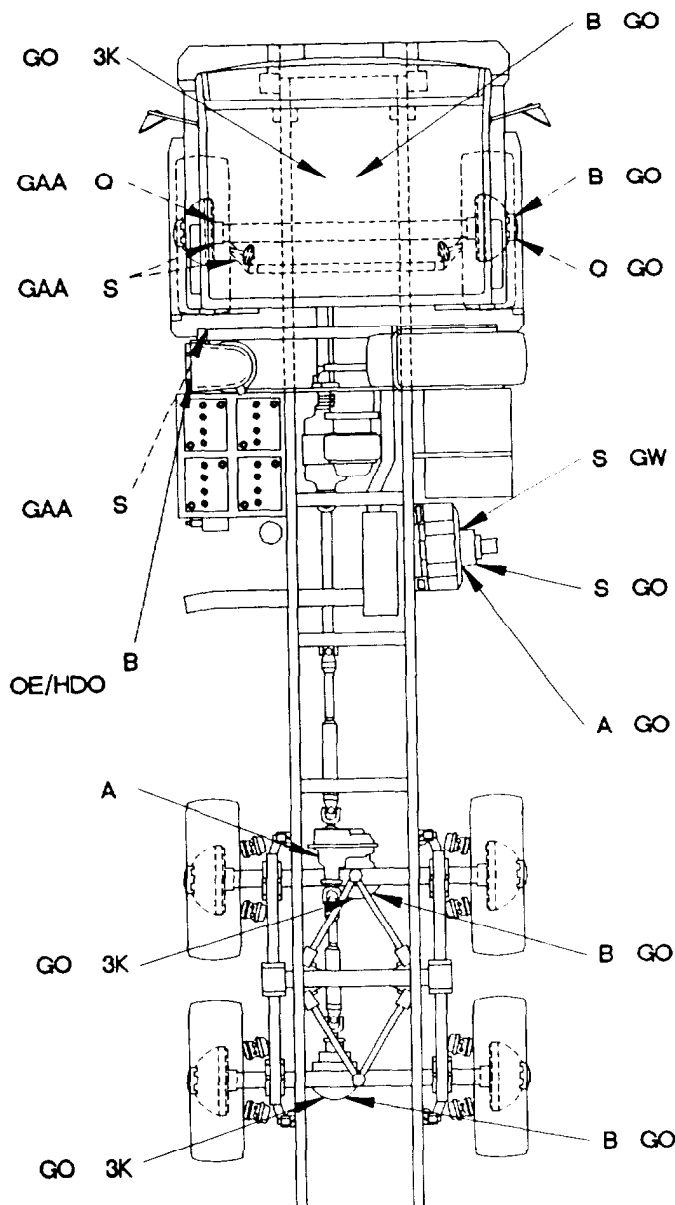
Front Lifting Beam
Clean and Fill (O)
(See note 36 and view AI)

Hydraulic Reservoir and Filter
Drain and Fill (O)
(See note 8 and view X)

Intermediate Axle Screen and Plug Oil Filter Assembly
Clean (O)
(See note 31 and view AH)

Intermediate Axle
Check and Fill (O)
(See note 11 and view T)

Rear Axle
Check and Fill (O)
(See note 11 and view T)



Front Axle
Drain and Fill (O)
(See note 11 and view T)

Wheel End Planetary Hubs
Drain and Fill (O)
(See note 12 and view V)

Wheel End Planetary Hubs
Check and Fill (O)
(See note 12 and view V)

15K Self-Recovery Winch (SRW) Cable
Fill (O)
(See note 14 and view W)

15K Self-Recovery Winch (SRW)
Check and Fill (O)
(See note 15 and view Y)

15K Self-Recovery Winch (SRW)
Drain and Fill (O)
(See note 15 and view Y)

Intermediate Axle
Drain and Fill (O)
(See note 11 and view T)

Rear Axle
Drain and Fill (O)
(See note 11 and view T)

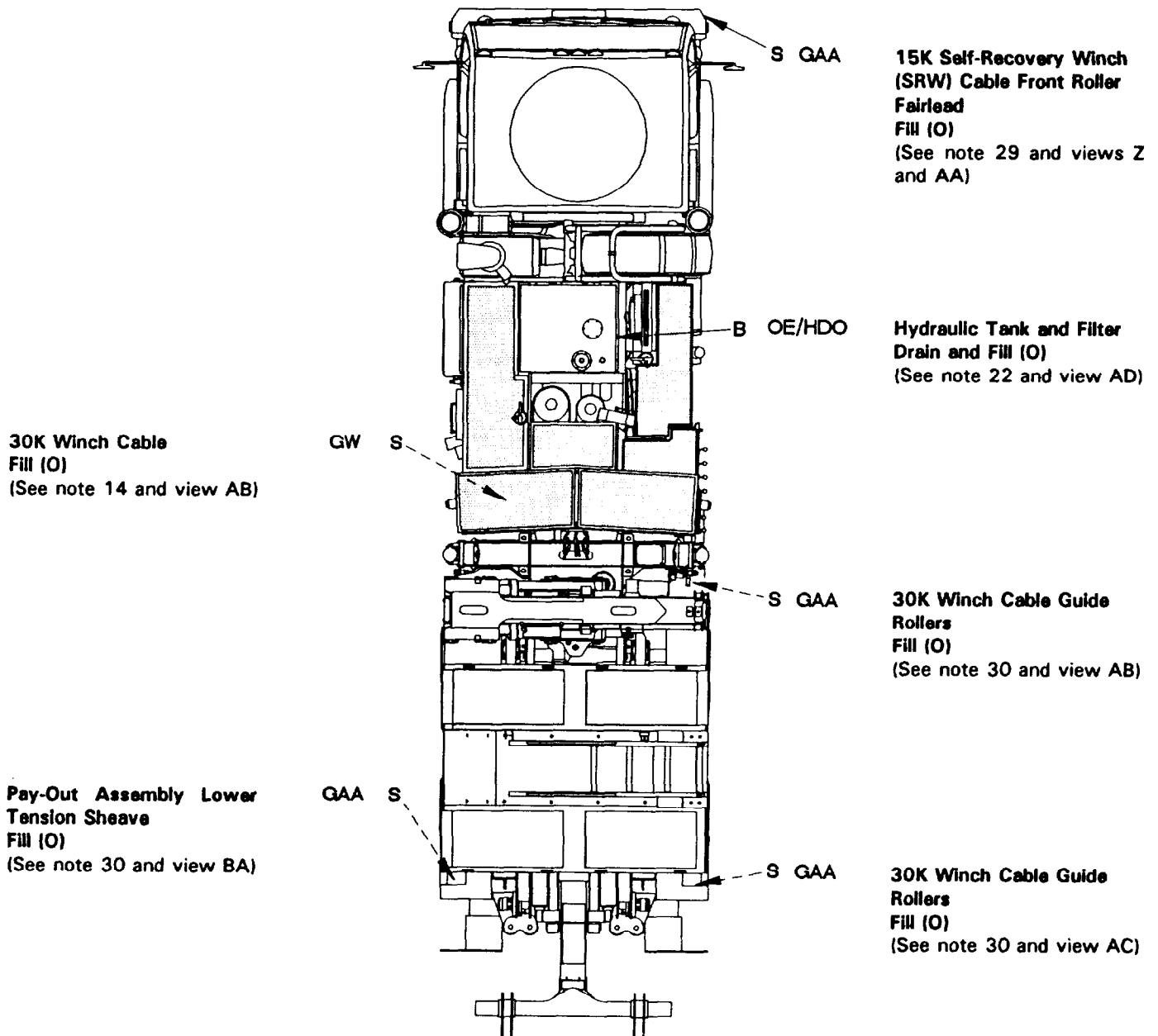
4APPH031

CHASSIS

NOTE: Dashed arrows indicate lubrication on both sides of vehicle.

LUBRICANT INTERVAL

INTERVAL LUBRICANT



4APPH04A

M1089

NOTE: Dashed arrows indicate lubrication on both sides of vehicle.

H-7. LUBRICATION LOCATOR VIEWS (CONT)

LUBRICANT INTERVAL

INTERVAL LUBRICANT

**Erection Cylinder and
Tension Link Pivots**
Fill (O)
(See note 34 and view AL)

Lift Cylinder Pivots
Fill (O)
(See note 34 and view AJ)

Erection Cylinder Pivots
Fill (O)
(See note 34 and view AK)

Tension Link Pivots
Fill
(See note 34 and view AL)

Turntable Bearing
Fill (O)
(See note 32 and view AP)

Turntable Gearbox
Check and Fill (O)
(See note 25 and view AQ)

Hoist Cable
Fill (O)
(See note 14)

**Turntable Bearing and
Pinion Gear Teeth**
Fill (O)
(See note 26 and view AM)

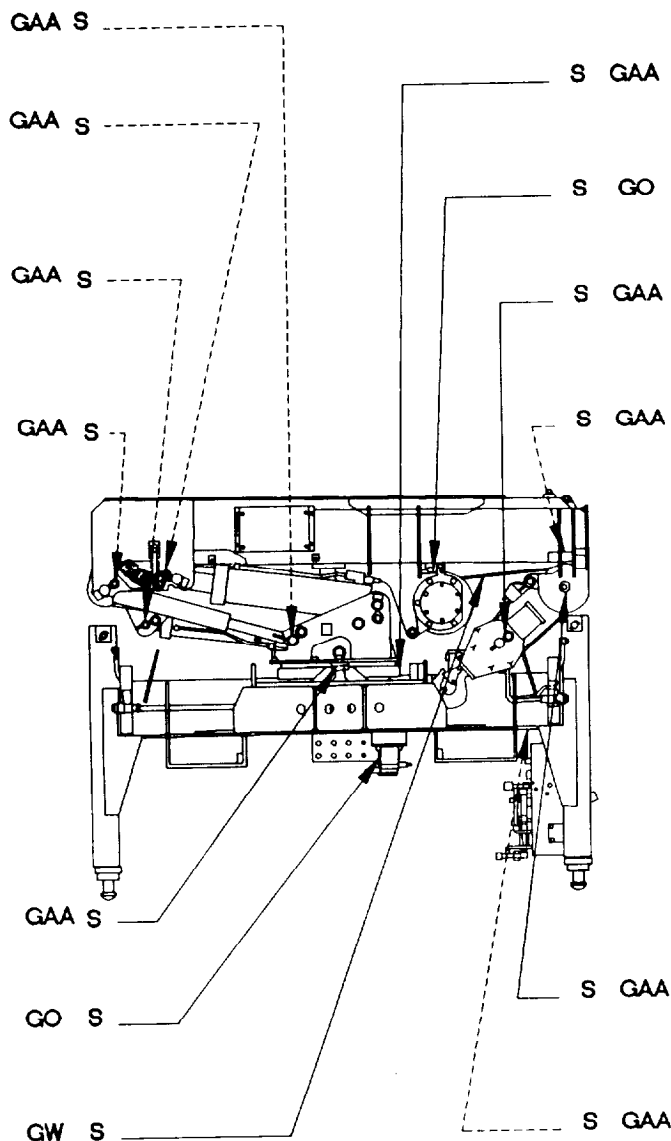
Hoist
Check and Fill (O)
(See note 24 and view AN)

Hook Block Sheave
Fill (O)
(See note 34 and view AO)

Boom Wear Pads
Fill (O)
(See note 23)

Boom Sheave
Fill (O)
(See note 34 and view AR)

Top and Bottom Plate
Fill (O)
(See note 33)



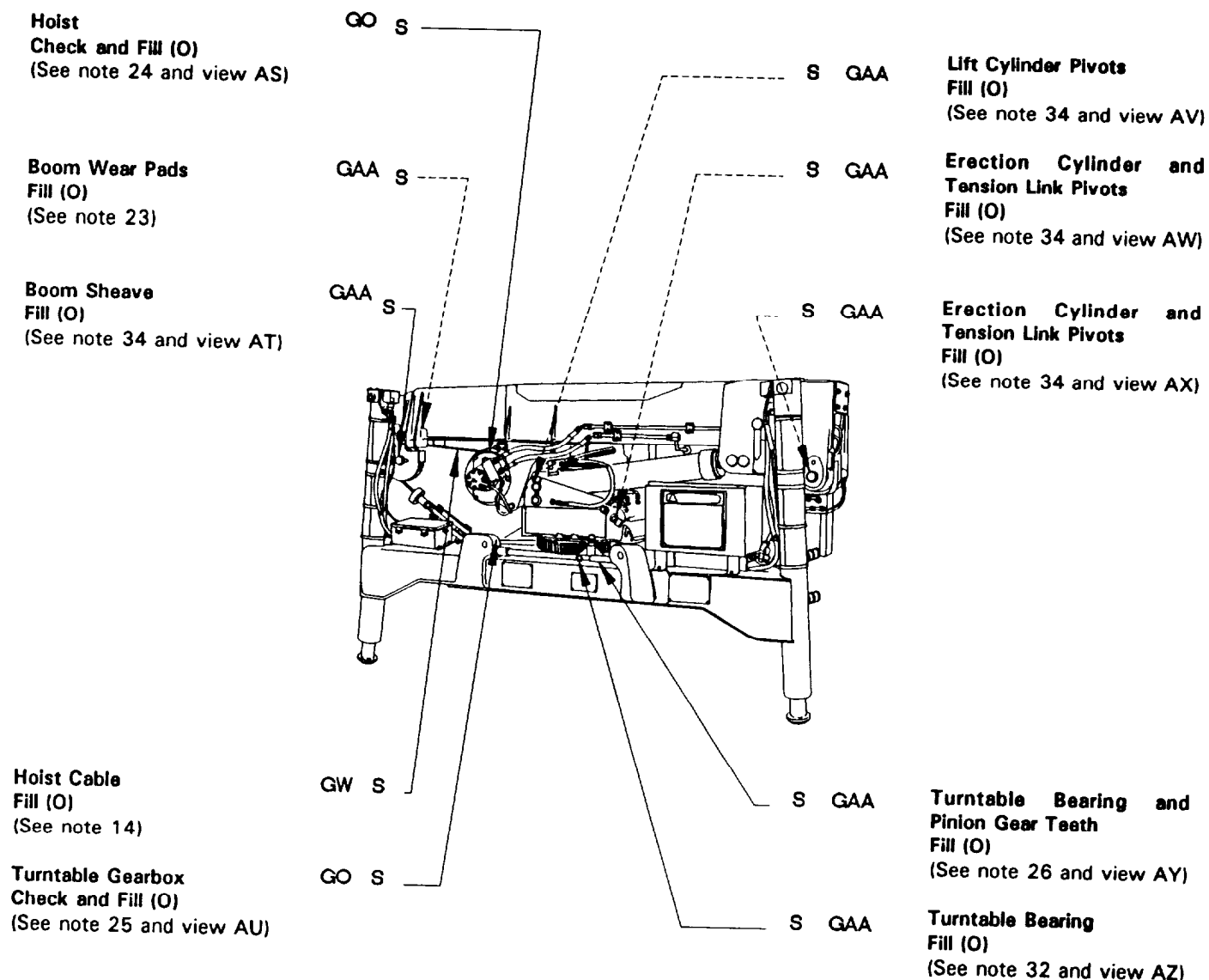
4APPH05A

M1089 MATERIAL HANDLING CRANE (MHC)

NOTE: Dashed arrows indicate lubrication on both sides of vehicle.

LUBRICANT INTERVAL

INTERVAL LUBRICANT



4APPH06A

M1084/M1086 MATERIAL HANDLING CRANE (MHC)

NOTE: Dashed arrows indicate lubrication on both sides of vehicle.

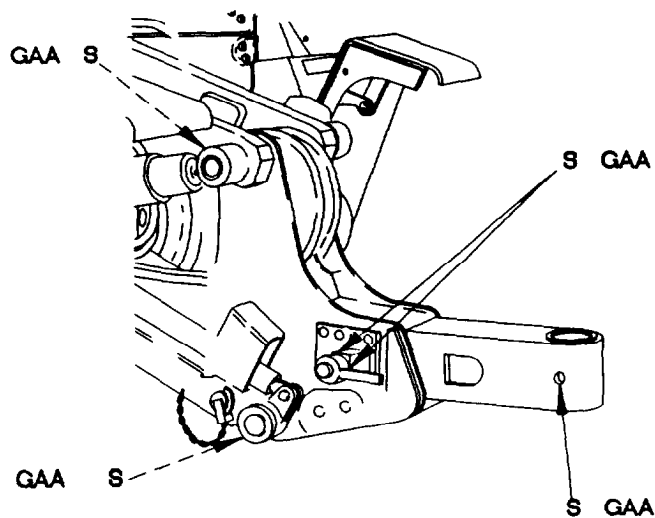
H-7. LUBRICATION LOCATOR VIEWS (CONT)

LUBRICANT INTERVAL

INTERVAL LUBRICANT

Left and Right Lift Cylinder
Pivots
Fill (O)
(See note 35)

Left and Right Lower Arm
Pivots
Fill (O)
(See note 35)



Camlock Assembly
Fill (O)
(See note 35)

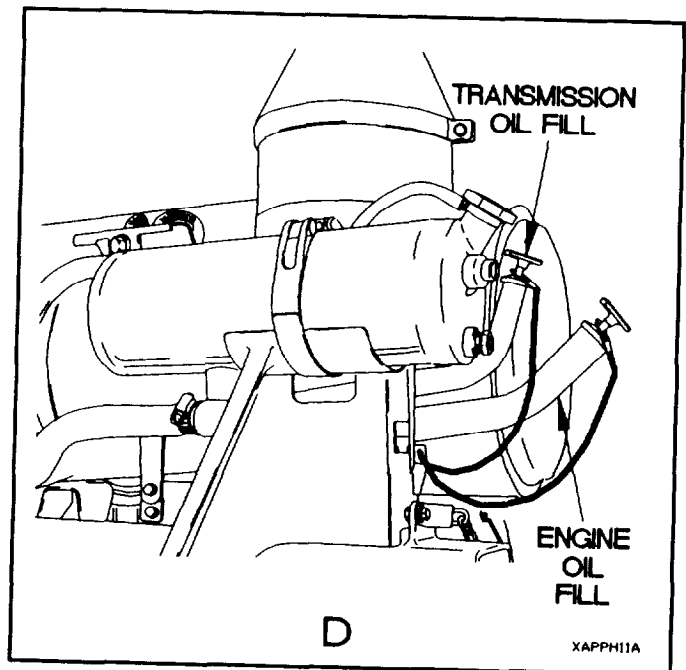
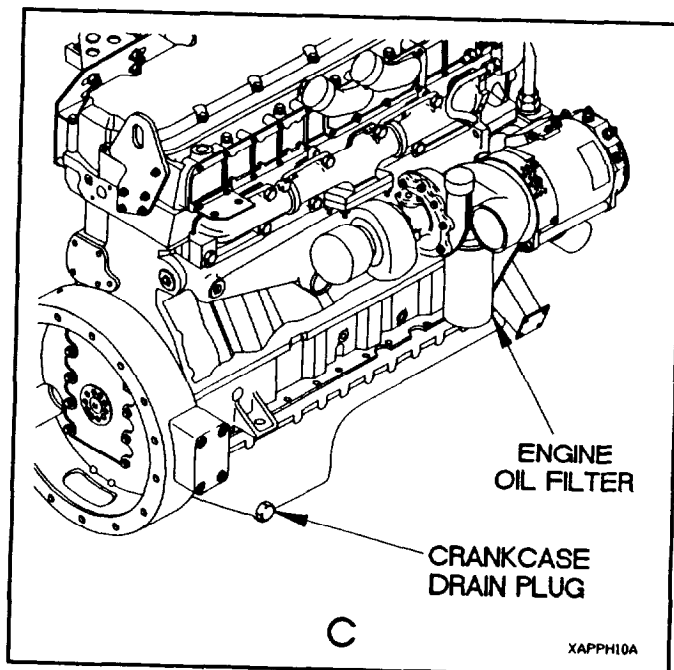
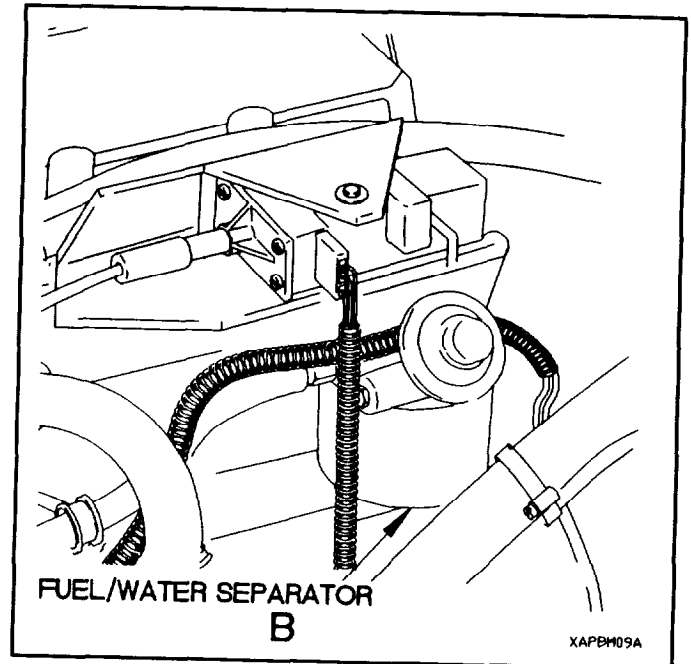
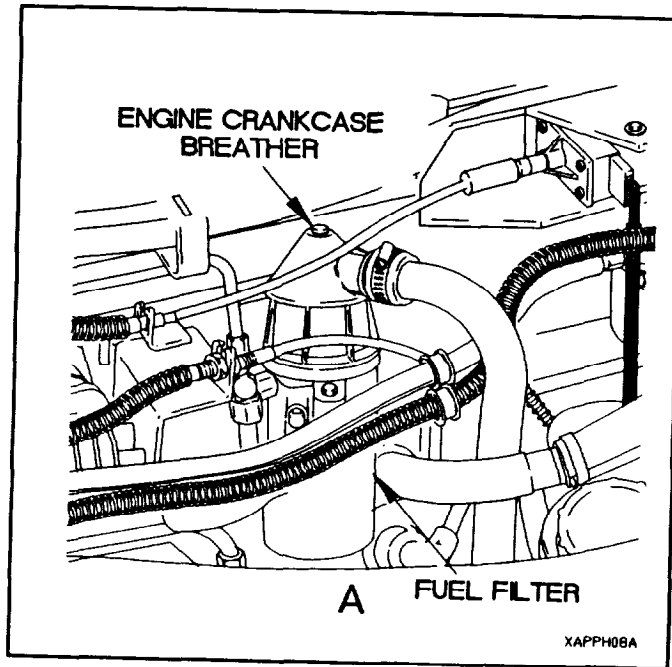
Crossbar Bushing
Fill (O)
(See note 35)

4APPH07A

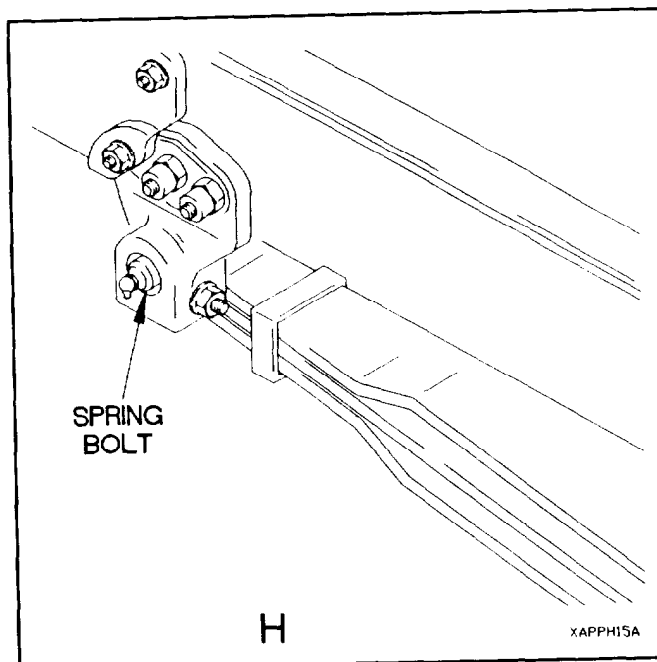
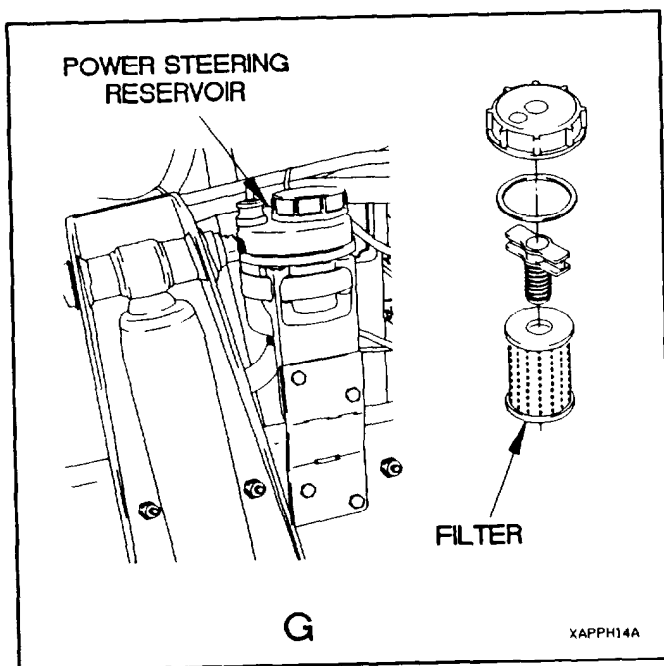
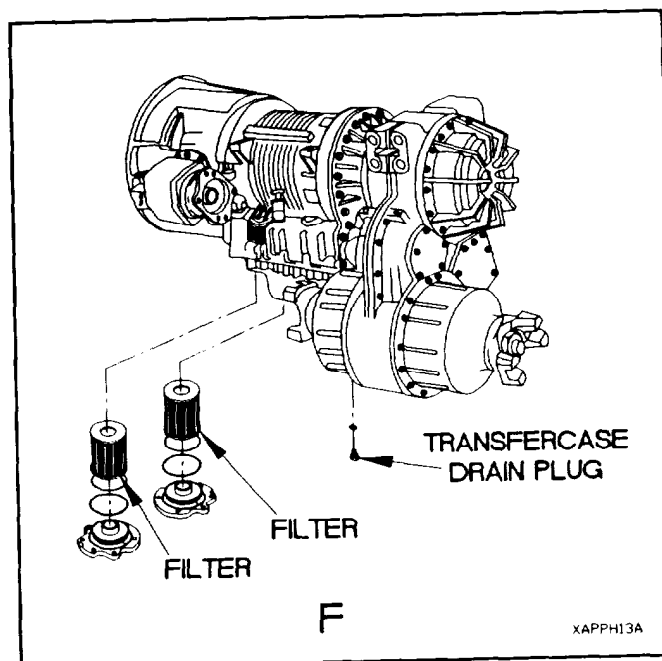
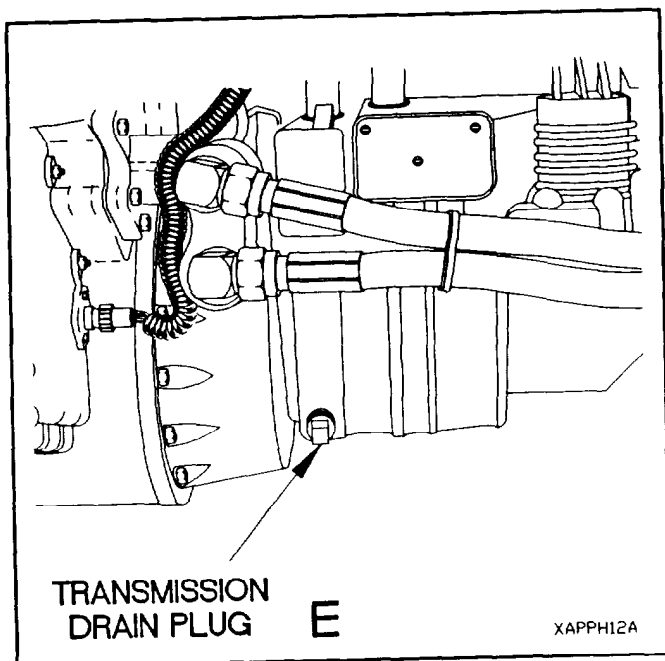
M1089 UNDERLIFT ASSEMBLY

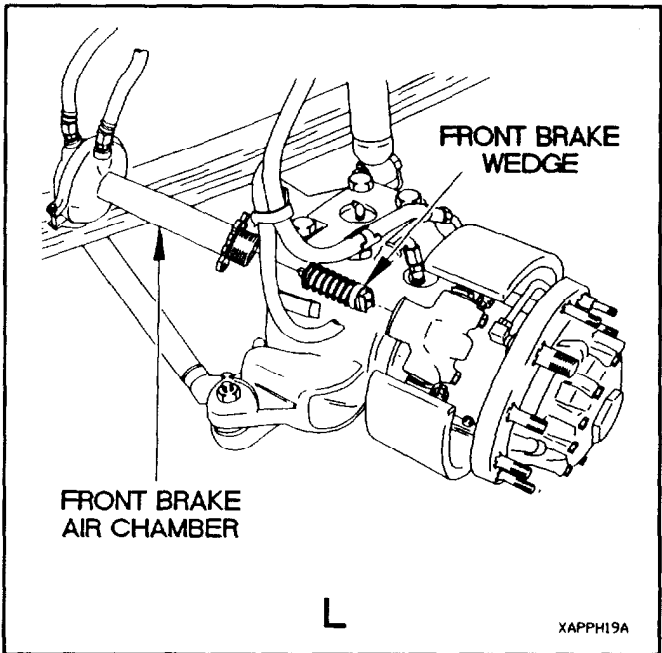
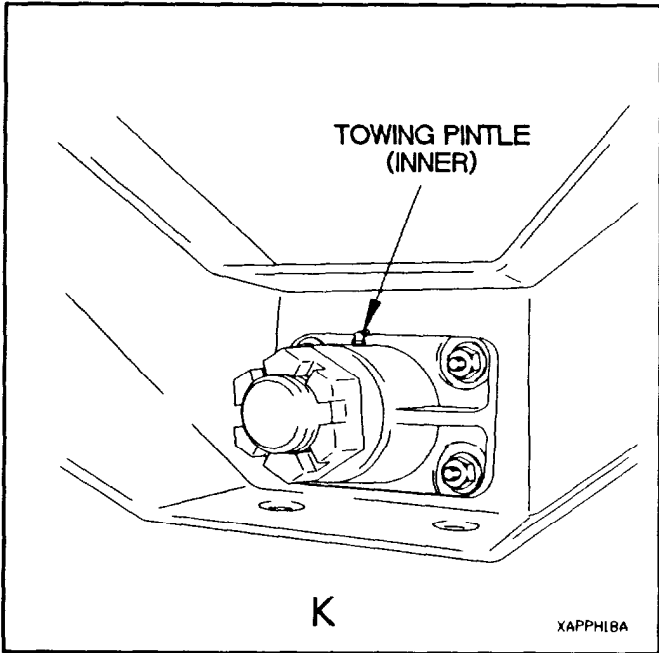
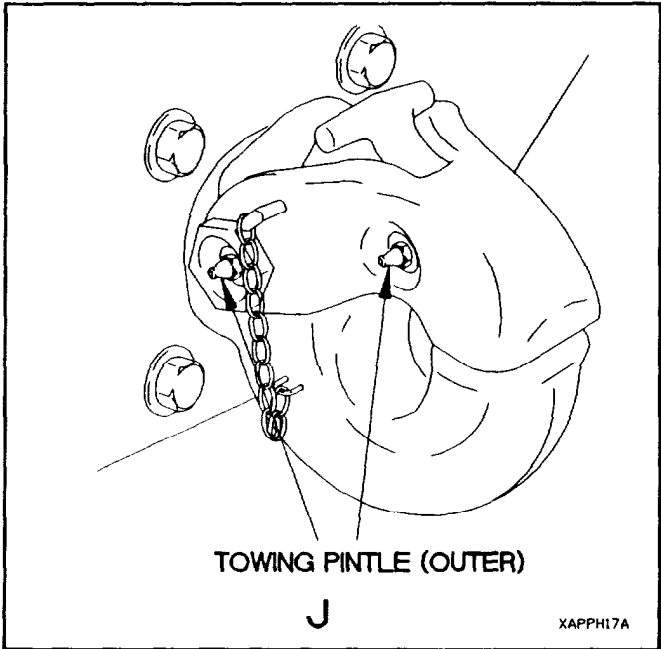
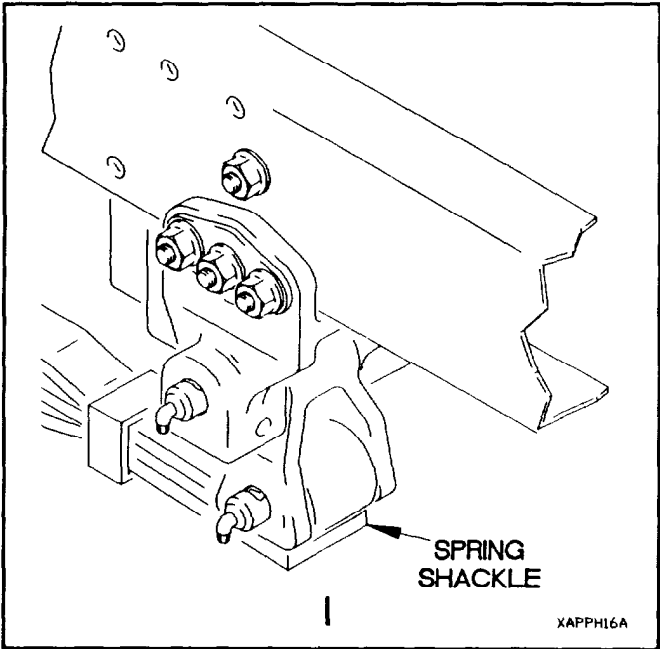
NOTE: Dashed arrows indicate lubrication on both sides of vehicle.

H-8. LUBRICATION LOCAL VIEWS

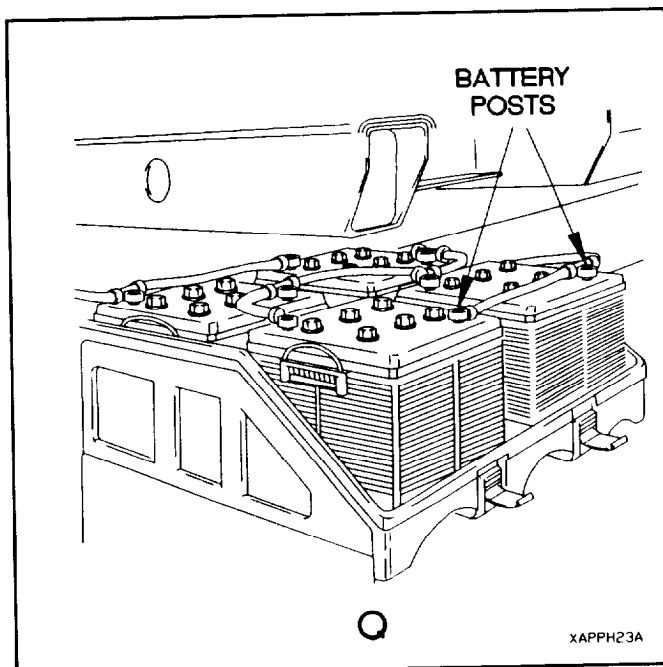
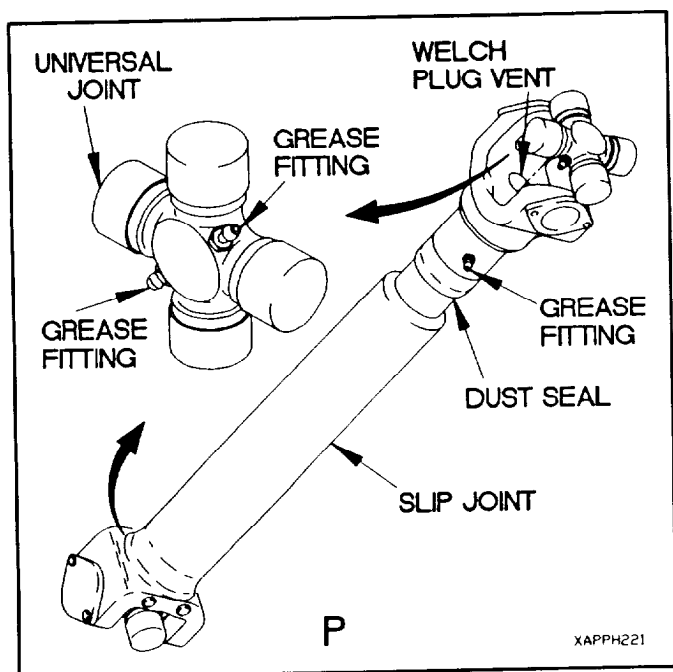
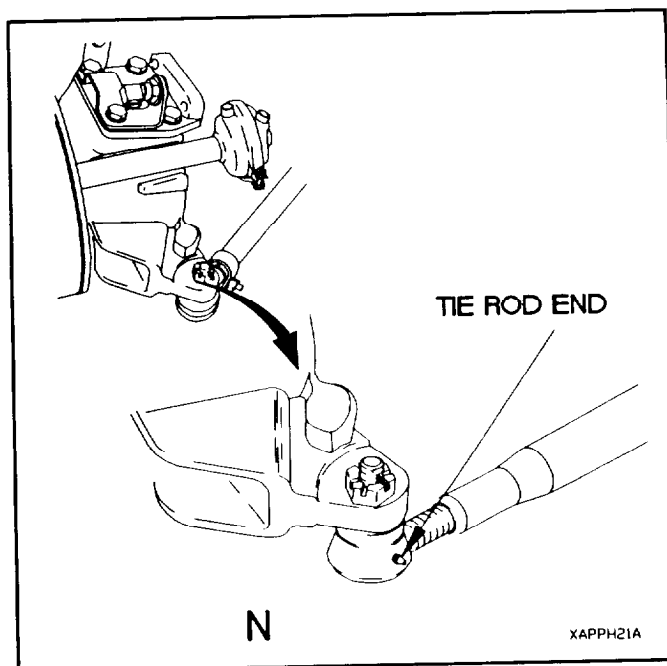
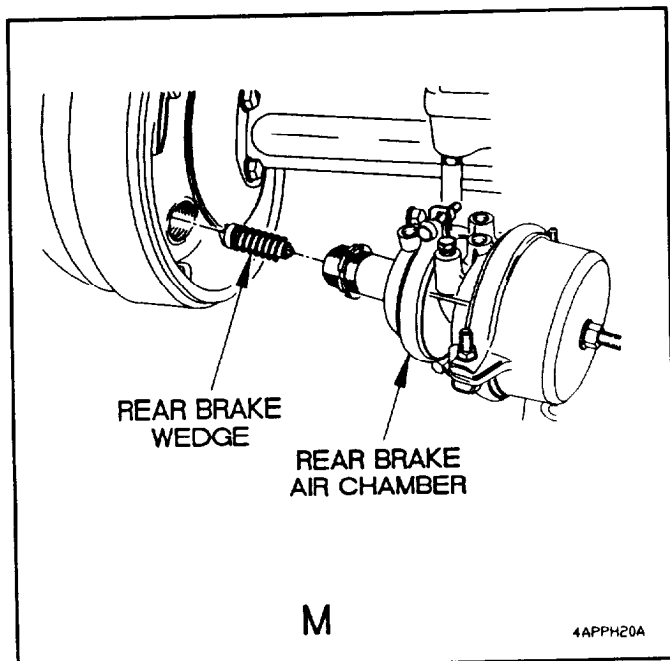


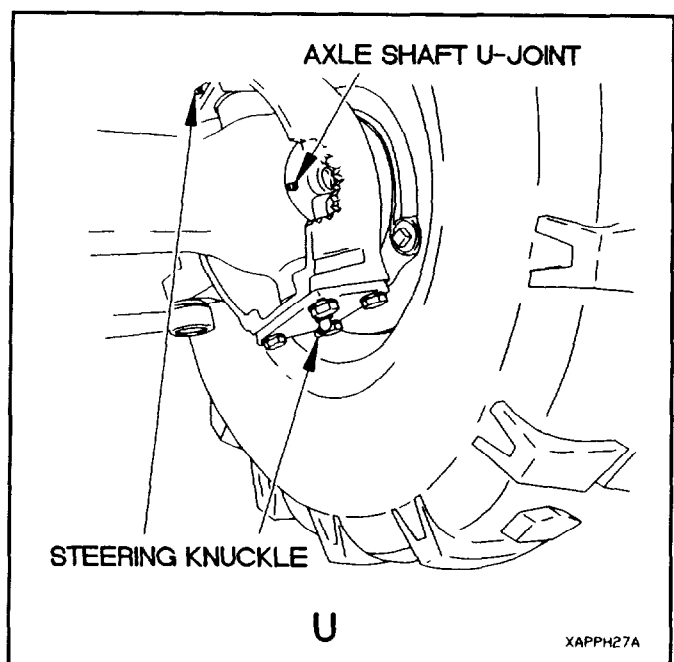
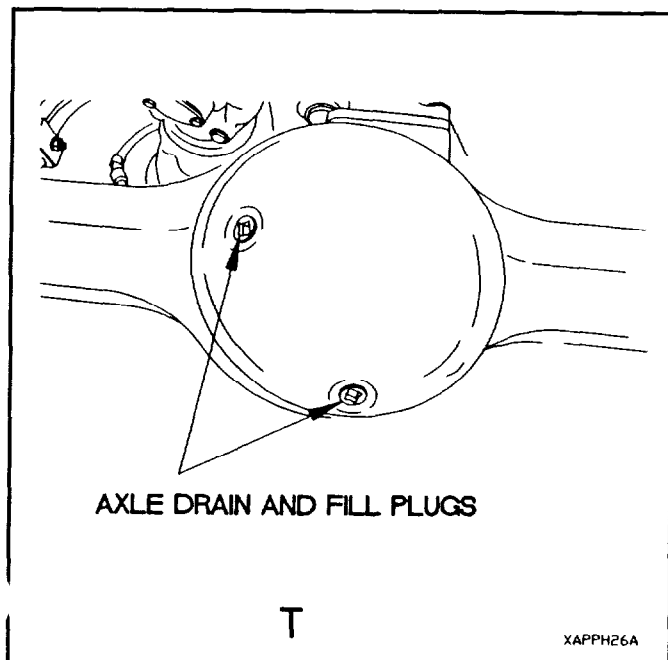
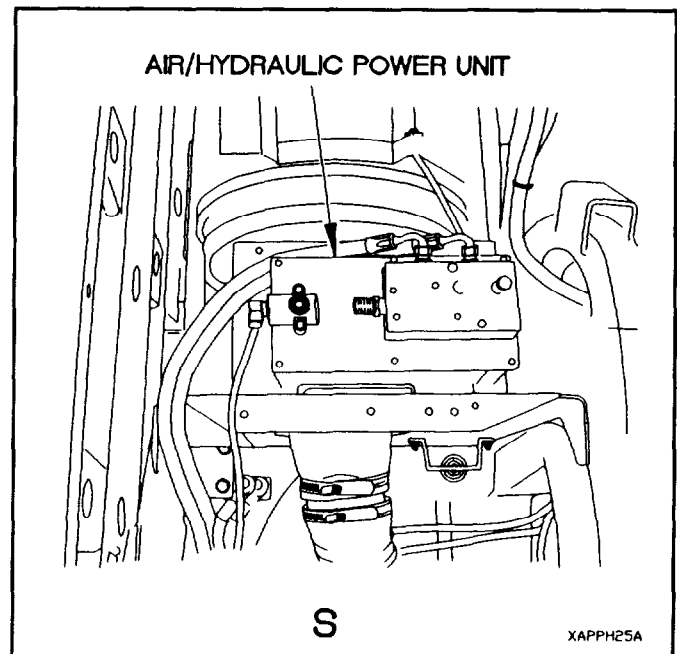
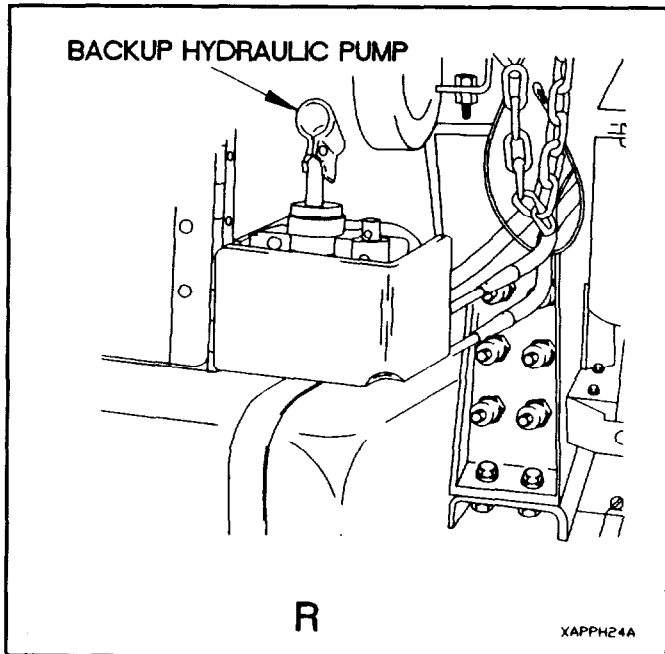
H-8. LUBRICATION LOCAL VIEWS (CONT)



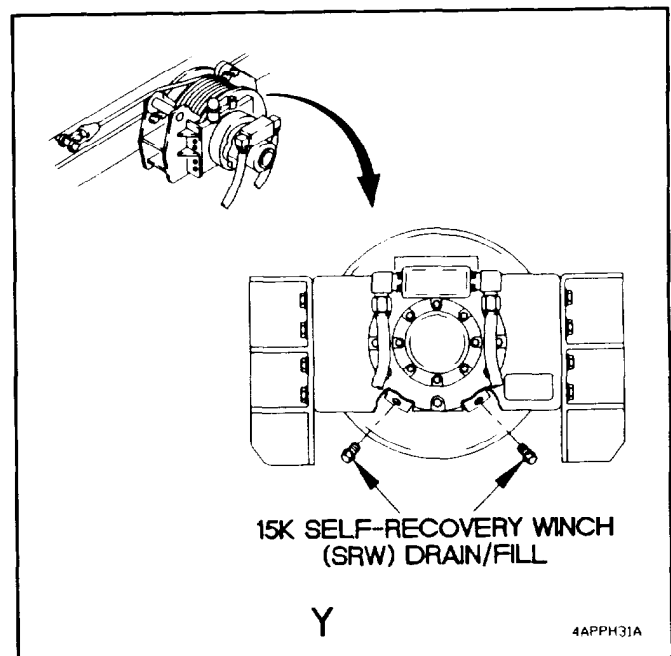
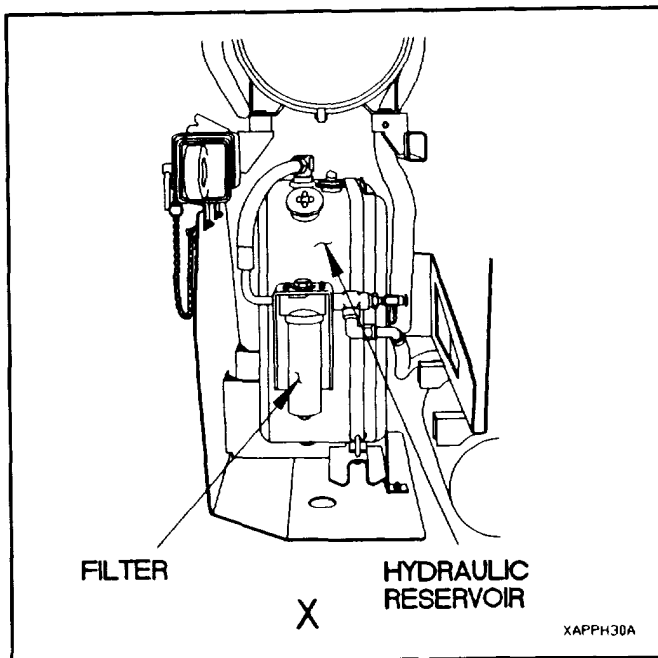
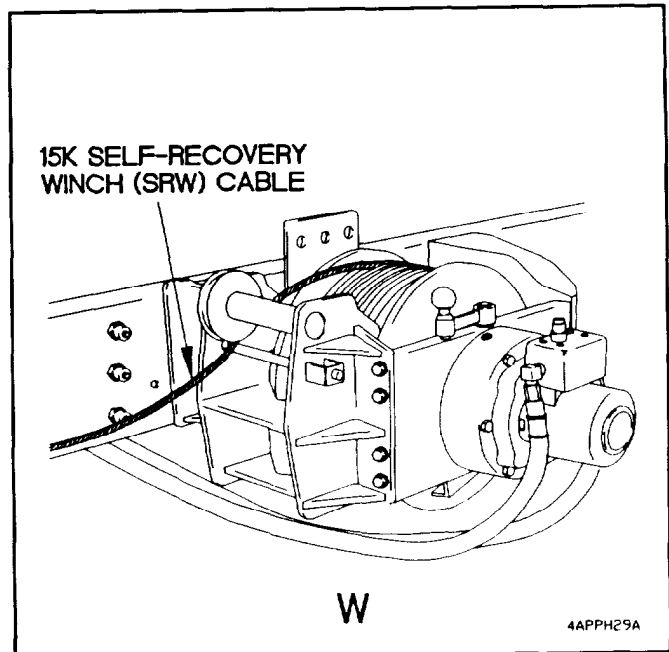
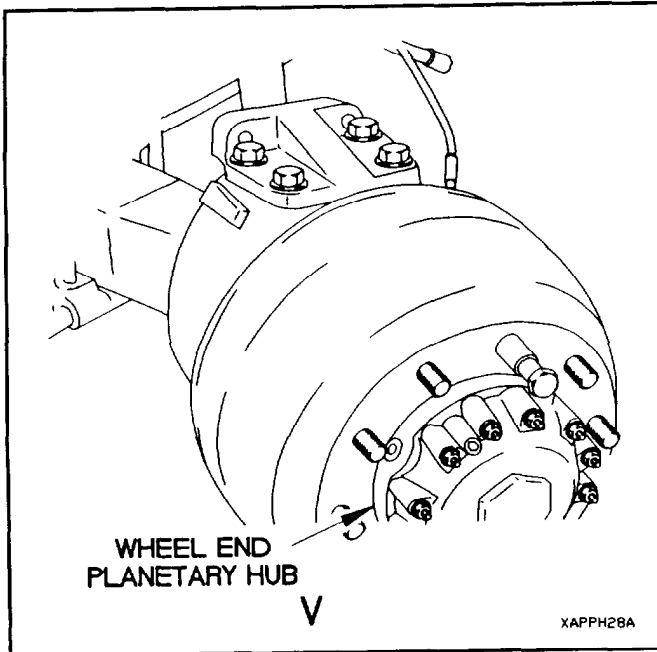


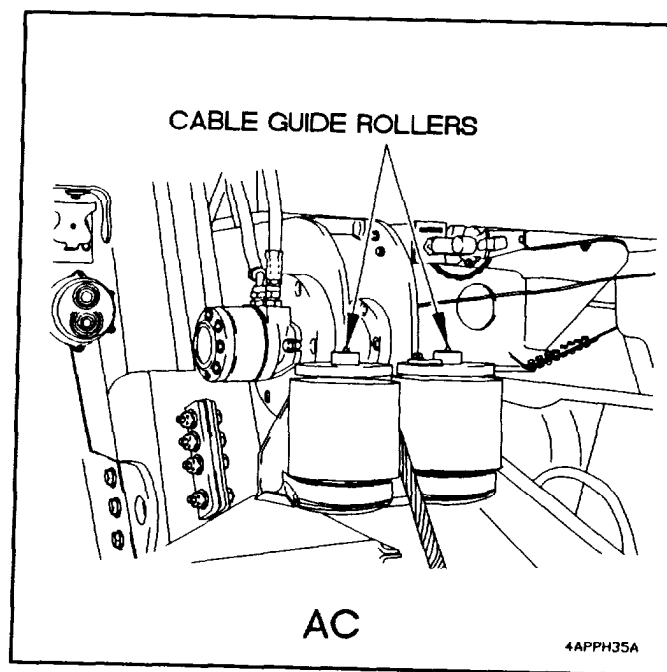
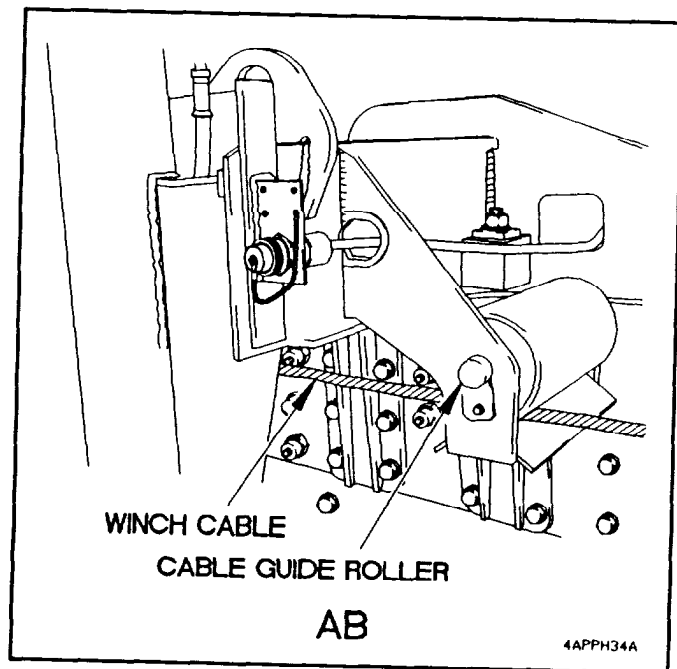
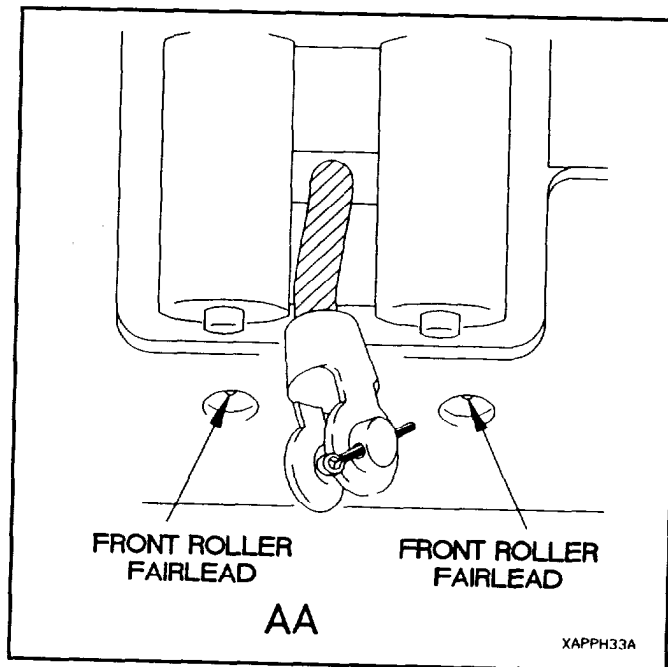
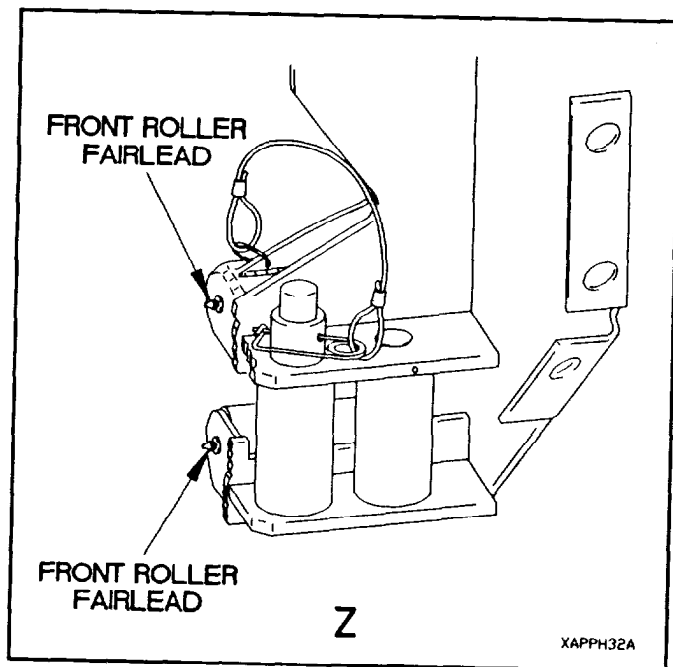
H-8. LUBRICATION LOCAL VIEWS (CONT)



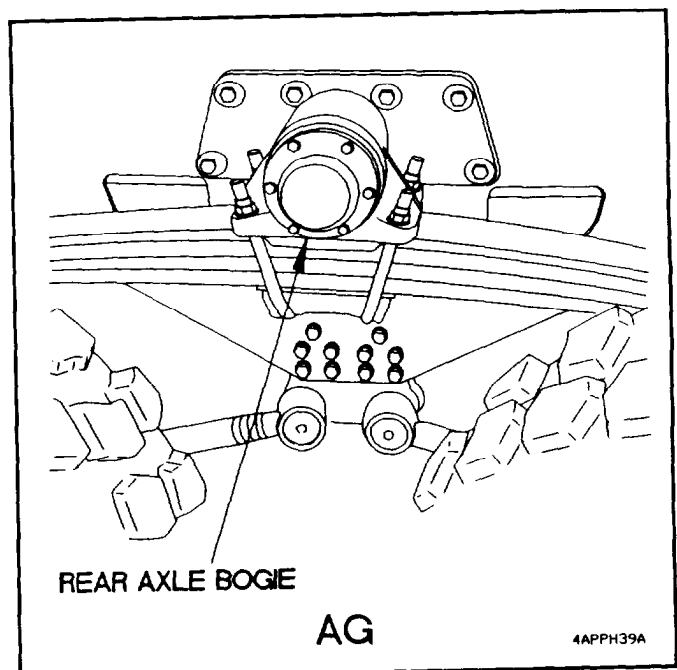
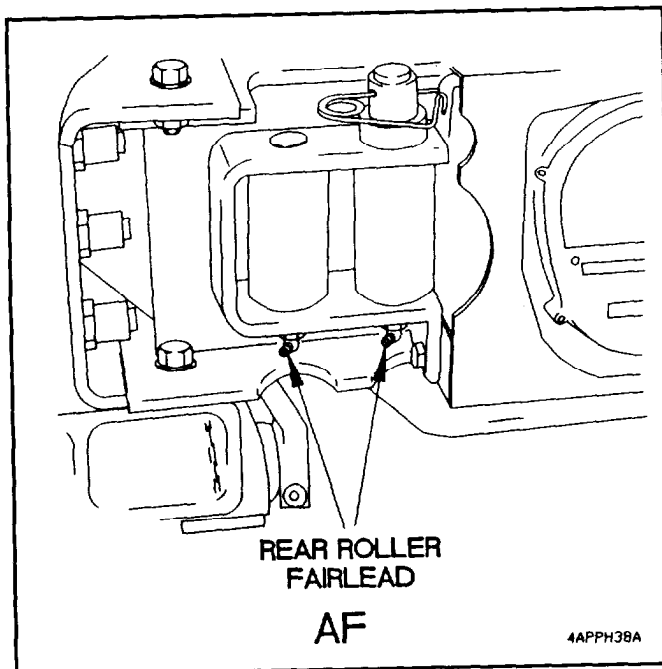
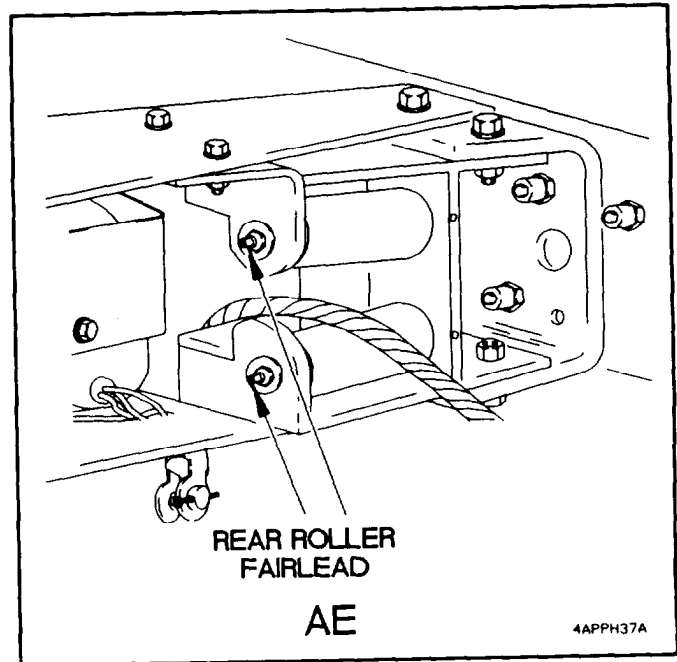
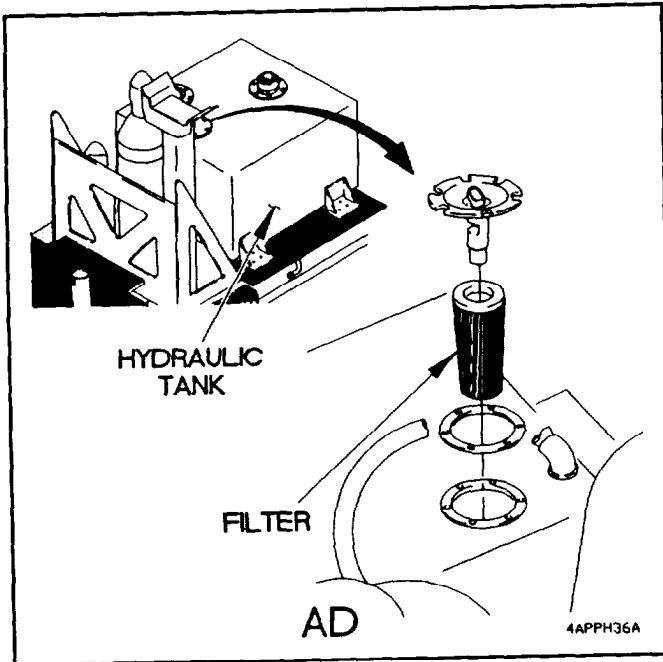


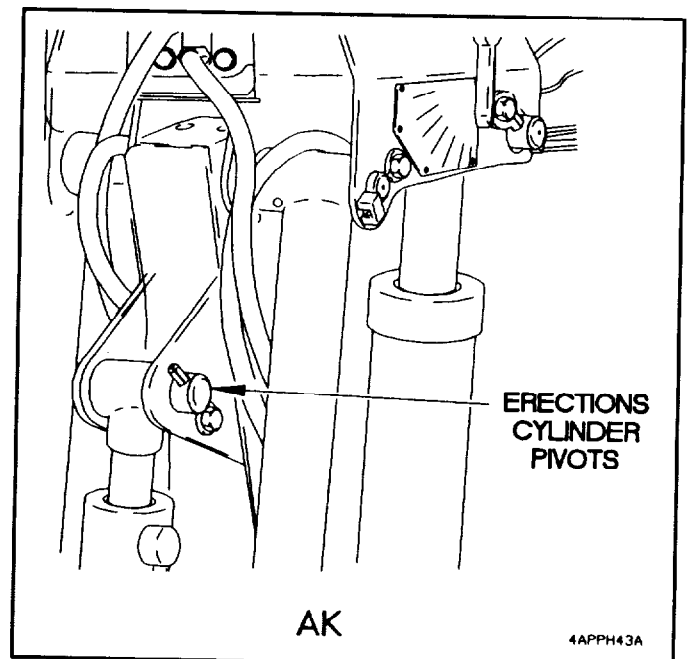
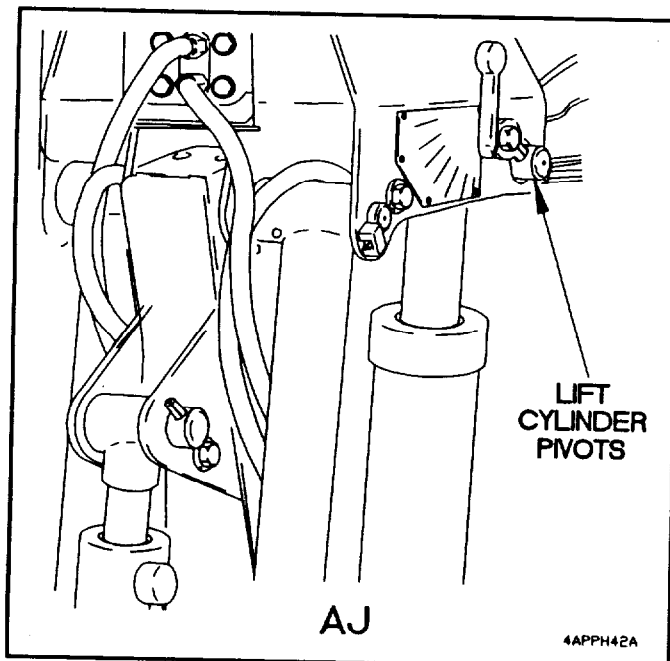
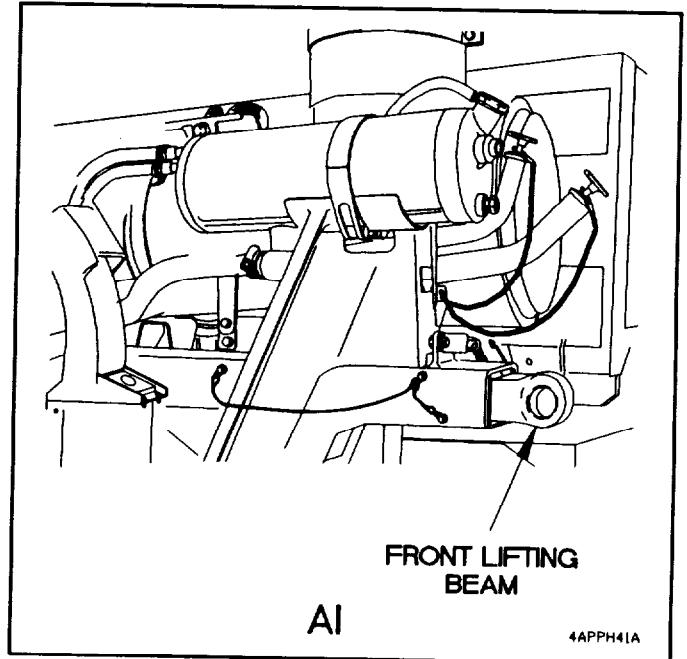
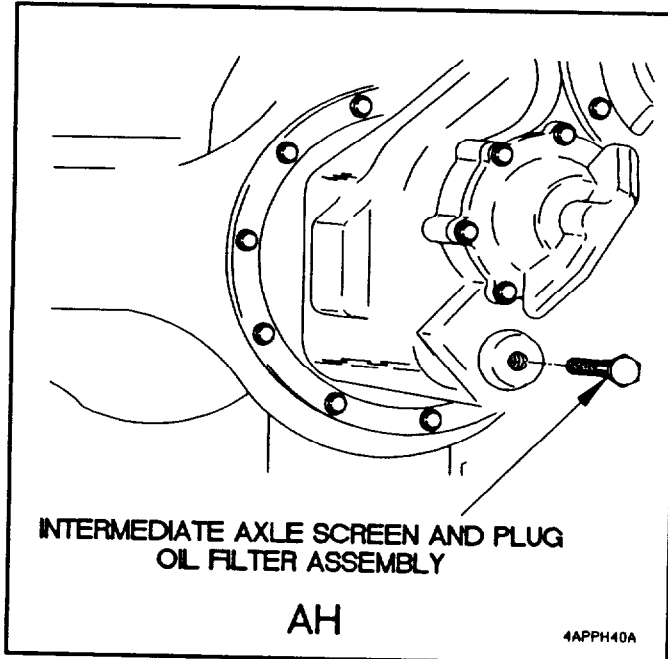
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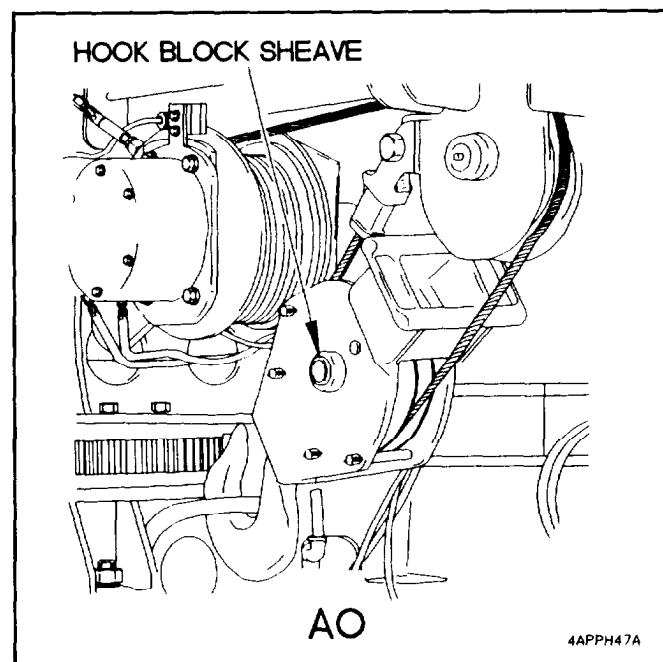
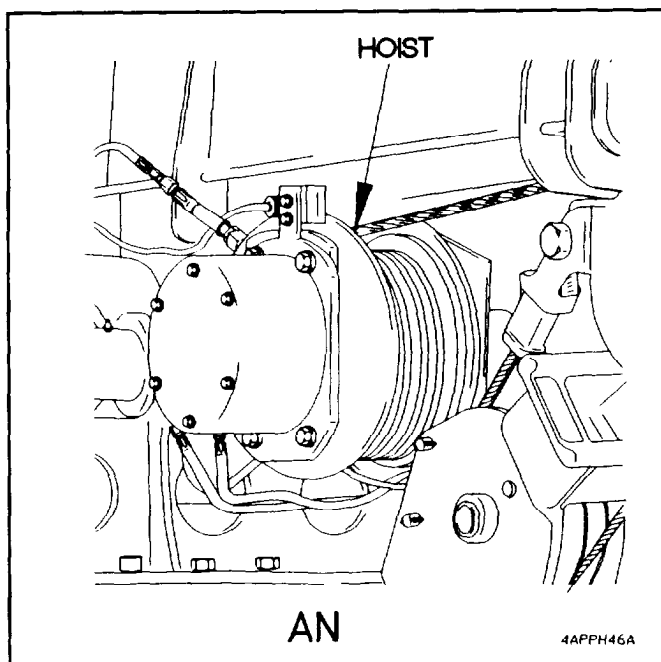
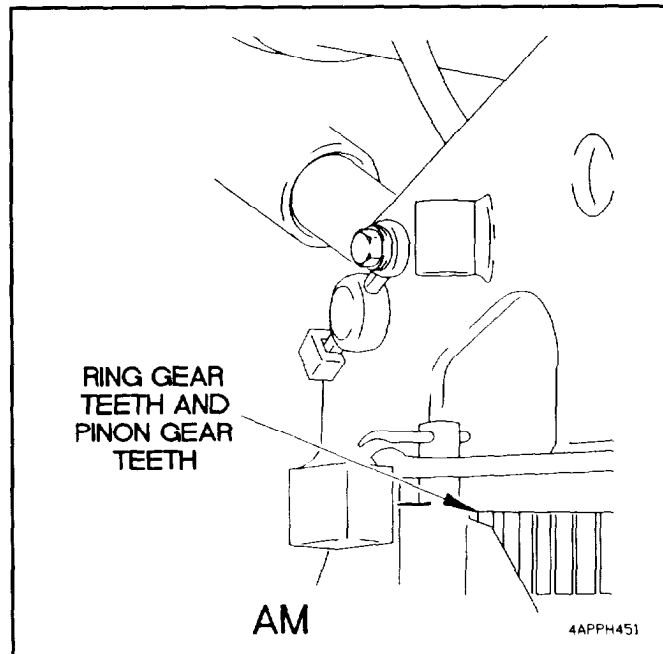
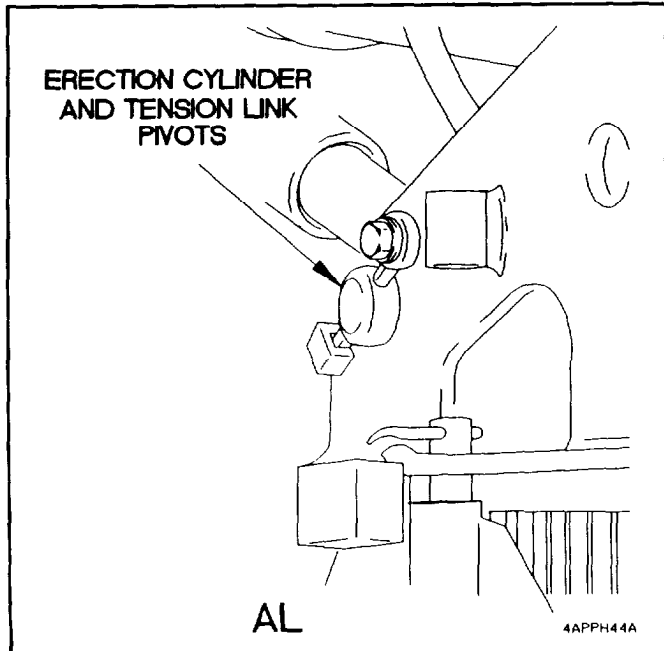


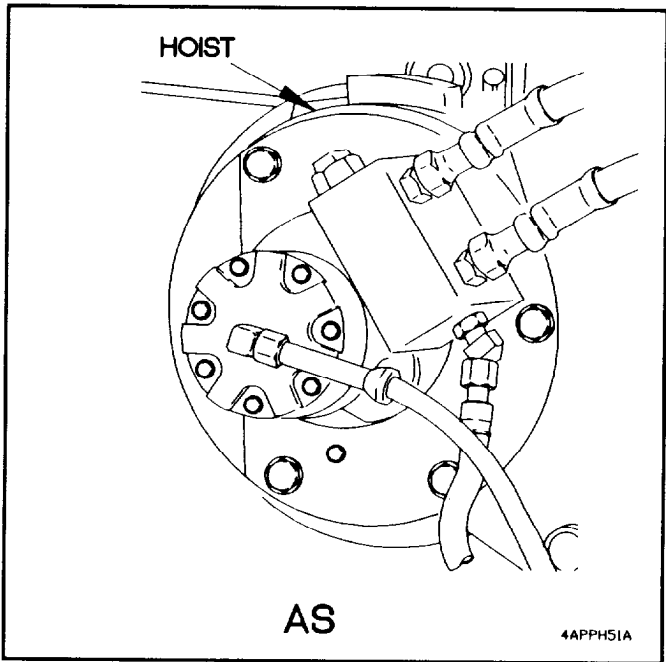
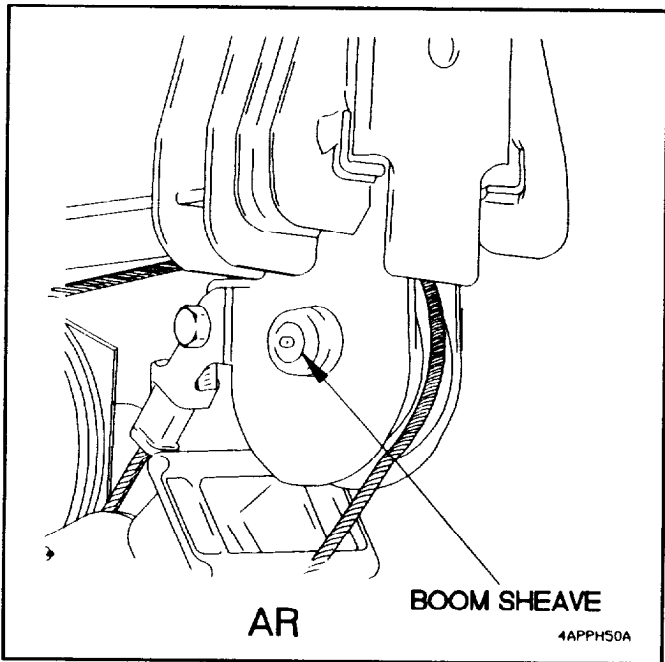
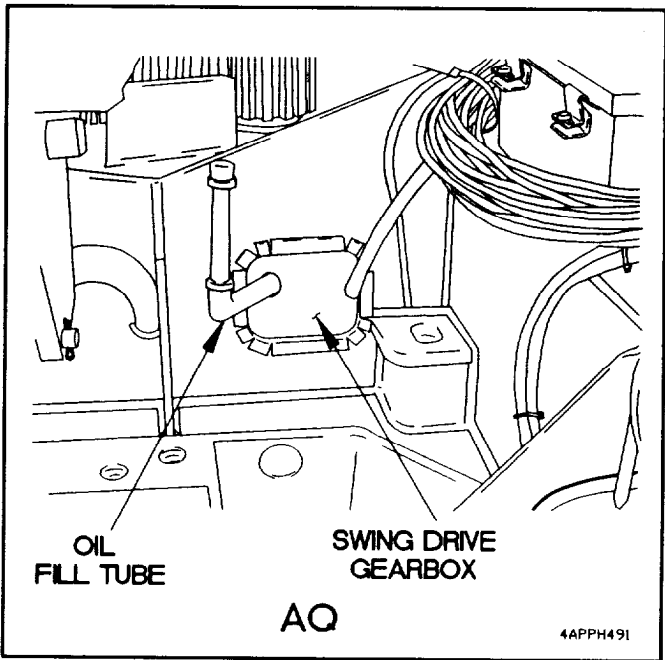
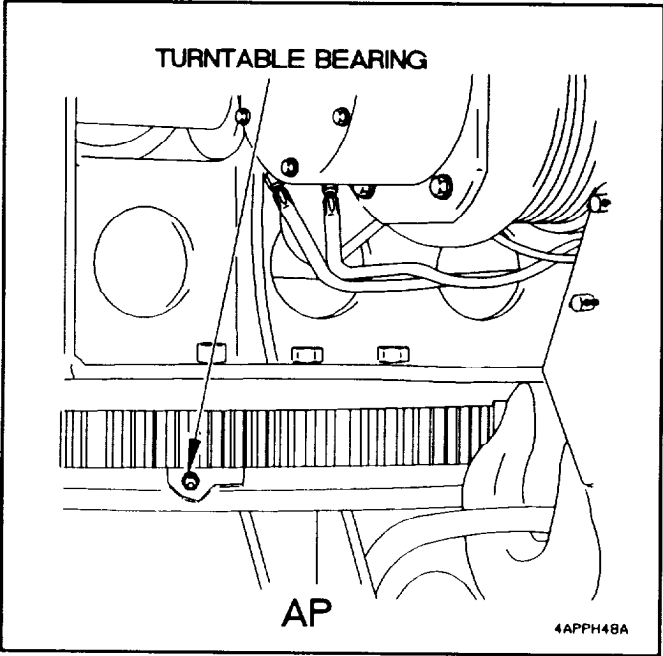
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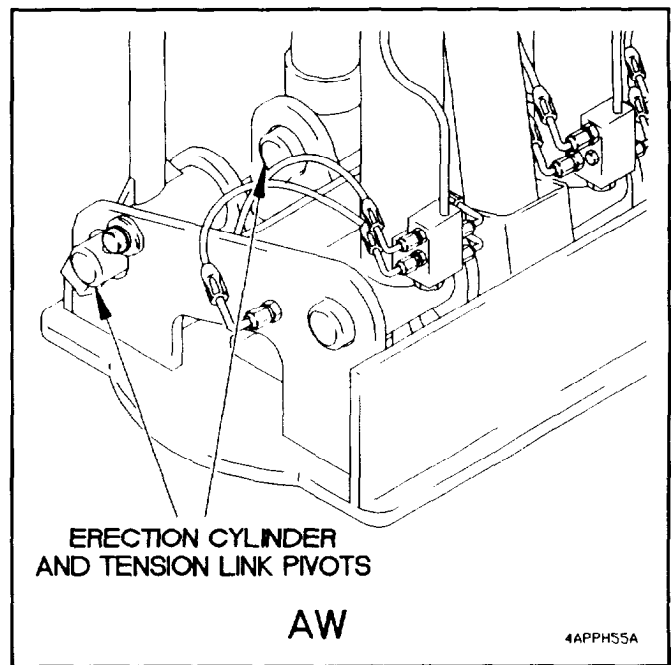
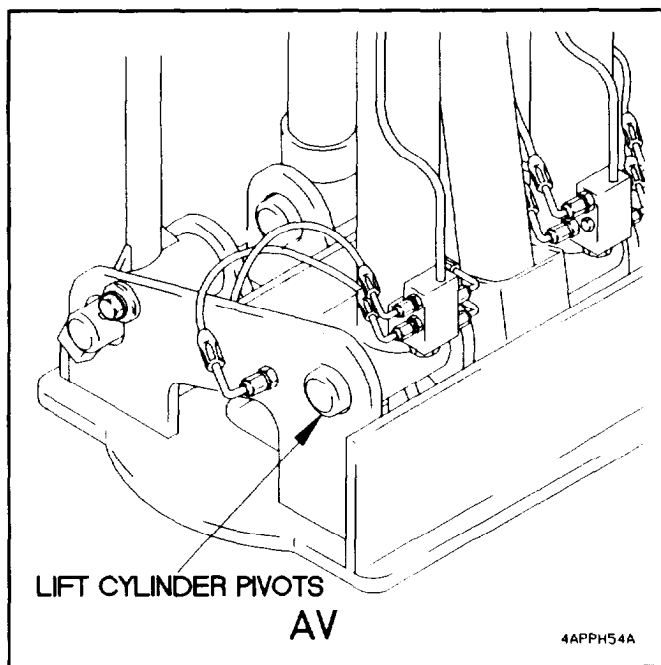
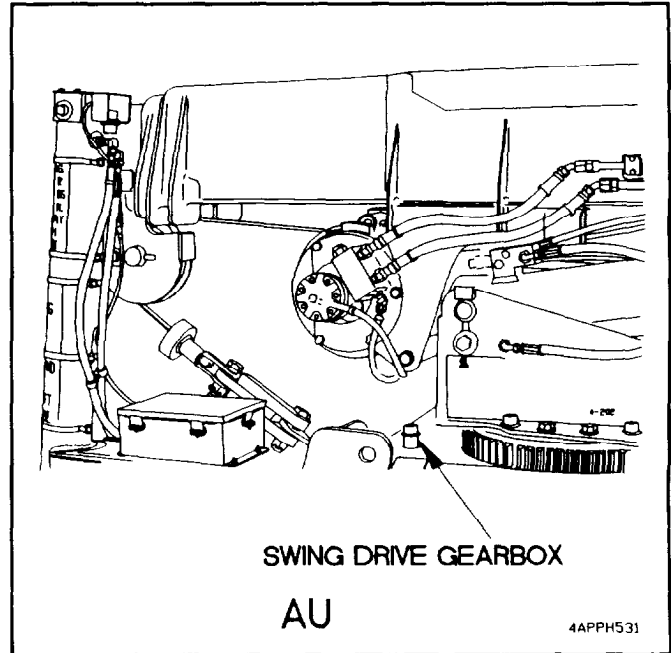
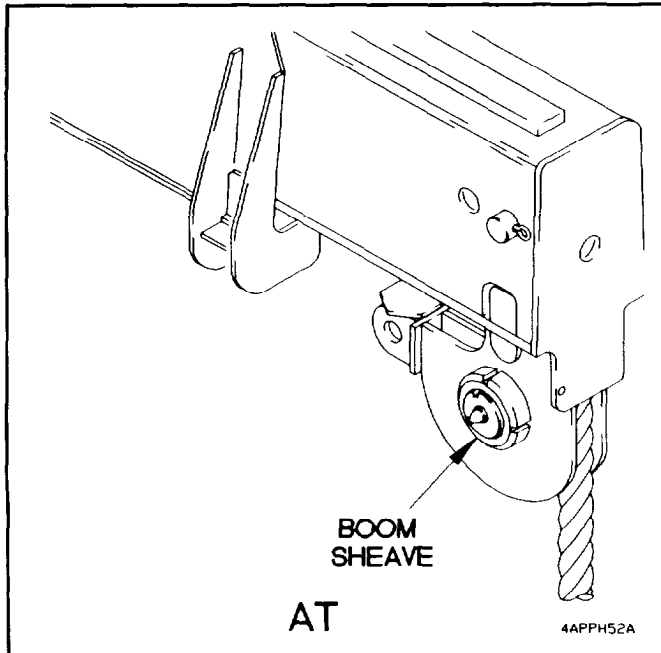


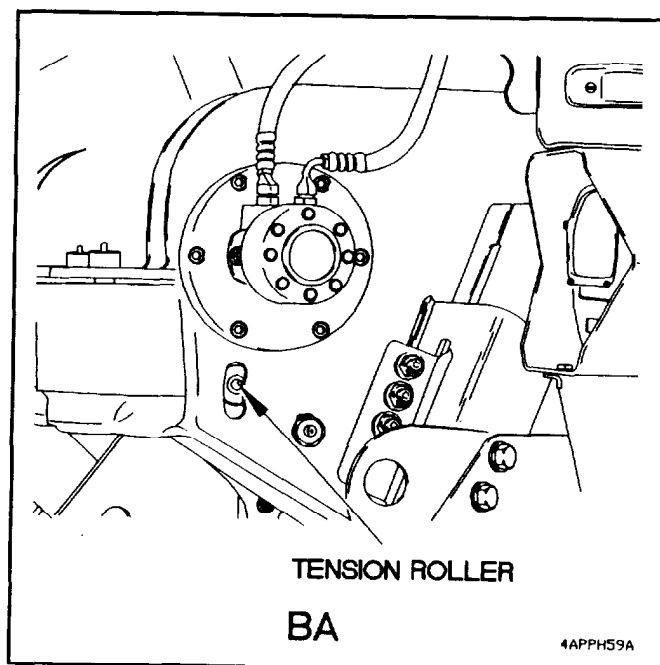
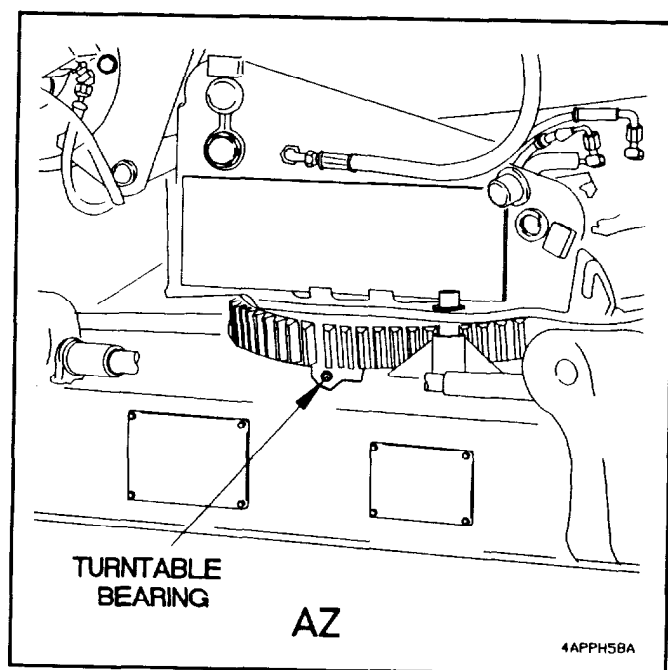
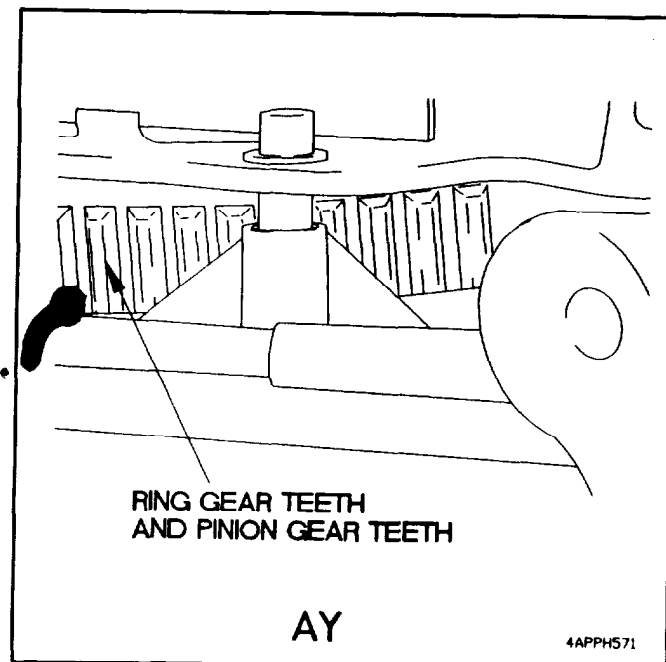
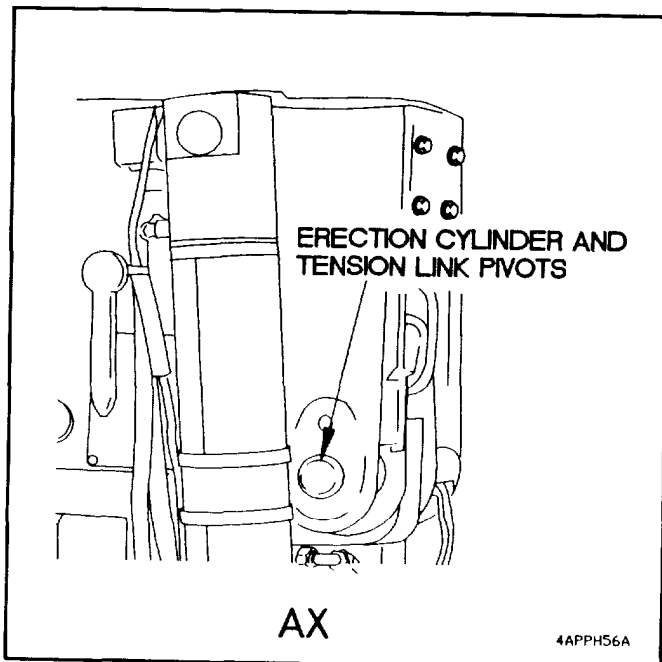
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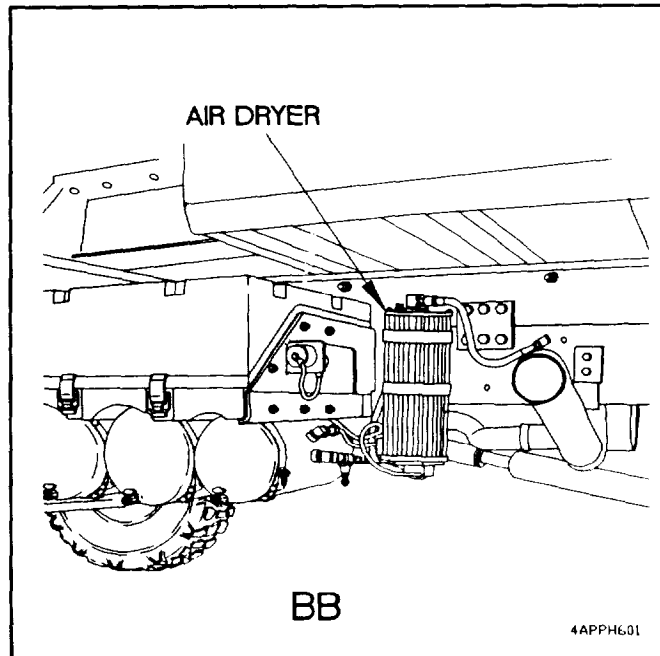


H-8. LUBRICATION LOCAL VIEWS (CONT)





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 9-2320-366-10-1). 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 (All Models Except M1089). Check oil level weekly and make sure oil level gage reads F (full). Units participating in AOAP will sample oil annually and change oil and filter as directed by AOAP. Units not participating in AOAP will change oil and filter every two years. Drain oil and refill hydraulic reservoir with OE/HDO specified for ambient operating temperature. Fill hydraulic reservoir until oil level gage reads F (full). Do not overfill. Replace oil filter each time oil is changed.

9. PROPELLER SHAFT UNIVERSAL and SLIP JOINTS.

Lubricate propeller 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.

- UNIVERSAL JOINT:
 - A. Apply grease to both grease fittings until new Qrease purges from all four bearing caps.
 - B. If grease does not purge from all four bearing caps, replace the complete U-joint.
- SLIP JOINT:
 - A. Apply Qrease until Qrease 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 Qrease does not purge from the dust seal, replace propeller shaft.

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 19-8. Air Transportability Hydraulic System Service.

11. ALL AXLE DIFFERENTIALS. Check oil level in differentials every 3,000 miles (4,827 km). Check oil level with vehicle parked on level surface and axle differential at ambient temperature, allowing at least one hour to cool down after vehicle operation. If oil is checked when axle differential is hot, it is normal for oil to spill out of the port due to expansion from the heat. Oil level is considered full if it is within one inch of the bottom of the fill port. If oil spills from the fill port when the axle differential is cool, it is overfull. Allow oil to drain until no more drains out. If the oil level is more than one inch below the bottom of the fill port, refill axle differential with GO specified for the ambient temperature until level with bottom of fill port. Change the oil every 24,000 miles (38,616 km) or once every two years, whichever occurs first. Drain oil when hot after operation.

H-9. LUBRICATION NOTES (CONT)

12. FRONT AXLE WHEEL END PLANETARY HUBS. There are two lube intervals for the front axle wheel end planetary hubs.

- a. Check and fill front axle wheel end planetary hubs every 3,000 miles (4,827 km) or once every three months, whichever occurs first, as follows:
 - (1) Position vehicle on a level surface. Allow 15 minutes for vehicle to cool before checking oil levels.
 - (2) Position fill port at 4 o'clock position. If oil flows from fill port when plug is loosened, let oil drain to correct level. If oil level is below fill port, fill hub with GO specified for the ambient temperature until oil is level with fill port.
- b. Drain and fill front axle wheel end planetary hubs every 24,000 miles (38,616 km) or once every two years, whichever occurs first, following the repacking of the inner wheel bearings, or whenever wheel end assemblies are taken apart for other maintenance as follows:
 - (1) Position vehicle on a level surface.
 - (2) Position fill port at the 6 o'clock (down) position.
 - (3) Drain hub oil (allow a minimum of 15 minutes for oil to drain down from vent tubes).
 - (4) Refill hubs with 11-13 ounces of GO specified for the ambient temperature.

13. TIE ROD ENDS. Lubricate tie rod ends with GAA every 6,000 miles (9,654 km) or once every six months, whichever occurs first, using a low pressure lubrication gun, until new grease is seen purging from the boot area. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

14. WINCH CABLES:

CAUTION

Do not use dry cleaning solvent to clean winch cables. Use of dry cleaning solvent will remove lubricant from inner strands of winch cables. Failure to comply may result in damage to equipment.

- a. After each operation:

Clean and lubricate length of winch cable reeled out with new OE/HDO 30.

- b. Infrequently use or in very damp conditions:

Lubricate winch cables with GW.

- c. Dry or dusty conditions:

Do not lubricate winch cables.

- d. Every six months:

- (1) Unwind entire length of winch cable (TM 9-2320-366-10-1).
- (2) Soak and clean winch cable with new OE/HDO 30.
- (3) Wipe off excess OE/HDO 30.
- (4) Coat winch cable with GW.
- (5) Rewind winch cable (TM 9-2320-366-10-1).

15. 15K SRW. Check 15K SRW gear oil level every 6,000 miles (9,654 km) or once every six months, whichever occurs first. Refill 15K SRW with GO specified for ambient temperature. Change oil every 12,000 miles (19,308 km) or once every year, whichever occurs first. Use procedure (a) to check and fill oil level; use procedure (b) to Change oil.

a. Check and fill oil level as follows:

- (1) Shift the freespool mechanism to the disengage position so the drum can be freely rotated.
- (2) Rotate the drum to where either plug is near the top of the 15K SRW. Remove the plug.
- (3) Rotate the drum 90 degrees in the direction that allows the other plug to be near the top of the 15K SRW. Remove the plug.

NOTE

Oil level is full if a small amount of oil runs out of lower plug.

- (4) Add oil until a small amount of oil runs out of lower plug hole.
- (5) Apply adhesive (Item 3, Appendix D) to plug and position plug in top hole.
- (6) Rotate drum until open hole is at top.
- (7) Apply adhesive (Item 3, Appendix D) to plug and position plug in top hole.
- (8) Tighten plugs to 13-15 lb-ft (18-20 N•m).

b. Change oil as follows:

- (1) Shift the freespool mechanism to the disengage position so the drum can be freely rotated.
- (2) Rotate the drum to where either plug is near the top of the 15K SRW. Remove the plug.
- (3) Rotate the drum 90 degrees in the direction that allows the other plug to be near the top of the 15K SRW. Remove the plug.
- (4) Position drain pan (Item 39, Appendix C) under 15K SRW.
- (5) Rotate the drum until either hole is straight down to the bottom of the 15K SRW. Allow the oil to drain completely.
- (6) Rotate the drum until either hole is at top.

NOTE

Oil level is full if a small amount of oil runs out of lower plug.

- (7) Add oil until a small amount of oil runs out of lower plug hole.
- (8) Apply adhesive (Item 3, Appendix D) to plug and position plug in top hole.
- (9) Rotate drum until open hole is at top.
- (10) Apply adhesive (Item 3, Appendix D) to plug and position plug in top hole.
- (11) Tighten plugs to 13-15 lb-ft (18-20 N•m).

16. TOWING PINTLE. Lubricate towing pintle with GAA every 6,000 miles (9,654 km) or once every six months, whichever occurs first, using a low pressure lubrication gun until new grease is seen purging.

H-9. LUBRICATION NOTES (CONT)

WARNING

- Dry Cleaning Solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in well-ventilated area; avoid contact with skin, eyes, and clothes, and do not breath vapors. Keep sway from heat or flame. Never smoke when using solvent; the flashpoint for Type I Dry Cleaning Solvent is 100°F (38°C) and for Type II is 138°F (50°C). Failure to comply may result in serious injury or death to personnel.
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get medical attention. Failure to comply may result in injury to personnel.

17. ENGINE CRANKCASE BREATHER. Remove crankcase breather and clean with Dry Cleaning Solvent (SD P-D-680) (Item 65, Appendix D) or equivalent, and replace o-ring seal every 6,000 miles (9,654 km) or once every six months, whichever occurs first.

18. FRONT AXLE SPRING BOLT and SPRING SHACKLE. Lubricate front axle spring bolt and spring shackle with GAA every 3,000 miles (4,827 km) or once every three months, whichever occurs first, using a low pressure lubrication gun until grease appears between pins and bushings at both ends of spring bolt and spring shackle. If pins do not accept grease, 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. HYDRAULIC TANK (M1089). Check oil level weekly and make sure oil level indicates FULL. Units participating in AOAP will sample oil annually and change oil and filter as directed by AOAP. Units not participating in AOAP will change oil and filter every two years. Drain oil and refill hydraulic tank with OE/HDO specified for ambient operating temperature. Fill hydraulic tank until oil level is at the FULL mark on the sight glass. Do not overfill. Clean air breather filter and replace hydraulic oil filter when oil is changed. Check oil level with Material Handling Crane (MHC) in the stowed position.

23. BOOM WEAR PADS (M1084/M1086/M1089). Lubricate every 6,000 miles (9,654 km) or once every six months, whichever occurs first. Coat boom wear pads with GAA while boom is extended, for the lower wear pads, boom must be retracted and access cover removed at rear of base boom to grease the upper wear pads. Extend boom in and out while applying grease. This method assures full lubrication for entire length of boom. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

24. HOIST ASSEMBLY DRUM (M1084/M1086/M1089). Check hoist assembly drum oil level every 6,000 miles (9,654 km) or every six months, whichever occurs first. Check oil level in hoist assembly drum using two pipe plugs (90 degrees apart) on the drum housing. Operate hoist assembly drum so that one pipe plug is positioned at top of drum (fill point) and the other is accessible and level with ground (check level point). Oil level is full if a small quantity of oil runs from check level opening. If oil level is low, add oil at fill opening. To drain, operate drum so that one pipe plug is bottom of drum. Remove plug to drain. Drain and refill with GO specified for the ambient temperature, if oil becomes contaminated.

25. SWING DRIVE GEARBOX (M1084/M1086/M1089). Check swing drive gearbox oil level every 6,000 miles (9,654 km) or once every six months, whichever occurs first. Oil level is checked by removing pipe plug located on side of gear reducer. Oil level is full if a small quantity of oil runs out of opening. Add oil at fill point if necessary. Drain and refill with GO specified for the ambient temperature, if oil becomes contaminated.

26. RING GEAR TEETH and PINION GEAR TEETH (M1084/M1086/M1089). Lubricate every 6,000 miles (9,654 km), after washing, or once every six months, whichever occurs first. Apply a light coat of GAA to ring gear teeth and pinion gear teeth. Operate MHC (TM 9-2320-366-10) to rotate turntable. This will allow grease to be applied to all gear teeth. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

27. FRONT, INTERMEDIATE, and REAR AXLE INNER WHEEL BEARINGS. Repack inner wheel bearings with GAA every 12,000 miles (19,308 km), when semiannual PMCS inspection of service brakes reveals oil leak from inner hub, or whenever wheel end assemblies are taken apart for other maintenance.

28. REAR AXLE BOGIE. Change oil every 6,000 miles (9,654 km) or once every six months, whichever occurs first. Remove six screws and rear axle bogie cover from one side at a time. Raise axle on opposite side of vehicle to allow oil to drain out. Lower axle and repeat on other side of vehicle. Apply thin bead of silicone adhesive sealant 593 to seating surface of housing. Position cover (with fill plug at the 1 o'clock position) and six screws on housing. Tighten six screws to 24 lb-ft (32 N•m). Remove plug from cover and plug from top of rear axle bogie housing. Refill rear axle bogie with GO specified for the ambient temperature, until level with port on housing cover. Install plugs in cover and housing.

29. 15K SELF-RECOVERY WINCH (SRW) CABLE ROLLER FAIRLEADS. Lubricate with GAA every 6,000 miles (9,654 km) or once every six months, whichever occurs first, using a low pressure lubrication gun. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

30. 30K WINCH CABLE GUIDE ROLLERS and PAY-OUT LOWER TENSION SHEAVE. Lubricate with GAA every 6,000 miles (9,654 km) or once every six months, whichever occurs first, using a low pressure lubrication gun. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

H-9. LUBRICATION NOTES (CONT)

WARNING

- Dry Cleaning Solvent (P-D-680) is TOXIC and flammable. Wear protective goggles and gloves; use only in well-ventilated area; avoid contact with skin, eyes, and clothes, and do not breath vapors. Keep away from heat or flame. Never smoke when using solvent; the flashpoint for Type I Dry Cleaning Solvent is 100°F (38°C) and for Type II is 138°F (50°C). Failure to comply may result in serious injury or death to personnel.
- If personnel become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts skin or clothes, flush with cold water. If solvent contacts eyes, immediately flush eyes with water and get medical attention. Failure to comply may result in injury to personnel.

31. SCREEN and PLUG OIL FILTER ASSEMBLY (intermediate axle only). Clean the area around the screen and plug oil filter assembly. Remove the screen and plug oil filter assembly. Clean with Dry Cleaning Solvent (Item 65, Appendix D) or equivalent, every 12,000 miles (19,308 km) or once every year, whichever occurs first. Clean filter each time the differential is drained. If screen is crushed or bent, replace with a new one. Clean the screen cavity in the carrier of all debris and particles. If excessive amount of metal particles are detected during oil filter servicing, notify Direct Support Maintenance personnel before refilling differential.

32. TURNTABLE BEARING (M1084/M1086/M1089). Lubricate with GAA every 6,000 miles (9,654 km), after washing, or once every six months, whichever occurs first. Use a low pressure lubrication gun. Apply lubrication to grease fitting inside turntable bearing. Operate MHC (TM 9-2320-366-10) to rotate turntable bearing through full range of travel between applications of grease. This method assures full lubrication of the turntable bearing. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

33. TOP and BOTTOM PLATES (M1089). Lubricate every 6,000 miles (9,654 km) or once every six months, whichever occurs first. Coat top and bottom plates with GAA. Extending outriggers in and out while applying grease assures full lubrication for the entire length of top and bottom plates. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

34. CRANE GREASE FITTINGS (M1084/M1086/M1089). Lubricate with GAA every 6,000 miles (9,654), after washing, or once every six months, whichever occurs first. Use a low pressure lubrication gun. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

35. UNDERLIFT ASSEMBLY GREASE FITTINGS. Lubricate with GAA every 6,000 miles (9,654), after washing, or once every six months, whichever occurs first. Use a low pressure lubrication gun. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

36. FRONT LIFTING BEAM. Remove left and right lifting beams and clean with Dry Cleaning Solvent (Item 65, Appendix D) or equivalent, every 6,000 miles (9,654 km) or once every six months, whichever occurs first. Apply a light coat of GAA to lifting beams. If operating conditions are severe or abnormal, service at 1,000 miles (1,609 km) or once every month, whichever occurs first.

37. AIR DRYER. Service air dryer (para 23-11) every 12,000 miles (19,308 km) or annually, whichever occurs first.

APPENDIX J ADDITIONAL AUTHORIZATION LIST (AAL)

Section I. INTRODUCTION

J-1. SCOPE

This appendix lists additional items you are authorized for the support of the MTV.

J-2. GENERAL

This list identifies items that do not have to accompany the MTV and that do not have to be turned in with it. These items are all authorized to you by Common Tables of Allowance (CTA), Modification Table of Organization and Equipment (MTOE), Tables of Distribution and Allowances (TDA), or Joint Table of Allowance (JTA).

J-3. EXPLANATION OF LISTING

National Stock Numbers, description, and quantities are provided to help you identify and request the additional items you require to support this equipment.

Section II. ADDITIONAL AUTHORIZATION LIST

(1) National Stock Number	(2) Description (CAGE) Part Number	(3) U/M	(4) Qty Auth
6685-01-193-1733	10,000 PSI Transducer: (19207) 12258956	EA	1

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GLOSSARY ABBREVIATIONS

ANSI	American National Standards Institute
CCW	Counterclockwise
CTIS	Central Tire Inflation System
CW	Clockwise
ECU	Electronic Control Unit
EMI	Electromagnetic Interference
LED	Light Emitting Diode
LH	Left Hand
LMHC	Light Material Handling Crane
MAC	Maintenance Allocation Chart
MHC	Material Handling Crane
NATO	North Atlantic Treaty Organization
NBC	Nuclear, Biological, or Chemical
NO/NC	Normally Open/Normally Closed
O/R	Outrigger
PDP	Power Distribution Panel
PMCS	Preventive Maintenance Checks and Services
PTO	Power Takeoff
RH	Right Hand
SAE	Society of Automotive Engineers
SRW	Self-Recovery Winch
STE/ICE-R	Simplified Test Equipment/Internal Combustion Engine-Reprogrammable
TEPSS	Transmission ECU Pushbutton Shift Selector
TM	Technical Manual
TPS	Throttle Position Sensor

GLOSSARY
ABBREVIATIONS (CONT)

TPSS	Transmission Pushbutton Shift Selector
VDC	Volts Direct Current
VIM	Vehicle Interface Module
WTEC II	World Transmission Electronic Controls (version 2)
WTEC III	World Transmission Electronic Controls (version 3)

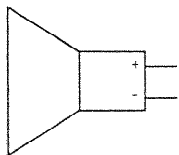
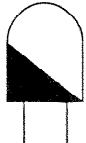
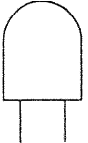
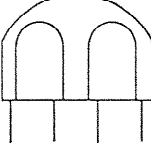
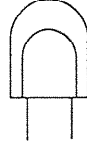
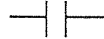
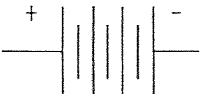
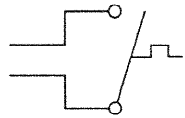
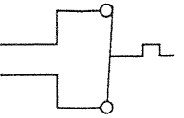
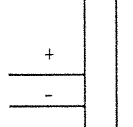
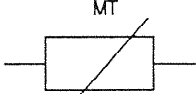
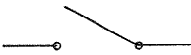
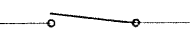
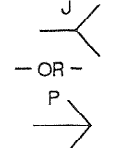
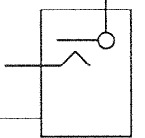
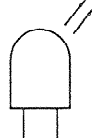
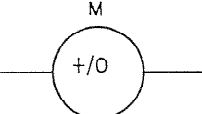
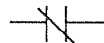
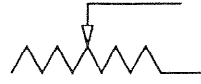
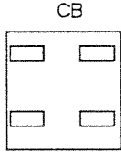
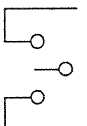
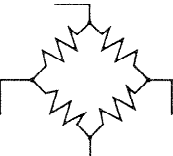
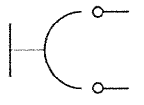
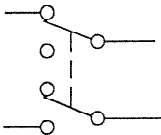
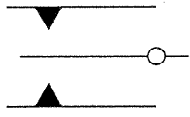
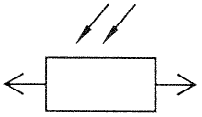
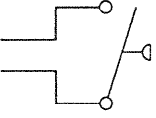
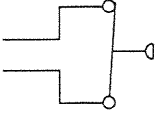
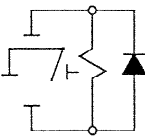
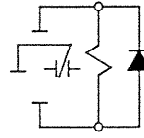
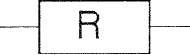
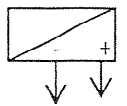
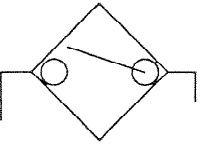
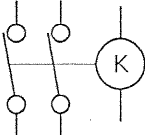
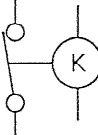
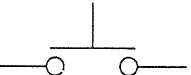
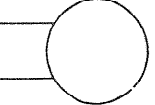
 HORN	 BLACKOUT MARKER	 LAMP	 DUALBEAM LAMP	 GROUND	 POWER LAMP	 OPEN CONTACT	 BATTERY
 TEMPERATURE SWITCH OPEN	 TEMPERATURE SWITCH CLOSED	 MAGNETIC PICKUP	 MT SENSOR	 NORMALLY OPEN	 NORMALLY CLOSED	 J P CONNECTOR	 J - OR - P RECEPTACLE
 B MOTOR	 L SOLENOID	 LEVEL SENSOR	 FL FILTER	 LED	 M + / 0 METER OR GAUGE	 CLOSED CONTACT	 DIMMER MODULE
 CB CIRCUIT BREAKER	 TWO WAY SWITCH	 BRIDGE RECTIFIER	 POWER SWITCH BREAKER	 DPDT SWITCH	 DPST SWITCH	 PHOTOCELL	 FUSE
 PRESSURE SWITCH OPEN	 PRESSURE SWITCH CLOSED	 NORMALLY OPEN	 NORMALLY CLOSED	 G ALTERNATOR	 R RESISTOR	 TERMINAL LUG	 ELECTRONIC IGNITION UNIT
 DIODE	 E SPICE	 SENSING SWITCH	 M MOTOR	 K GROUND RELAY	 K RELAY	 PUSHBUTTON	 CIRCULATING PUMP

FIGURE FO-1 ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 1 OF 40

SIZE B ILL. NO. 6WDO11A FP-1/FP-2 BLANK

10				11				12				13				14				15				16				17				18			
CONNECTORS				CONNECTORS (CONTINUED)				CONNECTORS (CONTINUED)				CONNECTORS (CONTINUED)				CONNECTORS (CONTINUED)				CONNECTORS (CONTINUED)				CONNECTORS (CONTINUED)				CONNECTORS (CONTINUED)							
NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION				
A	C294	33	ELECTRONIC CONTROL UNIT	J43X	G184	21	CAB - DASH - LEFT - UNDERDASH	J912	B133	15	CAB DASH CENTER HEATER / CTIS ECU	P55	C94	11	CAB MARKER LIGHT FRONT UPPER RIGHT	P86	A225	25	LH REAR MARKER LIGHT																
A	D300	34	ARCTIC KIT CAB HEATER	J44	B238	27	ROTARY WARNING LIGHT CONNECTOR	J912	D245	28	CAB DASH CENTER OPTIONS PANEL	P56	E224	25	MIDDLE REAR MARKER	P86	A234	26	LH REAR MARKER LIGHT																
B	E294	33	ELECTRONIC CONTROL UNIT	J45	C238	27	ROTARY WARNING LIGHT CONNECTOR	J912	G264	27	ALL MTV W/O PTO	P55	D242	27	RH FRONT TOP CAB MARKER LIGHT	P87	C207	23	BACKUP LIGHT																
B	E300	34	ARCTIC KIT CAB HEATER	J50	E94	11	CAB MARKER LIGHT FRONT UPPER LEFT	J912	F265	30	TRACTOR W/O WINCH	P56	D207	23	MIDDLE REAR MARKER	P87	B215	24	BACKUP LIGHT																
C	E296	33	ELECTRONIC CONTROL UNIT	J51	D51	6	CHASSIS - FRONT	J913	B131	15	CAB DASH CENTER HEATER / CTIS ECU	P56	F215	24	MIDDLE REAR MARKER	P87	C225	25	BACKUP LIGHT																
C	F302	34	ARCTIC KIT CAB HEATER	J52	E47	6	CHASSIS - FRONT BUMPER	J921	G70	8	TROOP TRANSPORT ALARM	P56	E234	26	MIDDLE REAR MARKER	P87	C234	26	BACKUP LIGHT																
CABLE A	G315	35	OVERLOAD SHUTDOWN SYSTEM	J52	B239	27	CHASSIS - FRONT	L4	E268	30	WINCH IN SOLENOID	P57	D94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT	P88	G207	23	RH SIDE MARKER LIGHT																
CABLE A	D317	36	WRECKER MATERIAL HANDLING CRANE	J53	F236	27	AIRDROP ONLY	L4	C277	31	WINCH OUT SOLENOID	P57	F242	27	LH FRONT TOP CAB CLEARANCE LIGHT	P88	H225	25	RH SIDE MARKER LIGHT																
CABLE A	F324	36	OVERLOAD SHUTDOWN SYSTEM	J55	C94	11	CAB MARKER LIGHT FRONT UPPER RIGHT	L5	D268	30	WINCH OUT SOLENOID	P58	E207	23	RIGHT REAR MARKER	P88	H234	26	RH SIDE MARKER LIGHT																
CABLE A	D340	38	WRECKER CONTROLS	J57	D94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT	L5	B277	31	WINCH IN SOLENOID	P58	E215	24	RIGHT REAR MARKER	P89	G207	23	RH REAR MARKER LIGHT																
CABLE B	A307	35	CARGO MATERIAL HANDLING CRANE	J59	C94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT	L7	B301	34	TAILGATE RELEASE CONNECTOR	P58	E215	24	RIGHT REAR MARKER	P89	C215	24	RH REAR MARKER LIGHT																
CABLE C	G308	35	CARGO MATERIAL HANDLING CRANE	J60	D94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE	L8	B301	34	DUMP BED UP CONNECTOR	P58	E224	25	RIGHT REAR MARKER	P89	G225	25	RH REAR MARKER LIGHT																
CABLE F	B308	36	INTERNAL REMOTE CONNECTOR	J62	E97	11	ROTARY WARNING LIGHT CONNECTOR	L9	A301	34	DUMP BED DOWN CONNECTOR	P58	E234	26	RIGHT REAR MARKER	P89	G234	26	RH REAR MARKER LIGHT																
CABLE G	F299	35	CARGO MATERIAL HANDLING CRANE	J65	E195	22	ROTARY WARNING LIGHT CONNECTOR	P2	A194	22	EMI FILTER	P59	C94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT	P107	B199	23	WRECKER REAR LIGHTS																
CABLE G	A324	36	INTERNAL REMOTE CONTROL CONNECTOR	J78	F194	22	CAB RADIO CONNECTOR	P2	G282	32	SWINGFIRE HEATER	P59	D242	27	RH FRONT TOP CAB CLEARANCE LIGHT	P108	B258	29	CAB DASH CENTER OPTIONS PANEL																
CABLE H	F304	35	CRANE CONTROL PANEL	J80	A299	34	AIR DRYER CONNECTOR	P3	D240	27	AIRDROP ONLY	P60	D94	11	CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE	P108	F199	23	WRECKER REAR LIGHTS																
CABLE H	E313	36	CRANE CONTROL PANEL	J83	D59	7	CHASSIS - SPARE TIRE	P5	A47	6	VEHICLE HORN	P60	E242	27	MIDDLE FRONT TOP CLEARANCE LIGHT	P110	E128	15	CTIS ELECTRONIC CONTROL UNIT																
CABLE I	G313	35	CRANE CONTROL PANEL	J95	E47	6	12V INTERVEHICULAR	P6	A47	6	VEHICLE HORN	P61	F207	23	RH COMPOSITE LIGHT	P111	E131	15	CTIS ELECTRONIC CONTROL UNIT																
CABLE I	F322	36	CRANE CONTROL PANEL	J95	B242	27	ENGINE	P8	B47	6	BLACKOUT MARKER RIGHT FRONT	P61	F224	25	RH COMPOSITE LIGHT	P112	G132	15	CAB DASH CENTER HEATER / CTIS ECU																
CABLE J	G313	35	CRANE CONTROL PANEL	J99	E196	22	CHEMICAL ALARM CONNECTOR	P9	C47	6	FRONT RIGHT TURN SIGNAL	P61	F234	26	RH COMPOSITE LIGHT	P113	F132	15	CTIS ELECTRONIC CONTROL UNIT																
CABLE J	F322	36	CRANE CONTROL PANEL	J106	F59	7	CHEMICAL DETECTOR RECEPTACLE	P10	B47	6	PARKING LIGHT FRONT RIGHT	P62	F207	23	RH COMPOSITE LIGHT	P114	C350	39	WTEC II CAB DASH RIGHT KICK PANEL																
CABLE K	G304	35	CRANE CONTROL PANEL	J108	B258	29	CAB DASH CENTER OPTIONS PANEL	P12	D47	6	RIGHT HEADLIGHT	P62	F224	25	RH COMPOSITE LIGHT	P115	C344	39	WTEC II CAB DASH RIGHT KICK PANEL																
CABLE K	F322	36	CRANE CONTROL PANEL	J111	E131	15	CTIS ELECTRONIC CONTROL UNIT	P13	C47	6	RIGHT HEADLIGHT	P62	F207	23	RH COMPOSITE LIGHT	P116	E345	39	WTEC II CAB DASH RIGHT KICK PANEL																
CABLE L	D304	35	CRANE CONTROL PANEL	J113	G195	22	CTIS PRESSURE TRANSDUCER	P14	C47	6	RIGHT HEADLIGHT	P62	F207	23	RH COMPOSITE LIGHT	P116	C194	22	CAB - DASH - RIGHT - UNDERDASH																
CABLE L	C322	36	CRANE CONTROL PANEL	J114	B173	20	CAB - DASH - LEFT - TRANSMISSION HARNESS	P17	H47	6	BLACKOUT DRIVE LIGHT	P62	F224	25	RH COMPOSITE LIGHT	P118	D170	19	CAB - DASH - LEFT - TRANSMISSION HARNESS																
CABLE M	D313	35	CRANE CONTROL PANEL	J115	C163	19	CAB - DASH - LEFT - WTEC III TRANSMISSION HARNESS	P18	D47	6	LEFT HEADLIGHT	P62	F224	25	RH COMPOSITE LIGHT	P119	A73	9	WTEC II TRANSMISSION SERIAL NUMBER (S/N) (6510032369)																
CABLE M	C322	36	CRANE CONTROL PANEL	J116	C168	19	CAB - DASH - LEFT - WTEC III TRANSMISSION HARNESS	P18	A186	21	CAB - DASH - LEFT - UNDERDASH	P62	F234	26	RH COMPOSITE LIGHT	P119	A78	9	WTEC II TRANSMISSION S/N (6510032369) AND HIGHER																
CABLE N	D313	35	CRANE CONTROL PANEL	J117	F170	19	CAB - DASH - LEFT - WTEC III TRANSMISSION HARNESS	P19	E47	6	LEFT HEADLIGHT	P63	G234	26	RH COMPOSITE LIGHT	P119	A82	10	WTEC II TRANSMISSION PRIOR TO S/N (6510032369) WITH ADAPTER CABLE ASSEMBLY																
CABLE N	D322	36	CRANE CONTROL PANEL	J118	D170	19	CAB - DASH - LEFT - WTEC III TRANSMISSION HARNESS	P20	D47	6	LEFT HEADLIGHT	P63	F224	25	RH COMPOSITE LIGHT	P119	B178	20	CAB - DASH - LEFT - TRANSMISSION HARNESS																
CABLE O	C313	35	CRANE CONTROL PANEL	J119	C352	40	WTEC III CAB FLOOR LEFT	P22	G47	6	PARKING LIGHT FRONT LEFT	P63	D215	24	RH COMPOSITE LIGHT	P125	G93	11	WINDSHIELD WASHER ROTARY PUMP (B3)																
CABLE O	G322	36	CRANE CONTROL PANEL	J129	F94	11	CAB MARKER LIGHT FRONT LOWER LEFT	P23	F47	6	FRONT LEFT TURN SIGNAL	P63	D215	24	RH COMPOSITE LIGHT	P129	F94	11	CAB MARKER LIGHT FRONT LOWER LEFT																
CABLE P	C313	35	CRANE CONTROL PANEL	J129	F94	11	CAB MARKER LIGHT LEFT DOOR	P24	H47	6	BLACKOUT MARKER LEFT FRONT	P63	G234	26	RH COMPOSITE LIGHT	P129	F94	11	CAB MARKER LIGHT LEFT DOOR																
CABLE P	C322	36	CRANE CONTROL PANEL	J130	F238	27	12 PIN CONNECTOR	P25	G94	11	WINDSHIELD WASHER ROTARY PUMP (B3)	P64	F207	23	RH COMPOSITE LIGHT	P131	A94	11	CAB MARKER LIGHT RIGHT DOOR																
CABLE O	E313	35	CRANE CONTROL PANEL	J131	B94	11	CAB MARKER LIGHT RIGHT DOOR	P25	B300	34	DUMP BED SWITCH CONNECTOR	P64	F224	25	RH COMPOSITE LIGHT	P132	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT																
CABLE O	E322	36	CRANE CONTROL PANEL	J132	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT	P27	A52	6	CHASSIS - FRONT	P64																							

19				20				21				22				23				24				25				26				27			
CONNECTORS (CONTINUED)				LIGHTS				LIGHTS (CONTINUED)				LIGHTS (CONTINUED)				LIGHTS (CONTINUED)				TERMINAL LUGS				TERMINAL LUGS (CONTINUED)				TERMINAL LUGS (CONTINUED)							
NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION				
P217	B274	31	ARCTIC KIT W/PTO EQUIPPED	DS1	D105	12	CAB DASH LEFT INSTRUMENT PANEL	DS52	D216	24	TRACTOR BLACKOUT MARKER RIGHT REAR	DS98	D251	28	CAB DASH CENTER OPTIONS PANEL	TL5	D294	33	WEBASTO CONTROL UNIT	TL5	D251	28	CAB DASH CENTER OPTIONS PANEL	TL6	D69	8	ALTERNATOR	TL6	D294	33	WEBASTO CONTROL UNIT				
P217	B304	34	PTO SOLENOID CONNECTOR	DS2	G115	12	CAB DASH LEFT INSTRUMENT PANEL	DS52	F225	25	LONG WHEEL BASE BLACKOUT MARKER RIGHT REAR	DS99	D255	29	CAB DASH CENTER OPTIONS PANEL	TL6	D294	33	WEBASTO CONTROL UNIT	TL6	D294	33	WEBASTO CONTROL UNIT	TL7	D294	33	WEBASTO CONTROL UNIT	TL7	D294	33	WEBASTO CONTROL UNIT				
P410	E276	31	ARCTIC KIT W/PTO EQUIPPED	DS3	F105	12	CAB DASH LEFT INSTRUMENT PANEL	DS52	F234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE BLACKOUT MARKER RIGHT REAR	DS100	B249	28	CAB DASH CENTER OPTIONS PANEL	TL9	D56	7	24V AUXILIARY STARTER SOLENOID	TL9	D56	7	24V AUXILIARY STARTER SOLENOID	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT				
P901	A245	28	CAB DASH CENTER OPTIONS PANEL	DS4	B105	12	CAB DASH LEFT INSTRUMENT PANEL	DS53	H46	6	BLACKOUT DRIVE LIGHT	DS101	D128	15	HEATER CONTROL PANEL ILLUMINATION	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT				
P902	C250	28	CAB DASH CENTER OPTIONS PANEL	DS5	B115	13	CAB DASH LEFT INSTRUMENT PANEL	DS53	H46	6	BLACKOUT DRIVE LIGHT	DS108	E100	12	CAB DASH LEFT INSTRUMENT PANEL	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT				
P902A	D250	28	CAB DASH CENTER OPTIONS PANEL	DS6	G110	13	CAB DASH LEFT INSTRUMENT PANEL	DS54	D93	11	CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT					TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT				
P903	C248	28	CAB DASH CENTER OPTIONS PANEL	DS7	D115	13	CAB DASH LEFT INSTRUMENT PANEL	DS54	D93	11	CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT					TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT				
P903A	D248	28	CAB DASH CENTER OPTIONS PANEL	DS8	C100	12	CAB DASH LEFT INSTRUMENT PANEL	DS54	F242	27	LH FRONT TOP CAB CLEARANCE LIGHT					TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT				
P904	C247	28	CAB DASH CENTER OPTIONS PANEL	DS9	B110	13	DUMP BODY UP	DS54	F242	27	LH FRONT TOP CAB CLEARANCE LIGHT					TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT				
P904A	D247	28	CAB DASH CENTER OPTIONS PANEL	DS10	E120	14	CAB DASH LEFT INSTRUMENT PANEL	DS55	F234	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE BLACKOUT MARKER RIGHT REAR					TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT				
P905	A247	28	CAB DASH CENTER OPTIONS PANEL	DS11	G100	12	CAB DASH LEFT INSTRUMENT PANEL	DS55	H46	6	BLACKOUT DRIVE LIGHT					TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT				
P905A	B247	28	CAB DASH CENTER OPTIONS PANEL	DS12	H120	14	CAB DASH LEFT INSTRUMENT PANEL	DS55	D93	11	CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT					TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT				
P906	A248	28	CAB DASH CENTER OPTIONS PANEL	DS13	C120	14	CAB DASH LEFT INSTRUMENT PANEL	DS55	D93	11	CAB MARKER LIGHT FRONT UPPER MIDDLE LEFT					TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT				
P906A	B248	28	CAB DASH CENTER OPTIONS PANEL	DS14	B110	13	LEFT TURN SIGNAL	DS55	D93	11	CAB MARKER LIGHT FRONT UPPER MIDDLE MIDDLE					TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT				
P908	A251	28	CAB DASH CENTER OPTIONS PANEL	DS15	B110	13	RIGHT TURN SIGNAL	DS55	E242	27	MIDDLE FRONT TOP CLEARANCE LIGHT					TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT				
P908A	B251	28	CAB DASH CENTER OPTIONS PANEL	DS16	E110	13	HIGH BEAM	DS56	C93	11	CAB MARKER LIGHT FRONT UPPER MIDDLE RIGHT					TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT				
P909	A256	29	CAB DASH CENTER OPTIONS PANEL	DS17	D128	15	HEATER CONTROL PANEL ILLUMINATION	DS56	D242	27	RH FRONT TOP CAB CLEARANCE LIGHT					TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT				
P909A	B256	29	CAB DASH CENTER OPTIONS PANEL	DS18	A244	28	CAB DASH CENTER OPTIONS PANEL	DS57	C93	11	CAB MARKER LIGHT FRONT UPPER RIGHT					TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT				
P910	B251	28	CAB DASH CENTER OPTIONS PANEL	DS19	E110	13	RADIATOR FAN OFF	DS57	D242	27	RH FRONT TOP CAB MARKER LIGHT					TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT				
P910A	D251	28	CAB DASH CENTER OPTIONS PANEL	DS21	C110	13	EMERGENCY BRAKE	DS58	E93	11	CAB MARKER LIGHT FRONT UPPER LEFT					TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT				
P911	B256	29	CAB DASH CENTER OPTIONS PANEL	DS22	D110	13	PARKING BRAKE	DS58	F242	27	LH FRONT TOP CAB MARKER LIGHT					TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT				
P911A	D256	29	CAB DASH CENTER OPTIONS PANEL	DS23	C110	13	PTO ON	DS59	B93	11	CAB MARKER LIGHT RIGHT DOOR					TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT				
P912	B133	15	CAB DASH CENTER HEATER / CTIS ECU	DS24	D110	13	OIL PRESSURE	DS60	F93	11	CAB MARKER LIGHT FRONT LOWER LEFT					TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT				
P912	F133	15	CAB DASH CENTER HEATER / CTIS ECU	DS25	C110	13	WATER TEMPERATURE	DS61	A93	11	CAB MARKER LIGHT RIGHT DOOR					TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT				
P913	B131	15	CAB DASH CENTER HEATER / CTIS ECU	DS27	C110	13	REAR BRAKE AIR	DS62	F93	11	CAB MARKER LIGHT LEFT DOOR					TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT				
P913	F245	28	CAB DASH CENTER OPTIONS PANEL	DS28	E110	13	FRONT AIR BRAKE	DS63	B246	28	CAB DASH CENTER OPTIONS PANEL					TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT				
P914	A250	28	CAB DASH CENTER OPTIONS PANEL	DS29	D110	13	ENGINE OIL LEVEL	DS64	B248	28	CAB DASH CENTER OPTIONS PANEL					TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT				
P914A	B250	28	CAB DASH CENTER OPTIONS PANEL	DS30	F110	13	MASTER STOP	DS64	B248	28	CAB DASH CENTER OPTIONS PANEL					TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT				
P921	G70	8	TROOP TRANSPORT ALARM	DS31	D249	28	CAB DASH CENTER OPTIONS PANEL	DS65	A207	23	WRECKER LH SIDE MARKER LIGHT					TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT				
P94	A199	23	LH INTERMEDIATE MARKER	DS32	B110	13	CHEMICAL DETECT	DS65	A225	25	LONG WHEEL BASE LH SIDE MARKER LIGHT					TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT	TL9	E294	33	WEBASTO CONTROL UNIT				
P94	A217	25	LH INTERMEDIATE MARKER	DS34	C110	13																													

28				29				30				31				32				33				34				35				36			
TERMINAL LUGS (CONTINUED)				TERMINAL LUGS (CONTINUED)				SWITCHES				RELAYS (CONTINUED)				MISCELLANEOUS																			
NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION	NUMBER	ZONE	SH	DESCRIPTION								
TL31	E225	25	LONG WHEEL BASE	TL82	F47	6	FRONT LEFT TURN SIGNAL	S3	A186	21	COLUMN SWITCH	K25	B346	39	WTEC II REVERSE WARNING RELAY	10A	C192	22	WTEC II VEHICLE INTERFACE MODULE																
TL31	E234	26	MIDDLE REAR MARKER	TL83	B61	7	FUEL TANK LEVEL SENSOR	S3	C186	21	COLUMN SWITCH	K26	B344	39	WTEC II NEUTRAL START RELAY	10A	E192	22	WTEC II VEHICLE INTERFACE MODULE																
TL32	E207	23	WRECKER REAR LIGHTS	TL84	B58	7	CHASSIS - SPARE TIRE (REF J93)	S4	D123	14	MAIN LIGHT SWITCH	K27	H152	17	BO STOP RELAY	A2	F127	15	CTIS ELECTRONIC CONTROL UNIT																
TL32	G215	24	REAR LIGHTS TRACTOR	TL85	G61	7	CHASSIS - REAR	S5/1	B120	14	IGNITION SWITCH	K28	H151	17	TRAILER REAR LIGHTS RELAY	A3	G123	14	INSTRUMENT PANEL LIGHTS DIMMER MODULE																
TL32	E225	25	LONG WHEEL BASE	TL86	C95	11	CAB MARKER LIGHTS	S5/11	A100	12	ENGINE FAN OFF SWITCH	K29	B349	39	WTEC II BLACKOUT DRIVE RELAY	A5	A143	16	WIPER DELAY MODULE																
TL32	E234	26	RIGHT REAR MARKER	TL86	D240	27	AIRDROP ONLY	S5/14	C249	28	WINCH ON OFF	K29	F151	17	BO MARKER RELAY	A7	B188	21	FREQUENCY DIVIDER																
TL320	E268	30	PTO EQUIPPED	TL87	F95	11	CAB MARKER LIGHTS	S5/15	B248	28	WINCH IN-OUT	K30	H156	18	REAR LEFT COMPOSITE LAMP RELAY	A1E	A112	13	LIGHTED INDICATOR DISPLAY																
TL320	C277	31	ARCTIC KIT W/PTO EQUIPPED	TL88	A199	23	WRECKER REAR LIGHTS	S5/16	F100	12	ETHER STARTER SWITCH	K31	H158	18	REAR RIGHT COMPOSITE LAMP RELAY	A20	H68	8	FUEL/WATER SEPARATOR																
TL33	E56	7	24V AUXILIARY STARTER SOLENOID	TL88	A217	25	LONG WHEEL BASE	S5/2	D100	12	LAMP TEST SWITCH	K32	B156	18	HORN RELAY	B1	C72	8	STARTER/STARTER SOLENOID																
TL35	D70	8	ALTERNATOR	TL89	G199	23	WRECKER REAR LIGHTS	S5/2	D120	14	ROTATING WARNING LIGHT SWITCH	K37	B348	39	WTEC II PTO ENABLE OUTPUT RELAY	B10	E76	9	WTEC II TRANSFER CASE (SERIAL # 6510032369)																
TL36	B62	7	POLARITY PROTECTION	TL89	G217	25	LONG WHEEL BASE	S5/22	G120	14	FULL HAZARD WARNING SWITCH	K52	H148	17	CTIS OVERSPEED INDICATION RELAY	B10	E81	9	WTEC II TRANSFER CASE (SERIAL # 651032369 AND HIGHER)																
TL36	F63	7	200 AMP	TL90	H199	23	WRECKER REAR LIGHTS	S5/25	A255	29	SWINGFIRE PUMP SWITCH	K53	H149	17	RADIO POWER RELAY	B10	E75	9	WTEC II TRANSMISSION (SERIAL # 6510032369)																
TL37	F63	7	200 AMP	TL90	H217	25	LONG WHEEL BASE	S5/37	C255	29	DUMP UP DOWN SWITCH																								
TL37	B63	7	POLARITY PROTECTION	TL92	H200	23	WRECKER REAR LIGHTS	S5/5	A247	28	WORKLIGHTS ON/OFF SWITCH																								
TL38	D59	7	SHUNT	TL92	C215	24	REAR LIGHTS TRACTOR	S5/6	B246	28	PTO ON/OFF SWITCH																								
TL39	C61	7	CHASSIS - REAR (REF E1)	TL92	G225	25	LONG WHEEL BASE	S5/8	A249	28	BLACKOUT OVERRIDE SWITCH																								
TL41	B62	7	POLARITY PROTECTION	TL92	F231	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE	S5/9	A250	28	FUEL PRE-HEAT SWITCH																								
TL42	B62	7	POLARITY PROTECTION					AND LONG WHEEL BASE	S6	A123	14	STARTER PUSHBUTTON																							
TL44	B62	7	POLARITY PROTECTION	TL93	H199	23	WRECKER REAR LIGHTS	S7	F146	17	START INHIBIT PUSHBUTTON																								
TL44	E53	7	200 AMP	TL93	G215	24	REAR LIGHTS TRACTOR	S10A	C188	21	STOPLIGHT SWITCH																								
TL45	D59	7	SHUNT	TL93	G230	26	ALL MODELS EXCEPT WRECKER, TRACTOR, AND LONG WHEEL BASE	S10B	D188	21	STOPLIGHT SWITCH																								
TL46	D58	7	SHUNT					AND LONG WHEEL BASE	S18	D305	34	PTO PRESSURE SWITCH																							
TL46	D71	8	STARTER/STARTER SOLENOID	TL93M	G208	24	REAR LIGHTS TRACTOR	S20	E186	21	SWITCH/FRONT AIR PRESSURE TRANSMITTER																								
TL47	F63	7	200 AMP	TL94	G94	11	WINDSHIELD WASHER ROTARY PUMP (B3)	S23	F61	7	AIR PRESSURE SWITCH FOR CTIS																								
TL47	C63	7	POLARITY PROTECTION	TL97	B97	11	CHEMICAL ALARM CONNECTOR	S24	E134	15	PARKING BRAKE SWITCH																								
TL48	E61	7	CHASSIS - REAR (REF E2)	TL98	B97	11	CHEMICAL ALARM CONNECTOR	S25	B299	34	DUMP BED POSITION SWITCH																								
TL49A	D61	7	CHASSIS - REAR (REF E1)	TL99	D61	7	CHASSIS - REAR (REF E2)	S26	C66	8	WATER TEMPERATURE SENSOR																								
TL49A	F61	7	NATO SLAVE RECEPTACLE	TL101	G264	30	ALL MTV W/O PTO	S27	E68	8	OIL PRESSURE WARNING LIGHT SWITCH																								
TL50	G130	15	CHASSIS GROUND	TL101	G267	30	TRACTOR W/O WINCH	S29	G186	21	SWITCH/REAR AIR PRESSURE TRANSMITTER																								
TL50A	F61	7	NATO SLAVE RECEPTACLE	TL101	B275	31	ARCTIC KIT W/PTO EQUIPPED	S31	A252	28	ARCTIC TROOP HEATER SWITCH																								
D	TL51	E59	7	SHUNT	TL102	F275	31	ARCTIC KIT W/PTO EQUIPPED	S36	C251	28	TAILGATE RELEASE SWITCH																							
	TL52	E59	7	SHUNT	TL103	G275	31	ARCTIC KIT W/PTO EQUIPPED	S40	F67	8	ETHER SENSOR SWITCH																							
	TL53	B56	7	CHASSIS - FRONT	TL109	C209	24	REAR LIGHTS TRACTOR	S45	G71	8	TROOP ALARM SWITCH																							
	TL53	B71	8	STARTER/STARTER SOLENOID	TL110	D70	8	ALTERNATOR	S56	A66	8	WATER TEMPERATURE SWITCH																							
E	TL54	C200	23	WRECKER REAR LIGHTS	TL111	D266	30	PTO EQUIPPED																											
	TL55	B56	7	CHASSIS - FRONT	TL123	E47	6	CHASSIS - FRONT (REF J19)																											
	TL55	C71	8	STARTER/STARTER SOLENOID	TL126	G95	11	WINDSHIELD WASHER ROTARY PUMP (B3)																											
	TL56	F145	17	X3 GROUND	TL126	E135	15	PARKING BRAKE SWITCH																											
	TL57	F145	17	CAB GROUND	TL130	F94	11	CAB MARKER LIGHTS																											
	TL58	D69	8	ALTERNATOR	TL131	A94	11	CAB MARKER LIGHTS																											
	TL59	C70	8	ALTERNATOR	TL133	F94	11	CAB MARKER LIGHTS																											
	TL60	C62	7	POLARITY PROTECTION	TL134	B94	11	CAB MARKER LIGHT FRONT LOWER RIGHT																											
	TL60	D69	8	ALTERNATOR	TL150	F186	21	SENSOR/FRONT AIR PRESSURE TRANSMITTER																											
	TL61	C62	7	POLARITY PROTECTION	TL151	G186	21	SENSOR/REAR AIR PRESSURE TRANSMITTER																											
	TL61	E69	8	ALTERNATOR	TL152	C188	21	STOPLIGHT SWITCH																											
F	TL61	F62	7	200 AMP	TL501	G197	22	CAB DASH RIGHT UNDERDASH																											
	TL62	C56	7	CHASSIS - FRONT	TL502	G197	22	CAB DASH RIGHT UNDERDASH																											
	TL63	C56	7	CHASSIS - FRONT	TL153	C188	21	STOPLIGHT SWITCH																											
	TL63	B71	8	STARTER/STARTER SOLENOID	TL154	D188	21	STOPLIGHT SWITCH																											
	TL66	H70	8	ENGINE (REF P201)	TL155	D188	21	STOPLIGHT SWITCH																											
	TL67	F307	35	CARGO MATERIAL HANDLING CRANE	TL156	F186	21	SWITCH/FRONT AIR PRESSURE TRANSMITTER																											
	TL68	D260	29	CAB DASH CENTER OPTIONS PANEL	TL157	G186	21	SWITCH/REAR AIR PRESSURE TRANSMITTER																											
	TL69	E260	29	CAB DASH CENTER OPTIONS PANEL	TL158	E146	17	START INHIBIT PUSHBUTTON																											
	TL70	B47	6	BLACKOUT MARKER RIGHT FRONT	TL159	E145	17	START INHIBIT PUSHBUTTON																											
	TL70	B47	6	PARKING LIGHT FRONT RIGHT	TL162	B123	14	STARTER PUSHBUTTON																											
	TL70	B47	6	FRONT RIGHT TURN SIGNAL	TL163	B123	14	STARTER PUSHBUTTON																											
G	TL71	A94	11	CAB MARKER LIGHT RIGHT DOOR	TL164	G71	8	ENGINE (REF J921)																											
	TL72	H47	6	BLACKOUT DRIVE LIGHT	TL165	G71	8	ENGINE (REF J921)																											
	TL73	B95	11	CAB MARKER LIGHTS	TL166	F62	7	200 AMP																											
	TL74	D95	11	CAB MARKER LIGHTS	TL167	E62	7	200 AMP																											
	TL74	E240	27	AIRDROP ONLY	TL168	D63	7	200 AMP																											
	TL75	F96	11	CAB MARKER LIGHTS	TL169	D62	7	200 AMP																											
	TL76	D265	30	PTO EQUIPPED	TL170	F284	32	SWINGFIRE HEATER																											
	TL77	B299	34	DUMP BODY	TL171	F62	7	200 AMP																											
	TL78	B298	34	DUMP BODY	TL172	F62	7	200 AMP																											
	TL79	F47	6	FRONT LEFT TURN SIGNAL	TL173	E63	7	200 AMP																											
	TL79	G47	6	PARKING LIGHT FRONT LEFT	TL174	D62	7	200 AMP																											
H	TL79	G47	6	BLACKOUT MARKER LEFT FRONT	TL190	D344	39	WTEC II PRESSURE SWITCH GROUND																											
	TL80	E53	7	200 AMP	TL201	E134	15	PARKING BRAKE SWITCH																											
	TL80	C62	7	POLARITY PROTECTION	TL202	E133	15	PARKING BRAKE SWITCH																											
	TL81	A48	6	CHASSIS - FRONT (REF J13)																															
	TL81	C47	6	CHASSIS - FRONT																															
	TL82	A47	6	CHASSIS - FRONT																															

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MISCELLANEOUS (CONTINUED)

NUMBER	ZONE	SH	DESCRIPTION
E27	F213	24	REAR LIGHTS TRACTOR
E28	G215	24	REAR LIGHTS TRACTOR
E29	E209	24	REAR LIGHTS TRACTOR
F3	H157	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
E30	D214	24	REAR LIGHTS TRACTOR
E31	D213	24	REAR LIGHTS TRACTOR
E32	G212	24	REAR LIGHTS TRACTOR
E33	C209	24	REAR LIGHTS TRACTOR
E34	B210	24	REAR LIGHTS TRACTOR
E35	F209	24	REAR LIGHTS TRACTOR
E36	E210	24	REAR LIGHTS TRACTOR
E37	E211	24	REAR LIGHTS TRACTOR
E38	F209	24	REAR LIGHTS TRACTOR
E39	E210	24	REAR LIGHTS TRACTOR
E4	H159	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
E40	F210	24	REAR LIGHTS TRACTOR
E41	D211	24	REAR LIGHTS TRACTOR
E42	D210	24	REAR LIGHTS TRACTOR
E43	D210	24	REAR LIGHTS TRACTOR
E44	H213	24	REAR LIGHTS TRACTOR
E45	G209	24	REAR LIGHTS TRACTOR
E46	G203	23	WRECKER REAR LIGHTS
E47	F203	23	WRECKER REAR LIGHTS
E48	E204	23	WRECKER REAR LIGHTS
E49	D203	23	WRECKER REAR LIGHTS
E5	B160	18	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
E50	E206	23	WRECKER REAR LIGHTS
E51	A206	23	WRECKER REAR LIGHTS
E52	G204	23	WRECKER REAR LIGHTS
E53	D200	23	WRECKER REAR LIGHTS
E54	B200	23	WRECKER REAR LIGHTS
E55	F200	23	WRECKER REAR LIGHTS
E56	E211	24	REAR LIGHTS TRACTOR
E57	E203	23	WRECKER REAR LIGHTS
E58	D204	23	WRECKER REAR LIGHTS
E59	G204	23	WRECKER REAR LIGHTS
F64	D221	25	LONG WHEEL BASE
E65	B50	6	CHASSIS - FRONT
E66	C50	6	CHASSIS - FRONT
E66	E352	40	WTEC II TRANSMISSION HARNESS
E67	D47	6	CHASSIS - FRONT
E68	D49	6	CHASSIS - FRONT
E69	D260	29	CAB DASH CENTER OPTIONS PANEL
E70	C265	30	PTO EQUIPPED
E70	F266	30	TRACTOR W/O WINCH
E70	A274	31	ARCTIC KIT W/PTO EQUIPPED
E71	F182	21	CAB - DASH - LEFT - UNDERDASH
E72	G222	25	LONG WHEEL BASE
E73	G174	31	ARCTIC KIT W/PTO EQUIPPED
E74	G266	30	TRACTOR W/O WINCH
E74	B265	31	ARCTIC KIT W/PTO EQUIPPED
E76	E265	31	ARCTIC KIT W/PTO EQUIPPED
E78	A290	34	DUMP BODY
E79	B227	27	ROTARY WARNING LIGHT CONNECTOR
F80	C227	27	ROTARY WARNING LIGHT CONNECTOR
E81	B228	27	ROTARY WARNING LIGHT CONNECTOR
E82	C228	27	ROTARY WARNING LIGHT CONNECTOR
E83	B228	27	ROTARY WARNING LIGHT CONNECTOR
E84	B228	27	ROTARY WARNING LIGHT CONNECTOR
E88	B106	13	CAB DASH LEFT INSTRUMENT PANEL
E89	C106	13	CAB DASH LEFT INSTRUMENT PANEL
E90	F352	40	WTEC III TRANSMISSION HARNESS
E91	D352	40	WTEC III TRANSMISSION HARNESS
FL	E183	22	WTEC II VEHICLE INTERFACE MODULE
FL1	G85	11	EMI FILTER
FL2	A184	22	EMI FILTER
FL3	C118	15	FAN MOTOR
G1	D60	6	ALTERNATOR
MPU1	F61	8	ENGINE SPEED MAGNETIC PICKUP
MT11	A63	8	THROTTLE POSITION SENSOR
MT3	F60	8	ENGINE OIL PRESSURE SENSOR
MT4	E177	21	SENSOR/FRONT AIR PRESSURE TRANSMITTER

MISCELLANEOUS (CONTINUED)

NUMBER	ZONE	SH	DESCRIPTION
MT5	G186	21	SENSOR/REAR AIR PRESSURE TRANSMITTER
MT6	B66	8	WATER COOLER TEMPERATURE
MT7	B61	7	FUEL TANK LEVEL SENSOR
NS	E192	22	WTEC II VEHICLE INTERFACE MODULE
NS	F192	22	WTEC II VEHICLE INTERFACE MODULE
RT1	D59	7	SHUNT
TB	C309	35	CARGO MATERIAL HANDLING CRANE
TB	F309	35	CARGO MATERIAL HANDLING CRANE
TB	D319	36	WRECKER MATERIAL HANDLING CRANE
TB	E247	38	WRECKER CONTROLS
TB1	B293	33	WEBASTO CONTROL UNIT
TB1	C137	16	CAB DASH RIGHT POWER
TB2	F139	16	CAB - DASH - RIGHT - POWER DISTRIBUTION PNL
TB2	D293	33	WEBASTO CONTROL UNIT
X1	C146	17	24 VDC
X11	F61	7	NATO SLAVE RECEPTACLE
X2	D146	17	24 VDC
X3	F146	17	GROUND

TRANSMISSION

NUMBER	ZONE	SH	DESCRIPTION
A10	B192	22	WTEC II VEHICLE INTERFACE MODULE
A11	C347	39	WTEC III TRANSMISSION ECU
A12	G347	39	WTEC III TRANSMISSION PUSHBUTTON SHIFT SELECTOR
A13	A75	9	WTEC II TRANSMISSION A13 (SERIAL # 6510032369)
A13	A79	9	WTEC II TRANSMISSION A13 (SERIAL # 6510032369 AND HIGHER)
A13	A83	10	WTEC II TRANSMISSION A13 PRIOR TO (SERIAL # 6510032369 WITH ADAPTER CABLE ASSEMBLY)
MT9	E75	9	WTEC II ENGINE SPEED SENSOR (SERIAL # 6510032369)
MT9	E79	9	WTEC II ENGINE SPEED SENSOR (SERIAL # 6510032369 AND HIGHER)
MT9	E83	10	WTEC II ENGINE SPEED SENSOR PRIOR TO (SERIAL # 6510032369 WITH ADAPTER CABLE ASSEMBLY)
MT11	F75	9	WTEC II TRANSMISSION (SERIAL # 6510032369)
MT11	F79	9	WTEC II TRANSMISSION (SERIAL # 6510032369 AND HIGHER)
MT11	F83	9	WTEC II TRANSMISSION PRIOR TO (SERIAL # 6510032369 WITH ADAPTER CABLE ASSEMBLY)
REV	C192	22	WTEC II VEHICLE INTERFACE MODULE
RW	D192	22	WTEC II VEHICLE INTERFACE MODULE
S02	F192	22	WTEC II VEHICLE INTERFACE MODULE
S03	F192	22	WTEC II VEHICLE INTERFACE MODULE
SF01	D192	22	WTEC II VEHICLE INTERFACE MODULE
SF01	D192	22	WTEC II VEHICLE INTERFACE MODULE
SF02	C192	22	WTEC II VEHICLE INTERFACE MODULE
SF02	D192	22	WTEC II VEHICLE INTERFACE MODULE
SF3	F192	22	WTEC II VEHICLE INTERFACE MODULE
SF04	C192	22	WTEC II VEHICLE INTERFACE MODULE
SF4	D192	22	WTEC II VEHICLE INTERFACE MODULE

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 5 OF 40

SIZE B

ILL. NO. 6WDO1L5A

FP-9/FP-10 BLANK

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FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 6 OF 40

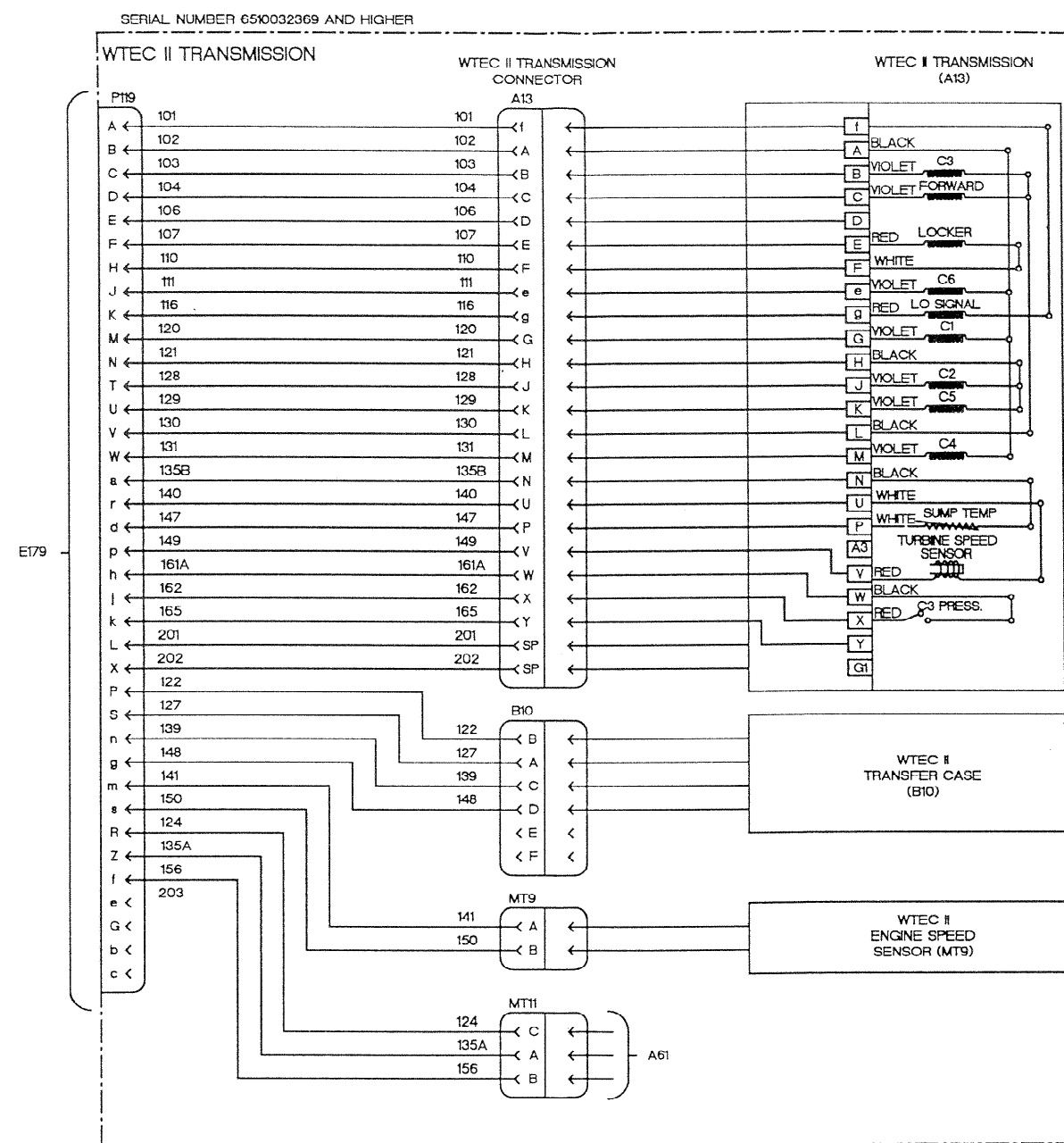
SIZE	B	ILL. NO.	6WD0101A	FP-11/FP-12 BLANK
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FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 7 OF 40

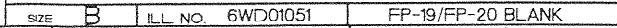
SIZE	B	ILL. NO.	6WD01021	FP-13/FP-14 BLANK
			62	63

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 8 OF 40

SIZE	B	ILL. NO.	6WD0103A	FP-15/FP-16 BLANK
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SIZE	B	ILL. NO.	GWD0104A	FP-17/FP-18 BLANK
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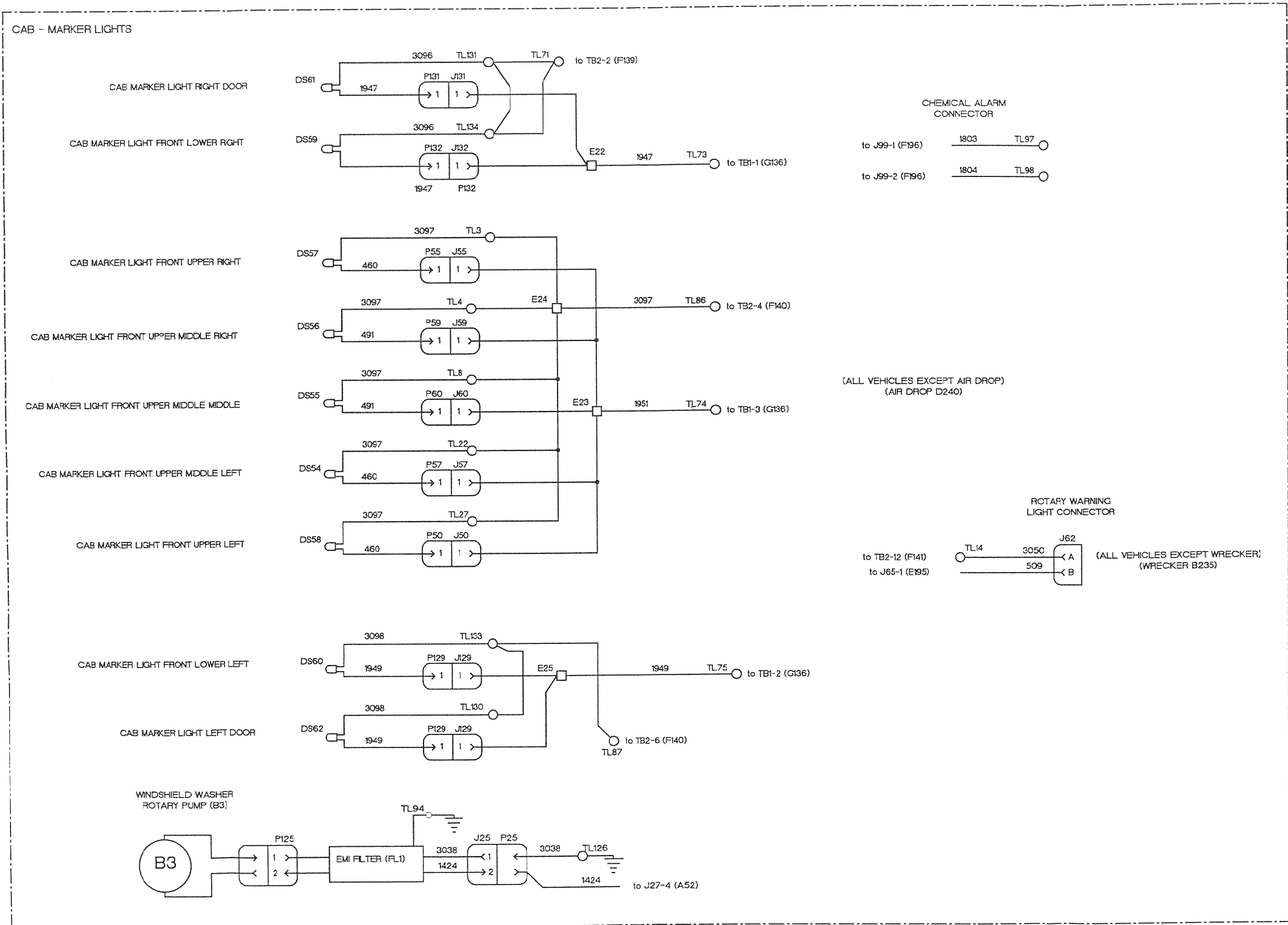


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 11 OF 40

SIZE	B	ILL. NO.	6WD0106A	FP-21/FP-22 BLANK
			98	99

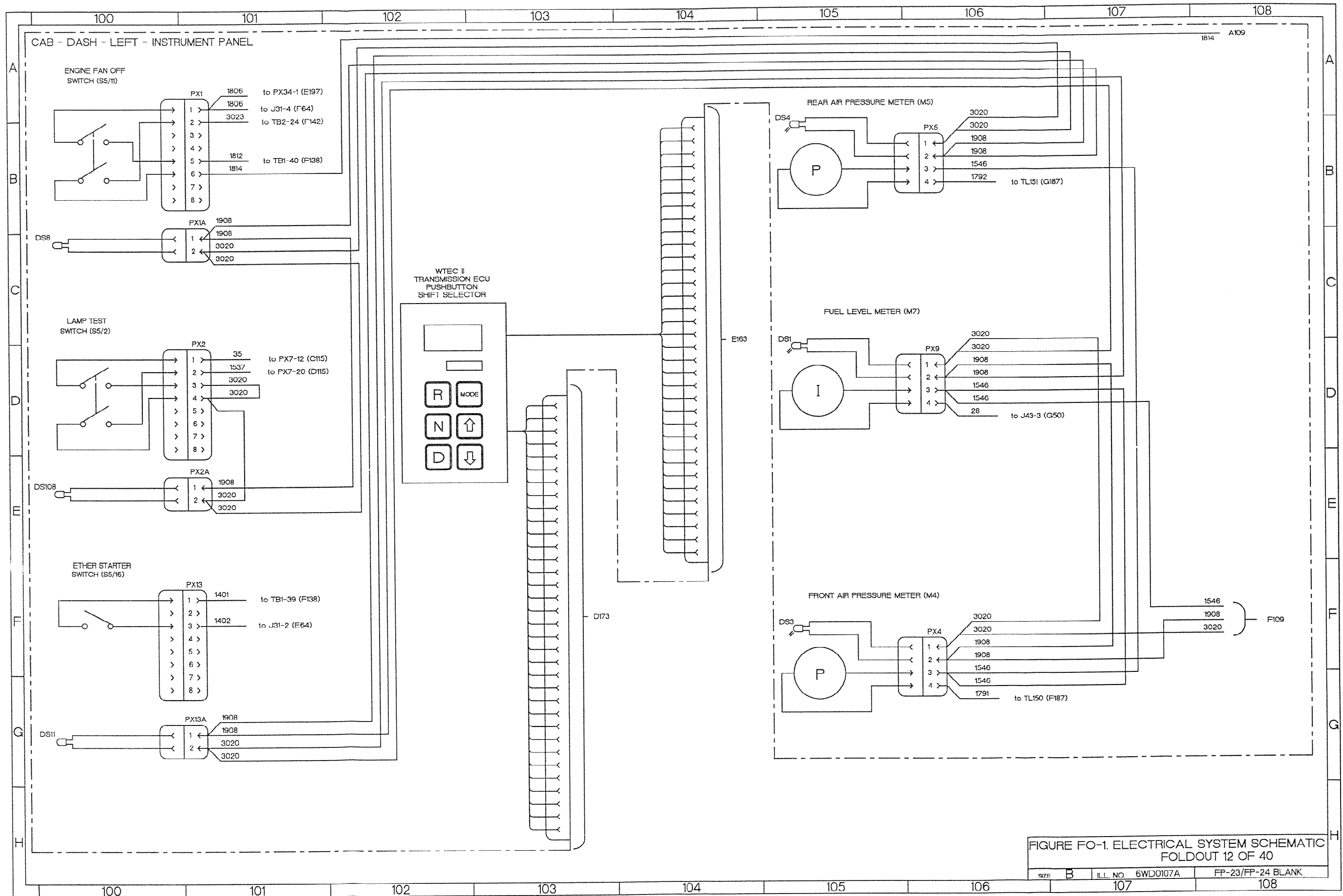
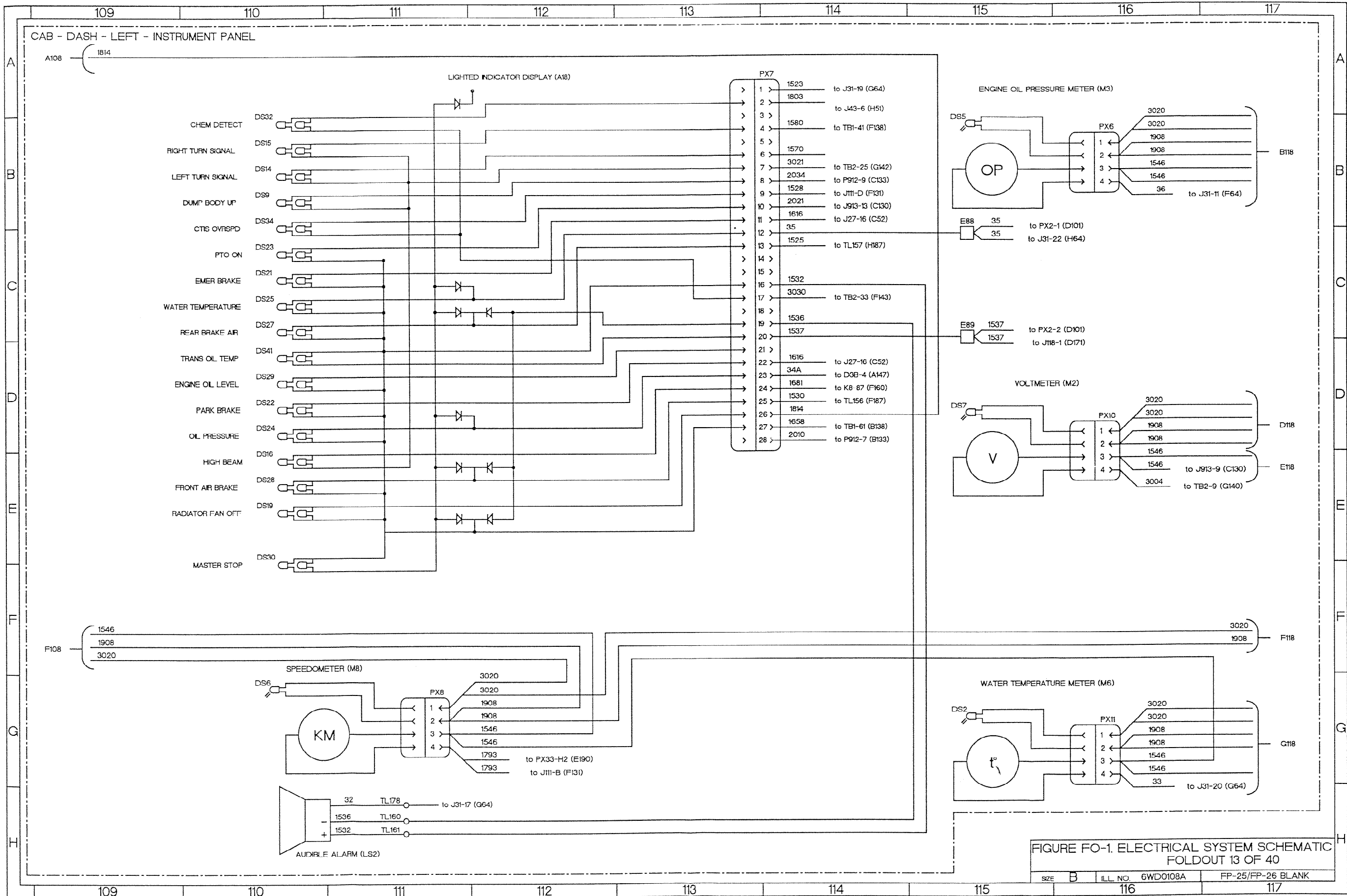
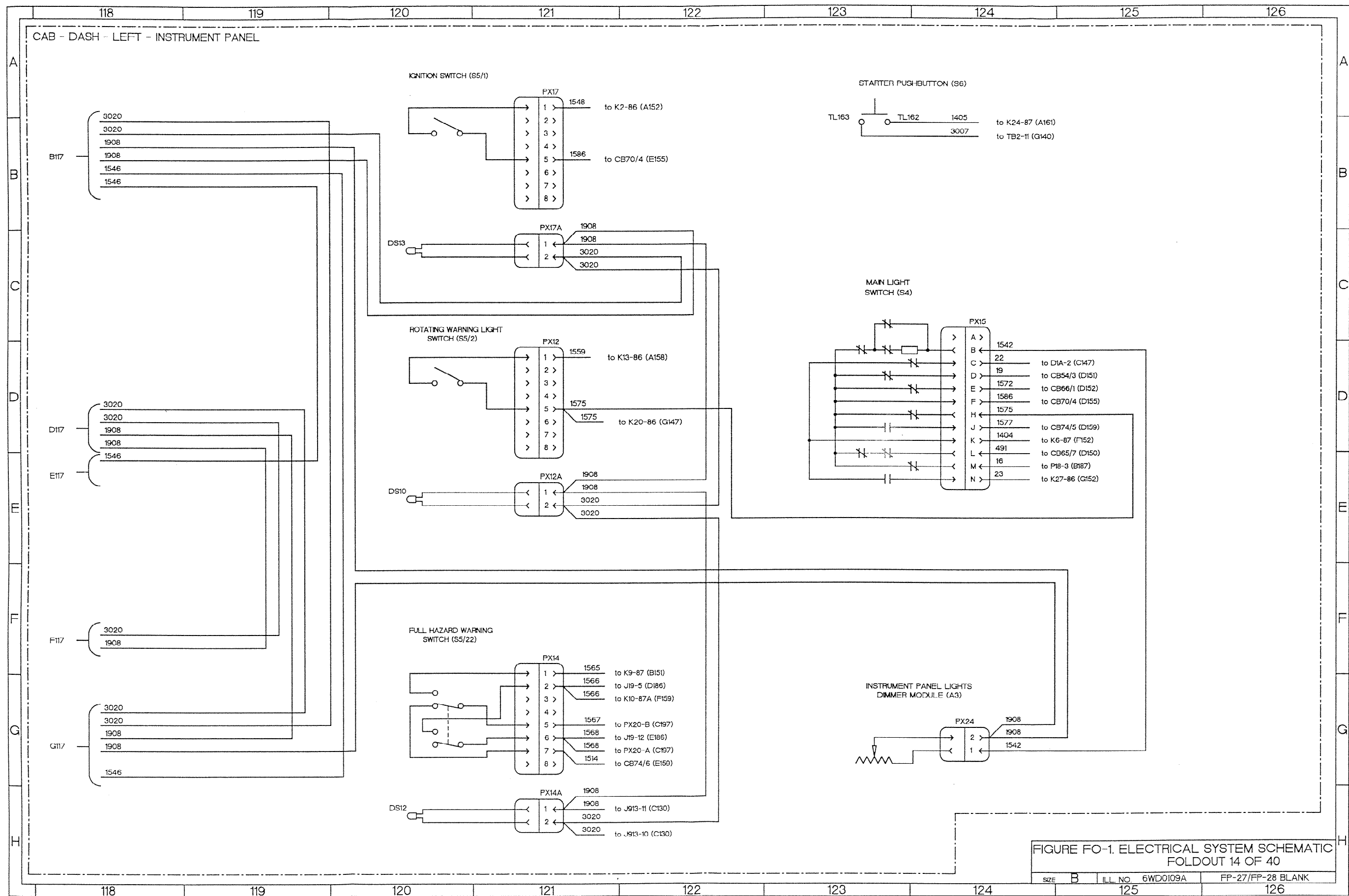
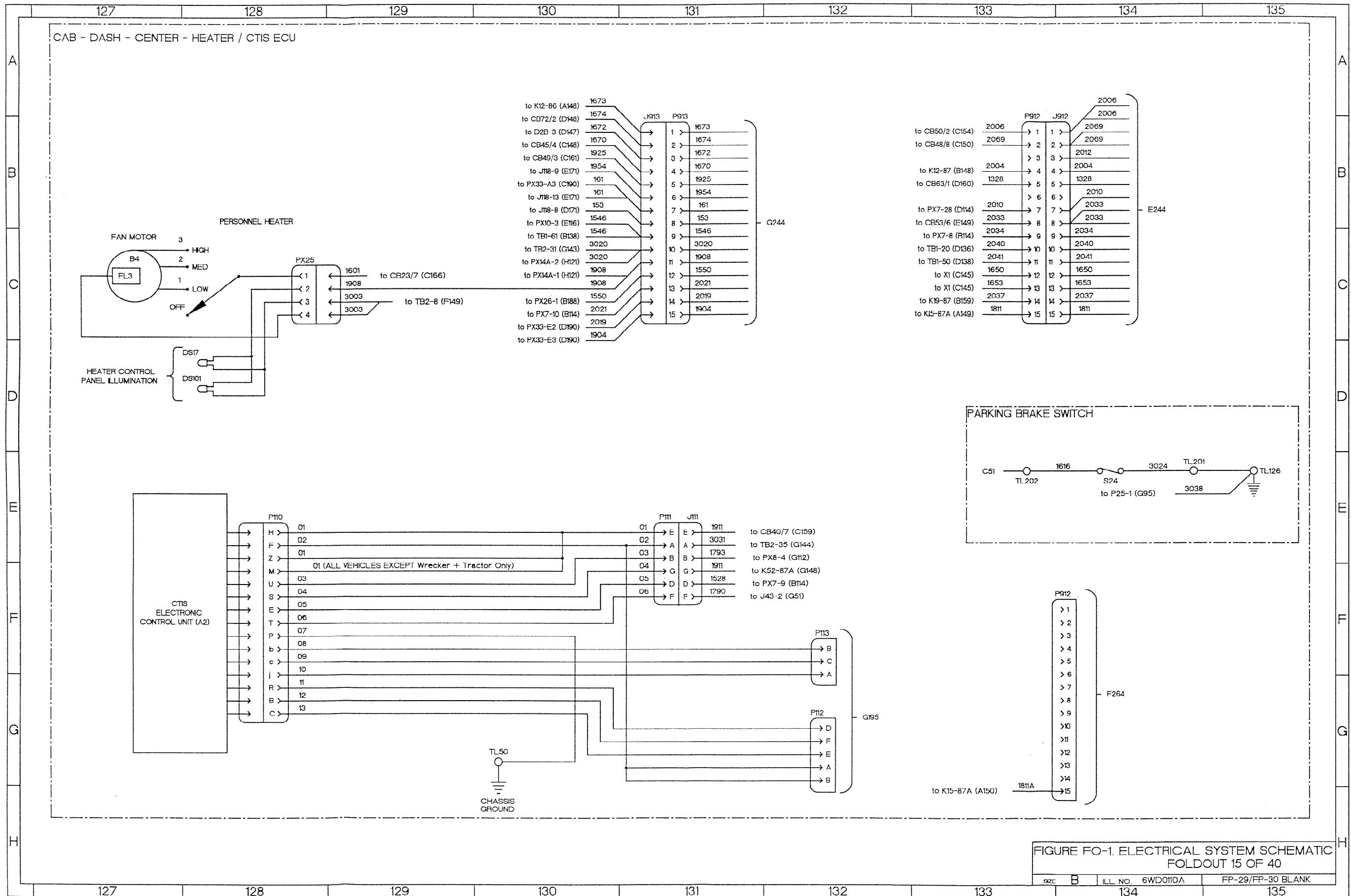


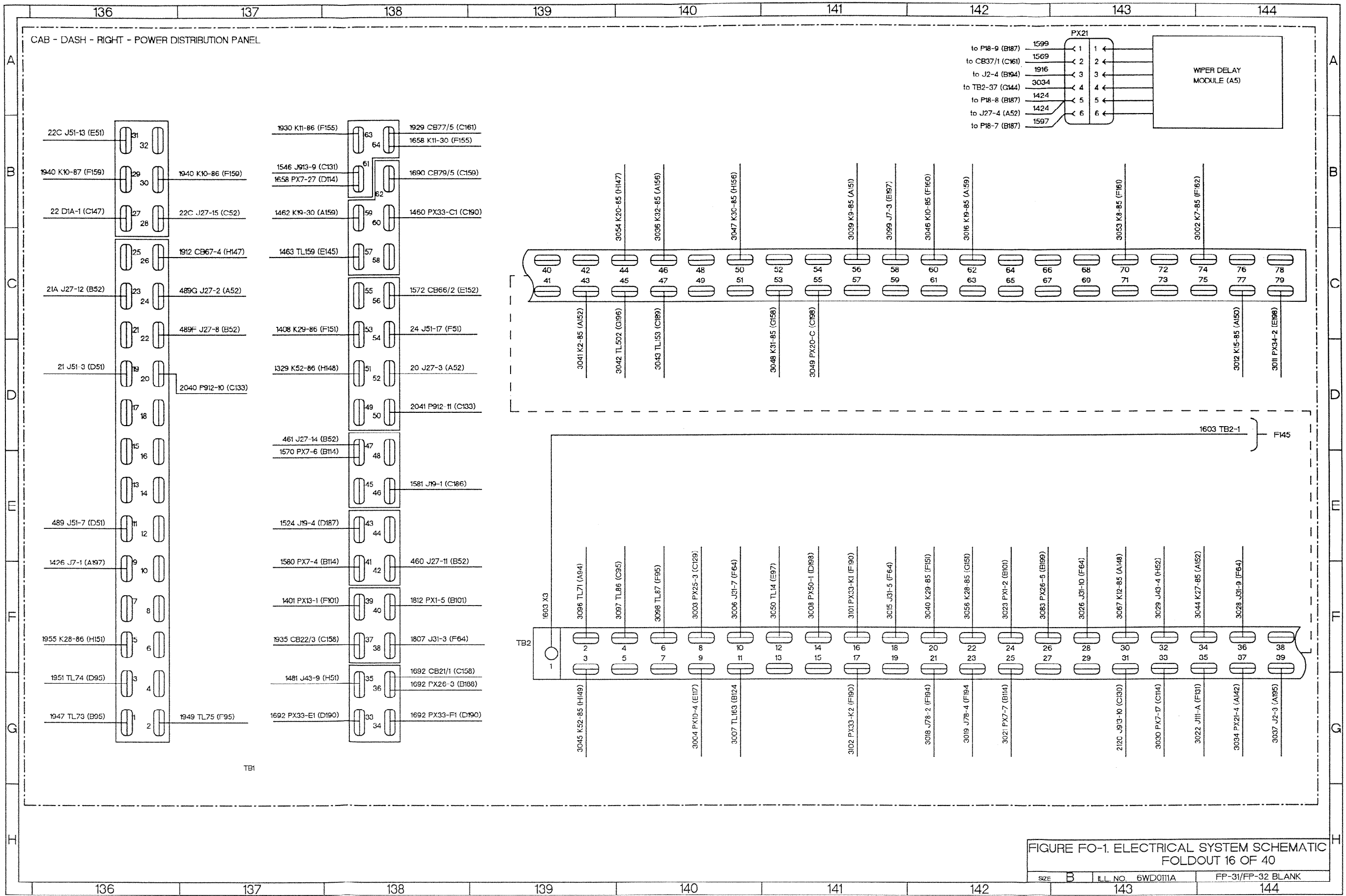
FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 12 OF 40

SIZE	B	ILL. NO.	6WD0107A	FP-23/FP-24 BLANK
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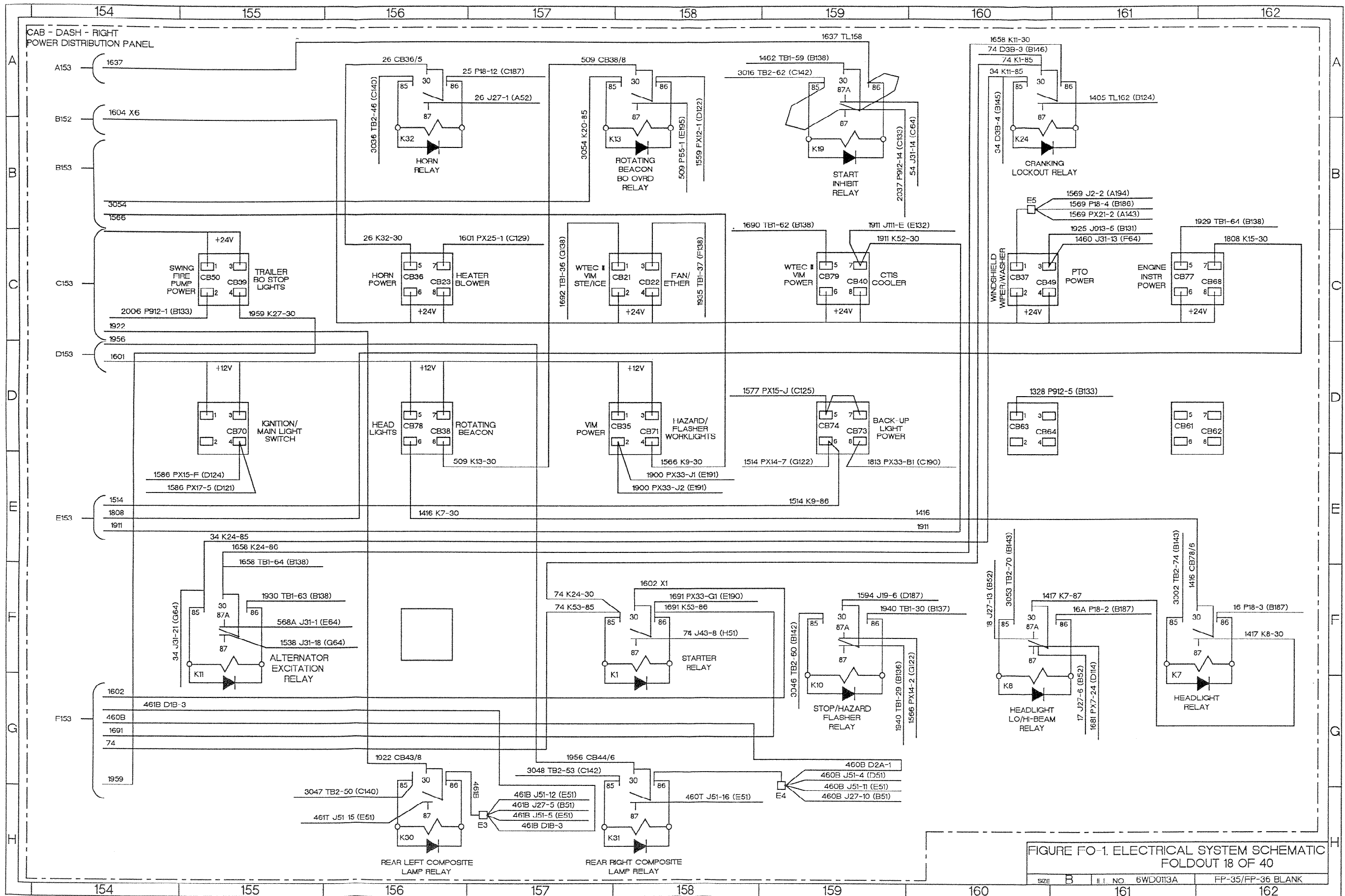


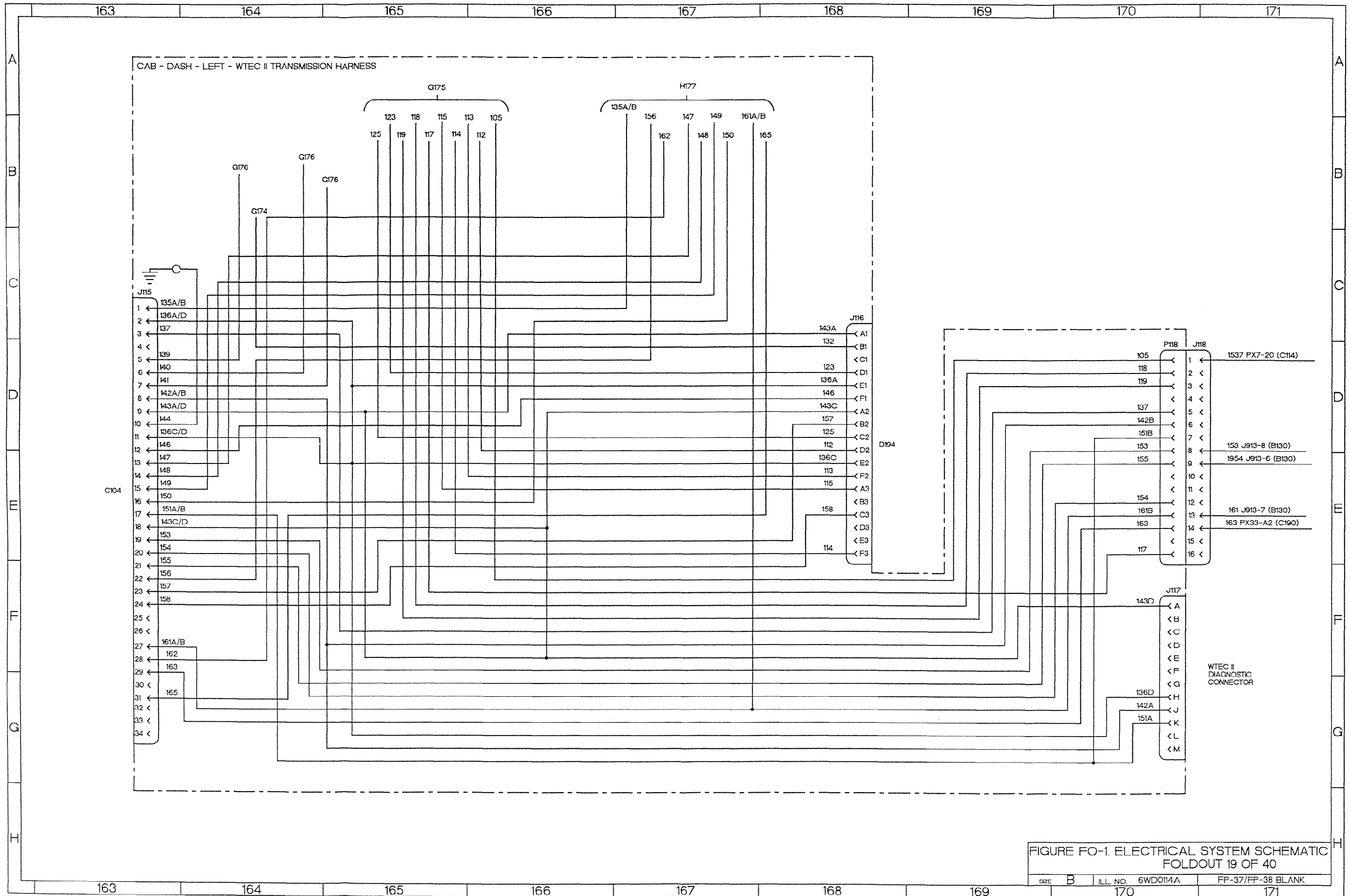






SIZE	B	ILL. NO.	6WD01121	FP-33/FP-34 BLANK
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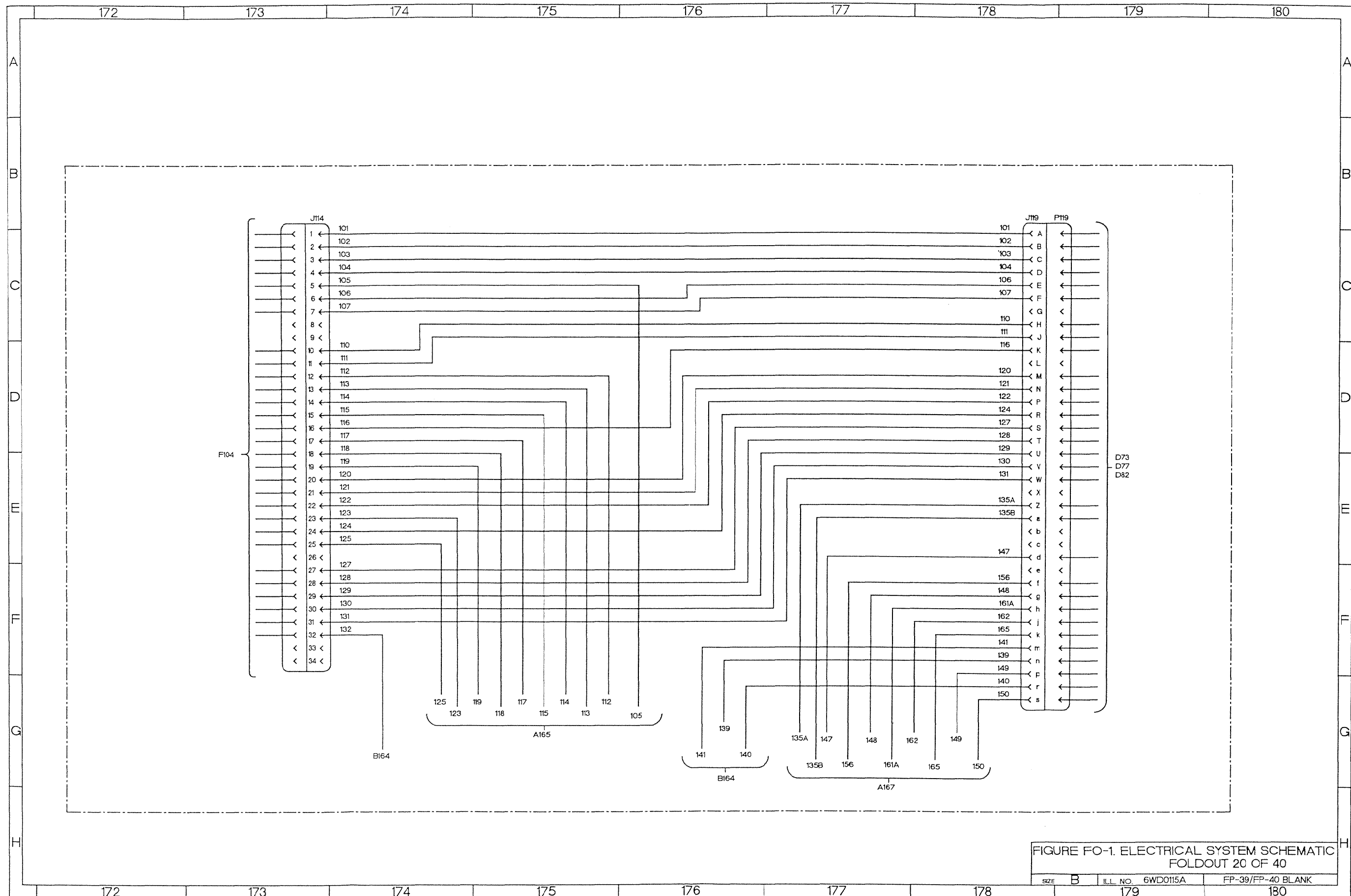
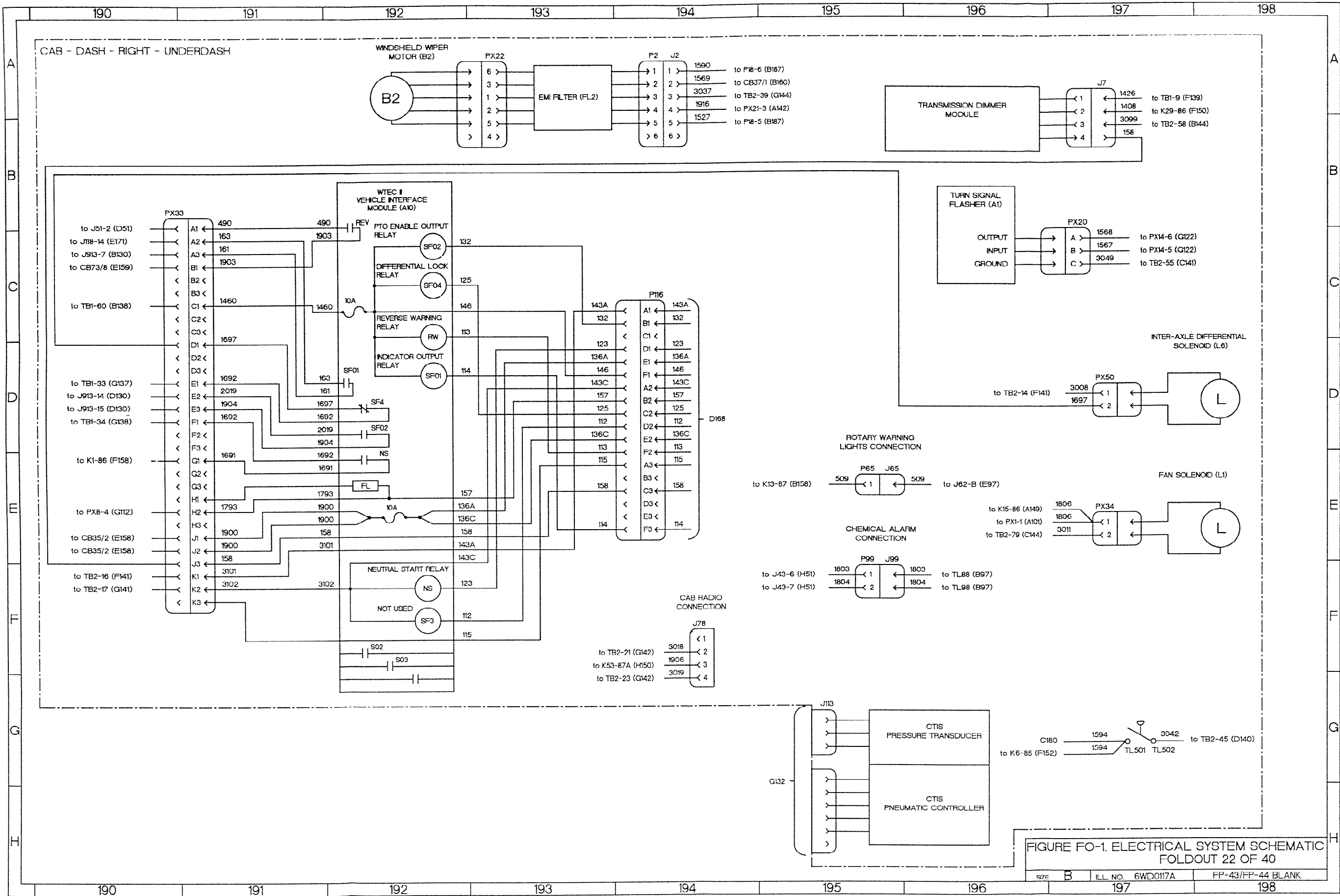


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 20 OF 40

SIZE	B	ILL. NO.	6WD0115A	FP-39/FP-40 BLANK
			179	180

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 21 OF 40

SIZE	B	ILL. NO.	6WD0116A	FP-41/FP-42 BLANK
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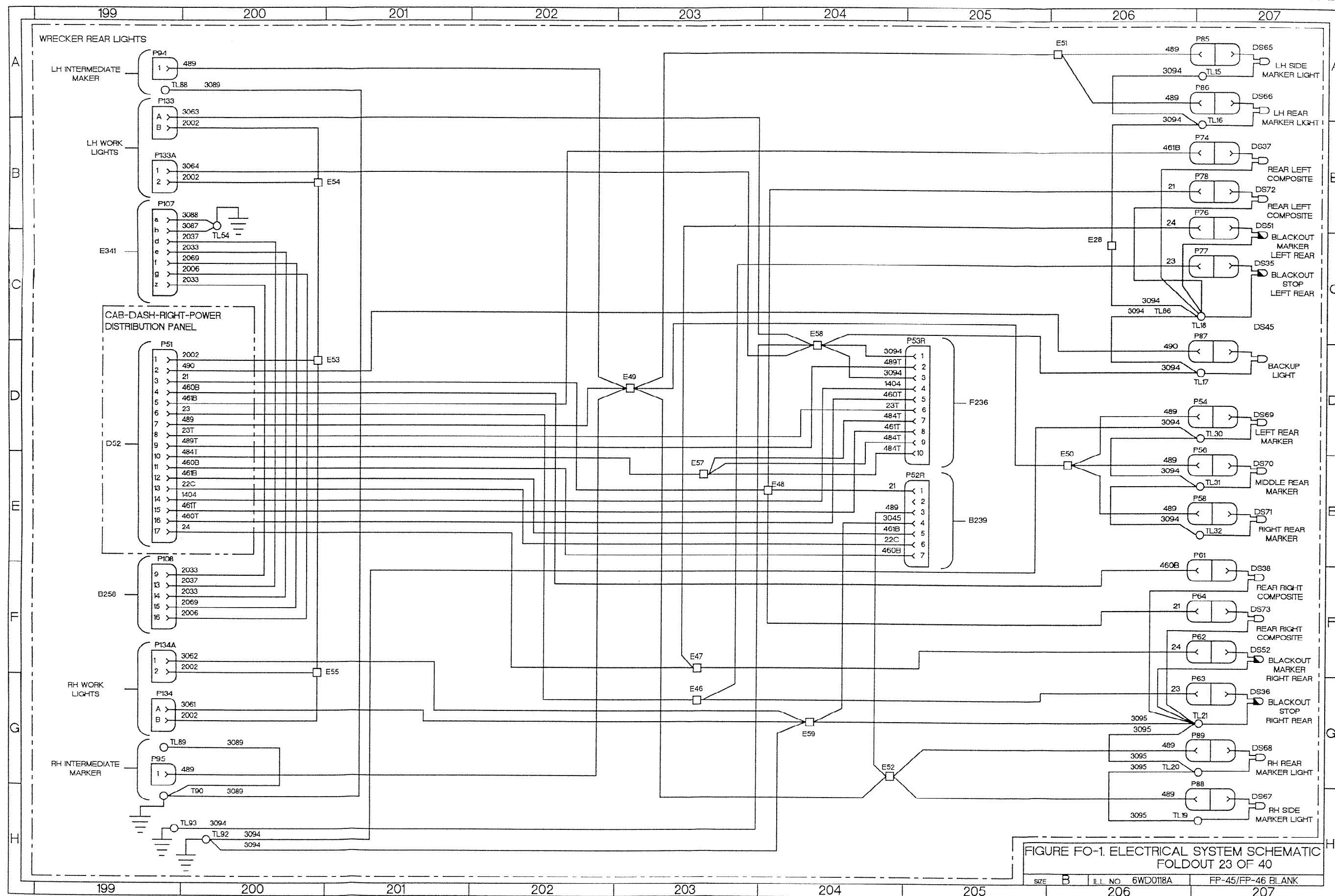
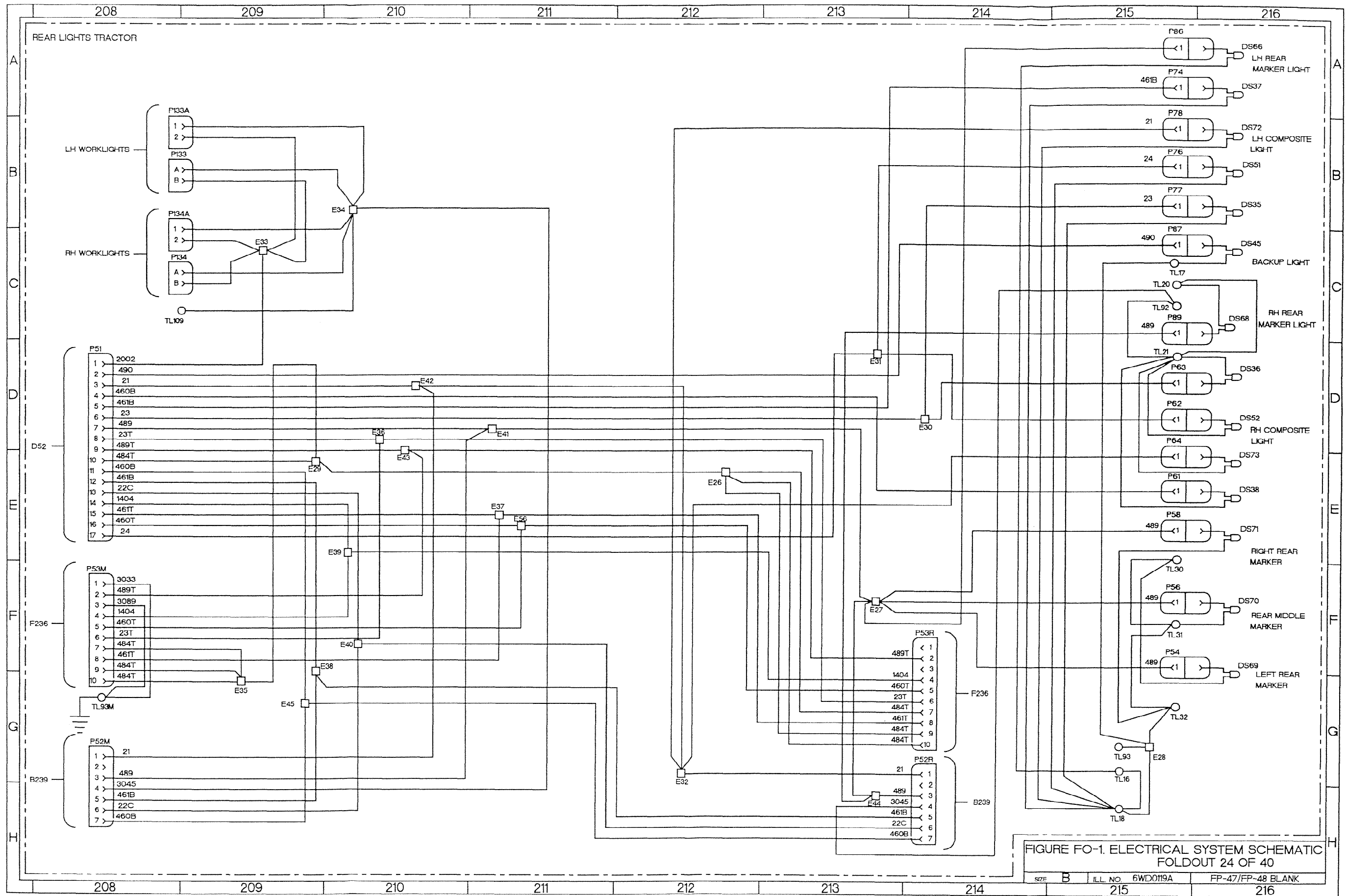
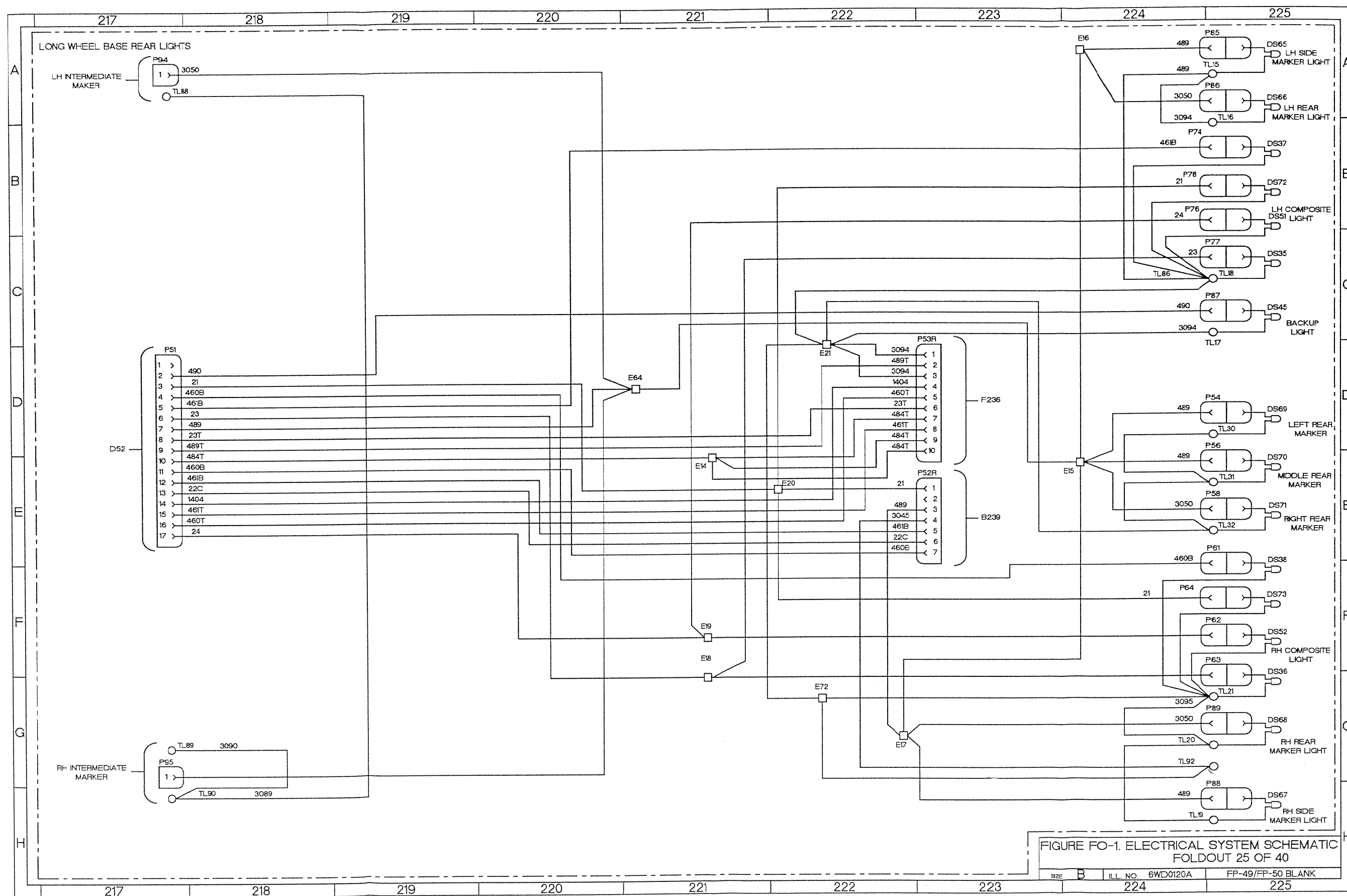
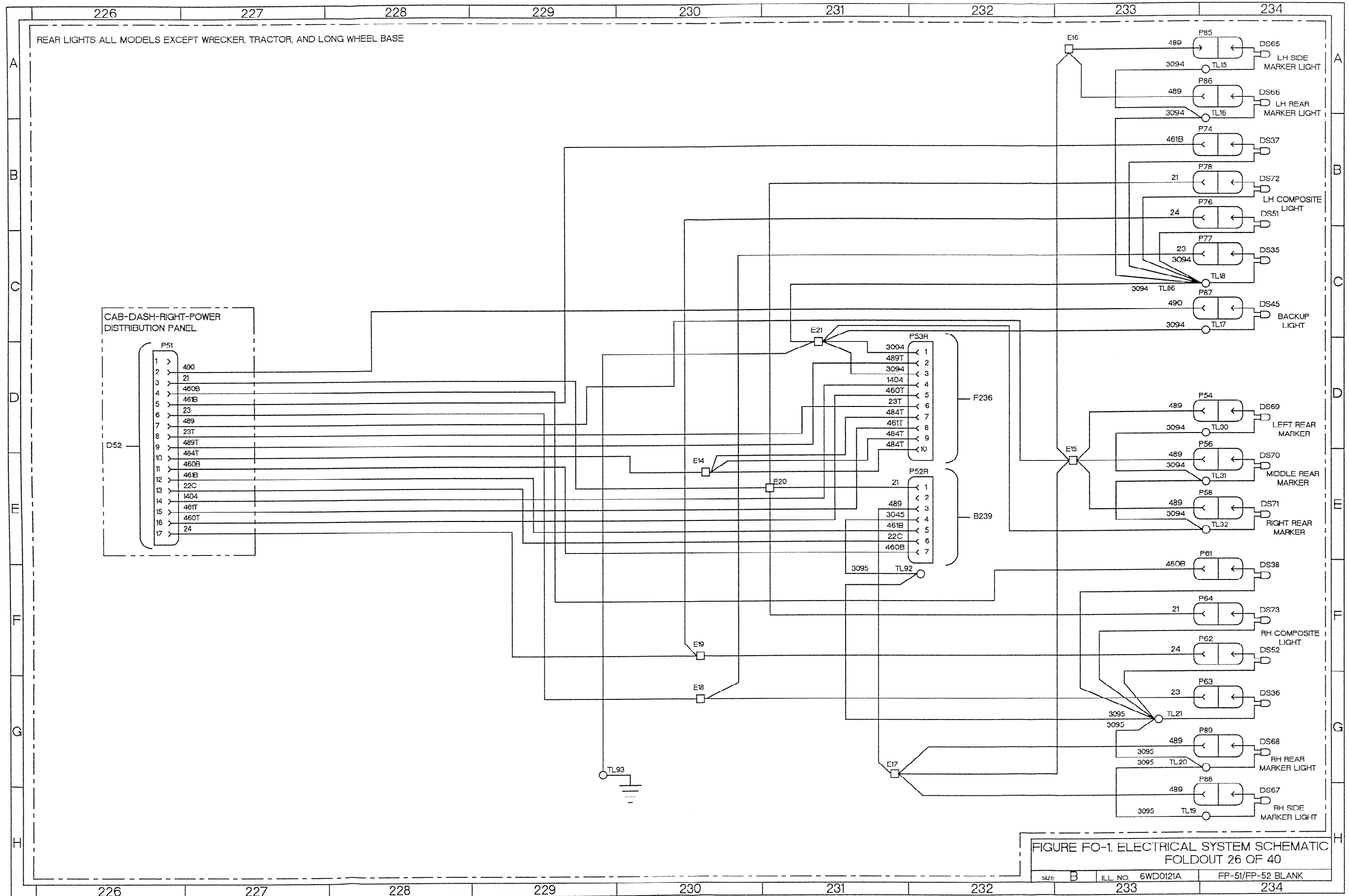


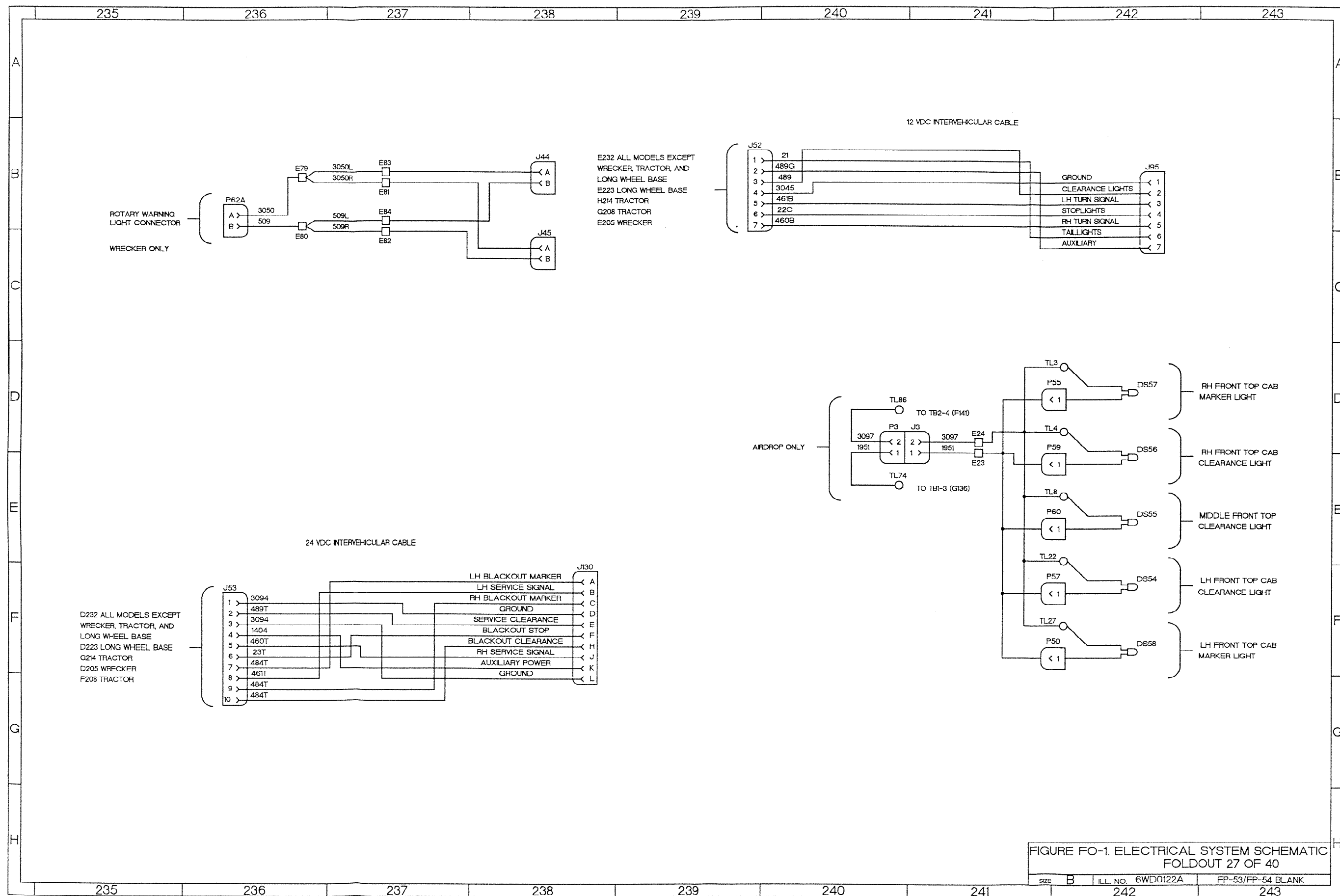
FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 23 OF 40

SIZE	B	ILL. NO.	6WD0118A	FP-45/FP-46 BLANK
			206	207









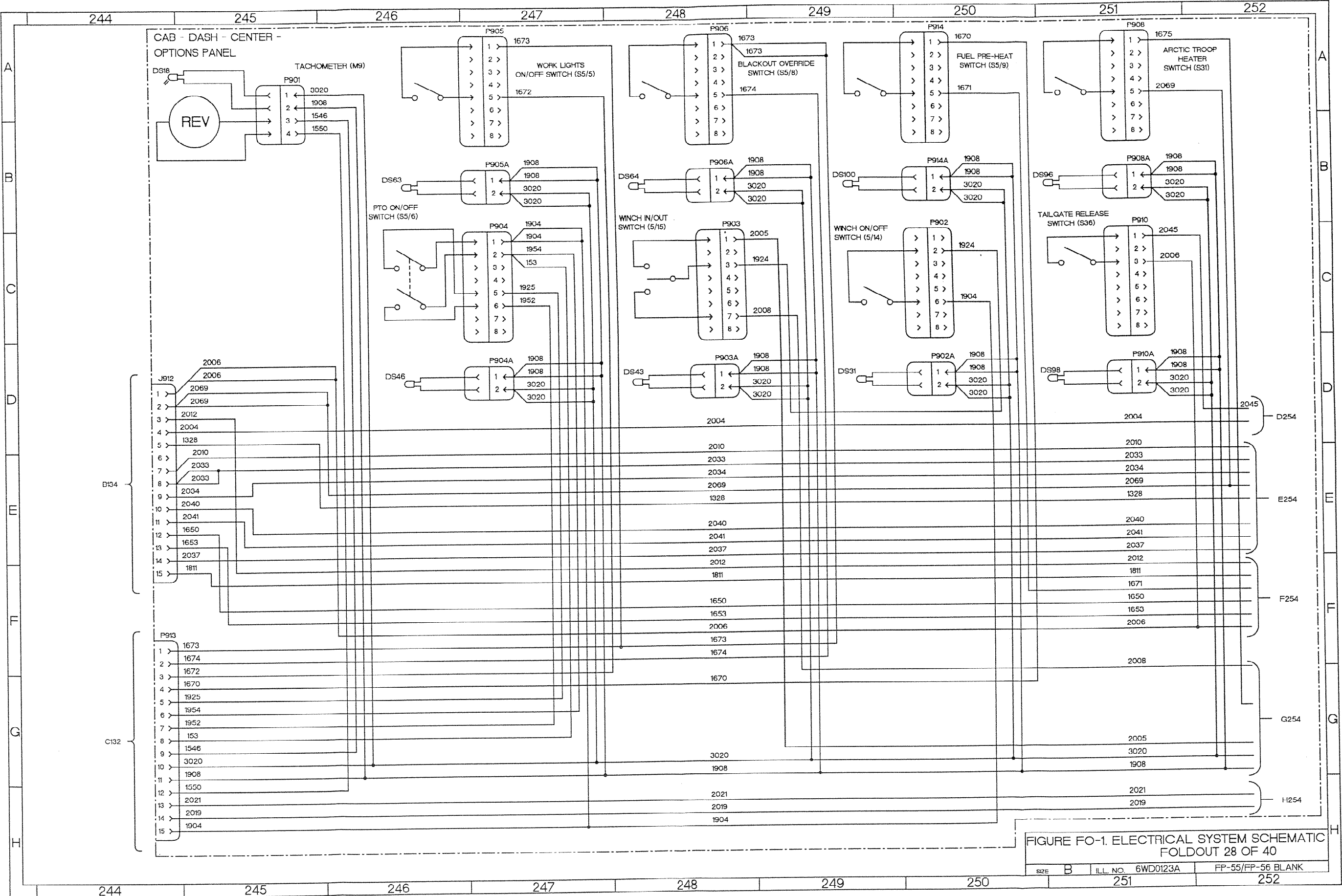


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 28 OF 40

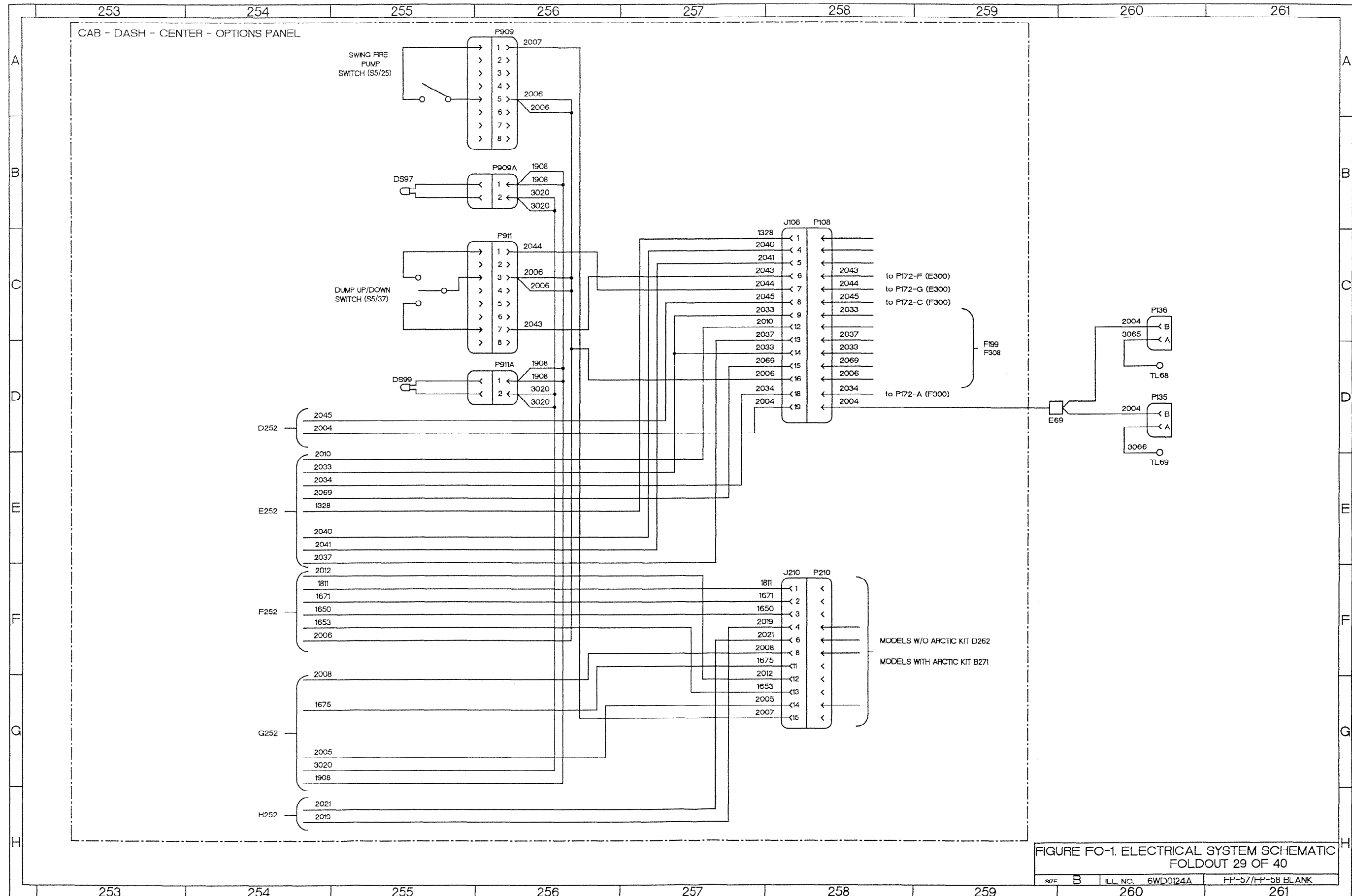
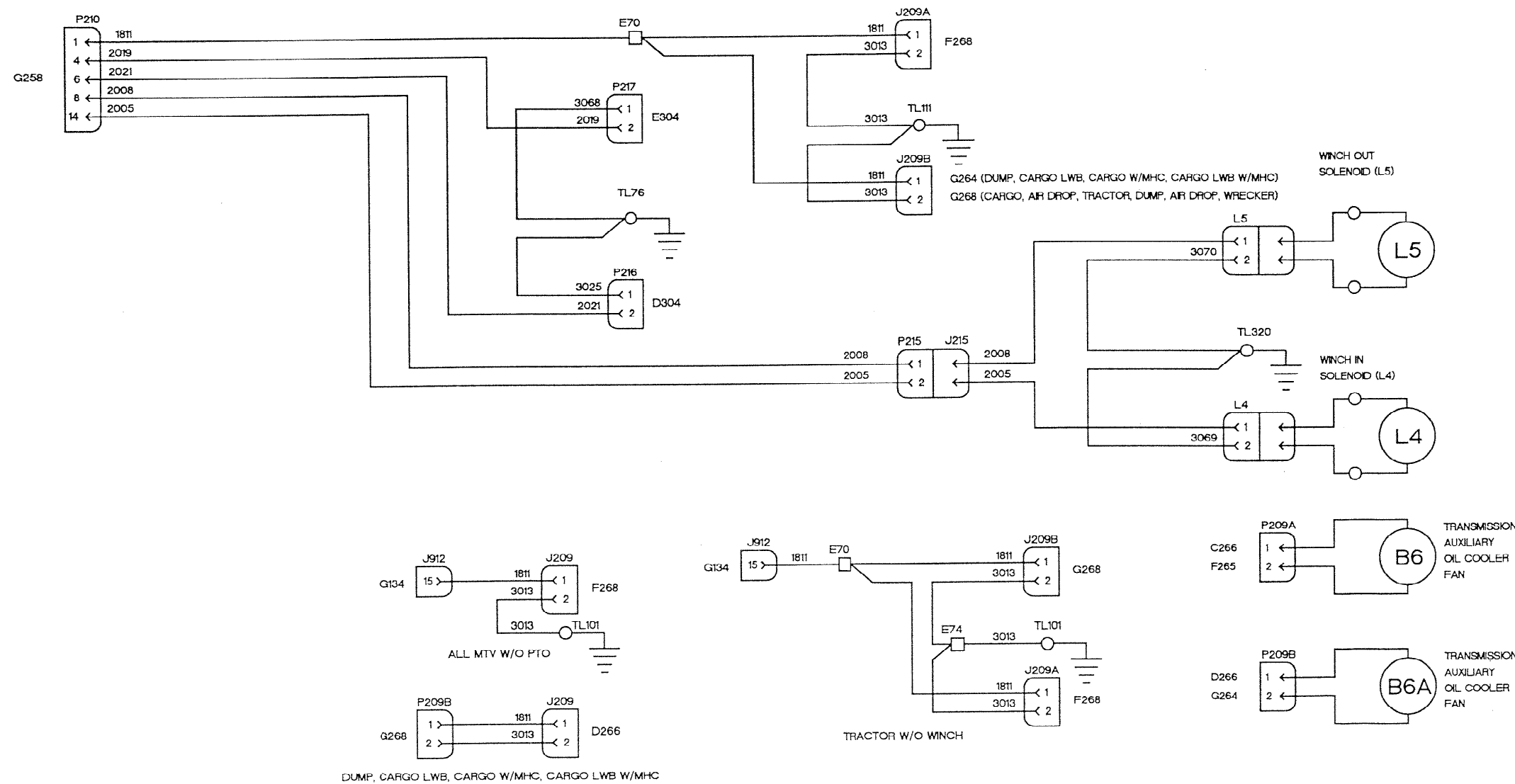


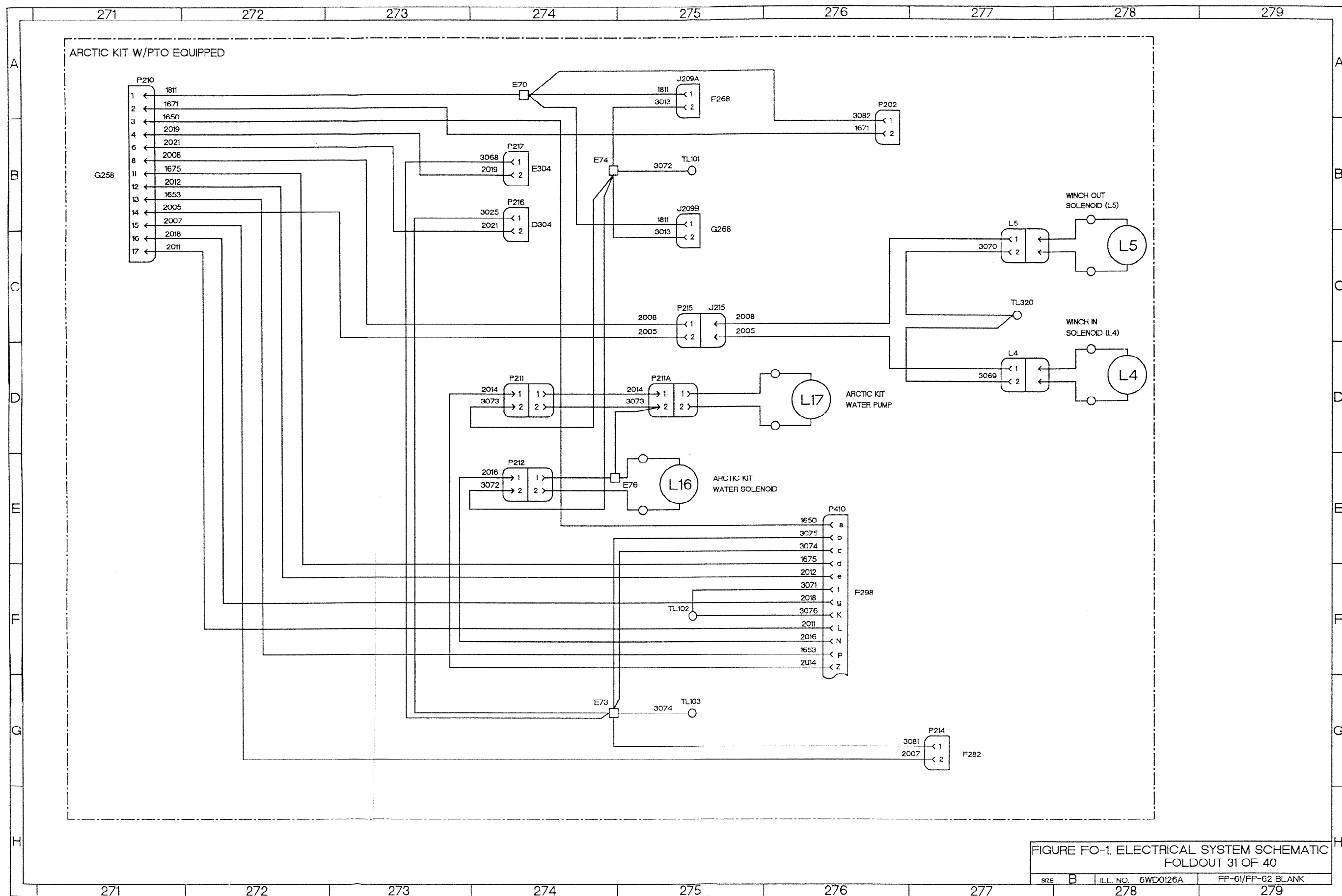
FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 29 OF 40

507F	B	ILL. NO.	6WD0124A	FP-57/FP-58 BLANK
253	254	255	256	257
258	259	260	261	

PTO EQUIPPED

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 30 OF 40

SIZE	B	ILL. NO.	6WD0125A	FP-59/FP-60 BLANK
				270



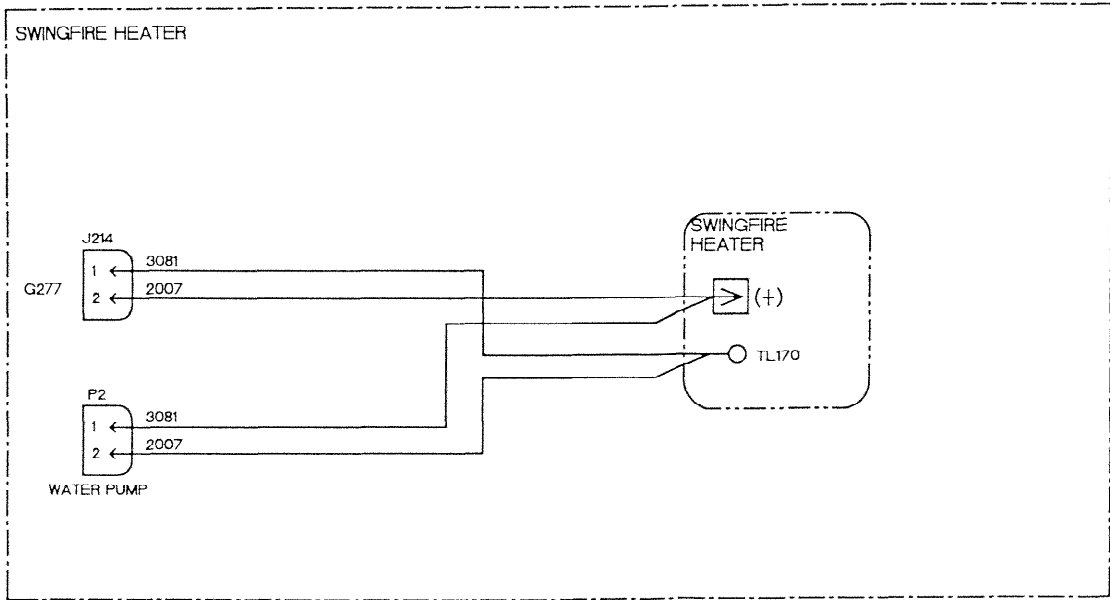


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 32 OF 40

SIZE	B	ILL. NO.	6WD0127A	FP-63/FP-64 BLANK
			287	288

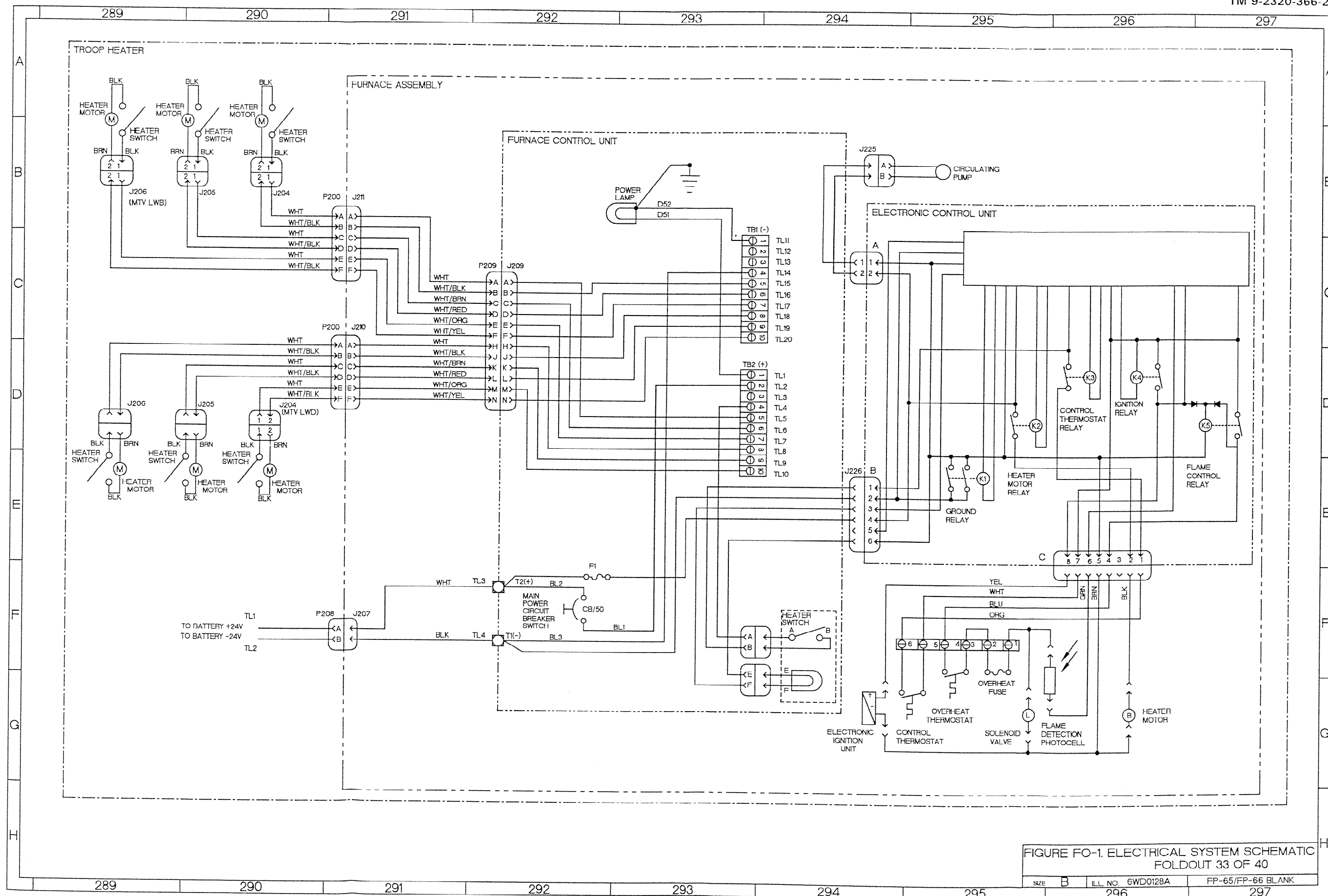


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 33 OF 40

FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 34 OF 40

SIZE	B	ILL. NO	6WD0129A	FP-67/FP-68 BLANK
			305	306

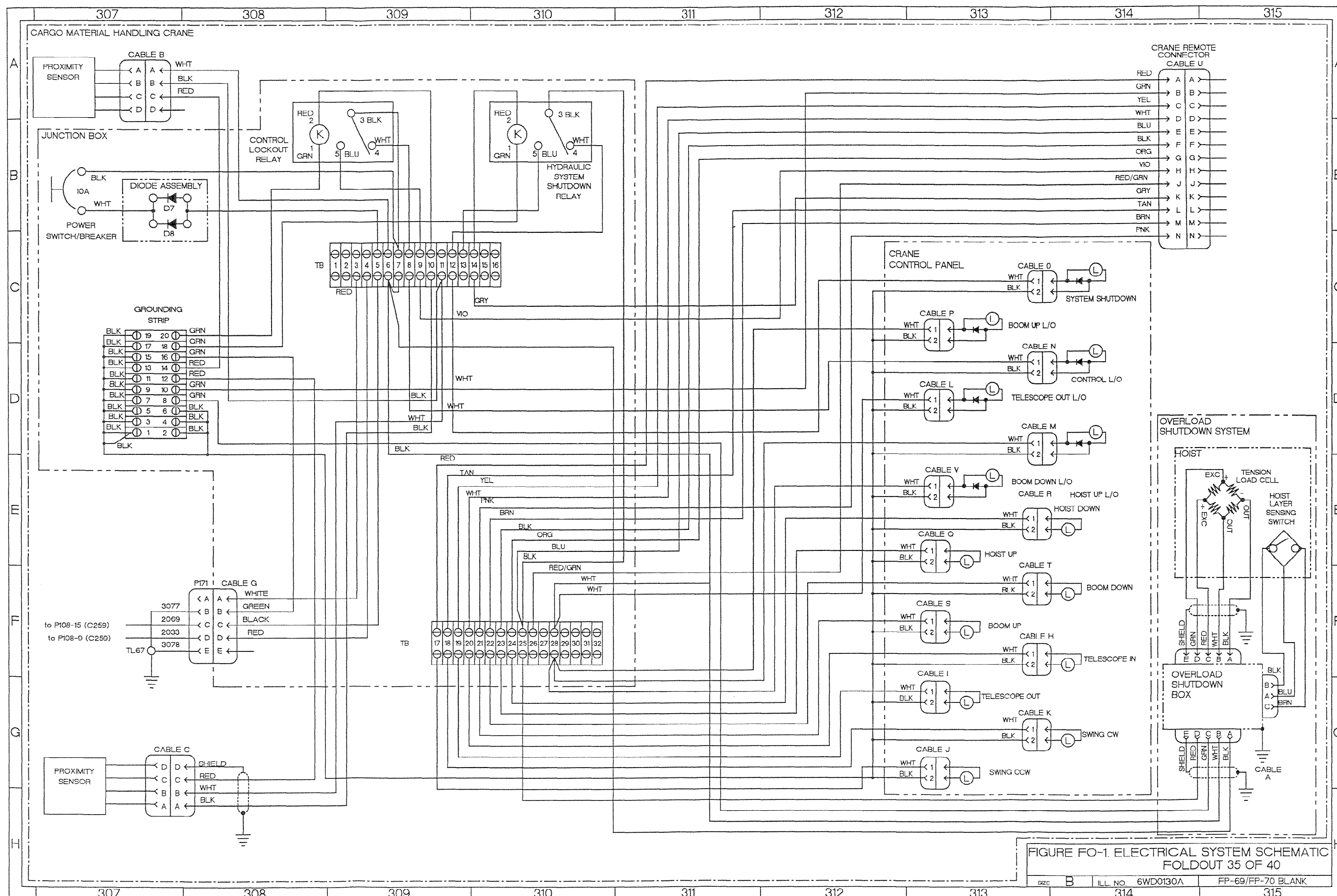
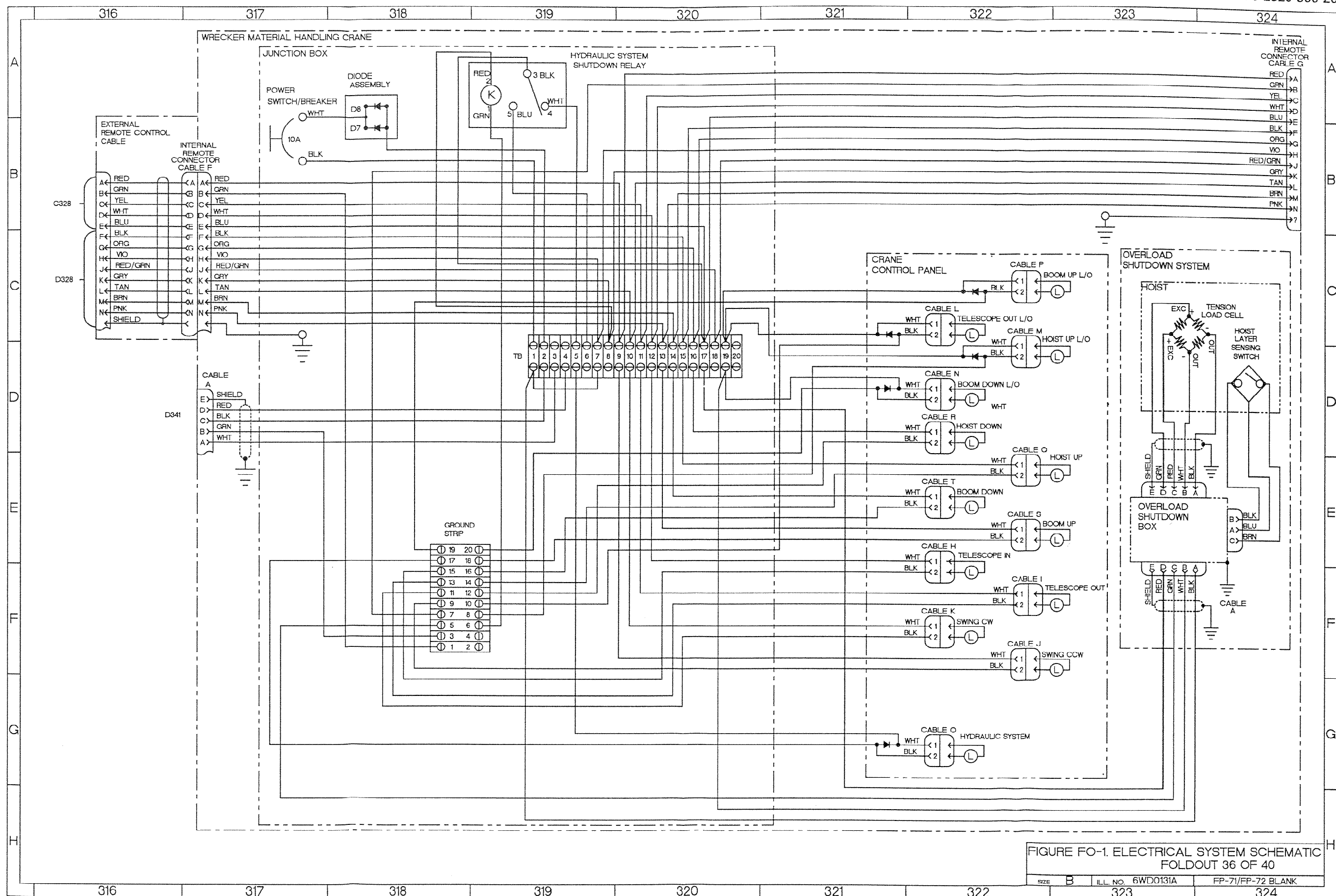


FIGURE FO-1. ELECTRICAL SYSTEM SCHEMATIC FOLDOUT 35 OF 40



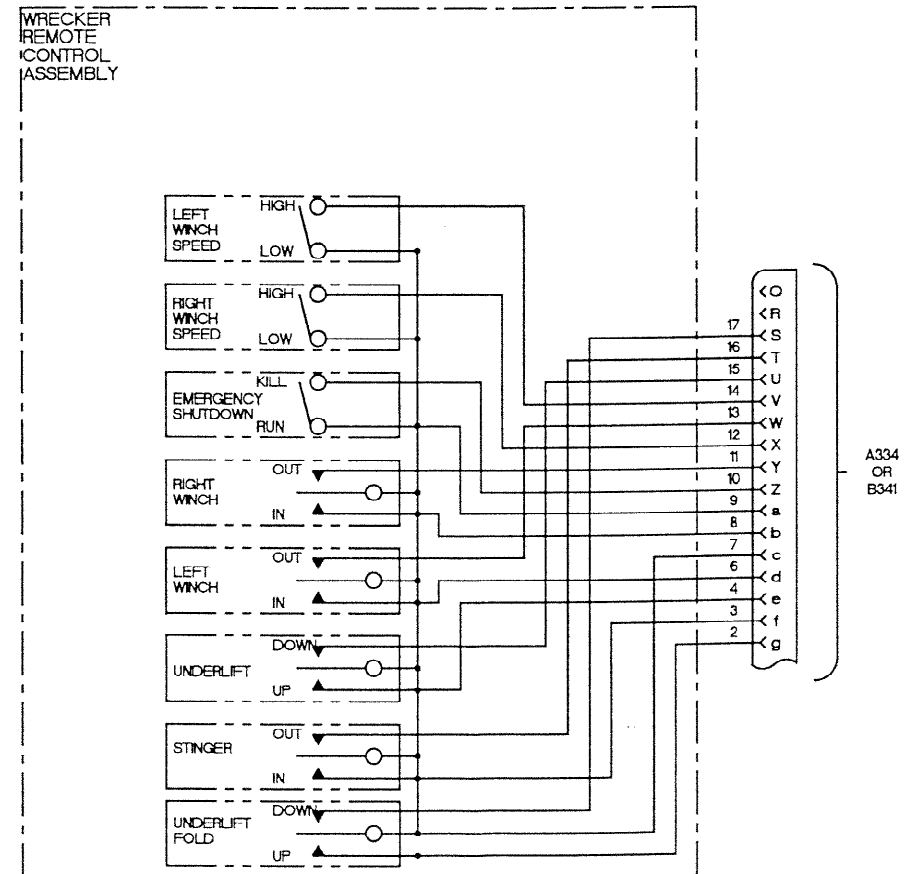
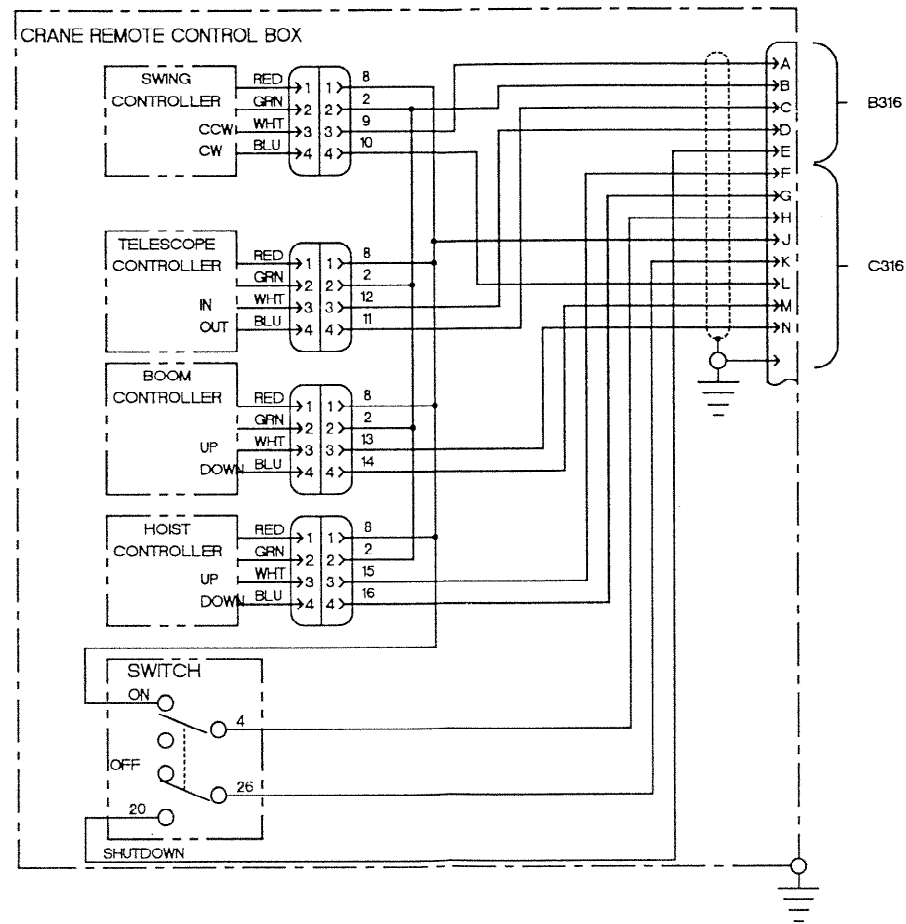


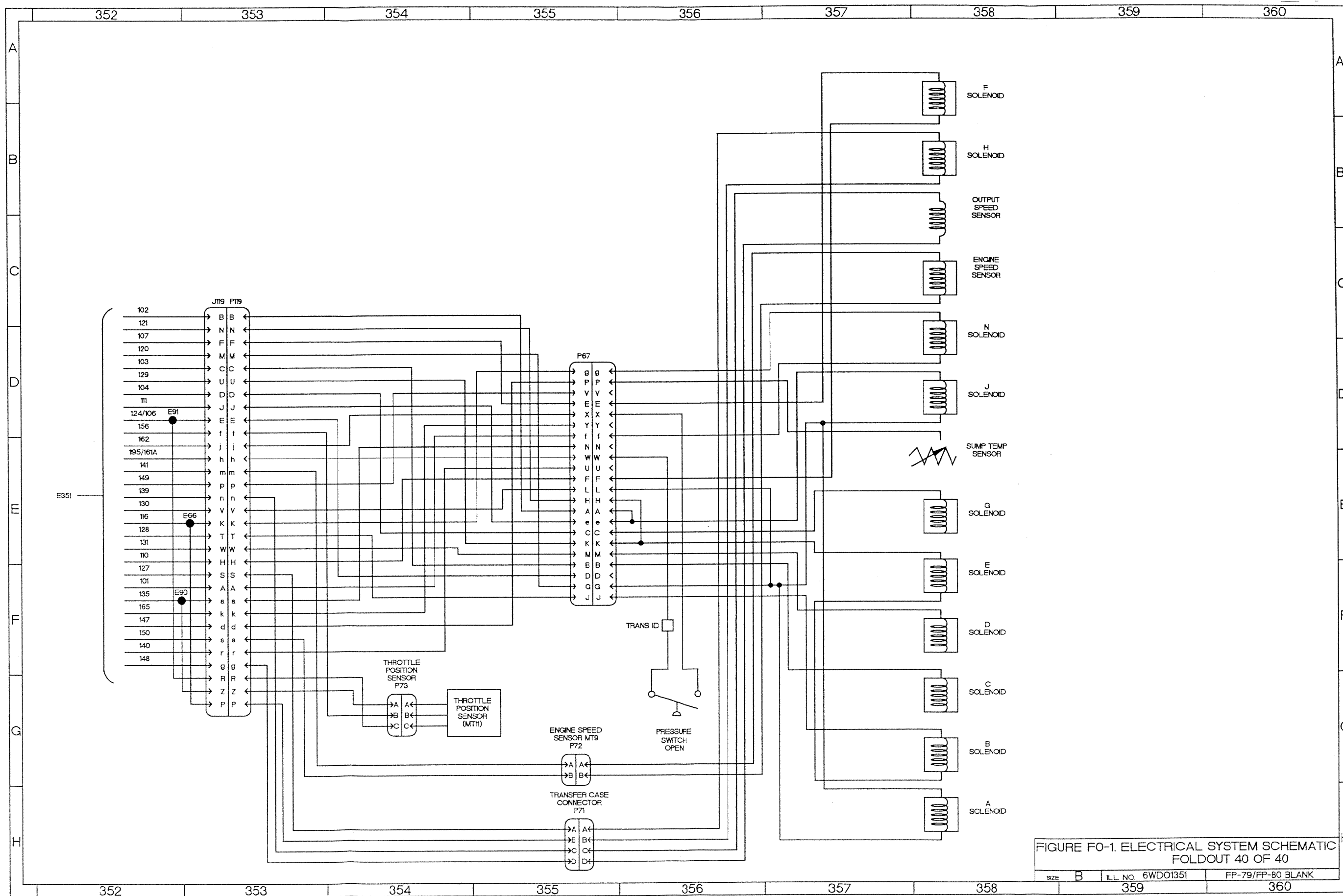
FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 37 OF 40

SIZE	B	ILL. NO.	6WDO132A	FP-73/FP-74 BLANK
			332	333

SIZE	B	ILL NO	6WD0133A	FP-75/FP-76 BLANK
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SIZE	B	ILL NO	6WD0133A	FP-75/FP-76 BLANK
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SIZE	B	ILL. NO. 6WD01341	FP-77/FP-78 BLANK
		350	351

FIGURE F0-1. ELECTRICAL SYSTEM SCHEMATIC
FOLDOUT 40 OF 40

SIZE	B	ILL. NO.	6WD01351	FP-79/FP-80	BLANK
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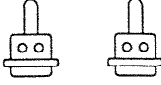
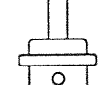
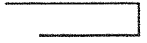
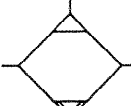
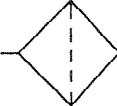
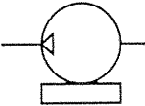
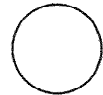
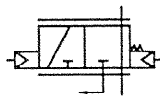
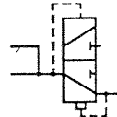
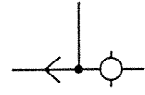
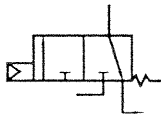
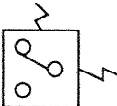
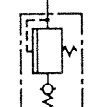
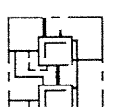
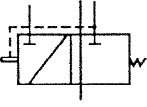
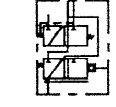
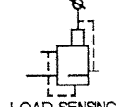
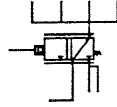
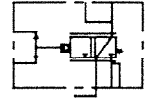
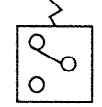
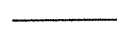
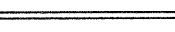
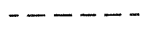
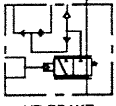
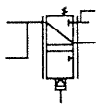
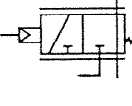
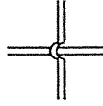
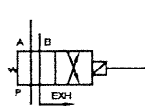
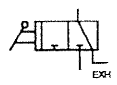
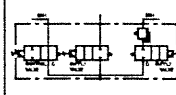
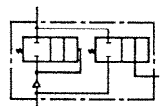
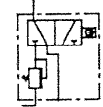
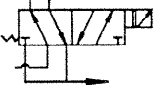
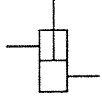
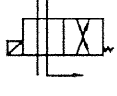
							
REAR AXLE BRAKE CHAMBER	FRONT AXLE BRAKE CHAMBER	COUPLER AIR BRAKE	AIR DRYER	AIR CLEANER INTAKE	AIR COMPRESSOR WITH GOVERNOR	AIR TANK	DASH GAUGE
							
MANUAL VALVE	ONE WAY CHECK VALVE	FAN CLUTCH	MODULATED CONTROL VALVE	QUICK RELEASE VALVE	TWO WAY CHECK VALVE	3/2 WAY SOLENOID VALVE	PRESSURE SWITCH
							
PRESSURE RELIEF VALVE	FOOT CONTROL VALVE	PARK CONTROL VALVE (HAND OPERATED)	TRAILER AIR SUPPLY VALVE (HAND OPERATED)	LOAD SENSING VALVE (MECHANICALLY CONTROLLED)	DIRECTIONAL RELAY VALVE	CONTROL VALVE WITH TWO WAY CHECK VALVE	STOPLIGHT SWITCH
							
CONNECTION	SUPPLY AIR HOSE	NO CONNECTION	DELIVERY AIR HOSE	PARK/EMERGENCY AIR HOSE	AIR BRAKE PROTECTING VALVE	INTERMEDIATE DIFFERENTIAL	AIR BRAKE PRESSURE TRANSMITTER
							
BOOSTER VALVE	AIR/HYDRAULIC INVERSION VALVE	DELIVERY AIR HOSE NO CONNECTION	DUMP TAILGATE SOLENOID	BLEED VALVE	TAILGATE CYLINDER	CTIS MANIFOLD VALVE	WHEEL VALVE
							
KNEELING VALVE	TIRE	(SINGLE ACTING) CYLINDER RETURN SPRING	2-POSITION SPRING OFFSET SOLENOID VALVE	(DOUBLE ACTING) CYLINDER	MANIFOLD VALVE	2-POSITION SOLENOID VALVE	

FIGURE F0-2 PNEUMATIC SYSTEM SCHEMATIC
FOLDOUT 1 OF 4

SIZE B ILL. NO. 6PD01A1 FP-1/FP-2 BLANK

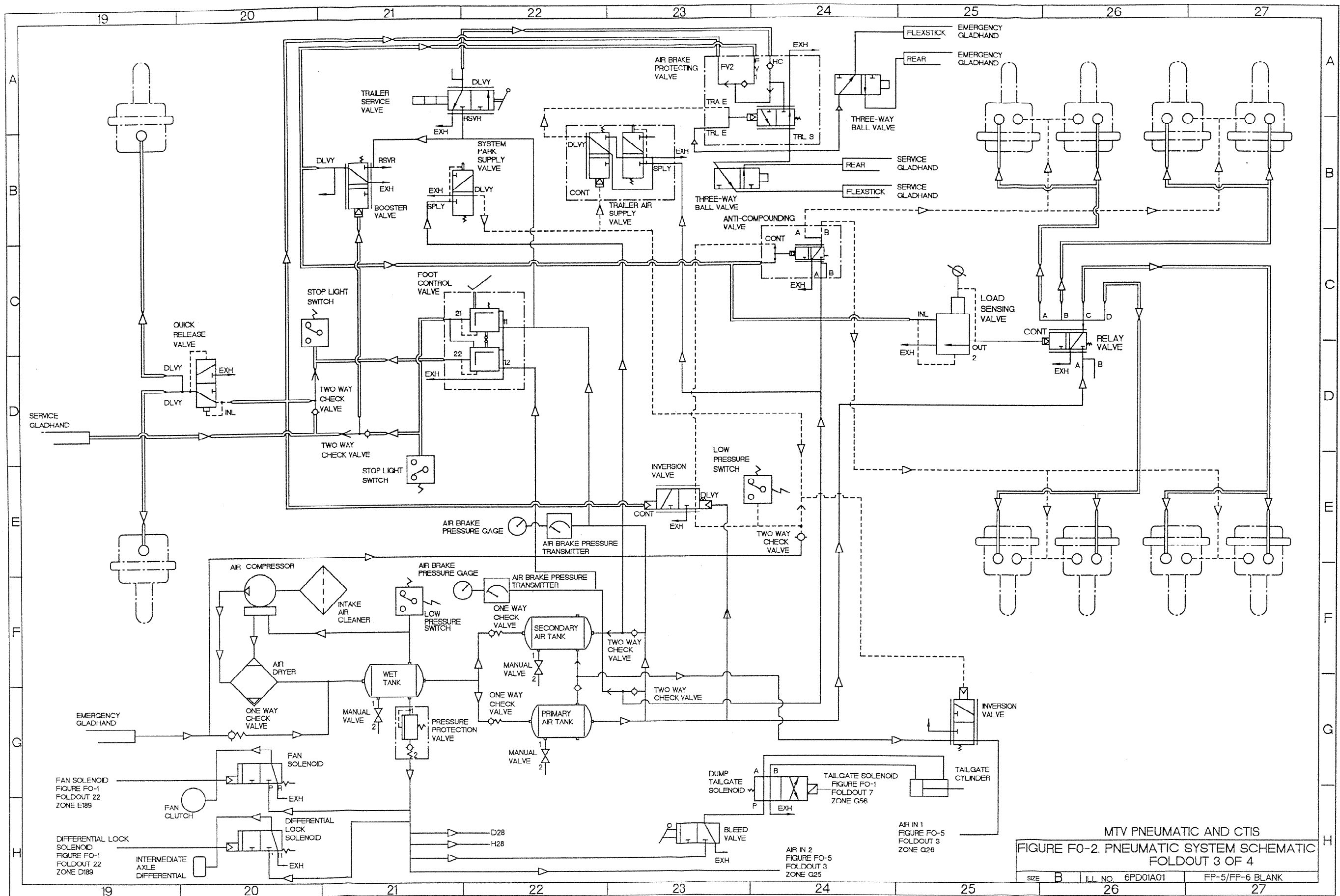
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A										A
B										B
C										C
D										D
E										E
F										F
G										G
H										H

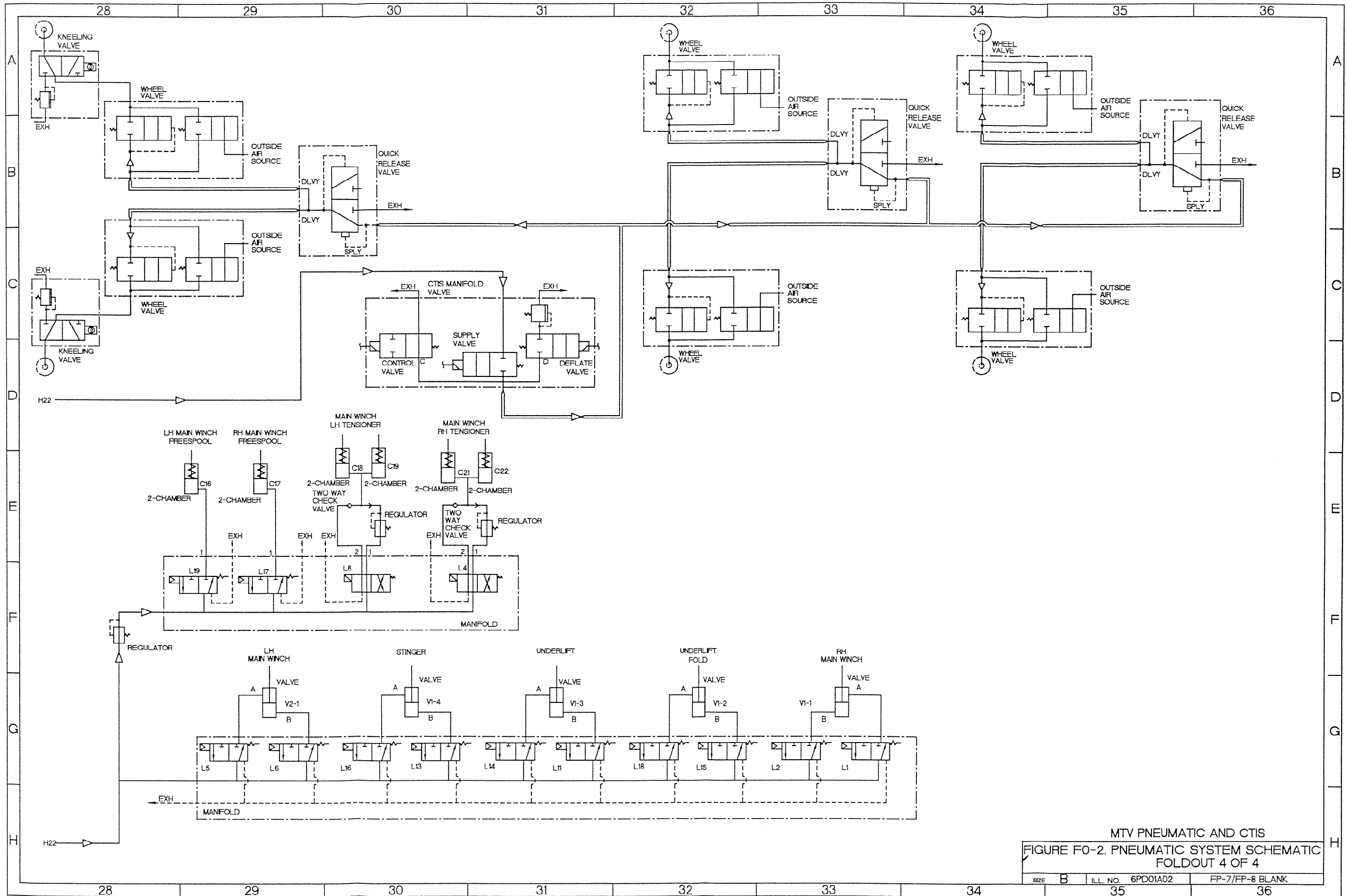
SH	ZONE	DESCRIPTION
3	E22	AIR BRAKE PRESSURE TRANSMITTER
3	F21	AIR BRAKE PRESSURE TRANSMITTER
3	A23	AIR BRAKE PROTECTING VALVE
3	F20	AIR COMPRESSOR
3	F20	AIR DRYER
3	B24	ANTI-COMPOUNDING VALVE
3	H23	BLEED VALVE
3	B21	BOOSTER VALVE
4	D30	CONTROL VALVE
4	C30	CTIS MANIFOLD VALVE
4	D31	DEFLATE VALVE
3	H20	DIFFERENTIAL LOCK SOLENOID
3	G24	DUMP TAILGATE SOLENOID
3	A25	EMERGENCY GLADHAND
3	A25	EMERGENCY GLADHAND
3	G19	EMERGENCY GLADHAND
3	H20	FAN CLUTCH
3	G20	FAN SOLENOID
3	C22	FOOT CONTROL VALVE
3	F20	INTAKE AIR CLEANER
3	H19	INTERMEDIATE AXLE DIFFERENTIAL
3	E23	INVERSION VALVE
3	G25	INVERSION VALVE
4	A28	KNEELING VALVE
4	C28	KNEELING VALVE
4	E28	LH MAIN WINCH FREESPOOL
4	E30	LH MAIN WINCH TENSIONER
4	G29	LH MAIN WINCH VALVE
3	C25	LOAD SENSING VALVE
3	E23	LOW PRESSURE SWITCH
3	F21	LOW PRESSURE SWITCH
4	F28	MANIFOLD
4	G29	MANIFOLD
3	F22	MANUAL VALVE
3	G21	MANUAL VALVE
3	G22	MANUAL VALVE
3	F22	ONE WAY CHECK VALVE
3	G20	ONE WAY CHECK VALVE
3	G22	ONE WAY CHECK VALVE
3	G21	PRESSURE PROTECTION VALVE
3	G22	PRIMARY AIR TANK
4	B30	QUICK RELEASE VALVE
4	B33	QUICK RELEASE VALVE
4	B36	QUICK RELEASE VALVE
3	C20	QUICK RELEASE VALVE
4	E30	REGULATOR
4	E31	REGULATOR

SH	ZONE	DESCRIPTION
4	F28	REGULATOR
3	D26	RELAY VALVE
4	E29	RH MAIN WINCH FREESPOOL
4	E30	RH MAIN WINCH TENSIONER
4	G33	RH MAIN WINCH VALVE
3	F22	SECONDARY AIR TANK
3	B24	SERVICE GLADHAND
3	B24	SERVICE GLADHAND
3	D19	SERVICE GLADHAND
4	G30	STINGER VALVE
3	C20	STOPLIGHT SWITCH
3	E21	STOPLIGHT SWITCH
4	D31	SUPPLY VALVE
3	B21	SYSTEM PARK SUPPLY VALVE
3	G25	TAILGATE CYLINDER
3	A24	THREE WAY BALL VALVE
3	B23	THREE WAY BALL VALVE
3	B22	TRAILER AIR SUPPLY VALVE
3	A21	TRAILER SERVICE VALVE
3	D21	TWO WAY CHECK VALVE
3	D21	TWO WAY CHECK VALVE
3	E24	TWO WAY CHECK VALVE
4	E30	TWO WAY CHECK VALVE
4	E30	TWO WAY CHECK VALVE
3	F23	TWO WAY CHECK VALVE
3	G23	TWO WAY CHECK VALVE
4	G32	UNDERLIFT FOLD VALVE
4	G31	UNDERLIFT VALVE
3	F21	WET TANK
4	C34	WHEEL VALVE
4	A28	WHEEL VALVE
4	A32	WHEEL VALVE
4	A34	WHEEL VALVE
4	C28	WHEEL VALVE
4	C32	WHEEL VALVE

SIZE	ILL. NO.	FP-3/FP-4 BLANK
B	6PDO1AL2	

MTV PNEUMATIC AND CTIS
FIGURE F0-2. PNEUMATIC SYSTEM SCHEMATIC
FOLDOUT 2 OF 4





MTV PNEUMATIC AND CTIS
 FIGURE F0-2. PNEUMATIC SYSTEM SCHEMATIC
 FOLDOUT 4 OF 4

SIZE	B	ILL. NO.	6PD01A02	FP-7/FP-8 BLANK
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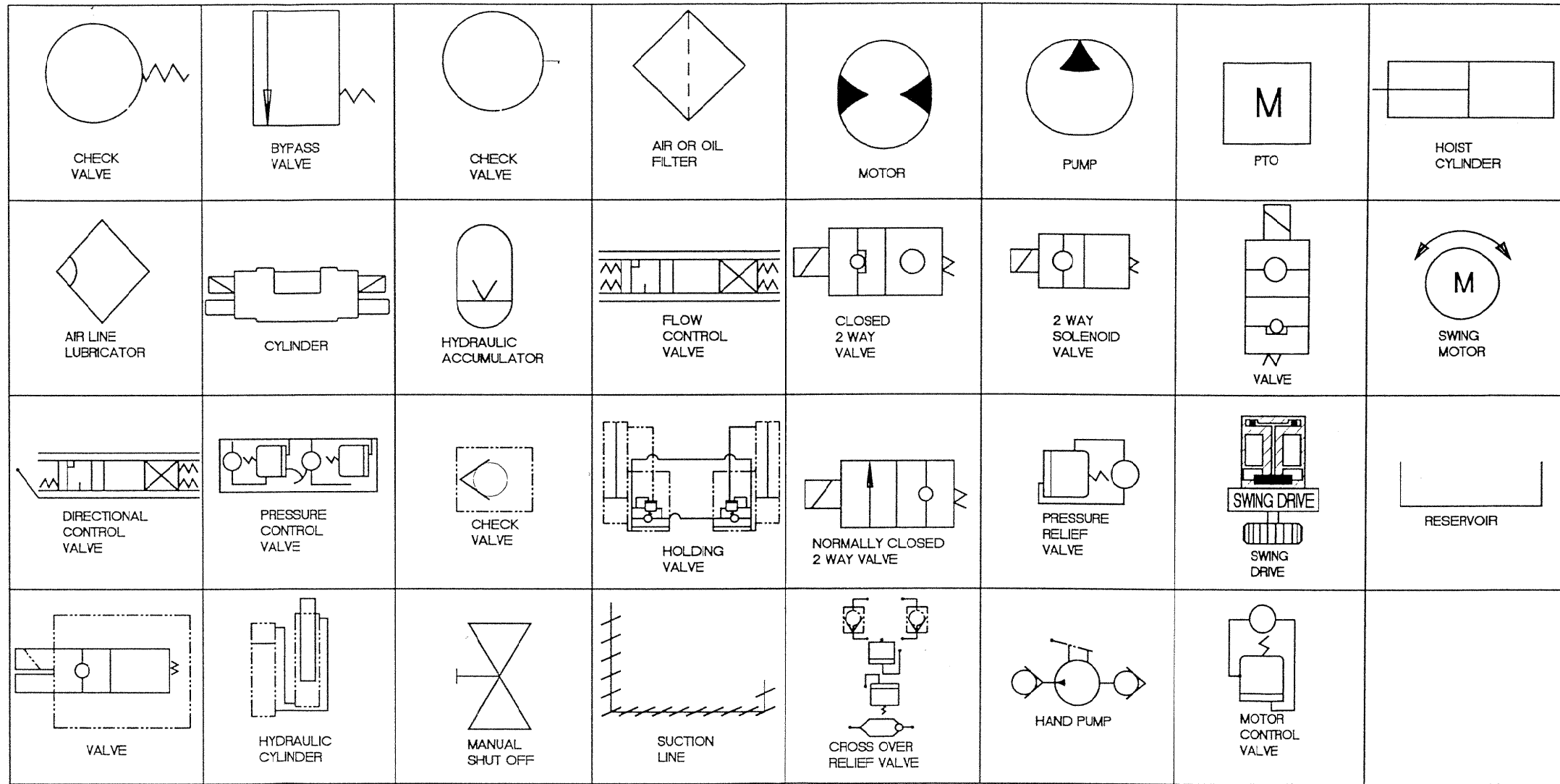


FIGURE FO-3. HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 1 OF 8
SIZE B ILL. NO. 6HDO1A11 FP-1/FP-2 BLANK

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B									
C									
D									
E									
F									
G									
H									

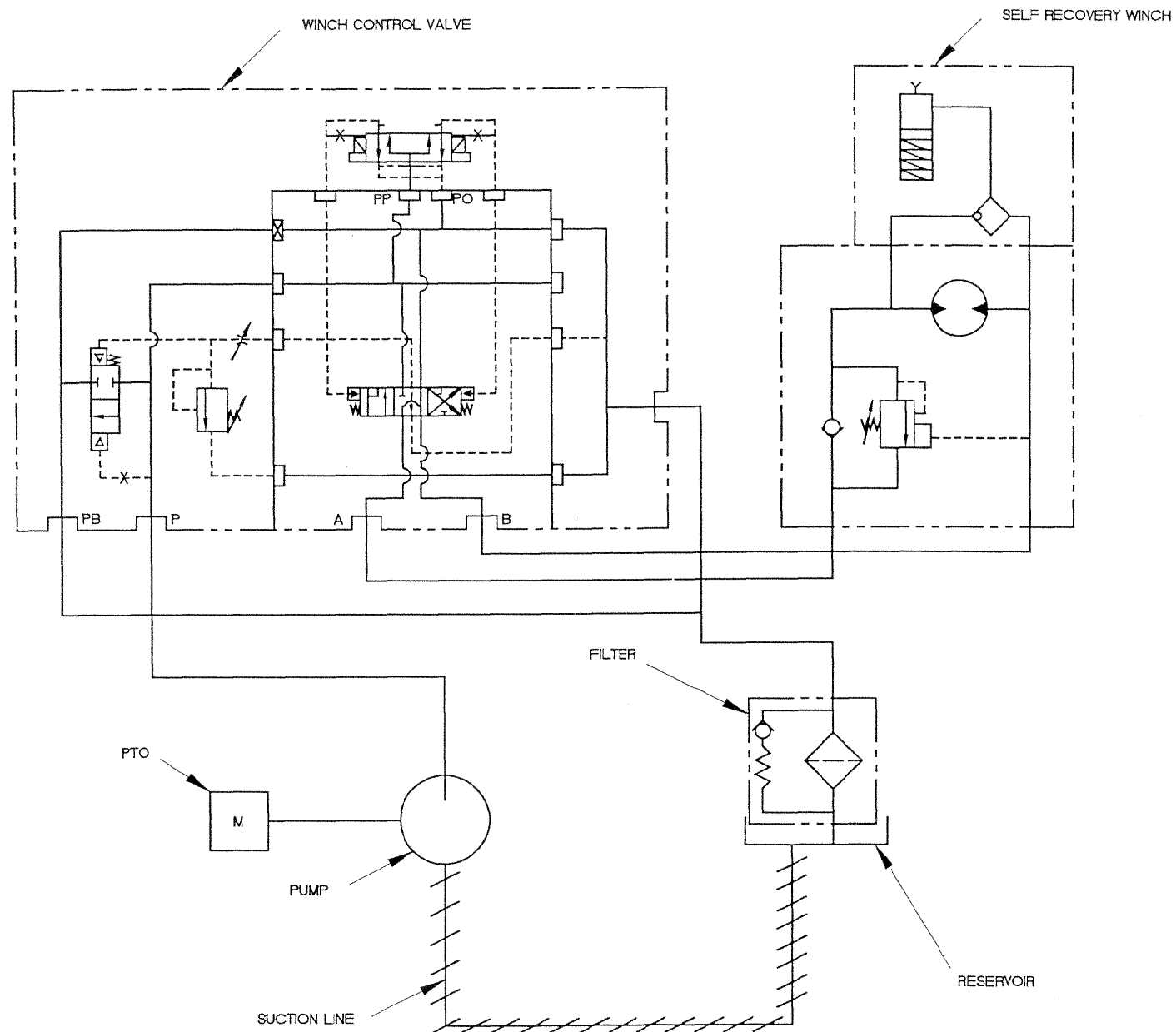
SH	ZONE	DESCRIPTION
6	D46	2 WAY SOLENOID VALVE
7	D60	2 WAY SOLENOID VALVE
7	D55	2 WAY SOLENOID VALVE, OPERATING PRESS
7	F60	3 BANK VALVE ASSEMBLY
7	C61	4 BANK VALVE ASSEMBLY
6	B52	BOOM
7	F55	BULKHEAD PLATE (SUBFRAME)
7	F57	CHECK VALVE
7	G62	CHECK VALVE
7	D55	CHECK VALVE
5	E37	CHECK VALVE CK1
5	E37	CHECK VALVE CK2
5	E37	CHECK VALVE CK3
5	E37	CHECK VALVE CK4
5	E37	CHECK VALVE CK5
5	E37	CHECK VALVE CK6
8	E65	CONTROL VALVE
5	B44	COUNTERBALANCE VALVE
6	B48	CROSS RELIEF VALVE
7	C57	CROSS RELIEF VALVE
8	E64	DUMP BODY HYDRAULIC HOIST
6	G48	ERECTION CYLINDER
5	E38	FC1 SLAVE POWER
5	E38	FC2 EXTERNAL POWER
3	F23	FILTER
4	D34	FILTER
8	E68	FILTER
5	B43	FLOW CONTROL VALVE
5	B45	FLOW CONTROL VALVE
5	B43	FOLD CYLINDER
7	C62	FULL FLOW
6	G54	GAUGE PORT
6	E47	HAND PUMP
7	E56	HAND PUMP
7	G57	HOIST
7	A62	HOIST
6	B53	HOIST
8	G65	HOIST CYLINDER
7	G58	HOIST MOTOR
6	G46	HOIST MOTOR
7	H57	HOIST MOTOR CONTROL VALVE
6	H46	HOIST MOTOR CONTROL VALVE
7	H59	HOLDING VALVE
7	G62	HOLDING VALVE
6	C47	HOLDING VALVE
6	H53	HOLDING VALVE
7	C55	HOLDING VALVE
7	G56	HOLDING VALVES
6	E48	HOLDING VALVES
6	G48	HOLDING VALVES
5	D41	HYDRAULIC MOTOR, PAY-OUT
5	E41	HYDRAULIC MOTOR, PAY-OUT
7	A60	HYDRAULIC ACCUMULATOR

SH	ZONE	DESCRIPTION
6	E54	HYDRAULIC ACCUMULATOR
7	H61	LEFT JACK CYLINDER
6	H49	LEFT JACK CYLINDER
5	G42	LEFT MAIN WINCH
7	A61	LIFT
6	E48	LIFT CYLINDERS
5	C37	LINEAR DIRECTIONAL CONTROL VALVE
5	B42	LOWER MAIN CONTROL VALVE ASSEMBLY
5	D37	M089 MATERIAL HANDLING CRANE LOC.
6	B51	MANUAL OVERRIDE
7	G61	MAST ERECTION
7	H59	MAST ERECTION CYLINDER
4	C30	MATERIAL HANDLING EQUIPMENT
5	E38	MC1 SLAVE POWER
5	E38	MC2 EXTERNAL POWER
5	D40	MONO BLOCK VALVE ASSEMBLY
7	G58	MOTOR DRAIN
6	G46	MOTOR DRAIN
6	D54	N/C 2 WAY VALVE
6	H52	OUTRIGGER EXTENSION CYLINDER
7	A60	PRESSURE CHECK POINT
3	F21	PTO
4	E32	PTO
8	G68	PTO
3	F22	PUMP
4	E33	PUMP
8	F68	PUMP
5	F37	PUMP ASSEMBLY
5	D41	RELIEF VALVE
5	E41	RELIEF VALVE
5	F42	RELIEF VALVE ASSEMBLY
5	B42	RELIEF VALVE ASSY (RIGHT MAIN WINCH)
3	F24	RESERVOIR
4	F34	RESERVOIR
8	G69	RESERVOIR
5	G40	RETURN VALVE
5	B44	RH UNDERLIFT COUNTERBALANCE VALVE
7	G62	RIGHT JACK CYLINDER
6	H54	RIGHT JACK CYLINDER
5	B42	RIGHT MAIN WINCH
5	F40	SAMPLING VALVE
3	B24	SELF RECOVERY WINCH
5	G41	SELF RECOVERY WINCH
8	B71	SELF RECOVERY WINCH
5	G43	STIFFLEG CYLINDER LH
5	G45	STIFFLEG CYLINDER RH
5	B45	STINGER CYLINDER
7	F55	SUCTION LINE-HAND PUMP
3	G22	SUCTION LINE
4	F33	SUCTION LINE
5	F37	SUPPLY VALVE
7	A58	SWING
6	B50	SWING

SH	ZONE	DESCRIPTION
6	B48	SWING DRIVE
7	B57	SWING DRIVE
6	A48	SWING MOTOR
7	B57	SWING MOTOR
6	C46	TELESCOPE CYLINDER
7	A59	TELESCOPE
6	B51	TELESCOPE
7	B55	TELESCOPE CYLINDER
5	A44	TELESCOPIC LIFT CYLINDER, LH
5	A45	TELESCOPIC LIFT CYLINDER, RH
6	F49	UNLOADER VALVE
7	E56	UNLOADER VALVE
5	E42	UPPER MAIN CONTROL VALVE ASSEMBLY
5	E37	VALVE, SELECTOR
3	B21	WINCH CONTROL VALVE
8	B69	WINCH CONTROL VALVE

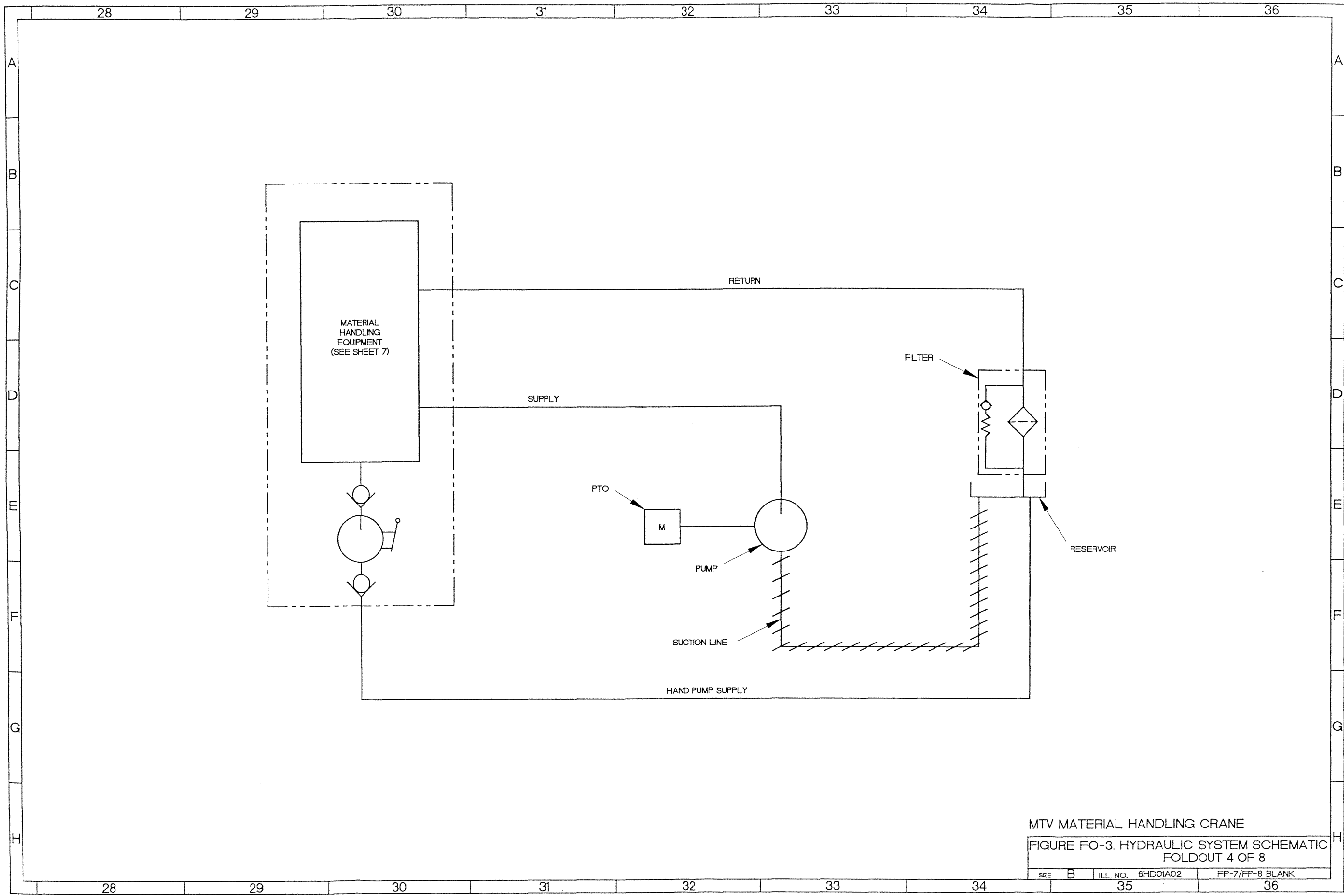
FIGURE FO-3 HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 2 OF 8

SPF	B	ILL. NO. 6H001AL2	FP-3/FP-4 BLANK
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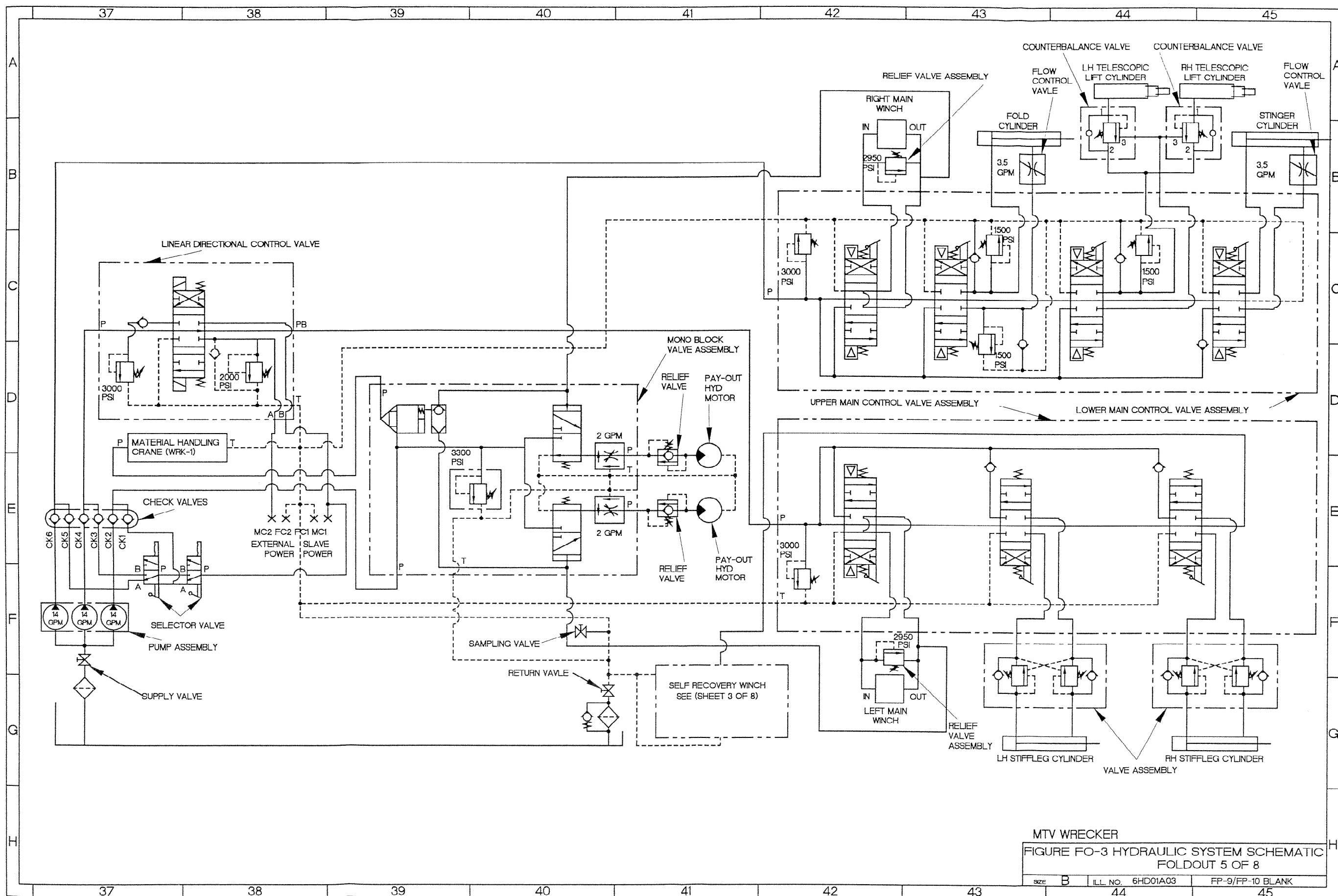
MTV TRUCK W/WINCH
 FIGURE FO-3. HYDRAULIC SYSTEM SCHEMATIC
 FOLDOUT 3 OF 8

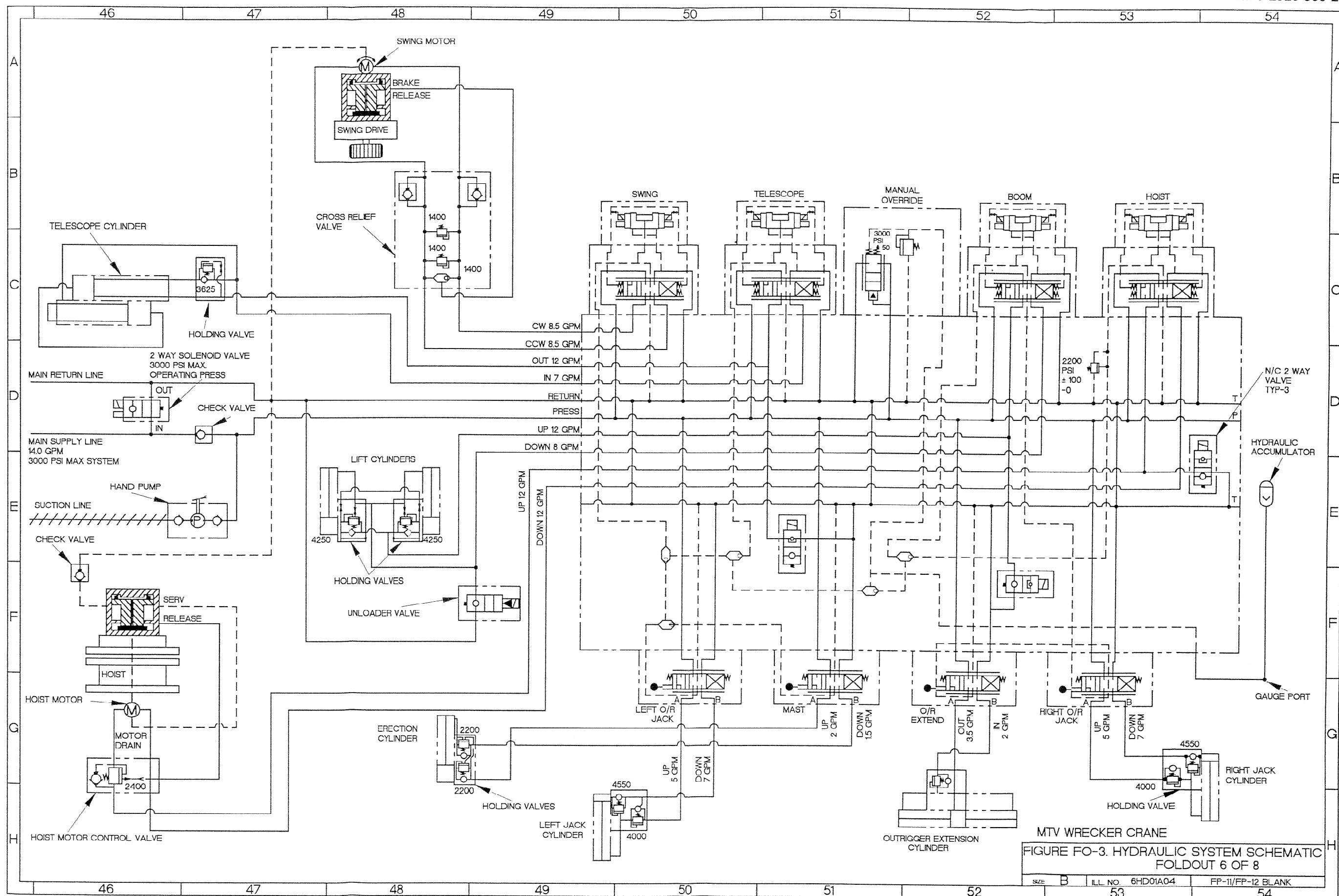
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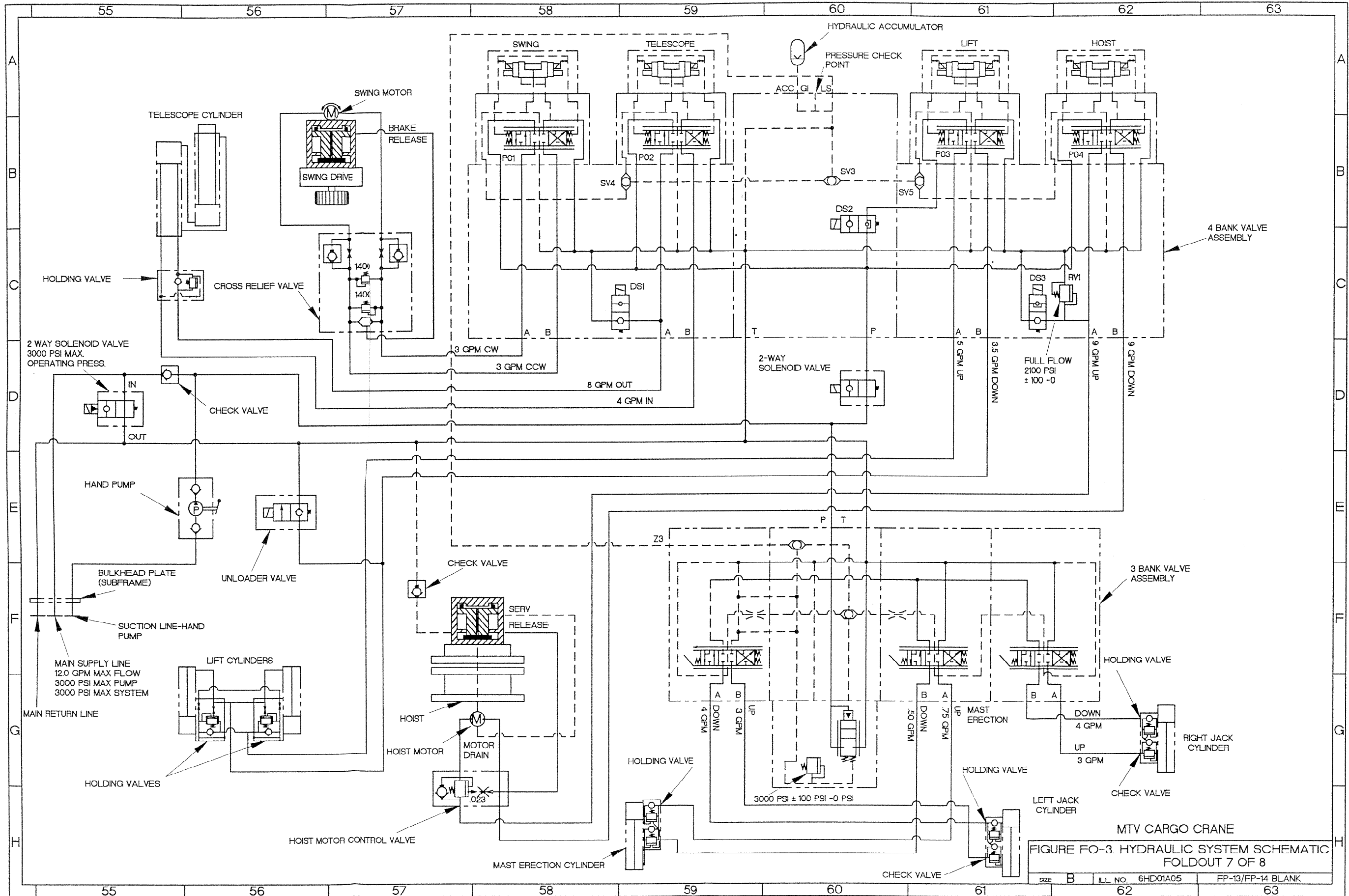


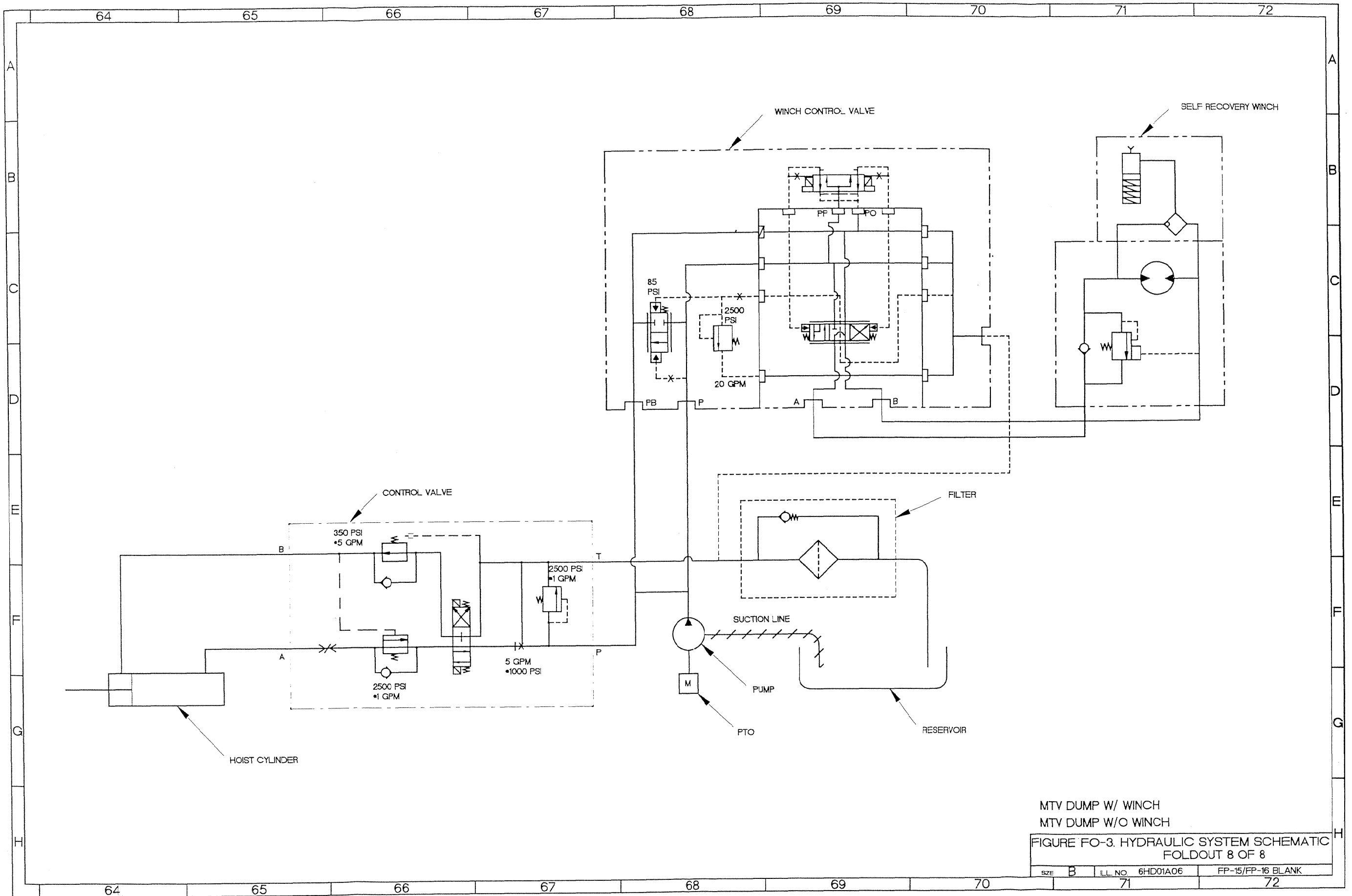
MTV MATERIAL HANDLING CRANE
FIGURE FO-3. HYDRAULIC SYSTEM SCHEMATIC
FOLDOUT 4 OF 8

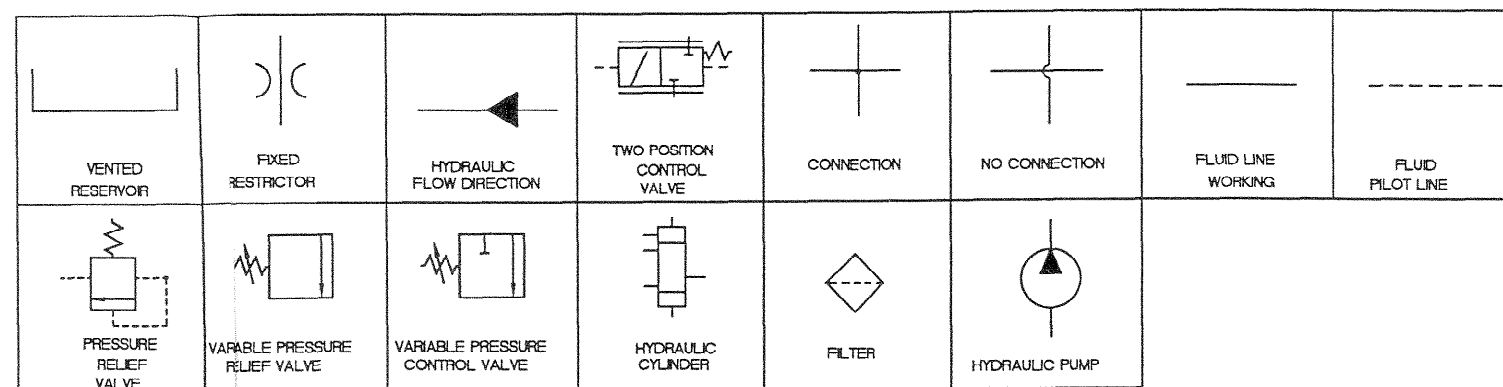
SIZE	B	ILL. NO.	6HD01A02	FP-7/FP-8 BLANK
			35	36











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. YSD01A11 FP-1/FP-2 BLANK

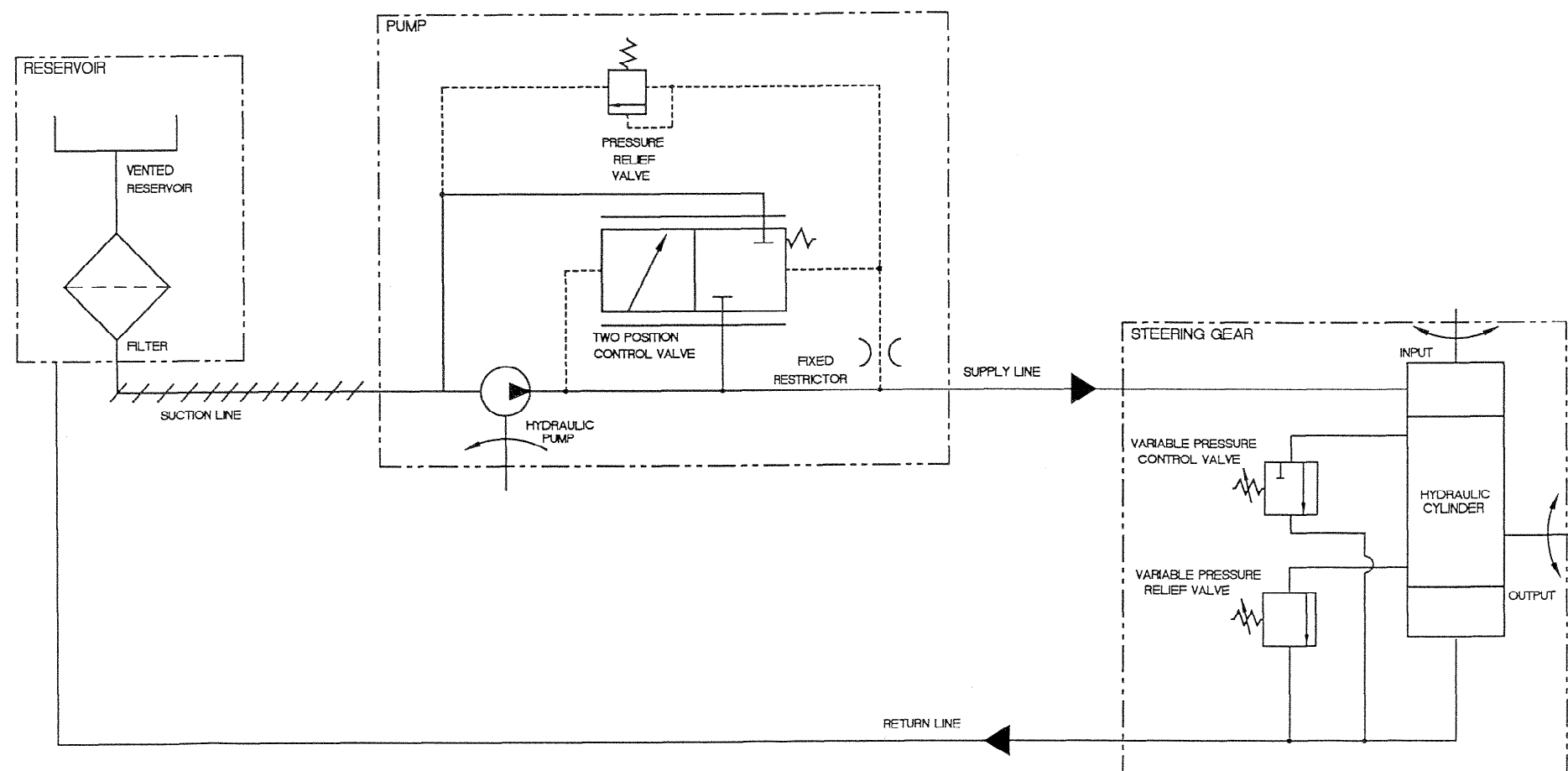


FIGURE FO-4 HYDRAULIC STEERING SYSTEM
FOLDOUT 2 OF 2

SIZE	B	ILL. NO.	YSD01A01	FP-3/FP-4 BLANK
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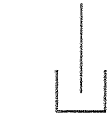
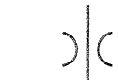
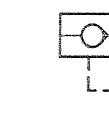
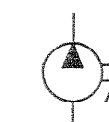
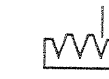
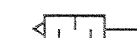
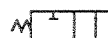
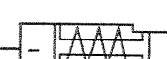
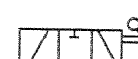
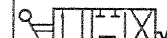
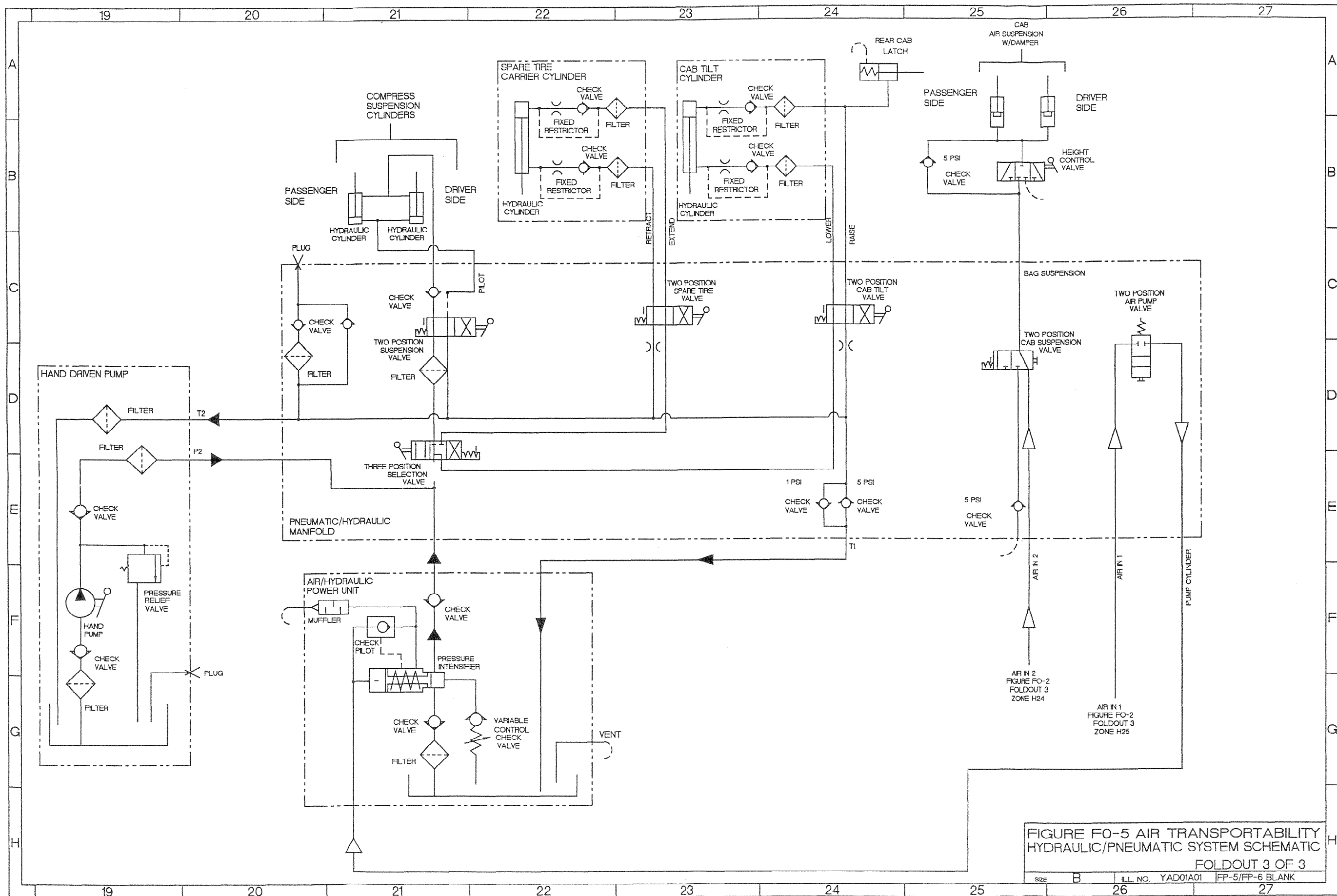
 VENTED RESERVOIR	 ABOVE FLUID LEVEL RESERVOIR	 HYDRAULIC FLOW DIRECTION	 PNEUMATIC FLOW DIRECTION	 CONNECTION	 NO CONNECTION	 FLUID LINE WORKING	 FLUID PILOT LINE
 FIXED RESTRICTOR	 CHECK VALVE	 VARIABLE CONTROL CHECK VALVE	 CHECK PILOT	 PRESSURE RELIEF VALVE	 FILTER	 HAND PUMP	 DETENT
 TWO POSITION CAB SUSPENSION VALVE	 MUFFLER	 HYDRAULIC CYLINDER	 CAB AIR SUSPENSION W/DAMPER	 REAR CAB LATCH	 TWO POSITION AIR PUMP VALVE	 PRESSURE INTENSIFIER	 HEIGHT CONTROL VALVE
 TWO POSITION CAB TILT VALVE	 TWO POSITION SUSPENSION VALVE	 TWO POSITION SPARE TIRE VALVE	 THREE POSITION SELECTION VALVE				

FIGURE FO-5 AIR TRANSPORTABILITY
HYDRAULIC/PNEUMATIC SYSTEM SCHEMATIC
FOLDOUT 1 OF 3
SIZE B ILL. NO. YAD01A11 FP-1/FP-2 BLANK

SH	ZONE	DESCRIPTION
3	A25	CAB AIR SUSPENSION W/DAMPER
3	F21	CHECK PILOT
3	A22	CHECK VALVE
3	A23	CHECK VALVE
3	B22	CHECK VALVE
3	B23	CHECK VALVE
3	B25	CHECK VALVE
3	C20	CHECK VALVE
3	C21	CHECK VALVE
3	E19	CHECK VALVE
3	E24	CHECK VALVE
3	E25	CHECK VALVE
3	F19	CHECK VALVE
3	F21	CHECK VALVE
3	G21	CHECK VALVE
3	A22	FILTER
3	B22	FILTER
3	A24	FILTER
3	B24	FILTER
3	D19	FILTER
3	D20	FILTER
3	D21	FILTER
3	E19	FILTER
3	G19	FILTER
3	G21	FILTER
3	A22	FIXED RESTRICTOR
3	B22	FIXED RESTRICTOR
3	A23	FIXED RESTRICTOR
3	B23	FIXED RESTRICTOR
3	F19	HAND PUMP
3	B25	HEIGHT CONTROL VALVE
3	B22	HYDRAULIC CYLINDER
3	B23	HYDRAULIC CYLINDER
3	C21	HYDRAULIC CYLINDER
3	F20	MUFFLER
3	F21	PRESSURE INTENSIFIER
3	F19	PRESSURE RELIEF VALVE
3	A24	REAR CAB LATCH
3	E21	THREE POSITION SELECTION VALVE
3	D26	TWO POSITION AIR PUMP VALVE
3	D25	TWO POSITION CAB SUSPENSION VALVE
3	C24	TWO POSITION CAB TILT VALVE
3	C23	TWO POSITION SPARE TIRE VALVE
3	D21	TWO POSITION SUSPENSION VALVE
3	G22	VARIABLE CONTROL CHECK VALVE
3	G22	VENTED RESERVOIR

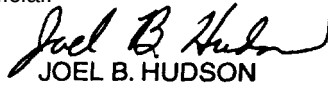
FIGURE FO-5 AIR TRANSPORTABILITY
HYDRAULIC/PNEUMATIC SYSTEM SCHEMATIC
FOLDOUT 2 OF 3

SIZE B ILL. NO. YAD01AL2 FP-3/FP-4 BLANK



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*Administrative Assistant to the
Secretary of the Army*
05189

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PAGE NO.	PARA- GRAPH	PICTURE NO.	TABLE NO.
15-33	15-7	4	
19-6	19-2		

IN THIS SPACE TELL WHAT IS WRONG
AND WHAT SHOULD BE DONE ABOUT IT:

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

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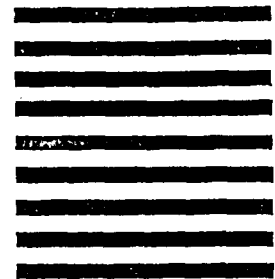
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TEAR ALONG PERFORATED LINE

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

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

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
 1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

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

CUBIC MEASURE

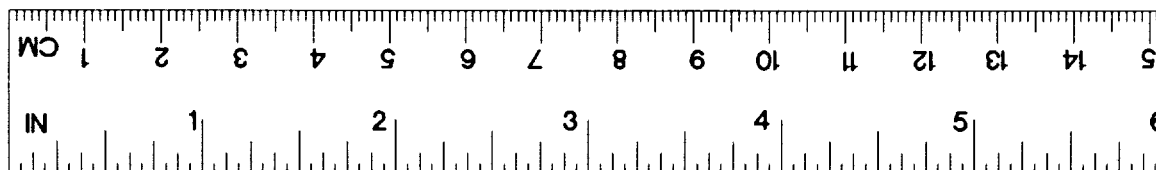
1 Cu Centimeter = 1000 Cu Millimeters = 0.06 Cu Inches
 1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

TEMPERATURE

$5/9 (^{\circ}\text{F} - 32) = ^{\circ}\text{C}$
 212° Fahrenheit is equivalent to 100° Celsius
 90° Fahrenheit is equivalent to 32.2° Celsius
 32° Fahrenheit is equivalent to 0° Celsius
 $9/5 \text{ C}^{\circ} + 32 = \text{F}^{\circ}$

APPROXIMATE CONVERSION FACTORS

<u>TO CHANGE</u>	<u>TO</u>	<u>MULTIPLY BY</u>	<u>TO CHANGE</u>	<u>TO</u>	<u>MULTIPLY BY</u>
Inches	Centimeters	2.540	Centimeters	Inches	0.394
Inches	Millimeters	25.4	Millimeters	Inches	3.937
Feet	Meters	0.305	Meters	Feet	3.280
Yards	Meters	0.914	Meters	Yards	1.094
Miles	Kilometers	1.609	Kilometers	Miles	0.621
Square Inches	Square Centimeters	6.451	Sq Centimeters	Square Inches	0.155
Square Feet	Square Meters	0.093	Square Meters	Square Feet	10.764
Square Yards	Square Meters	0.836	Square Meters	Square Yards	1.196
Square Miles	Square Kilometers	2.590	Square Kilometers	Square Miles	0.386
Acres	Square Hectometers	0.405	Sq Hectometers	Acres	2.471
Cubic Feet	Cubic Meters	0.028	Cubic Meters	Cubic Feet	35.315
Cubic Yards	Cubic Meters	0.765	Cubic Meters	Cubic Yards	1.308
Fluid Ounces	Milliliters	29.573	Milliliters	Fluid Ounces	0.034
Pints	Liters	0.473	Liters	Pints	2.113
Quarts	Liters	0.946	Liters	Quarts	1.057
Gallons	Liters	3.785	Liters	Gallons	0.264
Ounces	Grams	28.349	Grams	Ounces	0.035
Pounds	Kilograms	0.454	Kilograms	Pounds	2.205
Pounds (force)	Newtons	4.448	Newtons	Pounds (force)	0.2248
Short Tons	Metric Tons	0.907	Metric Tons	Short Tons	1.102
Pound-Feet	Newton-Meters	1.356	Newton-Meters	Pound-Feet	0.738
Pounds/Sq Inch	Kilopascals	6.895	Kilopascals	Pounds per Sq Inch	0.145
Miles per Gallon	Kilometers per Liter	0.425	Km per Liter	Miles per Gallon	2.354
Miles per Hour	Kilometers per Hour	1.609	Km per Hour	Miles per Hour	0.621



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